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## 2005 MAZDA 2 / Demio OEM Service and Repair Workshop Manual

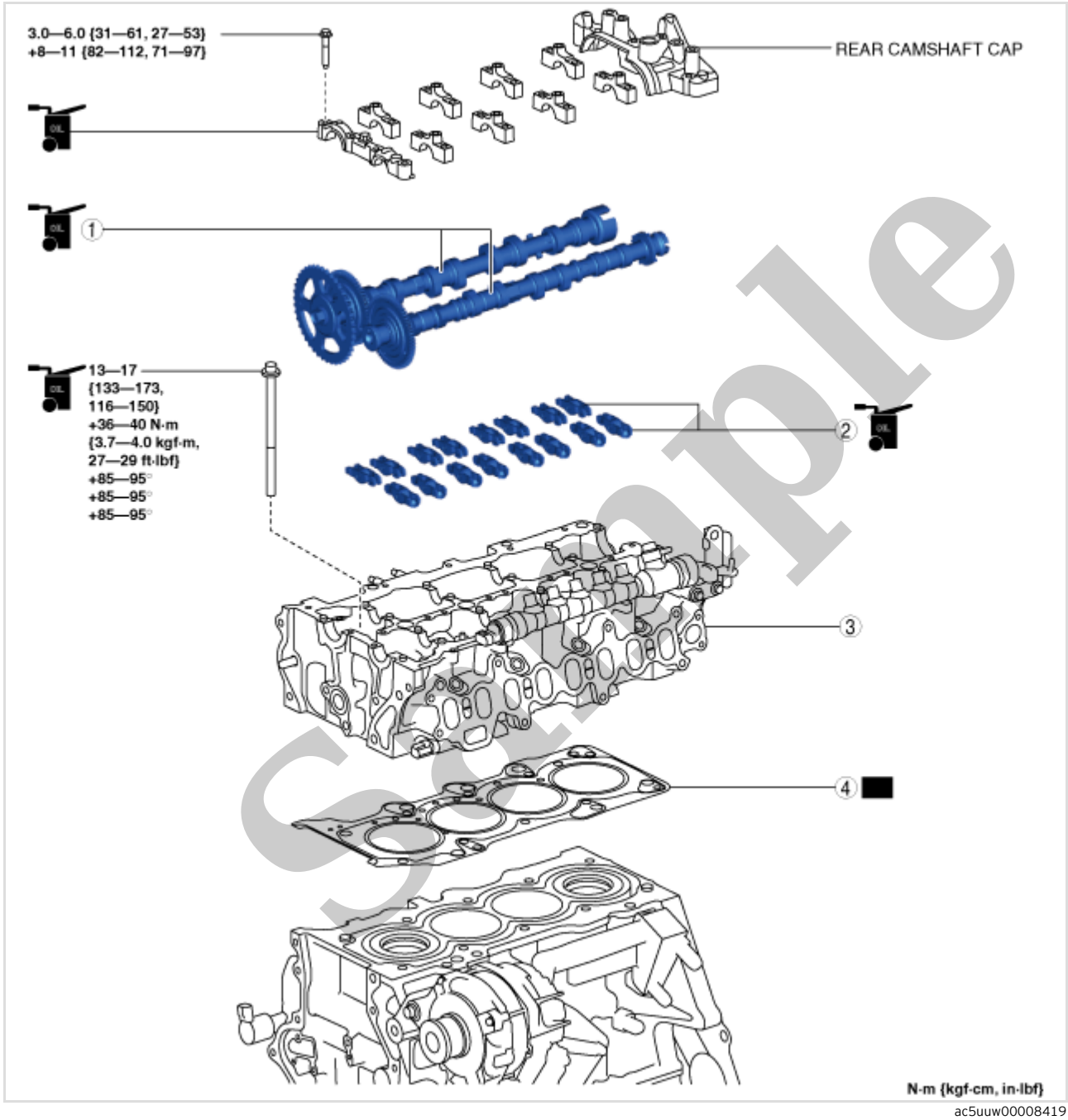
[Go to manual page](#)

