5. Camshaft

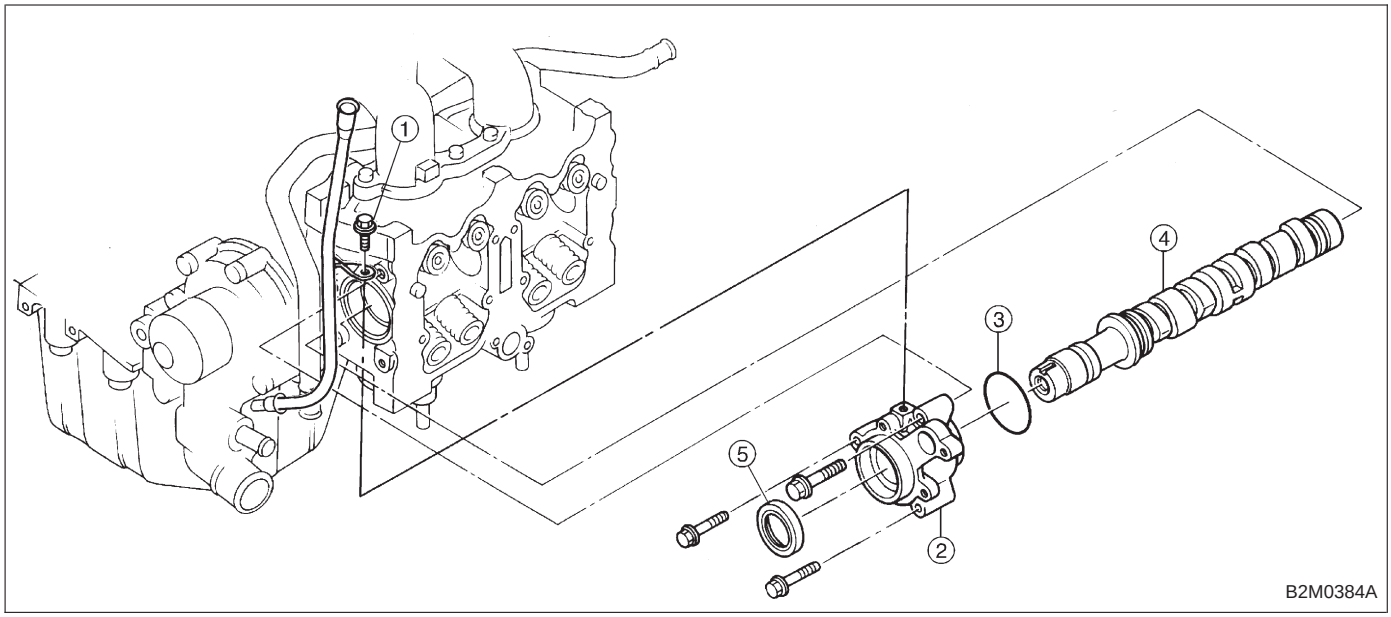
A: REMOVAL

1. RELATED PARTS

1) Remove timing belt, camshaft sprockets and related parts.
<Ref. to 2-3 [W3A0].>

2) Remove valve rocker assembly.
<Ref. to 2-3 [W4A0].>

2. CAMSHAFT LH



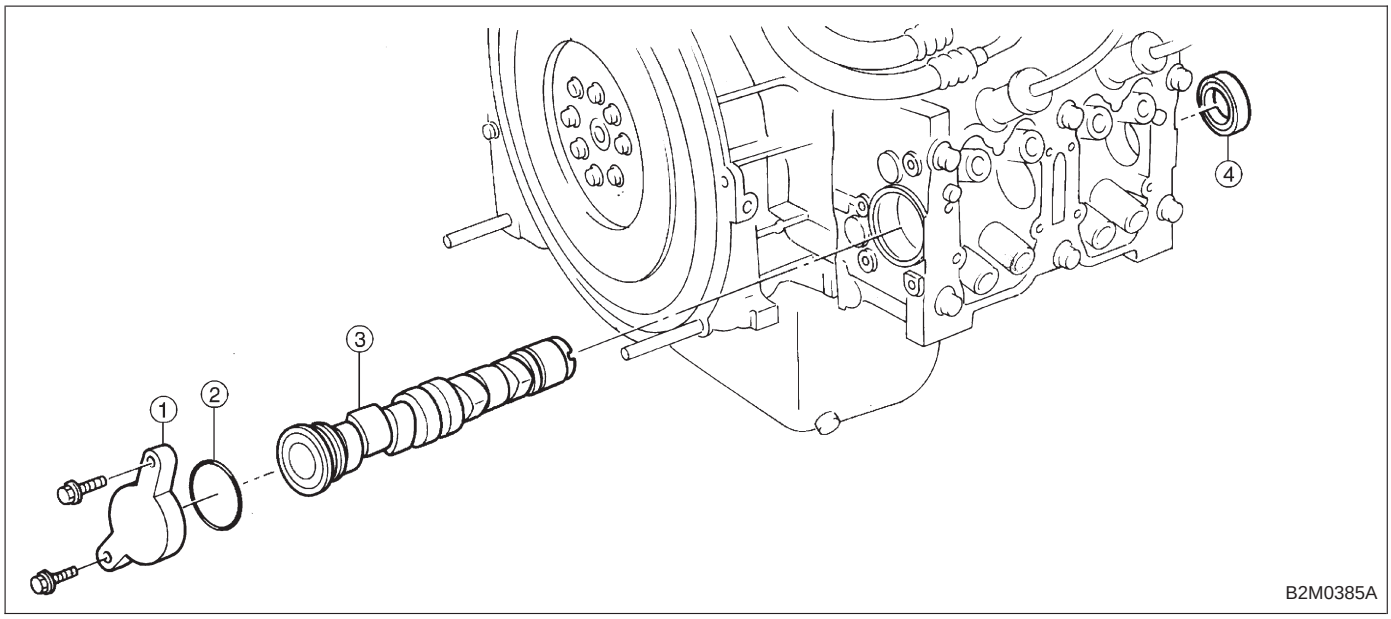
1) Remove oil level gauge guide attaching bolt.
2) Remove camshaft support LH.

