

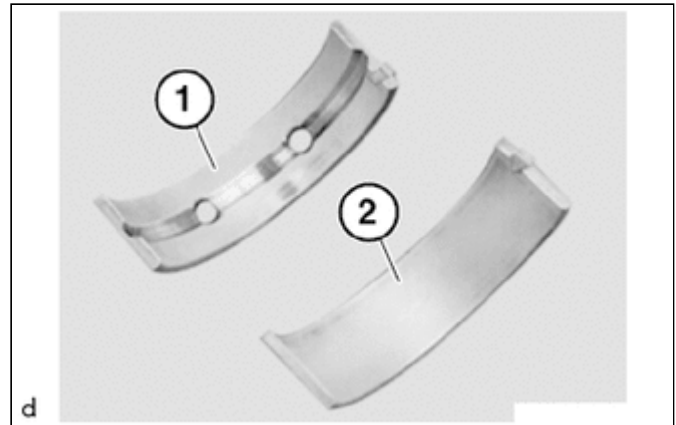
Last Modified: 10-16-2019	6.9:8.0.49	Doc ID: RM100000001JDFT
Model Year Start: 2020	Model: Supra	Prod Date Range: [03/2019 -]
Title: B58 (ENGINE MECHANICAL): CRANKSHAFT: REASSEMBLY; 2020 MY Supra [03/2019 -]		

REASSEMBLY

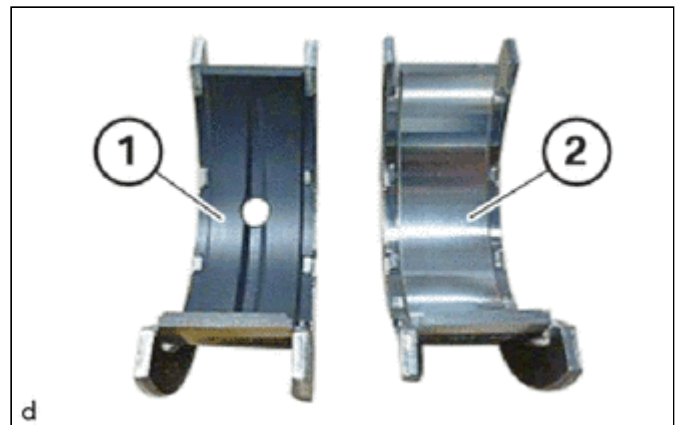
PROCEDURE

1. CRANKSHAFT BEARING

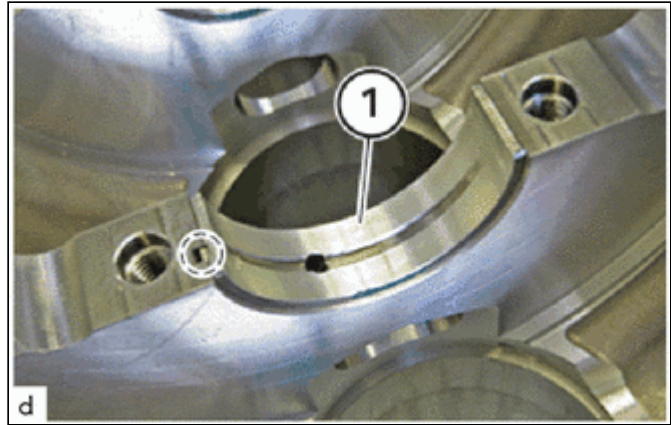
- (a) Replace crankshaft bearing with lubricating groove (1) and the crankshaft bearing (2).



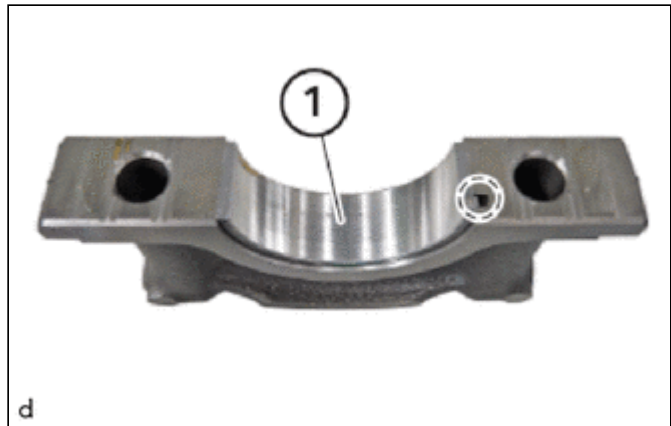
- (b) Replace upper crankshaft thrust washer (1) and the lower crankshaft thrust washer (2).



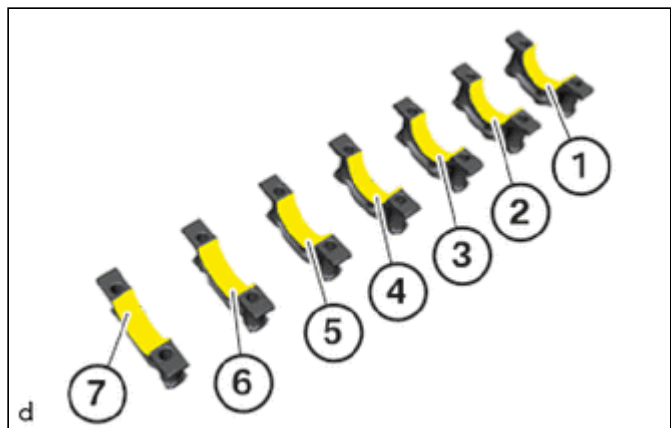
- (c) Make sure the crankshaft bearing (1) is correctly installed with the claw in the highlighted area.



(d) Make sure the crankshaft bearing (1) is correctly installed with the claw in the highlighted area.



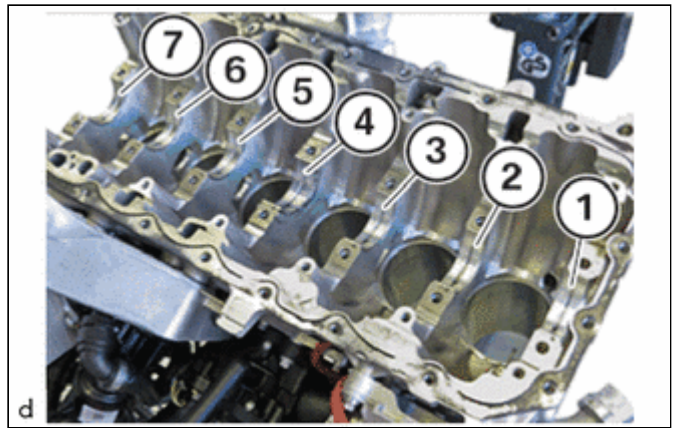
(e) Install crankshaft bearings (1) to (3) and (5) to (7) in to the crankshaft bearing cap.



(f) Install the lower crankshaft thrust washer (4) in the crankshaft bearing cap.

(g) Oil all crankshaft bearings and guide bearings (1) to (7).

(h) Install crankshaft bearings with lubricating groove (1) to (3) and (5) to (7) in the crankcase.



(i) Install the upper crankshaft thrust washer with lubricating groove (4) in the crankcase.

(j) Oil all crankshaft bearings and guide bearing shells with lubricating groove (1) to (7).

2. INSTALL CRANKSHAFT

NOTICE:

- Engine damage caused by incorrectly installed crankshaft bearings and crankshaft bearing caps.

Engine damage may result from incorrectly installing crankshaft bearings and crankshaft bearing caps.

- Always install all crankshaft bearings and crankshaft bearing caps in the same position from which they were removed.

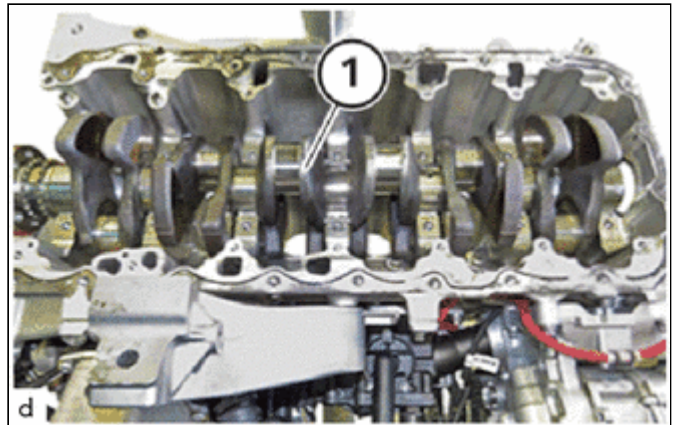
(a) Install the crankshaft (1).

CAUTION:

- Heavy component.

Heavy components can lead to injury or damage.

- Remove and install heavy components with the aid of another person/other persons.



(b) Observe the assignment and numbering (1) to (7) of the crankshaft bearing caps.

