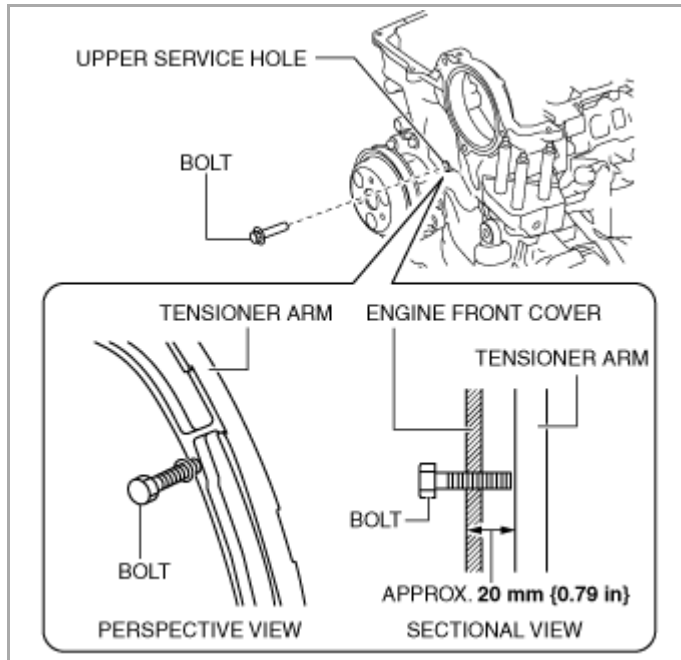


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## 2005 MAZDA MX-5 / Miata OEM Service and Repair Workshop Manual

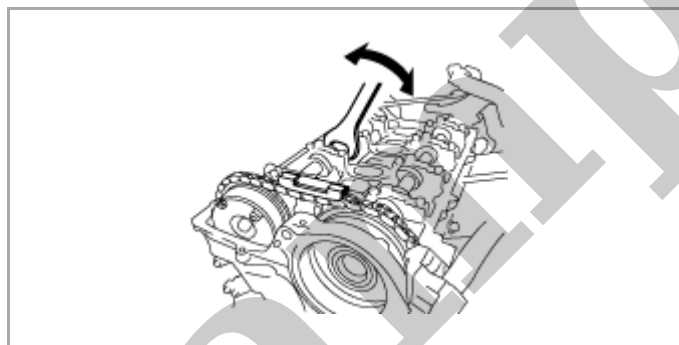
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#### Note

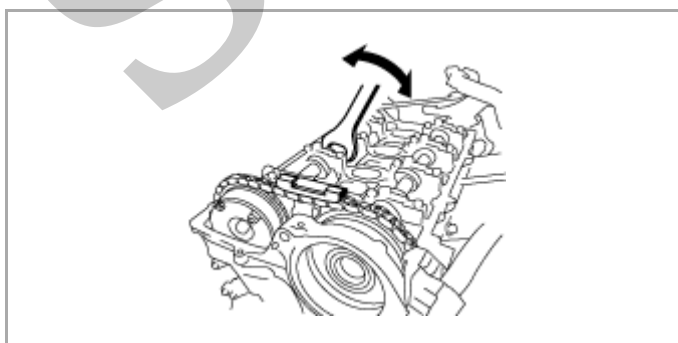
- The bolt contacts the tensioner arm when it is inserted approx. 20 mm {0.79 in}.
- Hold the exhaust camshaft using a wrench on the cast hexagon and move it back and forth a few times as shown in the figure. This will drain the oil from the chain tensioner and make the following servicing easier.



