

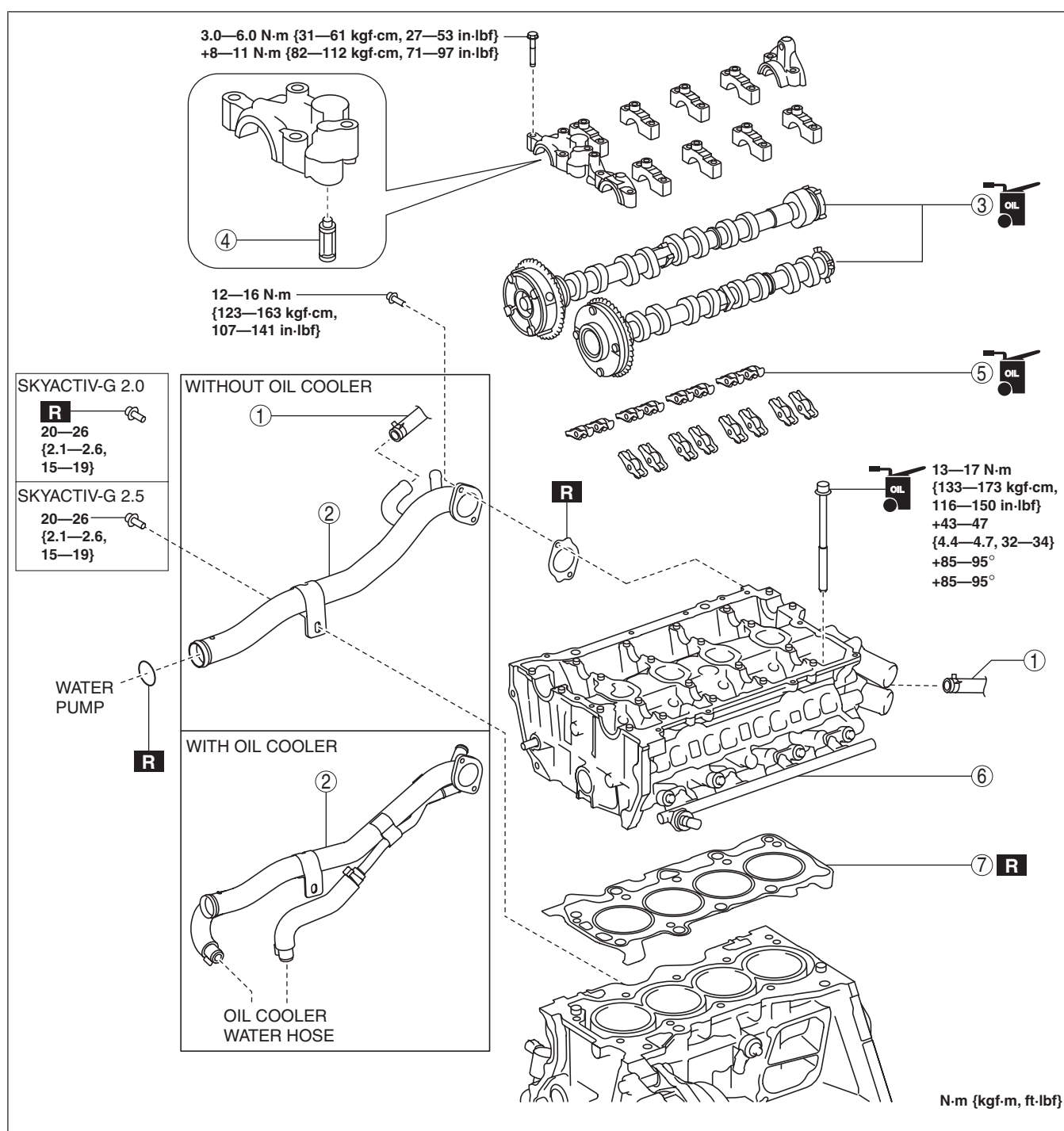
Warning

- **A hot engine can cause severe burns. Turn off the engine and wait until it is cool before servicing.**
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See BEFORE SERVICE PRECAUTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)**