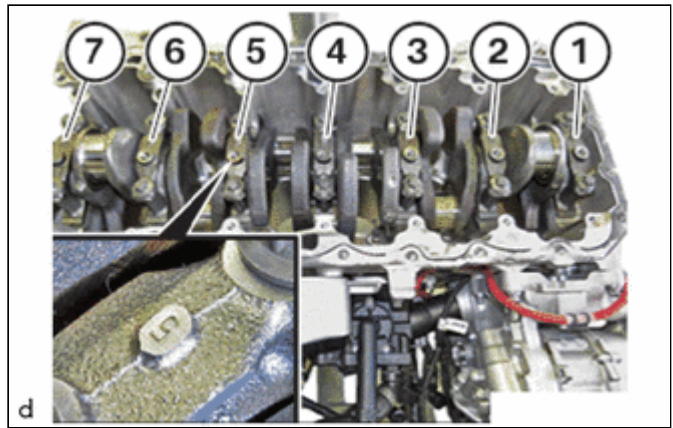
(1) (1) = Engine, front (vibration damper)

(2) (7) = Clutch side

HINT:

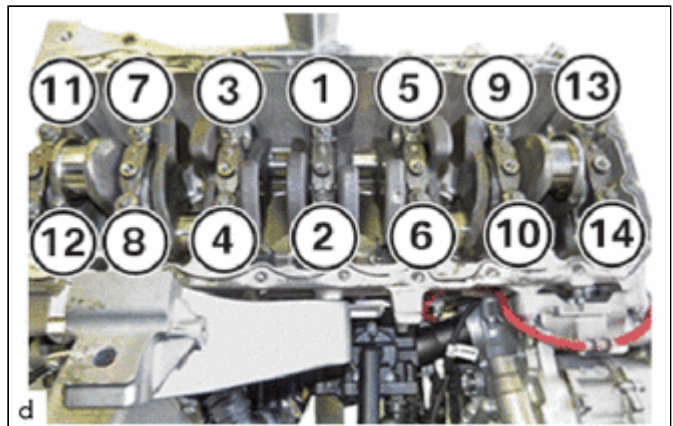
The crankshaft bearing cap, main bearing shell and guide bearing shell are aligned with each other.

Always install the crankshaft bearing cap, main bearing shells and guide bearing shells in the cylinder from which they were removed.



(c) Position the crankshaft bearing caps (1) to (7).

(d) Replace bolts (1) to (14).



(e) Step 1:

(1) Tighten the E14 bolts in sequence (1) to (14).

Torque:

25 N·m {255 kgf·cm, 18 ft·lbf}

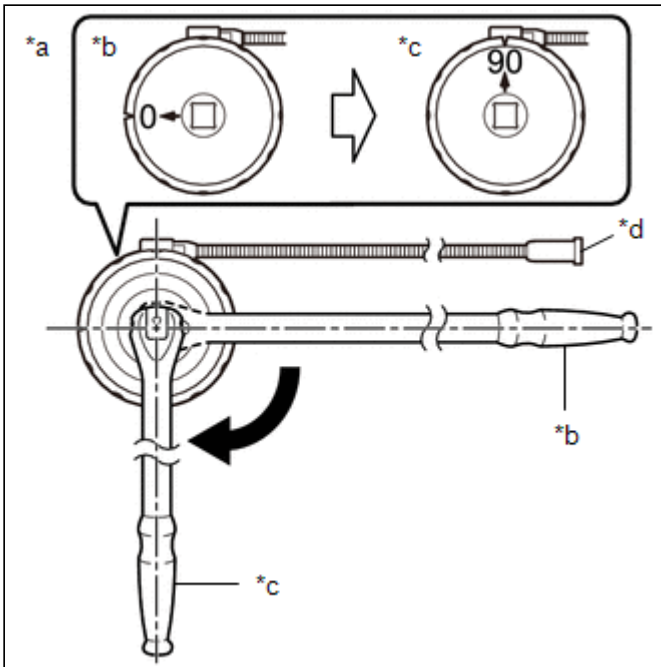
(f) Step 2:

(1) Tighten the bolts 65° in the order shown in step 1 with the special tool 0 490 504 (00 9 120).

SST: 09900-WA010

HINT:

- The magnetic portion is used to secure the gauge to the vehicle.
- After first adjusting the needle of the gauge to 0°, tighten to the specified angle.
- Perform the work procedure carefully so that the gauge, etc. does not become tilted.



*a	Example
*b	Before Tightening
*c	After Tightening
*d	Magnetic Portion

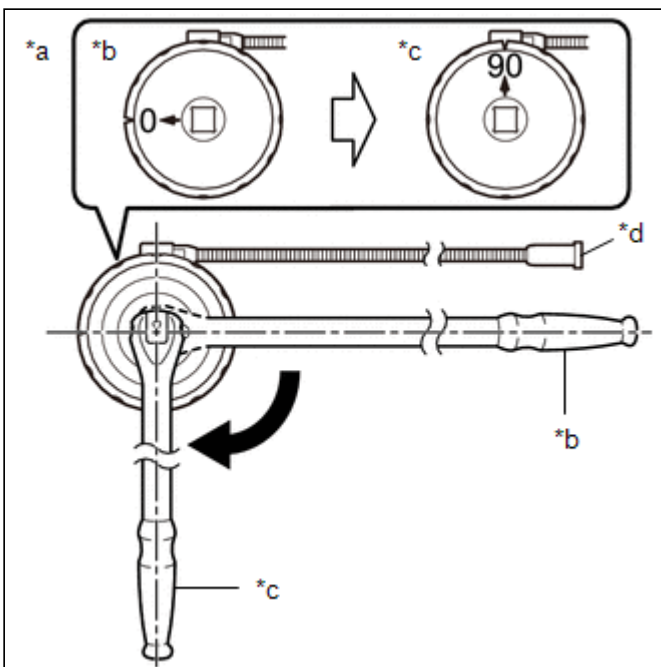
(g) Step 3:

(1) Tighten the bolts another 65° in the order shown in step 1 with the special tool 0 490 504 (00 9 120).

SST: 09900-WA010

HINT:

- The magnetic portion is used to secure the gauge to the vehicle.
- After first adjusting the needle of the gauge to 0°, tighten to the specified angle.
- Perform the work procedure carefully so that the gauge, etc. does not become tilted.



*a	Example
----	---------

*b	Before Tightening
*c	After Tightening
*d	Magnetic Portion

(h) Step 4:

(1) Release E14 bolts (1) to (14).

(i) Step 5:

(1) Tighten the E14 bolts in sequence (1) to (14).

Torque:

25 N·m {255 kgf·cm, 18 ft·lbf}

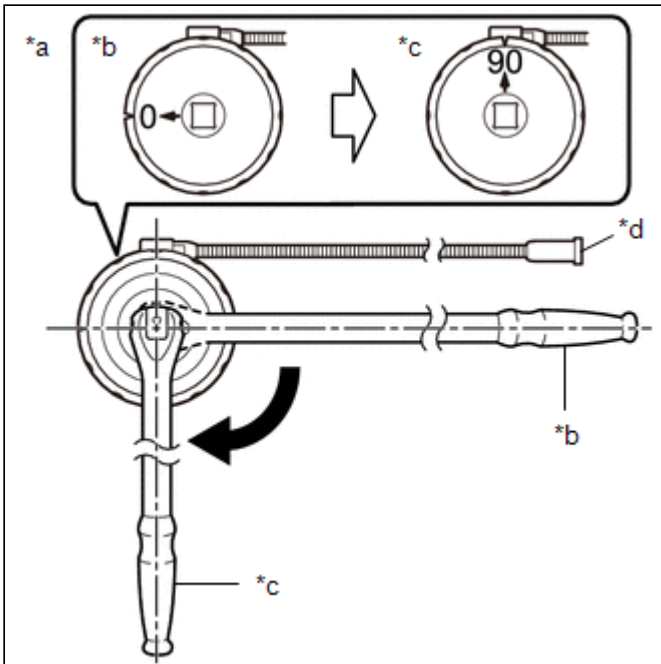
(j) Step 6:

(1) Tighten the bolts 65° in the order shown in step 1 with the special tool 0 490 504 (00 9 120).

SST: 09900-WA010

HINT:

- The magnetic portion is used to secure the gauge to the vehicle.
- After first adjusting the needle of the gauge to 0°, tighten to the specified angle.
- Perform the work procedure carefully so that the gauge, etc. does not become tilted.



*a	Example
*b	Before Tightening
*c	After Tightening
*d	Magnetic Portion

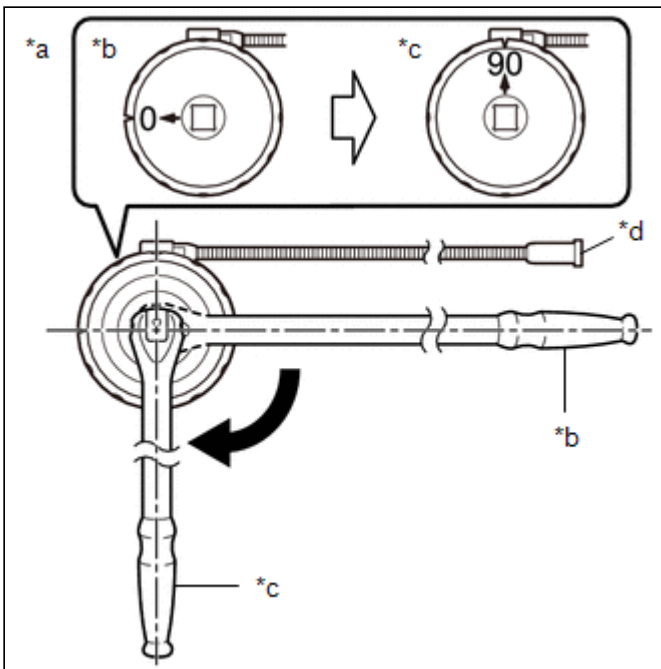
(k) Step 7:

(1) Tighten the bolts another 65° in the order shown in step 1 with the special tool 0 490 504 (00 9 120).