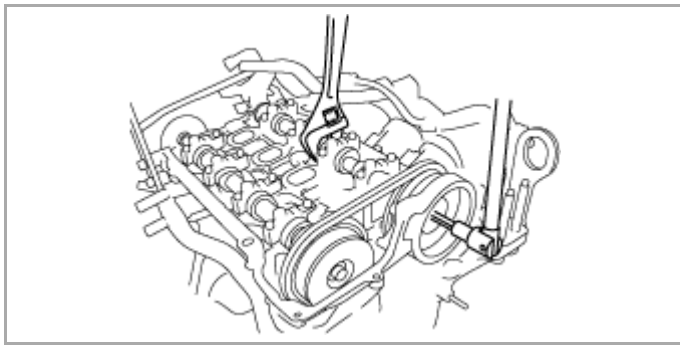
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(4) Insert a precision screwdriver into the lower service hole.

(5) While moving the exhaust camshaft back and forth in the direction of the arrow using a wrench on the cast hexagon, press down the link plate of the timing chain tensioner using a precision screwdriver and release the plunger lock.

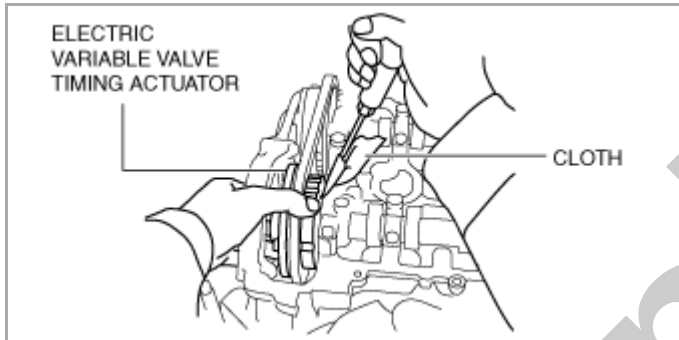


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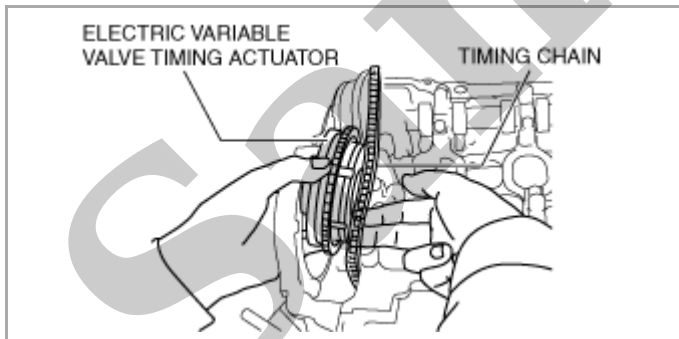
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3. Using a screwdriver wrapped in a clean cloth, lightly press the electric variable valve timing actuator to the front and separate the intake camshaft and the actuator.



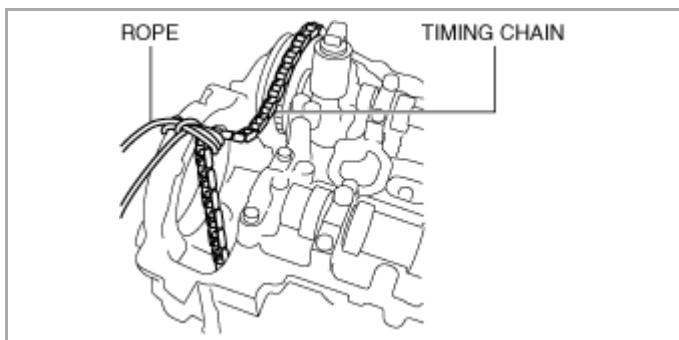
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4. Remove the timing chain from the exhaust and intake camshaft sprockets and set it aside, and remove the electric variable valve timing actuator.