Caution

- **If the camshaft is rotated with the timing chain removed and the piston at the top dead center position, the valve may contact the piston and the engine could be damaged. When rotating the camshaft with the timing chain removed, rotate it after lowering the piston from the top dead center position.**

1. Disconnect the negative battery cable. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5 (WITHOUT i-stop)].)
2. Remove the plug hole plate. (See PLUG HOLE PLATE REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
3. Remove the ignition coil/ion sensors. (See IGNITION COIL/ION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
4. Remove the front under cover No.2. (See FRONT UNDER COVER No.2 REMOVAL/INSTALLATION.)
5. Remove the splash shield. (See SPLASH SHIELD REMOVAL/INSTALLATION.)
6. Remove the drive belt. (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
7. Drain the engine oil. (See ENGINE OIL REPLACEMENT [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
8. Drain the engine coolant. (See ENGINE COOLANT REPLACEMENT [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
9. Remove the intake manifold. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
10. Set aside the exhaust manifold to the vehicle rear. (See EXHAUST SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
11. Disconnect the radiator hose (upper, lower).
12. Remove the vacuum pump. (See VACUUM PUMP REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
13. Remove the high pressure fuel pump and rear housing. (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
14. Disconnect the heater hose from the water outlet and water inlet pipe.
15. Remove the oil pan. (See OIL PAN REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
16. Remove the timing chain and chain guide. (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
17. Remove the OCV. (See OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
18. Remove in the order indicated in the table.
19. Install in the reverse order of removal.
20. Refill with the specified type and amount of the engine oil. (See ENGINE OIL REPLACEMENT [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
21. Refill the engine coolant. (See ENGINE COOLANT REPLACEMENT [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
22. Start the engine, and inspect and adjust the following:
 - Leakage of engine oil, engine coolant.
 - Runout and contact of pulley and belt.
 - Ignition timing, idle speed and idle mixture. (See ENGINE TUNE-UP [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
 - Compression pressure (See COMPRESSION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)



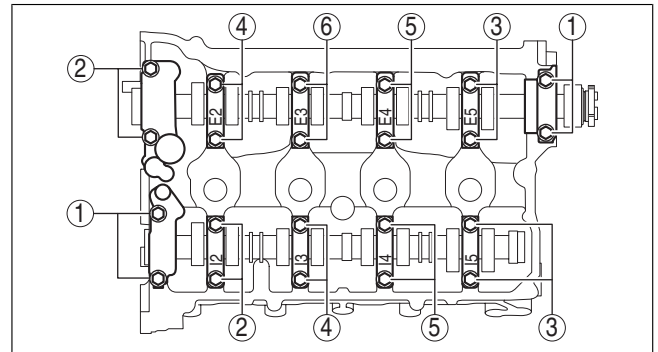
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1	Water hose (if equipped)
2	Water inlet pipe (See Water Inlet Pipe Installation Note.)
3	Camshaft (See Camshaft Removal Note.) (See Camshaft Installation Note.)
4	OCV oil filter
5	Rocker arm (See Rocker Arm Removal Note.) (See Rocker Arm Installation Note.)

6	Cylinder head (See Cylinder Head Removal Note.) (See Cylinder Head Installation Note.)
7	Cylinder head gasket

Camshaft Removal Note

1. Loosen the camshaft cap installation bolts in a few passes in the order shown in the figure and remove the camshaft caps.
2. Remove the camshaft.



