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2005 MAZDA RX-8 OEM Service and Repair Workshop Manual

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146.5 mm {5.767 in}

2.When a cylinder head bolt is reused, apply engine oil to any part of the following:

- Bolt seating surface
- Cylinder head seating surface

Caution

• Completely remove oil, dirt, and silicone sealant adhering to the cylinder head gasket contacting surfaces. Otherwise, a sealing malfunction may occur.

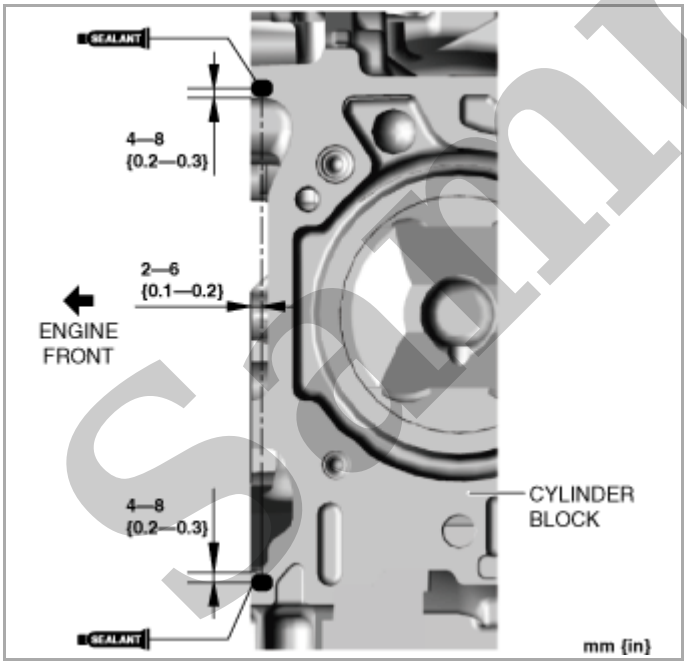
3.Completely remove any oil, dirt, and silicone sealant adhering to the cylinder block.

Caution

• Be aware of the following points, otherwise a sealing malfunction may occur due to hardening of the silicone sealant.

— Set cylinder head on cylinder block within 10 min after silicone sealant is applied
— After setting cylinder head, tighten cylinder head bolts immediately

4.Apply silicone sealant (TB1217D or equivalent) to the areas shown in the figure.



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Silicone sealant application diameter

5−10 mm {0.2−0.3 in}

5.Install a new cylinder head gasket to the cylinder block.

6.Apply silicone sealant (TB1217D or equivalent) to the areas shown in the figure.

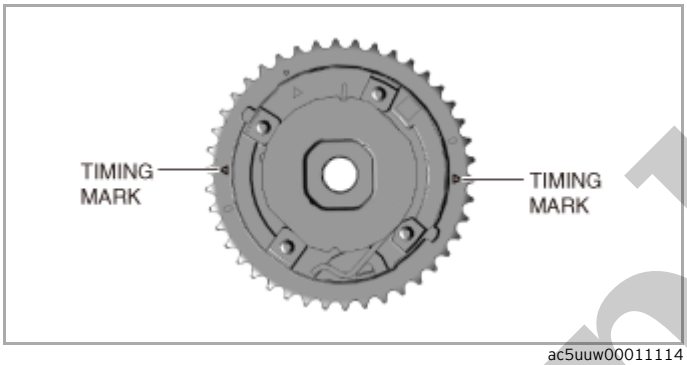
2.Apply gear oil (SAE 90 or equivalent) or engine oil to the thrust surface (both surfaces front and back) of the front journal on each camshaft.

Caution

• Be careful not to let oil adheres the engine front cover installation surface. If oil adheres to the engine front cover installation surface, a sealing malfunction may occur when the engine front cover is installed.
• If oil adheres to the engine front cover installation surface, remove any oil completely.