4	Engine cover (See <a href="#">ENGINE COVER REMOVAL/INSTALLATION [SKYACTIV-D 2.2].</a> )
5	Cylinder head gasket (See <a href="#">CYLINDER HEAD GASKET REPLACEMENT [SKYACTIV-D 2.2].</a> )
6	Rear oil seal (See <a href="#">REAR OIL SEAL REPLACEMENT [SKYACTIV-D 2.2].</a> )
7	Timing chain (See <a href="#">TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-D 2.2].</a> )
8	Front oil seal (See <a href="#">FRONT OIL SEAL REPLACEMENT [SKYACTIV-D 2.2].</a> )
9	HLA (See <a href="#">HYDRAULIC LASH ADJUSTER (HLA) INSPECTION [SKYACTIV-D 2.2].</a> ) (See <a href="#">HYDRAULIC LASH ADJUSTER (HLA) REMOVAL/INSTALLATION [SKYACTIV-D 2.2].</a> )
10	Cylinder head (See <a href="#">CYLINDER HEAD REMOVAL/INSTALLATION [SKYACTIV-D 2.2].</a> )

Sample

25.Start the engine, and inspect and adjust the following:

- Leakage of engine oil, engine coolant.
- Engine oil amount. (See [ENGINE OIL LEVEL INSPECTION \[SKYACTIV-D 2.2\].](#))
- Runout and contact of pulley and belt.
- Idle speed. (See [ENGINE TUNE-UP \[SKYACTIV-D 2.2\].](#))
- Compression pressure. (See [COMPRESSION INSPECTION \[SKYACTIV-D 2.2\].](#))

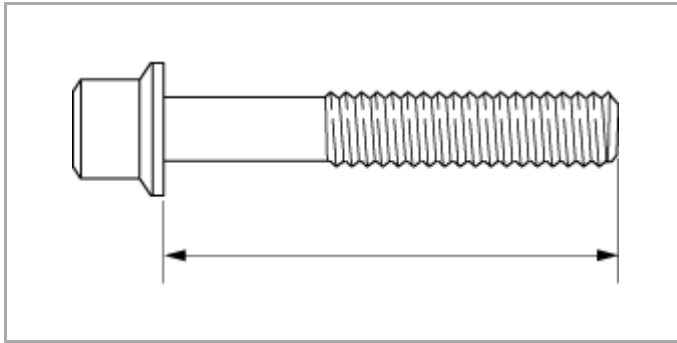


1	Camshaft (See <a href="#">Camshaft Removal Note.</a> ) (See <a href="#">Camshaft Installation Note.</a> )
2	Rocker arm (See <a href="#">Rocker Arm Removal Note.</a> ) (See <a href="#">Rocker Arm Installation Note.</a> )
3	Cylinder head (See <a href="#">Cylinder Head Removal Note.</a> ) (See <a href="#">Cylinder Head Installation Note.</a> )

- The end of the glow plug protrudes from the cylinder head (tightened surface of cylinder block). When removing/installing the cylinder head and placing the cylinder head on a workbench, be careful not to allow the end of the glow plug to contact the cylinder block or workbench. Otherwise, the end of the glow plug could be damaged.

1. Measure the length of the cylinder head bolt.

- If it exceeds the maximum specification, replace the cylinder head bolt.



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#### Standard cylinder head bolt length

