

**E: INSTALLATION**

- 1) Installation of valve rocker assembly
  - (1) Temporarily tighten bolts (a) through (d) equally as shown in figure.

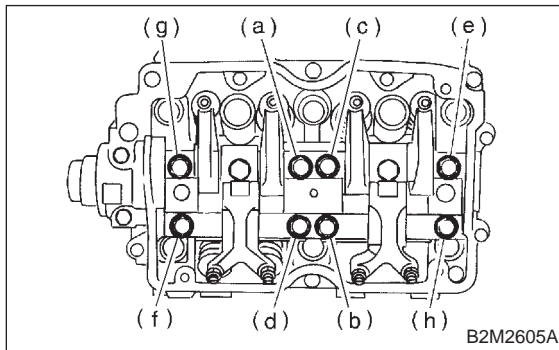
**CAUTION:**

**Do not allow valve rocker assembly to gouge knock pins.**

- (2) Tighten bolts (e) through (h) to specified torque.
- (3) Tighten bolts (a) through (d) to specified torque.

**Tightening torque:**

**$25 \pm 2$  N·m ( $2.5 \pm 0.2$  kg·m,  $18.1 \pm 1.4$  ft·lb)**



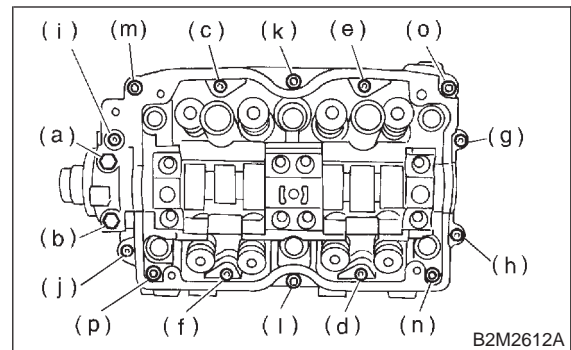
- 2) Adjust the valve clearances. <Ref. to 2-2 [W8B1].>
- 3) Install rocker cover and connect PCV hose.

**5. Camshaft****A: REMOVAL****1. RELATED PARTS**

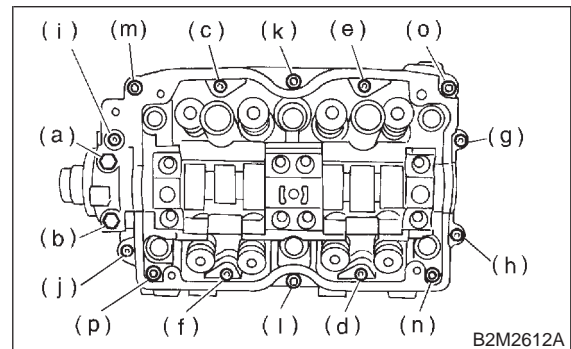
Remove timing belt, camshaft sprockets <Ref. to 2-3 [W3A0].> and valve rocker assembly. <Ref. to 2-3 [W4A0].>

**2. CAMSHAFT (LH)**

- 1) Remove camshaft cap.
  - (1) Remove bolts (a) through (b) in alphabetical sequence.

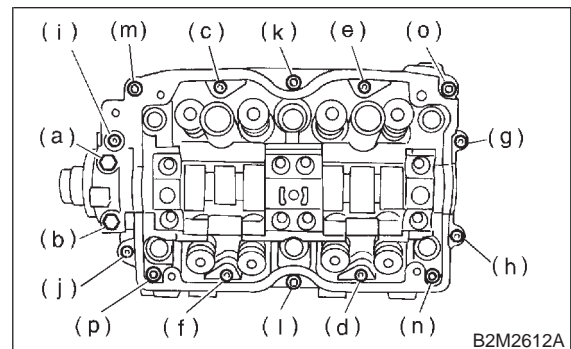


- (2) Equally loosen bolts (c) through (j) all the way in alphabetical sequence.

