

TRIUMPH GT6 and VITESSE 2-litre WORKSHOP MANUAL

GROUP 0

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Lubrication and regular maintenance—refer to Handbook supplied with vehicle.	

	GT6	GT6-MK. 2	GT6-PLUS	GT6-MK. 3	GT6-MK. 3 (USA MARKET)	VITESSE-2 LITRE	VITESSE-MK. 2
ENGINE							
Number of cylinders	6	6	6	6	6	6	6
Bore of cylinders	2.94in. 74.7mm.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Stroke of crankshaft	2.992in. 76.0mm.						
Piston area	40.7sq.in. 263sq.cms.						
Cubic capacity	122cu.in. 1998cu.cms.	9.25 to 1	9.25 to 1	1972/73—9.0 to 1	1972/73—8.0 to 1	9.5 to 1	9.25 to 1
Compression ratio	9.5 to 1			1971 —9.25 to 1	1971 —9.25 to 1		
Valve rocker clearances—inlet and exhaust (cold)	0.010in. 0.254mm.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Valve timing (with valve clearances set at 0.0165in.) (0.42mm.)	Inlet and exhaust valves to be equally open at T.D.C. on exhaust stroke No. 6 cylinder						
LUBRICATION (ENGINE)							
Type of oil pump	Hobourn Eaton—high capacity eccentric lobe type.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Oil filter	Purolator, A.C. Delco or Tecalemit full flow filter (replacement element).						
COOLING SYSTEM							
Circulation	No-loss system pump. Thermostatically controlled flow.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Fan	12½in. (318mm.) diameter, six blades fitted on crankshaft.	12½in. (318mm.) diameter, eight blades fitted on crankshaft.	As GT6	12½in. (318mm.) diameter, seven blades fitted on crankshaft.	1972/73—13in. (330mm.) diameter, 13 blades fitted on crankshaft. 1971—As GT6 Mk. 2	As GT6	As GT6
CARBURETTERS							
Type	Stromberg 150CD Twin side draught	As GT6	Stromberg 150CDSE Twin side draught	1972-73 Stromberg 150 CDSE 1971 Stromberg 150CD Twin side draught	1973—Stromberg 150 CDSE 1971/72 — Stromberg 150CDSE Twin side draught	As GT6	As GT6 Mk. 2
Jet needle	6J	6AC	B5AJ	1971-B59T 1972/73-B5CF	1973/72/71 B5CF	As GT6	6AC
Air cleaners	Twin paper elements, combined air cleaner and silencer.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Crankcase breathing	Closed circuit system incorporating a Smith's emission valve, fitted to certain models	Closed circuit system incorporating a Smith's emission valve	As GT6 Mk. 2	1972-73 closed circuit system from rocker cover to carbs. 1971—As GT6 Mk. 2	1972-73 closed circuit system from rocker cover to carbs. 1971—As GT6 Mk. 2	As GT6	As GT6 Mk. 2
FUEL SYSTEM							
Pump	A.C. mechanically operated Diaphragm type.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Tank	Located at rear. No reserve tap.	As GT6	As GT6	As GT6	As GT6	Located at the L.H. side of the luggage compartment and incorporating a reserve tap.	As Vitesse 2-litre
IGNITION SYSTEM							
Coil	Lucas HA12	Lucas HA12	Lucas HA12	1973—Lucas 15C6 1972-71—Lucas 16C6	1973—Lucas 15C6 1972-71—Lucas 16C6	Lucas HA12	Lucas HA12
Distributor type	Conventional Delco Remy D202 Emission control vehicles Delco Remy D204	Delco Remy D200	Delco Remy D204	1972-73 Delco Remy D204 1971 Delco Remy D200	1972/73 Delco Remy D204 Late 1971 / Early 1971 Delco Remy D200	Lucas 22D6	Lucas 22D6
contact gap	0.015in.	0.015in.	0.015in.	0.015in.	0.015in.	0.014-0.016in.	0.014-0.016in.
rotation viewed on rotor	Anti-clockwise	Anti-clockwise	Anti-clockwise	Anti-clockwise	Anti-clockwise	Anti-clockwise	Anti-clockwise
Engine firing order	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4

	GT6	GT6-MK. 2	GT6-PLUS	GT6-MK. 3	GT6 MK. 3 (USA MARKET)	VITESSE-2 LITRE	VITESSE-MK. 2
Sparkling plugs—type	Conventional— Champion N-9Y Emission control vehicles— Champion UN-12Y	Champion N-9Y	Champion UN-12Y	Champion N-9Y	Champion UN-12Y	Champion N-9Y	Champion N-9Y
gap	0.025 in.	0.025 in.	0.025 in.	0.025 in.	0.025 in.	0.025 in.	0.025 in.
Ignition timing—							
conventional—static	13 degs. BTDC	10 degs. BTDC	10 degs. BTDC	6 degs. BTDC	12 degs. BTDC	13 degs. BTDC	10 degs. BTDC
emission control vehicles— idling speed	4 degs. ATDC	—	4 degs. ATDC	—	4 degs. ATDC	—	—
approx. static	6 degs. BTDC	—	6 degs. BTDC	—	6 degs. BTDC	—	—
ELECTRICAL							
Voltage	12	12	12	12	12	12	12
Polarity	Negative earth	Negative earth	Negative earth	Negative earth	Negative earth	Negative earth	Negative earth
Fuses—							
fuse box	35 amp.	35 amp.	35 amp.	35 amp.	35 amp.	35 amp.	35 amp.
line fuse	—	—	—	—	—	25 amp.	25 amp.
Generator—							
type	Lucas C40L	—	—	—	—	Lucas C40L	Lucas C40L
maximum output	25 amp.	—	—	—	—	25 amp.	25 amp.
Control box	Lucas RB340	—	—	—	—	Lucas RB340	Lucas RB340
Alternator—							
type	—	Lucas 15ACR	Lucas 15ACR	Lucas 15ACR	Lucas 15ACR	—	—
nominal output	—	28 amp.	28 amp.	28 amp.	28 amp.	—	—
Alternator control unit	—	Incorporated in alternator	Incorporated in alternator	Incorporated in alternator	Incorporated in alternator	—	—
Battery—							
type	Exide Auto-Fit	Exide Supreme	Exide Supreme	Exide or Lucas	Exide or Lucas	Lucas D9	Lucas D9
capacity	56 amp. hour	56 amp. hour	56 amp. hour	56 amp. hour	56 amp. hour	40 amp. hour	40 amp. hour
plates per cell	9	9	9	9	9	9	9
normal charge rate	6 amps.	6 amps.	6 amps.	6 amps.	6 amp.	3.5 amps.	3.5 amps.
Starter motor	Lucas M35G	Lucas M35G	Lucas M35G	Lucas M35	Lucas M35	Lucas M35G	Lucas M35G
Turn signal flasher unit	Lucas FL5	Lucas 8FL 3.6A	Lucas 8FL 3.6A	Lucas 8FL 3.6A	Lucas 8FL 3.6A	Lucas FL5	Lucas FL5
Hazard flasher unit	—	Signal stat 180	Signal stat 180	Lucas 84W-9FL	Lucas 84W-9FL	—	—
Fuel and temperature indication	Smith's bi-metal resist- ance 10 volt system.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Oil pressure indication switch operating pressure	Early unit 4.5-7.5 p.s.i. Later unit 3-5 p.s.i.	3.5 p.s.i.	3-5 p.s.i.	3-5 p.s.i.	3-5 p.s.i.	Early unit 4.5-7.5 p.s.i. Later unit 3-5 p.s.i.	3-5 p.s.i.
TRANSMISSION							
Clutch	Diaphragm type, 8 1/2 in. dia. (21.5 cm.) (Borg and Beck). Hydraulically controlled.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Gearbox	Four forward ratios and one reverse, syn- chromesh on all for- ward ratios.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6
Ratios	Top 3rd 2nd 1st Rev. 1.0 1.251 .78 2.65 3.10						
Rear axle	Hypoid bevel gears. Axle centre rubber mounted to chassis. Swing axle shaft driven through needle bearing universal coupling.	Hypoid bevel gears. Axle centre rubber mounted to chassis. Final drive through inboard universal joint to outboard Rotoflex coupling.	As GT6 Mk. 2	Hypoid bevel gears. Differential housed in malleable iron casting attached to mounting plate forming part of axle assembly. 1971/72 Final drive through splined shafts with universal joints and Rotoflex. 1973 Final drive through universal joints by splined shafts supported by ball and needle roller bearings.	As GT6	As GT6	As GT6 Mk. 2

	GT6	GT6-MK. 2	GT6-PLUS	GT6 MK. 3	GT6 MK. 3 (USA MARKET)	VITESSE-2 LITRE	VITESSE-MK. 2					
Ratio	3.27:1 (normal fitment) 3.89:1 (when overdrive fitted)	As GT6	As GT6	As GT6	As GT6	3.89:1 (normal and overdrive fitment)	As Vitesse 2 Litre					
WHEELS Type	Steel disc type 4½ J rim. Wire wheels—centre lock type (optional).	As GT6	As GT6	As GT6	As GT6	Steel disc type 4½ J rim	As Vitesse 2 Litre					
TYRES Size and type	<i>Pressures</i> Front psi, kg./cm. ² Rear psi, kg./cm. ²		<i>Pressures</i> Front psi, kg./cm. ² Rear psi, kg./cm. ²		<i>Pressures</i> Front psi, kg./cm. ² Rear psi, kg./cm. ²		<i>Pressures</i> Front psi, kg./cm. ² Rear psi, kg./cm. ²		<i>Pressures</i> Front psi, kg./cm. ² Rear psi, kg./cm. ²		<i>Pressures</i> Front psi, kg./cm. ² Rear psi, kg./cm. ²	
155-13 SP or G.800	20 1.4 24 1.69	— —	— —	— —	— —	— —	22 1.55 26 1.83	— —	— —	— —	— —	
155SR-13 G.800 1971-	— —	24 1.69 30 2.11	24 1.69 30 1.96	24 1.69 30 2.11	24 1.69 30 2.11	— —	— —	24 1.69 24 1.69	— —	— —	— —	
SP68 Dunlop For 2 up 1972 laden only	— —	24 1.69 28 1.96	24 1.69 28 1.96	24 1.69 28 1.96	24 1.69 28 1.96	— —	— —	— —	— —	— —	— —	
155SR-13 G.800 or SP68 1973 only	— —	24 1.69 34 2.40	24 1.69 34 2.40	30 2.11 26 1.83	30 2.11 26 1.83	— —	— —	— —	— —	— —	— —	
5.60S-13	— —	— —	— —	— —	— —	— —	22 1.55 24 1.69	— —	— —	— —	— —	
5.60-13X	— —	— —	— —	— —	— —	— —	22 1.55 28 1.97	— —	— —	— —	— —	
BRAKE SYSTEM Type Front wheels	Girling brakes Caliper disc brakes; disc dia. 9.7" (246.4mm.)		As GT6		As GT6 } Servo assistance giving } boost ratio of 1.5:1		As GT6 } Servo assistance giving } boost ratio of 1.5:1		As GT6		As GT6	
Rear wheels	Drum brakes 8" - 1½" wide (203mm. - 31.75 mm.) leading and trailing shoe.		As GT6		1971/72—As GT6 1973 - Drum brakes 8" - 1½" (203mm. - 38mm) leading and trailing shoe.		1971/72—As GT6 1973 - Drum brakes 8" - 1½" (203mm. - 38mm) leading and trailing shoe.		As GT6		As GT6	
Front lining area	22.2sq.in. 143.22sq.cm.		As GT6		22.2sq.in. 143.22sq.cm.		22.2sq.in. 143.22sq.cm.		As GT6		As GT6	
Front swept area	197 sq.in. 1270.97sq.cm.		As GT6		197 sq.in. 1270.97sq.cm.		197 sq.in. 1270.97sq.cm.		As GT6		As GT6	
Rear lining area	38 sq.in. 245.16sq.cm.		As GT6		38 sq.in. 245.16sq.cm.		38 sq.in. 245.16sq.cm.		As GT6		As GT6	
Rear swept area	63 sq.in. 406.45sq.cm.		As GT6		75.5sq.in. 487sq.cm.		75.5sq.in. 487sq.cm.		As GT6		As GT6	
Total lining area	60 sq.in. 387.09sq.cm.		As GT6		60 sq.in. 387.09sq.cm.		60 sq.in. 387.09sq.cm.		As GT6		As GT6	
Total swept area	260 sq.in. 1677.42sq.cm.		As GT6		272.5sq.in. 1757sq.cm.		272.5sq.in. 1757sq.cm.		As GT6		As GT6	
Operation	Pedal operates all four brakes hydraulically. Centrally mounted handbrake coupled mechanically to rear wheels only.		As GT6		As GT6		As GT6		As GT6		As GT6	
CHASSIS DATA Wheelbase	83in. 2110mm.		83in. 2110mm.		As GT6 Mk. 2		1971/72 As GT6 Mk. 2 1973 50in. 1270mm. Rear Track		1971/72 as GT6 Mk. 2 1973 50in. 1270mm. Rear Track		91½in. 2325mm. 49in. 1245mm. 48in. 1220mm.	
Track—front	49in. 1245mm.		49in. 1245mm.		As GT6 Mk. 2		As GT6		As GT6		As GT6	
—rear	48in. 1220mm.		49in. 1245mm.		As GT6 Mk. 2		As GT6 Mk. 2		As GT6		As GT6	
Wheel alignment (kerb condition)—front	¼ to ½ in. (1.6 to 3.2 mm.) toe-in.		As GT6		As GT6		As GT6		As GT6		As GT6	
—rear	¼ to ½ in. (1.6 to 3.2 mm.) toe-out.		0 to ¼ in. (0 to 3mm.)		As GT6 Mk. 2		As GT6 Mk. 2		As GT6		Saloon 0 to ¼ in. (0 to 1.6mm.) toe-out. Convertible—¼ to ½ in. (1.6 to 3.2mm.) toe-out.	
Ground clearance—(laden)	4in. 102mm.		As GT6		As GT6		As GT6		As GT6		6½in. 170mm. 5½in. 140mm.	
Turning circle	25ft. 3in. 7700mm.		As GT6		As GT6		As GT6		As GT6		As GT6	
Steering unit	Rack and pinion, 4½" turns lock to lock. Collapsible column, 4" of movement fully depressed to fully extended.		As GT6		As GT6		As GT6		As GT6		Rack and pinion, 4½" turns lock to lock. Collapsible column, 4" of movement fully depressed to fully extended.	

	GT6	GT6-MK 2	GT6-PLUS	GT6-MK 3	GT6-MK 3 (USA MARKET)	VITESSE-2 LITRE	VITESSE-MK 2						
SUSPENSION													
Front	Low periodicity independent suspension system with rubber bushed wishbone pivots. Patented screwed bottom bush and top ball joint swivels. Coil springs controlled by telescopic type direct acting dampers and anti-roll bar. Taper roller bearings in hub.	As GT6	As GT6	As GT6	As GT6	As GT6	As GT6						
Rear	Swing axle type independent suspension, transverse leaf spring and radius rods. Balls and needle roller bearings in hubs.	Independent system with lower wishbone and transversely mounted semi-elliptic leaf spring. Fore and aft wheel location provided by flexibly mounted trailing radius rods. Lower wishbone inboard pivots, rubber bushed with pre-packed polyurethane bushed outboard pivots. Spring controlled by lever arm type dampers. Taper roller bearings in hubs.	As GT6 Mk2	1971/72 As GT6 Mk. 2 1973 — Independent swing axle type with central pivoting transverse leaf spring. Direct acting telescopic hydraulic dampers and trailing radius rods.	1971/72 As GT6 Mk. 2 1973 — Independent swing axle type with central pivoting transverse leaf spring. Direct acting telescopic hydraulic dampers and trailing radius rods.	As GT6	As GT6 Mk. 2						
CAPACITIES		<i>Imperial</i>	<i>Metric</i>	<i>U.S.A.</i>		<i>Imperial</i>	<i>Metric</i>	<i>U.S.A.</i>					
Fuel tank		9½ galls.	44.3 litres	11.7 galls.		8½ galls.	40.0 litres	10.5 galls.					
Engine sump		8 pints	4.5 litres	9.6 pints		8 pints	4.5 litres	9.64 pints					
Gearbox		1½ pints	85 litres	1.8 pints		1½ pints	85 litres	1.8 pints					
Gearbox with overdrive		2½ pints	1.4 litres	3.0 pints		2½ pints	1.35 litres	2.85 pints					
Rear axle		1 pint	57 litres	1.2 pints		1 pint	57 litres	1.2 pints					
Cooling system with heater and water bottle		11 pints	6.2 litres	13.2 pints		11 pints	6.2 litres	13.2 pints					
EXTERIOR DIMENSIONS													
Overall length	12ft. 1in. 368cm.	As GT6	As GT6	12ft. 5in. 379cm.	12ft. 5in. 379cm.	12ft. 9in. 388.5cm.	As Vitesse 2 Litre						
Width (over handles)	4ft. 9in. 145cm.			4ft. 10½in. 149cm.	4ft. 10½in. 149cm.	5ft. 0in. 152.5cm.							
Height (unladen)	3ft. 11in. 119cm.			3ft. 11in. 119cm.	3ft. 11in. 119cm.	4ft. 5½in. 136.5cm.							
WEIGHT (approx.)													
Dry (excluding extra equipment)	16cwt. 813kg.	As GT6	As GT6	17½cwt. 878kg.	17½cwt. 878kg.	17½cwt. 876kg.	As Vitesse 2 Litre						
Complete (including fuel, oil, water and tools)	17cwt. 865kg.			1973-18cwt. 918kg. 1971/72 18¼cwt. 921kg.	1973-18cwt. 918kg. 1971/72 18¼cwt. 921kg.	18½cwt. 927kg.							
Maximum gross vehicle weight	21cwt. 1067kg.			1973 22½cwt. 1145kg. 1971/72 23cwt. 1161kg.	22½cwt. 1145kg.	24½cwt. 1225kg.							
ROAD SPEED DATA		<i>Rear axle ratio 3.27:1 Normal</i>		<i>Rear axle ratio 3.89:1 Overdrive</i>				<i>Rear axle ratio 3.89:1 Normal and Overdrive</i>					
Engine speed at a road speed of—		Top	3rd	2nd	1st	Rev.	Top	Top	3rd	3rd	2nd	1st	Rev.
10 mph.		497	625	885	1318	1545	O/D 473	522	O/D 598	740	1052	1570	1836
10 k.m.p.h.		309	387	551	820	960	294	368	372	460	655	976	1140
Road speed at 1,000 r.p.m. in top gear		20-15 m.p.h. (approx.)				21-15 m.p.h. (approx.)				171.1 m.p.h. (approx.) 21.3 m.p.h. (approx.)—overdrive			

UNIT SERIAL NUMBERS AND DESIGNATION

The following list of serial numbers apply to all vehicles contained in this manual and serve to assist exact identification of a vehicle or unit being serviced.

Identification of Prefix and Suffix is as follows:—

Commission Numbers

KC	Denotes the model range.
L	Denotes Left Hand Steering (No letter is used to denote Right Hand Steering)
O	Denotes overdrive is fitted.

Engine Numbers

KC	Denotes the model range.
H	Denotes High Compression.
L	Denotes Low Compression.
E	Denotes Engine Unit.

Gearbox and Rear Axle Number

KC	Denotes model range (No Suffix letters added to these numbers).
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Body Numbers

KC	Denotes model range.
C	Denotes convertible body.

GT6 Mk. 1

Commission Numbers	KC1—Built from October 1966 to September 1968
Engine Numbers	.. ..	KC1 HE or LE
Gearbox Numbers	.. ..	KC1
Rear Axle Numbers	.. ..	KC1
Rear Axle Numbers O/Drive	..	FD1
Body Numbers	.. ..	1 KC

GT6 Mk. 2 and Plus

Commission Numbers	.. ..	KC50,001 and future—built from October 1968
Engine Numbers (Mk. 2)	.. ..	KC50,001 HE or LE
Engine Numbers (Plus Anti-Smog)	..	KD1 HE or LE
Gearbox Numbers	.. ..	KC1 as GT6 Mk. 1
Rear Axle Numbers	.. ..	KC50,001
Rear Axle Numbers O/Drive	..	KD50,001
Body Numbers	.. ..	50,001 KC

GT6 Mk. 3

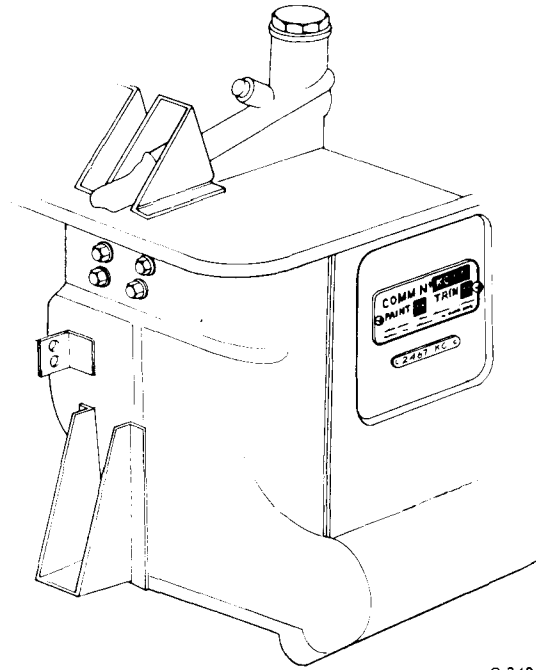
Commission Numbers	.. ..	KE1 and future—built from September 1970 KF1—USA market KG1—Swedish market
Engine Numbers	.. .. .	KE1 or KF1 (USA) or KG1 (Sweden) HE or LE (or UE. Later USA Engines)
Gearbox Numbers	.. .. .	KE1
Rear Axle Numbers	.. .. .	KC As GT6 and GT6 mark 2
Body Numbers	.. .. .	1 KE

VITESSE 2 LITRE

Commission Numbers	.. ..	HC1—Built from October 1966 to September 1968
Engine Numbers	.. .. .	HC1 HE or LE
Gearbox Numbers	.. .. .	HC1
Rear Axle Numbers	.. .. .	FD1
Rear Axle Numbers O/Drive	..	FD1
Body Numbers	.. .. .	1 HB—Saloon 1 HBC—Convertible

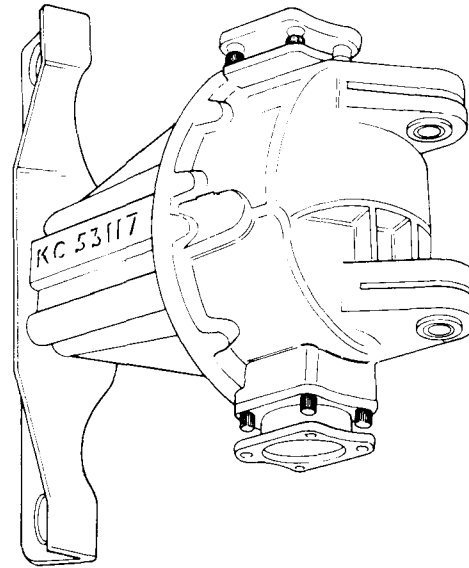
VITESSE MK. 2

Commission Numbers	.. ..	HC50,001 and future—built from October 1968
Engine Numbers	.. .. .	HC50,001 HE or LE
Gearbox Numbers	.. .. .	HC1
Rear Axle Numbers	.. .. .	HC50,001
Rear Axle Numbers O/Drive	..	HC50,001
Body Numbers	50,001 HC Saloon 50,001 HCC Convertible

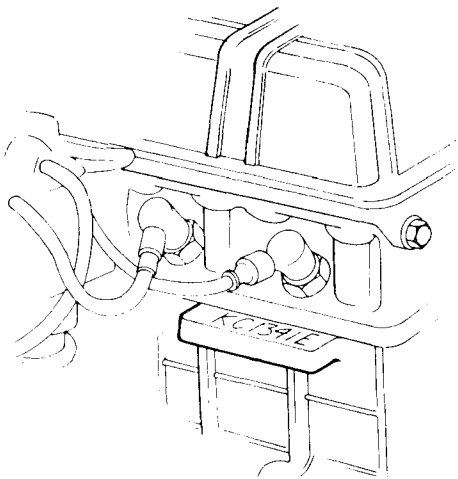


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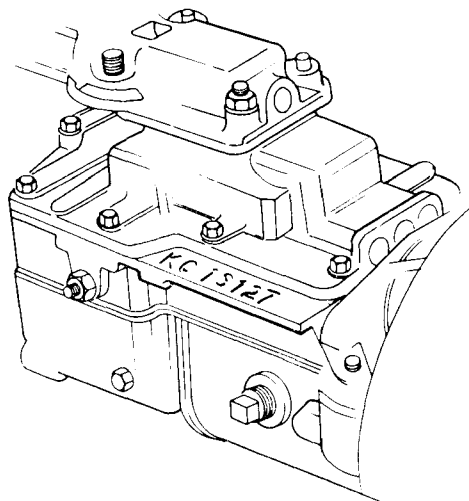
The commission number (chassis number), paint and trim code numbers are stamped on the plate attached to the bonnet scuttle side panel. The body number is stamped on a separate plate mounted below the commission number plate.



The rear axle number is stamped on the hypoid housing flange.



The engine serial number is stamped on the left-hand side of the cylinder block.



The gearbox serial number is stamped on the side of the gearbox casing flange.

In all communications relating to service or spares, please quote the vehicle commission number, the paint and trim code, if relevant, and the serial number of the unit affected.

Fig. 2

PAINT AND TRIM CODING SYSTEM

The commission number plate affixed to the scuttle side panel bears code symbols for identification of the vehicle's exterior paint colour, trim material, and trim colour.

Colour Code

Nine basic colours are allocated a number as shown in the table. Shades of these colours are classified as 1st shade, 2nd shade, 3rd shade, etc. The number of each shade change prefixes the basic colour to indicate the shade colour. Dual colours are identified by two code numbers separated by a stroke, e.g., 19/26 denotes "white" and "wedgwood", the predominant colour being white, this symbol being quoted first.

Trim Code

The main trim material is identified by prefixing the colour code number with a letter, e.g.:

Leathercloth—No prefix letter

Leather—Prefix letter H

Cloth—Prefix letter C

Basic colour	Basic colour number	1st shade	2nd shade	3rd shade	4th shade	5th shade	6th shade	7th shade	8th shade	9th shade	10th shade	11th shade	12th shade
Black	01	11											
Red	02	12 Matador	22 Cherry	32 Signal	42 Burgundy	52 Scarlet	62 Inca Red	72 Pimiento	82 Carmine	92 Magenta			
Brown	03	13 Light Tan	23 Sienna	33 New Tan	43 Saddle Tan	53 Dark Brown	63 Chestnut						
Yellow	04	14 Jonquil	24 Wimpey	34 Jasmine	44 Biege	54 Saffron	64 Mimosa						
Green	05	15 Cactus	25 Conifer	35 Olive	45 Liebfeld	55 Laurel	65 Emerald						
Blue	06	16 Midnight	26 Wedgwood	36 Dark Blue	46 Renoir	56 Royal	66 Valencia	76 Print Blue	86 Navy	96 Sapphire	106 Mallard	116 Ice	126 French
Purple	07	17 Damson	27 Shadow Blue										
Grey	08	18 Gunmetal	28 Dark Grey	38 Phantom	48 Dolphin	58 Shadow Blue	68 Slate	78 Grey					
White	09	19 White	29 Sebring White	39 Honey-suckle									

Thus: Paint 19/26 Trim 16

denotes that the vehicle is painted "White" and "Wedgwood" and trimmed in leathercloth coloured blue.

NOTE: Acrylic paints bear the suffix A.

The following Special Tools, recommended for the efficient servicing of the Triumph GT6 Mk. 1, Mk. 2, Mk. 3, Vitesse 2-litre and Vitesse Mk.2, should be ordered from Messrs. V. L. Churchill & Company Limited, P.O. Box No. 3, London Road, Daventry, Northants.

TOOL No.	DESCRIPTION	GT6 Mk. 1	Vitesse 2-litre	GT6 Mk. 2 and Plus	Vitesse Mk. 2	GT6 Mk. 3
18G.47BD	Differential Carrier Bearing Remover	*	*	*	*	*
18G.106	Valve Spring Compressor (Alternative to 6.118B)	*	*	*	*	*
18G.134DH	Differential Bearing Replacer	*	*	*	*	*
18G.191	Pinion Height Gauge	*	*	*	*	*
18G.191M	Dummy Pinion	*	*	*	*	*
47	Multi-Purpose Hand Press (Alternative to S.4221A)	*	*	*	*	*
60A	Valve Guide Remover and Replacer	*	*	*	*	*
S.60A-2A	Valve Guide Adaptor	*	*	*	*	*
S.60A-7	Valve Guide Adaptor	*	*	*	*	*
S.98A	Pinion Pre-load Gauge	*	*	*	*	*
S.101	Differential Case Spreader	*	*	*	*	*
S.108	Pinion Height Gauge	*	*	*	*	*
S.109C	Rear Hub Bearing Replacer	*	*	*	*	*
S.109C3	Thread Protector	*	*	*	*	*
S.123A	Pinion Bearing Outer Cup Remover	*	*	*	*	*
S.144	Gearbox Mainshaft Circlip Remover	*	*	*	*	*
S.145	Gearbox Mainshaft Circlip Replacer	*	*	*	*	*
S.160	Ball Joint Separator	*	*	*	*	*
S.300A	Rear Hub Needle Bearing Remover/Replacer	*	*	*	*	*
S.304	Rear Hub Bearing Replacer	*	*	*	*	*
S.306	Brake Adjusting Tool	*	*	*	*	*
S.314	Mainshaft Ball Bearing Replacer	*	*	*	*	*
S.322	Vertical Link Outer Oil Seal Replacer (use with Handle 550)	*	*	*	*	*
S.323	Bearing Extractor	*	*	*	*	*
S.323-1	Outer Hub Bearing Removal Adaptors	*	*	*	*	*
S.324	Outer Hub Bearing and Vertical Link Replacer	*	*	*	*	*
S.325	Hub End Float Gauge	*	*	*	*	*
S.328	Compression Clamp—Rotoflex Coupling	*	*	*	*	*
S.335	Crankshaft Rear Oil Seal Centraliser	*	*	*	*	*
335	Con Rod Aligning Jig	*	*	*	*	*
S.336-4	Con Rod Aligner Adaptor	*	*	*	*	*
S.337	Flange Holder (Alternative to RG.421)	*	*	*	*	*
S.341	Rack Mounting Compressor	*	*	*	*	*
S.342	Vertical Link Remover	*	*	*	*	*
S.353	Carburettor Adjusting Tool	*	*	*	*	*
RG.421	Flange Holder (Alternative to S.337)	*	*	*	*	*
550	Driver Handle	*	*	*	*	*
642	Electronic Tachometer	*	*	*	*	*
S.3600	Steering Wheel Remover	*	*	*	*	*
S.4221A	Multi-purpose Hand Press (Alternative to 47)	*	*	*	*	*
S.4221A-5	I.F.S. Coil Spring Remover and Replacer Adaptor	*	*	*	*	*
S.4221A-7B	Inner Axle Shaft Bearing Remover Replacer	*	*	*	*	*
S.4221A-8C	Differential Bearing Remover Adaptor	*	*	*	*	*
S.4221A-14	Rear Hub Bearing Remover Adaptor	*	*	*	*	*
S.4221A-17	Pinion Head Bearing Remover and Replacer Adaptor	*	*	*	*	*
S.4221A-19	Gearbox Mainshaft Ball Race Remover/Replacer Adaptor	*	*	*	*	*
S.4235A	Slide Hammer	*	*	*	*	*
S.4235A-2	Constant Pinion Remover Adaptor	*	*	*	*	*
S.4235A-7	Constant Pinion Shaft Bearing Remover Adaptor	*	*	*	*	*
6118B	Valve Spring Compressor (Alternative to 18G.106)	*	*	*	*	*
S.6118-1	Valve Spring Compressor Adaptor (Use with 6118B)	*	*	*	*	*
7066	Circlip Pliers	*	*	*	*	*
OVERDRIVE TOOLS 'D' TYPE						
L.178	Freewheel Assembly Ring	*	*	*	*	*
L.183A	Pump Barrel Remover (maintool)	*	*	*	*	*
L.183A-2A	Adaptor	*	*	*	*	*
L.188A	Hydraulic Test Equipment	*	*	*	*	*
L.188-4	Pressure Test Hose	*	*	*	*	*
L.201	Dummy Drive Shaft	*	*	*	*	*
L.202A	Tailshaft Ball Race Remover	*	*	*	*	*
L.206A	Oil Pump Body Replacer	*	*	*	*	*
L.213	Oil Pump Body Key	*	*	*	*	*

OPERATION	DESCRIPTION	SPECIFIED TORQUES	
		lb. ft.	kg. m.
ENGINE			
Air cleaner cover to back plate	$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	6-8	0.8-1.1
Air cleaner attachment	$\frac{5}{16}$ " U.N.F. \times $2\frac{1}{8}$ " bolt	6-8	0.8-1.1
Bearing cap bolts	$\frac{7}{16}$ " U.N.F. \times 3" bolt	55-60	7.6-8.3
Breather pipe and petrol pump attachment	$\frac{5}{16}$ " U.N.F. \times 1.16" stud	12-14	1.6-1.9
Carburettor attachment	$\frac{5}{16}$ " U.N.F. \times 1.50" stud	12-14	1.6-1.9
Camshaft chain: wheel attachment	$\frac{5}{16}$ " U.N.F. setscrew	24-26	3.3-3.6
Clutch attachment	$\frac{5}{16}$ " U.N.C. \times $\frac{3}{4}$ " setscrew	20	2.8
Coil attachments	$\frac{5}{16}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	16-18	2.2-2.5
Con rod bolt	$\frac{3}{4}$ " U.N.F. \times 1.65" bolt	38-42	5.3-5.8
Crankshaft oil retaining cover to cylinder block	$\frac{5}{16}$ " U.N.F. \times $1\frac{1}{8}$ " bolt	16-18	2.2-2.5
Crankshaft sealing block to cylinder block	$\frac{5}{16}$ " U.N.F. \times 0.94" Ch. head screw	12-14	1.7-1.9
Crankshaft pulley attachment	$\frac{3}{8}$ " U.N.F. \times 2" bolt 1.56"	90-100	12.4-13.8
Cylinder head attachment } GT6 Mk 1 and	$\frac{3}{8}$ " U.N.F. \times 1.63" stud	42-46	5.8-6.4
Cylinder head attachment } Vitesse 2 Litre	$\frac{3}{8}$ " U.N.F. \times 4.63" stud	42-46	5.8-6.4
Distributor pedestal attachment	$\frac{5}{16}$ " U.N.F. \times 1.31" stud	12-14	1.6-1.9
Distributor to pedestal	$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	8-10	1.1-1.4
Distributor clamp bolt	$\frac{1}{4}$ " B.S.F. \times $1\frac{1}{8}$ " bolt	3-4	0.4-0.6
Emission valve to bracket	$\frac{1}{4}$ " U.N.F. \times $\frac{1}{4}$ " setscrew	8-10	1.1-1.4
Engine plate front to engine	$\frac{5}{16}$ " U.N.F. \times $\frac{1}{4}$ " setscrew	18-20	2.5-2.8
Engine plate and locating plate to front of block	$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	18-20	2.5-2.8
Engine plate to engine and gearbox	$\frac{3}{8}$ " U.N.F. dowel bolt	18-20	2.5-2.8
Engine plate to engine and gearbox	$\frac{5}{16}$ " U.N.F. \times $1\frac{1}{2}$ " bolt	18-20	2.5-2.8
Engine plate to gearbox	$\frac{5}{16}$ " U.N.F. \times 1.84" stud	18-20	2.5-2.8
Engine plate to rear of cylinder block	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{8}$ " setscrew	18-20	2.5-2.8
Exhaust manifold attachment	$\frac{3}{8}$ " U.N.F. \times 1.34" stud	20-22	2.8-3.0
Exhaust & inlet manifold attachment	$\frac{3}{8}$ " U.N.F. \times $1\frac{1}{8}$ " bolt	20-22	2.8-3.0
Exhaust pipe to manifold (GT6 Mk 1 and Vitesse 2 Litre)	$\frac{5}{16}$ " U.N.F. \times 1.31" stud	14-16	1.9-2.2
Fan attachment	$\frac{5}{16}$ " U.N.F. \times $1\frac{1}{4}$ " bolt	12-14	1.7-1.9
Flywheel to crankshaft	$\frac{3}{8}$ " U.N.F. \times 1.03" bolt	42-46	5.8-6.4
Generator mounting bracket to cylinder block	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	18-20	2.5-2.8
Generator bracket to engine plate	$\frac{1}{2}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	45-50	6.2-6.9
Generator to mounting bracket	$\frac{5}{16}$ " U.N.F. \times $1\frac{1}{16}$ " bolt	18-20	2.5-2.8
Generator to mounting bracket	$\frac{5}{16}$ " U.N.F. \times $1\frac{1}{4}$ " bolt	18-20	2.5-2.8
Generator to adjusting link	$\frac{5}{16}$ " U.N.C. \times $\frac{7}{8}$ " setscrew	18-20	2.5-2.8
Inlet manifold attachment	$\frac{5}{16}$ " U.N.F. \times 1.31" stud	14-16	1.9-2.2
Inlet manifold to exhaust manifold	$\frac{3}{8}$ " U.N.F. \times 1.56" stud	20-22	2.5-3.0
Lifting eye attachment	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{8}$ " setscrew	16-18	2.2-2.5
Mounting rubber mounting bracket to engine	$\frac{3}{8}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	26-28	3.6-3.9
Mounting rubber to chassis front	$\frac{3}{8}$ " U.N.F. \times $1\frac{1}{2}$ " bolt	28-30	3.9-4.1
Mounting rubber to mounting bracket front	$\frac{3}{8}$ " U.N.F. mounting	26-28	3.6-3.9
Mounting rubber attachment rear	$\frac{5}{16}$ " U.N.F. mounting	12-14	1.6-1.9
Oil pump to cylinder block	$\frac{1}{4}$ " U.N.F. \times 3" bolt	8-10	1.1-1.4
Oil filter attachment	$\frac{7}{16}$ " U.N.C. bolt	15-18	2.0-2.5
Oil gallery plug	$\frac{3}{4}$ " U.N.F. \times $\frac{1}{2}$ " plug	25-30	3.4-4.1
Oil gallery plug	$\frac{1}{2}$ " N.F. \times .38" core plug	25-30	3.4-4.1
Oil gallery plug	$\frac{3}{8}$ " U.N.F. Dryseal Plug	20-22	2.8-3.0
Oil gallery plug	$\frac{1}{4}$ " N.P.S.I. plug	10-12	1.4-1.7
Rocker shaft locating screw	No. 12 \times 28 U.N.F. screw	3-4	0.4-0.6
Rocker cover attachment	$\frac{5}{16}$ " U.N.F. \times 4.13" stud	11	0.3-
Rocker oil feed	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{8}$ " setscrew	16-18	2.2-2.5
Rocker pedestal attachment	$\frac{3}{8}$ " U.N.F. \times 3.89" stud	24-26	3.3-3.6
Spark plug attachment	14m/m \times $\frac{1}{2}$ "	14-16	1.9-2.2
Starter motor attachment	$\frac{3}{8}$ " U.N.F. \times $2\frac{1}{4}$ " bolt	28-30	3.9-4.1
Sump attachment	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{8}$ " setscrew	16-18	2.2-2.5

Should maintain a minimum of 8 lb. ft. (1.1 kg. m.) after settling period

TIGHTENING TORQUES

OPERATION	DESCRIPTION	SPECIFIED TORQUES	
		lb. ft.	kg. m.
ENGINE—continued			
Sump drain plug	$\frac{3}{8}$ " \times 18 Dryseal plug	20—22	2.8—3.0
Timing cover and engine plate attachment	$\frac{5}{16}$ " U.N.F. \times 1.16" stud	12—14	1.6—1.9
Timing cover to engine plate	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{8}$ " pan head setscrew	8—10	1.1—1.4
		Should maintain a minimum of 4 lb. ft. (0.5 kg. m.) after a settling period	
Timing cover and engine plate to cylinder block	$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	18—20	2.5—2.8
Water passage plug	$\frac{3}{8}$ " \times 18 N.P. Dryseal plug	20—22	2.8—3.0
Water elbow attachment	$\frac{5}{16}$ " U.N.F. \times 1 $\frac{1}{2}$ " bolt	18—20	2.5—2.8
Water pipe adaptor to inlet manifold	$\frac{1}{2}$ " banjo bolt	20—22	2.8—3.0
Water pump to cylinder block	$\frac{5}{16}$ " U.N.F. 2 $\frac{1}{4}$ " bolt	18—20	2.5—2.8
Water pump to cylinder block	$\frac{5}{16}$ " U.N.F. 2 $\frac{3}{8}$ " bolt	18—20	2.5—2.8
Water pump to cylinder block	$\frac{5}{16}$ " U.N.F. \times 3 $\frac{1}{4}$ " bolt	18—20	2.5—2.8
Water pump to bearing housing attachment	$\frac{5}{16}$ " U.N.F. \times 1.31" stud	12—14	1.7—1.9
Water pump pulley to spindle	$\frac{5}{16}$ " U.N.F. spindle	14—16	1.9—2.2
GEARBOX			
Bell housing attachment	$\frac{3}{8}$ " U.N.F. \times 1" Wedgelok bolt setscrew	24—26	3.3—3.6
Clutch slave cylinder attachment	$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	18—20	2.5—2.8
Drain plug and filler	$\frac{3}{8}$ " \times 18 N.P. Dryseal plug	20—22	2.8—3.0
Extension to gearbox	$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	18—20	2.5—2.8
Fulcrum reverse operating lever	$\frac{3}{8}$ " U.N.F. lever	14—16	1.9—2.2
Gearlever coupling to operating shaft	$\frac{1}{4}$ " U.N.F. \times 1 $\frac{1}{8}$ " bolt	8—10	1.1—1.4
Gearlever to operating shaft	$\frac{1}{4}$ " U.N.F. bolt	6—8	0.8—1.1
Gear lever knob attachment	$\frac{5}{16}$ " N.C. knob	8	1.1
Overdrive adaptor to gearbox case	$\frac{5}{16}$ " U.N.F. stud	14—16	1.9—2.2
Overdrive support attachments	$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	18—20	2.5—2.8
Overdrive support attachments	$\frac{5}{16}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	18—20	2.5—2.8
Propellor shaft attachment flange to mainshaft	$\frac{9}{16}$ " U.N.F. mainshaft	90—100	12.4—13.8
Propellor shaft to flange	$\frac{3}{8}$ " U.N.F. \times 1" bolt	28—30	3.9—4.1
Reverse idler shaft	$\frac{5}{16}$ " U.N.F. bolt	14—16	1.9—2.2
Selector fork attachment	$\frac{5}{16}$ " U.N.F. taper Wedgelok setscrew	8—10	1.1—1.4
Top cover attachment	$\frac{1}{4}$ " U.N.F. $\frac{7}{8}$ " setscrew	8—10	1.1—1.4
Top cover attachment	$\frac{1}{4}$ " U.N.F. 1" setscrew	8—10	1.1—1.4
Top cover attachment	$\frac{1}{4}$ " U.N.F. \times 1 $\frac{1}{8}$ " bolt	8—10	1.1—1.4
Top cover to extension	$\frac{5}{16}$ " U.N.F. stud	12—14	1.7—1.9
REAR AXLE			
Bearing cap to housing	$\frac{3}{8}$ " U.N.F. bolt	32—34	4.5—4.7
Crown wheel to differential case	$\frac{3}{8}$ " U.N.F. \times .63" bolt	42—46	5.8—6.4
Drain and filler plug	$\frac{3}{8}$ " \times 18 N.P. Dryseal plug	20—22	2.8—3.0
Front mounting plate to axle	$\frac{3}{8}$ " U.N.F. bolt	35	4.8
		Tighten to 26-28 lb. ft. (3.6-3.9 kg. m.) on re-assembly	
Front mounting plate to chassis frame	$\frac{3}{8}$ " U.N.F. weld bolt	26—28	3.6—3.9
Hypoid housing	$\frac{3}{8}$ " U.N.F. \times 1.84" bolt	32—34	4.2—4.7
Hypoid housing to axle housing	$\frac{5}{16}$ " U.N.F. \times 1" setscrew	18—20	2.5—2.8
Inner axle flange to drive shaft	$\frac{3}{4}$ " U.N.F. bolt	32—36	4.4—5.0
Propeller attachment flange to hypoid pinion	$\frac{3}{8}$ " U.N.F. Pinion	90—100	12.4—13.8
Propeller attachment to flange	$\frac{3}{4}$ " U.N.F. \times 1" bolt	28—30	3.9—4.1
Rear axle mounting	$\frac{5}{16}$ " U.N.F. \times 7.4" bolt	38—42	5.2—5.8
Rear road spring to axle	$\frac{3}{8}$ " U.N.F. stud	28—30	3.9—4.1

OPERATION	DESCRIPTION	SPECIFIED TORQUES		
		lb. ft.	kg. m.	
FRONT SUSPENSION				
Anti-roll bar to chassis	$\frac{5}{16}$ " U.N.F. "U" bolts	3-4	0.4-0.6	
Anti-roll bar link attachment	$\frac{3}{8}$ " U.N.F. stud	12-14	1.7-1.9	
Anti-roll bar link attachment	$\frac{7}{16}$ " U.N.F. link	38-42	5.2-5.8	
Ball pin to vertical link	$\frac{7}{16}$ " U.N.F. pin	38-42	5.2-5.8	
Ball assembly to upper wishbone	$\frac{5}{16}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	18-20	2.5-2.8	
Brake disc to hub	$\frac{3}{8}$ " U.N.F. \times 1" bolt	32-35	4.4-4.8	
Caliper mounting plate to vertical link and tie rod	$\frac{3}{8}$ " U.N.F. \times 1 $\frac{1}{4}$ " bolt	32-35	4.4-4.8	
Caliper mounting plate to vertical link and tie rod	$\frac{3}{8}$ " U.N.F. \times 2 $\frac{1}{8}$ " bolt	32-35	4.4-4.8	
Caliper mounting plate to vertical link and tie rod	$\frac{7}{16}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	18-20	2.5-2.8	
Caliper to mounting bracket	$\frac{7}{16}$ " U.N.F. \times 1 $\frac{1}{16}$ " bolt	50-55	6.9-7.6	
Damper attachment top	$\frac{1}{2}$ " U.N.F. mounting plate	8-10	1.1-1.4	
Damper attachment bottom	$\frac{7}{16}$ " U.N.F. \times 2 $\frac{1}{2}$ " bolt	42-46	5.8-6.4	
Stub axle to vertical link	$\frac{19}{32}$ " U.N.F. axle	90-100	12.4-13.8	
Trunnion to wishbone	$\frac{7}{16}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	35-38	4.8-5.2	
Wishbone attachment to top fulcrum brackets	$\frac{3}{8}$ " U.N.F. \times 2 $\frac{1}{8}$ " bolt	28-30	3.9-4.1	
Wishbone attachment to top fulcrum brackets	$\frac{3}{8}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	28-30	3.9-4.1	
Wishbone attachment to lower fulcrum bracket	$\frac{3}{8}$ " U.N.F. \times 2 $\frac{3}{8}$ " bolt	26-28	3.6-3.9	
Wishbone to frame	$\frac{3}{4}$ " U.N.F. \times fulcrum brackets	22-24	3.0-3.3	
Wheel attachment disc type	$\frac{3}{8}$ " U.N.F. stud	38-42	5.2-5.8	
Wire wheel extension attachment	$\frac{3}{8}$ " U.N.F. stud	45	6.2	
Wheel hub attachment	$\frac{1}{2}$ " U.N.F. axle	Tighten to 5 lb. ft. (0.7 kg. m.). Unscrew one flat and insert Split pin .003 .005" (0.076- 0.127 mm. hub end float).		
REAR SUSPENSION				
Brake back plate attachment	$\frac{5}{16}$ " U.N.F. bolt	16-18	2.2-2.5	
Damper top mounting	} GT6 Mk 1 and Vitesse 2 Litre	$\frac{1}{2}$ " U.N.F. fulcrum pin	42-46	5.8-6.4
Damper bottom mounting		$\frac{7}{16}$ " U.N.F. vertical link	30-32	4.1-4.4
Radius arm pivot brackets to floor		$\frac{3}{8}$ " U.N.F. \times 1 $\frac{1}{4}$ " setscrew	28-30	3.9-4.1
Radius arm attachment		$\frac{3}{8}$ " U.N.F. \times 2 $\frac{3}{8}$ " bolt	28-30	3.9-4.1
Radius arm attachment		$\frac{3}{8}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	28-30	3.9-4.1
Vertical link plates to hub and spring ends	$\frac{7}{16}$ " U.N.F. \times 3 $\frac{3}{8}$ " bolt	42-46	5.8-6.4	
Wheel attachment disc	$\frac{3}{8}$ " U.N.F. stud	38-42	5.2-5.8	
Wire wheel extension attachment	$\frac{3}{8}$ " U.N.F. stud	45	6.2	
Wheel hub to axle shaft	$\frac{3}{4}$ " U.N.F. shaft	100-110	13.8-15.2	
STEERING				
Clamp to steering column	$\frac{1}{2}$ " U.N.F. 1 $\frac{1}{4}$ " bolt	6-8	0.8-1.1	
Clamp socket screw	$\frac{7}{16}$ " U.N.F. grub screw	18-20	2.5-2.8	
Coupling upper to lower	$\frac{1}{2}$ " U.N.F. bolt	6-8	0.8-1.1	
Coupling pinch bolts	$\frac{5}{16}$ " U.N.F. \times 1 $\frac{1}{4}$ " bolt	18-20	2.5-2.8	
Facia column clamp mtg. bracket	$\frac{1}{4}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	6-8	0.8-1.1	
Facia clamp upper and lower to mounting bracket	$\frac{1}{4}$ " U.N.F. \times 2 $\frac{3}{8}$ " bolt	6-8	0.8-1.1	
Facia clamp to support bracket	$\frac{1}{4}$ " U.N.F. \times $\frac{3}{4}$ " bolt	6-8	0.8-1.1	
Facia clamp support bracket to channel	$\frac{1}{4}$ " U.N.F. \times $\frac{3}{8}$ " setscrew	6-8	0.8-1.1	
Outer ball joint to tie rod lever	$\frac{3}{8}$ " U.N.F. ball pin	26-28	3.6-3.9	
Steering rack to chassis	$\frac{19}{32}$ " U.N.F. "U" bolt	14-16	1.9-2.2	
Steering wheel attachment	$\frac{9}{16}$ " whit. column	28-30	3.9-4.1	
Outer ball joint to tie rod lock nut	$\frac{1}{2}$ " U.N.F. lock nut on tie rod	30-35	4.1-4.8	
CHASSIS FRAME				
Brake four-way and three-way to chassis	1" U.N.F. \times 1" setscrew	8-10	1.1-1.4	
Exhaust pipe flexible strip attachment	$\frac{5}{16}$ " U.N.F. \times 1" setscrew	2-3	0.3-0.4	
Exhaust pipe front clip to mounting	$\frac{5}{16}$ " U.N.F. \times 2 $\frac{3}{8}$ " bolt	6-8	0.8-1.1	
Exhaust intermediate silencer attachment	$\frac{5}{16}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	6-8	0.8-1.1	
Exhaust mounting bracket to axle mounting plate	$\frac{5}{16}$ " U.N.F. \times 1 $\frac{1}{4}$ " bolt	16-18	2.2-2.5	
Exhaust pipe clip to exhaust and rear mounting	$\frac{5}{16}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	6-8	0.8-1.1	
Front suspension mounting turret to chassis	$\frac{3}{8}$ " U.N.F. \times 1" setscrew	28-30	3.4-4.1	
Front suspension mounting turret to chassis	$\frac{3}{8}$ " U.N.F. \times 1 $\frac{1}{8}$ " setscrew	28-30	3.4-4.1	
Rear engine mounting bracket and platform to chassis	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{8}$ " setscrew	18-20	2.5-2.8	
Brake pipe connections, single and double flares	$\frac{3}{8}$ " U.N.F.	5-7	0.7-1.0	
Brake bleeder screws	$\frac{1}{2}$ " U.N.F.	5-7	0.7-1.0	

TIGHTENING TORQUES

BODY	OPERATION	DESCRIPTION	SPECIFIED TORQUES	
			lb. ft.	kg. m.
Accelerator fulcrum bracket to body		$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	6-8	0.8-1.1
Body attachment—main floor to chassis outrigger		$\frac{5}{16}$ " U.N.F. \times 3" pointed bolt	12-14	1.7-1.9
Body attachment—dash to chassis outrigger		$\frac{5}{16}$ " U.N.F. \times 3 $\frac{1}{4}$ " bolt	12-14	1.7-1.9
Body attachment—heelboard crossmember to chassis		$\frac{5}{16}$ " U.N.F. \times 3 $\frac{1}{2}$ " pointed bolt	8-10	1.1-1.4
Body attachment—seat pan to chassis crossmember		$\frac{3}{8}$ " U.N.F. \times 1 $\frac{3}{4}$ " bolt	8-10	1.1-1.4
Battery earth to dash		$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	6-8	0.8-1.1
Brake and clutch pedal and master cylinder bracket attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	6-8	0.8-1.1
Brake and clutch master cylinder to bracket		$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	18-20	2.5-2.8
Bonnet link attachment		$\frac{1}{4}$ " U.N.F. \times 1" bolt	6-8	0.8-1.1
Bonnet link attachment		$\frac{1}{4}$ " U.N.F. \times 1 $\frac{1}{4}$ " bolt	6-8	0.8-1.1
Bonnet tube attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " weld bolt	6-8	0.8-1.1
Bonnet tube attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	6-8	0.8-1.1
Bonnet hinge tube to pivot brackets		$\frac{3}{8}$ " U.N.F. \times 2" bolt	22-24	3.0-3.3
Bonnet pivot bracket to chassis frame		$\frac{5}{16}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	14-16	1.9-2.2
Bonnet stay bracket		$\frac{1}{4}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	6-8	0.8-1.1
Bonnet lock catch plate attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	6-0	0.8-1.1
Bumper support to frame front		$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	14-16	1.9-2.2
Bumper support to front		$\frac{3}{8}$ " U.N.F. coach bolt	24-26	3.3-3.6
Bumper and over rider to chassis brkt.		$\frac{5}{16}$ " U.N.F. \times 2 $\frac{1}{8}$ " bolt	14-16	1.9-2.2
Bumper side attachment—rear		$\frac{5}{16}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	14-16	1.9-2.2
Door lock to door		$\frac{1}{4}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	6-8	0.8-1.1
Door lock striker to B post		$\frac{1}{4}$ " U.N.F. \times 1" setscrew	6-8	0.8-1.1
Door lock striker to B post		$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	6-8	0.8-1.1
Door hinge attachment		$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	16-18	2.2-2.5
Door hinge attachment		$\frac{5}{16}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	16-18	2.2-2.5
Door vent to door and mounting bracket		$\frac{1}{4}$ " U.N.F. setscrew	6-8	0.8-1.1
Door glass channel attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	6-8	0.8-1.1
Facia to support bracket		$\frac{1}{4}$ " U.N.F. \times 1 $\frac{1}{8}$ " setscrew	6-8	0.8-1.1
Facia support bracket to floor		$\frac{1}{16}$ " U.N.F. \times 1 $\frac{1}{8}$ " pointed setscrew	12-14	1.6-1.9
Grab handle attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	6-8	0.8-1.1
Handbrake fulcrum pin		$\frac{3}{8}$ " U.N.F. shouldered pin	26-28	3.6-3.9
Heater to dash shelf		$\frac{1}{4}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	6-8	0.8-1.1
Horn attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	8-10	1.1-1.4
Luggage floor to channel		$\frac{1}{4}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	6-8	0.8-1.1
Luggage support rail to board and front angle		$\frac{1}{4}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	6-8	0.8-1.1
Override mounting brackets to spring bar		$\frac{5}{16}$ " U.N.F. \times 3 $\frac{1}{8}$ " bolt	14-16	1.9-2.2
Override mounting brackets to spring bar		$\frac{5}{16}$ " U.N.F. \times 2 $\frac{1}{4}$ " bolt	14-16	1.9-2.2
Override spring bar attachment		$\frac{3}{8}$ " U.N.F. \times 1" setscrew	24-26	3.3-3.6
Petrol tank to body		$\frac{5}{16}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	8-10	1.1-1.4
Radiator to frame		$\frac{5}{16}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	16-18	2.2-2.5
Radiator overflow bottle attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	6-8	0.8-1.1
Rear door hinge attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{3}{8}$ " weld bolt	5-8	0.8-1.1
Rear door hinge attachment		$\frac{1}{4}$ " U.N.F. \times 1" bolt	6-8	0.8-1.1
Seat to slide		$\frac{5}{16}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	12-14	1.6-1.9
Seat slide to floor		$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	6-8	0.8-1.1
Safety belt fixing		$\frac{5}{16}$ " U.N.F. eye bolt	28-30	3.9-4.1
Valance attachments		$\frac{1}{4}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	6-8	0.8-1.1
Window regulator to door		$\frac{1}{4}$ " U.N.F. \times $\frac{1}{2}$ " setscrew	6-8	0.8-1.1
Windscreen wiper motor attachment		$\frac{1}{4}$ " U.N.F. \times $\frac{5}{8}$ " setscrew	6-8	0.8-1.1
Windscreen frame to roof		$\frac{5}{16}$ " U.N.F. \times 2 $\frac{1}{4}$ " setscrew	12-14	1.6-1.9
Windscreen frame to front deck		$\frac{5}{16}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	12-14	1.6-1.9
Windscreen frame to body outer		$\frac{1}{4}$ " U.N.F. \times 1" setscrew	6-8	0.8-1.1
Drain tap to radiator		$\frac{1}{4}$ " P.T.F. taper thread	10-12	1.4-1.6

OPERATION	DESCRIPTION	SPECIFIED TORQUES	
		lb. ft.	kg. m.
ENGINE			
GT6 Mk 2 & PLUS			
Cylinder head attachment	$\frac{7}{16}$ " U.N.F. \times 4.84" stud	65—70	9.0—9.7
Exhaust pipe to manifold	$\frac{3}{8}$ " \times 16 U.N.C. stud	24—26	3.3—3.6
Alternator mounting bracket to cylinder block	$\frac{1}{16}$ " U.N.F. \times 1" setscrew	18—20	2.5—2.8
Alternator to mounting bracket	$\frac{1}{16}$ " U.N.F. \times 4 $\frac{1}{8}$ " bolt	18—20	2.5—2.8
Alternator to adjusting link	$\frac{5}{16}$ " U.N.C. \times $\frac{3}{4}$ " setscrew	16—18	2.2—2.5
Alternator bracket to engine plate	$\frac{1}{2}$ " U.N.F. \times 1" setscrew	45—50	6.2—6.9
VITESSE MK II			
Cylinder head attachment	$\frac{7}{16}$ " U.N.F. \times 4.84" stud	65—70	9.0—9.7
Exhaust pipe to manifold	$\frac{3}{8}$ " \times 16 N.C. stud	24—26	3.3—3.6
REAR SUSPENSION MK II			
GT6 MK 2 & PLUS			
Wishbone to vertical link	$\frac{1}{2}$ " U.N.F. \times 7" bolt	55—60	7.6—8.3
Road spring eye to vertical link	$\frac{7}{16}$ " U.N.F. \times 4" bolt	42—46	5.8—6.4
Lower wishbone—outer	$\frac{1}{2}$ " U.N.F. \times 7" bolt	55—60	7.6—8.3
Outer drive shaft to rear hub	$\frac{5}{16}$ " U.N.F. on shaft	100—110	13.8—15.2
Intermediate drive shaft to flange	$\frac{5}{16}$ " U.N.F. on shaft	100—110	13.8—15.2
Rotoflex coupling to flange	$\frac{1}{2}$ " U.N.F. \times 3.19" bolt	65—70	9.0—9.7
Rotoflex coupling to flange	$\frac{1}{2}$ " U.N.F. \times 2 $\frac{5}{8}$ " bolt	65—70	9.0—9.7
Radius arm to bracket	$\frac{3}{8}$ " U.N.F. \times 1 $\frac{5}{8}$ " bolt	28—30	3.9—4.1
Radius arm mounting bracket to attachment plate	$\frac{1}{2}$ " U.N.F. \times 7" bolt	55—60	7.6—8.3
Radius arm mounting bracket to vertical link	$\frac{7}{16}$ " U.N.F. \times 2 $\frac{1}{2}$ " bolt	42—46	5.8—6.4
Mounting bracket to vertical link	$\frac{1}{2}$ " U.N.F. \times 2 $\frac{3}{4}$ " bolt	55—60	7.6—8.3
Damper—top fixing	$\frac{1}{2}$ " U.N.F. \times 7" bolt	55—60	7.6—8.3
Road wheel to hub	$\frac{3}{8}$ " U.N.F. wheel stud	38—42	5.2—5.8
Road spring to axle housing	$\frac{3}{8}$ " U.N.F. stud	28—30	3.9—4.1
Lock nut on radius rod	$\frac{1}{2}$ " U.N.F. on rod	42—46	5.8—6.4
EXHAUST SYSTEM			
Exhaust front clip to silencer	$\frac{5}{16}$ " U.N.F. \times 2 $\frac{3}{8}$ " bolt	6—8	0.8—1.1
Exhaust attachment clip to bracket	$\frac{5}{16}$ " U.N.F. \times 2 $\frac{3}{8}$ " bolt	6—8	0.8—1.1
Exhaust silencer and tail pipe support	$\frac{5}{16}$ " U.N.F. \times 2 $\frac{7}{8}$ " bolt	6—8	0.8—1.1
VITESSE MK II			
Wishbone to vertical link	$\frac{1}{2}$ " U.N.F. \times 7 $\frac{1}{2}$ " bolt	55—60	7.6—8.3
Road spring eye to vertical link	$\frac{7}{16}$ " U.N.F. \times 4" bolt	42—46	5.8—6.4
Vertical link to brake plate	$\frac{3}{8}$ " U.N.F. \times $\frac{7}{8}$ " bolt	28—30	3.9—4.1
Outer drive shaft to rear hub	$\frac{5}{16}$ " U.N.F. on shaft	100—110	13.8—15.2
Intermediate drive shaft to flange	$\frac{7}{16}$ " U.N.F. on shaft	100—110	13.8—15.2
Rotoflex coupling to flange	$\frac{1}{2}$ " U.N.F. \times 3.19" bolt	65—70	9.0—9.7
Rotoflex coupling to flange	$\frac{1}{2}$ " U.N.F. \times 2 $\frac{5}{8}$ " bolt	65—70	9.0—9.7
Road wheel to hub	$\frac{3}{8}$ " \times 24 U.N.F.	38—42	5.2—5.8
Back plate to hub	$\frac{5}{16}$ " U.N.F. \times .82" bolt	14—16	1.95—2.2
Adjuster on radius rod	Adjuster		
	Lock nut R. hand	42—46	5.8—6.4
	Lock nut L. hand		
Radius arm to chassis frame bracket	$\frac{3}{8}$ " U.N.F. \times 3" bolt	28—30	3.9—4.1
Radius arm to vertical link	$\frac{1}{2}$ " U.N.F. \times 7" bolt	55—60	7.6—8.3
Radius arm to bracket on vertical link and chassis frame	$\frac{7}{16}$ " U.N.F. \times 2 $\frac{3}{8}$ " bolt	42—46	5.8—6.4
Lower wishbone to frame	$\frac{1}{2}$ " U.N.F. \times 2 $\frac{3}{4}$ " bolt	55—60	7.6—8.3
Damper top mounting	$\frac{3}{8}$ " U.N.F. \times 1 $\frac{3}{4}$ " bolt	40—45	5.5—6.3
Damper link attachment	$\frac{3}{8}$ " U.N.F. link	18—20	2.5—2.8
Road spring to axle housing	$\frac{3}{8}$ " U.N.F. \times 3.13" stud	28—30	3.9—4.1

TIGHTENING TORQUES

OPERATION	DESCRIPTION	SPECIFIED TORQUES	
		lb. ft.	kg. m.
GT 6 MK 3			
ENGINE			
Camshaft chainwheel to camshaft	$\frac{5}{16}$ " U.N.F.	18-24	2.5-3.3
Cylinder head to block	$\frac{7}{16}$ " U.N.F. stud	60-80	8.3-11.1
Flywheel to crankshaft	$\frac{7}{16}$ " U.N.F. \times 1.06" bolt	50-75	6.9-10.4
Inlet manifold to head	$\frac{5}{16}$ " U.N.F. $3\frac{3}{4}$ " bolt	15-20	2.1-2.8
Oil pump to cylinder block	$\frac{1}{4}$ " U.N.F. \times 3"	6-10	0.8-1.4
Oil pump to cylinder block	$\frac{1}{4}$ " U.N.F. \times $3\frac{3}{8}$ "	6-10	0.8-1.4
Rocker pedestal attachment	$\frac{3}{8}$ " U.N.F. \times 3.09" stud	26-34	3.6-4.7
REAR AXLE			
Hypoid pinion attachment	$\frac{5}{8}$ " U.N.F. on pinion	90-120	12.4-16.6
Intermediate drive shaft to flange	$\frac{5}{8}$ " U.N.F. on shaft	90-120	12.4-16.6
Outer drive shaft to axle shaft	$\frac{3}{4}$ " U.N.F. bolt	38-46	5.2-6.4
Rear axle mounting to hypoid housing	$\frac{3}{8}$ " U.N.F. bolt	30-38	4.1-5.2
Rear hub to outer shaft	$\frac{5}{8}$ " U.N.F. on shaft	90-120	12.4-16.6
Rotoflex coupling attachment	$\frac{1}{2}$ " \times 2.63"	60-80	8.3-11.1
FRONT SUSPENSION			
Anti-roll bar fixing	$\frac{3}{8}$ " U.N.F. on stud	10-14	1.4-1.9
Anti-roll bar link attachment	$\frac{3}{8}$ " U.N.F. on link	7-10	1.0-1.4
Anti-roll bar assy. attachment	$\frac{7}{16}$ " U.N.F. on link	35-45	4.8-6.2
Ball pin to vertical link	$\frac{7}{16}$ " U.N.F. on link	30-38	4.1-5.2
Brake disc to hub	$\frac{3}{8}$ " U.N.F. \times 1" bolt	26-34	3.6-4.7
Fulcrum bracket to lower wishbone	$\frac{3}{4}$ " U.N.F. \times $2\frac{3}{8}$ " bolt	24-32	3.3-4.4
Mounting bracket to frame	$\frac{3}{8}$ " U.N.F. bolt	24-32	3.3-4.4
Mounting plate and tie rod levers to vertical links	$\frac{3}{8}$ " U.N.F. bolt	26-34	3.6-4.7
REAR SUSPENSION <i>Up to Commission Numbers KE 20,001 and KF 20,001</i>			
Lock nut on radius arm	$\frac{1}{2}$ " U.N.F. on rod	35-45	4.8-6.2
Radius arm bracket to floor	$\frac{3}{8}$ " U.N.F. \times $1\frac{5}{8}$ " bolt	24-32	3.3-4.4
Radius arm bracket to plate	$\frac{1}{2}$ " U.N.F. \times 7" bolt	50-65	6.9-9.0
Radius arm to bracket on vertical link	$\frac{7}{16}$ " U.N.F. \times $2\frac{1}{2}$ " bolt	38-48	5.2-6.6
Rear damper attachment	$\frac{1}{2}$ " U.N.F. \times 7" bolt	30-38	4.1-5.2
Rear road spring to vertical link	$\frac{7}{16}$ " U.N.F. \times 4" bolt	38-48	5.2-6.6
Vertical link to rear brake	$\frac{3}{8}$ " U.N.F. \times $\frac{7}{8}$ " setscrew	24-32	3.3-4.4
Wheel to hub	$\frac{3}{8}$ " U.N.F. stud	38-48	5.2-6.6
Wishbone to frame	$\frac{7}{16}$ " U.N.F. \times $2\frac{1}{2}$ " bolt	35-45	4.8-6.2
Wishbone to vertical link	$\frac{1}{2}$ " U.N.F. \times $7\frac{1}{2}$ " bolt	35-45	4.8-6.2
REAR SUSPENSION <i>From Commission Numbers KE 20,001 and KF 20,001 onwards</i>			
Axle mounting nose piece	$\frac{3}{8}$ " U.N.F. Stud	26-34	3.6-4.7
Damper attachment	$\frac{1}{2}$ " U.N.F.	28-38	3.9-5.2
Damper lower attachment	$\frac{7}{16}$ " U.N.F. bolt	28-38	3.9-5.2
Pivot bracket to body	$\frac{3}{8}$ " U.N.F.	26-34	3.6-4.7
Radius arm to pivot bracket	$\frac{3}{8}$ " U.N.F. \times 2 $\frac{1}{2}$ " bolt	26-34	3.6-4.7
Rear hub to axle shaft	$\frac{3}{8}$ " U.N.F. on shaft	90-120	12.4-16.6
Rear road spring and pivot bracket	$\frac{5}{16}$ " U.N.F. \times $2\frac{5}{8}$ "	15-20	2.1-2.8
Servo attachment bracket	$\frac{5}{16}$ " U.N.F. \times $\frac{3}{4}$ " setscrew	15-20	2.1-2.8
Servo attachment bracket	$\frac{3}{8}$ " U.N.F. \times $\frac{1}{4}$ " setscrew	15-20	2.1-2.8
Servo attachment bracket to shelf	$\frac{5}{16}$ " U.N.F. $\frac{5}{8}$ "	10-14	1.4-1.9
Vertical link plate to rear hub	$\frac{7}{16}$ " U.N.F. \times $3\frac{3}{4}$ "	38-48	5.2-6.6
Wheel attachment	$\frac{3}{8}$ " U.N.F. stud	38-48	5.2-6.6

SCREW THREADS

BSF

(British Std. Fine)

Size	Threads per Inch	Tapping Drill
$\frac{7}{32}$	28	$\frac{11}{64}$
$\frac{1}{4}$	26	$\frac{13}{64}$
$\frac{9}{32}$	26	$\frac{15}{64}$
$\frac{5}{16}$	22	$\frac{1}{4}$
$\frac{3}{8}$	20	$\frac{5}{16}$
$\frac{7}{16}$	18	$\frac{23}{64}$
$\frac{1}{2}$	16	$\frac{27}{64}$
$\frac{9}{16}$	16	$\frac{31}{64}$
$\frac{5}{8}$	14	$\frac{17}{32}$
$\frac{11}{16}$	14	$\frac{19}{32}$
$\frac{3}{4}$	12	$\frac{41}{64}$

BA

(British Association)

Size	Diameter	Threads per Inch	Tapping Drill
1	.236	25.4	7
1	.209	28.2	16
2	.185	31.4	22
3	.161	34.8	29
4	.142	38.5	31
5	.126	43.1	36
6	.110	47.9	42
7	.098	52.9	45
8	.087	59.2	49
9	.075	64.9	52
10	.067	72.5	54

UNC

(Unified Coarse)

Size	Diameter	Threads per Inch	Tapping Drill	
(No. 4)	.1120	40	42	44
(No. 6)	.1380	32	$\frac{7}{64}$	
(No. 6)	.1640	32	29	
(No. 10)	.1900	24	24	26
	$\frac{1}{4}$	20	$\frac{13}{64}$	
	$\frac{5}{16}$	18	$\frac{17}{64}$	
	$\frac{3}{8}$	16	$\frac{5}{16}$	
	$\frac{7}{16}$	14	"U"	
	$\frac{1}{2}$	13	$\frac{23}{64}$	

UNF

(Unified Fine)

Size	Diameter	Threads per Inch	Tapping Drill
(No. 10)	.190	32	$\frac{5}{32}$
	$\frac{1}{4}$	28	3
	$\frac{5}{16}$	24	1
	$\frac{3}{8}$	24	$\frac{21}{64}$
	$\frac{7}{16}$	20	$\frac{25}{64}$
	$\frac{1}{2}$	20	$\frac{29}{64}$
	$\frac{9}{16}$	18	13 mm. (.5118")
	$\frac{5}{8}$	18	14.5 mm. (.5709")
	$\frac{3}{4}$	16	$\frac{11}{16}$

SELF TAPPING SCREWS

Size	Tapping Drill
No. 2	49
No. 4	39
No. 6	35
No. 8	31
No. 10	27
No. 12	19
No. 14	11

FOR
20 SWG
SHEET

Spanner Sizes for Unified Nuts and Bolts Measured across the Flats (A/F)*

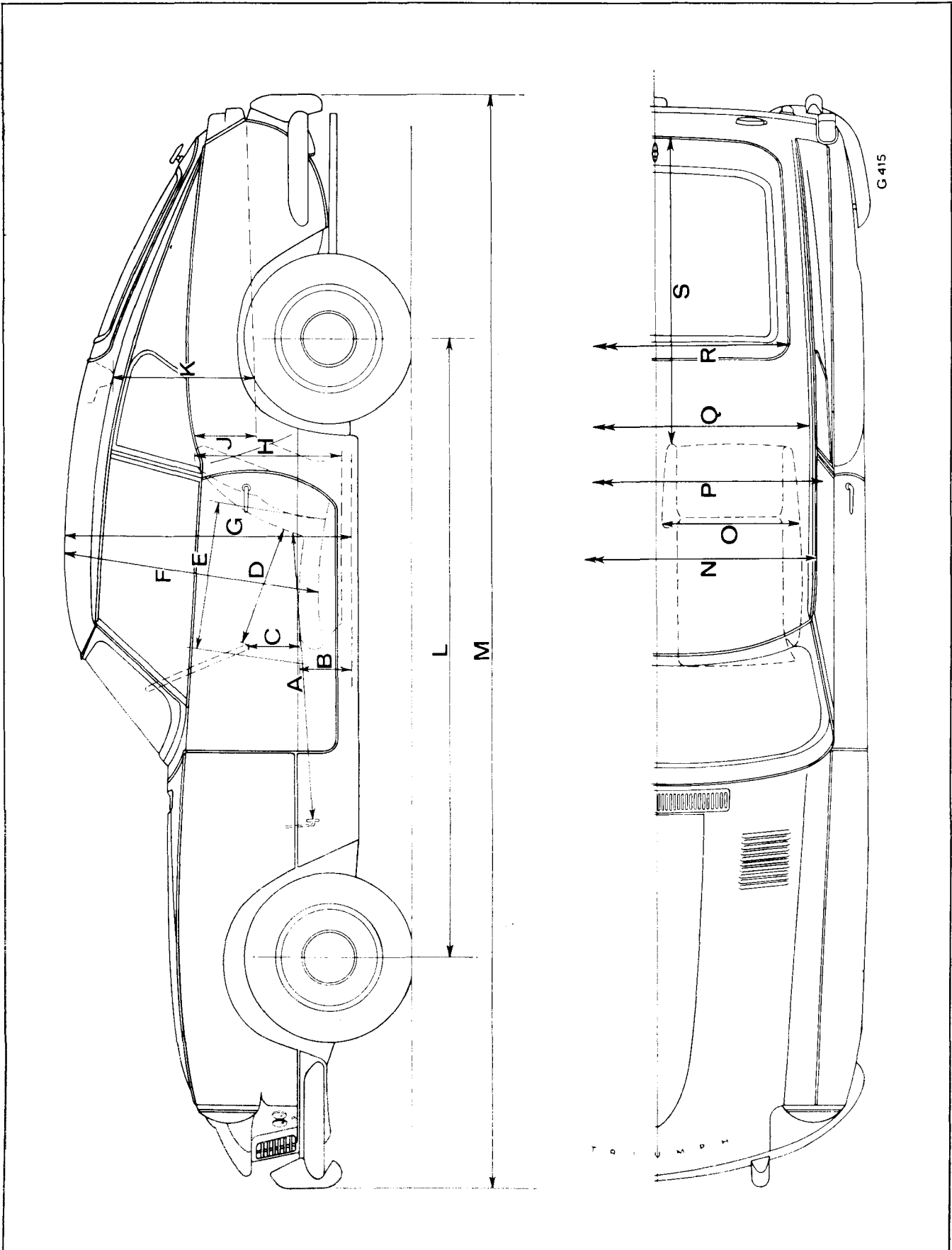
Bolt diameter	Inch $\frac{1}{4}$	Inch $\frac{5}{16}$	Inch $\frac{3}{8}$	Inch $\frac{7}{16}$	Inch $\frac{1}{2}$	Inch $\frac{9}{16}$ *	Inch $\frac{5}{8}$	Inch $\frac{3}{4}$
Spanner Nuts	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	$1\frac{1}{8}$
Spanner Bolts	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{8}$

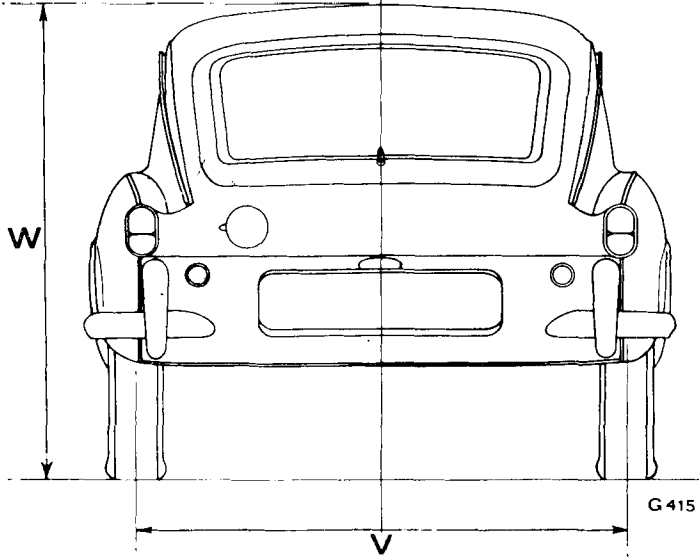
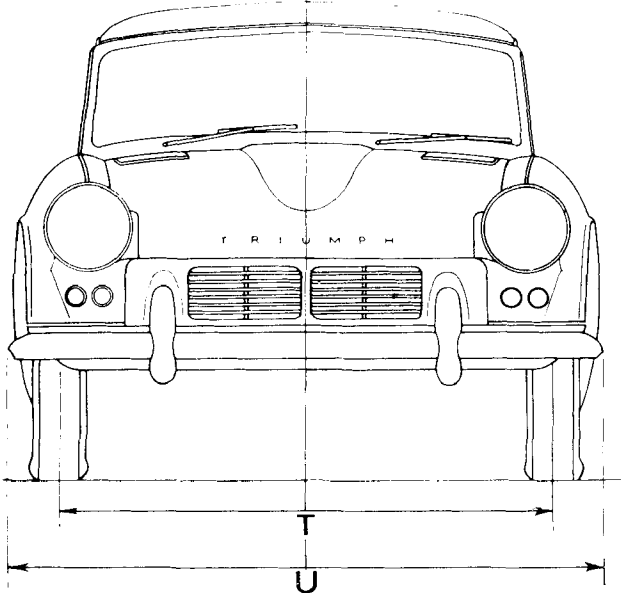
*Note variation in Nut and Bolt Head sizes.

Inches	Decimals	Millimetres	Inches to Millimetres		Millimetres to Inches		Fahrenheit and Centigrade			
			In.	mm.	mm.	In.	°F	°C	°C	°F
$\frac{1}{16}$	$\frac{1}{64}$	·015625	·0001	·00254	0·001	·000039	-20	-28·9	-30	-22
	$\frac{1}{32}$	·03125	·0002	·00508	0·002	·000079	-15	-26·1	-28	-18·4
$\frac{1}{8}$	$\frac{3}{64}$	·046875	·0003	·00762	0·003	·000118	-10	-23·3	-26	-14·8
	$\frac{1}{4}$	·0625	·0004	·01016	0·004	·000157	-5	-20·6	-24	-11·2
$\frac{3}{16}$	$\frac{5}{64}$	·078125	·0005	·01270	0·005	·000197	0	-17·8	-22	-7·6
	$\frac{3}{8}$	·09375	·0006	·01524	0·006	·000236	1	-17·2	-20	-4
$\frac{1}{2}$	$\frac{7}{64}$	·109375	·0007	·01778	0·007	·000276	2	-16·7	-18	-0·4
	$\frac{5}{8}$	·125	·0008	·02032	0·008	·000315	3	-16·1	-16	3·2
$\frac{5}{8}$	$\frac{9}{64}$	·140625	·0009	·02286	0·009	·000354	4	-15·6	-14	6·8
	$\frac{3}{4}$	·15625	·001	·0254	0·01	·00039	5	-15·0	-12	10·4
$\frac{7}{8}$	$\frac{11}{64}$	·171875	·002	·0508	0·02	·00079	10	-12·2	-10	14
	$\frac{1}{2}$	·1875	·003	·0762	0·03	·00118	15	-9·4	-8	17·6
$\frac{1}{2}$	$\frac{13}{64}$	·203125	·004	·1016	0·04	·00157	20	-6·7	-6	21·2
	$\frac{5}{4}$	·21875	·005	·1270	0·05	·00197	25	-3·9	-4	24·8
$\frac{1}{2}$	$\frac{15}{64}$	·234375	·006	·1524	0·06	·00236	30	-1·1	-2	28·4
	$\frac{3}{2}$	·25	·007	·1778	0·07	·00276	35	1·7	0	32
$\frac{1}{2}$	$\frac{17}{64}$	·265625	·008	·2032	0·08	·00315	40	4·4	2	35·6
	$\frac{7}{4}$	·28125	·009	·2286	0·09	·00354	45	7·2	4	39·2
$\frac{1}{2}$	$\frac{19}{64}$	·296875	·01	·254	0·1	·00394	50	10·0	6	42·8
	$\frac{9}{4}$	·3125	·02	·508	0·2	·00787	55	12·8	8	46·4
$\frac{1}{2}$	$\frac{21}{64}$	·328125	·03	·762	0·3	·01181	60	15·6	10	50
	$\frac{5}{2}$	·34375	·04	1·016	0·4	·01575	65	18·3	12	53·6
$\frac{3}{4}$	$\frac{23}{64}$	·359375	·05	1·270	0·5	·01969	70	21·1	14	57·2
	$\frac{3}{2}$	·375	·06	1·524	0·6	·02362	75	23·9	16	60·8
$\frac{3}{4}$	$\frac{25}{64}$	·390625	·07	1·778	0·7	·02756	80	26·7	18	64·4
	$\frac{7}{2}$	·40625	·08	2·032	0·8	·03150	85	29·4	20	68
$\frac{3}{4}$	$\frac{27}{64}$	·421875	·09	2·286	0·9	·03543	90	32·2	22	71·6
	$\frac{4}{2}$	·4375	·1	2·54	1	·03837	95	35·0	24	75·2
$\frac{3}{4}$	$\frac{29}{64}$	·453125	·2	5·08	2	·07874	100	37·8	26	78·8
	$\frac{5}{2}$	·46875	·3	7·62	3	·11811	105	40·6	28	82·4
$\frac{3}{4}$	$\frac{31}{64}$	·484375	·4	10·16	4	·15748	110	43·3	30	86
	$\frac{1}{2}$	·5	·5	12·70	5	·19685	115	46·1	32	89·6

Inches	Decimals	Millimetres	Inches to Millimetres		Millimetres to Inches		Fahrenheit and Centigrade				
			In.	mm.	mm.	In.	°F	°C	°C	°F	
	$\frac{1}{16}$	·515625	13·0969	·6	15·24	6	·23622	120	48·9	34	93·2
	$\frac{1}{8}$	·53125	13·4937	·7	17·78	7	·27559	125	51·7	36	96·8
	$\frac{3}{16}$	·546875	13·8906	·8	20·32	8	·31496	130	54·4	38	100·4
$\frac{1}{4}$	$\frac{1}{4}$	·5625	14·2875	·9	22·86	9	·35433	135	57·2	40	104
	$\frac{5}{16}$	·578125	14·6844	1	25·4	10	·39370	140	60·0	42	107·6
	$\frac{3}{8}$	·59375	15·0812	2	50·8	11	·43307	145	62·8	44	112·2
	$\frac{7}{16}$	·609375	15·4781	3	76·2	12	·47244	150	65·6	46	114·8
$\frac{1}{2}$	$\frac{1}{2}$	·625	15·8750	4	101·6	13	·51181	155	68·3	48	118·4
	$\frac{9}{16}$	·640625	16·2719	5	127·0	14	·55118	160	71·1	50	122
	$\frac{5}{8}$	·65625	16·6687	6	152·4	15	·59055	165	73·9	52	125·6
	$\frac{11}{16}$	·671875	17·0656	7	177·8	16	·62992	170	76·7	54	129·2
$\frac{3}{4}$	$\frac{3}{4}$	·6875	17·4625	8	203·2	17	·66929	175	79·4	56	132·8
	$\frac{13}{16}$	·703125	17·8594	9	228·6	18	·70866	180	82·2	58	136·4
	$\frac{7}{8}$	·71875	18·2562	10	254·0	19	·74803	185	85·0	60	140
	$\frac{15}{16}$	·734375	18·6531	11	279·4	20	·78740	190	87·8	62	143·6
$\frac{1}{8}$	$\frac{1}{8}$	·75	19·0500	12	304·8	21	·82677	195	90·6	64	147·2
	$\frac{17}{16}$	·765625	19·4469	13	330·2	22	·86614	200	93·3	66	150·8
	$\frac{9}{8}$	·78125	19·8437	14	355·6	23	·90551	205	96·1	68	154·4
	$\frac{19}{16}$	·796875	20·2406	15	381·0	24	·94488	210	96·9	70	158
$\frac{5}{8}$	$\frac{5}{8}$	·8125	20·6375	16	406·4	25	·98425	212	100·0	75	167
	$\frac{21}{16}$	·828125	21·0344	17	431·8	26	1·02362	215	101·7	80	176
	$\frac{11}{8}$	·84375	21·4312	18	457·2	27	1·06299	220	104·4	85	185
	$\frac{23}{16}$	·859375	21·8281	19	482·6	28	1·10236	225	107·2	90	194
$\frac{3}{4}$	$\frac{3}{4}$	·875	22·2250	20	508·0	29	1·14173	230	110·0	95	203
	$\frac{25}{16}$	·890625	22·6219	21	533·4	30	1·18110	235	112·8	100	212
	$\frac{13}{8}$	·90625	23·0187	22	558·8	31	1·22047	240	115·6	105	221
	$\frac{27}{16}$	·921875	23·4156	23	584·2	32	1·25984	245	118·3	110	230
$\frac{7}{8}$	$\frac{7}{8}$	·9375	23·8125	24	609·6	33	1·29921	250	121·1	115	239
	$\frac{29}{16}$	·953125	24·2094	25	635·0	34	1·33858	255	123·9	120	248
	$\frac{15}{8}$	·96875	24·6062	26	660·4	35	1·37795	260	126·6	125	257
	$\frac{31}{16}$	·984375	25·0031	27	690·6	36	1·41732	265	129·4	130	266

VEHICLE DIMENSIONS





VEHICLE DIMENSIONS

	GT6 Mk. 1		GT6 Mk. 2 and Plus		GT6 MK. 3	
	Inches	Centimetres	Inches	Centimetres	Inches	Centimetres
A	39.5	100	39.5	100	42	1067
B	8	20.3	7	17.8	7	17.8
C	6.5	16.5	7	17.8	7	17.8
D	19	48.2	15	38.1	19.5	49.5
E	20	50.8	20	50.8	20	50.8
F	34	86.4	34	86.4	34	86.4
G	38	96.6	38	96.6	38	96.6
H	17	53.3	17	53.3	17	53.3
J	8	20.3	8	20.3	8	20.3
K	18.25	46.4	18.25	46.4	18.25	46.4
L	83	212.8	83	212.8	83	212.8
M	145	371.7	147	373.4	149	378.5
N	44.5	113.0	44.5	113.0	45	114.3
O	19.5	49.5	19.5	49.5	18	45.7
P	45	114.5	45	114.5	46	116.8
Q	42	106.7	42	106.7	42	106.7
R	34	86.4	34	86.4	34	86.4
S	41.5	105.4	41.5	105.4	41.5	105.4
T	49	124.5	49	124.5	49	124.5
U	57	145.0	57	145.0	58.5	148.6
V	48	122.0	48	122.0	49	124.4
W	47	119.3	47	119.3	47	119.3

Fig. 3. Vehicle Dimensions GT6

TRIUMPH VITESSE 2-litre WORKSHOP MANUAL

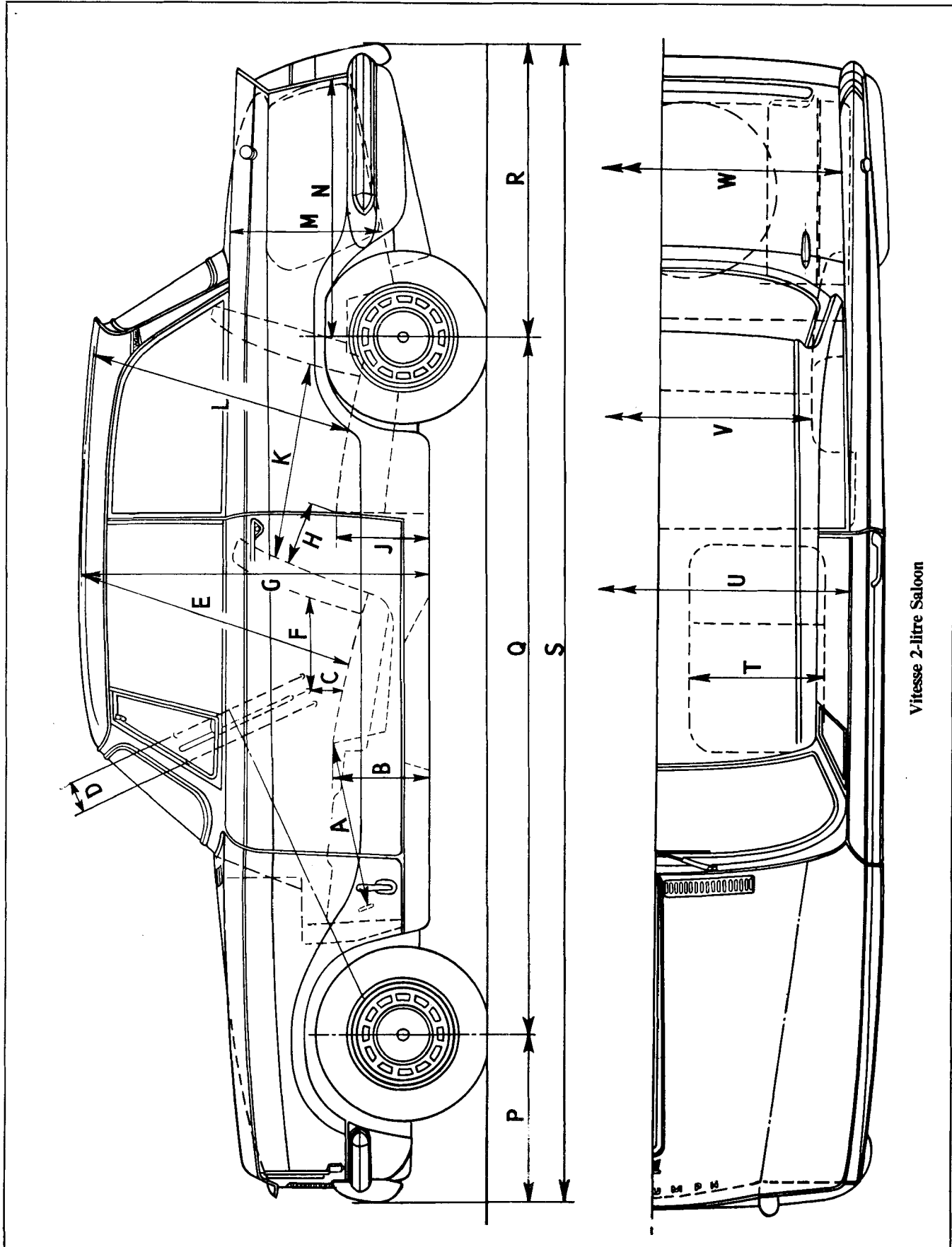
SUPPLEMENT TO GROUP 0

Information contained in this supplement applies specifically to the Triumph Vitesse 2-litre. In all other respects the relevant information is contained in the GT.6 section of this manual.

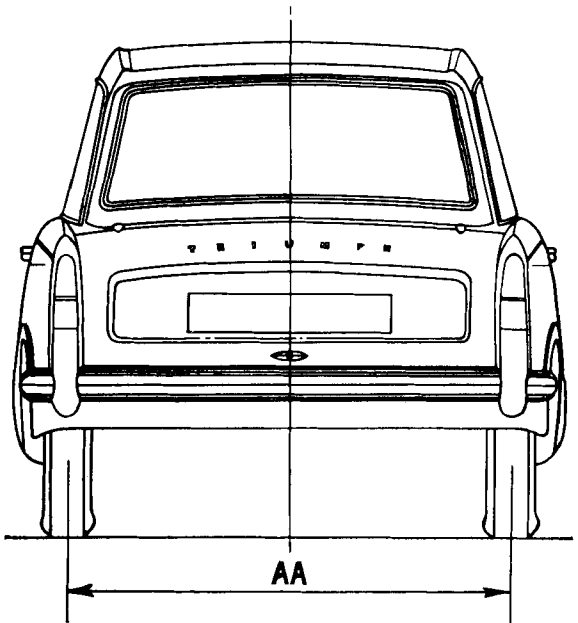
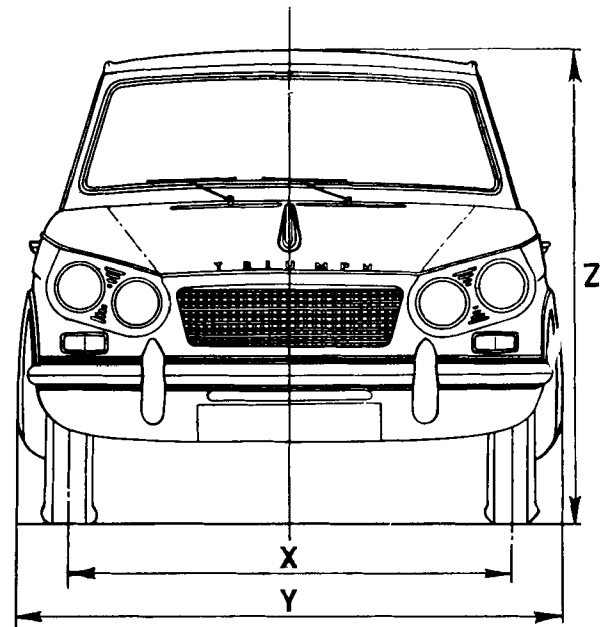
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VEHICLE DIMENSIONS



Vitesse 2-litre Saloon

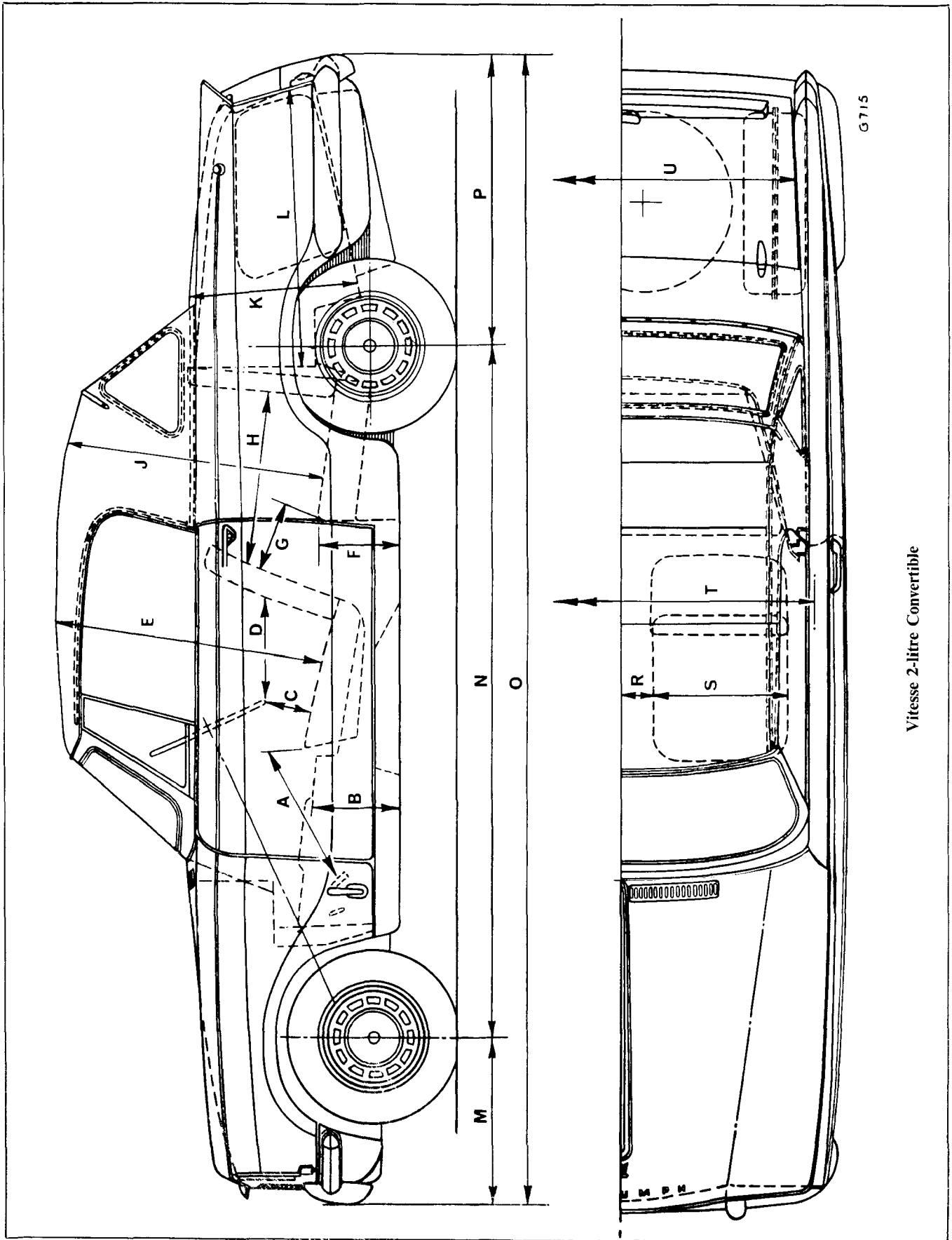


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VEHICLE DIMENSIONS

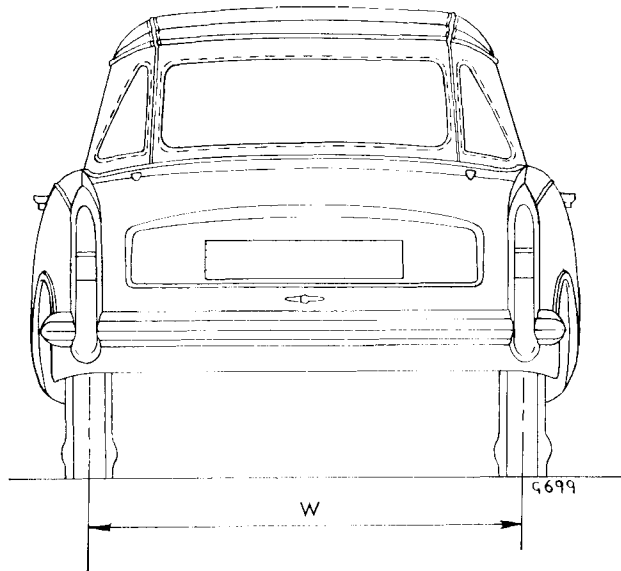
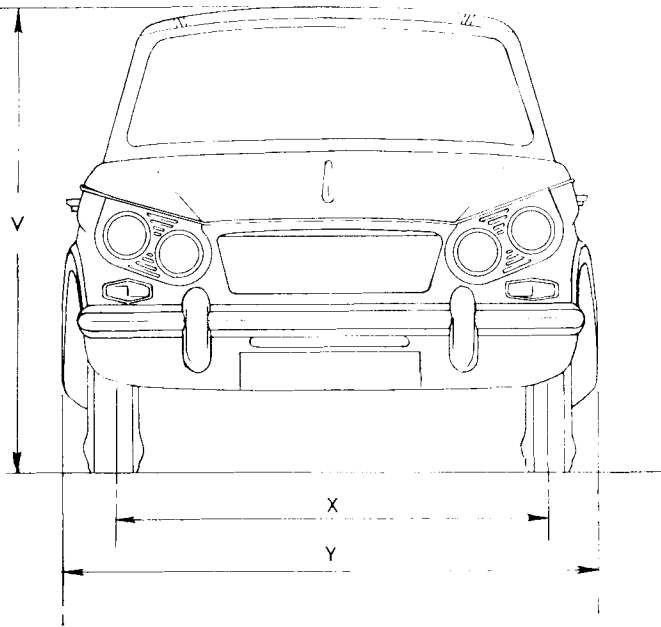
A Max.	1' 7 $\frac{3}{4}$ "	50.2 cm.
Min.	1' 2"	35.6 cm.
B	1' 0"	30.5 cm.
C Max.	5"	12.7 cm.
Min.	5 $\frac{3}{4}$ "	14.6 cm.
D	.. .. .	4"	10.16 cm.
E	.. .. .	2' 11 $\frac{3}{4}$ "	91.1 cm.
F Max.	.. .. .	1' 4"	40.65 cm.
Min.	.. .. .	10"	25.4 cm.
G	.. .. .	3' 9"	114.2 cm.
H Max.	.. .. .	11 $\frac{3}{4}$ "	29.84 cm.
Min.	.. .. .	5 $\frac{3}{4}$ "	14.60 cm.
J	.. .. .	1' 11 $\frac{1}{4}$ "	33.65 cm.
K Max.	.. .. .	2' 3 $\frac{1}{2}$ "	70.0 cm.
Min.	.. .. .	1' 9 $\frac{1}{2}$ "	54.6 cm.
L	.. .. .	2' 9"	84.0 cm.
M	.. .. .	1' 9"	53.53 cm.
N	.. .. .	3' 0"	91.44 cm.
P	.. .. .	1' 11"	58.42 cm.
Q	.. .. .	7' 7 $\frac{1}{2}$ "	2.324 m.
R	.. .. .	3' 2 $\frac{1}{2}$ "	97.79 cm.
S	.. .. .	12' 9"	3.886 m.
T	.. .. .	1' 8 $\frac{1}{2}$ "	52.10 cm.
U	.. .. .	4' 1"	1.245 m.
V	.. .. .	3' 1 $\frac{1}{4}$ "	94.6 cm.
W Max.	.. .. .	3' 4"	101.5 cm.
Min.	.. .. .	3' 2"	96.5 cm.
X	4' 1"	1.245 m.
Y	5' 0"	1.524 m.
Z Unladen	4' 5 $\frac{3}{4}$ "	1.365 m.
AA	4' 0"	1.219 m.

Fig. 1. Vitesse 2-litre Saloon



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Vitesse 2-litre Convertible



VEHICLE DIMENSIONS

A Max.	1' 7 $\frac{3}{4}$ "	50.2 cm.
Min.	1' 2"	35.6 cm.
B (from floor)	..	..	..	..	1' 0"	30.5 cm.
C Max.	..	..	..	..	5 $\frac{3}{4}$ "	14.6 cm.
Min.	..	..	..	..	5"	12.7 cm.
D Max.	..	..	..	..	1' 2 $\frac{1}{4}$ "	36.0 cm.
Min.	..	..	..	..	9"	23.0 cm.
E	..	..	..	..	2' 11 $\frac{3}{4}$ "	91.1 cm.
F (from floor)	..	..	..	..	1' 0 $\frac{1}{2}$ "	31.5 cm.
G Max.	..	..	..	..	11 $\frac{3}{4}$ "	30.0 cm.
Min.	..	..	..	..	5"	12.5 cm.
H Max.	..	..	..	..	2' 3 $\frac{1}{2}$ "	70.0 cm.
Min.	..	..	..	..	1' 10 $\frac{1}{4}$ "	56.5 cm.
J	..	..	..	..	2' 9"	84.0 cm.
K	..	..	..	..	1' 9"	53.3 cm.
L	..	..	..	..	3' 0"	91.4 cm.
M	..	..	..	..	1' 11"	58.42 cm.
N	..	..	..	..	7' 7 $\frac{1}{2}$ "	2.320 m.
P	..	..	..	..	3' 2 $\frac{1}{2}$ "	97.79 cm.
Q	..	..	..	..	12' 9"	3.885 m.
R	..	..	..	..	2 $\frac{5}{8}$ "	6.67 cm.
S	..	..	..	..	1' 8 $\frac{1}{2}$ "	52.0 cm.
T	..	..	..	..	4' 1"	1.240 m.
U Max.	..	..	..	..	3' 4"	101.5 cm.
Min.	..	..	..	..	3' 2"	96.5 cm.
V (unladen)	..	..	..	..	4' 4 $\frac{1}{2}$ "	1.335 m.
W	..	..	..	..	4' 0"	1.220 m.
X	..	..	..	..	4' 1"	1.245 m.
Y	..	..	..	..	4' 0"	1.220 m.

Fig. 2. Vitesse 2-litre Convertible

TRIUMPH GT6 and VITESSE 2-litre WORKSHOP MANUAL

GROUP 1

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PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS	
	in.	mm.	in.	mm.		
Piston Rings						
Compression ring thickness	0.077 0.0787	1.956 1.999	0.0019 to 0.0035	0.048 to 0.089		
Oil control ring width	0.1553 0.1563	3.945 3.970	0.0007 to 0.0027	0.178 to 0.068		
Piston Ring Groove						
Compression ring	0.0797 0.0807	2.024 2.050				
Oil control ring	0.1573 0.1583	3.995 4.023				
Piston ring gaps in cylinders	0.008 0.013	0.203 0.327				
Gudgeon Pin Diameter						
Grade: High	0.81242 0.81250	20.635 20.637			} Light push fit at 68 F.	
Medium	0.81234 0.81242	20.632 20.635				
Low	0.81226 0.81234	20.630 20.632				
				Colour white		
				Colour green		
				Colour yellow		
Pistons GRADING DIMENSIONS FOR STANDARD BORE SIZES						
	F		G		H	
	in.	mm.	in.	mm.	in.	mm.
Bore	2.9408 2.9405	74.696 74.689	2.9412 2.9409	74.706 74.699	2.9416 2.9413	74.717 74.709
Major top dia. A—A (Ref. Fig. 28)	2.9370 2.9366	74.600 74.590	2.9374 2.9370	74.610 74.600	2.9378 2.9374	74.620 74.610
Major bottom dia. B—B (Ref. Fig. 28)	2.9388 2.9384	74.646 74.635	2.9392 2.9388	74.656 74.646	2.9396 2.9392	74.666 74.656
Cylinder Liners	Part No. 130815					
	Bore out cylinder block to 3.063/3.062" dia. with surface finish of 45--60 micro-inches C.L.A.					
Oversize Pistons Available	+0.020" (+0.508 mm.)					
Oversize Piston Rings Available	+0.010" (+0.254 mm.)		+0.020" (+0.508 mm.)			
	+0.030" (+0.762 mm.)		+0.040" (+1.016 mm.)			

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Crankshaft					
Main bearing journal dia.	2.0005 2.001	50.813 50.825			
Main bearing internal dia.	2.0022 2.0025	50.856 50.863			Undersize bearings available: -0.010", -0.020", -0.030", (-0.254, -0.508, -0.762 mm.)
Main bearing housing internal dia.	2.146 2.1465	54.508 54.521			
Rear journal width	1.360 1.362	35.544 34.595			
Thickness of thrust washer	0.091	2.311	0.006 to 0.014	0.152 to 0.356	0.006 to 0.008 recommended crankshaft end-float (0.152 to 0.203 mm.)
Oversize thrust washers	0.096 0.098	2.436 2.487			
Crankpin dia.	1.875 1.8755	47.625 47.638			
Connecting Rods					
Big-end bearing internal dia.	1.8775 1.877	47.688 47.675	0.001 0.0027	0.0254 0.069	Undersize bearings available: -0.010", -0.020", -0.030", (-0.254, -0.508, -0.762 mm.)
Con-rod end float on crankpin			0.0086 0.0125	0.21844 0.3175	
Small-end bush internal dia.	0.8122 0.8126	20.630 20.640			Light hand push fit at 68 F.
Gudgeon pin dia.	0.81226 0.81234	20.630 20.633			
Max. Con-rod bend and twist	0.0015	0.038			In length of gudgeon pin
Camshaft					
Journal dia.	1.8402 1.8407	46.741 46.754	0.0026 0.0046	0.066 0.117	
Bore in block	1.8433 1.8448	46.820 46.858			
End-float	0.004 0.008	0.102 0.203			
Tappets					
Tappet dia.	0.8000 0.7996	20.32 20.310	0.0013 0.002	0.033 0.051	
Tappet bore in cylinder block	0.8009 0.8002	20.343 20.325			

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Oil Pump					
Depth of rotor	1.4985	38.062			A combined worn clearance of 0.004" (0.1016 mm.) indicates necessity for lapping/replacement of cover and housing face
	1.4995	38.087			
Depth of housing	1.500	38.1			A combined worn clearance of 0.004" (0.1016 mm.) indicates necessity for lapping/replacement of cover and housing face
	1.501	38.125			
Maximum permissible clearance between outer rotor and body	0.0075	0.1905			} Renew outer rotor and/or housing
Maximum permissible clearance between outer and inner rotors	0.004	0.1016			
	0.001	0.0254			
Distributor Drive Gear					
End-float	0.003	0.076			Adjust with paper washers beneath distributor pedestal
	0.007	0.178			
Spindle dia.	0.4991	12.677			
	0.4996	12.690			
Bush bore	0.5006	12.715	0.001	0.0254	
	0.5013	12.733	to	to	
			0.0022	0.0559	
Oil Pressure Relief Valve Spring					
Free length	1.55	39.37			
Fitted length	1.25	31.75			
Load at fitted length ..	14.5 lb.	6.58 kg.			
Rocker Shaft dia.					
	0.5607	14.241	0.0008	0.020	
	0.5612	14.253	to	to	
			0.0023	0.058	
Bore of Rockers					
	0.564	14.326			
	0.563	14.300			
Valve Guides					
Length	2.72	69.088			
Bore	0.312	7.924			
	0.313	7.950			
Outside dia.	0.501	12.725			
	0.502	12.750			
Amount valve guides protrude above cylinder head top face	0.749	19.025			Press fit in cylinder head
	0.751	19.075			

Refer to Page 1-138 for additional information Mk. 2, GT6 plus and GT6 Mk. 3 models.

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Valves					
Inlet valve head dia. ..	1.301	33.045			
	1.305	33.147			
Inlet valve stem dia. ..	0.3107	7.891	0.0018	0.046	
	0.3112	7.905	to	to	
			0.0023	0.058	
Exhaust valve head dia. ..	1.176	29.870			
	1.180	29.972			
Exhaust valve stem dia. ..	0.310	7.874	0.0015	0.038	
	0.3105	7.887	to	to	
			0.0025	0.064	

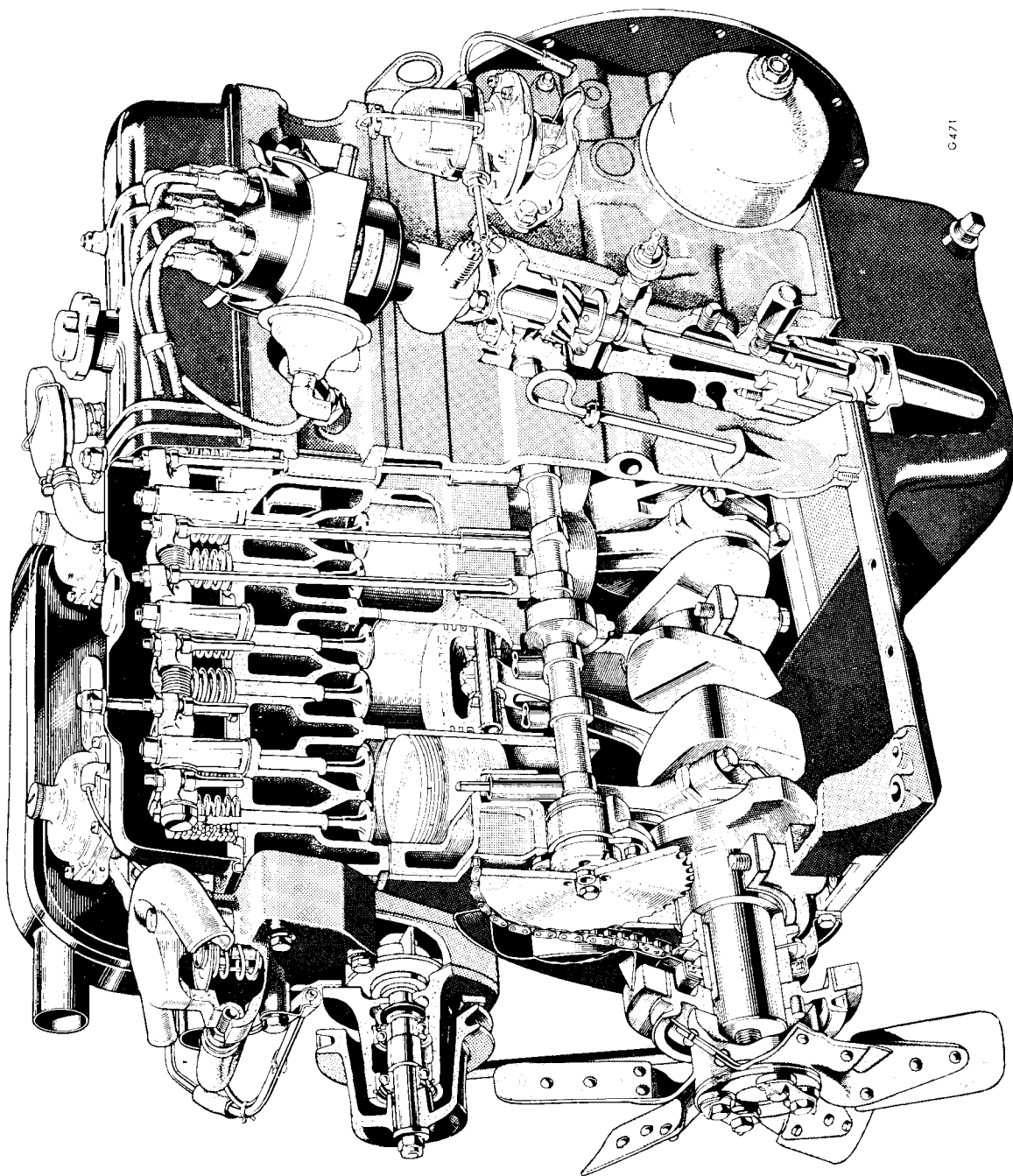
VALVE SEAT INSERT DIMENSIONS

	INSERT DIMENSIONS				BORE OUT				INSERT Part No.
	External dia.		Width		Diameter		Depth		
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	
EXHAUST	1.2535	31.839	0.216	5.486	1.250	31.750	0.219	5.563	130813
	1.2545	31.864	0.219	5.563	1.251	31.775	0.224	5.690	
INLET	1.3785	35.014	0.216	5.486	1.375	34.925	0.219	5.563	130814
	1.3795	35.039	0.219	5.563	1.376	34.950	0.224	5.690	

VALVE SPRINGS

	INNER		OUTER	
	in.	mm.	in.	mm.
Length	1.14	28.956	1.386	35.2
Load	lb.	kg.	lb.	kg.
	11 to 14	4.990 to 6.350	27 to 30	12.247 to 13.608
Free length	in.	mm.	in.	mm.
	1.56	39.624	1.61	40.894

Refer to Page 1-138 for additional information Mk. 2, GT6 plus and GT6 Mk. 3 Models.



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Fig. 1. Cut-away view of engine

LUBRICATION

Oil Circulation (Fig. 2)

Oil drawn from the sump is forced, by a Hobourn-Eaton eccentric rotor pump (1), through a passage cast in the cylinder block to a full-flow filter (3) bolted to the side of the engine. A spring-loaded relief valve (2), which communicates with this passage, opens at a pressure of 45-55 lbs/sq in. Oil is distributed via cross drillings to the crankshaft and camshaft bearings and through drillings in the crankshaft webs to the connecting rod bearings. The cylinder bores and small end bearings are lubricated by oil escaping from the crankshaft bearings.

To prevent excessive lubrication of the valve gear, a scroll and two flats on the rear camshaft journal meter the oil fed to the rocker shaft. Oil ejected from the rocker shaft lubricates the rocker pads, push rods and tappets before returning to the sump.

Oil leakage from the front of the crankshaft is prevented by a rotating disc secured between the crankshaft pulley and timing sprocket, and an oil seal which is pressed into the timing cover. Leakage at the rear of the crankshaft is prevented by a lipped seal fitted in a housing which is bolted to the cylinder block.

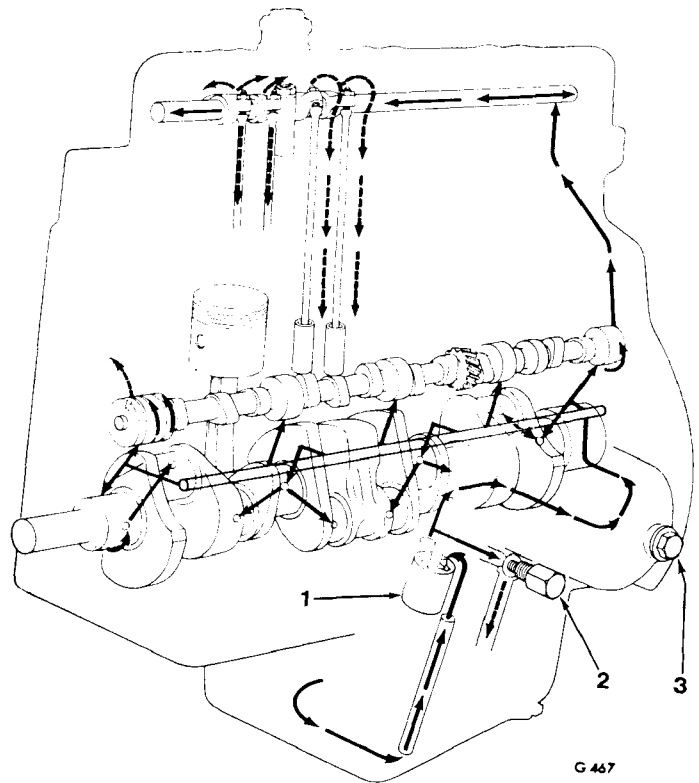


Fig. 2. Diagram of oil circulation

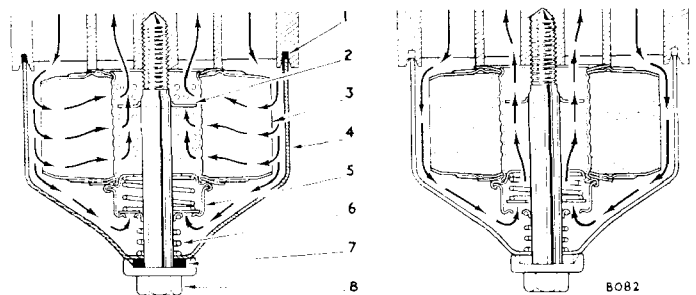
Oil Filtration

A full-flow oil filter comprising the components shown sectioned on Fig. 3, is attached by a single bolt (8) to the side of the engine and sealed by a rubber ring (1) interposed between the filter body (4) and crankcase.

Oil fed to the outside of the filter element, percolates to the centre and flows directly to the oil gallery. As the element becomes fouled and tends to restrict the oil flow, increased oil pressure opens the relief valve (5) to allow the passage of unfiltered oil to the oil gallery.

Crankcase Ventilation

The crankcase and rocker cover are ventilated by air drawn through the horse-hair filter in the filler cap. Clean incoming air circulates around the inside of the rocker cover, passes down the push rod tubes into the crankcase and is finally extracted through a breather pipe on the right-hand side of the rocker box, through a Smiths emission valve and into the induction manifold.



- | | |
|-------------------|-------------------|
| 1 Rubber seal | 5 Relief valve |
| 2 Locating washer | 6 Spring |
| 3 Filter element | 7 Seal |
| 4 Container | 8 Attachment bolt |

Fig. 3. Circulation of oil through filter unit

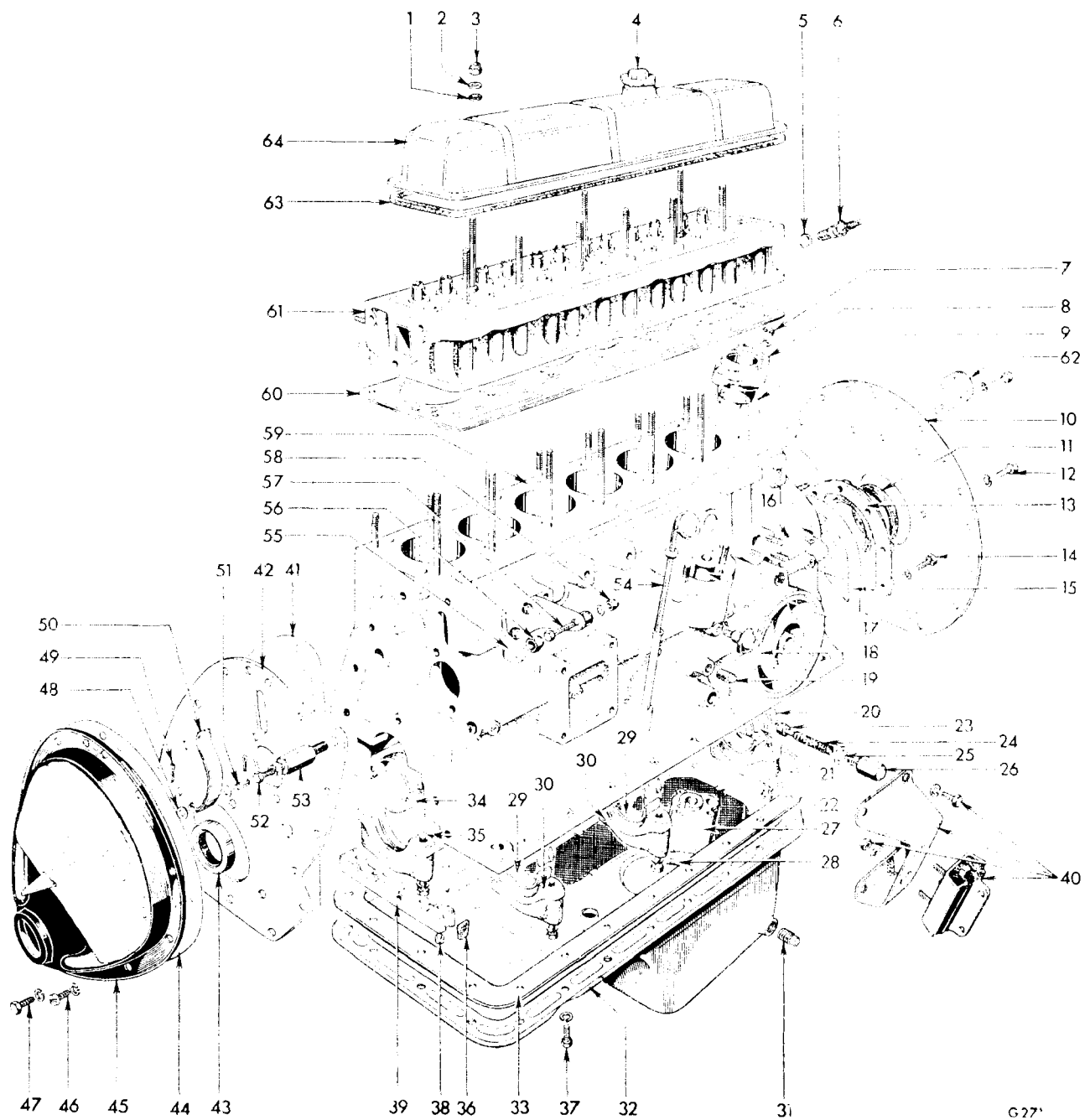


Fig. 4. Engine details (fixed parts)

Key to Fig. 4

1 Fibre washer	23 Relief valve	45 Front timing cover
2 Plain washer	24 Spring	46 Slotted setscrew
3 Nyloc nut	25 Copper washer	47 Bolt
4 Filler cap	26 Cap nut	48 Plain washer
5 Copper/asbestos washer	27 Oil pump body	49 Split pin
6 Sparking plug	28 Oil pump end plate	50 Chain tensioner
7 Nut	29 Centre bearing shell	51 Pivot pin
8 Adaptor	30 Centre main bearing cap	52 Bolt
9 Gasket	31 Sump plug	53 Generator pedestal
10 Rear engine plate	32 Sump	54 Dipstick
11 Rear oil seal	33 Sump gasket	55 Bracket
12 Bolt	34 Front bearing shell	56 Nyloc nut
13 Rear oil seal housing	35 Front main bearing cap	57 Bolt
14 Bolt	36 Sealing wedges	58 Nyloc nut
15 Gasket	37 Sump bolt	59 Cylinder block
16 Blanking plate	38 Slotted screw	60 Cylinder head gasket
17 Oil pump drive shaft bush	39 Front sealing block	61 Cylinder head
18 Oil pressure switch	40 Front engine mounting	62 Lifting eye
19 Plug	41 Gasket	63 Rocker cover gasket
20 Crankshaft thrust washer	42 Front engine plate	64 Rocker cover
21 Rear bearing shell	43 Oil seal	
22 Rear bearing cap	44 Gasket	

ENGINE AND GEARBOX REMOVAL (GT6)

1. Isolate the battery, drain the cooling system and engine sump, and remove the air cleaner.
2. Remove bonnet assembly (Group 5).
3. Referring to page 1-205 remove the radiator block, air duct and hoses.
4. Take out the engine bay side valances, by removing 3 bolts at the front and 2 bolts at the rear.
5. Release the gearbox attachments by carrying out the operations given for removal of gearbox on pages 2-207-8, except for the last paragraph.
6. Referring to Figs. 5, 6 and 7, remove the fuel inlet pipe from the fuel pump (1), disconnect the tachometer drive cable from the distributor (2). Release the oil pressure switch and generator leads (3) and (4). Release ignition lead (5) from the coil.
7. Disconnect the heater pipes (6) and (7) and remove the cable from the water control valve (8). Disconnect the choke and throttle controls (9) and (10). Disconnect the lead (11) from the starter motor. Disconnect the earth wire (12) from the bell housing.
8. Release the temperature transmitter electrical connection (13). And servo pipe connection (GT6 Mk. 3).
9. Disconnect exhaust front pipe from manifold flange and gearbox. Disconnect the earth lead from the front engine plate.
10. Taking the weight of the engine with a hoist, remove nuts, bolts, and packing pieces from the engine mountings (14). Raise the engine sufficiently to place the brake protection plate, Figs. 78 and 79, Page 1-135 in position.
11. Carefully raise the engine (Fig. 76), tilting rearwards and pulling forward at the same time. For engine and gearbox installation see page 1-132.

ENGINE DISMANTLING

Referring to Figs. 9 and 10:

Remove the clutch bell housing attachments, lift out the starter motor and withdraw the gearbox assembly.

Disconnect the fuel delivery pipe (6) from the pump, and unscrew two nuts (7). Lift off the pump (5).

Disconnect the H.T. leads from the sparking plugs and coil, and L.T. leads from the coil.

Remove the two bolts securing the distributor to its pedestal and lift out the distributor. Remove the two bolts securing the distributor pedestal, lift off the pedestal and take out the driving gear.

Remove the coil (2) by removing two securing bolts and take out the sparking plugs.

Remove the centre bolt (8) and lift off the oil filter (9).

Unscrew the oil pressure switch (10) and lift out the dipstick (11).

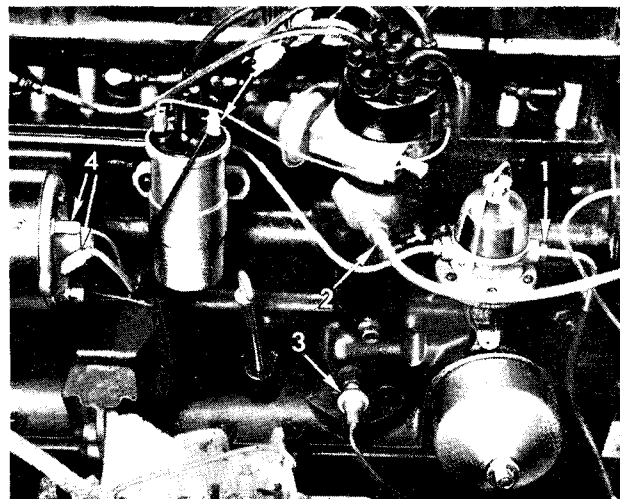


Fig. 5. Left-hand view of engine

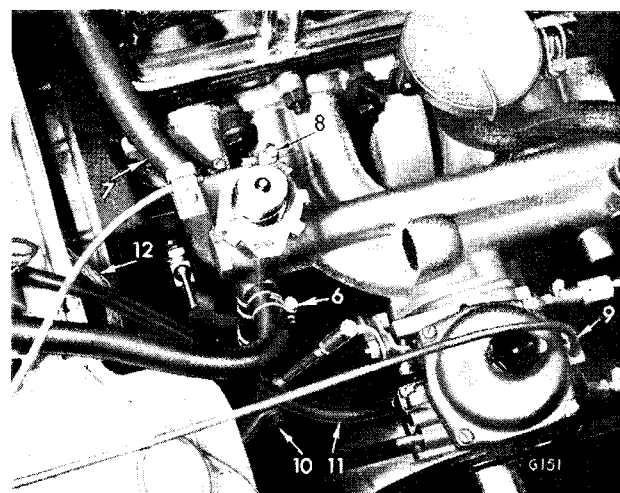


Fig. 6. Right-hand view of engine

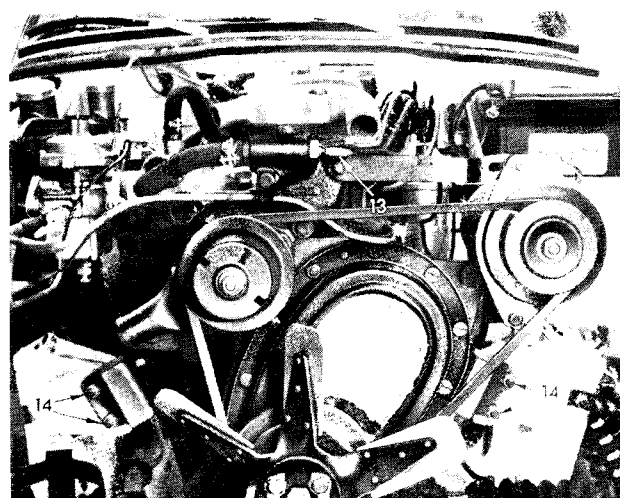


Fig. 7. Front view of engine

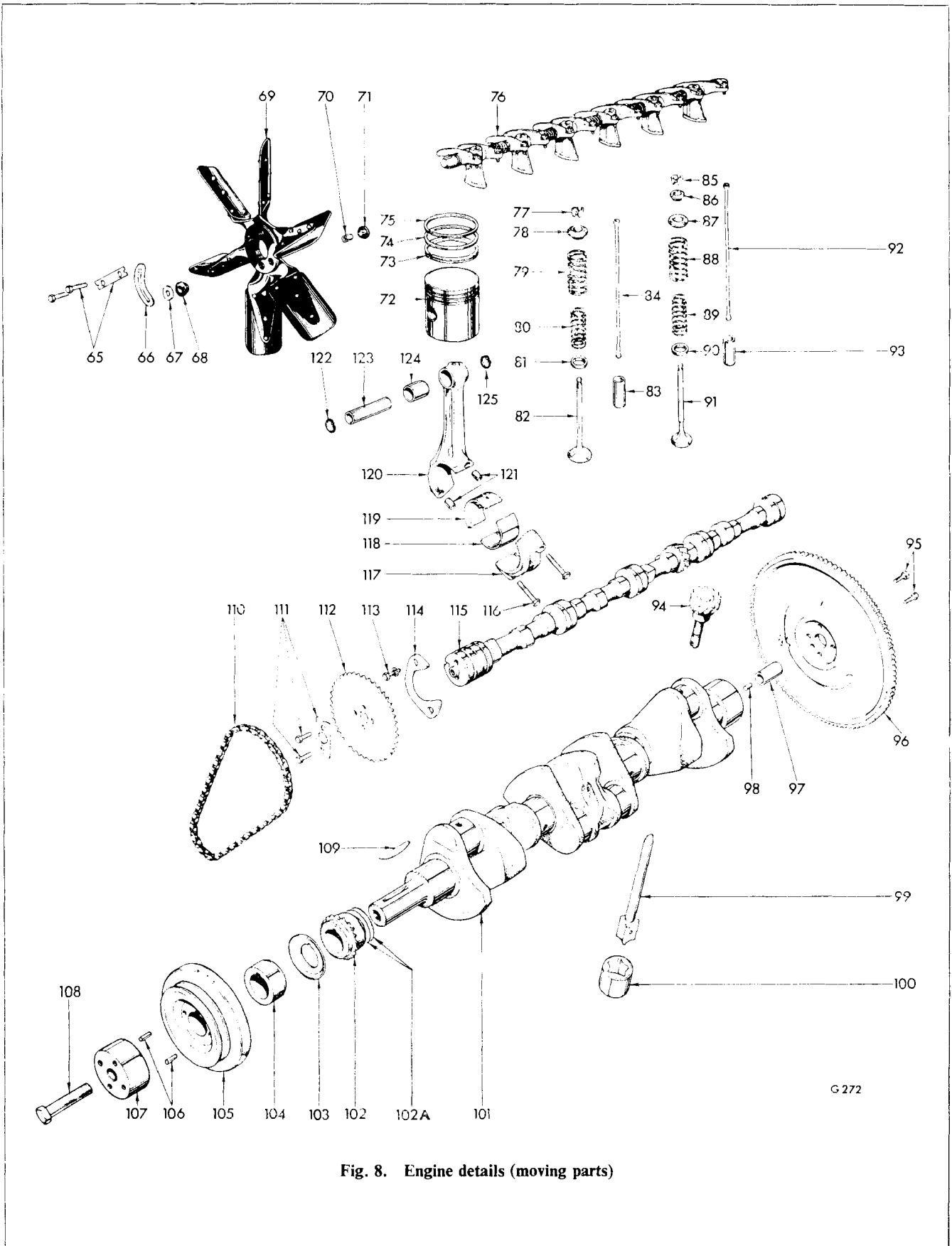


Fig. 8. Engine details (moving parts)

Key to Fig. 8

65 Bolts and lock tabs	86 Inner collar (exhaust)	106 Dowels
66 Balance weight	87 Outer collar (exhaust)	107 Fan boss
67 Washer	88 Spring—outer	108 Bolt
68 Rubber bush	89 Spring—inner	109 Key
69 Fan assembly	90 Lower collar	110 Timing chain
70 Steel bush	91 Exhaust valve	111 Bolts and lock plate
71 Rubber bush	92 Push rod	112 Camshaft sprocket
72 Piston	93 Tappet	113 Bolt
73 Oil control ring	94 Distributor and oil pump drive gear	114 Keeper plate
74 Tapered compression ring	95 Bolts	115 Camshaft
75 Plain compression ring	96 Flywheel	116 Bolt
76 Rocker shaft assembly	97 Bush	117 Con-rod cap
77 Split collets	98 Dowel	118 Con-rod bearing shell—lower
78 Collar	99 Inner rotor and spindle	119 Con-rod bearing shell—upper
79 Spring—outer	100 Outer rotor	120 Con-rod
80 Spring—inner	101 Crankshaft	121 Dowels
81 Lower collar	102 Sprocket	122 Circlip
82 Inlet valve	102A Shim	123 Gudgeon pin
83 Tappet	103 Flinger	124 Gudgeon pin bush
84 Push rod	104 Seal extension	125 Circlip
85 Split collets	105 Crankshaft pulley	

Unscrew the domed nut (12) and withdraw the spring and the oil pressure relief valve plunger.

Remove two pivot bolts (14) the adjuster bolt (17) and lift off the generator (13) and fan belt (15).

Remove the generator bracket attachments and lift off the bracket.

Release the clip retaining the fuel and vacuum pipes by removing the bolt (1).

Disconnect the fuel and vacuum pipes from the carburetors and remove the pipes from the engine.

Release the water hose (19).

Disconnect the water return pipe from the rear of the pump; unscrew two bolts (18) and lift off the water pump assembly.

Unscrew the centre bolt (16) and withdraw the fan and pulley assembly.

Remove the hoses (22) and (23), take out the bolt (20) and lift off the emission valve (21).

Release the manifold assembly by progressively slackening four nuts (29) and six clamps (27).

Remove the engine mounting brackets (24), the front and rear lifting eyes (28) and the cylinder block drain tap (26).

Take out the clutch attachment bolts (25) and lift off the clutch pressure plate assembly and centre plate.

To complete the dismantling, refer to figures (4) and (8) and continue as follows:

Unscrew two nyloc nuts (3). Lift off the washers (2) and (1), the rocker cover (64) and gasket (63).

Progressively unscrew the rocker pedestal securing nuts, lift off the rocker assembly (76) and lift out the push rods (84) and (92).

Progressively unscrew the cylinder head nuts in the reverse sequence to that shown in Fig. 49. and lift off the cylinder head (61) and gasket (60). Withdraw the tappets (83) and (93).

Using a spring compressor, remove the inlet valve collets (77), collar (78), outer spring (79), inner spring (80), lower collar (81) and valve (82). Remove the exhaust valve details by repeating the procedure.

Remove the timing cover attachments, withdraw the cover (45) and lift off the gasket (44).

Remove the attachments (111) withdraw the timing sprocket (112) and lift off the chain (110).

Withdraw the seal extension (104), flinger (103) and sprocket (102). Take out the key (109) and remove the shims (102A).

Take out the bolts (113), remove the keeper plate (114) and unscrew the front engine bearer plate attachments. Lift off the bearer plate (42) and withdraw the camshaft (115).

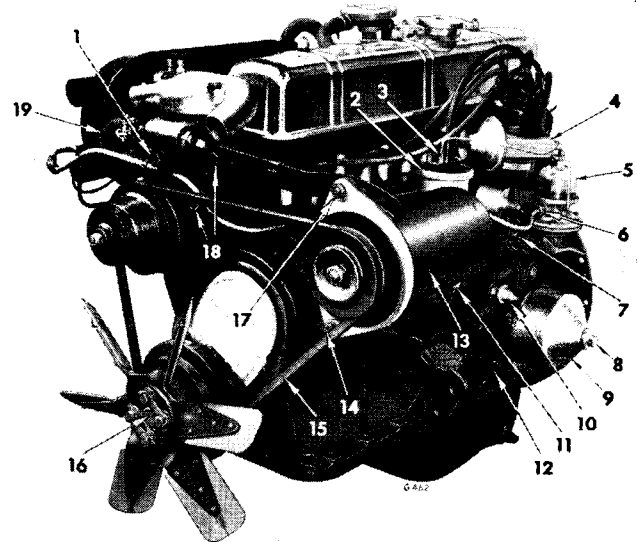


Fig. 9. Ancillary equipment (left-hand)

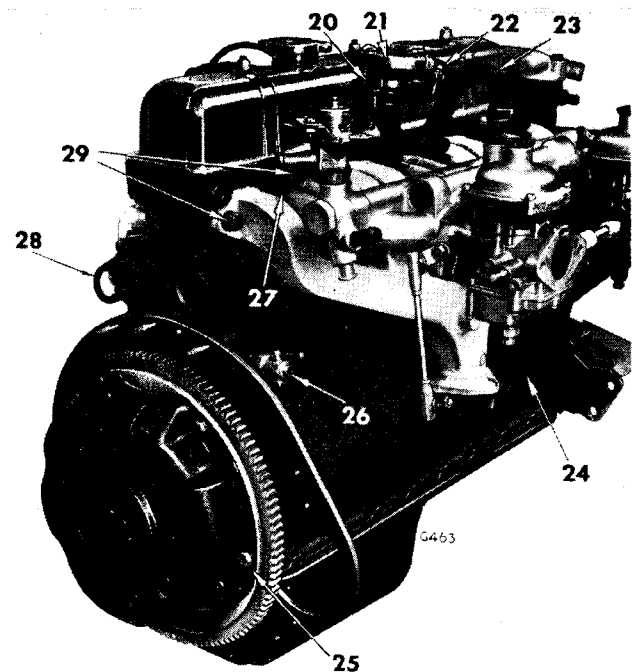


Fig. 10. Ancillary equipment (right-hand)

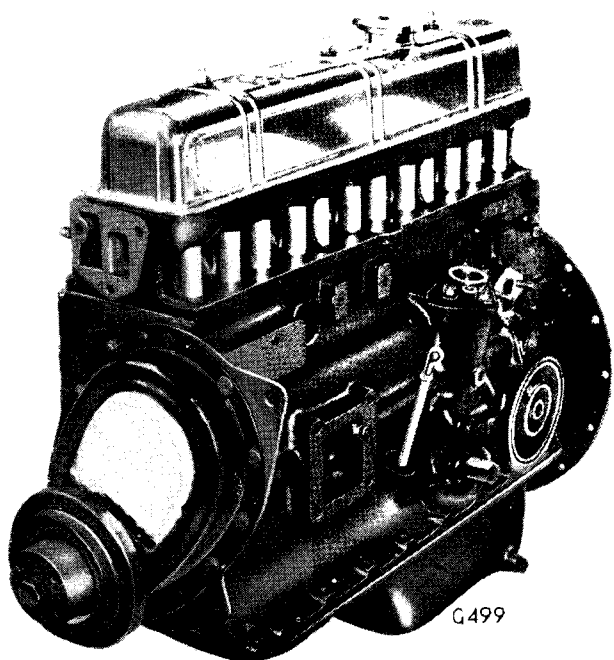


Fig. 11. Left-hand view of a replacement unit

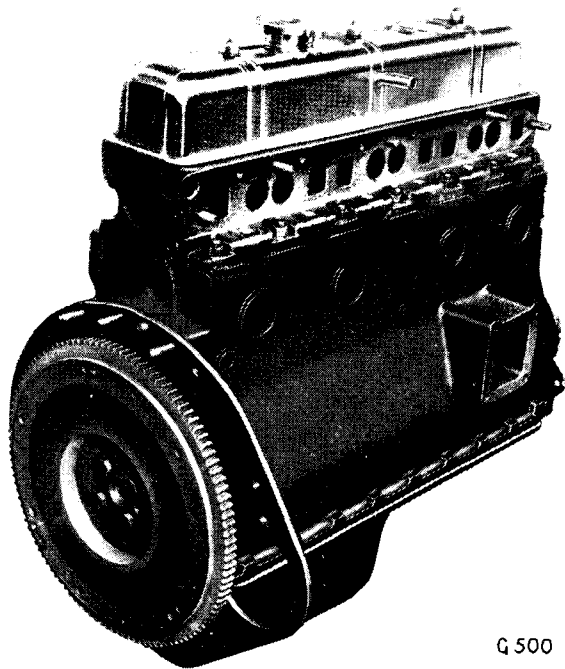


Fig. 12. Right-hand view of a replacement unit

Remove the cap-nut (26), the washer (25) and take out the spring (24) and relief valve (23).

Unscrew the sump securing bolts (37) and take off the sump (32) and gaskets (33).

Unscrew three oil pump securing screws and take off the oil pump (27).

Unscrew the big-end cap bolts (116). Take off the caps and push the connecting rod and piston assemblies out through the top of the cylinder bores. NOTE:—If the bearings are being re-used suitably mark them to ensure that they are refitted to the same positions.

Extract the circlips (122) (125), push out the gudgeon pins (123) to release the piston (72).

Using a block of wood to jam the crankshaft, unscrew the fly-wheel bolts (95), lift off the fly-wheel (96) and take out the spigot bush (97).

Unscrew the bolts (12) and take off the rear bearer plate (10).

Unscrew the bolts (14) and remove the rear seal housing (13).

Unscrew two cheese-headed screws (38) and tap out the sealing block (39). Unscrew the main bearing cap bolts, lift off the caps (30) and (22) and refer to the note above.

Lift out the crankshaft (101) and finally remove the studs and sealing plugs as required.

REPLACEMENT UNIT

Removing Ancillary Equipment

Before returning an engine for reconditioning, drain the sump and remove the following items:

- 1 Gearbox and clutch unit
- 2 Generator and fan belt
- 3 Water pump
- 4 Fuel pump
- 5 Distributor
- 6 Coil
- 7 Smiths emission valve
- 8 Inlet and exhaust manifold
- 9 Starter motor
- 10 Oil filter
- 11 Temperature transmitter
- 12 Sparking plugs
- 13 Drain tap
- 14 Engine mounting brackets
- 15 Fan
- 16 Lifting eyes

Refitting Ancillary Equipment

Remove all masking tape from the apertures in the reconditioned unit and ensure that all joint faces are clean. Using new gaskets, refit the above items.

ENGINE RECONDITIONING

General Recommendations

Remove all trace of old gasket material from joint faces and ensure that engine components are clean and free from burrs or other damage likely to prevent adequate sealing. Clean and degrease components in a trichlorethylene plant, if available, giving special attention to oilways.

All components should be carefully examined and working surfaces should be checked against the maximum worn tolerances given on pages 1-102 to 1-105.

When rebuilding an engine, use new gaskets and lockplates. Renew damaged studs, nuts, bolts, spring washers and leaking core plugs.

Use Hylomar, Wellseal or Hermatite jointing compound for all gaskets, joints and sealing block faces. Tighten all nuts, bolts and studs to the appropriate torque figures, see Group 0.

Studs

Refit all studs and dowels to the cylinder block as shown in Fig. 13.

STUDS, DOWELS AND PLUGS

No.	Sizes	No. Off	Part No.
1	Stud $\frac{3}{8}$ " U.N.F. \times 1-34"	2	105124
2	Stud $\frac{1}{8}$ " U.N.F. \times 1-31"	2	101962
3	Dowel ..	1	127398
4	Core plug $1\frac{1}{2}$ " dia.	5	144688
5	Core plug $1\frac{1}{4}$ " dia.	3	144686
6	Stud $\frac{7}{8}$ " U.N.F. \times 1-31"	2	101962
7	Stud $\frac{7}{8}$ " U.N.F. \times 1-16"	6	100433
8	Plug, dry seal $\frac{1}{8}$ " N.P.	6	118686
9	Plug $\frac{1}{2}$ " U.N.F. \times $\frac{1}{2}$ "	1	PU 1404
10	Plug $\frac{3}{8}$ " \times 18 N.P. taper	2	114774
11	Plug $\frac{1}{2}$ " N.F. \times -38"	1	PS 1103
12	Plug, core 1" dia. ..	1	144687
13	Dowel $\frac{1}{8}$ " \times $\frac{7}{8}$ " ..	2	DP 0514
14	Stud $\frac{3}{8}$ " U.N.F. \times 1-56"	7	133803
15	Stud $\frac{3}{8}$ " U.N.F. \times 4-63"	7	119758
16	Stud $\frac{3}{8}$ " U.N.F. \times 3-09"	6	132495
17	Stud $\frac{5}{8}$ " U.N.F. \times 4-13"	3	105123
18	Dowel $\frac{3}{8}$ " \times $\frac{3}{4}$ " ..	1	DP 0612
19	Plug, dry seal $\frac{1}{4}$ " NPSL ..	1	118632
20	Stud $\frac{1}{8}$ " U.N.F. ..	3	139836
21	Dowel $\frac{3}{8}$ " \times 1" ..	1	DP 0616
22	Copper washer $\frac{1}{8}$ " I.D. ..	1	500469
23	Setscrew $\frac{1}{8}$ " U.N.F. \times $\frac{3}{8}$ "	1	HU 0803
24	Plug, bucket 1-629 ..	1	144648
25	Plug $\frac{3}{8}$ " \times 18" N.P. ..	1	116511

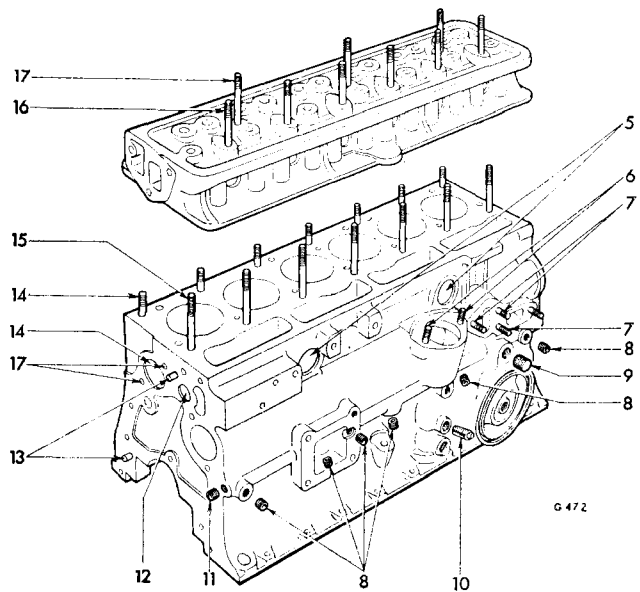
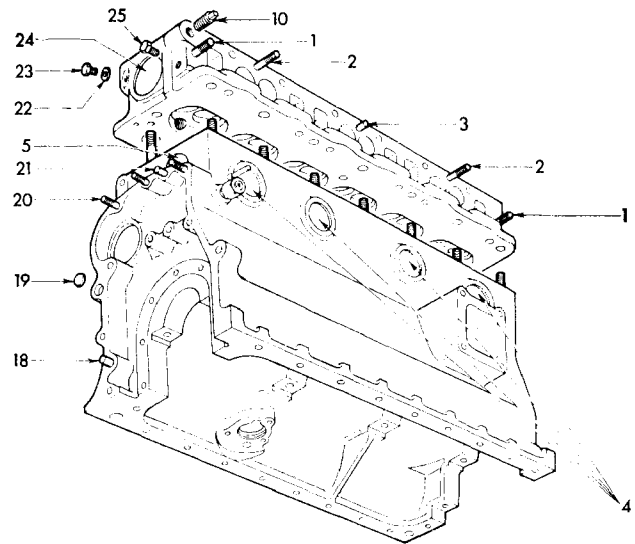


Fig. 13. Location of studs, dowels and plugs

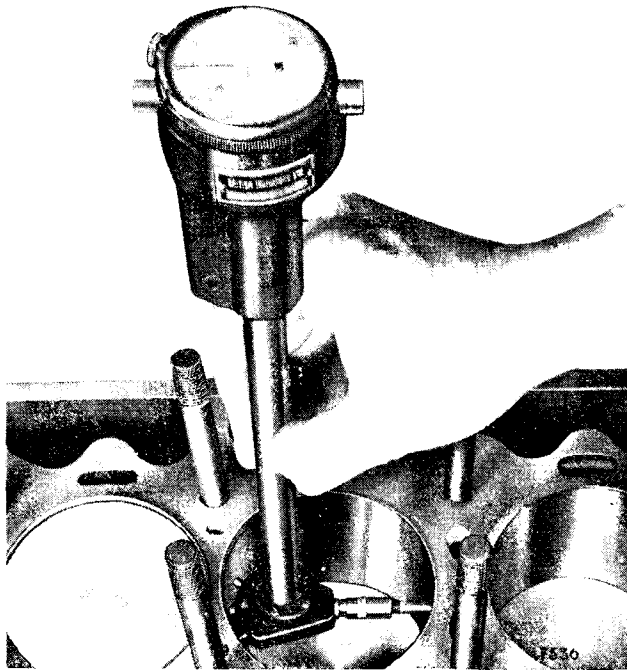
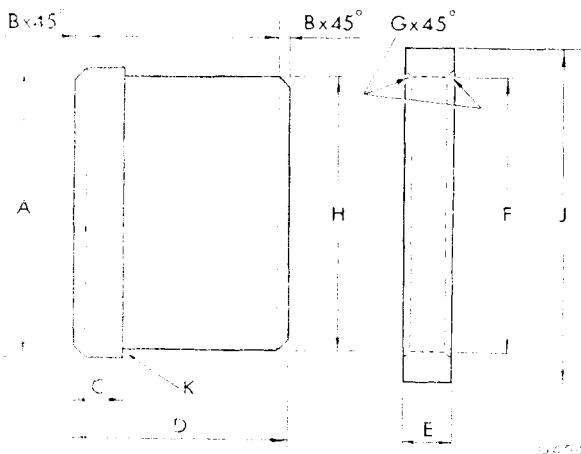


Fig. 14. Measuring cylinder bores



'A' dia. = 3.0615" (77.7621 mm.)	'F' dia. = 2.921" (74.1934 mm.)
3.0605" (77.7367 mm.)	2.922" (74.2188 mm.)
'B' = 3.175 mm.)	'G' = $\frac{1}{16}$ " (1.588 mm.)
'C' = 3.127 mm.)	'H' dia. = 2.9195" (74.1553 mm.)
'D' = 2.5715 mm.)	2.9205" (74.1807 mm.)
'E' = 3.127 mm.)	'J' dia. = 3 $\frac{1}{2}$ " (88.90 mm.)
'K' = Max. radius 0.010" (.254 mm.)	

NOTE: Remove all sharp edges.

Fig. 15. Mandrel and limiting ring for removing and installing liners

CYLINDER BLOCK

Measuring Cylinder Bores

Check the cylinder bore diameters with a cylinder gauge or comparator such as the Mercer dial gauge shown in Fig. 14.

Insert the gauge into the cylinder bore and by taking readings at different positions, determine the maximum bore wear which normally occurs towards the top of the bore across its thrust axis. The maximum permissible bore wear is .010" (.254 mm.).

Reboring Block to Suit Oversize Pistons

Pistons are available .020" (0.508 mm.) oversize. Before fitting, the cylinder block should be rebored to 2.9614/2.9609 (73.685/73.683 mm.) to suit the oversize pistons.

Cylinder Liners

When the cylinder bore will not machine to the maximum oversize dimension, the block can be salvaged by fitting thin wall cast iron liners which are available in sets of six. Before cylinder liners can be fitted, the block must be rebored to 3.063/3.062" dia. (77.8/77.775 mm.) with a surface finish of 45-60 micro-inches C.L.A. When fitting the liners a mandrel and limiting ring made to the dimensions in Fig. 15, will assist the operation.

To Fit a Cylinder Liner

Ensure that the top edge of the cylinder block is free from burrs. Clean and apply tallow to the cylinder bore and outside diameter of the liner.

Assemble the ring Fig. 15, over the mandrel and insert the mandrel into the top of the liner. With the cylinder block placed on the bed of a press, enter the liner squarely into the top of the cylinder bore and move the assembly as required, to centralise the mandrel with the ram of the press.

Before presenting the liner to the block, ensure that there is sufficient movement of the ram to accomplish the operation without interruption.

Using a continuous and even pressure, press in the liner until the ring is flush with the cylinder head joint face.

When fitted, bore out the liner to the standard bore size, or where necessary rebore to suit a 0.020" (0.508 mm.) maximum oversize piston.

To Remove a Cylinder Liner

If a worn liner will not obviously clean up at 0.020" (0.508 mm.) fit new liners as described below.

Dismantle the engine and place the cylinder head joint face of the cylinder block on the bed of a press, ensuring that the block face is supported over the largest possible area nearest to the liner.

Insert the shouldered mandrel into the liner and before moving the assembly to centralize the mandrel with a ram of the press, ensure that the total ram movement is not less than the length of the liner.

Using a continuous and even pressure, exerted over the centre of the mandrel, press out the liner in a single uninterrupted movement.

Crankshaft Regrinding

Measure the diameter of the crankshaft journals and crank pins at various points in order to establish maximum wear, taper and ovality. Should the wear be excessive, regrind the crankshaft to suit the nearest undersize bearings quoted on page 1-103, and indicate the amount removed by stamping the crankshaft webs.

To check the run-out of the centre journal, mount the crankshaft between centres. By applying sufficient load in the required direction reduce the run-out to a maximum of 0.002" (0.5 mm.).

NOTE: It is necessary to have a fillet radius of $\cdot 080/\cdot 100$ on the crankpins and journals.

Balance

Maximum permissible "out of balance" $\cdot 03$ oz. ins.

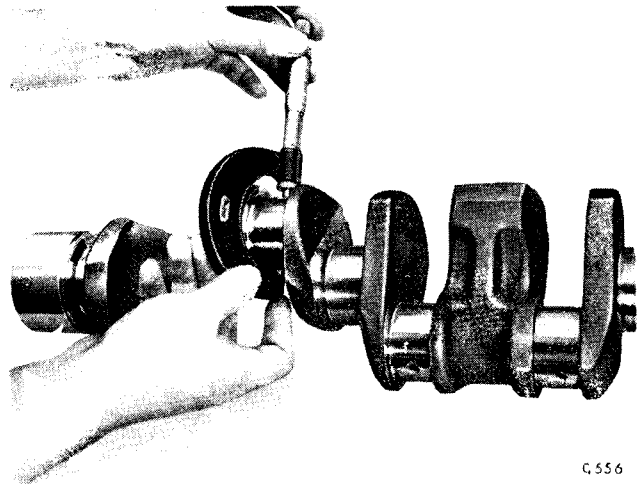
Crankshaft and Bearings

During manufacture the bearing caps are assembled to the cylinder block and line-bored as an assembly, thus the caps are not interchangeable and should not under any circumstances be defaced. Both the cylinder block and corresponding bearing caps are stamped with the same symbols, which are located on one side of the engine sump face and on the corresponding side of each bearing cap. (See Fig. 18).

Due to the precise limits of manufacture, both standard and undersize bearings should not be defaced in any way.

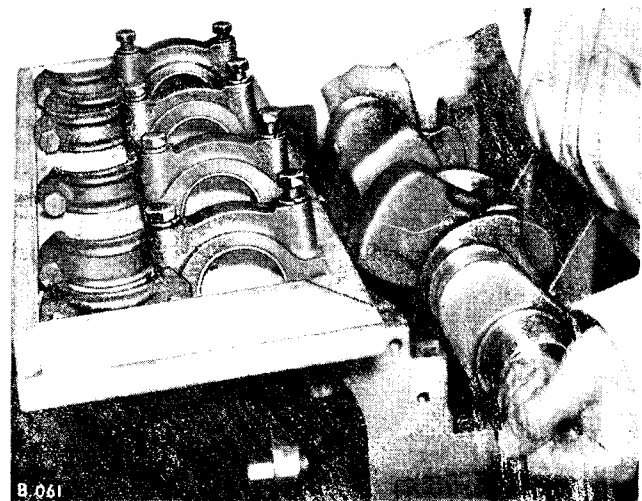
The following undersize bearings are available:
 $\cdot 010$ " ($\cdot 0\cdot 254$ mm.); $\cdot 020$ " ($\cdot 0\cdot 508$ mm.)
 $\cdot 030$ " ($\cdot 0\cdot 762$ mm.)

The undersize dimension is stamped on the back of the bearings. When a reground crankshaft is fitted, the undersize dimension is stamped on the crankshaft webs. Ensure that the bearing sizes correspond with the crankpin and journal sizes.



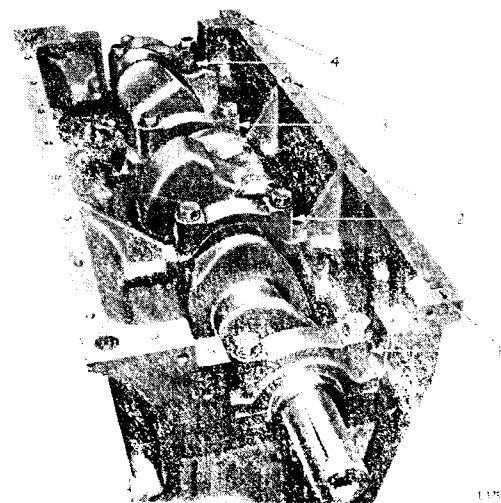
G 556

Fig. 16. Measuring crankshaft pins and journals



B 061

Fig. 17. Crankshaft assembly



L 135

Fig. 18. Relative position of main bearing cap numbers

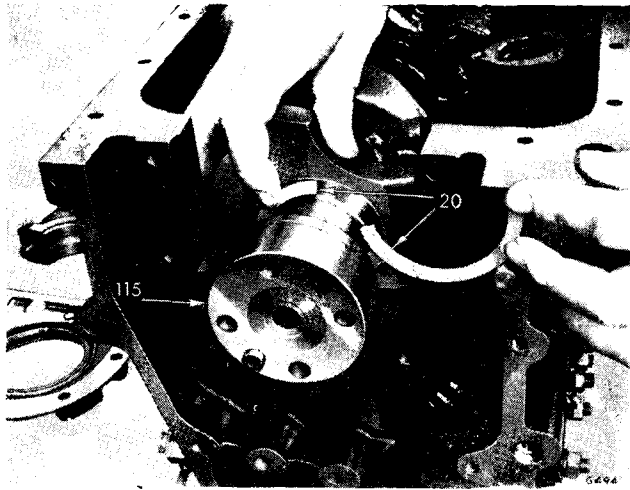


Fig. 19. Inserting thrust washers

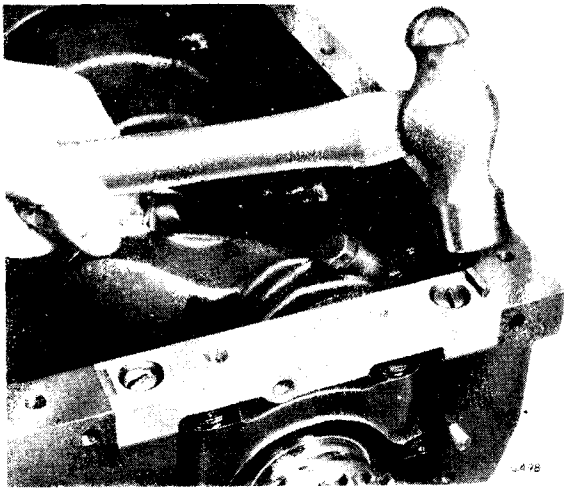


Fig. 20. Driving the sealing wedges into position

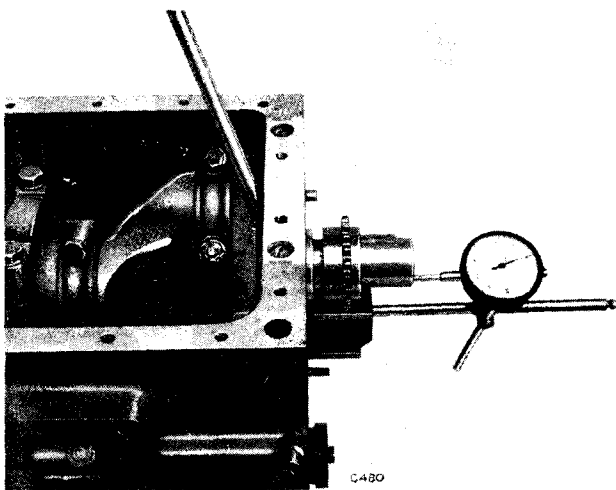


Fig. 21. Measuring crankshaft end-float

ENGINE ASSEMBLY

NOTE: Items bracketed in the text refer to Figs. 4, and 8 except where otherwise stated.

To Assemble

Ensure that all the oil passages are unobstructed and the bearing housings and journals are clean.

Locate the bearing shells in the cylinder block and bearing caps, ensuring that the "off-set" tags are correctly positioned in the corresponding slots. Lubricate the bearing surfaces and lower the crankshaft into position.

Placing the white metal face of each thrust washer against a thrust face of the crankshaft, slide both thrust washers (20) into position (Fig. 19).

Fit the bearing caps to the cylinder block, ensuring that the identification symbols correspond as shown on Fig. 18, and tighten the main bearing cap bolts.

Crankshaft End-Float (Fig. 21)

Move the crankshaft fore and aft and using a dial indicator or feeler gauges, measure the crankshaft end-float; this should be 0.006" (0.157 mm.) to 0.008" (0.203 mm.). Excess end-float can be reduced by fitting oversize thrust washers as required.

Front Sealing Block

Coat the ends of the sealing block with jointing compound and locate it in the cylinder block. Partially tighten the two cheese head screws.

Liberally coat the wooden packing pieces with sealing compound and drive them into the slots located at the ends of the sealing block. Tap the sealing block into alignment with the front face of the cylinder block, check with a straight-edge and fully tighten the screws.

Cut the protruding ends of the packing pieces flush with the engine sump face.

Front Engine Bearer Plate

Locate the paper gasket (41) and the front engine bearer plate (42) on two dowels and secure the plate on to the front face of the cylinder block.

Camshaft

NOTE: Before refitting, examine the camshaft for damage and wear to cam lobes, bearing surfaces, and distributor drive gear.

Lubricate the camshaft bearing surfaces and insert the camshaft (115) into the cylinder block. Fit the keeper plate (114) and secure it with two bolts (113). Camshaft end-float should be 0.004" to 0.008" (0.1016 mm. to 0.2032 mm.).

Rear Oil Seal

Ensuring that the "wiping" lip of the seal (11) faces forward, press the seal into the aluminium housing (13). The housing has two small holes which may be used for driving out a worn or damaged seal.

To fit the housing and seal assembly, coat a paper gasket (15) with jointing compound and locate it on the rear face of the cylinder block. Avoiding damage to the sealing lip, carefully slide the seal over the crankshaft and loosely secure the housing to the cylinder block.

Slide a centralizing tool (Churchill Tool No. S.335) over the crankshaft, simultaneously moving the housing to allow the tool to locate in the bore of the housing, and finally tighten the securing bolts. Remove the tool (Fig. 23).

Rear Engine Plate

Fit the rear bearer plate to the cylinder block.

Flywheel Clutch Face

If the flywheel clutch face is deeply scored, renew the flywheel, or alternatively, skim the face in a lathe, maintaining the following tolerances:

Maximum flywheel face run-out relative to spigot face at a radius of 5" $\cdot 003"$ ($\cdot 0762$ mm.)
Balance within 1 dram.

Replacing the Starter Ring Gear

The starter ring gear is an interference fit and is shrunk on to the flywheel during the initial assembly. Remove the gear by using a copper drift whilst supporting the flywheel on wooden blocks sufficiently thick to raise the ring gear clear of the bench surface.

With the engagement face of the teeth facing rearwards, fit a new ring gear by heating it in boiling water and then pressing it onto the flywheel. This operation will be facilitated by use of a drift and "G" clamps. Under no circumstances should the ring gear be flame-heated.

Fitting the Flywheel to the Crankshaft

Fit the crankshaft spigot bush to its bore in the crankshaft. Fit the flywheel to the crankshaft flange, ensuring that the dowel and dowel hole correspond. Using a dial indicator as shown in Fig. 24, measure the flywheel face for run-out which should not exceed $\cdot 003"$ ($\cdot 0762$ mm.). If a new flywheel is fitted, refer to "Re-marking the Flywheel to Establish T.D.C." on page 1-120.

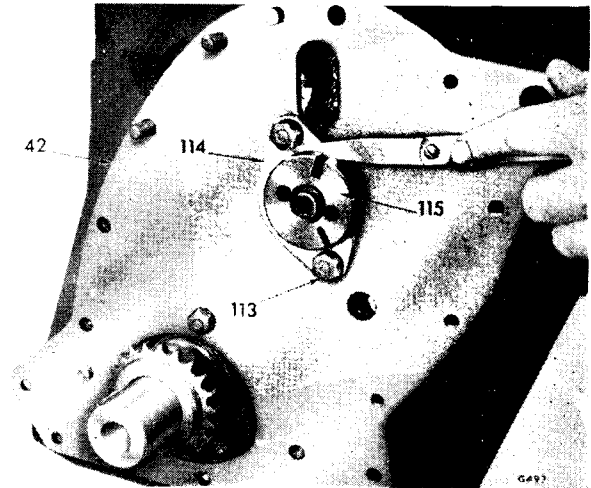


Fig. 22. Front engine bearer plate assembly

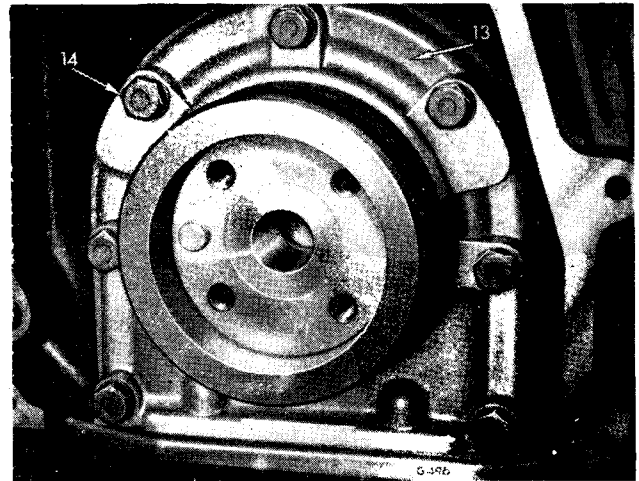


Fig. 23. Rear oil seal assembly

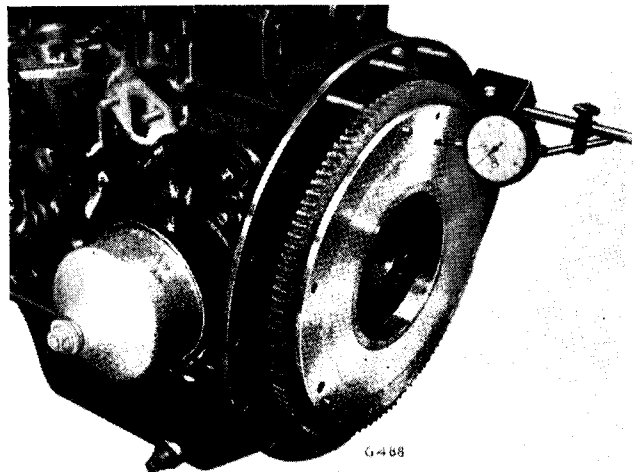


Fig. 24. Checking flywheel for run-out

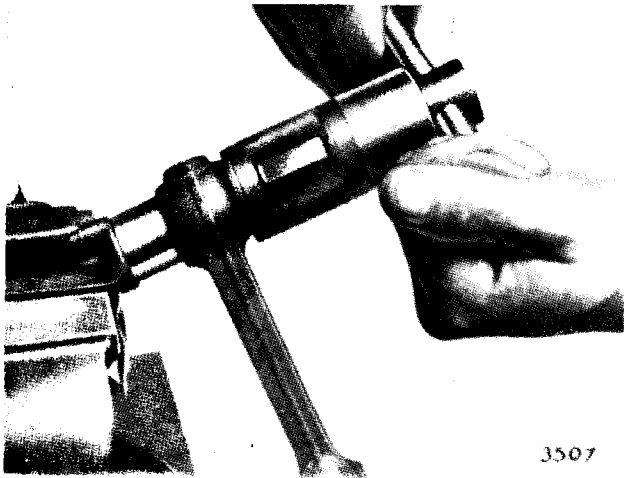


Fig. 25. Replacing gudgeon pin bush

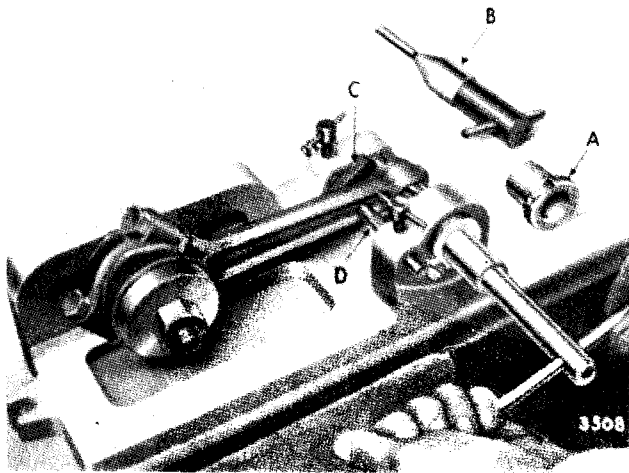


Fig. 26. Reaming gudgeon pin bush

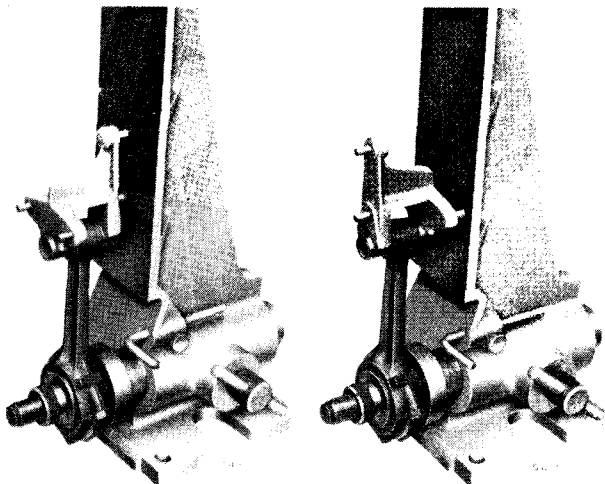


Fig. 27. Checking connecting rod for bend ("A") and twist ("B")

CONNECTING RODS

Replacing Gudgeon Pin Bushes

With the oil feed holes in the new bush aligned with those in the connecting rod, and the split in the bush opposite the big end cap, simultaneously press the new bush in and the old bush out by using Churchill Tool No. 20. SM.FT.6201 as shown on Fig. 25.

By use of the Churchill Fixture 20.FT.6200A, shown on Fig. 26, ream the gudgeon pin bushes to suit the gudgeon pin. For gudgeon pin grading see page 1-102.

CAUTION: The big end caps are not interchangeable and must not be filed to take up bearing wear.

Connecting Rod Alignment

Ensure that the alignment of the small end bore relative to the big end is accurate in both planes. Use Churchill Connecting Rod Fixture (S.335 with arbor S.336-2) to check the rod for bend and twist (Fig. 27). The maximum misalignment in either plane must not exceed 0.001" (0.0254 mm.) in length of gudgeon pin. Correct any misalignment by resetting the rod with a bending iron.

Balance

The maximum variation between the heaviest and lightest connecting rod in a set of six must not exceed four drams (7.09 grams).

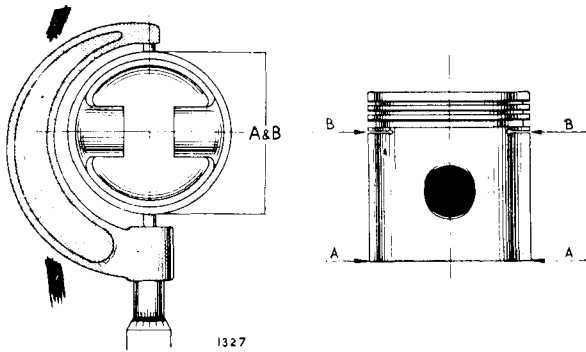


Fig. 28. Measuring pistons

PISTONS AND CYLINDER BORES

Pistons and cylinder bores are graded "E", "G" or "H" according to their dimensions. The appropriate symbol is stamped on the top face of each piston. When fitting new pistons to cylinder bores ensure that they are both of the same grade, for example, "F" pistons to "F" bore. The piston dimensions given on page 1-102 are the maximum measured across the thrust face at the top of the skirt "BB" and the bottom of the skirt "AA" (Fig. 28).

Piston Weight

The maximum variation in weight between six pistons comprising a "set" must not exceed 4 drams (7.09 grams).

Piston Rings (Fig. 29)

Rings are fitted to each piston as follows:—

1. Compression ring (plain).
2. Taper-faced compression ring. Fit with taper towards top and "T" or "Top" marking on upper face.
3. Oil control ring.

Gaps and Ring to Groove Clearance

First insert the ring into the cylinder bore, then use a piston to push the ring squarely down the bore to a point $\frac{1}{4}$ " (6 mm.) from the top. Measure the gap with feeler gauges (Fig. 30). Ring thickness, width of ring groove in the piston and recommended clearances are given on page 1-102.

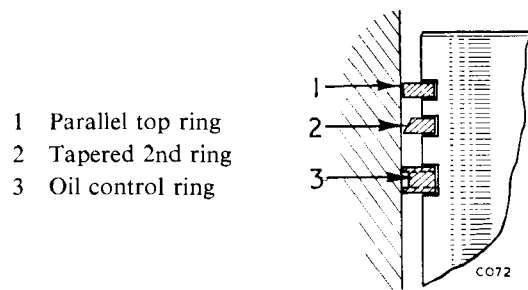


Fig. 29. Piston ring positions

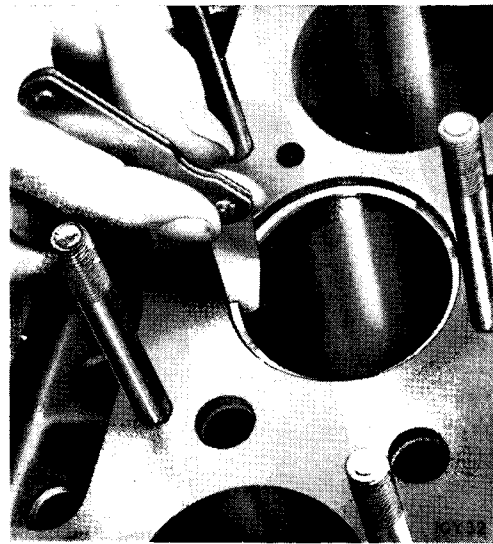


Fig. 30. Measuring piston ring gap

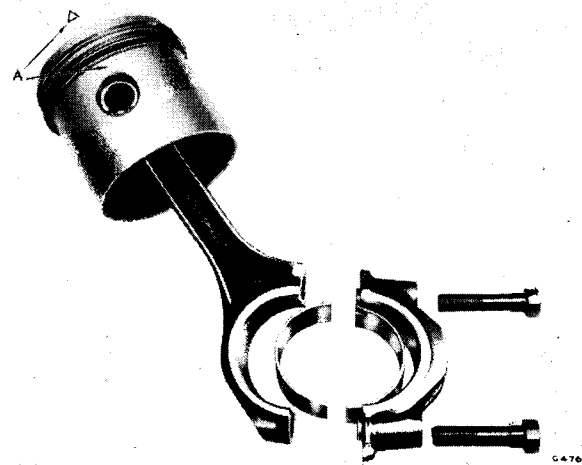


Fig. 31. Piston and connecting-rod assembly

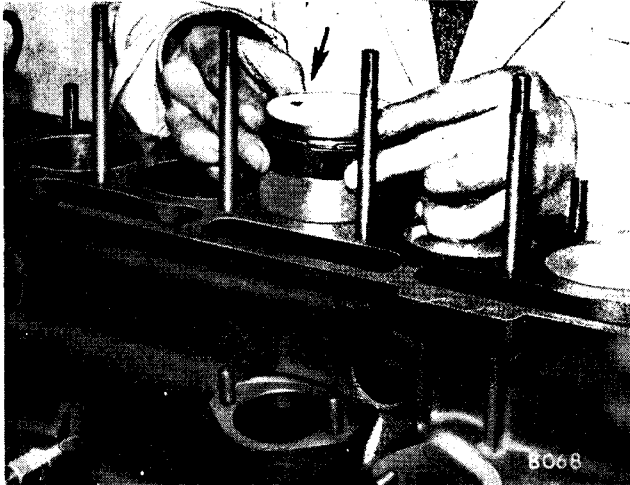


Fig. 32. Using piston ring compressor to insert the pistons into the cylinder bores.

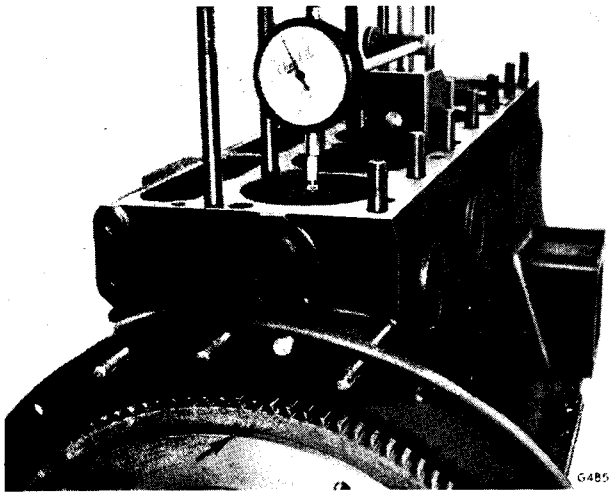


Fig. 33. Establishing top dead centre

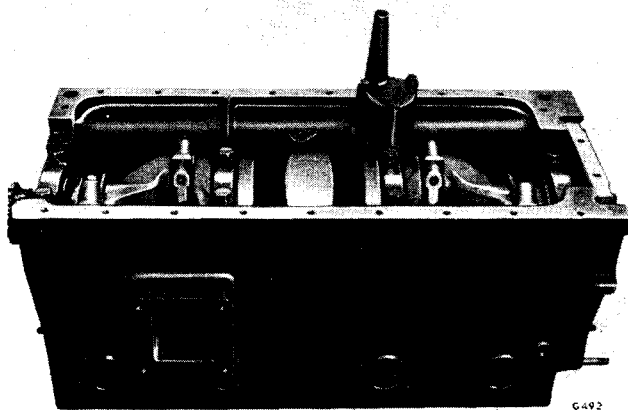


Fig. 34. Oil pump assembly

Fitting Pistons and Connecting Rods

Having selected pistons and connecting rods to conform with the weight tolerances, arrange the lightest pistons with the heaviest connecting rods and vice-versa. This will ensure that the maximum variation between the heaviest and lightest piston and connecting rod assembly in the set of six will not exceed 4 drams (7.09 grams).

Position the piston on the connecting rod as shown on Fig. 31. Press the gudgeon pin into the piston and connecting rod bush and secure by inserting circlips into the annular grooves in the gudgeon pin bore.

Lubricate each piston with clean engine oil. Position the piston rings so that the gaps are staggered and away from the thrust side of the piston.

Using a piston ring clamp, Fig. 32, compress the piston rings and lower the piston and connecting rod assembly into the cylinder bore, ensuring that the arrow on the piston crown is towards the front of the engine. Fit the upper half bearing shells to the connecting rods and locate the tabs in the slots provided.

Similarly, fit the lower half bearing shells to the connecting rod caps, lubricate the crankpins with clean oil and assemble the connecting rods to the crankpins. Fit the big end caps, ensuring that the markings correspond with those on the connecting rods.

Fit the big end bolts (116) and tighten them to the torque specified in Group 0.

Re-marking the Flywheel to Establish T.D.C. (Fig. 33)

When fitting a new flywheel, mount a magnetic base dial gauge indicator with its plunger acting on No. 1 or No. 6 piston crown. Rotate the crankshaft until the piston moves to its highest point and scribe a line across the flywheel to correspond with the line on the rear engine plate. Heavily mark the scribed line on the flywheel with a small chisel and punch the numbers 1 and 6 at either side of the line.

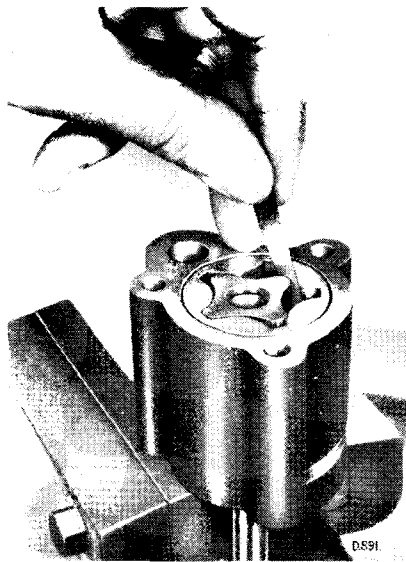


Fig. 35. Measuring clearance between inner and outer rotors

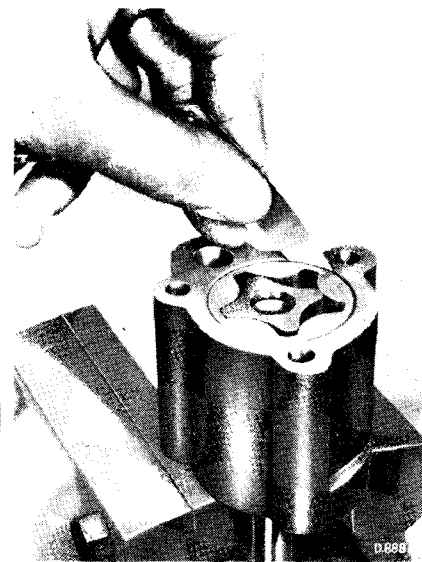


Fig. 36. Measuring clearance between outer rotor and body



Fig. 37. Measuring rotor end-float

Oil Pump Drive Shaft Bush

Insert the oil pump drive shaft and gear assembly into the bush (17) Fig. 4, and rock the shaft to assess the amount of bearing wear. If necessary, remove the bush by using a stepped drift having a pilot the same diameter as the drive gear spindle. Drive the bush upwards from the block. Fit a new bush by reversing the procedure.

Oil Pump

With the oil pump assembled, clean and dry, measure the clearance between the inner and outer rotors, Fig. 35. This must not exceed 0.010" (0.254 mm.).

Measure the clearance between the outer rotor and body Fig. 36. This must not exceed 0.010" (0.254 mm.).

Measure the rotor end clearance Fig. 37. This should not exceed 0.004" (0.102 mm.).

Renew worn and unserviceable items. Fit the inner rotor (2) Fig. 38 to the oil pump housing (1), followed by the outer rotor (3), with its chamfered face leading. Seat the assembly in the crankcase, attach the end plate (5) and secure the assembly with three bolts (4).

Oil Sump

Apply jointing compound to both faces of a new sump gasket (33), Fig. 4. Position the gasket on the crankcase flange and secure the sump (32), to the crankcase.

- 1 Housing
- 2 Inner rotor
- 3 Outer rotor
- 4 Bolt
- 5 End plate

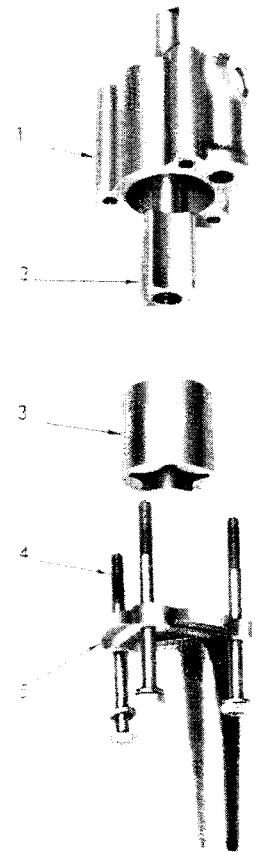


Fig. 38. Oil pump details

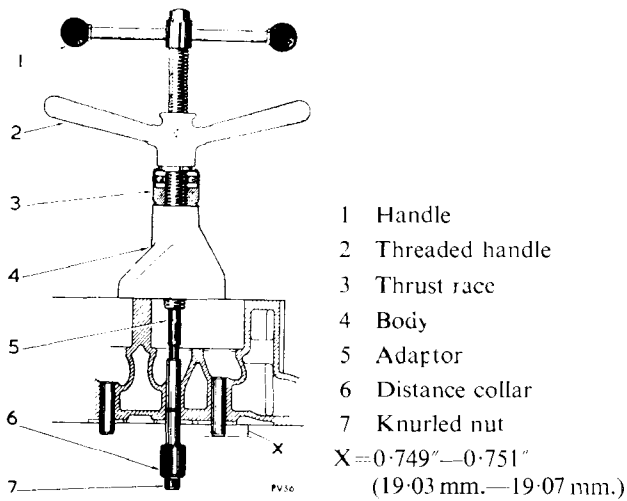
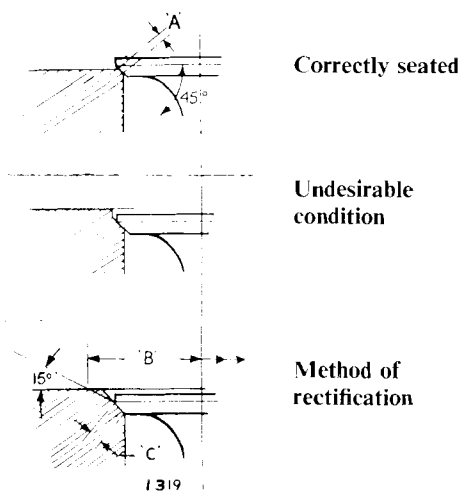


Fig. 39. Renewing valve guides using tool No. S 60A



A—0.06" (1.5 mm.) B— Inlet 1.375 (35 mm.)
 C—0.10" max. (2.5 mm.) Exhaust 1.25 (32 mm.)

Fig. 40. Valve seat conditions

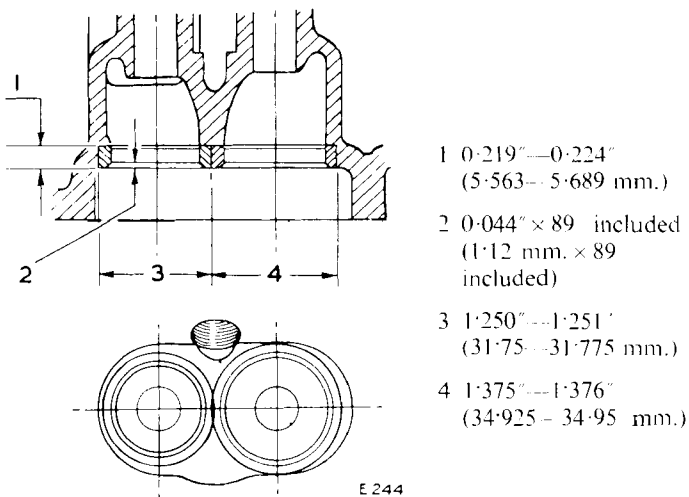


Fig. 41. Valve seat insert dimensions

CYLINDER HEAD

Remove residual carbon from the combustion chambers and ports. Thoroughly clean and examine the cylinder head for cracks, distortion and leakage from any of the core plugs, renewing or rectifying as necessary. The following checks should also be undertaken.

Valve Guides

Check the valve guide wear by inserting a new valve, lifting it $\frac{1}{8}$ " (3.2 mm.) from its seat and rocking it sideways (Fig. 43). Movement of the valve head across its seat must not exceed 0.020" (0.5 mm.). If required, renew the guide by using Churchill Tool No. S.60.A (Fig. 39)

Valve guide protrusion above the top face of the cylinder head must be:

0.749" to 0.751" (19.025 to 19.075 mm.).

Pull the new valve guide into the cylinder head from the valve spring side. Use of the correct limiting sleeves (item 6 Fig. 39) will ensure that the guide protrudes the mean distance 0.75" (19.05 mm.) above the cylinder head when fitted.

Valve Seats

Check the valve seats for scores, burns and ridges. If the valve seats will not easily clean up by normal valve to seat lapping or if new valve guides have been fitted, re-cut the valve seats.

Should it be necessary to use a 15 degree cutter for reducing the seat width, do not exceed the dimension "B" (Fig. 39) as this will prevent the fitting of valve inserts should they be required at a later stage.

Valve seat angle—45 degrees.

Valve Seat Inserts

When the original valve seats cannot be rectified by cutting, valve seat inserts can be fitted by boring the head to the following dimensions:

Inlet valve Bore 1.376/1.375 x .219/.224 deep
 Exhaust Valve Bore 1.251/1.250 x .219/.224 deep

It is advisable not to exceed a radius of .010" (0.25 mm.) at the bottom of the recess to ensure satisfactory seating of the insert when fitted.

Refer to page 1-138 for dimensions applicable to Mk. 2, GT6 plus and GT6 Mk. 3 models.

If both inlet and exhaust seat inserts are required, bore out the inlet seat recess seat first, fit the insert and then bore out the exhaust recess, cutting into the edge of the inlet insert.

Remove all swarf from the cylinder head and drive the insert squarely into its bore. Secure it by peening the edges of the combustion chamber. The valve seat chamfer is machined in the insert after fitting and should be 89° inclusive × .040/.045" deep.

Valves

Check the valve stems for wear and distortion. Examine the condition of each valve face and reject or renew the valve as required. Remove the minimum necessary to clean up the face. Reject the valve if its head thickness at the seat edge is less than $\frac{1}{32}$ " (0.8 mm.) Fig. 42.

Valve Seat Grinding

Grind the valves in their respective seatings in the cylinder head.

Test each seating by lightly smearing the valve face with engineer's marking blue. Insert the valve into its seating and rotate the valve not more than $\frac{1}{4}$ " (3 mm.) in each direction. A complete circle should appear on the valve face indicating satisfactory seating.

Valve Springs

Inspect the valve springs for cracks, distortion and length. Reject unserviceable springs. Valve spring data is given on page 1-105.

Tappets

Examine the tappets and renew those which are excessively worn, cracked, ridged or pitted.

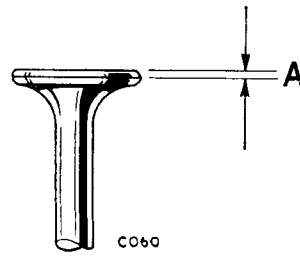


Fig. 42 Minimum thickness at "A" $\frac{1}{32}$ " (0.8 mm.)

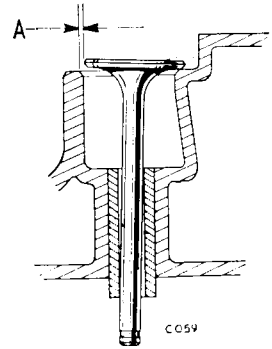


Fig. 43 Assessing valve guide wear A=0.020" (0.5 mm.) max.

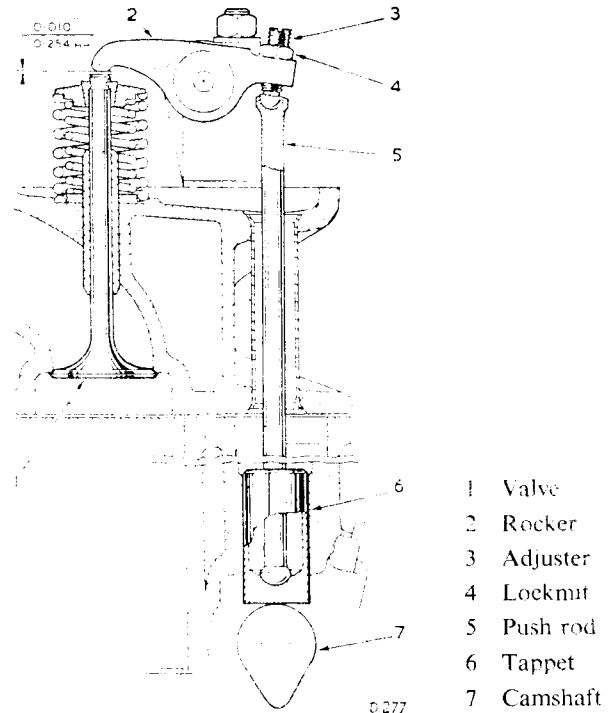


Fig. 44 Section through valve operating details

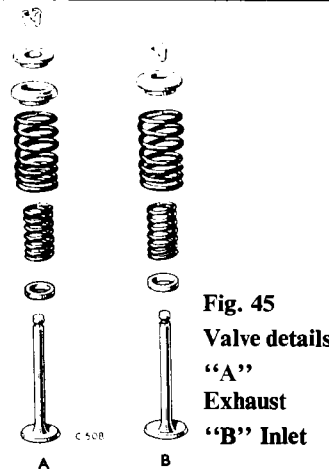


Fig. 45 Valve details "A" Exhaust "B" Inlet

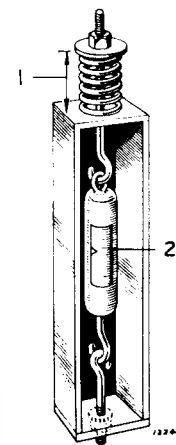


Fig. 46 Method of checking valve spring lead at fitted length

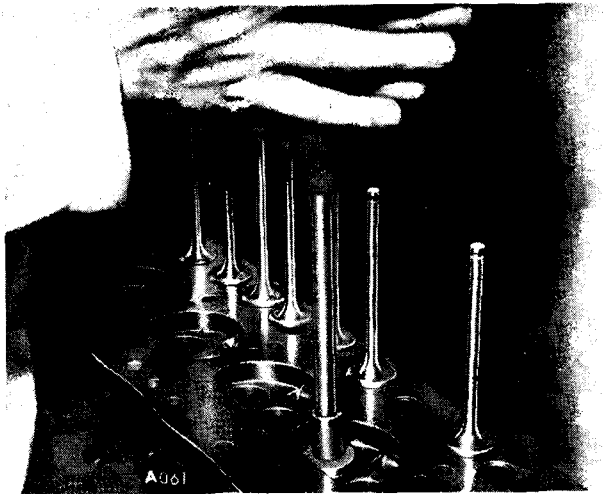


Fig. 47. Grinding in the valves

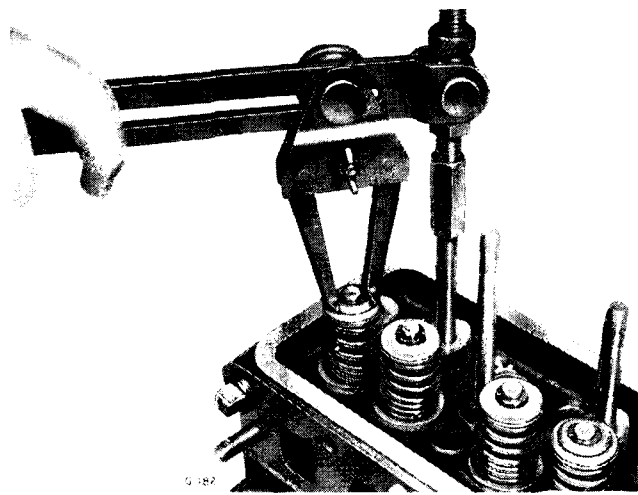


Fig. 48. Assembling valves and springs

Cylinder Head Assembly

Remove all trace of grinding paste, lubricate the valve stems and insert the valves into their guides. Support the valve heads and fit the valve collars over the valve guides. Fit the valve springs; ensuring that the "close coils" are adjacent to the cylinder head. Locate one collar on the inlet valve spring, and inner and outer collars on the exhaust valve spring. Compress the valve springs and insert the split collets into the groove in the valve stem.

Lubricate each tappet, insert it into the cylinder block and make sure it can be freely rotated.

Lower the cylinder head assembly onto the cylinder block and fit plain washers and nuts. Progressively tighten the nuts in the sequence shown in Fig. 49, and insert the spherical ends of the push rods into the tappets ensuring that they are seated correctly.

Rocker Shaft Assembly

Examine the rocker shaft details for wear and renew any unserviceable items. Noting that each pair of rockers are off-set and a shouldered screw with shakeproof washer is used to locate the rear pedestal in the shaft, lubricate and assemble as shown in Fig. 50.

To avoid the possibility of bending the push rods during assembly slacken the adjuster lock-nuts and screw the adjuster fully in. Lower the rocker shaft assembly over the studs, simultaneously locating the rocker adjusters in the push-rod cups (Fig. 52). Fit a plain washer and nut to each stud and progressively tighten the four nuts, each a little at a time until the correct torque is reached, see Group 0.

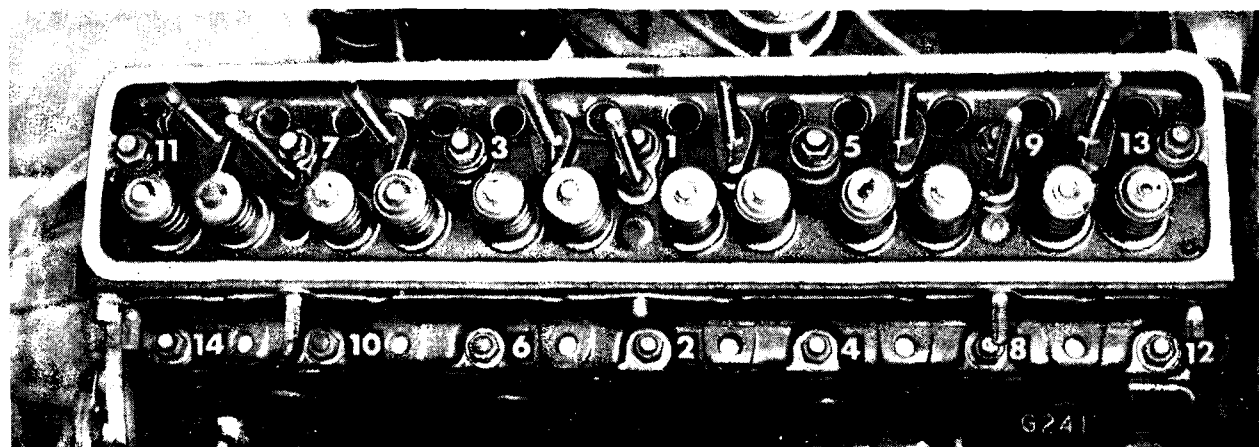


Fig. 49. Cylinder head nut tightening sequence

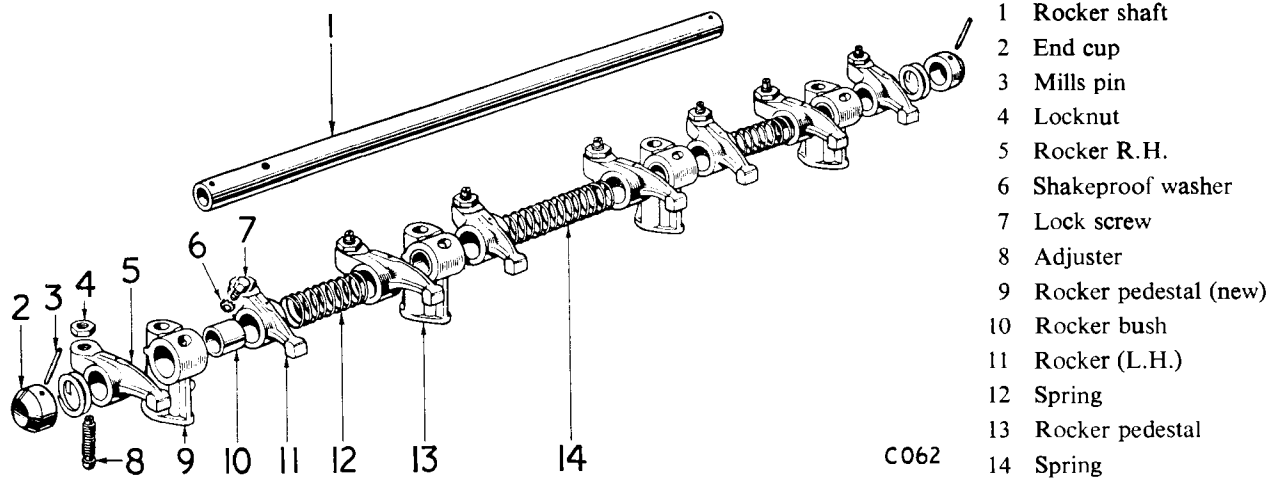


Fig. 50. Rocker shaft details

Rocker Clearance

Check, and if necessary, adjust the rocker clearances when the tappet is resting on the back of the cam. To obtain this position, turn the camshaft until number one push rod has reached its highest point, then turn a further full revolution to ensure that the push rod is fully down and the tappet is resting on the back of the cam.

If adjustment is necessary, slacken off the locknut and turn the adjusting screw until the correct clearance is obtained (Fig. 75).

Tighten the locknut and RE-CHECK the clearance. Treat each rocker similarly.

Rocker clearances 0.01 (0.25 mm.) cold.

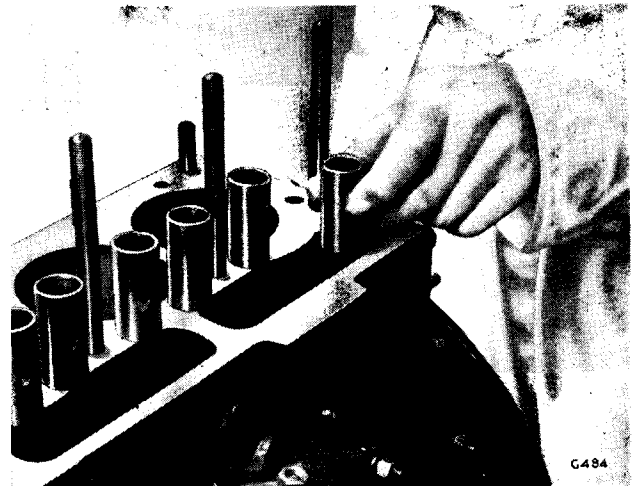


Fig. 51. Inserting tappets

Alignment of Timing Sprockets

Timing sprocket alignment is controlled by shims (102A) interposed between the rear face of the crankshaft sprocket and a shoulder on the crankshaft (Fig. 53).

To align the sprockets, temporarily fit the camshaft sprocket and check the alignment by placing a straight edge across both sprockets (Fig. 55). Remove or add shims as required.

When the correct number of shims has been established, remove both sprockets, insert the "Woodruffe" key in the crankshaft and finally refit the crankshaft sprocket.

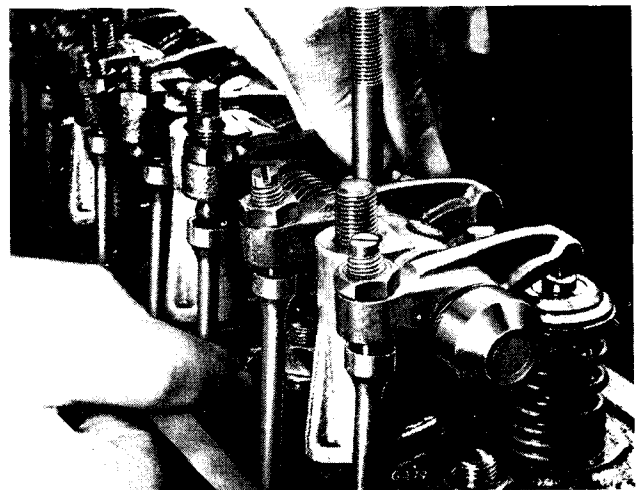


Fig. 52. Locating push rods in rockers

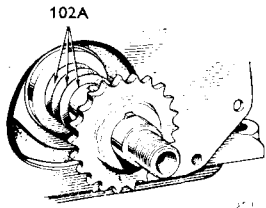


Fig. 53. Showing shims behind crankshaft sprocket

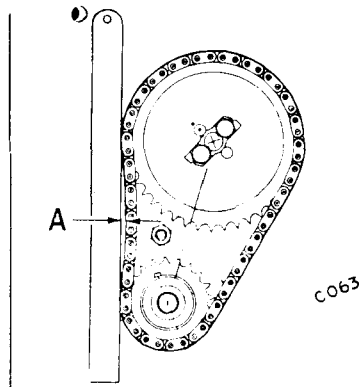


Fig. 54. Checking the timing chain for wear "A"—0.4 (10 mm.) max.

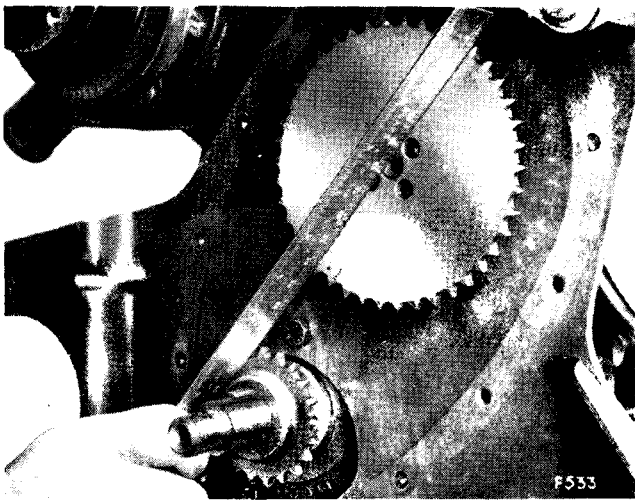
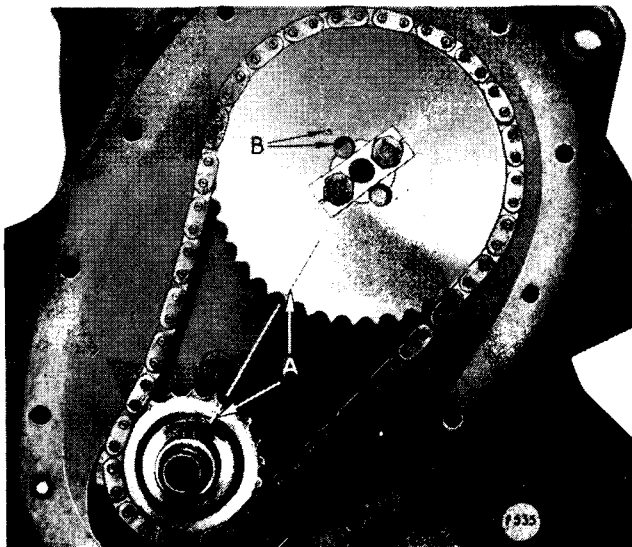


Fig. 55. Checking alignment of sprockets



A scribed lines B punch mark opposite camshaft groove
 Fig. 56. Relative position of timing marks when No. 1 piston is at T.D.C. (compression stroke)

Valve Timing with Marked Sprockets

If the original sprockets are being refitted, set the valve timing by utilizing the timing marks on the sprockets as shown on Fig. 56.

Valve Timing with Unmarked Sprockets

Temporarily attach the camshaft sprocket and turn the camshaft until number 12 push rod has reached its highest point. In this position, adjust number 1 rocker clearance to .040" (1 mm.).

Repeat the procedure with number 11 push rod and adjust number 2 rocker until its clearance is identical to that of number 1 rocker.

Again turn the camshaft until numbers 1 and 2 valves have reached to point of balance, that is, when one valve is about to open and the other is about to close. Fig. 57 illustrates the position of the rockers at this point.

Turn the crankshaft to bring numbers 1 and 6 pistons to T.D.C.

Fitting Timing Chain

Exercising the greatest care, remove the timing sprocket without disturbing the camshaft. Encircle both sprockets with the timing chain and offer up the camshaft sprocket to the camshaft.

NOTE: The camshaft timing sprocket is provided with four holes which are equally spaced but off set from a tooth centre. Half tooth adjustment is obtained by rotating the sprocket 90° from its original position. A quarter tooth adjustment may be obtained by turning the sprocket "back to front" by rotating it 90° in this reversed position; three quarters of a tooth variation is obtained.

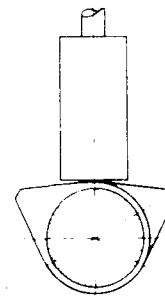


Fig. 57. Position of cams at point of balance

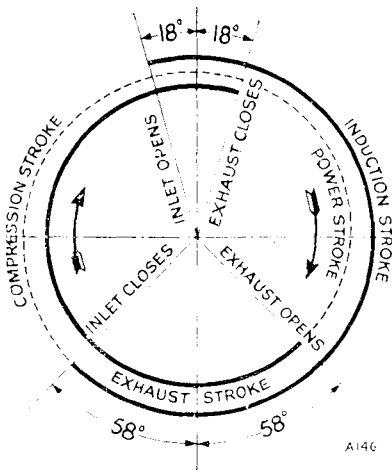


Fig. 58. Valve timing (theoretical reference only)

After securing the sprocket, re-check the timing to ensure that the camshaft has not been disturbed during this operation. With number 1 piston at T.D.C. numbers 1 and 2 rocker clearances should be identical.

Re-adjust the rocker clearances to 0.010" (0.254 mm.).

Timing Cover

Renew a worn or damaged seal (43). When pressing this into the cover, ensure that the sealing lip is towards the rear of the engine.

Remove a worn chain tensioner (50) by opening the blade sufficiently to spring it over the pin. Fit a new blade by reversing this procedure.

Positioning the dished face of the oil thrower (103) towards the oil seal, slide the oil thrower over the key (109), until it abuts against the crankshaft sprocket (102). Place a new gasket (44) over the dowels on the front engine plate and, using a hooked tool as shown in Fig. 60, compress the chain when fitting the cover. Secure the cover as shown in Fig. 61.

Fan Pulley Assembly

Fit the seal extension (104) to the crankshaft with its chamfered edge leading. Assemble the fan pulley assembly and secure it with the bolt (108).

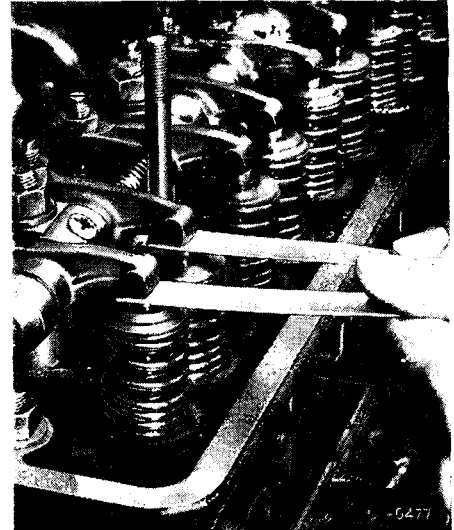


Fig. 59. Using feeler gauges of equal thickness to determine point of balance

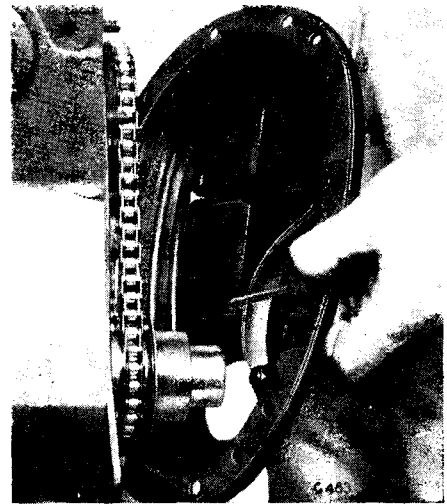


Fig. 60. Fitting timing cover

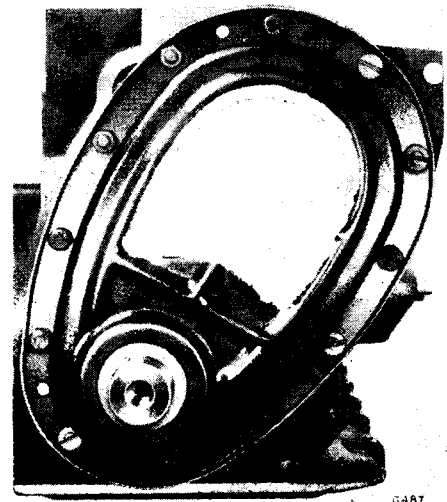


Fig. 61. Timing cover attachments

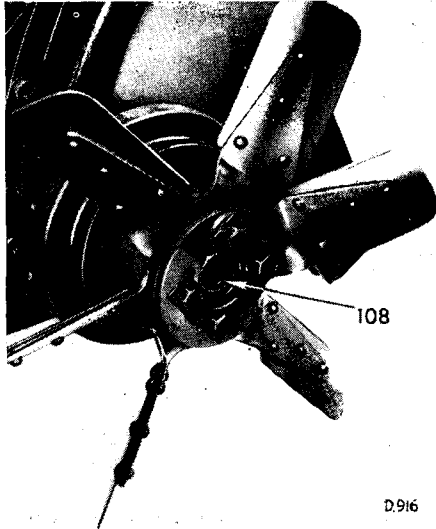


Fig. 62.
Fan blade
and pulley
attachment

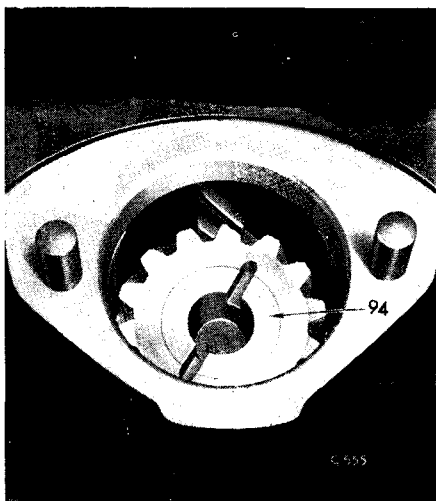


Fig. 63.
Position of
slot in
distributor
drive gear
with No. 1
piston at
T.D.C. on
compression
stroke



Fig. 64.
Fitting packing
washer and
distributor
adaptor

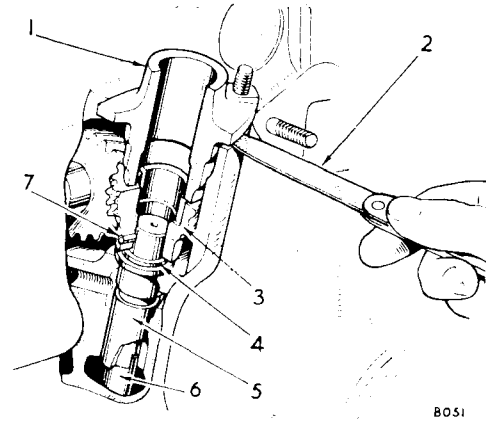


Fig. 65. Determining the packing required under the distributor pedestal

Distributor Drive Gear End-Float (Fig. 65)

To determine the amount of packing required under the pedestal to produce 0.003" to 0.007" (0.076 to 0.178 mm.) drive gear end float, adopt the following procedure:

1. Accurately measure the thickness of a plain washer (4), having an internal diameter of ½" (12.7 mm.), and place it over the distributor drive shaft.
2. Insert and lower the drive shaft into the bush (5) until the gear and plain washer rest on top of the bush. This may necessitate repeated removal of the gear shaft and turning the oil pump shaft (6) until their driving dogs engage with each other.
3. Place the distributor pedestal (1) in position and measure the gap between the pedestal and cylinder block as shown. Subtract this dimension from the washer thickness to determine the end-float of the gear.

Example 1

If the washer thickness is 0.062" 1.57 mm.
and the width of the gap is 0.060" 1.65 mm.
Clear Interference... .. + 0.003" 0.05 mm.

The float of 0.002" (0.0508 mm.) is insufficient and requires additional packing of 0.008" (0.2 mm.) thickness to produce an end float of 0.005" (0.12 mm.) (mean of tolerance).

Example 2

Thickness of washer .. 0.062" 1.57 mm.
Width of gap 0.065" 1.65 mm.
Clear Interference.. .. 0.003" 0.08 mm.

In this instance, the interference of 0.003" (0.08 mm.) required additional packing of 0.008" (0.2 mm.) thickness to give an end float of 0.005" (0.12 mm.).

Take out the driving gear assembly and remove the ½" internal diameter washer from the shaft.

To Position Driving Gear

Turn the crankshaft to bring No. 1 piston to the top of its compression stroke.

Lower the driving gear into the bush, allowing it to turn as it meshes with the camshaft and oil pump driving dog, until the gear is resting on top of the bush. The offset distributor drive slot should now be in the position shown in Fig. 63.

Fit the paper packing washers and secure the distributor pedestal (Fig. 64).

Distributor Timing (Static Setting)

Adjust the distributor points to 0.015" (0.4 mm.). Loosely secure the clamp plate to the pedestal and lower the distributor into the pedestal engaging the driving dog with the slot of the gear. Turn the crankshaft clockwise until the static ignition timing value, (see page 0.103) firing on No. 1 cylinder, is achieved (Example Fig. 67) on the crankshaft pulley; the distributor rotor arm will be positioned as shown on Fig. 66.

NOTE: Do not turn the engine anti-clockwise during the timing operations.

Set the vernier micro-adjustment in the mid-position of its scale. Connect a test lamp as shown in the circuit, Fig. 68, and rotate the distributor as required to bring the contacts to the point of opening. The lamp should be extinguished at this point. Tighten the distributor clamp plate.

With the lamp still in the circuit, turn the crankshaft through approximately one revolution clockwise until it fires on No. 6 cylinder and note the angle shown on the crankshaft pulley at the precise point when the lamp is extinguished. Turn through another revolution clockwise (now firing on No. 1 cylinder) and again note the angle shown on the pulley when the lamp is extinguished. The readings for numbers one and six cylinders should be the same. Secure the two distributor cap clips.

Distributor shaft rotation	Anti-clockwise
Firing order	1, 5, 3, 6, 2, 4

Rocker Cover

Apply jointing compound to the cover flange face and fit a new cork gasket. Leave to dry on a flat surface with a weight on top of the cover. Fit the rocker cover to the cylinder head and secure it using a fibre washer, plain washer and nyloc nut on each attachment stud.

Manifold

Fit a new manifold gasket. Secure the manifold assembly to the cylinder block by four nuts and six clamps which should be progressively tightened.

Water Pump

Secure the water pump to the engine by three bolts. When assembling ensure that the clip retaining the fuel and vacuum pipe is located on the correct bolt (1) (Fig. 9).



Fig. 66. Distributor rotor arm position at T.D.C. firing on No. 1 cylinder

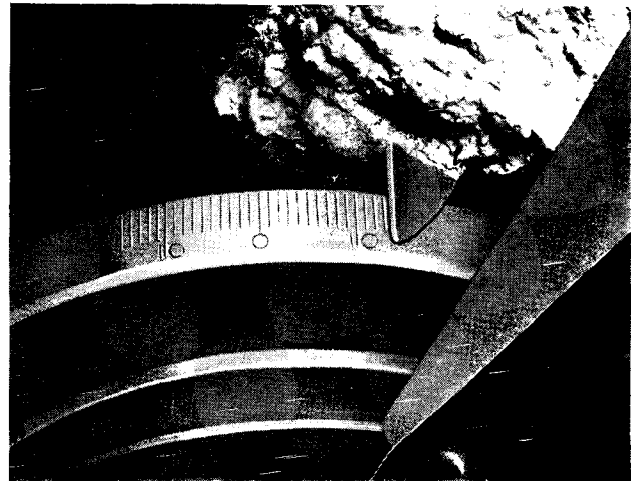


Fig. 67. Fan pulley timing marks

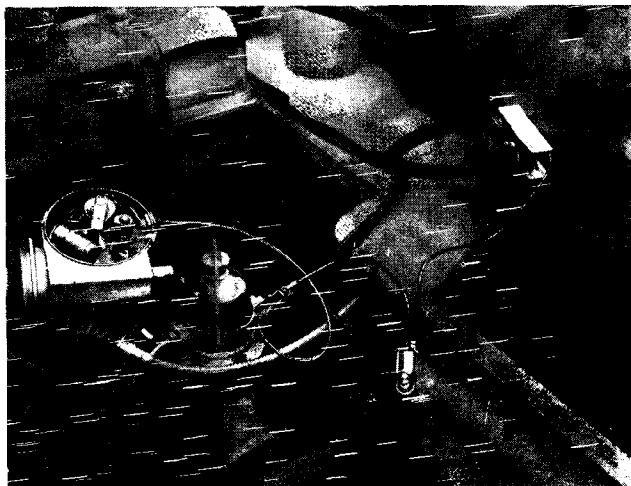


Fig. 68. Circuit for checking distributor setting

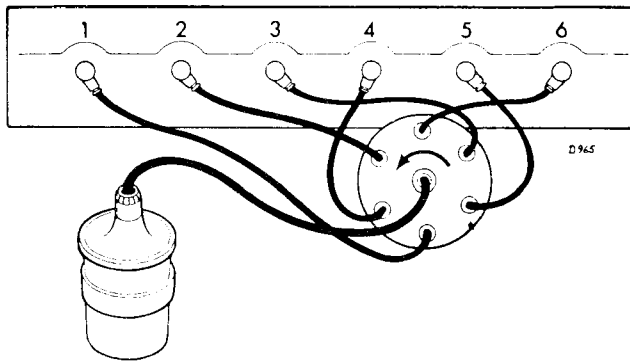


Fig. 69. Position of high-tension leads

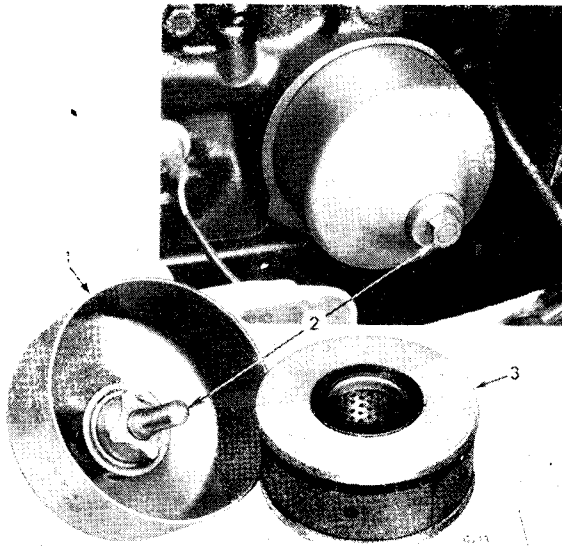


Fig. 70. Oil filter

Sparking Plugs

Replace sparking plugs; as a general recommendation, adjust electrode gaps to 0.025" (.635 mm.) every 6,000 miles and renew plugs every 12,000 miles.

Assessment of sparking plug operating conditions can be made by examining the plugs and comparing them with those shown in Fig. 71. Conditions most commonly encountered are as follows:

A. Burnt electrodes

Blistered insulator and eroded electrodes, indicating that the plug is running too hot—caused by excessive knocking, ignition too far advanced, defective cooling system, lean air fuel mixture, sticking valves.

B. Carbon failed

Dry sooty black deposits—caused by sticking choke, carburettor float level too high, clogged air cleaner, faulty breaker points, weak coil or condenser, plug too cold for slow, stop and go driving.

C. Worn out

Insulator pitted and electrodes eroded—causing inferior engine performance and high fuel consumption.

D. Oil-fouled

Wet oily deposit—causing misfiring and bad starting—results from worn or inaccurately assembled piston rings, worn valves and guides, or worn bearings.

E. Normal

Indicates proper heat range and mixed periods of high and low speed driving. Clean, re-gap and test for best performance before re-installing.

H.T. Cables

Reconnect the H.T. Cables to the sparking plugs. These cables are of special construction and must NOT be replaced by copper wired cables.

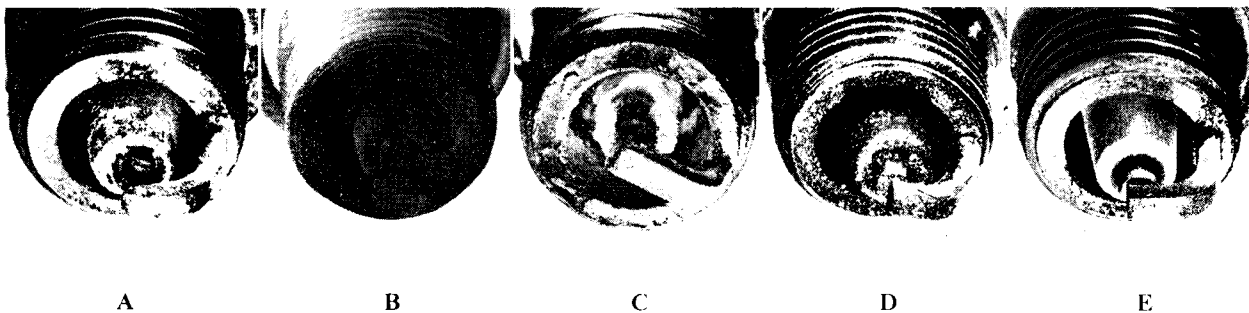


Fig. 71. Guide to sparking plug conditions

Oil Filter

Renew the oil filter element and rubber sealing ring. Assemble the oil filter to the engine, ensuring that the sealing ring is correctly positioned in its groove in the cylinder block, and tighten the centre bolt sufficiently to effect an oil tight joint.

Fuel Pump

Locate the fuel pump on the studs fitted in the cylinder block and secure it in position by two nuts.

Generator

Referring to Fig. 4, attach the generator support bracket (55) to the cylinder block using the two bolts shown. Fit the stud (53) through the engine bearer plate (42) and bracket (55), securing it with the nut (56).

Mount the generator on the bracket and loosely assemble the pivot bolts (52) and (57). Attach the adjusting link to the water pump and the top of the generator. Wind the fan belt over the three pulleys and adjust it as follows:

Fan Belt Adjustment (Fig. 72)

Swing the generator outwards until there is $\frac{1}{4}$ — $\frac{3}{4}$ " (12.—19. mm.) side movement of the belt at its longest run, i.e. between the crankshaft pulley and the generator. Maintaining the belt tension, tighten the adjuster bolt and the pivot bolts (52) and (57). Do not over-tension the belt as excessive load will be imposed on the generator and water pump bearings.

Refit the clutch as follows:

1. With the longer boss of the splined hub towards the gearbox, centralise the driven plate on the flywheel using a sawn-off input shaft.
2. Place the cover assembly over the locating dowels and secure it with six setscrews to the correct torque (Fig. 73).
3. Remove the centralising shaft.

Refit the gearbox and starter motor.

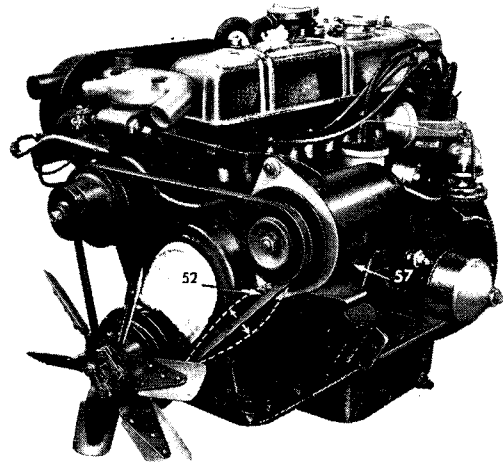


Fig. 72. Fan belt adjustment

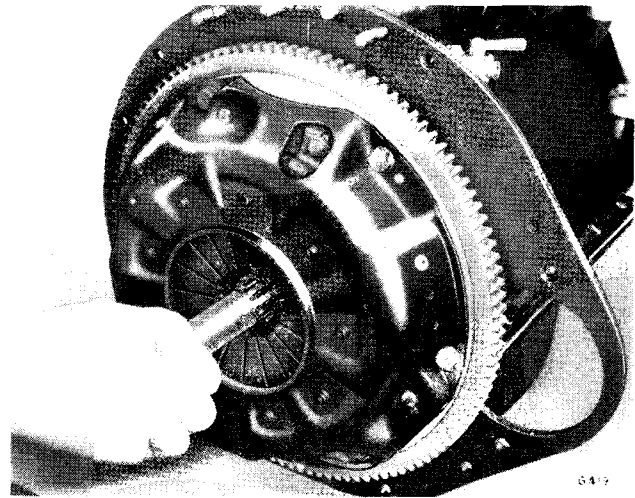


Fig. 73. Centralising the clutch centre plate

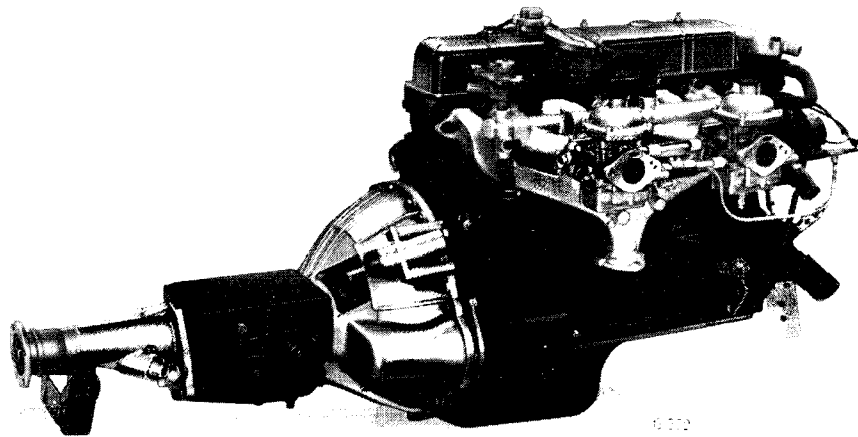


Fig. 74. Engine and gearbox assembly (right-hand)

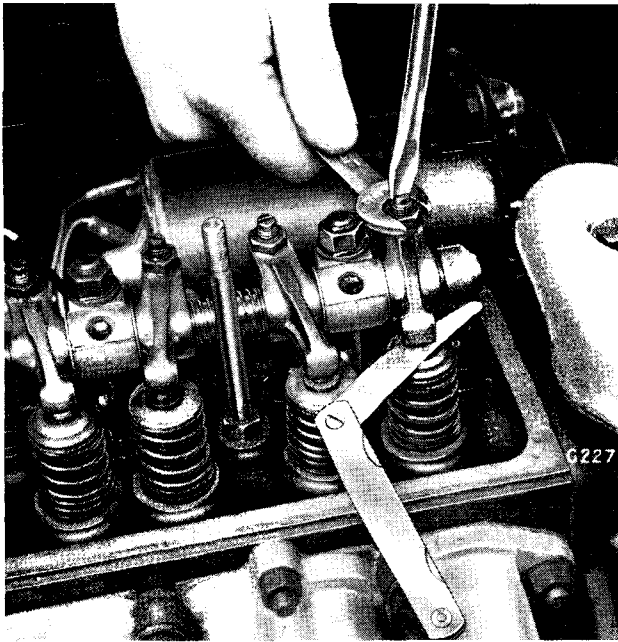


Fig. 75. Adjusting rocker clearances

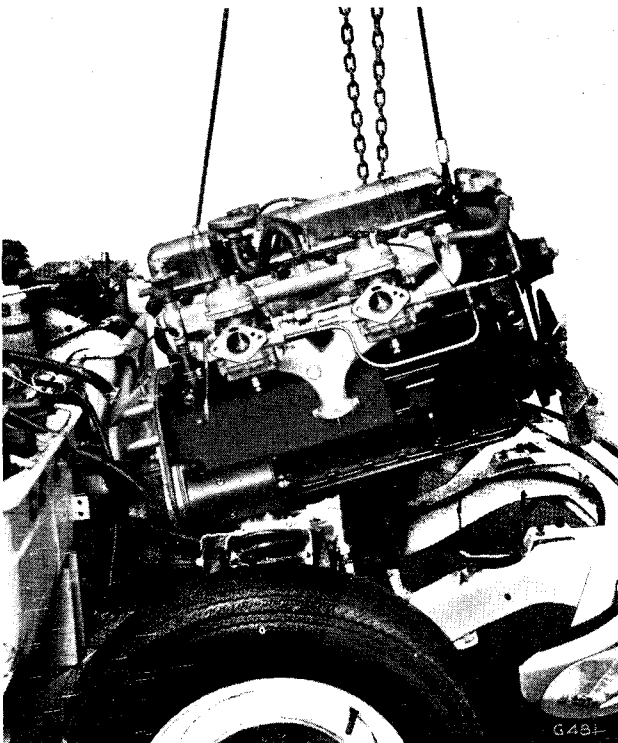


Fig. 76. Installing the engine

Engine and Gearbox Installation

Using a lifting cable and hoist (Fig. 75), lift and manoeuvre the engine into position and whilst suspended, remove the brake pipe protection plate and secure the front and rear mountings to the chassis frame.

Remove the lifting cable and refit the following: front exhaust pipe to manifold and gearbox, carburettor controls, heater hoses, fuel and vacuum pipes, and air cleaner.

Reconnect the electrical cables to the following points: oil pressure switch, ignition coil, generator, temperature transmitter, starter motor, and reconnect the brake servo hose.

Reconnect the earth straps to the clutch bell housing and front of the engine, and reconnect the tachometer drive cable to the distributor.

Refit the radiator, air duct, hoses, engine bay side valances and bonnet assembly.

Working inside the vehicle and referring to pages 2-207 and 2-208 re-attach the propeller shaft, speedo cable, slave cylinder, gearbox top cover and extension assemblies. Refit the gearbox cover, carpets, safety belt anchor bolts, transmission tunnel finishers, gear lever knob, facia support bracket, seats and cushions.

Replenish the cooling system, engine sump and gearbox to the correct levels. Reconnect the battery, prime the carburettors and start up and warm the engine before making the final adjustment to the carburettor and ignition distributor.

Servicing Operations With Engine in Place

The following operations can be undertaken without removing the engine from the vehicle.

Cylinder Head

To Remove

Lift the bonnet. Disconnect the battery. Detach the plug leads. Remove the manifold front hose and two heater hoses. Disconnect the Smiths emission valve hoses. Disconnect the cable on the water heater control valve. Remove the air cleaner. Disconnect the throttle rod, choke control cable and petrol and vacuum pipes. Disconnect the water return pipe from both the rear of the water pump and base of the water control valve. Remove the manifold as described on page 1-312. Slacken the generator pivot bolts, remove the generator top clamp bolt. Remove the fan belt and swing the generator clear. Unscrew the three water pump attachment bolts. Remove the rocker cover, rocker shaft assemble and push rods. Progressively slacken the cylinder head nuts. Remove the cylinder head and gasket. The tappets can now be lifted out of the engine block and examined for damage.

Refitting

Clean and deburr all faces and examine for damage. Fit new gaskets. To assemble, reverse the removal procedure. See page 1-124 for the nut tightening sequence. Replenish the cooling system.

Sump

To Remove

Disconnect the battery. Drain the radiator and engine sump. Disconnect the hoses from the top of the thermostat housing. Support the engine by lifting tackle utilising the two fitted lifting eyes. Slacken the right-hand engine mounting bolts and remove the left-hand engine mounting bolts. Remove the sump bolts. Raise the engine and lever it towards the rear of the vehicle, enabling the sump to clear the front cross member, and remove the sump.

To Refit

Reverse the dismantling procedure.

Connecting Rod Bearings

To Remove

Remove the sump and the bolts securing the bearing caps. Examine and renew the bearings, as necessary. See page 1-115.

To refit, reverse the dismantling procedure.

Connecting Rods and Pistons

To Remove

Remove the cylinder head and sump. Remove the two bolts retaining each big end cap and remove the cap. Push the complete assembly upwards through the bore. For examination and checking details refer to page 1-119.

To assemble, refer to page 1-120.

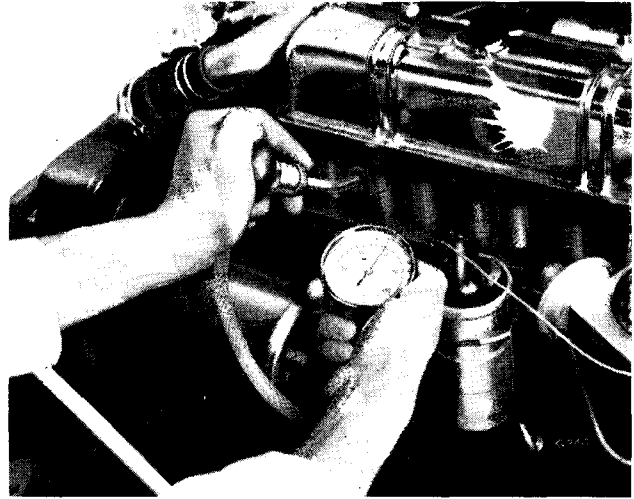


Fig. 77. Checking compression pressures

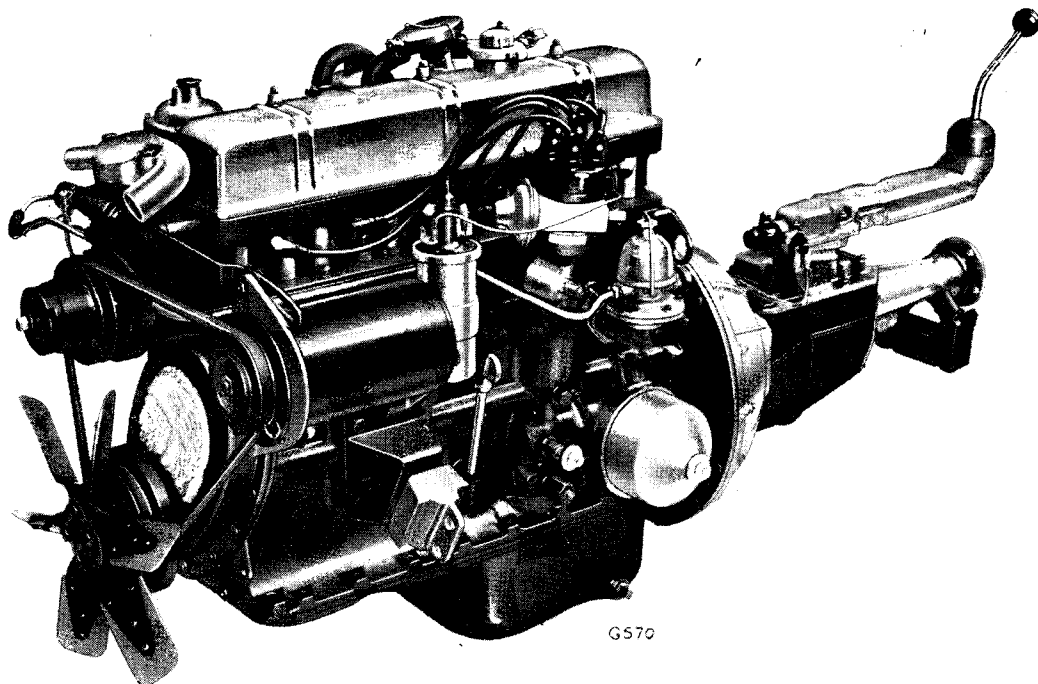


Fig. 78. Engine and gearbox assembly (left-hand)

Oil Pump

Remove the sump as described. Remove the three bolts attaching the oil pump to the block and take off the oil pump.

See page 1-121 for pump details. When re-fitting ensure that the driving tongue of the pump shaft locates correctly in the driving gear slot. Refit the sump and replenish the oil sump and radiator.

Water Pump Removal

See page 1-303.

Manifold Removal

See page 1-312.

Timing Gear**To Remove**

1. Remove the radiator fan belt, fan and pulley and the left-hand engine valance (Ref. page 1-205).
2. Referring to Fig. 61, remove the timing cover attachments, withdraw the cover (45) and lift off the gasket (44). To renew the oil seal or chain tensioner refer to page 1-127.
3. To remove the timing sprockets unscrew the two bolts (111), withdraw the sprocket (112) and lift off the chain (110).

To refit, reverse the foregoing, then retime the engine (See page 1-126).

Camshaft**To Remove**

1. Carry out the operation 1-3 above.
2. Remove the bonnet assembly (Ref. page 5-204).
3. Remove the fuel pump.
4. Remove the distributor and drive gear.
5. Remove the cylinder head and withdraw the tappets.
6. Withdraw the camshaft.

To refit, reverse the foregoing.

Front Engine Bearer Plate**To Remove**

1. Carry out operations 1-3 given under "Timing Gear".
2. Remove the generator and its attachment bracket.
3. Remove the camshaft keeper plate.
4. Unscrew three retaining bolts and remove the engine plate.

To refit, reverse the foregoing.

Flywheel and Ring Gear

Remove the gearbox and clutch (refer to pages 2-207 and 2-208). Remove the retaining bolts and take off the flywheel.

To service the flywheel and ring gear, refer to page 1-117.

Rear Crank Seal

Remove the flywheel. Using lifting tackle, support the engine by the two lifting eyes. Remove the rear crank seal retaining bolts. Slacken the sump bolts sufficiently to allow the withdrawal of the seal and housing taking care not to damage the oil sump gasket.

Sealing Plugs

Remove old plugs if necessary. Clean the seating in the plug hole and remove any burrs. Apply a jointing compound, such as Wellseal or thermatite and fit the plug. Spread the plug by striking in the centre with a large diameter punch. Do not apply a heavy blow as this will cause buckling.

L.H. Side of Engine

To replace the rear core plug, it is necessary to remove the distributor, distributor pedestal and disconnect the fuel pump. The front plug is accessible.

R.H. Side of Engine

To gain access to the front plug, remove the air-cleaner and disconnect the water return pipe from the water pump.

To gain access to the rear plug it is necessary to remove the water return pipe and air cleaner.

It is necessary to remove the manifold to gain access to the two centre plugs.

Rear of Cylinder Head

To gain access to the plug in the rear of the cylinder head, it is necessary to remove the cylinder head as described on page 1-132.

Rear of Engine

Remove the gearbox tunnel as detailed in Group 2 and gain access from inside the vehicle.

Under Front Engine Plate

Remove front engine plate.

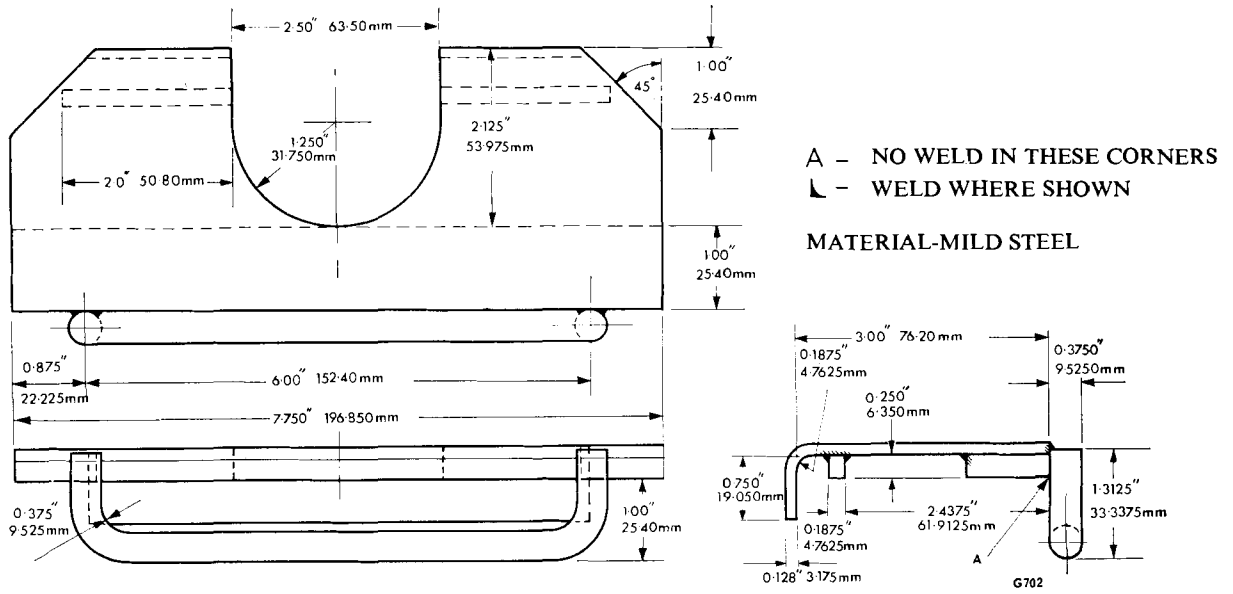


Fig. 78. Details of tool suggested for protection of brake pipe

BRAKE PIPE PROTECTION TOOL

When removing and refitting the engine it is necessary to protect the brake pipe which runs across the front chassis cross-member. A suggested design and details for its fabrication are given on Fig. 78. The application of the tool is shown on Fig. 79.

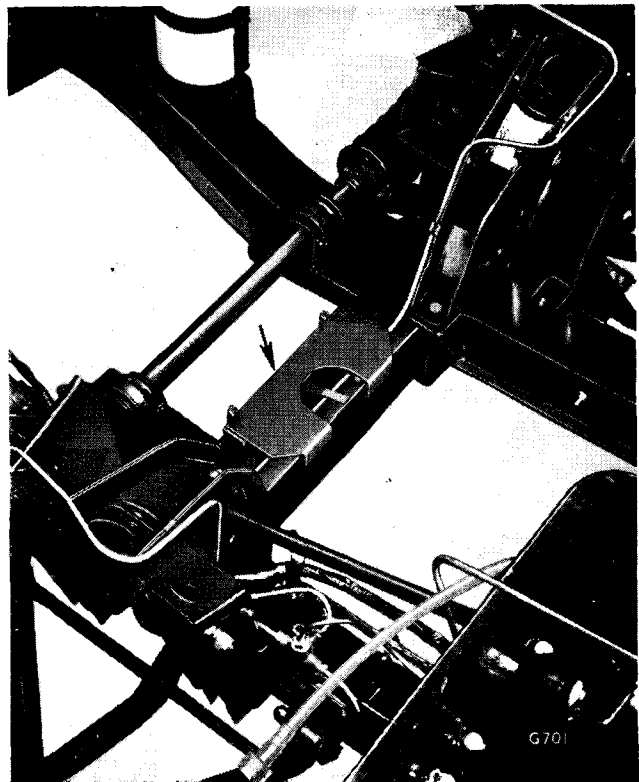


Fig. 79. Position of tool on front chassis cross member

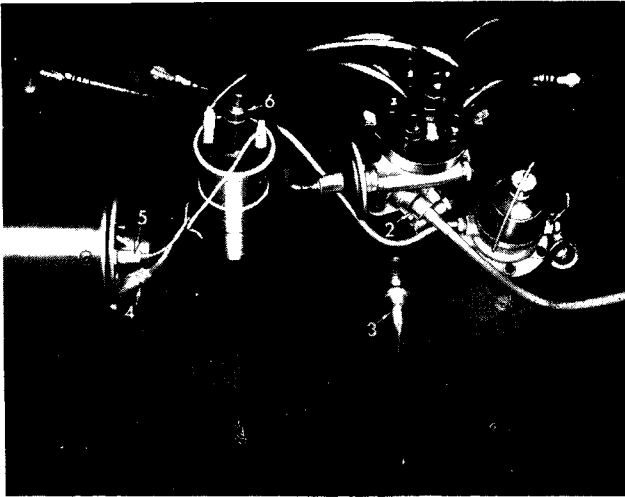


Fig. 80. Left hand view of engine

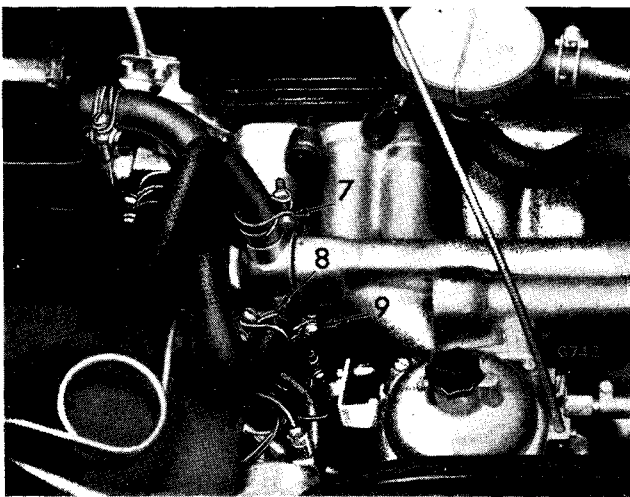


Fig. 81. Right hand view of engine

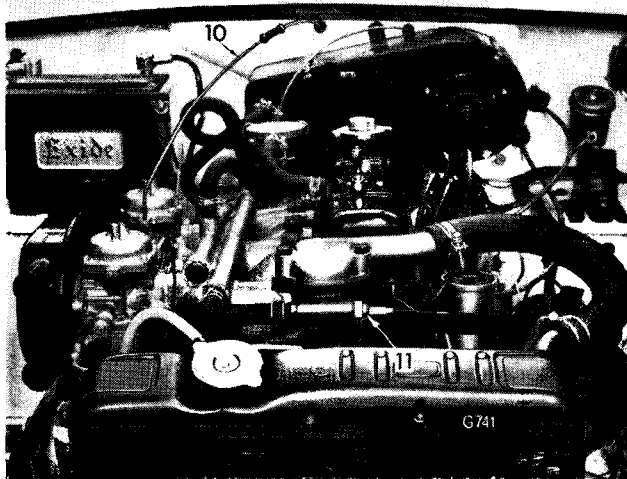


Fig. 82. Front view of engine

ENGINE AND GEARBOX (VITESSE)

To remove

Isolate the battery, drain the cooling system and engine sump, and remove the air cleaner.

Remove bonnet assembly (Group 5 of Vitesse Supplement).

Referring to Page 1-206, remove the radiator block and hoses, water bottle and bracket.

Release the gearbox attachments by carrying out the following operations; take out the front floor carpets and gearbox cover carpet. Referring to Fig. 63, (Page 2-224), unscrew the gearbox knob (A), twelve screws and plates (B), and remove the gearbox cover (C). Disconnect the propeller shaft (D), Fig. 65, from the gearbox driving flange and detach the slave cylinder (E), Fig. 66, speedometer drive cable (F) (Page 2-225) and remove the gearbox cover and top assembly. Place a suitable cover over the gearbox to prevent the ingress of foreign matter. Unscrew the nuts (G) from the gearbox mountings.

Referring to Fig. 80, remove the fuel inlet pipe from the fuel pump (1).

NOTE: If the tank is more than half-full, it may be necessary to disconnect the plastic pipe from the top of the fuel tank to prevent the fuel syphoning from the pipe.

Disconnect the tachometer drive cable (2) from the distributor. Release the oil pressure switch (3), the generator leads (4) and (5), and the ignition lead (6) from the coil.

Referring to Fig. 81, disconnect the three heater pipes (7), (8), (9) and the throttle linkage.

Disconnect the starter motor lead and the earth lead from the left-hand side of the front engine bearer plate. Referring to Fig. 82, release the choke control cable (10) and temperature transmitter electrical connection (11).

Disconnect the exhaust front pipe from the bell housing and manifold flange. Attach a lifting hoist to the front and rear lifting eyes, and taking the weight of the engine, remove the nuts, bolts and packing pieces from the engine mountings, and raise the engine sufficiently to place the brake protection plate, Figs. 78 and 79, Page 1-135, in position.

Whilst removing the engine and gearbox from the chassis, support the rear ends of the gearbox as the assembly is carefully manoeuvred through the aperture in the bulkhead.

To Refit

Reverse the removal procedure.

GT6+, GT6 MK. 2 AND VITESSE MK. 2

A revised cylinder head arrangement is fitted to the above models.

The new cylinder head continues the width of the cylinder block to the full height of the cylinder head.

The new arrangement permits the use of larger valves and improves the cylinder breathing which, together with a new camshaft, gives an increase in power.

The revised data is detailed overleaf and replaces the equivalent data at the front of this section. For revised performance data see Group 0.

Although a slight visual difference exists between the uprated engine and its predecessor illustrated in this section, no difficulty should be experienced in servicing the engine following the instructions previously detailed.

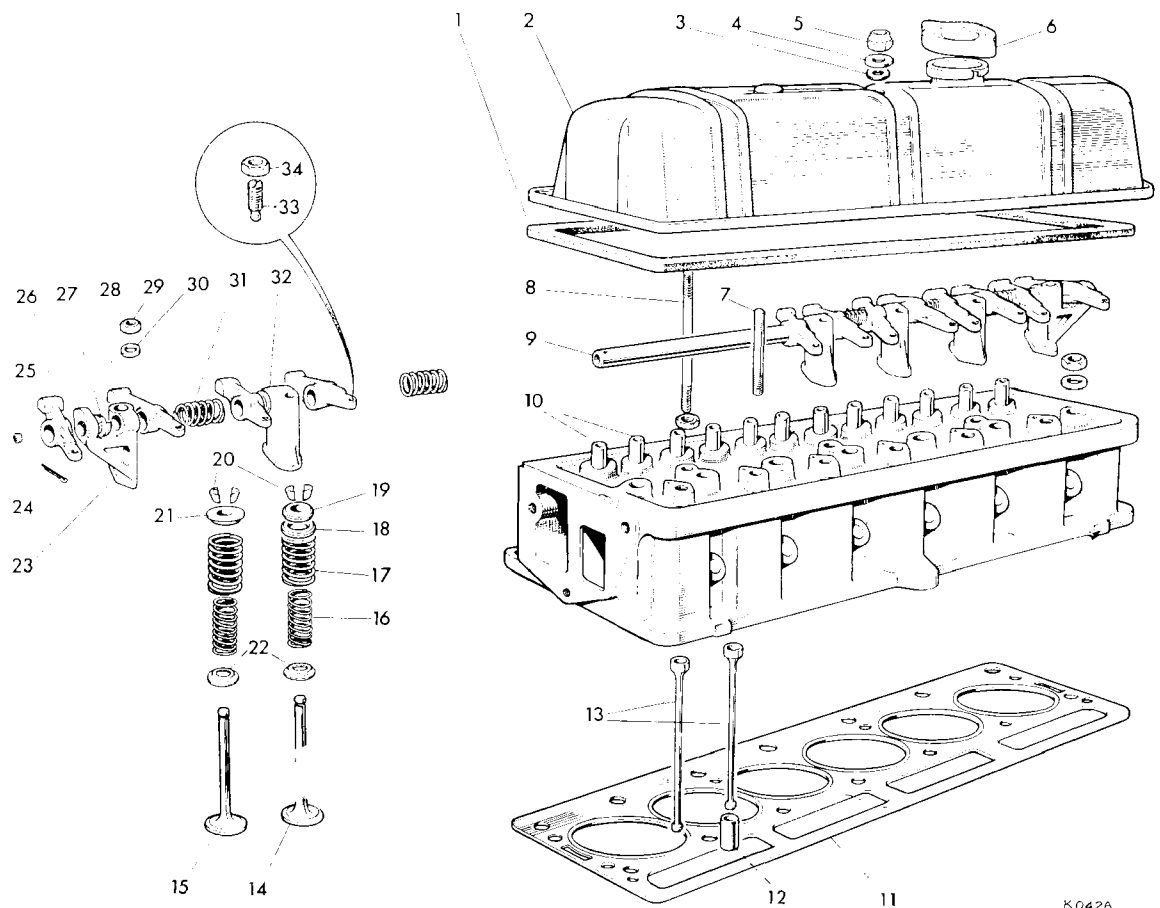


Fig. 83. Cylinder head details (earlier models only)

- | | | | | | |
|----|----------------------|----|------------------------------------|----|---|
| 1 | Gasket—rocker cover | 13 | Push rods | 24 | Cotter pin |
| 2 | Rocker cover | 14 | Valve—exhaust | 25 | End plug—rocker shaft |
| 3 | Fibre washer | 15 | Valve—inlet | 26 | Rocker |
| 4 | Plain washer | 16 | Valve spring—inner | 27 | Double spring washer—end
rocker pedestal |
| 5 | Nyloc nut | 17 | Valve spring—outer | 28 | Rocker |
| 6 | Oil filter cap | 18 | Upper spring seat—exhaust
valve | 29 | Nut |
| 7 | Stud—rocker pedestal | 19 | Valve cap—exhaust valve | 30 | Washer |
| 8 | Stud—rocker cover | 20 | Valve cotter pins | 31 | Spring—rocker shaft |
| 9 | Rocker shaft | 21 | Valve cap—inlet valve | 32 | Rocker pedestal—intermediate |
| 10 | Valve guides | 22 | Valve spring seats | 33 | Tappet adjuster |
| 11 | Gasket—cylinder head | 23 | Rocker pedestal—outer | 34 | Lock nut—tappet adjuster |
| 12 | Cam-follower | | | | |

K042A

DESCRIPTION

DIMENSIONS

VALVES

Inlet

Head dia.	.. .. .	1.441"—1.445"	(36.6—36.7 mm.)
Stem dia.	.. .. .	0.3107"—0.3112"	(7.891—7.904 mm.)
Seat angle	.. .. .	45	
Length	.. .. .	4.597"—4.607"	(116.764—117.018 mm.)

Exhaust

	GT6/Vitesse Mk. 2 up to Engine No. KC77052/HC55479	GT6/Vitesse Mk. 2 and GT6 Mk. 3 from Engine No. KC77052/HC55479	GT6 - and GT6 Mk. 3 USA Markets	GT6 Mk. 3 Interim from Engine No. KE21546
Head dia.	1.256"—1.260"	(31.9—32.0 mm.)		1.193" 1.597" (30.3—30.4 mm.)
Stem dia.	0.31"—0.3105"	(7.87—7.89 mm.)		0.31" 0.3106" (7.87—7.89 mm.)
Seat angle	45			45
Length	4.597"—4.607"	(116.76—117.02 mm.)		4.597"—4.607" (116.76—117.02 mm.)

VALVE SPRINGS

DOUBLE SPRINGS FITTED UP TO ENGINE No. KD 51116/HC 50270

Inner

Free length	.. .. .	1.56" (39.624 mm.)
Solid length-max	.. .. .	0.73" (18.542 mm.)
Outer dia.	.. .. .	0.73" (18.542 mm.)
Wire dia.	.. .. .	0.076" (1.9034 mm.)
Rate fitted	.. .. .	28.5 lb./in.

Outer

Free length	.. .. .	1.57" (39.878 mm.)
Solid length-max	.. .. .	0.918" (23.32 mm.)
Inner dia.	.. .. .	0.795" (20.193 mm.)
Wire dia.	.. .. .	0.136" (3.44 mm.)
Rate fitted	.. .. .	150 lb./in. \pm 3%

SINGLE SPRING FITTED FROM ENGINE No. KD 51116/HC 50270

Up to engine No. KE/KF 10,001

Free Length	.. .. .	1.59" (40.386 mm.)
Solid Length-max	.. .. .	0.96" (24.384 mm.)
Inner dia.	.. .. .	0.795" (20.193 mm.)
Wire dia.	.. .. .	0.148" (3.7592 mm.)
Rate fitted	.. .. .	235 lb./in. \pm 3%

From engine No. KE/KF 10,001

Free Length	.. .. .	1.52" (38.608 mm.)
Solid Length-max	.. .. .	0.875" (22.225 mm.)
Inner dia.	.. .. .	0.795" (20.193 mm.)
Wire dia.	.. .. .	0.152" (3.860 mm.)
Rate fitted	.. .. .	240 lb./in. \pm 3%

VALVE GUIDES

Length: Inlet	.. .. .	2.0625" (52.386 mm.)
Exhaust	.. .. .	2.25" (57.15 mm.)
External dia.	.. .. .	0.501" - 0.502" (12.725 - 12.751 mm.)
Bore	.. .. .	0.312" - 0.313" (7.925 - 7.95 mm.)
Height above cylinder head	.. .. .	0.63" (16.002 mm.)

VALVE SEAT INSERTS

Inlet

Outside dia.	.. .. .	1.4875"—1.4885"	(37.783 - 37.808 mm.)
Height	.. .. .	0.247" - 0.25"	(6.274 - 6.35 mm.)
Chamfer (At base)	.. .. .	0.032" - 0.052"	(0.813 - 1.321 mm.)

Exhaust

Outside dia.	.. .. .	1.2845" - 1.2855"	(32.626 - 32.652 mm.)
Height	.. .. .	0.247" - 0.25"	(6.274 - 6.35 mm.)
Chamfer (At base)	.. .. .	0.032" - 0.052"	(0.813 - 1.321 mm.)

Bore Out Cylinder Head

Inlet	.. .. .	1.484 (37.69 mm.) \times 0.25" (6.35 mm.)
	.. .. .	1.485 (37.72 mm.) \times 0.255" (6.48 mm.)
Bottom radius	.. .. .	0.03" (0.76 mm.)
Exhaust	.. .. .	1.281" (32.54 mm.) \times 0.25" (6.35 mm.)
	.. .. .	1.282" (32.56 mm.) \times 0.255" (6.48 mm.)
Valve seat angle	.. .. .	89" Inclusive

Note that Valve seats are to be concentric with guide bore to within 0.002" (0.05 mm.) T.I.R.

ROCKERS

Bore	.. .. .	0.563" - 0.564" (14.3 - 14.33 mm.)
Rocker shaft dia.	.. .. .	0.5604" - 0.5610" (14.234 - 14.249 mm.)

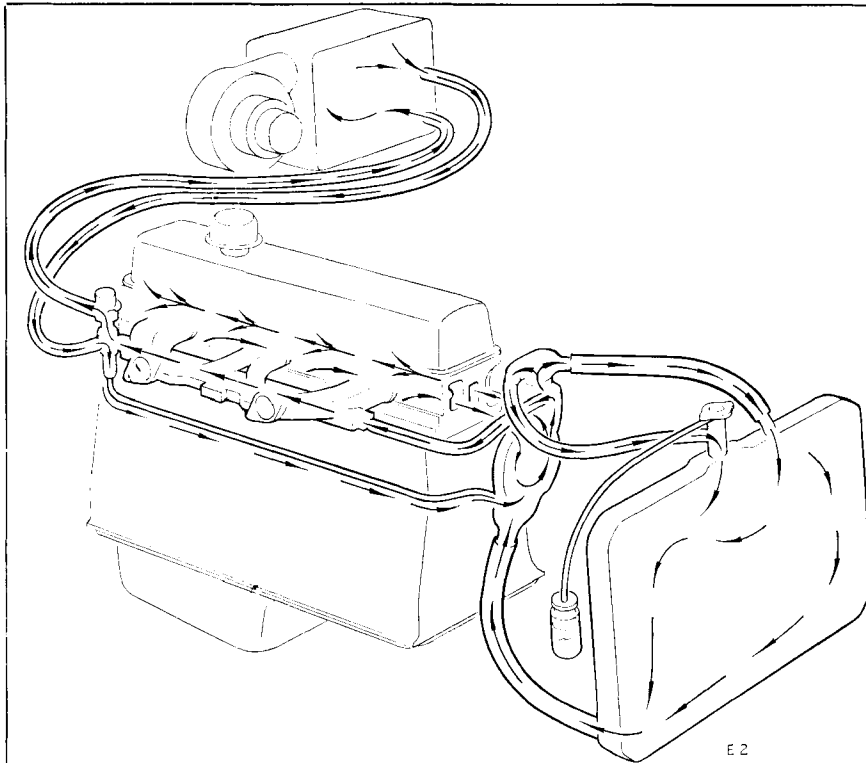


Fig. 1.
Coolant circulation diagram

E 2

COOLING SYSTEM

The pressurised "no loss" cooling system incorporates a translucent plastic overflow reservoir which collects excess coolant from the radiator as the coolant in the system expands with heat. Depression created as the system cools, causes the coolant to flow back from the reservoir into the radiator. The fluid level, which is visible through the translucent reservoir, should be maintained at half-full when cold.

Draining

To drain the system, move the heater control valve to the hot position, remove the radiator filler cap, open the tap in the bottom of the radiator and the tap at the rear right-hand side of the cylinder block.

CAUTION: If the engine is hot, avoid danger from scalding by exercising extreme care when removing the radiator filler cap. Turn it a half-turn and allow pressure to be fully released before completely removing the cap.

Flushing

Efficient cooling is maintained by thoroughly flushing the system once each year before adding anti-freeze. When carrying this out, it is advantageous to remove the drain tap completely and to use plenty of clean running water.

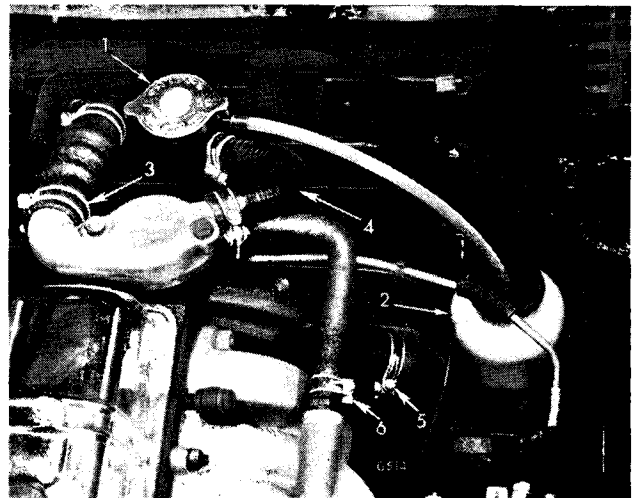


Fig. 2. Radiator filler cap (1) and overflow reservoir (2)

Anti-freeze Mixture

To protect the cooling system during frosty weather use an inhibited Glycol base anti-freeze solution. Because of the searching effect of these solutions, check the system for leaks before adding the anti-freeze.

For the % quantity of anti-freeze required to constitute the mixture see the table below.

It is recommended that fresh anti-freeze is used each year, since the inhibitor becomes exhausted and the components in contact with the cooling water may corrode. When topping up the coolant, use a mixture of anti-freeze and water.

ANTI-FREEZE CONCENTRATION	25%	30%	35%
Safe Limit:— Coolant in mushy state. Engine may be started and vehicle driven away after short warm up period.	0°F. (-17°C.)	-8°F. (-22°C.)	-18°F. (-28°C.)
Complete Protection:— Vehicle may be driven away immediately from cold	10°F. (-12°C.)	3°F. (-16°C.)	-4°F. (-20°C.)
Lower Protection Limit:— Prevents frost damage to cylinder head, block and radiator. Engine should NOT be started until thawed out	-14°F. (-26°C.)	-22°F. (-30°C.)	-28°F. (-33°C.)

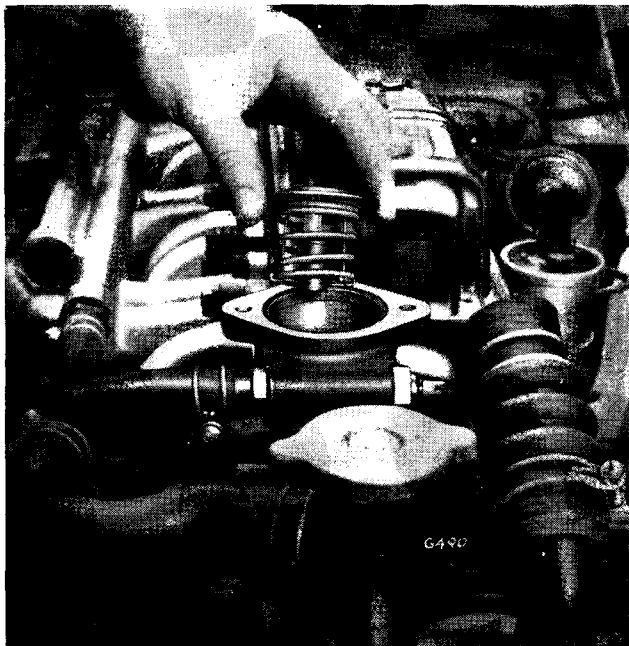


Fig. 3. Removing the thermostat

Concentration of Anti-Freeze

To check the percentage concentration of anti-freeze it is necessary to take Hydrometer and Thermometer readings.

The following table gives a recommended indication of the Specific Gravity, Temperature and Concentration.

Specific Gravity	Temperature indicates Concentration	
1.046	60°F./15°C.	25%
1.051	60°F./15°C.	27%
1.0545	60°F./15°C.	30%
1.0625	60°F./15°C.	35%
1.0715	60°F./15°C.	40%
1.0875	60°F./15°C.	50%

For higher temperatures, it is necessary to apply the following correction factor—add 0.0007 to the specific gravity reading for every degree above 15°C.

Thermostat Part No. 140970

To inspect the thermostat, drain the cooling system below the level of the thermostat, detach the top elbow and remove the thermostat from its housing (Fig. 3).

Functional failure of the thermostat is caused by corrosion or the subjection to a very high temperature through loss of water; evidence of over-heating being seal failure and a leakage of wax in the top area of the thermostat.

Testing the Thermostat

Test the thermostat by heating it in water together with a thermometer. Note the temperature at which the valve starts to open. It should commence to open within 5°F. of the temperature marked on the thermostat flange and continue to rise to the fully open position (at least ¼" valve lift), after the temperature has risen approximately 25°F.

If the thermostat fails the test, it should be replaced by a new unit. Part No. 140970.

- Opening temperatures .. 79.5° to 83.5°C.
(175° to 183 F.)
- Fully open 93.5° to 96°C.
(200° to 205 F.)
- Minimum valve lift .. 0.312" (7.925 mm.)
- Maximum valve lift .. 0.875" (22.225 mm.)

To Refit

Reverse the removal procedure.

Pressure Testing

Use an A.C. pressure tester to test the cooling system as follows:—

With the engine warm, remove the filler cap and top up the water level. Using an adaptor, fit the pressure tester to the filler neck and pump up to a pressure of 7 lbs./sq.in. (0.492 kg/sq.cm.).

The cooling system should maintain this pressure for ten seconds.

A more severe test may be applied by following the above procedure with the engine running. Absence of external leaks accompanied by pressure fluctuations usually indicates a leaking cylinder head gasket.

Filler Cap

Use an A.C. pressure tester to check the operation of the filler pressure cap as follows:—

1. Rinse the cap in water to remove sediment and fit the cap to the tester whilst wet.
2. Pump up the pressure until the gauge pointer stops rising.
3. Reject the cap if it will not register and maintain 7 lbs./sq.in. (0.492 kg/sq.cm.) for ten seconds without additional pumping.

Note: G16 Mk. 3 models are fitted with a 13 lb./sq. in. pressure cooling system.

WATER PUMP

Removal

Drain the cooling system. Disconnect the vacuum pipe at the distributor and manifold and disconnect the fuel pipe at the carburettors and fuel pump.

Pull off the Lucar connector on the thermometer gauge. Remove the two top hoses (3) and (4) and manifold hose (6), (Fig. 2). Detach the bottom hose (5) from the water pump body. Disconnect the water return pipe from the rear of the pump. Unscrew but do not remove, the bolt retaining the fuel and vacuum pipe clip. Remove the bolt retaining the upper dynamo bracket. Remove the remaining bolt securing the pump. Lift the pump clear of the engine and remove the bolt retaining the fuel and vacuum pipe clip.

Refitting

Renew the gasket. Reverse the removal procedure. Adjust the fan belt as described on page 1-000. Refill the cooling system.

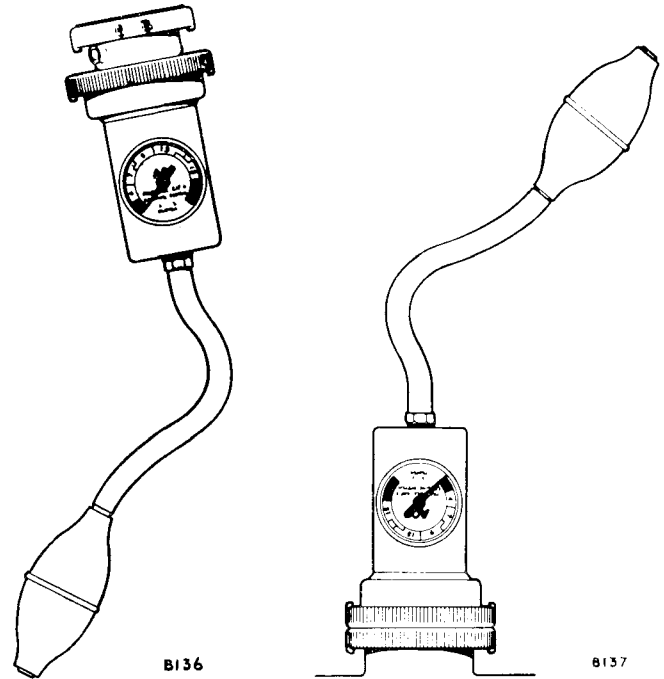
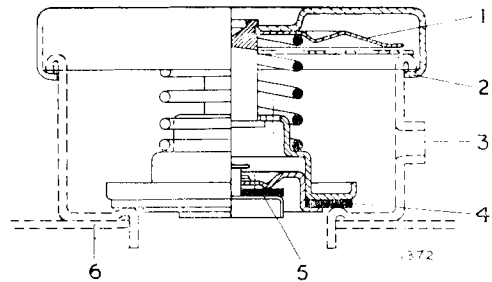


Fig. 4. Testing the radiator filler cap

Fig. 5. Testing the cooling system



- 1 Spring friction plate
- 2 Retaining lugs
- 3 Pressure release pipe
- 4 Pressure valve seal
- 5 Vacuum valve seal
- 6 Header tank

Fig. 6. Section through filler cap

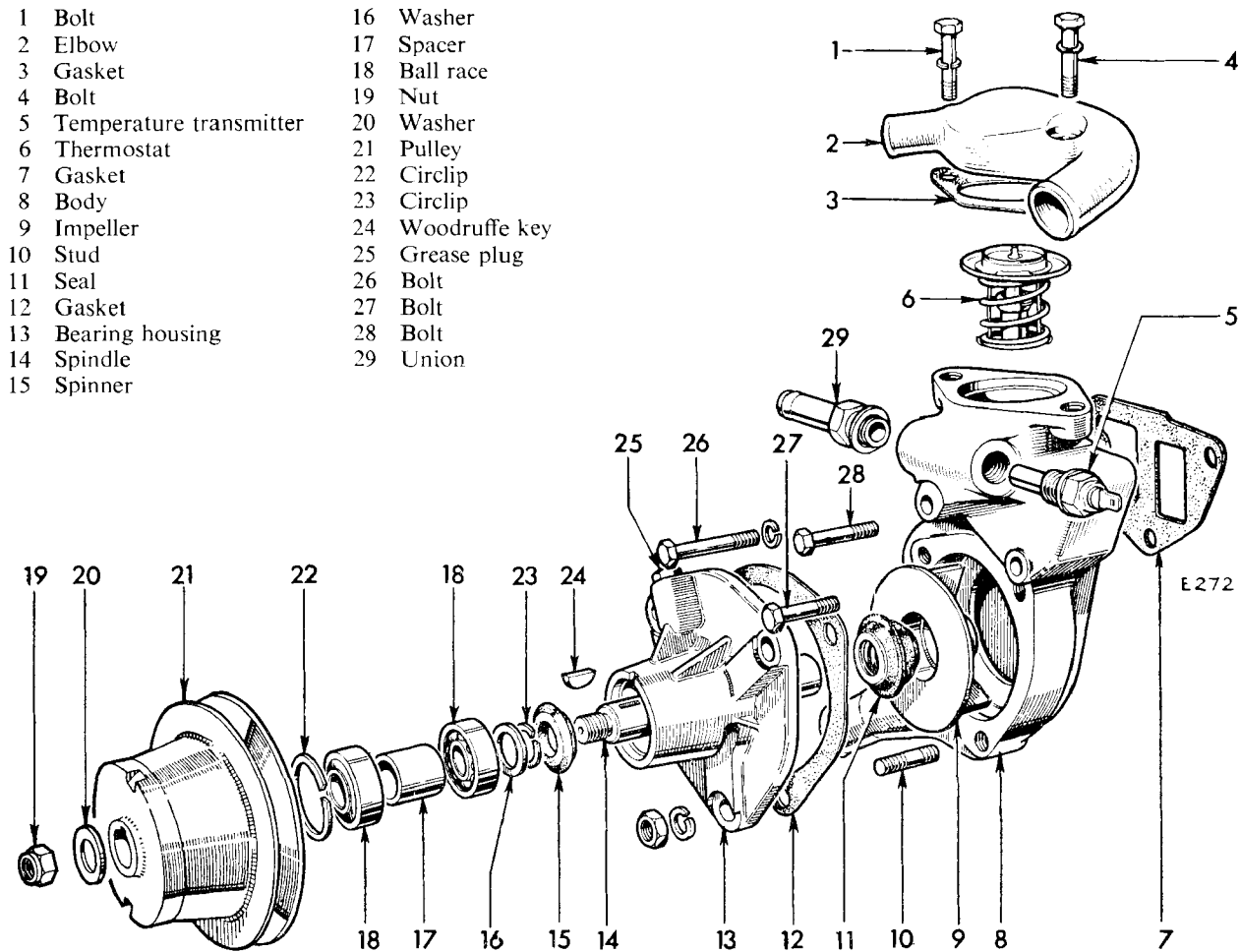


Fig. 7. Water pump details (Not later models GT6)

Bearing Housing**To Remove**

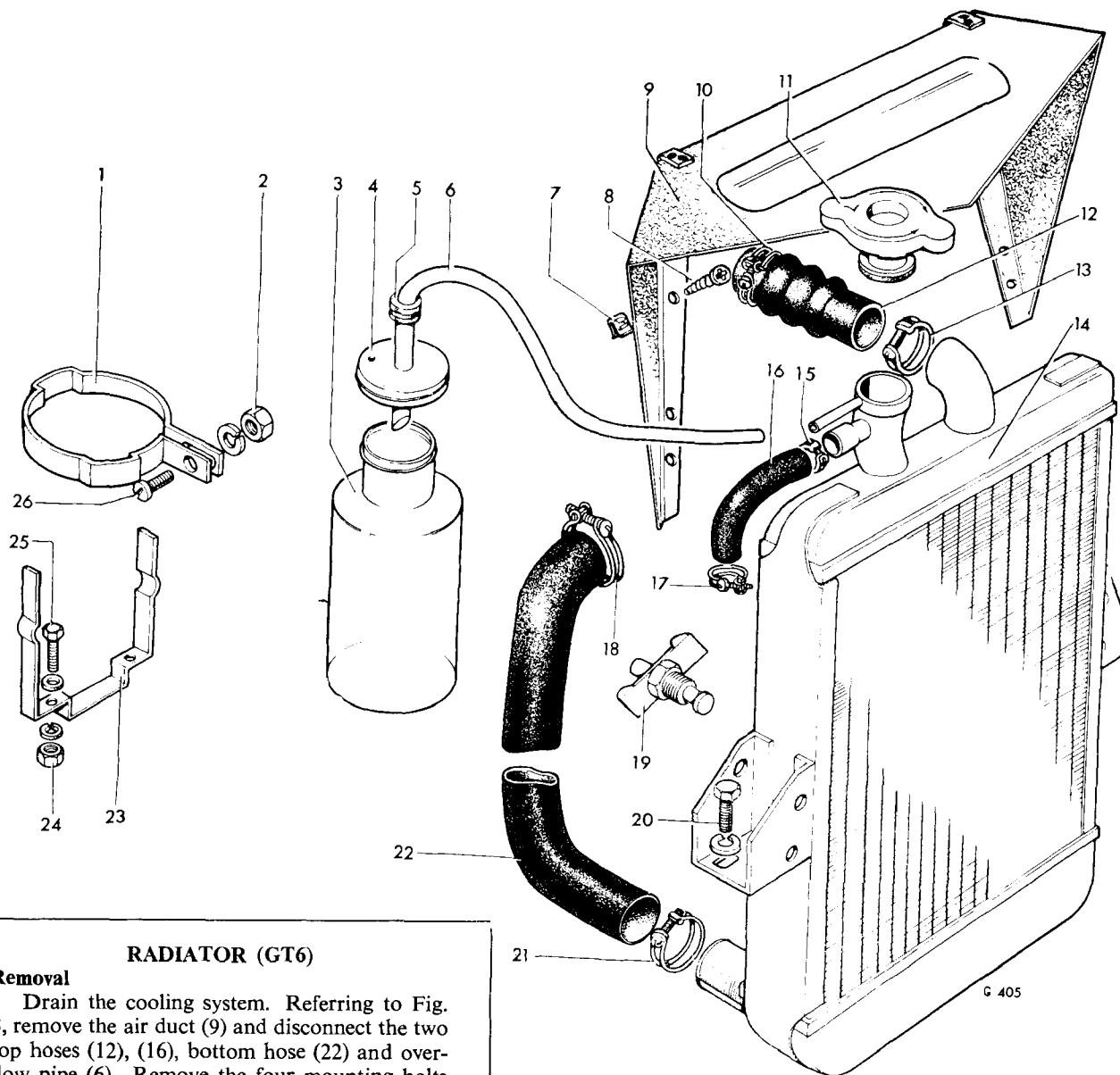
Remove three nuts from the studs (10) and withdraw the bearing housing assembly from the pump body.