Rocker Arm Removal Note

1. Keep the rocker arms in the order of removal to enable reassembly in their original positions.

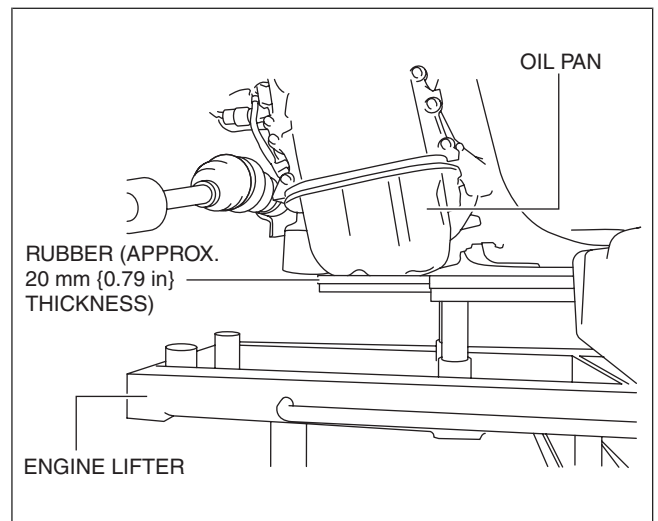
Cylinder Head Removal Note

1. Temporarily install the oil pan to support the engine from under the vehicle.

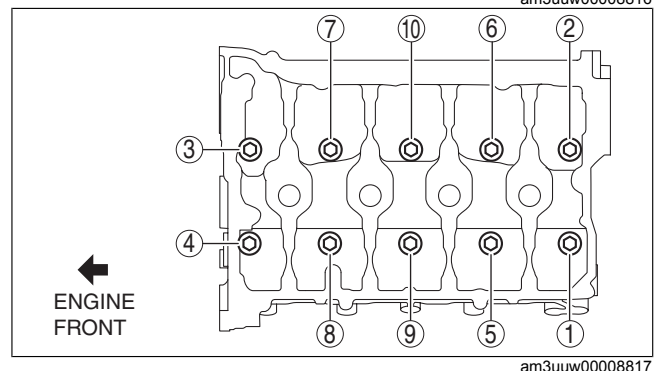
Caution

- To prevent deformation of the oil pan, support the engine using the following methods.
 - When using an engine lifter, insert rubber of appropriate size (approx. 20 mm {0.79 in} thickness) between the engine lifter and the oil pan to support the oil pan.
 - When using a garage jack, place rubber of appropriate size (approx. 20 mm {0.79 in} thickness) on a batten which is large enough to cover and support the oil pan.

2. Support the engine (oil pan) using a commercially available engine lifter or garage jack.
3. Remove the chain on the **SST** that suspended the engine and set it aside.



4. Loosen the cylinder head installation bolts in two or three passes in the order shown in the figure and remove them.
5. Remove the cylinder head.



Cylinder Head Installation Note

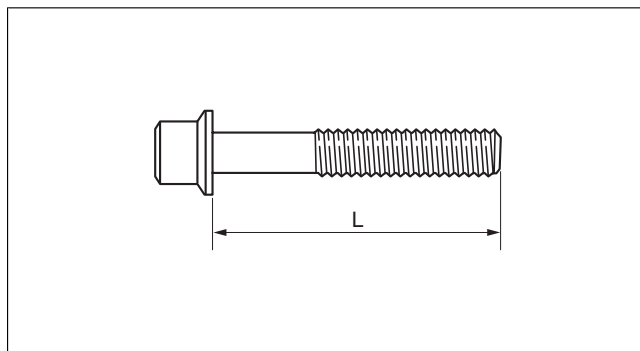
Caution

- If the following condition is met, replace the cylinder head bolts.
 - Length exceeds maximum specification

Cylinder head bolt length L
145.2—145.8 mm {5.717—5.740 in}

Cylinder head bolt length L maximum
146.5 mm {5.767 in}

1. When a cylinder head bolt is reused, apply engine oil to any part of the following:
 - Bolt seating surface
 - Cylinder head seating surface



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2. Tighten the cylinder head bolts in the order shown in the following 4 steps.

Tightening torque

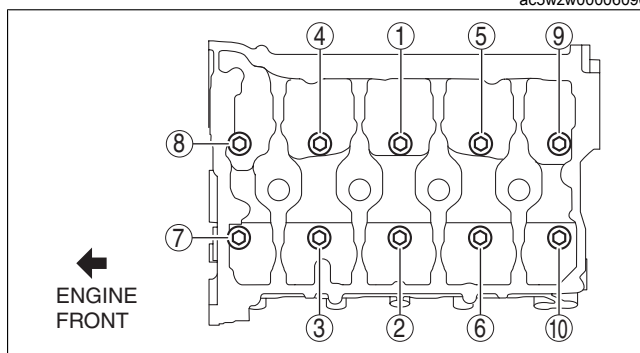
Step 1: 13—17 N·m {133—173 kgf·cm, 116—150 in·lbf}