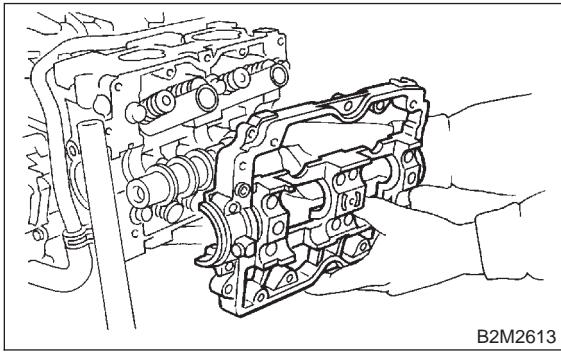


- (3) Remove bolts (k) through (p) in alphabetical sequence using ST.

ST 499497000 TORX PLUS



(4) Remove camshaft cap.



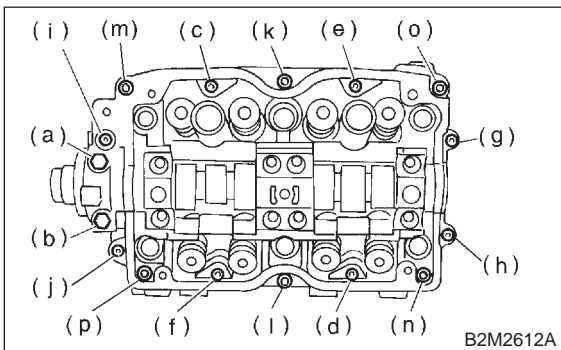
- 2) Remove camshaft (LH).
- 3) Remove oil seal.
- 4) Remove plug from rear side of camshaft (LH).

**CAUTION:**

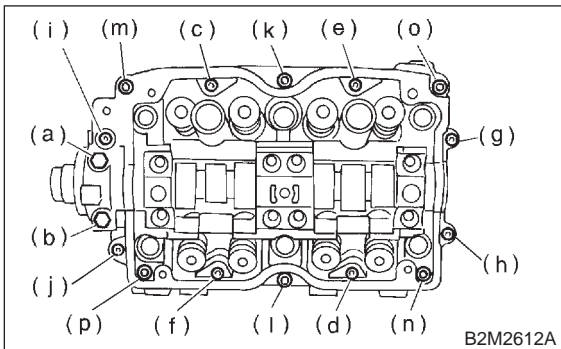
- Do not remove oil seal unless necessary.
- Do not scratch journal surface when removing oil seal.

**3. CAMSHAFT (RH)**

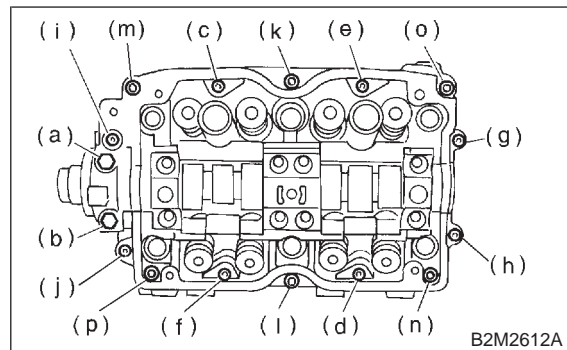
- 1) Remove camshaft cap.
  - (1) Remove bolts (a) through (b) in alphabetical sequence.



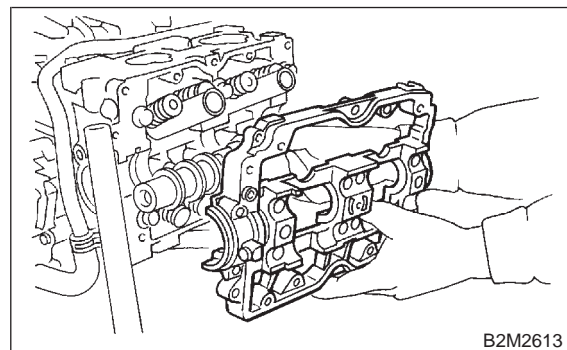
(2) Equally loosen bolts (c) through (j) all the way in alphabetical sequence.



