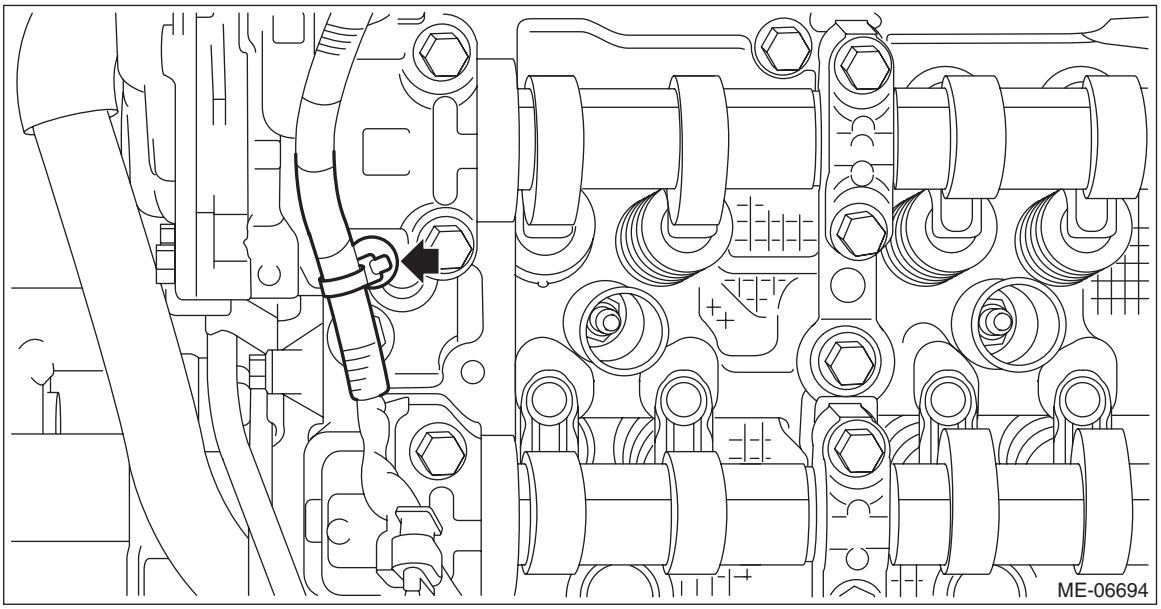
20.Cam Carrier

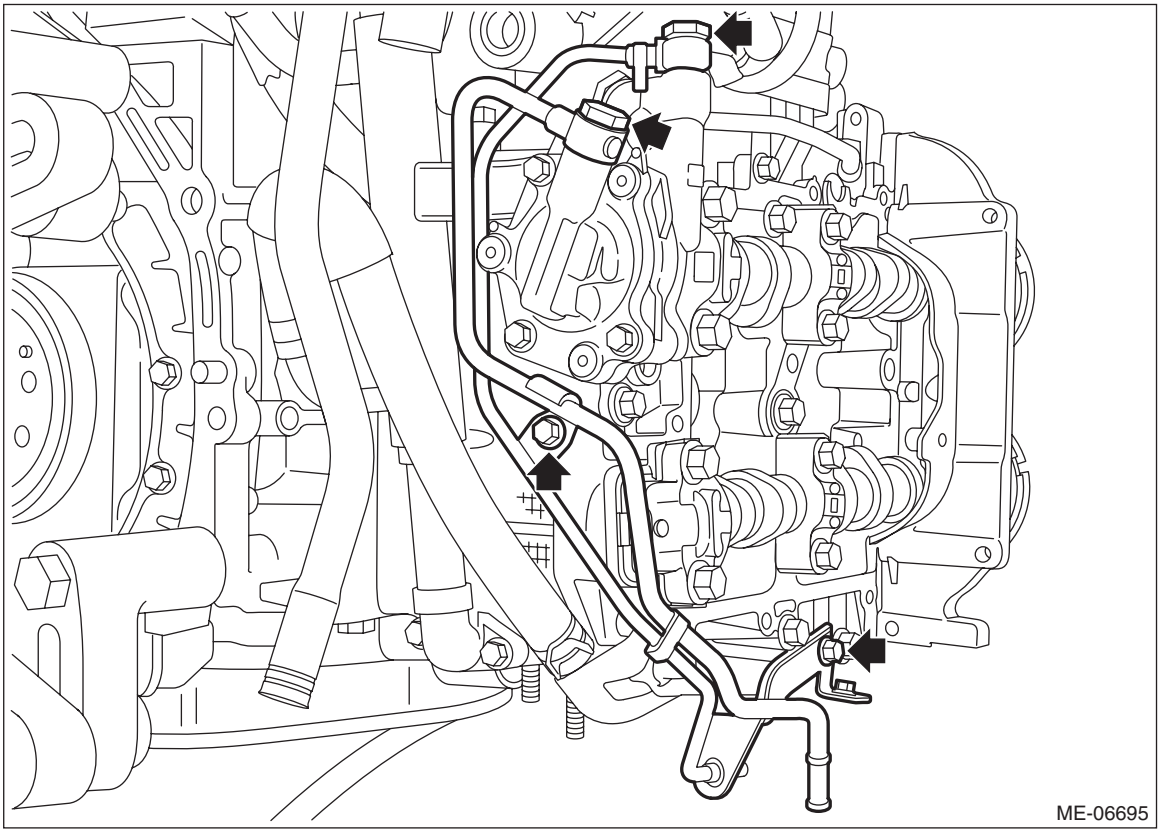
A: REMOVAL

1. CAM CARRIER RH

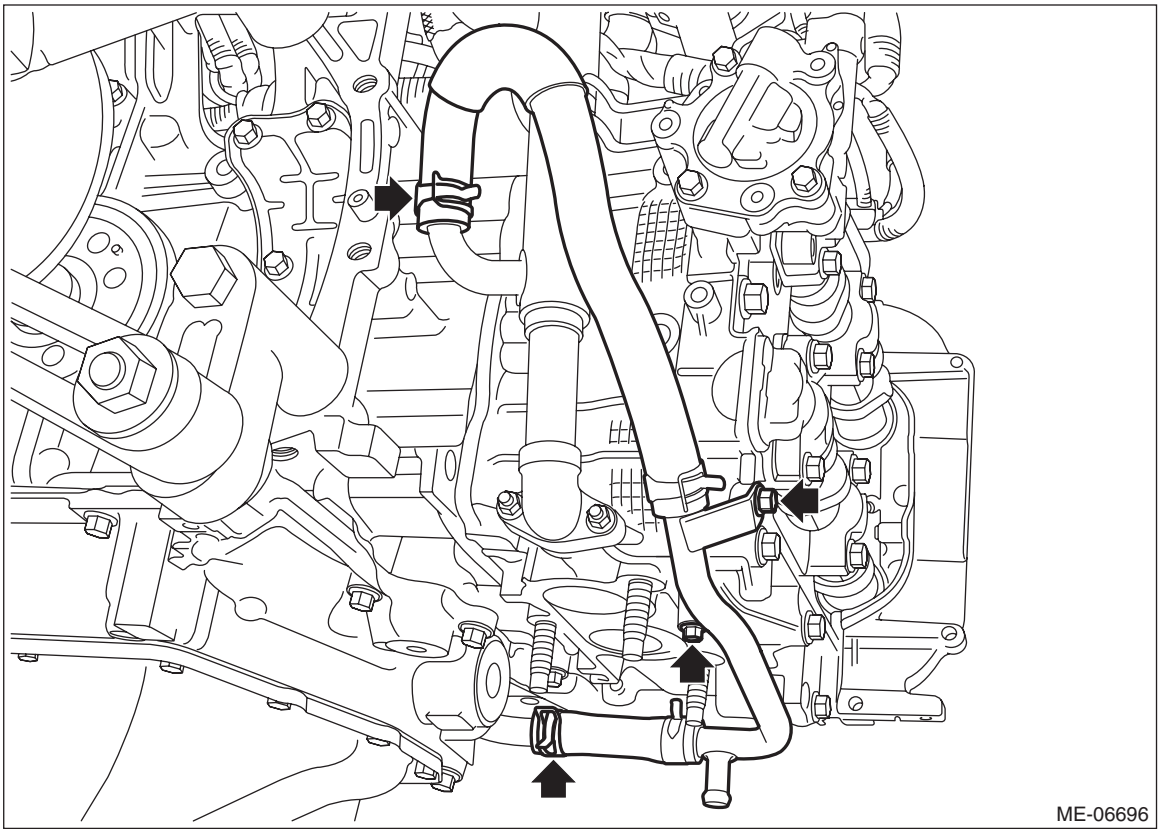
1) Remove the engine from the vehicle. <Ref. to ME(H4DOTC)-44, REMOVAL, Engine Assembly.>
2) Remove the chain cover. <Ref. to ME(H4DOTC)-90, REMOVAL, Chain Cover.>
3) Remove the timing chain RH. <Ref. to ME(H4DOTC)-111, TIMING CHAIN RH, REMOVAL, Timing Chain Assembly.>
4) Remove the rocker cover RH. <Ref. to ME(H4DOTC)-147, ROCKER COVER RH, REMOVAL, Rocker Cover.>
5) Remove the clip holding the engine harness from cam carrier RH.



6) Remove the oil pipe assembly from the scavenge pump and cam carrier RH.



7) Disconnect the water pipe hose from oil pan upper and EGR cooler, and remove the water pipe assembly.

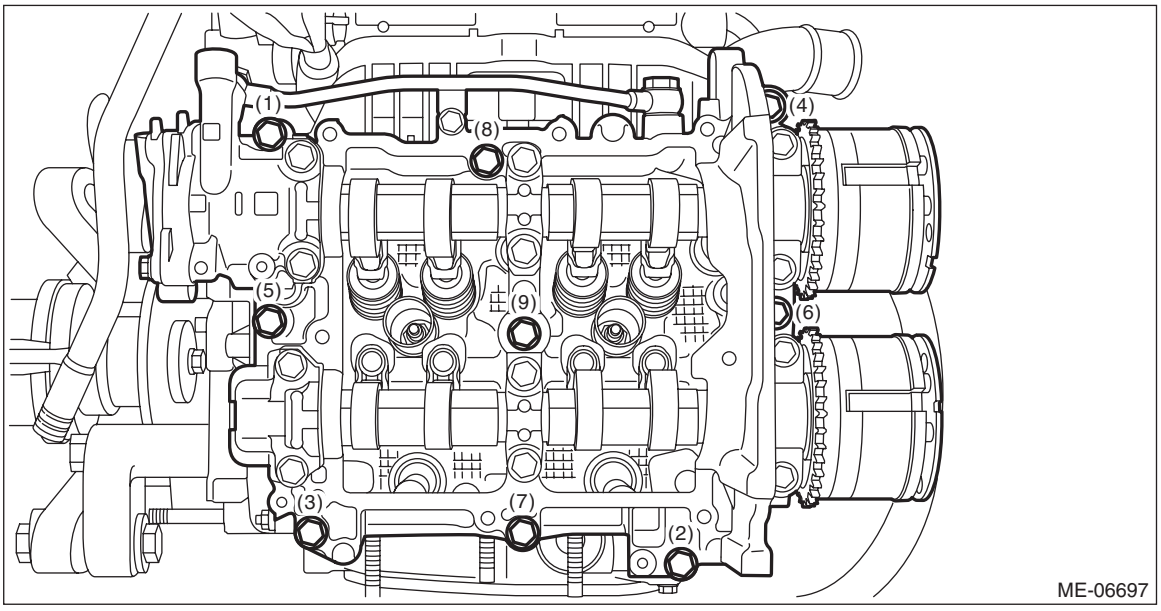


8) When disassembling the cam carrier RH

NOTE:
When disassembling the cam carrier RH, perform the following steps also.
(1) Remove the scavenge pump. <Ref. to LU(H4DO)-54, REMOVAL, Scavenge Pump.>
(2) Remove the cam sprocket RH. <Ref. to ME(H4DOTC)-137, CAM SPROCKET RH, REMOVAL, Cam Sprocket.>

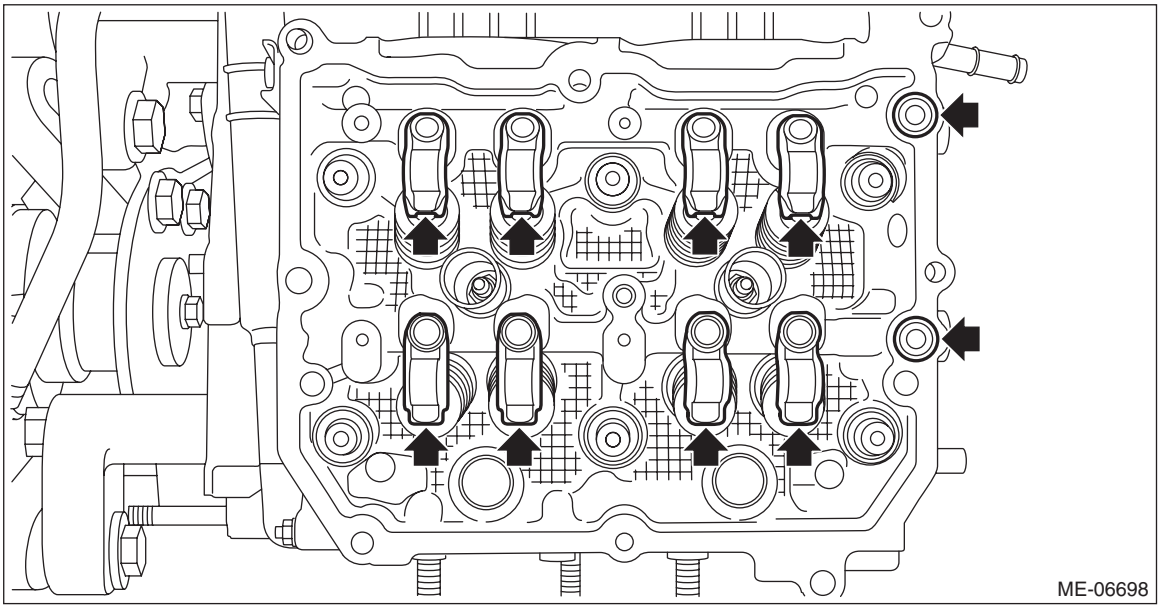
9) Set the part so that the cam carrier RH is on the upper side.

10) Loosen the bolts holding the cam carrier RH equally, a little at a time in numerical sequence as shown in the figure and remove the cam carrier RH.



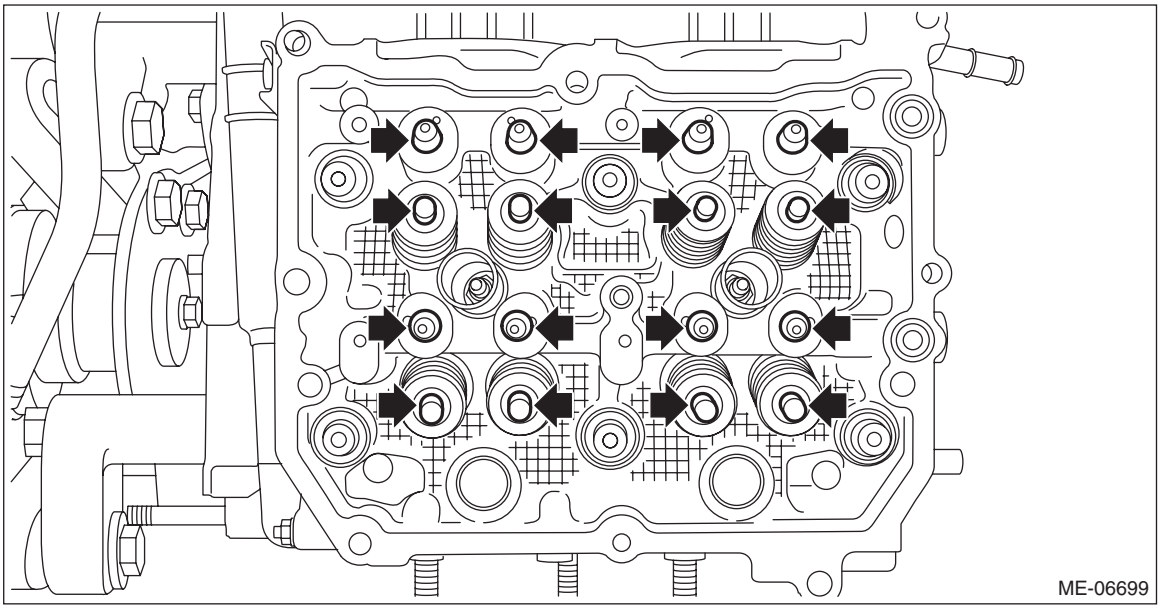
11) Remove the O-ring and the roller rocker arm from cylinder head RH.

NOTE:
Be careful not to confuse the roller rocker arms.



12) Remove the valve shim and the roller rocker arm pivot from cylinder head RH.

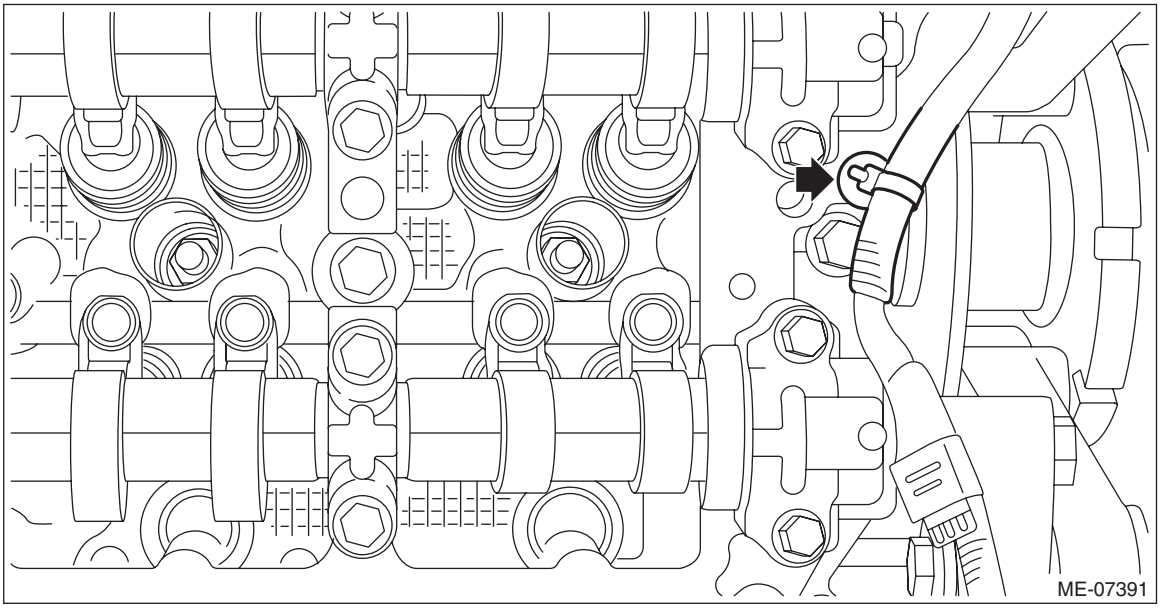
NOTE:
Be careful not to confuse the valve shim and the roller rocker arm pivot.



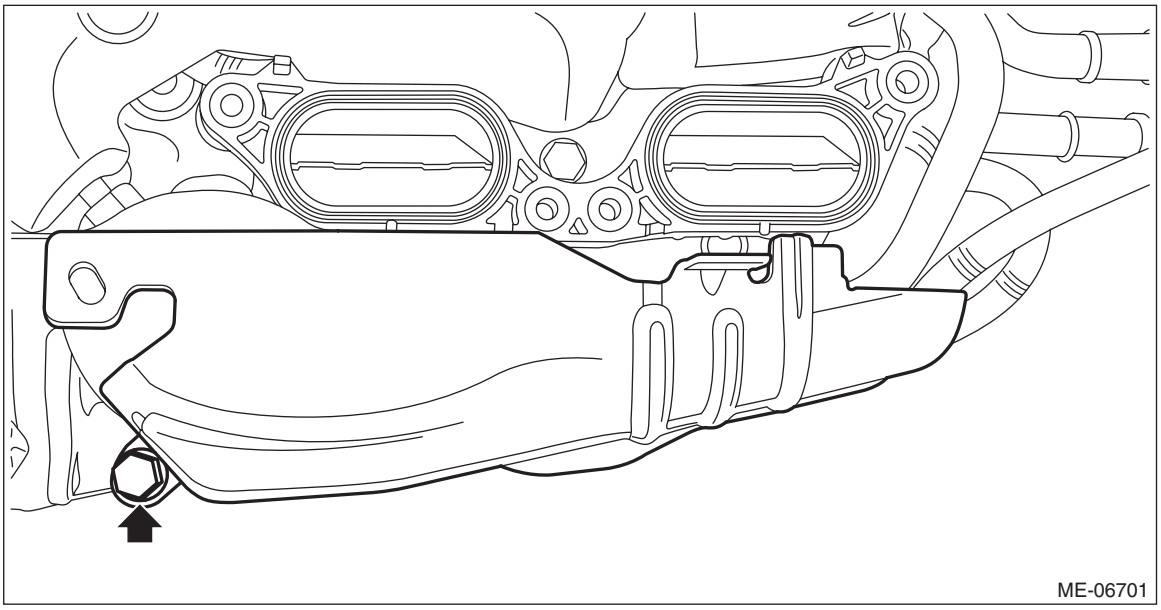
13) Remove the liquid gasket from cam carrier RH and cylinder head RH.

2. CAM CARRIER LH

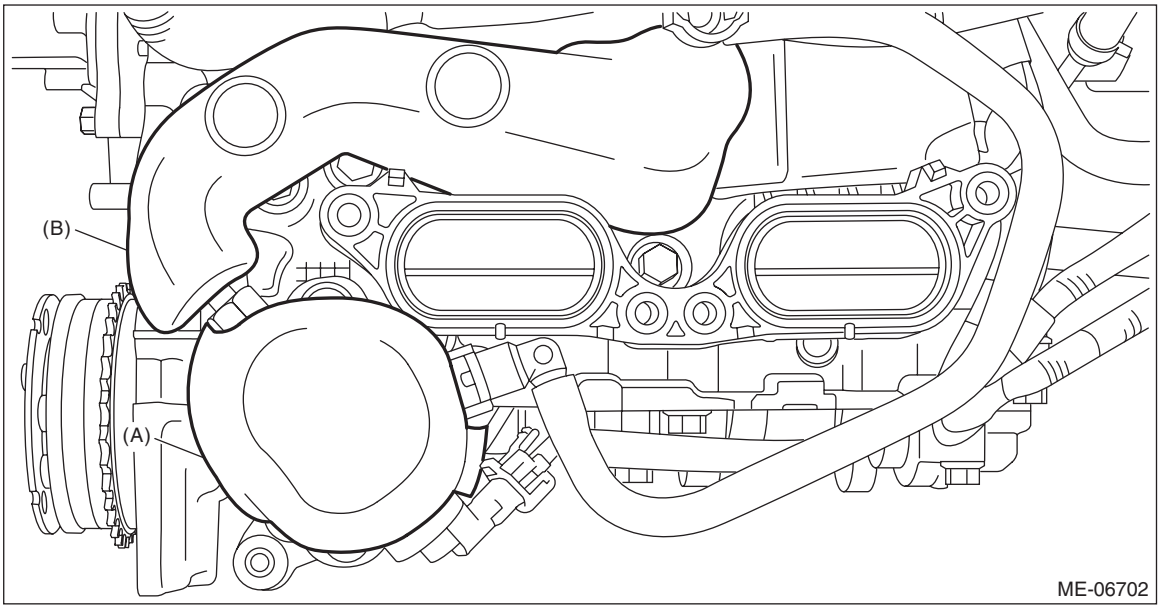
1) Remove the engine from the vehicle. <Ref. to ME(H4DOTC)-44, REMOVAL, Engine Assembly.>
2) Remove the chain cover. <Ref. to ME(H4DOTC)-90, REMOVAL, Chain Cover.>
3) Remove the timing chain LH. <Ref. to ME(H4DOTC)-114, TIMING CHAIN LH, REMOVAL, Timing Chain Assembly.>
4) Remove the intake manifold. <Ref. to FU(H4DOTC)-19, REMOVAL, Intake Manifold.>
5) Remove the rocker cover LH. <Ref. to ME(H4DOTC)-149, ROCKER COVER LH, REMOVAL, Rocker Cover.>
6) Remove the clip holding the engine harness from cam carrier LH.



7) Remove the fuel pipe protector from the high-pressure fuel pump case.