To Dismantle

1. Unscrew the nut (19) remove the washer (20) and extract the pulley (21).
2. Take out the circlip (22) and press the shaft (14), through the impeller (9) towards the pulley side of the bearing housing (13).
3. Remove the following items from the spindle: key (24), bearings (18), spacer (17), washer (16), circlip (23) and spinner (15).
4. Complete the dismantling by removing the sealing gland (11) from the impeller (9).

Re-assembly

1. Fit spinner (15), circlip (23) and washer (16) to the shaft (14). Pack the ball races (18) with grease (see Recommended Lubricants) and press them onto the shaft with the sealed faces outwards and the spacer (17) between them.
2. Using a tubular drift, drive the bearings with the shaft into the housing (13) and secure them with circlip (22). Press the seal gland (11) into the impeller (9).
3. Using a 0.030" (0.962 mm.) spacer, press the impeller onto the shaft until the spacer is nipped.
4. Remove the spacer and fit the Woodruffe key (24) and pulley (21) to the shaft (14), securing with a Nyloc nut (19) and plain washer (20).



RADIATOR (GT6)

Removal

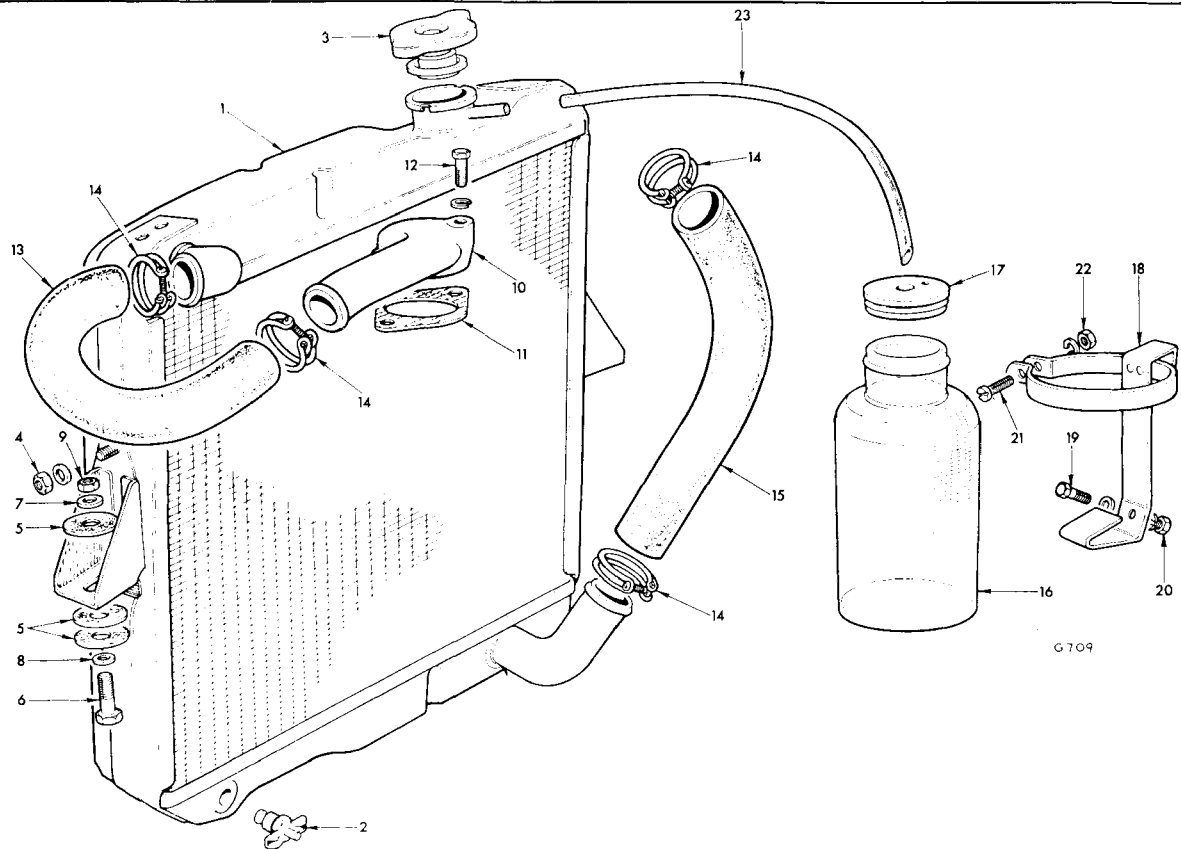
Drain the cooling system. Referring to Fig. 8, remove the air duct (9) and disconnect the two top hoses (12), (16), bottom hose (22) and overflow pipe (6). Remove the four mounting bolts (20) and lift the radiator from the vehicle.

Refitting

To refit, reverse the removal operation. Refill the cooling system.

- | | | | |
|----|-----------------------|----|---------------|
| 1 | Bottle strap | 14 | Radiator |
| 2 | Nut | 15 | Hose clip |
| 3 | Overflow bottle | 16 | Top hose |
| 4 | Cap | 17 | Hose clip |
| 5 | Grommet | 18 | Hose clip |
| 6 | Overflow pipe | 19 | Drain tap |
| 7 | Spire fix nut | 20 | Mounting bolt |
| 8 | Spire screw | 21 | Hose clip |
| 9 | Air duct | 22 | Bottom hose |
| 10 | Hose clip (top hose) | 23 | Bracket |
| 11 | Radiator cap | 24 | Nut |
| 12 | Top hose (convoluted) | 25 | Bolt |
| 13 | Hose clip (top hose) | 26 | Screw |

Fig. 8. Radiator, overflow bottle and hose details



Key

- | | | |
|-----------------|----------------|------------|
| 1 Radiator | 9 Nut | 17 Cap |
| 2 Tap | 10 Water elbow | 18 Bracket |
| 3 Filler cap | 11 Gasket | 19 Screw |
| 4 Nut | 12 Bolt | 20 Nut |
| 5 Packing piece | 13 Hose | 21 Screw |
| 6 Bolt | 14 Hose clips | 22 Nut |
| 7 Washer | 15 Hose | 23 Pipe |
| 8 Washer | 16 Bottle | |

Fig. 9. Radiator and attachment details

RADIATOR (VITESSE)

Removal (Figs. 9 and 10)

Remove the radiator cap and drain the cooling system. Release the radiator top hose clip (14), top hose clip (14) on bottom hose (15), and disconnect the overflow pipe (23). Remove nuts (4) and washers. Remove bolts (6), nuts (9) and associated washers and packing pieces. Carefully remove the radiator assembly from the vehicle.

Refitting

To refit, reverse the removal operation. Refill the cooling system and refit the radiator cap.

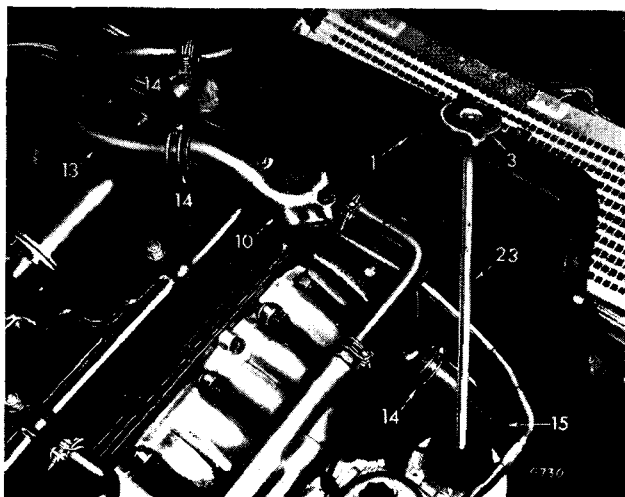


Fig. 10. Radiator, hoses and water bottle

ZENITH STROMBERG CARBURETTORS

Starting from Cold (Fig. 1)

The mixture is enriched from cold starting when the choke control is pulled. This operates a choke cam lever (71) which rotates the starter bar (26) to lift the air valve (9) and needle (11), thus increasing the area of the annulus between needle and jet orifice. Simultaneously, a cam on the cam lever (71) opens the throttle beyond its normal idle position to provide increased idling speed, according to the setting of the cam screw (66).

When the motor fires the increased depression will lift the air valve (9) to weaken the initial starting mixture and prevent the engine stalling through over richness.

Whilst the choke remains in action the car may be driven away but the control knob should be released or pushed in gradually as the engine attains normal working temperature. This will progressively decrease the extent of enrichment and the degree of throttle opening for fast-idle to the point where the cam screw (66) is out of contact with the cam on the choke lever and the throttle is permitted to return to the normal idle position as determined by the setting of the throttle stop screw (27).

NOTE: The accelerator pedal should not be depressed when starting from cold.

Normal Running (Fig. 1)

With the opening of the butterfly throttle manifold depression is transferred, via a drilling (9a) in the air valve, to the chamber (9b) which is sealed from the main body by the diaphragm (8).

The pressure difference between chamber (9b) and that existing in the bore (9c) causes the air valve to lift, thus any increase in engine speed or load will enlarge the effective choke area since the air valve lift is proportional to the weight of air passing the butterfly throttle (16). By this means air velocity and pressure drop across the jet orifice remain approximately constant at all speeds.

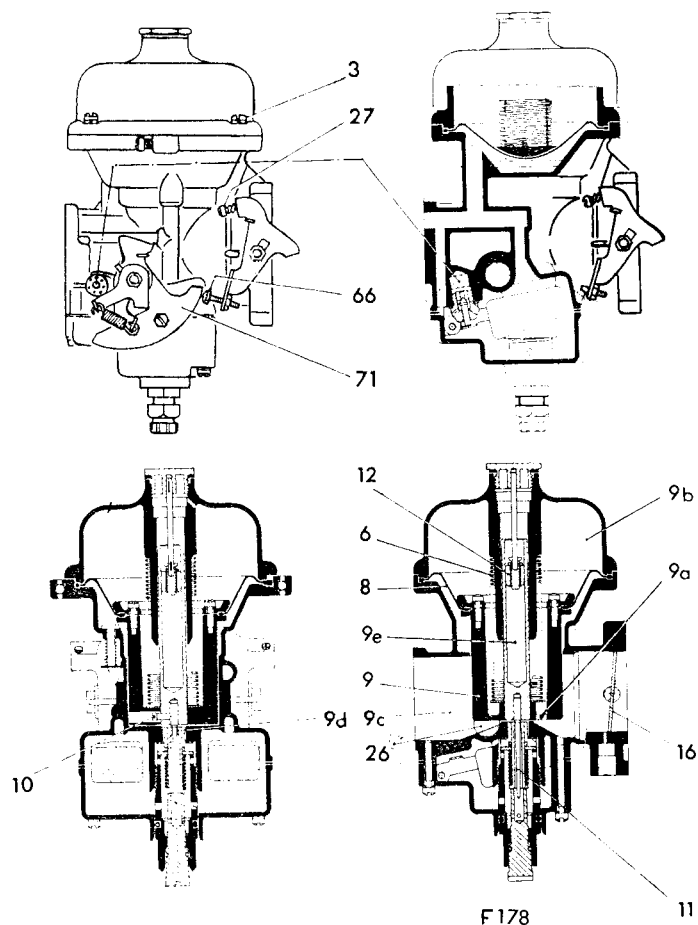
As the air valve (9) rises it withdraws a tapered metering needle (11) held in the base of the air valve by the locking screw (10), from the jet orifice (9d) so that fuel flow is increased relative to the greater air flow.

Acceleration

At any point in the throttle range a temporarily richer mixture is needed at the moment of further throttle opening. To provide this, a dash pot or hydraulic damper is arranged inside the hollow guide rod (9e) of the air valve.

The rod is filled with S.A.E. 20 oil to within a 1/4" of the end of the rod in which the damper (12) operates, when the throttle is opened, the immediate upward motion of the air valve is resisted by this plunger during which time the suction or depression at the jet orifice is increased to enrich the mixture.

The downward movement of the air valve (9) is assisted by the coil spring (6).



- | | | | |
|----|--------------------|----|---------------------|
| 3 | Top cover screw | 27 | Throttle stop screw |
| 6 | Coil spring | 66 | Cam screw |
| 8 | Diaphragm | 71 | Choke cam lever |
| 9 | Air valve | 9a | Air valve drilling |
| 10 | Locking screw | 9b | Chamber |
| 11 | Metering needle | 9c | Bore |
| 12 | Damper | 9d | Jet orifice |
| 16 | Butterfly throttle | 9e | Guide rod |
| 26 | Starter bar | | |

Fig. 1. Carburettor functional diagram

FUEL SYSTEM

Key to Fig. 2

1 Sleeve	25 Return spring	49 Jet
2 Nut	26 Starter bar spindle	50 Spring
3 Top cover screw	27 Throttle stop screw	51 Needle valve
4 Screw	28 Spring	52 Washer
5 Top cover	29 Throttle spindle	53 Gasket
6 Coil spring	30 Fuel pipe connector	54 Washer
7 Retaining ring	31 Pipe	55 "O" ring
8 Diaphragm	32 Circlip	56 Bushing
9 Air valve	33 Coupling	57 Washer
10 Locking screw	34 Clamping bolt	58 Connecting link
11 Needle	35 Pin	59 Screw
12 Damper	36 Coupling	60 Petrol inlet
13 Pipe	37 Air valve lifting pin	61 Body
14 Gasket	38 Spring clip	62 Stop lever
15 Insulator	39 Spring	63 Lock plate
16 Butterfly throttle valve	40 "O" ring	64 Coupling nut
17 Screws	41 Orifice adjusting screw	65 Clamping bolt
18 Grommet	42 Screw (long)	66 Cam screw
19 Bracket	43 Screw (short)	67 Coupling nut
20 Spring	44 Float chamber cover	68 Lock plate
21 Throttle stop lever	45 Fulcrum pin	69 Spring
22 Nuts	46 Float assembly	70 Cam screw
23 Lever	47 "O" ring	71 Choke cam lever
24 Bush	48 Bushing screw	72 Nut

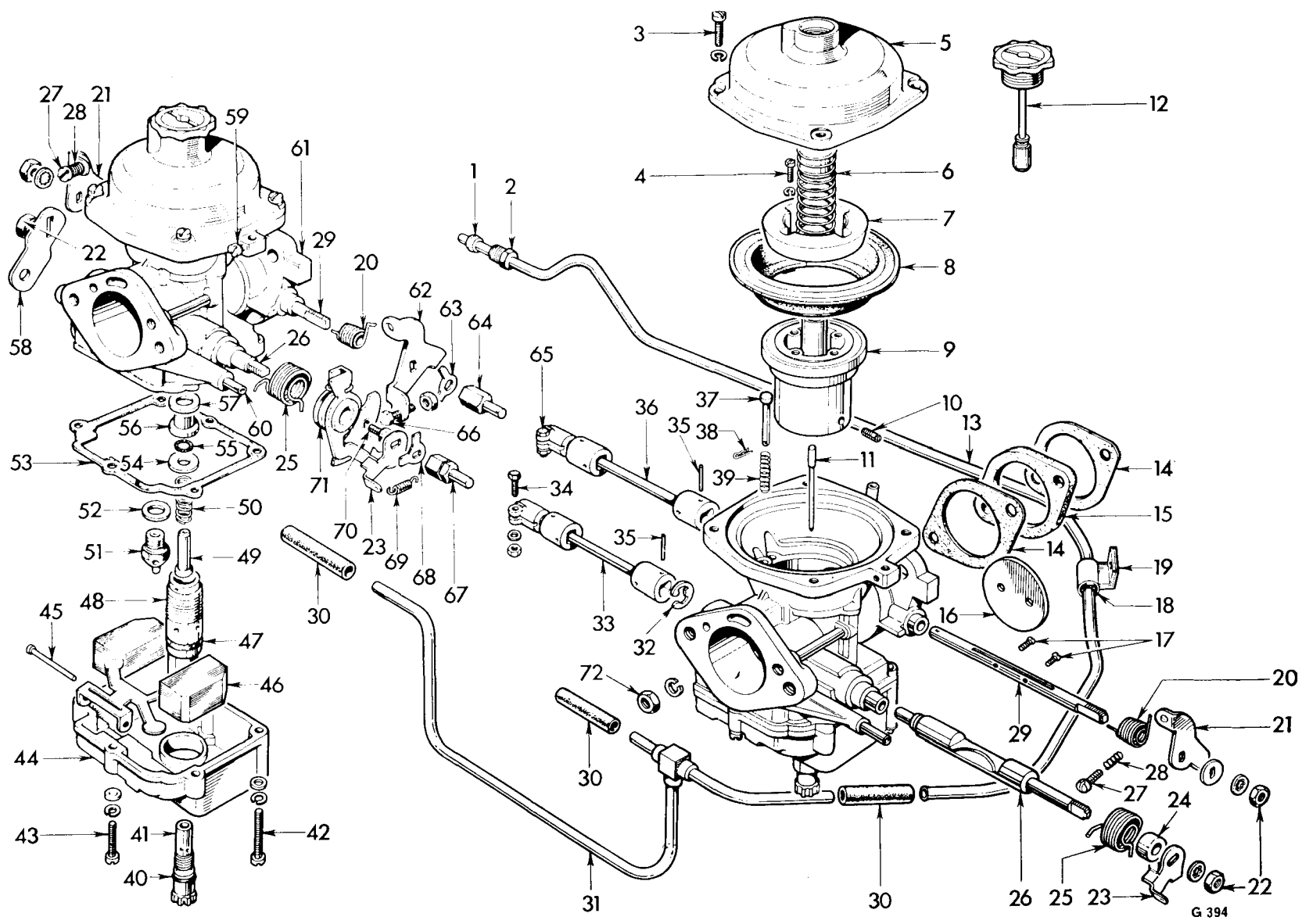


Fig. 2. Carburettor details

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To Dismantle

1. Take off the air cleaners (page 1-309), disconnect the carburetors from the manifold by unscrewing four nuts.
2. Uncouple the clamping bolts (65) (34) and separate the carburetors from each other.
3. Unscrew the dampers (12) and drain the oil from the dash pots.
4. Take out four top cover screws (3) and, to facilitate assembly, scribe a line across the upper flanges. Lift off the top cover (5) and coil spring (6), taking care to separate the air valve diaphragm (8) which, in some instances, may tend to stick to the cover.
5. Exercising care to avoid damaging the needle (11), withdraw the air valve/diaphragm assembly from the carburettor body.
6. Turn the carburettor onto its flange face and unscrew the bushing screw assembly, which comprises items (40), (41), (47) and (48).
7. Release the cover (44) by removing three screws (42) and three screws (43).
8. Lift out the jet assembly which comprises items (49), (50), (54), (55), (56) and (57).
9. Slide out the fulcrum pin (45), lift out the float assembly (46) and unscrew the needle valve (51) with washer (52).

Butterfly Spindle Assembly

10. Unscrew the nut and withdraw the throttle lever and stop (21) from the spindle (29).
11. Turn back the lock plate (63), unscrew the coupling nut (64), unhook the spring (20) and withdraw the stop lever (62) and return spring from the spindle.
12. Take out two screws (17) and slide the butterfly throttle valve from the slotted spindle (29). Withdraw the spindle from the carburettor body.

Starter Bar

13. Turn back the lock plate (68), unscrew the coupling nut (67) and withdraw the lock plate, the choke cam lever assembly (71), with lever (23) and spring (69) attached, and the return spring (25).
14. Withdraw the starter bar spindle (26) from the carburettor body and extract the circlip (32).
15. Complete the dismantling operation by extracting the spring clip (38) and removing the air valve lifting pin (37) and spring (39).

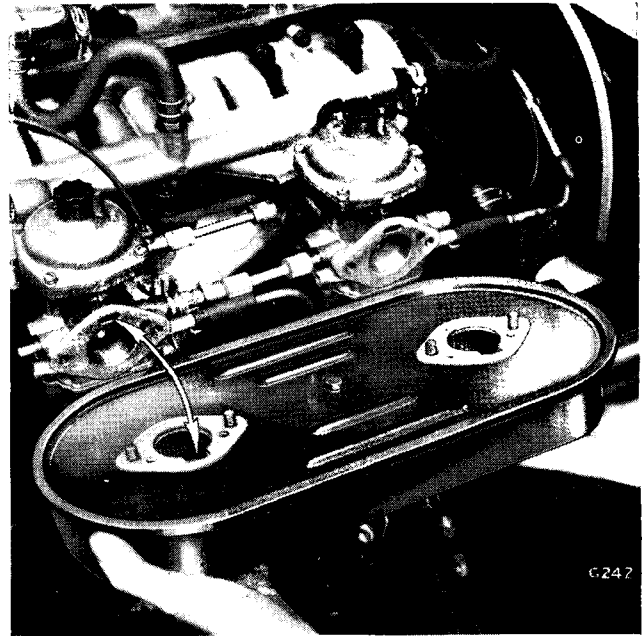


Fig. 3. Air cleaner attachment

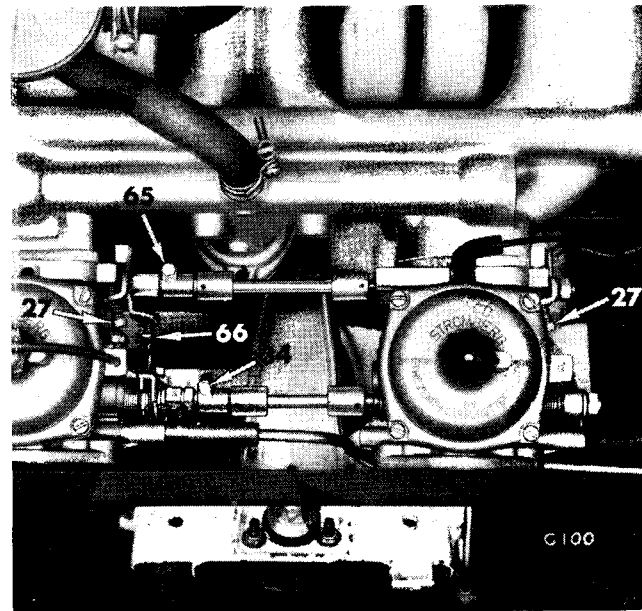


Fig. 4. Carburettor adjustment points

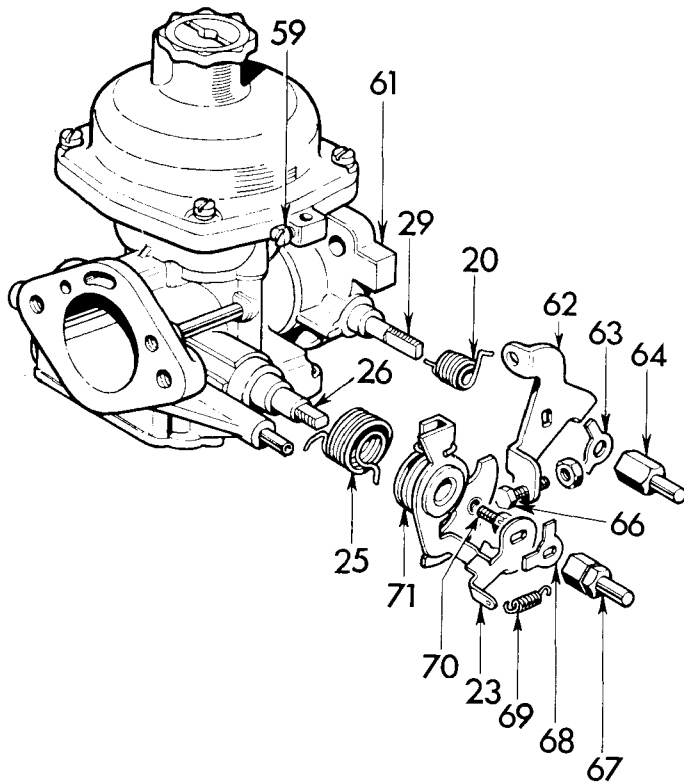


Fig. 5. Starter bar and throttle lever details

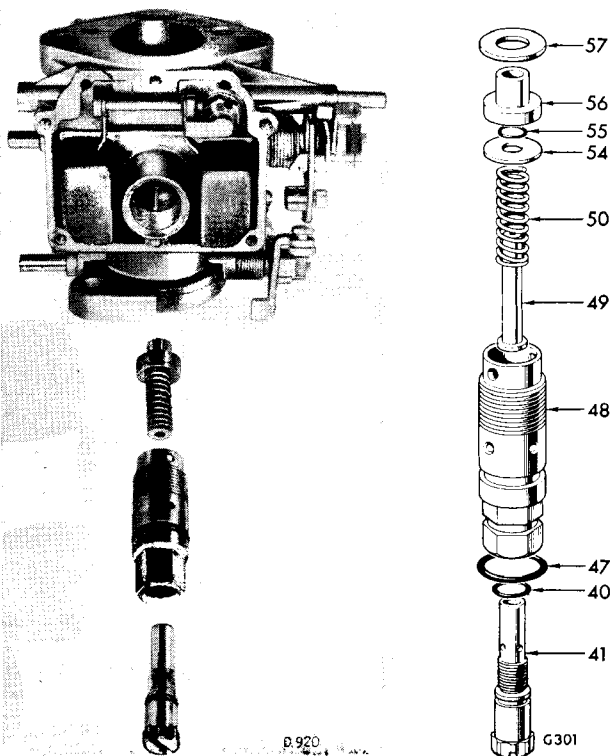


Fig. 6. Jet details

To re-assemble**Valve Lifting Pin**

1. Insert the air valve lifting pin (37) into the body of the carburettor, assemble the spring (39) and secure it by springing the clip (38) over the pin.

Starter Bar and Lever Assembly

2. Spring the circlip (32) over a groove at the end of the starter bar spindle (26) and with the flat milled face uppermost, insert the spindle into the carburettor body.
3. With the larger coils leading, place the spring (25) over the large part of the spindle boss and locate the spring ends at each side of the fuel pipe.
4. Assemble the choke cam lever assembly (71) on the smaller diameter of the spindle boss, placing the cam adjacent to the spring (25) and towards the throttle spindle.
5. Locate the lever (23) on the flats of the spindle (26) and in correct relation to the cam lever assembly (71) as shown on (Fig. 5). Pull the outer end of the spring (25) into engagement with a cut-out on the lower extremity of the lever (23).
6. Fit the lockplate (68), tighten the coupling nut (67) and lock it by turning the ends of the lockplate. Insert the ends of the spring (69) through holes provided at the extremities of the levers (23) and (71).

Throttle Valve and Spindle Assembly

7. Insert the spindle (29) into the bore of the carburettor, centralise the spindle and rotate it to bring the two counter sunk holes upwards. Ensuring that the two raised "pips" on the face of the valve are upwards and outwards, slide the valve into the slotted spindle until the "pips" contact the spindle. Turn the spindle to close the throttle and secure the valve by securely tightening two screws (17).
8. With the larger coils leading, place the spring (20) over the throttle spindle boss, at the same side as the choke cam lever. With the butterfly in the closed position, engage the stop lever (62) over the flats on the spindle, simultaneously engaging the ends of the spring as shown on Fig. 7, to ensure that the valve is spring loaded in the closed position. Fit the lockplate (63), tighten the coupling nut (64) and secure by turning the lockplate.
9. Locate the throttle stop lever (21) on the flats of the throttle spindle, at the opposite end to the actuating lever, followed by the connecting link (58). Secure the lever and link with a lock washer and nut.

Float Chamber (Fig. 7)

10. Placing an aluminium washer (52) over the threads of the needle valve (51) screw the valve firmly into the carburettor body.
11. Place the float assembly (46) into position and secure it with the fulcrum pin (45) as shown on Fig. 7. Check that the highest point of the float when the needle is against its seating, is 18 mm. above the face of the main body. See "A". Reset the level by carefully bending the tag which contacts the end of the needle. The addition of a thin fibre washer under the needle valve seat will lower the fuel level.

Jet Assembly (Figs. 6 and 8)

12. Insert a new "O" ring (55) in the recess of the bushing (56). Slide the spring (50) over the jet (49) followed by the washer (54). Insert the jet assembly into the "O" ring already positioned in the bushing.
13. Locate an aluminium washer (57) over the upper stem of the bushing and insert the completed assembly into the carburettor body.
14. Exercising care to avoid damage, spring a new "O" ring (47) into the external groove of the bushing screw (48). Similarly, fit a new "O" ring (40) to the jet adjusting screw (41). Screw the adjusting screw into the bushing screw approximately three turns. Screw the assembled bushing screw into the carburettor body until finger tight, then unscrew it one complete turn and looking down on the bridge, move the jet to its approximate centre.
15. Locate a new gasket (53) on the float chamber flange of the carburettor body and mount the float chamber (44) over the bushing screw (48). Loosely insert the screws (42), (43), press the float chamber into contact with the gasket and finally tighten the six securing screws.

Air Valve Diaphragm Assembly (Figs. 9 and 10)

16. A locating tab is moulded on the inner and outer peripheries of the rubber diaphragm (8). These locate in a corresponding recess formed in the top face of the air valve (9) and in the top flange of the carburettor body. To assemble the diaphragm, locate the inner tab in the air valve recess and ensure that the inner bore of the diaphragm locates correctly around a shoulder formed on the top face of the valve. Place the retaining ring (7) over the diaphragm, insert the four screws (4) and tighten them securely.
17. Insert the needle (11) into its bore in the lower face of the valve and whilst the shoulder on the needle is held flush, relative to the lower face of the valve, tighten the screw (10). (Fig. 2)
18. Exercising care to avoid damaging the needle, insert the air valve into its bore in the carburettor, simultaneously entering the needle into the jet. Rotate the valve until the outer tab of the diaphragm can be inserted into a

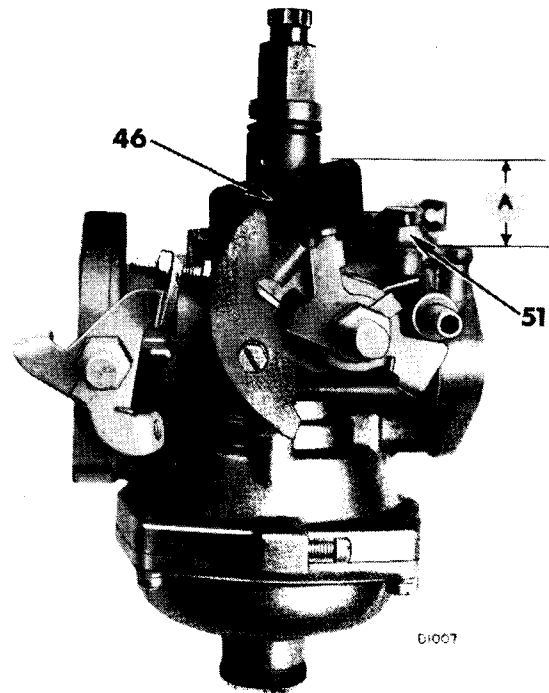


Fig. 7. Measuring float height

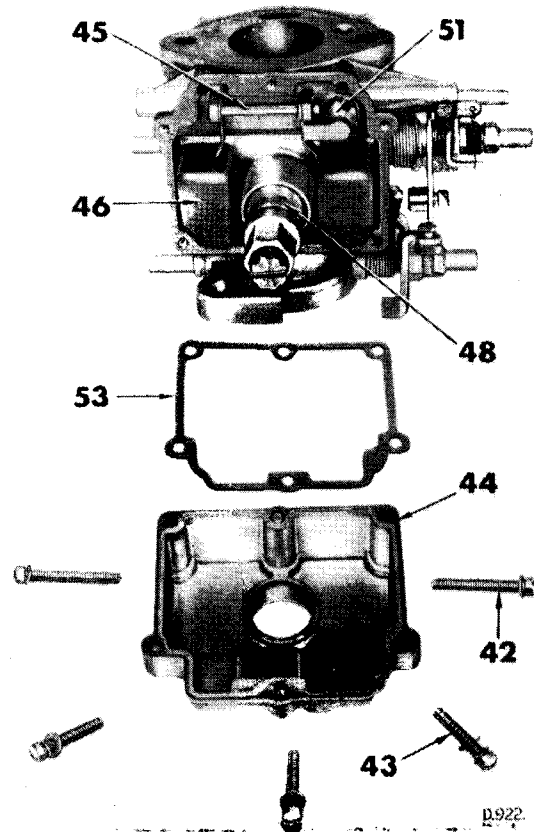


Fig. 8. Float chamber cover details

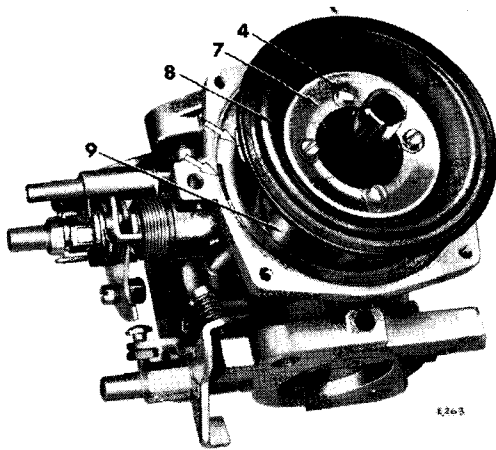


Fig. 9. Diaphragm assembly

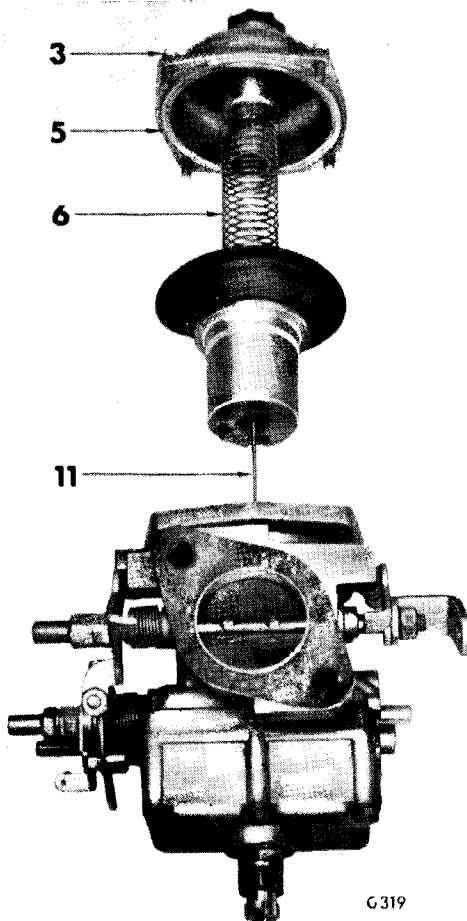


Fig. 10. Air valve details

corresponding recess adjacent to the choke outer cable fixing. Ensure that the outer edge of the diaphragm locates in the bore of the flange face.

19. Assemble the spring (6) over the air valve stem, locate the cover (5) on the stem and rotate the cover to bring the scribed marks into alignment. (See Dismantling, Operation 4.) Secure the cover by tightening four screws (3). Replenish the damper with oil (S.A.E. 20) and screw in the damper assembly (12).

Installation (Fig. 2)

20. Assemble the couplings (36), (33) to both carburettors, leaving the clamping bolts (34), (65) slack at this stage.
21. Using new gaskets (14) and insulators (15), assemble to each pair of studs on the manifold—a gasket, insulator, gasket, a carburettor and secure each assembly with two nuts and spring washers.
22. Reconnect the fuel pipes, vacuum pipe and before reconnecting the controls slacken back the throttle stop screw (27) of the rear carburettor and turn the cam screw (66) away from the cam to ensure that the throttle valve and choke cam lever are in the fully closed positions.
23. Slacken back the throttle stop screw (27) on the front carburettor and **only when both throttle valves are completely closed, tighten the coupling clamp bolt (65).**

Jet Centralisation

Efficient operation of the carburettor depends upon a freely moving air valve and a correctly centred needle in the jet orifice.

Check the air valve for free movement by lifting and releasing the valve, which should fall freely onto the bridge. Sluggish action indicates either (I) a sticking air valve which can be rectified by removing and cleaning the valve and bore with paraffin, or (II) by re-centralising the jet as follows:

24. Lift the air valve (9) and fully tighten the jet bushing screw (48). Screw up the orifice adjusting screw (41) until the orifice is just above the bridge.
25. Slacken off the jet bushing screw sufficiently to release the orifice bush (56), then allow the air valve to fall; this action will centralise the bush. Tighten the bushing screw to lock the bush and re-check by lifting and releasing the air valve. Repeat the procedure until a freely falling piston results.
26. Turn the adjusting screw (41) until it just contacts the underside of the air valve when it is resting on the bridge. From this position, unscrew the adjusting screw a further three turns to give an approximate jet position from which to work when synchronising the carburettors.

Starter Bar Adjustment

27. Pull the choke control until the lifting edge of the starter bar on the rear carburettor just contacts the underside of the air valve when resting on the bridge. Turn the starter bar lever (23) on the front carburettor to obtain a similar condition and whilst both starter bars are thus held, tighten the clamping bolt (34). The engine should now be started and run until normal running temperature is reached before making final adjustments.

Idling and Synchronising Adjustments

Two adjustment screws are used to regulate the idle speed and mixture of each carburettor. The throttle stop screws (27) control the speed and the jet adjusting screws (41) alters the ratio of air-fuel mixture entering the cylinders. Viewed from underneath, turn each jet adjusting screw **clockwise** to weaken the mixture strength, and **anti-clockwise** to enrich it.

Whilst the engine is thoroughly warm, the air cleaners removed and the jet adjusting screws set as described in operation 26, adjust the stop screws (27) to give idling speed of 600/650 r.p.m.

The idling mixture is correct when the engine beat is smooth and regular and the air intake is equal on both cylinders. This may be assessed by the amount of "hiss" as the air enters each carburettor, or by using the equipment shown on Fig. 13 which gives a comparative measurement of air flow.

As a check, lift the air valve a very small amount ($\frac{1}{32}$ ") using the piston-lifting pin (37) and listen to the effect on the engine. If the engine speed rises appreciably, the mixture is too rich, and if the engine stops, the mixture is too weak. By properly adjusting the jet screws, the engine speed will either remain constant or fall slightly on lifting the air valve.

Finally re-adjust the fast idling screw (66) to provide a clearance of $\frac{1}{16}$ " between the head of the screw and the adjacent face of the cam (71) as shown on Fig. 11.

NOTE: Satisfactory idling depends upon the general engine condition and tappet adjustment, spark plugs, and ignition timing, which should be inspected if idling is not stable.

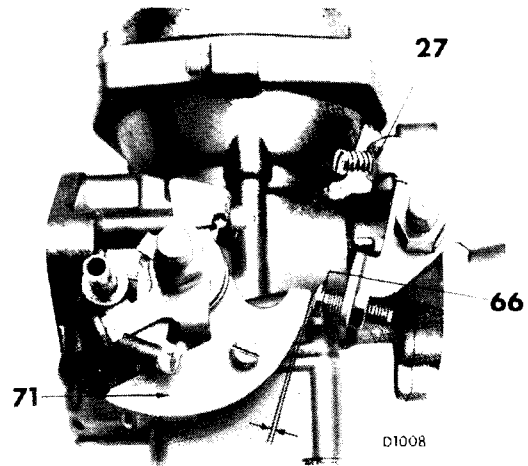


Fig. 11. Choke, cam and throttle adjusting screws

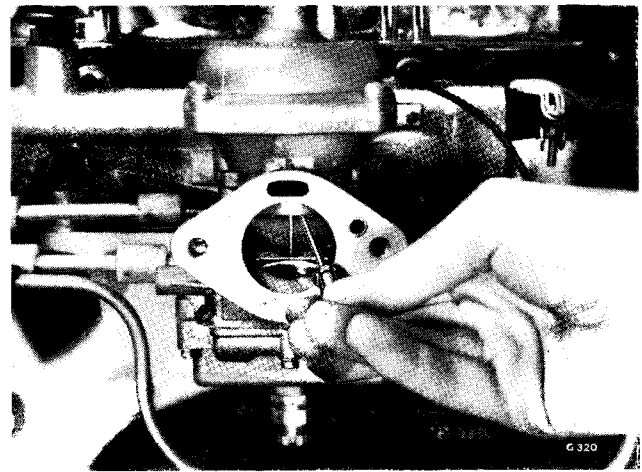
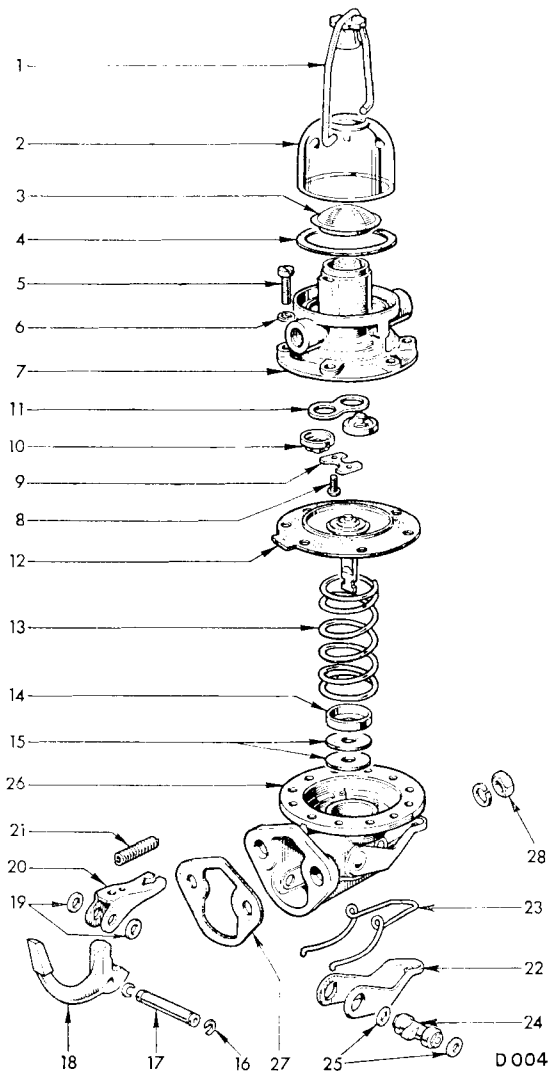


Fig. 12. Lifting the air valve for jet centering



Fig. 13. Using a Crypton "Synchro Check" for balancing the air intake



- | | | | |
|----|-----------------------|----|---------------------|
| 1 | Stirrup | 15 | Washers |
| 2 | Sediment bowl | 16 | Circlip |
| 3 | Filter gauze | 17 | Rocker arm pin |
| 4 | Cork seal | 18 | Rocker arm |
| 5 | Screw | 19 | Distance washers |
| 6 | Spring washer | 20 | Link lever |
| 7 | Upper body | 21 | Rocker arm spring |
| 8 | Retaining plate screw | 22 | Primer lever |
| 9 | Retaining plate | 23 | Primer lever spring |
| 10 | Valve assemblies | 24 | Primer lever shaft |
| 11 | Valve gasket | 25 | Cork seals |
| 12 | Diaphragm assembly | 26 | Lower body |
| 13 | Diaphragm spring | 27 | Pump gasket |
| 14 | Cup | 28 | Pump retainer nut |

Fig. 14. Fuel pump details

FUEL PUMP

A spring-loaded diaphragm pump, type AC U.G., lever operated from a separate cam on the camshaft is attached to the L.H. side of the engine by two studs and nuts. The pump is provided with a glass sediment bowl through which any build-up of sediment can be seen. When necessary, clean out the sediment chamber as follows:

Cleaning Sediment Bowl

1. Unscrew the stirrup nut on top of the bowl, swing the stirrup (1) to one side and remove the bowl (2).
2. Without denting the filter gauze (3) remove it and remove the cork gasket (4).

When refitting the bowl, tighten the stirrup only sufficiently to ensure a fuel tight joint.

Removal

Disconnect the fuel feed and outlet pipes from the pump. Unscrew two attachment nuts and remove the pump from the crankcase.

To Dismantle Fuel Pump

Dismantle in the sequence given on Fig. 14 and note the following:

1. Remove the diaphragm assembly (12) by turning it through 90° and lifting it out of engagement with the link lever (20).
2. The valves (10) are pressed into the body and the surrounding metal peened over to retain them. Items 8, 9 and 11 are not fitted.

Re-assembly

Re-assemble by reversing sequence.

Refitting

Clean the pump joint face and to avoid eventual oil leakage, check to ensure that the face is perfectly flat. Distortion can result from over-tightening.

Using a new gasket coated with jointing compound, locate the gasket (27) and the pump on two studs. Press the pump against the crankshaft and fit spring washers and nuts tightening them to the correct torque.

Reconnect the fuel pipes and test the fuel pump pressure.

- 1 Attachment bolts
- 2 Cover plate
- 3 Cleaner elements
- 4 Gasket
- 5 Back plate
- 6 Flange gasket
- 7 Centre bolt
- 8 Flange gasket

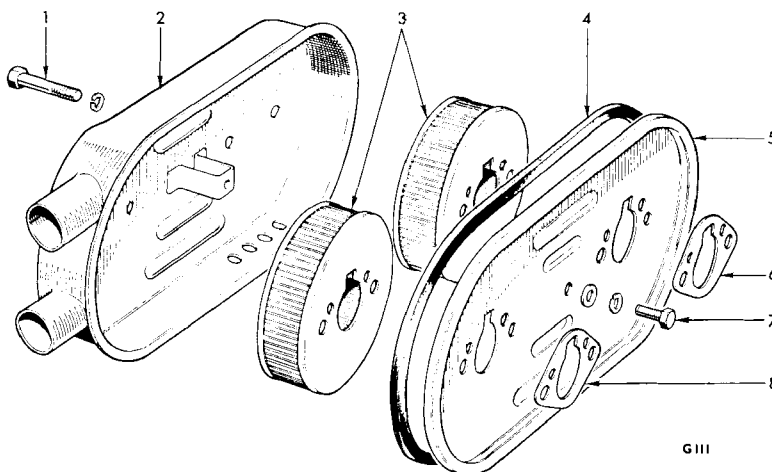


Fig. 15. Air cleaner details

G111

Testing (Fig. 17)

To test the petrol pump pressure, disconnect the fuel delivery line at the rubber connector. Remove the connector and attach a plastic hose to the fuel delivery pipe as shown. Start the engine, and allow it to run on the fuel remaining in the carburettor until the gauge reading on the PRESSURE scale ceases to rise. Stop the engine and observe the gauge pressure which should remain at its highest reading for a short period. A rapid fall off indicates a leaking diaphragm or a sticking outlet valve. Failure to read within a tolerance of $1\frac{1}{2}$ — $2\frac{1}{2}$ per sq. in. (0.106 to 0.176 kg/sq. cm.) indicates a defective pump or pipe line blockage.

AIR CLEANER

The air cleaner comprises two paper elements housed in a container attached to the carburettor intake flanges. When operating under conditions similar to those prevailing in the United Kingdom both elements should be removed for cleaning every 6,000 miles. Depending upon the severity of conditions, this period should be reduced where excessive amounts of dust are encountered. A choked air cleaner will adversely affect combustion efficiency.

To remove the cleaning elements, unscrew four bolts (1) securing the container to the carburettor flanges. (See Fig. 15)

Withdraw the container from the carburettor flanges, remove the centre bolt (7), take off the cover plate (2), and lift out the elements (3).

Clean out the container and use a high pressure air line, or foot pump, to remove dust from between the folds of the paper elements. Renew the elements when they can no longer be cleaned effectively.

Renewing the gaskets (4), (6) and (8) as necessary, re-assemble the air cleaner by reversing the foregoing procedure, and note the position of the slots relative to the carburettor flanges as shown on Fig. 16.

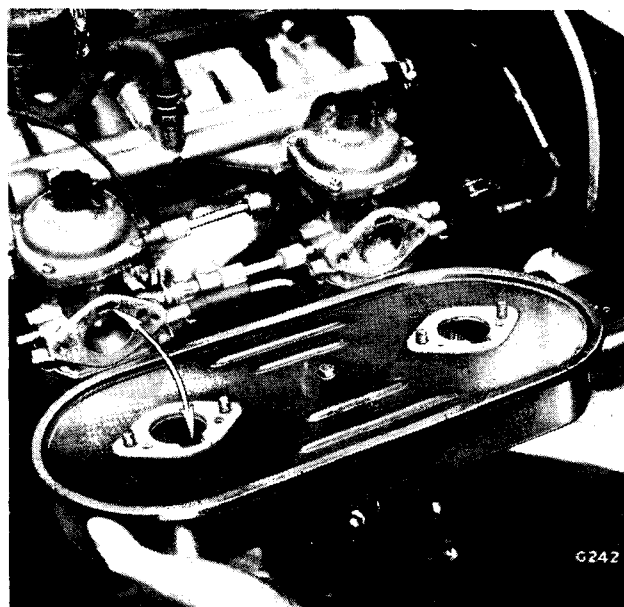


Fig. 16. Showing the position of slots relative to the carburettor flanges

G242

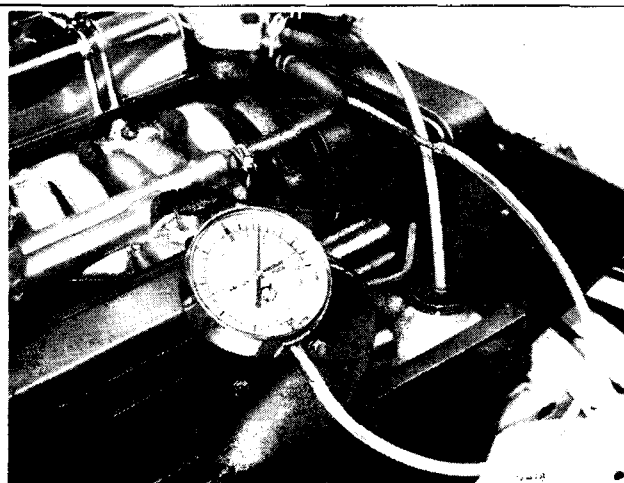


Fig. 17. Using vacuum/pressure gauge to check the fuel pump delivery pressure

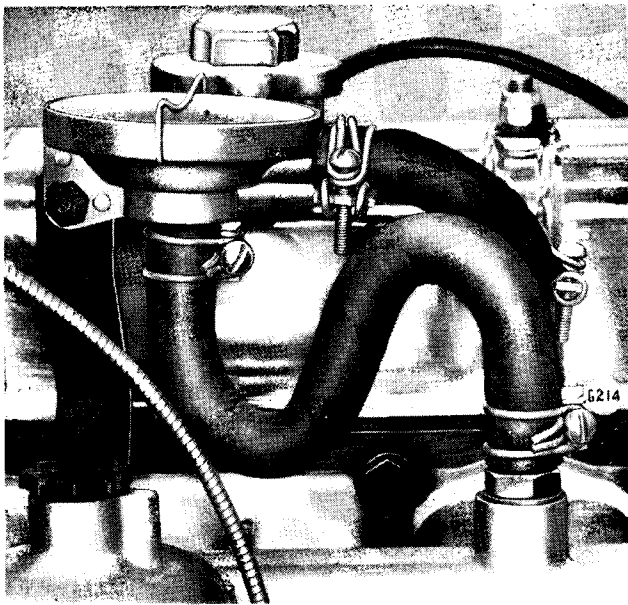
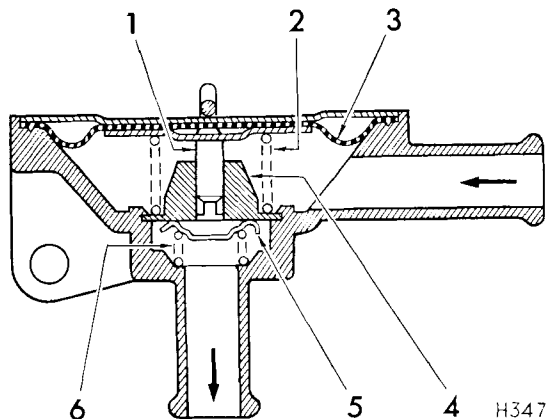


Fig. 18. Emission control valve assembly



1. Valve
2. Spring
3. Diaphragm
4. Orifice plate
5. Plate valve
6. Spring

Fig. 19. Emission control valve details

CRANKCASE EMISSION CONTROL

VALVE (Fig. 19)

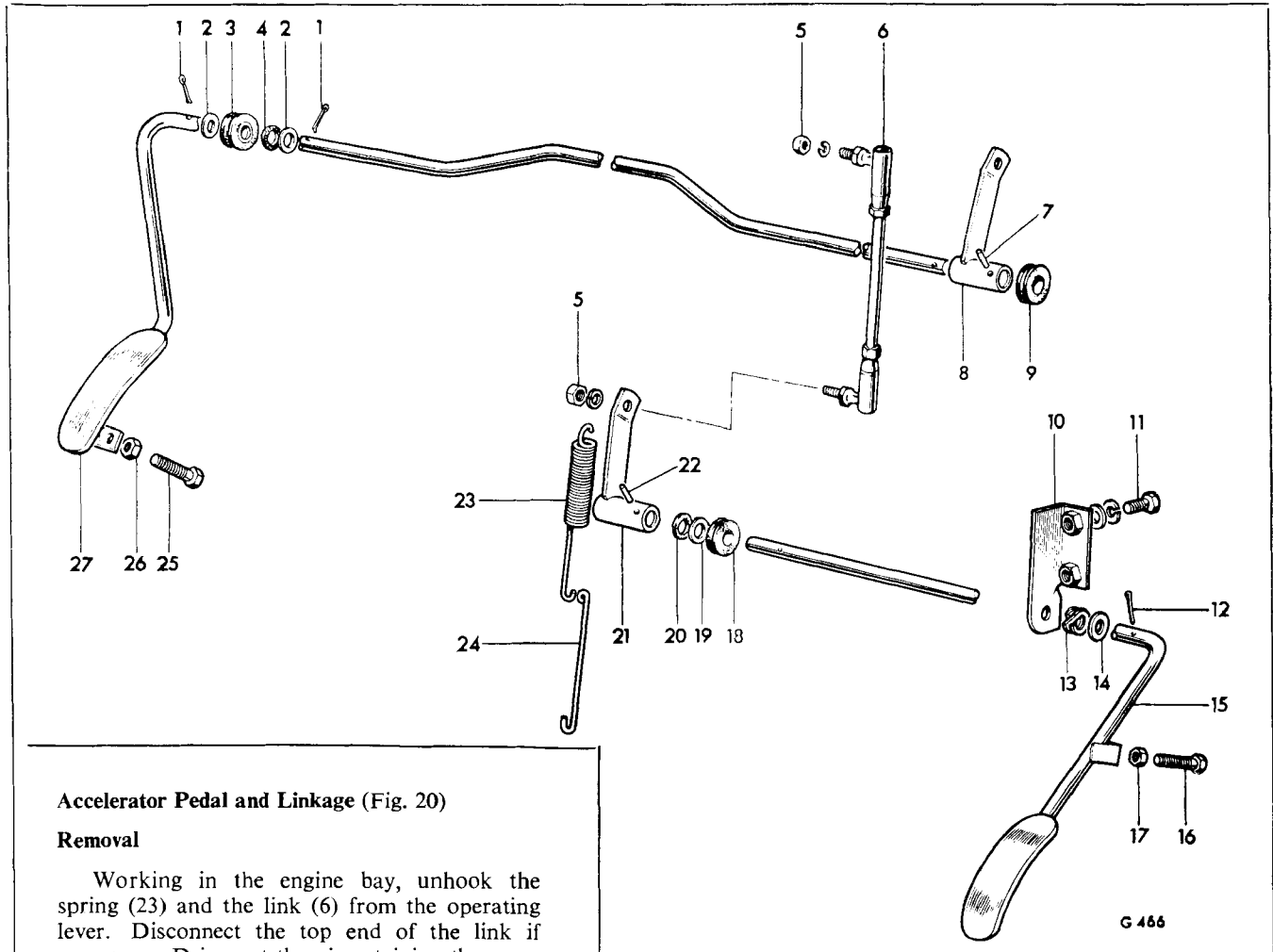
The valve pin and pressure plate assembly (1), which bears on the diaphragm (3), is positioned relative to the controlling orifice by the spring (2). The valve pin is located on the orifice plate (4) by guides which permit clearance between the pin and orifice to prevent sticking and allow a limited flow through the valve at engine idle. The plate valve (5) on the outlet side is controlled by a light spring (6).

When vacuum is applied, the lightly loaded plate valve (5) is sucked off its seat and a depression is created beneath the diaphragm (3). When this depression exceeds the diaphragm spring force, the valve (1) moves to reduce the controlling orifice until the spring and diaphragm forces are balanced. The value of the diaphragm spring force is such that, when operating, a reasonable depression is maintained in the crankcase. The plate valve (5) acts as a non-return valve against a back-fire within the carburettor intake manifold by isolating the crankcase and it also limits flow at cold starting.

In the system employed for the GT6 the oil-filler cap is sealed and ventilation air is drawn into the crankcase through a restrictor hole on the clean air side of the air-cleaner assembly. This air together with blow-by gas is drawn, via the emission valve into the combustion chamber. In the event of a blow-by gas exceeding the valve capacity, the excess emission reverses the cycle and escapes into the air cleaner assembly from where it is drawn into the engine and consumed during the combustion cycle.

Every 12,000 miles, service the valve as follows:—

- (a) Remove all connecting pipes.
- (b) Remove the spring clip and cover plate.
- (c) Take out the rubber diaphragm (3) noting the correct fitted position of its top face.
- (d) Remove the valve plate (1) and spring (2).
- (e) Clean the body, pipes and all remaining components in clean gasoline, taking particular care to ensure that the diaphragm is kept perfectly clean.
- (f) Check to ensure that the valve plate (1) is free to move and is maintained in its upward position by the spring underneath it.
- (g) Renew defective items and re-assembly by reversing the foregoing, taking care to correctly locate the plunger in the centre of the guides in the orifice plate (4).



Accelerator Pedal and Linkage (Fig. 20)

Removal

Working in the engine bay, unhook the spring (23) and the link (6) from the operating lever. Disconnect the top end of the link if necessary. Drive out the pin retaining the operating lever. Withdraw the lever (21). Unscrew two bolts (11). Withdraw the assembly from inside the vehicle. Slacken the locknut (17), unscrew the stop screw (16), withdraw split pin (12) and separate loose items.

Assembly

To assemble, reverse the dismantling procedure.

Adjustment of Linkage

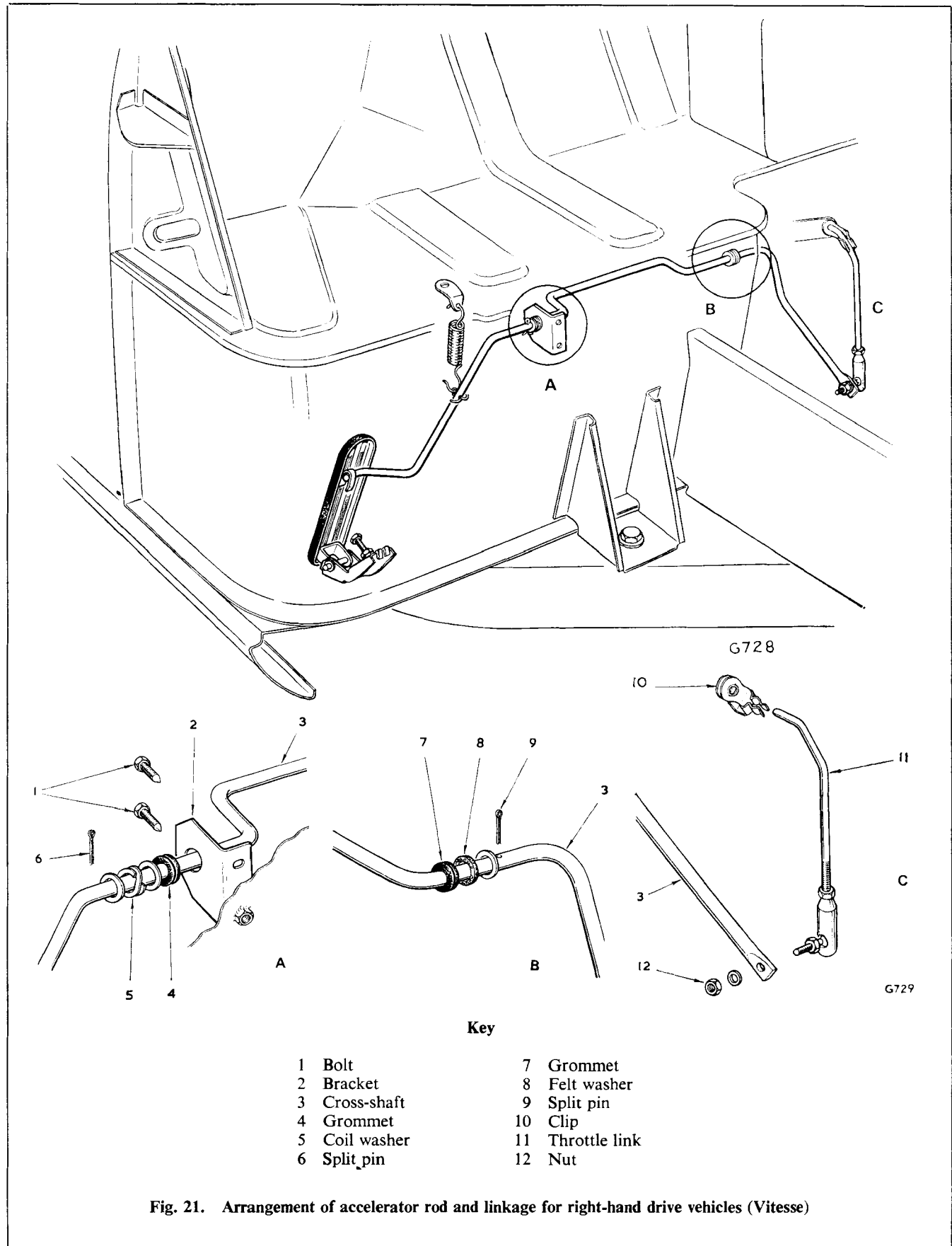
After dismantling adjustment of the link may be necessary. Slacken locknuts, fit the top end of the link to the carburettor lever and adjust the length of the link (6) to eliminate free play. Tighten the locknuts, attach the bottom end of the link to the operating lever, ensuring that full and closed throttle conditions can be attained.

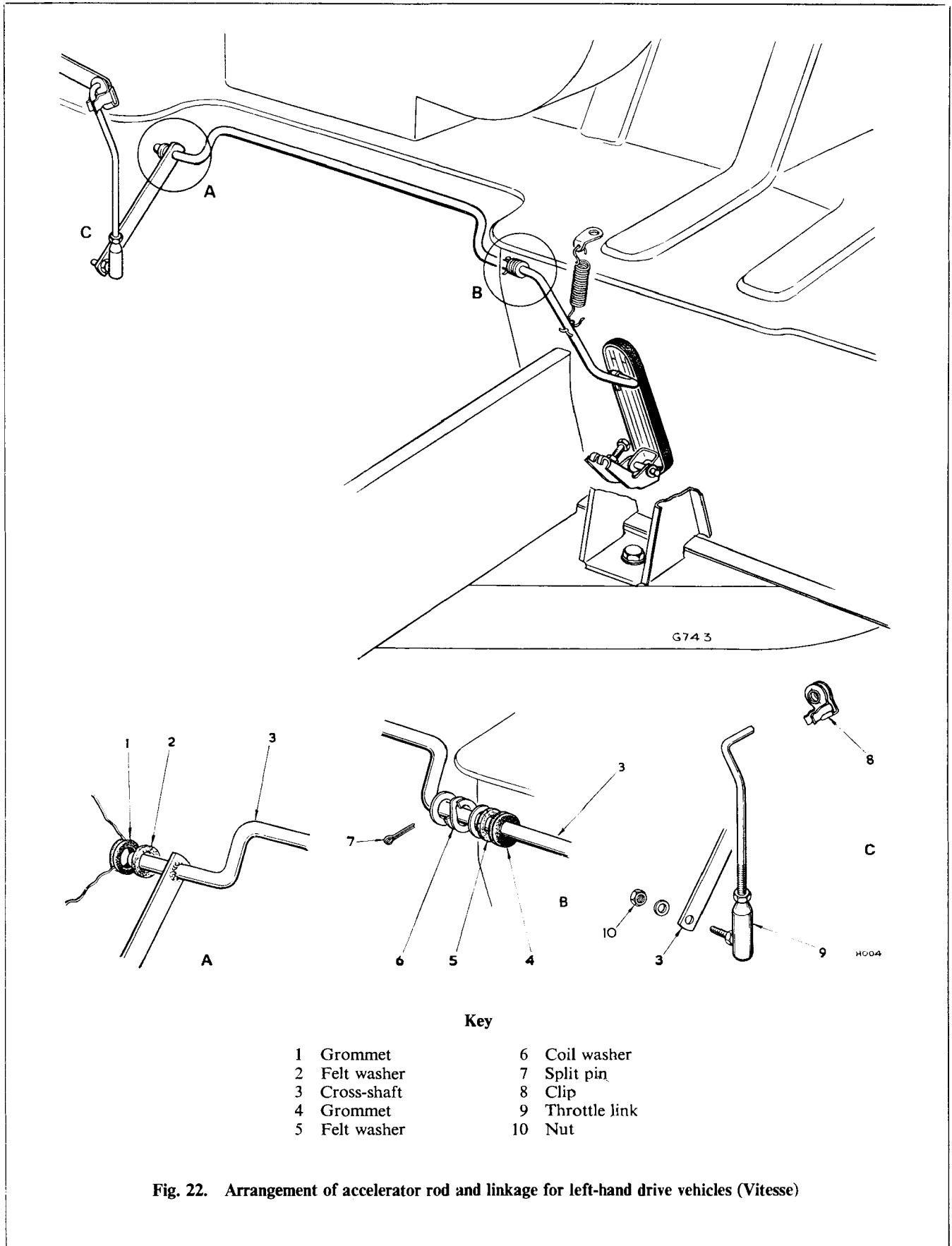
NOTE: Ensure that the ball joints are adjusted in order to give absence of free play consistent with freedom of movement. Lubricate sparingly with grease as recommended under "Oils and Lubricants".

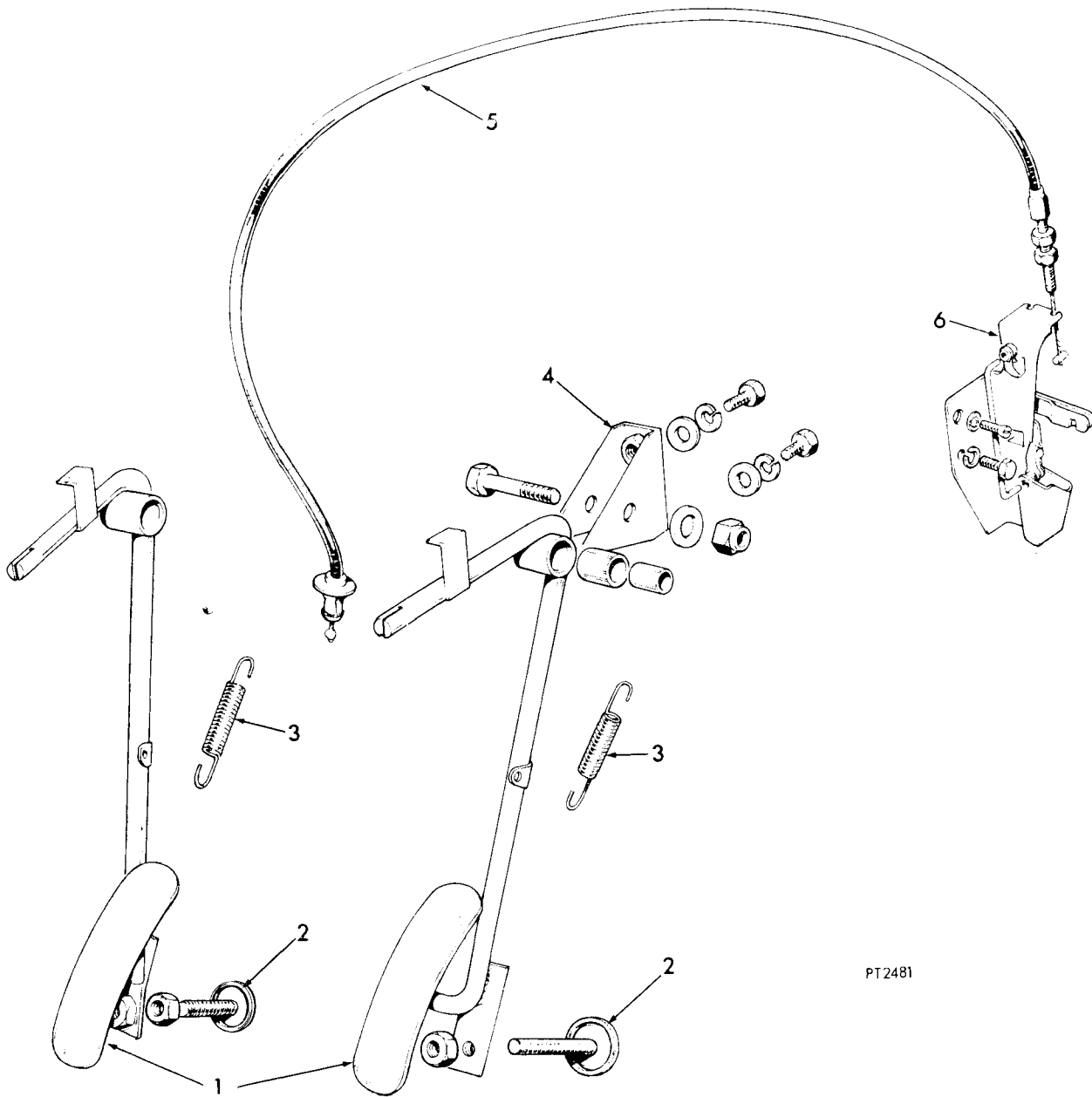
- | | |
|-------------------|----------------------|
| 1 Split pin | 15 Accelerator lever |
| 2 Washer | 16 Bolt |
| 3 Grommet | 17 Nut |
| 4 Washer | 18 Grommet |
| 5 Nut | 19 Washer |
| 6 Link | 20 Washer |
| 7 Pin | 21 Operating lever |
| 8 Operating lever | 22 Pin |
| 9 Grommet | 23 Spring |
| 10 Bracket | 24 Spring |
| 11 Bolt | 25 Bolt |
| 12 Split pin | 26 Nut |
| 13 Spring washer | 27 Accelerator pedal |
| 14 Washer | |

Fig. 20. Accelerator pedal and linkage details (GT6 Mk. 1 and Mk. 2)

G 466



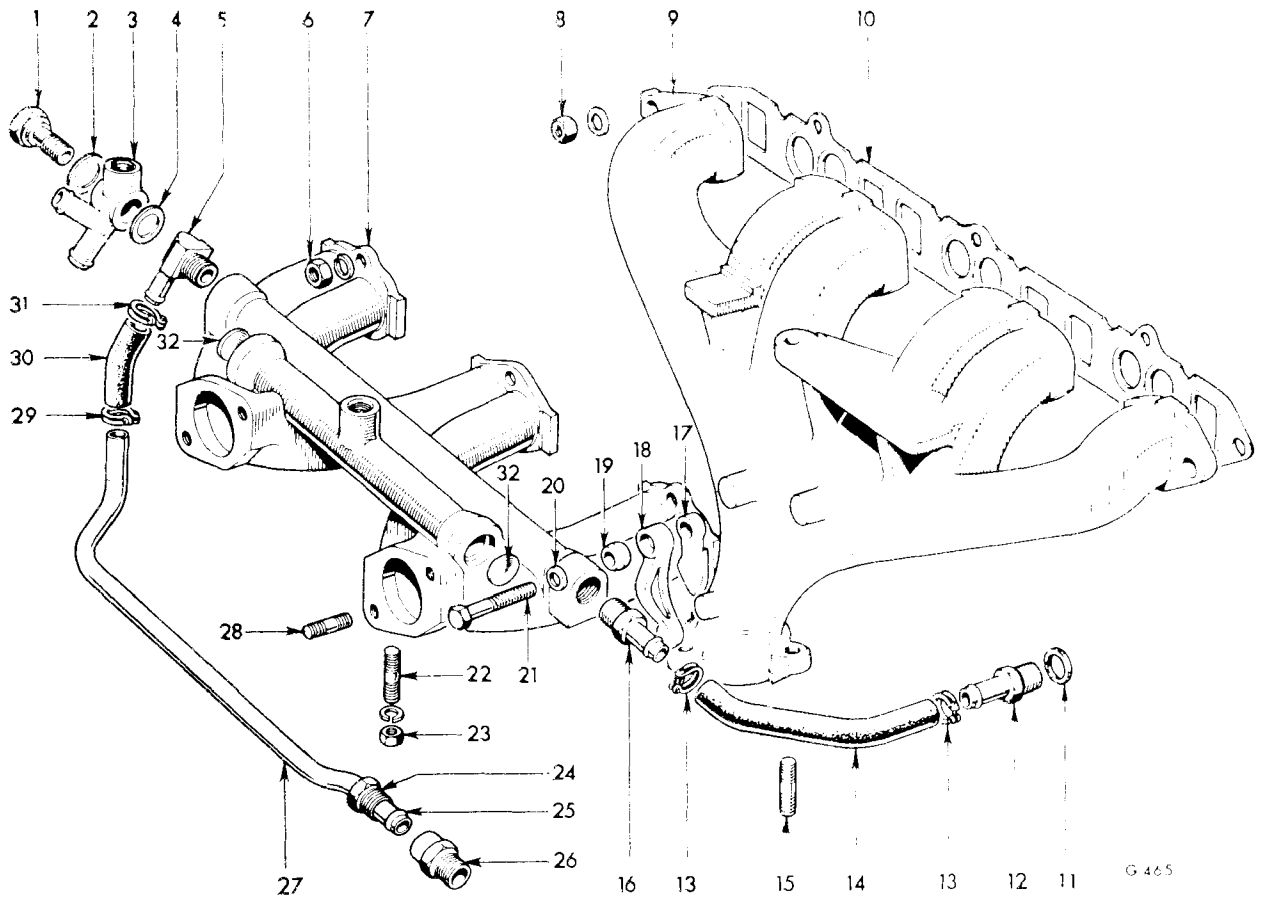




PT2481

- 1. Accelerator pedal left hand drive and right hand drive.
- 2. Pedal stop (Adjustable)
- 3. Pedal return spring
- 4. Pedal mounting bracket
- 5. Accelerator control cable
- 6. Carburetor bracket assy.

Fig. 22A. Arrangement of accelerator pedal and cable connections (GT6 Mk. 3)



- | | |
|--------------------|------------------|
| 1 Banjo bolt | 17 Clamp |
| 2 Washer | 18 Clamp |
| 3 Housing | 19 Washer |
| 4 Washer | 20 Washer |
| 5 Adaptor | 21 Bolt |
| 6 Nut | 22 Stud |
| 7 Inlet manifold | 23 Bolt |
| 8 Nut | 24 Union nut |
| 9 Exhaust manifold | 25 Olive |
| 10 Gasket | 26 Union |
| 11 Washer | 27 Delivery tube |
| 12 Union | 28 Stud |
| 13 Clip | 29 Clip |
| 14 Hose | 30 Hose |
| 15 Stud | 31 Clip |
| 16 Union | 32 Seal |

Fig. 23. Manifold details

INLET AND EXHAUST MANIFOLDS

Removal

Drain the cooling system. Remove the air cleaner. Disconnect the fuel and vacuum pipes from the carburetors and detach the link assembly. Disconnect the water return tube from the water control valve. Disconnect the remaining two hoses on the valve. Disconnect the hose from the Smiths emission valve. Progressively slacken the six retaining clips and four bolts which attach the manifold to the block. Remove the manifold and carburettor assembly complete.

Assembly

Reverse the removal procedure, clean all joint faces and renew the gaskets.

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FUEL PUMP

Used on later Mk. 1 models, Mk. 2 models and GT6 Mk. 3

Cleaning Filter Gauze and Body

Unscrew the retaining screw (1), lift off the cover (3) and gauze (5) from the body (7). Wash the gauze in petrol. Loosen any sediment in the body with a thin screwdriver and remove with compressed air. Avoid damaging the non-return valves (8) and (9). Renew the joint (4) if this has deteriorated. Refit the gauze (5), cover (3) and screw (1).

Removal

Disconnect the fuel feed and outlet pipes from the pump. Unscrew two attachment nuts (23) and remove the pump from the crankcase.

To Dismantle Fuel Pump

Dismantle in the sequence given on Fig. 24, and note the following:--

1. Remove the diaphragm assembly (10) by turning it through 90° and lifting it out of engagement with the link lever.
2. The valves (8) and (9) are pressed into the body and the surrounding metal peened over to retain them.

Re-assembly

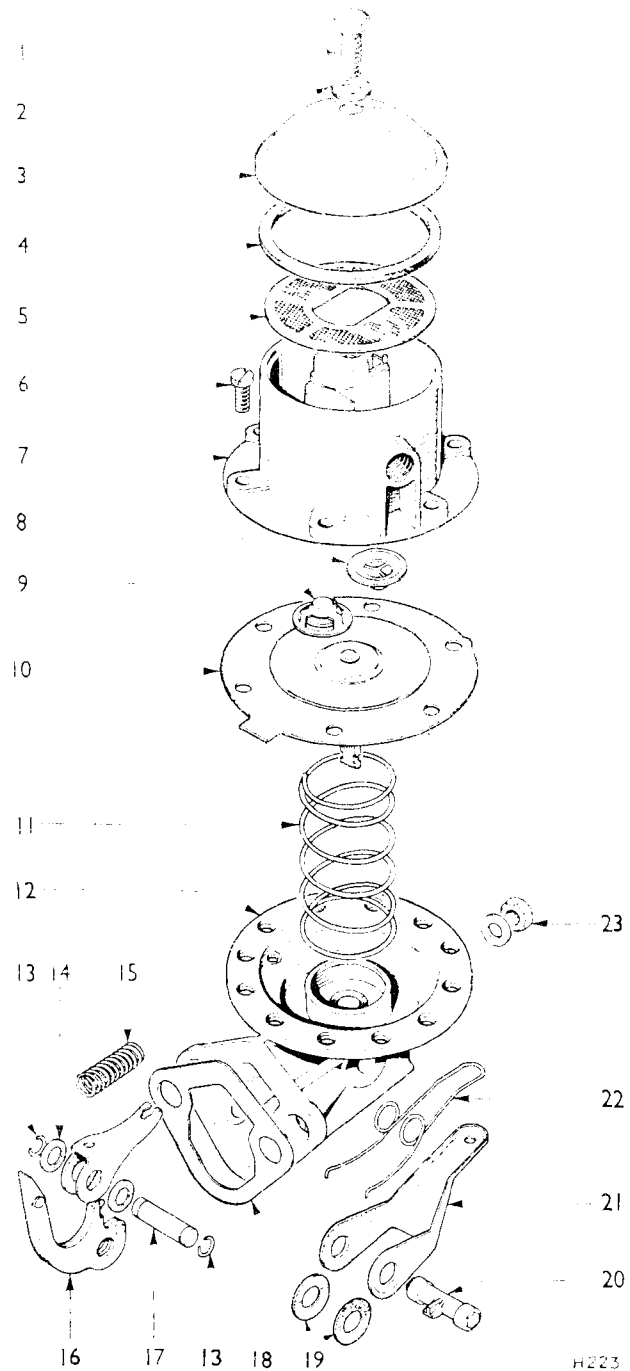
Re-assemble by reversing the sequence.

Refitting

Clean the pump joint face and to avoid possible oil leakage check to ensure that the face is perfectly flat. Distortion can result from over-tightening.

Using a new gasket coated with jointing compound, locate the gasket (18) and the pump on two studs; press the pump against the crankshaft and fit spring washers and nuts, tightening them to the correct torque.

Reconnect the fuel pipes and test the fuel pump pressure.



- | | | |
|-------------------|-----------------------|------------------------|
| 1 Retaining screw | 9 Outlet valve | 17 Rocker arm pin |
| 2 Washer | 10 Diaphragm assembly | 18 Gasket |
| 3 Cover | 11 Diaphragm spring | 19 Cork seals |
| 4 Joint | 12 Lower body | 20 Primer lever shaft |
| 5 Gauze | 13 Circlip | 21 Primer lever |
| 6 Screw | 14 Distance washer | 22 Primer lever spring |
| 7 Body | 15 Return spring | 23 Pump securing nut |
| 8 Inlet valve | 16 Rocker arm | |

Fig. 24. Fuel pump details

ADDITIONAL INFORMATION FOR CDSEV CARBURETTORS FITTED TO LATER GT6 MODELS

Float chamber ventilation valve

A feature of the C.D.S.E.V. type carburetors fitted to this vehicle is a mechanically operated valve which controls the route through which the fuel in the float-chamber is vented. The purpose of this valve is to allow fuel vapours to be drawn into the engine through a vent aperture in the front face of the carburetor under all running conditions except when the throttle is closed. When the throttle is in the closed condition the internal vent is closed off and an alternative one opened to route the vapour through an external pipe to a vapour trap to comply with evaporative control regulations where they exist.

The valve is set during manufacture and should not require any further adjustment throughout the service life of the carburetor.

Idle trimming screw (U.S.A. market only)

An idle trimming screw 'B' is provided but this is not an ordinary mixture adjusting screw. The purpose of the screw is to give a very fine adjustment to compensate for the difference between a new engine and one that is run-in. As the engine gradually frees off during the running-in period the screw can gradually be turned in a clockwise direction to reduce the air bleed, until it is fully home when the engine is run-in. On no account should the screw be overtightened.

Mixture check and adjustment (Figs. 26 and 30)

Remove the air cleaner and top up the dampers. Run the engine until normal operating temperature is reached. Check that the fast idle cam lever (2) is against its stop (6) and the correct clearance exists between the fast idle screw (1) and the cam.

Lift each piston (4) in turn approximately 1/32 in. (0.8mm) and note the engine response.

Engine speed increases immediately—Rich mixture

Engine speed decreases or Engine stalls—Weak mixture.

Engine speed increases slightly then returns to normal—Correct mixture



Fig. 25 Idle trimming screw

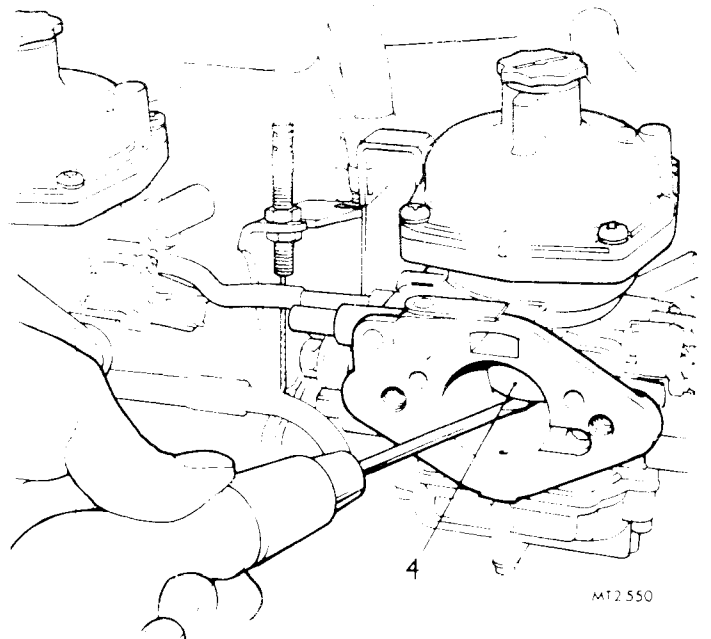
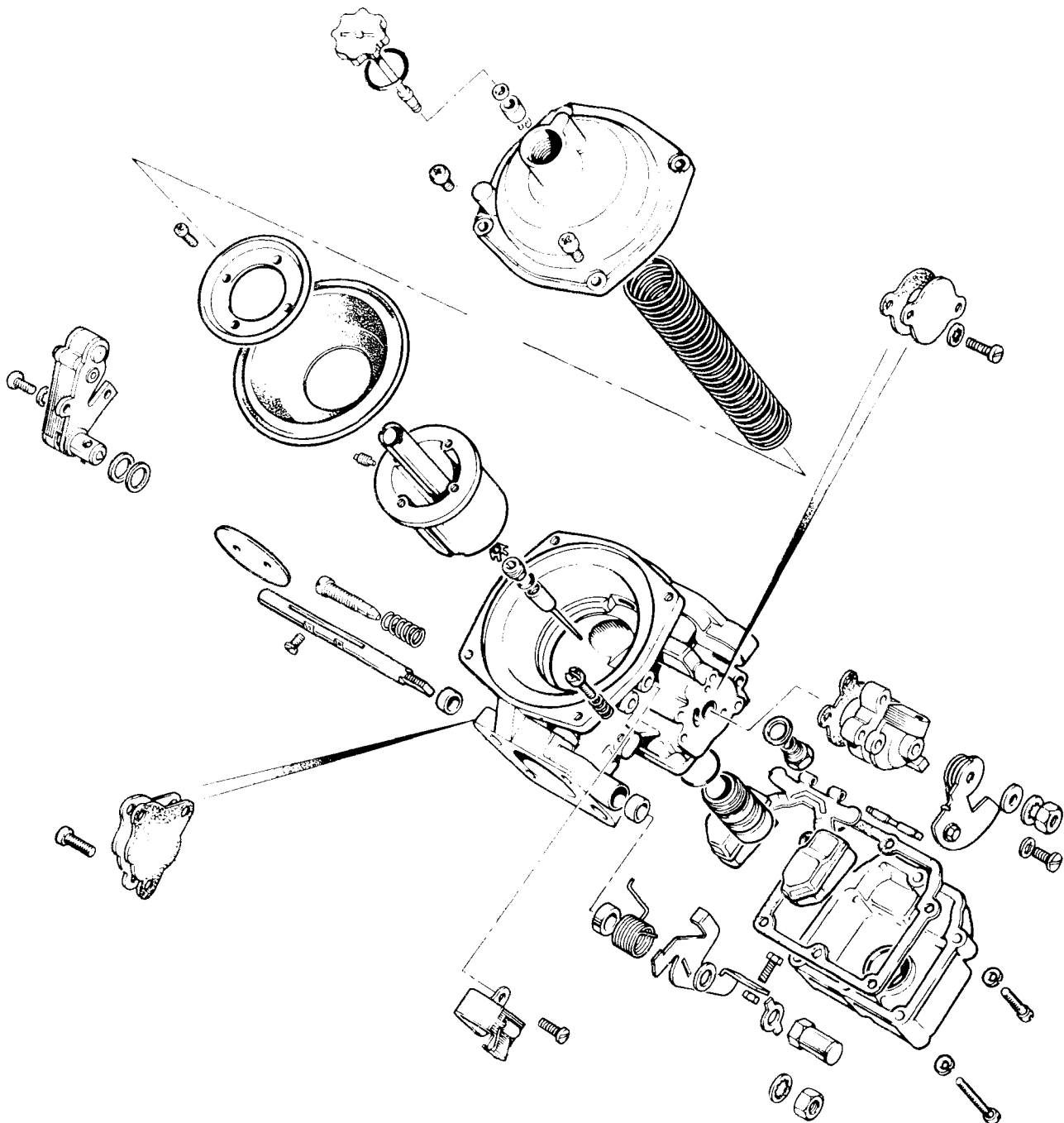


Fig. 26 Carburetor piston



PTO 752

Fig. 27 C.D.S.E.V. Carburetter Details

Should the mixture require adjustment, remove the carburetter damper and carefully insert the special tool S 353 into the hollow piston rod (Fig. 29) so that the inner part of the tool (1) engages in the female hexagon in the needle adjusting screw.

Hold the outer part of the tool (0) firmly and turn the inner tool clockwise to enrich or anti-clockwise to weaken the mixture.

Recheck the mixture by lifting the piston (4) and continue adjustment until the correct mixture is obtained.

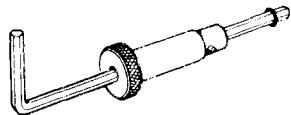


Fig. 28 Alternative Tool S 353

Idling Speed

Ensure that the fast idle screws (1) are clear of the cams (2) and the choke lever and cam is against its stop (6) with the choke control knob on the fascia pushed fully home. Turn the screws (3) 1½ turns clockwise to provide a datum setting.

Start the engine and attain normal running temperature (temperature gauge needle in centre of dial) and finally adjust idling screws (3) to achieve a constant engine speed of 700 to 750 r.p.m. (800 to 850 r.p.m.—U.S.A. markers emission controlled engines).

Fast idle speed setting:

Check that the mixture control cam lever (2) on both carburetters returns to its stop (6). Ensure that the mixture control cables are so adjusted that they are not slack or too tight. Pull the mixture control knob out on the fascia and insert a 5/16 in. (7.937 mm) diameter bar (8) between the cam and its stop on both carburetters in turn. Slacken the fast idle screw lock nut (1) on both carburetters and adjust the screws so that they just touch their respective cams. Remove the bar, push the control knob home and pull the control knob out again to check that the setting gives a fast idle speed of 1100 r.p.m. Make any necessary adjustments to the fast idle screw to achieve this setting whilst using the synchro check meter to maintain the carburetters in balance. Tighten the lock nuts, stop the engine, push the control knob fully home and refit the air cleaner.

Note: If the engine is hot during the fast idle setting, the speed should be 1100 to 1300 r.p.m.

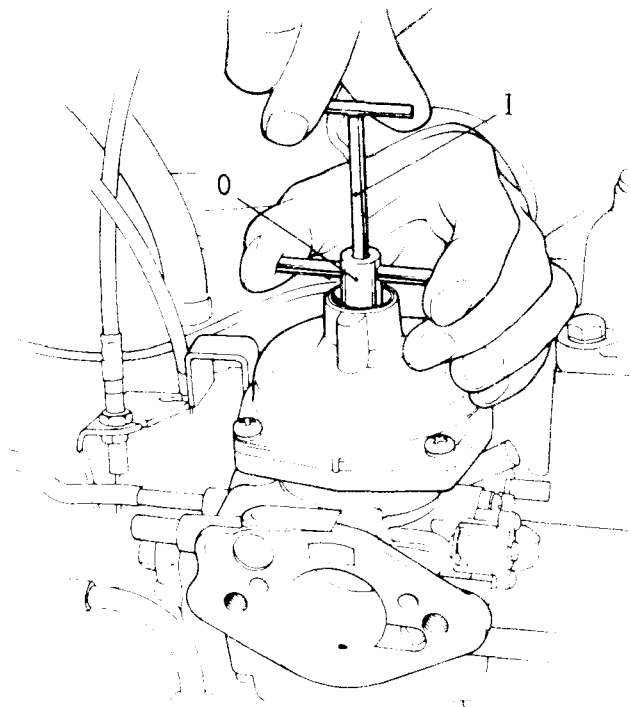


Fig. 29 Adjusting mixture

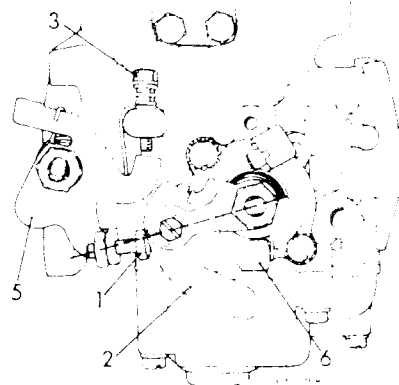


Fig. 30 Carburetter controls

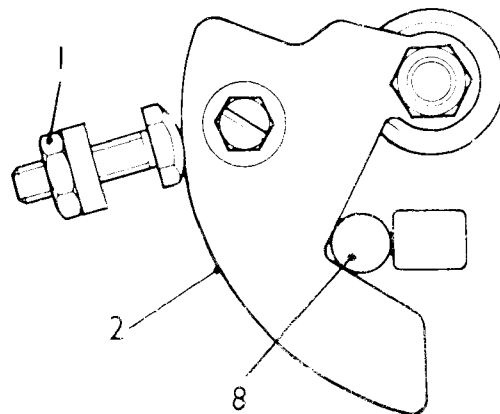


Fig. 31 Setting fast idle speed

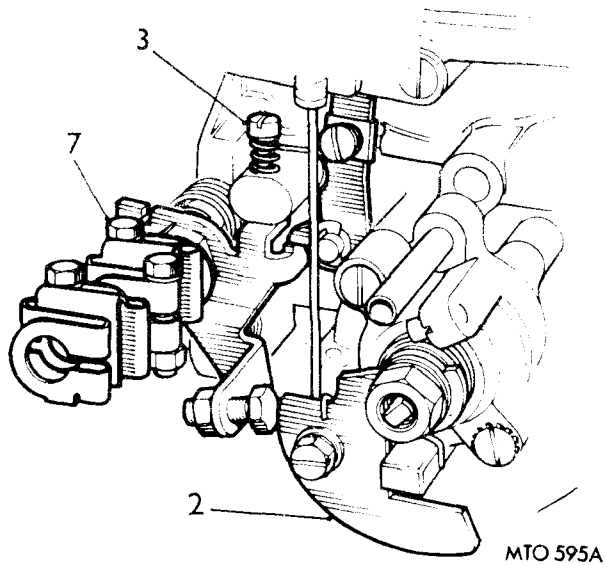


Fig. 32

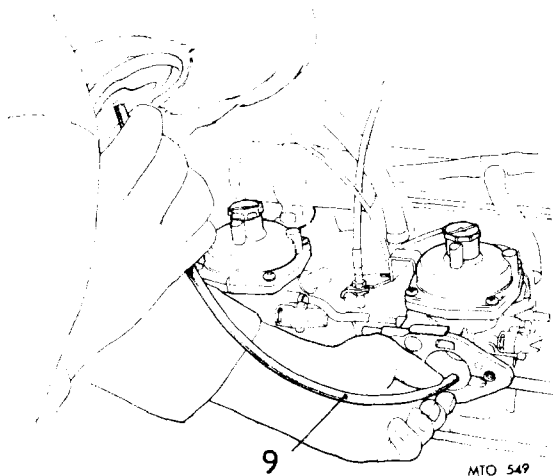


Fig. 33 Alternative to air flow meter

BALANCING CARBURETTERS

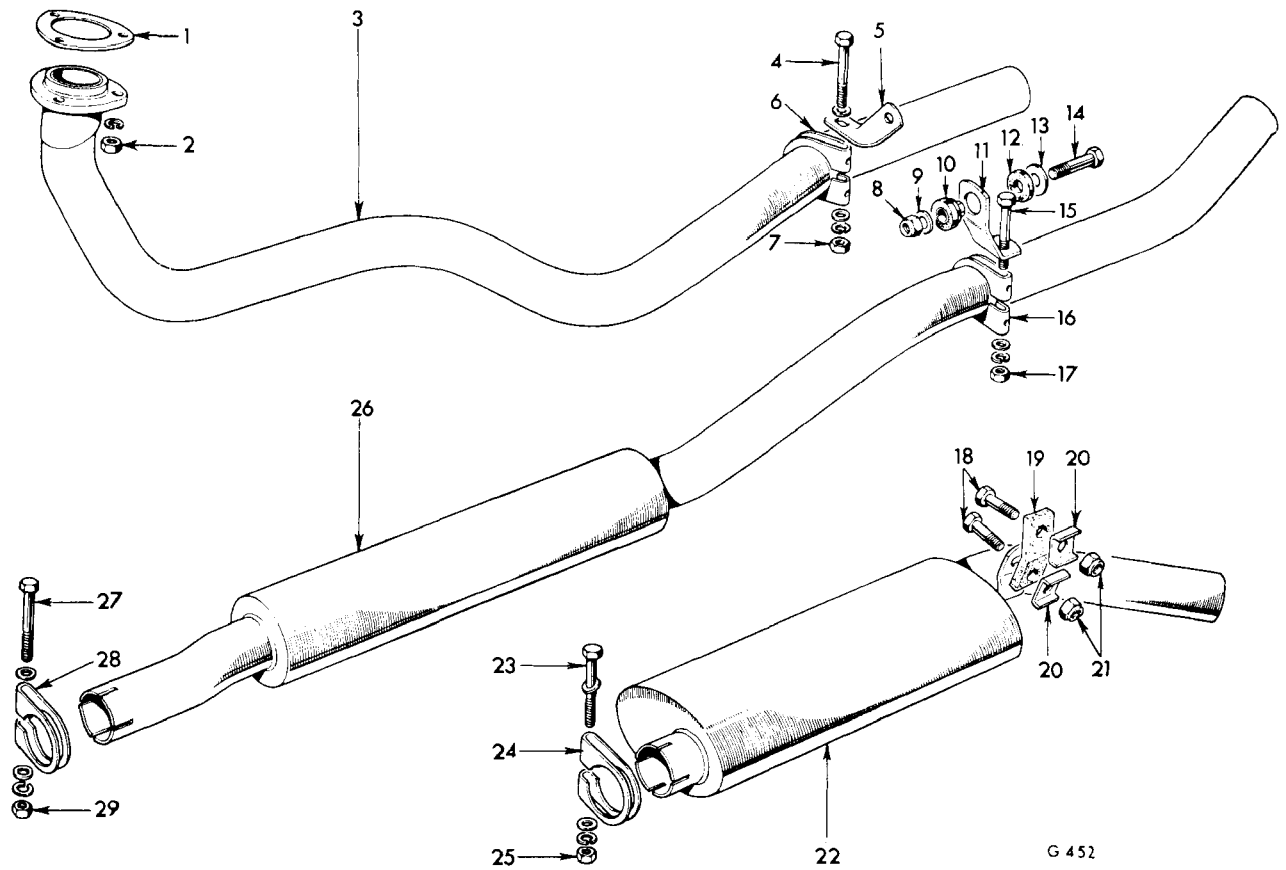
Check that the fast idle cam (2) is against its stop (6) on both carburetters and that the correct gap exists between the fast idle screw (1) and the cam. Run the engine until the normal operating temperature is reached.

Slacken one of the clamping nuts and bolts (7) on the throttle interconnecting spindles.

Unscrew the throttle adjusting screws (3) on both carburetters to permit the throttles to close completely, then turn the screws back so that their ends just touch the stops on the throttle levers (5). Turn both screws a further half turn to provide a datum setting.

Using an air-flow meter (Fig. 13 Page 1.307) check that the air flow to each carburetter is the same and if necessary adjust the throttle screws (3) to achieve this. If an air-flow meter is not available use a length of small bore rubber or plastic hose (9) holding one end close to the carburetter air intake and the other end close to the ear, to assess the amount of "hiss" as the air enters the carburetter.

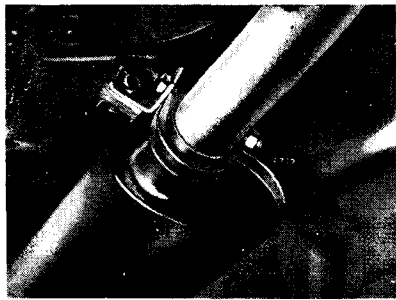
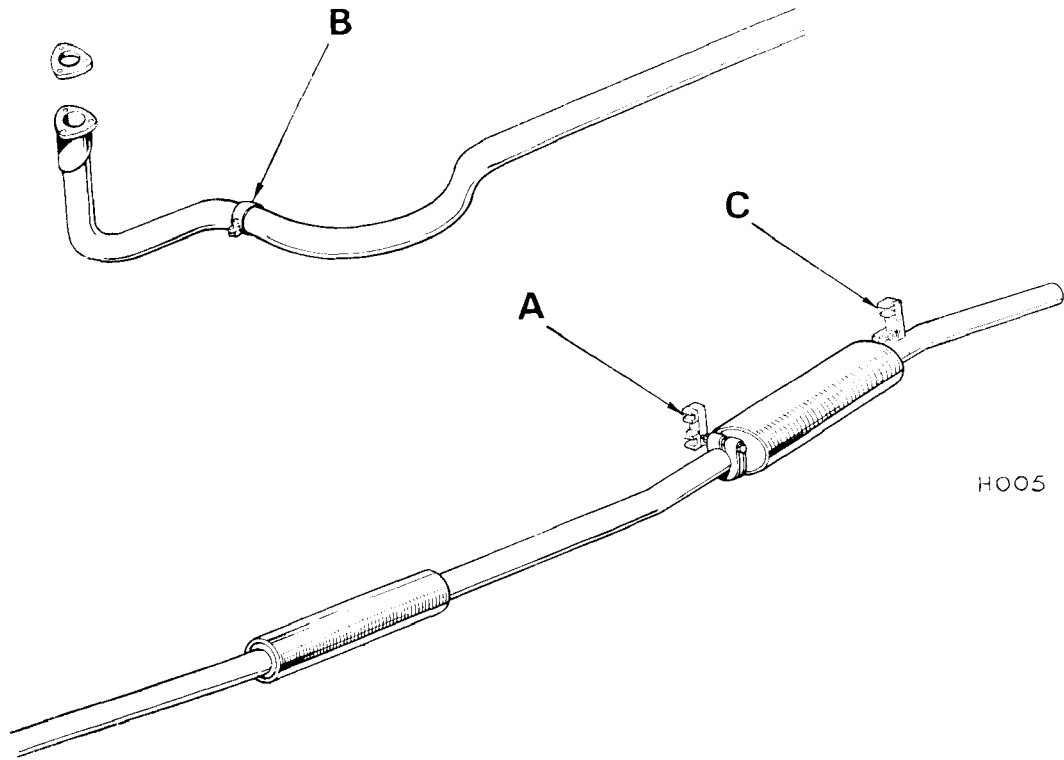
Carefully tighten the throttle interconnection spindle locknut and bolt (7). If necessary turn the throttle adjusting screws (3) on each carburetter equally to achieve the correct idle speed of 700/750 revs. per minute (800/850 revs per minute for U.S.A. Market emission controlled engines).



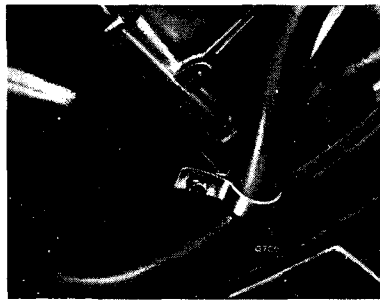
G 452

- | | | |
|--------------|------------|----------------|
| 1 Gasket | 11 Bracket | 21 Nut |
| 2 Nut | 12 Washer | 22 Tail pipe |
| 3 Front pipe | 13 Washer | 23 Bolt |
| 4 Bolt | 14 Bolt | 24 Clamp |
| 5 Bracket | 15 Bolt | 25 Nut |
| 6 Clamp | 16 Clamp | 26 Centre pipe |
| 7 Nut | 17 Nut | 27 Bolt |
| 8 Nut | 18 Bolt | 28 Clamp |
| 9 Washer | 19 Pad | 29 Nut |
| 10 Mounting | 20 Plate | |

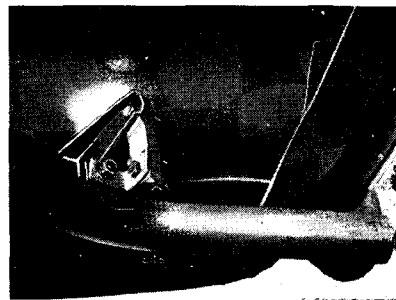
Fig. 1 Exhaust pipe details (GT6)



'A'

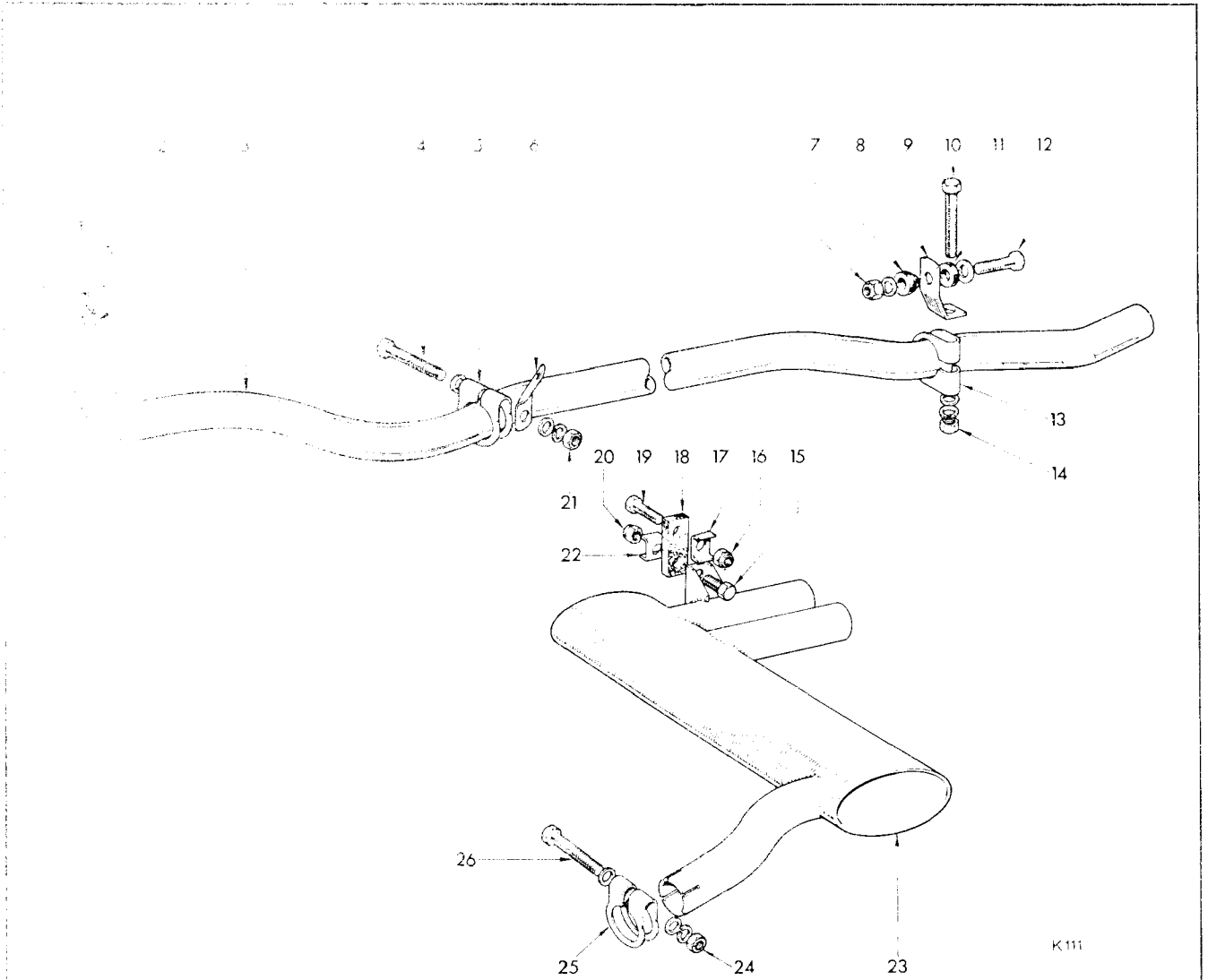


'B'



'C'

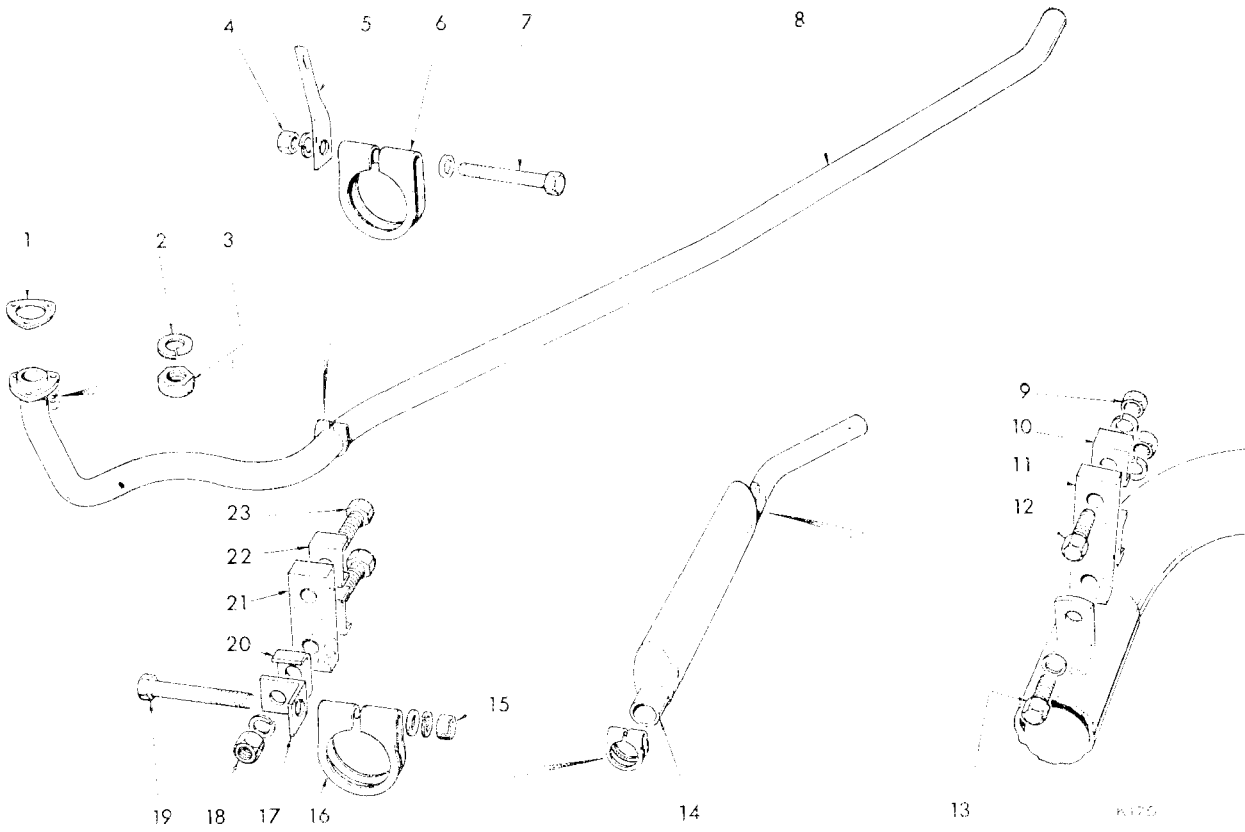
Fig. 2. Exhaust pipe attachment points (Vitesse)



K111

- | | | |
|--|---------------------------------|-------------------------------------|
| 1 Gasket | } Pipe to manifold | 13 Clip—exhaust pipe attachment |
| 2 Nut | | 14 Nut—retaining clip to pipe |
| 3 Front exhaust pipe assembly | | 15 Screw—tailpipe to flexible strip |
| 4 Bolt—retaining clip | | 16 Nyloc nut |
| 5 Clip—front exhaust pipe support | | 17 Clamp plate |
| 6 Support bracket—fitted to gearbox extension bolt | | 18 Flexible strip |
| 7 Nut | } Mounting exhaust pipe to axle | 19 Setscrew |
| 8 Grommet | | 20 Nyloc nut |
| 9 Bracket | } mounting plate | 21 Nut—retaining clip to pipe |
| 10 Bolt—retaining clip to pipe | | 22 Clamp plate |
| 11 Washer—grommet | | 23 Silencer and tailpipe |
| 12 Bolt—mounting exhaust pipe to axle mounting plate | | 24 Nut—retaining clip to pipe |
| | | 25 Clip—silencer and tailpipe |
| | | 26 Bolt—retaining clip to pipe |

Fig. 3. Exhaust pipe details (GT6 Mk. 2, Plus and GT6 Mk. 3)



- | | | | |
|----|---------------------------------|----|--|
| 1 | Gasket-exhaust pipe to manifold | 13 | Bolt—rear exhaust pipe |
| 2 | Lock washer } Front exhaust | 14 | Rear silencer and tail pipe assembly |
| 3 | Nut } pipe to manifold | 15 | Nut—clip to silencer |
| 4 | Nut—bracket to clip | 16 | Clip—front exhaust pipe to silencer |
| 5 | Bracket—front exhaust pipe | 17 | Bracket—front exhaust pipe to silencer |
| 6 | Clip—front exhaust pipe | 18 | Nut—bracket to flexible strip |
| 7 | Bolt—clip to bracket | 19 | Bolt—clip to silencer |
| 8 | Front exhaust pipe assembly | 20 | Clamp plate |
| 9 | Nut—flexible strip attachment | 21 | Flexible strip |
| 10 | Clamp plate | 22 | Clamp plate |
| 11 | Flexible strip | 23 | Bolt—flexible strip to chassis |
| 12 | Bolt—flexible strip attachment | | |

Fig. 4. Exhaust pipe details (Vitesse Mk. 2)

EMISSION CONTROL SYSTEM

Introduction—General Requirements

All 1968 model vehicles entering the United States of America will be required to comply with Federal Regulations (31 C.F.R., Part 85) governing the emission of Hydrocarbons and Carbon Monoxide from exhaust systems.

The Federal limits for exhaust emissions are as follows:

1. Vehicles with an engine displacement of 50 cubic inches or more but not in excess of 100 cubic inches:
 - (i) Hydrocarbons—410 parts per million.
 - (ii) Carbon Monoxide—2.3 per cent by volume.
2. Vehicles with an engine displacement in excess of 100 cubic inches but not more than 140 cubic inches:
 - (i) Hydrocarbons—350 parts per million.
 - (ii) Carbon Monoxide—2.0 per cent by volume.
3. Vehicles with an engine displacement in excess of 140 cubic inches:
 - (i) Hydrocarbons—275 parts per million.
 - (ii) Carbon Monoxide—1.5 per cent by volume.

In addition to the above requirements, existing regulations concerning Crankcase Emission will also apply. Category 2 applies to GT6 models which have a displacement of 122 cubic inches.

ENGINE MODIFICATIONS

Conformity with regulations imposed by the U.S.A. for controlling the engine emission of free Hydrocarbon and Carbon Monoxide is achieved by alterations to carburation and combustion characteristics. Brief details of modifications incorporated are as follows:

1. **Exhaust Valves**
Stellite faced exhaust valves are fitted to maintain effective valve seating between servicing intervals.
2. **Cylinder Head**
A modified cylinder head is fitted, giving a compression ratio of 8.5:1 which, together with a new camshaft, significantly reduces emissions.
3. **Camshaft**
A new camshaft with 10-50-50-10 timing is fitted to give better control of emissions during idling and low speed cruising.
4. **Ignition Distributor**
The system includes a special distributor which, in addition to the normal mechanical and vacuum advance characteristics, has provision for retarding the ignition at idling speeds and during deceleration, by utilising a double acting system.
5. **Carburettors**
Special twin Stromberg C.D.S.E. (Emission) carburettors are fitted. These instruments operate on the principle of varying the effective areas of choke and jet orifice, in accordance with the degree of throttle opening, engine speed and engine load. The following features are incorporated for controlling emission:
 - (a) Fixed non-adjustable jet assembly and biased needle to achieve consistent air to fuel ratio.
 - (b) Leak balancing screw for setting all carburettors to a common datum during manufacture, after which the screw is sealed to prevent further disturbance.
 - (c) Temperature compensator assembly which progressively opens at high engine temperature to correct the mixture and restore even running.
 - (d) Throttle by-pass valve which is set to open at a predetermined manifold depression to admit air during deceleration.
 - (e) Wire-locked and sealed cover to discourage unauthorised tampering.

6. **Air Cleaners**

Special air-cleaners are fitted having additional holes for matching with those provided in the emission carburettor flanges.

7. **Choke Cables**

A special control cable assembly is used for bringing two separate and independently adjustable choke cables to a single controlling cable.

8. **Accelerator Linkage**

The accelerator linkage is modified to provide a positive idle stop and incorporates "lost motion" for operating a vacuum control valve when the throttles are closed.

9. **Vacuum Control Valve**

This vacuum control valve is mechanically connected to, and operated by, the accelerator linkage, to permit normal vacuum ignition advance under part throttle condition. When the accelerator pedal is released, full manifold depression is allowed to operate on the distributor diaphragm to provide retarded ignition.

10. **Crankcase Emission Control Valve**

The emission control valve as fitted to the system is essentially a depression control device; the inlet pipe being connected to the engine crankcase and the outlet to the induction manifold. Manifold depression is used to remove the blow-by gases yet facilitate satisfactory idling.

11. **Spark Plugs**

Champion UN.12.Y sparking plugs are designed to give improved combustion.

12. **Pipe Layout**

The various devices employed in the emission control system are connected by rigid metal pipes.

GENERAL SERVICING PROCEDURE

Because of the extreme improbability of analytical equipment being available generally, checks using the "Sun" recognised equipment or other similar equipment, will prove adequate for dealing with a stable system that has proper testing and monitoring when the vehicle is first built. Durability testing on development vehicles indicates that once the system has been set correctly it will remain so, and may well improve, until severe deterioration in performance or misfiring indicate the need for attention.

Routine servicing, carried out at the specific mileage intervals quoted in the publications provided with each new vehicle, should rectify or lessen this deterioration. In addition to normal lubrication and nut tightness checks, those items which should receive attention during routine servicing include: Distributor maintenance, carburettor dash-pot oil replenishment and slow running adjustment, spark plugs, valve rocker clearances, air cleaner and fuel pump filter.

The procedures listed below and described in greater detail on the following pages, relate only to those items which affect emission control. This work must not be attempted by the owner but should be entrusted to an authorised Triumph Dealer.

Cylinder Compressions

Ignition Distributor

- Maintenance
- Performance checks
- Timing marks
- Ignition timing

Accelerator linkage

- General
- Setting the accelerator linkage and "slow running" controls.
- Setting the fast idling.

Carburettors

- General requirements
- Maintenance:

	1000 mile (Free Service)		
	6000 mile Routine Service		
	24000	"	"
	48000	"	"

Emission Control Valve

Inline Fuel Filter

SERVICING PROCEDURE

Cylinder Compressions

To maintain the quality of engine emission within the prescribed limits, given on page 1.501 it is extremely important that the valve seatings and combustion chambers continue to remain gas-tight. The general condition of these items can be assessed by measuring and comparing the compression pressures of all cylinders, at 6,000 mile intervals, in the following manner:

- (a) Immediately after a run, that is whilst the engine is at normal running temperature and the battery is fully charged, apply the handbrake, engage neutral and remove all sparking plugs.
- (b) Assemble the correct adaptor to the compression tester and insert the adaptor into No. 1 plug hole in the cylinder head. Depress the accelerator pedal.
- (c) Press the solenoid starter button and hold it for 2-3 seconds before reading and noting the pressure indicated on the gauge. Repeat the procedure with each of the remaining cylinders. The readings should be within 5 p.s.i. of each other.

As this service coincides with sparking plug servicing, clean, reset the gaps and test (at 6,000 miles), and renew the plugs (at 12,000 miles) before refitting them to the cylinder head.

Ignition Distributor

Distributors fitted to GT6 engines (Fig. 1) are provided with a double acting vacuum capsule, which operates in opposite directions to advance or retard the ignition.

Directional control of the vacuum retard capsule is determined by the position of a vacuum valve which is operated by the accelerator linkage, as shown on Fig. 3.

Directional control of the vacuum advance capsule is by a conventional manifold depression tapping.

Adjustment is made by turning the body of the distributor; separate vernier adjustment is not provided.

1. Maintenance

Every 6,000 miles—lubricate the distributor and re-adjust or renew the contact breaker points.

Every 12,000 miles—in addition to the 6,000 mile service, check the ignition timing at idling (800-850 r.p.m.).

2. Performance Checks

Should the distributor performance be suspect, or if the unit has been dismantled for the purpose of fitting new components to the automatic advance or retard mechanism, check the distributor by using proper equipment, to ensure that it operates within the limits quoted in Group 6—Ignition distributor.

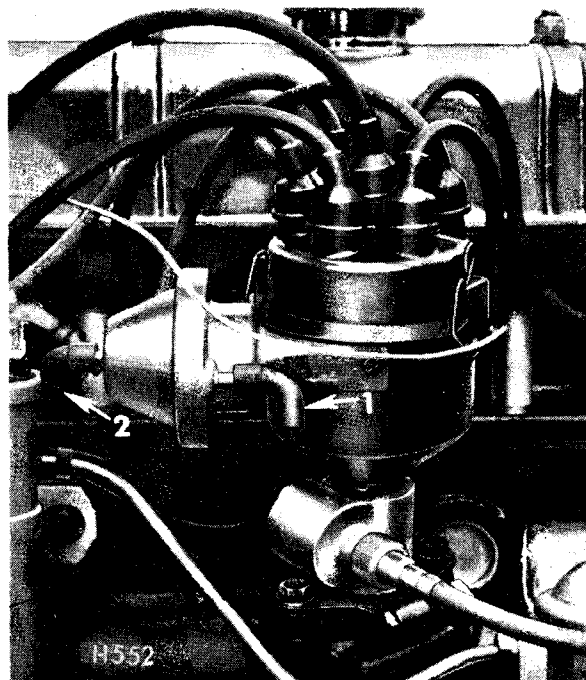


Fig. 1. Distributor, showing connections to (1) retard and (2) vacuum advance side of double acting vacuum capsule.

3. Timing Marks (See Fig. 2)

When No. 1 piston is at T.D.C. a pointer attached to the timing cover aligns with a white mark on the periphery of the crankshaft pulley assembly. An idling timing mark may also be provided 0.20" in retard of the T.D.C. mark.

To achieve the requisite accuracy, if the idling timing mark is not provided, use a pair of dividers, set to 0.20" and mark the appropriate idling point, in retard of the T.D.C. mark, on the periphery of the pulley.

Finally, apply white paint to the leading edge of the pointer and paint fine lines on the pulley, at the point made by the dividers, to make the timing mark visible when using a stroboscopic lamp.

The timing mark will be incorporated on production at an early date which will eliminate the need for this operation.

Ignition Timing Marks (Crankshaft Pulley)

Idle Speed (R.P.M.)	Ignition Static		Ignition at Idle	
	Crankshaft Degrees	Equivalent Distance "A" (Fig. 2)	Crankshaft Degrees	Equivalent Distance "B" (Fig. 2)
800/850	6° B.T.D.C.	.3"	4° A.T.D.C.	.2"

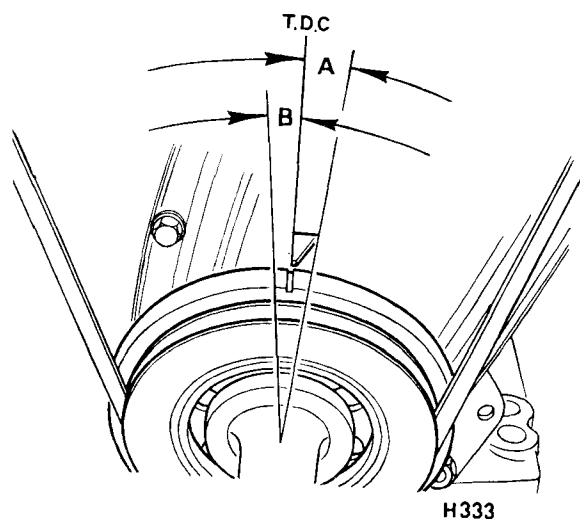


Fig. 2. Crankshaft pulley timing marks.

4. Ignition Timing

If the distributor has been removed from the engine, use the static timing procedure only for starting the engine. As this method cannot achieve the extreme accuracy required for the proper functioning of the emission control system, it is vitally important that the final ignition setting is made dynamically as follows:

- Prepare the timing marks as described in the previous instructions.
- Connect a stroboscopic timing lamp and tachometer to the engine in accordance with instructions provided by the manufacturer of the equipment in use.
- Start the engine and when normal running temperature is reached, set the idling speed at 800-850 r.p.m. by turning both carburettor throttle stop screws an equal amount to achieve this speed.
- Slacken the distributor clamping plate bolt (Fig. 1) and rotate the distributor body until the idling mark on the crankshaft pulley aligns with the timing pointer under the beam of the stroboscopic lamp. This may necessitate readjustment of the throttle stop screws (item 1, Fig. 4) to maintain the correct idle speed.
- Re-tighten the distributor clamp bolt securely, recheck the timing and if satisfactory, remove the stroboscopic lamp and tachometer.

ACCELERATOR LINKAGE

1. General

The accelerator pedal is connected to the carburettor throttle valves by a system of rods and levers which incorporate the following features.

Carburettor inter-connection (Fig. 3)

The throttle spindles of both carburettors are connected by a centre rod assembly having spring couplings at each end, and mid-way between, an operating lever arrangement which provides sufficient "free movement" of the linkage to allow the vacuum valve to open or close while the throttles remain closed. This free movement also permits "fast idle" without disturbing the closed position of the accelerator linkage.

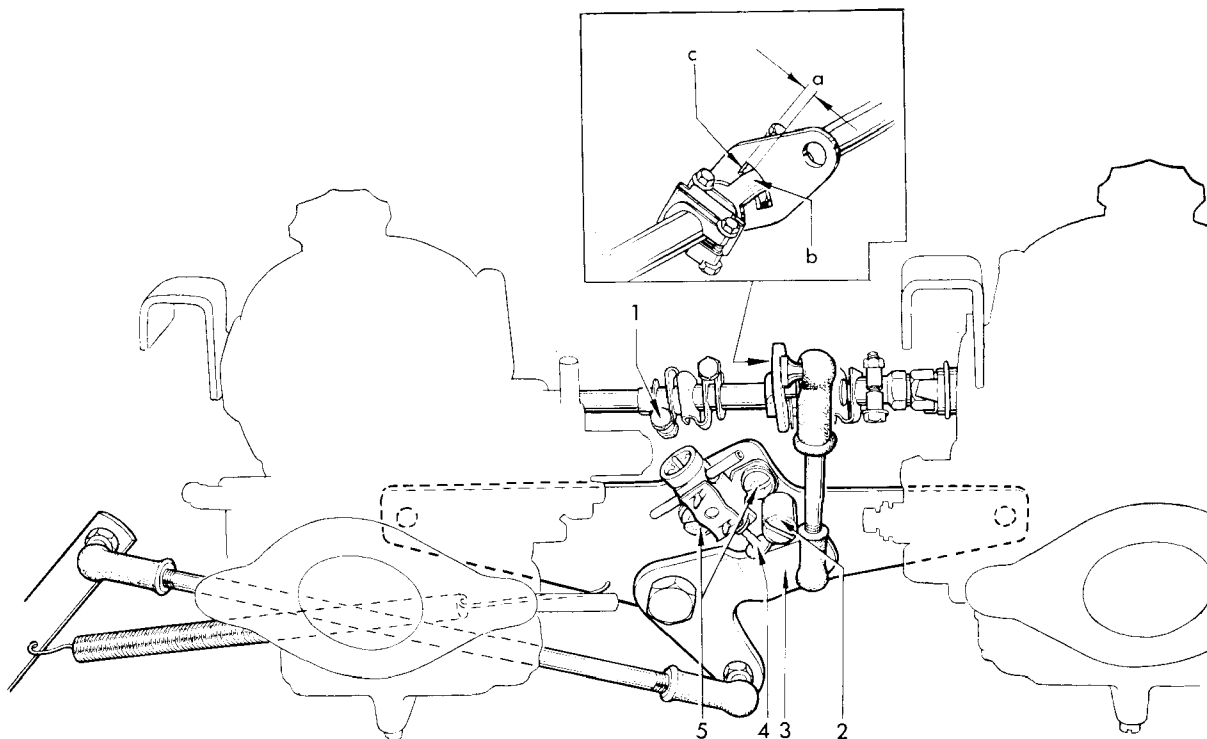
Relay lever assembly

The relay lever is mounted on a bracket attached to the carburettor inner attachment studs. This bracket also accommodates the vacuum valve and throttle stop. The relative position of these items is shown on Fig. 3.

2. Setting the Accelerator Linkage and Slow-running Controls

If the carburettors have been removed or if the linkage has been disturbed for other reasons, reset the linkage as follows:

- Isolate both throttle spindles by slackening the clamp bolts (item 1, Fig. 3) on both spring couplings.



- a insert a $\frac{1}{16}$ " drill shank in this space when adjusting accelerator controls
- b Driving tongue integral with operating shaft
- c Driving edge of lower slot

- 1 Spring coupling clamp bolts
- 2 Throttle stop
- 3 Relay lever
- 4 Vacuum valve plunger
- 5 Vacuum valve securing screws

Fig. 3. Accelerator linkage

- (b) Unscrew the slow running screw on each carburettor to ensure that both throttle valves are completely closed. From this point, rotate each stop screw $1\frac{1}{2}$ complete turns to open the throttles an equal amount, thus providing a basis from which the final idling speed can be set.

NOTE: Ensure that fast-idle screw (item 3, Fig. 4) is clear of cam (6), and both cold start levers are against their stops with the dashboard control pushed in. Adjust controls as necessary to achieve this.

- (c) Start the engine and warm-up to normal temperature. Using a suitable instrument to measure the air intake of both carburettors, adjust the slow-running screws as necessary to achieve balance at the correct idle speed. Stop the engine.

- (d) With the accelerator linkage assembled as shown on Fig. 3, insert the shank of a drill in the space (a) between the tongue of the lever (b) and the edge of the lever slot (c) (see inset, Fig. 3). With the drill held between these points and the relay lever (3) against the stop cam (2), tighten both spring coupling clamping bolts (1) and remove the drill.

- (e) Slacken the vacuum valve securing screws (5) and move the valve body towards the relay lever until the operating plunger is fully depressed (open position). Tighten the securing screws and check the operation as follows:

- (f) Slowly operate the accelerator linkage until the tongue (b) contacts the edge of the lever slot (c). At this point, the valve plunger (4) should have reached the end of its stroke (fully closed) and the throttles should be about to open.

3. Setting the Fast Idling (Fig. 4)

- (a) Make sure that the choke lever (6) on each carburettor is against its stop when the choke control on the facia is pushed fully in. If necessary, re-adjust the cables to achieve this condition.
- (b) Pull the control out sufficiently to bring the cable trunnion (5) into alignment with the centre of the fast idle adjusting screw (3) and the centre of the starter box (2). Slacken the lock nuts (4) and unscrew both fast idle screws until each is just contacting the cam.
- (c) Start the engine and while it is cold (68°–86°F.), adjust the fast idle screws by turning each screw (3) an equal amount to give a tachometer reading of 1,100 r.p.m.
- (d) Tighten the locknuts, recheck the fast idle speed and if satisfactory, push the control fully in and stop the engine.

STROMBERG C.D.S.E. (Emission) CARBURETTORS

General

The twin Stromberg emission carburetors are the prime components of the system and great care is exercised during the manufacture and initial adjustment of these instruments. Because of the precise manufacturing limits involved and the assembly methods adopted to prevent unauthorised tampering during use, the extent of permissible servicing is restricted to the following:

Adjustments

There are only three adjustments that can be made to emission carburetors in the field and these are:

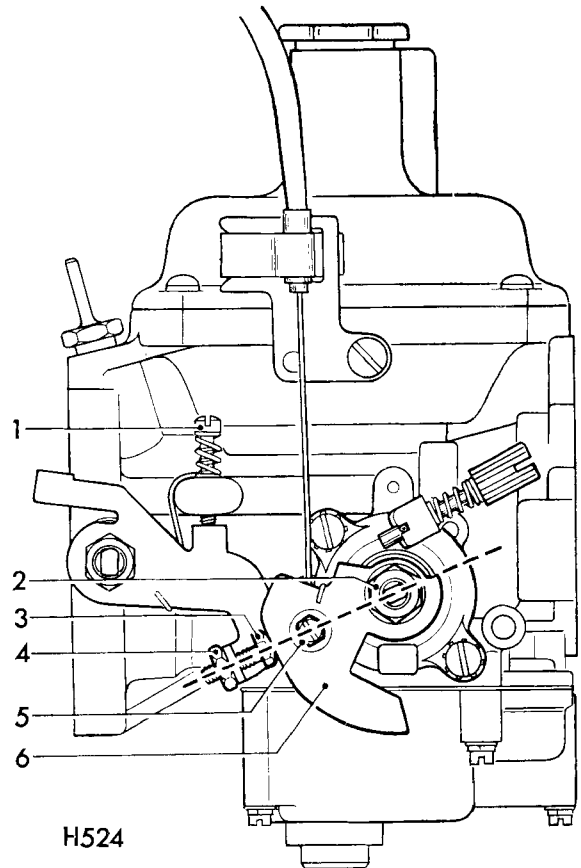
1. **Idle speed**—adjusted by throttle stop screw.
2. **Idle emission**—adjusted by trimming screw in conjunction with C.O. meter or air-fuel ratio meter.
3. **Fast idle**—adjusted by fast-idle screw.

Carburettor Servicing Schedules

To maintain the carburetors at peak efficiency, regular servicing at 6,000 mile intervals is essential. This also involves the use of coloured gaskets which give indication that the 24,000 mile service has been carried out. The appropriate servicing operations and the mileage intervals at which they should be performed are as follows:

Maintenance

1. **At the First 1,000 (Free Service)**
 - (a) Top up the air-valve damper reservoirs (dash-pots) with Zenith Lube-Pack or engine oil (see instruction book) within $\frac{1}{4}$ " of top of centre rod.
 - (b) Check and if required, adjust the slow-running by turning both slow-running screws an equal amount to maintain balance. This may also involve re-adjustment of the trimming screw as follows:



- 1 Idling screw
- 2 Starter box
- 3 Fast-idle screw
- 4 Locknut
- 5 Cable trunnion
- 6 Choke cam-lever

Fig. 4. Showing the position of the choke cam-lever when making fast-idle adjustment

- (c) An idle trimming screw is provided to give very fine adjustment to compensate for the difference between a new "stiff" engine and one that is "run in". **THIS IS NOT AN ORDINARY MIXTURE ADJUSTING SCREW:** It regulates a limited amount of air that can be introduced into the mixing chamber. It is important to remember that the ear will not detect any difference between the fully "home" and fully "open" position of the screw. The setting should, therefore, be checked by means of a C.O. meter or an air/fuel ratio meter attached to the exhaust pipe. (The correct C.O. level and air/fuel ratio is given on page 1.510.

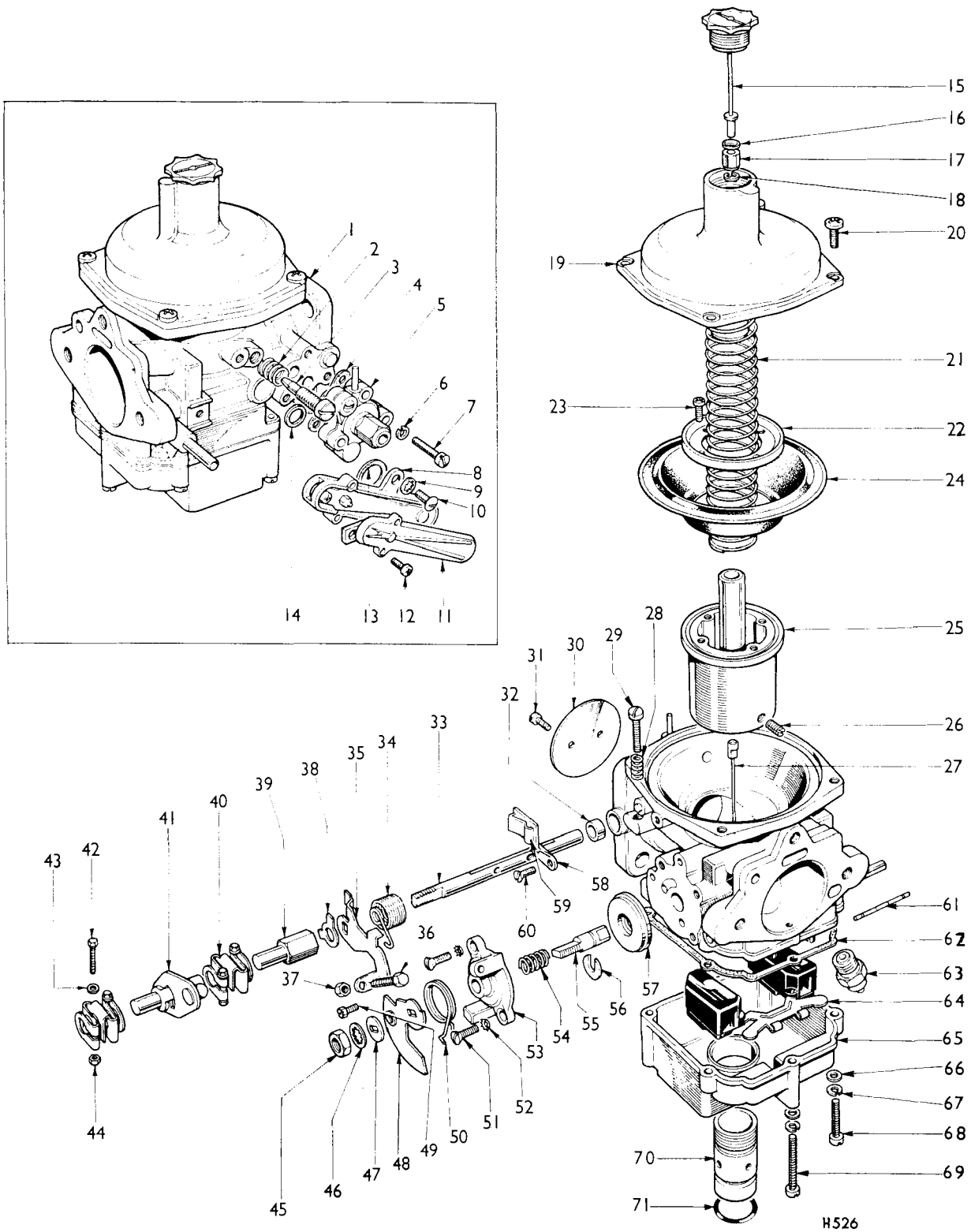


Fig. 5. Exploded view of Stromberg C.D.S.E. carburettor

Key to Fig. 5

- | | | |
|----------------------------------|--------------------------------|------------------------------|
| 1 Carburettor | 37 Locknut—securing (36) | |
| 2 Spring—idle trimming screw | 38 Lockwasher—retaining (39) | |
| 3 Idle trimming screw | 39 Nut—throttle spindle | |
| 4 Gasket—by-pass valve | 40 Coupling—throttle spindles | |
| 5 By-pass valve | 41 Connecting lever assembly | |
| 6 Lockwasher under (7) | 42 Clamping bolt | |
| 7 Screw—securing (5) | 43 Washer—under (42) | |
| 8 Temperature compensator unit | 44 Nut—securing (42) | |
| 9 Lockwasher under (10) | 45 Nut | |
| 10 Screw—securing (8) | 46 Shakeproof washer | } Starter
box
assembly |
| 11 Cover—temperature compensator | 47 Washer | |
| 12 Screw—securing (11) | 48 Lever | |
| 13 Seal—on compensator body | 49 Screw—cable attachment | |
| 14 Seal—inside carburettor | 50 Return spring | |
| 15 Damper rod | 51 Screw | |
| 16 Washer | 52 Shakeproof washer | |
| 17 Distance sleeve | 53 Starter box cover | |
| 18 Circlip | 54 Spring | |
| 19 Cover—air valve | 55 Spindle | |
| 20 Screws—securing (19) | 56 Retainer | |
| 21 Spring—air valve return | 57 Valve plate | |
| 22 Ring—diaphragm attachment | 58 Cable abutment bracket | |
| 23 Screw—securing (22) (24) | 59 Spring clip | |
| 24 Diaphragm | 60 Screw—securing (58) | |
| 25 Air-valve | 61 Float pivot pin | |
| 26 Screw—securing (27) | 62 Gasket—float chamber | |
| 27 Needle assembly | 63 Needle valve | |
| 28 Spring—idle adjusting screw | 64 Float assembly | |
| 29 Idle adjusting screw | 65 Float chamber cover | |
| 30 Throttle disc | 66 Washer—under (68/69) | |
| 31 Screw—securing (30) | 67 Spring washer—under (68/69) | |
| 32 Seal—throttle spindle | 68 Screw—securing (65) | |
| 33 Throttle spindle | 69 Screw—securing (65) | |
| 34 Spring—throttle return | 70 Plug | |
| 35 Lever—throttle | 71 Rubber “O” ring—for (70) | |
| 36 Screw—fast idle | | |

2. At 6,000 Mile Intervals

At these periods perform the operations 1a and 1b, listed under the 1,000 mile service.

3. At 12,000 Mile Intervals (Fig. 6)

Change the "inline" fuel filter by slackening the bolt attaching the filter clip to the valance panel, and disconnecting both rubber tubes to the filter. When fitting the new filter ensure that the inlet side is facing downwards i.e. towards the fuel flow.

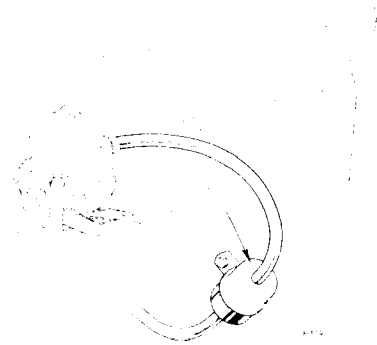


Fig. 6. Showing position of 'inline' fuel filter

4. At 24,000 Miles

This service requires one Red Emission Pack "B" containing two float-chamber gaskets (Red), two "O" rings, two needle valves, two diaphragms, four throttle spindle seals, four temperature compensator seals and two by-pass valve body gaskets. Additionally, a "Pozidrive" screwdriver is required for removing special screws.

IMPORTANT: Take all possible precautions to avoid the inter-mixing of similar components. Keep the relevant parts of one carburettor separate from those of the other.

Referring to Fig. 5, proceed as follows:

Float Chambers

Carry out the following operations using the new needle valves provided in the Red Emission Pack "B".

IMPORTANT: Do not inter-mix the carburettor components when carrying out the following procedure. Referring to Fig. 5:

- (a) Remove both carburettors from the manifold, place them on a clean bench surface and separate the two instruments. Unscrew the centre brass plug (70) and drain the fuel from each carburettor into a suitable receptacle. Unscrew the damper (15) from the top of the carburettor and drain the oil from the dash-pot.
- (b) Unscrew the float-chamber fixing screws (68) (69) and withdraw float-chamber (65) vertically from the body. Remove the float-chamber gaskets (62), unclip the float pivot pin (61) and take out the floats (64). Unscrew the needle valve (63) from the float-chamber cover and remove the "O" ring (71) from the centre plug.
- (c) Thoroughly cleanse all components removed. Using a new washer provided, securely screw the needle valve into position.
- (d) Having inspected the floats for damage or distortion, and rectified if required, refit the float assembly. Slide in the pivot pin and clip the assembly into position. To ensure correct fuel level, invert the instrument so that the tag closes the needle valve and measure from the face of the cover (i.e. with gasket removed) to the highest point of each float. Correct measurements are 16.0 to 17.0 mm.
- (e) Using a new gasket, refit the float chamber by tightening the retaining screws securely from the centre, outwards. Fit a new "O" ring to the centre plug and screw this tightly into position.
- (f) Using new gaskets, refit both carburettors to the induction manifold. Replenish the dash-pots with Zenith Lube-pack or the recommended grade of engine oil, to within $\frac{1}{2}$ " of the top of the centre rod and refit the dampers. Reconnect the accelerator controls and reset the carburettors as described on page 1.503.

Air Valve Assembly

- (i) Remove the damper assembly (15), unscrew the four cover fixing screws (20) and carefully lift off the cover (19). Remove the air valve return spring (21), lift out the air valve (25) and drain the oil from the guide rod. Slacken the metering needle clamping screw (26) and withdraw the needle (27), placing this carefully to one side to avoid damage.
- (ii) Take out the four diaphragm retaining screws (23) and remove the ring (22) and diaphragm (24). Locating its tag in the recess provided, position the new diaphragm on the air valve, followed by the ring and secure by firmly tightening the four screws.

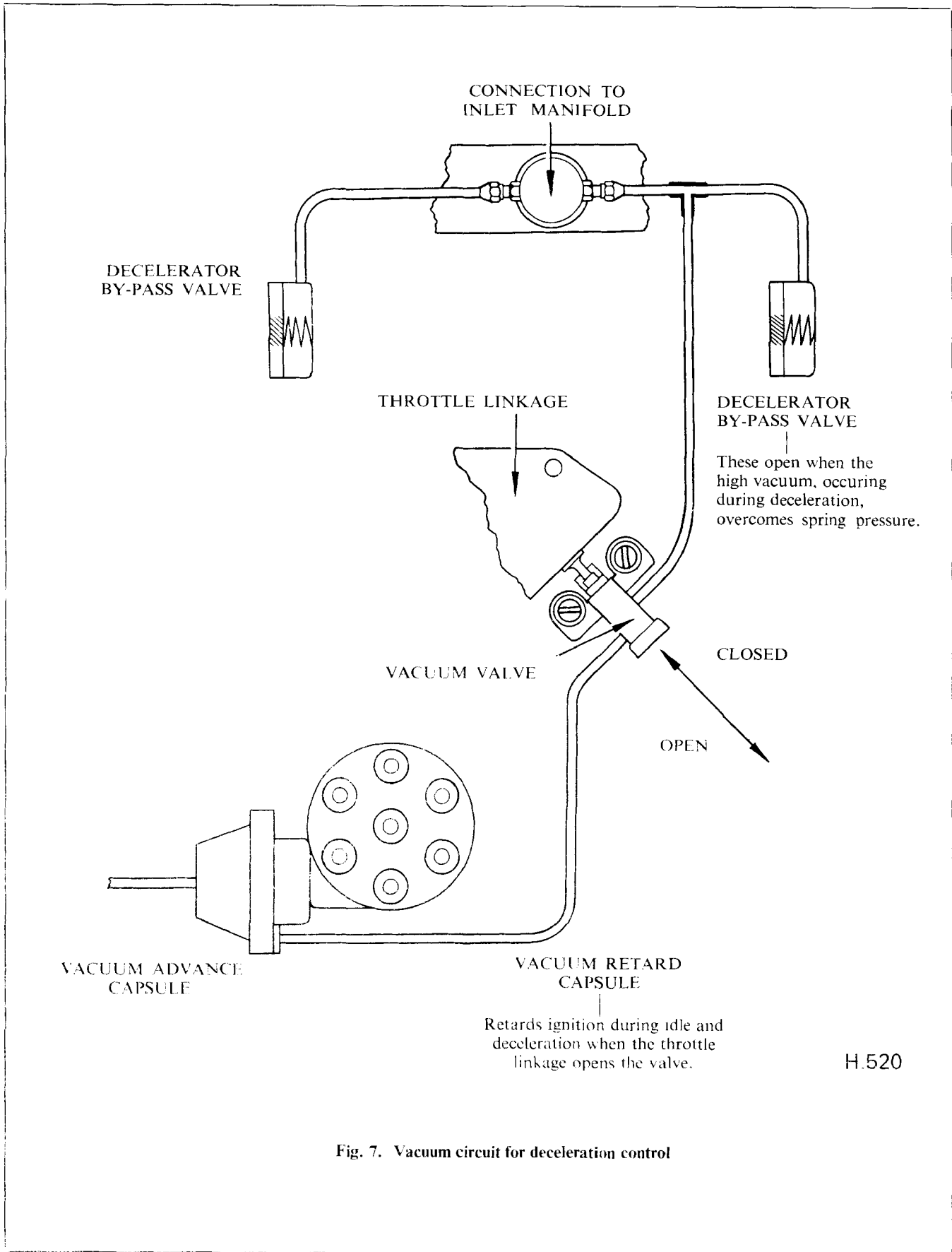


Fig. 7. Vacuum circuit for deceleration control

(iii) Having checked to ensure that there is spring action in the housing at the top of the metering needle shank (27), insert this into the base of the air valve, lining up the flat portion with the locking screw (26). Using a narrow straight edge (approximately 1" wide) placed against the needle shoulder, push the needle into the air valve until the straight edge aligns the shoulder with the flat face inside the flange formed on the outer edge of the air valve. This position is extremely critical. Lightly tighten the locking screw to avoid crushing the needle biasing spring housing. When correctly fitted, the needle is biased towards the throttle and the shoulder of the needle is exactly flush with the air valve face.

(iv) Carefully enter the air valve and diaphragm assembly into the main body, guiding the metering needle into the jet with a finger in the air intake.

Locate the outer tag of the diaphragm in a corresponding aperture on top of the body and look down the centre of the air valve to ensure that the two depression transfer holes are towards, and in line with, the throttle spindle. The metering needle should also be biased towards the throttle.

(v) Refit the air valve return spring and, holding air valve with finger or thumb in the air intake, slide on the cover and locate the screw holes:

The damper ventilation boss must be towards the air intake. Refit the four cover screws, tightening them evenly and securely, then check movement of air valve. Freedom of movement is essential and when released from the uppermost position, the air valve should fall with a sharp metallic click on to the carburettor bridge.

Temperature Compensator Unit

(i) Take out the screws (10) and remove the temperature compensator unit (8).

(ii) Release the cover (11) by removing two screws (12) and check for freedom of valve movement by lifting it from its seat. When released, the valve should return freely. Do not strain the bi-metal blade or attempt to alter its tension adjustment. There should be a consistent radial clearance around the valve to allow for thermal expansion. If offset, slacken the fixing screw and move the blade laterally to centralise the valve. Provided the valve is free, replace the cover (11) and tighten the screw (12).

(iii) Using the new seals provided, replace the inner seal (14) in the carburettor body, and the outer seal (13) on the compensator unit. Refit the unit to the carburettor and tighten the two screws (10).

Throttle Spindle Seals

(i) Unscrew three screws (7) and lift off the by-pass valve assembly (5) and gasket (4).

(ii) Unscrew the throttle spindle nut (39), release the throttle spring (34) and take off the lever (35) and spring (34).

(iii) Pull or prise out the old throttle spindle seals (32) and replace with new seals. A small hole is provided in the face of the seal to facilitate removal.

(iv) Re-assemble the spring and lever to the throttle spindle and securely tighten and lock the nut (39).

(v) Using a new gasket (4), refit the by-pass valve to the carburettor body and securely tighten the three screws (7).

Carburettor Installation

(i) Place new flange gaskets on the manifold studs, connect the two carburettors together and attach them to the manifold.

(ii) Connect the controls, replenish the dash-pots and reset the carburettors as described under "Accelerator Linkage", page 1.503.

5. 50,000 Miles Service

At this stage it is recommended that the 24,000 mile service is repeated or the old carburettors are removed, rebuilt and/or substituted by complete new exchange units. To conform with the mileage interval pattern of the vehicle general regular maintenance procedures, it is suggested for convenience that this be performed at the 48,000 miles routine vehicle service.

CRANKCASE EMISSION CONTROL VALVE

See page 3.110.

IGNITION AND CARBURETTOR SETTINGS

Idle speed (r.p.m.)	..	..	..	800/850
Ignition static (approx.)	..	..	..	6° B.T.D.C.
Ignition at idle	..	..	..	4° A.T.D.C.
Distributor Part Number	..	..	..	308372
Basic carburettor settings	..	..	..	Fixed
Idle C.O. level engine warm	..	..	..	2.5%–3.5%
Equivalent air/fuel ratio at idle (approx.)	..	..	..	13.5 : 1

In order to comply with Federal regulations concerning Emission and Evaporative Control Systems between 1969 and 1973, certain components have either been introduced or deleted.

The following notes will establish any alterations in component servicing. All relevant technical data is given on the underbonnet 'decal' for a particular model year.

Routine servicing schedules for all years are given in the appropriate 'Passport to Service'.

EMISSION AND EVAPORATIVE CONTROL SYSTEM

All Triumph models entering the North American markets incorporate efficient emission control systems. These systems enable the vehicles to conform with all current State and Federal Regulations governing the emission of hydrocarbons, carbon monoxide, nitric oxide and the emission of fuel, by evaporation, from the fuel delivery system.

The evaporative control system uses an activated carbon filter through which the fuel tank is vented. The following are features of the evaporative control system:

- 1) The carburetter float chambers are vented to the engine during open throttle conditions and to the carbon canister at closed throttle.
- 2) The carbon canister is vented to atmosphere (on later models only via an anti-run-on valve). The canister is purged and prevented from vapour build-up by piping to the constant depression area of each carburetter. The crankcase breathing is also linked to the above piping system via the right-hand cam cover.
- 3) A separator tank prevents fuel surges from reaching the canister and thus saturating the system.
- 4) The fuel filter cap is sealed to prevent evaporative losses.
- 5) On early models a pipe from each corner of the fuel tank is fed to a large expansion tank which prevents a fuel overflow to the evaporative system.
- 6) On later models, the fuel tank filler tube extends into the tank to prevent complete filling and so allow for expansion of fuel in hot weather.
- 7) The piping from the separator tank to canister contains a restrictor valve which will prevent the fuel tank being overfilled.

EVAPORATIVE LOSS CONTROL SYSTEM

Leak testing

Test apparatus: Water manometer, pressure regulating valve, pressure sealing valve and pressurized air supply. An alternative to the manometer is an accurate pressure gauge reading 0 to 30 in. of water with which a pressure relief valve or weak rubber connection will be necessary to protect against over-pressurizing the system.

WARNING: During the test, pressure will be applied to the fuel tank breather system. The pressure, albeit very low, may displace pipe connections or cause an emission of fuel vapour. It is, therefore very dangerous to allow smoking or naked lights in the test area, or exceed the pressure quoted.

Test procedure

1. At the carbon canister, detach the tube from the separator tank and insert the pressurizing tube of the test apparatus.
2. Apply 20 in. of water pressure to the system and close the sealing valve. **DO NOT EXCEED 25 INCHES OF WATER PRESSURE.**
3. After two minutes, check the pressure in the system. If this has fallen more than 2 in. of water, investigation and rectification is necessary.

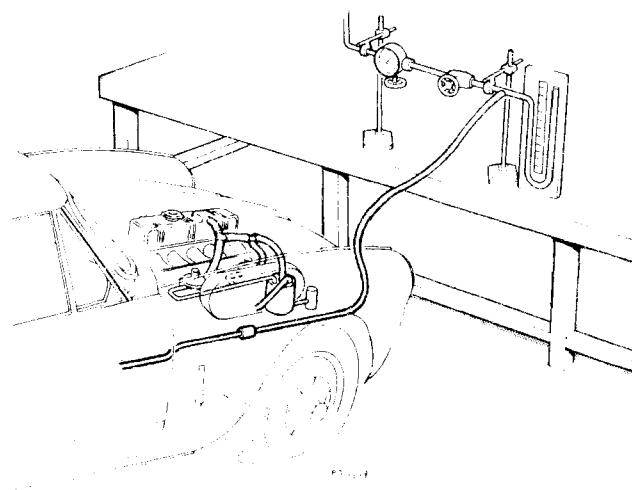


Fig. 8 Procedure

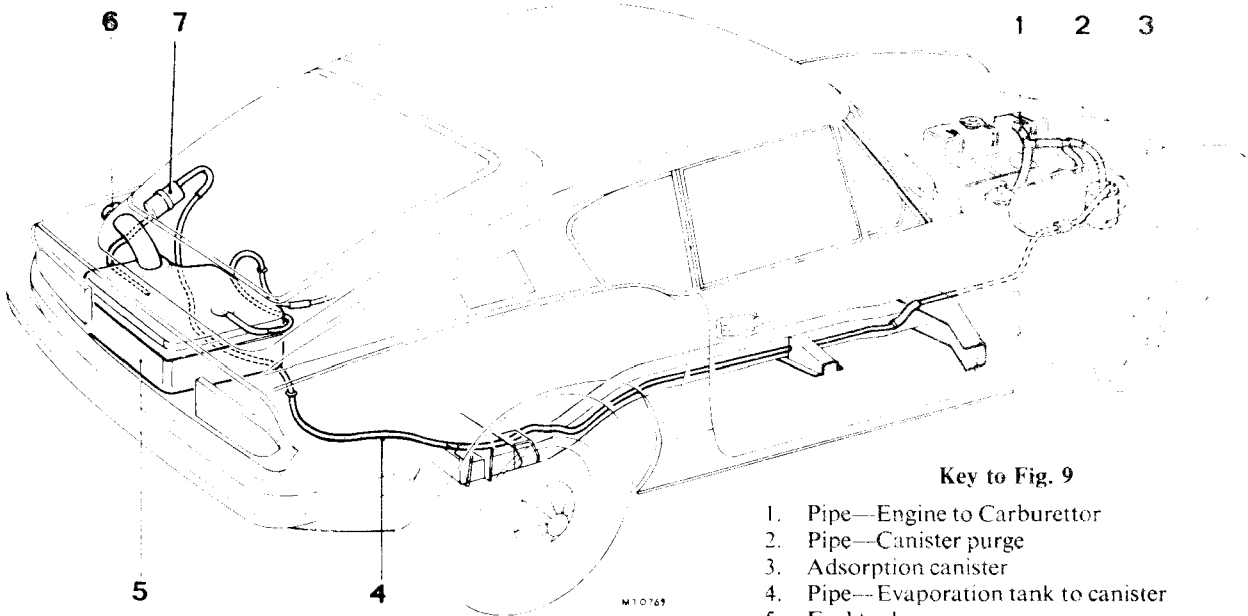


Fig. 9 Evaporation System: Later models

Key to Fig. 9

- 1. Pipe—Engine to Carburettor
- 2. Pipe—Canister purge
- 3. Adsorption canister
- 4. Pipe—Evaporation tank to canister
- 5. Fuel tank
- 6. Sealed filler cap
- 7. Seperator tank

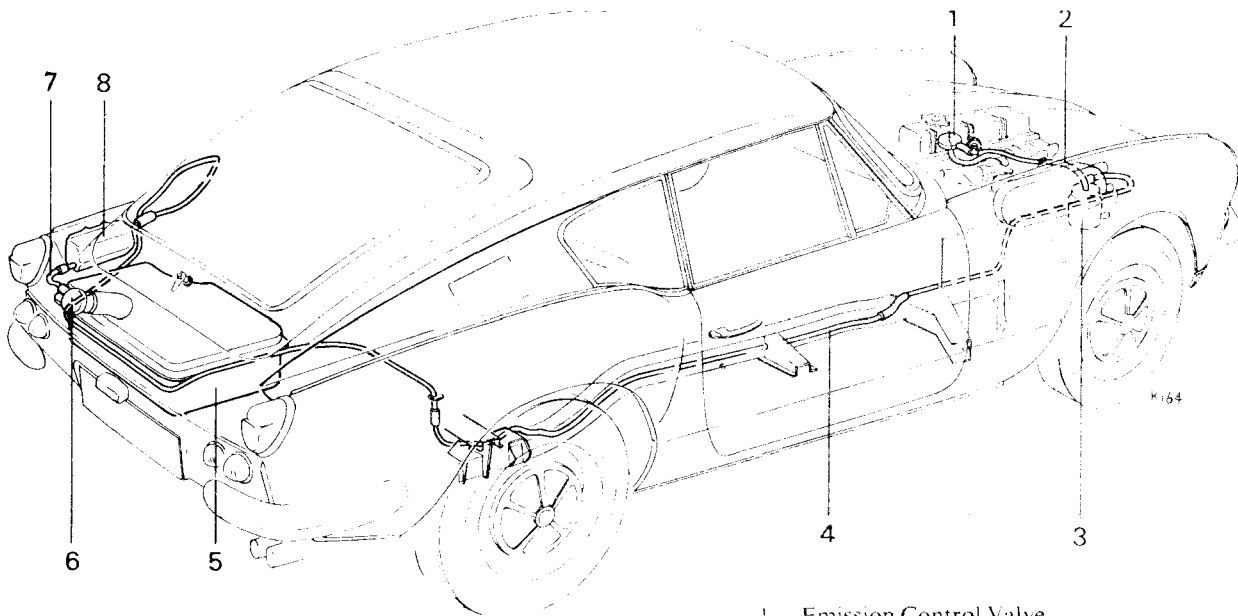


Fig. 10 Evaporation System: Early models

- 1. Emission Control Valve
- 2. Pipe - Rocker cover to Canister
- 3. Activated Carbon Canister
- 4. Pipe - Overflow tank to Canister
- 5. Main Fuel Tank
- 6. Sealed Filler Cap
- 5. Main Fuel Tank
- 7. Pipe - Filler tube to overflow tank
- 8. Overflow Tank

ADSORPTION CANISTER AND/OR AIR FILTER

Removing

1. Remove the nut and screw on the canister securing strap.
2. Lift the canister clear of the bracket.
3. Unscrew the base of the canister and lift out the filter.
4. Clean any carbon particles from the base of the canister.

Refitting

5. Fith the new filter into body of canister.
6. Reverse 1 to 3 ensuring that the canister pipes are still in position and that they present leak free joints.

WARNING: Because of the possible presence of fuel fumes, avoid naked lights or actions likely to cause sparks.

NOTE: 1973 model year vehicles have a non replaceable filter.

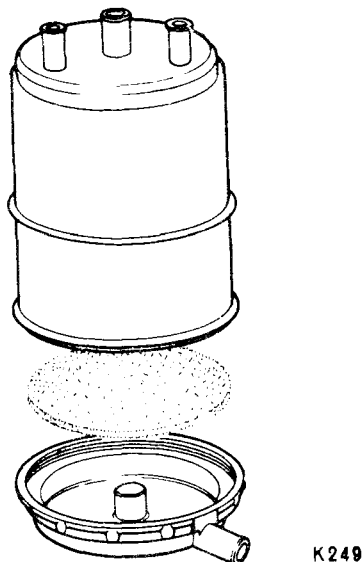


Fig. 11 Adsorption canister (pre 1973 only)

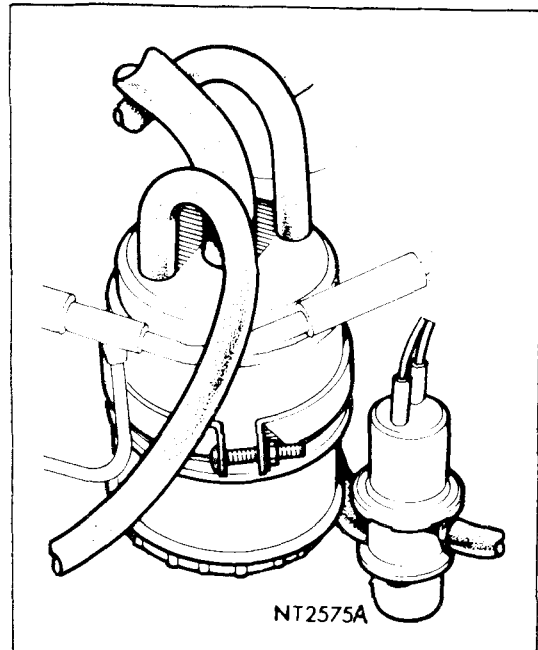


Fig. 12 Adsorption canister and running on control valve (1973 only)

RUNNING ON CONTROL VALVE

Description of operation

The running on control valve prevents the 'running-on' of the engine after the ignition is switched off when, due to the heat of the engine, a condition of compression ignition is set up. The method of achieving a cut-off is by applying a slight 'vacuum' to the float chamber of the carburetors when the ignition is switched off.

When the ignition is switched off a solenoid is activated which operates a valve that seals off the inlet to the bottom of the carbon canister. With the inlet sealed a connection to the inlet manifold applies a partial vacuum to the canister and consequently to the float chambers via an interconnecting pipe. The vacuum thus applied is sufficient to prevent fuel being drawn into the engine. When the engine has stopped and the oil pressure drops to zero the solenoid is de-activated and the engine is thus ready again for operation.

RUNNING ON CONTROL VALVE (1973 VEHICLES ONLY)

Remove and refit

Removing

1. Remove the carbon canister.
2. Disconnect the two electrical leads at the top of the valve.
3. Disconnect the vacuum signal pipe.
4. Remove the securing bolts and lift off the valve.

Refitting

5. Reverse instructions 1 to 4.

THERMOSTATIC SWITCH (1973 MODELS ONLY)

The thermostatic vacuum switch increases the speed of the engine during prolonged idling at high ambient temperatures thus promoting more efficient cooling and preventing overheating.

The valve, located in the cooling system, is connected in the vacuum pipe, carburettor to distributor. A sensor in the coolant vents the vacuum pipe to atmosphere at 105°C (220°F). The effect is to negate the retard system, thus advancing the timing of the ignition spark and increasing the engine speed.

Removing

1. Drain the coolant
2. Disconnect the vacuum pipes from the switch.
3. Carefully remove the switch from the radiator

Refitting

4. Reverse instruction 1 to 3 use a sealing compound to ensure a leak free joint.

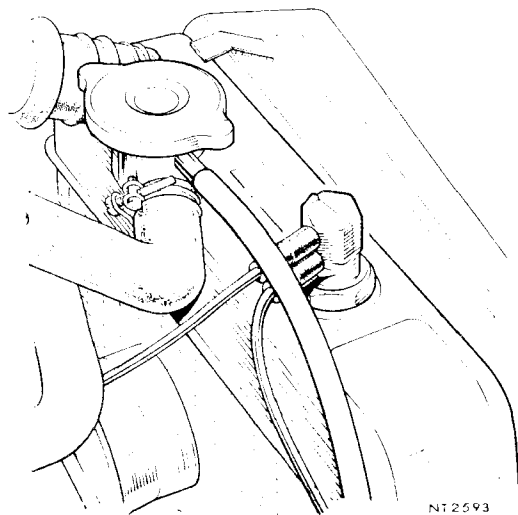


Fig. 14 Thermostatic vacuum switch

C. O. LEVELS AT IDLE

Check

Special tools: Approved infra-red gas analyser.

1. Attain normal engine running temperature.
2. Set the idle speed to that quoted on the emission control under bonnet decal.
3. Check ignition timing, reset if necessary.
4. Re-check idle speed—adjust if necessary.
5. Insert the gas analyser probe as far as possible into the exhaust pipe.
6. Check the C. O. reading (compare with emission control label).
- 7a. Adjust mixture if necessary.
- b. Check idle speed—adjust if necessary.
8. Withdraw the analyser probe.
9. Switch off the ignition.

NOTE Do not allow the engine to idle for longer than 3 minutes without a 'clear out' burst of 1 minute at 2000 rev/min.

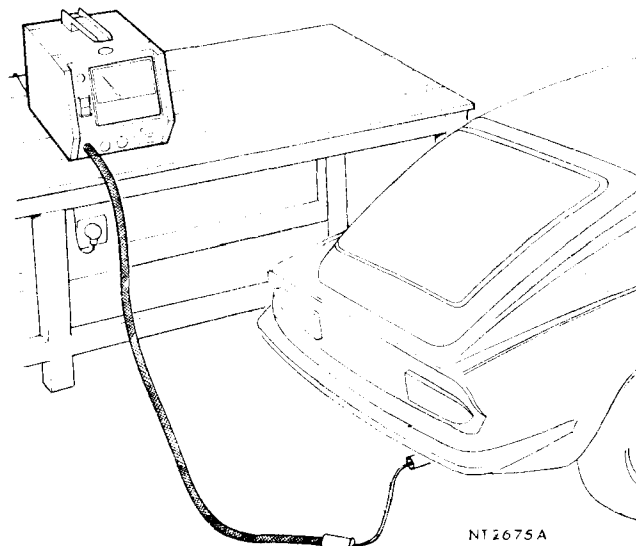


Fig. 15 Checking C. O. Level

CRANKCASE EMISSION CONTROL

Crankcase breathing and evacuation of 'blow by' gases is achieved by utilizing the characteristic partial vacuum in the constant depression carburetors. By this method crankcase emissions are burned in the engine combustion process. A wire gauze strainer in the engine top cover acts as an oil separator/flame arrestor.

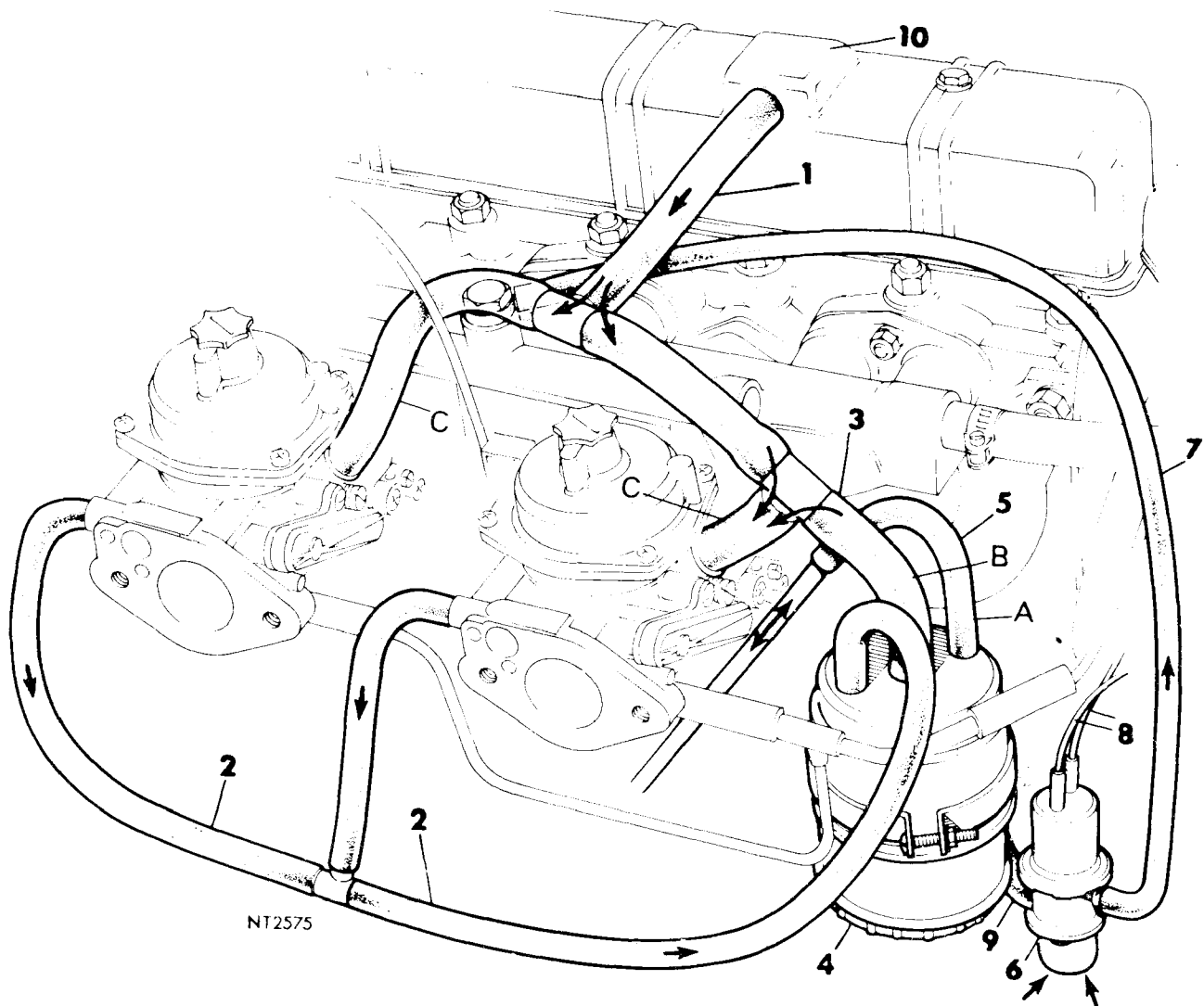


Fig. 16. Crankcase breathing system

- | | | |
|---------------------------------|------------------------------------|-----------------------------------|
| 1. Crankcase breather pipe | 5. Canister to fuel tank pipe | 10. Flame arrestor |
| 2. Vent valve connecting pipes | 6. Run-on control valve | A. $\frac{1}{32}$ in. restrictor |
| 3. Canister purge pipe | 7. Vacuum control pipe | B. $\frac{1}{32}$ in. restrictor |
| 4. Evaporative control canister | 8. Solenoid connections | C. $\frac{1}{16}$ in. restrictors |
| | 9. Canister to run-on control pipe | |

EMISSION CONTROL SYSTEM

SYMPTOM											CAUSE	ACTION	
POOR/ROUGH IDLE	LOSS OF POWER/POOR DRIVE AWAY	MISFIRING (under load conditions)	HIGH FUEL CONSUMPTION	HIGH IDLING SPEED	OVERHEATING (at idle speed)	LEAN RUNNING	ARCING AT PLUGS	SMELL OF FUEL	RICH MIXTURE	STALLING			ENGINE RUN ON
X	X	X										DISTRIBUTOR C. B. POINTS	CHECK DWELL ANGLE/CHECK GAP & RESET/RENEW POINTS
X	X	X										SPARKING PLUGS	CHECK GAP AND RESET/RENEW DEFECTIVE PLUG
X	X	X					X					IGNITION WIRING	INSPECT FOR FRAYING CHAFFING & DETERIORATION/RENEW
X	X		X									CHOKE MECHANISM	CHECK FAST IDLE ADJUSTMENT/CAM AND CABLE/ADJUST
X	X		X									CHOKE MECHANISM	REMOVE STARTER BOX AND CLEAN INTERFACE
X	X			X						X		VACUUM FITTINGS, HOSES AND CONNECTIONS	CHECK PIPING CONDITION AND SECURITY/RENEW AS NECESSARY
X	X					X						OIL FILLER CAP	CHECK FOR SECURITY/TIGHTEN CAP
X	X					X						VENTILATION HOSES	CHECK HOSES FOR SECURITY, BLOCKAGE & DETERIORATION
X			X									CARBURETTER	SEE CARBURETTER FAULT FINDING CHART
	X											DISTRIBUTOR	LUBRICATE/CHECK OPERATION BY REMOVING PIPE & NOTING R.P.M.
	X		X									CARBURETTER AIR CLEANER	CLEAN OR RENEW ELEMENT
	X			X	X							IGNITION TIMING AND ADVANCE SYSTEMS	CHECK AND RESET DYNAMIC TIMING
		(X)										CONDENSOR AND COIL	CHECK FOR BREAKDOWN ON OSCILLASCOPE TUNE
			X					X				HOSE CONNECTIONS	CHECK FOR HOSE DAMAGE AND DETERIORATION
									X			CARBON STORAGE CANISTER	RENEW CANISTER
					(X)							THERMOSTATIC SWITCH	CHECK SWITCH OPERATION AND RENEW IF NECESSARY
											X	RUNNING ON CONTROL VALVE	CHECK VALVE OPERATION AND RENEW IF NECESSARY

FAULT FINDING- EMISSION CARBURETTER

NOTE: Before undertaking extensive carburetter servicing it is recommended that other engine factors and components such as cylinder compressions, valve clearance, distributor, sparking plugs, air intake temperature control system etc., are checked for correctness of operation.

SYMPTOM	CAUSE	ACTION
1. Poor idle quality	a) Air leakage on induction manifold joints.	Remake joints as necessary. Check idle carbon monoxide level with CO meter.
	b) Throttles not synchronized.	Re-balance carburetters and reset linkage.
	c) Air valve or valves sticking in piston guide rods.	Clean air valve rods and guides and re-assemble. Check piston free movement by hand, unit should move freely and return carburetter bridge with an audible click.
	d) Partially or fully obstructed float chamber or diaphragm ventilation holes.	Check that gasket(s) are not causing obstruction or piping obstructed.
	e) Incorrect fuel level caused by maladjusted float assemblies or worn or dirty needle valve.	Reset float heights and clean or replace needle valves worn.
	f) Metering needle incorrectly fitted or wrong type of needle fitted.	Ensure shoulder of needle is flush with face of air valve and that needle bias is correct.
	g) Diaphragm incorrectly located or damaged.	Check location with air valve cover removed, piston depression holes should be in line with and face towards the throttle spindle. Renew diaphragm with correct type if damage is in evidence.
	h) Leakage from retard pipe connections.	Remake connections and recheck ignition settings.
	i) Temperature compensator faulty.	With engine and carburetter cold check that compensator cone is seated and free to move off seat. If any doubt exists, replace unit with new assembly.
	j) After considerable service leakage may occur at throttle spindle or secondary throttle spindles.	Replace spindle seals or spindles as required.
2. Hesitation or 'flat spot' ITEM 1---a, b, c, d, e,f, g and h plus	k) Piston damper inoperative	Check damper oil level and top up with specified oil; recheck damper operation by raising piston by hand, whereupon resistance should be felt.
	Air valve spring missing or wrong part fitted	Check correct grade of spring and refit as required.
	Ignition timing incorrect	Check and reset as required.
3. Heavy fuel consumption 1 and 2 plus	Throttle linkage operation incorrect.	Check operation of linkage between carburetters and operation of secondary throttle links; reset or replace parts as required.
	Leakage from the fuel connections, float chamber joints or sealing plug 'O' rings.	Replace gaskets and 'O' rings as required.
4. Lack of engine braking	Faulty by-pass valve.	Replace by-pass valve with new unit.
	Sticking throttles.	Check throttle operation and reset as required.
5. Lack of engine power	Ignition retard inoperative.	Check ignition setting at idle and ensure correct functioning of retard system.
	Damaged diaphragm.	Inspect and replace if incorrectly fitted or damaged.
	Low fuel flow.	Check discharge from fuel pump. Inspect needle valve seating.

NOTE: To ensure compliance with exhaust emission legislative requirements the following items **MUST NOT** be changed or modified in any way.
The fuel jet assembly; the air valve; the depression cover; the position of the fuel metering needle.
The following items must not be adjusted in service but should be replaced completely by factory-set units.
The temperature compensator; the air valve return spring; the by-pass unit; the starter assembly.

TRIUMPH

GT6 and VITESSE 2-litre

WORKSHOP MANUAL

GROUP 2

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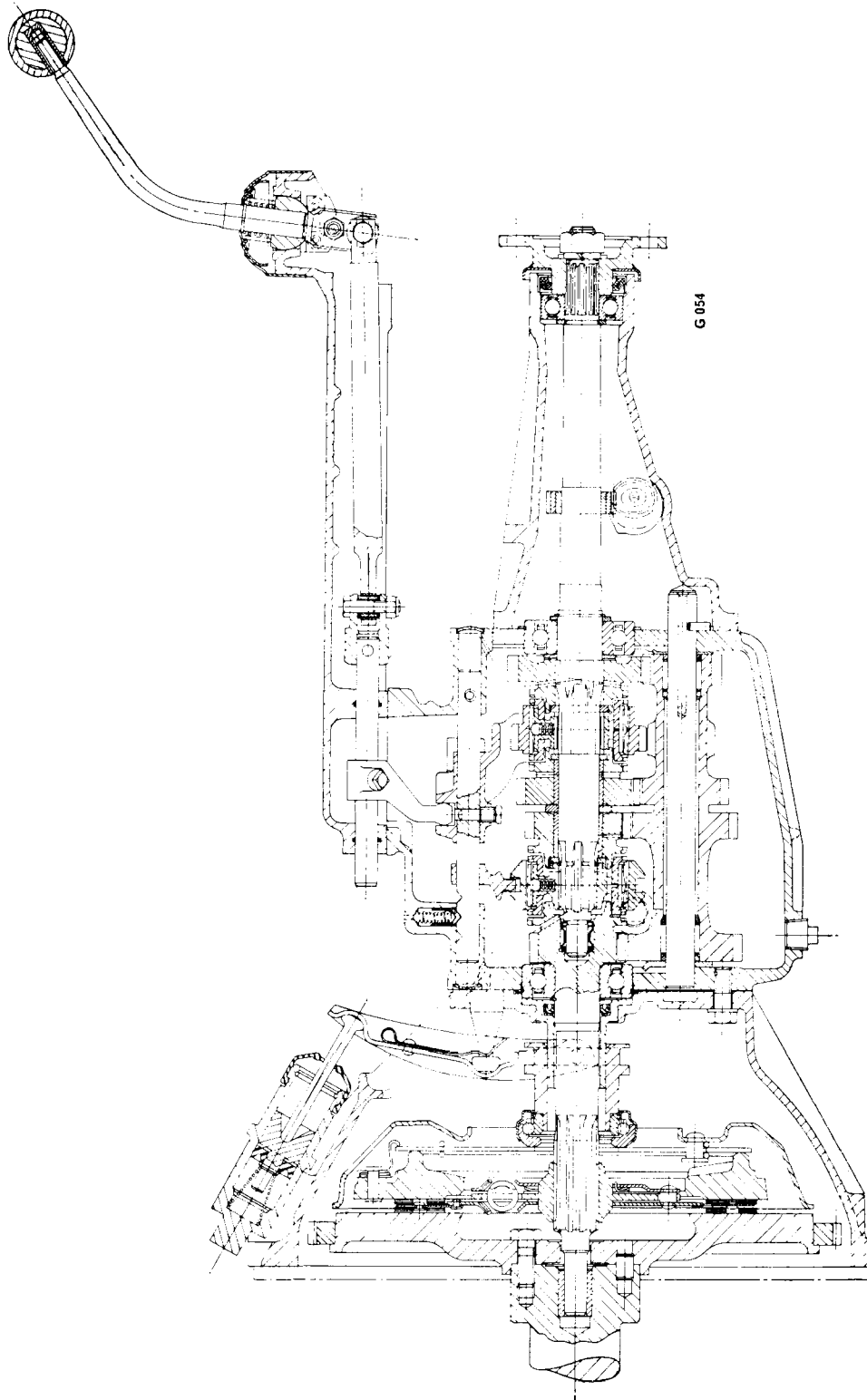


Fig. 1. Sectioned clutch and gearbox unit

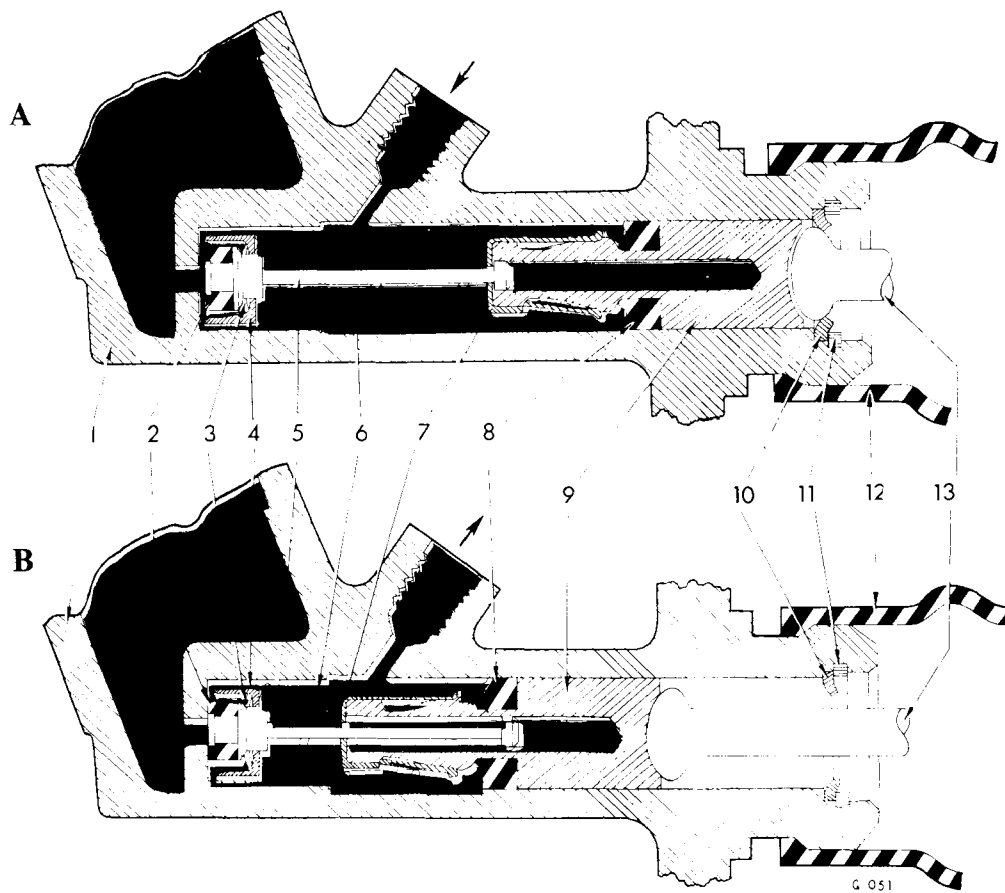
MASTER CYLINDER OPERATION

A. Clutch Driving Condition

When the clutch pedal is released, the push rod (13) is returned to its stop (10) by the pedal return spring. This permits the plunger (9) to move rearwards under pressure of the spring (6). The flange on the end of the valve shank (5) contacts the spring retainer (7) and as the plunger continues to move rearwards, the valve shank (5) lifts the seal (2) from its seat on the end of the cylinder bore and compresses the spring (3). Hydraulic fluid can then flow past the three-legged distance piece (4) and seal (2) either to or from the reservoir

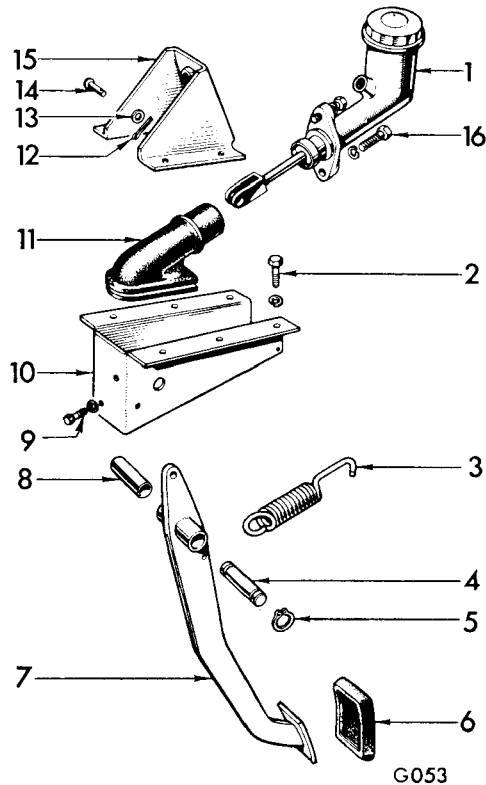
B. Clutch Released Condition

Initial movement of the push rod (13) and plunger (9) releases the valve shank (5) and permits the spring (3) to press the valve shank (5) and seal (2) against its seat. This cuts off communication between the cylinder and reservoir. Continued movement of the plunger displaces fluid through the hydraulic pipelines and releases the clutch.



- | | | |
|------------------------|-------------------------|-------------------|
| 1 Master cylinder body | 6 Plunger return spring | 10 Abutment plate |
| 2 Seal (valve) | 7 Retainer | 11 Circlip |
| 3 Spring (valve seal) | 8 Seal (plunger) | 12 Dust excluder |
| 4 Distance piece | 9 Plunger | 13 Push-rod |
| 5 Valve | | |

Fig. 2. Section through clutch master cylinder



- | | |
|-------------------|----------------------------|
| 1 Master cylinder | 9 Bolt |
| 2 Bolt | 10 Pedal bracket |
| 3 Spring | 11 Rubber dust excluder |
| 4 Fulcrum pin | 12 Split pin |
| 5 Circlip | 13 Plain washer |
| 6 Pedal rubber | 14 Clevis pin |
| 7 Pedal | 15 Master cylinder bracket |
| 8 Pivot bush | 16 Bolt |

Fig. 3. Exploded clutch pedal and bracket assembly

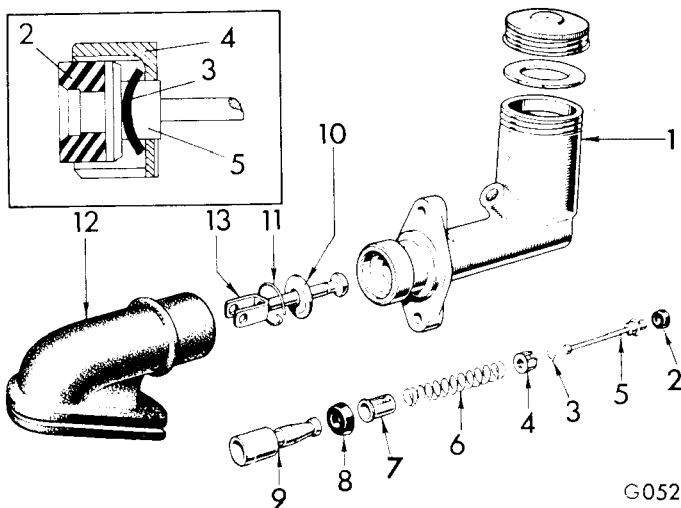


Fig. 4. Exploded clutch master cylinder
Annotations are given under Fig. 2
(Inset shows correct assembly of spring (3))

CLUTCH MASTER CYLINDER

To Remove (Figs. 3 and 5)

Proceed as follows:

Drain the hydraulic fluid through the clutch slave cylinder bleed nipple. Pull back the rubber dust excluder (11) and withdraw the clevis pin (14) securing the push rod to the pedal (7). Uncouple the hydraulic pipe from the master cylinder. Remove the bolts (16) from the master cylinder mounting flange and withdraw the unit from the bulkhead.

To Dismantle (Fig. 4)

IMPORTANT: Before carrying out work on the clutch master cylinder see warning note on page 3-202.

Depress the push rod (13), remove the circlip (11) and withdraw the push rod together with items (10) and (11).

Shake out the plunger, spring and valve assembly. If necessary, apply a low pressure air line to the outlet union to eject the assembly.

Lift the clip on the spring retainer (7) and remove the retainer from the plunger (9) with the valve and spring assembly.

Detach the valve shank (5) by passing it through the offset hole in the retainer (7). Remove the spring (6), distance piece (4) and spring (3) from the valve shank (5). Detach the seal (2) from the valve shank (5) and the seal (8) from the plunger (9).

Inspection

Clean all the components with Girling cleaning fluid, examine for deterioration and renew as necessary.

To Re-assemble (Fig. 4)

Fit new seals (8) and (2) to items (9) and (5). Assemble the spring (3), distance piece (4), spring (6) and retainer (7) to the valve shank (5). Attach the assembly to the plunger (9), lubricate with unused hydraulic fluid and fit into the master cylinder bore.

Refit the push rod (13) with abutment plate (10) and circlip (11).

To Refit (Figs. 3 and 5)

Reverse the removal operations, refill with hydraulic fluid and bleed the system as described on page 2-106.

CLUTCH PEDAL AND SUPPORT BRACKET

To Remove (Fig. 3)

Lift the rubber dust excluder (11) and remove the split pin (12) clevis pin (14) and washer (13).

Take out six bolts (2), two bolts (9) and detach the pedal and support bracket assembly from the bulkhead.

Dismantling (Fig. 3)

Detach the pedal rubber (6) and unhook the spring (3).

Remove the circlips (5) and withdraw the fulcrum pin (4).

Assembly (Fig. 3)

If necessary drive out the bush (8) and press a new one into the pedal arm (7).

Apply a little zinc oxide grease to the bush (8) and fulcrum pin (4) and replace the pedal (7), pin (4) and circlips (5).

To Refit (Fig. 3)

Reverse the removal procedure and apply Seclastik SR 51 around the attachment bolt holes and the lip of the dust excluder.

SLAVE CYLINDER

To Remove (Figs. 6 and 7)

Referring to page 2-207 remove the facia support bracket and gearbox cover. Drain the clutch hydraulic system by attaching a tube to the bleed nipple (4) and pumping the clutch pedal. Remove the tube and disconnect the hydraulic feed pipe.

Take out the bolts (9) and remove the slave cylinder.

To Dismantle (Fig. 7)

IMPORTANT: Before carrying out work on the clutch slave cylinder see warning note on page 3-202.

Remove the cover (1), circlip (2) and shake out the piston (7) and spring (6). Detach the seal (3) from the piston.

To Reassemble (Fig. 7)

Lubricate the components with unused hydraulic fluid and assemble a new seal (3) to the piston (7), placing the sealing lip towards the closed end of the body (5). Insert the spring (6) and piston into the body bore. Spring the circlip (2) into position and re-attach the rubber cover (1).

To Refit

Reverse the removal procedure, ensuring that the push rod is correctly engaged in the piston cup. Re-connect the hydraulic feed pipe, refill and bleed the system.

Replace the gearbox cover and facia support bracket.

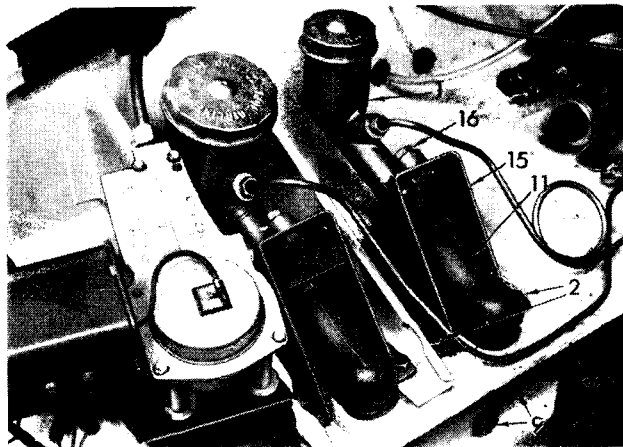


Fig. 5. Master cylinder location
Annotations are given under Fig. 3

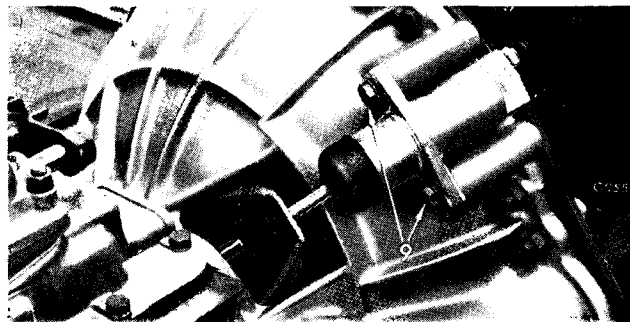
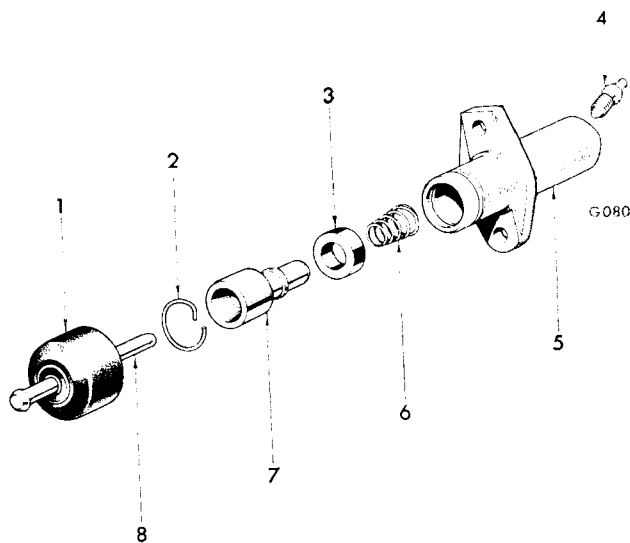


Fig. 6. Slave cylinder location



- | | |
|----------------|------------|
| 1 Dust cover | 5 Body |
| 2 Circlip | 6 Spring |
| 3 Seal | 7 Piston |
| 4 Bleed nipple | 8 Push rod |

Fig. 7. Slave cylinder details

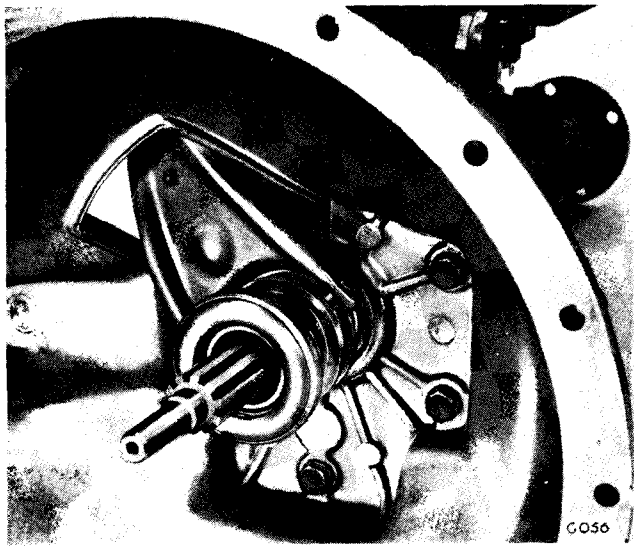
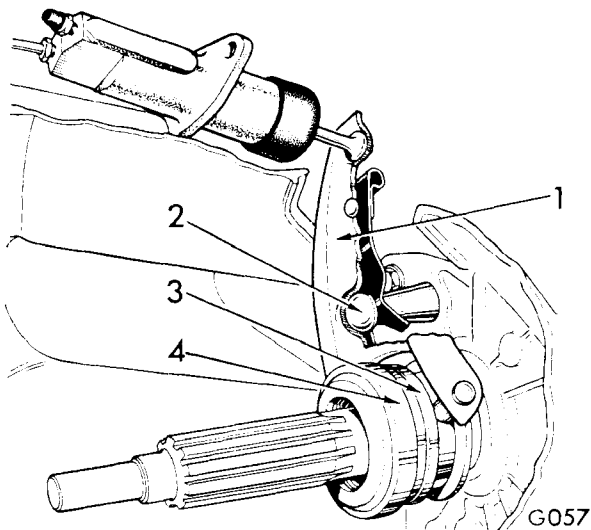


Fig. 8. Clutch release bearing



- | | |
|-----------------|--------------------|
| 1 Release lever | 3 Throwout sleeve |
| 2 Pivot pin | 4 Throwout bearing |

Fig. 9. Clutch release lever attachment

BLEEDING THE HYDRAULIC SYSTEM

1. Ensure that the reservoir is topped up to $\frac{1}{4}$ " from the top.
2. Wipe clean the bleed nipple and attach to it a short length of small bore tubing. Allow the tube to hang in a clean container partially filled with hydraulic fluid, so that its end is below the level of the fluid.
3. Unscrew the bleed nipple one complete turn. **NOTE:** During bleeding, the reservoir fluid level falls rapidly. Should the reservoir empty, air will be drawn into the system and necessitate repeating the bleeding procedure. Ensure that the level does not fall below half full, by constantly replenishing with **NEW FLUID**. (See pages 0-116/0-117).
4. Depress the clutch pedal fully and let it return without assistance. Repeat this operation with a slight pause between each depression of the pedal. Observe the fluid being discharged into the glass container and when all bubbles have ceased to appear, hold the clutch pedal down on the following down stroke. Whilst the pedal is thus held, securely tighten the bleed screw and remove the tubing from the nipple.
5. Top up the master cylinder with hydraulic fluid and road test the vehicle.

IMPORTANT: For bleeding or replenishment of the system use only fluid that has been stored in a container sealed from atmosphere. Immediately bleeding is completed, re-seal residual fluid in the container before it is again stored, as exposure to atmosphere lowers the fluid boiling point.

CLUTCH RELEASE BEARING

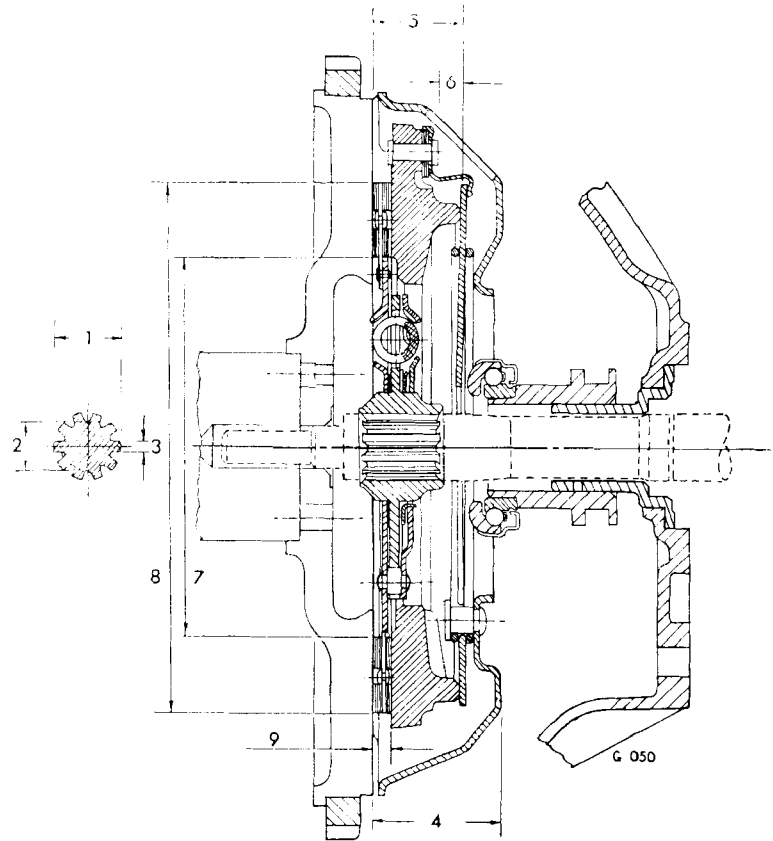
To Remove (Fig. 9)

Remove the gearbox from the vehicle as described on page 2-207.

Unclip the release lever (1) from the spherical pivot pin (2) and withdraw the bearing and sleeve. Press the sleeve (3) from the bearing (4).

To Refit

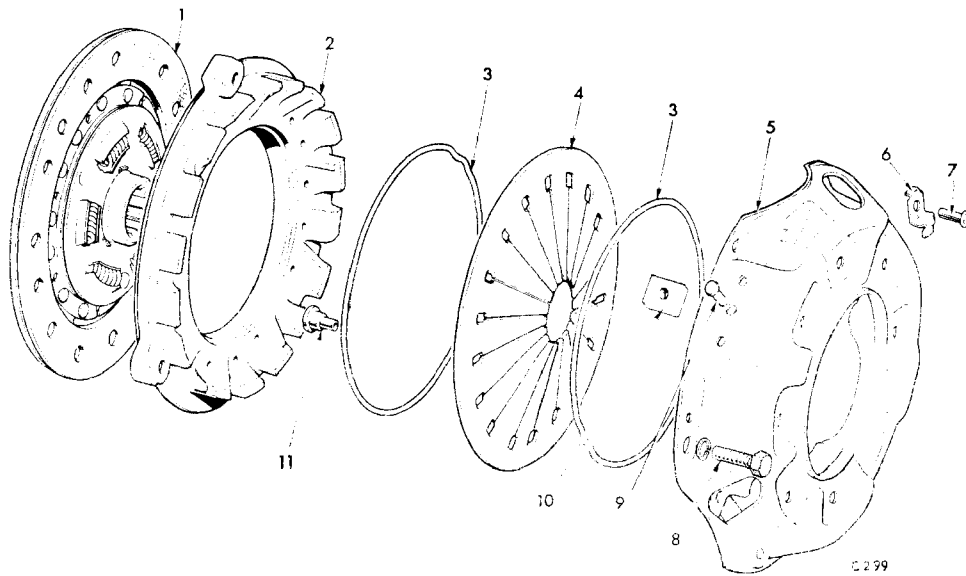
Reverse the removal procedure and apply a smear of zinc oxide grease to the pivot pins and sleeve (3).



CLUTCH DATA

	GT6	VITESSE
TYPE	Borg and Beck 8½" dia. DS. No. BB 8/235.	DS. No. BB 8/236.
LININGS	Wound yarn WR7	Raybestos 1133C
OPERATION	Hydraulic. Girling system.	
ADJUSTMENT	Not provided. Hydrostatic operation.	
DRIVEN PLATE	Belleville washer type cushioned by six White/Lt. Green springs.	
1 Splines O/D	0.998" (25.35 mm.), 0.996" (25.30 mm.)	
2 Splines I/D	0.870" (22.10 mm.), 0.804" (20.42 mm.)	
3 Splines	1.00" (25.4 mm.) × 10 S.A.E.	
4 Flywheel face to cover	2.05" (52.07 mm.)	
5 Flywheel face to spring tips (Measured 1.92" (48.77 mm.) dia. using 0.28" (7.1 mm.) thickness gauge plate	1.492" (35.35 mm.), 1.376" (34.95 mm.)	
6 Maximum travel	0.290" (7.36 mm.), 0.270" (6.86 mm.)	
7 Lining O/D	8.00" (203 mm.)	
8 Lining I/D	5.75" (146 mm.)	
9 Driven plate thickness (under 950 lb. (431 kg.) load)	0.290" (7.36 mm.), 0.270" (6.86 mm.)	

Fig. 10 Sectioned view of the clutch unit



- | | |
|--------------------|-------------------|
| 1 Driven plate | 7 Rivet |
| 2 Pressure plate | 8 Setscrew |
| 3 Fulcrum ring | 9 Rivet |
| 4 Diaphragm spring | 10 Balance weight |
| 5 Cover pressing | 11 Rivet |
| 6 Retractor clip | |

Fig. 11. Clutch unit details

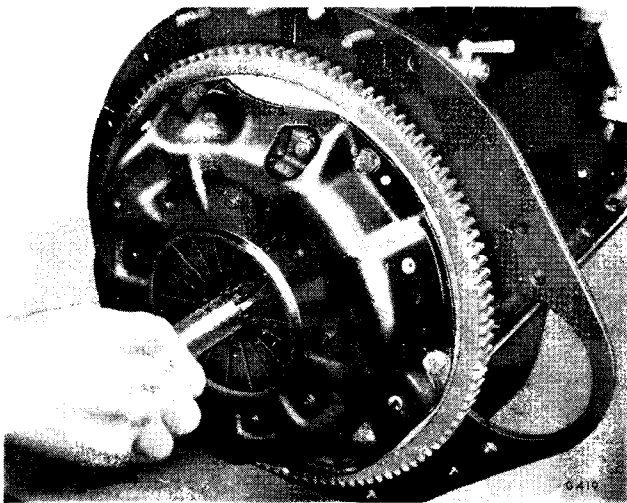


Fig. 12. Centralising the clutch unit

CLUTCH UNIT

To Remove

Remove the gearbox as described on page 2-207. (GT6) 2.224 (Vitesse) Progressively unscrew the clutch attachment setscrews (8) (Fig. 11) and detach the cover assembly and driven plate from the flywheel face.

To Refit

Check the clutch driven plate for run-out by mounting it on a mandrel between lathe centres and rotating it slowly whilst the plunger of a dial indicator bears against the outside face of the friction lining.

The maximum run-out must not exceed 0.035" (0.23 mm.). Prise the plate in the required direction until the run-out is within specified limits.

Check the flywheel clutch face for satisfactory condition, and refit the clutch unit as follows:

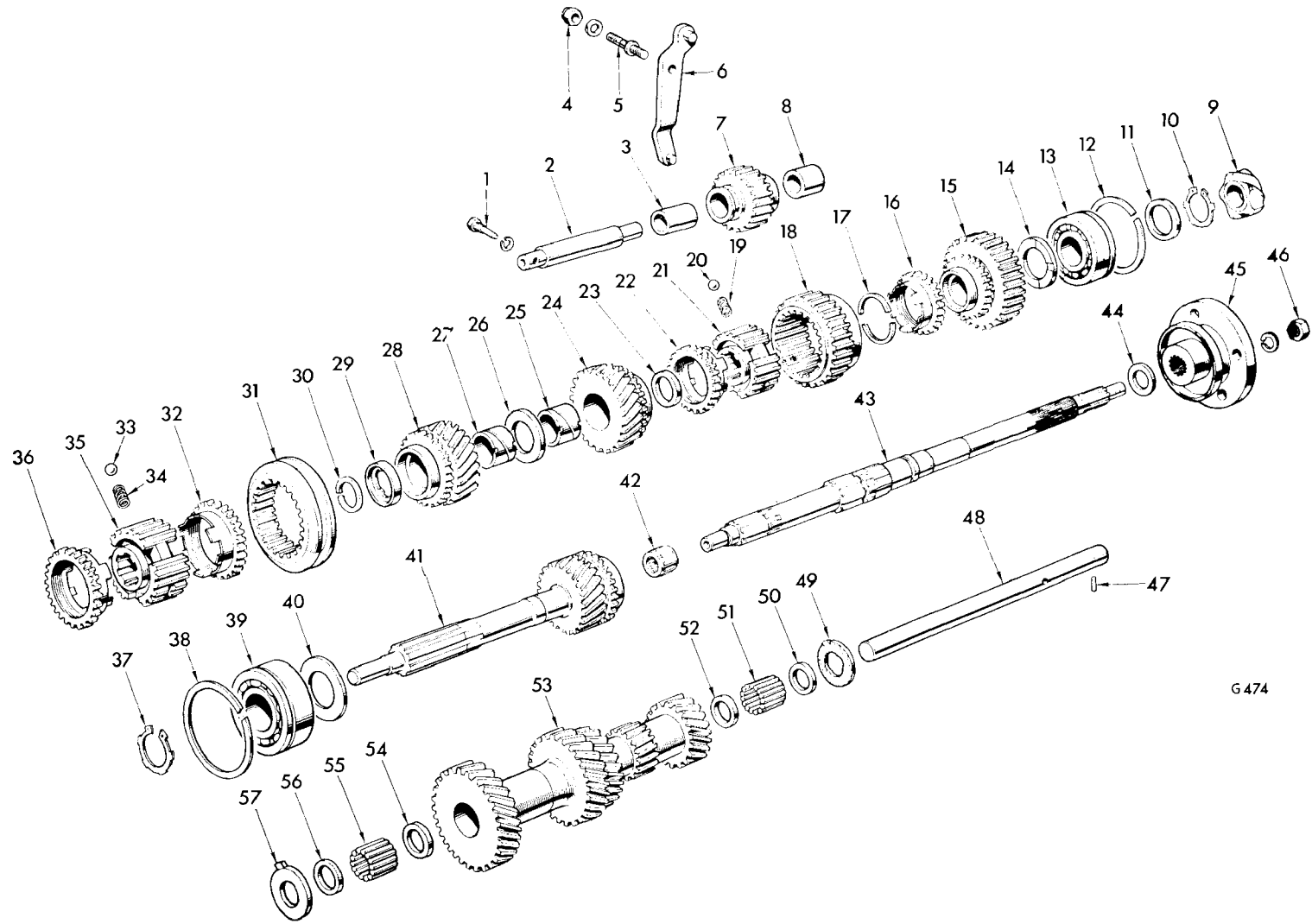
With the longer boss of the splined hub towards the gearbox, offer the driven plate up to the flywheel and centralise it by using a discarded input shaft (Fig. 12).

Locate the cover assembly over the three dowels and secure the cover pressing by evenly tightening the setscrews to the correct torque. Remove the centralising shaft.

NOTE: The clutch unit must not be dismantled nor serviced for any reason. Should any fault be evident, a replacement unit must be fitted.

DIMENSIONS AND TOLERANCES

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Input Shaft					
Spigot diameter	0.492	12.497			
	0.494	12.547	0.0058	0.147	
Crankshaft spigot bush I.D.	0.4998	12.795	0.0085	0.216	
	0.5005	12.813			
No. of splines		10			
Diameter of journal for front ballrace	1.0001	25.402			
	1.0005	25.413	-0.0008	-0.019	
Front ballrace I.D.	0.9997	25.392	0.0001	0.003	
	1.0002	25.405			
Front ballrace O.D.	2.4990	63.475			
	2.4995	63.487	-0.001	-0.03	
Bore in casing	2.4985	63.462	0.000	0.000	
	2.4990	63.475			
Bore for mainshaft spigot bearing	0.7505	19.063			
	0.7509	19.073			
No. of teeth		19			
Mainshaft					
Spigot diameter	0.4995	12.687			
	0.5000	12.700			
2nd/3rd gear bush journal diameter	0.8733	22.182			
	0.8738	22.194			
1st gear journal diameter	1.0912	27.716			
	1.0917	27.729			
Centre ballrace journal diameter	1.0000	25.400			
	1.0004	25.411	-0.0007	-0.018	
Centre ballrace I.D.	0.9997	25.392	0.0002	0.005	
	1.0002	25.405			
Centre ballrace O.D.	2.4990	63.475			
	2.4995	63.487	-0.001	-0.03	
Bore in casing	2.4985	63.462	0.000	0.00	
	2.4990	63.475			
Rear ballrace journal diameter	0.7501	19.055			
	0.7504	19.067	-0.0006	-0.015	
Rear ballrace I.D.	0.7498	19.045	-0.0001	-0.003	
	0.7502	19.055			
Rear ballrace O.D.	1.8742	47.605			
	1.8747	47.617			
Bore in rear extension	1.82	46.228			2° taper



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Fig. 1. Gearbox details (Moving parts)

Key to Fig. 1

1 Locating bolt	20 Ball	39 Front ballrace
2 Reverse idler spindle	21 1st/2nd synchro hub	40 Oil thrower
3 Reverse idler bush	22 Baulk ring	41 Input shaft
4 Nyloc nut	23 Thrust washer	42 Roller bearing
5 Pivot pin	24 2nd speed gear	43 Mainshaft
6 Reverse actuator	25 2nd gear bush	44 Thrust washer
7 Reverse idler gear	26 Thrust washer	45 Coupling flange
8 Distance tube	27 3rd gear bush	46 Nut
9 Speedo driven gear	28 3rd speed gear	47 Pin
10 Circlip	29 Circlip washer	48 Countershaft spindle
11 Washer	30 Circlip	49 Rear thrust washer
12 Snap ring	31 3rd/Top synchro sleeve	50 Retaining ring
13 Centre ballrace	32 Baulk ring	51 Needle rollers
14 Thrust washer	33 Ball	52 Retaining ring
15 1st speed gear	34 Spring	53 Countershaft gear cluster
16 Baulk ring	35 3rd/Top synchro hub	54 Retaining ring
17 Split collars	36 Baulk ring	55 Needle rollers
18 1st/2nd synchro sleeve	37 Circlip	56 Retaining ring
19 Spring	38 Snap ring	57 Front thrust washer

DIMENSIONS AND TOLERANCES—continued

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Mainshaft—continued					
3rd gear circlip groove width	0·076	1·930			
	0·079	2·007	0·004	0·102	
3rd gear circlip width	0·069	1·753	0·010	0·254	
	0·072	1·829			
Mainshaft length between front face of 1st/2nd synchro hub splines and front face of 3rd gear circlip groove	2·482	63·043	0·001	0·025	End float of bushes and thrust washers on mainshaft. Recommended end float 0·004"/0·010" (0·102/0·254 mm.)
	2·484	63·094	0·022	0·559	
Mainshaft length between rear face of split collar groove and front face of centre ballrace circlip groove	1·9648	49·906	- 0·0102	- 0·255	Adjust to provide 0·000"/0·002" (0·00/0·05 mm) end-float by selective assembly of centre ballrace circlip washer
	1·9808	50·058	0·0238	0·604	
Countershaft					
No. of teeth on gears—Top		26			
3rd		24			
2nd		20			
Rev.		15			
1st		15			
Spindle diameter	0·6548	17·632			
	0·6552	17·642	0·0005	0·013	
Bore in casing	0·6557	17·655	0·0017	0·043	
	0·6565	17·675			
Gear cluster length	6·788	172·415			
	6·790	172·466			
Distance between thrust faces in casing	6·990	177·546			
	6·992	177·597			
Front thrust washer thickness	0·123	3·124			
	0·125	3·175			
Rear thrust washer thickness	0·066	1·676	0·007	0·178	
	0·068	1·727	0·015	0·381	
Overall permissible end-float			0·007	0·178	Obtain by selective assembly of components
			0·013	0·330	

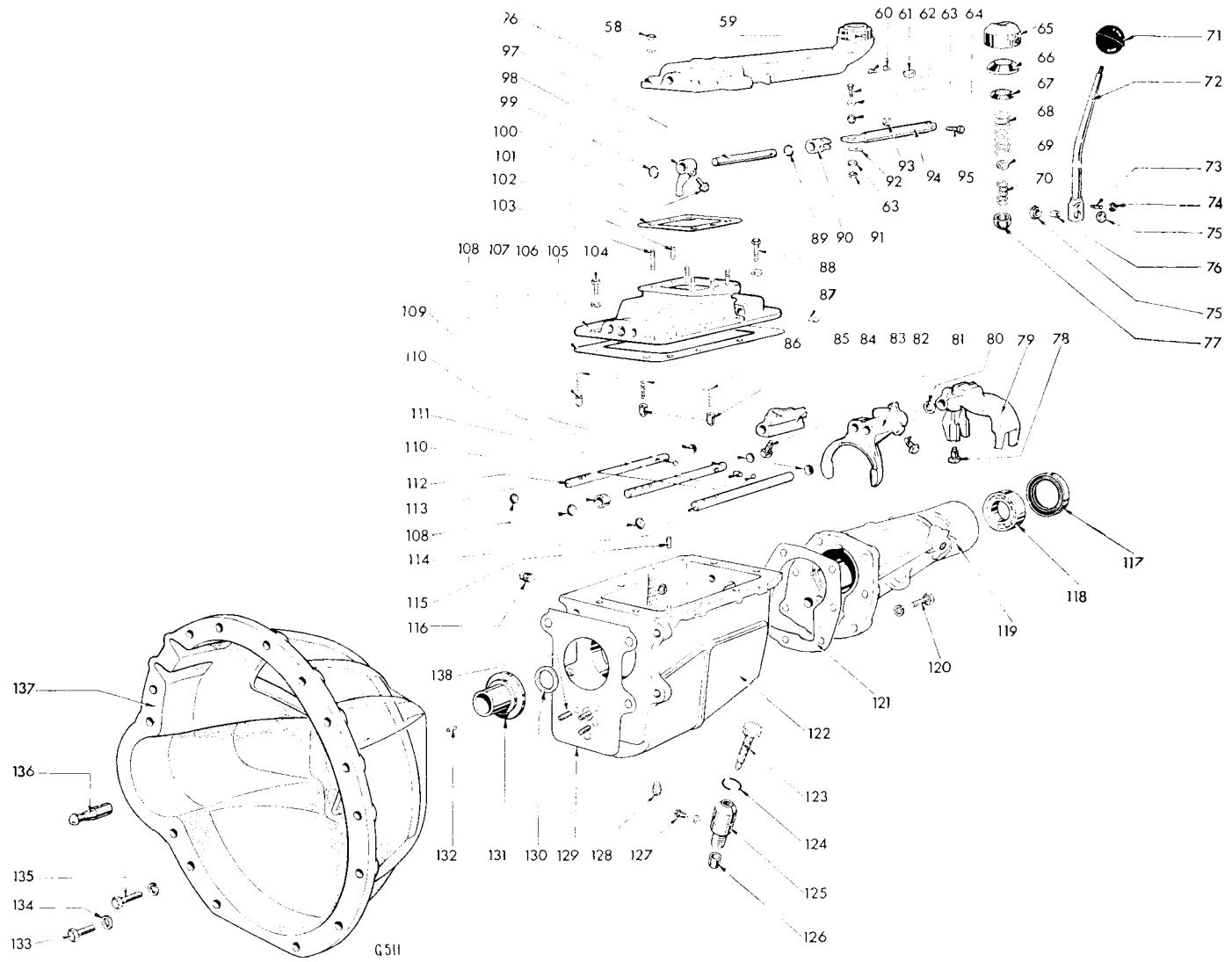


Fig. 2. Gearbox details (Fixed parts)

Key to Fig. 2

58 Nut	85 Detent plungers	112 Reverse selector shaft
59 Locating pin	86 Springs	113 Sleeve
60 Screws	87 Plug	114 3rd/Top selector shaft
61 Reverse stop plate	88 Bolt	115 Dowel
62 Pivot bolt	89 Rubber "O" ring	116 Filler/level plug
63 Fibre washers	90 Coupling fork	117 Oil seal
64 "Metalastik" bush	91 Nyloc nut	118 Rear ballrace
65 Cap	92 Hollow pin	119 Rear extension
66 Cup	93 Nyloc nut	120 Bolt
67 Cup	94 Gear lever shaft	121 Joint washer
68 Spring	95 Setscrew	122 Gear casing
69 Snap ring	96 Top cover extension housing	123 Speedo driven gear
70 Spring	97 Gear lever shaft	124 Rubber "O" ring
71 Knob	98 Selector	125 Bearing
72 Gear lever	99 Rubber "O" ring	126 Oil seal
73 Reverse stop bolt	100 Taper locking pin	127 Locating bolt
74 Locknut	101 Joint washer	128 Drain plug
75 Nylon bushes	102 Dowel	129 Joint washer
76 Distance tube	103 Stud	130 Oil seal
77 Nylon sphere	104 Bolt	131 Oil seal housing
78 Taper locking pin	105 Top cover housing	132 Pin
79 1st/2nd selector fork	106 Joint washer	133 Bolt
80 Distance washer	107 Detent plunger	134 Copper washer
81 Taper locking pin	108 Welch plugs	135 Bolt
82 3rd/Top selector fork	109 1st/2nd selector shaft	136 Pivot pin
83 Taper locking pin	110 Interlock balls	137 Clutch housing
84 Reverse selector	111 Interlock plunger	138 Springs

DIMENSIONS AND TOLERANCES—continued

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Reverse Idler Gear					
Reverse idler gear					
No. of teeth		21			
Mainshaft reverse gear					
No. of teeth		34			
Spindle—Main diameter	0.6550	16.637			
	0.6555	16.650			
Bush I.D.	0.639	16.231			Finish in position to suit shaft dia. 0.6562" (16.667 mm.)
	0.643	16.332			
Bush O.D.	0.7805	19.825			
	0.7815	19.850			
Idler gear I.D.	0.7805	19.825			
	0.7815	19.850			
Spindle spigot diameter	0.5613	14.257			
	0.5618	14.270	0.0002	0.005	
Bore in casing	0.5620	14.275	0.0015	0.038	
	0.5628	14.295			
Mainshaft Gears and Bushes					
3rd speed gear—No. of teeth		22			
3rd speed gear I.D.	1.0935	27.775			
	1.0945	27.800	0.0007	0.018	
3rd gear bush O.D.	1.0908	27.706	0.0047	0.118	
	1.0928	27.757			
3rd gear bush I.D.	0.875	22.225			
	0.876	22.500	0.0012	0.031	
			0.0027	0.068	
3rd speed gear hub width	0.996	25.298			
	0.998	25.349	0.002	0.051	End float of gear on bush
3rd gear bush length	1.000	25.400	0.006	0.152	
	1.002	25.451			
2nd speed gear—No. of teeth		26			
2nd speed gear I.D.	1.0935	27.775			
	1.0945	27.800	0.0007	0.018	
2nd gear bush O.D.	1.0908	27.706	0.0047	0.118	
	1.0928	27.757			
2nd gear bush I.D.	0.875	22.225	0.0012	0.031	
	0.876	22.500	0.0027	0.068	
2nd speed gear hub width	0.996	25.298			
	0.998	25.349	0.002	0.051	End float of gear on bush

DIMENSIONS AND TOLERANCES—continued

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Mainshaft Gears and Bushes —continued					
2nd gear bush length	1·000	25·400	0·006	0·152	
	1·002	25·451			
2nd/3rd gear thrust washer thickness	0·152	3·861			Alternative washer thickness 0·161"/0·163" (4·089/4·139 mm.)
	0·154	3·912			
3rd gear circlip washer thickness	0·122	3·099			
	0·124	3·149			
2nd gear thrust washer thickness	0·122	3·099			
	0·124	3·149			
1st/2nd synchro hub width	0·692	17·577			
	0·702	17·831			
Split collars width	0·1505	3·823			
	0·1510	3·835			
Split collar groove width	0·152	3·861			
	0·154	3·912			
1st speed gear—No. of teeth		29			
1st speed gear I.D.	1·0935	27·775	0·0018	0·046	
	1·0945	27·800	0·0033	0·084	
1st speed gear hub width	0·996	25·298			
	0·998	25·349			
1st gear thrust washer width	0·122	3·099			
	0·124	3·149			
Centre ballrace width	0·748	18·999			
	0·750	19·050			
Centre ballrace circlip washer		See table			

CENTRE BALLRACE-CIRCLIP WASHER

PART No.	THICKNESS	
	in.	mm.
143289	0·091/0·093	2·311/2·362
143290	0·094/0·096	2·387/2·438
143291	0·097/0·099	2·464/2·514
143292	0·100/0·102	2·540/2·591

GEARBOX

To Remove

Raise the vehicle clear of the ground and support on axle stands.

Disconnect the battery earth lead and drain the oil from the gearbox.

Unfasten and remove the seat cushions.

Remove the seats (4 bolts/seat), and facia support bracket (C) by removing the bolts (A) and (B) (Fig. 3).

Take out screws (E) and safety belt anchor bolts (F) and remove the transmission tunnel side finishers (G) (Fig. 4).

Remove the gearlever knob and take out the carpets.

Release the twelve screws and plates (R) and remove the gearbox cover (S) (Fig. 7).

Disconnect the propellor shaft (H) from the gearbox driving flange, and detach the slave cylinder (N), speedometer drive cable (P) and exhaust pipe attachment (K).

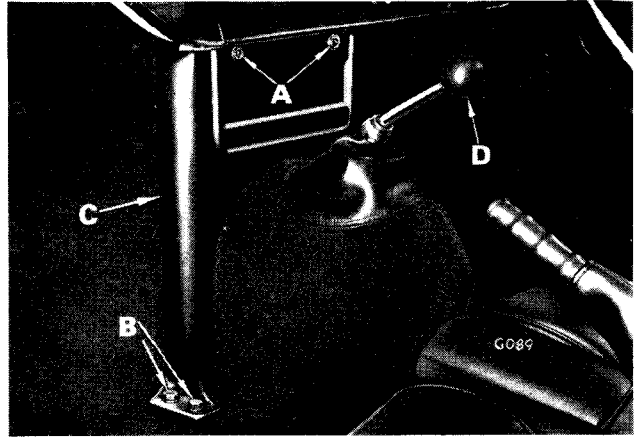


Fig. 3. Facia support bracket attachment

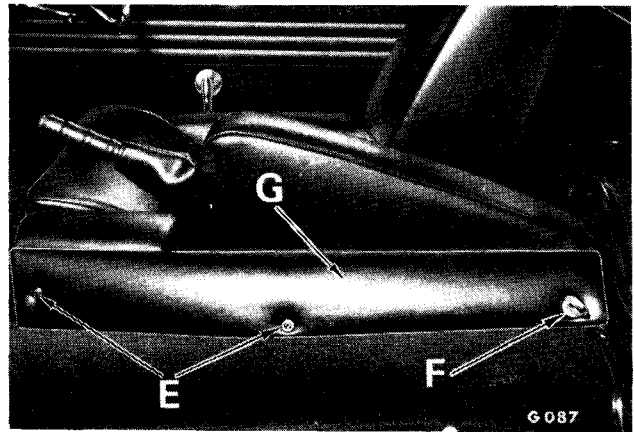


Fig. 4. Transmission tunnel side finishers

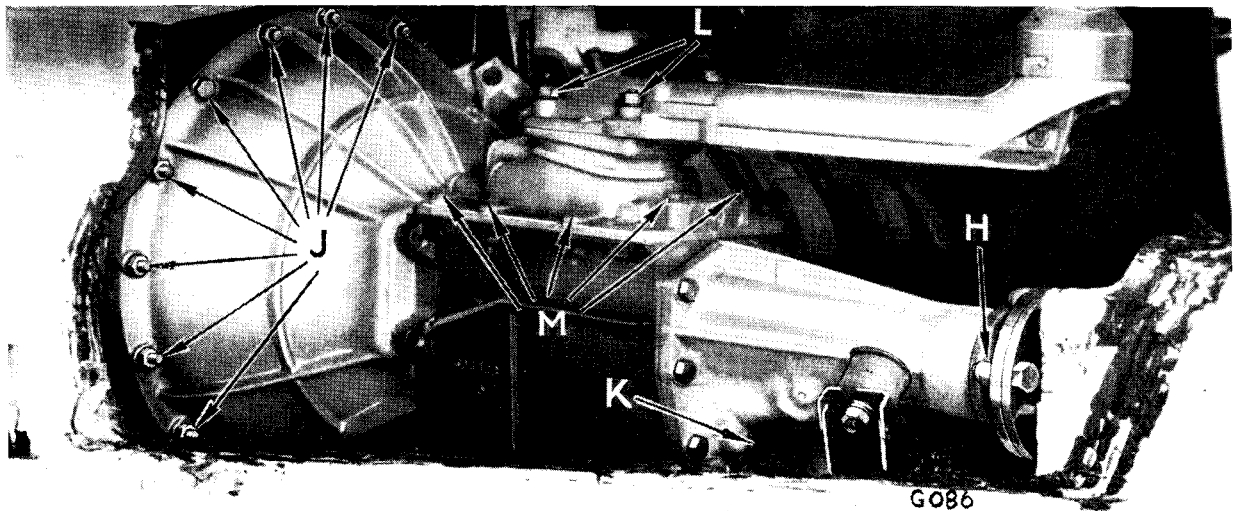


Fig. 5. View of gearbox unit from L.H. side

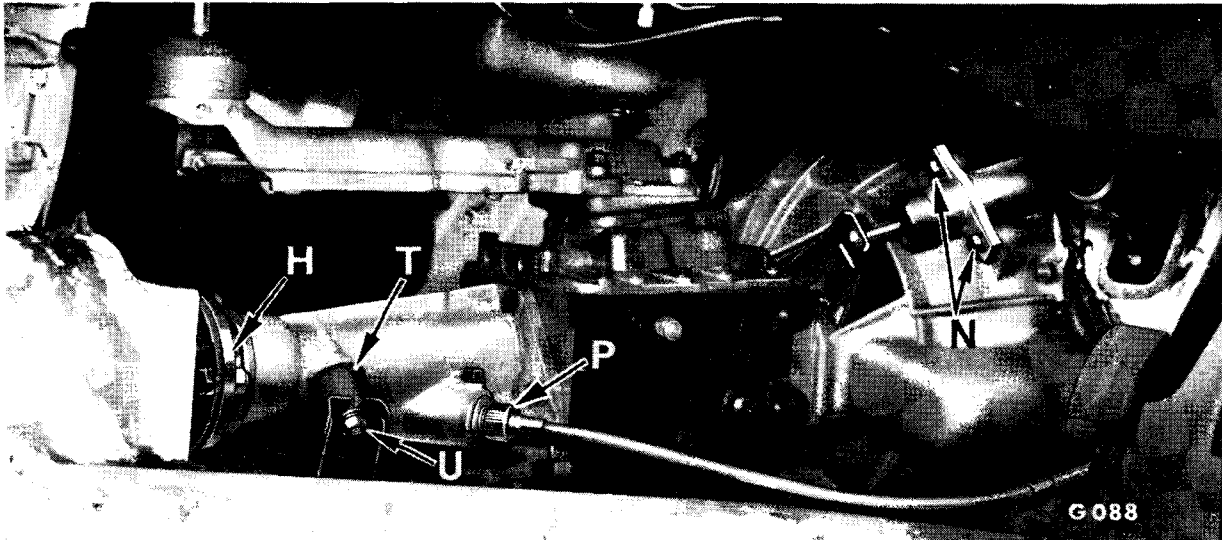


Fig. 6. View of gearbox unit from R.H. side

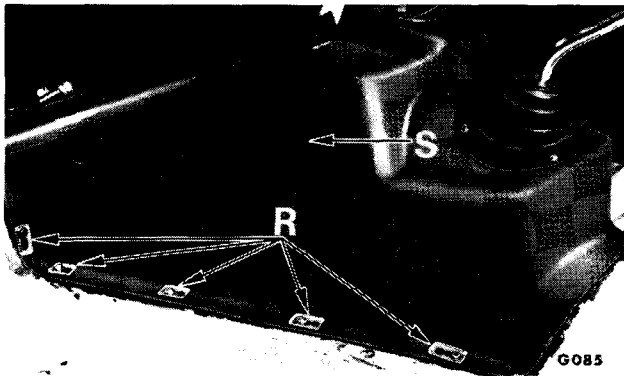


Fig. 7. Gearbox cover attachments

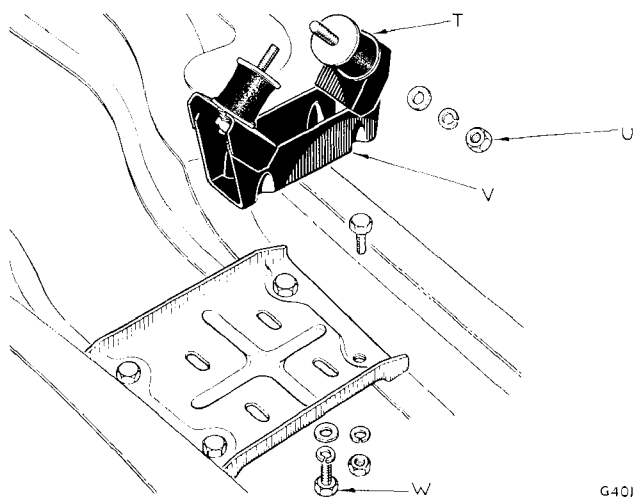


Fig. 8. Rear mounting details

Select first gear, unscrew nuts (L), bolts (M) and remove the gearbox top cover and extension assemblies. Fit a cardboard cover over the gearbox aperture to prevent the ingress of foreign matter.

Unscrew the nuts (U) and working beneath the vehicle and release the mounting bracket (V) (2 bolts (W)), (Fig. 8).

Place a jack under the sump and support the engine.

Detach the clutch-housing flange attachments and raise the engine until the gearbox can be withdrawn. Raise the rear end of the gearbox and manoeuvre the clutch housing under the passenger side parcel shelf.

To Refit

Reverse the removal procedure, exercising caution to prevent the gearbox hanging on the input shaft whilst fitting it to the engine.

Refill the gearbox with oil.

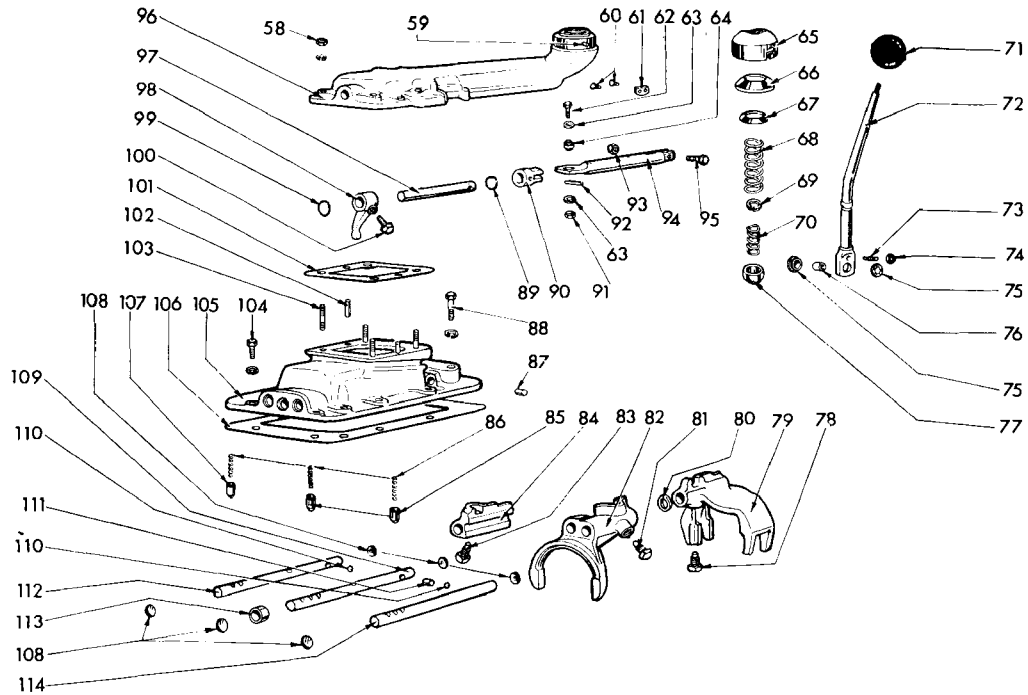


Fig. 9. Top cover details

TOP COVER

To Remove

Remove the fascia support bracket, gearbox cover and carpet as described on page 2-207.

Select first gear, unscrew nuts (58) and remove the top cover extension assembly. Unscrew bolts (88) and (104) and lift off top cover assembly.

To Refit

Select first gear and replace the top cover assembly with a new joint washer (106) ensuring that the reverse actuator (6) is correctly located in the reverse selector (84). Secure the top cover to the gearbox with the bolts (88) and (104).

Refit the top cover extension assembly with a new joint washer (101) and secure with nuts (58).

Refit the gearbox cover, carpet, fascia support bracket and gearlever knob.

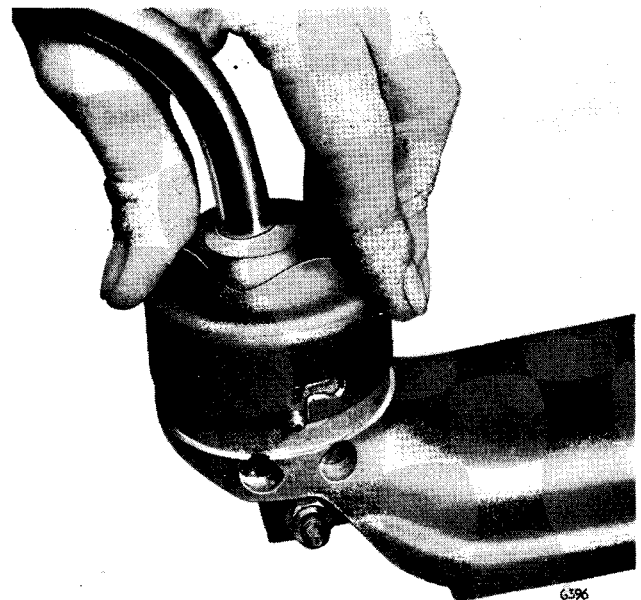


Fig. 10. Releasing the gearlever cap

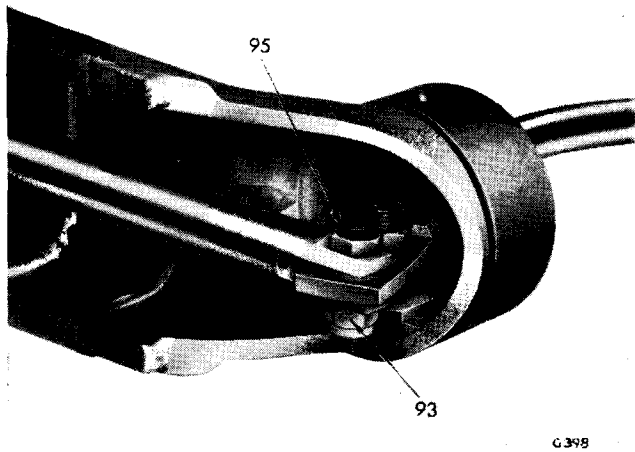


Fig. 11. Gearlever attachment

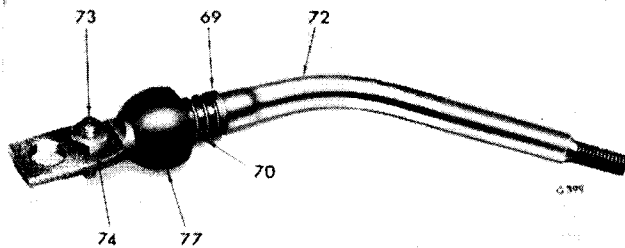


Fig. 12. Gearlever assembly

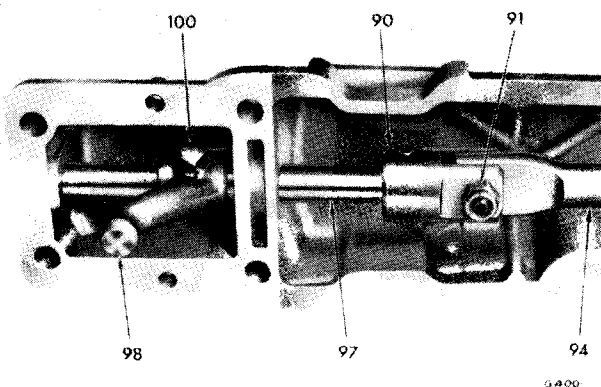


Fig. 13. Selector and coupling attachments

Dismantling

Release cap (65) as shown on Fig. 10. Remove the nyloc nut (93) and bolt (95) releasing the shaft (94) from the gearlever (72) (Fig. 11).

Lift the lever assembly out of the extension and remove the cups (66) and (67) together with the outer spring (68).

Remove the snap ring (69) from the gearlever, and detach the inner spring (70) and nylon sphere (77). Remove the two countersunk screws (60) and detach the reverse stop plate (61). Unscrew reverse stop bolt (73) from gear lever.

Remove the threaded taper locking pin (100) and withdraw the shaft (97) from the extension housing (96) and selector (98).

Remove the rubber "O" rings (89) and (99) from the extension housing bores (Fig. 14).

Unscrew the nut (91) and remove the pivot bolt (62) from the coupling fork (90). Withdraw the shaft (94) from the coupling together with fibre washers (63).

Detach the coupling fork (90) from shaft (97) by drifting out the hollow spring steel pin (92).

Dismantle the selector shaft and fork assemblies by driving out the plugs (108) with a $\frac{1}{8}$ " (3.17 mm.) dia. pin punch as shown in Fig. 15, ensuring that the selector shafts are clear.

Remove the threaded taper locking pins (78), (81) and (83) from the selector shafts and forks.

Push the first/second selector shaft (109) out of the cover and release items (79), (80) and (113). Remove the two interlock balls (110) and plunger (111).

Push the third/top selector shaft (114) out of the cover releasing the fork (82).

Push the reverse selector shaft (112) out of the cover and release item (84).

Shake out items (85), (107) and (86).

Re-assembly

Insert the plungers (85) and (107) and springs (86) into the cover, slide the third/top selector shaft (114) into the front end of the cover (105). Whilst feeding the shaft into position, press down on the selector plunger, thus enabling the shaft to pass over it and through the appropriate selector fork. Continue to insert the shaft until its middle indent registers with the plunger, i.e., the neutral position.

Repeat the procedure with the "reverse" shaft (112) and selector (84) until this shaft has also reached the neutral position.

Insert the interlock plunger (111) into the first/second selector shaft (109) and assemble the selector fork (79), sleeve (113) and washer (80) into the cover by adopting a similar procedure, ensuring that the shaft also passes through the third/top selector fork (82).

Before pushing the shaft (109) to its neutral position, insert the two interlock balls (110) into the transverse bore connecting the shaft bores at the rear of the casting as shown on Fig. 17, then push the shaft further into the cover until the selector plunger registers with the middle indent, and the interlock balls and plunger are retained by the shafts.

Secure the selector (84) and forks (79) and (82) to the shafts (112), (109) and (114) with new taper locking pins (83), (81) and (78). Using sealing compound around the edges of the plugs (108) drive these into the ends of the selector shaft bores.

Secure the fork (90) to the shaft (97) with a new pin (92).

If necessary replace the "metalastik" bush (64) in the shaft (94), and using new fibre washers (63) secure the shaft to the fork with the bolt (62) and nyloc nut (91).

Fit new "O" rings (89) and (99) into the casing (96) and fit the shaft (97) through the bores of the casing and through the selector (98). Secure the selector to the shaft (97) using a new taper locking pin (100).

Assemble the reverse stop bolt (73) and lock-nut (74) and the nylon sphere (77), spring (70) and snap ring (69) to the gear lever.

Fit the reverse stop plate to the cover, securing with screws (60).

Place the gear lever assembly into the cover and fit two new bushes (75) to the gear lever. Fit the distance tube (76) and secure the lever to the shaft (94) with the bolt (95) and nyloc nut (93).

Assemble the spring (68), cups (66) and (67) and cap (65) over the lever.

Adjust the reverse stop plate (61) and bolt (73) in the neutral position of the first/second gate as shown in Fig. 16.

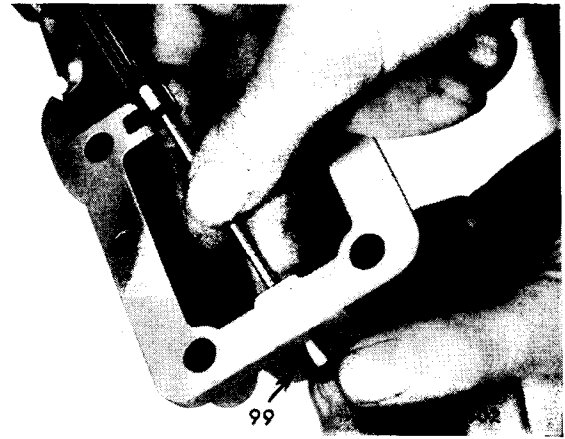


Fig. 14. Removing "O" rings from extension

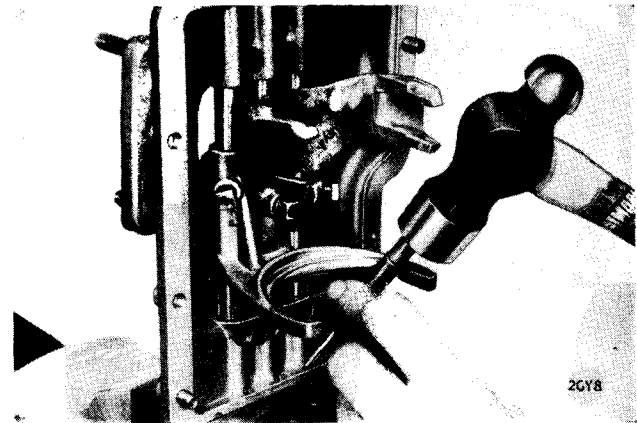


Fig. 15. Removing plugs from top cover

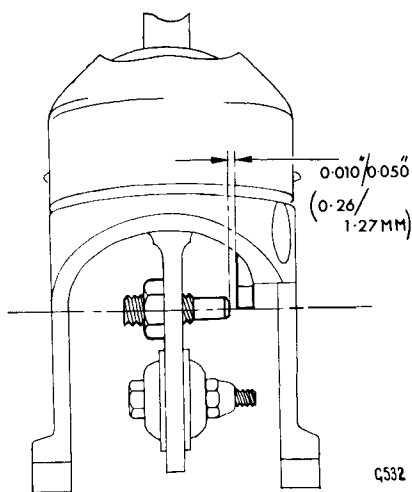


Fig. 16. Adjustment of reverse stop plate and bolt

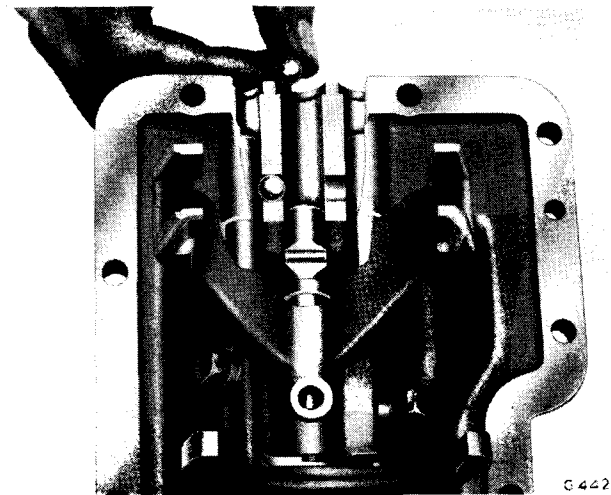


Fig. 17. Replacing interlock balls

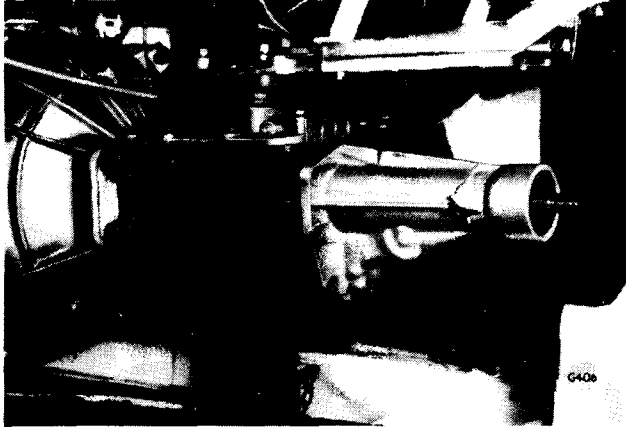


Fig. 18. Removal of rear extension

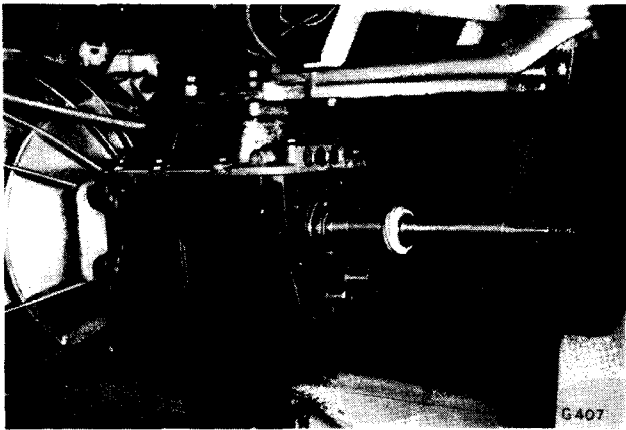


Fig. 19. Showing rear extension removed

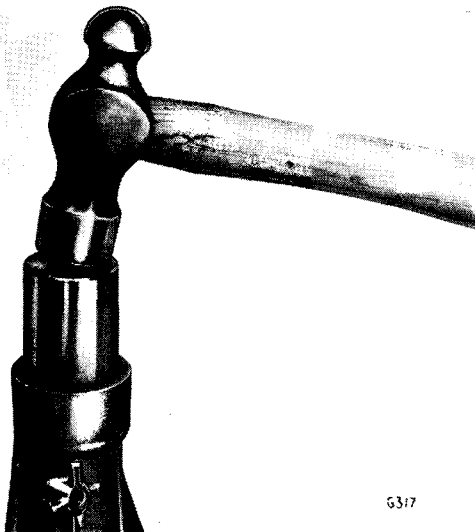


Fig. 20. Fitting ballrace and seal

REAR EXTENSION

Dismantling (In Situ)

Raise the vehicle on a ramp, drain the cooling system and remove the top hoses. Detach the exhaust front pipe from the manifold flange and gearbox, and drain the gearbox.

Take out the facia support bracket and gearbox cover as described on page 2-207.

Detach the clutch slave cylinder from the clutch-housing, the speedometer drive cable from the gearbox, and the propeller shaft from the gearbox driving flange.

Unscrew the nuts (U) and remove the spring and plain washers (Fig. 8).

Place a jack under the gearbox casing and raise the gearbox.

Using Tool No. S.337 to retain the driving flange (45), unscrew the nut (46) and withdraw the flange and spring washer.

Unscrew the mounting rubbers and take out the rear extension attachment bolts (120).

Exercising caution to prevent damage to the mounting lugs carefully withdraw the rear extension assembly and remove the washer (44). If necessary withdraw the speedometer drive gear (9).

Extract the seal (117) and drive out the ballrace (118).

Re-assembly

Reverse the dismantling procedure, replenish the cooling system, and refill the gearbox with oil.

SPEEDOMETER DRIVEN GEAR AND BEARING

Take out the fascia support bracket and gearbox cover as described on page 2-207.

Detach the speedometer driving cable, take out the locating bolt (127) and withdraw the speedometer driven gear and bearing assembly. Separate the driven gear (123) and bearing (125), remove the "O" rings (124) and extract the seal (126).

Press a new seal (126) into the bearing (125), fit the "O" rings (124) and insert the driven gear (123).

Fit the assembly into the rear extension and secure with the locating bolt (127) and spring washer.

Refit the speedometer drive cable, replace the gearbox cover, carpet, and fascia support bracket.

SPEEDOMETER CABLE

To Remove

Take out the fascia support bracket and gearbox cover as described on page 2-207.

Unscrew the speedometer cable ends from the gearbox and the instrument. Disconnect the cable clip and withdraw the cable into the engine compartment. Remove the inner cable from the outer cable.

To Refit

Smear the inner cable with grease to within 6" (152 mm.) from the instrument end and feed into the outer cable. Ensure that all excess grease is removed from the upper end, and reverse the removal procedure.

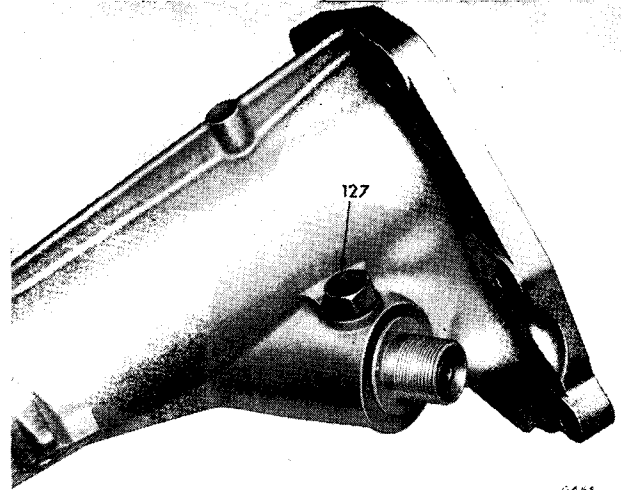


Fig. 21. Location of speedometer driven gear

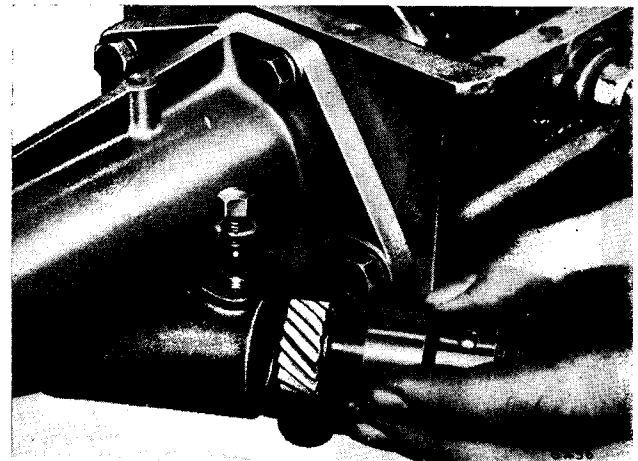


Fig. 22. Removing driven gear assembly

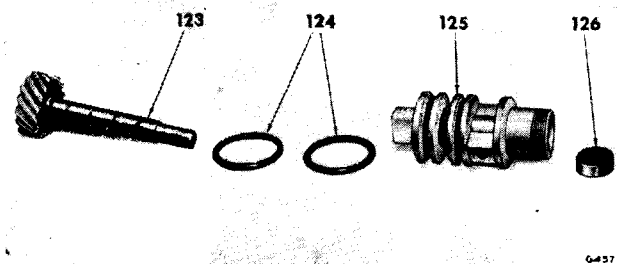


Fig. 23. Speedometer driven gear details

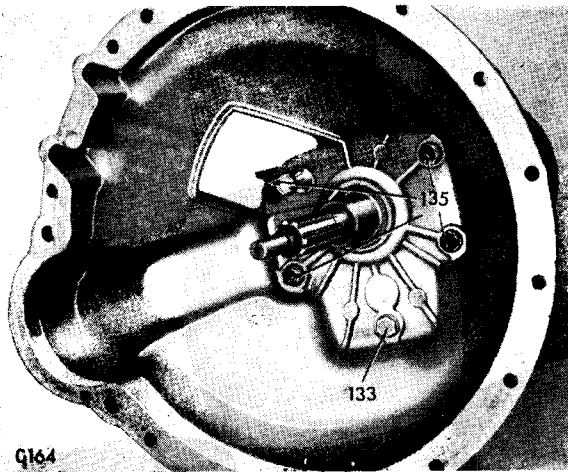


Fig. 24. Clutch housing attachments

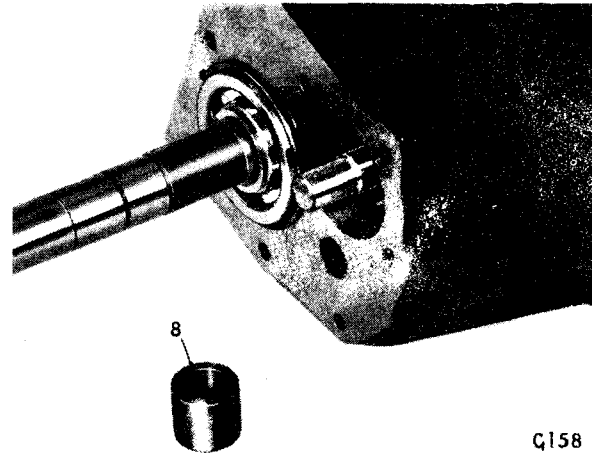


Fig. 25. Reverse idler distance tube

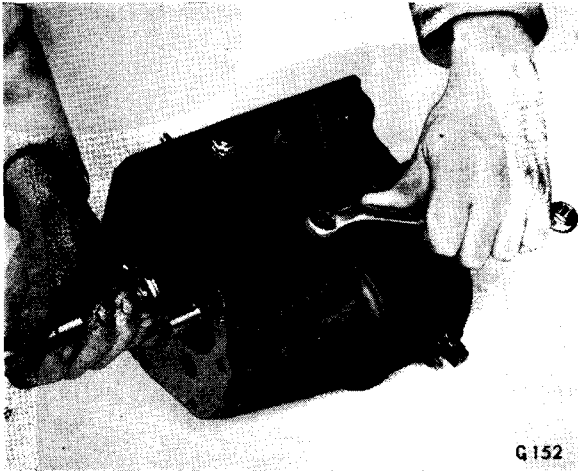


Fig. 26. Removing reverse spindle retaining bolt

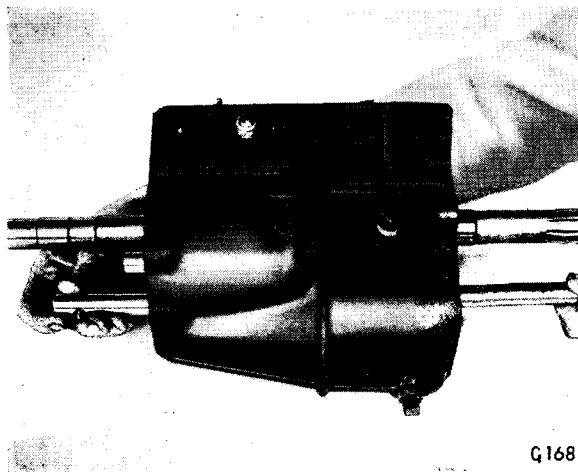


Fig. 27. Withdrawing countershaft spindle

GEARBOX DISMANTLING

Clutch Housing

Unclip the release lever from the pivot pin (136) and remove the lever and bearing.

Remove the bolts (133) and (135) to release the clutch housing. Take out springs (138).

Rear Extension

Remove the nut (46) and spring washer and withdraw the driving flange (45) from the mainshaft (43).

Unscrew the bolts (120) securing the extension (119) to the gearbox. Carefully withdraw the extension by lightly tapping the mounting lugs with a hide-faced hammer. Remove the paper joint washer (121), and the distance washer (44) from the mainshaft.

Take out the retaining bolt (1) and withdraw the reverse spindle (2) and distance tube (8).

If necessary, eject the ballrace (118) and seal (17) from the extension.

Countershaft

Withdraw the countershaft and retain the needle roller bearings by inserting a length of tubing 0.655" (16.64 mm.) O/D x 6.5" (165 mm.) long.

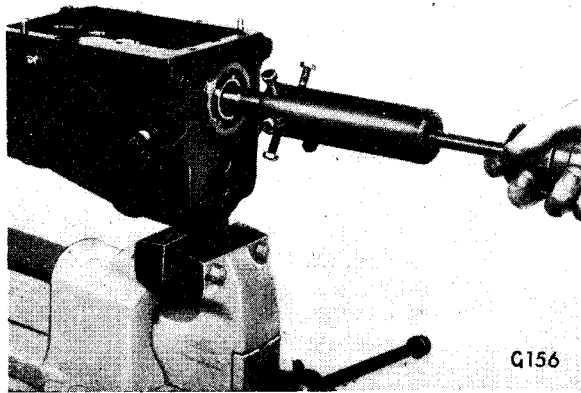


Fig. 28. Removing input shaft

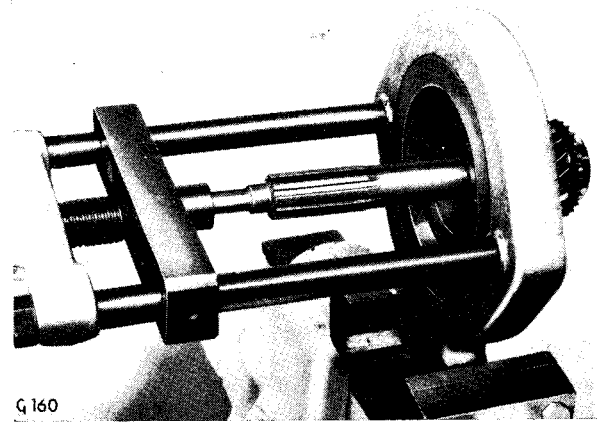


Fig. 29. Withdrawing input shaft ballrace

Input Shaft

Utilizing Churchill Tool No. S.4235A-2, withdraw the input shaft assembly from the gearbox. Shake out the roller bearing (42) and remove the baulk ring (36).

Remove the circlip (37) and snap ring (38). Using Tool No. S.4221A and adaptor No. S.4221A-19/1, extract the ballrace (29) and oil thrower (40), Fig. 29.

Mainshaft and Gears

Fit the abutment plate, Tool No. S.4221A-19, and remove the snap ring (12), circlip (10) and distance washer (11). Using Tool No. S.4221A and adaptor No. S.4221A-19/1, withdraw the ballrace (13) and speedometer drive gear (9). Remove the abutment plate.

Tilt the mainshaft assembly and remove it from the gearbox (Fig. 32)

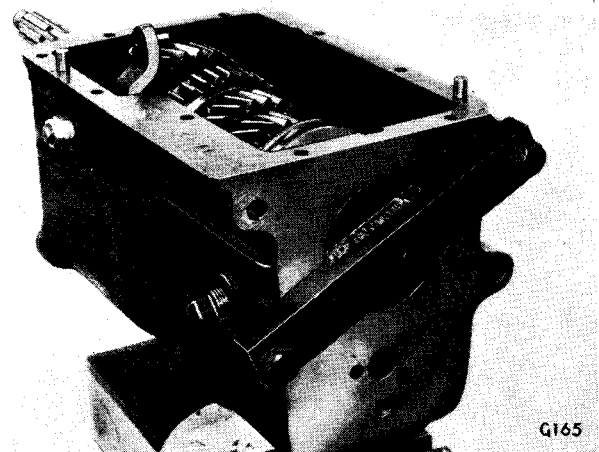


Fig. 30. Abutment plate fitted to gearbox

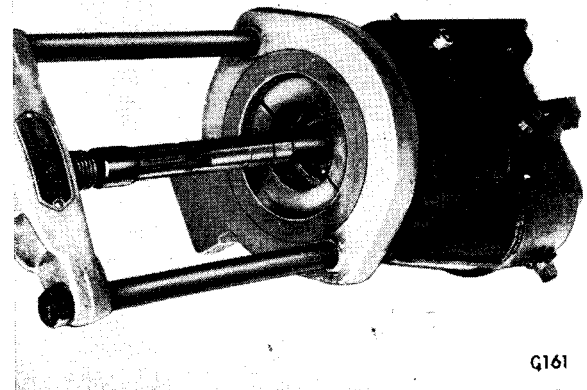


Fig. 31. Withdrawing mainshaft ballrace

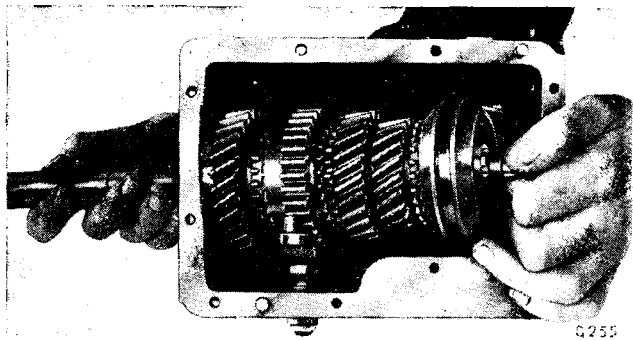


Fig. 32. Removing mainshaft assembly

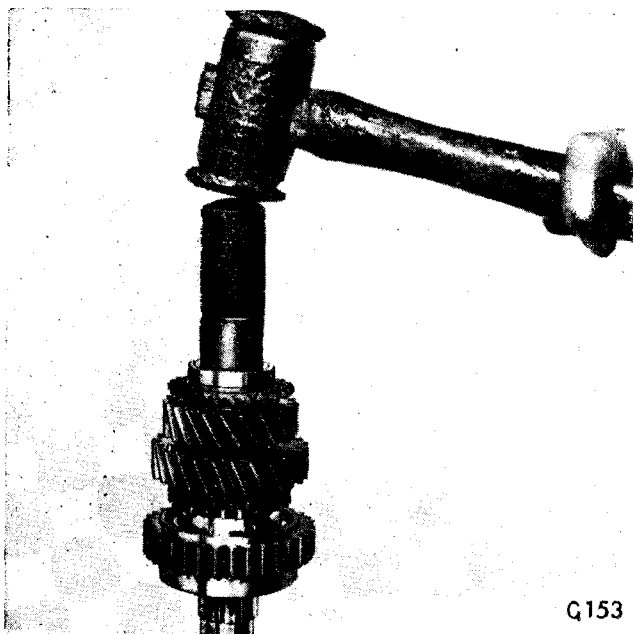


Fig. 33. Removing mainshaft circlip

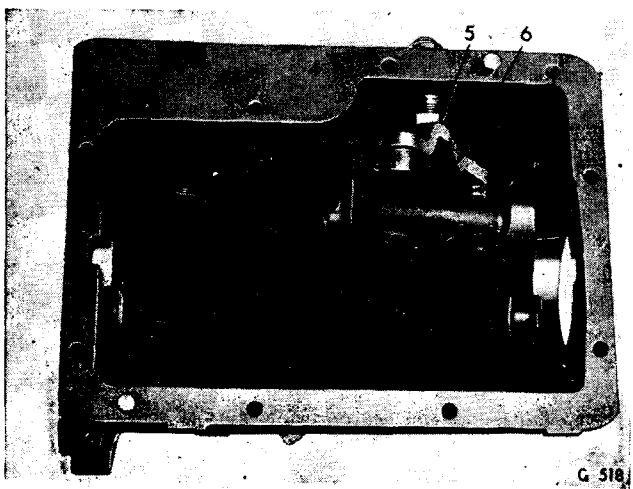


Fig. 34. Reverse actuator and pivot

Remove:—

- Third/top synchro unit.
- Third gear baulk ring (32).
- Thrust washer (14).
- First speed gear (15)
- First gear baulk ring (16).

Using Tool No. S.144, remove the circlip (30) (Fig. 33).

Take off:—

- Washer (29).
- Third speed gear (28).
- Bush (27).
- Thrust washer (26).
- Second speed gear (24).
- Bush (25).
- Thrust washer (23).
- Second gear baulk ring (22).
- First/second synchro unit.
- Split collars (17).

Synchro Units

Place the unit in a small box to prevent losing the spring loaded balls, and press the hub (35) or (21) through the sleeve (31) or (18).

Countershaft

Lift the countershaft assembly out of the gearbox and take out the thrust washers (49) and (57).

If necessary shake-out the needle rollers (51) and (55) and prise out the retaining rings (50), (52), (54) and (56).

Reverse Idler gear and Actuator

Take out the reverse idler gear (7), unscrew the nut (4), remove the actuator (6) and pivot pin (5).

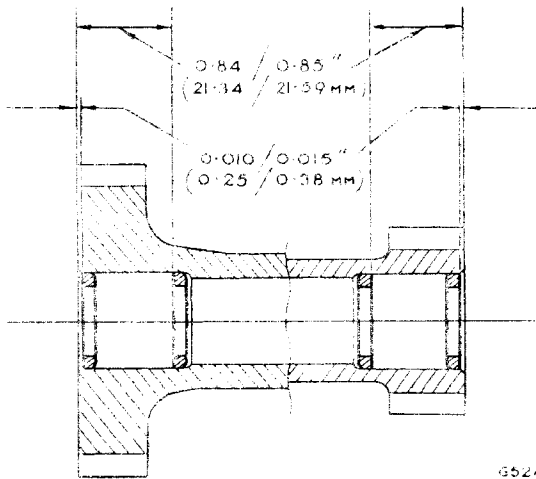


Fig. 35. Dimensions for fitting countershaft needle roller retaining rings

GEARBOX ASSEMBLY

Thoroughly clean and carefully examine the gearbox components, renew all defective and doubtful items and proceed to re-assemble as follows:

If necessary fit new retaining rings (50), (52), (54) and (56) to the dimensions shown in Fig. 35. Replace the needle rollers (51) and (55), smear them with heavy grease and insert the retaining tube.

Smear the steel face of the front thrust washer (57) with heavy grease and locate in the gear-casing with the tag in the recess provided. Insert the end of the countershaft spindle through the casing to centralise the thrust washer.

Lower the countershaft cluster assembly into the gearbox, fit the rear thrust washer (49) and insert the spindle (48).

Measure the countershaft end float as shown in Fig. 37. Adjust the end float to $0.007/0.013$ " ($0.178/0.330$ mm.) by selective use of thrust washers. If it is necessary to reduce the thickness of a thrust washer **DO NOT REMOVE METAL FROM THE BRONZE FACE.**

Insert the needle roller retaining tube, eject the countershaft spindle (48) and allow the cluster assembly to drop to the bottom of the gearbox.

Reverse Idler Gear

Screw the pivot pin (5) into the reverse actuator (6) until a thread protrudes through the attached boss on the lever, then assemble this into the gearbox and secure it with a nut (4) and plain washer.

Position the reverse idler gear in the casing as shown in Fig. 38.

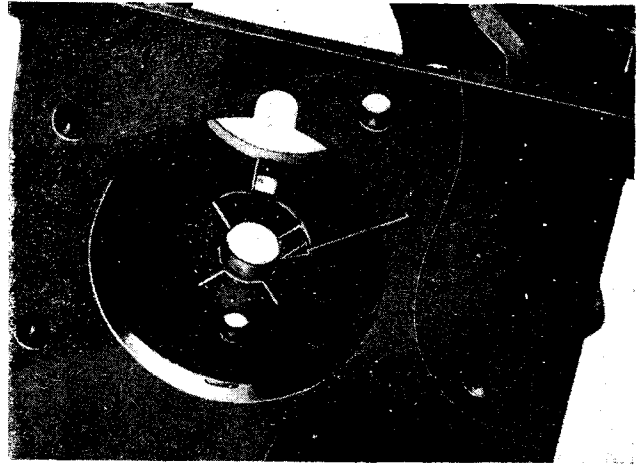


Fig. 36. Front thrust washer fitted in casing

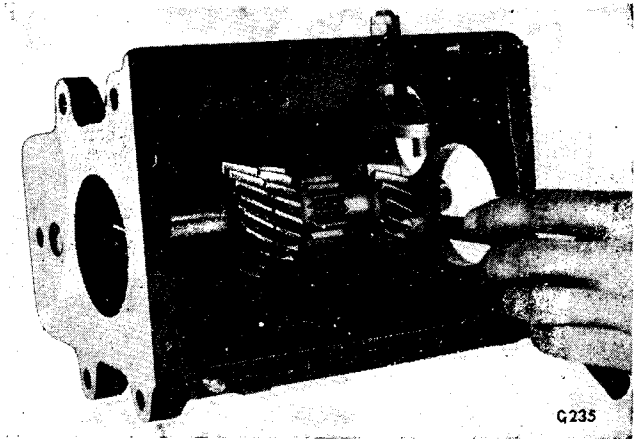


Fig. 37. Measuring countershaft end-float

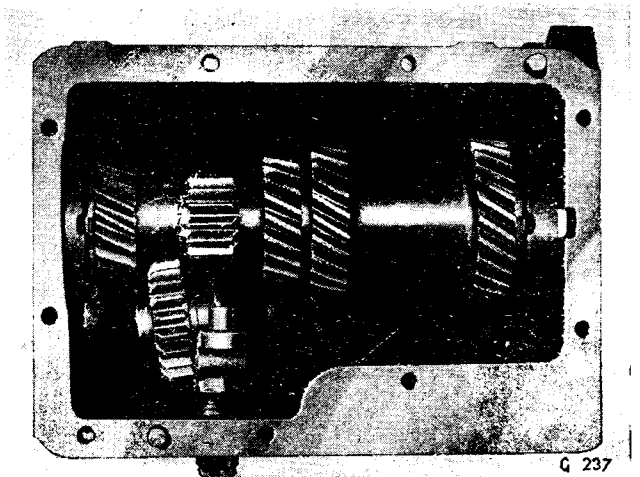


Fig. 38. Reverse idler gear in position

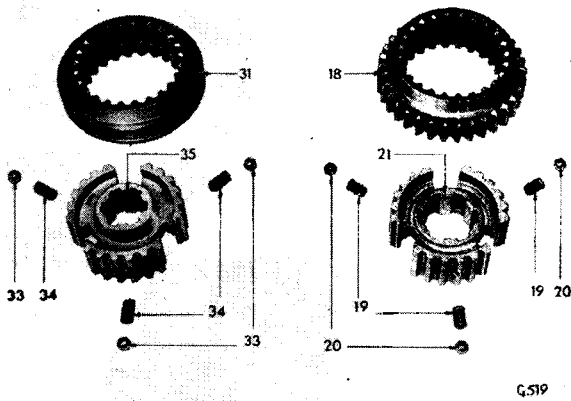


Fig. 39. Synchro unit details

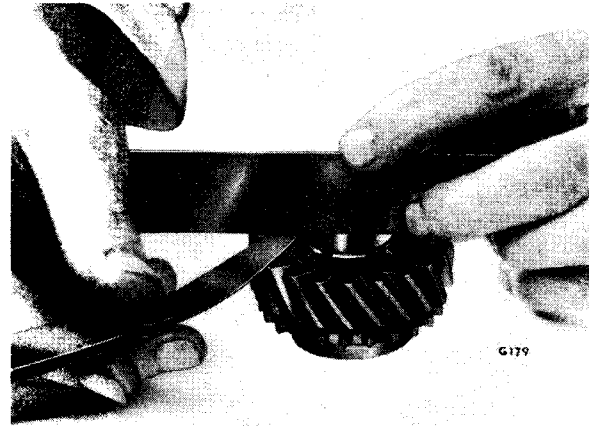


Fig. 40. Measuring 3rd gear end-float on bush

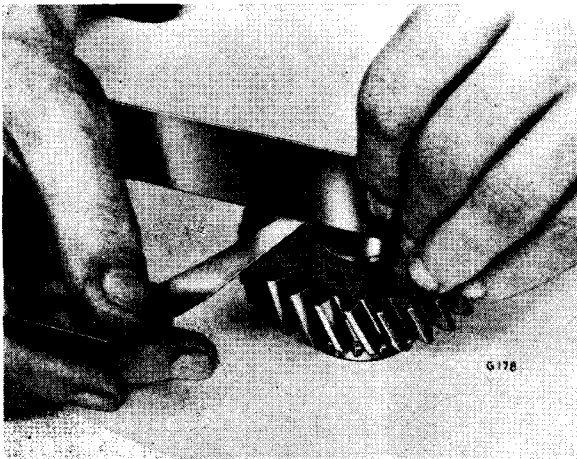


Fig. 41. Measuring 2nd gear end-float on bush

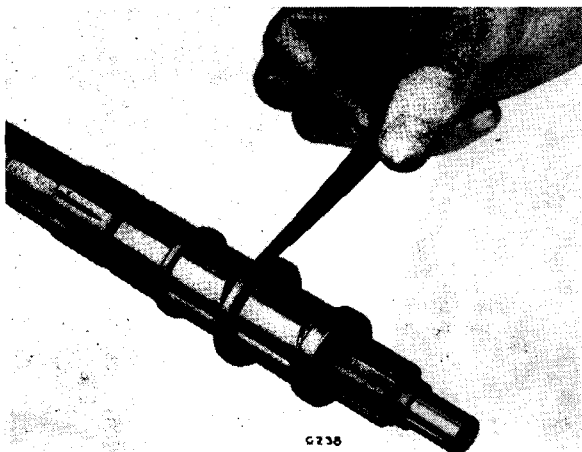


Fig. 42. Measuring end-float of bushes on mainshaft

Synchro Units

Assemble the synchro springs (34) and balls (33) to the 3rd/Top synchro hub. Fit the outer sleeve (31).