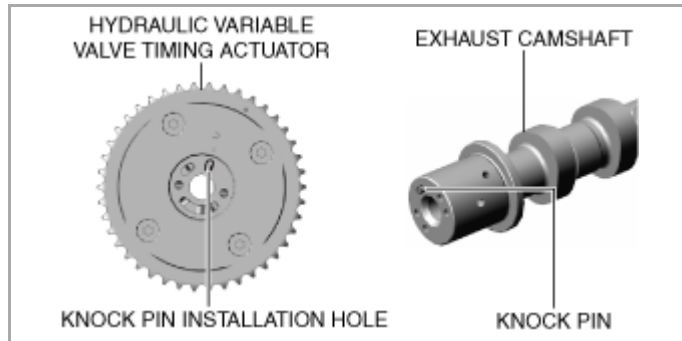


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5. Return the timing chain to the exhaust camshaft sprocket, and pull the timing chain up and suspend it using a rope as shown in the figure.

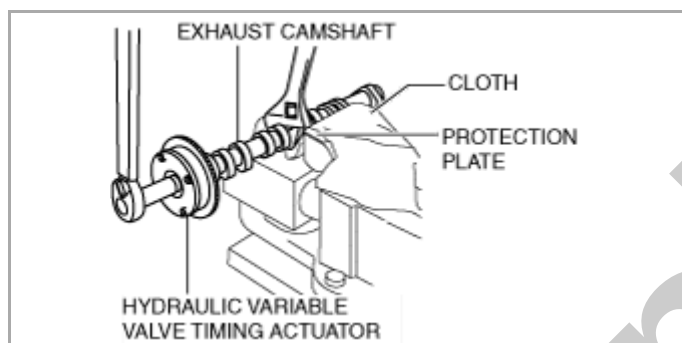


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3.Lock the exhaust camshaft against rotation by holding the exhaust camshaft with a vise and securing the cast hexagon with a wrench.



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4.Tighten the hydraulic variable valve timing actuator installation bolt.

#### Tightening torque

75–85 N·m {7.7–8.6 kgf·m, 56–62 ft·lbf}

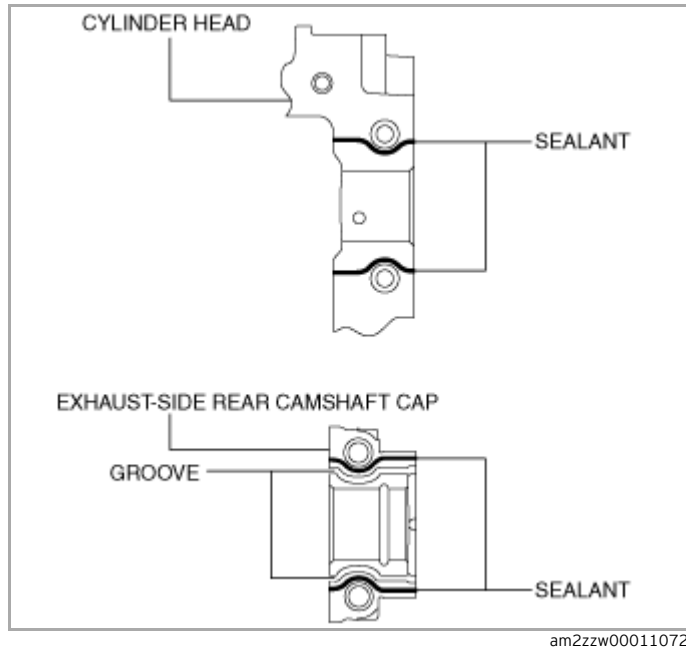
### Hydraulic Variable Valve Timing Actuator and Exhaust Camshaft Component Installation Note

1.Apply SAE 90 gear oil or equivalent, or engine oil to the positions shown in the figure.

#### Caution

- Apply 0.05 ml {0.05 cc, 0.003 in<sup>3</sup>} or less of oil to area A in the figure.