(3) Remove bolts (k) through (p) in alphabetical sequence using ST.  
ST 499497000 TORX PLUS



(4) Remove camshaft cap.



- 2) Remove camshaft (RH).
- 3) Remove oil seal.
- 4) Remove plug from rear side of camshaft (RH).

**CAUTION:**

- Do not remove oil seal unless necessary.
- Do not scratch journal surface when removing oil seal.

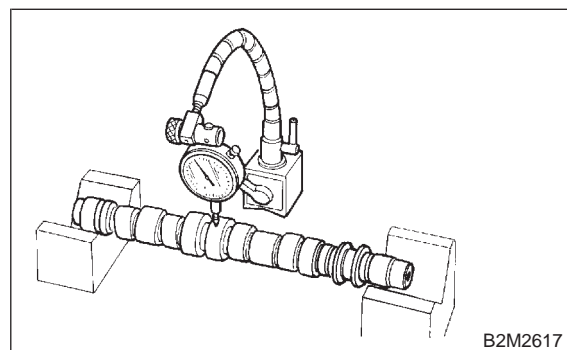
**B: INSPECTION**

**1. CAMSHAFT**

1) Measure the bend, and repair or replace if necessary.

**Limit:**

**0.025 mm (0.0010 in)**



2) Check journal for damage and wear. Replace if faulty.

3) Measure outside diameter of camshaft journal and inside diameter of cylinder head journal, and determine the difference between the two (= oil

clearance). If oil clearance exceeds specifications, replace camshaft or cylinder head as necessary.

		Unit: mm (in)
Clearance at journal	Standard	0.055 — 0.090 (0.0022 — 0.0035)
	Limit	0.10 (0.0039)
Camshaft journal O.D.		31.928 — 31.945 (1.2570 — 1.2577)
Journal hole I.D.		32.000 — 32.018 (1.2598 — 1.2605)

4) Check cam face condition; remove minor faults by grinding with oil stone. Measure the cam height H; replace if the limit has been exceeded.

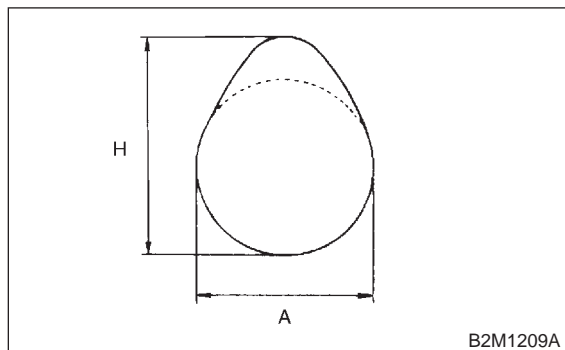
**Cam height: H**

Item		Unit: mm (in)
Intake	STD	39.485 — 39.585 (1.5545 — 1.5585)
	Limit	39.385 (1.5506)
Exhaust	STD	39.257 — 39.357 (1.5455 — 1.5495)
	Limit	39.157 (1.5416)

**Cam base circle diameter A:**

**IN: 34.00 mm (1.3386 in)**

**EX: 34.00 mm (1.3386 in)**



**2. CAMSHAFT SUPPORT**

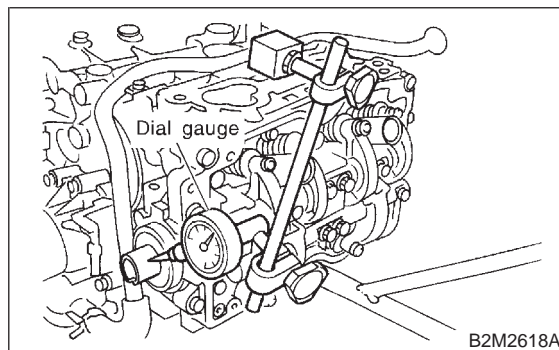
Measure the thrust clearance of camshaft with dial gauge. If the clearance exceeds the limit, replace camshaft support.

