

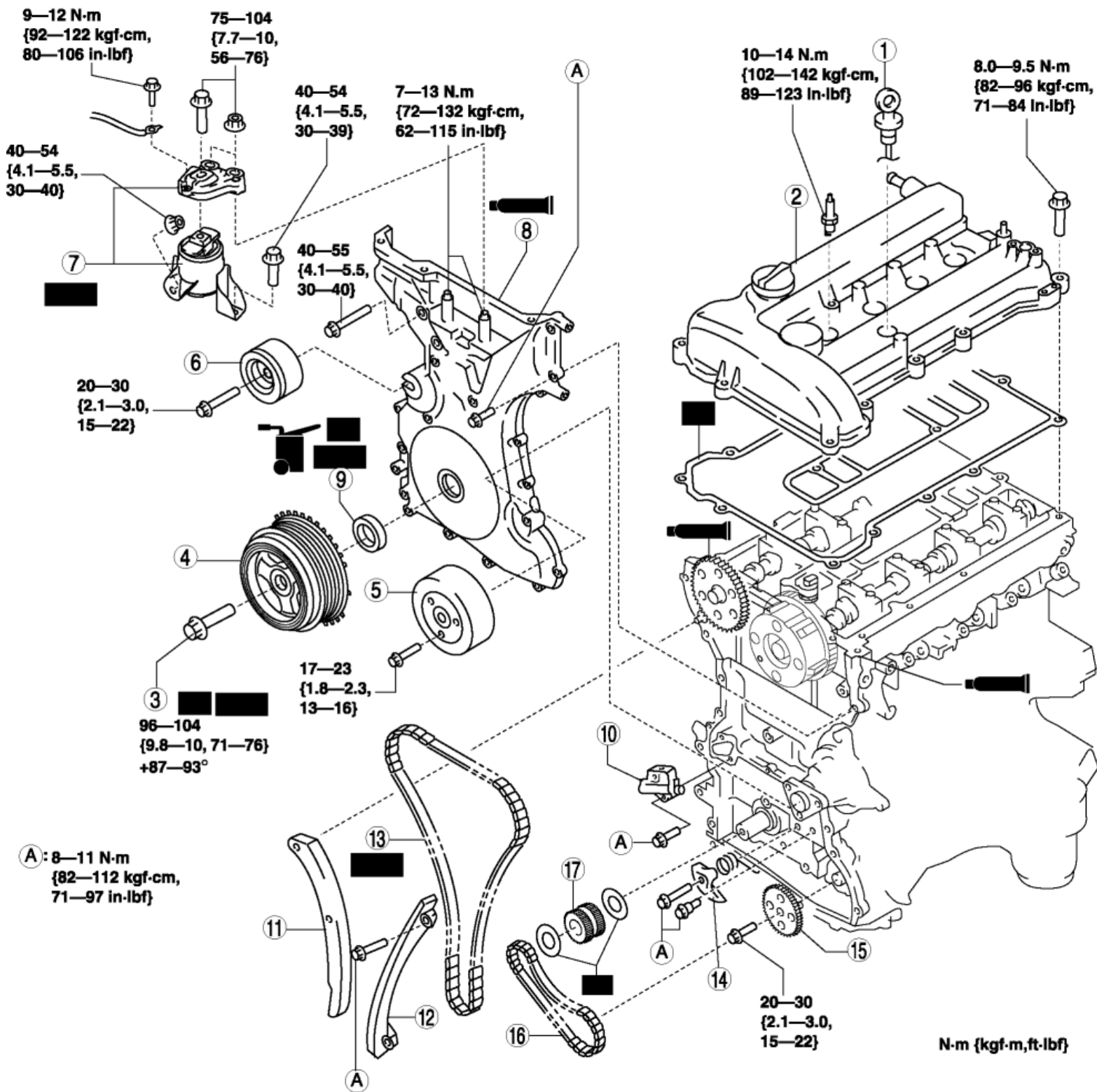
2012 - Mazda6 - Engine

TIMING CHAIN REMOVAL/ INSTALLATION [MZR 2.5]

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
3. Remove the ignition coils. (See [IGNITION COIL REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
4. Remove the ventilation hose. (See [INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
5. Disconnect the camshaft position (CMP) sensor connector.
6. Disconnect the oil control valve (OCV) connector.
7. Remove the front wheel and tire (RH). (See [GENERAL PROCEDURES \(SUSPENSION\)](#).)
8. Set the front mudguard (RH) out of the way. (See [FRONT MUDGUARD REMOVAL/ INSTALLATION](#).)
9. Remove the splash shield (RH).
10. Remove the aerodynamic under cover No.2. (See [AERODYNAMIC UNDER COVER NO.2 REMOVAL/ INSTALLATION](#).)
11. Loosen the water pump pulley bolts and remove the drive belt. (See [DRIVE BELT REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
12. Remove the crankshaft position (CKP) sensor. (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
13. Disconnect the drive shaft (RH) from joint shaft, set the drive shaft (RH) out of the way. (ATX) (See [DRIVE SHAFT REMOVAL/ INSTALLATION](#).)
14. Remove the coolant reserve tank. (See [COOLANT RESERVE TANK REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
15. Remove the P/S oil pump with the hoses and pipes still connected. (See [POWER STEERING OIL PUMP REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)

NOTE:

- Position and secure the P/S oil pump out of the way with a rope or wire.
16. Remove in the order indicated in the table.
 17. Install in the reverse order of removal.
 18. Start the engine. And inspect and adjust the following:
 - Leakage of engine oil.
 - Runout and contact of pulley and belt.
 - Verify the ignition timing, idle speed and idle mixture. (See [ENGINE TUNE-UP \[MZR 2.5\]](#).)



1 Dipstick

2 Cylinder head cover

(See [Cylinder Head Cover Removal Note](#).)

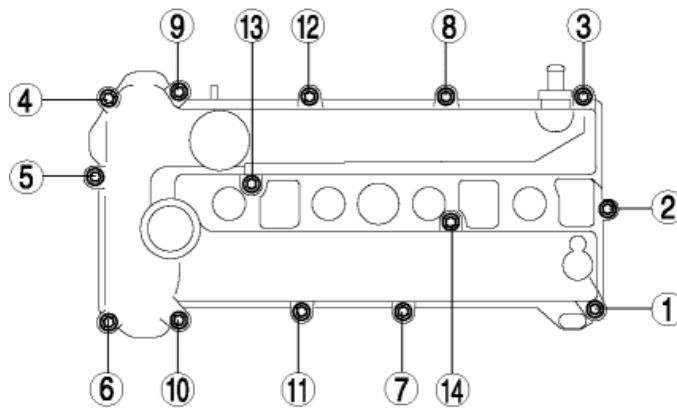
(See [Cylinder Head Cover Installation Note](#).)

3 Crankshaft pulley lock bolt

	(See Crankshaft Pulley Lock Bolt Removal Note.)
	(See Crankshaft Pulley Lock Bolt Installation Note.)
4	Crankshaft pulley
5	Water pump pulley
6	Drive belt idler pulley
7	No.3 engine mount (See No.3 Engine Mount Removal Note.) (See No.3 Engine Mount Installation Note.)
8	Engine front cover (See Engine Front Cover Installation Note.)
9	Front oil seal (See FRONT OIL SEAL REPLACEMENT [MZR 2.5].)
10	Chain tensioner (See Chain Tensioner Removal Note.)
11	Tensioner arm
12	Chain guide
13	Timing chain (See Timing Chain Installation Note.)
14	Oil pump chain tensioner
15	Oil pump sprocket (See Oil Pump Sprocket Removal/ Installation Note.)
16	Oil pump chain
17	Crankshaft sprocket