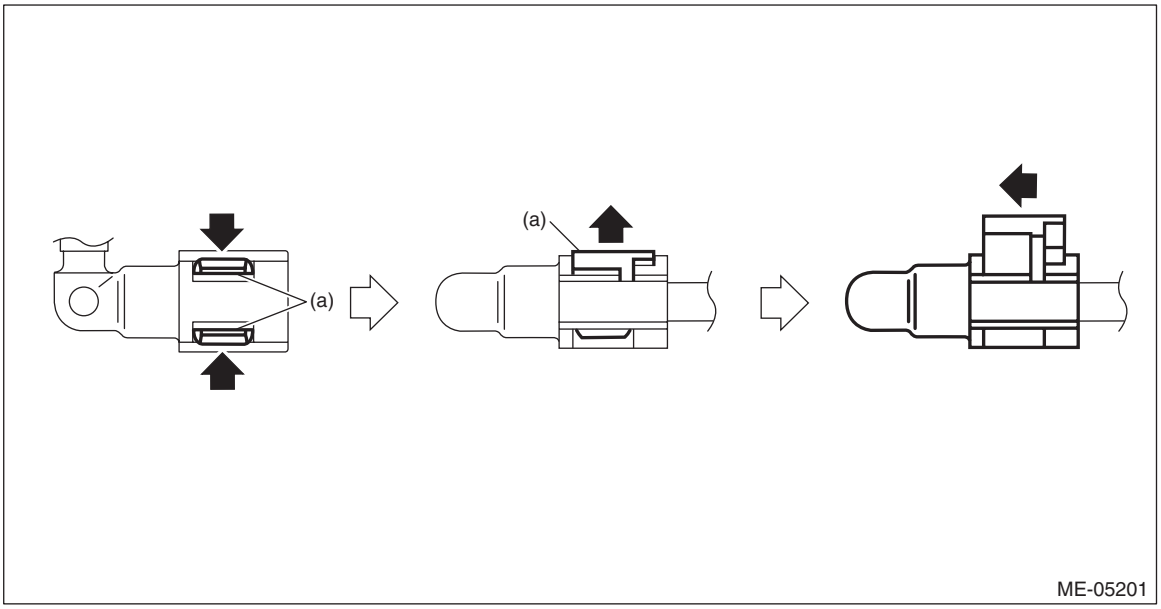


8) Remove the fuel pump insulator (A) from the high-pressure fuel pump, and then remove the fuel pipe insulator No. 1 (B) from the high-pressure fuel delivery pipe.

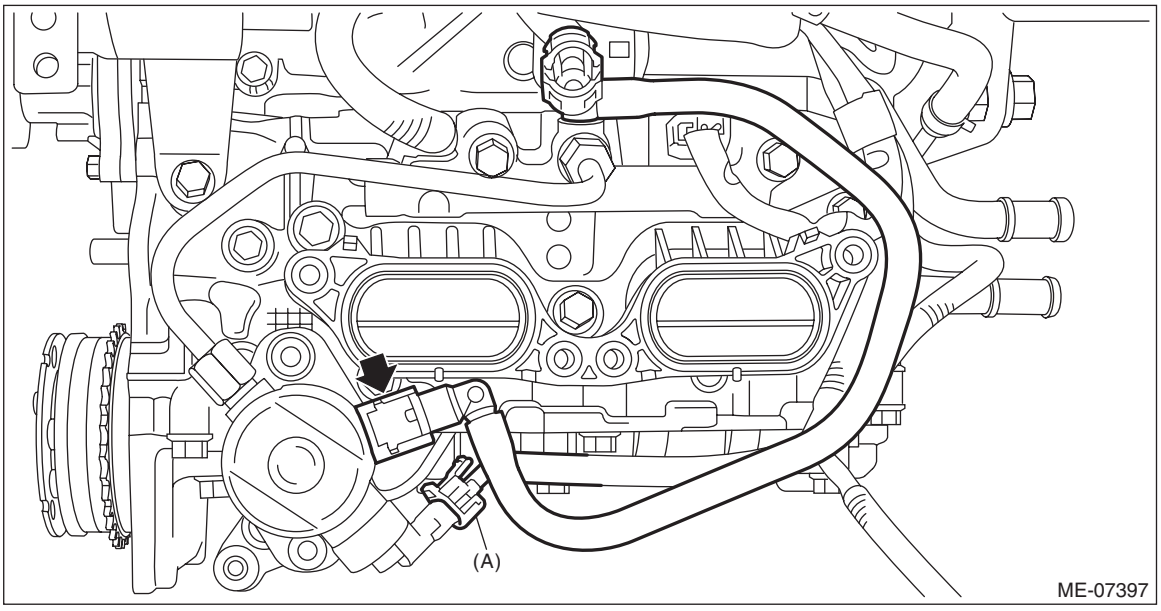


9) Disconnect the connector (A) from the high-pressure fuel pump, and remove the fuel delivery pipe from the high-pressure fuel pump.

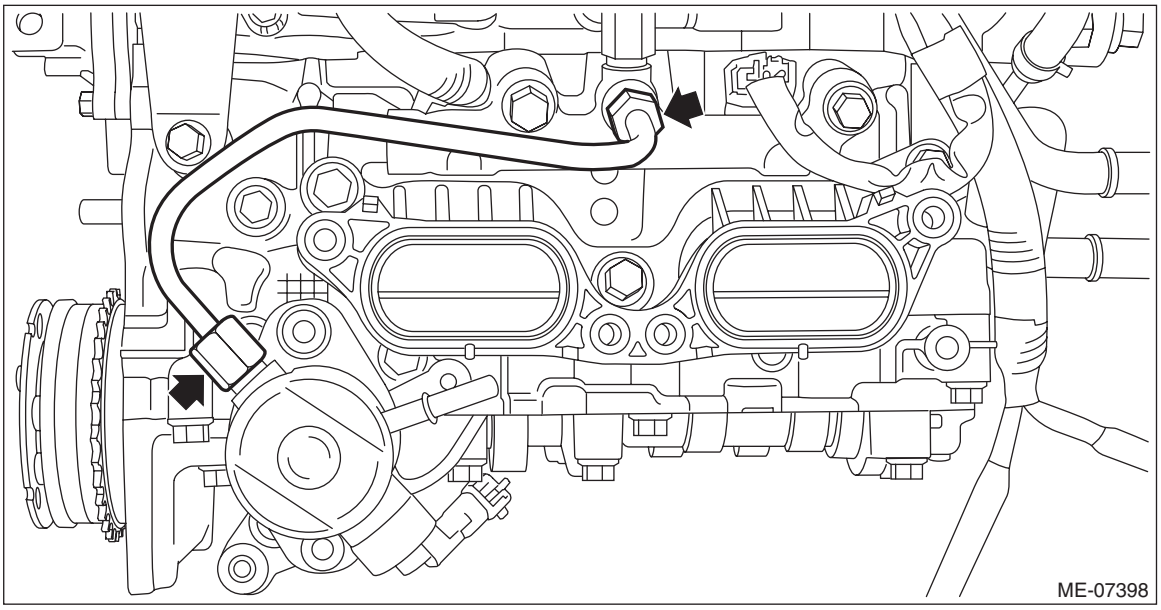
NOTE:
Disconnect the quick connector as shown in the figure.



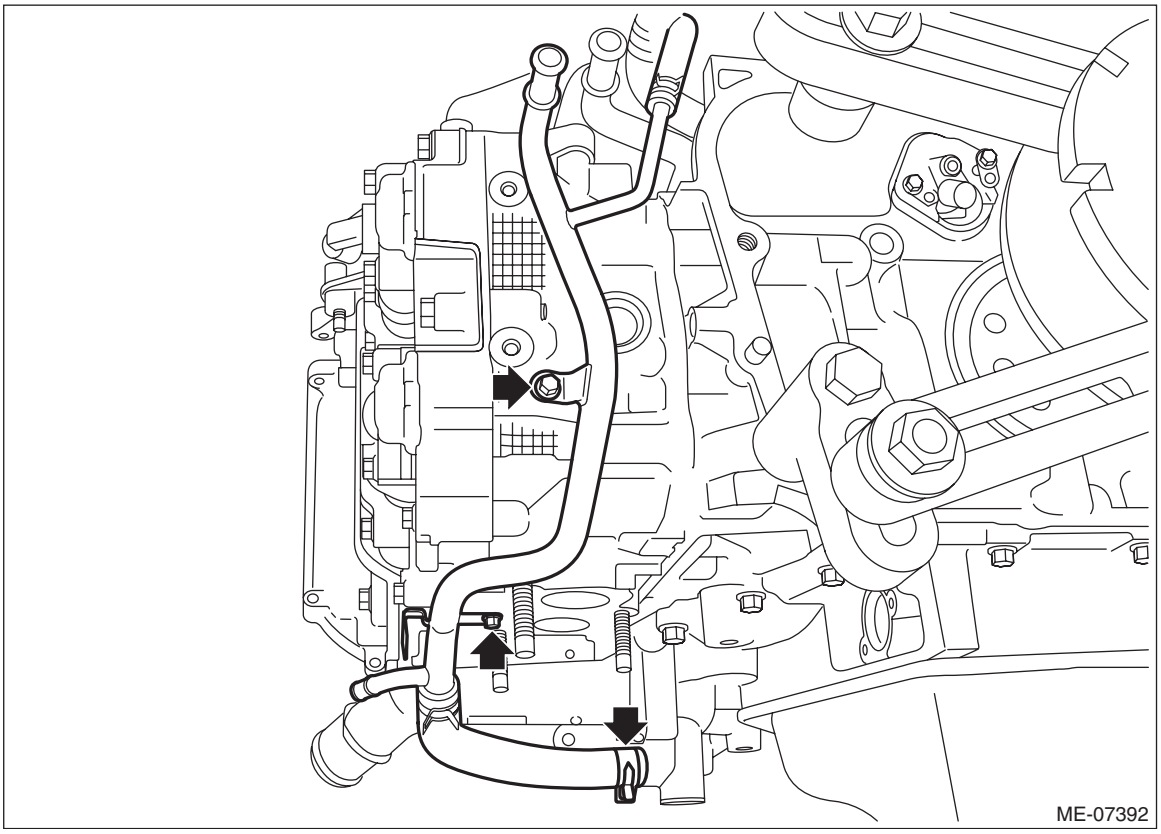
(a) Slider



10) Remove the high-pressure fuel delivery pipe from the high-pressure fuel pump and fuel injector pipe.



11) Disconnect the water pipe hose from oil pan upper, and remove the water pipe assembly.

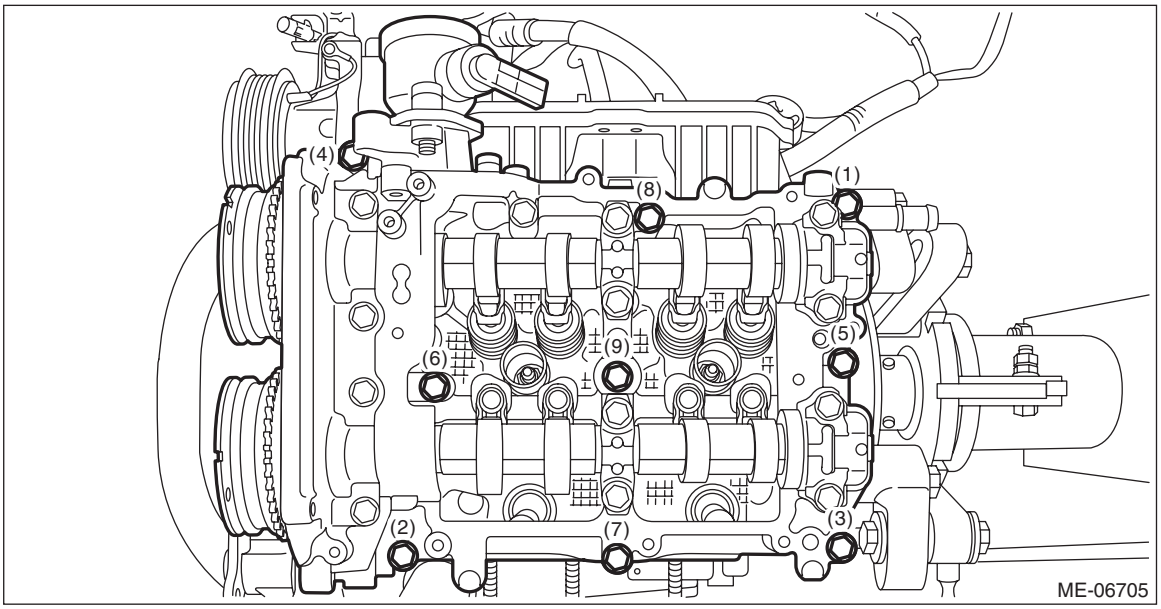


12) When disassembling the cam carrier LH

NOTE:
When disassembling the cam carrier LH, perform the following steps also.
(1) Remove the high-pressure fuel pump. <Ref. to FU(H4DOTC)-75, REMOVAL, High Pressure Fuel Pump.>
(2) Remove the cam sprocket LH. <Ref. to ME(H4DOTC)-138, CAM SPROCKET LH, REMOVAL, Cam Sprocket.>

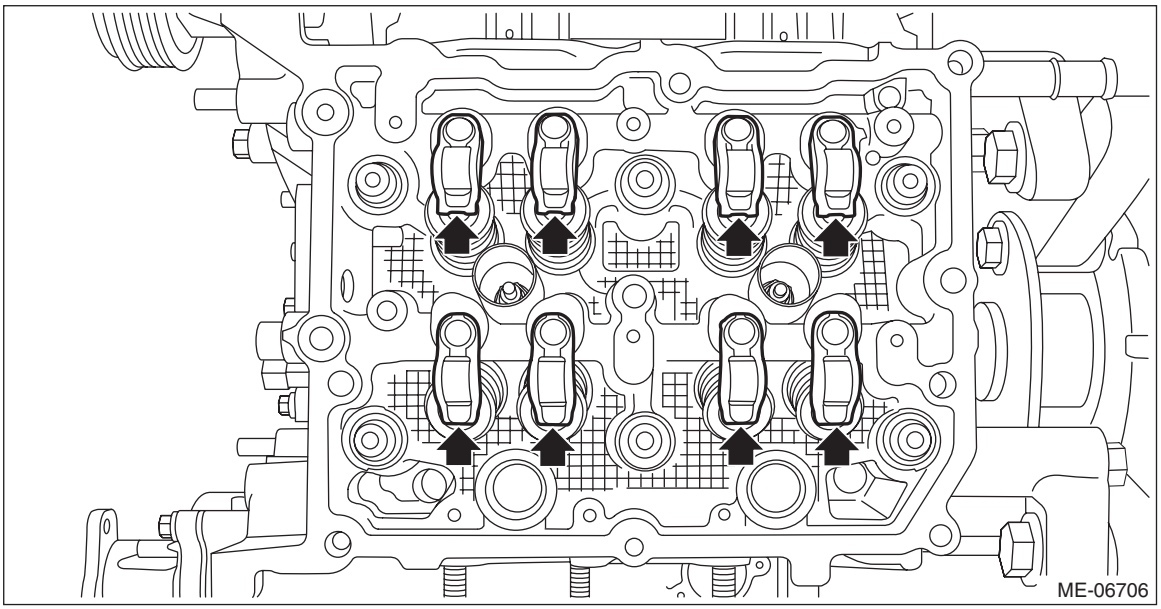
13) Set the part so that the cam carrier LH is on the upper side.

14) Loosen the bolts holding the cam carrier LH equally, a little at a time in numerical sequence as shown in the figure and remove the cam carrier LH.



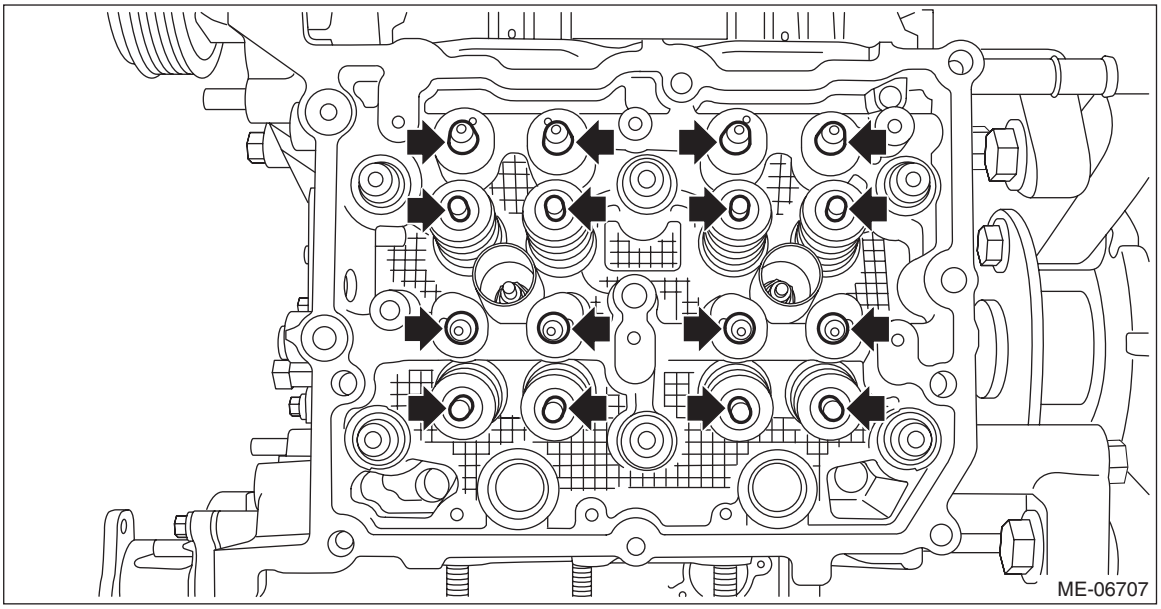
15) Remove the O-ring and the roller rocker arm from cylinder head LH.

NOTE:
Be careful not to confuse the roller rocker arms.



16) Remove the valve shim and the roller rocker arm pivot from cylinder head LH.

NOTE:
Be careful not to confuse the valve shim and the roller rocker arm pivot.

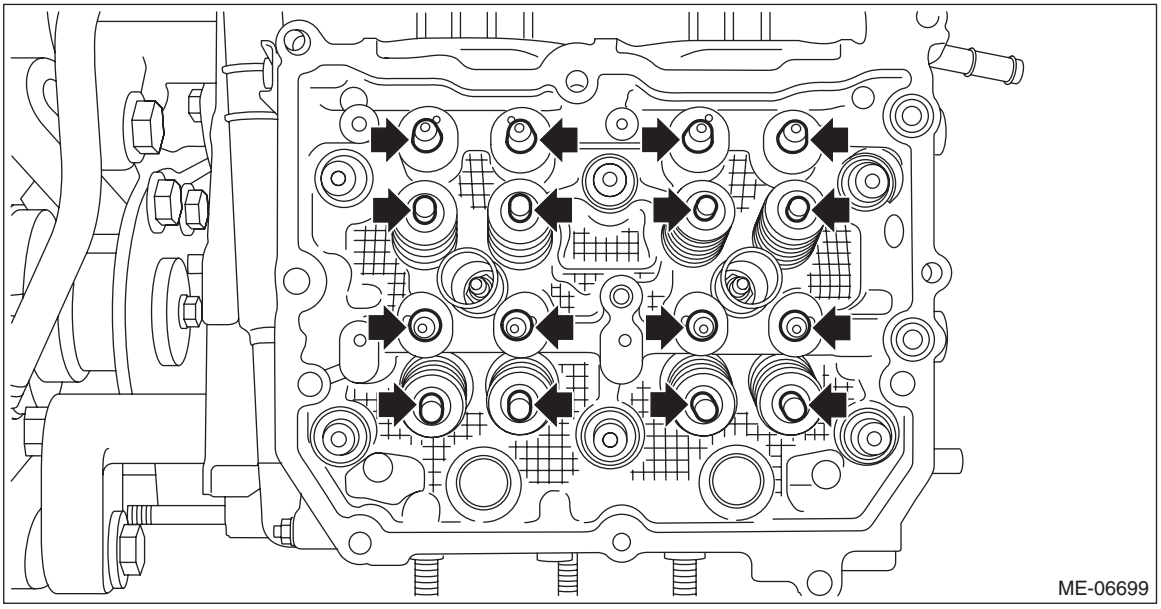


17) Remove the liquid gasket from cam carrier LH and cylinder head LH.

B: INSTALLATION

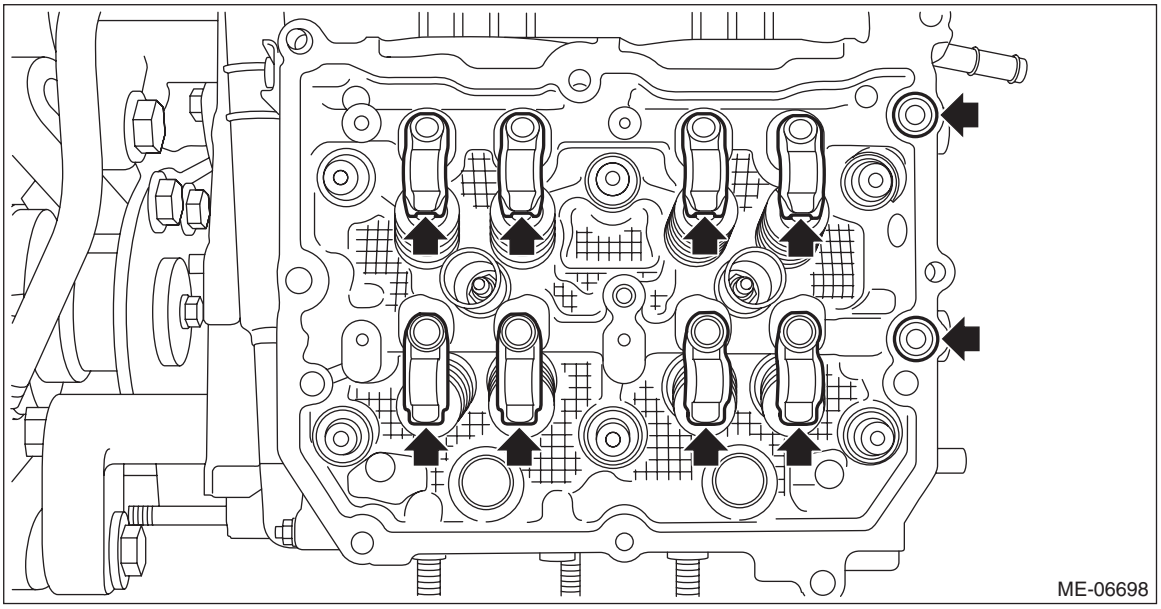
1. CAM CARRIER RH

1) Set the part so that the cylinder head RH is on the upper side.
2) Apply engine oil to the valve shim and the roller rocker arm pivot, and install the valve shim and the roller rocker arm pivot to the cylinder head RH.



3) Apply engine oil to the O-ring and the roller rocker arm, and install the O-ring and the roller rocker arm to the cylinder head RH.

NOTE:
Use new O-rings.

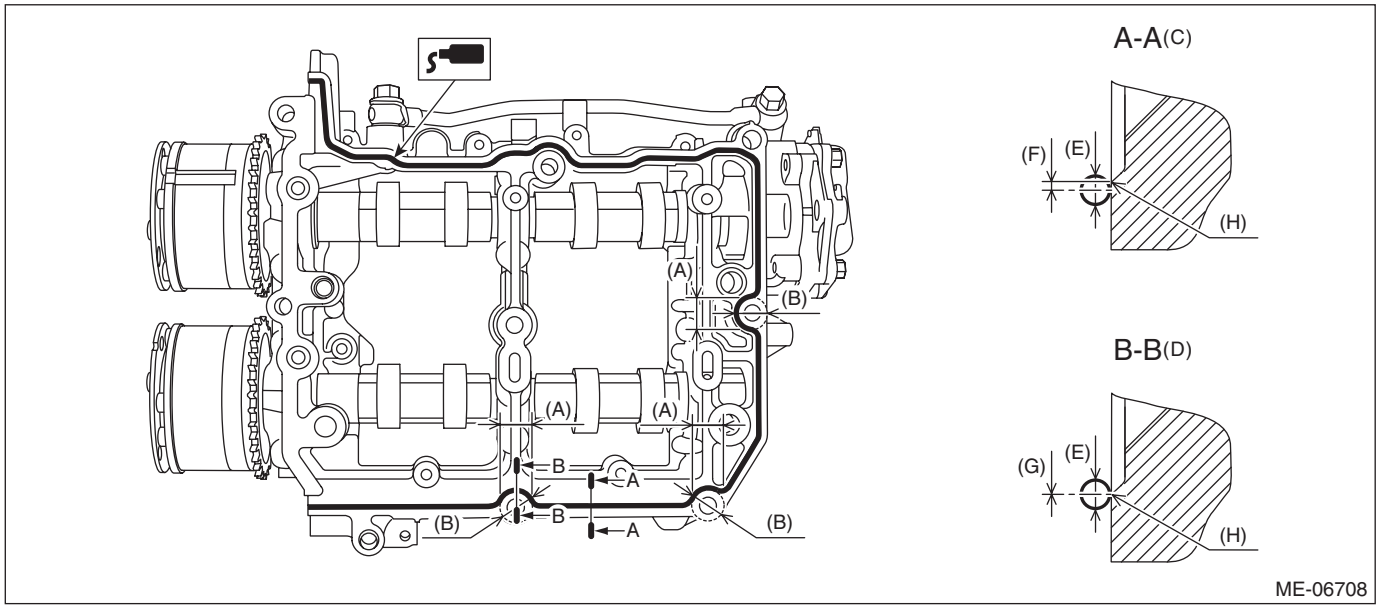


4) Apply liquid gasket to the mating surface of cam carrier RH as shown in the figure.