**Standard:**

**0.030 — 0.090 mm (0.0012 — 0.0035 in)**

**Limit:**

**0.10 mm (0.0039 in)**



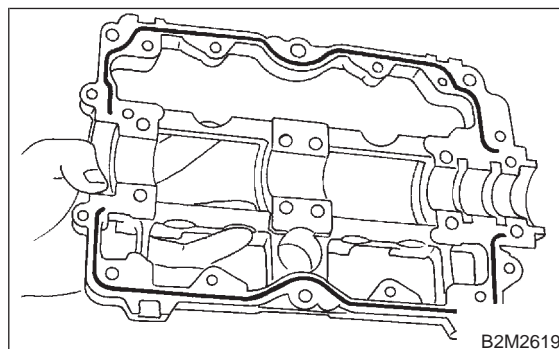
**C: INSTALLATION**

**1. CAMSHAFT (LH)**

- 1) Apply a coat of engine oil to camshaft journals and install camshaft (LH).
- 2) Install camshaft cap.
  - (1) Apply liquid gasket on the around of camshaft cap.

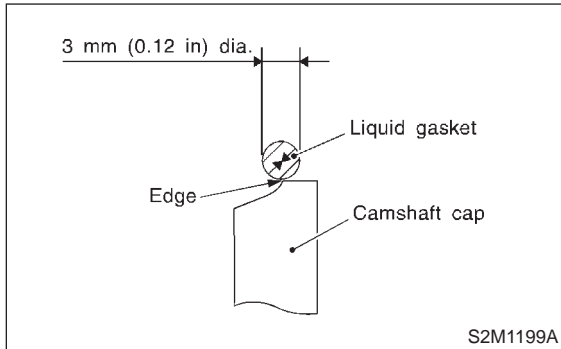
**Liquid gasket:**

**THREE BOND 1280B**

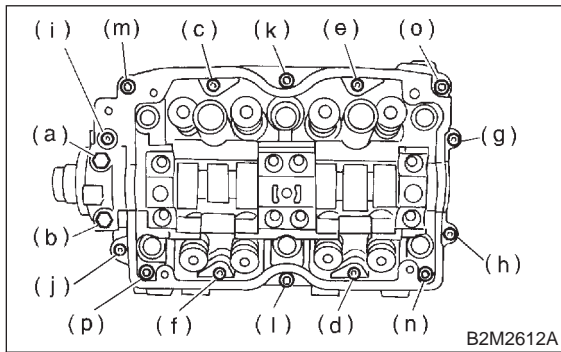


NOTE:

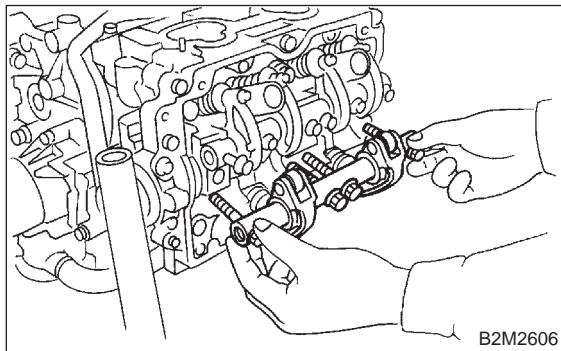
Apply a coat of 3 mm (0.12 in) dia. liquid gasket along edge of cam cap mating surface.



(2) Temporarily tighten bolts (g) through (j) in alphabetical sequence.



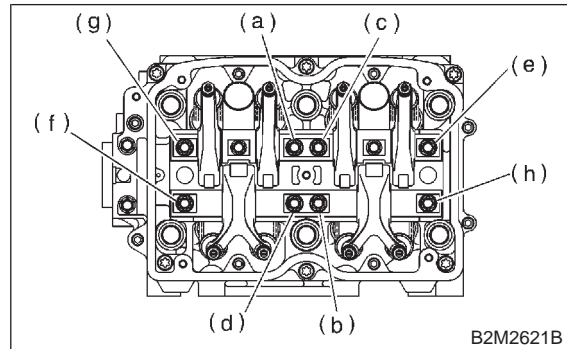
(3) Install valve rocker assembly.  
<Ref. to 2-3 [W4E0].>



(4) Tighten bolts (a) through (h) in alphabetical sequence.

