




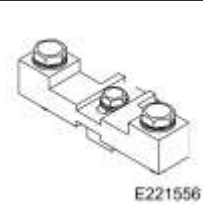

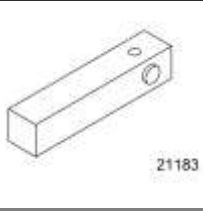


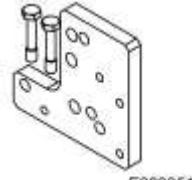


Engine

Special Tool(s) / General Equipment

 <p>15046</p>	205-069 Dial Indicator Gauge (Metric)
 <p>15022a</p>	205-070 Holding Fixture, Dial Indicator Gauge
 <p>E141998</p>	303-1611 Torque Multiplier
 <p>E244335</p>	303-1611-03 Adapter for 303-1611, Torque Multiplier
 <p>E221551</p>	303-1637 Holding Tool, Crankshaft
 <p>E221556</p>	303-1643 Locking Tool, Flywheel
 <p>E224683</p>	303-1650 Mounting Device, Timing Belt
 <p>21183</p>	303-432 Holding Fixture, Dial Indicator Gauge (Cylinder Liner Protrusion)

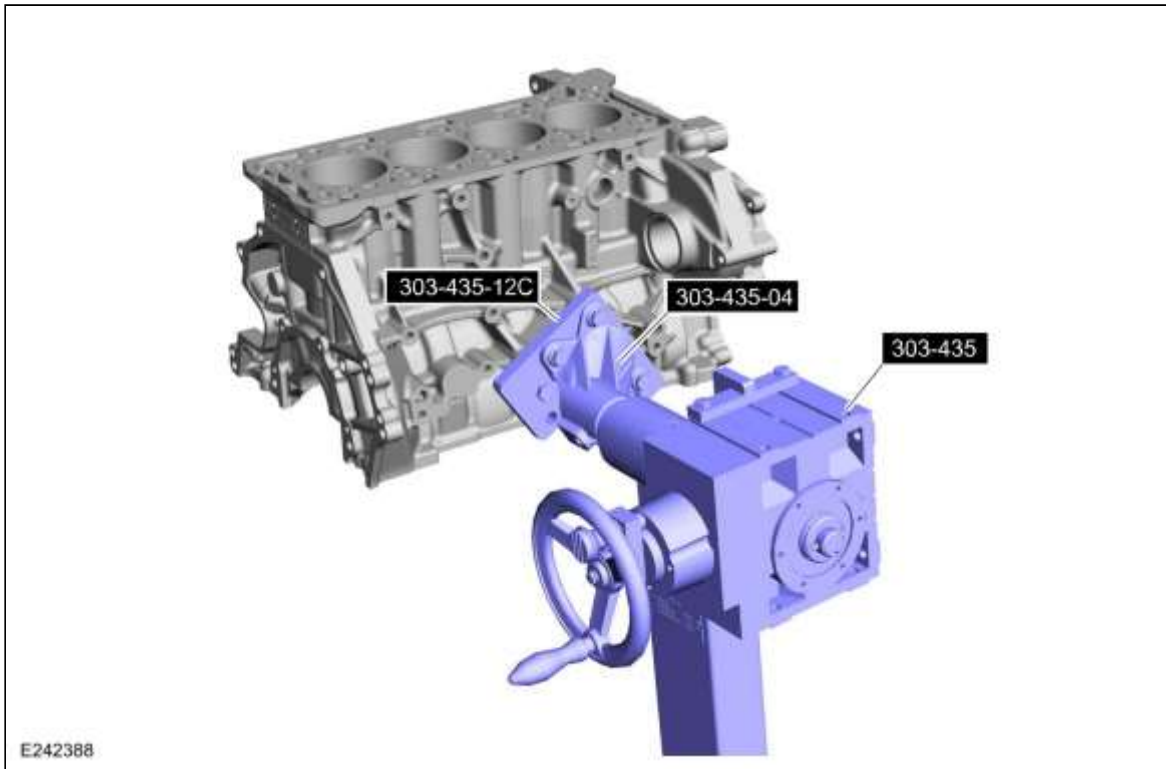
 <p>E252718</p>	<p>303-435 Mounting Stand</p>
 <p>21064</p>	<p>303-435-04 Mounting Bracket for 303-435</p>
 <p>E229951</p>	<p>303-435-12C Mounting Plate</p>
<p>Plastic Scraper</p>	
<p>6 mm Drill Bit</p>	
<p>1/2 Inch Square Drive Breaker Bar</p>	
<p>4 mm Drill Bit</p>	

Materials

Name	Specification
Primer H-BW CU7J-BNDRT-AA/CA	-
Silicone Sealant LB-AX Silicone Sealant LB-AX	WSS-M4G323-A10
Reinigingsmiddel voor remmen 3U7J-2C410-AB/BA	-

NOTICE: Extreme cleanliness must be exercised when handling the components.

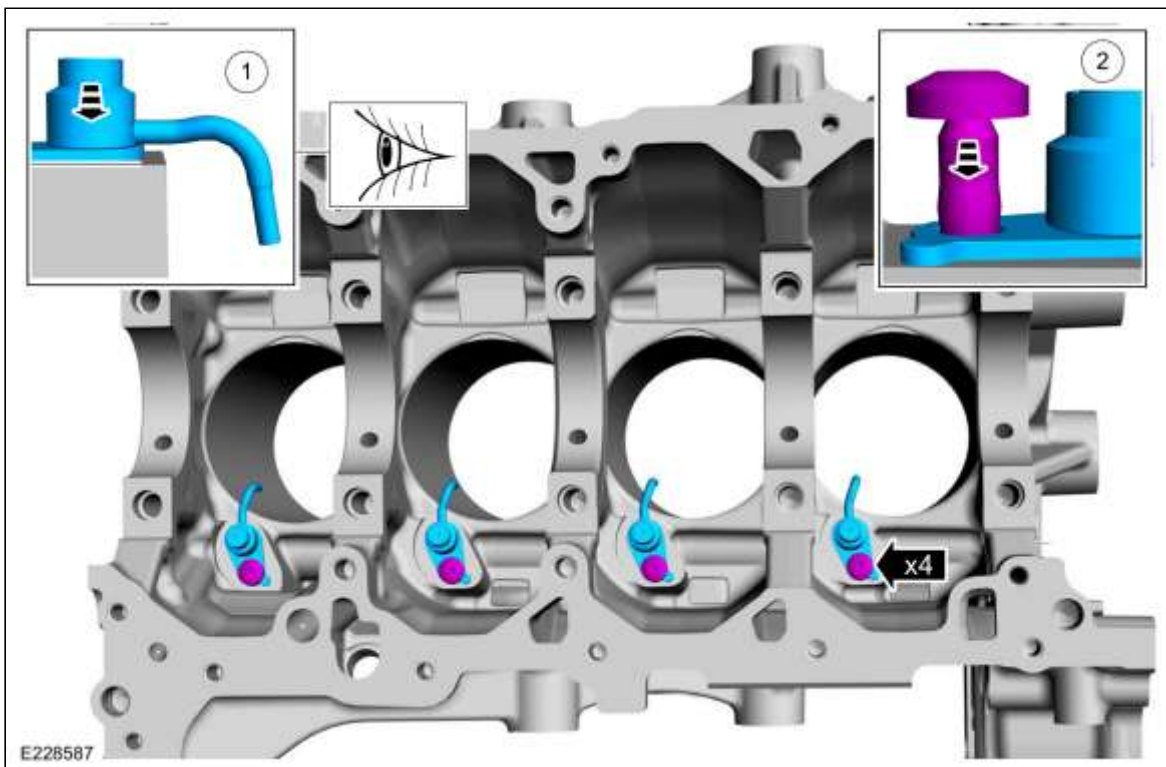
1. Install Special Service Tool: 303-435 Mounting Stand. , 303-435-04 Mounting Bracket for 303-435. , 303-435-12C Mounting Plate.



2. **NOTE:** Make sure that new bolts are installed.

NOTE: Make sure that the components are correctly located.

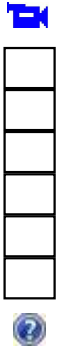
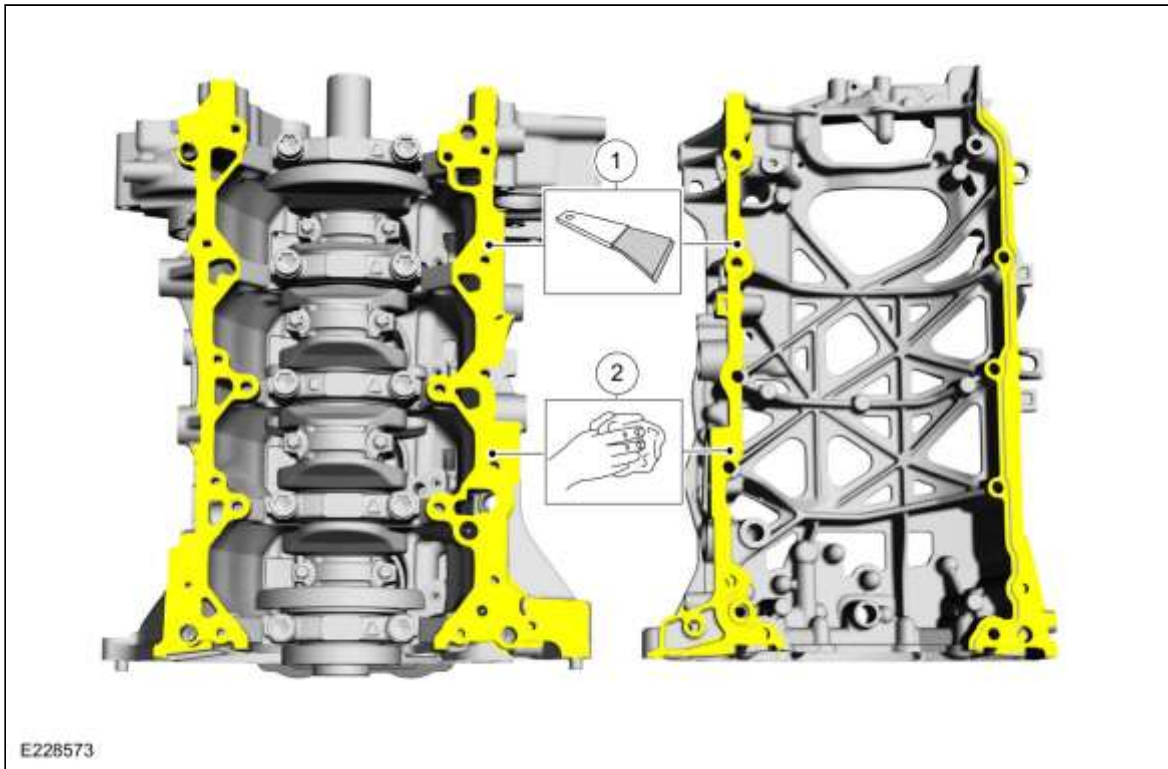
Torque: 10 Nm



3. **NOTE:** Make sure that the mating faces are clean and free of foreign material.

1. Use the General Equipment: Plastic Scraper

2. *Material:* Reinigingsmiddel voor remmen / 3U7J-2C410-AB/BA



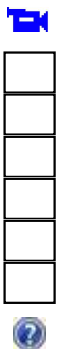
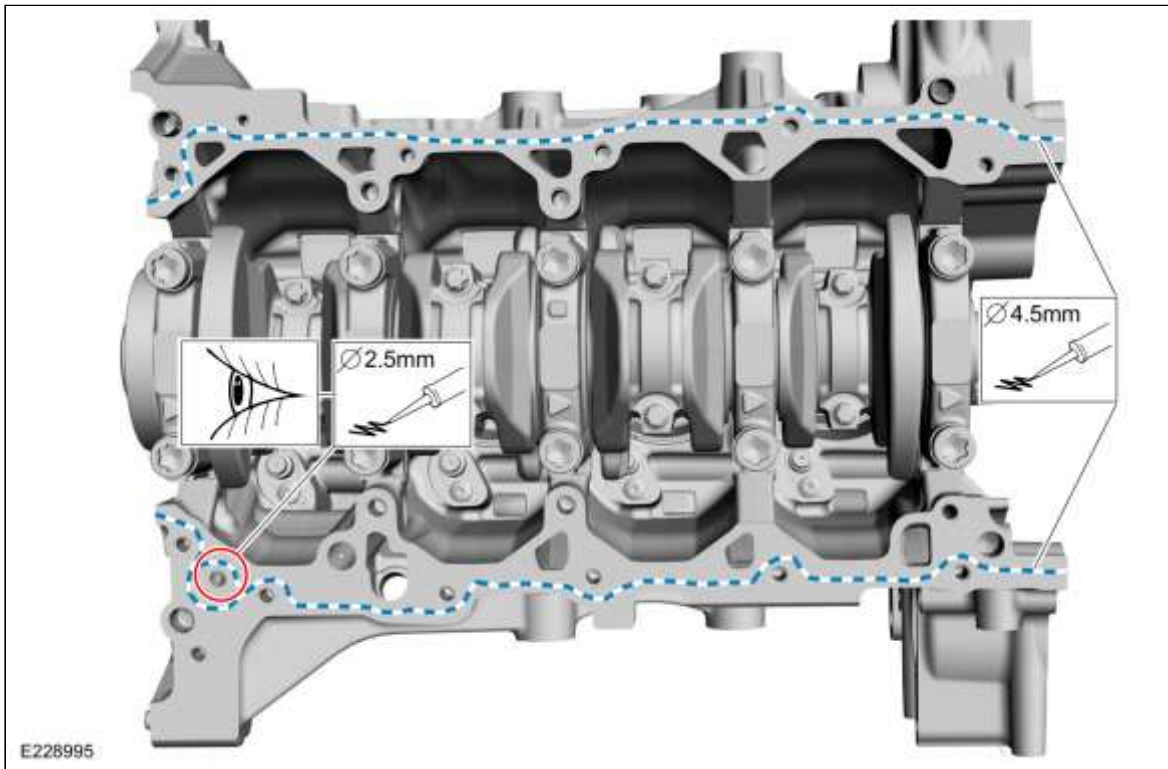
4. **NOTE:** The component must be installed within 5 minutes of applying the sealant.



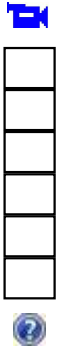
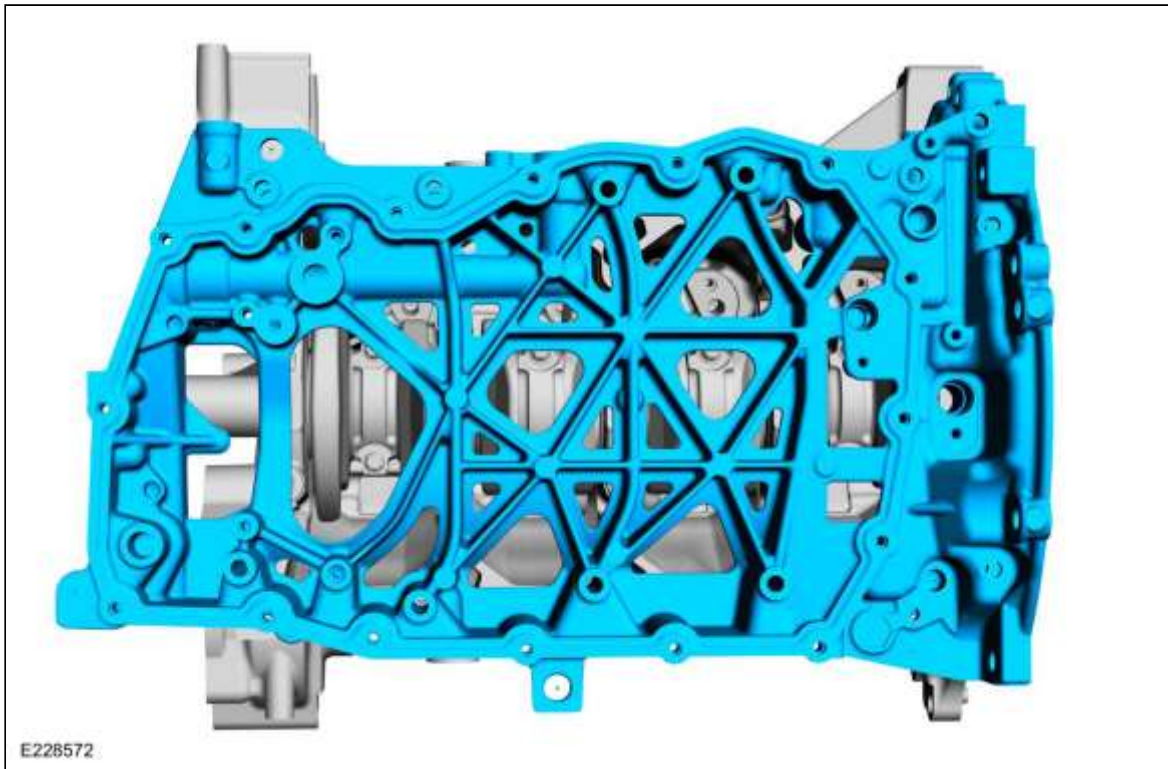
Complete this step within: 5min

Material: Silicone Sealant LB-AX / Silicone Sealant LB-AX (WSS-M4G323-A10)

Wait 5 min

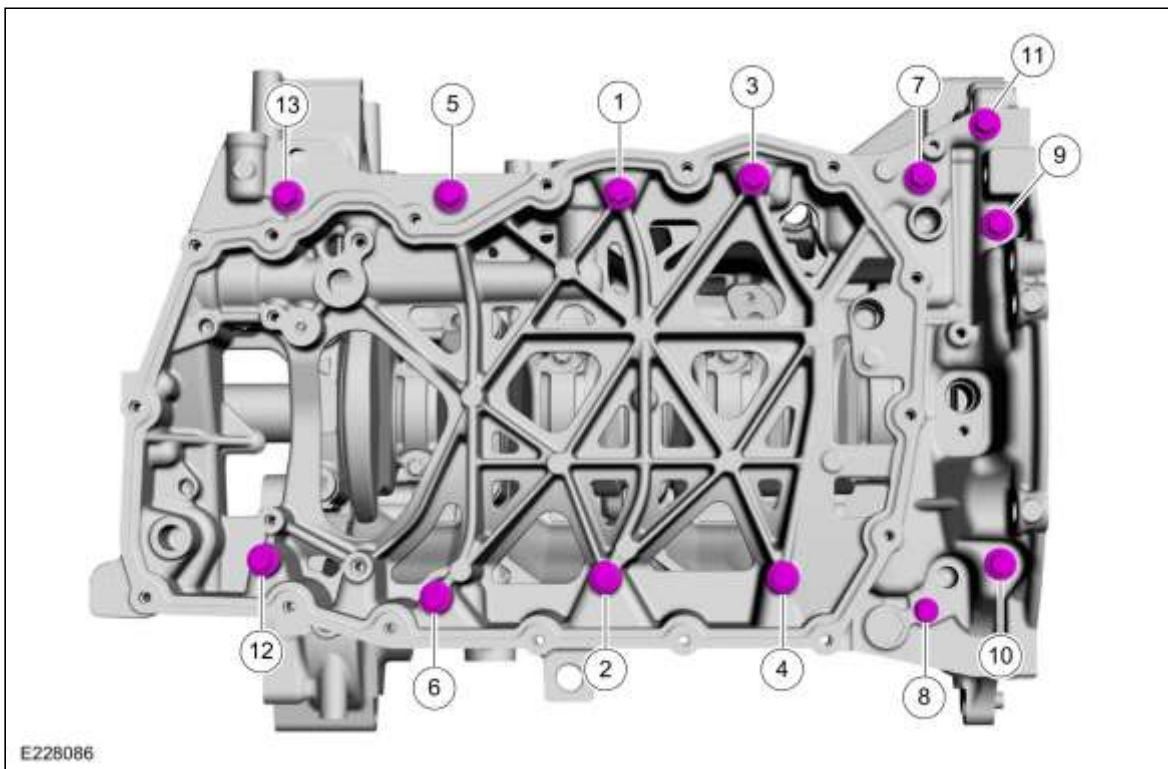


5.



6. **NOTE:** Only tighten the bolts finger tight at this stage.

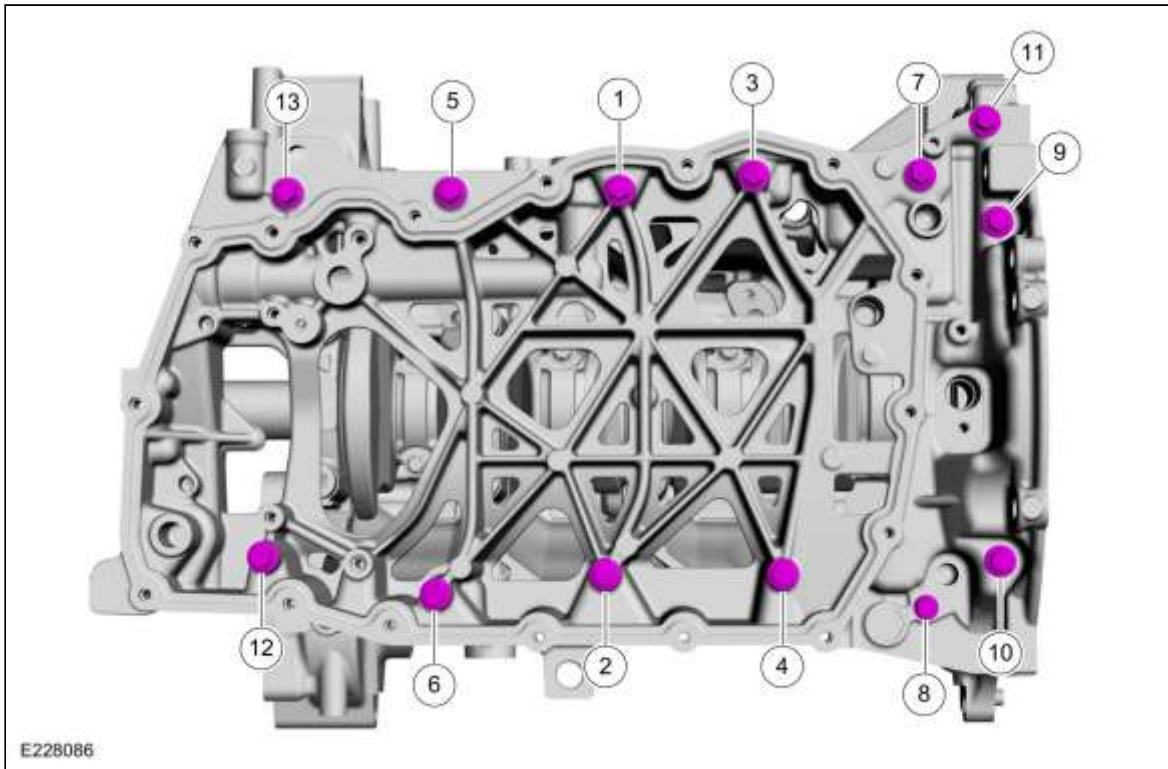
6. Make sure that a new bolt is installed on position 8.



7. 6. Make sure that a new bolt is installed on position 8.

Torque:

1-13: 5 Nm



8. 6. Make sure that a new bolt is installed on position 8.

Torque:

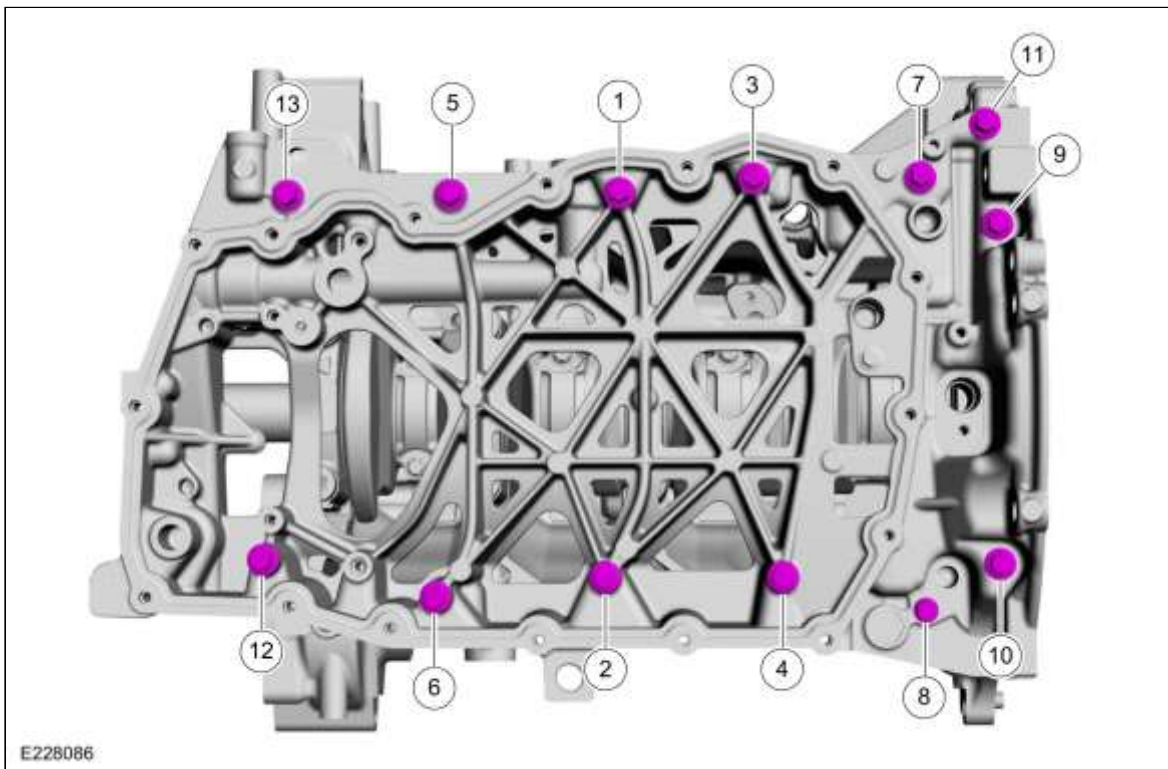
1-7:: 23 Nm

8:: 13 Nm

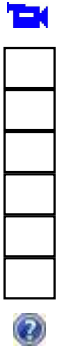
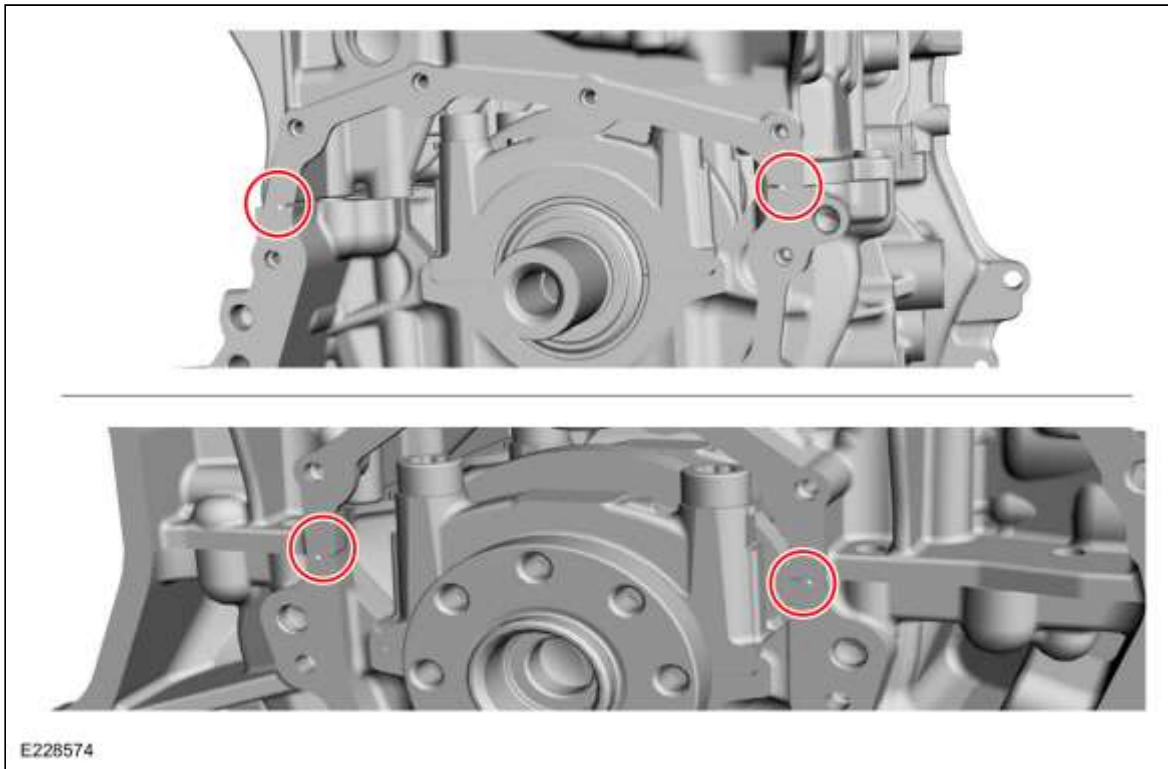
9-10:: 23 Nm

11:: 13 Nm

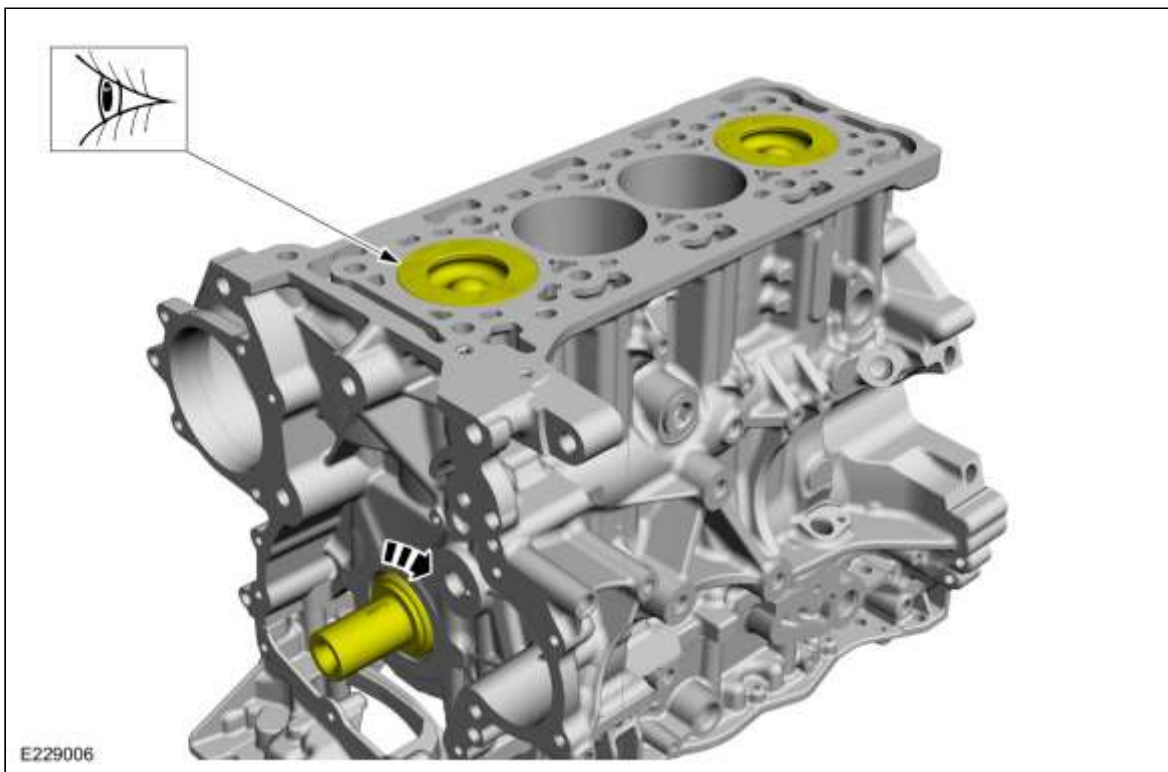
12-13:: 23 Nm



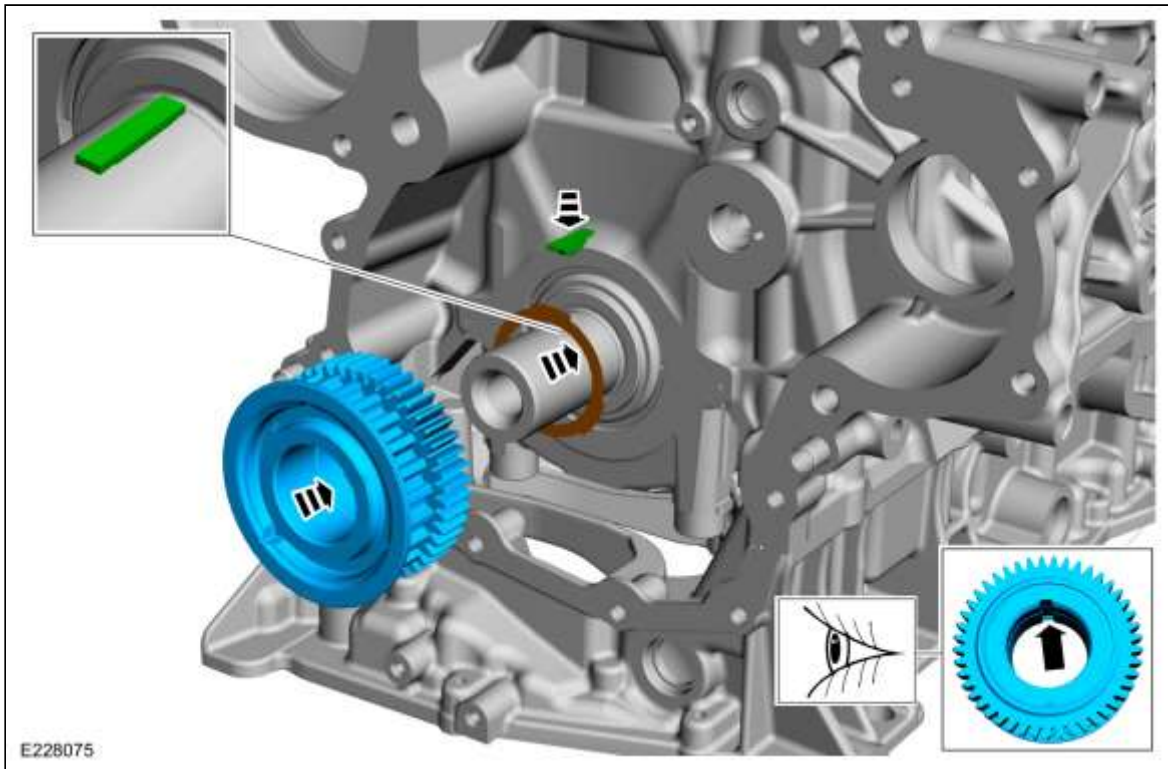
9. **NOTICE:** Make sure that no excess sealant residue is evident.