### Caution

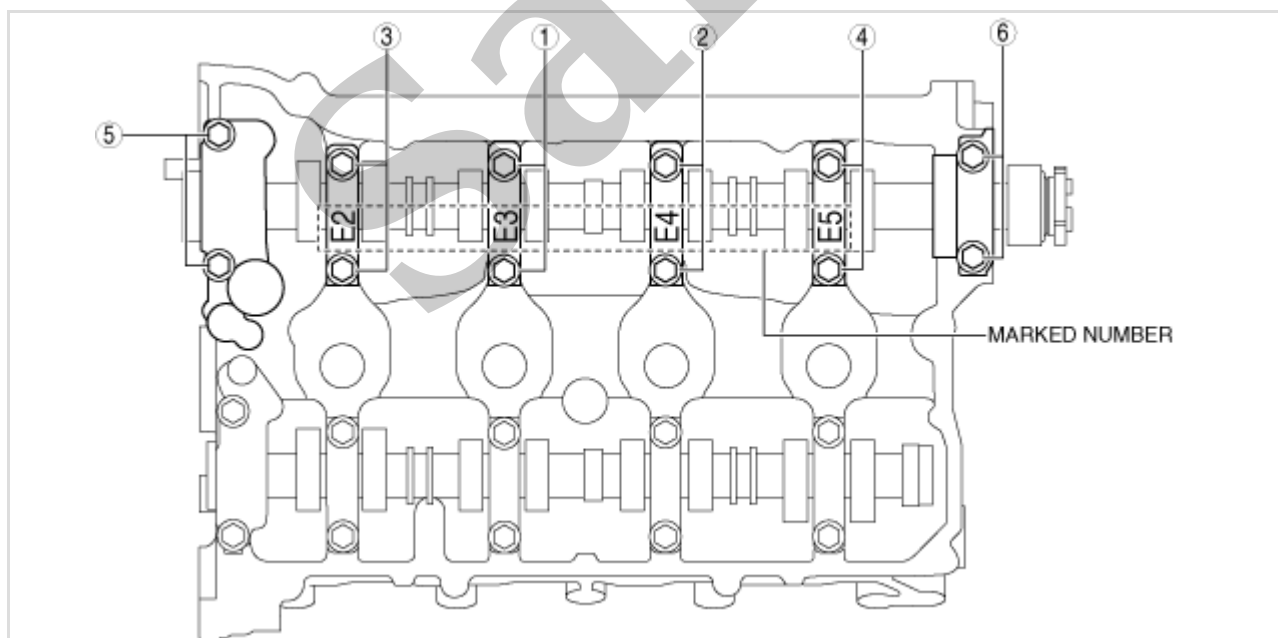
- Do not spill sealant on the journal.