NOTE:
- Before applying liquid gasket, degrease the old liquid gasket seal surface of the cylinder head RH and cam carrier RH.
- Install within 5 min. after applying liquid gasket.

Liquid gasket:
THREE BOND 1217G (Part No. 0877Y0100) or equivalent

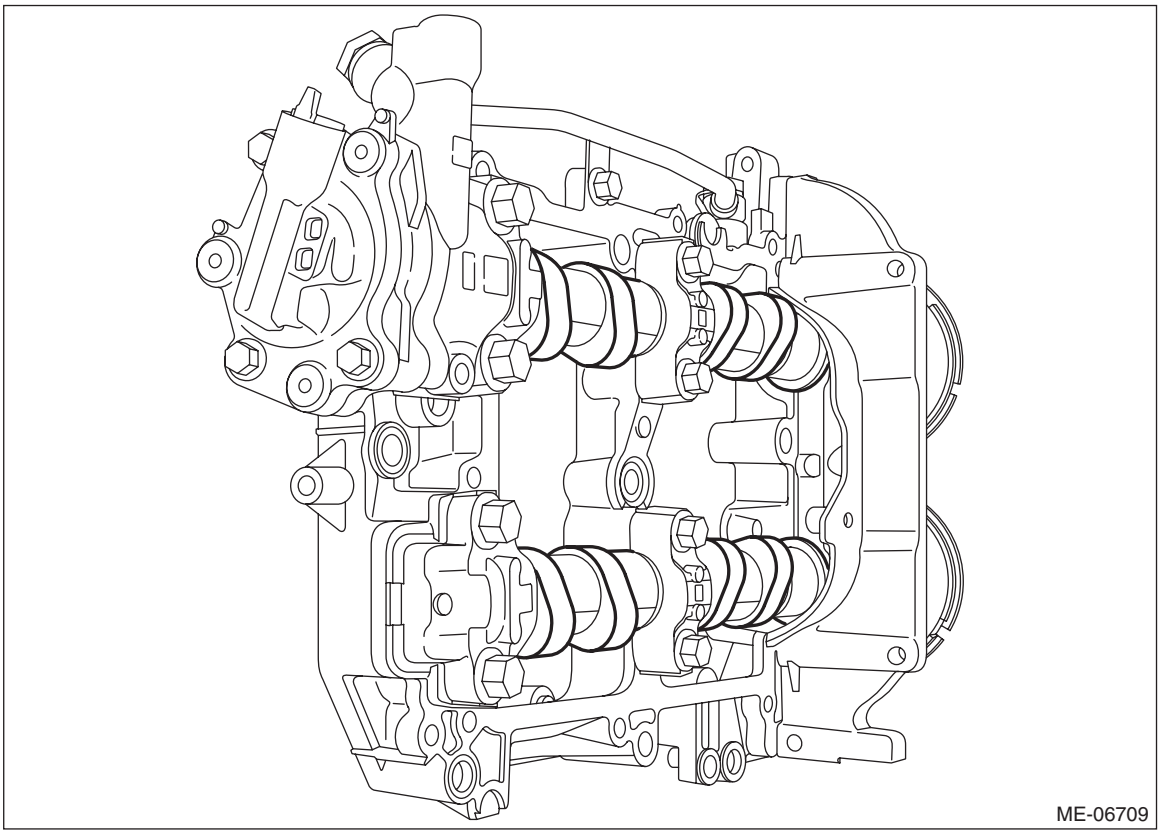
Liquid gasket applying diameter:
3±0.5 mm (0.1181±0.0197 in)

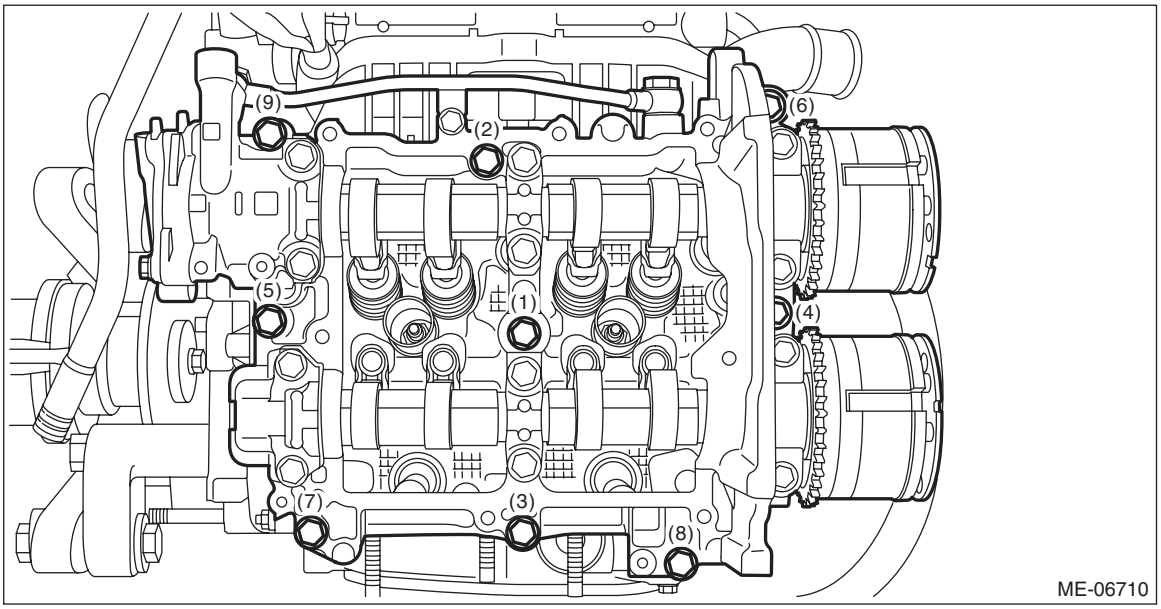


(A) Range A
(B) ϕ18 mm (0.7087 in)
(C) Liquid gasket applying position of mating surfaces of range A
(D) Liquid gasket applying position of mating surfaces other than range A
(E) ϕ3±0.5 mm (0.1181±0.0197 in)
(F) 1 mm (0.0394 in) or less
(G) 0±0.5 mm (0±0.0197 in)
(H) Chamfer edge

5) Install the cam carrier RH to the cylinder head RH.
   (1) Mount the cam carrier RH, then tighten all bolts with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.

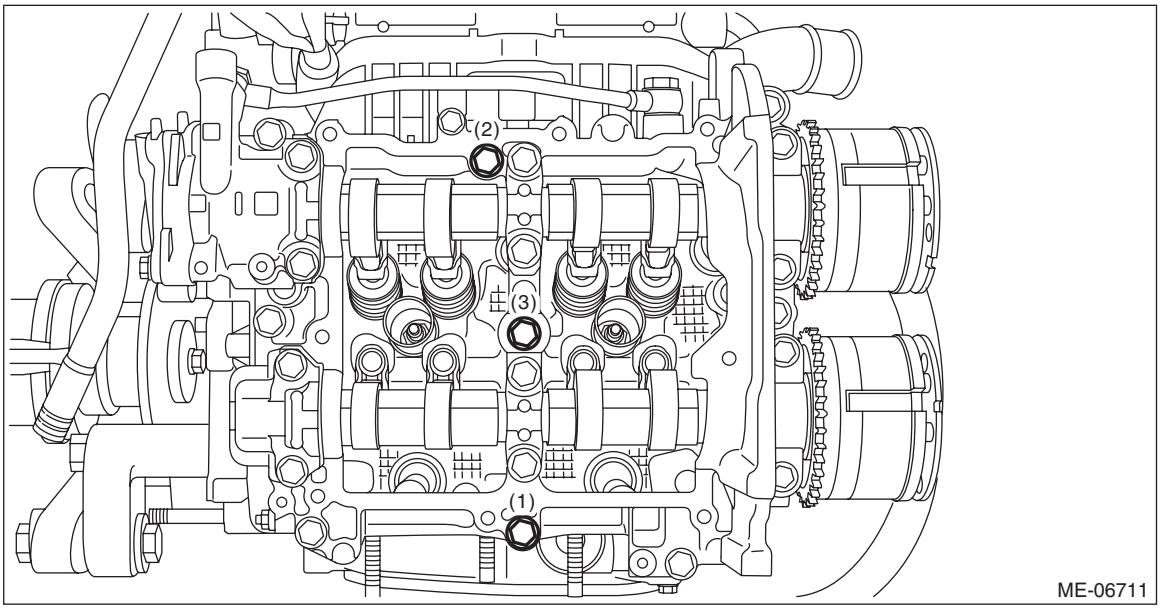
NOTE:
Set the intake camshaft RH and the exhaust camshaft RH to the zero-lift position as shown in the figure.


ME-06709

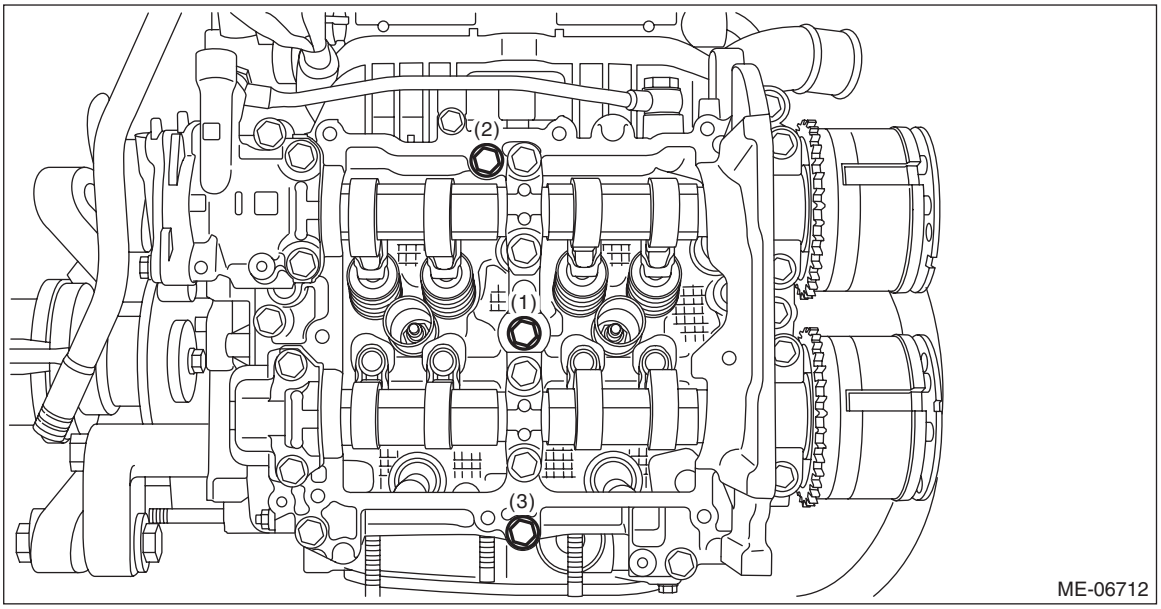


ME-06710

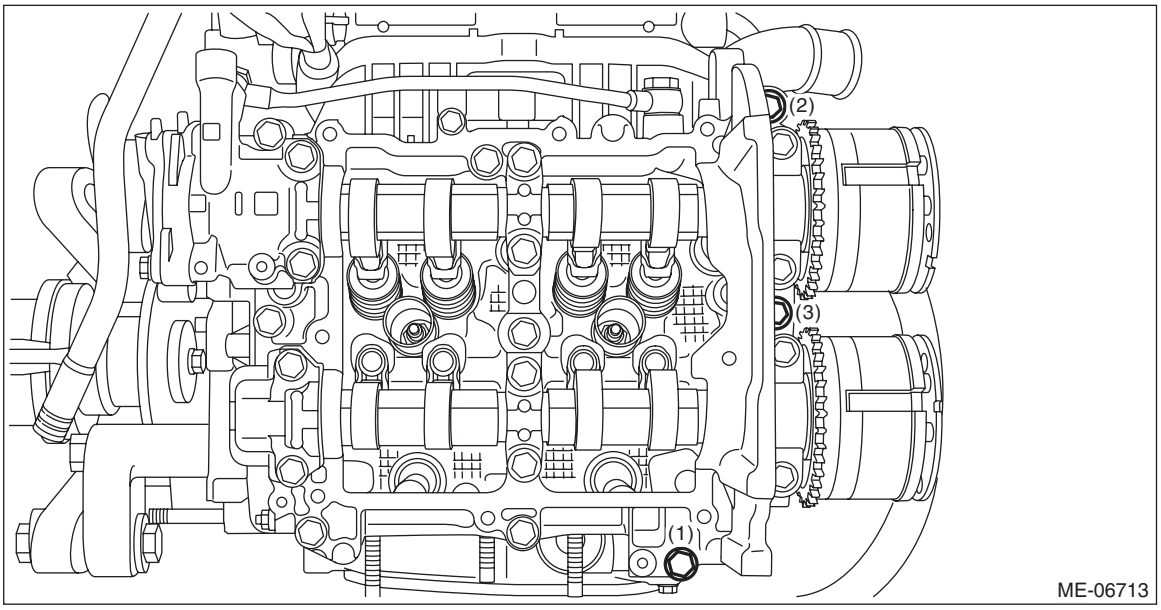
(2) Loosen the bolts (3 places) by 180° in numerical order as shown in the figure.



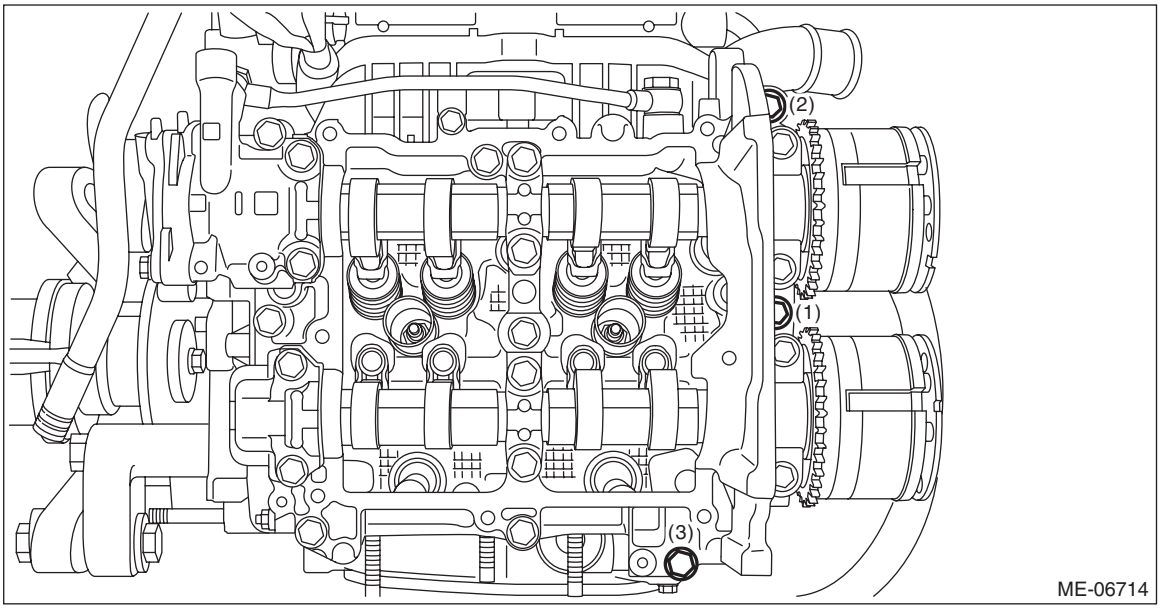
(3) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.



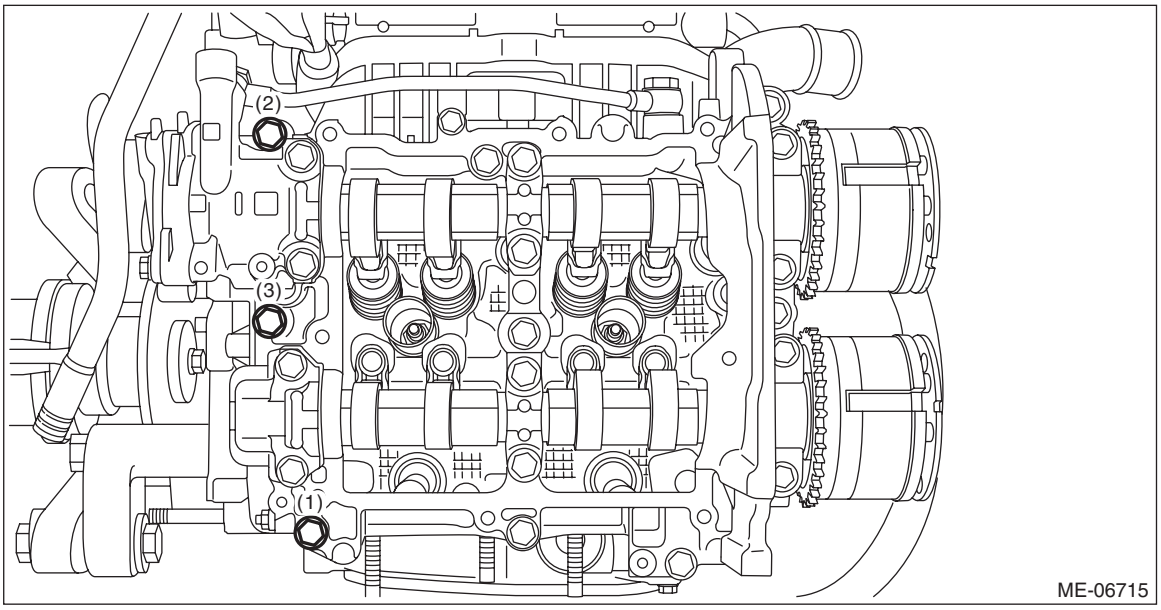
(4) Loosen the bolts (3 places) by 180° in numerical order as shown in the figure.



(5) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.

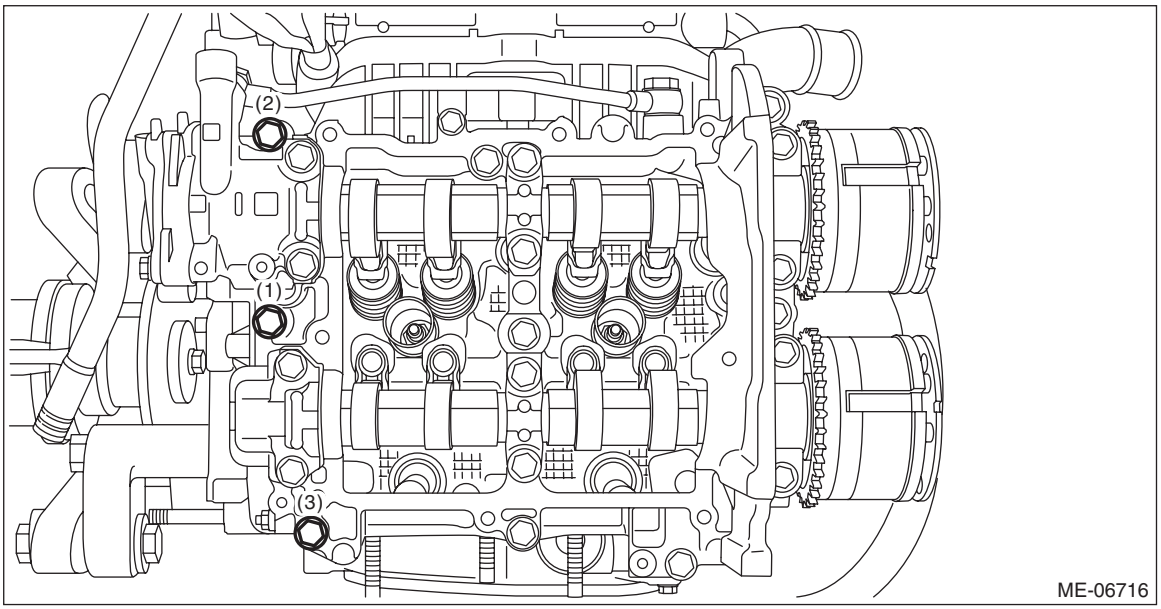


(6) Loosen the bolts (3 places) by 180° in numerical order as shown in the figure.



(7) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.

NOTE:
After tightening, if the liquid gasket is squeezed out onto the seal surface of the chain cover, completely remove any squeezed-out liquid gasket.



6) Set the part so that the intake manifold is on the upper side.
7) When the cam carrier RH has been disassembled

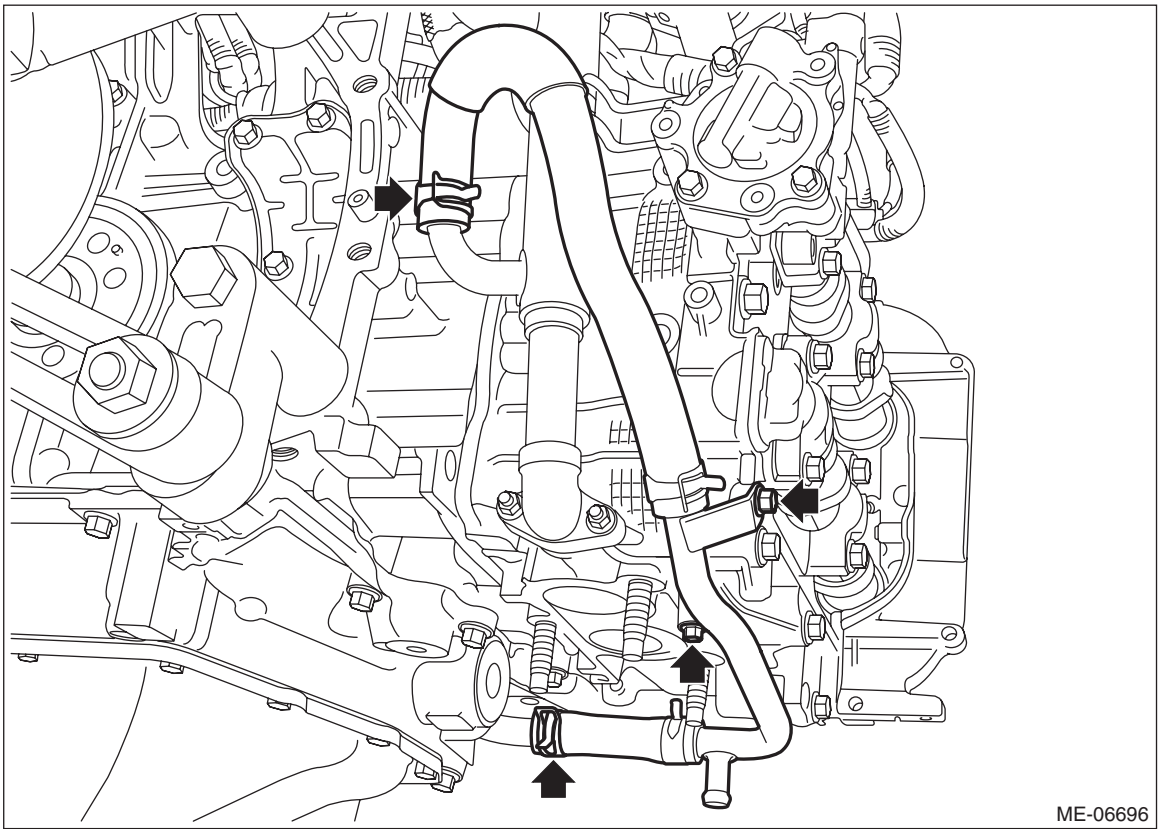
NOTE:
When the cam carrier RH has been disassembled, perform the following steps also.

(1) Install the cam sprocket RH. <Ref. to ME(H4DOTC)-140, CAM SPROCKET RH, INSTALLATION, Cam Sprocket.>
(2) Install the scavenge pump. <Ref. to LU(H4DO)-55, INSTALLATION, Scavenge Pump.>

NOTE:
When installing the scavenge pump, do not turn the intake camshaft RH to the outside of range of zero-lift (in range where it can be turned lightly by hand).