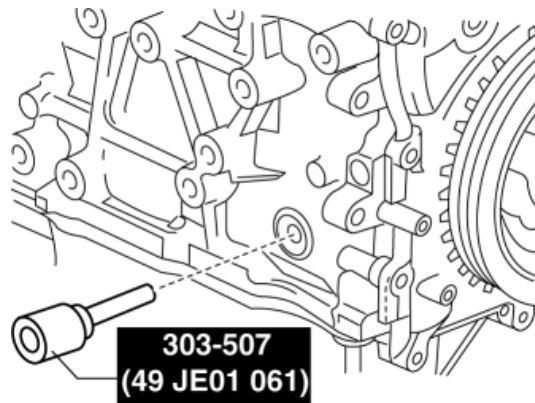
Cylinder Head Cover Removal Note

1. Loosen the cylinder head cover bolts in the order shown in the figure.



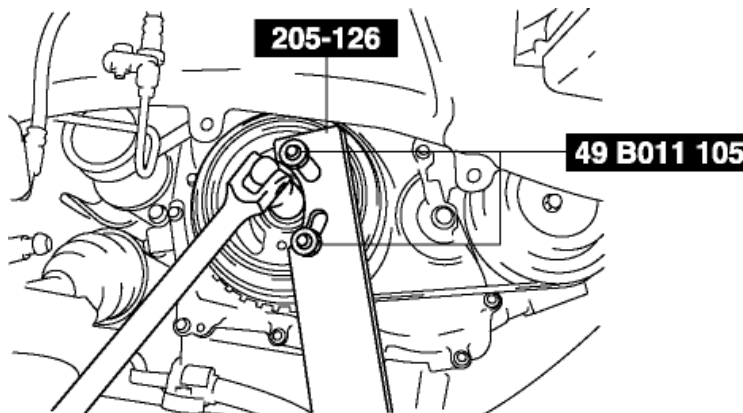
Crankshaft Pulley Lock Bolt Removal Note

1. Rotate the crankshaft in the direction of the engine rotation and remove the cylinder block lower blind plug when the No. 1 cylinder is at the point prior to top dead center (TDC) of compression, then install the **SST**.



2. Rotate the crankshaft in the direction of the engine rotation so that the No.1 piston is at TDC of the compression stroke. (Until the counterweight contacts **SST** and stops.)

3. Hold the crankshaft pulley by using the **SSTs**.



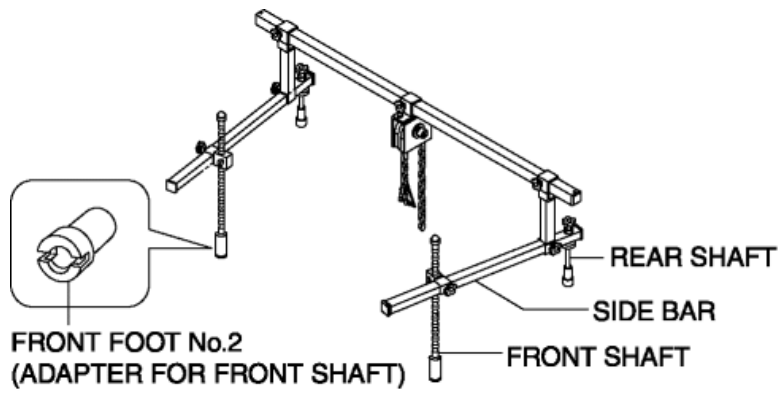
No.3 Engine Mount Removal Note

1. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)

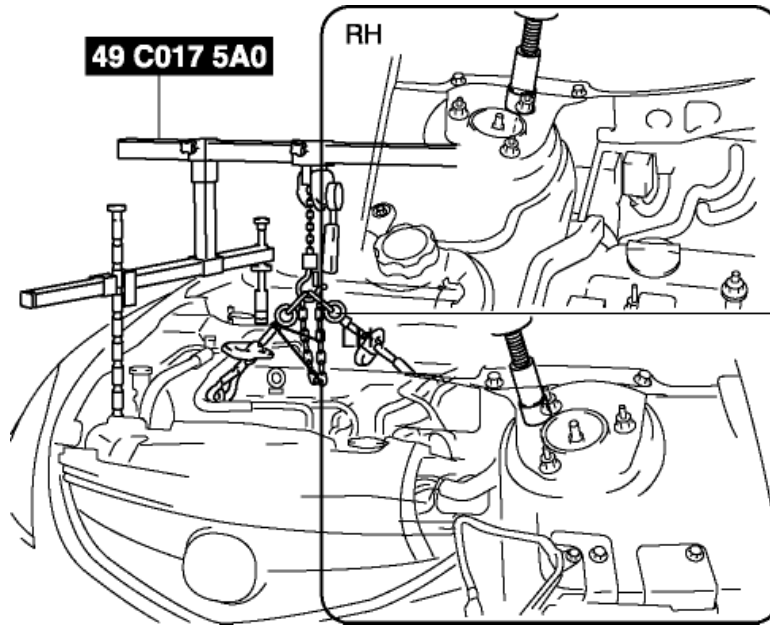
2. Install the **SST** using the following procedure.

CAUTION:

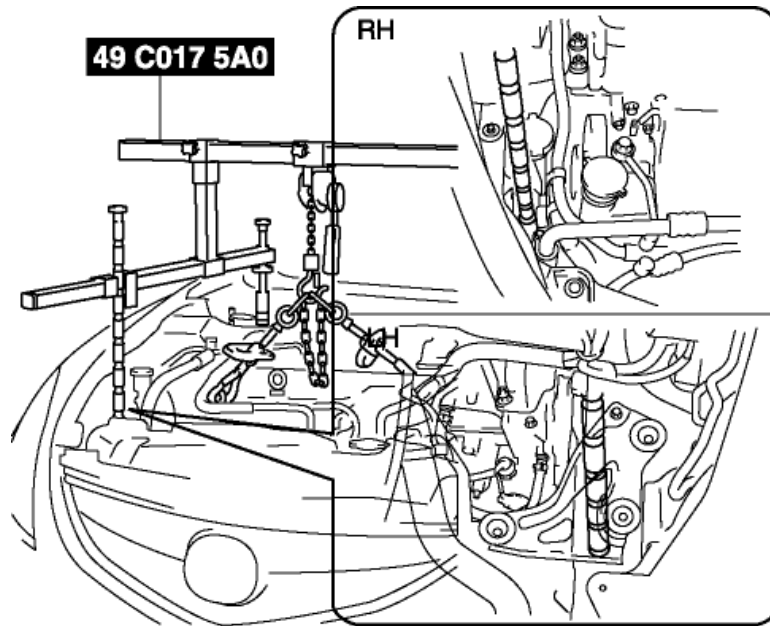
- Refer to the SST instruction manual for the basic handling procedure.



a. As shown in the figure, set the rear shafts of the **SST** to the left and right shock absorber bolts.



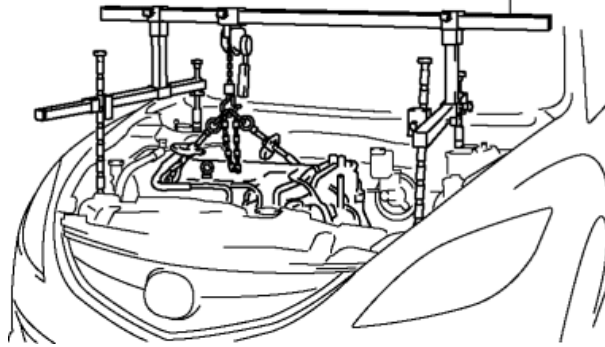
b. Install front foot No.2 to the left/right front shaft of the **SST**, then align the groove of the front shaft of the **SST** with the folded up part of the vehicle as shown in the figure.



c. Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.

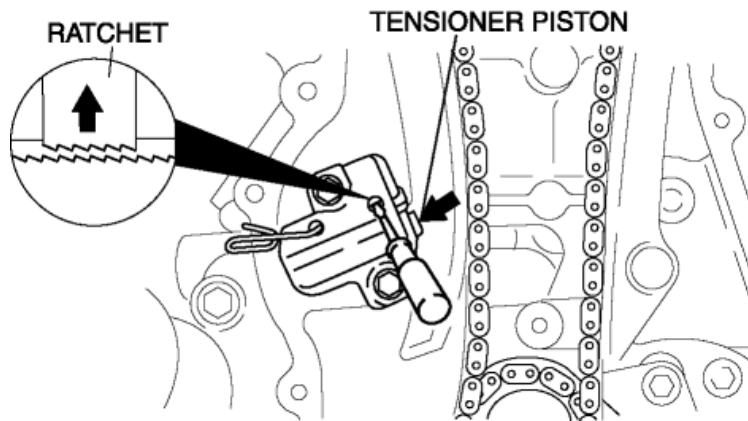
d. Make sure each joint is securely tightened.