**Tightening torque:**

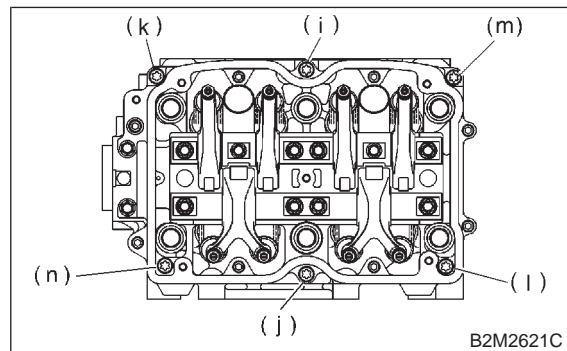
**25±2 N·m (2.5±0.2 kg·m, 18.1±1.4 ft·lb)**



(5) Tighten TORX bolts (i) through (n) in alphabetical sequence using ST.  
ST 499497000 TORX PLUS

**Tightening torque:**

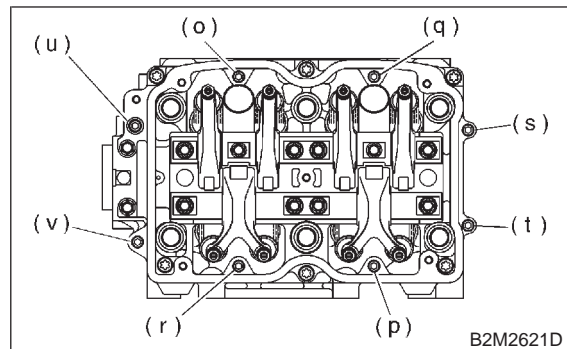
**18±2 N·m (1.8±0.2 kg·m, 13.0±1.4 ft·lb)**



(6) Tighten bolts (o) through (v) in alphabetical sequence.

**Tightening torque:**

**10±2 N·m (1.0±0.2 kg·m, 7.2±1.4 ft·lb)**

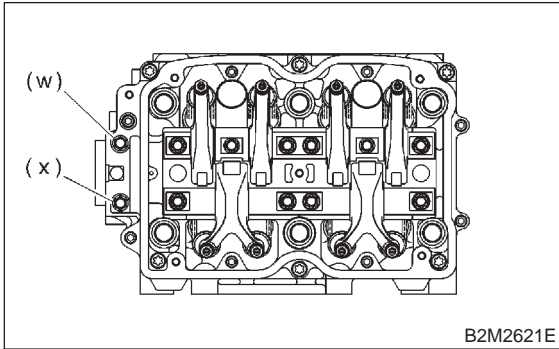


5. Camshaft

(7) Tighten bolts (w) through (x) in alphabetical sequence.

**Tightening torque:**

**10±2 N·m (1.0±0.2 kg·m, 7.2±1.4 ft·lb)**



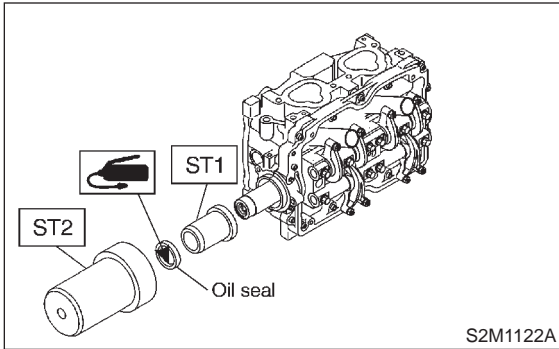
B2M2621E

3) Apply a coat of grease to oil seal lips and install oil seal (A) on camshaft using ST1 and ST2.

**CAUTION:**

**Use a new oil seal.**

- ST1 499597000 OIL SEAL GUIDE
- ST2 499587500 OIL SEAL INSTALLER



S2M1122A

- 4) Install plug using ST.
- ST 499587700 OIL SEAL INSTALLER
- 5) Install oil level gauge guide.
- 6) Install camshaft position sensor support.