10. Rotate the crankshaft until piston No. 1 is at top dead center (TDC).

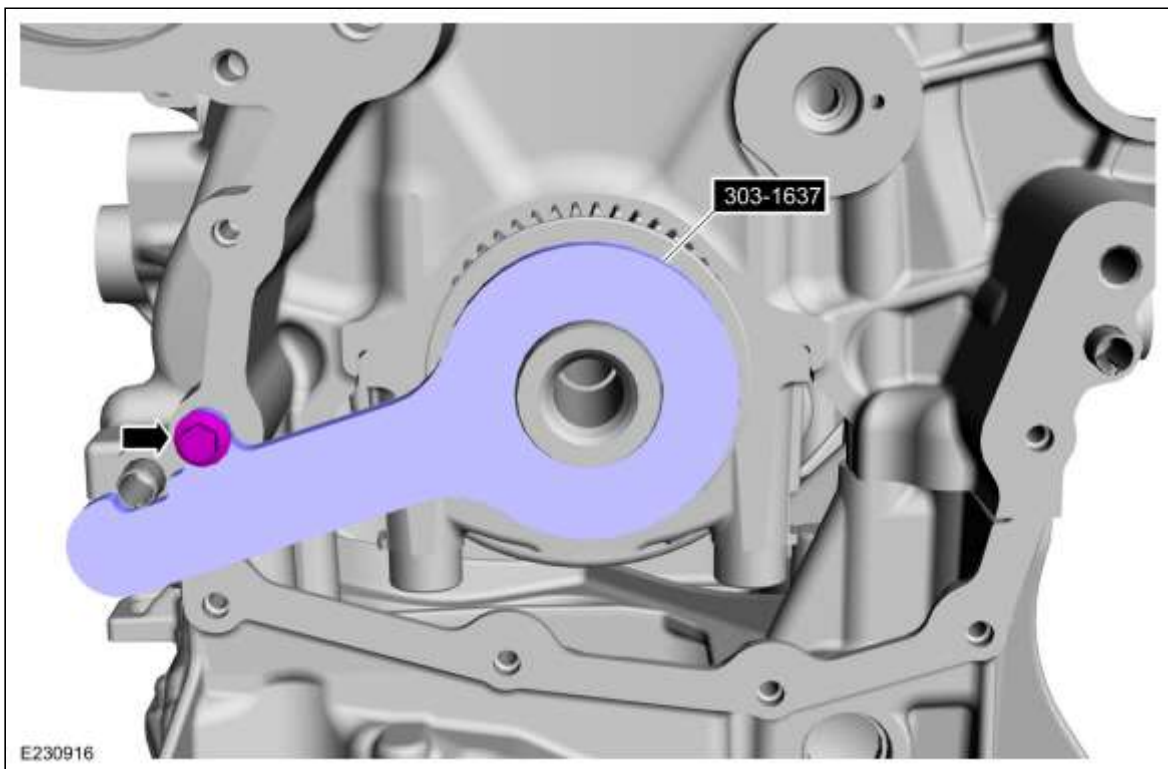


11.



12. **NOTICE:** The special tool must only be used to align the crankshaft timing.

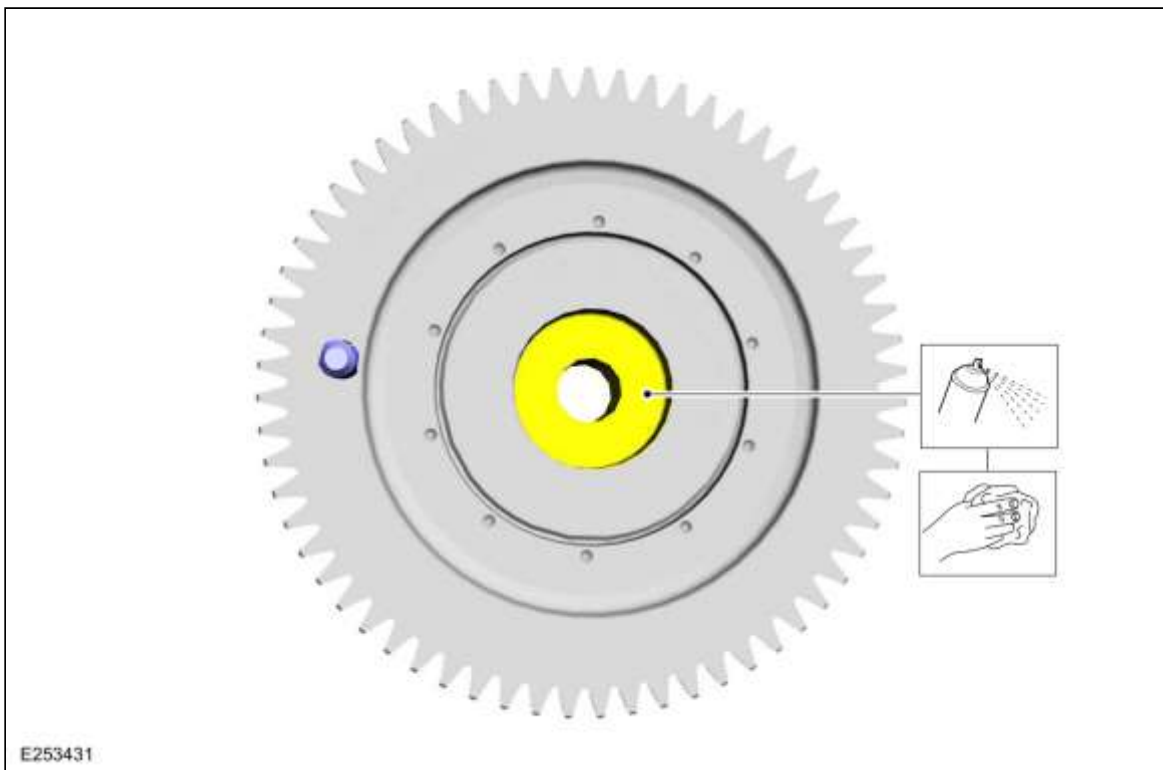
Install Special Service Tool: 303-1637 Holding Tool, Crankshaft.



13. **NOTICE:** Make sure that the surface is clean and free of foreign material.

NOTICE: Use lint free cloth.

Material: Reinigingsmiddel voor remmen / 3U7J-2C410-AB/BA



14.
 1. **NOTICE: Make sure that the component aligns with the installation mark.**
 2. **NOTICE: Make sure that a new bolt is installed.**

Torque:

Standard bolts torque:

Stage 1: 60 Nm

Stage 2: Loosen: 90°

Stage 3: 20 Nm

Stage 4: 45 Nm

Stage 5: 45°

Self-locking bolts torque:

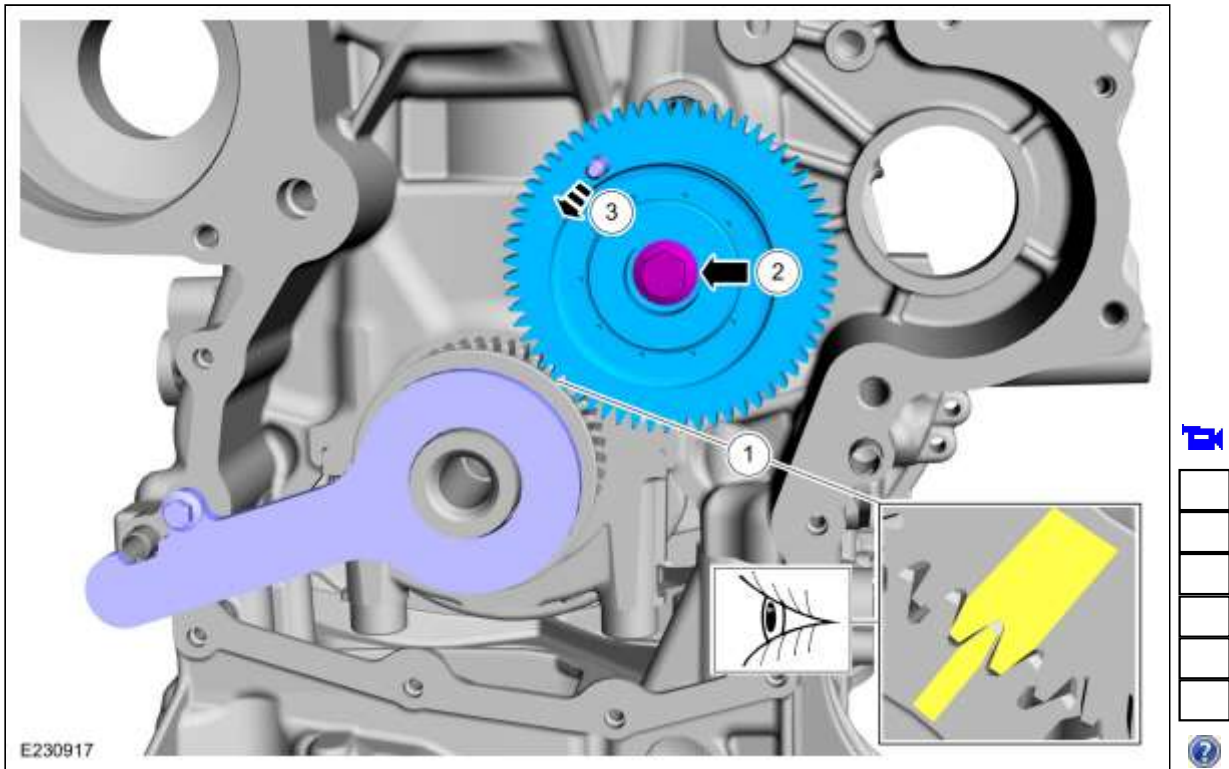
Stage 6: 60 Nm

Stage 7: Loosen: 90°

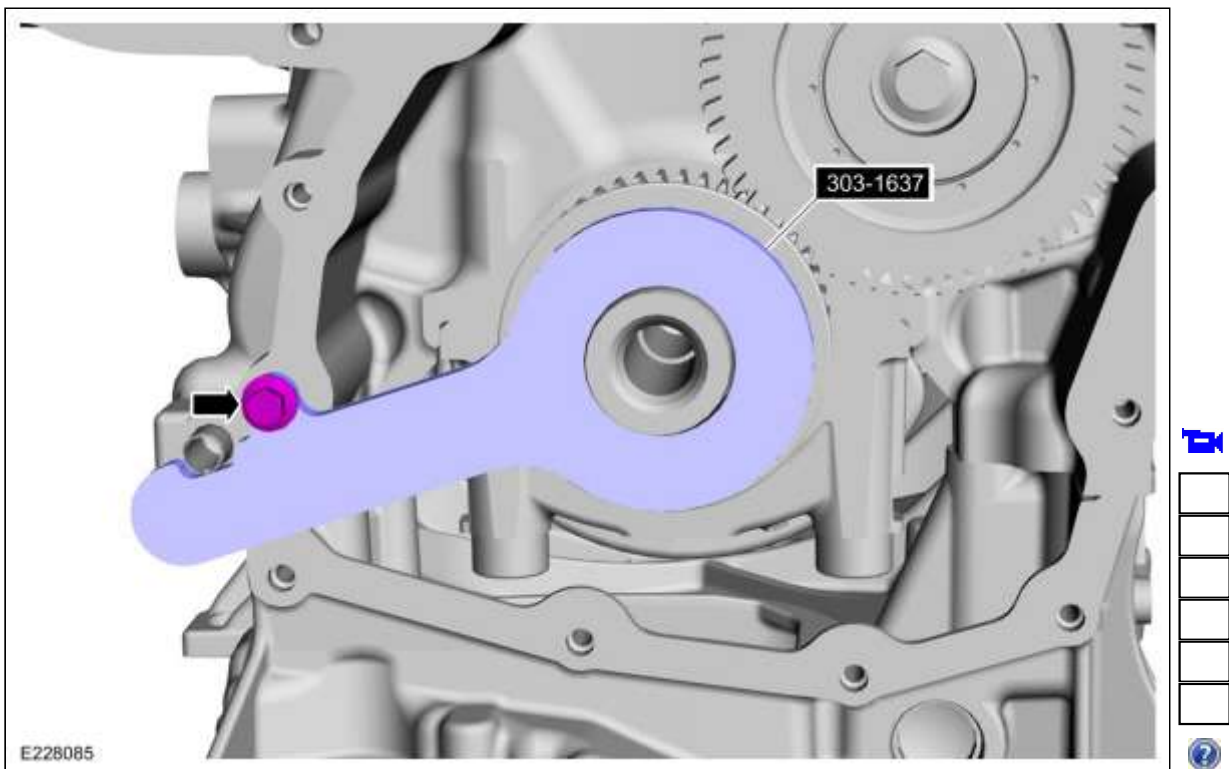
Stage 8: 20 Nm

Stage 9: 30 Nm

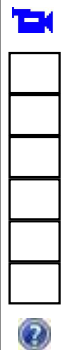
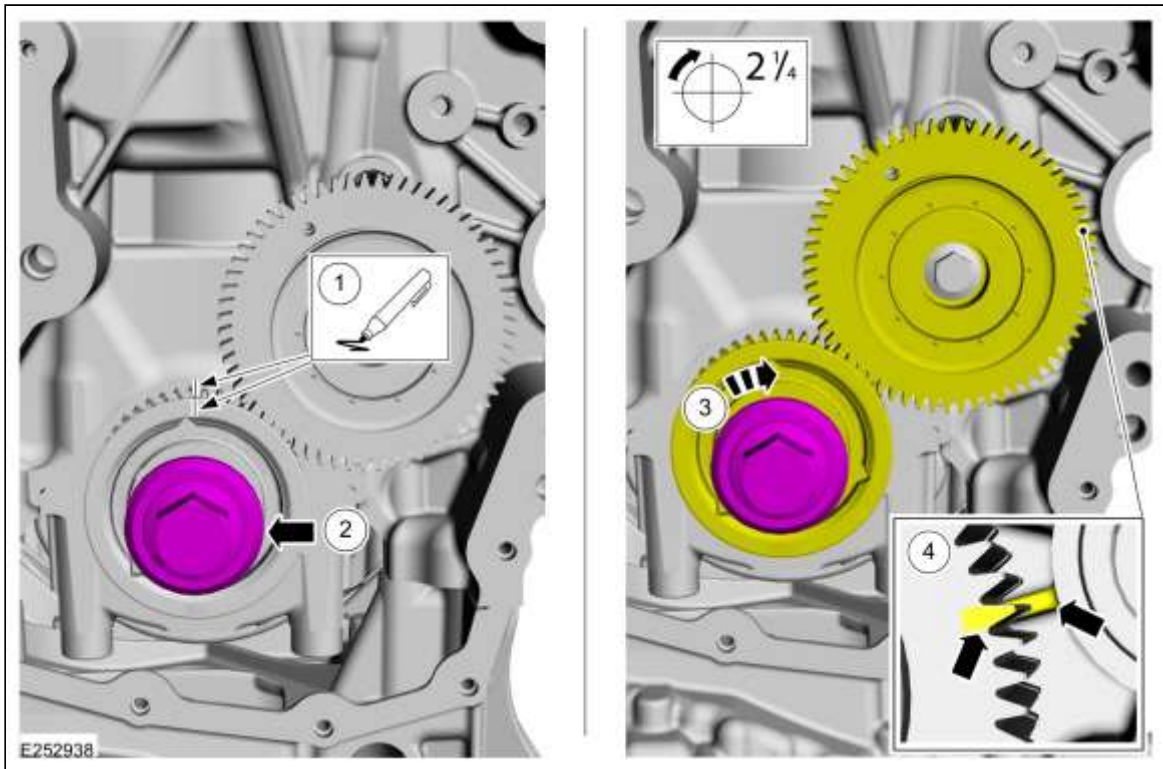
Stage 10: 60°



15. Remove Special Service Tool: 303-1637 Holding Tool, Crankshaft.



16.
 1. **NOTICE:** Make sure that the crankshaft is not rotated
Mark the position of the component.
 2. **NOTE:** Only tighten the bolt finger tight at this stage.
 3. **NOTICE:** Only rotate the crankshaft clockwise.



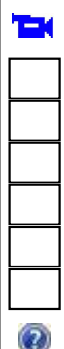
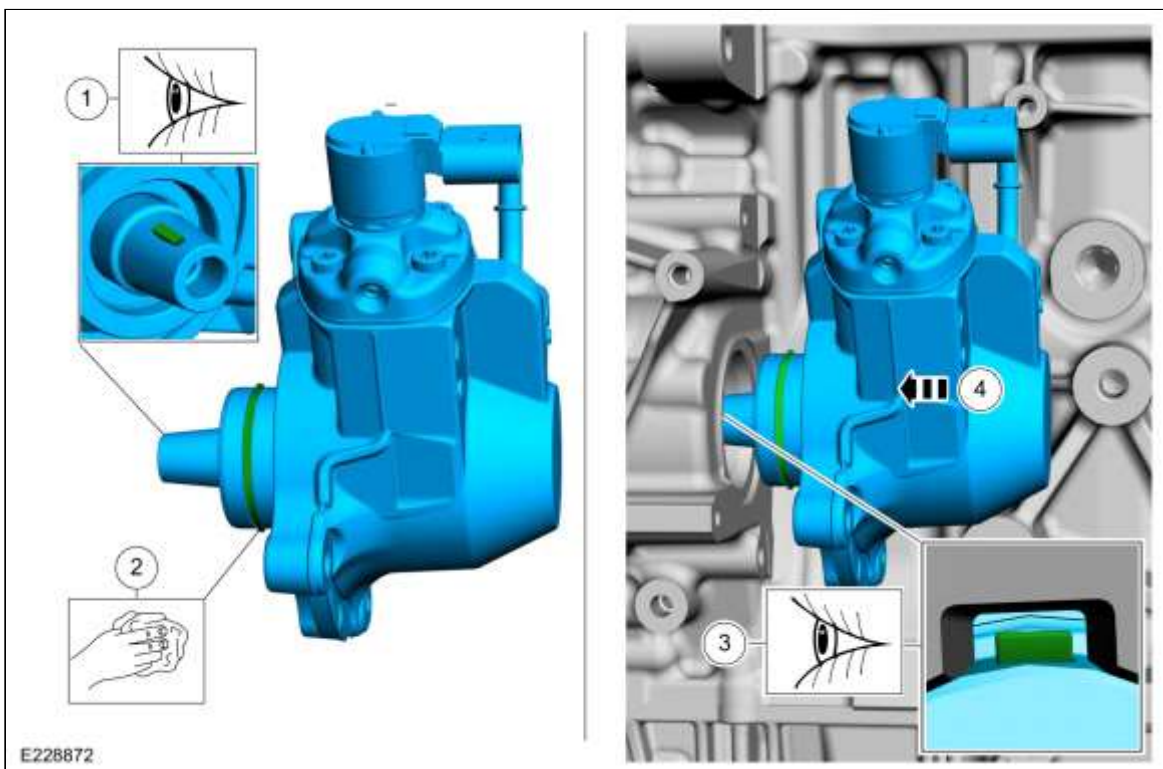
17. **NOTICE:** Extreme cleanliness must be exercised when handling the component.

NOTICE: Use lint free cloth.

NOTE: Make sure that the seal is correctly located.

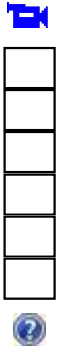
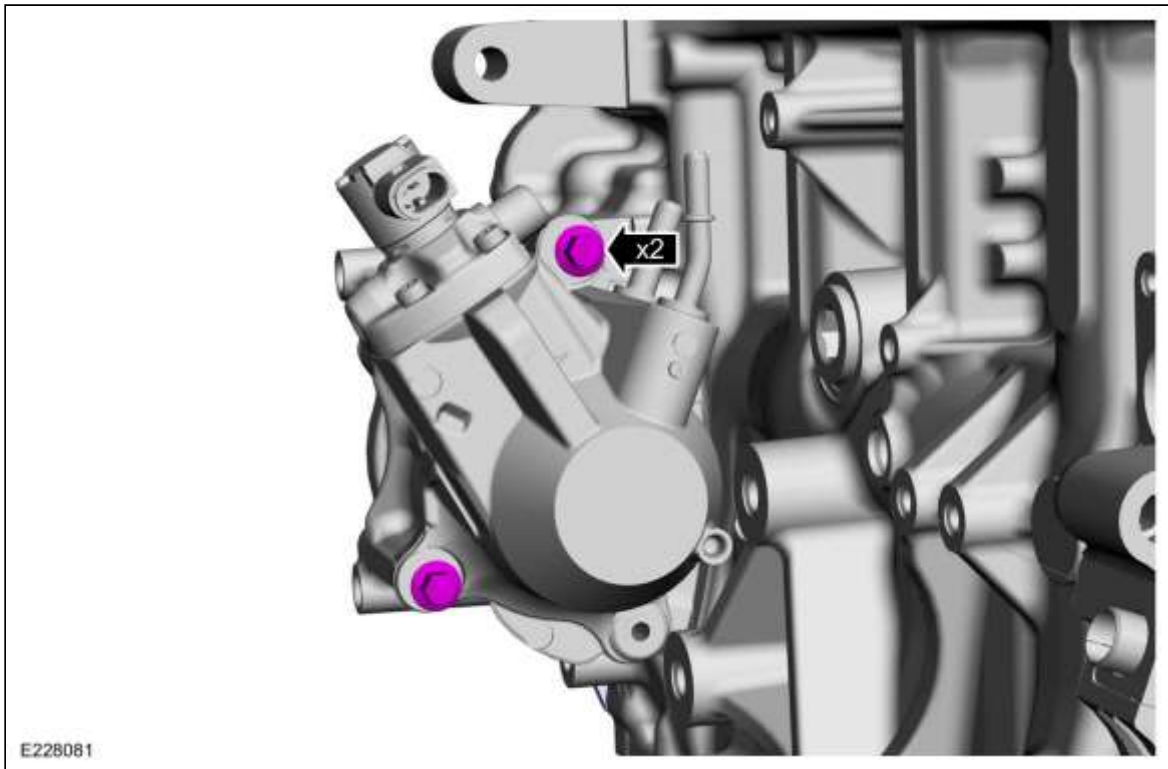
NOTE: Use a new seal.

NOTE: The component must be installed by hand before final tightening.

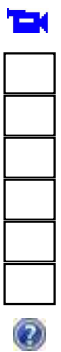
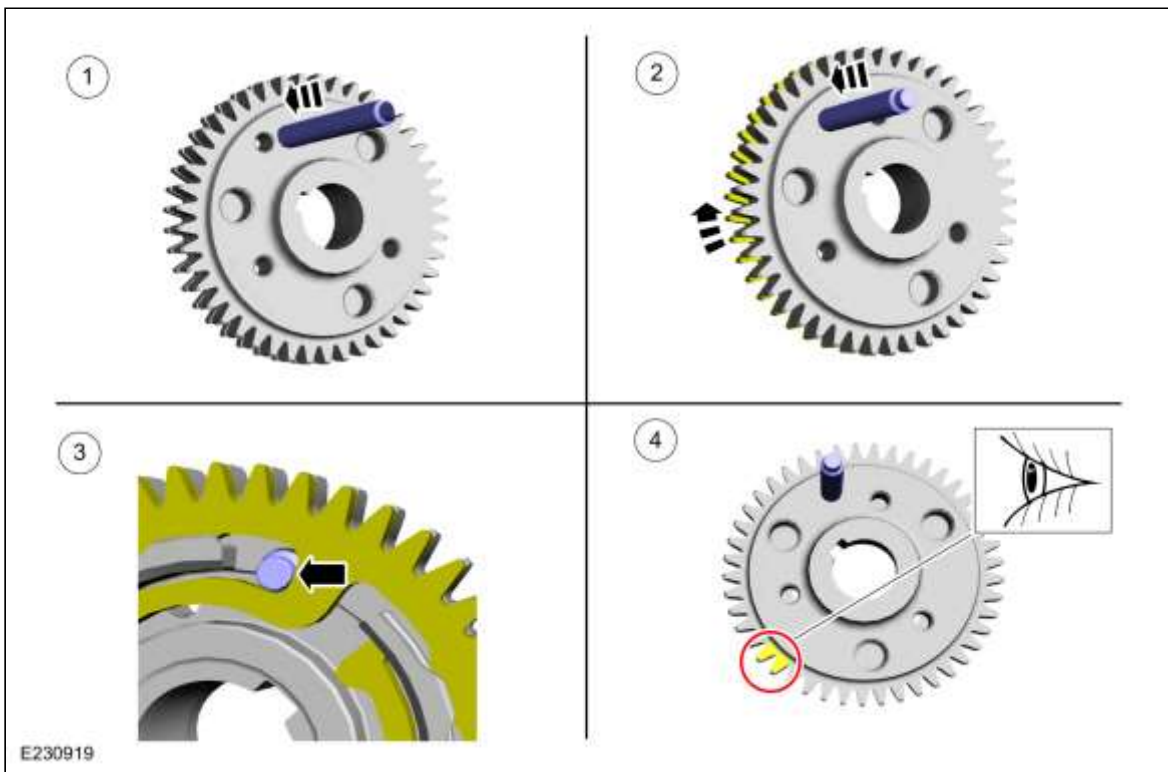


18. **NOTE:** Make sure that new bolts are installed.

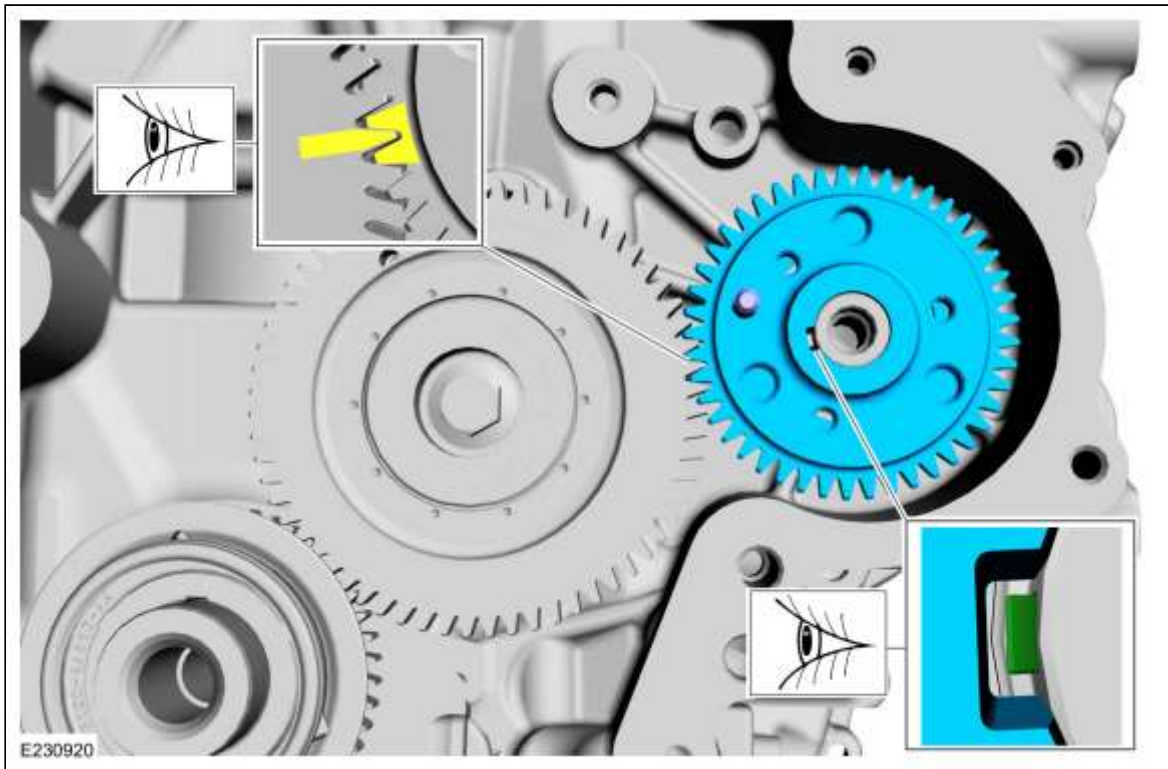
Torque: 23 Nm



19. Install the General Equipment: 4 mm Drill Bit



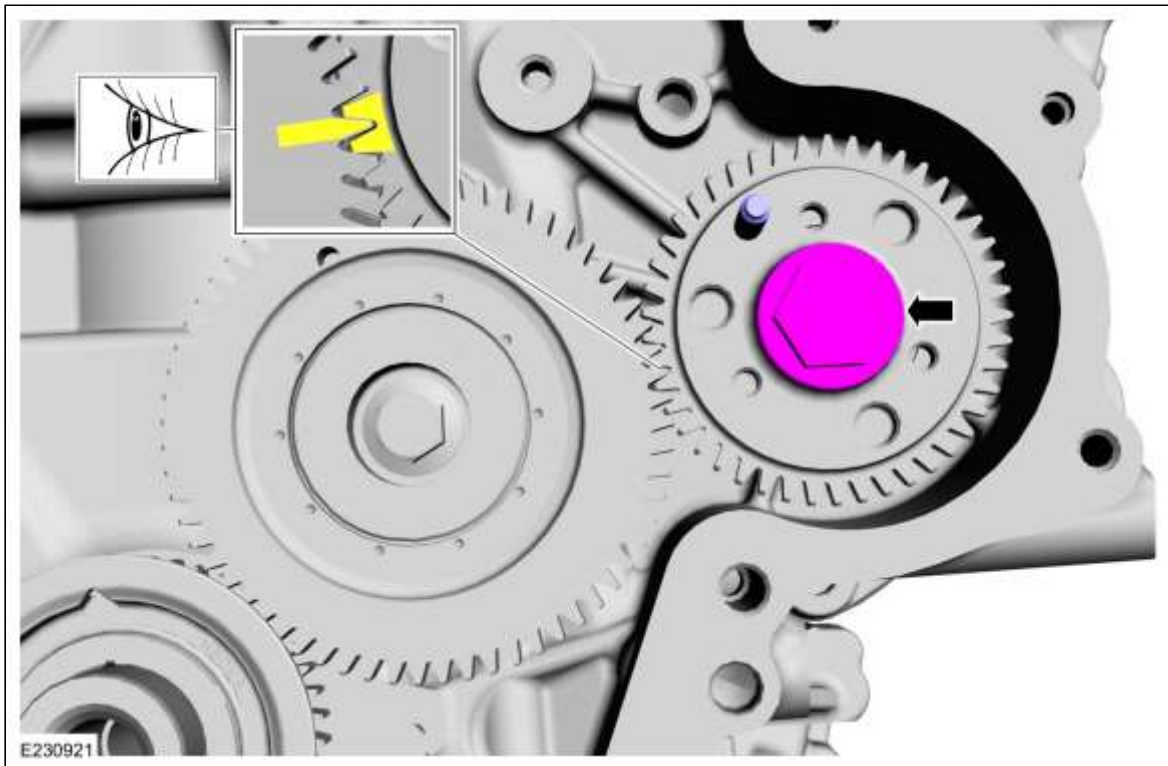
20. **NOTE:** Make sure that the installation marks are aligned.



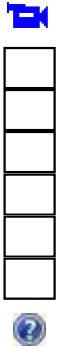
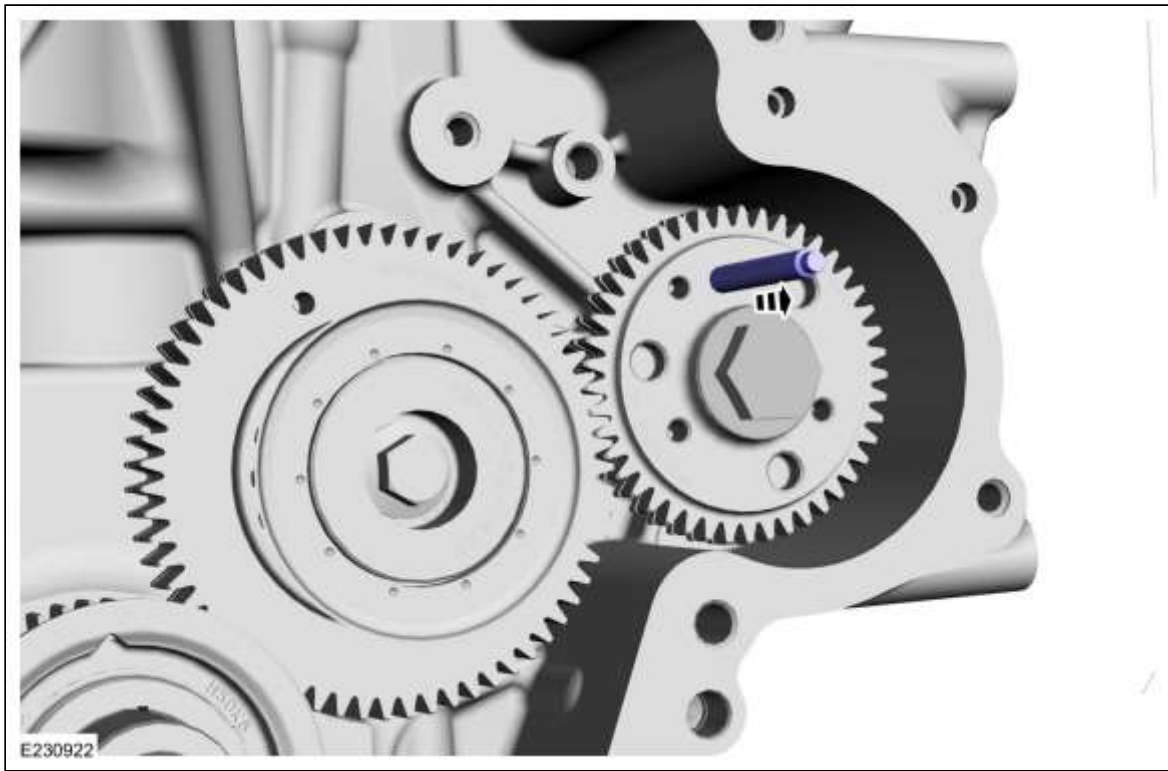
21. **NOTE:** Make sure a new bolt is installed.

NOTE: Make sure that the installation marks are aligned.

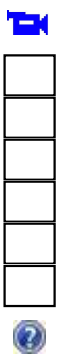
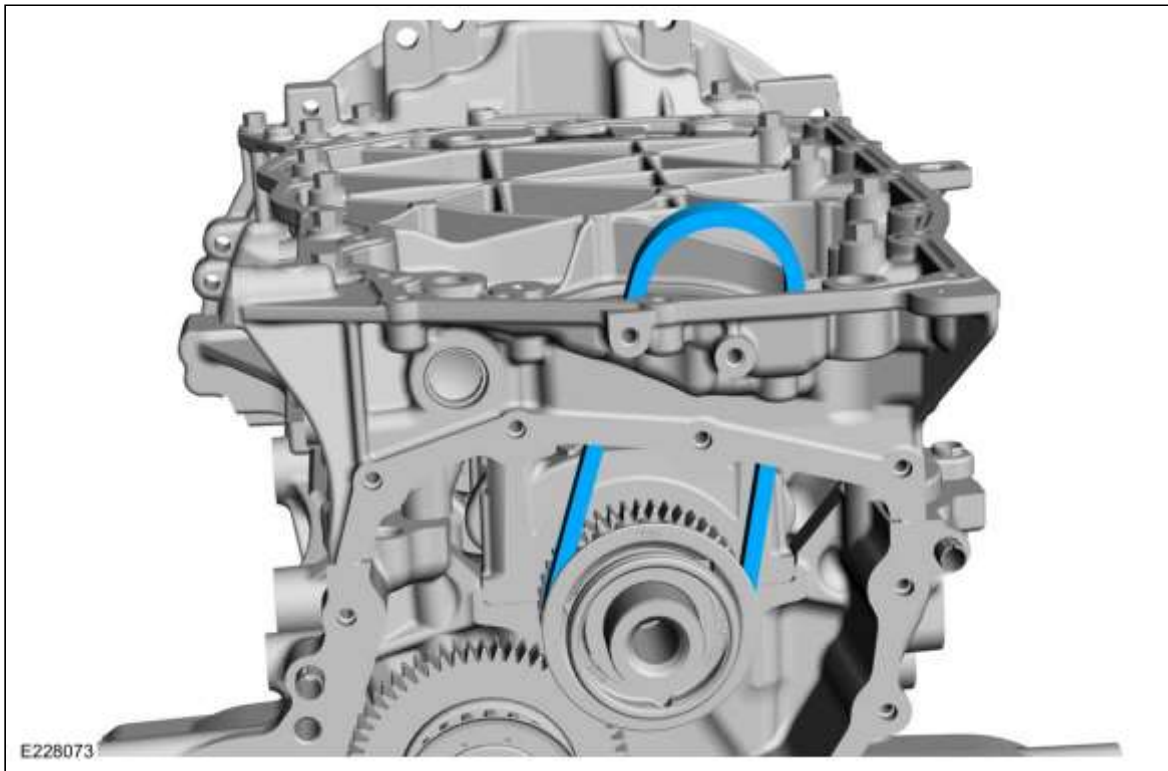
NOTE: Only tighten the bolt finger tight at this stage.