169.2–169.8 mm {6.662–6.685 in}

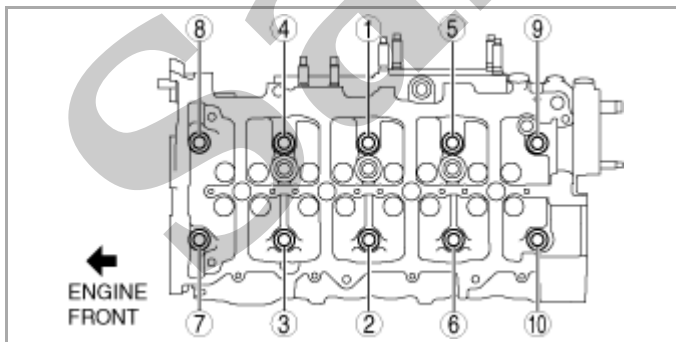
#### Maximum cylinder head bolt length

170.5 mm {6.713 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

3. Tighten the cylinder head bolts in the order shown in the following 5 steps.



ac5uuw00008422

#### Tightening torque

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

Step 2: 36–40 N·m {3.7–4.0 kgf·m, 27–29 ft·lbf}

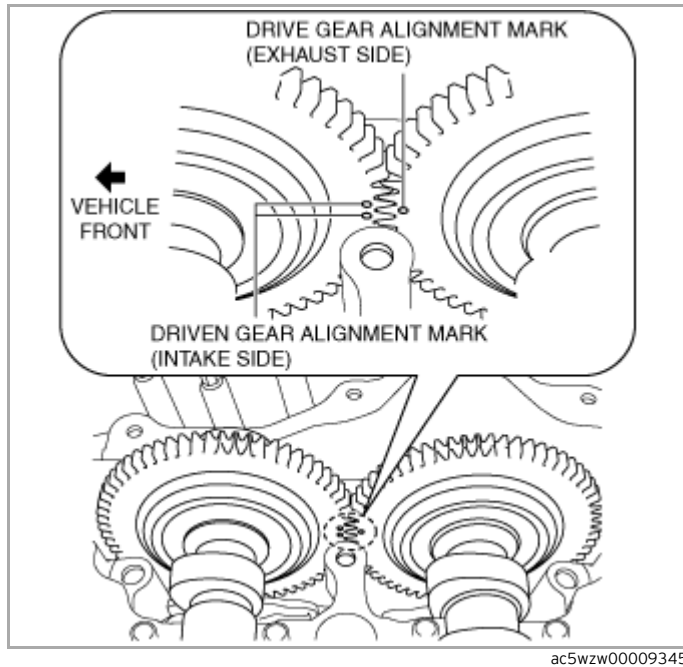
Step 3: 85–95°

Step 4: 85–95°

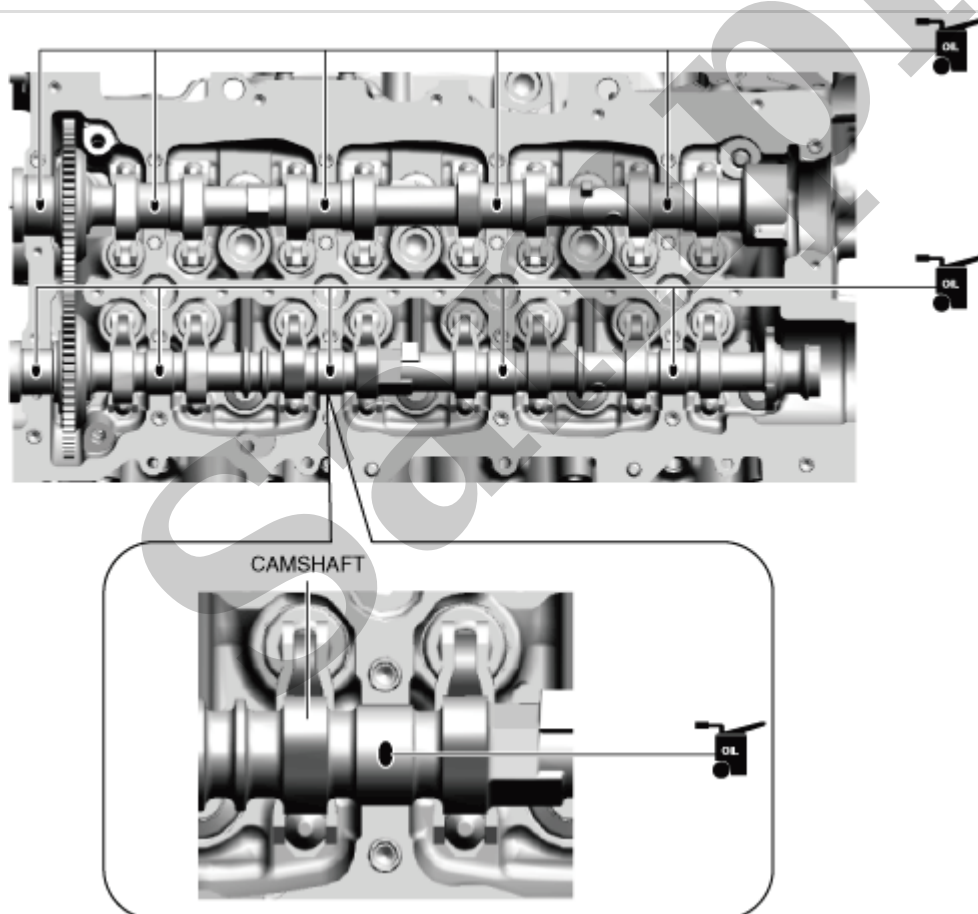
Step 5: 85–95°

4. Install the SST (49 L017 5A0) which was set aside and secure the engine. (See [TIMING CHAIN REMOVAL/INSTALLATION \[SKYACTIV-1 2.2\].](#))





4. Apply gear oil (SAE 90 or equivalent) or engine oil to the center area of each journal of the camshaft.



#### Caution

- Do not spill sealant agent on the journal.
- Apply sealant in a single, unbroken line to prevent a seal malfunction.