Repeat with 1st/2nd synchro unit.

Test the axial release loads which should be:—

3rd/Top: 19/21 lbs. (8-6/9-5 kg.);

1st/2nd: 19/21 lbs. (8-6/9-5 kg.).

NOTE: If the actual release loads differ from those specified, fit new springs or add shims beneath each synchro spring to give the correct loading.

2nd and 3rd Mainshaft Gear End Float on Bushes

Measure the end float of each gear on its respective bush as shown on Fig. 41. This should be 0.002" to 0.006" (0.05 to 0.15 mm.). Fit a new bush to increase float; decrease float by reducing bush length.

CAUTION: Reduced bush length will increase end float of bushes on mainshaft.

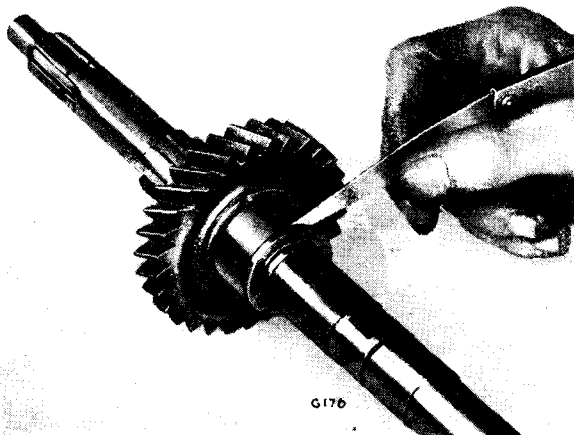


Fig. 43. Determining thickness of circlip washer

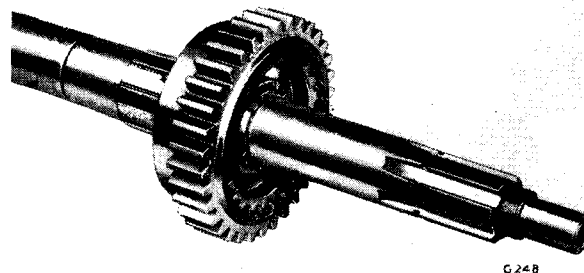


Fig. 44. 1st/2nd synchro unit fitted on mainshaft

Overall End Float of Bushes (Mainshaft)

Assemble the thrust washer (23), bush (25), thrust washer (26), bush (27) and washer (29) to the mainshaft. Secure the assembly with a discarded half-circlip (30) and measure the total end float of the bushes and thrust washers on the mainshaft (Fig. 46). If necessary, adjust the end float by selective use of thrust washers to give 0.004" to 0.010" (0.10 to 0.25 mm.).

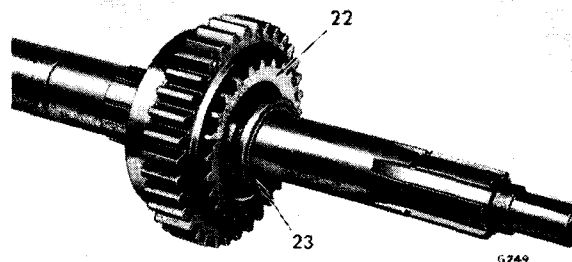


Fig. 45. 2nd gear baulk ring fitted

Determining Required Thickness of Circlip Washer (11)

Assemble the split collars (17), first speed gear (15), thrust washer (14), bearing inner race (or distance tube), distance washer (11) and discarded half circlip (10) to the mainshaft. Measure the gap as shown in Fig. 43, and adjust to give 0.000"/0.002" (0.00/0.050 mm.) by selective use of washers (11).

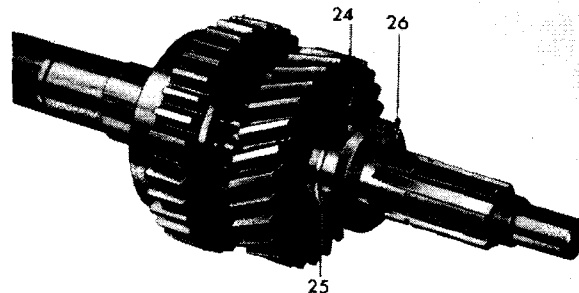


Fig. 46. 2nd gear, bush and 2nd/3rd gear thrust washer fitted on mainshaft

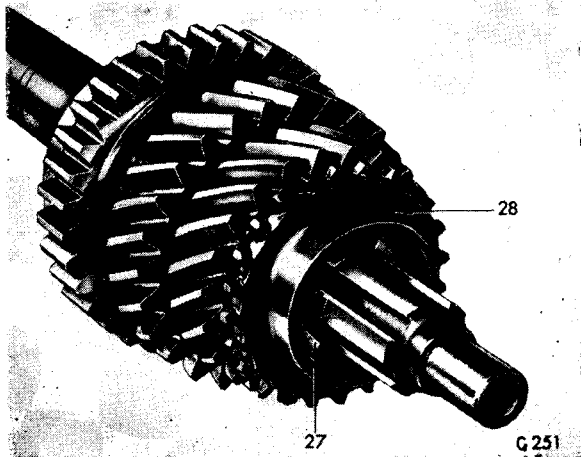


Fig. 47. 3rd gear and bush fitted on mainshaft

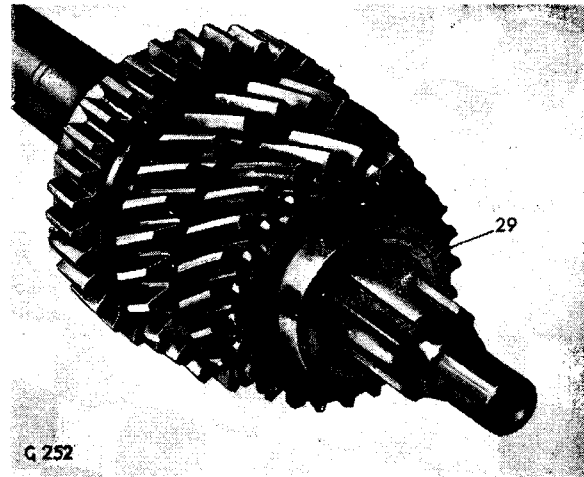


Fig. 48. Circlip washer fitted on mainshaft

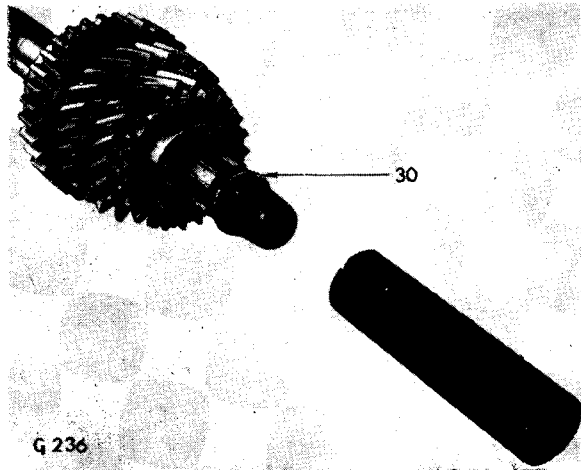


Fig. 49. Special tool for fitting mainshaft circlip

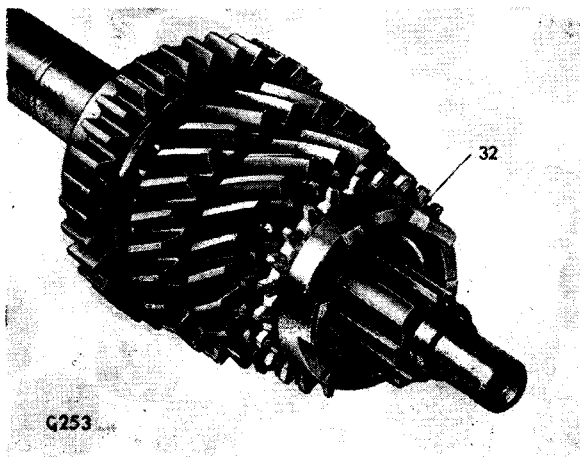


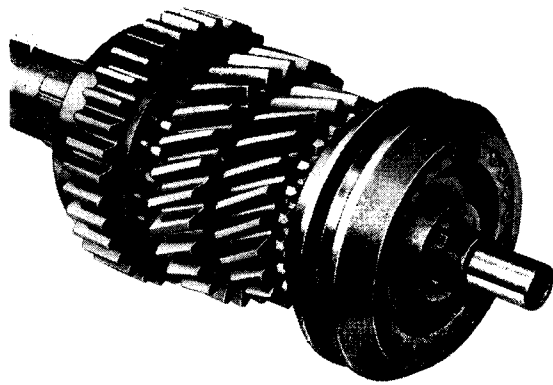
Fig. 50. 3rd gear baulk ring fitted

Mainshaft Assembly

Fit components to the mainshaft as follows:—

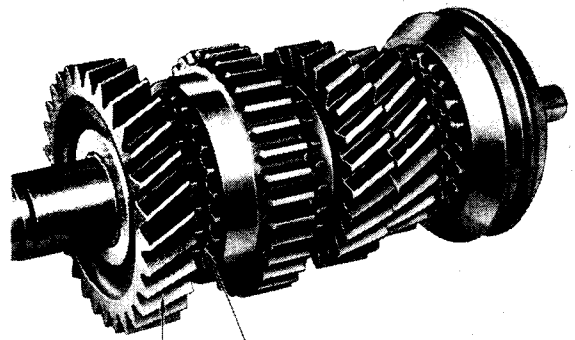
- First/second synchro unit.
- Second gear baulk ring (22).
- Thrust washer (23).
- Second gear bush (25).
- Second speed gear (24).
- Thrust washer (26).
- Third gear bush (27).
- Third speed gear (28).
- Washer (29).

- Circlip (30) (Using Tool No. S.145)
- Third/top synchro unit.
- Split collars (17).
- First gear baulk ring (16).
- First speed gear (15).



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Fig. 51. 3rd/Top synchro unit fitted on mainshaft



15 16

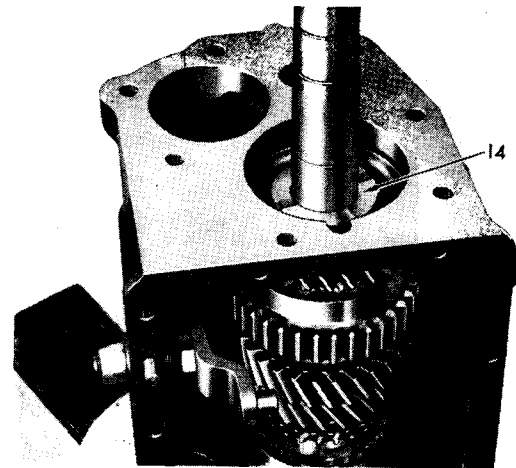
G 523

Fig. 52. 1st gear and baulk ring fitted on mainshaft

Place the mainshaft assembly in the gearbox and fit the abutment plate Tool No. S.4221A-19/2. Fit the thrust washer (14).

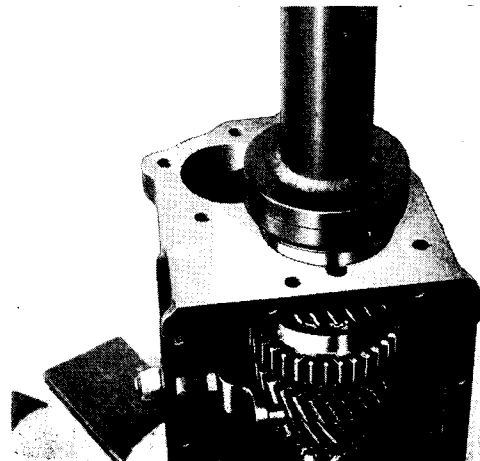
Up-end the gearbox and hold the abutment plate in a vice. Fit the snap ring (12) to the ballrace (13) and place the ballrace over the mainshaft. Ensure that the mainshaft is correctly located in the abutment plate and drive the ballrace home using Tool No. S.314/1 and adaptor No. S.4221A-19/3.

Fit the speedometer drive gear (9) and remove the abutment plate from the gearbox.



G257

Fig. 53. 1st gear thrust washer in position



G256

Fig. 54. Fitting mainshaft centre ballrace

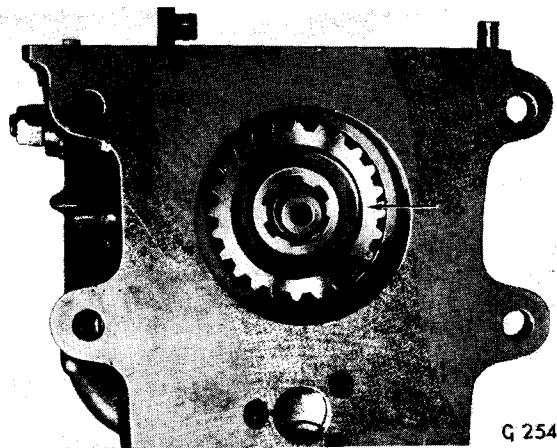


Fig. 55. Top gear baulk ring located

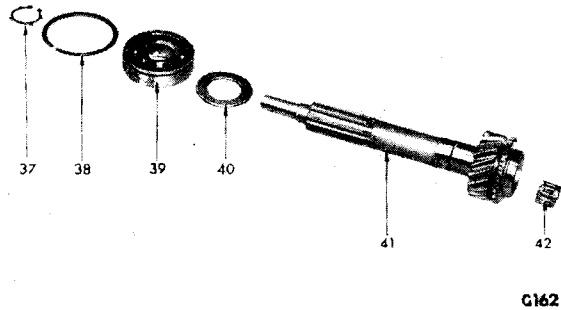


Fig. 56. Input shaft details

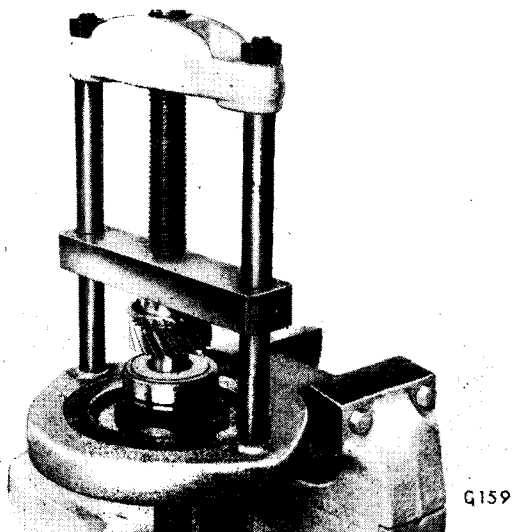


Fig. 57. Pressing ballrace onto input shaft

Input Shaft

Place the top gear baulk ring (36) into the 3rd/top synchro unit as shown on Fig. 55.

Using Tool No. S.4221A and adaptor S.4221A-19 press the ballrace (39) and oil thrower (40) onto the input shaft. Secure the ballrace with the circlip (37). Fit the snap ring (38) onto the ballrace and place the roller bearing (42) in the bore of the input shaft. Drive the input shaft assembly into the casing, ensuring that the baulk ring (36) is correctly located.

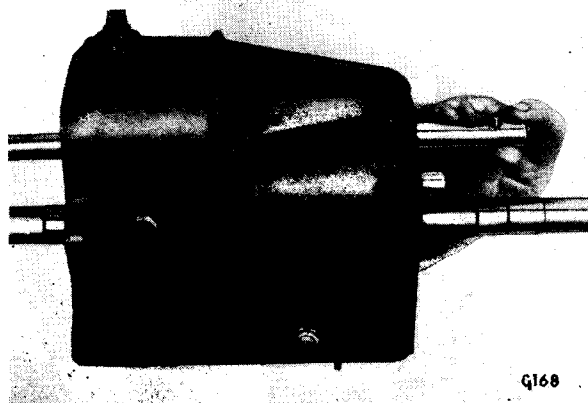


Fig. 58. Fitting countershaft spindle

Countershaft

Invert the gearbox, align the countershaft thrust washers and gear cluster and insert the spindle (48) from the rear.

Reverse Idler Shaft

Ensure that the reverse idler gear is correctly positioned, insert the spindle (2) and fit the distance tube (8).

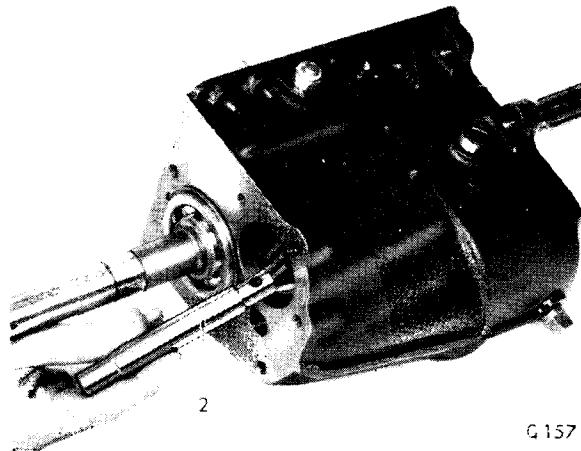


Fig. 59. Replacing reverse idler spindle (2)

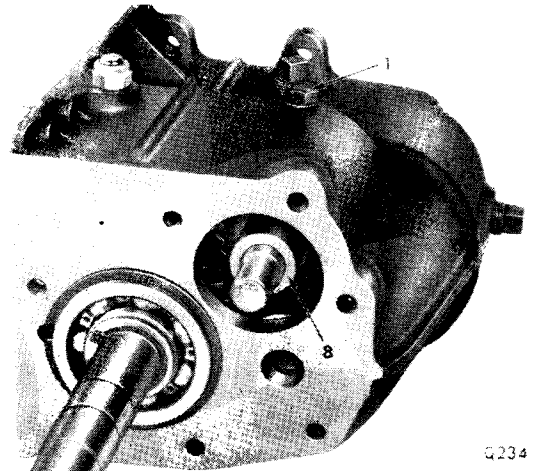


Fig. 60. Showing reverse idler locating bolt, and distance tube (8)

Rear Extension

Refit the ballrace (118) and seal (117) to the extension (119). Fit a new joint washer (121) to the rear face of the gearbox and place the washer (44) over the end of the mainshaft. Fit the rear extension assembly and secure with bolts (120). Replace the driving flange (45) and secure with the nut (46) and spring washer.

Assemble the bearing (125), oil seal (126), "O" rings (124) and driven gear (123). Fit the assembly to the extension housing and secure with the locating bolt (127).

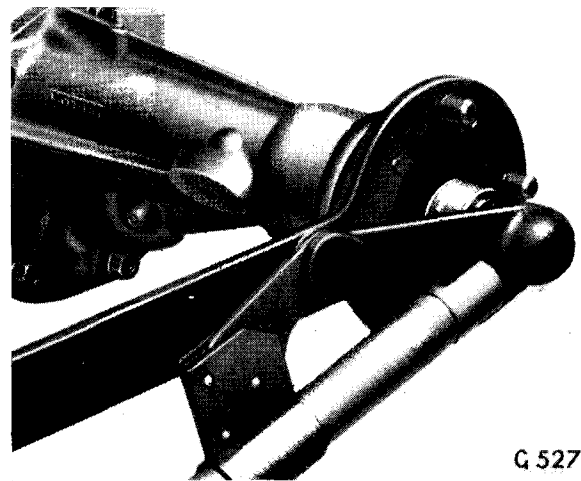


Fig. 61. Securing coupling flange

Clutch Housing

Insert the springs (138) into the three holes in the front face of the gearbox casing.

If necessary renew the oil seal (130) in the clutch housing (137). Fit a new joint washer to the front face of the gearbox, and secure the clutch housing with bolts (133) and (135), spring washers (134) and copper washer.

Refit the clutch throw-out bearing and sleeve, and release lever.

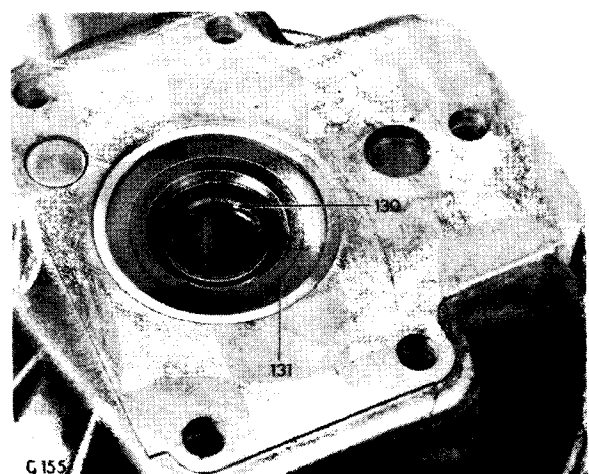


Fig. 62. Location of oil seal in clutch housing

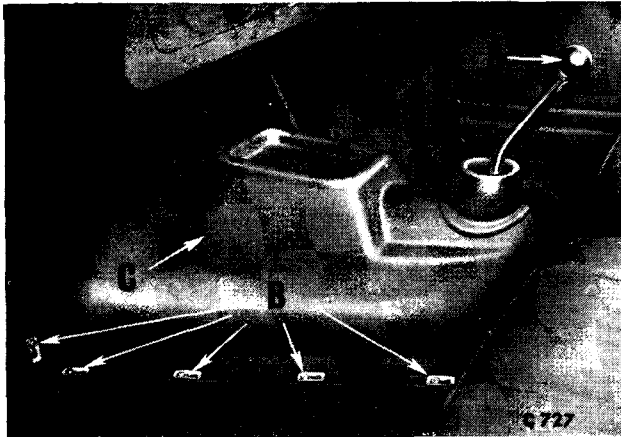


Fig. 63. Gearbox cover attachments

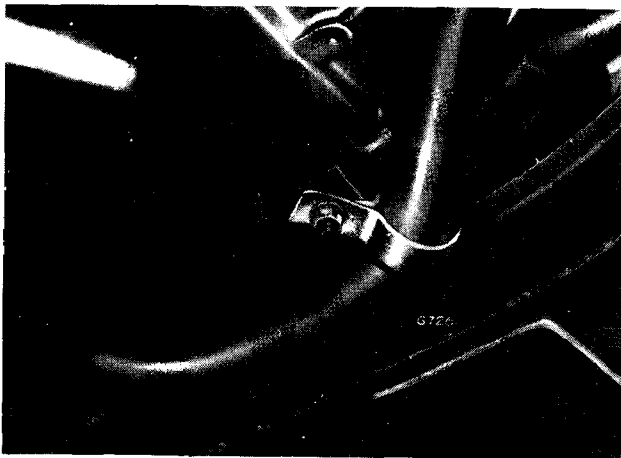


Fig. 64. Exhaust pipe front attachment

GEARBOX

Gearbox removal procedure, leaving the engine in position, is as follows:

To Remove

Raise the vehicle clear of the ground and support it on axle stands.

Isolate the battery and drain the oil from the gearbox.

Take out the front floor carpets, gearbox cover carpet and front seats (4 bolts/seat).

Unscrew the gear lever knob (A).

Release twelve screws and plates (B) and remove the gearbox cover (C).

Disconnect the propeller shaft (D) from the gearbox driving flange and detach the slave cylinder (E) and speedometer drive cable (F).

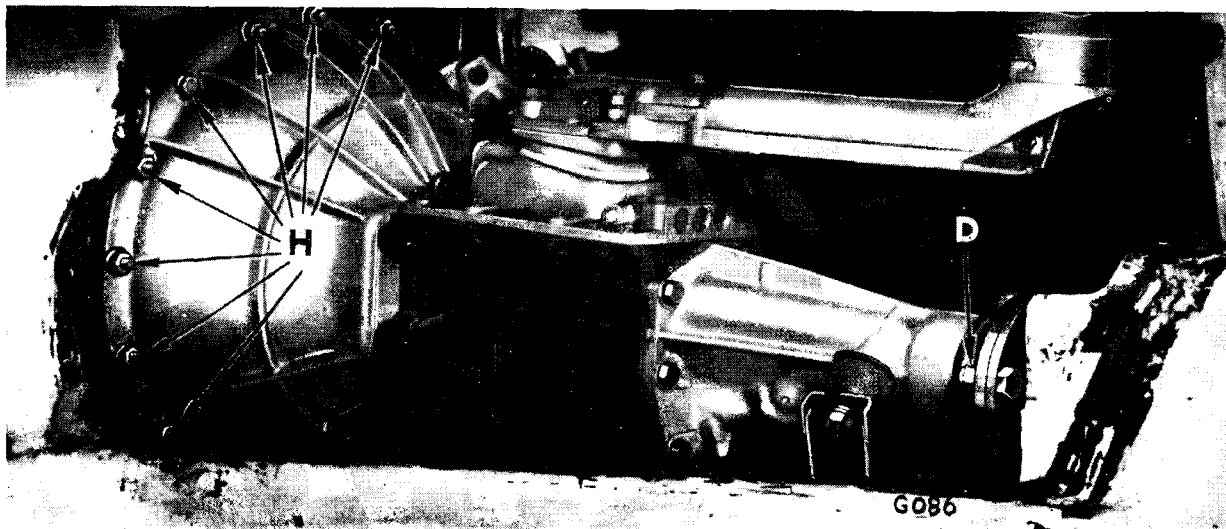


Fig. 65. View of gearbox from L.H. side

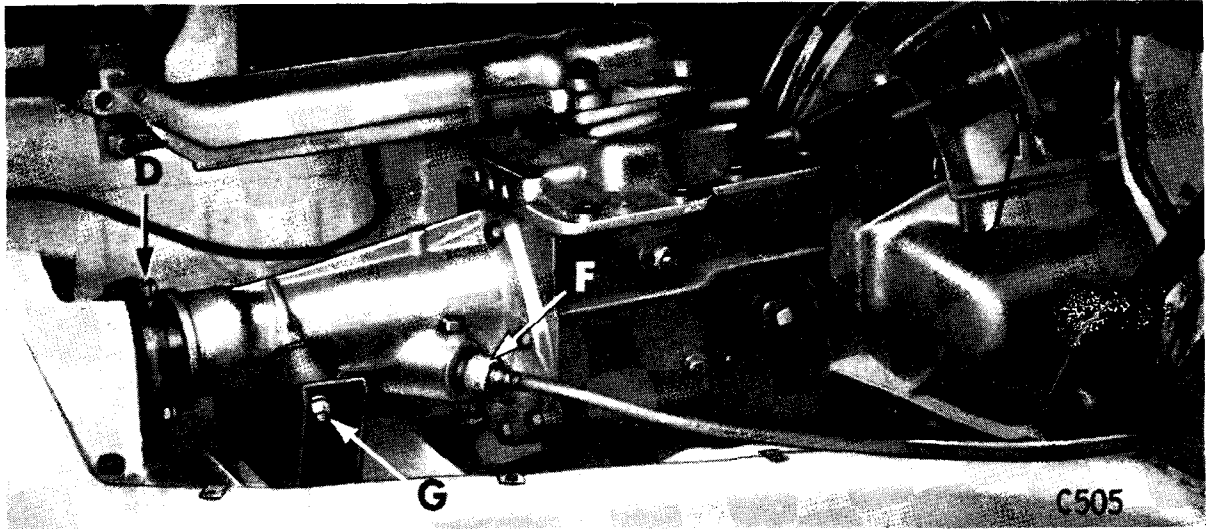


Fig. 66. View of gearbox from R.H. side

Unscrew the nuts (G) and place a jack under the sump to support the engine.

Take out the clutch-housing flange bolts (H) and release the exhaust pipe from the clutch-housing (Fig. 64).

Raise the engine and withdraw the gearbox rearwards.

To Refit

Reverse the removal procedure, exercising caution to prevent the gearbox hanging on the input shaft whilst fitting it to the engine. Refill the gearbox with oil.

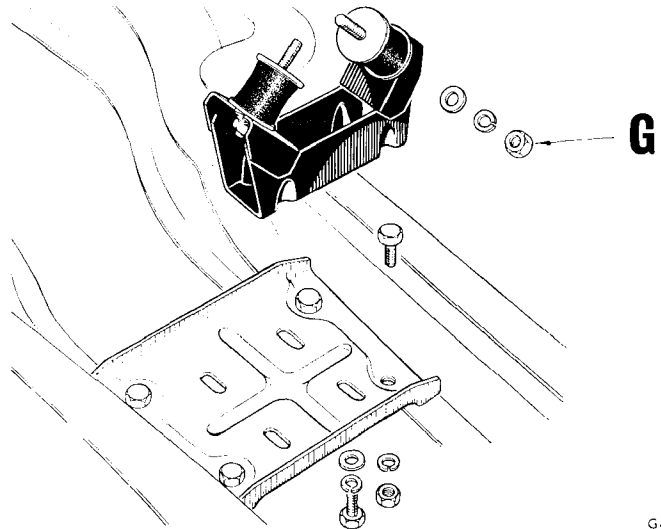


Fig. 67. Rear mounting details

G401

DIMENSIONS AND TOLERANCES

PARTS AND DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW	
	in.	mm.	in.	mm.
Pump				
Plunger diameter	0.3742	9.504	0.0002	0.005
	0.3746	9.514	0.0016	0.041
Pump body bore	0.3748	9.52	0.0002	0.005
	0.3758	9.545	0.0016	0.041
Pin for roller diameter	0.2497	6.342	0.0007	0.018
	0.2502	6.355	0.0022	0.056
Roller bore diameter	0.251	6.375	0.0007	0.018
	0.252	6.4	0.0022	0.056
Pump Roller Bush				
Outside diameter of bush	0.3736	9.49	0.0005	0.013
	0.3745	9.512	0.0023	0.058
Inside diameter of roller	0.375	9.525	0.0005	0.013
	0.3759	9.548	0.0023	0.058
Inside diameter of bush	0.251	6.375	0.0007	0.018
	0.2518	6.396	0.002	0.051
Outside diameter of pin	0.2497	6.342	0.0007	0.018
	0.2502	6.355	0.002	0.051
Relief Valve				
Relief valve plunger diameter	0.3122	7.93	0.0002	0.005
	0.3127	7.942	0.0013	0.033
Relief valve body bore diameter	0.3129	7.958	0.0012	0.005
	0.3135	7.963	0.0013	0.033
Operating piston diameter	0.8735	22.187	0.0003	0.008
	0.8742	22.205	0.002	0.051
Operating piston bores	0.8745	22.212	0.0003	0.008
	0.8755	22.237	0.002	0.051
Operating valve diameter	0.2494	6.335	0.0003	0.008
	0.2497	6.342	0.0012	0.03
Operating valve bore	0.2500	6.35	0.0003	0.008
	0.2506	6.365	0.0012	0.03
Gearbox Mainshaft				
Diameter at hub bush	0.9236	23.46	0.004	0.102
	0.9244	23.48	0.006	0.152
Bush internal diameter	0.9284	23.581	0.004	0.102
	0.9296	23.612	0.006	0.152
Diameter at sunwheel	0.873	22.174	0.003	0.076
	0.874	22.2	0.005	0.127
Inside diameter of sunwheel bush	0.877	22.276	0.003	0.076
	0.878	22.301	0.005	0.127
Diameter at steady bearing	0.562	14.275		
	0.5625	14.287		
Planet pin diameter: 0.802 to 1 ratio (25%)	0.4372	11.105		
	0.4375	11.112		
Miscellaneous				
Clutch movement from direct to overdrive .. .. .	.04	1.016		
	.06	1.524		
Hydraulic operation pressure	540—560 lb./sq. in. (35.853—37.259 kg./cm.)			
Ratio	0.802:1			

LAYCOCK DE NORMANVILLE OVERDRIVE

The overdrive is an additional gear unit, mounted on the rear face of the gearbox in place of the normal extension. When in operation, the unit provides a higher overall gear ratio than is available with the standard transmission. Reduced engine speed, resulting from the higher ratio, will reduce fuel consumption, increase engine life, and ensure greater driving comfort, providing the unit is used correctly.

The overdrive is operated by an electrical solenoid, controlled by a switch mounted on the steering column. An inhibitor switch, fitted in the electrical circuit, prevents engagement of overdrive in reverse, first and second gears.

Suggested minimum engagement speeds:	Top gear	.. .. .	40 m.p.h.
	Third gear	.. .. .	30 m.p.h.

Maximum disengagement speed: 4,800 r.p.m.

Disengagement of the overdrive at a speed higher than stated may cause damage from "over-revving".

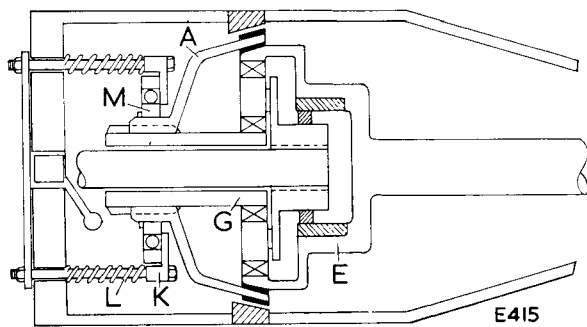


Fig. 1. Overdrive disengaged

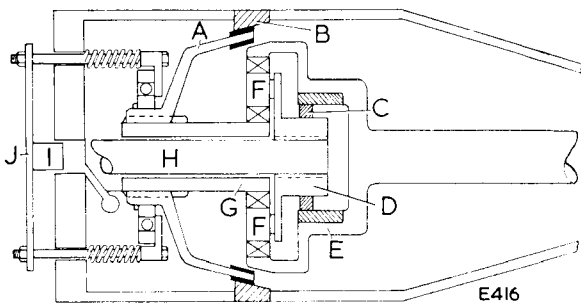


Fig. 2. Overdrive engaged

WORKING PRINCIPLES

Overdrive Gears

The epicyclic gear train of the unit consists of a central sun gear, meshing with three planet gears which in turn mesh with an internally toothed annulus.

Overdrive Disengaged (Fig. 1)

A cone clutch (A), mounted on the externally splined extension of the sun gear (G) is spring-loaded by four clutch springs (L), via a thrust ring (K) and bearing (M), against the annulus (E), thus locking the gear train and permitting over-run and reverse torque to be transmitted.

Overdrive Engaged (Fig. 2)

When overdrive is selected, two hydraulically operated pistons (I) acting against bridge pieces (J), move forward and, overcoming the spring pressure, cause the cone clutch (A) to engage the brake ring (B) with sufficient load to hold the sun gear (G) at rest. The planet carrier (D) can now rotate with the input shaft (H), via the planet gears (F) to rotate about their own axis to drive the annulus at a faster speed than the input shaft, this being allowed by the free-wheeling action of the uni-directional clutch (C).

HYDRAULIC SYSTEM

Hydraulic pressure is developed by a plunger pump, cam operated, from the input shaft. The pump draws oil through a wire mesh filter and delivers it to the operating valve. A relief valve, incorporated in the system, controls the working pressure.

Operating Valve (Fig. 3)

In direct drive position, the ball valve (G) is seated in the casing thereby isolating the supply (B) from the operating cylinders (F).

When overdrive is selected, a solenoid causes cam (D) to rotate lifting the ball from its seat in the casing, and sealing the top of the valve, thus directing oil under pressure from port (B) to the operating cylinders (F).

When the valve is returned to the direct drive position, oil from the operating cylinders is exhausted down the hollow valve stem through the restrictor (E).

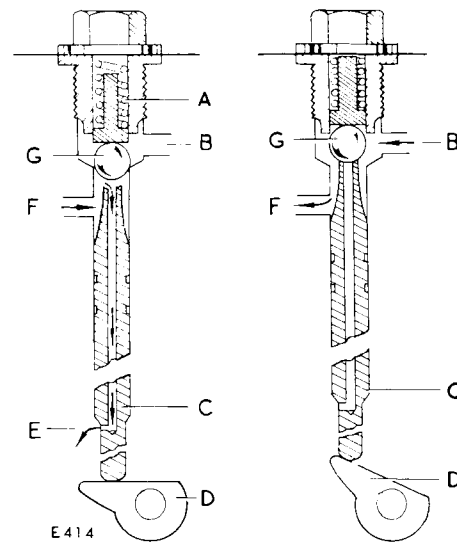


Fig. 3. Operating valve

LUBRICATION

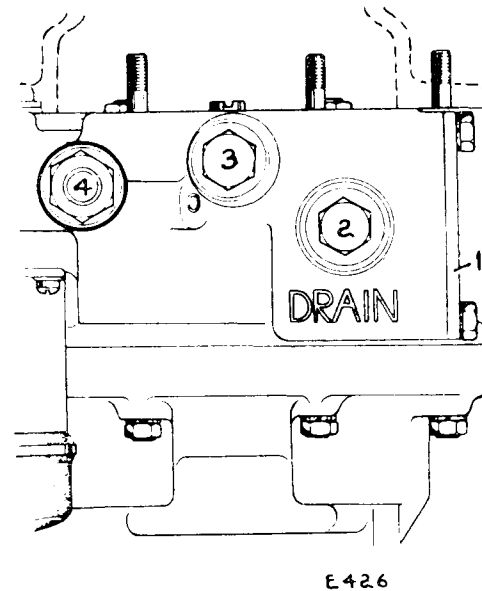
Being interconnected, the gearbox and overdrive unit have a common oil level, indicated by a plug on the side of the gearbox. When draining the oil, remove the overdrive unit drain plug and gearbox drain plug. Access to the gauze filter, which must be removed and cleaned prior to refilling with oil, is effected by removing plate (1) (Fig. 4) retained by four setscrews.

Spill oil, from the relief valve, is diverted through drilled passages to a bush in the front casing, then into the mainshaft and along a central drilling to the rear bearing in the annulus. From the bearing, oil is passed, due to centrifugal force, through the uni-directional clutch to an oil thrower, from which it is picked up by a catcher on the planet carrier and then to the planet gears via the hollow bearing pins.

NOTE: All gearbox and overdrive units fitted to new cars are filled with a special oil, formulated to give all necessary protection to new gears. Under normal circumstances, this oil should not be changed, but may be topped up with any of the approved oils. If a new unit is fitted, or parts of an existing unit are renewed, the unit should be replenished with new special oil, supplied with a new unit, or ordered separately from the Spares Division.

Should difficulty be experienced in obtaining the special oil, use one of the approved lubricants listed on page 0-116-0-117. **ON NO ACCOUNT SHOULD ANTI-FRICTION ADDITIVES BE PUT INTO THE OIL.**

After refilling the gearbox and running the car for a short distance, re-check and top up the oil level to replace the oil which has been distributed around the hydraulic system. Always use clean oil and take great care to prevent the entry of foreign matter when any part of the casing is opened.



- 1 Filter cover plate
- 2 Drain plug
- 3 Non-return valve plug
- 4 Relief valve plug

Fig. 4. Front casing viewed from underneath

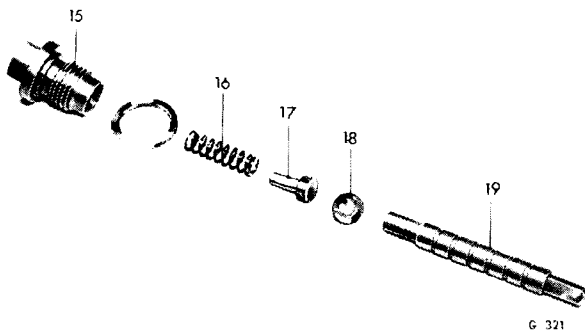
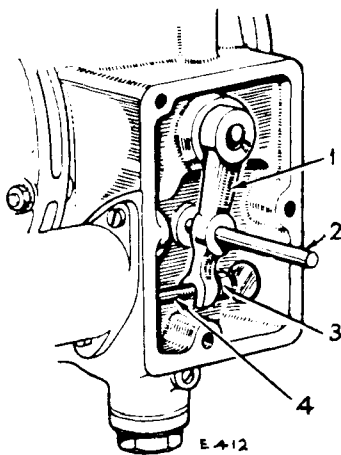


Fig. 5. Operating valve components



- | | |
|-------------------|--------------------|
| 1 Operating lever | 3 Adjusting nut |
| 2 Setting pin | 4 Solenoid plunger |

Fig. 6. Adjustment of operating lever

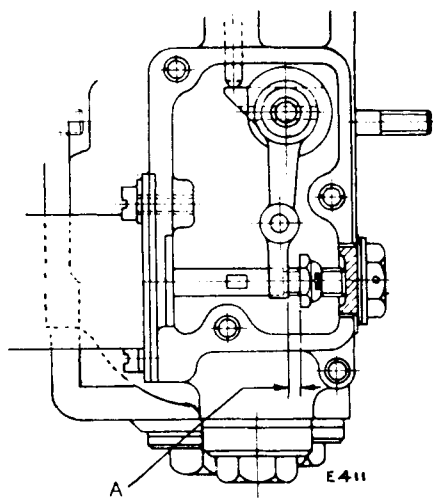


Fig. 7. Dimensional checks

SERVICING

The Operating Valve

Access to the valve plug, on top of the unit, is gained by removal of the fascia support bracket and the gearbox cover (page 2-207). Operate the solenoid several times to release the hydraulic pressure. Unscrew the valve plug and, with the aid of a small magnet, remove the spring, plunger and valve. Taking great care to avoid damage to the valve seat, remove the operating valve, by inserting a length of stiff wire down its centre and drawing it up. Ensure that the small hole at the bottom of the valve, breaking through to the central drilling, is not choked. This hole provides a passage for oil exhausted from the operating cylinders when the valve is moved to the "direct drive" position.

If necessary the ball can be re-seated as follows:—

Place the ball on a block of wood, position the seat of the valve on the ball and give the valve a sharp gentle tap. Clean the valve seat in the casing, locate the ball on its seat and gently tap the ball using a copper drift. Tapping the ball too hard will close the mouth of the valve seat and prevent valve re-assembly.

Adjustment of Solenoid Operating Lever

The operating valve, referred to above, is raised by a cam pinned on a transverse shaft. A solenoid-operated lever is attached to the opposite end of the shaft (Fig. 6).

Remove the cover plate from the solenoid housing, move the operating lever until a $\frac{1}{8}$ " (4.762 mm.) setting pin, pushed through the hole in the lever aligns with a hole in the casing. With the solenoid energised, screw the adjusting nut until it just contacts the operating lever. Remove the setting pin and de-energise the solenoid. Energise the solenoid and re-check the alignment of the holes.

Check that the current consumption is approximately 2 amps. A reading of 20 amps. indicates that the solenoid plunger is not moving far enough to switch from the solenoid operating coil to the holding coil of the solenoid and the operating lever must be re-adjusted.

CONTINUOUS HIGH CURRENT WILL CAUSE PREMATURE SOLENOID FAILURE.

With the solenoid de-energised, re-align the setting holes and insert the setting pin. Hold the solenoid plunger against the blanking plug (Fig. 7) and check that dimension "A" is .1" to .12" (2.54 to 3.05 mm.). Obtain this dimension by varying the thickness of the washer between the blanking plug and the casing, as necessary. Alternatively, on later units, adjust the position of the adjuster screw (32A) (inset Fig. 18).

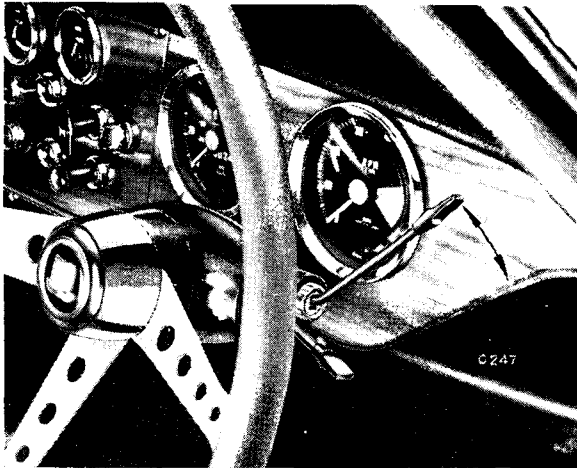
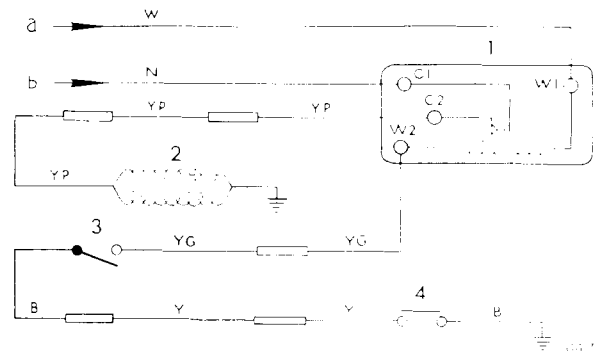


Fig. 10. Location of overdrive switch (Vitesse)



a) from ignition switch terminal 2
1 relay
2 solenoid
b) from ignition switch terminal 1
3 column switch
4 gearbox switch

Fig. 11. Overdrive circuit

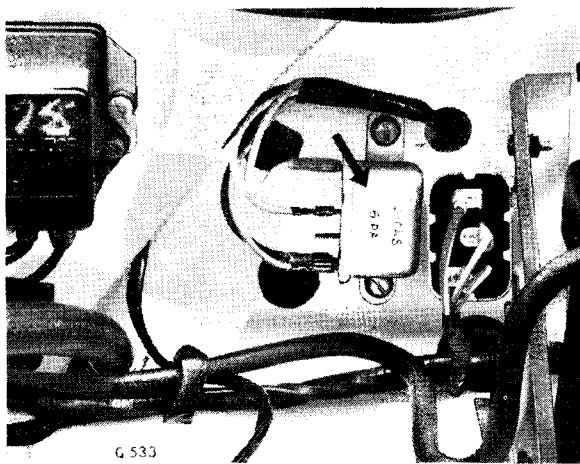


Fig. 12. Location of relay

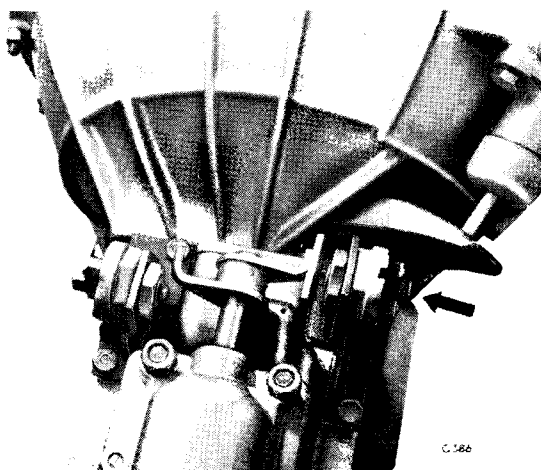


Fig. 13. Location of gear selector switch

The Electrical Circuit

Because many operational failures are due to corroded terminals and faulty wiring, check the wiring and connections before dismantling any part of the overdrive unit.

Good earth connections are essential on all earthed components. This applies particularly to the solenoid because of the heavy current passed momentarily each time the overdrive is engaged.

Incorrect adjustment of the solenoid, resulting in failure of the main winding contact to open, may cause damage to the solenoid and relay.

If the overdrive fails to operate after checking all the electrical connections, refer to Fig. 11, and proceed as follows:—

1. Switch on the ignition and engage top gear. Set the column switch (3) to overdrive position. Check that the battery voltage is present at terminals C.1 and W.2.
2. Short out the terminals on C.1 and C.2 on the relay unit (1). If the solenoid (2) operates then the relay unit, column switch and gearbox switch are suspect. Remove short circuiting link from between terminals C.1 and C.2.
3. Earth terminal W.1 on the relay unit. If the overdrive solenoid operates, then the gearbox switch is suspect. If the relay unit does not operate, renew the relay unit.
4. Earth the yellow/green cable on the switch. If the solenoid operates, renew the control switch.

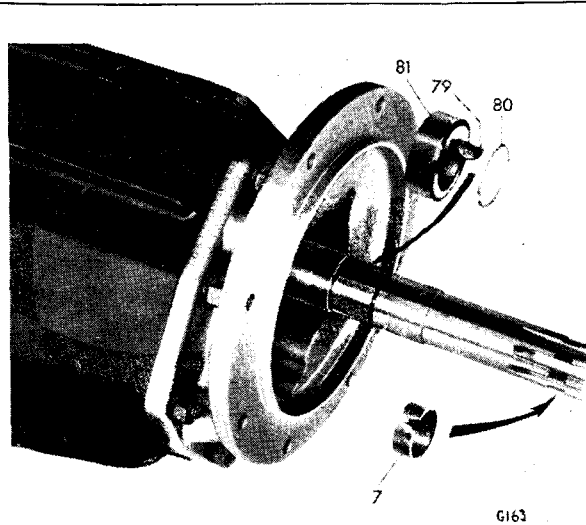


Fig. 14. Adaptor plate and mainshaft details

OVERDRIVE UNIT

To Remove

Disconnect the connectors from the gearbox overdrive switch, reverse lamp switch and overdrive solenoid, and remove the gearbox/overdrive unit from the vehicle in a similar manner to that described for gearbox removal on page 2-207 (GT6) 2-224 (Vitesse).

Remove the nuts and spring washers securing the overdrive unit to the adaptor flange, and carefully withdraw the overdrive unit.

To Refit

Align the splines of the planet carrier and uni-directional clutch using a long screwdriver. Check the alignment by inserting dummy mainshaft (Tool No. L 201) (Fig. 15).

Rotate the gearbox mainshaft and position the pump operating cam with its highest point uppermost. Check that the spring clip (7) is correctly located in its groove on the mainshaft and does not protrude above the splines.

NOTE: It is essential that rotation of gearbox mainshaft and overdrive coupling flange is avoided until the unit is fitted to the gearbox.

Remove the dummy mainshaft and fit the unit to the gearbox, secure with spring washers and nuts.

To refit the gearbox/overdrive unit to the vehicle, reverse the removal procedure.

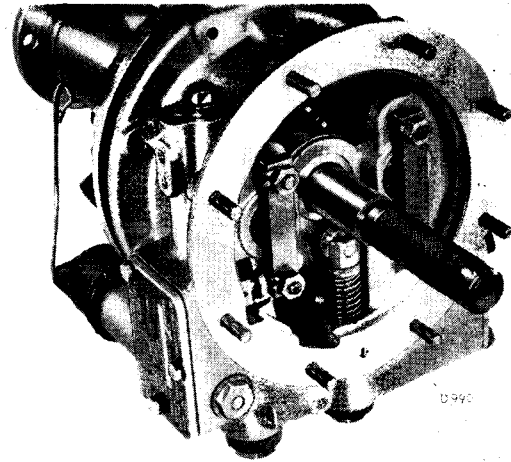


Fig. 15. Alignment check using Tool No. L 201

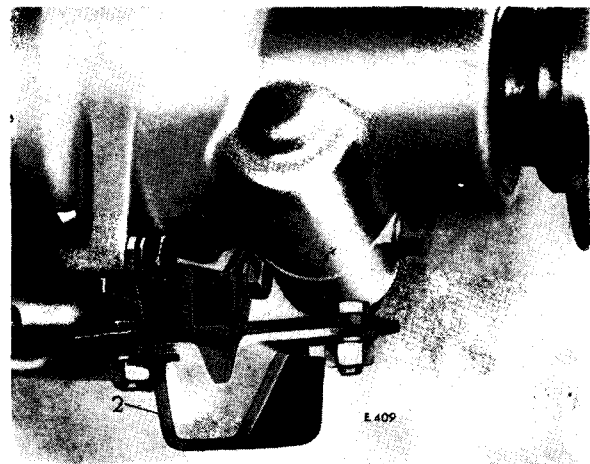


Fig. 16. Overdrive support bracket (1) and flexible mounting (2)

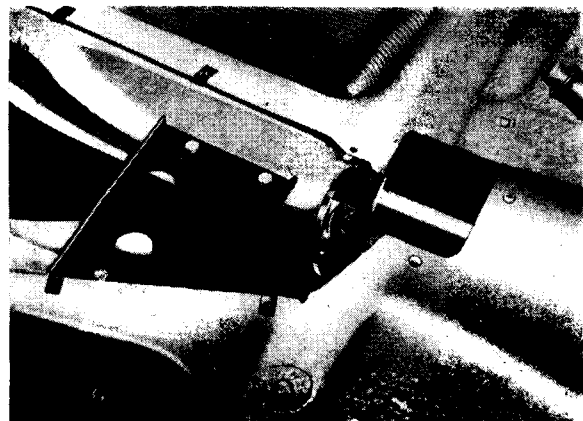


Fig. 17. Overdrive mounting platform

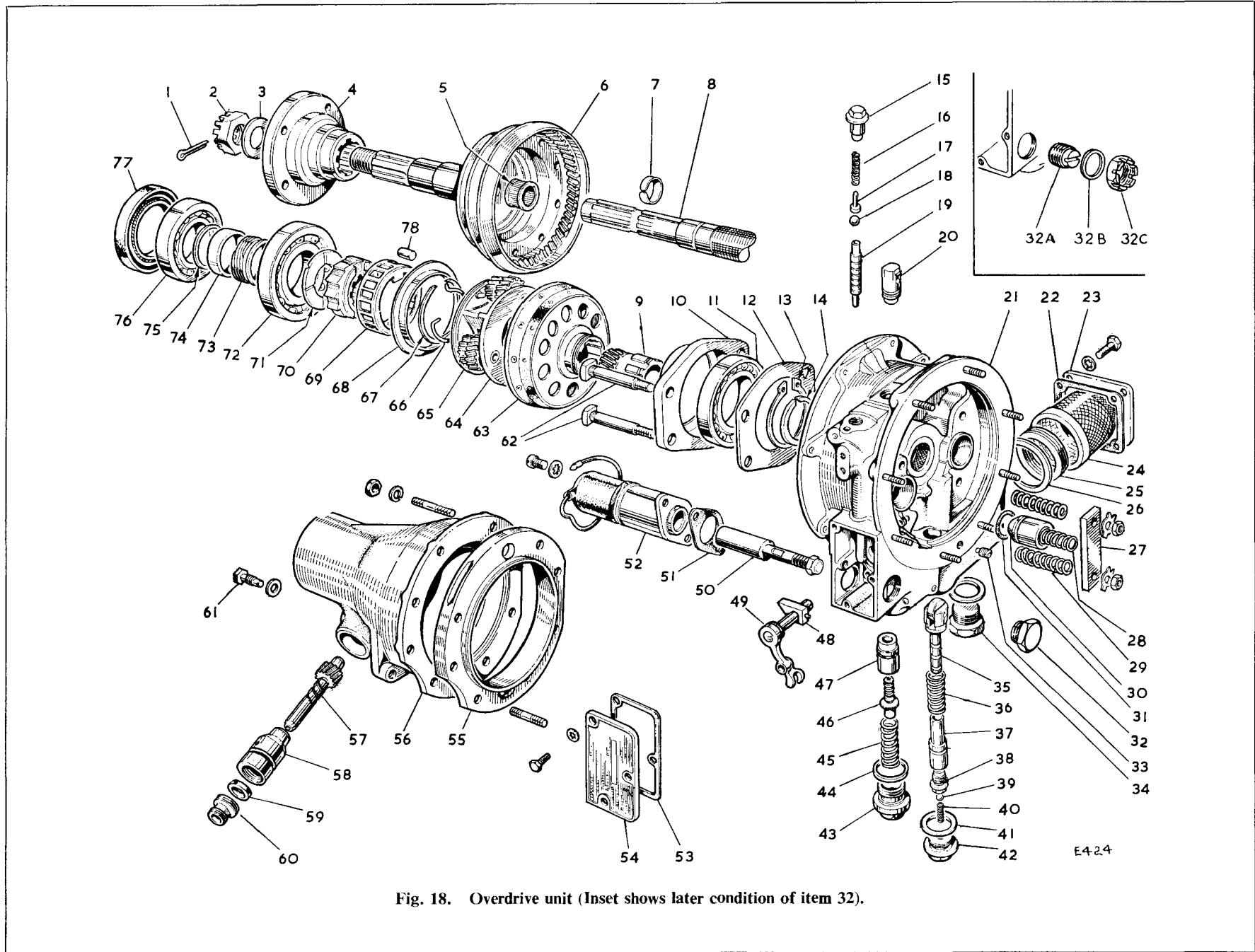


Fig. 18. Overdrive unit (Inset shows later condition of item 32).

Key to Fig. 18

1 Split pin	28 Bias spring	52 Solenoid
2 Nut	29 Clutch return spring	53 Gasket
3 Washer	30 Piston	54 Cover plate
4 Coupling flange	31 Piston "O" ring	55 Brake ring
5 Needle bearing	32 Plug	56 Rear casing
6 Annulus	32A Adjuster screw	57 Speedometer pinion
7 Spring	32B Locknut	58 Speedometer pinion bush
8 Main shaft	32C Fibre washer	59 Seal
9 Sungear	33 Pump locating screw	60 Screwed end
10 Thrust ring	34 Plug	61 Locating screw
11 Thrust bearing	35 Pump plunger	62 Bolts
12 Retaining plate	36 Return spring	63 Cone clutch
13 Circlip	37 Pump body	64 Planet carrier assembly
14 Circlip	38 Non-return valve body	65 Planet gear
15 Plug	39 Ball	66 Spring
16 Spring	40 Spring	67 Circlip
17 Plunger	41 Washer	68 Oil thrower
18 Ball	42 Plug	69 Cage
19 Operating valve	43 Plug	70 Inner member
20 Lubrication bush	44 Washer	71 Thrust washer
21 Front casing	45 Spring	72 Front bearing
22 Gasket	46 Relief valve plunger	73 Speedometer drive gear
23 Cover plate	47 Relief valve body	74 Distance piece
24 Filter	48 Cam	75 Spacer
25 Magnetic rings	49 Operating lever	76 Rear bearing
26 Rubber/Steel washer	50 Solenoid plunger	77 Oil seal
27 Bridge piece	51 Gasket	78 Roller

These items
replace item
32 on later
units

DISMANTLING (Fig. 18)

To prevent damage or faulty operation resulting from the inclusion of foreign matter, scrupulous cleanliness must be observed during all service operations. Prepare a clean area in which to lay out the dismantled unit and clean containers to receive the smaller parts.

With the front casing uppermost, secure the unit in suitably protected vice jaws. Release the tab washers securing the four bridge piece retaining nuts, remove the nuts, washers, bridge pieces (27) and, from the operating piston bores, remove the bias springs (28).

Loosen the two solenoid securing screws to prevent the rubber solenoid cover fouling during front casing removal.

Progressively loosen, to ensure gradual release of the clutch spring loading, the eight nuts securing the front casing (21) and brake ring (51) to the rear casing (56). Remove the nuts, spring washers and lift off the front casing. If the brake ring remains with the rear casing, tap gently to remove.

Remove the four clutch return springs (29) and withdraw the clutch sliding member complete with thrust bearing (11), thrust ring (10), retaining plate (12) and sun gear (9).

Operating Valve and Relief Valve

Remove as detailed on p. 2-304 and p. 2-305 respectively.

Pump

Remove the pump plug (42), non-return valve spring (40) and ball (39), and the pump locating screw (33). Unscrew the non-return valve body (38) using tool L 213. Using tools L 183A, L 183A2 and adaptor L 205, extract the pump body as follows (Fig. 19):—

Screw the spindle into the pump body, position the adaptor against the casing and screw the wing nut down.

Filter

Remove the cover plate (23), retained by four setscrews and withdraw the filter (24), three magnetic rings (25), and the rubber/steel bonded sealing washer (26).

Operating Pistons

Withdraw the operating pistons (30) from their respective housings using tool L 252.

Sliding Clutch Member

Remove the sun gear retaining circlip (14) from its groove in the sun gear extension and withdraw the sun gear (9).

Remove the thrust bearing retaining plate (12), bearing circlip (13) from its groove on the cone clutch hub and press the hub from the bearing (11) and thrust ring (10). Extract the bearing from the thrust ring using tool L 210A.

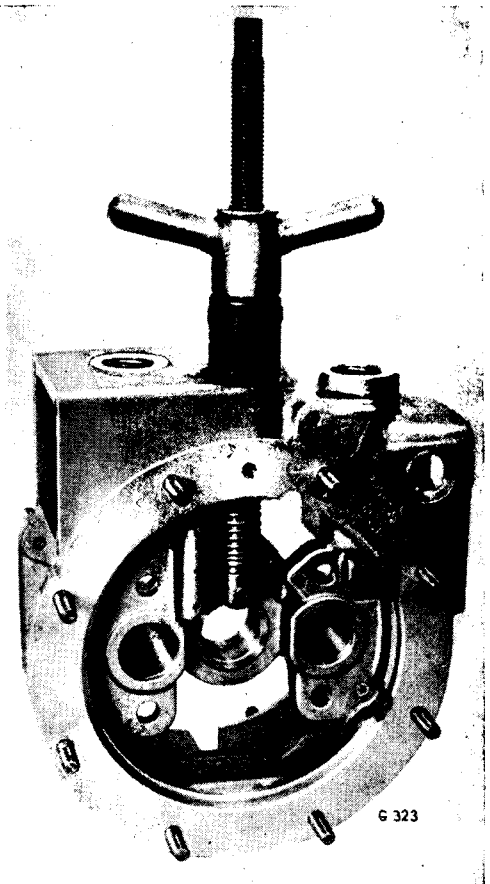


Fig. 19.
Extracting
pump body

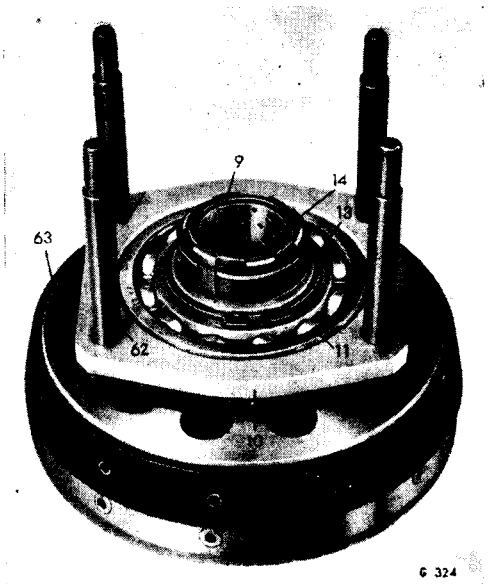


Fig. 20.
Clutch sliding
member
assembly

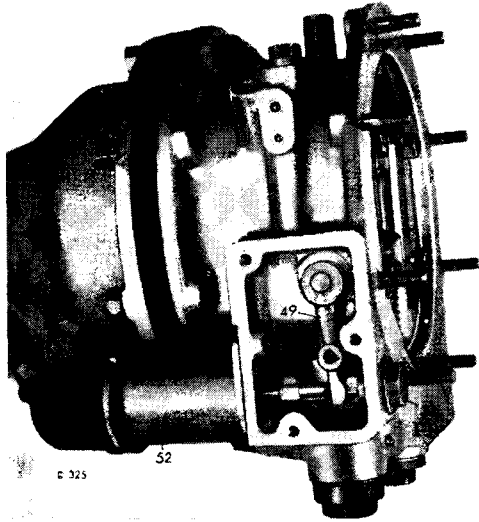


Fig. 21.
View of unit
from right-hand
side showing
solenoid cover
removed

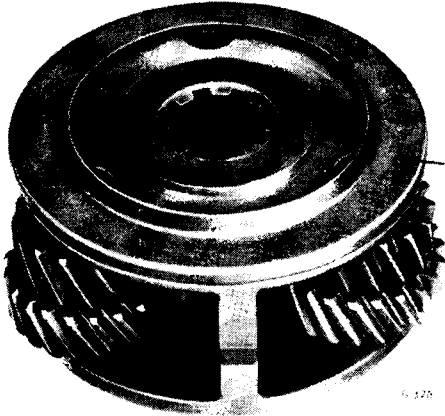


Fig. 22.
Planet carrier
assembly and
oil pick-up ring

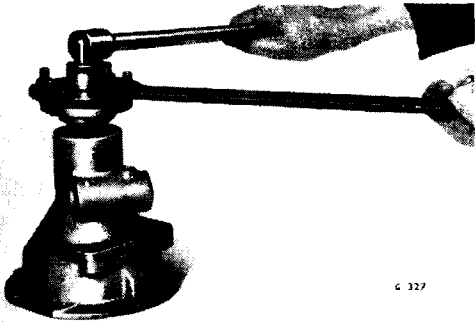


Fig. 23.
Removal of
coupling
flange nut

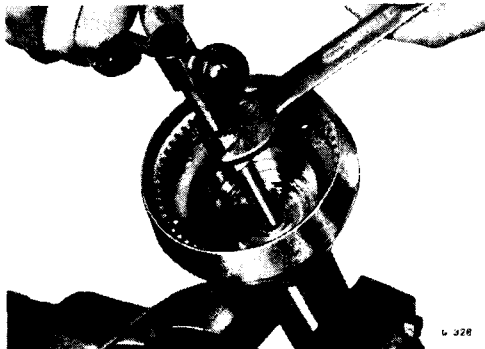


Fig. 24.
Removing
needle bearing
from annulus

Solenoid

Remove the cover plate (54), retained by four setscrews, blanking plug (32), and unscrew the adjusting nut. Unscrew the two solenoid retaining screws and remove the solenoid (52) and plunger (50).

Planet Carrier Assembly

Inspect the gear teeth for damage and wear and check for excessive movement indicating needle bearing or retaining pin wear.

If necessary, renew the complete carrier assembly (64).

Annulus, Removal from Rear Casing

Remove the speedometer bush locating screw (61) and, to avoid damage to threads, use tool L 214 to extract speedometer drive bush (58) and pinion (57) from the rear casing.

Remove the split pin (1) and nut (2) securing the coupling flange (4) and press the annulus forward out of the rear case (56). The rear bearing (76) and oil seal (77) will remain in situ while the front bearing (72), speedometer drive gear (73), distance piece (74) and spacer washer (75) will be withdrawn with the annulus.

Remove circlip (67) and brass oil thrower ring (68) and withdraw the uni-directional clutch from the annulus.

The needle bearing (5) in the centre of the annulus may be withdrawn using tool L 208 as follows:—

Withdraw the central bolt from the tool and locate the outer part of the tool inside the bearing, ensuring the four tangs register behind it. Insert the central bolt and screw against the annulus.

Tap out the oil seal and rear bearing from the rear casing.

RE-ASSEMBLY (Fig. 18)

Renew gaskets, "O" rings, seals and tab washers, as necessary, during re-assembly operations.

Operating Valve

Locate the operating valve (19) within its orifice in the front casing and check that its hemispherical end abuts the flat of the operating cam (48). Position the steel ball (18), plunger (17) and spring (16) and secure with blanking plug (15).

Relief Valve

Insert the relief valve plunger (46) in the relief valve body and locate the assembly within its orifice at the base of the front casing. Insert the spring (45), locating it on the boss of the plunger, and secure with the relief valve blanking plug (43).

Pump

Assemble the pump plunger (35), spring (36) and body (37) and locate the assembly within its orifice in the front casing, locating the flat of the plunger roller fork against the thrust button situated below the centre bush. Press the pump body home, using tool L 206A, until the annular groove in the pump body is in alignment with the locating screw orifice. Insert the dowelled locating screw and tighten, ensuring that the dowel locates in the groove.

Screw in the non-return valve body (38), using tool L 213, position the ball (39) and spring (40) in the body and fit the retaining plug, ensuring that the spring locates correctly in the plug recess.

Filter

Position the three magnetic rings (25) in the mouth of the filter (24) and the bonded steel/rubber sealing ring (26) in the filter housing with its steel face against the casing.

Locate the filter in its housing, open end against the rubber surface of the bonded washer, fit the cover plate (23) and secure with the four retaining setscrews. Fit the drain plug (34).

Operating Pistons

Replace the pistons with the open end of the piston bore facing forward, carefully easing the sealing rings into the cylinder bores.

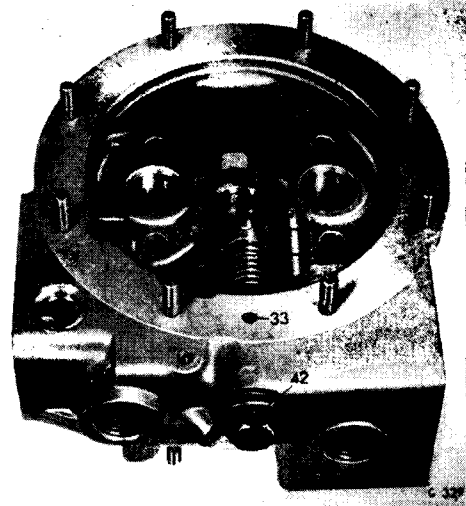


Fig. 25.
View of front casing showing pump installed

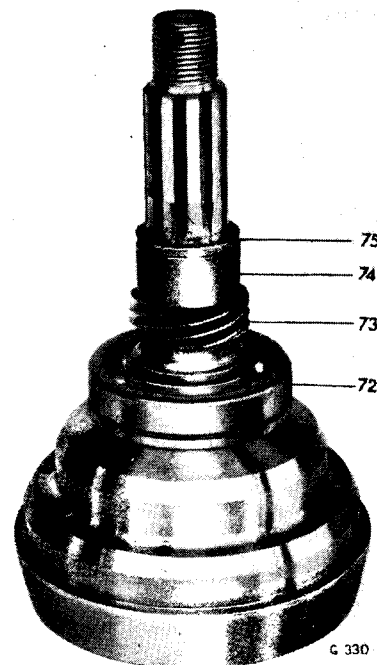


Fig. 26.
Annulus prior to fitting to rear casing

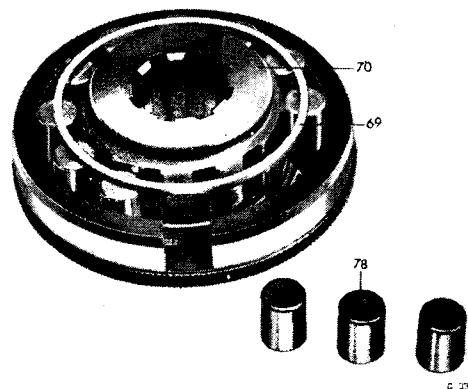


Fig. 27.
Fitting rollers to uni-directional clutch

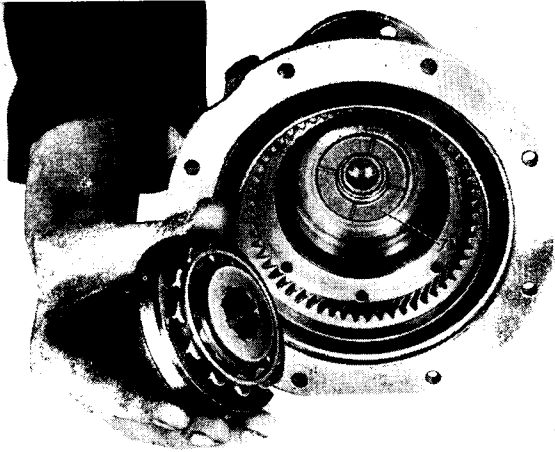


Fig. 28. Fitting uni-directional clutch to annulus

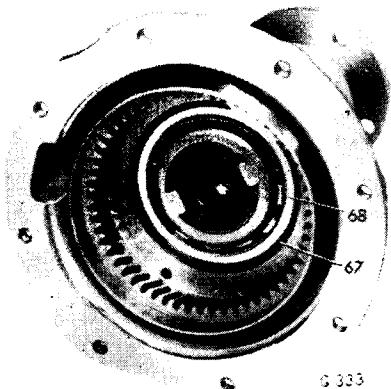


Fig. 29.
Uni-directional
clutch in
position

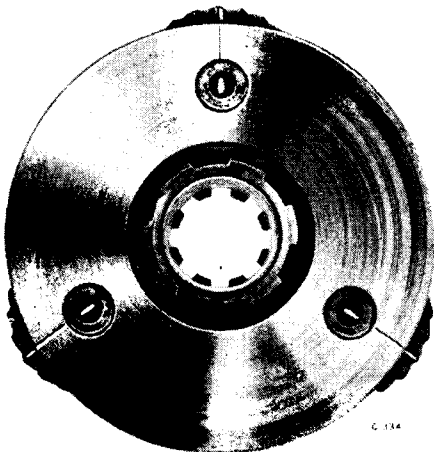


Fig. 30.
Planet gear
alignment

Annulus and Rear Casing

Locate the front bearing (72) over the annulus tail shaft and press into position against the locating shoulder at the rear of the annulus.

Position the speedometer drive gear (73), distance piece (74), and, if fitted, the spacing washer (75) on the tail shaft. Fit the assembly to the rear casing.

NOTE: Where new parts have been fitted, make a dimensional check between the distance piece and abutment shoulder for the rear bearing. Fit spacing washers, as required, to give a .005" to .010" (.1270 to .254 mm.) end float between the rear bearing and the casing.

Press the rear bearing (76) on the tail shaft and into the rear casing simultaneously. Fit the oil seal (77) using tool L 212.

Press the rear coupling flange (4) on the tail shaft, locate the washer (3) and secure with nut (2) and split pin (1).

Insert the speedometer drive pinion (57) and bush (58) turning the annulus as necessary to engage the gear. Align the bush and casing holes and fit the dowelled locating screw (61).

Insert the needle bearing (5) in the centre of the annulus using Tool L 209.

Fit the spring (66) in the roller cage (69) of the uni-directional clutch, engaging one end in the cage. Insert the inner member (70), engaging the opposite end of the spring, and ensure that the slots of the inner member engage the tongues of the cage.

Place the assembly, front face down, in the assembly tool L 178 (Fig. 27) and fit the rollers. Check that the spring rotates the cage to drive the rollers up the inclined faces of the inner member.

Refit the thrust washer (71) and uni-directional clutch (Fig. 28) transferring the clutch direct from the assembly tool. Fit the brass oil thrower ring (68) and secure with circlip (67).

Planet Gears

Rotate the gears until the etched lines on the gear and carrier coincide (Fig. 30). Insert the sun gear and recheck the etched lines for alignment. Position the assembly within the annulus and remove the sun gear.

Clutch Sliding Member

Press the thrust bearing (11) into the thrust ring and fit the four bolts ensuring the heads are correctly positioned. Press the assembly on the cone clutch hub and secure with circlip (13). Fit the retaining plate (12).

Insert the sun gear (9) in the splined bore of the cone clutch and secure with circlip (14). Locate the assembly within the annulus and fit the four clutch return springs (29).

Front Case to Rear Case

Position the brake ring, both faces coated with suitable jointing compound, on the rear face of the front case, ensuring the kidney-shaped slot in the brake ring is located at the bottom (Fig. 31).

Fit the front casing to the rear casing. Clutch spring pressure will now be felt and it will be necessary to exert a slight pressure to bring the two casings together sufficiently to start the nuts. Tighten diametrically opposed nuts until the two faces meet.

Locate the bias springs (28) within the piston bores, fit the bridge pieces (27) and secure with nuts and tub washers.

Position the solenoid plunger (50) in the fork of the operating lever (49) and screw on the adjusting nut, replace the solenoid and secure with the two setscrews. Adjust as detailed on page 2-304 and, on completion, refit cover plate (54) and blanking plug (32).

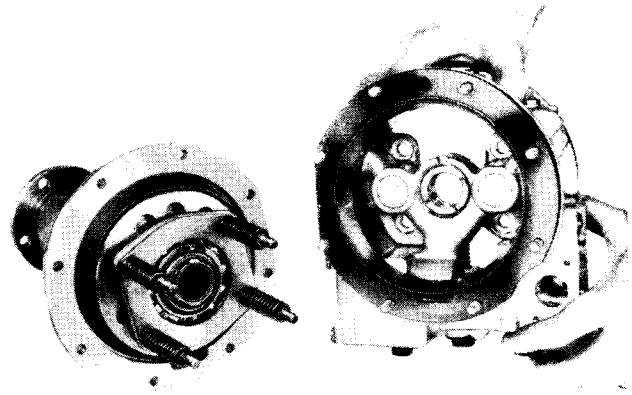
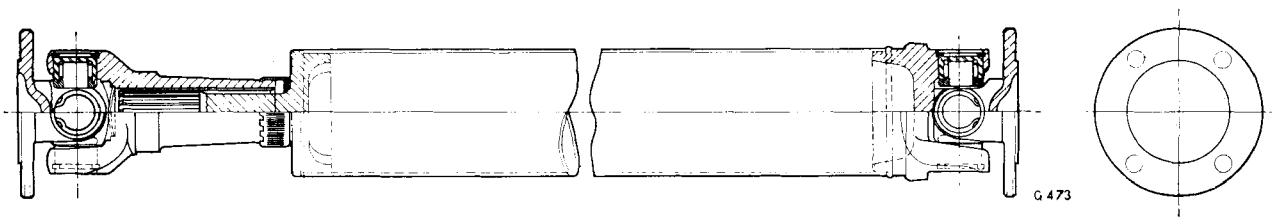


Fig. 31. Offering front case to rear case



GT6	Normal Fitment	O/Drive Condition
Length (closed)	38.75" (948.3 mm.)	35.28" (896.1 mm.)
(fitted)	39.56" (1004.8 mm.)	36.09" (916.7 mm.)
Extension	1.58/1.68" (40.13/42.67 mm.)	1.25 (31.75" mm.)
Vitesse		
Length (closed)	47.65" (1210.3 mm.)	44.20" (1122.7 mm.)
(fitted)	46.79" (1188.5 mm.)	43.53" (1105.6 mm.)
Extension .. ..	.. ..	1.25" (31.75 mm.)
Mounting flange holes. P.C.D.	.. ..	2.997/3.003" (76.02/76.18 mm.)
Angular movement .. ..	.. ..	15°
Maximum run-out (at ends) .. ..	.. ..	0.008" (0.203 mm.)
(at centre) .. ..	.. ..	0.012" (0.305 mm.)
Maximum out of balance (at each end) .. ..	.. ..	0.5 oz in. (36.06 grm.cm)

Fig. 1. Propeller shaft data

- 1 Sliding yoke
- 2 Circlips
- 3 Bearing cups
- 4 Seals
- 5 Retainers
- 6 Spider
- 7 Flange

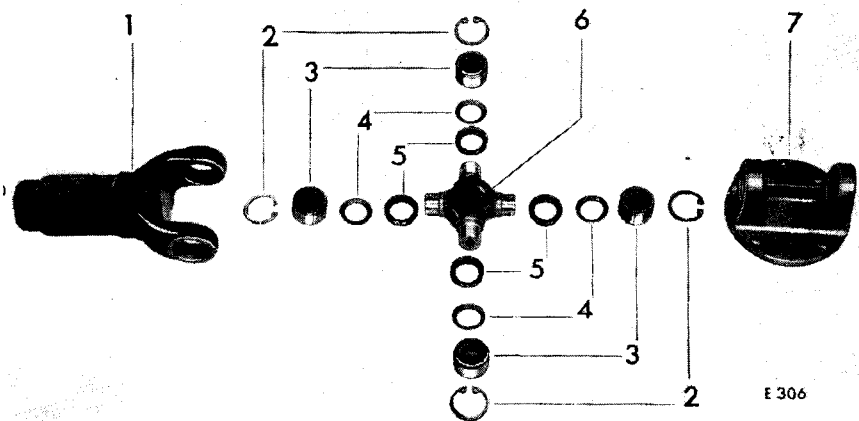
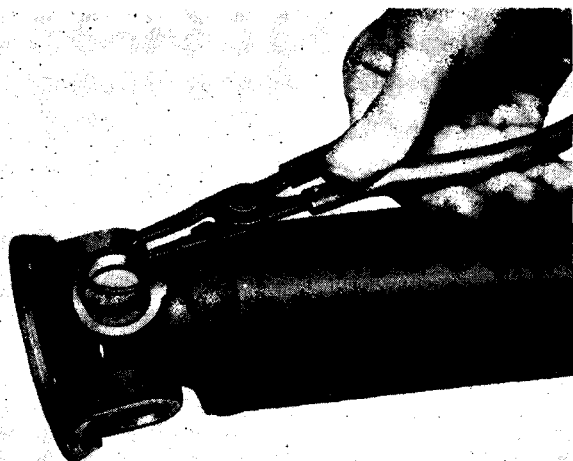
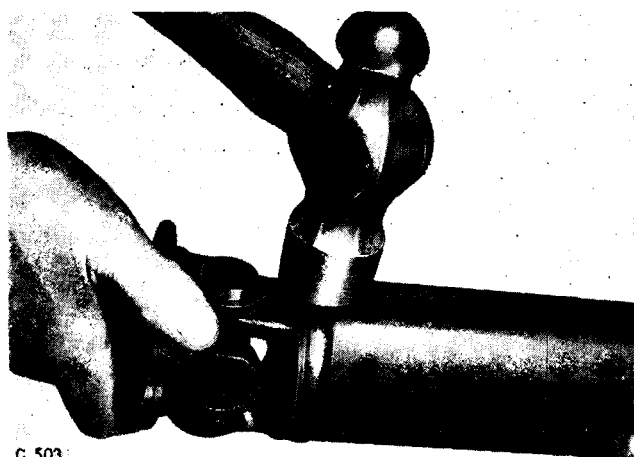


Fig. 2. Universal coupling details



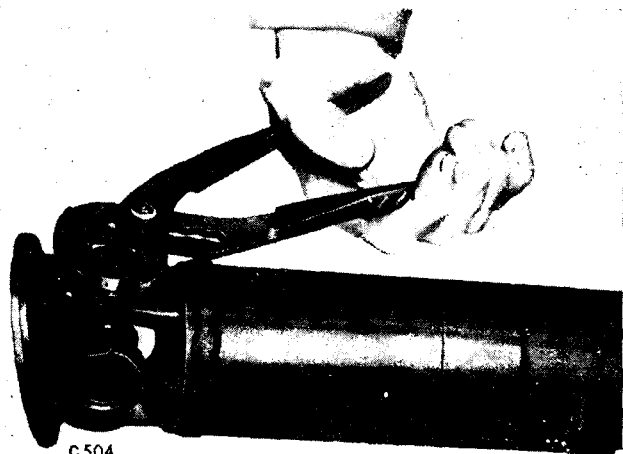
G502

Fig. 3. Removing circlip



G 503

Fig. 4. Tapping bearing cups from yoke



G504

Fig. 5. Removing bearing cups

PROPELLER SHAFT

To preserve the fine degree of balance throughout the transmission, should radial play develop in the propeller shaft universal couplings the complete assembly should be replaced with an exchange unit. Where exchange units are not available, proceed as follows:

To Remove

Raise the vehicle on stands or a ramp.

Remove the fascia support bracket and gearbox cover as described on page 2-207 (GT6), 2-224 (Vitesse).

Remove the bolts and nyloc nuts securing the propeller shaft flanges to the gearbox and rear axle units.

Remove the propeller shaft rearwards.

To Refit

Reverse the removal procedure, using new nyloc nuts, if the original nuts can be screwed on to the bolts with finger pressure.

NOTE: The propeller shaft must be fitted with the sliding joint at the rear end.

Dismantling

Remove one circlip from the forked end of the shaft and tap the lug until the bearing cup emerges (Fig. 4). Finally remove the cup using grips. Repeat this operation on the opposite bearing and remove the companion flange from the propeller shaft.

Remove the two remaining circlips, and resting the two exposed trunnions on wooden block, tap the lugs of the flange or yoke to remove the remaining bearings and cups.

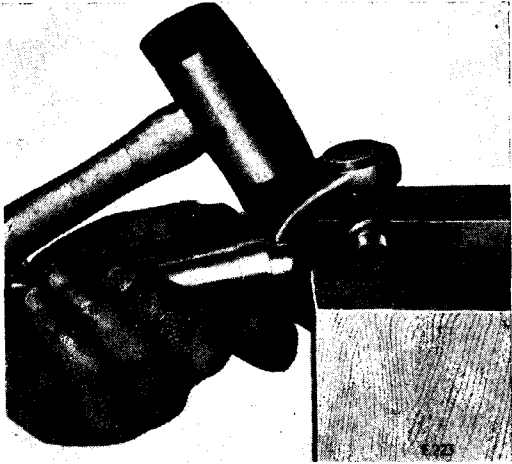


Fig. 6. Tapping cups from yoke

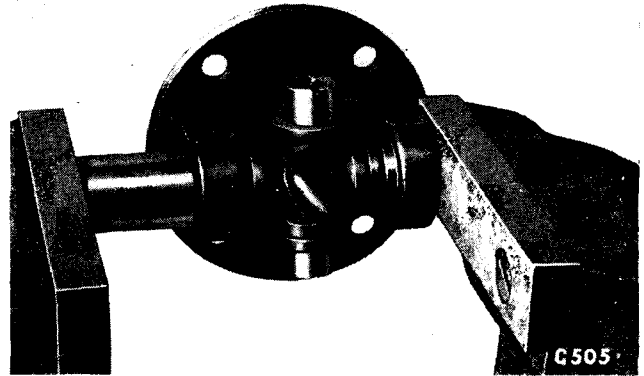


Fig. 7. Refitting bearing cups

Re-assembly

Apply jointing compound to the journal shoulders on the new spider. Fit the oil seal retainers over the trunnions using a tubular drift. Fit the oil seals to the retainers.

Pass two trunnions of the spider through the bearing bores in the companion flange and fit the bearing cups and circlips, ensuring that these are properly seated.

The spider must be fitted with the lubrication boss towards the propeller shaft as shown in Fig. 9.

Pass the other pair of trunnions through the bearing bores in the forked end of the propeller shaft and fit the bearing cups and circlips.

Repeat the foregoing operations on the other universal coupling and refit the complete shaft assembly to the vehicle.

NOTE: The sliding joint should not be dismantled for any reason.

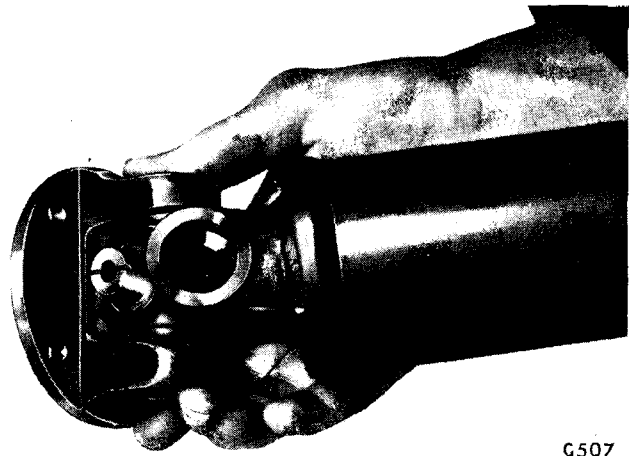


Fig. 8. Refitting spider

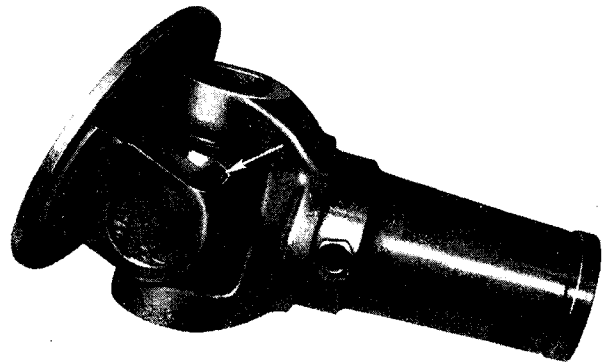


Fig. 9. Location of grease plug

TRIUMPH

GT6 and VITESSE 2-litre

WORKSHOP MANUAL

GROUP 3

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REAR AXLE

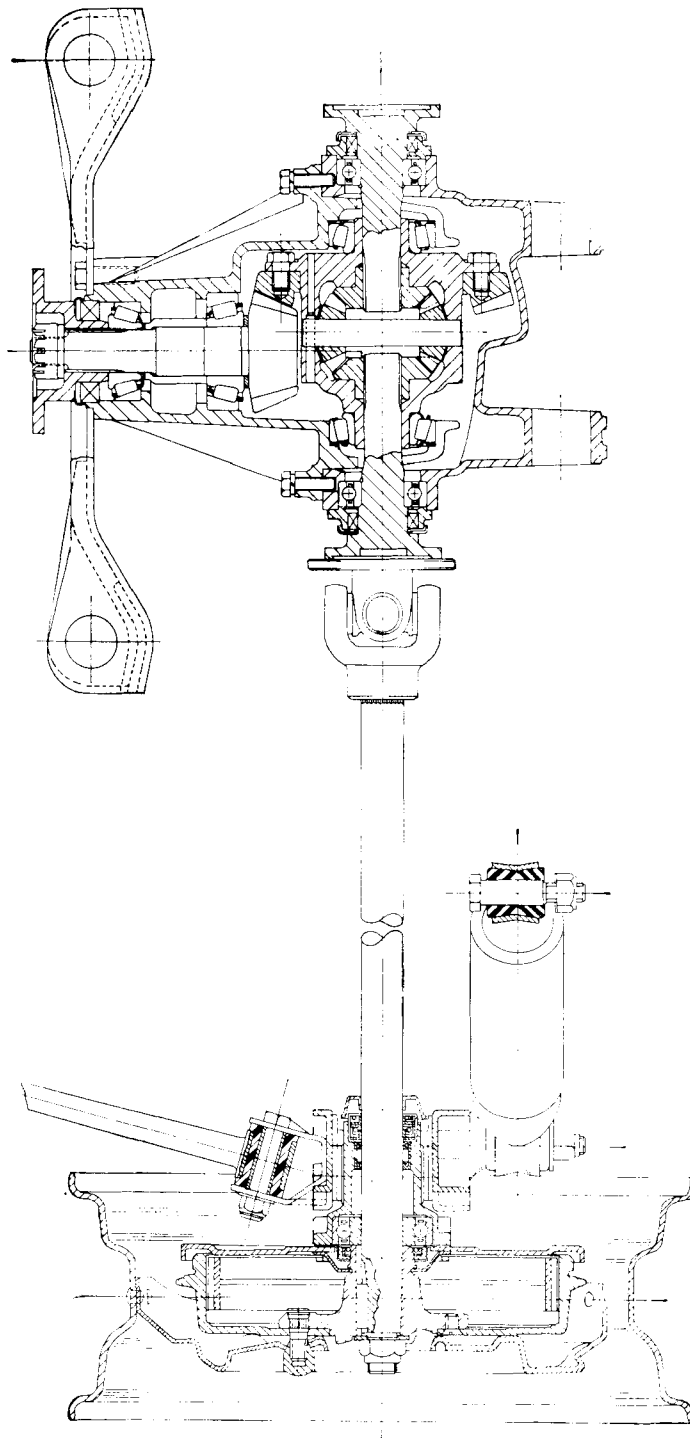


Fig. 1. Rear Axle Arrangement

DIMENSIONS AND TOLERANCES—continued

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Inner Axle Shafts					
Bearing journal diameter	0.9847	25.011			Bearing press fit on inner axle shaft
	0.9852	25.024			
No. of serrations		20			
Oil seal journal diameter	1.130	28.702			
	1.135	28.829			
Outer Axle Shafts					
Shaft length	18.53	470.662			
Shaft end to centre line of universal coupling	0.880	22.352			
No. of serrations		24			
Mills Pin--Type		G.P.3.			
--Length	1.63	41.402			
Keyway width	0.1865	4.737			
	0.1875	4.762			
Driving key dimensions: width	0.1875	4.762			
	0.1885	4.788			
depth	0.250	6.35			
	0.251	6.38			
Pinion Setting Dimensions					
Distance from head bearing abutment face on pinion to centre of crown wheel bearings	3.03125	76.994			Alternative spacer length 1.544/1.549 (39.22/39.34 mm.)
Pinion centre line "off-set" below crown wheel centre line	0.7445	19.037			
	0.7505	19.063			
Pinion bearing pre-load (without oil seal)	12-16 lbs./in. (0.0138-0.185 m.k.g.)				
Length of bearing spacer	1.450	36.83			
	1.455	36.96			
Backlash between pinion and crown wheel			0.004	.102	
			0.006	.152	
Differential Carrier					
Crown wheel locating spigot diameter	3.6855	93.726			
	3.6865	98.751			
Bore for cross-shaft	.6245	15.862			
	.6255	15.888			

REAR AXLE

DIMENSIONS AND TOLERANCES

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
Axle Ratio Track	Vitesse—3·89:1 GT6—3·27:1 4 ft. (122 cms.)				3·89:1 when overdrive is fitted to GT6 or Vitesse
Crown Wheel Number of teeth Locating diameter Maximum permissible run-out Backlash	in.	mm. 36 3·6875 93·662 3·6885 93·687 0·003 0·076	in.	mm. 0·001 0·025 0·003 0·076 0·004 0·101 0·006 0·152	Obtained by shimming between differential side bearings and casing.
Pinion Number of teeth Diameter of journal: —for pinion bearing head for pinion tail bearing Spline diameters —Maximum —Minimum Thread dimensions	11 1·1256 28·590 1·1261 28·626 1·0004 25·410 1·0009 25·423 0·8460 21·488 0·8475 21·527 0·990 25·146 0·994 25·248 0·005" × 18 t.p.i. U.N.F				Bearing press-fit on pinion
Hypoid Housing Internal diameter for: —pinion head bearing outer ring pinion tail bearing outer ring differential bearing outer rings Width between differential bearing outer ring abutments Maximum spreading load for entry of assembled differential unit	2·6860 68·224 2·6870 68·249 2·2485 57·112 2·2495 57·137 2·4418 62·022 2·4428 62·047 5·120 130·048 5·128 130·251 3360 lbs. (1524 kg.)				Ring is press fit in bore

REAR AXLE

DIMENSIONS AND TOLERANCES—continued

PARTS & DESCRIPTION	DIMENSIONS NEW		CLEARANCES NEW		REMARKS
	in.	mm.	in.	mm.	
Differential Carrier—continued					
Bore for sun gear spigot	1.251	31.775			
	1.253	31.826			
Side bearing spigot O.D.	1.251	31.788			
Max. permissible run-out	.003	0.076			
Differential Gears					
Differential sun gear					
No. of teeth		16			
Spigot diameter	1.2485	31.798	0.0017	0.043	Clearance of gear spigot in carrier
	1.2485	31.798	0.0045	0.114	
No. of internal serrations		20			
Sun gear thrust washer thickness	0.0345	0.876			
	0.0375	0.952			
Differential planet gear:					
No. of teeth		10			
Diameter of bore	0.625	15.815	0.0008	0.020	
	0.625	15.913	0.0028	0.071	
Backlash between any two pairs of gears			0.002	0.051	
Diameter of cross-shaft	0.6237	15.842	0.004	0.102	
	0.6242	15.855			
Hubs (rear)					
Inner hub assembly					
Internal dia. for:					
Needle roller bearing	1.2508	31.750	0.0005	0.0137	
	1.2498	31.775	0.0015	0.038	
Hub bearing outer ring and outer grease seal	2.2493	57.132			
	2.2499	57.147			
Inner grease seal	1.4990	38.075			
	1.5000	38.100			
Diameter of hub bearing outer ring	2.2490	57.125			
	2.2495	57.137			
External diameter of needle roller bearing	1.2495	31.737			
Dimension from face of needle roller bearing to inner face of hub	0.500	12.700			

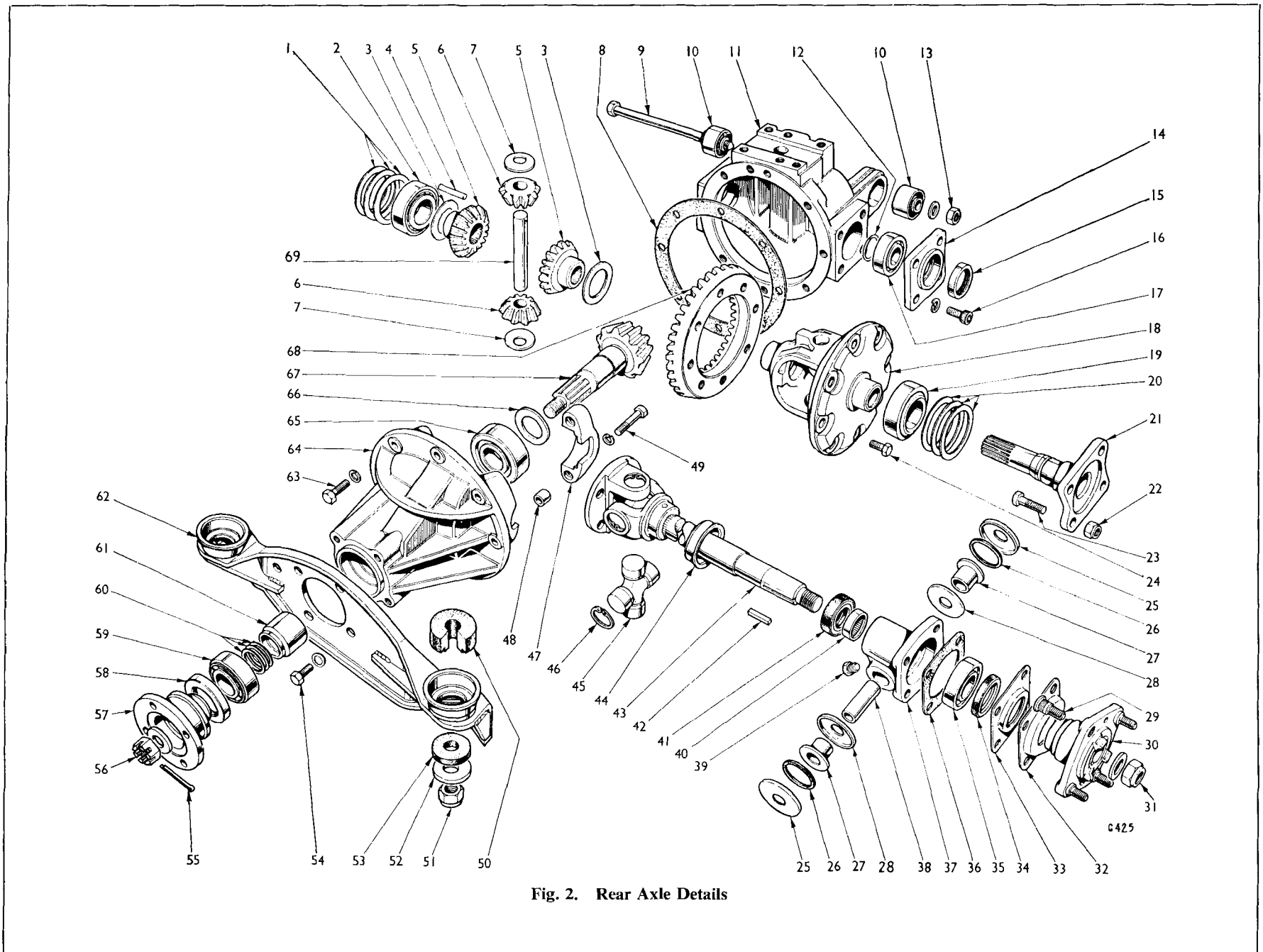


Fig. 2. Rear Axle Details

G425

Key to Fig. 2

1 Shims	26 Rubber sealing ring	51 Nyloc nut
2 Differential side bearing	27 Nylon bush	52 Plain washer
3 Thrust washer	28 Shim	53 Rubber pad
4 Cross-shaft locking pin	29 Stud	54 Bolt
5 Sun gear	30 Hub	55 Split pin
6 Planet gear	31 Nyloc nut	56 Slotted nut
7 Thrust washer	32 Grease trap	57 Coupling flange
8 Joint washer	33 Outer seal housing	58 Oil seal
9 Rear mounting bolt	34 Seal	59 Pinion tail bearing
10 Metalastik bush	35 Ballrace	60 Shims
11 Hypoid rear casing	36 Joint washer	61 Spacer
12 Circlip	37 Trunnion housing	62 Mounting plate
13 Nyloc nut	38 Distance tube	63 Bolt
14 Seal housing plate	39 Grease plug	64 Hypoid nose piece casing
15 Oil seal	40 Needle roller bearing	65 Pinion head bearing
16 Hexagon socket screw	41 Inner oil seal	66 Spacer
17 Ball race	42 Key	67 Pinion
18 Differential carrier	43 Outer axle shaft	68 Crownwheel
19 Differential side bearing	44 Grease flinger	69 Cross-shaft
20 Shims	45 Universal joint assembly	70 Bolt
21 Inner axle shaft	46 Circlip	71 Lockplate
22 Nyloc nut	47 Bearing cap	72 Brake backplate
23 Bolt	48 Tubular dowel	73 Bolt
24 Bolt	49 Bolt	74 Nyloc nut
25 Shim	50 Mounting rubber	75 Vertical link

REAR AXLE

REAR AXLE

DIFFERENTIAL BEARING-SHIMS

PART No.	THICKNESS	
	in.	mm.
123813	0-0085/0-0095	0-216/0-241
123814	0-012/0-013	0-30/0-330
123815	0-014/0-015	0-350/0-381
123816	0-016/0-017	0-406/0-432
123817	0-019/0-021	0-483/0-533

PLANET GEAR—THRUST WASHERS

PART No.	THICKNESS	
	in.	mm.
138440	0-025/0-028	0-560/0-511
134076	0-030/0-032	0-562/0-613
136441	0-034/0-036	0-664/0-714
138442	0-028/0-040	0-765/0-816

PINION HEAD BEARING—SPACER

PART No.	THICKNESS	
	in.	mm.
140793	0-003	0-076
140792	0-005	0-127
140791	0-010	0-25
140790	0-030	0-76

PINION HEAD BEARING—SPACER

PART No.	THICKNESS	
	in.	mm.
145918	0-075	1-905
145919	0-0765	1-943
145920	0-078	1-981
145921	0-0795	2-019
145922	0-081	2-057
145923	0-0825	2-096
145924	0-084	2-134
145925	0-0855	2-172
145926	0-087	2-210
145927	0-0885	2-248
145928	0-090	2-287
145929	0-0915	2-325
145930	0-093	2-363
145931	0-0945	2-401
145932	0-096	2-439

HUB AND OUTER AXLE SHAFT ASSEMBLY

To Remove

Jack up the rear of the vehicle, support it on chassis stands and remove the nave plate, wheel nuts and road wheel.

Disconnect the flexible brake hose (A) from the chassis bracket (B) and pipe (C).

Disconnect the handbrake cable from the lever (D).

Using a jack to relieve the damper of load, remove the bolt (E) to release the radius arm.

Remove four bolts (F) and nyloc nuts (G) to release the axle shaft coupling flange.

Remove the nyloc nut (H) and washer from the damper lower attachment eye and pull the bottom of the damper clear of its mounting pin.

Remove the jack from beneath the vertical link plates, and whilst supporting the brake assembly by hand, remove the nut (J) bolt from the road spring eye.

Withdraw the hub and outer axle shaft assembly from the vehicle.

To Refit

Assemble the vertical link to the road spring eye, leaving the nyloc nut semi-tight at this stage.

Carefully jack up the vertical link plate and secure the extended damper to its lower attachment.

Re-attach the radius arm to the vertical link bracket and secure with bolt (E) and nut.

Secure the outer axle shaft to the flange of the inner axle shaft and remove the jack.

Load the vehicle to a "Static Laden" condition and tighten the nyloc nut securing the vertical link to the road spring.

Re-connect the handbrake cable to the handbrake lever (D).

Re-connect the flexible brake pipe to the chassis bracket (B) and pipe union (C).

Adjust and bleed the brake system.

Fit the road wheel, nuts and nave plate.

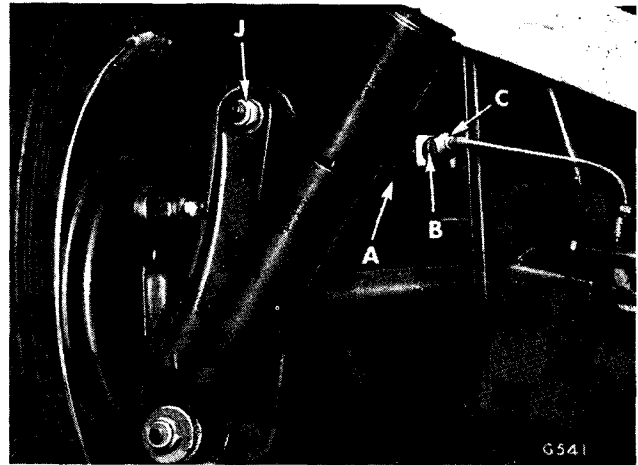


Fig. 3. Rear damper and brake pipe attachments

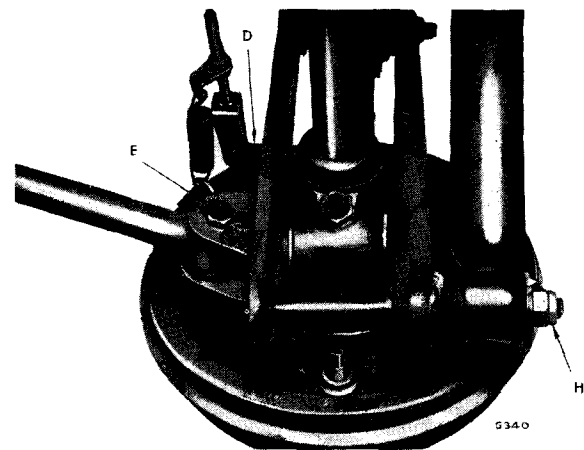


Fig. 4. Handbrake cable and radius arm attachments

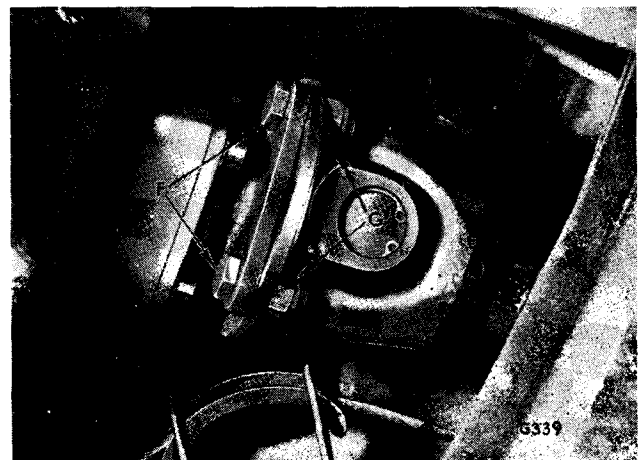


Fig. 5. Axle shaft coupling

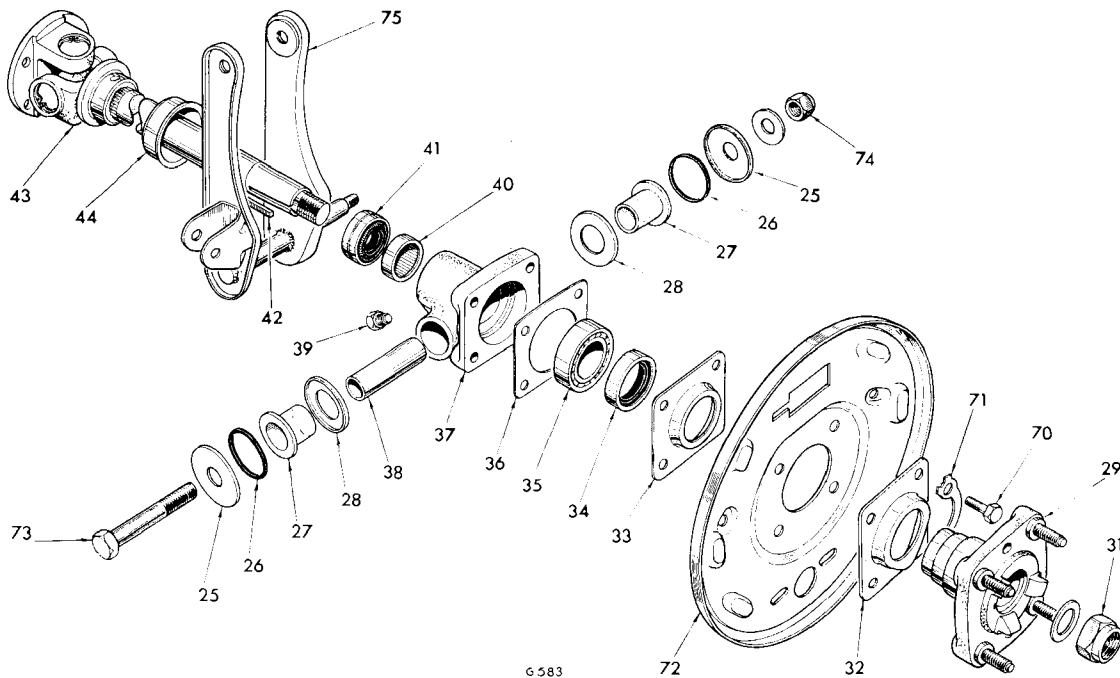


Fig. 6. Outer axle shaft and hub assembly details
(annotations are given under Fig. 2)

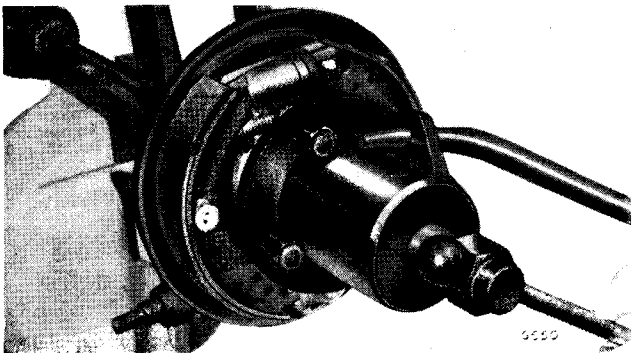


Fig. 7. Using Tool No. S109B to remove rear hub

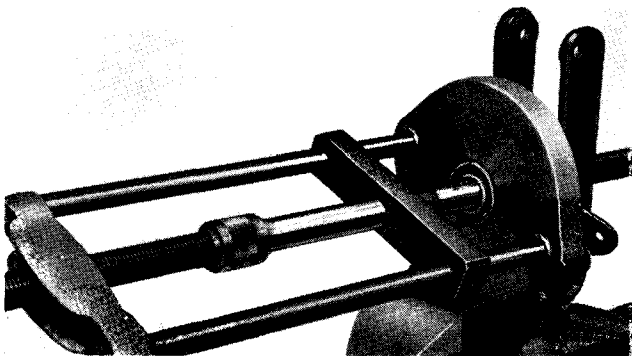


Fig. 8. Pressing the axle shaft through the trunnion assembly

Dismantling

Remove the countersunk screws and detach the brake drums.

Remove the hub nut (31), plain washer and extract the hub (30) and key (42) using Tool No. S109B.

Remove the nyloc nut (74) and withdraw the bolt (73). Detach the vertical link (75) from the trunnion, remove the shims (25 and 28), rubber seals (26), steel bush (38) and nylon inserts (27) from the trunnion.

Release the lockplates (71), withdraw four bolts (70) and remove the grease trap (32), brake backplate (72), seal housing (33), and joint washer.

Remove the oil seal (34) from its housing (33).

Remove the ballrace (35), trunnion housing (37) and flinger (44) together, using Churchill Tool No. S4221A with adaptors S4221A/14.

Extract the inner oil seal (41) and needle roller bearing (40) from the trunnion.

Re-assembly

Using Tool No. S300A, fit the needle roller bearing (40) into the trunnion (37), (pressing on the lettered end) to a depth of 0.5" (12.7 mm.) from the trunnion face.

Fig. 9. Section through rear hub

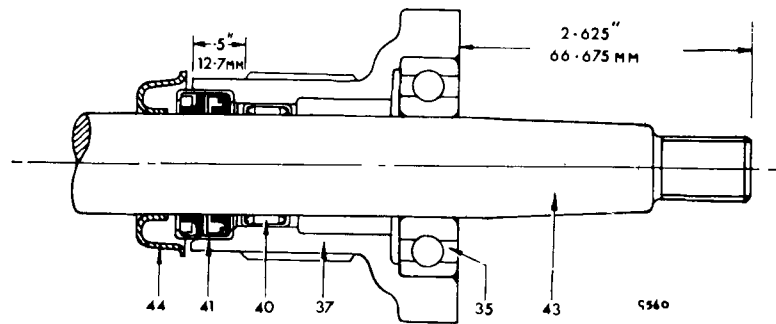
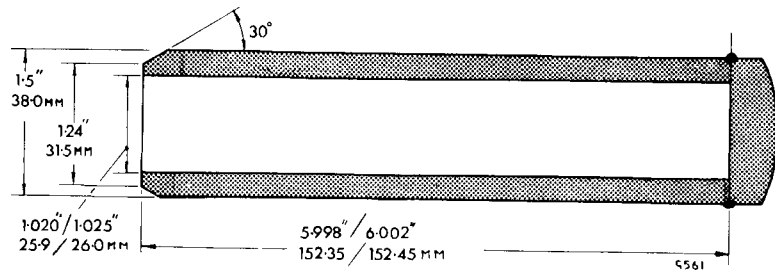


Fig. 10. Dimensions of tool for fitting flinger



With the sealing lips trailing, drift the inner oil seal (41) into the trunnion.

Drive the flinger (44) on to the axle shaft using the tool shown on Fig. 10.

Pack the needle rollers with grease and pass the axle shaft through the trunnion, taking care not to damage the inner oil seal.

Secure the axle shaft in the protected jaws of a vice, pack the ballrace with grease and drift it on to the shaft, using Tool No. S.304, as shown on Fig. 12.

With the sealing lip trailing, press a new seal (34) into the seal housing (33). Coat a new paper joint (36) with grease, position it on the trunnion outer face, and assemble the seal housing, brake backplate assembly (72) (with wheel cylinder at the top) and grease trap (32) (with duct to bottom). Secure the assembly with bolts (70) and new lockplates (71).

Insert the key (42) into its keyway in the axle shaft and, ensuring that the tapers are clean, fit the hub (30) and secure it with a plain washer and new nyloc nut (31).

Secure the brake drums with the countersunk screws.

Complete the trunnion assembly by fitting the nylon bushes (27), steel sleeve (38), shims (28 and 25) rubber seals (26) and vertical link (75).

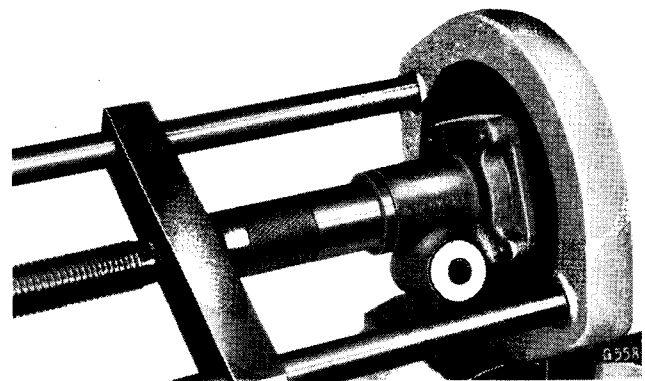


Fig. 11. Pressing the needle roller bearing into the trunnion

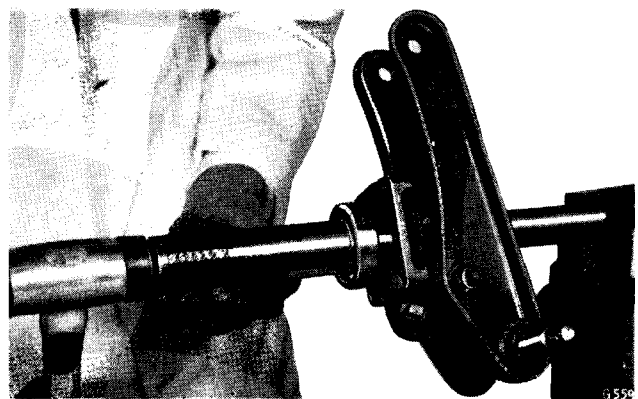
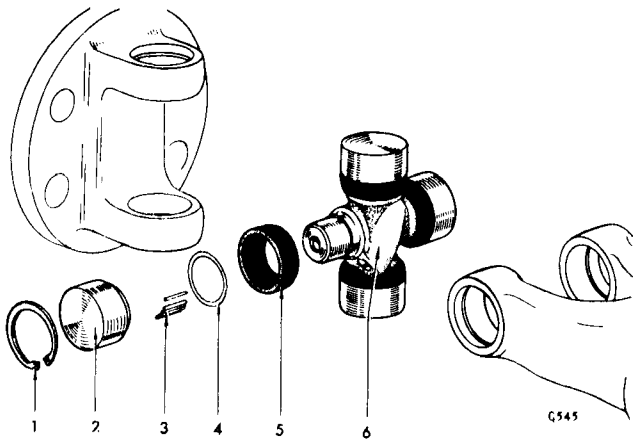


Fig. 12. Driving the ballrace onto the shaft



- | | |
|------------------|----------|
| 1 Circlip | 4 Washer |
| 2 Cup | 5 Seal |
| 3 Needle rollers | 6 Spider |

Fig. 13. Coupling details

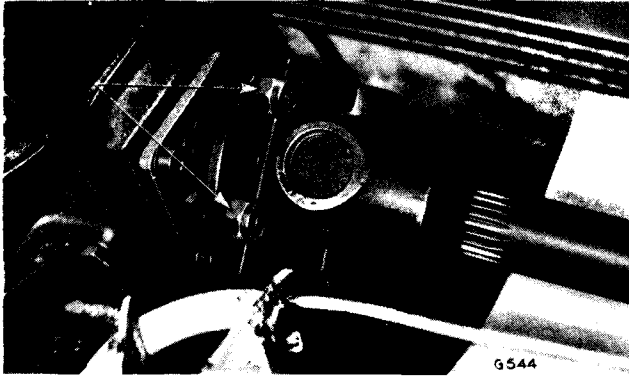


Fig. 14. Coupling attachment

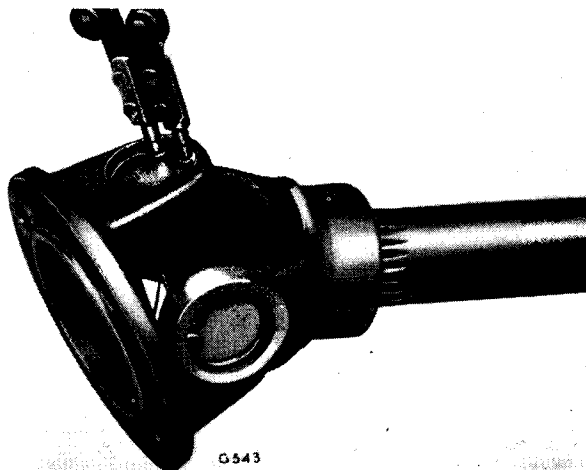


Fig. 15. Removing circlips

OUTER AXLE SHAFT COUPLINGS

Inspection

Jack up the rear of the car and support it on chassis stands. Remove the nave plates and road wheels.

Place a trolley jack under the vertical link and raise it until the assembly assumes its normal operating position.

Remove the bolts securing the coupling to the inner axle shaft. Taking care not to damage the flange faces, lever the flanges apart, easing the vertical link outwards on the jack.

Holding the axle shaft firmly, move the flange yoke axially along the spider journals. If end float exists, renew the spider and cup assemblies. This will necessitate removal of the outer axle shaft assembly as described on page 3-105.

Repeat the inspection procedure on the other axle shaft coupling.

Dismantling (Fig. 13)

Secure the axle shaft in a vice and remove the circlips (1) retaining the roller cups (2).

Support the flange yoke and tap it with a hide-faced mallet (Fig. 16) to partially eject the cup from the yoke. Completely withdraw the cup using grips (Fig. 17). Repeat the operation with the opposite cup.

Detach the flange yoke from the spider and remove the cups as described above. Remove the spider from the outer yoke.

NOTE: A tight cup may be removed by gripping it in the jaws of a vice and tapping the yoke with a hide faced mallet.

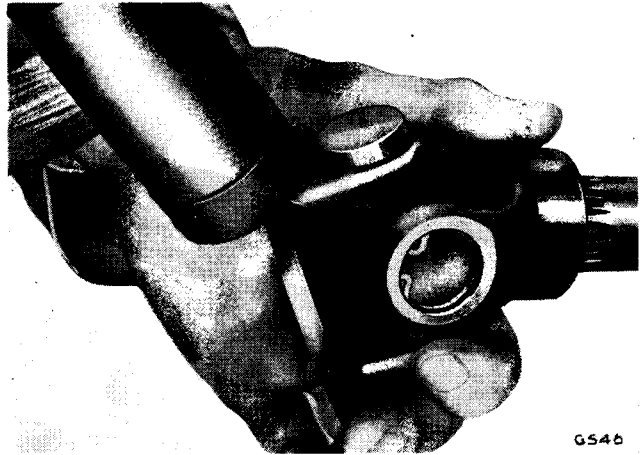
Replacement of Parts

The needle rollers, cups, spiders, seals and circlips are supplied only as a complete package. The occurrence of wear in the bores of a universal joint yoke will necessitate its removal. The outer yoke is attached to the axle shaft and can only be obtained as an assembly.

Re-assembly

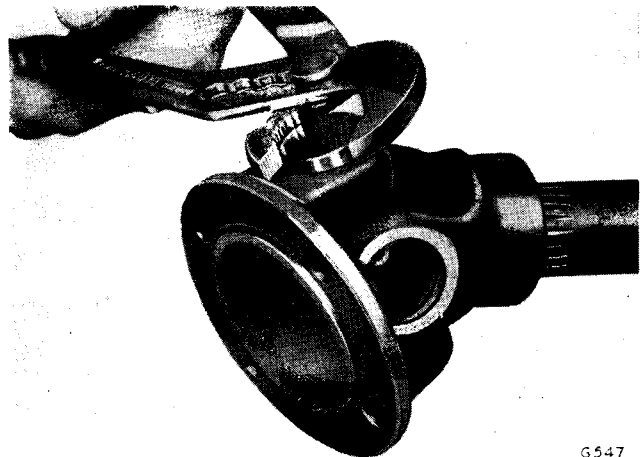
Carefully fit the seals (5) and washers (4) onto the cups (2). Manoeuvre the spider into the outer yoke. Press the cups squarely into the yoke ensuring that the needle rollers engage with the spider journals. Repeat with the flange yoke.

Secure the cups in the yokes by inserting the circlips in their grooves.



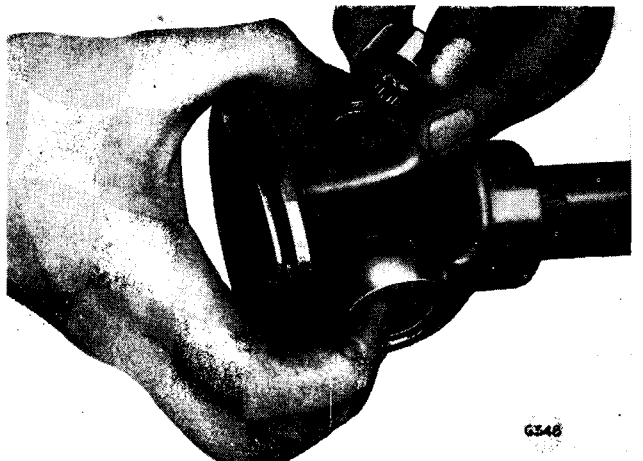
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Fig. 16. Tapping cup from flange yoke



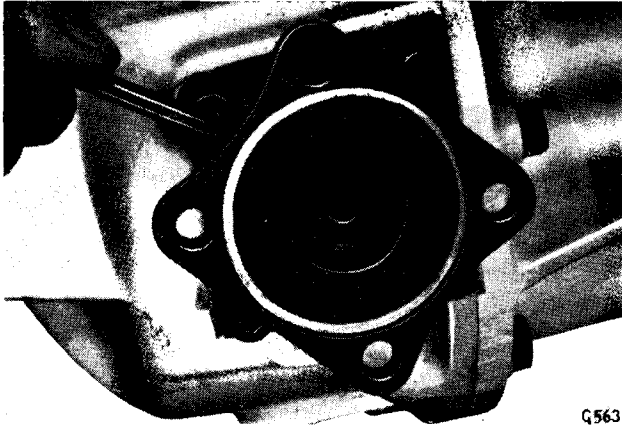
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Fig. 17. Using grips to remove needle roller cup



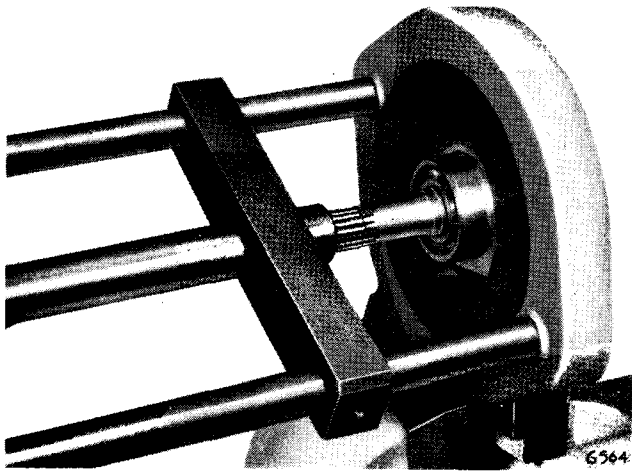
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Fig. 18. Fitting cup and needle rollers



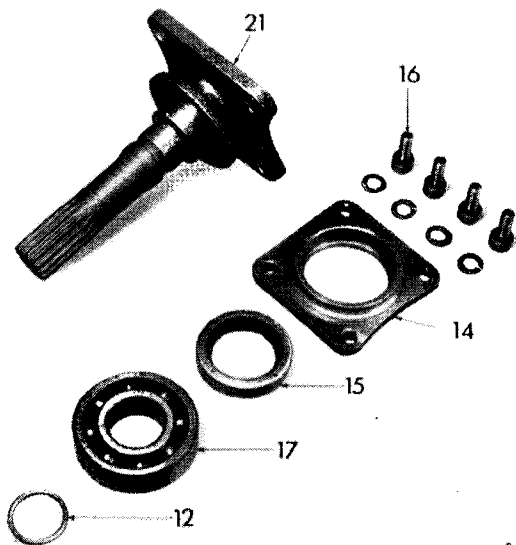
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Fig. 19. Unscrewing hexagon socket screws



Q564

Fig. 20. Pressing out inner axle shaft



Q 565

Fig. 21. Inner axle shaft details

INNER AXLE SHAFT AND BEARING ASSEMBLIES

To Remove (Fig. 19)

Remove the hub and outer axle shaft assembly, as described on page 3-105.

Drain rear axle oil.

Utilizing a $\frac{3}{16}$ " (6.763 mm.) hexagon socket key, as shown on Fig. 19, remove the socket screws from the hypoid casing.

Withdraw the inner axle shaft assembly.

To Refit

Insert the inner axle shaft into the hypoid housing and secure it with the four hexagon socket screws (16).

Refill the hypoid housing with oil and refit the outer axle shaft.

Dismantling

Remove the circlip (12) (Fig. 21) and, using a Churchill Press and Adaptor Set No. S.4221A-7A withdraw the race from the inner axle shaft, as shown on Fig. 20.

Detach the seal housing plate (14) and drive out the oil seal (15).

Re-assembly

With the lip of the seal leading, drive a new seal into the housing plate (14).

With the sealing lip trailing, slide the housing on to the inner axle shaft, taking care not to damage the seal as it passes over the serrations.

Press the ballrace on to the axle shaft, as shown on Fig. 23.

Fit the circlip (12) to the inner axle shaft groove.

PINION OIL SEAL

To Replace (Fig. 24)

Drain the hypoid unit, remove the exhaust tail pipe and disconnect the rear end of the propeller shaft. Withdraw the split pin (55), unscrew the nut (56) and remove the driving flange (57).

Lever out the old oil seal (58) and drive a new one into position.

Refit the driving flange (57), reconnect the propeller shaft and refit the exhaust pipe.

Refill the hypoid unit with oil.

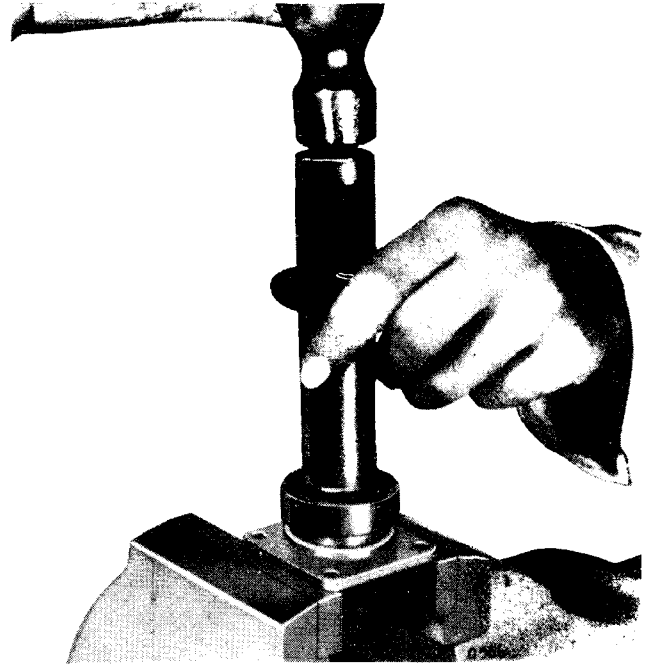


Fig. 22. Fitting inner axle shaft oil seal

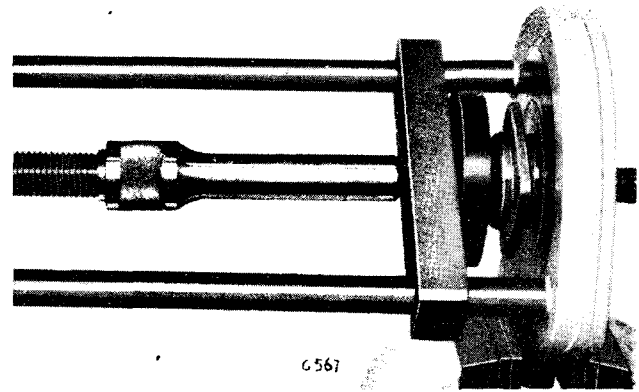


Fig. 23. Pressing inner axle shaft through bearing and housing

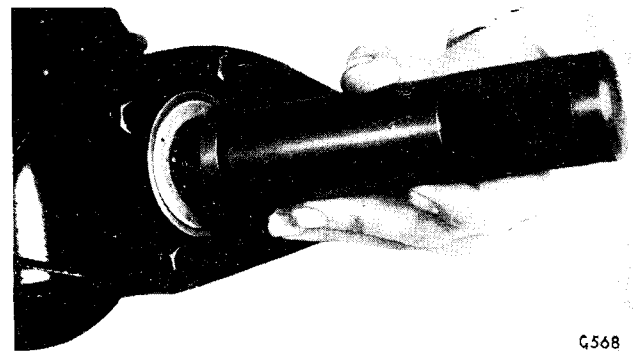


Fig. 24. Driving pinion oil seal into position

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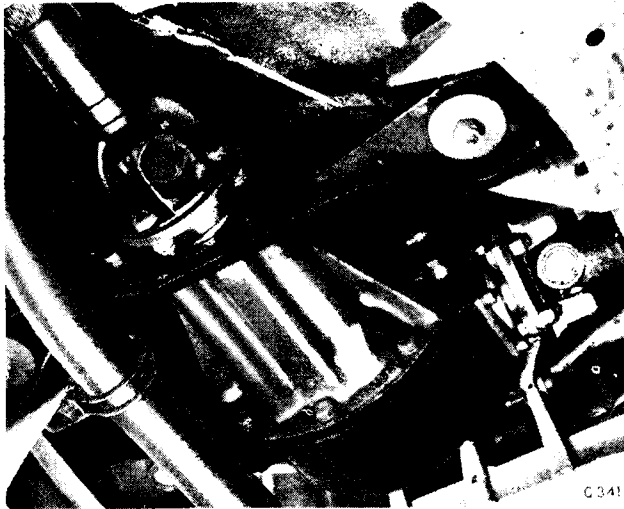


Fig. 25. Underside view of hypoid unit

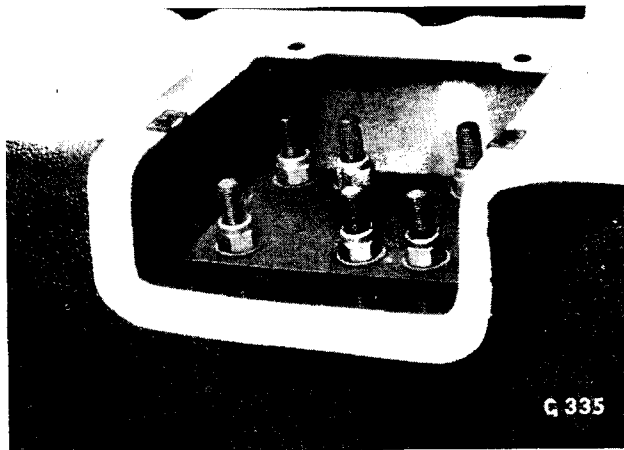


Fig. 26. Cover removed to show rear road spring attachment

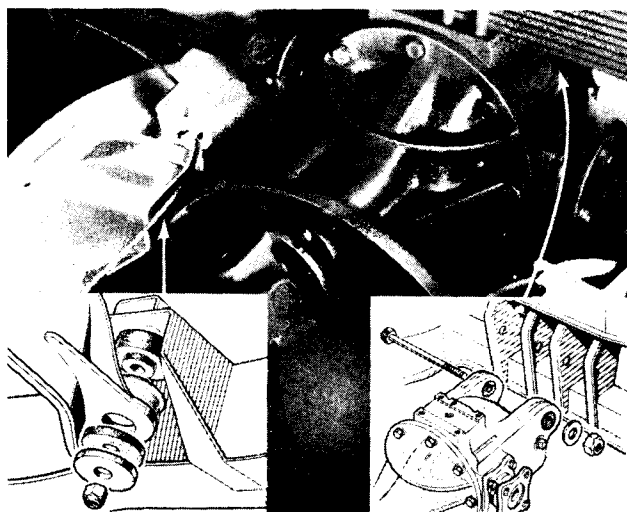


Fig. 27. Hypoid unit attachments

HYPOID UNIT

To Remove

Jack up the rear of the vehicle, place on stands and drain the hypoid unit.

Remove the nave plates and road wheels.

Support the vertical links with screw jacks to relieve the dampers of spring load.

Remove the nyloc nuts and washers from the damper lower attachment eyes and pull the bottom of the dampers clear of the mounting pins.

Remove the exhaust silencer and tail pipe from the vehicle.

Disconnect the inner shaft couplings and the rear end of the propeller shaft from the hypoid unit.

Take out the front luggage floor panel (GT6) or rear seat assembly (Vitesse) and remove the spring access plate from the floor.

Release the spring retaining plate and remove the three rear studs from the axle casing (Fig. 26) (4 nuts and studs—GT6 Mk. 3).

Release the rear attachment by removing the nyloc nut (13), plain washer and withdrawing the bolt (9).

With the assistant taking the weight of the hypoid unit, release the front mounting by removing the nyloc nuts (51), large plain washers (52) and rubber pads (53).

Manoeuvre the hypoid unit forward and down from beneath the vehicle.

To Refit

Offer up the hypoid unit to its rear mounting points and fit the bolt through the rear mounting lugs.

Fit the front rubber pads (53) ensuring that the upper ones locate in the corresponding holes in the front mounting plate. Fit the plain washers (52) and tighten the nyloc nuts (51).

Refit the three rear spring attachment studs, the spring plate, plain washers and tighten the nyloc nuts.

Jack up each vertical link and refit the axle shaft couplings.

Refit the dampers and tighten the attachments.

Reconnect the propeller shaft and refit the exhaust tail pipe and silencer.

Refill the unit with oil, and adjust the brakes.

Refit the road wheels, remove the stands, and tighten the wheel nuts and refit nave plates.

HYPOID UNIT

General Recommendations

Scrape existing joint material from the joint faces and clean the axle components, preferably in a trichlorethylene degreasing plant, giving particular attention to the bearings.

Examine all joint faces and bearing locations for burrs and other damage likely to affect proper seating of the components and rectify as necessary.

Avoid the intermixing of bearing components and keep all shim packs intact. Assess the serviceability of all components by careful examination and by checking the measurement of worn surfaces against the maximum worn tolerances given on page 3-101.

When re-building the unit, use new joint washers and spring washers and renew damaged studs, nuts, bolts and unservicable components. Use Hylomar, Wellseal or Hermetite for all gasket joints.

Tighten all nuts, bolts and studs to the appropriate torque figures listed on page 0-125.

To Remove Differential Housing from Casing

Clean the unit with paraffin, and place it on a clean bench. Remove the inner axle shafts as described on page 3-110. Remove the bolts (63) and spring washers and turn the pinion until the two chamfered portions on the edge of the differential carrier permit withdrawal of the differential housing.

To Refit

Reverse the removal procedure, ensuring that the differential housing and casing flange faces are clean. Fit a new paper joint, coated with grease, between the two faces.

Removal of Differential Carrier

Remove the bearing cap bolts (49) and detach the bearing caps (47). Assemble the Churchill spreading tool on the housing face as shown on Fig. 30. Spread the fixture by turning the double-ended tensioner screw until it is hand tight, then complete the spread by moving it a further half-turn with a spanner.

IMPORTANT: DO NOT OVER-SPREAD BY EXCEEDING THIS AMOUNT OR THE HOUSING WILL BE DAMAGED BEYOND REPAIR.

Lift the differential carrier from the housing. If the bearings are to be re-used, suitably identify them or, preferably, tie the bearing outer rings and shims to their respective inner races.

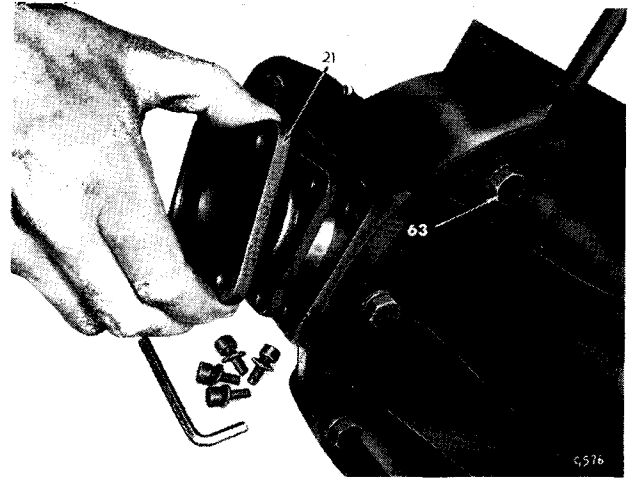


Fig. 28. Removing inner axle shaft from hypoid unit

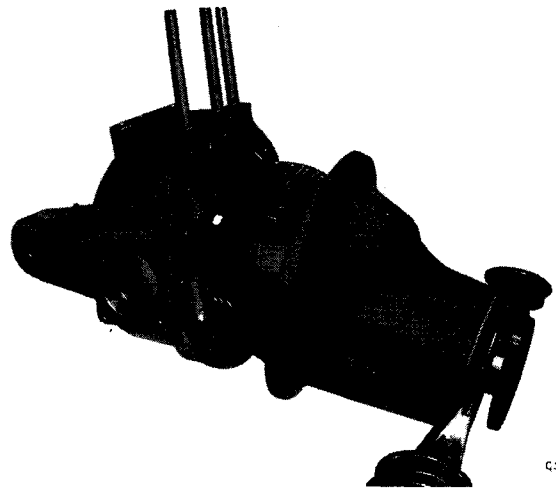


Fig. 29. Hypoid unit removed from rear casing

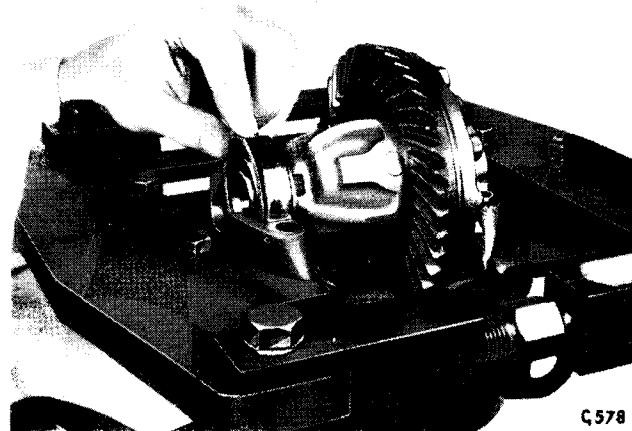


Fig. 30. Using spreading tool to release differential carrier

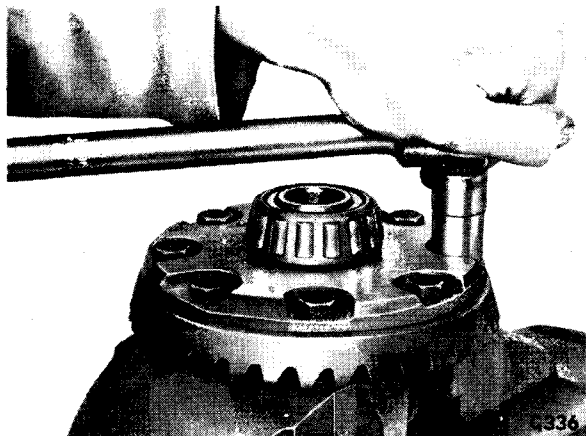


Fig. 31. Unscrewing crownwheel attachment bolts

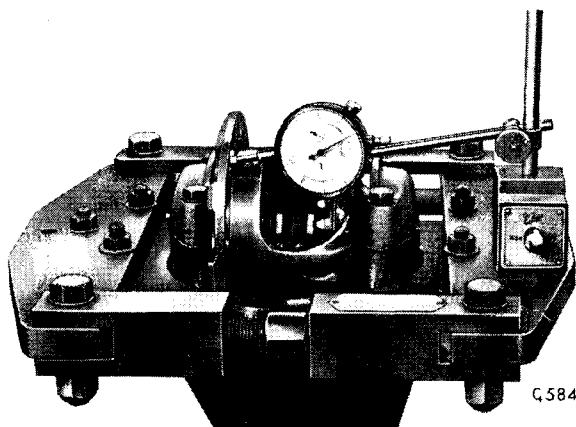


Fig. 32. Checking differential carrier flange run-out

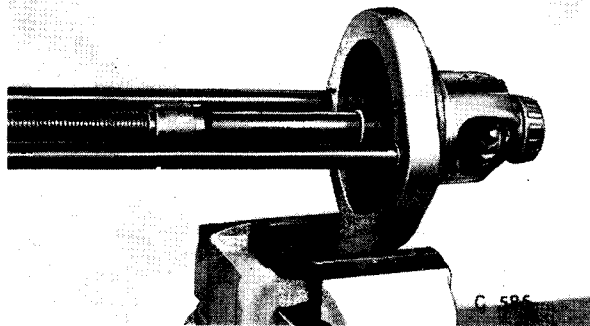


Fig. 33. Withdrawing differential side bearings

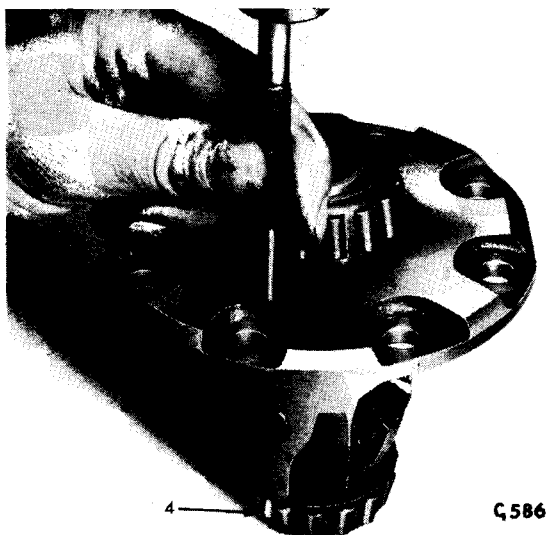


Fig. 34. Driving out cross-shaft locking pin

Dismantling the Differential Unit

Remove the bolts (24) and detach the gear (68) from the carrier. Refit the differential assembly, complete with bearings and shims but without the crown wheel, into the pinion housing and release the Churchill spreading tool.

With a dial indicator gauge mounted on the housing and the plunger operating squarely against the carrier face, slowly rotate the carrier and check the "run-out". Maximum "run-out" must not exceed 0.003" (0.076 mm.).

Remove the differential carrier assembly and the spreading tool. Using Tool No. S.4221A-8C, withdraw the bearings (19) as shown on Fig. 33.

Drive out the cross-shaft locking pin (4) and remove the cross-shaft (69), differential gears (5), (6) and thrust washers (3), (7).

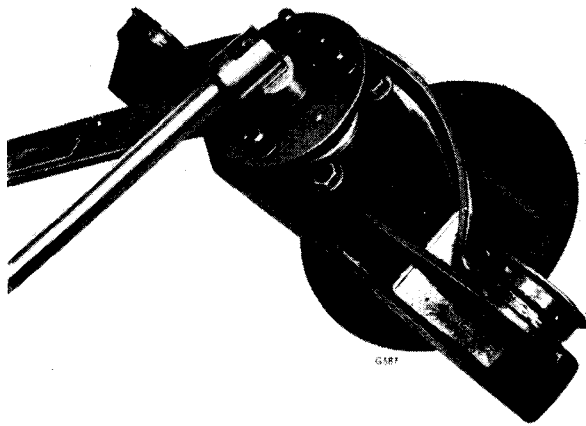


Fig. 35. Unscrewing pinion flange nut

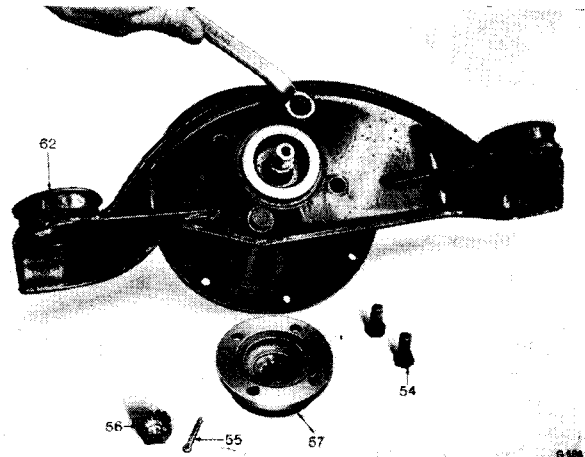


Fig. 36. Removing front mounting plate

Removing Pinion

Remove the split pin (55), nut (56) and plain washer. Withdraw the flange (57) from the pinion (67) and drive the pinion from the casing. Carefully keeping all shims intact, remove these and the spacer (61) from the pinion. Extract the pinion head bearing and selective spacer (66) using Tool No. S.4221A-17, as shown on Fig. 38.

Drive out the pinion tail bearing outer race, the oil seal (58) and the head bearing outer race. See Fig. 37.

Remove the four "Wedgelok" setscrews (54) and front mounting plate (62).

Examination of Pinion Housing

Before proceeding to re-assemble the axle components, check the bearing housing for burrs or other damage likely to prevent correct seating of the bearings.

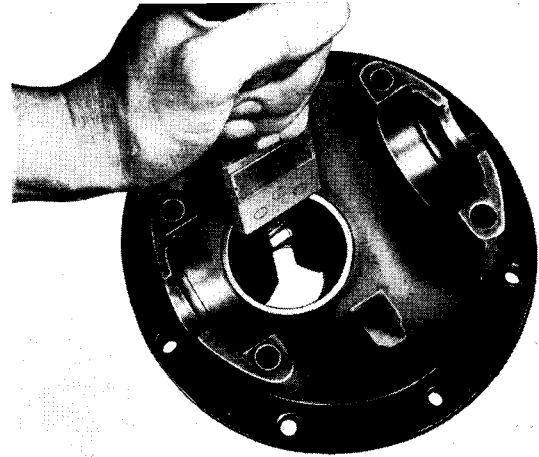


Fig. 37. Driving out pinion bearing outer races

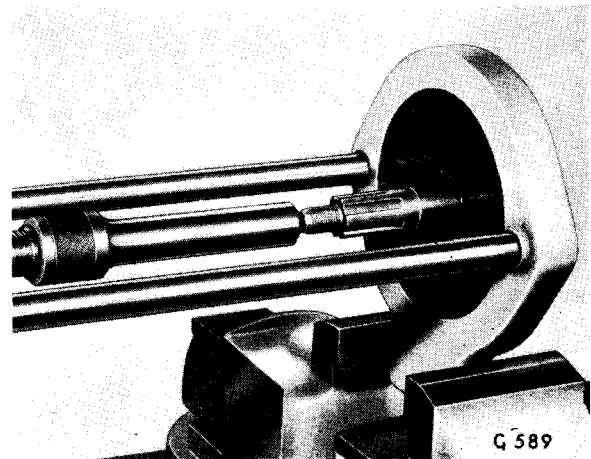


Fig. 38. Withdrawing pinion head bearing

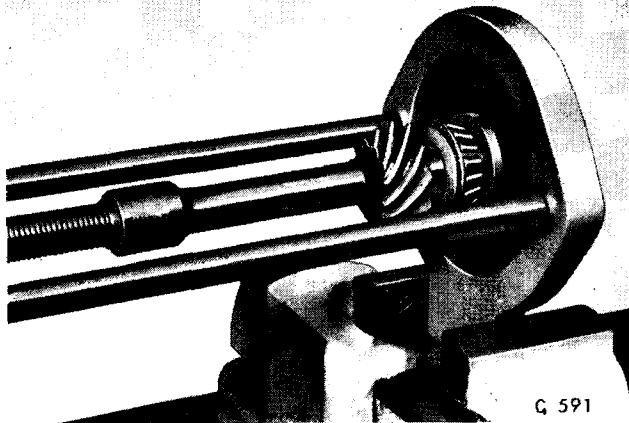


Fig. 39. Fitting pinion head bearing

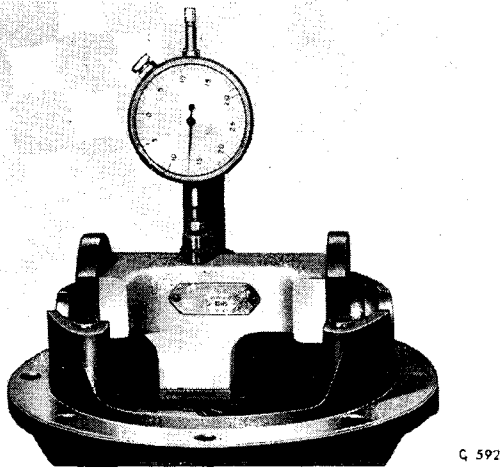


Fig. 40. Measuring pinion height



Fig. 41. Crownwheel and pinion markings

RE-ASSEMBLY

Carefully examine all components and decide which items require renewal. If slight damage to the crown wheel or the pinion necessitates replacement, discard both items and fit a new matched pair. These gears are lapped together during manufacture and etched with similar marking to identify them as a pair, therefore, before fitting, ensure that each gear is similarly marked as shown on Fig. 41.

Installing Pinion and Bearings

Locate the pinion bearing outer races in the differential housing (64). Omitting the selective spacer (66), at this stage, lightly oil the head bearing (65) and press it on to the pinion (67).

Install the pinion into the housing and omitting the spacer (61), shims (60) and oil seal (58) assemble the tail bearing (59), driving flange (57), plain washer and nut (56). Tighten the nut to a torque of 12/16 lbs./ft. (1.65/2.2 Kg./m.).

IMPORTANT: To ensure correct location of the bearing rollers, spin the pinion whilst tightening the flange nut.

Adjusting Pinion Height

Using the ground button, depress the dial gauge plunger to its limit and "zero" the gauge.

Place the gauge in the axle casing with the plunger contacting the pinion (Fig. 40).

Exerting downward pressure on the gauge, obtain a maximum reading. This figure subtracted from 0.100" indicates the thickness of shims required between a normal pinion and head bearing.

A pinion of normal height bears the letter "N" on the top face of the pinion. Hypoid pinions not marked in this manner bear a number preceded by a plus or minus sign as shown in Fig. 41. These symbols indicate the amount which must be added to, or subtracted from the figure derived from gauge reading.

e.g. Gauge reading .013"
 Marking on pinion head "+1"
 Selective spacer required = 0.100"
 -0.013"
 +0.001"

 = 0.088"

Having determined the requisite spacer thickness, remove the pinion, bearings and driving flange from the housing but leave the bearing outer rings in place. Assemble the spacer (66) to the pinion and refit the head bearing.

Adjusting Pinion Bearing Pre-load

Assemble the spacer (61) and the shim pack (60) to the pinion shaft and fit the assembly into the housing.

NOTE: The thickness of the shim pack (60) may require re-adjusting to give correct pre-loading.

Drive the bearing (59) on to the pinion shaft and fit the driving flange (57), plain washer and nut (56). Tighten the nut to 90/100 lb./ft. (12.4/13.8 Kg./m.) torque.

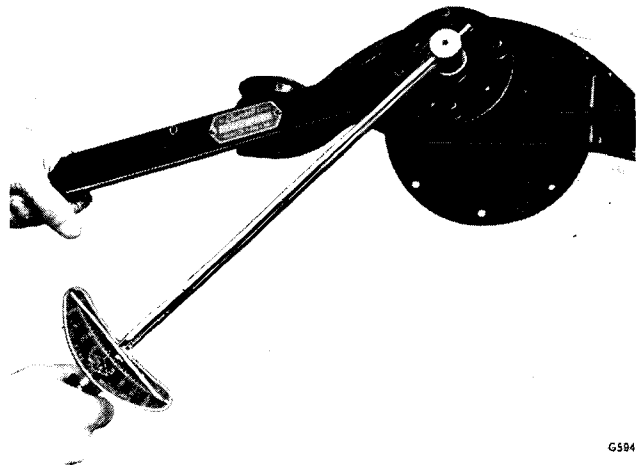
Attach a pre-load gauge to the driving flange as shown in Fig. 43. Slowly move the weight along the graduated scale and note the point at which it falls. The gauge should read 12-16 lb./in.

Higher readings require a thicker shim pack between the tail bearing and spacer, lower readings require a thinner shim pack.

NOTE: One thousandth of an inch shim thickness = 4 lb./in. torque (approx).

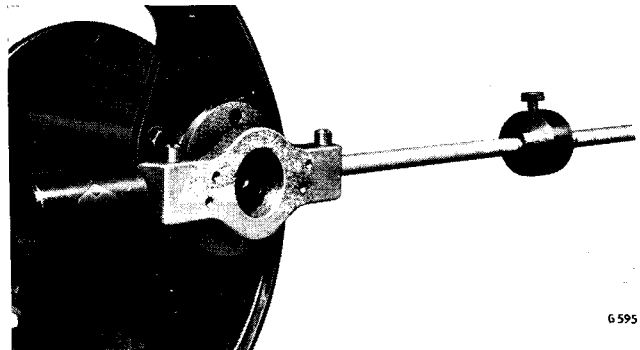
When the pre-load is correct, remove the driving flange and fit a new oil seal. Re-attach the flange, plain washer and nut. Tighten the nut and secure it with a split pin.

Measure the flange 'run-out' as shown in Fig. 44. Maximum 'run-out' must not exceed 0.002in. (0.05mm.).



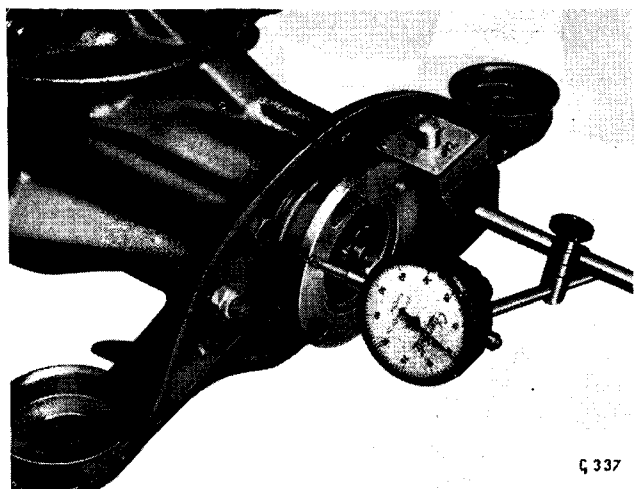
G 594

Fig. 42. Tightening pinion flange nut



G 595

Fig. 43. Measuring pinion bearing preload



G 337

Fig. 44. Measuring pinion flange run-out

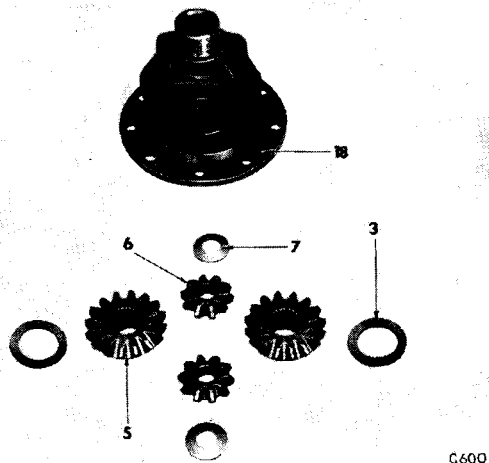


Fig. 45. Differential gears

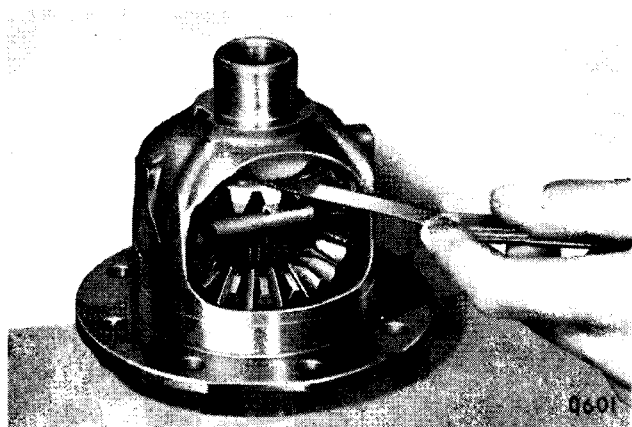


Fig. 46. Measuring differential gear backlash

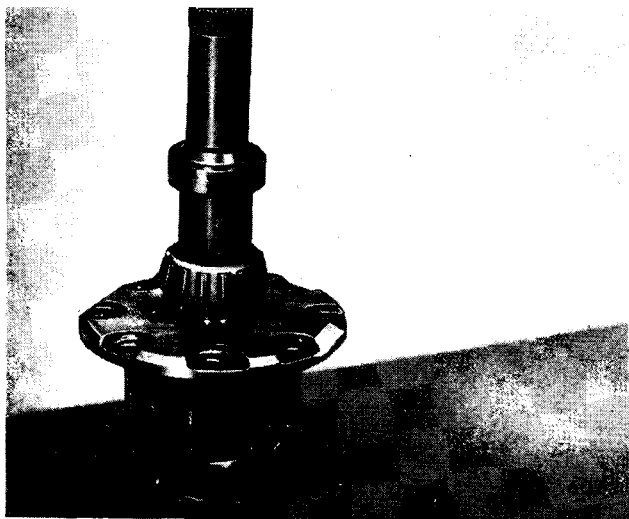


Fig. 47. Fitting differential side bearings

Differential Gears (Fig. 45)

Assemble the sun gears (5), planet gears (6) and thrust washers (3), (7) into the differential carrier (18).

Insert the cross-shaft (69) into the carrier and check the planet gear backlash. By selection of planet gear thrust washers, reduce the end float to give minimum backlash consistent with freedom of rotation.

Insert the cross shaft locking pin (4) and secure it by peening the metal over the end of the pin.

Measuring Total Differential Float

Fit the differential bearings to the carrier journals and place the assembly in the housing, omitting the shims.

Attach a dial gauge to the housing so that the dial plunger operates squarely against the crown wheel mounting face of the carrier (Fig. 48). Pressing both bearing outer rings towards each other, move the assembly away from the gauge and "zero" the dial.

Similarly, move the assembly towards the gauge, and note the dial reading. This indicates the total side float and is referred to as dimension "A" (see Fig. 50).

Remove the dial gauge and the differential carrier from the hypoid housing.

Crown Wheel—Measuring “In and Out” of Mesh

Ensuring that the mounting faces are clean and free from burrs, attach the crown wheel (68) to the carrier (18) and secure with new bolts (24).

NOTE: Thoroughly clean the carrier flange, crownwheel and bolts in a degreasing plant and apply 2 drops of “Loctite Studlok” to the threads of the bolts. Tighten the bolts to a torque of 42/46 lb./ft. (5·8/6·3 Kg./m.).

Refit the differential unit in the hypoid casing and position the dial gauge as shown on Fig. 49.

Move the differential unit away from the gauge, to the “Full Mesh” position and “zero” the dial.

Move the differential unit towards the gauge and note the dial reading. This is the “in and out” of mesh dimension used in the following calculations and is referred to as dimension “B” (see Fig. 50).

Lift the differential carrier from the housing taking care not to mix the bearing out rings.

Differential Bearing Pre-load

By substituting correct measurement in place of those used in the following examples, calculate the thickness of both shim packs as follows:

Example

Total float “A”	0·060”
Plus 0·003” pre-load	0·003”

Total thickness of shims required	0·063”
-----------------------------------	--------

Shim thickness at “Y”:

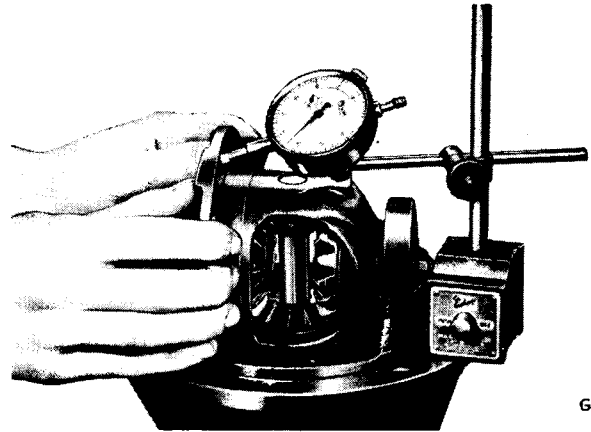
In/Out of mesh clearance “B”	0·025”
Subtract specified backlash	0·005”

Shim pack thickness required at “Y”	0·020”
-------------------------------------	--------

Shim thickness at “X”:

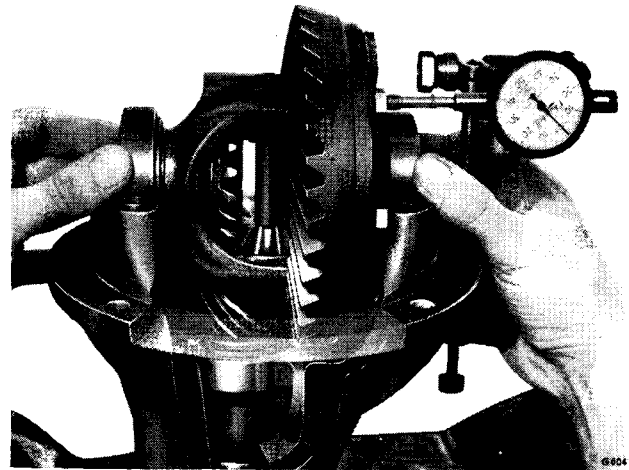
Total shim thickness	0·063”
Minus shim pack thickness at “Y”	0·020”

Shim pack thickness required at “X”	0·043”
-------------------------------------	--------



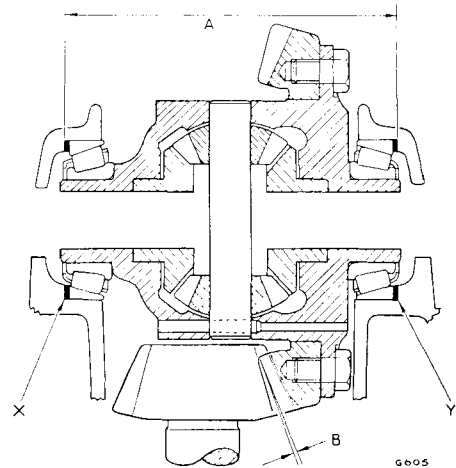
G 603

Fig. 48. Measuring total side float



G 604

Fig. 49. Measuring in/out of mesh



G 605

Fig. 50. Diagram for calculating shim pack thicknesses

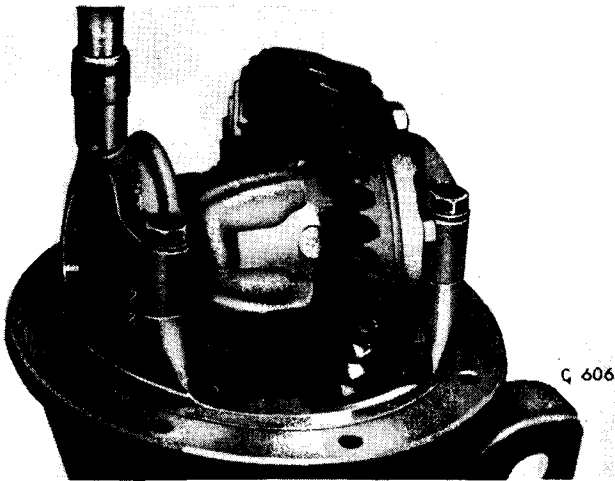


Fig. 51. Tightening bearing cap bolts

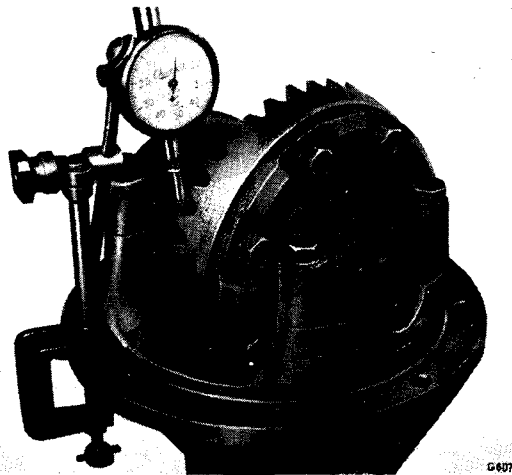


Fig. 52. Measuring crownwheel/pinion backlash

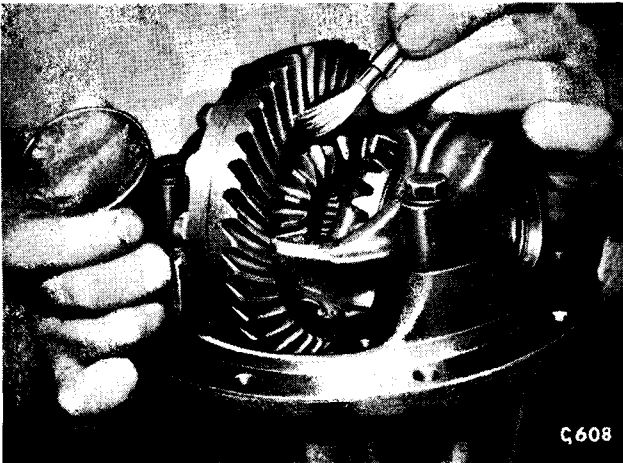


Fig. 53. Painting crownwheel teeth to check pinion meshing

Using the axle spreading tool, and again taking care not to overspread, insert the differential carrier complete with shims into the casing. Remove the axle spreader, assemble the caps to their respective bearings and tighten the securing bolts.

Crown Wheel Backlash

Mount the dial gauge on the casing (Fig. 52) and by moving the crown wheel in either direction, take up the free movement, noting the readings on the dial gauge. Measure this backlash at several positions, each of which should be within the limits of 0.004"–0.006" (0.1–0.15 mm.).

Should the backlash be excessive, reduce the thickness of the shim pack at "X", (Fig. 50) and add an equal amount to "Y". If the backlash is insufficient, reverse the procedure.

Tooth Markings

After setting the backlash to the required figure, use a small brush to lightly smear eight or ten of the crown wheel teeth with engineers' blue. Move the painted gear in mesh with the pinion to obtain a good tooth impression.

(a) Correct Markings (Fig. 54)

When the gear meshing is correctly adjusted the markings obtained should closely approximate those shown at (a), this being the ideal contact.

The area of contact is evenly distributed over the working depth of the tooth profile and is located slightly nearer to the TOE than the heel.

(b) High Contact

The markings shown at (b) are those produced by high contact i.e., when the tooth contact is heavy on the crown wheel face or addendum and caused by the pinion being too far out of mesh. To rectify, move the pinion deeper into mesh by adding shims between the pinion and head bearing. To maintain the existing pinion bearing preload, an equal amount of shims must also be added between the tail bearing inner cone and the bearing distance piece.

(c) Low Contact

Fig. 54 (c) shows heavy markings on the crown wheel flank or dedendum this being the opposite to that shown in (b). Rectification of this condition necessitates moving the pinion out of mesh by removing an equal amount of shims from the positions described in (b).

NOTE: When correcting for (b), the new position will tend to move the tooth contact towards the toe on drive and the heel on coast, whilst correcting for (c) will tend to move the tooth contact towards the heel on drive and the toe on coast. In either case it may be necessary, after correcting the pinion mesh, to re-adjust the crown wheel as described in (d) and (e).

(d) Toe Contact

The markings shown on Fig. 54 (d) result when the tooth contact is concentrated at the small end of the tooth. To rectify this condition, move the crown wheel out of mesh, i.e., increase backlash by transferring shims from the crown wheel side of the differential to the opposite side.

(e) Heel Contact

Fig. 54 (e) shows the markings obtained when the tooth contact is concentrated at the large end of the tooth. This condition is rectified by reducing backlash, i.e., by transferring shims in the opposite direction as for (d).

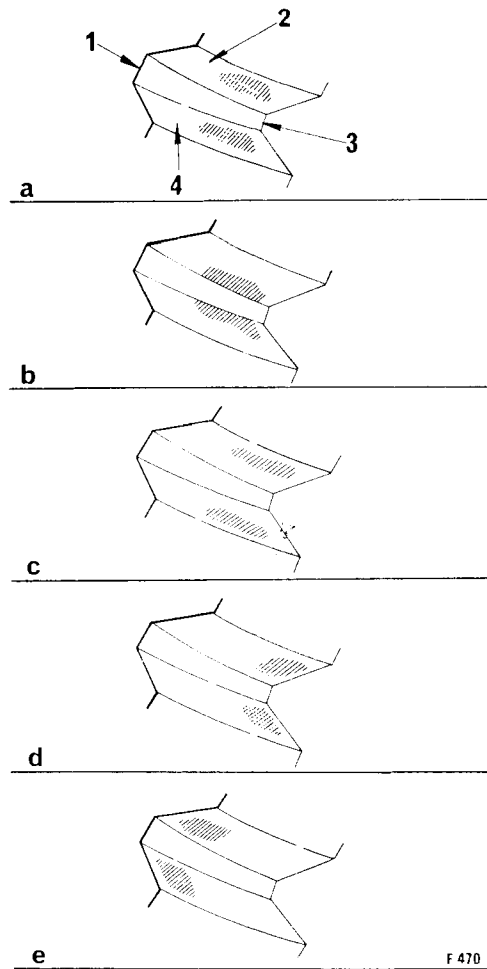
IMPORTANT: Whatever corrections are necessary, it is most important that the backlash at all times is within the specified limits.

- (i) **BACKLASH.** When adjusting for backlash, always move the crown wheel as this member has more direct influence on backlash.
- (ii) **CROWN WHEEL MOVEMENT.** Moving the gear out of mesh has the effect of moving the tooth contact towards the heel and raising it slightly towards the top of the tooth.
- (iii) **PINION MOVEMENT.** Moving the pinion out of mesh raises the tooth contact on the face of the tooth and slightly towards the heel on drive, and towards the toe on coast.

Having assembled the differential unit, refit it to the casing (as described on page 3-113 and attach the assembly to the vehicle (as described on page 3-112).

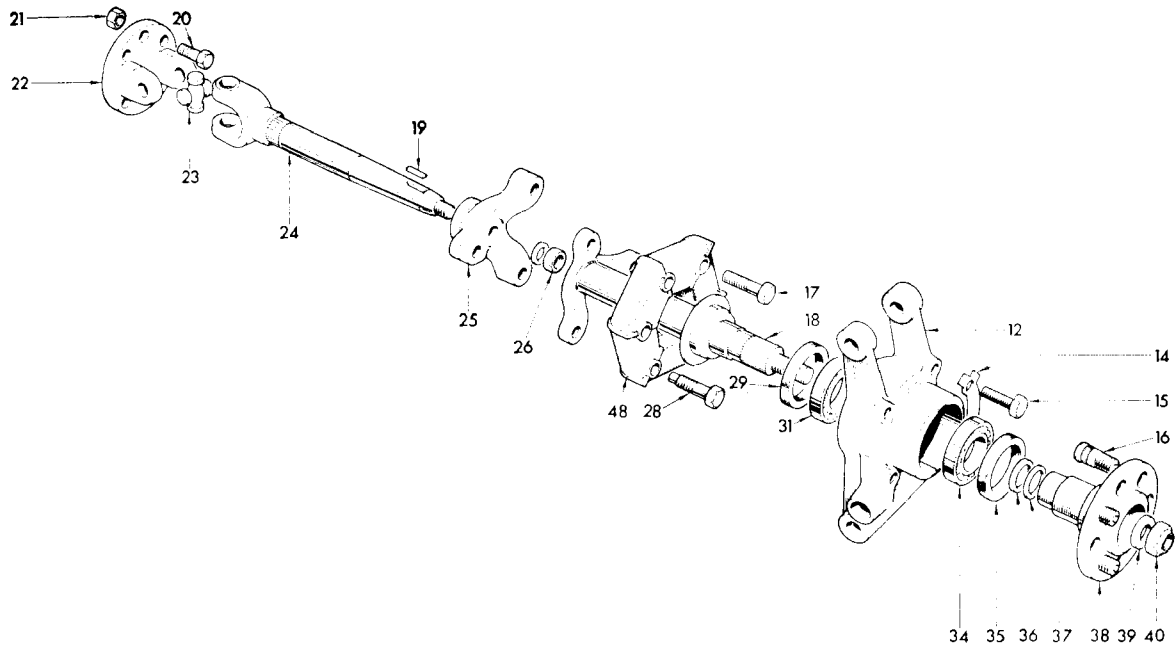
Refill the axle with one of the approved lubricants listed on page 0-118.

ADDENDUM—Pitch line to tooth tip
DEDENDUM—Pitch line to tooth root



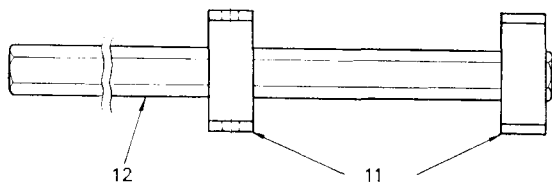
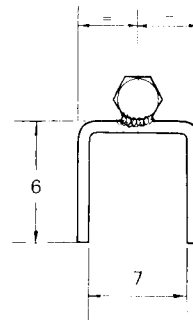
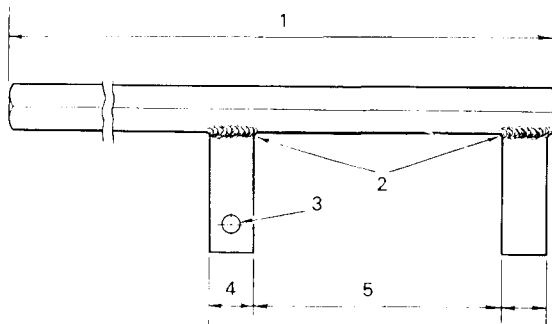
- 1 Heel (thick end)
- 2 Coastsides (concave)
- 3 Toe (thin end)
- 4 Drive side (convex)

Fig. 54. Crownwheel tooth markings



K113

Fig. 55. Outer drive shaft and hub assembly details
(annotations are given under Fig. 42, page 4-120)



K156

Key to Fig. 56

- 1 36" (91.5 cm.)
- 2 Weld area as shown
- 3 Drill two holes $\frac{3}{8}$ " (9.5 mm.)
- 4 1" (2.5 cm.)
- 5 5 $\frac{3}{4}$ " (14.6 cm.)
- 6 2 $\frac{3}{4}$ " (7.0 cm.)
- 7 2 $\frac{1}{4}$ " (5.7 cm.)
- 8 $\frac{3}{8}$ " (9.5 mm.) nut and bolt
- 9 2 $\frac{1}{2}$ " (6.3 cm.)
- 10 3 $\frac{1}{2}$ " (8.9 cm.)
- 11 Make from $\frac{1}{4}$ " (6.3 mm.) mild steel
- 12 Make from 1" (2.5 cm.) hexagon bar mild steel

Fig. 56. Special hexagon bar

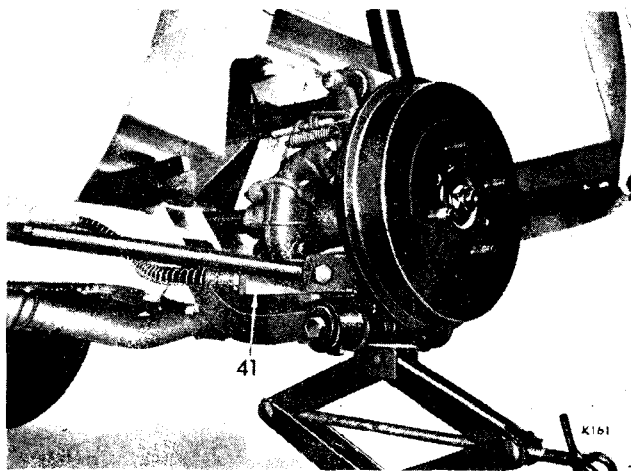


Fig. 57. Brake pipe and handbrake cable attachments

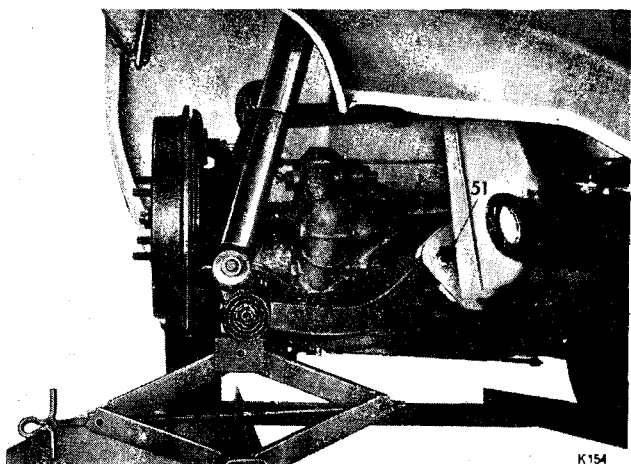


Fig. 58. Jacking up vertical link



Fig. 59. Axle shaft coupling

Unless otherwise stated, all operations contained in the following pages of this Rear Axle section appertain to GT6 Mk. 2, Plus and Vitesse Mk. 2.

HUB AND AXLE DRIVE SHAFT ASSEMBLY

To Remove (Fig. 55)

Jack up the rear of the vehicle and lower it onto chassis stands, suitably positioned to give maximum support. Remove the nave plate, wheel nuts and road wheel and jack up the vertical link (Fig. 58).

Disconnect the brake pipe and flexible hose from the support bracket (41) Fig. 57.

Disconnect the handbrake cable, and spring from the operating lever on the brake back plate.

Remove four bolts (20) to release the intermediate drive shaft (24) from the inner axle shaft coupling.

Make up hexagon bar to the dimensions given on Fig. 56. Attach the bar to the spring in the position as shown on Fig. 60. Proceed to jack up the spring to relieve the damper load and maintain the spring in this position by placing an axle stand under the outer extremity of the hexagon bar.

CAUTION: Make sure the hexagon bar is well supported by the axle stands, see Fig. 60.

Remove the bolt (52) and swing the radius arm (53) clear of the axle shaft.

Vitesse Mk. 2 only—Referring to Fig. 47, Page 4-122 slacken the lower damper link attachment nut (13), remove the nut (8) and washer securing the link (10) to the damper arm (7) and tap the link taper (9) clear of its attachment point.

GT6 and Plus only—Referring to Fig. 46, Page 4-122 slacken the upper damper attachment nut (62), remove the lower attachment nut (63) and move the lower end of the damper, clear of the axle shaft.

Remove the bolt (51) securing the lower wishbone to the chassis frame and take out the bolt (30) to release the rear road spring eye from the vertical link.

Withdraw the hub, vertical link and drive shaft assembly from the vehicle.

To Refit

Position the hub and axle drive shaft assembly to the vehicle and refit the lower wishbone to the chassis frame, leaving the nyloc nut semi-tight at this stage.

Fit the hexagon bar to the spring, place a jack under the outer extremity of the bar and relieve the load. Maintain this position by using axle stands.

Carefully jack up the vertical link plate, and fit the road spring to the vertical link and fully tighten the attachment nut.

Remove the hexagon bar and axle stands. Refit the intermediate drive shaft to the inner axle shaft coupling.

Re-attach the damper link (*Vitesse Mk. 2*) or the damper (*GT6 Mk 2, Plus*) and radius arm to the vertical link.

Tighten the nyloc nut securing the lower wishbone to the chassis frame.

Re-connect the handbrake cable and spring to the brake lever on the back plate.

DIMENSIONS AND TOLERANCES

GT6 Mk. 2, Plus and Vitesse Mk. 2

PARTS AND DESCRIPTION	DIMENSIONS	
	NEW	
	in.	mm.
Intermediate Drive Shaft		
Shaft length	9.13	232.2
Shaft end to centre line of universal coupling	0.90	23.0
Centre of Mills pin hole to centre line of universal coupling ..	1.56	39.6
No. of serrations		24
Mills Pin—Type		GP3
—Length	1.63	41.402
Keyway width	0.1865	4.737
	0.1875	4.762
Driving key dimensions:		
Width	0.1875	4.762
	0.1885	4.788
Depth	0.250	6.35
	0.251	6.38
Outer Drive Shaft		
Shaft length (including flange)	9.19	233.8
Shaft diameter	1.38	34.9
No. of splines		23
Full spline length	1.25	31.7
P.C. diameter of holes in flange	4.43	113.0
Hubs (rear)		
Diameter of hub outer bearing location	1.5013	38.10
	1.5018	38.10
Diameter of hub inner bearing location	1.2493	31.70
	1.2498	31.70
Diameter of hub outer oil seal location	1.875	47.62
	1.880	47.63
No. of serrations		23
P.C. diameter of the four holes	3.745	95.00
	3.755	95.25
P.C. diameter of the two holes	3.120	79.30
	3.130	79.55

For all other dimensions and tolerances relating to the rear axle section, refer to page 3-102.

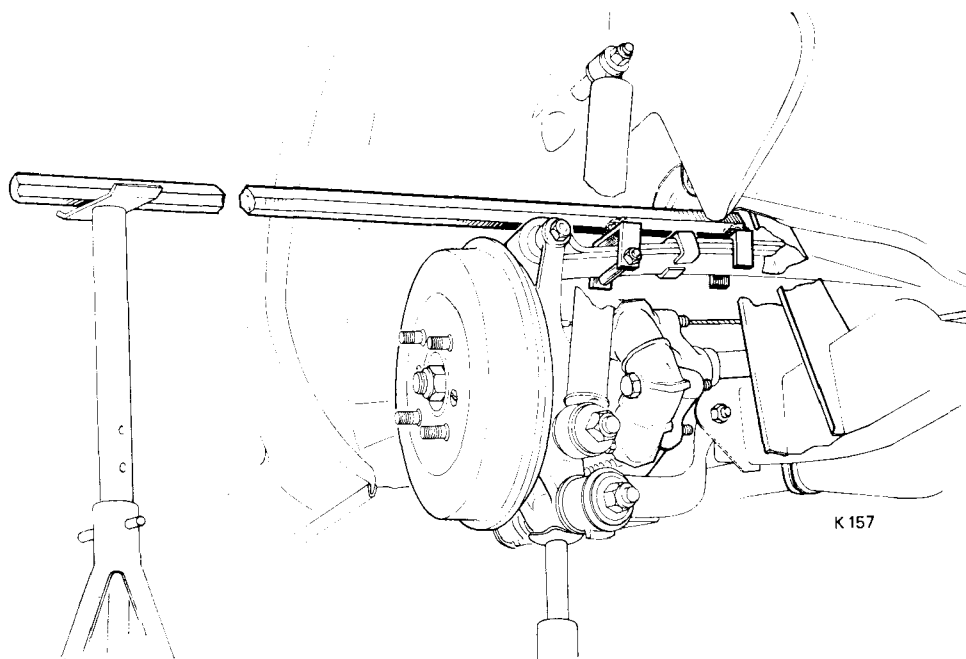


Fig. 60. Hexagon bar fitted in position on road spring

Reconnect the brake pipe and flexible hose to its support bracket.

Adjust and bleed the brake system, fit the road wheel, nuts and nave plate and road test the vehicle.

Dismantling Rotoflex Coupling (Fig. 55)

Working on the bench, fit the Churchill compression clamp Tool S 328 to the rotoflex rubber coupling (48). Detach the coupling from both drive shafts by removing six bolts (17 and 28).

Remove the brake drum, hub nut (40) and washer (39). Using Churchill Tool S 109B with thread protector S 109C press the outer drive shaft (18) from the hub assembly, taking care not to lose the shims (36), and spacer (37) fitted to the neck of the shaft.

Using Churchill press Tool S4221 and adaptors S 4221A-17, remove the stoneguard and spacer from the outer shaft (Fig. 62).

Withdraw the rotoflex coupling (48) from the drive shaft.

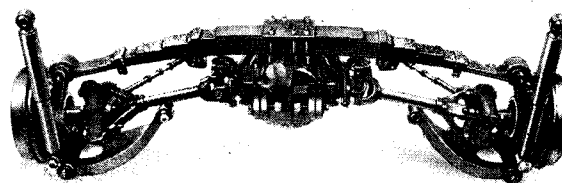
Re-assembly

Feed the outer drive shaft through the new rotoflex coupling and secure the coupling to the spider with three new bolts (28). Using a suitable drift, replace the stoneguard and spacer.

Refit the collar and shim to the outer drive shaft. Insert the splined end of the shaft into the hub assembly using a drift tool to gain sufficient threads for the new nyloc nut. Replace the hub washer and nut.

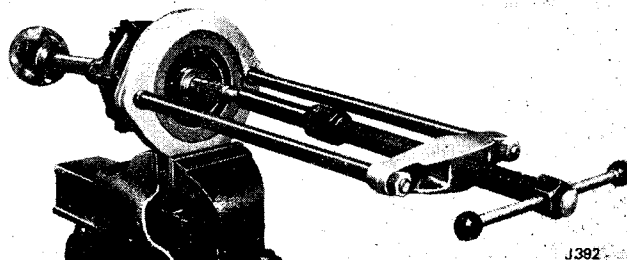
Secure the intermediate drive shaft to the outer shaft with three new bolts. Remove the mild steel band from the new rotoflex rubber coupling.

Refit the brake drum. Refer to Group 'O' Section 1 for tightening torque figures.



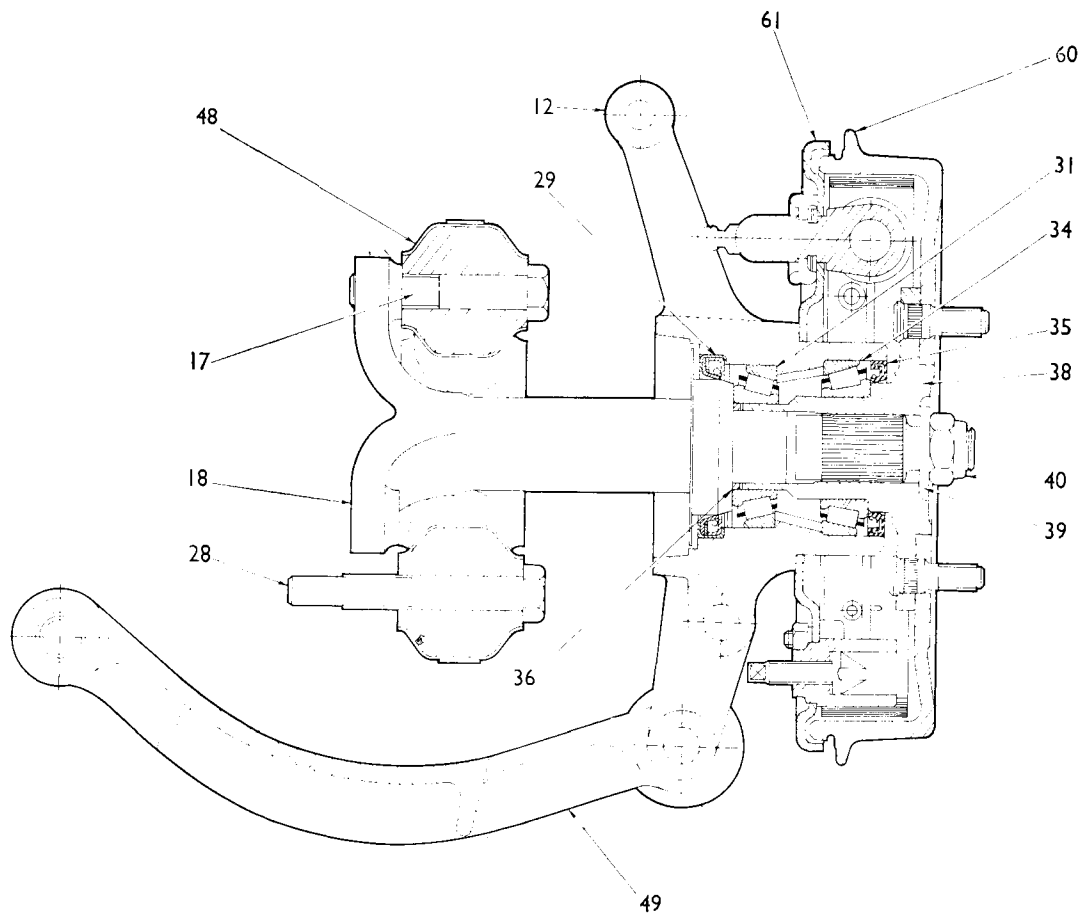
J390

Fig. 61. Outer drive shafts (fitted-condition)



J392

Fig. 62. Removing stoneguard and spacer



K118

Fig. 63. Rear hub arrangement (annotations are given under Fig. 42, Page 4-120)

REAR HUBS

General

Servicing of the rear hub and its associated components will necessitate prior removal of the hub and axle drive shaft assembly as previously described on page 3.122. Refer to page 0.110 for list of special tools required to dismantle the following components:—

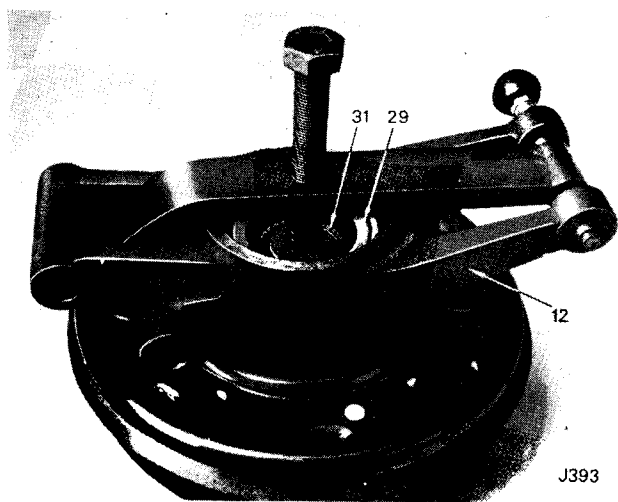
Separating Vertical Link from Rear Hub

1. Fit thrust button S 323/1.
2. Fit tool S342 and secure with a suitable bolt.
3. Push the hub clear of the vertical link and remove the tool (Fig. 64).

Removing Bearings and Grease Seals

Inner

1. Turn the bearing (31) sideways to permit its removal through the inner grease seal.
2. Using a screwdriver, drift out grease seal (29) from the vertical link (Fig. 66).
3. Remove inner bearing cup (60) by using tool S 123A or a soft metal drift (Fig. 65).



J393

Fig. 64. Separating vertical link from rear hub

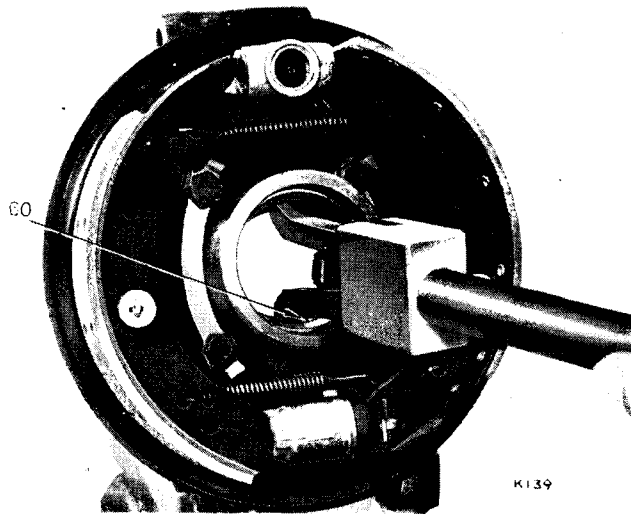


Fig. 65. Removing inner bearing cups

Outer

1. Push the outer seal (35) away from the bearing face and fit thrust button S 323.
2. Position tool S 323 with adaptors S 323-1 around bearing (Fig. 67). To avoid distorting the bearing cage, tap main collar supporting adaptors firmly into position before applying load.
3. Withdraw the outer bearing (34) and grease seal, drift out the outer bearing cup.

TO ASSEMBLE

Hub Bearing End Float (Fig. 68 and 69)

1. Place the gauge S 325-1 over the hub extension of the wheel flange.
2. Place the gauge plate S 325-3 on the end of the wheel flange hub, applying pressure centrally to gauge plate to avoid tilting.
3. With a feeler gauge measure the clearance "A" Fig. 69.

Selecting Spacer and Shims (Fig. 63 and 70)

1. Press inner and outer bearing cups into position.
2. In a dry condition place both tapered roller bearings into the vertical link as shown on Fig. 63.
3. Fit hub extension S 325-2 through both races.
4. Fit gauge S 325-1 as shown on Fig. 70 with slot uppermost.
5. Attach the gauge plate S 325-3 to the gauge body (Fig. 70) and whilst lightly tightening the thumb screw, rotate the gauge clockwise to allow the bearings to track correctly. **Do not** pre-load the bearings by **over-tightening** the thumb screw.
6. Place the pre-determined feeler gauge size achieved at clearance "A" (Fig. 69), into the slot in the gauge, together with one of the five available spacers (listed on page 3-126) and two shims if necessary, which collectively will tightly fill the gauge slot Fig. 70.

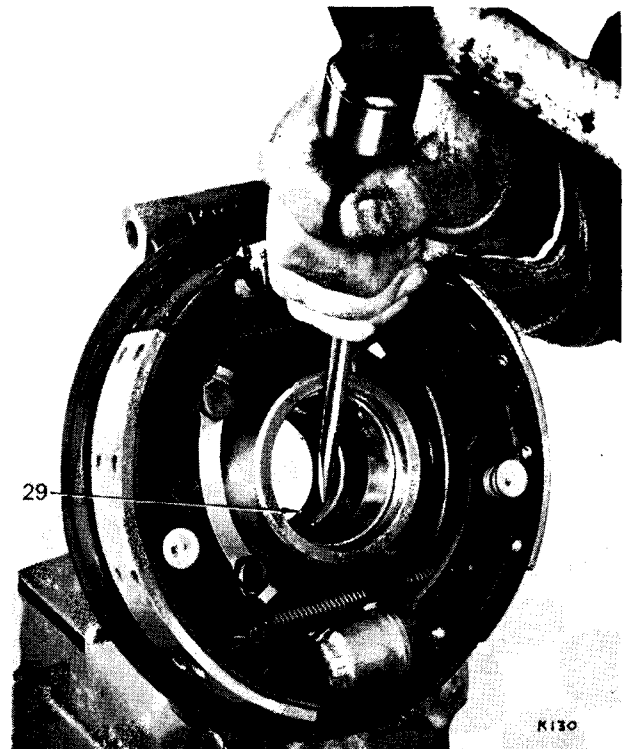


Fig. 66. Drifting out inner oil seal

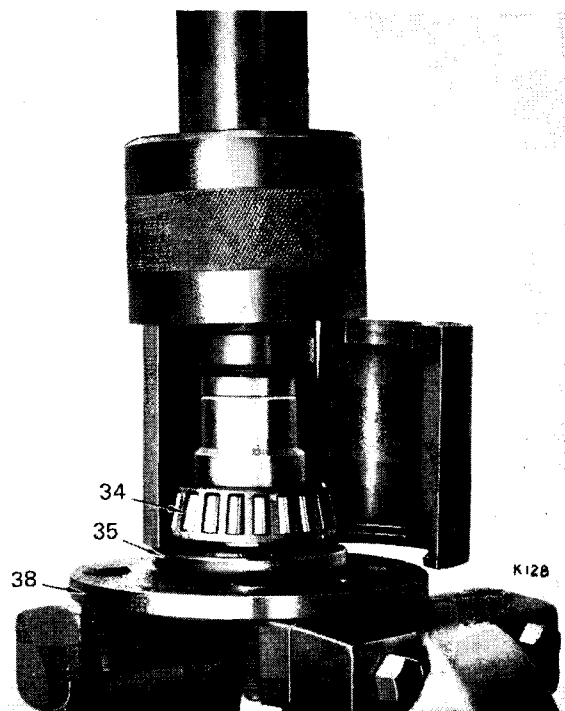
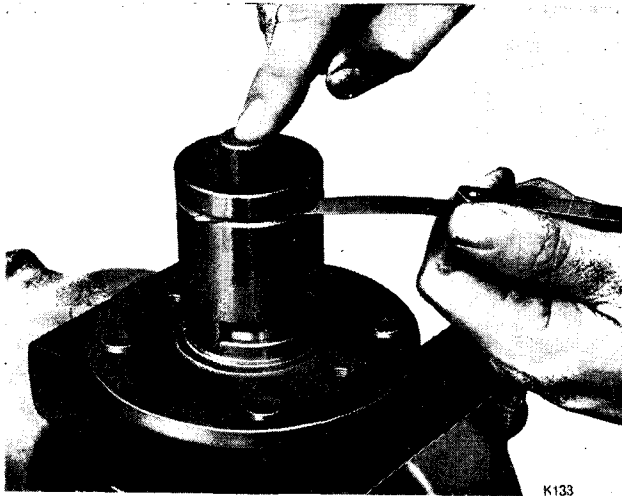
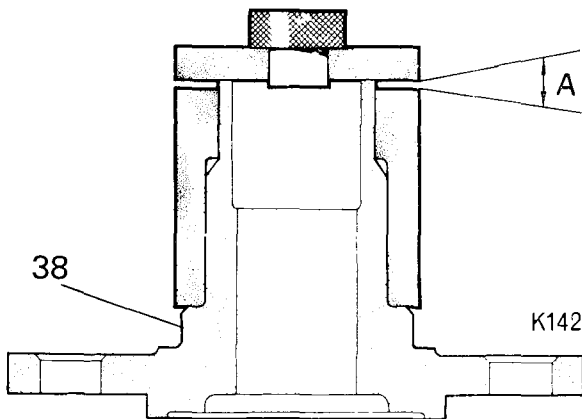


Fig. 67. Fitting Churchill tool around outer bearing



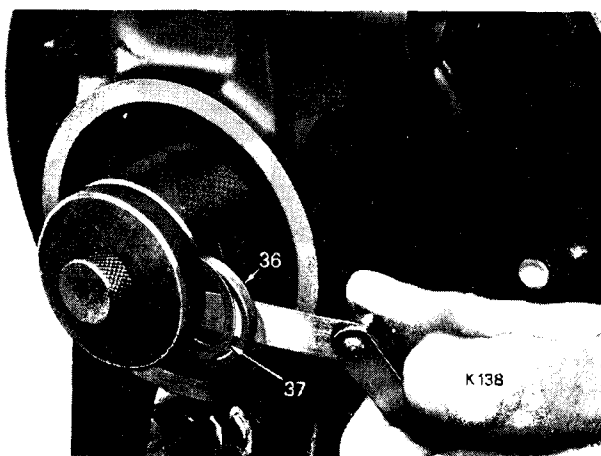
K133

Fig. 68. Measuring hub bearing end float



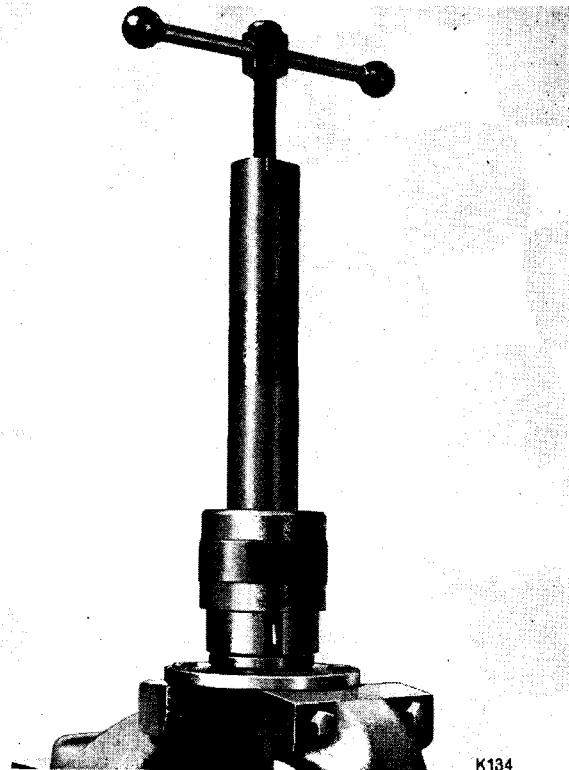
K142

Fig. 69. Sectioned view of hub showing special tool fitted



K 138

Fig. 70. Selecting spacer and shims.



K134

Fig. 71. Removing outer bearing

The spacer (and shims) thus selected, will when fitted to the axle shaft, ensure correct hub float of 0.0005-0.0025 in. (0.0127-0.0635 mm.) during final assembly.

NOTE: Five spacers of the following thickness are available:—

Pt. number 152483	0.139 in. (3.531 mm.)
Pt. number 152484	0.141 in. (3.581 mm.)
Pt. number 152485	0.143 in. (3.632 mm.)
Pt. number 152486	0.148 in. (3.759 mm.)
Pt. number 152487	0.155 in. (3.937 mm.)
The shim thickness is .003 in. (0.0762 mm.) Pt. number 142340.	

Fitting Outer Bearing and Grease Seal into Vertical Link (Fig. 72).

1. Thoroughly grease outer bearing and fit into position.
2. With the seal lip facing inwards use tool S 322 and handle 550 to drive the seal squarely into position.

Fitting Vertical Link to Rear Hub (Fig. 73)

1. Position the vertical link over the hub centre and using tool S 324 located against the inner member of the outer bearing, drive the bearing into position.
2. Remove the tool and apply a liberal quantity of SHELL Retinax 'A' grease or approved alternative to the inner cavity of the hub.

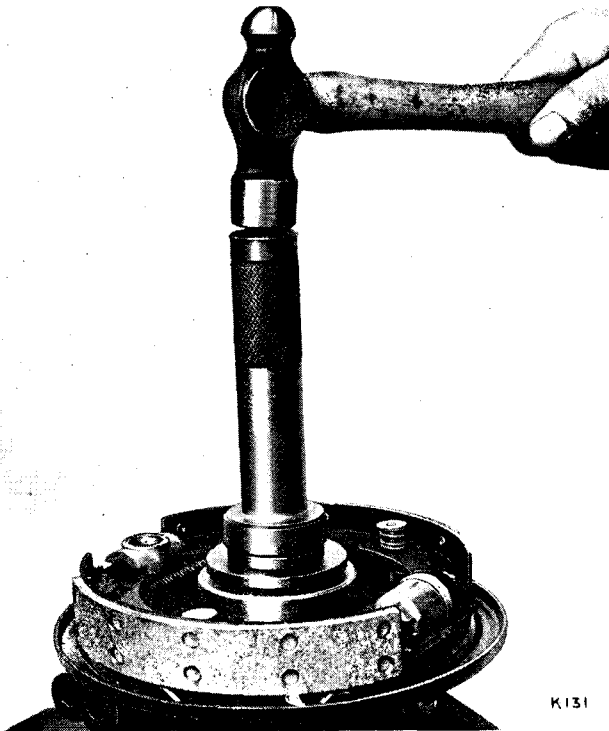


Fig. 72. Fitting outer bearing and grease seal to vertical link

Fitting Inner Bearing (Fig. 74)

IMPORTANT: As correct end float necessitates drawing the bearing into position during the final stage of assembly, the bearing must not be driven fully home during the following operation:—

1. Position the bearing as shown and using tool S 324 tap the bearing just sufficiently to allow the outer extremities of the vertical link to have a minimum up and down movement of $\frac{1}{16}$ in. (1.58 mm.).

Fitting the Inner Grease Seal (Fig. 75)

Position the seal with the lip facing inwards, and drive it into position with tool S 322 and handle 550.

Referring to Fig. 55 fit the selected spacer (36), latest type (without the chamfer), and shim (37) if necessary onto the outer axle shaft (18) using grease to hold them in position while mating the axle shaft and hub splines.

To avoid stripping threads during initial stages of drawing the outer axle shaft fully into position, it is advisable, to use a slave nut without the flat washer.

When the axle shaft is correctly positioned, remove the slave nut, fit flat washer and new nyloc nut. Tighten the nut with a torque wrench set at 110–115 lbs. ft. (15.21–15.900 kg./m.).

IMPORTANT: While tightening the nut rotate the vertical link to ensure that the bearings are tracked into their final running position.

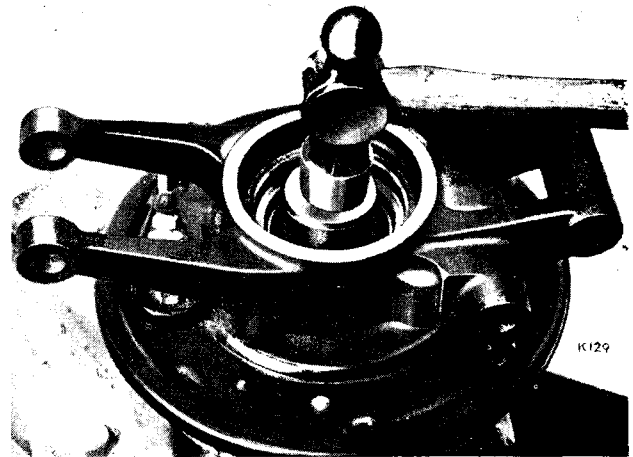


Fig. 73. Fitting vertical link to hub

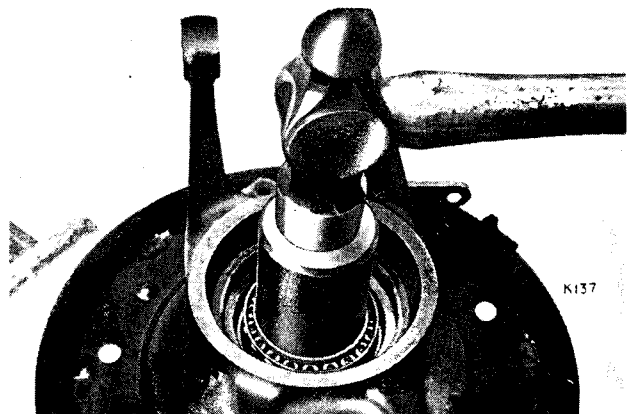


Fig. 74. Fitting inner bearing

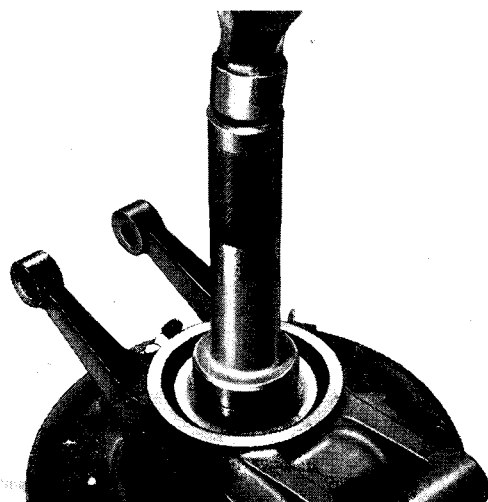


Fig. 75. Fitting inner grease seal

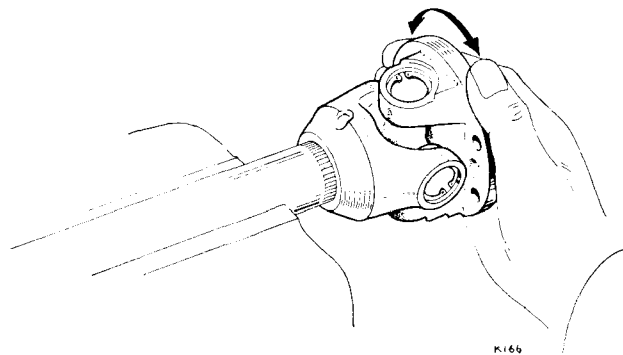


Fig. 76. Checking spider journals for end float

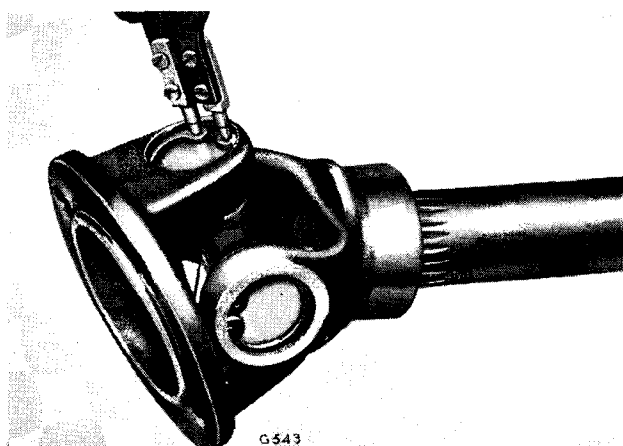
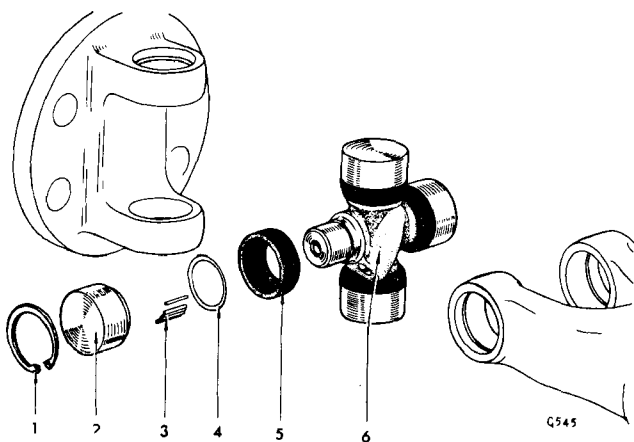


Fig. 77. Removing circlips from flange yoke



- | | |
|------------------|----------|
| 1 Circlip | 4 Washer |
| 2 Cup | 5 Seal |
| 3 Needle rollers | 6 Spider |

Fig. 78. Universal coupling details

INTERMEDIATE AXLE SHAFT COUPLINGS

Inspection

Jack up the rear of the vehicle and support it on chassis stands. Remove the nave plates and road wheels and jack up the vertical link.

Attach the special hexagon bar (Fig. 60 refers) to the spring and jack up the spring to relieve the dampers of spring load, and maintain the spring in this position by placing axle stands under the outer extremity of the hexagon bar.

Remove the bolts (Fig. 59) securing the coupling to the intermediate drive shaft. Taking care not to damage the flange faces, lever the flanges apart.

Holding the axle shaft firmly, move the flange yoke axially along the spider journals Fig. 76. If end float exists, renew the spider cup assemblies. This will necessitate removal of the outer drive shaft assembly as described on page 3-122.

Repeat the inspection procedure on the other axle shaft coupling.

For dismantling, replacement of parts and re-assembly, refer to page 3-108 and 3-109.

INNER AXLE SHAFT AND BEARING ASSEMBLIES

To Remove (Fig. 19)

Remove the hub and outer axle drive shaft assembly and intermediate shaft, as described on page 3-122.

Drain the rear axle oil.

Utilising a $\frac{3}{8}$ in. (6.763 mm.) hexagon socket key, as shown on Fig. 19, remove the socket screws from the hypoid casing.

Withdraw the inner axle shaft assembly.

To Refit

Insert the inner axle shaft into the hypoid housing and secure it with the four hexagon socket screws (16) Fig. 21.

Refill the hypoid housing with oil and refit the intermediate axle shaft and the hub and outer axle drive shaft assembly.

For dismantling and re-assembly, refer to page 3-111.

To replace pinion oil seal, refer to page 3-111.

HYPOID UNIT

GT6 Mk. 2, Plus and Vitesse Mk. 2

To Remove (Fig. 2)

Jack up the rear of the vehicle, place on axle stands and drain the hypoid unit.

Remove the nave plates and road wheels.

Disconnect the intermediate drive shafts from the inner axle shaft coupling and the rear end of the propeller shaft from the hypoid unit.

Remove the exhaust silencer and tail pipe from the vehicle.

Remove the radius arm mounting bolt from the chassis. Release the handbrake clevis pin and spring from the brake backplate.

Attach the hexagon bar (Fig. 60 refers) to the spring, and jack the spring to relieve the dampers of spring load, and maintain the spring in this position, by placing axle stands under the outer extremity of each hexagon bar.

Remove the damper links page 4.122 (Vitesse Mk 2) or the dampers page 4.122 (GT6 Mk 2 and Plus).

Take out the spring eye mounting bolts (30).

Take out the rear seat assembly (Vitesse Mk 2) or the front luggage floor panel (GT6 Mk 2 and Plus) and remove the spring access cover plate from the floor.

Remove six nyloc nuts and washers to release the spring retaining plate and remove the three rear studs from the axle casing (Fig. 79).

Release the rear attachment to the chassis frame by removing the nyloc nuts (13), plain washers and withdrawing the bolts (9).

With an assistant taking the weight of the hypoid unit, release the front mounting by removing the nyloc nuts (51), large plain washers (52) and rubber pads (53).

Manoeuvre the hypoid unit forward and down from beneath the vehicle.

To Refit

Push the intermediate drive shafts up towards the body to give sufficient clearance for the unit.

Offer up the hypoid unit to its rear mounting points and fit the bolts (9) through the rear mounting lugs.

Fit the rubber pads (53) ensuring that the upper ones locate in the corresponding holes in the front mounting plate. Fit the plain washers (52) and tighten the nyloc nuts. Align the road spring with the hypoid unit and refit the three rear spring attachment studs, the spring plate, plain washers and tighten the nyloc nuts.

Refit the special hexagon bar to the spring and relieve load as previously described and fit the spring eye bolts.

Fit the damper links or dampers and reconnect the radius arms to the chassis.

Reconnect the intermediate drive shafts to the inner axle shaft couplings and the handbrake clevis pin and spring to the brake backplate.

Refit the propeller shaft to the hypoid unit and the exhaust silencer and tailpipe to their respective mountings.

Refill the unit with oil and adjust the brakes.

Remove the special hexagon bar, refit the road wheels, remove the axle stands, and tighten the wheel nuts and refit nave plates.

Refit the spring access cover plate and reseal in accordance with instructions given on page 5.304.

Replace the rear seat assembly or front luggage floor panel.

Finally, road test the vehicle.

For dismantling, inspection and re-assembly, refer to pages 3-113 to 3-121.

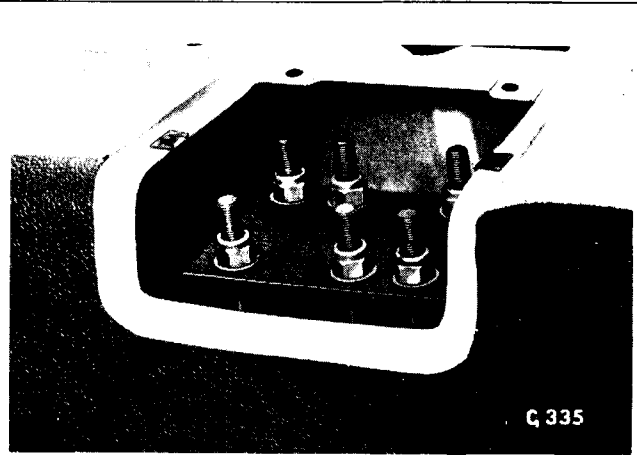


Fig. 79. Spring access cover removed to show rear road spring attachments

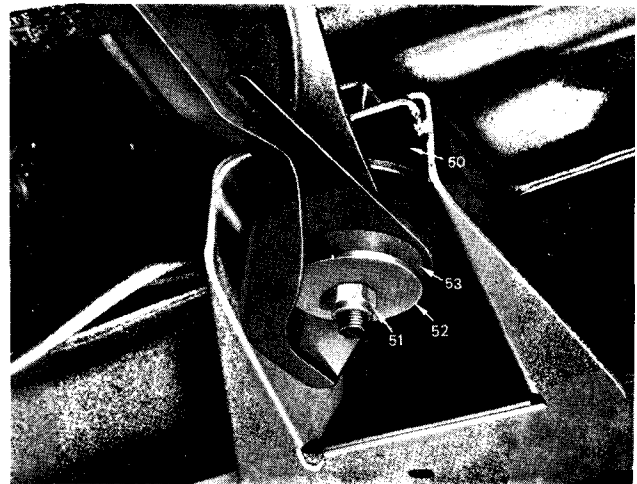


Fig. 80. Nose plate front mountings

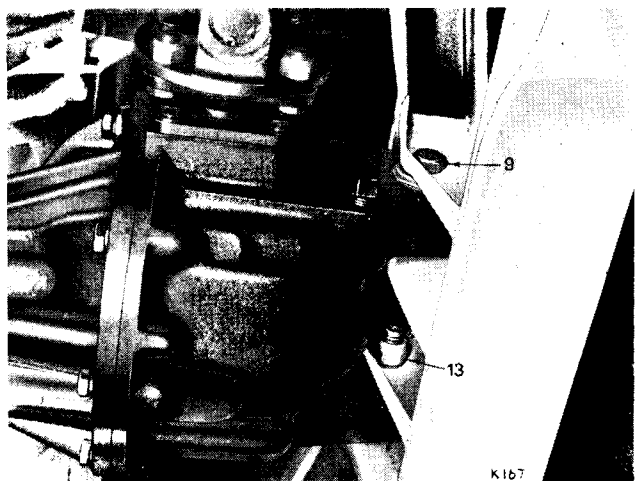


Fig. 81. Hypoid unit rear attachment (Vitesse Mk. 2)

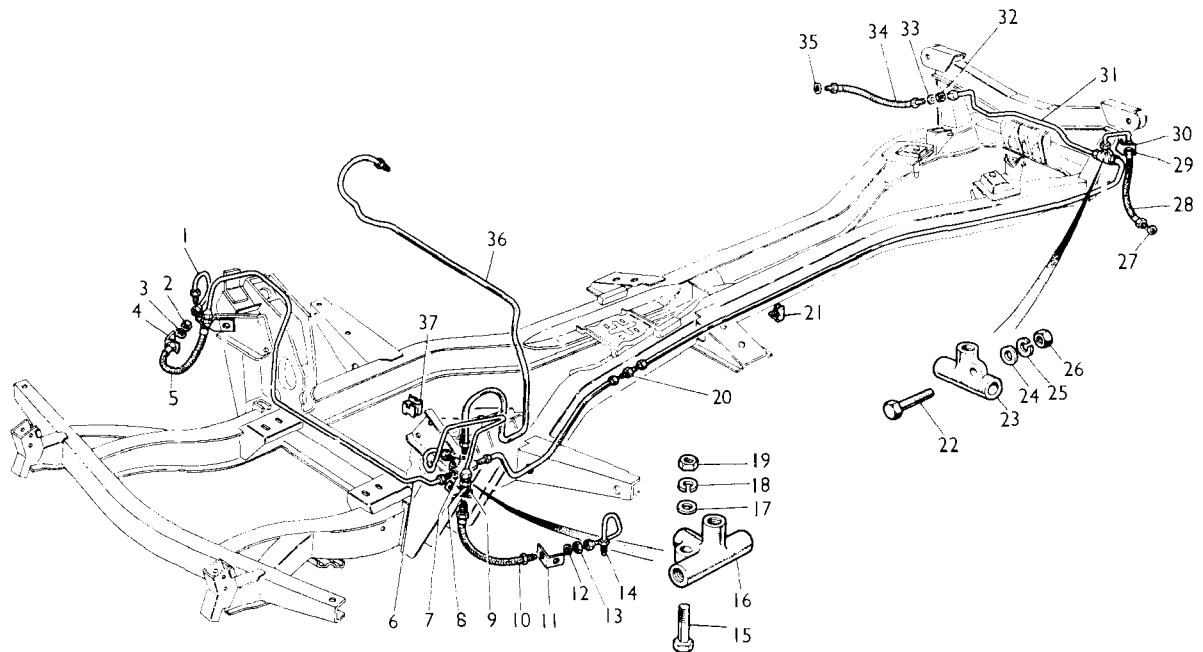
BRAKES

Introduction

The vehicle is equipped with a hydraulic braking system, comprising self-adjusting opposed piston caliper disc brakes at the front and adjustable drum brakes at the rear. The system is pressurised from a master cylinder, incorporating a reservoir, directly operated by a pendant pedal. Flexible, reinforced rubber hoses convey pressurised fluid from rigid, body-mounted pipes to the calipers and rear wheel cylinders.

The rear brakes are equipped with leading and trailing shoes. External provision is made for their adjustment, except later GT6 Mk. 3 cars, from an adjuster unit mounted internally at the bottom of the back plate. The wheel cylinder incorporates a lever for mechanical operation of the brake unit, via a lever connected to a cable operated through linkage by the handbrake lever.

Each brake assembly is handed and is not inter-changeable with its counterpart, from the left-hand to the right-hand side of the vehicle.



- | | |
|------------------------------------|---|
| 1 Pipe to caliper R.H. | 20 Pipe connector |
| 2 Locknut | 21 Pipe clip |
| 3 Washer | 22 Bolt |
| 4 Support bracket | 23 3-way union |
| 5 Flexible hose R.H. | 24 Plain washer |
| 6 Pipe—4-way union to R.H.S. Front | 25 Spring washer |
| 7 Pipe—4-way union to L.H.S. Front | 26 Nut |
| 8 Nut | 27 Washer |
| 9 Washer | 28 Flexible hose to caliper L.H. Rear |
| 10 Flexible hose L.H. Front | 29 Support bracket |
| 11 Support bracket | 30 Pipe 3-way union to flexible hose L.H.S. |
| 12 Washer | 31 Pipe 3-way union to flexible hose R.H.S. |
| 13 Nut | 32 Nut |
| 14 Pipe to caliper L.H. Front | 33 Washer |
| 15 Bolt | 34 Flexible hose to caliper R.H. Rear |
| 16 4-way union | 35 Washer |
| 17 Washer | 36 Pipe 4-way union to master cylinder |
| 18 Spring washer | 37 Pipe clip |
| 19 Nut | |

Fig. 1. Brake pipe layout

Maintenance

Recommended checks and adjustments for maintaining the braking system are given in Group 'O', together with the intervals at which they are recommended.

Pad and Shoe Renewal

Brake pads should be fitted in sets of four. Similarly, brake shoes should also be fitted in sets of four. This condition also applies, should it be necessary to renew a suspension unit complete with a brake unit. The pads or shoes of the opposite hand should be renewed.

Overhaul

In addition to adjustment and examination/renewal of shoes and pads at the intervals recommended in Group O, it is strongly recommended by the Royal Society for the Prevention of Accidents and the Manufacturers of brake components, that the braking system be overhauled every 36,000 miles or 3 years (whichever is sooner).

This involves dismantling the brake system and examining each item for defects. All seals and defective components must be renewed. Renew the brake fluid using new fluid from a sealed container, reseal the container after use.

NOTE: This process does not include separating the disc brake caliper body. On no account should any attempt be made to separate this component.

Warning

The importance of maintaining scrupulous cleanliness when working on hydraulic brake and clutch units cannot be over emphasised.

Before opening a hydraulic brake or clutch unit, the outside should be carefully cleaned to prevent the entry of abrasive matter, which may score the working surfaces, thereby causing internal leakage.

As components are removed they should be placed, for cleaning and examination, in order of dismantling upon a clean tray or sheet of clean paper. Bores and internal passages should be cleaned only with Girling Brake Fluid or Girling Cleaning Fluid.

At this stage the hands should be washed and dried, before re-assembling the unit, thus minimising the risk of contamination of rubber seals, should the hands previously have been in contact with vehicle lubricants.

Lightly smear the bores with clean Girling Brake Fluid before assembly.

Avoid contamination of pads, linings and clutch facings with hydraulic fluids, oil or grease.

Cleaning

The use of Girling cleaning fluid is recommended for cleaning components and for flushing the braking system, when this operation is necessary.

Hose Clamp

A hose clamp, Girling Part No. 64947017, available from Girling agents, is a valuable aid to an operator engaged in diagnosing faults in a braking system. The use of the clamp saves time in locating faults, servicing cylinders and eliminates unnecessary bleeding, as frequently occasioned by haphazard procedures.

The clamp is fitted in turn to the flexible hoses, and the brake pedal action checked each time. When pedal action improves, the cylinder clamped off at that time is the doubtful one. The use of four clamps permits more rapid and effective diagnosis, than one clamp.

There is no danger of splitting or damaging serviceable hoses by fitting the clamp.

Sequence of Bleeding

Air is compressible, and its presence in the system will prevent the correct functioning of the brakes. Therefore if a pipe joint has been uncoupled, or if air has been admitted during some other operation, the system must be bled until sponginess at the foot pedal is eliminated. Bleed the system from each wheel cylinder in turn, starting with the front left-hand side wheel and proceeding in anti-clockwise sequence (right-hand steering). For left-hand steering start at the front right-hand side and proceed in a clockwise sequence. (Refer to page 3-203).

BLEEDING

Procedure

With the aid of a second operator, proceed as follows:—

1. Raise the rear wheels. Tighten the rear brake shoes hard against the drum, to reduce the space in the cylinders.
2. Ensure that the reservoir is topped up to the level marked on the master cylinder.
3. Wipe clean and unplug the bleed nipple and attach to it a short length of small bore tubing Fig. 4. Hold the tube in a clean glass container partially filled with hydraulic fluid, so that its end is below the level of the fluid. Unscrew the bleed nipple one half turn.
NOTE: During bleeding, the reservoir fluid level falls rapidly. Ensure that the level does not fall below half full, constantly replenishing slowly with new Castrol-Girling Brake and Clutch Fluid (Crimson). Immediately bleeding is completed re-seal residual fluid in the container, as exposure to atmosphere lowers the boiling point.
4. Operate the pedal with a succession of rapid long and short strokes as follows: Push the pedal through its full stroke, followed by two or three short rapid strokes; then allow the pedal to return to its stop unaided (foot removed) Fig. 3. Observe the fluid being discharged into the glass container and when all bubbles have ceased to appear close the bleed screw on the downward stroke of the pedal. Securely tighten the bleed screw (4 to 6 lb. ft. 0.55 to 0.83 kg. m.) and remove the tubing from the nipple.
5. Repeat with the remaining brakes.
NOTE: If difficulty is experienced in bleeding a cylinder it may be that air is being drawn in past the bleed screw threads. In such instances, the bleed screw should be tightened at the end of each downward stroke of the pedal and the master cylinder piston allowed to return fully before the bleed screw is re-opened.
6. Top up the master cylinder with unused hydraulic fluid and replace the cap. Check the system for leaks. Re-adjust the rear brakes and lower the rear wheels. Check the action of the brakes by road-testing.

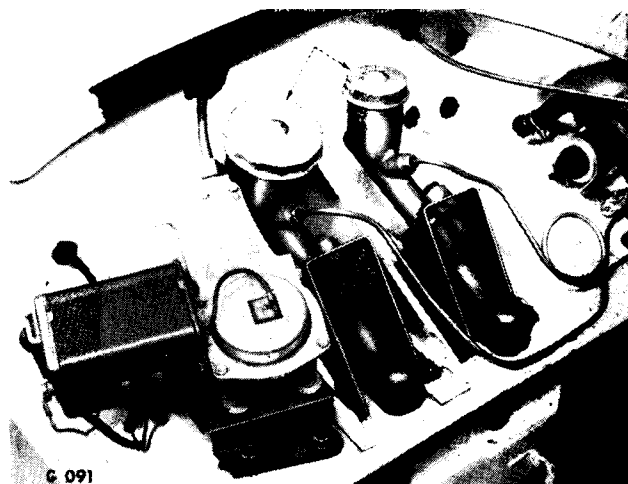


Fig. 2. Master cylinders

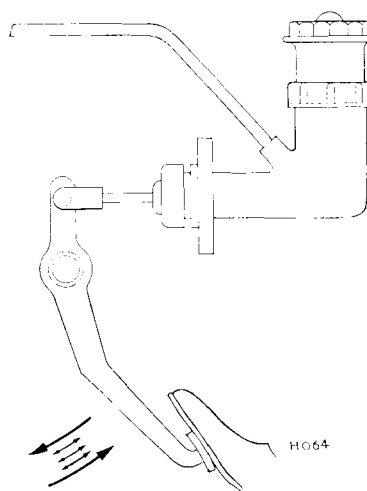


Fig. 3. Pedal operation

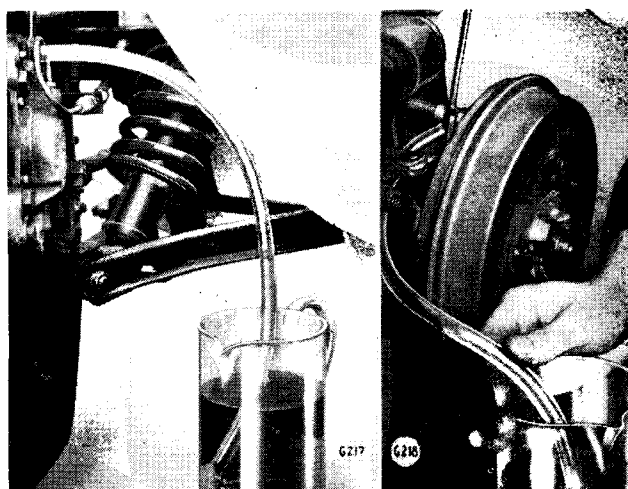


Fig. 4. Bleeding

FAULT DIAGNOSIS

FAULT	CAUSE	ACTION
Fade	Incorrect linings. Badly lined shoes. Distorted shoes. Overloaded vehicle. Excessive braking. Old hydraulic fluid.	Replace the shoes, decrease vehicle load or renew hydraulic fluid as necessary.
Spongy pedal	Air in system. Badly lined shoes. Shoes distorted or incorrectly set. Faulty drums. Weak master cylinder mounting.	Check for air in the system using the Girling Hose Clamp and bleed if necessary. Check the master cylinder mounting, lined shoes and drums and replace as necessary. Renew the hydraulic fluid if applicable.
Long pedal travel	A. Disc brakes Discs running-out pushing pads back. Distorted damping shims. Misplaced dust covers.	A. See page 3-207.
	B. Drum brakes Brakes need adjustment. Fluid leak. Fluid contamination. Worn or swollen seals in master cylinder. Blocked filler cap vent.	B. Check the brake adjustment, filler cap vent, and for fluid leak. Adjust brakes, repair leak, if necessary, or renew seals and change fluid. If a system is contaminated, flush out with Girling Cleaning Fluid.
Brakes binding*	No clearance at master cylinder push rod. Seals swollen. Seized pistons. Shoe springs weak or broken. Brakes or hand-brake maladjusted.	Check the brake adjustment and hand-brake linkage. Check for clearance at the master cylinder, seized pistons or weak shoe springs. Repair or replace parts as necessary.
Hard pedal—poor braking*	Incorrect linings. Glazed linings. Linings wet, greasy or not bedded correctly. Seized caliper pistons.	Replace the shoes, or if glazed, lightly rub down with rough sandpaper. Check caliper for damage and repair as necessary.
Brakes pulling	Seized pistons. Variation in linings. Unsuitable tyres or pressures. Loose brakes. Greasy linings. Faulty drums, suspension or steering.	Check the tyres and pressures, seized pistons, greasy linings, or loose brakes; then check suspension, steering and drums. Repair or replace as necessary.
Fall in fluid level*	Worn disc pads. External leak.	Check the pads for wear and for hydraulic fluid leakage.
Brake squeal-pad rattle	Worn retaining pins. Worn discs. No pad damping shims or springs	Renew the retaining pins or discs. Fit damping shims or springs.
Uneven or excessive pad wear	Discs corroded (by salt). Disc badly scored. Pads require interchanging. Incorrect pad material.	Check the disc for corrosion, or scoring, and replace if necessary. Alternatively, interchange pads. Fit new pads.

* The faults marked by an asterisk may be caused by a faulty Servo unit, should this be fitted.

MASTER CYLINDER OPERATION

A. Brakes Released Condition

When the brake pedal is released hydraulic pressure created by the brake shoe pull-off spring, plus the plunger return spring (6), causes the plunger (9) to return to its rear stop (10). The last $\frac{1}{32}$ " (0.794 mm.) of movement withdraws the valve shank (5) rearwards, lifting the seal (2) from its seat on the end face of the cylinder, thus permitting recuperation of the hydraulic fluid to the reservoir via the drilled passage.

B. Brakes Applied Condition

Pressure applied to the push-rod (13) by operation of the pedal, forces the plunger (9) forward. This in turn allows the valve shank (5) to move forward under the influence of the spring (6) until the valve spacer contacts the end face of the cylinder. The spring washer (3) then forces the valve shank and seal (2) forward until the seal contacts the end face and closes the passage to the reservoir.

Continued movement of the piston displaces fluid through the hydraulic pipe lines and applies the brakes, the valve shank (5) passing further into the hollow centre of the piston as the latter moves down the cylinder bore.

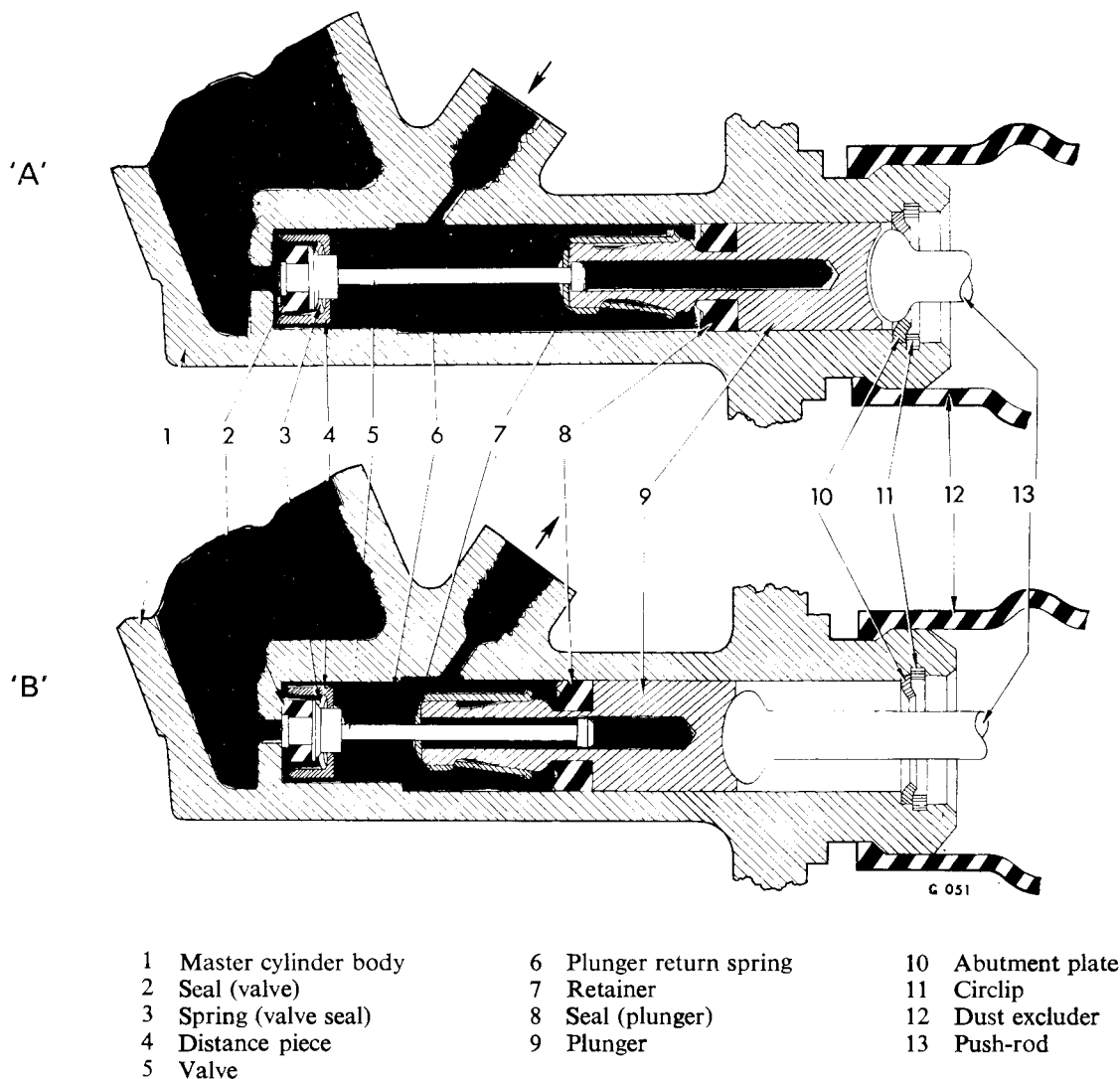
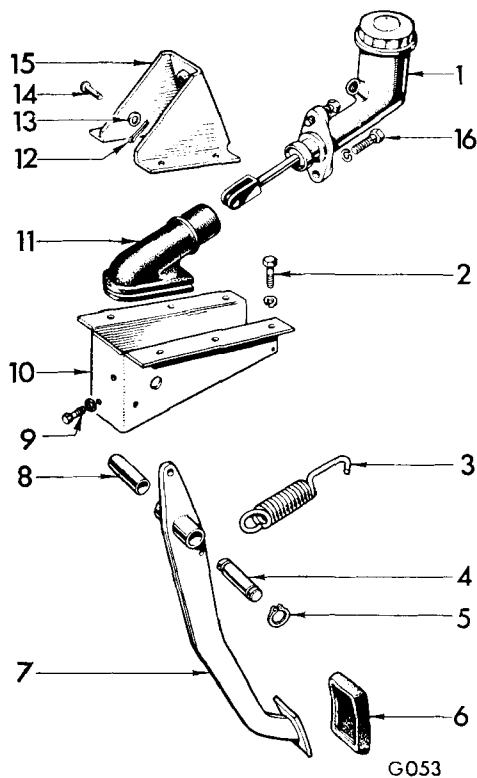


Fig. 5. Section through brake master cylinder



- | | |
|-------------------|----------------------------|
| 1 Master cylinder | 9 Bolt |
| 2 Bolt | 10 Pedal bracket |
| 3 Spring | 11 Rubber dust excluder |
| 4 Fulcrum pin | 12 Split pin |
| 5 Circlip | 13 Plain washer |
| 6 Pedal rubber | 14 Clevis pin |
| 7 Pedal | 15 Master cylinder bracket |
| 8 Pivot bush | 16 Bolt |

Fig. 6. Exploded brake pedal and bracket assembly

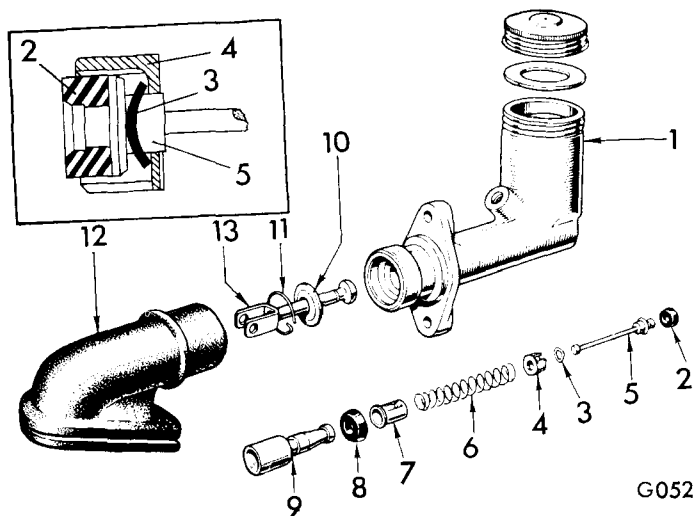


Fig. 7. Exploded brake master cylinder
Annotations are given under Fig. 5
(Inset shows correct assembly of spring (3))

BRAKE MASTER CYLINDER

To Remove (Fig. 6)

Drain the hydraulic fluid. Pull back the rubber dust excluder (11) and withdraw the clevis pin (14) securing the push rod to the pedal (7). Uncouple the hydraulic pipe from the master cylinder. Remove the bolts (16) from the master cylinder mounting flange and withdraw the unit from the bulkhead.

To Dismantle (Fig. 7)

IMPORTANT: Before carrying out work on the brake master cylinder see warning note on page 3-202.

Depress the push rod (13), remove the circlip (11) and withdraw the push rod together with items (10) and (11).

Shake out the plunger, spring and valve assembly. If necessary, apply a low pressure air line to the outlet union to eject the assembly.

Lift the clip on the spring retainer (7) and remove the retainer from the plunger (9) with the valve and spring assembly.

Detach the valve shank (5) by passing it through the offset hole in the retainer (7). Remove the spring (6), distance piece (4) and spring (3) from the valve shank (5). Detach the seal (2) from the valve shank (5) and the seal (8) from the plunger (9).

To Re-assemble (Fig. 7)

Fit new seals (8) and (2) to items (9) and (5).

Assemble the spring (3), distance piece (4), spring (6) and retainer (7) to the valve shank (5). Attach the assembly to the plunger (9), lubricate with unused hydraulic fluid and fit into the master cylinder bore.

Refit the push rod (14) with abutment plate (11) and circlip (12).

To Refit (Figs. 3 and 5)

Reverse the removal operations, refill with hydraulic fluid and bleed the system as described on page 3-203.

BRAKE PEDAL

To Renew Pivot Bush (Fig. 6)

Pull back the rubber dust excluder (11) and withdraw the clevis pin (14).

Detach the pedal return spring (3), remove the circlip (5), push the pivot pin (4) from the bracket and pedal and withdraw the pedal from the bracket.

Renew the pivot bush (8) and re-assemble by reversing the dismantling sequence.

FRONT BRAKES

Disc Brake Caliper

The Girling cast iron double acting caliper units permit speedy inspection or renewal of the brake pads, without the necessity of bleeding the system.

Pad and Lining Wear

Brake pads must not be permitted to wear below $\frac{1}{8}$ " (3.17 mm.) and shoe linings below $\frac{1}{16}$ " (1.59 mm.). Pads and shoes should be renewed before this condition is reached, if they are incapable of giving safe braking for a further 6,000 miles (10,000 km.) (interval between routine services).

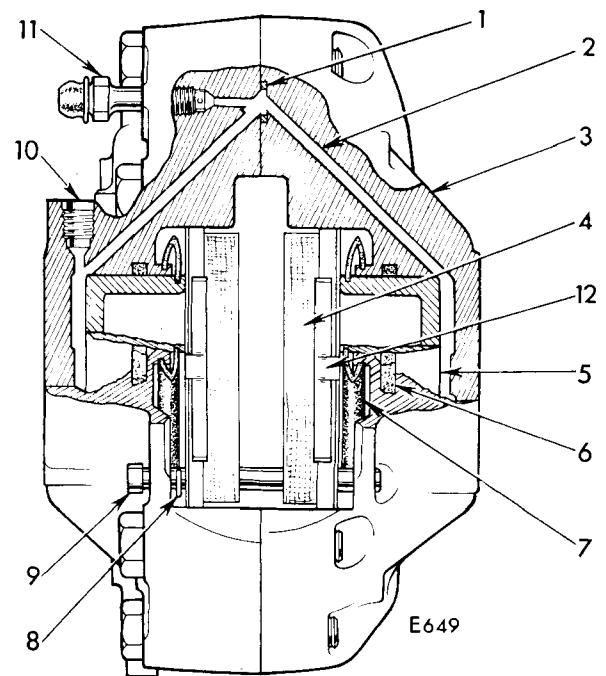
Friction Pad Replacement (Figs. 8 and 9)

1. Jack up the car and remove the front road wheels.
2. Release two spring retainers (8) and remove the pad retainer pins (9) and damping shims (12).
3. Lift the friction pads (4) from the caliper and renew them if worn. **Do not attempt to re-line worn pad assemblies.**
4. Before fitting new pads, open the bleed screw (11) and push the pistons (5) back to the full extent of their travel. Tighten the bleed screw, fit the new pads (4) and top up the master cylinder. Insert the damping shims (12) and retainer pins (9) and secure with the retainer clips (8). Note that the arrow engraved on the shim must point in the direction of the forward rotation of the wheel. Check fluid level and road test vehicle.

Caliper Cylinder Maintenance (Fig. 10)

To replace piston sealing rings or dust excluders, drain and dismantle as follows:—

1. Holding the flexible pipe lock-nut (3) at the support bracket, unscrew the pipe connection (4). Be particularly careful not to twist the metal pipe, otherwise it may sustain a hair-line fracture, difficult to detect visually, but clearly evidenced when the system is pressurised. Plug the flexible pipe to avoid loss of fluid.
2. Remove two bolts (1 and 2) securing the caliper to its support bracket.



- | | |
|--------------------------|------------------------|
| 1 'O' ring seal | 7 Dust excluder |
| 2 Fluid transfer passage | 8 Spring clip retainer |
| 3 Caliper body | 9 Pad retainer |
| 4 Brake pad | 10 Hose connection |
| 5 Piston | 11 Bleed nipple |
| 6 Piston seal | 12 Damping shim |

Fig. 8. Section through caliper

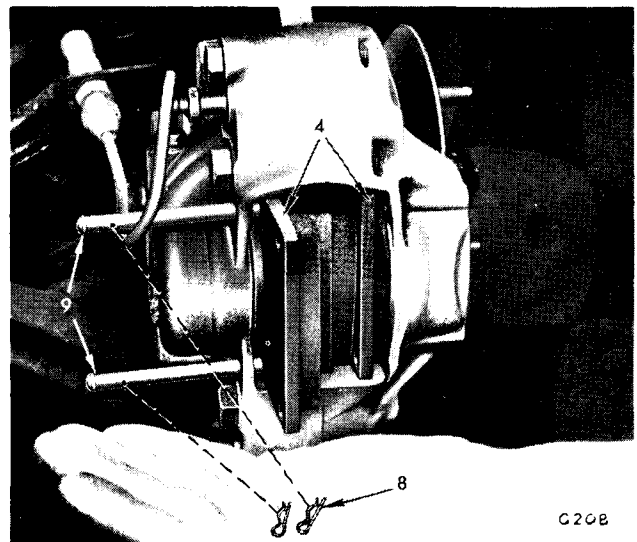


Fig. 9. Pad removal

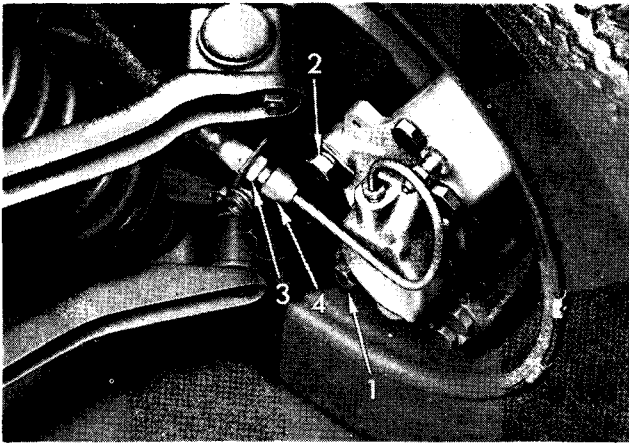


Fig. 10. Caliper mounting bolts

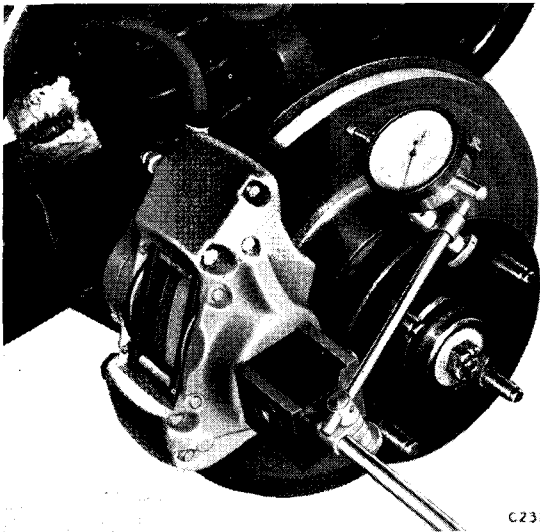
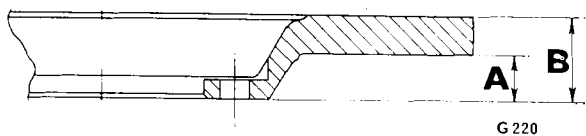


Fig. 11. Measuring disc run-out



	Inches	Millimetres
A	0.612	15.54
B	1.072	27.23

Fig. 12. Limiting dimensions

3. Remove the caliper and before withdrawing the pistons from the body, refer to WARNING on page 3-202.
4. Carefully remove the rubber sealing ring (6) (Fig. 8) from its recess.
5. Clean the piston, cylinder and rubbers with clean brake fluid or cleaning fluid.
6. Examine all components for serviceability and renew where necessary. Seals must always be renewed.

Re-assembly

1. Fit a new piston seal (6) into the recess in the cylinder.
2. Locate the projecting lip of the rubber dust excluder (7) (Fig. 8) in its recess in the cylinder.
3. Insert the piston (5), closed end leading, into the cylinder, taking care not to damage the polished surface. Push the piston fully home and engage the outer lip of the dust excluder with the recess in the piston. Replace the friction pads.
4. Assemble the caliper over the disc, and refit to the mounting bracket.
5. Refit the flexible brake hose and bleed the system. Check for leaks.

Brake Discs (Figs. 11 and 12)

A deeply scored disc accelerates brake pad wear and is, therefore, detrimental to brake efficiency. Such a disc should be replaced with a new one. Only, if a replacement disc is unobtainable should rectification by machining be undertaken, and the process should only be entrusted to specialists in this type of work.

It is important that the disc friction faces are machined parallel to each other, and that not more than 0.020" (0.508 mm.) is removed from each face. The minimum thickness of the finished machined disc must not be less than 0.460" (11.68 mm.). The surface finish of the machined faces should conform to—

32 micro ins. (C.L.A.) measured circumferentially.

50 micro ins. (C.L.A.) measured radially.

When the disc is assembled to and rotated on the stub axle, the amount of run-out must not exceed 0.006" (0.152 mm.) total indicator reading, taken at 0.50" (12.7 mm.) from the outer edge of the disc.

Front hub removal for replacement of disc

Check that the handbrake is firmly applied, slacken the front wheel nuts one turn, jack up the car and remove the road wheel.

Detach the disc brake caliper and the hose support bracket from the vertical link. Hang the caliper, via a wire hook, on the upper wishbone to avoid straining the hose. Wedge a piece of material between the pads to prevent inadvertent ejection of caliper pistons.

Extract the grease cap by screwing a No. 10 U.N.F. bolt into the threaded hole at the centre of the cap; if the hole threads are damaged, use a suitable self-tapping bolt.

Remove the split pin and the slotted nut, slide the hub off the stub axle taking care to collect the washer and the outer cage and race; avoid damaging the felt seal.

Fit the new disc and re-assemble by reversing the above procedure. Spin the hub and tighten the nut until resistance is felt; then slacken the nut one half flat and secure it with a new split pin. Refit the grease cap.

Check that the hub revolves, freely and check the disc run-out. Page 3-208.

REAR DRUM BRAKES

Introduction

Unless otherwise stated, the following operations upon the rear hydraulic and handbrake systems are performed with the handbrake lever in the off position. In the interests of safety, therefore, particularly if chassis stands are not available, place a choc against a wheel not being lifted.

Dismantled components should be cleaned and examined for wear. Frayed cables or cables stretched to preclude further adjustment should be renewed; cut or worn clevis pins, and levers having worn holes should also be renewed. Small amounts of wear at clevis points become cumulative throughout the system and cause considerable lost movement at the handbrake lever.

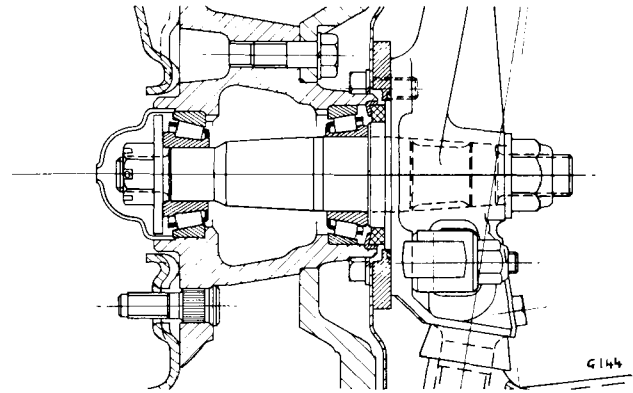


Fig. 13. Section through front hub

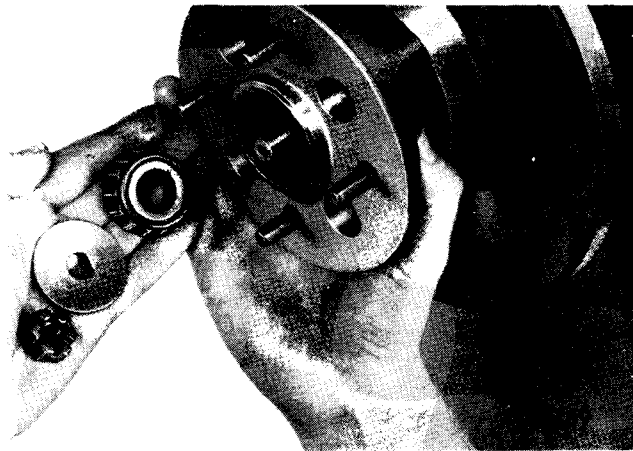
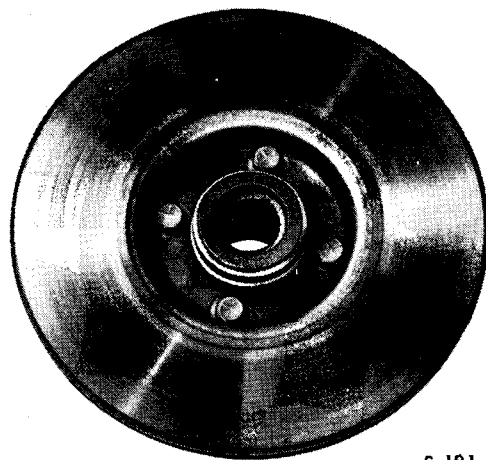


Fig. 14. Collecting hub bearing



G 191

Fig. 15. Disc securing bolts

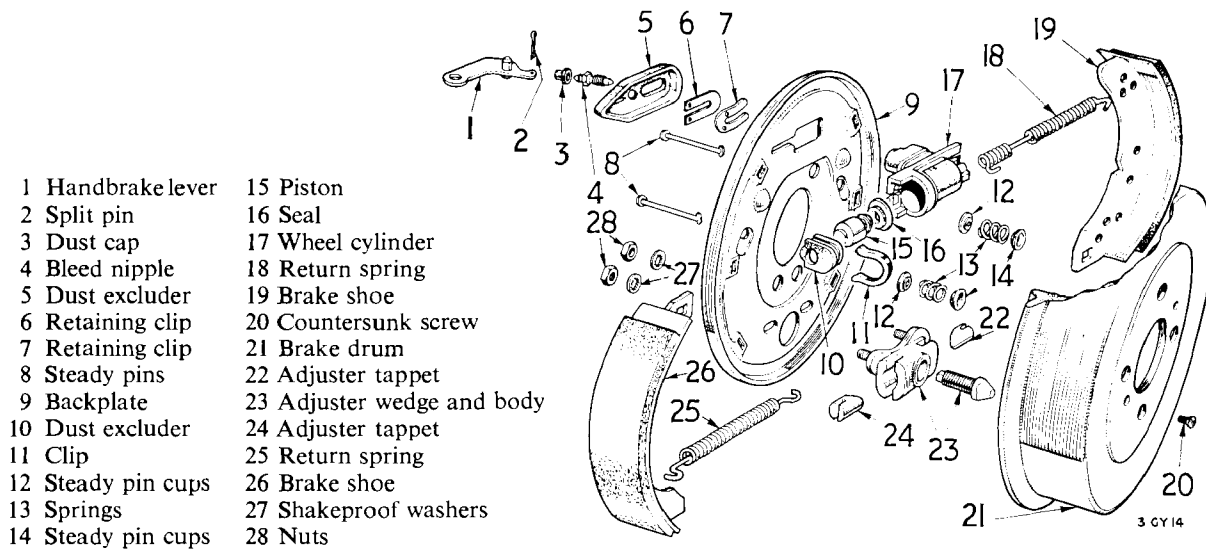


Fig. 16. Exploded rear brake assembly (L.H. side)

Brake Shoes (Fig. 16)**To Remove**

Jack up the rear of the car and place it on chassis stands. Remove the nave plate, road wheel, brake drum and turn the adjuster anti-clockwise to the off position.

Withdraw the split pin (2), release the steady pins (8), cups (12) and (14) and springs (13).

Detach the return springs (18) and (25) by lifting the shoes out of their abutments, disengaging the front shoe from the handbrake lever, and manoeuvring the shoes until the tension of the return springs is released.

Re-assembly

Lightly smear the shoe steady posts and the ends of the shoe webs with Girling Brake grease, taking care not to contaminate the linings.

Assemble the springs to the shoes, as shown on Fig. 17, engage the front shoe with its abutments, ensuring that the handbrake lever enters the slotted shoe web; then manoeuvre the rear shoe into position.

Fit a new split pin (2) to the handbrake lever (1).

Refit the brake drum and adjust the shoe clearances as follows:—

Adjustment

Each rear wheel brake is provided with one adjuster which is turned fully clockwise to lock. Turn the adjuster anti-clockwise by single notch increments until the drum is free to rotate.

Refit the road wheel, remove the chassis stands, tighten the wheel nuts and refit the nave plate.

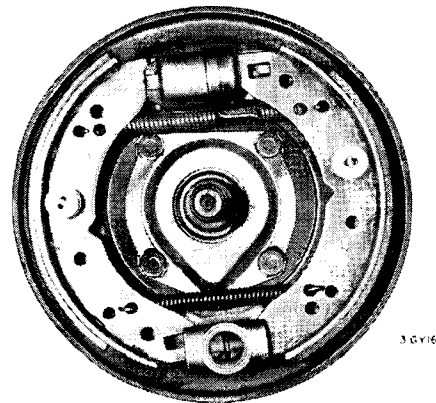


Fig. 17. Rear brake assembly (R.H. side)

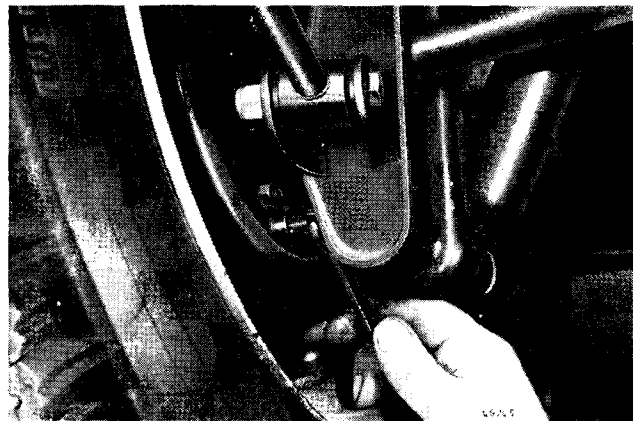


Fig. 18. Rear brake shoe adjuster

REAR BRAKE SLAVE CYLINDERS

To Remove

1. Remove the brake shoes.
2. Disconnect the flexible brake hose from the metal brake pipe and plug the latter to avoid loss of fluid.
3. Unscrew the flexible hose from the brake cylinder.
4. Disconnect the handbrake cable clevis from the handbrake lever.
5. Remove the dust excluder, retaining plate and spring clip (Fig. 19) and withdraw the cylinder from the backplate (Fig. 20).

To Refit

Reverse the above procedure and bleed the brakes.

TO RENEW PISTON SEAL

1. Remove the rubber dust excluder and withdraw the piston. (Refer to WARNING on page 3-202).
2. Remove the old seal from the piston and using fingers only, fit the new seal with its lip towards the bottom of the cylinder.
3. Lubricate the seal with hydraulic fluid, fit the piston into the cylinder and refit the dust excluder.

HANDBRAKE MECHANISM

Handbrake Lever

To Remove and Dismantle (Fig. 22)

Access is gained to the handbrake adjuster/clevis, by removing the tunnel trim, safety harness eye-bolt and screws and manoeuvring the combined cover gaiter clear of the handbrake lever. Removal of the seats will obviate damage to the upholstery.

Release the handlever by removing the circlip (2), washer (3), pivot pin (6) and the clevis pin (41). Take out the ratchet (44) and withdraw the pawl release rod (1), spring (46) and pawl (45).

To Re-assemble and Refit

Reverse the foregoing procedures.

Primary Cable

To Remove (Fig. 22)

Take out the pivot pin (6), lift the handlever from its bracket and withdraw the clevis pin (41).

Unscrew the clevis fork (40) and pull the free end of the cable through the floor. Withdraw the clevis pin (25) and remove the clamp (31) from the cable.

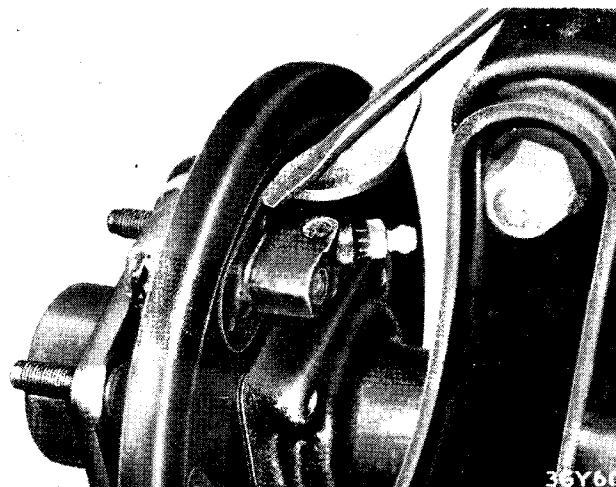


Fig. 19. Wheel cylinder retainer plate removal

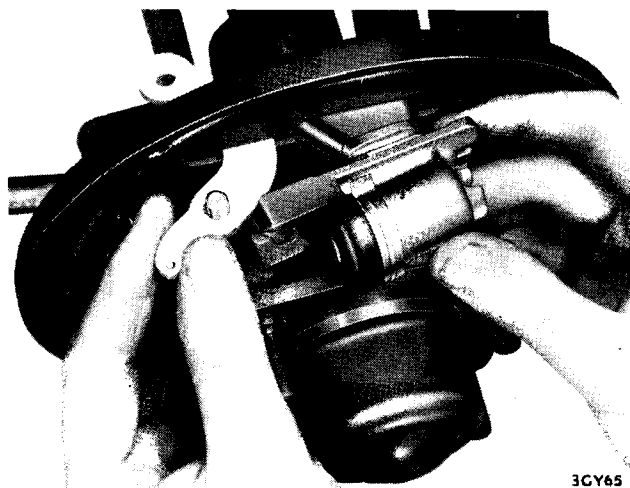


Fig. 20. Wheel cylinder removal

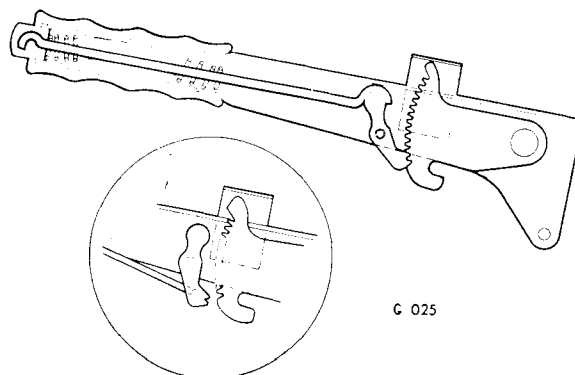
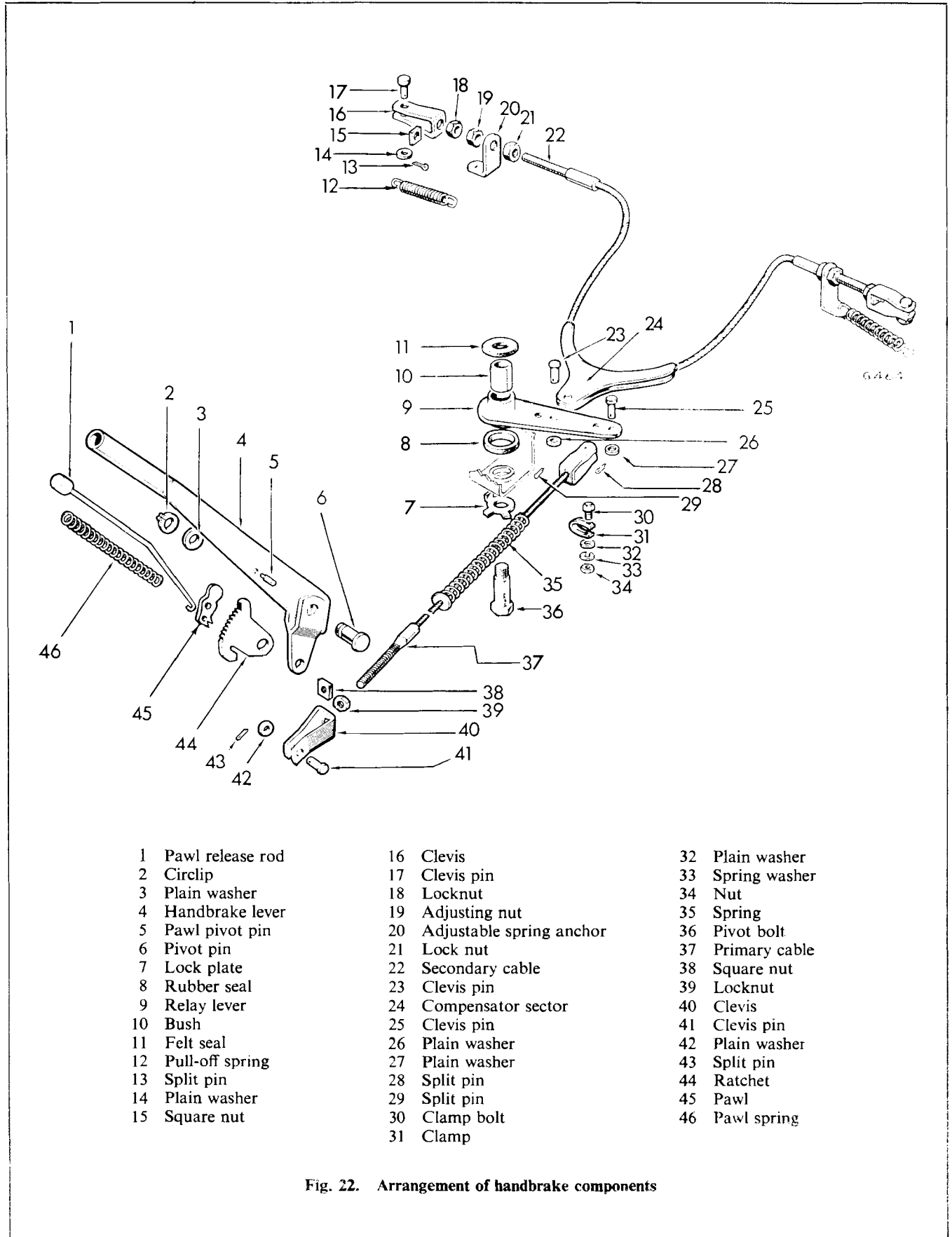


Fig. 21. Handbrake lever (Inset GT6 arrangement)



- | | | |
|--------------------|-----------------------------|------------------|
| 1 Pawl release rod | 16 Clevis | 32 Plain washer |
| 2 Circlip | 17 Clevis pin | 33 Spring washer |
| 3 Plain washer | 18 Locknut | 34 Nut |
| 4 Handbrake lever | 19 Adjusting nut | 35 Spring |
| 5 Pawl pivot pin | 20 Adjustable spring anchor | 36 Pivot bolt |
| 6 Pivot pin | 21 Lock nut | 37 Primary cable |
| 7 Lock plate | 22 Secondary cable | 38 Square nut |
| 8 Rubber seal | 23 Clevis pin | 39 Locknut |
| 9 Relay lever | 24 Compensator sector | 40 Clevis |
| 10 Bush | 25 Clevis pin | 41 Clevis pin |
| 11 Felt seal | 26 Plain washer | 42 Plain washer |
| 12 Pull-off spring | 27 Plain washer | 43 Split pin |
| 13 Split pin | 28 Split pin | 44 Ratchet |
| 14 Plain washer | 29 Split pin | 45 Pawl |
| 15 Square nut | 30 Clamp bolt | 46 Pawl spring |
| | 31 Clamp | |

Fig. 22. Arrangement of handbrake components

BRAKES



Fig. 23. Primary cable adjuster

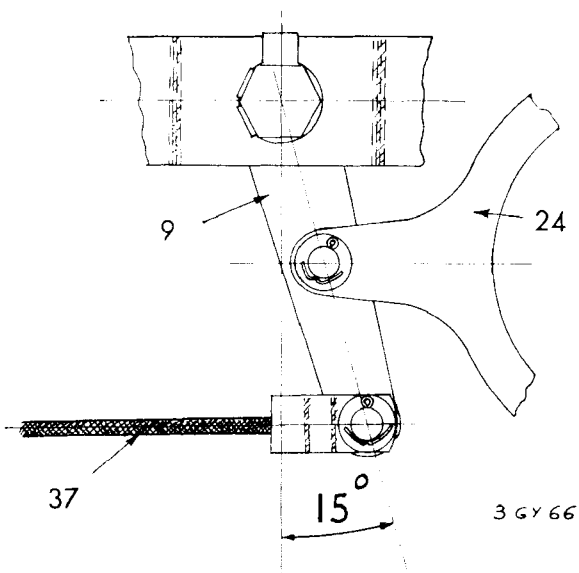


Fig. 24. Showing the correct angular position of the relay lever when the handlever is released

To Refit

Reverse the removal procedure and, with the handlever in the off position, adjust the cable to position the relay as shown on Fig. 24.

Moving the clamp (31) against the spring (35), compress the spring approximately 1" (25.4 mm.) and tighten the clamp. Ensure that the spring does not become coil bound when the handbrake is fully applied.

Relay Lever

To Remove (Fig. 22)

Take out the clevis pin (25), unscrew the pivot bolt (36) and withdraw the relay clear of the propeller shaft. Remove the clevis pin (23) and if necessary, renew the bearing (10).

To Refit

Insert the clevis pin (23), securing the compensator sector (24) to the relay lever (9), and fit plain washer (26) and split pin (29).

Attach the primary cable clevis fork to the outer hole of the relay lever (9). Smear the relay lever bush (10) and the pivot bolt (36) with grease, and assemble the lever to the body floor bracket, placing the felt seal (11) above the lever and the rubber seal (8) below, as shown on Fig. 22.

Insert the pivot bolt (36) with its lock plate (7) through the relay lever and floor bracket. Tighten the bolt and lock with the lock plate.

Secondary Cable

To Remove (Fig. 22)

Release the cable "pull-off" springs (12) from the cable brackets (20) and remove the clevis pins (17).

Release the tab washer (7), remove the pivot bolt (36), lower the relay lever (9) and remove the clevis pin (23).

Remove from one side the clevis (16), nuts (18, 19 and 21) and spring anchor (20).

Lift off the compensating sector (24) and remove the cable by pulling it through the curved guides shown on Fig. 27.

To Refit

Feed the threaded end of the cable through the left-hand and right-hand guides.

Assemble the compensating sector (24) over the cable and secure it to the relay lever (9) with the clevis pin (23). Refit the relay lever.

Whilst the cable is still slack, apply grease liberally to the cable guides and compensator sector, working the cable backwards and forwards to distribute the grease.

Re-assemble and connect both ends of the cable to the brake levers as shown on Fig. 26.

Handbrake Adjustment (Fig. 26)

Under normal circumstances, adjustment of the rear brakes will automatically provide satisfactory handbrake adjustment. Stretched cables will necessitate further adjustment as follows:—

1. Jack up the rear wheels, release the handbrake and lock the brake drums by screwing each brake adjuster fully in.
2. Disconnect the pull-off spring (12) and remove the clevis pin (17) from the brake lever.
3. Adjust the clevis (16) at each end of the cable by equal amounts to reduce the cable slackness. The cables are too tight if the clevis pins cannot be easily inserted without straining the cables.

Secure the clevis pins, re-connect the spring (12) and readjust the cable brackets (20) to provide slight spring tension. Turn each rear brake adjuster back by one notch increments until the wheels are free to rotate. Lower the vehicle and remove the jack.