SST: 09900-WA010

HINT:

- The magnetic portion is used to secure the gauge to the vehicle.
- After first adjusting the needle of the gauge to 0°, tighten to the specified angle.
- Perform the work procedure carefully so that the gauge, etc. does not become tilted.



*a	Example
*b	Before Tightening
*c	After Tightening
*d	Magnetic Portion

3. INSPECT CRANKSHAFT THRUST CLEARANCE

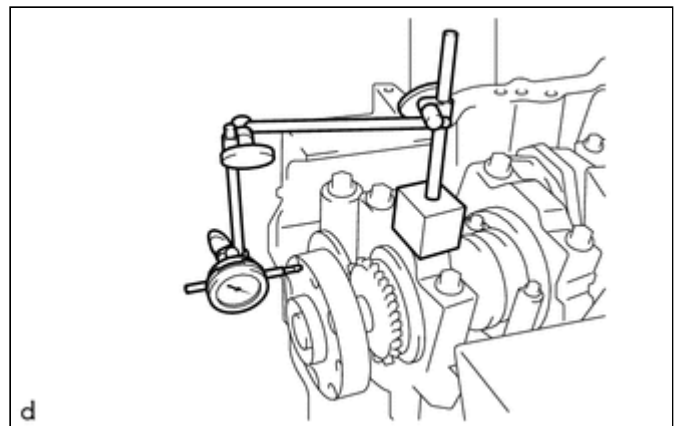
(a) Using a dial indicator, check crankshaft thrust clearance.

Axial play of crankshaft:

0.09 to 0.314 mm (0.00354 to 0.01236 in.)

HINT:

If the thrust clearance is not as specified, replace worn components.



4. INSPECT CRANKSHAFT

(a) Turn the crankshaft clockwise with the special tool 0 490 130 (00 2 010) and compare the reading on the scale to the maximum permitted torque.

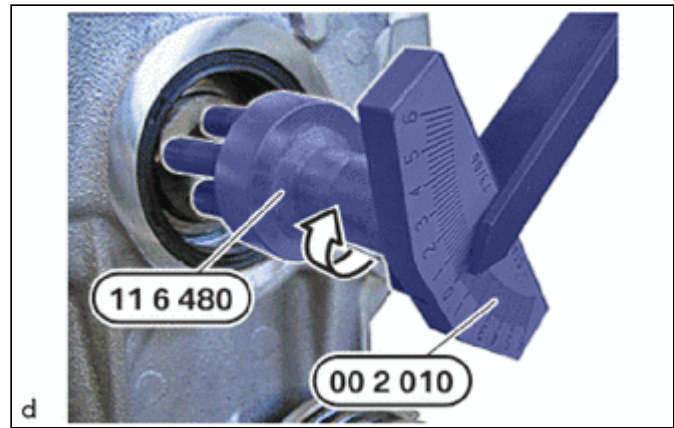
SST: 09200-WA190

Maximum permitted torque of the crankshaft:

12 N*m (122 kgf*cm, 9 ft.*lbf)

HINT:

If the maximum permitted torque is exceeded, correct the radial clearance.



5. INSPECT PISTON

Click here [INFO](#)

6. INSPECT CYLINDER BORE

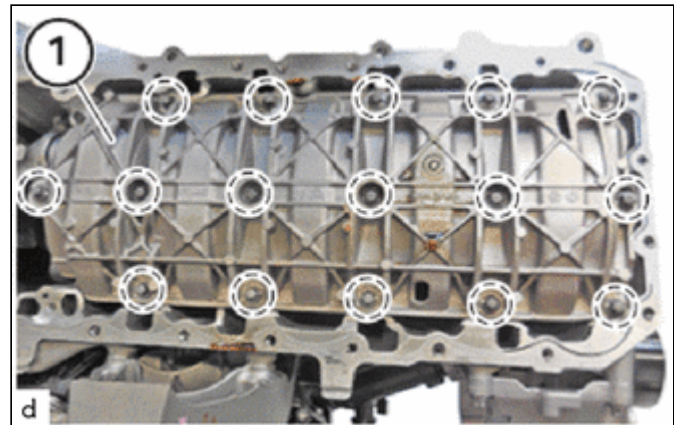
Click here [INFO](#)

7. INSTALL CONNECTING ROD SUB-ASSEMBLY

Click here [INFO](#)

8. INSTALL NO. 1 OIL PAN BAFFLE PLATE

(a) Replace bolts (markings).



(b) Insert No. 1 oil pan baffle plate (1) and position.

(c) Tighten the E10 bolts in a crosswise pattern.

Torque:

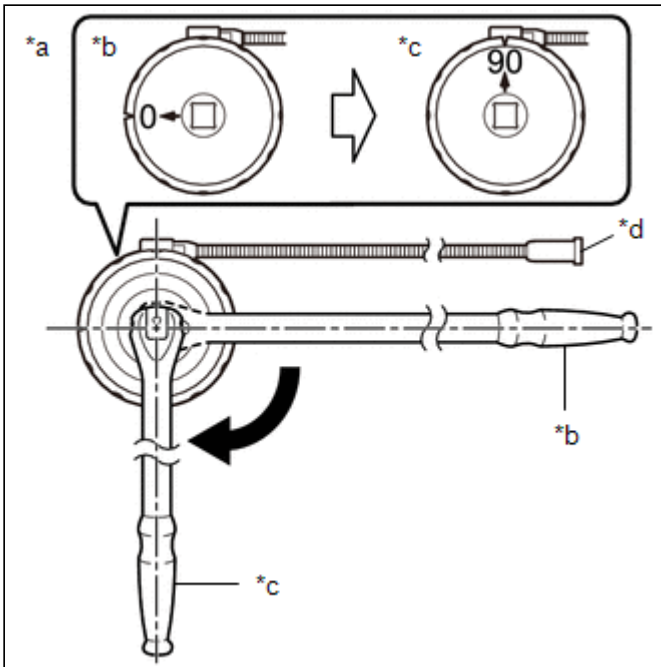
15 N·m {153 kgf·cm, 11 ft·lbf}

(d) Using SST, tighten the E10 bolts an additional 45°.

SST: 09900-WA010

HINT:

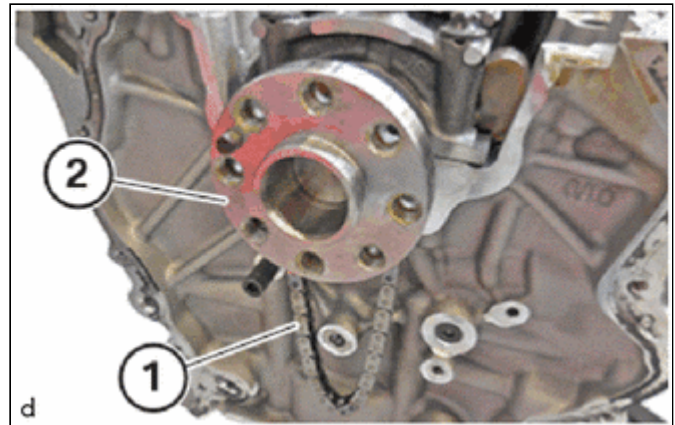
- The magnetic portion is used to secure the gauge to the vehicle.
- After first adjusting the needle of the gauge to 0°, tighten to the specified angle.
- Perform the work procedure carefully so that the gauge, etc. does not become tilted.



*a	Example
*b	Before Tightening
*c	After Tightening
*d	Magnetic Portion

9. INSTALL OIL PUMP DRIVE CHAIN SUB-ASSEMBLY

(a) Guide in and install oil pump drive chain sub-assembly (1) on crankshaft (2).



10. INSTALL OIL PUMP ASSEMBLY

Click here [INFO](#)

11. INSTALL CHAIN SUB-ASSEMBLY

Click here [INFO](#)

12. INSTALL TIMING GEAR CASE

Click here [INFO](#)

13. INSTALL TIMING CHAIN COVER OIL SEAL

14. INSTALL OIL PAN SUB-ASSEMBLY

NOTICE:

- Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.

- Damage to the surface.

The use of metal-cutting tools (e.g. sandpaper) to clean the surfaces can damage them and lead to leaks or engine damage.

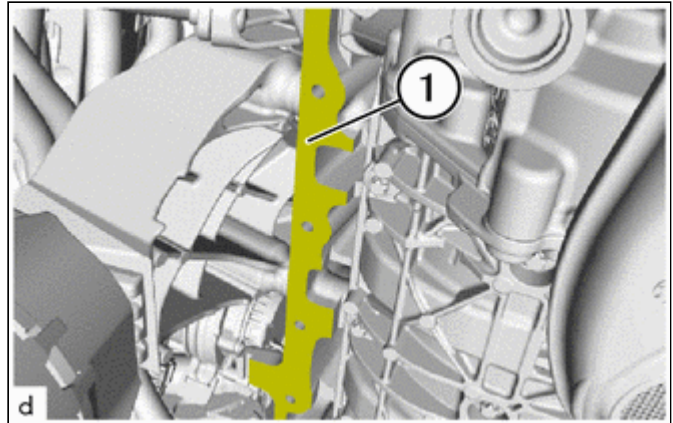
- Do not use any metal-cutting tools.

- (a) Remove coarse seal packing remains on the sealing surface of the cylinder block (1) and the sealing surface on the oil pan sub-assembly.