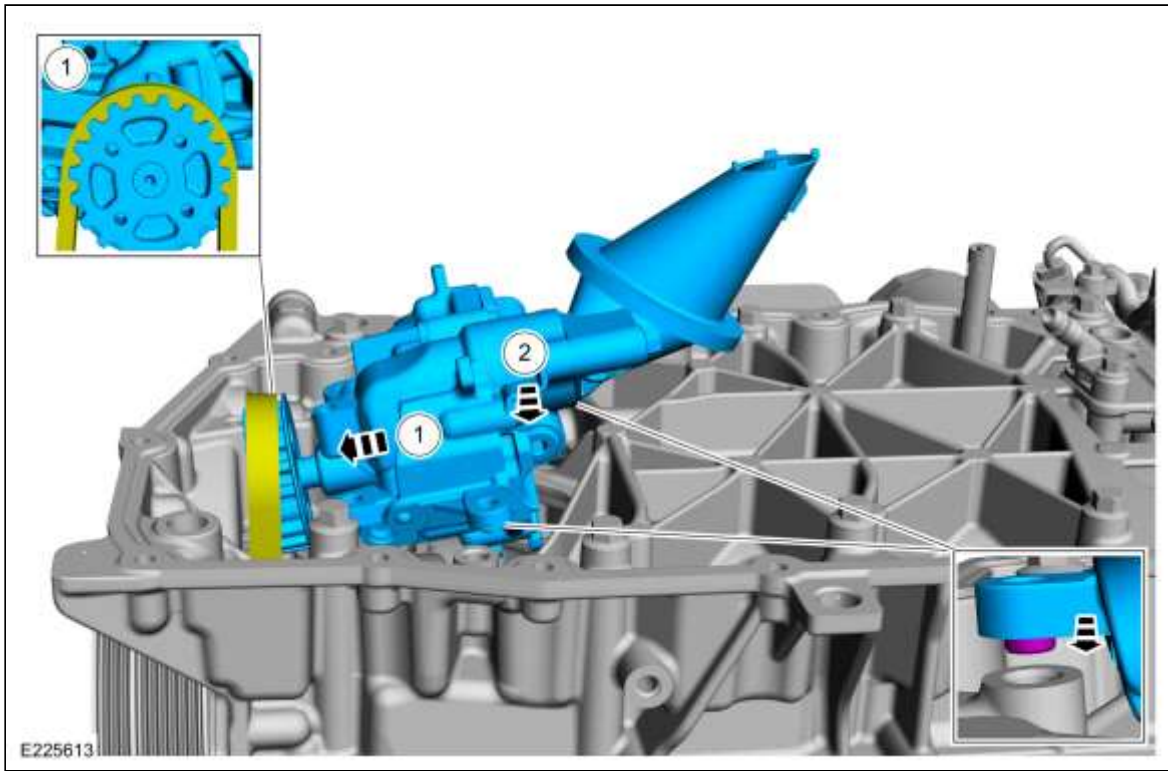
22. Remove the General Equipment: 4 mm Drill Bit



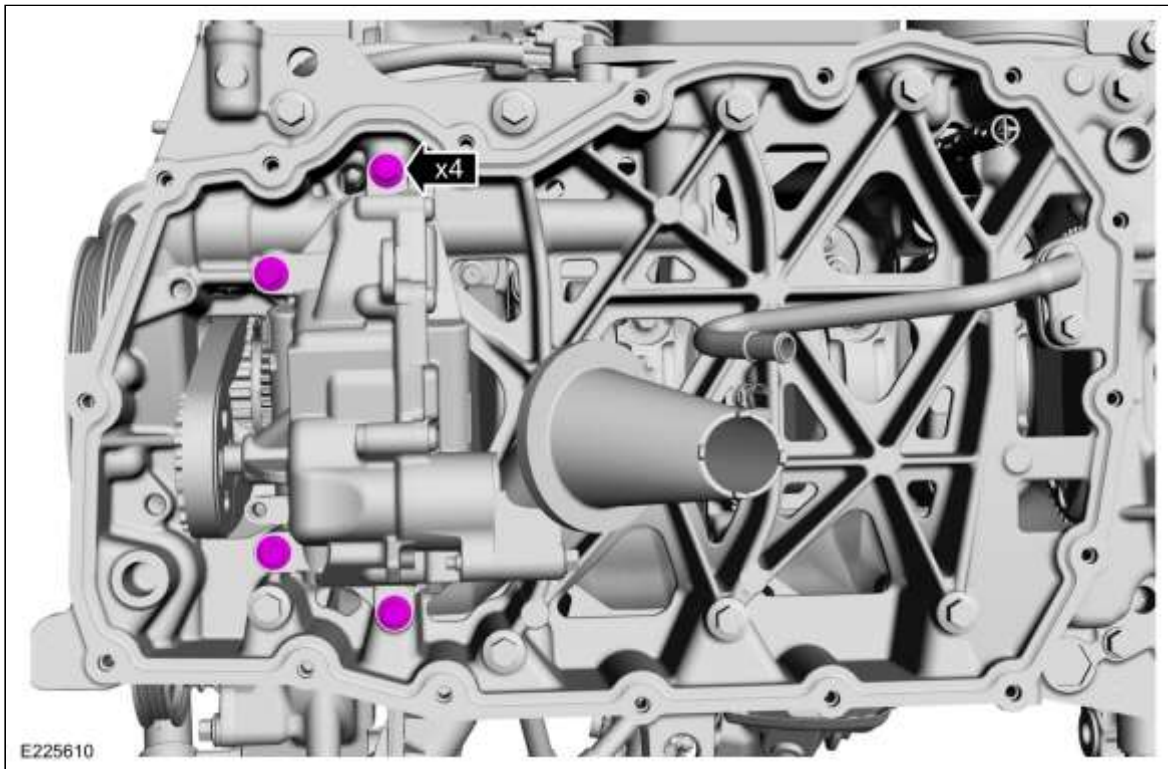
23.



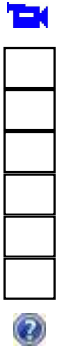
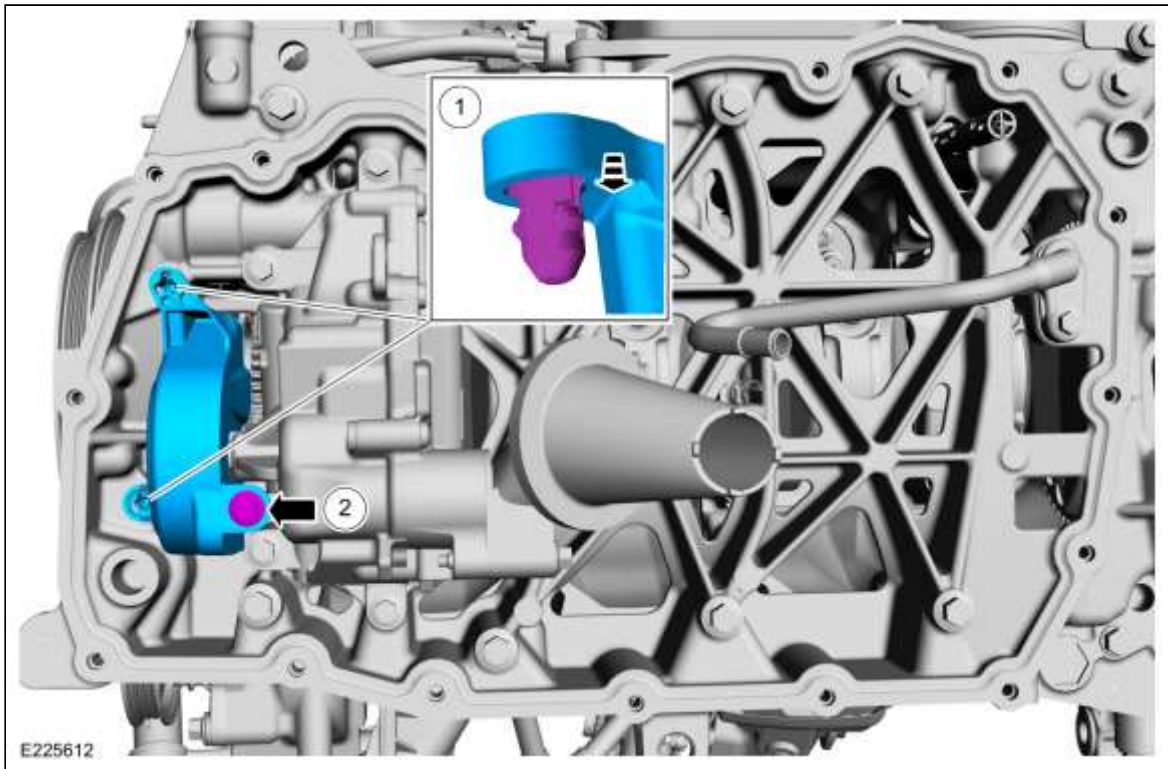
24.



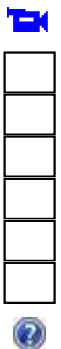
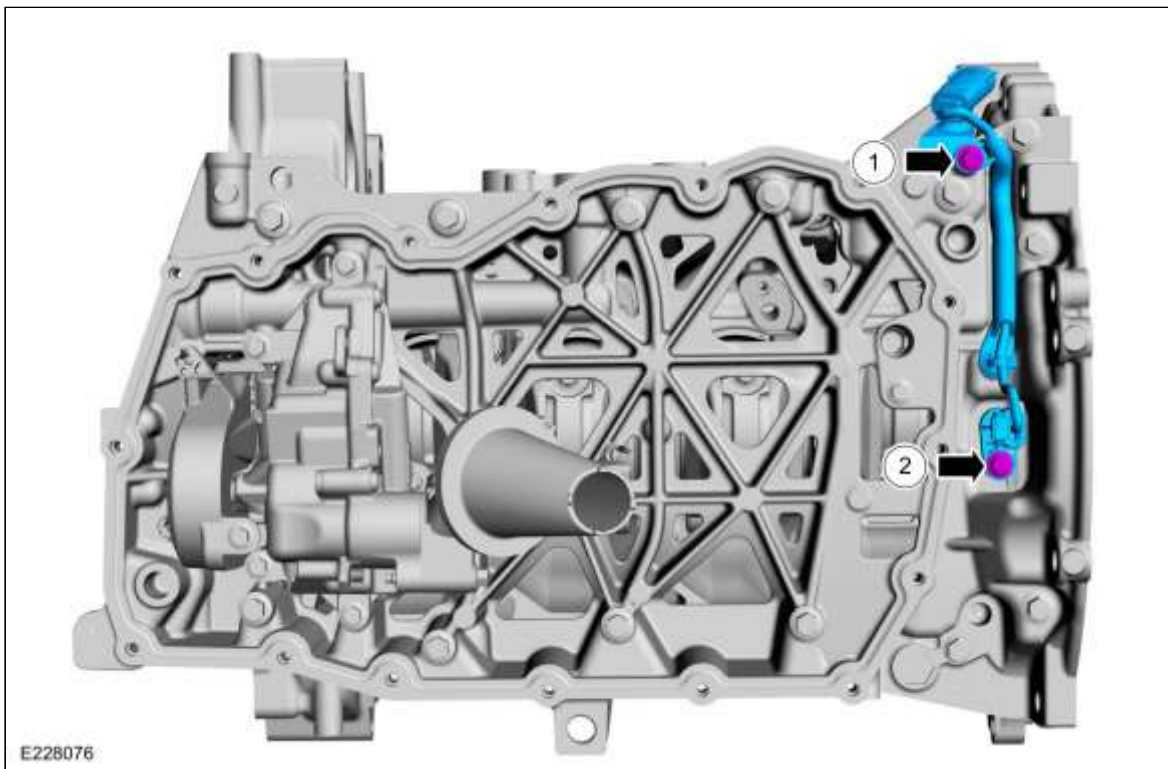
25. Torque:
 Stage 1: 5 Nm
 Stage 2: 10 Nm



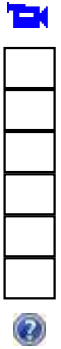
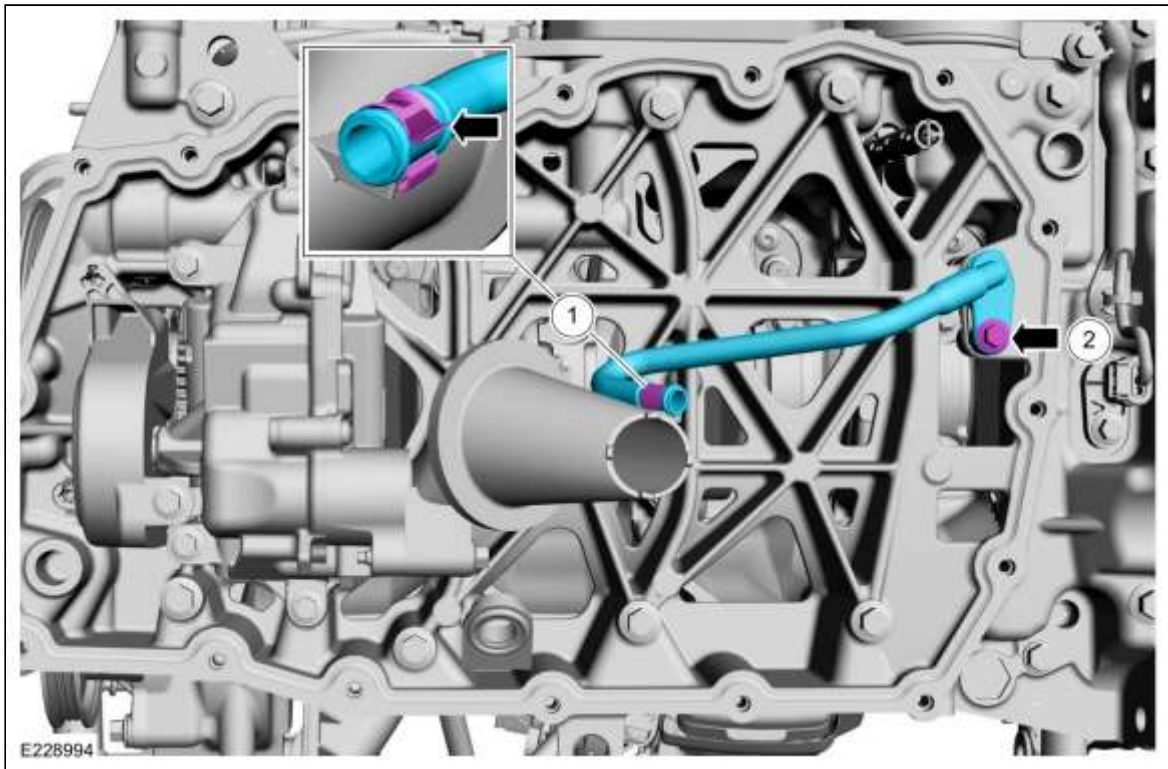
26. Torque: 10 Nm



27. Torque:
 1:: 10 Nm
 2:: 10 Nm



28. Torque: 10 Nm



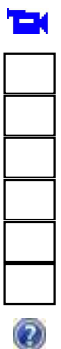
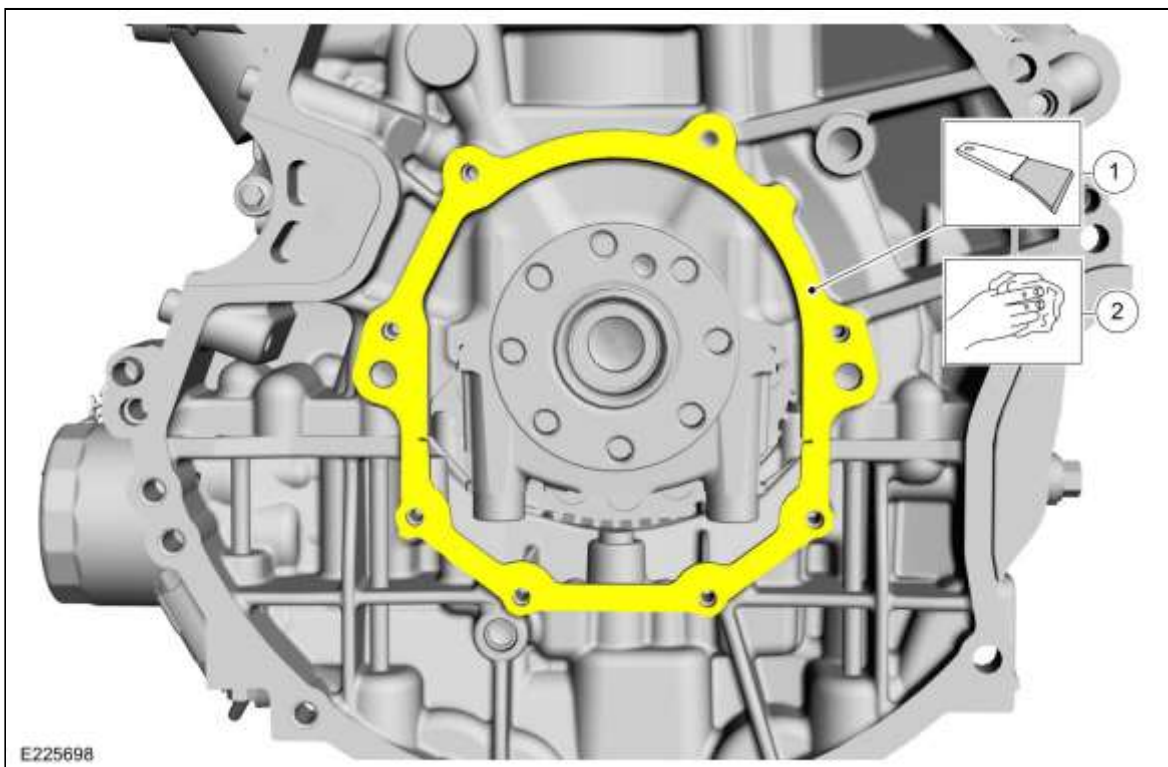
29.



1. Use the General Equipment: Plastic Scraper

2. **NOTE:** Make sure that the mating faces are clean and free of foreign material.

Material: Primer H-BW / CU7J-BNDRT-AA/CA



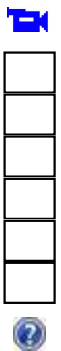
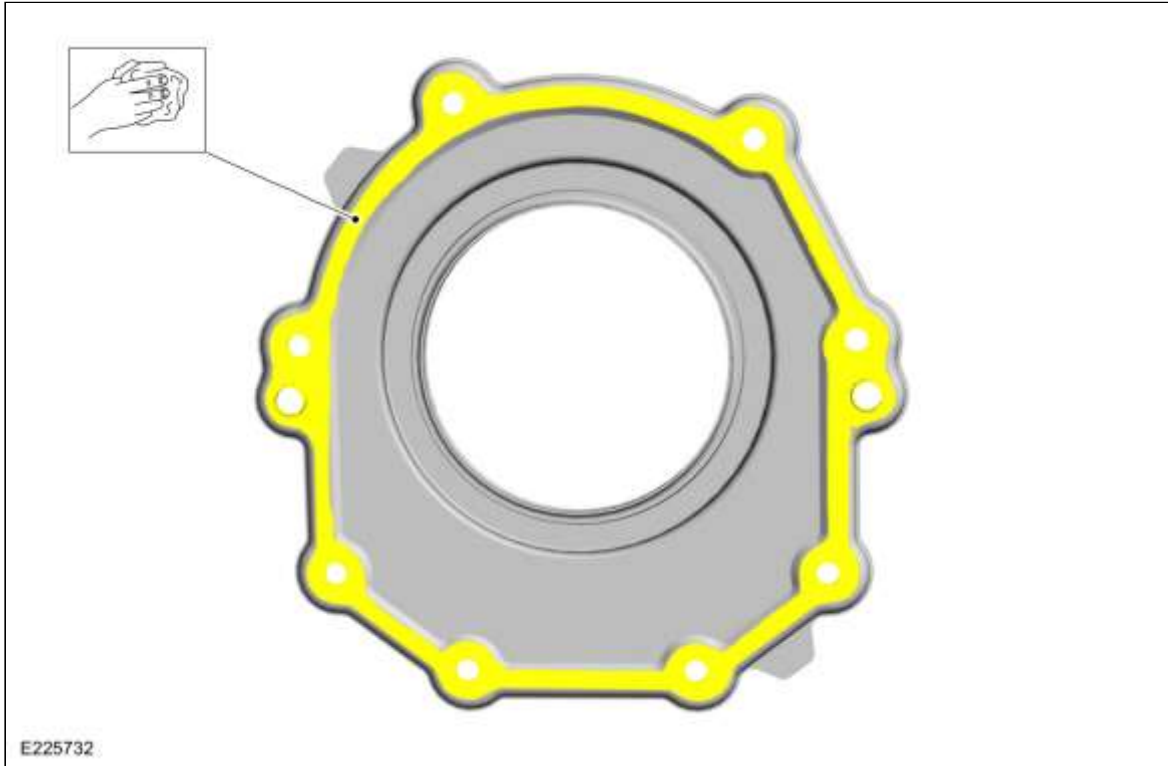
30.



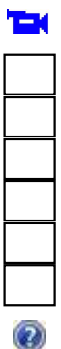
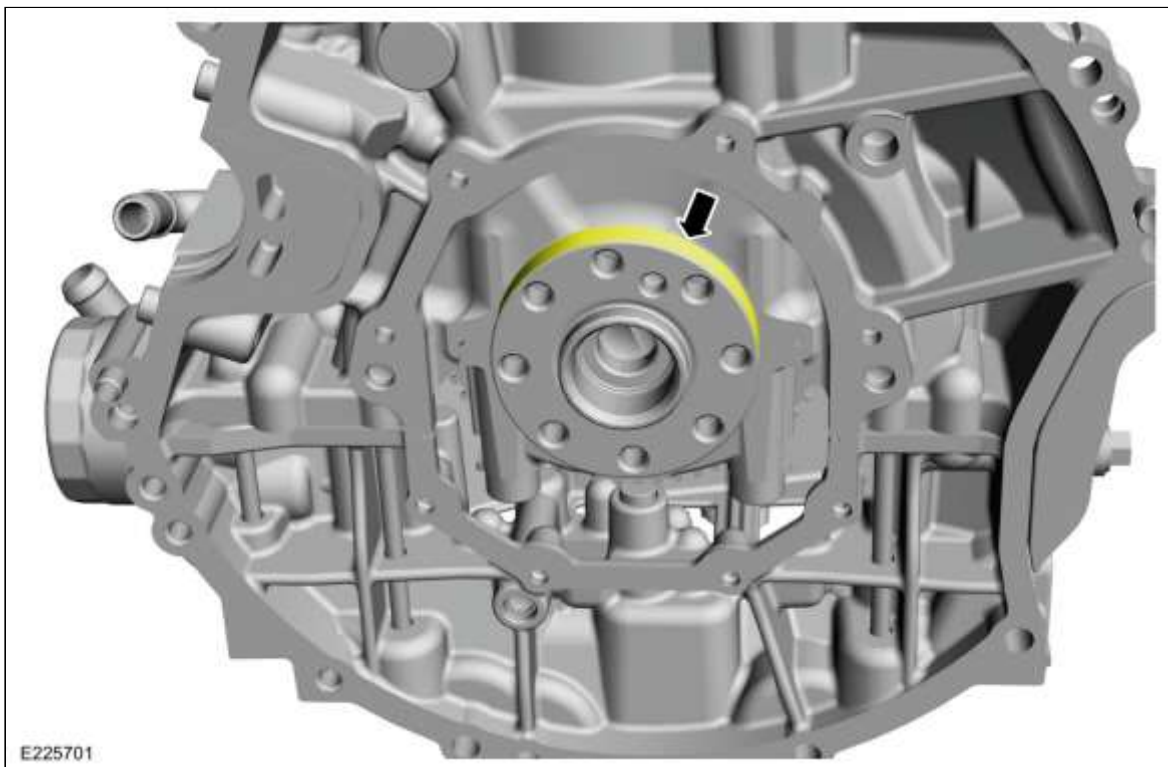
NOTE: Make sure that a new component is installed.

NOTE: Make sure that the mating faces are clean and free of foreign material.

Material: Primer H-BW / CU7J-BNDRT-AA/CA



31. **NOTE:** Make sure that the mating faces are clean and free of foreign material.

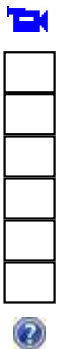
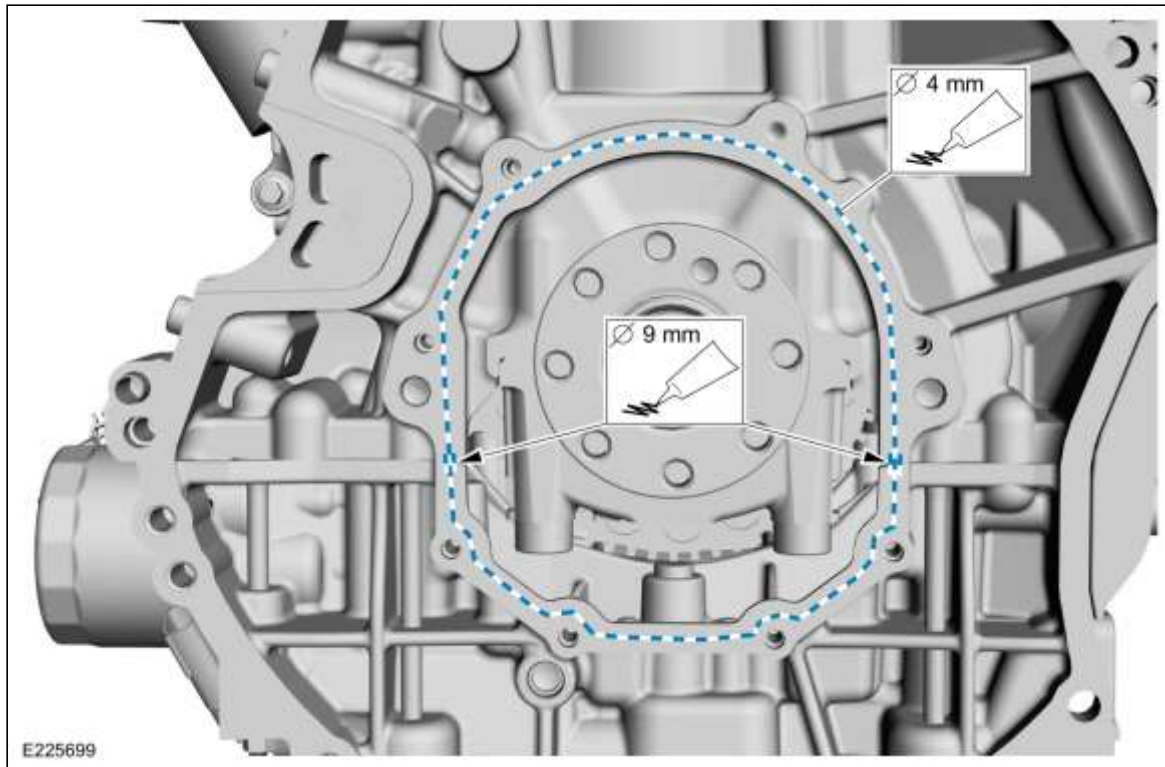


32. **NOTE:** The component must be installed within 5 minutes of applying the sealant.



Complete this step within: 5min

Material: Silicone Sealant LB-AX / Silicone Sealant LB-AX (WSS-M4G323-A10)



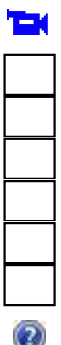
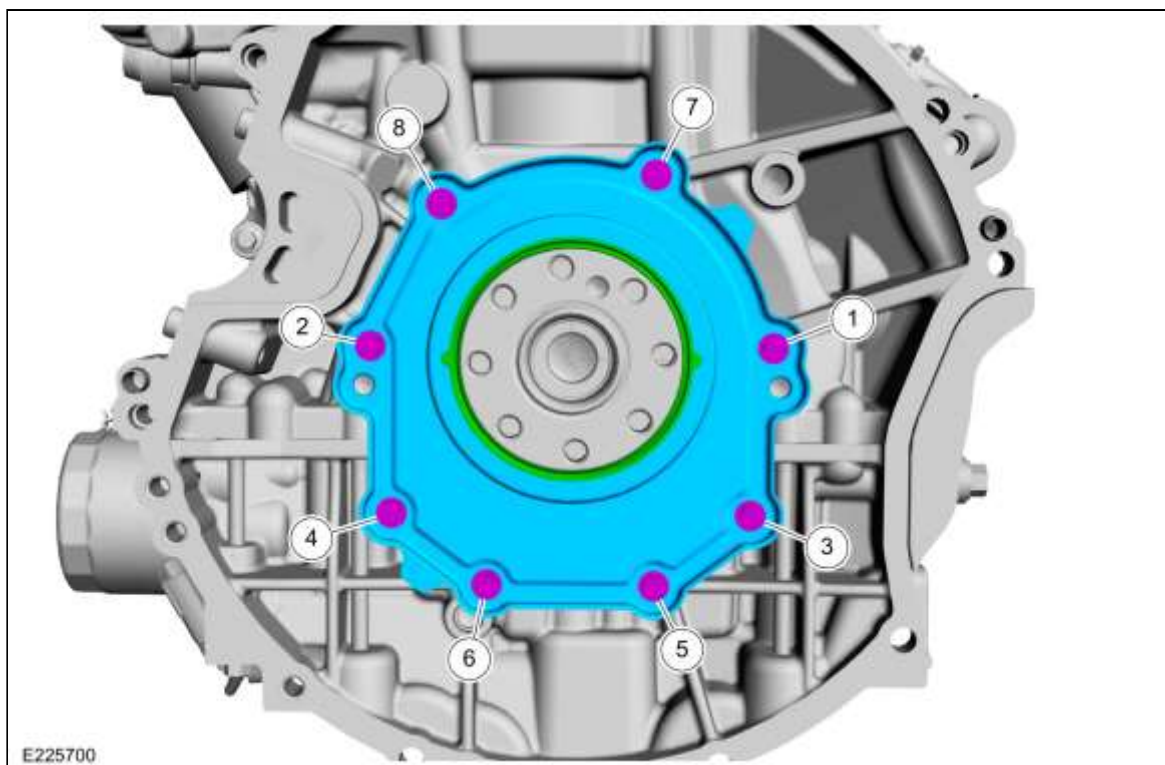
33. **NOTICE:** Take extra care not to damage the mating faces.

NOTE: New crankshaft rear seal carriers are supplied with an alignment sleeve which must be removed after installation.

Torque:

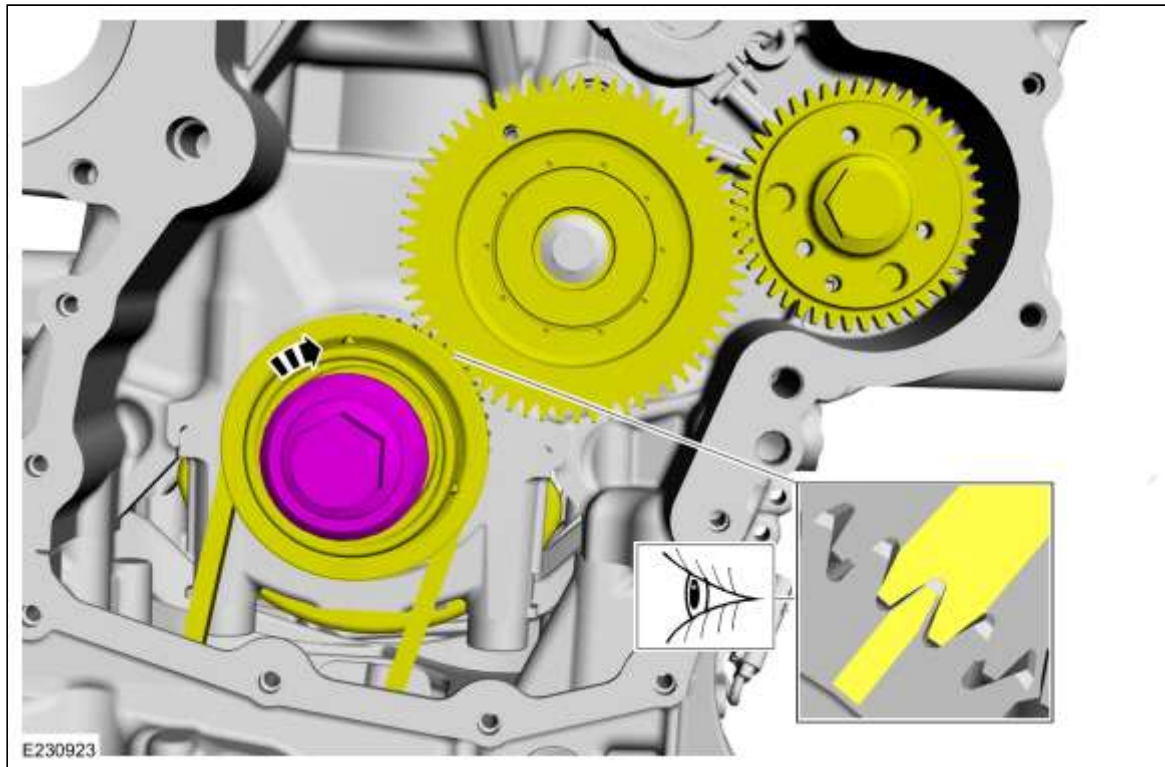
Stage 1: 5 Nm

Stage 2: 10 Nm



34. **NOTICE:** Only rotate the crankshaft clockwise.

Rotate the crankshaft until piston No. 1 is at top dead center (TDC).



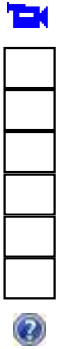
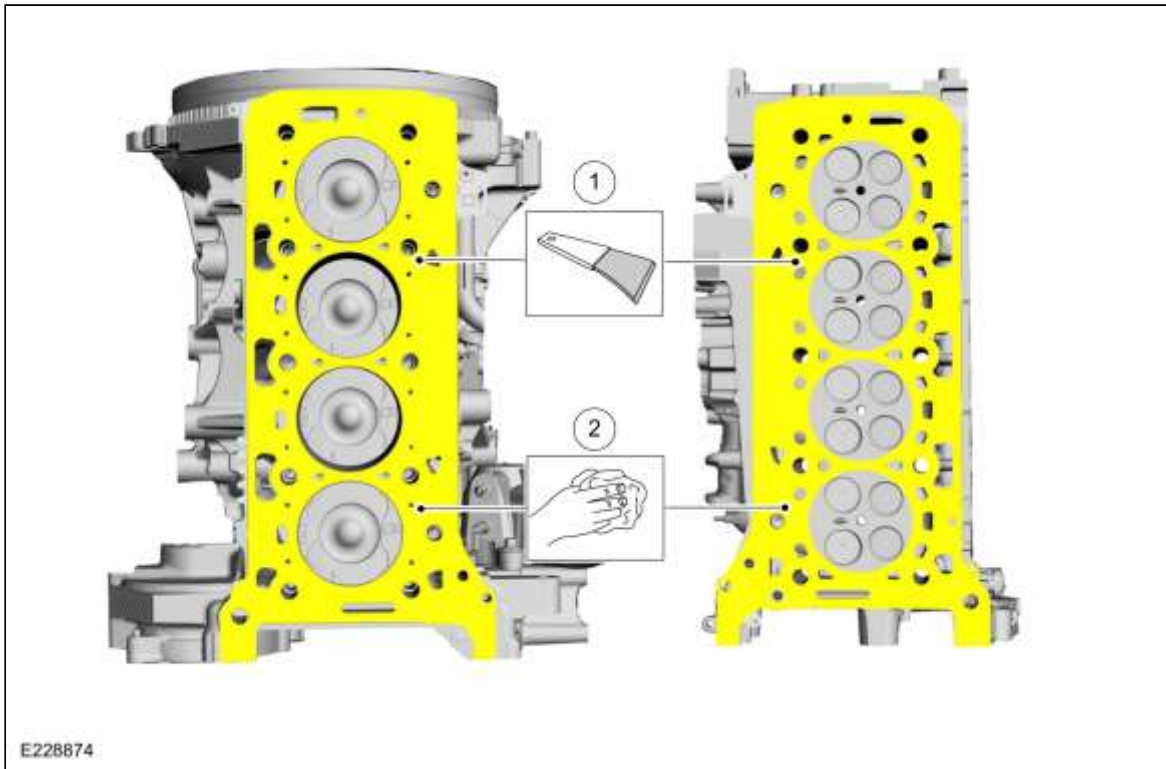
35.



