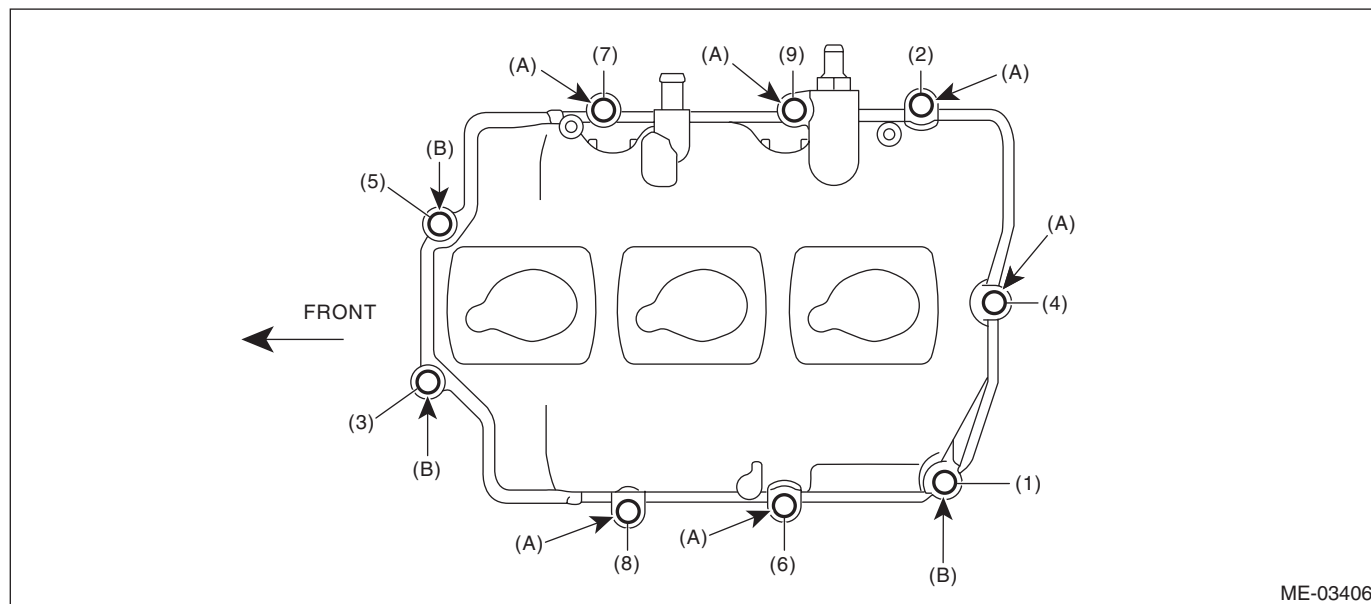


18. Camshaft

A: REMOVAL

- 1) Remove the engine from vehicle. <Ref. to ME(H6DO)-33, REMOVAL, Engine Assembly.>
- 2) Remove the crank pulley. <Ref. to ME(H6DO)-44, REMOVAL, Crank Pulley.>
- 3) Remove the chain cover. <Ref. to ME(H6DO)-45, REMOVAL, Chain Cover.>
- 4) Remove the timing chain assembly. <Ref. to ME(H6DO)-51, REMOVAL, Timing Chain Assembly.>
- 5) Remove the cam sprocket. <Ref. to ME(H6DO)-69, REMOVAL, Cam Sprocket.>
- 6) Remove the crank sprocket. <Ref. to ME(H6DO)-70, REMOVAL, Crank Sprocket.>
- 7) Remove the exhaust oil flow control solenoid valve. <Ref. to FU(H6DO)-33, REMOVAL, Oil Flow Control Solenoid Valve.>
- 8) Remove the camshaft position sensor. <Ref. to FU(H6DO)-25, REMOVAL, Camshaft Position Sensor.>
- 9) Loosen the rocker cover bolts in the order indicated in the figure, and remove the rocker cover.