3. Support the engine using the **SST**.



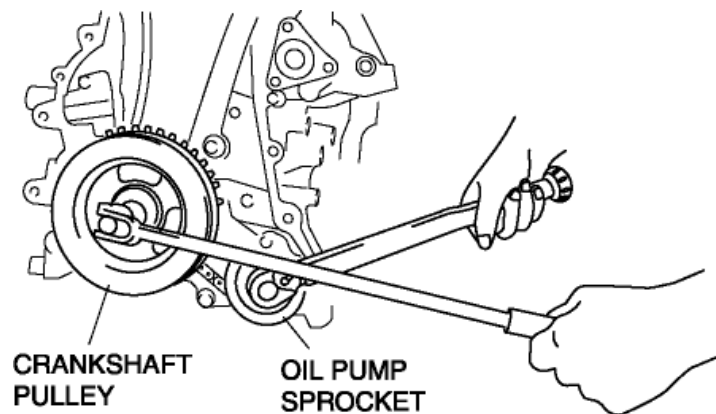
Chain Tensioner Removal Note

1. Using a thin screwdriver, hold the chain tensioner ratchet lock mechanism away from the ratchet stem.
2. Slowly compress the tensioner piston.
3. Hold the tensioner piston using a 1.5 mm { 0.059 in } wire or paper clip.



Oil Pump Sprocket Removal/ Installation Note

1. Temporarily install the crankshaft pulley and crankshaft pulley lock bolt to the crankshaft, and lock the oil pump against rotation as shown in figure.



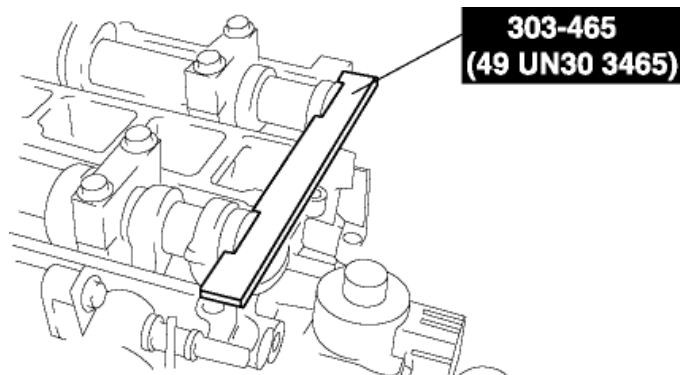
2. Remove/install the oil pump sprocket, and then remove the crankshaft pulley and crankshaft pulley lock bolt.

Tightening torque

- 20—30 N·m {2.1—3.0 kgf·m, 15—22 ft·lbf}

Timing Chain Installation Note

1. Install the **SST** to the camshaft as shown.



2. Install the timing chain.
3. Remove the retaining wire or paper clip from the auto tensioner to apply tension to the timing chain.

Engine Front Cover Installation Note

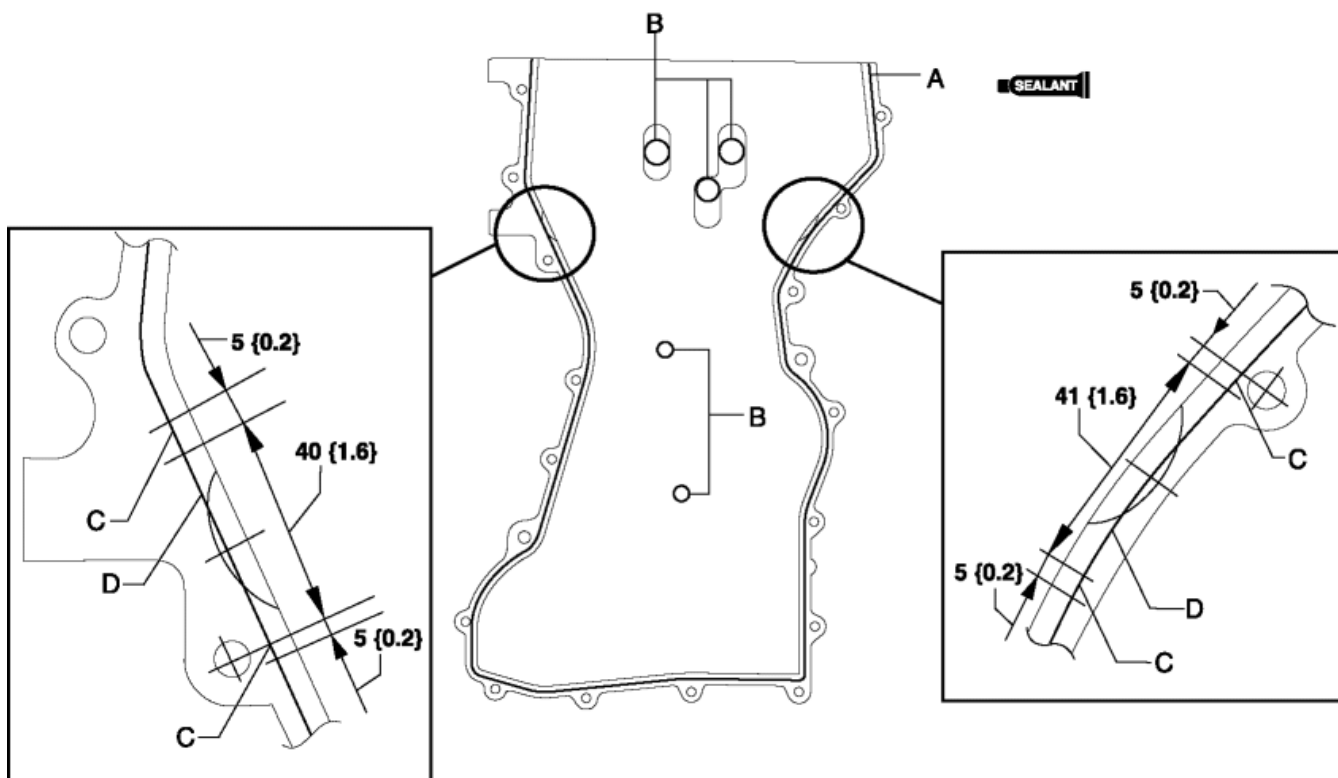
CAUTION:

- Install the engine front cover before the applied silicone sealant starts to harden.

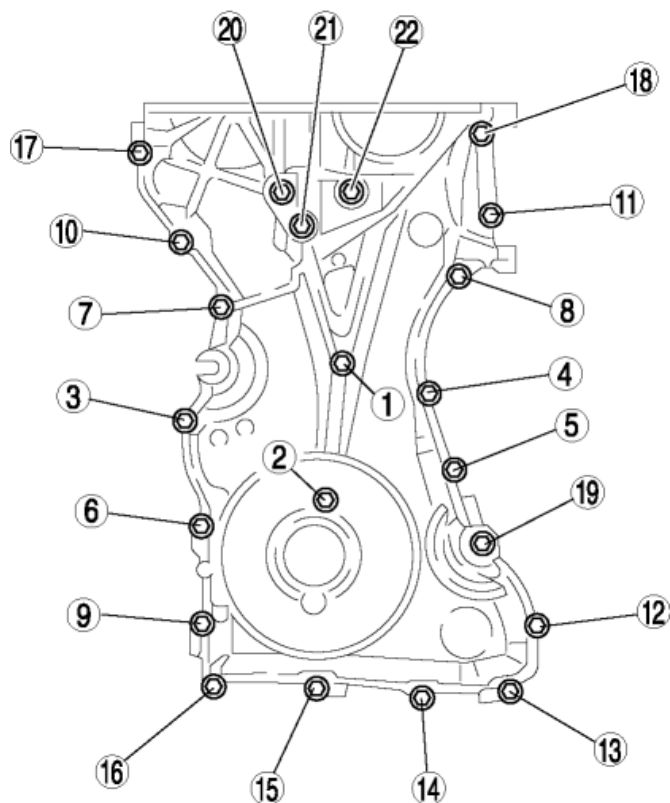
1. Apply silicone sealant to the engine front cover as shown.

Thickness

- A: 2.2—3.2 mm {0.09—0.12 in}
- B: 1.5—2.5 mm {0.06—0.098 in}
- C: 2.2—4.3 mm {0.09—0.16 in}
- D: 3.3—4.3 mm {0.13—0.16 in}



2. Install the engine front cover bolts in the order as shown.



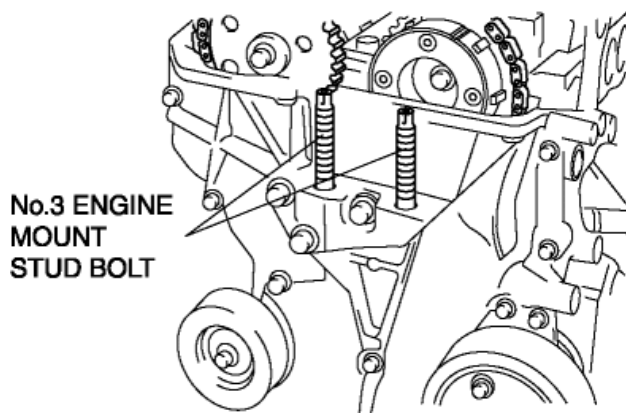
No.	Tightening torque
1—18	8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}
19—22	40—55 N·m {4.1—5.5 kgf·m, 30—40 ft·lbf}

No.3 Engine Mount Installation Note

NOTE:

- If the No.3 engine mount bracket and the engine are removed, retighten the No.3 engine mount stud bolts.