5. Apply sealant (LOCTITE 962T, 518, 272 or equivalent) to the rear side of the cylinder head or rear camshaft cap along the application line shown in the figure.

# DRIVE BELT AUTO TENSIONER REMOVAL/INSTALLATION [SKYACTIV-D 2.2]

SM2897202

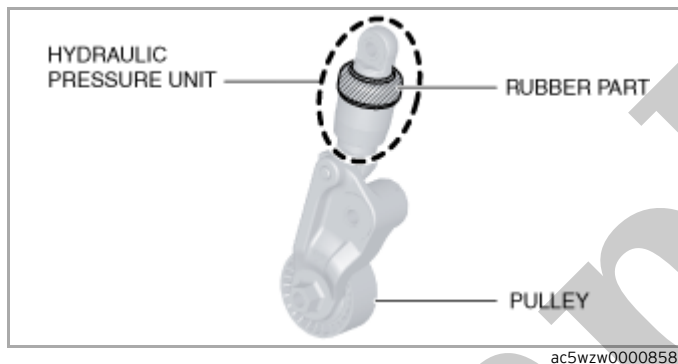
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## Warning

- A hot engine can cause severe burns. Turn off the engine and wait until it is cool before servicing.

## Caution

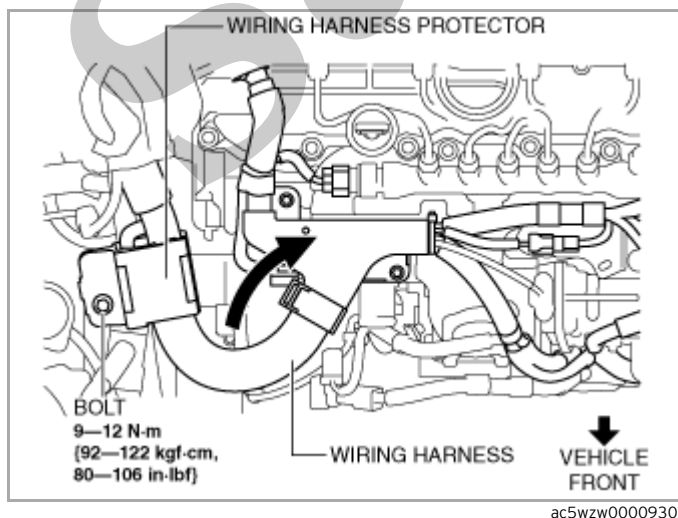
- If the rubber part of the drive belt auto tensioner is damaged by a screwdriver or other tool, oil in the hydraulic pressure unit could leak and the tensioner may not operate normally. Be careful not to damage the rubber part of the drive belt auto tensioner.



1.Remove the engine cover. (See [ENGINE COVER REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\]](#).)

2.Remove the drive belt. (See [DRIVE BELT REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\]](#).)

3.Remove the wiring harness protector bolt and set the wiring harness aside.



4.Remove in the order indicated in the table.

5.Install in the reverse order of removal.

# COMPRESSION INSPECTION [SKYACTIV-D 2.2]

SM2897204

id0110s580030

## Special Service Tool (SST)

49 S010 1A0A		49 JP04 002	
Compression gauge set		Adaptor comp. test	

### 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 \[SKYACTIV-D 2.2\]](#).)

- RPM (engine speed)

5. Remove the engine cover. (See [ENGINE COVER REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\]](#).)
6. Disconnect the fuel injector connector.
7. Remove the glow plugs. (See [GLOW PLUG REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\]](#).)
8. Install the SST using the following procedure:

(1) Install the SST (49 JP04 002) to the glow plug installation hole.

# ENGINE REMOVAL/INSTALLATION [SKYACTIV-D 2.2]

SM2897205

id0110s580040

### 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.

### Note

- Perform the engine and transaxle component removal/installation from the lower side of the vehicle after removing the front crossmember component.

## Operation After Replacing Engine

### Note

- Because there will be a new timing chain if the engine is replaced, perform the same procedure as “Operation After Replacing Timing Chain”.

1.After replacing the engine, perform the following procedure.