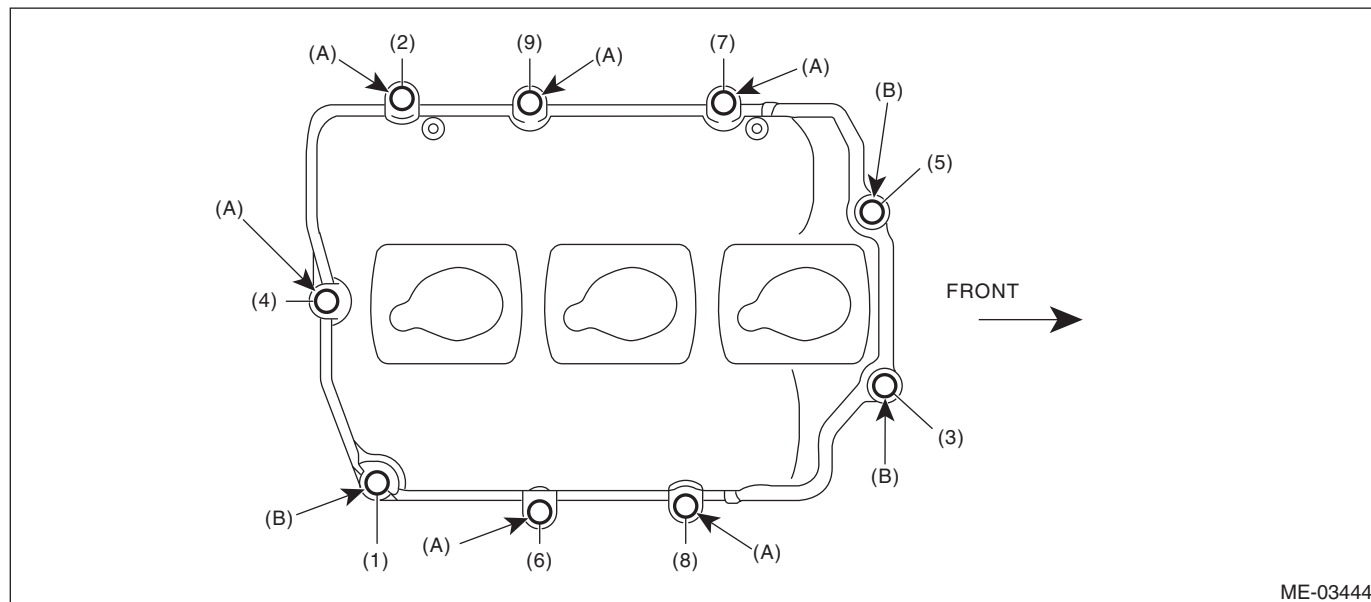
- LH side



(A) M6 × 37

(B) M6 × 23

- RH side



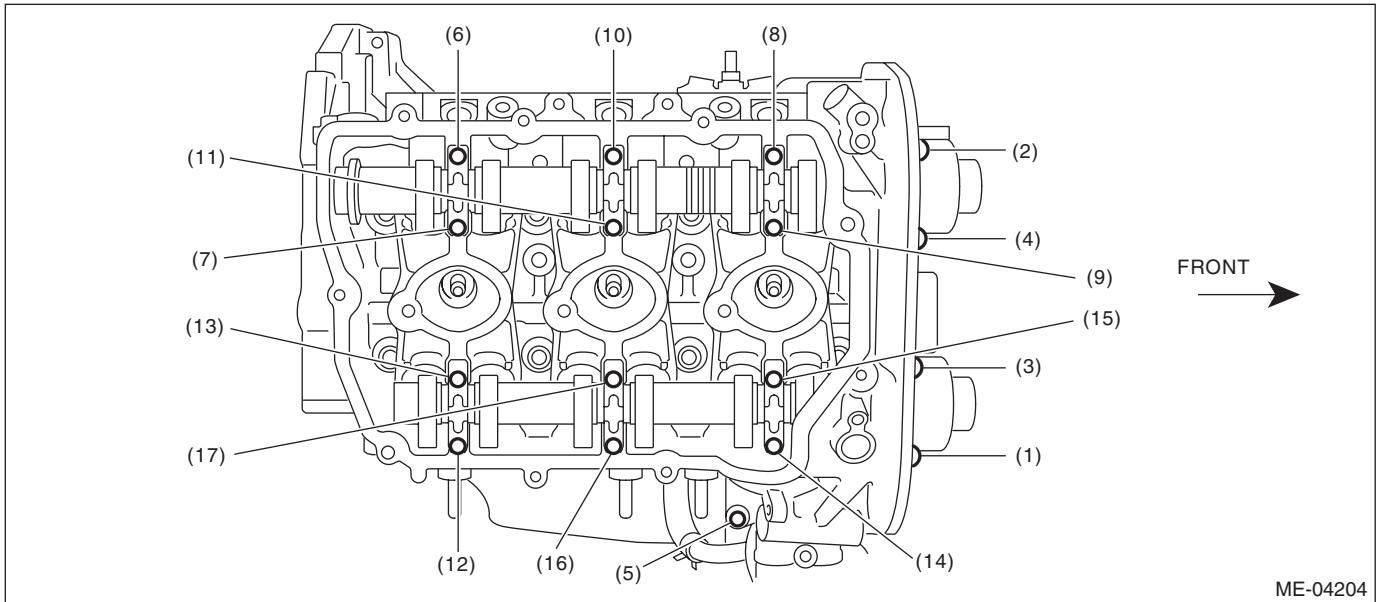
(A) M6 × 37

(B) M6 × 23

Camshaft

MECHANICAL

10) Loosen the camshaft cap bolts equally, a little at a time in numerical sequence as shown in the figure.



11) Remove the camshaft caps and camshaft (RH).

NOTE:

Arrange camshaft caps in order so that they can be installed in their original positions.

12) Similarly, remove the camshafts (LH) and related parts.

B: INSTALLATION