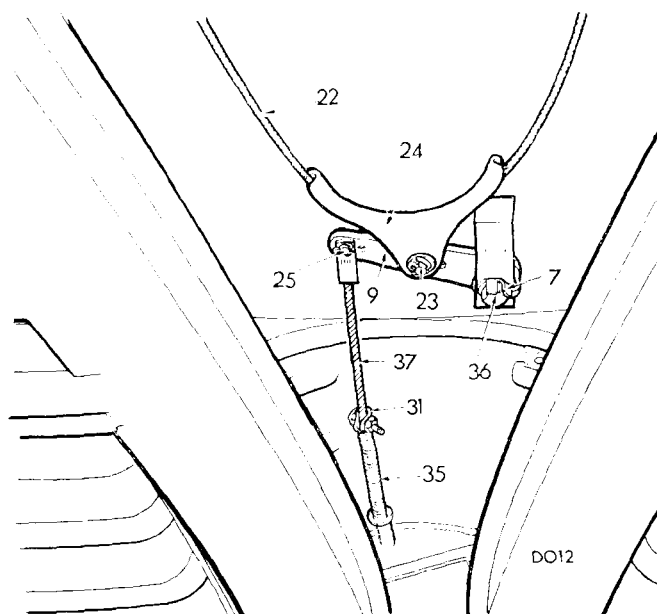


Fig. 25. Handbrake relay lever and compensator

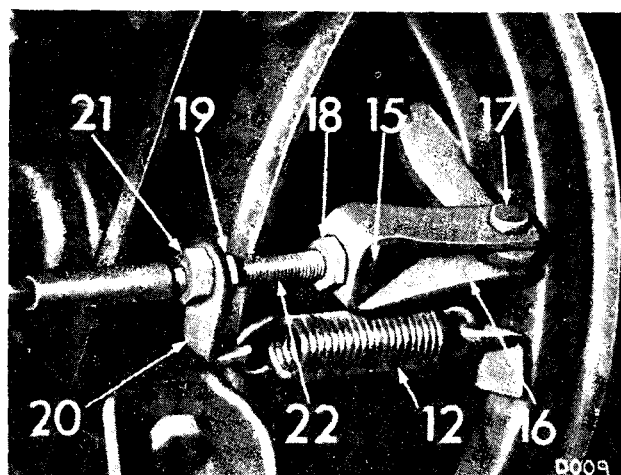


Fig. 26. Handbrake secondary cable arrangement

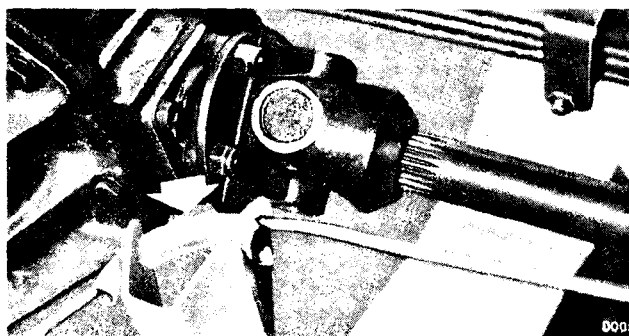
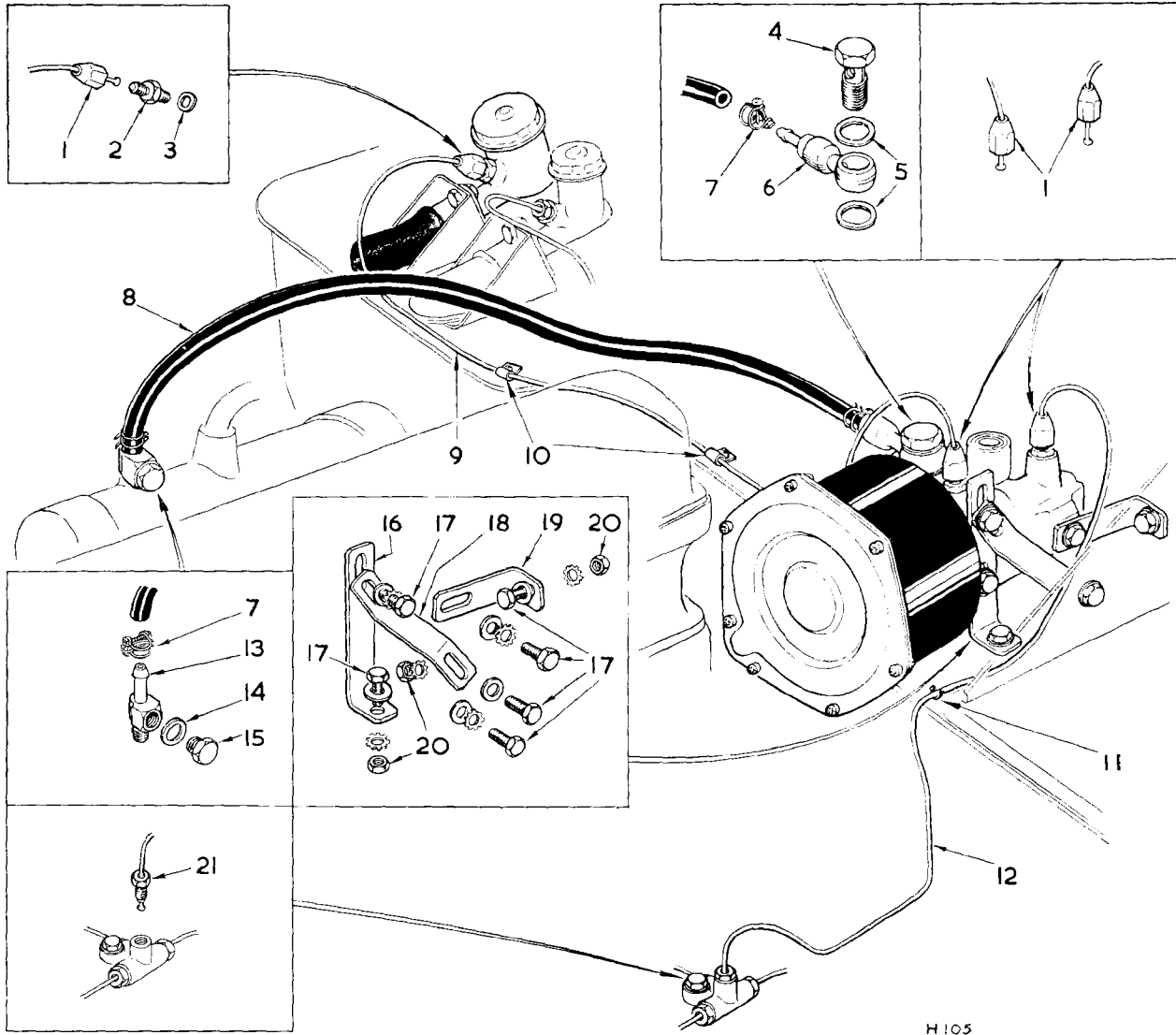


Fig. 27. Secondary cable guides

'GIRLING POWERSTOP'



H105

- | | | |
|--------------------|------------------|-----------------|
| 1 Unions (female) | 8 Vacuum hose | 15 Plug |
| 2 Adaptor | 9 Brake pipe | 16 Bracket |
| 3 Copper washer | 10 Pipe clips | 17 Bolts |
| 4 Banjo bolt | 11 Pipe clip | 18 Bracket |
| 5 Copper washers | 12 Brake pipe | 19 Bracket |
| 6 Non-return valve | 13 Adaptor | 20 Nuts |
| 7 Hose clips | 14 Copper washer | 21 Union (male) |

Fig. 28. 'Powerstop' installation details

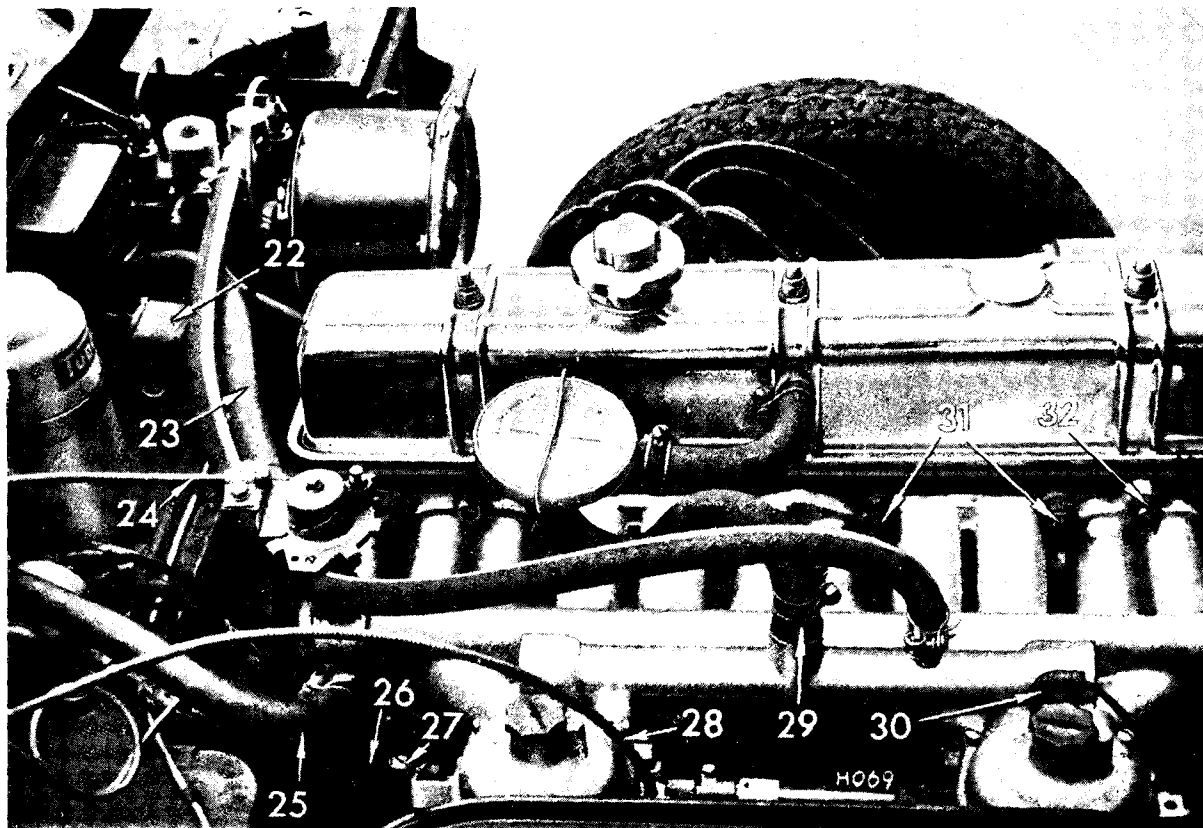


Fig. 29. Manifold attachments and overdrive relay

KIT FITTING INSTRUCTIONS (GT6)

(Kit Part Number 514600)

Kit contents:

- adaptor 1
- copper washer 1
- adaptor 1
- copper washer 1
- plug 1
- copper washers 2
- banjo bolt 1
- non-return valve 1
- brackets 2
- bolts 6
- nuts 3
- plain washers 6
- lock washers 6
- pipe clips 4
- hose clips 2
- vacuum hose 1
- brake pipe (fitted with 2 female unions) 1
- brake pipe (fitted with 1 male and 1 female union) 1
- Servo unit 1

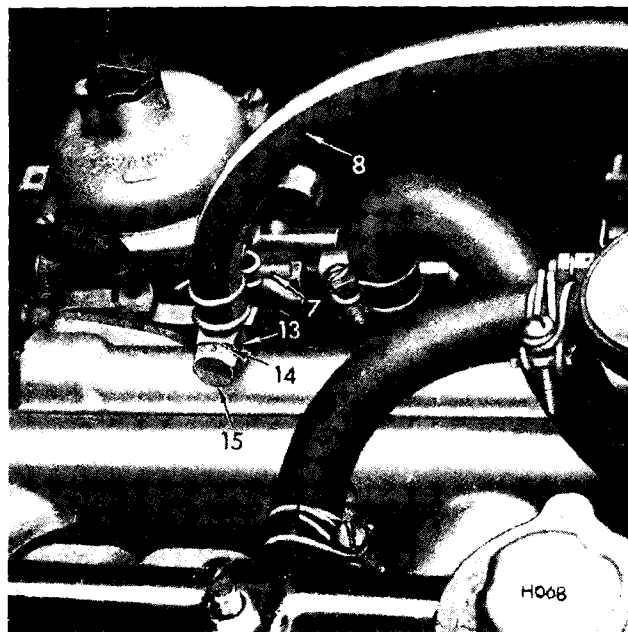


Fig. 30. Manifold adaptor

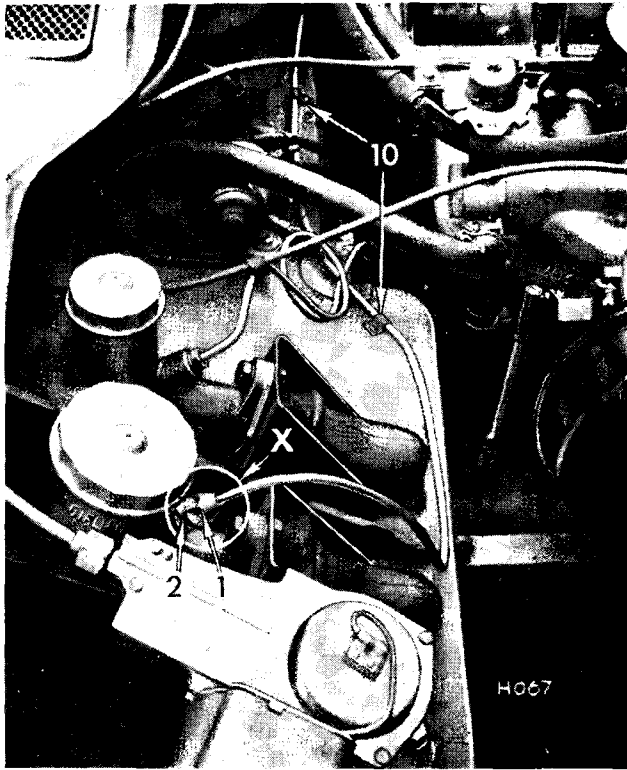


Fig. 31. Master cylinder pipe-run

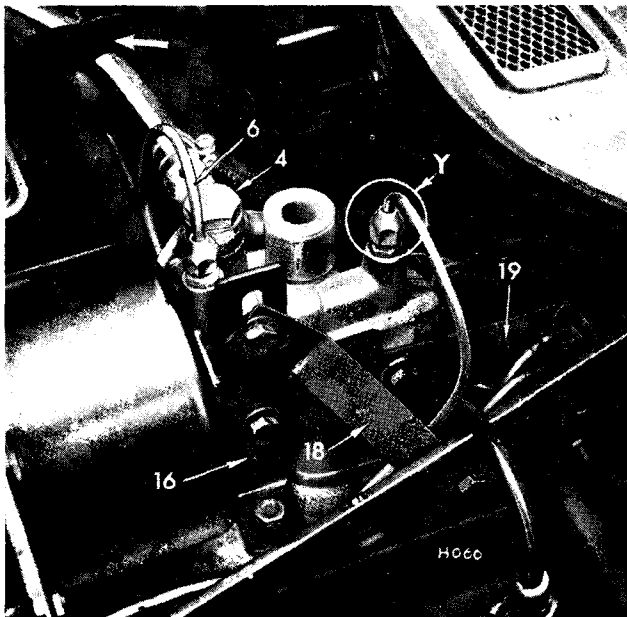


Fig. 32. Servo unit installed

Drain the cooling system and remove the battery (R.H.S. vehicles) or disconnect the negative earth lead from the battery (L.H.S. vehicles).

Remove the Manifold Assembly as follows:

Disconnect—Fuel and vacuum pipes (30) from carburettors.

Accelerator linkage (27) and choke cable (28) from the rear carburettor.

Water control valve cable (24).

Three hoses (23, 25 and 26) from the water control valve assembly.

One hose from the front end of the inlet manifold.

The exhaust down pipe from the manifold.

The emission valve hose (29) from the inlet manifold.

Progressively slacken the six clamp bolts (31) and four nuts (32). Remove the manifolds and carburettor assembly complete.

Drill the inlet manifold approximately $2\frac{1}{2}$ " (64.0 mm.) from the emission valve take-off adaptor (Fig. 30), using a size 'R' drill. Tap $\frac{1}{8}$ " x 27 N.P.T. to suit the adaptor (13) supplied in the kit. Clean out all swarf. Referring to Fig. 30, screw in the blanking plug (15) and copper washer (14) and assemble the adaptor to the manifold.

To Refit

Reverse the removal procedure, clean all joint faces and renew the gaskets.

Refill the cooling system.

Overdrive Relay

When an overdrive is fitted, remove the relay (22) and secure it to the bulkhead shelf as shown in Fig. 29. Stick a small piece of 'Dalmas Klingfast' tape over the original holes.

Fitting the Servo Unit

Shape the brackets as shown in Fig. 33, taking care to keep the mounting faces flat.

Bolt the brackets (16, 18 and 19) loosely to the servo unit and position it adjacent to the battery on R.H.S. models or in the corresponding position, next to the master cylinder, on L.H.S. models, with the vacuum cylinder facing forward and as low as possible. Using the assembly as a template, mark off and drill three $\frac{3}{8}$ " (9.5 mm.) dia. holes. Ensure that the wiring harness is clear of the drilling points.

IMPORTANT: To avoid damaging the servo body, first secure the brackets (16, 18 and 19) to the bulkhead and gusset. Finally, tighten the bolts (17) securing the brackets to the servo unit.

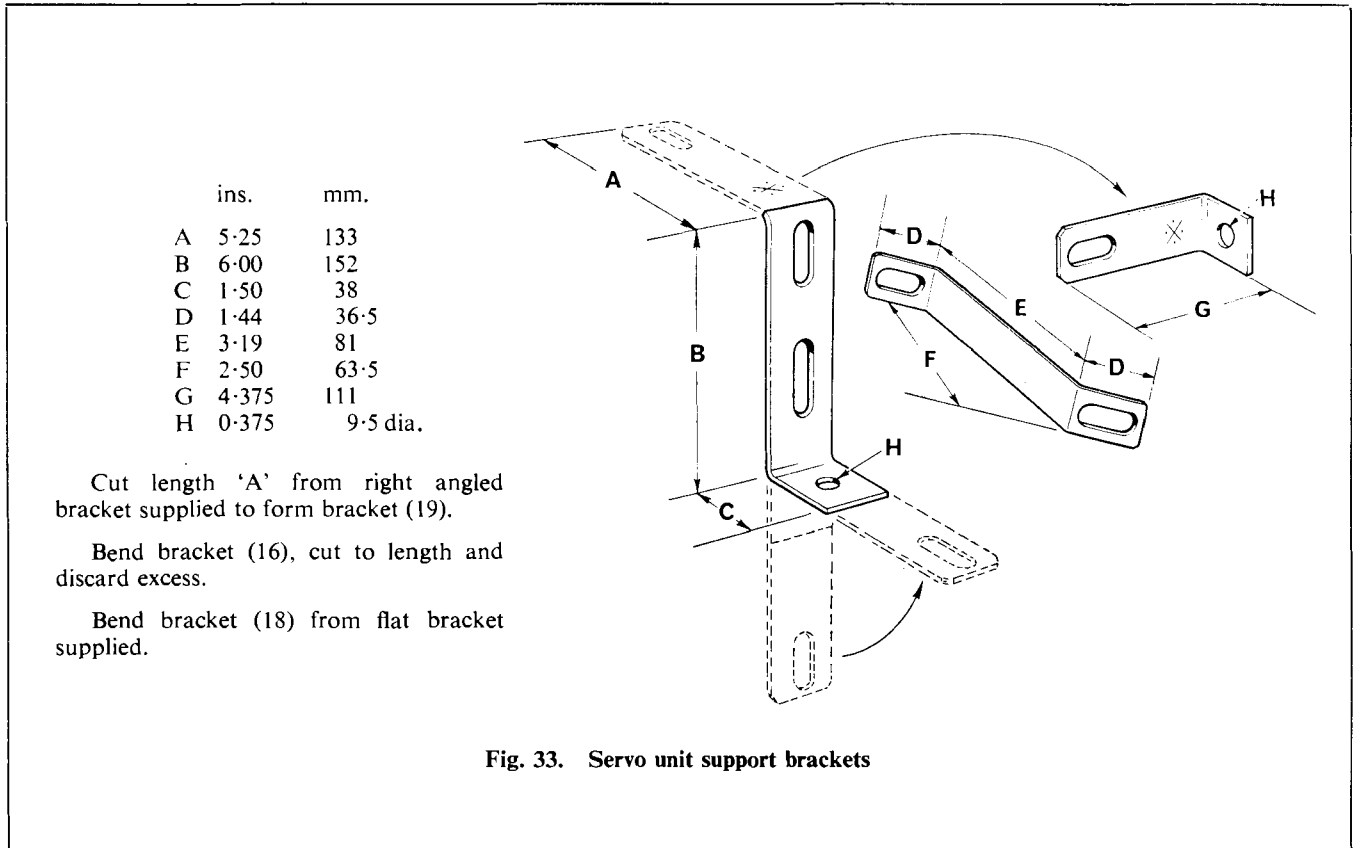


Fig. 33. Servo unit support brackets

Connecting Hydraulic Pipes

Unscrew the master cylinder cap. Place a small piece of polythene sheet over the reservoir and replace the cap. This will prevent excessive loss of fluid when hydraulic pipes are disconnected. Disconnect and remove the hydraulic pipe connecting the master cylinder and the fourway union. Screw the adaptor (2) and copper washer (3) supplied in the kit into the master cylinder outlet port (Fig. 31).

Carefully straighten both hydraulic pipes, supplied in the kit. Commencing at 'X' (Fig. 31) route the pipe (9) with the two female unions (1) by bending, cutting to length and flaring. Commencing at (Y) (Fig. 32) route the pipe (12) with one male and one female union (21 and 1) by bending, cutting to length and flaring.

CAUTION: To avoid cracks and malformation, it is essential to exercise care and to use the correct flaring tools.

Utilising existing clips (10), secure the pipe (9) to the bulkhead. Drill a $\frac{1}{8}$ " (3.2 mm.) dia. hole through the overhanging flange on the bulkhead shelf (Fig. 32), and secure the pipe from the servo unit to the four-way union using a clip (11) supplied in the kit.

To measure the clearance between the pipes and bonnet build a small piece of plasticine on the highest point of each pipe and close the bonnet. Open the bonnet and check for compression of the plasticine, if necessary, rebend the pipes to achieve a maximum clearance of $\frac{1}{4}$ " (6.3 mm.). Fully tighten all pipe unions.

Fitting Vacuum Hose

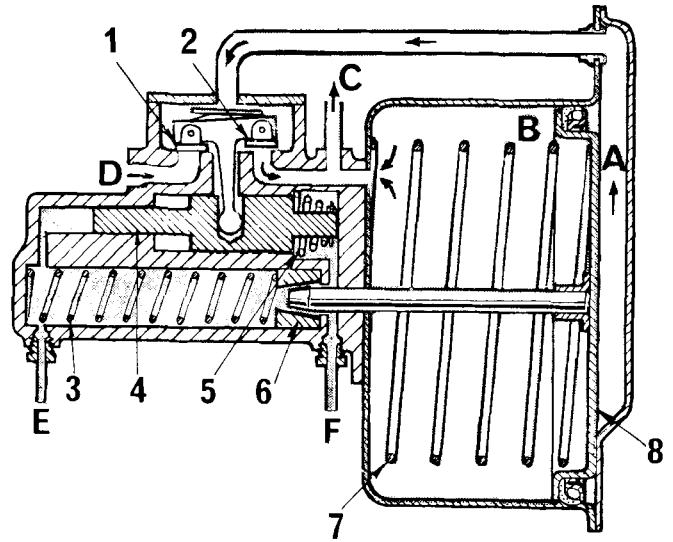
Assemble the banjo non-return valve (4, 5 and 6) to the servo unit. Connect the vacuum hose (8) to the non-return valve and the inlet manifold adaptor. Secure with hose clips (7). Tape the vacuum pipe to the heater hose pipe to prevent chafing (Fig. 32).

Bleeding the Brakes

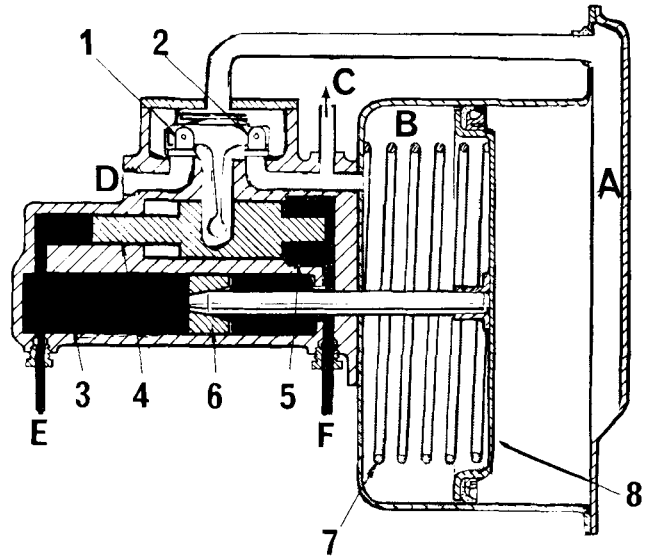
Bleed the system as detailed in the Owner's Handbook or Workshop Manual. Start the engine and adjust the carburettor slow running. Pressurize the braking system by applying the foot brake, and check all new and previously disturbed connections for leakage.

Road test the vehicle.

Released condition



Brakes held



High pressure fluid

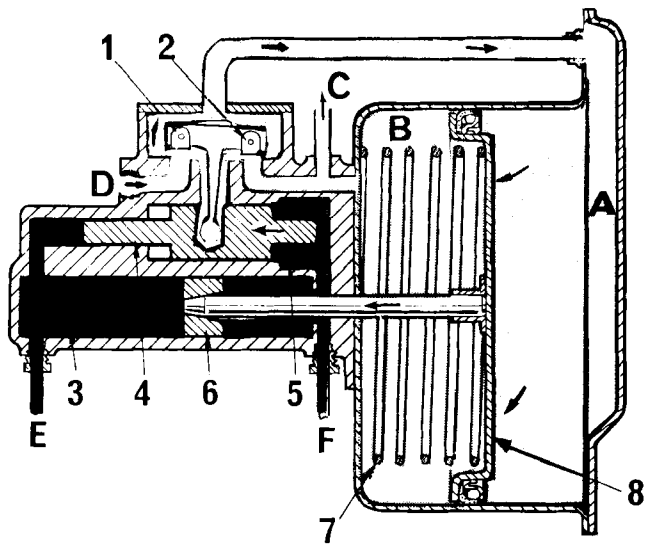


Low pressure fluid

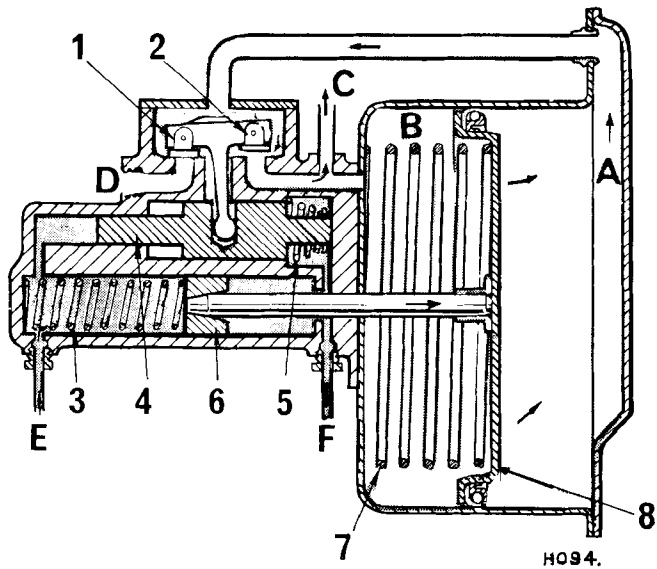


Fluid

Fig. 34. Girling 'Powers'



Brakes held



Recuperation

H094.

Vacuum

Atmosphere

WORKING PRINCIPLES

Released Condition

Manifold depression exhausts air from the chambers 'A' and 'B' which are interconnected via the valve (2).

The vacuum piston (8), output piston (6) and control piston (4) are all fully retracted by their respective springs (7), (5) and (3).

Brakes Applied

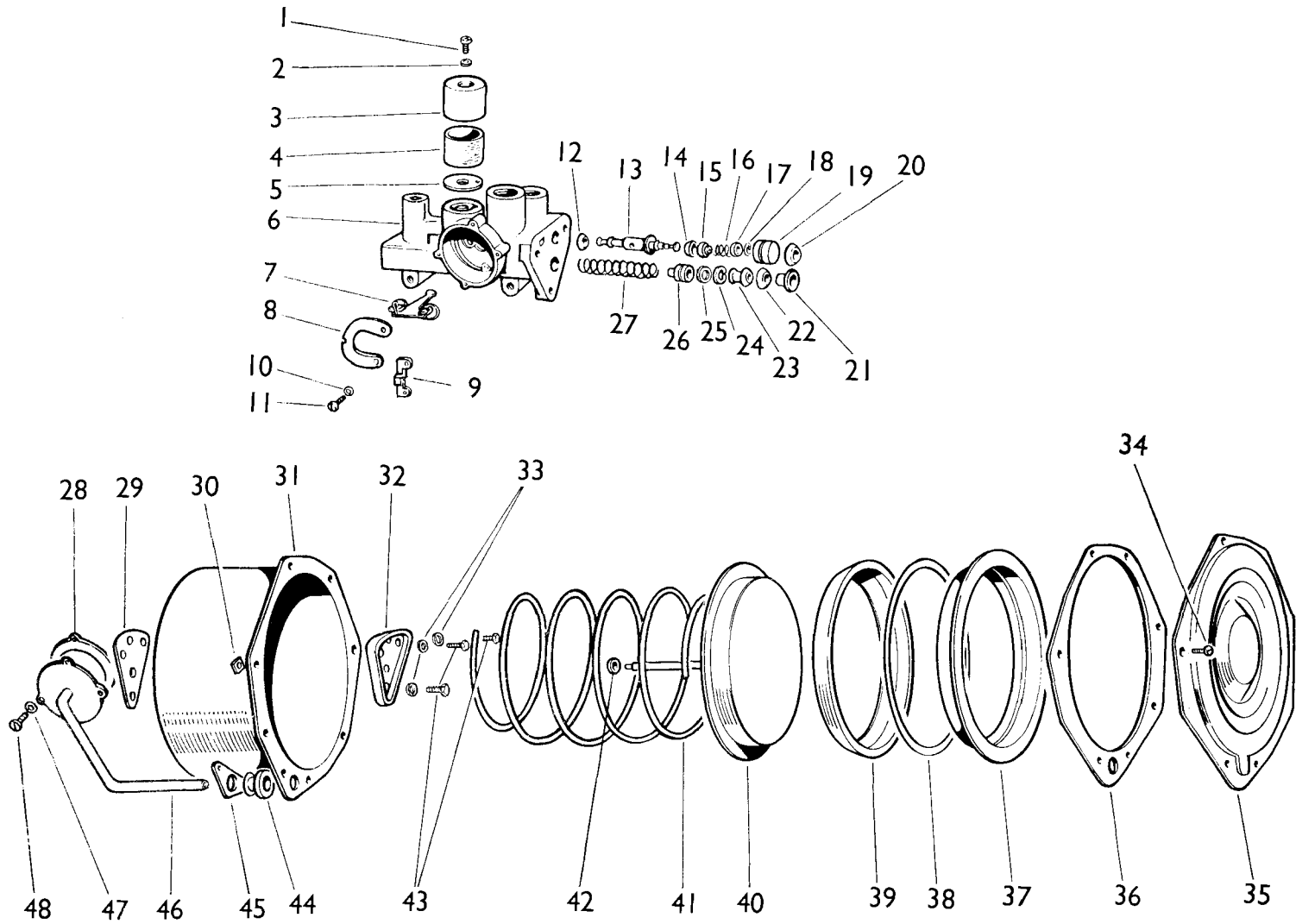
Brake pedal application produces equal hydraulic fluid pressure on both ends of the control piston (4). The force resulting from the area differential between the end faces of the piston causes it to move away from the vacuum cylinder. Movement of the control piston in this direction, closes the valve (2), thus sealing chamber 'A' from chamber 'B' and opens the air valve (1), admitting air into chamber 'B'. Atmospheric pressure drives the vacuum piston (8) and rod forward, sealing the bore in the output piston (6). Continued movement of the vacuum piston push-rod, drives the output piston along its cylinder, applying the brakes.

Brakes Held

When the thrust acting on the small end of the control piston (4) exceeds that acting on the large end, the piston moves towards the vacuum cylinder, closing the valve (1). In this condition both valve (1) and (2) are closed and the brakes are held on.

Recuperation

Releasing the brake pedal, reduces the fluid pressure acting on the large end of the control piston (4). The high fluid pressure acting on the small end drives the piston towards the vacuum cylinder, opening the valve (2). Air flows from chamber 'A' to chamber 'B', and the return spring (7) drives the vacuum piston to the end of its cylinder. As the piston-rod is withdrawn, it is followed by the output piston (6) until finally, the bore in the piston is uncovered, permitting fluid to flow from the wheel cylinders to the master cylinder.



H095

Fig. 35. Servo unit details

Key to Fig. 35

- | | | | | | |
|----|----------------|----|-----------------|----|----------------|
| 1 | Screw | 17 | Retainer | 33 | Washers |
| 2 | Washer | 18 | Circlip | 34 | Screw |
| 3 | Filter cover | 19 | Plug | 35 | Endcover plate |
| 4 | Filter element | 20 | Taper seal | 36 | Joint washer |
| 5 | Rubber pad | 21 | Bush | 37 | Seal retainer |
| 6 | Servo body | 22 | Gland seal | 38 | Backing ring |
| 7 | Valve assembly | 23 | Spacer | 39 | Seal |
| 8 | Spring | 24 | Circlip | 40 | Vacuum piston |
| 9 | Retainer | 25 | Washer | 41 | Spring |
| 10 | Washer | 26 | Output piston | 42 | Seal |
| 11 | Screw | 27 | Spring | 43 | Screws |
| 12 | Seal—secondary | 28 | Joint washer | 44 | Grommet |
| 13 | Control piston | 29 | Joint washer | 45 | Retainer |
| 14 | Seal—primary | 30 | Nut | 46 | Vacuum pipe |
| 15 | Abutment plate | 31 | Vacuum cylinder | 47 | Washer |
| 16 | Spring | 32 | Clamping plate | 48 | Screw |

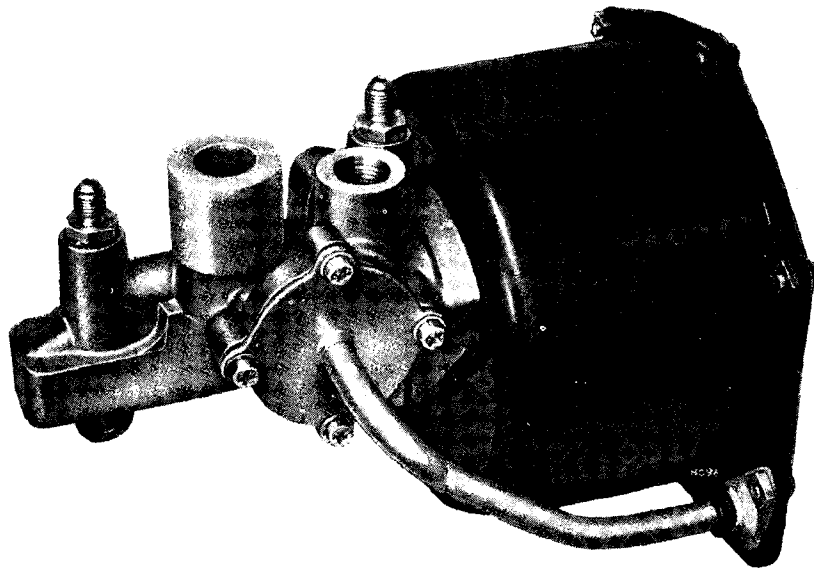


Fig. 35. 'Powerstop' servo unit

SERVICING

All seals should be changed at 36,000 miles (60,000 Km.) or three years (whichever is the sooner). Whenever possible the servo unit should be returned to Girling for replacement, but if this is not possible the replacing of all seals as contained in the service kit should provide a satisfactory unit providing **the internal working surfaces are in good condition.**

There must be no sign of corrosion, pitting, scoring or steps on piston rod, pistons or bores and the surfaces should be smooth to the touch.

When dismantling, absolute cleanliness is essential. Wash the hands and lay out a clean sheet of paper on which to work and place the parts. Take care of all highly finished working surfaces on pistons, rods and bores. Clean hydraulic parts with Girling Cleaning Fluid, Alcohol or Castrol Girling Brake and Clutch Fluid (Crimson) and do not allow any other fluid, oil, or grease to touch them. Special care should be exercised when removing and refitting the circlip in the hydraulic output cylinder and when assembling the vacuum cylinder to the body. Particular attention is directed to the remarks in the sections concerned.

The unit may be considered in five parts:

1. The Air Filter.
2. The Vacuum Cylinder which supplies the force to operate the output cylinder.
3. The Valve Chest which houses the valves, controlling the movement of air to and from the vacuum cylinder.
4. The valve control piston occupying the upper bore of the body.
5. The hydraulic output cylinder from which the pressure is applied to the brakes.

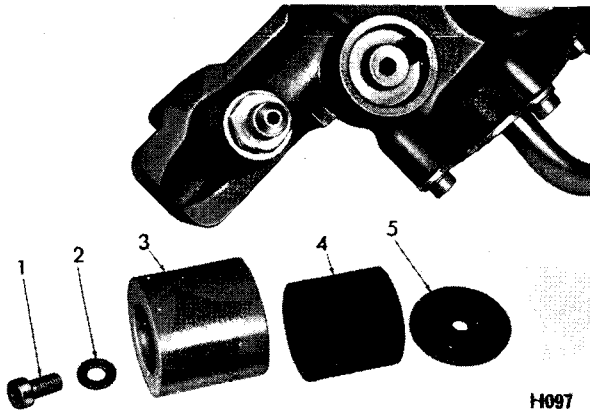


Fig. 37. Air filter details

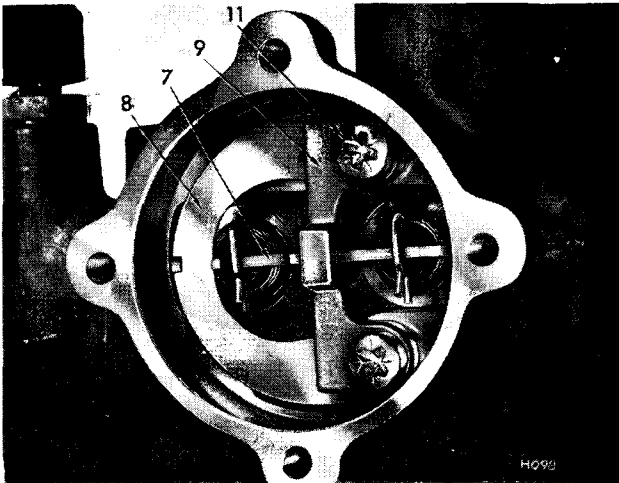


Fig. 38. Valve chest

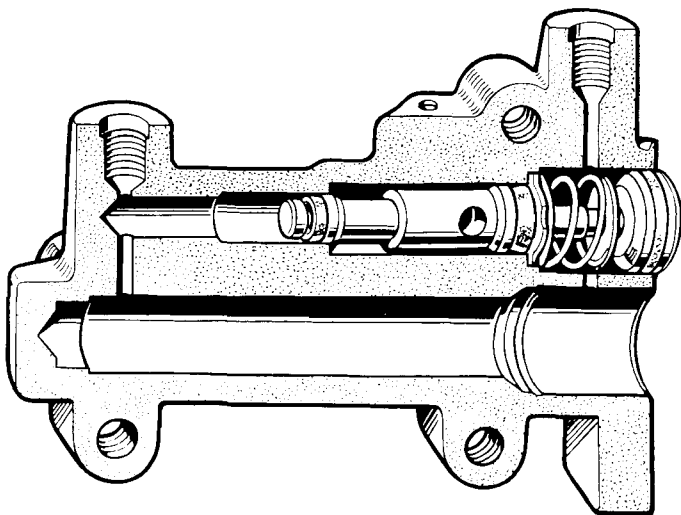


Fig. 39. Control cylinder

The Air Filter (Fig. 37)

The element, of moulded cellular construction, should be changed whenever replacement brake shoes are fitted and on the occasion when the servo unit is overhauled.

Take out the screw (1) and lift off the cover (3), filter element (4) and rubber pad (5). Discard the filter element and rubber pad.

Clean the base plate, fit a new rubber pad and element, replace the cover and secure with the screw.

DISMANTLING THE UNIT

Vacuum Cylinder (Fig. 35)

Hold the unit by its mounting lugs, between the jaws of a vice.

Remove the bolts (34) and nuts (30), and applying pressure to the end cover (35) gradually allow the spring (41) to push out the piston assembly. Remove the end cover and piston assembly. Take out the bolts (43) and separate the clamp plate (32), vacuum cylinder (31) and joint washer (29) from the servo body.

Valve Chest (Figs. 35 and 38)

Take out the screws (48) and lift off the cover and tube assembly (46) and joint washer (28).

Remove the screws (11), spring (8) and valve retainer (9). Depress the plug (19) and carefully lift out the rocking lever and valve assembly (7).

Clean all parts with Girling Cleaning Fluid and, if necessary, lap the nylon air valves on a sheet of glass using fire lapping paste.

Control Cylinder (Figs. 35, 39 and 43)

Tap the face of the body on a wooden surface to jar out the plug (19). Withdraw the control piston assembly from the bore.

Dismantle the control piston assembly as follows:

- compress the spring (16) and push off the circlip (18).
- take off the retainer (17), spring (16) and abutment plate (15).
- remove the seals (12), (14) and (20) from the piston (13) and plug (19).

Clean all parts with Girling Cleaning Fluid and lubricate with clean Brake Fluid.

Fit new seals (12) and (14) to the piston (13) (lips facing away from the centre hole). Refit the abutment plate (15), spring (16), retainer (17) and circlip (18) to the piston. Fit a new seal (20) to the plug (19).

Output Cylinder (Figs. 35, 40 and 42)

Withdraw the piston rod bush (21) from the bore, and using a hooked wire, remove the gland seal (22). Shake out the nylon spacer (23).

Depress the piston (26) using the piston compression tool (Fig. 44) as shown in Fig. 41: clip the ends of the tool under the edge of the body.

Locate the ends of a pair of circlip pliers in the holes in the circlip (24).

Squeeze the circlip pliers until the circlip is fully compressed and, holding the pliers tightly, carefully lift out the circlip, making quite sure the bore is not damaged in the process, otherwise brake failure may result.

Release the compression tool, and the piston spring (27) will push out the washer (25) and piston (26). Discard the piston.

Thoroughly clean the body with Girling Cleaning Fluid, and lubricate the bores with Castrol-Girling Red Rubber Grease. Examine the surfaces of the cylinder bores as described on page 3-221.

ASSEMBLING THE UNIT**Output Cylinder**

A new output piston (26) must be fitted when overhauling the unit, because the seal fitted into the piston during manufacture cannot be replaced.

Ensure that the outer seal is fitted with the lip towards the smaller end of the piston (26). Smear the piston with Red Rubber Grease and fit it into the end of the spring (27). Place the washer (25) on the piston and fit the compression tool into the end of the piston. Feed the spring into the bore and carefully enter the piston.

Keeping the piston 'square' in the bore gradually depress it until the compression tool can be clipped over the edge of the body.

Fit the circlip (24) around the compression tool and securely locate the tips of the circlip pliers into the holes in the circlip.

Compress the circlip and carefully insert it into the bore. When the circlip is resting on the washer (25) release the pliers. Ensure that the circlip is correctly located in its groove and remove the compression tool.

CAUTION: THIS OPERATION MUST BE PERFORMED WITH EXTREME CARE AS DAMAGE TO THE BORE MAY CAUSE SUBSEQUENT BRAKE FAILURE.

Fit the spacer (23) (large end first), gland seal (22) (lipped edge first) and bush (21) into the bore.

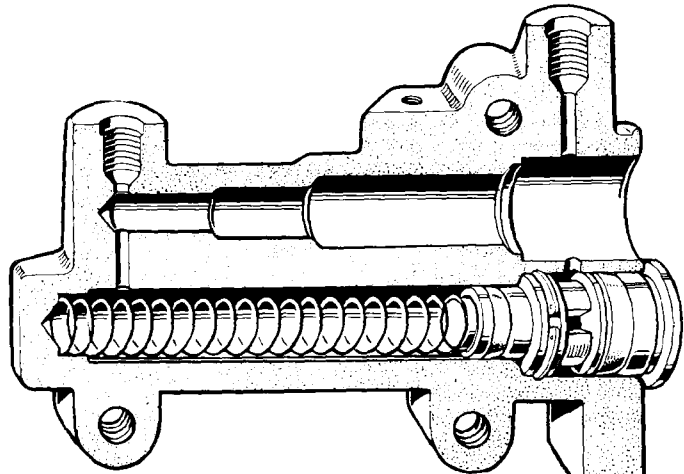


Fig. 40. Output cylinder

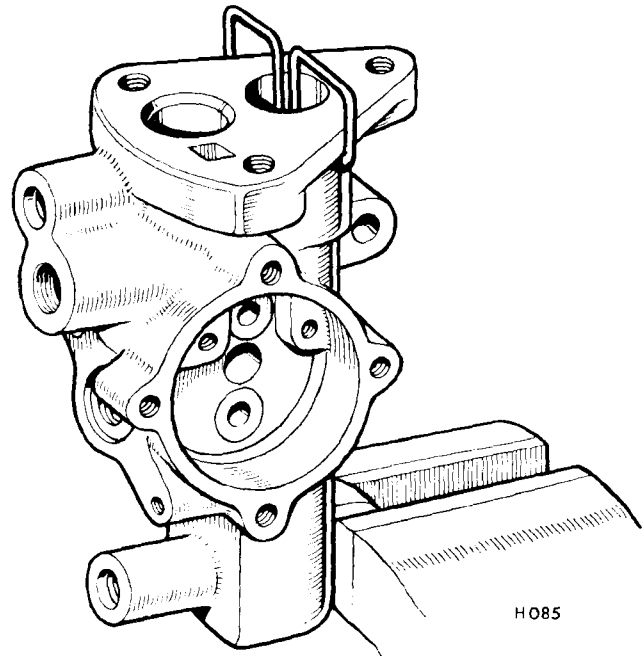


Fig. 41. Removing output piston

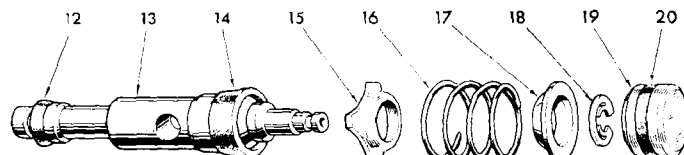


Fig. 42. Output piston details

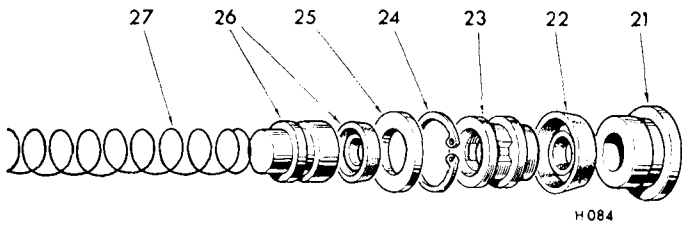


Fig. 43. Control piston details

Valve Control Cylinder

Lubricate the bore with Red Rubber Grease and insert the control piston assembly, aligning the hole in the piston with the hole in the valve chest. Press the sealing plug (19) into the end of the bore.

Valve Chest

Depress the plug (19) to align the hole in the control piston (13) with the hole in the valve chest. Insert the rocking lever and valve assembly with the spring location away from the retaining screws. Fit the spring (8) and valve retainer (9) and secure with the screws (11) and washers. Fit a new joint washer (28) and replace the cover and pipe (46). Fit the screws (48) and washers, but do not tighten.

Vacuum Cylinder

Mount the body mounting face uppermost in a vice. Place a new joint washer (29) in position and fit a new grommet (44) in the flange of the vacuum cylinder (31). Locate the vacuum cylinder over the projecting flange of the bush (21) and place the clamp plate (32) in position. Loosely secure, leaving the bolts (43) *finger tight*.

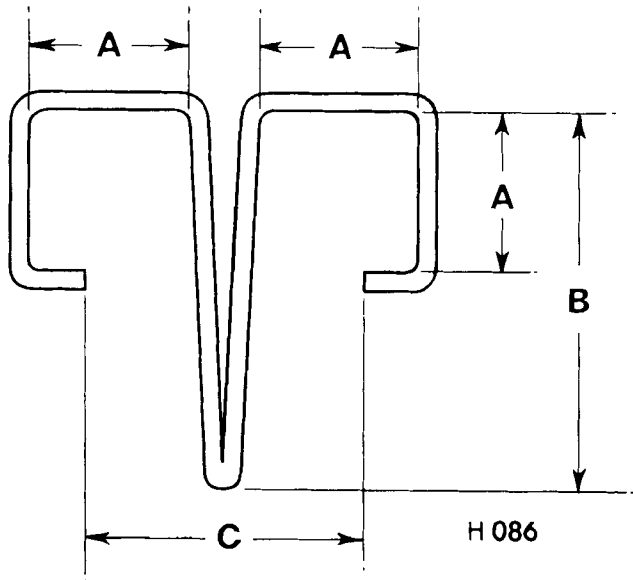
Place the piston (40) and spring (42) in position and push the piston through the full stroke several times to align the bush (21). Carefully remove the piston and spring and tighten the three bolts (43).

Tighten the screws (48) securing the valve cover.

Replace the rubber backing ring (28) with the new ring supplied in the kit. Smear the piston rod with Red Rubber Grease and apply the special lubricant supplied in the kit to the leather seal (39). Fit the spring (41) and piston assembly and place a new joint washer (36) on the vacuum cylinder flange.

Locate the cover plate (35) on top of the piston and depress the cover plate. Fit the nuts (30) and bolts (34) around the flange and tighten.

If the unit is not to be fitted to the vehicle, plug or tape the ports to prevent the ingress of foreign matter.



	ins.	mm.
A	1.0	25
B	1.75	45
C	2.375	60

Fig. 44. Tool for removing output piston

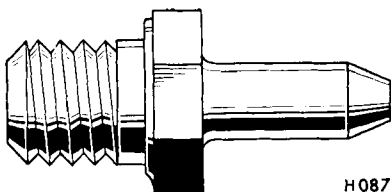


Fig. 45. Hydraulic take-off adaptor

TESTING THE SERVO UNIT

Simple tests described below can be made when the unit is installed. The only piece of equipment required is an adaptor to fit into the hydraulic inlet port. The adaptor is shown in Fig. 45, and can be made from a suitable pipe union ($\frac{3}{8} \times 24$ UNF).

It is assumed that any faults connected with the brake system, such as contamination, lack of adjustment, air in the system, fluid leaks, etc., have been recognised and eliminated.

TEST 1 Fit the completed unit to the mounting brackets and, before connecting the pipes, fit a bleed screw in the hydraulic outlet port and an adaptor shown in Fig. 18, into the hydraulic inlet port. Connect the Vacuum hose to the adaptor and remove the filter element. While the engine is "ticking over" place fingers over the air inlet and vacuum ports to determine if there is any suction at either orifice. If suction can be detected it indicates that the bores are scored or the components incorrectly assembled.

TEST 2 Connect up the hydraulic and vacuum pipes and bleed the system. Run the engine and, while the brake is being applied, it should be possible to hear the hiss of the air inlet and, with a hand on the vacuum cylinder, feel the movement of the unit working.

TEST 3 Run the engine for half-a-minute, switch off and leave for two minutes. Apply the brake and the Servo unit should operate and the operation should be detected as detailed in test 2.

TEST 4 Run the engine and apply the brake hard, and hold it for fifteen to twenty seconds. There should be no perceptible creep of the pedal. If there is it indicates leaks or scored bores in the components.

TEST 5 Jack up the front wheels and with the engine running apply the brake and release. The wheels should be free to move half-a-second after the release of the

pedal. Tests 2 to 5 can be used to test a suspect Servo unit before it is removed from the car.

If the results is unsatisfactory on—

TEST 2 It means the unit is not working at all which could be caused by a lack of vacuum, possibly a faulty non-return valve, or a fault within the unit.

TEST 3 It indicates leaking gaskets, air valve or rubber grommet. Clamp the vacuum hose and repeat Test 3. If satisfactory the non-return valve is faulty. To test for a leaking air valve run the engine and place the finger over the air inlet. If the suction is only slight the air valve is satisfactory and the leak is elsewhere.

TEST 4 The source of trouble can only be found by elimination. Check for leaks. If no leak of hydraulic fluid is evident clamp each hose successively and repeat test each time. Finally plug the master cylinder outlet and test. If creeping of the pedal is evident when the hoses are clamped and the pedal is solid when the master cylinder outlet is plugged, the Servo Unit is faulty.

TEST 5 If the brakes remain on, disconnect the vacuum pipe, operate the brakes to eliminate all vacuum in the Servo Unit and make the test again. If the brakes remain on, the fault is not in the Servo Unit. If the brakes now release normally, the fault is in the Servo Unit and the vacuum piston alignment is suspect.

FAULT DIAGNOSIS CHART

FAULT	CAUSE	ACTION
Hard Pedal—apparent lack of assistance with engine running.	Lack of vacuum. Restricted hose. Blocked air inlet. Rubber grommet swollen. Faulty output piston. Major fault in unit	Check vacuum connections. Check hose and replace if necessary—fit parts from Service Kit—examine filter and air inlet—fit new unit.
Brakes hanging on.	Misaligned vacuum piston (after servicing unit). Swollen rubber grommet or swollen backing ring. Maladjustment of piston return stop.	Check as Test No. 5. Replace parts as necessary. Reset piston stop.
Slow action of Servo Unit.	Swollen rubber grommet. Blocked filter or restricted air inlet.	Check and replace as necessary. Tighten vacuum connections. Replace hose.
Lack of assistance on heavy braking. Servo operating only when engine is running. Poor slow running of engine.	Air leak in servo low vacuum. Air leaks in gaskets or air valve. Vacuum hoses or faulty non-return valve.	Dismantle and replace all parts in Service Kit. Tighten vacuum connections. Replace vacuum hose or replace non-return valve.
Loss of fluid.	Failure of a seal or seals in unit or scored bores.	Replace unit or fit a Service Kit of seals and gaskets.

TANDEM BRAKING SYSTEM

Hydraulic System

Description

The foot operated hydraulic braking system employs a tandem master cylinder for transmitting pressure to independent front and rear braking systems. Both systems are connected to opposing sides of a pressure differential warning actuator (P.D.W.A.) which operates an electrical switch when a pressure drop on one side of the valve causes a shuttle to move from its mid-position. The P.D.W.A. switch operates a warning light on the fascia which is series/parallel connected with the oil warning light. Thus when the brakes are working correctly, the brake warning light and the oil warning light are both extinguished as the engine speed is increased from idle (giving regular assurance that the brake warning light is functioning). In the event of a partial brake failure the brake warning system is earthed directly, causing the warning light to glow brightly.

Bleeding the Hydraulic Braking System

General

If air has entered either of the hydraulic braking systems then only the system affected need be bled. During bleeding, exercise care, as described in the following procedure, to avoid moving the shuttle from its mid-position. However, if the shuttle has moved during bleeding or subsequent to a fault condition, centralise the shuttle by performing operations 5-9 below.

Preparation for Bleeding

Before commencing to bleed the brakes ensure that all the bleed nipples are clean, and, taking care to avoid dirt entering the fluid reservoir, remove its filter cap and top-up with new hydraulic fluid. During the bleeding operation keep the level of fluid above the dividing partition in the reservoir. Do not use fluid bled from the system for topping-up.

Use new fluid from a sealed container, resealing the container after use.

Procedure

Commence with the brake, of the pair being bled, farthest from the master cylinder. If both systems are to be bled, bleed the rear brakes first. When bleeding the rear brakes, release the handbrake and turn the brake adjusters to lock the shoes against the drums. When the bleeding is completed adjust the brakes as detailed on page 3.210.

1. Attach a rubber tube of approx. $\frac{1}{4}$ " (6 mm.) bore to the brake bleed nipple allowing the other end of the tube to hang submerged in a jar containing a quantity of clean brake fluid.
2. Unscrew the bleed-screw enough to allow the fluid to be pumped out (half a turn is normally sufficient).
3. Depress the brake pedal and allow it to return slowly noting that only a LIGHT pedal effort is required and the pedal must NOT be pushed through the end of the stroke. (In addition, never "try" the pedal until all air has been dispelled and the system is fully bled, as either action will cause the shuttle to move

and actuate the switch). Pausing between each depression of the pedal, continue pumping until all air has been dispelled from the bleed-screw (denoted by the absence of bubbles in the fluid being pumped into the jar).

4. With the pedal depressed, close the bleed-screw nipple and repeat the operation on the other brake.

Procedure for Re-centralising the P.D.W.A. Piston

If, for reasons described above, the P.D.W.A. shuttle requires to be re-centralised, adopt the following procedure.

5. Fit a rubber tube, as described in 1 above, to a brake bleed-screw at the opposite end of the car to that which has just been bled.
6. Open the bleed-screw.
7. Switch the ignition on but **DO NOT START THE ENGINE**. (The brake warning light will glow but the oil warning light will remain extinguished).
8. Exert a steady pressure on the brake pedal until the brake light dims and the oil light glows. (A click should be felt on the pedal as the shuttle returns to its mid-position).
9. Tighten the bleed-screw.

NOTE. If the pedal has been pushed too hard the shuttle will move to the other side of the valve, thus requiring the procedure to be repeated on a brake at the opposite end of the car.

MASTER CYLINDER

General

The GT6 employs a tandem master cylinder which consists of two independent and complete hydraulic cylinders in series, one operating on the front brakes and the other on the rear. Both cylinders are supplied by a common reservoir divided by a partition.

Different tandem master cylinders have varying volume ratios (70-30 to 50-50) it is, therefore, of paramount importance to use only the correct replacement parts or cylinders.

Operation of the T.V. C.V. Master Cylinder (Fig. 46)

Application of pressure on the push rod moves the primary plunger up the cylinder bore and allows a spring loaded tipping valve to return to centre. The primary supply port is closed by the valve and further movement of the primary plunger results in hydraulic pressure being transmitted to the wheel cylinders of the front brakes. At the same time the pressure created acts in conjunction with the increasing force of the intermediate spring to overcome the stronger secondary spring, thus actuating the secondary plunger.

Initial movement of the secondary plunger closes off the centre valve supply port and the hydraulic pressure is transmitted to the wheel cylinders of the rear brakes.

In case of failure of either chamber or circuit, mechanical contact takes place within the cylinders and the remaining chamber builds up the normal pressure to operate the brakes that it controls.

Regular Maintenance

Every week check the level of fluid in the brake master cylinder reservoir. The fluid level is visible through the translucent casing of the reservoir, **do not remove the cap**. A gradual lowering of the level over a long period is caused by brake pad wear and does not require topping-up. A sudden appreciable drop in the level must be investigated, the cause ascertained and rectified immediately.

Do not allow the level to drop below the danger line on the side of the casing (see Fig. 47).

To avoid dirt entering the system ensure that the reservoir is clean externally before removing the cap. Use only new fluid from a sealed container and re-seal the container after use. Replace the reservoir cap immediately after filling.

Removing

1. Detach both fluid pipes from the cylinder body, plug the open ports of the master cylinder to prevent fluid draining onto the paintwork.
2. Withdraw the rubber dust cover to expose the master cylinder push rod and clevis pin.
3. Remove the clevis pin, secured by a split pin, attaching the push rod to the brake pedal.
4. Remove the bolts attaching the master cylinder to the bulkhead and lift off the unit.

Dismantling (Fig. 50)

IMPORTANT: Before carrying out work on the brake master cylinder, see warning note on page 3.202.

1. Drain and discard the master cylinder fluid.
2. Remove four screws (12) attaching the reservoir to the cylinder body.
3. Depress the push rod (11), remove the circlip (10) and withdraw the push rod together with abutment plate (9) and circlip (10).
4. With an Allen key unscrew the tipping valve securing nut (5) and remove the seal (7).
5. Depress the primary plunger and remove the tipping valve (6).
6. Remove the internal parts either by applying low air pressure to the end inlet orifice or by shaking the cylinder body.
7. Separate the plunger and intermediate spring.
8. Lift the leaf spring of the spring retainer (insert Fig. 50) and remove the spring and centre valve sub-assembly from the secondary plunger (16).
9. Remove the spring (19), valve spacer (20) and spring washer (21) from the valve stem (22), and remove the valve seal (23) from the valve head.
10. Remove the seals from the primary (14) and secondary (16) plungers.
11. Lever out the baffle (2) and remove the cap washer (3) from the filler cap.

Cleaning/Examination

Replace all seals with those contained in the service kit. Clean all the remaining parts and the cylinder thoroughly with hydraulic cleaning fluid.

Examine the bore of the cylinder and the plunger for visible score marks, ridges or corrosion. The slightest imperfection of the bore will necessitate the fitting of a new master cylinder.

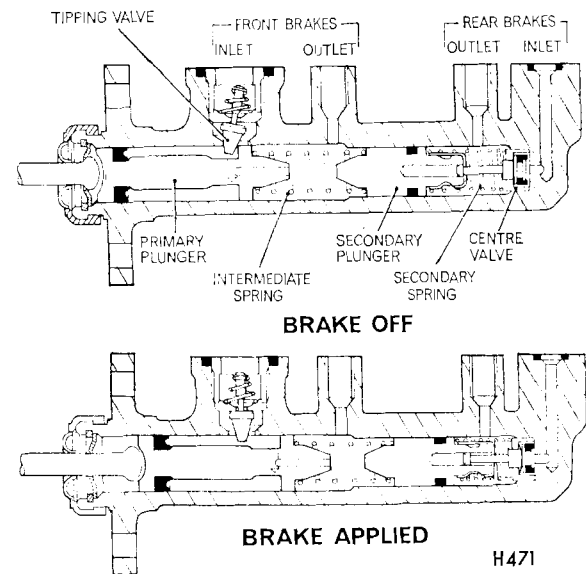


Fig. 46. Operation of the master cylinder.

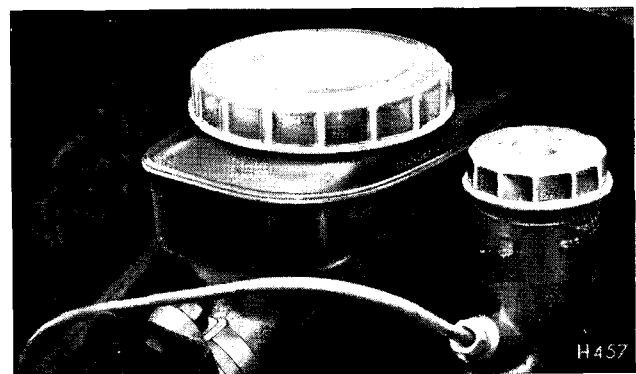


Fig. 47. Showing the danger line on the side of the master cylinder.

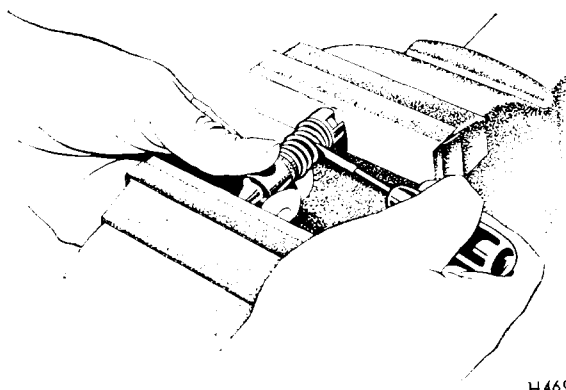
Assembling

Prior to assembly lubricate all parts with new hydraulic fluid.

1. Assemble the seals to the primary and secondary plungers.
2. Referring to inset on Fig. 50, fit the valve seal (23) smallest diameter leading, on to the valve head (22).
3. Position the spring washer (21) on the valve stem so that it 'flares' away from the valve stem shoulder and follow with the valve spacer (20), legs first.
4. Attach the spring retainer (18) to the valve stem, keyhole first.
5. Slide the secondary spring (19) over the spring retainer, then position the sub-assembly on the secondary plunger (16).
6. The spring must now be compressed whilst the leaf of the spring retainer is pressed down behind the head of the plunger. To do this, position the sub-assembly between the jaws of a bench vice and, to prevent possible contamination, place a clean piece of paper between each end of the sub-assembly and the vice jaws (Fig. 48). Close the vice to compress the spring until it is almost coil bound. Use a small screwdriver to press the spring retainer right back against the secondary plunger (Fig. 48). Using a pair of pointed nose pliers (Fig. 49), depress the leaf of the spring retainer behind the head of the plunger. Ensure that the retainer leaf is straight and firmly located behind the plunger head as shown on Fig. 50 inset.
7. Fit the intermediate spring (19) into position between the primary and secondary plunger.
8. Lubricate the cylinder bore and plunger seals with hydraulic brake fluid.
9. Insert the plunger assemblies into the bore, valve-end leading, easing the entrance of the plunger seals.
10. Press the primary plunger down the bore and fit the tipping valve, securing nut and seal. Tighten to a torque of 35 to 40 lb./ft.
11. Fit the cap washer and baffle to filler cap. Screw the cap on the reservoir.
12. Fit the reservoir seals (24 and 7), position the reservoir on the cylinder and secure with the retaining screws.
13. Fit the push rod (11) with the abutment plate (9) and circlip.

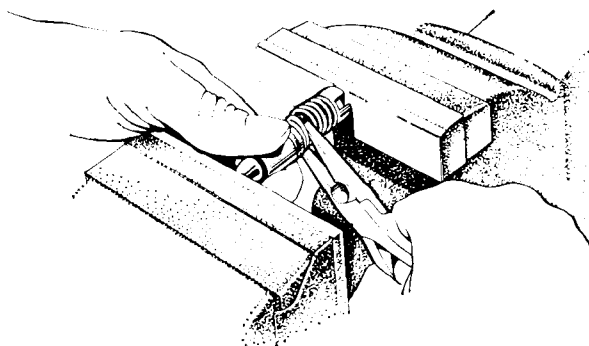
Refitting

Refitting is the reversal of removing, ensure that the fluid pipes are securely tightened. Bleed the system as described on Page 3.226.



H469

Fig. 48. Pressing the spring retainer back against the secondary plunger.



H468

Fig. 49. Depressing the leaf of the spring retainer behind the head of the plunger.

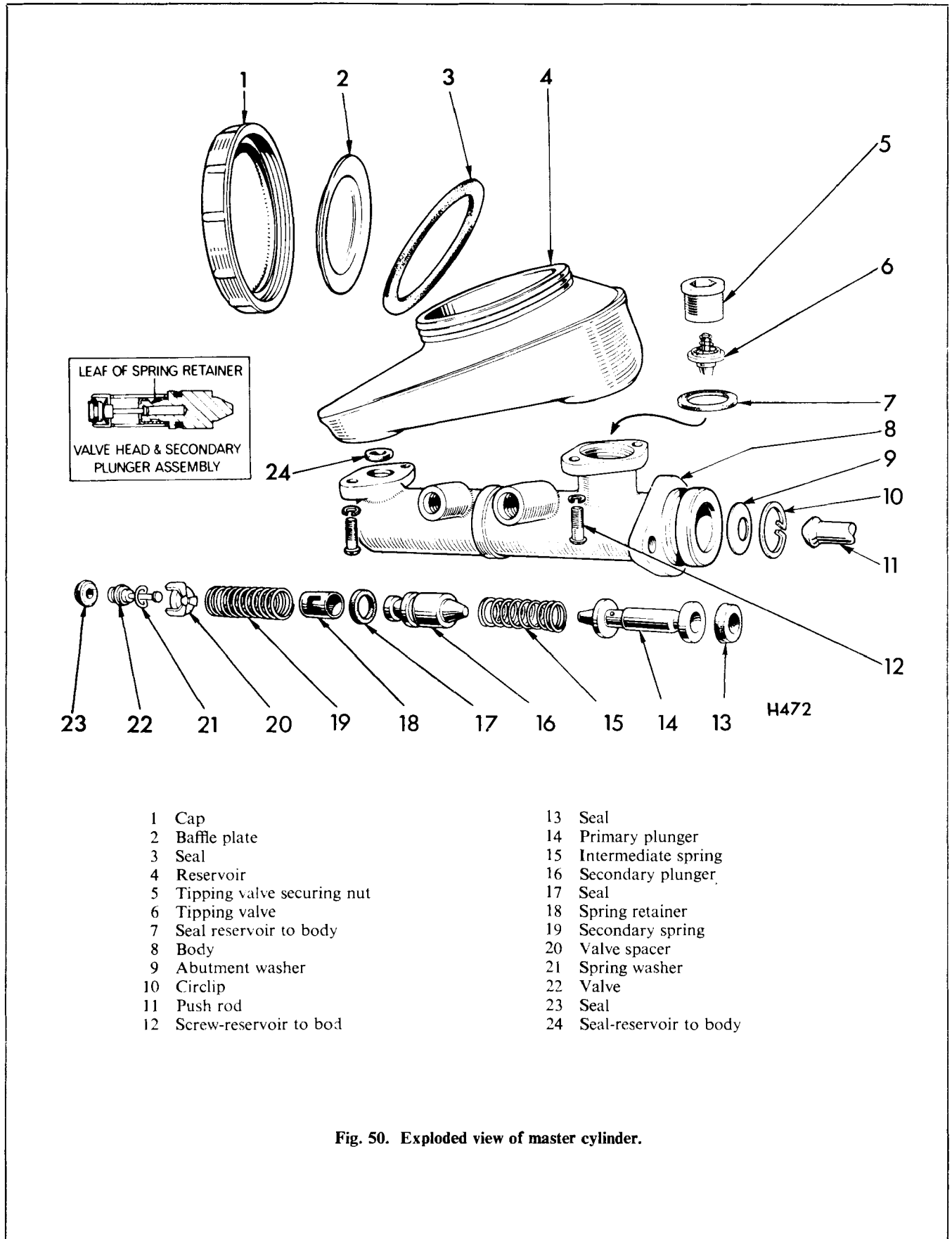


Fig. 50. Exploded view of master cylinder.

PRESSURE DIFFERENTIAL WARNING ACTUATOR (P.D.W.A.)

General

The P.D.W.A. is an 'inline' hydraulic valve through which both brake fluid lines are routed. The purpose of the device is to detect failure in either of the systems and to transmit, electrically, warning of the failure to a light on the fascia.

From Fig. 51 it will be appreciated that the shuttle valve is held in mid-position in the body by equalised pressure in the fluid lines; the switch is in contact with a peripheral groove in the shuttle valve. Lack of pressure in either line allows the pressure in the other line to displace the shuttle and force the plunger to actuate the switch.

For ease of assembly the shuttle valve is made in two parts.

Removing and Refitting

1. Remove the electrical connection.
2. Disconnect the two inlet and two outlet pipes, plug all inlet and outlet ports to prevent loss of fluid and ingress of dirt to the system.
3. Remove the bolt securing the P.D.W.A. to the bulkhead and lift off the unit.

Refitting is a reversal of removing: ensure that all connections are securely tightened before bleeding and, if necessary, recentralise the P.D.W.A. as described on Page 3.226.

After bleeding check for fluid leaks with the pedal fully depressed and with the system at rest.

Dismantling (Fig. 51)

1. Remove the unit from the vehicle.
2. Remove the end plugs from the unit and discard the copper washers.
3. Remove the nylon switch.

4. Carefully push out the valves taking care not to damage the bore.
5. Remove the seals taking care not to score the shuttle valves.

Examination

Replace the seals and copper washers with new parts from a Girling Service Kit.

Thoroughly clean the remaining parts in clean brake fluid. Dry the parts thoroughly and inspect the bore of the body and the shuttle valves for scoring or imperfections. The unit must be replaced if these items are found defective.

To test the nylon switch assembly, reconnect the warning light circuit and actuate the plunger at the base of the switch by pressing it against the earthed frame of the vehicle.

Reassembling

1. Lubricate the valve pistons, seals and bore with unused brake fluid.
2. Using the fingers only, fit the new seals onto the pistons with the lips facing outwards i.e. facing the slots in the end of the valve pistons.
3. Insert the longer piston into the bore (slotted end outermost) until the radiused groove is opposite the switch plunger aperture. Screw in the switch plunger and tighten to a torque of 2 to 2.5 lb./ft. Ensure that the piston seals are never pushed across the central aperture in the valve body as this will damage the seals and require them to be replaced.
4. Insert the shorter piston into the bore (slotted end outermost).
5. Ensuring that the seating faces on the body and plugs are clean and undamaged, fit new copper washers and screw in the plugs, tightening to a torque of 16 to 20 lb./ft.
6. Refit the unit to the vehicle as detailed above.

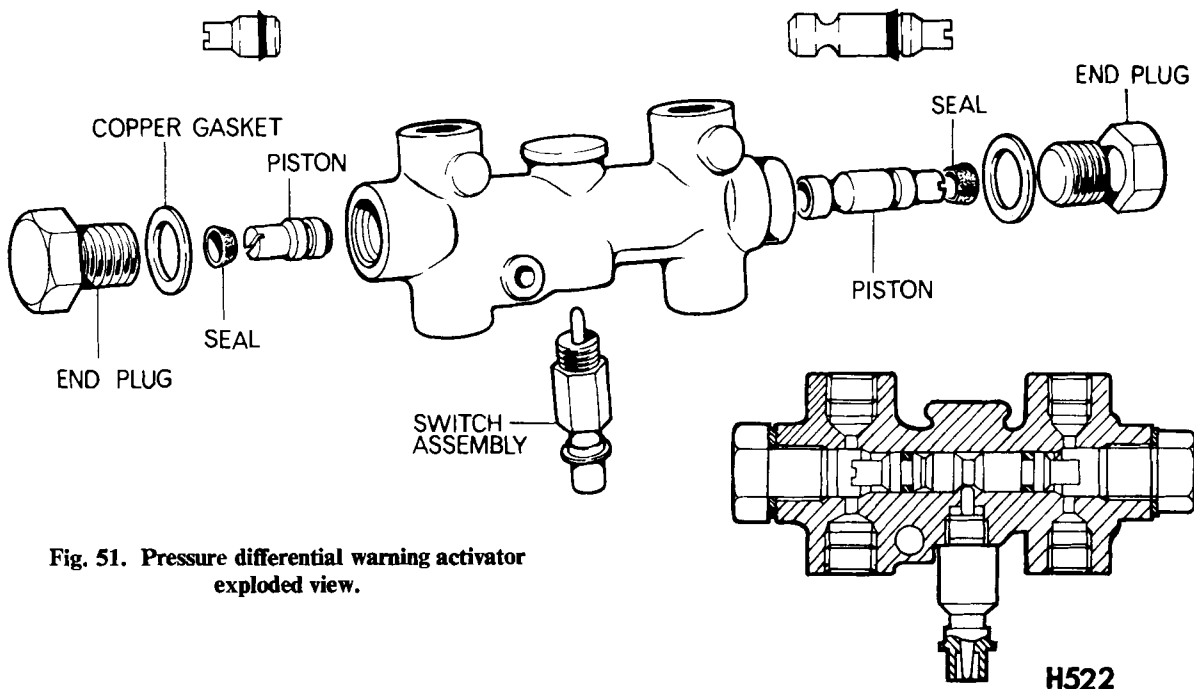


Fig. 51. Pressure differential warning activator exploded view.

WHEELS AND TYRES

General

The wheels and tyres, their correct types and pressures, are an integral part of a vehicle's design. Thus the regular maintenance of the tyres contributes not only to the safety but to the designed functioning of the vehicle, as road holding, steering and braking are especially vulnerable to the use of incorrectly pressurised, badly fitted or worn tyres.

It is both dangerous and, in the U.K., illegal to use, on the public roads, a vehicle fitted with unsuitable combinations of tyres. The following recommendations should therefore be observed.

1. Do not mix radial-ply and cross-ply tyres on the same axle.
2. Do not fit radial-ply tyres to the front wheels and cross-ply to the rear wheels.
3. With suitable tyre pressure adjustments it may be possible to obtain acceptable handling with cross-ply tyres on the front wheels and radial-ply tyres on the rear wheels, but this combination is not recommended.

Winter Tyres

Winter tyres are designed primarily to give improved traction and braking in mud and snow. Their performance on hard surfaces may, however, be inferior to normal road tyres and extra care is required when using them under normal conditions.

Wheel Tolerances

The maximum permissible tolerances for wheel run out and ovality, as defined below, are as follows:—

- A. **Run out**, i.e., the lateral variation, measured on the vertical inside face of the flange (point A, Fig. 1): Not to exceed
 Disc wheels—0.06 in. (1.78 mm.)
 Wire wheels—0.05 in. (1.27 mm.)
- B. **Ovality**, i.e., the difference between the high and low points of a rotating wheel measured at any point on either bead seat (point B, Fig. 1): Not to exceed
 Disc wheels—0.06 in. (1.78 mm.)
 Wire wheels—0.05 in. (1.27 mm.)

Measurements A and B above should be used when the tyre is removed, points C and D may be used when the tyre is fitted.

Lateral and radial inaccuracies outside these limits contribute dynamic and radial unbalance respectively.

Severe eccentricity intermittently increases the load on the tyre and results in irregular wear. Static and dynamic balancing will not rectify this condition and a new wheel must be fitted.

Pressed Steel Wheel Maintenance

Ensure that the bead seats and flange faces are kept free from rust and dirt and that wheels having damaged or elongated stud holes are replaced.

Locally damaged flanges may be corrected by careful hammering, but a buckled wheel, i.e. one which no longer conforms to the tolerances quoted must be replaced.

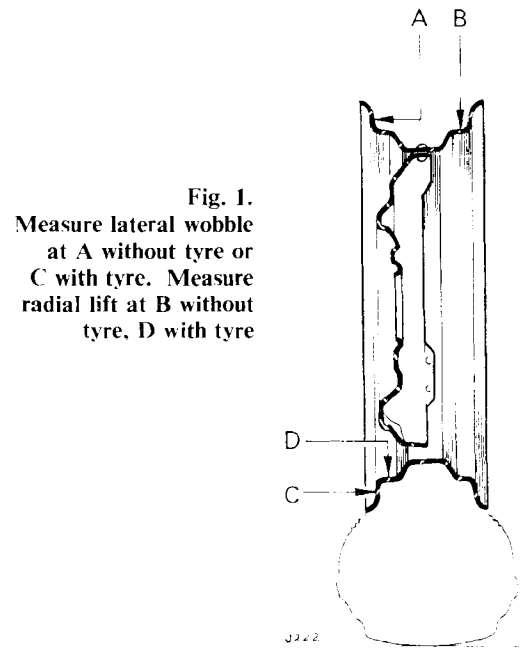
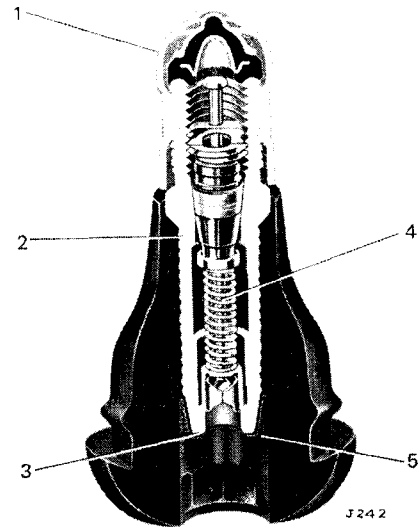


Fig. 1. Measure lateral wobble at A without tyre or C with tyre. Measure radial lift at B without tyre, D with tyre



1. Cap with doubly reinforced swivel seal.
2. Solid brass insert; rubber covered.
3. Rounded and free insert end.
4. Interchangeable valve core.
5. Free-floating, tapering insert giving "ball and socket" action.

Fig. 2. Tubeless tyre valve

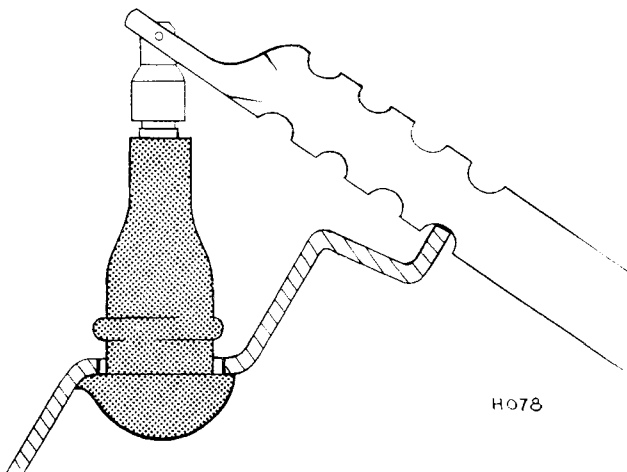


Fig. 3. Inserting a new valve

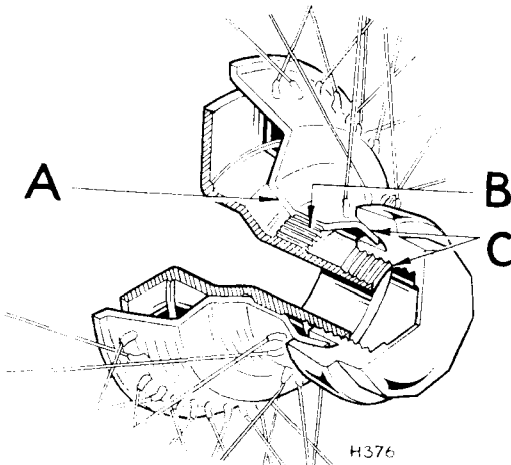


Fig. 4. Wheel nut tapers

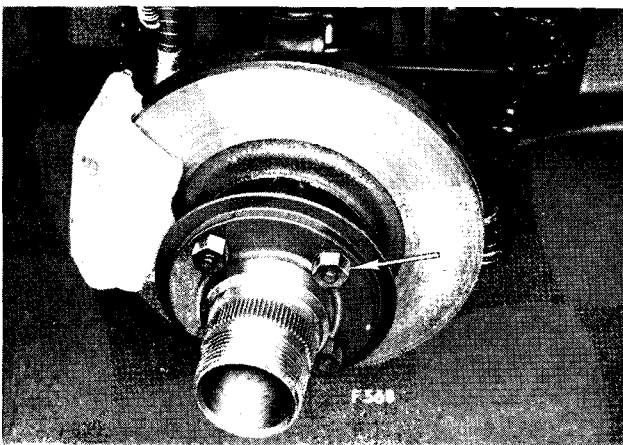


Fig. 5. Wire wheel adaptor nuts

Valve

Whenever a new tubeless tyre is fitted it is essential to fit a new Schrader snap-in valve, part number 414—Rim Hole Dia. .453 (11.41 mm.) as shown on Fig. 3. Before fitting, the valve should be lubricated with a soap solution. The lever mounting tool, part number 992, is screwed on to the valve thread, as shown in Fig. 3, and the notched handle locates on the wheel rim to provide leverage and assistance in aligning the valve.

Wire Wheel Maintenance

When the wheels are built the spokes are tightened to a pre-determined torque loading as follows:—

Minimum average spoke torque	Outer rim spokes		Inner rim spokes	
	lb. in.	kg./cm.	lb. in.	kg./cm.
	60	69.7	30	34.8

A wheel should maintain this torque loading throughout its life and spoke tightening should be unnecessary. If, however, a wheel sustains damage, as for example, from curb impact, looseness of spokes may result.

If a wheel is used in this condition additional loading is imposed on other spokes in the assembly, with the result that these in turn will also become loose. This condition would permit the wheel to distort and result in increased tyre wear. It is, therefore, recommended that wheels be checked periodically and loose spokes tightened. This will necessitate removing the tyre and tube and filing the spoke ends flush with the retaining nipples.

Unless trained personnel and wheel equipment are available, such work should be entrusted to specialists.

To Refit—Wire Wheels

Before fitting a wheel, ensure that the following are undamaged, cleaned and coated with P.B.C. GREASE* provided in the tool kit:

- A. Adaptor taper and mating wheel hub taper.
- B. Splines.
- C. Wheel hub outer taper and large wheel nut taper.

Slide the wheel on to the adaptor and pushing against the wheel hub centre to maintain concentric location, simultaneously screw on the retaining nut by hand until the wheel is felt to seat on the adaptor taper.

*P.B.C. GREASE is obtainable from TRIUMPH dealers in 4½ oz. tubes under Part Number 153317.

RESTRAINING THE WHEEL WITH ONE HAND, CONTINUE TO TIGHTEN THE WHEEL WITH A SPANNER. GRIP TYRE AT DIAMETRICALLY OPPOSITE AREAS OF ITS CIRCUMFERENCE AND ATTEMPT TO ROCK THE WHEEL ON ITS ADAPTOR. IF FREE PLAY (OTHER THAN THAT DUE TO HUB BEARING CLEARANCE) IS APPARENT, RELEASE CENTRE LOCK NUT AND RE-TIGHTEN WHILST PUSHING WHEEL ON TO ADAPTOR.

Lower the wheel to the ground and finally tighten (Fig. 8). Check that each wheel retaining nut tightens in the opposite direction to the wheel rotation. The foregoing instructions apply each time a wheel is removed and replaced.

IMPORTANT: Splined adaptor must be fitted to the correct side of the vehicle—left-hand threaded adaptors to the right-hand side and right-hand threaded adaptors to the left-hand side (as viewed from the driver's seat).

Tyre Care

Check at frequent intervals that the tyre pressures are correct.

Ensure that the tyres are cold when checking the pressures. Never bleed air out of a warm tyre in order to achieve the recommended pressure, since when the tyre cools it will be under-inflated.

If oil or grease have been in contact with a tyre wipe the affected area with a cloth lightly moistened with petrol or trichlorethylene. Remove any flints or road debris from the tyre thread as soon as possible as these tend to accelerate tyre wear.

Puncture Repair

The use of the 'plug' tyre repair should be reserved for emergency only, the tyre should then be repaired and vulcanised as soon as possible to effect a permanent repair.

Adjust tyre pressures in accordance with the recommendations given on page 0.104. These pressures are satisfactory for sustained speeds up to 110 m.p.h. (175 k.m.h.).

NOTE: Should the vehicle be tuned to increase its maximum speed, or be used for racing, consult the respective tyre company regarding the need for tyres of full racing construction.

Wheel Alignment

For correct front and rear wheel alignment, refer to Group O page 0.104. Excessive misalignment caused by kerb impact or other accidental damage will result in severe tyre wear and faulty steering (see Tyre Wear).

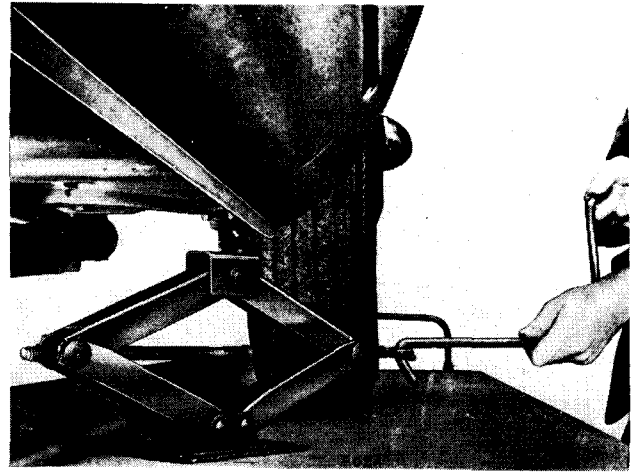


Fig. 6. Locating wheel jack under sill

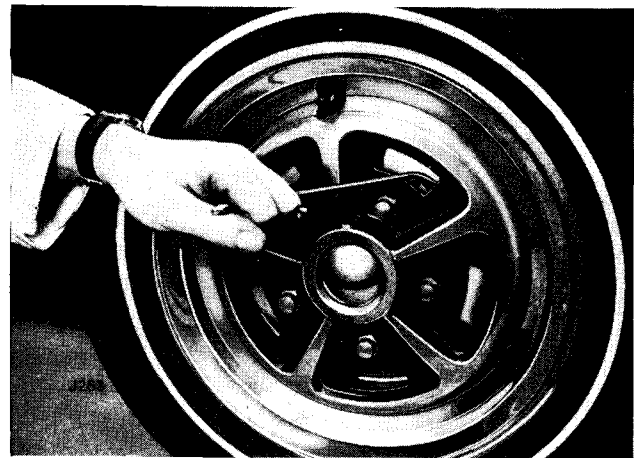


Fig. 7. Removing wheel trim

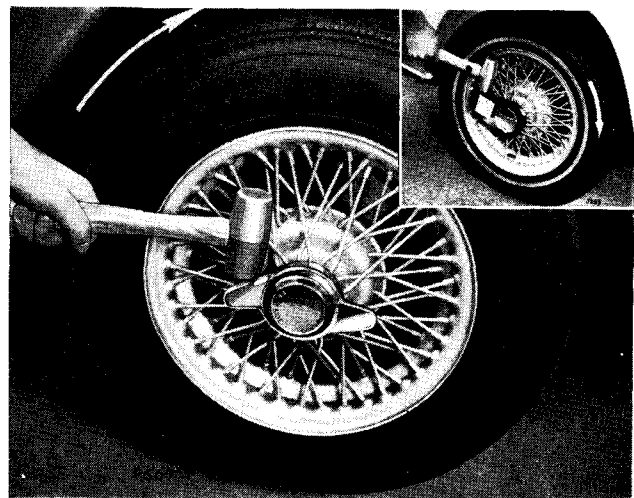


Fig. 8. Tightening hub nuts

FACTORS AFFECTING TYRE LIFE

Inflation Pressures

There is an average loss of 13% tread mileage for every 10% reduction in inflation pressure below the recommended figure.

Severe and persistent under-inflation produces unmistakable evidence on the tread (Fig. 9). It also causes structural failure due to excessive friction and temperature within the casing.

Pressures higher than those recommended reduce tread life by concentrating the load on a small tread area. Excessive pressures overstrain the casing cords, cause rapid wear, and make the tyres more susceptible to impact fractures and cuts (see Fig. 10).

Effect of Temperature

Air expands with heating and tyre pressures increase as the tyres warm up. Pressures increase more in hot weather than in cold weather and as a result of high speed.

Pressure in warm tyres should not be reduced to standard pressure for cold tyres. "Bleeding" the tyres increase their deflections and causes their temperatures to climb still higher, the tyres will also be under-inflated when they have cooled.

The rate of tread wear may be twice as fast at 50 m.p.h. (80 k.p.h.) as at 30 m.p.h. (50 k.p.h.).

High speed causes increased temperatures due to more deflections per minute and a faster rate of deflection and recovery. The resistance of the tread to abrasion decreases with increased tyre temperature.

Tyre Wear

The characteristics of tyres vary considerably and, therefore when new tyres are fitted, all four tyres must be of the same type and rating. Refer to page 0-104 for size and type.

Occasionally remove flints and other road matter from the treads and examine the tyres for sharp fins, flats and other irregularities. An upstanding sharp fin on the edge of each pattern rib is a sure sign of road wheel misalignment (Fig. 11).

Fins on the inside of the pattern ribs indicate toe-in. Fins on the outside edges indicate toe-out. Sharp pattern edges may also be caused by road camber, even when wheel alignment is correct. In such cases, it is better to make sure by having the track checked with an alignment gauge.

Fig. 9.
Tyre wear resulting from under-inflation

Under-inflation causes fast wear, excessive heating, and can bring about tyre failure through blow-out.



Fig. 10.
Tyre wear resulting from over-inflation

This causes the fabric to be easily damaged, and seriously shortens tyre life by rapidly wearing the centre of the tread.



Fig. 11.
Tyre wear resulting from wheel misalignment

This is apparent by the sharp fins which appear on the edge of each pattern rib.



TRIUMPH

GT6 and VITESSE 2-litre

WORKSHOP MANUAL

GROUP 4

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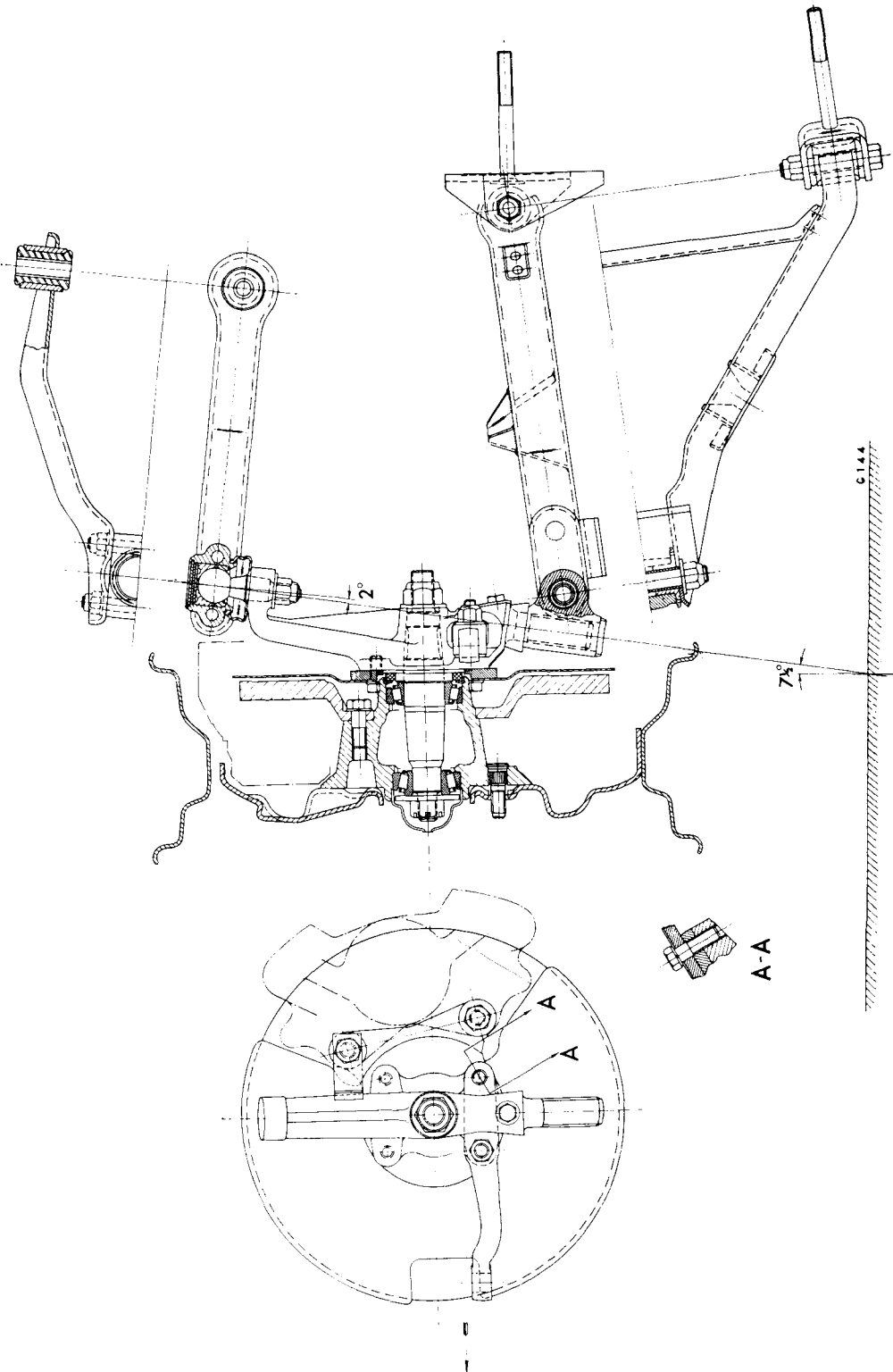


Fig. 1. Arrangement of R.H. front suspension

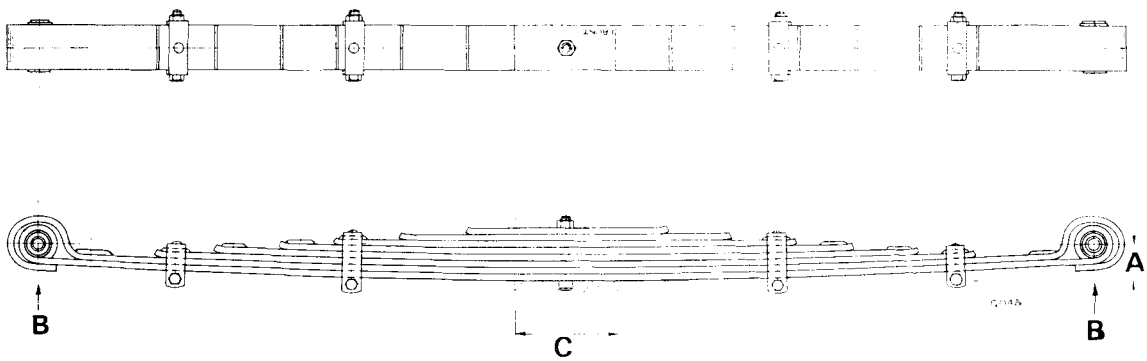


Fig. 2. Rear transverse leaf road spring

REAR ROAD SPRING DATA

GT6 Mk. 1 and Vitesse 2-litre (refer to page 4.118 for Mk. 2 and GT6 Mk. 3 conditions)

	Vitesse Saloon from		
	Comm. No.	Vitesse Saloon up to	
	HC.1420.DL.	Comm. No.	
	and Convertible	HC.1419.DL.	
	GT6 Mk. 1		
Part Number	307324	305945	303727
Number of blades	8	11	11
Blade thickness	0.25" (6.35 mm.)	0.219" (5.56 mm.)	0.219" (5.56 mm.)
Test camber 'A'	2.38" ± 0.13"	1.94" ± 0.13"	1.54" ± 0.13"
under	(60.4 ± 3.3 mm.)	(49.3 ± 3.3 mm.)	(39.1 ± 3.3 mm.)
*Test load 'B'	1238 lb. (561 kg.)	1420 lb. (644 kg.)	1420 lb. (644 kg.)

*Clamp spring over dimension 'C' (4"—100 mm.) and apply test load at spring eye centres.

FRONT ROAD SPRING DATA

	GT6 Range	Vitesse Range
Part number	212425	209009
Wire diameter	0.45 ± 0.002" (11.43 ± 0.05 mm.)	0.47 ± 0.002" (11.94 ± 0.05 mm.)
Mean coil diameter	3.13 ± 0.020" (79.5 ± 0.5 mm.)	3.13 ± 0.020" (79.5 ± 0.5 mm.)
Number of working coils	9½	10
Free length	12.46" (316.5 mm.)	12.49" (317.3 mm.)
Fitted length (test length)	8.06 ± 0.09" (204.7 ± 2.3 mm.)	8.18 ± .09" (207.75 ± 2.3 mm.)
Fitted load (test load)	880 lb. (399.2 kg.)	940 lb. (426.5 kg.)

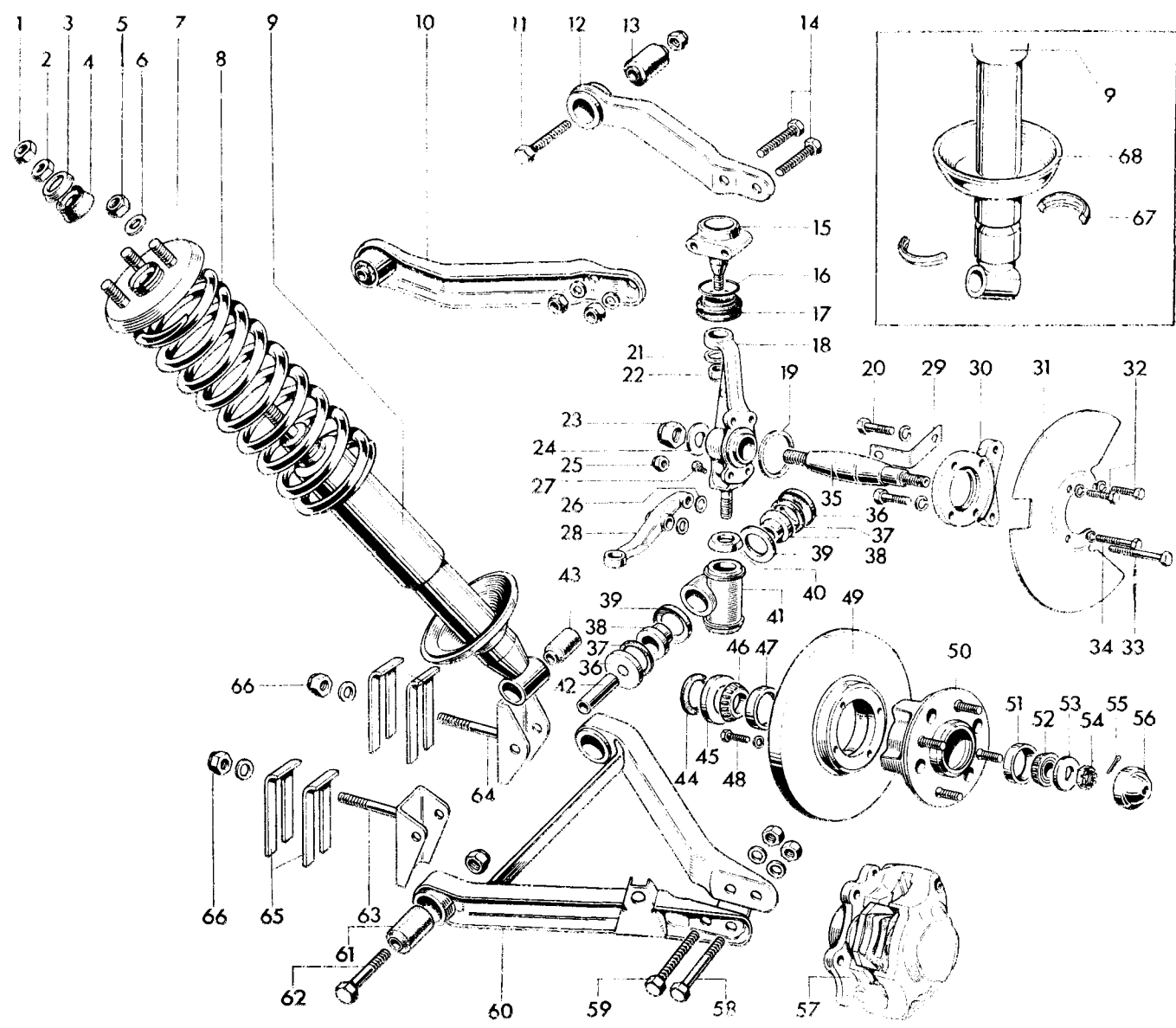


Fig. 3. Exploded view of I. H. front suspension (Inset, Woodhead-Monroe type)

Key to Fig. 3

1 Nut	18 Vertical link	35 Stub axle	52 Inner race
2 Nut	19 Rubber seal	36 Dust seal	53 Washer
3 Washer	20 Bolt	37 Rubber ring	54 Nut
4 Mounting rubber	21 Washer	38 Nylon bush	55 Split pin
5 Nut	22 Nut	39 Dust seal	56 Grease cap
6 Washer	23 Nut	40 Rubber seal	57 Brake caliper
7 Upper spring pan	24 Washer	41 Trunnion	58 Trunnion bolt
8 Road spring	25 Nut	42 Bush	59 Damper bolt
9 Damper	26 Spacer	43 Fulcrum bush	60 Lower wishbone
10 Top wishbone arm	27 Plug	44 Felt seal	61 Fulcrum bush
11 Fulcrum bolt	28 Steering arm	45 Seal holder	62 Bolt
12 Top wishbone arm	29 Bracket	46 Inner race	63 Front fulcrum bracket
13 Fulcrum bush	30 Caliper bracket	47 Outer track	64 Rear fulcrum bracket
14 Bolt	31 Dust shield	48 Bolt	65 Shim
15 Ball-joint	32 Bolt	49 Brake disc	66 Nut
16 Retainer	33 Bolt	50 Hub	67 Collet
17 Rubber seal	34 Bolt	51 Outer track	68 Lower spring pan

SUSPENSION AND STEERING DATA

Maximum back lock	50° 30'	} GT6 and Vitesse Range
Maximum front lock	48'	
20° front lock gives	20° back lock	

NOTE: Maximum permissible differential on castor and camber between right and left side is 1°.

Vehicle Type	FRONT				REAR	
	Camber	Castor	KPI	Wheel Alignment	Camber	Wheel Alignment
Vitesse 2-litre Saloon up to Commission No. HC1419DL	$3\frac{1}{4}^{\circ} \pm 1^{\circ}$ positive	$3\frac{1}{2}^{\circ} \pm 1^{\circ}$ positive	$5\frac{1}{2}^{\circ} \pm 1^{\circ}$ positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in	$5^{\circ} \pm 1^{\circ}$ positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-out
Vitesse 2-litre Saloon from Commission No. HC1420DL and Convertible	$3\frac{1}{4}^{\circ} \pm 1^{\circ}$ positive	$3\frac{1}{2}^{\circ} \pm 1^{\circ}$ positive	$5\frac{1}{2}^{\circ} \pm 1^{\circ}$ positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in	$3^{\circ} \pm 1^{\circ}$ positive	$0^{\circ} - \frac{1}{16}''$ (0—1.5 mm.) toe-out
GT6 Mk. 1	$3\frac{1}{2}^{\circ} \pm 1^{\circ}$ positive	$3\frac{1}{2}^{\circ} \pm 1^{\circ}$ positive	$6^{\circ} \pm 1^{\circ}$ positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in	$0^{\circ} \pm 1^{\circ}$	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-out

Table 1. Steering Data for Unladen Vehicle (refer to page 4.119 for Mk. 2 and GT6 Mk. 3 conditions)

Vehicle Type	FRONT				REAR	
	Camber	Castor	KPI	Wheel Alignment	Camber	Wheel Alignment
Saloon up to Commission No. HC1419DL 4 up	$2^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$4\frac{1}{2}^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$6\frac{3}{4}^{\circ} \pm \frac{3}{4}^{\circ}$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in	$2^{\circ} \pm \frac{1}{2}^{\circ}$ negative	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in
Saloon from Commission No. HC1420DL 4 up	$2^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$4\frac{1}{2}^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$6\frac{3}{4}^{\circ} \pm \frac{3}{4}^{\circ}$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in	$3\frac{1}{2}^{\circ} \pm \frac{1}{2}^{\circ}$ negative	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in
Convertible 2 up	$2^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$3\frac{1}{2}^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$6\frac{3}{4}^{\circ} \pm \frac{3}{4}^{\circ}$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in	$\frac{3}{4}^{\circ} \pm \frac{1}{2}^{\circ}$ negative	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in
GT6 Mk. 1 up	$2^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$4^{\circ} \pm \frac{1}{2}^{\circ}$ positive	$6\frac{3}{4}^{\circ} \pm \frac{3}{4}^{\circ}$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in	$2\frac{1}{2}^{\circ} \pm \frac{1}{2}^{\circ}$ negative	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in

Table 2. Steering Data for Static Laden Vehicle (refer to page 4.119 for Mk. 2 and GT6 Mk. 3 condition)

FRONT SUSPENSION

General Instructions

Before commencing work on the front suspension, **ensure that the handbrake is firmly applied**. Raise the front of the vehicle, place stands under the chassis, open the bonnet and remove the road wheel.

Examine all threads before re-assembling components and renew any nuts, bolts or studs with damaged threads. Renew any worn Nyloc nuts.

Refer to the nut-tightening torques specified in Group 0 when refitting components.

FRONT HUBS

To Remove

1. Remove two bolts (20) (Fig. 4) and the brake caliper (57). Suspend the caliper from the top wishbone to avoid straining the flexible brake hose and place a wedge between the brake pads to retain the pistons.
2. Extract the grease cap (56) by screwing a No. 10 U.N.F. bolt into the centre of the cap.
3. Remove the split-pin (55), the nut (54) and the washer (53).
4. Pull off the hub and brake disc assembly; avoid damaging the felt seal (44).

Dismantling

1. Drift out the seal holder (45) and the bearing tracks (47, 51).
2. Carefully clean the bearings, stub axle and seal track.
3. Examine the bearings and renew if worn.

To Refit

1. Fit the bearing outer tracks (47, 51) to the hub (50) with the tapered faces outwards.
2. Fit the inner races (46, 52) and the hub assembly on to the stub axle (35).
3. Fit the washer (53) and the nut (54).
4. Tighten the nut to give an end-float of 0.003"–0.005" (0.08–0.13 mm.).
5. Mark the nut and washer so that the nut can be replaced in the same position.
6. Remove the nut, washer and hub assembly.
7. Thoroughly grease the bearings (see Recommended Lubricants, Group 0), and fit the inner race (46) to the hub.
8. Fit the seal holder (45) and a new felt seal (44) to the hub. Soak the seal in oil before fitting.
9. Push the hub on to the stub axle and fit the outer race (52), washer (53) and nut (54). Tighten the nut to its marked position and then slacken it just sufficiently to fit a new split-pin (55).
10. Refit the grease retaining cap (56) and the brake caliper.

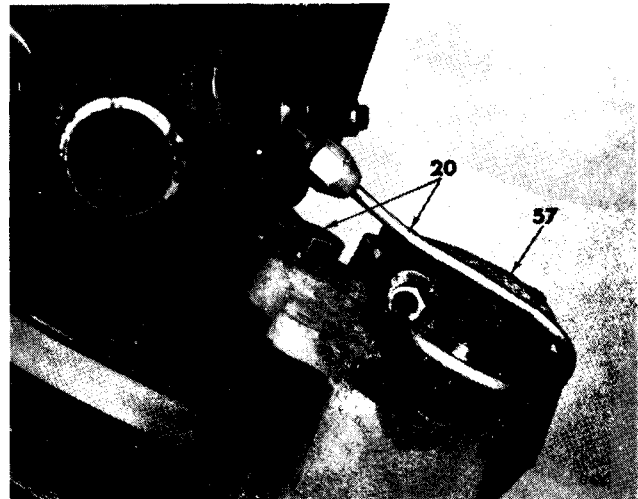


Fig. 4. Caliper attachment

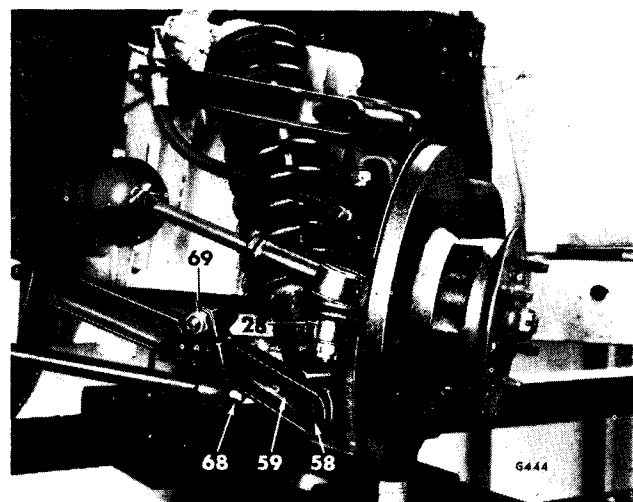


Fig. 5. Steering arm attachment

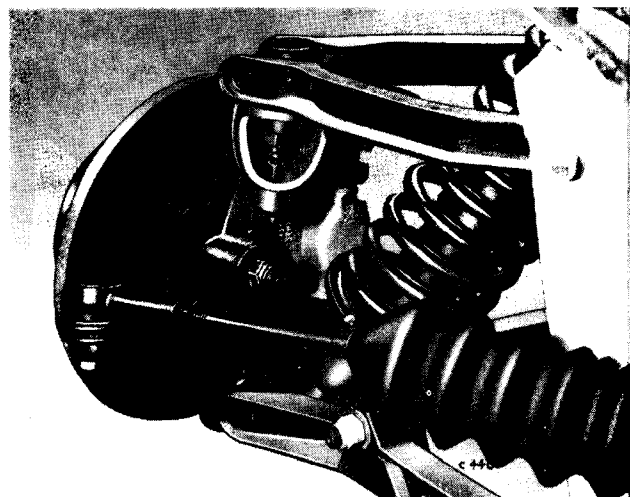


Fig. 6. Separating top ball-joint

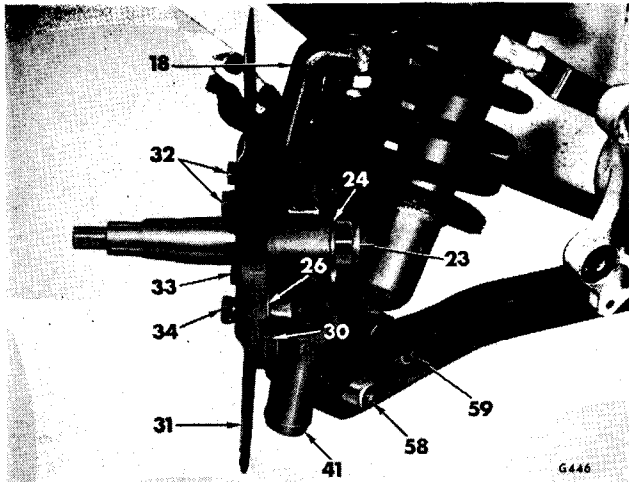


Fig. 7. Bottom trunnion attachment

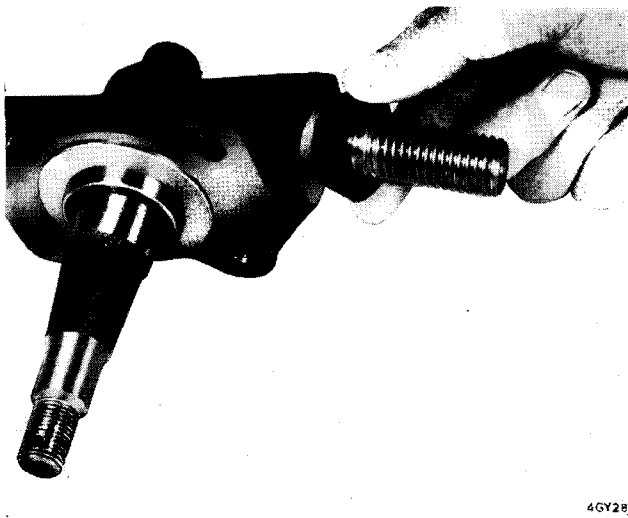


Fig. 8. Bottom trunnion seal

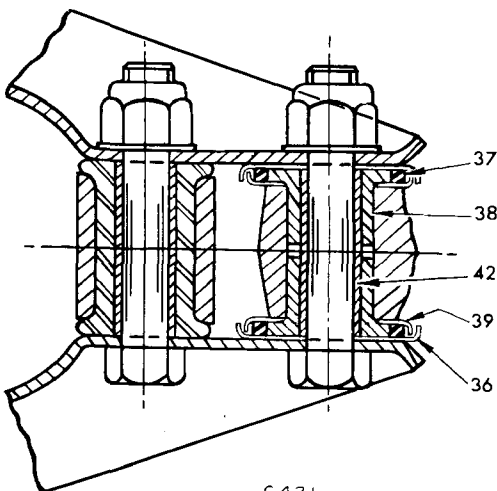


Fig. 9. Trunnion bushes and seals

TOP BALL-JOINT

To Remove

1. Remove the Nyloc nut (22) and washer (21).
2. Use the ball-joint separator S.160 (Fig. 6) to remove the ball-joint (15) from the vertical link (18).

3. Remove two bolts (14).

NOTE: When the top ball-joint is removed, the hub assembly is free to tip outwards and must be steadied to prevent damage.

To Refit

1. Ensure that the coned faces of the ball-joint and vertical link are perfectly clean.
2. Loosely attach the ball-joint to the top wishbone arms (10, 12) by the bolts (14).
3. Fit the ball-joint into the vertical link and fully tighten it using a plain nut and washer.
4. Replace the plain nut by a Nyloc nut (22).
5. Fully tighten the bolts (14).

BOTTOM TRUNNION

To Remove (Fig. 7)

1. Remove the hub.
2. Remove four bolts (32, 33, 34), spacers (26) (if fitted), dust shield (31), caliper bracket (30) and rubber ring seal (19).
3. Slacken the damper bolt (59) a few turns.
4. Remove the trunnion bolt (58), pull the vertical link (18) out of the bottom wishbone and unscrew the trunnion (41) from the vertical link.
5. Remove the rubber seal (40).
6. Remove the bush assembly from the trunnion.
7. Examine all dismantled items and renew those which are unserviceable.

To Refit

1. Refit the bush assembly to the trunnion (Fig. 9) liberally smearing the bushes with grease.
2. Fit a new seal (40) to the vertical link (Fig. 8).
3. Screw the trunnion on to the vertical link as far as possible and then unscrew it to its first working position. This will allow the trunnion to turn at least 60° to either side of the straight ahead position without binding.

NOTE: The R.H. vertical link has a R.H. thread and the L.H. vertical link has a L.H. thread. The base of the R.H. trunnion has a reduced diameter.

4. Push the trunnion back into the bottom wishbone and fit the bolt (58).
5. With the vehicle in the static laden condition, fully tighten the bolts (58, 59).

VERTICAL LINK

To Remove (Fig. 7)

1. Remove the hub.
2. Remove four bolts (32, 33, 34), spacers (26) (if fitted), dust shield (31), caliper bracket (30) and rubber ring seal (19). Pull out the steering arm (28).
3. Remove the Nyloc nut (22) and detach the top ball-joint from the vertical link (Fig. 6).
4. Unscrew the vertical link from the trunnion and remove the seal (40).
5. Check the dimensions of the vertical link against those given on page 4-116.

To Refit

Reverse the above procedure. Screw the vertical link into the trunnion as far as possible and then unscrew it to its first working position.

STUB AXLE

To Remove (Fig. 7)

1. Remove the vertical link.
2. Remove the nut (23) and washer (24).
3. Press out the stub axle.

To Refit

Reverse the above procedure.

ROAD SPRING ASSEMBLY

To Remove

1. Slacken the trunnion bolt (58) a few turns.
2. Remove the damper bolt (59).
3. Remove three nuts (5) (Fig. 10).
4. Remove the damper assembly (Fig. 11).

To Refit

1. Fit the spring assembly to the vehicle and refit the nuts (5) and washers (6).
2. Replace the damper bolt (59).
3. With the vehicle, in the static laden condition, tighten the damper bolts (59) and trunnion bolt (58).

To Dismantle

1. Remove the road spring assembly.
2. Using a press (Fig. 12) compress as many coils of the road spring as possible to relieve the load on the damper top nuts.
3. Remove the nuts (1, 2), washer (3) and rubber (4).
4. Carefully release the load on the road spring and withdraw the assembly from the press.
5. Withdraw the damper (9) from the upper spring pan (7) and road spring (8).
6. On Woodhead-Monroe dampers, remove the lower spring pan (68) and the collets (67).

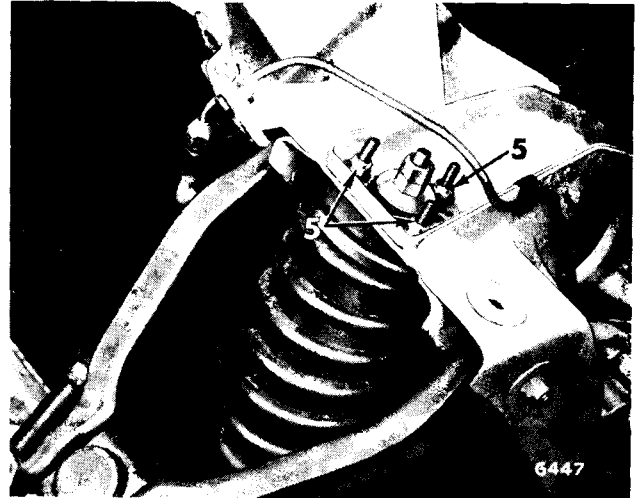


Fig. 10. Road spring attachment

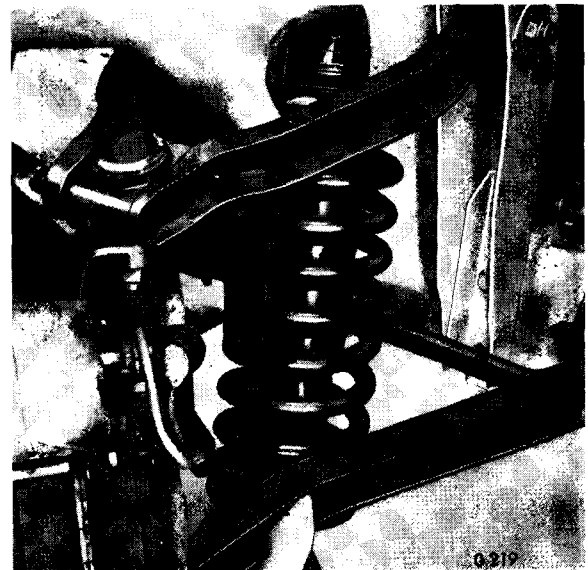


Fig. 11. Damper assembly removal

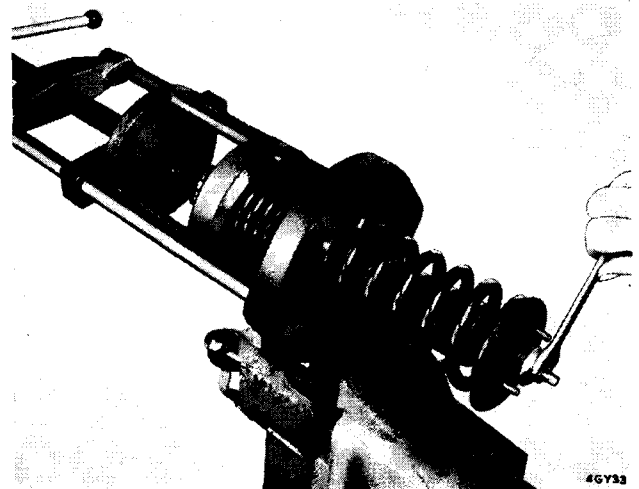


Fig. 12. Road spring dismantling

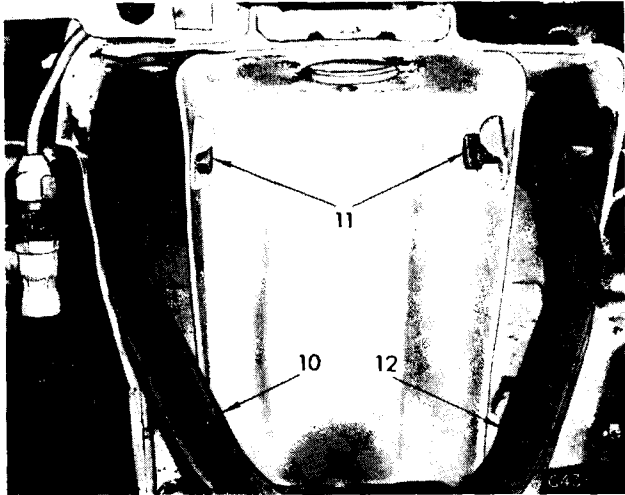


Fig. 13. Top wishbone attachment

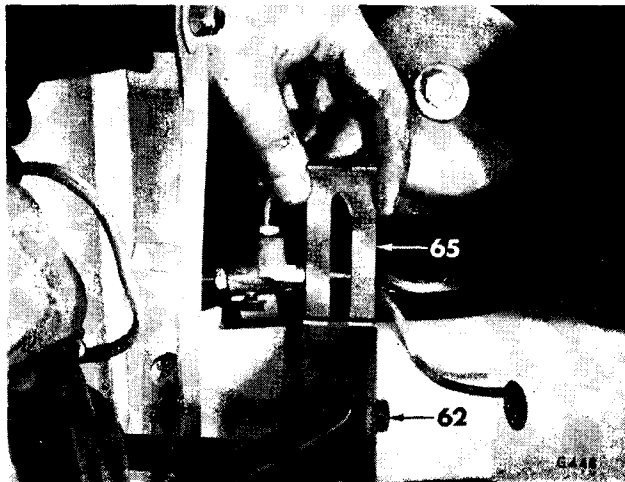


Fig. 14. Suspension shims

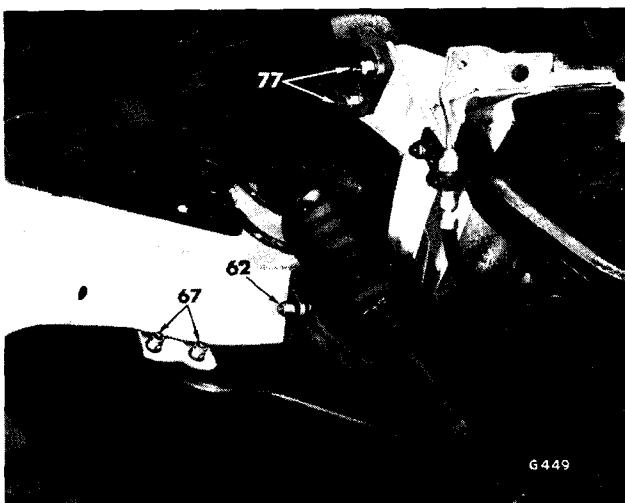


Fig. 15. Anti-roll bar attachment

Testing the Dampers

The servicing of a spring damper is not generally practicable. The damper should be renewed if any of the following defects are apparent:—

- damaged or dented body;
- bent piston rod;
- loosened mounting;
- fluid leakage.

If none of these defects is apparent, **hold the unit vertically** and perform the following manual operations:—

Slowly extend and compress the damper approximately 10 times, moving it to the limit of its stroke in both directions. **There should be appreciable and constant resistance in both directions.**

Reject damper units having the following defects:—

- none or only slight resistance in one or both directions;
- excessive resistance; cannot be operated manually;
- pocket of no resistance when reversing direction.

Comparative performance can be assessed against the action of a new damper after taking care to expel air, but allowance must be made for greater resistance in the new unit due to the slightly increased friction between the piston rod and its oil seal.

UPPER WISHBONE ARMS

To Remove

1. Remove the road spring assembly.
2. Remove two bolts (14) (Fig. 3) and prevent the hub assembly from tipping outwards.
3. Remove two fulcrum bolts (11) (Fig. 13).
4. Check the arms against the dimensions given on page 4-115.
5. Renew the rubber fulcrum bushes (13) if necessary.

To Refit

Reverse the above procedure. Tighten the fulcrum bolts (11) with the vehicle in the static laden condition.

LOWER WISHBONE

To Remove

1. Disconnect the anti-roll bar, nut (69) (Fig. 19).
2. Remove the damper bolt (59) and trunion bolt (58).
3. Remove two nuts (66), note quantity and position of shims.
4. Withdraw the lower wishbone assembly.
5. Remove two fulcrum bolts (62) (Fig. 14).
6. Check the wishbone against the dimensions given on page 4-115.
7. Renew the rubber fulcrum bushes (61) if necessary.

To Refit

Reverse the above procedure. Tighten the fulcrum bolts (62) with the vehicle in the static laden condition.

SUSPENSION SUB-ASSEMBLY

To Remove

1. Remove the engine bay valance.
2. Detach the brake pipe union (1) (Fig. 16), and plug the end to avoid loss of fluid.
3. Remove two nuts (66) from the lower fulcrum brackets. Note the quantity and position of shims behind the brackets.
4. Disconnect the anti-roll bar.
5. Remove the inner sub-frame bolt (1) (Fig. 18) and packing piece if fitted.
6. Support the engine and disconnect the engine mounting bracket.
7. If the driver's side suspension is being removed, disconnect and withdraw the steering column, Section 2, Group 4.
8. Remove the nut and disconnect the steering tie-rod from the steering arm (28).
9. On the L.H. suspension, support the bonnet and disconnect the bonnet stay.
10. Remove four bolts (1) (Fig. 17), spring and plain washers and tapping plates.
11. Remove the suspension sub-assembly from the chassis.

To Refit

Reverse the above procedure, taking care to replace the shims (65) (Fig. 14) in their original positions.

Bleed the brake hydraulic system and check the suspension geometry.

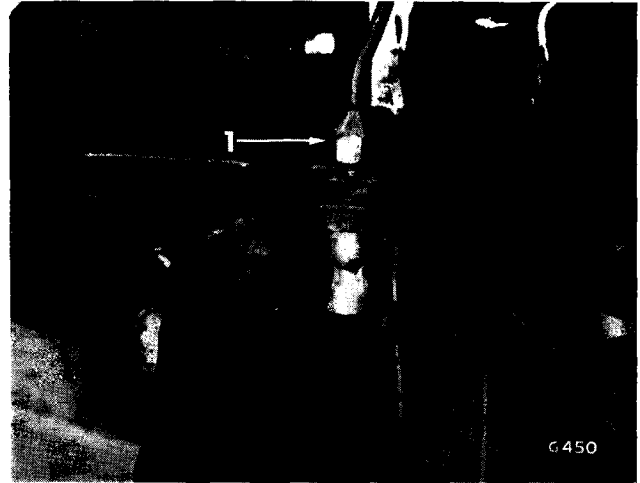


Fig. 16. Brake pipe union

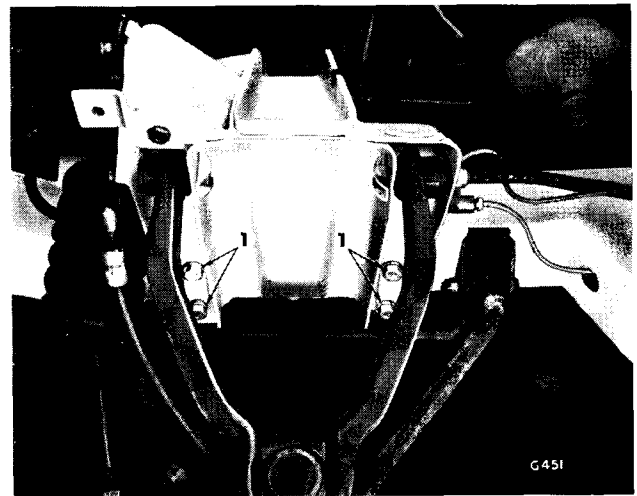


Fig. 17. Sub-frame attachment

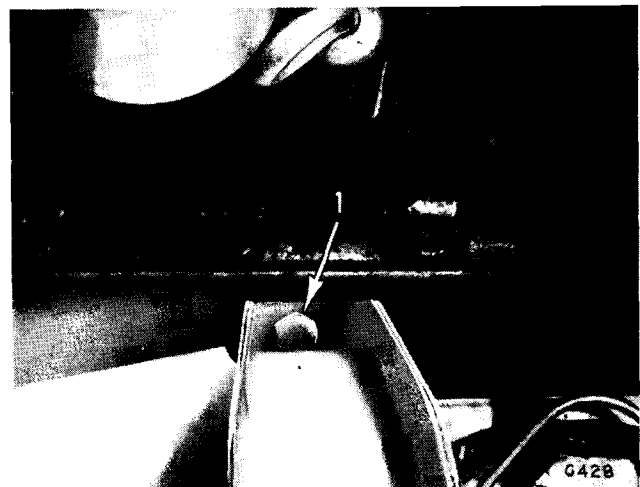
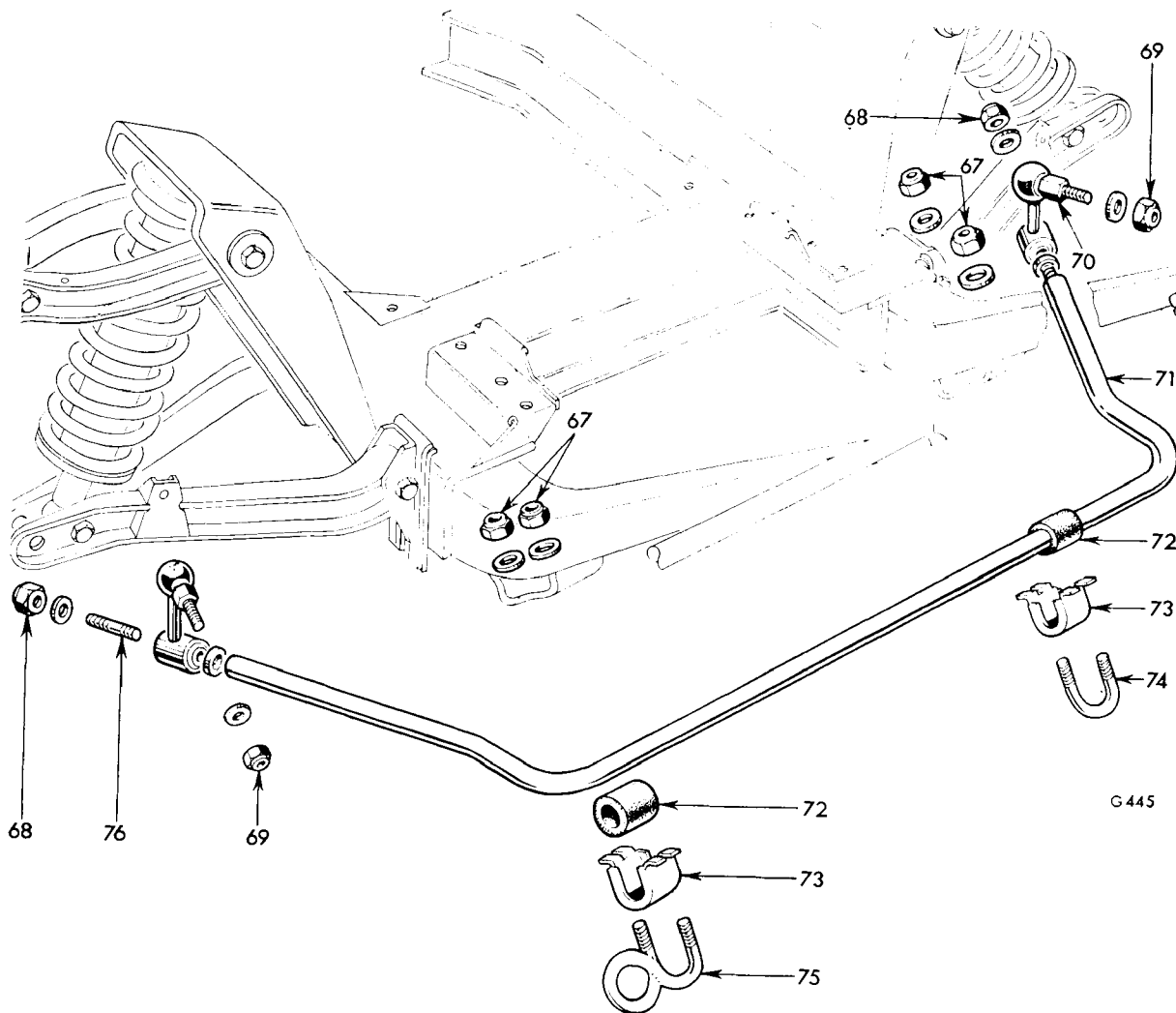


Fig. 18. Sub-frame inner attachment bolt



G 445

67 Nut	72 Rubber bush
68 Nut	73 Clamp
69 Nut	74 "U" bolt
70 Link	75 "U" bolt (Export models)
71 Anti-roll bar	76 Stud

Fig. 19. Anti-roll bar details

ANTI-ROLL BAR**To Remove**

1. Remove the nyloc nuts (69) and plain washers.
2. Remove the nyloc nuts (67), plain washers, clamps (73) and "U" bolts (74) and withdraw anti-roll bar (71). If necessary remove the nuts (68), washers and detach links (70) from anti-roll bar (71).

To Refit

1. Fit the clamps over the rubber bushes (72) on the anti-roll bar (71) and attach to the chassis crossmember with "U" bolts (74), plain washers and nyloc nuts (67).
2. Assemble the links (70) to the anti-roll bar (71) with washers and nuts (68).
3. Engage the links in the lower wishbone bracket and fit the nyloc nuts (69) and plain washers.
4. Tighten all nuts whilst the vehicle is static-laden.

REAR SUSPENSION

Before carrying out any work on the rear suspension, jack up the rear of the vehicle and support it on chassis stands. Remove the road wheels.

REAR ROAD SPRING

To Remove

1. Disconnect each brake hose from its steel pipe and chassis bracket by unscrewing the union nut (56), Fig. 20, and removing the nut (58) whilst holding the flexible pipe (57).
2. Disconnect the handbrake cable (64) from the backplate lever by withdrawing the clevis pin (61). Disconnect the spring (63), Fig. 21.
3. Jack up the vertical link (10), as shown on Fig. 22, to relieve the dampers of load. Remove nuts (47), bolts (43), Fig. 24, and disconnect the axle shaft couplings.
4. Slacken the damper upper attachment bolt (44), Fig. 20, remove the nyloc nut (13) and washer (14) from the lower attachment and pull the damper (9) clear of its lower fulcrum. Remove the jack from the vertical link.
5. Supporting the vertical link (10), remove the bolt (46) from the road spring eye as shown on Fig. 25.
6. Take out the luggage floor (GT6) or rear seat assembly (Vitesse) and remove the spring access cover.
7. Remove the six nyloc nuts (4) (4 nuts on GT6 Mk. 3), plain washers (5), detach the spring clamp plate (3) and unscrew the rear studs (42) from the axle casing (Fig. 26).
8. Withdraw the road spring from the vehicle (Fig. 27).

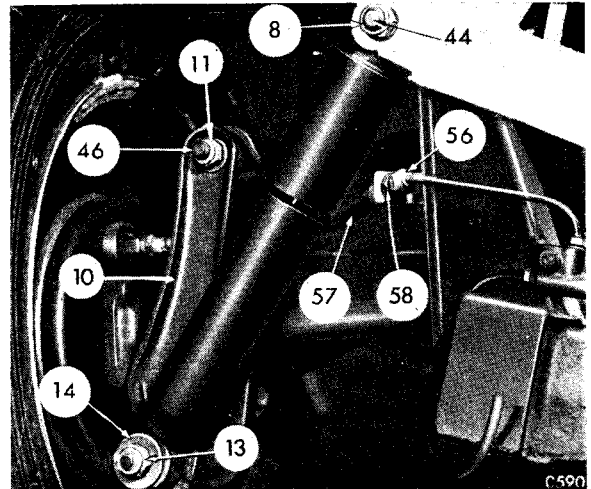


Fig. 20. Vertical link, brake pipe and damper attachments

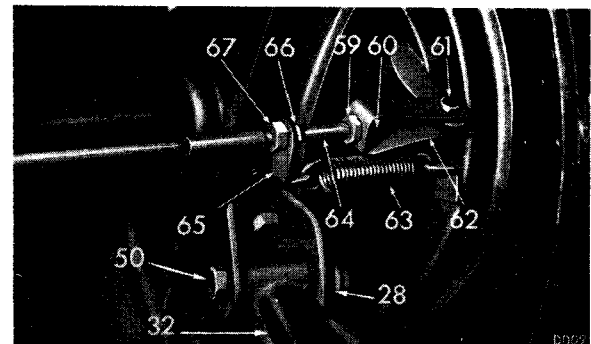


Fig. 21. Handbrake connections

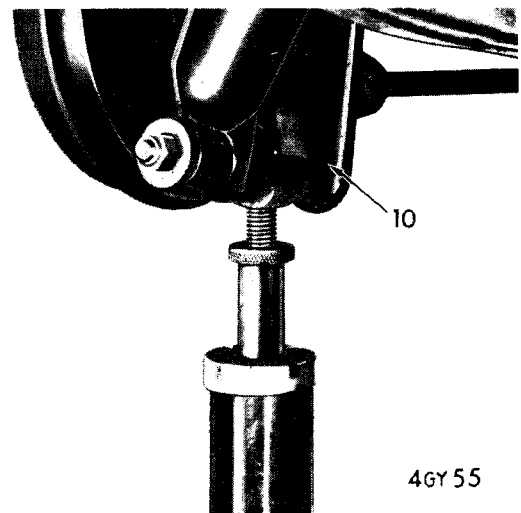
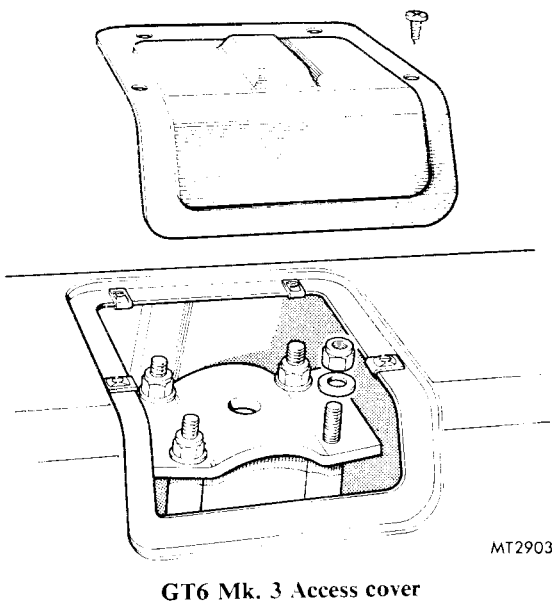
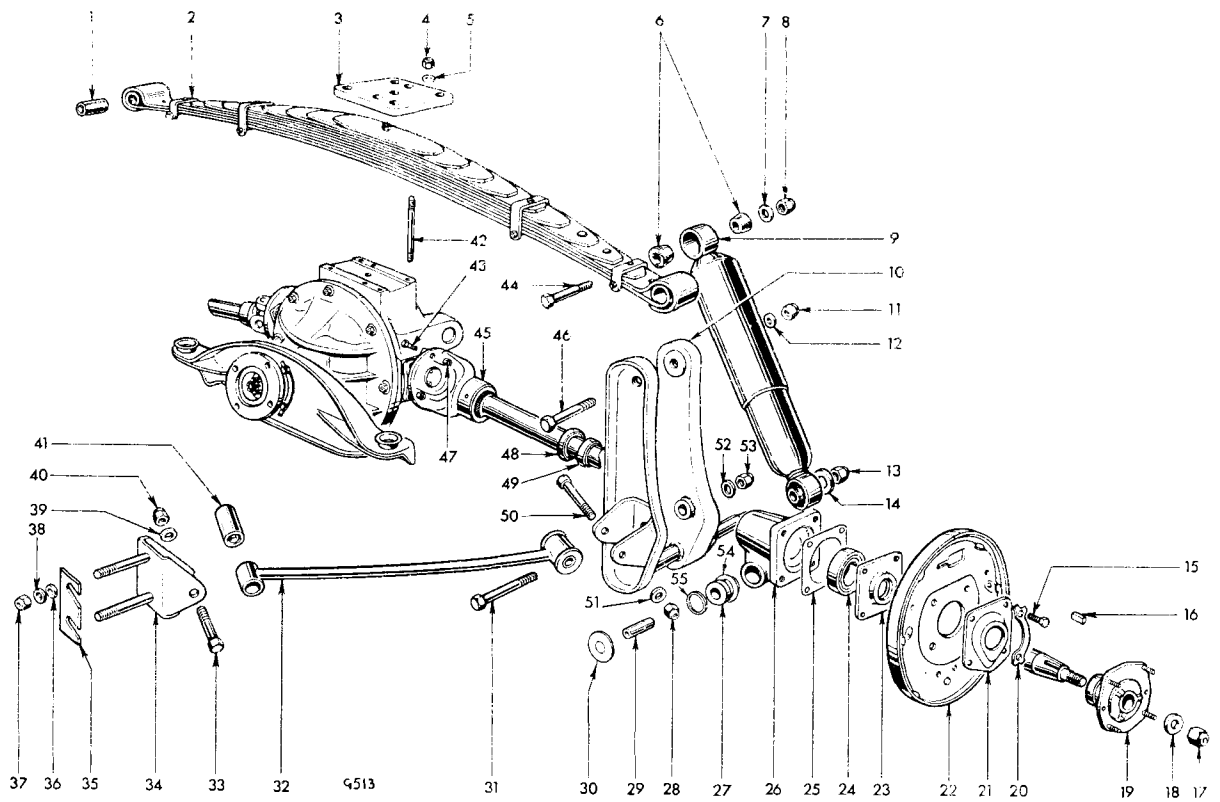


Fig. 22. Jacking up vertical link



- | | | |
|----------------------|-----------------------|------------------------|
| 1 Spring eye bush | 20 Locktab | 39 Washer |
| 2 Road spring | 21 Grease retainer | 40 Nut |
| 3 Spring clamp plate | 22 Brake backplate | 41 Rubber bush |
| 4 Nut | 23 Seal housing | 42 Stud |
| 5 Washer | 24 Bearing | 43 Bolt |
| 6 Rubber bush | 25 Gasket | 44 Bolt |
| 7 Washer | 26 Trunnion housing | 45 Axle shaft coupling |
| 8 Nut | 27 Nylon bush | 46 Bolt |
| 9 Damper | 28 Nut | 47 Nut |
| 10 Vertical link | 29 Steel bush | 48 Flinger |
| 11 Nut | 30 Dust seal | 49 Seal |
| 12 Washer | 31 Bolt | 50 Bolt |
| 13 Nut | 32 Radius arm | 51 Washer |
| 14 Washer | 33 Bolt | 52 Washer |
| 15 Bolt | 34 Radius arm bracket | 53 Nut |
| 16 Key | 35 Shim | 54 Dust seal |
| 17 Nut | 36 Washer | 55 Rubber ring |
| 18 Washer | 37 Nut | |
| 19 Hub | 38 Washer | |

Fig. 23. Exploded view of rear suspension

SUSPENSION

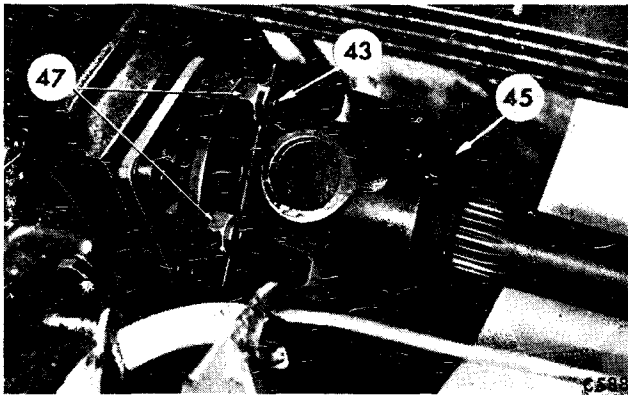


Fig. 24. Axle shaft universal joint connections

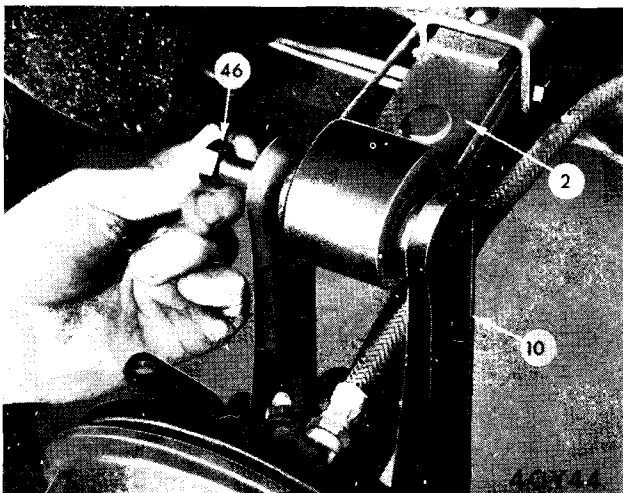


Fig. 25. Removing spring eye bolt

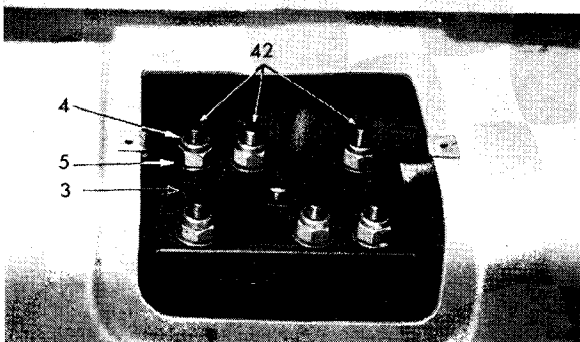


Fig. 26. Spring clamp plate attachments

To Refit

1. Fit the road spring into its recess in the axle casing with the centre bolt spigoting in its locating hole. The spring is marked "FRONT" for correct location.
2. Refit the three studs (42) with the shorter threaded portion leading, into the axle casing. Refit the spring clamp plate (3) and tighten the nyloc nuts (4).
3. Apply "Prestik" sealer to the edge of the access plate, refit the plate, securing with two screws, and liberally apply "Seelastik" to the joint.
4. Attach the vertical links (10) to the spring eyes using bolts (46), washers (12) and nyloc nut (11). Do not tighten the nut (11) at this stage.
5. Jack up the vertical links (10), fit the dampers and reconnect the axle shaft couplings.
6. Connect the handbrake cable to the back-plate lever, refit the pull-off spring (63), Fig. 21, and reconnect the flexible brake hose. Adjust and bleed the brakes.
7. Place a trolley jack under the differential casing, remove the chassis stands and, with the vertical links supported at their running height, load the car and lower its rear end until the axle shafts assume their static laden operating position. This is to allow the rubber bushes to assume their correct working position before tightening the nuts (11), (8) and (13).

DAMPERS

To Remove

1. Jack up the vertical link (10) to relieve the damper (9) of load, as shown on Fig. 29, remove the bolt (44) from the upper attachment and the nyloc nut (13) from the lower damper eye.
2. Pull the damper clear of its attachment points.

To Refit

Bleed air from the damper by holding it in a vertical position and operating the damper over its full stroke. Maintaining the unit in a vertical position, refit the damper by reversing the removal procedure, fitting new rubber bushes if necessary.

RADIUS ARMS

To Remove

Proceed as for removal of dampers, adjusting the jack beneath the vertical link (10) until the radius arm attachment bolts (33) and (50) can be easily withdrawn.

If the rubber bushes (41) are perished, worn or cut, use a press to remove them, and press in new bushes. If the radius arm chassis attachment brackets (34) are removed, ensure that on re-assembly the same number of shims (35) are refitted.

To Refit

Refit the radius arm (32), tighten the attachment bolts and nuts (50) and (28), (33) and (40), remove the jack from the vertical link.

Rear Wheel Alignment Mk. 1 and GT6 Mk. 3.

Check, and if necessary, adjust the rear wheel alignment. Removing an equal number of shims from both sides (35) Fig. 23 increases the rear wheel toe-in and the addition of shims decreases the rear wheel toe-in.

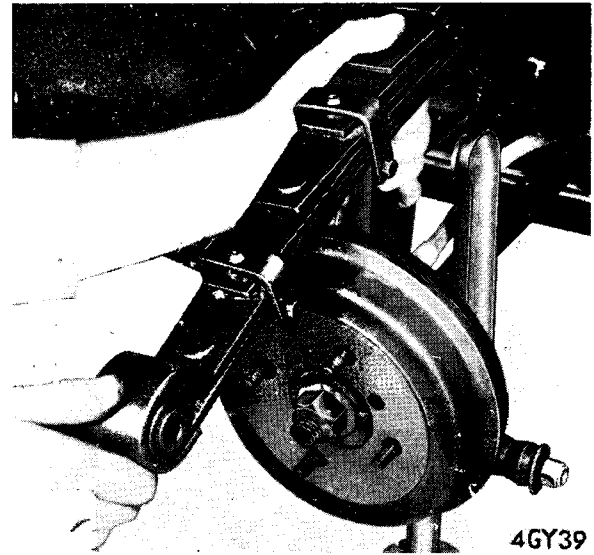


Fig. 27. Removing road spring

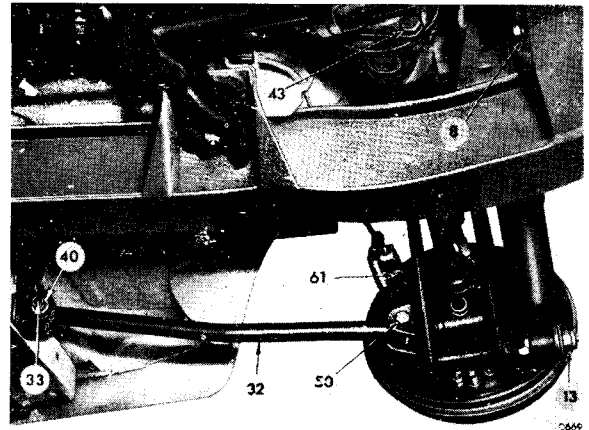


Fig. 28. Radius arm attachment

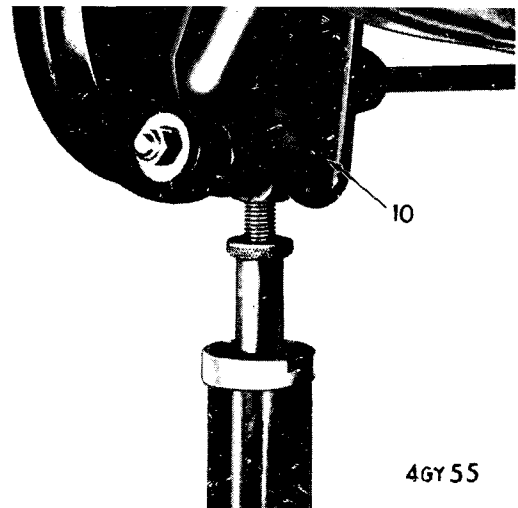


Fig. 29. Jacking vertical link

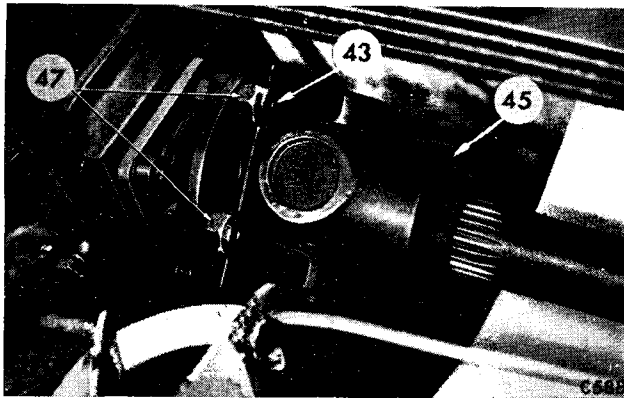


Fig. 30. Axle shaft universal joint connections

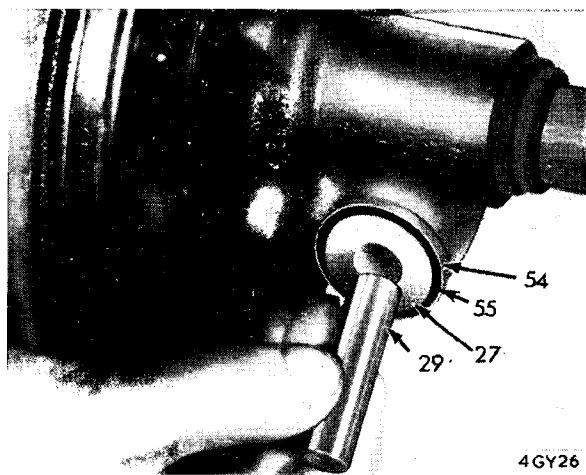


Fig. 31. Trunnion bush

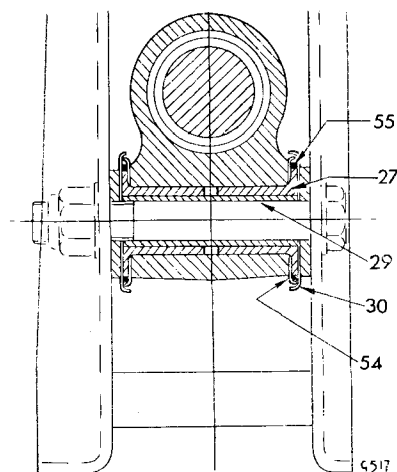


Fig. 32. Sectioned view of trunnion bushes

VERTICAL LINK ASSEMBLY

To Renew Trunnion Housing Bushes

1. Jack up under the vertical link to relieve the damper of load as shown on Fig. 29.
2. Disconnect:—
 - the brake hose (57) from its steel pipe and chassis bracket;
 - the handbrake cable (64) from the back-plate lever, and return spring (63) Fig. 21;
 - the axle shaft coupling Fig. 30;
 - the radius arm from the vertical link.
3. Remove the damper (9), lower and remove the jack.
4. Supporting the brake assembly, remove the bolt (46) from the road spring eye Fig. 25 and place the brake/axle shaft assembly on a clean bench.
5. Remove the bolt (31), Fig. 23, and withdraw the vertical link (10) from the trunnion housing (26). Remove the steel bush (29), Fig. 31.
6. Examine and if necessary replace the seals and bushes as Fig. 32.

NOTE: Sufficient grease (Shell, Retinax "A" or approved alternative) must be used during assembly of these bearings to ensure that the space around the bearings is full.
7. Fit the vertical link assembly (10) to the trunnion housing (26) and to the road spring eye bush (1). Do not, at this stage, fully tighten the spring eye bolt (46).
8. Jack up beneath the vertical link and fit the damper (9), radius arm (32) and the axle shaft coupling (45).
9. Place a trolley jack under the differential casing, remove the chassis stands and, with the vertical link supported at its running height, load the car and lower its rear end until the axle shaft assumes its static laden operating position. This is to allow the rubber bushes to assume their correct working position before tightening the nuts (11), (8), (13) and (28).
10. Connect the brake hose and handbrake cable. Adjust and bleed the brakes.

REFER TO FIG. 42B FOR GT6 Mk. 3 ASSEMBLY DETAILS.

ASSESSMENT OF ACCIDENTAL DAMAGE

The following dimensional illustrations assist in the assessment of accidental damage. It is suggested that any components which have sustained damage or are suspect in any way, should first be removed from the vehicle as instructed, then cleaned and accurately measured on a surface table. The measurements obtained should then be compared with those given in the appropriate illustration and the serviceability of the components determined.

FRONT SUSPENSION

Dimension	In.	Mm.
1	5.19	131.8
2	1.88	47.75
3	10.13	257.3
4	5.88	149.35
5	1.5	38.1

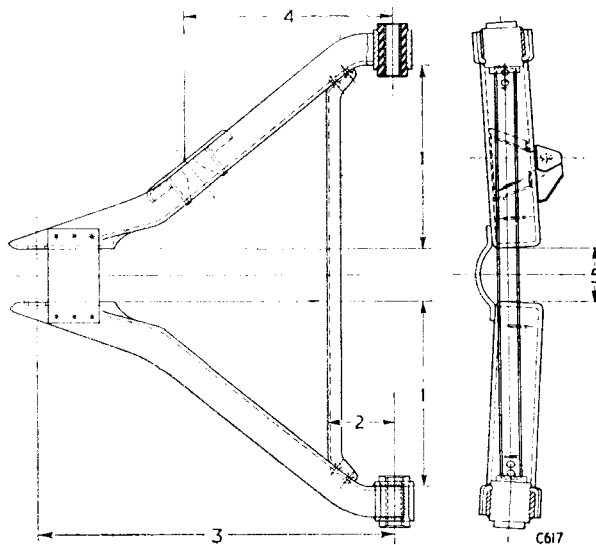


Fig. 33. Lower wishbone arm assembly

Dimension	In.	Mm.
1	1.5	38.1
2	7	177.8
3	2.13	54.1

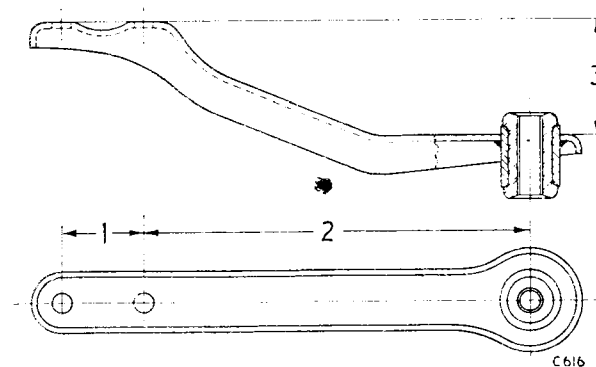
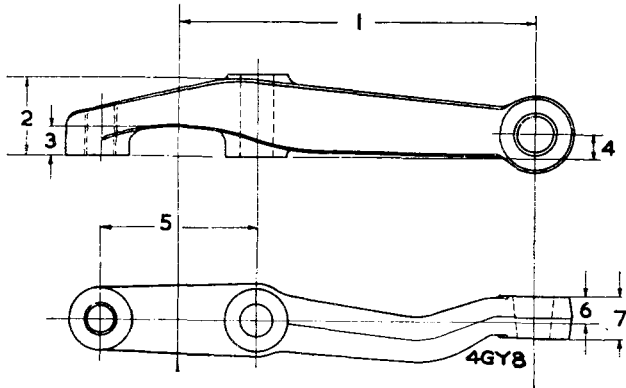
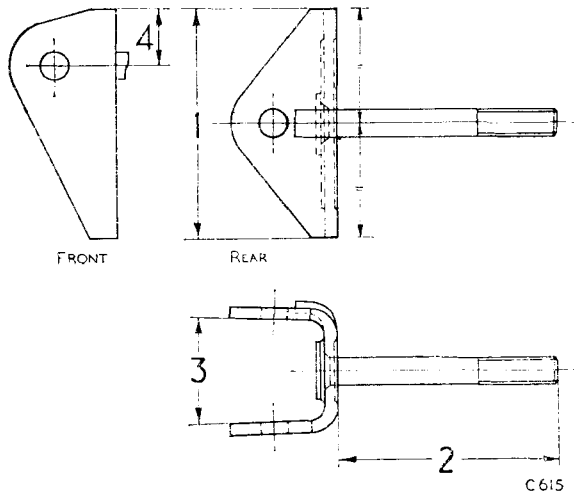


Fig. 34. Upper wishbone arm



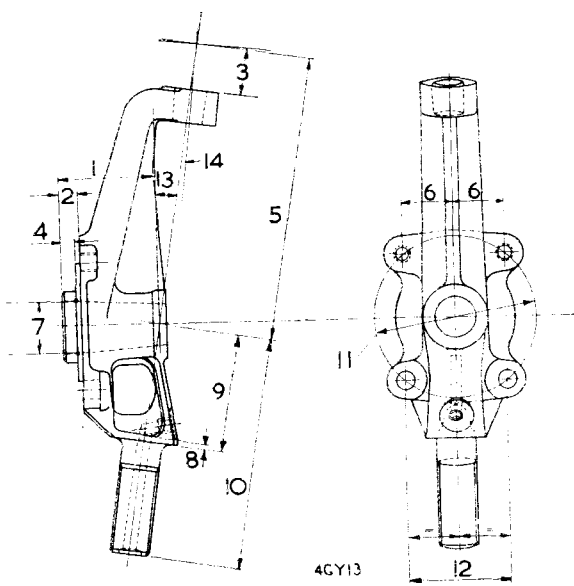
Dimension	In.	Mm.
1	4.375	111.13
2	0.99	25.14
3	0.39	9.9
4	0.367	9.32
	0.377	9.57
5	1.936	49.17
	1.94	49.28
6	0.31	7.87
7	0.5	12.7

Fig. 35. Steering lever



Dimension	In.	Mm.
1	3.25	82.5
2	3.13	79.5
3	1.445	36.7
	1.460	37.1
4	0.74	18.8

Fig. 36. Lower wishbone fulcrum bracket

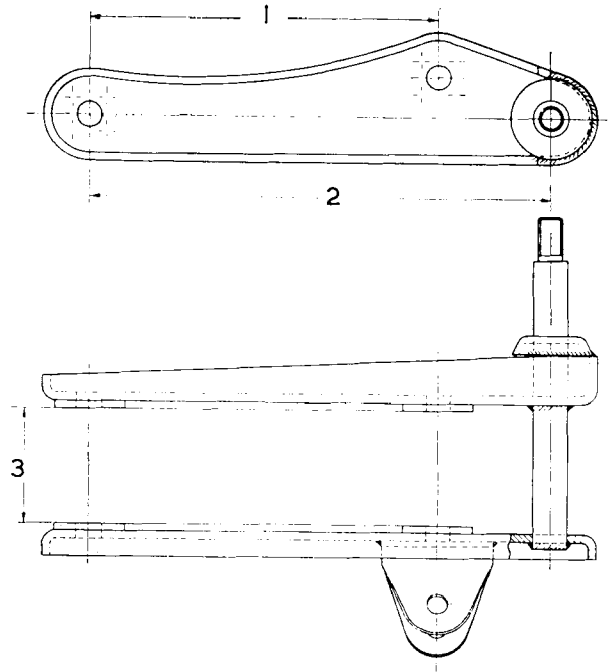


Dimension	In.	Mm.
1	1.83	46.48
2	0.335	8.51
	0.345	8.76
3	0.875	22.22
4	0.245	6.22
	0.255	6.48
5	5.44	138.18
6	0.968	24.58
	0.97	24.84
7	1.062	26.97
	1.063	27.00
8	0.13	3.3
9	2.25	57.15
10	4.44	112.77
11	3.12	79.25
	3.13	79.5
12	1.936	49.17
	1.940	49.28
13	9°	
14	2°	

Fig. 37. Vertical link

REAR SUSPENSION

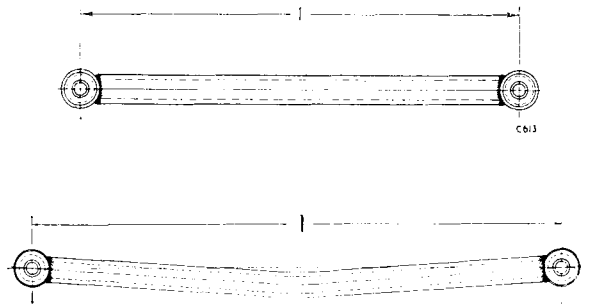
Dimension	In.	Mm.
1	6.185	157.1
	6.195	157.35
2	8.185	207.9
	8.195	208.15
3	2	50.8



4GY2

Fig. 38. Vertical link assembly (GT6 Mk. 1, Vitesse 2 Litre and GT6 Mk. 3 from Comm. No. KF20,001)

Dimension	In.	Mm.
(GT6) 1	11.91	302.5
	11.97	304
(GT6 Mk. 3) 1	12.230	310.6
	12.290	312.2
(Vitesse) 1	15.88	403.3



4GY6

Fig. 39. Radius arm (GT6 Mk. 1, GT6 Mk. 3 from Comm. No. KF20,001 and Vitesse 2 Litre)

Dimension	In.	Mm.
1	14°	
2	1.70	43.18
3	1.59	40.39
4	1.182	30.02
	1.192	30.28
5	0.38	9.65
6	0.40	10.16
6	2.31	58.67
7	0.81	20.57

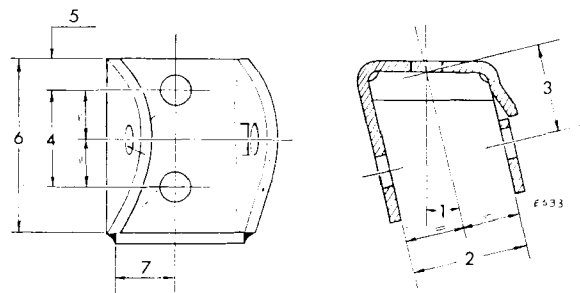


Fig. 40. Radius arm bracket (GT6 Mk. 1, GT6 Mk. 3 from Comm. No. KF20,001 and Vitesse 2 Litre)

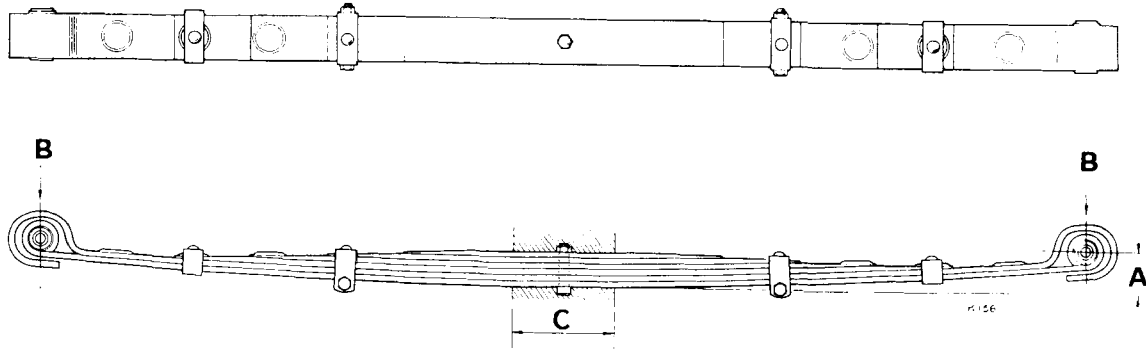


Fig. 41 Rear transverse leaf road spring

REAR ROAD SPRING DATA

	GT6 Mk. 3 From Comm. No. KF20,001	GT6 Mk. 2 and Plus and GT6 Mk. 3 up to Comm. No. KF20,001	Vitesse Mk. 2
Part number	313148	308499	308485
Number of blades	5	6	11
Blade thickness	0.3125"/0.375" (7.938/9.525mm.)	0.234" (5.943mm.)	0.203" (5.159mm.)
Test camber "A" under	1.55" ± 0.09" (39.37 ± 2.29mm.)	1.75 ± 0.13 (44.450 ± 3.3mm.)	1.88" ± 0.13 (47.75 ± 3.3mm.)
*Test load "B"	1230lb. (558kg.)	971lb. (440kg.)	1302lb. (590kg.)

*Clamp spring over dimension "C" (4"—100mm.) and apply test load at spring eye centres.

SUSPENSION AND STEERING DATA

Vehicle Type	FRONT				REAR	
	Camber	Castor	KPI	Wheel Alignment	Camber	Wheel Alignment
Vitesse Mk. 2 Saloon	$3\frac{1}{4} \pm 1^\circ$ positive	$2\frac{3}{4} \pm 1^\circ$ positive	$5\frac{1}{2} \pm 1^\circ$ positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in	$2^\circ \pm 1$ positive	$0 \pm \frac{3}{32}''$ (0±0.79 mm.)
Vitesse Mk. 2 Convertible	$3\frac{1}{4} \pm 1^\circ$ positive	$4^\circ \pm 1$ positive	$5\frac{1}{2} \pm 1^\circ$ positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in	$2\frac{1}{4} \pm 1$ positive	$0 \pm \frac{3}{32}''$ (0±0.79 mm.)
GT6 Mk. 2, Plus and Mk. 3 up to Comm. No. KF 20,001	$2\frac{3}{4} \pm 1^\circ$ positive	$3\frac{1}{2} \pm 1^\circ$ positive	$6^\circ \pm 1^\circ$ positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in	$0^\circ \pm 1$	$0 \pm \frac{1}{32}''$ (0±0.79 mm.)
GT6 Mk. 3 From Comm. No. KF 20,001	$2\frac{3}{4} \pm 1$ positive	$3\frac{1}{2} \pm 1$ positive	6 ± 1 positive	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5-3.0mm) toe-in	1 ± 1 negative	$\frac{1}{32}'' - \frac{3}{32}''$ toe out

Table 1. Steering Data for Unladen Vehicle

Vehicle Type	FRONT				REAR	
	Camber	Castor	KPI	Wheel Alignment	Camber	Wheel Alignment
Vitesse Mk. 2 Saloon 4 UP	$2^\circ \pm \frac{1}{2}^\circ$ positive	$4^\circ \pm \frac{1}{2}^\circ$ positive	$6\frac{3}{4} \pm \frac{3}{4}^\circ$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in	$2^\circ \pm \frac{1}{2}^\circ$ negative	$0 \pm \frac{1}{32}''$ (0±0.79 mm.)
Vitesse Mk. 2 Convertible 2 UP	$2^\circ \pm \frac{1}{2}^\circ$ positive	$4^\circ \pm \frac{1}{2}^\circ$ positive	$6\frac{3}{4} \pm \frac{3}{4}^\circ$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in	$\frac{1}{2}^\circ \pm \frac{1}{2}^\circ$ positive	$0 \pm \frac{1}{32}''$ (0±0.79 mm.)
GT6 Mk. 3 From Comm. No. KF 20,001 2 UP	$2^\circ \pm \frac{1}{2}^\circ$ positive	$4^\circ \pm \frac{1}{2}^\circ$ positive	$6\frac{3}{4} \pm \frac{3}{4}^\circ$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm.) toe-in	$2^\circ \pm \frac{1}{2}^\circ$ negative	$\frac{1}{16}'' - \frac{1}{8}''$ (1.5—3.0 mm.) toe-in
GT6 Mk. 2, plus and Mk. 3 up to Comm. No. KF 20,001 2 UP	$2^\circ \pm \frac{1}{2}^\circ$ positive	$4 \pm \frac{1}{2}$ positive	$6\frac{3}{4} \pm \frac{3}{4}$ positive	$0'' - \frac{1}{16}''$ (0—1.5 mm) toe-in	$3\frac{1}{4} \pm 1$ Negative	$0'' - \frac{1}{16}''$ (0—1.5 mm) toe-in

Table 2. Steering Data for Static Laden Vehicle

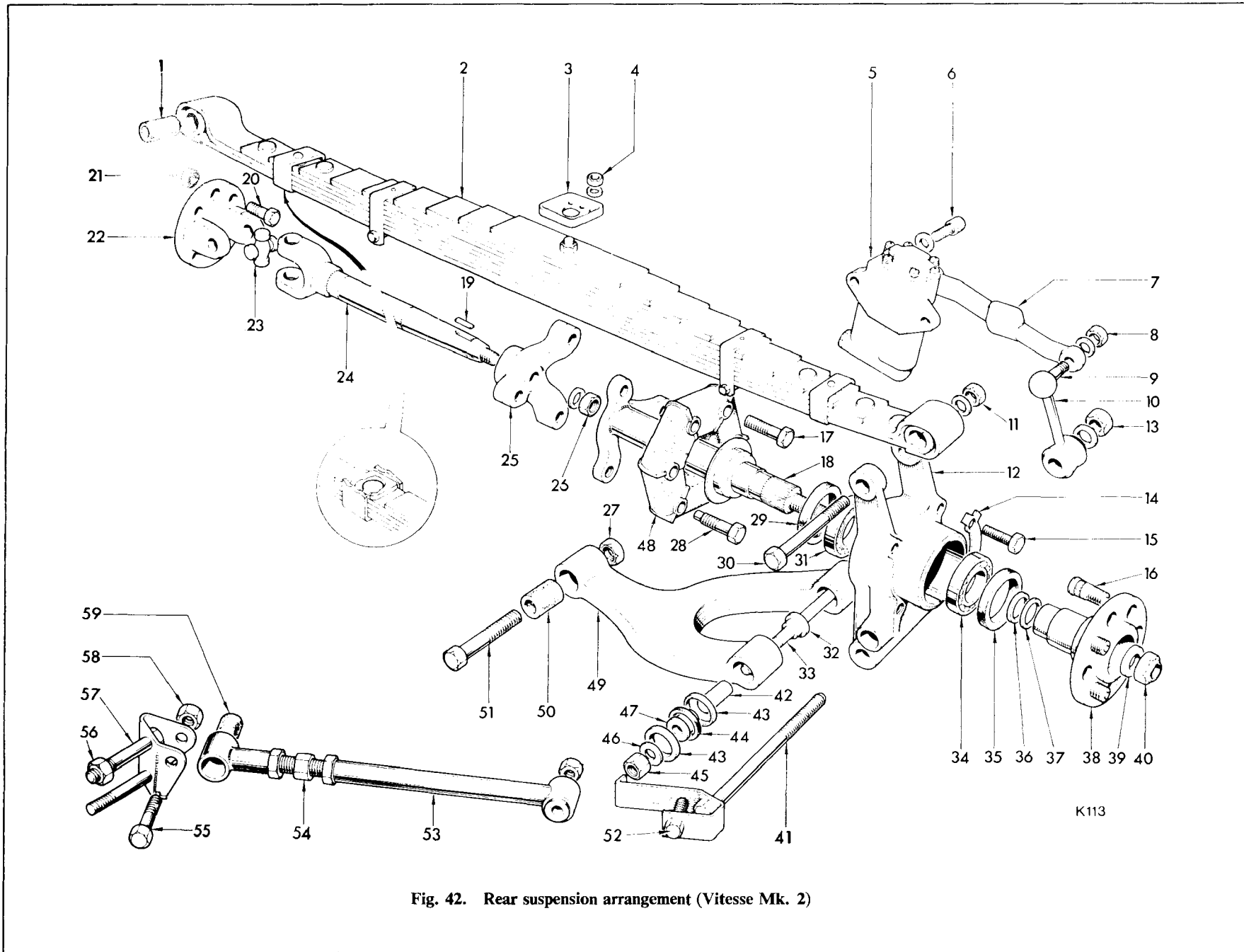
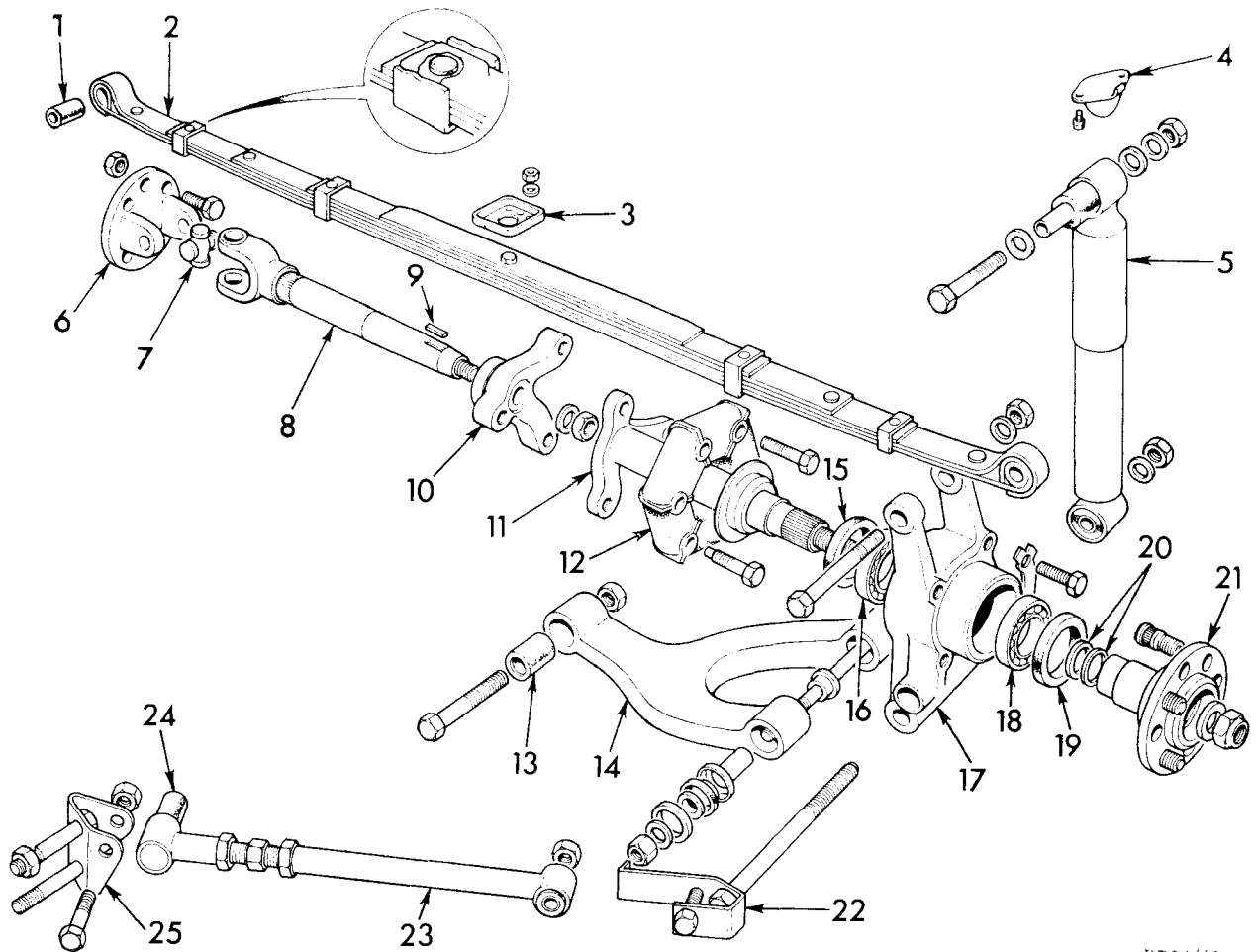


Fig. 42. Rear suspension arrangement (Vitesse Mk. 2)

Key to Fig. 42

- | | |
|---|--|
| 1 Rubber bush—spring eye | 31 Inner bearing |
| 2 Rear transverse road spring | 32 Outer bush } wishbone to vertical link |
| 3 Spring plate | 33 Bolt } |
| 4 Nyloc nut—spring plate to axle housing | 34 Outer bearing |
| 5 Rear damper—lever arm type | 35 Outer oil seal |
| 6 Screw—damper to mounting bracket | 36 Spacer } outer drive shaft |
| 7 Damper arm | 37 Shim } |
| 8 Nyloc nut— damper arm to damper link | 38 Rear hub and stud assembly |
| 9 Ball end taper | 39 Washer |
| 10 Link assembly | 40 Nyloc nut—rear hub to outer drive shaft |
| 11 Nyloc nut—rear road spring ends to vertical link | 41 Bracket—assembly mounting radius arm to vertical link |
| 12 Rear vertical link | 42 Distance piece } |
| 13 Nyloc nut—damper link to vertical link | 43 Water shield } wishbone to vertical link |
| 14 Tab washer—vertical link to rear brake | 44 Dirt seal } |
| 15 Setscrew—vertical link to rear brake | 45 Nyloc nut } |
| 16 Wheel stud | 46 Washer } wishbone to vertical link |
| 17 Bolt outer drive shaft - rotoflex coupling | 47 Outer bush } |
| 18 Outer drive shaft assembly | 48 Rotoflex wishbone assembly |
| 19 Key—intermediate shaft | 49 Lower wishbone assembly |
| 20 Bolt - shaft joint to inner axle shaft | 50 Lower wishbone—inner bush |
| 21 Nyloc nut—inner axle shaft | 51 Bolt—wishbone to chassis |
| 22 Flange yoke -coupling | 52 Bolt - radius arm to vertical link |
| 23 Yoke | 53 Radius arm |
| 24 Intermediate drive shaft | 54 Radius arm adjuster |
| 25 Driven flange | 55 Bolt - radius arm to bracket |
| 26 Nyloc nut - driven flange to shaft | 56 Nyloc nut - radius arm to bracket |
| 27 Nyloc nut - lower wishbone to chassis | 57 Bolt - radius arm support bracket |
| 28 Bolt -driven flange to rotoflex coupling | 58 Nut—radius arm to bracket |
| 29 Inner oil seal | 59 Rubber bush - radius arm |
| 30 Bolt - rear spring ends to vertical link | |



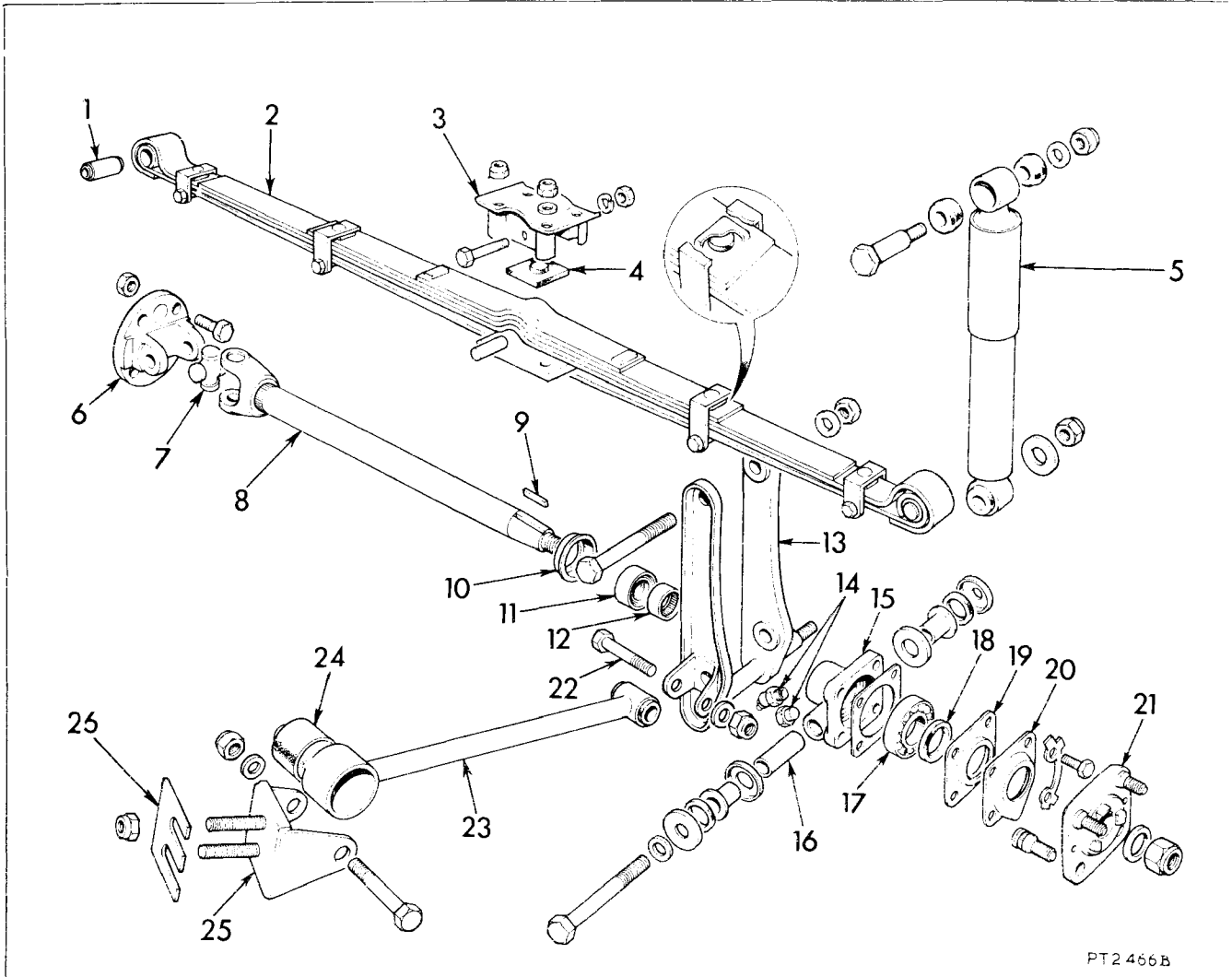
PT2466A

Fig. 42A. REAR SUSPENSION ARRANGEMENT GT6 Mk. 2, PLUS AND GT6 Mk. 3 up to commission Number KF 20,001

KEY TO FIG. 42A

- | | |
|-------------------------------|--|
| 1 Spring eye bush | 14 Lower wishbone assembly |
| 2 Road spring | 15 Inner oil seal |
| 3 Spring clamp plate | 16 Inner bearing |
| 4 Bump stop | 17 Vertical link |
| 5 Damper | 18 Outer bearing |
| 6 Flange yoke-coupling | 19 Outer oil seal |
| 7 Yoke | 20 Spacer and shim |
| 8 Intermediate drive shaft | 21 Hub and stud assembly |
| 9 Key | 22 Bracket-radius arm to vertical link |
| 10 Driven flange | 23 Radius arm |
| 11 Outer drive shaft | 24 Rubber bush |
| 12 Rotoflex wishbone assembly | 25 Radius arm bracket |
| 13 Inner bush-lower wishbone | |

SUSPENSION



PT2 466B

Fig. 42B. REAR SUSPENSION ARRANGEMENT GT6 Mk. 3 from Commission Number KF20,001

KEY TO FIG. 42B

- | | |
|------------------------|-------------------------------------|
| 1 Spring eye bush | 14 Grease nipple or plug |
| 2 Road spring | 15 Inner hub |
| 3 Spring clamp plate | 16 Distance piece |
| 4 Spring plate pad | 17 Outer bearing |
| 5 Damper | 18 Outer oil seal |
| 6 Flange yoke-coupling | 19 Oil seal housing |
| 7 Yoke | 20 Oil catcher |
| 8 Drive shaft | 21 Hub and stud assembly |
| 9 Key | 22 Bolt-radius arm to vertical link |
| 10 Flinger | 23 Radius arm |
| 11 Inner oil seal | 24 Rubber bush |
| 12 Inner bearing | 25 Radius arm bracket |
| 13 Vertical link | 26 Shim |

REAR SUSPENSION

Before carrying out any work on the rear suspension, jack up the rear of the vehicle and support it on chassis stands. Remove the nave plates and road wheels.

REAR ROAD SPRING

To Remove (Fig. 42)

1. Jack up the vertical link.
2. Disconnect each brake hose from its steel pipe and chassis bracket by unscrewing the union nut, Fig. 57 Page 3-122, and removing the nut whilst holding the flexible pipe.
3. Release the handbrake clevis pin and spring from the brake backplate.
4. Disconnect the intermediate drive shafts from the inner axle shaft couplings and remove the radius arm mounting bolts from the chassis (both sides).
5. Remove both damper links (Vitesse Mk 2) or dampers (GT6 Mk 2 and Plus).
6. Fit the special hexagon bar to both sides of the spring, page 3.123 refers, and remove the spring eye bolts (30) attaching the road spring to the vertical link.
7. Take out the luggage floor (GT6 Mk 2 and Plus) or the rear seat assembly (Vitesse Mk 2) and remove the spring access cover.
8. Remove the six nyloc nuts (4), plain washers (5), detach the spring clamp plate (3) and unscrew the three rear studs (42) from the axle casing Fig. 45.
9. Remove the special hexagon tool from the spring and withdraw the road spring from the vehicle Fig. 27.

To Refit

1. Fit the road spring into the recess in the axle casing, with the centre bolt spigoting in its locating hole. The spring is marked "FRONT" for correction location.
2. Refit the three rear studs (42) with the shorter threaded portion leading, into the axle casing. Refit the spring clamp plate (3) and tighten the nyloc nuts (4).
3. Fit the special hexagon bar to both sides of the spring and fit the spring eye bolts (30), leaving the nyloc nuts (11) semi-tight at this stage.
4. Refit the damper links (Vitesse Mk 2) or dampers (GT6 Mk 2 and Plus). Reconnect the radius arms to the chassis (both sides) and the intermediate drive shafts to the inner axle shaft couplings.
5. Connect the handbrake cable to the backplate lever, refit the pull-off spring, Fig. 57 Page 3-122, and reconnect the flexible brake hose. Adjust and bleed the brakes.
6. Referring to the Dust and Water Sealing Section, page 5.301. Refit the spring access cover plate securing with two screws. Replace the luggage floor (GT6 Mk 2 and Plus) or the rear seat assembly (Vitesse Mk 2). Remove the special hexagon bar.

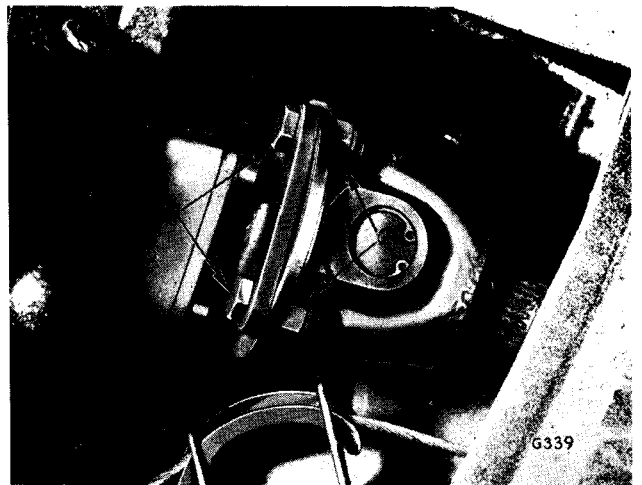


Fig. 43. Axle shaft coupling

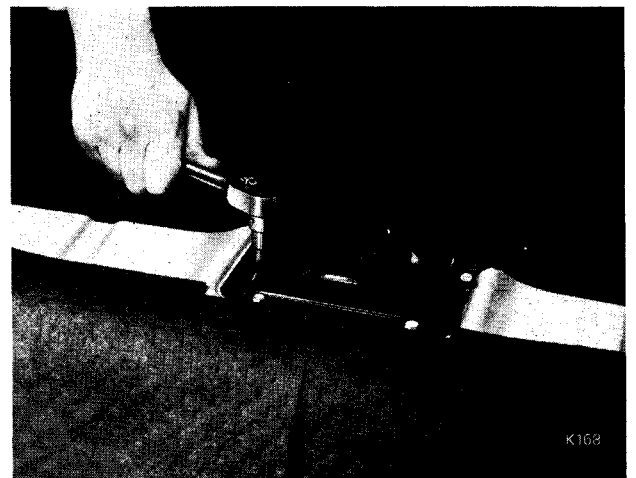


Fig. 44. Removing spring access cover

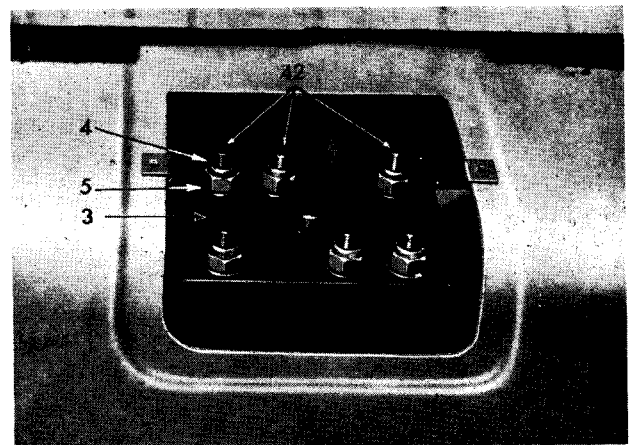


Fig. 45. Spring clamp plate attachments

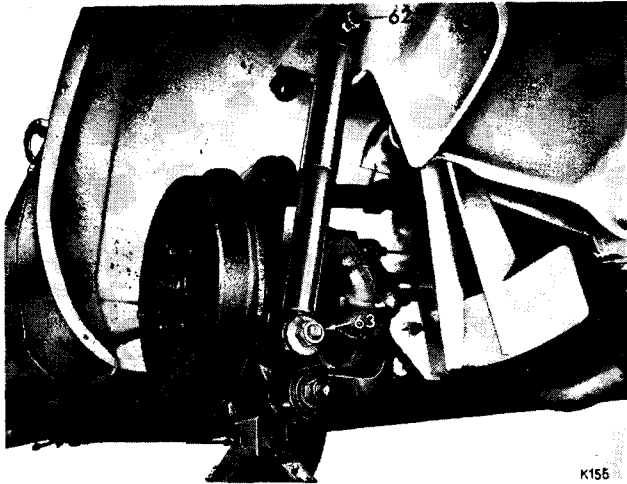


Fig. 46. Telescopic type damper

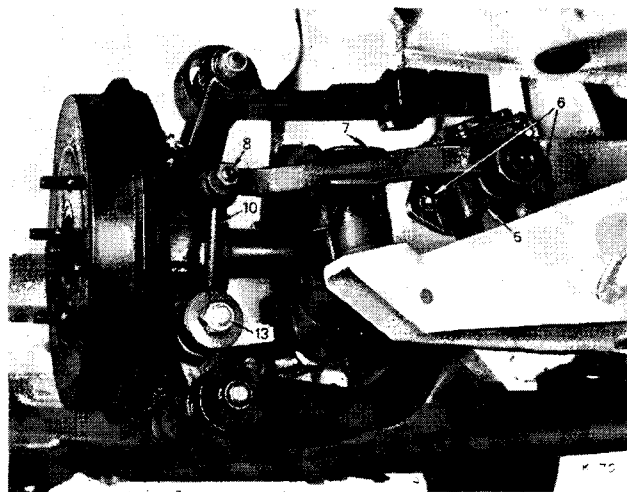


Fig. 47. Lever and arm type damper

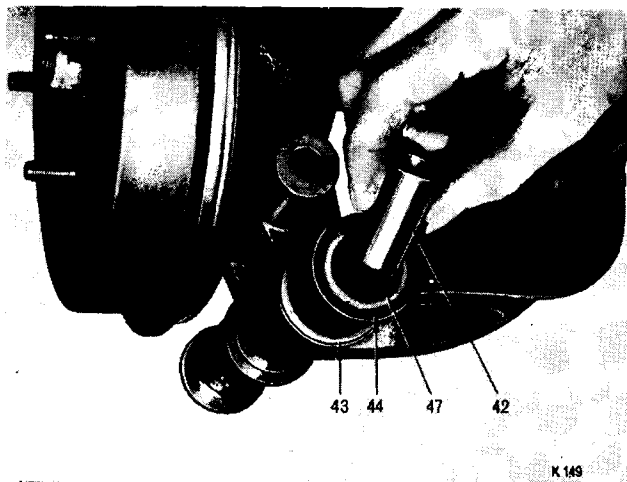


Fig. 48. Fitting lower wishbone distance piece

7. Refit the road wheels and nave plates. Place a trolley jack under the differential casing, remove the chassis stands and with the vertical links supported at their running height, load the vehicle and lower its rear end until the axle shafts assume their static laden operating position. This is to allow their correct working position before tightening the nuts (11), (13) and (45).

DAMPERS

Telescopic Type (GT6 Mk 2 and Plus)

To Remove (Fig. 46)

1. Jack up the vertical link to relieve the damper of load.
2. Remove the top attachment nyloc nut (62) and the lower attachment nyloc nut (63).
3. Pull the damper clear of its attachment points.

To Refit

Bleed air from the damper by holding it in a vertical position and operating the damper over its full stroke. Maintaining the unit in a vertical position, refit the damper by reversing the removal procedure, fitting new rubber bushes if necessary.

Lever and Arm Type (Vitesse Mk 2)

To Remove (Fig. 47)

1. Jack up the vertical link to relieve the damper of load.
2. Remove the two damper mounting screws (6) attaching the damper (5) to the chassis frame using a $\frac{5}{16}$ in. (7.39 mm.) allen key.
3. Remove the nyloc nut (13) attaching the lower portion of the damper link (10) to the vertical link, and lift the damper assembly complete with link from the vehicle.
4. Remove the link (10) from the damper arm (7) by using a suitable extractor.

To Refit

Reverse the removal procedure, fitting new damper link if necessary.

Damper Link (Vitesse Mk 2)

To Remove (Fig. 47)

1. Jack up the vertical link to relieve the damper of load.
2. Release the link from the damper arm by removing the nyloc nut (8).
3. Remove the nyloc nut (13) attaching the damper link to the vertical link. Release the link (10) from the damper arm (7) by using a suitable extractor.

To Refit

Reverse the removal procedure.

Rear Lower Wishbone and/or Bushes

To Remove (Fig. 42)

1. Jack up the vertical link to relieve the damper of load.

2. Remove the inner wishbone bolt (51) and the outer wishbone bolt (33) and remove the wishbone from the vehicle.
3. Working on the bench remove the outer water shield (43) dirt seal, (44), nylon bush (47), inner water shield (43) and distance piece (42).
4. Press out the inner bush (50).

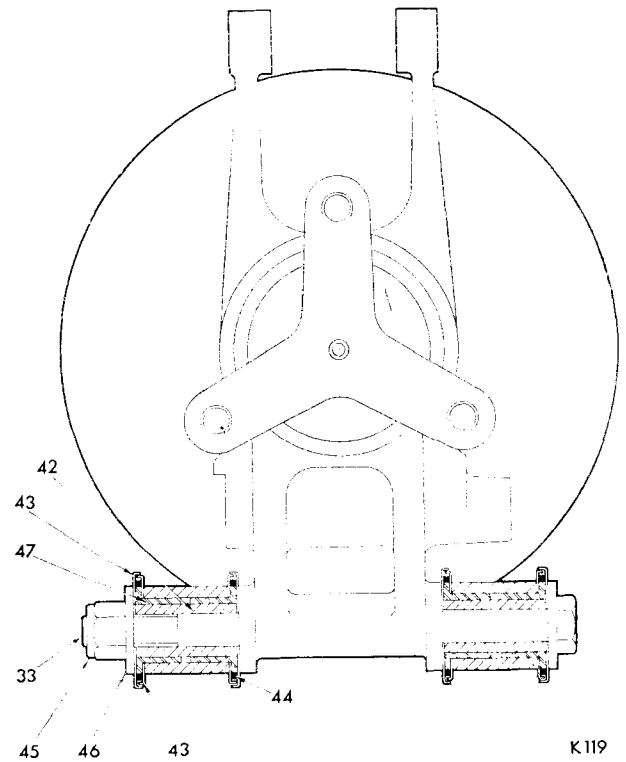
To Refit Wishbone and Renew Bushes

1. Examine and if necessary replace the seals and bushes as Figs. 48 and 49.

NOTE: Sufficient grease (Mobilgrease M.P. or recommended alternative) must be used during assembly of these outer bushes to ensure that the space around the bushes is full.

2. Fit the inner bush (50) Fig. 42.
3. Position the wishbone to the vertical link and secure with bolt (33), plain washers (46) and nyloc nut (45), leaving the nyloc nut semi-tight.
4. Align the inner end of the wishbone with its mounting point on the chassis frame and secure with bolt (51) and nyloc nut (27) leaving the nyloc nut semi-tight.
5. Fully tighten the nyloc nuts (45) and (27). Remove the jack from under the vertical link, refit road wheels and nave plates.

NOTE: The outer bushes may be replaced with the wishbone in situ.



K119

Fig. 49. Rear lower wishbone bushes

RADIUS ARMS

To Remove (Fig. 42)

Proceed as for removal of dampers adjusting the jack beneath the vertical link (12) until the radius arm attachment bolts (52) and (55) can be easily withdrawn.

If the rubber bushes (59) are perished, worn or cut, use a press to remove them and press in new bushes.

To Refit

Refit the radius arm (53), tighten the attachment bolts and nuts and remove the jack from the vertical link.

Rear Wheel Alignment (Fig. 50) GT6 Mk. 2 and early GT6 Mk. 3 cars only

Check, and if necessary, adjust the rear wheel alignment as follows:

Release the radius arm lock nuts (61), rotate the adjuster (54) clockwise or anti-clockwise to achieve correct wheel alignment as given below:—

GT6 Mk 2 & Plus

Loading Condition

Laden—2 up

Kerb

Wheel Alignment

$\frac{1}{16}$ in. to $\frac{1}{8}$ in. toe-in
(1.6 to 3.2 mm.)

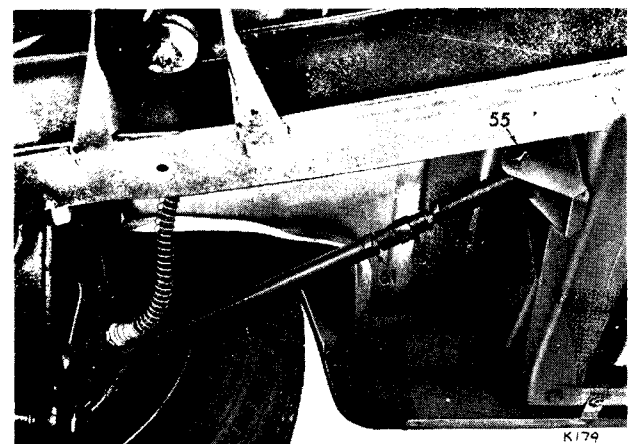
$0 \pm \frac{1}{32}$ in.
(0 ± 0.8 mm.)

Vitesse Mk 2

Laden and Kerb

$0 \pm \frac{1}{32}$ in.
(0 ± 0.8 mm.)

Finally tighten the lock nuts (61) to the specified torque, refer to Group "O" for torque figures.



K179

Fig. 50. Radius arm assembly

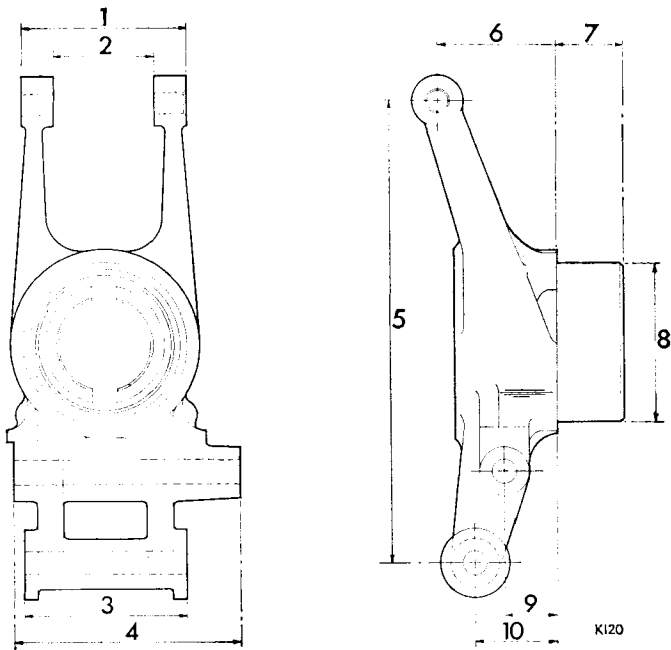
ASSESSMENT OF ACCIDENTAL DAMAGE

REAR SUSPENSION—GT6 Mk. 2, Plus, GT6 Mk. 3 up to Commission Number KF 20,001 and Vitesse Mk. 2

The following dimensional illustrations assist in the assessment of accidental damage.

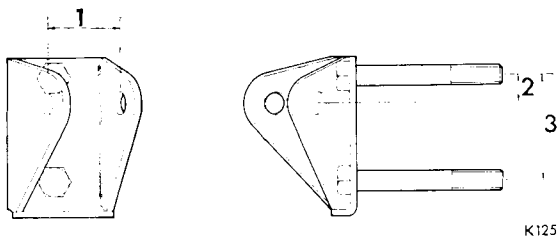
It is suggested that any components which have sustained damage or are suspect in any way, should first be removed from the vehicle as instructed, then cleaned and accurately measured on a surface table.

The measurements obtained should then be compared with those given in the appropriate illustration and the serviceability of the components determined.



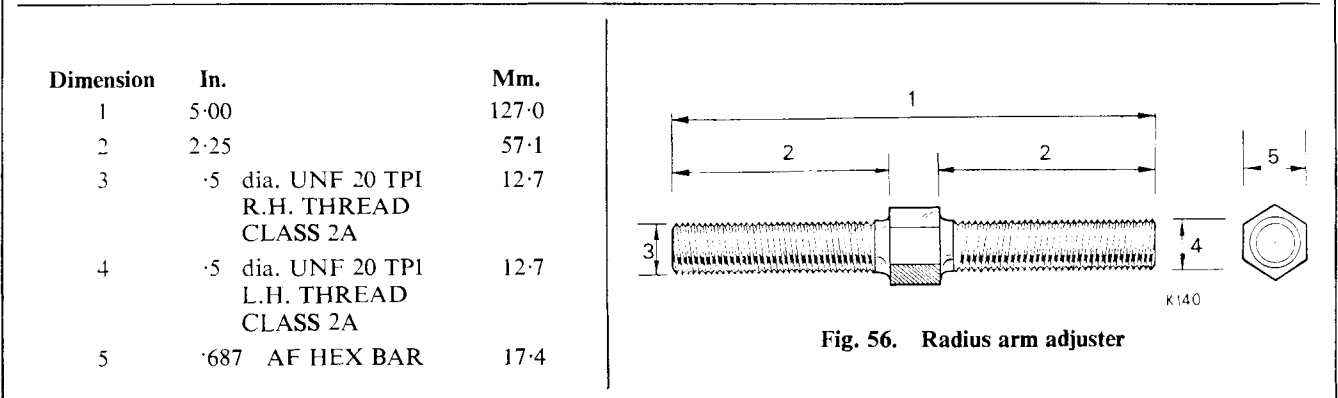
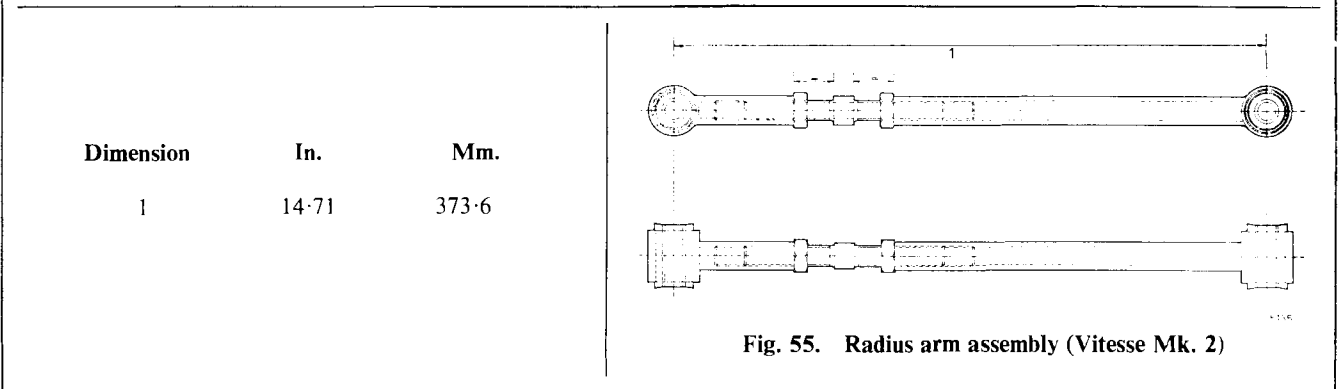
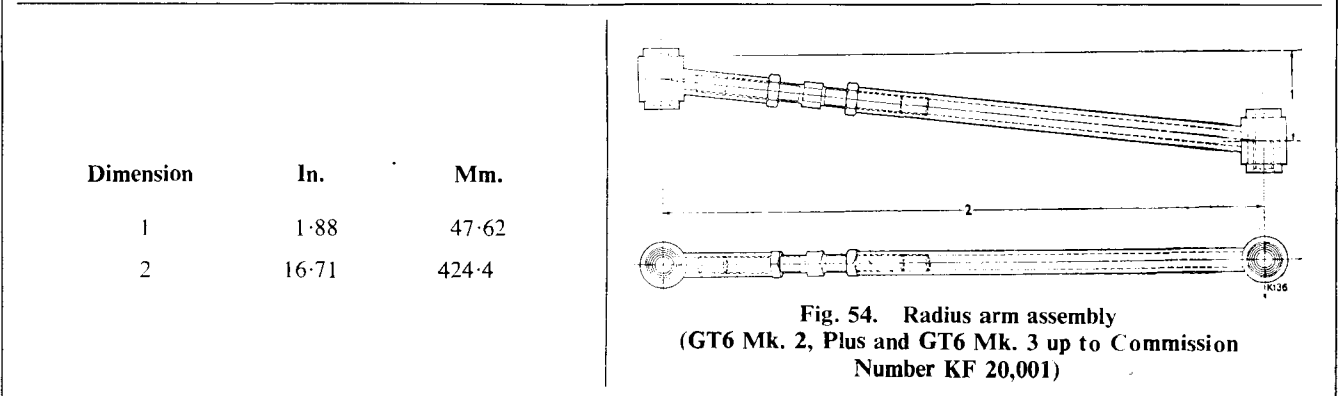
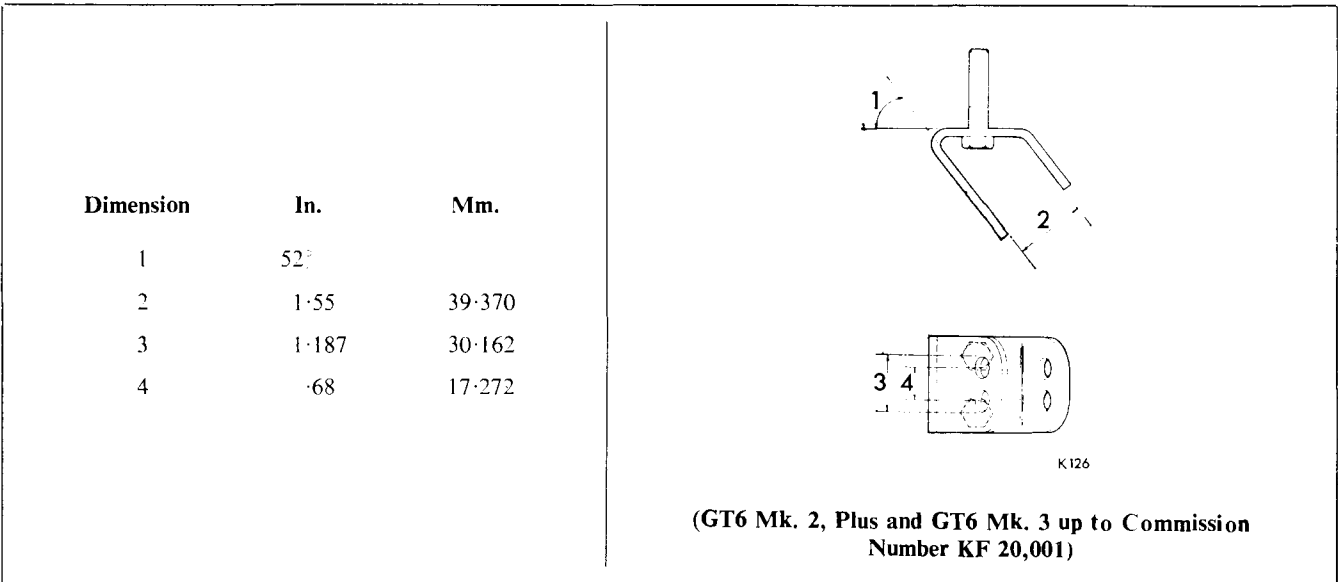
Dimension	In.	Mm.
1	3.25	82.550
2	2.006	50.952
3	3.232	82.092
4	4.500	113.300
5	9.1875	233.3625
6	2.375	60.325
7	1.340	34.036
8	3.125	79.375
9	1.031	26.187
10	1.625	41.275

Fig. 51. Rear vertical link



Dimension	In.	Mm.
1	1.406	35.718
2	.50	12.700
3	2.060	52.324

Fig. 52. Radius arm mounting bracket (Vitesse Mk. 2)



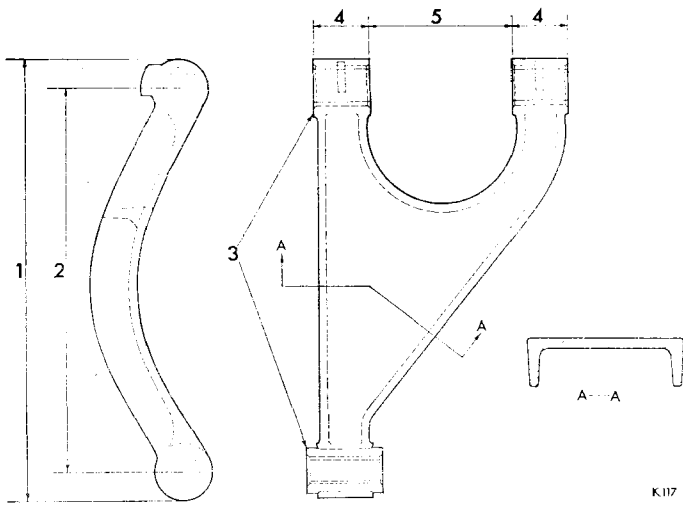
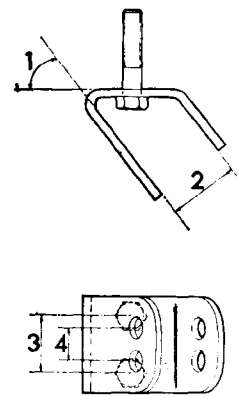


Fig. 57. Rear lower wishbone

Dimension	In.	Mm.
1	10.78	273.812
2	9.31	236.474
3	THESE FACES TO BE WITHIN .010	.254
4	1.380	35.052
5	3.507	89.077

Dimension	In.	Mm.
1.	52°	
2	1.55	39.370
3	1.187	30.162
4	.68	17.272



K126

Fig. 53. Radius arm mounting bracket (GT6 Mk. 2 and Plus)

Dimension	In.	Mm.
1	14.71	373.6

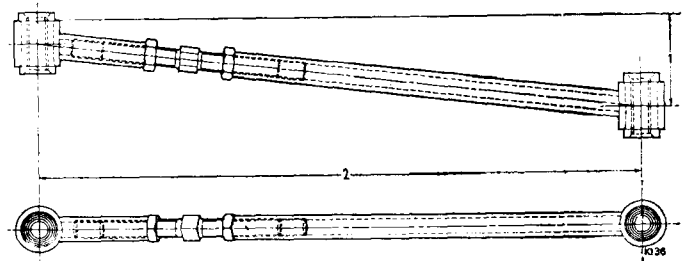
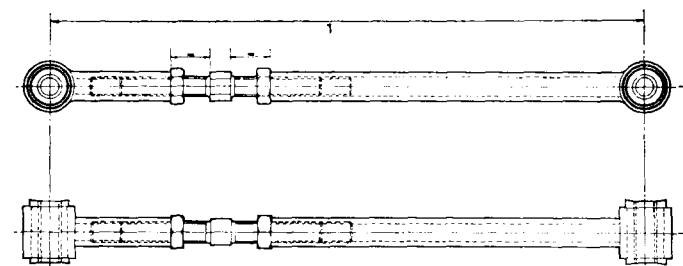


Fig. 54. Radius arm assembly (GT6 Mk. 2 and Plus)

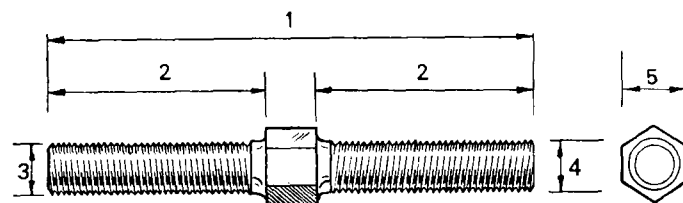
Dimension	In.	Mm.
1	1.88	47.62
2	16.71	424.4



K135

Fig. 55. Radius arm assembly (Vitèsse Mk. 2)

Dimension	In.	Mm.
1	5.00	127.0
2	2.25	57.1
3	.5 dia. UNF 20 TPI R.H. THREAD CLASS 2A	12.7
4	.5 dia. UNF 20 TPI L.H. THREAD CLASS 2A	12.7
5	.687 AF HEX BAR	17.4



K140

Fig. 56. Radius arm adjuster

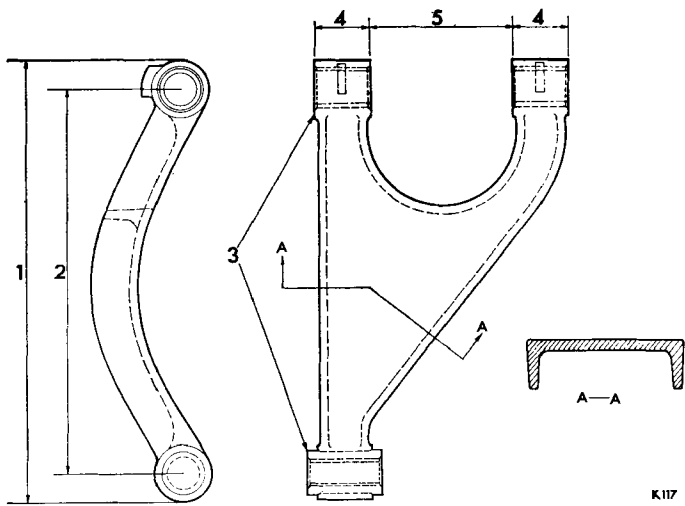


Fig. 57. Rear lower wishbone

Dimension	In.	Mm.
1	10.78	273.812
2	9.31	236.474
3	THESE FACES TO BE WITHIN	.010 .254
4	1.380	35.052
5	3.507	89.077

STEERING

Introduction

The method used for checking and adjusting steering and suspension geometry will vary according to the equipment used.

The figures given in Table 1 on page 4-202 are checked or achieved with the vehicle in the unladen condition (i.e. full fuel tank, oil and water, tool kit and spare wheel).

Operators are however, reminded that the setting of rear wheel alignment is impracticable without the use of jigs, unless optical equipment (such as Optiline, Optoflex, etc.) is used.

Such equipment enables the front and rear wheels to be aligned simultaneously. A beam of light emitted from a projector at right angles to each individual wheel, is focussed onto a graduated screen, placed at a set distance. The various angles and dimensions may be read directly and accurately from the screen.

Poor steering and tyre wear are often caused by unbalance of wheel assemblies. Optical equipment for balancing wheel assemblies, in situ on the vehicle, has been developed of recent years, and its use is strongly advocated.

Steering Geometry and Suspension Geometry

The term "steering geometry" refers to the lay-out of the steering mechanism and any of its dimensions, linear or angular, which contribute to the required behaviour of the steering system. The steering system is always designed to comply with the specification of the front suspension, in order that the best possible steering behaviour is obtained under all conditions.

For example, Toe-in and Camber are classed as suspension geometry; K.P.I. and Castor are classed as steering geometry.

Departure from any steering/suspension dimensions may result in unsatisfactory steering and/or abnormal wear of tyres, steering and suspension components.

Steering Axis Inclination (Fig. 1)

The steering axis "A" is an imaginary line between the upper and lower swivel centres, and the steering axis inclination is the amount in degrees that this is inclined from the vertical, viewed in front elevation.

Camber (Fig. 1)

Positive camber "B" is the amount in degrees that the front wheels are tilted outwards at the top from the vertical, viewed in front elevation.

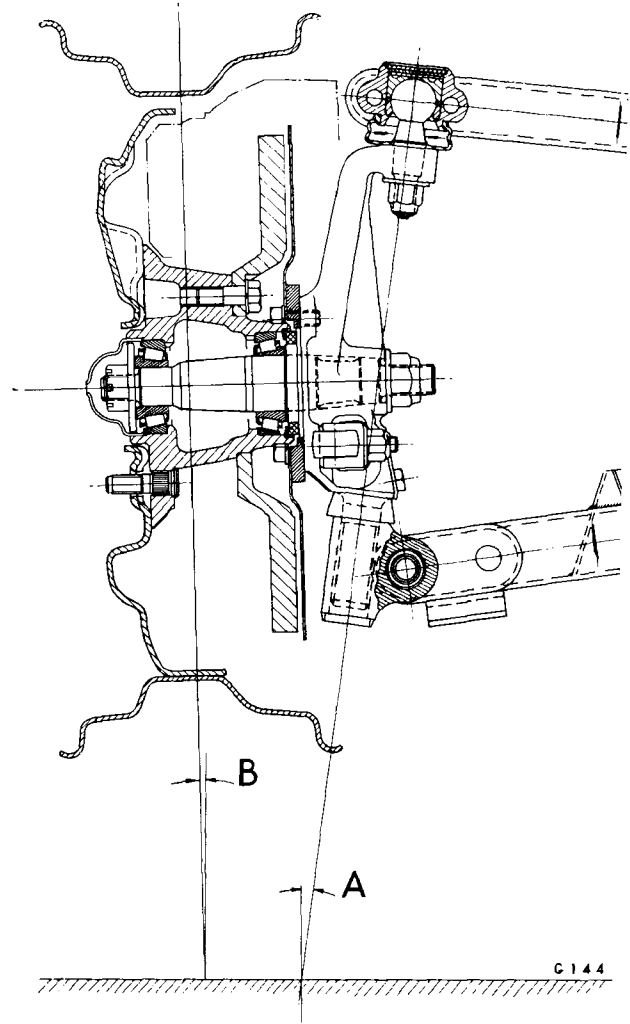


Fig. 1. Steering axis inclination and camber angle

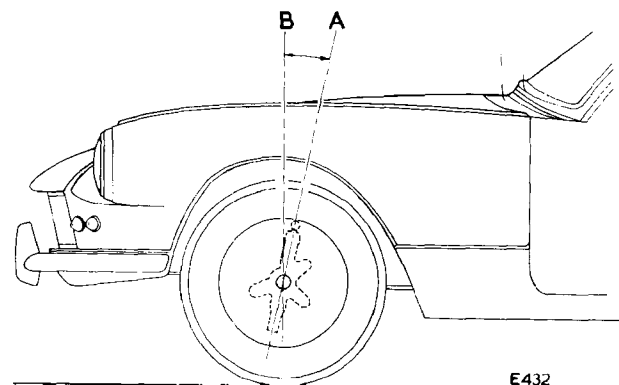


Fig. 2. Castor angle

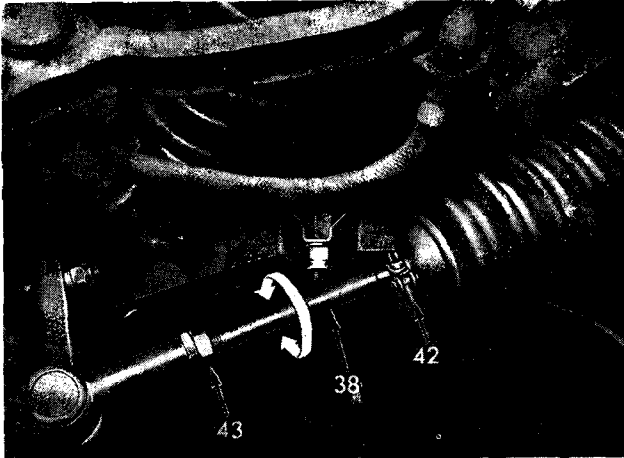


Fig. 3. Tie rod end locknut

Castor (Fig. 2)

Castor is the angle in side elevation between the steering axis "A" and the vertical line "B". It is considered positive when the steering axis is inclined rearwards.

NOTE: Maximum permissible differential on castor and camber between right- and left-hand side is 1°.

Toe-out on Turns

This is the alignment of the front wheels relative to each other as they are turned to the left or right.

Unfortunately, using simple steering mechanisms, it is not possible to obtain the exact toe-out at every position through the complete turn from straight-ahead to full lock. However, scuffing can be minimised by careful positioning of the steering components.

Static Laden

Static laden is a condition obtained by placing a 150 lb. (68 kg.) load on each seat. The steering is designed and built to the static laden condition. These figures are given in Table 2. For convenience, the figures quoted in Table 1 may be used for checking geometry, providing the vehicle complies with the unladen condition.

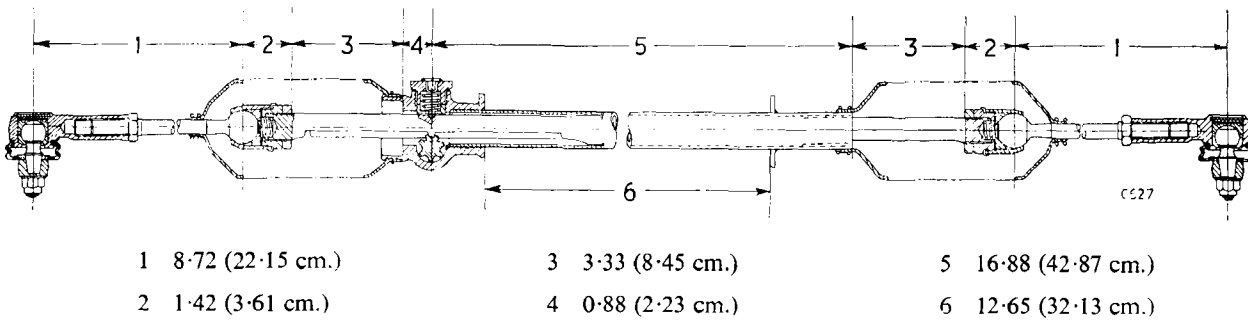


Fig. 4. Steering unit dimensions

STEERING MEASUREMENTS AND ADJUSTMENTS

Before carrying out measurements and adjustments on the front suspension and steering, inflate the tyres to the correct pressures and position the vehicle on a smooth, level surface.

Checking Steering Locks

NOTE: The back and front lock angles are equal to each other only when the wheels are set at 20° from the straight-ahead position.

Drive the vehicle onto Weaver gauges with wooden wedges under the rear wheels as Fig. 5. The wedges must be the same thickness as the gauges.

Set the front wheels straight ahead and zero the gauges. Turn each wheel to 20° front lock and read the opposite gauge. Repeat the procedure with 20° back lock. If the front and back lock angles do not conform to 20°, damage to suspension components must be assumed and a dimensional check is necessary to establish the faulty components.

Lock Stop Adjustment (Fig. 6)

Limitation of the steering lock is controlled by the locknut (33) contacting the rack tube. Thus dimension (3) Fig. 4 is particularly important. Providing that this dimension is accurate and the steering unit is centrally mounted on the chassis, correct steering locks should result.

Track Adjustment (Fig. 3)

Centralize the steering unit and measure the front wheel alignment. If adjustment is required, slacken the locknuts (43), the clips (42) and rotate the tie-rods (38) until alignment is correct. Note the reading. Rotate the wheels 180°, and take a second reading. Adjust the tie-rods to a mean of the two readings thus allowing for wheel rim run-out.

Tighten the tie-rod locknuts and gaiter clips.

Castor and Camber Adjustments (Fig. 7)

Adjustment of camber and castor angles is accomplished by altering the number of shims assembled between the chassis and the lower inner fulcrum brackets.

Referring to page 4-104, jack up the vehicle and slacken the nuts (66). Increase or decrease the number of shims as required and retighten the nuts.

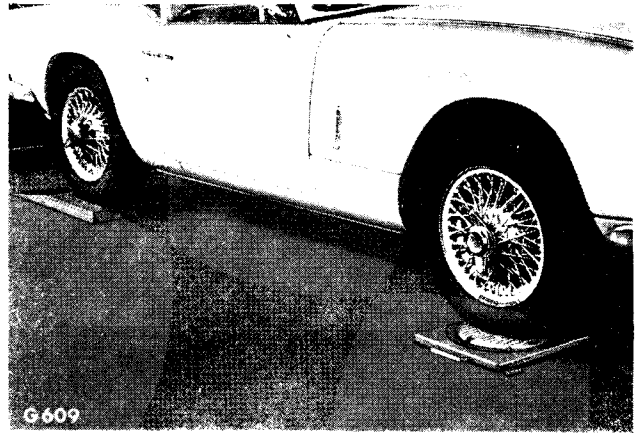


Fig. 5. Checking steering locks

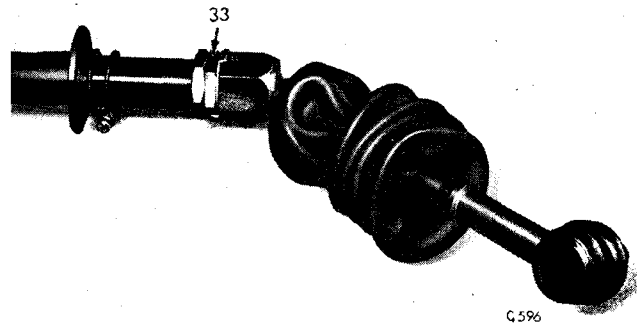


Fig. 6. Limitation of steering lock

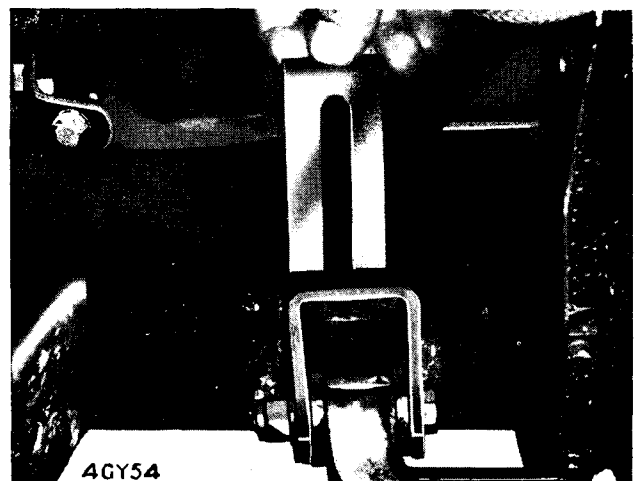
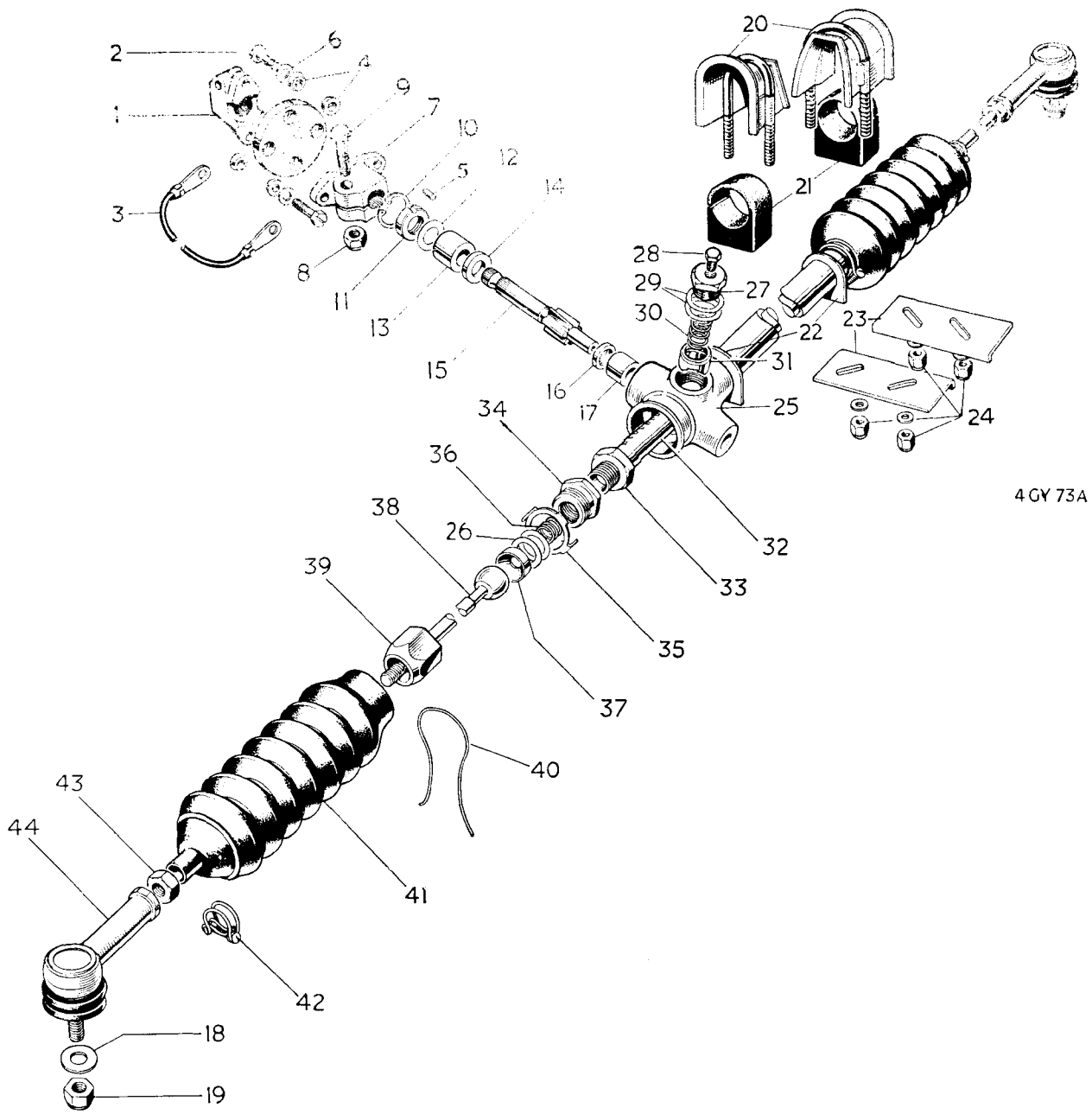


Fig. 7. Fulcrum bracket shims



4GY 73A

Fig. 8. Exploded steering unit

Key to Fig. 4

1	Steering coupling (upper)	23	Locating plates
2	Bolt	24	Nyloc nuts
3	Earth cable (soldered in position)	25	Rack assembly
4	Rubber bushes	26	Shims
5	Dowel	27	Cap
6	Washer	28	Grease plug
7	Steering coupling (lower)	29	Shims
8	Nyloc nut	30	Spring
9	Pinch bolt	31	Plunger
10	Circlip	32	Rack
11	Retaining ring	33	Locknut
12	Shims	34	Sleeve nut
13	Bush	35	Lock tab
14	Thrust washer	36	Spring
15	Pinion shaft	37	Cup
16	Thrust washer	38	Tie-rod
17	Bush	39	Cup nut
18	Washer	40	Locking wire
19	Nyloc nut	41	Rubber gaiter
20	“U” bolts	42	Clip
21	Rubber bushes	43	Locknut
22	Abutment plates	44	Tie-rod end

Castor Angles

To decrease, add shims to the front bracket or remove shims from the rear.
To increase, reverse the procedure.

Camber Angles

To decrease, add an equal number of shims to both brackets.
To increase, reverse the procedure.

STEERING UNIT**Removal (Fig. 9)**

1. Remove item (9) from the coupling (7). Disconnect the earth strap, secured by item (28) at one end, from the bolt securing it to the front of the engine.
2. Referring to Fig. 10, extract the tie-rod ends (44) from the steering arms, after removing the securing nuts and washers.
3. Remove the L.H. engine bay valance.
4. Remove the nuts (24) and plates (23) (Fig. 8).
5. Using a sling and hoist, relieve the vehicle of the weight of the engine and remove the bolts (A) (Fig. 11).
6. Raise the L.H. side of the engine approximately $1\frac{1}{2}$ " (114 mm.), taking care not to damage the radiator top hose. Remove the "U" bolts (20) and rubber bushes (21) (Fig. 8).
7. Move the steering unit forward to disengage the coupling from the steering column and manoeuvre the unit from the vehicle, via the driver's side.

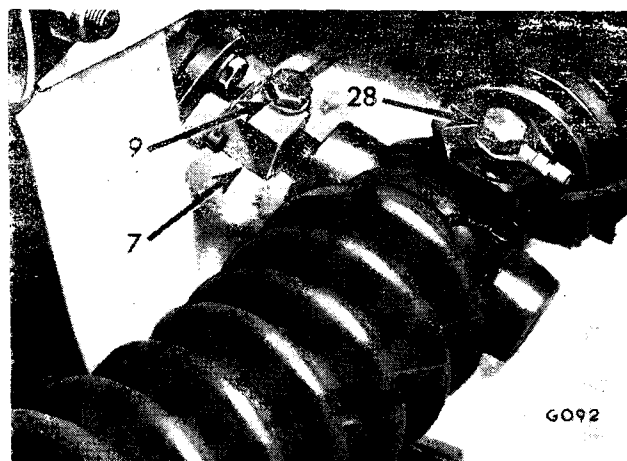


Fig. 9. Steering coupling and attachments

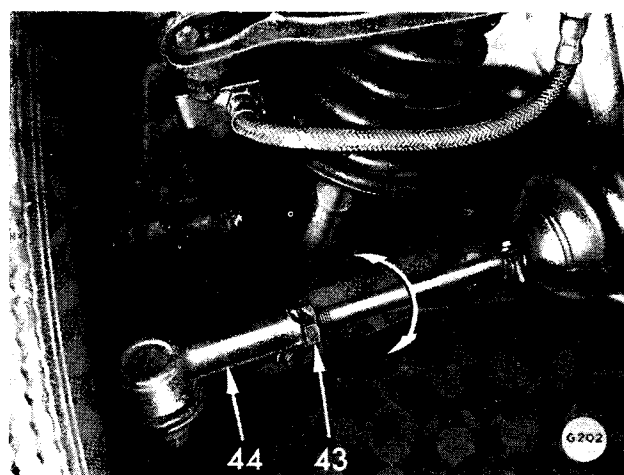


Fig. 10. Tie rod end

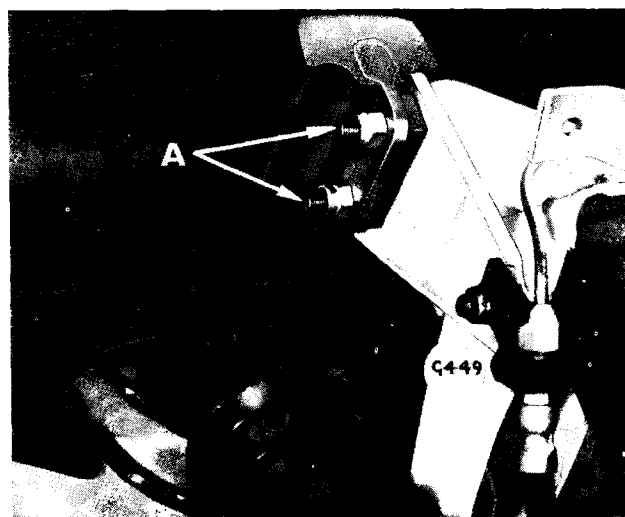
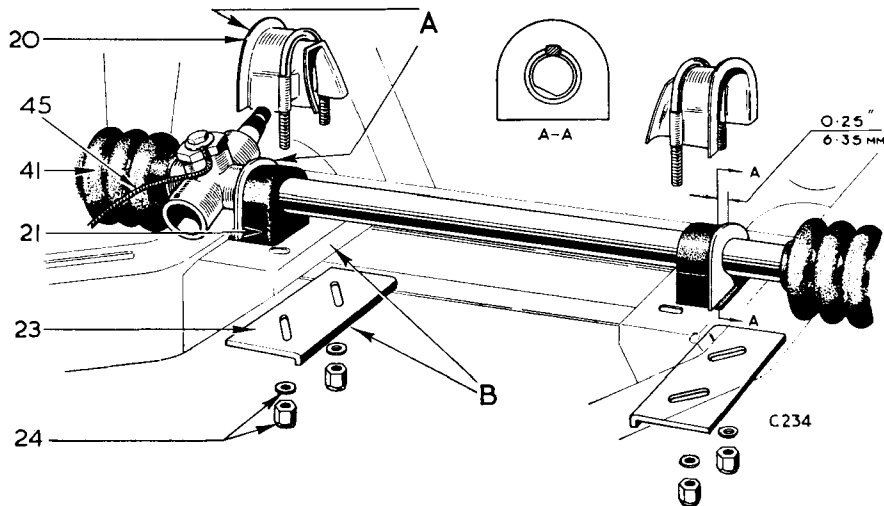


Fig. 11. Engine mounting bolts



- A Distance between flanges must be $\frac{1}{8}$ " (3.17 mm.)
- B Flange of item (23) must contact innermost flange of frame
- 20 "U" bolt
- 21 Rubber bush
- 23 Locating plates
- 24 Nyloc nuts
- 41 Rubber gaiter
- 45 Steering column earth cable

Fig. 12. Steering unit attachments

Refitting

1. Referring to Figs. 4 and 12, ensure that the steering unit is assembled to the dimensions given.
2. Rotate the pinion shaft from lock to lock, counting the number of revolutions. Turn the pinion shaft back half this number of rotations, thus centralizing the rack in relation to the pinion.
3. Position the steering wheel in the straight ahead position, *i.e.*, with the spokes horizontal and beneath the wheel boss centre.
4. With the engine hoisted, page 4-205, manoeuvre the steering unit through the wing valance aperture on the driver's side of the vehicle and engage the steering column in the flexible coupling.
5. Fit the rubber bushes (21) to the steering unit. Assemble the "U" bolts (20) as shown on Fig. 12 and loosely secure them with the plates (23) and nyloc nuts (24). Lower the engine, refit the engine mounting bolts and remove the sling.
6. Push the "U" bolt assemblies outwards until a $\frac{1}{8}$ " (3.175 mm.) clearance exists between the flange plates welded on the rack tube and the retainers welded to the "U" bolts.
7. Hold the "U" bolts in the position achieved in (6), while an assistant slides the plates (23) inwards to abut their flanged faces against the chassis frame flange. Tighten the nuts.
8. Fit the nyloc nut (8) and bolt (9) to the steering coupling (7) (Fig. 8).
9. Re-connect the earth strap from the steering unit to the front of the engine.
10. Refit the tie-rod ends (44) to the steering arms and secure with plain washers (18) and nyloc nuts (19) (Fig. 8).
12. Check the front wheel alignment adjusting, if necessary, to the figures given on page 4-202

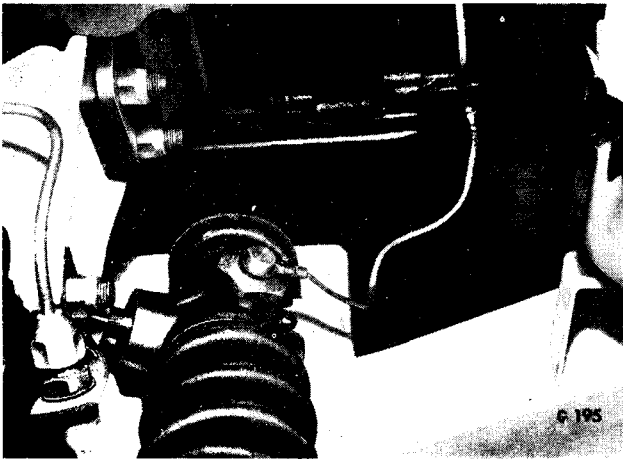


Fig. 13. Rack/engine earth connection

Steering Unit (Figs. 8, 14, 15 and 16)

Dismantling

Release the clips (42) and (40), and slide both bellows towards the outer ball joints. Slacken the locknuts (33) and unscrew both outer tie rod assemblies from the rack (32). Withdraw the coil spring (36) from each end of the rack.

Release the tabwasher (35), unscrew the sleeve nut (34) and remove the tabwasher (35), shims (26) and cup (37). Slacken the locknuts (43) and unscrew the outer ball joint assemblies (44) from the tie rods (38).

Remove the locknuts (43), rubber bellows (41), clips (42) and cup nut (39) from each outer tie-rod (38).

Remove the locknuts (33) from the ends of the rack. Unscrew the cap (27) and remove the shims (29), spring (30) and pressure pad (31) from the housing.

Remove the circlip (10) and withdraw the pinion assembly, taking care not to lose the dowel peg (5). Remove the retaining ring (11), shims (12), bush (13) and thrust washer (14). Detach the rubber "O" ring from the annular groove in the retaining ring (11).

Withdraw the rack (32) from the tube (25) and remove the thrust washer (16) and bush (17) from the pinion housing.

Inspection

Clean and examine all components for wear and damage, renewing parts as required. If necessary, renew the bush in the end of the rack tube, by drifting out the old bush and pressing in a new one.

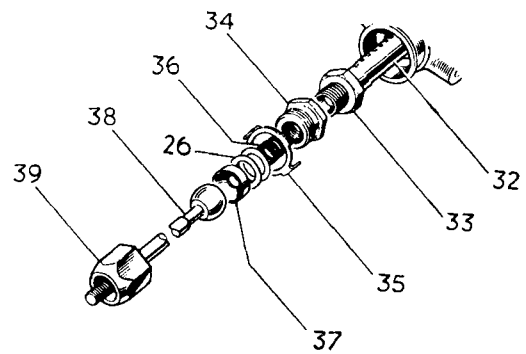


Fig. 14. Tie-rod inner ball joints

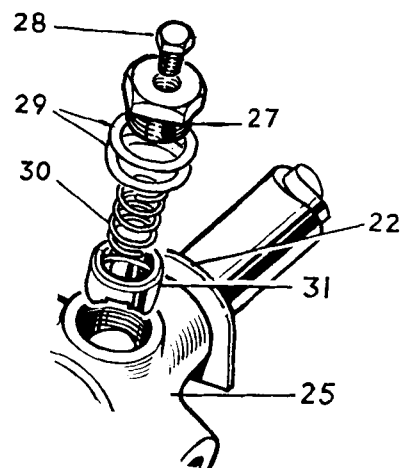


Fig. 15. Pinion thrust pad assembly

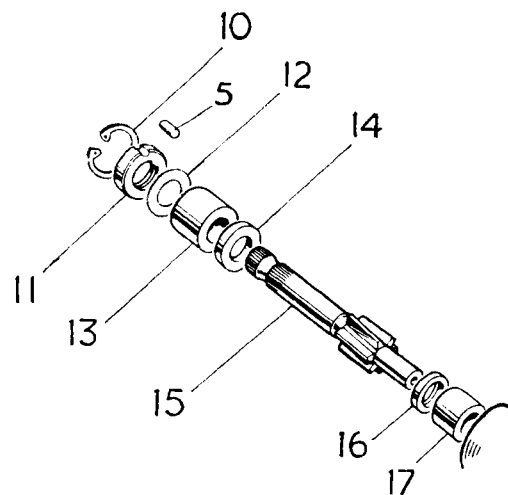


Fig. 16. Pinion assembly

Fig. 17.
Cross-section
through
steering unit

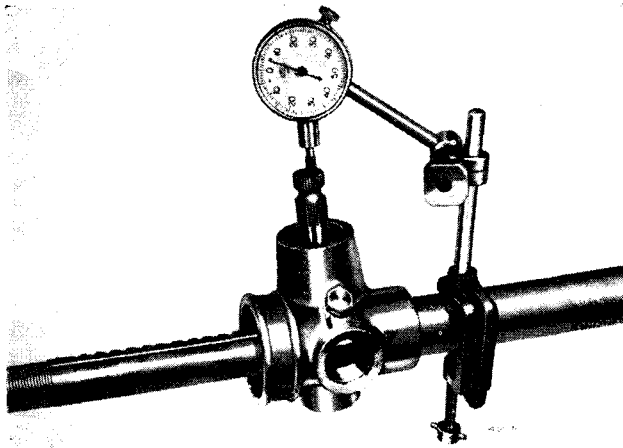
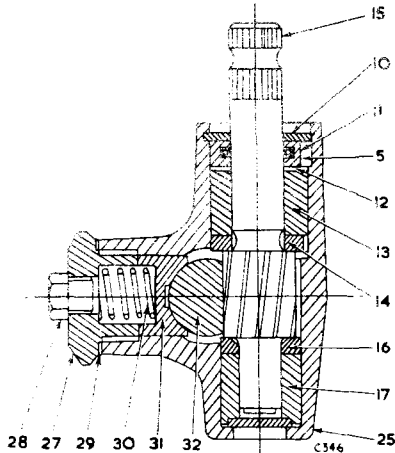


Fig. 18. Measuring pinion end float

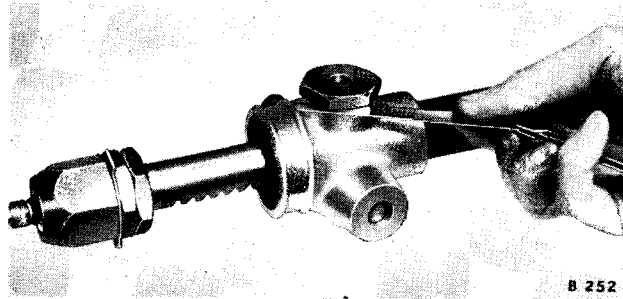


Fig. 19. Using feeler gauge to determine shim thickness required under cap nut

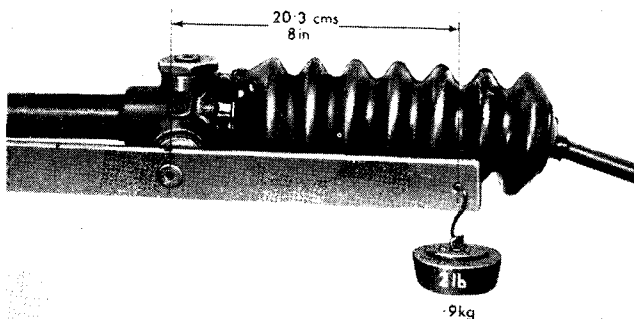


Fig. 20. Measuring load required to rotate pinion

Assembly (Fig. 8)

Insert the rack (32) into the tube and place the bush (17) and thrust washer (16) into the pinion housing (25).

Adjust the pinion end float as follows:

1. Assemble the thrust washer (14), bush (13) and retaining ring (11) to the pinion (15). Insert the assembly into the pinion housing and secure the pinion with the circlip (10).
2. Mount a dial gauge on the tube as shown on Fig. 18. Push the pinion down to its limit and zero the dial gauge. Lift the shaft until the retaining ring contacts the circlip and note the dial reading. This represents the total pinion shaft end float. Remove the circlip (10) and withdraw the pinion shaft assembly. Remove the retaining ring (11) and fit a new rubber "O" ring.
3. Make up a shim pack to give minimum end float consistent with free rotation of the pinion shaft. Shims are available in 0.004" (0.102 mm.) and 0.010" (0.254 mm.) thickness.
4. Assemble the shim pack (12) and retainer ring (11) to the pinion. Re-insert the assembly into the housing and finally secure it by fitting the dowel (5) and circlip (10).

Adjust the pinion pressure pad as follows:

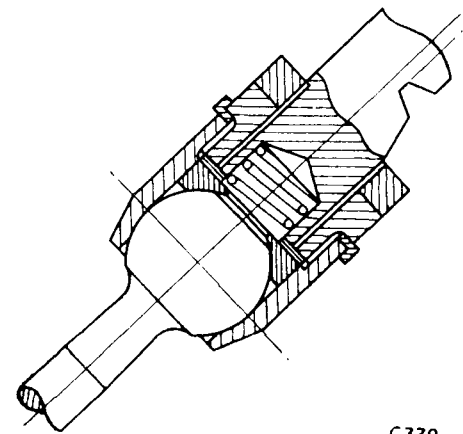
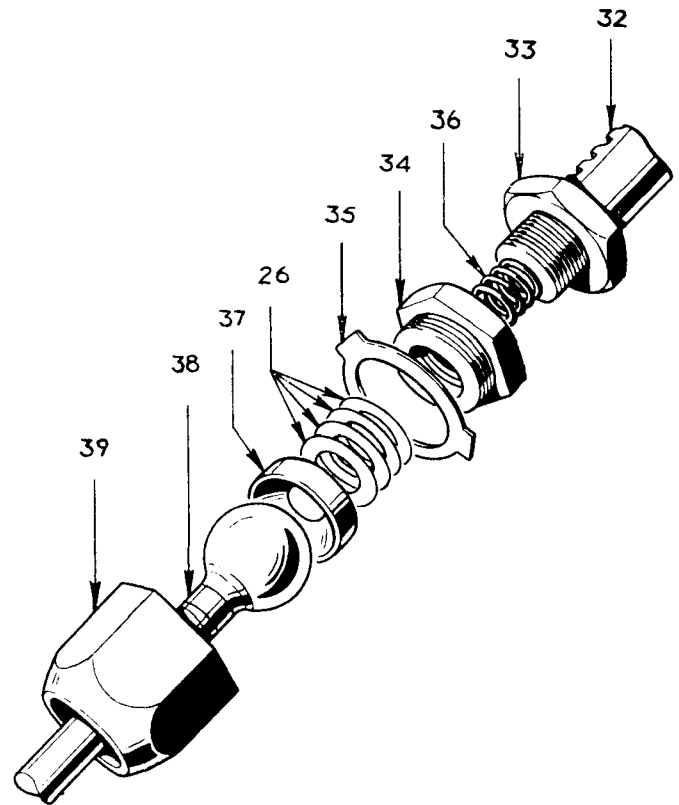
5. Fit the plunger (31) and cap nut (27) to the pinion housing (25). Tighten the nut to eliminate all end float and, using feeler gauges, measure the clearance between the nut and housing as shown on Fig. 19. Remove the cap nut (27) and plunger (31).
6. Make up a shim pack equal to the cap nut to housing clearance, plus 0.004" (0.1 mm.).
7. Pack the unit with grease and assemble the cap nut (27), shim pack (29), spring (30) and plunger (31) to the housing (25) and tighten the cap nut.
8. When the nut is correctly adjusted, a force of 2 lb. (0.91 kg.) is required to rotate the pinion shaft at a radius of 8" (20.3 cm.) see Fig. 20. Check and re-adjust the unit, if necessary, by adding or subtracting shims from beneath the cap nut (27).

Assembling and Adjusting Tie-rod Inner Ball Joints (Fig. 21)

1. Slide the cup nut (39) over the tie-rod (38) and insert the cup (37) into the cup nut (39).
2. Position the lock tab (35) over the sleeve nut (34) and screw this fully into the cup nut (39). With the cup nut held in a vice, move the tie-rod (38) axially to determine the approximate shim pack thickness required. Remove the assembly from the vice and remove sleeve nut (34).
3. Prepare a shim pack (26) in excess of the estimated ball end movement and insert this in the cup nut behind the cup (37).
4. Screw the sleeve nut (34) with lock tab (35) fully into the cup nut (39).
5. Using feeler gauges, measure the gap between the sleeve nut flange, lock tab (35) and cup nut face (39). This dimension, plus 0.002" (0.05 mm.) is the amount by which the trial shim pack must be reduced to give the correct ball end movement.
6. Dismantle the ball joint and re-assemble it with the correct shim pack determined in (5). Test adjustment by applying a load of 1½ lb. (0.681 kg.) at the outer end of the tie-rod (38), when the tie-rod should articulate freely. If necessary, adjust the shim pack until correct operation is obtained. Shims are obtainable in 0.002" (0.05 mm.) and 0.010" (0.254 mm.) thickness.
7. When adjustment is correct, lock the assembly by bending the lock tab (35) over the sleeve nut (34) and cup nut (39).

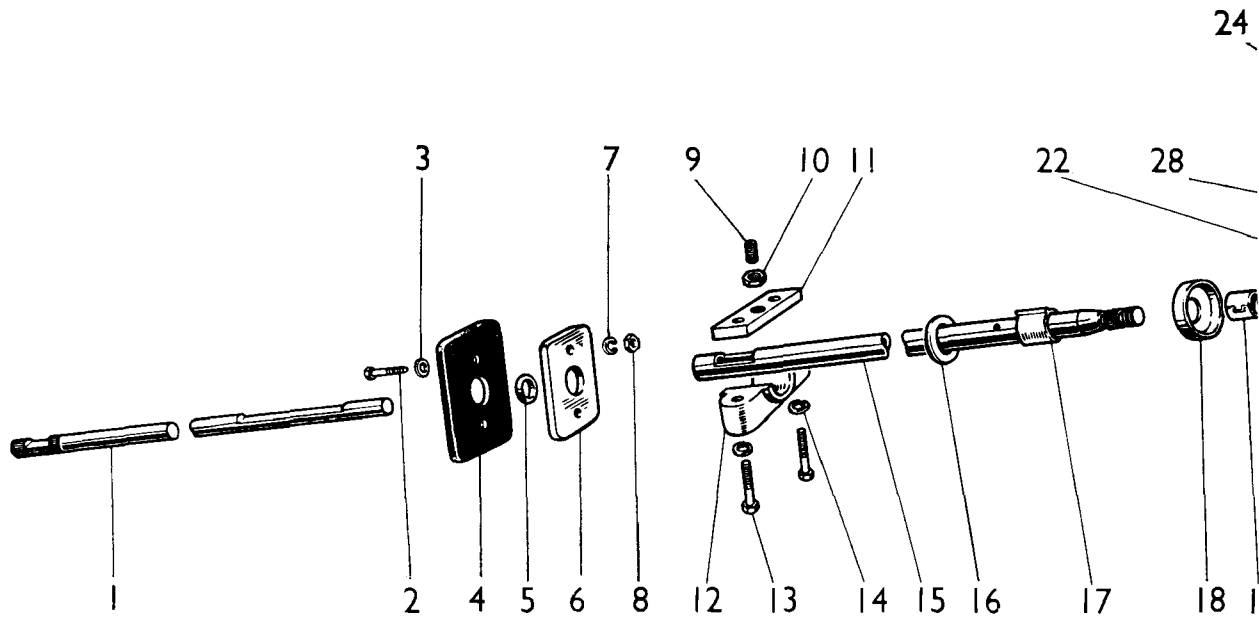
Refitting Ball Joint to Steering Rack

1. Screw the locknut (33) on to the end of the rack (32) so that its position corresponds with dimensions 3 + 4 + 5 + 3 on Fig. 4, *i.e.*, 24.42" (62.03 cm.) between inner locknut faces.
2. Insert the spring (36) into the end of the rack and screw the ball joint assembly as far as possible up to the locknut (33).
3. Push the bellows (41) on to the tie-rods (38).
4. Fit the locknuts (43) and outer tie-rod ends (44) to the tie-rods (38), adjusting them so that they correspond with dimensions 1 + 2 on Fig. 4, *i.e.* 10.14" (25.75 cm.).
5. Repack the bellows with grease (¼ oz. of Retinax "A") and secure them in position with clips (42) and wire (40).



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Fig. 21. Tie-rod coupling details



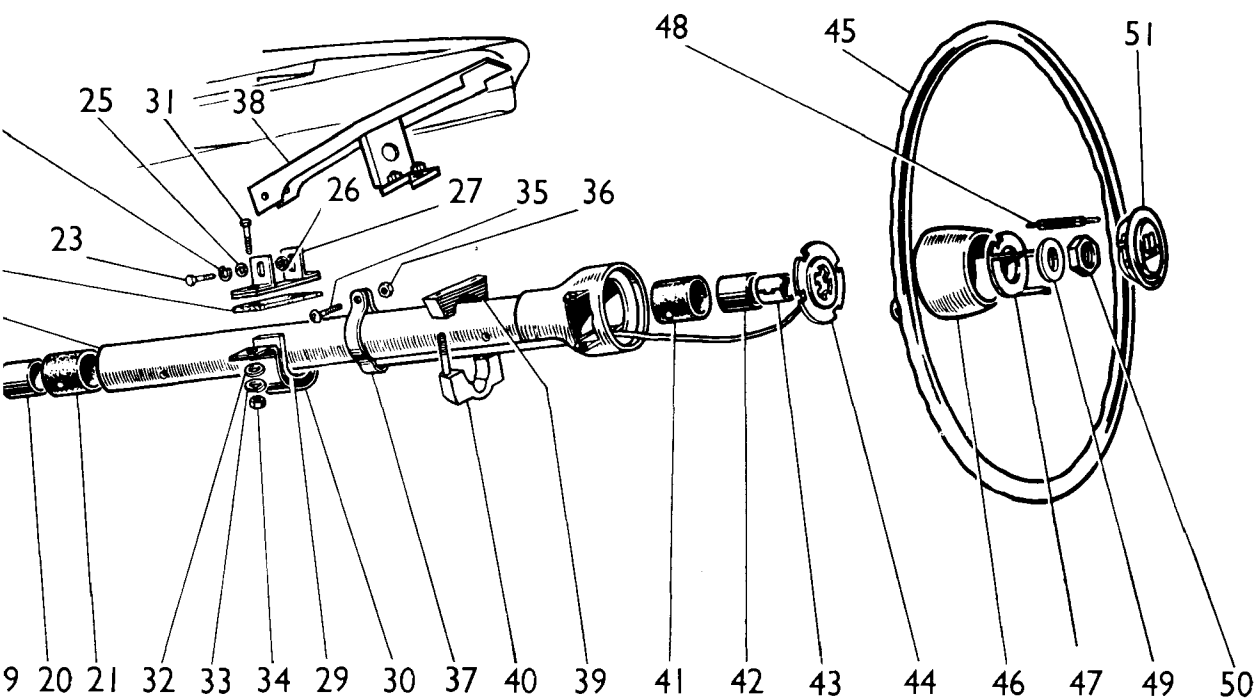
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Key to Fig. 22

- | | |
|--|-----------------------|
| 1 Inner steering column (Lower) | 27 Bracket |
| 2 Bolt | 28 Felt pad |
| 3 Washer | 29 Felt pad |
| 4 Rubber seal | 30 Outer column sup |
| 5 Washer | 31 Bolt |
| 6 Retaining plate | 32 Plain washer |
| 7 Spring washer | 33 Spring washer |
| 8 Nut | 34 Nut |
| 9 Impact clamp adjusting screw | 35 Bolt |
| 10 Lock nut | 36 Nut |
| 11 Impact clamp (upper) | 37 Cable trough clip |
| 12 Impact clamp (lower) | 38 Support bracket |
| 13 Impact clamp bolts | 39 Outer column upp |
| 14 Spring washers | 40 Outer column upp |
| 15 Upper inner steering column | 41 Rubber bush |
| 16 Nylon washer | 42 Steel sleeve |
| 17 Direction indicator cancelling ring | 43 Nylon bush |
| 18 End cap | 44 Horn contact ring |
| 19 Nylon bush | 45 Steering wheel |
| 20 Steel sleeve | 46 Steering wheel bos |
| 21 Rubber bush | 47 Spring clip |
| 22 Outer steering column | 48 Contact brush |
| 23 Bolt | 49 Washer |
| 24 Spring washer | 50 Steering wheel nut |
| 25 Plain washer | 51 Horn push assemb |
| 26 Nut | |

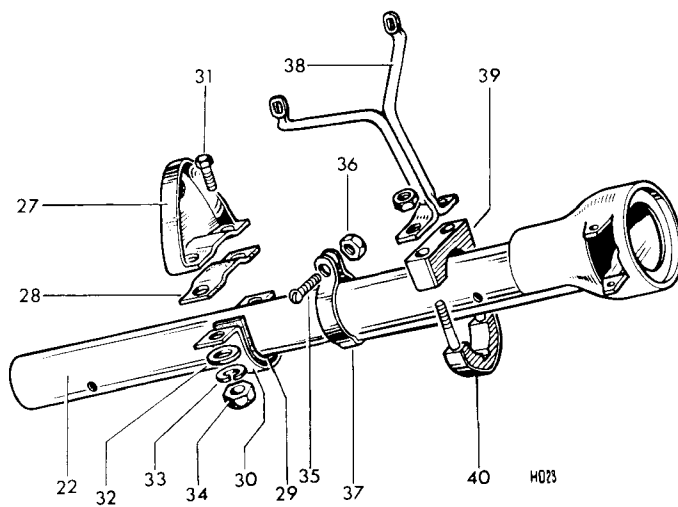
Fig. 22. Steerir

RING



port clamp (lower)

er support clamp (top half)
er support clamp (lower half)



Vitesse condition

g column details

STEERING COLUMN

Removal

1. Remove the bolt (A) from the steering coupling (7), Fig. 23.
2. Disconnect the steering head cables at their snap connectors beneath the fascia, and note the colours to facilitate re-assembly.
3. Referring to Figs. 22 and 24, remove the outer column support clamp (30) (lower) and the lower portion of the steering column upper clamp (40).
4. Withdraw the steering column assembly from the vehicle.

To Dismantle

1. Remove the cable trough (37).
2. Prise the horn push assembly (51) from the steering wheel boss and withdraw the contact brush (48).
3. Remove the switch covers and detach each switch from the column.
4. Remove the bolts (13), spring washers (14), and detach the halves of the impact clamp (11) and (12). Withdraw the lower column (1) downwards and detach the nylon washer (16). Withdraw the upper inner column (15) and the steering wheel (45) from the top of the outer column (22).
5. Hold the column (15) in the protected jaws of a vice and remove the nut (50), plain washer and spring clip (47). Use an extractor to remove the wheel from the column.
6. Remove the end cap (18) and depress the protrusions on the rubber bushes (21) and (41) as shown on Fig. 27. Using a length of bar, eject the bushes from the outer column (22). Remove the metal inserts (20) (42) and nylon bushes (19) (4) from the rubber bushes.

Re-Assembly

1. Assemble the nylon bush (19) and steel sleeve (20) to the rubber bush (21) and push the assembly into the bottom of the outer column (22) engaging the locating lugs with the holes as shown on Fig. 27. Ensure that the metal reinforcement ring at the end of the bush is positioned towards the lower end of the column. Repeat the procedure with the upper bush assembly.
2. Fit the end cap (18) to the lower end of the column (22).

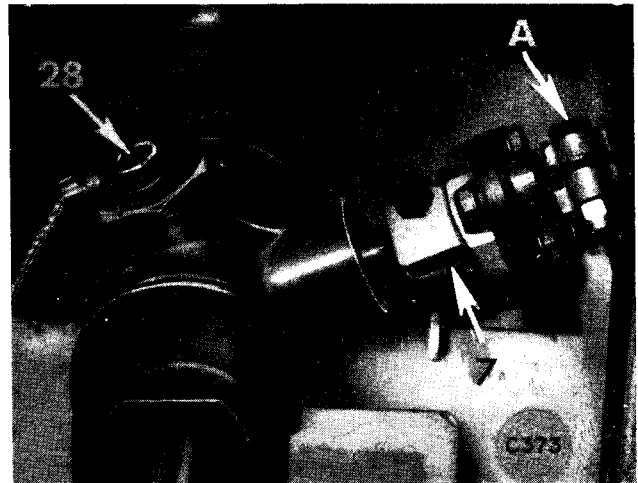


Fig. 23. Steering unit coupling

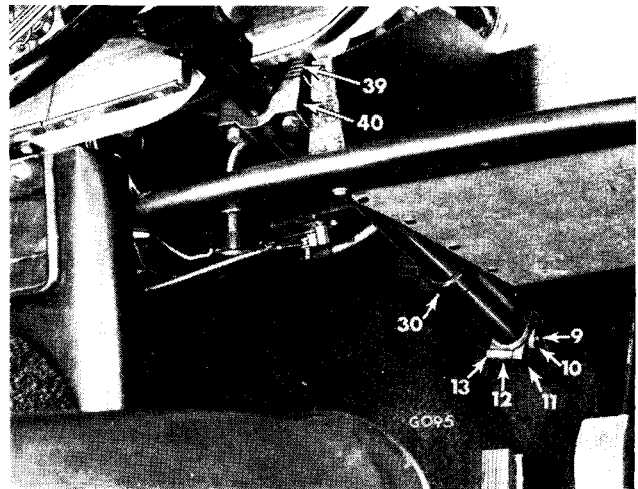


Fig. 24. Steering column clamps

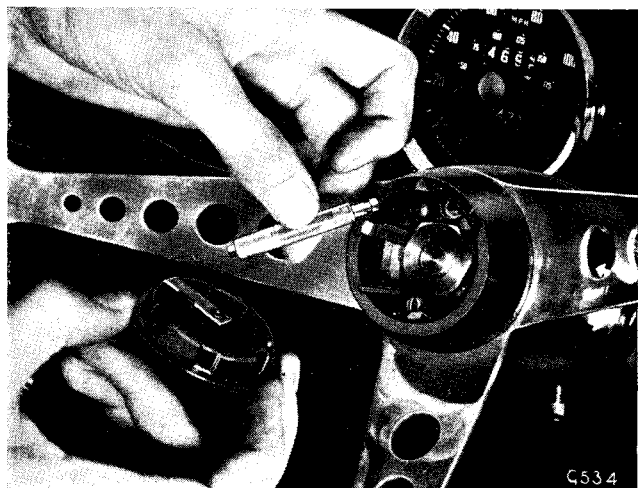


Fig. 25. Withdrawal of contact brush

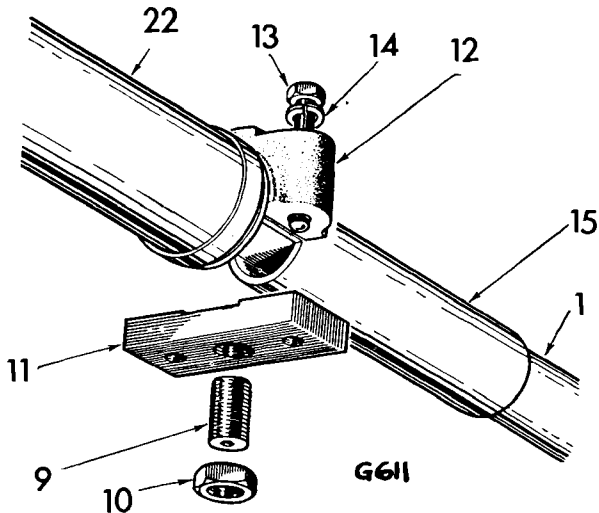


Fig. 26. Impact clamp details

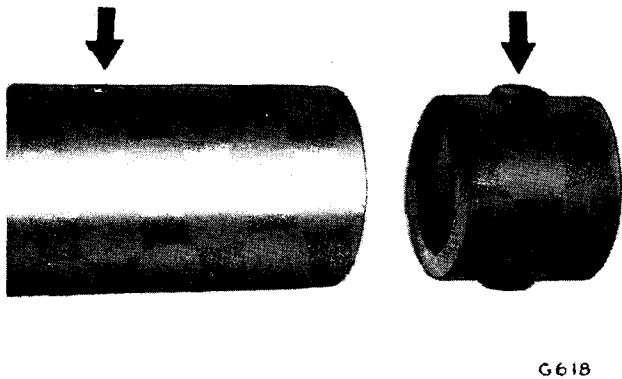


Fig. 27. Protrusions on rubber bushes

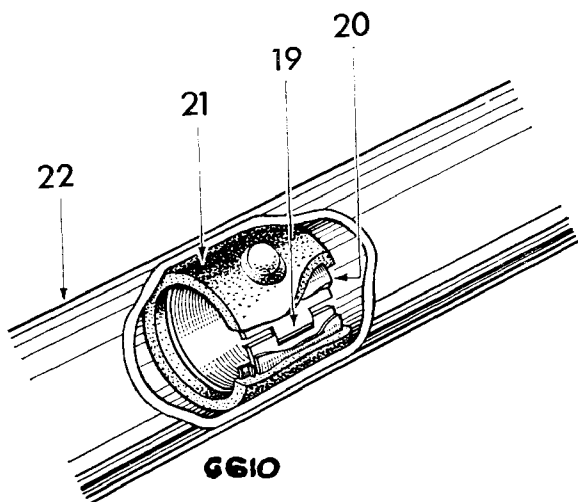


Fig. 28. Rubber, steel and nylon bushes

3. Fit the steering wheel to the inner column (15), aligning the direction indicator cancelling lugs on the column to correspond with the steering wheel spokes. Fit the clip (47) and plain washer and secure with the nut (50). Peen the metal of the nut to the inner column to prevent it unscrewing.
4. Insert the inner column (15) into the outer column (22), taking care not to dislodge the bushes.
5. Pass the cables of the direction indicator and lighting switches through the apertures in the upper end of the outer column, and fit the switches and covers.
6. Insert the horn contact plunger (48) into the steering wheel boss and fit the horn button assembly (51).
7. Fit the lower column (1) and assemble the impact clamps (11) (12), leaving the bolts (13) slack at this stage.

To Refit the Column Assembly

1. Fit the steering column assembly to the vehicle, passing the column through the rubber grommet in the bulkhead.
 2. Fit the cable trough and the lower half of the upper support clamp (40).
 3. Fit the lower clamp (30) with felt (29) and secure with nuts (34) and washers (33) and (32).
 4. Position the steering wheel at the desired height and tighten the clamps (30) and (40).
 5. With the steering wheel and road wheels in the straight ahead position, engage the lower column (1) with the steering coupling Fig. 23, and secure with the pinch bolt and nut "A".
 6. Re-tighten the bolts (13) on the impact clamp (12). Using a socket key tighten the screw (9), Fig. 26, by hand as much as possible without bending the wrench. Tighten the locknut (10).
- NOTE: The column will be unable to telescope if adjusted to its lowest position.
7. Re-connect the horn, direction indicator and lighting cables at the snap connectors and re-clip the cables beneath the facia.

STEERING COLUMN GT6 Mk. 3

Removal

- 1 Disconnect the battery.
- 2 Remove the driver's parcel shelf.
- 3 Remove the pinch bolt securing the steering mast to the flexible coupling.
- 4 Remove the nuts, spring and plain washers from the two bolts securing the steering column forward bracket.
- 5 Withdraw forward support housing and felt liner.
- 6 Disconnect connections for horn, trafficators and lights.
- 7 Disconnect electrical plug from steering column lock.
- 8 Remove the two cap screws securing the steering column rear bracket and withdraw both clamp halves and upper screwed plate.
- 9 Withdraw steering column complete with tie-bar.

To dismantle

- 1 Remove the steering wheel.
- 2 Remove the lights and trafficator, switches.
- 3 Unlock the steering column lock.
- 4 Remove the two set bolts and spring washers securing the safety clamp and remove the safety clamp and thrust washer.
- 5 Withdraw the lower mast.
- 6 Withdraw the cap from the lower end of the steering column tube and remove the tubular cardboard distance piece.
- 7 Move the upper steering mast axially towards the upper end of the column tube, and remove the trafficator cam.
- 8 Move the steering mast axially towards the lower end of the column tube until the column is felt to butt against the column tube lower bush.
- 9 Depress the rubber locating buttons on the column lower bush and withdraw the steering mast and the lower bush.
- 10 Remove the lower bush from the mast.
- 11 Remove the upper bush from the column tube.

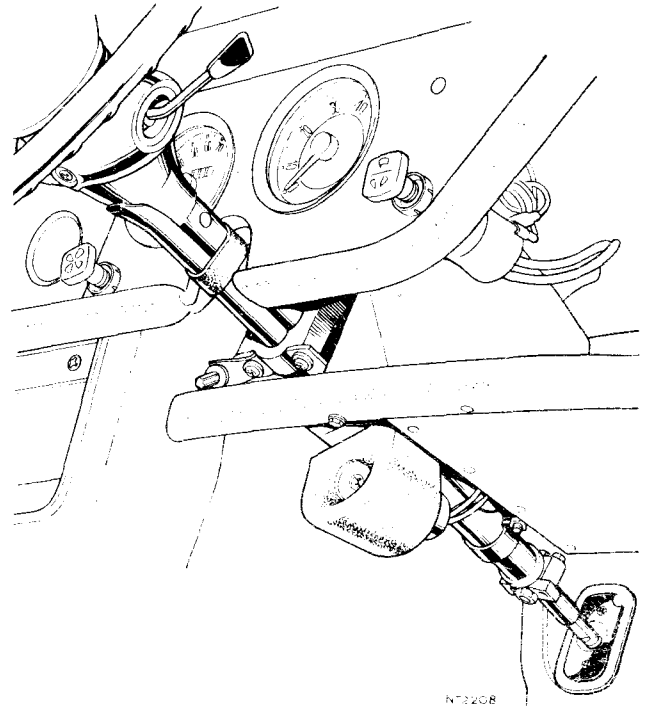


Fig. 29 GT6 Mk. 3 Steering Column

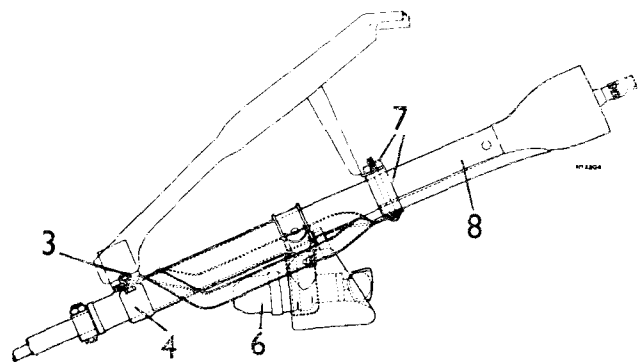


Fig. 30 Steering column connections

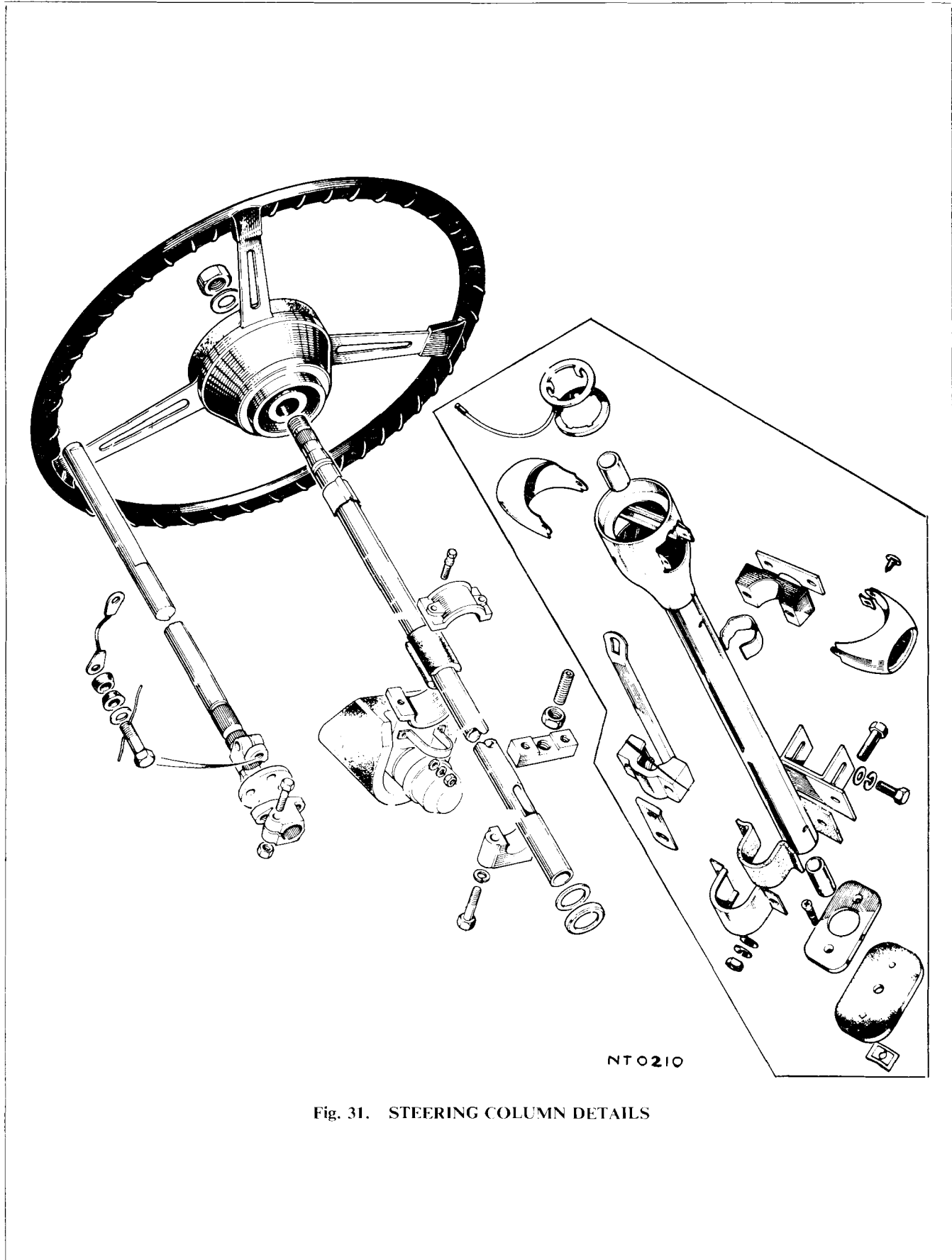


Fig. 31. STEERING COLUMN DETAILS

Re-Assembly

- 1 Fit a new upper bush to the column tube ensuring that it is entered with the rubber dots on the end face of the bush leading. That is with the rubber dots towards the bottom of the column tube.
- 2 Enter the steering mast from the bottom of the column tube ensuring that the upper bush is not displaced and that the rubber locating dowels remain aligned with the holes in the column tube.
- 3 Enter the lower bush in the column tube ensuring that the rubber dots on the end face of the bush are trailing (dots to bottom of tube) and that the rubber locating dowels engage the holes in the column tube.
- 4 Fit the trafficator cam.
- 5 Fit the end cap to the column tube.
- 6 Fit the lower steering mast.
- 7 Align the flat on the lower mast with the slot on the upper mast and fit the thrust washer and safety clamp. Do not tighten the safety clamp at this stage. The safety clamp must be tightened after the column is installed in the car and the position of the lower column determined.
- 8 Fit the lights and trafficator switches.
- 9 Fit the steering wheel

To refit the column assembly

- 1 Locate road wheels in straight ahead position.
- 2 Hold steering wheel with two spokes horizontal and the third spoke towards drivers seat and engage lower end of steering mast in splines of flexible coupling.
- 3 Fit and tighten pinchbolt in flexible coupling.
- 4 Slide cardboard tube rearwards and fit felt over steering mast housing ensuring ends of felt are below mast housing.
- 5 Engage forward ends of tie-bar in forward mounting bolts.
- 6 Fit felt housing and engage forward mounting bolts. Fit plain and spring washers and nuts to mounting bolts.
- 7 Ensure spring clip is fitted on mast housing to align with rear clamp bracket.
- 8 Fit upper and lower clamp halves to mast housing.
- 9 Place screwed plate in bracket above clamp halves.
- 10 Enter cap bolts through tie bar, upper and lower clamp halves, and mounting bracket and engage screwed plate. Tighten cap bolts.
- 11 Tighten bolts and nuts securing forward bracket.
- 12 Make good connections to horn, lights, trafficators and steering lock.
- 13 Fit drivers parcel tray.
- 14 Connect battery.