1. Tighten the No.3 engine mount stud bolts.

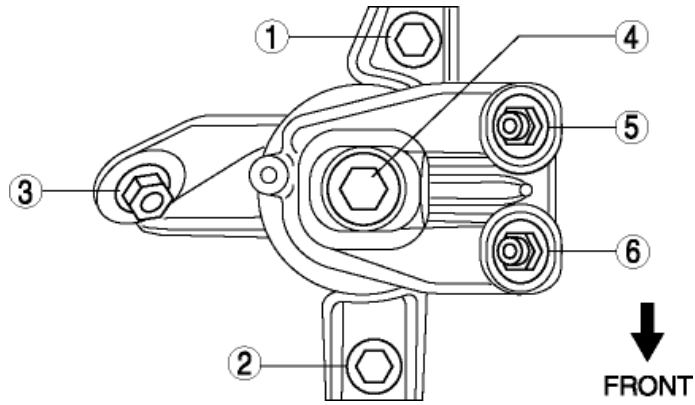


Tightening torque

- 7—13 N·m {72—132 kgf·cm, 62—115 in·lbf}

2. Install the No.3 engine mount rubber hand-tighten.

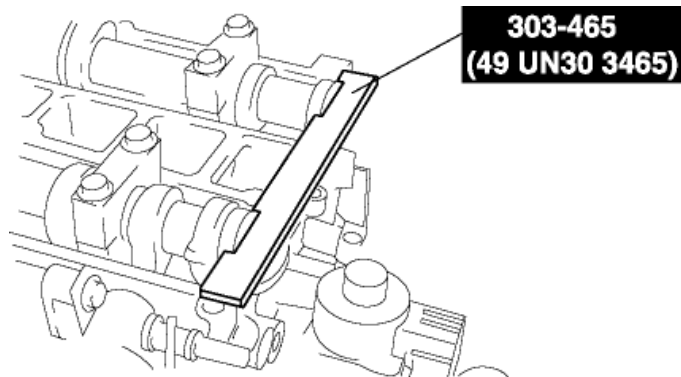
3. Tighten the No.3 engine mount bracket is attached and bolts, nuts in the order as shown.



No.	Tightening torque
1—340—54 N·m {4.1—5.5 kgf·m, 30—39 ft·lbf}	
4—675—104 N·m {7.7—10 kgf·m, 56—76 ft·lbf}	

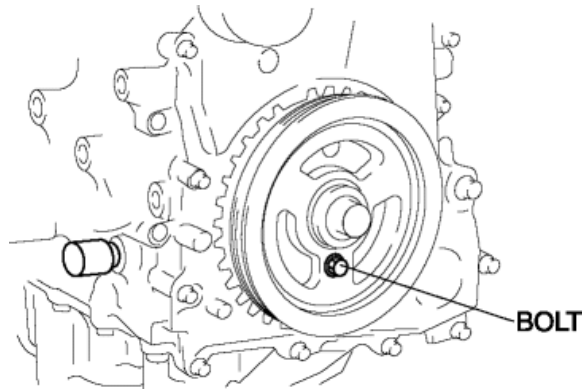
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** to the camshaft as shown.

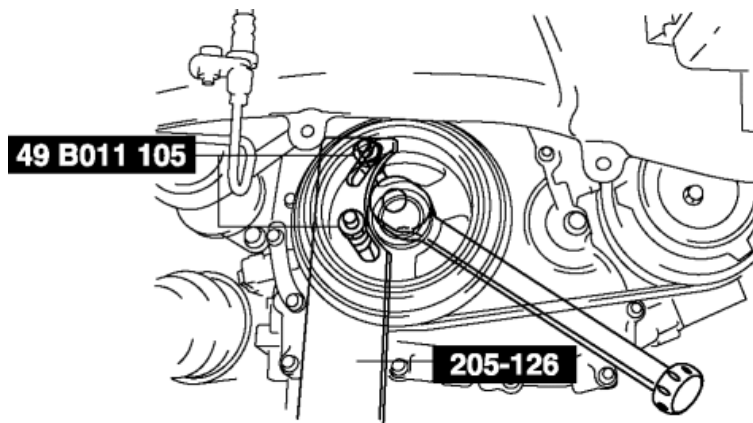


2. Verify that No.1 cylinder is at TDC of the compression stroke. (Position counterweight contacts **SST**.)

3. To position the crankshaft pulley, temporarily tighten it and, using a suitable bolt (**M6 X 1.0**), fix the crankshaft pulley to the engine front cover.



4. Hold the crankshaft pulley using the **SSTs**.



5. Tighten the crankshaft pulley lock bolt in the order shown in the following two steps using the **SST** (49 D032 316).

Tightening procedure

- 96—104 N·m {9.8—10 kgf·m, 71—76 ft·lbf}
- 87—93°

6. Remove the bolt (**M6 X 1.0**) installed to the crankshaft pulley.

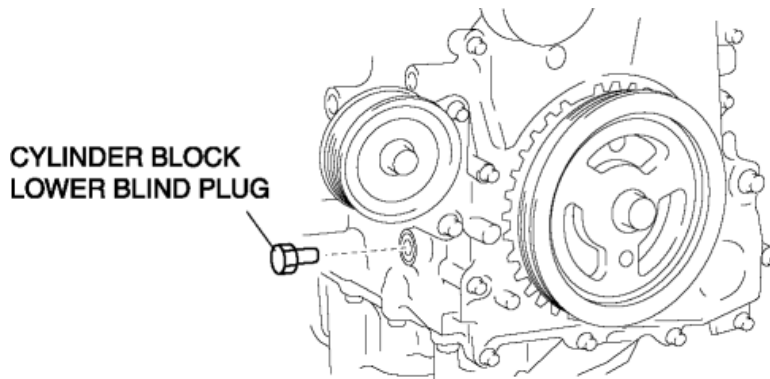
7. Remove the **SST** from the camshaft.

8. Remove the **SST** from the cylinder block lower blind plug hole.

9. Rotate the crankshaft clockwise two turns and inspect the valve timing.

- If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.

10. Install the cylinder block lower blind plug.



Tightening torque

- 18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}

Cylinder Head Cover Installation Note

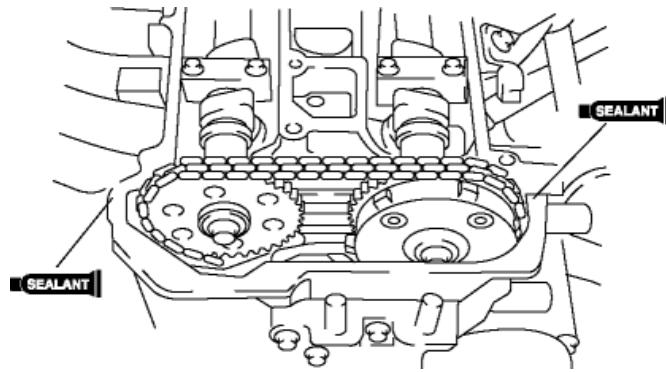
CAUTION:

- Install the cylinder head cover before the applied silicone sealant starts to harden.