36. 1. Use the General Equipment: Plastic Scraper

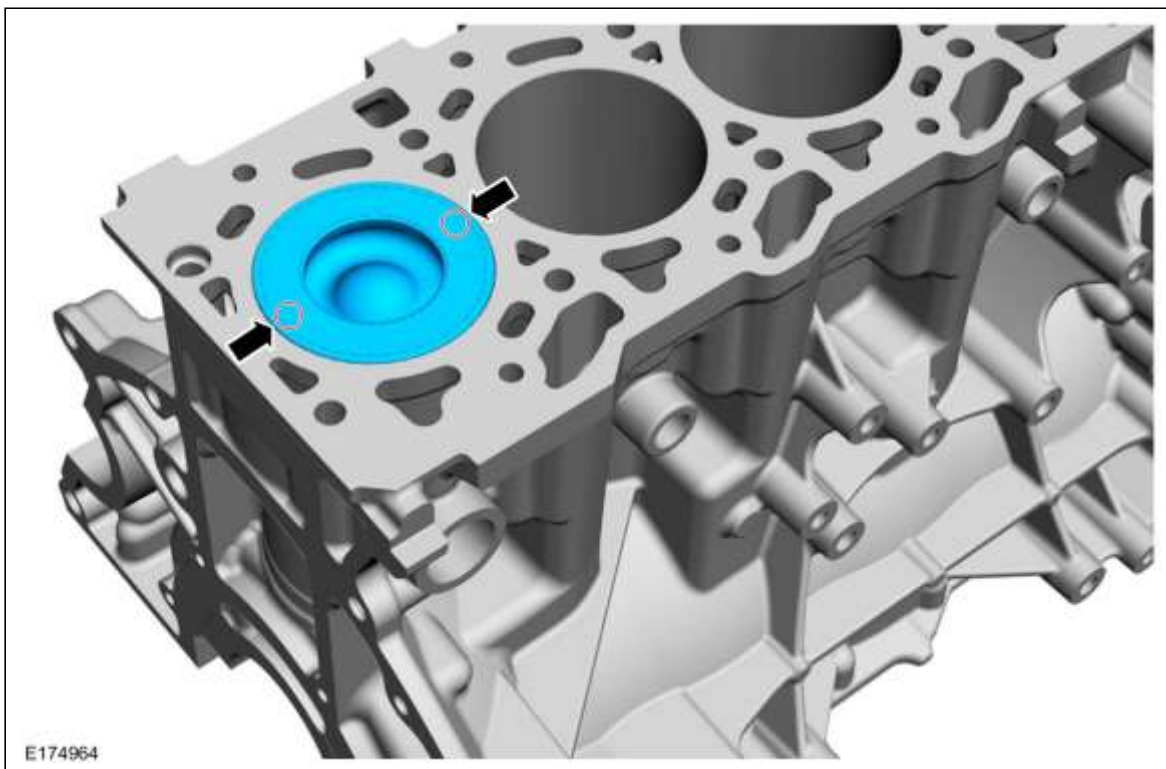
2. **NOTE:** Make sure that the mating faces are clean and free of foreign material.

Material: Reinigingsmiddel voor remmen / 3U7J-2C410-AB/BA

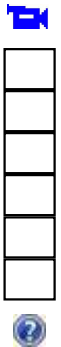
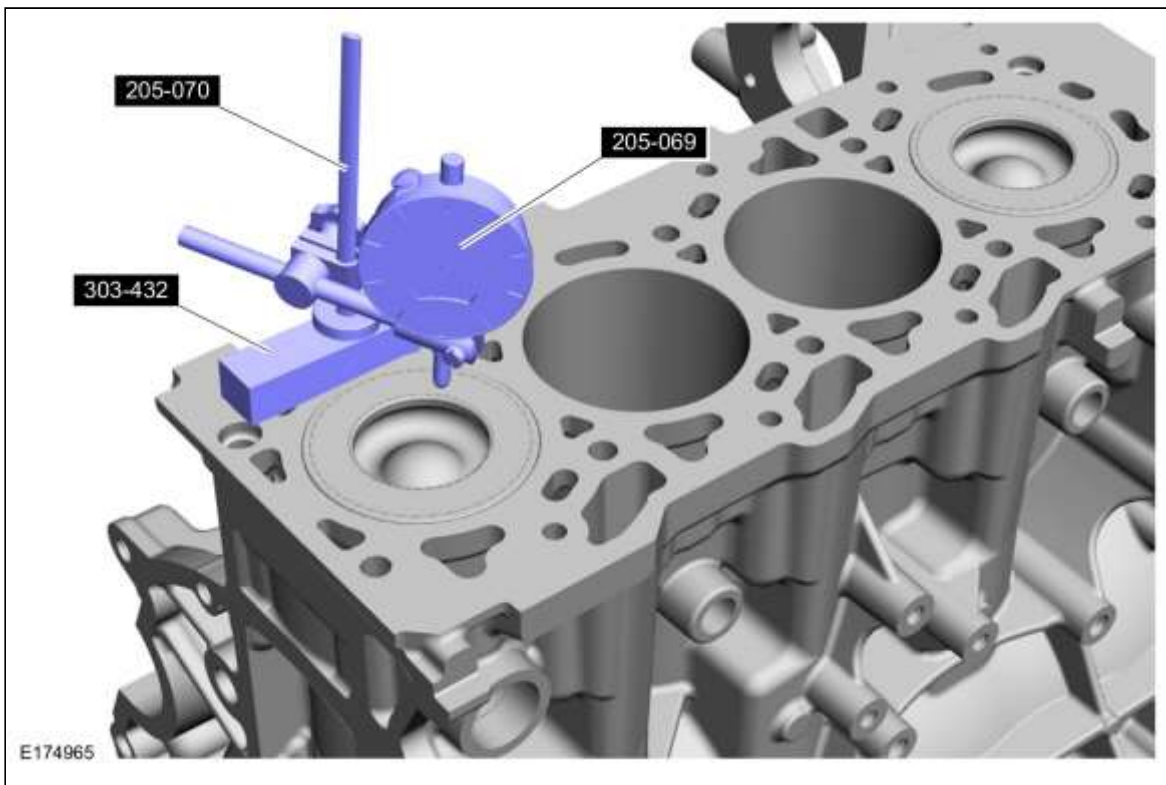


37. **NOTE:** Measure the piston protrusion of each cylinder at top dead center (TDC)

Measure the distance between the piston crown and the cylinder block at the points indicated.



38. The largest measurement determines the choice of the cylinder head gasket.
 Use Special Service Tool: 205-070 Holding Fixture, Dial Indicator Gauge. , 205-069 Dial Indicator Gauge (Metric). , 303-432 Holding Fixture, Dial Indicator Gauge (Cylinder Liner Protrusion).

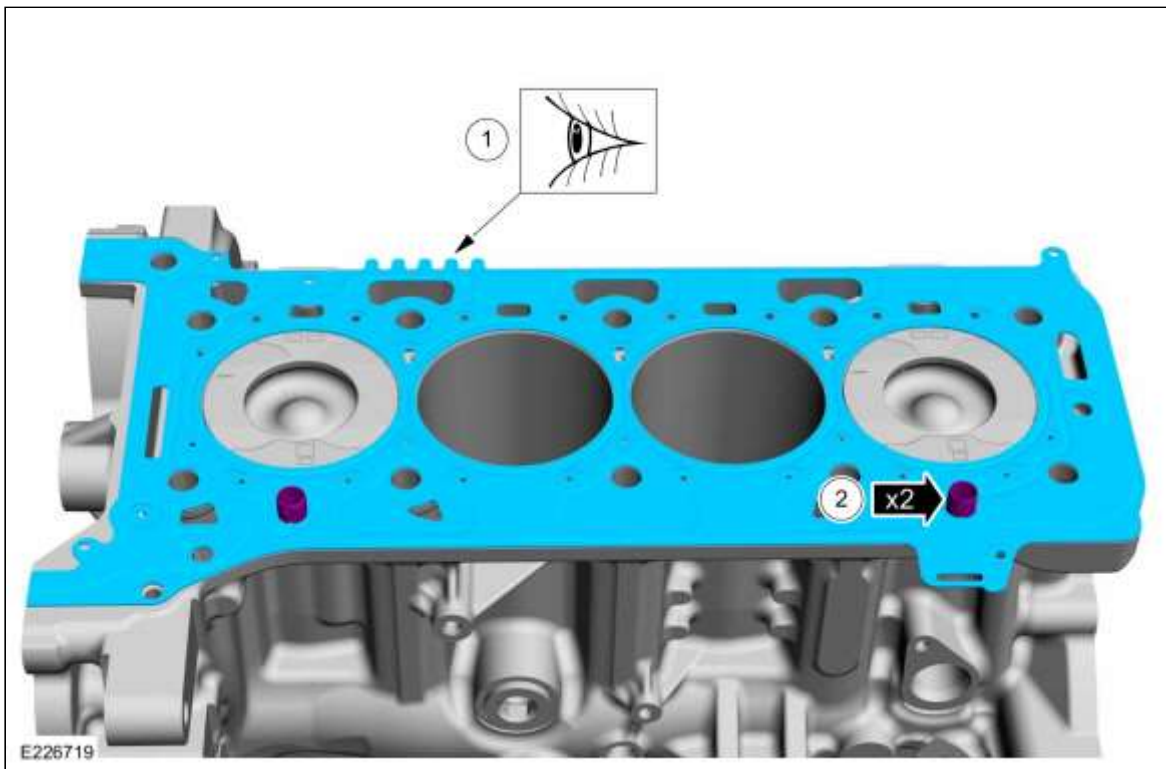


39. **NOTICE:** Make sure that no fluids are present in the cylinder head bolt threaded bores.

1. **NOTE:** Make sure that a new component is installed.

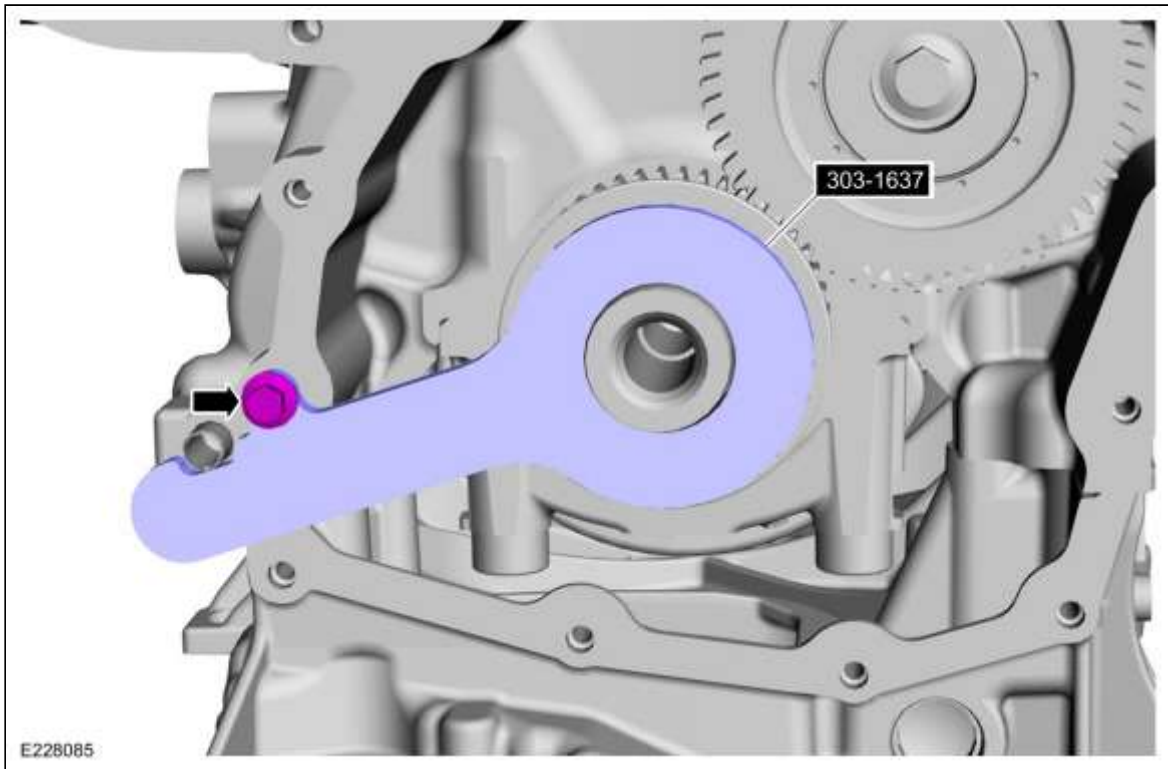
Refer to: Specifications (303-01) .

2. **NOTICE:** Make sure that the gasket is correctly located.



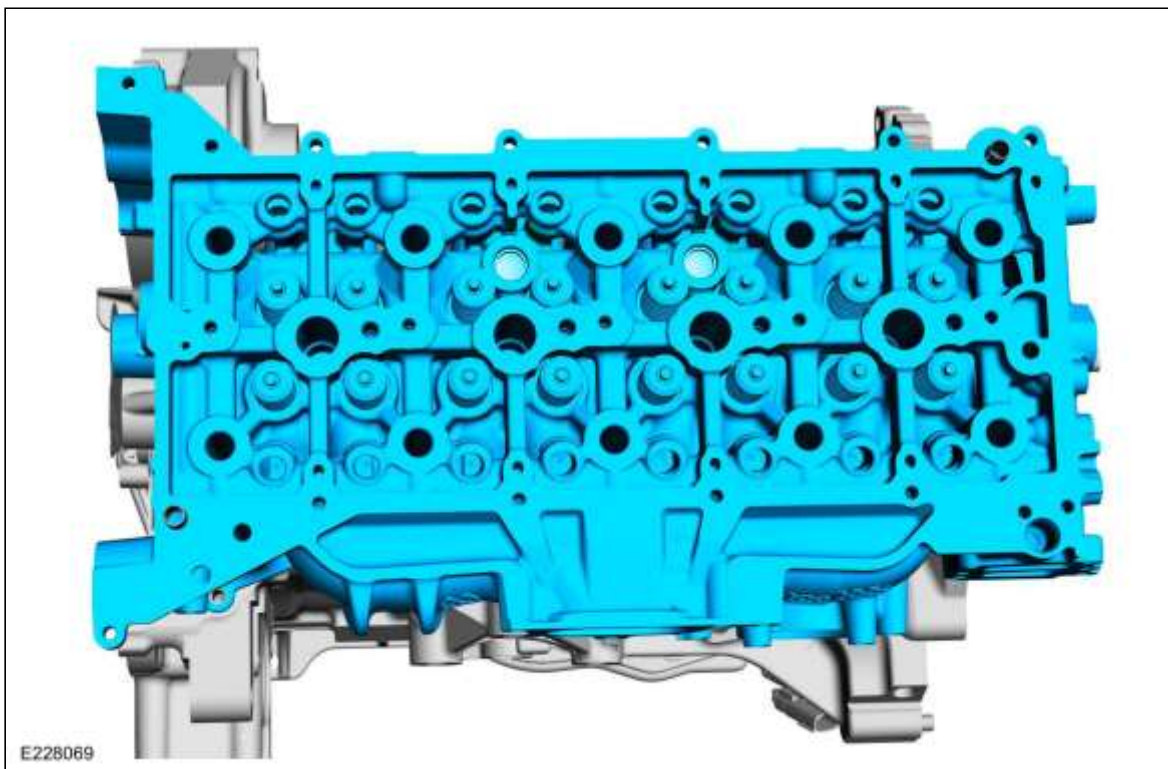
40. **NOTICE:** The special tool must only be used to align the crankshaft timing.

Install Special Service Tool: 303-1637 Holding Tool, Crankshaft.



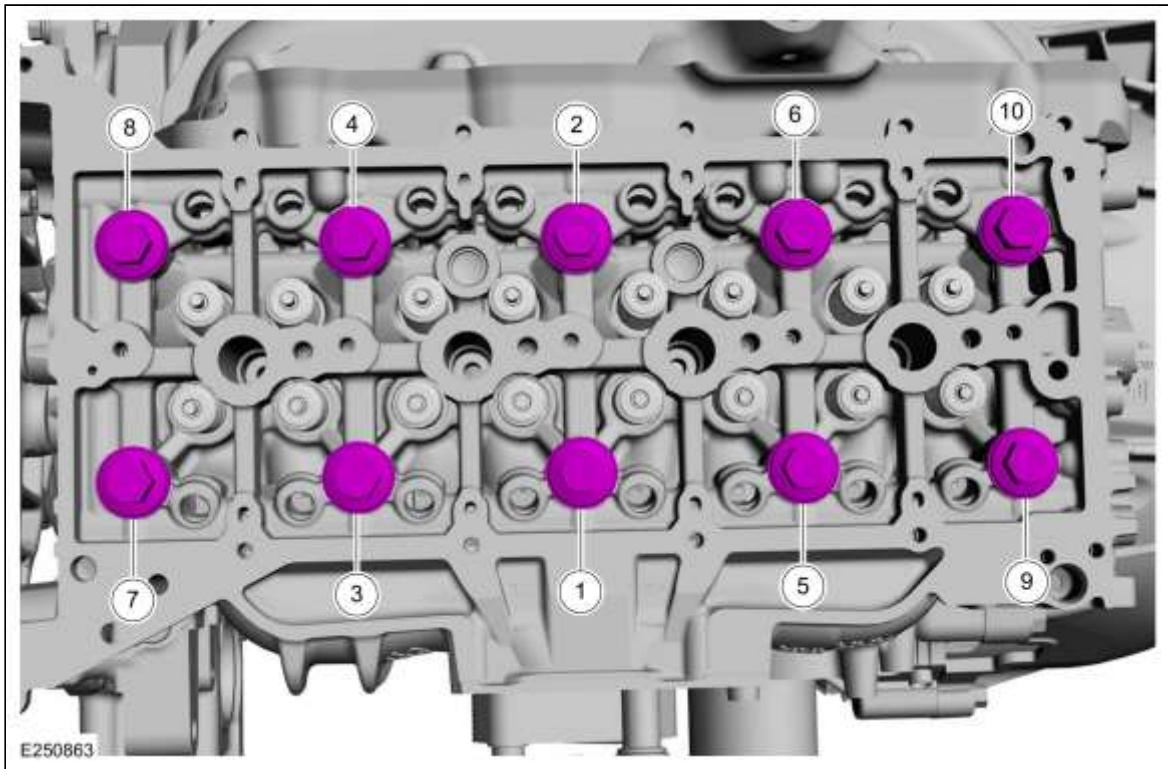
41. **NOTICE:** Make sure that the component is correctly located on the locating dowels.

NOTE: Make sure that no components catch.



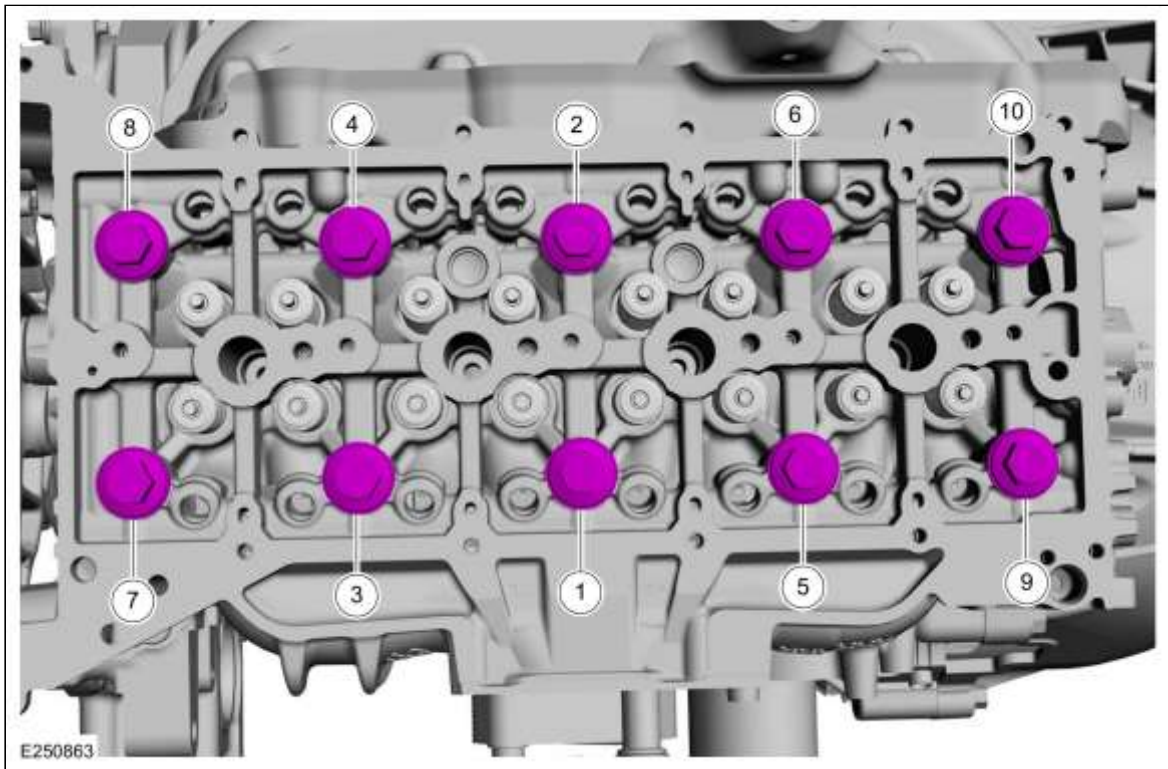
42. **NOTE:** Only tighten the bolts finger tight at this stage.

NOTE: Make sure that new bolts are installed.

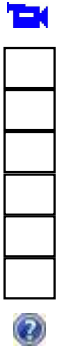
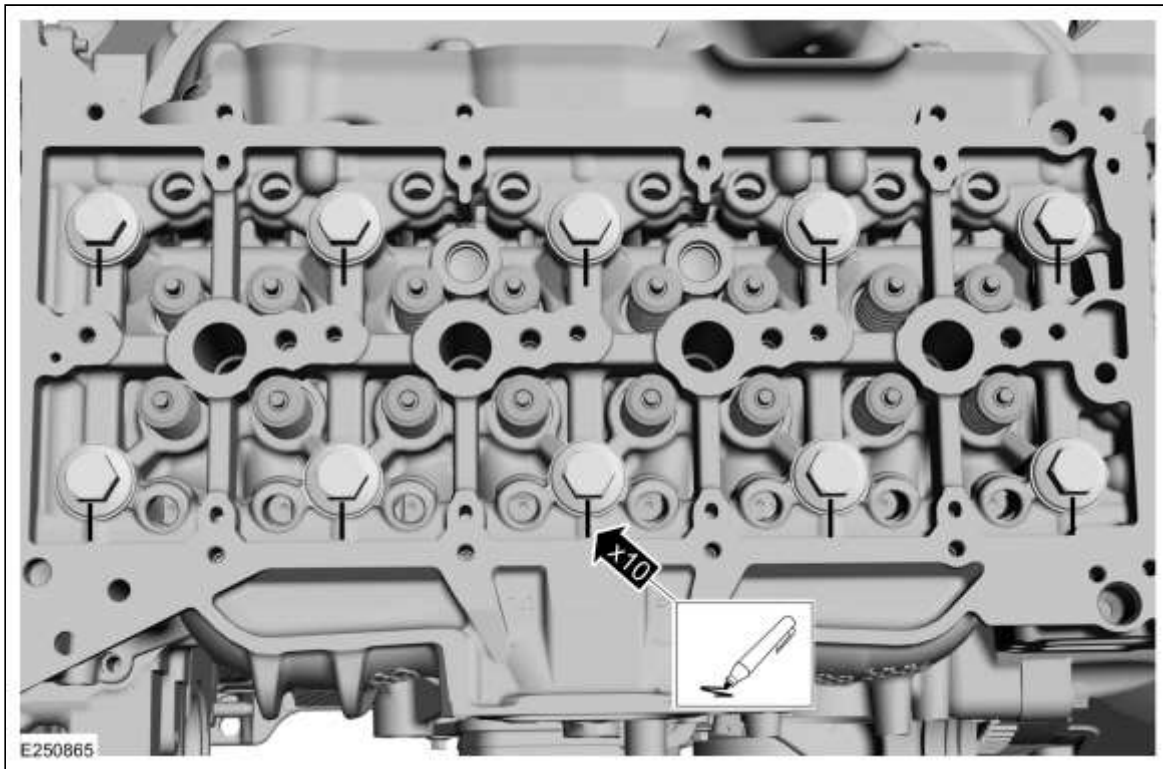


43. Torque:

- Stage 1: 15 Nm
- Stage 2: 25 Nm
- Stage 3: 40 Nm
- Stage 4: 90°
- Stage 5: 90°

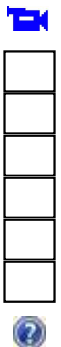
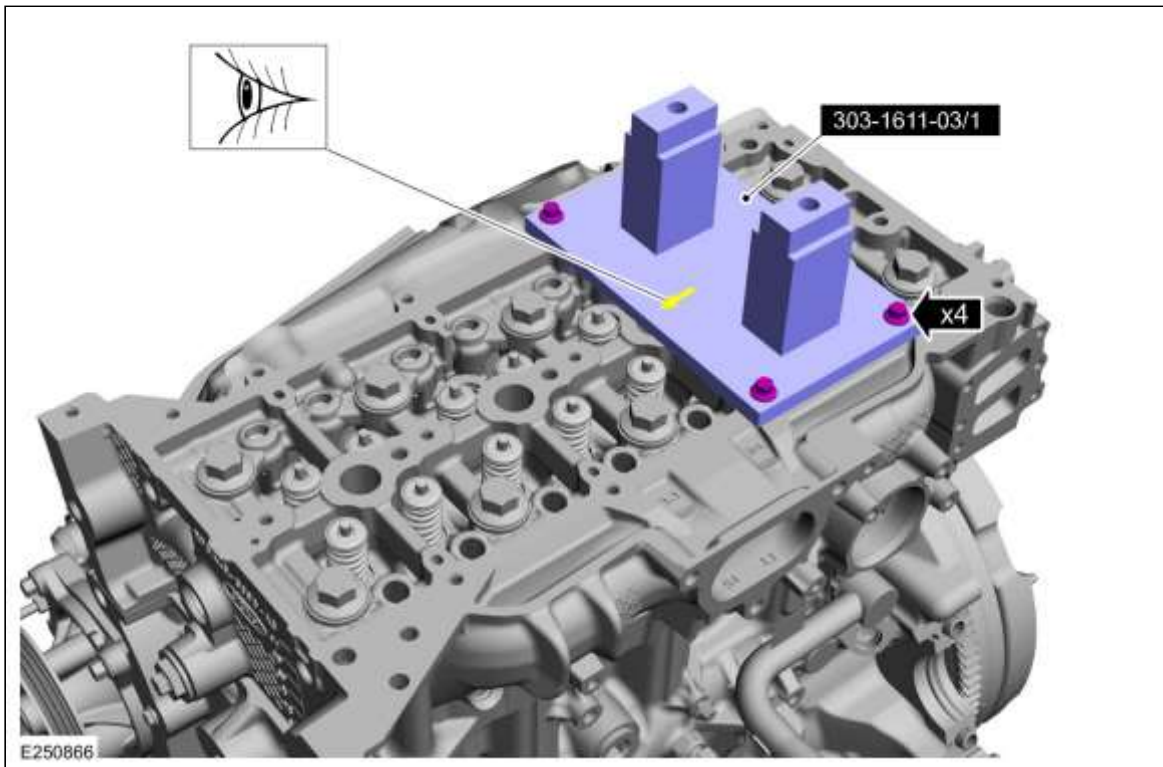


44. Mark the position of the bolts.

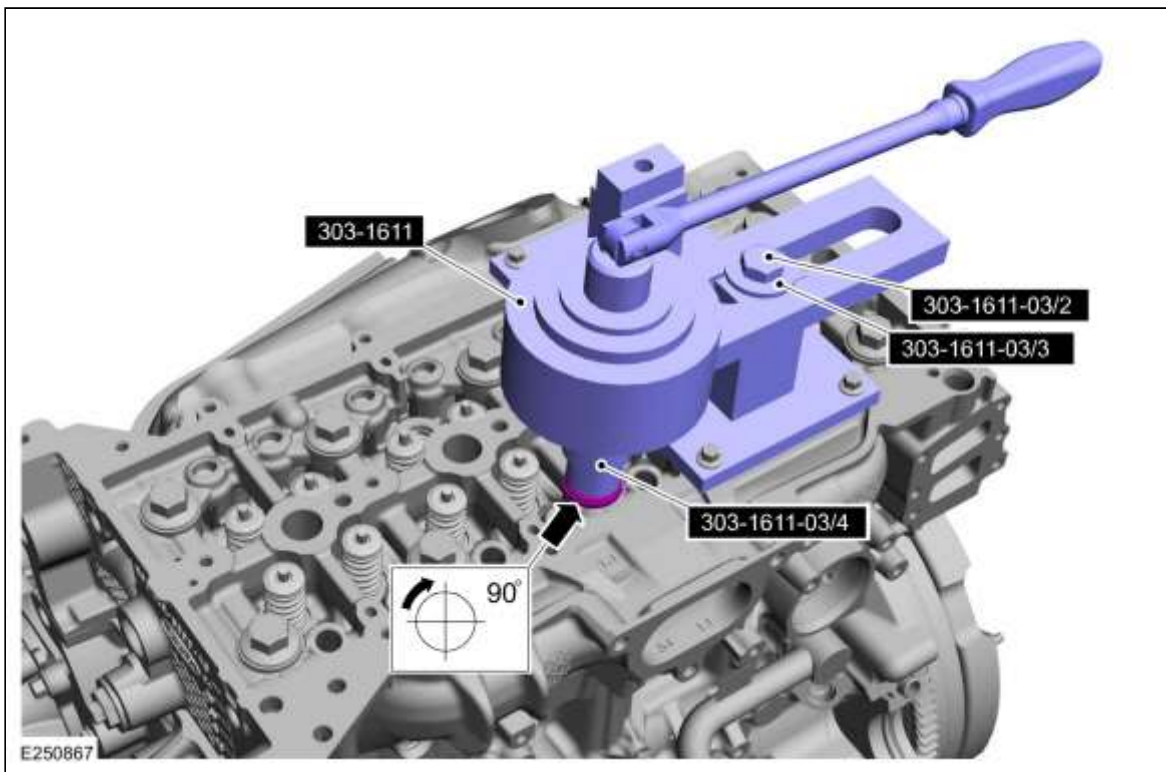


45. **NOTE:** Make sure that the component is correctly installed.

Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier.
 Torque: 10 Nm



46. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier.
 Use the General Equipment: 1/2 Inch Square Drive Breaker Bar
 Torque:
 Stage 6:: 90°

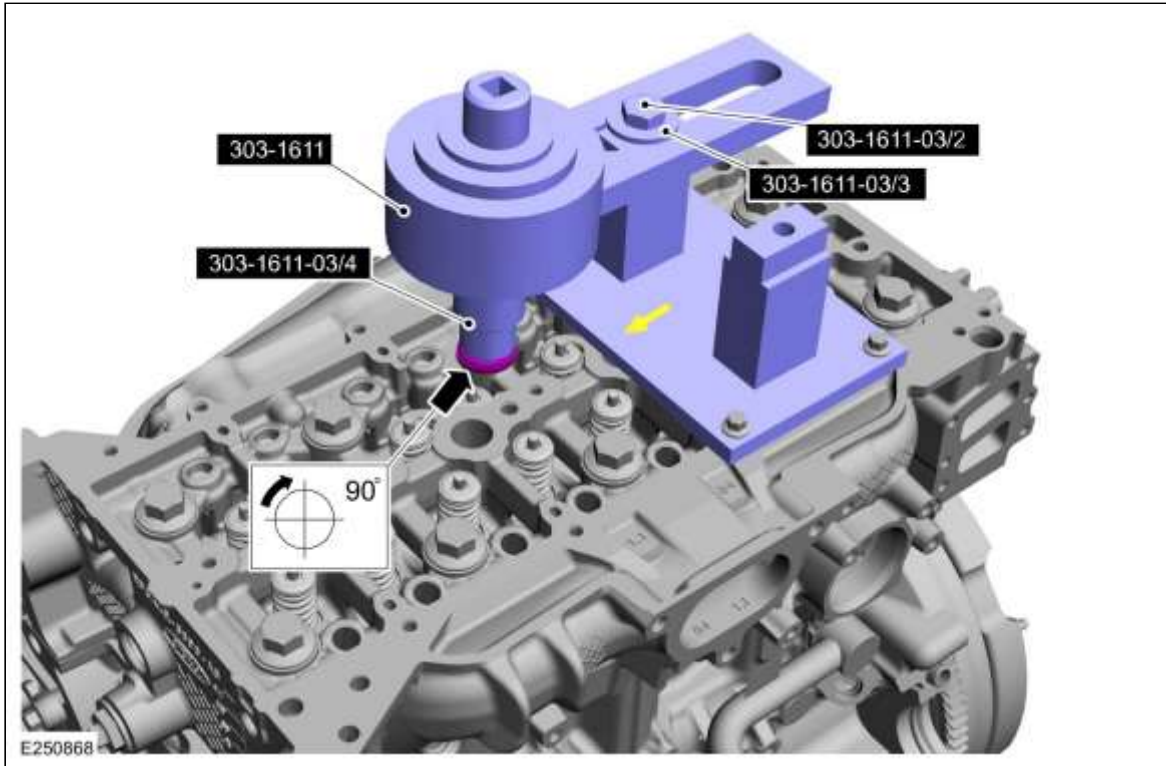


47. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

48. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier. Use the General Equipment: 1/2 Inch Square Drive Breaker Bar

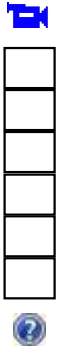
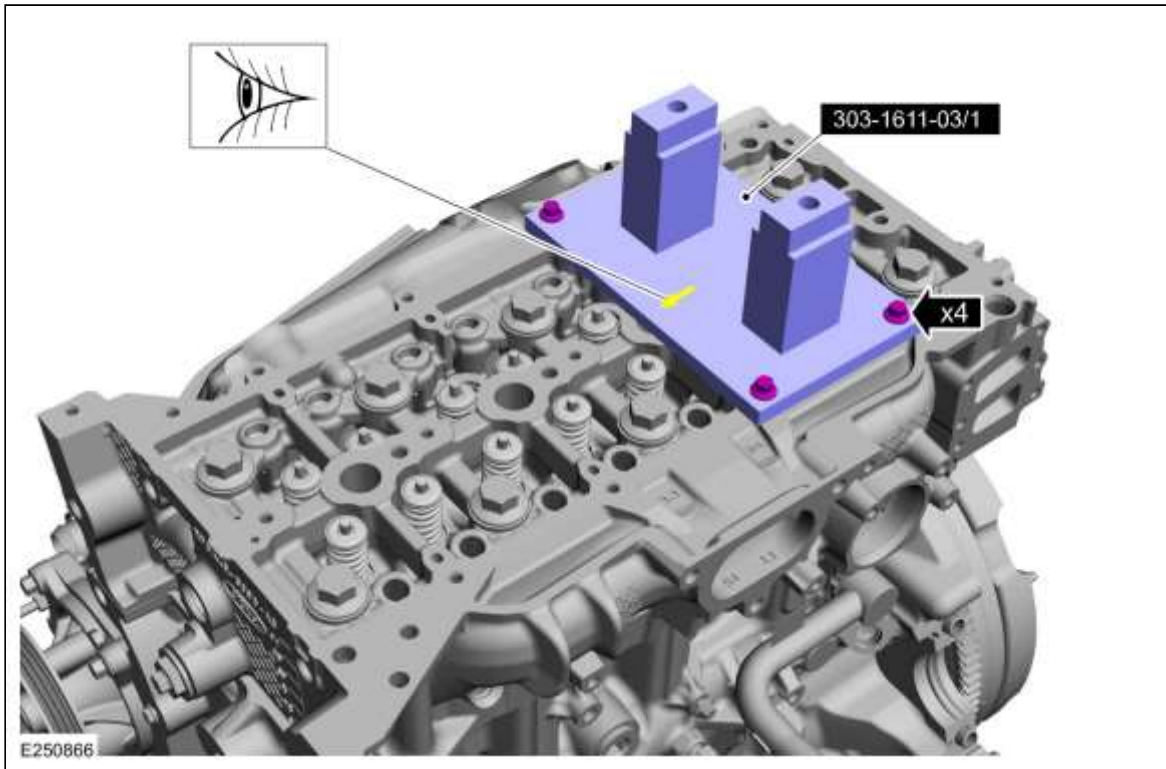
Torque:

Stage 6:: 90°



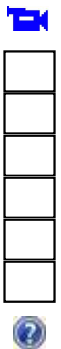
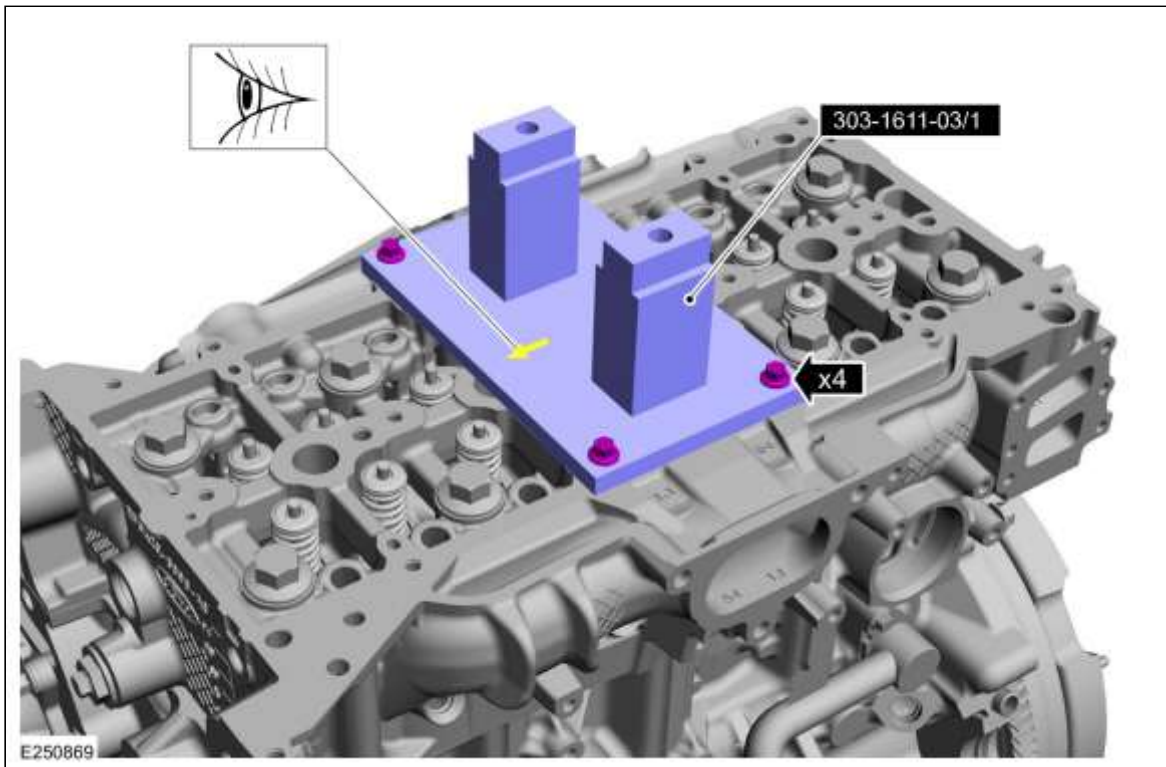
49. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

50. Remove Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier.

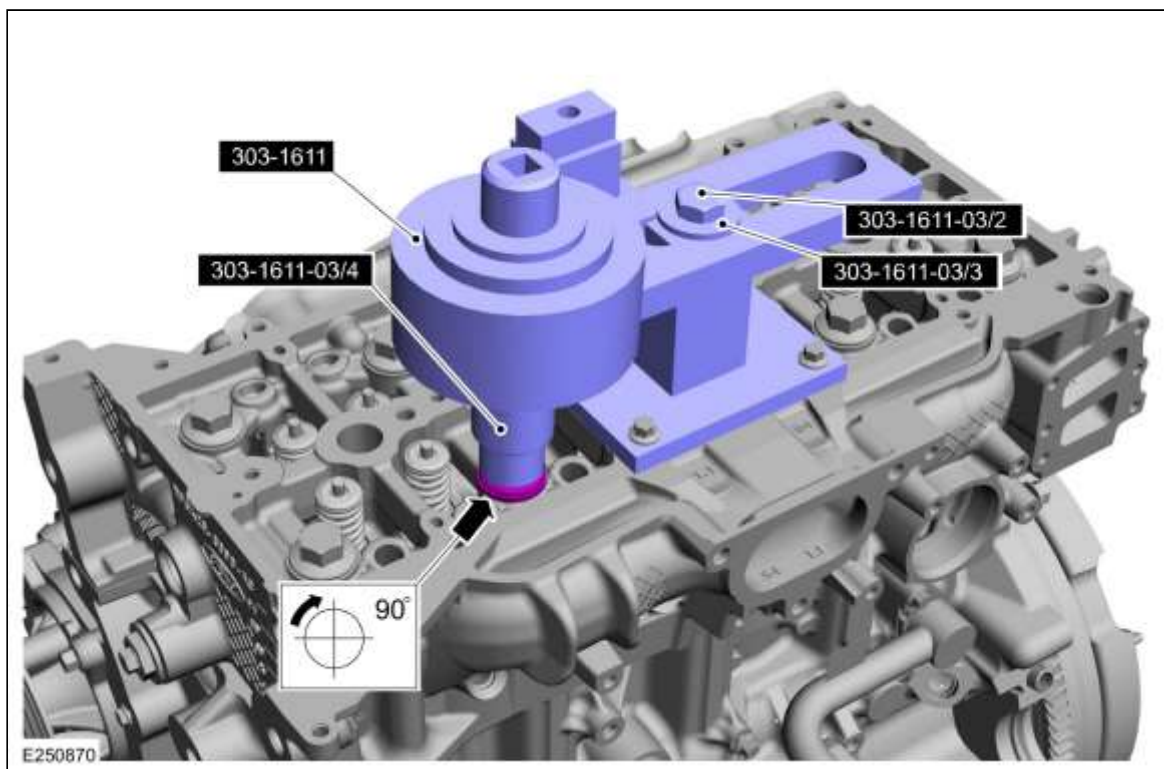


51. **NOTE:** Make sure that the component is correctly installed.

Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier.
Torque: 10 Nm



52. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier.
Use the General Equipment: 1/2 Inch Square Drive Breaker Bar
Torque:
Stage 6:: 90°

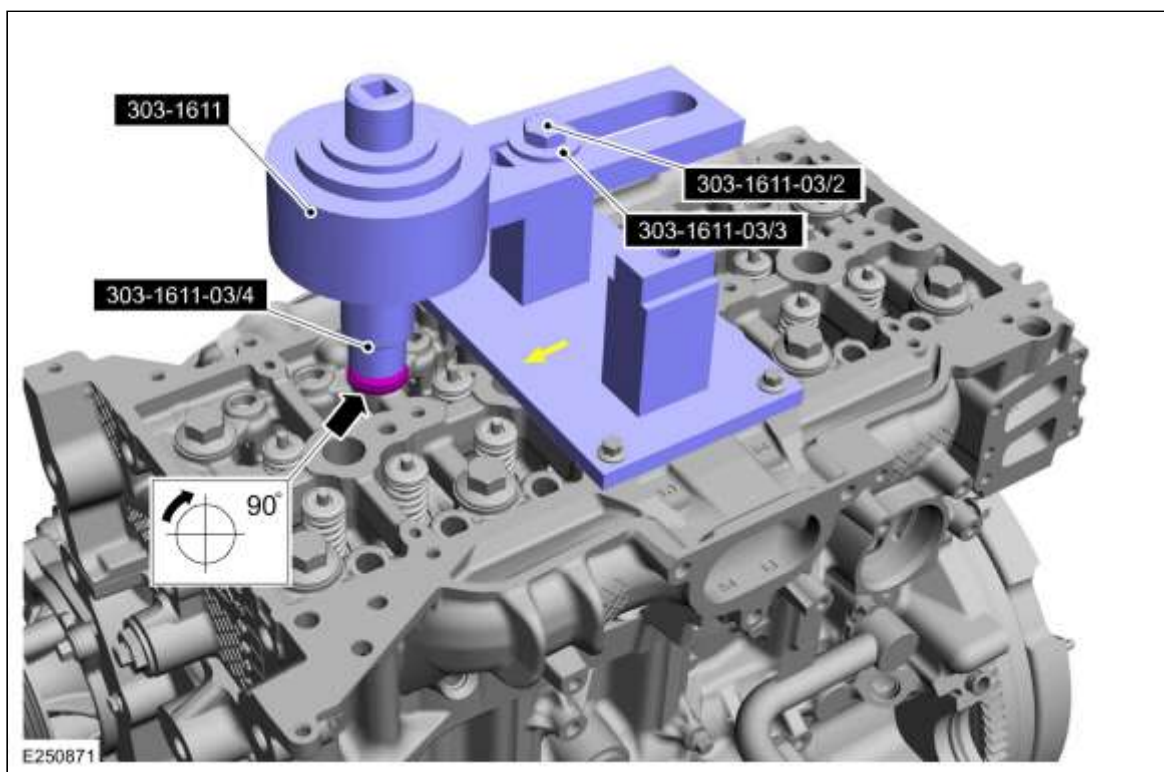


53. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

54. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier. Use the General Equipment: 1/2 Inch Square Drive Breaker Bar

Torque:

Stage 6:: 90°

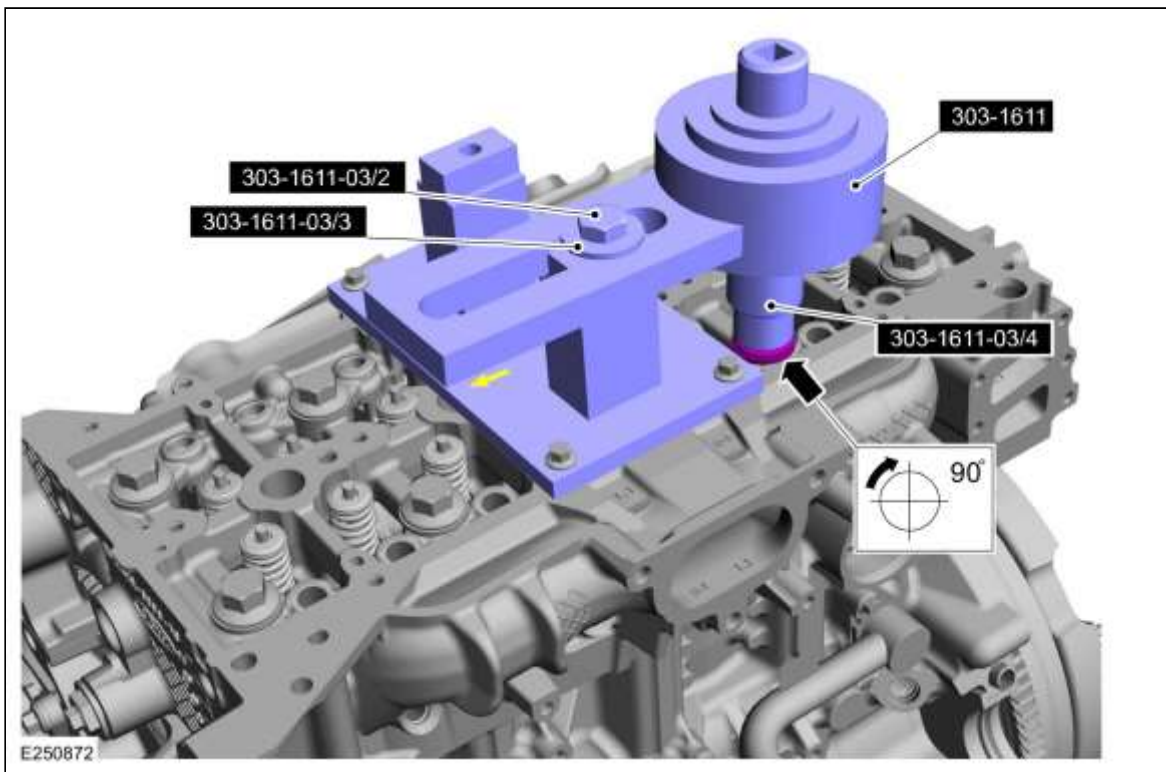


55. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

56. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier. Use the General Equipment: 1/2 Inch Square Drive Breaker Bar

Torque:

Stage 6:: 90°

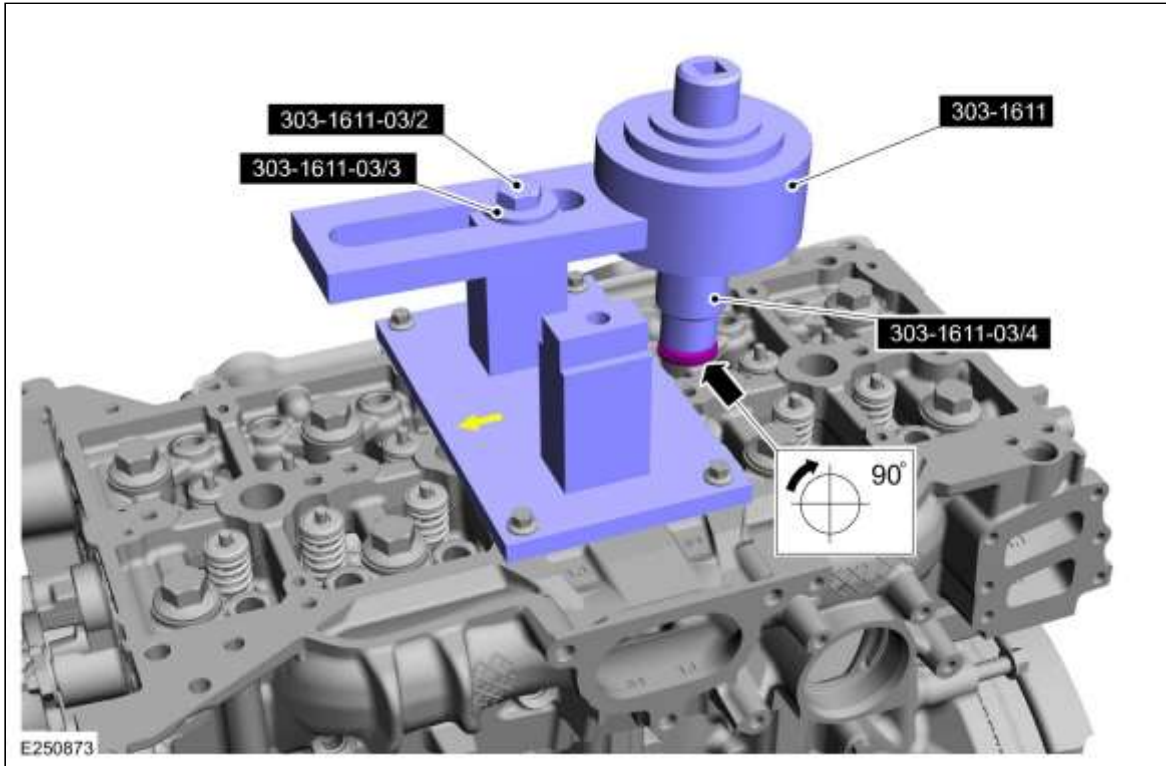


57. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

58. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier. Use the General Equipment: 1/2 Inch Square Drive Breaker Bar

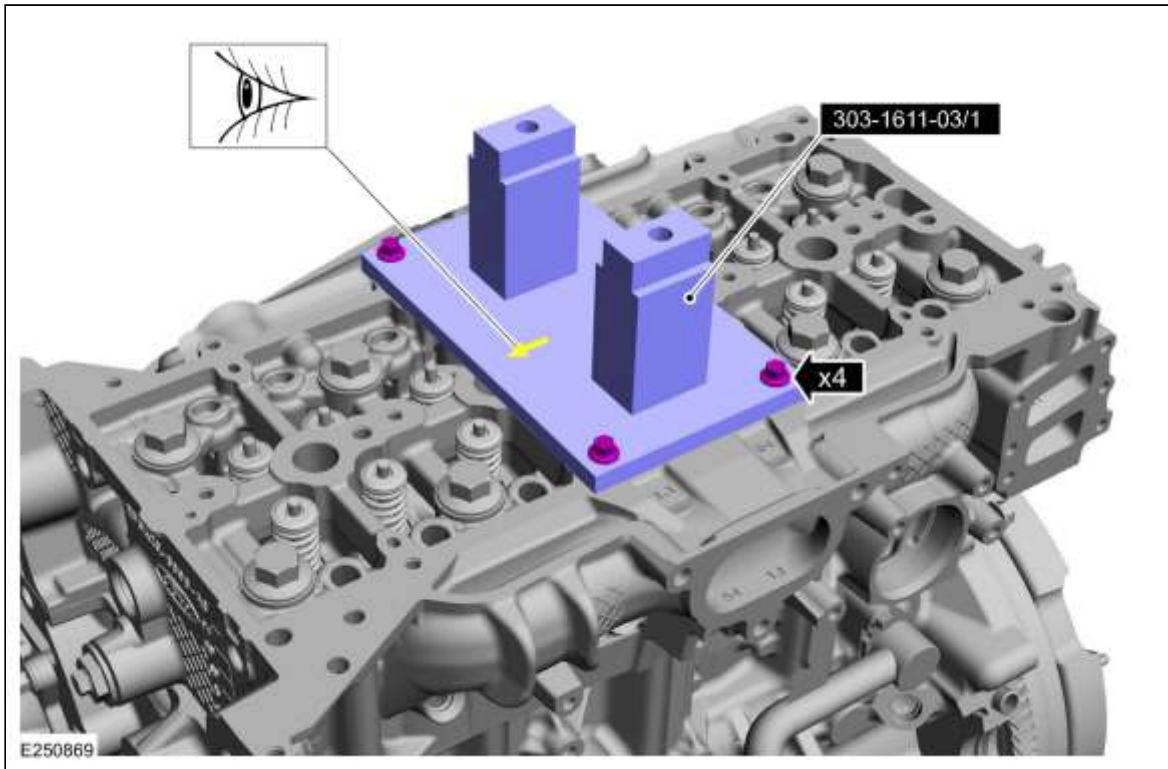
Torque:

Stage 6:: 90°



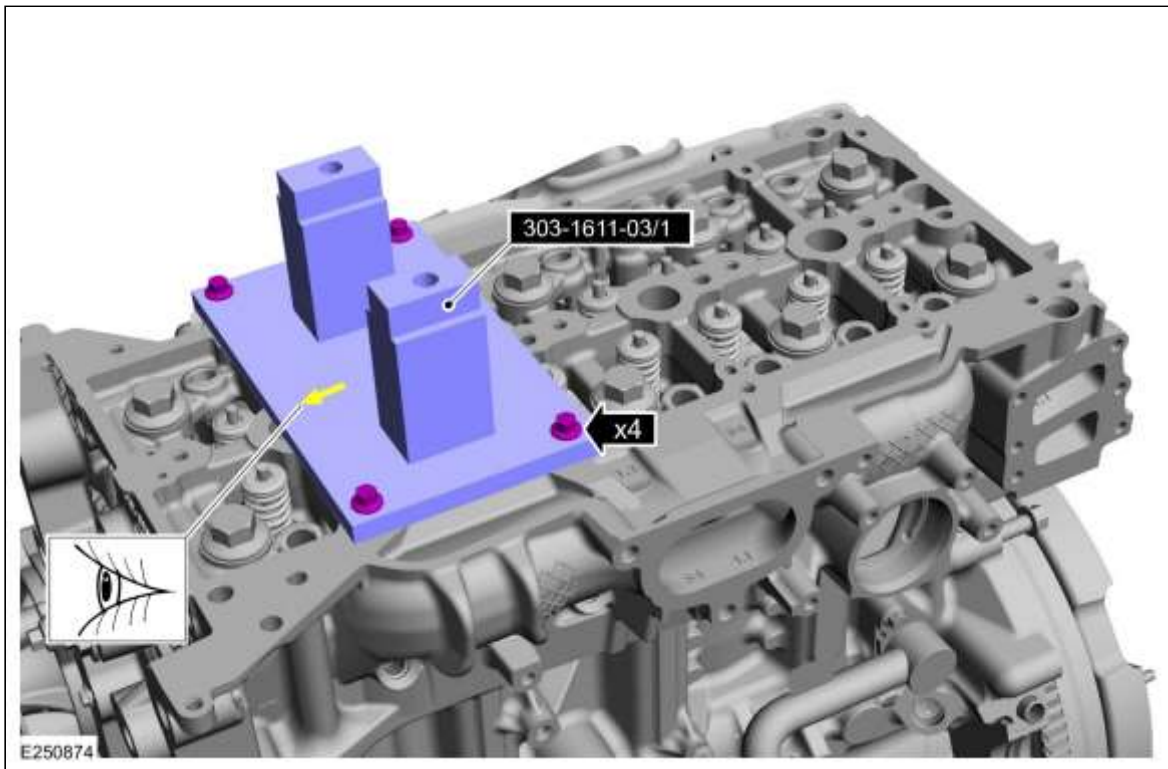
59. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

60. Remove Special Service Tool: 303-1611 Torque Multiplier.

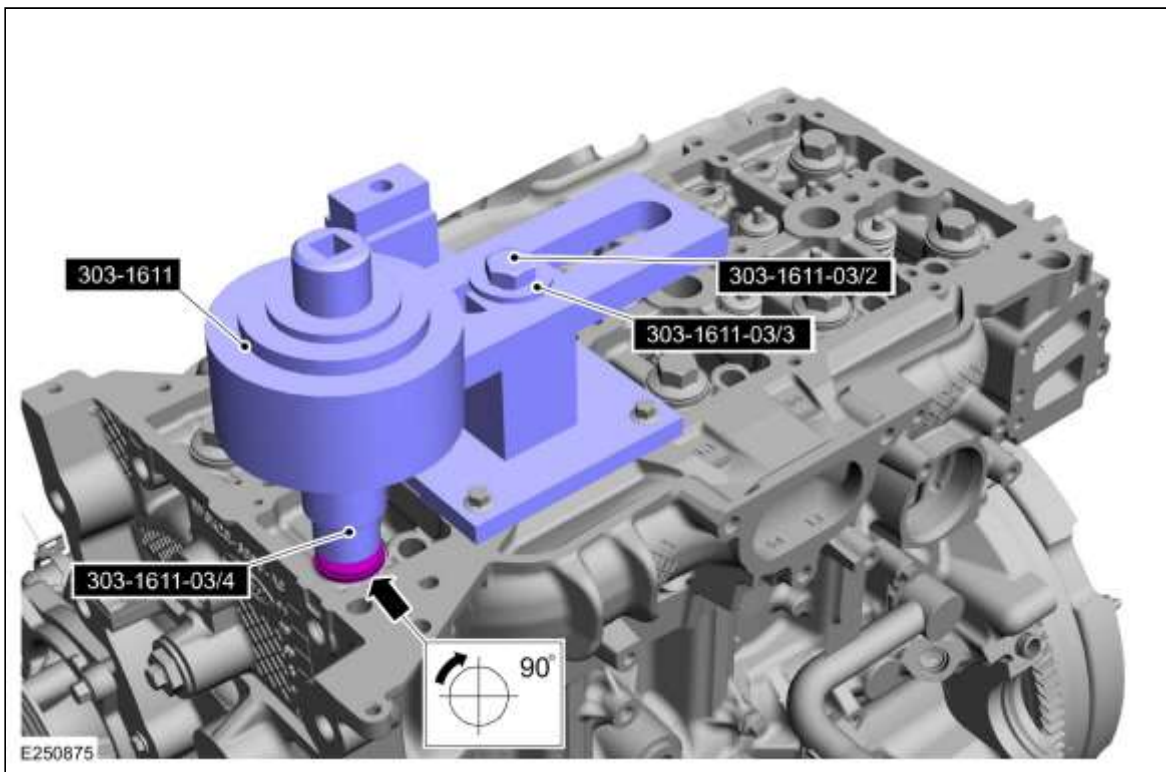


61. **NOTE:** Make sure that the component is correctly installed.

Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier.
Torque: 10 Nm



62. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier.
Use the General Equipment: 1/2 Inch Square Drive Breaker Bar
Torque:
Stage 6:: 90°

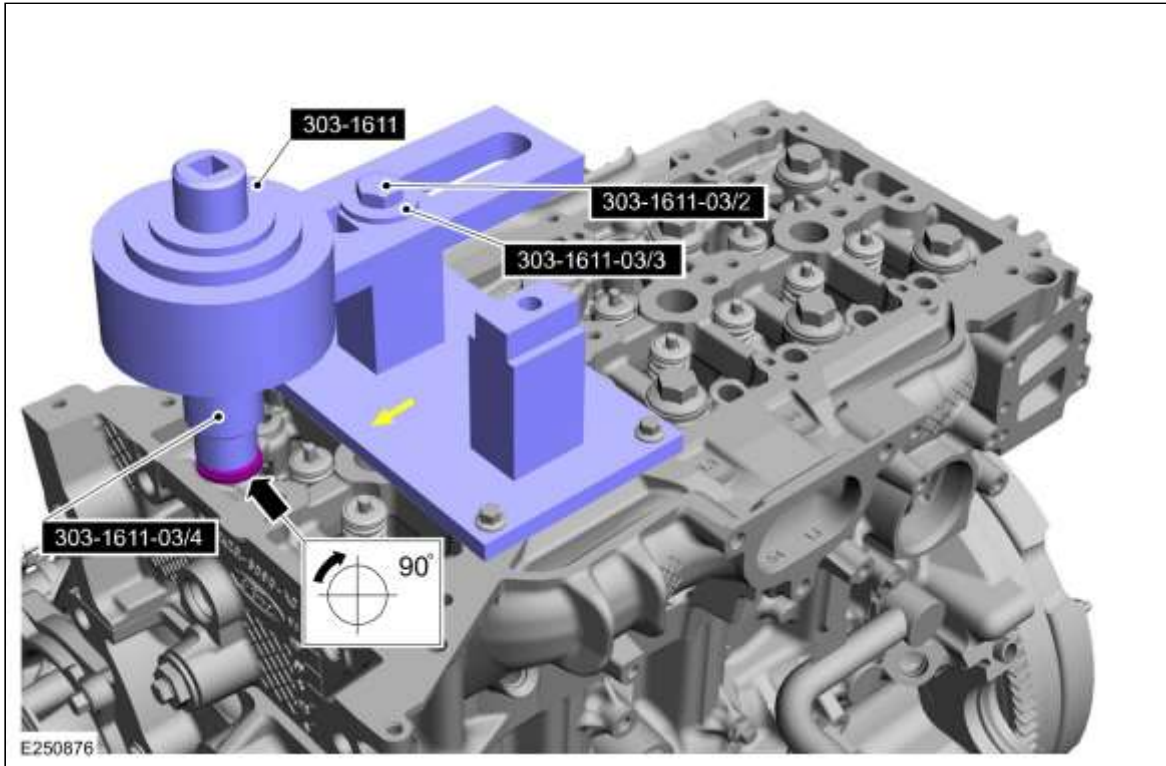


63. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

64. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier. Use the General Equipment: 1/2 Inch Square Drive Breaker Bar

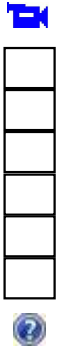
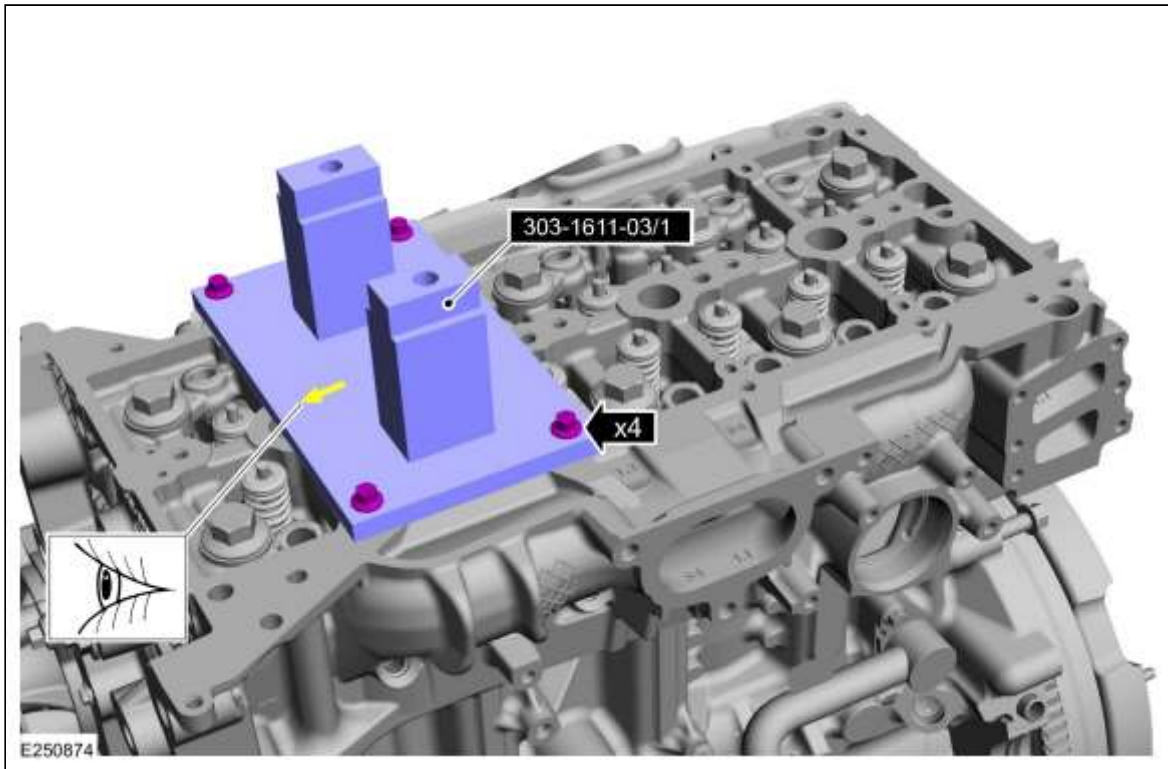
Torque:

Stage 6:: 90°



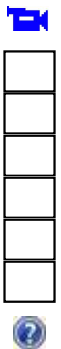
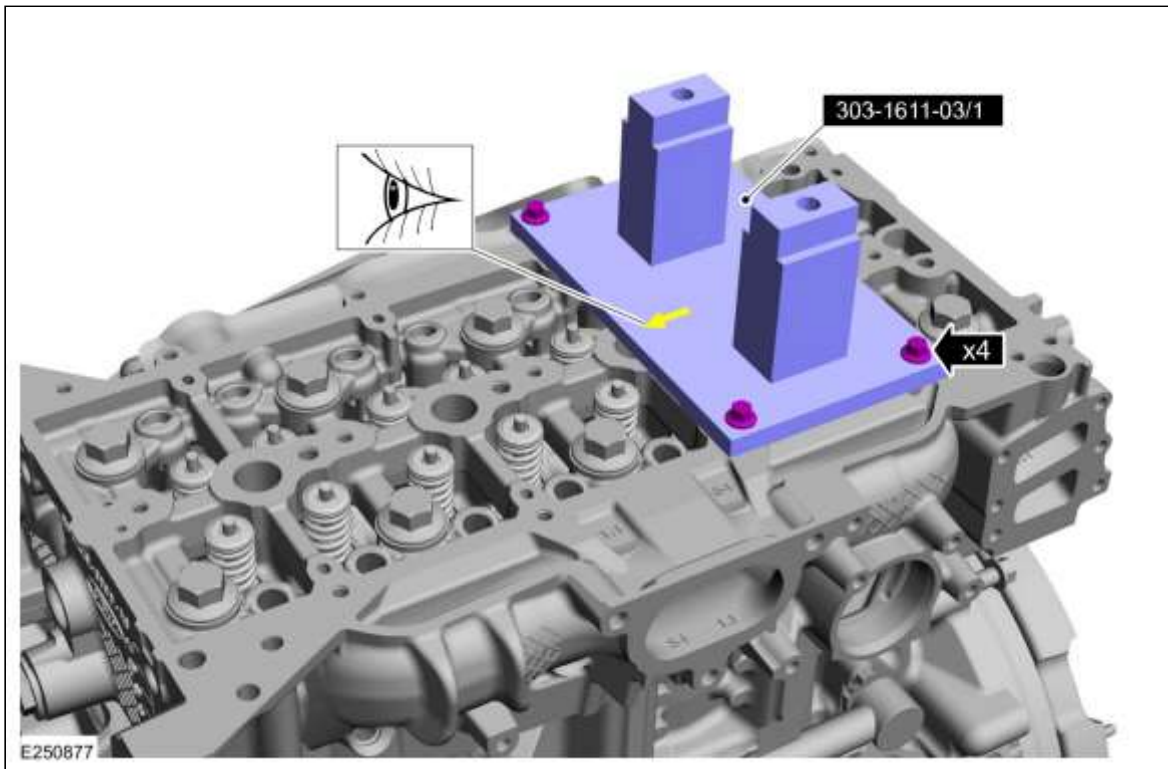
65. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

66. Remove Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier.

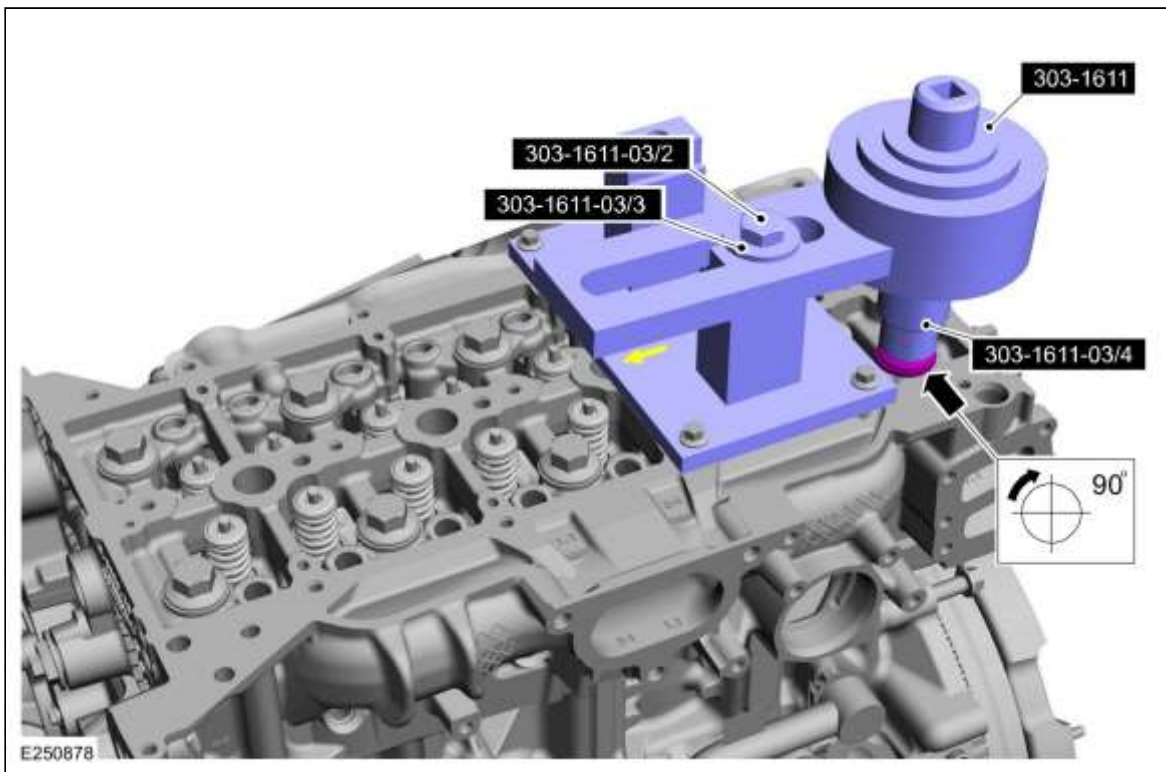


67. **NOTE:** Make sure that the component is correctly installed.

Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier.
Torque: 10 Nm



68. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier.
Use the General Equipment: 1/2 Inch Square Drive Breaker Bar
Torque:
Stage 6:: 90°

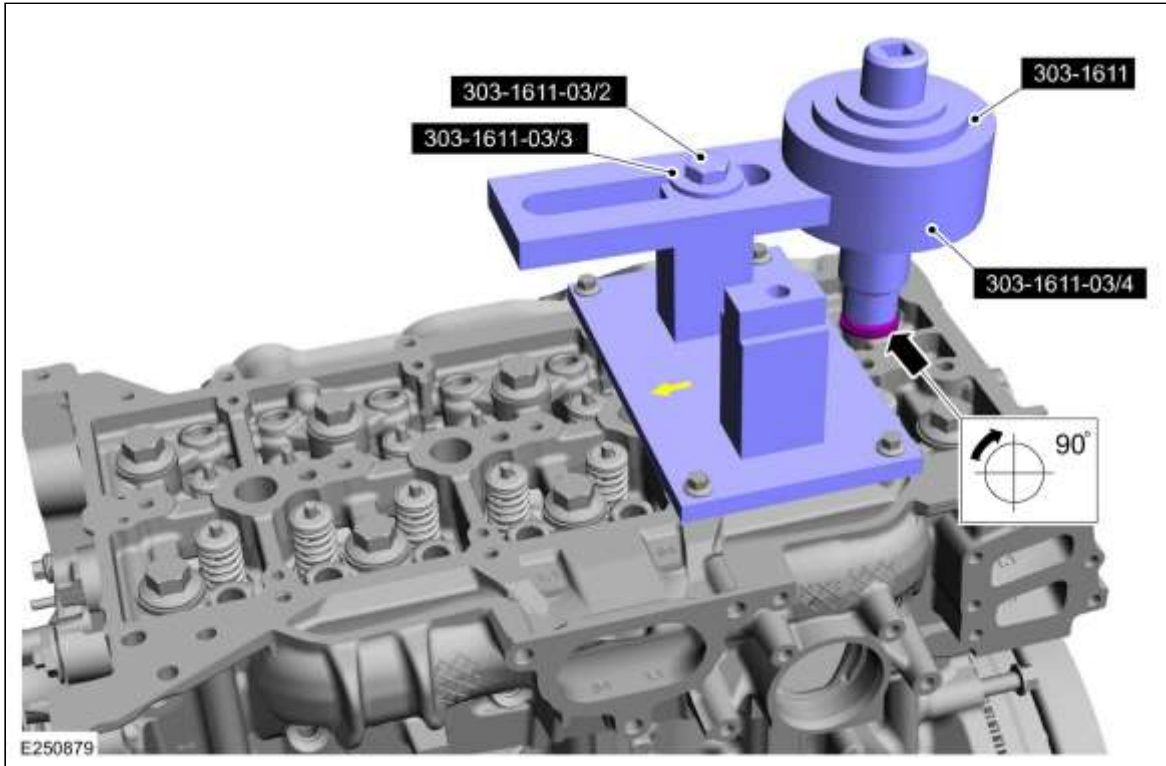


69. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

70. Install Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier. , 303-1611 Torque Multiplier. Use the General Equipment: 1/2 Inch Square Drive Breaker Bar

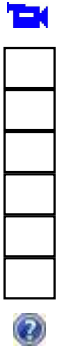
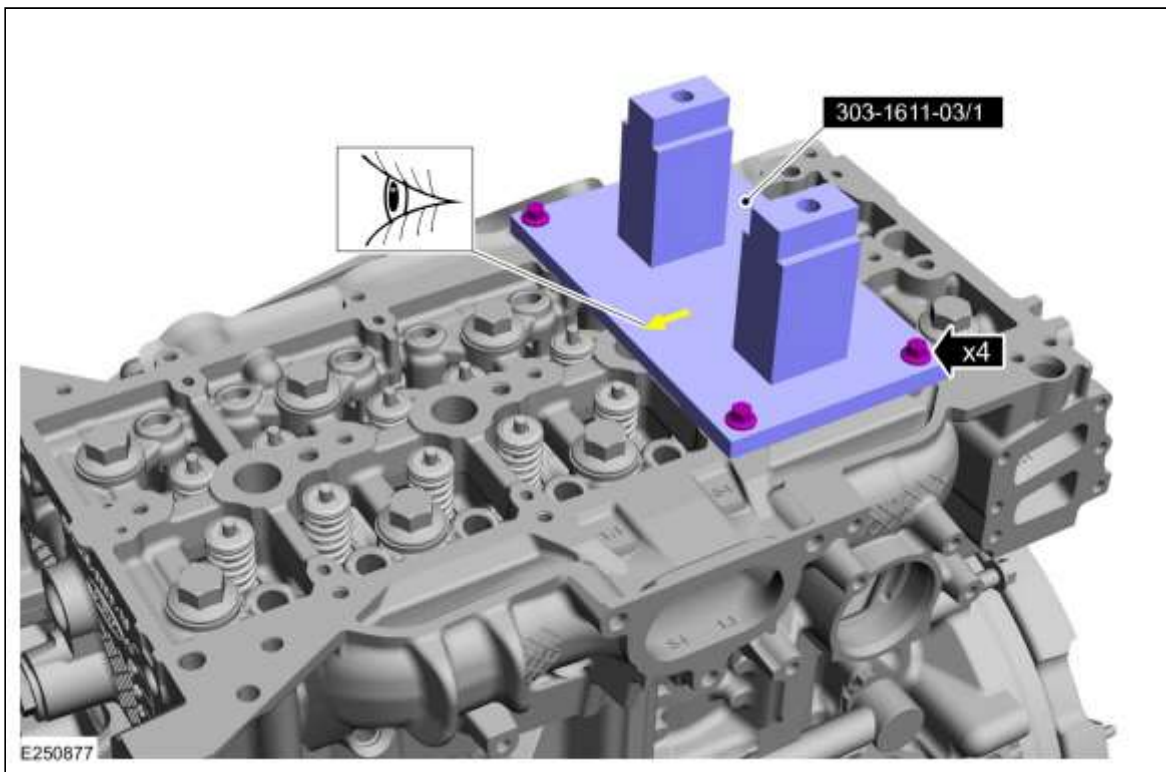
Torque:

Stage 6:: 90°



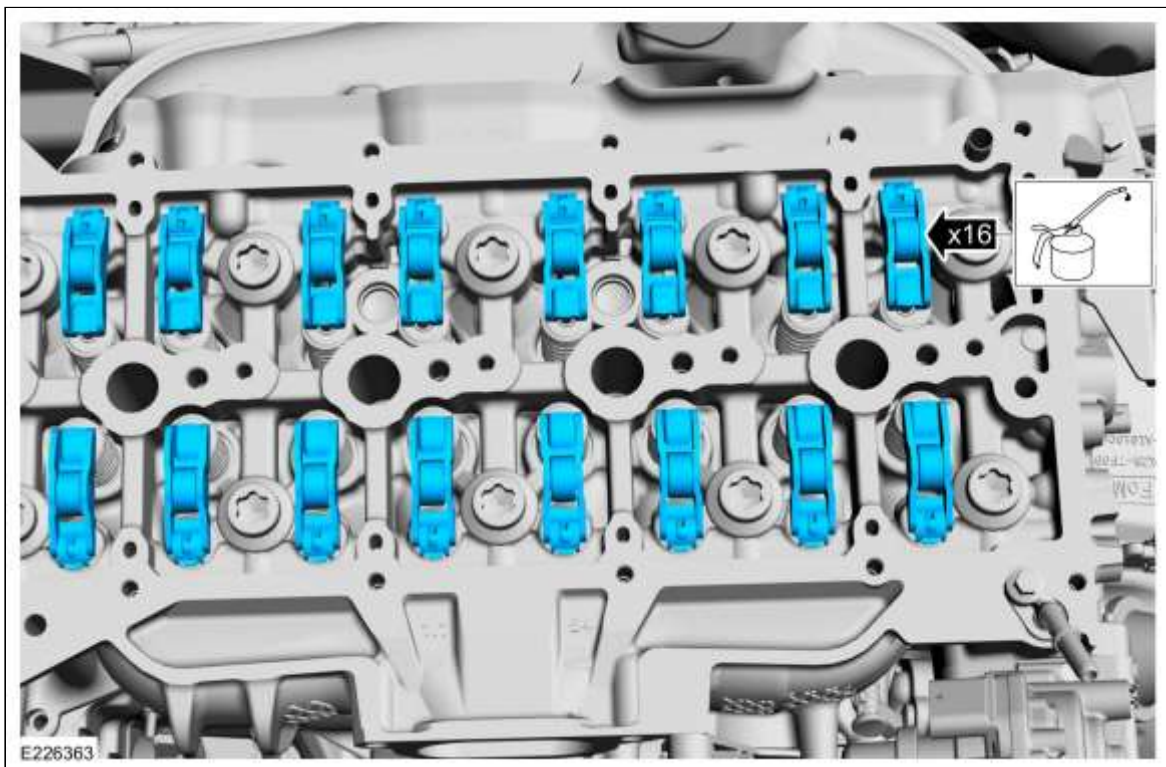
71. Remove Special Service Tool: 303-1611 Torque Multiplier. , 303-1611-03 Adapter for 303-1611, Torque Multiplier.

72. Remove Special Service Tool: 303-1611-03 Adapter for 303-1611, Torque Multiplier.



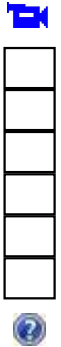
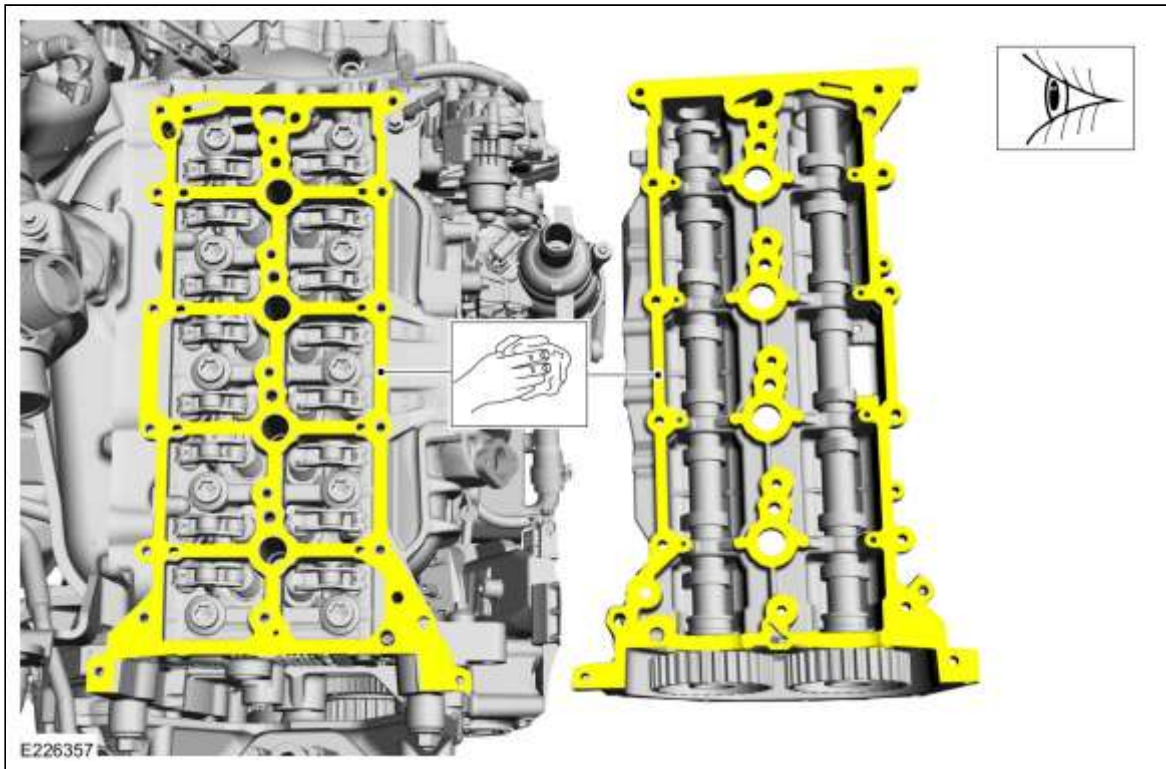
73. **Stage 7: Repeat the steps 46 to 73.**

- 74.
- **NOTE:** Component must be lubricated with clean engine oil.
Refer to: Specifications (303-01) .
 - **NOTE:** Make sure that the components are installed to the position noted before removal.



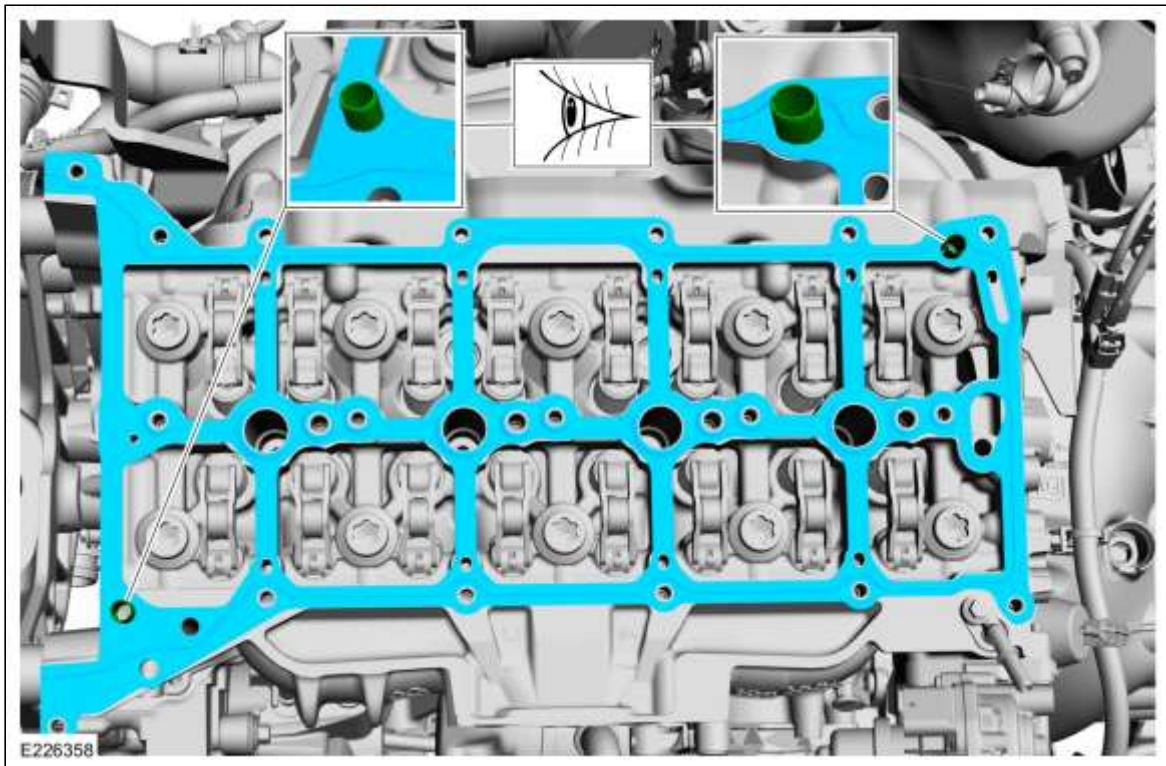
75. **NOTE:** Make sure that the mating faces are clean and free of foreign material.

Material: Reinigingsmiddel voor remmen / 3U7J-2C410-AB/BA



76. **NOTICE:** Make sure that the component is correctly located on the locating dowels.

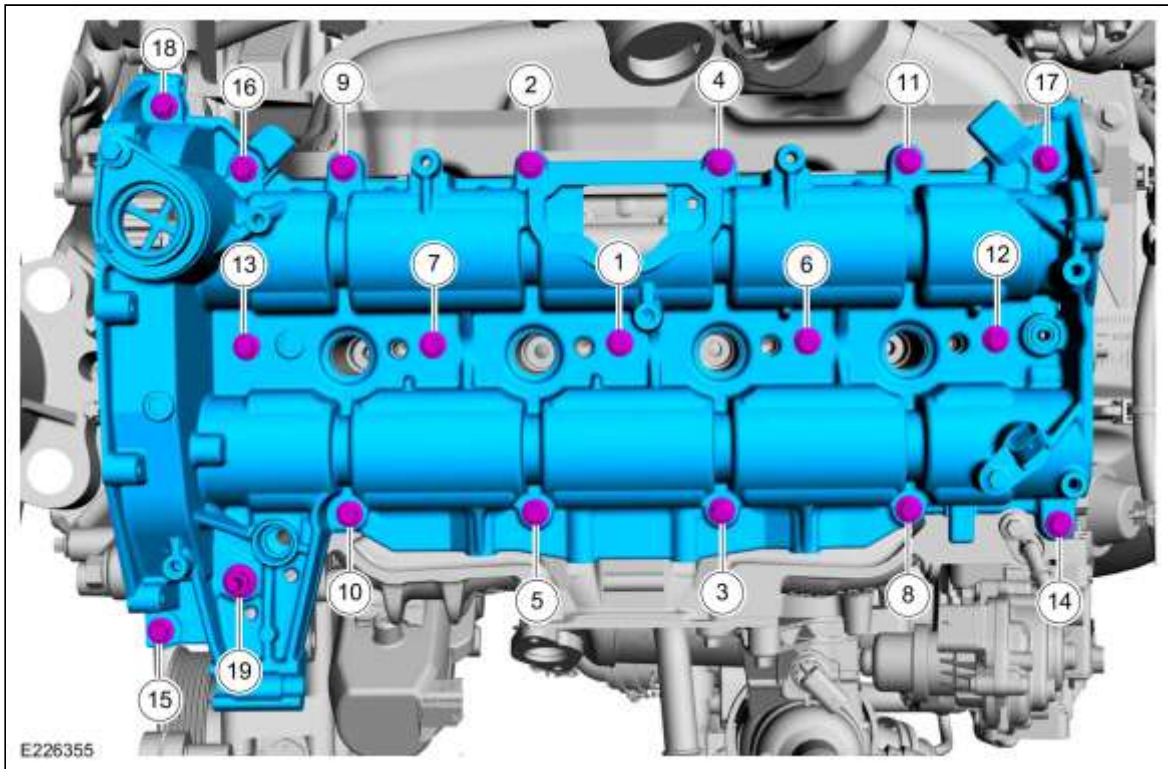
NOTE: Make sure that a new component is installed.



77. **NOTICE:** Make sure that the component is correctly located on the locating dowels.

NOTE: Make sure that the component is at ambient air temperature.

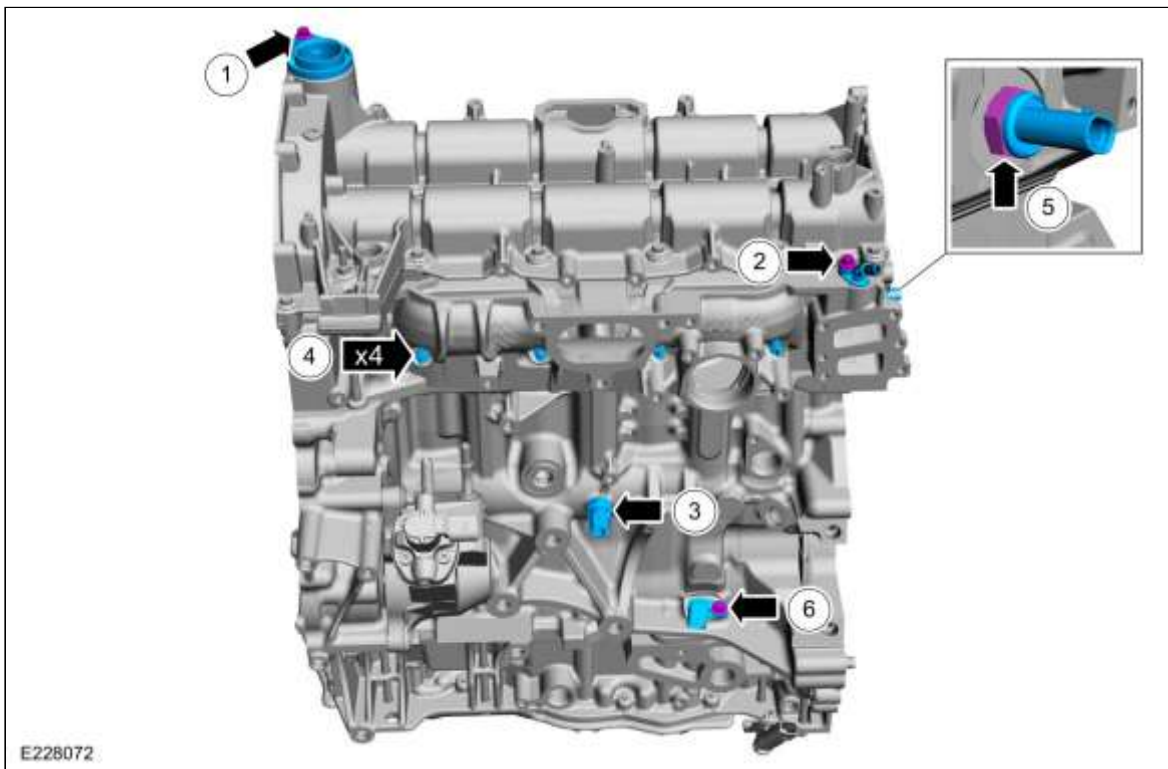
1. Tighten each bolt 2 turns at a time.
Torque:
1-19: 5 Nm
2. Torque:
1-18: 10 Nm
3. Torque:
19: 23 Nm



78. **NOTE:** Only tighten the bolts finger tight at this stage.

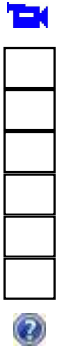
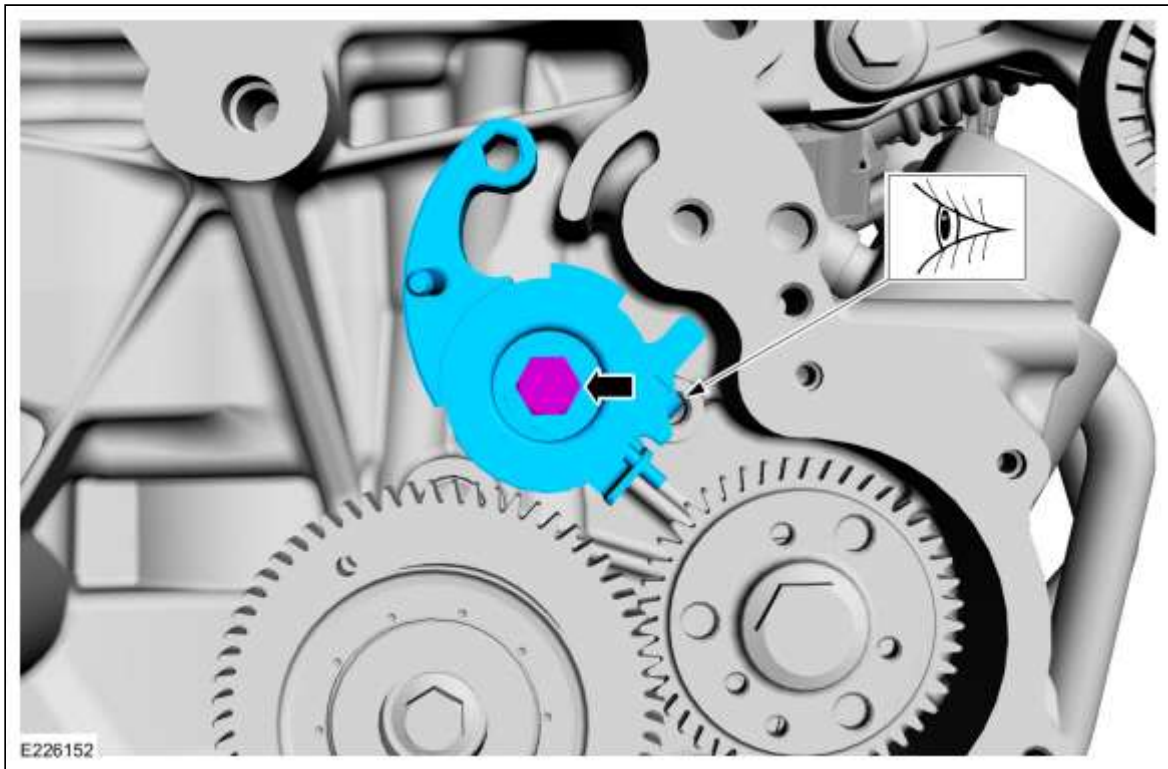
Torque:

- 1:: 10 Nm
- 2:: 10 Nm
- 3:: 20 Nm
- 4:: 13 Nm
- 5:: 11 Nm
- 6:: 10 Nm

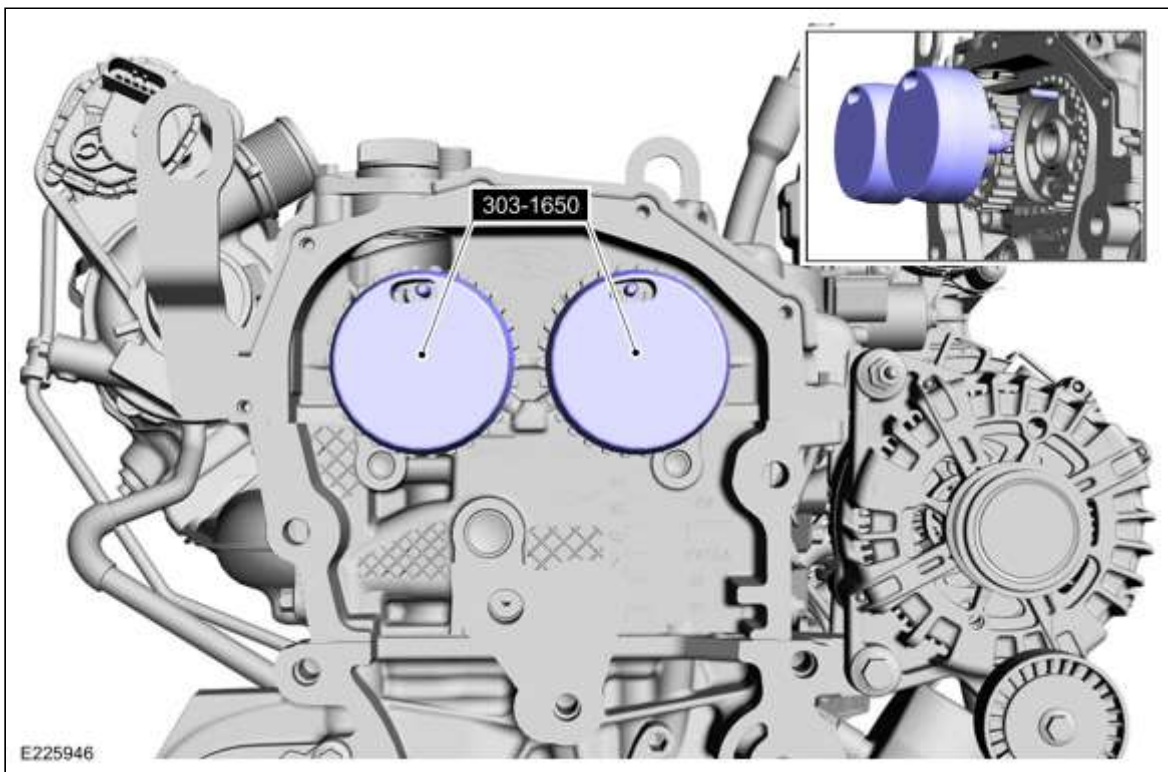


79. **NOTE:** Make sure that new components are installed.

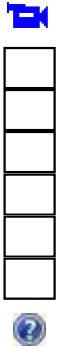
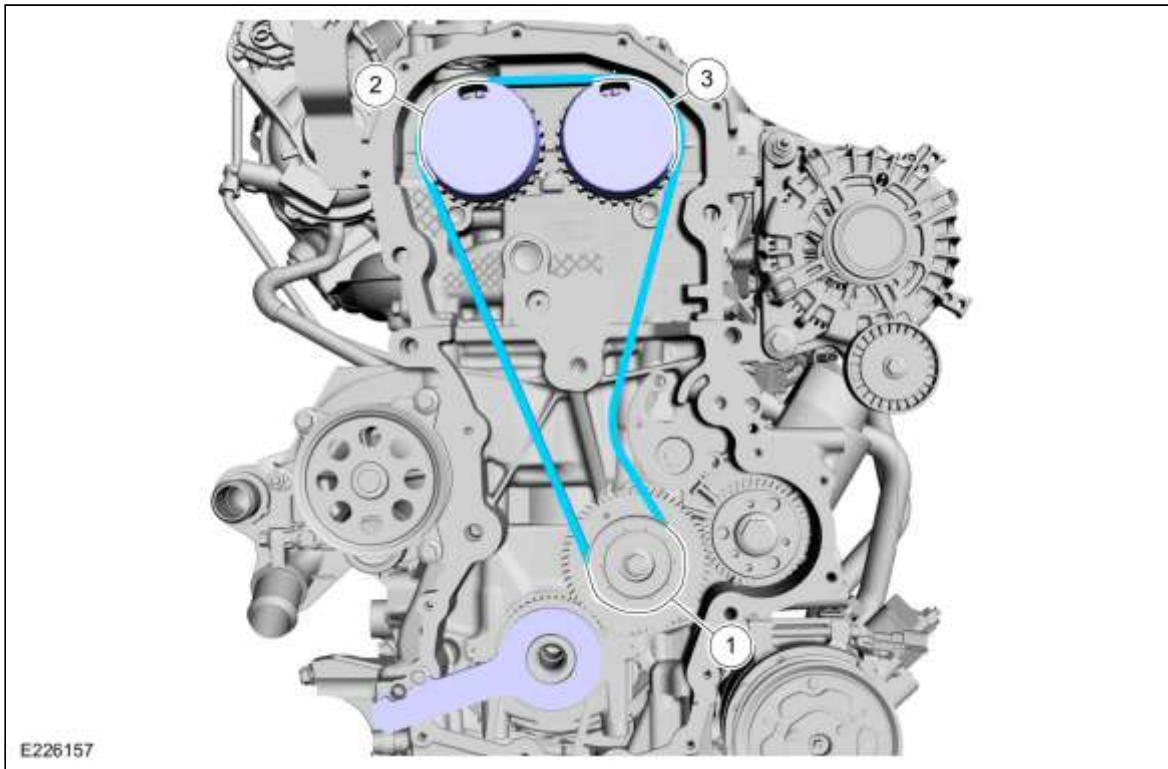
Torque: 25 Nm



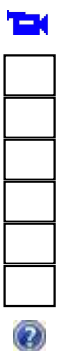
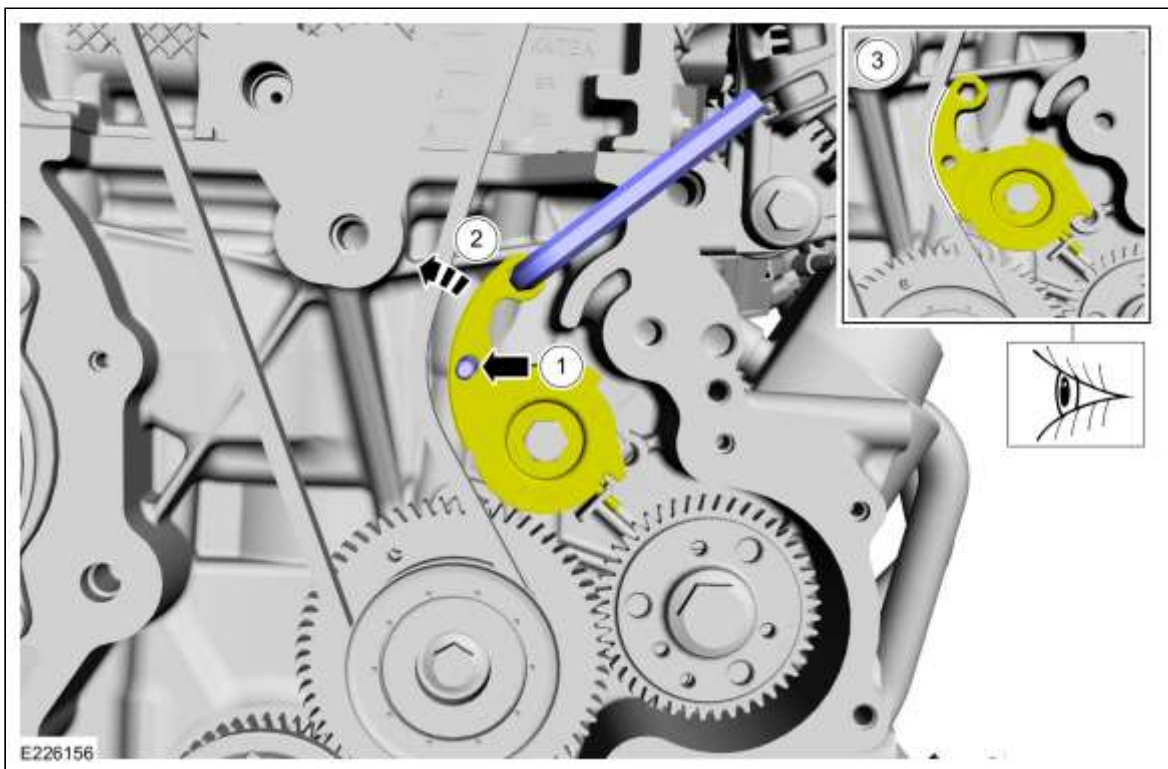
80. Install Special Service Tool: 303-1650 Mounting Device, Timing Belt.



81. **NOTE:** Make sure that a new component is installed.

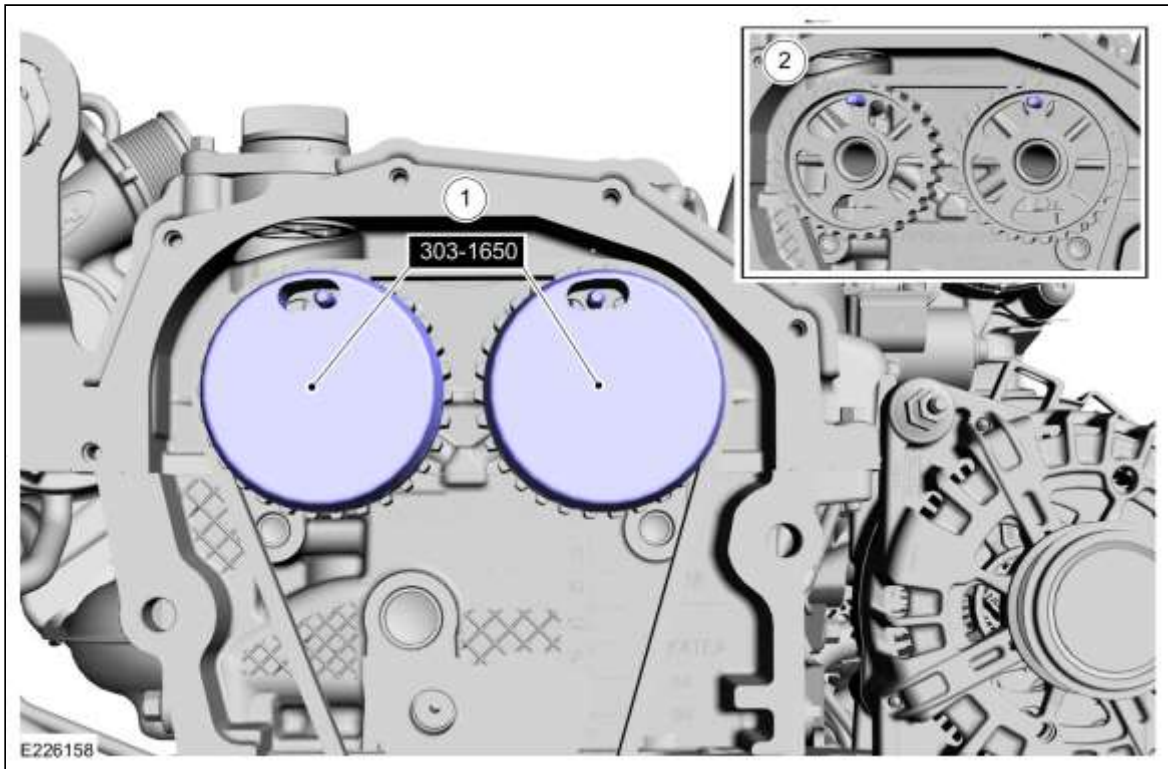


82.