1) Apply engine oil to camshaft journals, and install the camshaft.

2) Install the camshaft cap.

(1) Apply liquid gasket sparingly to back side of front camshaft cap as shown in the figure.

CAUTION:

Do not apply liquid gasket excessively. Applying excessively may cause excess gasket to flow toward cam journal, resulting in engine seizure.

NOTE:

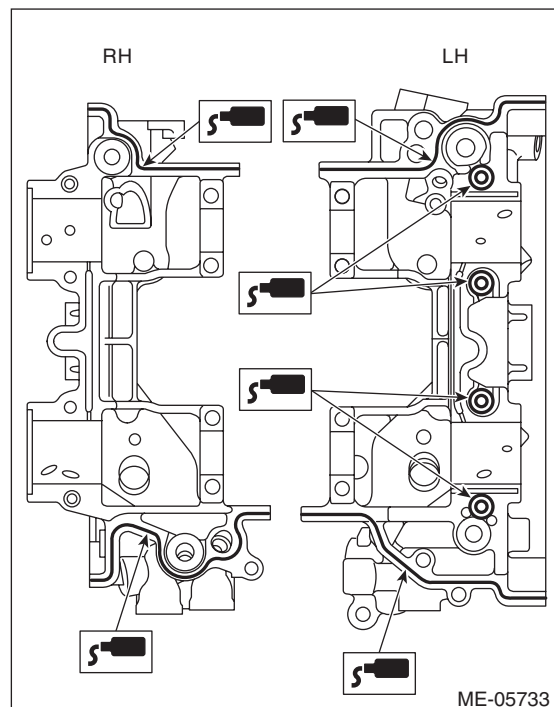
Install within 5 min. after applying liquid gasket.

Liquid gasket:

**THREE BOND 1217G (Part No. K0877Y0100)
or equivalent**

Liquid gasket applying diameter:

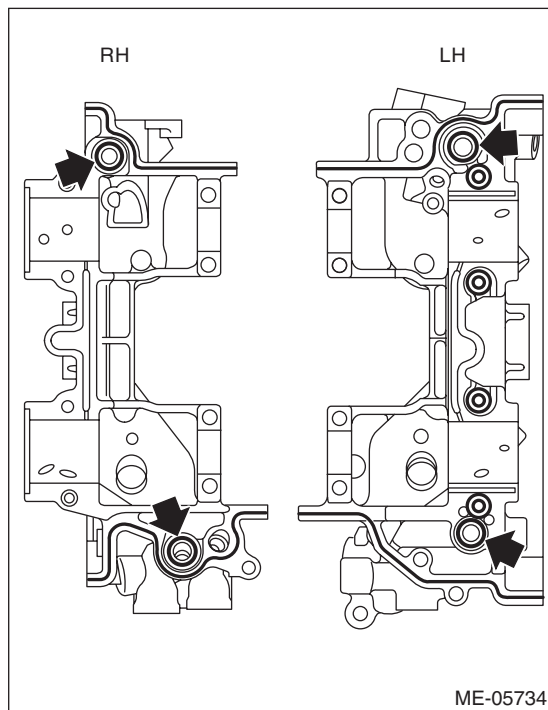
2.0 ± 0.5 mm (0.079 ± 0.020 in)



- (2) Install O-rings to the front camshaft cap.

NOTE:

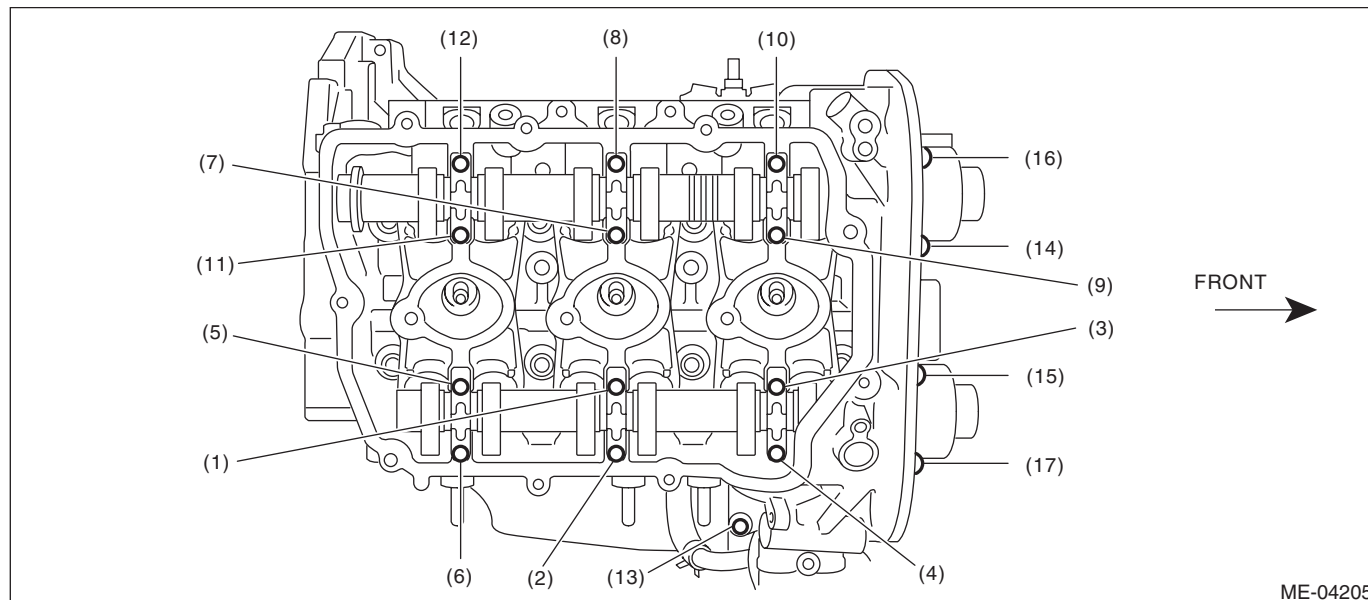
Use new O-rings.



- (3) Apply engine oil to cap bearing surface, and install the cap to camshaft.
- (4) Tighten the camshaft cap bolts in the numerical order as shown in the figure.

Tightening torque:

- (1) — (12): 16 N·m (1.6 kgf-m, 11.8 ft-lb)
- (13) — (16): 9.75 N·m (1.0 kgf-m, 7.2 ft-lb)



- 3) Install the rocker cover.
- (1) Install the rocker cover gasket to the rocker cover.

NOTE:

Use a new rocker cover gasket.

Camshaft

MECHANICAL

(2) Apply liquid gasket sparingly to the mating surface of cylinder head and rocker cover as shown in the figure.