1. Apply silicone sealant to the mating faces as shown.

Thickness

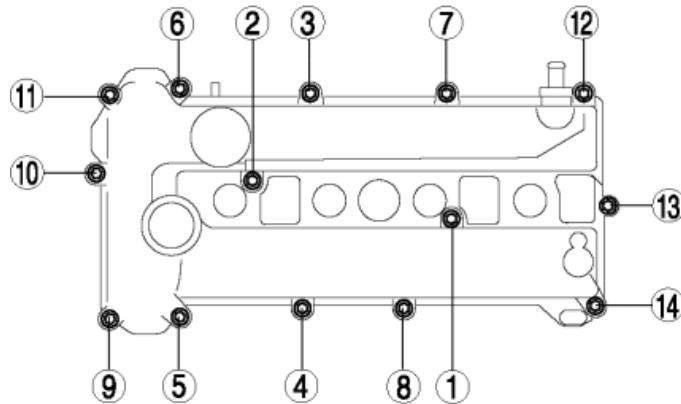
- 4.0—6.0 mm {0.16—0.23 in}



2. Install the cylinder head cover with a new gasket.
3. Tighten the bolts in the order shown.

Tightening torque

- 8.0—9.5 N·m {82—96 kgf·cm, 71—84 in·lbf}



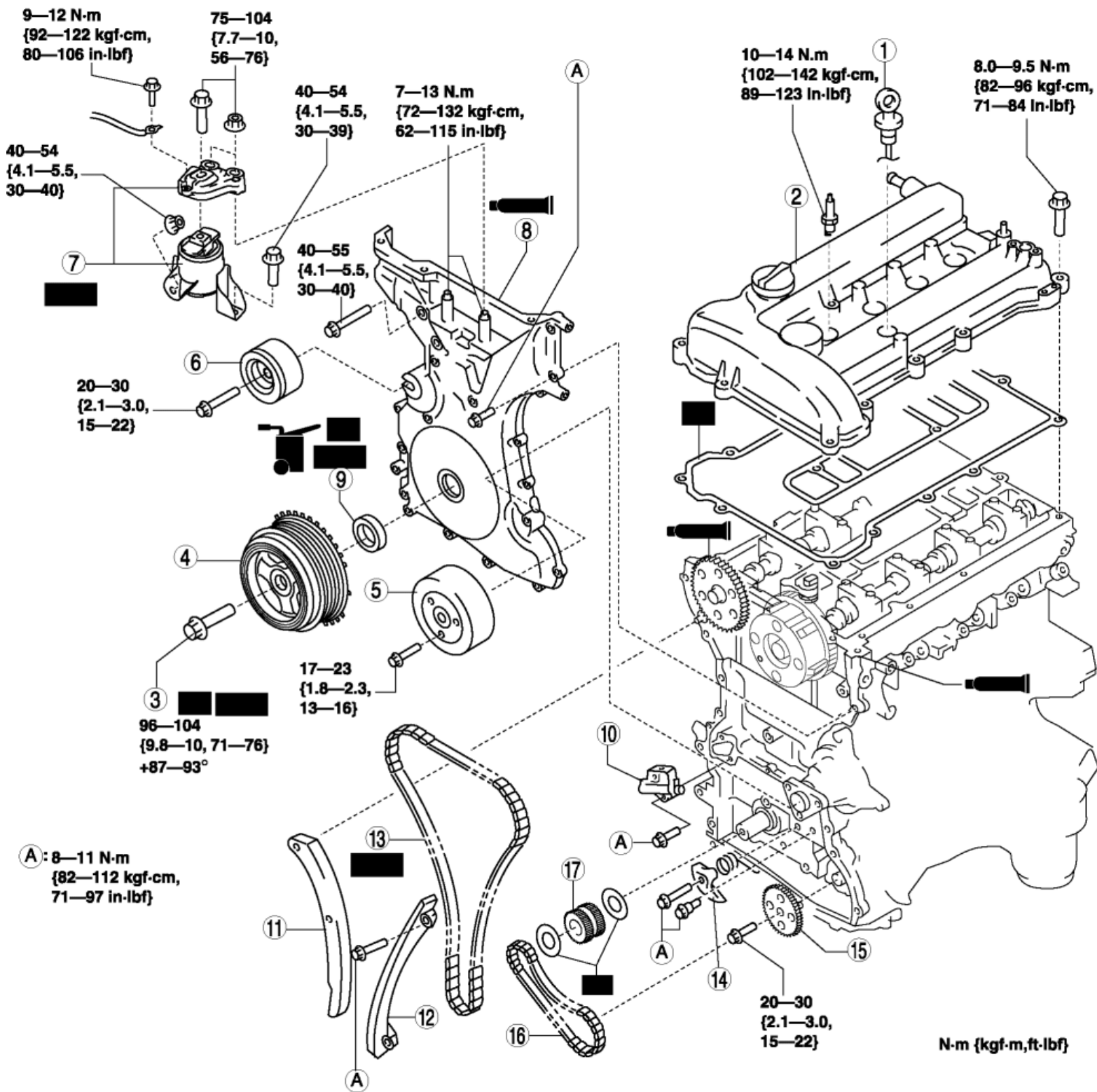
2012 - Mazda6 - Engine

TIMING CHAIN REMOVAL/ INSTALLATION [MZR 2.5]

1. Disconnect the negative battery cable.
2. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
3. Remove the ignition coils. (See [IGNITION COIL REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
4. Remove the ventilation hose. (See [INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
5. Disconnect the camshaft position (CMP) sensor connector.
6. Disconnect the oil control valve (OCV) connector.
7. Remove the front wheel and tire (RH). (See [GENERAL PROCEDURES \(SUSPENSION\)](#).)
8. Set the front mudguard (RH) out of the way. (See [FRONT MUDGUARD REMOVAL/ INSTALLATION](#).)
9. Remove the splash shield (RH).
10. Remove the aerodynamic under cover No.2. (See [AERODYNAMIC UNDER COVER NO.2 REMOVAL/ INSTALLATION](#).)
11. Loosen the water pump pulley bolts and remove the drive belt. (See [DRIVE BELT REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
12. Remove the crankshaft position (CKP) sensor. (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
13. Disconnect the drive shaft (RH) from joint shaft, set the drive shaft (RH) out of the way. (ATX) (See [DRIVE SHAFT REMOVAL/ INSTALLATION](#).)
14. Remove the coolant reserve tank. (See [COOLANT RESERVE TANK REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)
15. Remove the P/S oil pump with the hoses and pipes still connected. (See [POWER STEERING OIL PUMP REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)

NOTE:

- Position and secure the P/S oil pump out of the way with a rope or wire.
16. Remove in the order indicated in the table.
 17. Install in the reverse order of removal.
 18. Start the engine. And inspect and adjust the following:
 - Leakage of engine oil.
 - Runout and contact of pulley and belt.
 - Verify the ignition timing, idle speed and idle mixture. (See [ENGINE TUNE-UP \[MZR 2.5\]](#).)



1 Dipstick

2 Cylinder head cover

(See [Cylinder Head Cover Removal Note](#).)

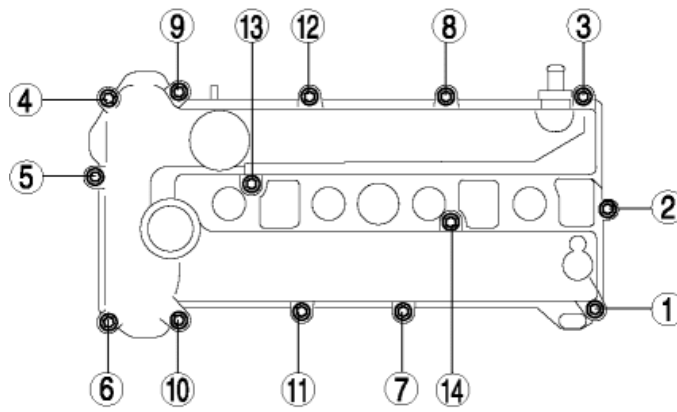
(See [Cylinder Head Cover Installation Note](#).)

3 Crankshaft pulley lock bolt

	(See Crankshaft Pulley Lock Bolt Removal Note.)
	(See Crankshaft Pulley Lock Bolt Installation Note.)
4	Crankshaft pulley
5	Water pump pulley
6	Drive belt idler pulley
7	No.3 engine mount (See No.3 Engine Mount Removal Note.) (See No.3 Engine Mount Installation Note.)
8	Engine front cover (See Engine Front Cover Installation Note.)
9	Front oil seal (See FRONT OIL SEAL REPLACEMENT [MZR 2.5].)
10	Chain tensioner (See Chain Tensioner Removal Note.)
11	Tensioner arm
12	Chain guide
13	Timing chain (See Timing Chain Installation Note.)
14	Oil pump chain tensioner
15	Oil pump sprocket (See Oil Pump Sprocket Removal/ Installation Note.)
16	Oil pump chain
17	Crankshaft sprocket