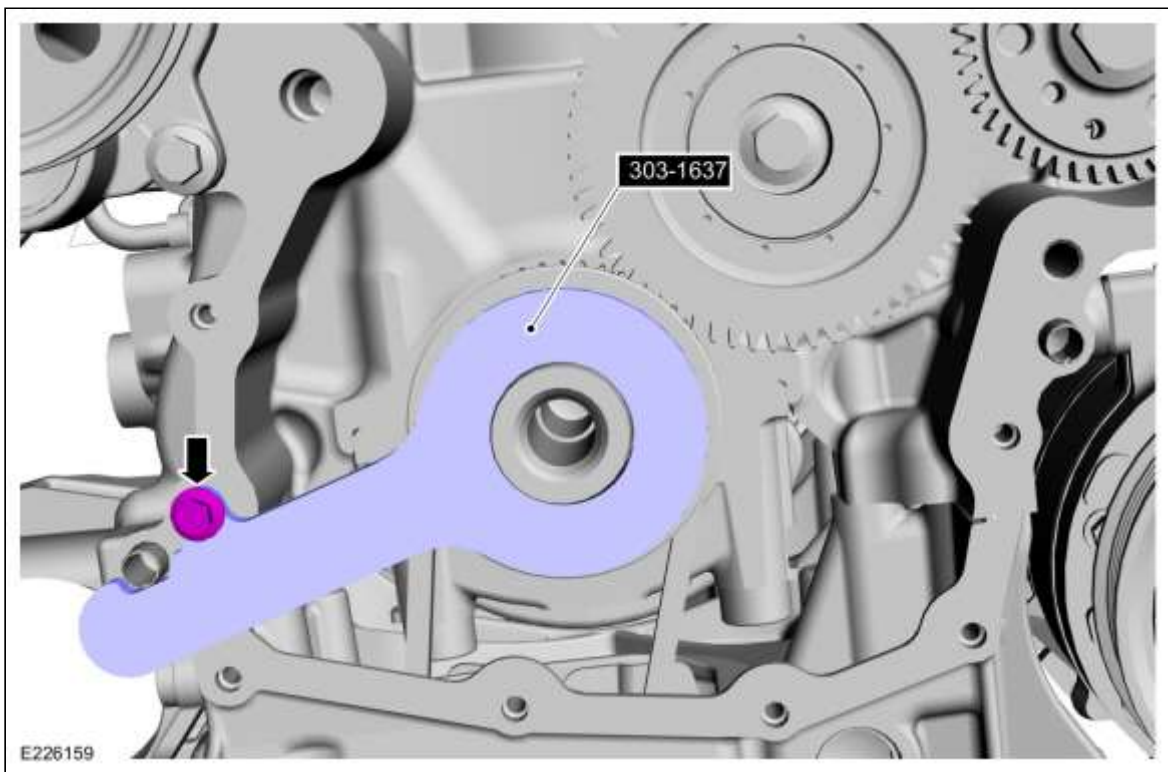


83. Remove the following items:

1. Use Special Service Tool: 303-1650 Mounting Device, Timing Belt.
2. Use the General Equipment: 6 mm Drill Bit



84. Remove Special Service Tool: 303-1637 Holding Tool, Crankshaft.

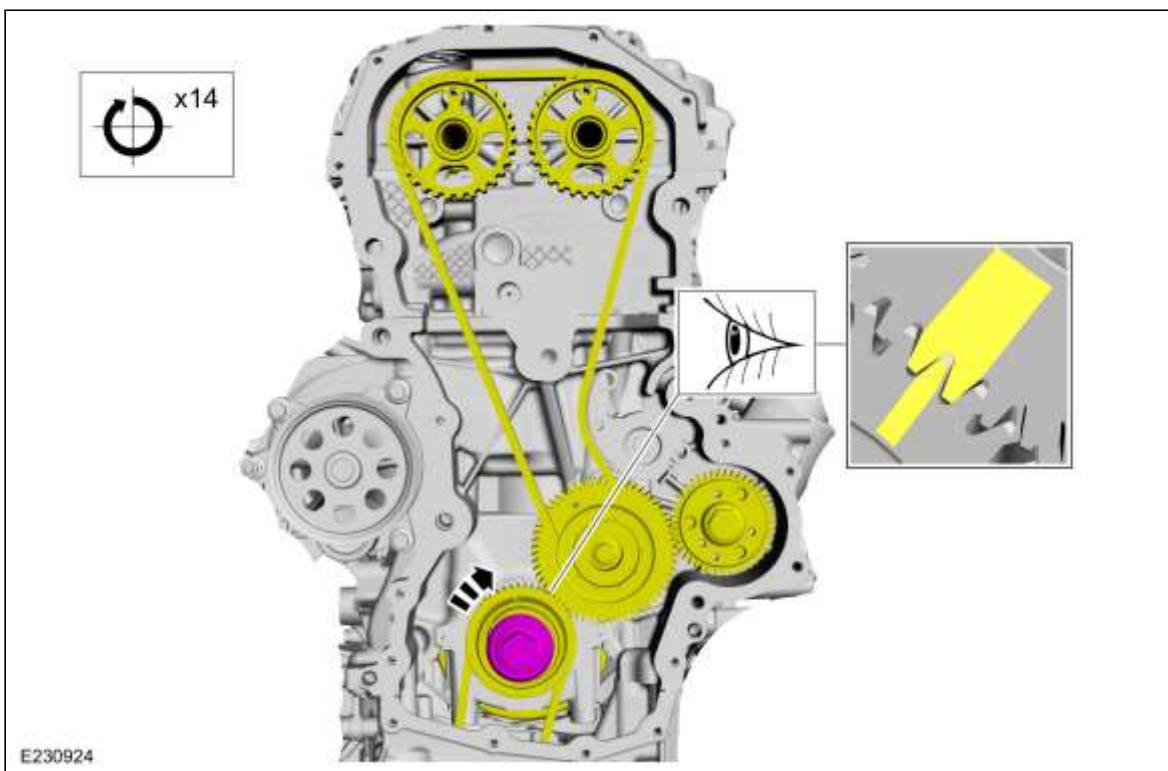


85. **NOTE:** Only tighten the bolt finger tight at this stage.

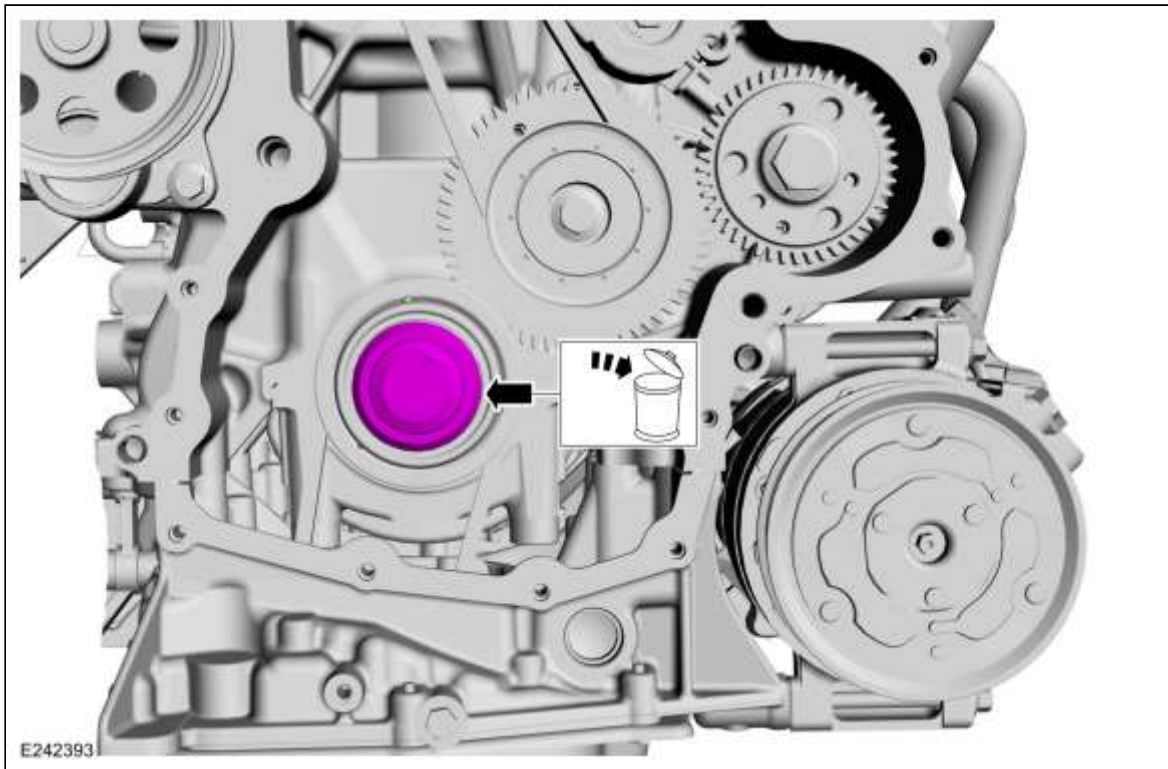


86. **NOTICE:** Only rotate the crankshaft clockwise.

Rotate the crankshaft 14 revolutions.



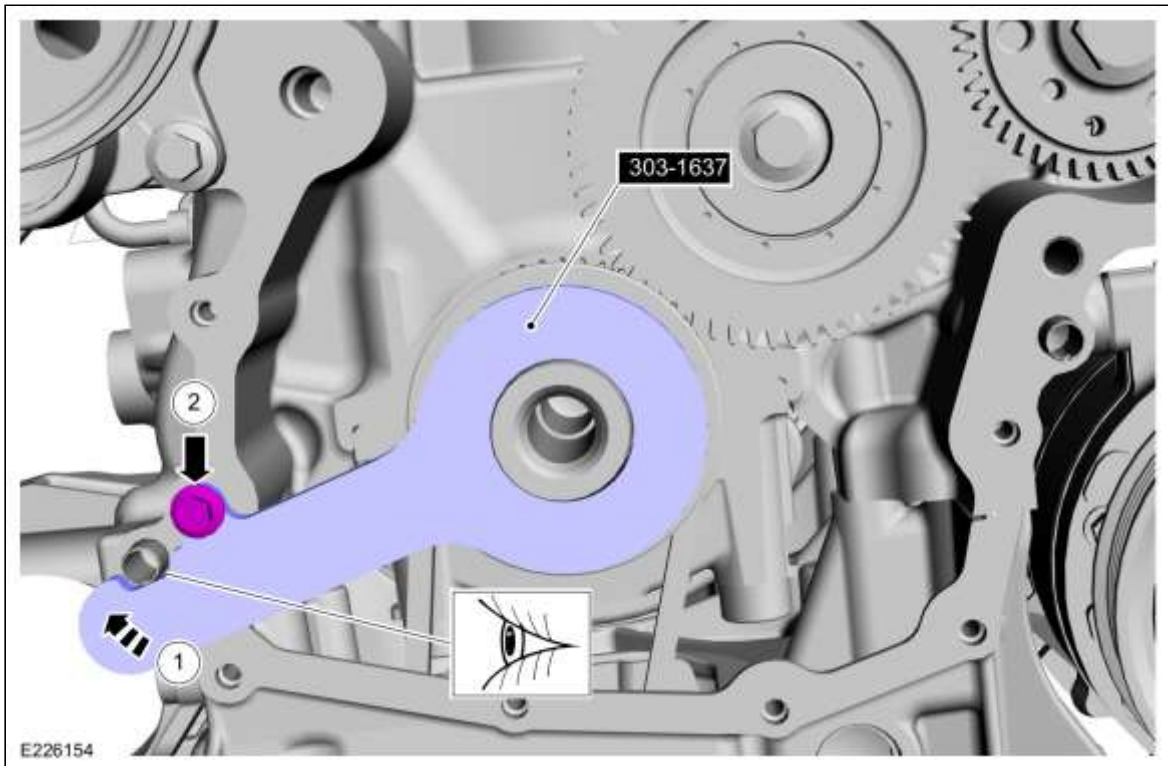
87.



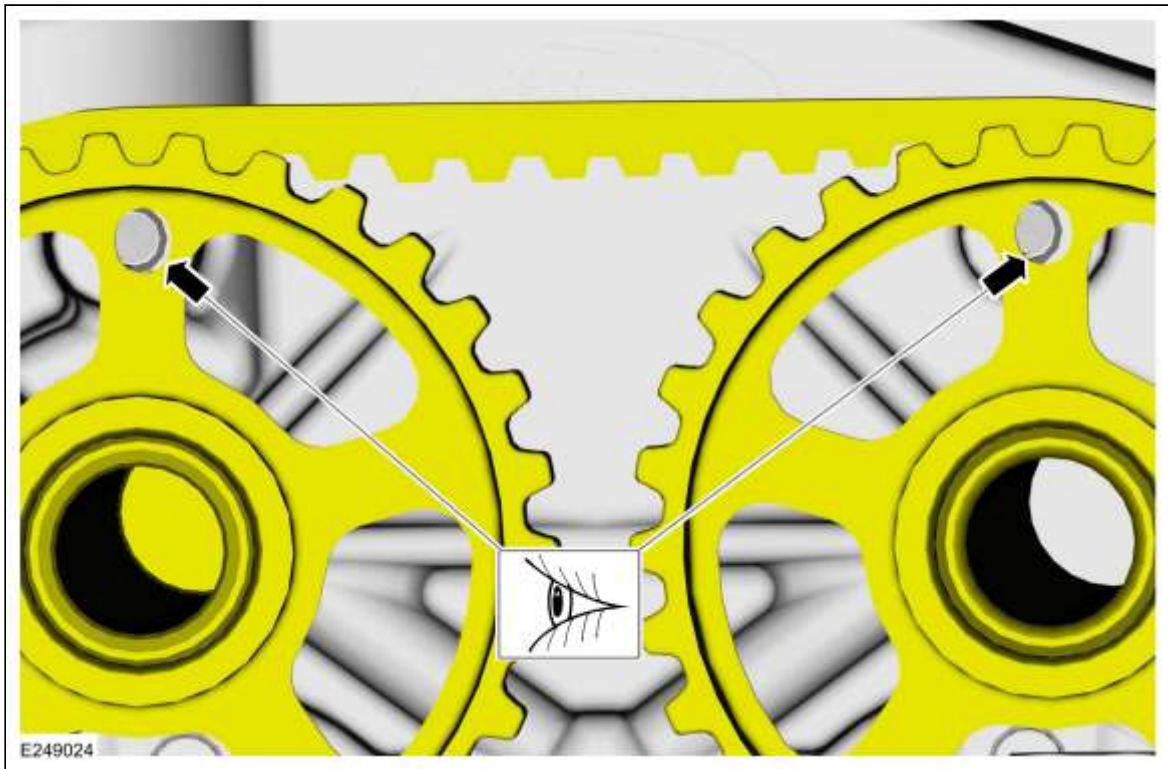
88. **NOTICE:** The special tool must only be used to align the crankshaft timing.

NOTE: Only tighten the bolt finger tight at this stage.

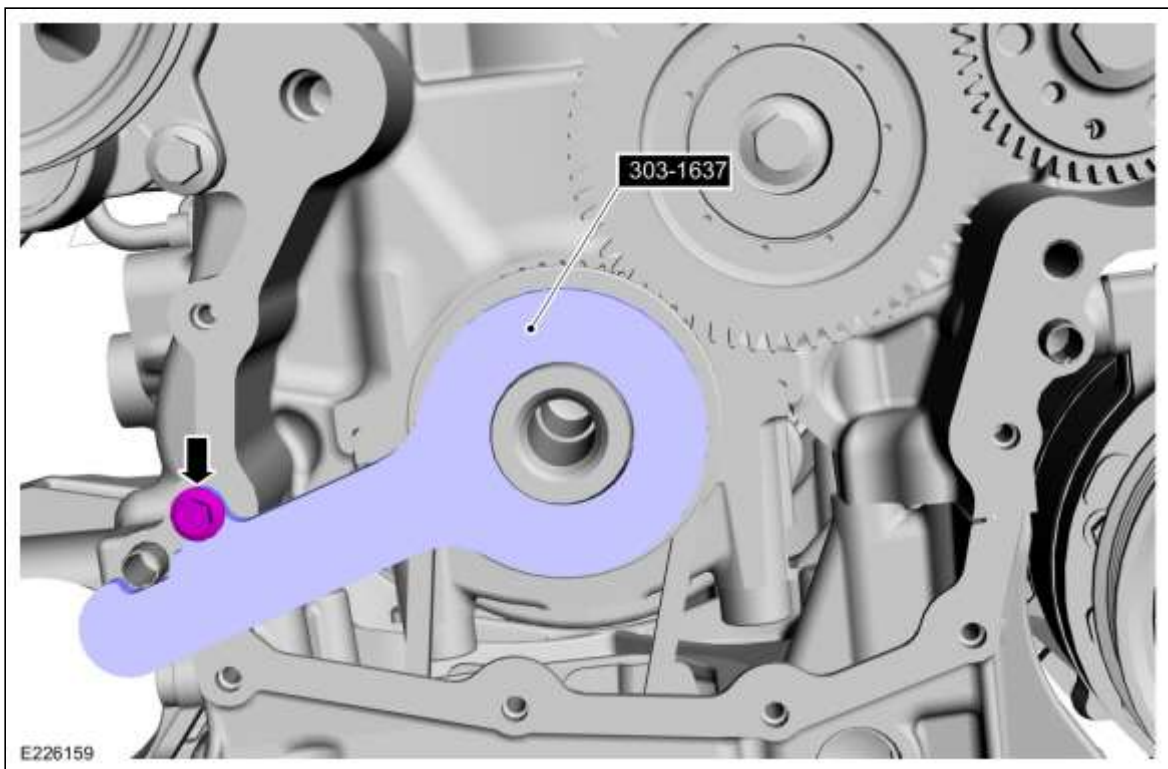
Install Special Service Tool: 303-1637 Holding Tool, Crankshaft.



89. **NOTICE:** Visually check if the timing holes of the camshaft sprockets are in a clockwise overlap position to the timing holes in the camshaft module.



90. Remove Special Service Tool: 303-1637 Holding Tool, Crankshaft.



91. Refer to: [Flexplate](#) (303-01D Engine - 2.0L EcoBlue (132kW/180PS) (YM)/2.0L TDCi Diesel (96kW/130PS) (YL)/2.0L TDCi Diesel (125kW/170PS) (BC), Removal and Installation).
 Refer to: [Flywheel](#) (303-01D Engine - 2.0L EcoBlue (132kW/180PS) (YM)/2.0L TDCi Diesel (96kW/130PS) (YL)/2.0L TDCi Diesel (125kW/170PS) (BC), Removal and Installation).

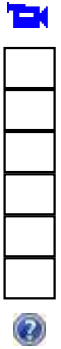
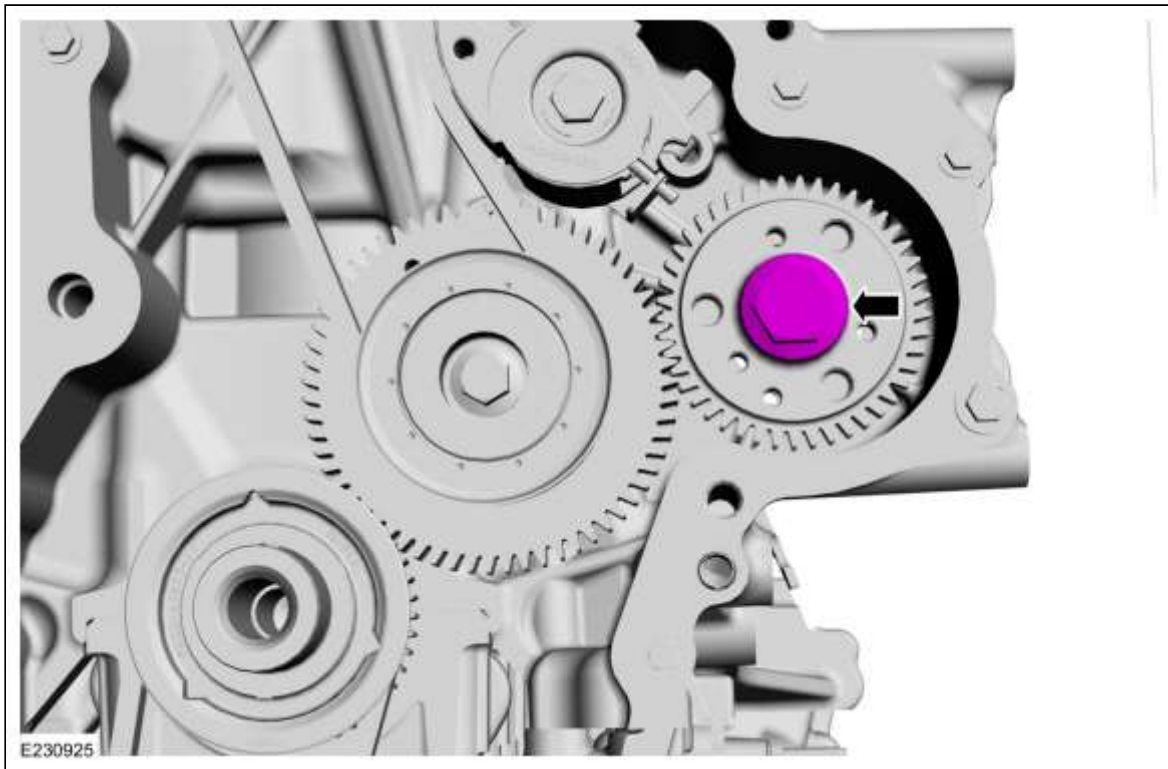
92. **NOTE:** Only tighten the bolt finger tight at this stage.

NOTE: Make sure a new bolt is installed.

Torque:

Stage 1: 25 Nm

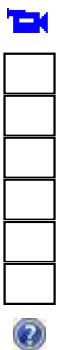
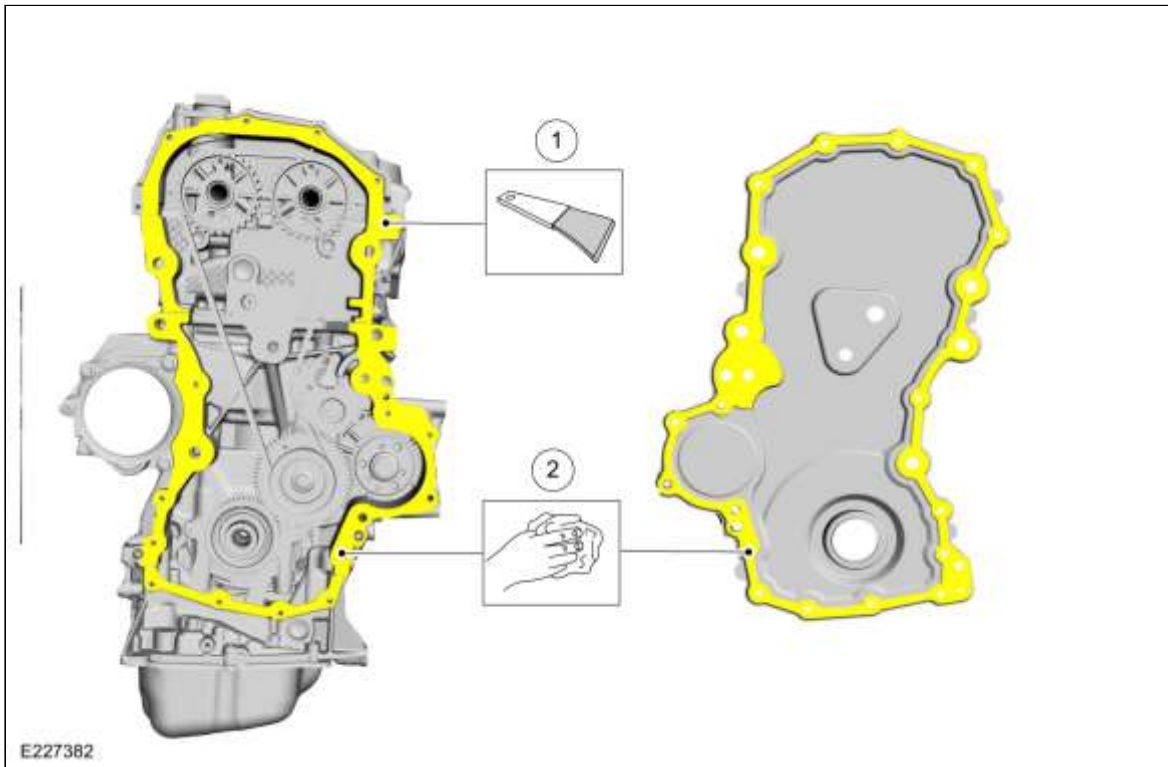
Stage 2: 75 Nm



93.

NOTE: Make sure that the mating faces are clean and free of foreign material.

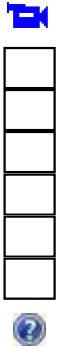
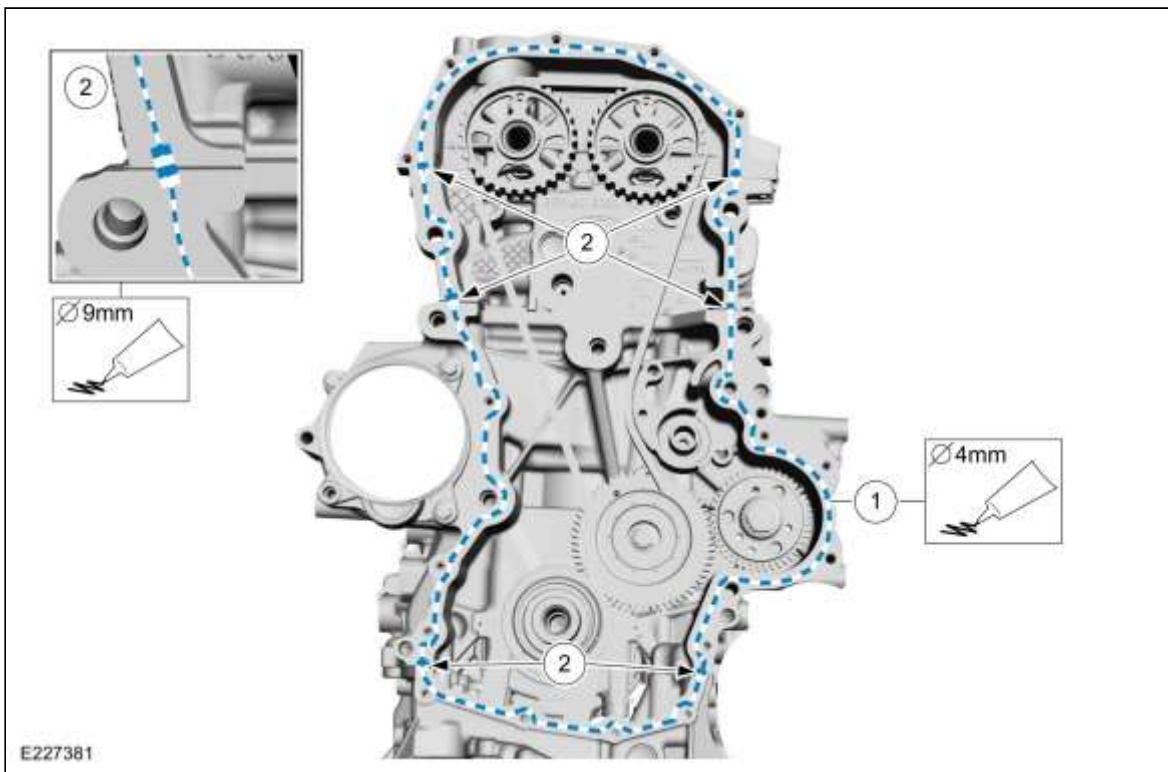
1. Use the General Equipment: Plastic Scraper
2. Material: Primer H-BW / CU7J-BNDRT-AA/CA



94. **NOTE:** The component must be installed within 5 minutes of applying the sealant.

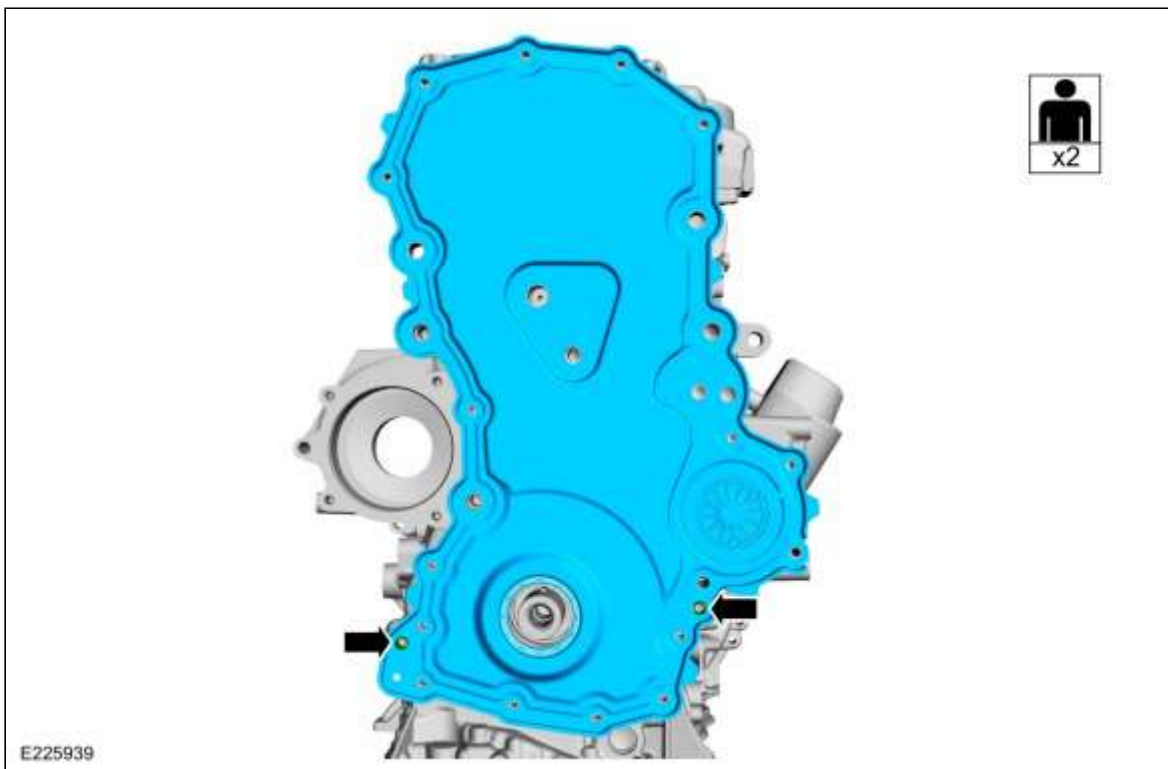


Complete this step within: 5min
 Material: Silicone Sealant LB-AX / Silicone Sealant LB-AX (WSS-M4G323-A10)

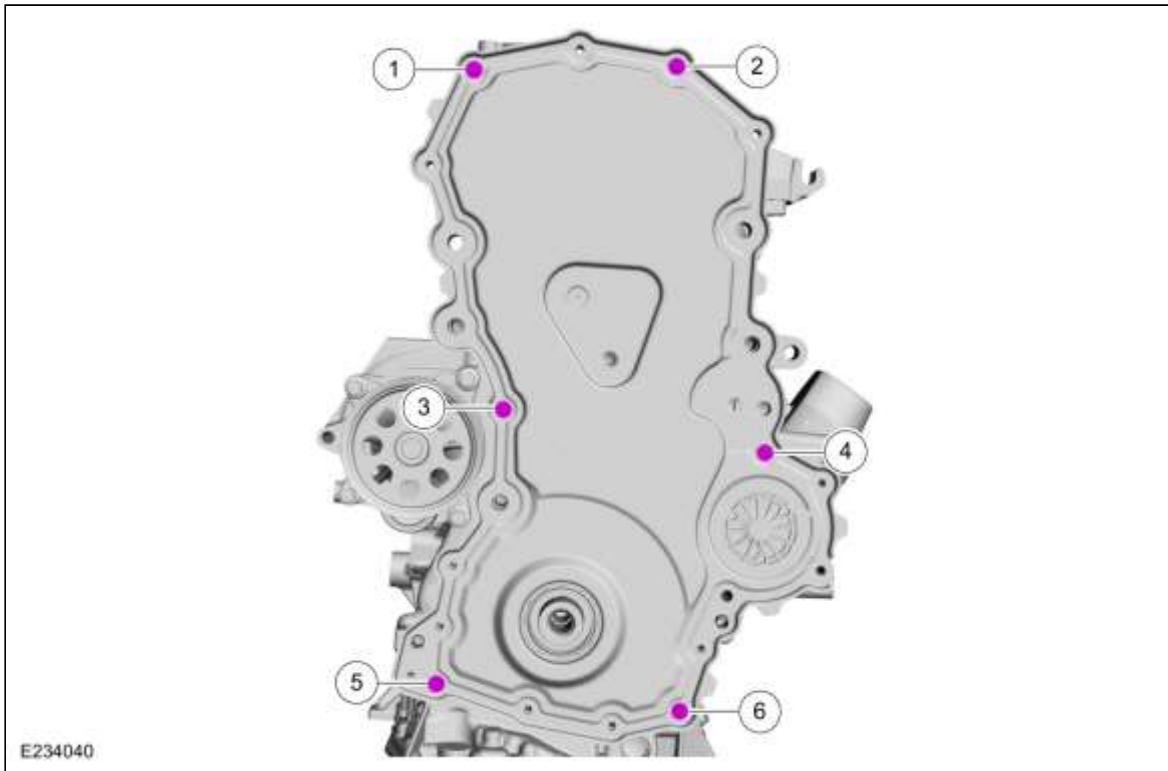


95. **NOTICE:** Make sure that the component is correctly located on the locating dowels.

NOTE: Make sure that a new component is installed.



96. **NOTE:** Only tighten the bolts finger tight at this stage.