Step 2: 43—47 N·m {4.4—4.7 kgf·m, 32—34 ft·lbf}

Step 3: 85—95°

Step 4: 85—95°

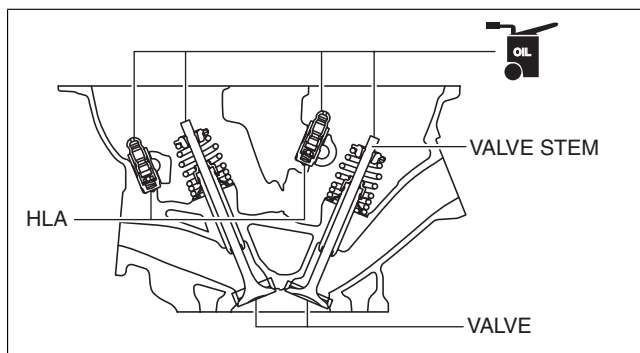
3. Install the chain for the **SST** which was set aside and secure the engine.
4. Remove the engine lifter or garage jack.
5. Remove the temporarily assembled oil pan.



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Rocker Arm Installation Note

1. Apply engine oil to the HLAs and the end of the valve stems.
2. Install the rocker arms to the same positions as before removal.



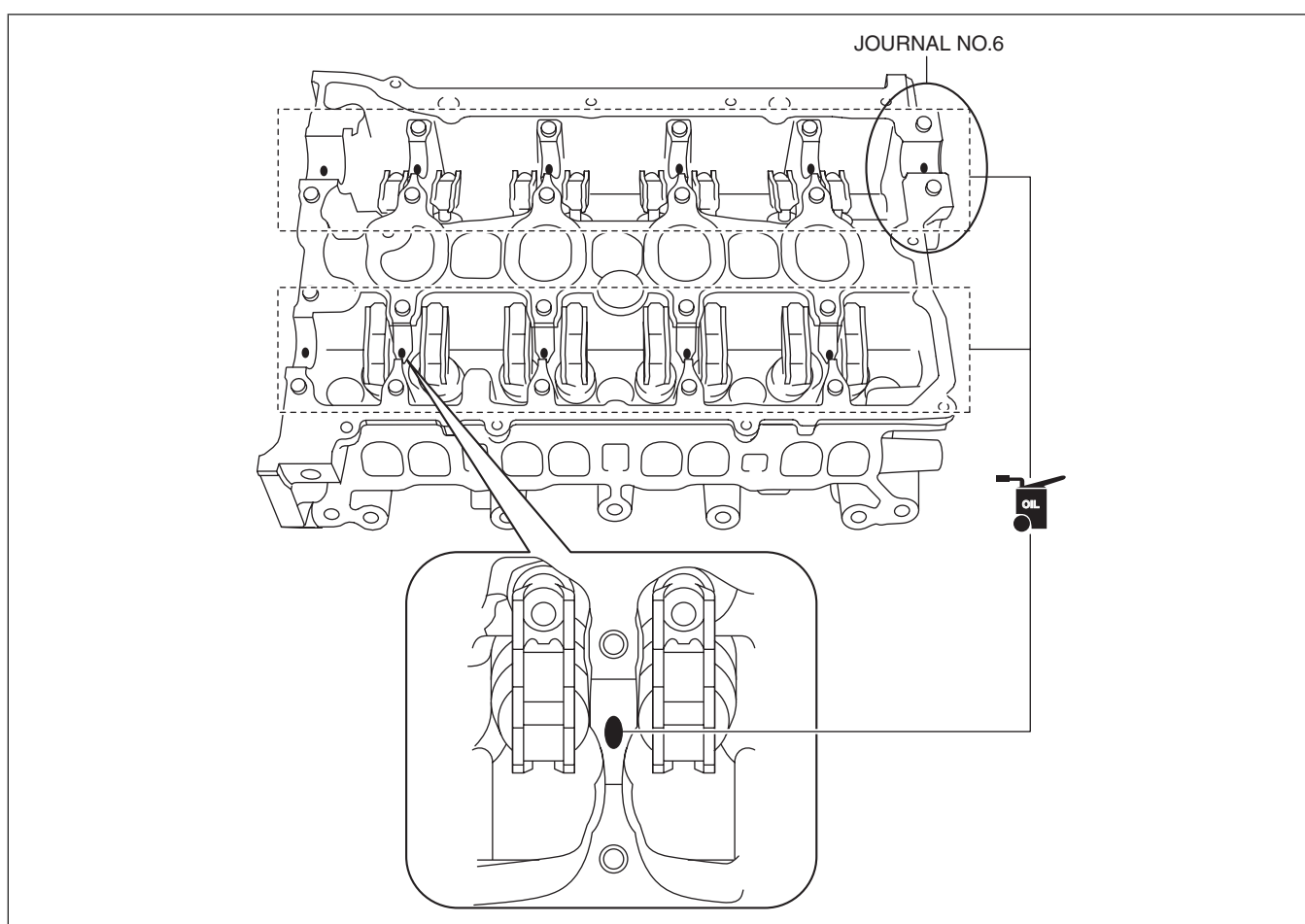
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Camshaft Installation Note