Note

• If oil is applied to the front camshaft cap, oil should not be applied to the thrust surface of the front journal.
• The timing mark of the hydraulic variable timing actuator differs depending on the specification.



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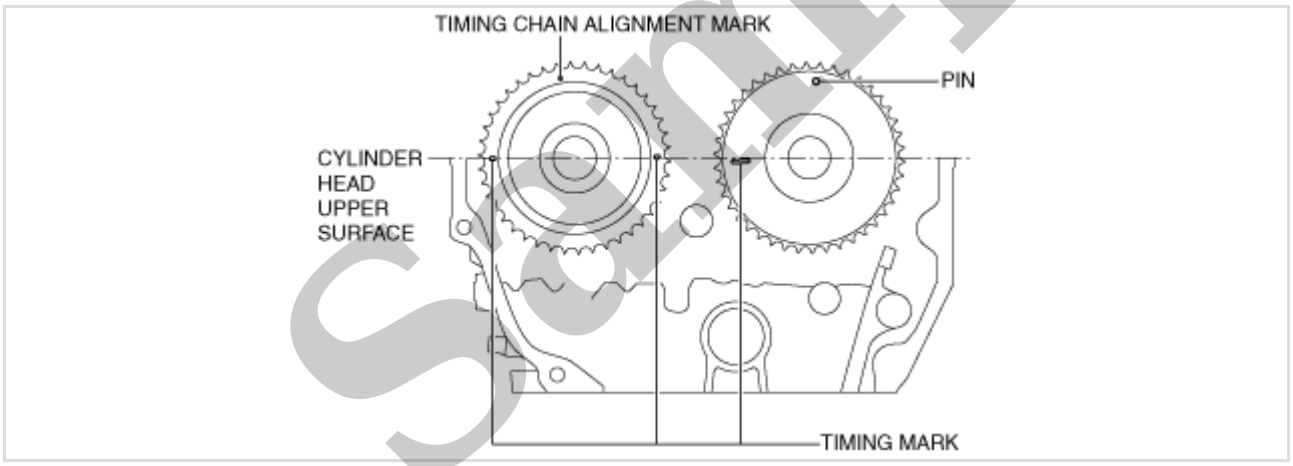
3.Install the camshafts with cylinder No.1 cam aligned to the TDC position as shown in the figure.



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4.Apply SAE 90 gear oil or equivalent, or engine oil to the central area of each journal on the camshaft.

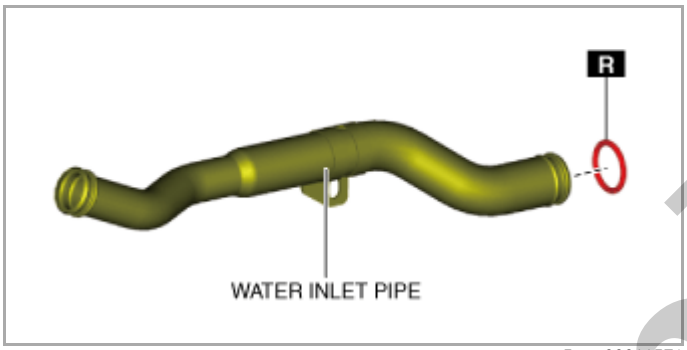
Water Inlet Pipe and Flange Installation Note

Caution

- Be aware of the following points, otherwise engine coolant leakage could result.
  - — Do not allow oil (such as engine oil, ATF) to contact O-ring
  - — Do not damage O-rings

1.Apply engine coolant to a new O-ring (water pump side).

2.Install the O-ring to the water inlet pipe.