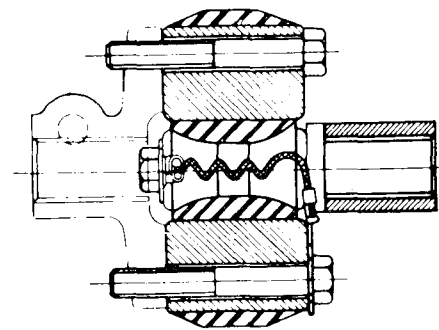


Fig. 32 Steering Column flexible coupling

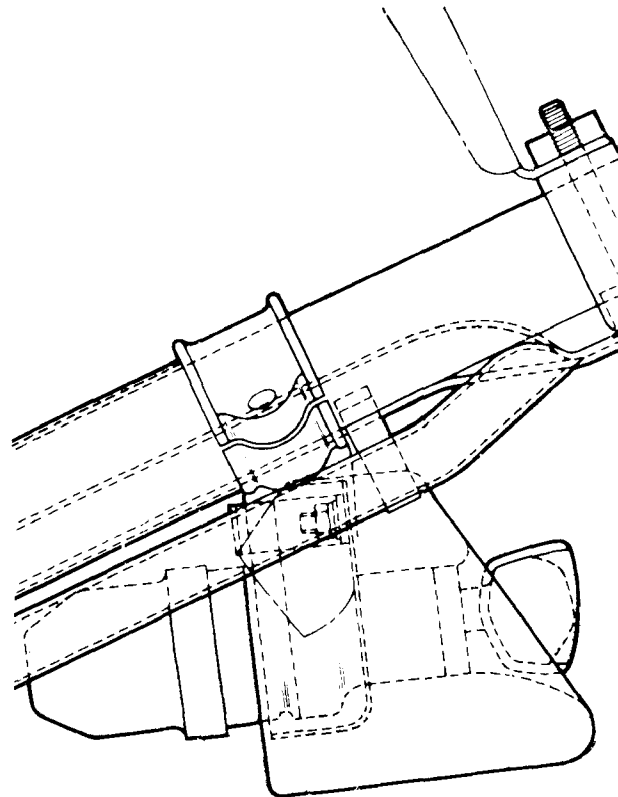
STEERING COLUMN LOCK/IGNITION SWITCH

Removal

1. Remove steering column assembly.
2. Remove the two nuts and washers securing steering lock shroud and withdraw shroud and steering column tie-bar.
3. With a centre punch mark the centre of the two shear bolt heads securing the steering lock clamp bracket.
4. Using a small chisel unscrew the shear head bolts.
- or
- 4a If instruction 4 proves unsuccessful drill into the shear bolt heads where previously marked by centre punch and using an Easiout extractor unscrew the shear-heads bolts.
5. Remove the steering lock.

Refitting

6. Offer up steering column lock to steering column and locate the dowel in the column drilling.
7. Fit steering lock clamp and secure with two new shear bolts.
8. Evenly tighten shear bolt until heads shear.
9. Install steering column assembly in car.



NT 2209 A

Fig. 23 Steering column lock

TRIUMPH GT6 and VITESSE 2-litre WORKSHOP MANUAL

GROUP 5

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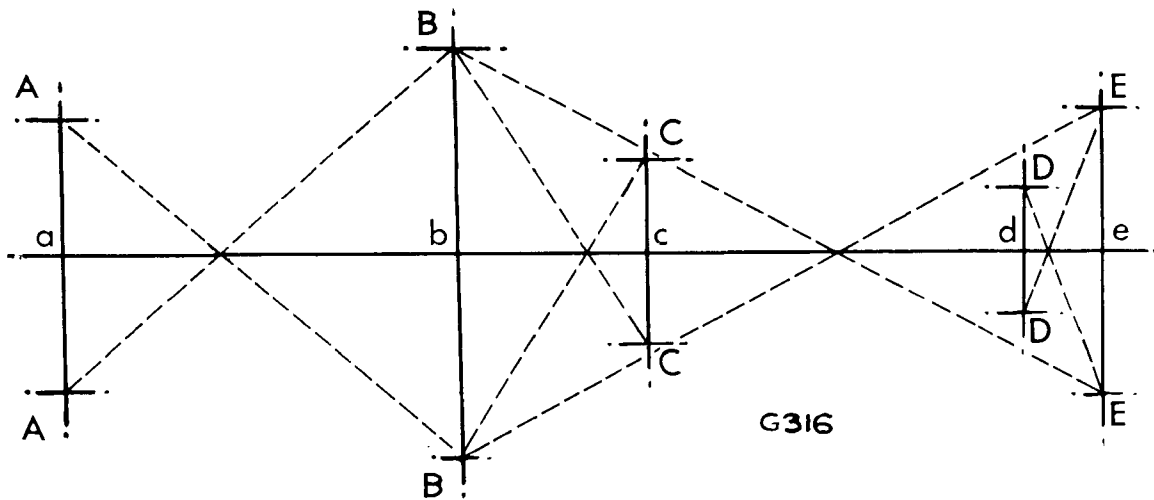


Fig. 1. Diagonal checking diagram

Assessment of Damage

Severe damage to the chassis is apparent; however, damage of a less serious nature may cause distortion of the frame which may not be readily detected visually.

If a check on the steering and suspension geometry reveals distortion of the chassis; check for twist and squareness.

Checking for Twist

With the vehicle on a clean level floor, place a jack under each jacking point and raise the vehicle sufficiently to enable the road wheels to be removed.

Adjust the jacks until the following conditions are achieved:—

Points "A" are 25.29 in. (64.23 cm.)

and

Points "E" are 24.94 in. (63.35 cm.) above the floor.

This condition sets the datum 20 in. (50.8 cm.) above the floor.

If it is impossible to equalise the heights of points "A", then the chassis is twisted, the amount of twist being the difference in height of points "A".

Checking for Squareness

Position the vehicle as previously described and, referring to Fig. 2, transfer the lettered points to the floor using a plumb-bob and fine cord.

Letter the points transferred to the floor and connect each pair by drawing a straight line between them, as Fig. 1.

Mark and letter the central point of each line and place a straight-edge along these mid-points. The frame may be considered true when the straight-edge passes through all of these points.

Continue a further check for squareness as follows:—

Using a straight-edge mark the diagonals as shown dotted in Fig. 1. If the frame is square then each pair of opposite diagonals must be equal in length and the points of intersection of each pair of diagonals must lie on the same straight line.

Chassis distortion is assessed by the amount and direction which any central point on the transverse line and/or the point of intersection of any pair of diagonals deviates from the centre line.

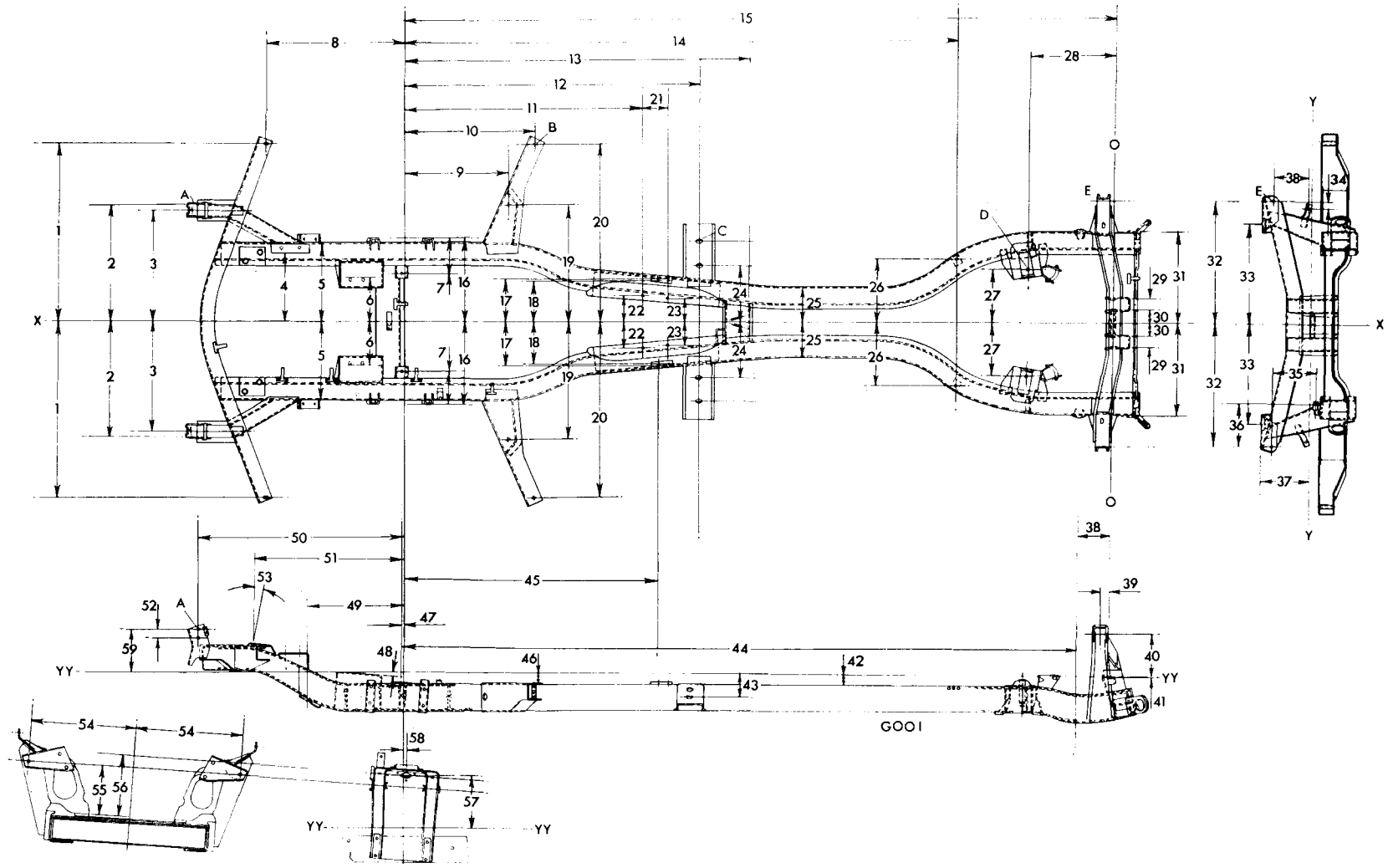


Fig. 2. GT6 chassis frame dimensions

Key to Fig. 2

	Inches		Centimetres			Inches		Centimetres	
1	22.09	22.15	56.11	56.26	31	11.22	11.28	28.50	28.65
2	* 14.56		36.98		32	14.75		37.46	
3	13.72	13.78	34.84	34.99	33	12.00		30.48	
4	8.50		21.59		34	*0.78		1.98	
5	9.72	9.78	24.69	24.84	35	5.47		13.89	
6	5.50	5.53	13.97	14.04	36	5.13		13.03	
7	4.30	4.32	10.92	10.97	37	6.22		15.80	
8	17.25	17.37	43.81	44.12	38	*4.25		10.79	
9	12.72	12.78	32.31	32.46	39	1.00	1.12	2.54	2.84
10	16.03	16.09	40.11	40.26	40	4.88	5.00	12.40	12.70
11	29.50	29.62	75.41	75.71	41	0.15		0.38	
12	36.44	36.56	92.56	92.86	42	1.13		2.87	
13	41.94	42.19	106.53	107.16	43	2.74	2.80	6.96	7.11
14	68.10	68.22	172.97	173.27	44	83.26		211.48	
15	86.93	87.19	220.83	221.49	45	31.39	31.45	79.73	79.88
16	10.31		26.19		46	1.06		2.69	
17	5.36	5.39	13.61	13.68	47	0.26		0.66	
18	5.20	5.23	13.21	13.28	48	4½			
19	14.48	14.51	36.78	36.85	49	11.94	12.06	30.33	30.63
20	20.97	21.03	53.26	53.41	50	*25.47	25.59	64.69	64.99
21	2.98	3.02	7.57	7.67	51	18.75	18.88	47.62	47.95
22	3.21	3.23	8.15	8.20	52	*1.00		2.54	
23	2.89	2.91	7.34	7.39	53	5			
24	7.13	7.19	18.11	18.26	54	12.94	13.06	32.87	33.17
25	4.25		10.79		55	5.91		15.01	
26	7.80	7.83	19.81	19.88	56	7.31		18.57	
27	6.61	6.64	16.79	16.86	57	6.17	6.29	15.67	15.97
28	10.64	10.70	27.03	27.18	58	0.12	0.24	0.31	0.61
29	1.51		3.83		59	*5.26	5.32	13.36	13.51
30	1.61	1.62	4.08	4.10					

* These dimensions are not applicable to GT6 Mk. 2

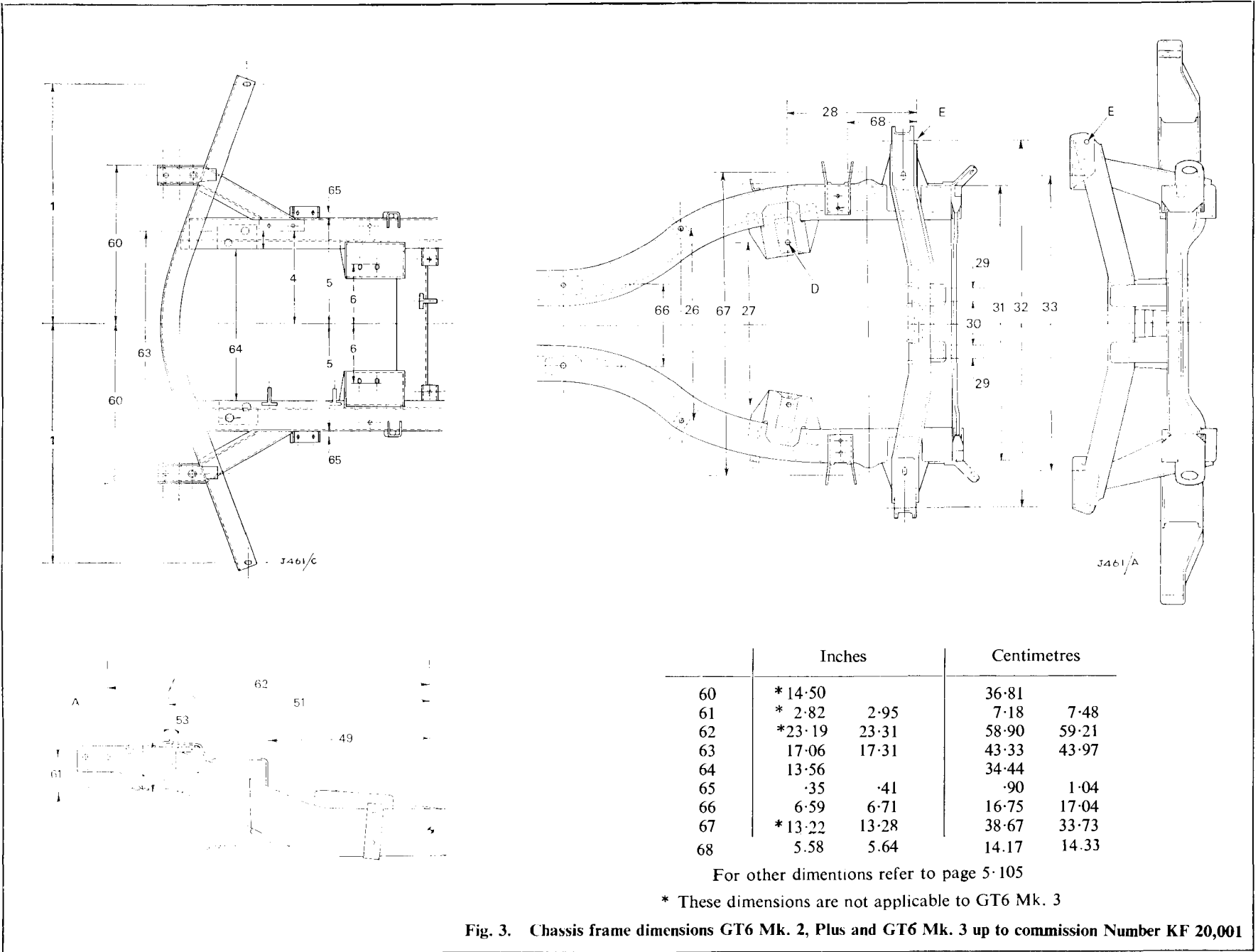


Fig. 3. Chassis frame dimensions GT6 Mk. 2, Plus and GT6 Mk. 3 up to commission Number KF 20,001

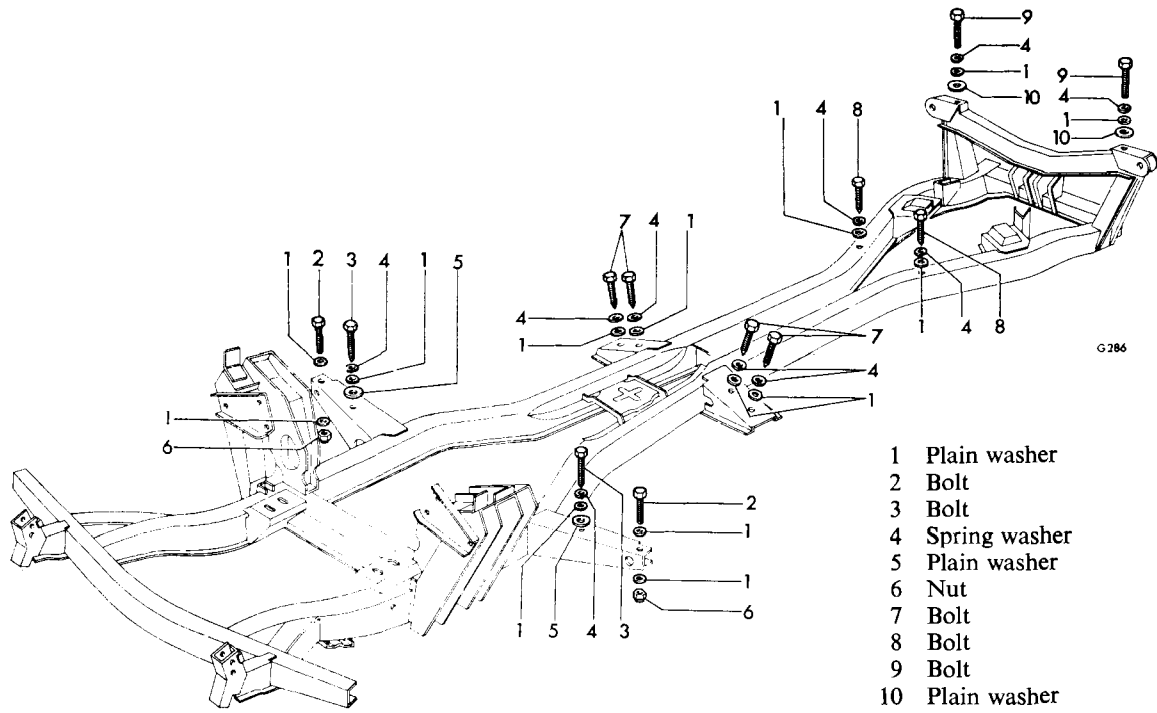


Fig. 1. Body mounting bolts

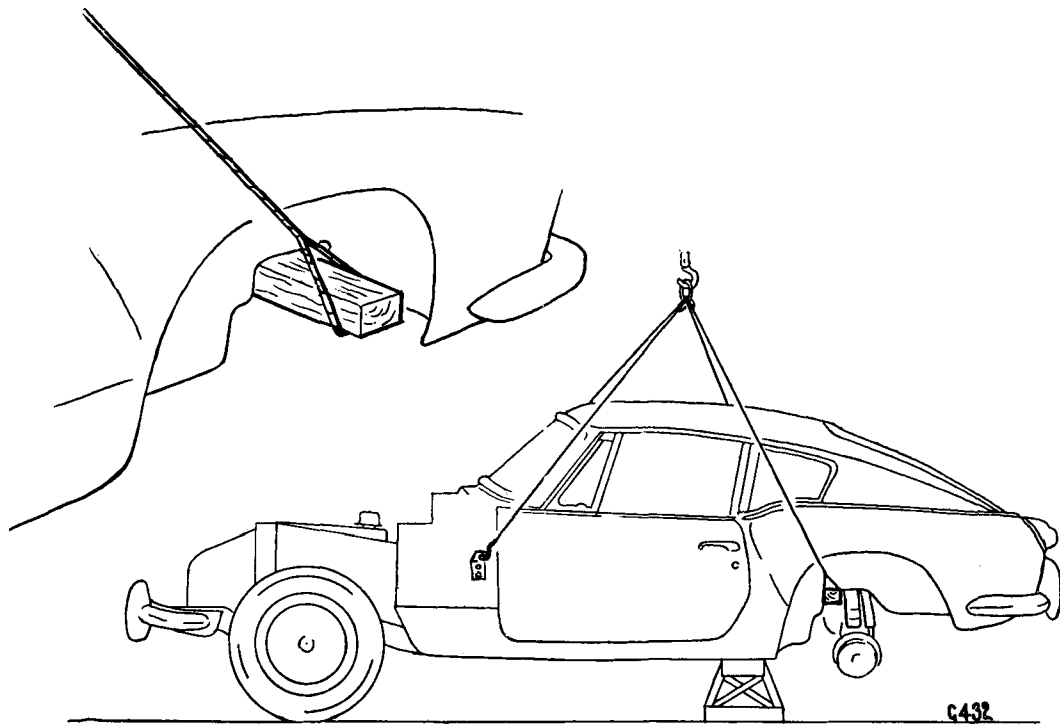


Fig. 2. Body lifting

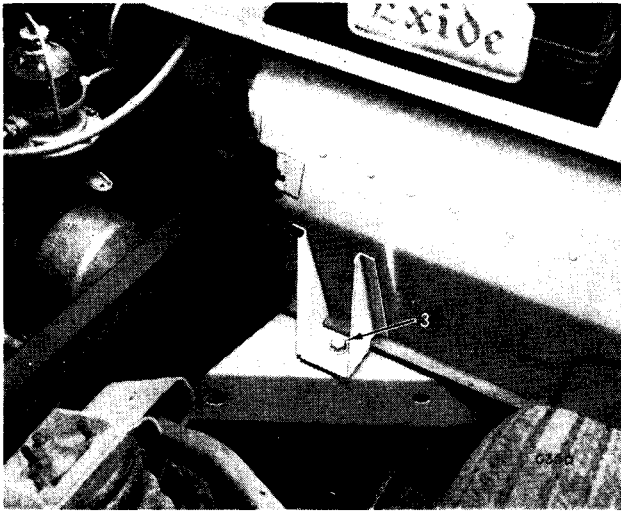


Fig. 3. Engine bay mounting points

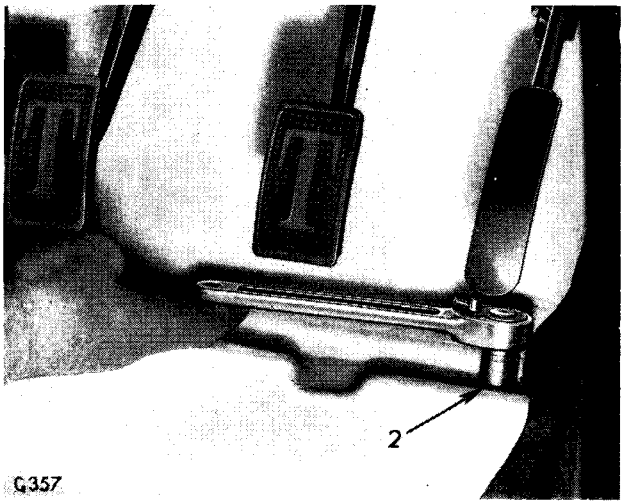


Fig. 4. Toe board mounting points

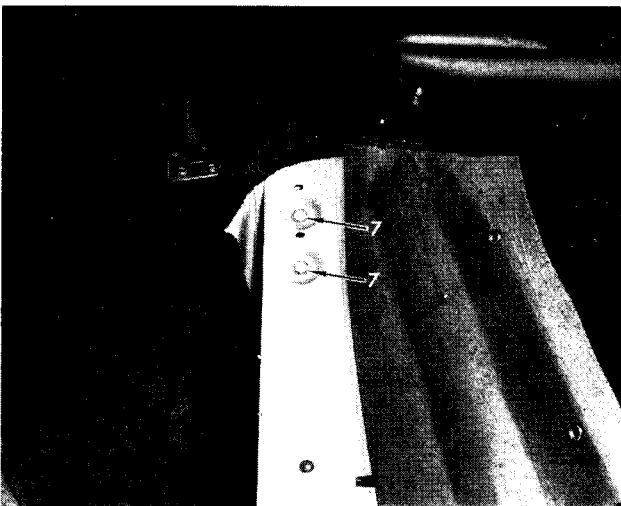


Fig. 5. Seat well mounting points

BODY REMOVAL

Remove the battery, drain the engine coolant and disconnect the following:—

Lighting cables at bonnet (Fig. 9);

Cables from temperature transmitter, oil pressure switch, generator, coil and earth wire from steering unit;

Tachometer drive cable from distributor;

Engine earth strap from top of clutch housing and starter motor lead;

Choke and accelerator controls;

Heater pipes and control cable at water valve (Fig. 25);

Handbrake cable at compensator pin.

Exhaust tail pipe.

Remove:—

Bonnet, page 5-204;

Engine bay side valances;

Brake hydraulic pipe between master cylinder and three way connector;

Seats, page 5-213;

Floor covering and passenger's toe-board, four screws;

Gearbox cover, page 2-207, disconnect speedometer drive cable and cables to actuator switches;

Detach clutch slave cylinder, page 2-105;

Fuel tank, page 5-221;

Spare wheel and freight floor.

Release all clips securing the main harness to the chassis and withdraw it clear of the engine and chassis.

Referring to Group 4, slacken the steering column impact clamp, release the clamp bolt from the lower steering coupling and push the inner column upwards, clear of the front suspension. Disconnect the rear suspension radius arms from the body.

Remove twelve bolts securing the body to the chassis. The bolts are located as follows:—

Two in the engine compartment (3), Fig. 3;

Two at the toe-board (2), Fig. 4;

Four in line with the end of the propeller shaft (7), Fig. 5;

Two to the rear of the seats (8), Fig. 6;

Two adjacent to the rear spring access cover (9), Fig. 7. These bolts are covered by grommets.

Make up two lifting brackets to the dimensions given in Fig. 8.

Remove the bonnet catch brackets (2) (Fig. 12) and fit the lifting brackets to the body.

Raise the rear of the body and pass a beam under the rear spring tunnel.

Sling the body as Fig. 2.

Lift off the body.

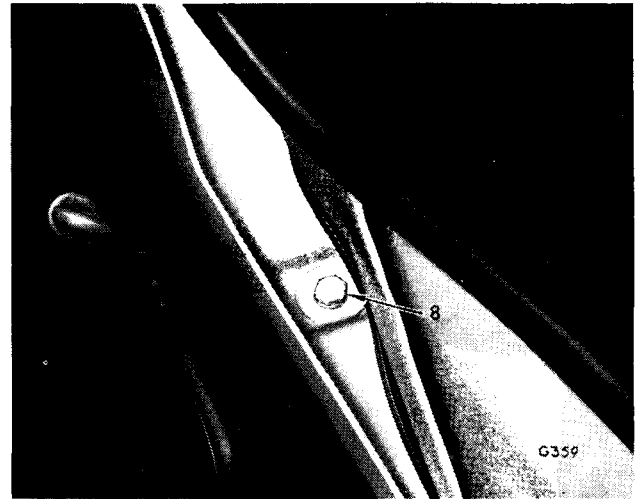


Fig. 6. Freight floor mounting points

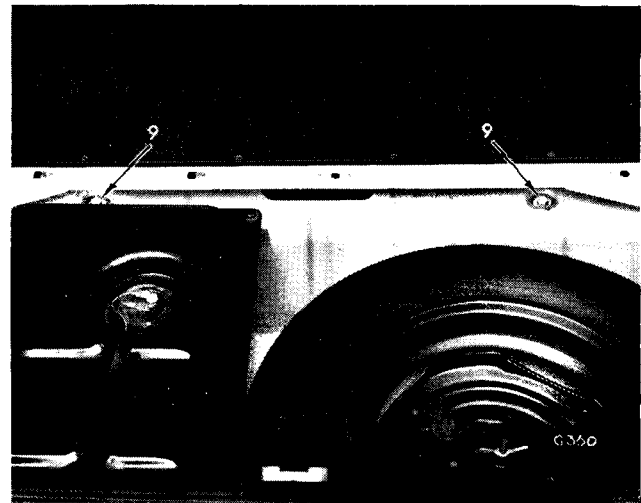


Fig. 7. Spring tunnel mounting points

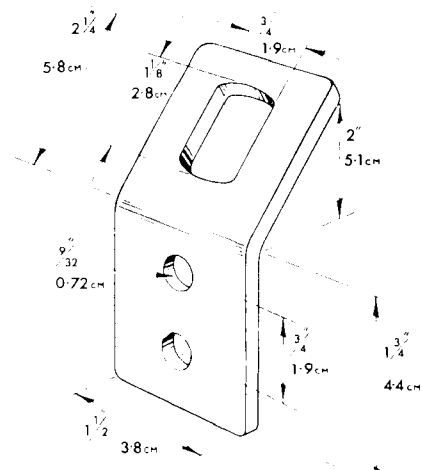


Fig. 8. Lifting bracket dimensions

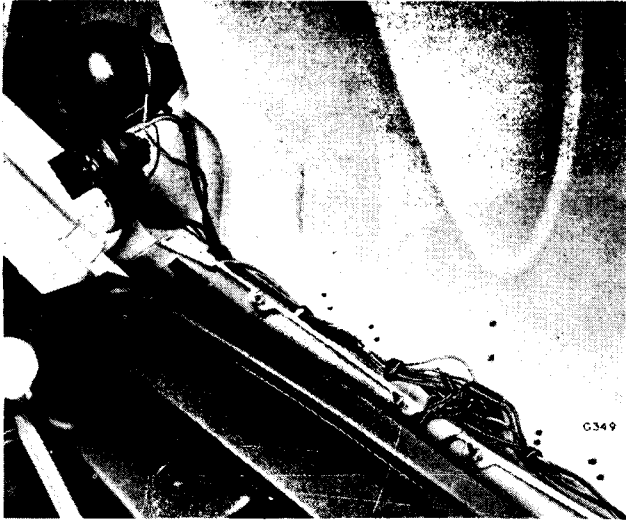


Fig. 9. Bonnet snap connectors

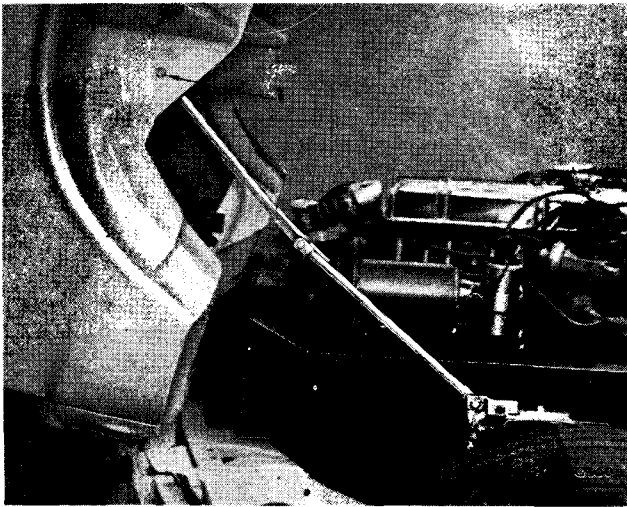


Fig. 10. Bonnet stay

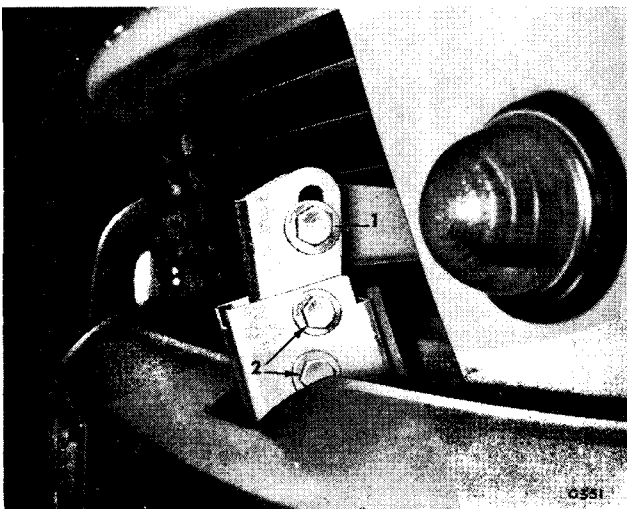


Fig. 11. Bonnet adjustment

BONNET

To Remove

Disconnect the battery.

Remove the overrides, one bolt in each.

Disconnect the front lighting and horn cables at the snap connectors (Fig. 9).

Remove the bolt (1) (Fig. 10) to disconnect the bonnet stay.

Close the bonnet and remove two bolts (1) (Fig. 11).

Lift off.

Refitting is the reverse of removal.

Height Adjustment. Front (Fig. 11)

Remove the overrides, one bolt in each.

Slacken the bolts (1) and raise the bonnet to give parallel gap between the rear vertical edge and the doors.

Retighten the bolts.

Refit the overrides.

Horizontal Adjustment

Remove the overrides, one bolt in each.

Slacken the bolts (2) and move the bonnet forwards or rearwards to achieve a parallel gap of $\frac{1}{8}$ " (3 mm.) between the bonnet and the scuttle and the doors.

Retighten the bolts.

Refit the overrides.

Height Adjustment, Rear (Fig. 12)

Slacken the locknut (1). Screw the buffer in or out to lower or raise the bonnet.

Re-tighten the locknut.

Re-adjust the bonnet fastener brackets (2).

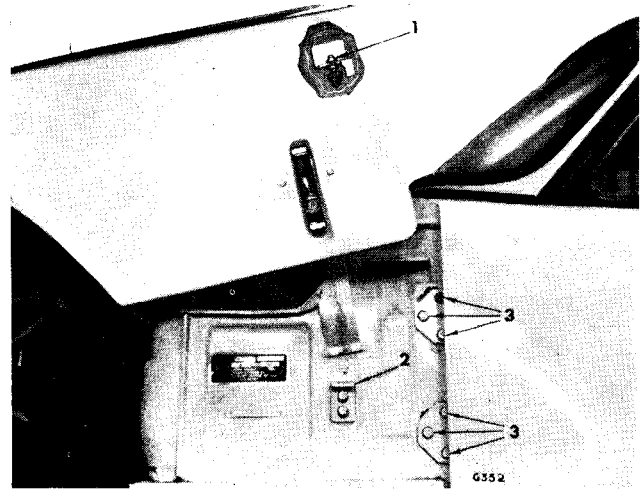


Fig. 12. Bonnet height adjustment

FRONTAL GRILLE**To Remove**

Remove eight screws (arrowed Fig. 13).

Collect two spacers from two top centre screws.

To Refit

Reverse the above procedure.

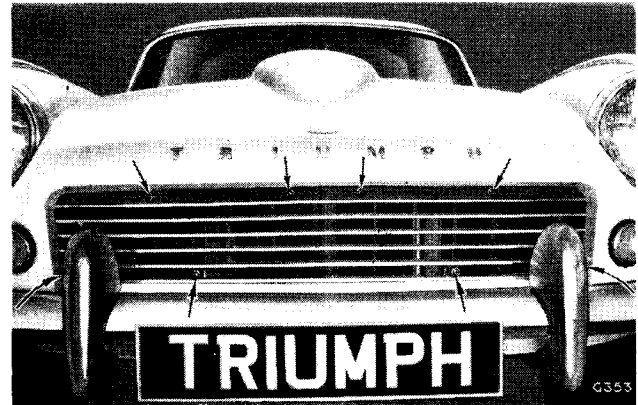


Fig. 13. Grille attachment

FRONT VALANCE**To Remove**

Remove front bumper brackets, three bolts in each.

Remove eight screws (arrowed Fig. 14).

To Refit

Reverse the above procedure.

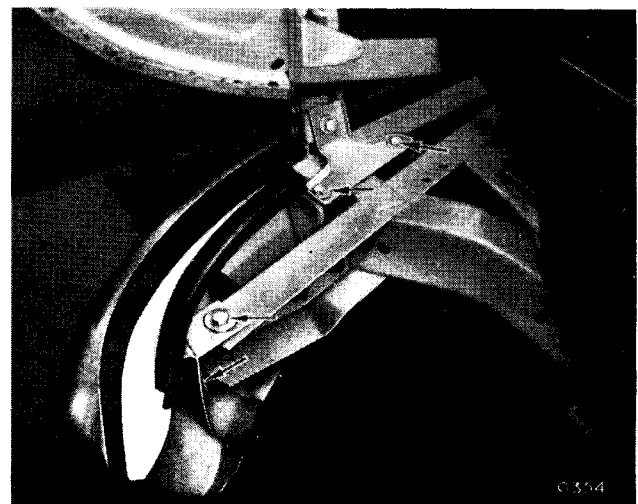


Fig. 14. Front valance attachment

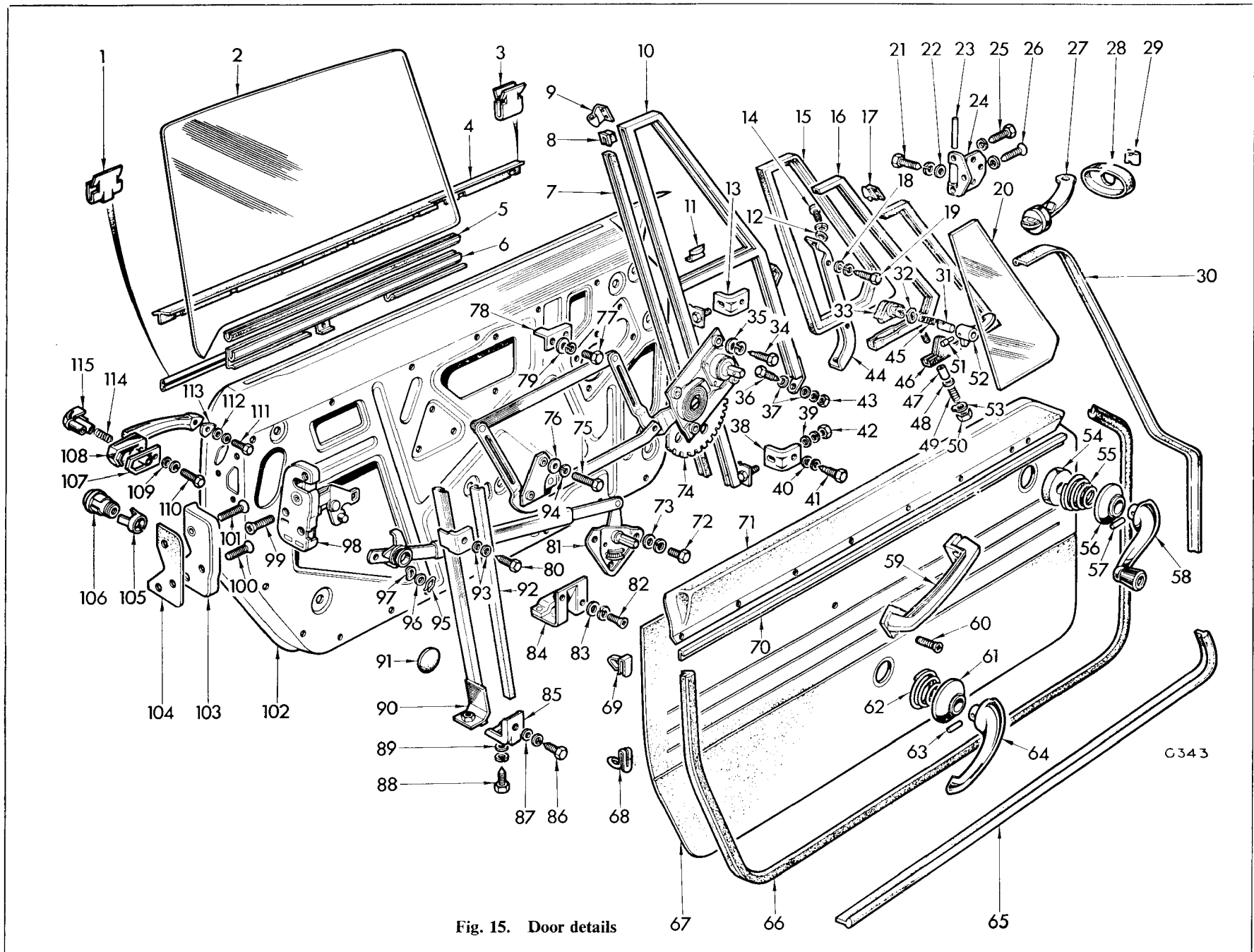


Fig. 15. Door details

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Key to Fig. 15

1 Clip	30 Sealing rubber	59 Handle	88 Bolt
2 Door glass	31 Push button	60 Screw	89 Washer
3 Clip	32 Spring washer	61 Escutcheon	90 Glass run channel
4 Outer weatherstrip	33 Bracket	62 Spring	91 Grommet
5 Glazing strip	34 Bolt	63 Pin	92 Rubber channel
6 Glass channel	35 Washer	64 Handle	93 Washer
7 Vent rubber channel	36 Bolt	65 Sealing rubber	94 Spring washer
8 Channel stop	37 Washer	66 Sealing rubber	95 Spring clip
9 Pivot socket	38 Bracket	67 Trim pad	96 Washer
10 Vent frame	39 Washer	68 Clip	97 Spring washer
11 Locking plate	40 Washer	69 Clip	98 Lock
12 Washer	41 Bolt	70 Finisher strip	99 Screw
13 Bracket	42 Nut	71 Trim pad	100 Screw
14 Screw	43 Nut	72 Bolt	101 Screw
15 Weatherstrip	44 Vent bracket	73 Washer	102 Door panel
16 Vent inner frame	45 Spring	74 Regulator mechanism	103 Striker
17 Pivot pin bracket	46 Glazing strip	75 Bolt	104 Washer
18 Washer	47 Collar	76 Washer	105 Spring clip
19 Bolt	48 Washer	77 Bolt	106 Private lock
20 Vent glass	49 Spring	78 Glass stop bracket	107 Washer
21 Bolt	50 Nut	79 Washer	108 Handle
22 Washer	51 Pin	80 Bolt	109 Washer
23 Hinge pin	52 Locking handle	81 Remote control	110 Bolt
24 Hinge	53 Tab washer	82 Screw	111 Bolt
25 Bolt	54 Rubber washer	83 Washer	112 Washer
26 Bolt	55 Spring	84 Glass stop	113 Washer
27 Check strap	56 Escutcheon	85 Bracket	114 Spring
28 Sealing rubber	57 Pin	86 Bolt	115 Plunger
29 Clip	58 Handle	87 Washer	

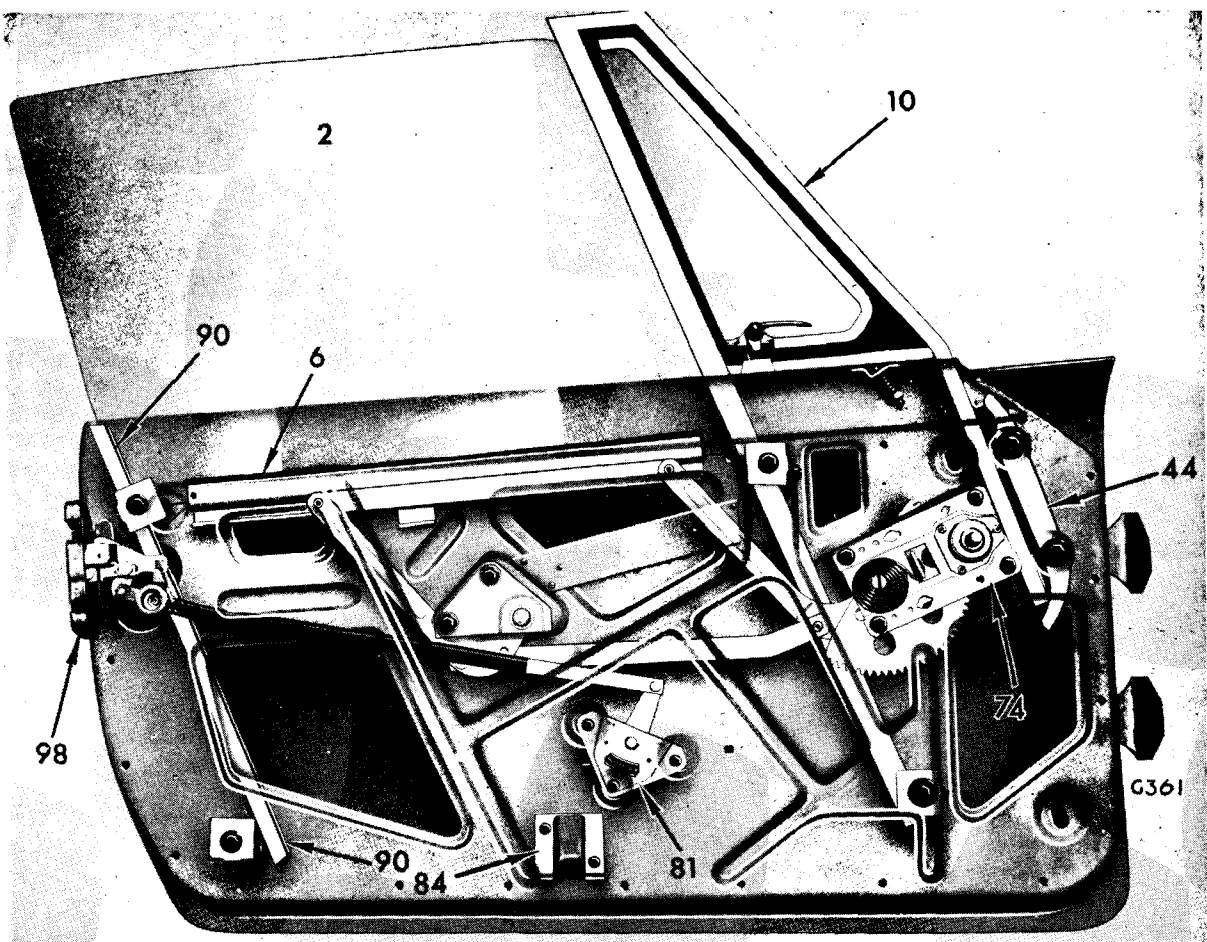


Fig. 16. Door components

DOORS

A. To remove the trim

1. Remove two handles (Fig. 17).
2. Remove the grab handle, two screws (60) (Fig. 15).
3. Prise off the trim (Fig. 21).

B. To remove the remote control

1. Perform operation A.
2. Remove the spring clip (95) (Fig. 19).
3. Remove three screws (72) (Fig. 18).
4. Withdraw through the hole in the door panel.



Fig. 17. Door handle removal

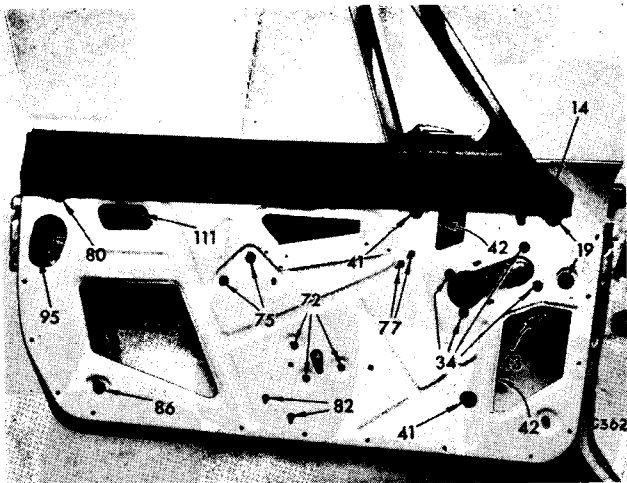


Fig. 18. Door details

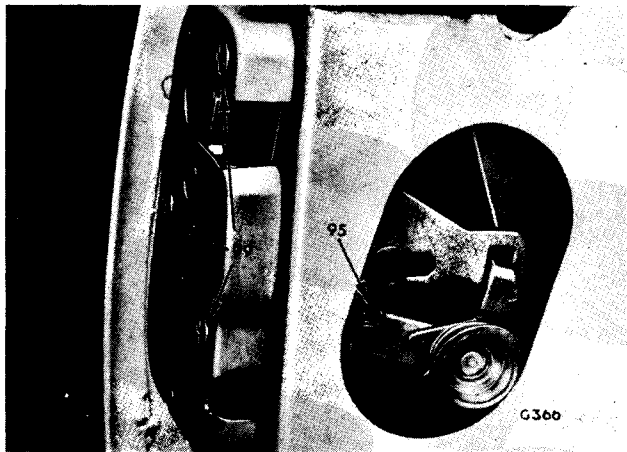


Fig. 19. Remote control clip



Fig. 20. Regulator engagement

C. To remove the door lock

1. Perform operation A.
2. Remove the spring clip (95) (Fig. 19).
3. Remove three screws (99) (Fig. 19).

When replacing the door lock, ensure that it engages with the private lock.

Anti-Burst Door Lock

From Body No. 20,001 KC, anti-burst locks were introduced. This feature, in the event of a collision, resists the separation of the latching elements and the consequent risk of the door flying open. The standard of the anti-burst meets the American Society of Automotive Engineers' recommendations as follows:—

Longitudinal separation: Full latch 2,500 lb.
(Under an opening force of 200 lb.)

1st safety 1,000 lb.

Transversely opening: Full latch 2,000 lb.
1st safety 1,000 lb.

Inertia loading: Components comprising the latch system must collectively withstand 30G in any direction without releasing.

D. To remove the outside handle

1. Perform operation A.
2. Remove two screws (110) (111) (Fig. 15).

E. To remove the private lock

1. Perform operation A.
2. Compress the spring clip (105) (Fig. 15) and push out.

F. To remove the regulator mechanism

1. Perform operation A.
2. Remove the glass stop, two screws (82) (Fig. 18).
3. Wind down the window until the runner disengages from the channel (Fig. 20).
4. Lift the glass to the top.
5. Remove six screws (34) (75) (Fig. 18).
6. Withdraw the mechanism.

When engaging the regulator mechanism with the glass channel, note that there are two runners (as Fig. 20) to be engaged.

Glass maximum height is controlled by the position of the bracket, two screws (77) (Fig. 18).

The glass stop is adjustable to give minimum height.

G. To remove the glass-run channel

1. Perform operation A.
2. Raise the door glass to its top position.
3. Remove two bolts (80) (86) (Fig. 18).
4. Pull out the channel through the large aperture.

H. To remove the door glass

1. Perform operation A.
2. Remove the glass stop, two screws (82) (Fig. 18).
3. Wind down the window until the runner disengages from the channel (Fig. 20).
4. Push off the inner and outer weatherstrips.
5. Lift out the glass.

An easily made tool (Fig. 23) is required for refitting the weatherstrips.

Inner clips, A = $\frac{3}{16}$ " (4.75 mm.)
 Outer clips, A = $\frac{1}{4}$ " (6.35 mm.)

J. To remove the quarter-vent

1. Perform operation H.
2. Remove three nuts (42) (43) (Fig. 18).
3. Remove the rubber grommet in the front closing face of the door and remove the screw (14) (Fig. 18).
4. Lift out the vent.

K. To remove the lock striker

1. Remove three screws (100) (101) (Fig. 22).

L. To remove door exterior mirror

1. Perform operation A.
2. Loosely refit the regulating handle and raise the glass to the fully closed position.
3. Release the nut retaining the mirror to the door, using a bent-shafted ring spanner.
4. Withdraw the mirror from the door.

Refitting all parts is the same as removal except where stated.

To remove the door complete, drill out the rivet in the door check strap and remove six bolts (3) (Fig. 12).

To remove the hinges from the door, remove six bolts.

To adjust the position of the door, slacken the appropriate bolts, adjust the door to suit and retighten the bolts.

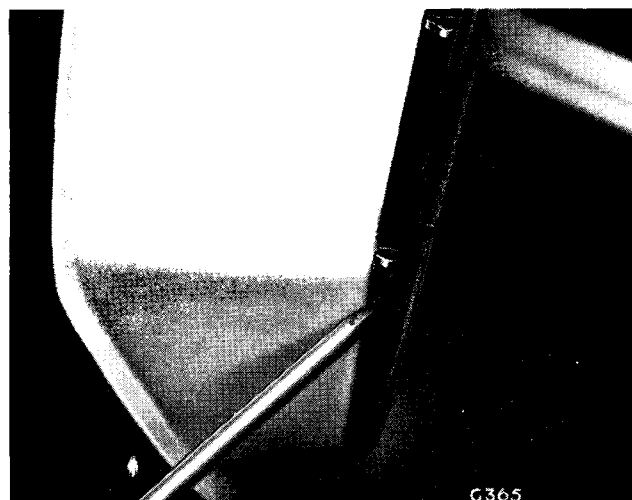


Fig. 21. Prising off door trim

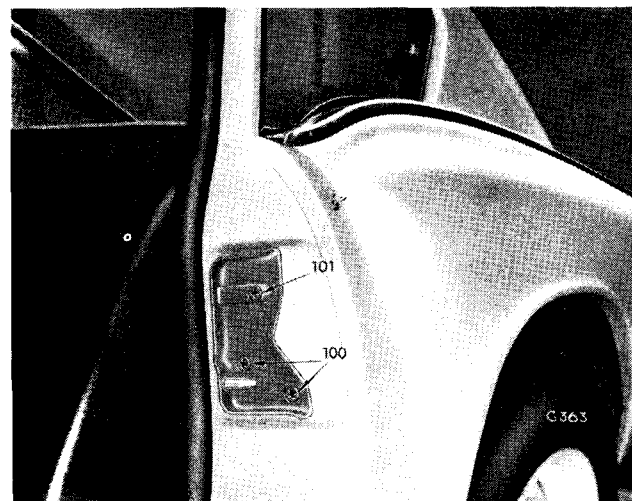


Fig. 22. Door lock striker

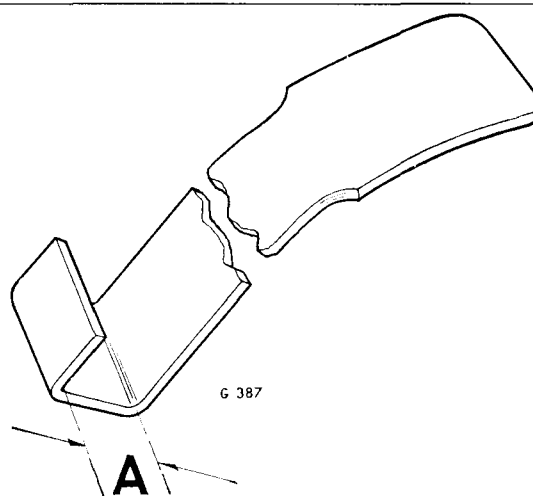


Fig. 23. Weatherstrip clip tool

HEATER

To Remove

Disconnect the battery.

Drain the coolant. Disconnect the heater hoses at the valve (Fig. 25). With one hose in a container, blow down the other to clear the coolant from the heater matrix.

Remove the passenger's side parcel shelf, page 5-215. Pull off the demister hose and remove the demister fishtail, two nuts (2) (Fig. 26).

Slacken the bolt (44) and the clamping bolt (33) and disconnect the control cable (Fig. 25).

Disconnect the cables to the heater blower motor at the snap connectors.

Remove the heater control cable from the fascia.

Disconnect the hoses (26) (Fig. 27).

Remove four bolts (5) (Fig. 27).

Manœuvre the heater from behind the fascia.

Refitting is the reverse of removal. A second operator is required when refitting four bolts (5) (Fig. 27). Refer to Dust and Water Sealing, page 5-310.

Before reconnecting the control cable, close the flap valves and push the control knob fully in. Check its operation after reconnection.

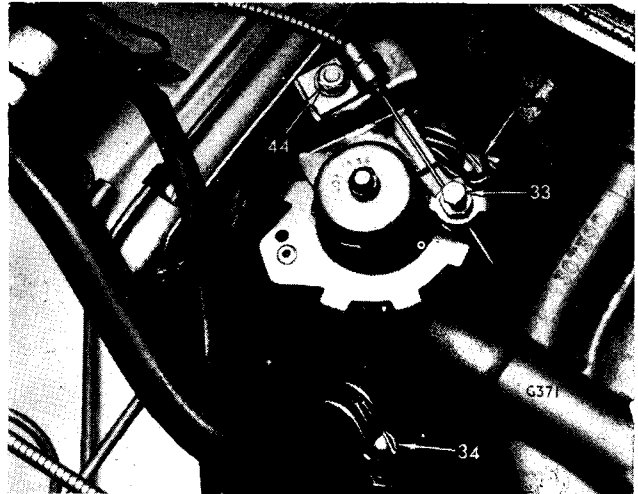


Fig. 25. Heater valve

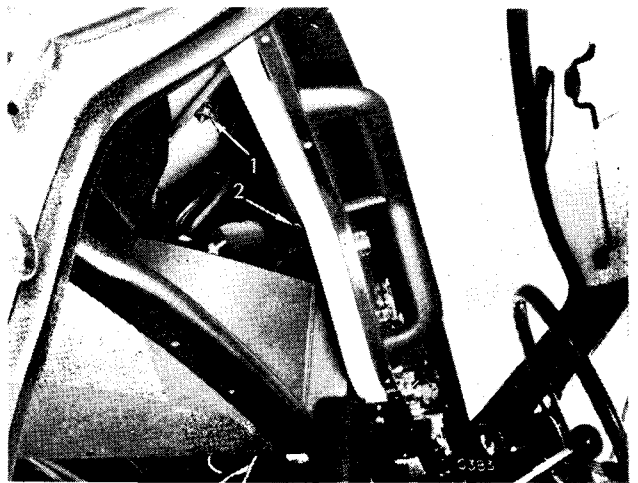


Fig. 26. Demister fishtail attachment

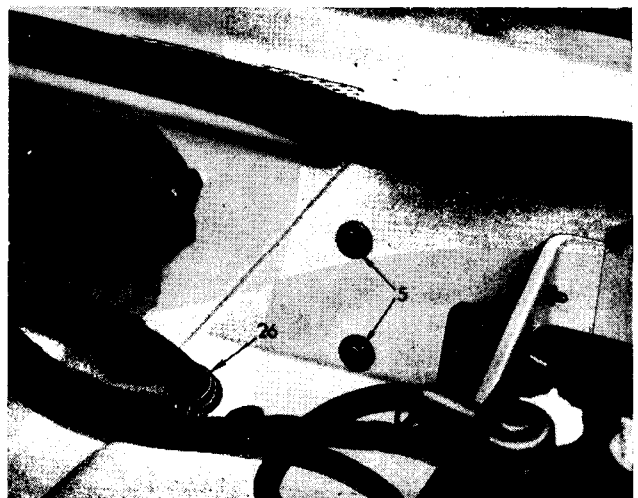
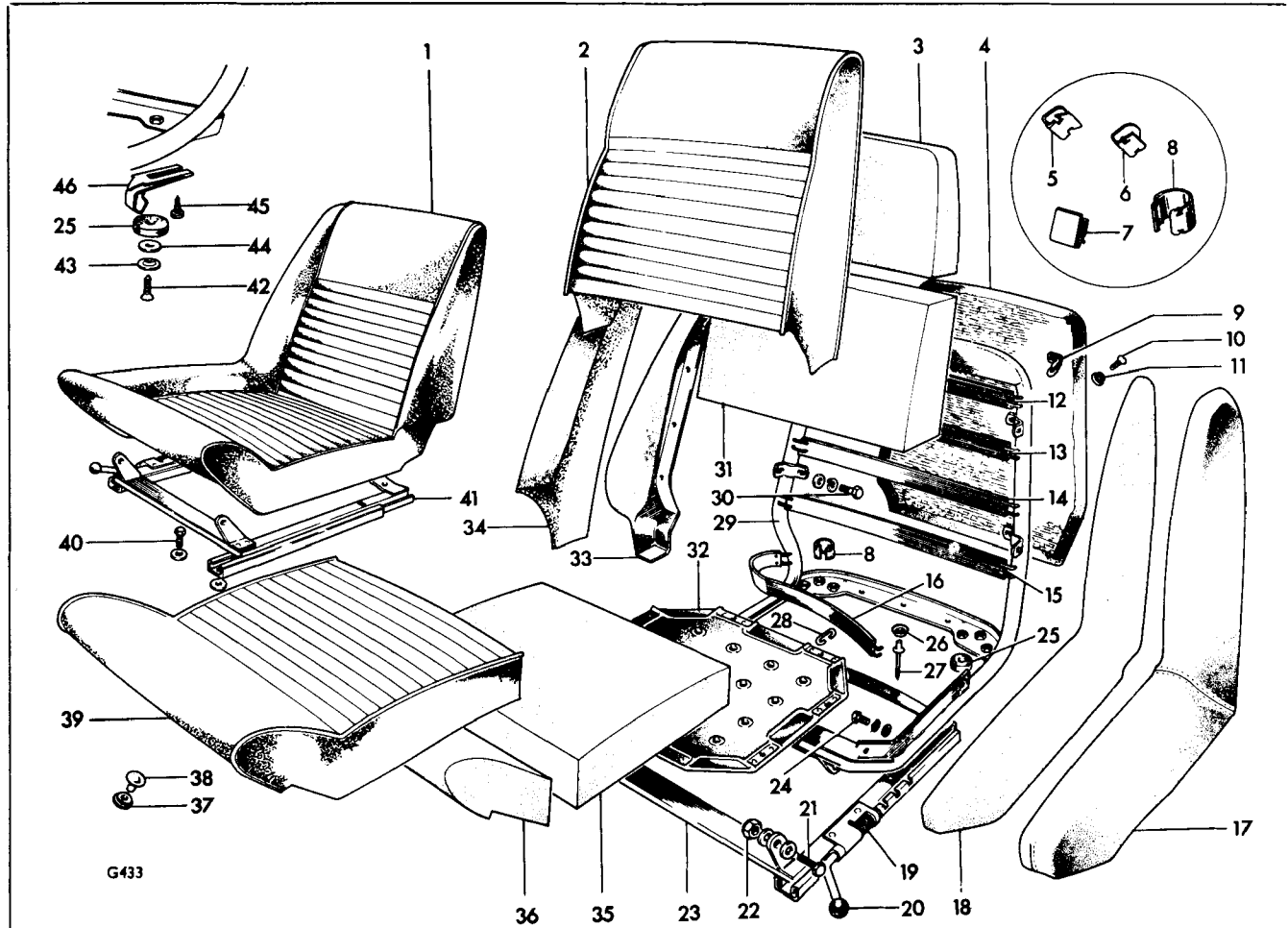


Fig. 27. Heater attachment bolts



- | | | | | | |
|----|-----------------|----|------------------|----|----------------|
| 1 | Seat assembly | 17 | Armrest cover | 32 | Diaphragm |
| 2 | Squab cover | 18 | Armrest pad | 33 | Side pad |
| 3 | Squab upper pad | 19 | Spring | 34 | Side pad cover |
| 4 | Back cover | 20 | Adjustment lever | 35 | Cushion pad |
| 5 | Clip | 21 | Bolt | 36 | Front roll pad |
| 6 | Clip | 22 | Nut | 37 | Cup |
| 7 | Clip | 23 | Base frame | 38 | Rivet |
| 8 | Clip | 24 | Bolt | 39 | Cushion cover |
| 9 | Clip | 25 | Buffer | 40 | Bolt |
| 10 | Screw | 26 | Press-stud | 41 | Frame assembly |
| 11 | Cup washer | 27 | Pop-rivet | 42 | Screw |
| 12 | Top strap | 28 | Hook | 43 | Cup washer |
| 13 | Centre strap | 29 | Seat frame | 44 | Washer |
| 14 | Centre strap | 30 | Bolt | 45 | Screw |
| 15 | Centre strap | 31 | Squab lower pad | 46 | Retaining clip |
| 16 | Bottom strap | | | | |

Fig. 28. Seat details

SEATS

To remove the cushion

Pull off the press-studs (1) (Fig. 29) and (3) (Fig. 30) and lift clear.

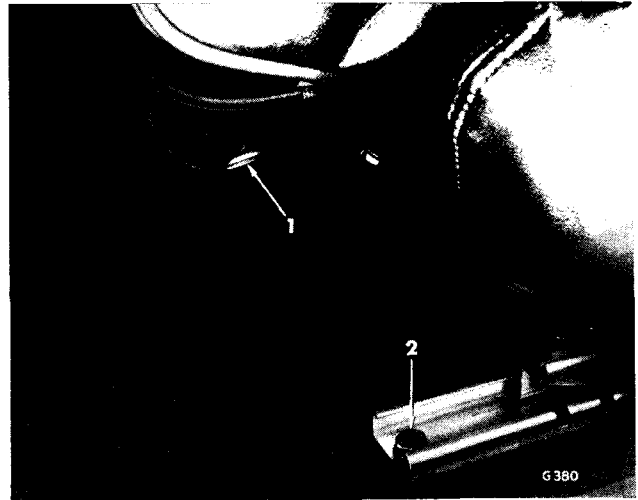


Fig. 29. Seat front attachment

To remove complete

Remove two bolts (2) (Fig. 29) and two bolts (4) (Fig. 30).

Lift out the seat and collect the spacing rings.

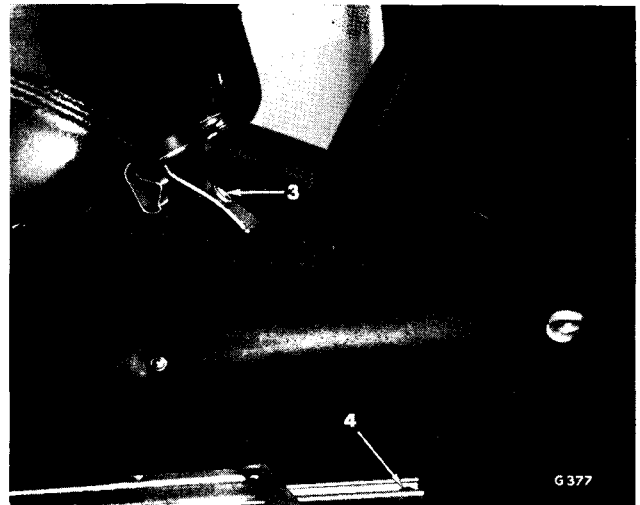
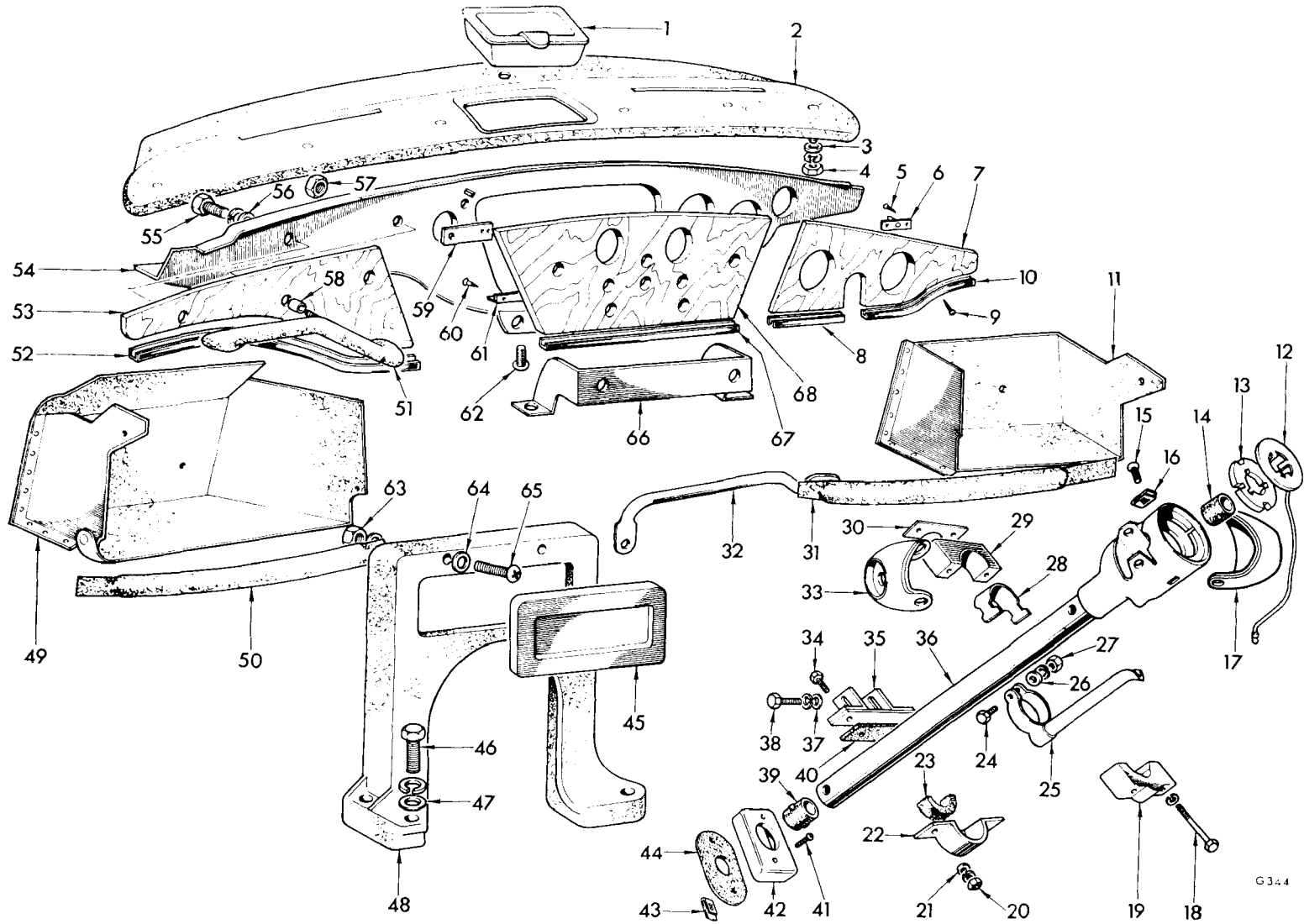


Fig. 30. Seat rear attachment



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Fig. 31. Facia details

Key to Fig. 31

1 Ash tray	18 Bolt	35 Support bracket	52 Edging
2 Facia capping	19 Clamp	36 Column cowl	53 Veneer
3 Washer	20 Nut	37 Washer	54 Facia
4 Nut	21 Washer	38 Bolt	55 Bolt
5 Screw	22 Clamp	39 Bearing	56 Washer
6 Stud plate	23 Felt strip	40 Felt strip	57 Nut
7 Driver's side veneer	24 Bolt	41 Screw	58 Spacer
8 Edging	25 Harness cover	42 Retaining plate	59 Plate
9 Screw	26 Washer	43 Spire nut	60 Screw
10 Edging	27 Nut	44 Sealing pad	61 Support strip
11 Driver's parcel shelf	28 Spring	45 Cover plate	62 Screw
12 Slip ring	29 Clamp	46 Bolt	63 Nut
13 Insulator	30 Packing	47 Washer	64 Washer
14 Bearing	31 Pad	48 Facia support bracket	65 Screw
15 Screw	32 Stiffener	49 Passenger's parcel shelf	66 Support bracket
16 Spire nut	33 Escutcheon	50 Pad	67 Edging
17 Escutcheon	34 Bolt	51 Grab handle	68 Centre veneer

PARCEL SHELF

To Remove (Fig. 32)

Remove two screws (1), two nuts and bolts (2) and one screw (3).

On the driver's side, also detach the speedometer trip cable.

Refitting is the reverse of removal

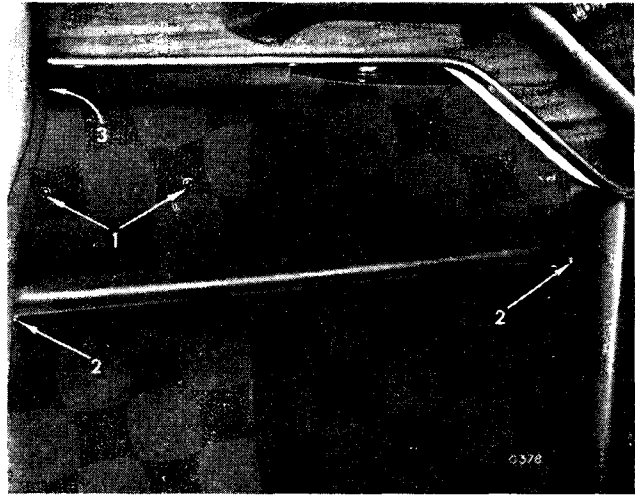


Fig. 32. Parcel shelf attachment

FACIA CAPPING

To Remove (Fig. 31)

1. Lift out the ash tray (1).
2. Remove two nuts (2) (Fig. 26) and lift out the vent trims.
3. Remove six nuts (4).
4. Prise off the capping (2).

Refitting is the reverse of removal.

FACIA SUPPORT BRACKET

To Remove (Fig. 33)

1. Remove four bolts (46).
2. Remove two screws (65) and nyloc nuts.
3. Lift clear.

Refitting is the reverse of removal.

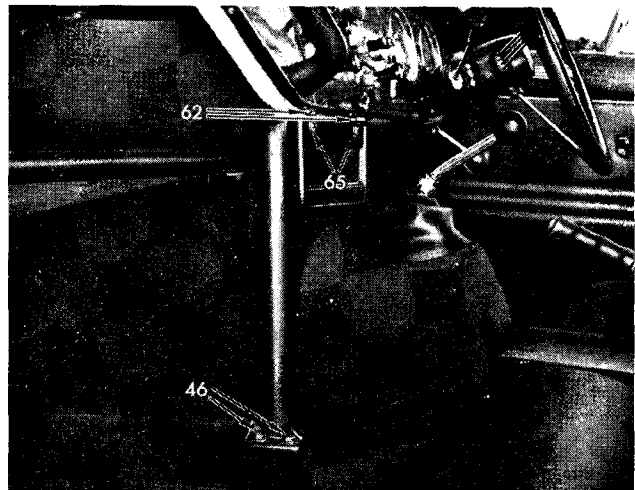


Fig. 33. Facia support bracket

INSTRUMENT PANEL

To allow access to the instruments, the instrument panel can be pulled clear of the facia (Fig. 34).

1. Disconnect the battery.
2. Remove two screws (62) (Fig. 33).
3. Remove two screws from the top corners of the panel.
4. Lift out.

Refitting is the reverse of removal.

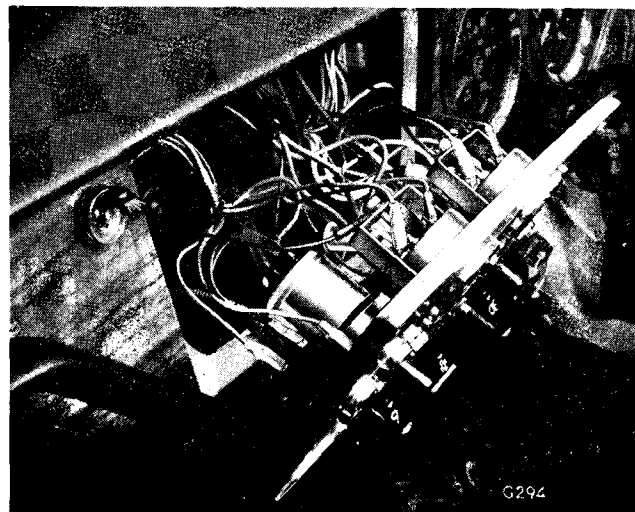
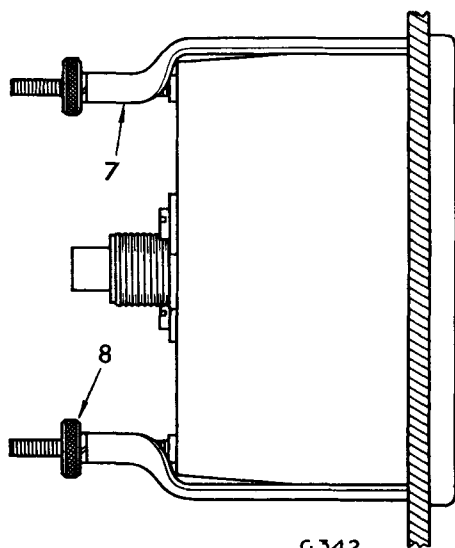
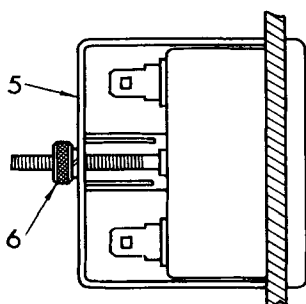
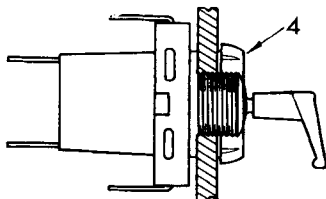
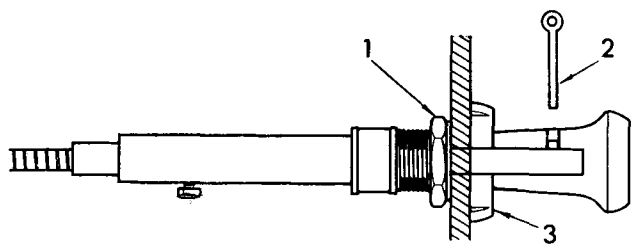


Fig. 34. Instrument panel



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Fig. 35. Switch, instrument and control fixings

SWITCHES, INSTRUMENTS AND CONTROLS

Before carrying out any work on switches and instruments, disconnect the battery.

CONTROL CABLES

Choke, heat and air distribution.

To Remove

Depress the spring plunger by pushing a suitable pin (2) in the hole and pull off the knob.

Unscrew the bezel (3).

To Refit

Screw on the bezel until its face is flush with the end of the threaded portion. Tighten the lock-nut (1) and push on the knob with the hole in line with the spring plunger.

SWITCHES

Roof lamp, windscreen wiper, lights and heater motor.

To Remove

Pull off the Lucar connectors and unscrew the bezel (4).

To Refit

Reverse the above procedure, referring to the wiring diagram.

INDICATORS

Fuel and water temperature.

To Remove

Pull off the Lucar connectors and illumination bulb holder. Remove the knurled nut (6), spring washer and clamp (5).

To Refit

Reverse the above procedure, referring to the wiring diagram.

INSTRUMENTS

Speedometer, tachometer.

To Remove

Disconnect the drive cable and pull out the bulb holders. On the speedometer, pull the Lucar connectors off the voltage stabilizer.

Remove the steering column switch cowls, two screws.

Remove two knurled nuts (8), spring washers and clamps (7).

To Refit

Reverse the above procedure, referring to the wiring diagram.

ROOF LINING

To Remove

Disconnect the battery.

Remove the sun visors (3 screws) and the rear-view mirror (2 screws).

Remove the door aperture seals and the quarter-casings.

Remove two screws (1) (Fig. 36) in the rear quarter-vent catch, open out the vent and pull off the sealing rubber.

Pull off the tailgate aperture sealing rubber.

Twist the roof lamp lens (2) (Fig. 37) to reveal two screws. Remove the screws, lower the lamp and pull off the Lucar connectors.

Remove the two screws (3) (Fig. 37) and detach the tailgate hinge cover.

Peel back the top edge of the windscreen sealing rubber and cut through the lining where it is covered by the rubber.

Release the edges of the lining from the body flanges.

Spring the listing rails away from the roof edges.

Remove the clips from the rails and the rails from the lining.

To fit a new lining

Clean the old adhesive from the body flanges with white spirit.

Apply a two inch border of adhesive to the edge of the new lining and the body flanges. (Dunlop SP.758 used in production).

Allow ten minutes for it to become tacky.

Fit the colour-coded listing rails to the lining. Green at the front, white, then brown. Fit the clips to the listing rails.

Hook the front rail into the roof edges.

Clip the rail into the listing rail retaining clips. Hook the centre and rear rails into the roof edges and position the centre of the lining about the interior lamp mounting bracket (4) (Fig. 38).

Peel back the windscreen sealing rubber and stick down the front edge of the lining. Before pressing the lining firmly down, ensure that it is pulled taut and follows the contour of the roof.

Press the edges of the lining firmly into contact with the body flanges with a slicker; a flat, diamond-shaped tool made from hardwood or plastic from which all the sharp edges have been removed.

Replace the pieces (5) and (6) if necessary.

Refit all components removed.

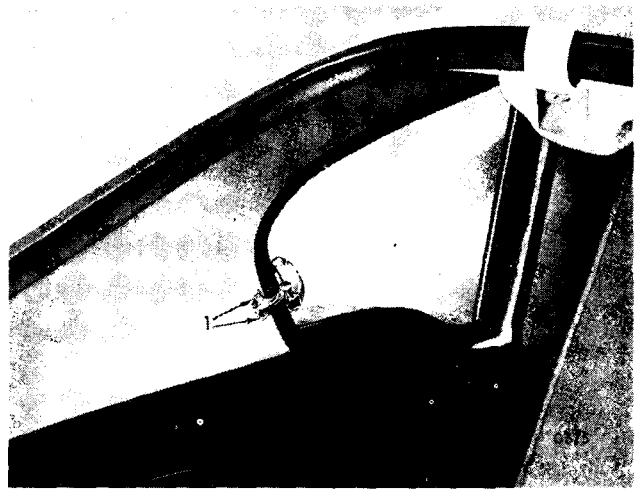


Fig. 36. Rear quarter-vent catch

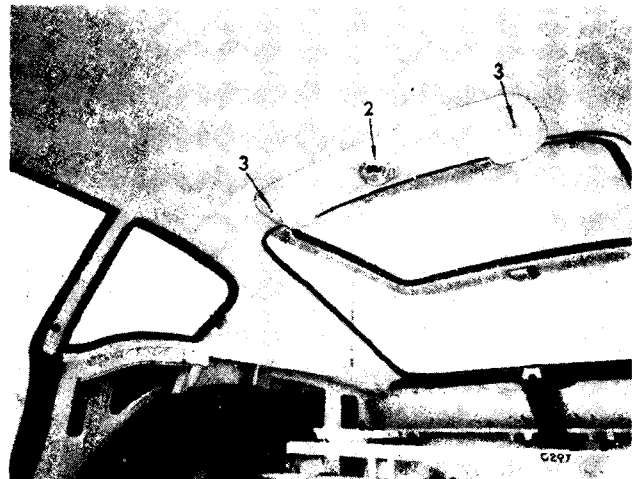


Fig. 37. Tailgate hinge cover

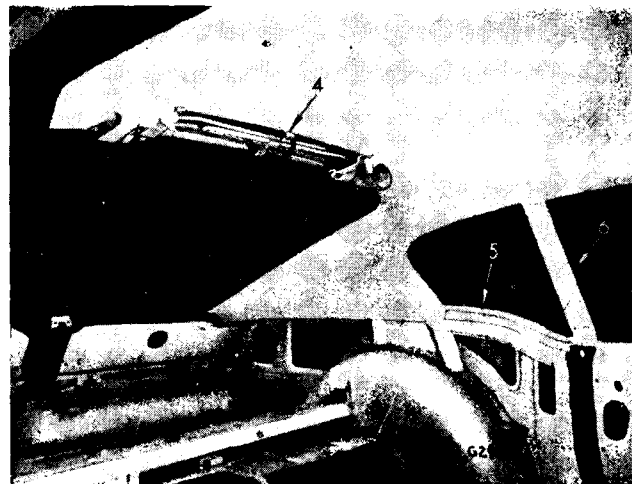
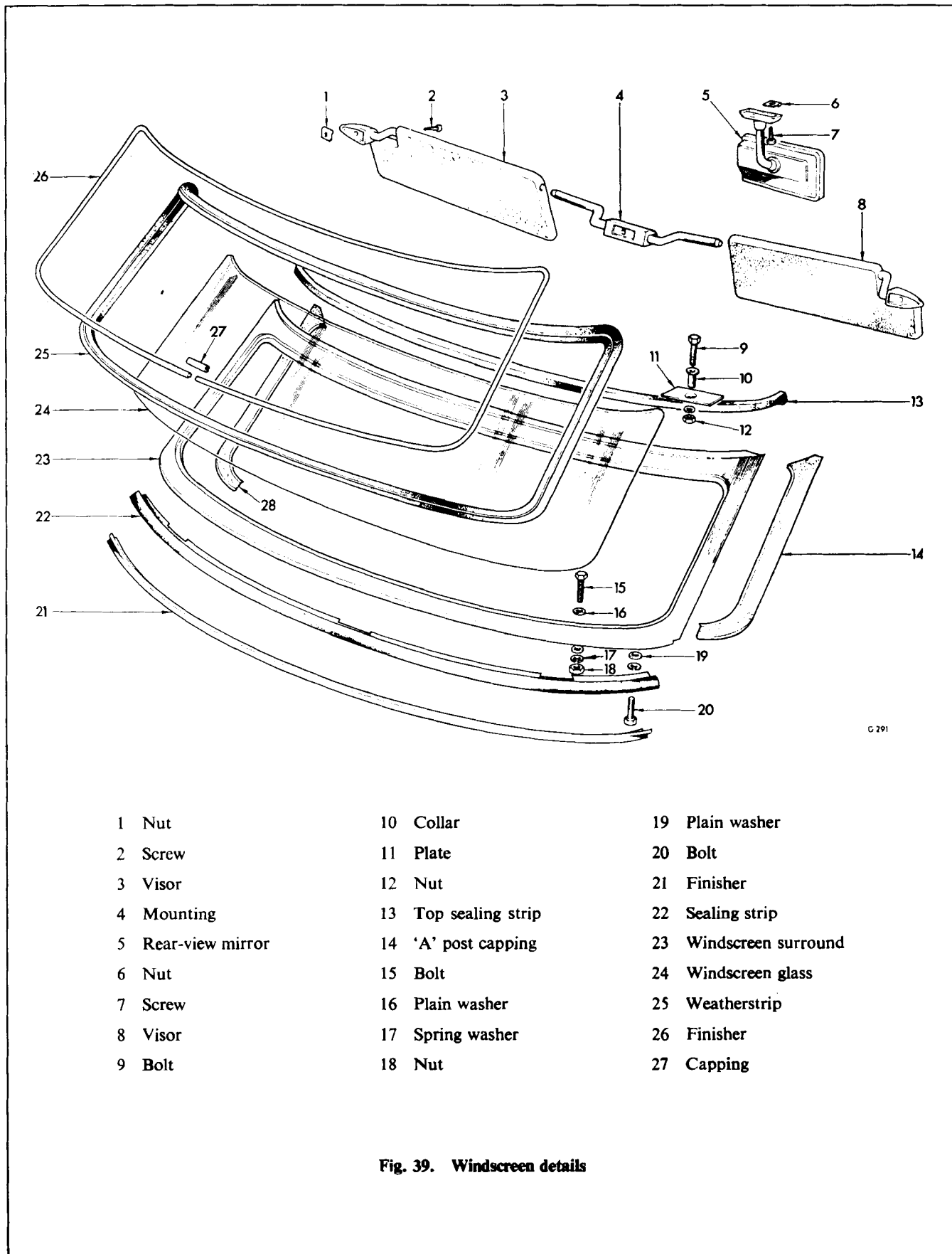


Fig. 38. Roof lining positioning



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- | | | |
|--------------------|----------------------|------------------------|
| 1 Nut | 10 Collar | 19 Plain washer |
| 2 Screw | 11 Plate | 20 Bolt |
| 3 Visor | 12 Nut | 21 Finisher |
| 4 Mounting | 13 Top sealing strip | 22 Sealing strip |
| 5 Rear-view mirror | 14 'A' post capping | 23 Windscreen surround |
| 6 Nut | 15 Bolt | 24 Windscreen glass |
| 7 Screw | 16 Plain washer | 25 Weatherstrip |
| 8 Visor | 17 Spring washer | 26 Finisher |
| 9 Bolt | 18 Nut | 27 Capping |

Fig. 39. Windscreen details

WINDSCREEN AND BACKLIGHT

To Remove Windscreen

Using a thin wedge of hardwood, with the point inserted under the rubber, break the Seelastik seal round the outer edge of the windscreen sealing rubber.

Prise off the windscreen wiper arms (Fig. 40).

With a second operator steadying the glass from the outside, sit in the passenger's seat, place one foot against the glass and push out. Use a soft foot pad to avoid scratching the glass.

Examine the weatherstrip for evidence of deterioration and renew if necessary. Should the finisher strip need replacing, pull it out of the weatherstrip and push a new finisher strip, with the joint at the top, into the groove in the weatherstrip.

To Refit

1. Use petrol or white spirit to remove the old sealing compound from the windscreen aperture edge.
2. Fit the weatherstrip to the windscreen with its joint at the bottom. Seal the rubber to the glass.
3. Insert a thick cord, of greater length than the periphery of the glass, into the inner channel of the rubber strip and permit the ends to protrude from the bottom edge of the weatherstrip.
4. Apply a soapy water solution to the flange of the windscreen aperture. Position the windscreen centrally in the aperture after passing the ends of the cord through into the vehicle. With a second operator maintaining steady pressure on the outside of the glass, pull the ends of the cord to bring the lip of the rubber over the body flange. It may be necessary to strike the outside of the weatherstrip with a rubber-faced hammer to seat the windscreen properly.
5. Withdraw the cord completely and seal the weatherstrip to the body, pressing it firmly into contact. Remove surplus sealing compound using a cloth moistened with petrol or white spirit. Do not allow any excess liquid to seep into the joint and destroy the bond.

To Remove Backlight

Removing and refitting the backlight is the same as for the windscreen. On later GT6 models the heated backlight electrical lead must be disconnected, and in this case the battery should also be disconnected.

Refer to Dust and Water Sealing, page 5-310.

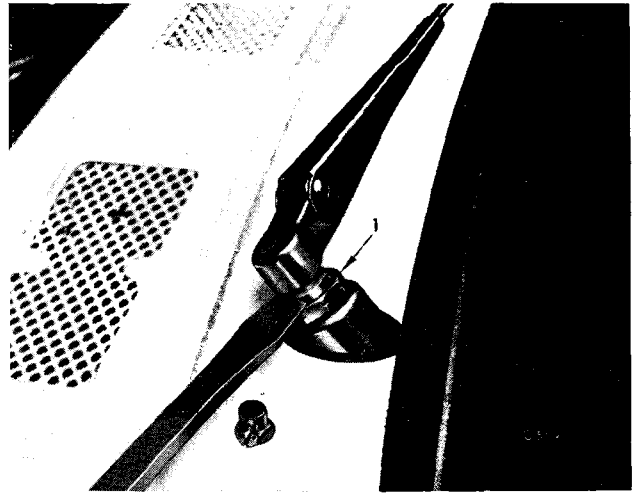


Fig. 40. Removing wiper arms

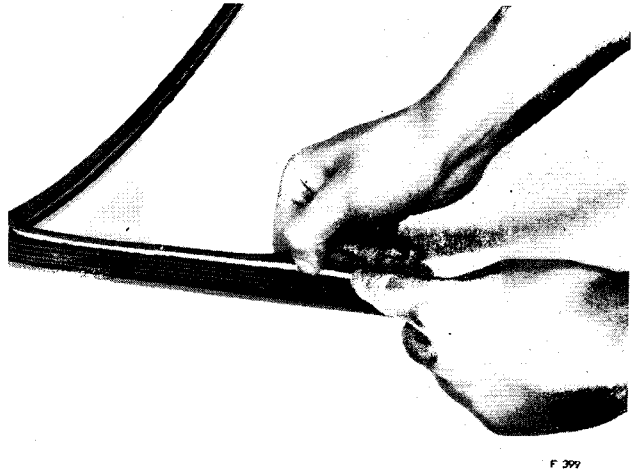


Fig. 41. Inserting cord in weatherstrip

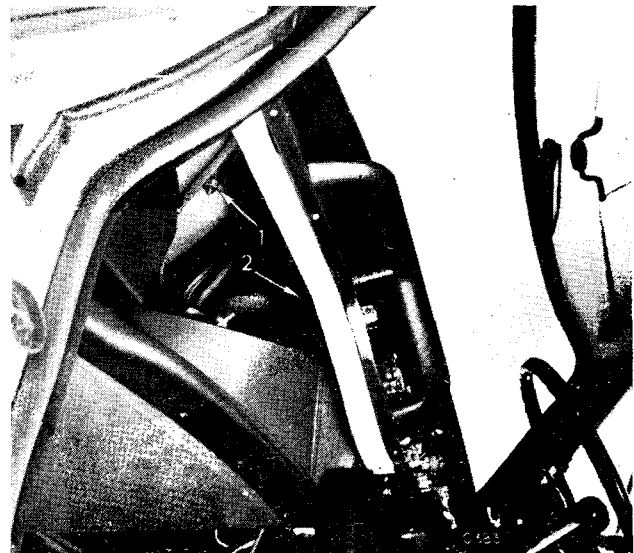


Fig. 42. Windscreen frame attachment

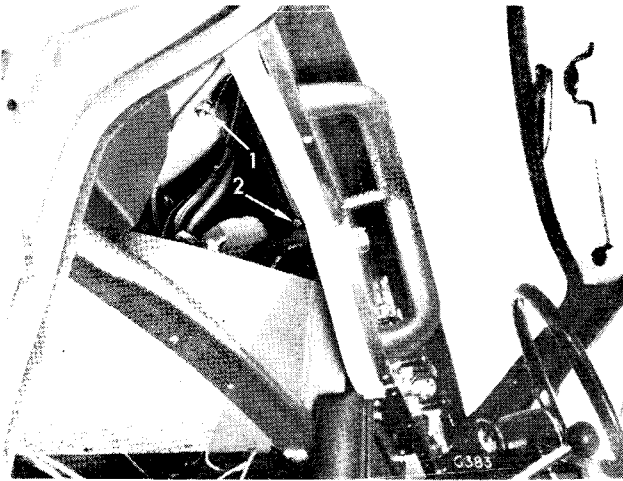


Fig. 43. Demister fishtail

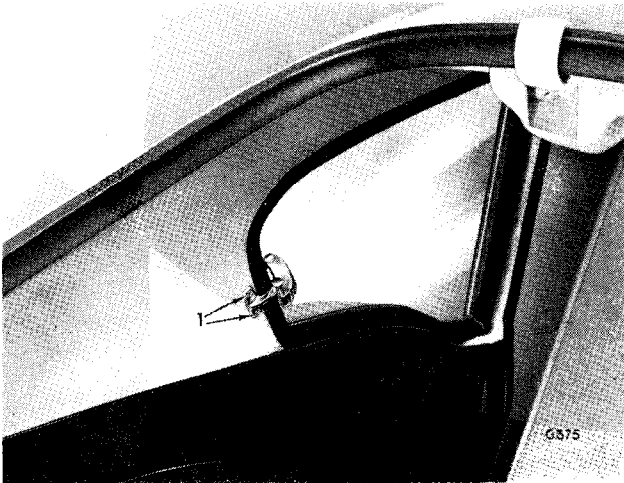


Fig. 44. Rear quarter-light catch

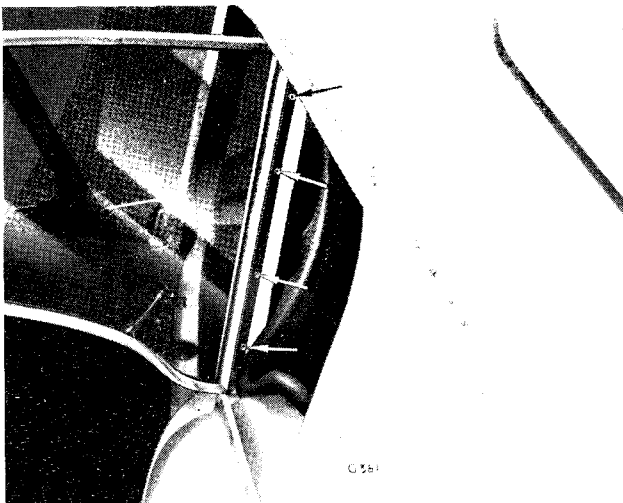


Fig. 45. Rear quarter-light pop-rivets

WINDSCREEN WIPER WHEEL BOXES

To Remove

Remove the wiper arms and locknuts (1) (Fig. 40).

Remove the right-hand demister fishtail, two nuts (2) (Fig. 43).

Remove the left-hand parcel shelf, page 5-215.

Disconnect the drive cable, Group 6.

Withdraw the instrument panel (Fig. 34).

Manoeuvre the wheelbox assembly from behind the facia.

Refitting is the reverse of removal. Refer to Dust and Water Sealing, page 5-310.

WINDSCREEN FRAME

To Remove (Fig. 39)

Remove the windscreen.

Peel back the front edge of the headlining and remove two bolts (9).

From below the facia remove bolts (15) and (20).

Pull off door sealing rubber.

Refer to Dust and Water Sealing when refitting.

Note: This operation is not applicable to later GT6 models.

REAR QUARTER-LIGHTS

To Remove

Remove two screws (1) (Fig. 44). Prise off the rear wing finisher strip. Pull away the fore-edge of the aperture sealing rubber. Drill out four pop-rivets (Fig. 45).

Refitting is the reverse of removal.

TAILGATE**To Remove**

Support the tailgate and remove six bolts (1) (Fig. 46).

To remove the hinges

Disconnect the battery.

Twist the lamp lens (2) (Fig. 37) to reveal two screws. Remove the screws, lower the lamp and pull off the Lucar connectors.

Remove two screws (3) (Fig. 37) and detach the hinge cover.

Disconnect the interior light switch.

Remove eight bolts (2) (Fig. 46) and lift out the hinge.

Refitting is the reverse of removal.

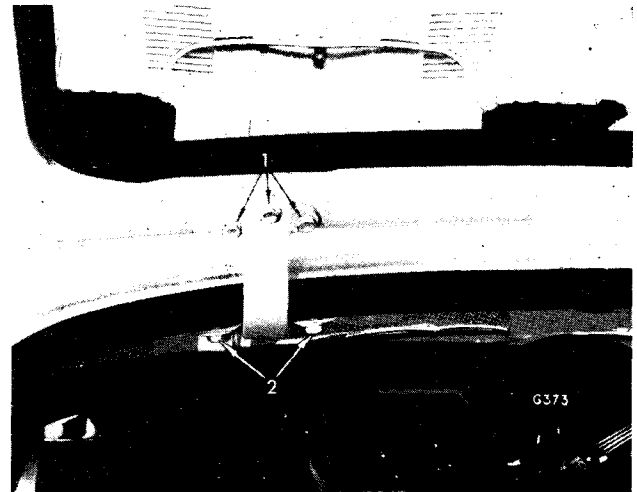


Fig. 46. Tailgate hinge

TAILGATE LOCK**To Remove (Fig. 47)**

Remove one screw (1) and pull out the handle.

Remove four screws (2).

Remove two screws (3).

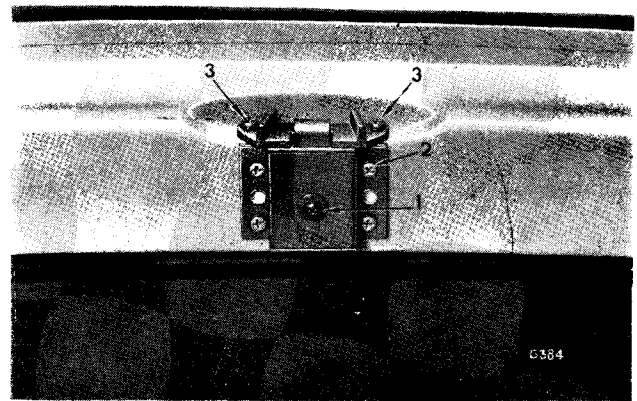


Fig. 47. Tailgate lock

FUEL TANK**To Remove (Fig. 48)**

Disconnect the battery. Drain the fuel by disconnecting the fuel feed pipe where it enters the fuel tank beneath the vehicle. Do not refit the pipe.

Remove the luggage floor carpet and the luggage floor panel, two screws.

Remove the left-hand side trim panel and the left-hand rear trim panel. Slacken two clips (1) and push down the rubber fuel filler pipe.

Remove two screws (2) and the strap (3). Slacken the clip (4) and pull off the breather pipe (not applicable to GT6 Mk. 3). Disconnect the Lucar connectors from the tank unit (5).

Remove three bolts (6)—on GT6 Mk. 3, 2 bolts and one domed nut—and lift out the tank; lifting the front edge first.

Refitting is the reverse of removal. Refer to Dust and Water Sealing page 5-312.

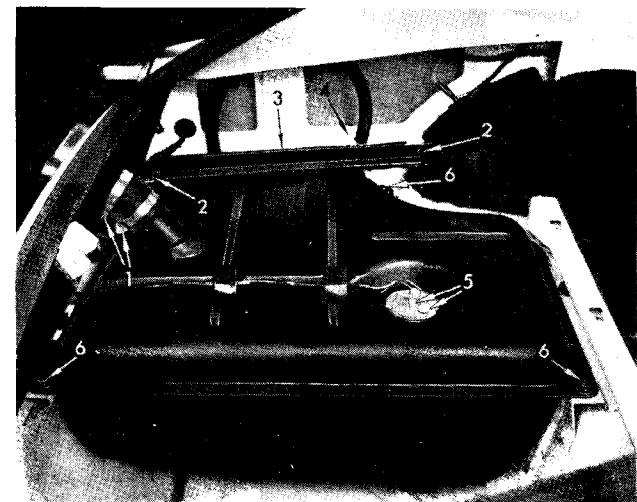


Fig. 48. Fuel tank attachment

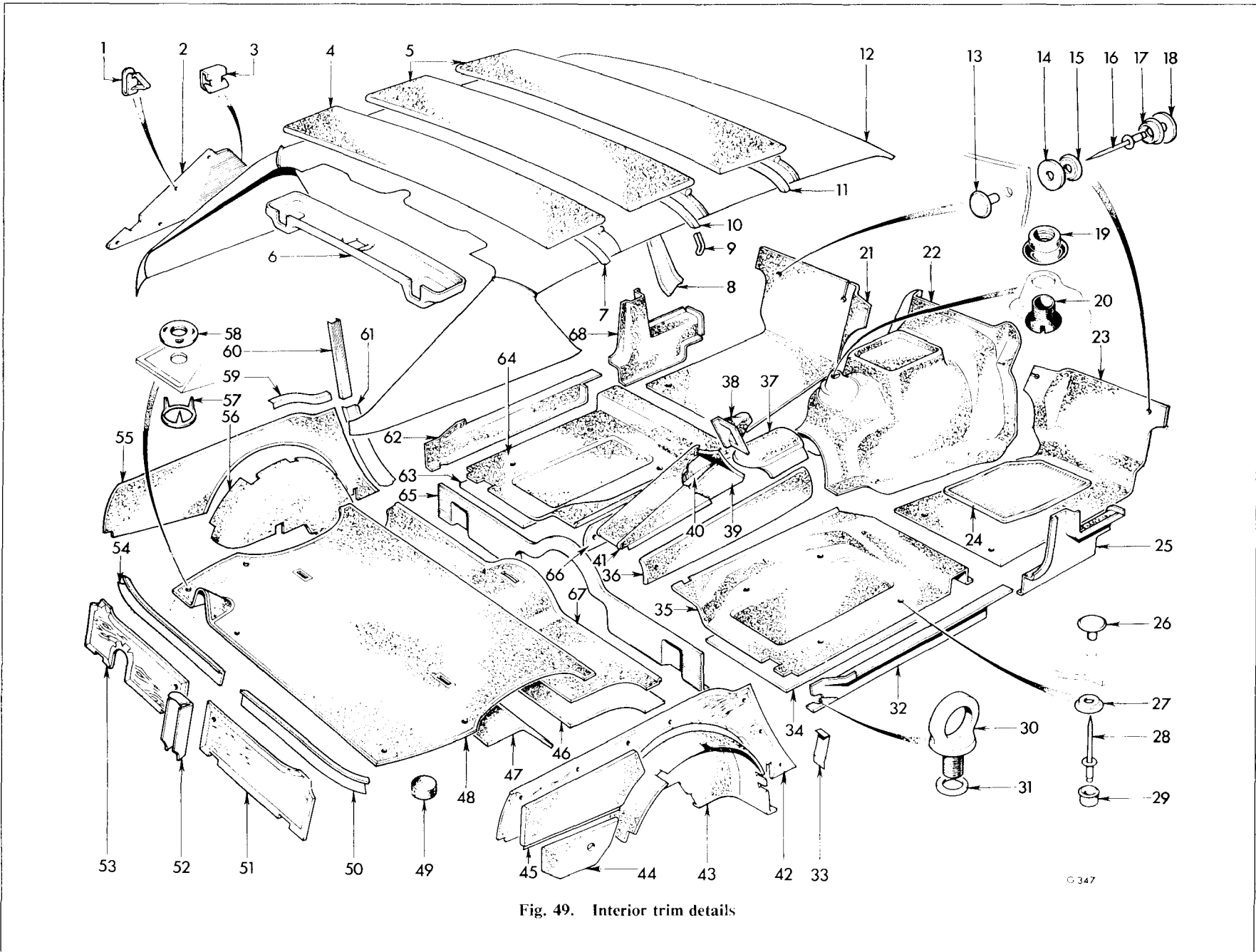
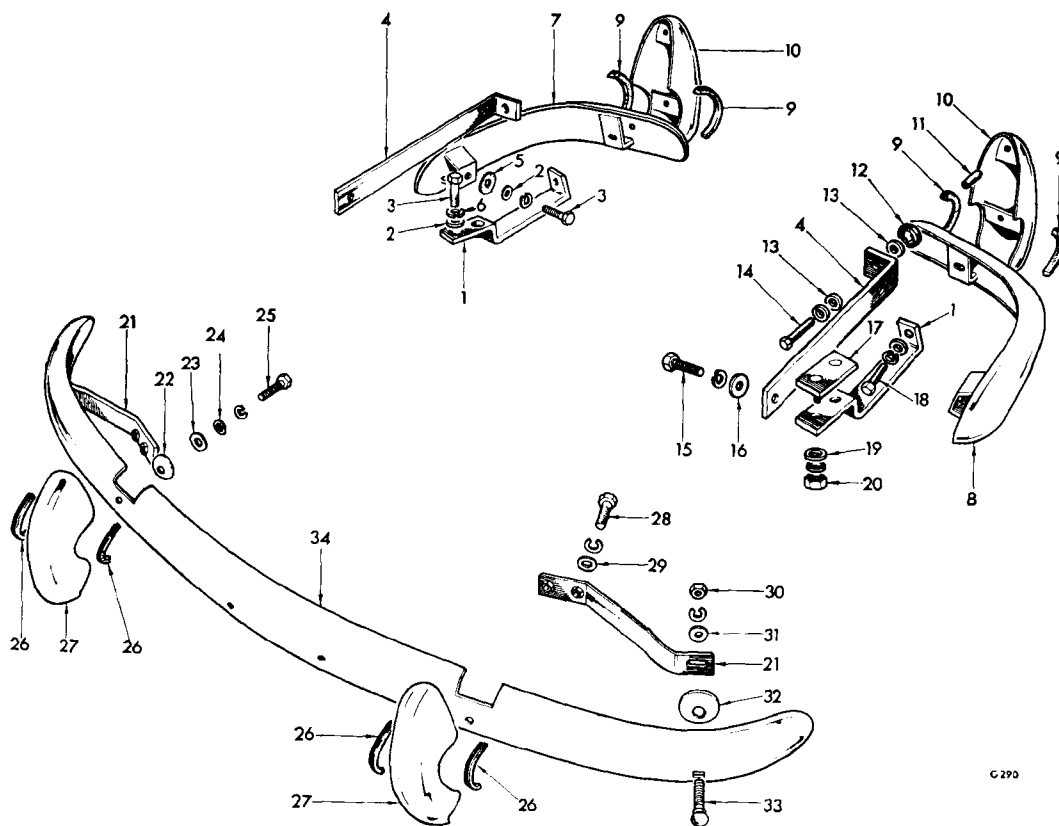


Fig. 49. Interior trim details

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Key to Fig. 49

1 Spring clip	24 Rubber mat	47 Spring tunnel pad
2 Backing board	25 Dash side mat	48 Freight floor carpet
3 Clip	26 Button	49 Buffer
4 Insulation pad	27 Socket	50 Tailgate aperture trim
5 Insulation pads	28 Pop-rivet	51 Rear trim panel
6 Tailgate hinge cover	29 Stud	52 Lock bracket cover
7 Brown listing rail	30 Safety-belt eye-bolt	53 Rear trim panel
8 "A" post trim	31 Washer	54 Tailgate aperture trim
9 Listing rail clip	32 Sill carpet	55 Quarter casing
10 White listing rail	33 Support bracket trim	56 Wheelarch trim
11 Green listing rail	34 Felt	57 Locking ring
12 Roof lining	35 Rear floor mat	58 Socket ring
13 Button	36 Tunnel side cover	59 Quarter-vent trim
14 Washer	37 Tunnel top cover	60 "A" post upper trim
15 Socket	38 Handbrake grommet	61 "A" post lower trim
16 Pop-rivet	39 Armrest backing	62 Sill carpet
17 Stud	40 Armrest backing	63 Felt
18 Washer	41 Armrest	64 Rear floor mat
19 Collar	42 Quarter casing	65 Heelboard carpet
20 Ring nut	43 Wheelarch trim	66 Tunnel side cover
21 Front floor mat	44 Insulation pad	67 Lower floor trim
22 Gearbox cover mat	45 Insulation pad	68 Dash side mat
23 Front floor mat	46 Seat pan pad	



- | | | |
|-------------------------|---------------------|--------------------|
| 1 Lower support bracket | 12 Sealing washer | 23 Washer |
| 2 Plain washer | 13 Washer | 24 Washer |
| 3 Bolt | 14 Bolt | 25 Bolt |
| 4 Side support bracket | 15 Bolt | 26 Moulding |
| 5 Packing washer | 16 Washer | 27 Override |
| 6 Spring washer | 17 Stud plate | 28 Bolt |
| 7 Rear bumper | 18 Bolt | 29 Washer |
| 8 Rear bumper | 19 Washer | 30 Nut |
| 9 Moulding | 20 Nut | 31 Washer |
| 10 Override | 21 Mounting bracket | 32 Distance washer |
| 11 Distance piece | 22 Distance washer | 33 Bolt |

Fig. 50. Bumper details

FRONT BUMPER	REAR BUMPER
<p>To Remove</p> <p>Remove overriders, two bolts (25).</p> <p>Remove two bolts (33).</p> <p>To remove mounting brackets, remove four bolts (28).</p>	<p>To Remove</p> <p>Remove spare wheel and fuel tank, page 5.221.</p> <p>Remove two bolts (14) and two bolts (18).</p> <p>Remove two side bolts (3).</p>

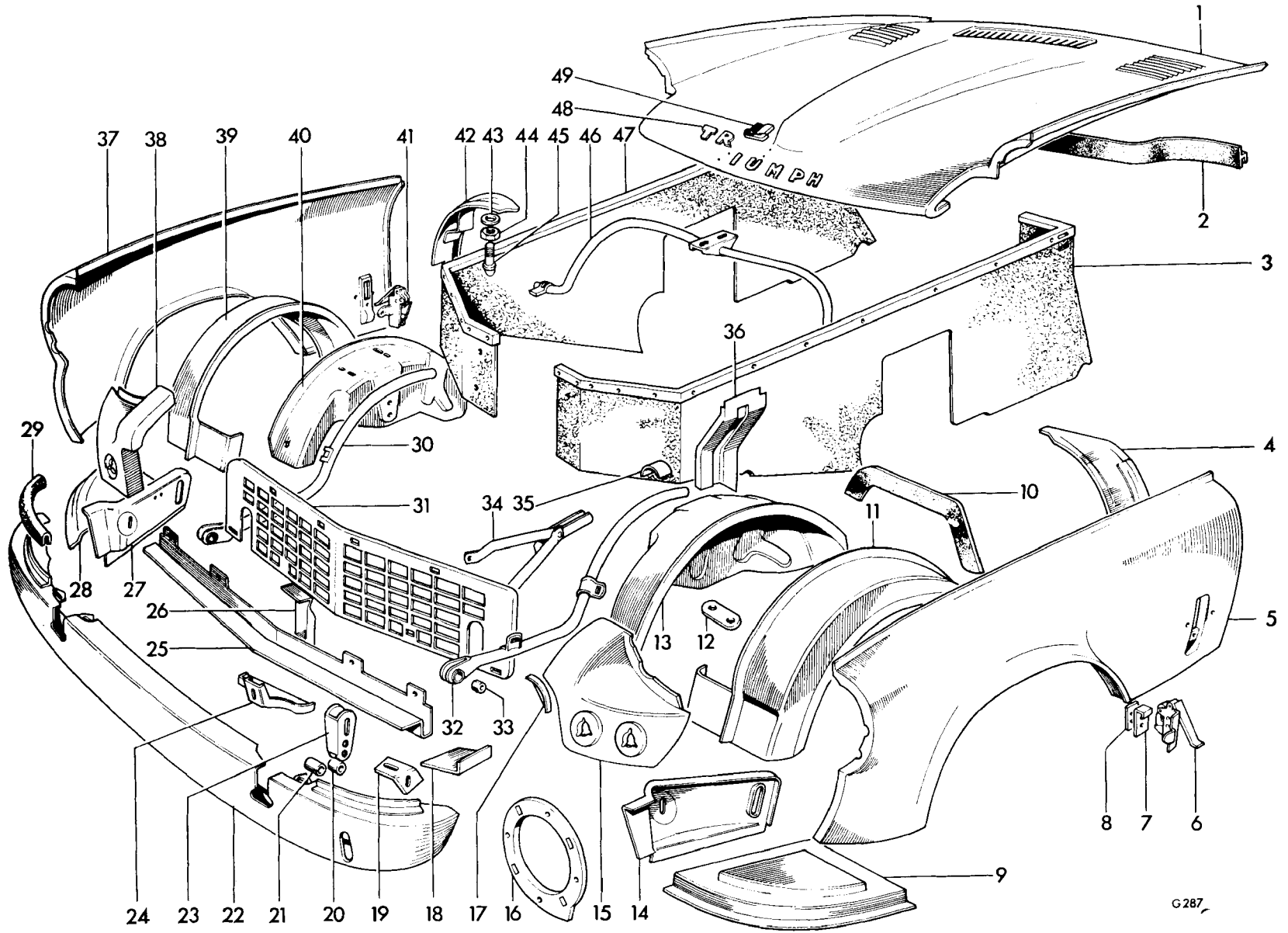


Fig. 51. Body panel details

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Key to Fig. 51

1 Bonnet top assembly	17 Nose panel reinforcement	33 Distance piece
2 Bonnet sealing rubber	18 Valance bracket	34 Support stay
3 L.H. engine valance	19 Front valance support	35 Tube backing peice
4 Front wing reinforcement	20 Distance tube	36 Wing support
5 Front wing side panel	21 Distance tube	37 Front wing side panel
6 Bonnet catch assembly	22 Front valance	38 Nose panel
7 Bonnet catch plate	23 Bonnet hinge bracket	39 Outer wheelarch panel
8 Tapping plate	24 Front valance support	40 Inner wheelarch panel
9 Nose filler panel	25 Grille mounting	41 Bonnet catch
10 Wheelarch rear seal	26 Grille reinforcement	42 Front wing reinforcement
11 Outer wheelarch panel	27 Grille aperture closing panel	43 Washer
12 Backing plate	28 Nose filler panel	44 Locknut
13 Inner wheelarch panel	29 Bonnet seal	45 Bonnet location peg
14 Grille aperture closing panel	30 Bonnet hinge tube	46 Rear support tube
15 Nose panel	31 Grille	47 R.H. engine valance
16 Headlamp mounting bracket	32 Bonnet hinge tube	48 Lettering
		49 Bonnet badge

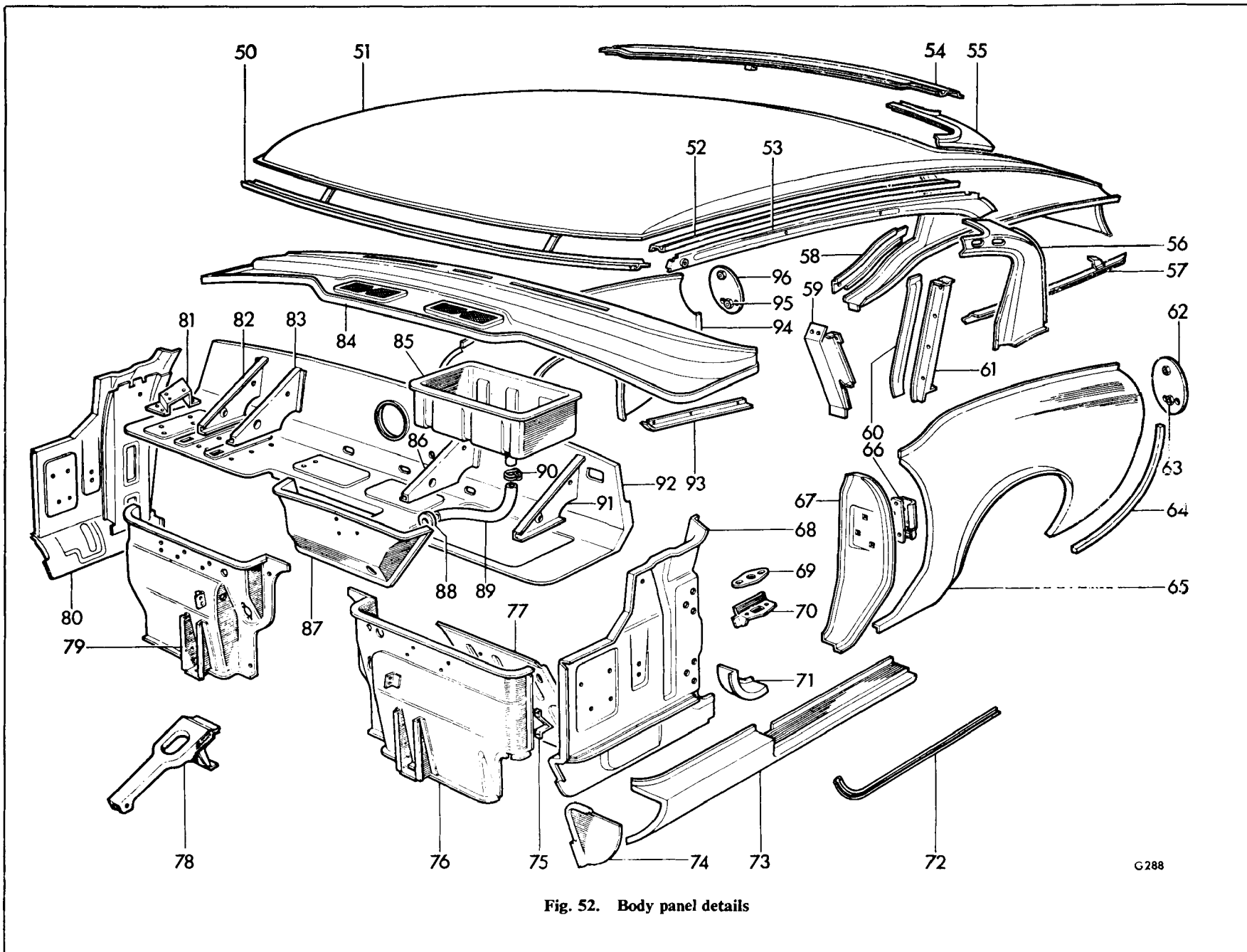


Fig. 52. Body panel details

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Key to Fig. 52

50 Roof front reinforcement	66 Striker plate	82 Dash gusset
51 Roof panel	67 "B" post panel	83 Dash gusset
52 Drain channel	68 "A" post and sill reinforcement	84 Front deck panel
53 Cantrail	69 Bonnet location plate	85 Battery box
54 Tailgate aperture panel	70 Bonnet location bracket	86 Dash gusset
55 Corner filler panel	71 "A" post outer lower panel	87 Plenum box
56 Rear quarter panel	72 Door seal retainer	88 Grommet
57 Rear quarter reinforcement	73 Sill outer panel	89 Drain hose
58 Rear quarter reinforcement	74 Sill front filler panel	90 Clip
59 Tailgate lock support	75 Toe-board support bracket	91 Dash gusset
60 "B" post inner panel	76 Dash front panel	92 Dash shelf panel
61 "B" post outer panel	77 Toe-board	93 Front deck support rail
62 Side lamp filler plate	78 Steering column support channel	94 Rear wing
63 Nut	79 Dash front panel	95 Nut
64 Joint finisher	80 "A" post and sill reinforcement	96 Side lamp filler plate
65 Rear wing panel	81 Wiper motor support bracket	

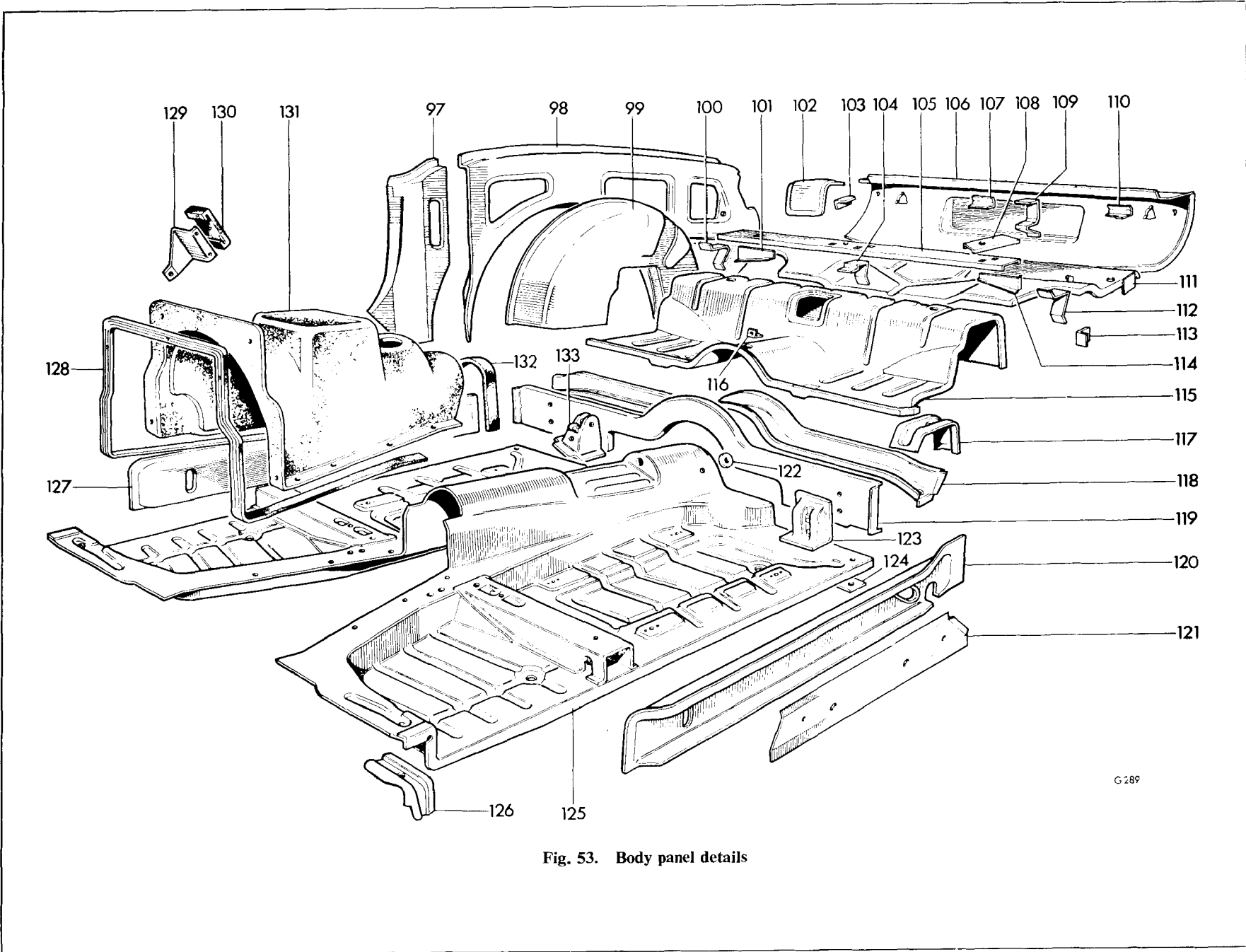
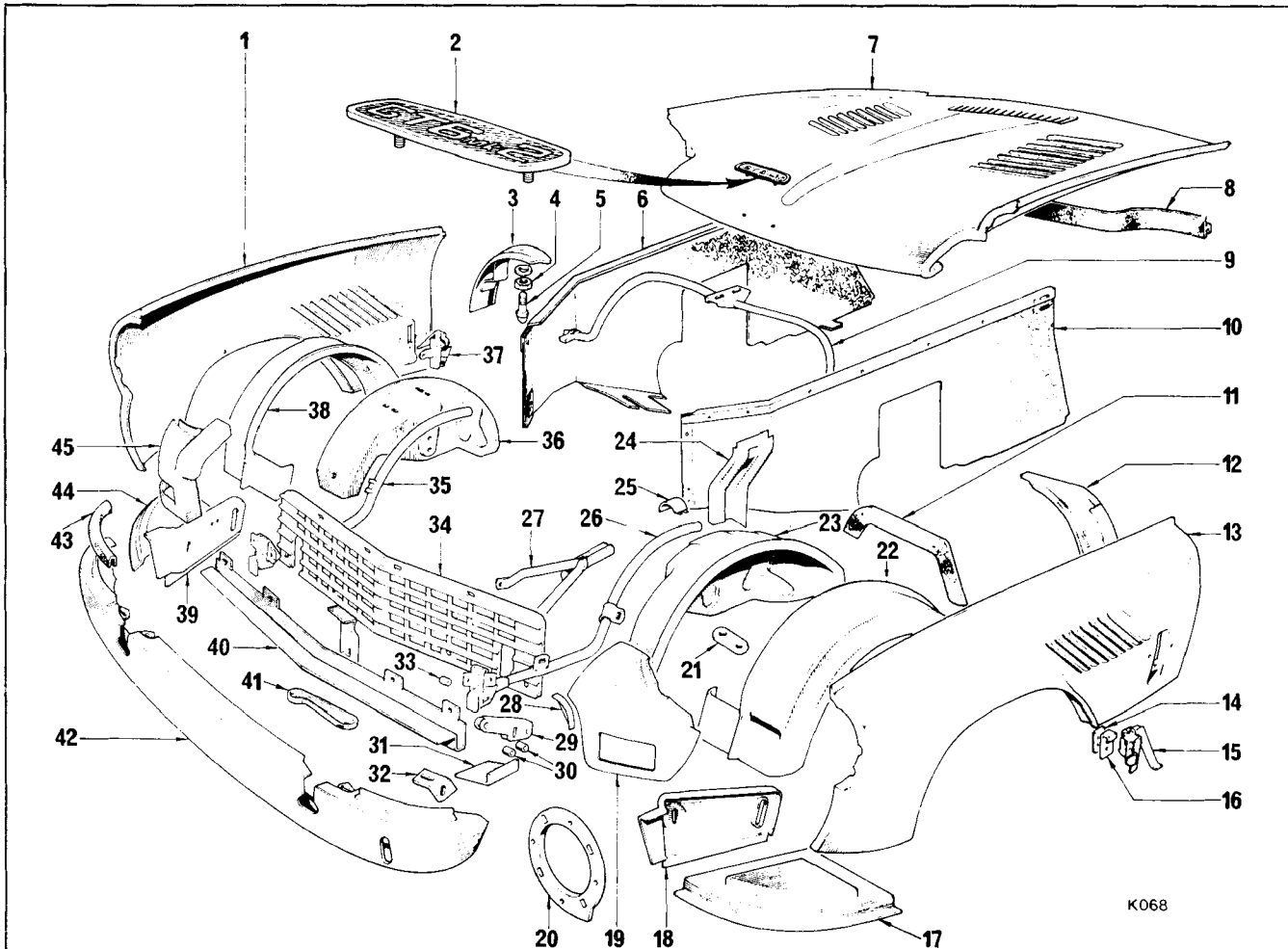


Fig. 53. Body panel details

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Key to Fig. 53

97 Front outer wheelarch panel	109 Fuel tank support	121 Sill reinforcement
98 Wheelarch outer panel	110 Support angle	122 Nut
99 Wheelarch inner panel	111 Plate	123 Radius arm mounting bracket
100 Support bracket	112 Support bracket	124 Reinforcement plate
101 Fillet	113 Angle	125 Main floor
102 Spring access cover	114 Fillet	126 Front outer mounting bracket
103 Rear valance angle	115 Seat pan	127 Inner sill panel
104 Support bracket	116 Angle bracket	128 Sealing rubber
105 Support rail	117 Body mounting reinforcement	129 Footrest
106 Rear valance panel	118 Heelboard crossmember	130 Footrest rubber
107 Support angle	119 Heelboard panel	131 Gearbox cover
108 Support bracket	120 Inner sill panel	132 Sealing rubber
		133 Handbrake bracket



- | | |
|-----------------------------------|-------------------------------------|
| 1 Front side wing—R.H. | 24 Support—wheelarch to wing |
| 2 Name plate—bonnet top | 25 Anchor bracket—bonnet hinge tube |
| 3 Front wing side reinforcement | 26 Bonnet hinge tube |
| 4 Jam—nut | 27 Support stay |
| 5 Bonnet location peg | 28 Nose panel reinforcement |
| 6 Engine bay valance—R.H. | 29 Bonnet hinge bracket assembly |
| 7 Bonnet top assembly | 30 Distance piece |
| 8 Bonnet sealing rubber | 31 Valance bracket |
| 9 Rear tube assembly | 32 Front valance support |
| 10 Engine bay valance—L.H. | 33 Bonnet hinge tube—spacer |
| 11 Rear seal—wheelarch to dash | 34 Front grille assembly |
| 12 Front wing side reinforcement | 35 Bonnet hinge tube |
| 13 Front side wing—L.H. | 36 Inner panel—wheelarch |
| 14 Tapping plate | 37 Bonnet catch assembly |
| 15 Bonnet catch assembly | 38 Outer panel—wheelarch |
| 16 Catch plate—dash side | 39 Closing panel assembly |
| 17 Filler panel—nose to wheelarch | 40 Grille mounting |
| 18 Closing panel assembly | 41 Support bracket—front valance |
| 19 Nose panel | 42 Front valance |
| 20 Headlamp mounting bracket | 43 Bonnet seal |
| 21 Backing plate—anchor brackets | 44 Nose filler panel |
| 22 Outer panel—wheelarch | 45 Nose panel |
| 23 Inner panel—wheelarch | |

Fig. 54. Bonnet, front valance and grille details

MODIFICATIONS TO BODY SECTION

With the exception OF CHANGES from Commission No. KC 50001 (GT6 Mk. 2) all servicing procedures given in the preceding pages remain unaltered.

BONNET ASSEMBLY

To Remove

Isolate the battery.

Disconnect the front lighting and horn cables at the snap connectors (Fig. 9).

Remove both overrides (page 5.232).

Disconnect the bonnet stay from the wheelarch (1) (Fig. 10).

Close the bonnet and take out two bolts (2) (Fig. 55).

With the aid of a second operator, lift the bonnet away.

To Refit

Reverse the removal procedure and refer to bonnet adjustment procedure as follows:—

Horizontal Adjustment

Slacken the bolts (2) (Fig. 55), move the bonnet forwards or rearwards to achieve a parallel gap of $\frac{1}{16}$ " (5 mm.) between the bonnet, scuttle and doors.

Retighten the bolts.

Height Adjustment—Front (Fig. 55)

Slacken the bolts (1) and raise the bonnet to achieve a parallel gap between the rear vertical edge and the doors.

Re-tighten the bolts.

Height Adjustment—Rear (Fig. 12)

Slacken the locknut (1) securing the cone shaped buffer to the bonnet screw. Screw the buffer in or out to lower or raise the bonnet rear edge.

Re-tighten the locknut and re-adjust the bonnet fastener brackets (2).

FRONT GRILLE

To Remove

Remove eight screws (arrowed Fig. 56) and manoeuvre the grille away from the bonnet.

To Refit

Reverse the removal procedure.

FRONT VALANCE

To Remove

Take out bolts (1), (2) and (3) (Fig. 57), from each side of the radiator and pull the valance forward and lower it clear of the body.

To Refit

Reverse the removal procedure.

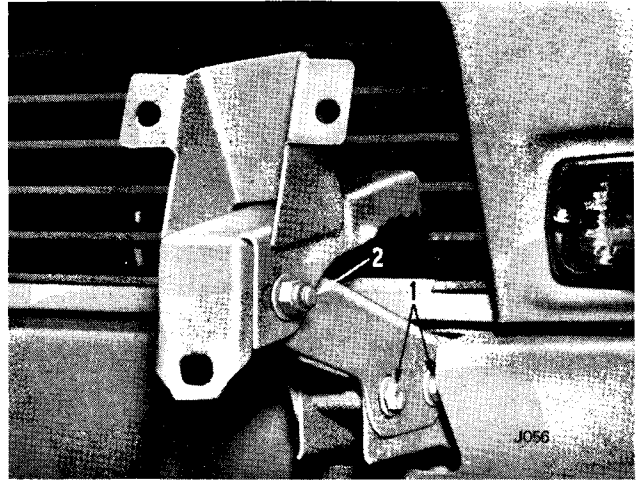


Fig. 55. Bonnet adjustment

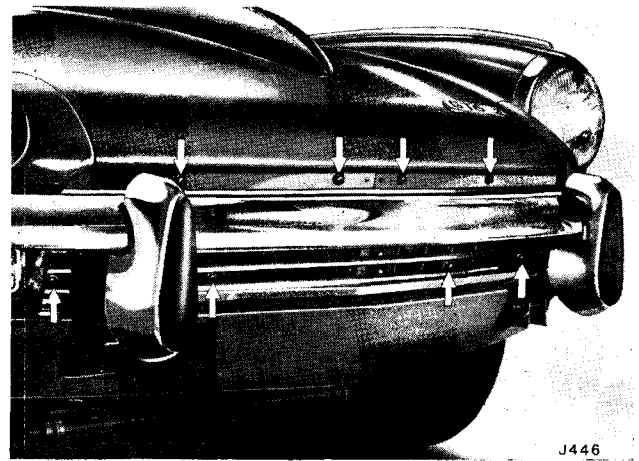


Fig. 56. Front grille attachment

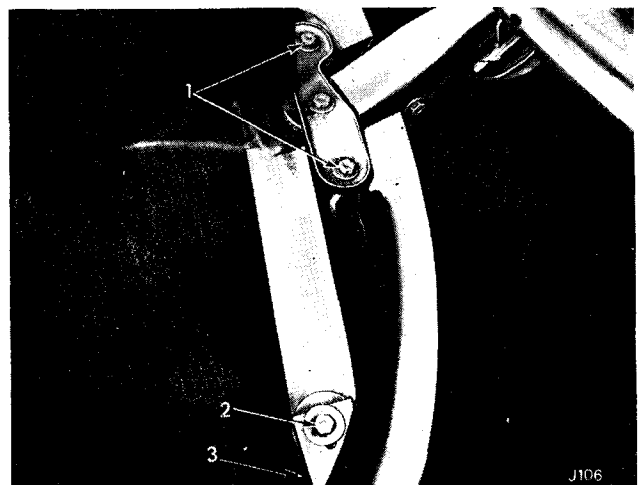


Fig. 57. Front valance attachment

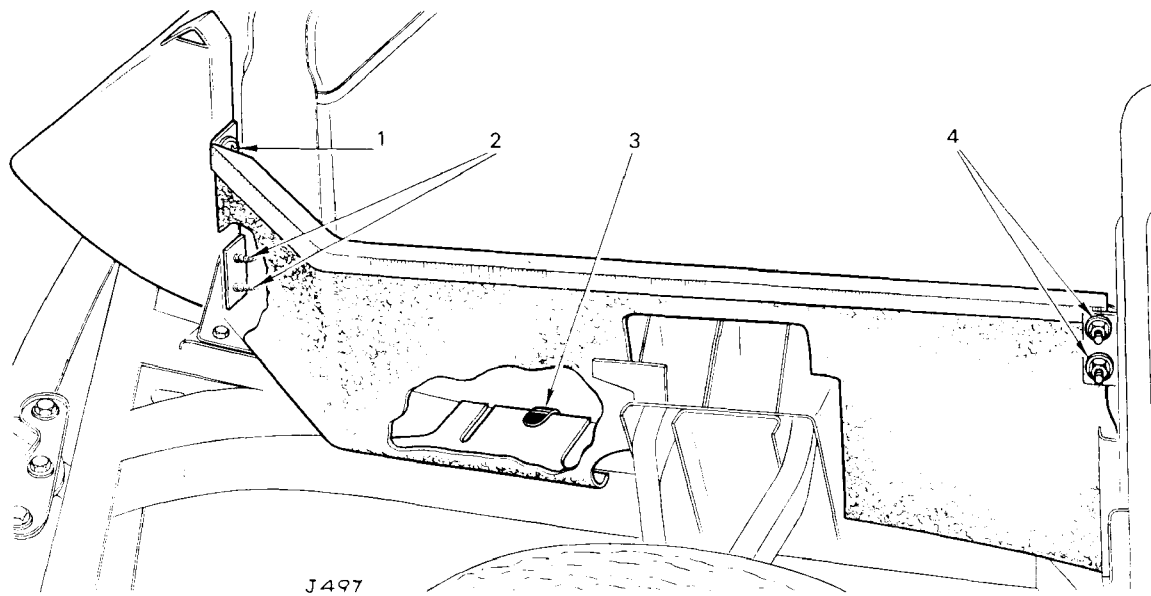


Fig. 58. Engine bay valance

ENGINE BAY VALANCES

To Remove (Fig. 58)

1. Take out two self-tapping screws (1) and one cross/recess screw (2) securing the front portion of the valance to the radiator support bracket.
2. Remove the trim clip (3) securing the valance to the frame sidemember.
3. Remove the two screws (4), washers and nuts, securing the rear portion of the valance to the scuttle panel.
4. Lift the engine bay valance clear, first releasing any attached electrical harness.

To Refit

Reverse the removal procedure.

OVERRIDERS

Front—To Remove (Fig. 60)

Remove bolts (2), (22) and (23), release the bumper and take out the exposed screw (24) retaining the over-riding to the bumper.

To Refit

Reverse the removal procedure and refer to Dust and Water Sealing, page 5.301.

Rear—NOT FITTED TO GT6 Mk. 2 GT6 PLUS, AND GT6 Mk. 3.

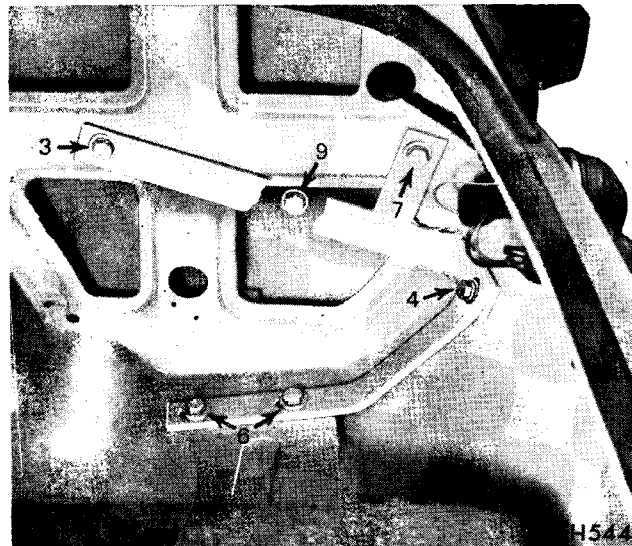


Fig. 59. Rear bumper attachment

BODY

5-233

BUMPERS

Front—To Remove (Fig. 60)

Take out the bolts (2), (22) and (23) and lift the bumper clear complete with override.

To Refit

Reverse the removal procedure, ensuring that the rubber packing washer (1) is fitted between the body and the bumper. Refer to Dust and Water Sealing, page 5.301.

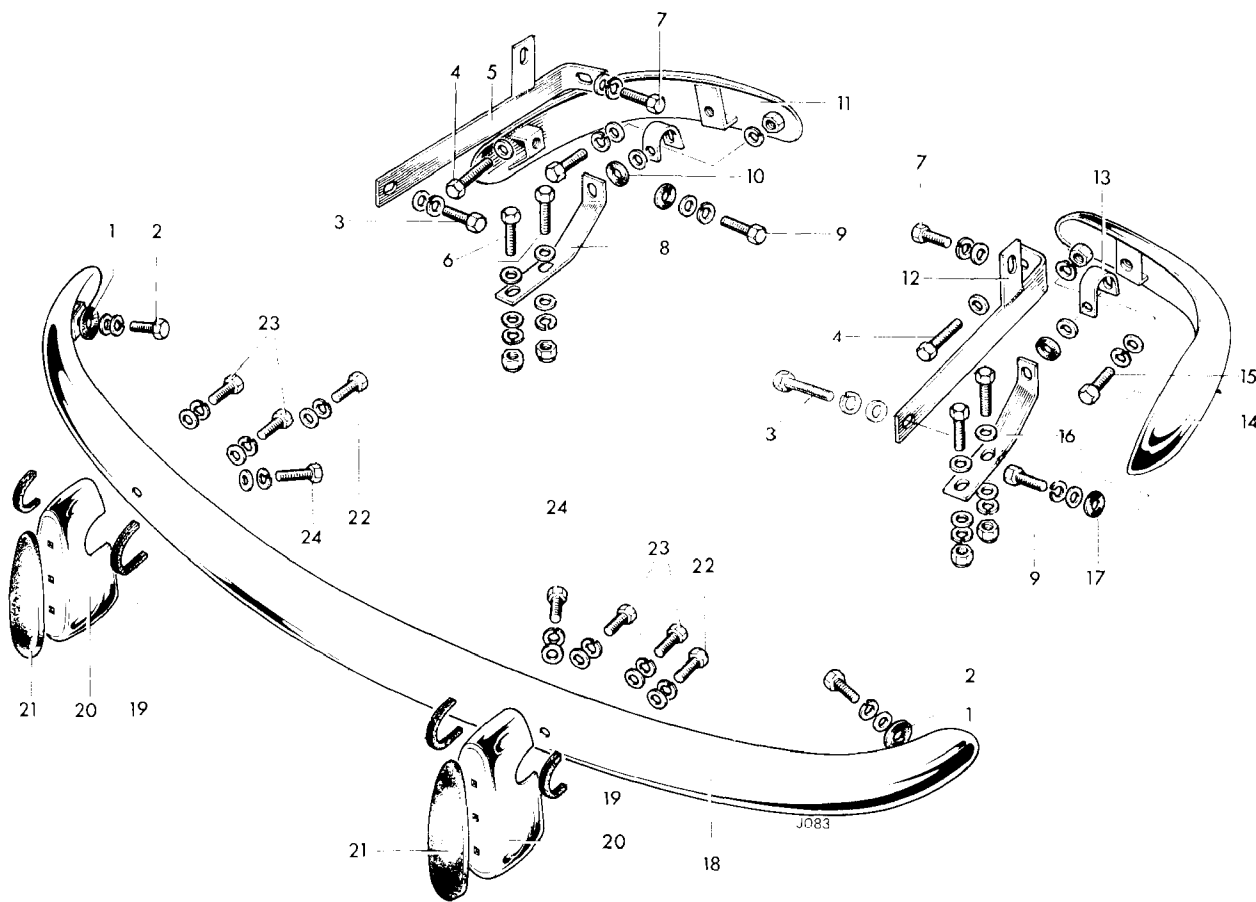
Rear—To Remove (Figs. 59 and 60)

Working inside the luggage compartment remove the luggage floor (two pieces).

Remove the spare wheel and fuel tank, page 5.221. Take out the bolts (4) and (9) to release the bumpers. To remove the bumper support brackets, take out the bolts (3), (6) and (7).

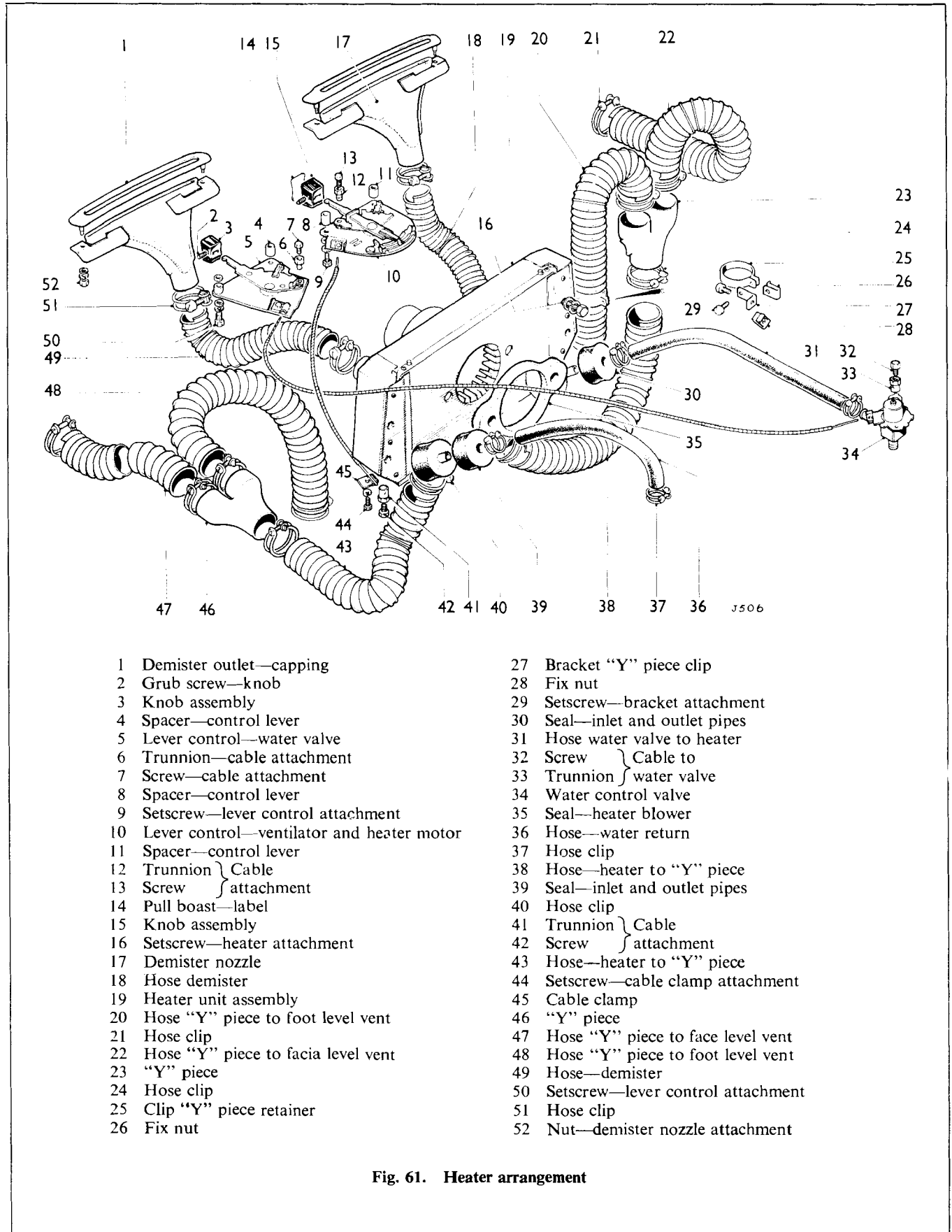
To Refit

Reverse the removal procedure, ensuring that the rubber packing washer (1) is fitted between the body and the bumper. Refer to Dust and Water Sealing, page 5.301.



- | | |
|------------------------------|------------------------------------|
| 1 Rubber washer | 13 Support extensions—rear bumper |
| 2 Bolt—front bumpers to body | 14 Rear bumper—L.H. |
| 3 Bolt—support bracket | 15 Bolt—support extension |
| 4 Bolt—spring bar | 16 Rear bumper support |
| 5 Spring bar—upper | 17 Rubber washer |
| 6 Bolt—support bar | 18 Front bumper |
| 7 Bolt—spring bar | 19 Moulding—P.V.C. |
| 8 Rear bumper support | 20 Override assembly |
| 9 Bolt—body side | 21 Rubber buffer—override |
| 10 Rubber washers | 22 Bolt—lower override attachments |
| 11 Rear bumper—R.H. | 23 Bolt—front bumper to body |
| 12 Spring bar upper | 24 Bolt—override to front bumper |

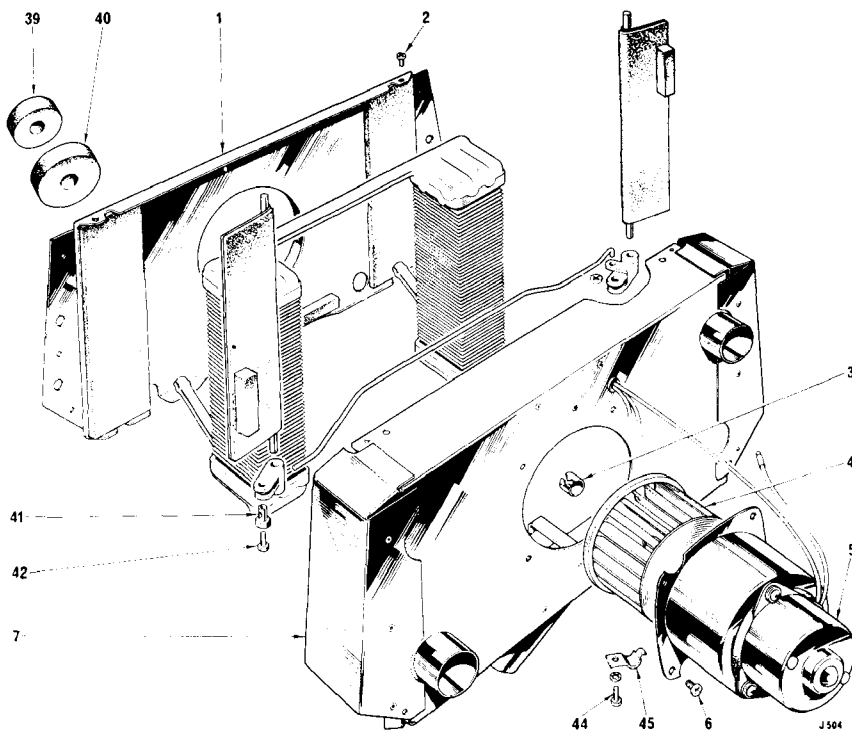
Fig. 60. Exploded view of bumpers



- | | |
|--|--------------------------------------|
| 1 Demister outlet—capping | 27 Bracket "Y" piece clip |
| 2 Grub screw—knob | 28 Fix nut |
| 3 Knob assembly | 29 Setscrew—bracket attachment |
| 4 Spacer—control lever | 30 Seal—inlet and outlet pipes |
| 5 Lever control—water valve | 31 Hose water valve to heater |
| 6 Trunnion—cable attachment | 32 Screw } Cable to |
| 7 Screw—cable attachment | 33 Trunnion } water valve |
| 8 Spacer—control lever | 34 Water control valve |
| 9 Setscrew—lever control attachment | 35 Seal—heater blower |
| 10 Lever control—ventilator and heater motor | 36 Hose—water return |
| 11 Spacer—control lever | 37 Hose clip |
| 12 Trunnion } Cable | 38 Hose—heater to "Y" piece |
| 13 Screw } attachment | 39 Seal—inlet and outlet pipes |
| 14 Pull boast—label | 40 Hose clip |
| 15 Knob assembly | 41 Trunnion } Cable |
| 16 Setscrew—heater attachment | 42 Screw } attachment |
| 17 Demister nozzle | 43 Hose—heater to "Y" piece |
| 18 Hose demister | 44 Setscrew—cable clamp attachment |
| 19 Heater unit assembly | 45 Cable clamp |
| 20 Hose "Y" piece to foot level vent | 46 "Y" piece |
| 21 Hose clip | 47 Hose "Y" piece to face level vent |
| 22 Hose "Y" piece to facia level vent | 48 Hose "Y" piece to foot level vent |
| 23 "Y" piece | 49 Hose—demister |
| 24 Hose clip | 50 Setscrew—lever control attachment |
| 25 Clip "Y" piece retainer | 51 Hose clip |
| 26 Fix nut | 52 Nut—demister nozzle attachment |

Fig. 61. Heater arrangement

BODY



Key to Fig. 62

- 1 Inner heater box
- 2 Screw-heater box
- 3 Metal clip
- 4 Nylon impellor
- 5 Blower motor
- 6 Screw-motor attachment
- 7 Outer heater box

Fig. 62. Exploded view of heater unit

HEATER

To Remove (Fig. 61)

1. Isolate the battery.
2. Drain the coolant. Disconnect the water heater hoses at the valve (34). With one hose in a container, blow down the other to clear the coolant from the heater matrix.
3. Referring to Fig. 27, disconnect the water hoses (26).
4. Working inside the car, remove the facia support bracket, page 5.244 and the gearbox cover, page 5.207. Remove the passengers' side parcel shelf, and to assist removal of the heater box remove the instrument panel page 5.244.
5. Disconnect the air hoses (18), (38), (43) and (49) (Fig. 63) from the heater box.
6. Slacken the setscrew (44) and the clamping screw (42) and release the control cable from the bottom right hand side of the heater box. Disconnect the cables to the heater blower motor.
7. Remove four bolts (16) securing the heater unit to the dash bulkhead and manoeuvre the unit from behind the facia.

To Refit

Reverse the removal procedure. A second operator is required when refitting the four bolts (16). Refer to Dust and Water Sealing, page 5.301.

WATER CONTROL VALVE

To Remove (Fig. 61)

Drain the coolant.
Disconnect the heater hose (31). Release the temperature control cable from the water valve (34).
Unscrew the water valve from the manifold.

To Refit

Reverse the removal procedure using "Hermetite" sealing compound to seal the valve to manifold.
Reconnect the temperature control cable as follows:—

Push the control cable fully in and assemble it to the water valve. Turn the valve to the "OFF" position and retighten the trunion nut.

NOTE: The water control valve is serviced only by replacement.

HEATER BLOWER MOTOR

To Remove (Fig. 62)

Remove the heater unit. Take out ten screws (2) securing the inner and outer heater box. Using a screw-driver release the metal clip retaining the nylon impellor to the blow motor shaft and withdraw the impellor. Take out four screws (6) and remove the blower motor (5) from the heater box.

To Refit

Reverse the removal procedure.

NOTE: The blower motor assembly is serviced only by replacement.

AIR FLOW

When the air is allowed to enter the vehicle through the heater or the ventilators it flows through the vehicle and out through the louvres at either side of the tail gate. The louvres incorporate flap valves which only permit air to be extracted.

CAUTION: Ensure that packages and personal items do not obstruct the extraction louvres at each side of the tail gate.

SWIVELLING FRESH AIR VENTS

To Remove Facia Air Vents

1. Working behind the facia release the clip from the air hose and pull the hose away from the vent.
2. Referring to Fig. 64 remove the two knurled nuts (1) and clamp supports (2) from the retaining clamp (3) securing the air vents to the facia. Rotate the clamp clockwise until it can be released from the retaining pins (4) on the air vents and lift clear of facia.
3. The fresh air vents (5) can now be removed from the facia.

To Remove Foot Well Air Vents (Fig. 63)

1. Working below the parcel shelf release the clip from the air hose and pull the hose away from the facia vent.
2. Remove the nut (53) bolt and washer retaining the vent to the mounting clip.
3. The fresh air vent (5) can now be removed from the shelf.

To Refit

Reverse the removal procedure.

VENTILATION LOUVRES

To Remove

Remove the four cross/recess screws securing the two louvres and bezels to the body and pull clear.

To Refit

Reverse the removal procedure.

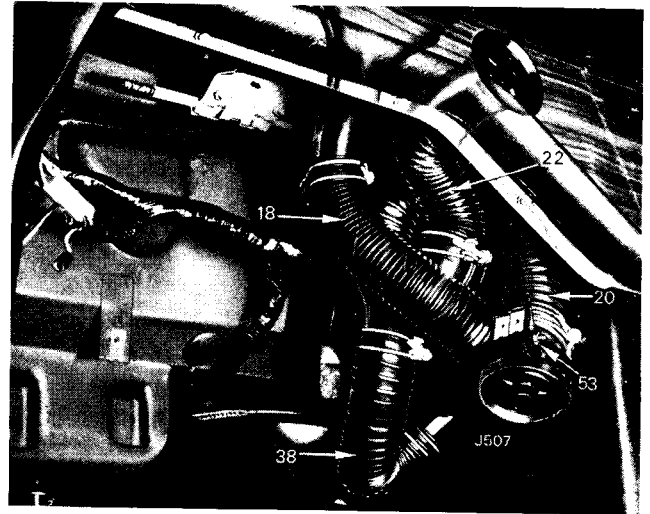


Fig. 63. Air hoses-view under facia

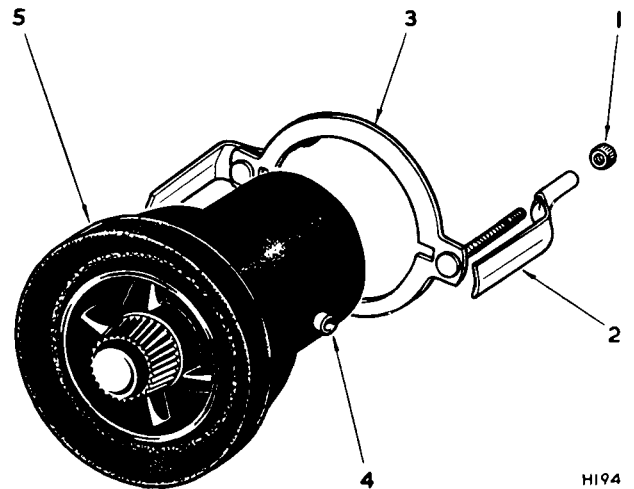
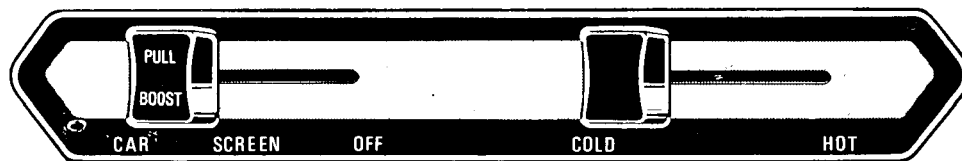
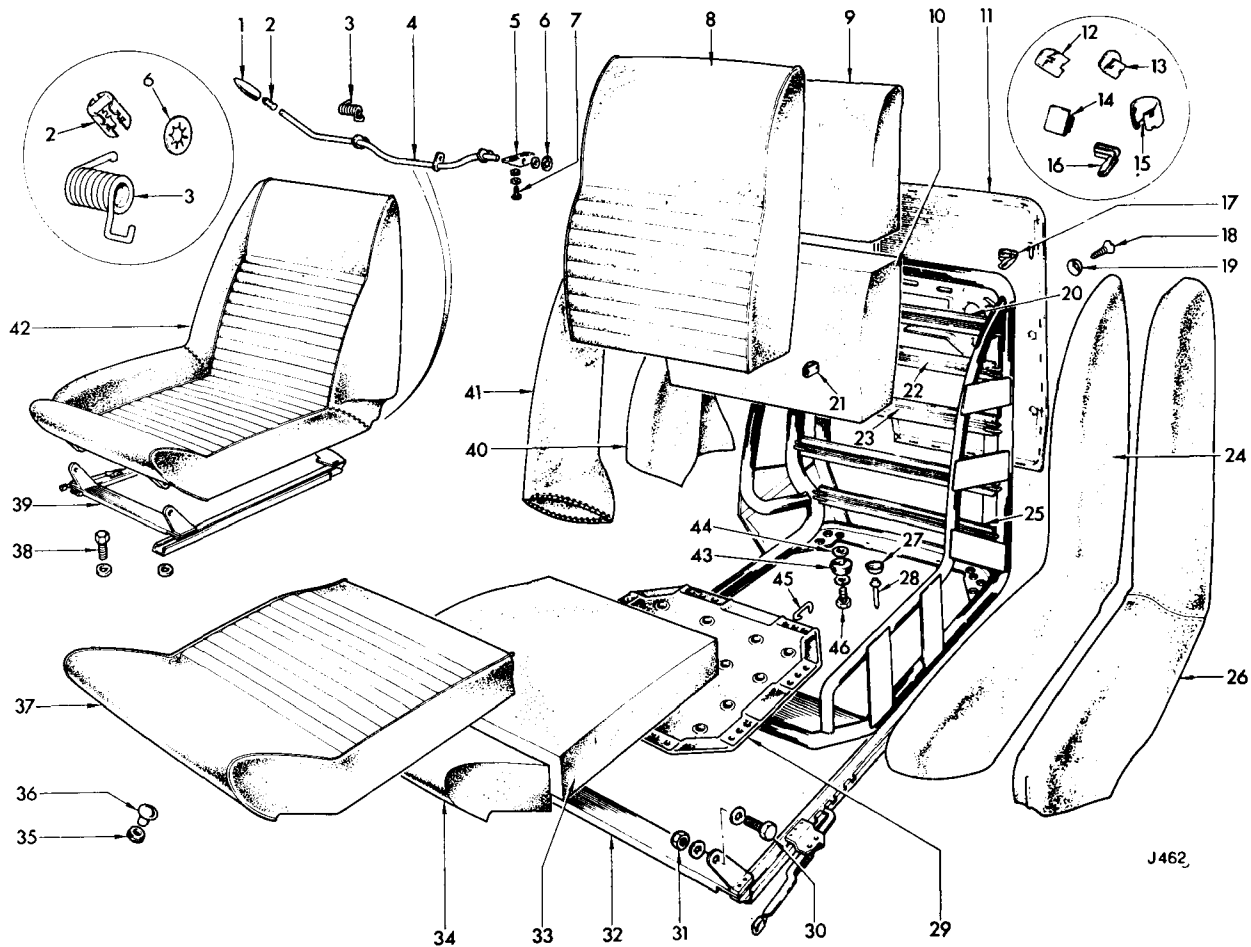


Fig. 64. Arrangement of fresh air vent



J465

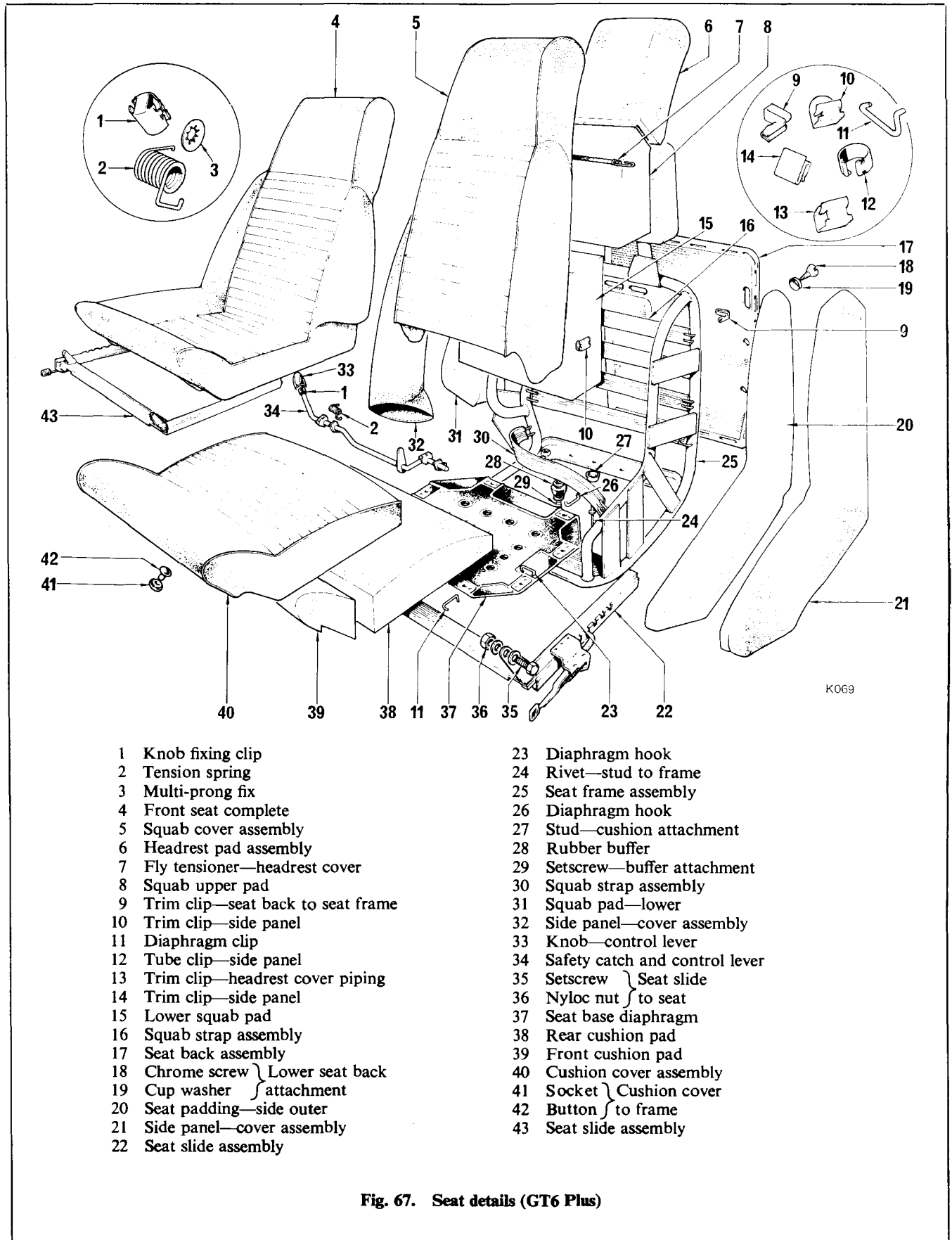
Fig. 65. Heating and ventilating control panel



J462

- | | |
|----------------------------------|--------------------------------|
| 1 Knob control lever | 22 Squab strap assembly—top |
| 2 Knob fixing clip | 23 Squab strap assembly—centre |
| 3 Tension spring | 24 Seat padding—side outer |
| 4 Safety catch and control lever | 25 Squab strap assembly—bottom |
| 5 Support bracket—control lever | 26 Side panel—cover assembly |
| 6 Multi-prong fix | 27 Stud—cushion attachment |
| 7 Setscrew—support bracket | 28 Rivet—stud to frame |
| 8 Squab cover assembly | 29 Seat base diaphragm |
| 9 Squab pad—upper | 30 Setscrew } Seat slide |
| 10 Squab pad—lower | 31 Nyloc nut } to seat |
| 11 Seat back assembly | 32 Seat slide assembly |
| 12 Trim clip—side panel | 33 Rear cushion pad |
| 13 Trim clip—side panel | 34 Front cushion pad |
| 14 Trim clip—seat back | 35 Socket } Cushion cover |
| 15 Tube clip—side panel | 36 Button } to frame |
| 16 Trim clip—seat back | 37 Cushion cover assembly |
| 17 Trim clip—seat back | 38 Bolt—seat slide to floor |
| 18 Chrome screw } Lower seat | 39 Seat slide assembly |
| 19 Cup washer } back attachment | 40 Inner padding—seat side |
| 20 Squab strap assembly—top | 41 Side panel—cover assembly |
| 21 Trim clip—squab cover | 42 Seat complete assembly |

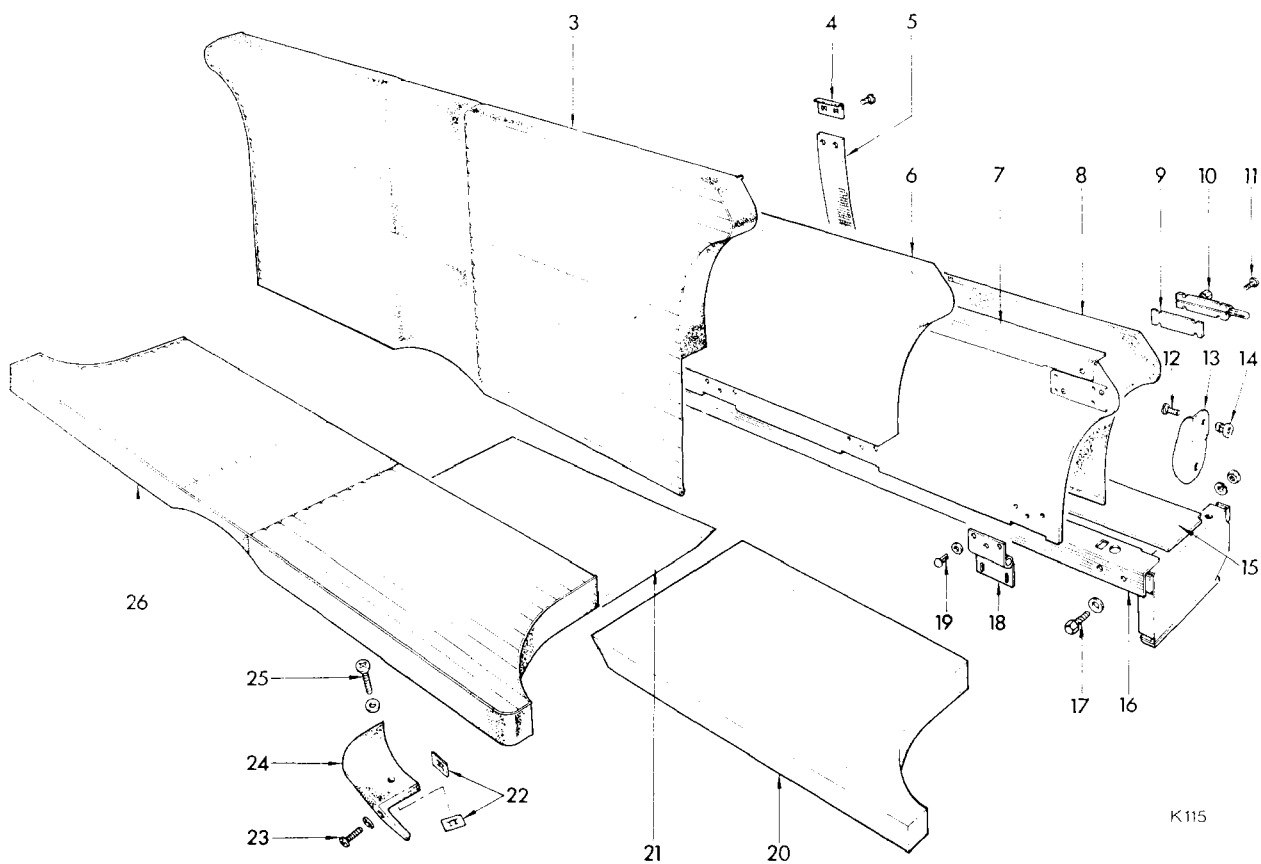
Fig. 66. Seat details (GT6 Mk. 2)



K069

- | | |
|-------------------------------------|-----------------------------------|
| 1 Knob fixing clip | 23 Diaphragm hook |
| 2 Tension spring | 24 Rivet—stud to frame |
| 3 Multi-prong fix | 25 Seat frame assembly |
| 4 Front seat complete | 26 Diaphragm hook |
| 5 Squab cover assembly | 27 Stud—cushion attachment |
| 6 Headrest pad assembly | 28 Rubber buffer |
| 7 Fly tensioner—headrest cover | 29 Setscrew—buffer attachment |
| 8 Squab upper pad | 30 Squab strap assembly |
| 9 Trim clip—seat back to seat frame | 31 Squab pad—lower |
| 10 Trim clip—side panel | 32 Side panel—cover assembly |
| 11 Diaphragm clip | 33 Knob—control lever |
| 12 Tube clip—side panel | 34 Safety catch and control lever |
| 13 Trim clip—headrest cover piping | 35 Setscrew } Seat slide |
| 14 Trim clip—side panel | 36 Nyloc nut } to seat |
| 15 Lower squab pad | 37 Seat base diaphragm |
| 16 Squab strap assembly | 38 Rear cushion pad |
| 17 Seat back assembly | 39 Front cushion pad |
| 18 Chrome screw } Lower seat back | 40 Cushion cover assembly |
| 19 Cup washer } attachment | 41 Socket } Cushion cover |
| 20 Seat padding—side outer | 42 Button } to frame |
| 21 Side panel—cover assembly | 43 Seat slide assembly |
| 22 Seat slide assembly | |

Fig. 67. Seat details (GT6 Plus)



K115

- | | | | | |
|----|-------------------------------|--------------------------------|----|---|
| 3 | Cover assembly | | 15 | Centre luggage board |
| 4 | Strap retainer | } Part of
squab
assembly | 16 | Support rail |
| 5 | Squab strap | | 17 | Setscrew—hinge attachment |
| 6 | Squab foam pad | | 18 | Squab board hinge |
| 7 | Squab board | | 19 | Rivet—hinge to squab |
| 8 | Squab board carpet | | 20 | Cushion pad—L.H. } Part of
cushion
cover assembly |
| 9 | Packing plate | | 21 | Cushion pad—R.H. } |
| 10 | Sliding bolt | | 22 | Fix nut—squab support |
| 11 | Screw-sliding bolt attachment | | 23 | Screw—squab support |
| 12 | Screw squab support | | 24 | Squab support—wheelarch |
| 13 | Squab support—roof side | | 25 | Screw—squab support |
| 14 | 'Lokut' nut | | 26 | Cushion cover |

Fig. 68. Occasional rear seat arrangement

OCCASIONAL REAR SEAT FITTING INSTRUCTIONS

Optional Extra on GT6 Mk. 2 Models Only
Stanpart Kit No. 575292/9

Preparation

To Remove—Front Seats

Remove two bolts (2) (Fig. 29) and two bolts (4) (Fig. 30). Lift out the seats and pick up the spacing washers.

To Remove—Luggage Floor Boards

Remove and discard:

- the rear floor carpet by releasing the press-stud fasteners;
- the front floor board with rail attached, by unscrewing the two outer countersunk screws adjacent to each wheelarch.

Unscrew four countersunk screws securing both rear boards and pull each board forward to release its rear edge from the spring clips. Do not discard these rear boards.

Installing Occasional Seat-squab Squab Support Bracket—Wheelarch (Fig. 68)

Position the trimmed bracket (24) over the angled support welded to the front of each rear wheelarch, and secure with cross recess screws (23) and (25), washers and spire nuts (22).

Squab Hinges (Fig. 68)

The hinges (18) are supplied as part of the squab assembly and are rivetted to the squab board (7).

Sliding Bolt (Fig. 68)

Assemble the sliding bolt (10) together with packing plate (9) and secure them to the squab back with cross/recess screws (11).

NOTE: Tapped holes are provided in the squab back for mounting the sliding bolt assembly.

Before fitting the squab to the car, secure the support rail (16) to the squab hinges with eight setscrews (17) washers and nuts.

Referring to Fig. 69, position the squab assembly complete with support rail as shown, and secure the support rail to the centre crossmember with screws (29) and hexagon headed screws (28), plain washer, spring washer and nut. Fit four spire clips (27) to the support rail.

Squab Support Bracket—Roof Side (Fig. 70)

Using finger pressure along the trim on the roof side panels locate the two hole positions for the bracket (13).

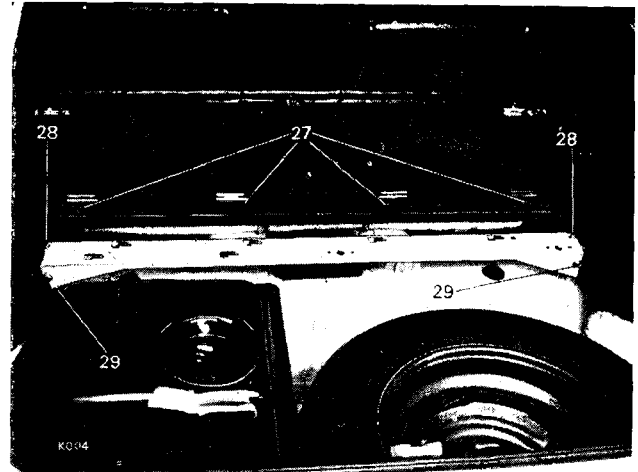


Fig. 69. Support rail fitted to centre cross member

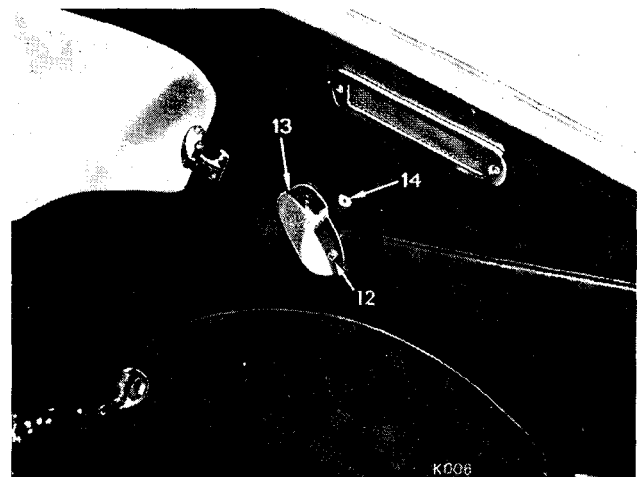


Fig. 70. Fitting roof side support bracket

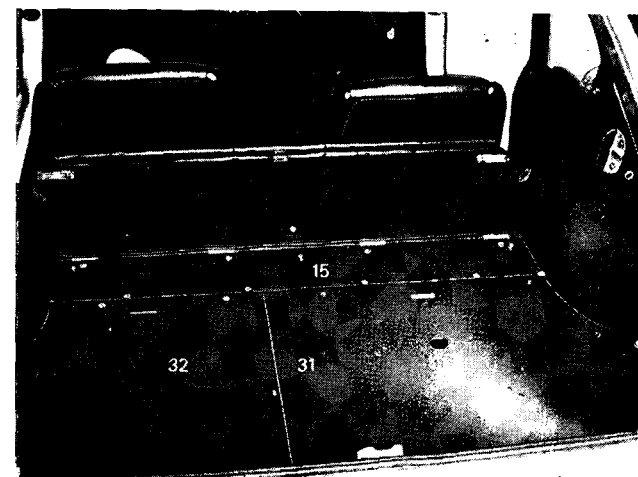


Fig. 71. Luggage floor layout with the squab in the down position



Fig. 72. General view showing cushion in position

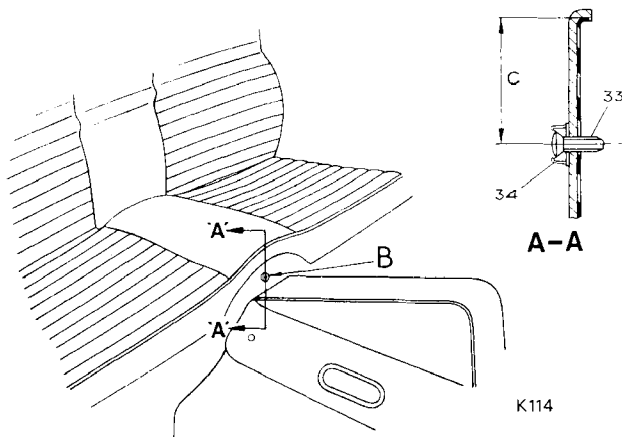


Fig. 73. Retaining strap fitting instructions



Fig. 74. Squab in the down position showing strap fitted

Pierce the trim covering the holes, insert the nylon nut (14), and secure the bracket with cross/recess screws (12). Raise the squab to the upright position and check the alignment of the sliding bolt behind the bracket. Adjust the bracket as necessary to obtain a secure retention.

Occasional Seat Cushion

Place the seat cushion in the rear seat pan as illustrated on Fig. 72.

Fitting Squab Retaining Strap Stud (Fig. 73)

Working to dimension (C) 1'38" (34.92 mm.) to achieve the correct drilling position, drill a .109" (2.80 mm.) diameter hole in position (B) on the centre line of the car in the heelboard panel.

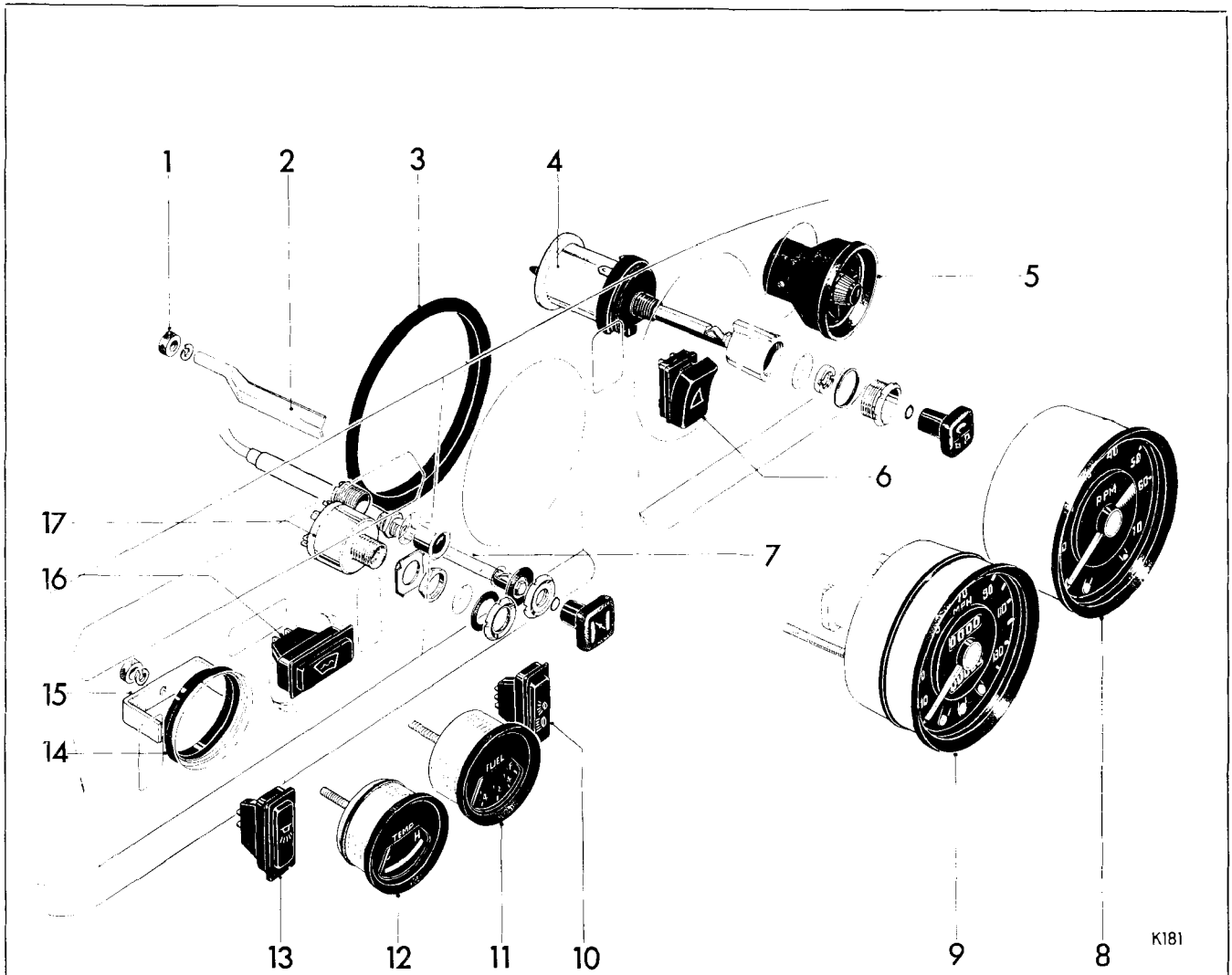
Referring to Fig. 71, secure the centre luggage board (15) with eight countersunk screws. Guide the rear edge of each rear board (31) and (32) into their spring retaining clips and secure in the position shown with four countersunk screws.

Fit the new luggage floor carpet and secure the press studs (Fig. 74).

Refit both front seats.

KIT CONTENTS

Detail No.	Description	Quantity
908721	Squab assembly	1
815601	Cushion assembly	1
814046	Support rail assembly	1
FF2545/4	Fix nut—support rail	2
508790	Setscrew	8
508875	Plain washer	20
505307	Lock washer	10
505771	Nut	8
625501	Trimmed bracket—R.H.	1
625491	Trimmed bracket—L.H.	1
FN2045/9	Fix nut—trimmed bracket	4
623854	Bracket—R.H.	1
623853	Bracket—L.H.	1
621535	Nut (Lokut)	4
716703	Centre board assembly	1
KT4706	Screw flat countersunk	4
FQ3405	Nut retainer—centre board	4
508271	Screw	2
814461	Luggage floor carpet	1



K181

- | | |
|--|---|
| 1 Knurled nut | 19 Speedometer |
| 2 Clamp support—tachometer and speedometer | 10 Lighting switch |
| 3 Support ring—tachometer and speedometer | 11 Fuel gauge |
| 4 Windscreen washer and wiper switch (2 speed) | 12 Temperature gauge |
| 5 Fresh air vent | 13 Interior lamp switch |
| 6 Hazard warning light switch | 14 Support ring—fuel and temperature gauge |
| 7 Choke control | 15 Clamp support—fuel and temperature gauge |
| 8 Tachometer | 16 Heated backlight switch |
| | 17 Ignition and starter switch (not GT6 Mk. 3). |

Fig. 75. Switches, instruments and controls

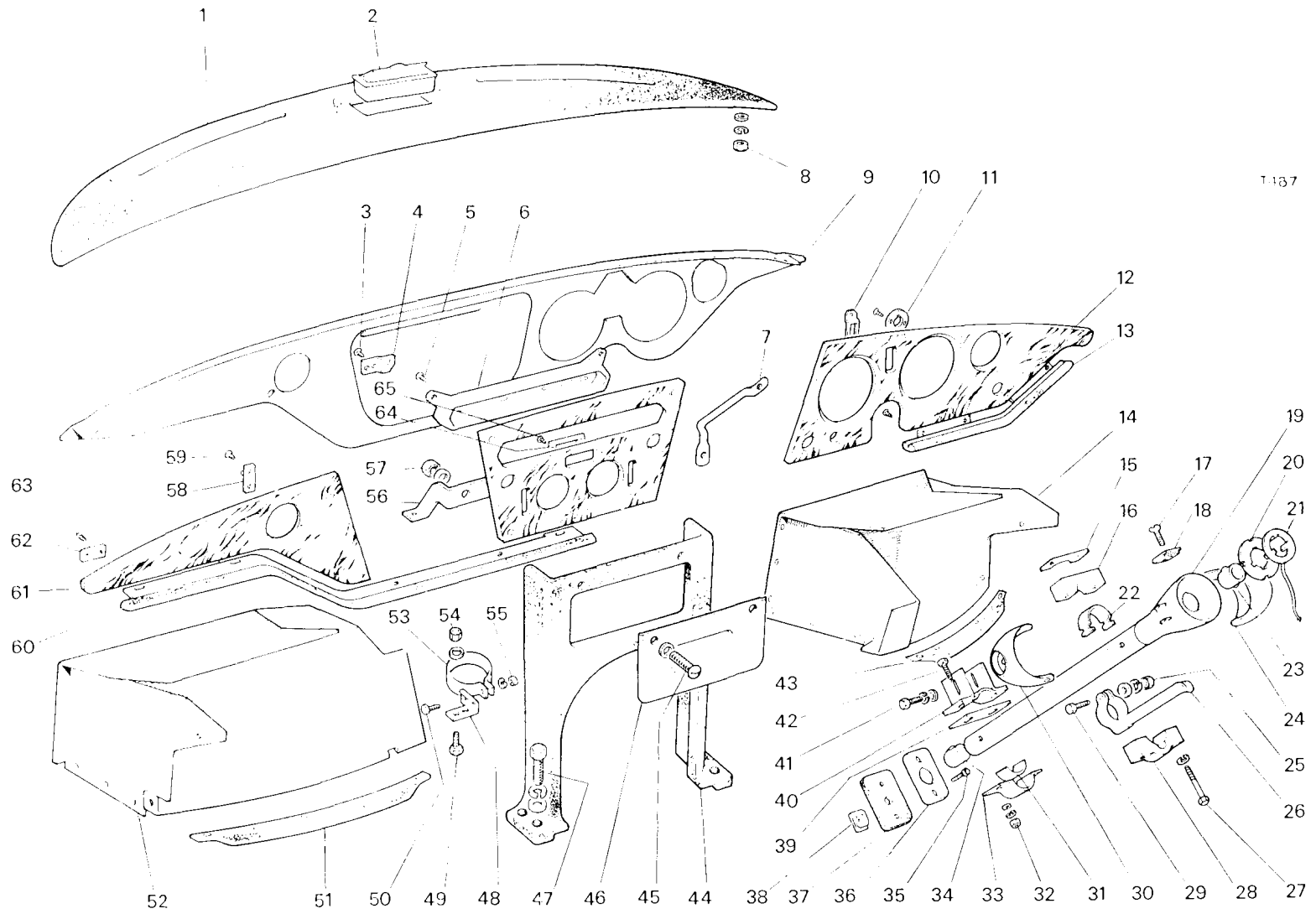


Fig. 76. Facia details (GT6 Mk. 2, Plus and Mk. 3)

Key to Fig. 76

- | | | | |
|----|--|----|---------------------------------------|
| 1 | Crash pad | 34 | Bearing assembly |
| 2 | Ash tray | 35 | Self tapping screw |
| 3 | Woodscrew—attachment plate | 36 | Retaining plate |
| 4 | Attachment plate | 37 | Rubber sealing pad |
| 5 | Woodscrew—heater control escutcheon | 38 | Spire nut |
| 6 | Heater control escutcheon | 39 | Felt strip—support ebrack |
| 7 | Tie bar—steering column to facia | 40 | Support bracket assembly |
| 8 | Nut—crash pad to deck | 41 | Setscrew—support bracket |
| 9 | Facia panel assembly | 42 | Bolt—clamp to support bracket |
| 10 | Retainer plate—hazard light switch | 43 | Support assembly—parcel tray |
| 11 | Plate washer—screen washer | 44 | Gearbox support bracket |
| 12 | Veneered facing—R.H. | 45 | Setscrew—support bracket to facia |
| 13 | Padding—lower facia | 46 | Cover plate—radio aperture |
| 14 | Parcel tray assembly—driver's side | 47 | Bolt—support bracket to floor |
| 15 | Tapped plate | 48 | Bracket-foot level vent |
| 16 | Clamp—steering column upper | 49 | Setscrew—bracket attachment |
| 17 | Self-tapping screw | 50 | Setscrew—clamp ring attachment |
| 18 | Fix nut | 51 | Support assembly—parcel tray |
| 19 | Steering column cowl | 52 | Parcel tray assembly—passengers' side |
| 20 | Insulator—slip ring | 53 | Clamping ring |
| 21 | Slip ring | 54 | Nut—vent bracket attachment |
| 22 | Spring—column clamp | 55 | Nut—vent bracket attachment |
| 23 | Bearing assembly | 56 | Bracket—parcel tray support |
| 24 | Escutcheon—flasher and lighting switch | 57 | Nyloc nut—support bracket |
| 25 | Nut—harness cover attachment | 58 | Attachment plate |
| 26 | Harness cover | 59 | Woodscrew—attachment plate |
| 27 | Bolt—upper and lower clamp attachment | 60 | Padding assembly—lower facia |
| 28 | Upper column clamp | 61 | Veneered facing—passengers' side |
| 29 | Bolt—harness cover attachment | 62 | Attachment plate |
| 30 | Escutcheon—flasher and lighting switch | 63 | Woodscrew—attachment plate |
| 31 | Felt strip—support bracket | 64 | Plate—switch retainer |
| 32 | Nut—support bracket clamp | 65 | Woodscrew—switch plate to facia |
| 33 | Clamp—support bracket | | |

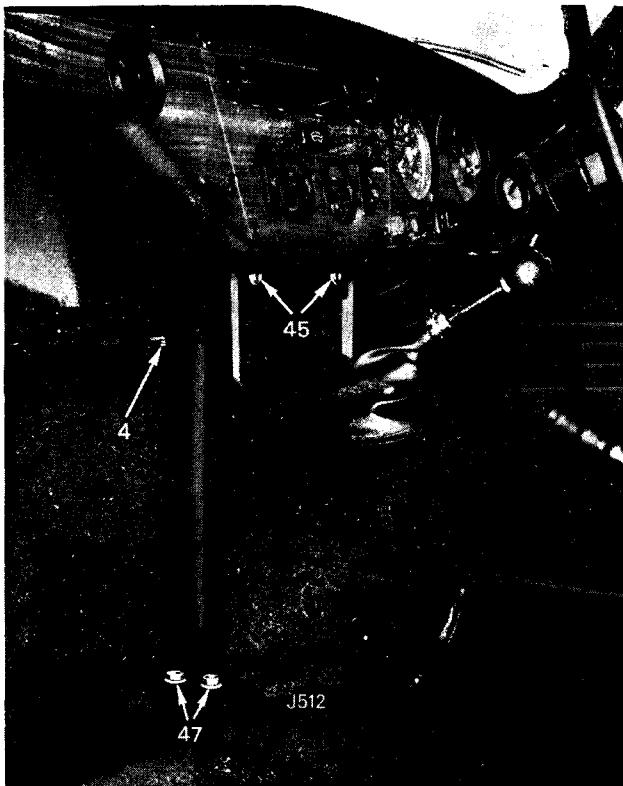


Fig. 77. Facia support bracket

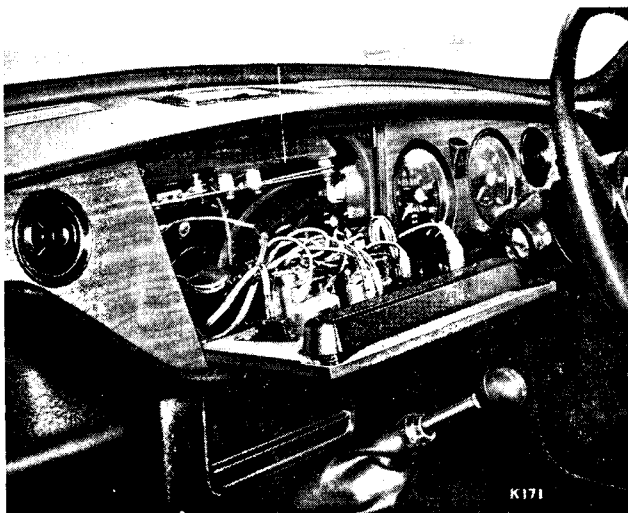


Fig. 78. Instrument panel

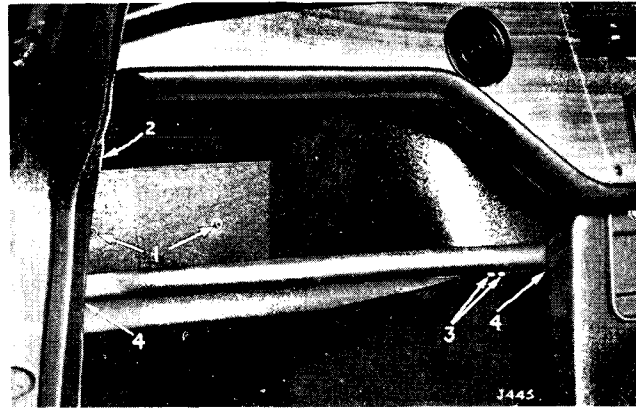


Fig. 79. Parcel tray-passengers side

FACIA COMPONENTS

Parcel Shelf

To Remove (Fig. 79)

1. Remove three cross/recess screws (1) and (2).
2. Take out two screws (3), securing the fresh air vent to the shelf.
3. Remove two nuts and bolts (4) and manoeuvre the parcel shelf away from the facia.
4. On the driver's side, also detach the speedometer trip cable.

To Refit

Reverse the removal procedure.

Facia Capping

To Remove and Refit—Refer to page 5-215

Facia Support Bracket

To Remove (Fig. 77)

1. Remove four bolts (47) securing the support bracket to floor.
2. Remove two screws (45) securing the support bracket to facia.
3. Lift the support bracket clear.

To Refit

Reverse the removal procedure.

Instrument Panel

To allow access to the instruments and other facia components, the instrument panel can be pulled clear of the facia (Fig. 78).

To Remove

1. Isolate the battery.
2. Remove the heater control knobs from the levers using a $\frac{1}{16}$ " (1.6 mm.) allen key.
3. Take out four screws from the top and bottom corners of the panel.
4. Lift the panel clear.

To Refit

Reverse the removal procedure.

WINDSCREEN WIPER WHEELBOXES

To Remove—Wheelbox, Passengers' side (Fig. 81)

Remove the wiper arms and lock nuts (Fig. 80).

Bend the top portion of the parcel shelf downwards to expose the wheelbox.

Release the wheelbox outer casing (1) from the wheelbox main body by removing two nuts (2) (Fig. 81). Support the drive cable and wheelbox tubing in a convenient position and withdraw the wheelbox main body.

To Remove—Wheelbox Driver's Side

Remove the wiper arms and locknuts (1) (Fig. 80).

Remove the parcel shelf, page 5-244.

Disconnect and remove the eye-level air hose between the heater box and facia and remove the demister fishtail, two nuts (2) (Fig. 26).

Withdraw the instrument panel (Fig. 78).

Release the wheelbox outer casing (1) from the wheelbox body by removing two nuts (2) (Fig. 81).

Manoeuvre the wheelbox main body from behind the facia.

To Refit

Reverse the removal procedure. Refer to Dust and Water Sealing, page 5-301.

To Remove—Wheelbox Drive Cable

Remove the wiper arms and locknuts (Fig. 80).

Referring to page 6-325 remove the connecting rod from the wiper motor and pull the drive cable clear of the dash panel.

To Refit

Feed the drive cable through the wheelbox tubing.

Attach a suitable spring scale to hole in crosshead.

Maximum permissible force to move cable rack in tubing is 6.0 lb.

Install the connecting rod to the wiper motor, page 6-325.

Refit the wiper arms to the spindles.

TAILGATE

To Remove

Isolate the battery.

Disconnect the electrical connectors.

With the aid of a second operator, support the tailgate and remove six bolts (1) (Fig. 46) securing the hinges to the tailgate.

To Refit

Reverse the removal procedure.

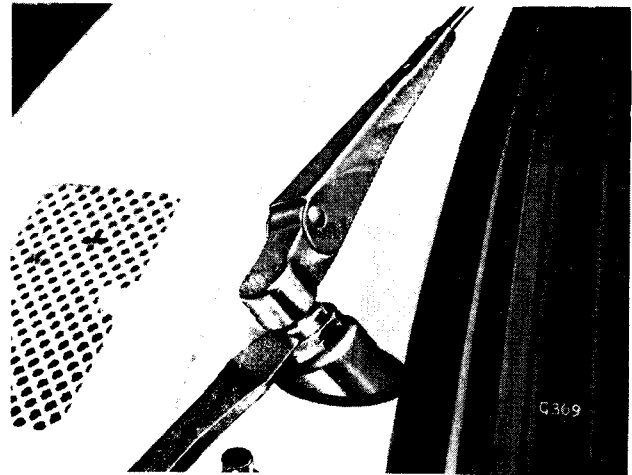


Fig. 80. Removing wiper arms

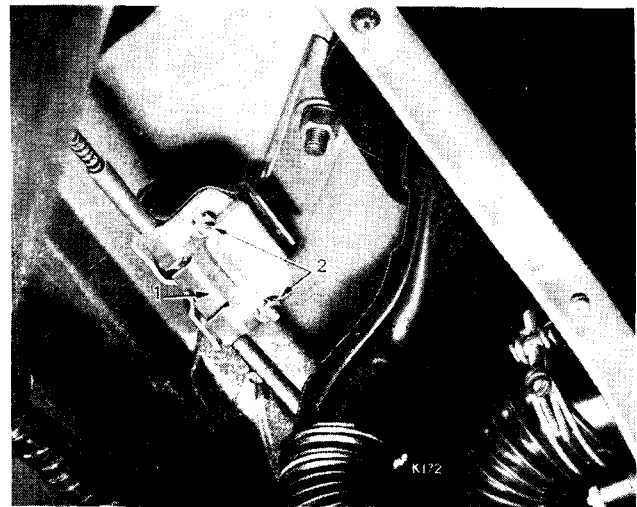


Fig. 81. Windscreen wiper wheelbox

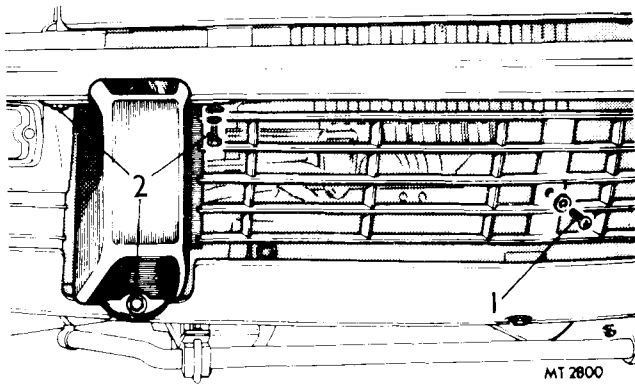


Fig. 82 Front grille and underrider

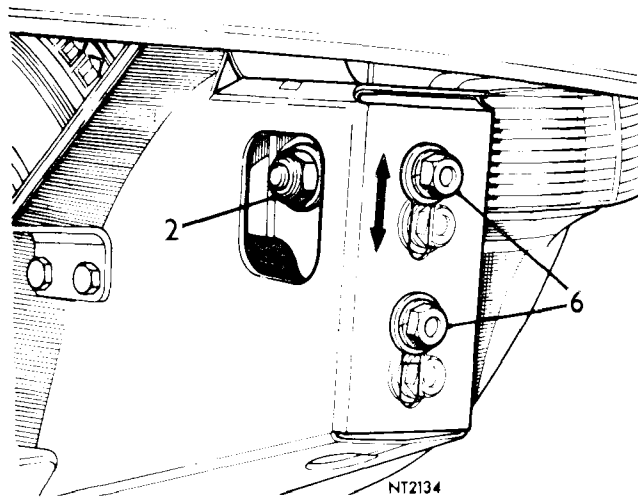


Fig. 83 Bonnet fixing and adjustment points

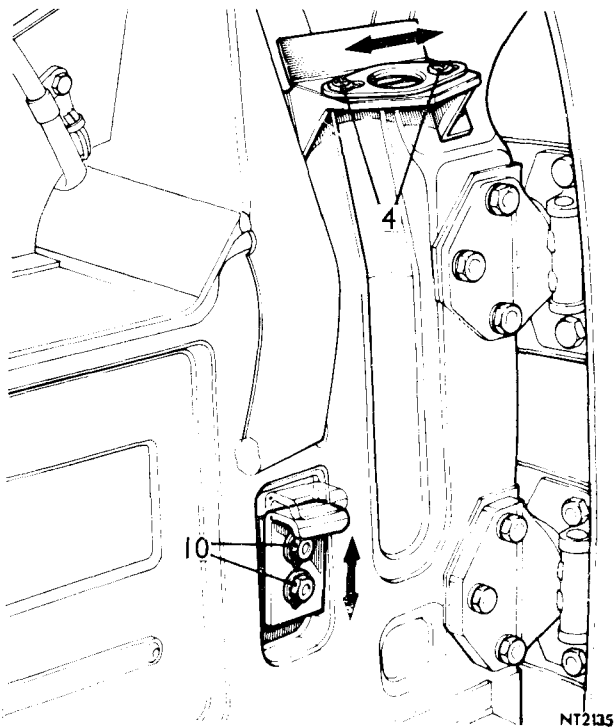


Fig. 84 Bonnet catch and buffer plate

MODIFICATIONS TO BODY SECTION

With the exception OF CHANGES from Commission Nos. KE 1, KF 1 (U.S.A. market) and KG 1 (Sweden only) all servicing procedures given in the preceding pages remain unaltered.

UNDERRIDERS AND FRONT GRILLE

To Remove

1. Remove one screw and plain washer at the centre of the grille.
2. Remove three bolts and washers around the underrider.
3. Lift off the underrider complete with front grille and detach the underrider from the grille.

To Refit

Reverse the removal procedure.

BONNET ASSEMBLY

To Remove

1. Disconnect the battery and six electrical leads from the headlamps.
2. Remove the nut, bolt and washer securing the bonnet stay.
3. Lower the bonnet and remove the underriders.
4. Remove two bolts and washers securing the bonnet (item 2 Fig. 83) and lift off the bonnet.

To Refit

Reverse the removal procedure, ensuring that any distance pieces and thrust washers fitted to the bolts (4) are correctly located, and refer to the bonnet adjustment procedure as follows:-

Horizontal Adjustment

1. Remove the underriders.
2. Slacken the two bolts (Fig. 83) and move the bonnet forwards or rearwards to achieve a parallel gap of $\frac{3}{16}$ " (5mm) between the bonnet scuttle and doors.
3. Re-tighten the bolts.
4. Slacken four screws (Fig. 84) and move the stop plates forwards or rearwards to give a correct location for the buffers.
5. Retighten the screws.

Vertical Adjustment

6. Slacken the four bolts (Fig. 83) and raise or lower the bonnet, as required.
7. Retighten the bolts.
8. Slacken two locknuts on the bonnet buffers and screw the buffers in or out to ensure correct location with the buffer plates.
9. Retighten the two locknuts.
10. Slacken four bolts (Fig. 84) and re-position the bonnet catch plates to correctly locate with the bonnet catches.
11. Retighten the bolts.
12. Refit the underriders.

FRONT VALANCE**To Remove**

1. Remove the front grille and underridders.
2. Disconnect the electrical harness from its clips and snap connectors.
3. Remove three bolts at the front and five bolts either side securing the valance to the chassis.
4. Lift off the valance.

To Refit

Reverse the removal procedure.

BUMPERS**Front—To Remove (Fig. 85)**

1. Remove four bolts and washers securing the underridders to the bumper.
2. Raise the bonnet and remove four bolts and washers securing the bumper ends.
3. Lower the bonnet and lift off the bumper.

Rear—To Remove (Fig. 86)

1. Remove the petrol tank and disconnect the two number plates electrical leads.
2. Remove two bolts and washers securing the bumper ends.
3. Remove two bolts, nuts and washers securing the centre of the bumper.
4. Lift off the bumper.

To Refit

Reverse the removal procedure ensuring that all washers and packing pieces are correctly located.

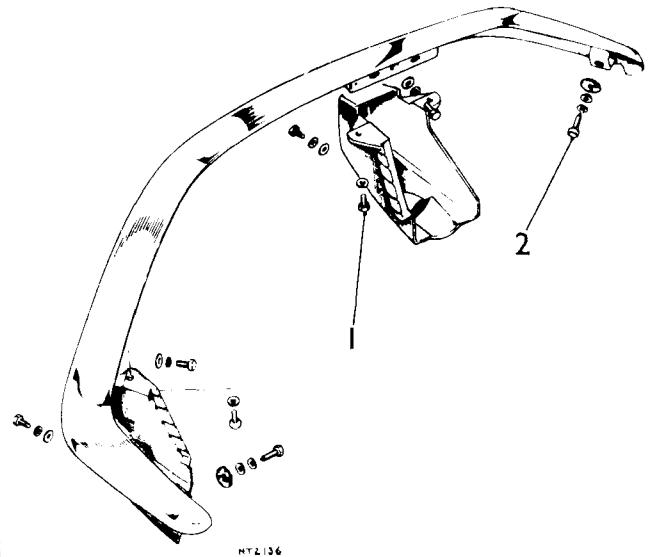


Fig. 85 Front bumper fixings

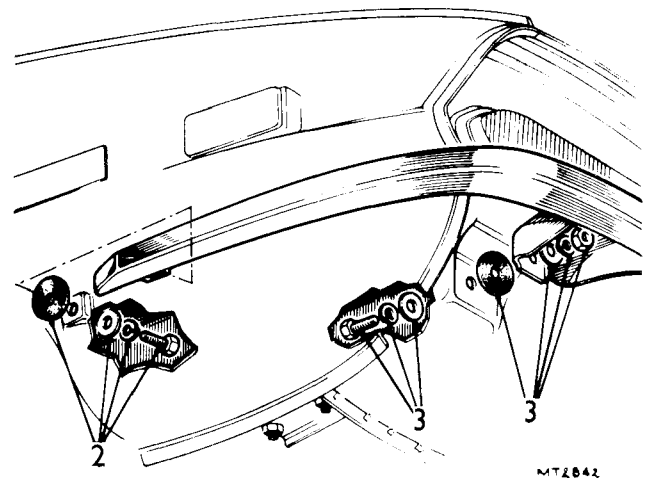


Fig. 86 Rear bumper fixings

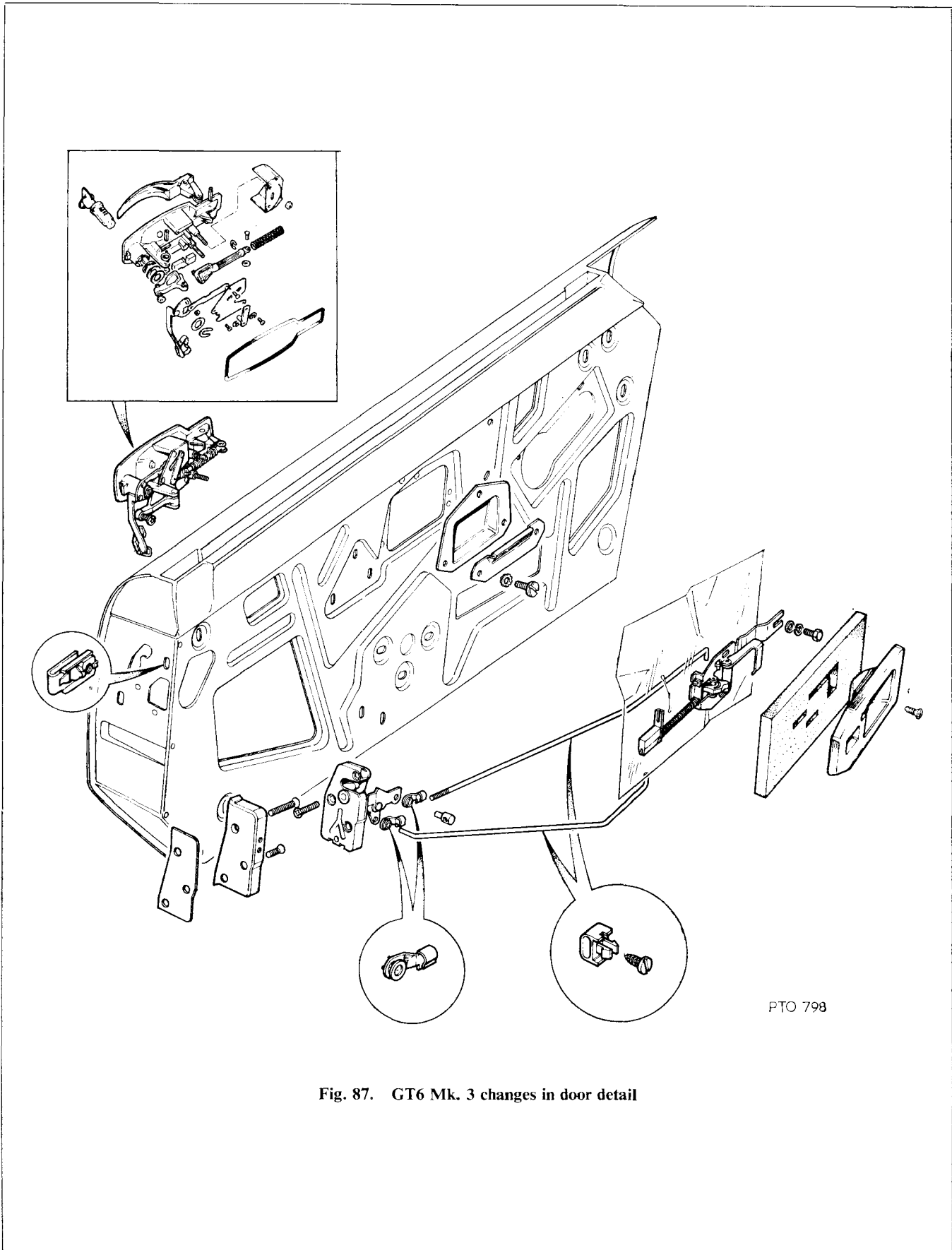


Fig. 87. GT6 Mk. 3 changes in door detail

DOOR**To Remove**

1. Disconnect the battery.
2. Drill out the rivet securing the check strap.
3. Support the door and remove six bolts (Fig. 88) together with their washers.

To Refit

Reverse the removal procedure.

DOOR TRIM (Fig. 89)**To Remove**

1. Depress the bezel and press out the pin securing the window handle.
2. Withdraw the window handle and bezel.
3. Remove the door lock interior handle cover plate.
4. Working around the edges, prise off the door trim pad.

To Refit

Reverse the removal procedure.

DOOR LOCK REMOTE CONTROL (Fig. 90)**To Remove**

1. Remove the trim pad and the door lock interior handle.
2. Remove the foam pad behind the door lock interior handle.
3. Detach the clip from the control rod.
4. Remove three bolts and washers securing the remote control unit.
5. Disconnect the control rod from the locking lever, and remove the remote control unit.

To Refit

Reverse the removal procedure adjusting the control rod positions as necessary.

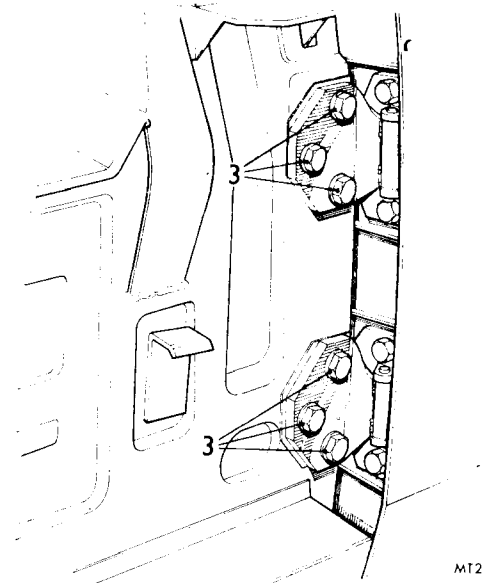


Fig. 88 Door hinges

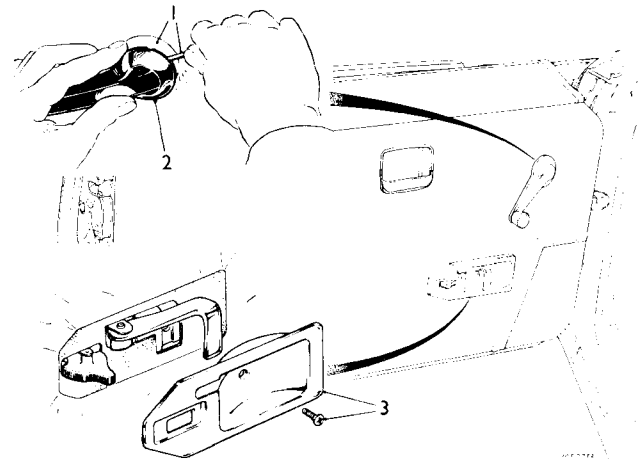


Fig. 89 Removing the door trim

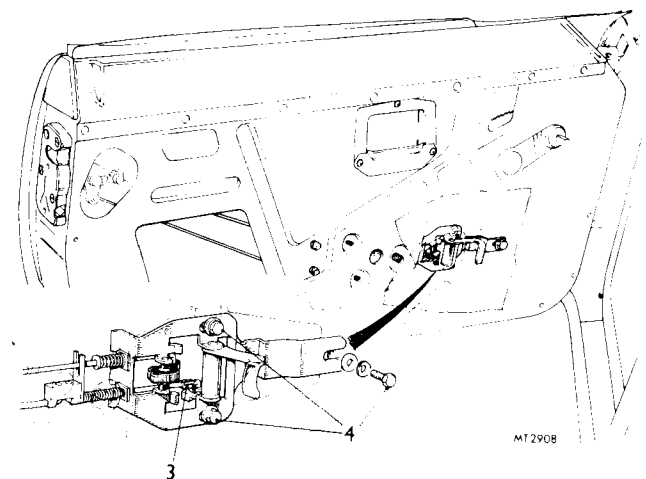


Fig. 90 Door lock remote control

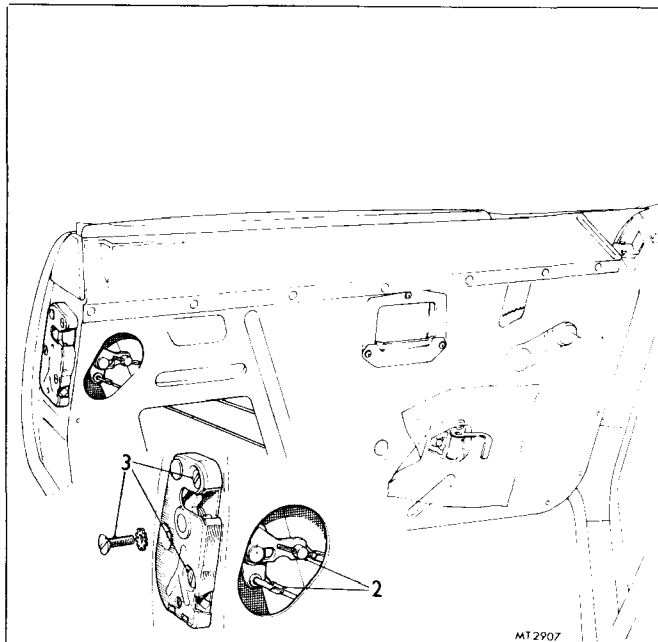


Fig. 91 Door lock

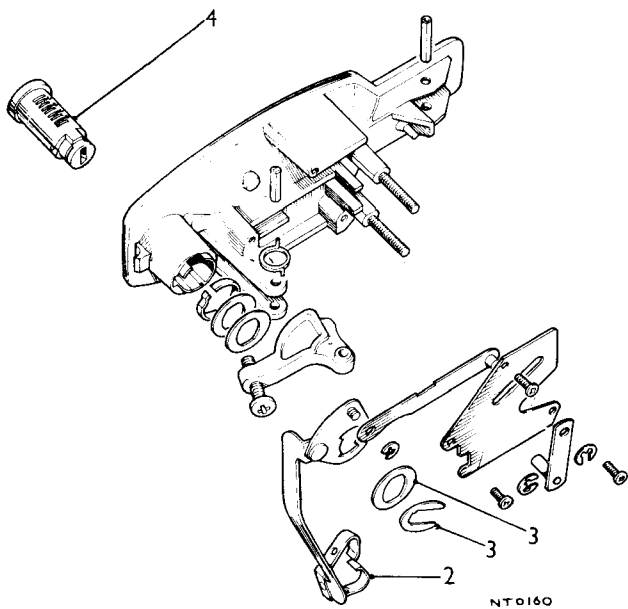


Fig. 92 Door handle and private lock

DOOR LOCK

To Remove

1. Remove the trim pad.
2. Release two control rods from the door lock
3. Remove three screws securing the door lock and lift the lock away from the door.

To Refit

Reverse the removal procedure.

DOOR HANDLE

To Remove

1. Fully raise the door window glass.
2. Remove the trim pad.
3. Remove the clamping bracket by releasing two nuts and washers.
4. Disconnect the door lock control rod from its spring clip.
5. Carefully withdraw the door handle and its seating gasket from outside the door.

To Refit

Reverse the removal procedure.

PRIVATE LOCK

To Remove

1. Remove the trim pad and door handle.
2. Remove the spring clip from the back of the lock.
3. Remove the plain washers and waved washers securing the pivot bracket.
4. Push out the lock from inside the door.

To Refit

Reverse the removal procedure.

DUST AND WATER SEALING

The following notes and diagrams indicate the locations of sealed joints and serve to familiarise dealers with the necessary materials and techniques employed to render the body shell dust and water proof.

The list of approved sealing compounds has been broken down into sections, appertaining to the progressive body build. The diagrams showing the location of sealed joints (heavy lines) show, in some cases, seams which are sealed with compounds which require curing in heated atmosphere. These compounds are listed under the general term "Plastisol" and are not suitable for application in service. In every case where Plastisol compounds have been used and the seal has failed, Hermetal "Double Bond" Metallic Cream, Docker's Compound or Hermetal Plastic Metal Filler should be used.

The scrap sections in the following pages correspond with the numbers on the diagram showing the complete car.

SEALING COMPOUNDS

COMPOUND	MANUFACTURER	COMPOUND	MANUFACTURER
Glasticon 303 Glasticord 305 and 400 Kelseal 3/315M. Kelseal 305.	Kelseal Ltd., Vogue House, Hanover Square, London, W.1.	Seelastik SR.51 Seelastrip LS.105	Expandite Ltd., Cunard Road Works, London, N.W.10.
Docker's Compound	Docker Bros. Ltd., Rotton Park Street, Birmingham, 16.	Boscoseal B.B. Plastisol Putty S.106.46	B.B. Chemicals, Ulverscroft Road, Leicester.
Supra Dedseal	Supra Chemical & Paint Ltd., Hainge Road, Tipton, Staffs.	Hermetal "Double Bond" Metallic Cream Hermetal Plastic Metal Filler	The Kenilworth Mfg. Co. Ltd., West Drayton, Middlesex.
3M's EC 1168 Mastic Sealer	Minnesota Mining and Manufacturing, 3M House, Wigmore Street, London, W.1.	Dunlop DS.5035/S Sealer	Dunlop Chemical Division, Chester Road, Erdington, Birmingham, 24.

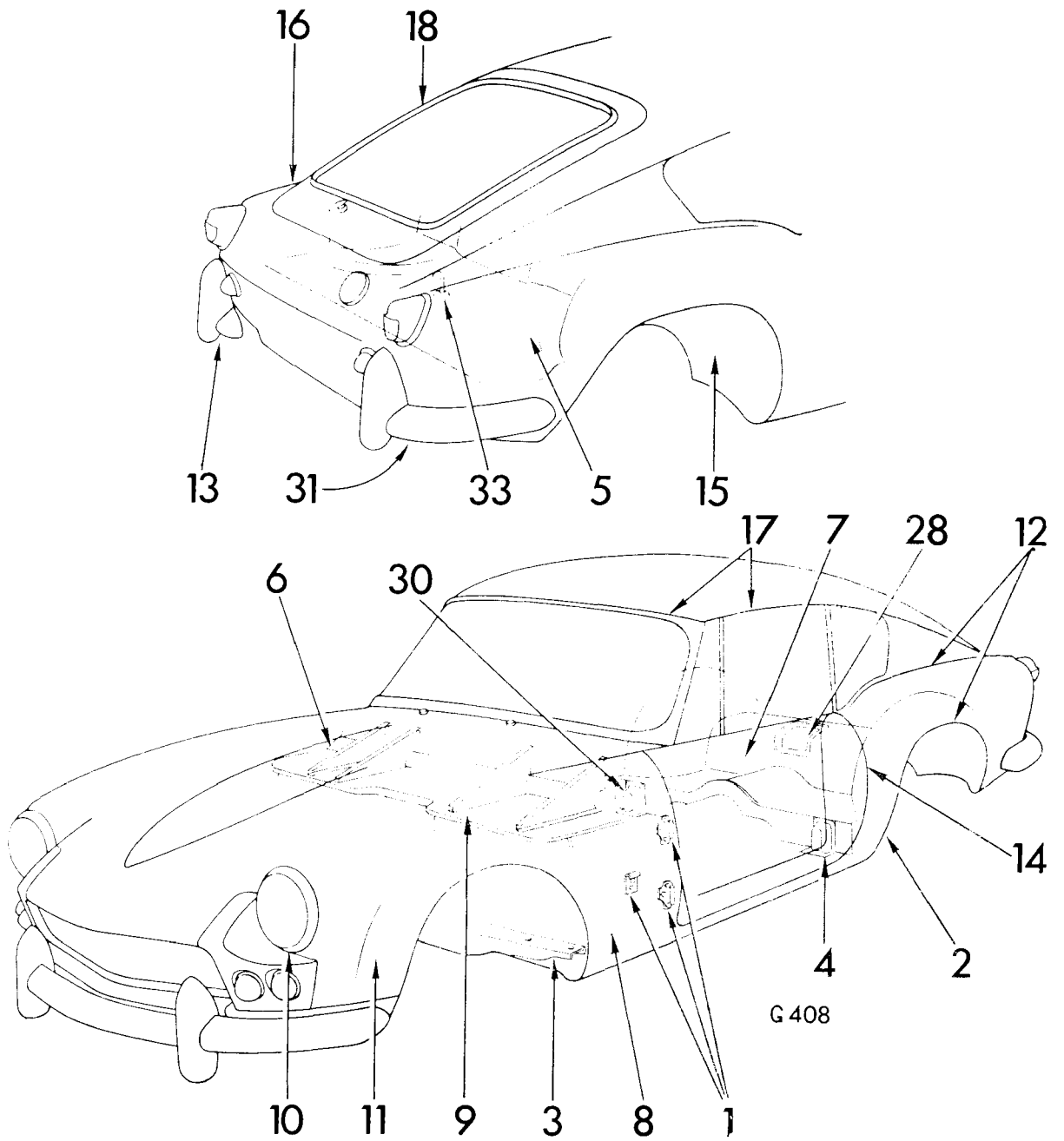
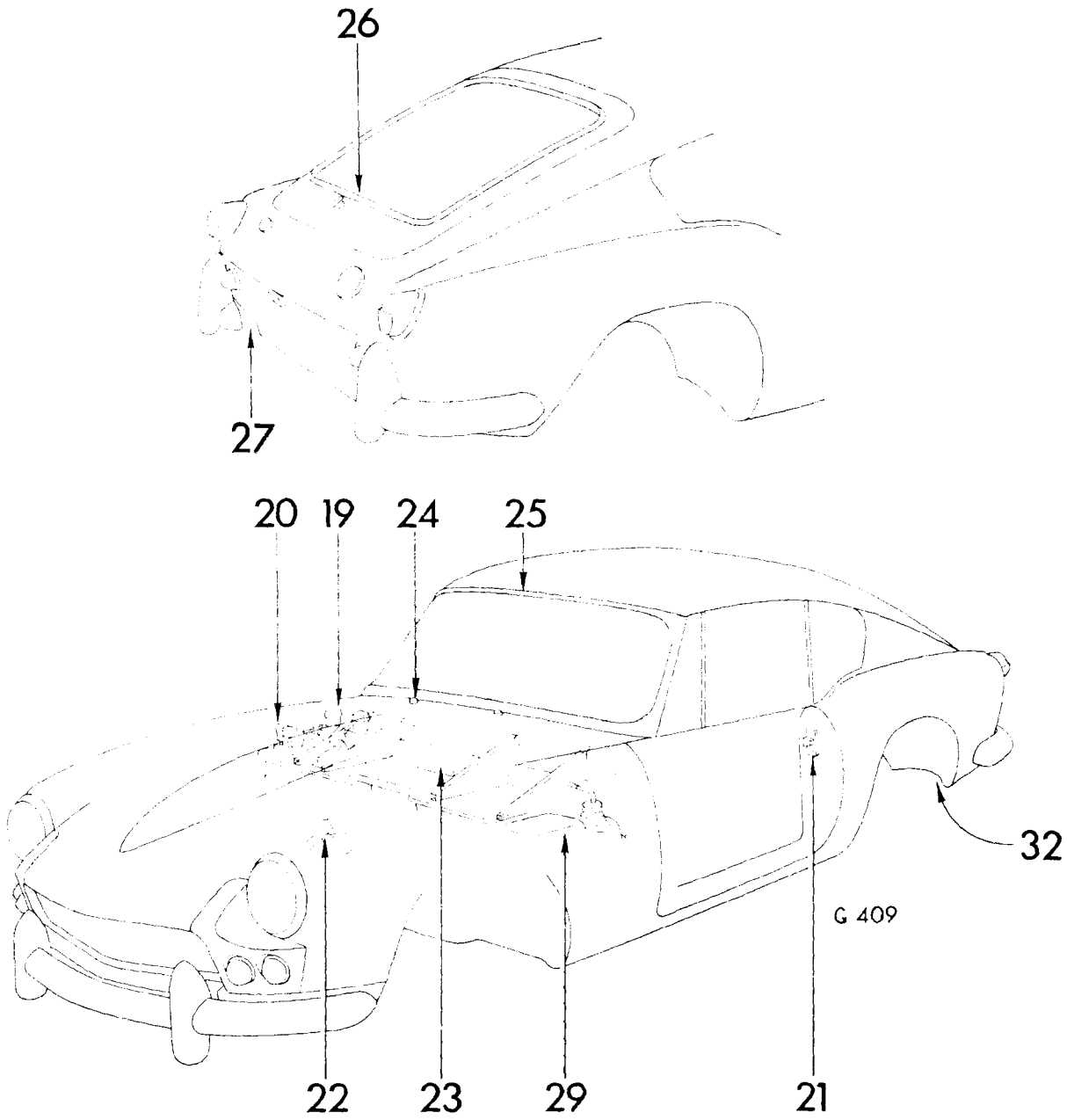


Fig. 1. Location of



ated joints

APPROVED SEALING MATERIALS—BODY IN WHITE (UNPAINTED)

APPLICATION	MASTICS	STRIP SEALERS
Spotweld Sealers	553938 Expandite Seelastik (Natural) 559357 3 M's EC 1168	569630 Expandite Seelastrip LS.105 571214 Glasticord $\frac{1}{2} \times \frac{1}{2}$ 400 Strip Sealer
Plugging small holes		569630 Expandite Seelastrip LS.105 554422 Glasticon 303
Pre-Phosphate Sealer	566800-BB. Chemical S.23/206	

PAINT SHOP

APPLICATION	GUN APPLIED SEALERS	PUTTIES	PLASTISOL	REMARKS
Internal joints	514698—Plus Products PD 16/17 562959 Supraseal 574270—Expandite - Heat Gel Sealer 607/1 574699—Plus Products HG9 574700—Dunlop Chemical Products DS5035/S			To be pumped with Graco equipment
External joints			560563 Kelseal 3/315 m. 574701—Expandite Plastisol 869	Low temperature cure
Plugging small holes		554422—Glasticon 303	564159—B.B. Plastisol Putty S.106.46 564158—Expandite Plastisol Putty	

DUST AND WATER SEALING

APPROVED SEALING MATERIALS—
TRIM AND FINISH

APPLICATION	MASTICS	STRIP SEALERS	PUTTIES	REMARKS
Windscreen sealers, rubber weatherstrips, plugs and grommets	566600 Seelastik SR.51			
Bolted metal-to-metal joints, metal mouldings, small holes, screw fix-ings, etc.	566600 Expandite Seelastik SR.51 554200 Expandite Seelastik M.1.	Prestik Expandite Seelastrip LS.105 Kelseal Strip 305 B.B. Chem. P41.228	554422 Glasticon 303	Strip sealers have Part Nos. allocated according to section
Special Purpose, i.e., paper to metal		Glasticord 400		

AFTER PAINT REPAIRS

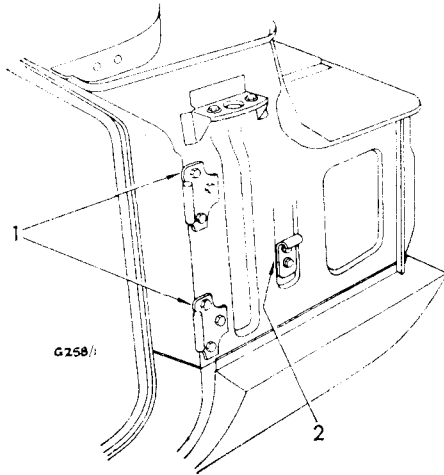
APPLICATION	MISCELLANEOUS
External Joints	Docker's Compound Hermetal Double Bond

BODY UNDERSIDE PROTECTORS

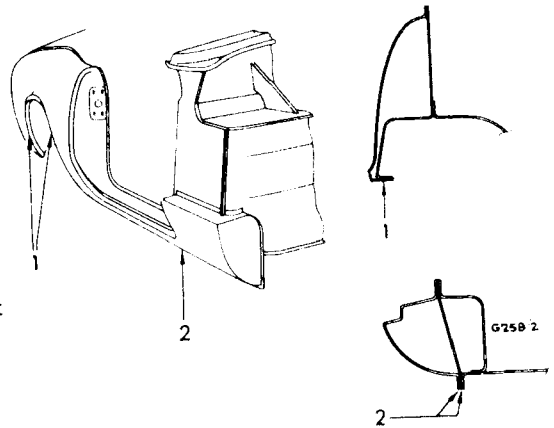
APPLICATION	SOLVENT BASED
Sealing external joints and protection of vulnerable areas on underside of body	554419 SUPRA DEDSEAL 557167 BOSCOSEAL 9010 567815 BOSCOSEAL 9020 Plus Products LCHM 10

Section 1

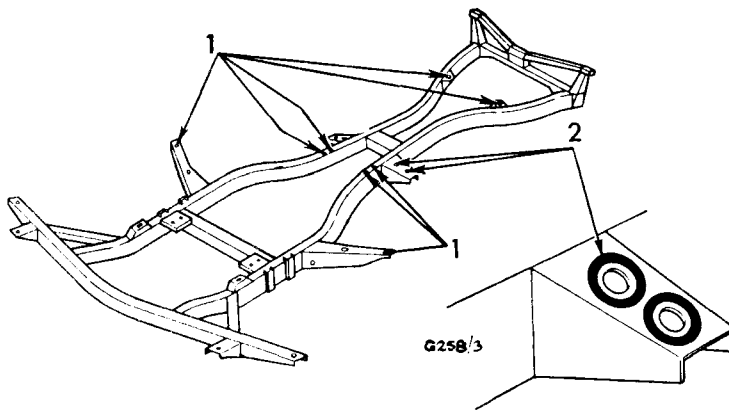
The sealing processes contained in this section apply to the white (unpainted) body and, although the joints are in many cases accessible only with difficulty, the illustrations serve to indicate where an obscure leak may be located. Use approved mastics (page 5-303), except where otherwise stated.



- 1. 1 Door hinges to "A" post.
- 2 Bonnet lock catch plate is dash side.

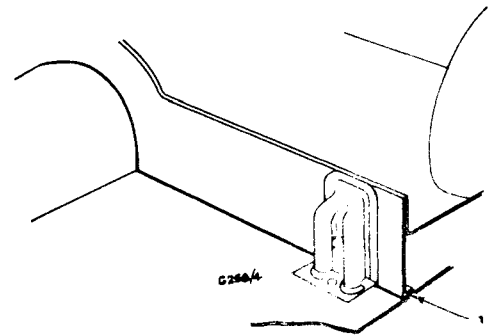


- 2. 1 Rear wing to wheelarch.
- 2 Between sill outer and sill reinforcement and sill reinforcement and floor.



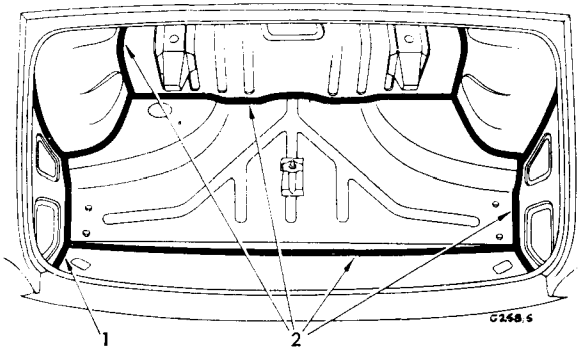
- 3. 1 Rings round each mounting point.
- 2 As 1.

- 4. 1 Heelboard to floor panel for full length of heelboard.

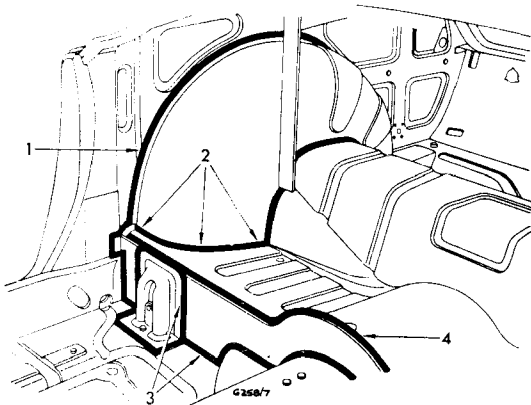


Section 2

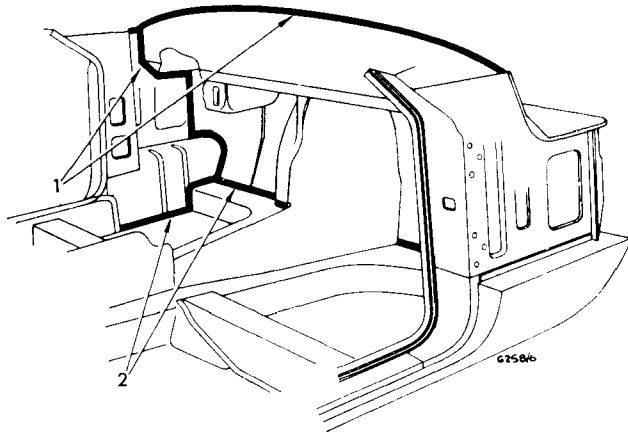
Sealing operations after primer surfacer. Use approved gun-applied sealers (page 5-303), except where otherwise stated.



6. 1 Dash top to scuttle and dash sides.
- 2 Sill inner front to dash and floor.



5. 1 Wheelarch to back panel.
- 2 Luggage floor to surrounding panels.

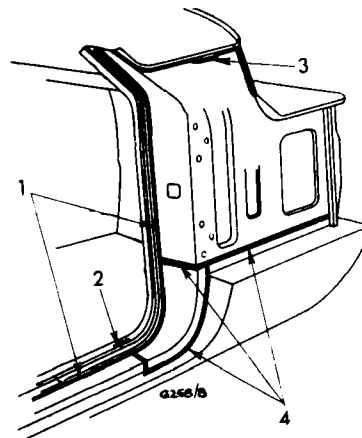


7. 1 Rear wheelarch to wheelarch outer.
- 2 Rear wheelarch to seat pan (use approved Plastisol).
- 3 Heelboard to floor and reinforcement brackets (use approved Plastisol).
- 4 Heelboard to seat pan.

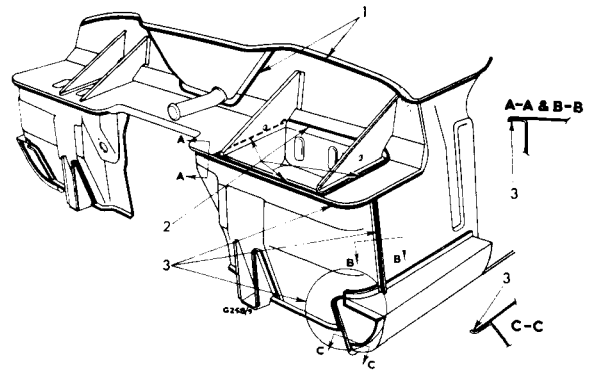
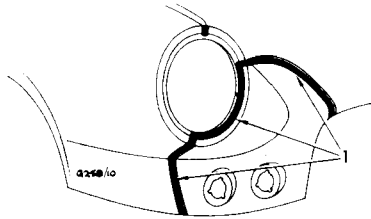
Section 3

Sealing operations after wet rub and dry off operations. Use approved Plastisol compounds (page 5-303).

8. 1 Full length of door seal retainer to body*
- 2 "A" post lower to sill inner flange.
- 3 Dash side to scuttle panel.
- 4 Sill to dash side and "A" post.

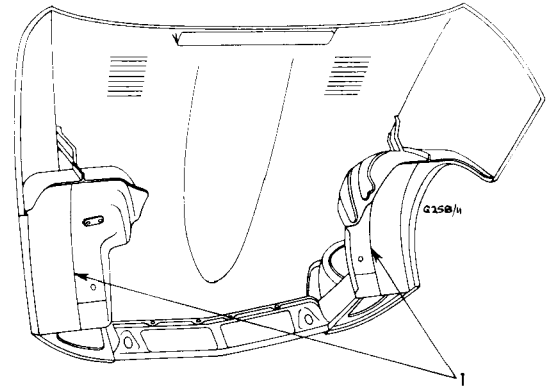
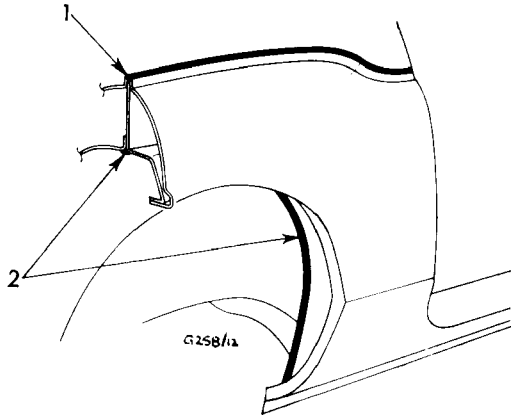


- 9. 1 Dash to scuttle panel and plenum box to dash.
- 2 Battery box to dash top.
- 3 All scuttle joints.



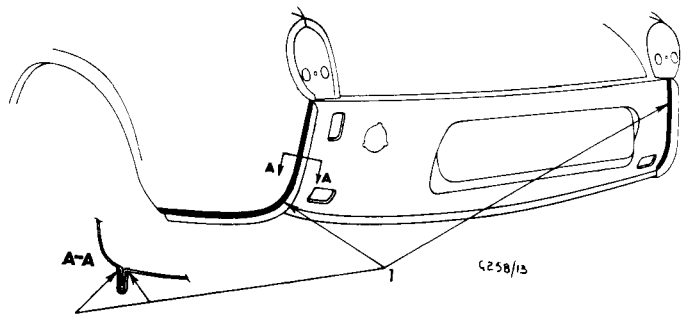
- 10. 1 Nose panel joints.

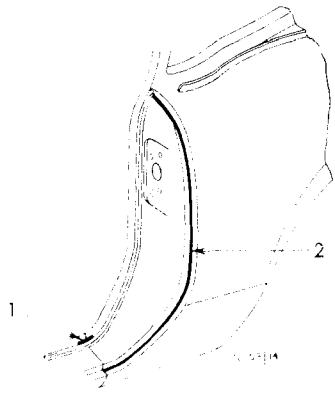
- 11. 1 Front wheelarch joints.



- 12. 1 Rear wing top joint.
- 2 Wheelarch inner to outer (Plus Products PD18/11).

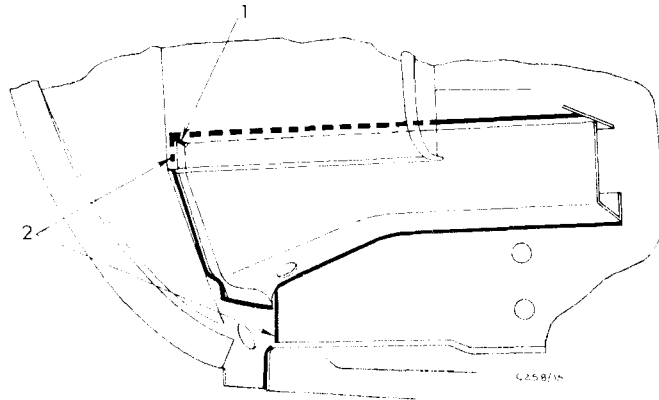
- 13. 1 Wing capping section to body.





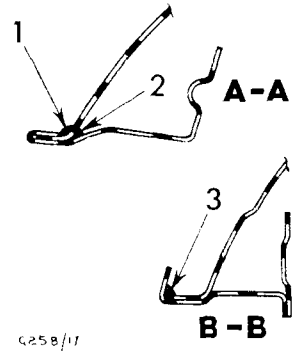
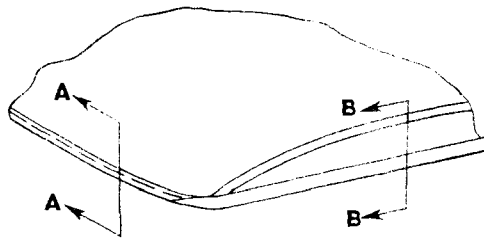
- 14. 1 "B" post to sill joint inner flange.
- 2 Rear wing to "B" post.

- 15. View forward from position of near-side rear wheel.
- 1 Glasticon 303 in corner.
- 2 Crossmember joints (Expandite 607/1).



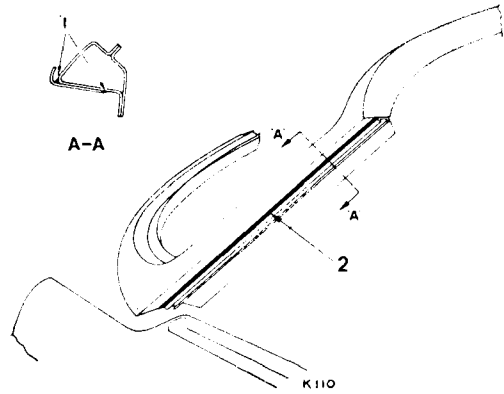
- 16. 1 Roof panel and tail-light panel.

- 17. 1 Roof fore-edge.
- 2 Inner joint of roof fore-edge.
- 3 Roof drain channel joint.



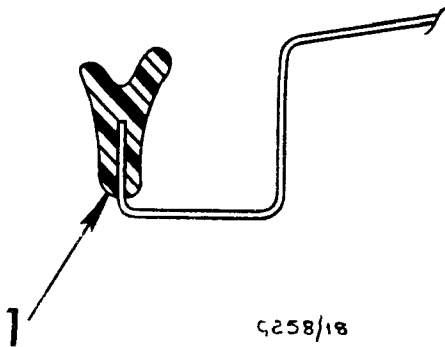
- 17A. Seal 'B' post top to cantrail.

- 17B.** 1 Seal dip channel to pillar.
 2 Seal door retainer to screen pillar.



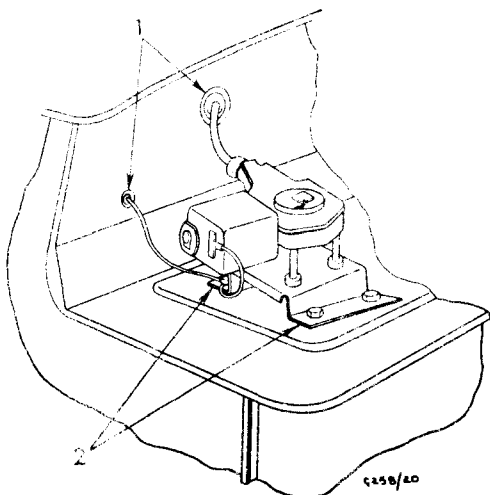
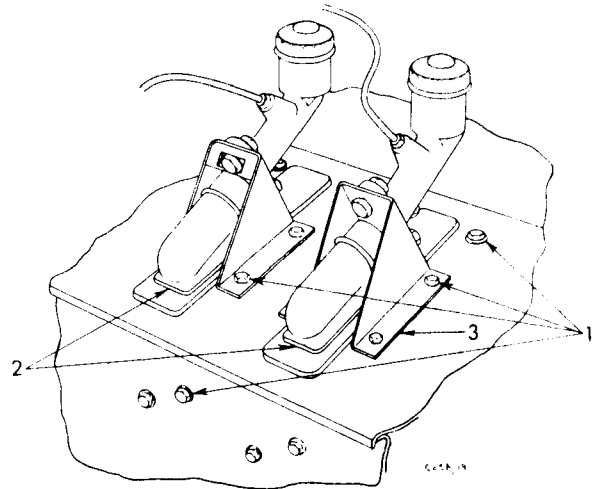
Section 4

Sealing applied during assembly of trim, hardware, etc. Use approved mastics except where otherwise specified.

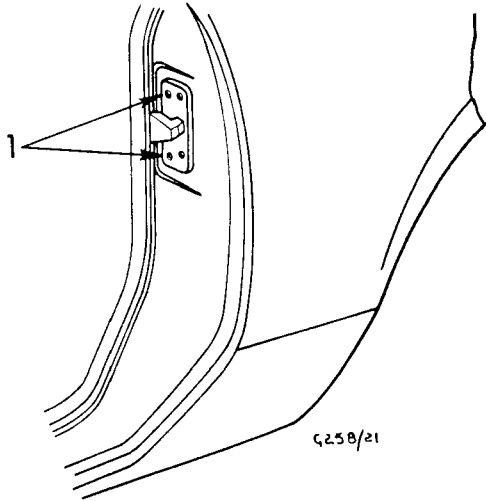


- 18.** 1 Tailgate aperture seating rubber

- 19.** 1 Master cylinder fixing bolts.
 2 Rubber covers to dash.
 3 Underside of master cylinder brackets before assembly.



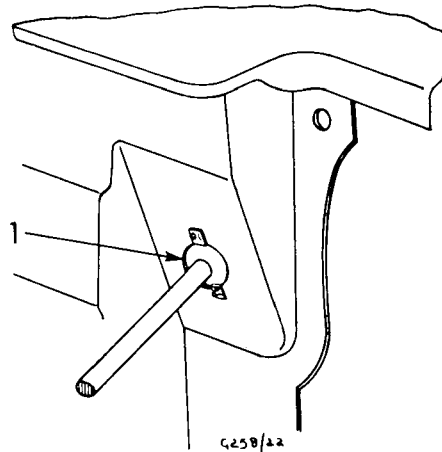
- 20.** 1 Grommets to dash.
 2 Underside of wiper motor mounting bracket before assembly.



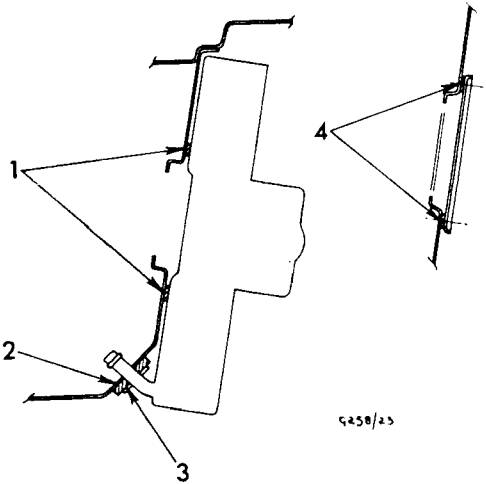
G258/21

21. 1 Door lock striker fixings.

22. 1 Steering column sealing rubber to dash.



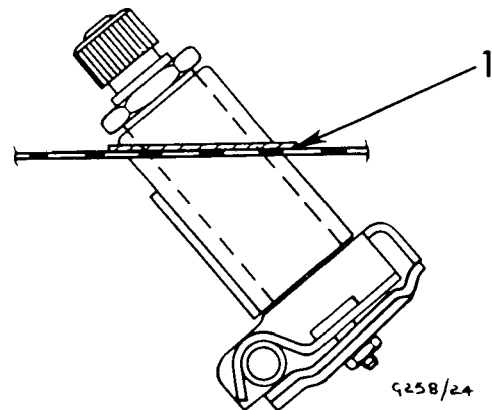
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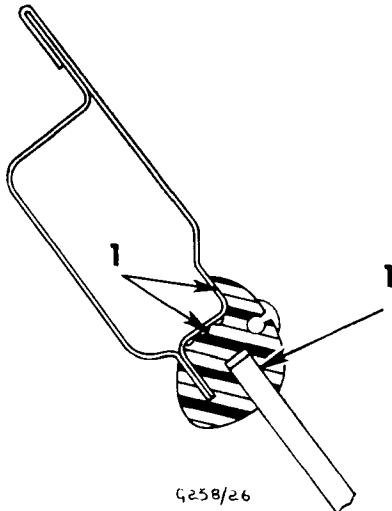
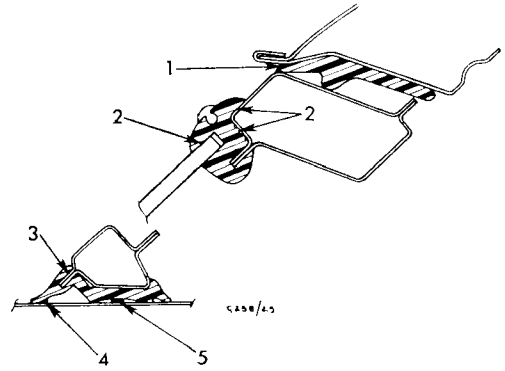
23. 1 Between heater, sealing rubber and dash.
 2 Between heater pipe, sealing rubbers and dash.
 3 Heater pipes to sealing rubbers before assembly.
 4 When heater not fitted; blanking plate to dash with Prestik $\frac{1}{8}$ " \times $\frac{1}{2}$ " wide.

24. 1 Between rubber seal and scuttle panel.



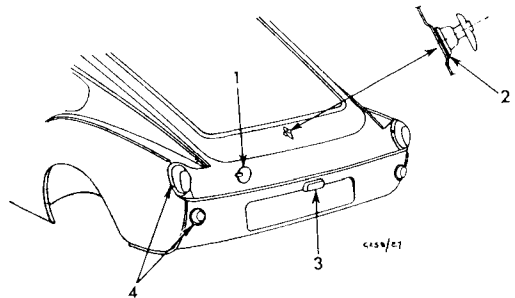
G258/24

25. 1 Rubber to roof panel and header panel.
 2 Rubber to glass and panel.
 3 Rubber to panel.
 4 Front lip of rubber for 2" either side of windscreen wiper spindle.
 5 Rubber to scuttle (Seel-A-Strip $\frac{1}{8}$ " dia. LS 105).



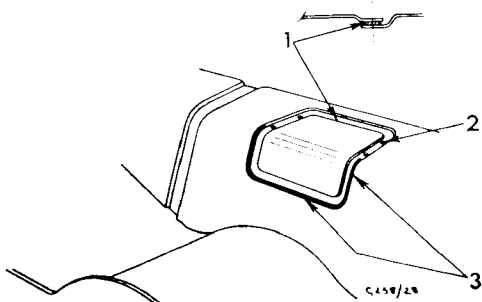
26. 1 Rubber to glass and rear door panel.

27. 1 Petrol filler rubber to panel.
 2 Tailgate lock handle to panel.
 3 Number plate illumination light fixings and wiring grommet.
 4 Tail-light and direction indicator light rubbers to body.

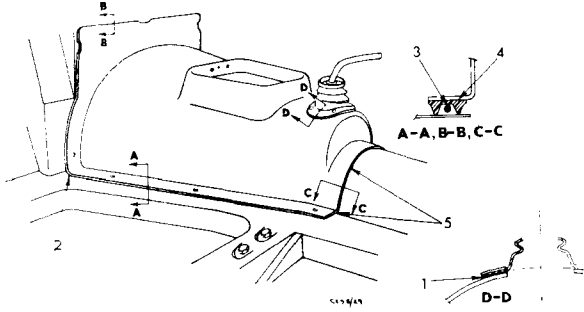


Section 5

Sealing applied during body mounting. Use approved mastics except where otherwise stated.

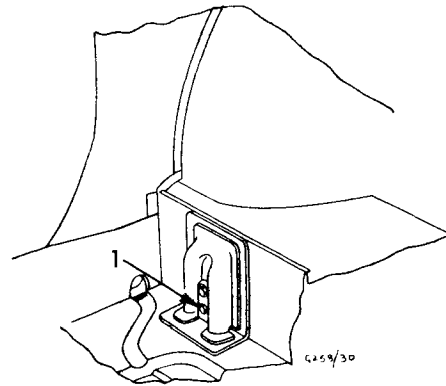


28. 1 Rear spring access hole cover (Prestik $\frac{1}{16}$ " \times $\frac{1}{2}$ " wide).
 2 Cover fixings.
 3 Front edge of cover, forward of fixings, with SR.51 in addition to Prestik.



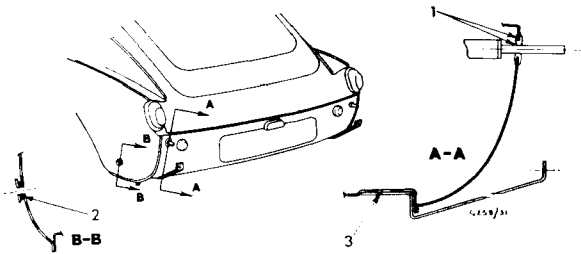
29. 1 Grommet to cover (Glasticord 400, $\frac{3}{4}$ " x $\frac{1}{16}$ " strip).
- 2 Corner of cover (Glasticon 303).
- 3 Apply $\frac{1}{8}$ " dia. bead of Seelastik to sealing rubber before fitting cover.
- 4 Secure sealing rubber to cover with Bostik 1261 adhesive.
- 5 Double application of Seelastik at corners and over tunnel.

30. 1 Between radius arm fixing plate and body; also fixing bolts.



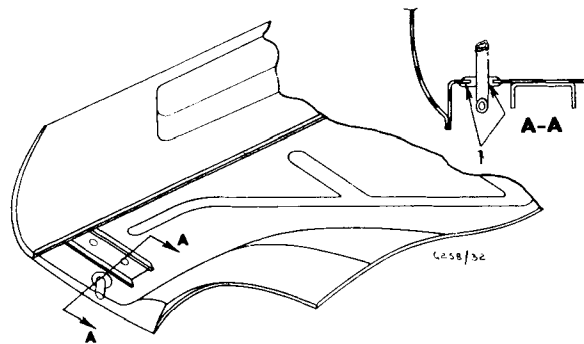
Section 6

Sealing of fixings, rubber grommets and plugs. Use approved Mastics except where otherwise stated.

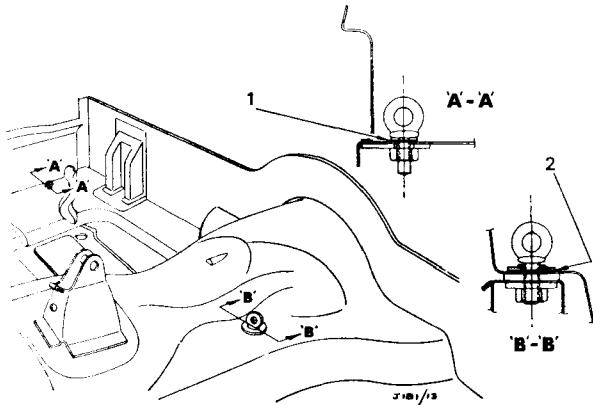
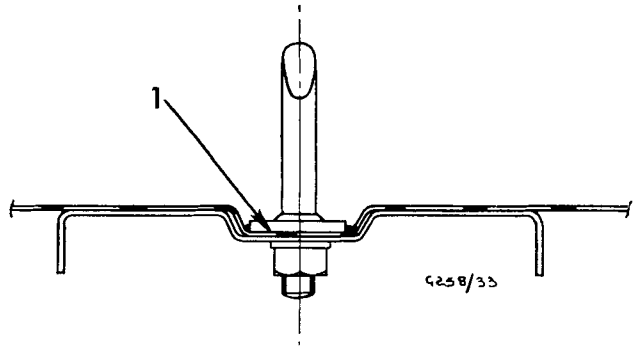


31. 1 Grommet to body and override tube.
- 2 Rubber washer to body and bumper bracket.
- 3 Override bracket to body.

32. 1 Grommet to body and fuel tank breather tube.

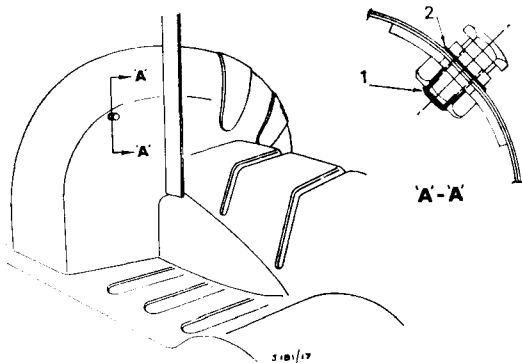
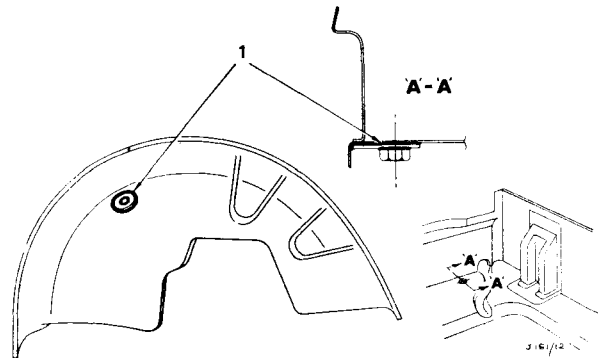


33. 1 Underside of shoulder on spare wheel hook bolt.



34. 1 Safety harness bolts and nuts to rear floor.
2 Seal safety harness bolts to floor tunnel.

35. 1 Safety harness reinforcement plate.



36. 1 Under pivot bolt spacer.
2 Wheelarch safety harness fixing nut.

TRIUMPH VITESSE 2-litre WORKSHOP MANUAL

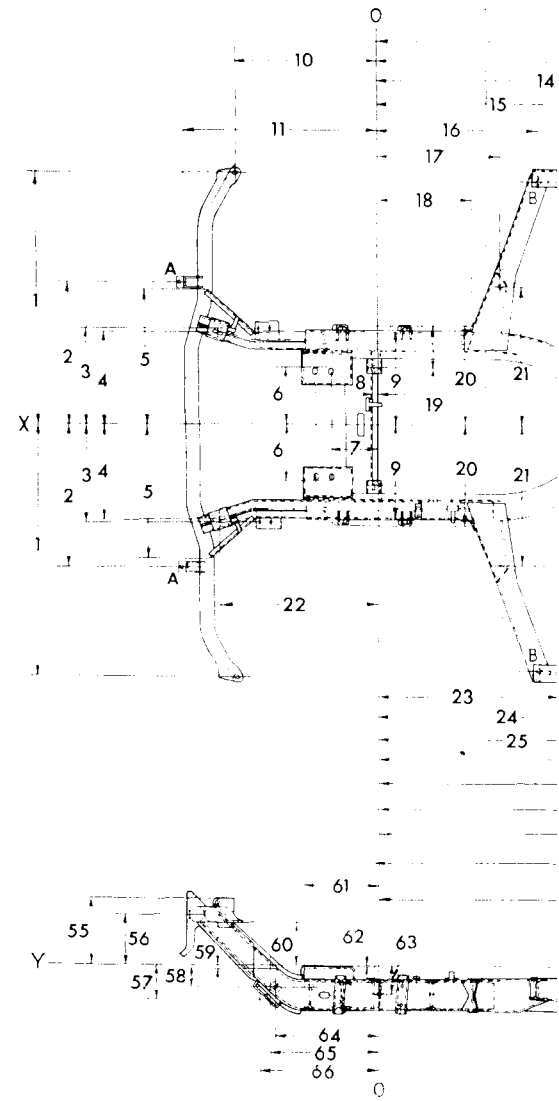
SUPPLEMENT TO GROUP 5

Information contained in this supplement applies specifically to the Triumph Vitesse 2-litre. In all other respects the relevant information is contained in the GT6 section of this manual.

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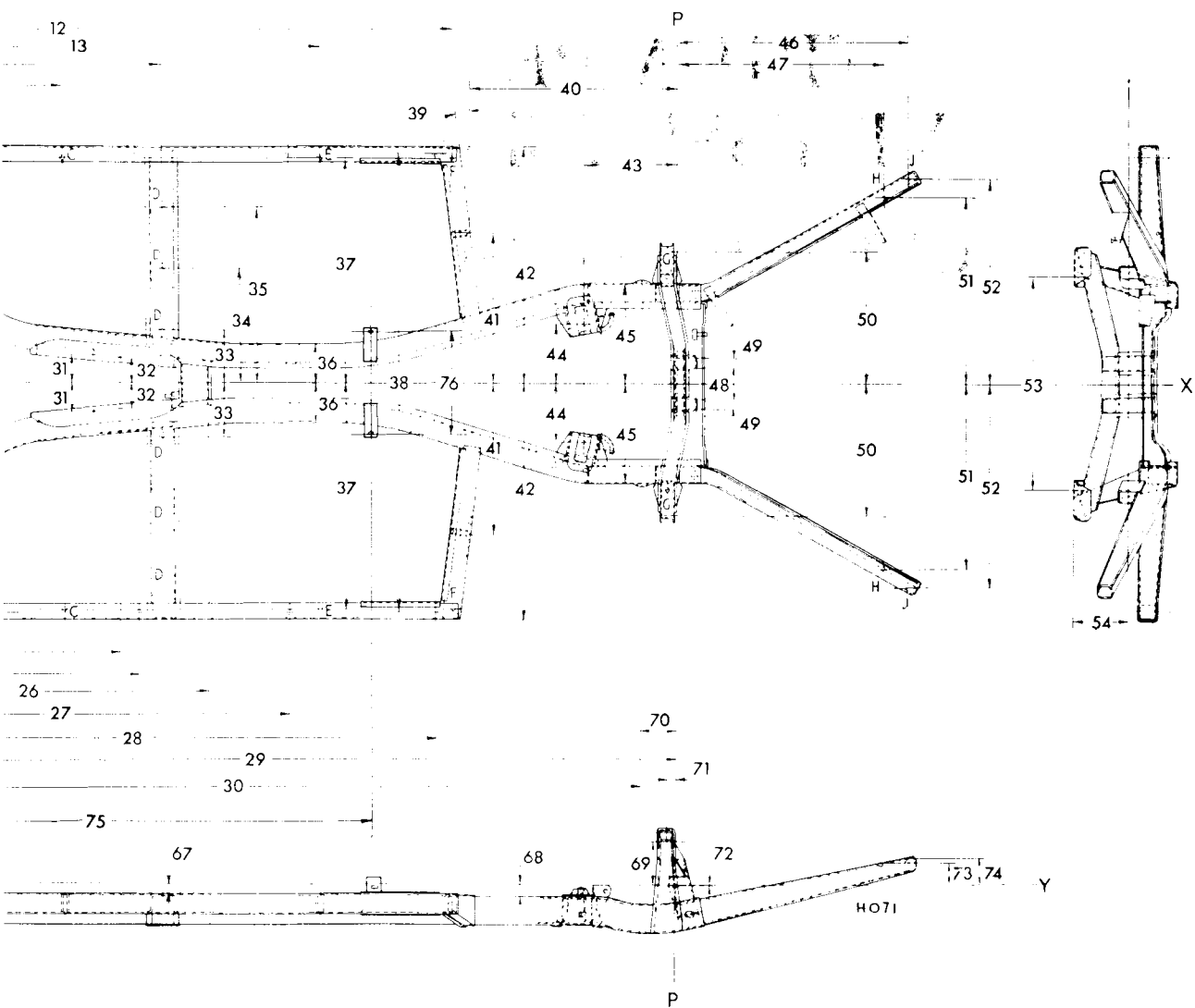
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	Inches	Centimetres
1	26.09	66.27
2	14.75	37.47
3	10.07	25.58
	9.94	25.25
4	9.78	24.84
	9.72	24.69
5	13.50	24.09
	13.38	33.99
6	5.53	14.05
	5.50	13.97
7	4.82	12.24
	4.76	12.09
8	0.50	1.27
9	9.78	24.84
	9.72	24.69
10	14.70	37.34
11	20.06	50.95
	19.94	50.65
12	70.00	177.80
13	55.00	139.70
14	37.37	94.92
	37.25	94.62
15	26.10	66.29
16	16.81	42.69
	16.69	42.39
17	12.78	32.46
	12.72	32.31
18	9.81	24.92
19	4.32	10.97
	4.30	10.92
20	10.32	26.21
21	14.52	36.88
	14.49	38.81
22	16.56	42.06
	16.44	41.76
23	18.75	47.63
24	32.64	82.91
	32.48	82.49
25	34.50	87.63
26	42.19	107.16
	41.94	106.53
27	51.50	130.81
28	68.00	172.72
29	95.69	243.05
	95.44	242.42
30	91.76	233.07
31	3.23	8.20
	3.21	8.15
32	2.92	7.42
	2.89	7.34
33	6.03	15.32
	5.97	15.16
34	13.00	33.02
35	20.00	50.80
36	4.25	10.79
37	25.35	64.39
	25.28	64.21
38	51.63	131.14
39	7° 27'	7° 27'
40	23.54	59.79
	23.42	59.49



	Inches	Centimetres
41	16.91	42.95
42	16.85	42.79
43	26.50	67.31
	10.70	27.18
44	10.65	27.03
	6.64	16.87
	6.61	16.79
45	11.28	28.65
	11.22	28.49
46	25.94	65.89
47	23.30	59.18
	23.18	58.88
48	3.25	8.26
	3.22	8.18
49	1.51	3.84
50	14.75	37.47
51	21.07	53.52
	20.94	53.19

Fig. 1. Vitesse 2-litre chassis frame dir



	Inches	Centimetres		Inches	Centimetres
52	23.08	58.62	66	12.06	30.63
53	24.00	60.96	67	11.94	30.33
54	6.22	15.79	68	1.03	2.62
55	7.03	17.86	69	0.97	2.46
	6.97	17.7	70	1.13	2.87
56	5.5	13.97	71	5.00	12.70
57	3.00	7.62	72	4.88	12.39
	2.88	7.32	73	4.06	10.31
58	1.94	4.93	74	1.12	2.85
59	0.25	0.64	75	1.00	2.54
60	4.81	12.22	76	0.15	0.38
	4.69	11.91	77	2.97	7.54
61	7.44	18.89		2.85	7.24
62	0.20	0.51	74	3.47	8.81
	0.18	0.46	75	61.31	155.72
63	2.63	6.68		61.19	155.42
64	10.19	25.88	76	10.78	27.38
65	10.78	27.38		10.66	27.07

ensions

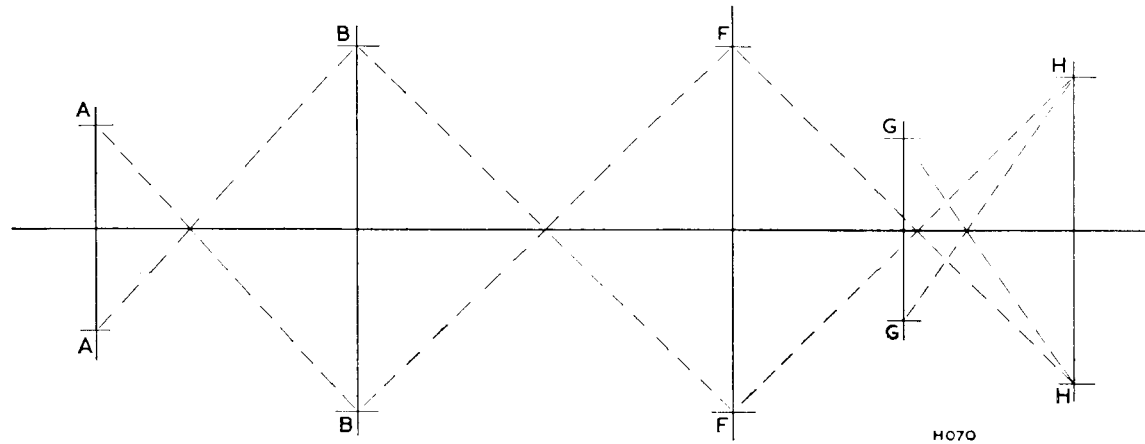


Fig. 2. Diagonal checking diagram

Assessment of Damage

Severe damage to the chassis is readily apparent: damage of a less serious nature may cause distortion of the frame which may not be readily detected visually.

If a check on the steering and suspension geometry reveals distortion of the chassis, check for twist and squareness.

Checking for Twist

With the vehicle on a clean level floor, place a jack under each jacking point and raise the vehicle sufficiently to enable the road wheels to be removed.

Adjust the jacks until the following conditions are achieved:—

Points "A" are 25.53 in. (64.81 cm.) and points "E" are 24.94 in. (63.35 cm.) above the floor.

This condition sets the datum 20 in. (50.8 cm.) above the floor.

If it is impossible to equalise the heights of both points "A", then the chassis is twisted, the amount of twist being the difference in height between points "A".

Checking for Squareness

Position the vehicle as previously described and, referring to Fig. 1, transfer the lettered points to the floor, using a plumb-bob and fine cord.

Letter the points transferred to the floor and connect each pair by drawing a straight line between them, as Fig. 2.

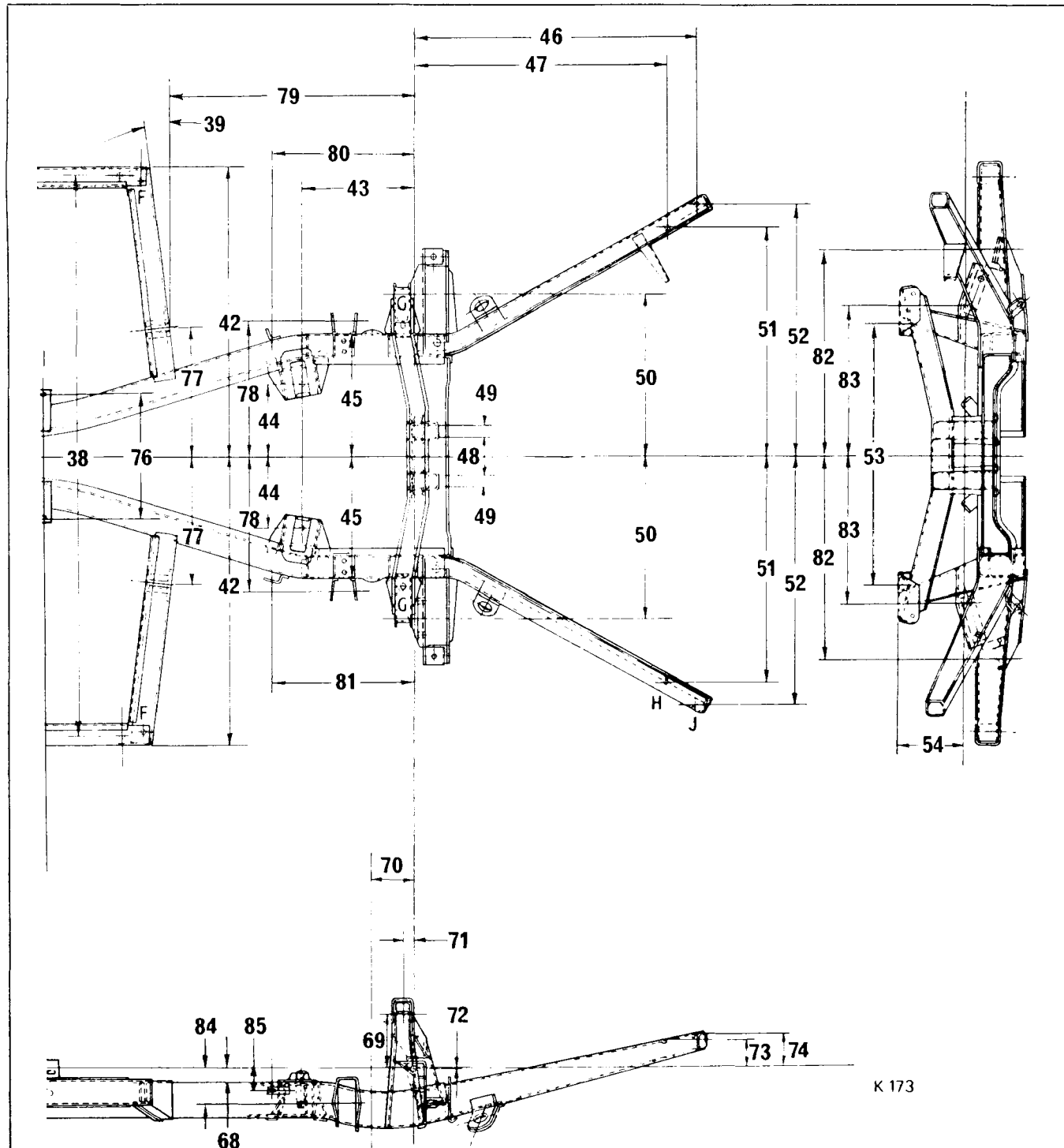
Mark and letter the central point of each line and place a straight-edge along these mid-points. The frame may be considered true when the straight-edge passes through all of these points.

Continue a further check for squareness as follows:—

Using a straight-edge mark the diagonals as shown dotted in Fig. 2. If the frame is square then each pair of opposite diagonals must be of equal length and the points of intersection must lie on the same straight line.

Chassis distortion is assessed by the amount and direction which any central point on the transverse line and/or the point of intersection of any pair of diagonals deviates from the centre line.