1. As shown in the figure, apply gear oil (SAE No. 90 or equivalent) or engine oil to the center area of each journal of the cylinder head.

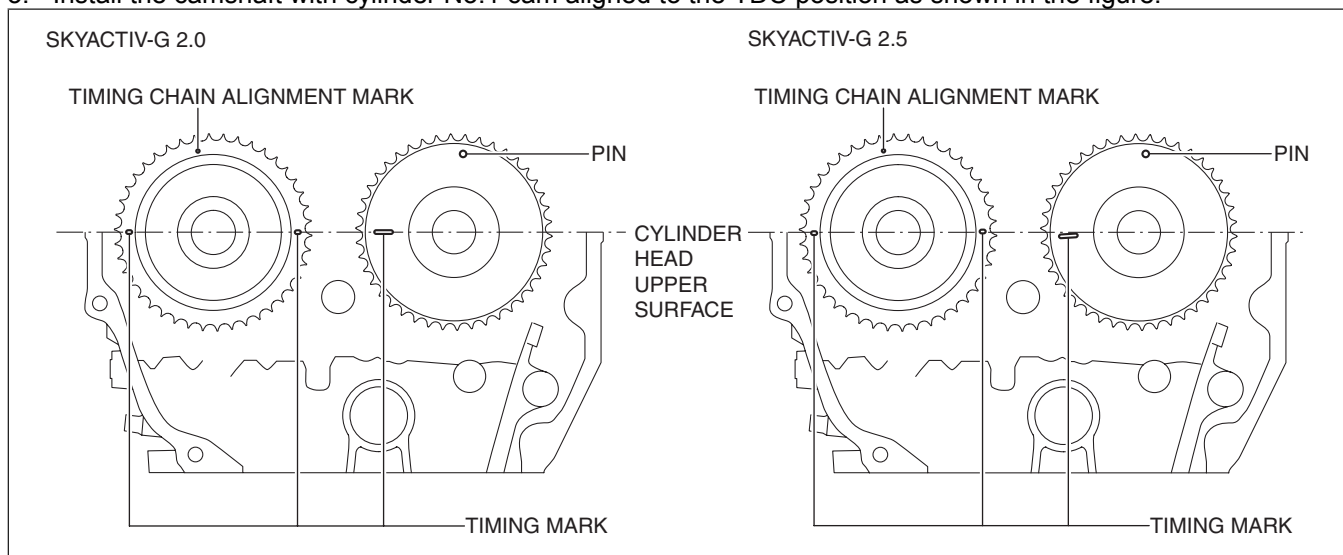
Caution

- Apply 0.05 ml {0.05 cc, 0.003 in³} or less of oil to journal No.6.



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2. Apply gear oil (SAE No. 90 or equivalent) or engine oil to the following location of each camshaft.
 - Thrust surface of front journal
3. Install the camshaft with cylinder No.1 cam aligned to the TDC position as shown in the figure.