SST: 09900-WA030

NOTICE:

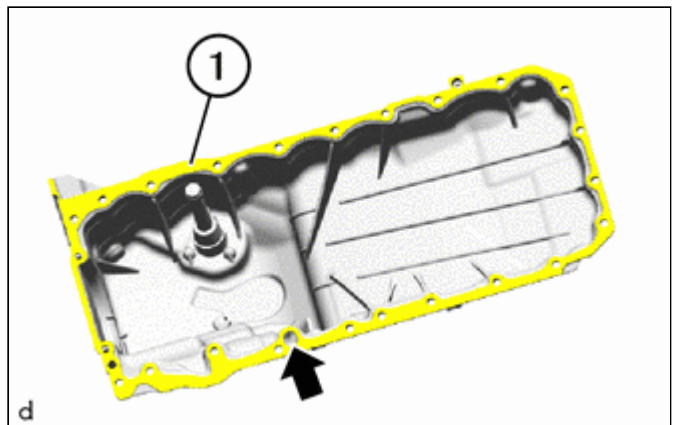
The sealing surfaces must be free from oils, grease and cleaning agents.



- (b) Remove fine seal packing remains on the sealing surface of the oil pan sub-assembly (1) and the sealing surface on the cylinder block.

NOTICE:

The sealing surfaces must be free from oils, grease and cleaning agents.



- (c) Load the sealer gun with the seal packing.

Seal Packing:

Loctite 5970 Flange Sealant

- (d) Apply sealing bead (1) with the seal packing in the

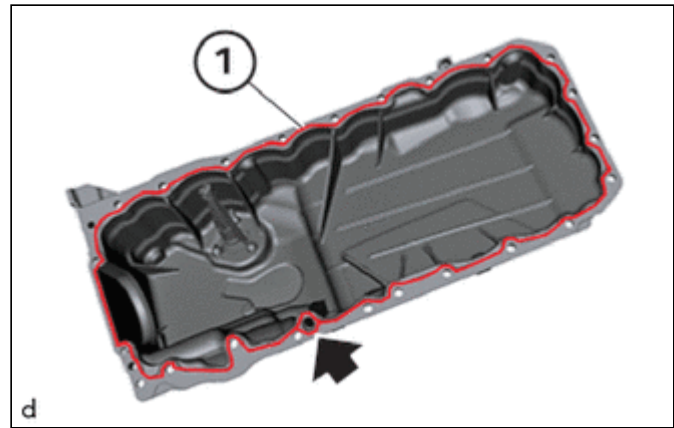
marked area along the inner edge.

Height of the sealing bead:

2.0 to 2.5 mm (0.0787 to 0.0984 in.)

NOTICE:

The maximum application time of the liquid seal packing is 12 minutes.

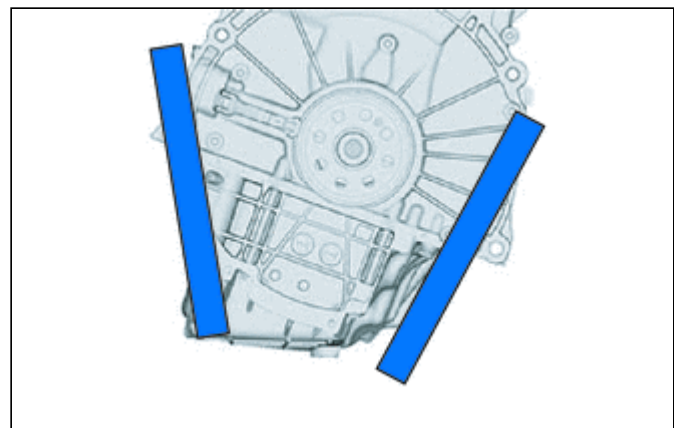


(e) Completely encircle the oil return orifice (arrow) with the seal packing.

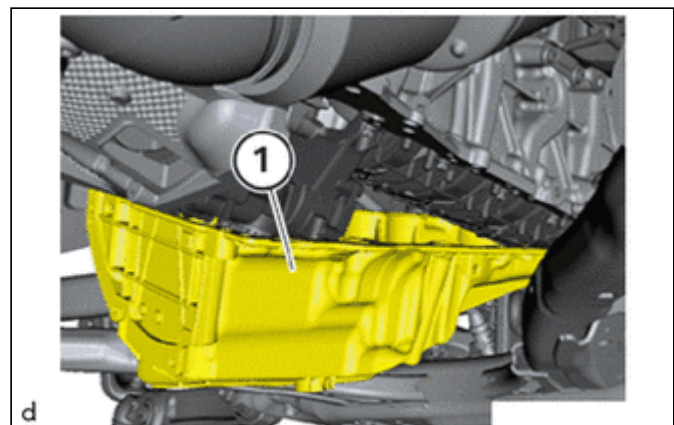
(f) Using a straightedge, position the oil pan sub-assembly and timing case cover so that their surfaces are aligned.

HINT:

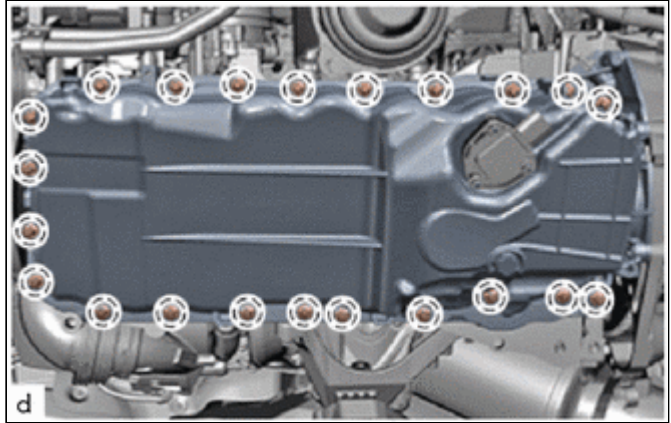
The straightedge is only required when the transmission is removed.



(g) Insert oil pan sub-assembly (1) upwards and forwards and position.



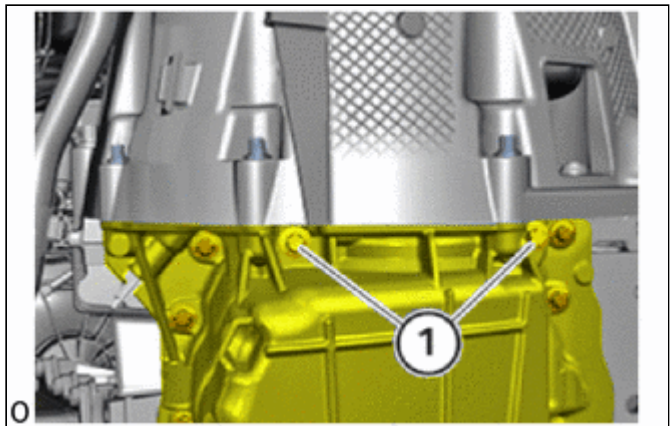
(h) Tighten all the oil pan sub-assembly E10 bolts (marks) hand-tight, do not yet tighten fully.



(i) Tighten the E10 bolts (1).

Torque:

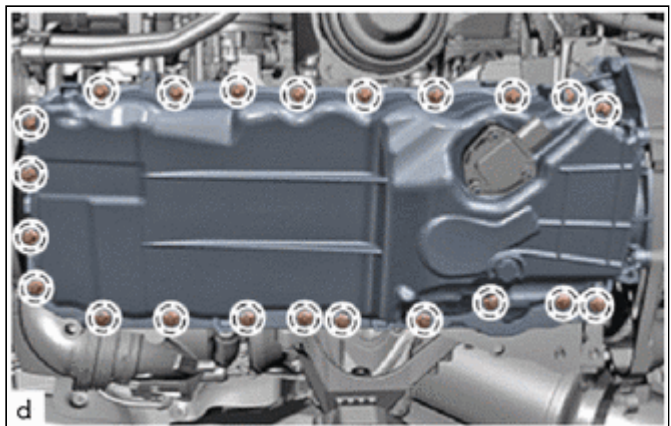
24 N·m {245 kgf·cm, 18 ft·lbf}



(j) Tighten all E10 bolts (marks).

Torque:

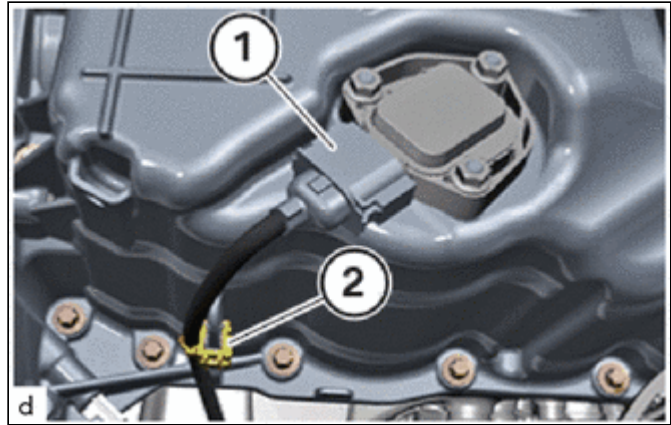
24 N·m {245 kgf·cm, 18 ft·lbf}



(k) Connect connectors (1) and lock.

HINT:

Make sure the connector engages audibly.



(l) Secure clamps (2).