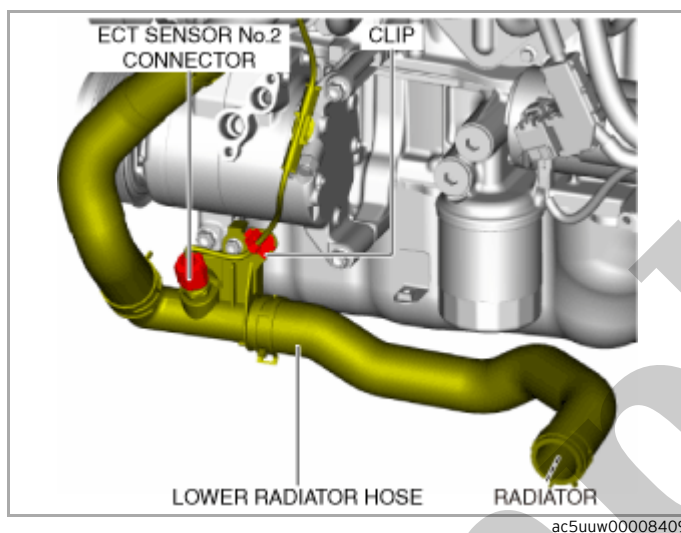
STEP	ACTION	PAGE/CONDITION
1	Perform KOEO self-test procedure.	(See <a href="#">KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)]</a> .)
2	Start the engine.	—
3	Verify that the check engine light does not illuminate.	—
4	Perform KOER self-test procedure.	(See <a href="#">KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)]</a> .)
5	Perform fuel injector injection amount correction.	(See <a href="#">FUEL INJECTOR INJECTION AMOUNT CORRECTION [SKYACTIV-D 2.2]</a> .)
6	Perform timing chain learning procedure.	(See <a href="#">TIMING CHAIN LEARNING [SKYACTIV-D 2.2]</a> .)
7	Clear the DTCs.	(See <a href="#">OBD-II READ/CLEAR DIAGNOSTIC TEST RESULTS [PCM (SKYACTIV-D 2.2)]</a> .)
8	Switch the ignition off.	—
9	Wait for 20 s or more.	—

20. Disconnect the heater hose. (See [A/C UNIT REMOVAL/INSTALLATION](#).)

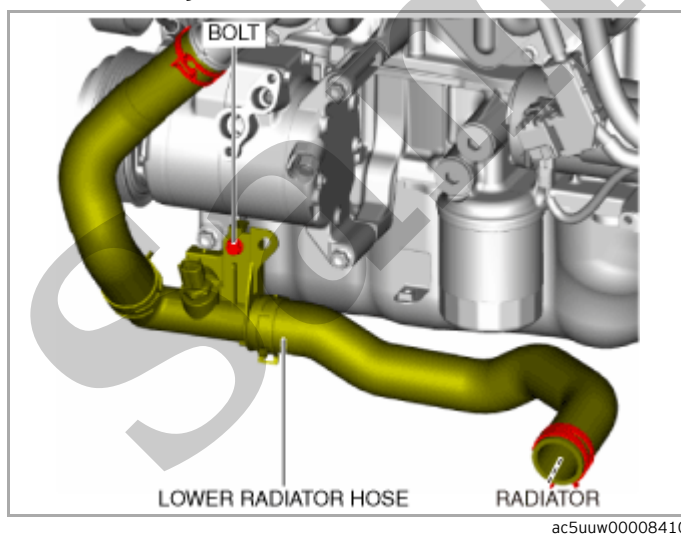
21. Remove the charge air cooler outlet hose and charge air cooler outlet pipe as a single unit. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\]](#).) (See [CHARGE AIR COOLER REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\]](#).)

22. Remove the lower radiator hose using the following procedure:

(1) Disconnect the connector and clip shown in the figure.