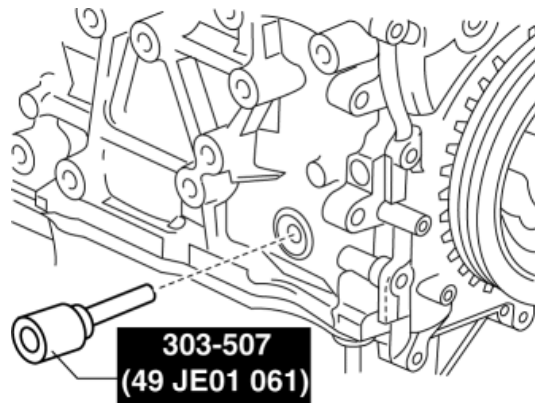
Cylinder Head Cover Removal Note

1. Loosen the cylinder head cover bolts in the order shown in the figure.



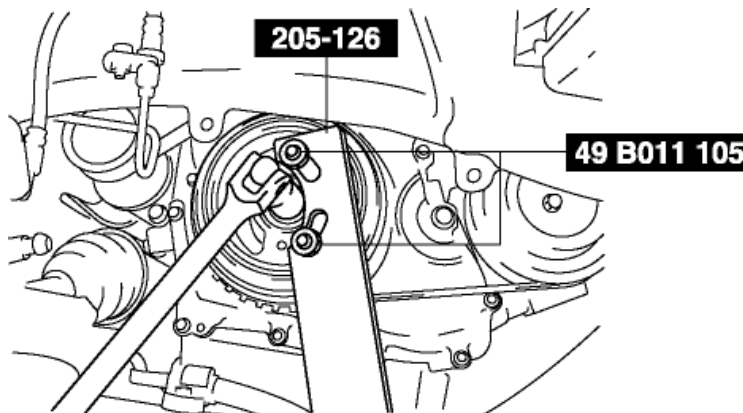
Crankshaft Pulley Lock Bolt Removal Note

1. Rotate the crankshaft in the direction of the engine rotation and remove the cylinder block lower blind plug when the No. 1 cylinder is at the point prior to top dead center (TDC) of compression, then install the **SST**.



2. Rotate the crankshaft in the direction of the engine rotation so that the No.1 piston is at TDC of the compression stroke. (Until the counterweight contacts **SST** and stops.)

3. Hold the crankshaft pulley by using the **SSTs**.



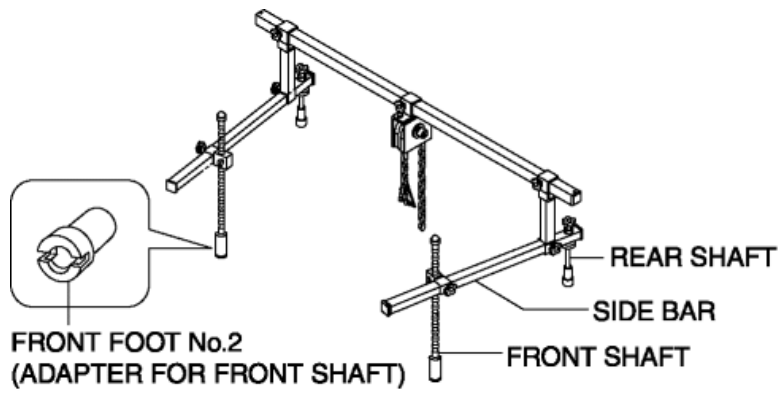
No.3 Engine Mount Removal Note

1. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION \[MZR 2.5\]](#).)

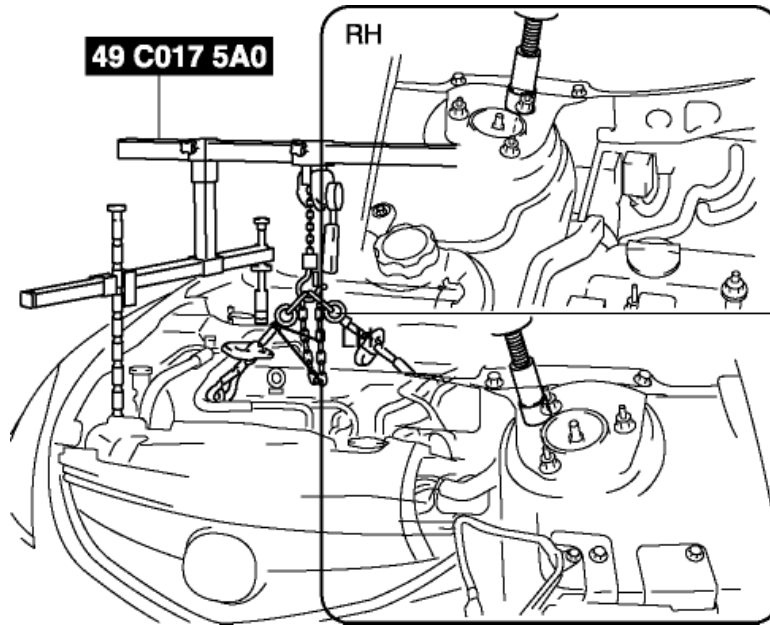
2. Install the **SST** using the following procedure.

CAUTION:

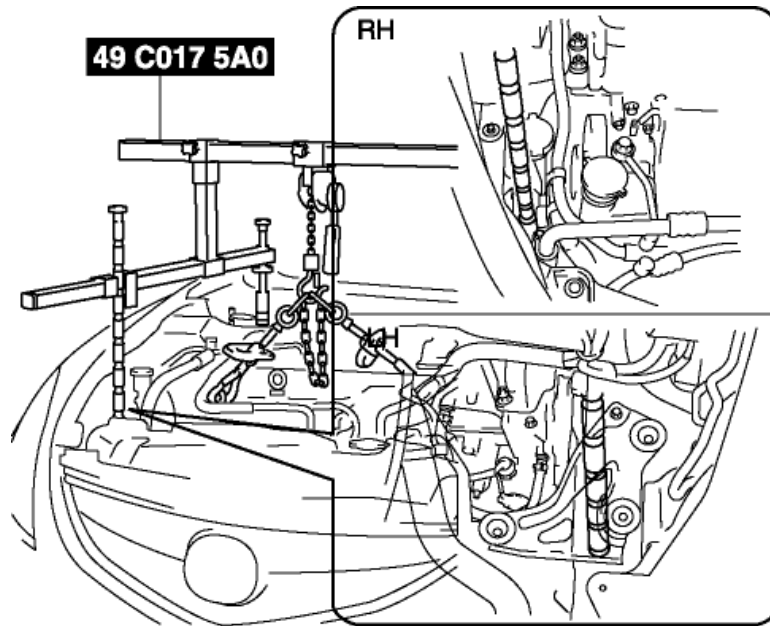
- Refer to the SST instruction manual for the basic handling procedure.



a. As shown in the figure, set the rear shafts of the **SST** to the left and right shock absorber bolts.



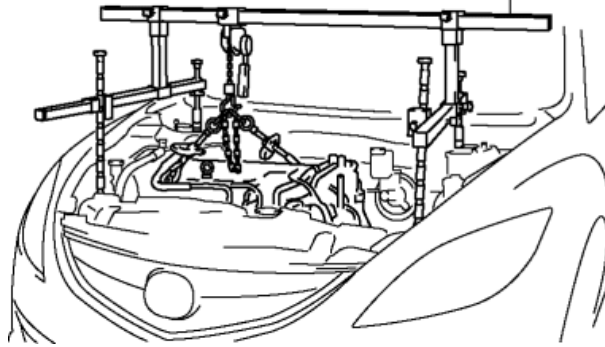
b. Install front foot No.2 to the left/right front shaft of the **SST**, then align the groove of the front shaft of the **SST** with the folded up part of the vehicle as shown in the figure.



c. Adjust the positions of the **SST** side bars so that they are the same height (left and right) and horizontal.

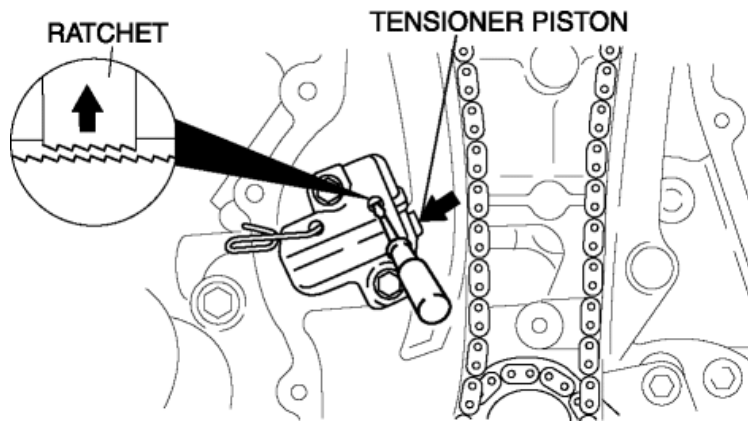
d. Make sure each joint is securely tightened.