### Sealant agent bead width

1–3 mm {0.04–0.11 in}

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

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

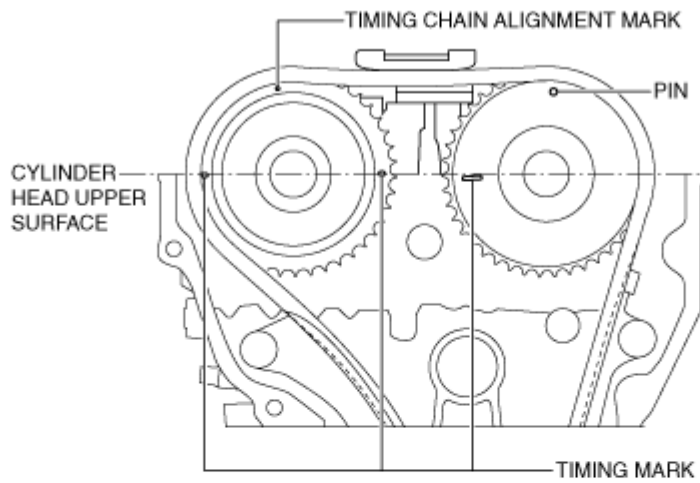


### Tightening torque

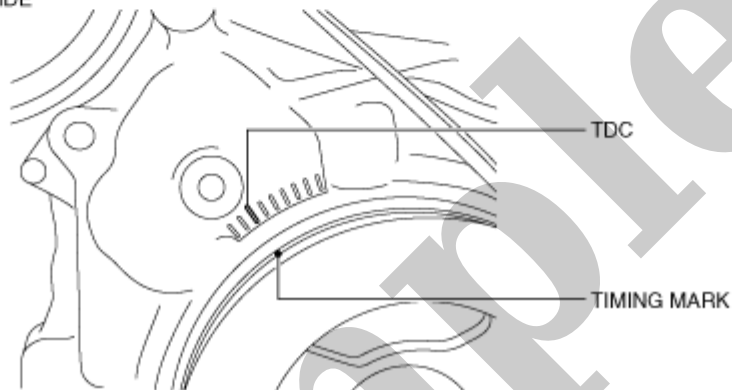
First step: 3.0–6.0 N·m {31–61 kgf·cm, 27–53 in·lbf}

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

#### CAMSHAFT SIDE



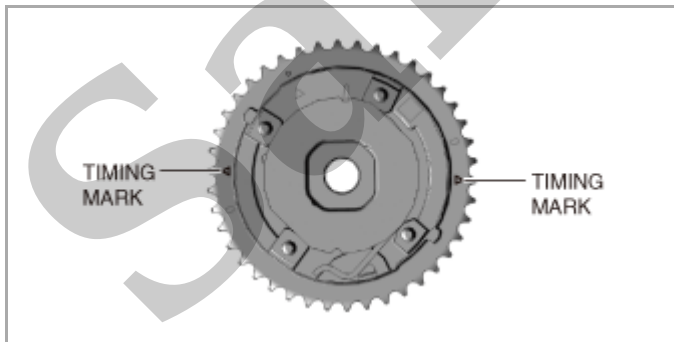
#### CRANKSHAFT SIDE



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#### Note

- The timing mark of the hydraulic variable timing actuator differs depending on the specification.



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

4. Install the blind plugs (upper and lower) for the engine front cover service holes.

# Drive Belt Auto Tensioner Installation Note

## Caution

- To allow the drive belt auto tensioner to function correctly, always bleed the air from the drive belt auto tensioner using the following procedure after assembling the drive belt auto tensioner.

1. Install the drive belt auto tensioner to the engine.

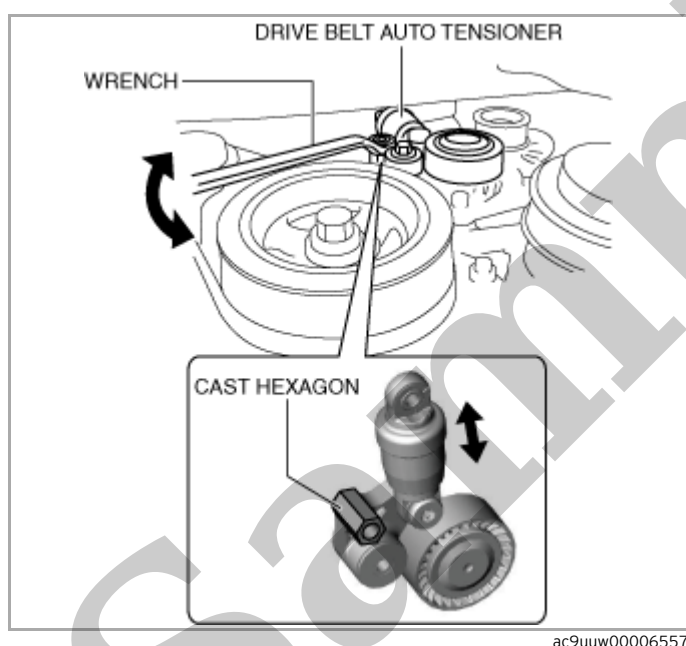
## Tightening torque

22–30 N·m {2.3–3.0 kgf·m, 17–22 ft·lbf}

## Caution

- To prevent damage to the drive belt auto tensioner, do not apply excessive torque after the tensioner moves full-stroke.

2. Insert the wrench onto the cast hexagon on the drive belt auto tensioner, move the drive belt auto tensioner up and down at full-stroke three times to bleed the air.