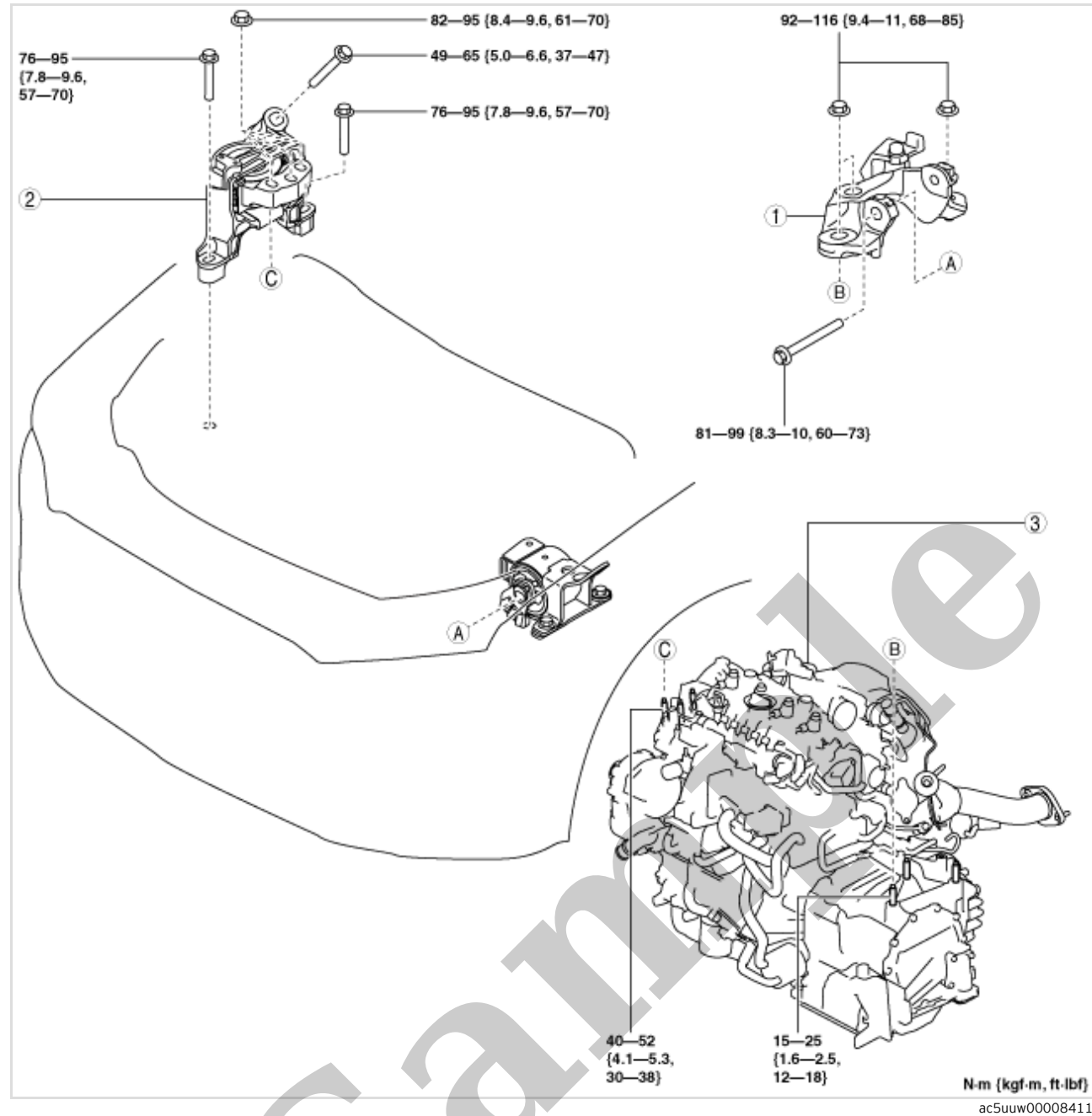
(2) Remove the bolt shown in the figure.



(3) Remove the lower radiator hose.

23. Remove the drive belt. (See [DRIVE BELT REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\]](#).)

24. Remove the front crossmember extension (RH).



1	No.4 engine mount bracket (See <a href="#">No.3 engine mount, No.4 engine mount bracket removal note.</a> )
2	No.3 engine mount (See <a href="#">No.3 engine mount, No.4 engine mount bracket removal note.</a> )
3	Engine, transaxle

## No.3 engine mount, No.4 engine mount bracket removal note

### Warning

- When removing/installing the engine, verify that the engine and transaxle are securely supported. Otherwise, the engine may fall off and cause serious injury or death, and damage to the vehicle.

1.Set the PCM wiring harness and PCM component aside using the following procedure:

- (1)Disconnect the PCM connector (140 pin side) from the PCM. (See [PCM REMOVAL/INSTALLATION \[SKYACTIV-D 2.2\].](#))
- (2)Remove the bolt and connector shown in the figure and set aside the PCM wiring harness to the engine upper side.