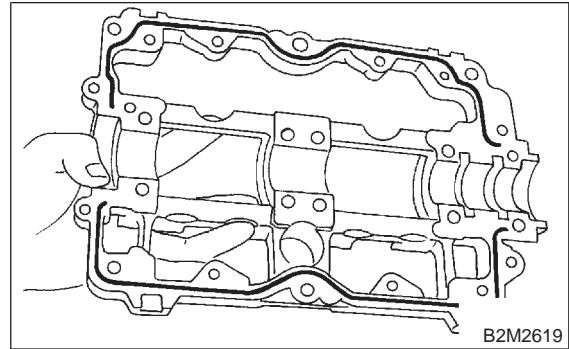
**2. CAMSHAFT (RH)**

- 1) Apply a coat of engine oil to camshaft journals and install camshaft (RH).
- 2) Install camshaft cap.

(1) Apply liquid gasket on the around of camshaft cap.

**Liquid gasket:**

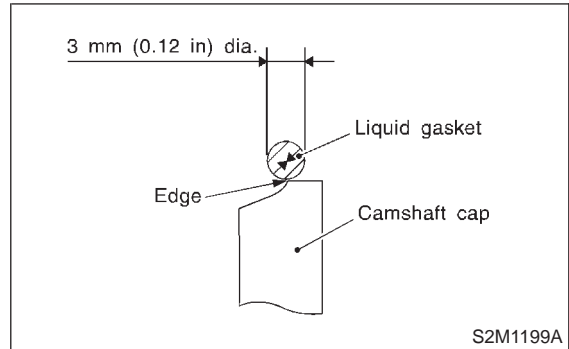
**THREE BOND 1280B**



B2M2619

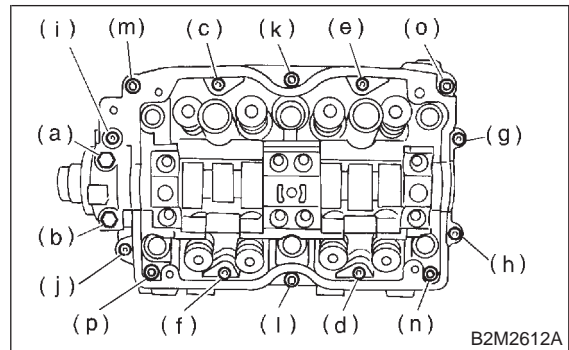
**NOTE:**

Apply a coat of 3 mm (0.12 in) dia. liquid gasket along edge of cam cap mating surface.



S2M1199A

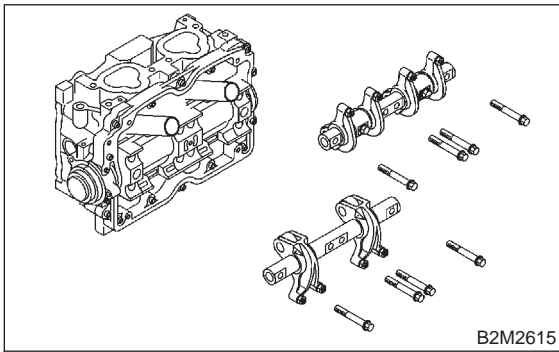
(2) Temporarily tighten bolts (g) through (j) in alphabetical sequence.



B2M2612A

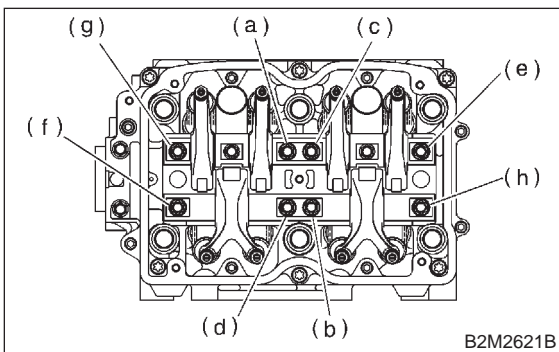


(3) Install valve rocker assembly.  
<Ref. to 2-3 [W4E0].>



(4) Tighten bolts (a) through (h) in alphabetical sequence.