CHASSIS



77	11.57"	29.39 cms.	79	22.84"	58.01 cms.	82	36.94"	93.89 cms.	84	3.22"	8.18 cms.
	11.51"	29.26 cms.		22.72"	57.71 cms.		36.82"	93.52 cms.		3.16"	8.03 cms.
78	25.16"	63.91 cms.	80	13.00"	33.02 cms.	83	26.94"	68.43 cms.	85	2.00"	5.08 cms.
	25.04"	63.60 cms.					26.82"	68.12 cms.			
			81	13.00"	33.02 cms.						

Fig. 3. Vitesse Mk. 2 chassis frame dimensions (for other dimensions see page 5-102V)

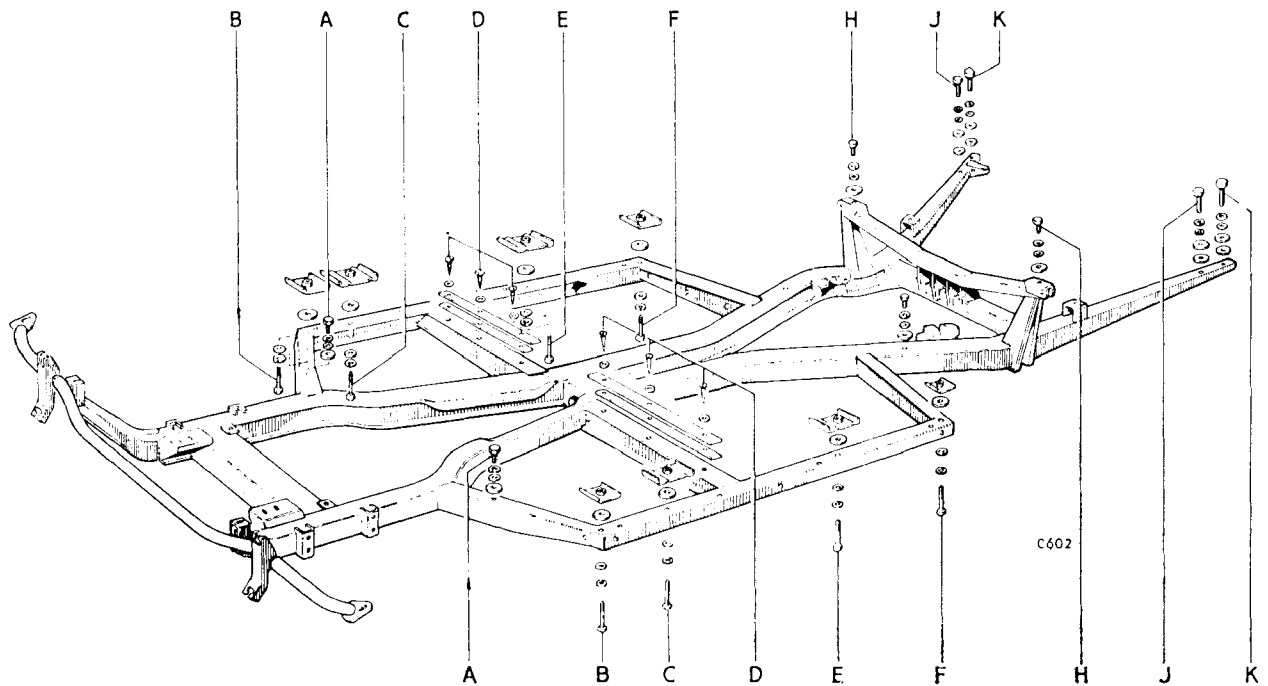


Fig. 1. Body mounting points

The design and construction of the Vitesse 2-litre body is a combination of conventional chassis and separate body units. This method of body build facilitates removal and replacement of body sections when accident repair is carried out.

The main sub-units are as follows:—

- | | |
|------------------------------------|--------------------|
| 1 Bonnet | 5 Roof |
| 2 Front valance | 6 Rear end section |
| 3 Rear quarter and centre valances | 7 Centre section |
| 4 Sills | 8 Doors |

The centre section is the key section and is attached to the frame at six points A, B and C.

Close tolerance holes in the centre section are provided to enable accurate location of the bolts in the frame at point "D".

Wide tolerance holes in the rear section, are provided to enable adequate body adjustment at points "D". (Reference page 5-215V).

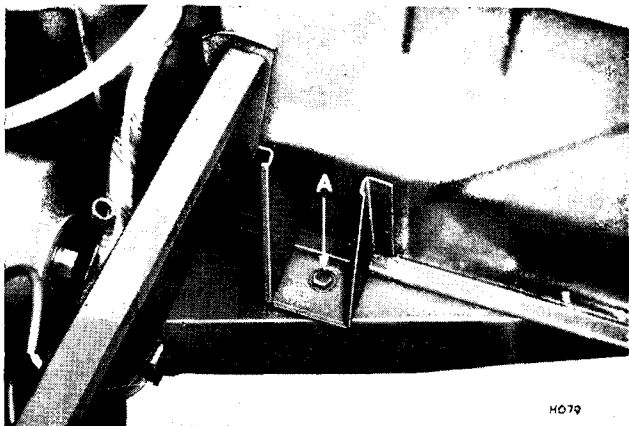


Fig. 2. Dashpanel to front outrigger mounting bolts

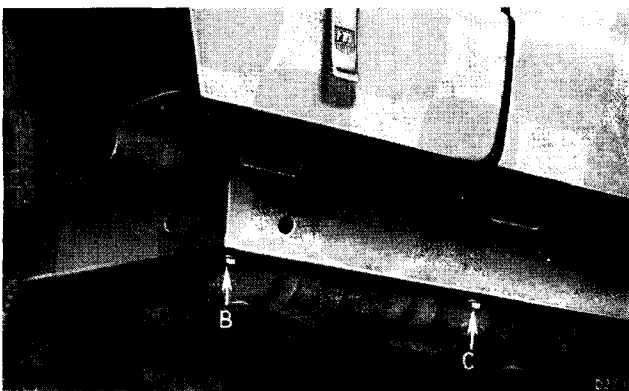


Fig. 3. Front floor to side channel mounting bolt

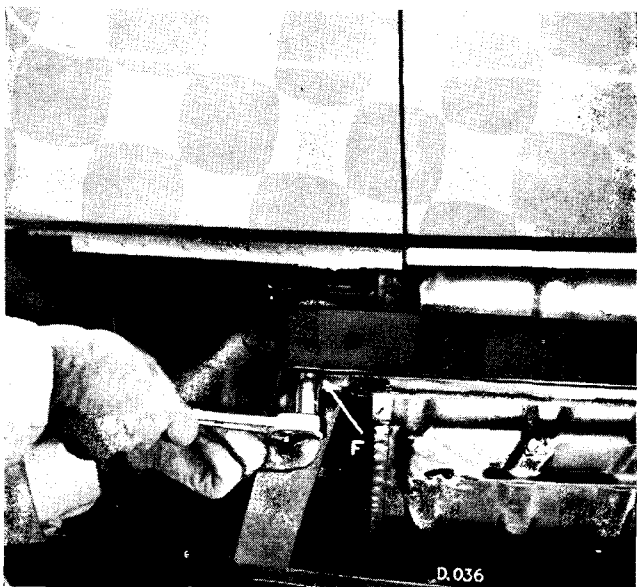


Fig. 4. Rear seat pan side channel mounting bolts

BODY REMOVAL

Remove the battery, drain the engine coolant and carry out the following:

Disconnect

- lighting cables at bonnet (Fig. 11);
- cables from temperature gauge transmitter, oil pressure switch, generator and coil;
- tachometer drive cable from distributor;
- choke and accelerator controls;
- fuel pipe from the tank;
- heater pipes and control cable at water valve (Fig. 75);
- speedometer drive cable from speedo head and pull the cable into the engine compartment;
- handbrake cable at compensator pin.

Remove

- bonnet (page 5-205V);
- engine bay side valances;
- brake hydraulic pipe between master cylinder and four-way connector;
- seats (page 5-242V);
- gearbox cover (page 5-213V);
- floor covering (page 5-245V).

Remove both sill panels (page 5-208V). Fit reinforcement bracket (Fig. 5), using four $\frac{1}{4}$ " bolts with nuts and washers.

Referring to page 4-211, slacken the steering column impact clamp, release the clamp bolt from the lower steering coupling and push the inner column upwards, clear of the front suspension.

Remove twenty-two bolts securing the body to the chassis (Fig. 1). The bolts are located as follows:

- two in engine compartment, adjacent to dash panel (A) (Fig. 2);
- eight at frame side channel, adjacent to sill panels (B), (C), (E), (F) (Figs. 3 and 4);
- six at frame intermediate outrigger, through front and rear floor (D);
- four at frame rear extension, through luggage floor (J) and (K).

Lift the body from the frame. The method of lifting the body will be determined by the equipment available. Fig. 5, shows two hoists in use.

To refit, reverse the removal procedure and note the adjustment procedures given on page 5-215V.

Reinforcement bracket dimensions

	<i>Inches</i>	<i>Millimeires</i>
A	0.75	19.0
B	3.375	85.0
C	6.625	168.3
D	0.50	12.7
E	1.00	25.4

Material—1" (25.4 mm.) angle iron.

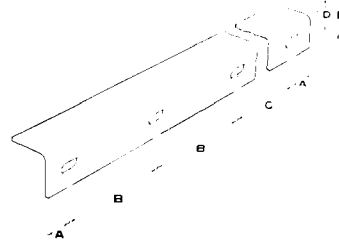
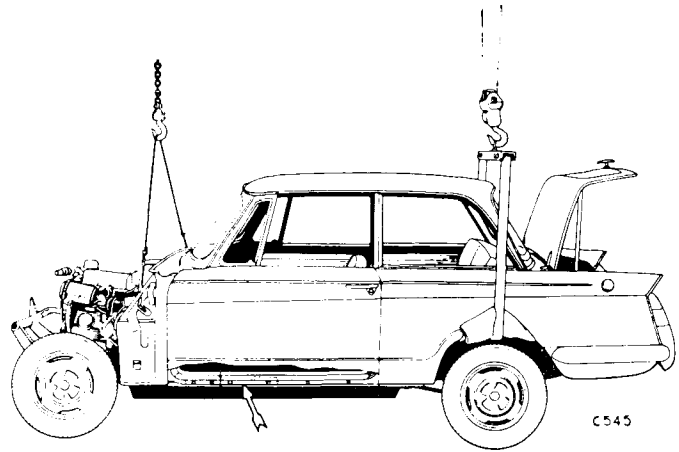
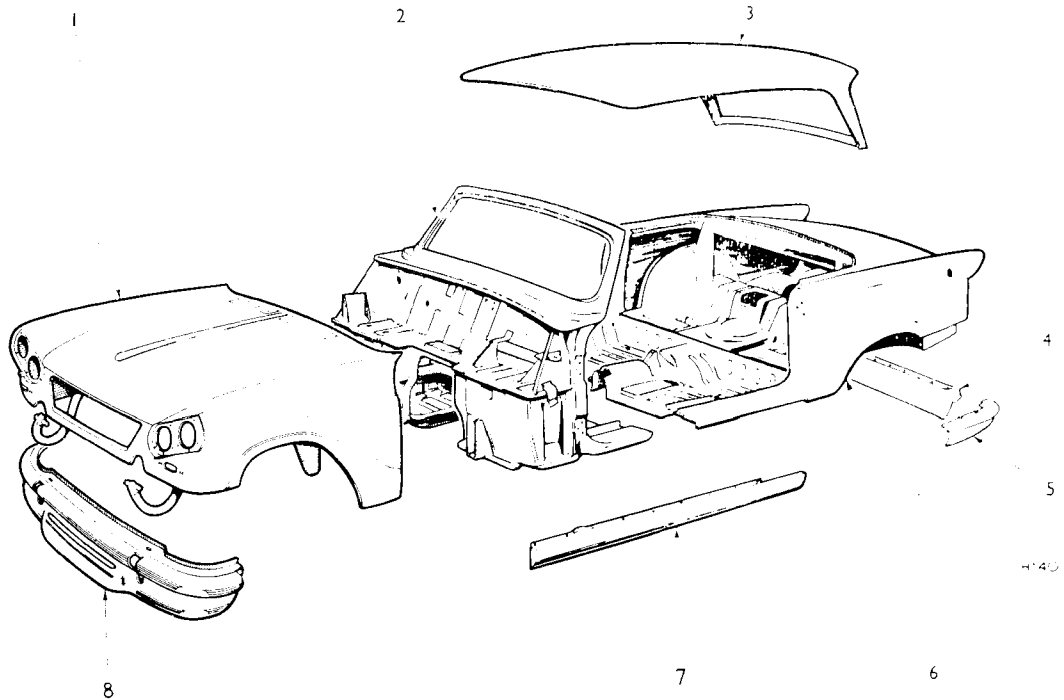


Fig. 5. Lifting body (arrow indicates position of sill reinforcement bracket)



- | | | | |
|-------------------|----------------|--------------------|-----------------|
| 1 Bonnet assembly | 3 Roof panel | 5 Quarter valance | 7 Sill panel |
| 2 Centre section | 4 Rear valance | 6 Rear end section | 8 Front valance |

Fig. 6. Body sub-assemblies

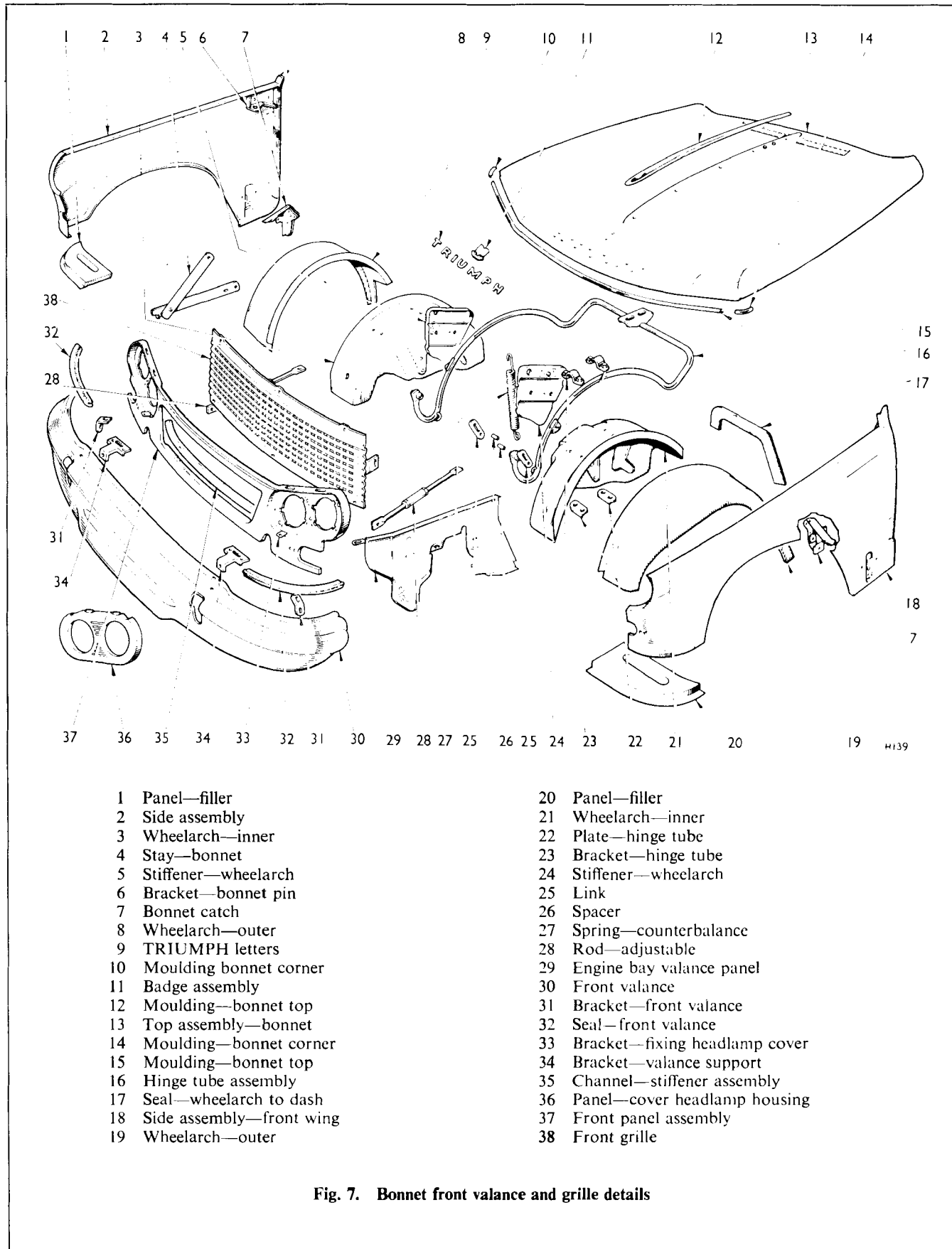


Fig. 7. Bonnet front valance and grille details

BONNET ASSEMBLY

To Remove

Disconnect the battery.

Disconnect the front lighting and horn cables at the snap connectors on the top centre of grille (Fig. 11).

Remove both overrides by unscrewing items (4) and (7) (Fig. 9), take out bolt (8) (Fig. 10) and support the bonnet as the hinge bolts (5) and (6) (Fig. 9) are withdrawn.

Lift off bonnet.

To Refit

Reverse the above procedure and refer to bonnet adjustment procedure as follows:

Height Adjustment (Fig. 8)

Slacken the locknut (1) securing the cone-shaped buffer to the mounting bracket (2) on the dash side panel. Screw the buffer in or out to respectively lower or raise the bonnet rear edge.

Retighten the locknut.

Adjust the bonnet catch plate by slackening the bolt (3) and moving the catch plate as required.

Horizontal Adjustment

If slight adjustment is required to achieve a parallel clearance of $\frac{1}{16}$ " (5 mm.) between the bonnet and scuttle, slacken the locknuts (2) (Fig. 9) and turn the sleeve nut (1) (Fig. 9) on either side, as necessary.

Appreciable horizontal or vertical movement will necessitate the removal of both overrides (See page 5-207V).

Vertical Adjustment

Lift or lower the front of the bonnet until parallel clearance between the bonnet and door is achieved. During this movement, the rear of the bonnet will pivot on the bracket shown arrowed on (2) (Fig. 8). Tighten the link bolts (5) and (6) (Fig. 9).

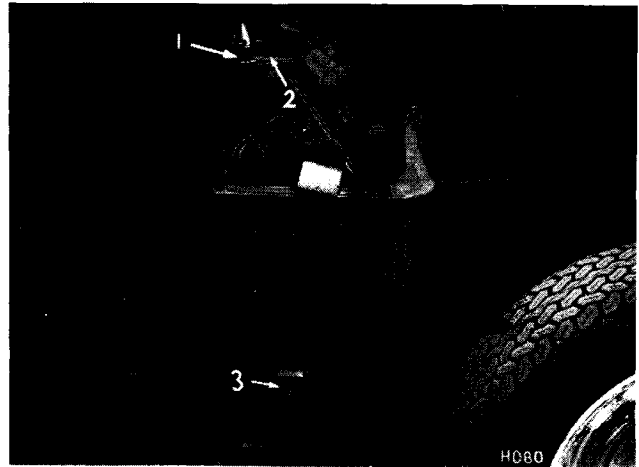


Fig. 8. Bonnet height adjusters

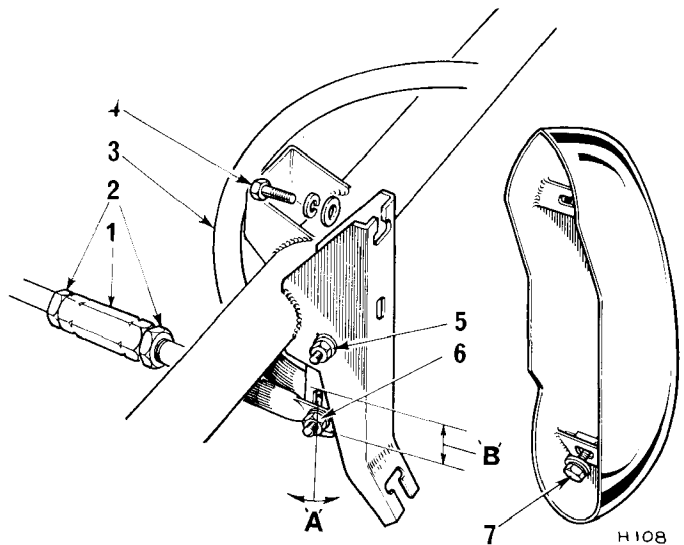


Fig. 9. Bonnet adjustment points

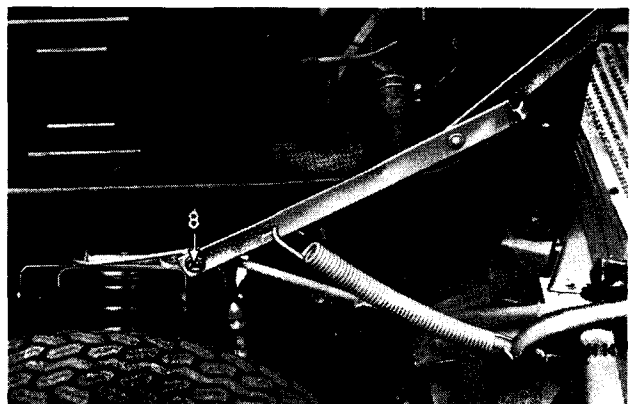


Fig. 10. Bonnet stay attachment

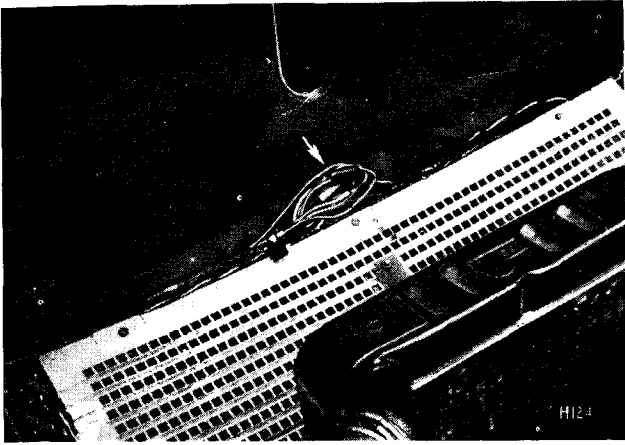


Fig. 11. Bonnet snap connectors

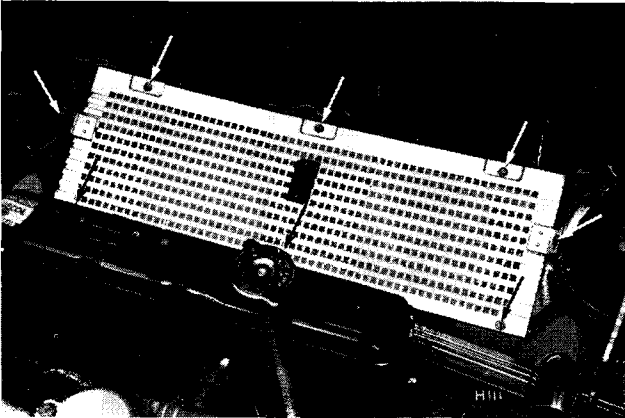


Fig. 12. Front grille attachment

FRONT GRILLE

To Remove

Remove eight screws and eight washers (arrowed Fig. 12).

To Refit

Reverse the removal procedure.

FRONT VALANCE

To Remove

Overrides (Fig. 9)

Remove bolts (7) and slacken upper bolts (4), remove overrides from mounting brackets.

Valance attachment (Fig. 13)

Remove four cross-recess headed screws (2) and four hex/headed setscrews (1) and (3) and pull the valance clear.

To Refit

Reverse the removal procedure.

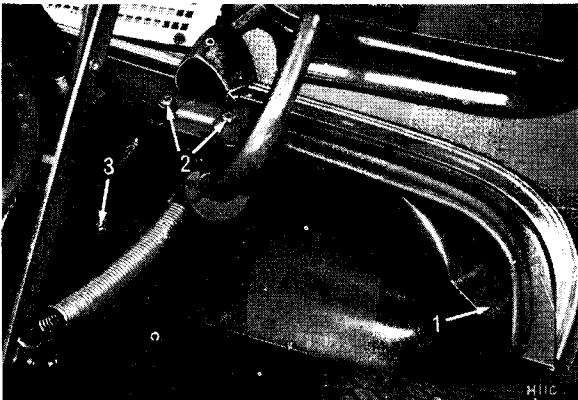


Fig. 13. Front valance attachment

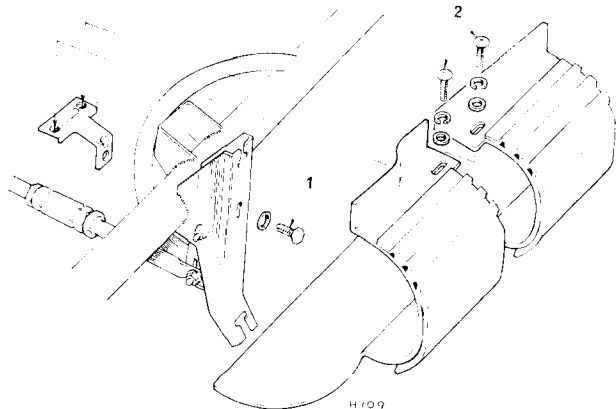


Fig. 14. Front valance retaining bracket

OVERRIDERS

Front—To Remove

Open the bonnet and referring to Fig. 9 (page 5-205V), slacken the upper bolt (4), remove the lower bolt (7) and remove the override.

The upper and lower override fixings are slotted to facilitate fitting and adjustment.
To Refit—Reverse the removal procedure.

Rear—To Remove (Fig. 15)

Remove the fuel tank as described on page 5-248V, (left-hand side only).

Release each override from the body by removing two bolts.

The upper bolt is also used as an earthing terminal for the tail lamps.

To Refit—Reverse the removal procedure.

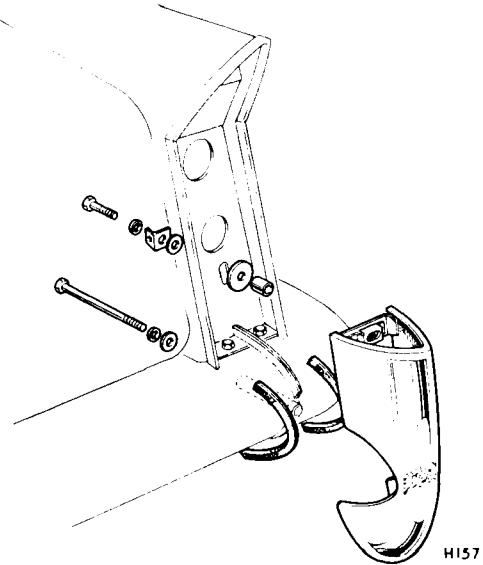


Fig. 15. Rear override attachments

REAR AND QUARTER VALANCES

Rear Valance—To Remove (Fig. 16)

Referring to page 6-120V, remove the lens from the stop/tail lamps.

Referring to page 5-248V; remove the fuel tank.

Remove both override.

Remove luggage compartment lock striker plate (two screws).

Take out 12 acme hex/headed screws and remove rear valance.

To Refit—Reverse the removal procedure and reseal in accordance with instructions given on page 5-301V.

Quarter Valance—To Remove (Fig. 16)

Remove the lens from the stop/tail lamps, page 6-120V, and remove the fuel tank (left-hand side valance only), page 5-248V.

Remove override.

Take out 10 acme hex/headed screws, five at each side and remove quarter valance.

To Refit—Reverse the removal procedure and reseal in accordance with instructions on page 5-301V.

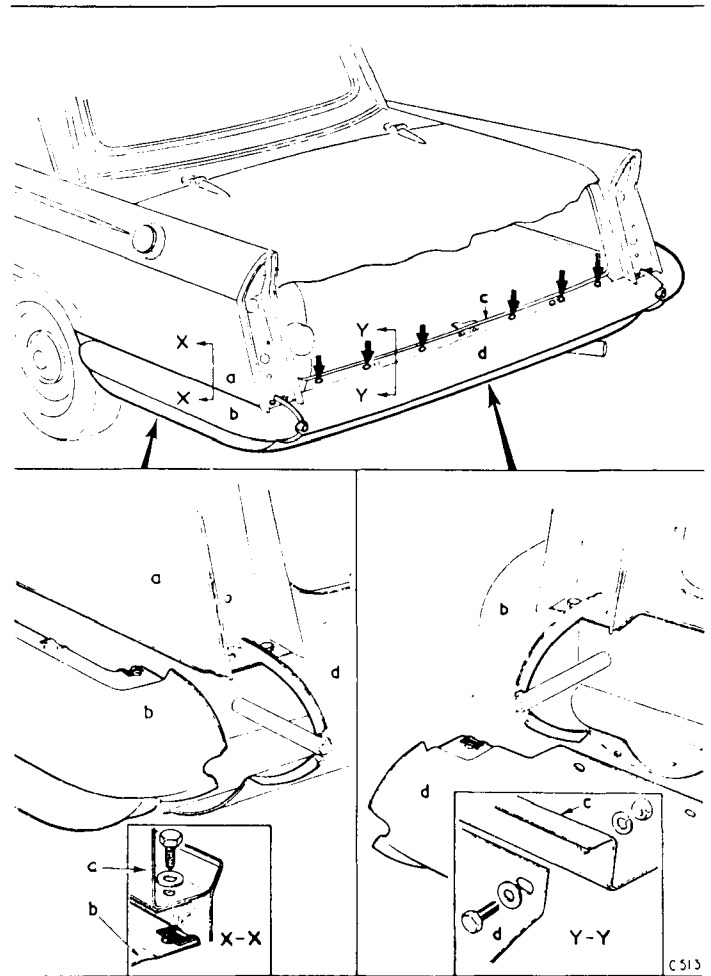
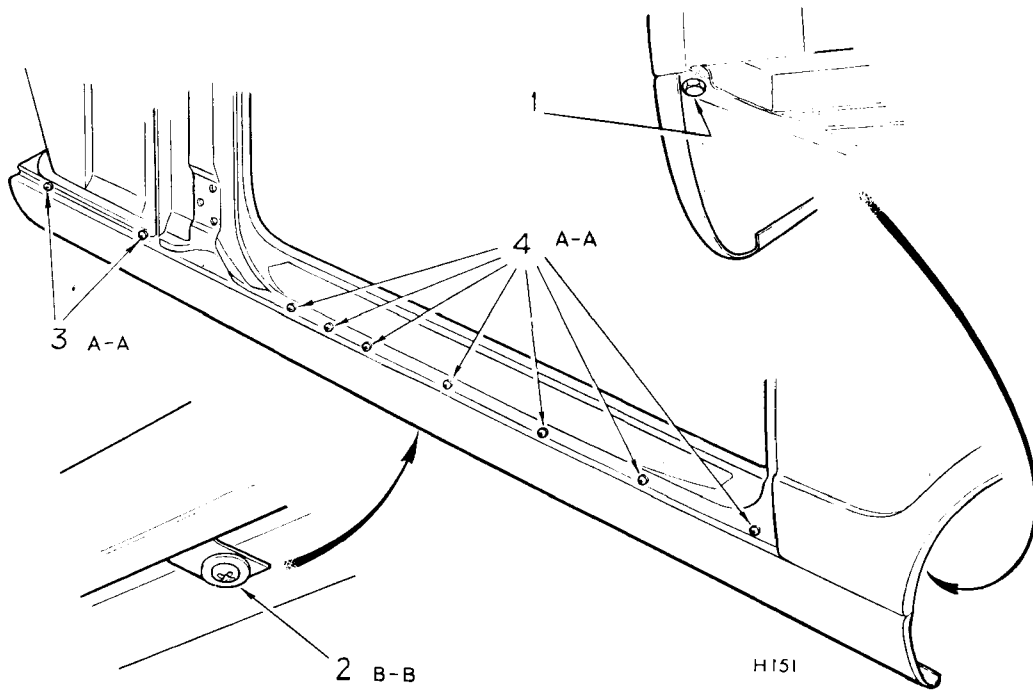


Fig. 16. Rear valance attachments

Key to Fig. 16

- A—Tonneau side panel
- B—Rear quarter valance
- C—Luggage floor panel
- D—Rear centre valance



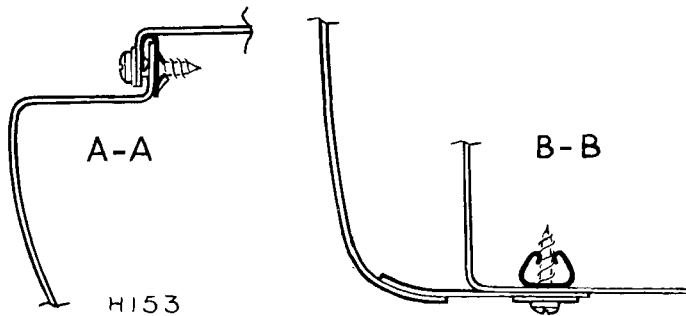
SILLS

To Remove (Fig. 17)

Lift the bonnet and open the door.

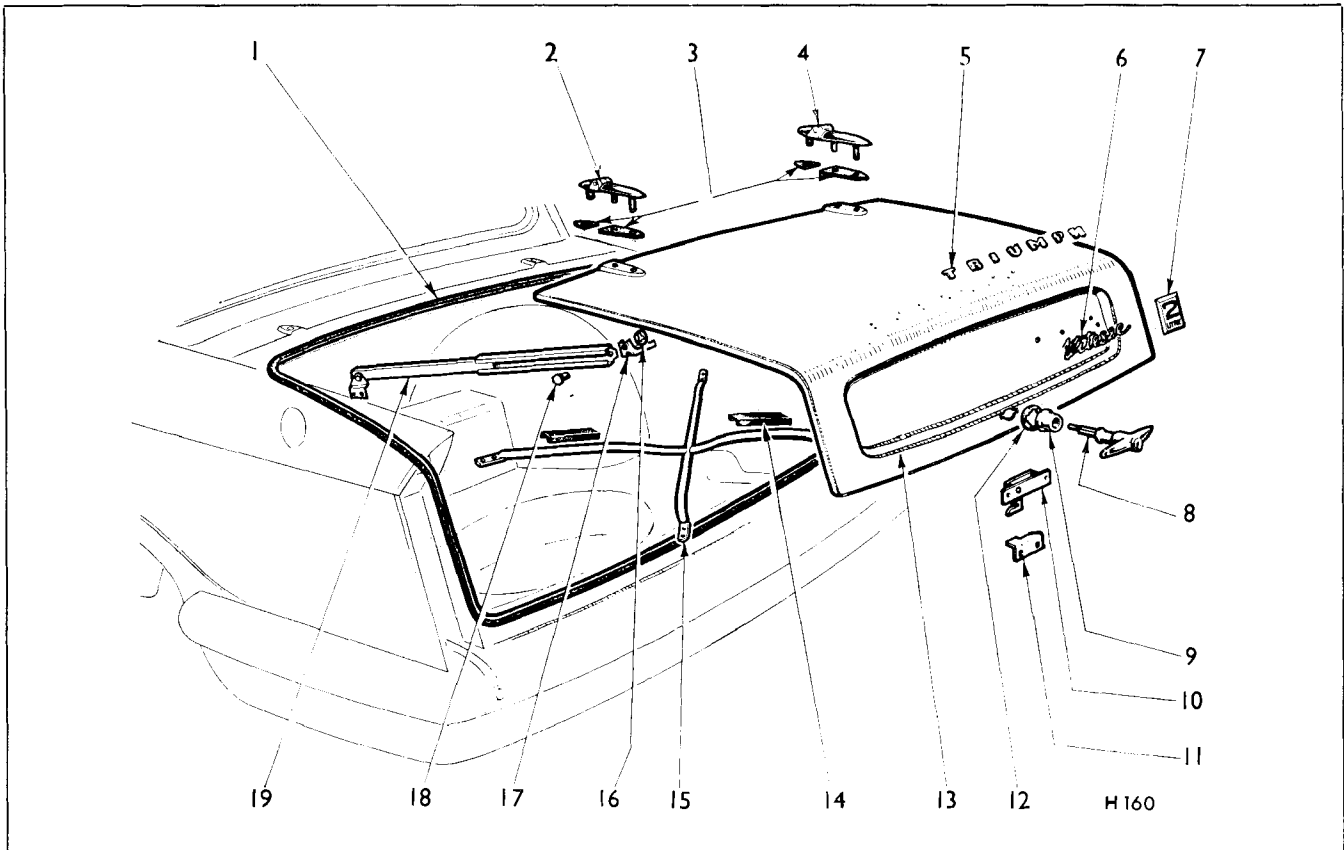
1. Remove one hex./headed self-tapping screw and lockwasher (1) securing the underside of the sill to the tonneau side panel.
2. Remove four cross/recess self-tapping screws and plain washers (2) securing the brackets on the underside of the sill assembly to the chassis frame.
3. Take out two self-tapping cross/recess screws and lockwashers (3) fixing the sill to the dash side panel.
4. Take out seven self-tapping cross/recess screws and lockwashers securing the sill assembly to the floor panels (4).
5. Pull the sill clear of the car.

To Refit—Reverse the removal procedure.



- 2-B-B — Sill panel to chassis frame
 3-A-A — Sill panel to dash side panel
 4-A-A — Sill panel to floor panel

Fig. 17. Sill panel attachments



LUGGAGE COMPARTMENT LID

To Remove

Support the lid in the open position and release the upper end of the stay (19) from the bracket (17). Remove the securing nut from the forward stud of each hinge and lift the lid, complete with hinges, from the body.

If necessary, release the hinges (2) and (4) from the lid and note the position of the sealing washers (3).

To Refit

Reverse the removal procedure leaving the hinge nuts semi-tight. Oversize holes permit limited adjustment. Move the lid as required to effect a close fit and finally tighten the hinge nuts.

Lock

To Remove

Raise the luggage lid, remove the nut from the inner end of the handle (8) and withdraw the handle from the lock (10). Release the lock (10) by removing two securing screws.

To Refit

Reverse the removal procedure.

Striker

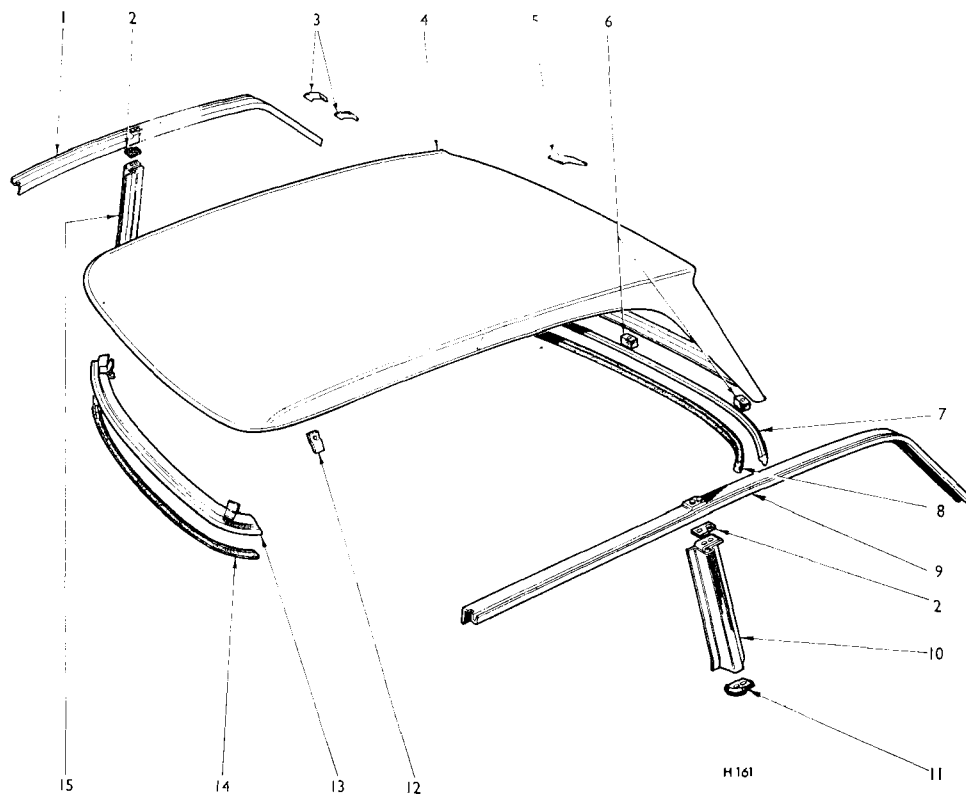
Oversize holes in the striker plate (11) permit limited adjustment.

Sealing

Refer to "Dust and Water Sealing", page 5-301V.

- 1 Weatherstrip
- 2 Hinge
- 3 Gaskets
- 4 Hinge
- 5 Letters
- 6 Name plate
- 7 Badge
- 8 Locking handle
- 9 Escutcheon
- 10 Lock
- 11 Striker
- 12 Seal
- 13 Trunk lid
- 14 Packing rubber
- 15 Lid reinforcement
- 16 Clip
- 17 Bracket support
- 18 Pivot
- 19 Support stay

Fig. 18. Luggage compartment details



- | | |
|----------------------------------|----------------------------------|
| 1 Cantrail assembly—R.H. | 9 Cantrail assembly—L.H. |
| 2 Sealing rubber—quarter pillar | 10 Pillar—quarter light |
| 3 Tie plate—upper and lower roof | 11 Sealing rubber—quarter pillar |
| 4 Roof panel assembly | 12 Bracket—listing rail |
| 5 Reinforcement—backlight | 13 Panel—header assembly |
| 6 Distance piece—roof | 14 Weatherstrip—header rail |
| 7 Finisher—seal—roof to deck | 15 Pillar—quarter light |
| 8 Seal—roof to deck | |

Fig. 19. Roof panel details

ROOF PANEL

To Remove

Isolate the battery and remove the sun visors. Take out two bolts securing the roof panel to the header rail (Fig. 20). Remove the draught welt from both door apertures. Remove the quarter lights and the backlight, page 5-229V. Detach the trim from the centre pillar. Disconnect the roof lamp (purple and purple with white cables) at the snap connectors located adjacent to the upper forward edge of the fuel tank in the luggage compartment.

Release the roof panel by removing four screws (two at each side), securing the centre pillar to the roof, and three nuts (A) from the studs (B) shown on inset (Fig. 21) securing the rear lower edge of the roof to the body.

As the roof panel is lifted, withdraw the roof lamp cables from the luggage compartment. Note that three rubber blocks are used between the rear edge of the roof panel and the body.

To Refit

1. Clean off the old sealing compound from the roof panel, windscreen header rail and rubber weatherstrips. Examine the rubber and renew if necessary.
2. Liberally coat the upper edge of the header rail with Seelastik. Attach the rubber weatherstrip and apply Seelastik to the upper surface of the rubber.
3. Position the sealing rubbers at the base of the roof rear pillar and seal with Seelastik.
4. Apply adhesive to the lower rear edge of the roof panel and to the rubber weatherstrip channel. When tacky, refit the weatherstrip.
5. Apply Seelastik to the contact faces and assemble a small rubber block over each of the three studs on the rear of the roof. Place the roof in position and secure it to the header rail by refitting the two outer bolts (Fig. 20).
6. Lift the rear end of the roof panel, attach a rubber seal to the top of each pillar and, pass the cables from the rear lamp through the rear deck into the luggage compartment.
7. Lower the roof and secure the rear end with three nuts. Align the top of each pillar and secure it to the roof with two screws.
8. Refit the quarter lights and the backlight, page 5-229V, and reconnect the roof lamp cables in the luggage compartment. Refit the battery cables and sun visors.

For sealing operations refer to 'Dust and Water Sealing' section, page 5-301V.

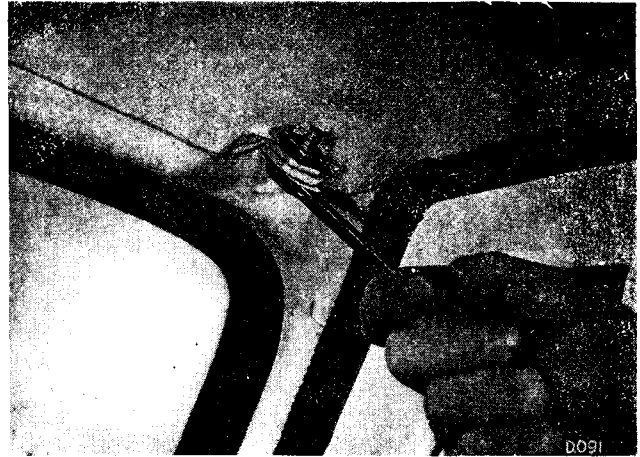


Fig. 20. Releasing roof header rail fixing

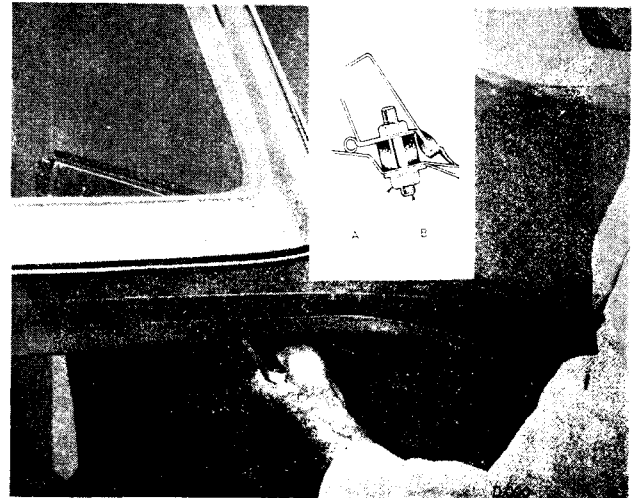


Fig. 21. Releasing roof rear deck fixing

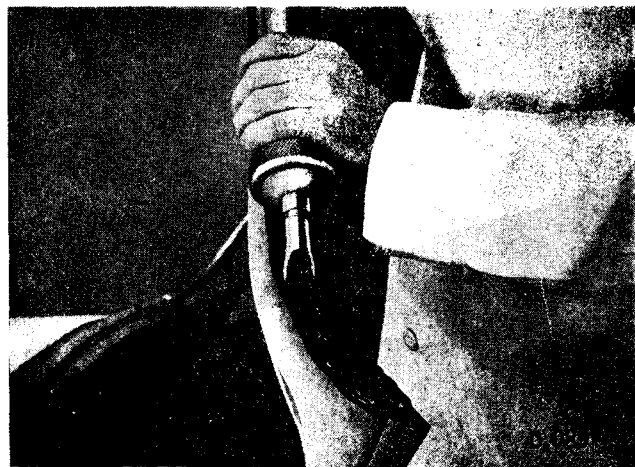


Fig. 22. Applying sealer to header rail rubber

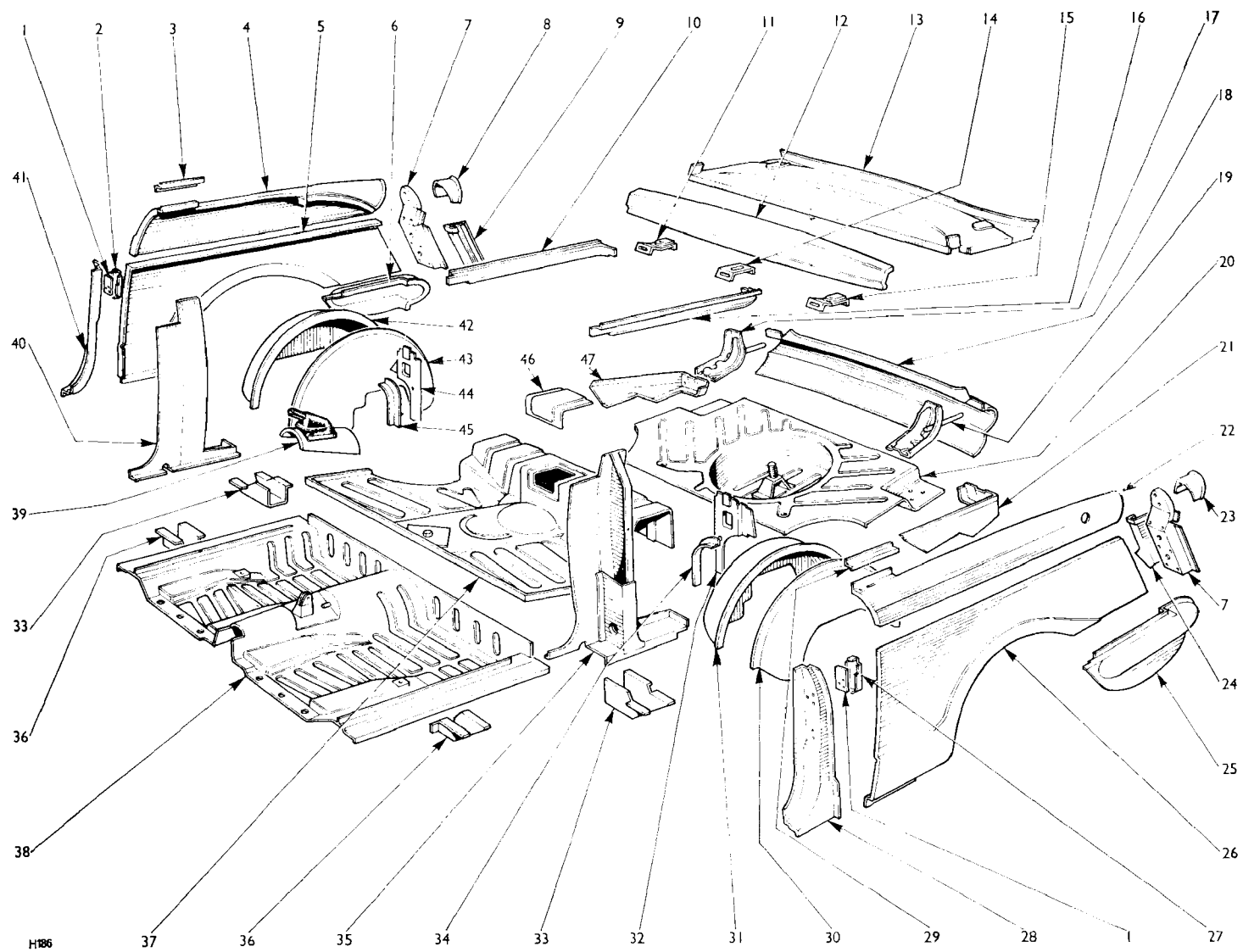


Fig. 23. Rear end section details

Key to Fig. 23

- | | |
|------------------------------------|--|
| 1 Tapped plate | 25 Quarter valance |
| 2 Retainer—tapped plate | 26 Lower panel—tonneau side |
| 3 Filler panel—tonneau upper | 27 Retainer—tapped plate |
| 4 Upper panel—tonneau side | 28 “B” post panel |
| 5 Lower panel—tonneau side | 29 Filler panel—tonneau upper |
| 6 Quarter valance | 30 Outer wheelarch |
| 7 Closing panel lower—tonneau side | 31 Inner wheelarch |
| 8 Closing panel—tonneau end | 32 Stiffener—wheelarch to tonneau side |
| 9 Side panel—trunk aperture | 33 Mounting bracket—“B” post |
| 10 Waist rail | 34 Angle support—squab side |
| 11 Reinforcement—roof fixing | 35 Inner panel—“B” post |
| 12 Reinforcement—rear deck | 36 Mounting bracket—rear floor |
| 13 Rear deck | 37 Rear seat pan |
| 14 Reinforcement—roof fixing | 38 Rear floor panel |
| 15 Reinforcement—roof fixing | 39 Handbrake cover and grommet |
| 16 Waist rail | 40 Inner panel—“B” post |
| 17 Mounting bracket—luggage floor | 41 “B” post |
| 18 Rear valance | 42 Outer wheelarch |
| 19 Mounting bracket—luggage floor | 43 Inner wheelarch |
| 20 Luggage floor | 44 Stiffener—wheelarch to tonneau side |
| 21 Luggage floor—side panel | 45 Angle support—squab side |
| 22 Upper panel—tonneau side | 46 Cover—spring access |
| 23 Closing panel—tonneau end | 47 Luggage floor sidepanel |
| 24 Side panel—trunk aperture | |

REAR END SECTION

To Remove

Isolate the battery and release the accelerator linkage from the carburettor and pedal.

Remove:—

- seats (page 5-242V);
- floor covering (page 5-245V);
- rear quarter trim (page 5-245);
- doors (page 5-216V);
- both sill panels (page 5-208V);
- roof panel (page 5-211V);
- luggage compartment lid (page 5-209V).

Remove the floor covering from the luggage compartment and take out the spare wheel.

Drain and remove the fuel tank (page 5-248V).

Disconnect the rear brake cable at the compensator (page 3-212).

Remove the dash side trim panel from the left-hand side of the car (three screws) and disconnect the cables to the rear of the vehicle at the snap connectors under the fascia.

Take-off the knob from the change speed lever and remove the gearbox cover by unscrewing eleven screws. Eight of the screws (4 at each side) are accessible from the driving compartment (Fig. 24), the remaining three screws are located below the heater unit in the engine compartment.

Remove two hex/headed screws and two plain washers, one each side of the vehicle, positioned in front of the out-board seat runners.

Referring to page 5-201V, release the rear end section from the chassis frame by removing:—

- six bolts (D), positioned transversely across the vehicle in front of the seat runners;
- two bolts (G) located rear of the seat pan;
- four bolts (H) (J) accessible from inside the luggage compartment;
- eight bolts (B), (C), (E) and (F) located beneath the frame sidemembers.

Lift the rear section and note the location of mounting pads between the body and the chassis frame.

To Refit

Remove the old sealing compound from the rear and centre section joint faces and apply new lengths of 'Everseal' strip to the outer joint face of the centre section (1) Fig. 26, and Rubberised canvas between the centre and rear section joints (2) Fig. 26.

Position and secure the mounting pads to the chassis, using Bostik 1261. The pads are $\frac{1}{4}$ " (6.3 mm.) thick. On some vehicles, two pads $\frac{3}{8}$ " (3 mm.) are used in place of a single pad.

Refit the rear end section by reversing the removal procedure.

Referring to page 5-215V, adjust the rear end section to obtain an even clearance of the doors.

Refit the roof panel (page 5-211V), rear quarter glass (page 5-229) and reconnect the electrical system and the handbrake mechanism.

Refit the seats, carpets and remaining components.

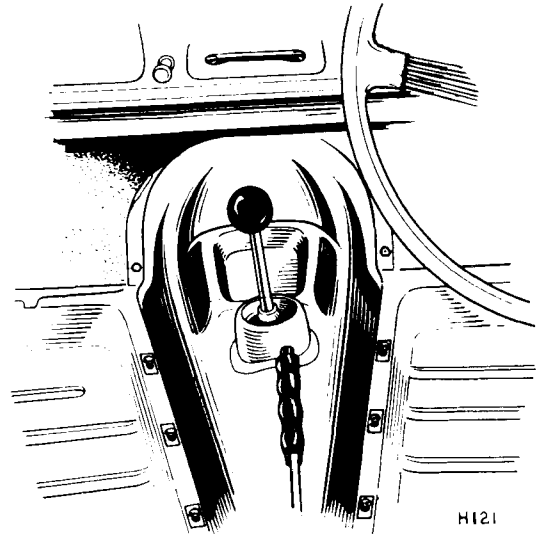


Fig. 24. Location of gearbox cover

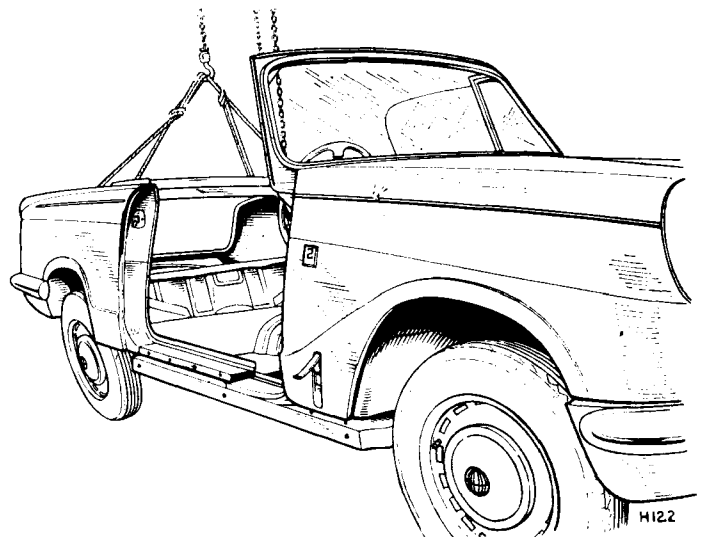


Fig. 25. Lifting rear end section

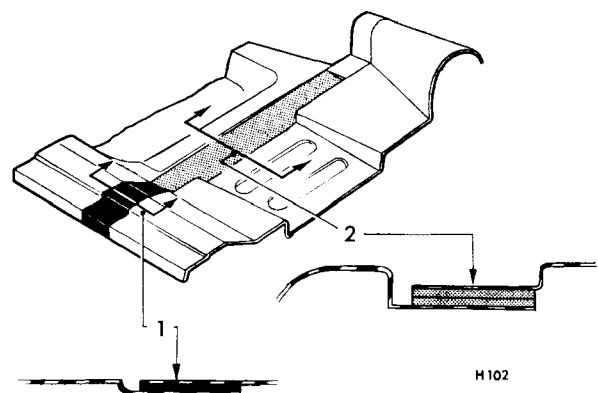


Fig. 26. Location of floor panel sealing strips

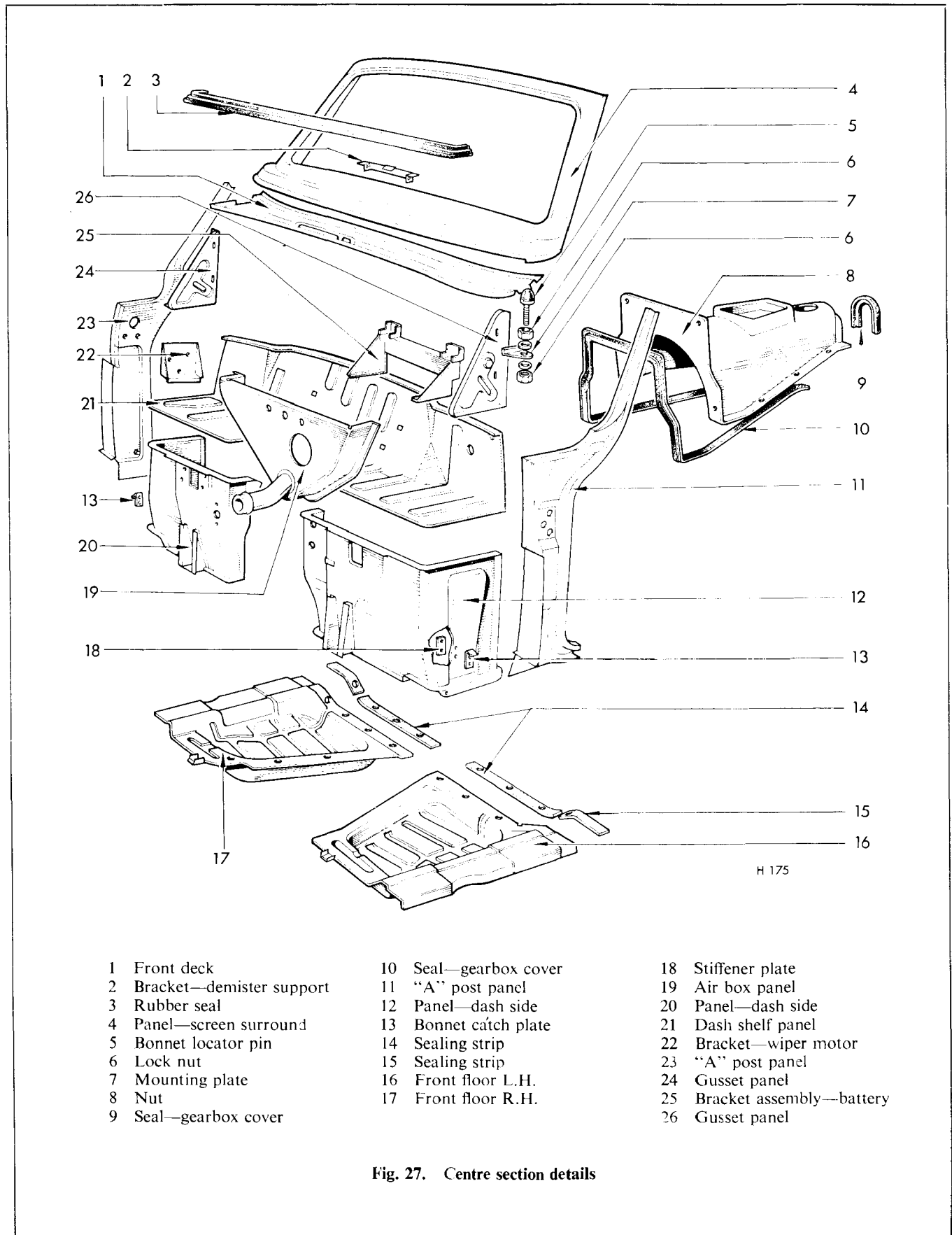
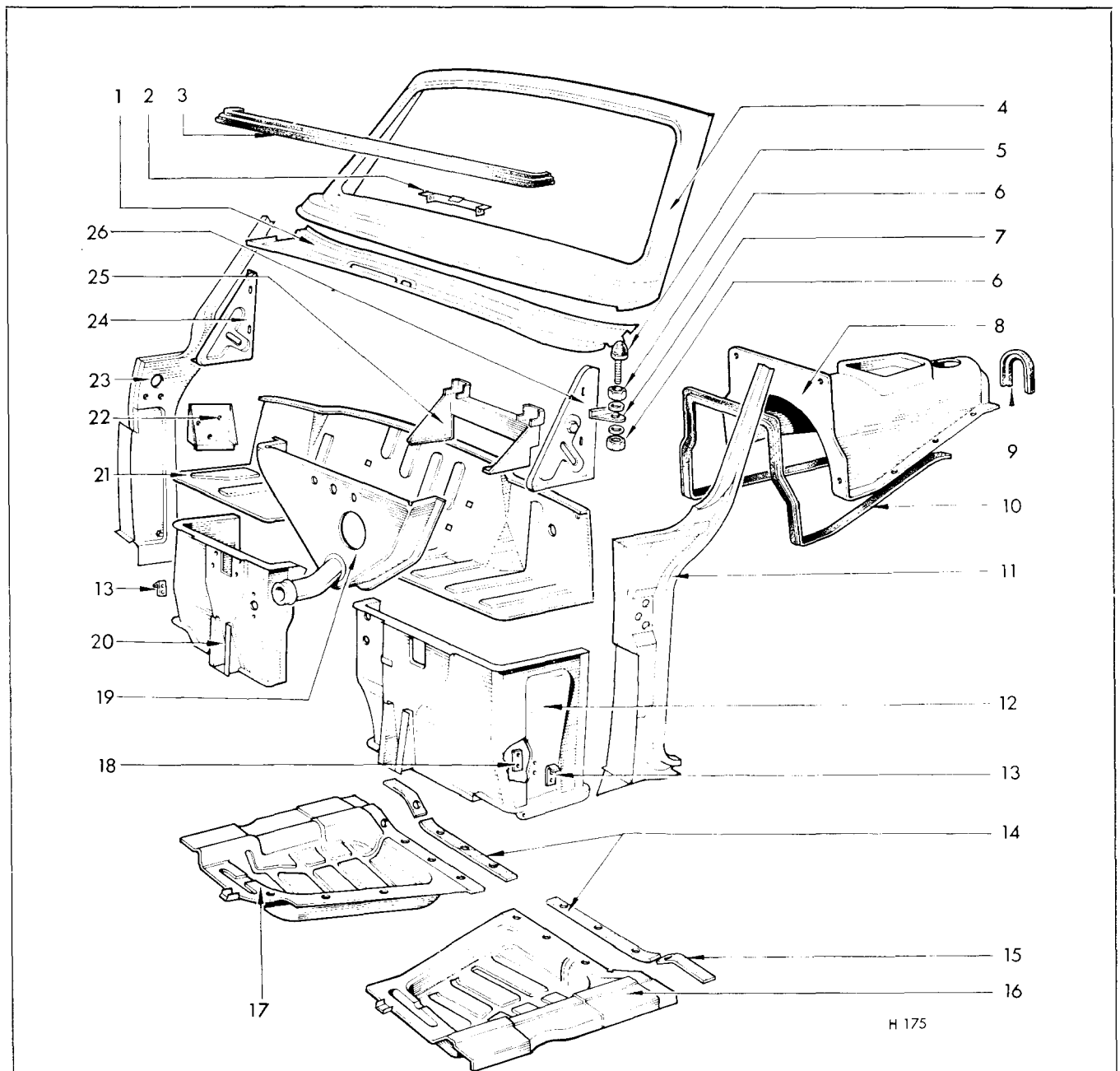


Fig. 27. Centre section details



- | | | | | | |
|---|--------------------------|----|--------------------|----|--------------------------|
| 1 | Front deck | 10 | Seal—gearbox cover | 18 | Stiffener plate |
| 2 | Bracket—demister support | 11 | “A” post panel | 19 | Air box panel |
| 3 | Rubber seal | 12 | Panel—dash side | 20 | Panel—dash side |
| 4 | Panel—screen surround | 13 | Bonnet catch plate | 21 | Dash shelf panel |
| 5 | Bonnet locator pin | 14 | Sealing strip | 22 | Bracket—wiper motor |
| 6 | Lock nut | 15 | Sealing strip | 23 | “A” post panel |
| 7 | Mounting plate | 16 | Front floor L.H. | 24 | Gusset panel |
| 8 | Nut | 17 | Front floor R.H. | 25 | Bracket assembly—battery |
| 9 | Seal—gearbox cover | | | 26 | Gusset panel |

Fig. 27. Centre section details

BODY ADJUSTMENT

A general clearance of approximately $\frac{5}{16}$ " (5 mm.) should exist between the bonnet, door and rear section.

Bonnet adjustments are given on page 5-205V.

Should normal door adjustment fail to produce a satisfactory clearance, move the rear section of the body as required. Limited movement without disturbance to the roof or side windows is affected as follows:—

Insufficient clearance (Fig. 33)

Remove the sill from the side requiring adjustment and slacken the body mounting bolts D, E, F, G, H and J (Fig. 1)

Insert a hardwood wedge between the shut face of the door and rear section as shown.

Close the door to spread the sections sufficiently to produce a satisfactory clearance.

Re-tighten all body mounting bolts.

Remove the wedge, check the clearance and refit the sill.

Excessive clearance (Fig. 31)

Remove the sill panel from the side of the car requiring adjustment, and slacken the body mounting bolts D, E, F, H and K (page 5-201V).

Insert two hardwood wedges between the frame and the rear floor approximately 2" (5.1 mm.) inward of body mounting point "F". Gently hammer the wedges in, as shown, until satisfactory clearance is achieved.

Re-tighten body mounting bolts. Remove the wedges, check the clearance and refit the sill.

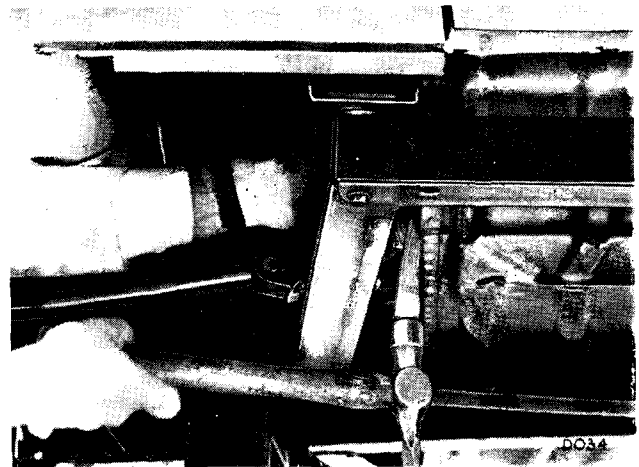


Fig. 31. Inserting wedges to reduce gap



Fig. 32. Re-tightening body mounting bolts

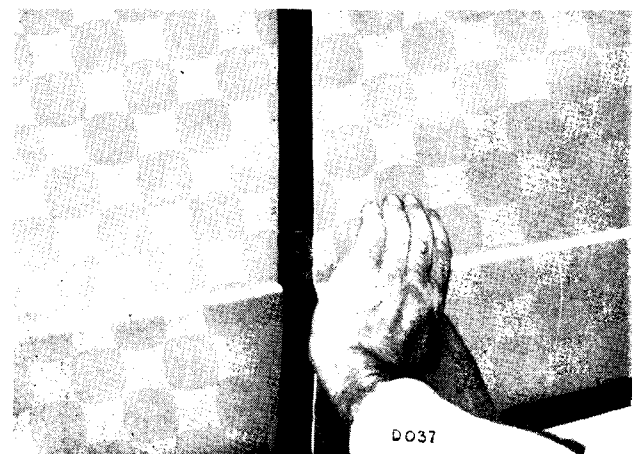


Fig. 33. Inserting wedges to increase gap

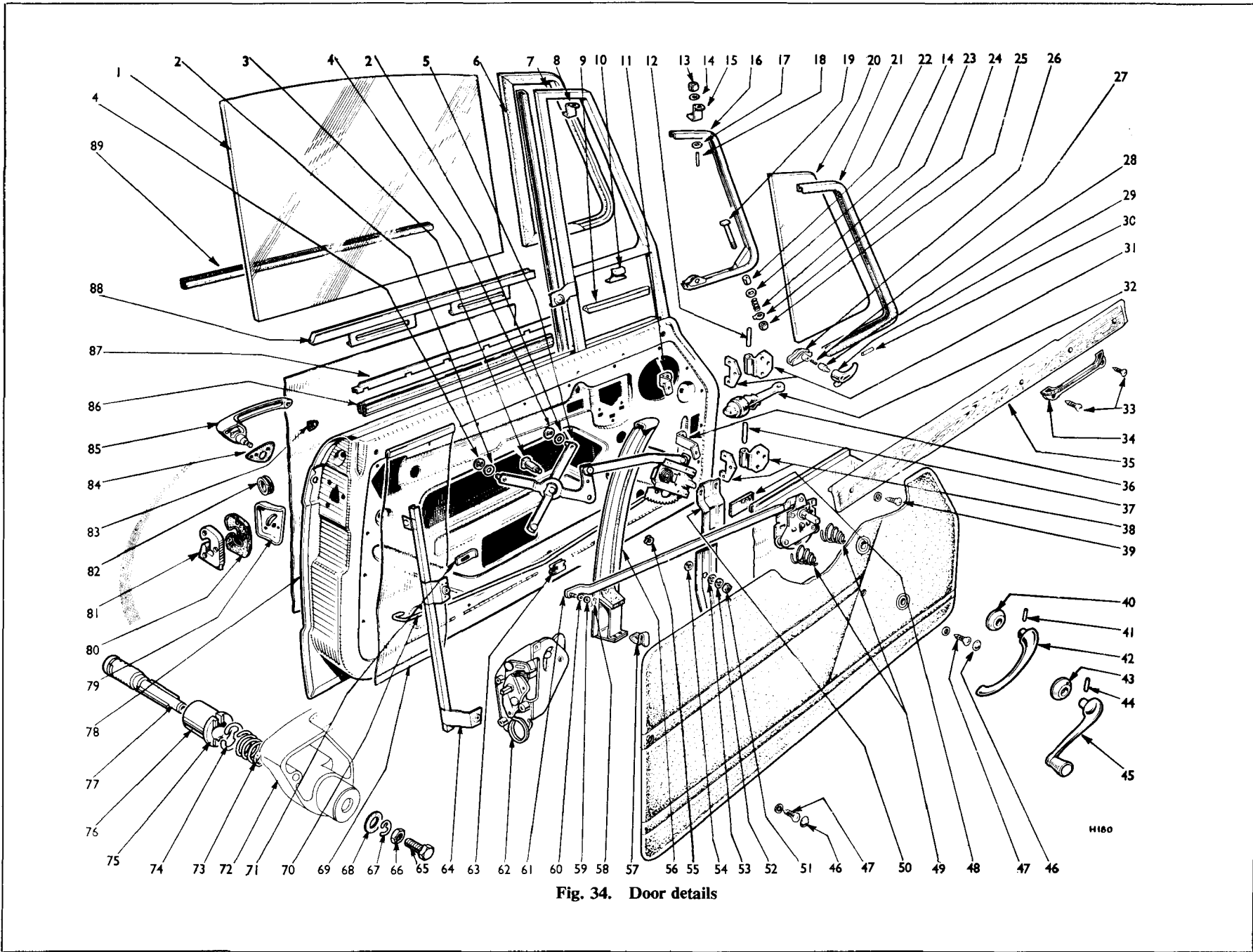


Fig. 34. Door details

Key to Fig. 34

- | | |
|----------------------------------|--|
| 1 Glass—door | 46 Cap—door trim |
| 2 Washer—leather | 47 Screw—door trim |
| 3 Pivot—regulator mounting | 48 Felt pad |
| 4 Clip—retainer | 49 Spring—regulator |
| 5 Window regulator assembly | 50 Reinforcement—regulator pivot |
| 6 Weatherstrip | 51 Nut |
| 7 Outer frame | 52 Washer—lock |
| 8 Bracket—top pivot, outer | 53 Washer—plain |
| 9 Finisher—waist forward, inner | 54 Washer—plain (thin) |
| 10 Plate—catch | 55 Washer—special |
| 11 Bracket—vent support | 56 Stiffener assembly—anti-drum |
| 12 Pin—door hinge | 57 Clip—trim panel to door |
| 13 Washer—thick | 58 Clip |
| 14 Washer—thin | 59 Washer—waved |
| 15 Bracket—top pivot, inner | 60 Washer—plain |
| 16 Inner frame—assembly | 61 Remote control mechanism |
| 17 Washer—thin | 62 Cam lock assembly |
| 18 Rivet—semi-tubular | 63 Clip—tie rod attachment |
| 19 Shaft assembly—bottom pivot | 64 Channel—glass assembly |
| 20 Glass—vent | 65 Bolt—lock adjusting |
| 21 Strip—glazing | 66 Nut—lock adjusting |
| 22 Spacing piece | 67 “E” clip—securing push button in handle |
| 23 Spring | 68 Washer—rubber |
| 24 Washer—tab | 69 Weather curtain |
| 25 Nut | 70 Rod—tie, glass channel, bottom |
| 26 Bracket assembly—handle | 71 Window regulator stop bracket |
| 27 Spring | 72 Body—door handle, outside |
| 28 Button—push | 73 Spring—button return |
| 29 Handle—locking | 74 “E” clip—locking handle only |
| 30 Pin—locking | 75 Plunger—locator |
| 31 Hinge—door | 76 Button—push, locking handle only |
| 32 Check link assembly—door | 77 Barrel—locking (plunger), locking handle only |
| 33 Screw | 78 Door assembly |
| 34 Handle—door pull | 79 Plate—dove tail, cam lock |
| 35 Capping—veneer | 80 Rubber sealing—striker, cam lock |
| 36 Bracket—vent support assembly | 81 Striker assembly—cam lock |
| 37 Pin—door hinge | 82 Grommet—rubber |
| 38 Hinge—door | 83 Washer—seating, small |
| 39 Screw—capping veneer | 84 Washer—seating, large |
| 40 Escutcheon—inside handle | 85 Door handle assembly—outside |
| 41 Pin—handle fixing | 86 Strip—sealing, waist, door inner |
| 42 Handle—remote control | 87 Strip—sealing, waist, door outer |
| 43 Escutcheon—inside handle | 88 Channel assembly—window regulator |
| 44 Pin—handle fixing | 89 Strip—glazing channel |
| 45 Window regulator handle | |

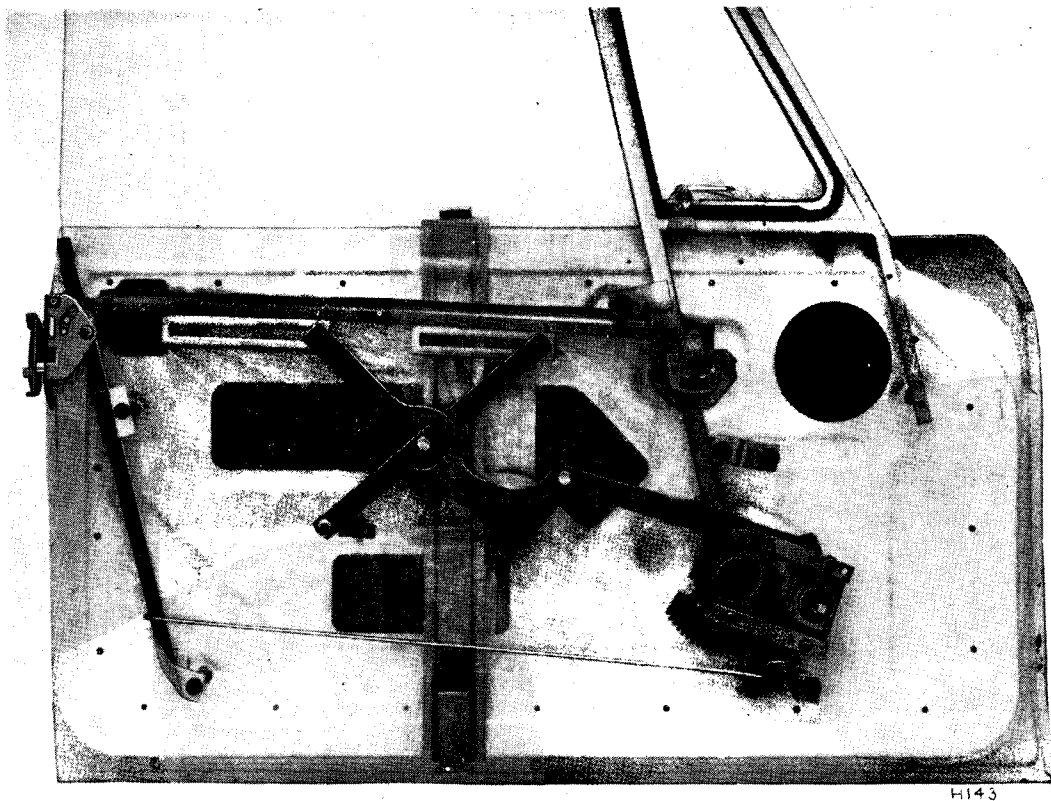


Fig. 35. Door components

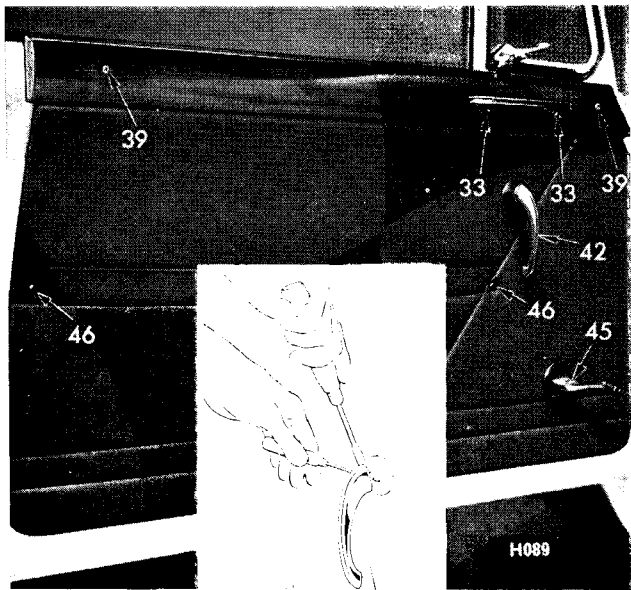


Fig. 36. Trim panel attachments

DOORS

General

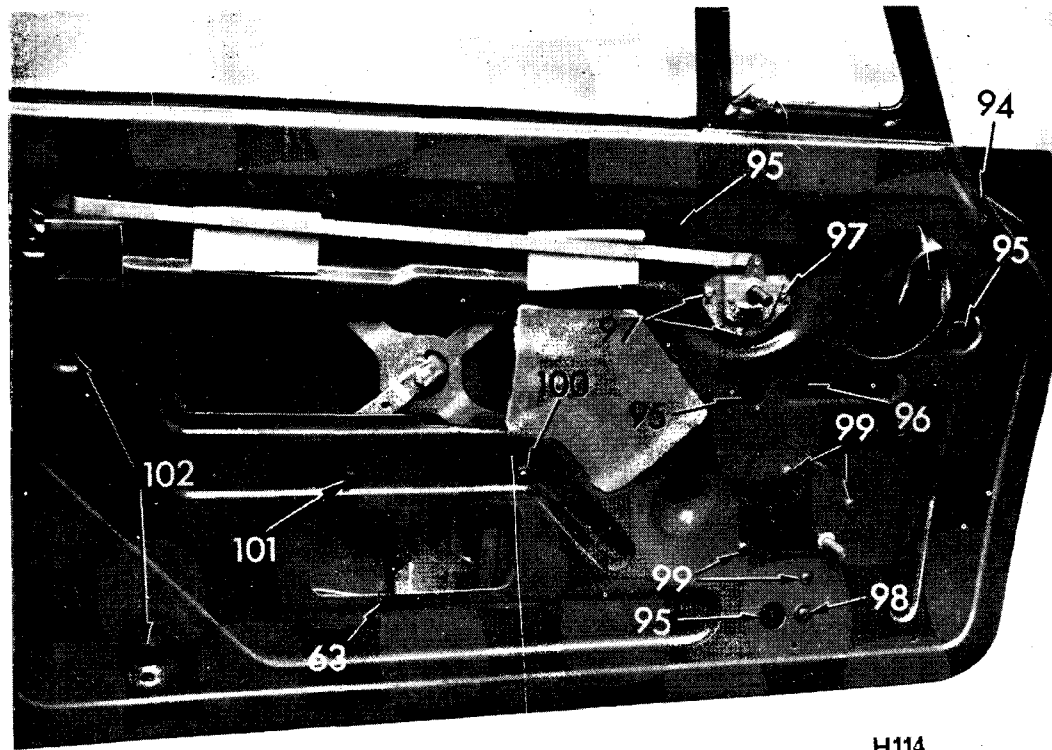
The procedures A-K should be adopted, in the sequence given, when dismantling and removing the door assembly. Reverse these procedures when refitting and re-assembling the door.

As the occasion warrants, each of these dismantling procedures can be carried out separately and should be reversed for re-assembly.

Adjustment and additional procedures are listed under the headings L. T.

A. Trim Panel: To Remove (Fig. 36)

1. Remove four screws (39) and (33) securing the wood capping.
2. Lever off two buttons (46), unscrew the exposed screws and remove the flat washers.
3. Remove two interior handles (42) and (45) by pressing the escutcheons (40) and (43) firmly against the trim panel and pushing out the retaining pins (41) and (44).
4. Prise the edge of the trim casing from the door.
5. Remove the coil springs (49) from the spindles.



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Fig. 37. Door component attachment

B. Remote Control: To Remove (Figs. 37 and 38)

1. Perform operation 'A'.
2. Refit the interior door handle and retain it in the door open position.
3. Remove the spring clip (58) waved washer, (59) and release the link arm from the lock assembly.
4. Take out three screws (97) and remove the remote control assembly (61) from the door panel.

C. Glass-run Channel: To Remove (Figs. 34 and 37)

1. Perform operation 'A'.
2. Raise the door glass to the fully closed position.
3. Remove the rubber grommet (82) and take out the exposed hexagon headed bolt and washer.
4. Remove two hexagon headed bolts (102) and washers. Pull the lower end of the channel (64) forward of the tension wire (70).
5. Lower the channel into the bottom of the door and manoeuvre it through the lower door aperture.

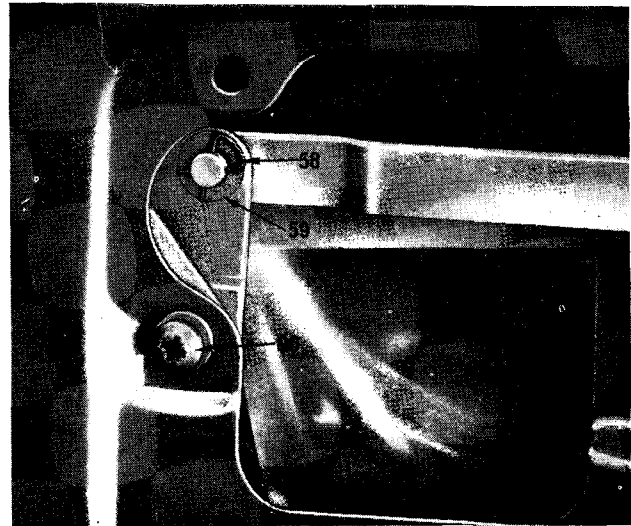


Fig. 38. Door lock/link attachments

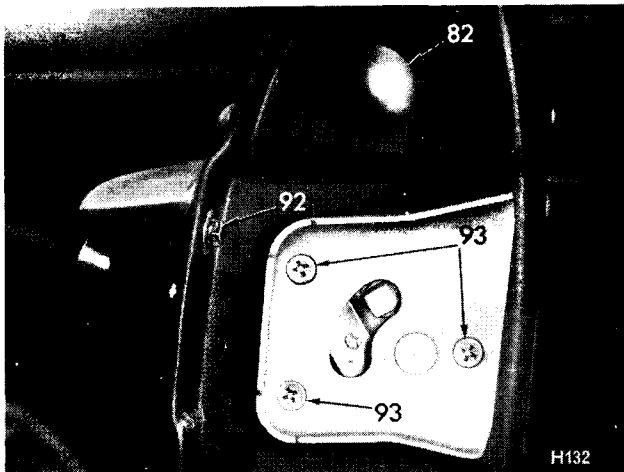


Fig. 39. Dovetail plate/lock attachment

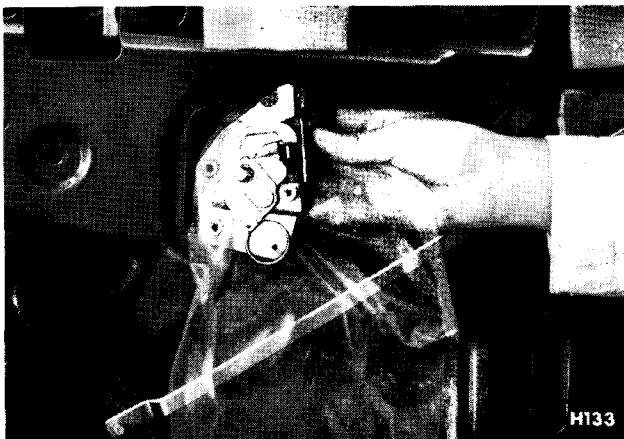


Fig. 40. Removing/fitting door lock

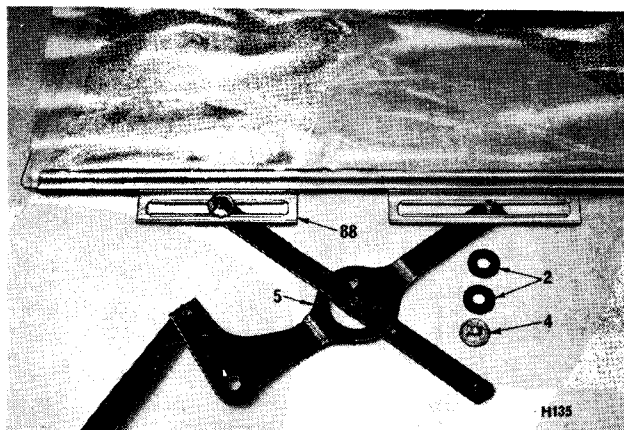


Fig. 41. Regulator arms

D. Door Lock: To Remove

1. Perform operations 'A' and 'C'.
2. Remove the spring clip (58) waved washer (59) and release the link arm from the lock.
3. Remove three cross-recess headed screws (93) securing the lock and dovetail to the door and remove one cross-recess headed screw (90).
4. Referring to Fig. 40, remove the lock.

E. Exterior Handle: To Remove

1. Perform operation 'A' and raise the door glass to the fully closed position.
2. Release the handle by removing two screws. One (92) is shown in Fig. 39, the other is located on the inside of the door panel at the forward end of the handle.

F. Regulator Mechanism: To Remove

1. Perform operation 'A'.
2. Loosely refit the regulating handle and lower the glass until the operating arms are accessible through the large aperture, in the door inner panel.
3. Remove the clips (4) and leather washer (2). Spring the arms clear of the channel and lift the glass to its highest position.
4. Remove the nut (51) and spring washer (52) securing the regulator pivot (3) to the inner panel.
5. Remove the pivot (3) and the double coil spring washer (55) which is fitted between the regulator and the inner panel of the door.
6. Take out two hexagon headed bolts (95) and two cross-recess headed screws which are accessible through circular holes in the door panel, and one screw (94). Lift the ventilator assembly approximately 2" (50 mm.). (When refitting the ventilator assembly ensure that the screw (98) secures the forward end of the tension wire (69).)
7. Remove four cross-recess headed screws (99) and pass the regulator into the door inner compartment. Remove the assembly through the large aperture.

G. Door Glass: To Remove

1. Perform operations 'A', 'C' and 'F' 2.
2. Remove the spring clips (4) leather washers (2). Disconnect the arms from the operating channel on the bottom edge of the glass and lower the glass.
3. Press the six inner weatherstrip clips downwards and remove the weatherstrip (86).
4. Remove two hexagon headed bolts (95 and 94) and three cross-recess headed screws and lift the ventilator assembly approximately 1½" (38 mm.).
5. Lift out the glass by tilting it as required.

H. Quarter Vent: To Remove

1. Perform operations 'A' and 'G'
2. Lift out the vent.
Dismantle the ventilator assembly as follows:
Bend back the tag on the washer (24).
Remove the nut (25), washers (14) and spring (23) from the bottom swivel (19).
Remove the rivet (18) and spacer (13) from the upper swivel. Push the upper edge of the inner frame of the vent outward and withdraw the assembly from the outer frame.
Tap out the retaining pin (30) and remove the vent locking handle (29) and push button (28).

J. Reinforcement Plate: To Remove

1. Raise the door glass to the fully closed position.
2. Remove two cross-recess headed screws from under the door panel.
3. Release the plate from the two clips attached to the top inner door edge by tapping the plate to one side.
4. Remove the plate through the large aperture.

K. Door Assembly: To Remove

1. Remove the rivet securing the check arm (32) to the 'A' post.
2. Take out three bolts (103) securing each hinge to the 'A' post and lift the door from the vehicle.
Each hinge is secured to the door by two bolts and one cross-recess headed screw.

L. Weatherstrip: To Refit

An easily made tool (see Fig. 43) is required for refitting the inner weatherstrip from inside the door panel as follows:

Holding the weatherstrip in position, locate a spring clip over the edge of the door panel and weatherstrip. Using the tool shown in Fig. 44 pull the clip firmly onto the door flange and repeat with the remaining clips.

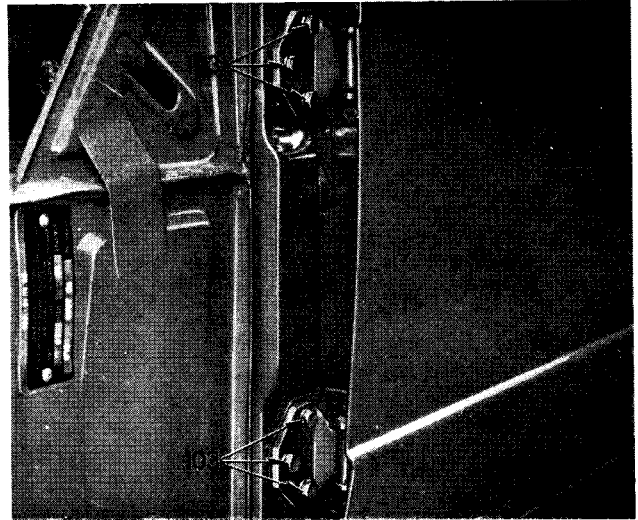


Fig. 42. Door hinge attachment

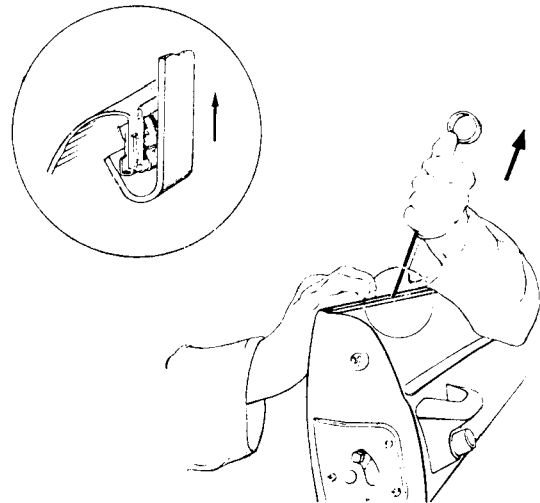


Fig. 43. Fitting weatherstrip

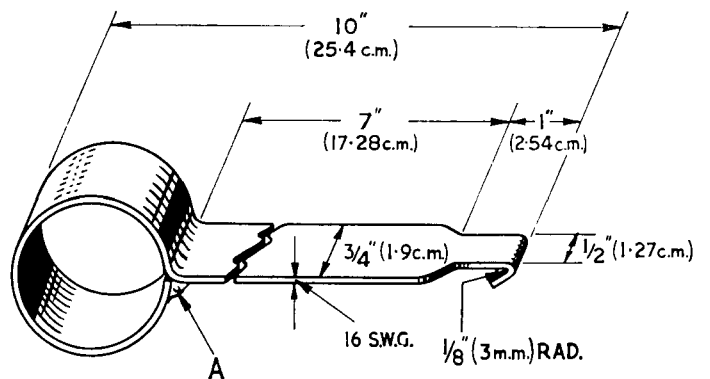


Fig. 44. Weatherstrip fitting tool

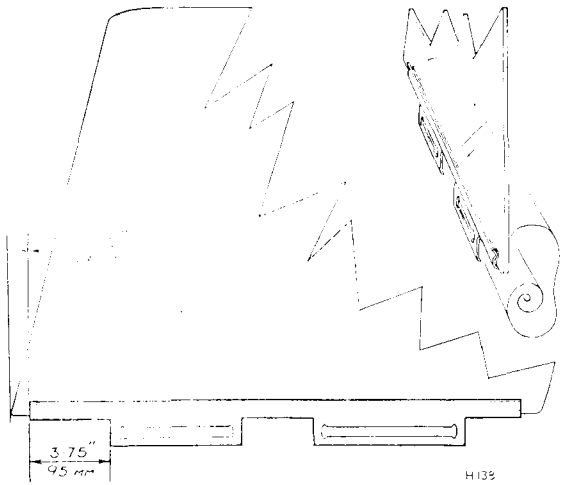


Fig. 45. Door glass/channel

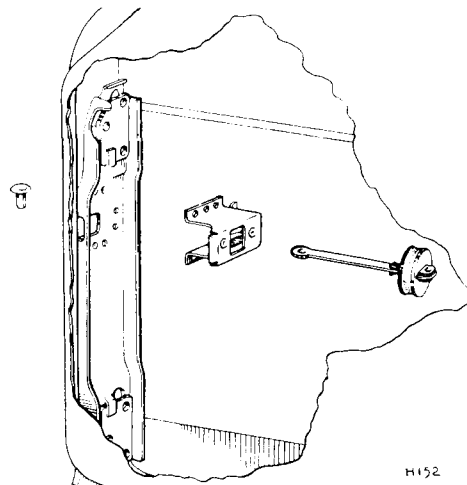


Fig. 46. Check strap bracket

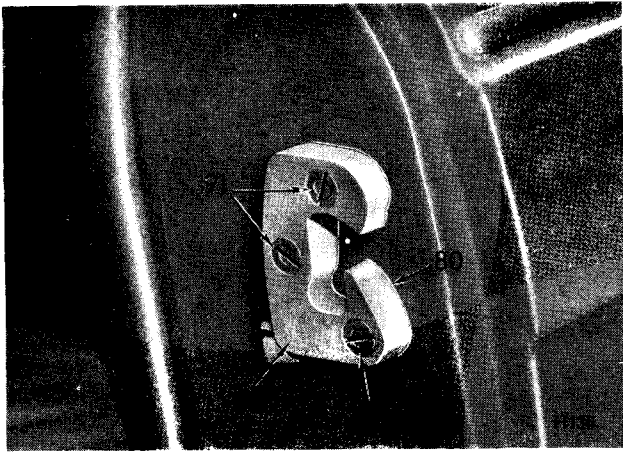


Fig. 47. Door lock striker plate

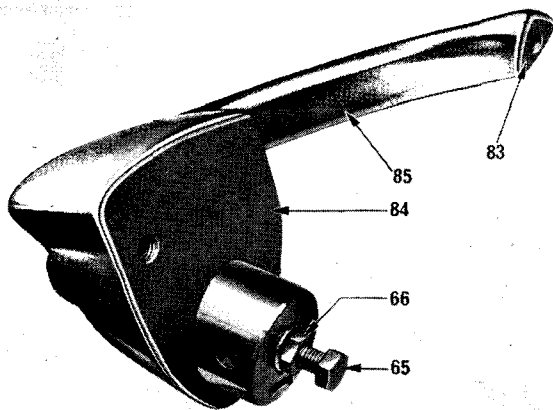


Fig. 48. Exterior handle details

M. Door Glass to Channel: To Refit

1. Place one end of the polythene sheet together with the rubber weatherstrip over the channel run, Fig. 45.
2. Position the glass, as shown on Fig. 45 and compress the glass into the channel.

N. Lock Striker Plate: To Remove (Fig. 47)
Remove three screws (91).**P. Lock striker plate: To refit and adjust**

Correct position of the striker plate is carried out by a process of trial and error, proved by checking the door closing action and its position when closed. Ensure that the striker is in the horizontal plane relative to the axis of the door movement.

R. Check Strap Bracket: To Remove (Fig. 46)

1. Remove all components from the door panel.
2. Perform operation 'K'.
3. Drill through the spot welds securing the bracket to the door panel.

S. Check Strap Bracket: To Refit

1. Secure the bracket to the door with four $\frac{1}{8}$ " (3.0 mm.) dia. cheese headed steel rivets.
2. Reverse operation 'K'.
3. Refit all door components.

T. Adjustment to the Exterior Door Handle Push Button (Fig. 48)

1. Perform operations 'A' and 'E'.
2. Slacken the locknut (66) and adjust the bolt (65) to give a clearance of $\frac{1}{16}$ " between the bolt head and lock lever. Retighten the locknut.

ROOF LINING

Maintenance

Maintenance is restricted to cleaning the material with warm soapy water. Obstinate grease marks may be removed using a cloth moistened in trichlorethylene. The edges of the lining are secured to the roof panel with a rubber solution, and in consequence, damage may result from the careless use of adhesive solvents.

To Remove

Remove the roof panel as described on page 5-211V. Release the edges of the lining from the panel, taking care, if the lining is to be subsequently refitted.

Press the ends of the listing rails inward to release them from the locations in the cantrails.

Withdraw the rails from the lining.

To Refit

1. Using an adhesive solvent, remove all trace of adhesive from the flange of the roof panel and lining.
2. Assemble the listing rails to the lining and ensure that they are correctly located by referring to the individual colour coding of each rail.

The colour code is as follows:

(Numbered from the front of the vehicle)

- No. 1 Green
- No. 2 White
- No. 3 Black
- No. 4 Grey
- No. 5 Double section—no colour

3. Apply a fresh coating of adhesive to the roof flange and lining.
4. Commencing at the rear, assemble the rails to the roof panel cantrail. Secure the front rail No. 1 behind two retainings clips (Fig. 49). Gently pull the lining to the rear and lightly secure it to the roof flange only (Fig. 50).

Lightly secure the lining to the front edge of the roof panel (Fig. 51).

Working outwards from the centre of the lining, smooth out all wrinkles and seal lining to the edge of the roof panel.

If a new lining is being fitted, cut the edges to within $\frac{1}{8}$ " (3 mm.) of the turnover.

The cuts should be approximately $\frac{1}{4}$ " (13 mm.) apart.

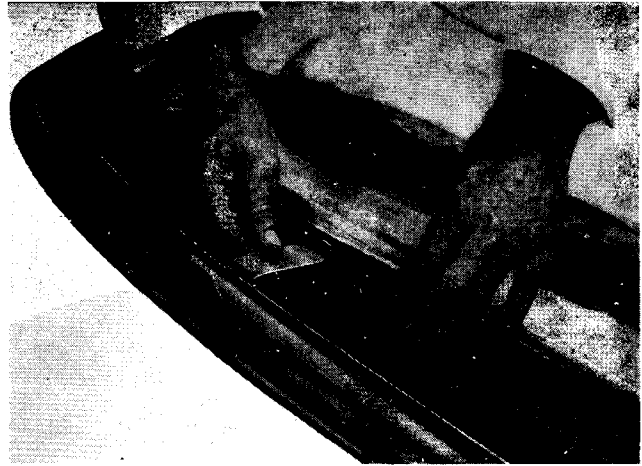


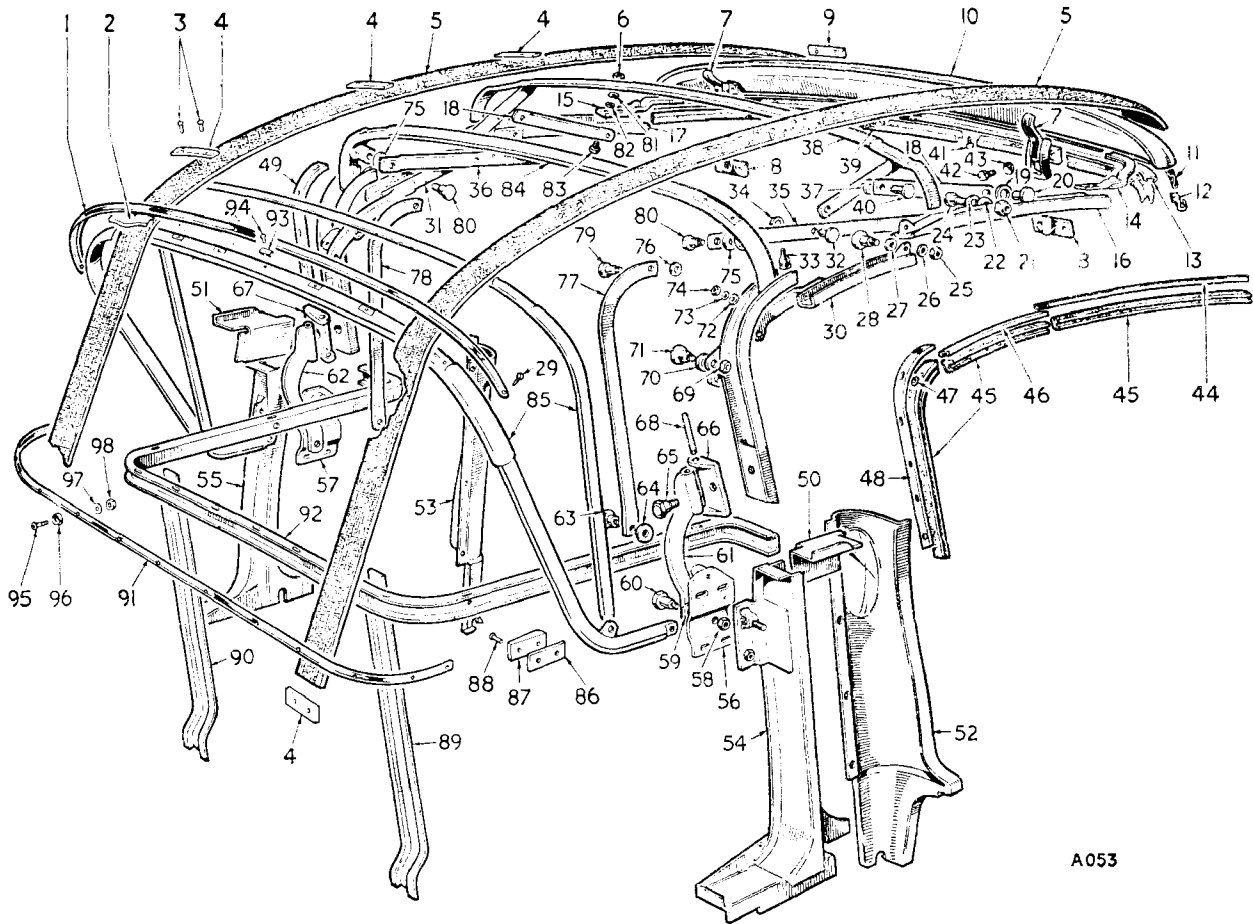
Fig. 49. Assembling listing rail No. 1 to the retaining clips



Fig. 50. Securing rear edge of roof lining



Fig. 51. Fitting front edge of lining



A053

- | | | | |
|--|---|---------------------------------------|--|
| 1 Finishing strip—rear hood stick | 26 Plain washer | 51 "B" post filler panel—L.H. | 75 Plain washer |
| 2 Webbing retaining plate | 27 Plain washer | 52 "B" post closing panel—R.H. | 76 Plain washer |
| 3 Rivets | 28 Shouldered bolt | 53 "B" post closing panel—L.H. | 77 Rear cantrail control link—R.H. |
| 4 Webbing retaining plate | 29 Finisher strip retaining screw | 54 "B" post inner panel assembly—R.H. | 78 Rear cantrail control link—L.H. |
| 5 Webbing | 30 Cantrail rear assy.—R.H. | 55 "B" post inner panel assembly—L.H. | 79 Shouldered bolt |
| 6 Nut | 31 Cantrail rear assy.—L.H. | 56 Pivot mounting bracket—R.H. | 80 Shouldered bolt |
| 7 Head catch assembly—front hood stick | 32 Rivet | 57 Pivot mounting bracket—L.H. | 81 Spring washer |
| 8 Head catch assembly—screen header | 33 Rubber buffer | 58 Nut | 82 Plain washer |
| 9 Webbing retaining plate | 34 Plain washer | 59 Plain washer | 83 Bolt |
| 10 Front stick assembly | 35 Front cantrail link—R.H. | 60 Shouldered bolt | 84 Intermediate hood stick, and "B" post upper assy. |
| 11 Roof header finisher | 36 Front cantrail link—L.H. | 61 Hinge link—R.H. | 85 Rear hood stick and intermediate stick assembly |
| 12 Front hood stick end finisher | 37 Plain washer | 62 Hinge link—L.H. | 86 Packing piece |
| 13 Weather strip retainer | 38 Front intermediate hood stick assembly | 63 Shouldered bolt | 87 Nylon guide block |
| 14 Pivot bracket assembly—R.H. | 39 Front hood stick weather strip | 64 Plain washer | 88 Rivet |
| 15 Pivot bracket assembly—L.H. | 40 Rivet | 65 Shouldered bolt | 89 Tonneau support strut—R.H. |
| 16 Cantrail assembly—R.H. | 41 Screw | 66 "B" post hinge—R.H. | 90 Tonneau support strut—L.H. |
| 17 Cantrail assembly—L.H. | 42 Screw | 67 "B" post hinge—L.H. | 91 Head cloth finishing strip |
| 18 Front cantrail link | 43 Washer | 68 Pivot pin | 92 Tonneau support rail |
| 19 Plain washer | 44 Front cantrail weather strip retainer | 69 Nut | 93 Finishing strip retaining clips |
| 20 Rivet | 45 Weather strip | 70 Plain washer | 94 Rivet |
| 21 Nyloc nut | 46 Rear cantrail weather strip retainer | 71 Shouldered bolt | 95 Screw |
| 22 Nut | 47 Screw | 72 Plain washer | 96 Snap fastener |
| 23 Plain washer | 48 "B" post—upper—R.H. | 73 Shakeproof washer | 97 Rubber washer |
| 24 Shoulder bolt | 49 "B" post—upper—L.H. | 74 Nut | 98 Nut |
| 25 Nut | 50 "B" post filler panel—R.H. | | |

Fig. 52. Soft-top frame details

SOFT TOP ADJUSTMENTS

CONVERTIBLE MODEL ONLY (Fig. 52)

CONDITION	ADJUSTMENT
Cantrail low in the centre causing it to foul the door glass.	Remove and re-set the curved section of the rear cantrail assembly (30 and 31).
Upper edge of door glass fouls the cantrail.	Adjust door glass stop until satisfactory clearance is obtained.
Rear corner of door glass fouls curved section of rear cantrail assembly.	Remove pivot mounting bracket (56 and 57) and elongate the holes to provide sufficient vertical adjustment. Use oversize washers when refitting the securing screws.
"B" post weatherstrip does not form an effective seal at the rear edge of door glass.	<p>Two adjustments are available:</p> <ol style="list-style-type: none"> 1. Slacken the pivot bracket (30 and 31) securing bolts and move the bracket forward. If hood material between the "B" post and rear deck is now subject to undue stress, remove the "B" post weatherstrip and release the hood material as necessary. 2. Remove the weatherstrip and hood material from "B" post. Insert suitable packing between the hood material and "B" post. Refit the hood material and weatherstrip.
Hood stitching broken away at the base of the "B" post.	Remove the bolts securing the pivot mounting bracket (30 and 31) to the body and insert suitable packing between the bracket and body to obtain a clearance of approximately $\frac{1}{4}$ " (6.3 mm.) between the hoodsticks and the body outer panel.
Small holes in hood 4" to 6" (10.16 cm. to 15.24 cm.) above the body outer panel and to the rear of the "B" post are caused by the hood material being trapped between the hoodsticks when the hood is lowered.	Shorten the bolts securing the weatherstrip to the "B" post. Remove the fourth bolt, counting from the bottom, and discard it.

HOOD FASTENER ADJUSTMENTS

CONDITION	ADJUSTMENT
Hood peak rail out of line with windscreen header rail.	Slacken the screws securing the clamps (7) to the peak rail and centralize. Re-tighten the screws.
Incorrect tension on hood fasteners.	Slacken the screws plate (8) to the windscreen header rail and raise or lower the to plate obtain correct tension. Re-tighten the screws.

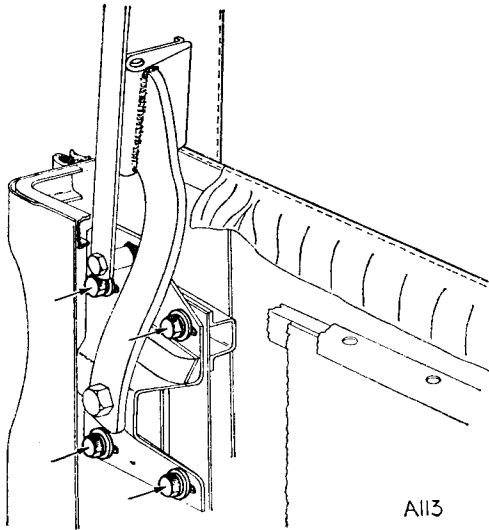


Fig. 53. Soft-top pivot mounting

CONVERTIBLE HOOD ASSEMBLY

To Remove (Fig. 52)

1. Remove twelve screws (95), fasteners (96), washers (97) and nuts (98).
2. Detach the finisher strip (91), release the hood material from the body and drill out twelve rivets (3) retaining the plates (4) and the webbing (5) to the hood sticks and rear deck flange.
3. Release the head catch assemblies (7) on the screen rail and two snap-on clips securing the hood to the body side flanges.
4. Remove the trim quarter panels to gain access to the pivot mounting brackets (56) and (57). Release the bracket by removing the four securing bolts arrowed (Fig. 53). Lift the hood assembly from the body.

To Refit

Reverse the removal procedure and make adjustments as required in accordance with the conditions listed on page 5-225.

SLIDING ROOF ASSEMBLY

To Remove (Fig. 54)

With the sliding roof in the half-open position, hold one side steady and pull the other side forward. This releases the nylon sliders from the metal runners. Repeat the operation until all the sliders are clear.

Remove four screws (30) and lift clear.

To Refit

Reverse the above procedure.

Adjustment

The four screws (30) pass through elongated holes to enable the fabric to be slackened or tensioned as necessary to improve appearance.

Any stiffness in the sliding action may be relieved by applying Ambersil Silicone Formula 1 spray to the runners.

Should it be necessary to service the sliding roof catch mechanism, remove the sliding roof assembly complete. Pull the ends of the front listing rail clear of the fabric, pull the fabric clear of the front box-section. Remove two screws (6) (Fig. 55) and lift the metal section clear.

To re-assemble, reverse the above procedure.

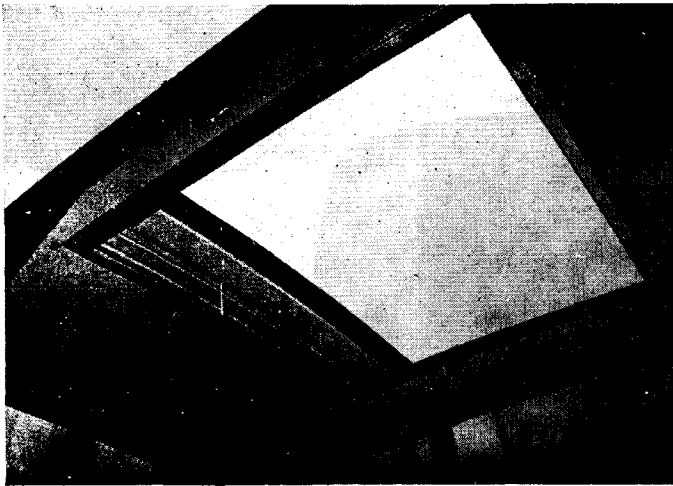
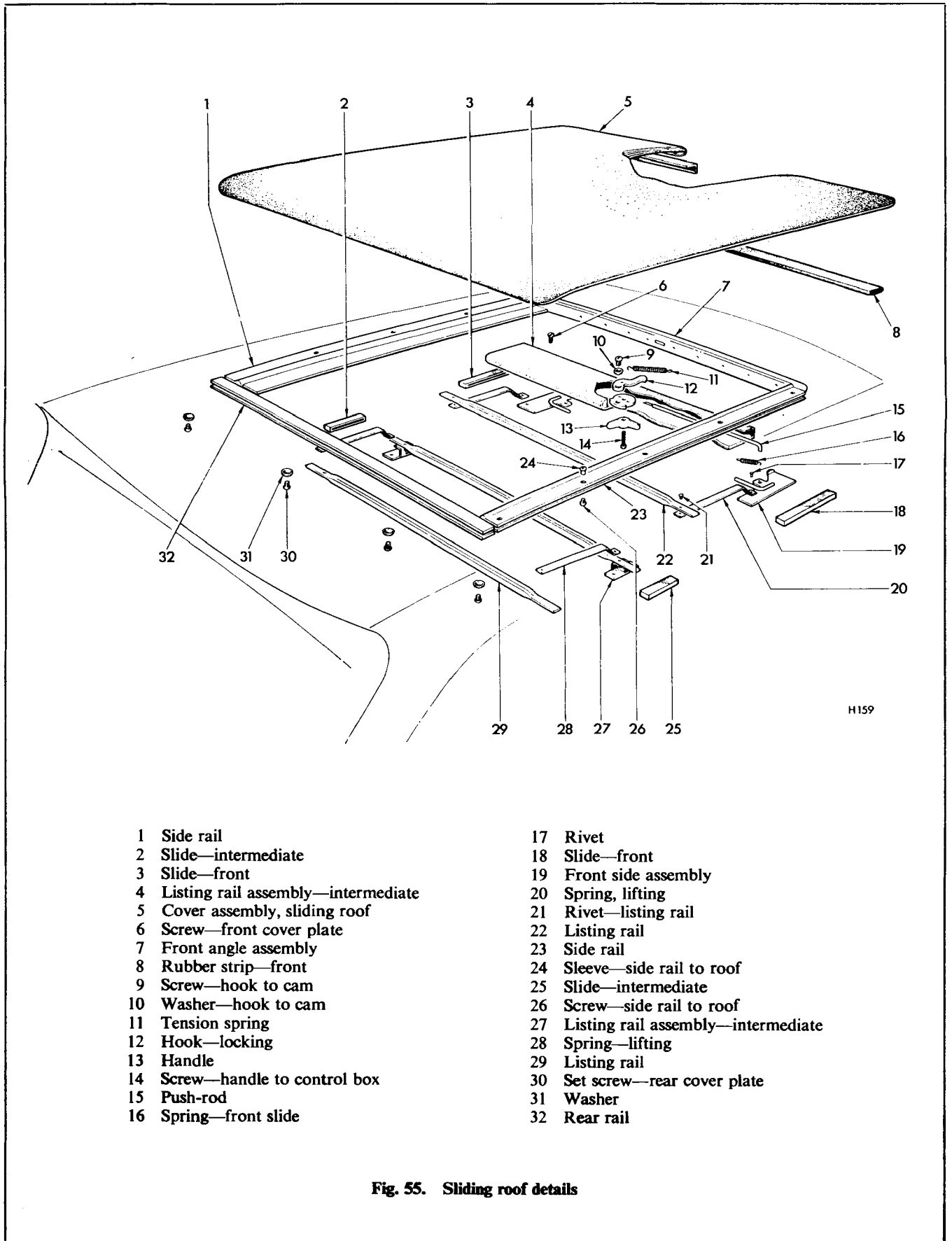


Fig. 54. Sliding roof



- | | |
|--------------------------------------|---------------------------------------|
| 1 Side rail | 17 Rivet |
| 2 Slide—intermediate | 18 Slide—front |
| 3 Slide—front | 19 Front side assembly |
| 4 Listing rail assembly—intermediate | 20 Spring, lifting |
| 5 Cover assembly, sliding roof | 21 Rivet—listing rail |
| 6 Screw—front cover plate | 22 Listing rail |
| 7 Front angle assembly | 23 Side rail |
| 8 Rubber strip—front | 24 Sleeve—side rail to roof |
| 9 Screw—hook to cam | 25 Slide—intermediate |
| 10 Washer—hook to cam | 26 Screw—side rail to roof |
| 11 Tension spring | 27 Listing rail assembly—intermediate |
| 12 Hook—locking | 28 Spring—lifting |
| 13 Handle | 29 Listing rail |
| 14 Screw—handle to control box | 30 Set screw—rear cover plate |
| 15 Push-rod | 31 Washer |
| 16 Spring—front slide | 32 Rear rail |

Fig. 55. Sliding roof details

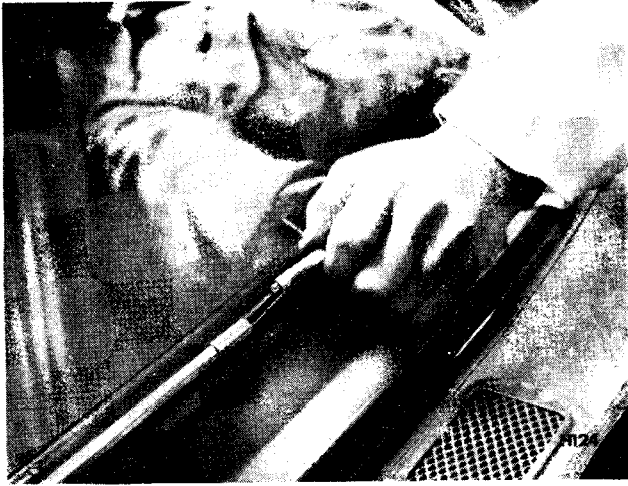


Fig. 56. Removing windscreen mouldings

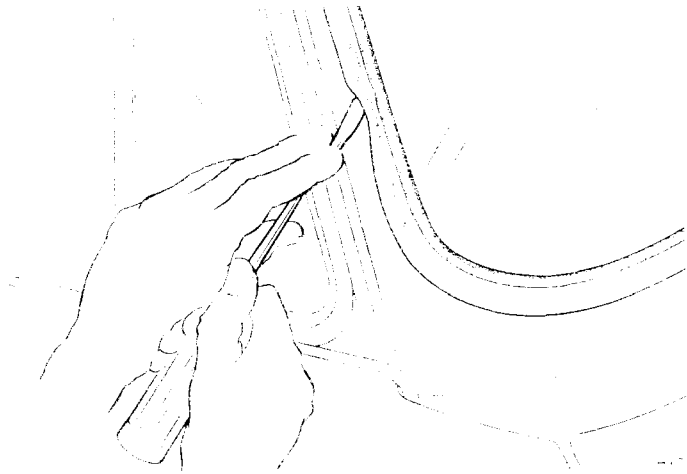


Fig. 57. Breaking weatherstrip seal

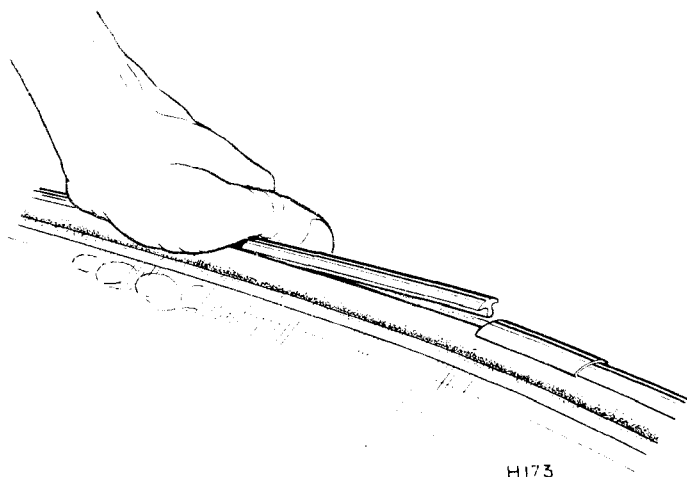


Fig. 58. Fitting windscreen moulding

WINDSCREEN

To Remove

Remove both windscreen wiper arms, sun visors and rear view mirror.

Using a small screwdriver from which all sharp edges have been removed, break the sealing between the rubber weatherstrip and body flange (Fig. 57).

Avoid damage to the surrounding paint work by keeping the tool pressed firmly under the lip of the rubber while breaking the seal. Commencing at one of the lower corners, apply hand pressure from inside the car and force the windscreen outward, whilst a second operator, working outside the car, takes the weight of the glass as it is released.

Release the moulding by sliding the upper and lower cover plates away from the moulding joint and remove both sections from the rubber (Fig. 56).

To Refit (Weatherstrip to glass)

1. Remove all trace of old sealing compound from the glass and weatherstrip.
2. Assemble the weatherstrip to the glass and reseal with Seelastik.
3. Using a small screwdriver, clear all obstructions from the channel in the weatherstrip, into which the moulding is to be fitted.
4. Press both sections of the moulding into place and secure them by sliding the cover plates over the ends of the moulding (Fig. 58).

To Refit (Glass to body)

1. Insert a length of strong cord into the inner channel of the rubber, positioning the loose ends at the lower centre of the glass (Fig. 59).
2. Apply a coating of Seelastik to the outer channel of the weatherstrip and to the outer flange of the aperture.
3. Pass the ends of the cord into the vehicle and with the aid of a second operator maintaining steady pressure on the outside of the glass, pull the ends of the cord to bring the lip of the rubber over the body flange. It may be necessary to strike the outside of the weatherstrip with a rubber-faced hammer to seat the windscreen properly (Fig. 60).
4. Withdraw the cord completely and seal the weatherstrip to the body pressing it firmly into contact. Remove surplus sealing compound using a cloth moistened with petrol or white spirit. Do not allow any excess liquid to seep into the joint and destroy the bond.

BACKLIGHT

To Remove and Refit

Instructions for removing and refitting the backlight are identical to those given for the windscreen except reference to wiper arms, rear-view mirror and sunvisors.

For sealing operations, refer to 'Dust and Water Sealing', page 5-306V.

QUARTER LIGHTS

To Remove

Using a small screwdriver from which all sharp edges have been removed, break the seal between the rubber and body and, starting at the lower corner, force the window outward, whilst a second operator, working outside the car, takes the weight of the glass as it is released. Remove the moulding and weatherstrip.

To Refit

1. Use an adhesive solvent to remove the old sealing compound from the glass weatherstrip and body flanges. Examine the rubber for cracks or other defects and renew if necessary.
2. Plug the gaps between the lower edge of the roof rear pillar and the body, and at a corresponding position at the base of the roof centre pillar.
3. Fit the weatherstrip to the glass, insert the moulding and use Seelastik to seal the rubber to the glass.
4. Insert a length of strong cord into the inner channel around the periphery of the weatherstrip and permit the ends to protrude from the bottom edge of the weatherstrip.
5. Offer the window up to the body and pass the free ends of the cord into the car. Maintain firm pressure on the corner and side of the glass, as a second operator, working inside the car, withdraws the cord to turn the lip of the rubber over the body flange. It may be necessary to gently strike the glass with a rubber mallet or the palm of the hand as near as possible to its edge (Fig. 61).
6. Seal the rubber to the body with Seelastik. Remove surplus sealing compound using a cloth moistened with petrol or white spirit. Do not allow any excess liquid to seep into the joint and destroy the bond.

For sealing operations, refer to 'Dust and Water Sealing', page 5-309V.

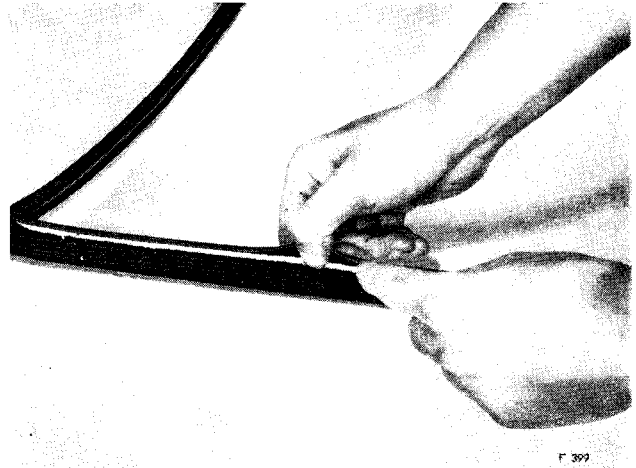


Fig. 59. Inserting cord into weatherstrip channel

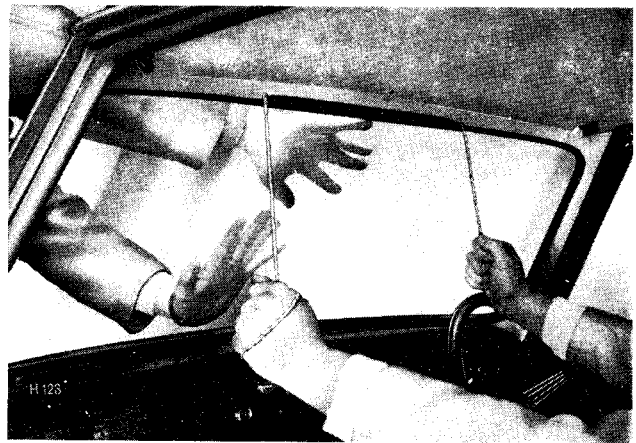


Fig. 60. Fitting windscreen



Fig. 61. Fitting quarter light

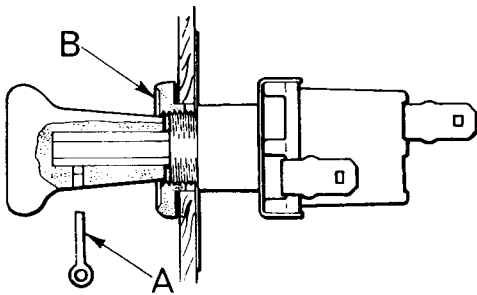


Fig. 62. Lighting switch

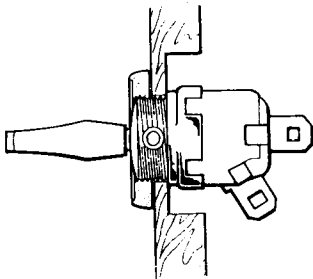


Fig. 63. Heater blower switch

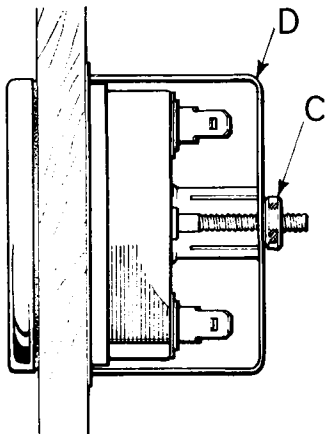


Fig. 64. Fuel/temperature gauge

SWITCHES INSTRUMENTS AND CONTROLS

NOTE: Before disturbing any part of the facia, isolate the battery. When reconnecting any of the Lucar connectors described in the following procedures, refer to Fig. 74.

SWITCHES

Windscreen wiper and lights (Fig. 62)

To Remove

Depress the spring plunger by pushing a suitable pin (A) into the hole and pull off the knob. Unscrew the bezel (B), withdraw the switch from behind the facia and pull off the Lucar connectors.

To Refit

With the spring plunger on the knob spindle lowermost, locate the switch on the facia and secure it by tightening the bezel (B). Push on the knob to engage with the spring and re-attach the Lucar connectors.

Heater blower (Fig. 63)

To Remove

Pull the Lucar connectors from the switch, unscrew the bezel and take out the switch from behind the facia.

To Refit

With the angled connector blade pointing downward, locate the switch on the facia and secure it by tightening the bezel re-attach the Lucar connectors.

INSTRUMENTS

Fuel contents and water temperature (Fig. 64)

To Remove

Pull off the Lucar connectors and illumination bulb holder from the gauge. Remove the knurled nut (C), spring washer, clamp (D) and earth lead. Push out the gauge through the front of the facia, simultaneously removing the reinforcing ring from behind.

To Refit

Ensuring that the rubber ring is undamaged and located adjacent to the rim, mount the gauge on the facia and secure it from behind by fitting the reinforcing ring, clamp (D), earth lead, spring washer and knurled nut. Push the illumination bulb holder into position and reconnect the Lucar connectors.

Speedometer and tachometer (Fig. 65)

To Remove

Disconnect the drive cable and pull out the illumination bulb holders. From the speedometer and voltage stabiliser, disconnect the trip reset cable and disconnect the Lucar connectors. Remove two knurled nuts (E), spring washers, one earth lead from speedometer or two leads from tachometer, and clamps (F). Push the instrument out through the front of the facia, simultaneously removing the reinforcing ring from behind.

To Refit

Ensuring that the rubber ring is undamaged and located adjacent to the rim, mount the instrument on the facia and secure it from behind by fitting the reinforcing ring, clamps, (F), earth lead/s, spring washers and knurled nuts (E). Push the illumination bulb holders into position and reconnect the drive cable. To the speedometer and voltage stabiliser, reconnect the trip reset cable and Lucar connectors.

Flasher warning light

To Remove

Pull the bulb holder from the body, unscrew the body and, if required, push the lens out through the front of the facia.

To Refit

Reverse the removal procedure.

CONTROL CABLES

Heat control and air distribution (Fig. 66)

To Remove

Depress the spring plunger by pushing a suitable pin (A) into the hole and pull off the knob. Unscrew the bezel (G) and withdraw the cable.

To Refit

With the spring plunger lowermost, attach the cable to the facia by screwing on the bezel (G) until flush with the threaded end of the cable. Tighten the locknut (H) and push on the knob to engage with the spring plunger.

Choke pull

To Remove

Disconnect the inner and outer cables from the carburettors and pull the choke knob complete with inner cable from the front of the facia. Unscrew the bezel and withdraw the outer cable.

To Refit

Feed the outer cable through the facia, screw on the bezel until flush with the threaded end of the cable and insert the inner cable. Rotate the outer cable in the facia to correctly position the emblem and tighten the locknut. Reconnect the opposite end of the cables to the carburettors.

Windscreen washer pump (Fig. 67)

To Remove

Unscrew the knob and collar (J) and disconnect the pipes from the rear of the pump. Unscrew the nut (K) and withdraw the pump body (L) to the rear. If necessary unscrew the bezel (M) and remove the nut (N).

To Refit

Secure the distance piece (N) and mount the pump body (L) to the facia (M) using the nut (K). Connect the pipes to the pump body with the correct size hose, clamps and nuts.

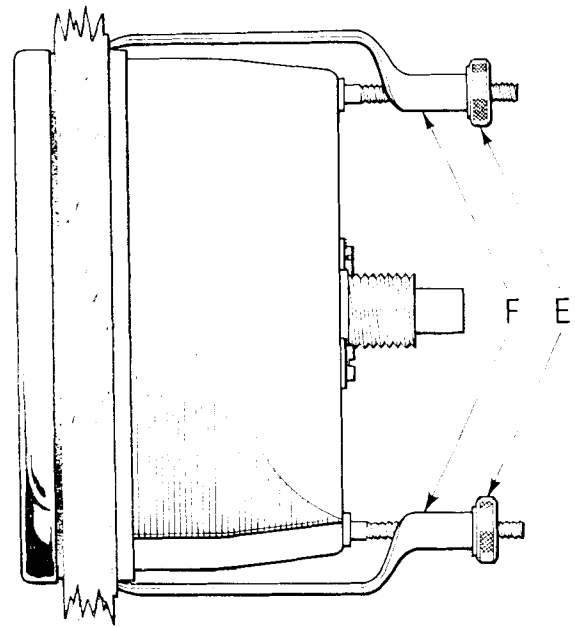


Fig. 65. Tachometer/speedometer

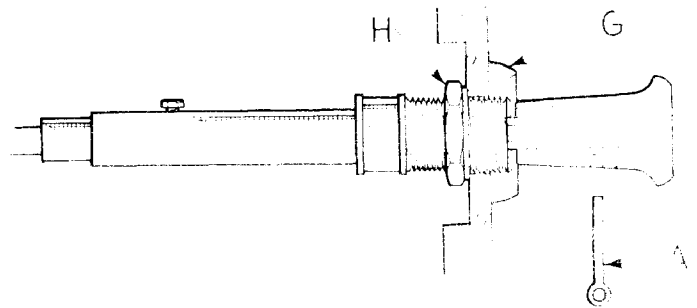


Fig. 66. Control cable

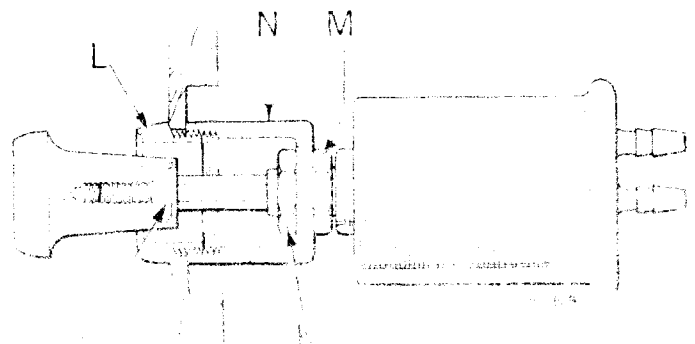
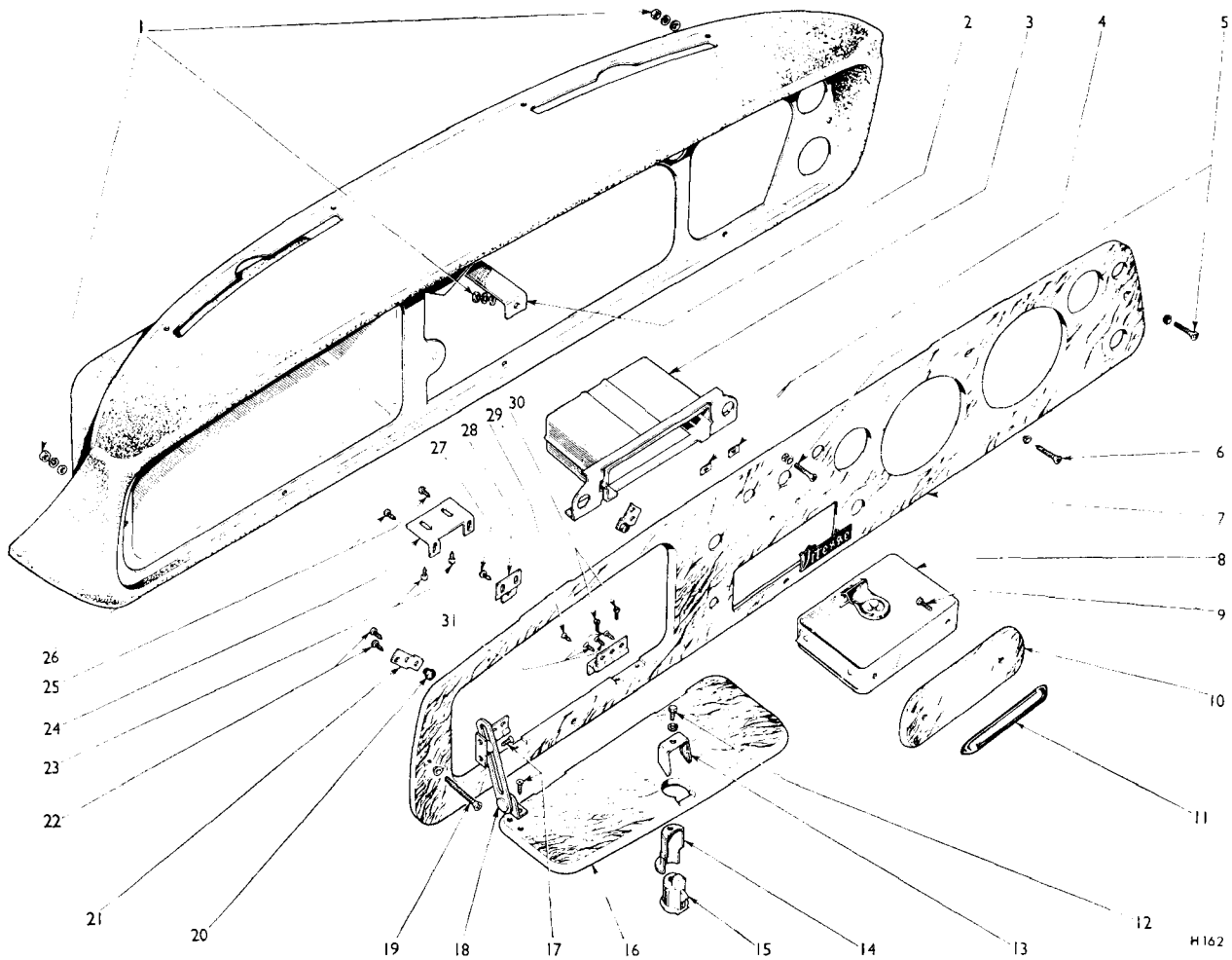
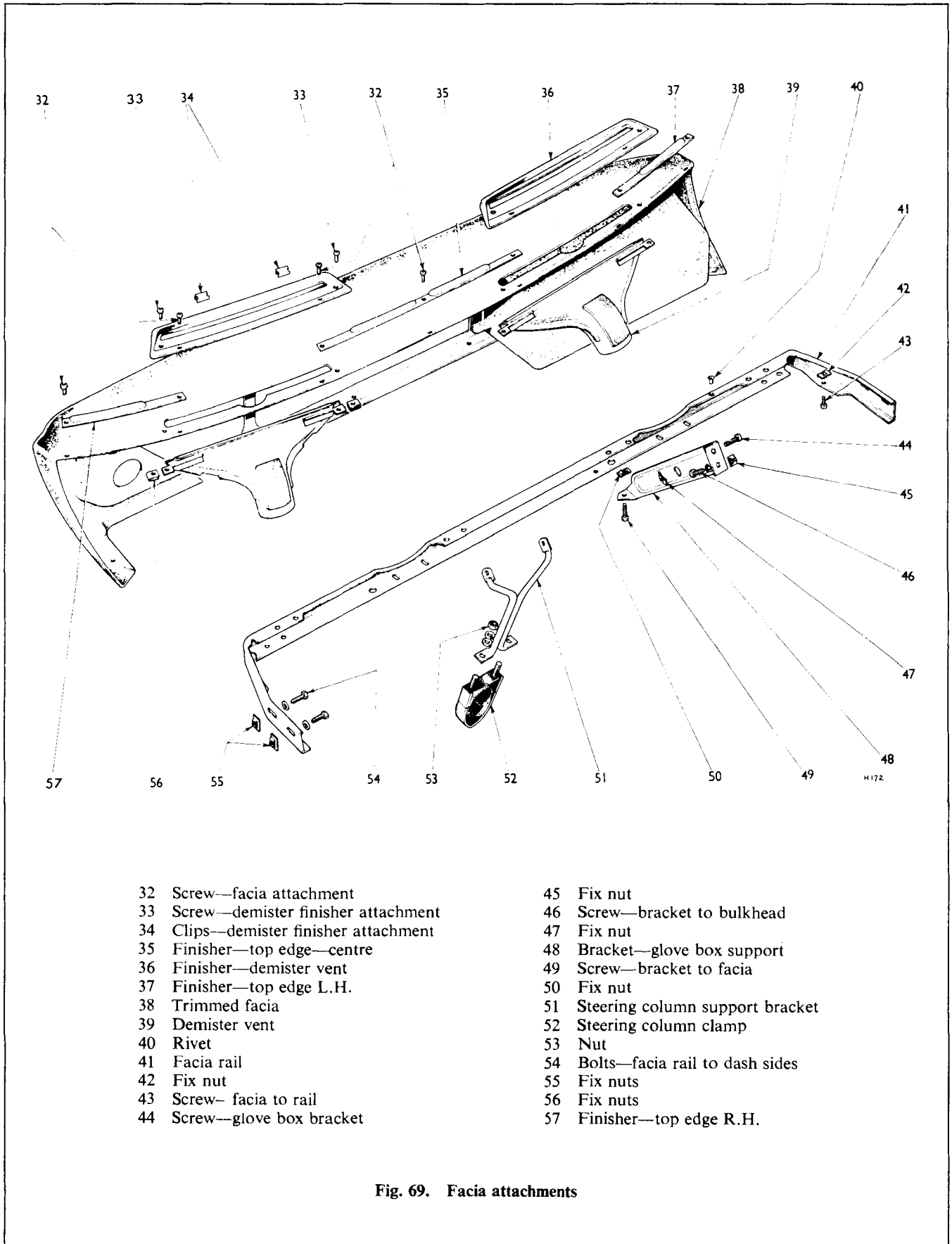


Fig. 67. Windscreen washer pump



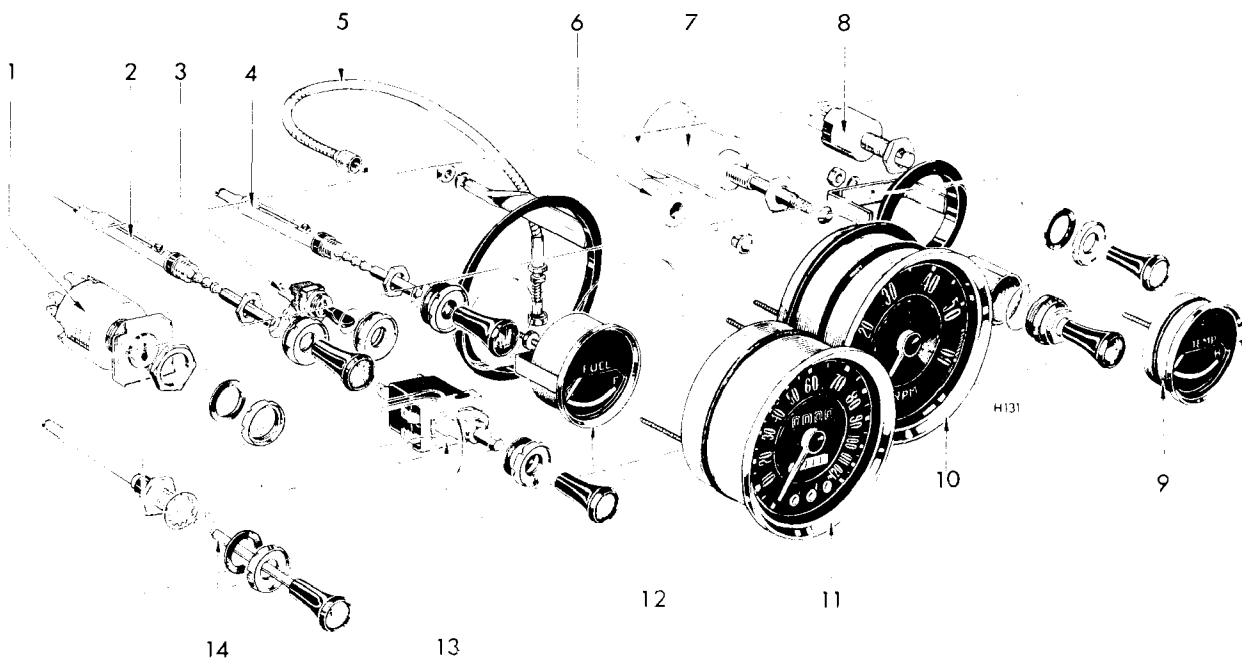
- | | |
|------------------------------|-----------------------------|
| 1 Nut-panel attachment | 17 Screw-link attachment |
| 2 Bracket—centre attachments | 18 Check link |
| 3 Ash tray housing | 19 Screw—facia attachment |
| 4 Clips | 20 Rubber—buffer |
| 5 Screw—panel attachment | 21 Buffer—bracket |
| 6 Screw—panel attachment | 22 Screw—bracket attachment |
| 7 Veneered panel | 23 Screw—tie bracket |
| 8 Ash tray bowl | 24 Tie bracket |
| 9 Screw—capping attachment | 25 Screw—tie bracket |
| 10 Ash tray capping | 26 Trimmed facia |
| 11 Pull handle | 27 Screw—striker bracket |
| 12 Screw lock clamp | 28 Striker bracket |
| 13 Lock clamp | 29 Screw—hinge to lid |
| 14 Finger pull | 30 Screw—hinge to panel |
| 15 Glove box lock | 31 Screw—hinge to lid |
| 16 Glove box lid | |

Fig. 68. Facia panel details



- | | | | |
|----|------------------------------------|----|---------------------------------|
| 32 | Screw—facia attachment | 45 | Fix nut |
| 33 | Screw—demister finisher attachment | 46 | Screw—bracket to bulkhead |
| 34 | Clips—demister finisher attachment | 47 | Fix nut |
| 35 | Finisher—top edge—centre | 48 | Bracket—glove box support |
| 36 | Finisher—demister vent | 49 | Screw—bracket to facia |
| 37 | Finisher—top edge L.H. | 50 | Fix nut |
| 38 | Trimmed facia | 51 | Steering column support bracket |
| 39 | Demister vent | 52 | Steering column clamp |
| 40 | Rivet | 53 | Nut |
| 41 | Facia rail | 54 | Bolts—facia rail to dash sides |
| 42 | Fix nut | 55 | Fix nuts |
| 43 | Screw— facia to rail | 56 | Fix nuts |
| 44 | Screw—glove box bracket | 57 | Finisher—top edge R.H. |

Fig. 69. Facia attachments



- 1 Ignition/Starter switch
- 2 Heater control cable
- 3 Heater blower switch
- 4 Air distribution control cable
- 5 Odometer trip release cable
- 6 Flasher warning light body
- 7 Windscreen washer pump
- 8 Windscreen wiper switch
- 9 Temperature gauge
- 10 Tachometer
- 11 Speedometer
- 12 Fuel gauge
- 13 Lighting switch
- 14 Choke cable

Fig. 70. Switches, instruments and controls

FACIA ASSEMBLY

To Remove (Fig. 69)

Isolate the battery. Release the clips securing the wiring harness to the bulkhead panel and disconnect the harness leads from the stop lamp switch, wiper motor and steering column switches.

Release:—

- choke cable from the rear carburettor;
- heater control cable from the water control valve;
- air distribution cable from the air distribution flap

Disconnect the pipes from the windscreen washer pump.

Unscrew the drive cables from the speedometer and tachometer and remove the air hoses from the demister vents (39). Release the steering column support clamps from the facia rail (41) and bulkhead. Disconnect the steering coupling and withdraw the column assembly into the car.

Take out

- screws (46) securing the glove box bracket (48) to the bulkhead (Fig. 71);
- screws (32) securing facia top edge and trimsters to the windscreen (lower) (Fig. 71)

—screws (36) securing the steering column assembly to the bulkhead (Fig. 71)

Carefully withdraw the facia assembly and disconnect the wiring harness from the switches, instruments and facia lamp.

To Refit

Reverse the removal procedure, referring to Fig. 74 when connecting harness leads. Road test the vehicle and check the operation of all instruments and controls.

FACIA RAIL

To Remove (Figs. 68 and 69)

Remove the facia assembly from the vehicle. Open the glove box lid and drill out the pop-riquet (40). Take out the screw (49) and slacken the three lower screws (6) securing the veneered panel to the facia pressing. Remove the screws (43) and (49) and withdraw the facia rail (41) and bracket (48).

To Refit

Reverse the removal procedure.

VENEERED PANEL

To Remove

Remove the facia assembly from the vehicle. Pull out the ashtray, depress the spring and withdraw the ashtray assembly from the facia. Take out the screws (9) and separate the ashtray bowl (8), capping (10) and pull handle (11).

Remove the instruments, switches, controls and ashtray housing (3) from the facia panel.

Take out screws (5), (6), (19) and (23), and remove the veneered panel assembly.

Pull off the clips (4) and remove the badge.

Take out the screws (22), (27) and (25) and remove the buffer brackets (21), striker plate (28) and tie bracket (24).

Take out the screw (12) and remove the lock assembly (15), clamp (13) and finger pull (14).

Take out the screws (17), (29), (30) and (31) and remove the check link assembly (18) and hinges (7).

To Refit

Reverse the removal procedure.

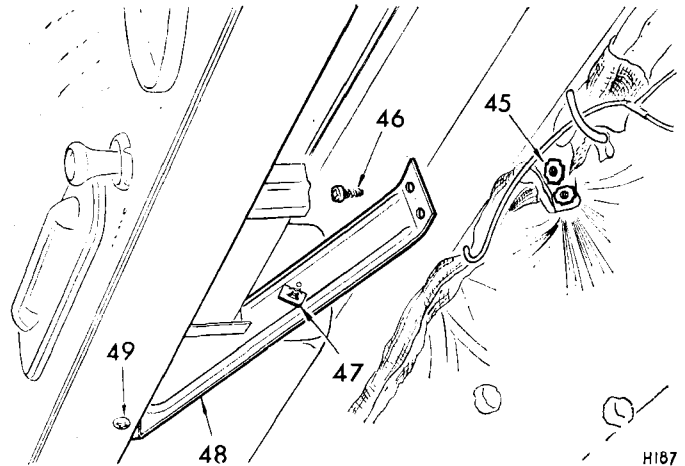


Fig. 71. Glove box bracket attachment

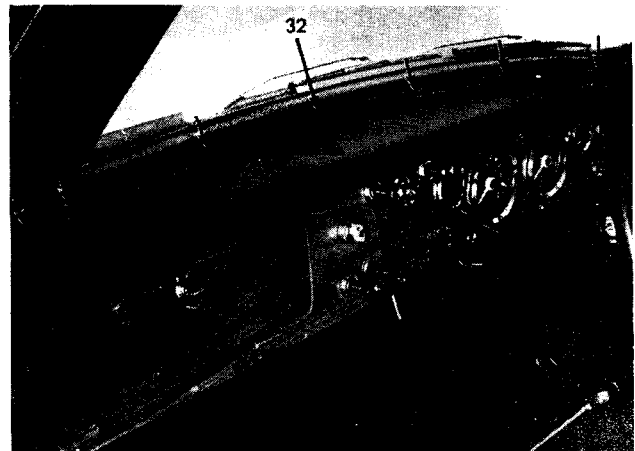


Fig. 72. Facia top edge attachment

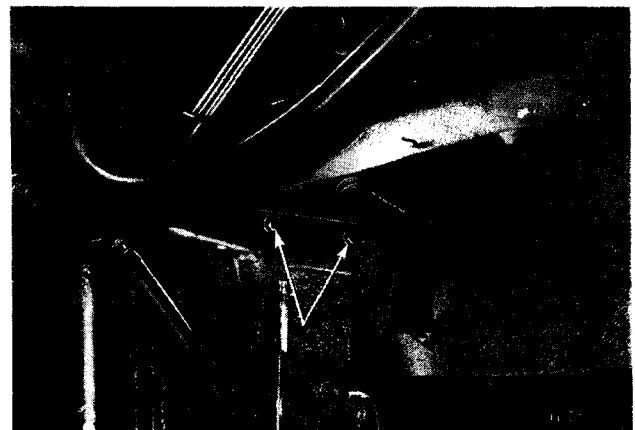


Fig. 73. Facia rail to dash sides

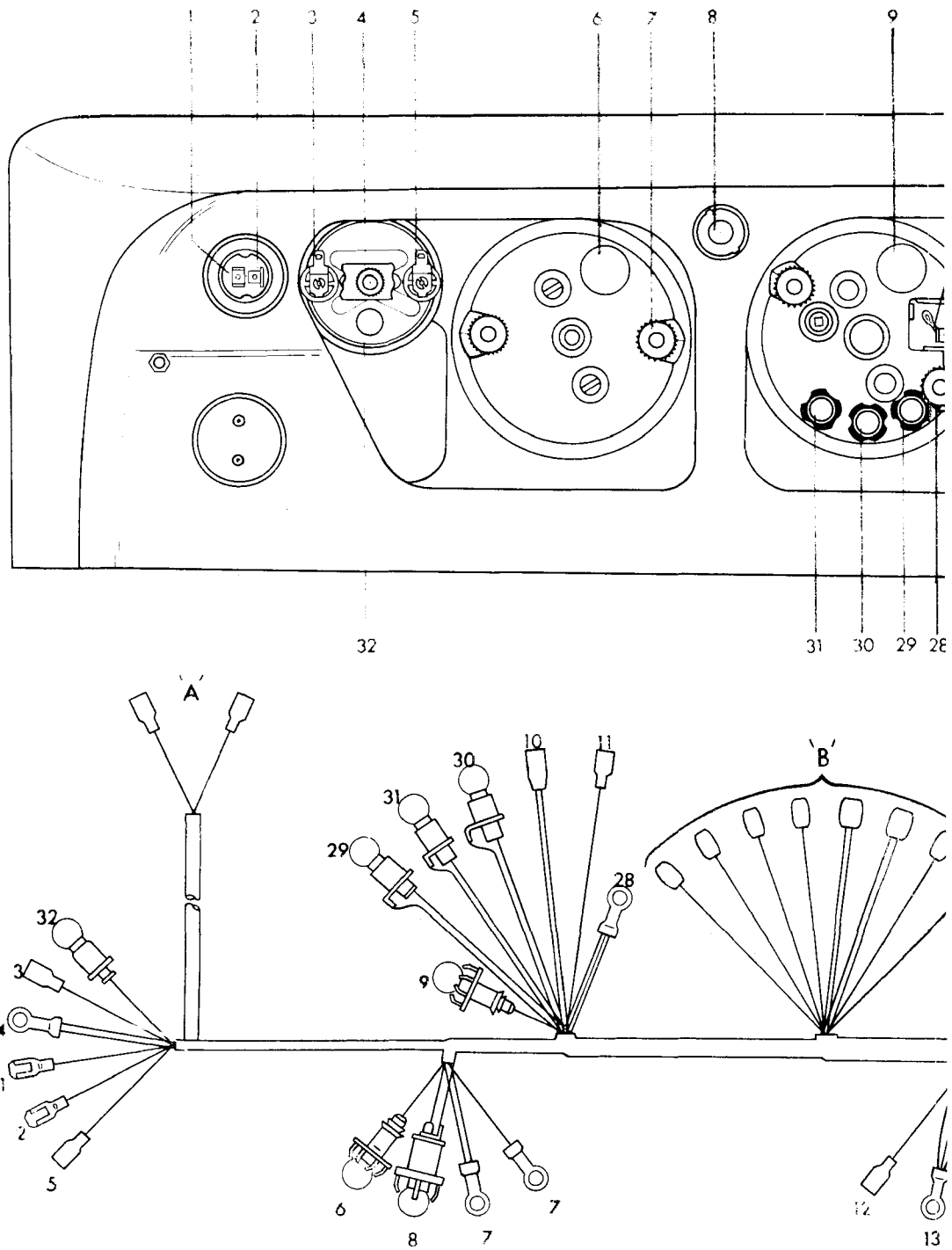
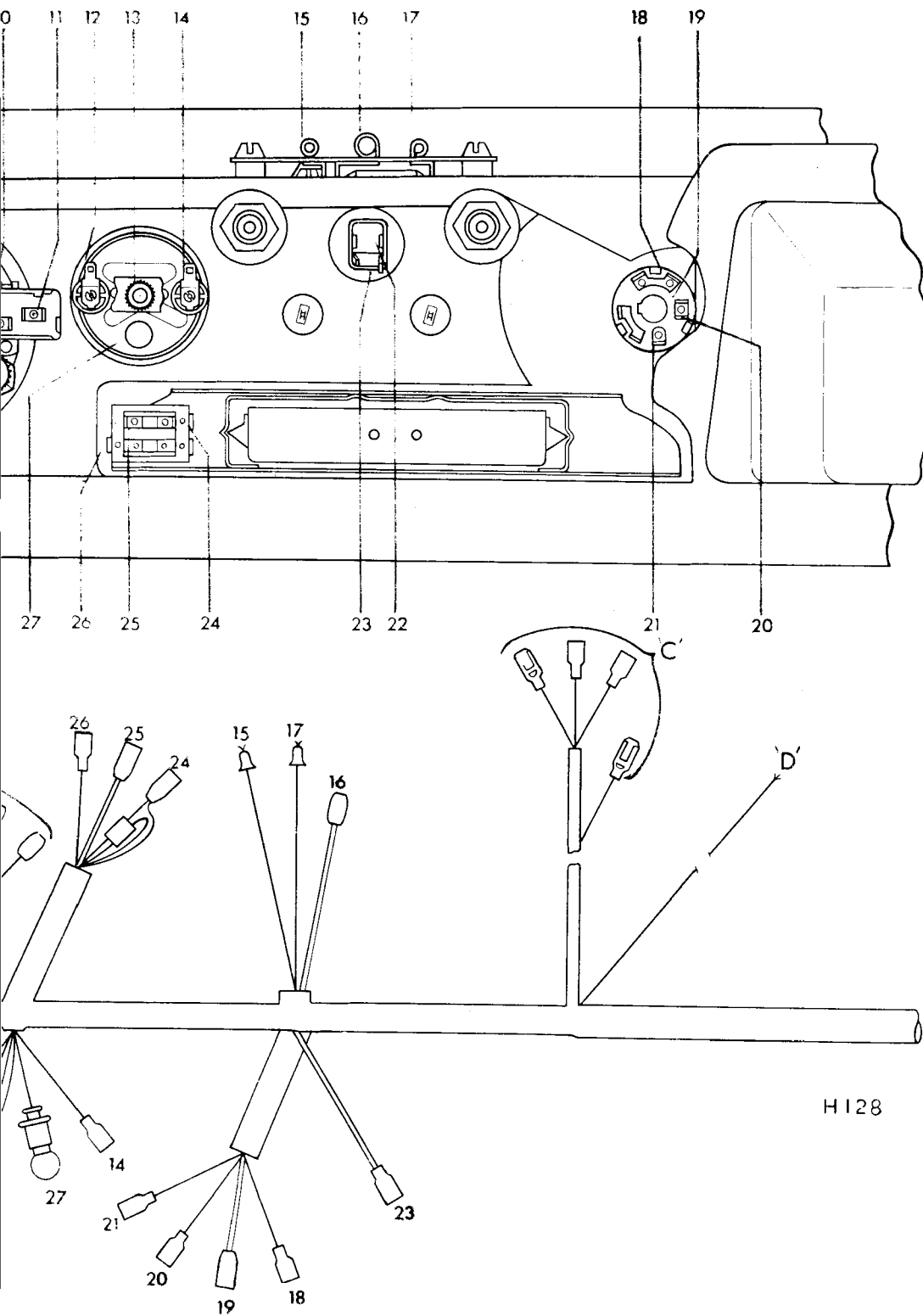


Fig. 74. Facia h:

ODY

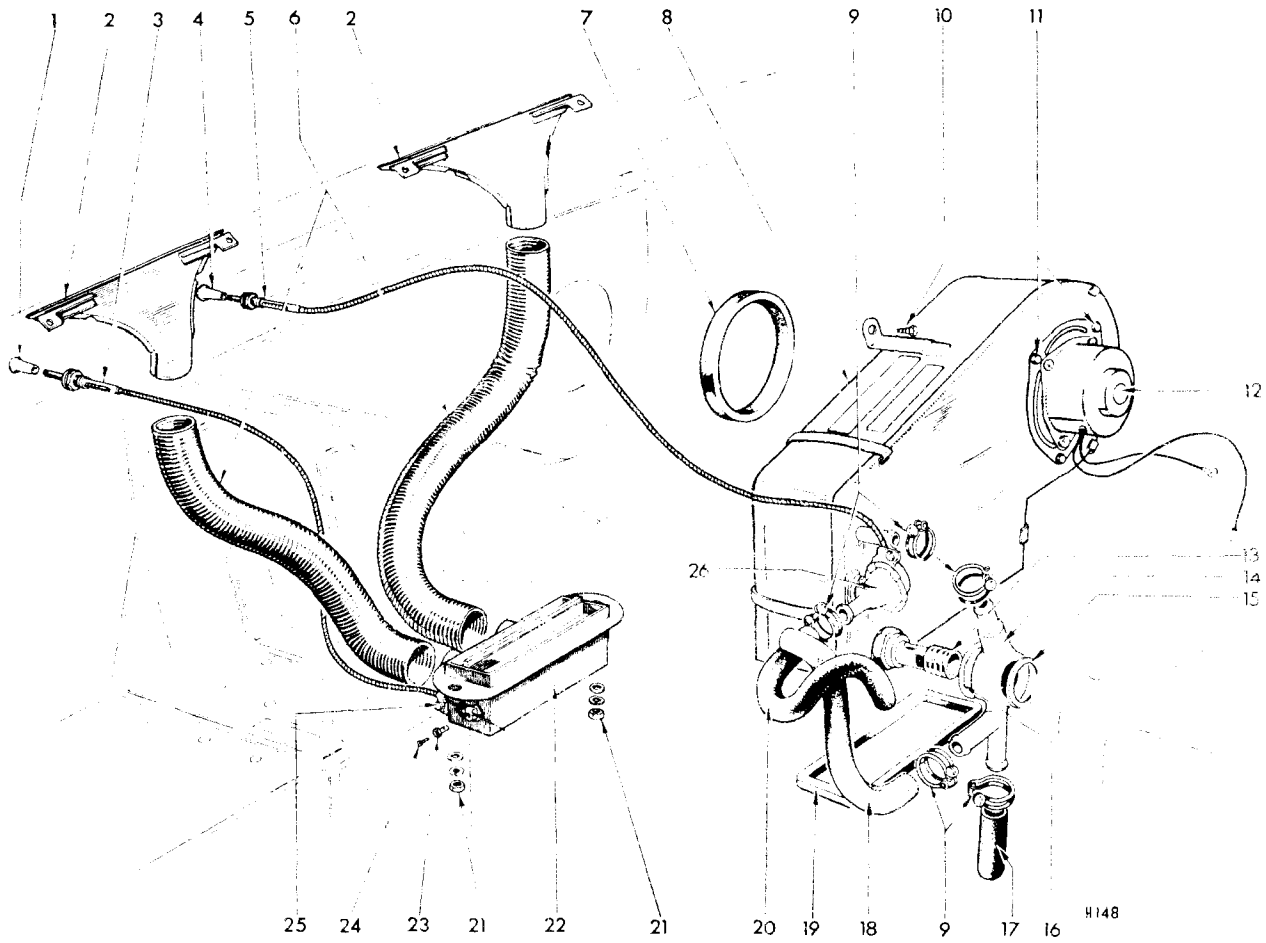


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Wiring connections

Key to Fig. 74

Ref.	Colour	Terminal End	Connected to:
1.	Black/Green	17½ amp. 'Lucar'	Wiper switch—from motor.
2.	Black	17½ amp. 'Lucar'	Wiper switch—earth.
3.	Green/Blue	17½ amp. 'Lucar' and cover	Temperature indicator—from transmitter.
4.	Black (2)	Eyelet	Temperature indicator—earth
5.	Lt. Green/Green	17½ amp. 'Lucar' and cover	Temperature indicator—from voltage stabilizer.
6.	Red/White	'Snap in' bulbholder	Tachometer—instrument illumination.
7.	{ Black (2)	Eyelet	Tachometer clamp—earth.
	{ Black	Eyelet	
8.	Lt. Green/Purple, Black	'Snap in' bulbholder	Flasher warning light.
9.	Red/White	'Snap in' bulbholder	Speedometer—instrument illumination.
10.	Lt. Green/Green (2)	Double 17½ amp. 'Lucar' and cover	Voltage stabilizer 'I'—output.
11.	Green	17½ amp. 'Lucar' and cover	Voltage stabilizer 'B'—input.
12.	Green/Black	17½ amp. 'Lucar' and cover	Fuel indicator—from tank unit.
13.	Black (3)	Eyelet	Fuel indicator—earth.
14.	Lt. Green/Green	17½ amp. 'Lucar' and cover	Fuel indicator—from voltage stabilizer.
15.	Black	Bullet connector	Facia lamp switch—earth.
16.	Purple/White (2)	Double snap connector	(Saloon). Not connected.
17.	Purple	Bullet connector	(Convertible). facia lamp—from door switches.
18.	Brown	17½ amp. 'Lucar' and cover	Facia lamp—supply.
19.	White (2)	Double 17½ amp. 'Lucar' and cover	Ign./Starter switch: terminal 1—supply.
20.	White	17½ amp. 'Lucar' and cover	Ign./Starter switch: terminal 2—supply to ignition and oil pressure warning lights.
21.	White/Red	17½ amp. 'Lucar' and cover	Ign./Starter switch: terminal 2—supply to fuse box.
22.	Black	17½ amp. 'Lucar'	Ign./Starter switch: terminal 3—supply to starter solenoid.
23.	Green (2)	Double 17½ amp. 'Lucar' and cover	Heater switch— from motor.
24.	Red/White (2)	Double 17½ amp. 'Lucar' and cover	Heater switch—supply.
25.	Brown/Red (2)	Double 17½ amp. 'Lucar' and cover	Lighting switch: terminal 8. Instrument illumination only.
26.	Brown	17½ amp. 'Lucar' and cover	Lighting switch: terminal 4—to column switch and parking lamps.
27.	Red/White	'Push in' bulbholder	Lighting switch terminal 1—supply.
28.	Black (3)	Eyelet	Fuel indicator—instrument illumination.
29.	Blue/White, Black	'Push in' bulbholder	Speedometer—earth.
30.	White, White/Brown	'Push in' bulbholder	Main beam warning light.
31.	White, Brown/Yellow	'Push in' bulbholder	Oil pressure warning light.
32.	Red/White	'Push in' bulbholder	Ignition warning light.
A.	{ Green/Purple	17½ amp. 'Lucar' and cover	} Stop lamp switch.
	{ Green	17½ amp. 'Lucar' and cover	
B.	{ Green/White	Snap connector	} Flasher switch
	{ Green/Red	Snap connector	
	{ Lt. Green/Brown	Snap connector	} Horn push.
	{ Purple/Black (2)	Double snap connector	
	{ Blue/White (2)	Double snap connector	} Column light switch
	{ Blue/Red	Snap connector	
	{ Brown/Red	Snap connector	
	{ Purple	Snap connector	
E.	{ Black	17½ amp. 'Lucar'	Wiper motor bracket
	{ Black	17½ amp. 'Lucar'	Wiper motor frame
	{ Black/Green	17½ amp. 'Lucar' and cover	Wiper motor terminal 1.
	{ Green	17½ amp. 'Lucar' and cover	Wiper motor terminal 2.
D.	Purple/White		Door switch



- | | | | |
|----|--------------------------------|----|-------------------------------|
| 1 | Control knob | 16 | Washer |
| 2 | Demister duct | 17 | Bottom hose |
| 3 | Air distribution control cable | 18 | Adaptor/heater unit hose |
| 4 | Control knob | 19 | Seal |
| 5 | Temperature control cable | 20 | Adaptor/water valve hose |
| 6 | Demister hoses | 21 | Nuts |
| 7 | Sealing rubber | 22 | Air distribution box |
| 8 | Heater unit | 23 | Trunnion |
| 9 | Hose clips | 24 | Securing bolt |
| 10 | Spire screw | 25 | Securing bracket |
| 11 | Blower motor attachment screws | 26 | Water valve |
| 12 | Heater blower | 27 | Spire screws |
| 13 | Banjo bolt | 28 | Demister vent finisher |
| 14 | Adaptor | 29 | Air distribution control flap |
| 15 | Washer | | |

Fig. 75. Heating system details

HEATER AND VENTILATING SYSTEM

Heater Unit Removal (Figs. 75 and 76)

Drain the cooling system and isolate the battery. Release the temperature control cable (5) from the water control valve (26) and remove the hoses (17), (18) and (20). Disconnect the blower motor leads. Release the choke from the rear carburettor.

Working inside the vehicle unscrew the nuts (21), remove the washers and lift the heater unit from the bulkhead.

To Refit

Apply a liberal coating of 'Seelastik S.R.51' to the contact faces of the rubbers (7) and (19) and bulkhead panel. Locate the heater unit studs through the holes in the bulkhead and air distribution box. Secure the top centre bracket with one screw (10) and working inside the car tighten the two nuts and washers (21) to retain the heater unit assembly.

Viewed from the right-hand side of the vehicle adjust the control as follows:

Push the temperature control knob (4) fully in, feed the inner cable through the trunnion and secure the outer cable by tightening the clip (26). With the operating arm of the water control valve turned fully clockwise, tighten the trunnion.

Reconnect the battery, blower motor, water hoses and refill the cooling system. Align and clip the trim panel into position. Start the engine and check for leaks.

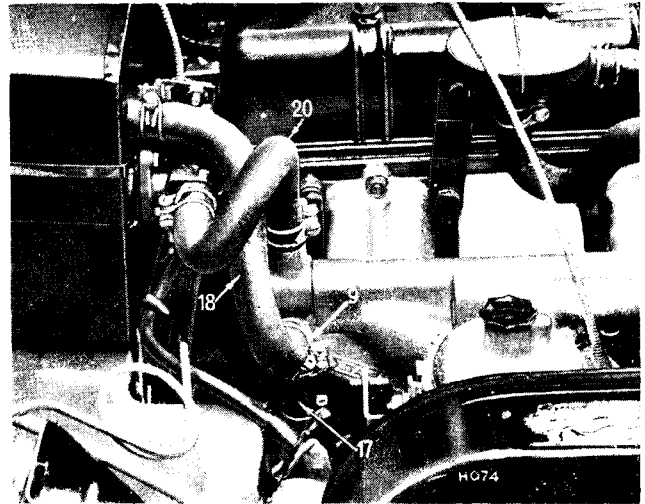


Fig. 76. Water hoses

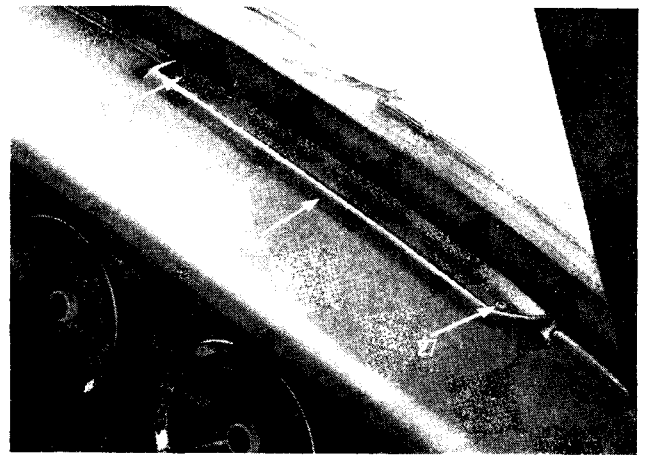
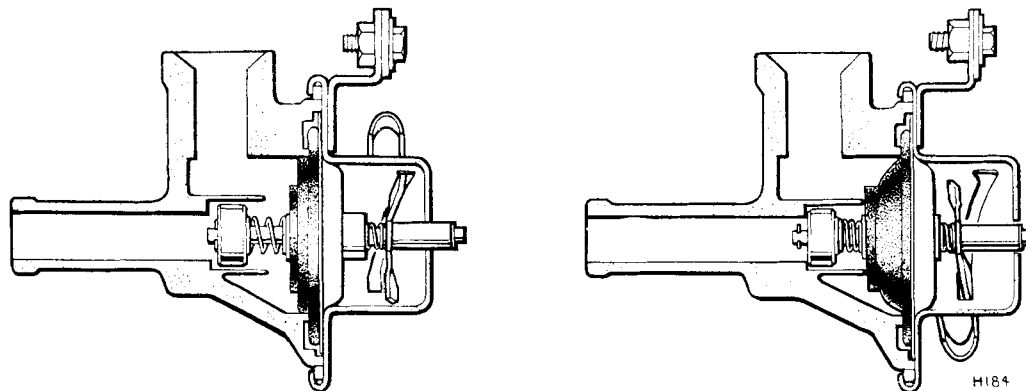


Fig. 77. Demister vent attachment



Open condition

Closed condition

Fig. 78. Water control valve operation

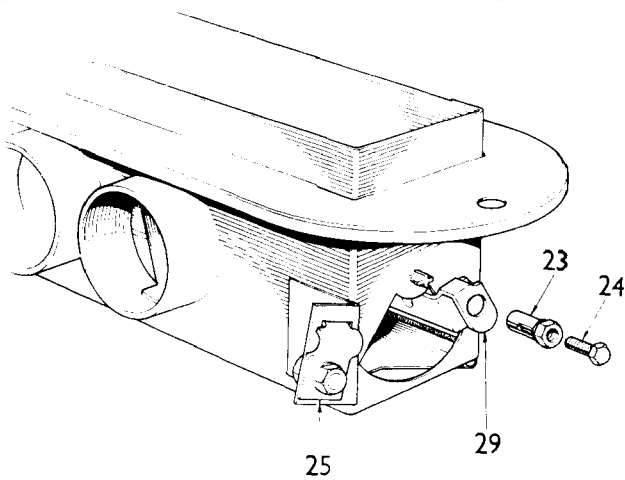


Fig. 79. Air distribution control flap

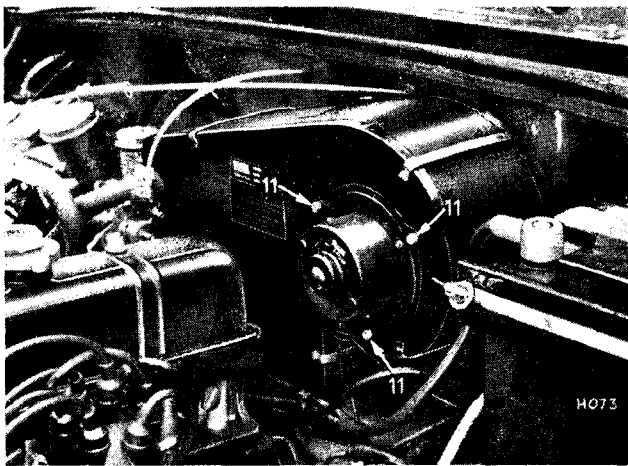


Fig. 80. Blower motor attachment

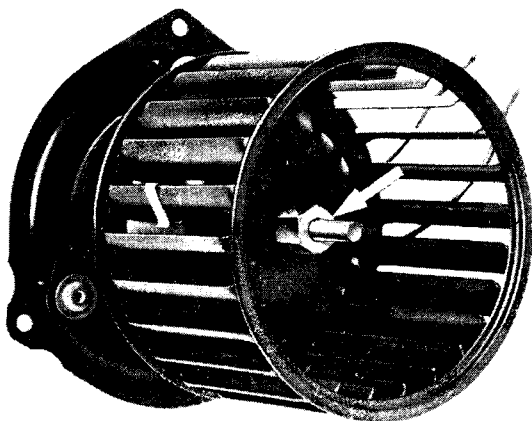


Fig. 81. Fan attachment

Air distribution box and demisting system (Figs. 77 and 79)

Removal

Unclip the dash millboard (Item 25, Page 5-245V).

Pull the demister hoses (6) from the air distribution box (22) and the demister ducts (2). Disconnect the control cable (3) from the air distribution box, remove two nuts (21) and washers and take off the box.

To remove either demister duct from the fascia assembly remove the two spire screws (27) from the extremities of the heater vent finisher (28) and manoeuvre the duct from the fascia.

To Refit

Push the control knob (1) fully in. As before ensure that the inner and outer cables run through their attachment points. Turn the air distribution flap (20) fully anticlockwise and tighten securing bracket (25) and trunnion (23).

Position the demister duct underneath the fascia assembly, align the holes with those in the extremities of the heater vent finisher and secure with two screws.

Water control valve (Figs. 75 and 78)

Removal

Disconnect the hose (20) and the temperature control cable (5) from the valve (26) and remove the two nuts and serrated washers retaining the water control valve. Remove the valve from the studs ensuring that the sealing rubber ring is not misplaced.

The operation of the water control valve is shown in Fig. 78.

To Refit

Reverse the above procedure, referring to the refitment of the heater unit when refitting the control cable.

NOTE: The water control valve is serviced only by replacement.

Heater Blower Motor (Figs. 80 and 81)

Removal

Isolate the battery and disconnect the heater blower. Remove three retaining screws and washers (11) and take out the blower motor assembly (12).

Loosen the brass nut in the centre of the impellor and withdraw the impellor from the blow motor shaft.

NOTE: The blower motor assembly is serviced only by replacement.

To Refit

Reverse the above procedure.

WINDSCREEN WASHER SYSTEM

The screen washer is manually operated from a knob and plunger fitted to the fascia panel, refer to page 5-213.

To Remove (Fig. 82)

Isolate the battery.

Remove the water container cap, located on the R.H. side of the car under the bonnet adjacent to the wiper motor, and lift the water container (8) clear of its retaining clip (7).

Pull the feed tube from the water container to the pump (9) through the aperture in the dash panel into the engine compartment.

Remove the knob and plunger as described on page 5-231V.

Release the dash millboard trim panel and pull the water delivery tubing (5), (6) and (10) away from the jet nozzles and the plunger.

Remove the nut (4) and washer (3) from the jet assembly under the windscreen surround panel.

Withdraw the jet assembly together with the fibre washer (2) from the top side of the windscreen surround panel.

To Refit—Reverse the removal procedure.

WINDSCREEN WIPER WHEELBOXES

To Remove—Wheelboxes (Fig. 84)

Remove the wiper arms and locknuts.

Remove four screws arrowed, accessible from behind the fascia panel and release the wheelbox outer casings from the wheelbox main body.

Manoeuvre the wheelbox main body from behind the fascia panel.

To Refit—Reverse the removal procedure, refer to "Dust and Water Sealing," page 5-301V.

To Remove—Wheelbox Drive Cable

Remove the wiper arms from the spindles.

Referring to page 6-126V, remove the connecting rod, from the wiper motor and pull the drive cable clear of the dash panel.

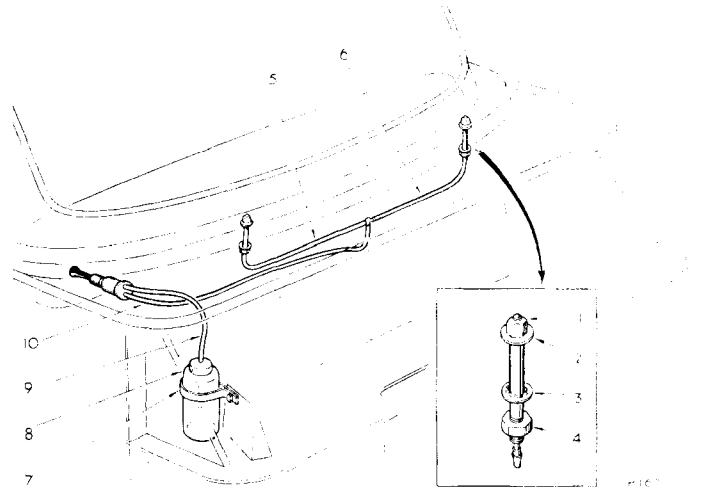
To Refit—Feed the drive cable through the wheelbox tubing.

Attach a suitable spring scale to hole in cross-head.

Maximum permissible force to move cable rack in tubing is 6.0 lb.

Install the connecting rod to the wiper motor page 6-127V.

Refit the wiper arms to the spindles.



- 1 Jet
- 2 Fibre washer
- 3 Washer
- 4 Nut
- 5 Delivery-tubing
- 6 Delivery-tubing
- 7 Retaining clip-container
- 8 Cap-water container
- 9 Fuel tubing
- 10 Delivery-tubing

Fig. 82. Windscreen washer system

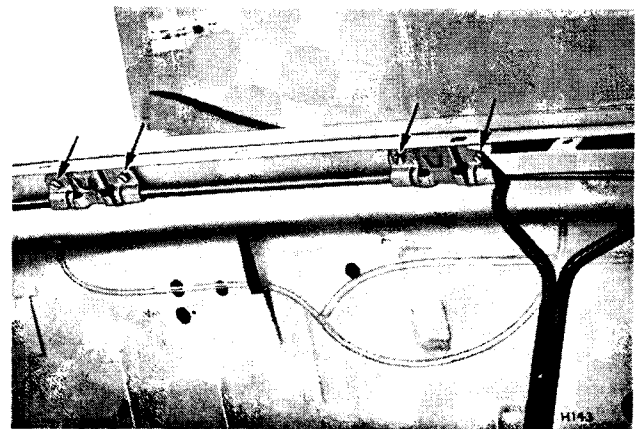
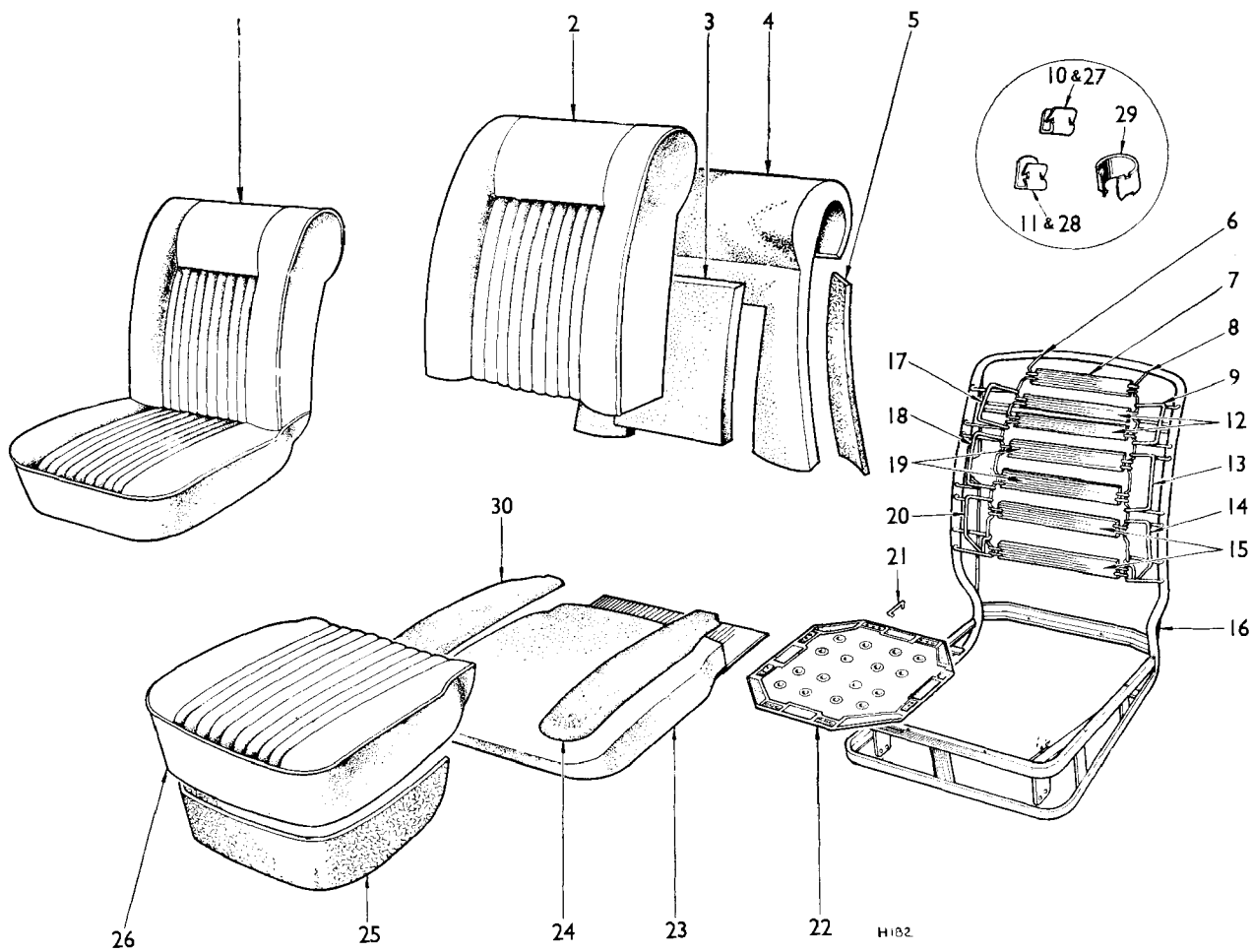


Fig. 83. Wiper wheelbox attachment

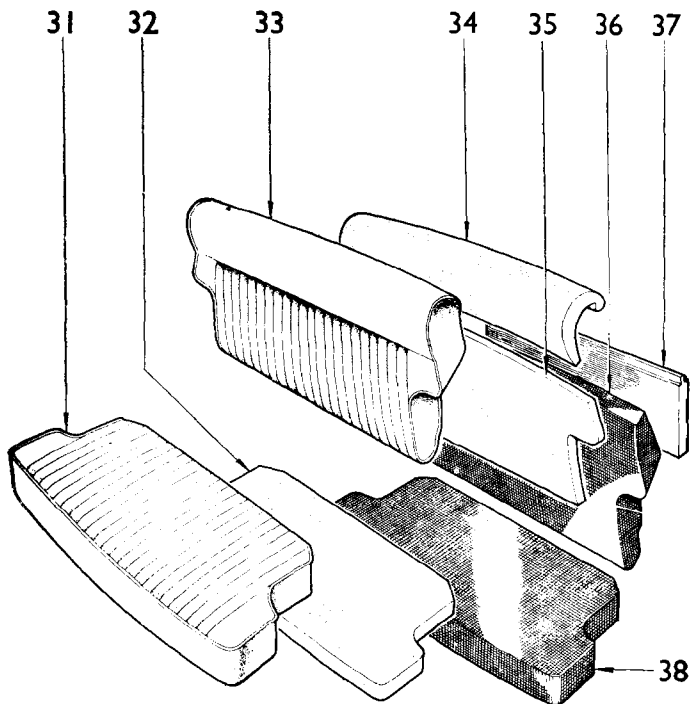
BODY



- | | | | |
|----|---------------------------------|----|--------------------------|
| 1 | Front seat complete assembly | 16 | Frame assembly |
| 2 | Squab cover assembly | 17 | Upper wire outer—squab |
| 3 | Centre pad—squab | 18 | Centre wire outer—squab |
| 4 | Surround pad—squab | 19 | Rubber strap large—squab |
| 5 | Hair pad—squab | 20 | Lower wire outer—squab |
| 6 | Inner wire—squab (Right/hand) | 21 | Clip—seat diaphragm |
| 7 | Rubber strap small—squab | 22 | Seat diaphragm |
| 8 | Inner wire—squab (Left/hand) | 23 | Seat cushion pad |
| 9 | Upper wire—outer squab | 24 | Cushion—side roll |
| 10 | Trim clip | 25 | Cushion border pad |
| 11 | Trim clip | 26 | Seat cushion—cover |
| 12 | Rubber strap intermediate—squab | 27 | Trim clip |
| 13 | Centre wire outer—squab | 28 | Trim clip |
| 14 | Lower wire outer—squab | 29 | Tube clip |
| 15 | Rubber strap large—squab | 30 | Cushion—side roll |

Fig. 84. Front seat details

BODY



- 31 Cushion—cover assembly
- 32 Cushion pad
- 33 Squab—cover assembly
- 34 Top roll—foam pad
- 35 Foam pad—rear squab
- 36 Spring case—squab
- 37 Pad—rear seat squab
- 38 Spring case—cushion
- 39 Trim channel
- 40 Trim angle
- 41 Hair pad
- 42 Squab board
- 43 Spring case—cushion
- 44 Pad—rear seat cushion
- 45 Cushion cover assembly
- 46 Squab cover assembly
- 47 Staple
- 48 Trim angle

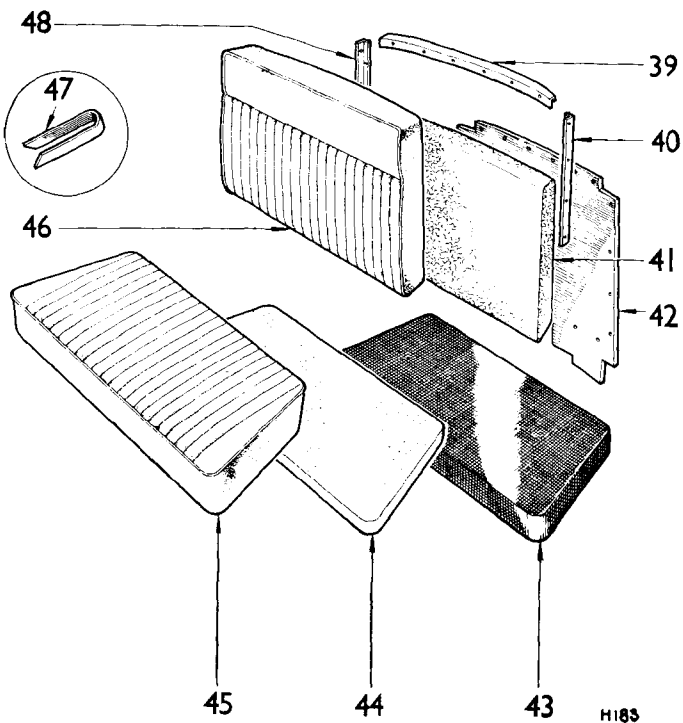


Fig. 85. Rear seat details

SEATS

Front Seats—Saloon and Convertible (Fig. 86)

To Remove

Move the seat fully forward and remove one bolt from the rear of each channel (2). Push the seat fully rearwards and remove one bolt from the front of each channel. Lift the seat clear, complete with seat slide channel.

To Refit

Reverse the removal procedure.

Fore and aft—Adjustment

The drivers and passengers seats are adjustable for leg reach by pulling forward the lever at the front of each seat and sliding the seat to the desired position. Some additional seat movement may be necessary to ensure positive location of the nearest adjustment notch.

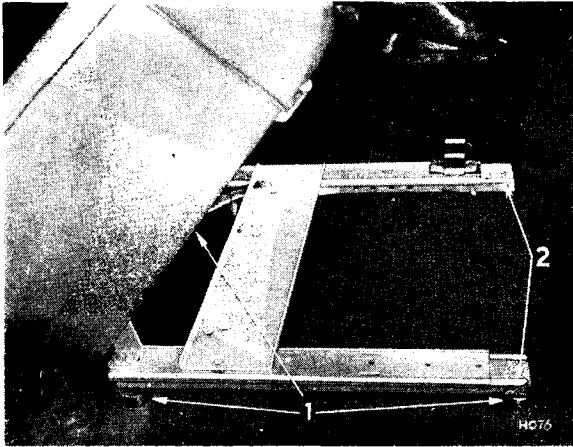


Fig. 86. Front seat attachment and packings

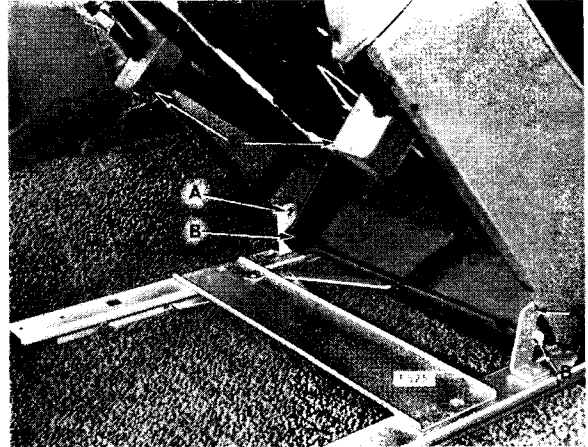


Fig. 87. Front seat adjustment

Height Adjustment (Fig. 87)

By attaching the seat frame to either of the two locations 'A' or 'B', at the front of the seat runners, alternative seat height positions are possible.

Back Rest—Adjustment (Fig. 87)

The drivers seat is adjusted for rake by turning the rubber blocks 'C' to the most suitable of the four numbered positions.

Seat Packing (Fig. 86)

Seat packings are fitted under the front mounting bolts and to the rear outer mounting bolts on both seats.

Rear Seats—Saloon (Fig. 88)

To Remove

Lift out the seat cushion.

Remove two bolts, washers and nuts (1), accessible from the luggage compartment.

Lift the squab clear of the two retainers on the rear bulkhead and remove the squab from the car.

To Refit

Reverse the removal procedure.

Rear Seats—Convertible (Fig. 89)

To Remove

Lift out the seat cushion.

Drill out six pop rivets (1) with No. 30 (3.30 m/m) drill. Remove four acme hex/headed screws, two each side (2).

Lift the squab clear and remove the squab from the car.

To Refit

Reverse the removal procedure.

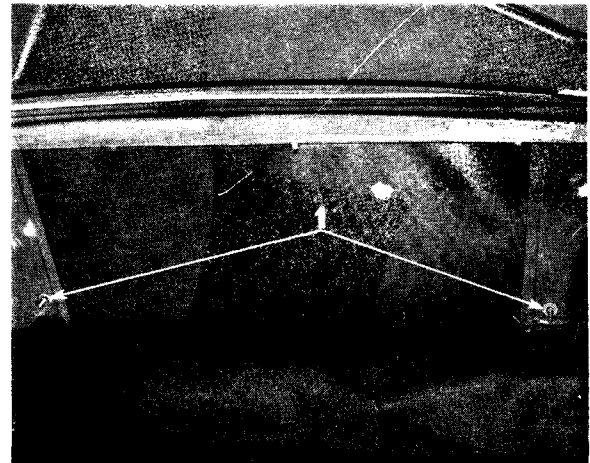


Fig. 88. Rear seat attachment—Saloon

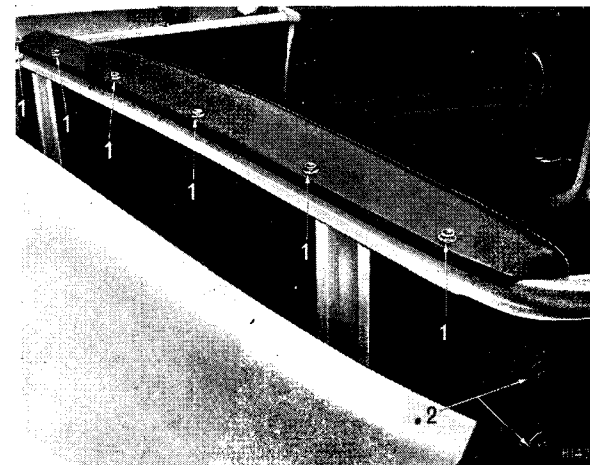


Fig. 89. Rear seat attachment—Convertible

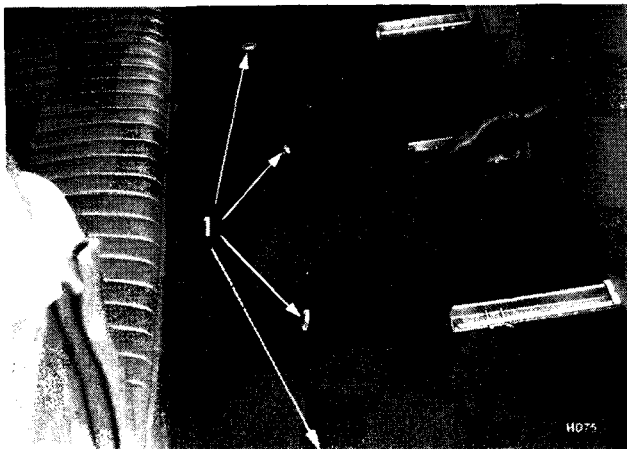


Fig. 90. Floor eyebolt attachment



Fig. 91. Waist rail attachment—Saloon

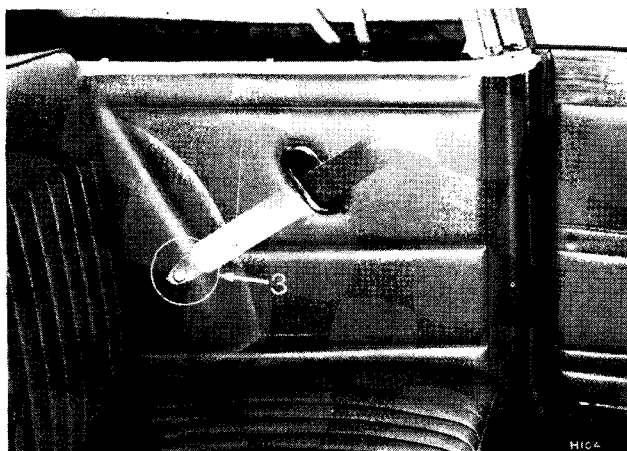


Fig. 92. Wheelarch attachment—Convertible

SAFETY HARNESS ANCHORAGES 3 POINT FIXING-FRONT

Saloon and Convertible (Fig. 90)

Attach the latched hooks on safety belt to the eye bolts (1).

Saloon (Fig. 91)

To Remove

Unscrew the pivot bolt and remove the waved washer and the pivot bolt spacer from the veneered capping rear waist rail (2).

To Refit

Pass the pivot bolt through the belt strap attachment plate, waved washer and spacer. Refit the assembly to the waist rail.

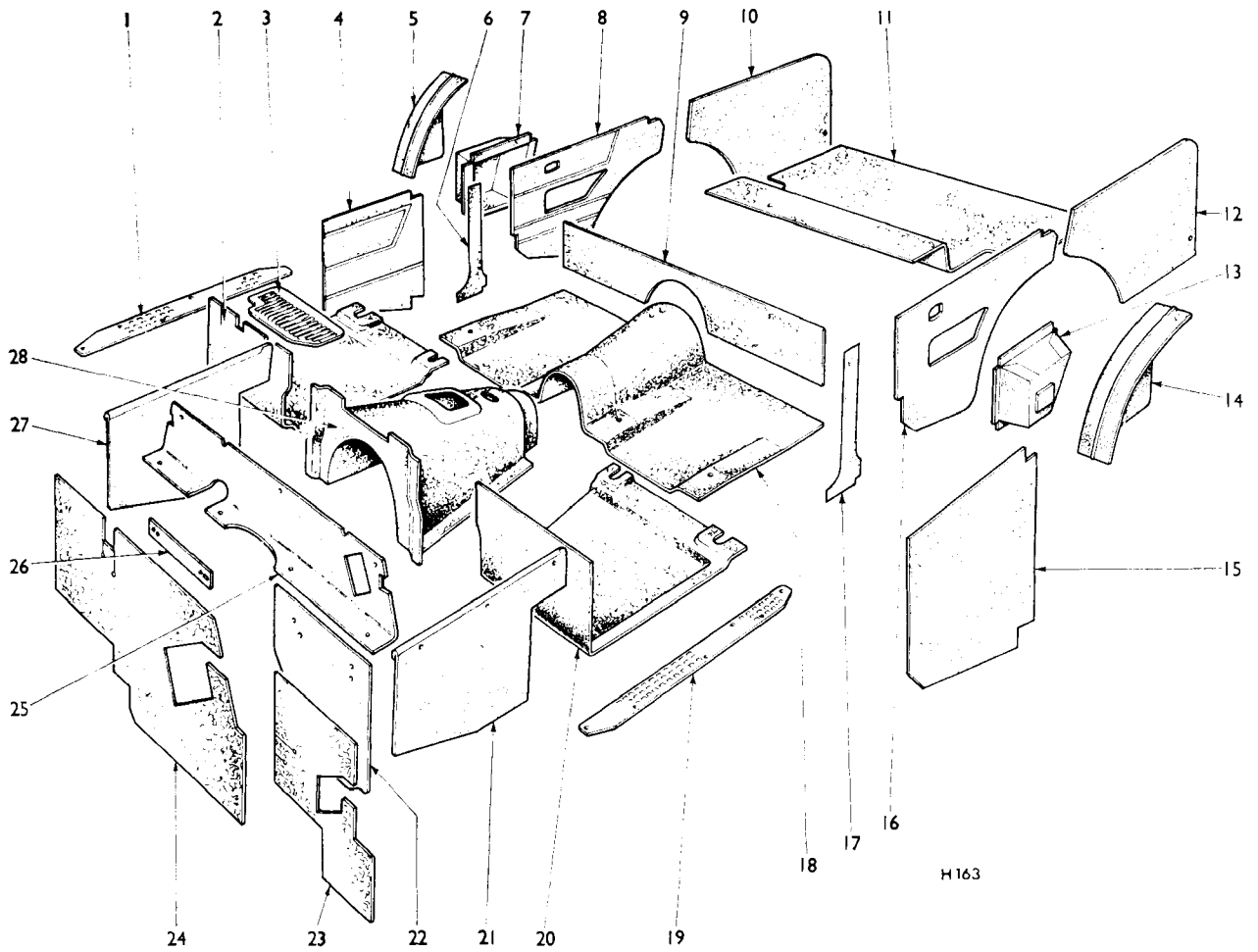
Convertible (Fig. 92)

To Remove

Unscrew the pivot bolt and remove the waved washer and pivot bolt spacer from the rear wheelarch (3).

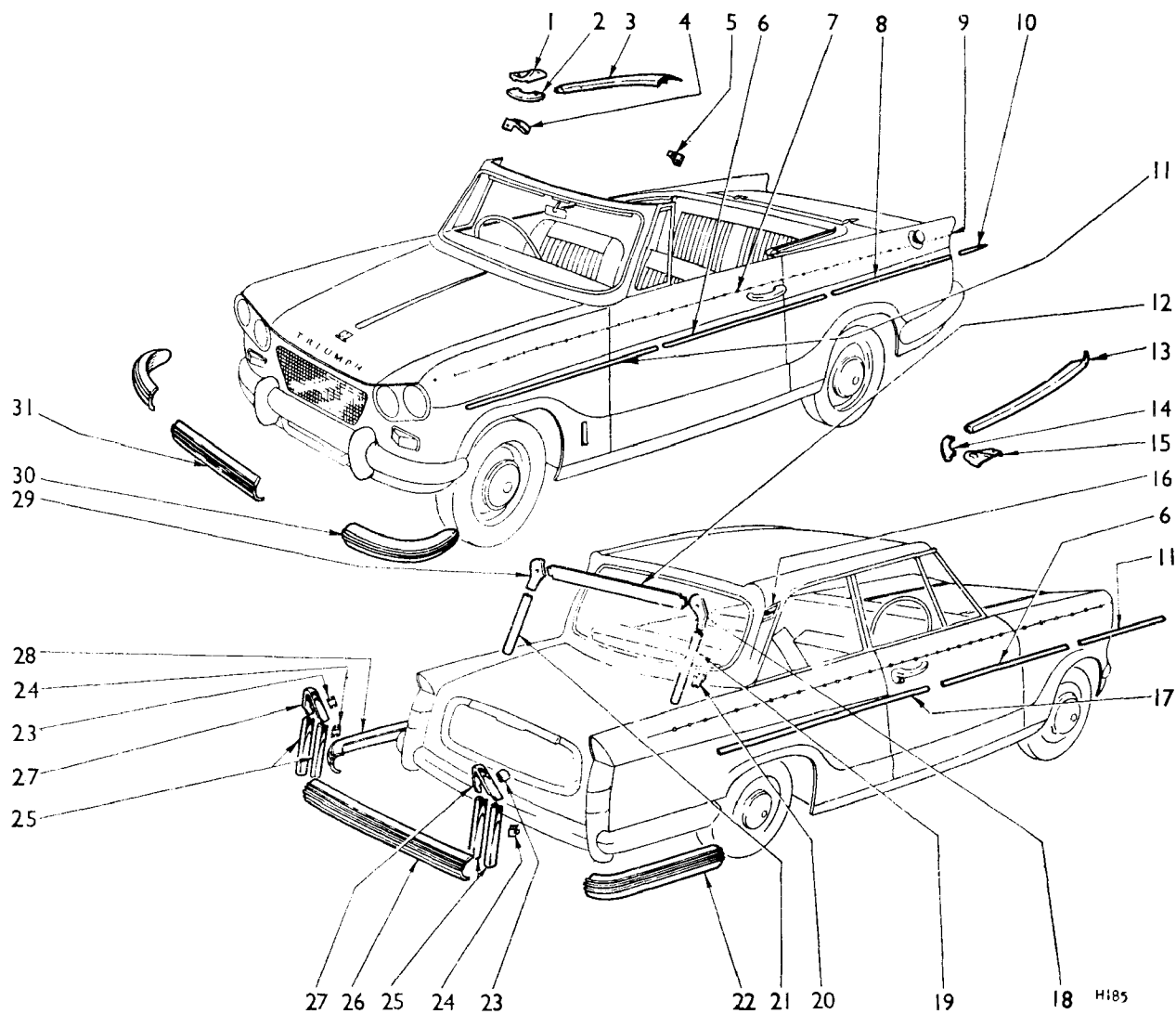
To Refit

Pass the safety belt through aperture in rear quarter trim panel as shown. Pass the pivot bolt through belt strap attachment plate, waved washer and spacer. Refit the assembly to the wheelarch.



- | | |
|--------------------------------------|---|
| 1 Tread plate sill | 16 Trim pad rear quarter—Saloon |
| 2 Carpet front floor | 17 Cover "B" post trim |
| 3 Heel mat | 18 Carpet rear floor |
| 4 Trim pad rear quarter convertible | 19 Tread plate sill |
| 5 Cover wheelarch | 20 Carpet front floor |
| 6 Cover "B" post trim | 21 Millboard dash side |
| 7 Pocket assembly rear quarter | 22 Millboard dash lower |
| 8 Trim pad rear quarter—Saloon | 23 Pad sound insulation dash upper
Left-hand/Right-hand steering |
| 9 Mat heelboard | 24 Pad sound insulation dash upper
Left-hand/Left-hand steering |
| 10 Luggage compartment trim | 25 Millboard dash upper |
| 11 Luggage compartment mat | 26 Strip sound deadening |
| 12 Luggage compartment trim | 27 Millboard deadening |
| 13 Pocket assembly rear quarter | 28 Carpet gearbox cover |
| 14 Cover wheelarch | |
| 15 Trim pad rear quarter—Convertible | |

Fig. 93. Floor coverings and trim casings



- | | | |
|--------------------------|--------------------------|-------------------------|
| 1 Finisher hoodstick | 12 Finisher roof/rear | 22 Finisher bumper |
| 2 Finisher hoodstick | 13 Squab rail | 23 Clip |
| 3 Squab rail | 14 Finisher hoodstick | 24 Clip |
| 4 Finisher "A" post—R.H. | 15 Finisher hoodstick | 25 Moulding rear lamp |
| 5 Finisher "A" post—L.H. | 16 Badge | 26 Finisher bumper |
| 6 Door moulding | 17 Tonneau side moulding | 27 Finisher tail lamp |
| 7 Clip—moulding | 18 Finisher roof corner | 28 Finisher bumper |
| 8 Tonneau side moulding | 19 Finisher | 29 Finisher roof corner |
| 9 Retainer—moulding | 20 Clip | 30 Finisher bumper |
| 10 Tonneau side moulding | 21 Finisher roof/rear | 31 Finisher bumper |
| 11 Bonnet moulding | | |

Fig. 94. Exterior mouldings finishers and bumpers

FINISHER MOULDINGS

Waistline Mouldings

The waistline mouldings are retained by clips riveted to the bonnet, door and tonneau side panels.

To Remove

Using a small screwdriver from which all sharp edges have been removed, gently lever the mouldings from the panels.

To Refit

Place the mouldings on to the clips and applying firm hand pressure, snap the mouldings into position.

Stop/Tail Lamp Surround

The stop/tail lamp surround comprises three sections, which are retained to the rear end of the tonneau side panel by barbed clips.

To Remove

Using a small screwdriver from which all sharp edges have been removed, gently lever the surround off the clips.

To Refit

The clips are forced into position with light blows from a mallet and the surround pushed on to the clips.

Backlight Surround—Saloon Only

To Remove

Take out one screw from each corner section and three screws from the upper section. Using a piece of hardwood as a drift, remove both side sections, and note the position of the clips in the channel.

To Refit

Using a hide mallet, force the side section into position. Apply Seelastik to five screw holes along the top and refit the upper and corner sections.

BUMPER FINISHERS

The front and rear bumper finishers each comprise three sections.

To Remove

Using a $\frac{1}{8}$ " (3 mm.) diameter drill, drill out two rivets from each of the front sections and three rivets from each of the rear sections.

To Refit

Secure the sections with $\frac{1}{8}$ " (3 mm.) pop rivets.

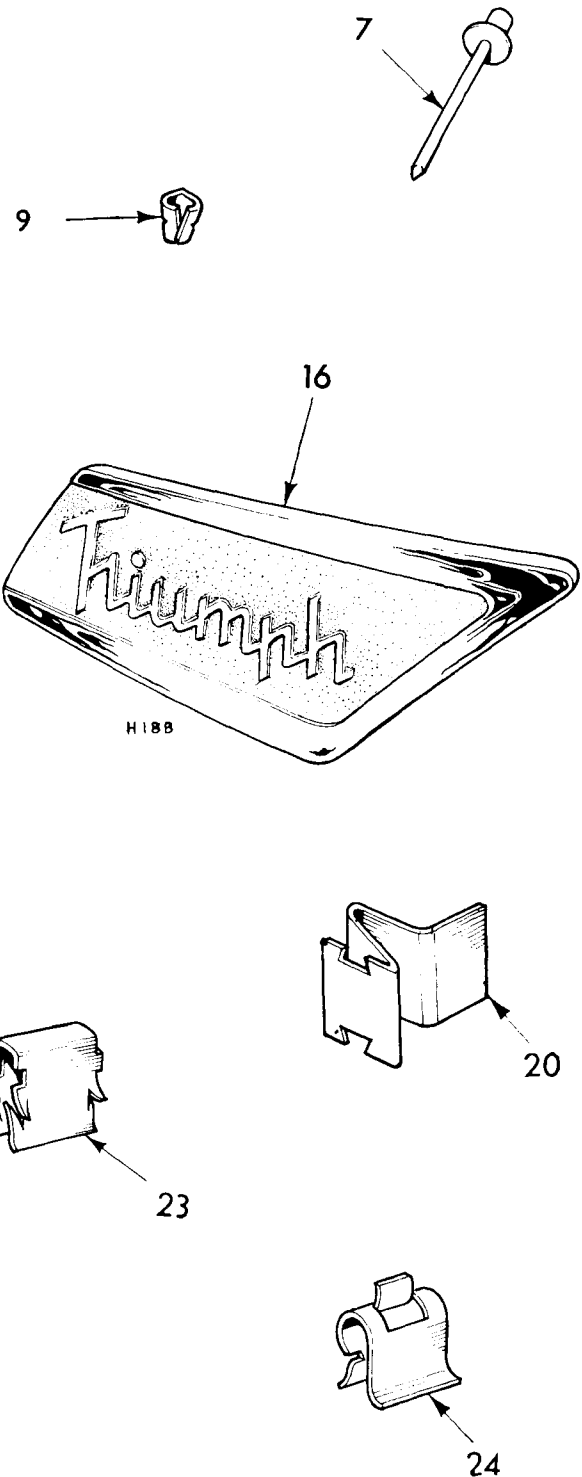


Fig. 95. Exterior moulding fixings details

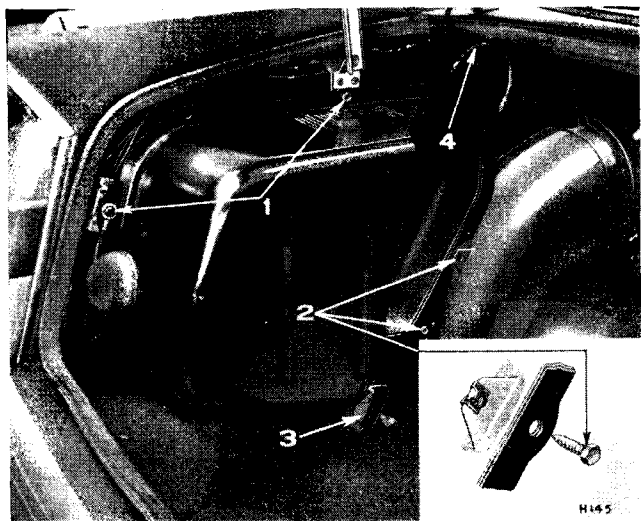


Fig. 96. Fuel tank fixings

FUEL TANK

To Remove (Fig. 96)

Isolate the battery.

Remove the luggage compartment floor covering.

Disconnect the cables from the fuel indication tank unit.

Drain the fuel tank. The drain plug is accessible from under the vehicle behind the left-hand side of the rear wheelarch.

Disconnect the fuel pipe by pulling the rubber connector (4) from the upper forward corner of the tank.

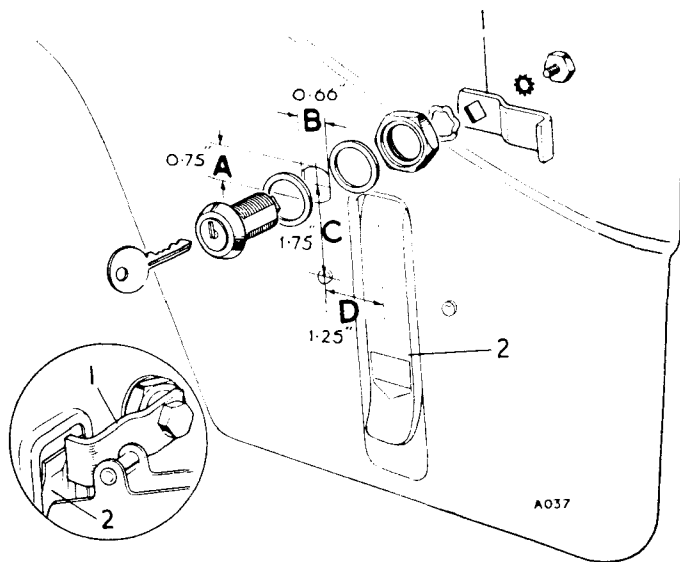
Remove four acme screws (1 and 2) and one bolt securing the fuel tank to luggage floor (3).

Take off the filler cap and manoeuvre the tank from the luggage compartment.

To Refit

Reverse the removal procedure. Refer to 'Dust and Water Sealing' section, page 5-301V.

OPTIONAL ACCESSORIES



	Inches	Millimetres
A	0.75"	19.05
B	0.66"	16.80
C	1.75"	44.45
D	1.25"	31.75

Fig. 97. Exploded arrangement of bonnet lock details

BONNET LOCK

A bonnet lock is available as a special accessory in kit form comprising two lock assemblies.

Fitting Instructions (Fig. 97)

Cover the area, forward of the bonnet catch lever, with white masking tape. Use a pencil to mark the position of a hole as shown and dimensioned. Open out the hole to $\frac{3}{8}$ " (15.9 mm.) diameter, and shape the hole as dimensioned. Remove the tape and paint the edge of the metal to prevent rust formation.

Assemble the bonnet lock details in the sequence shown.

MODIFICATION TO BODY SECTION

With the exception of the following changes from Commission No. HC.50001 (Vitesse Mk. 2), all servicing procedures given in the preceding pages remain unaltered.

FRONT GRILLE

To Remove

Remove six cross/recess screws and washers (arrowed Fig. 98).

To remove the three grille support brackets, take out six cross/recess screws and washers (two in each support).

To Refit

Reverse the removal procedure.

TRIM PANEL-TRUNK LID RECESS

To Remove

Open the luggage lid and release the two friction bushes or fix plates retaining the Triumph nameplate to the lid.

Remove eight nuts and washers (arrowed Fig. 99) and ease the trim panel assembly away from the luggage compartment lid recess.

To Refit (Fig. 100)

Reverse the removal procedure and seal the underside of the rubber sealing washers (2) with Seelastik SR51 and the nameplate fix plates with Kelseal.

Key to Fig. 100

- 1 Trim panel
- 2 Sealing washer
- 3 Luggage lid panel
- 4 Plain washer
- 5 Spring washer
- 6 Hexagon nut
- 7 Weld bolt

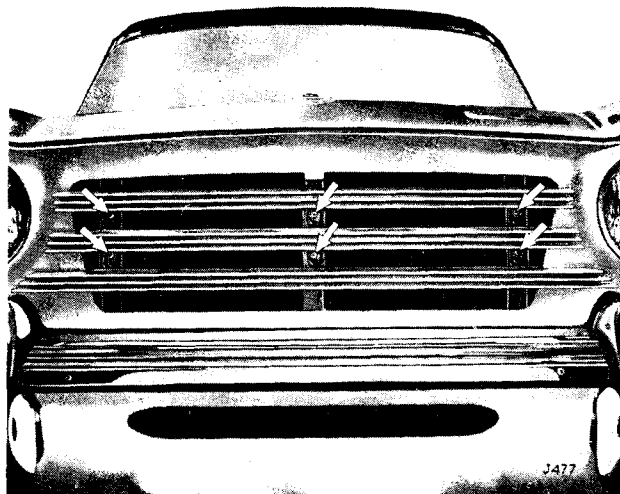


Fig. 98. Front grille attachment

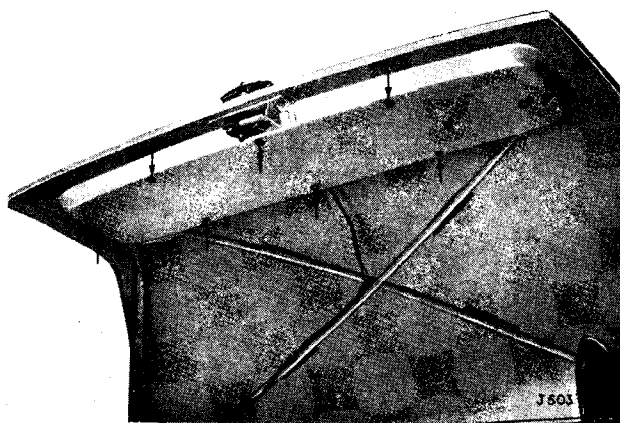


Fig. 99. Trim panel attachment

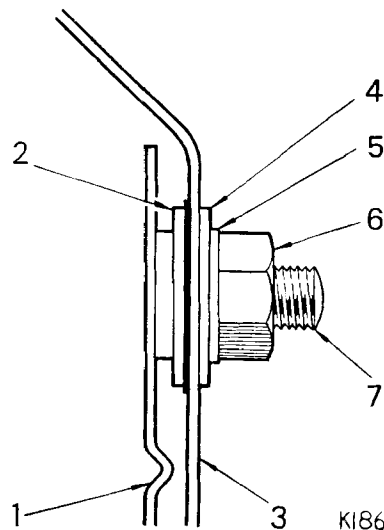


Fig. 100. Trim panel fitting instructions

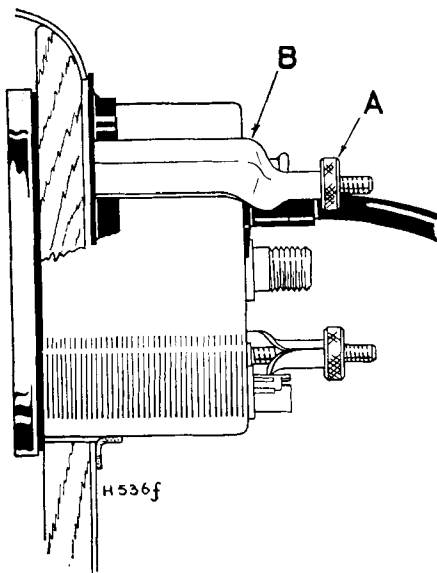


Fig. 101. Speedometer/tachometer

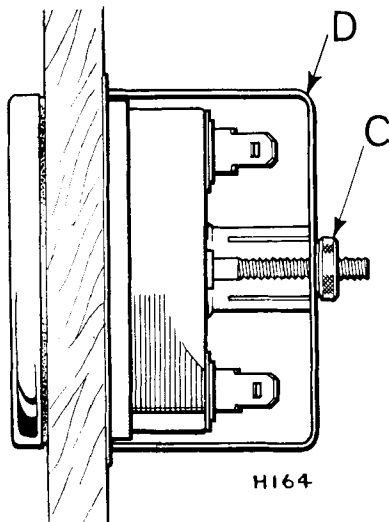


Fig. 102. Fuel/temperature gauge

INSTRUMENTS, SWITCHES AND CONTROLS

NOTE: Before disturbing any part of the facia isolate the battery. When refitting any of the Lucar connectors described in the following procedures, refer to Group 6—Facia Connections.

INSTRUMENTS

Speedometer and Tachometer (Fig. 101)

To Remove

Disconnect the drive cable and pull out the illumination bulb holders. From the speedometer and voltage stabiliser, disconnect the trip reset cable and disconnect the Lucar connectors. Remove two knurled nuts (A), spring washers, one earth lead from speedometer or two leads from tachometer, and clamps (B). Push the instrument out through the front of the facia, simultaneously removing the reinforcing ring from behind.

To Refit

Ensuring that the rubber ring is undamaged and located adjacent to the rim, mount the instrument on the facia and secure it from behind by fitting the reinforcing ring, clamps (B), earth lead/s, spring washers and knurled nuts (A). Push the illumination bulb holders into position and re-connect the drive cable. To the speedometer and voltage stabiliser re-connect the trip reset cable and Lucar connectors.

Flasher Warning Light

To Remove

Pull the bulb holder from the body, unscrew the body and, if required, push the lens out through the front of the facia.

To Refit

Reverse the removal procedure.

Fuel Contents and Water Temperature Gauge (Fig. 102)

To Remove

Pull off the Lucar connectors and illumination bulb holder from the gauge. Remove the knurled nut (C), spring washer, clamp (D) and earth lead. Push out the gauge through the front of the facia, simultaneously removing the reinforcing ring from behind.

To Refit

Ensuring that the rubber ring is undamaged and located adjacent to the rim, mount the gauge on the fascia and secure it from behind by fitting the reinforcing ring, clamp (D), earth lead, spring washer and knurled nut. Push the illumination bulb holder into position and re-connect the Lucar connectors.

SWITCHES**Ignition/Starter Switch (Fig. 103)****To Remove**

Pull off the Lucar connectors from the switch, unscrew the bezel (D) and withdraw the switch from behind the fascia.

To Refit

Reverse the removal procedure and refer to Group 6 —Facia Connections.

Master Light Switch (Fig. 104)**To Remove**

Depress the spring plunger by pushing a suitable pin (C) into the hole and pull off the knob. Unscrew the bezel (D), withdraw the switch from behind the fascia and pull off the Lucar connectors.

To Refit

Locate the switch on the switch panel and secure it by tightening the bezel, re-attach the Lucar connectors. Push on the knob to engage with the spring plunger.

Heater Blower Switch (Fig. 105)**To Remove**

Pull off the Lucar connectors from the switch, unscrew the bezel (D) and withdraw the switch from behind the fascia.

To Refit

Reverse the removal procedure and refer to Group 6 —Facia Connections.

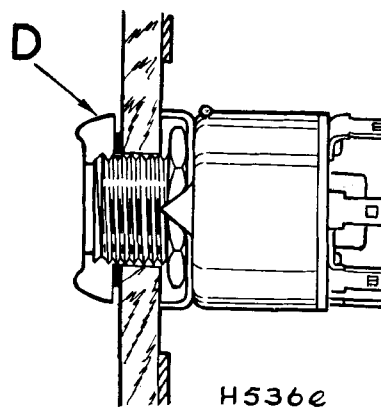


Fig. 103. Ignition/starter switch

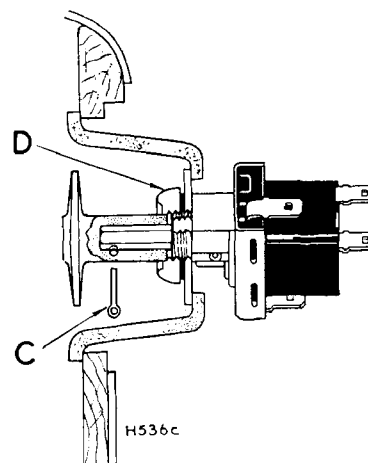


Fig. 104. Master light switch

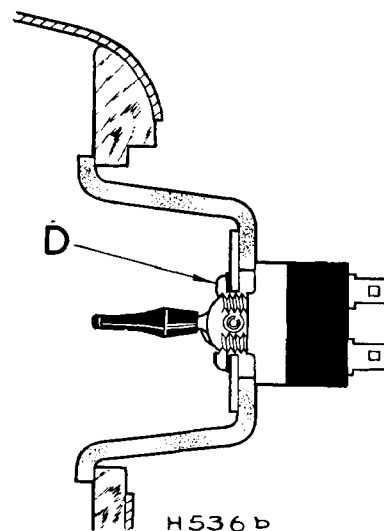


Fig. 105. Heater blower switch

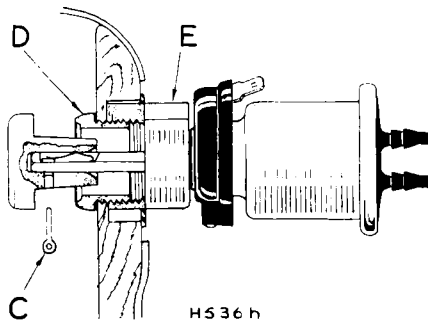


Fig. 106. Windscreen washer/wiper control

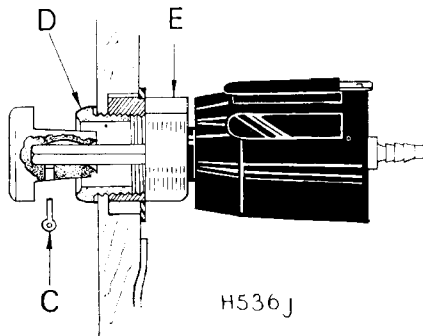


Fig. 107. Windscreen washer/wiper control
(alternative fitment)

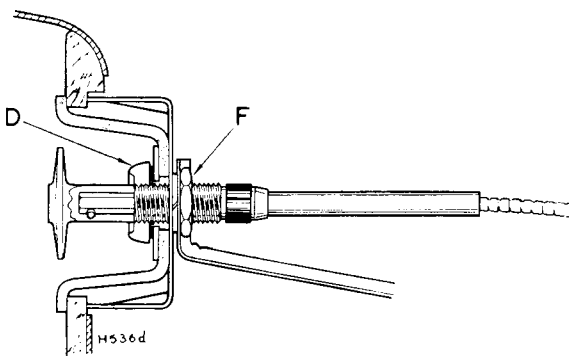


Fig. 108. Choke control

Windscreen Washer/Wiper Control (Figs. 106 and 107)

To Remove

Depress the spring plunger by pushing a suitable pin (C) into the hole and pull off the knob. Unscrew the bezel (D), withdraw the switch from behind the facia and pull off the nylon washer pipes and the Lucar connectors.

To Refit

Working behind the facia, locate the keyway (E) on the switch body into the cutout in the metal support, attached to the veneered panel and secure the switch by tightening the bezel (D). Push on the knob to engage with the spring and re-attach the nylon pipes and Lucar connectors.

Choke Control (Fig. 108)

To Remove

Disconnect the inner and outer cables from the carburettor and pull the choke knob complete with inner cable from the front of the facia. Unscrew the bezel (D) and withdraw the outer cable.

To Refit

Feed the outer cable complete with support bracket through the switch panel, screw on the bezel until flush with the threaded end of the cable and insert the inner cable. Rotate the outer cable in the switch panel to correctly position the knob and tighten the locknut (F). Re-connect the opposite end of the cables to the carburettors.

Heat Control and Air Distribution (Fig. 109)

To Remove

Disconnect the control cables from the water valve and heater unit. Depress the spring plunger by pushing a suitable pin (C) into the hole and pull off the knob. Unscrew the bezel (D) and withdraw the cable.

To Refit

Attach the cables to the switch panel by screwing the bezel (D) until flush with the threaded end of the cable. Push on the knob to engage with the spring plunger. Re-connect the opposite end of the cables to the water valve and heater unit.

FACIA ASSEMBLY

Vitesse Mk. 2

To Remove (Figs. 110 and 111)

Isolate the battery. Release the clips securing the wiring harness to the bulkhead and disconnect the harness leads from the stop lamp switch, wiper motor and steering column switches.

Release the control cables from carburettor, water valve and heater air distribution flap.

Unscrew the drive cable from the speedometer and remove the air hoses from the demister vents (38). Disconnect the plastic pipes from the windscreen washer pump and unscrew the drive cable from the tachometer.

Release the steering column assembly (as described on page 4-211) and withdraw it from the car.

Take out two screws (44) securing the facia rail support (45) to the bulkhead (Fig. 71) and one screw (51) securing the choke control support bracket (54) to the bulkhead.

Remove seven screws (32) securing the facia top edge and finishers to the windscreen lower rail (Fig. 72). Remove four screws (52) two each side securing the facia rail (40) to the dash sides (Fig. 111).

Carefully withdraw the facia assembly and disconnect the wiring harness from the switches, instruments and facia lamp.

To Refit

Reverse the removal procedure and refer to Group 6—Facia Connections. Road test the vehicle and check the operation of all instruments and controls.

FACIA RAIL

To Remove (Figs. 110 and 111)

Remove the facia assembly from the vehicle. Working on the bench, open the glove box lid and drill out the pop rivet (39). Release the trip cancelling control from the facia rail. Take out the screw (46) and remove the bracket (45). Slacken the three lower screws (8) securing the veneered panel to the facia rail

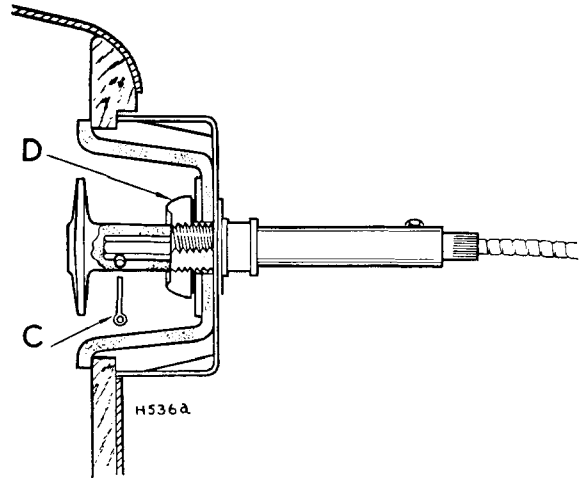


Fig. 109. Heat/Air control

(40). Remove four screws (42) securing the fibre trimmed facia to the facia rail and withdraw the rail.

To Refit

Reverse the removal procedure.

VENEERED PANEL

To Remove (Fig. 110)

Remove the facia assembly from the vehicle. Working on the bench remove the instruments, switches, controls and switch panel (9) from the facia panel. Take out eight screws (8), (19) and (23) and remove the veneered panel assembly (7).

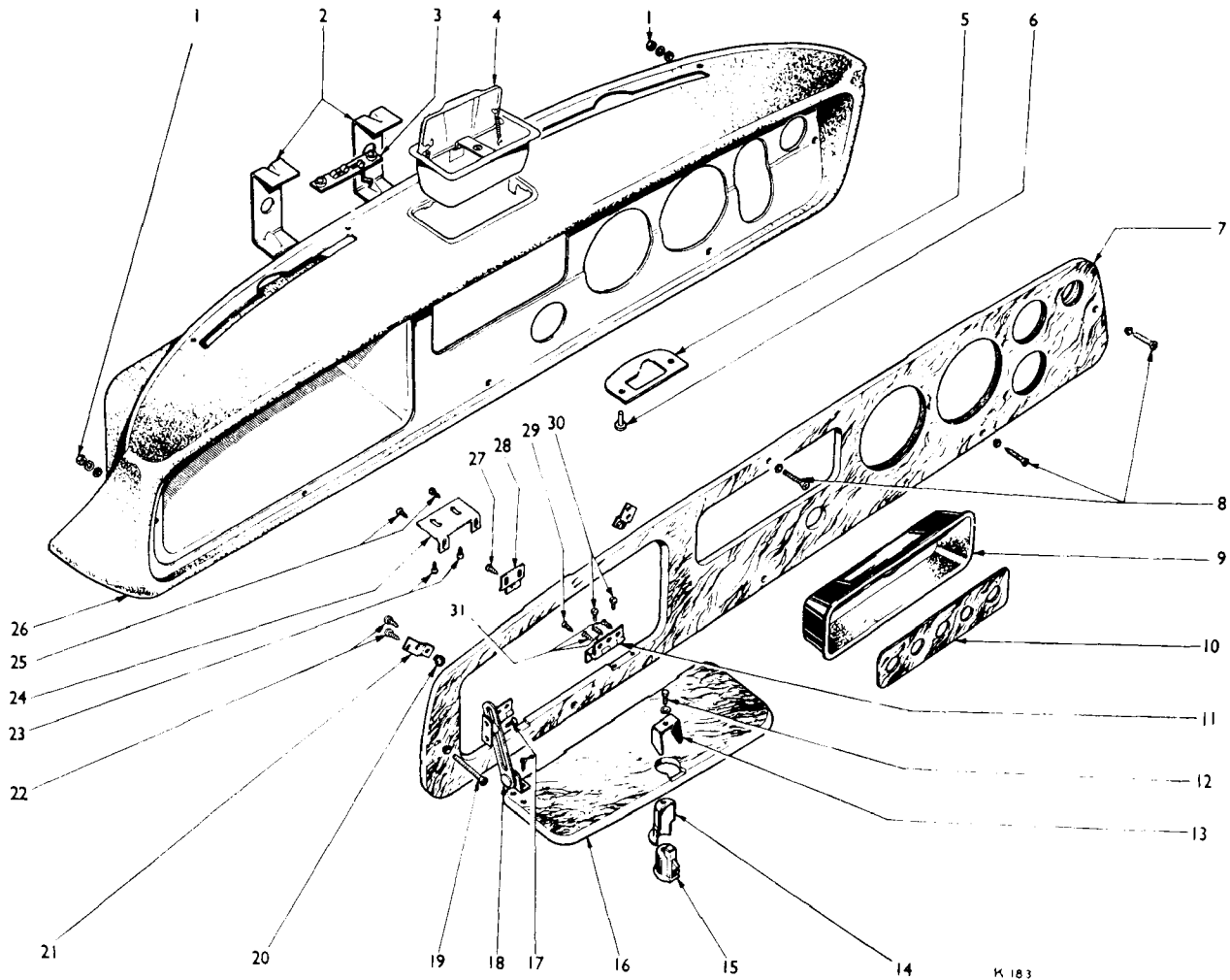
Take out the screws (22), (27) and (25) and remove the buffer brackets (21), striker plate (28) and tie bracket (24).

Take out screw (12) and remove the lock assembly (15) clamp (13) and finger pull (14).

Take out the screws (17), (29), (30) and (31) and remove the check link assembly (18) and hinge (11).

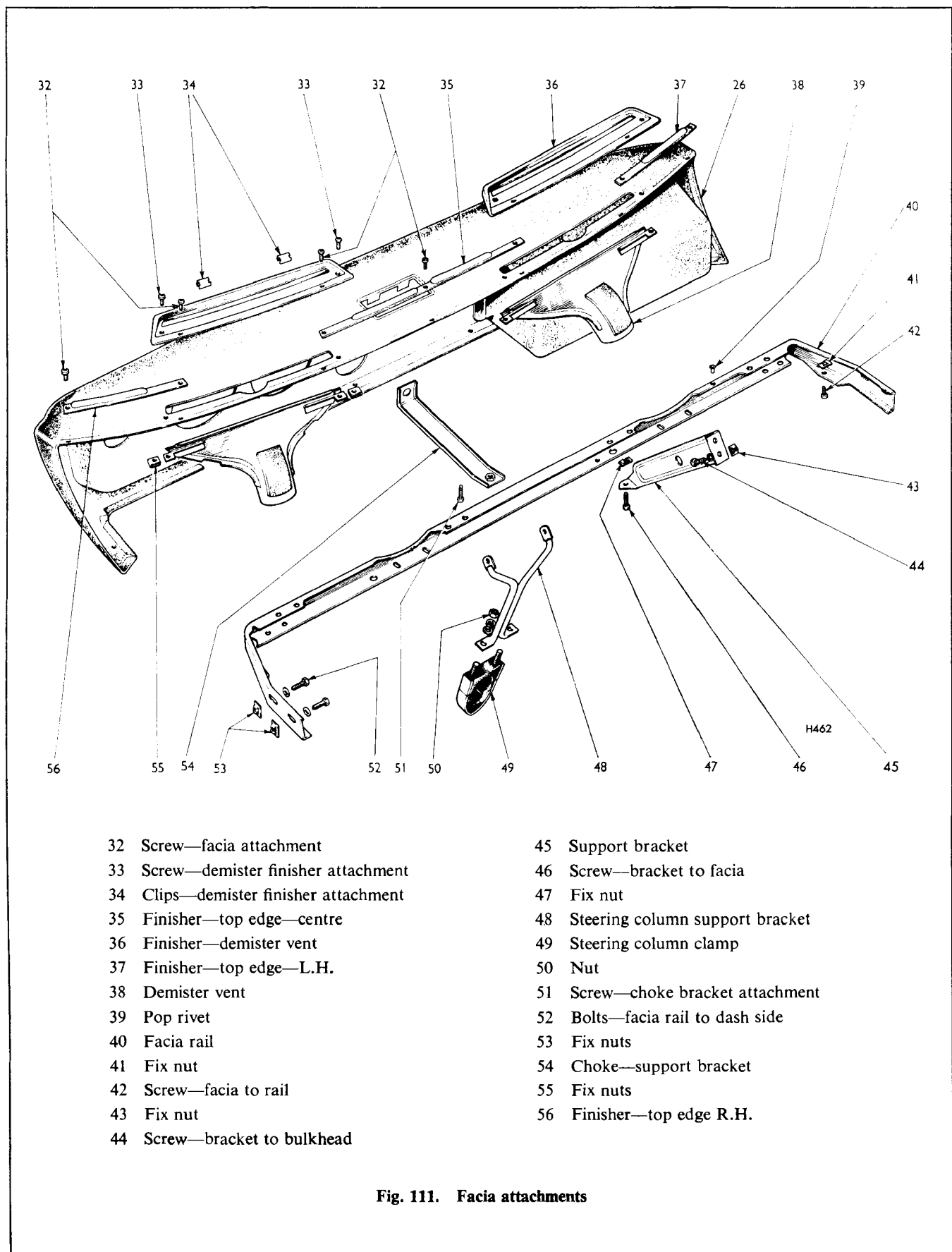
To Refit

Reverse the removal procedure.



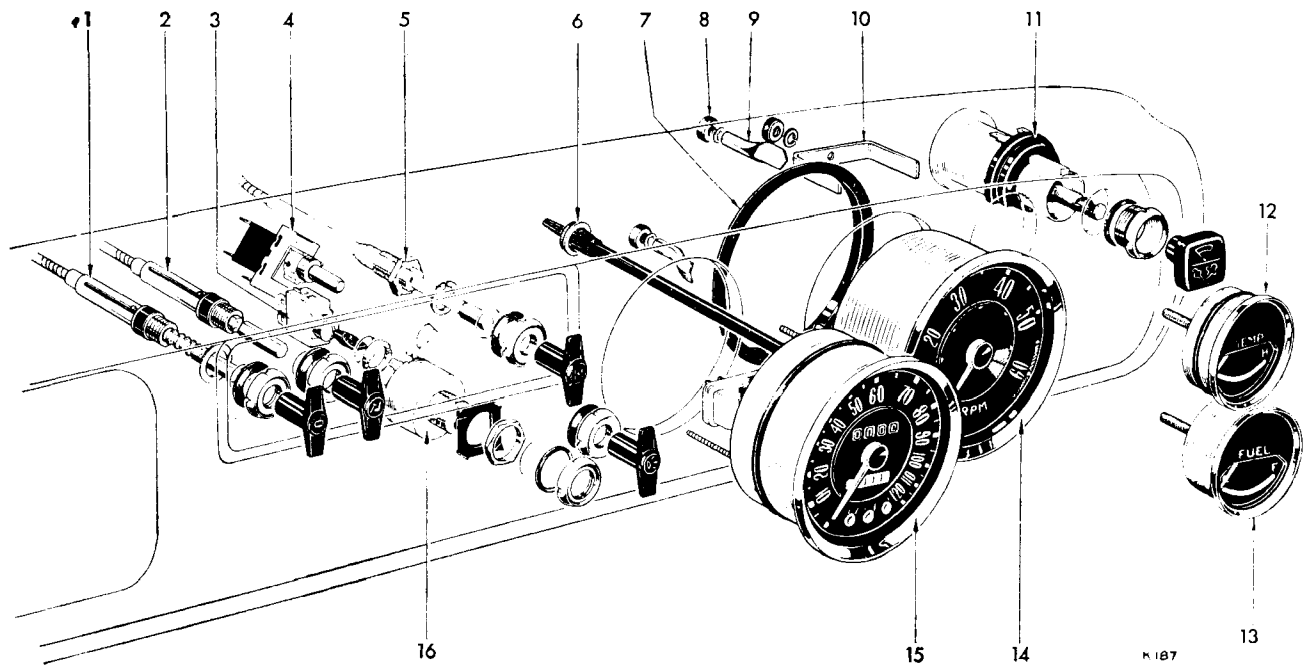
- | | | |
|-------------------------------|---------------------------|-----------------------------|
| 1 Nut—panel attachment | 12 Screw—lock clamp | 22 Screw—bracket attachment |
| 2 Switch panel—saddle bracket | 13 Lock clamp | 23 Screw—tie bracket |
| 3 Facia—light switch | 14 Finger pull | 24 Tie bracket |
| 4 Ash tray | 15 Glove box lock | 25 Screw—tie bracket |
| 5 Light switch—cover plate | 16 Glove box lid | 26 Trimmed facia |
| 6 Nylon stud—light switch | 17 Screw—link attachment | 27 Screw—striker bracket |
| 7 Veneered panel | 18 Check link | 28 Striker bracket |
| 8 Screw panel—attachment | 19 Screw—facia attachment | 29 Screw—hinge to lid |
| 9 Switch panel | 20 Rubber—buffer | 30 Screw—hinge to panel |
| 10 Finisher plate | 21 Buffer—bracket | 31 Screw—hinge to lid |

Fig. 110. Facia panel details



- | | | | |
|----|------------------------------------|----|---------------------------------|
| 32 | Screw—facia attachment | 45 | Support bracket |
| 33 | Screw—demister finisher attachment | 46 | Screw—bracket to facia |
| 34 | Clips—demister finisher attachment | 47 | Fix nut |
| 35 | Finisher—top edge—centre | 48 | Steering column support bracket |
| 36 | Finisher—demister vent | 49 | Steering column clamp |
| 37 | Finisher—top edge—L.H. | 50 | Nut |
| 38 | Demister vent | 51 | Screw—choke bracket attachment |
| 39 | Pop rivet | 52 | Bolts—facia rail to dash side |
| 40 | Facia rail | 53 | Fix nuts |
| 41 | Fix nut | 54 | Choke—support bracket |
| 42 | Screw—facia to rail | 55 | Fix nuts |
| 43 | Fix nut | 56 | Finisher—top edge R.H. |
| 44 | Screw—bracket to bulkhead | | |

Fig. 111. Facia attachments



- | | |
|---|---|
| 1 Heat control | 9 Clamp support—tachometer and speedometer |
| 2 Air distribution control | 10 Clamp support—temperature and fuel gauge |
| 3 Heat blower switch | 11 Windscreen washer and wiper switch |
| 4 Lighting switch | 12 Temperature gauge |
| 5 Choke control | 13 Fuel gauge |
| 6 Trip cancelling control | 14 Tachometer |
| 7 Support ring—tachometer and speedometer | 15 Speedometer |
| 8 Knurled nut | 16 Ignition and starter switch |

Fig. 112. Switches, instruments and controls

DUST AND WATER SEALING

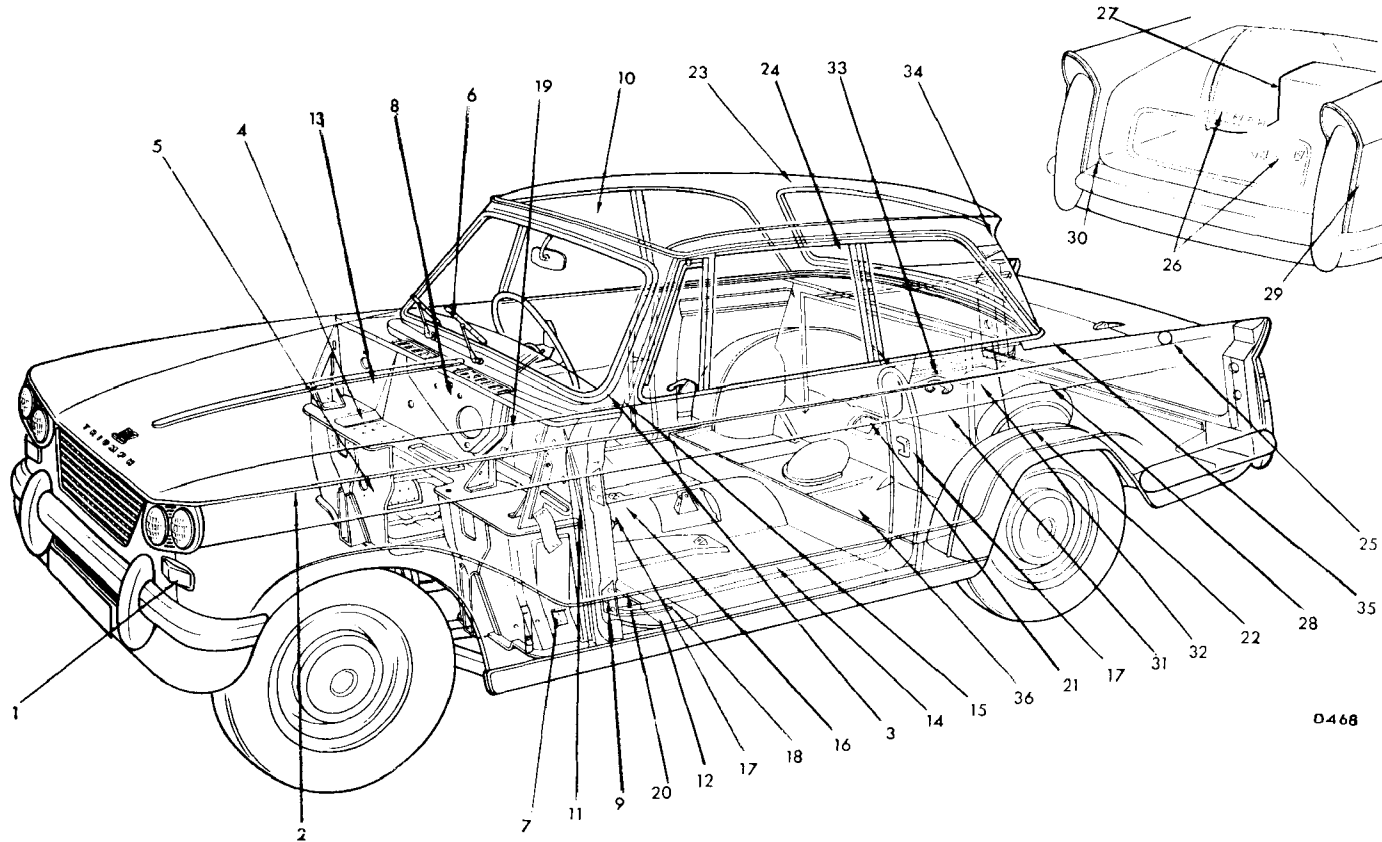
The following notes and diagrams indicate the locations of sealed joints and serve to familiarise dealers with the necessary materials and techniques employed to render the body shell dust and water proof.

The list of approved sealing compounds has been broken down into sections, appertaining to the progressive body build. The diagrams showing the location of sealed joints (heavy lines) show, in some cases, seams which are sealed with compounds which require curing in heated atmosphere. These compounds are listed under the general term "Plastisol" and are not suitable for application in service. In every case where Plastisol compounds have been used and the seal has failed, Hermetal "Double Bond" Metallic Cream, Docker's Compound or Hermetal Plastic Metal Filler should be used.

The scrap sections in the following pages correspond with the numbers on the diagram showing the complete car.

SEALING COMPOUNDS

COMPOUND	MANUFACTURER	COMPOUND	MANUFACTURER
Glasticon 303 Glasticord 305 and 400 Kelseal 3/315M. Kelseal 305.	Kelseal Ltd., Vogue House, Hanover Square, London, W.1.	Seelastik SR.51 Seelastrip LS.105	Expandite Ltd., Cunard Road Works, London, N.W.10.
Docker's Compound	Docker Bros. Ltd., Rotton Park Street, Birmingham, 16.	Boscoseal B.B. Plastisol Putty S.106.46	B.B. Chemicals, Ulverscroft Road, Leicester.
Supra Dedseal	Supra Chemical & Paint Ltd., Hainge Road, Tipton, Staffs.	Hermetal "Double Bond" Metallic Cream Hermetal Plastic Metal Filler	The Kenilworth Mfg. Co. Ltd., West Drayton, Middlesex.
3M's EC 1168 Mastic Sealer	Minnesota Mining and Manufacturing, 3M House, Wigmoore Street, London, W.1.	Dunlop D5.5035/S Sealer	Dunlop Chemical Division, Chester Road, Erdington, Birmingham, 24.



D468

Fig. 1. Location of sealed joints

NOTE: The locations given above relate to those numbered in the following pages.

**APPROVED SEALING MATERIALS—
BODY IN WHITE (UNPAINTED)**

APPLICATION	MASTICS	STRIP SEALERS
Spotweld Sealers	553938 Expandite Seelastik (Natural) 559357 3 M's EC 1168	569630 Expandite Seelastrip LS.105 571214 Glasticord $\frac{1}{2} \times \frac{1}{2}$ 400 Strip Sealer
Plugging small holes		569630 Expandite Seelastrip LS.105 554422 Glasticon 303
Pre-Phosphate Sealer	566800—B.B. Chemical S.23/206	

PAINT SHOP

APPLICATION	GUN APPLIED SEALERS	PUTTIES	PLASTISOL	REMARKS
Internal joints	514697—Plus Products PD 18/11 562959 Supraseal 574270—Expandite—Heat Gel Sealer 607/1 574699—Plus Products HG9 574700—Dunlop Chemical Products DS5035/S			To be pumped with Graco equipment
External joints			560563 Kelseal 3/315 m. 574701—Expandite Plastisol 869	Low temperature cure
Plugging small holes		554422 Glasticon 303	564159—B.B. Plastisol Putty S.106.46 564158 Expandite Plastisol Putty	

APPROVED SEALING MATERIALS

TRIM AND FINISH

APPLICATION	MASTICS	STRIP SEALERS	PUTTIES	REMARKS
Windscreen sealers, rubber weatherstrips, plugs and grommets	566600 Seelastik SR.51			
Bolted metal to metal joints, metal mouldings, small holes, screw fixings, etc.	566600 Expandite Seelastik SR.51	Prestik Expandite Seelastrip LS.105 Kelseal Strip 305 B.B. Chem. P41.228 563615 $\frac{3}{4}$ " x $\frac{1}{16}$ " Glasticord Strip Sealer	554422 Glasticon 303	Strip sealers have Part Nos. allocated according to section
Special Purpose, <i>i.e.</i> paper to metal		Glasticord 400		

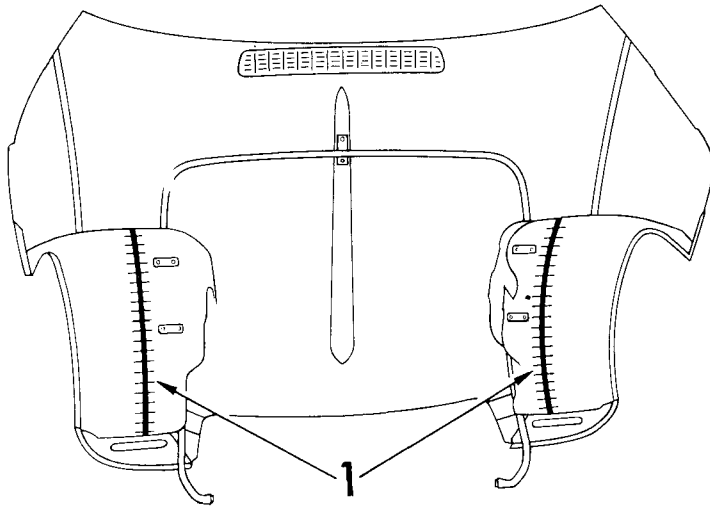
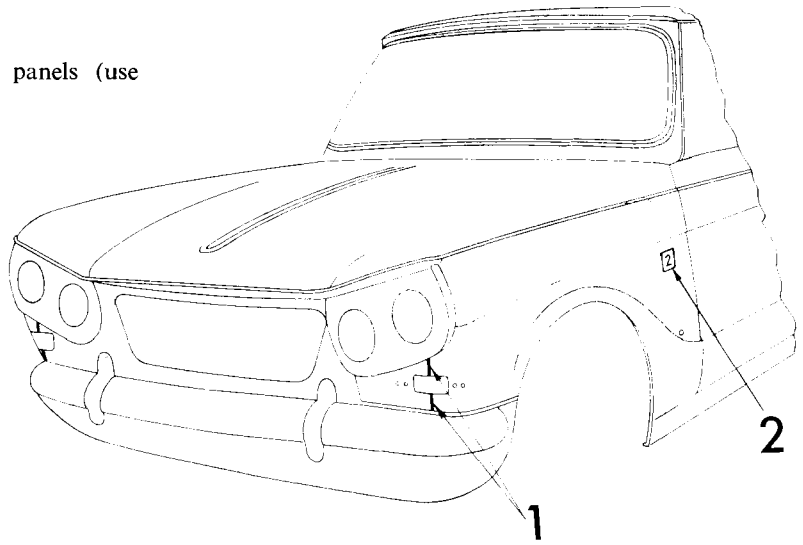
AFTER PAINT REPAIRS

APPLICATION	MISCELLANEOUS
External Joints	Docker's Compound Hermetal Double Bond

BODY UNDERSIDE PROJECTORS

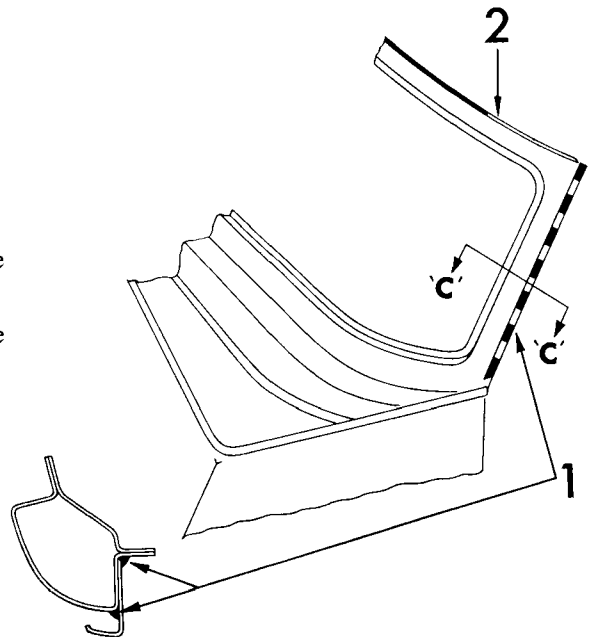
APPLICATION	SOLVENT BASED
Sealing external joints and protection of vulnerable areas on underside of body	554419 SUPRA DEDSEAL 557167 BOSCOSEAL 9010 567815 BOSCOSEAL 9020 Plus Products LCHM 10

- 1. 1 Wing side to wing front panels (use approved Plastisol).
- 2 2-litre badge to bonnet side (used approved Mastics).
- 3 Side and flasher lamp rubber and lamp to bonnet (used approved Mastics).

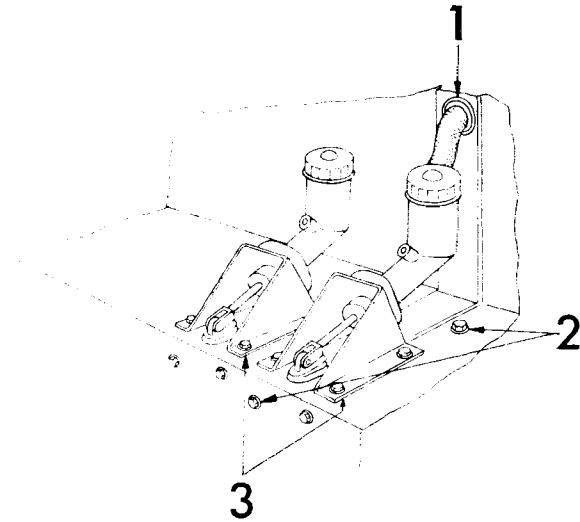


- 2.1 Wheelarch inner to wheelarch outer (used approved Plastisol).

- 3. 1 Windscreen pillar drip channel (use approved Plastisol).
- 2 Top finisher front edge to screen (use approved Plastisol) (Convertible only).

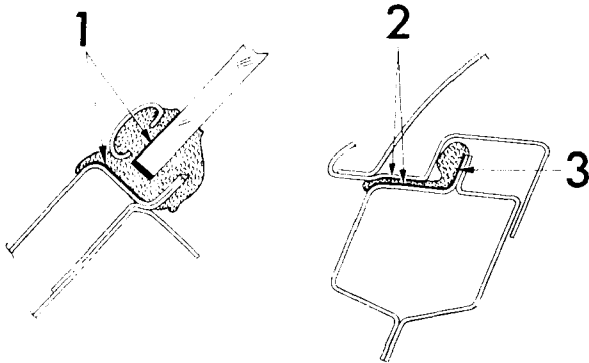
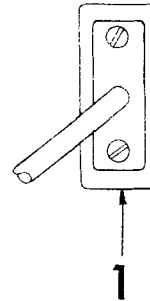


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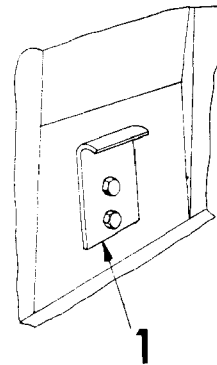
4. 1 All rubber grommets to components attached to the dash panel, including those on the inside of the car (use approved Mastics).
- 2 Master cylinder fixing bolts (use approved Mastics).
- 3 Underside of master cylinder brackets before assembly (used approved Mastics).
- 4 Master cylinder rubber covers to dash (use approved Mastics).

5. 1 Steering column to rubber grommet and grommet to dash panel (use approved Mastics).

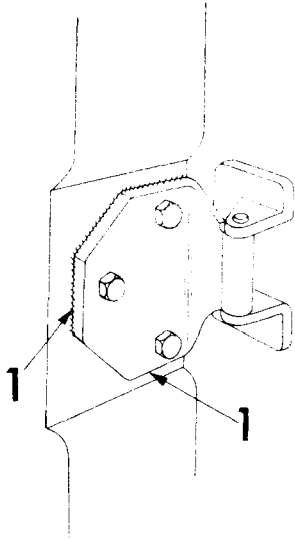
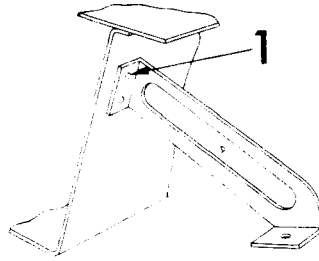


6. 1 Windscreen to glazing rubber and rubber to body (use approved Mastics).
- 2 Roof panel weatherstrip to screen header rail and roof (use approved Mastics).
- 3 Roof panel weatherstrip to screen header (Plus products 6/63D).

7. 1 Catch plate bonnet to dash side panel (use approved Mastics).

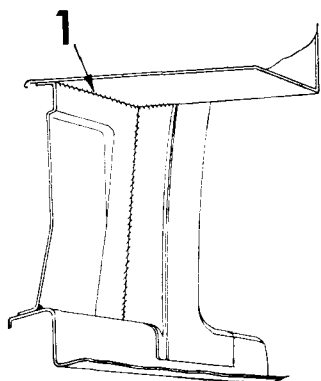
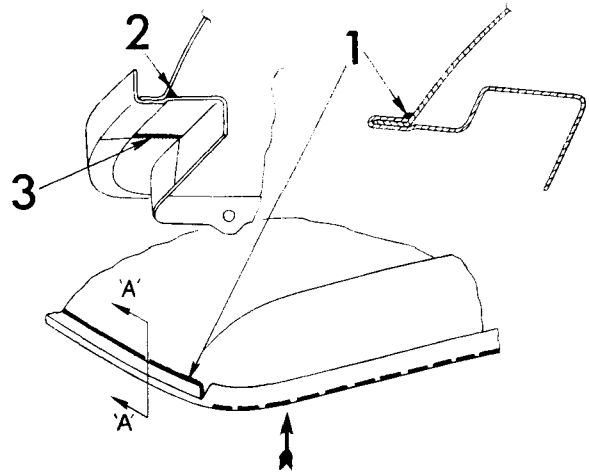


8. 1 Facia stay bracket to dash side panel (use approved Mastics).



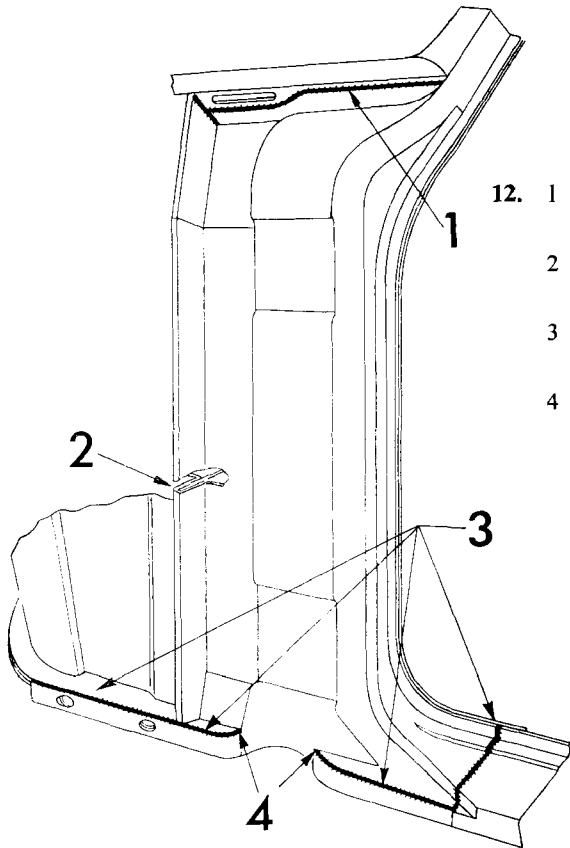
9. 1 Door hinge to "A" post (use approved Mastics).

10. 1 Roof panel, joint edge of flange to cantrail inside of water channel (use approved Plastisol).
 2 Cantrail to roof panel (use approved Mastics).
 3 Cantrail and header panel joint (use approved Plastisol).

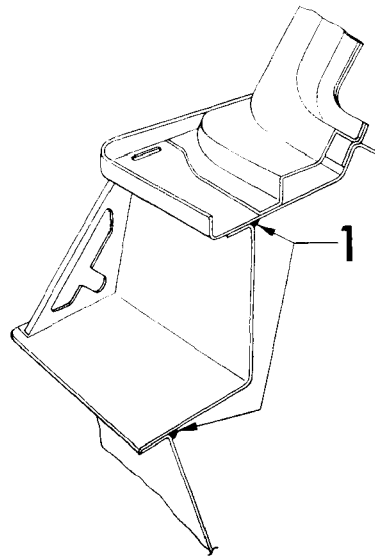


11. 1 "A" post inner panel to dash side panels (use approved Mastics).

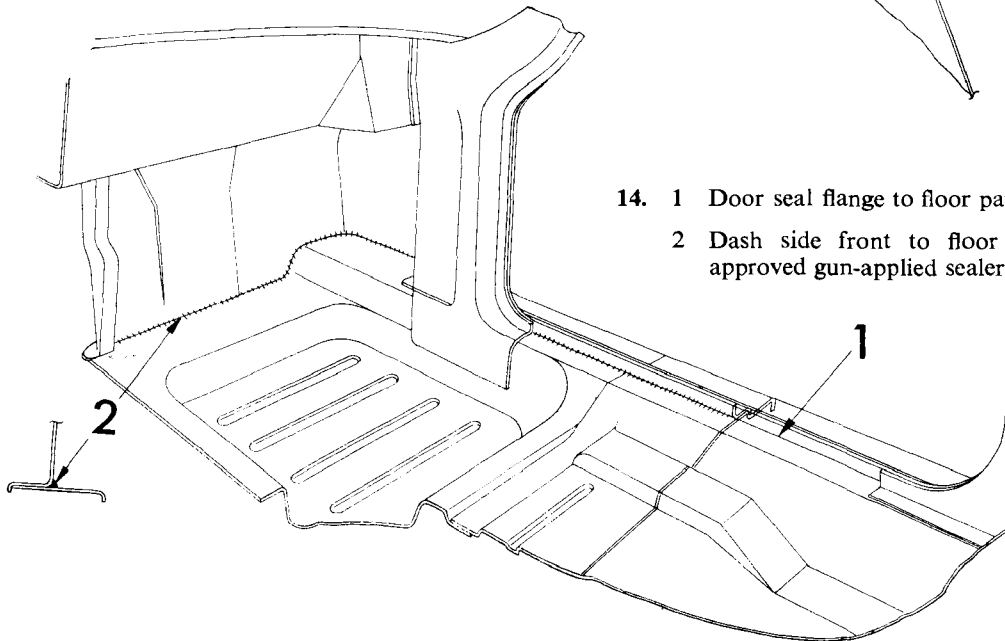
DUST AND WATER SEALING



12. 1 Dash shelf panel to front deck panel (use approved Plastisol).
- 2 Front deck panel to dash shelf panel (use approved Plastisol).
- 3 Outer "A" post to front floor panels (use approved Plastisol).
- 4 Plug two corner holes at the base of the "A" post (Glasticon 303).

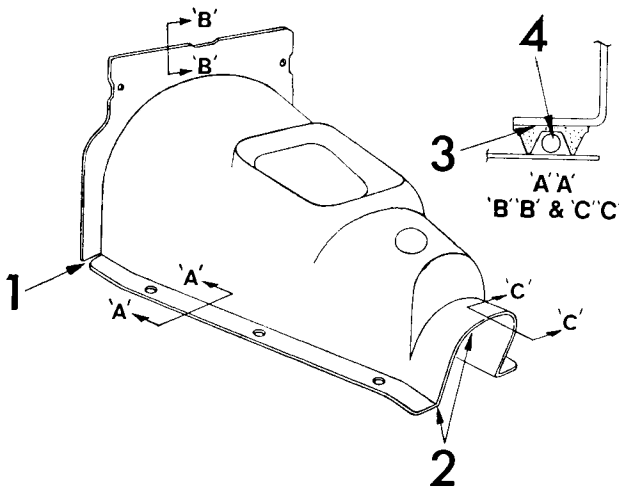
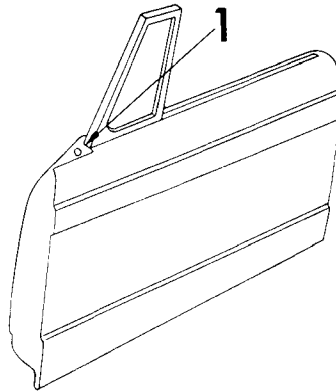


13. 1 Dash side front to dash shelf and dash shelf to Panel deck front (use approved gun-applied sealers).



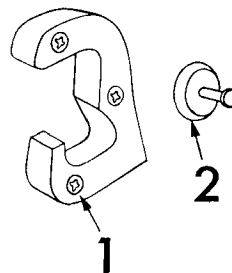
14. 1 Door seal flange to floor panels.
- 2 Dash side front to floor panel (use approved gun-applied sealers).

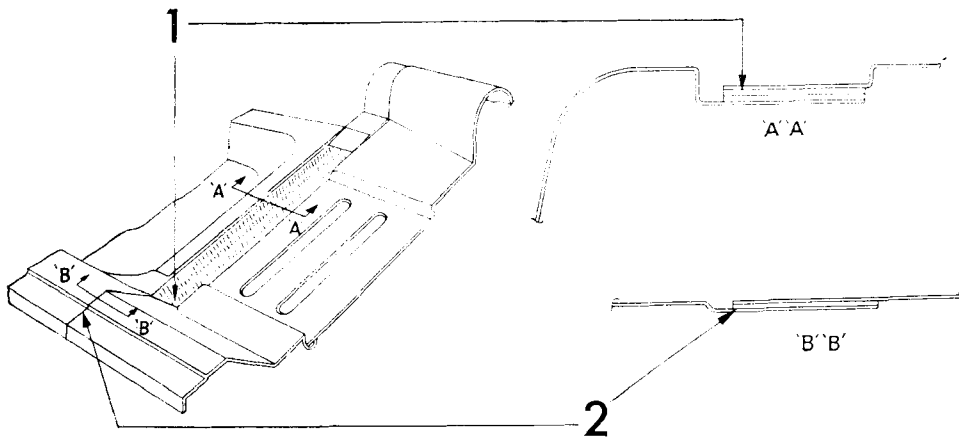
15. 1 Seal opening between draught ventilator and door panel (Glasticon 303).



16. 1 Gearbox cover corner (Glasticon 303).
 2 Gearbox cover rear corners and over tunnel, double application of (approved Mastics).
 3 Seal to gearbox cover (Bostik 8GC.122).
 4 Apply to sealing rubber before fitting cover $\frac{1}{8}$ " bead of (approved Mastics).

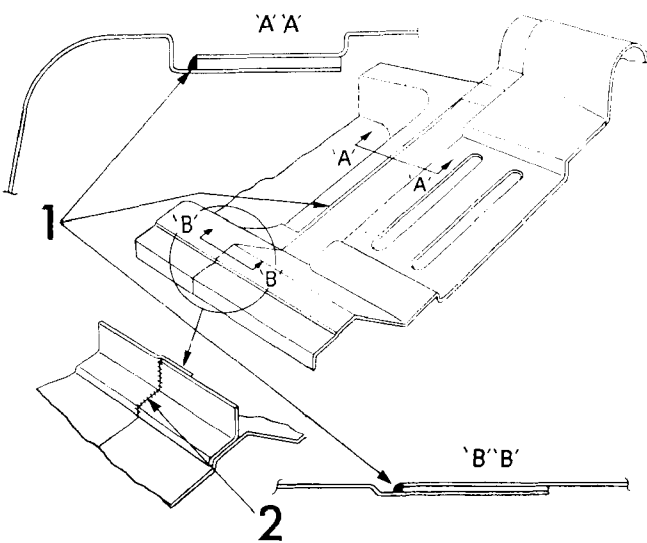
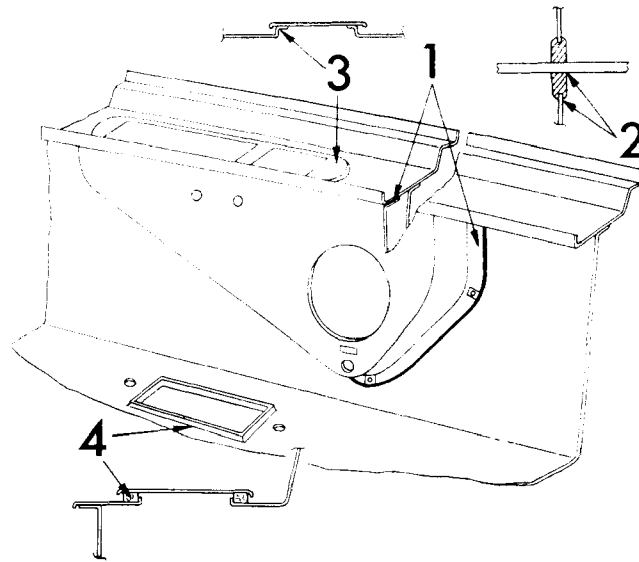
17. 1 Striker plate to "B" post (use approved Mastics).
 2 Courtesy switch to "A" post (use approved Mastics).





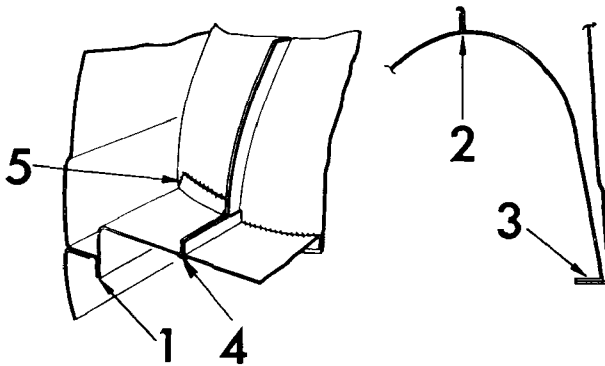
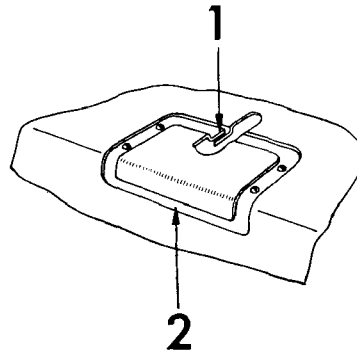
18. 1 Rear floor to front floor panel centre (Rubberised canvas).
 2 Rear floor to front floor panel outer (Everseal strip).

19. 1 Air distribution box to dash panel (use approved Plastisol).
 2 Heater control and choke cables to grommet and dash panel (use approved Mastics).
 3 Cover plate to be sealed when heater is not fitted (use approved Mastics).
 4 Cover plate to be sealed when heater is not fitted (use approved Mastics).



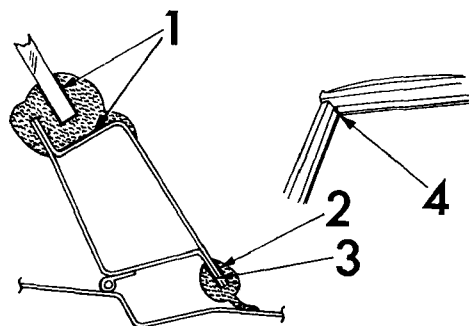
20. 1 Rear floor to front floor panel joint (use approved Mastics).
 2 Sill panel angle joints (use approved Plastisol).

21. 1 Seal cover-rear spring access hole (Prestik $\frac{1}{2}'' \times \frac{1}{8}''$).
- 2 Cover spring access to rear of seat pan (use approved Mastics).

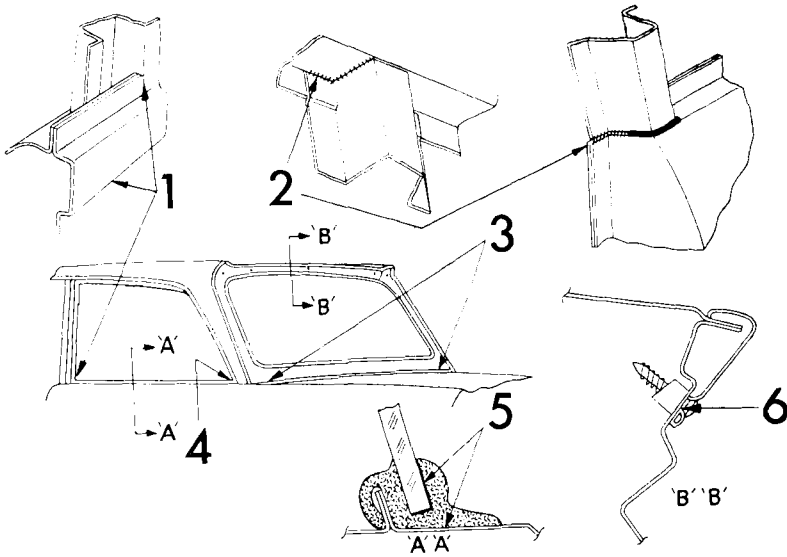


22. 1 Panel side rear seat pan to tonneau side (Seelastik interweld).
- 2 Wheelarch outer panel to wheelarch inner panels (use approved Mastics).
- 3 Wheelarch outer panel to tonneau side panel (Seelastik interweld).
- 4 Rear seat pan to panel side (top and underside) (use approved Mastics).
- 5 Corner holes plugged at the joints between outer wheelarch, tonneau lower side and seat panel (Glasticon 303).

23. 1 Backlight weatherstrip to glass and roof panel (use approved Mastics).
- 2 Backlight sealing rubber to roof (use approved Mastics).
- 3 Sealing rubber to be fixed firmly to panel (Bostik 1261).
- 4 Plug hole at roof to screen panel joint (use approved sealer).