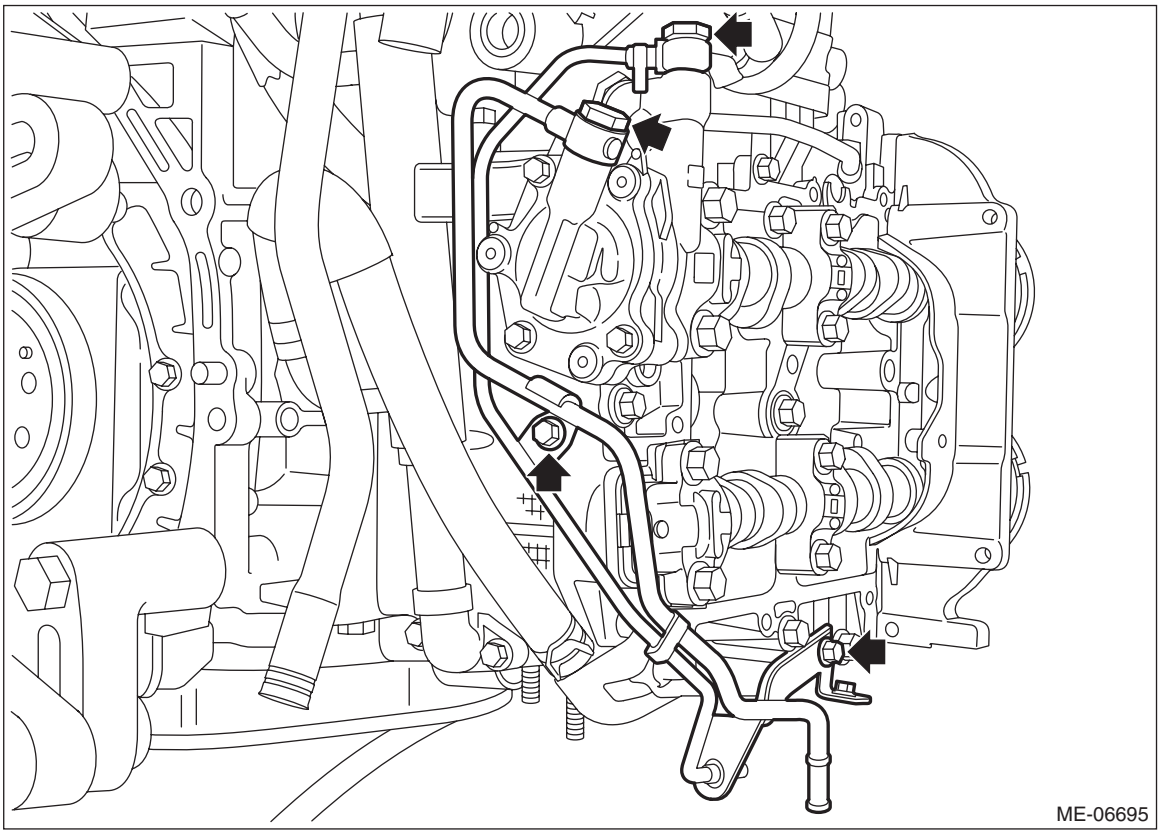
8) Check the cam clearance. <Ref. to ME(H4DOTC)-39, WHEN TIMING CHAIN ASSEMBLY IS REMOVED, INSPECTION, Cam Clearance.>
9) Connect the water pipe hose to oil pan upper and EGR cooler, and install the water pipe assembly.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



10) Install the oil pipe assembly to the scavenge pump and cam carrier RH.
(1) Set the oil pipe assembly to the scavenge pump and cam carrier RH, and temporarily tighten the bolts which secure the oil pipe assembly to the scavenge pump and cam carrier RH.

NOTE:
Use a new gasket.

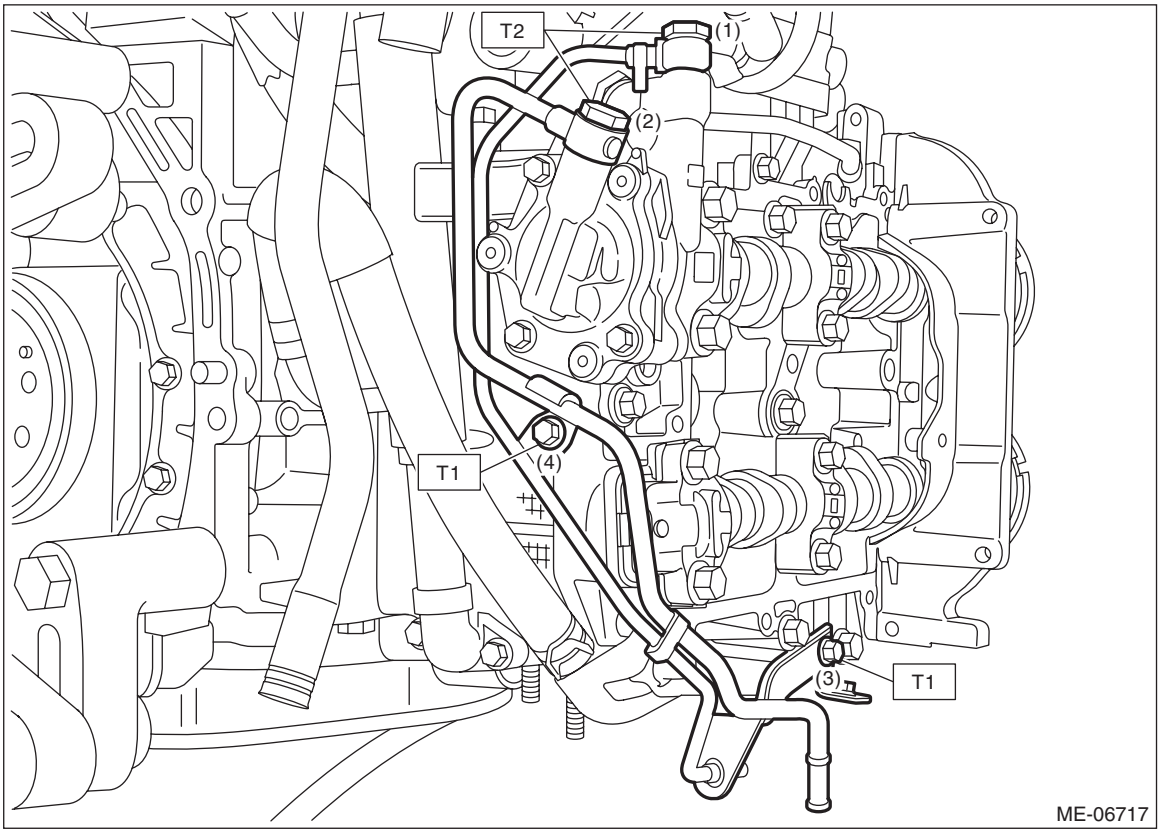


(2) Tighten the bolts which secure the oil pipe assembly to the scavenge pump and cam carrier RH in numerical order as shown in the figure.

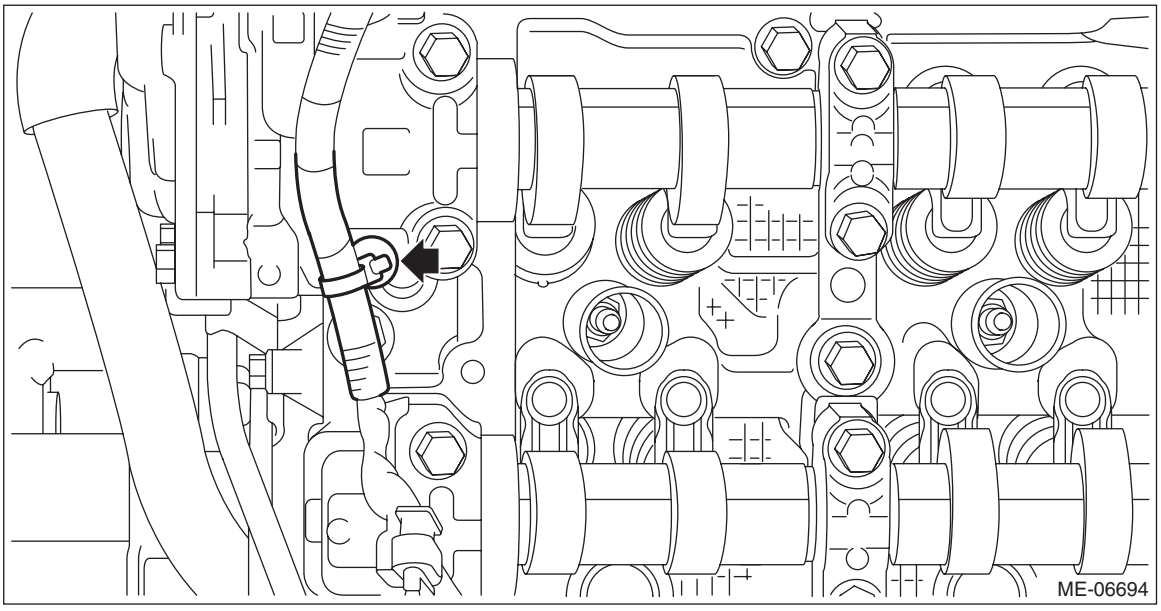
Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 29 N·m (3.0 kgf-m, 4.7 ft-lb)



11) Secure the engine harness to the cam carrier RH with a clip.



12) Install the rocker cover RH. <Ref. to ME(H4DOTC)-159, ROCKER COVER RH, INSTALLATION, Rocker Cover.>

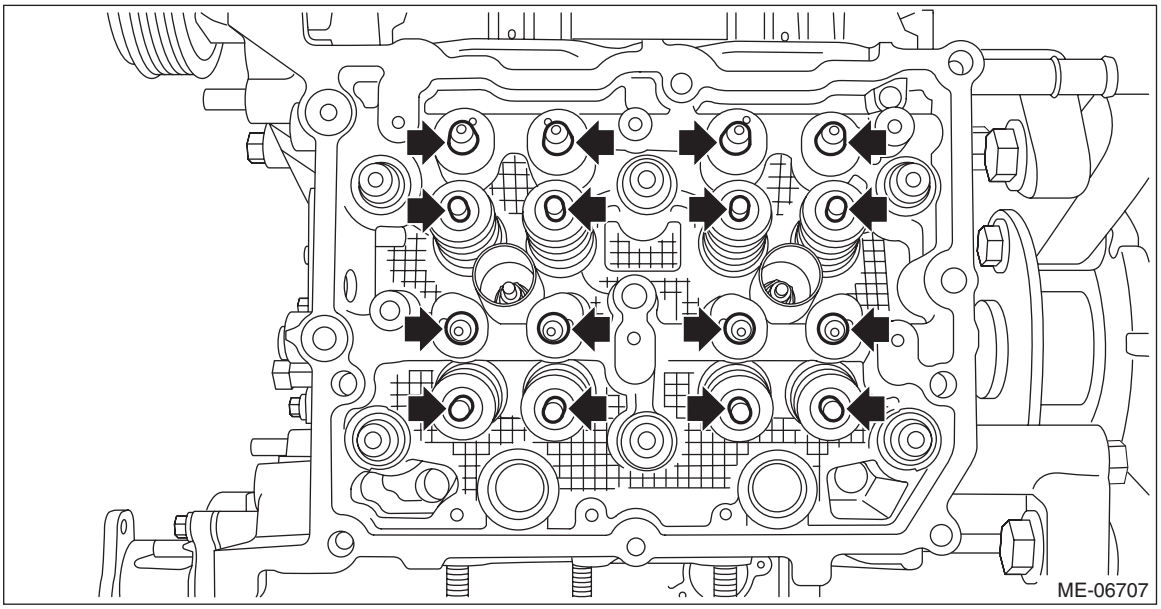
13) Install the timing chain RH. <Ref. to ME(H4DOTC)-129, TIMING CHAIN RH, INSTALLATION, Timing Chain Assembly.>

14) Install the chain cover. <Ref. to ME(H4DOTC)-97, INSTALLATION, Chain Cover.>

15) Install the engine to the vehicle. <Ref. to ME(H4DOTC)-59, INSTALLATION, Engine Assembly.>

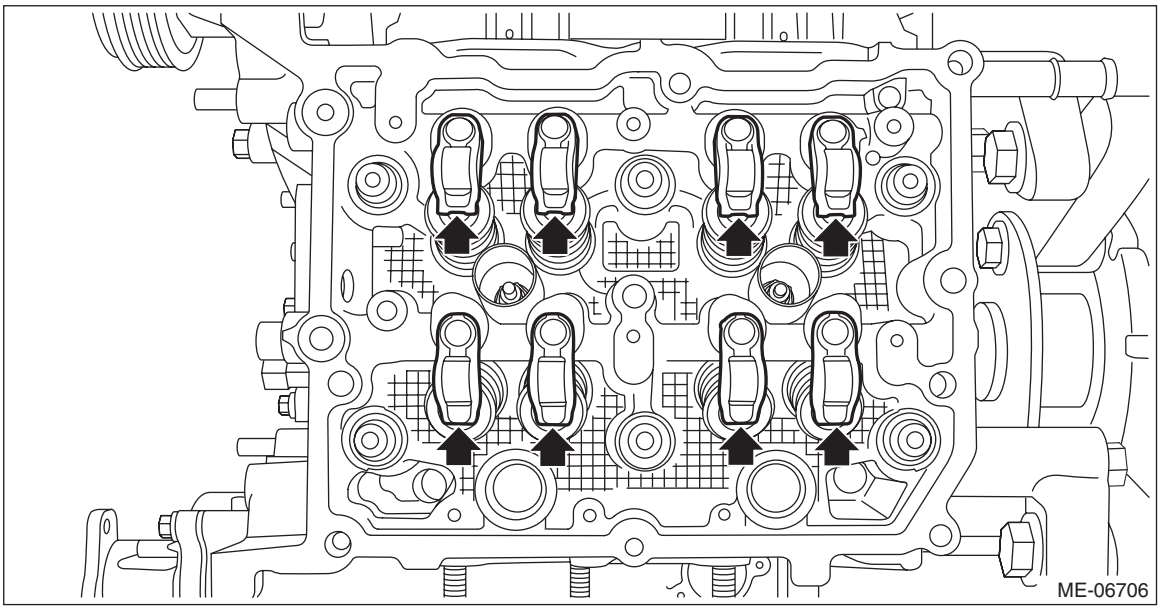
2. CAM CARRIER LH

1) Set the part so that the cylinder head LH is on the upper side.
2) Apply engine oil to the valve shim and the roller rocker arm pivot, and install the valve shim and the roller rocker arm pivot to the cylinder head LH.



3) Apply engine oil to the O-ring and the roller rocker arm, and install the O-ring and the roller rocker arm to the cylinder head LH.

NOTE:
Use new O-rings.

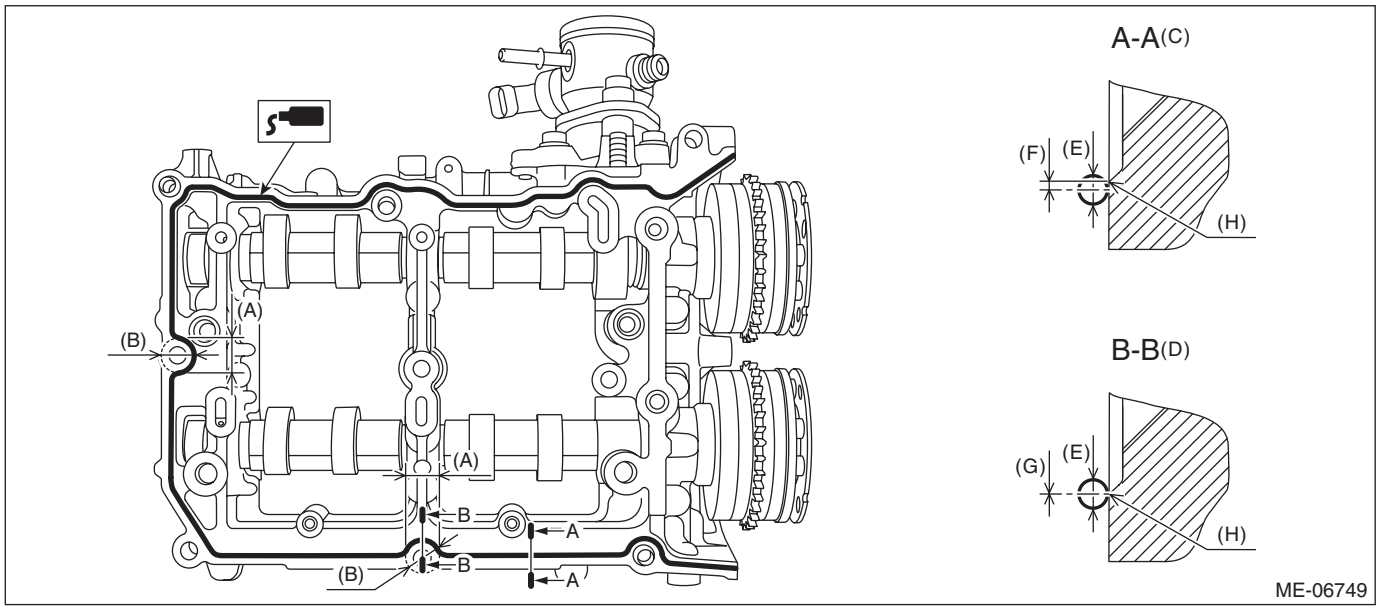


4) Apply liquid gasket to the mating surface of cam carrier LH as shown in the figure.

NOTE:
- Before applying liquid gasket, degrease the old liquid gasket seal surface of the cylinder head LH and cam carrier LH.
- Install within 5 min. after applying liquid gasket.

Liquid gasket:
THREE BOND 1217G (Part No. 0877Y0100) or equivalent

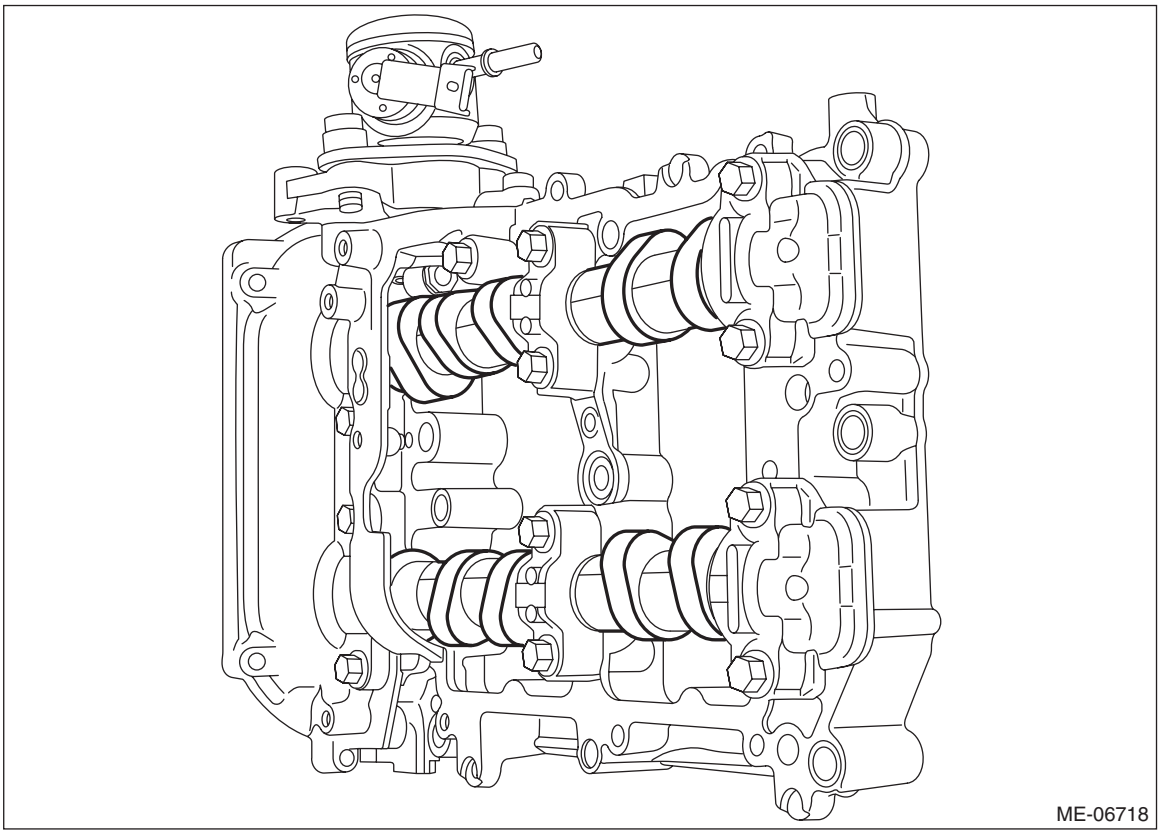
Liquid gasket applying diameter:
3±0.5 mm (0.1181±0.0197 in)

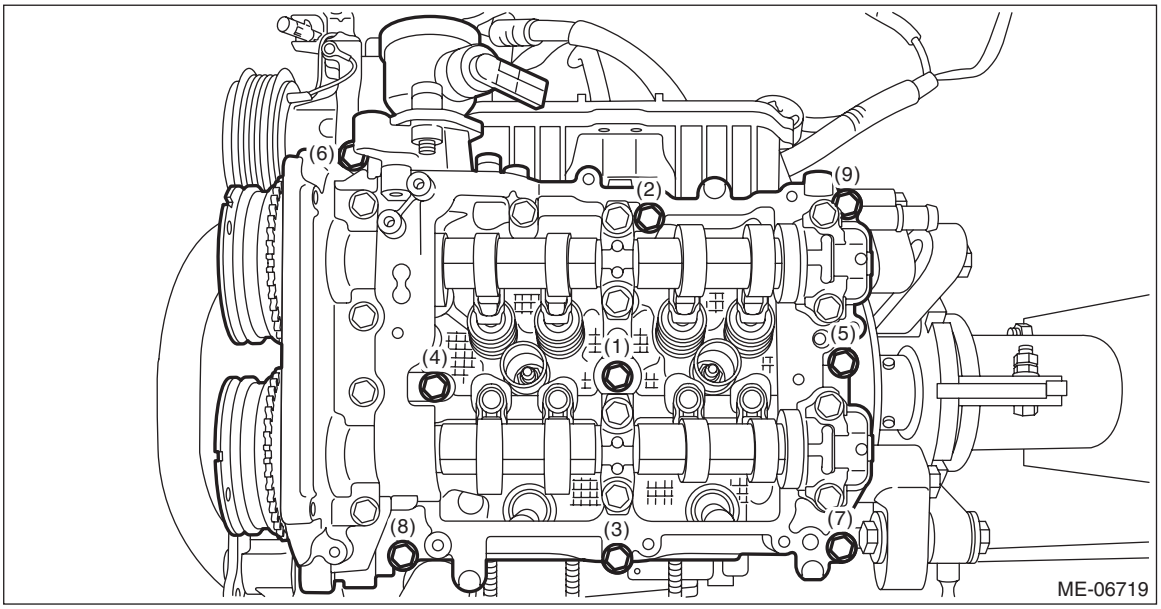


(A)	Range A	(D)	Liquid gasket applying position of mating surfaces other than range A	(G)	0±0.5 mm (0±0.0197 in)
(B)	ϕ18 mm (0.7087 in)	(E)	ϕ3±0.5 mm (0.1181±0.0197 in)	(H)	Chamfer edge
(C)	Liquid gasket applying position of mating surfaces of range A	(F)	1 mm (0.0394 in) or less		

5) Install the cam carrier LH to the cylinder head LH.
   (1) Mount the cam carrier LH, then tighten all bolts with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.

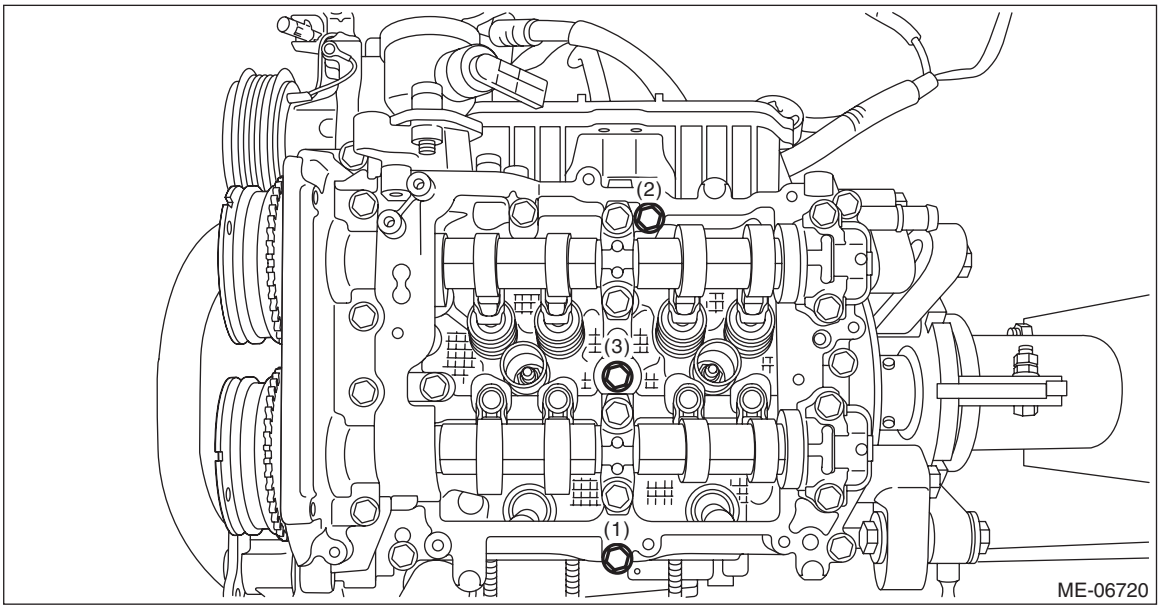
NOTE:
Set the intake camshaft LH and the exhaust camshaft LH to the zero-lift position as shown in the figure.