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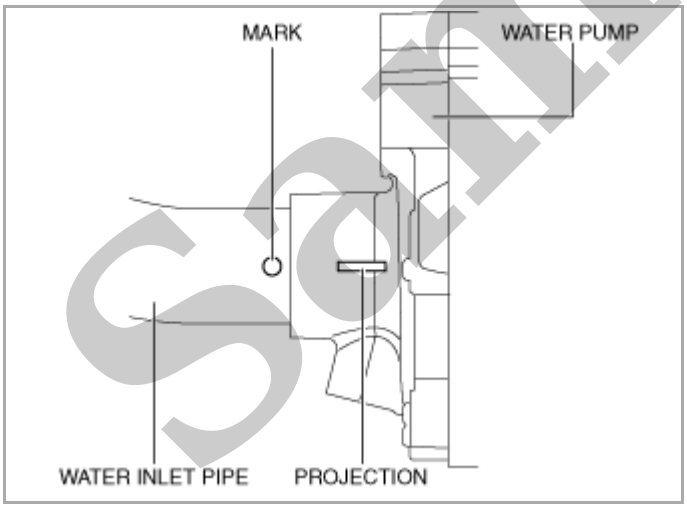
3.Insert the water inlet pipe into the water pump so that the marked position is aligned with the projection position.



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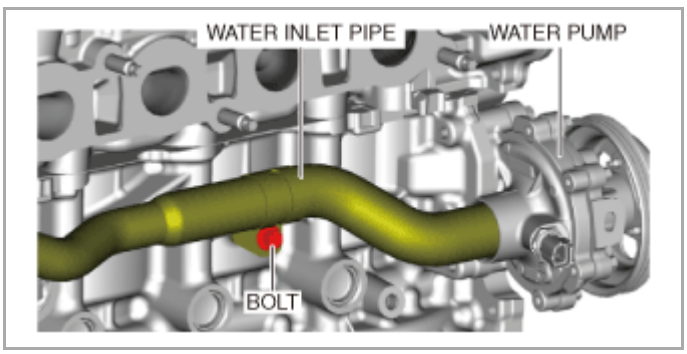
4.Temporarily tighten the bolt shown in the figure.



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ENGINE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)]

SM2897251

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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

• Secure the steering wheel using tape or a cable to prevent the steering shaft from rotating after disconnecting the steering shaft. If the steering wheel rotates after the steering shaft and the steering gear and linkage are disconnected, the internal parts of the clock spring could be damaged.
• Applying excessive force (force of 100 N {10.2 kgf, 22.5 lbf} or more) to the electric variable valve timing motor/driver may cause a malfunction. When servicing, be careful not to apply excessive force to the electric variable valve timing motor/driver using other parts or tools.

Note

• Perform the engine and transaxle component removal/installation from below the vehicle.

Engine Removal

1.Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)

2.Remove the plug hole plate. (See PLUG HOLE PLATE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)

3.Remove the air cleaner, air hose and fresh air duct as a single unit. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)

4.Remove the PCM component. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)

5.Remove the bolts, nut and connector shown in the figure, and set the wiring harness aside.

21.Disconnect the lower radiator hose from the radiator.

22.Remove the generator drive belt. (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)

23.Remove the A/C compressor with the cooler hose still connected and secure it using wire or rope so that it is out of the way. (See A/C COMPRESSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5].)

24.Remove the TWC installation nuts (exhaust manifold side) and secure the TWC using wire or rope so that it is out of the way. (See EXHAUST SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)

25.Remove the propeller shaft. (AWD) (See PROPELLER SHAFT REMOVAL/INSTALLATION.)

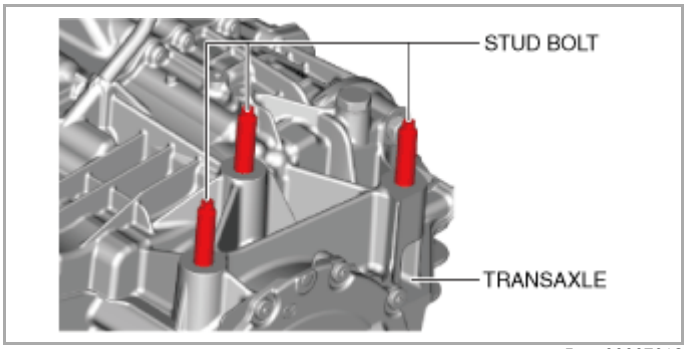
26.Disconnect the front drive shaft (LH) from the transaxle side and set the front drive shaft (LH) out of the way. (See FRONT DRIVE SHAFT REMOVAL/INSTALLATION.)