CAUTION:

Do not apply liquid gasket excessively. Applying excessively may cause excess gasket to flow toward cam journal, resulting in engine seizure.

NOTE:

Install within 5 min. after applying liquid gasket.

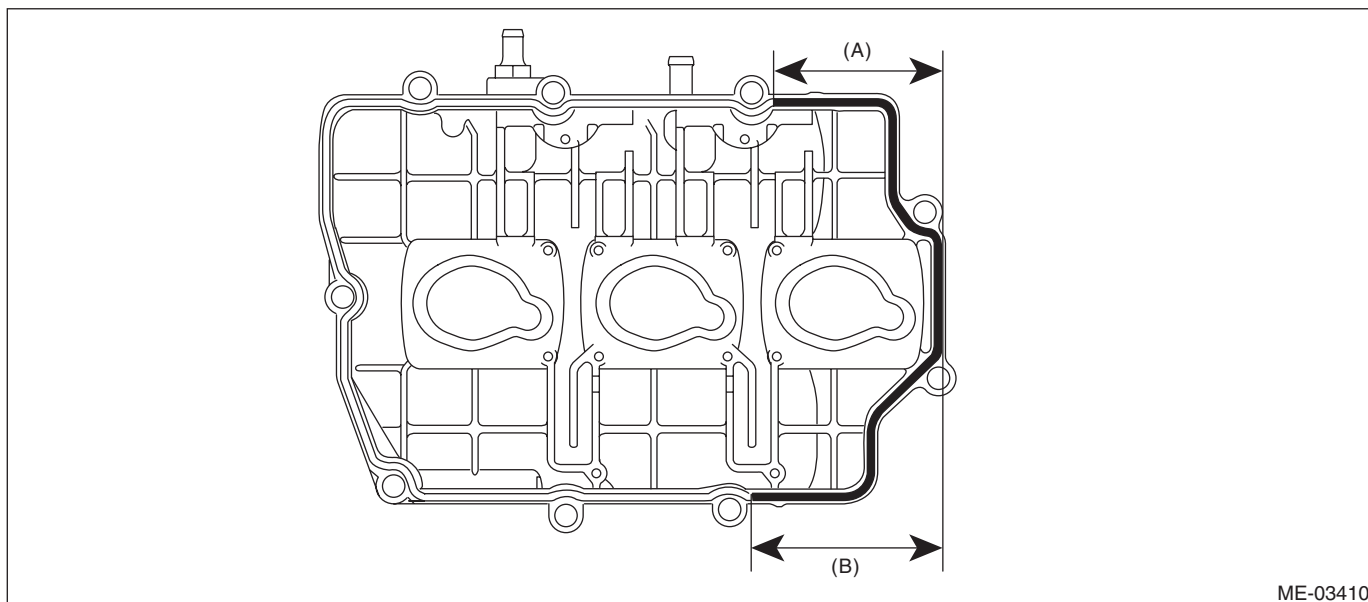
Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100) or equivalent

Liquid gasket applying diameter:

3.5 ± 0.5 mm (0.138 ± 0.020 in)