15. INSTALL DRIVE PLATE AND RING GEAR SUB-ASSEMBLY

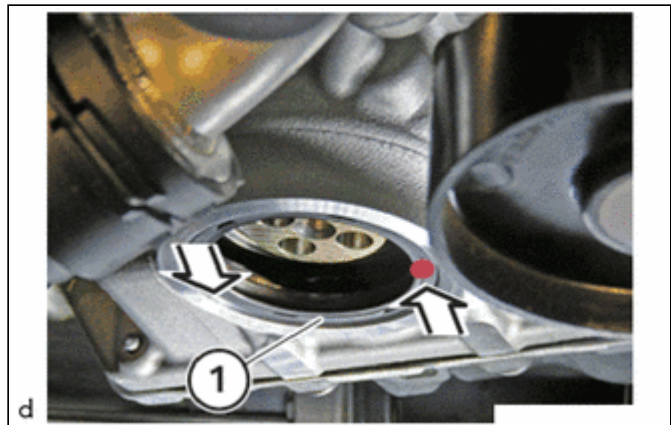
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16. REMOVE AND INSTALL FRONT CRANKSHAFT OIL SEAL

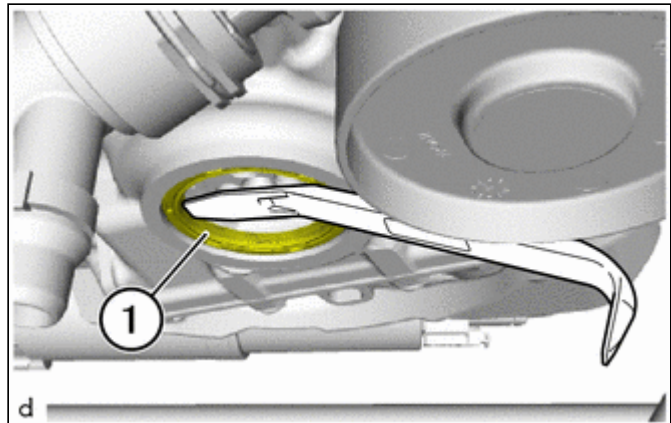
(a) Drive in the front crankshaft oil seal (1) in the marked area with a punch to approx. 1 cm deep.

HINT:

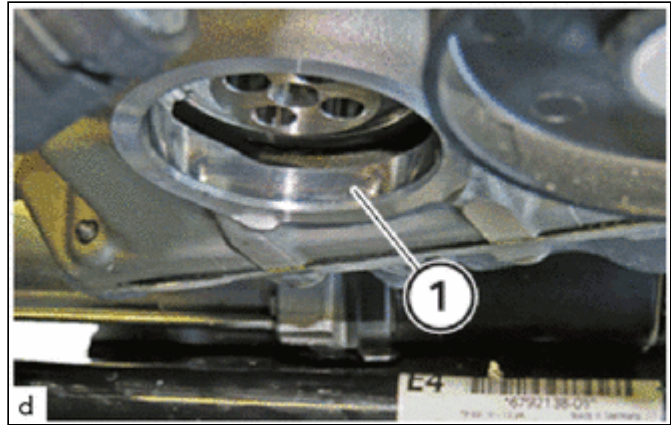
- Scratches.
 - Tools and sharp-edged components can cause scratches.
 - Protect working area.
 - Handle tools and components carefully.



(b) Carefully lever out and remove the front crankshaft oil seal (1).

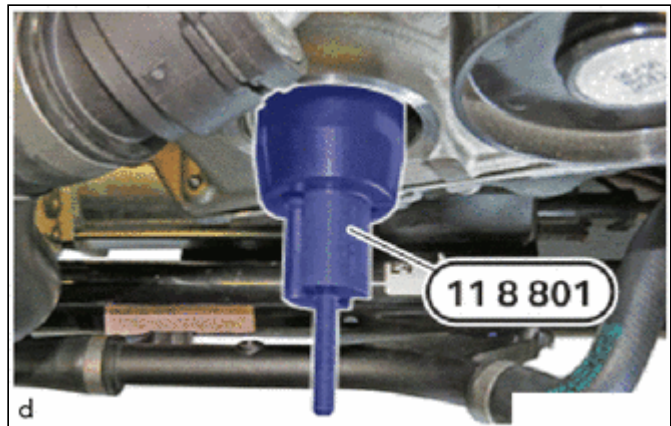


(c) Clean sealing surface (1).



- (d) Clean the special tool 0 496 128 (11 8 801) from the set of special tools 0 496 127 (11 8 800) and coat it with fresh engine oil.

SST: 09200-WA080

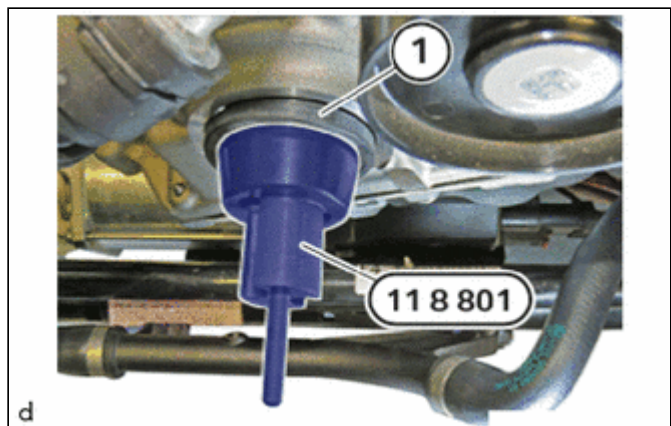


- (e) Position the special tool 0 496 128 (11 8 801) from the set of special tools 0 496 127 (11 8 800) on the crankshaft and bolt it on.

SST: 09200-WA080

HINT:

- Front crankshaft oil seal damage. Touching the sealing lip (inner) and applying oil to the front crankshaft oil seal will lead to its destruction.
 - Do not touch the sealing lip (inner) of the front crankshaft oil seal.
 - Do not apply oil to the front crankshaft oil seal.
 - Install the front crankshaft oil seal dry.



- (f) Replace front crankshaft oil seal (1).

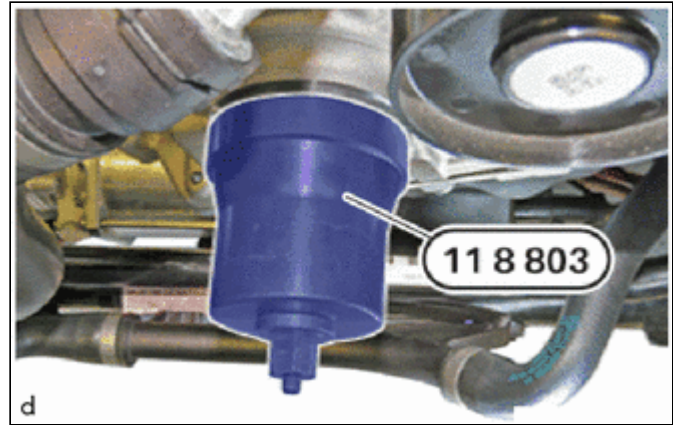
- (g) Carefully slide the front crankshaft oil seal (1) straight in a rotational movement onto the special tool 0 496 128 (11 8 801) from the set of special tools 0 496 127 (11 8 800) until the front crankshaft oil seal is positioned flush against the cylinder block sub-assembly.

SST: 09200-WA080

- (h) Position the special tool 0 496 130 (11 8 803) from the set of special tools 0 496 127 (11 8 800)

and bolt on hand-tight with the nut.

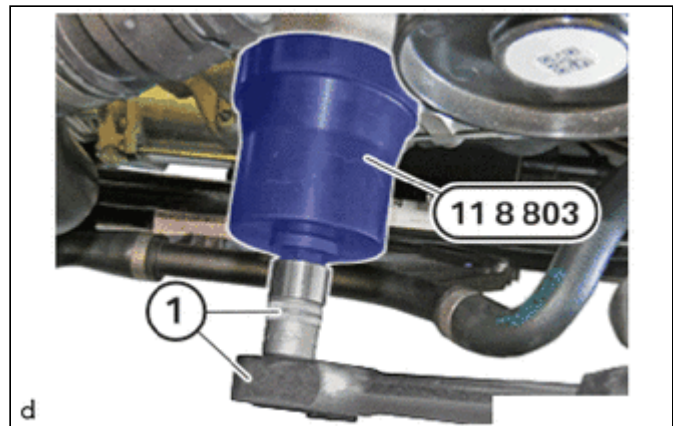
SST: 09200-WA080



(i) Ensure that the front crankshaft oil seal moves evenly.

(j) Bolt in the special tool (sleeve) 0 496 130 (11 8803) from the set of special tools 0 496 127 (11 8800) with the tool (1) until the special tool (sleeve) 0 496 130 (11 8 803) is flush with the cylinder block sub-assembly.

SST: 09200-WA080



17. INSTALL CRANKSHAFT PULLEY ASSEMBLY

Click here [INFO](#)

18. SEALING OIL DUCT

Click here [INFO](#)

19. CLEAN SEALING SURFACE

Click here [INFO](#)

20. INSTALL CYLINDER HEAD GASKET

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21. SET NO. 1 CYLINDER TO TDC (COMPRESSION)

NOTICE:

- Damage to the engine.

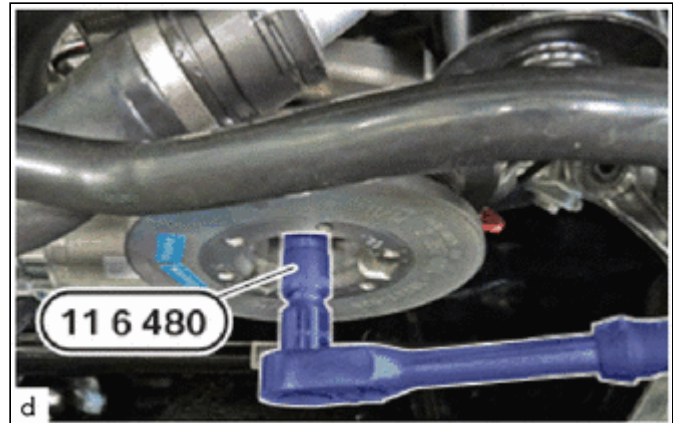
The engine may be damaged if it is manually rotated in the wrong direction.