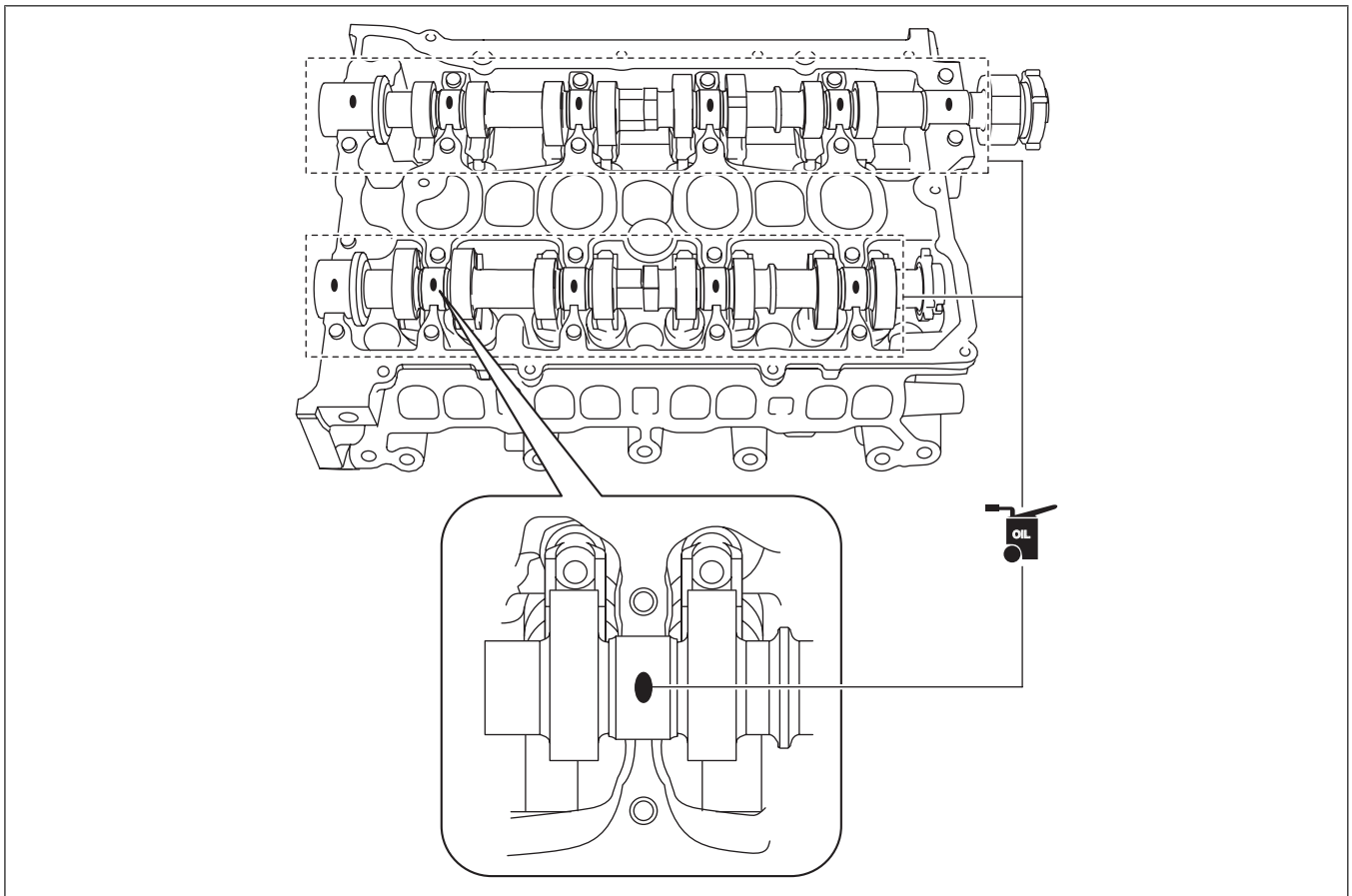


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Note

- The timing mark of SKYACTIV-G 2.5 is not completely parallel with the upper surface of the cylinder head.

4. As shown in the figure, apply gear oil (SAE No. 90 or equivalent) or engine oil to the center area of each journal of the camshaft.