ME-06718

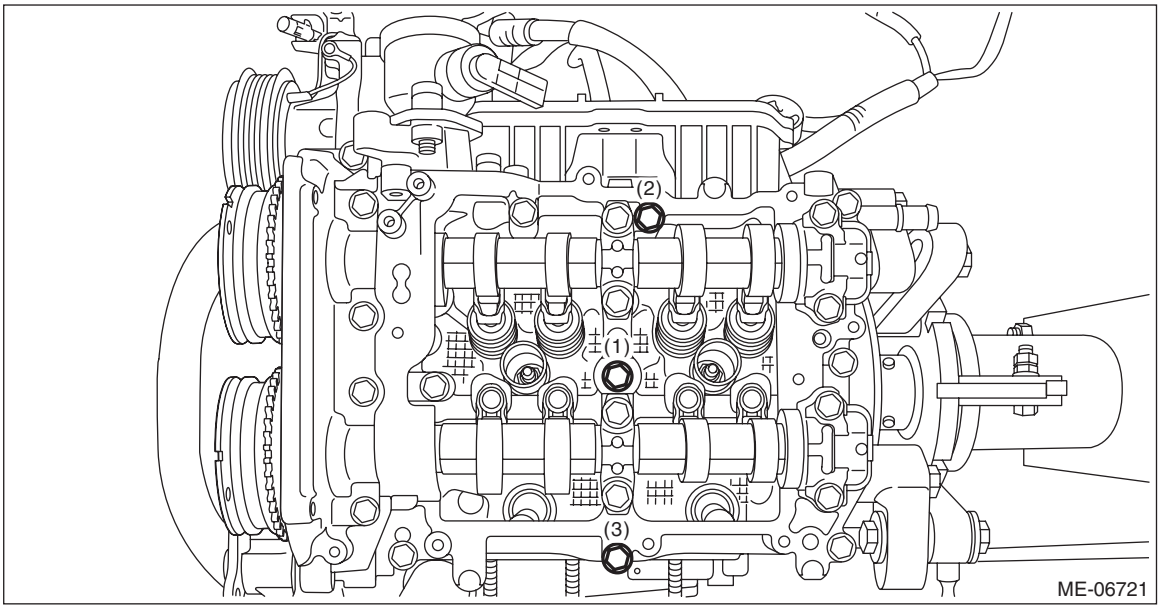


ME-06719

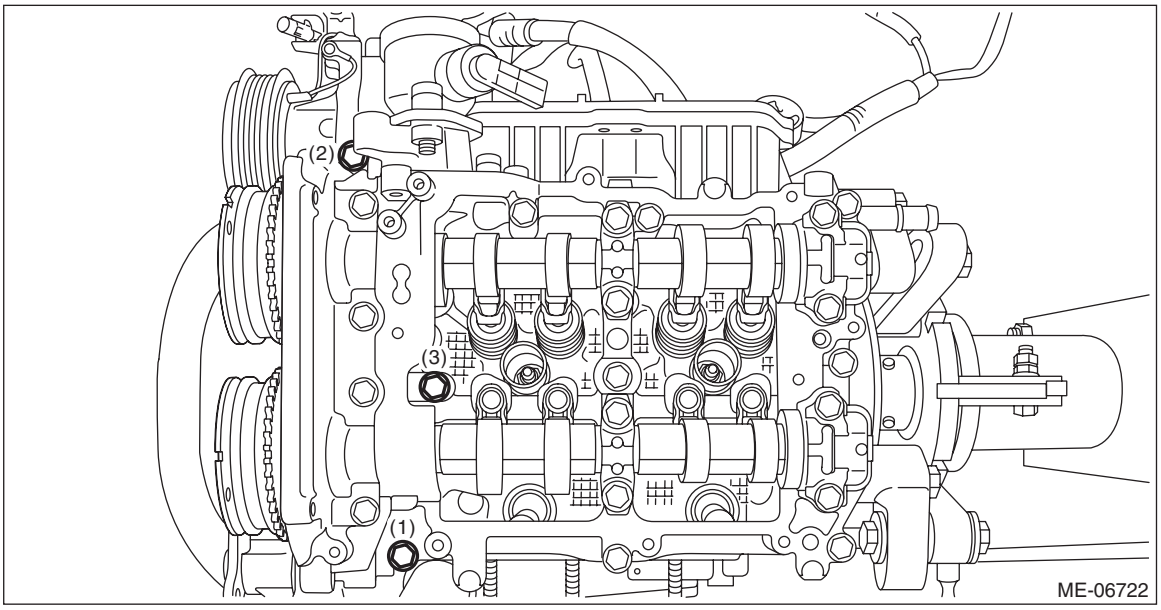
(2) Loosen the bolts (3 places) by 180° in numerical order as shown in the figure.



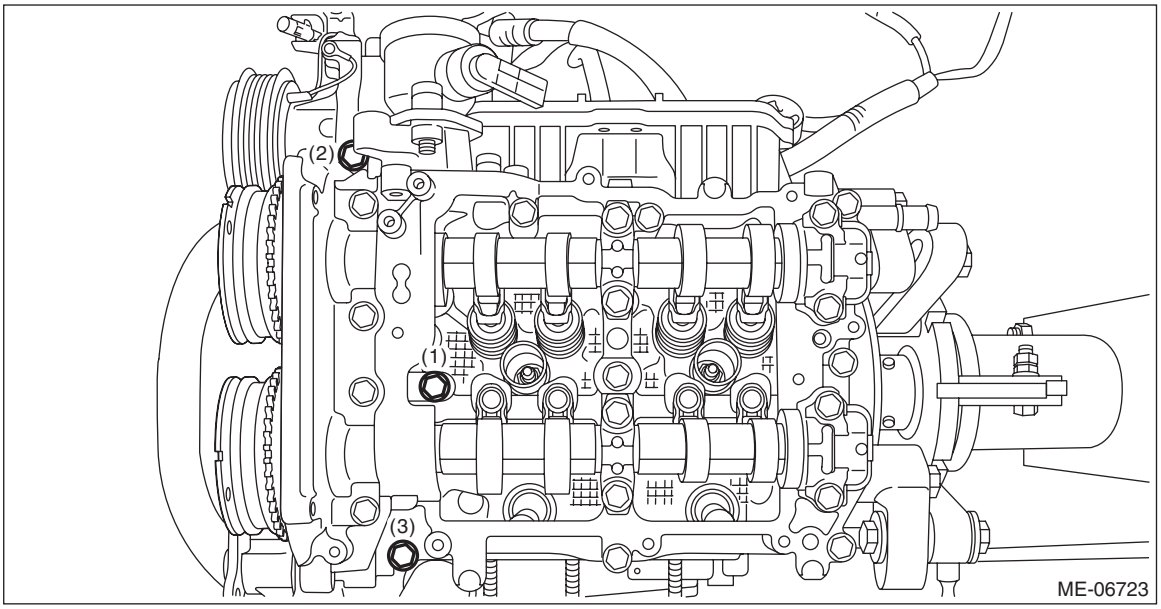
(3) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.



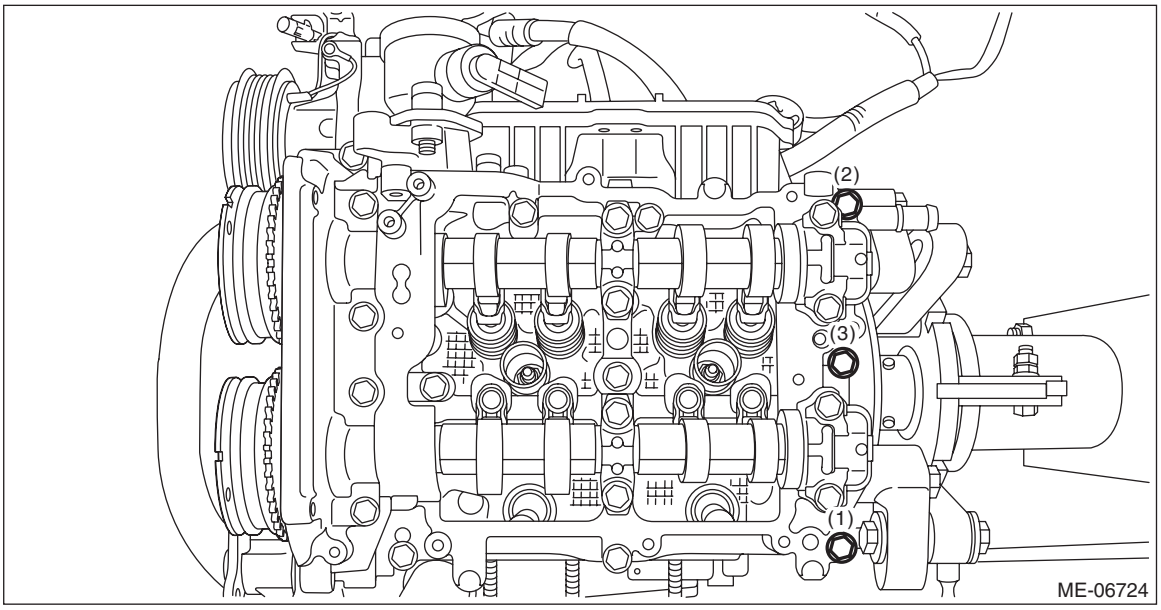
(4) Loosen the bolts (3 places) by 180° in numerical order as shown in the figure.



(5) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.

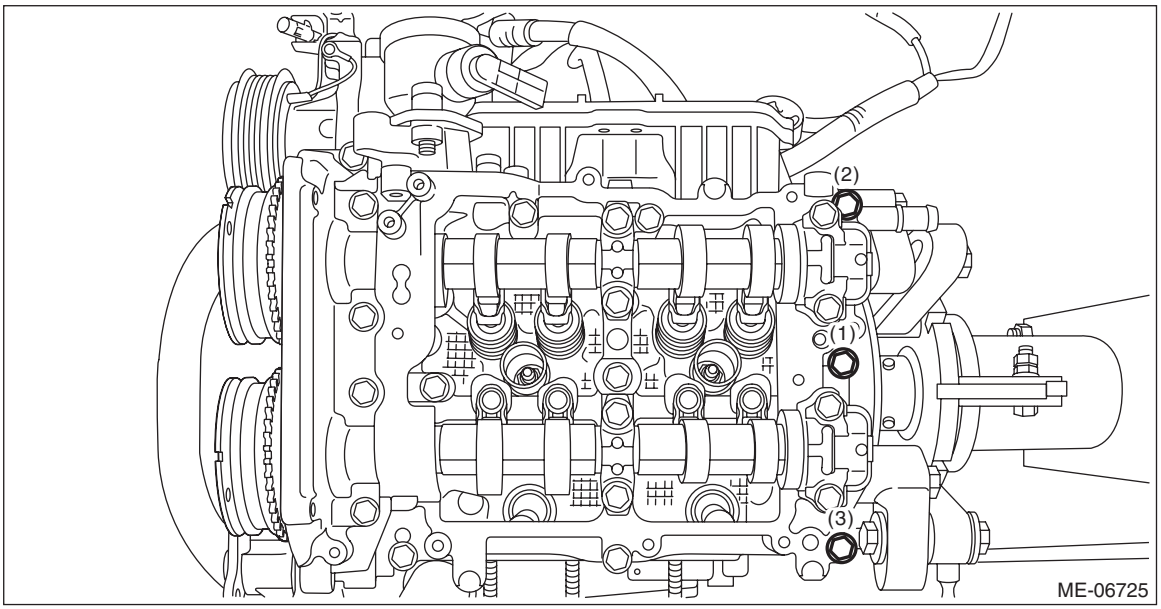


(6) Loosen the bolts (3 places) by 180° in numerical order as shown in the figure.



(7) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.

NOTE:
After tightening, if the liquid gasket is squeezed out onto the seal surface of the chain cover, completely remove any squeezed-out liquid gasket.



6) Set the part so that the installation surface of the intake manifold is on the upper side.

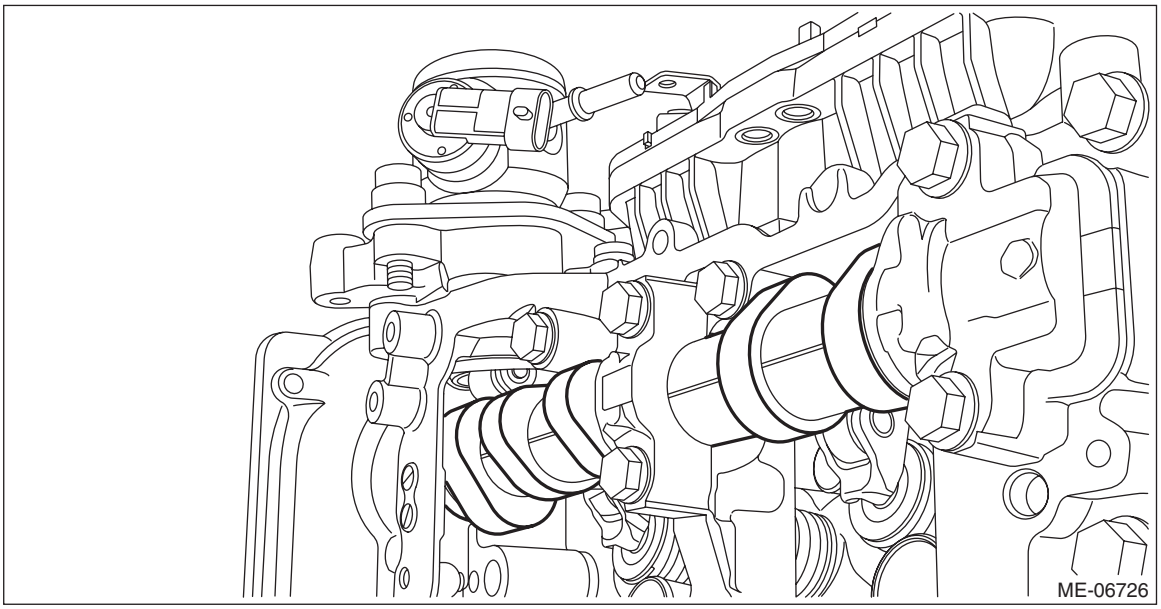
7) When the cam carrier LH has been disassembled

NOTE:
When the cam carrier LH has been disassembled, perform the following steps also.

(1) Install the cam sprocket LH. <Ref. to ME(H4DOTC)-142, CAM SPROCKET LH, INSTALLATION, Cam Sprocket.>

(2) Install the high-pressure fuel pump. <Ref. to FU(H4DOTC)-79, INSTALLATION, High Pressure Fuel Pump.>

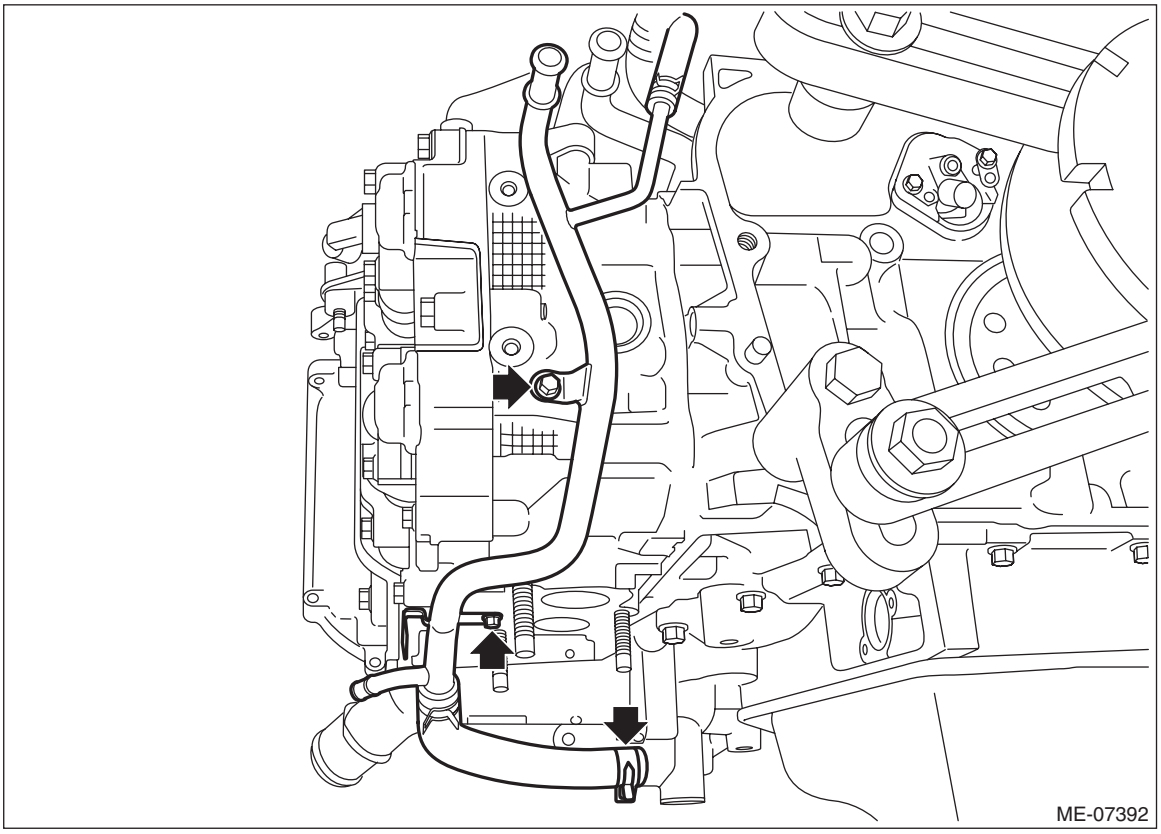
NOTE:
Install the high-pressure fuel pump so that the cam lobes on the intake camshaft LH are positioned as shown in the figure. Perform adjustment within the range of zero-lift (in range where it can be turned lightly by hand).



8) Check the cam clearance. <Ref. to ME(H4DOTC)-39, WHEN TIMING CHAIN ASSEMBLY IS REMOVED, INSPECTION, Cam Clearance.>

9) Connect the water pipe hose to oil pan upper, and install the water pipe assembly.

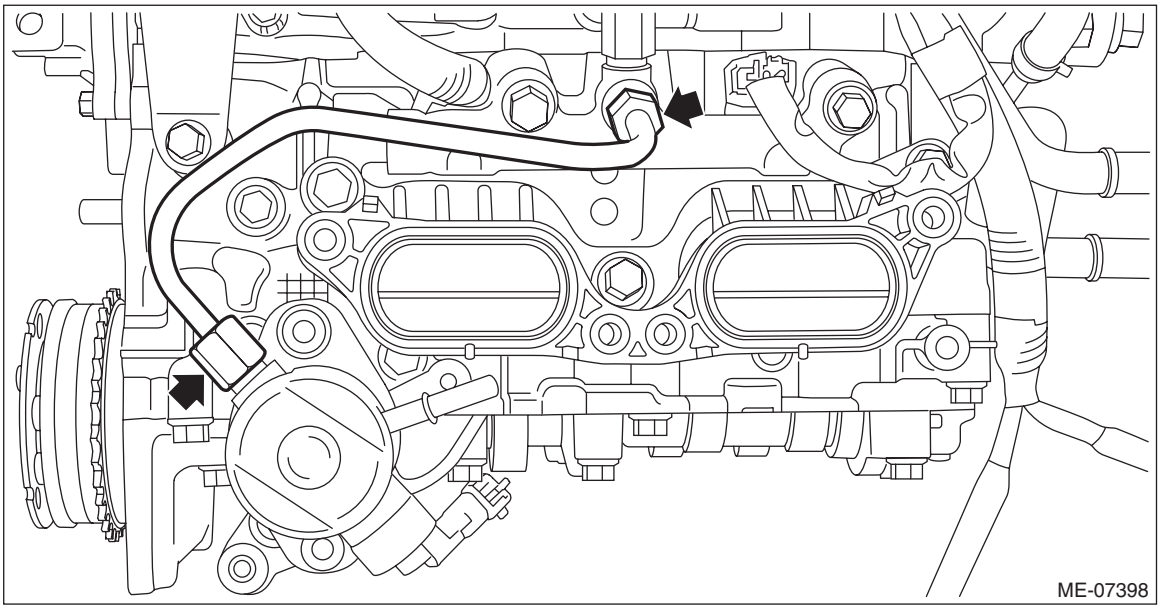
Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



10) Install the high-pressure fuel delivery pipe to the high-pressure fuel pump and fuel injector pipe.

NOTE:
Use a new fuel delivery pipe.

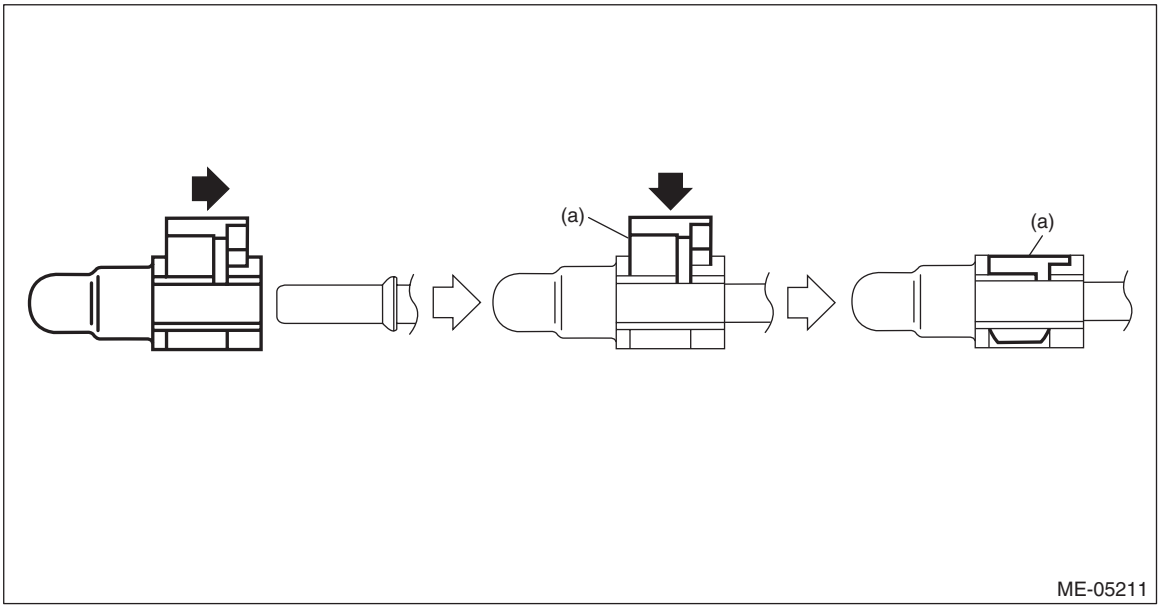
Tightening torque:
25 N·m (2.5 kgf-m, 18.4 ft-lb)



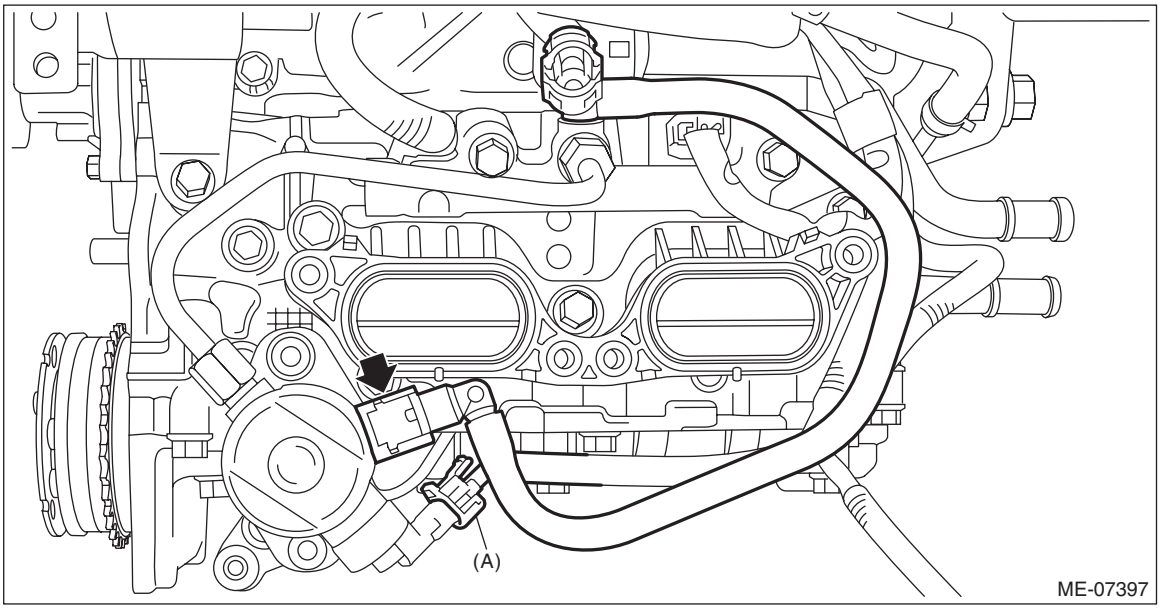
11) Install the fuel delivery pipe to the high-pressure fuel pump, and connect the connector (A) to the high-pressure fuel pump.