- Always rotate the engine in the correct direction of rotation by hand: a) Clockwise, facing the vibration damper or b) Counter-clockwise, facing the timing chain. (b) only applies when the chain

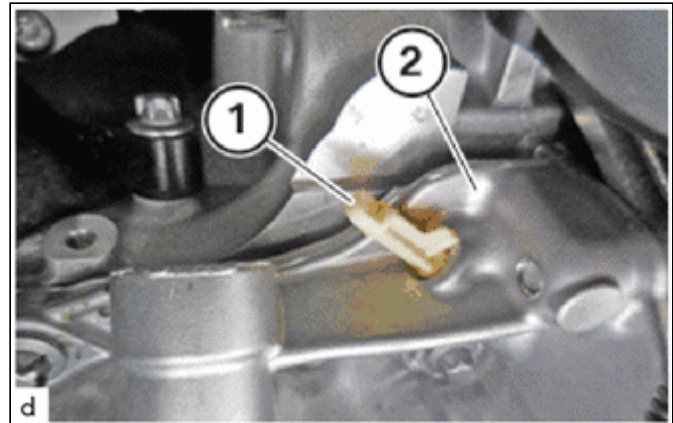
sub-assembly is installed.

- (a) Turn the engine with the special tool 0 493 380 (11 6 480) to the TDC firing position of cylinder 1.

SST: 09200-WA190



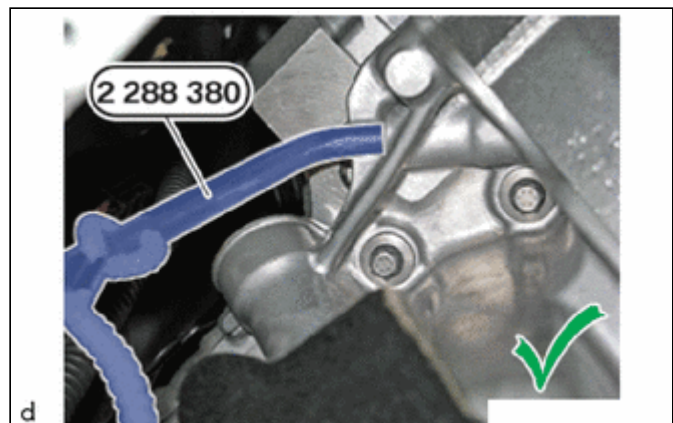
- (b) Guide out and remove sealing cap (1) on oil pan sub-assembly (2).



- (c) Make sure that the special tool 2 288 380 is positioned correctly .

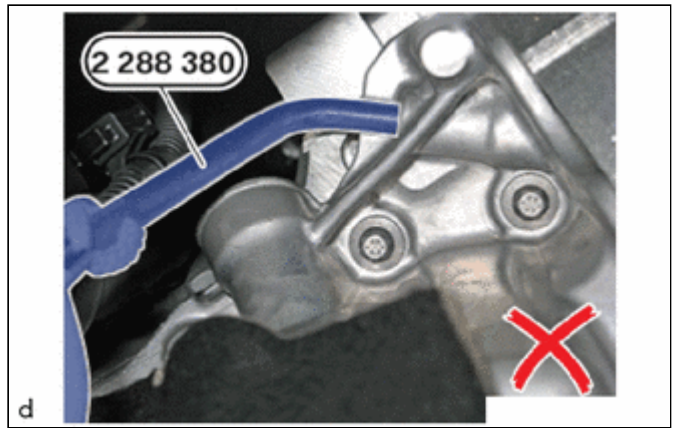
SST: 09200-WA570

- (1) The engine is in the TDC firing position of cylinder 1.



- (d) The TDC firing position of the 1st cylinder is not reached and the special tool 2 288 380 is positioned incorrectly: Position the special tool 2 288 380 again.

SST: 09200-WA570



22. INSTALL CYLINDER HEAD SUB-ASSEMBLY

Click here [INFO](#)

23. ADJUST CAMSHAFT

Click here [INFO](#)

24. INSTALL CAMSHAFT TIMING EXHAUST GEAR ASSEMBLY

Click here [INFO](#)

25. TEMPORARILY TIGHTEN EXHAUST CAMSHAFT TIMING GEAR BOLT ASSEMBLY

Click here [INFO](#)

26. INSTALL CAMSHAFT TIMING GEAR ASSEMBLY

Click here [INFO](#)

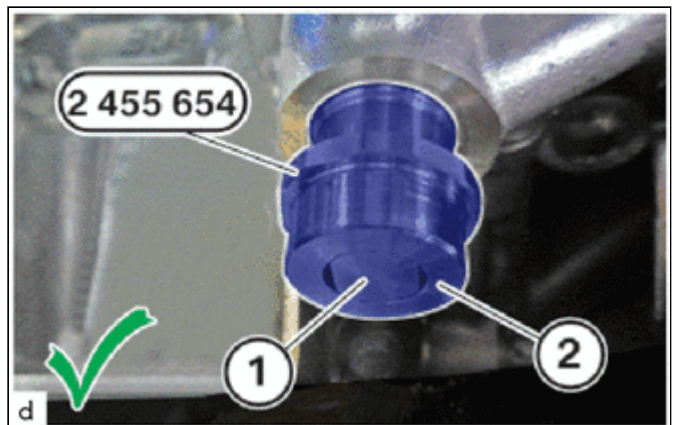
27. TEMPORARILY TIGHTEN INTAKE CAMSHAFT TIMING GEAR BOLT ASSEMBLY

Click here [INFO](#)

28. TEMPORARILY INSTALL CHAIN SUB-ASSEMBLY

(a) Pretension the timing chain correctly with the special tool 2 455 654 .

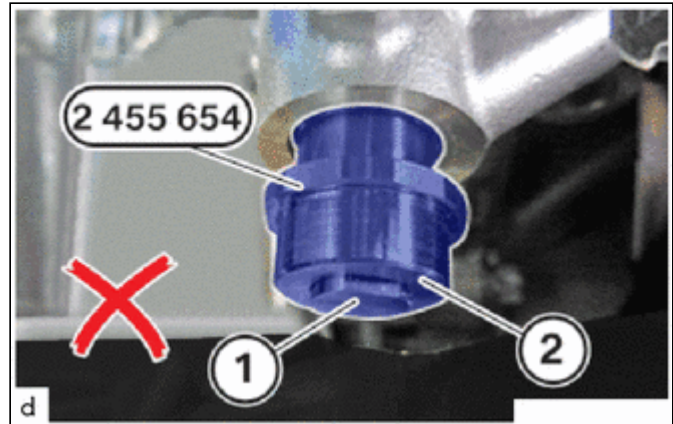
SST: 09200-WA810



(b) Make sure that pin (1) is flush with housing (2).

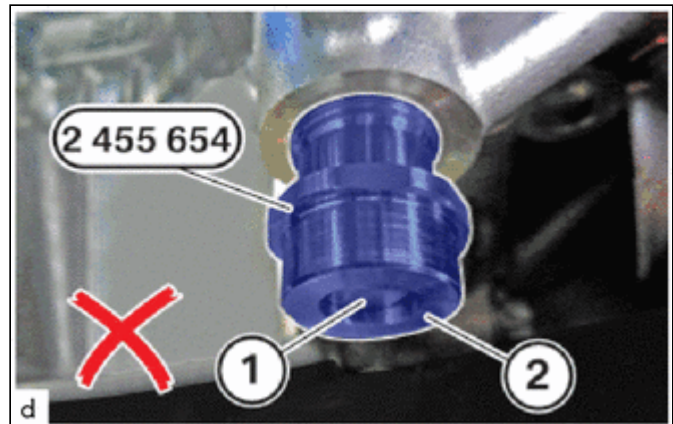
(c) Make sure that the preload of the timing chain is not insufficient. The preload is insufficient when the pin (1) of the special tool 2 455 654 is not aligned flush with the housing (2). The timing chain is not correctly pre-tensioned.

SST: 09200-WA810



(d) Make sure that the preload of the timing chain is not too high. The preload is too high when the pin (1) of the special tool 2 455 654 is not aligned flush with the housing (2). The timing chain is not correctly pre-tensioned.

SST: 09200-WA810



29. TIGHTEN EXHAUST CAMSHAFT TIMING GEAR BOLT ASSEMBLY

Click here [INFO](#)

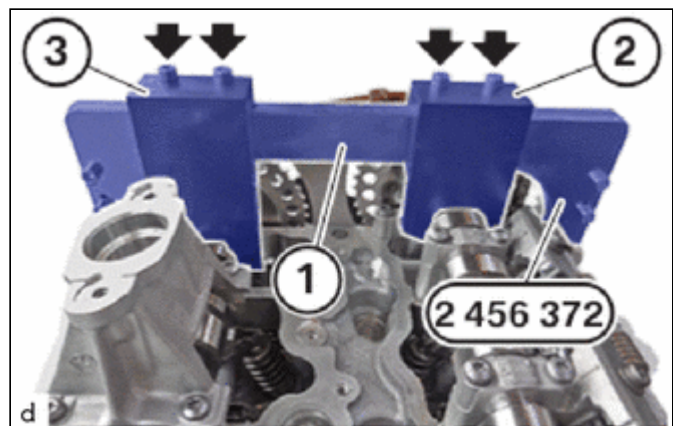
30. TIGHTEN INTAKE CAMSHAFT TIMING GEAR BOLT ASSEMBLY

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31. REMOVE SST

(a) Release the bolts (arrows) from the set of special tools 2 456 372 .