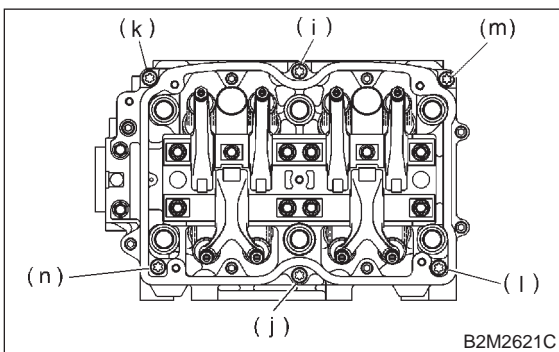
**Tightening torque:**  
**25±2 N-m (2.5±0.2 kg-m, 18.1±1.4 ft-lb)**



(5) Tighten TORX bolts (i) through (n) in alphabetical sequence using ST.

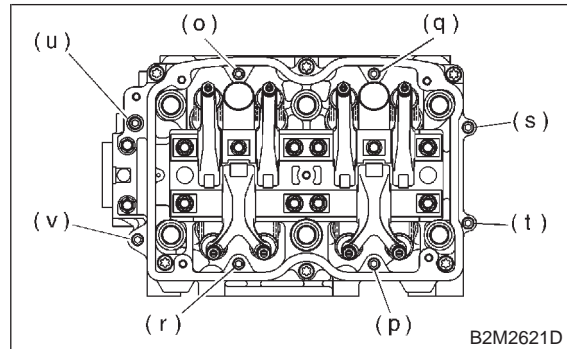
ST 499427000 TORX PLUS

**Tightening torque:**  
**18±2 N-m (1.8±0.2 kg-m, 13.0±1.4 ft-lb)**



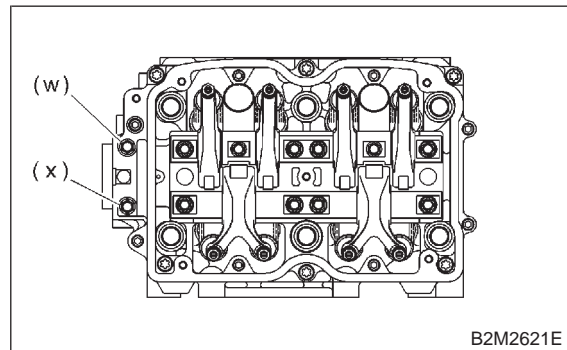
(6) Tighten bolts (o) through (v) in alphabetical sequence.

**Tightening torque:**  
**10±2 N-m (1.0±0.2 kg-m, 7.2±1.4 ft-lb)**



(7) Tighten bolts (o) through (p) in alphabetical sequence.

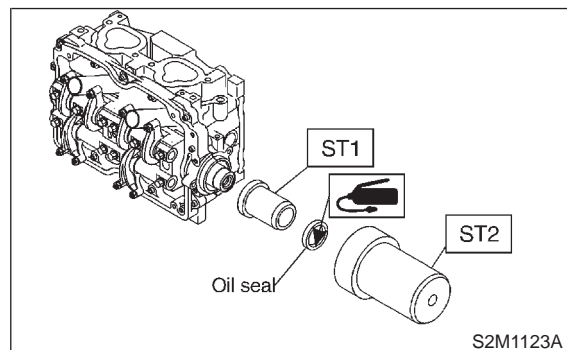
**Tightening torque:**  
**10±2 N-m (1.0±0.2 kg-m, 7.2±1.4 ft-lb)**



3) Apply a coat of grease to oil seal lips and install oil seal (A) on camshaft using ST1 and ST2.

**CAUTION:**  
**Use a new oil seal.**

ST1 499597000 OIL SEAL GUIDE  
ST2 499587500 OIL SEAL INSTALLER



4) Install plug using ST.  
ST 499587700 OIL SEAL INSTALLER