## Note

- By moving the drive belt auto tensioner up and down full-stroke three times, the piston inside the tensioner moves to bleed the air.

# COMPRESSION INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]

SM2897250

id0110t280030

## Warning

- Hot engines and oil can cause severe burns. Be careful not to burn yourself during removal/installation of each component.
- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Highly pressurized fuel may spray out if the fuel line is cut. Due to the following dangers occurring with a fuel spray, always complete the “Fuel Line Safety Procedure” to prevent the fuel from spraying.
  - Fuel may cause irritation if it comes in contact with skin and eyes.
  - If fuel ignites and causes a fire, it may lead to serious injury or death, and damage to property and facilities.

1. Verify that the battery is fully charged. (See **BATTERY INSPECTION**.)

2. Connect the M-MDS to the DLC-2.

3. Warm up the engine to the normal operating temperature.

4. Display the following PIDs using the M-MDS data monitor function. (See **PCM INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)

- RPM (engine speed)

5. Perform the “Fuel Line Safety Procedure” to remove the fuel pump relay. (See **BEFORE SERVICE PRECAUTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)

6. Remove the following parts.

(1) Plug hole plate. (See **PLUG HOLE PLATE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)

(2) Ignition coil/ion sensors. (See **IGNITION COIL/ION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)

(3) Spark plugs. (See **SPARK PLUG REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)

(4) Fuel injector relay. (See **RELAY LOCATION**.)

7. Measure the compression pressure using the following procedure.

(1) Install the compression gauge to the spark plug hole.

(2) Fully depress the accelerator pedal.

## Note

# CYLINDER HEAD GASKET REPLACEMENT [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]

SM2897254

id0110t280070

## Replacement Part

O-ring Quantity: 1 Location of use: Water inlet pipe	Gasket Quantity: 1 Location of use: Water inlet pipe	Cylinder head gasket Quantity: 1 Location of use: Cylinder head
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## Oil and Chemical Type

Engine oil Type: Recommended oil	Gear oil Type: SAE 90 gear oil or equivalent	Sealant Type: LOCTITE 962T, 518, 272 or equivalent
Silicone sealant Type: TB1217D or equivalent	Coolant Type: Recommended coolant	-