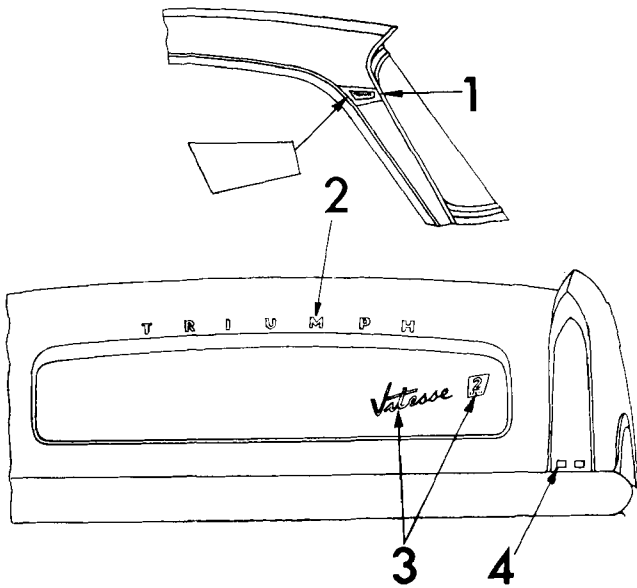
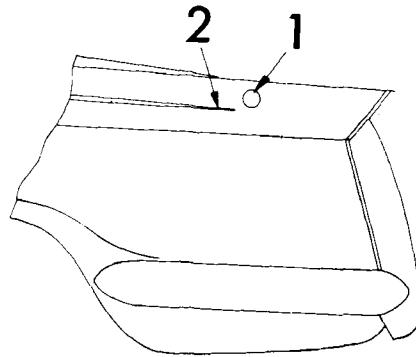


DUST AND WATER SEALING



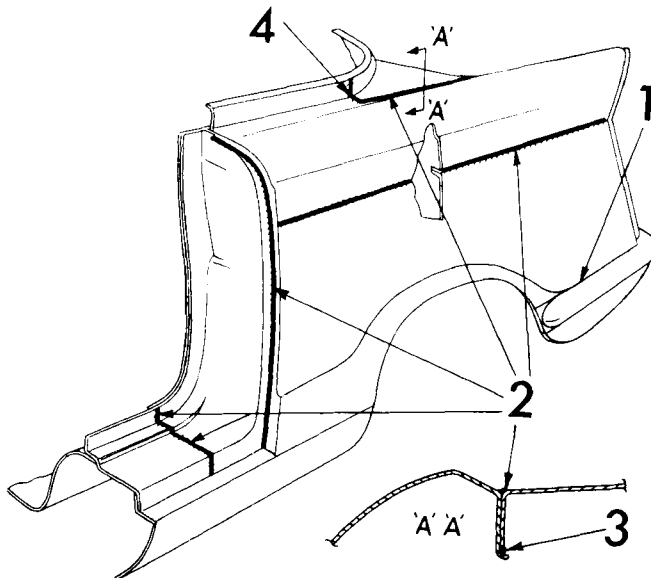
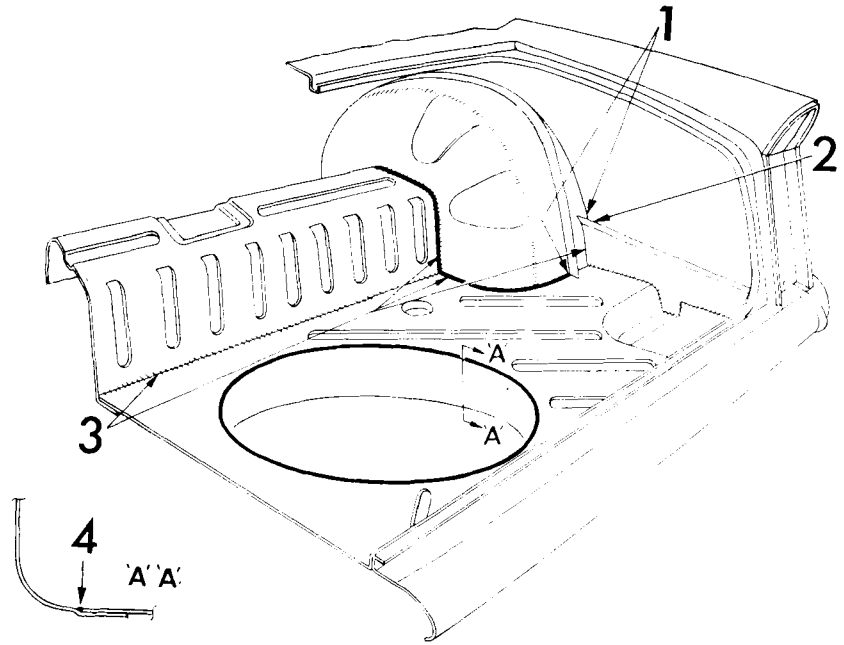
24. 1 Plug hole from interior of the body (Glasticon 303).
 2 Quarter light pillar (Glasticon 303).
 3 Seal roof rubber to deck 3" each side (Glasticon 303).
 4 Seal corner of roof to tonneau side before fitting quarter light rubber (Glasticon 303).
 5 Seal all round quarter light glazing strip to glass and body (use approved Mastics).
 6 Seal roof capping fixing to body (use approved Mastics).

25. 1 Seal round petrol tank filler neck grommet and body panel (use approved Mastics).
 2 End fixing of tonneau side moulding (Glasticon 303).



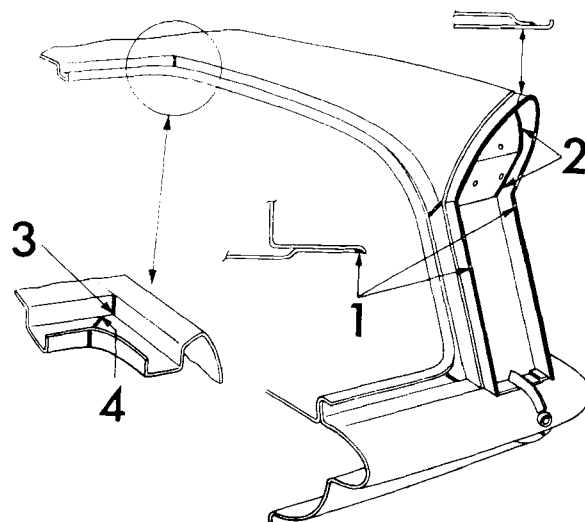
26. 1 Triumph badge to roof panel (Glasticon 303).
 2 Triumph letters to luggage compartment lid (Glasticon 303).
 3 Vitesse 6 badge to luggage compartment lid depression (use approved Mastics).
 4 Seal holes with Dalmas Klingfast C10 tape 1" wide.

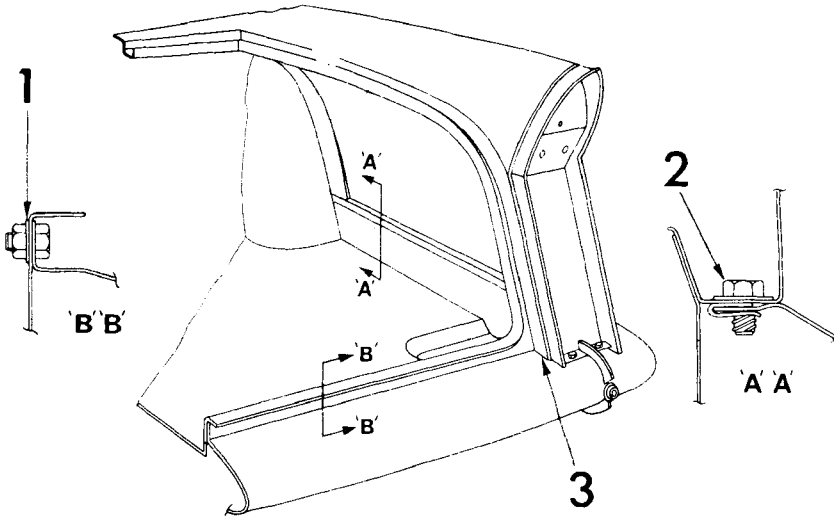
27. 1 Corner holes between the wheelarch outer panel and luggage floor side panel and between the inner and outer wheelarch panels and luggage floor (Glasticon 303).
- 2 Outer wheelarch tonneau side panel and rear valance side panel (use approved Mastics).
- 3 Luggage floor panel to seat pan
Seat pan to inner wheelarch panel
Inner wheelarch to floor panel
Wheelarch to luggage floor side panel (use approved Mastics).
- 4 Spare wheel tray to luggage floor (use approved Plastisol).



28. 1 Luggage compartment to valance fixings (use approved Plastisol).
- 2 "B" post outer panel to tonneau side
"B" post outer panel to sill
Tonneau side upper to lower panel
Rear deck to tonneau upper panel (use approved Plastisol).
- 3 Rear deck to tonneau side panel (use approved Mastics).
- 4 Seal hole in rear deck as shown (Glasticon 303).

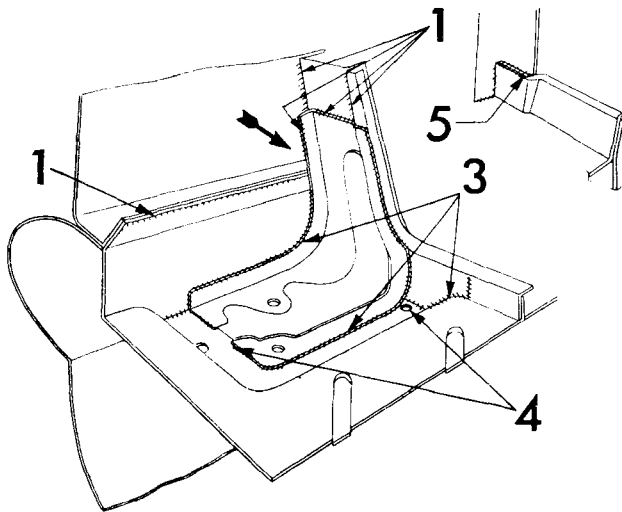
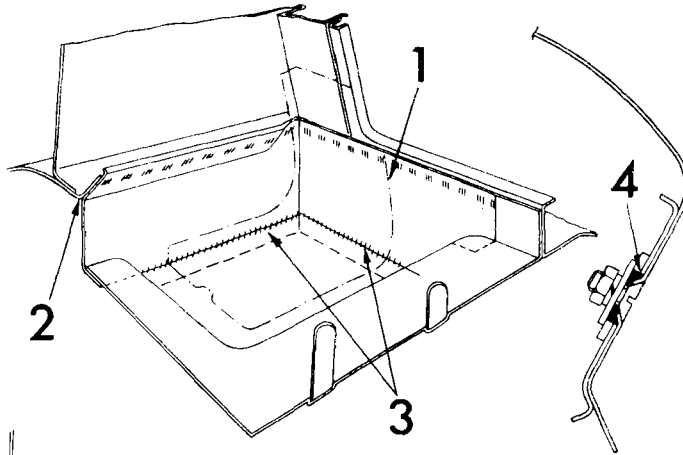
29. 1 Tonneau side rear end closing panel (use approved Plastisol).
- 2 Inside edge of tail lamp apertures (use approved Plastisol).
- 3 Rear deck to tonneau side (Glasticon 303).
- 4 Water channel-rear deck to tonneau side (use approved Plastisol).





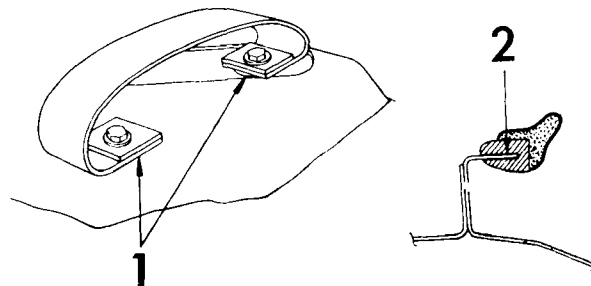
30. 1 Seal valance fixings on inside of body (use approved Mastics).
 2 Seal side valance fixings on inside of body (use approved Mastics).
 3 Lower ends of tail lamp aperture before assembly of valance panels (use approved Strip Sealer).

31. 1 Seal between rear valance centre and luggage floor panel side (Seelastik interweld).
 2 Seal between rear valance side panel and luggage floor panel side (Seelastik interweld).
 3 Seal luggage compartment floor joint as shown (Seelastik interweld).
 4 Trunk lid stay fixings (Seelastik interweld).

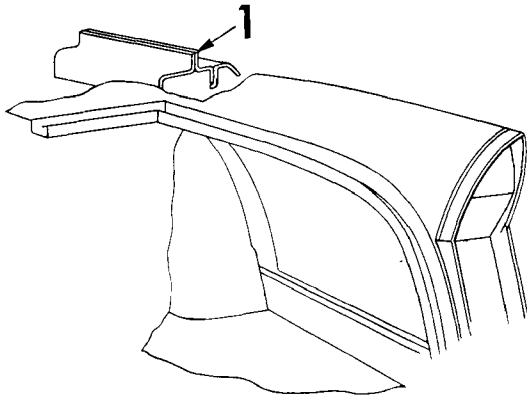
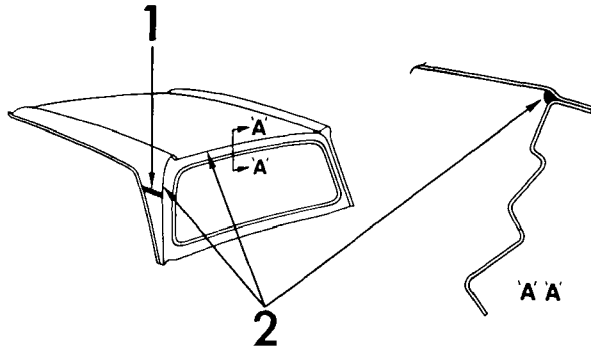


32. 1 Luggage floor side to tonneau side lower panel (use approved Mastics).
 2 Rear body mounting bracket to tonneau closing panel (use approved Mastics).
 3 Rear body mounting bracket to luggage compartment floor and rear valance (use approved Mastics).
 4 Corner holes plugged (Glasticon 303).
 5 Tonneau side panel lower corner holes (use approved Mastics).

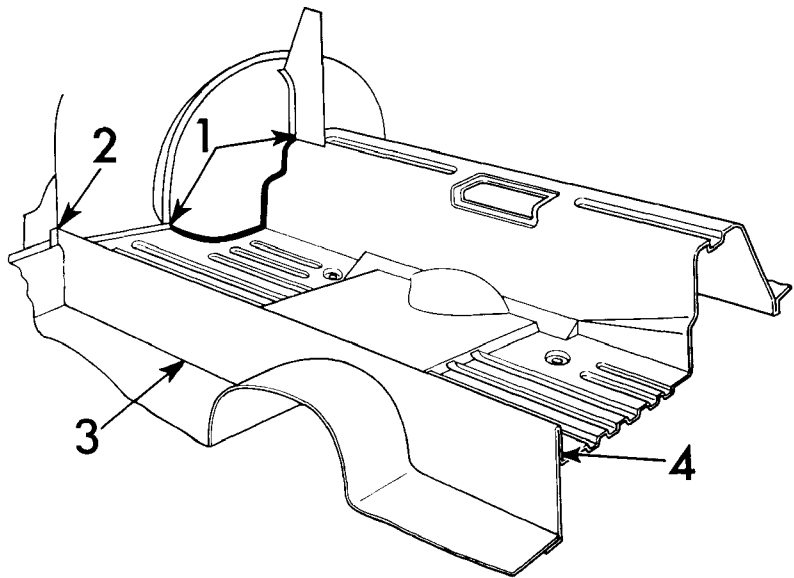
33. 1 Seal tool kit strap to luggage floor panel (use approved Mastics).
 2 Trunk lid seal to be fixed firmly in position (Plus products 6/63D).



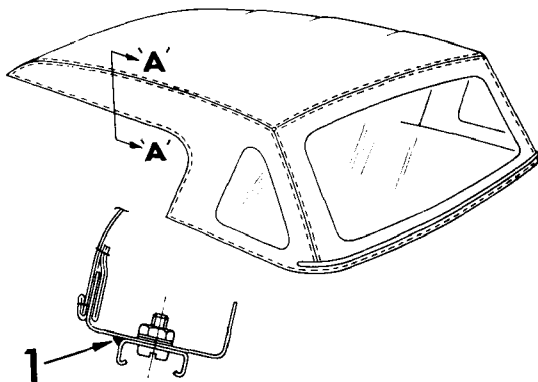
34. 1 Roof top to lower panel (Plastisol 53).
 2 Panel roof top to panel lower roof (Expandite 607/1).



35. 1 Joint between waist rail and deckpanel (use approved Plastisol, approx. 1/2" each side).



36. 1 Wheelarch to seat pan (use approved Plastisol).
 2 Seal holes at base of "B" post (use approved Mastics).
 3 Rear floor panel to heelboard (use approved Mastics).
 4 Heelboard panel to rear seat pan (use approved Mastics).



37. 1 Rubber retainer to cantrail after setting with (cream Seelastik).

TRIUMPH GT6 and VITESSE 2-litre WORKSHOP MANUAL

GROUP 6

CONTENTS

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GT6 MARK 1—NORTH AMERICAN MARKET ONLY. MODIFICATIONS TO COMPLY WITH U.S. FEDERAL STANDARDS

Wiring diagram	Refer to page 6-104
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continued

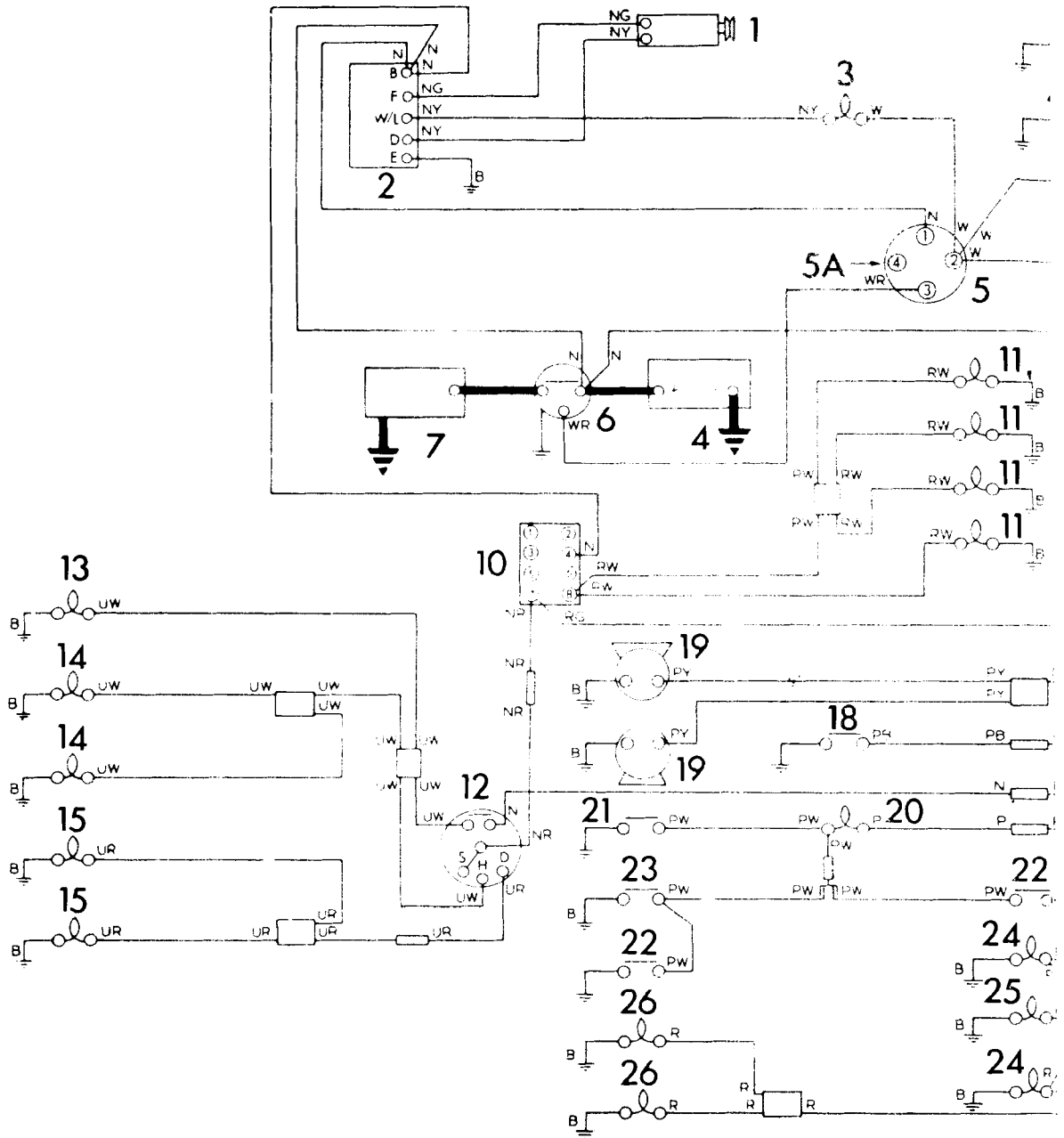
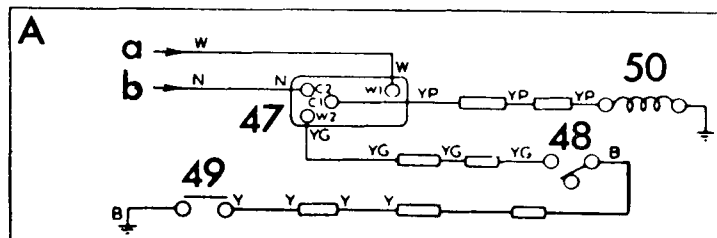
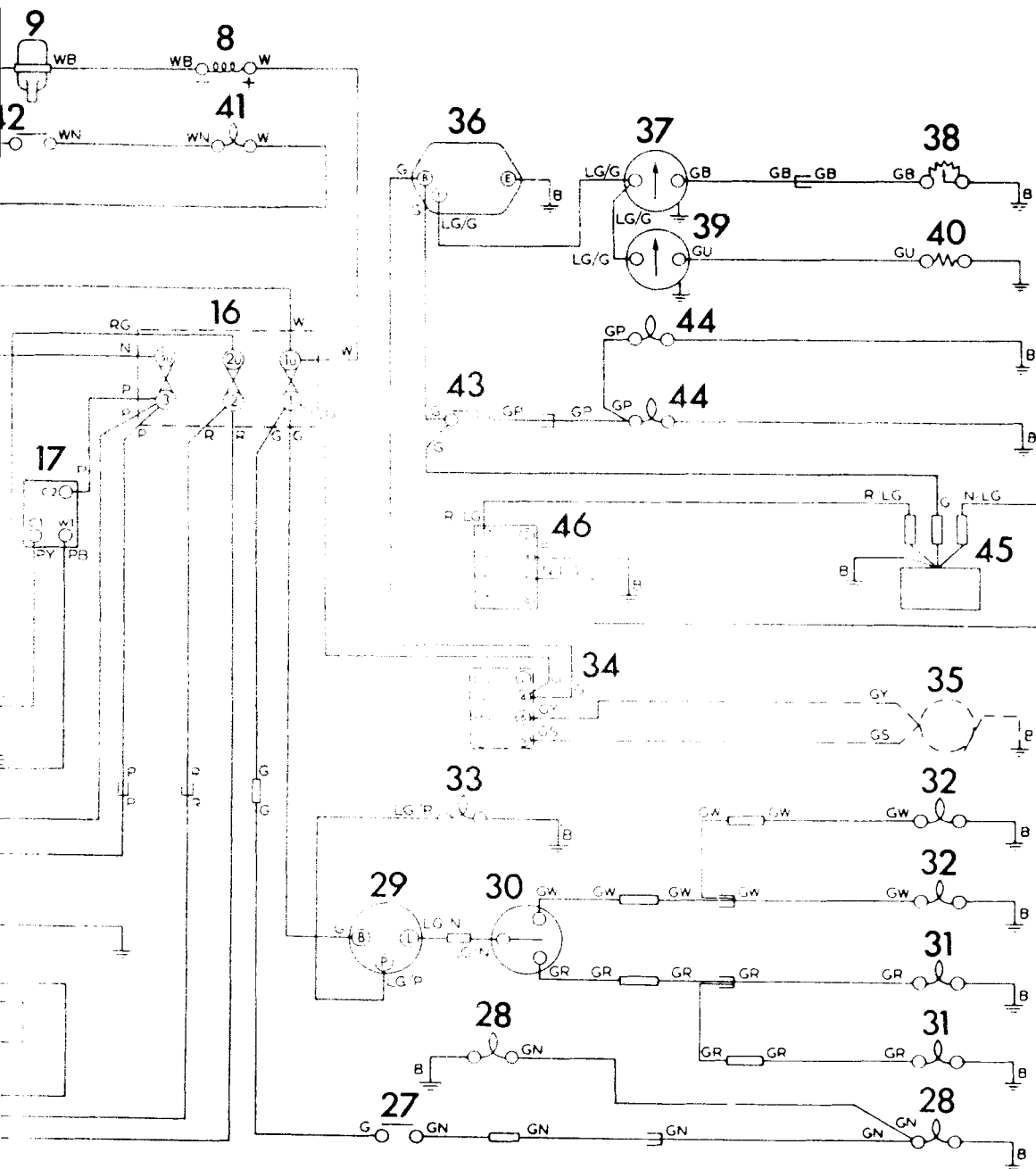


Fig. 1. Wiring diagram—C



G084

T6 Mark 1—right hand steer

KEY TO WIRING DIAGRAM—GT6 MARK 1—RIGHT HAND STEER

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

EXERCISE CARE WHEN CONNECTING INTO CIRCUIT ANY ACCESSORY THAT MAY CONTAIN SILICON DIODES OR TRANSISTORS. IRREPARABLE DAMAGE MAY RESULT TO SUCH POLARITY SENSITIVE COMPONENTS IF INCORRECTLY FITTED.

- | | |
|---|--|
| 1 Generator | 34 Heater switch (optional extra) |
| 2 Control box | 35 Heater motor (optional extra) |
| 3 Ignition warning light | 36 Voltage stabilizer |
| 4 Battery | 37 Fuel indicator |
| 5 Ignition/starter switch | 38 Fuel tank unit |
| 5A Ignition/starter switch—
radio supply connector | 39 Temperature indicator |
| 6 Starter solenoid | 40 Temperature transmitter |
| 7 Starter motor | 41 Oil pressure warning light |
| 8 Ignition coil | 42 Oil pressure switch |
| 9 Ignition distributor | 43 Stop lamp switch |
| 10 Master light switch | 44 Stop lamp |
| 11 Instrument illumination | 45 Windscreen wiper motor |
| 12 Column light switch | 46 Windscreen wiper switch |
| 13 Main beam warning light | |
| 14 Main beam | A. Overdrive (optional extra) |
| 15 Dip beam | |
| 16 Fuse assembly | 47 Overdrive relay |
| 17 Horn relay | 48 Overdrive column switch |
| 18 Horn push | 49 Overdrive gearbox switch |
| 19 Horn | 50 Overdrive solenoid |
| 20 Roof lamp | (a) From ignition/starter switch—
connector 2 |
| 21 Roof lamp tailgate switch | (b) From ignition/starter switch—
connector 1 |
| 22 Roof lamp door switch | |
| 23 Roof lamp fascia switch | |
| 24 Tail lamp | |
| 25 Plate illumination lamp | |
| 26 Front parking lamp | |
| 27 Reverse lamp switch | |
| 28 Reverse lamp | |
| 29 Flasher unit | |
| 30 Flasher switch | |
| 31 L.H. Flasher lamp | |
| 32 R.H. Flasher lamp | |
| 33 Flasher warning light | |

COLOUR CODE

- | | |
|-----------|-----------------|
| N. Brown | L/G Light Green |
| U. Blue | W. White |
| R. Red | Y. Yellow |
| P. Purple | S. Slate |
| G. Green | B. Black |

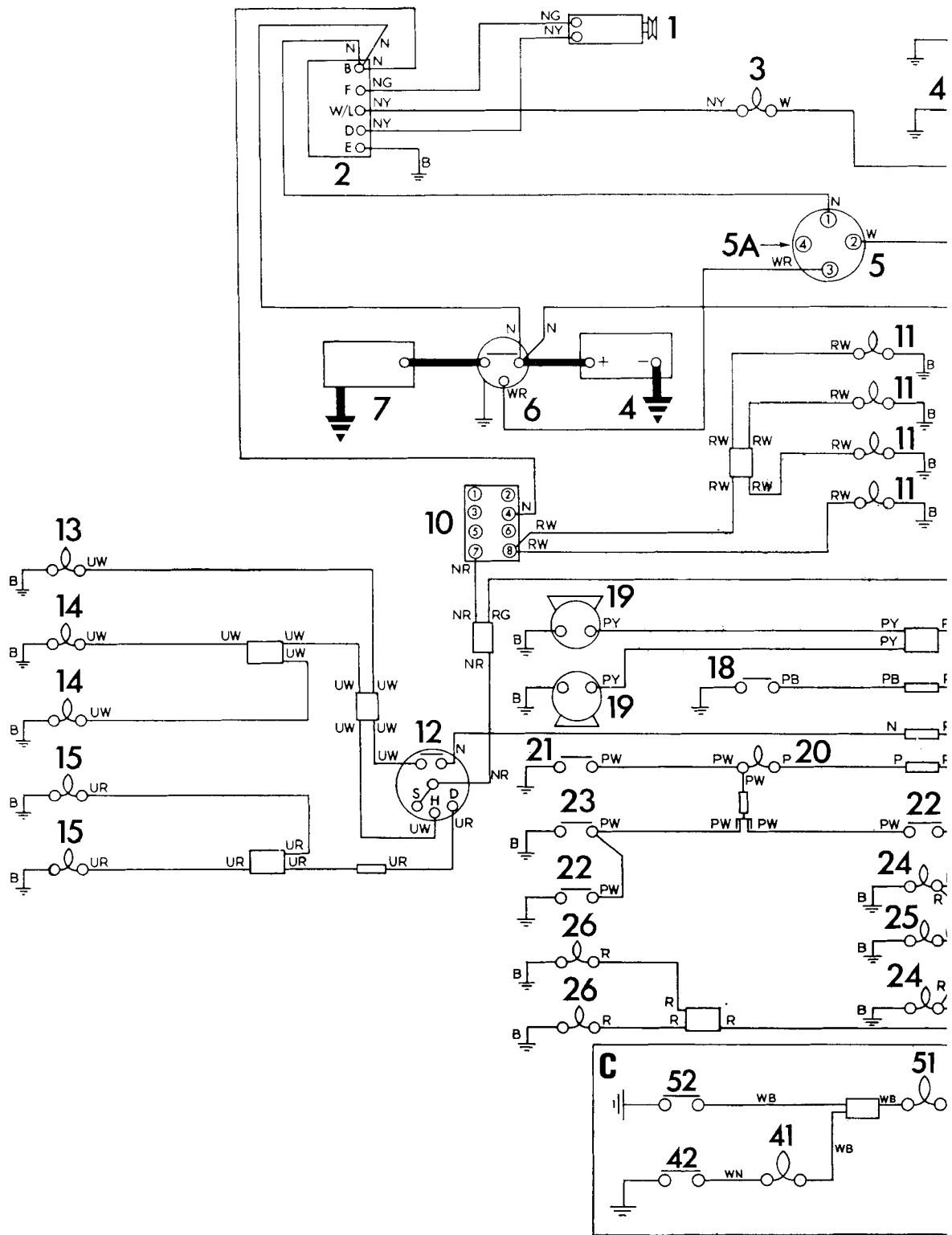
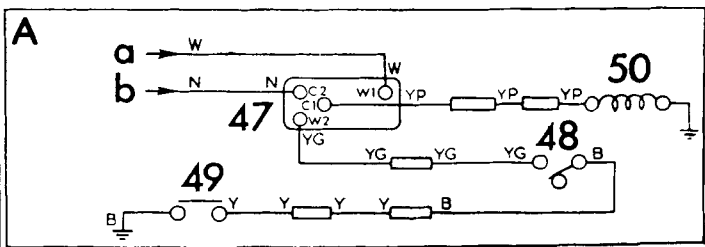
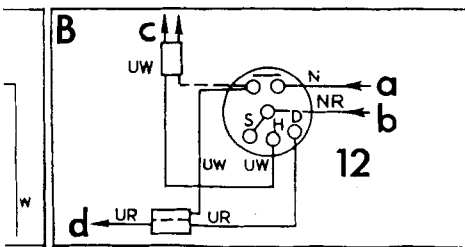
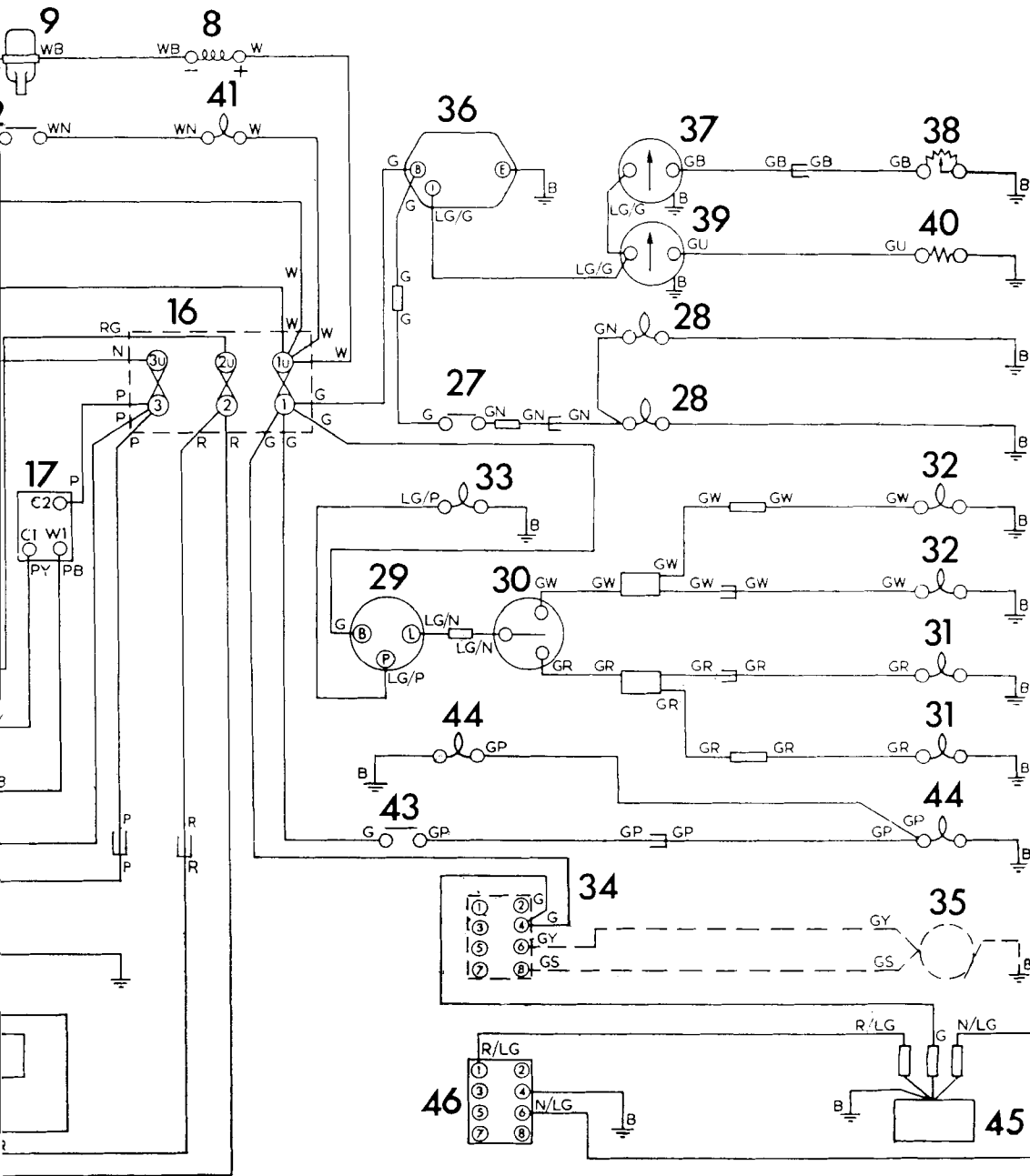


Fig. 2. Wiring diagram—



G083

GT6 Mark 1—left hand steer

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Brake line failure and oil pressure indication—left hand steer only	Refer to page 6-207

GT6 PLUS—INTRODUCED OCTOBER 1968
THIS VEHICLE IS PRODUCED FOR THE NORTH AMERICAN MARKET
ONLY AND COMPLIES WITH U.S. FEDERAL STANDARDS

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Starter motor	Refer to page 6-124
Ignition coil	Refer to page 6-129
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Bulb chart	Refer to page 6-319
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Heated backlight—tinted	6-404
Horns	Refer to page 6-146
Overdrive	Refer to page 6-148
Windscreen wiper motor	Refer to page 6-323
Voltage stabilizer	Refer to page 6-155
Fuel indication	Refer to page 6-327
Temperature indication	Refer to page 6-327
Brake line failure and oil pressure indication—left hand steer only	Refer to page 6-207

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Fuse box and line fuse	6-104V
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Ignition/starter switch	Refer to GT6 Page 6-122
Starter solenoid	Refer to GT6 Page 6-123
Starter motor	Refer to GT6 Page 6-124
Ignition coil	Refer to GT6 Page 6-129
Ignition distributor	6-108V
Lamp switches	6-115V
Lamps and bulbs	6-188V
Flasher unit	6-124V
Horns	6-124V
Overdrive	6-125V
Windscreen wiper motor	6-126V
Voltage stabilizer	Refer to GT6 Page 6-155
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Fuse box and line fuse	Refer to Vitesse Page 6-104V
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Starter solenoid	Refer to GT6 page 6-317
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Lamp switches	Refer to Vitesse Page 6-115V
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Horns	Refer to Vitesse Page 6-124V
Overdrive	Refer to Vitesse Page 6-125V
Windscreen wiper motor	Refer to Vitesse Page 6-126V
Voltage stabilizer	Refer to GT6 Page 6-155
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Ignition distributor	6.516
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Turn signal flasher unit	Refer to page 6.320
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Heated backlight—clear	6.519
Horns	6.519
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Windscreen wiper motor	6.520
Voltage stabilizer	6.520
Fuel indication	Refer to page 6.327
Temperature indication	Refer to page 6.327
Oil pressure indication—right hand steer only	Refer to page 6.160
Brake line failure and oil pressure indication—left hand steer only	Refer to page 6.207

GT6 MARK 3—INTRODUCED OCTOBER 1970

THIS VEHICLE IS PRODUCED FOR THE NORTH AMERICAN MARKET
ONLY AND COMPLIES WITH U.S. FEDERAL STANDARDS.

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Wiring diagram	6.602
Fuse assembly	6.608
Alternator	Refer to page 6.510
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Starter solenoid	Refer to page 6.514
Starter motor	Refer to page 6.124
Ignition coil	Refer to page 6.515
Ignition distributor	6.610
Bulb chart	Refer to page 6.518
Turn signal flasher unit	Refer to page 6.320
Hazard warning system	Refer to page 6.519
Head beacklight—clear	Refer to page 6.519
Horns	Refer to page 6.519
Overdrive	Refer to page 6.148
Windscreen wiper motor	Refer to page 6.520
Voltage stabilizer	Refer to page 6.520
Fuel indication	Refer to page 6.327
Temperature indication	Refer to page 6.327
Oil pressure indication—right hand steer only	Refer to page 6.160
Brake line failure and oil pressure indication—left hand steer only	Refer to page 6.207
Seat belt warning system	6.612

KEY TO WIRING DIAGRAM—GT6 MARK 1—LEFT HAND STEER

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

EXERCISE CARE WHEN CONNECTING INTO CIRCUIT ANY ACCESSORY THAT MAY CONTAIN SILICON DIODES OR TRANSISTORS. IRREPARABLE DAMAGE MAY RESULT TO SUCH POLARITY SENSITIVE COMPONENTS IF INCORRECTLY FITTED.

- | | |
|---|--|
| 1 Generator | 43 Stop lamp switch |
| 2 Control box | 44 Stop lamp |
| 3 Ignition warning light | 45 Windscreen wiper motor |
| 4 Battery | 46 Windscreen wiper switch |
| 5 Ignition/starter switch | |
| 5A Ignition/starter switch—
radio supply connector | A. Overdrive (optional extra) |
| 6 Starter solenoid | 47 Overdrive relay |
| 7 Starter motor | 48 Overdrive column switch |
| 8 Ignition coil | 49 Overdrive gearbox switch |
| 9 Ignition distributor | 50 Overdrive solenoid |
| 10 Master light switch | (a) From ignition/starter switch—
connector 2 |
| 11 Instrument illumination | (b) From ignition/starter switch—
connector 1 |
| 12 Column light switch | |
| 13 Main beam warning light | B. Dip beam flasher (Italy only) |
| 14 Main beam | 12 Column light switch |
| 15 Dip beam | (a) From fuse assembly |
| 16 Fuse assembly | (b) From master light switch |
| 17 Horn relay | (c) To main beam circuit |
| 18 Horn push | (d) To dip beam circuit |
| 19 Horn | |
| 20 Roof lamp | C. GT6 Mark 1—Modifications to comply
with U.S. Federal standards |
| 21 Roof lamp tailgate switch | 41 Oil pressure warning light |
| 22 Roof lamp door switch | 42 Oil pressure switch |
| 23 Roof lamp fascia switch | 51 Brake line failure warning light |
| 24 Tail lamp | 52 Brake line failure switch |
| 25 Plate illumination lamp | |
| 26 Front parking lamp | |
| 27 Reverse lamp switch | |
| 28 Reverse lamp | |
| 29 Flasher unit | |
| 30 Flasher switch | |
| 31 L.H. Flasher lamp | |
| 32 R.H. Flasher lamp | |
| 33 Flasher warning light | |
| 34 Heater switch (optional extra) | |
| 35 Heater motor (optional extra) | |
| 36 Voltage stabilizer | |
| 37 Fuel indicator | |
| 38 Fuel tank unit | |
| 39 Temperature indicator | |
| 40 Temperature transmitter | |
| 41 Oil pressure warning light | |
| 42 Oil pressure switch | |

COLOUR CODE

N. Brown	L/G Light Green
U. Blue	W. White
R. Red	Y. Yellow
P. Purple	S. Slate
G. Green	B. Black

FUSE ASSEMBLY

Data

Fuse

Manufacturer	..	..	..	..	..	..	..	..	Lucas
Rating	..	..	..	..	..	..	..	..	35 amp.
Lucas part No.	..	..	..	..	..	..	..	..	188218
Stanpart No.	..	..	..	..	..	..	..	..	58465
Lucas colour code	..	..	..	..	..	..	..	..	White
Current capacity	..	..	..	..	..	..	..	..	17.5 amp.
Fusing current—Prolonged	..	..	..	..	..	..	..	..	35 amp.
Instantaneous	..	..	..	..	..	..	..	..	40 amp.

CIRCUITS

The top fuse fed by a white cable from the ignition/starter switch protects the following circuits:

- Flasher lamp circuit
- Reverse lamp circuit
- Stop lamp circuit
- Heater circuit (optional extra)
- Windscreen wiper circuit
- Fuel indication circuit
- Temperature indication circuit

The centre fuse fed by a red/green cable from the master light switch protects the following circuits:

- Front parking lamp circuit
- Tail lamp circuit
- Plate illumination lamp circuit

The bottom fuse fed by a brown cable from the battery protects the following circuits:

- Headlamp flasher circuit
- Roof lamp circuit
- Horn circuit

Description

The fuse assembly is a component of the main harness. It is secured to an aperture provided on the bulkhead by integral plastic clips. The unit contains three operational fuses and has provision to house two spares.

The fuses are protected by a pull-off transparent plastic cover which need not be removed to inspect the fuses.

Failure of a particular fuse is indicated when all the circuits protected by it become inoperative. If a new fuse fails establish the cause and rectify the fault before fitting a second replacement.

To obtain access to the connectors at the rear of the unit it is necessary to remove the parcel shelf as detailed in Group 5

Removal/Installation

It is possible to remove the fuse assembly from the vehicle and main harness. However as the fuse assembly is a component of the main harness this procedure should not normally be required.

Remove fuse assembly

1. Remove battery as detailed in Group 6—Battery.
2. Disconnect harness from appropriate components on bulkhead and earth wire from side of battery box.
3. Remove parcel shelf as detailed in Group 5.
4. Disconnect electrical connectors from rear of fuse assembly.
5. Ease plastic clips over edge of bulkhead aperture to release fuse assembly.
6. Detach rubber grommet from fuse assembly. Withdraw fuse assembly over harness.
7. If required remove rubber grommet by carefully withdrawing over harness.

Install fuse assembly

1. If required install rubber grommet by carefully fitting over harness. Inner lip should face forward.
2. Fit fuse assembly over harness. Attach rubber grommet to fuse assembly.
3. Position upper plastic clips to edge of bulkhead aperture and push home lower clips to secure fuse assembly.
4. Connect electrical connectors to rear of fuse assembly.
5. Install parcel shelf as detailed in Group 5.
6. Connect harness to appropriate components on bulkhead. Fit earth wire and battery earth lead to side of battery box ensuring good electrical contact.
7. Install battery as detailed in Group 6—Battery.



Fig. 3. Fuse assembly installed

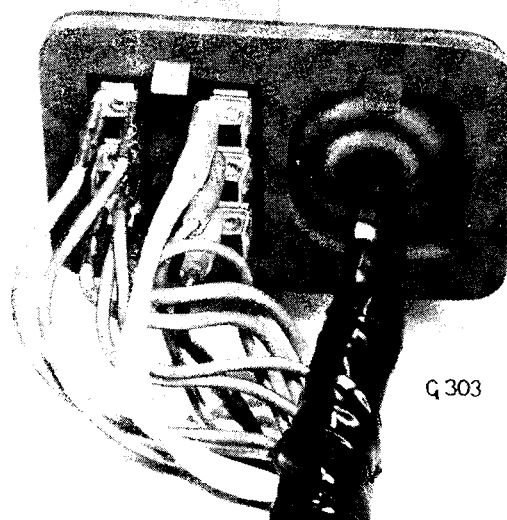


Fig. 4. Fuse assembly—rear view

GENERATOR

Data

Manufacturer	Lucas
Type	C4OL
Lucas part No... .. .	22763
Stanpart No.	212792
Yoke diameter	4.062 in max.
Output—maximum cold at 2275 generator r.p.m. (1660 engine r.p.m.) at 13.5 generator volts with 0.54 ohm. resistance load	25 amp.
Skim commutator—minimum skimming diameter	1.430 in.
Brush length—renew if less than	$\frac{9}{32}$ in.
Brush carbon grade	H 100
Brush spring tension	17—32 ozs.
Field winding resistance—measured between field connector and yoke	5.9 ± 0.3 ohm.

Description

The generator is a two-pole two-brush machine arranged to work in conjunction with a control box. Ventilation apertures in the commutator end bracket and drive end bracket allow a fan which is mounted adjacent to the pulley to draw cooling air through the unit. The armature shaft is supported at the drive end by a ballrace and at the commutator end by a porous bronze bearing bush. The commutator is moulded.

Service

Inject a few drops of engine oil into OIL hole on commutator end bracket.

The generator will benefit from an occasional clean and inspection.

Clean and inspection

1. Disassemble generator as detailed below.
2. Clean dust from all components.
3. Clean commutator with petrol moistened cloth. Clear insulation slots of copper and carbon residue. If worn refer to Commutator below.
4. Inspect ballrace and porous bronze bearing bush. If worn renew.
5. Clean brushes and holders with petrol moistened cloth. Check brush length—renew if less than $\frac{9}{32}$ ". If assemblies are in poor condition refer to Brushes below.
6. Assemble generator as detailed below.

Removal/installation generator

Refer to Group 1.

Disassemble generator

1. Remove through bolts.
2. Remove commutator end bracket.
3. Remove fibre thrust washer.
4. Remove drive end bracket complete with armature and pulley.

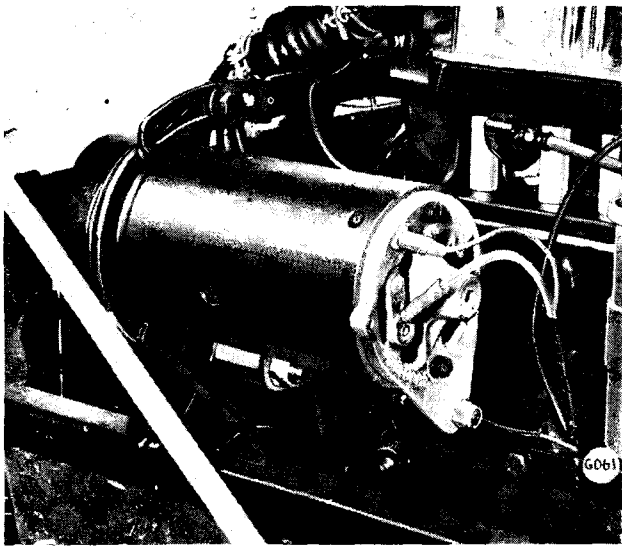
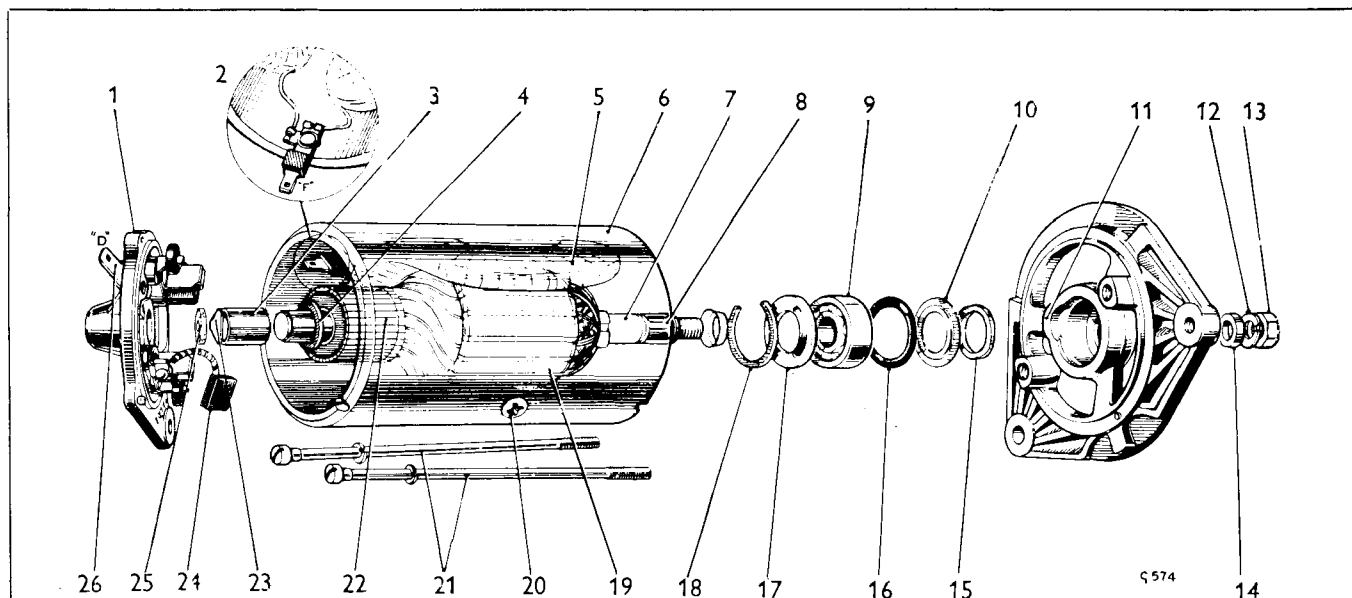


Fig. 5. Generator installed



Assemble generator

1. Fit drive end bracket complete with armature and pulley.
2. Fit fibre thrust washer.
3. Lightly lubricate porous bronze bearing bush with engine oil. Position brush springs to side and insert brushes into holders. Position commutator end bracket.
4. Fit through bolts.
5. Insert thin screwdriver through ventilation holes and position brush springs correctly to brushes.

Remove pulley and fan

1. Remove shaft nut.
NOTE: Prevent the shaft turning while performing this operation by wrapping a scrap fan belt round pulley and retaining by hand or vice.
2. Remove washer.
3. Remove pulley. If necessary employ extractor.
4. Remove fan.
5. Remove key.
6. Remove pulley spacer.

Install pulley and fan

1. Ensure drive end bracket is correctly fitted to shaft.
2. Fit pulley spacer.
3. Fit key.
4. Fit fan. Blades must face drive end bracket.
5. Fit pulley. Machined centre boss must face fan.
6. Fit washer.
7. Fit shaft nut.
NOTE: Prevent the shaft turning while performing this operation by wrapping a scrap fan belt round pulley and retaining by hand or vice.

- 1 Commutator end bracket
- 2 Field connector and field winding earth lead
- 3 Porous bronze bearing bush
- 4 Fibre thrust washer
- 5 Field winding
- 6 Yoke
- 7 Shaft
- 8 Key
- 9 Ballrace
- 10 Pressure ring and felt ring retaining plate
- 11 Drive end bracket
- 12 Washer
- 13 Shaft nut
- 14 Pulley spacer
- 15 Felt ring
- 16 Pressure ring
- 17 Bearing retaining plate
- 18 Circlip
- 19 Armature
- 20 Pole shoe screw
- 21 Through bolts
- 22 Commutator
- 23 Felt ring retainer
- 24 Brush
- 25 Felt ring
- 26 Output connector

Fig. 6. Generator details

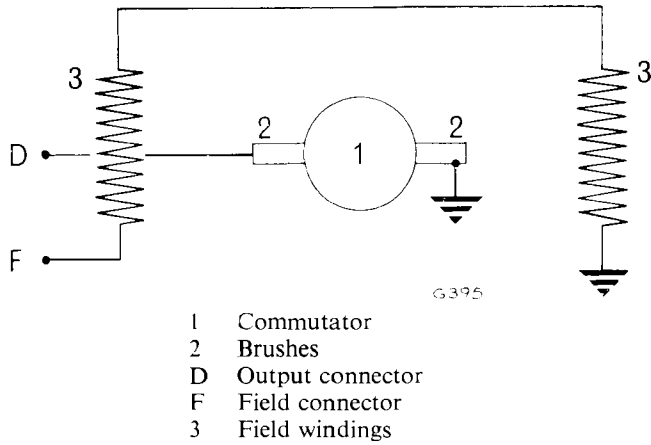


Fig. 7. Component wiring diagram

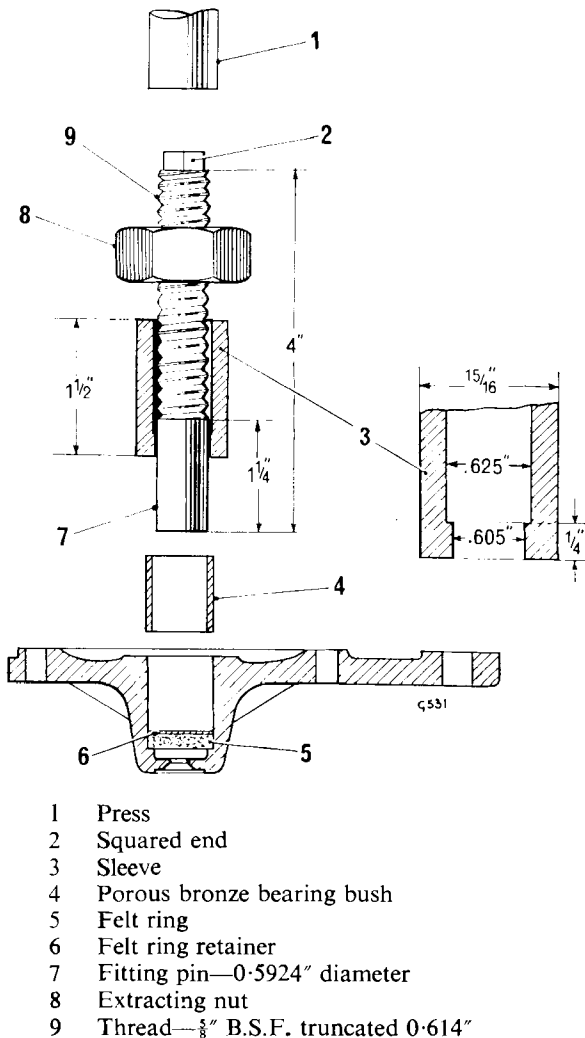


Fig. 8. Install porous bronze bearing bush

Remove drive end bracket

1. Disassemble generator as detailed above.
2. Remove pulley and fan as detailed above.
3. Using suitable press remove drive end bracket. CAUTION: DO NOT ATTEMPT TO REMOVE DRIVE END BRACKET BY APPLYING HAMMER BLOW TO SHAFT END. SUCH ACTION MAY BURR OVER AND DAMAGE SHAFT NUT THREAD.

Install drive end bracket

1. Using pulley spacer and suitable tube fitted over shaft fit drive end bracket by applying pressure to ballrace inner journal. CAUTION: IF PULLEY SPACER IS NOT EMPLOYED FELT RING MAY BE DAMAGED.

Remove ballrace

1. Disassemble generator as detailed above.
2. Remove pulley and fan as detailed above.
3. Remove drive end bracket as detailed above.
4. Insert screwdriver in extractor notch and prise out circlip.
5. Using suitable press remove ballrace and associated components.

Install ballrace

1. Fit felt ring, pressure ring and felt ring retaining plate and pressure ring.
2. Pack ballrace with lubricant Shell 'Alvania' RA grease or equivalent.
3. Using suitable press fit ballrace.
4. Fit bearing retaining plate and circlip. If necessary compress assembly to allow circlip to be fitted.

Remove porous bronze bearing bush

1. Disassemble generator as detailed above.
2. Remove porous bronze bearing bush. This operation can be performed using suitable extractor or by screwing a $\frac{3}{8}$ " tap squarely into bush and withdrawing.
3. Withdraw felt ring retainer and felt ring.

Install porous bronze bearing bush

1. Prepare porous bronze bearing bush by immersing in thin engine oil for 24 hours. If required this period may be reduced by immersing in thin engine oil heated to 100° C. for 2 hours. Allow oil to cool before removing bush.
2. Insert felt ring and felt ring retainer.
3. Using tool as shown on Fig. 8 and suitable press fit bush. Tool fitting pin must be highly polished and 0.5924" diameter. To withdraw tool after fitting turn extracting nut while retaining squared end. Do not ream bush after fitting or porosity may be impaired.

Remove brushes

1. Disassemble generator as detailed above.
2. Remove screws to release eyelets. Remove brushes from commutator end bracket.

Install brushes

CAUTION: BRUSHES OF SPECIAL CARBON GRADE H 100 ARE FITTED TO C40L GENERATORS. TO AVOID NOISIER COMMUTATION AND SLIGHTLY INFERIOR BRUSH LIFE DO NOT FIT BRUSHES OF ORDINARY CARBON GRADE B AS REPLACEMENTS. CARBON GRADE IS MARKED ON BRUSH SIDE.

NOTE: New brushes are pre-formed. Bedding of brushes to commutator is not required.

1. Fit brushes to commutator end bracket. Fit screws to secure eyelets.

Remove field windings

1. Disassemble generator as detailed above.
2. Release field connector and field winding earth lead by drilling out rivet from yoke.
3. Mark pole shoes and yoke so original positions are known.
4. Using suitable wheel operated screwdriver remove two pole shoe screws.
5. Remove insulation strip.
6. Withdraw assembly from yoke.
7. Remove pole shoes from field windings.

Install field windings

1. Observe relationship of field windings to yoke determined by commutator end bracket. Fit pole shoes to field windings so original positions are maintained.
2. Insert assembly into yoke. Ensure that taping of field windings is not damaged. Fit two pole shoe screws finger tight.
3. Fit insulation strip.
4. Using suitable wheel operated screwdriver tighten two pole shoe screws.
5. Secure field connector and field winding earth lead by riveting to yoke.

Defective charging system

In the event of a defective charging system check the generator as follows.

Check two electrical connectors are correctly fitted.

Ensure that fan belt is not slipping on generator pulley. If required adjust fan belt as detailed in Group 1.

If a radio interference suppression capacitor is fitted between generator armature line and earth disconnect this unit and perform system functional test. If system now operates correctly renew capacitor.

If required perform generator functional check.

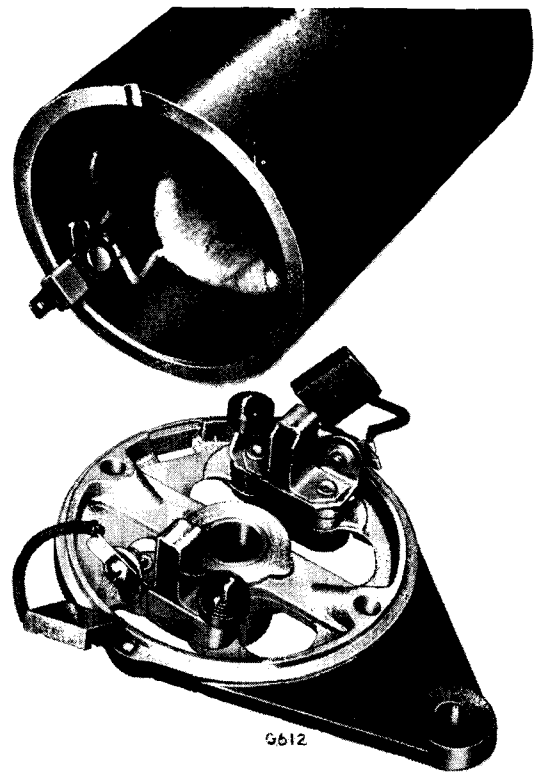


Fig. 9. Brushes

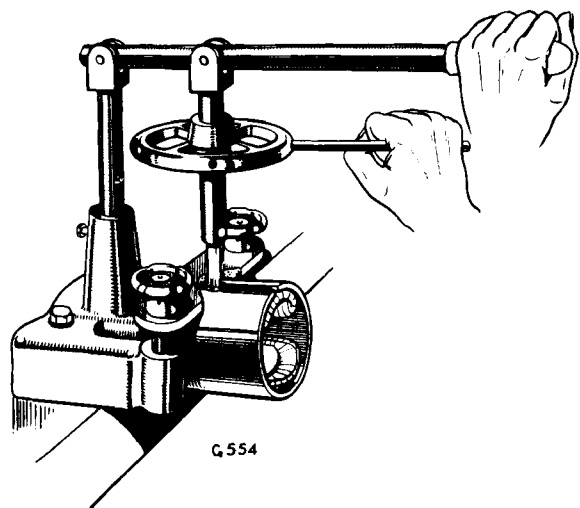


Fig. 10. Wheel operated screwdriver

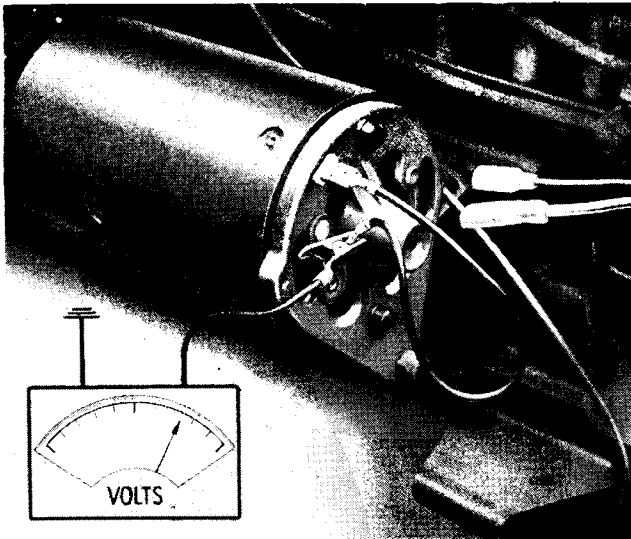


Fig. 11. Generator functional check

General functional check

1. Disconnect electrical connectors.
2. Using suitable jumper lead connect generator connectors.
3. Connect voltmeter (0-20 volt scale) between jumper lead and earth.
4. Run engine gradually increasing speed. Voltmeter reading should rise rapidly without fluctuation. Restrict engine speed so voltmeter reading does not exceed 20 volts. Do not race engine in an attempt to increase voltmeter reading. It should be sufficient to run engine up to approximately 730 r.p.m. If voltmeter reading does not rise rapidly or fluctuates the indication is that the generator requires overhaul or replacement.

Commutator

Clean commutator with petrol moistened cloth. Clear insulation slots of copper and carbon residue. If the unit is in good condition it will be smooth and free from pits or burned spots. If necessary polish with fine glass paper. If excessively worn skim commutator.

Skim commutator

1. Remove pulley and fan as detailed above.
2. Remove drive end bracket as detailed above.
3. Mount armature in lathe.
4. If badly worn rough turn. Finish by diamond turning. Do not remove more metal than necessary. Do not cut below minimum skimming diameter 1.430".
5. Polish with fine glass paper.
6. Clean with petrol moistened cloth and clear insulation slots of all residue.

CAUTION: DO NOT UNDERCUT THE INSULATORS BETWEEN THE SEGMENTS—THE PRODUCTION UNDERCUT IS OF SUFFICIENT DEPTH TO OBLVIATE ANY NEED FOR THIS.

Brushes

Clean brushes and holders with petrol moistened cloth. Ensure that the brushes move freely in the holders. If necessary lightly polish holder sides with a fine file.

Check brush length—renew if less than $\frac{9}{32}$ ".

Using a suitable spring scale check brush spring tension. Tension should be 17-32 ozs. If tension is low renew brush springs.

Field winding continuity

Field winding continuity may be checked using ammeter or ohmmeter.

Using ammeter—Provide suitable test circuit with 12 volts DC supply, ammeter and field winding in series. Connect field winding into circuit between field connector and yoke. Ammeter reading should be approximately 2 amp.

If ammeter reading is zero the indication is an open circuit in the field winding.

If ammeter reading is much more than 2 amp. the indication is that the insulation of one field winding is defective.

Using ohmmeter—Connect ohmmeter between field connector and yoke. Ohmmeter reading should be 5.9 ± 0.3 ohm.

If ohmmeter reading is 'infinity' the indication is an open circuit in the field winding.

If ohmmeter reading is much below 5.9 ohm. the indication is that the insulation of one field winding is defective.

CONTROL BOX

Data

Manufacturer	Lucas
Type	RB 340
Lucas part No... .. .	37342
Stanpart No.	208952

Voltage regulator

Voltage setting—open circuit

Ambient temperature degs. centigrade	Voltage setting
10	14.9—15.5
20	14.7—15.3
30	14.5—15.1
40	14.3—14.9

Shunt winding resistance	10.8—11.8 ohm at 20 deg. centigrade
Core gap	See Adjust voltage regulator core gap

Current regulator

Current setting—on load	24—26 amp.
Core gap	See Adjust current regulator core gap

Cut out

Cut in voltage	12.7—13.3 volts
Drop off voltage	9.5—11.0 volts
Shunt winding resistance	9.5—10.5 ohm. at 20 degs. centigrade
Core gap	See Adjust cut out core gap

Resistors

Contact resistor	55—65 ohm.
Contact resistor colour code	Red
Swamp resistor—measured between centre tag and base	13.25—14.25 ohm.

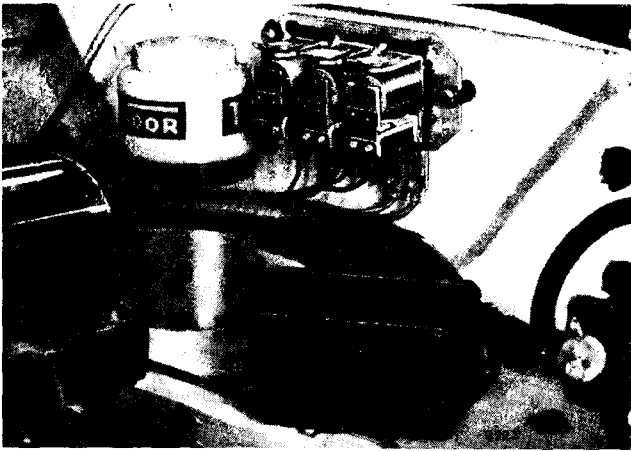
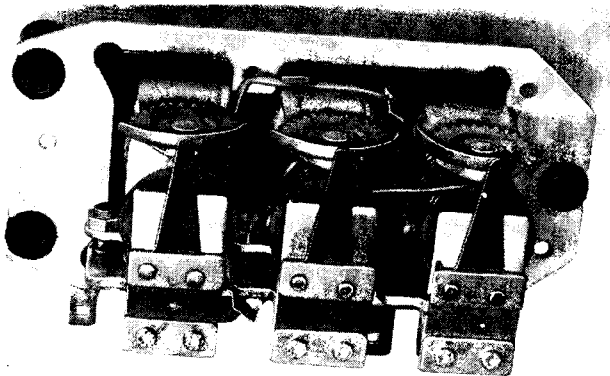


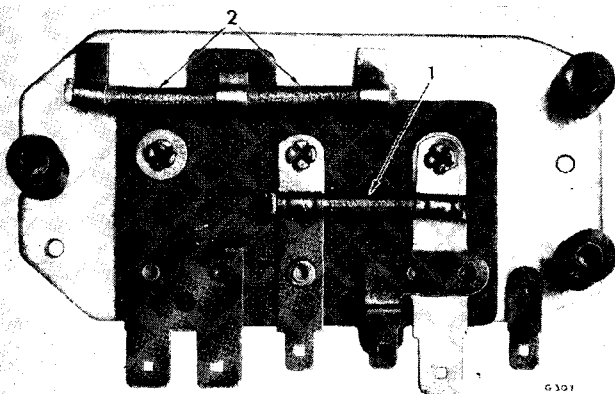
Fig. 12. Control box installed



VR CR CO 6328

VR Voltage regulator
CR Current regulator
CO Cut out

Fig. 13. Control box—front view



1 Contact resistor
2 Swamp resistor

Fig. 14. Control box—rear view

Description

The control box regulates the generator output. It contains three units; the voltage regulator, the current regulator, and the cut out. Each unit consists of a frame, a winding or windings, a fixed contact, an adjustable cam and a spring mounted armature which carries a moving contact.

The voltage regulator and current regulator together control the generator output. The contacts of these two units are connected in series between the generator armature line and the supply line to the generator field winding. At rest both contacts are closed; in this condition the generator will charge when rotated.

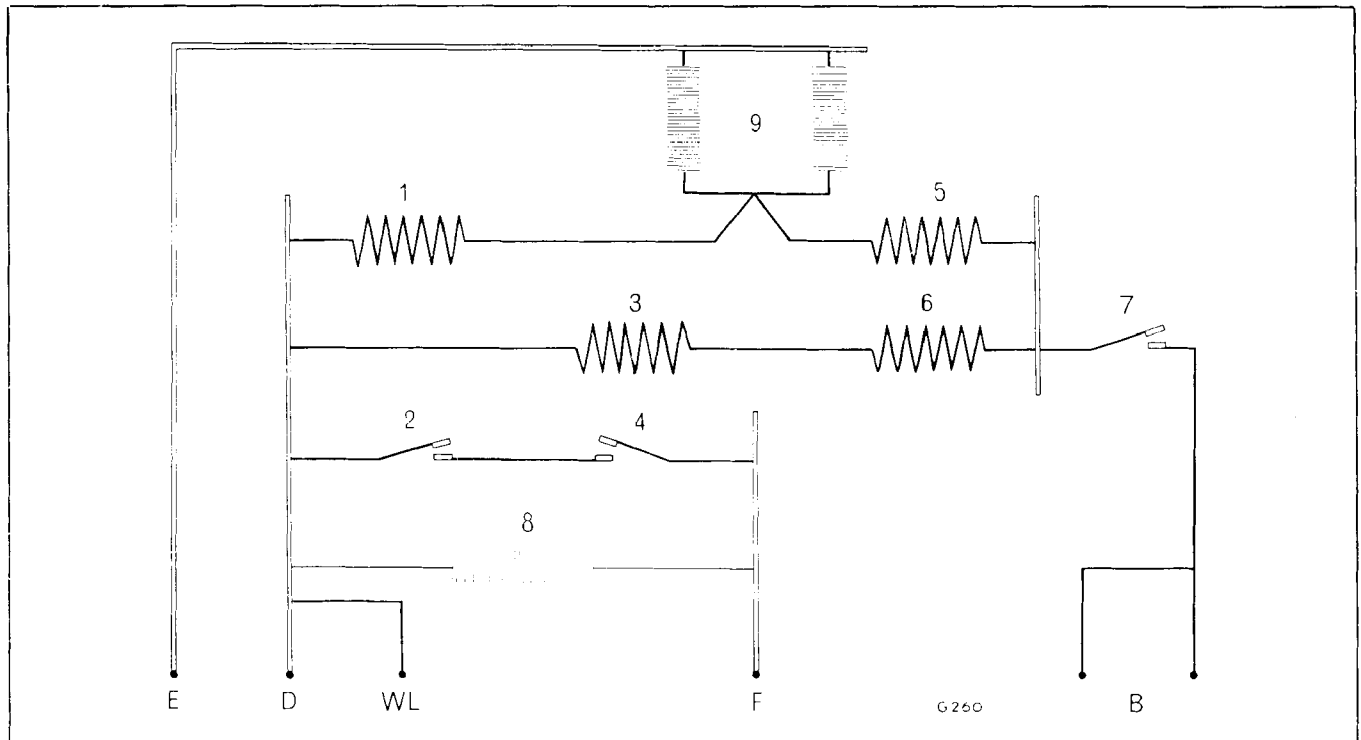
When either contact opens the supply line to the generator field winding is broken and the generator will cease to charge. In operation this action is a rapid opening and closing of the contacts at a frequency of approximately 30-50 cycles per second. A contact resistor connected between terminals D and F prevents heavy arcing at both sets of contacts.

The current regulator controls the initial high uniform charging rate. The unit contains one series winding which consists of a few turns of thick copper wire whose resistance does not vary significantly with temperature. Temperature compensation is therefore not provided.

The voltage regulator controls the charging rate after the circuit voltage reaches the voltage setting. While the voltage regulator is operating the charging current tapers off until only a trickle charge is delivered. The unit contains one shunt winding which consists of many turns of fine copper wire whose resistance varies with temperature. A bimetal spring employed as the armature hinge and the swamp resistor provide temperature compensation.

The cut out functions as a switch between the generator and the battery. When the generator is at rest or the output voltage is low the contact is open to prevent current from the battery flowing through the generator to earth. When the generator output voltage rises current flow through the shunt winding closes the contact.

A charging current will now be permitted to flow into the battery circuit. This current flow which passes through the series winding will assist to hold in the contact. When the generator output voltage drops below the battery voltage a reverse current flow through the series winding will commence that will demagnetise the winding core and immediately cause the contact to open. The units shunt winding consists of many turns of fine copper wire whose resistance varies with temperature. A bimetal spring assisting the main armature spring and the swamp resistor provide temperature compensation.



Service

Clean voltage regulator and current regulator contacts—Use fine carborundum stone or silicon carbide paper followed by methylated spirit.

Clean cut out contacts—Use fine glass paper followed by methylated spirit. Do not use carborundum stone or emery cloth.

Remove control box

Disconnect electrical connectors. Remove control box from bulkhead.

Install control box

Fit control box to bulkhead. Connect electrical connectors.

Defective charging system

In the event of a defective charging system check the following items before making any adjustments to the control box.

Check the generator. Refer to Group 6—Generator—Defective charging system.

Inspect charging system wiring. Perform continuity checks between generator, control box, ignition warning light and battery.

Check five electrical connectors are correctly fitted to control box.

Check control box earthing. Inspect earth connector on control box and harness earth wire attachment at side of battery box.

Check attachment of battery leads to ensure good electrical contact.

Check the battery is in a serviceable condition. Refer to Group 6—Battery—Specific gravity check and Heavy discharge check.

Voltage regulator

- 1 Voltage regulator shunt winding
- 2 Voltage regulator contacts

Current regulator

- 3 Current regulator series winding
- 4 Current regulator contacts

Cut out

- 5 Cut out shunt winding
- 6 Cut out series winding
- 7 Cut out contacts

Resistors

- 8 Contact resistor
- 9 Swamp resistor

Fig. 15. Component wiring diagram

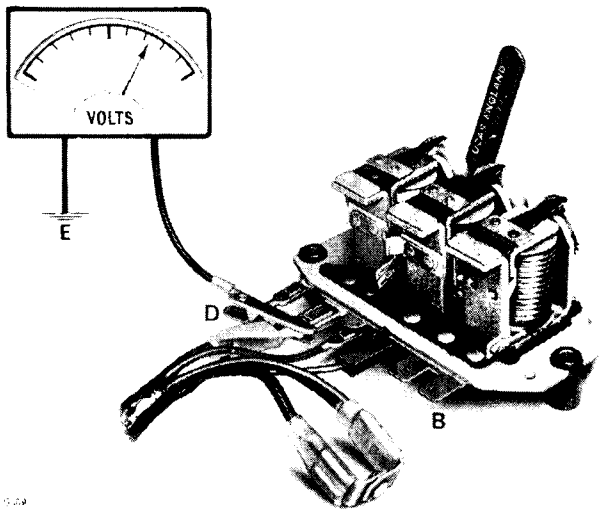


Fig. 16. Adjust voltage setting

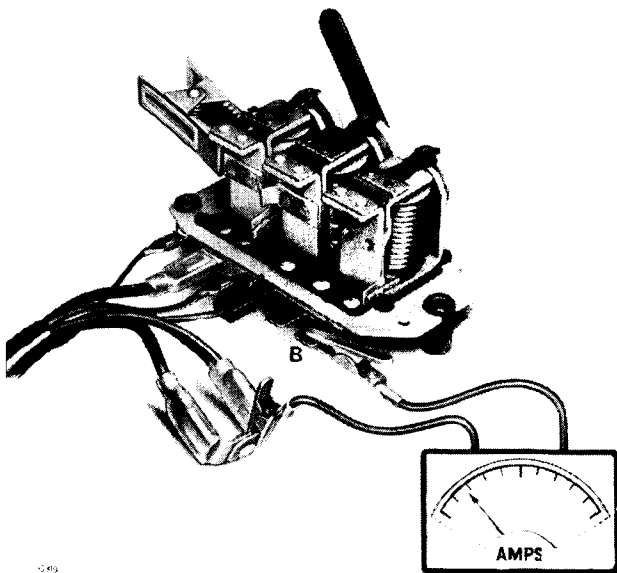


Fig. 17. Adjust current setting

Adjust voltage setting

1. Disconnect electrical connectors from two connector blades B.
2. Using suitable jumper lead connect two removed connectors—this will enable ignition circuit to be energised by battery.
3. Connect voltmeter suitable for voltage setting (See Data) between D and earth.
4. Run engine at approximately 2200 r.p.m.
5. Voltmeter reading should be steady and within voltage setting limits given in Data.
6. If voltmeter reading is not steady contacts may be dirty. Clean voltage regulator contacts as detailed above and repeat test.
7. If voltmeter reading is steady but not within required limits adjust as follows:
 - (a) Remove control box cover.
 - (b) Run engine at approximately 2200 r.p.m.
 - (c) Using suitable setting tool position voltage regulator adjustment cam to obtain required voltage reading.

To increase voltage reading turn adjustment cam anticlockwise

To decrease voltage reading turn adjustment cam clockwise.

8. Remove jumper lead and voltmeter. Replace all disturbed components.

Adjust current setting

1. Remove control box cover.
2. Using suitable bulldog clip short out voltage regulator contacts—this will enable generator to develop its maximum rated output.
3. Disconnect electrical connectors from two connector blades B.
4. Using suitable jumper lead connect two removed connectors.
5. Connect ammeter suitable for current setting (See Data) between a B connector blade and jumper lead.

CAUTION: ENSURE THAT THE TWO B CONNECTOR BLADES CARRY ONLY THIS ONE CONNECTION.

6. Switch on all lights—this will ensure that generator develops its maximum rated output. **CAUTION: DURING THIS PROCEDURE DO NOT SWITCH ON LIGHTS WHILE ENGINE IS RUNNING. SUCH ACTION MAY BLOW BULBS.**
7. Run engine at approximately 3300 r.p.m.
8. Ammeter reading should be steady and within current setting limits given in Data.
9. If ammeter reading is not steady contacts may be dirty. Clean current regulator contacts as detailed above and repeat test.
10. If ammeter reading is steady but not within required limits adjust as follows:
 - (a) Switch on all lights—this will ensure that generator develops its maximum rated output.

CAUTION: DURING THIS PROCEDURE DO NOT SWITCH ON LIGHTS WHILE ENGINE IS RUNNING. SUCH ACTION MAY BLOW BULBS.

- (b) Run engine at approximately 3300 r.p.m.
- (c) Using suitable setting tool position current regulator adjustment cam to obtain required current reading.

To increase current reading turn adjustment cam anticlockwise.

To decrease current reading turn adjustment cam clockwise.

- 11. Remove bulldog clip, jumper lead and ammeter. Replace all disturbed components.

Adjust cut in voltage

1. Connect voltmeter suitable for cut in voltage (See Data) between D and earth.
2. Switch on all lights—this will provide the required electrical load.
3. Run engine slowly increasing speed.
4. Voltmeter reading should rise steadily and then drop slightly from within cut in voltage limits given in Data as contacts close.
5. If voltmeter reading does not drop from within required limits adjust as follows:
 - (a) Remove control box cover.
 - (b) Using suitable setting tool turn cut out adjustment cam a small amount in appropriate direction.
 - To increase voltage reading turn adjustment cam anticlockwise.
 - To decrease voltage reading turn adjustment cam clockwise.
 - (c) Repeat test until correct result is obtained.
6. Remove voltmeter. Replace all disturbed components.

Adjust drop off voltage

1. Disconnect electrical connectors from two connector blades B.
2. Using suitable jumper lead connect two removed connectors—this will enable ignition circuit to be energised by battery.
3. Connect voltmeter suitable for drop off voltage (See Data) between B and earth.
4. Run engine at approximately 2200 r.p.m. and then slowly decrease speed.
5. Voltmeter reading should drop to zero from within drop off voltage limits given in Data.
6. If voltmeter reading does not drop from within required limits adjust as follows:
 - (a) Remove control box cover.
 - (b) Bend cut out fixed contact a small amount in appropriate direction.
 - To increase voltage reading reduce contact gap.
 - To decrease voltage reading increase contact gap.
 - (c) Repeat test until correct result is obtained.
7. Remove jumper lead and voltmeter. Replace all disturbed components.

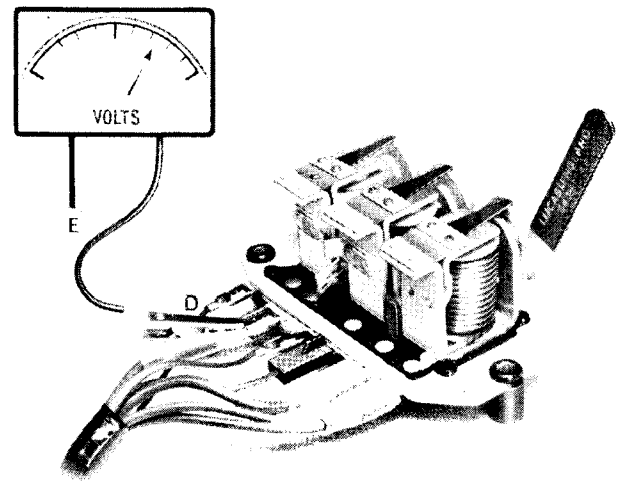


Fig. 18. Adjust cut in voltage

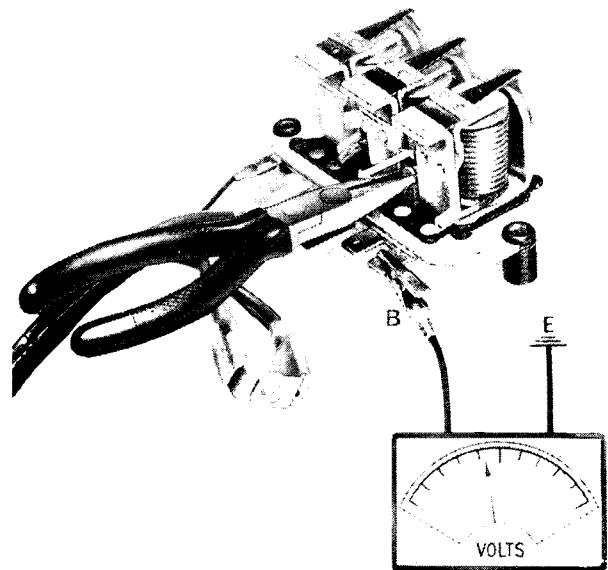


Fig. 19. Adjust drop off voltage

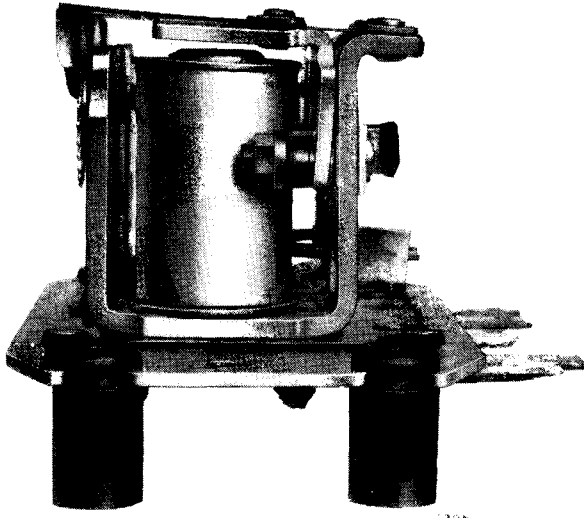


Fig. 20. Adjust voltage regulator core gap

Adjust voltage regulator core gap

The core gap is set during production and should normally require no attention in service. If the setting has been lost re-set as follows:

1. Using suitable setting tool turn voltage regulator adjustment cam fully clockwise to obtain minimum lift.
2. Slacken lock nut and screw back adjustable contact.
3. Insert a 0.054 in. feeler gauge between armature and core. Position gauge against first of two rivet heads.
4. Press armature down squarely. Screw in adjustable contact until it touches moving contact. Tighten lock nut.
5. Adjust voltage setting as detailed above.

Adjust current regulator core gap

The core gap is set during production and should normally require no attention in service. If the setting has been lost re-set as follows:

1. Using suitable setting tool turn current regulator adjustment cam fully clockwise to obtain minimum lift.
2. Slacken lock nut and screw back adjustable contact.
3. Insert a 0.054 in. feeler gauge between armature and core. Position gauge against first of two rivet heads.
4. Press armature down squarely. Screw in adjustable contact until it touches moving contact. Tighten lock nut.
5. Adjust current setting as detailed above.

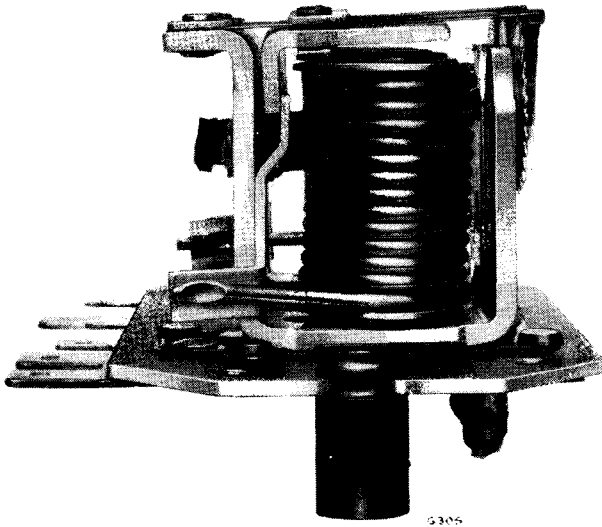


Fig. 21. Adjust cut out core gap

Adjust cut out core gap

The core gap is set during production and should normally require no attention in service. If the setting has been lost re-set as follows:

1. Insert a 0.015 in. feeler gauge between armature and core.
2. Press armature down squarely. Bend cut out fixed contact until contacts just touch. Release armature.
3. Bend cut out back stop to give a core gap of 0.035—0.045 in.
4. Adjust cut in voltage and drop off voltage as detailed above.

BATTERY

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

EXERCISE CARE WHEN CONNECTING INTO CIRCUIT ANY ACCESSORY THAT MAY CONTAIN SILICON DIODES OR TRANSISTORS. IRREPARABLE DAMAGE MAY RESULT TO SUCH POLARITY SENSITIVE COMPONENTS IF INCORRECTLY FITTED.

NOTE: No polarity sensitive components are fitted to the vehicle during production. However any of the following accessories—approved or unapproved by Leyland Triumph—may contain such components: Alternator systems, Automatic anti-dazzle mirrors, Automatic dipping systems, Automatic parking lamp systems, Electronic ignition systems, Electronic tachometers and Radios.

Data

Manufacturer	Exide
Type	Auto-Fil
Exide part No. .. .	6-XNAZ9R
Stanpart No. Normal .. .	213188
Dry charged .. .	515186
Capacity—at 20 hour rate .. .	56 amp. hour
Plates per cell .. .	9
Normal charge rate .. .	6 amps.
Weight .. .	41 lbs.
Dimensions—overall	
Width .. .	6.62—6.72 in.
Length .. .	9.81—9.91 in.
Height—over terminals .. .	8.66—8.78 in.

Charge condition of cell—Temperate climate

Temperate climate has air temperature ordinarily below 32 degs. centigrade. Normal gravity electrolyte should be employed.

Ambient temperature degs. centigrade	Specific gravity of electrolyte		
	Charged	Half	Discharged
5	1.287	1.207	1.117
15	1.280	1.200	1.110
25	1.273	1.193	1.103
35	1.266	1.186	1.096

Charge condition of cell—Tropical climate

Tropical climate has air temperature frequently above 32 degs. centigrade. Low gravity electrolyte should be employed.

Ambient temperature degs. centigrade	Specific gravity of electrolyte		
	Charged	Half	Discharged
15	1.250	1.180	1.100
25	1.243	1.173	1.093
35	1.236	1.166	1.086
52	1.224	1.154	1.074

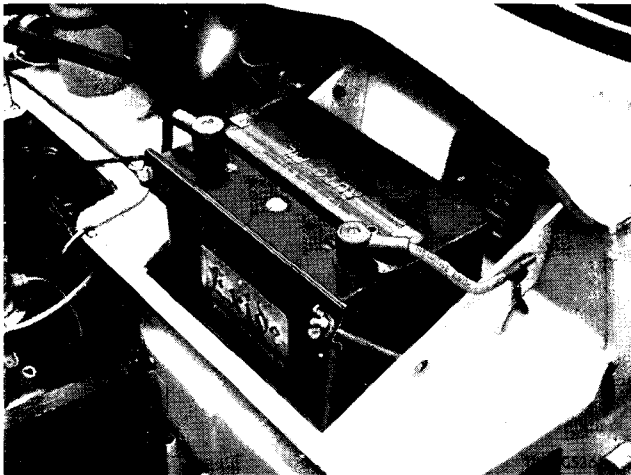
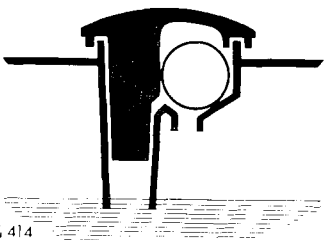
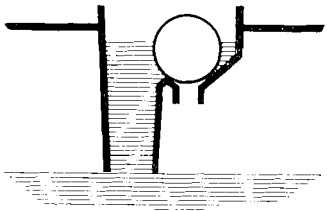
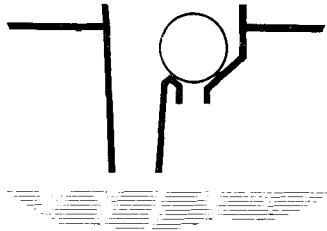


Fig. 22. Battery installed



G 414

Fig. 23. Auto-Fil feature

Description

Auto-Fil feature—this enables all the cells to be automatically replenished to the correct level.

Removing the cover allows the balls to fall into a position obstructing the vent holes.

Pure water poured into the trough flows freely into the cells until the levels reach the bottoms of the filling tubes. When this level is reached an air lock is formed in each cell. Air above the electrolyte is trapped and the entry of additional water into the cells is prevented. The filling tubes will now quickly fill at which time replenishment should cease.

Fitting the cover forces the balls to lift opening the vent holes. The air locks are broken. Water in the filling tubes flows into the cells automatically establishing the correct level—just above the bottoms of the filling tubes—in each cell.

Service

Ensure that the battery top and terminals remain clean and dry.

Coat terminals with petroleum jelly to prevent corrosion.

Check electrolyte level monthly and if required replenish with pure water.

Replenish with pure water

1. Remove cover.
2. If electrolyte levels are below bottoms of filling tubes pour pure water into trough until all tubes are filled.
3. Immediately fit cover.

Remove battery

1. Remove battery leads.
2. Slacken wing nuts and swing down battery retaining assembly.
3. Lift battery from box.

Install battery

1. Lift battery into box.
2. Swing up battery retaining assembly and tighten wing nuts.
3. Fit battery leads. Do not hammer terminals to terminal posts. Such action may damage battery.

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

4. Coat terminals with petroleum jelly to prevent corrosion.

Charge from external supply

If the battery is serviceable but in a low state of charge, it may be charged from an external supply.

Before commencing charge, check electrolyte level and if required, replenish with pure water as detailed above.

The cover must always be in position during charge. If the cover is removed the balls will obstruct the vent holes, preventing free gassing of the cells.

Using a suitable battery charger, charge at normal charge rate given in Data. During charge, ensure that electrolyte temperature does not exceed 52 degs. centigrade. Cells should gas freely during charge. Continue charge until specific gravity readings and heavy discharge voltage readings show no increase. Employ battery charger as detailed by the manufacturer.

Specific gravity check

Specific gravity checks, performed just after replenishing with pure water, are unreliable. Mix electrolyte by providing a gassing charge before performing check.

Using hydrometer as shown on Figure 24, note specific gravity reading for each cell.

Specific gravity readings approximately equal for all cells indicate a battery in serviceable condition. Assess charge condition of each cell by referring to appropriate table—temperate climate or tropical climate—given in Data.

If any cells show a specific gravity reading lower than the others, the indication is that the battery is approaching the end of its useful life.

Heavy discharge check

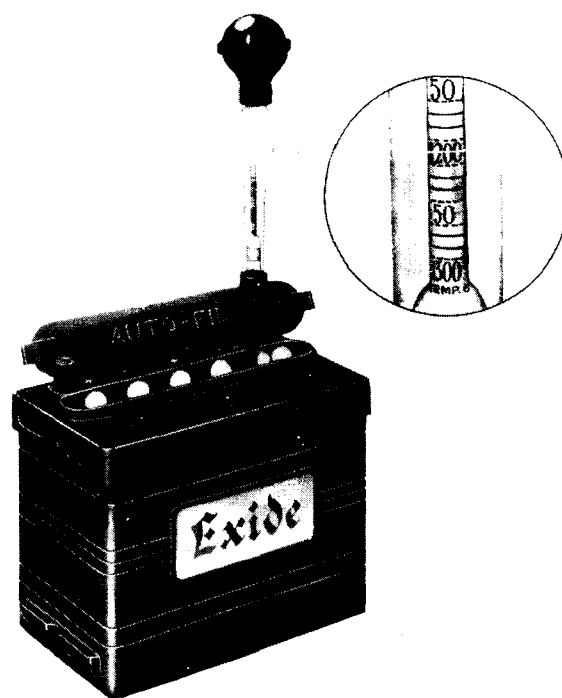
Before performing a heavy discharge check on a battery that has just completed an operational journey, remove surface charge by switching on headlamps for 2—3 minutes.

Using heavy discharge tester, as shown on Fig. 25, maintain in position across each cell for approximately 5 seconds and note voltage reading for each cell.

Voltage readings approximately equal for all cells indicate a battery in serviceable condition. A specific gravity check may however indicate that the battery is in a low state of charge.

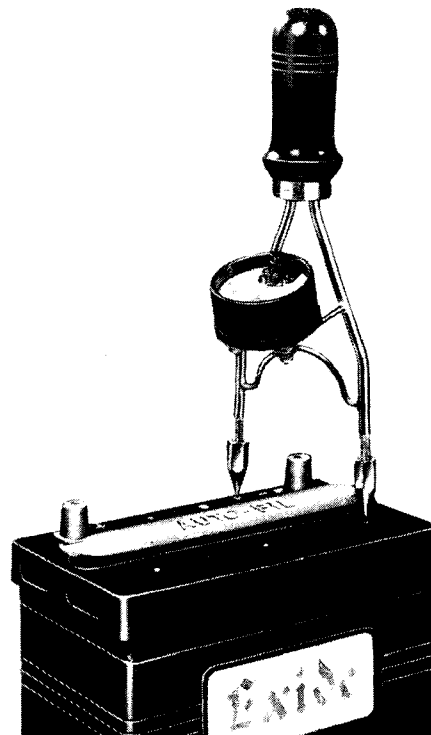
If any cells show a voltage reading lower than the others, or the voltage reading falls during test, the indication is that the battery is approaching the end of its useful life.

NOTE: Reference only—during each test discharge across cell will be approximately 150—200 amps.



C 58

Fig. 24. Specific gravity check



C 58a

Fig. 25. Heavy discharge check

IGNITION/STARTER SWITCH

Data										
Manufacturer .. .. .	..	..	..	..	..	..	..	..	..	Lucas
Type .. .. .	..	..	..	..	..	..	..	..	..	47SA
Lucas part No. . . . .	..	..	..	..	..	..	..	..	..	31873
Stanpart No. . . . .	..	..	..	..	..	..	..	..	..	127651

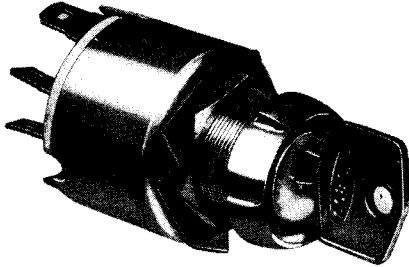


Fig. 26
Ignition/starter
switch

G171

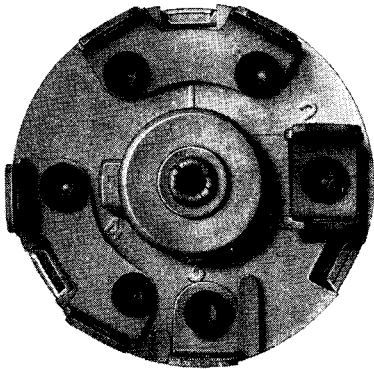


Fig. 27.
Ignition/starter
switch—
rear view

G391

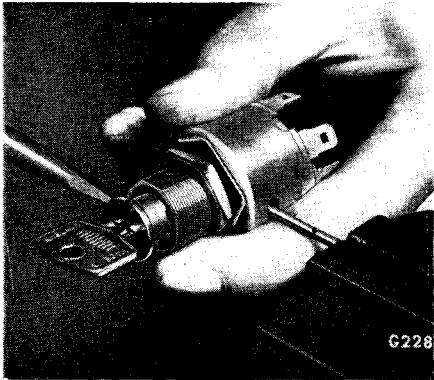


Fig. 28.
Remove lock
barrel

G228

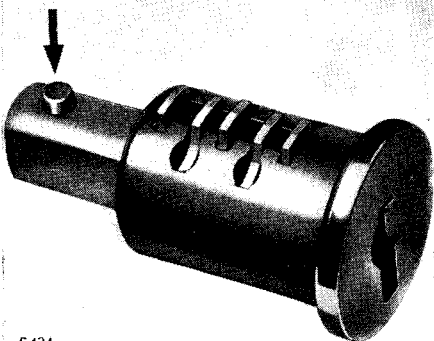


Fig. 29.
Lock barrel
showing spring
loaded plunger

G424

Description

The ignition/starter switch is a four-terminal four-position rotary switch designed to control the ignition circuits, starter solenoid and some auxiliary circuits.

Service—No maintenance is required.

Removal/installation ignition/starter switch

Refer to Group 5.

Remove lock barrel

It is possible to remove the lock barrel with or without the key fitted.

CAUTION: IF THE KEY IS FITTED ENSURE THAT THE SWITCH IS IN THE OFF POSITION. IT WILL NOT BE POSSIBLE TO REMOVE THE LOCK BARREL IF ANY OTHER POSITION IS SELECTED.

1. Secure suitable probe in vice as shown on Fig. 28.
2. Position switch so probe is inserted through hole in body to depress spring loaded plunger shown on Fig. 29.
3. With plunger depressed use screwdriver as shown on Fig. 28 to ease lock barrel from housing.

Install lock barrel

1. Lightly lubricate spring loaded plunger.
2. Insert lock barrel in housing. Gently tap home.

Repair—Repair is by replacement.

STARTER SOLENOID

Data

Manufacturer	Lucas
Type	2ST
Lucas part No... .. .	76464
Stanpart No.	121269
Plunger pull in voltage	5—9 volts
Plunger release voltage—after applying 12 volts	0—2.5 volts
Winding resistance—measured between single 17½ amp. connector and unit body	2.1—2.5 ohms at 20 degs. centigrade

Description

The starter solenoid is normally solenoid operated by remote control from the ignition/starter switch. It can also be actuated manually from the engine compartment by depressing the rubber end cap.

Service—No maintenance is required.

Remove starter solenoid

1. Disconnect Lucar electrical connectors.
2. Pull back rubber protector. Disconnect battery and starter motor leads.
3. Remove starter solenoid from bulkhead.

Install starter solenoid

1. Position engine earth lead. Ensure good electrical contact. Fit starter solenoid to bulkhead.
2. Connect battery and starter motor leads. Position rubber protector.
3. Connect Lucar electrical connectors.

Repair—Repair is by replacement.

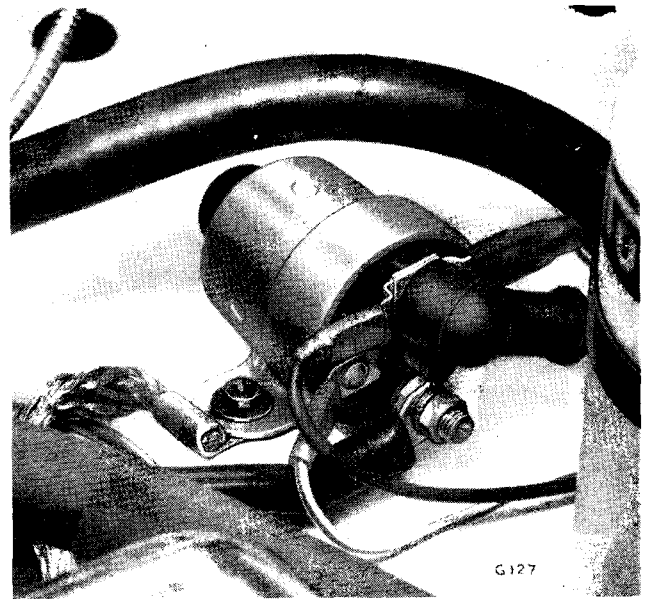


Fig. 30. Starter solenoid installed

- 1 Supply from ignition/starter switch
- 2 Shunt winding
- 3 Plunger contact
- 4 Battery terminal
- 5 Starter motor terminal

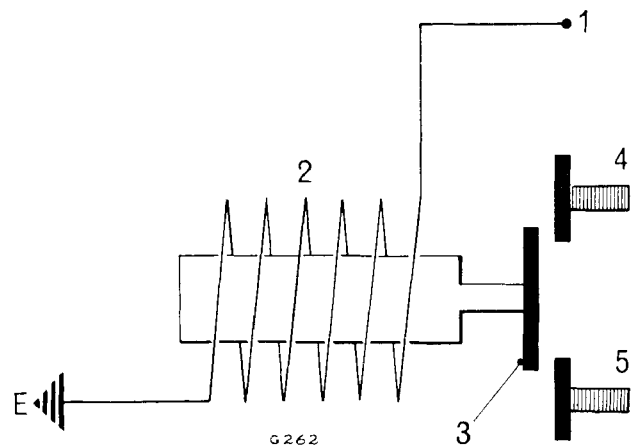


Fig. 31. Component wiring diagram

STARTER MOTOR

Data

Manufacturer	Lucas
Type	M35G
Lucas part No.	25079
Stanpart No.	200535
Yoke diameter	3.5 in.
Light running current at 8000—11500 r.p.m.	60 amp. max.
Torque at 1000 r.p.m. with 270 amp. at 8.6—9.0 volts	5 lb. ft.
Lock torque with 370 amp. at 7.5—7.9 volts	8.2 lb. ft.
Skim commutator—minimum skimming diameter	1 $\frac{9}{32}$ in.
Brush length—renew if less than	$\frac{5}{16}$ in.
Brush spring tension	30—34 ozs.

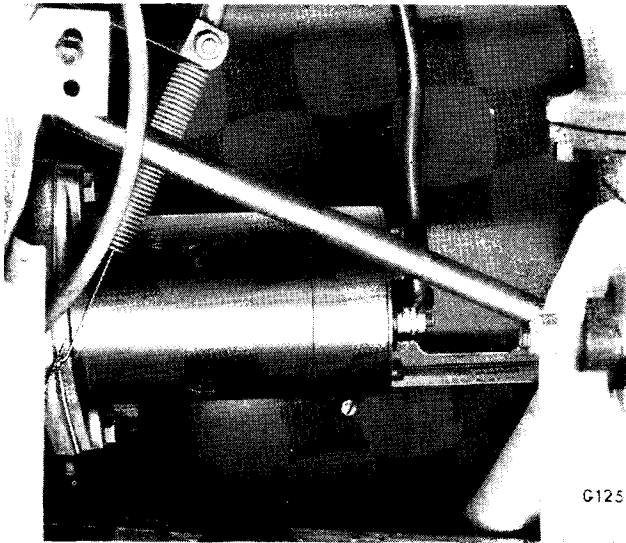


Fig. 32. Starter motor installed

Description

The starter motor is a four-pole four-brush machine having an extended shaft which carries the starter drive.

Service

No regular maintenance is required.

The starter motor will however benefit from an occasional clean and inspection.

Clean and inspection

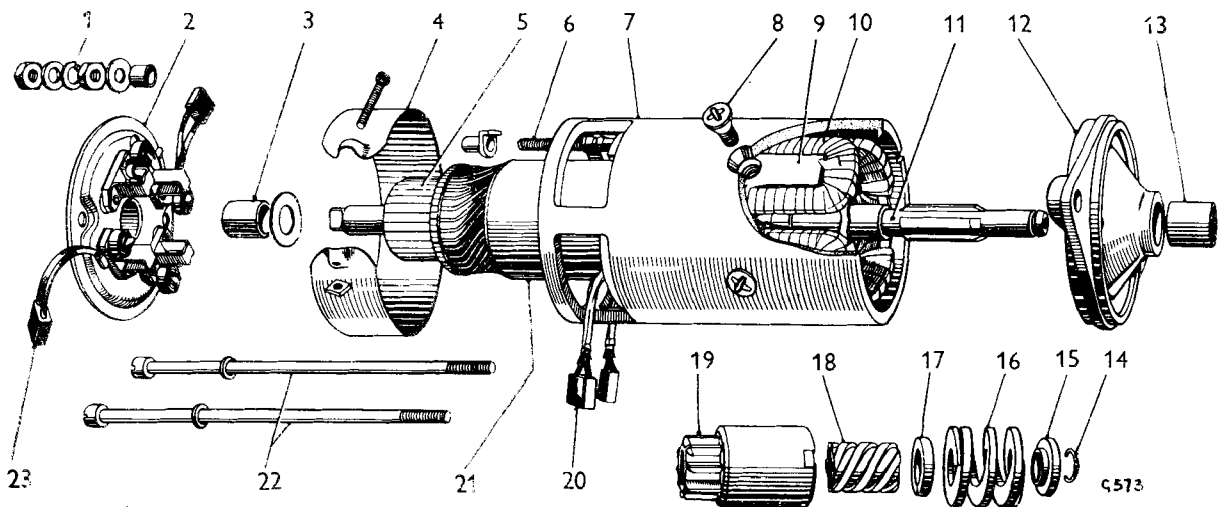
1. Disassemble starter motor as detailed below.
2. Clean dust from all components.
3. Wash starter drive in petrol or paraffin. Lubricate lightly with thin engine oil.
4. Inspect armature for lifted commutator segments, loose turns in the winding, bent shaft or score marks on the laminations. If any fault exists refer to Armature below.
5. Clean commutator with petrol moistened cloth. If worn refer to Commutator below.
6. Inspect bearing bushes. If worn renew.
7. Clean brushes and holders with petrol moistened cloth. Check brush length—renew if less than $\frac{5}{16}$ ". If assemblies are in poor condition refer to Brushes below.
8. Assemble starter motor as detailed below.

Removal/installation starter motor

Refer to Group 1.

Disassemble starter motor

1. Remove cover band.
2. Withdraw brushes from holders.
3. Remove terminal post nuts and washers.
4. Remove through bolts.
5. Remove commutator end bracket.
6. Remove drive end bracket complete with armature and starter drive.



Assemble starter motor

1. Slide drive end bracket along shaft towards starter drive. Lightly lubricate shaft bearing surface with engine oil. Fit drive end bracket complete with armature and starter drive to yoke.
 2. Lightly lubricate commutator end bracket bearing bush with engine oil. Ensure no brushes are inserted in holders. Position commutator end bracket.
 3. Fit through bolts.
 4. Fit terminal post nuts and washers.
- CAUTION: DO NOT DAMAGE TERMINAL POST BY OVERTIGHTENING. LOCK NUTS TO EACH OTHER.**
5. Insert brushes into holders.
 6. Fit cover band.

Remove starter drive

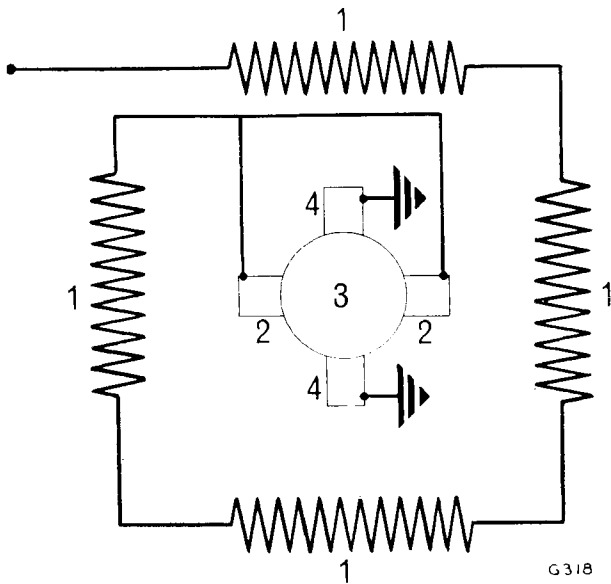
1. Disassemble starter motor as detailed above.
2. Using suitable press compress starter drive assembly and ease jump ring from shaft.
NOTE: A Churchill press No. S.4221A and adaptor set No. S.4221A—14 may be employed to perform this operation.
3. Withdraw starter drive components from shaft.

Install starter drive

1. Lightly lubricate drive end bracket bearing bush with thin engine oil. Position drive end bracket.
2. Fit starter drive components as detailed on Fig. 33 to shaft.
NOTE: Screwed sleeve may be fitted either way round.
3. Using suitable press compress starter drive assembly and fit jump ring to shaft.

- 1 Terminal post nuts and washers
- 2 Commutator end bracket
- 3 Commutator end bracket bearing bush
- 4 Cover band
- 5 Commutator
- 6 Terminal post
- 7 Yoke
- 8 Pole shoe screw
- 9 Pole shoe
- 10 Field winding
- 11 Shaft
- 12 Drive end bracket
- 13 Drive end bracket bearing bush
- 14 Jump ring
- 15 Shaft collar
- 16 Main spring
- 17 Buffer washer
- 18 Screwed sleeve
- 19 Pinion and barrel
- 20 Field winding brush
- 21 Armature
- 22 Through bolts
- 23 Earth brush

Fig. 33. Starter motor details



- 1 Field windings
- 2 Field winding brushes
- 3 Commutator
- 4 Earth brushes

Fig. 34. Component wiring diagram

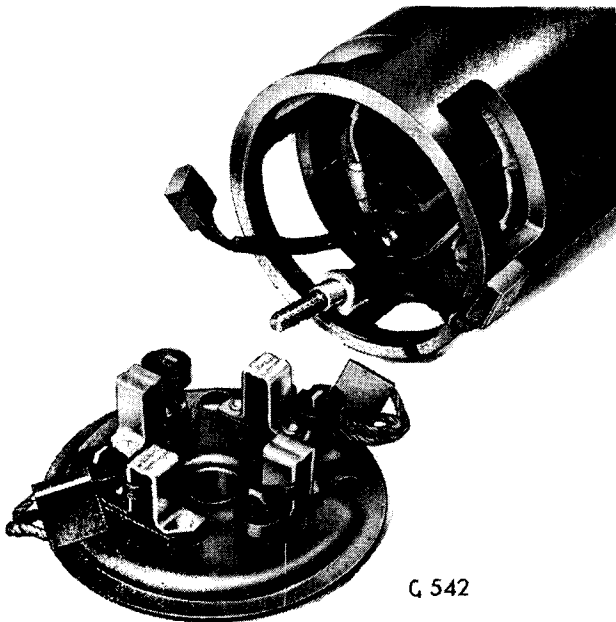


Fig. 35. Brushes

Remove bearing bushes

1. Disassemble starter motor as detailed above.
2. Drive end bracket bearing bush only—Remove starter drive as detailed above.
3. Drive end bracket bearing bush only—Remove bearing bush. This operation can be performed using suitable extractor or by screwing a $\frac{1}{8}$ " tap squarely into bush and withdrawing.
4. Commutator end bracket bearing bush only—Remove bearing bush. This operation can be performed using suitable extractor or by screwing a $\frac{1}{8}$ " tap squarely into bush and withdrawing.

Install bearing bushes

1. Prepare porous bronze bearing bushes by immersing in thin engine oil for 24 hours. If required this period may be reduced by immersing in thin engine oil heated to 100 degs. centigrade for 2 hours. Allow oil to cool before removing bushes.
2. Drive end bracket bearing bush only—Using highly polished shouldered mandrel of 0.7490 ± 0.0005 " diameter and suitable press fit bush. Do not ream bush after fitting or porosity may be impaired.
3. Commutator end bracket bearing bush only—Using highly polished shouldered mandrel of 0.4985 ± 0.0005 " diameter and suitable press fit bush. Do not ream bush after fitting or porosity may be impaired.

Remove field winding brushes

1. Disassemble starter motor as detailed above.
2. This operation will be facilitated by removing field windings. If suitable wheel operated screwdriver is available remove field windings as detailed below.
3. Cut flexibles $\frac{1}{4}$ " from field winding joint.

Install field winding brushes

NOTE: New brushes are pre-formed. Bedding of brushes to commutator is not required.

1. Clean and tin resistance brazed joint. Open and tin loop of new flexible. Do not allow any solder to run towards brushes. Position loop over joint. Squeeze up and solder.
2. If required install field windings as detailed below.

Remove earth brushes

1. Disassemble starter motor as detailed above.
2. Unsolder flexibles from clips on commutator end bracket.

Install earth brushes

NOTE: New brushes are pre-formed. Bedding of brushes to commutator is not required.

1. Open clips and position ends of new flexibles. Squeeze up and solder.

Remove field windings

1. Disassemble starter motor as detailed above.
2. Mark pole shoes and yoke so original positions are known.
3. Using suitable wheel operated screwdriver remove four pole shoe screws.
4. Remove insulation strip.
5. Withdraw assembly from yoke.
6. Remove pole shoes from field windings.

Install field windings

1. Observe relationship of field windings to yoke determined by commutator end bracket. Fit pole shoes to field windings so original positions are maintained.
2. Insert assembly into yoke. Ensure that taping of field windings is not damaged. Fit four pole shoe screws finger tight.
3. Fit insulation strip.
4. Using suitable wheel operated screwdriver tighten four pole shoe screws.

Light running current

1. Secure starter motor in suitable vice.
2. Provide suitable test circuit. The starter motor should be connected in series with switch and ammeter capable of carrying 600 amp. Use leads similar to those in vehicle starter motor circuit.
3. Provide tachometer to indicate starter motor speed.
4. Perform test. Ammeter reading should be 60 amp. max. with speed 8000—11500 r.p.m.
5. During test check brushes and commutator for excessive sparking or brush movement.

Lock Torque

1. Secure starter motor in suitable vice.
2. Provide suitable test circuit. The starter motor should be connected in series with switch and ammeter capable of carrying 600 amp. Use leads similar to those in vehicle starter motor circuit.
3. Provide voltmeter across battery terminals.
4. Provide suitable equipment to measure lock torque. See Fig. 37.
5. Perform test. Lock torque should be 8.2 lb. ft. with ammeter reading of 370 amp. and voltmeter reading of 7.5—7.9 volts.

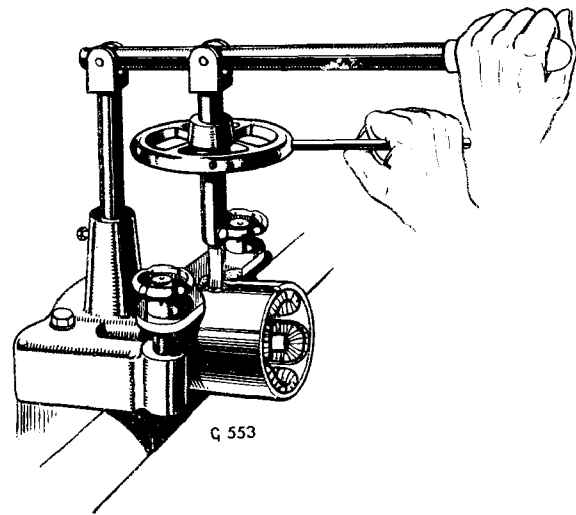


Fig. 36. Wheel operated screwdriver

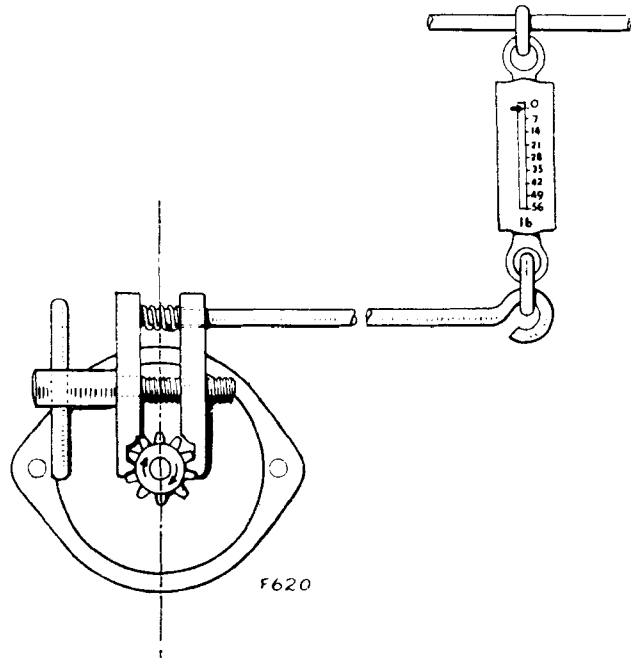


Fig. 37. Measuring lock torque

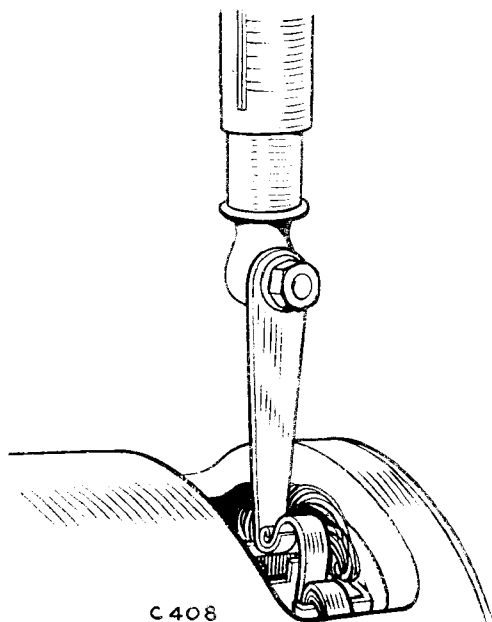


Fig. 38. Checking brush spring tension

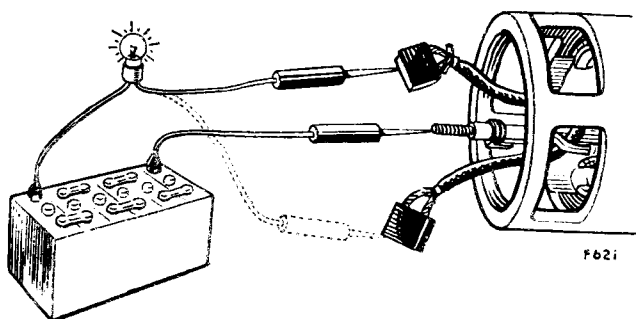


Fig. 39. Field winding continuity

Jammed starter drive

If the starter motor fails to operate when selected the starter drive may be jammed in mesh with the engine flywheel ring gear.

This condition can usually be freed by using a spanner to turn the squared extension of the starter motor shaft.

Starter drive

Wash starter drive in petrol or paraffin. Lubricate lightly with thin engine oil.

Armature

Inspect for lifted commutator segments or loose turns in the winding. These defects may result if the starter motor is over-revved by the starter drive remaining engaged with the ring gear while the engine is running.

Ensure the shaft is not bent. Score marks on the laminations may indicate a bent shaft or a loose pole shoe on the yoke.

Do not attempt to rectify a defective armature. Repair is by replacement.

Commutator

Clean commutator with petrol moistened cloth. If the unit is in good condition it will be smooth and free from pits or burned spots. If necessary polish with fine glass paper. If excessively worn skim commutator.

Skim commutator

1. Remove starter drive as detailed above.
2. Remove drive end bracket.
3. Mount armature in lathe.
4. Rotate at high speed. Using a very sharp tool take a light cut. Do not remove more metal than necessary. Do not cut below minimum skimming diameter $1\frac{3}{32}$ ".
5. Polish with fine glass paper.

CAUTION: THE INSULATORS BETWEEN THE SEGMENTS MUST NOT BE UNDERCUT.

Brushes

Clean brushes and holders with petrol moistened cloth. Ensure that the brushes move freely in the holders. If necessary lightly polish holder sides with a fine file.

Check brush length—renew if less than $\frac{1}{8}$ ".

Using a suitable spring scale check brush spring tension as shown on Fig. 38. Tension should be 30—34 ozs. If tension is low renew brush springs.

Field winding continuity

1. Provide suitable test circuit. See Fig. 39.
2. Connect probes to terminal post and a field winding brush. Test lamp should illuminate.
3. Repeat test connecting to other field winding brush.

NOTE: A satisfactory test result does not indicate that the field windings are serviceable. A field winding may be earthed to a pole shoe or the yoke.

IGNITION COIL

Data	
Manufacturer	Lucas
Type	HA12

Primary winding resistance—measured between positive and negative connectors 3.0–3.5 ohms

Description

The ignition coil is mounted directly to the cylinder block on the left hand side of the engine.

This vehicle is fitted with a negative earth electrical system. The ignition coil connectors are marked positive and negative to facilitate the units inclusion in such a system. The positive connector must be connected to the appropriate harness supply wire and the negative connector to the ignition distributor low tension wire.

The ignition coil has fluid cooled primary and secondary windings wound on a square section laminated iron core. The winding assembly is located in a seamless aluminium container having a sealed phenolic terminal moulding.

Service

The only maintenance required is to ensure that the terminal moulding and connectors remain clean and dry.

Remove Ignition Coil

1. Disconnect Lucar electrical connectors.
2. Move rubber protector upwards. Remove high tension lead by pulling from retainer.
3. Remove ignition coil from cylinder block.

Install Ignition Coil

1. Fit ignition coil to cylinder block.
2. Secure high tension lead by pushing into retainer. Position rubber protector.
3. Connect Lucar electrical connectors.

Repair—Repair is by replacement.

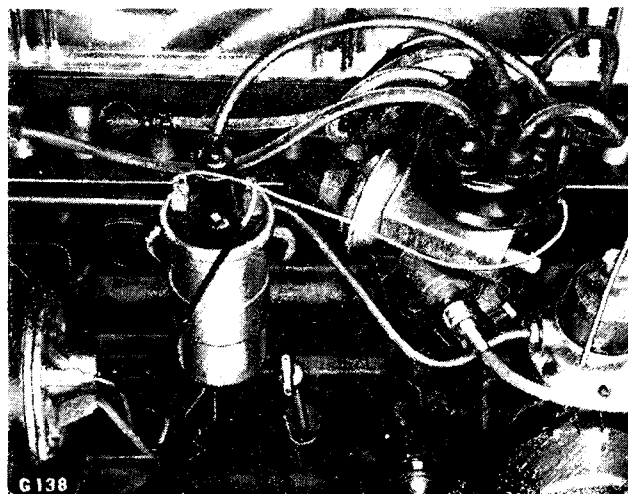


Fig. 40. Ignition coil installed

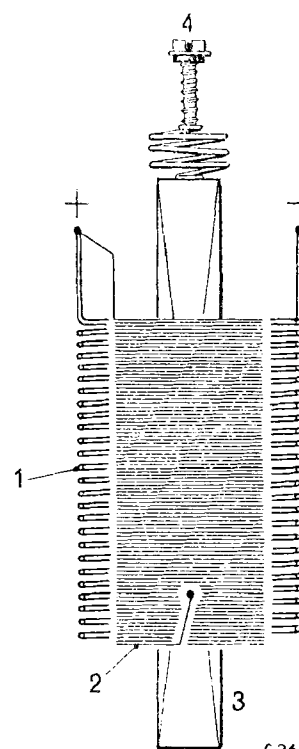


Fig. 41. Component wiring diagram

- + Supply
- 1 Primary winding
- Ignition distributor low tension wire connector
- 2 Secondary winding
- 3 Square section laminated iron core
- 4 High tension output

IGNITION DISTRIBUTOR

Data

Manufacturer	Delco Remy
Series	D 202
Delco Remy part No.	7953291
Stanpart No.	213186
Contact gap	0.015 in.
Rotation—viewed on rotor	Anticlockwise
Firing angles	60 ± 1 degs.
Dwell angle	40—42 degs.
Open angle	18—20 degs.
Moving contact spring tension	17—21 ozs.
Condenser capacity	0.18—0.23 mfd.
Engine firing order	1-5-3-6-2-4

Centrifugal advance

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
250	0	0	500	0	0
450	0	1.9	900	0	3.8
825	3.5	5.5	1650	7.0	11.0
1200	4.4	6.4	2400	8.8	12.8
1800	5.8	7.8	3600	11.6	15.6
2400	7.3	9.3	4800	14.6	18.6
2500	7.5	9.5	5000	15.0	19.0

Vacuum advance

Run distributor at 500 r.p.m. maximum in the appropriate direction of rotation.

Ins. of mercury vacuum	Advance
0— 3.8	Distributor must not start to advance
3.8— 6.2	Distributor must start to advance
8.6—11.0	4 degs. distributor advance— 8 degs. crankshaft advance—must occur
12.2—14.6	7 degs. distributor advance—14 degs. crankshaft advance—must occur
14.6—17.0	9 degs. distributor advance—18 degs. crankshaft advance—must occur
20	11 degs. distributor advance—22 degs. crankshaft advance—must not be exceeded

Description

The distributor shaft rotates at half crankshaft speed driven from the engine camshaft via a drive gear.

The shaft and centrifugal advance mechanism are assembled as a unit and rotate in two sintered iron bearings contained in the housing.

The centrifugal advance mechanism advances the spark under increasing engine speed. This is achieved by two weights extending outwards against the action of the control springs. The resulting cam action causes the cam spindle to rotate slightly anticlockwise relative to the shaft.

When the contacts close a circuit is completed via the low tension wire, moving contact, fixed contact, mounting plate and mounting plate earth lead to earth. When the contacts open the low tension circuit is broken causing a collapse of the magnetic field in the ignition coil.

The moving contact, fixed contact and condenser are located on the mounting plate. This assembly can be rotated through a limited angle by the vacuum advance mechanism which functions to improve fuel economy by timing the spark earlier at part throttle. Engine timing can be adjusted by rotating the vernier adjustment knob which positions the mounting plate assembly relative to the vacuum advance mechanism control.

The condenser is connected between the terminal stud and mounting plate—that is parallel with the contacts—and functions to produce the desirable quick collapse of the magnetic field in the ignition coil. Condenser action also prevents arcing across the contacts.

High tension surges initiated in the ignition coil are distributed in the correct sequence to the sparking plugs by the cap, rotor and high tension leads.

A drive gear contained within the housing provides a drive for the tachometer

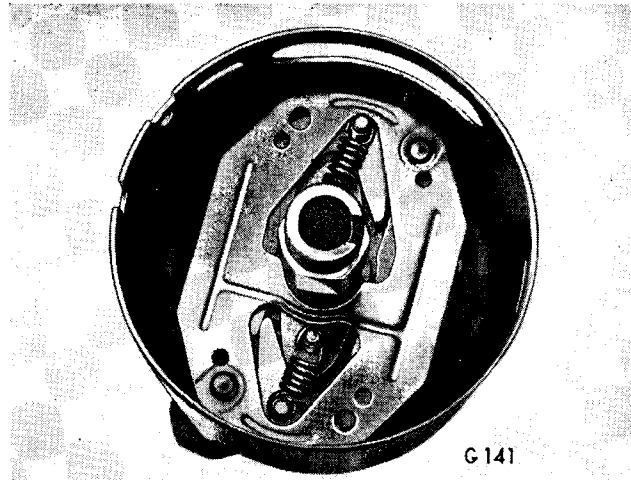


Fig. 42. Centrifugal advance mechanism

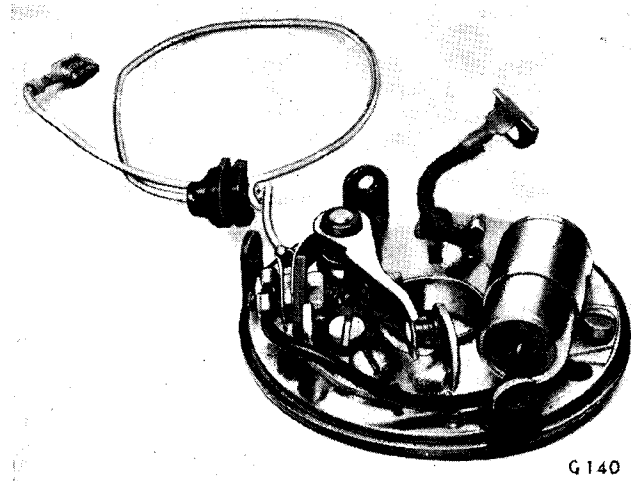


Fig. 43. Mounting plate assembly

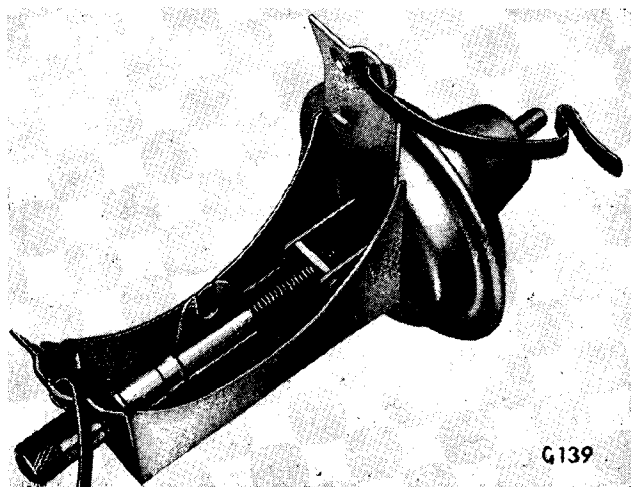


Fig. 44. Vacuum advance mechanism

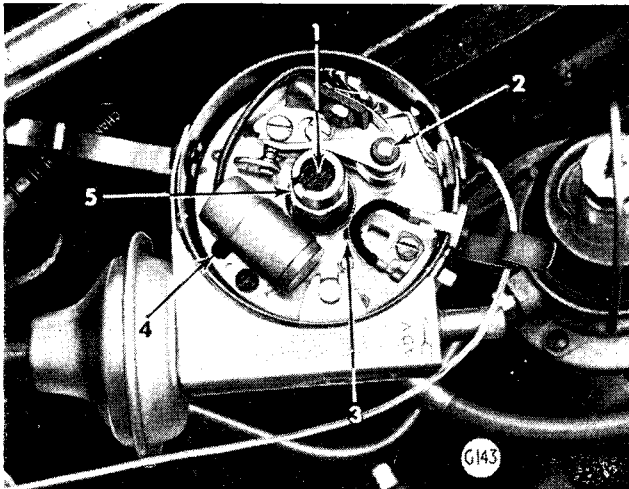


Fig. 45. Lubrication

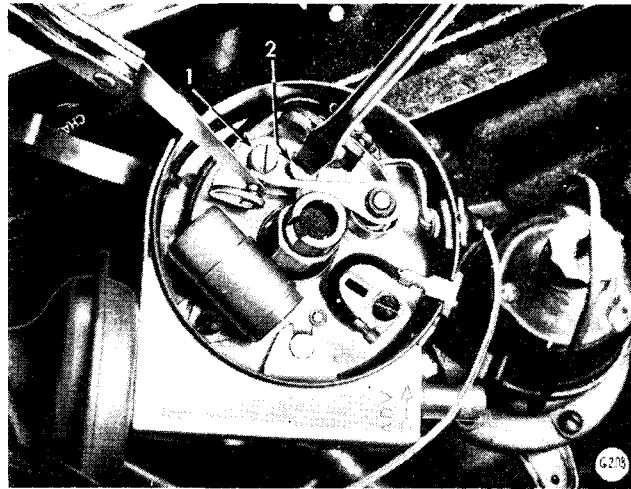


Fig. 46. Adjust contact gap

Service

Lubrication—Remove cap and rotor

1. Few drops of engine oil to oil retaining felt to lubricate shaft—cam spindle.
2. One drop of engine oil to lubricate moving contact pivot.
3. Several drops of engine oil through OIL hole.
4. Approximately 5 cc.—about one teaspoonful—of engine oil through OIL hole.
Oil is inserted through OIL holes 3 and 4 to lubricate centrifugal advance mechanism and upper sintered iron bearing.
5. Lightly grease with petroleum jelly to lubricate cam.

Wipe away any surplus oil. Ensure contacts are oil free. Any oil on contacts may result in burning.

Contacts—The contact surfaces should have a grey frosted appearance. If the surfaces are partly worn clean as detailed below. If excessively worn or pitted renew contact set.

Clean contacts—Use a clean fine cut contact file. Do not attempt to remove all roughness or dress contacts smooth. Remove only scale or dirt.

Do not use emery cloth or sandpaper as cleaning with either can result in particles becoming embedded causing arcing and subsequent rapid deterioration of the contacts.

Contact gap—It is important that the correct gap be maintained. Contacts set too closely may tend to burn rapidly. Contacts set too wide may tend to cause a weak spark at high speed.

Adjust Contact Gap

1. Remove cap and rotor.
2. Rotate cam so moving contact is positioned on a cam peak.

NOTE: When distributor is in situ rotate cam by turning crankshaft mounted cooling fan.

3. Slacken lock screw (1).
4. Position a 0.015 in. feeler gauge between contacts. Rotate eccentric screw (2) to adjust gap. Tighten lock screw.
5. Check 0.015 in. gap has been maintained.

Advance mechanism

Centrifugal advance mechanism action—This can be checked by removing cap and turning rotor anticlockwise against control springs. Rotation through a small angle should be possible and rotor should return to its original position when released.

Vacuum advance mechanism action—This can be checked by depressing vernier adjustment knob against unit spring. Action should be smooth and assembly should return to its original position when released.

Centrifugal advance mechanism operation—This can only be checked by employing an electronic engine tester or timing light. Refer to Group 6—Test data and equipment.

Vacuum advance mechanism operation—This can be checked visually with engine running by observing vernier adjustment knob while actuating throttle linkage. Knob should move in and out with changes in depression in vacuum advance mechanism. Vacuum advance mechanism operation can also be checked by employing an electronic engine tester or timing light. Refer to Group 6—Test data and equipment.

Engine timing

Static engine timing—Refer to Group 1.

Timing with engine running employing electronic engine tester—Refer to Group 6—Test data and equipment.

Timing with engine running employing timing light—Refer to Group 6—Test data and equipment.

Remove ignition distributor

NOTE: To facilitate re-timing do not slacken clamp bolt.

1. Remove cap.
2. Disconnect low tension wire from ignition coil negative connector.
3. Pull off vacuum advance mechanism pipe.
4. Remove tachometer drive.
5. Remove rear mounting bolt.
6. Remove forward mounting bolt while withdrawing distributor from adaptor. A sharp upward pull may be required to withdraw.

Install ignition distributor

NOTE: To facilitate re-timing do not slacken clamp bolt.

1. Position forward mounting bolt and washers to distributor. Insert distributor into adaptor. Ensure coupling offset key locates correctly in drive gear offset slot while screwing in forward mounting bolt.
2. Fit rear mounting bolt.
3. Fit tachometer drive by inserting cable and securing with knurled connector.
4. Push on vacuum advance mechanism pipe.
5. Connect low tension wire to ignition coil negative connector.
6. Check engine timing as detailed in Group 1.
7. Fit cap.

Remove Contacts

1. Remove cap and rotor.
2. Slacken terminal stud inner nut.
3. Withdraw moving contact.
4. Remove lock screw.
5. Withdraw fixed contact.
6. Remove fixed contact from terminal stud.

Install Contacts

1. Ensure contacts are clean. If a new contact set is being fitted ensure preservative is removed from contact faces.
2. Fit fixed contact to terminal stud. Tighten nut finger tight only.
3. Position fixed contact.
4. Fit lock screw.
5. Position moving contact with spring on outer side of insulation strip.
6. Tighten terminal stud inner nut.
7. Adjust contact gap as detailed above.

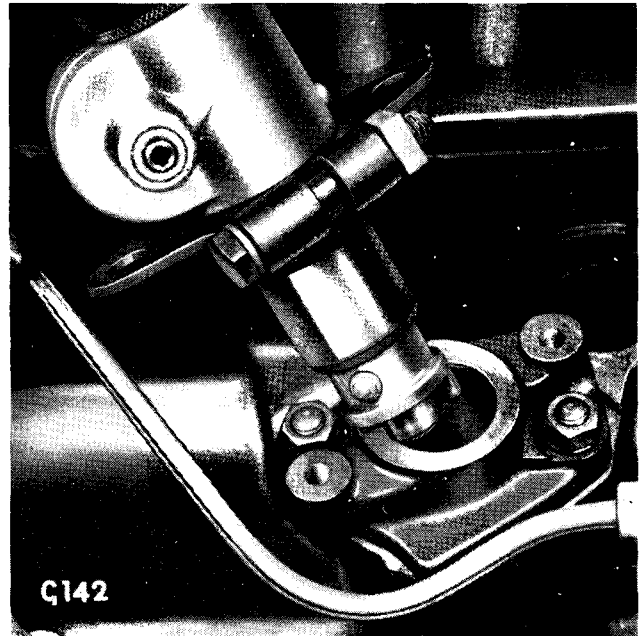


Fig. 47. Remove/install ignition distributor

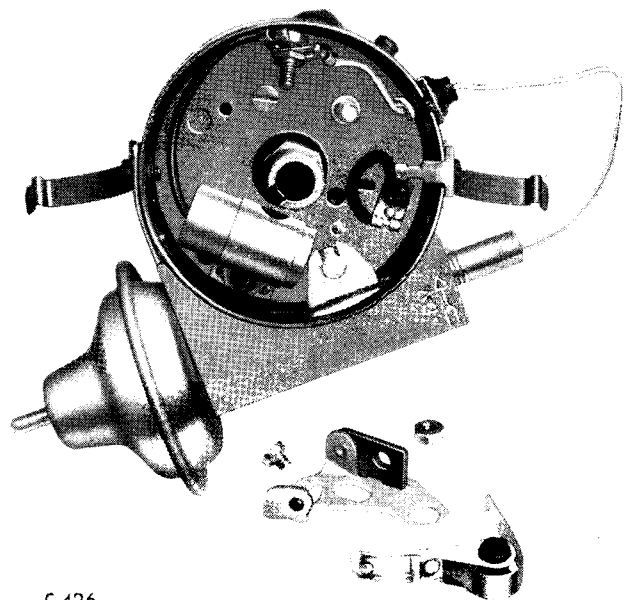
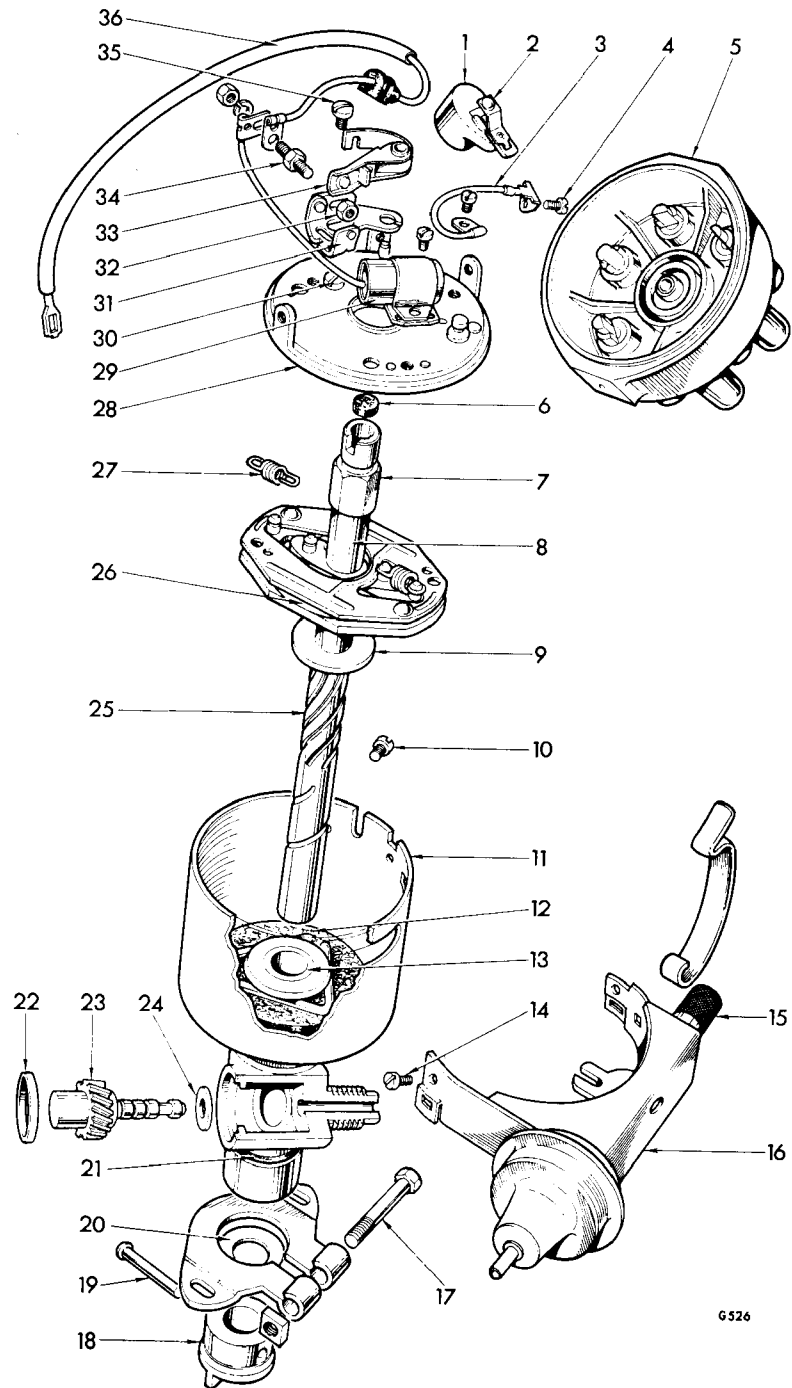


Fig. 48. Remove/install contacts

- 1 Rotor
- 2 Rotor contact
- 3 Mounting plate earth lead
- 4 Side screw
- 5 Cap
- 6 Oil retaining felt
- 7 Cam
- 8 Cam spindle
- 9 Upper thrust washer
- 10 Short side screw
- 11 Housing
- 12 Oil retaining felt
- 13 Upper sintered iron bearing
- 14 Side screw
- 15 Vernier adjustment knob
- 16 Vacuum advance mechanism
- 17 Clamp bolt
- 18 Coupling
- 19 Coupling pin
- 20 Lower thrust washer
- 21 Rubber 'O' ring
- 22 Staked plug
- 23 Tachometer drive gear
- 24 Thrust washer
- 25 Shaft and centrifugal advance mechanism unit
- 26 Weight
- 27 Control spring
- 28 Mounting plate
- 29 Condenser
- 30 Eccentric screw
- 31 Fixed contact
- 32 Terminal stud inner nut
- 33 Moving contact
- 34 Terminal stud
- 35 Lock screw
- 36 Low tension wire



G526

Fig. 49. Ignition distributor details

Disassemble Ignition Distributor

1. Remove ignition distributor as detailed above.
2. Remove rotor.
3. Remove two side screws to release vacuum advance mechanism.
4. Remove remaining short side screw. Withdraw mounting plate assembly.
5. If required remove tachometer drive gear. Using thin chisel or screwdriver pierce staked plug and prise out. Withdraw tachometer drive gear and thrust washer.
CAUTION: DO NOT PERFORM THIS REMOVAL UNLESS A NEW STAKED PLUG IS AVAILABLE.
6. If required remove shaft and centrifugal advance mechanism unit. Ensure tachometer drive gear has been removed. File and tap out coupling pin. Remove coupling and lower thrust washer. Ensure shaft is burr free and withdraw. Remove upper thrust washer.
CAUTION: DO NOT PERFORM THIS REMOVAL UNLESS A NEW STAKED PLUG AND COUPLING PIN ARE AVAILABLE.
7. If required remove control springs. Do not attempt to disassemble shaft and centrifugal advance mechanism unit further. Repair is by unit replacement.

Assemble Ignition Distributor

1. If required fit control springs. Exercise care not to distort springs.
When overhauling distributor it is recommended that control springs are renewed. Tired or distorted springs will effect engine performance.
2. Lubricate and fit upper thrust washer and shaft and centrifugal advance mechanism unit. Fit lower thrust washer and coupling. Secure with new coupling pin.
If fitting a new undrilled shaft assemble and drill so end float is 0.002"—0.005" and relationship of coupling offset key to rotor locating slot is as shown on Fig. 50.
3. Lubricate nylon tachometer drive gear generously with Shell "Alvania" No. 2 grease or equivalent. Fit thrust washer and tachometer drive gear. Secure with new staked plug staking in six positions.
4. Fit mounting plate assembly. Secure initially with short side screw.
5. Fit vacuum advance mechanism. Secure with two side screws. Include mounting plate earth lead tag in appropriate screw assembly.
6. Fit rotor.
7. Install ignition distributor as detailed above.

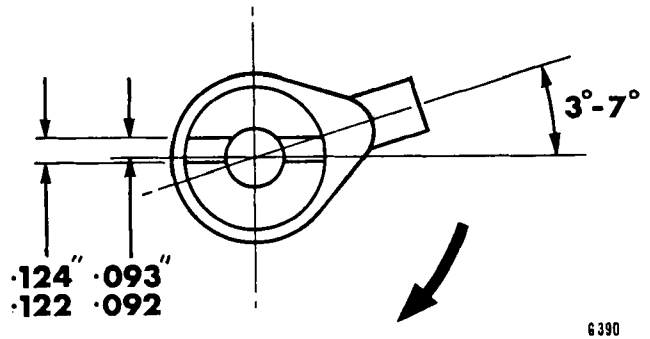
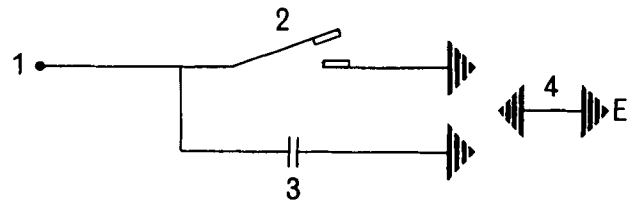


Fig. 50. Relationship of coupling offset key to rotor—view on coupling



- 1 Low tension wire to ignition coil negative connector
- 2 Contacts
- 3 Condenser
- 4 Mounting plate earth lead
- 5 High tension input from ignition coil
High tension distribution
High tension output to sparking plugs

Fig. 51. Component wiring diagram

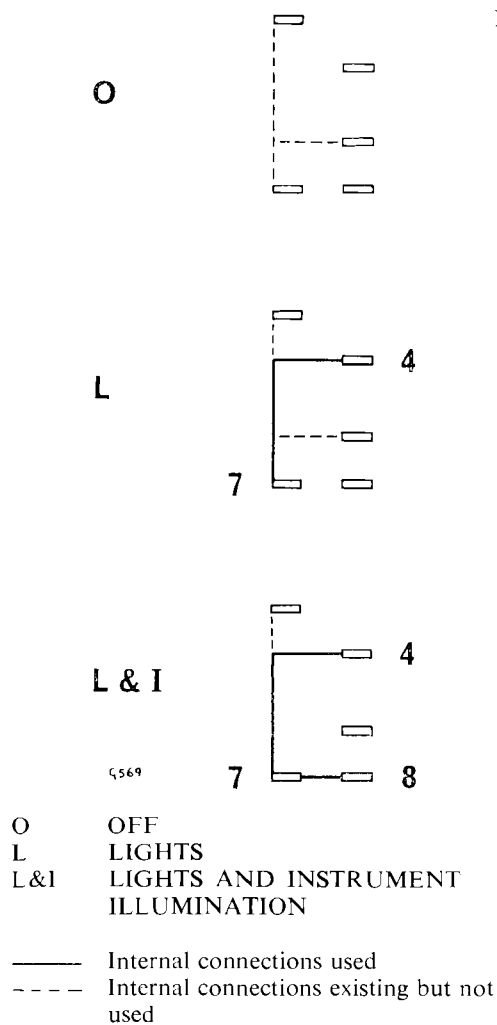


Fig. 52. Master light switch—component wiring diagram

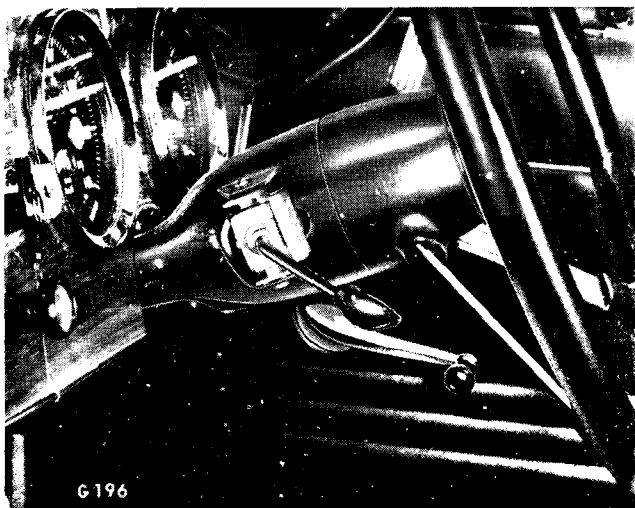


Fig. 53. Column light switch—fairings removed

MASTER LIGHT SWITCH

Description

The master light switch mounted on the facia panel is a three position OFF—LIGHTS—LIGHTS AND INSTRUMENT ILLUMINATION unit which controls the following circuits:

- Supply to column light switch.
- Front parking lamp circuit.
- Tail lamp circuit.
- Plate illumination lamp circuit.
- Instrument illumination circuit.

Removal/Installation—Refer to Group 5

COLUMN LIGHT SWITCH

Description

The column light switch mounted on the steering column operates in two planes.

In the up/down plane three positions SIDE—MAIN BEAM—DIP BEAM control the headlamp circuits. The supply for this section of the switch is taken from the master light switch. The column light switch is therefore only operative in this plane when the master light switch is selected to LIGHTS or LIGHTS AND INSTRUMENT ILLUMINATION.

In the release/pull plane two positions OFF—ON control the main beam flasher circuit. (Italy only—dip beam flasher circuit.)

Remove Column Light Switch

1. Remove fairings.
2. Remove upper steering column clamp.
3. Remove harness cover screw.
NOTE: This is located at lower end of harness cover directly above steering column.
4. Remove harness cover.
5. Disconnect electrical connections.
6. Remove switch retaining screws.
7. Withdraw switch and harness.

Install Column Light Switch

1. Insert harness through aperture and position switch.
2. Fit switch retaining screws.
3. Connect electrical connections.
NOTE: The main beam flasher circuit (Italy only—dip beam flasher circuit) supply wire in the main harness is correctly coloured purple. This should be connected to the brown wire in the switch harness. This inconsistency enables a standard five wire switch harness to be employed.
4. Fit harness cover with tongue located correctly to steering column.
5. Fit harness cover screw.
6. Fit upper steering column clamp.
7. Fit fairings.

FLASHER LAMP SWITCH

Description

The flasher lamp switch mounted on the steering column is a three position L.H.—OFF—R.H. unit which controls the flasher lamp circuit. The switch includes a self cancelling feature that operates in conjunction with a cancelling clip on the steering column.

Remove Flasher Lamp Switch

1. Remove fairings.
2. Remove upper steering column clamp.
3. Remove harness cover screw.
NOTE: This is located at lower end of harness cover directly above steering column.
4. Remove harness cover.
5. Disconnect electrical connections.
6. Remove switch retaining screws.
7. Withdraw switch and harness.

Install Flasher Lamp Switch

1. Insert harness through aperture and position switch.
2. Fit switch retaining screws.
3. Connect electrical connections.
4. Fit harness cover with tongue located correctly to steering column.
5. Fit harness cover screw.
6. Fit upper steering column clamp.
7. Fit fairings.

REVERSE LAMP SWITCH

Description

The reverse lamp switch mounted on a bracket attached to the gearbox top cover is a two position OFF—ON unit. The switch is automatically selected ON when reverse is engaged by the selector shaft striker arm depressing the switch plunger.

Remove Reverse Lamp Switch

1. Remove facia support bracket and gearbox cover as detailed in Group 2.
2. Disconnect electrical connectors.
3. Remove switch from bracket.

Install Reverse Lamp Switch

1. Fit switch to bracket.
2. Connect electrical connectors.
3. Perform functional test to ensure correct operation.
4. Fit gearbox cover and facia support bracket as detailed in Group 2.

STOP LAMP SWITCH

Description

The stop lamp switch mounted on a bracket below the brake pedal mounting is a two position OFF—ON unit. The switch is automatically selected ON when the brake pedal striker moving away from the switch plunger.

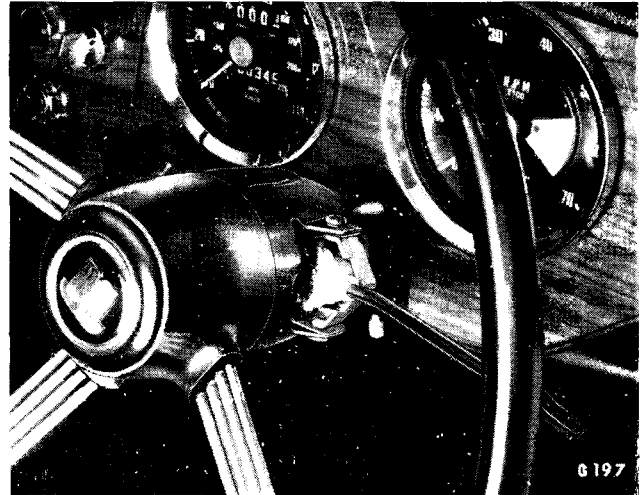


Fig. 54. Flasher lamp switch—fairings removed

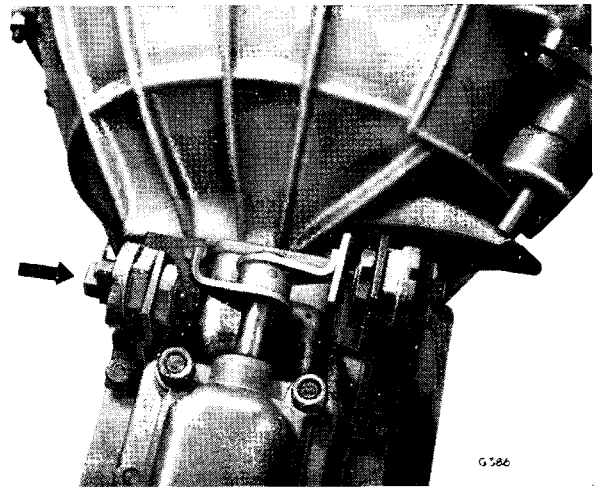


Fig. 55. Reverse lamp switch

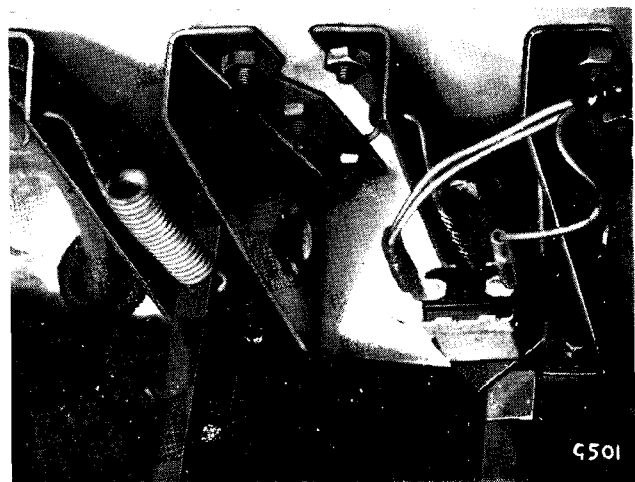


Fig. 56. Stop lamp switch

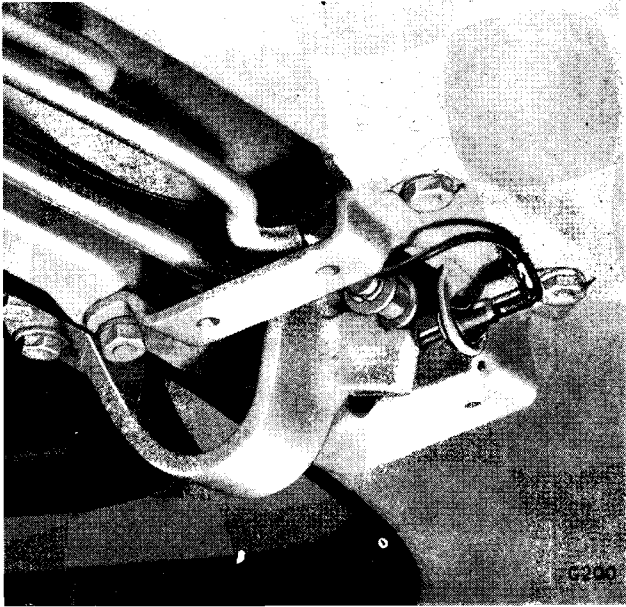


Fig. 57. Tailgate switch

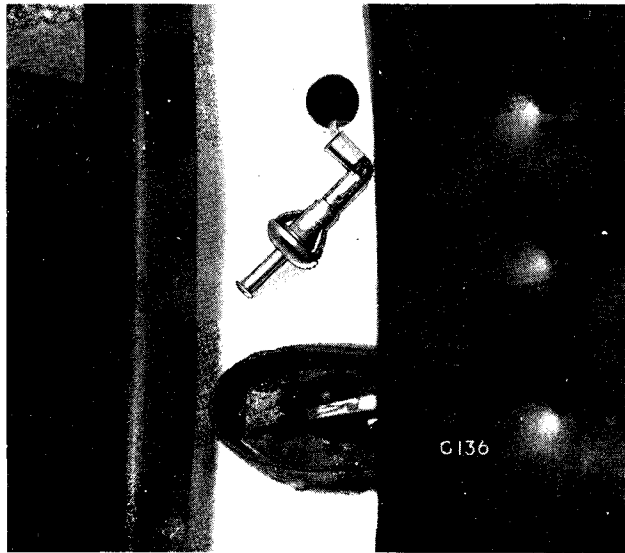


Fig. 58. R.H. door switch

Remove Stop Lamp Switch

1. Disconnect electrical connectors.
2. Remove switch from bracket.

Install Stop Lamp Switch

1. Fit switch to bracket.
2. Connect electrical connectors.
3. Perform functional test to ensure correct operation.

ROOF LAMP SWITCHES

Description

Tailgate switch
L.H. door switch
R.H. door switch
Facia switch

The roof lamp is controlled by the four OFF—ON switches detailed above.

When the tailgate and doors are shut the appropriate switches are held in the OFF position. Opening the tailgate or either door will automatically select a switch ON to illuminate the roof lamp.

The facia switch allows the roof lamp to be selected manually when the tailgate and doors are shut.

Remove Tailgate Switch

1. Remove tailgate hinge cover as detailed in Group 5.
2. Pull switch from bracket.
3. Disconnect electrical connection.

Install Tailgate Switch

1. Pass wire through switch bracket aperture. Connect electrical connection.
2. Fit switch to bracket. Ensure good electrical contact.
3. Perform functional test to ensure correct operation.
4. Fit tailgate hinge cover as detailed in Group 5.

Remove Door Switch

1. Pull switch from aperture.
NOTE: If difficulty is experienced use screwdriver to lever out.
2. Disconnect electrical connection.

Install Door Switch

1. Connect electrical connection.
2. Fit switch to aperture. Ensure good electrical contact.
3. Perform functional test to ensure correct operation.

Removal/Installation Facia Switch—Refer to Group 5.

LAMPS AND BULBS

Bulb chart

Lamp	Watts	Lucas part No.	Stanpart No.
Headlamps L.H. Dip—Normal	60/45	54521872	512231
L.H. Dip—Sweden			
Until 1st Sept '67	45/40	410	510218
R.H. Dip—Normal	45/40	410	510218
R.H. Dip—Sweden			
After 1st Sept. '67	45/40	410	510218
R.H. Dip—U.S.A.	50/40	54522231	514578
R.H. Dip—France	45/40	411	510219
Front parking lamps	6	207	57591
Front flasher lamps	21	382	502379
Rear flasher lamps	21	382	502379
Reverse lamps	21	382	502379
Tail/stop lamps	6/21	380	502287
Plate illumination lamp—Normal	6	989	59467
U.S.A. & Denmark	4	222	501436
Roof lamp	6	—	59897
Instrument illumination	2·2	987	59492
Warning lights	2·2	987	59492

HEADLAMPS

Description

Each headlamp consists of a sealed beam light unit secured between a unit seating and retaining rim. These items are held together by screws 1, 2 and 3. This assembly is fitted to a housing by a spring and beam aiming screws A and B. A chrome rim clipped to the housing provides embellishment.

Remove Rim

Insert a large screwdriver behind rim adjacent to clip. Twist screwdriver to release rim from clip. Lift rim from upper retainers.

Install Rim

Ensure clip projection on rim is not bent. Position rim so clip components are aligned. Locate rim behind upper retainers and push to engage clip.

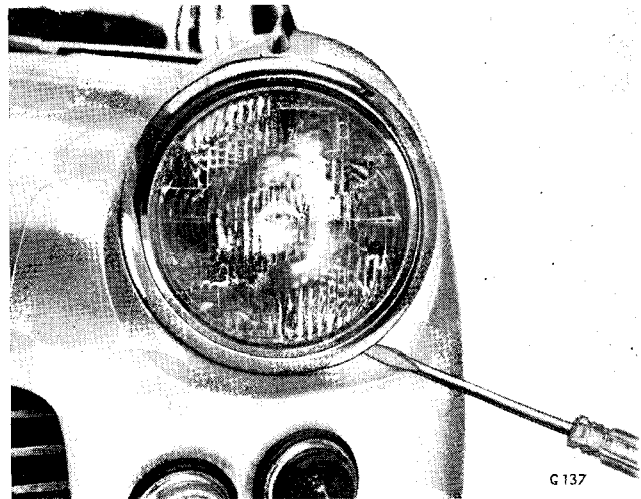


Fig. 59. Remove rim

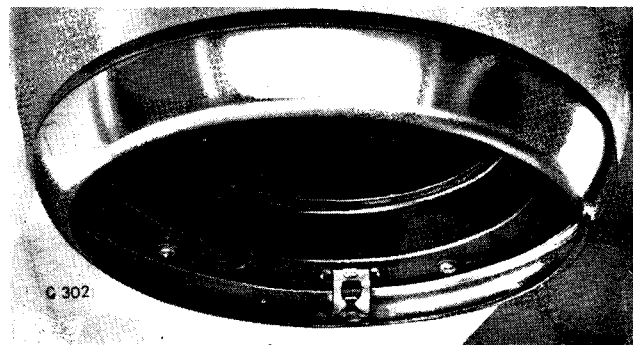


Fig. 60. Rim clip

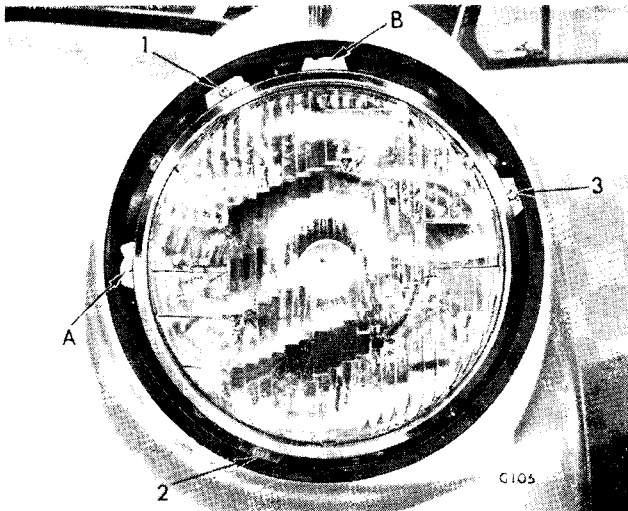


Fig. 61. Headlamp—rim removed

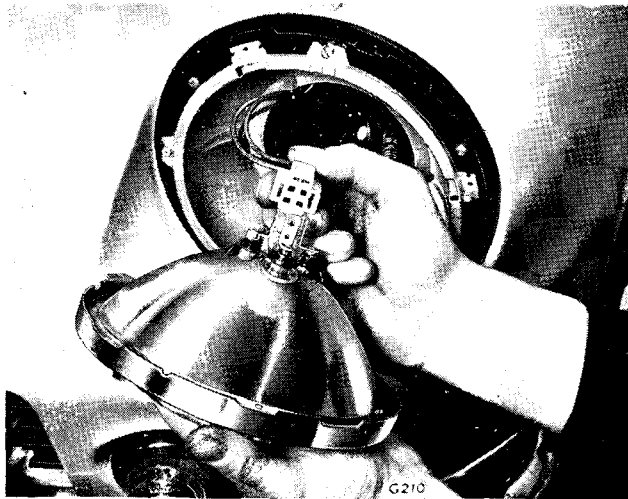


Fig. 62. Retaining rim and sealed beam light unit

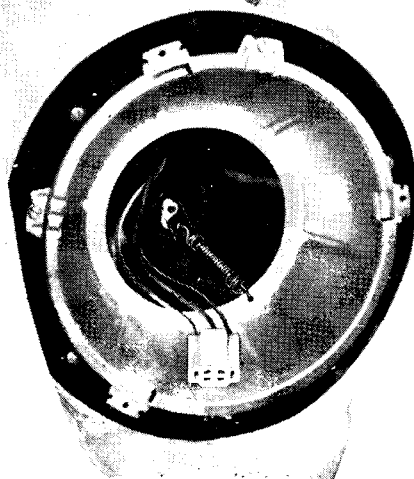


Fig. 63. Unit seating and housing

Remove sealed beam light unit

NOTE: TO AVOID BEAM AIMING DO NOT DISTURB BEAM AIMING SCREWS A AND B.

1. Remove rim as detailed above.
2. Remove three screws 1, 2 and 3 to release retaining rim and sealed beam light unit.
3. Pull connector from sealed beam light unit.

Install sealed beam light unit

NOTE: TO AVOID BEAM AIMING DO NOT DISTURB BEAM AIMING SCREWS A AND B.

1. Fit connector to sealed beam light unit.
2. Position retaining rim and sealed beam light unit. Secure with three screws 1, 2 and 3.
3. Install rim as detailed above.

Beam Aiming

Remove rim as detailed above. Screw A positions the beam in the horizontal plane. Screw B controls beam height.

Beam aiming can best be accomplished using equipment such as Lucas "Beamsetter" or "Lev-L-Lite". Employ equipment as detailed by the manufacturer.

**FRONT PARKING LAMPS
FRONT FLASHER LAMPS
REAR FLASHER LAMPS
REVERSE LAMPS**

Description

The above lamps are all similar in construction. A rubber body encloses a metal bulbholder. Three screws attach these components to the vehicle body. The lens flange is positioned under a retaining lip formed on the body. A chrome rim attached by a second lip provides embellishment and secures the lens attachment. The front parking lamps and reverse lamps have clear lenses. The front and rear flasher lamps have amber lenses.

Remove Bulb

Use screwdriver to turn back lip to remove rim. Remove lens in a similar manner. Remove bulb from bayonet fitting.

Install Bulb

Fit bulb to bayonet fitting. Locate lens to lip and "run round" with screwdriver to secure lens flange under lip. Fit rim in a similar manner.

TAIL/STOP LAMPS

Description

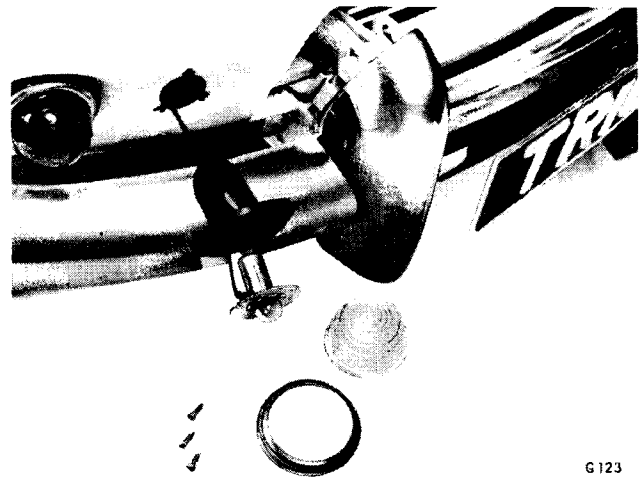
The tail/stop lamps consist of a base which supports a reflector plate and a bayonet socket for the double filament bulb. Two screws attach the base to the vehicle body. The lens which incorporates a reflector is positioned under a retaining lug and secured with a single screw.

Remove Bulb

Remove lens by withdrawing single screw and lifting from retaining lug. Remove bulb from bayonet fitting.

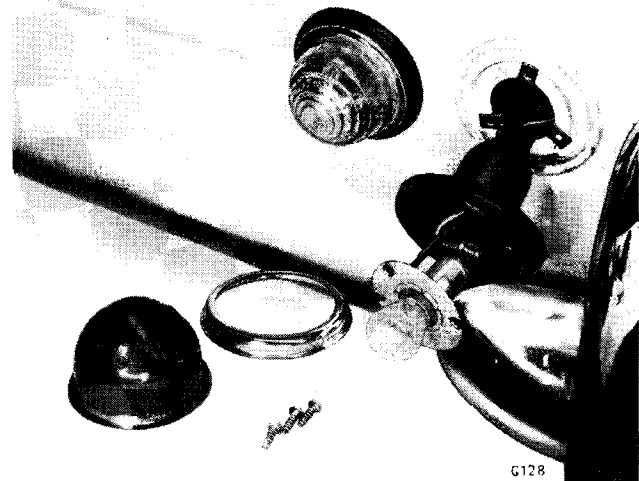
Install Bulb

Locate bulb correct way round and fit to bayonet fitting. Position lens under retaining lug and secure with single screw.



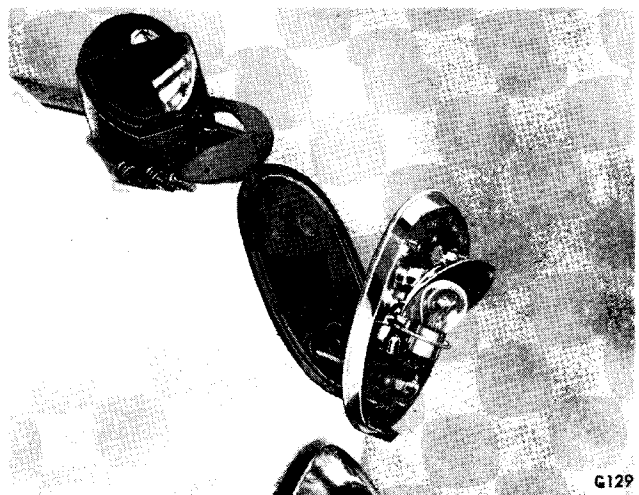
G123

Fig. 64. Front parking lamp and front flasher lamp



G128

Fig. 65. Rear flasher lamp and reverse lamp



G129

Fig. 66. Tail/stop lamp

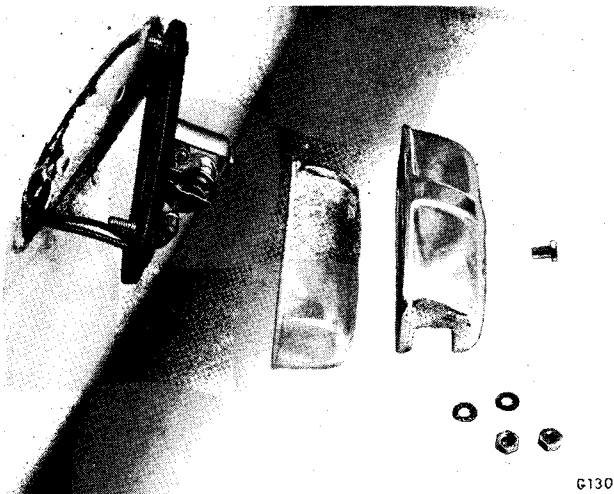


Fig. 67. Plate illumination lamp

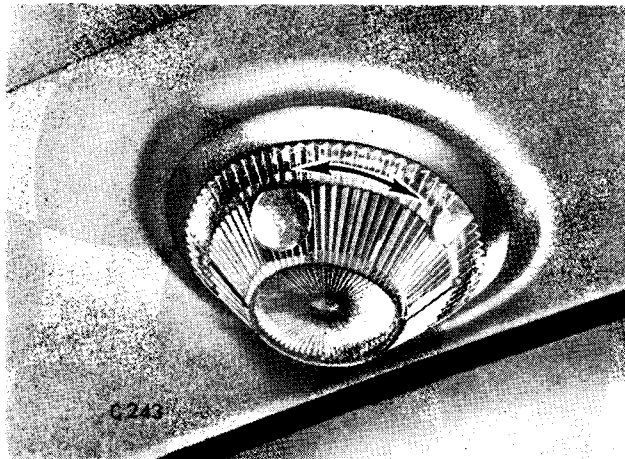


Fig. 68. Roof lamp installed

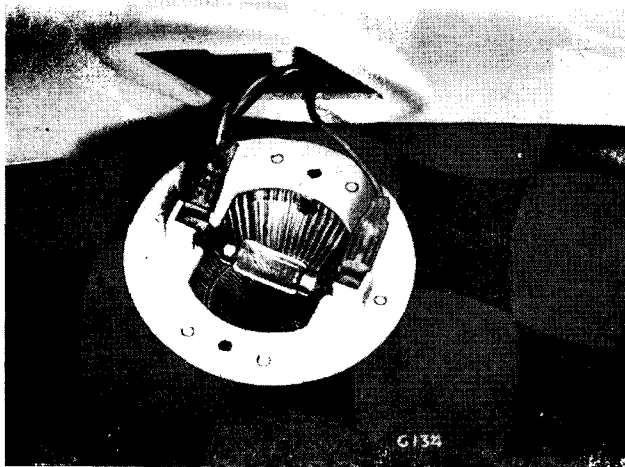


Fig. 69. Roof lamp removed

PLATE ILLUMINATION LAMP

Description

The plate illumination lamp consists of a base which supports a bayonet socket, two studs that attach the unit to the vehicle body and a bracket to retain the cover and lens. The cover and lens are secured to the bracket by a retainer.

Remove Bulb

Remove cover and lens by unscrewing single retainer. Remove bulb from bayonet fitting.

Install Bulb

Fit bulb to bayonet fitting. Locate cover and lens to retainer. Position assembly and secure by tightening retainer.

ROOF LAMP

Description

The roof lamp consists of a base which supports two contacts for the festoon bulb and a lens which incorporates a rotatable spotlight feature. Two screws attach the lamp to the vehicle body.

Remove Bulb

Rotate lens until two screws are exposed. Withdraw screws and lower lamp. Remove festoon bulb.

Install Bulb

Fit festoon bulb. Position lamp and secure with two screws.

INSTRUMENT ILLUMINATION

Description

Speedometer
Tachometer
Fuel indicator
Temperature indicator

The above instruments are each illuminated by a miniature Edison screw cap bulb contained in a holder which is a component of the main harness.

The holders for the speedometer and tachometer are attached by claws to apertures provided on the rear of the instruments.

The holders for the fuel indicator and temperature indicator are inserted into tube assemblies mounted on the rear of the instruments.

Remove Bulb

Pull holder from instrument. Unscrew bulb from holder.

Install Bulb

Screw bulb into holder. Fit holder to instrument.

WARNING LIGHTS

Description

Speedometer: Main beam warning light
Oil pressure warning light
Ignition warning light

Tachometer: Flasher warning light

The speedometer and tachometer together house four warning lights as detailed above.

Each warning light consists of a miniature Edison screw cap bulb contained in a holder which is a component of the main harness.

The holders are inserted in plastic tube assemblies contained in the instruments. The tubes align with coloured lenses fitted to the instrument faces.

Remove Bulb

Pull holder from instrument. Unscrew bulb from holder.

Install Bulb

Screw bulb into holder. Fit holder to instrument.

- A. Main beam warning light
- B. Oil pressure warning light
- C. Ignition warning light
- D. Flasher warning light

Fig. 73. Warning lights

Fig. 70
Instrument
illumination

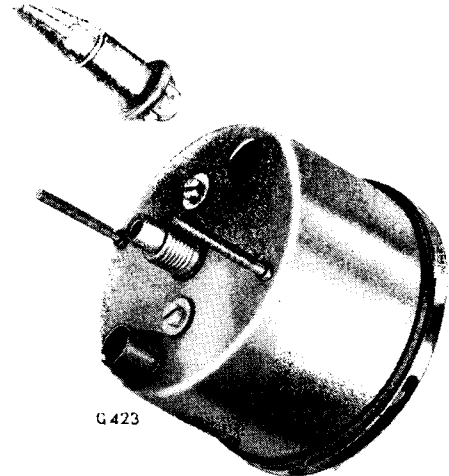


Fig. 71
Instrument
illumination

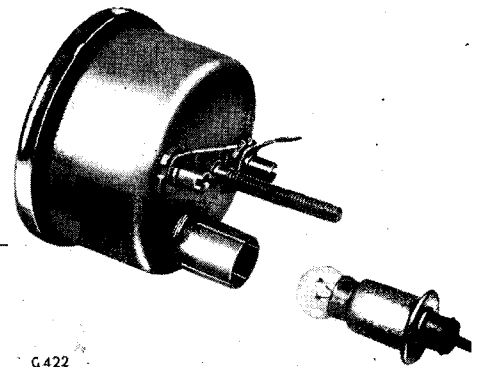
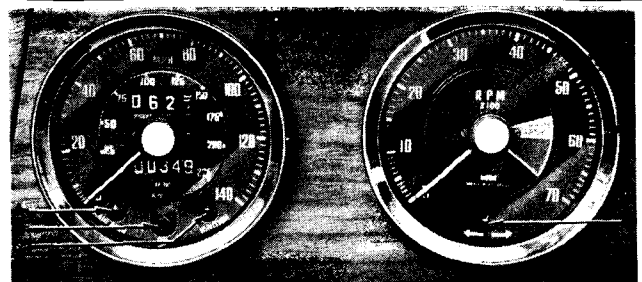
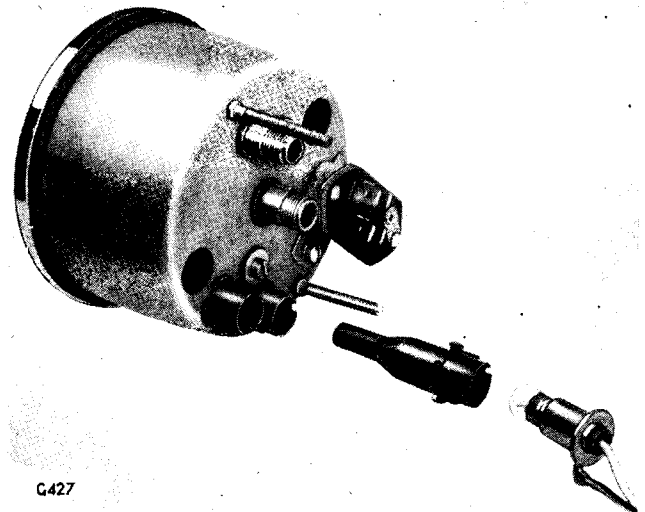


Fig. 72
Warning
lights



FLASHER UNIT

Data

Manufacturer	Lucas
Type	FL 5
Lucas part No.	35011
Stanpart No.	131251
Nominal voltage	12 volts
Flashes per minute	70—100 at 12.8 ± 0.1 volts
Light to dark ratio	$50-50 \pm 15\%$
Resistance between terminals B and L	9.75 ± 0.5 ohms
Rating	42 watt (supplying two flasher lamps of 21 watt each)

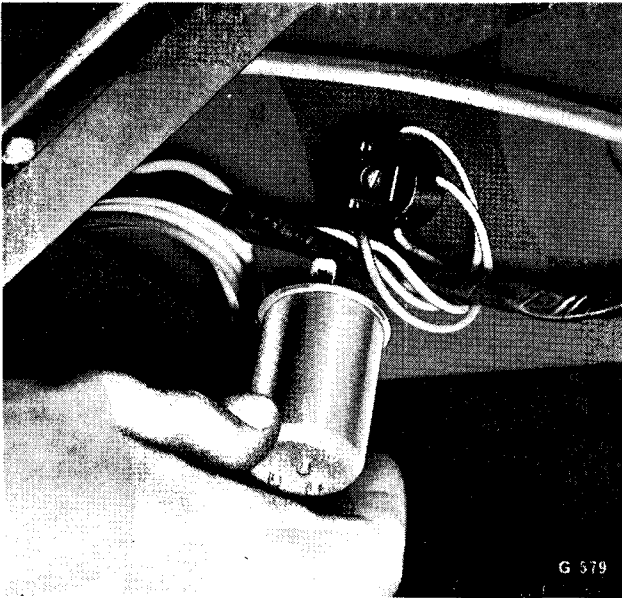


Fig. 74. Remove/install flasher unit

Description

The flasher unit is housed in a cylindrical container. The mechanism consists of an actuating wire, ballast resistor, two sets of contacts and a steel core partially enclosed by a series winding. These components function as follows:

Current supplied to terminal B flows through the actuating wire, ballast resistor and series winding to terminal L. From terminal L it flows across the filaments of the two selected lamps to earth.

In this condition the current is limited by the ballast resistor. The series winding is not energised to any effect. The lamps do not illuminate. The current is however large enough to heat the actuating wire causing expansion. This expansion finally allows the main contacts to close under the action of a spring.

Current supplied to terminal B now flows across the main contacts, through the series winding to terminal L. From terminal L it flows to the two selected lamps.

In this condition the current is not limited by the ballast resistor. The series winding is energised to assist the spring to hold in the main contact and pull in the warning light contact against the action of a spring. The two selected lamps and the warning light illuminate. The actuating wire is now removed from the direct circuit causing it to cool and contract. This contraction finally overcomes both spring and magnetic forces to pull the main contacts apart. Current flow through the series winding is reduced allowing the warning light contacts to part under the action of a spring.

The situation is now reverted to the original condition and a second cycle commences.

Service—No maintenance is required.

Removal Installation

CAUTION: HANDLE FLASHER UNIT WITH CARE. MANUFACTURERS SETTING—SATISFACTORY FOR CONDITIONS OF NORMAL AUTOMOBILE DUTY—CAN BE DISTURBED BY ROUGH HANDLING.

Remove Flasher Unit

Locate unit behind fascia on right hand side of bulkhead. Pull flasher unit from socket.

Install Flasher Unit

Fit flasher unit to socket.

Repair

Repair of the flasher unit is by replacement.

If the flasher lamp circuit is not operating correctly to one side only indicated by the flasher warning light failing to illuminate perform the following check:

Select the defective flasher lamp circuit. Although the flasher warning light is not illuminating inspect appropriate pair of flasher lamps. If one is operating—possibly at a higher flasher speed than normal—while the other remains extinguished a blown filament in the extinguished lamp is indicated. Renew the bulb as detailed in Group 6—Lamps and bulbs.

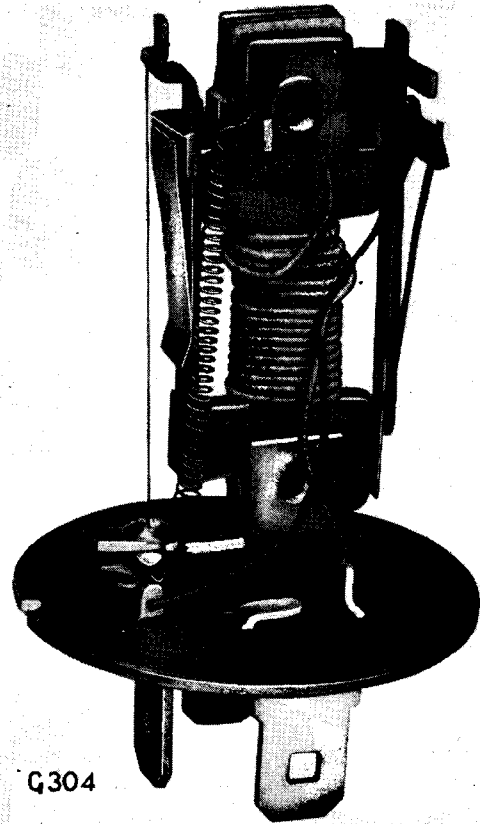


Fig. 75. Flasher unit—internal view

B. Supply

1. Actuating wire
 2. Ballast resistor
 3. Series winding
 4. Main contacts
 5. Main contact spring
 6. Warning light contacts
 7. Warning light contact spring
- L. Output terminal to lamps
P. Output terminal to warning light

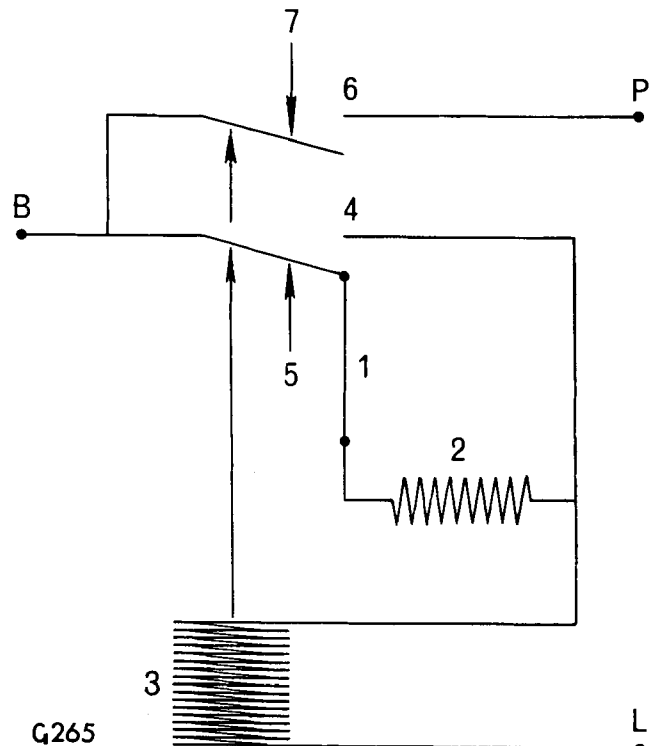


Fig. 76. Component wiring diagram

G265

HORNS

Data

Horn relay

Manufacturer	..	..	..	..	..	..	..	..	..	Lucas
Type..	..	..	..	..	..	..	..	..	..	6RA
Lucas part No.	..	..	..	..	..	..	..	..	..	33188
Stanpart No.	..	..	..	..	..	..	..	..	..	137747
Winding connectors	..	..	..	..	..	..	..	..	..	C2 and W1
Contact connectors	..	..	..	..	..	..	..	..	..	C2 and C1
Contact	..	..	..	..	..	..	..	..	..	Single pole—normally open
Contact pull in voltage	..	..	..	..	..	..	..	..	..	4—9 volts
Contact release voltage	..	..	..	..	..	..	..	..	..	2—5 volts

Some vehicles may be fitted with an alternative horn relay manufactured by Clear Hooter.

Horns

Manufacturer	..	..	..	..	..	..	..	..	..	Lucas
Type..	..	..	..	..	..	..	..	..	..	9H
Lucas part No.	High note	..	..	..	..	..	..	..	..	69144
	Low note..	..	..	..	..	..	..	..	..	69143
Stanpart No.	High note	..	..	..	..	..	..	..	..	143794
	Low note	..	..	..	..	..	..	..	..	142301
Operating current	..	..	..	..	..	..	..	..	..	7.0—7.5 amps.
Weight—single unit	..	..	..	..	..	..	..	..	..	1.75 lbs. approx.

Some vehicles may be fitted with alternative horns manufactured by Clear Hooter.

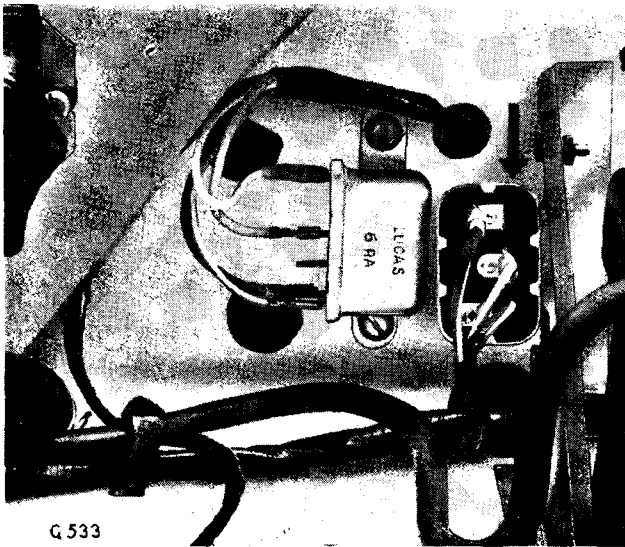


Fig. 77. Horn relay installed

Description

The horn system consists of a horn relay mounted on the bulkhead, a horn push, connection brush and slip ring assembly associated with the steering column and two horns—a high and low note unit—mounted on the bonnet assembly.

The horn relay consists of an operating winding and a set of contacts. The unit is rated for intermittent operation.

The W1 connector of the relay is electrically connected to the static slip ring mounted inside the steering column cowl. A spring loaded connection brush and horn push are mounted in the steering wheel boss and rotate with the wheel. The brush sliding contact sweeps the slip ring while the upper end of the brush is positioned against the horn push contact strip. The horn push has a side earth connection to the steering wheel boss. To ensure a good earth return for the horn control circuit two earth leads are provided. The first is fitted between the two adaptors of the flexible joint at the lower end of the steering column. The second connects the steering rack and pinion assembly to the engine.

The Lucas wind tone horns operate on the principle of a resonating air column vibrated by a diaphragm actuated electro-magnetically by a self interruptory circuit. The horns are sounded in a matched pair consisting of a high note unit and a low note unit. The notes differ by a definite musical interval.

Service

No maintenance is required.

Remove horn relay

Disconnect electrical connectors.
Remove relay from mounting.

Install horn relay

Fit relay to mounting. Connect electrical connectors.

Remove horn push and connection brush

1. Using screwdriver, prise out horn push from steering wheel boss.
2. Withdraw connection brush.

Install horn push and connection brush

1. Apply petroleum jelly to connection brush sliding contact. Insert connection brush so sliding contact sweeps slip ring.
2. Locate horn push contact strip to connection brush. Ensure good electrical contact for side earth connection to steering wheel boss. Press horn push into position.

Remove slip ring

1. Remove horn push and connection brush as detailed above.
2. Remove steering wheel as detailed in Group 4.
3. Remove upper steering column clamp.
4. Remove harness cover screw.
NOTE: This is located at lower end of harness cover directly above steering column.
5. Remove harness cover.
6. Disconnect electrical connection.
7. Bend out two metal tags. Withdraw slip ring from steering column cowl.

Install slip ring

1. Insert wire through aperture. Position slip ring to steering column cowl. Bend in two metal tags to secure.
2. Connect electrical connection.
3. Fit harness cover with tongue located correctly to steering column.
4. Fit harness cover screw.
5. Fit upper steering column clamp.
6. Fit steering wheel as detailed in Group 4.
7. Install horn push and connection brush as detailed above.

Remove horn

Disconnect electrical connectors. Remove horn from mounting bracket.

Install horn

Fit horn to mounting bracket. Connect electrical connectors.

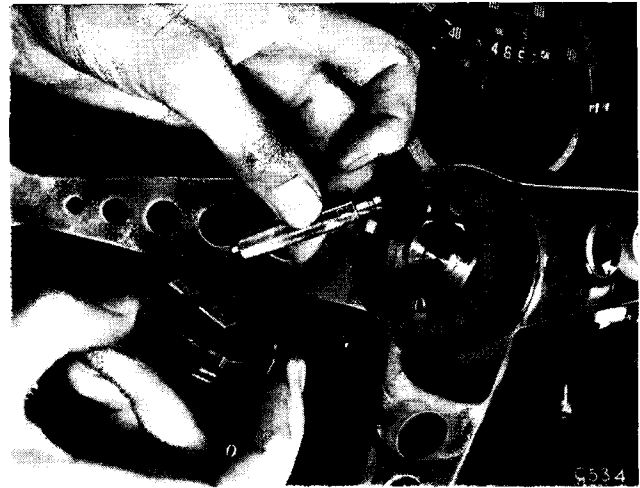


Fig. 78. Connection brush and horn push

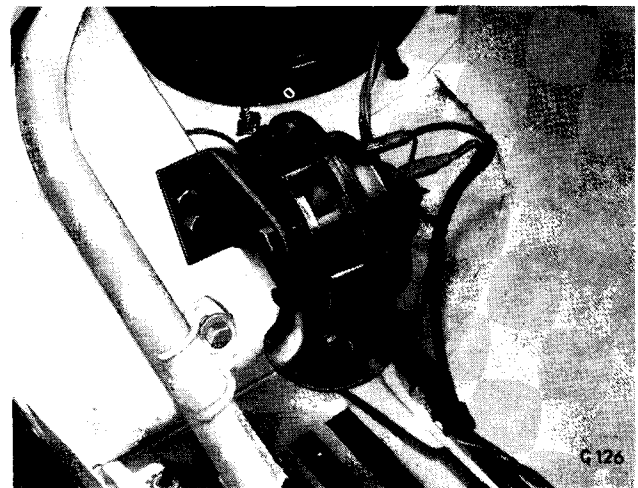
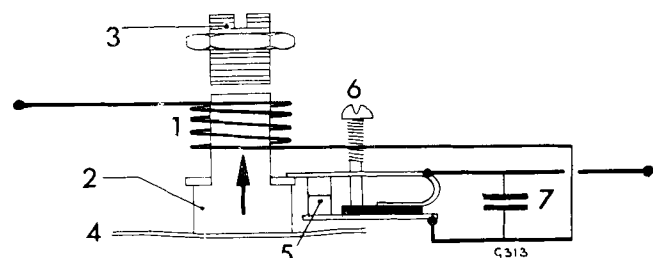


Fig. 79. Horn installed



- 1 Winding
- 2 Plunger
- 3 Central slotted stem
- 4 Diaphragm
- 5 Contacts
- 6 Adjustment screw—left hand thread
- 7 Condenser

Fig. 80. Horn—component wiring diagram

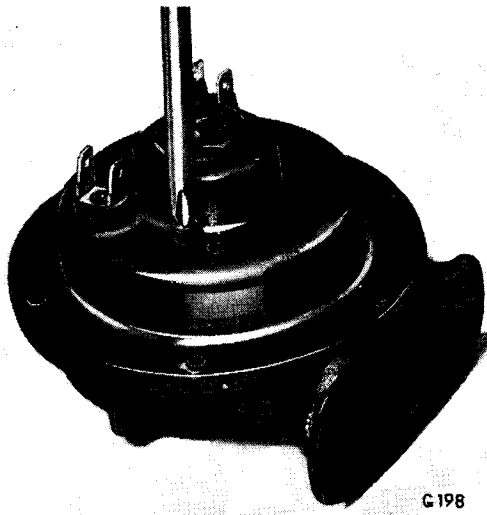


Fig. 81. Adjust Lucas horn

Adjust Lucas horn

This operation should only be required after a long period of service and should only be undertaken if poor performance is experienced. Adjustment will not alter the pitch of the note but may improve performance by taking up wear of the moving parts.

To obtain easy access to adjustment screw and prevent fuse blowing while adjusting, remove horn as detailed above.

Provide suitable test circuit. If during adjustment the horn fails to sound when selected, a heavy current may be flowing. Interrupt current flow instantly.

To adjust turn adjustment screw anticlockwise until horn just fails to sound—then turn clockwise through approximately 90 degrees.

If an ammeter suitable for the operating current—see Data—is available an alternative method of adjustment may be employed. Connect ammeter in series with horn. Turn adjustment screw to obtain the best performance with the least current.

To decrease current turn adjustment screw anticlockwise.

To increase current turn adjustment screw clockwise.

CAUTION: DO NOT DISTURB CENTRAL SLOTTED STEM AND LOCK NUT.

Repair

Repair is by replacement.

OVERDRIVE

The mechanical, hydraulic and electrical circuit aspects of the overdrive are included in Group 2. The four components of the electrical circuit are detailed below:

OVERDRIVE RELAY

Data

Manufacturer	Lucas
Type	6RA
Lucas part No.	33213
Stanpart No.	126792
Winding connectors	W1 and W2
Contact connectors	C1 and C2
Contact	Single pole—normally open
Contact pull in voltage	8—9 volts
Contact release voltage	4 volts minimum

Description

The overdrive relay mounted on the bulkhead consists of an operating winding and a set of contacts. The unit is rated for continuous operation.

Service—No maintenance is required.

Remove overdrive relay

Disconnect electrical connectors. Remove relay from mounting.

Install overdrive relay

Fit relay to mounting. Connect electrical connectors.

Repair—Repair is by replacement.

OVERDRIVE COLUMN SWITCH**Description**

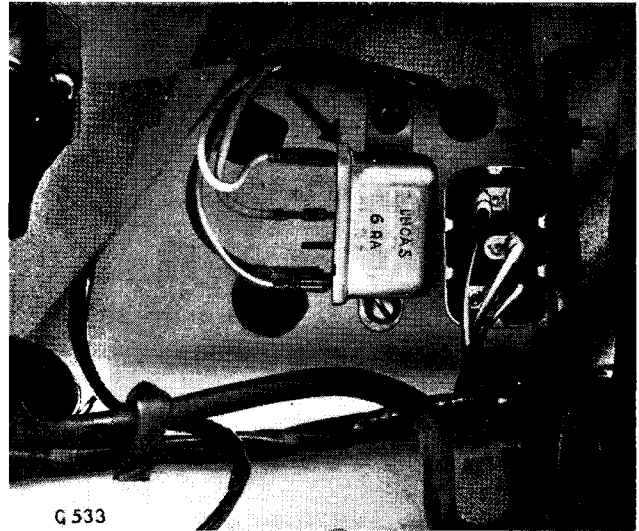
The overdrive column switch mounted on the steering column is a two position OFF—ON unit which in conjunction with the overdrive gearbox switch controls the overdrive circuit.

Remove overdrive column switch

1. Remove fairings.
2. Remove upper steering column clamp.
3. Remove harness cover screw.
NOTE: This is located at lower end of harness cover directly above steering column.
4. Remove harness cover.
5. Disconnect electrical connections.
6. Withdraw harness.
7. Remove switch from fairing.

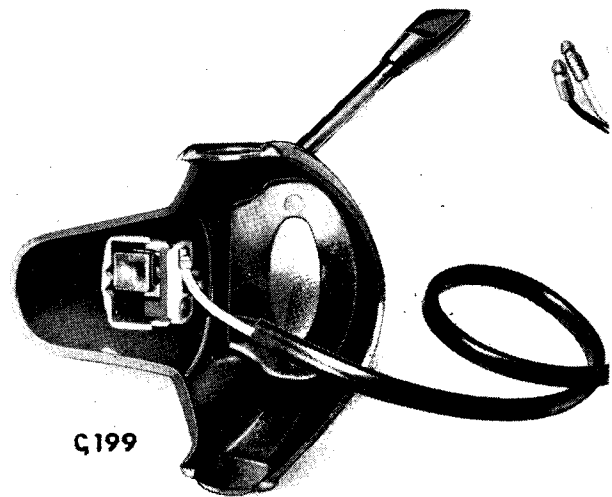
Install overdrive column switch

1. Fit switch to fairing.
2. Insert harness through aperture.
3. Connect electrical connections
NOTE: The wire connecting the overdrive column switch to the overdrive gearbox switch in the overdrive harness is correctly coloured yellow. This should be connected to the black wire in the switch harness. This inconsistency enables a standard two wire switch harness to be employed.
4. Fit harness cover with tongue located correctly to steering column.
5. Fit harness cover screw.
6. Fit upper steering column clamp.
7. Fit fairings.



G 533

Fig. 82. Overdrive relay installed



G199

Fig. 83. Overdrive column switch

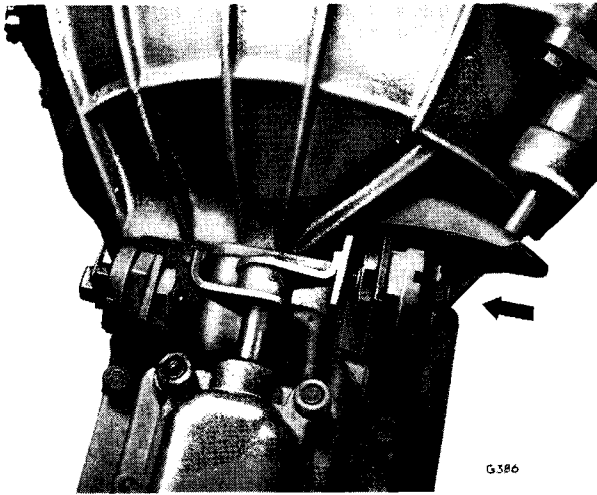


Fig. 84. Overdrive gearbox switch

OVERDRIVE GEARBOX SWITCH

Description

The overdrive gearbox switch mounted on a bracket attached to the gearbox top cover is a two position OFF—ON unit. The switch is automatically selected ON when third or top are engaged by the selector shaft striker arm depressing the switch plunger.

Remove overdrive gearbox switch

1. Remove facia support bracket and gearbox cover as detailed in Group 2.
2. Disconnect electrical connectors.
3. Remove switch from bracket.

Install overdrive gearbox switch

1. Fit switch to bracket.
2. Connect electrical connectors.
3. Perform functional test to ensure correct operation.
4. Fit gearbox cover and facia support bracket as detailed in Group 2.

OVERDRIVE SOLENOID

Data

Manufacturer	Lucas
Type	11S
Lucas part No.	76522
Stanpart No.	512114

Series winding resistance—
measured between A and B
—Figure 87 0.44 ohm.

Shunt winding resistance—
measured between A and
C—Figure 87 11 ohm.

Description

The overdrive solenoid is mounted directly to the right hand side of the overdrive unit.

The solenoid consists of a heavy pull-in series winding, a set of contacts, a light hold-in shunt winding and a plunger.

Current supplied to the solenoid initially flows through the series winding, across the contacts to earth and through the shunt winding to earth. The combined action of the two windings pulls in the plunger to cause engagement of the overdrive unit. This plunger movement displaces a rod that is in communication with the contact arm. The contacts are opened causing the heavy pull-in series winding to be put out of circuit.

Current supplied to the solenoid now flows through the light hold-in shunt winding to earth. The plunger is maintained in position to hold the overdrive unit engaged.

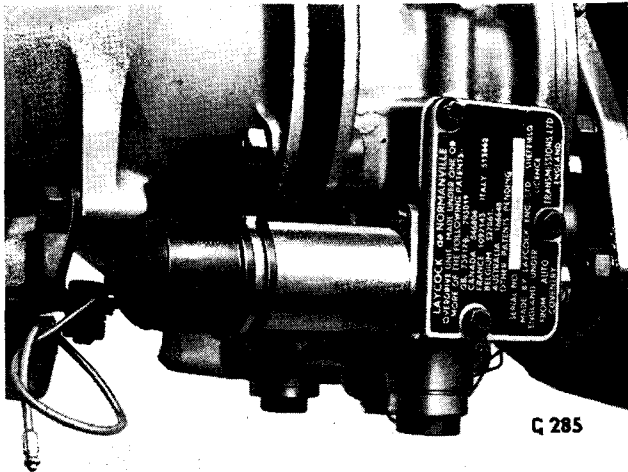


Fig. 85. Overdrive solenoid installed

Service—No maintenance is required.

Remove overdrive solenoid

1. Remove facia support bracket and gearbox cover as detailed in Group 2.
2. Remove overdrive unit side cover plate.
3. Disconnect electrical connection.
4. Remove two screws and withdraw solenoid leaving plunger attached to operating lever.
5. If required remove plunger by unscrewing plunger nut and withdrawing.

CAUTION: DO NOT HOLD PLUNGER BODY WITH GRIPS WHILE UNSCREWING NUT. SUCH ACTION MAY CAUSE BURRING WHICH COULD AFFECT SOLENOID OPERATION.

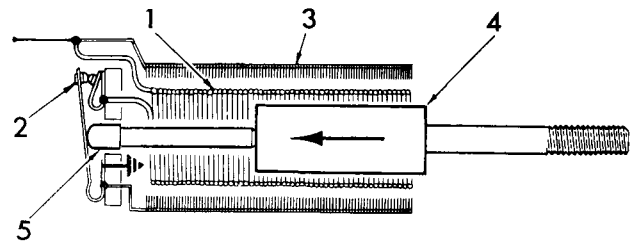
Install overdrive solenoid

1. If required install plunger by inserting into position and fitting plunger nut.
CAUTION: DO NOT HOLD PLUNGER BODY WITH GRIPS WHILE FITTING NUT. SUCH ACTION MAY CAUSE BURRING WHICH COULD AFFECT SOLENOID OPERATION.
2. Fit solenoid over plunger and secure with two screws. Use a new joint washer if available.
NOTE: Solenoid may be fitted either way round.
3. Connect electrical connection.
4. Adjust solenoid operating lever as detailed in Group 2.
5. Fit overdrive unit side cover plate. Use a new joint washer if available.
6. Perform functional test to ensure correct operation.
7. Fit gearbox cover and facia support bracket as detailed in Group 2.

Series and shunt winding continuity

1. Ensure that overdrive solenoid is clean.
2. Withdraw rubber cover.
3. Remove two nuts and withdraw plastic contact cover.
4. Provide suitable test circuit.
5. Insert suitable insulation strip between contacts to ensure electrical separation.
6. Check series winding continuity by connecting to positions A and B—Fig. 87. Series winding resistance is given in Data.
7. Check shunt winding continuity by connecting to positions A and C—Fig. 87. Shunt winding resistance is given in Data.

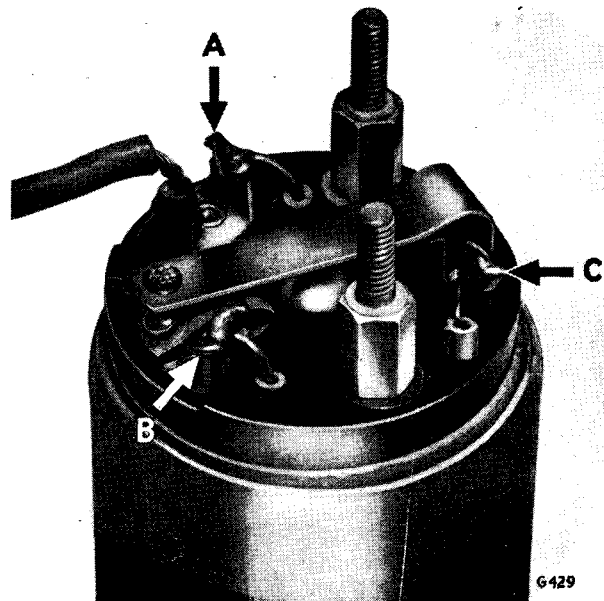
Repair—Repair is by replacement.



G461

- 1 Series winding
- 2 Contacts
- 3 Shunt winding
- 4 Plunger
- 5 Rod

Fig. 86. Overdrive solenoid—component wiring diagram



G429

Fig. 87. Overdrive solenoid—series and shunt winding continuity

WINDSCREEN WIPER MOTOR

Data

Manufacturer	Lucas
Type	DR3A
Lucas part No. R.H. Steer	54071439
L.H. Steer	54071440
Stanpart No. R.H. Steer	212793
L.H. Steer	212794
Running current—after 60 secs. from cold with connecting rod removed:	
Normal speed	3.4 amps. max.
High speed	2.6 amps. max.
Running speed—Final gear after 60 secs. from cold with connecting rod removed:	
Normal speed	44—48 r.p.m.
High speed	58—68 r.p.m.
Field winding resistance	8.0—9.5 ohms at 15.5 degs. centigrade
High speed field resistor	9.5—11.0 ohms
Brush force against commutator—new	4.4—5.6 ozs.
Maximum permissible force to move cable rack in tubing—arms and blades removed	6.0 lbs

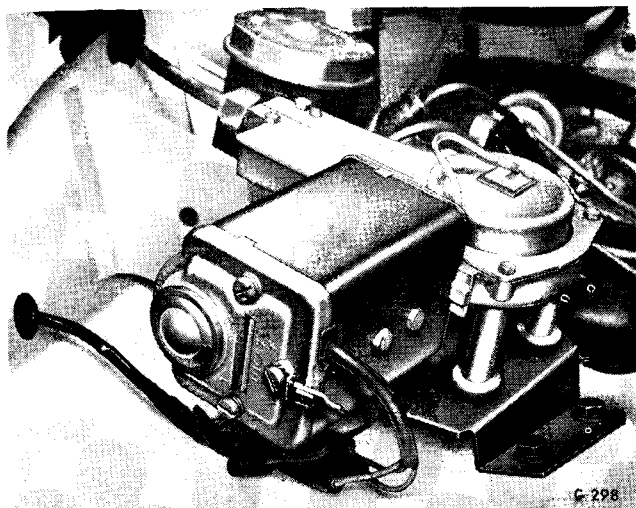


Fig. 88. Windscreen wiper motor installed

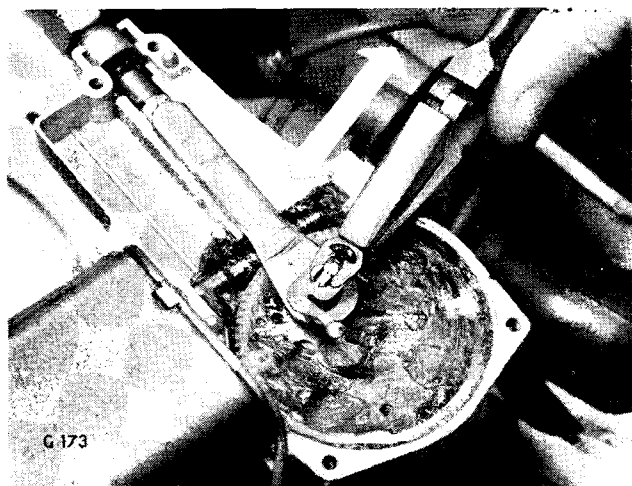


Fig. 89. Crank pin spring clip

Description

The windscreen wiper motor comprises a two speed electric motor and a gearbox unit which drives a cable rack mechanism. Rotation of the motor armature is converted to a reciprocating motion of the cable rack by a single stage worm and gear, a connecting rod and a crosshead contained in a guide channel.

A switching feature stops the arms and blades in the park position irrespective of their position when the facia switch is selected OFF. This is effected by a limit switch contained in the gearbox. The limit switch components are a moving contact mounted on the crank pin and a sector type fixed contact in the domed cover. For the greater part of each stroke the limit switch contacts are closed providing an earth return for the motor current parallel to the facia switch. When the facia switch is selected OFF the motor will continue to run until the limit switch contacts open which will occur when the arms and blades are in the park position.

The park position can be adjusted by rotation of the domed cover which positions the sector type fixed contact.

Service

The windscreen wiper motor is greased during manufacture and no maintenance is required.

Remove Windscreen Wiper Motor

1. Disconnect electrical connections.
2. Remove connecting rod as detailed below.
3. Remove mounting bracket from bulkhead.
4. Manoeuvre unit to allow crosshead and tubing assembly to be released.
5. Remove mounting bracket.

Install Windscreen Wiper Motor

1. Fit mounting bracket to windscreen wiper motor.
2. Position unit so crosshead and tubing assembly are correctly located in guide channel.
3. Fit mounting bracket to bulkhead. Ensure to secure harness earth wire under rearmost bolt. Ensure good electrical contact.
4. Install connecting rod as detailed below.
5. Connect electrical connections and secure wires under adjacent clip.
6. Wet windscreen and perform functional test. Ensure park position is correct. If adjustment is required adjust as detailed below.

Remove Connecting Rod

1. Mark position of domed cover with relation to gearbox cover. This will facilitate connecting rod installation.
2. Remove four screws. Swing gearbox cover and domed cover clear.
3. Remove crank pin spring clip by withdrawing sideways as shown on Fig. 89.
4. Remove limit switch moving contact.
5. Remove connecting rod.

Install Connecting Rod

1. Fit connecting rod.
2. Fit limit switch moving contact.
3. Fit crank pin spring clip by inserting sideways as shown on Fig. 89.
4. Position gearbox cover and domed cover with marks made above aligned. Secure with four screws.
If aligning marks have been lost adjust park position as detailed below.

Adjust Park Position

The arms and blades should stop at the end of a stroke. The park position can be adjusted by slackening four screws and rotating the domed cover.

The correct park position should be attained when the domed cover setting pip is positioned as shown on Figs. 91 and 92 for R.H. Steer and L.H. Steer vehicles respectively.

To retard stop rotate domed cover clockwise.

To advance stop rotate domed cover anti-clockwise.

When the domed cover is positioned correctly tighten four screws.

Repair

If the windscreen wiper motor is not operating correctly perform the voltage check as detailed below to locate the fault.

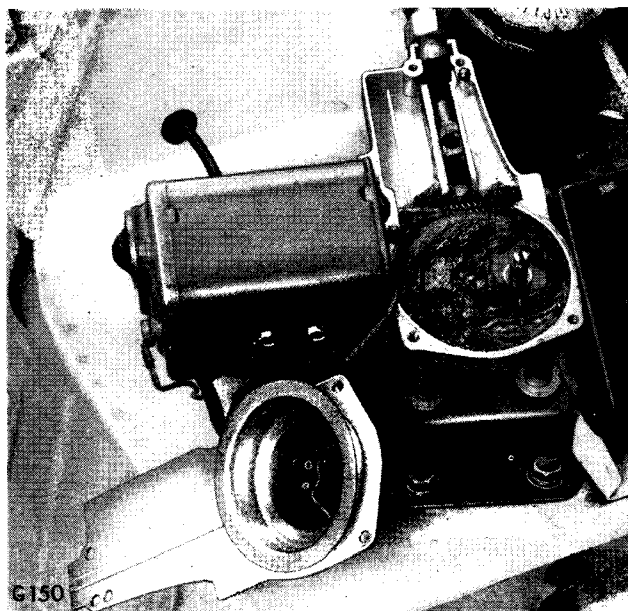


Fig. 90. Connecting rod removed

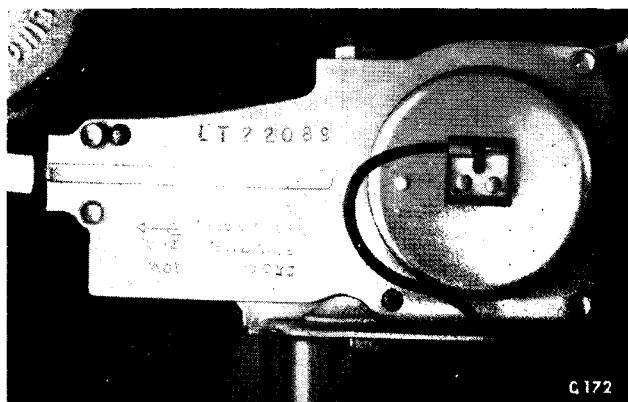


Fig. 91. Park position—R.H. Steer

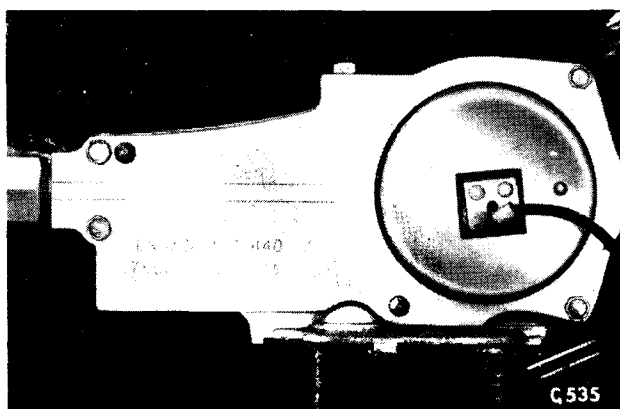


Fig. 92. Park position—L.H. Steer

- 1 Supply
- 2 Armature
- 3 Field winding
- 4 High speed field resistor
- 5 Limit switch

Colour code

- G Green
- R Red
- N Brown
- LG Light green

Facia switch

- OFF 1 connected to 6
- NORMAL 1 and 6 connected to 4
- HIGH 1 connected to 4

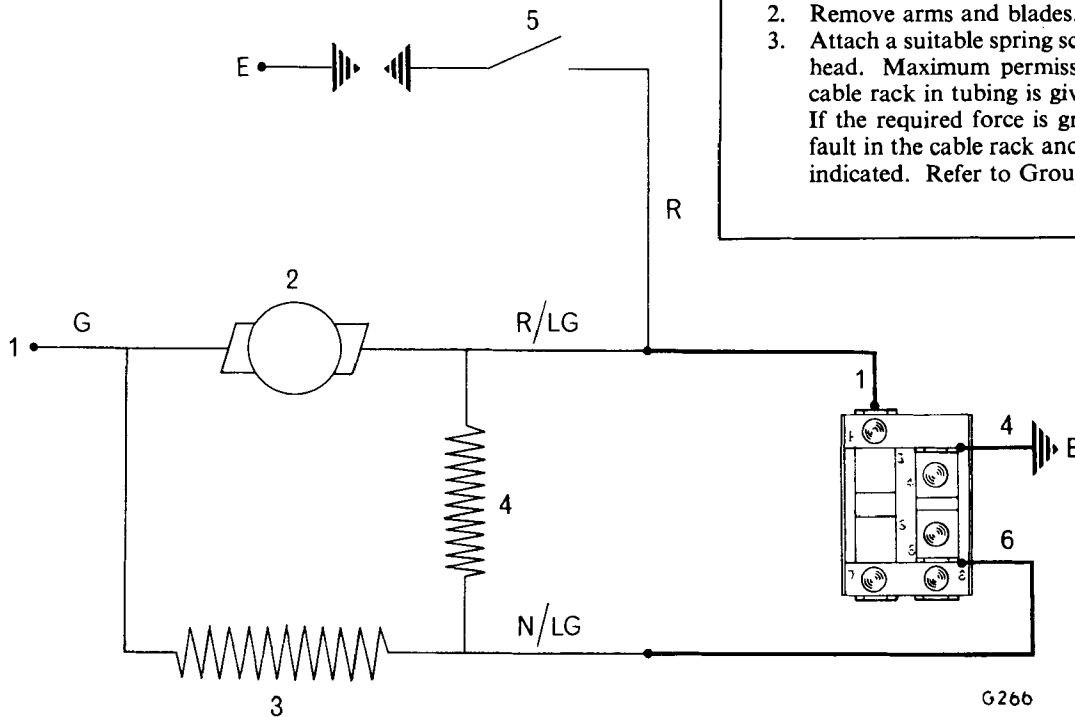


Fig. 93. Component and switch wiring diagram

Voltage Check

1. Connect voltmeter suitable for voltage between supply wire (Colour code—Green) and earth.
2. Select motor ON. Voltmeter reading should be approximately 11.5 volts.
If the reading is zero check supply circuit.
If the reading is appreciably below 11.5 volts excessive current flow through the motor is indicated. This may be due to a fault in the motor or a fault in the cable rack and tubing assembly resulting in the motor being required to drive an excessive load.

Running Current

1. Remove connecting rod as detailed above.
2. Connect ammeter suitable for running current (See Data) in supply circuit.
3. Select motor ON. Allow to run for 60 seconds. Ammeter reading should then be as given in Data.
If the reading is not as stated a fault in the motor is indicated.

Running Speed

1. Remove connecting rod as detailed above.
2. Select motor ON. Allow to run for 60 seconds. Speed of final gear should then be as given in Data.
If the speed is not as stated a fault in the motor is indicated.

Force to move Cable Rack in Tubing

1. Remove connecting rod as detailed above.
2. Remove arms and blades.
3. Attach a suitable spring scale to hole in cross-head. Maximum permissible force to move cable rack in tubing is given in Data.
If the required force is greater than stated a fault in the cable rack and tubing assembly is indicated. Refer to Group 5.

VOLTAGE STABILIZER

Data

Manufacturer	Smiths
Smiths part No.	BR 1300/01
Stanpart No.	128484
Type	Bimetal resistance
Average stabilized output voltage	10 volts

Description

The voltage stabilizer which is mounted on the rear of the speedometer provides a suitable supply for the fuel and temperature indication systems. The unit functions as follows:

Current supplied to terminal B flows across the contacts to output terminal I and across the contacts to the heater shunt winding and earth. Current flow through the shunt winding heats the bimetal strip which consequently distorts causing the contacts to part.

Current flow to terminal I and the heater shunt winding is terminated. The bimetal strip cools causing the contacts to close.

The situation is now reverted to the original condition and a second cycle commences.

The slow vibration of the bimetal strip results in an average stabilized output voltage over a period of time at terminal I which is a suitable supply for the slow reaction bimetal resistance type fuel and temperature indication systems.

Service—No maintenance is required.

Remove voltage stabilizer

1. Remove speedometer as detailed in Group 5.
2. Remove voltage stabilizer from speedometer.

Install voltage stabilizer

1. Fit voltage stabilizer to speedometer.
2. Fit speedometer as detailed in Group 5.

CAUTION: VOLTAGE STABILIZER SHOULD BE MOUNTED WITH B AND E UPPERMOST AND NOT TILTED MORE THAN 20 DEGS. FROM THE VERTICAL IN EITHER PLANE.

Repair—Repair is by replacement.

NOTE: If a voltmeter is connected between output terminal I and earth a constant 10 volt reading should not be expected. The reading should fluctuate between system voltage and a low voltage.

NOTE: When performing any tests that include a unit containing a bimetal strip ensure to allow ample time—approximately one minute—for the unit to react.

Electrical instrument tester—Refer to Group 6—Test data and equipment.

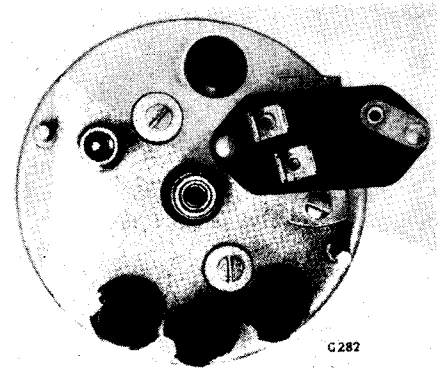


Fig. 94
Voltage stabilizer—
mounted on
speedometer

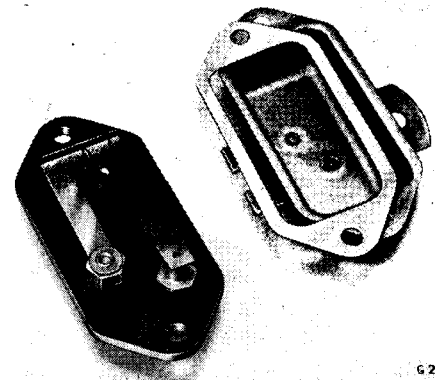
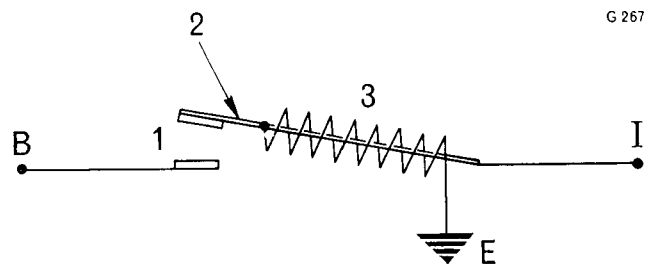


Fig. 95
Voltage stabilizer—
internal view



B Supply
1 Contacts
2 Bimetal strip
3 Heater shunt winding
I Output terminal

Fig. 96. Component wiring diagram

FUEL INDICATION

Data

Fuel indicator										
Manufacturer	..	..	..	..	..	..	..	..	..	Smiths
Smiths part No.	..	..	..	..	..	..	..	..	..	BF 2201/07
Stanpart No.	..	..	..	..	..	..	..	..	..	143577
Type..	..	..	..	..	..	..	..	..	..	Bimetal resistance
Body diameter	..	..	..	..	..	..	..	..	..	52 mm.
Illumination	..	..	..	..	..	..	..	..	..	Internal
Tank unit										
Manufacturer	..	..	..	..	..	..	..	..	..	Smiths
Smiths part No.	..	..	..	..	..	..	..	..	..	TBS 1114/001
Stanpart No.	..	..	..	..	..	..	..	..	..	307474
Type..	..	..	..	..	..	..	..	..	..	Bimetal resistance

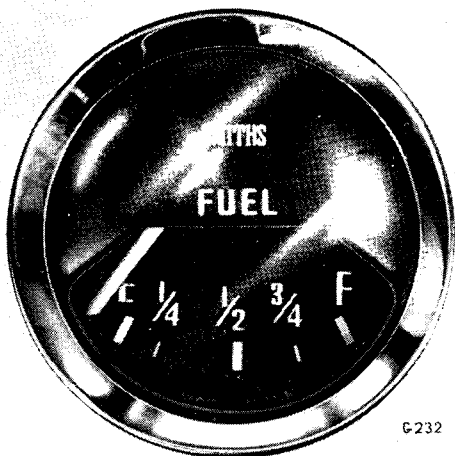


Fig. 97. Fuel indicator
For illustrations of Fuel indicator—rear view and internal view refer to Group 6—Figs. 103 and 104.

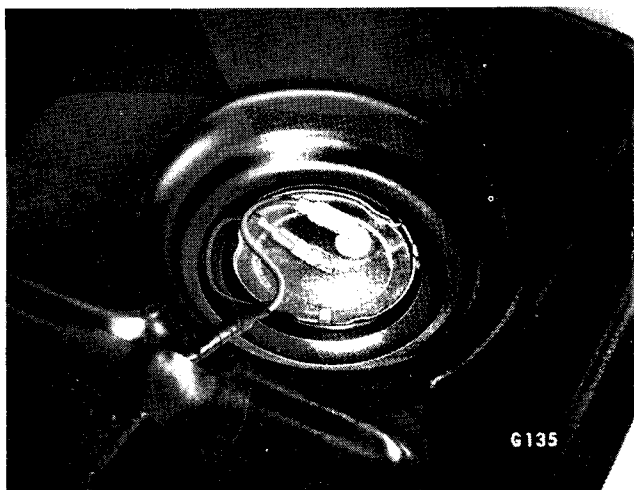


Fig. 98. Tank unit installed

Description

The fuel indication system consists of a fuel indicator mounted on the fascia centre panel and a tank unit located in the fuel tank. These two components are electrically connected as shown in the system wiring diagram.

The fuel indicator contains a bimetal strip surrounded by a heater series winding. Current flow through the series winding heats the bimetal strip which consequently distorts. The pointer is suspended between the moving end of the bimetal strip and a spring blade. This arrangement causes the pointer to take up a position over the scale that is related to current flow through the system circuit.

The tank unit consists of a resistance winding swept by a contact arm. The arm is attached to the float pivot and is at earth potential. A full tank results in few turns of the resistance winding in circuit and a heavy current. A low tank results in many turns of the resistance winding in circuit and a reduced current. Current flow through the system circuit is thus related to fuel level.

The system is voltage sensitive. To achieve consistent fuel indication the voltage stabilizer provides an average stabilized output voltage which is a suitable supply for this slow reaction bimetal resistance type system.

Service—No maintenance is required.

Removal/Installation Fuel Indicator—Refer to Group 5.

Remove Tank Unit

1. Fold forward luggage floor carpet.
2. Lift out spare wheel cover panel.
3. Withdraw two screws. Remove fuel tank cover panel.
4. Disconnect electrical connectors.
5. Release locking ring by tapping anticlockwise.
6. Withdraw tank unit.

Install Tank Unit

1. Position tank unit. Ensure location lugs engage correctly.
2. Secure locking ring by tapping clockwise.
3. Connect electrical connectors.
4. Fit fuel tank cover panel. Secure with two screws.
5. Fit spare wheel cover panel.
6. Secure luggage floor carpet in position.

Repair

Repair of both units is by replacement.

NOTE: When performing any tests that include a unit containing a bimetal strip ensure to allow ample time—approximately one minute—for the unit to react.

Electrical Instrument Tester—Refer to Group 6—Test data and equipment.

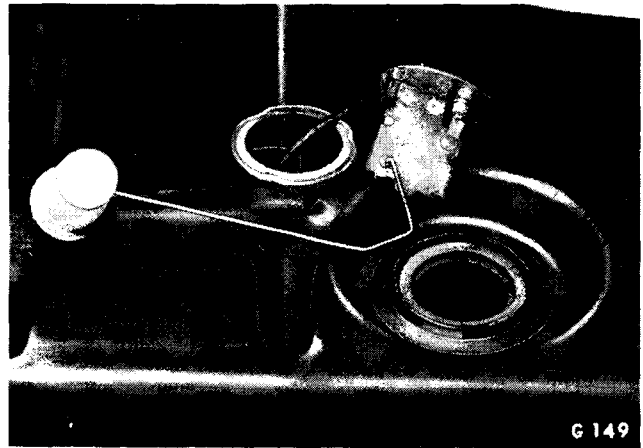


Fig. 99. Tank unit removed

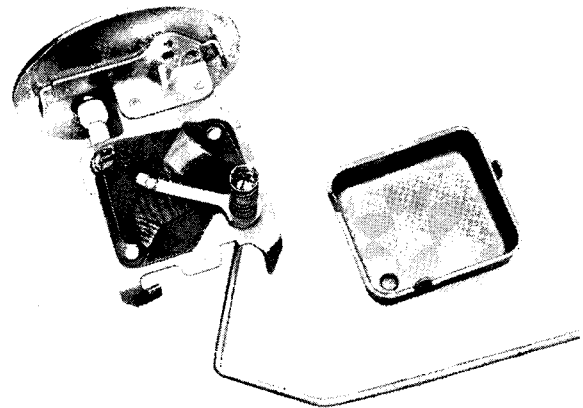


Fig. 100. Tank unit—internal view

1. Supply from voltage stabilizer

Fuel indicator

2. Heater series winding
3. Bimetal strip
4. Spring blade
5. Pointer

Tank unit

6. Resistance winding
7. Contact arm

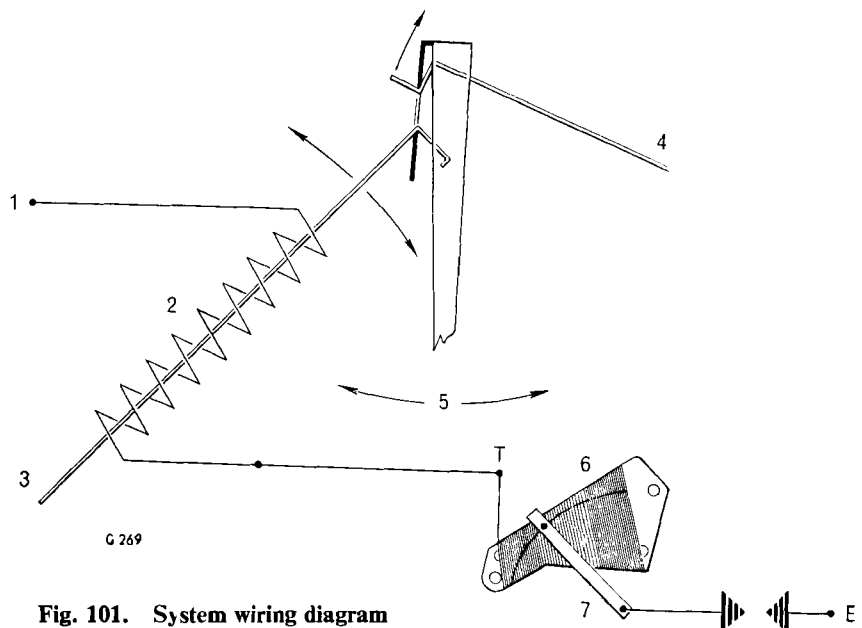


Fig. 101. System wiring diagram

TEMPERATURE INDICATION

Data

Temperature indicator

Manufacturer	.. .. .	Smith's
Smiths part No.	.. .. .	BT2204/O7
Stanpart No.	.. .. .	145002
Type..	.. .. .	Bimetal resistance
Body diameter	.. .. .	52 mm.
Illumination	.. .. .	Internal

Transmitter

Manufacturer	.. .. .	Smiths
Smiths part No.	.. .. .	TT 4802/00
Stanpart No.	.. .. .	137705
Type..	.. .. .	Semi conductor
Indication range	.. .. .	50—120 degs. centigrade
Thread	.. .. .	$\frac{5}{8}$ in.—18 UNF

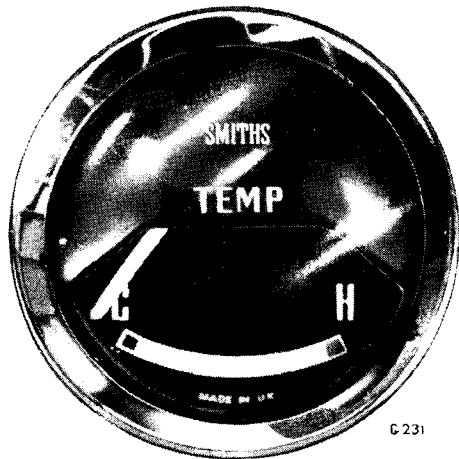


Fig. 102. Temperature indicator

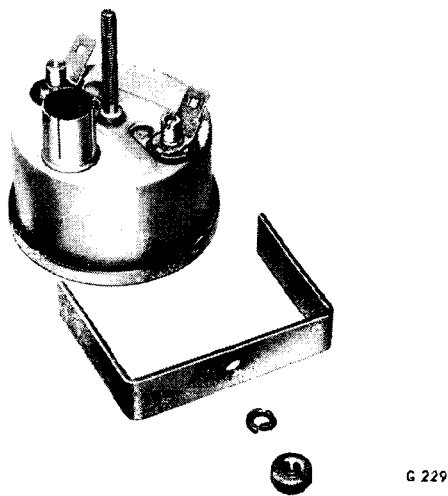


Fig. 103. Temperature indicator—rear view

Description

The temperature indication system consists of a temperature indicator mounted on the facia centre panel and a transmitter located in a tapping in the water pump body. These two components are electrically connected as shown in the system wiring diagram.

The temperature indicator contains a bimetal strip surrounded by a heater series winding. Current flow through the series winding heats the bimetal strip which consequently distorts. The pointer is suspended between the moving end of the bimetal strip and a spring blade. This arrangement causes the pointer to take up a position over the scale that is related to current flow through the system circuit.

The transmitter contains a small semi-conducting disc which is held at the far end of the body under the action of a spring. The resistance of the disc varies with temperature. A hot engine results in a low resistance and a heavy current. A cool engine results in a high resistance and a reduced current. Current flow through the system circuit is thus related to engine temperature.

The system is voltage sensitive. To achieve consistent temperature indication the voltage stabilizer provides an average stabilized output voltage which is a suitable supply for this slow reaction bimetal resistance type system.

Service—No maintenance is required.

Removal/Installation Temperature Indicator—Refer to Group 5.

Remove Transmitter

1. Drain cooling system sufficiently to ensure water pump body is dry.
2. Disconnect electrical connector.
3. Remove transmitter from water pump body.

Install Transmitter

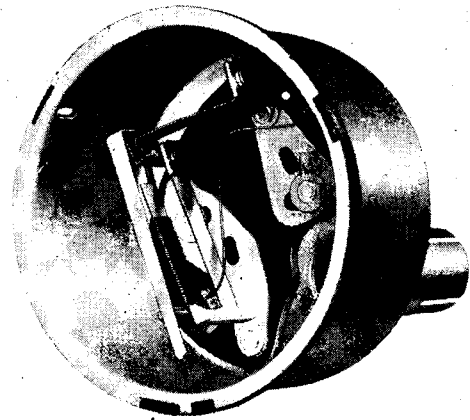
1. Fit transmitter to water pump body. Employ a new sealing washer if available.
2. Connect electrical connector.
3. Fill cooling system.

Repair

Repair of both units is by replacement.

NOTE: When performing any tests that include a unit containing a bimetal strip ensure to allow ample time—approximately one minute—for the unit to react.

Electrical Instrument Tester—Refer to Group 6—Test data and equipment.



G279

Fig. 104. Temperature indicator—internal view

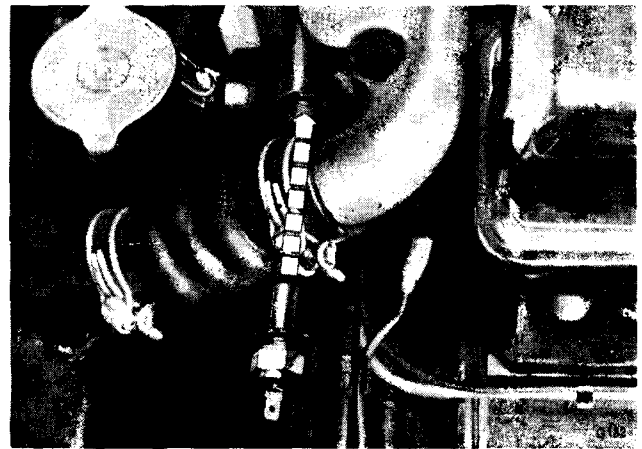


Fig. 105. Transmitter

1. Supply from voltage stabilizer

Temperature indicator

2. Heater series winding
3. Bimetal strip
4. Spring blade
5. Pointer

Transmitter

6. Spring
7. Semi-conducting disc
8. Body

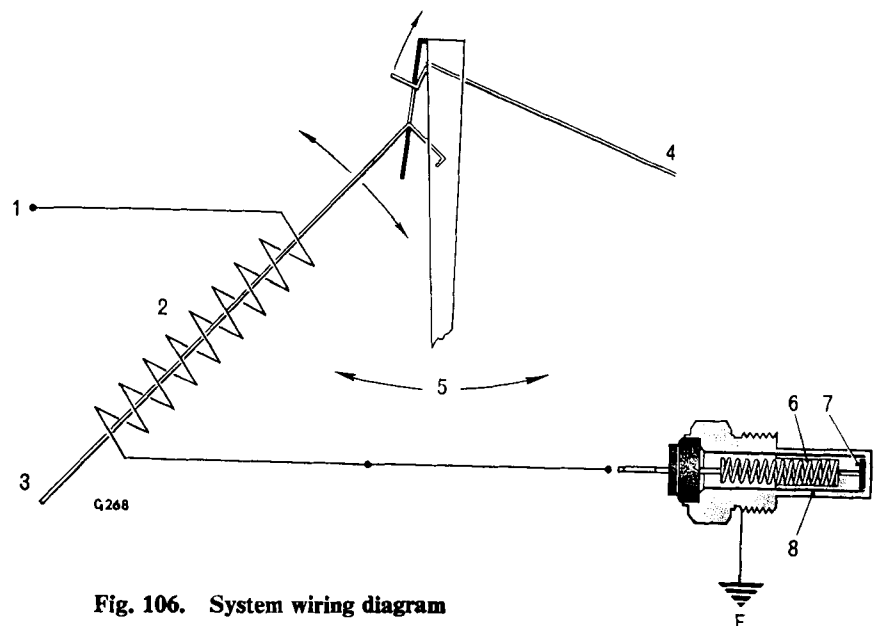


Fig. 106. System wiring diagram

TEST DATA AND EQUIPMENT

ELECTRICAL INSTRUMENT TESTER

The Smiths Automotive electrical instrument tester enables the following to be checked on the vehicle:

Battery voltage.

Voltage stabilizer.

Fuel indication system—by substituting the tester for the tank unit. If the fuel indicator operates correctly, a defective tank unit is indicated. If the fuel indicator does not operate correctly, a defective fuel indicator or a wiring fault is indicated.

Temperature indication system—by substituting the tester for the transmitter. If the temperature indicator operates correctly, a defective transmitter is indicated. If the temperature indicator does not operate correctly, a defective temperature indicator or a wiring fault is indicated.

NOTE: When performing any tests that include a unit containing a bimetal strip ensure to allow ample time—approximately one minute—for the unit to react.



Fig. 110. Electrical instrument tester

ELECTRONIC ENGINE TESTER

An electronic engine tester enables a number of checks to be performed on the vehicle. The tester consists of a combination of meters, an oscilloscope and a stroboscopic timing light. The following is a summary of the checks included in the Crypton "Quality control quick check".

STARTABILITY

Volts at coil switch terminal. Static

Voltage drop test on ignition circuit between battery and ignition coil positive connector.

Volts at coil switch terminal. Cranking

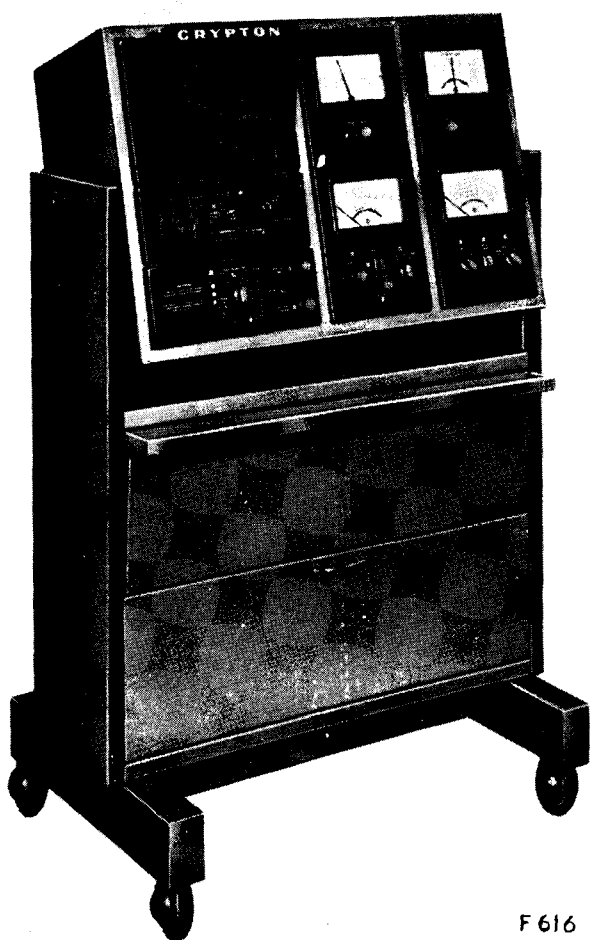
Checks ignition/starter switch action, starter solenoid operation, battery under load, starter motor operation, engine flywheel ring gear condition and starter motor circuit including battery and engine earth leads.

Volts at coil switch terminal. Charging

Checks charging system operation and control box voltage setting.

Volt drop through distributor

Voltage drop test on ignition circuit between ignition coil negative connector and earth. Indicates ignition distributor electrical condition.



F 616

Fig. 111. Electronic engine tester

AT 1000 R.P.M.**Distributor points dwell**

Checks ignition distributor contact gap and operation of contacts and condenser. Dwell angle which is related to contact gap can be read directly from oscilloscope. Sparking at contacts or uncertain condenser action will be indicated on oscilloscope.

Distributor dwell overlap

Checks drive from crankshaft to ignition distributor and distributor mechanical condition. Slack in drive or wear in distributor may cause differences in timing between cylinders resulting in rough running. Differences in timing between cylinders are indicated on oscilloscope by unequal dwell angles.

Spark plugs minimum and Spark plugs maximum

Checks KV required to fire sparking plugs. See "Coil H.T. output" below.

Rotor gap

Checks ignition distributor rotor gaps. A wide gap may cause missing when cylinder pressures are high, i.e. at high speed or under load. A narrow gap may cause missing due to lack of spark intensifying action which is required to fire sooted or oiled sparking plugs.

Coil H.T. output

Checks ignition coil high tension KV output. The KV required to fire sparking plugs—obtained above—taken from the coil high tension KV output provides the important reserve KV value.

Power check R.P.M. drop

Checks to ensure equal cylinder compressions, correct rocker clearances, no air leaks into inlet manifold and correct carburettor synchronisation. Preventing each sparking plug from firing in turn should result in an equal R.P.M. drop.

AT ENGINE IDLE SPEED**Idle set to**

Idle speed is correctly adjusted.

Timing at idle

Engine timing at idle speed is noted.

NOTE: On this vehicle crankshaft pulley timing marks "O" aligned with pointer indicates numbers 1 and 6 pistons at T.D.C.

Air-fuel ratio

This is noted and used as a guide if carburettor adjustment is required.

ENGINE AT 3000 R.P.M.**Timing without vacuum advance**

Engine timing is correctly adjusted with the engine running in its normal cruising speed range. Immobilise vacuum advance by pulling off vacuum pipe.

This adjustment is important as accurate static engine timing may not always result in accurate timing when the engine is running in its normal cruising speed range. This is due to tolerances that must exist in the drive from crankshaft to ignition distributor and in the distributor advance mechanisms. Employing an electronic engine tester with a facility to adjust the timing light flashes to occur a measurable number of degrees after the sparking plug has fired engine timing can be adjusted accurately with the engine running.

Timing with vacuum advance

Checks vacuum advance by comparing engine timing with and without vacuum pipe fitted.

Air-fuel ratio

Checks air flow is not excessively restricted by dirty air cleaner elements.

FINAL IDLE SPEED**In neutral**

Idle speed is correctly adjusted.

In drive

Checks excessive clutch drag. Idle speed is noted with clutch disengaged and first gear selected.

TIMING LIGHT

A timing light enables advance mechanism operation to be checked visually with the engine running. Position timing light as shown on Figure 112 so that flashes illuminate crankshaft pulley timing marks.

NOTE: On this vehicle crankshaft pulley timing marks "O" aligned with pointer indicates numbers 1 and 6 pistons at T.D.C.

To check centrifugal advance immobilise vacuum advance by pulling off vacuum pipe. To check vacuum advance compare engine timing with and without vacuum pipe fitted.

WARNING: ENSURE THAT PERSONNEL AND EQUIPMENT ARE KEPT CLEAR OF ROTATING COOLING FAN WHILE USING TIMING LIGHT.

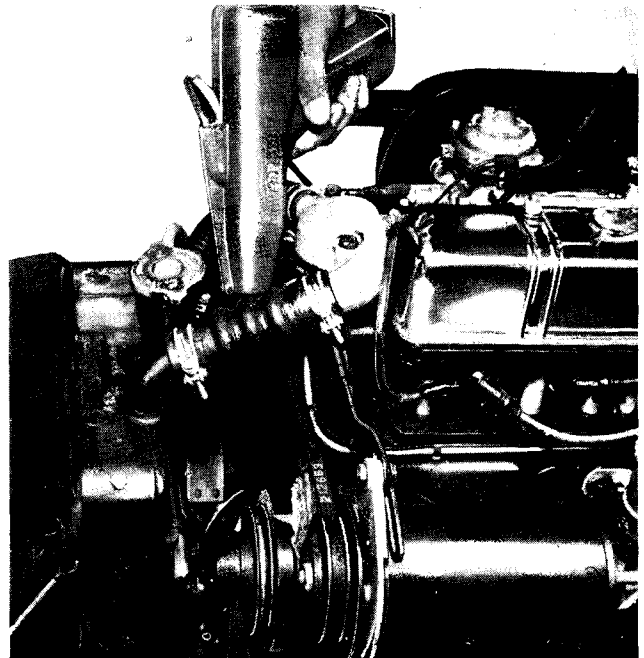


Figure 112. Timing light

IGNITION DISTRIBUTOR

Emission control component

Data

Manufacturer	Delco Remy
Series	D204
Delco Remy part No.	7953547
Stanpart No.	308372
Contact gap	0.015 in.
Rotation—viewed on rotor	Anticlockwise
Firing angles	60 ± 1 degs.
Dwell angle	40-42 degs.
Open angle	18-20 degs.
Moving contact spring tension	17-21 ozs.
Condenser capacity	0.18-0.23 mfd.
Engine firing order	1-5-3-6-2-4

Centrifugal advance

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
425	No advance to occur		850	No advance to occur	
500	0	1.3	1000	0	2.6
875	4.6	8.0	1750	9.2	16.0
1200	6.8	9.2	2400	13.6	18.4
1800	9.2	11.4	3600	18.4	22.8
2500	12.0	14.0	5000	24.0	28.0

Vacuum advance

Ins. of mercury vacuum	Degs. distributor advance		Degs. crankshaft advance	
	Minimum	Maximum	Minimum	Maximum
Below 3	No advance to occur			
4-6	Advance to start			
11	4.0	6.0	8.0	12.0
14	6.5	8.5	13.0	17.0
20	—	11.0	—	22.0

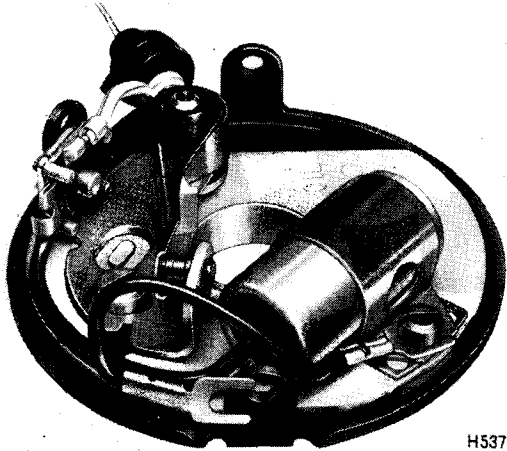
Retard unit

Ins. of mercury vacuum	Degs. distributor retard		Degs. crankshaft retard	
	Minimum	Maximum	Minimum	Maximum
Below 2.5	No retard to occur			
15.0	4.25	5.75	8.5	11.5

CAUTION: U.S. FEDERAL STANDARDS.
CONTROL OF AIR POLLUTION.

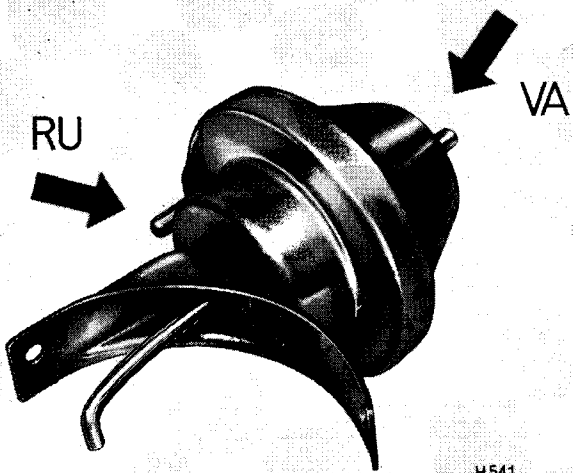
UNAUTHORISED INTERFERENCE WITH, OR ADJUSTMENTS TO, THE IGNITION DISTRIBUTOR MUST NOT BE MADE, AS IF MADE, WOULD ALMOST CERTAINLY RESULT IN THE VEHICLE FAILING TO MEET THE LEGAL REQUIREMENTS IN RESPECT OF AIR POLLUTION.

For illustration of centrifugal advance mechanism refer to GT6—Group 6—Fig. 42.



H537

Fig. 1. Mounting plate assembly



H541

VA Vacuum advance
RU Retard unit

Fig. 2. Double acting vacuum capsule

Description

The distributor shaft rotates at half crankshaft speed driven from the engine camshaft via a drive gear.

The shaft and centrifugal advance mechanism are assembled as a unit and rotate in two sintered iron bearings contained in the housing.

The centrifugal advance mechanism advances the spark under increasing engine speed. This is achieved by two weights extending outwards against the action of the control springs. The resulting cam action causes the cam spindle to rotate slightly anticlockwise relative to the shaft.

When the contacts close a circuit is completed via the low tension wire, moving contact, fixed contact, mounting plate and mounting plate earth lead to earth. When the contacts open the low tension circuit is broken causing a collapse of the magnetic field in the ignition coil.

The moving contact, fixed contact and condenser are located on the mounting plate. This assembly can be rotated through a limited angle by the diaphragm of the double acting vacuum capsule to adjust the ignition timing. One chamber of the capsule operates as a conventional vacuum advance mechanism which functions to improve fuel economy by timing the spark earlier at part throttle. The opposing chamber is a retard unit which provides additional retard at idle and during deceleration to reduce exhaust emission. The retard unit is a component of the "Emission control system" detailed in Group 1.

Ignition timing can be adjusted by slackening the clamp bolt and rotating the distributor housing. (No vernier adjustment knob is fitted to this unit).

The condenser is connected between the terminal point and mounting plate—that is parallel with the contacts—and functions to produce the desirable quick collapse of the magnetic field in the ignition coil. Condenser action also prevents arcing across the contacts.

High tension surges initiated in the ignition coil are distributed in the correct sequence to the sparking plugs by the cap, rotor and high tension leads.

A drive gear contained within the housing provides a drive for the tachometer.

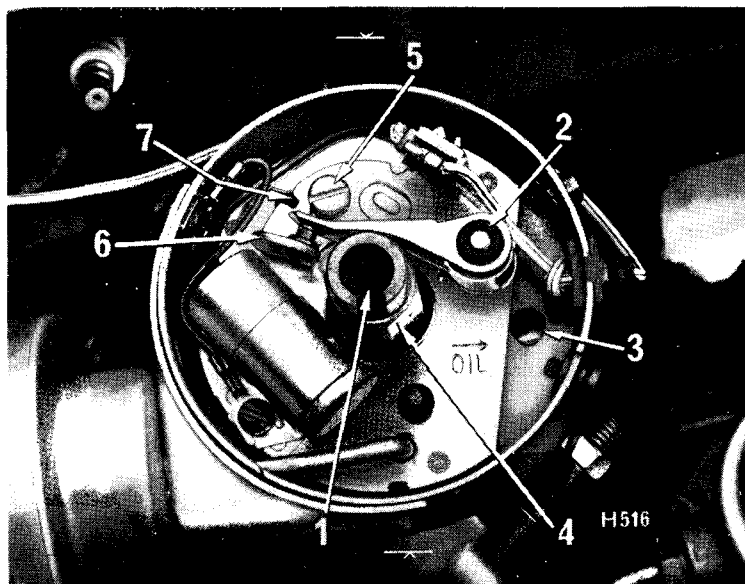


Fig. 3.

Lubrication

Remove cap and rotor.

1. Few drops of engine oil to oil retaining felt to lubricate shaft—cam spindle.
2. One drop of engine oil to lubricate moving contact pivot.
3. Approximately 5 c.c.—about one teaspoonful—of engine oil through OIL hole to lubricate centrifugal advance mechanism and upper sintered iron bearing.
4. Lightly grease with petroleum jelly (Vaseline) to lubricate cam.

Wipe away any surplus oil. Ensure contacts are oil free. Any oil on contacts may result in burning.

Contacts

The contact surfaces should have a grey frosted appearance. If the surfaces are partly worn, clean as detailed below. If excessively worn or pitted renew contact set.

Clean contacts—use a clean fine cut contact file. Do not attempt to remove all roughness or dress contacts smooth. Remove only scale or dirt. Do not use emery cloth or sandpaper as cleaning with either can result in particles becoming embedded causing arcing and subsequent rapid deterioration of the contacts.

Contact gap—it is important that the correct gap be maintained. Contacts set too closely may tend to burn rapidly. Contacts set too wide may tend to cause a weak spark at high speed.

Adjust contact gap

1. Remove cap and rotor.
2. Rotate cam so moving contact is positioned on a cam peak.

NOTE: When distributor is insitu rotate cam by turning crankshaft mounted cooling fan.

3. Slacken lock screw (5).

4. Position a 0-015" feeler gauge between contacts. Move fixed contact (6) about moving contact pivot (2) to adjust gap. Tighten lock screw.
- NOTE:** This operation may be facilitated by inserting a screwdriver in slots (7) and twisting to move fixed contact.

5. Check 0-015" gap has been maintained.

Ignition timing mechanism action

Centrifugal advance mechanism action—this can be checked by removing cap and turning rotor anti-clockwise against control springs. Rotation through a small angle should be possible and rotor should return to its original position when released.

Vacuum advance mechanism action—this can be checked by removing the double acting vacuum capsule. Depress control link against spring. Action should be smooth and link should return to its original position when released.

Retard unit mechanism action—this can be checked by removing the double acting vacuum capsule. Pull out control link against spring. Short movement should be smooth but strongly resisted and link should return to its original position when released.

Ignition timing mechanism operation

Centrifugal advance operation, vacuum advance operation and retard unit operation can only be checked by employing an electronic engine tester or timing light. Refer to Group 6—Test data and equipment.

Ignition timing

Refer to Group 1—Emission control system.

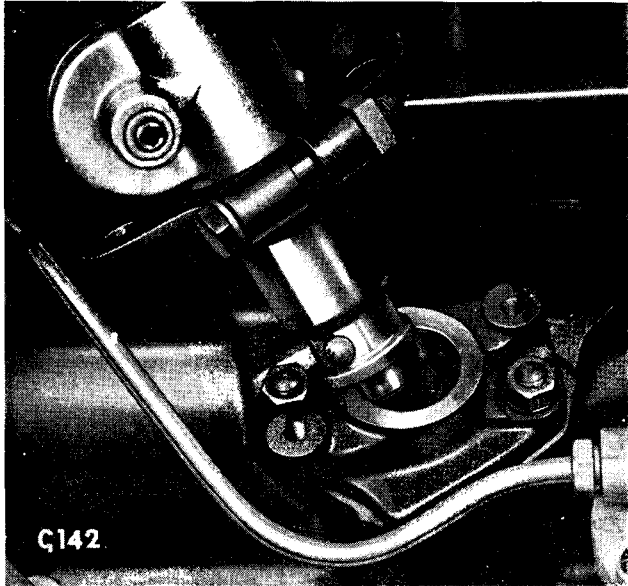


Fig. 4. Remove/install ignition distributor

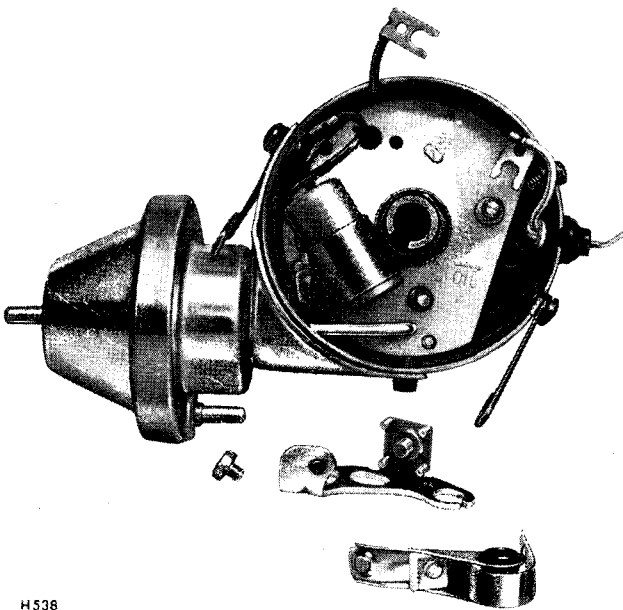


Fig. 5. Remove/install contacts

Remove ignition distributor

NOTE: To facilitate re-timing do not slacken clamp bolt.

1. Remove cap.
2. Disconnect low tension wire from ignition coil negative connector.
3. Note positions of vacuum advance pipe and retard unit pipe on double acting vacuum capsule.
4. Pull off two vacuum pipes.
5. Remove tachometer drive.
6. Remove rear mounting bolt.
7. Remove forward mounting bolt while withdrawing distributor from adaptor. A sharp upward pull may be required to withdraw.

Install ignition distributor

NOTE: To facilitate re-timing do not slacken clamp bolt.

1. Position forward mounting bolt and washers to distributor. Insert distributor into adaptor. Ensure coupling offset key locates correctly in drive gear offset slot while screwing in forward mounting bolt.
2. Fit rear mounting bolt.
3. Fit tachometer drive by inserting cable and securing with knurled connector.
4. Push on two vacuum pipes as noted at Remove ignition distributor—operation 3 above.
5. Connect low tension wire to ignition coil negative connector.
6. Check approximate static ignition timing as detailed in Group 1—Emission control system.

NOTE: This operation is required only to start the engine.

7. Fit cap.
8. Adjust idling speed ignition timing as detailed in Group 1—Emission control system.

CAUTION: TO ACHIEVE THE ACCURACY REQUIRED FOR THE PROPER FUNCTIONING OF THE EMISSION CONTROL SYSTEM IT IS IMPORTANT THAT THE FINAL IGNITION TIMING ADJUSTMENT IS MADE DYNAMICALLY.

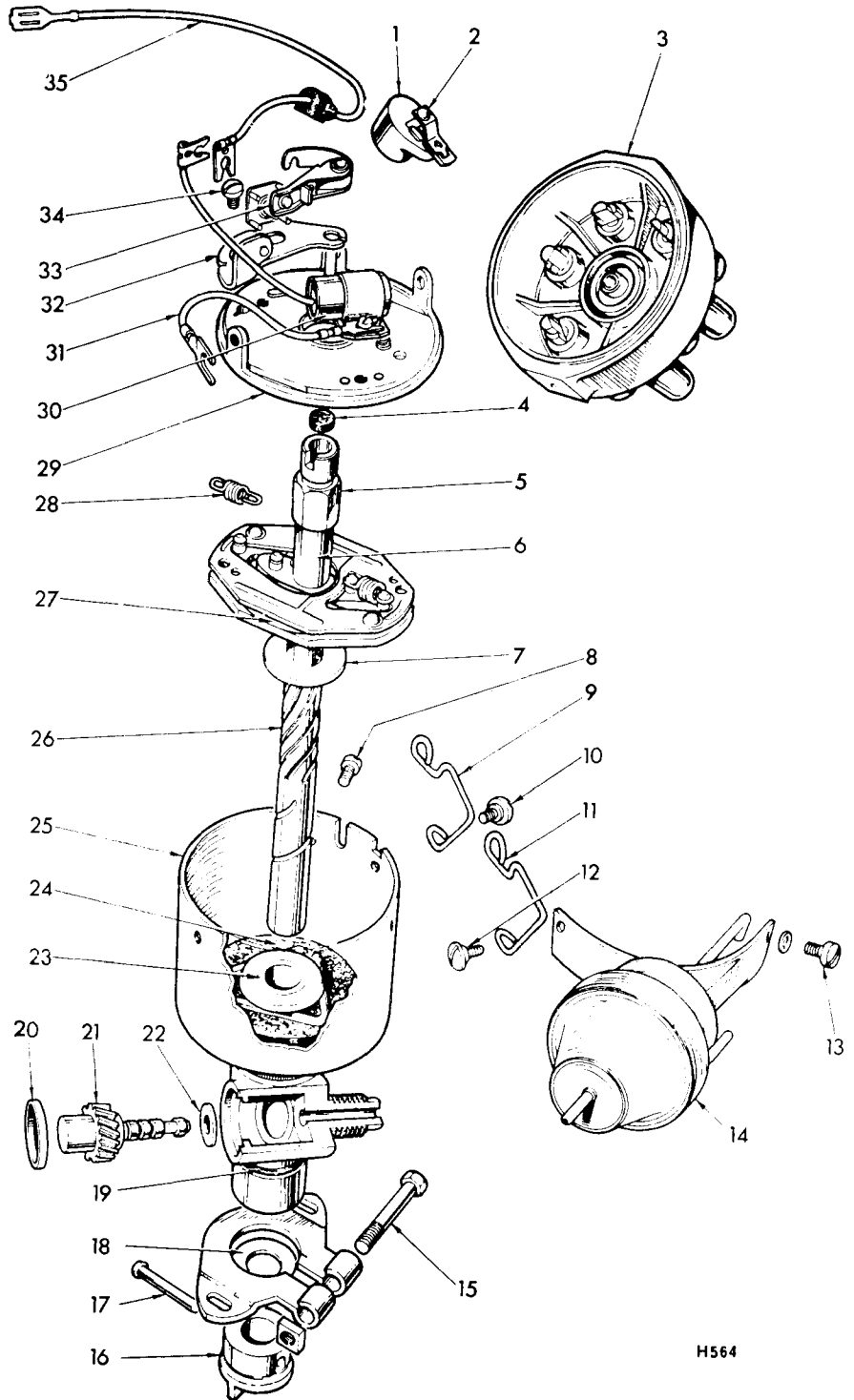
Remove contacts

1. Remove cap and rotor.
2. Release moving contact spring from terminal point and withdraw moving contact from pivot.
3. Withdraw low tension wire and condenser wire from terminal point.
4. Remove lock screw.
5. Withdraw fixed contact.

Install contacts

1. Ensure contacts are clean. If a new contact set is being fitted ensure preservative is removed from contact faces.
2. Position fixed contact.
3. Fit lock screw.
4. Position condenser wire and low tension wire to terminal point.
5. Position moving contact to pivot and locate moving contact spring to terminal point. Ensure two wire terminals are correctly secured by spring.
6. Adjust contact gap as detailed above.

- 1 Rotor
- 2 Rotor contact
- 3 Cap
- 4 Oil retaining felt
- 5 Cam
- 6 Cam spindle
- 7 Upper thrust washer
- 8 Side screw
- 9 Clip
- 10 Side screw—clip securing
- 11 Clip
- 12 Side screw—clip securing
- 13 Side screw—with washer
- 14 Double acting vacuum capsule
- 15 Clamp bolt
- 16 Coupling
- 17 Coupling pin
- 18 Lower thrust washer
- 19 Rubber 'O' ring
- 20 Staked plug
- 21 Tachometer drive gear
- 22 Thrust washer
- 23 Upper sintered iron bearing
- 24 Oil retaining felt
- 25 Housing
- 26 Shaft and centrifugal advance mechanism unit
- 27 Weight
- 28 Control spring
- 29 Mounting plate
- 30 Condenser
- 31 Mounting plate earth lead
- 32 Fixed contact
- 33 Moving contact
- 34 Lock screw
- 35 Low tension wire



H564

Fig. 6. Ignition distributor details

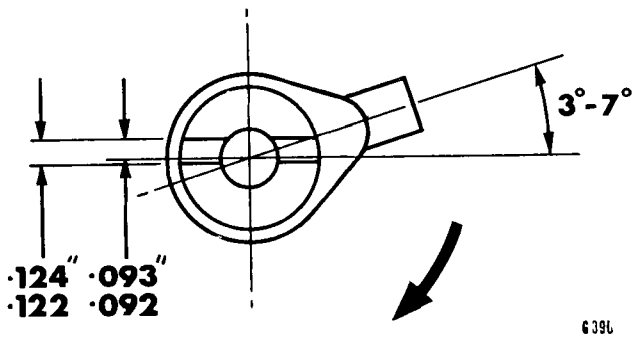
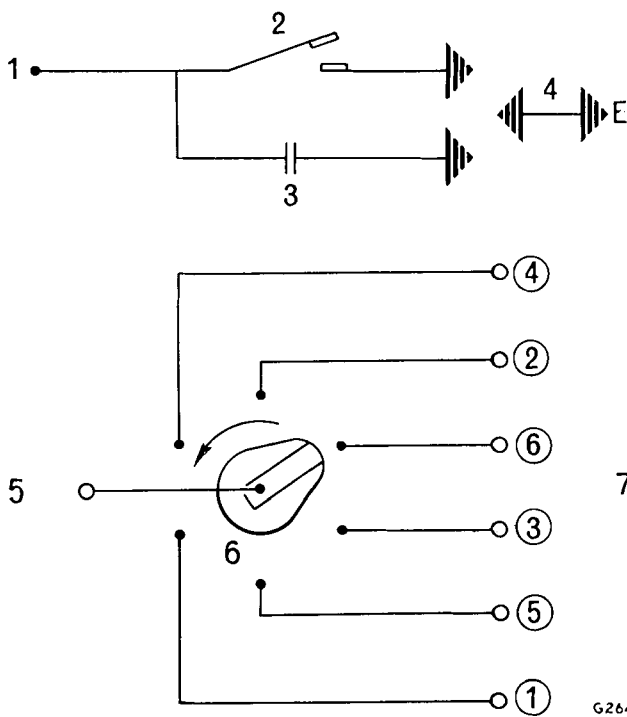


Fig. 7. Relationship of coupling offset key to rotor—view on coupling



- 1 Low tension wire to ignition coil negative connector
- 2 Contacts
- 3 Condenser
- 4 Mounting plate earth lead
- 5 High tension input from ignition coil
- 6 High tension distribution
- 7 High tension output to sparking plugs

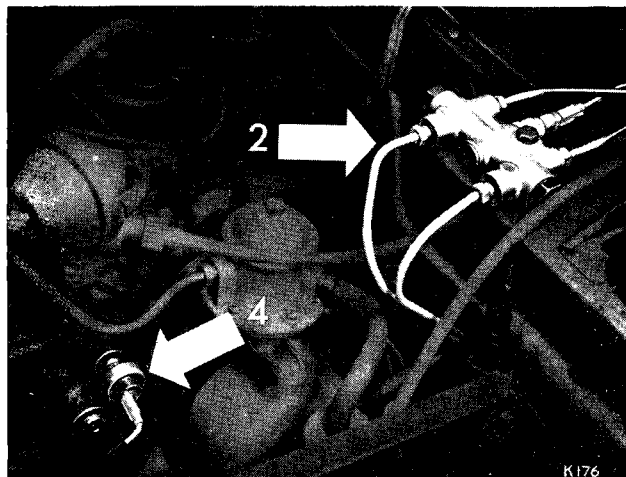
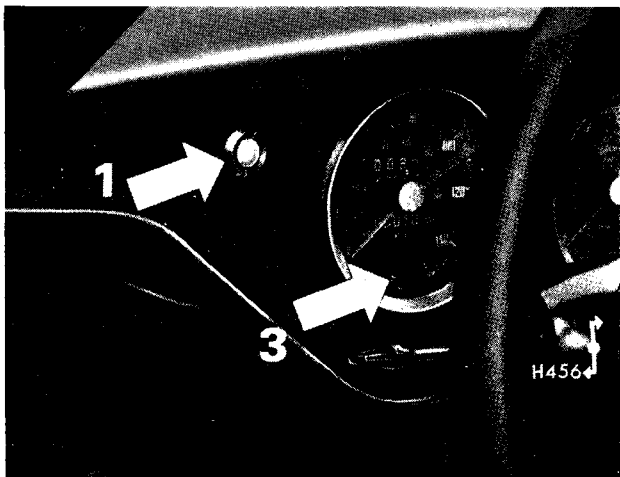
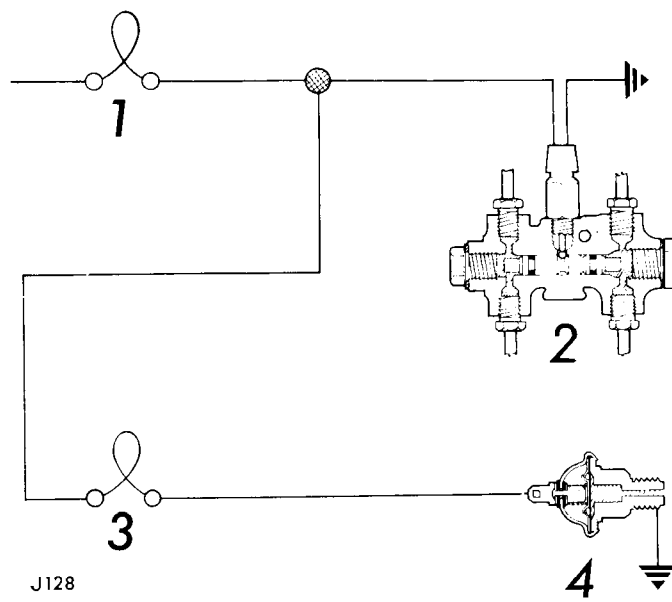
Fig. 8. Component wiring diagram

Disassemble ignition distributor

1. Remove ignition distributor as detailed above.
2. Remove rotor.
3. Remove two side screws to release double acting vacuum capsule.
4. Remove remaining two side screws. Withdraw mounting plate assembly.
5. If required remove tachometer drive gear. Using thin chisel or screwdriver pierce staked plug and prise out. Withdraw tachometer drive gear and thrust washer.
CAUTION: DO NOT PERFORM THIS REMOVAL UNLESS A NEW STAKED PLUG IS AVAILABLE.
6. If required remove shaft and centrifugal advance mechanism unit. Ensure tachometer drive gear has been removed. File and tap out coupling pin. Remove coupling and lower thrust washer. Ensure shaft is burr free and withdraw. Remove upper thrust washer.
CAUTION: DO NOT PERFORM THIS REMOVAL UNLESS A NEW STAKED PLUG AND COUPLING PIN ARE AVAILABLE.
7. If required remove control springs. Do not attempt to disassemble shaft and centrifugal advance mechanism unit further. Repair is by unit replacement.

Assemble ignition distributor

1. If required fit control springs. Exercise care not to distort springs.
When overhauling distributor it is recommended that control springs are renewed. Tired or distorted springs will effect engine performance.
2. Lubricate and fit upper thrust washer and shaft and centrifugal advance mechanism unit. Fit lower thrust washer and coupling. Secure with new coupling pin.
If fitting a new undrilled shaft assemble and drill so end float is 0.002"-0.005" and relationship of coupling offset key to rotor locating slot is as shown on Fig. 7.
3. Lubricate nylon tachometer drive gear generously with Shell "Alvania" No. 2 grease or equivalent. Fit thrust washer and tachometer drive gear. Secure with new staked plug staking in six positions.
4. Fit mounting plate assembly. Secure initially with side screw (8) and side screw—clip securing (10).
5. Fit double acting vacuum capsule. Secure with side screw—with washer (13) and side screw—clip securing (12). Clamp mounting plate earth lead terminal between housing and mounting plate as shown on Fig. 3.
CAUTION: IT IS POSSIBLE FOR THE TERMINAL TO BE POSITIONED SO THAT THE CAP CANNOT BE CORRECTLY FITTED. ENSURE THAT THE TERMINAL IS CLAMPED HORIZONTAL SO NO FOUL OCCURS.
6. Fit rotor.
7. Install ignition distributor as detailed above.



- 1 Brake line failure warning light
- 2 Brake line failure switch
- 3 Oil pressure warning light
- 4 Oil pressure switch

Fig. 9. System wiring diagram
and
Figs. 10 and 11. Components installed

INTRODUCTION TO SECTION 3

Information contained in this section details electrical equipment specific to the GT6 Mark 2. For the full contents list of electrical equipment fitted to the GT6 Mark 2 refer to page 6-101A at the front of Group 6.