SST: 09200-WA690



(b) Guide the setting gauge 0.5 ° (3) out of the special tool 2 456 372 between the exhaust camshaft and basic carrier (1) and remove it.

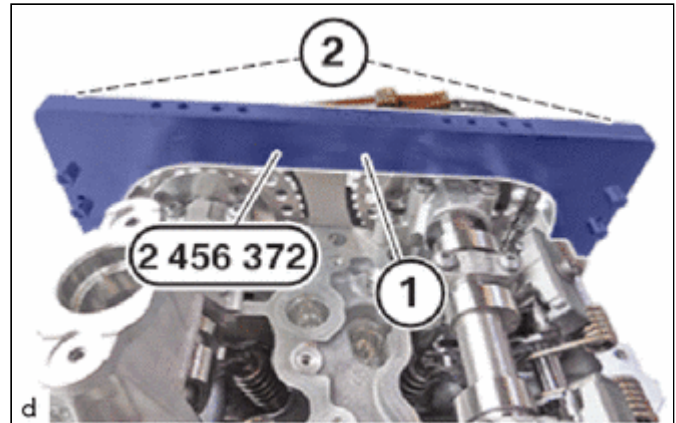
SST: 09200-WA690

(c) Guide setting gauge 0.7 ° (2) out of the special tool 2 456 372 between the intake camshaft and basic carrier (1) and remove it.

SST: 09200-WA690

(d) Unscrew the bolts (2) from the set of special tools 2 456 372 .

SST: 09200-WA690



(e) Thread the basic carrier (1) out of the special tool 2 456 372 and remove.

SST: 09200-WA690

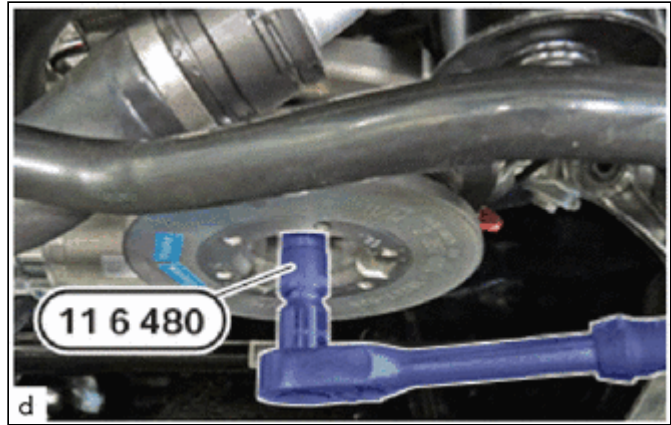
(f) Guide the special tool 2 288 380 out and remove.

SST: 09200-WA570



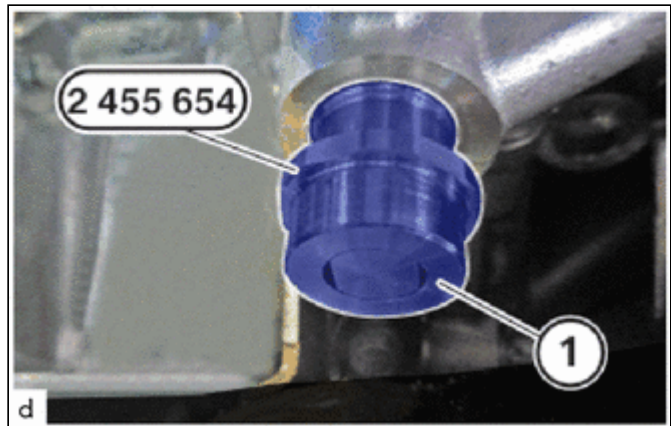
(g) Guide the special tool 0 493 380 (11 6 480) out and remove.

SST: 09200-WA190



(h) Guide the special tool 2 455 654 (1) out and remove.

SST: 09200-WA810



32. INSTALL NO. 1 CHAIN TENSIONER ASSEMBLY

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33. INSPECT CAMSHAFT TIMING

(a) Turn the engine with the special tool 0 493 380 (11 6 480) to the TDC firing position of cylinder 1.

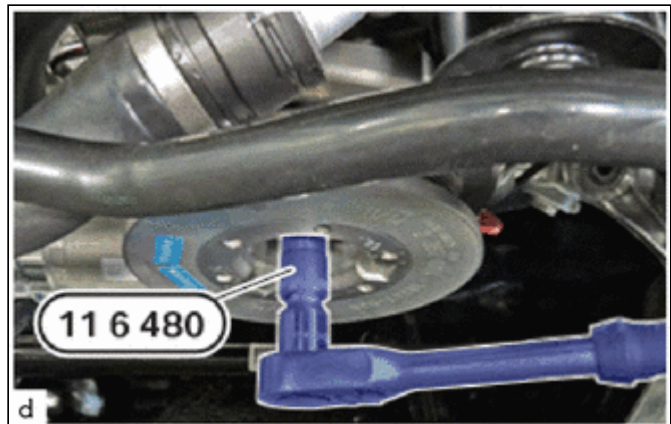
SST: 09200-WA190

NOTICE:

- Damage to the engine.

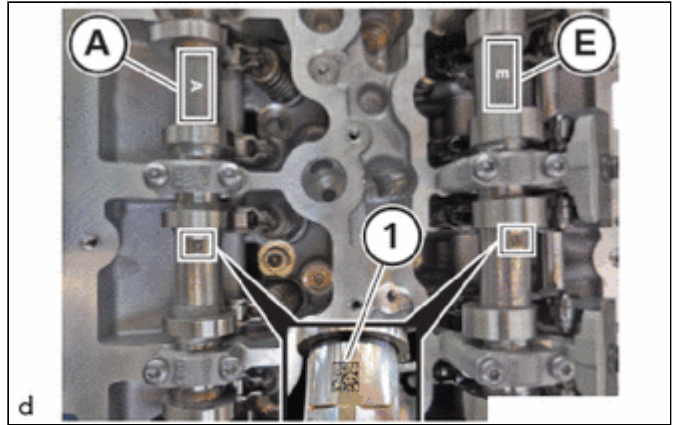
The engine may be damaged if it is manually rotated in the wrong direction.

- Always rotate the engine in the correct direction of rotation by hand: a) Clockwise, facing the crankshaft pulley assembly or b) Counter-clockwise, facing the timing chain. (b) only applies when the chain sub-assembly is installed.

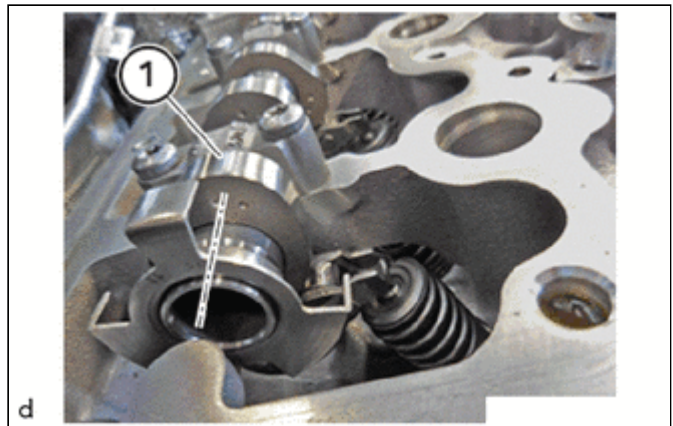


(b) Make sure that the marks (1) on the intake camshaft sub-assembly (E) and the exhaust

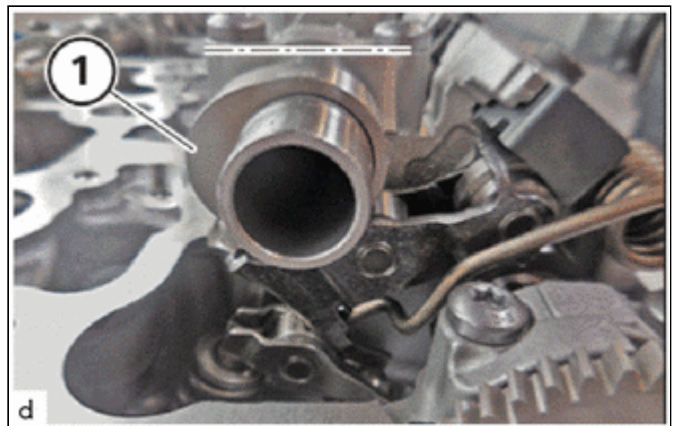
camshaft sub-assembly (A) are legible from above.



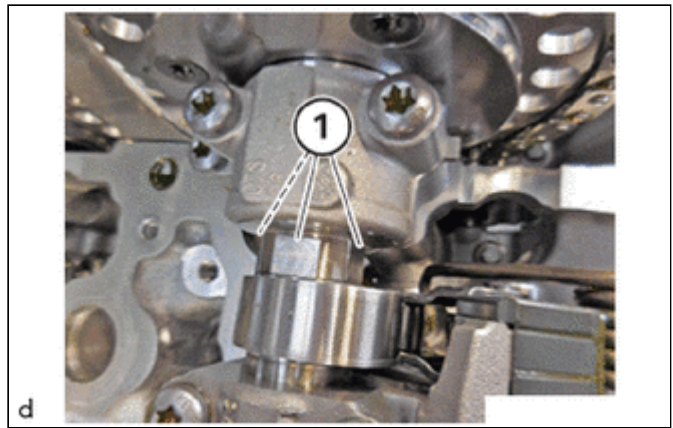
(c) Ensure that the cam (1) on the exhaust camshaft sub-assembly on cylinder 1 points to the inside right at a slight angle.