3. Support the engine using the **SST**.



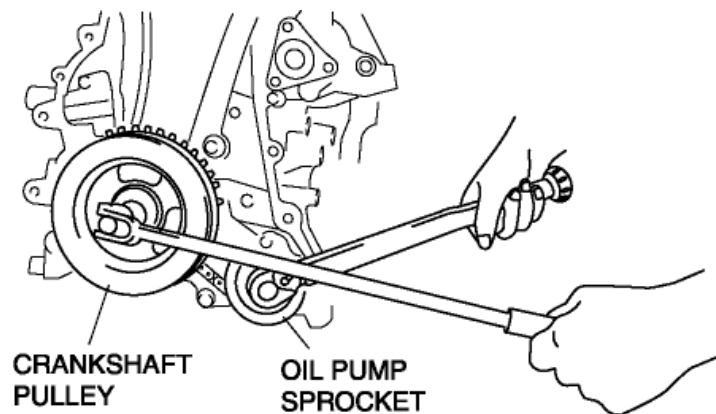
Chain Tensioner Removal Note

1. Using a thin screwdriver, hold the chain tensioner ratchet lock mechanism away from the ratchet stem.
2. Slowly compress the tensioner piston.
3. Hold the tensioner piston using a 1.5 mm { 0.059 in } wire or paper clip.



Oil Pump Sprocket Removal/ Installation Note

1. Temporarily install the crankshaft pulley and crankshaft pulley lock bolt to the crankshaft, and lock the oil pump against rotation as shown in figure.



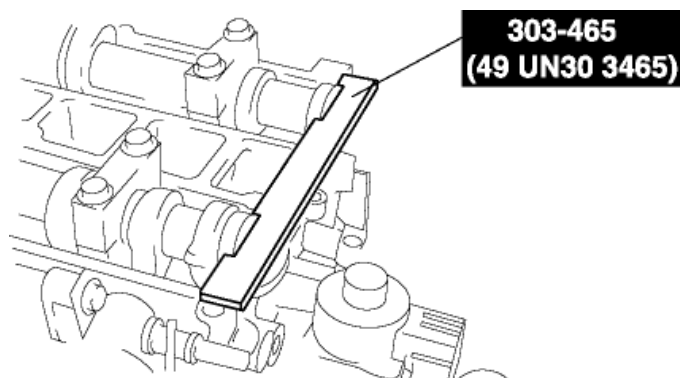
2. Remove/install the oil pump sprocket, and then remove the crankshaft pulley and crankshaft pulley lock bolt.

Tightening torque

- 20—30 N·m { 2.1—3.0 kgf·m, 15—22 ft·lbf }

Timing Chain Installation Note

1. Install the **SST** to the camshaft as shown.



2. Install the timing chain.
3. Remove the retaining wire or paper clip from the auto tensioner to apply tension to the timing chain.

Engine Front Cover Installation Note

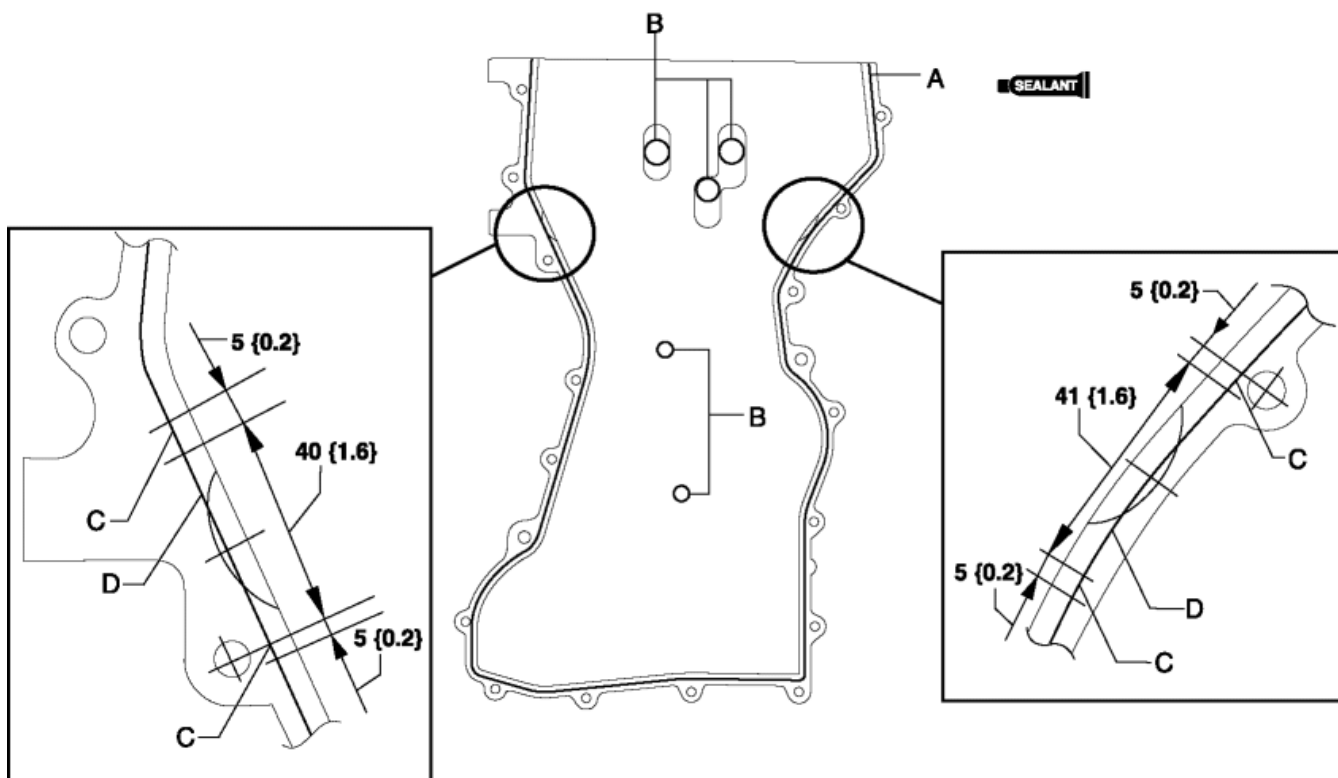
CAUTION:

- Install the engine front cover before the applied silicone sealant starts to harden.

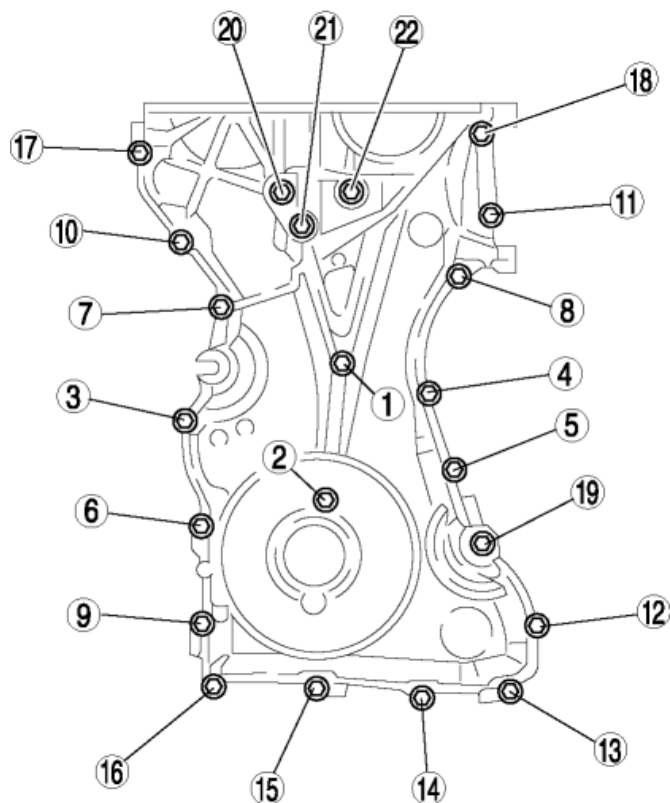
1. Apply silicone sealant to the engine front cover as shown.