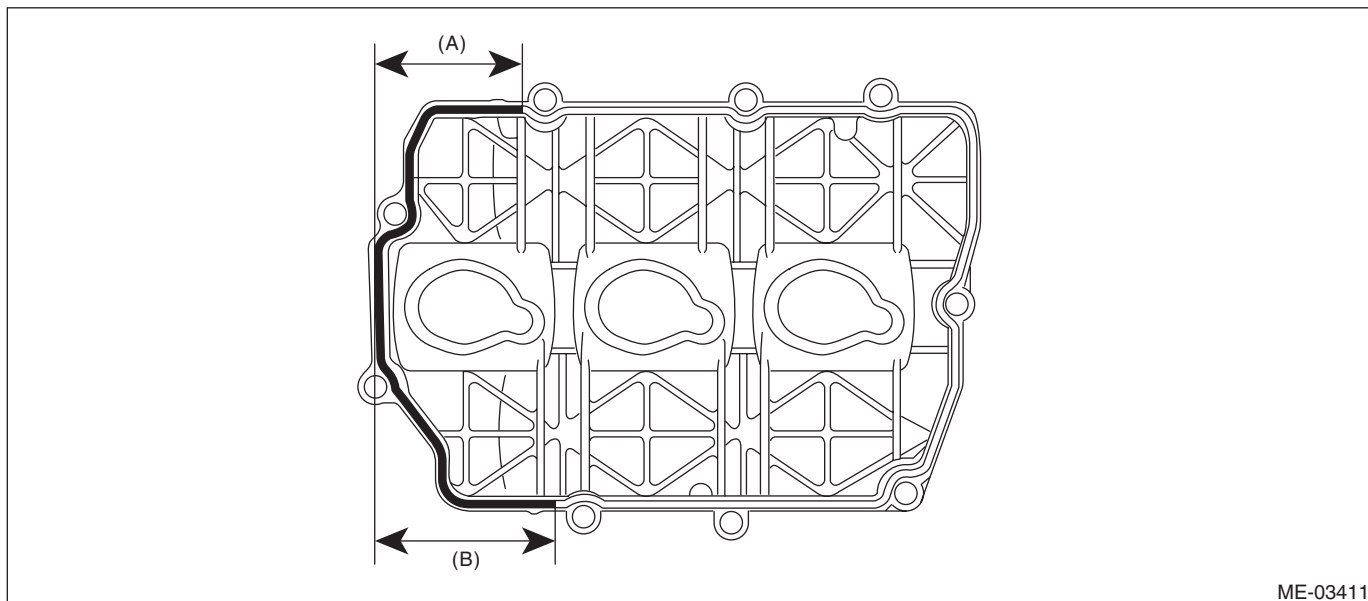
- LH side



(A) 90 mm (3.543 in) or more

(B) 105 mm (4.134 in) or more

- RH side



(A) 80 mm (3.150 in) or more

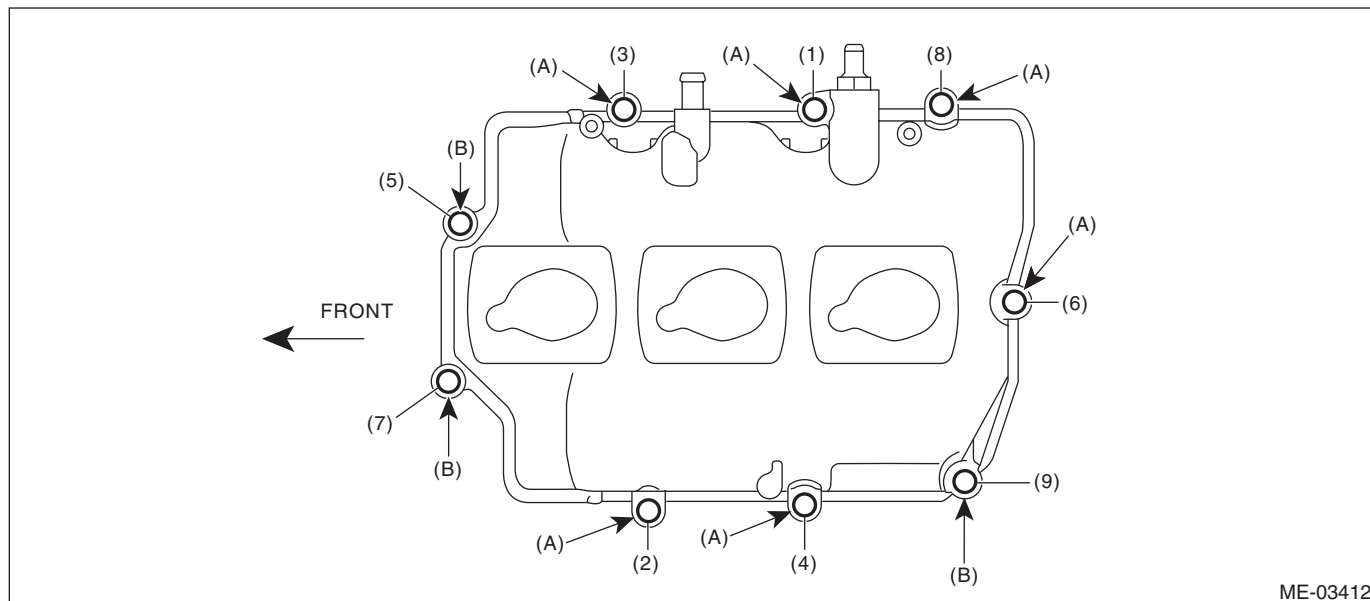
(B) 100 mm (3.937 in) or more

(3) Tighten the rocker cover bolts in the numerical order as shown in the figure.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