(d) Ensure that the cam (1) on the intake camshaft sub-assembly on cylinder 1 points to the inside left at an angle.

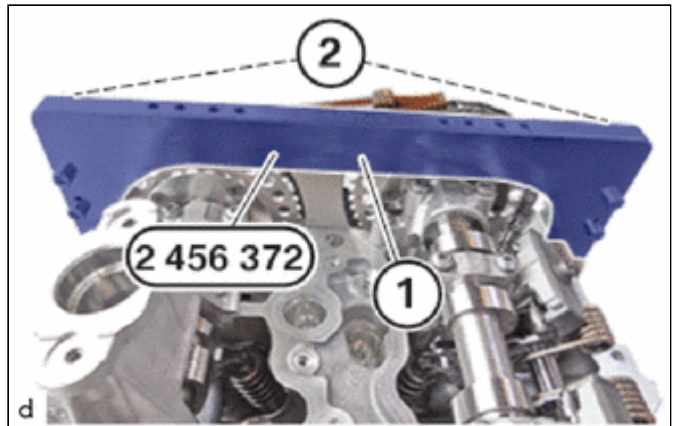


(e) Ensure that the flattened areas (1) on the intake camshaft sub-assembly and the exhaust camshaft sub-assembly point upwards.



(f) Position the basic carrier (1) from the set of special tools 2 456 372 on the cylinder head sub-assembly.

SST: 09200-WA690



(g) Tighten the bolts (2) from the set of special tools 2 456 372 .

SST: 09200-WA690

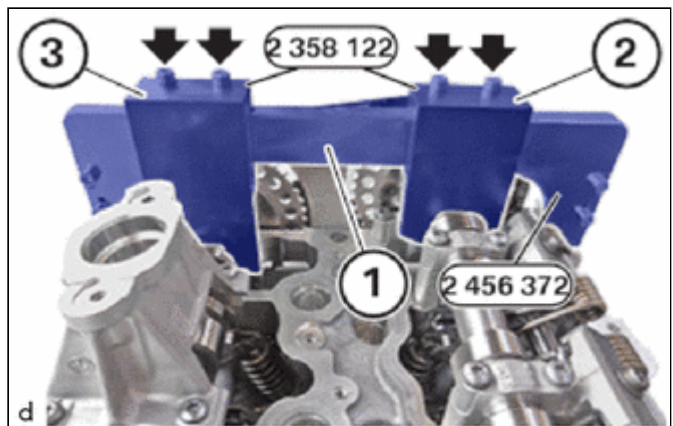
Torque:

8.0 N·m {82 kgf·cm, 71 in·lbf}

(h) Position the test gauge (2) from the set of special tools 2 358 122 between the intake camshaft sub-assembly and the basic carrier (1) from the set of special tools 2 456 372 .

SST: 09200-WA380

SST: 09200-WA690



(i) Position the test gauge (3) from the set of special tools 2 358 122 between the exhaust camshaft sub-assembly and the basic carrier (1) from the set of special tools 2 456 372 .

SST: 09200-WA380

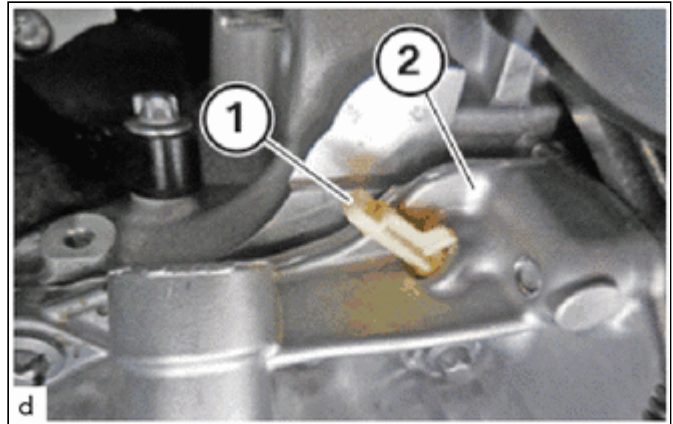
SST: 09200-WA690

(j) Tighten bolts (arrows).

Torque:

8.0 N·m {82 kgf·cm, 71 in·lbf}

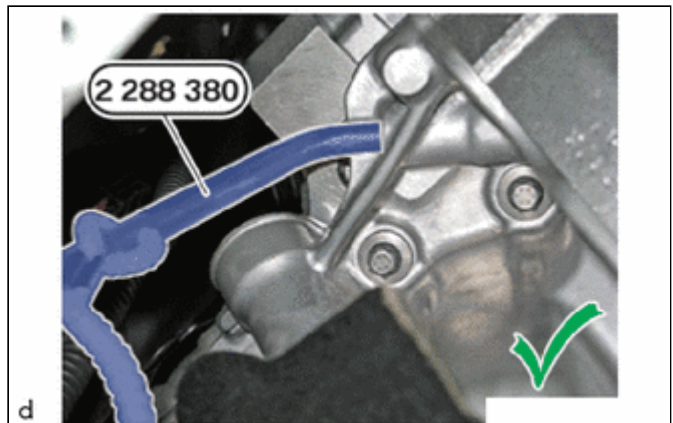
(k) Guide out and remove sealing cap (1) on oil pan sub-assembly (2).



(l) Position the special tool 2 288 380 correctly in the dowel hole .

SST: 09200-WA570

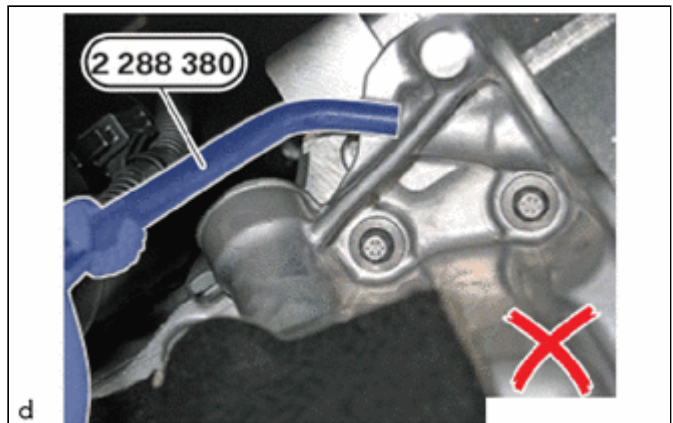
(1) The engine is in the TDC firing position of cylinder 1.



(m) Make sure that the special tool 2 288 380 is not positioned incorrectly.

SST: 09200-WA570

(1) The TDC firing position of cylinder 1 was not reached.

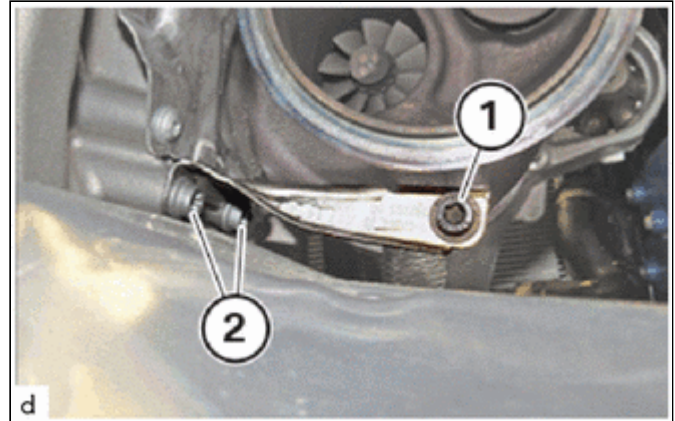


34. INSTALL SPARK PLUG

Click here [INFO](#)

35. INSTALL TURBOCHARGER STAY

(a) Replace bolts (2).



(b) Position support and tighten with the T45 bolt (2).

Torque:

19 N·m {194 kgf·cm, 14 ft·lbf}

(c) Replace bolts (1).

(d) Tighten down T45 bolt (1).

Torque:

19 N·m {194 kgf·cm, 14 ft·lbf}

36. INSTALL OUTLET TURBO OIL PIPE

Click here [INFO](#)

37. INSTALL INTAKE MANIFOLD

Click here [INFO](#)

38. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY

Click here [INFO](#)

39. INSTALL CAM TIMING OIL CONTROL SOLENOID ASSEMBLY

Click here [INFO](#)

40. REPLACE FUEL INJECTOR SEAL

Click here [INFO](#)

41. INSTALL FUEL INJECTOR ASSEMBLY (for Rear Side)

Click here [INFO](#)

42. INSTALL FUEL INJECTOR ASSEMBLY (for Front Side)

Click here [INFO](#)

43. ADJUST FUEL PUMP LIFTER ASSEMBLY

Click here [INFO](#)

44. INSTALL FUEL PUMP ASSEMBLY

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45. INSTALL NO. 1 FUEL PIPE SUB-ASSEMBLY

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46. ADD ENGINE OIL

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47. INSTALL NO. 2 AIR CLEANER HOSE

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48. INSTALL ENGINE ASSEMBLY

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