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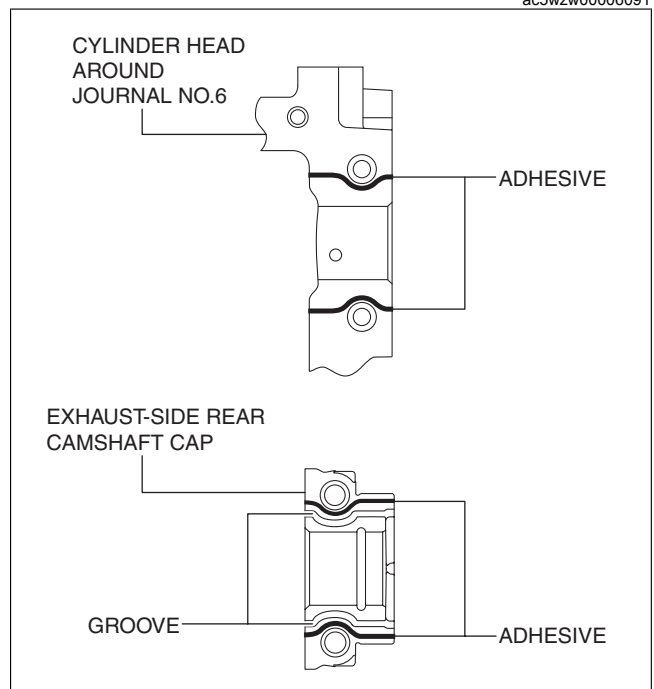
5. Apply adhesive agent (Loctite 962T) around journal No.6 of the cylinder head or the exhaust-side rear camshaft cap.

Caution

- Verify that there is no adhesive agent on the journal.

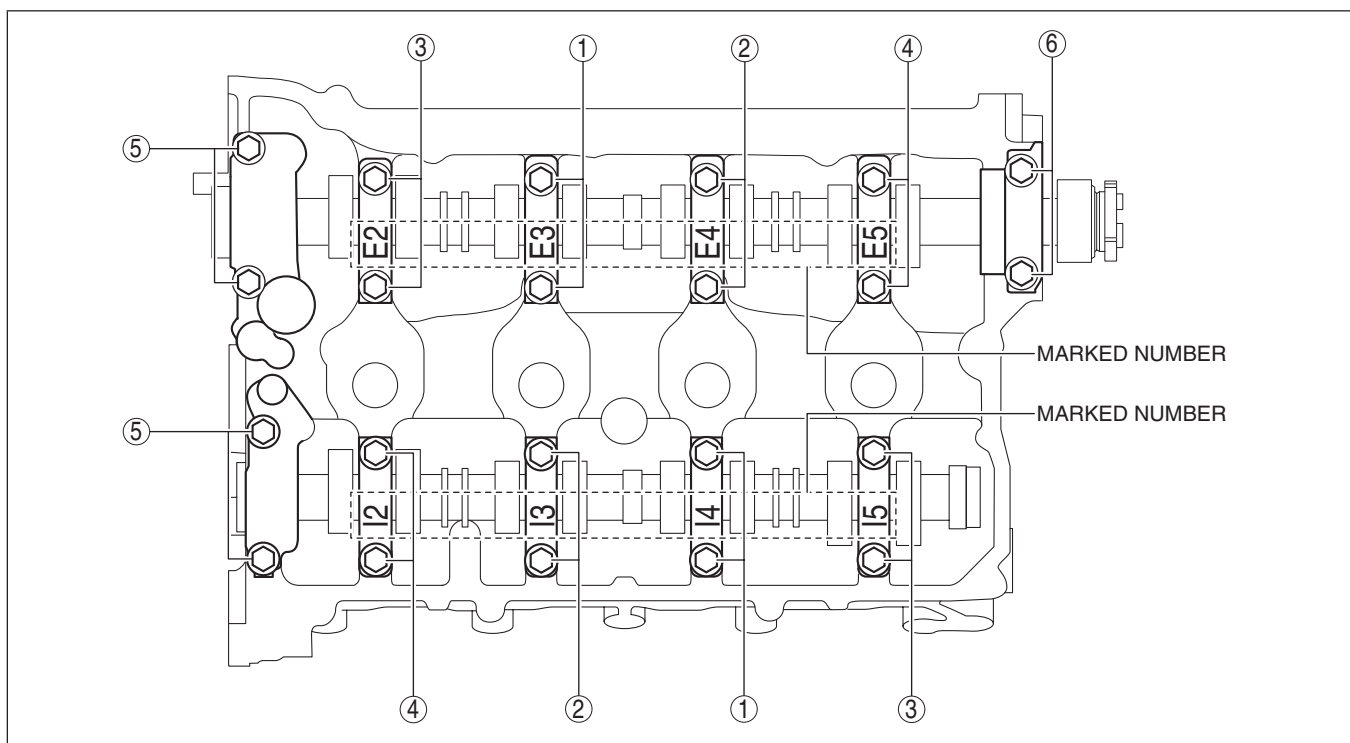
Adhesive agent bead width
0.5—1.5 mm {0.02—0.05 in}