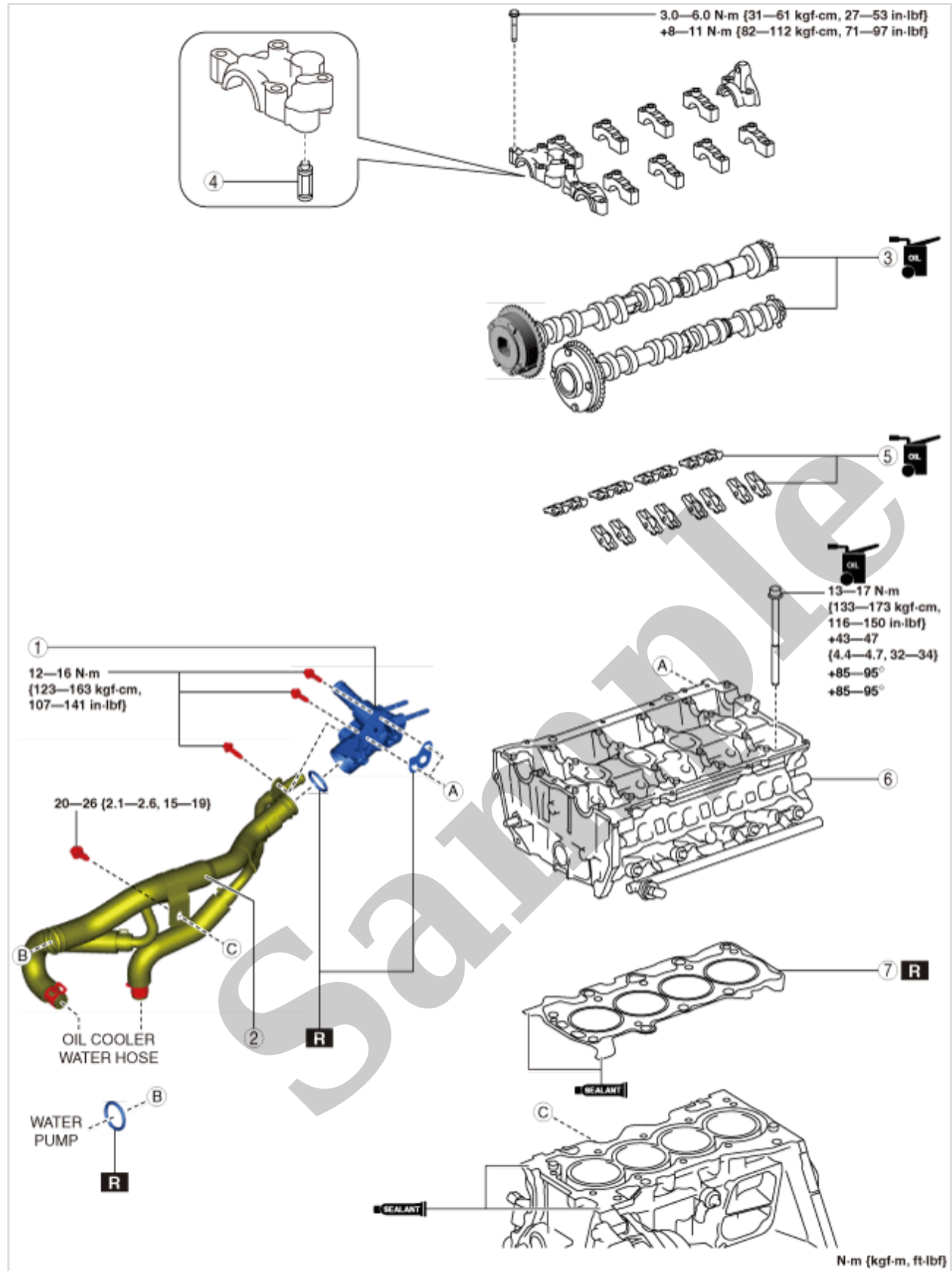
## Warning

- 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.
- Highly pressurized fuel may spray out if the fuel line is cut. Due to the following dangers occurring with a fuel spray, always complete the "Fuel Line Safety Procedure" to prevent the fuel from spraying.
  - Fuel may cause irritation if it comes in contact with skin and eyes.
  - If fuel ignites and causes a fire, it may lead to serious injury or death, and damage to property and facilities.

## Caution

- If the camshaft is turned with the piston position at the top dead center while the timing chain is removed, the valve and piston will contact each other and it could cause engine damage. When turning the camshaft with the timing chain removed, turn the camshaft after the piston has rotated the crankshaft 90 degrees from the top dead center position.

- 1.Perform the [Fuel Line Safety Procedure] referring to [BEFORE SERVICE PRECAUTION]. (See **BEFORE SERVICE PRECAUTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)
- 2.Disconnect the negative battery terminal. (See **NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION**.)
- 3.Remove the plug hole plate. (See **PLUG HOLE PLATE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)
- 4.Remove the ignition coil/ion sensors. (See **IGNITION COIL/ION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]**.)
- 5.Remove the front under cover No.2. (See **FRONT UNDER COVER No.2 REMOVAL/INSTALLATION**.)



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1	Flange (See <a href="#">Water Inlet Pipe and Flange Installation Note.</a> )
2	Water inlet pipe (See <a href="#">Water Inlet Pipe and Flange Installation Note.</a> )
3	Camshaft (See <a href="#">Camshaft Removal Note.</a> ) (See <a href="#">Camshaft Installation Note.</a> )
4	OCV oil filter