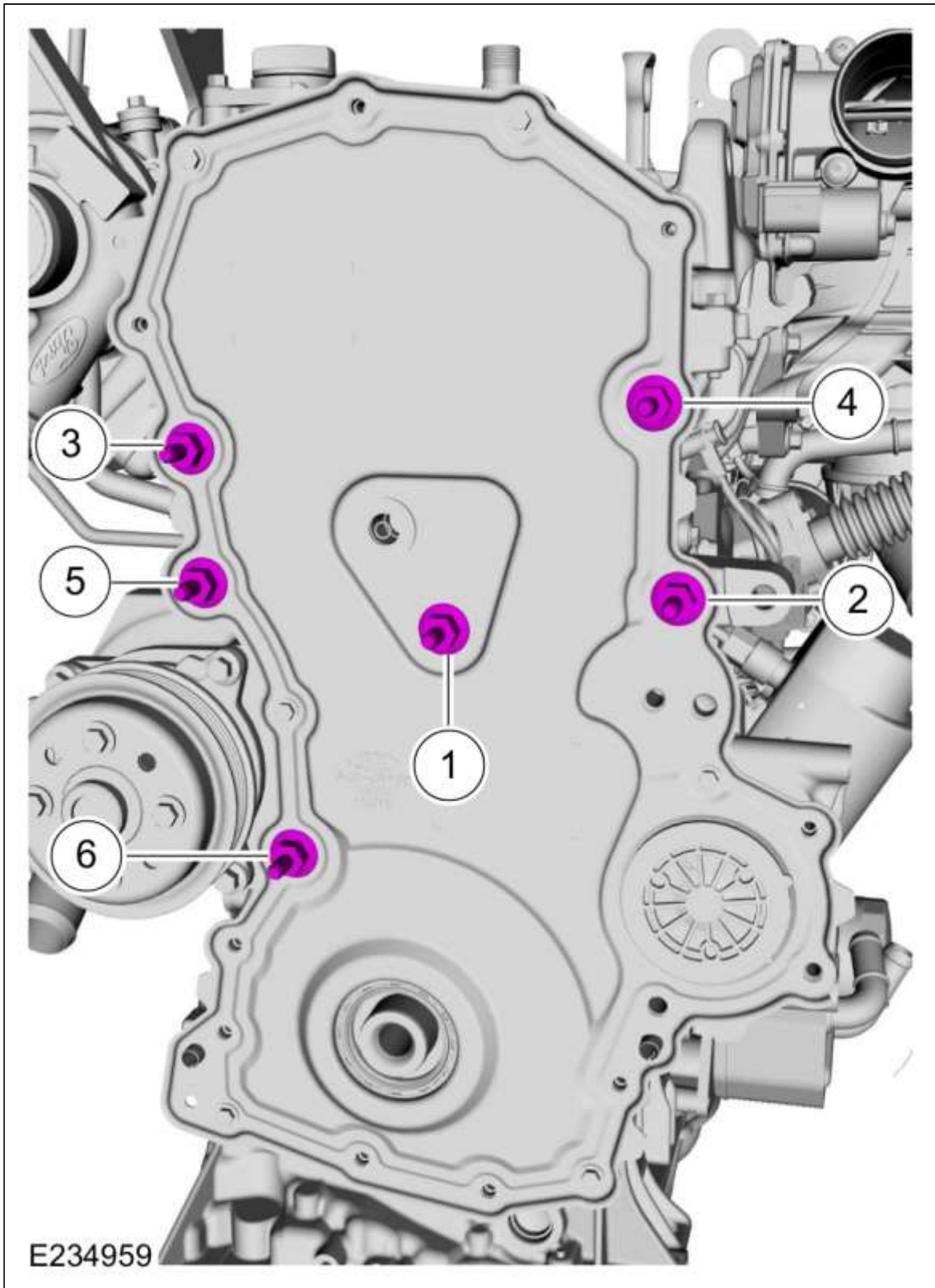


97. **NOTE:** Only tighten the bolts finger tight at this stage.

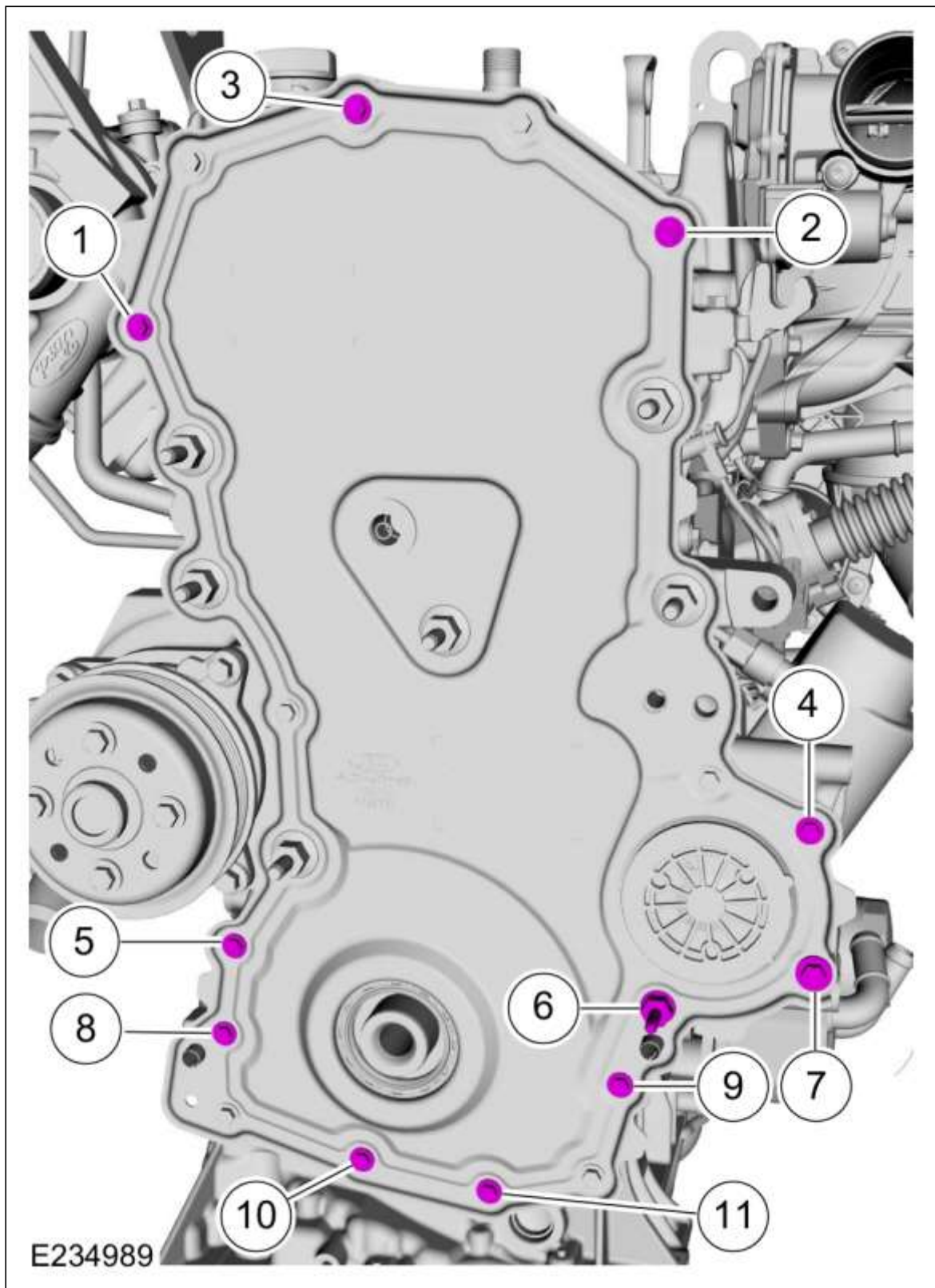
Torque:

Stage 1: 12 Nm

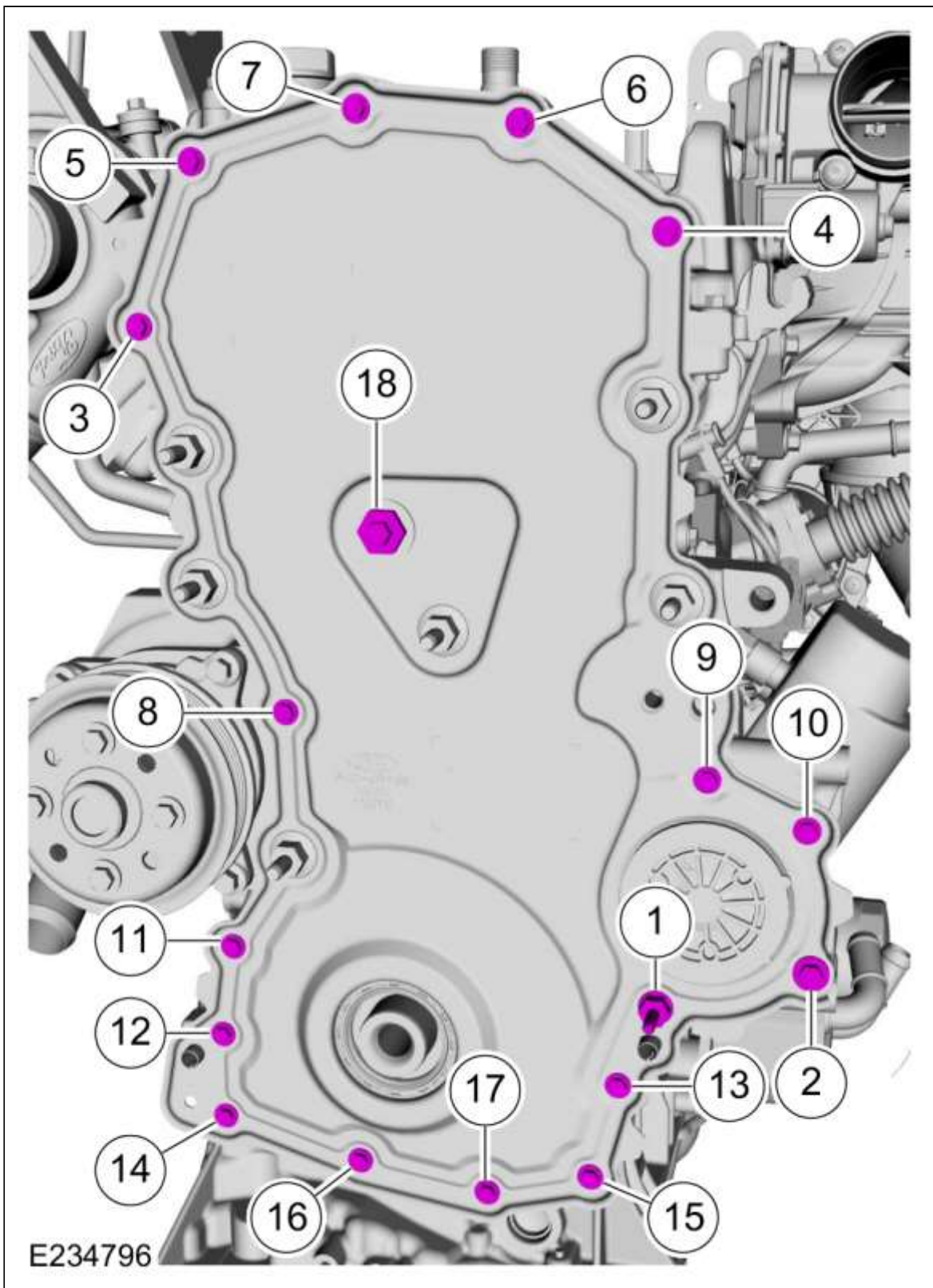
Stage 2: 65 Nm



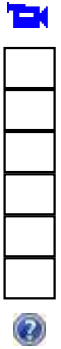
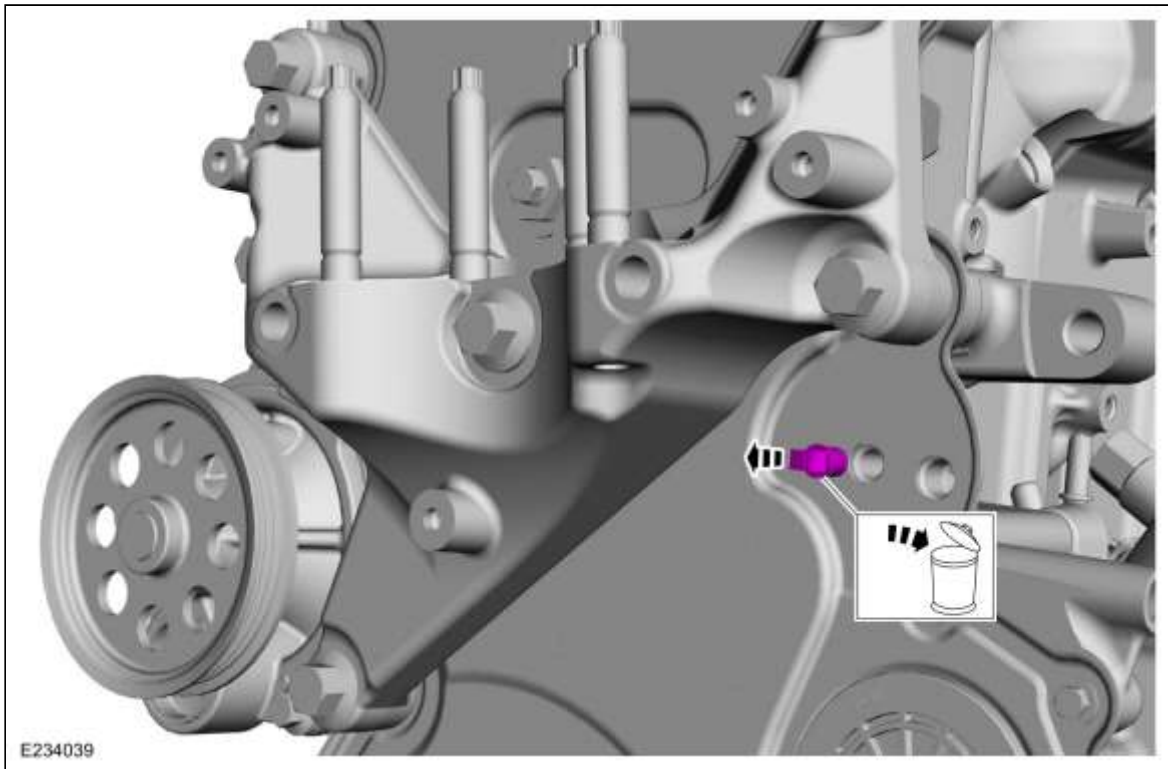
98. **NOTE:** Only tighten the bolts finger tight at this stage.



99. *Torque:*
 1-2: 18 Nm
 3-17: 10 Nm
 18: 40 Nm



100.



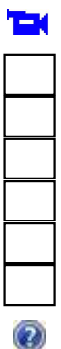
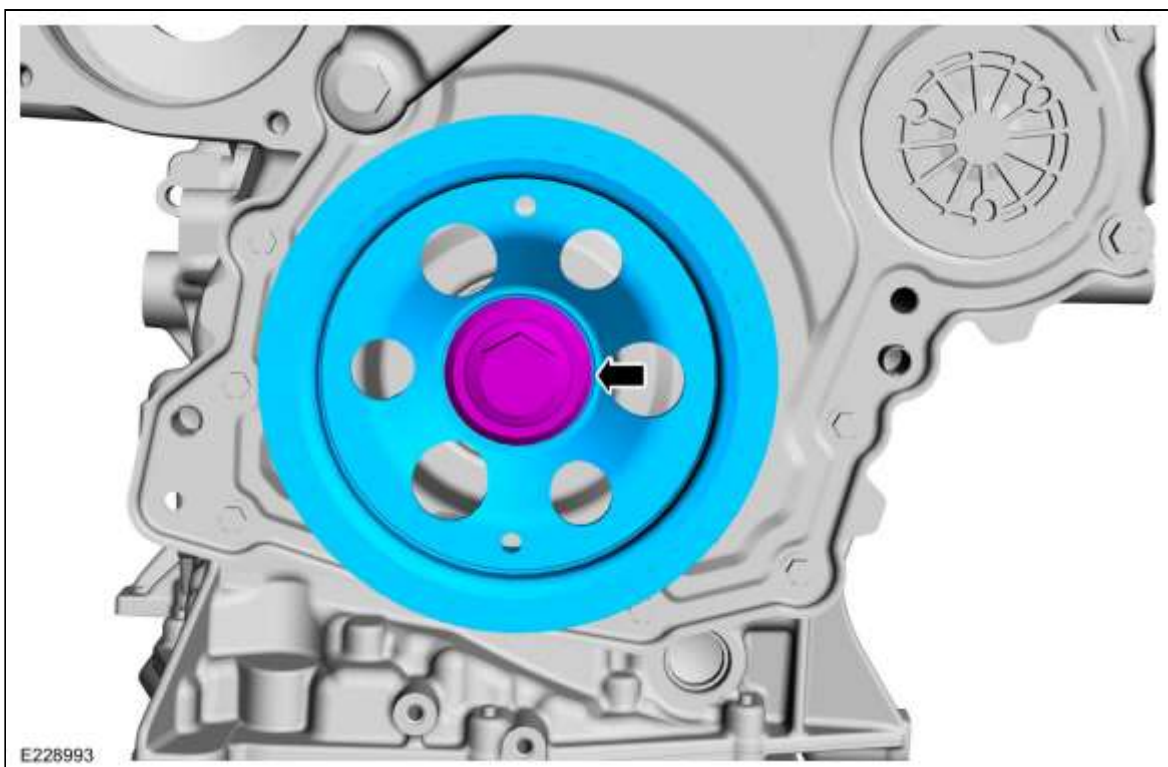
101. **NOTE:** Make sure a new bolt is installed.

NOTE: Only tighten the bolt finger tight at this stage.

If equipped. Vehicles without damper pulley.

Torque:

- Stage 1: 10 Nm
- Stage 2: Loosen: 60°
- Stage 3: 20 Nm
- Stage 4: 70 Nm
- Stage 5: 150 Nm
- Stage 6: Loosen: 90°
- Stage 7: 100 Nm
- Stage 8: 300 Nm
- Stage 9: 90°

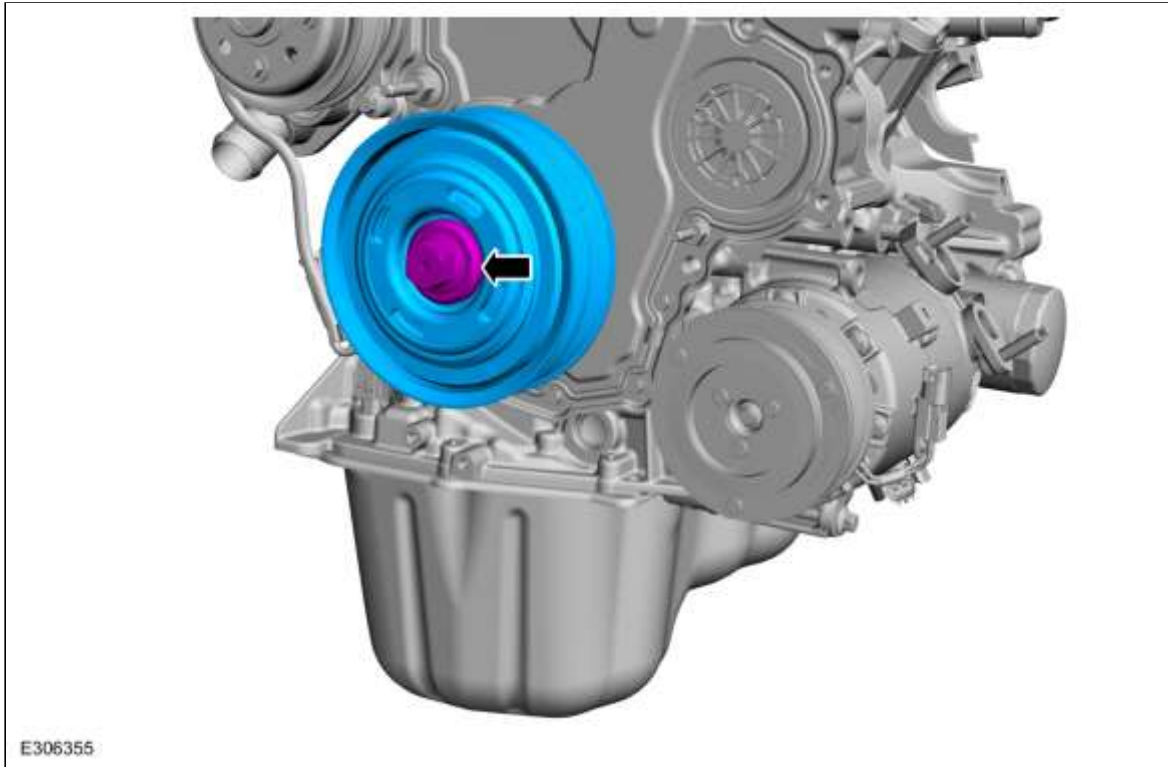


102. **NOTE:** Make sure a new bolt is installed.

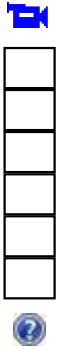
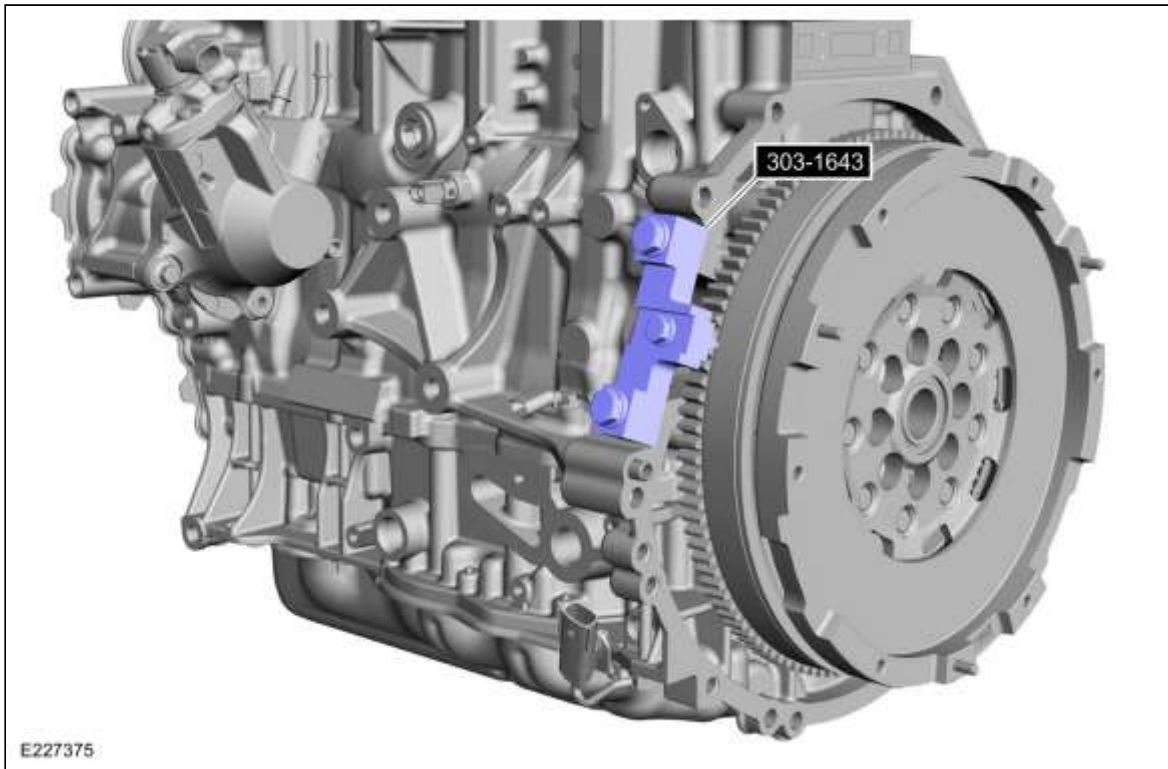
NOTE: Only tighten the bolt finger tight at this stage.

If equipped. Vehicles with damper pulley.
Torque:

- Stage 1: 10 Nm
- Stage 2: Loosen: 60°
- Stage 3: 20 Nm
- Stage 4: 70 Nm
- Stage 5: 150 Nm
- Stage 6: Loosen: 90°
- Stage 7: 100 Nm
- Stage 8: 300 Nm
- Stage 9: 90°

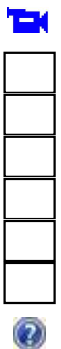
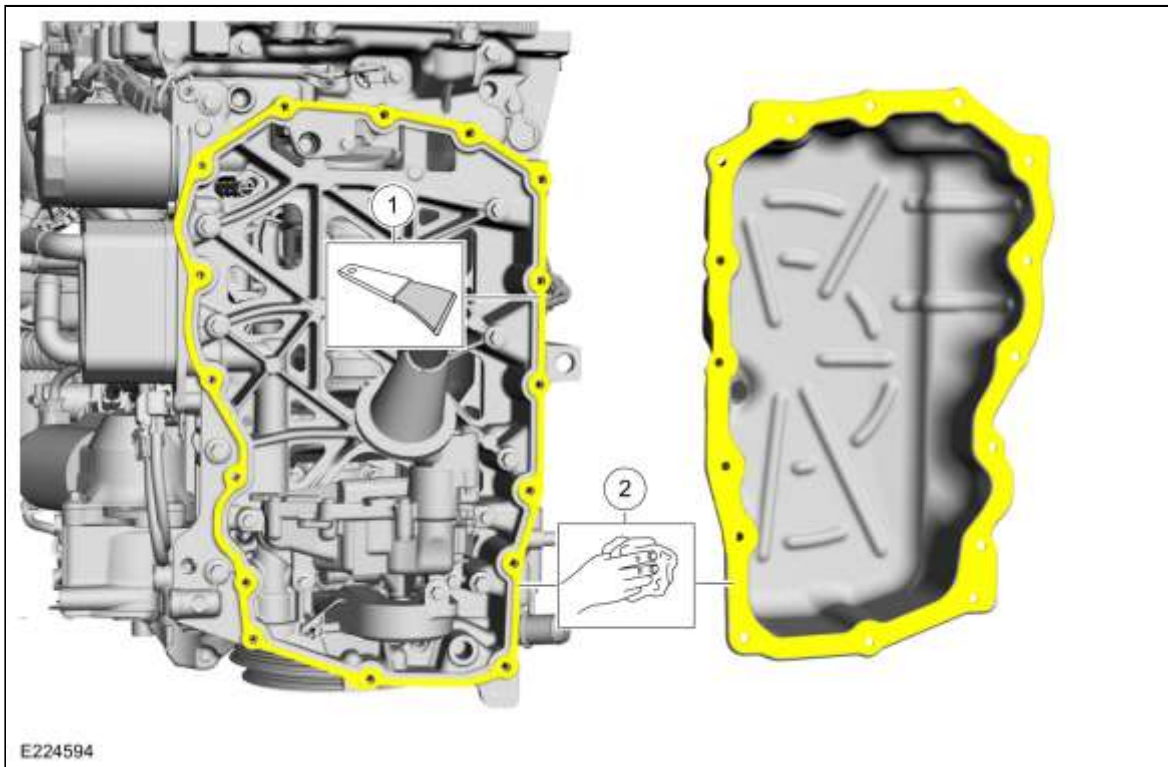


103. Remove Special Service Tool: 303-1643 Locking Tool, Flywheel.



104.

1. Use the General Equipment: Plastic Scraper
 2. **NOTE:** Make sure that the mating faces are clean and free of foreign material.
- NOTE:** Make sure that a new component is installed.
- Material:* Primer H-BW / CU7J-BNDRT-AA/CA

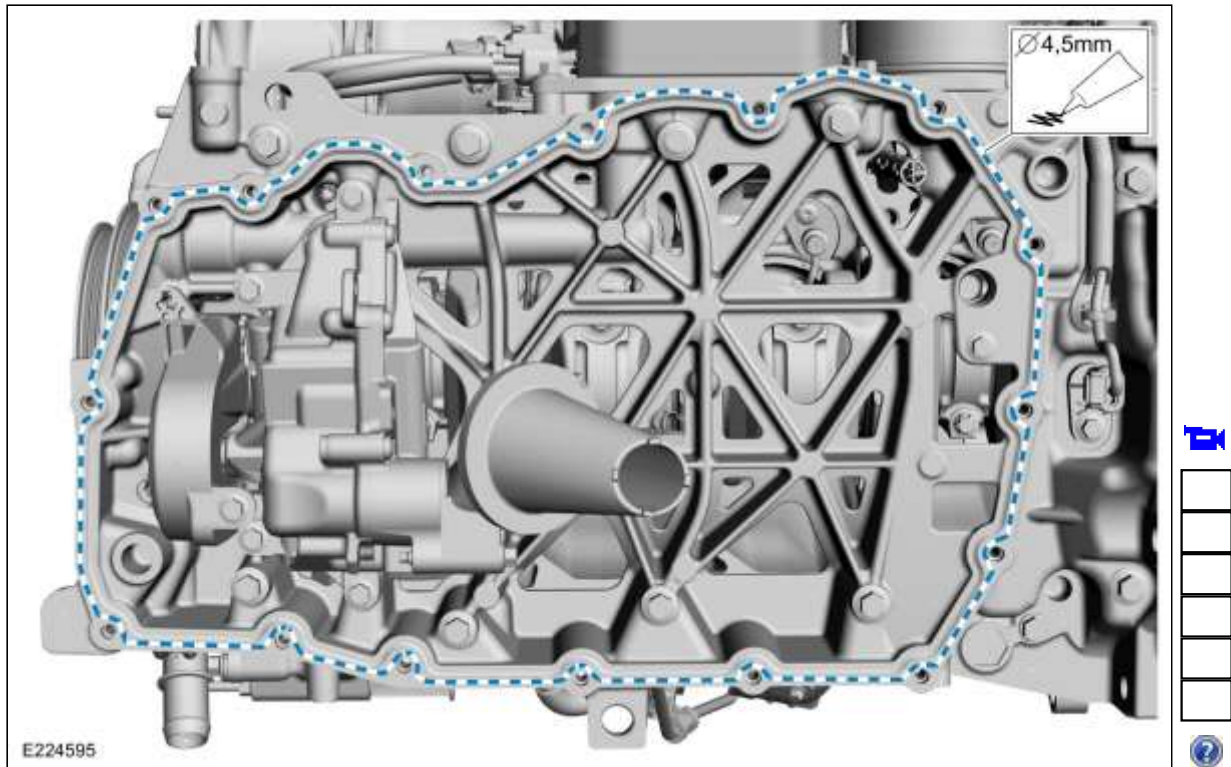


105. **NOTE:** The component must be installed within 5 minutes of applying the sealant.



Complete this step within: 5min

Material: Silicone Sealant LB-AX / Silicone Sealant LB-AX (WSS-M4G323-A10)

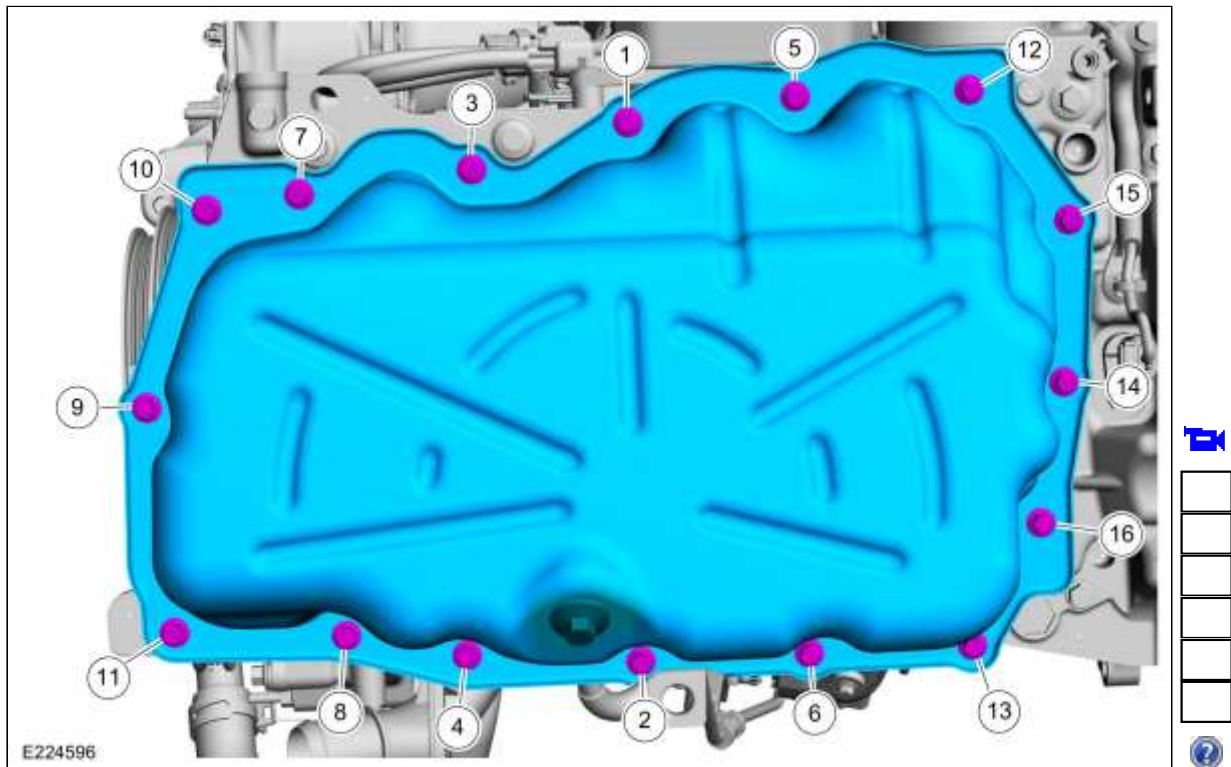


106. **NOTE:** Make sure that a new component is installed.

Torque:

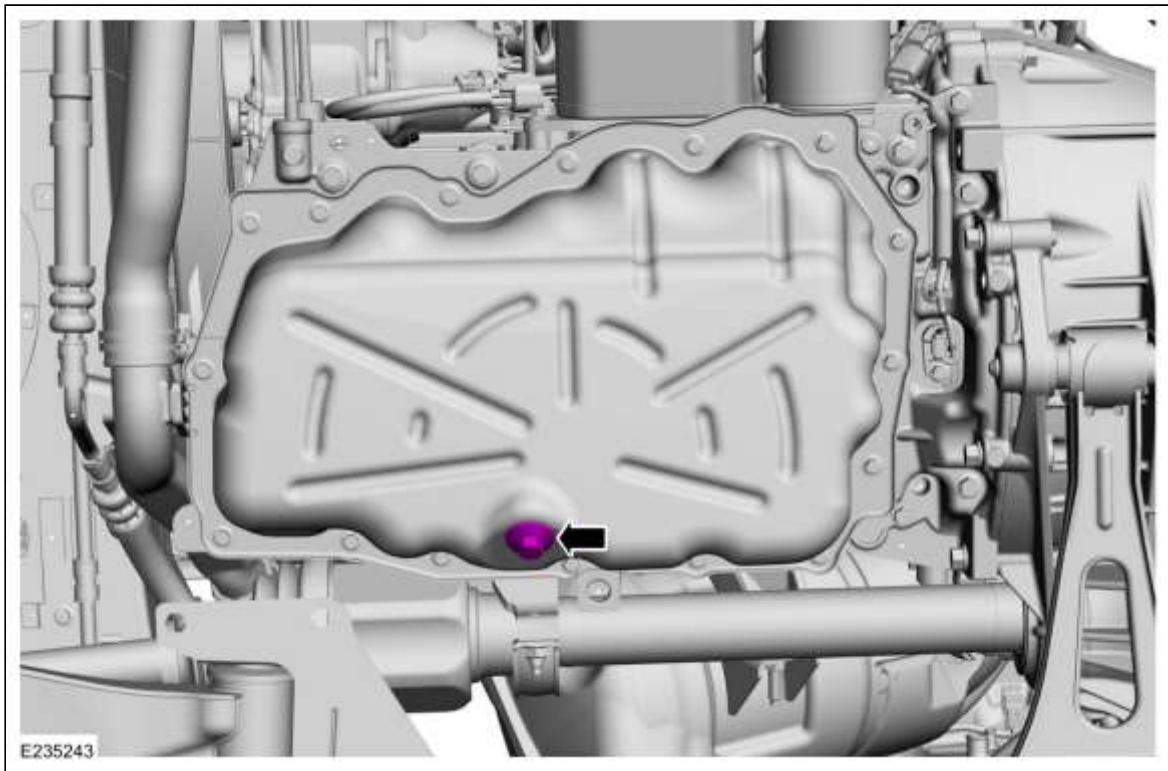
Stage 1: 5 Nm

Stage 2: 10 Nm



107. **NOTE:** Make sure that a new component is installed.

Torque: 39 Nm



© Copyright 2023, Ford Motor Company.