CAUTION:
• Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.
• When connecting the quick connector, make sure to insert the pipe all the way in before locking the slider.
• When it is difficult to lock the slider, check that the pipe is fully inserted.
• Make sure that the quick connector is securely connected.

NOTE:
Connect the quick connector as shown in the figure.

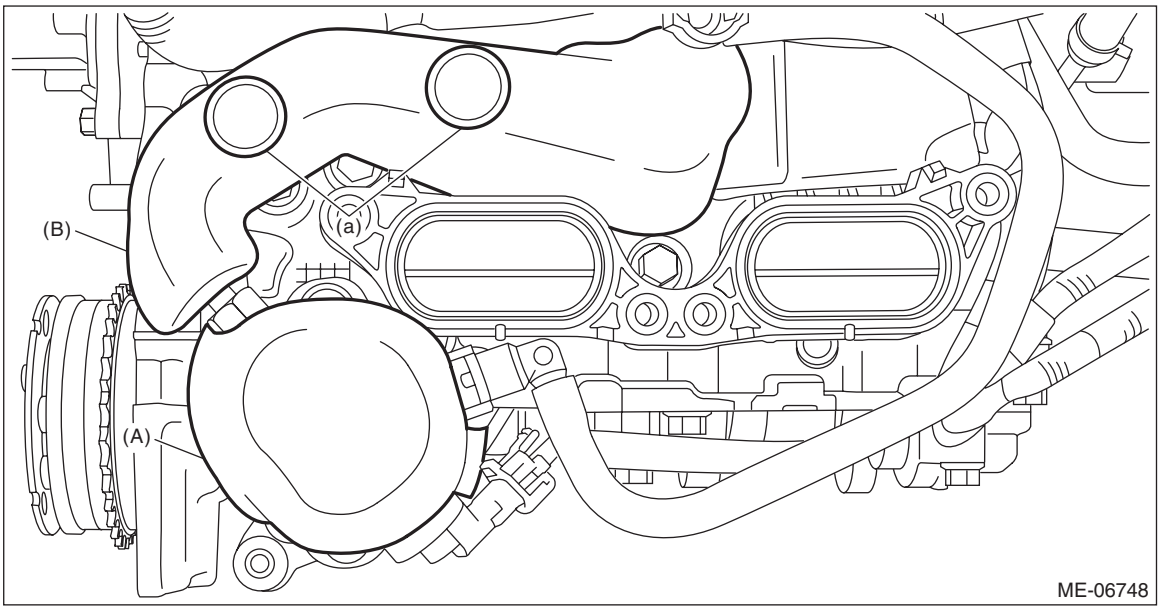


(a) Slider



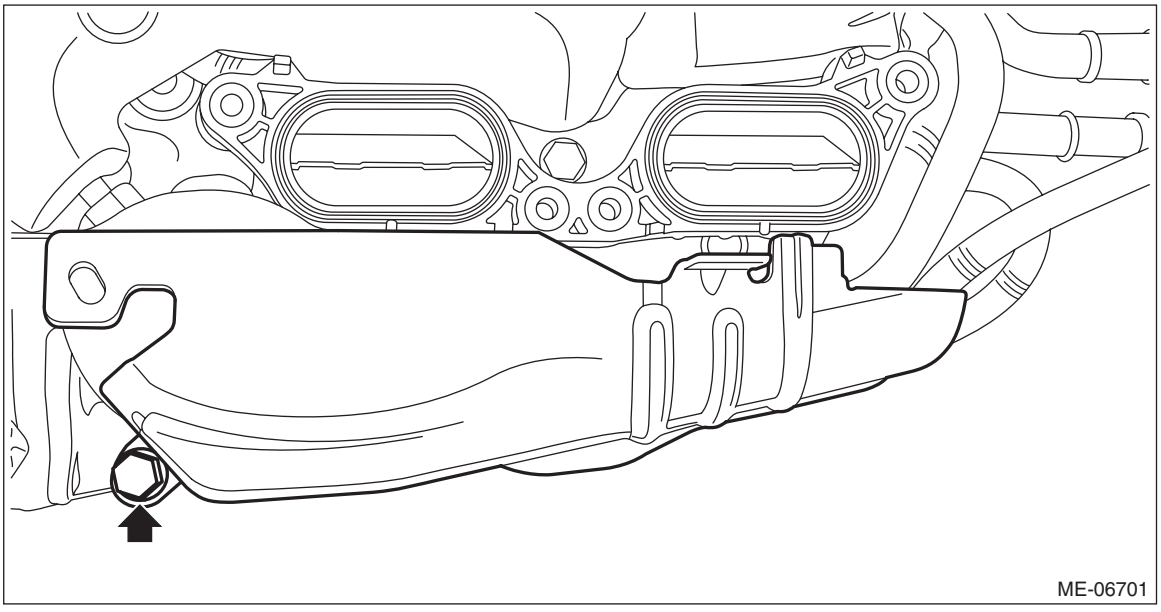
12) Install the fuel pump insulator (A) to the high-pressure fuel pump, and then install the fuel pipe insulator No. 1 (B) to the high-pressure fuel delivery pipe.

NOTE:
By pushing the sections (a) shown in the figure, fix the fuel pipe insulator No. 1 (B) to the high-pressure fuel delivery pipe.

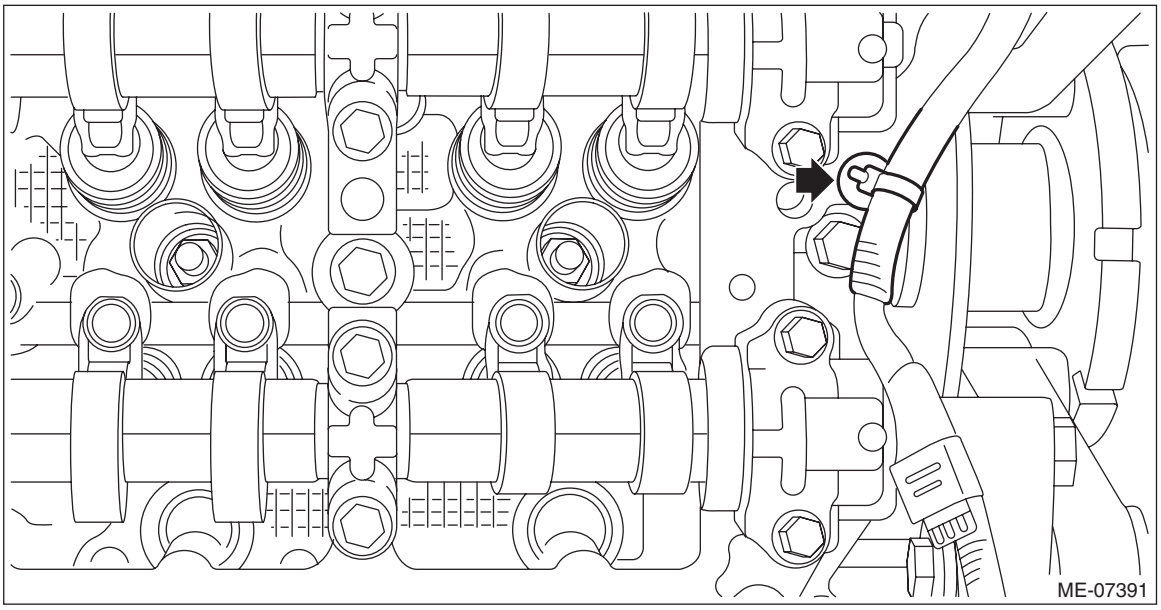


13) Install the fuel pipe protector to the high-pressure fuel pump case.

Tightening torque:
19 N·m (1.9 kgf-m, 14.0 ft-lb)



14) Secure the engine harness to the cam carrier LH with a clip.

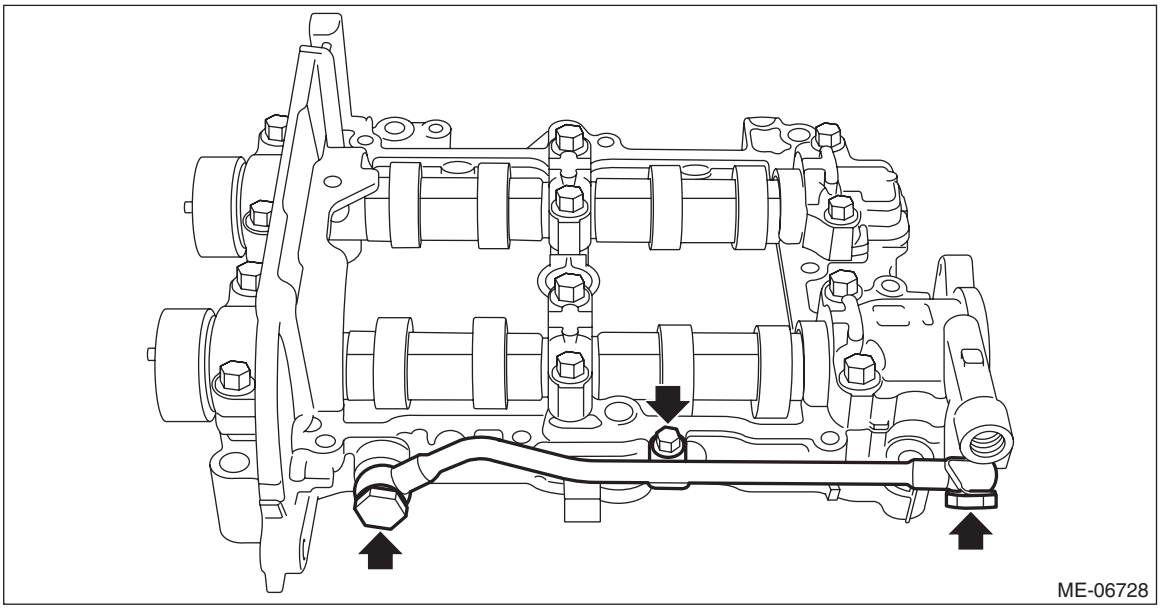


15) Install the rocker cover LH. <Ref. to ME(H4DOTC)-161, ROCKER COVER LH, INSTALLATION, Rocker Cover.>
16) Install timing chain LH. <Ref. to ME(H4DOTC)-120, TIMING CHAIN LH, INSTALLATION, Timing Chain Assembly.>
17) Install the chain cover. <Ref. to ME(H4DOTC)-97, INSTALLATION, Chain Cover.>
18) Install the engine to the vehicle. <Ref. to ME(H4DOTC)-59, INSTALLATION, Engine Assembly.>

C: DISASSEMBLY

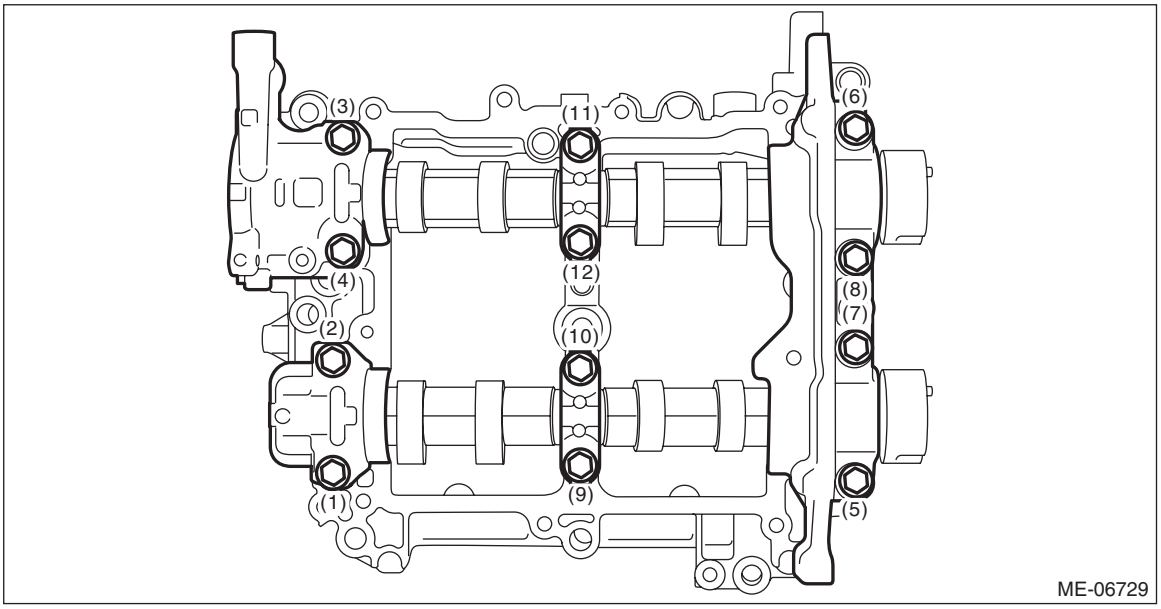
1. CAM CARRIER RH

1) Remove the oil pipe from cam carrier RH.

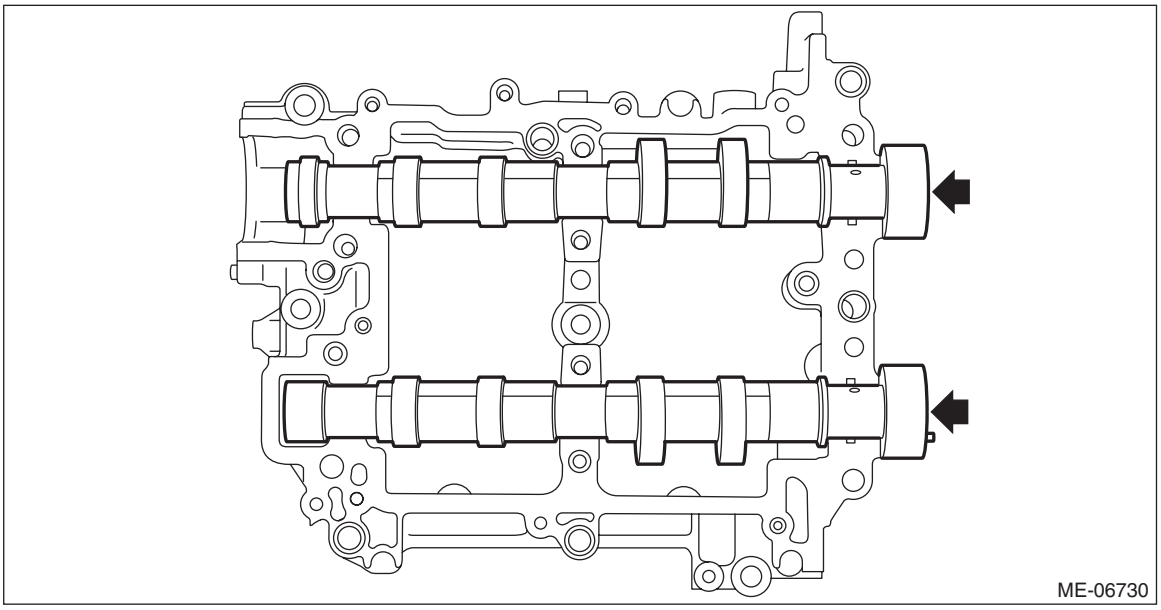


2) Loosen the bolts (front camshaft cap RH, intake center camshaft cap RH, intake rear camshaft cap RH, exhaust center camshaft cap RH, and exhaust rear camshaft cap RH) equally, a little at a time in numerical sequence as shown in the figure, and remove each camshaft cap.

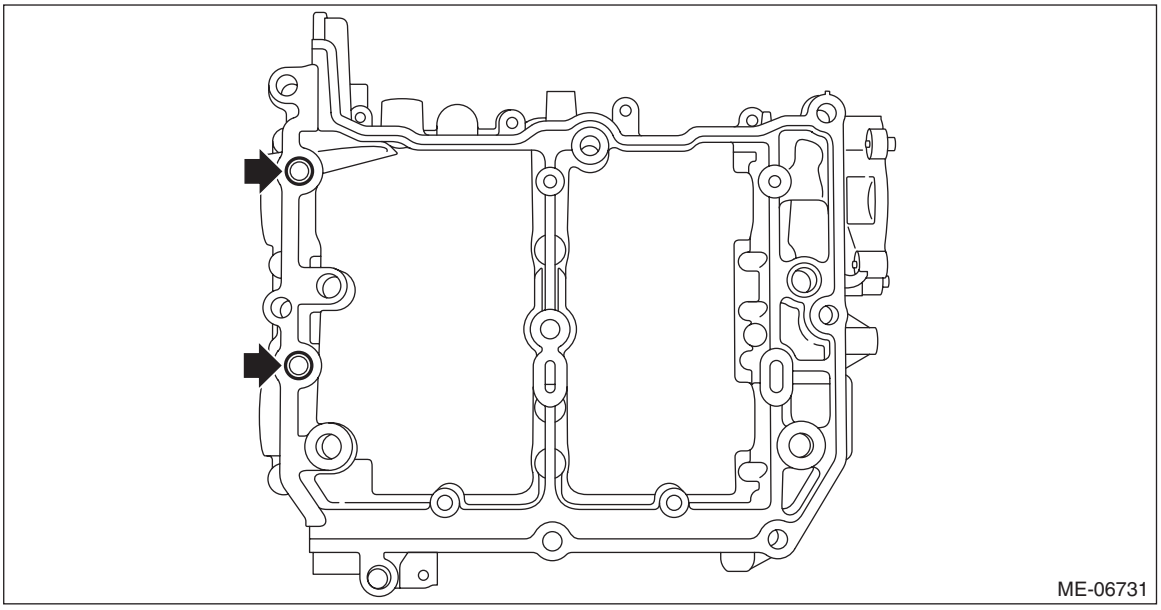
NOTE:
Arrange camshaft caps in order so that they can be installed in their original positions.



3) Remove the intake camshaft RH and the exhaust camshaft RH from cam carrier RH.



4) Remove the filter from cam carrier RH.

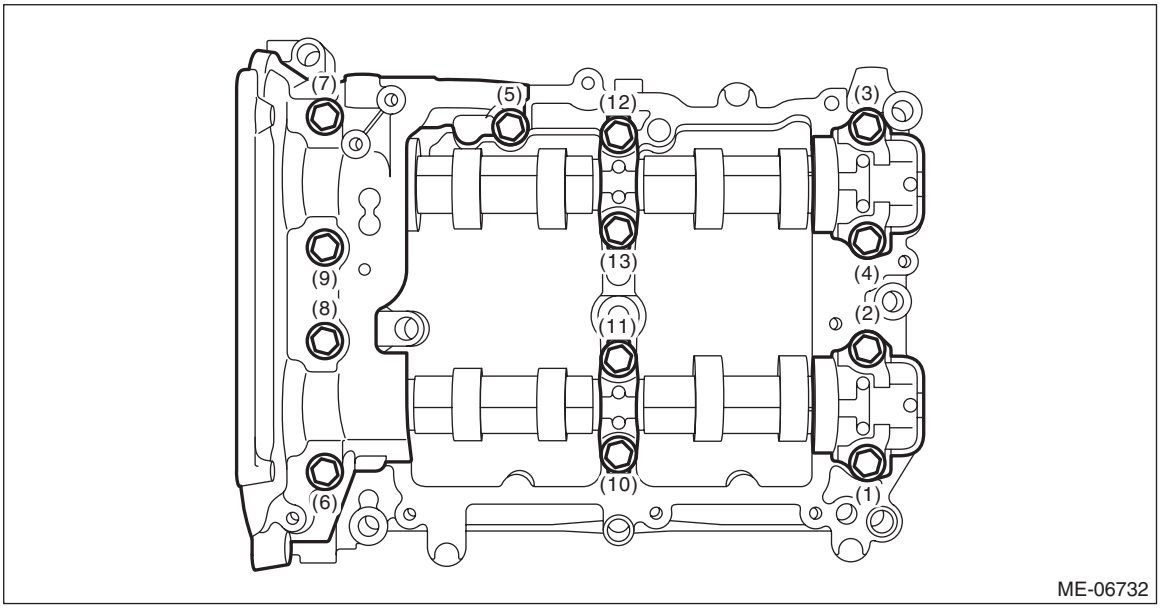


5) Remove the liquid gasket from cam carrier RH and front camshaft cap RH, intake rear camshaft cap RH and exhaust rear camshaft cap RH.

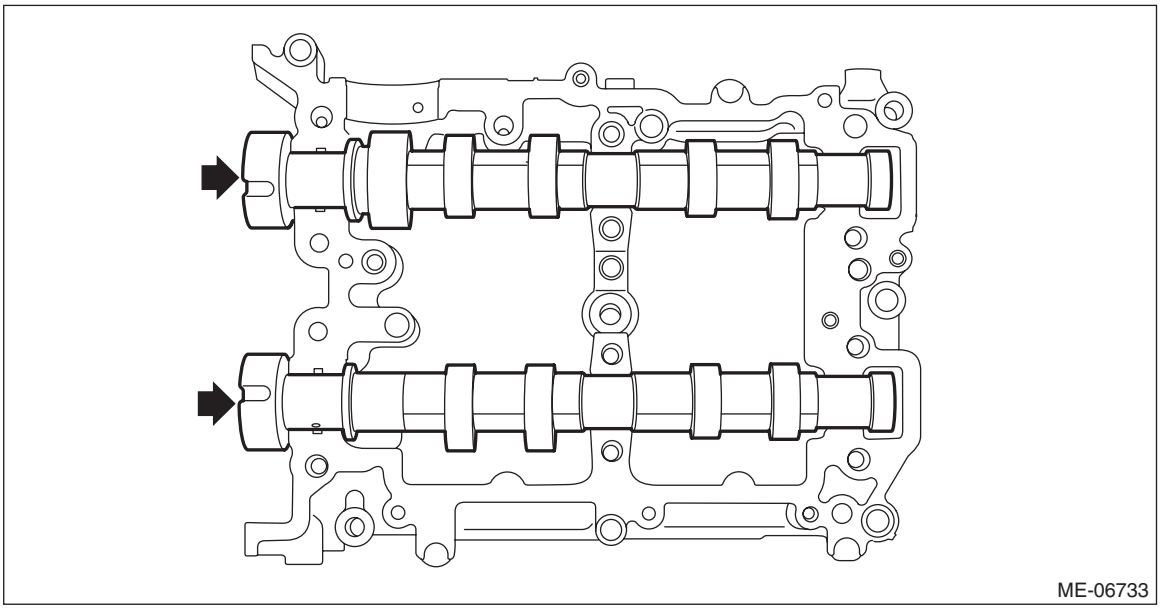
2. CAM CARRIER LH

1) Loosen the bolts (front camshaft cap LH, intake center camshaft cap LH, intake rear camshaft cap LH, exhaust center camshaft cap LH and exhaust rear camshaft cap LH) equally, a little at a time in numerical sequence as shown in the figure, and remove each camshaft cap.

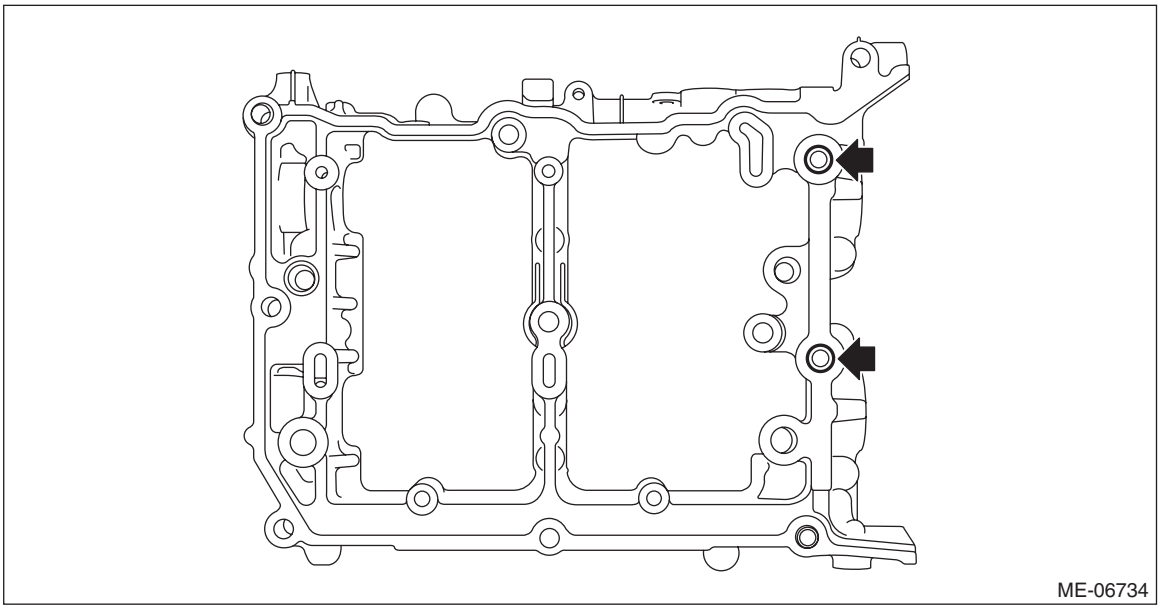
NOTE:
Arrange camshaft caps in order so that they can be installed in their original positions.