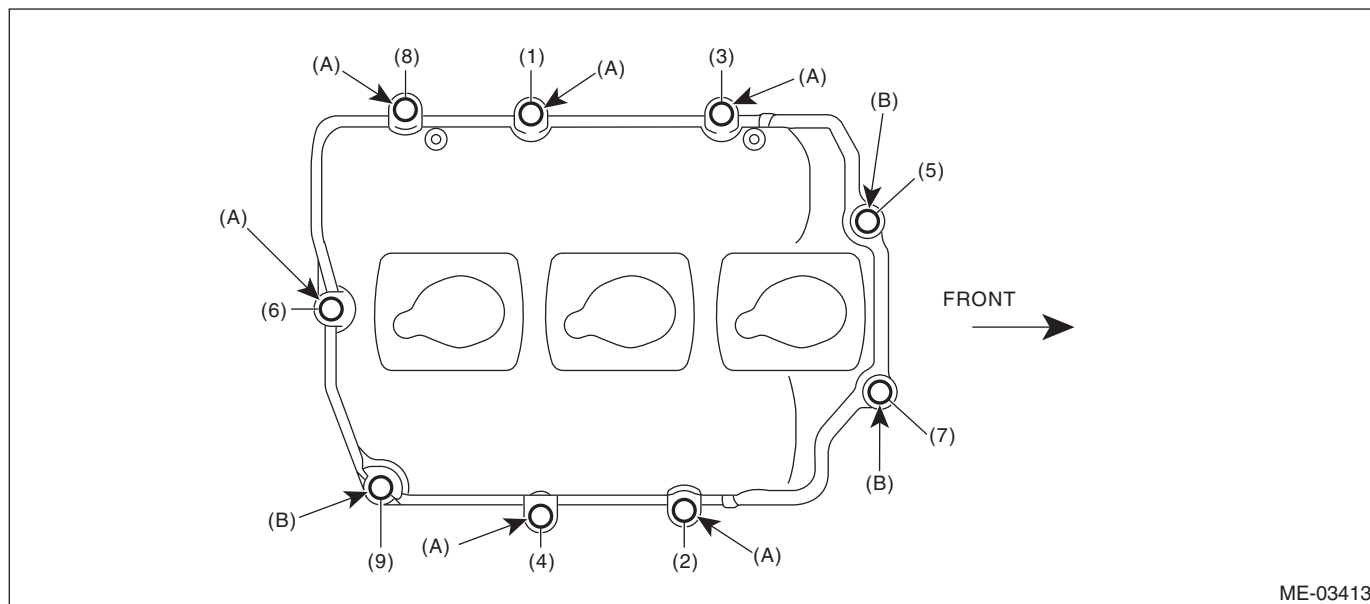
- LH side



(A) M6 × 37

(B) M6 × 23

- RH side



(A) M6 × 37

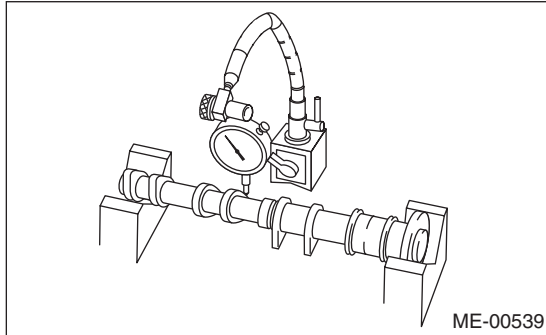
(B) M6 × 23

- 4) Install the crank sprocket. <Ref. to ME(H6DO)-70, INSTALLATION, Crank Sprocket.>
- 5) Install the cam sprocket. <Ref. to ME(H6DO)-69, INSTALLATION, Cam Sprocket.>
- 6) Install the timing chain assembly. <Ref. to ME(H6DO)-57, INSTALLATION, Timing Chain Assembly.>
- 7) Install the chain cover. <Ref. to ME(H6DO)-46, INSTALLATION, Chain Cover.>
- 8) Install the crank pulley. <Ref. to ME(H6DO)-44, INSTALLATION, Crank Pulley.>
- 9) Install the engine to the vehicle. <Ref. to ME(H6DO)-37, INSTALLATION, Engine Assembly.>

C: INSPECTION

1) Measure the bend of camshaft. Repair or replace if bent.

Camshaft bend limit:
0.020 mm (0.00079 in)



- 2) Check the journal for damage and wear. Replace if faulty.
- 3) Check the cutout portion used for camshaft sensor for damage. Replace if faulty.
- 4) Measure the outside diameter of camshaft journal. If the journal diameter is not within specification, check the oil clearance.

	Camshaft journal	
	Front	Except for front
Standard mm (in)	37.946 — 37.963 (1.4939 — 1.4946)	25.946 — 25.963 (1.0215 — 1.0222)

5) Measurement of the camshaft journal oil clearance:

- (1) Clean the camshaft cap and cylinder head camshaft journal.