Thickness

- A: 2.2—3.2 mm {0.09—0.12 in}
- B: 1.5—2.5 mm {0.06—0.098 in}
- C: 2.2—4.3 mm {0.09—0.16 in}
- D: 3.3—4.3 mm {0.13—0.16 in}



2. Install the engine front cover bolts in the order as shown.



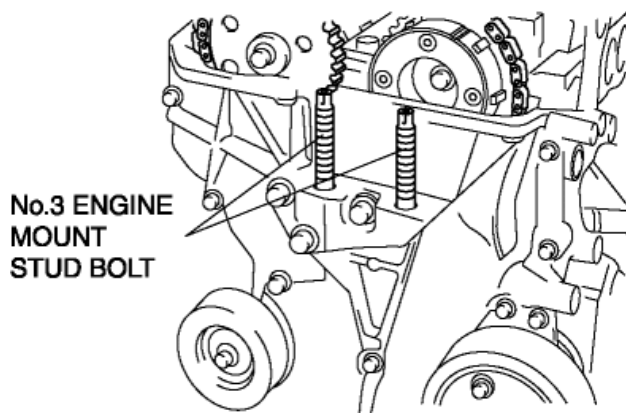
No.	Tightening torque
1—18	8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}
19—22	40—55 N·m {4.1—5.5 kgf·m, 30—40 ft·lbf}

No.3 Engine Mount Installation Note

NOTE:

- If the No.3 engine mount bracket and the engine are removed, retighten the No.3 engine mount stud bolts.

1. Tighten the No.3 engine mount stud bolts.

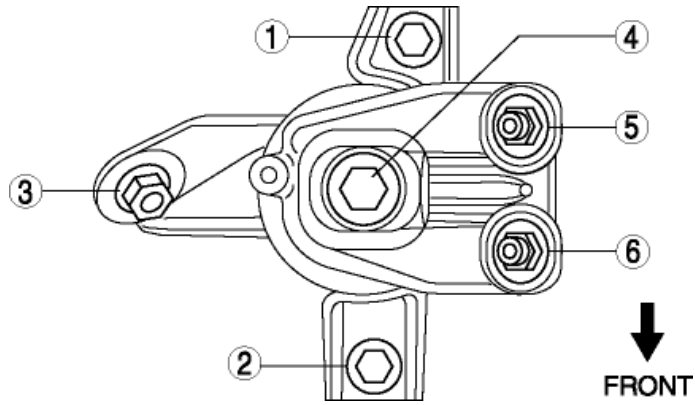


Tightening torque

- 7—13 N·m {72—132 kgf·cm, 62—115 in·lbf}

2. Install the No.3 engine mount rubber hand-tighten.

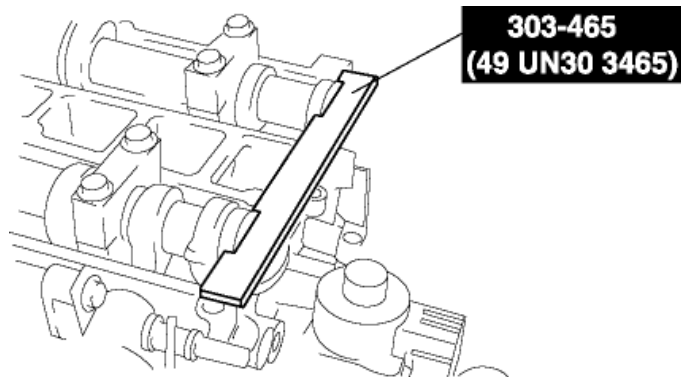
3. Tighten the No.3 engine mount bracket is attached and bolts, nuts in the order as shown.



No.	Tightening torque
1—340—54 N·m {4.1—5.5 kgf·m, 30—39 ft·lbf}	
4—675—104 N·m {7.7—10 kgf·m, 56—76 ft·lbf}	

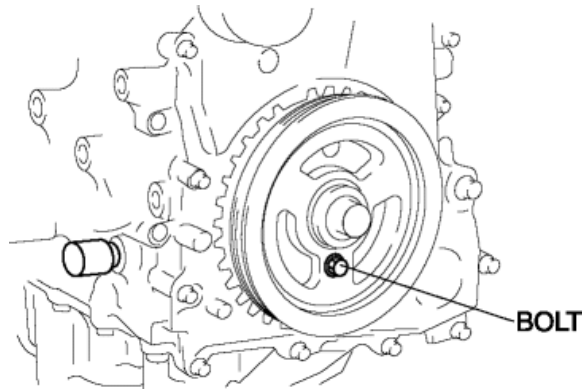
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** to the camshaft as shown.

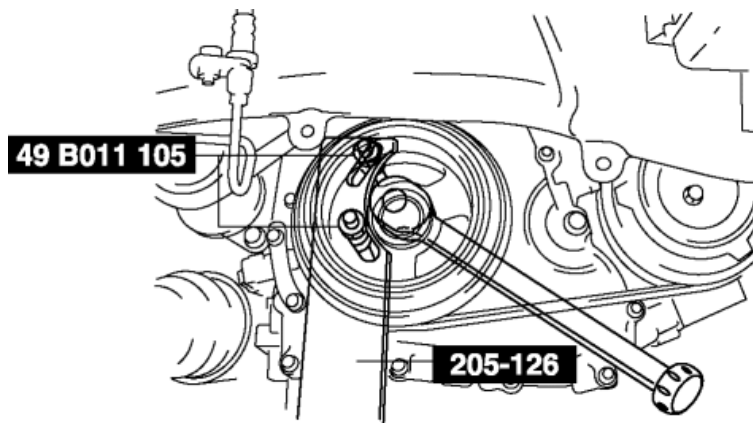


2. Verify that No.1 cylinder is at TDC of the compression stroke. (Position counterweight contacts **SST**.)

3. To position the crankshaft pulley, temporarily tighten it and, using a suitable bolt (**M6 X 1.0**), fix the crankshaft pulley to the engine front cover.



4. Hold the crankshaft pulley using the **SSTs**.



5. Tighten the crankshaft pulley lock bolt in the order shown in the following two steps using the **SST** (49 D032 316).

Tightening procedure

- 96—104 N·m {9.8—10 kgf·m, 71—76 ft·lbf}
- 87—93°

6. Remove the bolt (**M6 X 1.0**) installed to the crankshaft pulley.

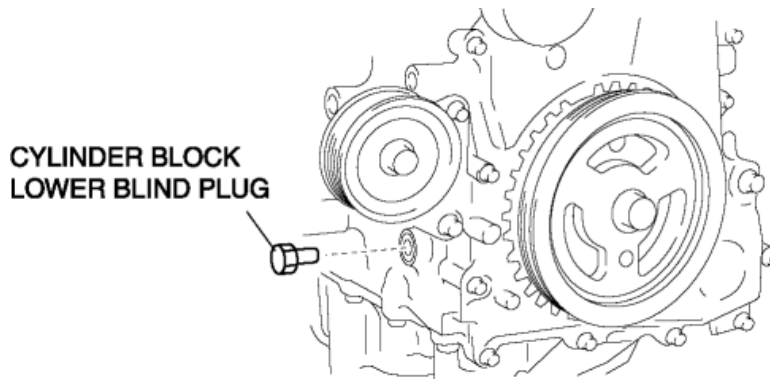
7. Remove the **SST** from the camshaft.

8. Remove the **SST** from the cylinder block lower blind plug hole.

9. Rotate the crankshaft clockwise two turns and inspect the valve timing.

- If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.

10. Install the cylinder block lower blind plug.



Tightening torque

- 18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}

Cylinder Head Cover Installation Note

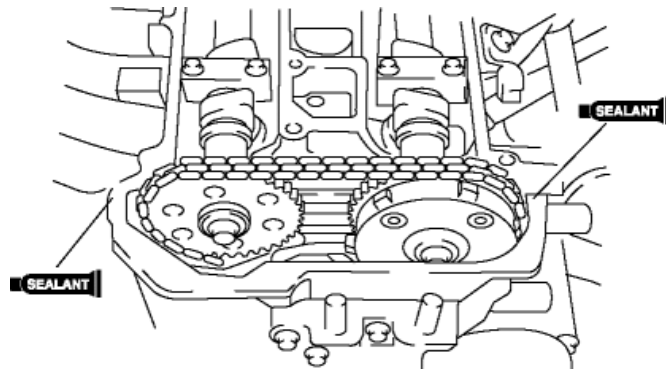
CAUTION:

- Install the cylinder head cover before the applied silicone sealant starts to harden.

1. Apply silicone sealant to the mating faces as shown.

Thickness

- 4.0—6.0 mm {0.16—0.23 in}



2. Install the cylinder head cover with a new gasket.
3. Tighten the bolts in the order shown.

Tightening torque

- 8.0—9.5 N·m {82—96 kgf·cm, 71—84 in·lbf}