2) Remove the intake camshaft LH and the exhaust camshaft LH from cam carrier LH.



3) Remove the filter from cam carrier LH.



4) Remove the liquid gasket from cam carrier LH and front camshaft cap LH, intake rear camshaft cap LH and exhaust rear camshaft cap LH.

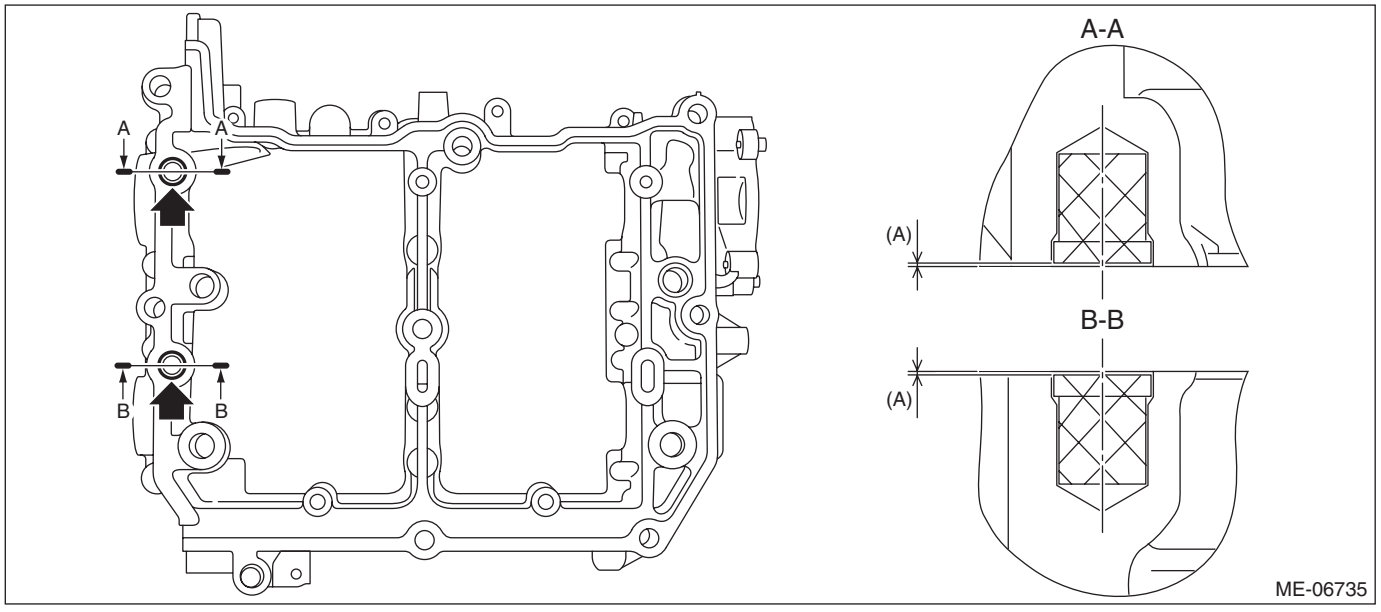
D: ASSEMBLY

1. CAM CARRIER RH

1) Install the filter to the cam carrier RH.

NOTE:
Use a new filter.

Filter insert position:
Cam carrier RH end face $0^{+0}_{-0.5}$ mm ($^{+0}_{-0.0197}$ in) position



(A) 0 — 0.5 mm (0 — 0.0197 in)

2) Set the intake camshaft RH and the exhaust camshaft RH to the cam carrier RH.

NOTE:
Apply engine oil to the journals of cam carrier RH before setting the intake camshaft RH and exhaust camshaft RH.

3) Install the front camshaft cap RH, intake center camshaft cap RH, intake rear camshaft cap RH, exhaust center camshaft cap RH and exhaust rear camshaft cap RH.

(1) Apply liquid gasket to the mating surface of front camshaft cap RH, intake rear camshaft cap RH and exhaust rear camshaft cap RH as shown in the figure.

CAUTION:

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

• Do not apply liquid gasket excessively to the intake center camshaft cap RH and exhaust center camshaft cap RH.

NOTE:

• Before applying liquid gasket, degrease the old liquid gasket seal surface of the front camshaft cap RH, intake rear camshaft cap RH, exhaust rear camshaft cap RH, and cam carrier RH.

• Install within 5 min. after applying liquid gasket.

Liquid gasket:

THREE BOND 1217G (Part No. 0877Y0100) or equivalent

Liquid gasket applying diameter:

Mating surfaces other than ranges A and B

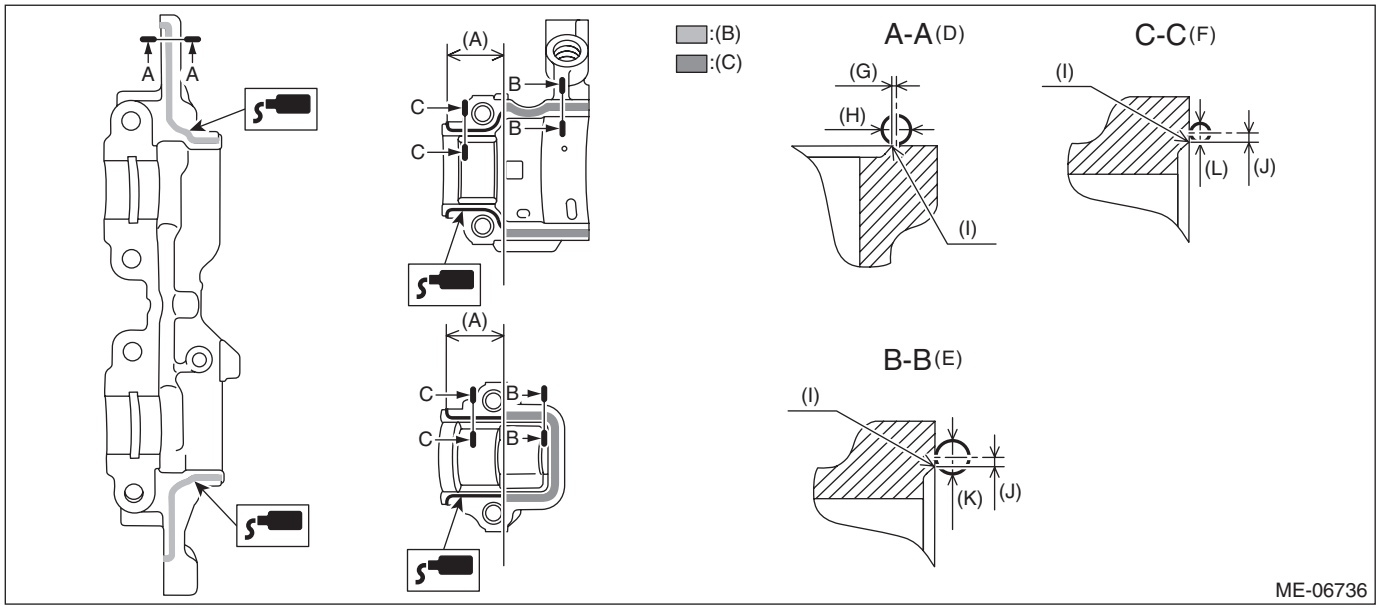
2±0.5 mm (0.0787±0.0197 in)

Mating surfaces of range A

$3^{+1}_{-0.5}$ mm ($0.1181^{+0.0394}_{-0.0197}$ in)

Mating surfaces of range B

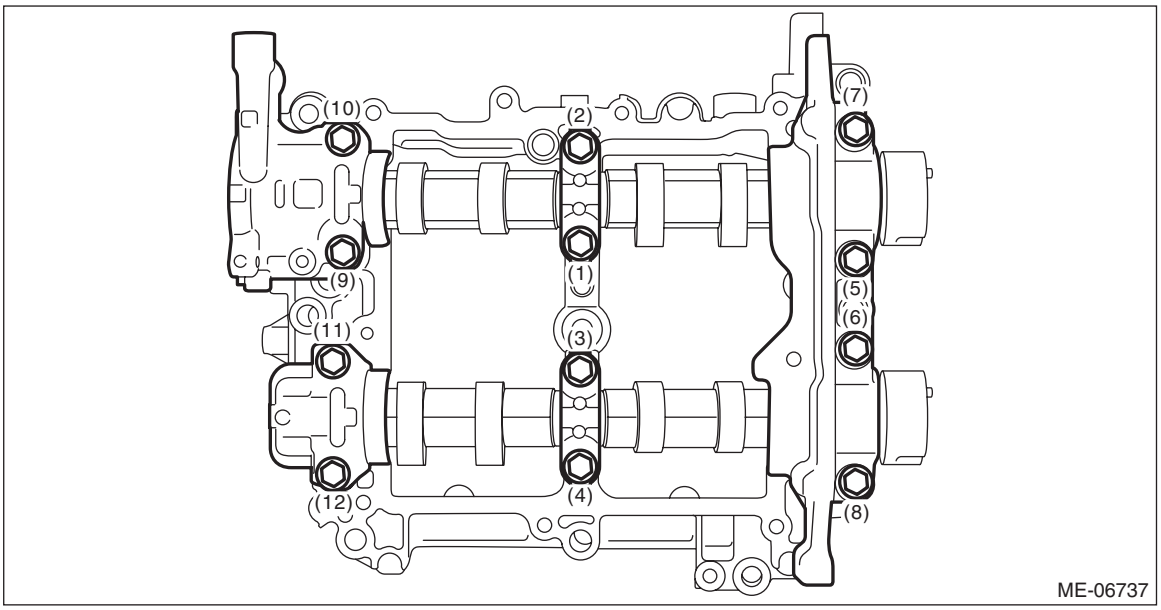
3.5±0.5 mm (0.1378±0.0197 in)



(A)	28.5 mm (1.122 in)	(E)	Liquid gasket applying position of mating surfaces of range B	(I)	Chamfer edge
(B)	Range A	(F)	Liquid gasket applying position of mating surfaces other than range A and range B	(J)	1 mm (0.0394 in) or less
(C)	Range B	(G)	0.5 mm (0.0197 in)	(K)	ϕ3.5±0.5 mm (0.1378±0.0197 in)
(D)	Liquid gasket applying position of mating surfaces of range A	(H)	$\phi 3^{+1}_{-0.5}$ mm ($0.1181^{+0.0394}_{-0.0197}$ in)	(L)	ϕ2±0.5 mm (0.0787±0.0197 in)

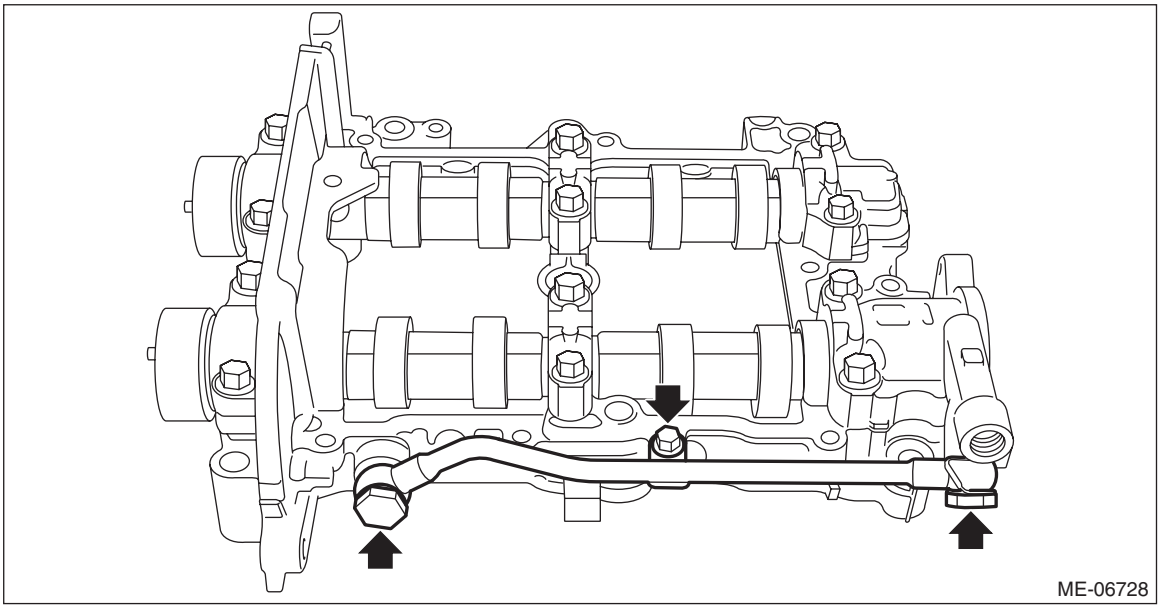
(2) Apply engine oil to the journals of each camshaft cap before setting the camshaft cap.
(3) Tighten the bolts which secure front camshaft cap RH, intake center camshaft cap RH, intake rear camshaft cap RH, exhaust center camshaft cap RH and exhaust rear camshaft cap RH in numerical order as shown in the figure.

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)



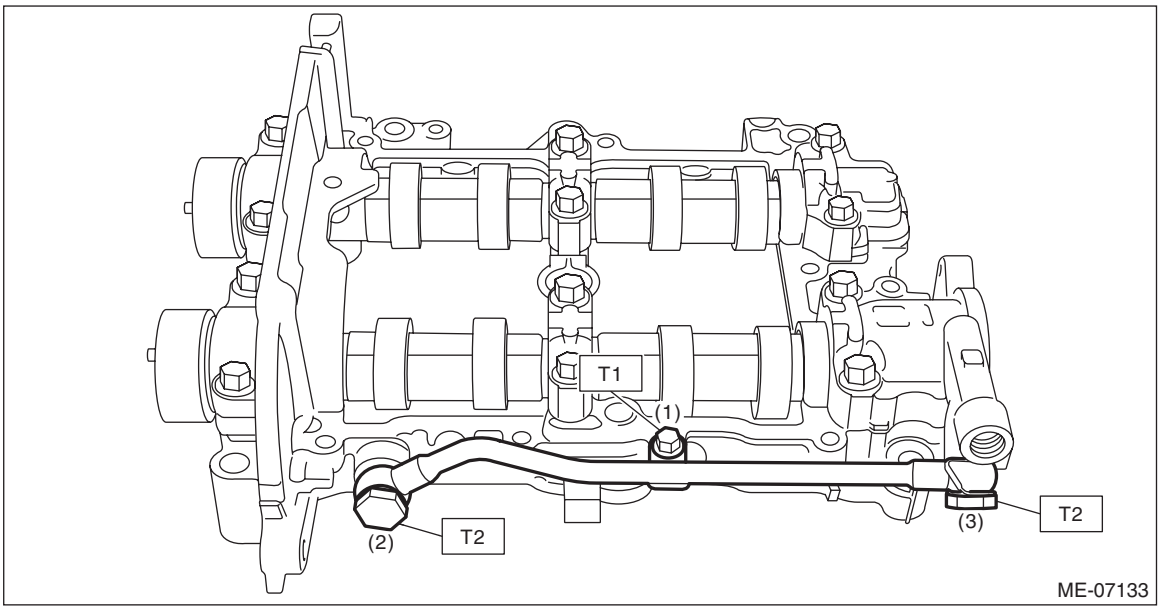
4) Install the oil pipe to the cam carrier RH.
(1) Set the oil pipe to the cam carrier RH, and temporarily tighten the bolts which secure the oil pipe to the cam carrier RH.

NOTE:
Use a new gasket.



(2) Tighten the bolts which secures the oil pipe to the cam carrier RH in numerical order as shown in the figure.

Tightening torque:
T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
T2: 31 N·m (3.2 kgf-m, 22.9 ft-lb)

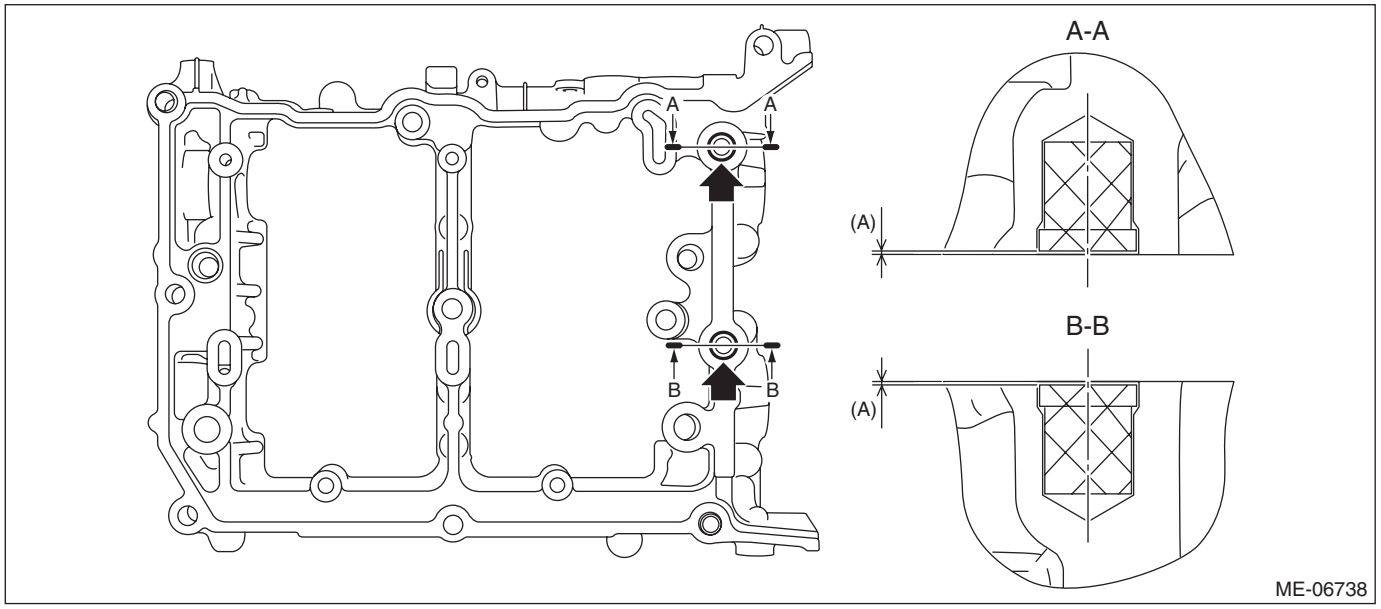


2. CAM CARRIER LH

1) Install the filter to the cam carrier LH.

NOTE:
Use a new filter.

Filter insert position:
Cam carrier LH end face $0^{+0}_{-0.5}$ mm ($^{+0}_{-0.0197}$ in) position



(A) 0 — 0.5 mm (0 — 0.0197 in)

2) Set the intake camshaft LH and the exhaust camshaft LH to the cam carrier LH.

NOTE:
Apply engine oil to the journals of cam carrier LH before setting the intake camshaft LH and exhaust camshaft LH.

3) Install the front camshaft cap LH, intake center camshaft cap LH, intake rear camshaft cap LH, exhaust center camshaft cap LH and exhaust rear camshaft cap LH.

(1) Apply liquid gasket to the mating surface of front camshaft cap LH, intake rear camshaft cap LH and exhaust rear camshaft cap LH as shown in the figure.

CAUTION:

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

• Do not apply liquid gasket excessively to the intake center camshaft cap LH and exhaust center camshaft cap LH.

NOTE:

• Before applying liquid gasket, degrease the old liquid gasket seal surface of the front camshaft cap LH, intake rear camshaft cap LH, exhaust rear camshaft cap LH, and cam carrier LH.

• Install within 5 min. after applying liquid gasket.

Liquid gasket:

THREE BOND 1217G (Part No. 0877Y0100) or equivalent

Liquid gasket applying diameter:

Mating surfaces other than ranges A, B and C

2±0.5 mm (0.0787±0.0197 in)

Mating surfaces of range A

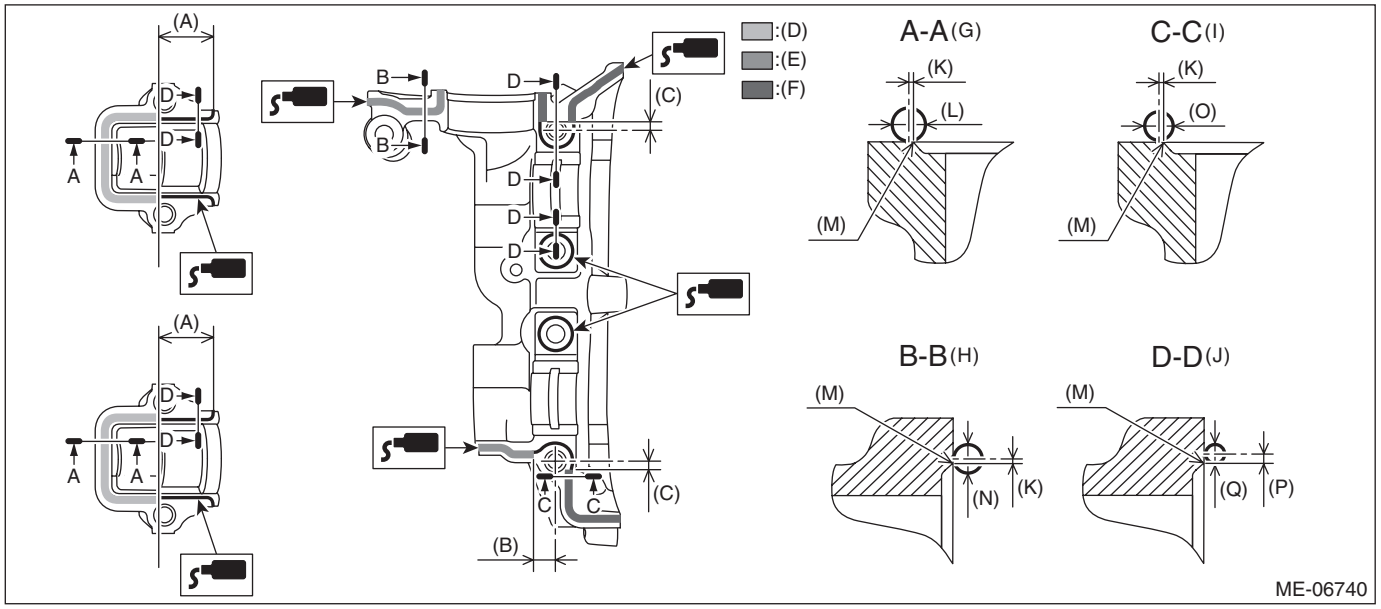
3.5±0.5 mm (0.1378±0.0197 in)

Mating surfaces of range B

3±0.5 mm (0.1181±0.0197 in)

Mating surfaces of range C

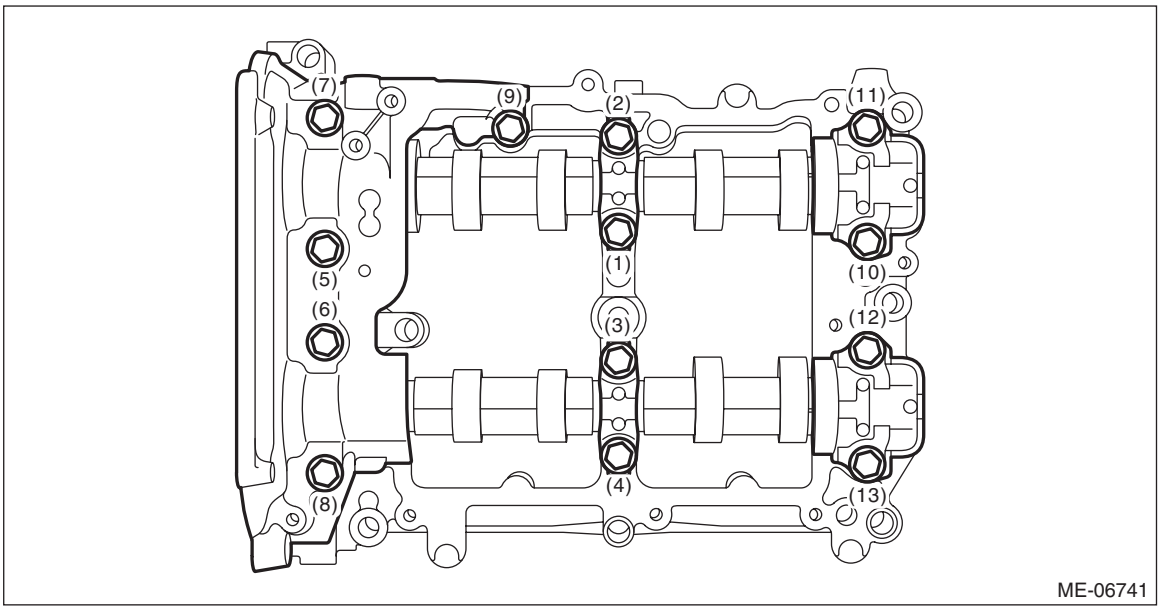
$3^{+1}_{-0.5}$ mm ($0.1181^{+0.0394}_{-0.0197}$ in)



