

Engine - ID4 2.2L Diesel -

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Lubricants, Fluids and Sealers		Specification	
Item			
SAE 5W-30 engine oil (With DPF)		5W/30 – WSS-M2C934-B	
SAE 5W-30 engine oil (Without DPF)		5W/30 – WSS-M2C913-B or C	
Sealant – oil pan, camshaft carrier and engine front cover		WSE-M4G323-A4	
Cylinder Head Dimensions			
Description		mm	
Maximum distortion – measured longitudinally and diagonally		0.10	
Peak to valley height of mating surface		0.02	
Cylinder head gasket thickness			
Piston protrusion of 0.310 - 0.400 mm		1.1 (one tooth)	
Piston protrusion of 0.401 - 0.450 mm		1.15 (two teeth)	
Piston protrusion of 0.451 - 0.500 mm		1.2 (three teeth)	
Oil pressure specifications			
Description		bar	
Minimum oil pressure at idle speed		1.25	
Minimum oil pressure at 2000 rpm		2.0	
Description		Nm	lb-ft
Transmission to engine bolts	40	30	
Engine mount nuts	80	59	
Engine mount bolts	80	59	
Engine mount bracket bolts	63	46	
Valve cover bolts	10	7	
• Rocker shaft bolts			
Stage 1	10	7	
Stage 2	Further 30 degrees		
Timing chain guide bolts	15	11	
Timing chain tensioner nut	15	11	
Timing chain tensioner bolts	15	11	
Oil pump chain tensioner bolts	22	16	
Camshaft sprocket bolts	35	24	
Fuel injection pump sprocket bolts	33	26	
Generator bolts	48	35	
Generator mounting bracket bolts	25	18	
Exhaust gas recirculation (EGR) valve to EGR valve outlet tube bolts	10	7	
EGR valve to EGR cooler bolts	23	17	
Exhaust manifold to EGR cooler bolts	23	17	
Intake manifold bolts	15	11	
Intake manifold to EGR valve outlet tube bolts	10	7	
Coolant pump bolts	23	17	
Oil level indicator tube bolt	10	7	
Oil pump pickup tube bolts	10	7	
Oil filter housing assembly bolts	23	17	
Oil pump bolts	10	7	
Oil pan drain plug	23	17	
Oil pressure switch	15	11	
Oil pan bolts			
Stage 1	7	5	
Stage 2	14	10	
Coolant manifold bolts	10	7	
EGR cooler to cylinder head bolts	23	17	
• Cylinder head bolts	A	-	
Engine front cover bolts	14	10	
Engine front cover nuts	10	7	
Glow plugs	10	7	
Power steering pump bolts	22	17	
Power steering pump bracket bolts	23	17	
Exhaust manifold bolts	40	30	
• Exhaust manifold nuts	40	30	
• Exhaust manifold studs	20	15	
Turbocharger oil return tube bolts	10	7	

Turbocharger oil return tube clamp bolt	22	16
Turbocharger oil supply line banjo bolt	35	26
Engine lifting eye bolts	22	16
Cranksaft position sensor (CKP) bolt	7	5
• Cranksaft pulley bolts		
Stage 1	45	33
Stage 2	Further 120 degrees	
Cranksaft rear oil seal carrier bolts	10	7
• Flywheel bolts		
Stage 1	25	18
Stage 2	40	30
Stage 3	Further 48 degrees	
• Cranksaft main bearing cap bolts		
Stage 1	45	33
Stage 2	80	59
Stage 3	Further 105 degrees	
• Connecting rod bearing cap bolts		
Stage 1	30	22
Stage 2	Further 100 degrees	
Ladder frame bolts	23	17
Camshaft carrier bolts	A	-
Fuel injector clamp bolts		
Stage 1	6	4
Stage 2	Further 180 degrees	

• New nuts/bolts/studs must be installed

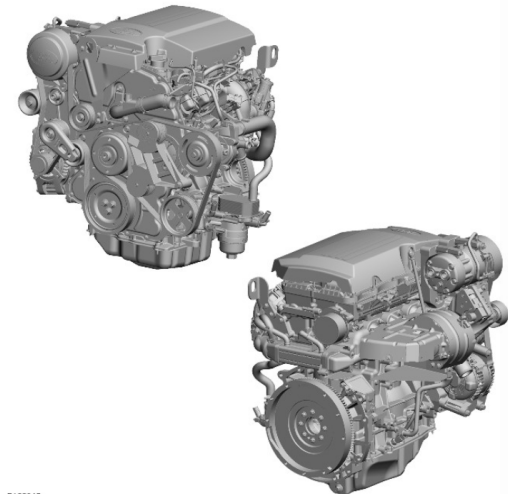
A - Refer to the procedure in this section