27.Disconnect the front drive shaft (RH) from the transaxle side and set the front drive shaft (RH) out of the way. (2WD) (See FRONT DRIVE SHAFT REMOVAL/INSTALLATION.)

28.Remove the front drive shaft (RH). (AWD) (See FRONT DRIVE SHAFT REMOVAL/INSTALLATION.)

29.Remove the front crossmember component and No.1 engine mount rubber as a single unit. (See FRONT CROSSMEMBER REMOVAL/INSTALLATION.)

30.Remove in the order indicated in the table.



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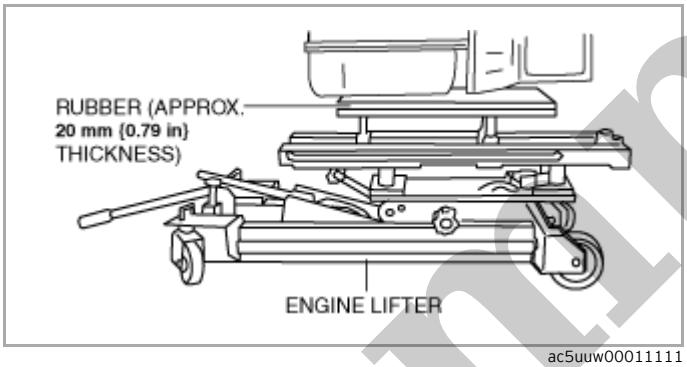
Tightening torque

15–25 N·m {1.6–2.5 kgf·m, 12–18 ft·lbf}

Caution

• When supporting the engine and transaxle, insert rubber of appropriate size (approx. 20 mm {0.79 in} thickness) between the engine lifter and the oil pan, transaxle to prevent the deformation of the oil pan and damage of the transaxle.

3.Secure the engine and transaxle using a commercially available engine lifter.



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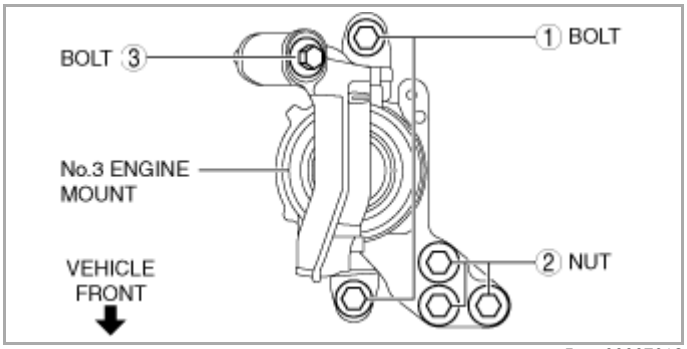
4.Return the engine and transaxle to their original positions.

5.Temporarily tighten the No.3 engine mount installation bolts and nuts using the following procedure:

(1)Temporarily tighten the bolts so that the bolt holes of the body are centered on the No.3 engine mount slots.



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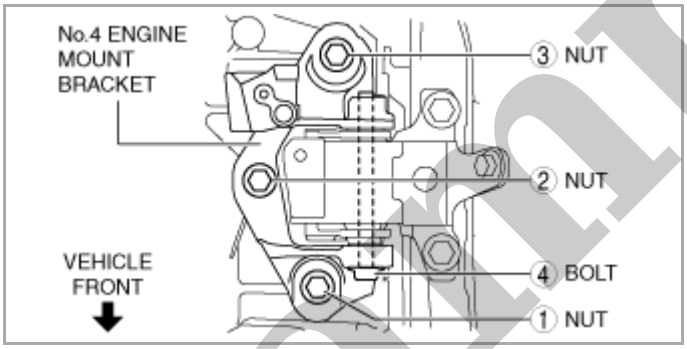
Tightening torque

Installation position	Tightening torque
1	76–95 N·m {7.8–9.6 kgf·m, 57–70 ft·lbf}
2	82–95 N·m {8.4–9.6 kgf·m, 61–70 ft·lbf}
3	49–65 N·m {5.0–6.6 kgf·m, 37–47 ft·lbf}

9.Tighten the No.4 engine mount bracket installation bolt and nuts in the order shown in the figure.