6. Install the camshaft caps in the marked number order, and temporarily tighten the camshaft cap installation bolts in two or three passes evenly.



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7. Tighten the camshaft cap installation bolts in two steps in the order shown in the figure.



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Tightening torque

First step: 3.0—6.0 N·m {31—61 kgf·cm, 27—53 in·lbf}

Second step: 8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

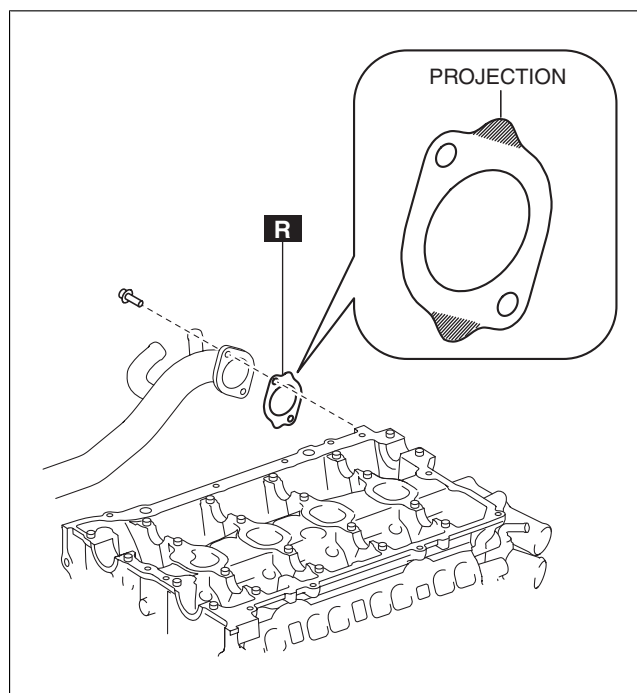
Water Inlet Pipe Installation Note

Caution

- Do not apply oil (such as engine oil, ATF) to the O-ring of the water inlet pipe. Otherwise, the O-ring could swell causing a seal malfunction.

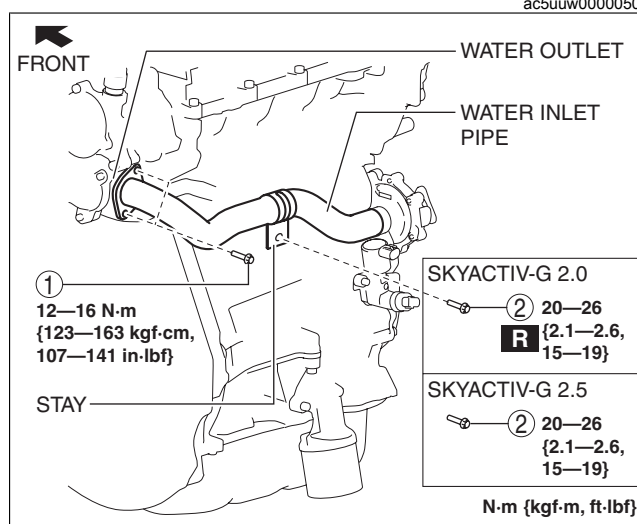
1. Clean away the sealant adhering to the bolt hole on the cylinder block side of the water inlet pipe stay.
2. Apply engine coolant to the O-ring.
3. Install the O-ring to the water inlet pipe.
4. Insert the water inlet pipe into the water pump being careful not to damage the O-ring.

5. Install the water inlet pipe gasket with the gasket projection facing the direction shown in the figure.



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6. Tighten the bolts in the order shown in the figure.



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