(A)	28.5 mm (1.122 in)	(G)	Liquid gasket applying position of mating surfaces of range A	(M)	Chamfer edge
(B)	11.6 mm (0.4567 in)	(H)	Liquid gasket applying position of mating surfaces of range B	(N)	ϕ3±0.5 mm (0.1181±0.0197 in)
(C)	5.1 mm (0.2008 in)	(I)	Liquid gasket applying position of mating surfaces of range C	(O)	$\phi 3^{+1}_{-0.5}$ mm ($0.1181^{+0.0394}_{-0.0197}$ in)
(D)	Range A	(J)	Liquid gasket applying position of mating surfaces other than range A, range B and range C	(P)	1 mm (0.0394 in) or less
(E)	Range B	(K)	0.5 mm (0.0197 in)	(Q)	ϕ2±0.5 mm (0.0787±0.0197 in)
(F)	Range C	(L)	ϕ3.5±0.5 mm (0.1378±0.0197 in)		

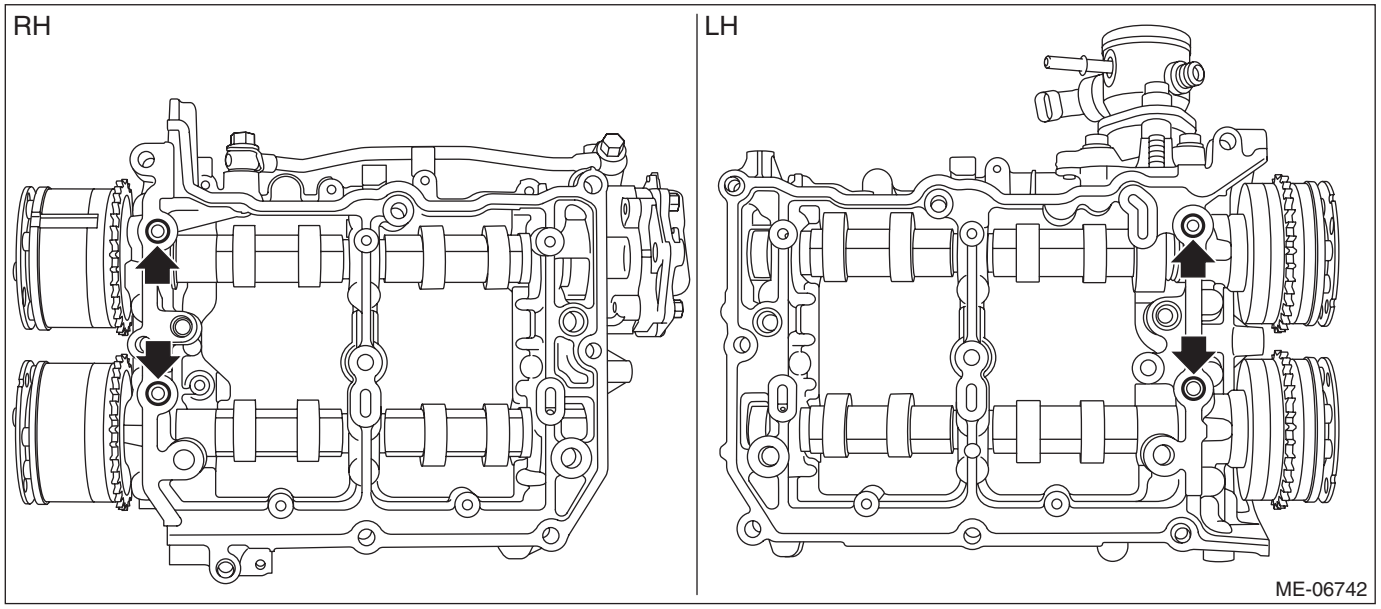
(2) Apply engine oil to the journals of each camshaft cap before setting the camshaft cap.
(3) Tighten the bolts which secure front camshaft cap LH, intake center camshaft cap LH, intake rear camshaft cap LH, exhaust center camshaft cap LH and exhaust rear camshaft cap LH in numerical order as shown in the figure.

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)



E: INSPECTION

1) Visually check the cam carrier filter, and if clogging is found, replace with a new part.

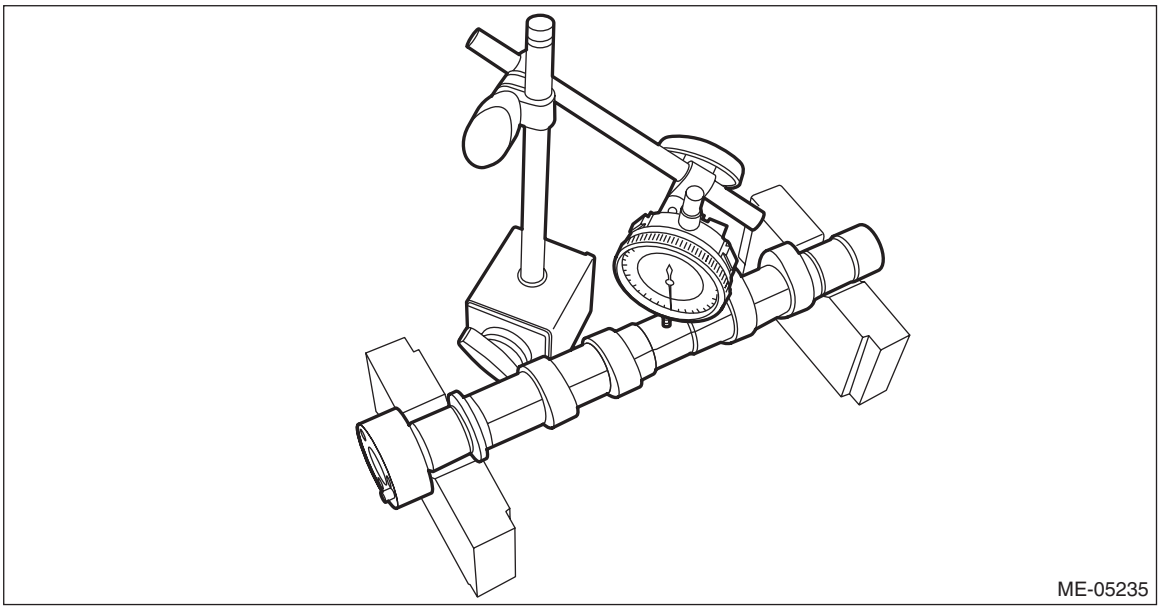


2) Check the camshaft journals for damage and wear. Replace the camshaft if faulty.
3) Check the cam face condition of camshaft, and remove the minor faults by grinding with oil stone. Replace the camshaft if uneven wear is found.

4) Using a dial gauge, check the camshaft bend. If it exceeds the limit, replace the camshaft.

NOTE:
Measurement should be performed at a temperature of 20°C (68°F).

Camshaft bend:
Limit
0.020 mm (0.00079 in)



5) Check the cam lobe height “H” and cam base circle diameter “A” of camshaft as shown in the figure, using micrometer. If it is not within the standard, replace the camshaft.

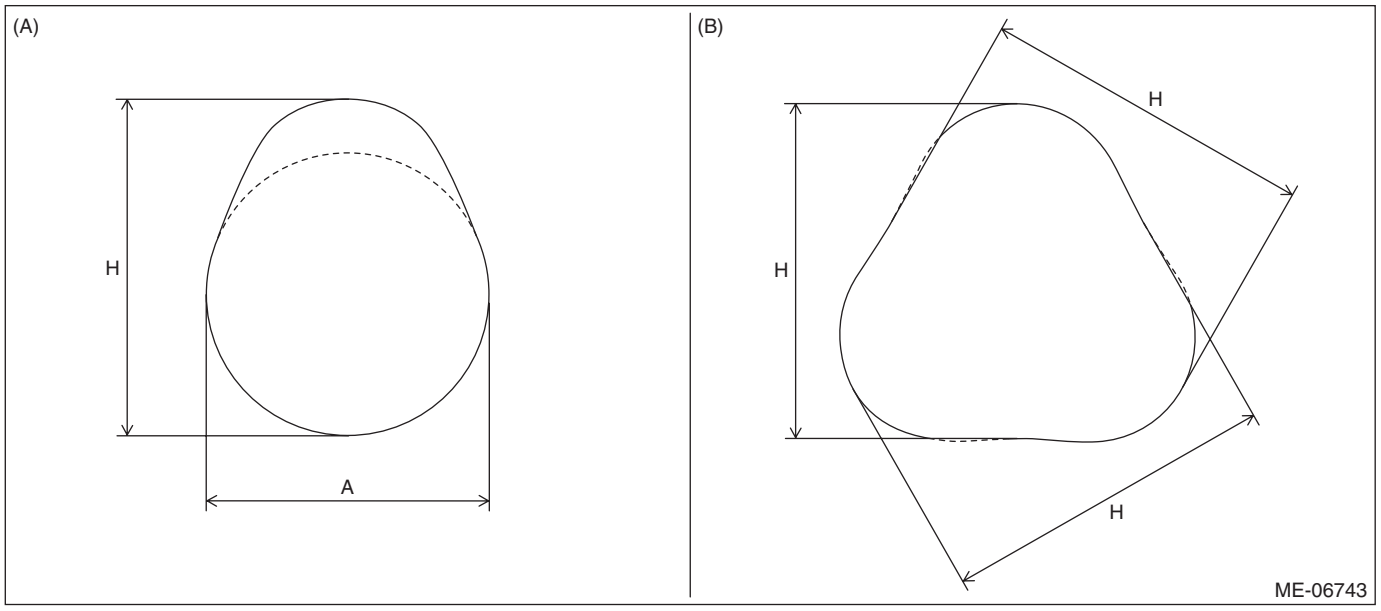
NOTE:
- Measurement should be performed at a temperature of 20°C (68°F).
- Perform measurement of cam lobe height for fuel pump drive section at three points.

Camshaft cam lobe overall height H:

Intake
Valve drive section
Standard
40.77 — 40.87 mm (1.605 — 1.609 in)
Fuel pump drive section
Standard
41.97 — 42.03 mm (1.652 — 1.655 in)

Exhaust
Standard
40.72 — 40.82 mm (1.603 — 1.607 in)

Camshaft cam base circle diameter A:
Standard
34.0 mm (1.339 in)

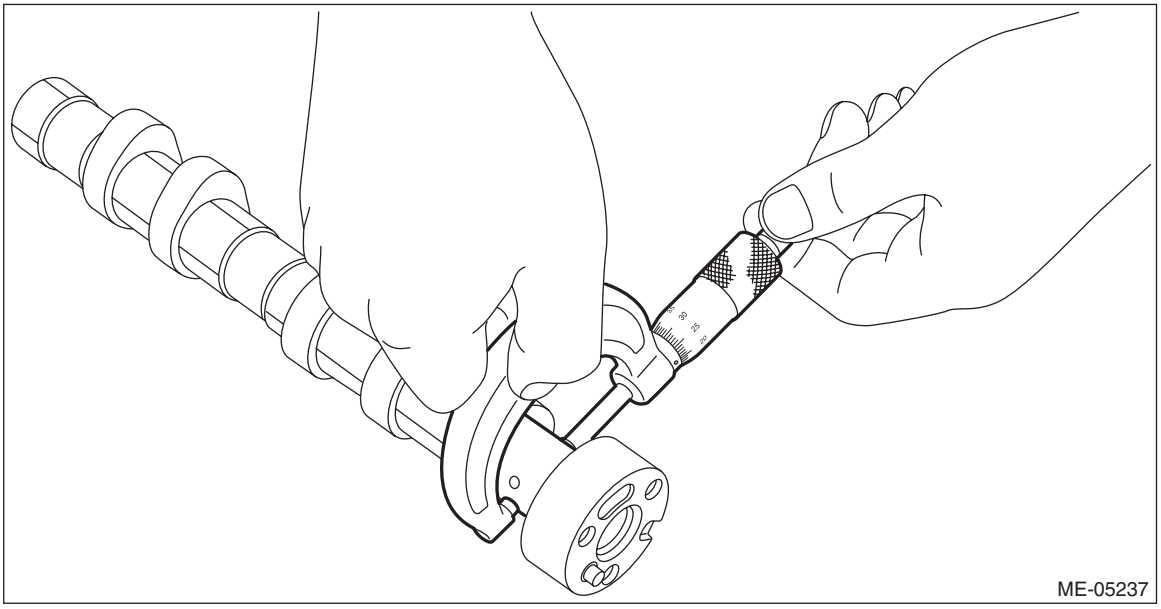


(A) Valve drive section (B) Fuel pump drive section

6) Check the camshaft journal outer diameter using micrometer. If it is not within the standard, replace the camshaft.

NOTE:
- Measurement should be performed at a temperature of 20°C (68°F).
- Measure outer diameter of each journal at several points, and read the value of most worn location.

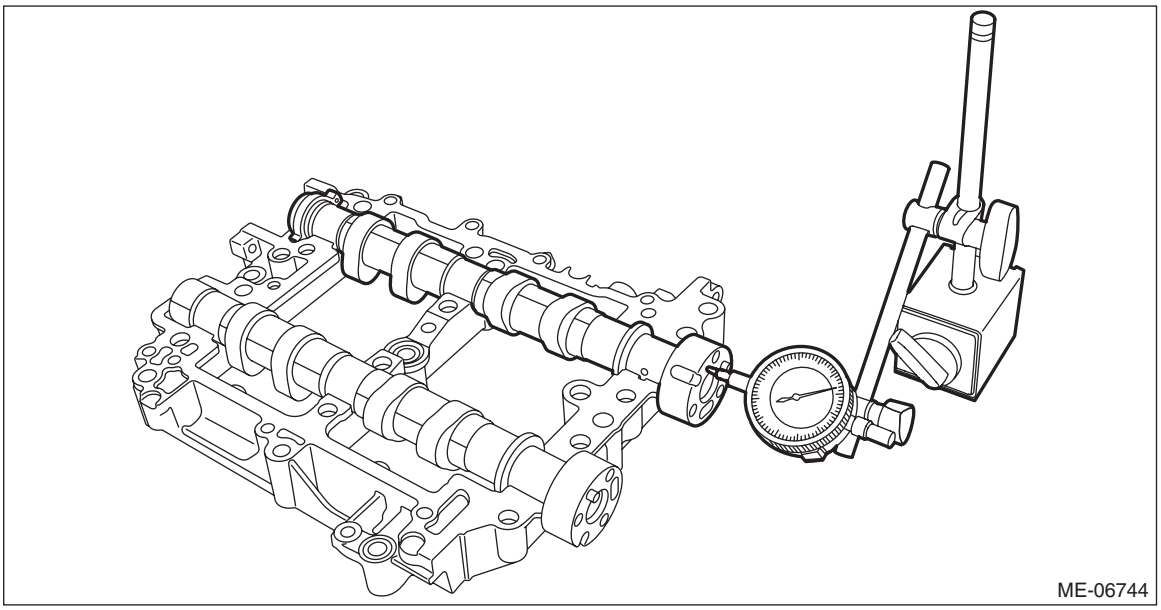
Camshaft journal outer diameter:
Standard
25.946 — 25.963 mm (1.0215 — 1.0222 in)



7) Using a dial gauge, check the thrust clearance of the camshaft. If it is not within the standard or if uneven wear is found, replace each camshaft cap and cam carrier as a set. If necessary replace the camshaft.

NOTE:
- Measurement should be performed at a temperature of 20°C (68°F).
- Set the dial gauge at end surface of camshaft.

Camshaft thrust clearance:
Standard
0.068 — 0.116 mm (0.0027 — 0.0047 in)



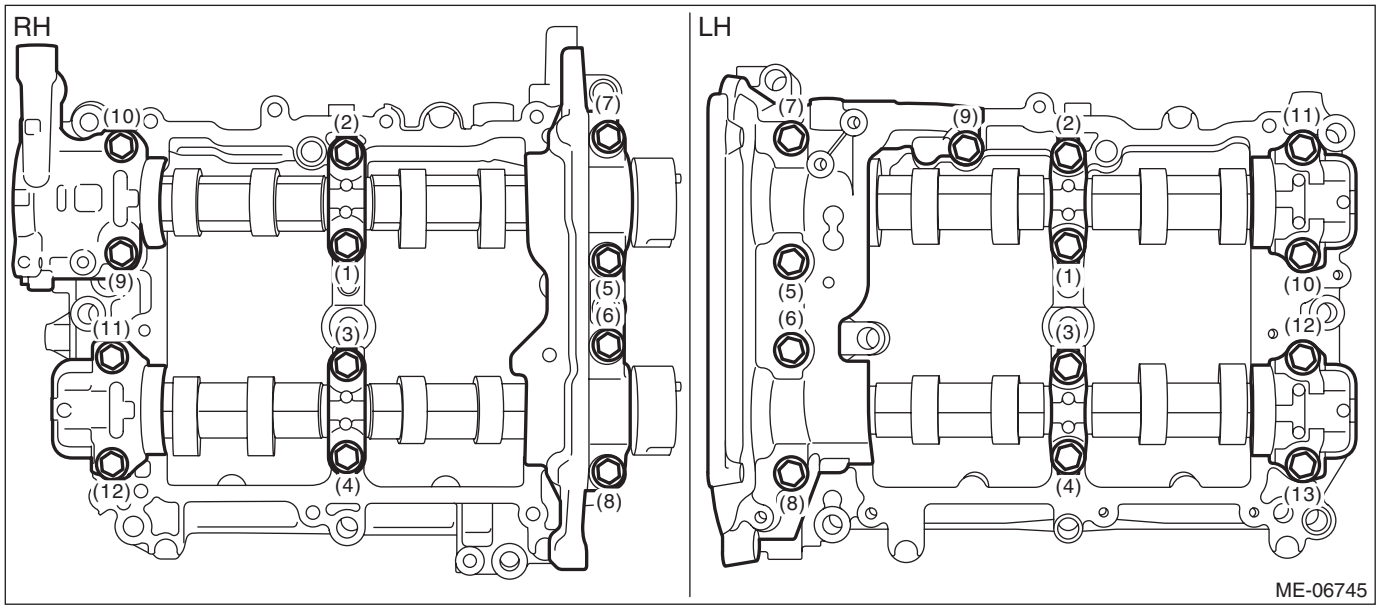
8) Check the oil clearance on the camshaft using a plastigauge.

NOTE:
Measurement should be performed at a temperature of 20°C (68°F).

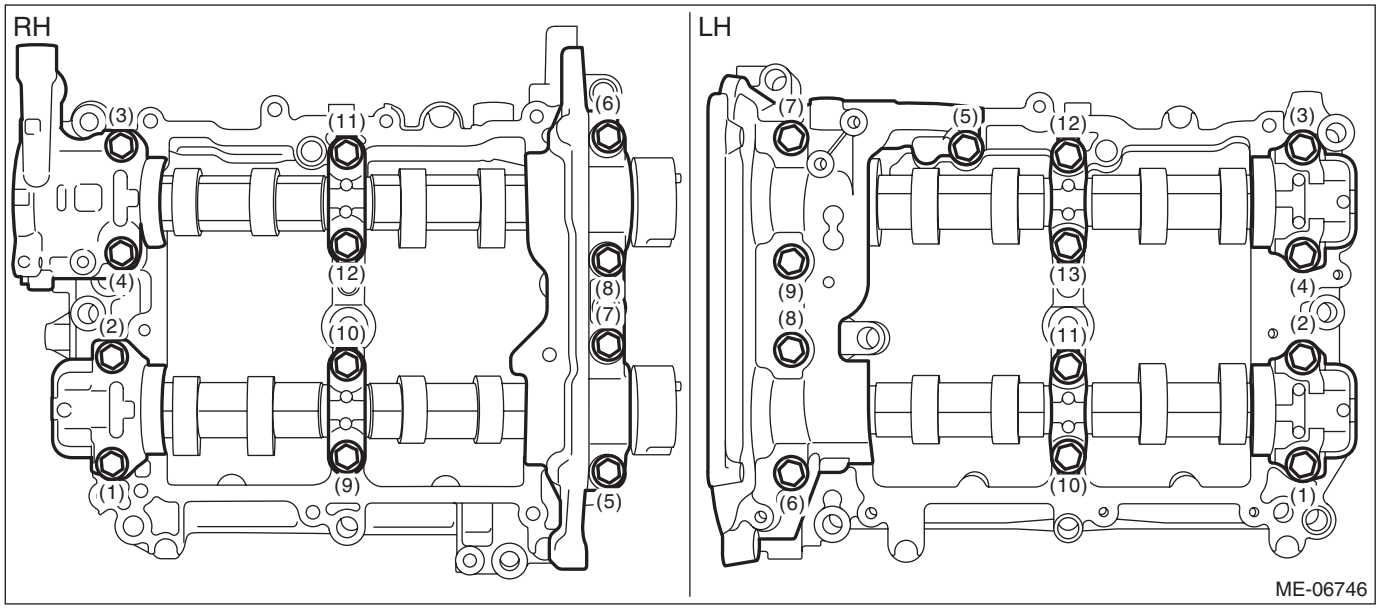
(1) Remove the liquid gasket from cam carrier and front camshaft cap, intake rear camshaft cap and exhaust rear camshaft cap.
(2) Clean each camshaft cap and cam carrier journals.
(3) Set the camshaft to the cam carrier.
(4) Place a plastigauge across the camshaft journals of each camshaft and set the camshaft caps.

(5) Tighten the bolts which secure front camshaft cap, intake center camshaft cap, intake rear camshaft cap, exhaust center camshaft cap and exhaust rear camshaft cap in numerical order as shown in the figure.

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)

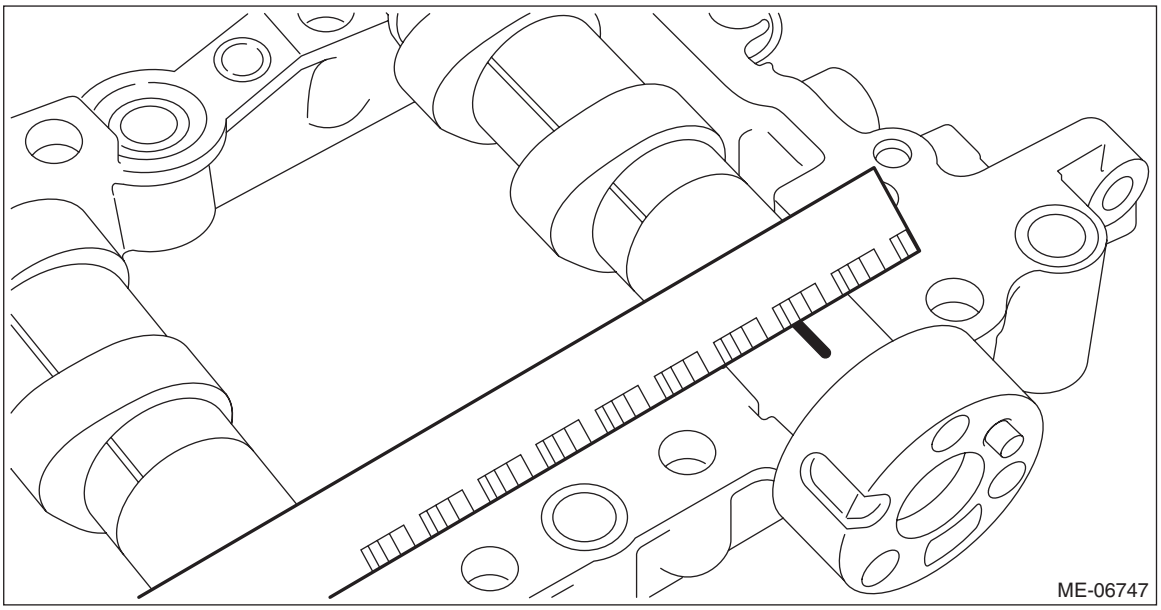


(6) Loosen the bolts (front camshaft cap, intake center camshaft cap, intake rear camshaft cap, exhaust center camshaft cap and exhaust rear camshaft cap) equally, a little at a time in numerical sequence as shown in the figure, and remove each camshaft cap.



(7) Determine camshaft oil clearance by matching the widest point of plastigauge on each journal against scale printed on a package of plastigauge. If it is not within the standard, replace each camshaft cap and cam carrier as a set. If necessary replace the camshaft.

Camshaft oil clearance:
Standard
0.037 — 0.072 mm (0.0015 — 0.0028 in)



(8) Completely remove the plastigauge.