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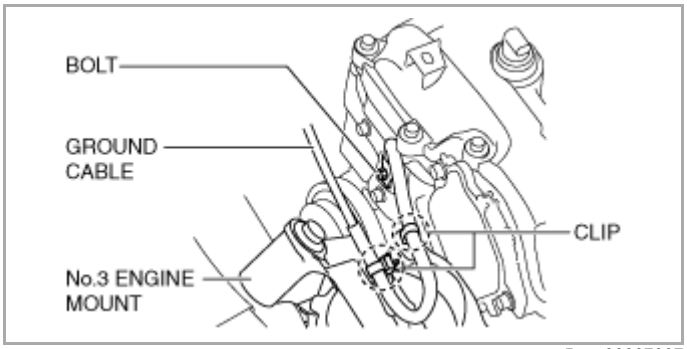
Tightening torque

Installation position	Tightening torque
1, 2, 3	92–116 N·m {9.4–11 kgf·m, 68–85 ft·lbf}
4	81–99 N·m {8.3–10 kgf·m, 60–73 ft·lbf}

10.Tighten the No.1 engine mount rubber installation bolts.

2WD



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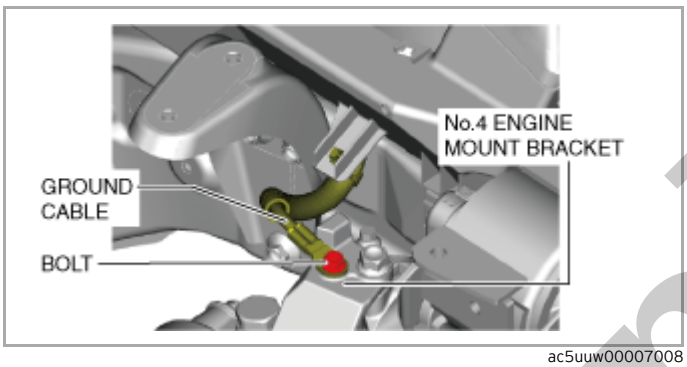
Tightening torque

9–12 N·m {92–122 kgf·cm, 80–106 in·lbf}

LH



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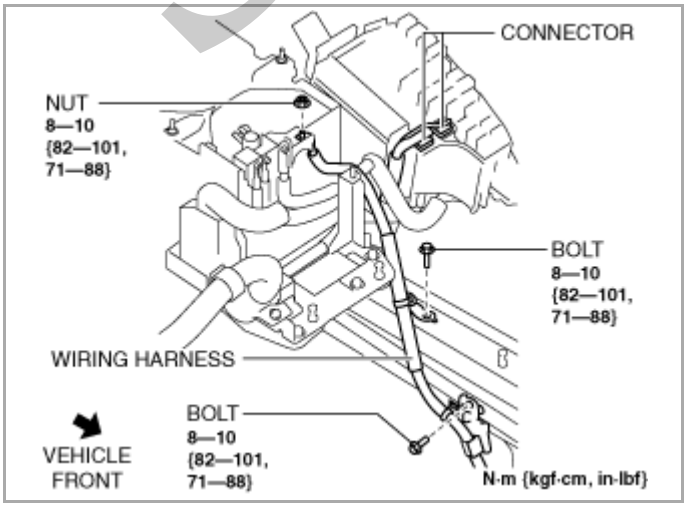
Tightening torque

9–12 N·m {92–122 kgf·cm, 80–106 in·lbf}

26.Install the battery tray and battery. (See BATTERY REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)

27.Install the PCM component. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)

28.Connect the wiring harness shown in the figure.