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Description and Operation

EXTERNAL VIEW



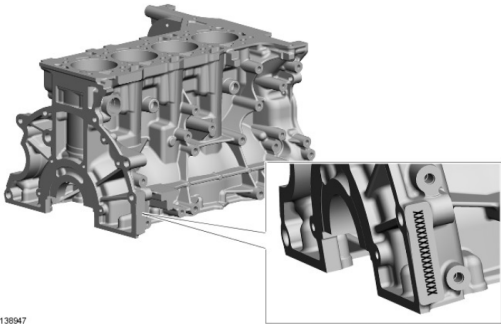
E138945

OVERVIEW

The 2.2 liter diesel engine is a 4 cylinder unit with common rail fuel injection and with four valves per cylinder operated by dual overhead camshafts. The unit is liquid cooled and turbocharged.

The cylinder block is manufactured in Compacted Graphite Iron (CGI) and is coupled with a separate aluminum 'ladder-frame' skirt stiffener to provide a lightweight, compact and very stiff bottom end of the engine. The cylinder head and camshaft carrier are cast aluminum. The single-piece oil pump is formed from pressed steel. The exhaust manifold is cast iron and includes connections for the turbocharger and EGR (exhaust gas recirculation) cooler. A plastic acoustic cover is fitted over the upper engine to absorb engine-generated noise.

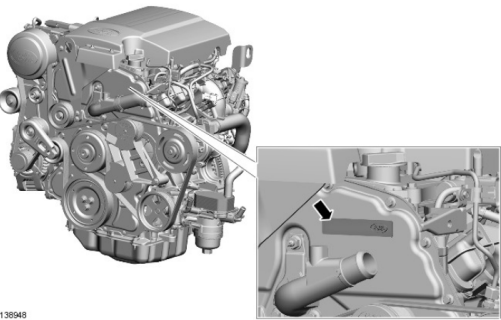
Engine Structure



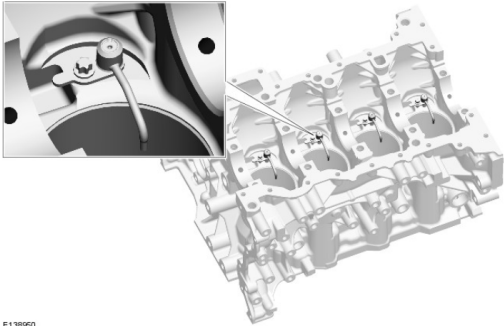
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The alpha-numeric engine type number (5 digits) and numeric identification number (12 digits) are stamped on the rear right side of the cylinder block. These numbers are repeated on a tamper-proof engine identification label on the timing cover.

Engine Identification Label



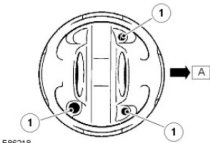
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E138950

Jets located in the cylinder block provide piston and piston pin lubrication and cooling. These jets spray oil on to the inside of the piston. The oil then flows through an internal wave shaped oil cooling channel to help cool the piston crown.

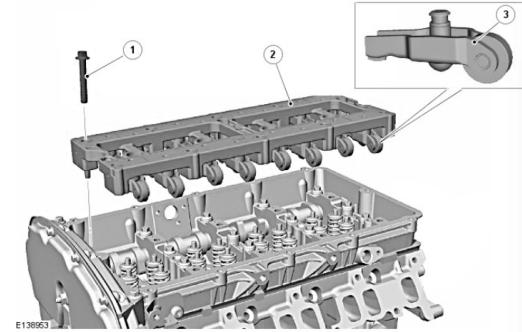
Piston Oil Cooling



E86216

Item	Part Number	Description
A	-	Front of the engine
1	-	Oil cooling channels

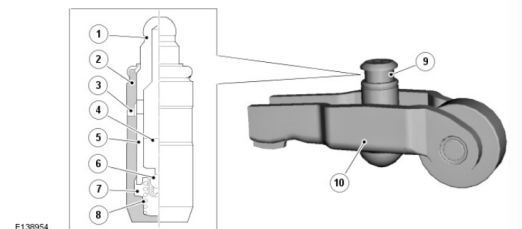
CRANKSHAFT



Item	Part Number	Description
1	-	Bolt (10 off)
2	-	Frame
3	-	Rocker assembly (16 off)

The valves are operated through roller-type rocker arms with integrated hydraulic lash adjusters, actuated by the camshaft lobes. The use of this type of actuation method helps reduce friction in the valve operating mechanism. The rocker arms are installed in a frame located in the camshaft carrier and secured with 10 bolts.

Lash Adjuster



Item	Part Number	Description
1	-	Plunger cap
2	-	Hydraulic lash adjuster body
3	-	Oil hole

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