- (2) Place the camshaft on cylinder head. (Without installing the valve rocker.)
- (3) Place a plastigauge across each camshaft journals.
- (4) Install the camshaft cap.

NOTE:

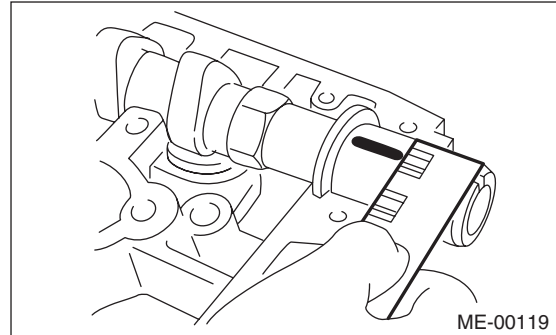
Do not turn the camshaft.

- (5) Remove the camshaft cap.
- (6) Measure the widest point of the plastigauge on each journal. If oil clearance exceeds the standard, replace the camshaft. If necessary, replace the camshaft caps and cylinder head as a set.

Camshaft oil clearance:

Standard

0.037 — 0.072 mm (0.0015 — 0.0028 in)



- (7) Completely remove the plastigauge.
- 6) Check the cam face condition; remove the minor faults by grinding with oil stone. Measure the cam height H. If it exceeds the standard or offset wear occurs, replace it.

Cam lobe height H:

Standard

Intake

45.90 — 46.00 mm (1.8071 — 1.8110 in)

Exhaust

44.65 — 44.75 mm (1.7579 — 1.7618 in)

Cam base circle diameter A:

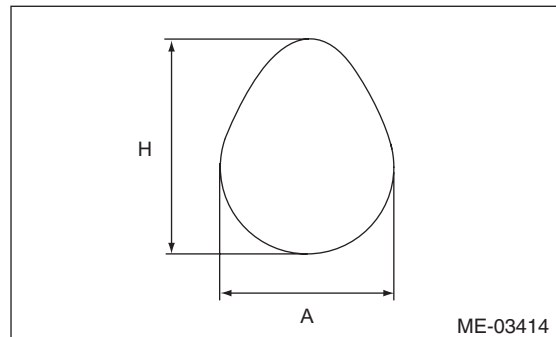
Standard

Intake

36.00 mm (1.4173 in)

Exhaust

36.00 mm (1.4173 in)



- 7) Measure the thrust clearance of the camshaft with a dial gauge. If the clearance is not within the standard or there is offset wear, replace the camshaft caps and cylinder head as a set. If necessary replace the camshaft.

Camshaft thrust clearance:

Standard

Intake

0.075 — 0.135 mm (0.0030 — 0.0053 in)

Exhaust

0.075 — 0.135 mm (0.0030 — 0.0053 in)