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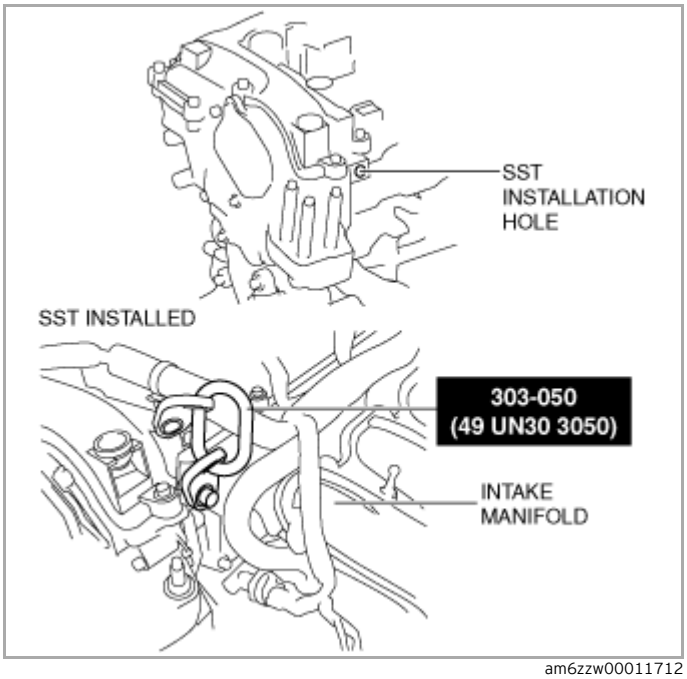

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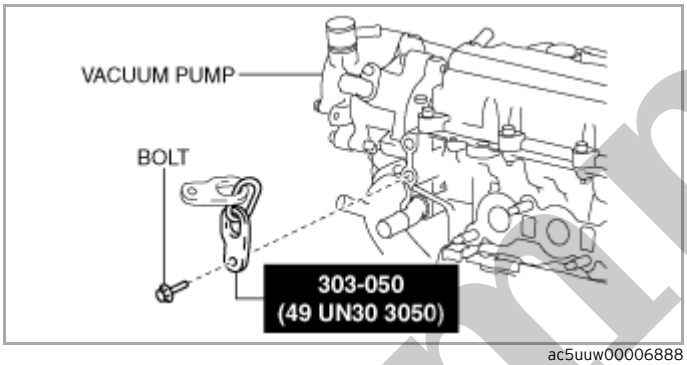
Engine rear side



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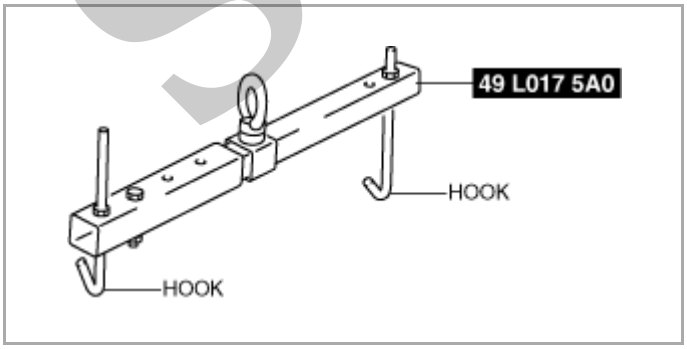
Tightening torque

38–51 N·m {3.9–5.2 kgf·m, 29–37 ft·lbf}

3.Engage the hooks of the SST (49 L017 5A0) to the SST (49 UN30 3050).



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4.To ensure the safety of the work (control engine and transaxle sway), set a hoist as shown in the figure.

Caution

• Do not lift up the engine.