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

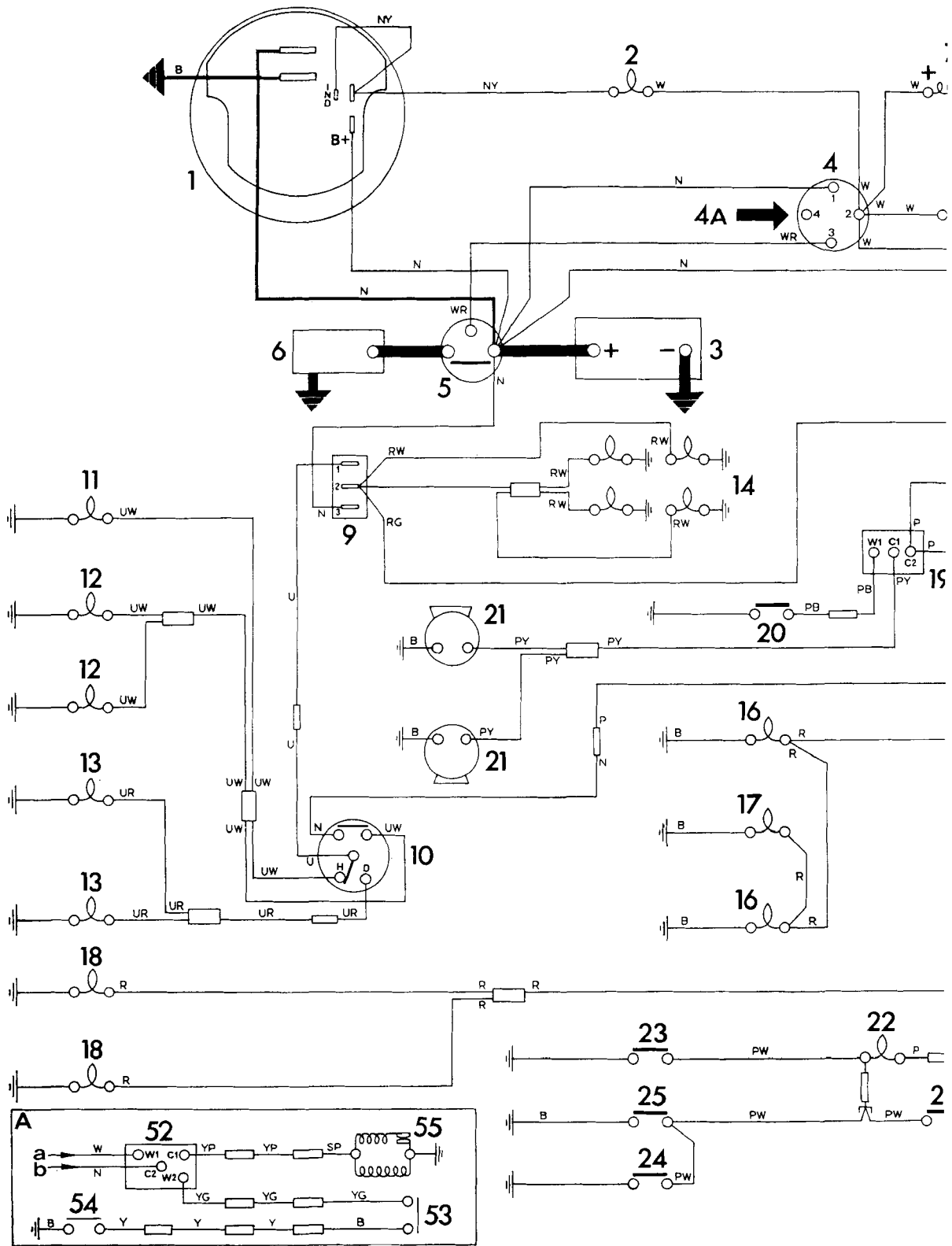
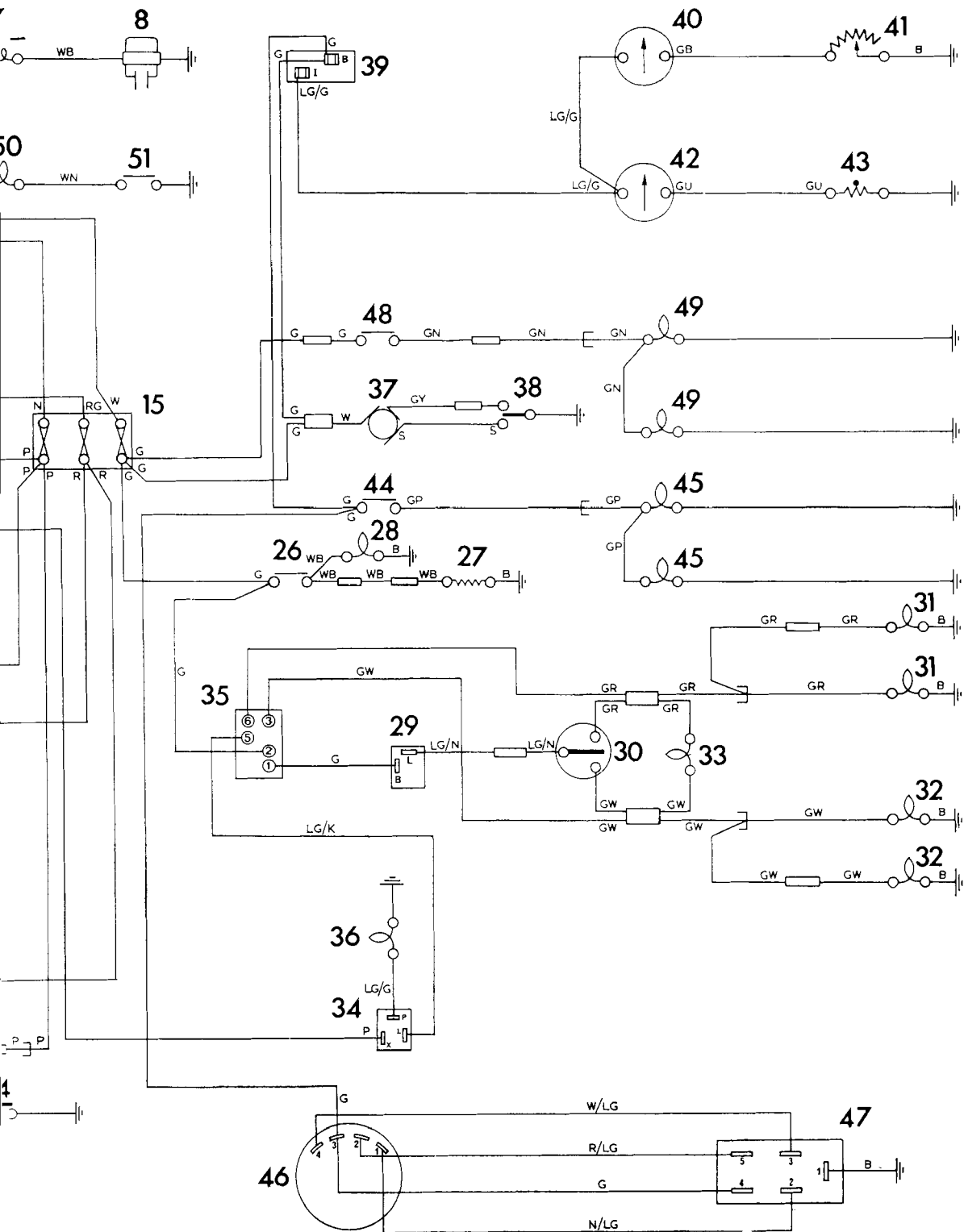


Fig. 1. Wiring diagram—C



J 229

T6 Mark 2—right hand steer

KEY TO WIRING DIAGRAM—GT6 MARK 2—RIGHT HAND STEER

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

- | | | | |
|----|--|-----|--|
| 1 | Alternator | 34 | Hazard flasher unit |
| 2 | Ignition warning light | 35 | Hazard switch |
| 3 | Battery | 36 | Hazard warning light |
| 4 | Ignition/starter switch | 37 | Heater motor |
| 4A | Ignition/starter switch—
radio supply connector | 38 | Heater switch |
| 5 | Starter solenoid | 39 | Voltage stabilizer |
| 6 | Starter motor | 40 | Fuel indicator |
| 7 | Ignition coil | 41 | Fuel tank unit |
| 8 | Ignition distributor | 42 | Temperature indicator |
| 9 | Master light switch | 43 | Temperature transmitter |
| 10 | Column light switch | 44 | Stop lamp switch |
| 11 | Main beam warning light | 45 | Stop lamp |
| 12 | Main beam | 46 | Windscreen wiper switch |
| 13 | Dip beam | 47 | Windscreen wiper motor |
| 14 | Instrument illumination | 48 | Reverse lamp switch |
| 15 | Fuse assembly | 49 | Reverse lamp |
| 16 | Tail lamp | 50 | Oil pressure warning light |
| 17 | Plate illumination lamp | 51 | Oil pressure switch |
| 18 | Front parking lamp | | |
| 19 | Horn relay | A. | Overdrive (optional extra) |
| 20 | Horn push | 52 | Overdrive relay |
| 21 | Horn | 53 | Overdrive column switch |
| 22 | Roof lamp | 54 | Overdrive gearbox switch |
| 23 | Roof lamp tailgate switch | 55 | Overdrive solenoid |
| 24 | Roof lamp door switch | (a) | From ignition/starter switch—
connector 2 |
| 25 | Roof lamp facia switch | (b) | From ignition/starter switch—
connector 1 |
| 26 | Heated backlight switch | | |
| 27 | Heated backlight | | |
| 28 | Heated backlight warning light | | |
| 29 | Turn signal flasher unit | | |
| 30 | Turn signal flasher switch | | |
| 31 | L.H. Flasher lamp | | |
| 32 | R.H. Flasher lamp | | |
| 33 | Turn signal warning light | | |
-
- | COLOUR CODE | | | |
|-------------|--------|----|-------------|
| N. | Brown | LG | Light Green |
| U. | Blue | W. | White |
| R. | Red | Y. | Yellow |
| P. | Purple | S. | Slate |
| G. | Green | B. | Black |

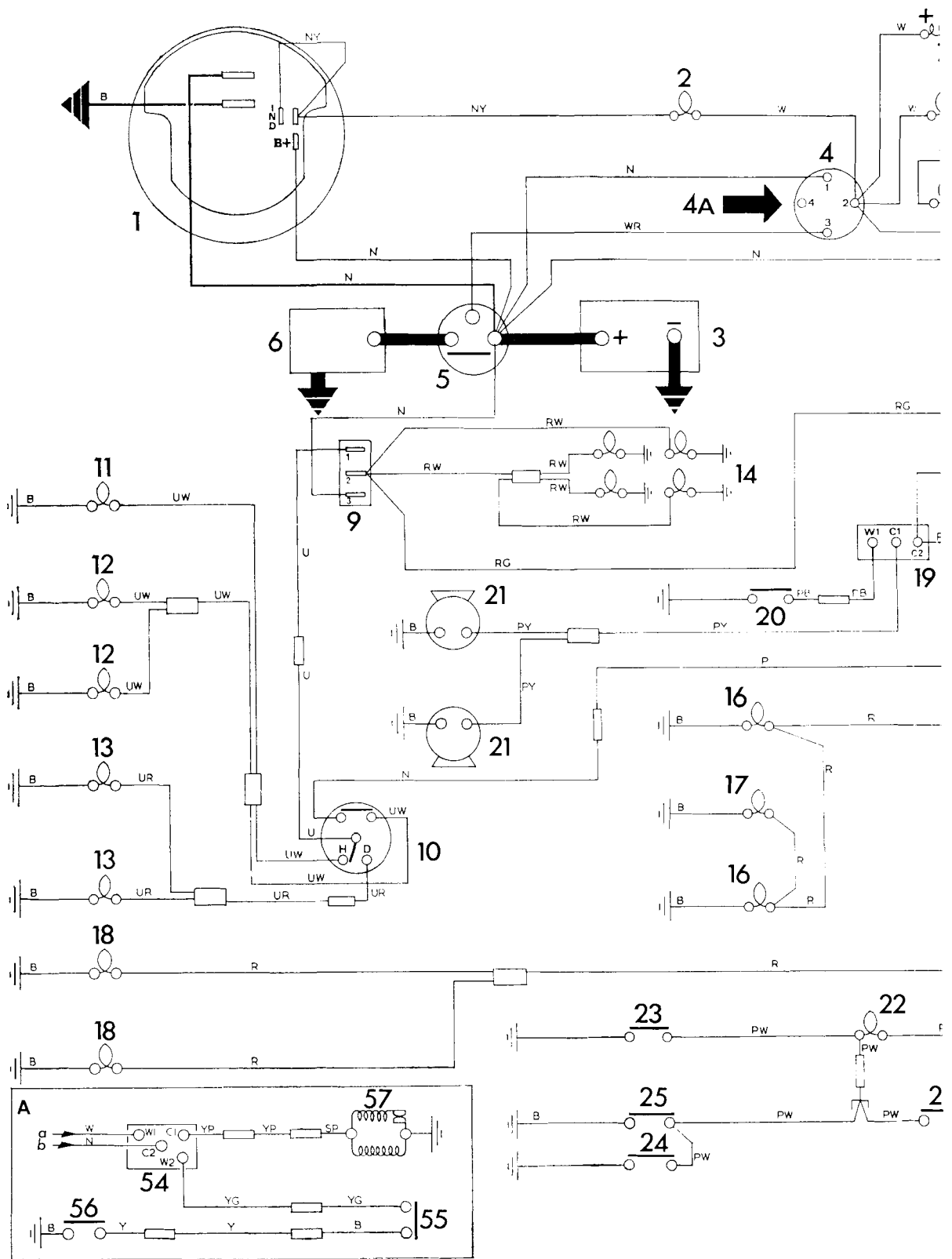
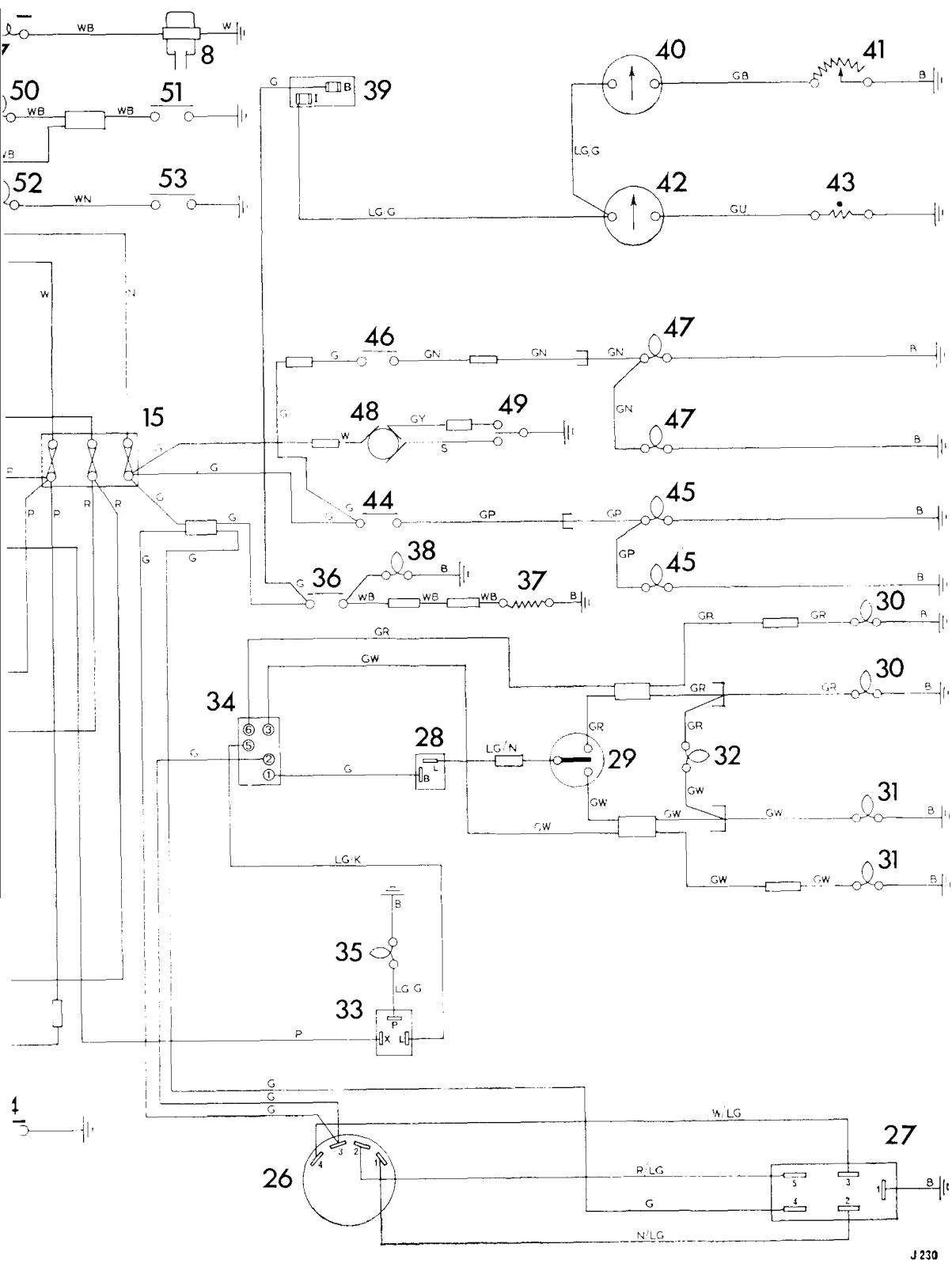


Fig. 2. Wiring diagram—

TRICAL



J 230

GT6 Mark 2—left hand steer

KEY TO WIRING DIAGRAM—GT6 MARK 2—LEFT HAND STEER

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

- | | |
|---|--|
| 1 Alternator | 36 Heated backlight switch |
| 2 Ignition warning light | 37 Heated backlight |
| 3 Battery | 38 Heated backlight warning light |
| 4 Ignition/starter switch | 39 Voltage stabilizer |
| 4A Ignition/starter switch—
radio supply connector | 40 Fuel indicator |
| 5 Starter solenoid | 41 Fuel tank unit |
| 6 Starter motor | 42 Temperature indicator |
| 7 Ignition coil | 43 Temperature transmitter |
| 8 Ignition distributor | 44 Stop lamp switch |
| 9 Master light switch | 45 Stop lamp |
| 10 Column light switch | 46 Reverse lamp switch |
| 11 Main beam warning light | 47 Reverse lamp |
| 12 Main beam | 48 Heater motor |
| 13 Dip beam | 49 Heater switch |
| 14 Instrument illumination | 50 Brake line failure warning light |
| 15 Fuse assembly | 51 Brake line failure switch |
| 16 Tail lamp | 52 Oil pressure warning light |
| 17 Plate illumination lamp | 53 Oil pressure switch |
| 18 Front parking lamp | |
| 19 Horn relay | A. Overdrive (optional extra) |
| 20 Horn push | 54 Overdrive relay |
| 21 Horn | 55 Overdrive column switch |
| 22 Roof lamp | 56 Overdrive gearbox switch |
| 23 Roof lamp tailgate switch | 57 Overdrive solenoid |
| 24 Roof lamp door switch | (a) From ignition/starter switch—
connector 2 |
| 25 Roof lamp fascia switch | (b) From ignition/starter switch—
connector 1 |
| 26 Windscreen wiper switch | |
| 27 Windscreen wiper motor | |
| 28 Turn signal flasher unit | |
| 29 Turn signal flasher switch | |
| 30 L.H. Flasher lamp | |
| 31 R.H. Flasher lamp | |
| 32 Turn signal warning light | |
| 33 Hazard flasher unit | |
| 34 Hazard switch | |
| 35 Hazard warning light | |

COLOUR CODE

N Brown	LG Light Green
U Blue	W White
R Red	Y Yellow
P Purple	S Slate
G Green	B Black

FUSE ASSEMBLY

Data

Fuse

Manufacturer	..	..	..	..	..	..	..	..	Lucas
Rating	..	..	..	..	..	..	..	..	35 amp.
Lucas part No.	..	..	..	..	..	..	..	..	188218
Stanpart No.	..	..	..	..	..	..	..	..	58465
Lucas colour code	..	..	..	..	..	..	..	..	White
Current capacity	..	..	..	..	..	..	..	..	17.5 amp.
Fusing current—Prolonged	..	..	..	..	..	..	..	..	35 amp.
Instantaneous	..	..	..	..	..	..	..	..	40 amp.

Circuits

The top fuse fed by a white cable from the ignition/starter switch protects the following circuits:

- Heated backlight circuit
- Turn signal flasher lamp circuit
- Heater circuit
- Fuel indication circuit
- Temperature indication circuit
- Stop lamp circuit
- Windscreen wiper circuit
- Reverse lamp circuit

The centre fuse fed by a red/green cable from the master light switch protects the following circuits:

- Tail lamp circuit
- Plate illumination lamp circuit
- Front parking lamp circuit

The bottom fuse fed by a brown cable from the battery protects the following circuits:

- Horn circuit
- Hazard warning circuit
- Headlamp flasher circuit
- Roof lamp circuit.

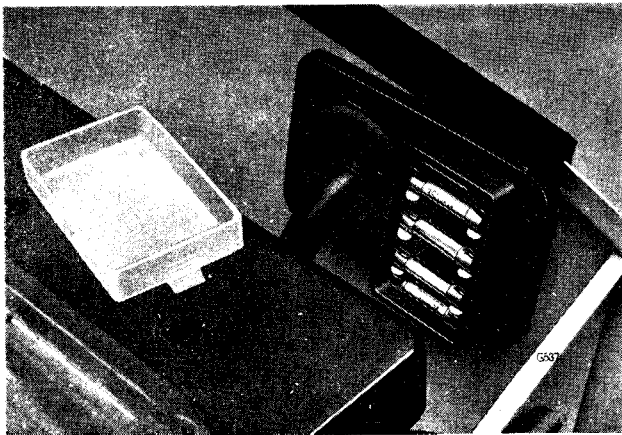


Fig. 3. Fuse assembly installed

Description

The fuse assembly is a component of the main harness. It is secured to an aperture provided on the bulkhead by integral plastic clips. The unit contains three operational fuses and has provision to house two spare. The fuses are protected by a pull-off transparent plastic cover.

Failure of a particular fuse is indicated when all the circuits protected by it become inoperative. If a new fuse fails establish the cause and rectify the fault before fitting a second replacement.

ALTERNATOR

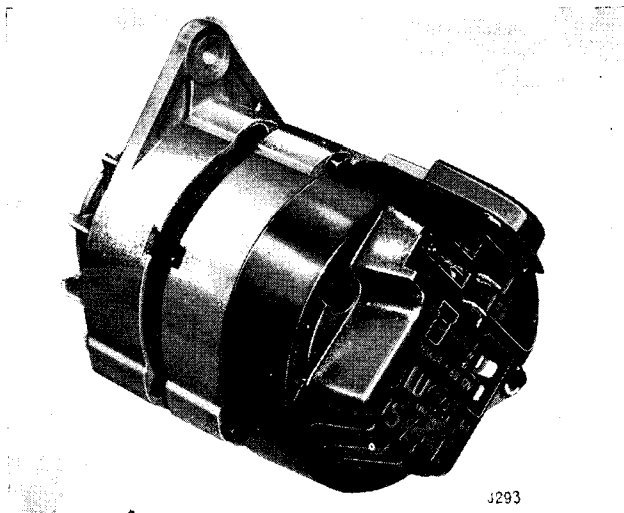
CAUTION: THE ALTERNATOR CONTAINS POLARITY SENSITIVE COMPONENTS. REFER TO 'CAUTION' ON PAGE 6-303.

DO NOT MAKE OR BREAK ANY CONNECTIONS IN THE CHARGING CIRCUIT—INCLUDING THE BATTERY LEADS—WHILE THE ENGINE IS RUNNING OR DAMAGE TO COMPONENTS MAY OCCUR. THE ALTERNATOR MUST ONLY BE RUN WITH ALL THE CHARGING CIRCUIT CONNECTIONS MADE OR THE ALTERNATOR MULTI-SOCKET CONNECTORS DISCONNECTED.

HIGH VOLTAGES MAY DAMAGE SEMI-CONDUCTOR DEVICES. REMOVE ALTERNATOR MULTI-SOCKET CONNECTORS BEFORE PERFORMING ANY ELECTRIC ARC WELDING ON THE VEHICLE.

Data

Manufacturer	.. .. .	Lucas
Type	.. .. .	15ACR
Lucas part No.	.. .. .	54021230
Stanpart No.	.. .. .	215346
Polarity	.. .. .	Negative earth only
Brush length—new	.. .. .	0.5 in.
—renew if less than	.. .. .	2.0 in. protrudes from brushbox when free
Brush spring pressure—face flush with brushbox	.. .. .	7-10 ozs.
Rectifier pack—output rectification	.. .. .	6 diodes (3 live side—3 earth side)
—field winding supply rectification	.. .. .	3 diodes
Stator windings	.. .. .	Three phase—star connected
Field winding rotor—poles	.. .. .	12
—maximum permissible speed	.. .. .	12,500 r.p.m.
—shaft thread	.. .. .	$\frac{3}{8}$ in.—18 U.N.F. RH 2A
Field winding resistance	.. .. .	4.33 \pm 5% ohm. at 20 deg. centigrade
Nominal output—hot at 6,000 alternator r.p.m. (2,870 engine r.p.m.) at 14 volts	.. .. .	28 amp.
Triumph—GT6 Mark 2		
Crankshaft pulley—effective diameter	.. .. .	4.50 in.
Alternator pulley—effective diameter	.. .. .	2.75 in.
Drive ratio—engine RPM: alternator RPM	.. .. .	11:18



J293

Fig. 4. Alternator

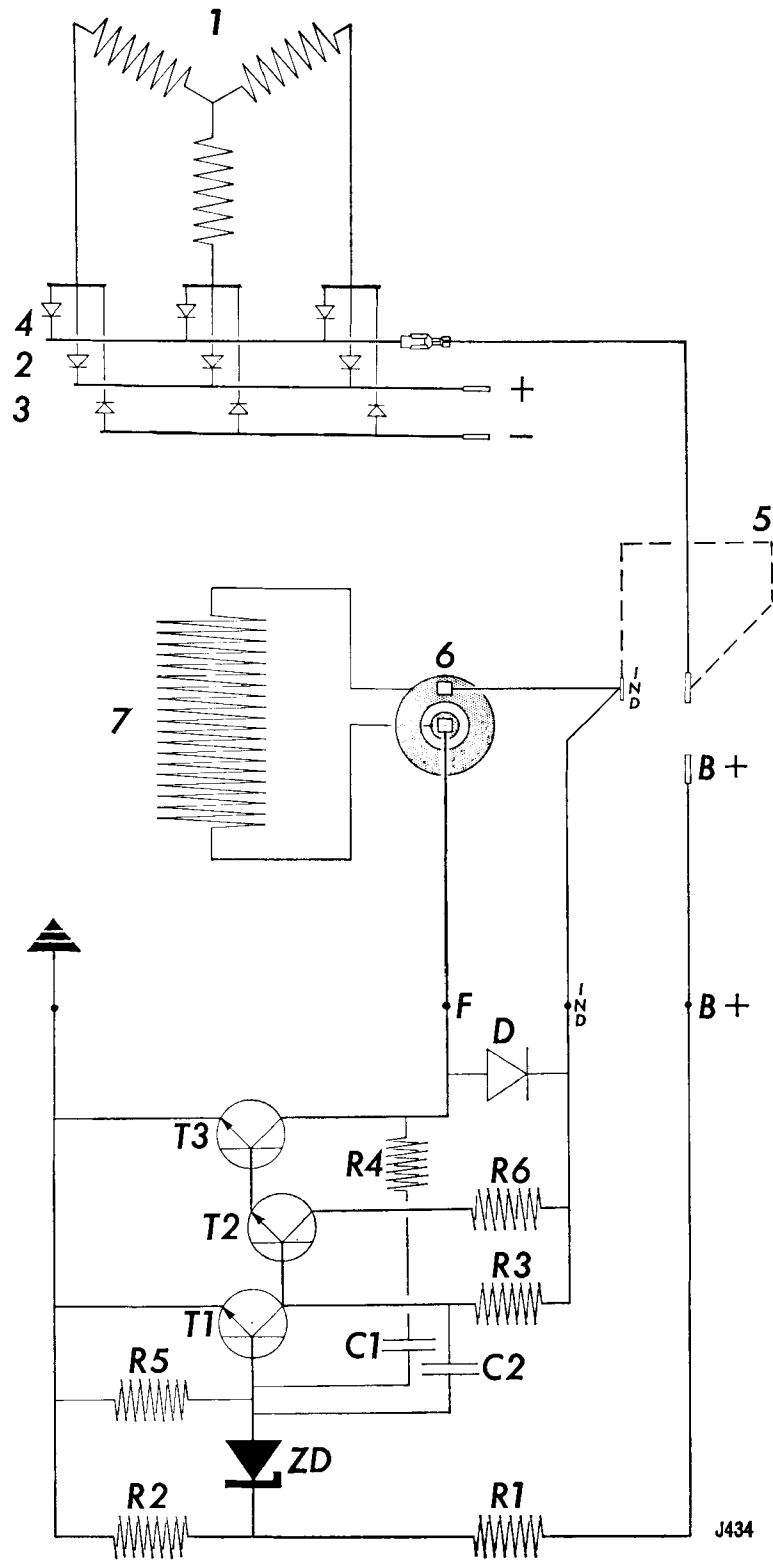
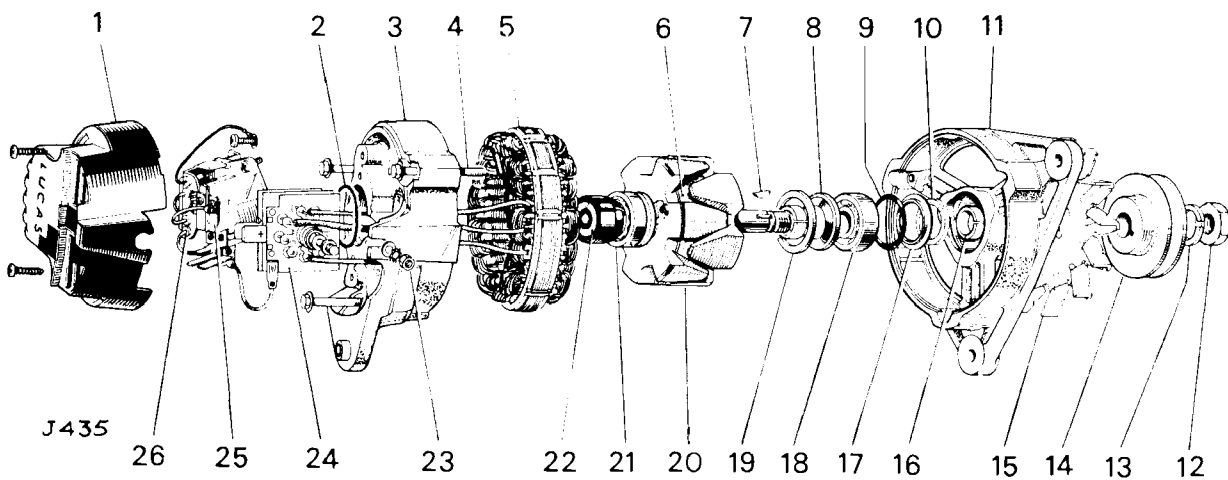


Fig. 5. Component wiring diagram

KEY TO COMPONENT WIRING DIAGRAM

1	Stator windings	
2	Live side output diodes	
3	Earth side output diodes	
4	Field winding supply diodes	
5	Harness loop	Circuit is made when multi-socket connector is fitted and broken when connector is removed
6	Brushes and slip rings	
7	Field winding	
R3	Resistor	Restricts T2 base current supplied from 'field winding supply' diodes
T2	Intermediate transistor	Controls T3 base current direct
R6	Resistor	Restricts T3 base current supplied from 'field winding supply' diodes
T3	Output transistor	Controls field winding earth return circuit
R1 and R2	Potential divider	Senses battery reference voltage
ZD	Zener diode	Voltage sensitive component. Opposes passage of current until breakdown voltage—approximately 8 volts—is reached. Controls T1 base current direct.
T1	Input transistor	Controls T2 base current by diverting current passing through R3 to earth when ZD is conducting
C1 and R4	Capacitor and Resistor	Prevents transistor overheating by providing positive feedback circuit to ensure quick switching of transistors from 'fully on' to 'fully off'
R5	Resistor	Path for small leakage current which may pass through ZD at high temperatures
D	Surge quench diode	Connected across field winding. Protects T3 from field winding high induced voltage surge and smooths field winding current
C2	Condenser	Radio interference suppression



- | | | |
|---------------------------|--|--------------------------|
| 1 Moulded cover | 10 Felt ring | 18 Drive end bearing |
| 2 Rubber 'O' ring | 11 Drive end bracket | 19 Circlip |
| 3 Slip ring end bracket | 12 Nut | 20 Rotor |
| 4 Through bolt | 13 Spring washer | 21 Slip ring end bearing |
| 5 Stator windings | 14 Pulley | 22 Slip ring moulding |
| 6 Field winding | 15 Fan | 23 Nut |
| 7 Key | 16 Spacer | 24 Rectifier pack |
| 8 Bearing retaining plate | 17 Pressure ring and felt ring retaining plate | 25 Brushbox assembly |
| 9 Pressure ring | | 26 Control unit |

Fig. 6. Alternator details

Description

The alternator contains its own control unit. A fan mounted at the drive end draws cooling air through the unit. The field winding rotor runs on two 'lubricated for life' ball bearings. (No routine lubrication is required.)

An alternating current is produced in the three phase-star connected static stator windings. This is partly rectified by six diodes—three on the live side and three on the earth side—to supply direct current to the vehicle electrical circuits and battery. Three additional diodes rectify part of the stator output to energise the field winding via a pair of brushes and slip rings. This circuit is controlled by the control unit.

The control unit adjusts the current flow through the field winding to control the alternator output to suit the electrical requirements of the vehicle and the state of charge of the battery. Control is achieved by a voltage sensitive electronic circuit. The unit is built employing micro-circuit techniques. The resulting space saving enables it to be mounted on the slip ring end bracket below the moulded cover.

(No current regulator is required as the inherent self regulating properties of the alternator limit the output current. No cut out is required since the diodes incorporated in the alternator prevent reverse currents from flowing.)

Ignition warning light—the three 'field winding supply' diodes enable a circuit similar to a conventional generator warning light circuit to be employed. When the ignition circuits are energised battery voltage is applied to the light. When the alternator is at rest an earth path exists through the field winding and control unit and the light illuminates. When the alternator commences to charge the voltage at terminal 'IND' approximately equals that at the battery and the light extinguishes. If the warning light remains illuminated during normal running a fault is indicated.

Service

Ensure that the ventilation apertures in the moulded cover remain clean.

Adjust tension of vee drive belt as detailed in Group 1.

CAUTION: WHEN TENSIONING BELT LEVER ON THE DRIVE END BRACKET ONLY. USE A LEVER OF SOFT MATERIAL—PREFERABLY WOOD. DO NOT LEVER ON ANY OTHER PART OF THE ALTERNATOR OR BEARING DAMAGE MAY RESULT.

Defective charging system

Check multi-socket connectors are correctly fitted.

Ensure that vee drive belt is not slipping on alternator pulley. If required adjust tension of belt as detailed in Group 1.

Prove alternator operation by performing both an Alternator functional check with control unit inoperative and a Control unit functional check as detailed below.

Inspect charging system wiring. Perform continuity checks between alternator, ignition warning light and battery. With alternator running at 6000 r.p.m. (2870 engine r.p.m.) and headlamps switched on voltage drop between alternator '+' connector blade and battery positive terminal should not exceed 0.5 volt. Similarly with the same running conditions voltage drop between alternator '-' connector blade and battery negative terminal should not exceed 0.25 volt.

Check attachment of battery leads to ensure good electrical contact.

Check the battery is in a serviceable condition. Perform a Specific gravity check and a Heavy discharge check.

NOTE: If equipment is not available to perform an Alternator functional check with control unit inoperative or a Control unit functional check a Diode check as detailed below could be performed.

Alternator functional check with control unit inoperative.

The stated output may be exceeded slightly when the alternator is cold. To avoid misleading results the check should be performed with the unit as near to its normal operating temperature as possible.

1. Disconnect multi-socket connectors.
2. Remove moulded cover.
3. Provide test circuit as shown on Fig. 7.

CAUTION: THE ALTERNATOR CONTAINS POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY. OBSERVE POLARITY OF ALTERNATOR AND BATTERY TERMINALS.

Do not connect variable resistor across battery for longer than is necessary to perform check.

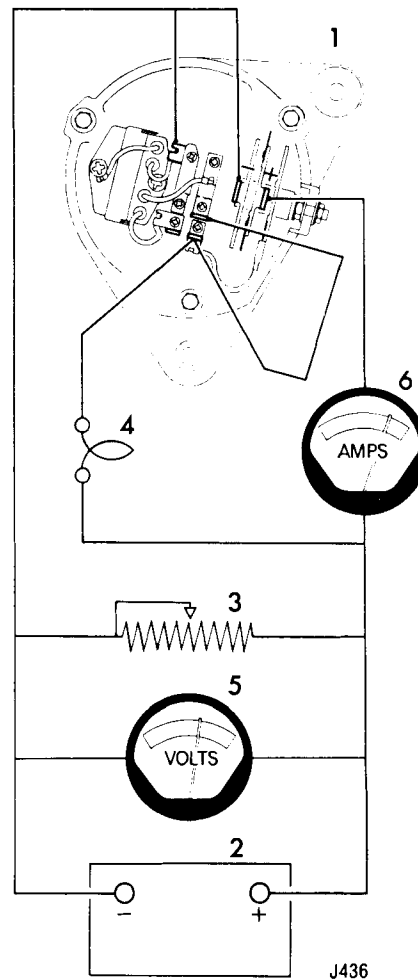
4. Run engine gradually increasing speed.

At 1500 alternator r.p.m. (720 engine r.p.m.) light should be extinguished.

Hold speed at approximately 6000 alternator r.p.m. (2870 engine r.p.m.). Adjust variable resistor so voltmeter reads 14 volts. Ammeter reading should now be approximately 28 amps.

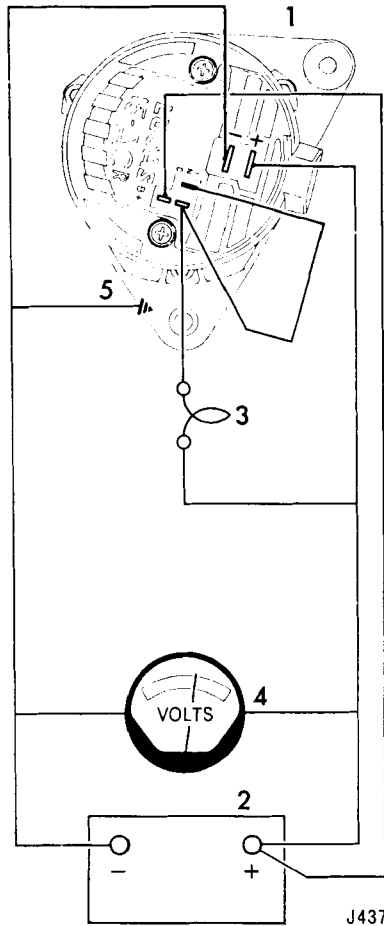
If the ammeter reading is not approximately 28 amps. the indication is that the alternator requires overhaul or replacement.

NOTE: If the indication is that the alternator requires overhaul or replacement, diode failure may be suspected. A Diode check as detailed below could be performed.



1	Alternator		
2	Battery	.. ..	12 volt
3	Variable resistor	.. ..	0-15 ohm-35 amp.
4	Light	.. ..	12 volt-2.2 watt
5	Voltmeter	.. ..	0-20 volt
6	Ammeter	.. ..	0-40 amp.

Fig. 7. Alternator functional check with control unit inoperative



- 1 Alternator
- 2 Battery 12 volt
- 3 Light 12 volt—2.2 watt
- 4 Voltmeter 0-20 volt
- 5 Earth connection to alternator body

Fig. 8. Control unit functional check

Control unit functional check

The stated output may be exceeded slightly when the alternator is cold. To avoid misleading results the check should be performed with the unit as near to its normal operating temperature as possible.

1. Disconnect multi-socket connectors.
2. Provide test circuit as shown on Fig. 8.

CAUTION: THE ALTERNATOR CONTAINS POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY. OBSERVE POLARITY OF ALTERNATOR AND BATTERY TERMINALS.

3. Run engine gradually increasing speed.

At 1500 alternator r.p.m. (720 engine r.p.m.) light should be extinguished.

Hold speed at approximately 6000 alternator r.p.m. (2870 engine r.p.m.). Voltmeter reading should now be steady at 14.0-14.4 volts.

If the voltmeter reading is not steady at 14.0-14.4 volts—and a satisfactory Alternator functional check with control unit inoperative has been performed—the indication is that the control unit should be replaced.

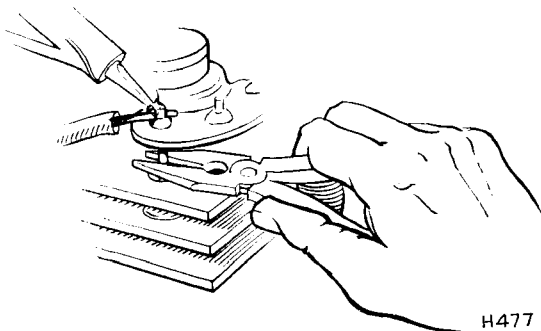


Fig. 9. Soldering operation

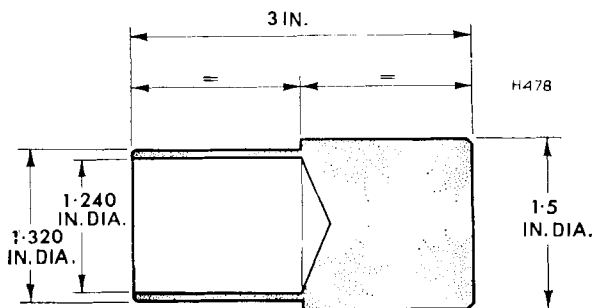


Fig. 10. Extractor tool

Disassemble alternator

1. Remove moulded cover.
2. Remove brushbox and control unit assembly by disconnecting 'Lucar type' connector from rectifier pack and unscrewing three screws.
3. If required control unit may be detached from assembly. Note position of three wire eyelets. Withdraw screw to release control unit and three screws to release wire eyelets.
4. Note position of three stator wires on rectifier pack.
5. Unsolder three stator wire connections.

Take care not to overheat diodes or bend diode pins. Perform soldering operation as quickly as possible and provide a heat sink by lightly gripping diode pin with long-nosed pliers as shown on Fig. 9.

6. Slacken nut and withdraw rectifier pack.
7. Remove through bolts.
8. Provide extractor tool as detailed on Fig. 10.

To remove slip ring end bracket position extractor tool to engage with outer journal of slip ring end bearing.

NOTE: It may be necessary to carefully file away surplus solder from two field winding connections on slip ring moulding if extractor tool will not pass over moulding.

Employ a second operator to support slip ring end bracket by hand. Carefully tap extractor tool to drive bearing from housing.

9. Rubber 'O' ring fitted in slip ring end bracket bearing housing may remain in situ unless replacement is contemplated.
10. Remove stator windings from drive end bracket.
11. Remove nut, spring washer, pulley and fan. If necessary use suitable extractor.

NOTE: Prevent the shaft turning while removing the nut by wrapping a scrap fan belt round pulley and retaining by hand or vice.

12. Remove key.
13. Using suitable press remove rotor from drive end bracket.

CAUTION: DO NOT ATTEMPT TO REMOVE ROTOR BY APPLYING HAMMER BLOWS TO SHAFT END. SUCH ACTION MAY BURR OVER AND DAMAGE THREAD.

Assemble alternator

1. Using spacer (Fig. 6—item 16) and suitable tube fit rotor to drive end bracket by applying pressure to bearing inner journal.

CAUTION: DO NOT USE DRIVE END BRACKET AS SUPPORT WHILE FITTING ROTOR.

IF SPACER IS NOT EMPLOYED FELT RING MAY BE DAMAGED.

2. Fit key.
3. Fit fan, pulley, spring washer and nut. Torque load nut to 25–30 lb. ft.

NOTE: Prevent the shaft turning while tightening the nut by wrapping a scrap fan belt round pulley and retaining by hand or vice.

4. Observe relationship of stator windings to drive end bracket determined by stator wire connections, rectifier pack position on slip ring end bracket, alignment of mounting lugs on end brackets and through bolt clearances on stator windings.

Position stator windings to drive end bracket.

5. Ensure that rubber 'O' ring is fitted correctly in slip ring end bracket bearing housing.
6. Fit slip ring end bracket by carefully pushing bearing into housing.
7. Fit through bolts tightening evenly.
8. Ensure that rubber locating piece is correctly fitted to rectifier pack. Position rectifier pack and secure with nut.
9. Position three stator wires on rectifier pack as noted at Disassemble alternator—operation 4 above. Solder using only 'M' grade 45–55 tin lead solder. Note precaution stated at Disassemble alternator—operation 5 above.

10. If required attach control unit to brushbox. Position three wire eyelets on brushbox as noted at Disassemble alternator—operation 3 above. Insert screw to secure control unit and three screws to secure wire eyelets.

11. Ensure that brushes are entered correctly in brushbox. Fit brushbox and control unit assembly by inserting three screws and connecting 'Lucar type' connector to rectifier pack.

12. Fit moulded cover.

Brushes

Clean brushes with petrol moistened cloth. Ensure that the brushes move freely in the brushbox. If necessary lightly polish brush sides with a fine file.

Check brush length—renew brushbox assembly if less than 0.2 in. protrudes from brushbox when free.

Using a suitable push type spring scale check brush spring pressure. Pressure should be 7–10 ozs. with face flush with brushbox. If pressure is low renew brushbox assembly.

Slip rings

Clean slip rings with petrol moistened cloth. If there is evidence of burning use very fine glasspaper. The surfaces should be smooth and uncontaminated by oil or other foreign matter.

CAUTION: DO NOT USE EMERY CLOTH OR SIMILAR ABRASIVE.

DO NOT MACHINE SKIM—ANY ECCENTRICITY IN MACHINING WILL ADVERSELY AFFECT THE ALTERNATORS HIGH SPEED PERFORMANCE.

Diode check

If diode failure is suspected perform the following check on each of the nine diodes.

1. Remove moulded cover.
2. Disconnect 'Lucar type' connector from rectifier pack.

3. Note position of three stator wires on rectifier pack.
4. Unsolder three stator wire connections.

Take care not to overheat diodes or bend diode pins. Perform soldering operation as quickly as possible and provide a heat sink by lightly gripping diode pin with long nosed pliers as shown on Fig. 9.

5. Provide test circuit as shown on Fig. 11.
6. Place each diode in circuit with battery positive to diode pin. Repeat check with battery negative to diode pin.

When placing each diode in circuit wire 'A' must be connected to the heat sink plate to which the diode is associated.

Light illumination—indicating current flow—should occur in one direction only.

If light illuminates in both directions, or fails to illuminate in either, the diode is unserviceable and a new rectifier pack must be fitted.

Bearings

The field winding rotor runs on two 'lubricated for life' ball bearings. (No routine lubrication is required.)

The need for bearing replacement during the life of the alternator is extremely unlikely—provided the vee drive belt is correctly adjusted and the unit is mounted correctly.

Should bearing replacement be required proceed as follows:

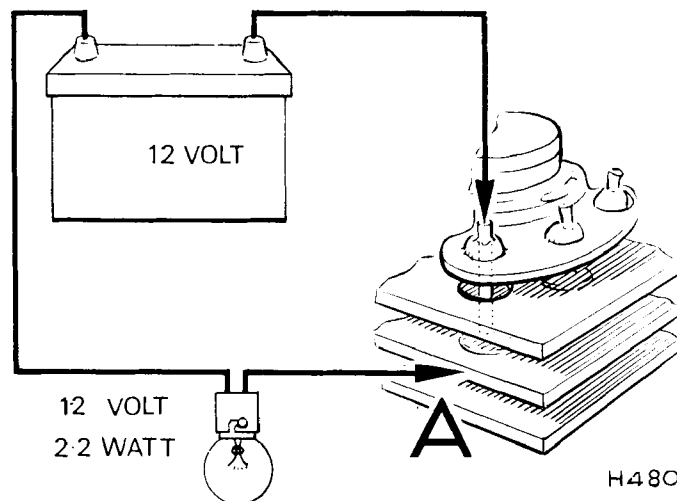


Fig. 11. Diode check

Remove Slip Ring End Bearing

1. Perform Disassemble alternator operations 1-10 as detailed above.
2. Unsolder two field winding connections to slip ring moulding.
3. Pull slip ring moulding from shaft.
4. Using suitable extractor remove bearing.

Install Slip Ring End Bearing

1. Ensure that bearing is correctly packed with lubricant 'Shell Alvania RA' grease or equivalent.
2. Using suitable tube fit bearing to shaft by applying pressure to bearing inner journal. Ensure that shielded side faces slip ring moulding and bearing is positioned as far as it will go along shaft towards rotor.
3. Fit slip ring moulding to shaft. Ensure that projections engage correctly with shaft slot.

NOTE: Slip ring moulding may be fitted either way round.

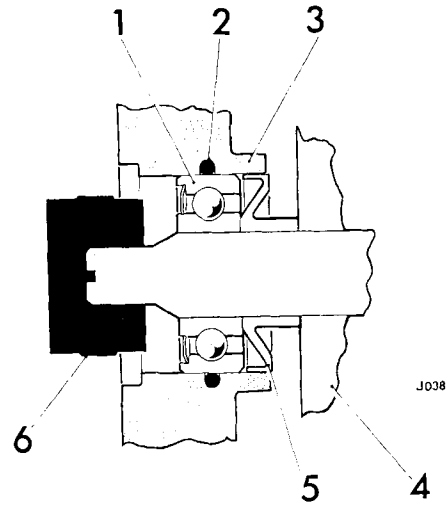
4. Solder two field winding connections to slip ring moulding using 'Frys H.T.3' solder.

Remove Drive End Bearing

1. Perform Disassemble alternator as detailed above.
2. Insert large screwdriver in extractor notch and prise out circlip.
3. Remove bearing retaining plate.
4. Push out bearing and associated components.

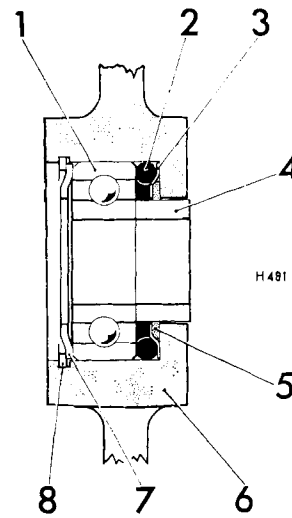
Install Drive End Bearing

1. Ensure that bearing is correctly packed with lubricant 'Shell Alvania RA' grease or equivalent.
2. Assemble bearing, pressure ring, pressure ring and felt ring retaining plate, spacer and felt ring as detailed on Fig. 13. Fit assembly to drive end bracket.
3. Fit bearing retaining plate.
4. Fit circlip.



- | | |
|-------------------------|----------------------|
| 1 Bearing | 4 Rotor |
| 2 Rubber 'O' ring | 5 Grease retainer |
| 3 Slip ring end bracket | 6 Slip ring moulding |

Fig. 12. Slip ring end bearing



- | | |
|---|---------------------------|
| 1 Bearing | 5 Felt ring |
| 2 Pressure ring | 6 Drive end bracket |
| 3 Pressure ring and felt ring retaining plate | 7 Bearing retaining plate |
| 4 Spacer | 8 Circlip |

Fig. 13. Drive end bearing and associated components

STARTER SOLENOID

Data

Manufacturer	Lucas
Type	4ST
Lucas part No... .. .	76766
Stanpart No.	121269
Plunger pull in voltage	4-9 volts
Plunger release voltage	0-2.5 volts
Winding resistance	2.3-2.8 ohms

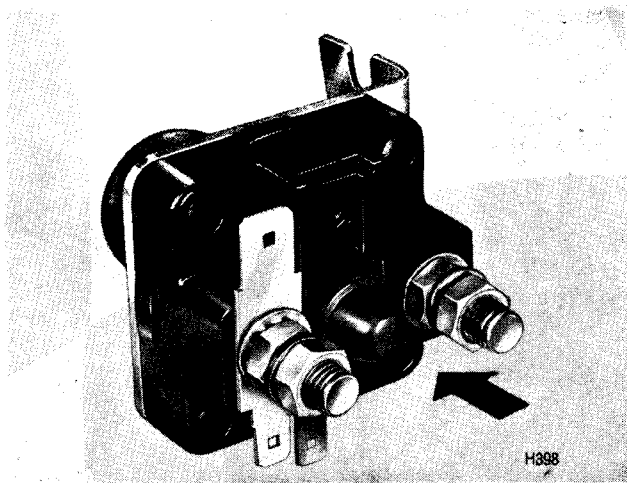


Fig. 14. Starter solenoid

Description

The starter solenoid is normally solenoid operated by remote control from the ignition/starter switch. It may also be actuated manually from the engine compartment by depressing the rubber cap shown arrowed on Fig. 14.

Service—No maintenance is required.

Repair—Repair is by replacement.

- 1 Supply from ignition/starter switch
- 2 Shunt winding
- 3 Plunger contact
- 4 Battery terminal—with battery to harness connectors
- 5 Starter motor terminal

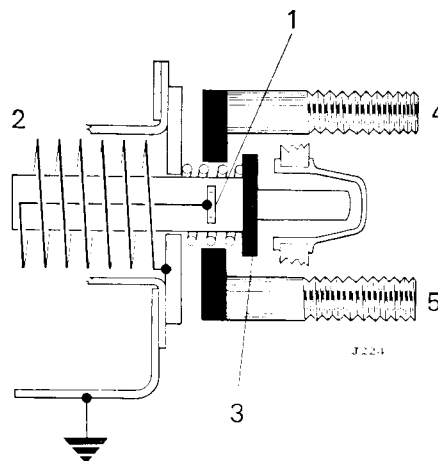


Fig. 15. Component wiring diagram

IGNITION DISTRIBUTOR

Data

Manufacturer	.. .. .	Delco Remy
Series	.. .. .	D200
Delco Remy Part No.	.. .. .	7953681
Stanpart No.	.. .. .	215511
Contact gap	.. .. .	0.015 in.
Rotation—viewed on rotor	.. .. .	Anticlockwise
Firing angles	.. .. .	60 degs.
Dwell angle	.. .. .	40–42 degs.
Open angle	.. .. .	18–20 degs.
Moving contact spring tension	.. .. .	17–21 ozs.
Condenser capacity	.. .. .	0.18–0.23 mfd.
Engine firing order	.. .. .	1-5-3-6-2-4

Centrifugal Advance

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
200	0	0	400	0	0
800	3.5	5.5	1600	7	11
1200	7.0	9.0	2400	14	18
1600	8.0	10.5	3200	16	21
2200	10.0	12.0 max	4400	20	24 max

Vacuum Advance

Ins. of mercury vacuum	Degs. distributor advance		Degs. crankshaft advance	
	Minimum	Maximum	Minimum	Maximum
2	Advance commence			
4	0	2	0	4
8	3	5	6	10
13	7	9 max	14	18 max
20	7	9 max	14	18 max

For all other details refer to Group 6—GT6 Mark 1—Ignition distributor

BULB CHART

Lamp	Watts	Lucas Part No.	Stanpart No.	
Headlamps—L.H. Dip	60/45	54521872	512231	*
R.H. Dip—Normal	45/40	410	510218	
France	45/40	411	510219	
U.S.A.	50/40	54522231	—	*
Front parking lamps	6	207	57591	
Front flasher lamps	21	382	502379	
Tail/stop lamps	6/21	380	502287	
Rear flasher lamps	21	382	502379	
Reverse lamps	21	382	502379	
Plate illumination lamp—Normal	6	989	59467	
U.S.A. and Denmark	4	222	501436	
Roof lamp	6	254	59897	
Instrument illumination	2·2	987	59492	
Warning lights	2·2	987	59492	

* Sealed beam light unit

TURN SIGNAL FLASHER UNIT

Data

Manufacturer	.. .. .	Lucas
Type	.. .. .	8FL 3·6A
Lucas part No.	.. .. .	35048
Stanpart No.	.. .. .	148644
Nominal voltage	.. .. .	12 volts
Flashes per minute	.. .. .	60-120
Percentage on time—flasher lamps are on for this percentage of each flash cycle	.. .. .	30 to 75%
Total bulb load	.. .. .	44·2 watts
Rating	.. .. .	3·6 amp.

Description

The turn signal flasher unit consists of a moulded base carrying a snap action metal vane held in tension by a metal ribbon. A set of normally closed contacts are positioned on the base and ribbon. A pressed cover is gimped to the base.

Current supplied to terminal B flows immediately across the contacts, through the ribbon and vane to terminal L. From terminal L it flows to the selected lamps giving immediate indication of the driver's selection.

The current heats the ribbon causing expansion which finally allows the vane to relax and the contacts to open.

The current flow is terminated, the lamps extinguish and the ribbon cools and contracts. The vane is re-tensioned until the contacts close and a second cycle commences.

Service—No maintenance is required.

Renew Turn Signal Flasher Unit

Locate unit below facia panel on right hand side of bulkhead. Pull unit from socket. Fit new unit to socket.

Repair—Repair of the unit is by replacement.

CAUTION: TO ENSURE THE CORRECT OPERATION OF THE FLASHER SYSTEM WITHIN LEGAL LIMITS, IT IS IMPORTANT THAT A NEW UNIT SHOULD BE OF THE CORRECT TYPE WITH A RATING OF 3·6A.

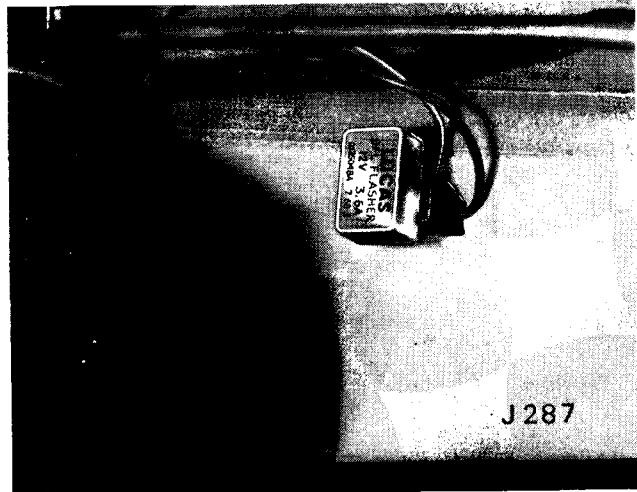
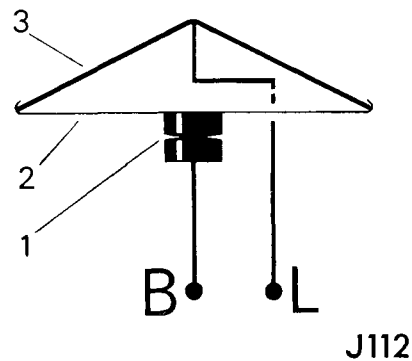


Fig. 16. Turn signal flasher unit installed



- B Supply
- 1 Contacts
- 2 Metal ribbon
- 3 Metal vane
- L Output terminal to lamps

Fig. 17. Component wiring diagram

HAZARD WARNING SYSTEM

Data

Hazard flasher unit—

Manufacturer	Signal-stat (made in Brooklyn, New York, U.S.A.—available through Lucas dealers)
Type	180
Lucas part No.	54362147
Stanpart No.	148576
Nominal voltage	12 volts
Flashes per minute	60 to 120
Percentage on time—flasher lamps are on for this percentage of each flash cycle	30 to 75%
Total bulb load	86.2 watts

Description

Operating the hazard switch on the facia panel isolates the turn signal flasher lamp circuit and makes the switch terminals 5, 6 and 3 common. A circuit now exists through the hazard flasher unit to both the left hand and right hand flasher lamps. A hazard warning light mounted on the facia panel flashes in unison with the lamps.

In the event of minor crash damage the system may safely be selected providing petrol spillage has not occurred. If one or more lamps are inoperative the remaining lamps may continue to flash at the correct speed. If the circuit has become earthed the appropriate fuse will blow when the selection is made. System selection should not result in a fire or a harness 'burn out' provided petrol spillage has not occurred.

Hazard Flasher Unit Operation

Current supplied to terminal X flows across the resistor wire, through the ribbon and vane to terminal L. From terminal L it flows to earth via the lamps. The lamps do not illuminate as the current is limited by the resistor wire.

The current is however large enough to heat the ribbon causing expansion which finally allows the vane to relax and the main contacts to close.

Current supplied to terminal X now flows through the series winding—to close the warning light contacts—and across the main contacts to terminal L. From terminal L it flows to the lamps causing illumination.

Current flow across the ribbon is terminated and it cools and contracts. The vane is retensioned until the main contacts open and a second cycle commences.

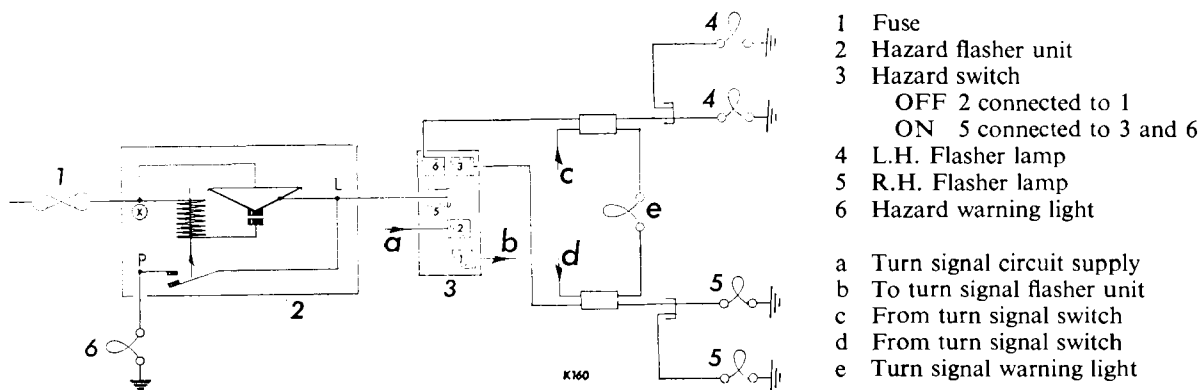


Fig. 18. System wiring diagram

HEATED BACKLIGHT—CLEAR

Data

Manufacturer	.. .. .	Triplex
Type	.. .. .	Hotline
Stanpart No.	.. .. .	714115
Design operating current	.. .. .	10.2 amps.

Description

A heated backlight with a facia mounted switch and a red warning light incorporated in the tachometer is fitted to all vehicles as standard equipment.

The 'Hotline' unit is produced by first printing the heating element on the inside of the glass. During the subsequent toughening process this element is fused into the glass.

The resultant toughened backlight should provide long life and reliability. No special operating instructions or precautions are required.

Service—No maintenance is required.

Removal/Installation

The heated backlight removal/installation is the same as for a conventional backlight except that the two electrical connectors require to be carefully disconnected/connected.

Removal/installation for a conventional backlight is detailed in Group 5.

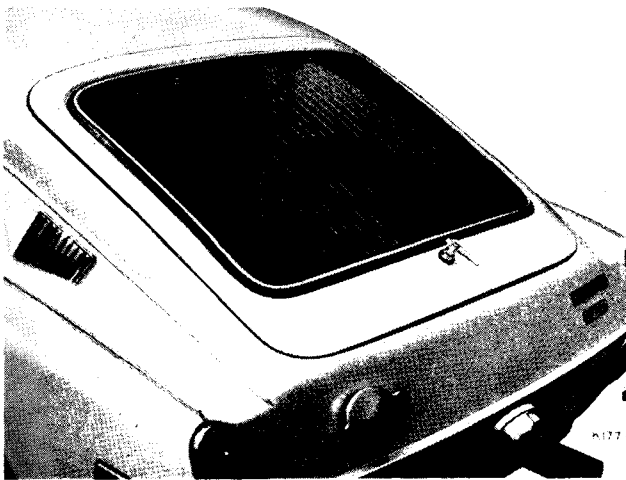


Fig. 19. Heated backlight

WINDSCREEN WIPER MOTOR

CAUTION: THE WINDSCREEN WIPER MOTOR IS POLARITY SENSITIVE. REFER TO 'CAUTION' ON PAGE 6-303.

OBSERVE POLARITY WHEN PERFORMING ANY TESTING OF THE UNIT.

Data

Manufacturer	.. .. .	Lucas
Type	.. .. .	14W
Lucas Part No.	.. .. .	75704
Stanpart No.	.. .. .	517621
Running current—after 60 seconds from cold with connecting rod removed—		
Normal speed	.. .. .	1.5 amp.
High speed	.. .. .	2.0 amp.
Running speed—final gear after 60 seconds from cold with connecting rod removed—		
Normal speed	.. .. .	46-52 r.p.m.
High speed	.. .. .	60-70 r.p.m.
Armature end float	.. .. .	0.002-0.008 in.
Brush length—normal speed—new	.. .. .	0.380 in.
renew if less than	.. .. .	$\frac{3}{16}$ in.
high speed —new	.. .. .	0.380 in.
renew if less than	.. .. .	0.280 in.
(i.e. when narrow section is worn to step into full width section)		
earth —new	.. .. .	0.380 in.
renew if less than	.. .. .	$\frac{3}{16}$ in.
Brush spring pressure—when compressed so brush bottom is aligned with brushbox slot end	.. .. .	5-7 ozs.
Maximum permissible force to move cable rack in tubing—arms and blades removed	.. .. .	6 lbs.

Description

The unit consists of a two speed permanent magnet motor and a gearbox unit which drives a cable rack mechanism. Rotation of the motor armature is converted to a reciprocating motion of the cable rack by a single stage worm and gear, a connecting rod and a crosshead contained in a guide channel.

Two speed operation is provided by a third brush. When high speed is selected the positive supply is transferred from the normal speed brush to the high speed brush.

A switching feature stops the blades in the park position irrespective of their position when the facia switch is selected OFF. This is effected by a two stage limit switch unit attached to the gearbox. The contacts are actuated by a cam on the final gear.

When the facia switch is selected OFF the motor will continue to run until the limit switch first stage contacts open. A momentary period follows during which no contact is made. The second stage contacts then close causing regenerative braking of the armature which maintains consistent parking of the blades.

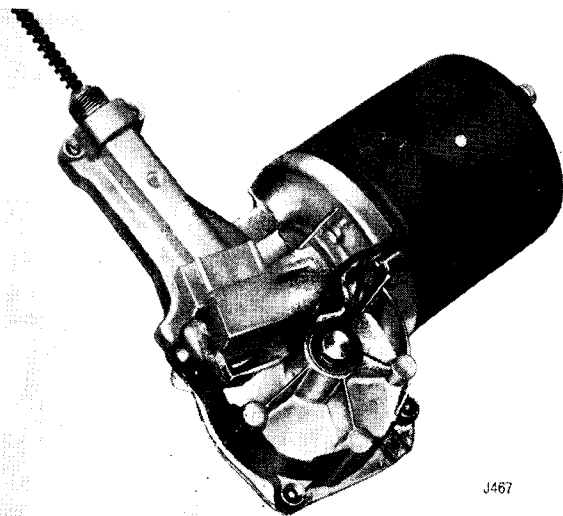


Fig. 20. Windscreen wiper motor

Service

The windscreen wiper motor is greased during manufacture and no maintenance is required.

Adjust park position

The park position is not adjustable at the windscreen wiper motor. The arms and blades may be repositioned on the splined wheelbox spindles to alter the swept arc.

Adjust armature end float

On a new windscreen wiper motor armature end float is normally controlled by a non adjustable thrust screw.

To check armature end float when a non adjustable thrust screw is fitted perform the following operation. Position a feeler gauge between armature shaft and thrust screw. Push armature towards cover. End float should be 0.002-0.008 in. In the unlikely event of adjustment being required end float may be increased by fitting shim washer/washers under thrust screw head or reduced by mounting thrust screw in lathe and removing metal from underside of head.

If a service replacement armature is fitted it should be supplied with an adjustable thrust screw and lock nut as a boxing sundry.

To adjust armature end float when an adjustable thrust screw and lock nut is fitted perform the following operation. Slacken lock nut. Screw thrust screw in until resistance is felt. Screw thrust screw out quarter of a turn—maintain in this position and tighten lock nut.

Repair

If the windscreen wiper motor is not operating correctly first check electrical supply of 12 volts on terminal 5 with normal speed selected and terminal 3 with high speed selected.

If electrical supply is satisfactory perform the following operations to determine if the fault is in the motor or in the cable rack and tubing assembly resulting in the motor being required to drive an excessive load.

Running Current

1. Remove four screws. Lift off gearbox cover.
2. Remove crank pin spring clip by withdrawing sideways. Remove washer (Fig. 23—item 19). Carefully withdraw connecting rod. Remove washer (17).
3. Connect ammeter suitable for running current (See Data) in supply circuit.
4. Allow motor to run for 60 seconds. Ammeter reading should then be as given in Data for normal speed and high speed respectively.

If the reading is not as stated a fault in the motor is indicated.

Running Speed

1. Remove four screws. Lift off gearbox cover.
2. Remove crank pin spring clip by withdrawing sideways. Remove washer (Fig. 23—item 19). Carefully withdraw connecting rod. Remove washer (17).
3. Allow motor to run for 60 seconds. Speed of final gear should then be as given in Data for normal speed and high speed respectively.
If the speed is not as stated a fault in the motor is indicated.

Force to Move Cable Rack in Tubing

1. Remove four screws. Lift off gearbox cover.
2. Remove crank pin spring clip by withdrawing sideways. Remove washer (Fig. 23—item 19). Carefully withdraw connecting rod. Remove washer (17).
3. Remove arms and blades.
4. Attach a suitable spring scale to hole in crosshead. Maximum permissible force to move cable rack in tubing is 6 lbs.

If the required force is greater than 6 lbs. a fault in the cable rack and tubing assembly is indicated.

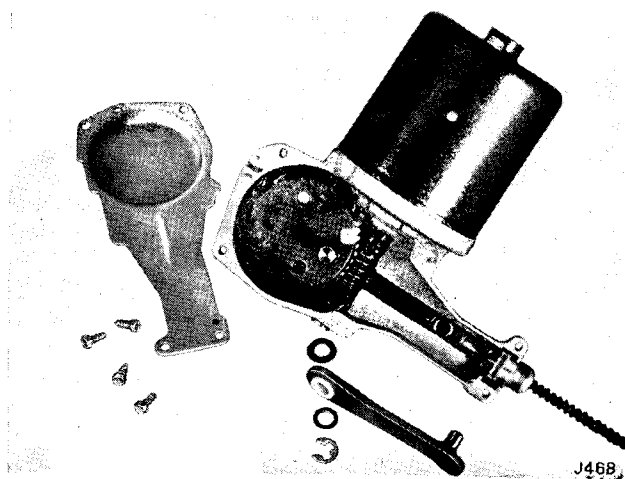
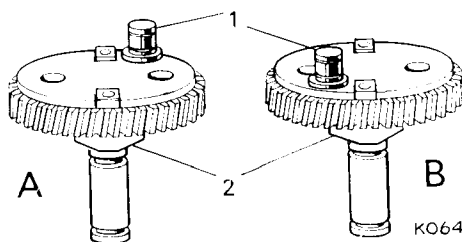
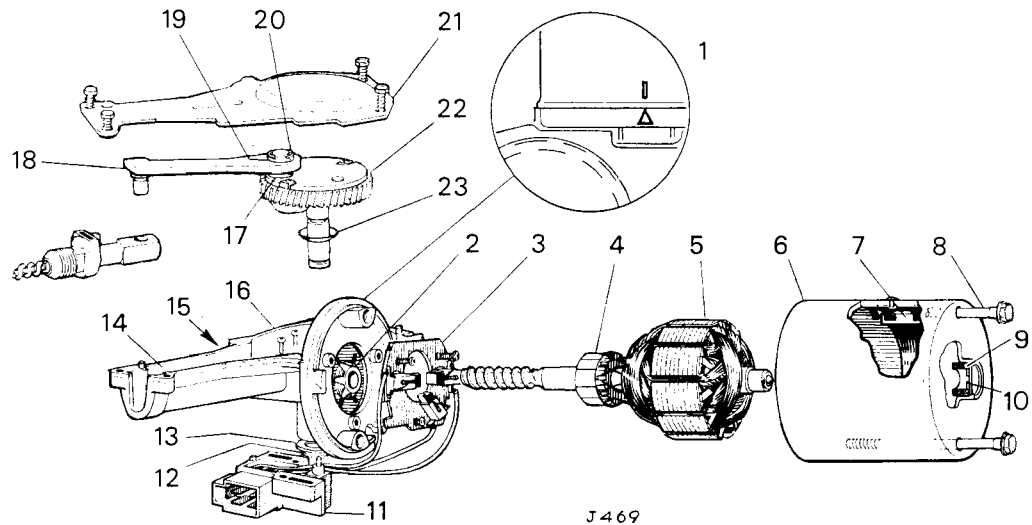


Fig. 21. Connecting rod removed



A Park position—cable rack retracted 1 Crankpin.
B Park position—cable rack extended 2 Cam

Fig. 22. Relationship of crankpin to cam for correct park position



- | | | | | | |
|---|-----------------------|----|-------------------------------|----|-----------------------|
| 1 | Aligning marks | 10 | Felt washer | 16 | Gearbox |
| 2 | Self aligning bearing | 11 | Limit switch unit | 17 | Washer |
| 3 | Brush assembly | 12 | Final gear shaft spring clip | 18 | Connecting rod |
| 4 | Commutator | 13 | Washer | 19 | Washer |
| 5 | Armature | 14 | Crosshead guide channel | 20 | Crank pin spring clip |
| 6 | Cover | 15 | Thrust screw (non adjustable) | 21 | Gearbox cover |
| 7 | Permanent magnet | or | Thrust screw and lock nut | 22 | Final gear |
| 8 | Through bolt | | (adjustable) | 23 | Dished washer |
| 9 | Cover bearing | | | | |

Fig. 23. Windscreen wiper motor details

Disassemble Windscreen Wiper Motor

1. Remove four screws. Lift off gearbox cover.
2. Remove crank pin spring clip by withdrawing sideways. Remove washer (19). Carefully withdraw connecting rod. Remove washer (17).
3. Remove final gear shaft spring clip by withdrawing sideways. Remove washer (13). Ensure shaft is burr free and withdraw. Remove dished washer.
4. Remove through bolts.
5. Carefully withdraw cover and armature about $\frac{1}{8}$ in. Continue withdrawal allowing brushes to drop clear of commutator. Ensure that brushes are not contaminated with grease.
6. Pull armature from cover against action of permanent magnet.
7. Remove five screws to release brush assembly and limit switch unit. Remove both units joined together by wires.

Assemble Windscreen Wiper Motor

NOTE: The following lubricants are used during assembly:

Shell Turbo 41 oil
Ragosine Listate grease

1. Position brush assembly and limit switch unit joined together by wires. Secure with five screws.
 2. Lubricate cover bearing and saturate cover bearing felt washer with Shell Turbo 41 oil. Position armature to cover against action of permanent magnet.
 3. Lubricate self aligning bearing with Shell Turbo 41 oil. Carefully insert armature shaft through bearing. Ensure that brushes are not contaminated with lubricant. Push three brushes back to clear commutator.
 4. Seat cover against gearbox. Turn cover to align marks shown on Fig. 23. Fit through bolts and torque load to 12-16 lb. in.
- CAUTION: IF MARKS ARE NOT ALIGNED MOTOR WILL RUN IN REVERSE DIRECTION.
5. Determine if a non adjustable thrust screw or adjustable thrust screw and lock nut is fitted. Refer to Adjust armature end float above and perform appropriate operation.

6. Lubricate final gear bushes with Shell Turbo 41 oil. Lubricate final gear cam with Ragosine Listate grease. Fit dished washer with concave surface facing final gear. Insert shaft. Fit washer (13). Fit spring clip by inserting sideways.
NOTE: The final gear is serviced only as an assembly. Normally the crankpin mounting plate is not separated from the moulded gearwheel. If they should become parted assemble so relationship of crankpin to cam is as shown on Fig. 22.
7. Pack Ragosine Listate grease around worm gear, final gear and into crosshead guide channel.
8. Fit washer (17). Lubricate final gear crankpin with Shell Turbo 41 oil and crosshead end of connecting rod including pin with Ragosine Listate grease. Carefully insert connecting rod. Fit washer (19). Fit spring clip by inserting sideways.
9. Position gearbox cover. Secure with four screws.

Commutator

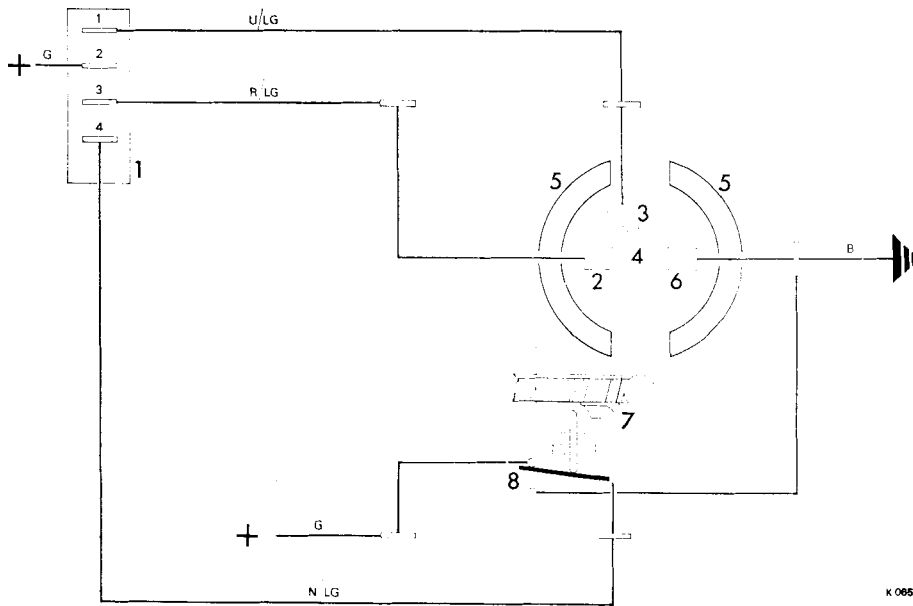
Clean commutator with petrol moistened cloth. If the unit is in good condition it will be smooth and free from pits or burned spots. If necessary polish with fine glass paper. If excessively worn replace armature.

Brushes

Clean brushes with petrol moistened cloth. Ensure that the brushes move freely in the brushplate.

Check brush length—renew brush assembly if any brush is less than respective dimension given in Data.

Using a suitable push type spring scale check brush spring pressure. Pressure should be as given in Data. If pressure is low renew brush assembly.



- | | |
|-------------------------|---------------------|
| + Supply | 3 High speed brush |
| 1 Facia switch | 4 Commutator |
| OFF 3 connected to 4 | 5 Permanent magnet |
| NORMAL 2 connected to 3 | 6 Earth brush |
| HIGH 2 connected to 1 | 7 Final gear cam |
| 2 Normal speed brush | 8 Limit switch unit |

Fig. 24. Component and switch wiring diagram

FUEL INDICATION

Data	Up to Commission No. KE/KF 20,001	From Commission No. KE/KF 20,001
Fuel indicator		
Manufacturer	Smiths	Smiths
Smiths part No.	BF 2201/17	BF 2232/01
Stanpart No.	150162	159611
Type	Bimetal resistance	Bimetal resistance
Body diameter	52mm.	52mm.
Illumination	Internal	Internal
Tank unit		
Manufacturer	Smiths	
Smiths part No.	TBS 1114/001	
Stanpart No.	307474	
Type	Bimetal resistance	

For all other details refer to page 6.156

TEMPERATURE INDICATION

Data	Up to Commission No. KE/KF 20,001	From Commission No. KE/KF 20,001
Temperature indicator		
Manufacturer	Smiths	Smiths
Smiths part No.	BT 2204/13	BT 2230/00
Stanpart No.	150163	159606
Type	Bimetal resistance	Bimetal resistance
Body diameter	52mm.	52mm.
Illumination	Internal	Internal
Transmitter		
Manufacturer	Smiths	Smiths
Smiths part No.	TT 4-02/00	TT 4803/00A
Stanpart No.	137705	150843
Type	Semi conductor	Semi-conductor
Indication range.. .. .	50—120 degs. centigrade	50—140 degs centigrade
Thread	$\frac{5}{8}$ in.—18 UNF	$\frac{5}{8}$ in.—18 UNF

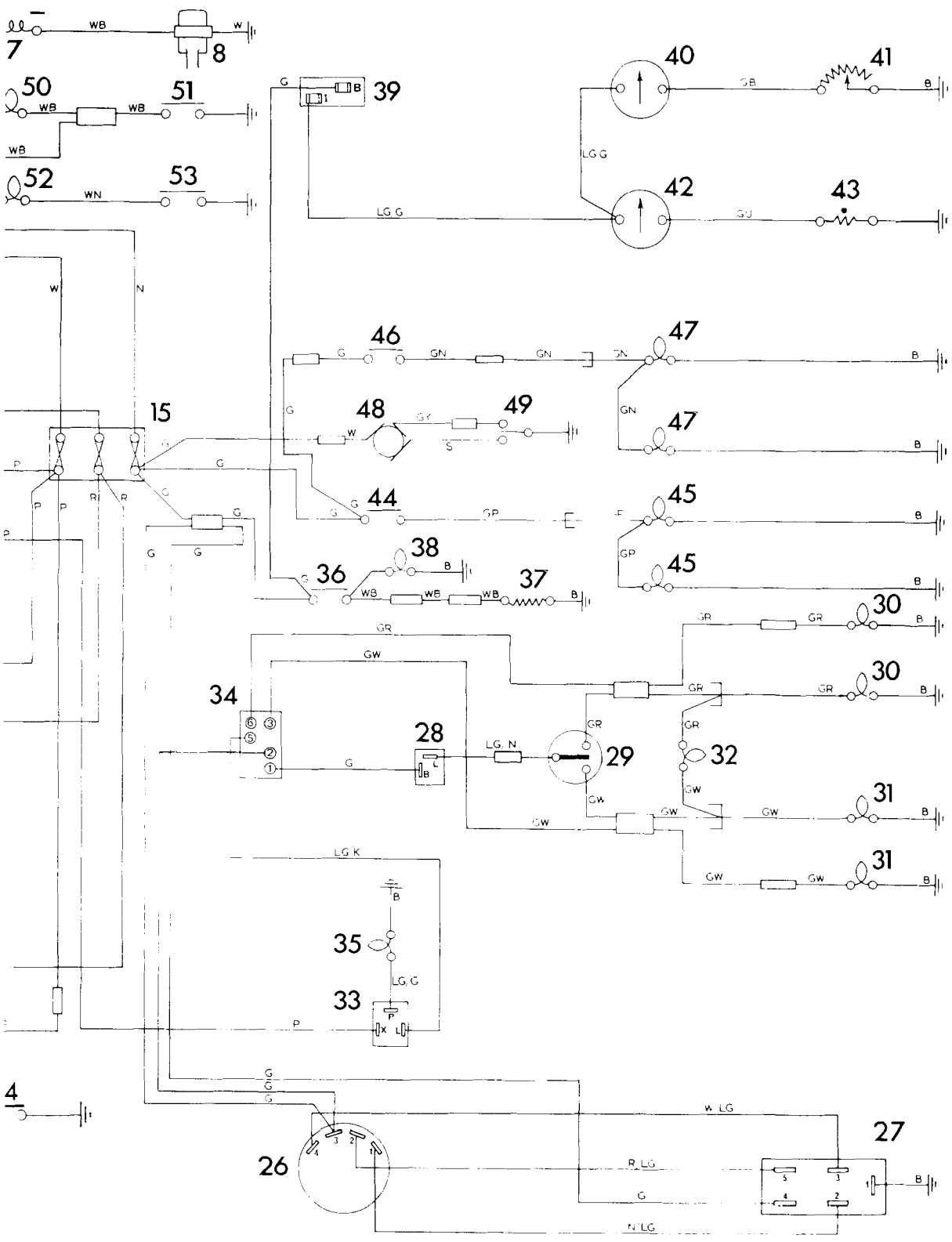
For all other details refer to page 6.158

INTRODUCTION TO SECTION 4

Information contained in this section details electrical equipment specific to the GT6 Plus that was introduced in October 1968. This vehicle is produced for the North American market only and complies with U.S. Federal Standards.

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.



KEY TO WIRING DIAGRAM—GT6 PLUS

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

- | | |
|---|--|
| 1 Alternator | 36 Heated backlight switch |
| 2 Ignition warning light | 37 Heated backlight |
| 3 Battery | 38 Heated backlight warning light |
| 4 Ignition/starter switch | 39 Voltage stabilizer |
| 4A Ignition/starter switch—
radio supply connector | 40 Fuel indicator |
| 5 Starter solenoid | 41 Fuel tank unit |
| 6 Starter motor | 42 Temperature indicator |
| 7 Ignition coil | 43 Temperature transmitter |
| 8 Ignition distributor | 44 Stop lamp switch |
| 9 Master light switch | 45 Stop lamp |
| 10 Column light switch | 46 Reverse lamp switch |
| 11 Main beam warning light | 47 Reverse lamp |
| 12 Main beam | 48 Heater motor |
| 13 Dip beam | 49 Heater switch |
| 14 Instrument illumination | 50 Brake line failure warning light |
| 15 Fuse assembly | 51 Brake line failure switch |
| 16 Tail lamp | 52 Oil pressure warning light |
| 17 Plate illumination lamp | 53 Oil pressure switch |
| 18 Front parking lamp | |
| 19 Horn relay | A. Overdrive (optional extra) |
| 20 Horn push | 54 Overdrive relay |
| 21 Horn | 55 Overdrive column switch |
| 22 Roof lamp | 56 Overdrive gearbox switch |
| 23 Roof lamp tailgate switch | 57 Overdrive solenoid |
| 24 Roof lamp door switch | (a) From ignition/starter switch—
connector 2 |
| 25 Roof lamp fascia switch | (b) From ignition/starter switch—
connector 1 |
| 26 Windscreen wiper switch | |
| 27 Windscreen wiper motor | |
| 28 Turn signal flasher unit | |
| 29 Turn signal flasher switch | |
| 30 L.H. Flasher lamp | |
| 31 R.H. Flasher lamp | |
| 32 Turn signal warning light | |
| 33 Hazard flasher unit | |
| 34 Hazard switch | |
| 35 Hazard warning light | |

COLOUR CODE

N	Brown	LG	Light Green
U	Blue	W	White
R	Red	Y	Yellow
P	Purple	S	Slate
G	Green	B	Black

HEATED BACKLIGHT—TINTED**Data**

Manufacturer	Triplex
Type	Hotline Sundym
Stanpart No.	714571
Design operating current	10.2 amps.

Description

A heated backlight with a facia mounted switch and a red warning light incorporated in the tachometer is fitted to all vehicles as standard equipment.

The 'Hotline Sundym' unit is produced by first printing the heating element on the inside of the tinted glass. During the subsequent toughening process this element is fused into the tinted glass.

The resultant toughened backlight should provide long life and reliability. No special operating instructions or precautions are required.

Service—No maintenance is required.

Removal/Installation

The heated backlight removal/installation is the same as for a conventional backlight except that the two electrical connectors require to be carefully disconnected/connected.

Removal/installation for a conventional backlight is detailed in Group 5.

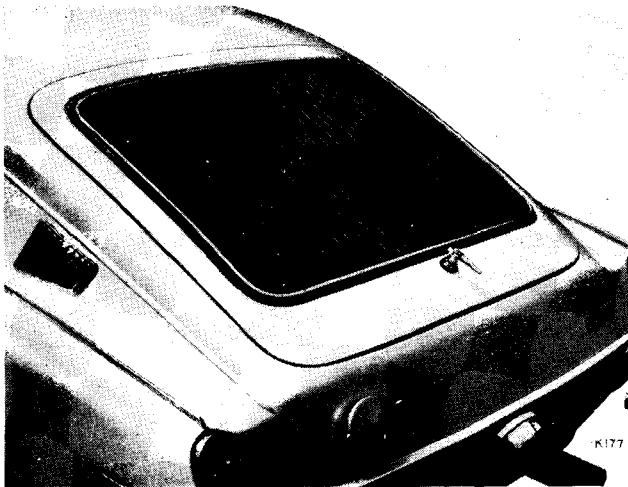


Fig. 2. Heated backlight

INTRODUCTION TO SECTION 5

Information contained in this section details electrical equipment specific to the GT6 Mark 3. For the full contents list of electrical equipment fitted to the GT6 Mark 3 refer to page 6.101E at the front of Group 6.

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

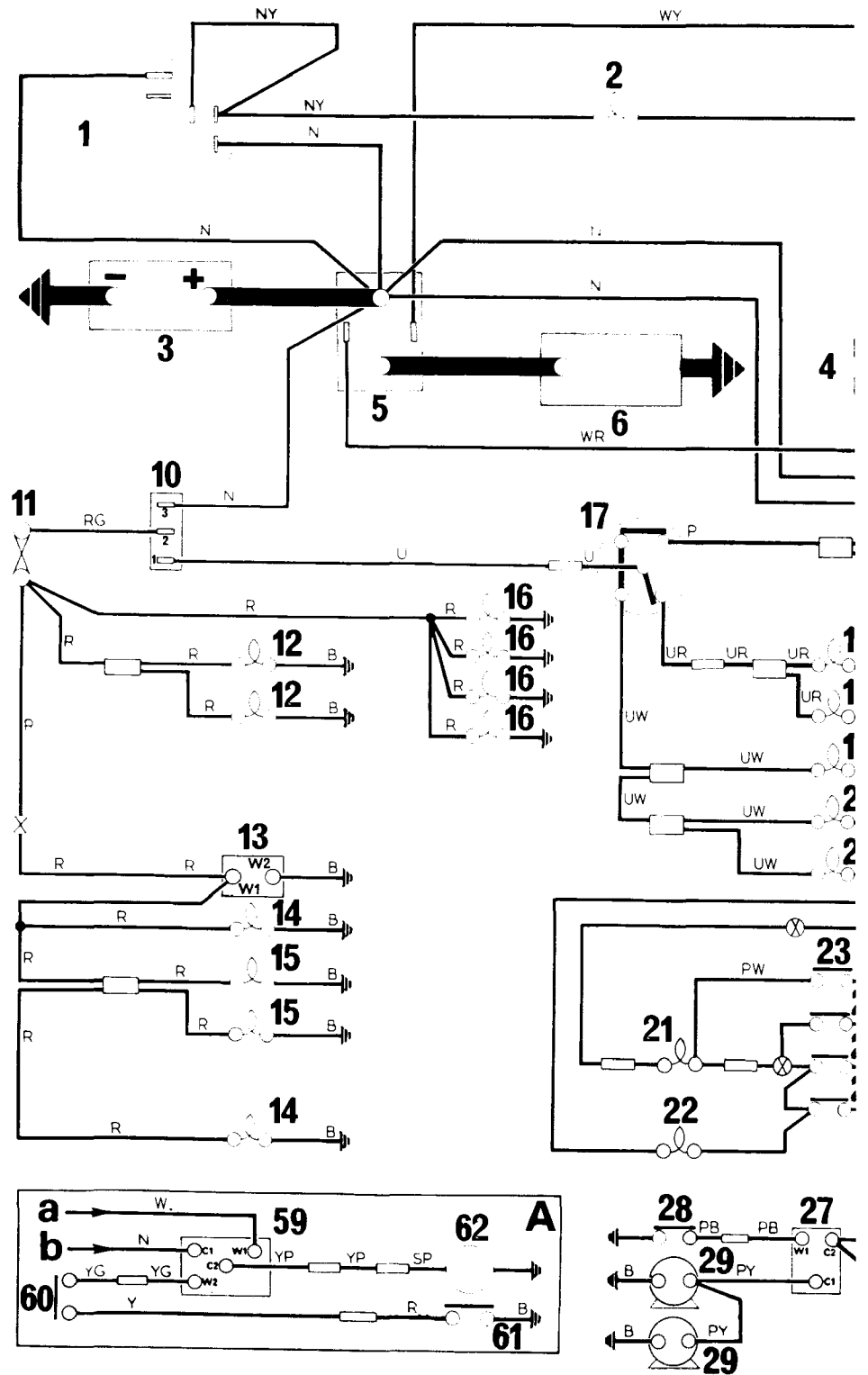
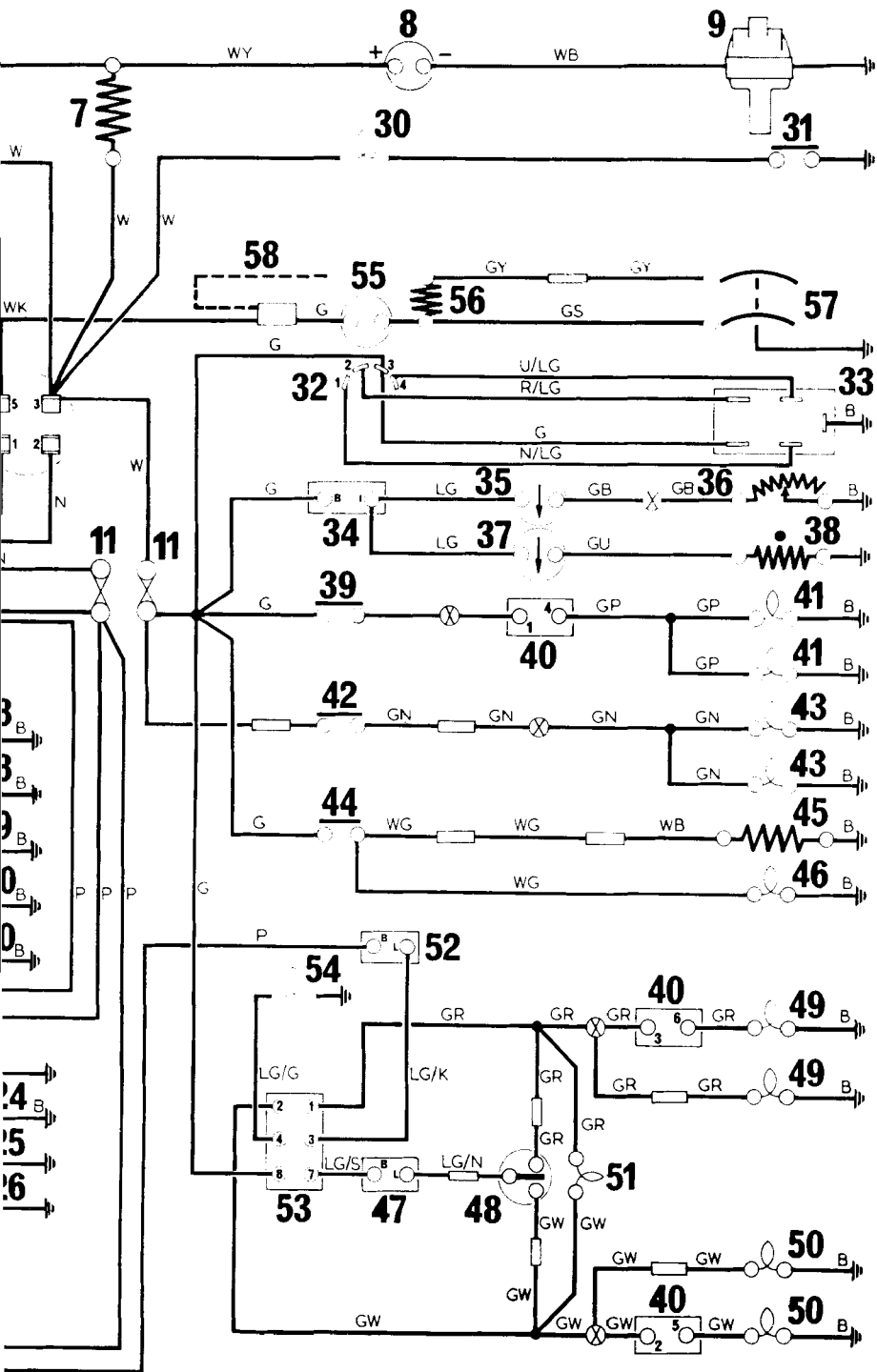


Fig. 1. Wiring diagram—GT6 MK. 3.—Right hand



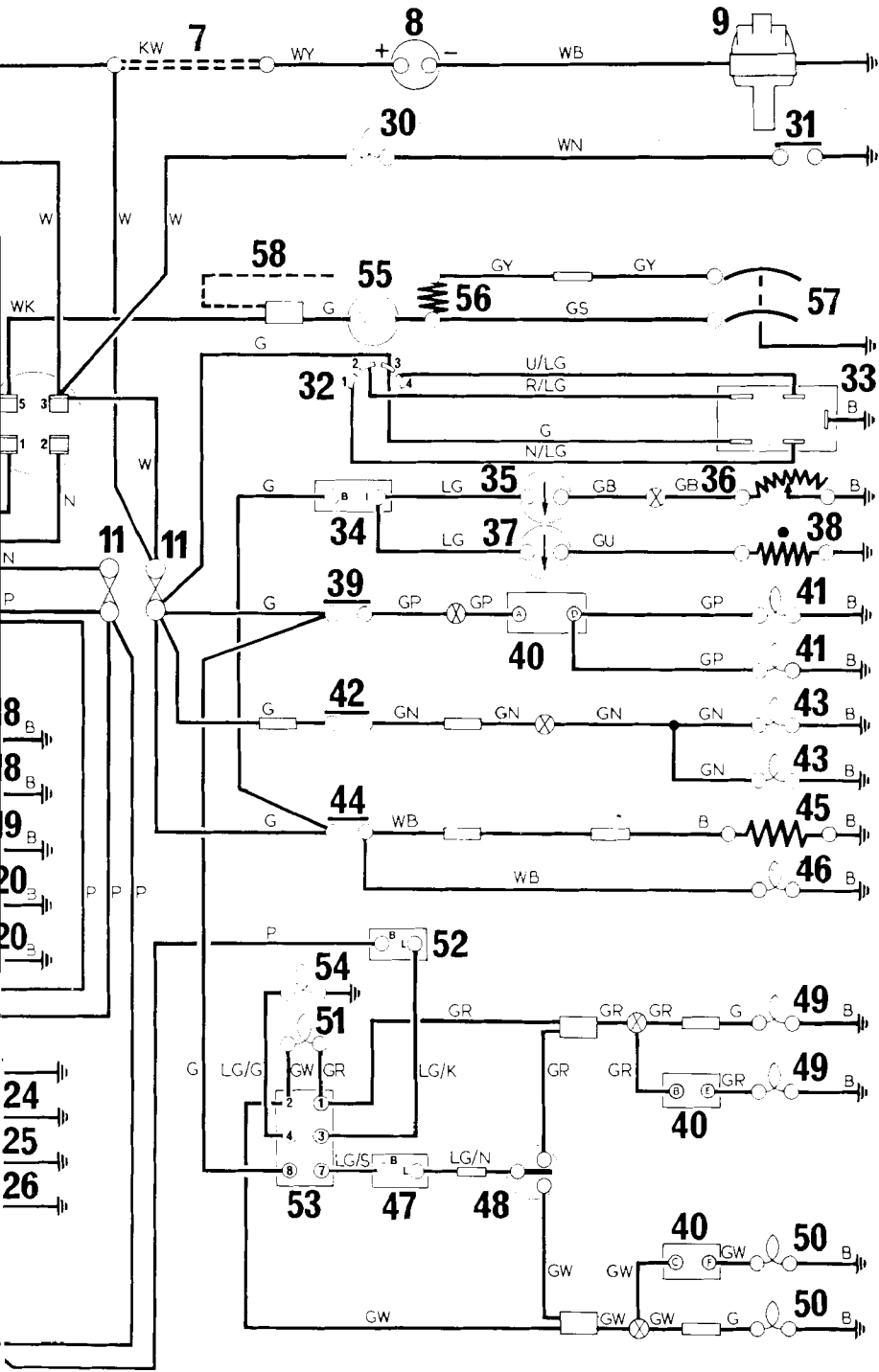
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KEY TO WIRING DIAGRAM—GT6 MARK 3—RIGHT HAND STEER
Commission Numbers KE 1 to KE 20,000

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

1 Alternator	34 Voltage stabilizer
2 Ignition warning light	35 Fuel indicator
3 Battery	36 Fuel tank unit
4 Ignition/starter switch	37 Temperature indicator
5 Starter solenoid	38 Temperature transmitter
6 Starter motor	39 Stop lamp switch
7 Ballast resistor	40 Night dimming relay
8 Ignition coil—6 volt	41 Stop lamp
9 Ignition distributor	42 Reverse lamp switch
10 Master light switch	43 Reverse lamp
11 Fuse	44 Heated backlight switch
12 Front parking lamp	45 Heated backlight
13 Night dimming relay winding	46 Heated backlight warning light
14 Tail lamp	47 Turn signal flasher unit
15 Plate illumination lamp	48 Turn signal switch
16 Instrument illumination	49 L.H. flasher lamp
17 Column light switch	50 R.H. flasher lamp
18 Dip beam	51 Turn signal warning light
19 Main beam warning light	52 Hazard flasher unit
20 Main beam	53 Hazard switch
21 Roof lamp	54 Hazard warning light
22 Key courtesy light	55 Heater motor
23 Tailgate switch	56 Heater rheostat
24 L.H. door switch	57 Heater switch
25 Facia switch	58 Radio facility
26 R.H. door switch	
27 Horn relay	A Overdrive (optional extra)
28 Horn push	59 Overdrive relay
29 Horn	60 Overdrive gearbox switch
30 Oil pressure warning light	61 Overdrive gear lever switch
31 Oil pressure switch	62 Overdrive solenoid
32 Windscreen wiper switch	a From ignition/starter switch—terminal 3
33 Windscreen wiper motor	b From ignition/starter switch—terminal 2



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KEY TO WIRING DIAGRAM—GT6 MARK 3—RIGHT HAND STEER
Commission Numbers KE 20,001 and Future

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

1 Alternator	34 Voltage stabilizer
2 Ignition warning light	35 Fuel indicator
3 Battery	36 Fuel tank unit
4 Ignition starter switch	37 Temperature indicator
5 Starter solenoid	38 Temperature transmitter
6 Starter motor	39 Stop lamp switch
7 Ballast resistor wire	40 Night dimming relay
8 Ignition coil—6 volt	41 Stop lamp
9 Ignition distributor	42 Reverse lamp switch
10 Master light switch	43 Reverse lamp
11 Fuse	44 Heated backlight switch
12 Front parking lamp	45 Heated backlight
13 Night dimming relay winding	46 Heated backlight warning light
14 Tail lamp	47 Turn signal flasher unit
15 Plate illumination lamp	48 Turn signal switch
16 Instrument illumination	49 L.H. flasher lamp
17 Column light switch	50 R.H. flasher lamp
18 Dip beam	51 Turn signal warning light
19 Main beam warning light	52 Hazard flasher unit
20 Main beam	53 Hazard switch
21 Roof lamp	54 Hazard warning light
22 Key courtesy light	55 Heater motor
23 Tailgate switch	56 Heater rheostat
24 L.H. door switch	57 Heater switch
25 Facia switch	58 Radio facility
26 R.H. door switch	
27 Horn relay	A Overdrive (optional extra).
28 Horn push	59 Overdrive gearbox switch
29 Horn	60 Overdrive gear lever switch
30 Oil pressure warning light	61 Overdrive solenoid
31 Oil pressure switch	
32 Windscreen wiper switch	
33 Windscreen wiper motor	

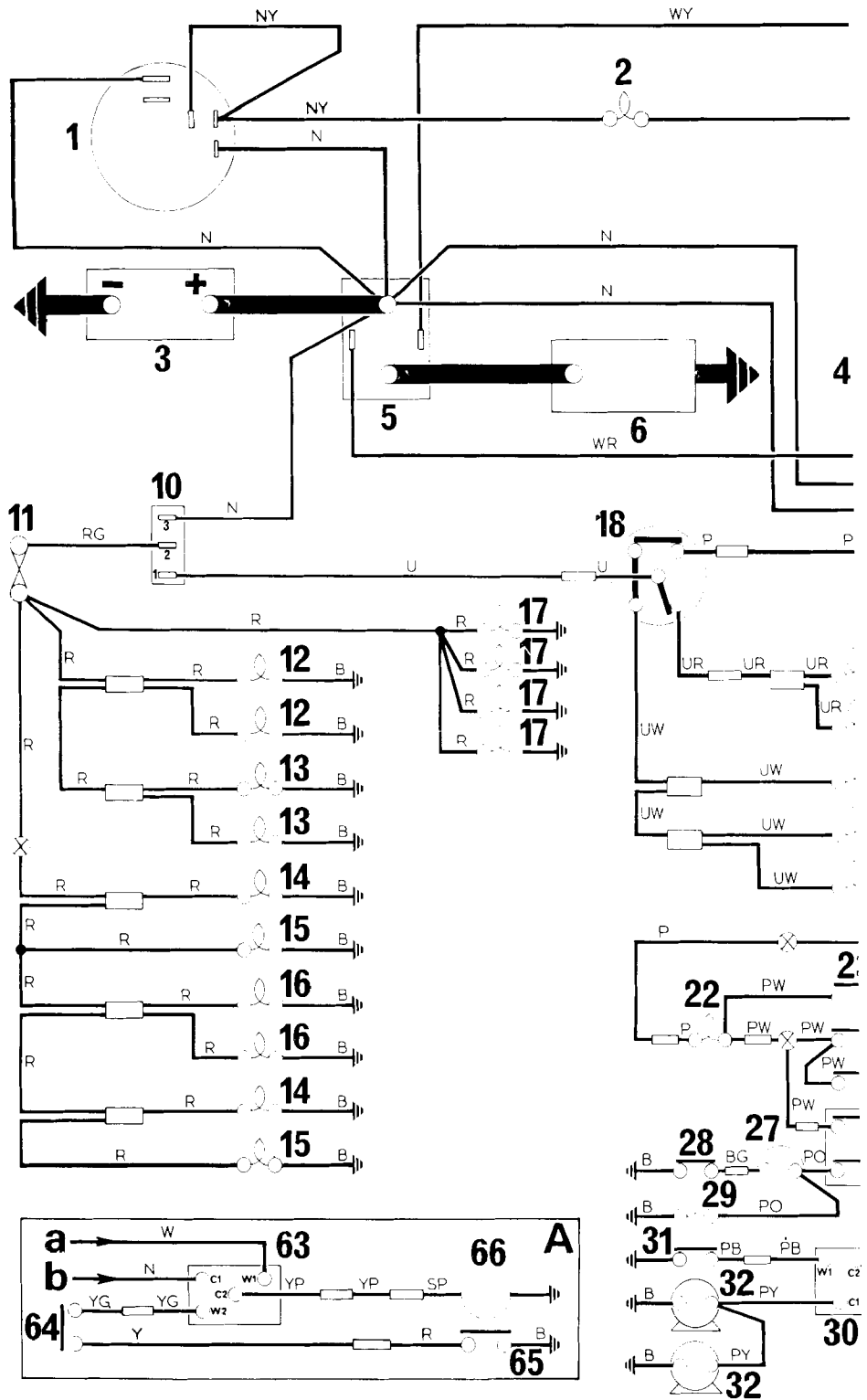
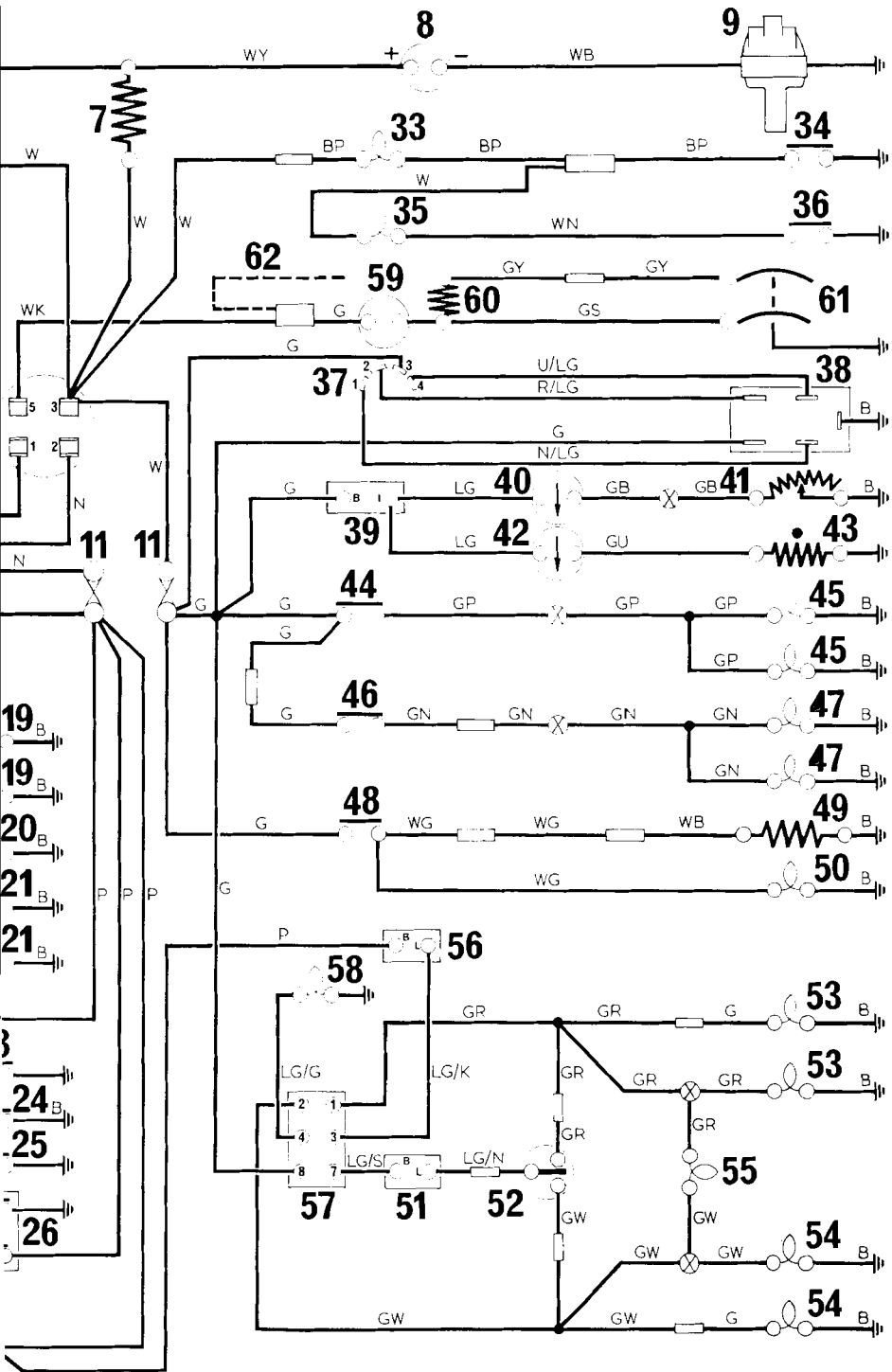


Fig. 3. Wiring diagram—GT6 Mk. 3.—Left hand steer commission



L369

in Nos. KE 1 to KE 20,000 and commission Nos. KG 1 and future

KEY TO WIRING DIAGRAM—GT6 MARK 3—LEFT HAND STEER
Commission Numbers KE 1 to KE 20,000 and Commission Numbers KG 1 and Future

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

- | | |
|----------------------------------|---|
| 1 Alternator | 34 Brake line failure switch |
| 2 Ignition warning light | 35 Oil pressure warning light |
| 3 Battery | 36 Oil pressure switch |
| 4 Ignition/starter switch | 37 Windscreen wiper switch |
| 5 Starter solenoid | 38 Windscreen wiper motor |
| 6 Starter motor | 39 Voltage stabilizer |
| 7 Ballast resistor | 40 Fuel indicator |
| 8 Ignition coil—6 volt | 41 Fuel tank unit |
| 9 Ignition distributor | 42 Temperature indicator |
| 10 Master light switch | 43 Temperature transmitter |
| 11 Fuse | 44 Stop lamp switch |
| 12 Front parking lamp | 45 Stop lamp |
| 13 Front marker lamp | 46 Reverse lamp switch |
| 14 Rear marker lamp | 47 Reverse lamp |
| 15 Tail lamp | 48 Heated backlight switch |
| 16 Plate illumination lamp | 49 Heated backlight |
| 17 Instrument illumination | 50 Heated backlight warning light |
| 18 Column light switch | 51 Turn signal flasher unit |
| 19 Dip beam | 52 Turn signal switch |
| 20 Main beam warning light | 53 L.H. flasher lamp |
| 21 Main beam | 54 R.H. flasher lamp |
| 22 Roof lamp | 55 Turn signal warning light |
| 23 Tailgate switch | 56 Hazard flasher unit |
| 24 Facia switch | 57 Hazard switch |
| 25 R.H. door switch | 58 Hazard warning light |
| 26 L.H. door switch | 59 Heated motor |
| 27 Key warning buzzer (USA only) | 60 Heater rheostat |
| 28 Key switch (USA only) | 61 Heater switch |
| 29 Key courtesy light | 62 Radio facility |
| 30 Horn relay | A Overdrive (optional extra). |
| 31 Horn push | 63 Overdrive relay |
| 32 Horn | 64 Overdrive gearbox switch |
| 33 Brake warning light | 65 Overdrive gear lever switch |
| | 66 Overdrive solenoid |
| | a From ignition/starter switch—terminal 3 |
| | b From ignition/starter switch—terminal 2 |

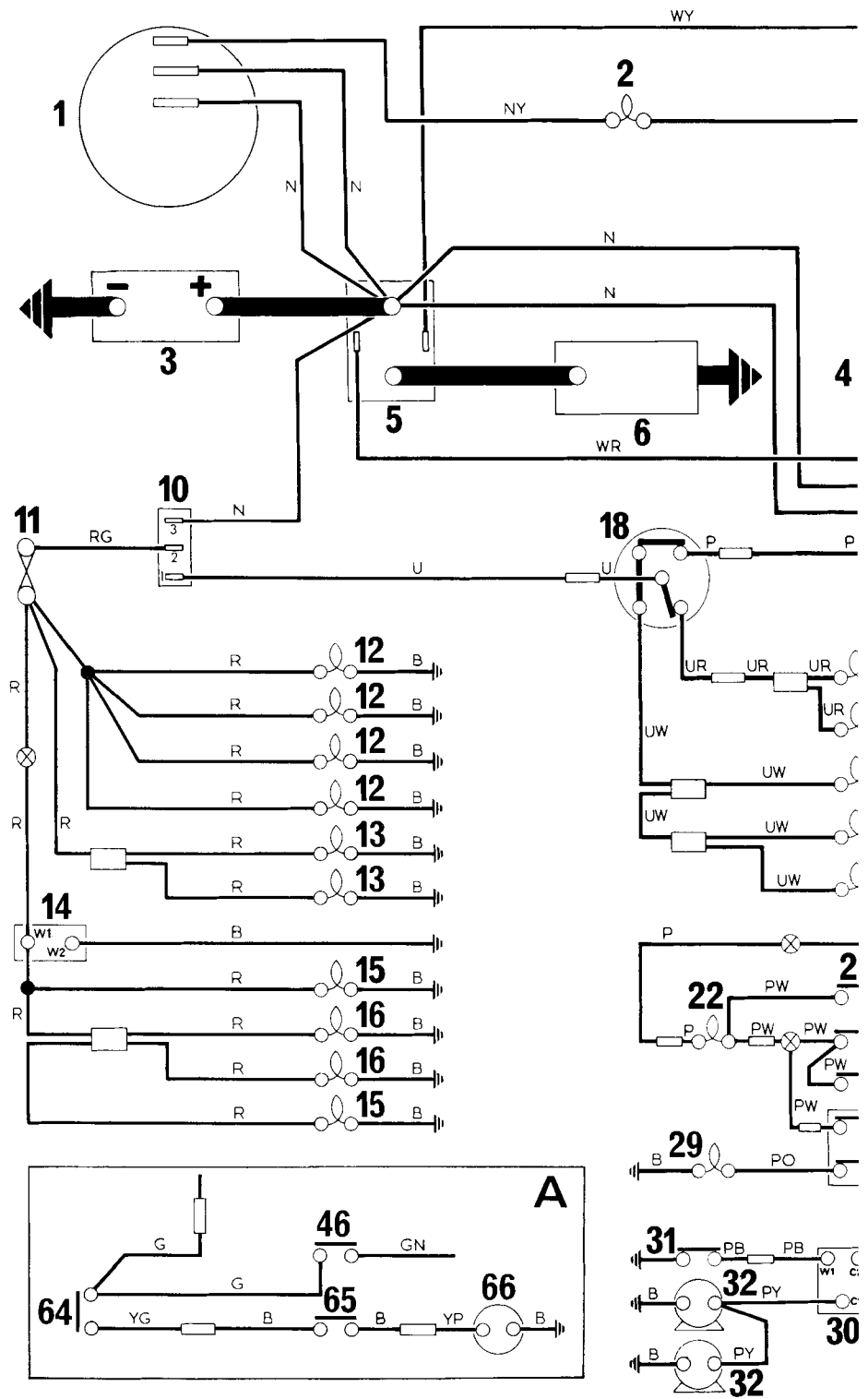
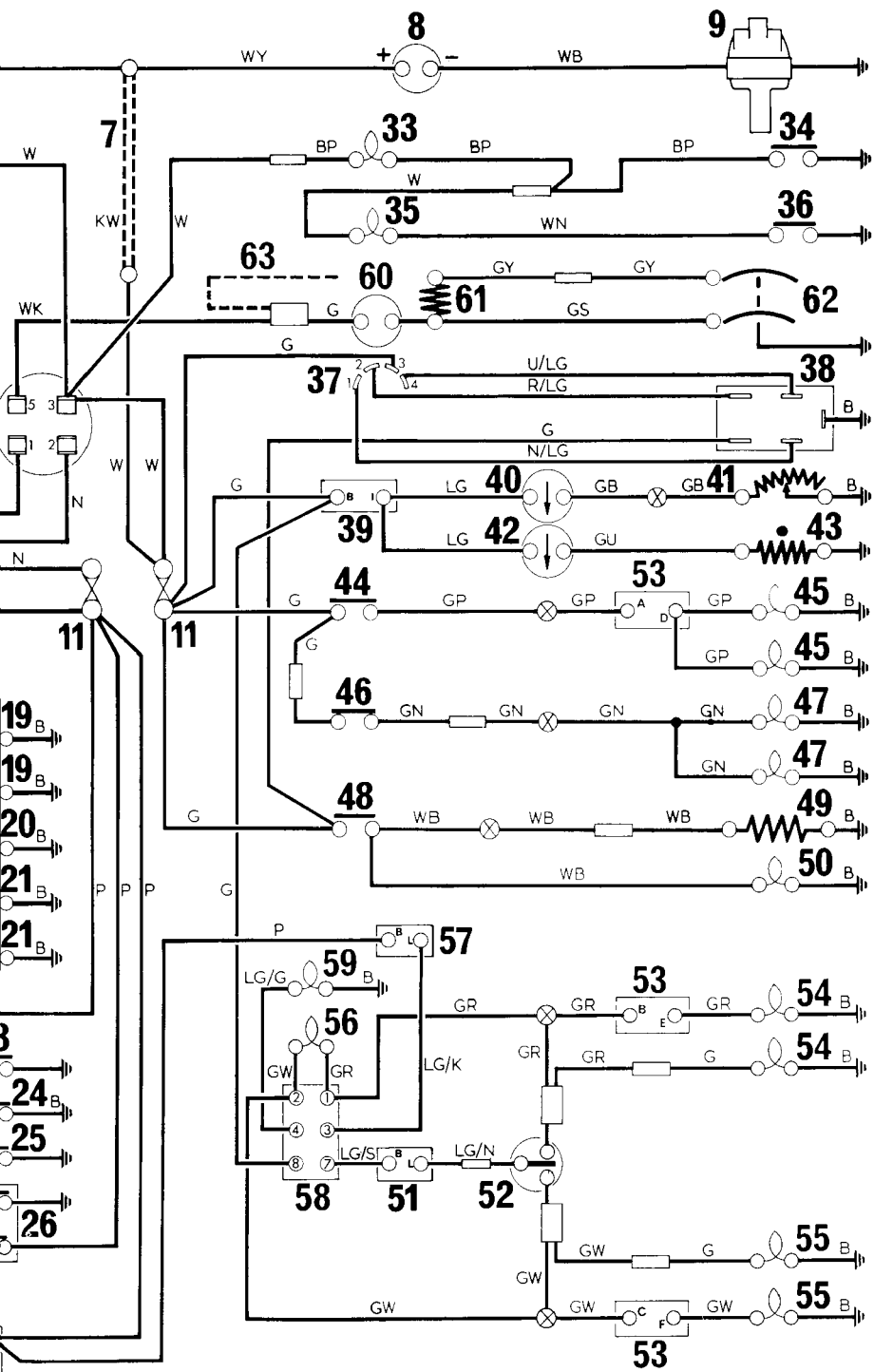


Fig. 4. Wiring diagram—GT6 Mk. 3—Left ha



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KEY TO WIRING DIAGRAM—GT6 MARK 3—LEFT HAND STEER
Commission Numbers KE 20,001 and Future

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

- | | |
|--------------------------------------|--|
| 1 Alternator | 34 Brake line failure switch (when fitted) |
| 2 Ignition warning light | 35 Oil pressure warning light |
| 3 Battery | 36 Oil pressure switch |
| 4 Ignition/starter switch | 37 Windscreen wiper switch |
| 5 Starter solenoid | 38 Windscreen wiper motor |
| 6 Starter motor | 39 Voltage stabilizer |
| 7 Ballast resistor wire | 40 Fuel indicator |
| 8 Ignition coil—6 volt | 41 Fuel tank unit |
| 9 Ignition distributor | 42 Temperature indicator |
| 10 Master light switch | 43 Temperature transmitter |
| 11 Fuse | 44 Stop lamp switch |
| 12 Instrument illumination | 45 Stop lamp |
| 13 Front parking lamp | 46 Reverse lamp switch |
| 14 Night dimming relay winding | 47 Reverse lamp |
| 15 Tail lamp | 48 Heated backlight switch |
| 16 Plate illumination lamp | 49 Heated backlight |
| | 50 Heated backlight warning light |
| | 51 Turn signal flasher unit |
| 18 Column light switch | 52 Turn signal switch |
| 19 Dip beam | 53 Night dimming relay contacts |
| 20 Main beam warning light | 54 L.H. flasher lamp |
| 21 Main beam | 55 R.H. flasher lamp |
| 22 Roof lamp | 56 Turn signal warning light |
| 23 Tailgate switch | 57 Hazard flasher unit |
| 24 Facia switch | 58 Hazard switch |
| 25 R.H. door switch | 59 Hazard warning light |
| 26 L.H. door switch | 60 Heater motor |
| | 61 Heater rheostat |
| | 62 Heater switch |
| | 63 Radio facility |
| 29 Key light | |
| 30 Horn relay | A Overdrive (optional extra) |
| 31 Horn push | 64 Overdrive gearbox switch |
| 32 Horn | 65 Overdrive gear lever switch |
| 33 Brake warning light (when fitted) | 66 Overdrive solenoid |

ALTERNATOR DATA CHART—EARLIER VEHICLES

CAUTION The alternator contains polarity sensitive components that may be irreparably damaged if subjected to incorrect polarity.

Do not connect or disconnect any part of the charging circuit—including the battery leads—while the engine is running. Run the alternator with all connections made or with the unit disconnected.

NOTE: Four Lucas alternators have been fitted to the GT6 Mark 3 model range up to October 1973. Identify the unit on the specific vehicle to ensure that information obtained from this manual refers to the appropriate alternator

Manufacturer Type	Lucas 15 ACR Battery sensed with small lugs		Lucas 15 ACR Machine sensed	
	Lucas Part No.	Stanpart No.	Lucas Part No.	Stanpart No.
Part numbers—	—	216970	—	217690
assembly	23562	215346	23634	217699
—comprising—	54217652	147990	54217652	147990
alternator	54218695	154334	54218695	154334
fan				
pulley				
Polarity	Negative earth only		Negative earth only	
Brush length—new	0.5 in (12.70 mm)		0.5 in (12.70 mm)	
—renew if less than	0.2 in (5.00 mm) protrudes from brushbox when free		0.2 in (5.00 mm) protrudes from brushbox when free	
Brush spring pressure	9 to 13 oz (255 to 370 g) at face flush with brushbox		9 to 13 oz (255 to 370 g) at face flush with brushbox	
Rectifier pack—output rectification	6 diodes (3 live side and 3 earth side)		6 diodes (3 live side and 3 earth side)	
—field winding supply rectification	3 diodes		3 diodes	
Stator windings	Three phase—star connected		Three phase—star connected	
Field winding rotor	12		12	
—poles	15,000 rev/min		15,000 rev/min	
—maximum permissible speed	$\frac{7}{8}$ in - 18 U.N.F.		$\frac{7}{8}$ in - U.N.F.	
—shaft thread	4.33 \pm 5% ohm		Hot	
Field winding resistance at 20°C	Hot		6000 rev/min	
Nominal output—condition	6000 rev/min		2450 rev/min	
—alternator speed	2450 rev/min		14 volt	
—engine speed	14 volt		28 amp	
—control voltage	28 amp			
—amp				

ALTERNATOR DATA CHART—LATER VEHICLES

Manufacturer Type	Lucas 15 ACR Machine sensed with large lugs		Lucas 16 ACR Battery sensed	
	Lucas Part No.	Stanpart No.	Lucas Part No.	Stanpart No.
Part numbers—				
assembly	—	217771	—	219267
—comprising—	23634	217772	23795	219268
alternator	54217652	147990	54217652	147990
fan	54218695	154334	54218695	154334
pulley				
Polarity	Negative earth only		Negative earth only	
Brush length—new	0.5 in (12.70 mm)		0.5 in (12.70 mm)	
—renew if less than	0.2 in (5.00 mm) protrudes from brushbox when free		0.2 in (5.00 mm) protrudes from brushbox when free	
Brush spring pressure	9 to 13 oz (255 to 370 g) at face flush with brushbox		9 to 13 oz (255 to 370 g) at face flush with brushbox	
Rectifier pack—output rectification	6 diodes (3 live side and 3 earth side)		6 diodes (3 live side and 3 earth side)	
—field winding supply rectification	3 diodes		3 diodes	
Stator windings	Three phase—star connected		Three phase—star connected	
Field winding rotor				
—poles	12		12	
—maximum permissible speed	15,000 rev/min		15,000 rev/min	
—shaft thread	$\frac{9}{16}$ in - 18 U.N.F.		$\frac{9}{16}$ in - 18 U.N.F.	
Field winding resistance at 20°C	4.33 \pm 5% ohm			
Nominal output—condition	Hot		Hot	
—alternator speed	6000 rev/min		6000 rev/min	
—engine speed	2450 rev/min		2450 rev/min	
—control voltage	14 volt		14 volt	
—amp	28 amp		34 amp	

FUSE ASSEMBLY

Data

Fuse

Manufacturer	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Lucas
Rating	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35 amp.
Lucas part No.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	188218
Stanpart No.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	58465
Lucas colour code	..	..	..	..	..	..	..	..	..	..	..	..	..	..	White
Current capacity	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17.5 amp.
Fusing current—Prolonged	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35 amp.
Instantaneous	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40 amp.

Circuits

The top fuse fed by a white cable from the ignition/starter switch protects the following circuits:

- Heated backlight circuit
- Turn signal flasher lamp circuit
- Fuel indication circuit
- Temperature indication circuit
- Stop lamp circuit
- Windscreen wiper circuit
- Reverse lamp circuit

The centre fuse fed by a red/green cable from the master light switch protects the following circuits:

- Tail lamp circuit
- Plate illumination lamp circuit
- Front parking lamp circuit
- Instrument illumination circuit

The bottom fuse fed by a brown cable from the battery protects the following circuits:

- Horn circuit
- Hazard warning circuit
- Headlamp flasher circuit
- Roof lamp circuit
- Courtesy light circuit

Description

The fuse assembly is a component of the main harness. It is secured to an aperture provided on the bulkhead by integral plastic clips. The unit contains three operational fuses and has provision to house two spare. The fuses are protected by a pull-off transparent plastic cover.

Failure of a particular fuse is indicated when all the circuits protected by it become inoperative. If a new fuse fails establish the cause and rectify the fault before fitting a second replacement.

IGNITION/STARTER SWITCH

Data

Manufacturer	.. .. .	Lucas
Stanpart No.	.. .. .	158459
Steering column lock assembly Stanpart No.	.. .. .	216449

Description

The ignition/starter switch is a four-terminal four-position rotary switch designed to control the ignition circuits, starter solenoid and some auxiliary circuits.

Service—No maintenance is required.

Removal ignition/starter switch

- 1 Isolate the battery.
- 2 Pull back the switch cover.
- 3 Withdraw the switch.
- 4 Disconnect the five Lucas connectors.

Installation ignition/starter switch

- 5 Reverse instructions 1 to 3. When inserting the switch into the steering column lock assembly, note the keyway and ensure that the lock shaft and switch are aligned for correct engagement.
- 6 Connect the wires as follows:
 - White/red to terminal 1
 - Brown to terminal 2
 - White to terminal 3
 - White/pink to terminal 5

Remove/install lock barrel.

Refer to page 6.122

Repair—Repair is by replacement.

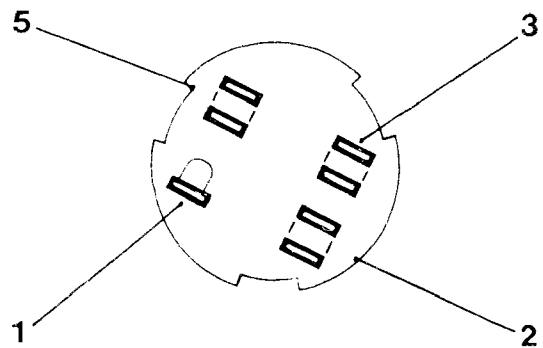


Fig. 5. Wiring for ignition/starter switch

Position 0	Off	No connections
Position 1	Auxiliary	2 to 5
Position 2	Ignition	2 to 5 to 3
Position 3	Start	2 to 3 to 1

STARTER SOLENOID

Data

Manufacturer	Lucas
Type	4ST
Lucas part No.	54334683
Stanpart No.	134174
Plunger pull in voltage	4-9 volts
Plunger release voltage	0-2.5 volts
Winding resistance	2.3-2.8 ohms

Description

The starter solenoid is normally solenoid operated by remote control from the ignition/starter switch.

Service—No maintenance is required.

Remove starter solenoid

- 1 Isolate the battery.
- 2 Note the four wire colour codes and positions.
- 3 Disconnect the four Lucar connectors.
- 4 Note the position of the battery lead and starter motor lead. This is important to ensure correct operation of the ballast resistor starter system.
- 5 Pull back the rubber protector.
- 6 Remove the two nuts and spring washers. Disconnect the battery lead and starter motor lead.
- 7 Note the position of the solenoid.
- 8 Remove the two screws, washers and spring washers, and lift the solenoid from the vehicle.

Install starter solenoid

- 9 Reverse 1 to 8. Ensure that the battery lead, starter motor lead and four Lucar connectors are positioned as shown. Ensure good electrical contact between the solenoid and the vehicle body.

Repair—Repair is by replacement.

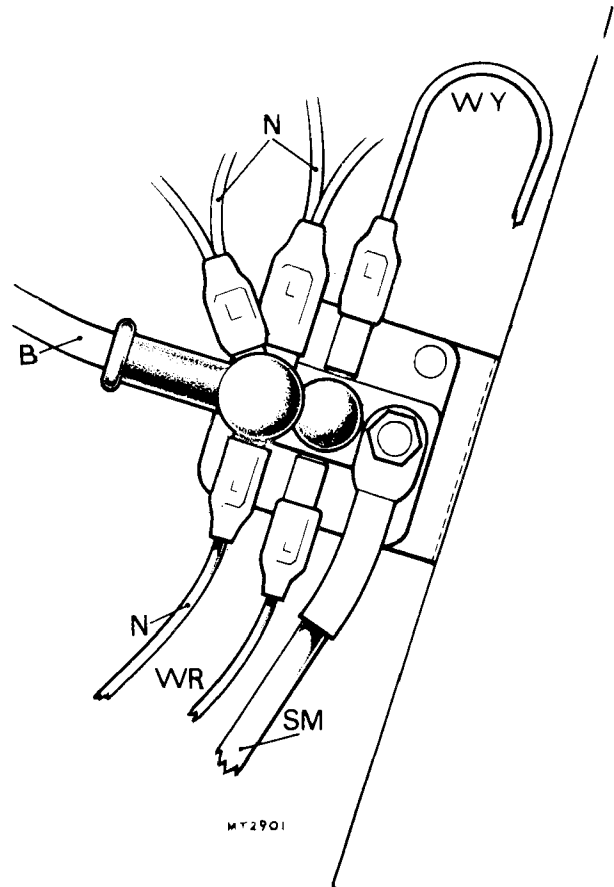


Fig. 6. Starter solenoid

- B Battery lead
- N Brown wire
- WY White/Yellow wire
- N Brown wire
- WR White/Red wire
- SM Starter motor lead

IGNITION COIL AND BALLAST RESISTOR

Ignition coil		Early	Later
Manufacturer	.. .. .	Lucas	Lucas
Type	.. .. .	16C6	15C6
Lucas part No.	.. .. .	45232	45243
Stanpart No.	.. .. .	154272	158830
Primary winding resistance	.. .. .	1.43 to 1.58 ohms	1.30 to 1.45 ohms
Ballast resistor unit—Early vehicles only			
Manufacturer	.. .. .	Lucas	
Type	.. .. .	3BR	
Lucas part No.	.. .. .	47170	
Stanpart No.	.. .. .	134176	
Resistance	.. .. .	1.3 to 1.4 ohms	
Ballast resistor wire—Later vehicles only			
Resistance	.. .. .	1.3 to 1.5 ohms	
Wire length	.. .. .	63 in. (160 cm.)	

Early vehicles only—

This system is designed to assist engine starting under adverse conditions. A ballast resistor is positioned in series in the normal supply to the ignition coil. This unit causes a voltage drop in the circuit so that the 12-volt supply from the ignition switch may be employed to power the nominally rated 6-volt ignition coil.

Later vehicles only—

This system is designed to assist engine starting under adverse conditions. A ballast resistor wire built into the harness between two crimped joints is electrically positioned in series in the normal supply to the ignition coil. This wire causes a voltage drop in the circuit so that the 12 volt supply from the ignition switch may be employed to power the nominally rated 6 volt ignition coil.

All vehicles—

During engine start the resistor is by-passed and the battery voltage (reduced from 12-volt by the starter motor load) is applied to the coil direct from the starter solenoid. This slight voltage overload provides an increased high tension voltage at the spark plugs.

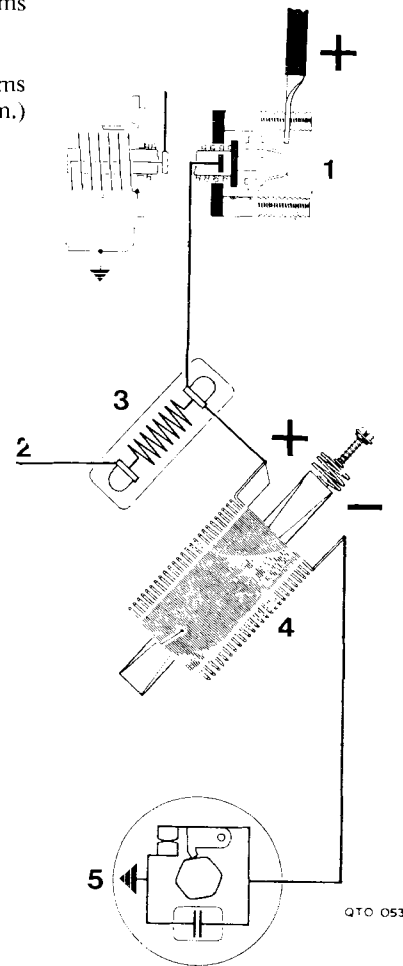


Fig. 7. Wiring diagram ignition coil and ballast resistor

- 1 Starter solenoid
- 2 Normal ignition supply
- 3 Ballast resistor unit—shown
or
Ballast resistor wire—not shown
- 4 Ignition coil—6 volt
- 5 Ignition distributor

IGNITION DISTRIBUTOR DATA
Up to Engine Number KE 10,000

Data											
Manufacturer	..	..	..	..	..	..	..	..	..	..	Delco Remy
Series	..	..	..	..	..	..	..	..	..	..	D200
Delco Remy Part No.	..	..	..	..	..	..	..	..	..	..	7953681
Stanpart No.	..	..	..	..	..	..	..	..	..	..	215511
Contact gap	..	..	..	..	..	..	..	..	..	..	0.015 in.
Rotation—viewed on rotor	..	..	..	..	..	..	..	..	..	..	Anticlockwise
Firing angles	..	..	..	..	..	..	..	..	..	..	60 degs.
Dwell angle	..	..	..	..	..	..	..	..	..	..	40-42 degrees
Open angle	..	..	..	..	..	..	..	..	..	..	18-20 degrees
Moving contact spring tension	..	..	..	..	..	..	..	..	..	..	17-21 oz.
Condenser capacity	..	..	..	..	..	..	..	..	..	..	0.18-0.23 microfarad
Engine firing order	..	..	..	..	..	..	..	..	..	..	1-5-3-6-2-4

Centrifugal Advance

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
200	0	0	400	0	0
800	3-5	5-5	1600	7	11
1200	7-0	9-0	2400	14	18
1600	8-0	10-5	3200	16	21
2200	10-0	12-0 max	4400	20	24 max

Vacuum Advance

Ins. of mercury vacuum	Degs. distributor advance		Degs. crankshaft advance	
	Minimum	Maximum	Minimum	Maximum
2	Advance commence			
4	0	2	0	4
8	3	5	6	10
13	7	9 max	14	18 max
20	7	9 max	14	18 max

IGNITION DISTRIBUTOR DATA
Enging Number KE 10,001 and Future

Data

Manufacturer	.. .. .	Delco Remy
Series	.. .. .	D204
Delco Remy part No.	.. .. .	7992127
Stanpart No.	.. .. .	218173
Contact gap	.. .. .	0.015in. to 0.017in.
Rotation—viewed on rotor	.. .. .	Anticlockwise
Firing angles	.. .. .	60 degrees
Dwell angle	.. .. .	38-40 degrees
Open angle	.. .. .	20-22 degrees
Moving contact spring tension	.. .. .	19-24 ozs.
Condenser capacity	.. .. .	0.18-0.23 microfarad
Engine firing order	.. .. .	1-5-3-6-2-4

Centrifugal advance

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
400	0	0	800	0	0
600	0.4	2.4	1200	0.8	4.8
1000	6.0	8.0	2000	12.0	16.0
1500	7.0	9.0	3000	14.0	18.0
2000	8.0	10.0	4000	16.0	20.0
2500	9.0	11.0	5000	18.0	22.0
2800	11.0 max.		5600	22.0 max	

Vacuum advance

Ins. of mercury vacuum	Degs. distributor advance		Degs. crankshaft advance	
	Minimum	Maximum	Minimum	Maximum
3.00	Advance commence			
5.00	0.50	2.50	1.0	5.0
7.00	3.50	5.50	7.0	11.0
8.00	5.00	7.00	10.0	14.0
20.00	7.00 max		14.0 max	

BULB CHART

Lamp	Watts	Lucas Part No.	Stanpart No.	
Headlamps—R.H. Dip—U.S.A.	50/40	54522231	—	*
France	45/40	411	510219	
Other R.H. Dip markets	60/50	54523079	215735	*
L.H. Dip	60/45	54521872	512231	*
Front parking lamps	5	207	57591	
Front flasher lamps	21	382	502379	
Front marker lamps	4	222	501436	
Rear marker lamps	4	222	501436	
Tail/stop lamps	5/21	380	502287	
Rear flasher lamps	21	382	502379	
Reverse lamp	21	382	502379	
Plate illumination lamp	5	207	57591	
Roof lamp	6	254	59897	
Instrument illumination	2.2	987	59492	
Key light	2.2	987	59492	
Warning lights	2.2	987	59492	

* Sealed beam light unit

HAZARD WARNING SYSTEM

Data

Hazard flasher unit---

Manufacturer	.. .. .	Lucas
Type	.. .. .	9FL
Lucas part No.	.. .. .	35053
Stanpart No.	.. .. .	154577
Nominal voltage	.. .. .	12 volts
Flashes per minute	.. .. .	60 to 120
Percentage on time—flasher lamps are on for this percentage of each flash cycle	.. .. .	60 to 75
Total bulb load	.. .. .	120 watts

HEATED BACKLIGHT

Data

Manufacturer	.. .. .	Triplex
Type	.. .. .	Hotline
Stanpart No.	.. .. .	722661/722662/722843/722844
Design operating LOAD	.. .. .	160-206 watts
Design operating resistance	.. .. .	0.70-0.90 ohms

HORN

Data

Horn relay		
Manufacturer	.. .. .	Lucas
Type	.. .. .	6RA
Lucas part No.	.. .. .	33188
Stanpart No.	.. .. .	137747
Winding connectors	.. .. .	C2 and W1
Contact connectors	.. .. .	C2 and C1
Contact	.. .. .	Single pole—normally open
Contact pull in voltage	.. .. .	4-9 volts
Contact release voltage	.. .. .	2-5 volts

Some vehicles may be fitted with an alternative horn relay manufactured by Clear Hooter.

WINDSCREEN WIPER MOTOR

CAUTION: THE WINDSCREEN WIPER MOTOR IS POLARITY SENSITIVE. REFER TO 'CAUTION' ON PAGE 6.303.

OBSERVE POLARITY WHEN PERFORMING ANY TESTING OF THE UNIT.

Motor:

Manufacturer	.. .. .	Lucas
Type	.. .. .	14W
Lucas part No: motor minus gear assembly	.. .. .	75664
gear assembly—normal	.. .. .	54702581
— U.S.A.	.. .. .	54702582
Stanpart No: motor minus gear assembly	.. .. .	517621
gear assembly	.. .. .	520101
Running current—after 60 seconds from cold with connecting rod removed:		
Normal speed	.. .. .	1.5 amp
High speed	.. .. .	2.0 amp.
Running speed—final gear after 60 seconds from cold with connecting rod removed:		
Normal speed	.. .. .	46 to 52 rev/min.
High speed	.. .. .	60 to 70 rev/min.
Armature end float	.. .. .	0.002 to 0.008 in. (0.05 to 0.20 mm.)
Brush length—new	.. .. .	0.250 in. (6 mm.)
renew if less than	.. .. .	0.125 in. (3 mm.)
		For high speed brush this is when narrow section is worn into full width section.
Brush spring pressure—when compressed so brush bottom is aligned with brushbox slot end	.. .. .	5 to 7 oz. (140 to 200 g.)
Maximum permissible force to move cable rack in tubing—arms and blades removed	.. .. .	6 lb. (3 kg.)

VOLTAGE STABILIZER

Data

Manufacturer	.. .. .	Smiths
Smiths part No.	.. .. .	BR1207 (0)
Stanpart No.	.. .. .	148876
Type	.. .. .	B-metal resistance
Average stabilized output voltage	.. .. .	10 volts

INTRODUCTION TO SECTION 6

Information contained in this section details electrical equipment specific to the GT6 Mk. 3 that was introduced in October 1970 for the North American market only and complies with U.S. Federal Standards.

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

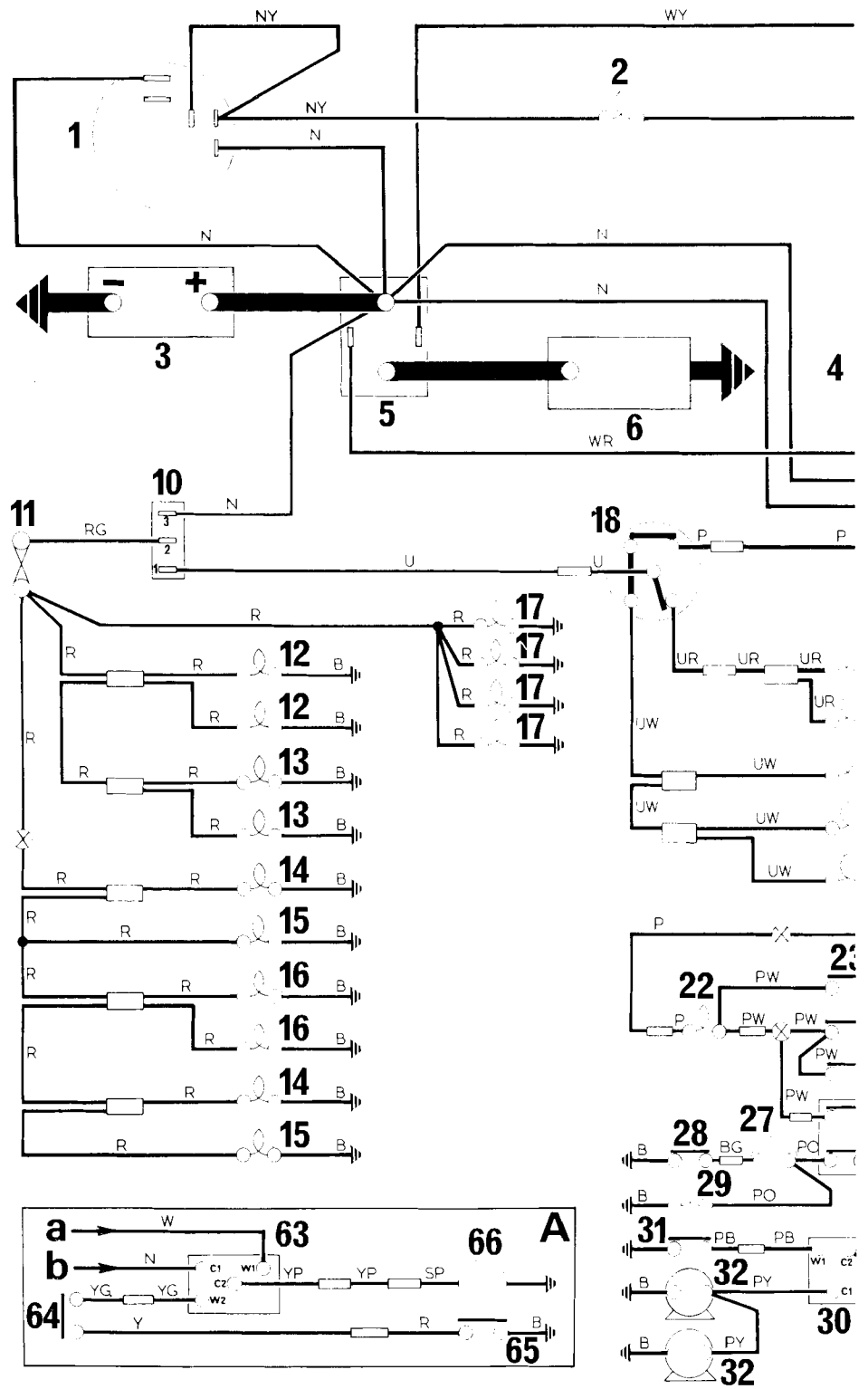
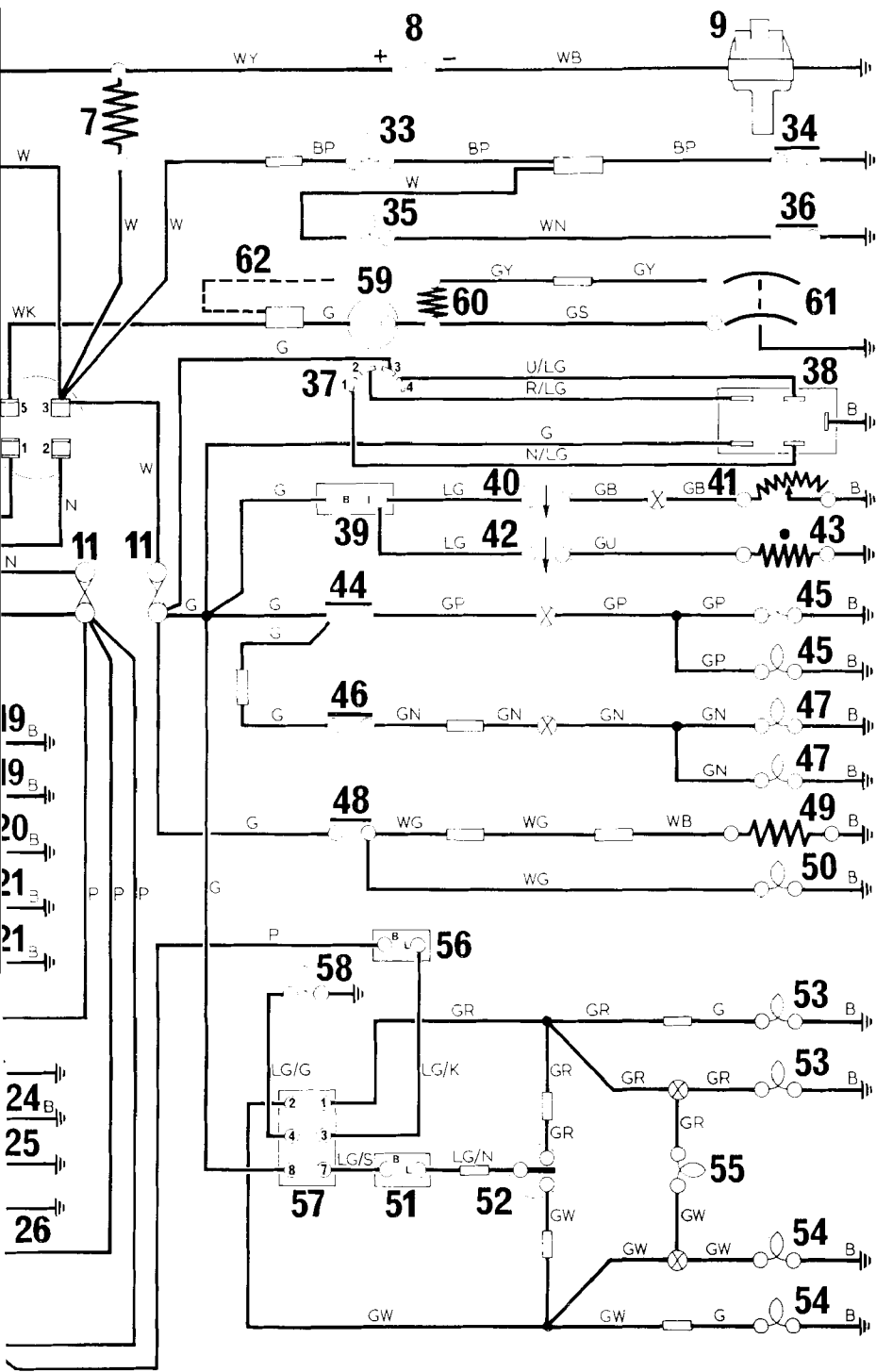


Fig. 1. Wiring diagram—GT6 Mk. 3.—U.S.A.



L369

KEY TO WIRING DIAGRAM—GT6 MARK 3—U.S.A. MARKET ONLY
Commission Numbers KF 1 to KF 11,389

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

- | | |
|-------------------------------|---|
| 1 Alternator | 37 Windscreen wiper switch |
| 2 Ignition warning light | 38 Windscreen wiper motor |
| 3 Battery | 39 Voltage stabilizer |
| 4 Ignition/starter switch | 40 Fuel indicator |
| 5 Starter solenoid | 41 Fuel tank unit |
| 6 Starter motor | 42 Temperature indicator |
| 7 Ballast resistor | 43 Temperature transmitter |
| 8 Ignition coil—6 volt | 44 Stop lamp switch |
| 9 Ignition distributor | 45 Stop lamp |
| 10 Master light switch | 46 Reverse lamp switch |
| 11 Fuse | 47 Reverse lamp |
| 12 Front parking lamp | 48 Heated backlight switch |
| 13 Front marker lamp | 49 Heated backlight |
| 14 Rear marker lamp | 50 Heated backlight warning light |
| 15 Tail lamp | 51 Turn signal flasher unit |
| 16 Plate illumination lamp | 52 Turn signal switch |
| 17 Instrument illumination | 53 L.H. flasher lamp |
| 18 Column light switch | 54 R.H. flasher lamp |
| 19 Dip beam | 55 Turn signal warning light |
| 20 Main beam warning light | 56 Hazard flasher unit |
| 21 Main beam | 57 Hazard switch |
| 22 Roof lamp | 58 Hazard warning light |
| 23 Tailgate switch | 59 Heater motor |
| 24 Facia switch | 60 Heater rheostat |
| 25 R.H. door switch | 61 Heater switch |
| 26 L.H. door switch | 62 Radio facility |
| 27 Key warning buzzer | |
| 28 Key switch | |
| 29 Key courtesy light | |
| 30 Horn relay | A Overdrive (optional extra) |
| 31 Horn push | 63 Overdrive relay |
| 32 Horn | 64 Overdrive gearbox switch |
| 33 Brake warning light | 65 Overdrive gear lever switch |
| 34 Brake line failure switch | 66 Overdrive solenoid |
| 35 Oil pressure warning light | a From ignition/starter switch—terminal 3 |
| 36 Oil pressure switch | b From ignition/starter switch—terminal 2 |

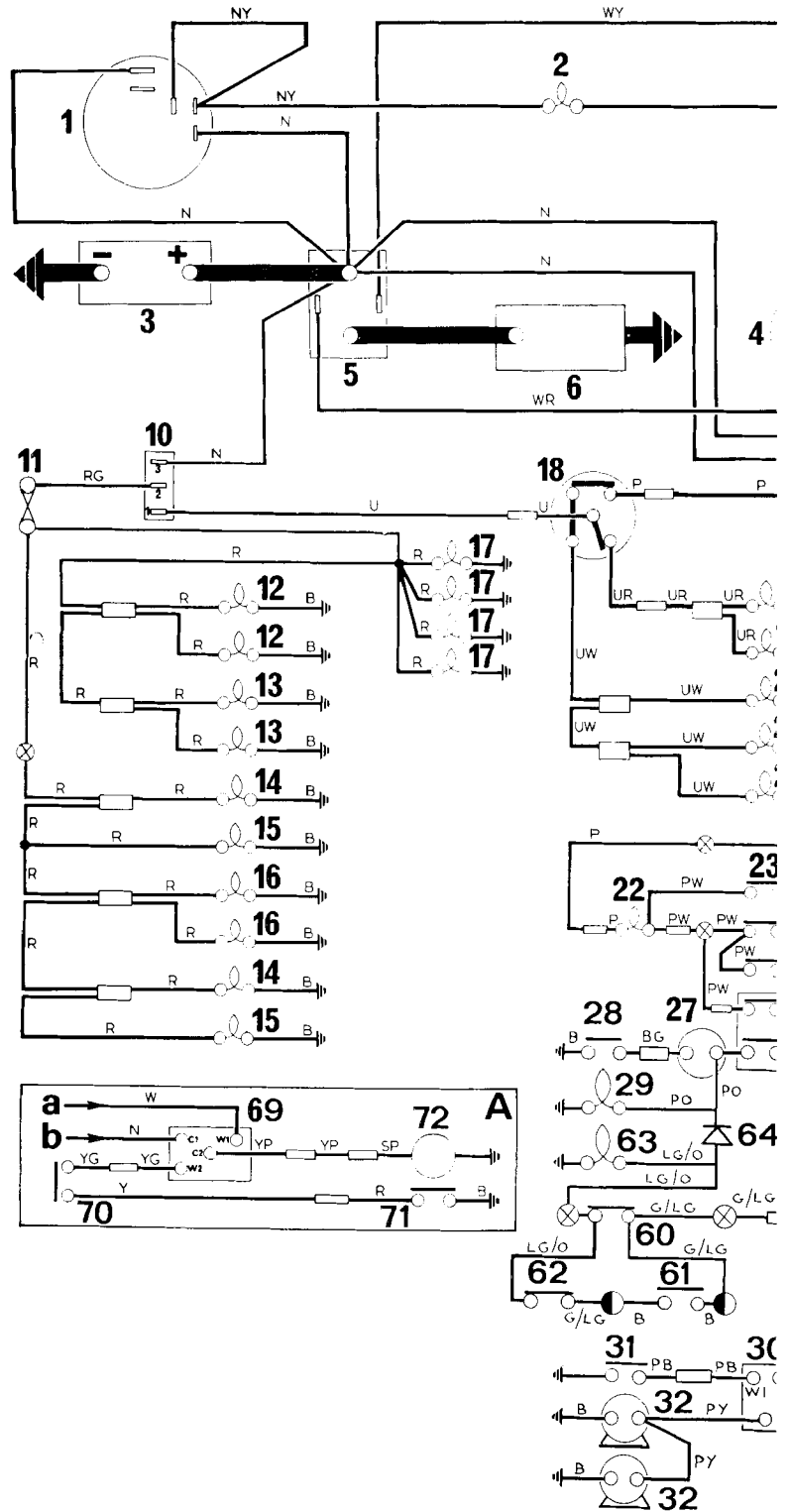
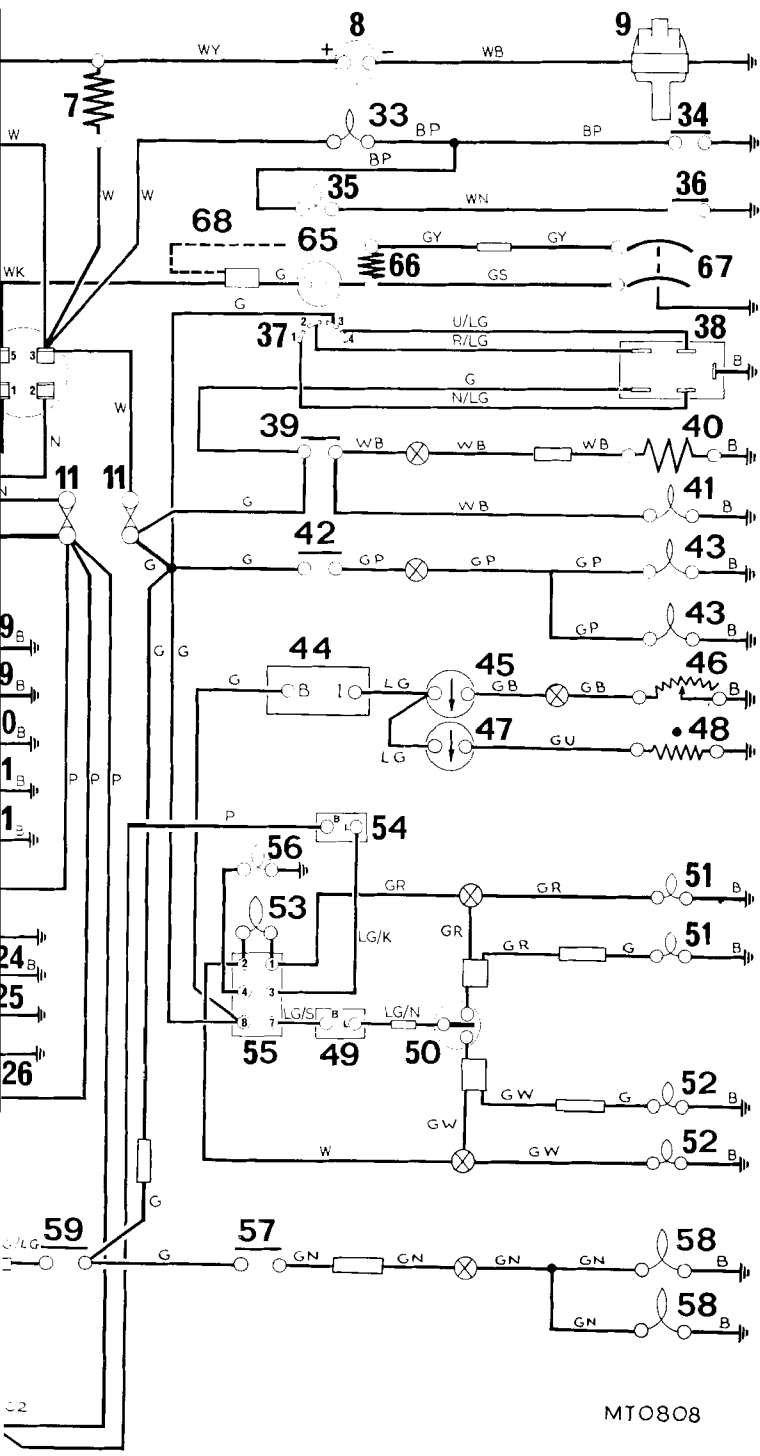


Fig. 2. Wiring diagram—GT6 Mk. 3.—U.S.A. m



Market only commission Nos. KE 11390 to KF 20,000

WIRING DIAGRAM—GT6 MARK 3—U.S.A. MARKET ONLY
Commission Numbers KF 11,390 to KF 20,000

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

- | | |
|-------------------------------|---|
| 1 Alternator | 39 Heated backlight switch |
| 2 Ignition warning light | 40 Heated backlight |
| 3 Battery | 41 Heated backlight warning light |
| 4 Ignition/starter switch | 42 Stop lamp switch |
| 5 Starter solenoid | 43 Stop lamp |
| 6 Starter motor | 44 Voltage stabilizer |
| 7 Ballast resistor | 45 Fuel indicator |
| 8 Ignition coil—6 volt | 46 Fuel tank unit |
| 9 Ignition distributor | 47 Temperature indicator |
| 10 Master light switch | 48 Temperature transmitter |
| 11 Fuse | 49 Turn signal flasher unit |
| 12 Front parking lamp | 50 Turn signal switch |
| 13 Front marker lamp | 51 L.H. flasher lamp |
| 14 Rear marker lamp | 52 R.H. flasher lamp |
| 15 Tail lamp | 53 Turn signal warning light |
| 16 Plate illumination lamp | 54 Hazard flasher unit |
| 17 Instrument illumination | 55 Hazard switch |
| 18 Column light switch | 56 Hazard warning light |
| 19 Dip beam | 57 Reverse lamp switch |
| 20 Main beam warning light | 58 Reverse lamp |
| 21 Main beam | 59 Seat belt gearbox switch |
| 22 Roof lamp | 60 Driver's belt switch |
| 23 Tailgate switch | 61 Passenger's seat switch |
| 24 Facia switch | 62 Passenger's belt switch |
| 25 R.H. door switch | 63 Seat belt warning light |
| 26 L.H. door switch | 64 Diode |
| 27 Key warning buzzer | 65 Heater motor |
| 28 Key switch | 66 Heater rheostat |
| 29 Key light | 67 Heater switch |
| 30 Horn relay | 68 Radio facility |
| 31 Horn push | |
| 32 Horn | A Overdrive (optional extra) |
| 33 Brake warning light | 69 Overdrive relay |
| 34 Brake line failure switch | 70 Overdrive gearbox switch |
| 35 Oil pressure warning light | 71 Overdrive gear lever switch |
| 36 Oil pressure switch | 72 Overdrive solenoid |
| 37 Windscreen wiper switch | a From ignition/starter switch—terminal 3 |
| 38 Windscreen wiper motor | b From ignition/starter switch—terminal 2 |

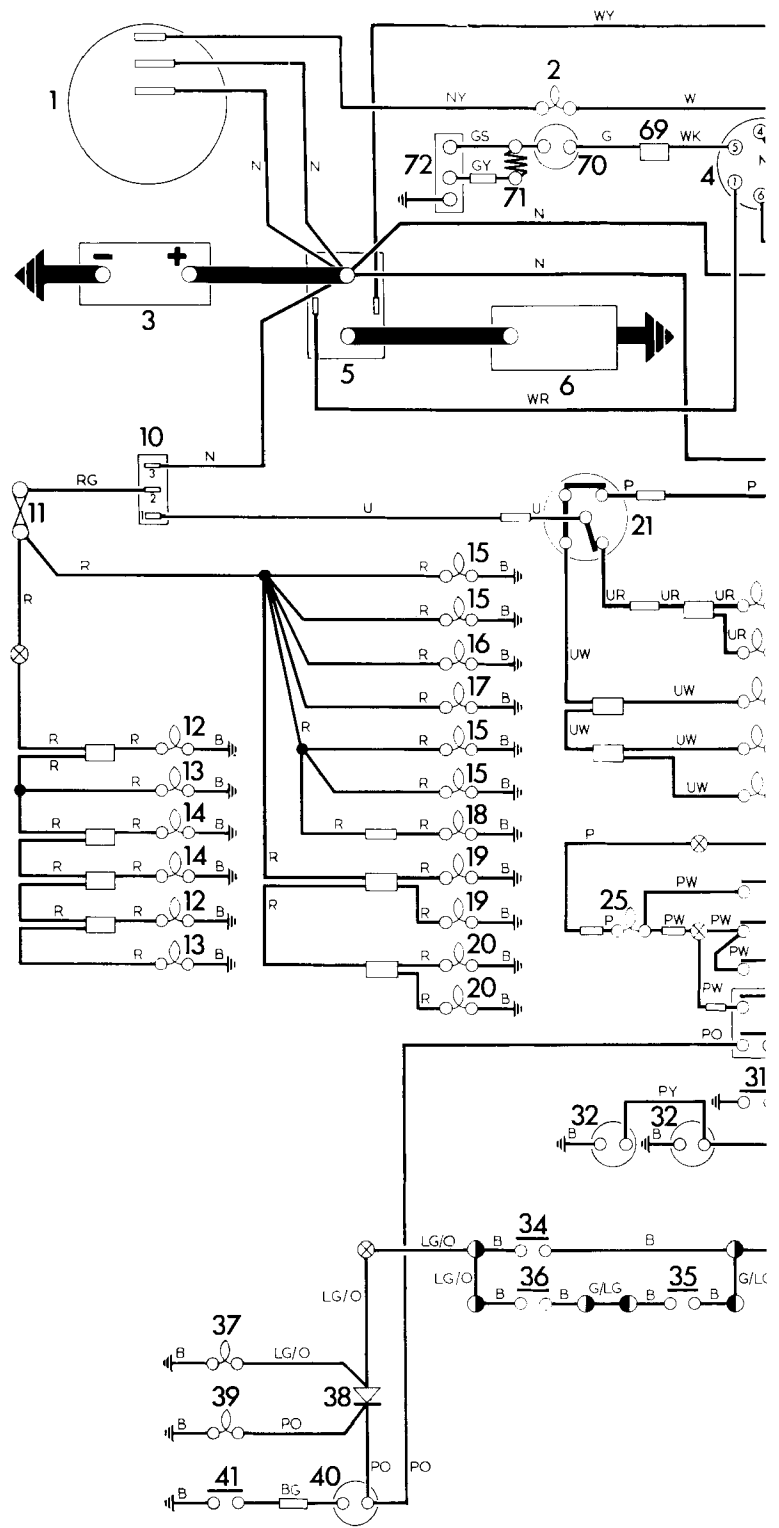
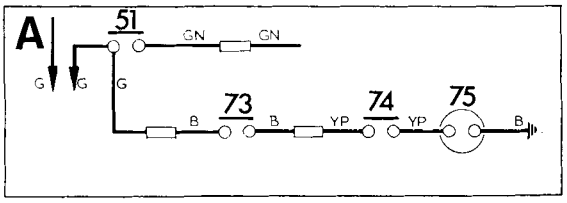
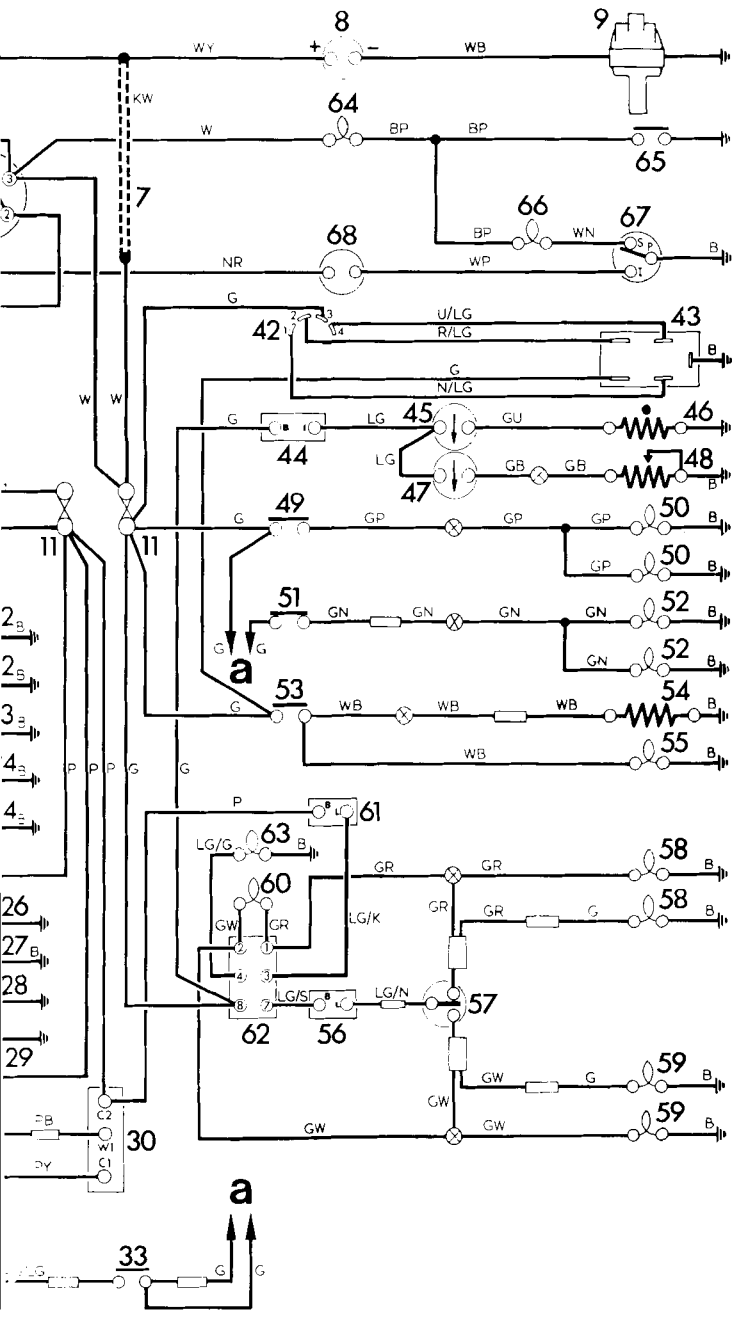


Fig. 3. Wiring diagram—GT6 Mk. 3—U.S.A. model



PTO576

ket only commission Nos. KF 20,001 and future

KEY TO WIRING DIAGRAM—GT6 MARK 3—U.S.A. MARKET ONLY
Commission Numbers KF 20,001 and Future

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

THE ALTERNATOR—AND POSSIBLY SOME ACCESSORIES—CONTAIN POLARITY SENSITIVE COMPONENTS THAT MAY BE IRREPARABLY DAMAGED IF SUBJECTED TO INCORRECT POLARITY.

1 Alternator	40 Buzzer
2 Ignition warning light	41 Key switch
3 Battery	42 Windscreen wiper switch
4 Ignition/starter switch	43 Windscreen wiper motor
5 Starter solenoid	44 Voltage stabilizer
6 Starter motor	45 Temperature indicator
7 Ballast resistor wire	46 Temperature transmitter
8 Ignition coil—6 volt	47 Fuel indicator
9 Ignition distributor	48 Fuel tank unit
10 Master light switch	49 Stop lamp switch
11 Fuse	50 Stop lamp
12 Rear marker lamp	51 Reverse lamp switch
13 Tail lamp	52 Reverse lamp
14 Plate illumination lamp	53 Heated backlight switch
15 Instrument illumination	54 Heated backlight
16 Hazard switch identification light	55 Heated backlight warning light
17 Wipe/wash switch identification light	56 Turn signal flasher unit
18 Heater control identification light	57 Turn signal switch
19 Front parking lamp	58 L.H. flasher lamp
20 Front marker lamp	59 R.H. flasher lamp
21 Column light switch	60 Turn signal warning light
22 Dip beam	61 Hazard flasher unit
23 Main beam warning light	62 Hazard switch
24 Main beam	63 Hazard warning light
25 Roof lamp	64 Brake warning light
26 Tailgate switch	65 Brake line failure switch
27 Facia switch	66 Oil pressure warning light
28 R.H. door switch	67 Oil pressure switch
29 L.H. door switch	68 Anti run on valve
30 Horn relay	69 Radio facility
31 Horn push	70 Heater motor
32 Horn	71 Heater rheostat
33 Belt warning gearbox switch	72 Heater switch
34 Drivers belt switch	
35 Passengers seat switch	
36 Passengers belt switch	A Overdrive (optional extra)
37 Fasten belts warning light	73 Overdrive gearlever switch
38 Diode	74 Overdrive gearbox switch
39 Key light	75 Overdrive solenoid

FUSE ASSEMBLY

Data

Fuse

Manufacturer	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Lucas
Rating	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35amp.
Lucas part No.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	188218
Stanpart No.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	58465
Lucas colour code	..	..	..	..	..	..	..	..	..	..	..	..	..	..	White
Current capacity	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17.5amp.
Fusing current—Prolonged	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35amp.
Instantaneous	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40amp.

Circuits

The top fuse fed by a white cable from the ignition/starter switch protects the following circuits:

- Heated backlight circuit
- Turn signal flasher lamp circuit
- Fuel indication circuit
- Temperature indication circuit
- Stop lamp circuit
- Windscreen wiper circuit
- Reverse lamp circuit

The centre fuse fed by a red/green cable from the master light switch protects the following circuits:

- Tail lamp circuit
- Plate illumination lamp circuit
- Front parking lamp circuit
- Front marker lamp circuit
- Rear marker lamp circuit
- Instrument illumination circuit

The bottom fuse fed by a brown cable from the battery protects the following circuits:

- Horn circuit
- Hazard warning circuit
- Headlamp flasher circuit
- Roof lamp circuit
- Key warning lamp circuit
- Courtesy light circuit

Description

The fuse assembly is a component of the main harness. It is secured to an aperture provided on the bulkhead by integral plastic clips. The unit contains three operational fuses and has provision to house two spare. The fuses are protected by a pull-off transparent plastic cover.

Failure of a particular fuse is indicated when all the circuits protected by it become inoperative. If a new fuse fails establish the cause and rectify the fault before fitting a second replacement.

IGNITION/STARTER SWITCH

Data	Up to Commission No. KF20,001	Commission No. KF20,001 and Future
Manufacturer	Lucas	Lucas
Type	157SA	157SA
Lucas part No.	35856	30364
Stanpart No.	158459	158238

Description

The ignition/starter switch is a four-terminal four-position rotary switch designed to control the ignition circuits, starter solenoid and some auxiliary circuits.

Service—No maintenance is required.

Removal/installation ignition/starter switch

Refer to Page 6.513.

Removal/installation lock barrel

Refer to Page 6.122,
and to Wiring diagrams for switch connection.

Repair—Repair is by replacement.

IGNITION DISTRIBUTOR DATA
Up to Engine Number KF 10,000

Data

Manufacturer	.. .. .	Delco Remy
Series	.. .. .	D204
Delco Remy part No.	.. .. .	7953945
Stanpart No.	.. .. .	311 810
Contact gap	.. .. .	0.015in.-0.017in.
Rotation—viewed on rotor	.. .. .	Anti-clockwise
Firing angles	.. .. .	60 ± 1 degrees
Dwell angle	.. .. .	38-40 degrees
Open angle	.. .. .	20-22 degrees
Moving contact spring tension	.. .. .	19-24ozs.
Condenser capacity	.. .. .	0.18-0.23 microfarads
Engine firing order	.. .. .	1-5-3-6-2-4

Centrifugal advance

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
500	0	1.33	1000	0	2.66
700	1.93	4.87	1400	3.86	9.74
875	4.64	8.00	1750	9.28	16.00
950	5.80	8.28	1900	11.60	16.56
1800	9.20	11.41	3600	18.40	22.82
2500	12.00	14.00 max	5000	24.00	28.00 max

Retard unit

Ins. of mercury vacuum	Degs. distributor retard		Degs. crankshaft retard	
	Minimum	Maximum	Minimum	Maximum
5.0	Retard commences			
9.0	2.5	0.0	5.0	0.0
12.5	6.0	2.5	12.0	5.0
14.5	6.0	4.0	12.0	8.0
16.0	6.0 max		12.0 max	

IGNITION DISTRIBUTOR DATA
Engine Number KF10.001 and Future

Data

Manufacturer	.. .. .	Delco Remy
Series	.. .. .	D204
Delco Remy part No.	.. .. .	7992101
Stanpart No.	.. .. .	312232
Contact gap	.. .. .	0.015-0.017in.
Rotation—viewed on rotor	.. .. .	Anticlockwise
Firing angles	.. .. .	60±1 degrees
Dwell angle	.. .. .	38-40 degrees
Open angle	.. .. .	20-22 degrees
Moving contact spring tension	.. .. .	19-24ozs.
Condenser capacity	.. .. .	0.18-0.23 microfarad
Engine firing order	.. .. .	1-5-3-6-2-4

Centrifugal advance

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
400	0	0	800	0	0
600	0	2.00	1200	0	4.0
900	2.80	4.80	1800	5.6	9.6
1200	5.65	7.65	2400	11.3	15.3
1500	8.50	10.50	3000	17.0	21.0
2500	10.50 max		5000	21.0 max	

Retard unit

Ins. of mercury vacuum	Degs. distributor retard		Degs. crankshaft retard	
	Minimum	Maximum	Minimum	Maximum
3.00	Retard commences			
5.00	0.0	2.3	0.0	4.6
11.00	7.0	9.0	14.0	18.0
20.00	9.0 max		18.0 max	

SEAT BELT WARNING SYSTEM

The purpose of this system, fitted to U.S.A. Market cars only, is to discourage the use of the car without the seat belt in operation. The system is supplied with power from the output terminal of the ignition switch.

From Fig. 4 below it can be seen that a light (5) on the facia will illuminate and a buzzer (8) will sound if the ignition switch is turned on and a gear selected without the driver's seat belt switch (2) being actuated through use of the seat belt.

If a front seat passenger is present a pressure switch (3) in the passenger's seat is closed causing the facia light and buzzer to operate unless the passenger seat belt switch (4) is actuated through use of the seat belt.

The door switch (7), key switch (9) and key light (10) are shown on the diagram to illustrate the relationship between the Key Warning System and the Seat Belt Warning System. (In the Key Warning System a buzzer sounds if the ignition key is left in the ignition lock and the driver's door is opened). The diode (6) allows one buzzer unit to be used for both Key and Seat Belt Warning Systems.

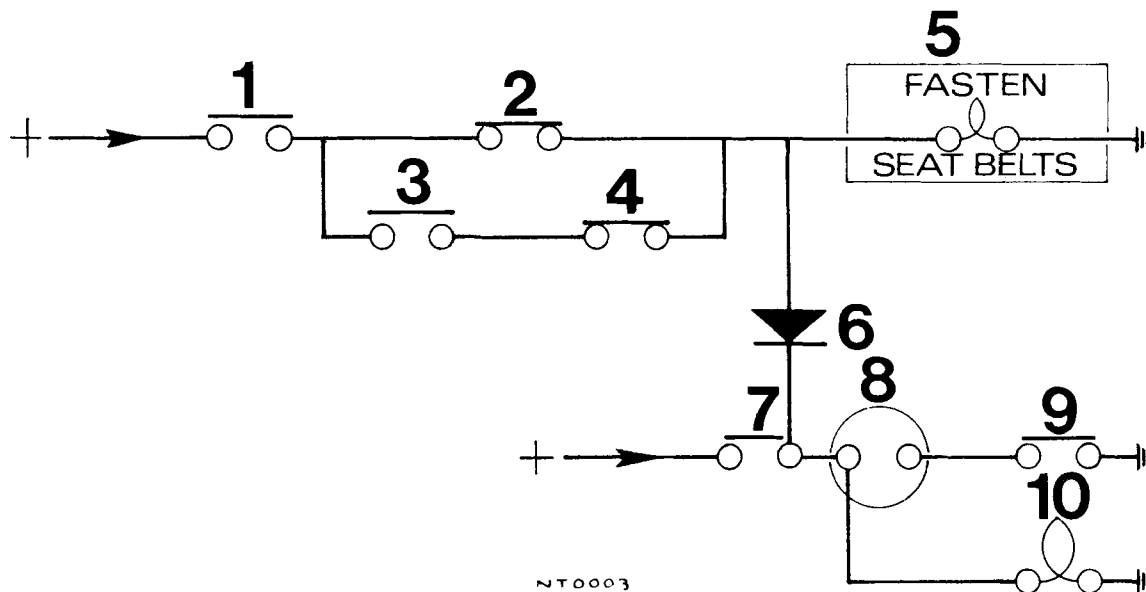


Fig. 4. Schematic Wiring Diagram—Seat Belt Warning Device—U.S.A. Markets

Key

- | | |
|---------------------------|------------------------|
| 1 Gearbox switch | 6 Diode |
| 2 Driver's belt switch | 7 Driver's door switch |
| 3 Passenger's seat switch | 8 Buzzer |
| 4 Passenger's belt switch | 9 Key switch |
| 5 Facia warning light | 10 Key light |

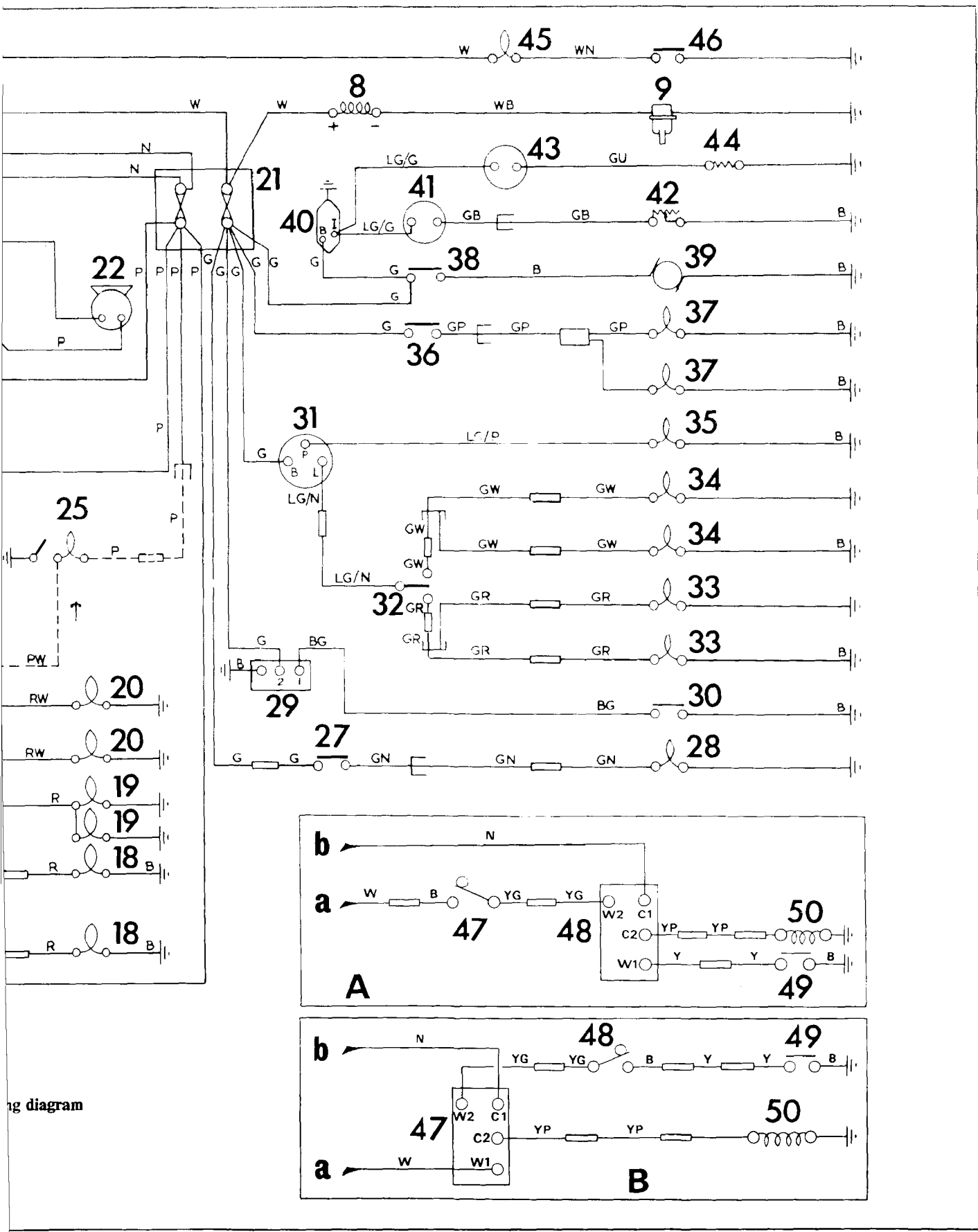
INTRODUCTION TO VEHICLE ELECTRICAL SYSTEM

The information contained in this section is for electrical system components only. For more information on the full contents of the Electrical System, refer to the Electrical System section on page 610 of the Owner's Manual. For more information refer to page 610 of the Owner's Manual.

CAUTION: THIS VEHICLE IS EQUIPPED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY POSITIVE LEAD IS ALWAYS CONNECTED TO THE BATTERY POSITIVE TERMINAL AND THE BATTERY NEGATIVE TERMINAL.

EXERCISE CARE WHEN CONNECTING INTO CIRCUIT ANY ACCESSORY THAT MAY CONTAIN SILICON DIODES OR TRANSISTORS. IRREPARABLE DAMAGE MAY RESULT TO SUCH POLARITY SENSITIVE COMPONENTS IF INCORRECTLY FITTED.

NOTE: No polarity sensitive components are fitted to the vehicle during production. However, any of the following accessories –approved or unapproved by Leyland Triumph—may contain such components. Alternator systems, Automatic anti-dazzle mirrors, Automatic dipping systems, Automatic parking lamp systems, Electronic ignition systems, Electronic tachometers and Radios.



ing diagram

Key to Fig. 1

WIRING DIAGRAM

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

EXERCISE CARE WHEN CONNECTING INTO CIRCUIT ANY ACCESSORY THAT MAY CONTAIN SILICON DIODES OR TRANSISTORS. IRREPARABLE DAMAGE MAY RESULT TO SUCH POLARITY SENSITIVE COMPONENTS IF INCORRECTLY FITTED.

- | | |
|--|--|
| 1 Generator | 40 Voltage stabilizer |
| 2 Control box | 41 Fuel indicator |
| 3 Ignition warning light | 42 Fuel tank unit |
| 4 Battery | 43 Temperature indicator |
| 5 Ignition/starter switch | 44 Temperature transmitter |
| 5A Ignition/starter switch—radio supply position | 45 Oil pressure warning light |
| 6 Starter solenoid | 46 Oil pressure switch |
| 7 Starter motor | |
| 8 Ignition coil | A. Overdrive (optional extra)—Early vehicles built before approximately April '67 only— |
| 9 Ignition distributor | 47 Overdrive column switch |
| 10 Master light switch | 48 Overdrive relay |
| 11 Column light switch | 49 Overdrive gearbox switch |
| 12 Main beam warning light | 50 Overdrive solenoid |
| 13 Main beam—outer | (a) From fuse box |
| 14 Main beam—inner | (b) From ignition/starter switch—connector 1 |
| 15 Dip beam | |
| 16 Line fuse | B. Overdrive (optional extra)—Vehicles built after approximately April '67 only— |
| 17 Front parking lamp | 47 Overdrive relay |
| 18 Tail lamp | 48 Overdrive column switch |
| 19 Plate illumination lamp | 49 Overdrive gearbox switch |
| 20 Instrument illumination | 50 Overdrive solenoid |
| 21 Fuse box | (a) From fuse box |
| 22 Horn | (b) From ignition/starter switch—connector 1 |
| 23 Horn push | |
| 24 Facia lamp | |
| 25 Roof lamp (Saloon only) | |
| 26 Door switch | |
| 27 Reverse lamp switch | |
| 28 Reverse lamp | |
| 29 Windscreen wiper motor | |
| 30 Windscreen wiper switch | |
| 31 Flasher unit | |
| 32 Flasher switch | |
| 33 L.H. Flasher lamp | |
| 34 R.H. Flasher lamp | |
| 35 Flasher warning light | |
| 36 Stop lamp switch | |
| 37 Stop lamp | |
| 38 Heater switch | |
| 39 Heater motor | |

NOTE: On convertible no roof lamp is fitted—door switches (26) control facia lamp (24). PW wire shown dotted and indicated * is fitted on convertible only. On saloon door switches (26) control roof lamp (25). P and PW wires shown dotted and indicated † are fitted on saloon only.

COLOUR CODE

N. Brown	L/G Light Green
U. Blue	W. White
R. Red	Y. Yellow
P. Purple	S. Slate
G. Green	B. Black

FUSE BOX AND LINE FUSE

Data

Fuse box—fuse

Manufacturer	..	..	..	..	..	..	..	..	Lucas
Rating	..	..	..	..	..	..	..	..	35 amp.
Lucas part No.	..	..	..	..	..	..	..	..	188218
Stanpart No.	..	..	..	..	..	..	..	..	58465
Lucas colour code	..	..	..	..	..	..	..	..	White
Current capacity	..	..	..	..	..	..	..	..	17.5 amp.
Fusing current—Prolonged	..	..	..	..	..	..	..	..	35 amp.
Instantaneous	..	..	..	..	..	..	..	..	40 amp.

Line fuse—fuse

Manufacturer	..	..	..	..	..	..	..	..	Lucas
Rating	..	..	..	..	..	..	..	..	25 amp.
Lucas part No.	..	..	..	..	..	..	..	..	188216
Stanpart No.	..	..	..	..	..	..	..	..	503488
Lucas colour code	..	..	..	..	..	..	..	..	Pink
Current capacity	..	..	..	..	..	..	..	..	12.5 amp.
Fusing current—Prolonged	..	..	..	..	..	..	..	..	25 amp.
Instantaneous	..	..	..	..	..	..	..	..	30 amp.

CIRCUITS

Fuse box

The fuse fed by a brown cable from the battery protects the following circuits:

- Main beam flasher circuit
- Roof lamp circuit
- Facia lamp circuit
- Horn circuit

The fuse fed by a white cable from the ignition/starter switch protects the following circuits:

- Flasher lamp circuit
- Stop lamp circuit
- Reverse lamp circuit
- Heater circuit
- Windscreen wiper circuit
- Fuel indication circuit
- Temperature indication circuit

Line fuse

The fuse fed by a brown/red cable from the master light switch protects the following circuits:

- Front parking lamp circuit
- Tail lamp circuit
- Plate illumination lamp circuit

FUSE BOX

Description

The fuse box is mounted on the bulkhead. The unit contains two operational fuses and has provision to house two spares. The fuses are protected by a pull-off cover.

Failure of a particular fuse is indicated when all the circuits protected by it become inoperative. If a new fuse fails establish the cause and rectify the fault before fitting a second replacement.

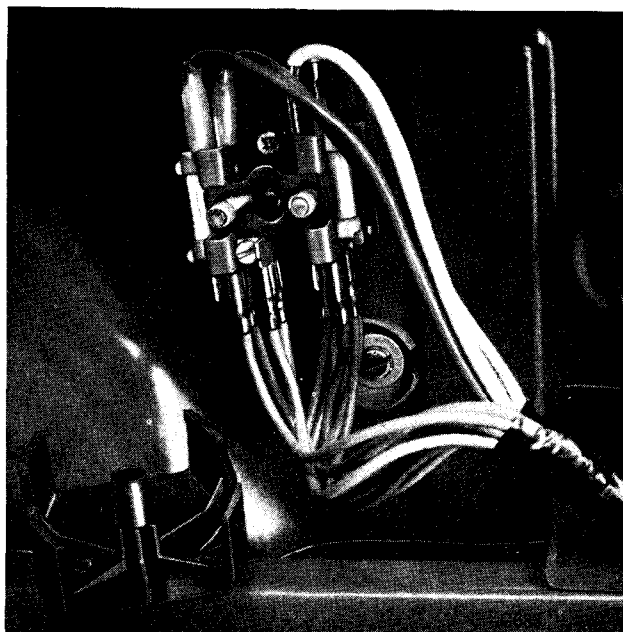


Fig. 2. Fuse box

LINE FUSE

Description

The line fuse is a component of the main harness. It is positioned behind the facia panel adjacent to the left hand dash side panel. The unit contains one operational fuse. The two parts of the fuse holder are retained together by a bayonet fitting.

Failure of the fuse is indicated when all the circuits protected by it become inoperative. If a new fuse fails establish the cause and rectify the fault before fitting a second replacement.

NOTE: To locate the line fuse when the unit is not visible carefully pull the brown/red and red wires adjacent to the harness "break out" point. This action should draw the unit into view.

Removal/installation

It is possible to remove the line fuse from the main harness by disconnecting a snap connector each side of the unit.

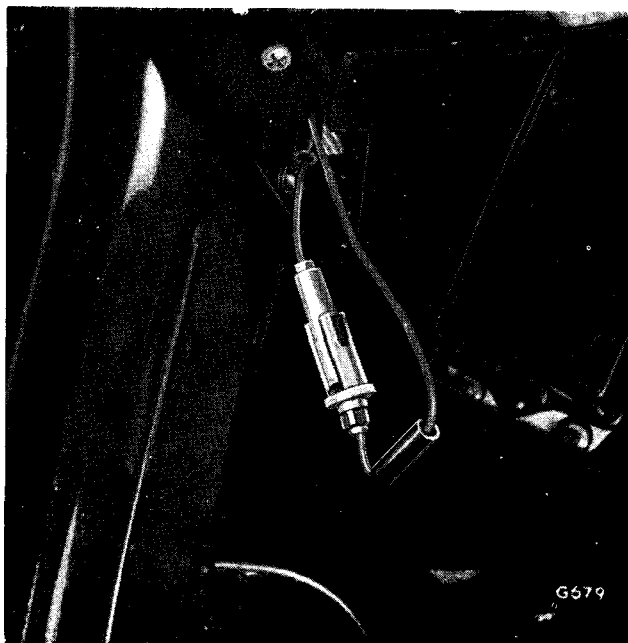


Fig. 3. Line fuse

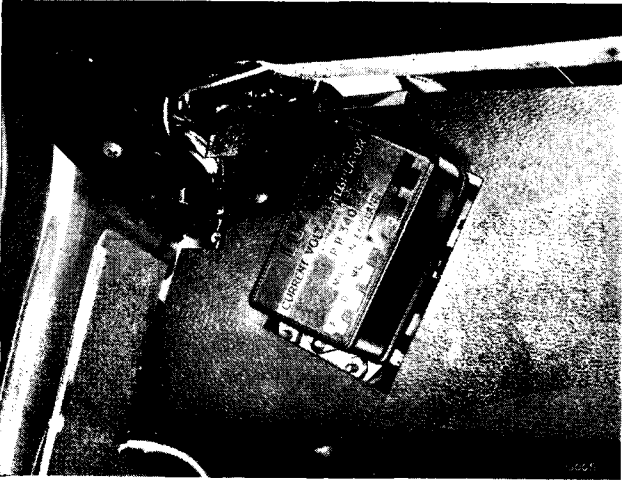


Fig. 4. Control box installed

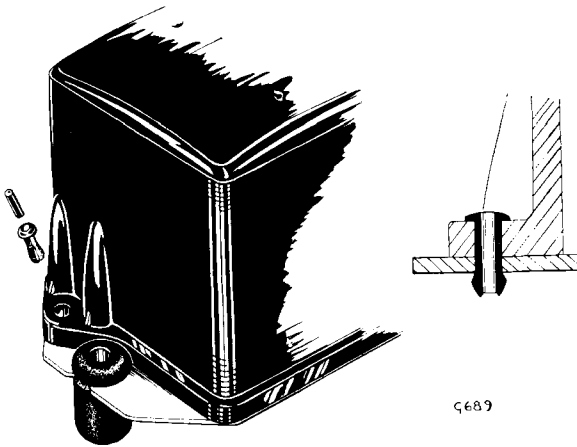


Fig. 5. Plastic fastener

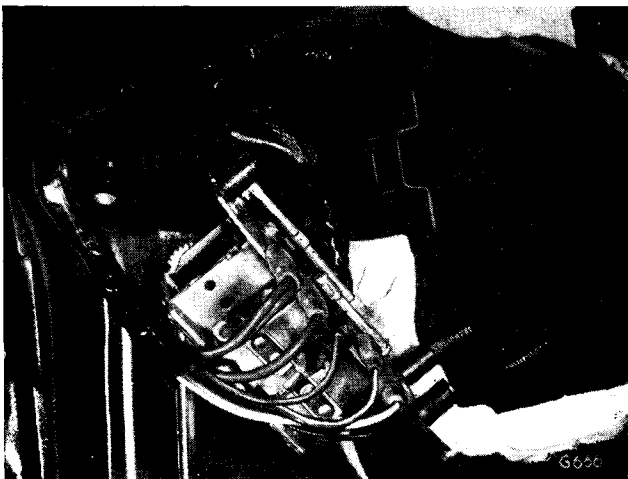


Fig. 6. Remove/install control box

CONTROL BOX

The GT6 and Vitesse 2-litre are fitted with the same control box.

On the Vitesse 2-litre the control box is mounted below the facia on the left hand side of the bulkhead. To obtain free access to the control box it is necessary to remove the dash upper trim panel.

Some vehicles are fitted with control box covers that are secured with plastic fasteners. Removal/installation of these covers is detailed below. Removal/installation of covers that are secured with screws is self evident.

Remove cover secured with plastic fasteners

1. Remove dash upper trim panel as detailed in Vitesse 2-litre—Group 5.
2. Using suitable probe carefully push out centre core of each fastener. Retrieve both centre cores.
3. Pull cover from base.

Install cover secured with plastic fasteners

1. Ensure that outer section of each fastener is inserted in a cover hole. Position cover to base. Push outer section of each fastener through a base hole.
2. Push in centre core of each fastener to secure assemblies.
3. Install dash upper trim panel as detailed in Vitesse 2-litre—Group 5.

Remove control box

CAUTION: TO PREVENT THE POSSIBILITY OF A SERIOUS ELECTRICAL SHORT ENSURE THAT ELECTRICAL POWER IS ISOLATED DURING THIS OPERATION.

1. Remove battery as detailed in GT6—Group 6—Battery.
2. Remove dash upper trim panel as detailed in Vitesse 2-litre—Group 5.
3. Remove control box from mounting.
4. Disconnect electrical connectors.

Install control box

CAUTION: TO PREVENT THE POSSIBILITY OF A SERIOUS ELECTRICAL SHORT ENSURE THAT ELECTRICAL POWER IS ISOLATED DURING THIS OPERATION.

1. Connect electrical connectors.
2. Fit control box to mounting.
3. Install dash upper trim panel as detailed in Vitesse 2-litre—Group 5.
4. Install battery as detailed in GT6—Group 6—Battery.

For all other details refer to GT6—Group 6—Control box.

BATTERY

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

EXERCISE CARE WHEN CONNECTING INTO CIRCUIT ANY ACCESSORY THAT MAY CONTAIN SILICON DIODES OR TRANSISTORS. IRREPARABLE DAMAGE MAY RESULT TO SUCH POLARITY SENSITIVE COMPONENTS IF INCORRECTLY FITTED.

NOTE: No polarity sensitive components are fitted to the vehicle during production. However any of the following accessories—approved or unapproved by Leyland Triumph—may contain such components: Alternator systems, Automatic anti-dazzle mirrors, Automatic dipping systems, Automatic parking lamp systems, Electronic ignition systems, Electronic tachometers and Radios.

Data

Manufacturer	Exide
Type	Auto-Fil
Exide part No.	6-VTAZ9BR
Stanpart No. Normal	211873
Dry charged	515188
Capacity—at 20 hour rate	39 amp. hour
Plates per cell	9
Normal charge rate	4 amps.
Weight	29 lbs.
Dimensions—overall	
Width	5·38—5·48 in.
Length	9·41—9·47 in.
Height—over terminals	8·00—8·12 in.

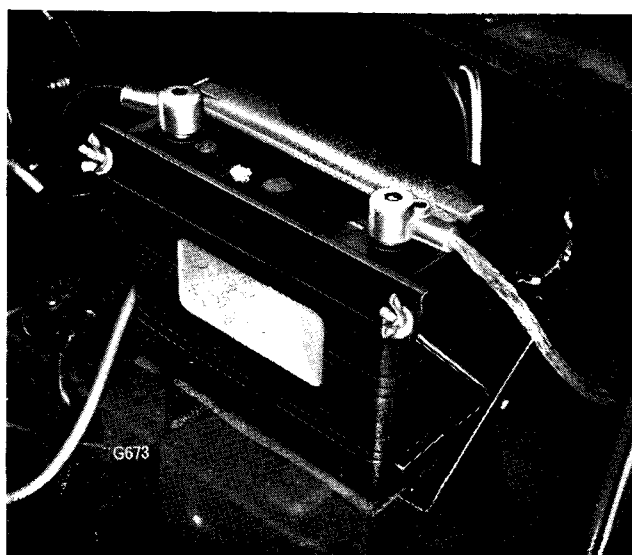


Fig. 7. Battery installed

For all other details refer to GT6—Group 6—Battery.

Some vehicles may be fitted with an alternative battery manufactured by Lucas.

IGNITION DISTRIBUTOR

Data—Normal compression ratio engine 9·5 : 1

Manufacturer	Lucas
Type	22D6
Lucas part No.	41168
Stanpart No.	213754
Contact gap	0·014—0·016 in.
Rotation—viewed on rotor	Anticlockwise
Firing angles	60 ± 1 degs.
Dwell angle	35 ± 3 degs.
Open angle	25 ± 3 degs.
Moving contact spring tension	18—24 ozs.
Capacitor capacity	0·20 mfd.
Engine firing order	1-5-3-6-2-4

Centrifugal advance

Check at decelerating speeds

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
Below 250	No advance to occur		Below 500	No advance to occur	
300	0	0·5	600	0	1·0
750	2·5	4·5	1500	5·0	9·0
1150	4·0	6·0	2300	8·0	12·0
2300	7·5	9·5	4600	15·0	19·0
3200	8·0	10·0	6400	16·0	20·0

Vacuum advance

Ins. of mercury vacuum	Degs. distributor advance		Degs. crankshaft advance	
	Minimum	Maximum	Minimum	Maximum
Below 4	No advance to occur			
6·0	0	2·0	0	4·0
8·5	1·0	4·0	2·0	8·0
14·0	5·5	8·5	11·0	17·0
18·0	7·5	11·0	15·0	22·0
20·0	9·0	11·0	18·0	22·0

Data—Low compression ratio engine 7·0 : 1

Manufacturer	Lucas
Type	22D6
Lucas part No.	41182
Stanpart No.	213741
Contact gap	0·014—0·016 in.
Rotation—viewed on rotor	Anticlockwise
Firing angles	60± 1 degs.
Dwell angle	35± 3 degs.
Open angle	25± 3 degs.
Moving contact spring tension	18—24 ozs.
Capacitor capacity	0·20 mfd.
Engine firing order	1-5-3-6-2-4

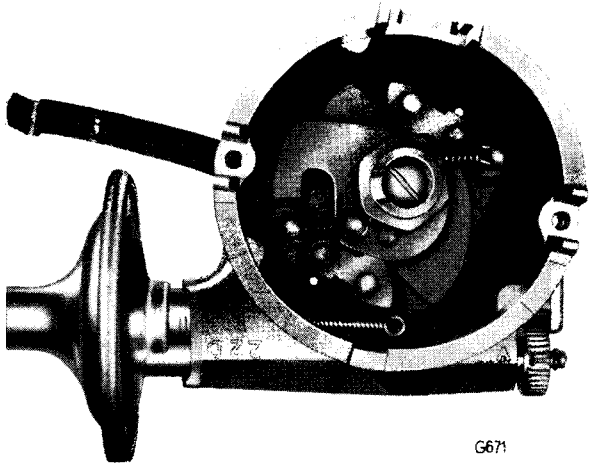
Centrifugal advance

Check at decelerating speeds.

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
Below 300	No advance to occur		Below 600	No advance to occur	
400	0	1·0	800	0	2·0
550	1·0	3·0	1100	2·0	6·0
1050	7·5	9·5	2100	15·0	19·0
1250	10·0	12·0	2500	20·0	24·0
2000	12·5	14·5	4000	25·0	29·0
2500	14·0	16·0	5000	28·0	32·0

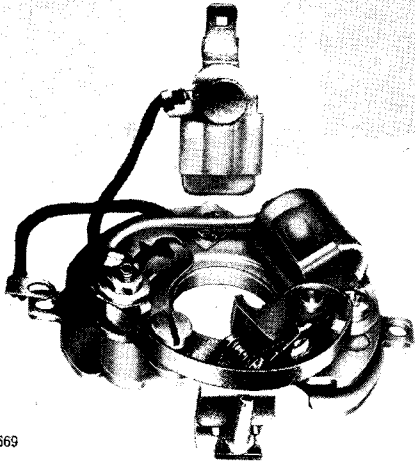
Vacuum advance

Ins. of mercury vacuum	Degs. distributor advance		Degs. crankshaft advance	
	Minimum	Maximum	Minimum	Maximum
4·0	0	0·5	0	1·0
6·5	1·5	5·0	3·0	10·0
9·0	5·5	8·0	11·0	16·0
12·0	8·5	10·5	17·0	21·0
20·0	9·0	11·0	18·0	22·0



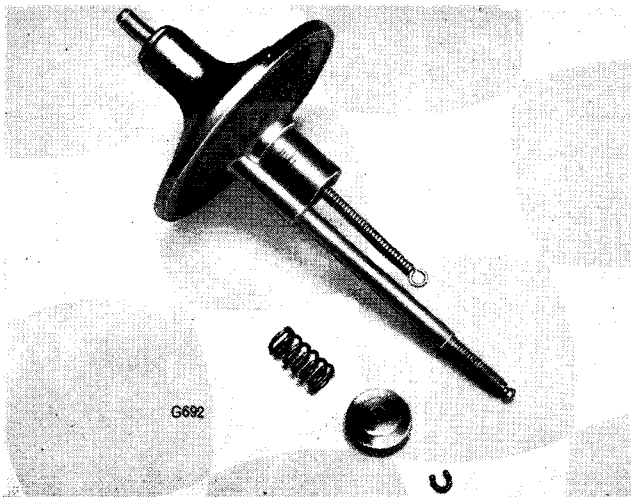
G671

Fig. 8. Centrifugal timing control



G669

Fig. 9. Contact breaker assembly



G682

Fig. 10. Vacuum timing control

Distributor

The distributor shaft rotates at half crankshaft speed driven from the engine camshaft via a drive gear.

The shaft and action plate rotate in two bearing bushes contained in the body.

The centrifugal timing control advances the spark under increasing engine speed. This is achieved by two weights extending outwards about the cam spindle weight pillars. The resulting cam action about the action plate cam surfaces causes the cam spindle to rotate slightly anticlockwise relative to the shaft.

When the contacts close a circuit is completed via the low tension wire, moving contact, fixed contact, moving plate and moving plate earth lead to earth. When the contacts open the low tension circuit is broken causing a collapse of the magnetic field in the ignition coil.

The moving contact, fixed contact and capacitor are located on the moving plate. This assembly can be rotated through a limited angle by the vacuum timing control which functions to improve fuel economy by timing the spark earlier at part throttle. Engine timing can be adjusted by rotating the micrometer adjustment nut which positions the moving plate assembly and vacuum timing control relative to the body.

The capacitor is connected between the moving contact spring and moving plate—that is parallel with the contacts—and functions to produce the desirable quick collapse of the magnetic field in the ignition coil. Capacitor action also prevents arcing across the contacts.

High tension surges initiated in the ignition coil are distributed in the correct sequence to the sparking plugs by the high tension carbon brush, rotor, cover electrodes and high tension leads.

The high tension carbon brush is of composite construction. The centre portion is of resistive compound which gives a measure of radio interference suppression. The ends are of softer carbon.

A drive gear contained within the body provides a drive for the tachometer.

Service

Lubrication—Remove cover and rotor.

1. Few drops of engine oil to cavity to lubricate cam spindle bearing.
2. One drop of engine oil to lubricate moving contact pivot.
3. Few drops of engine oil through aperture at edge of contact breaker assembly to lubricate centrifugal timing control.
4. Lightly grease with Mobilgrease No. 2 or equivalent to lubricate cam.

Wipe away any surplus oil. Ensure contacts are oil free. Any oil on contacts may result in burning.

Contacts—The contact surfaces should be oil free. If the surfaces are burned or blackened clean as detailed below. If excessively worn or pitted renew contact set.

Clean contacts—Use fine carborundum stone or emery cloth followed by a petrol moistened cloth.

Contact gap—It is important that the correct gap be maintained. Contacts set too closely may tend to burn rapidly. Contacts set too wide may tend to cause a weak spark at high speed.

Adjust contact gap

1. Remove cover and rotor.
 2. Rotate cam so moving contact is positioned on a cam peak.
- NOTE: When distributor is insitu rotate cam by turning crankshaft mounted cooling fan.
3. Slacken lock screw (1).
 4. Position a 0.014—0.016 in. feeler gauge between contacts. Move fixed contact (2) about moving contact pivot (3) to adjust gap. Tighten lock screw.

NOTE: This operation may be facilitated by inserting a screwdriver in slots (4) and twisting to move fixed contact.

5. Check 0.014—0.016 in. gap has been maintained.

Timing control operation

Centrifugal timing control operation and vacuum timing control operation can only be checked by employing an electronic engine tester or timing light. Refer to GT.6—Group 6—Test data and equipment.

Engine timing

Static engine timing—Refer to Group 1.

Timing with engine running employing electronic engine tester—Refer to GT.6—Group 6—Test data and equipment.

Timing with engine running employing timing light—Refer to GT.6—Group 6—Test data and equipment.

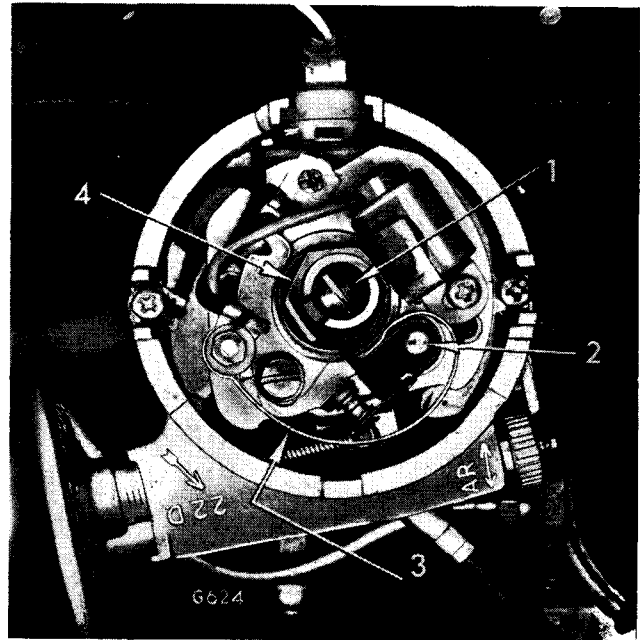


Fig. 11. Lubrication

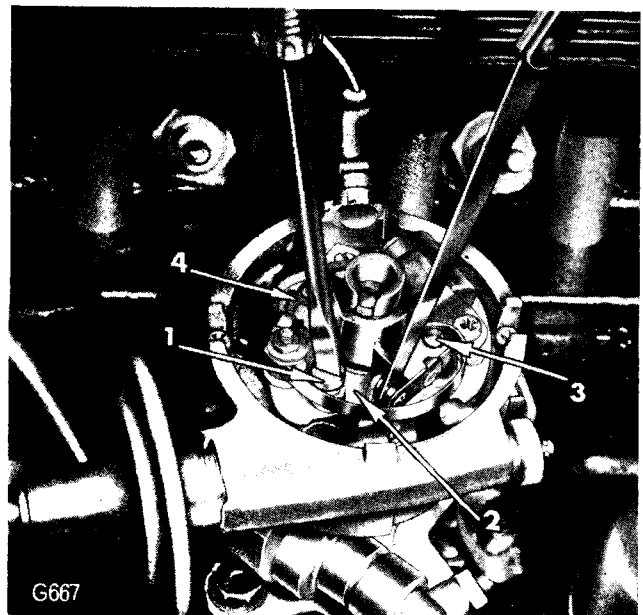


Fig. 12. Adjust contact gap

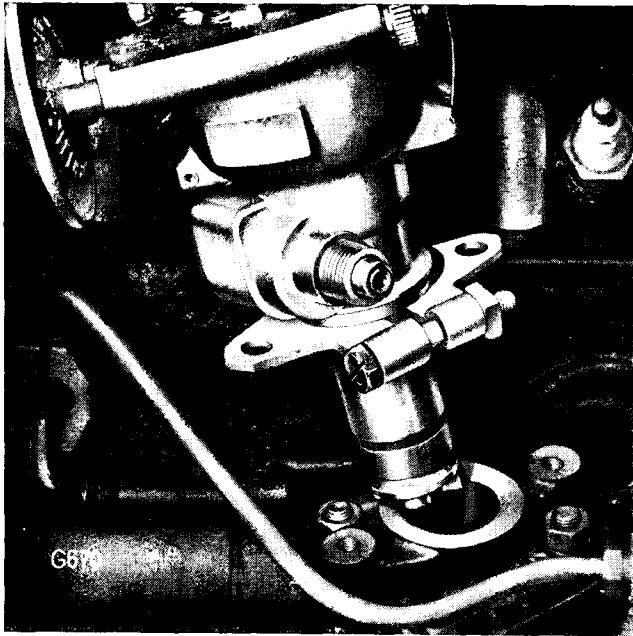


Fig. 13. Remove/install ignition distributor

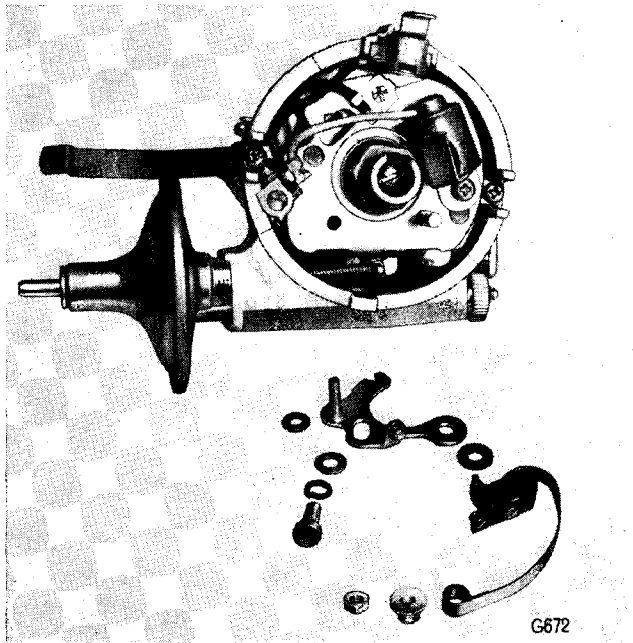


Fig. 14. Remove/install contacts

Remove ignition distributor

NOTE: To facilitate re-timing do not slacken clamp bolt.

1. Remove cover.
2. Disconnect low tension connector from distributor.
3. Pull off vacuum timing control pipe.
4. Remove tachometer drive.
5. Remove rear mounting bolt.
6. Remove forward mounting bolt while withdrawing distributor from adaptor. A sharp upward pull may be required to withdraw.

Install ignition distributor

NOTE: To facilitate re-timing do not slacken clamp bolt.

1. Position forward mounting bolt and washers to distributor. Insert distributor into adaptor. Ensure driving dog tongue locates correctly in drive gear offset slot while screwing in forward mounting bolt.
2. Fit rear mounting bolt.
3. Fit tachometer drive by inserting cable and securing with knurled connector.
4. Push on vacuum timing control pipe.
5. Check engine timing as detailed in Group 1.
6. Connect low tension connector to distributor.
7. Fit cover.

Remove contacts

1. Remove cover and rotor.
2. Remove nut, insulation piece, low tension wire eyelet and capacitor wire eyelet.
3. Withdraw moving contact.
4. Remove large insulation washer and small insulation washer.
5. Remove lock screw.
6. Withdraw fixed contact.

Install contacts

1. Ensure contacts are clean. If a new contact set is being fitted ensure preservative is removed from contact faces.
2. Position fixed contact.
3. Fit lock screw.
4. Fit large insulation washer and small insulation washer.
5. Position moving contact.
6. Fit capacitor wire eyelet, low tension wire eyelet, insulation piece and nut.
7. Adjust contact gap as detailed above.

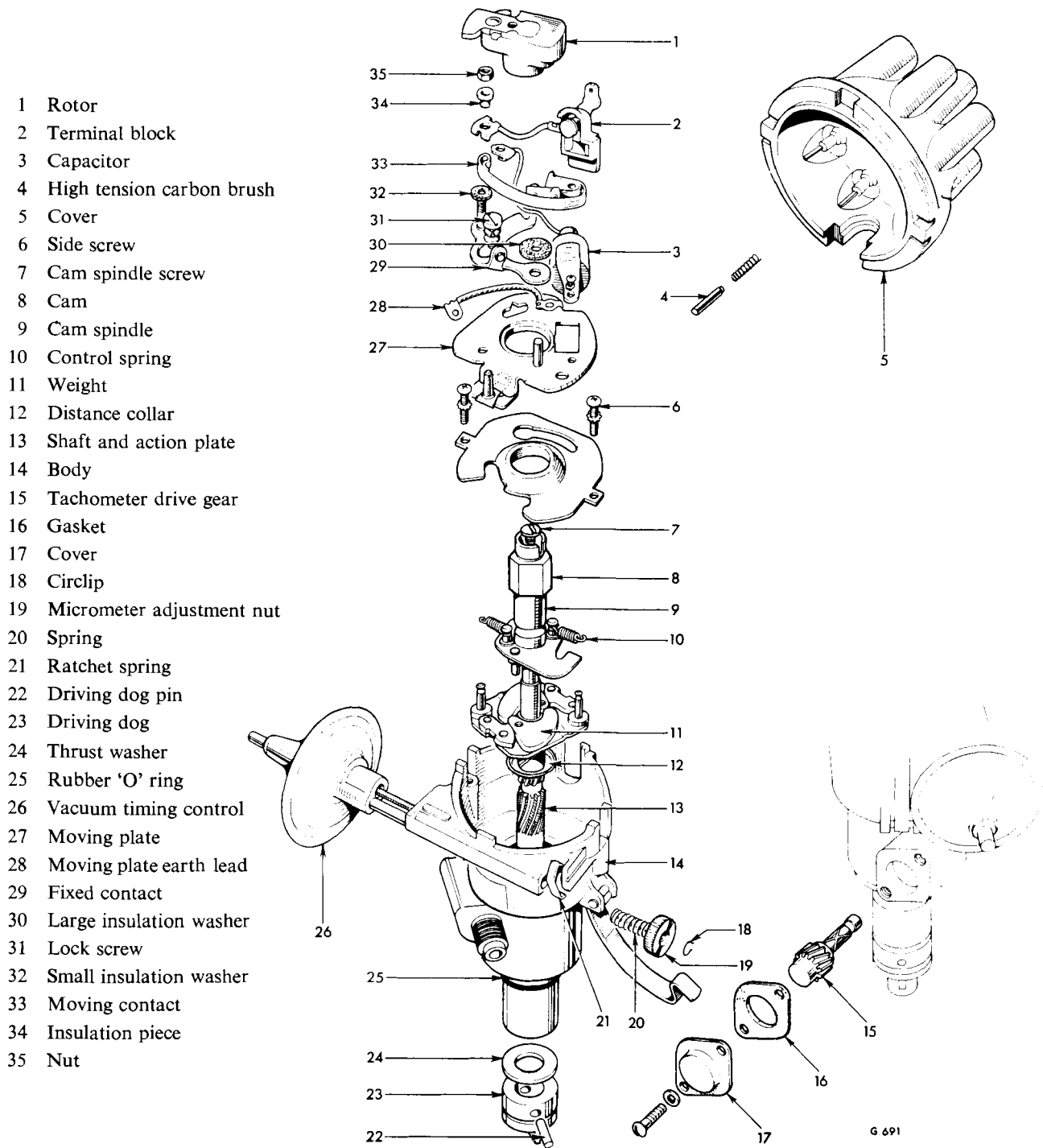


Fig. 15. Ignition distributor details

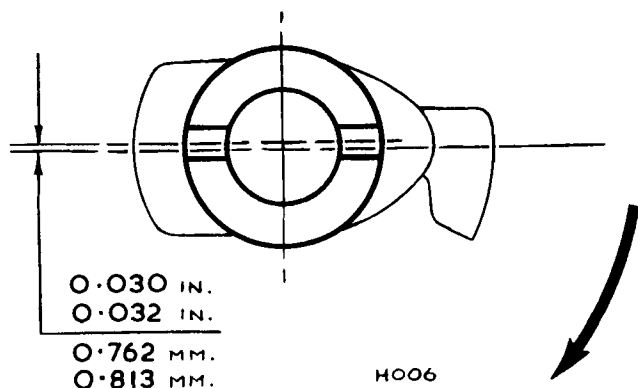
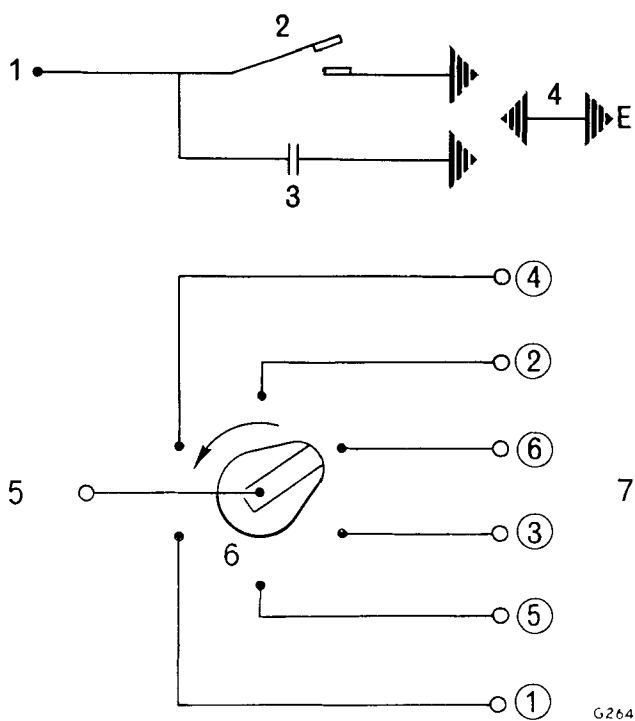


Fig. 16. Relationship of driving dog offset tongue to rotor—view on driving dog



- 1 Low tension connector
- 2 Contacts
- 3 Capacitor
- 4 Moving plate earth lead
- 5 High tension input from ignition coil
- 6 High tension distribution
- 7 High tension output to sparking plugs

Fig. 17. Component wiring diagram

Disassemble ignition distributor

1. Remove ignition distributor as detailed above.
2. Remove rotor.
3. Remove two side screws. Withdraw terminal block. Lift off vacuum timing control link. Withdraw contact breaker assembly.
4. Prise off circlip. Unscrew micrometer adjustment nut and remove spring. Withdraw vacuum timing control. If required push off ratchet spring.
5. Remove cover, gasket and tachometer drive gear.
6. **CAUTION: ENSURE TACHOMETER DRIVE GEAR HAS BEEN REMOVED.** Tap out driving dog pin. Remove driving dog and thrust washer. Ensure shaft is burr free and withdraw. Remove distance collar.
7. Remove control springs exercising care not to distort springs.
8. Remove cam spindle screw. Withdraw cam spindle.
9. Remove weights.

Assemble ignition distributor

1. Lubricate action plate sliding surfaces and cam surfaces with engine oil. Position weights on action plate.
2. Lubricate cam spindle bearing and cam spindle weight pillars with engine oil. Fit cam spindle ensuring that it is the correct way round so that relationship of driving dog offset tongue to rotor will be as shown on Fig. 16. Fit cam spindle screw.
3. Fit control springs exercising care not to distort springs.
4. **CAUTION: ENSURE TACHOMETER DRIVE GEAR IS NOT FITTED.** Fit distance collar. Lubricate shaft with engine oil and insert into body. Fit thrust washer and driving dog. Secure with driving dog pin. If fitting a new undrilled shaft assemble and drill so end float is 0.002—0.006 in. and relationship of driving dog offset tongue to rotor will be as shown on Fig. 16.
5. Lubricate tachometer drive gear with engine oil. Fit tachometer drive gear, gasket and cover.
6. If required push on ratchet spring. Insert vacuum timing control. Fit spring and screw on micrometer adjustment nut. Prise on circlip.
7. Insert contact breaker assembly. Lift on vacuum timing control link. Insert terminal block. Fit two side screws—include moving plate earth lead tag in appropriate screw assembly.
8. Apply one drop of engine oil to moving contact pivot and lightly grease cam with Mobilgrease No. 2 or equivalent.
9. Fit rotor.
10. Install ignition distributor as detailed above.

LAMP SWITCHES

MASTER LIGHT SWITCH

Description

This unit mounted on the facia panel is a three position OFF—LIGHTS—LIGHTS AND INSTRUMENT ILLUMINATION pull-push switch which controls the following circuits:

- Supply to column light switch.
- Front parking lamp circuit.
- Tail lamp circuit.
- Plate illumination lamp circuit.

Instrument illumination circuit.

Removal/installation—Refer to Group 5.

COLUMN LIGHT SWITCH

Description

This unit mounted on the steering column operates in two planes.

In the up-down plane three positions SIDE—MAIN BEAM—DIP BEAM control the head-lamp circuits. The supply for this section of the switch is taken from the master light switch. The column light switch is therefore only operative in this plane when the master light switch is selected to LIGHTS or LIGHTS AND INSTRUMENT ILLUMINATION.

In the release-pull plane two positions OFF—ON control the main beam flasher circuit.

Remove column light switch

1. Remove fairings.
2. Remove upper steering column clamp.
3. Remove harness cover screw.
NOTE: This is located at lower end of harness cover directly above steering column.
4. Remove harness cover.
5. Remove "fir tree clip" securing switch harnesses to speedometer trip reset cable.
6. Disconnect electrical connections.
7. Remove switch retaining screws.
8. Withdraw switch and harness.

Install column light switch

1. Insert harness through aperture and position switch.
2. Fit switch retaining screws.
3. Connect electrical connections.
NOTE: The main beam flasher circuit supply wire in the main harness is correctly coloured purple. This should be connected to the brown wire in the switch harness. This inconsistency enables a standard five wire switch harness to be employed.
4. Fit "fir tree clip".
5. Fit harness cover with tongue located correctly to steering column.
6. Fit harness cover screw.
7. Fit upper steering column clamp.
8. Fit fairings.

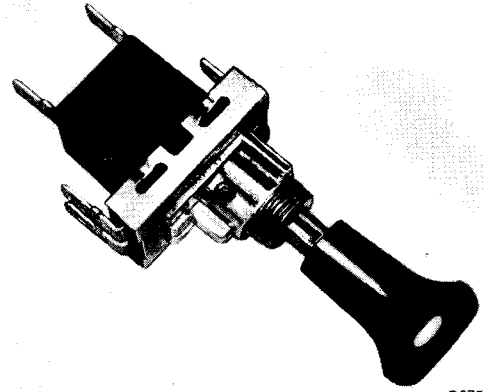


Fig. 18. Master light switch

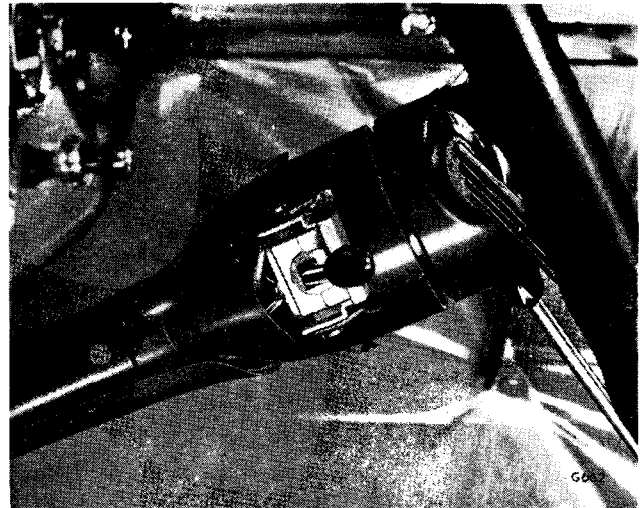


Fig. 19. Column light switch—fairings removed

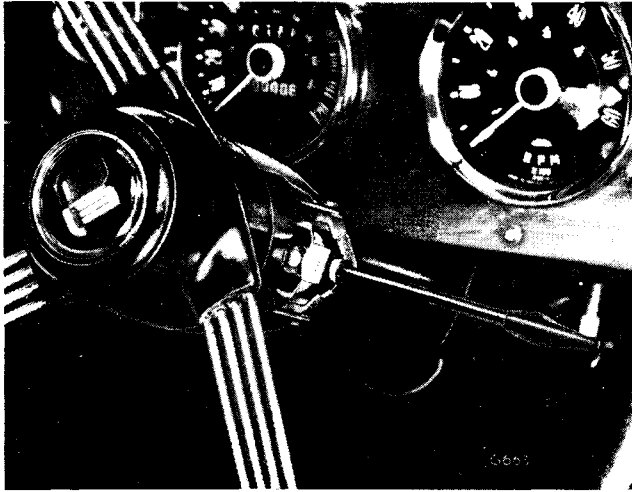


Fig. 20. Flasher lamp switch—fairings removed

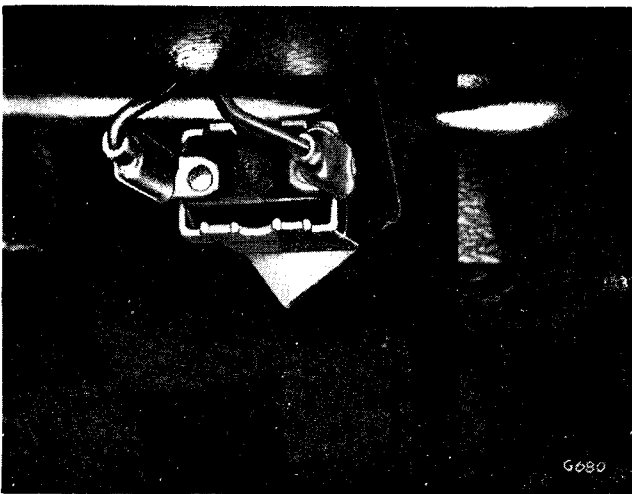


Fig. 21. Stop lamp switch

FLASHER LAMP SWITCH

Description

This unit mounted on the steering column is a three position L.H.—OFF—R.H. switch which controls the flasher lamp circuit. The switch includes a self cancelling feature that operates in conjunction with a cancelling clip on the steering column.

Remove flasher lamp switch

1. Remove fairings.
2. Remove upper steering column clamp.
3. Remove harness cover screw.
NOTE: This is located at lower end of harness cover directly above steering column.
4. Remove harness cover.
5. Remove "fir tree clip" securing switch harnesses to speedometer trip reset cable.
6. Disconnect electrical connections.
7. Remove switch retaining screws.
8. Withdraw switch and harness.

Install flasher lamp switch

1. Insert harness through aperture and position switch.
2. Fit switch retaining screws.
3. Connect electrical connections.
4. Fit "fir tree clip".
5. Fit harness cover with tongue located correctly to steering column.
6. Fit harness cover screw.
7. Fit upper steering column clamp.
8. Fit fairings.

STOP LAMP SWITCH

Description

This unit mounted on a bracket below the brake pedal mounting is a two position OFF—ON switch. When the brakes are applied the switch is automatically selected ON by the brake pedal striker moving away from the switch plunger.

Remove stop lamp switch

1. Disconnect electrical connectors.
2. Remove switch from bracket.

Install stop lamp switch

1. Fit switch to bracket.
2. Connect electrical connectors.
3. Perform functional test to ensure correct operation.

REVERSE LAMP SWITCH

Description

This unit mounted on a bracket attached to the gearbox top cover is a two position OFF—ON switch. When reverse is engaged the switch is automatically selected ON by the selector shaft striker arm depressing the switch plunger.

Remove reverse lamp switch

1. Remove gearbox cover as detailed in Group 2.
2. Disconnect electrical connectors.
3. Remove switch from bracket.

Install reverse lamp switch

1. Fit switch to bracket.
2. Connect electrical connectors.
3. Perform functional test to ensure correct operation.
4. Fit gearbox cover as detailed in Group 2.

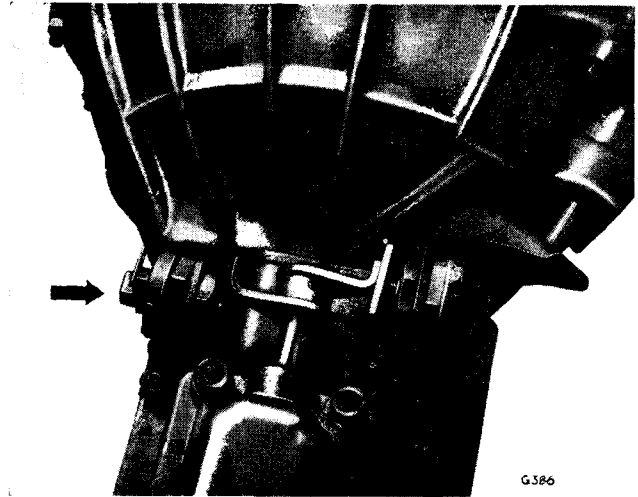


Fig. 22. Reverse lamp switch

ROOF LAMP AND FACIA LAMP SWITCHES

Description

Saloon only—

The roof lamp is controlled by the three OFF—ON switches detailed below:

- L.H. door switch
- R.H. door switch
- Roof lamp switch

When the doors are shut the appropriate switches are held in the OFF position. Opening either door will automatically select a switch to ON to illuminate the roof lamp.

The roof lamp may be selected manually when the doors are shut by operating the switch incorporated in the unit.

The facia lamp is controlled manually by the switch incorporated in the unit.

Convertible only—

No roof lamp is fitted.

The facia lamp is controlled by the three OFF—ON switches detailed below:

- L.H. door switch
- R.H. door switch
- Facia lamp switch

When the doors are shut the appropriate switches are held in the OFF position. Opening either door will automatically select a switch to ON to illuminate the facia lamp.

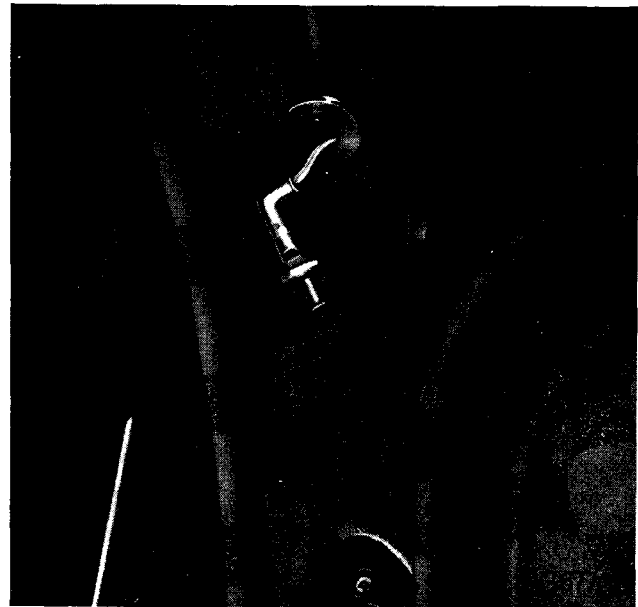


Fig. 23. R.H. door switch

The facia lamp may be selected manually when the doors are shut by operating the switch incorporated in the unit.

Remove door switch

1. Pull switch from aperture.
NOTE: If difficulty is experienced use screwdriver to lever out.
2. Disconnect electrical connection.

Install door switch

1. Connect electrical connection.
2. Fit switch to aperture. Ensure good electrical contact.
3. Perform functional test to ensure correct operation.

LAMPS AND BULBS

Bulb chart

Lamp	Watts	Lucas part No.	Stanpart No.	
Headlamps				
L.H. Dip—Normal	37·5/50	54521806	511603	★
—Outer				
—Inner	37·5	54521805	511599	★
L.H. Dip—Sweden				
Until 1st Sept '67	45/40	410	510218	●
—Outer				
—Inner	37·5	54521805	511599	★
R.H. Dip—Normal	45/40	410	510218	●
—Outer				
—Inner	37·5	54521805	511599	★
R.H. Dip—Austria	45/40	410	510218	●
—Outer				
—Inner	37·5	54521615	511608	★
R.H. Dip—France	45/40	411	510219	●
—Outer				
—Inner	37·5	54520931	511609	★
R.H. Dip—Italy	45/40	411	510219	†
—Outer				
—Inner	45/40	410	510218	†
R.H. Dip—Sweden				
After 1st Sept. '67	45/40	410	510218	●
—Outer				
—Inner	37·5	54521805	511599	★
R.H. Dip—U.S.A.	37·5/50	54521808	—	★
—Outer				
—Inner	37·5	54521807	—	★
Front parking lamps	6	989	59467	
Front flasher lamps	21	382	502379	
Rear flasher lamps	21	382	502379	
Tail/stop lamps	6/21	380	502287	
Plate illumination lamp	4	222	501436	
Reverse lamp	21	382	502379	
Roof lamp (Saloon only)	6	254	59897	
Facia lamp	6	254	59897	
Instrument illumination	2·2	987	59492	
Warning lights	2·2	987	59492	

★ —Sealed beam light unit.

● —The 45 watt filament positioned at the focal point of the reflector provides the dip beam. The 40 watt filament provides part of the main beam.

† —The 45 watt filament only is employed.

France only—The inner headlamps may be either a sealed beam light unit featuring a "soldered in" yellow bulb or a light unit fitted with a detachable yellow bulb.

HEADLAMPS

Description

This vehicle is fitted with a four headlamp system. When main beam is selected all four light units are in use while on dip beam the two outer light units only are illuminated.

The inner light units contain one main beam filament positioned at the focal point of the reflector. This provides the major portion of the main beam.

The outer light units contain two filaments. A secondary filament provides a wide deep supplementary main beam to illuminate the nearer section of the road. The optical requirements of this secondary beam are not critical. A primary filament positioned at the focal point of the reflector provides the best practical dip beam.

Each headlamp consists of a light unit secured between a seating rim and retaining rim. These items are held together by screws 1, 2 and 3. This assembly is fitted to a housing by a flexible rubber pivot 4 and spring loaded beam aiming screws A and B. A cover panel secured to the vehicle body faired in each pair of headlamps.

Remove cover panel

Remove two flange securing screws from positions shown on figure 24. Pull lower edge of cover panel outwards to allow upper edge clip projections to release.

Install cover panel

Position cover panel clip projections in vehicle body slots. Position cover panel over headlamps and secure with two screws.

Remove sealed beam light unit

NOTE: TO AVOID BEAM AIMING DO NOT DISTURB BEAM AIMING SCREWS A AND B.

1. Remove cover panel as detailed above.
2. Slacken three screws 1, 2 and 3.
3. Rotate retaining rim anticlockwise to release retaining rim and sealed beam light unit.
4. Pull connector from sealed beam light unit.

Install sealed beam light unit

NOTE: TO AVOID BEAM AIMING DO NOT DISTURB BEAM AIMING SCREWS A AND B.

1. Fit connector to sealed beam light unit.
2. Position sealed beam light unit. Locate retaining rim so three flange cut outs are adjacent to flexible rubber pivot 4 and beam aiming screws A and B. Fit retaining rim to three screws 1, 2 and 3 and rotate clockwise.
3. Tighten three screws 1, 2 and 3.
4. Install cover panel as detailed above.

Beam aiming

Remove cover panel as detailed above. Screw A positions the beam in the horizontal plane. Screw B controls beam height.

Beam aiming can best be accomplished using equipment such as Lucas 'Beamsetter' or 'Lev-L-Lite'. Employ equipment as detailed by the manufacturer.



Fig. 24. Remove/install cover panel

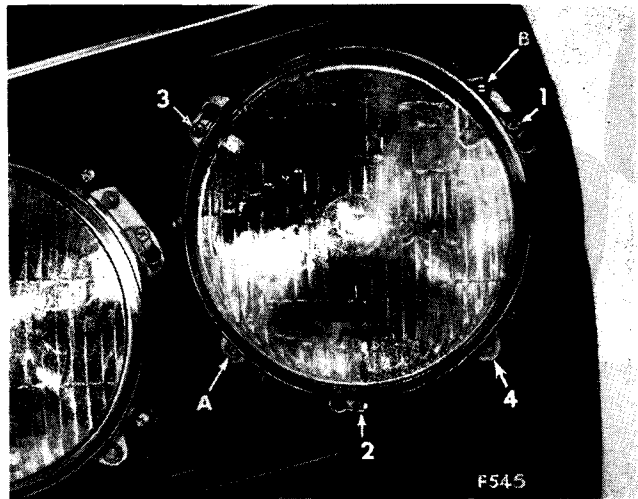


Fig. 25. Headlamp—cover panel removed

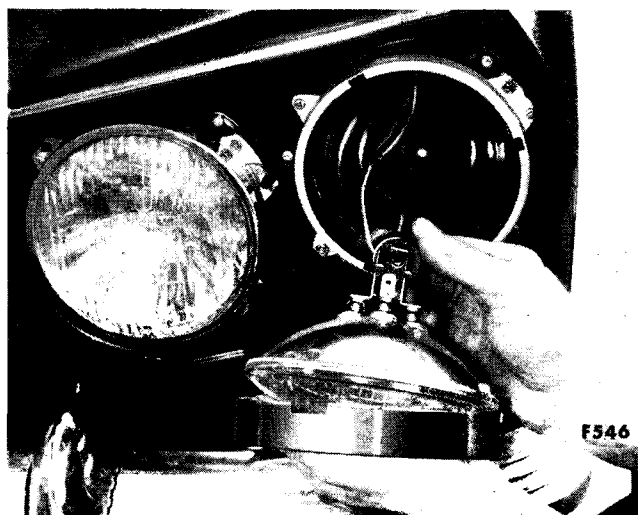


Fig. 26. Retaining rim and sealed beam light unit

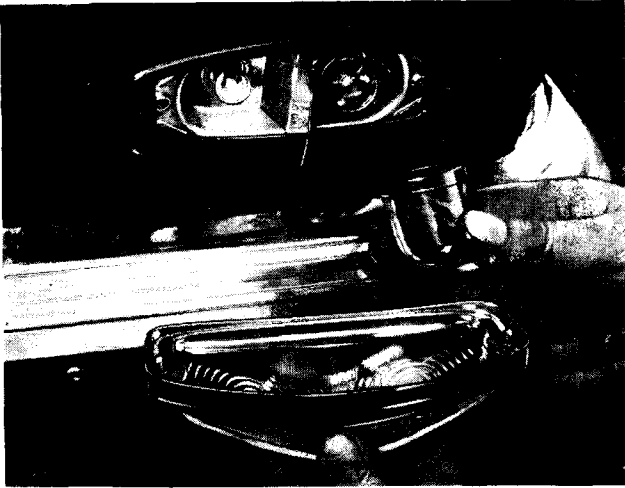


Fig. 27. Front parking and flasher lamp

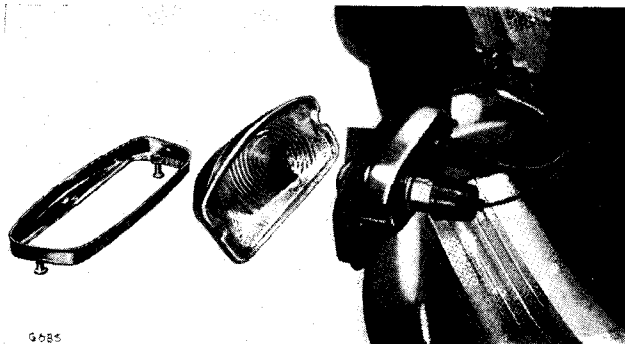


Fig. 28. Front parking and flasher lamp

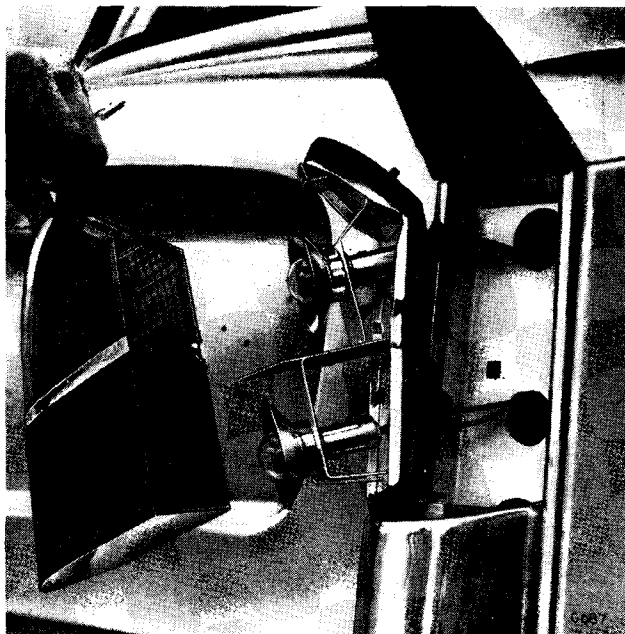


Fig. 29. Rear flasher and tail/stop lamp

FRONT PARKING AND FLASHER LAMPS

Description

Each lamp consists of a base which supports two bulb holders, a clip, two studs that attach the unit to the vehicle body and a thick rubber surround. An amber glass cover is retained in position over a clear flasher bulb by the clip. The rim and lens are secured with two screws.

Remove bulbs

Remove rim and lens by unscrewing two screws. Flasher bulb only—unclip amber glass cover. Remove bulbs from bayonet fittings.

Install bulbs

Fit bulbs to bayonet fittings. Flasher bulb only—clip amber glass cover into position. Secure rim and lens with two screws.

REAR FLASHER AND TAIL/STOP LAMPS

Description

Each lamp consists of a common base assembly which supports two bulb holders, two reflectors and four studs that attach the unit to the vehicle body. The one piece amber—red lens is secured to tappings in the base assembly with two screws.

Remove bulbs

Remove amber—red lens by unscrewing two screws and withdrawing squarely—do not tilt lens. Remove bulbs from bayonet fittings.

Install bulbs

Fit bulbs to bayonet fittings. Tail/stop bulb only—bulb must be located correct way round. Fit amber—red lens by inserting squarely—do not tilt lens—and secure with two screws.

PLATE ILLUMINATION AND REVERSE LAMP

Description

This lamp consists of a lamp unit containing two plate illumination bulbs and a centrally mounted reverse bulb. Two studs attach the lamp unit to a mounting bracket. The mounting bracket is attached to the vehicle body by a second pair of studs. A deflector pressing in the cover isolates the two light functions. Two downward facing lenses illuminate the plate. A single rearward facing lens provides the reverse beam. The cover is secured with two screws.

Remove bulbs

Remove cover by unscrewing two screws. Remove bulbs from bayonet fittings.

Install bulbs

Fit bulbs to bayonet fittings. Secure cover with two screws.

ROOF LAMP (SALOON ONLY)

Description

This lamp consists of a plastic base which supports two contacts for the festoon bulb and a slide switch. Two screws attach the base to the vehicle body. A plastic lens is secured to the base with four integral clip projections.

Remove bulb

Gently squeeze lens adjacent to clip projections and lift out lower clips. Withdraw upper clips to release lens. Remove festoon bulb.

Install bulb

Fit festoon bulb. Insert lens upper clip projections. Gently squeeze lens adjacent to clips and position lower clips.

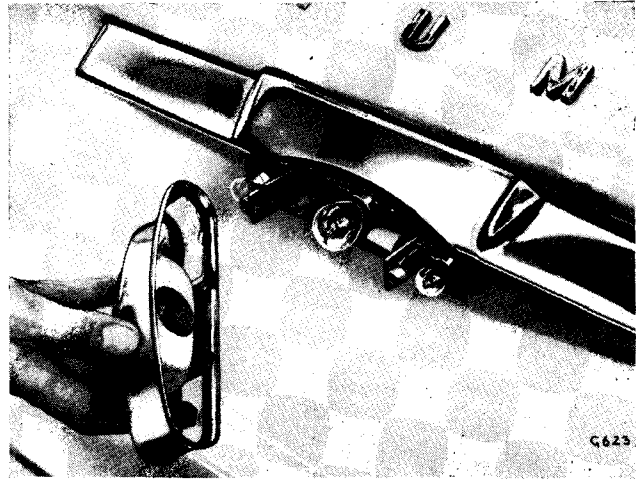


Fig. 30. Plate illumination and reverse lamp

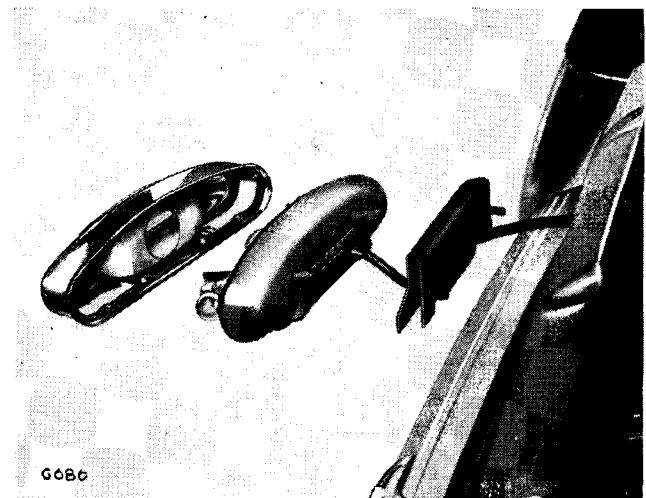


Fig. 31. Plate illumination and reverse lamp



Fig. 32. Roof lamp (Saloon only)

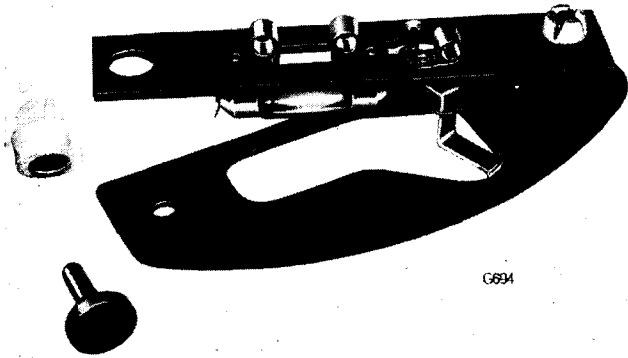


Fig. 33. Facia lamp

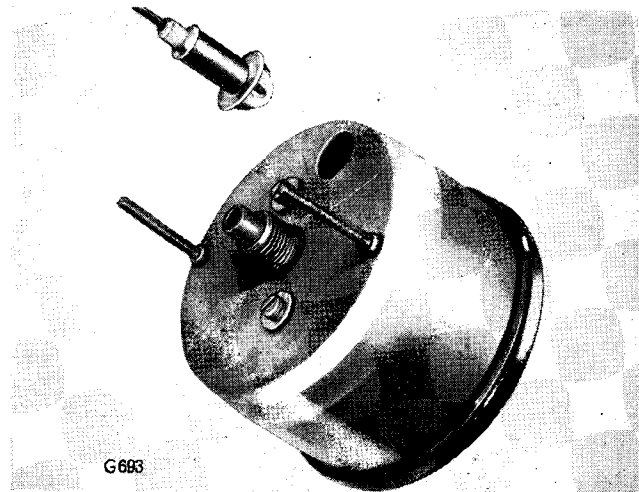


Fig. 35. Instrument illumination

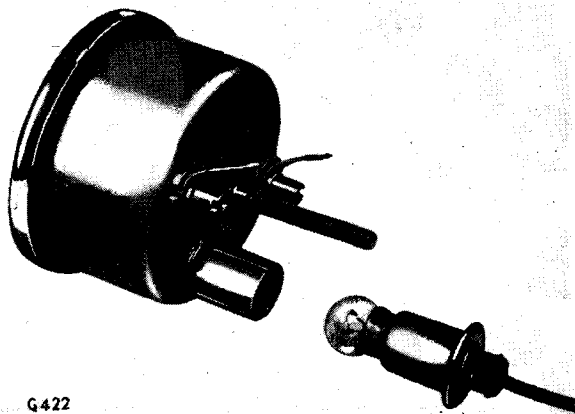


Fig. 36. Instrument illumination

FACIA LAMP

Description

This lamp consists of a base plate which supports two contacts for the festoon bulb and a lever switch. This unit is positioned in the peak of the facia panel surround. An aperture cut in the surround aligns with the bulb and switch lever. A trim protection board is fitted below the aperture. The base plate and trim protection board are secured to the facia panel surround with two plastic fasteners that each consist of a splayed bush and locking peg.

Remove bulb

Using screwdriver carefully lever festoon bulb from contacts.

Install bulb

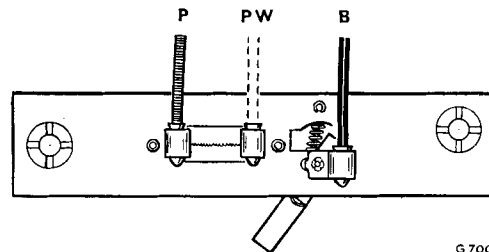
Fit festoon bulb to contacts.

Remove facia lamp

1. Remove one battery lead to isolate electrical power.
2. Using screwdriver carefully prise out locking pegs. Lift away trim protection board.
3. From behind facia carefully manoeuvre lamp unit from position and withdraw from facia panel surround.
4. Disconnect electrical connections.

Install facia lamp

1. Connect electrical connections as detailed on Fig. 34.



- P Purple.
 B Black.
 PW Purple/White.—This wire shown dotted is fitted on convertible only. On convertible no roof lamp is fitted—door switches control facia lamp.

Fig. 34. Facia lamp electrical connections

2. From behind facia insert lamp unit into facia panel surround and carefully manoeuvre into position.
3. Position trim protection board. Push in locking pegs to secure assembly.
4. Fit battery lead to restore electrical power.

INSTRUMENT ILLUMINATION

Description

Speedometer
Tachometer
Fuel indicator
Temperature indicator

The above instruments are each illuminated by a miniature Edison screw cap bulb contained in a holder which is a component of the main harness.

The holders for the speedometer and tachometer are attached by claws to apertures provided on the rear of the instruments.

The holders for the fuel indicator and temperature indicator are inserted into tube assemblies mounted on the rear of the instruments.

Remove Bulb

Pull holder from instrument. Unscrew bulb from holder.

Install Bulb

Screw bulb into holder. Fit holder to instrument.

WARNING LIGHTS

Description

Speedometer: Main beam warning light
Oil pressure warning light
Ignition warning light

The speedometer houses three warning lights as detailed above.

Each warning light consists of a miniature Edison screw cap bulb contained in a holder which is a component of the main harness.

The holders are inserted in plastic tube assemblies contained in the instrument. The tubes align with coloured lenses fitted to the instrument face.

The flasher warning light unit is mounted directly to the fascia panel.

The warning light consists of a miniature Edison screw cap bulb contained in a holder which is a component of the main harness.

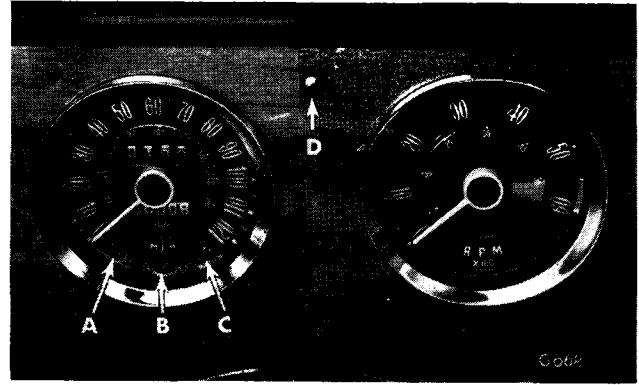
The holder is attached by claws to a housing that is secured to the fascia panel with a threaded coloured lens.

Remove bulb

Pull holder from instrument or housing. Unscrew bulb from holder.

Install bulb

Screw bulb into holder. Fit holder to instrument or housing.



- A. Main beam warning light
- B. Oil pressure warning light
- C. Ignition warning light
- D. Flasher warning light

Fig. 37. Warning lights

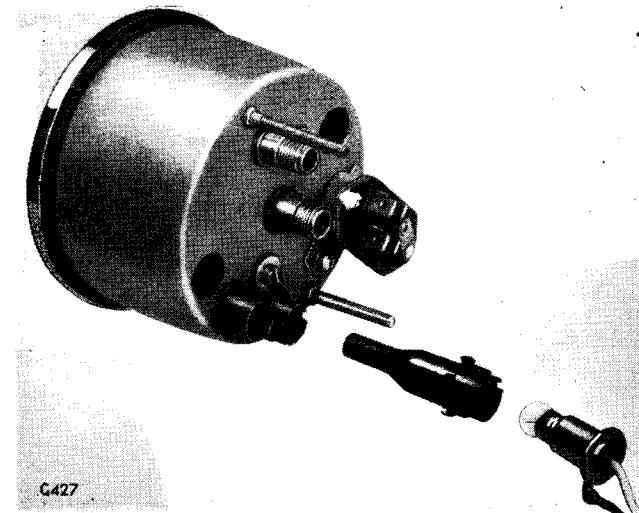


Fig. 38. Speedometer housed warning lights

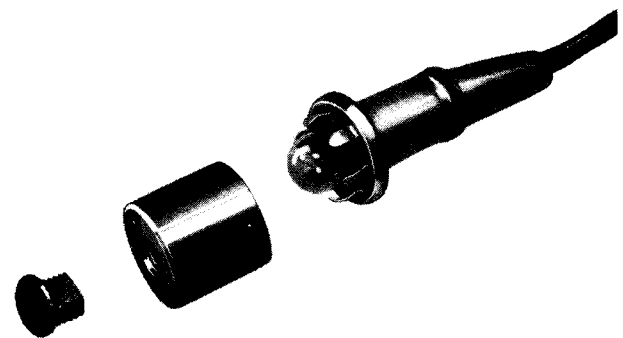


Fig. 39. Flasher warning light

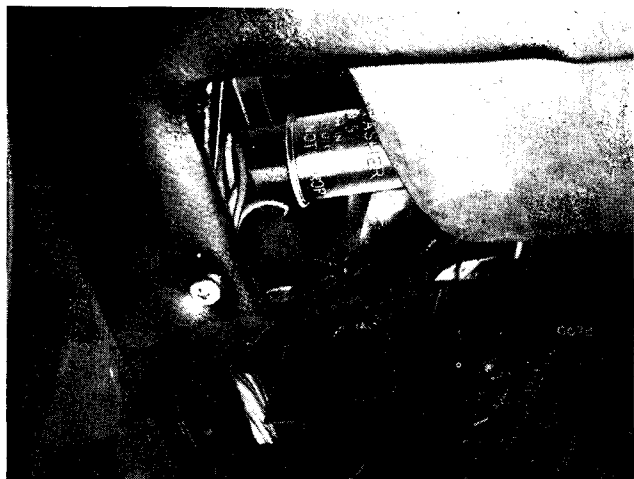


Fig. 40. Flasher unit

FLASHER UNIT

The GT.6 and Vitesse 2-litre are fitted with the same flasher unit.

On the Vitesse 2-litre the flasher unit is mounted behind the facia on the left hand dash side panel.

Removal/installation

CAUTION: HANDLE FLASHER UNIT WITH CARE. MANUFACTURERS SETTING—SATISFACTORY FOR CONDITIONS OF NORMAL AUTOMOBILE DUTY—CAN BE DISTURBED BY ROUGH HANDLING.

Remove flasher unit

Locate unit behind facia on left hand dash side panel. Pull flasher unit from socket.

Install flasher unit

Fit flasher unit to socket.

For all other details refer to GT.6—Group 6—Flasher unit.

HORNS

The GT.6 and Vitesse 2-litre are fitted with a similar horn system.

The principle difference is that on the Vitesse 2-litre no horn relay is employed. The static slip ring, connection brush, horn push and two earth leads are positioned on the earth side of the horn units.

Data

Manufacturer	.. .. .	Lucas
Type	.. .. .	9H
Lucas part No.	High note	69158
	Low note	69157
Stanpart No.	High note	208660
	Low note	208659
Operating current	.. .. .	3.5—4.0 amps.
Weight—single unit	.. .. .	1.75 lbs. approx.

For all other details refer to GT6—Group 6—Horns.

Some vehicles may be fitted with alternative horns manufactured by Clear Hooter.

OVERDRIVE RELAY

The GT6 and Vitesse 2-litre are fitted with the same overdrive relay.

On the Vitesse 2-litre the overdrive relay is mounted on the bulkhead as shown on Fig. 41.

For all other details refer to GT6—Group 6—Overdrive.

OVERDRIVE COLUMN SWITCH

The GT6 and Vitesse 2-litre are fitted with the same overdrive column switch.

Description

Refer to GT6—Group 6—Overdrive.

Remove overdrive column switch

Refer to GT6—Group 6—Overdrive.

Install overdrive column switch

1. Fit switch to fairing.
2. Insert harness through aperture.
3. Connect electrical connections.

NOTE: Early vehicles built before approximately April '67 only—The supply wire from the fuse box in the overdrive harness is correctly coloured white. This should be connected to the black wire in the switch harness. This inconsistency enables a standard two wire switch harness to be employed.

NOTE: Vehicles built after approximately April '67 only—The wire connecting the overdrive column switch to the overdrive gearbox switch in the overdrive harness is correctly coloured yellow. This should be connected to the black wire in the switch harness. This inconsistency enables a standard two wire switch harness to be employed.

4. Fit harness cover with tongue located correctly to steering column.
5. Fit harness cover screw.
6. Fit upper steering column clamp.
7. Fit fairings.

OVERDRIVE

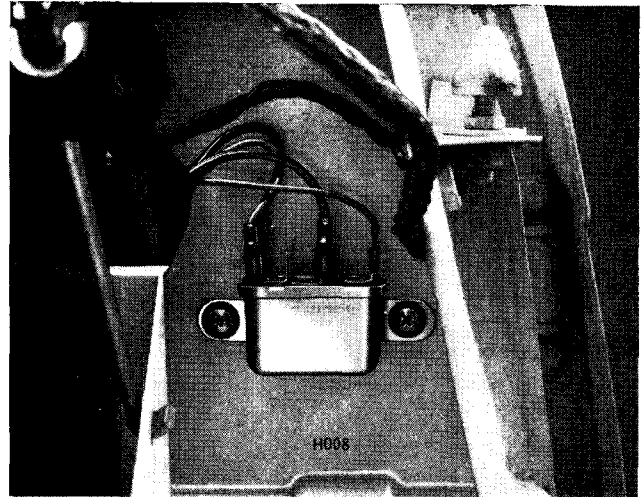


Fig. 41. Overdrive relay installed

OVERDRIVE GEARBOX SWITCH

The GT6 and Vitesse 2-litre are fitted with the same overdrive gearbox switch.

A facia support bracket is fitted on the GT6 only. No facia support bracket has therefore to be removed or installed during the Removal/installation of the overdrive gearbox switch.

For all other details refer to GT6—Group 6—Overdrive.

OVERDRIVE SOLENOID

The GT6 and Vitesse 2-litre are fitted with the same overdrive solenoid.

A facia support bracket is fitted on the GT6 only. No facia support bracket has therefore to be removed or installed during the Removal/installation of the overdrive solenoid.

For all other details refer to GT6—Group 6—Overdrive.

WINDSCREEN WIPER MOTOR

The GT.6 and Vitesse 2-litre are fitted with a similar windscreen wiper motor.

The principle differences are that on the Vitesse 2-litre a single speed motor is employed and the unit is mounted in a vertical position.

Data

Manufacturer	Lucas
Type	DR3A
Lucas part No.	75446
Stanpart No.	510987

Running current—after 60 secs. from cold with connecting rod removed	3.4 amps. max.
Running speed—final gear after 60 secs. from cold with connecting rod removed	45—50 r.p.m.
Field winding resistance	8.0—9.5 ohms at 15.5 degs. centigrade
Brush force against commutator—new	4.0—6.0 ozs.
Maximum permissible force to move cable rack in tubing—arms and blades removed	6.0 lbs.

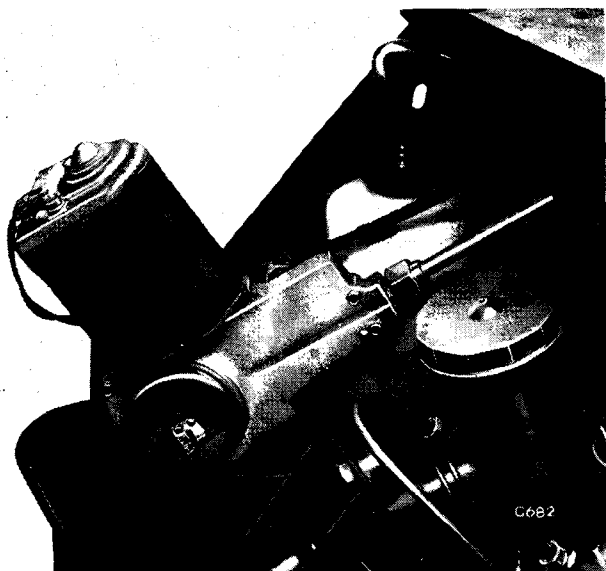


Fig. 42. Windscreen wiper motor installed

Remove windscreen wiper motor

1. Remove connecting rod as detailed below.
2. Disconnect electrical connectors.
3. Remove unit from mounting bracket.
4. Push crosshead and tubing assembly from guide channel.

Install windscreen wiper motor

1. Position unit so crosshead and tubing assembly are correctly located in guide channel.
2. Fit unit to mounting bracket.
3. Install connecting rod as detailed below.
4. Connect electrical connectors.
5. Wet windscreen and perform functional test. Ensure park position is correct. If adjustment is required adjust as detailed below.

Remove connecting rod

1. Mark position of domed cover with relation to gearbox cover. This will facilitate connecting rod installation.
2. Remove four screws. Swing gearbox cover and domed cover clear.
3. Operate facia switch to motor final gear to position shown on Fig. 43.
4. Remove crank pin spring clip by withdrawing as shown on Fig. 43.
5. Remove limit switch moving contact.
6. Remove connecting rod.

Install connecting rod

1. Fit connecting rod.
2. Fit limit switch moving contact.
3. Fit crank pin spring clip by inserting as shown on Fig. 43.
4. Position gearbox cover and domed cover with marks made above aligned. Secure with four screws.

If aligning marks have been lost adjust park position as detailed below.

Adjust park position

The arms and blades should stop at the end of a stroke. The park position can be adjusted by slackening four screws and rotating the domed cover.

The correct park position should be attained when the domed cover setting pip position relative to the windscreen wiper motor unit is as shown on the following figures:

R.H. Steer vehicles GT.6—Group 6—Fig. 91.
L.H. Steer vehicles GT.6—Group 6—Fig. 92.

To retard stop rotate domed cover clockwise.

To advance stop rotate domed cover anti-clockwise.

When the domed cover is positioned correctly tighten four screws.

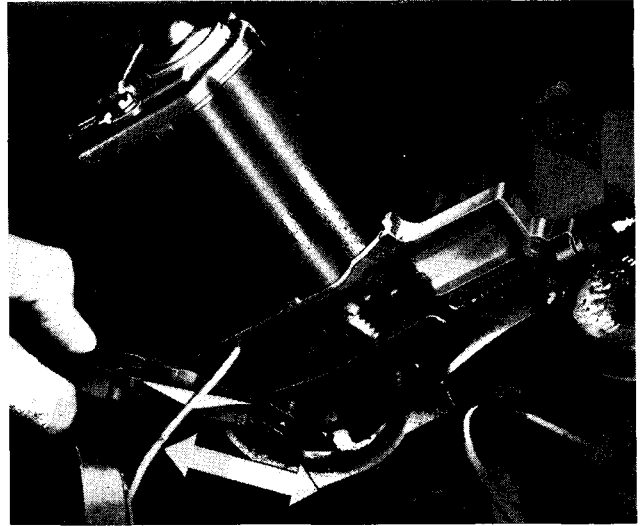


Fig. 43. Crank pin spring clip

1 Supply to connector ②

2 Armature

3 Field winding

4 Limit switch

5 Facia switch

Colour code

R Red

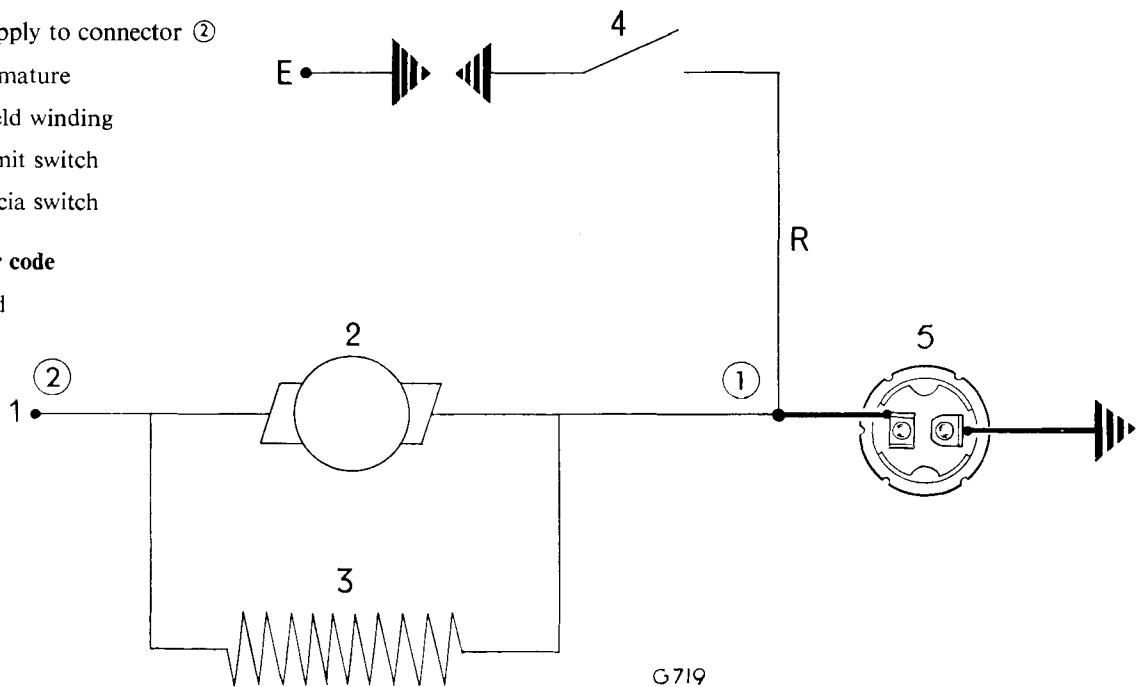


Fig. 44. Component and switch wiring diagram

For all other details refer to GT6—Group 6—Windscreen wiper motor

FUEL INDICATION

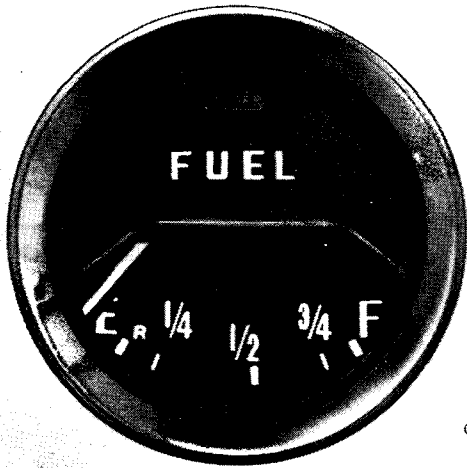
Data

Fuel indicator

Manufacturer	..	..	..	..	..	..	..	..	..	Smiths
Smiths part No.	..	..	..	..	..	..	..	..	..	BF 2201/08
Stanpart No.	..	..	..	..	..	..	..	..	..	145700
Type	..	..	..	..	..	..	..	..	..	Bimetal resistance
Body diameter	..	..	..	..	..	..	..	..	..	52 mm.
Illumination	..	..	..	..	..	..	..	..	..	Internal

Tank unit

Manufacturer	..	..	..	..	..	..	..	..	..	Smiths
Smiths part No.	..	..	..	..	..	..	..	..	..	TB 1514/000
Stanpart No.	..	..	..	..	..	..	..	..	..	213411
Type	..	..	..	..	..	..	..	..	..	Bimetal resistance



G674

Fig. 45. Fuel indicator

For illustrations of fuel indicator—rear view and internal view refer to GT6—Group 6—Figures 103 and 104.



G664

Fig. 46. Tank unit installed

Description

The fuel indication system consists of a fuel indicator mounted on the facia panel and a tank unit located in the fuel tank. These two components are electrically connected as shown in the system wiring diagram.

The fuel indicator contains a bimetal strip surrounded by a heater series winding. Current flow through the series winding heats the bimetal strip which consequently distorts. The pointer is suspended between the moving end of the bimetal strip and a spring blade. This arrangement causes the pointer to take up a position over the scale that is related to current flow through the system circuit.

The tank unit consists of a resistance winding swept by a contact arm. The arm is attached to the float pivot and is at earth potential. A full tank results in few turns of the resistance winding in circuit and a heavy current. A low tank results in many turns of the resistance winding in circuit and a reduced current. Current flow through the system circuit is thus related to fuel level.

The system is voltage sensitive. To achieve consistent fuel indication the voltage stabilizer provides an average stabilized output voltage which is a suitable supply for this slow reaction bimetal resistance type system.

Service—No maintenance is required.

Removal/installation fuel indicator—Refer to Group 5.

Remove tank unit

1. Drain fuel tank sufficiently to ensure fuel level is below unit aperture.
- NOTE: It is not necessary to drain the tank if the contains are less than approximately 3 gallons.
2. Remove rubber cover.
3. Disconnect electrical connectors.
4. Remove screws.
5. Break seal and withdraw tank unit.

Install tank unit

1. Use a new joint washer. Apply "Heldite" or similar adhesive to both faces. Position joint washer and tank unit.
2. Fit screws.
3. Connect electrical connectors.
4. Fit rubber cover.
5. If required ensure tank drain plug and washer are correctly fitted. Replenish fuel tank.

Repair

Repair of both units is by replacement.

NOTE: When performing any tests that include a unit containing a bimetal strip ensure to allow ample time—approximately one minute—for the unit to react.

Electrical instrument tester—Refer to GT6—Group 6—Test data and equipment.

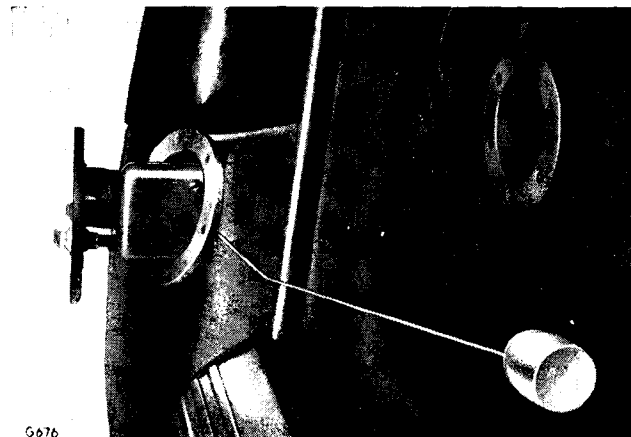


Fig. 47. Tank unit removed

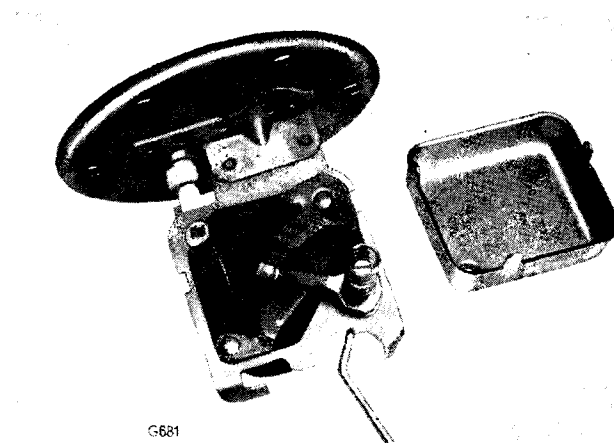


Fig. 48. Tank unit—internal view

1. Supply from voltage stabilizer

Fuel indicator

2. Heater series winding
3. Bimetal strip
4. Spring blade
5. Pointer

Tank unit

6. Resistance winding
7. Contact arm

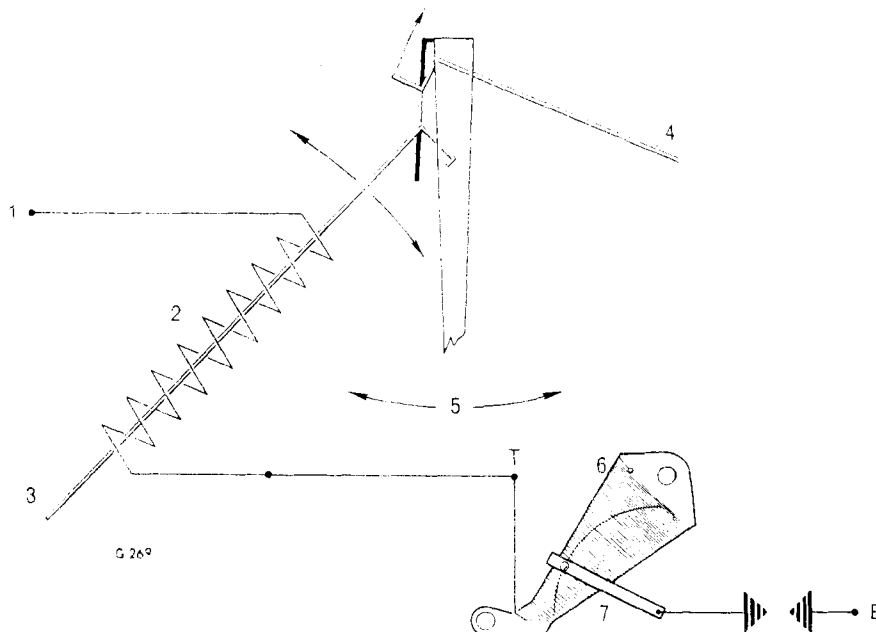


Fig. 49. System wiring diagram

TEMPERATURE INDICATION

Data

Temperature indicator

Manufacturer	..	..	..	..	..	..	..	..	Smiths
Smiths part No.	..	..	..	..	..	..	..	..	BT 2204/03
Stanpart No.	..	..	..	..	..	..	..	..	134243
Type	..	..	..	..	..	..	..	..	Bimetal resistance
Body diameter	..	..	..	..	..	..	..	..	52 mm.
Illumination	..	..	..	..	..	..	..	..	Internal

Transmitter

Manufacturer	..	..	..	..	..	..	..	..	Smiths
Smiths part No.	..	..	..	..	..	..	..	..	TT 4802/00
Stanpart No.	..	..	..	..	..	..	..	..	137705
Type	..	..	..	..	..	..	..	..	Semi conductor
Indication range	..	..	..	..	..	..	..	..	50—120 degs. centigrade
Thread	..	..	..	..	..	..	..	..	$\frac{3}{8}$ in.—18 UNF

For all other details refer to GT6—Group 6—Temperature indication

INTRODUCTION TO VITESSE SECTION 2

Information contained in this section details electrical equipment specific to the Vitesse Mark 2. For the full contents list of electrical equipment fitted to the Vitesse Mark 2 refer to page 6-101D at the front of Group 6.

CAUTION: THIS VEHICLE IS FITTED WITH A NEGATIVE EARTH ELECTRICAL SYSTEM. ENSURE THAT THE BATTERY EARTH LEAD IS ALWAYS CONNECTED TO THE BATTERY NEGATIVE TERMINAL.

EXERCISE CARE WHEN CONNECTING INTO CIRCUIT ANY ACCESSORY THAT MAY CONTAIN SILICON DIODES OR TRANSISTORS. IRREPARABLE DAMAGE MAY RESULT TO SUCH POLARITY SENSITIVE COMPONENTS IF INCORRECTLY FITTED.

NOTE: No polarity sensitive components are fitted to the vehicle during production. However, any of the following accessories—approved or unapproved by Leyland Triumph—may contain such components: Alternator systems, Automatic anti-dazzle mirrors, Automatic dipping systems, Automatic parking lamp systems, Electronic ignition systems, Electronic tachometers and Radios.

IGNITION DISTRIBUTOR

Data

Manufacturer	Lucas
Type/Series	2206
Lucas/Delco Remy part No.	41273
Stanpart No.	215512
Contact gap	0.014—0.016 in.
Rotation—viewed on rotor	Anticlockwise
Firing angles	60 ± 1 degs.
Dwell angle	35 ± 3 degs.
Open angle	25 ± 3 degs.
Moving contact spring tension	18—24 ozs.
Capacitor/Condenser capacity	0.18—0.23 mfd.
Engine firing order	1-5-3-6-2-4

Centrifugal advance

Check at decelerating speeds

Distributor r.p.m.	Degs. distributor advance		Crankshaft r.p.m.	Degs. crankshaft advance	
	Minimum	Maximum		Minimum	Maximum
Below 200	No advance to occur		Below 400	No advance to occur	
400	0	2	800	0	4
600	2	4	1200	4	8
900	5	7	1800	10	14
1000	6	8	2000	12	16
1500	8	10	3000	16	20
2000	10	12	4000	20	24
2500	12	12	5000	24	24

Vacuum advance

Ins. of mercury vacuum	Degs. distributor advance		Degs. crankshaft advance	
	Minimum	Maximum	Minimum	Maximum
Below 1	No advance to occur			
2	0	2.0	0	4
4	3.0	6.0	6	12
6	6.5	9.5	13	19
9	9.5	12.5	19	25
16	11.0	13.0	22	26

For all other details refer to Vitesse pages 6-110V—6-114V