CAUTION:
Do not damage the camshaft position sensor.

3) Remove O-ring.
4) Remove camshaft LH.
5) Remove oil seal.

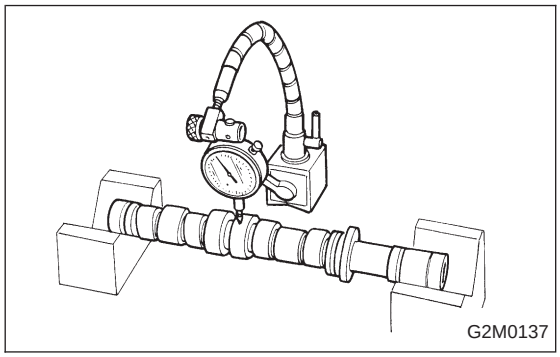
CAUTION:
- **Do not remove oil seal unless necessary.**
- **Do not scratch journal surface when removing oil seal.**

3. CAMSHAFT RH



1) Remove camshaft support RH.
2) Remove O-ring.
3) Remove camshaft.
4) Remove oil seal.

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.

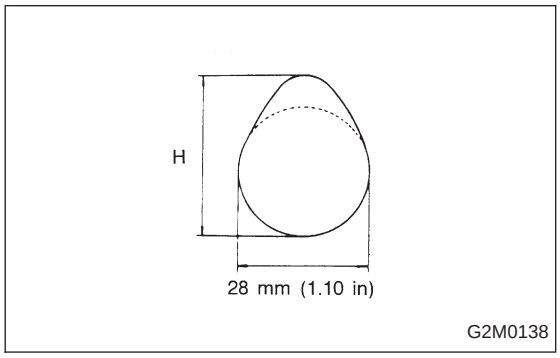
Limit:
0.025 mm (0.0010 in)

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)

Item	Right-hand camshaft	Front	Center	Rear
	Left-hand camshaft	Rear	Center	Front
Clearance at journal	Standard	0.055 — 0.090 (0.0022 — 0.0035)		
	Limit	0.10 (0.0039)		
Camshaft journal O.D.		31.935 — 31.950 (1.2573 — 1.2579)	37.435 — 37.450 (1.4738 — 1.4744)	37.935 — 37.950 (1.4935 — 1.4941)
Journal hole I.D.		32.005 — 32.025 (1.2600 — 1.2608)	37.505 — 37.525 (1.4766 — 1.4774)	38.005 — 38.025 (1.4963 — 1.4970)



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

Standard

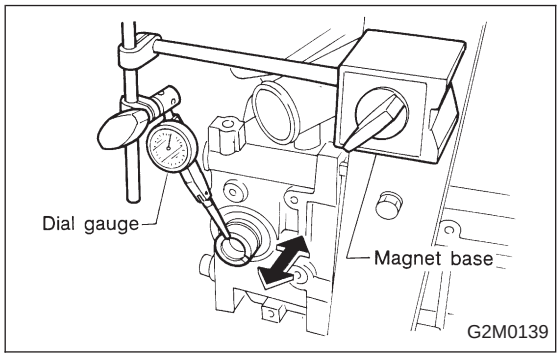
IN: 31.994 — 32.094 mm (1.2596 — 1.2635 in)

EX: 32.624 — 32.724 mm (1.2844 — 1.2883 in)

Limit

IN: 31.844 mm (1.2537 in)

EX: 32.474 mm (1.2785 in)



2. CAMSHAFT SUPPORT

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

Standard:

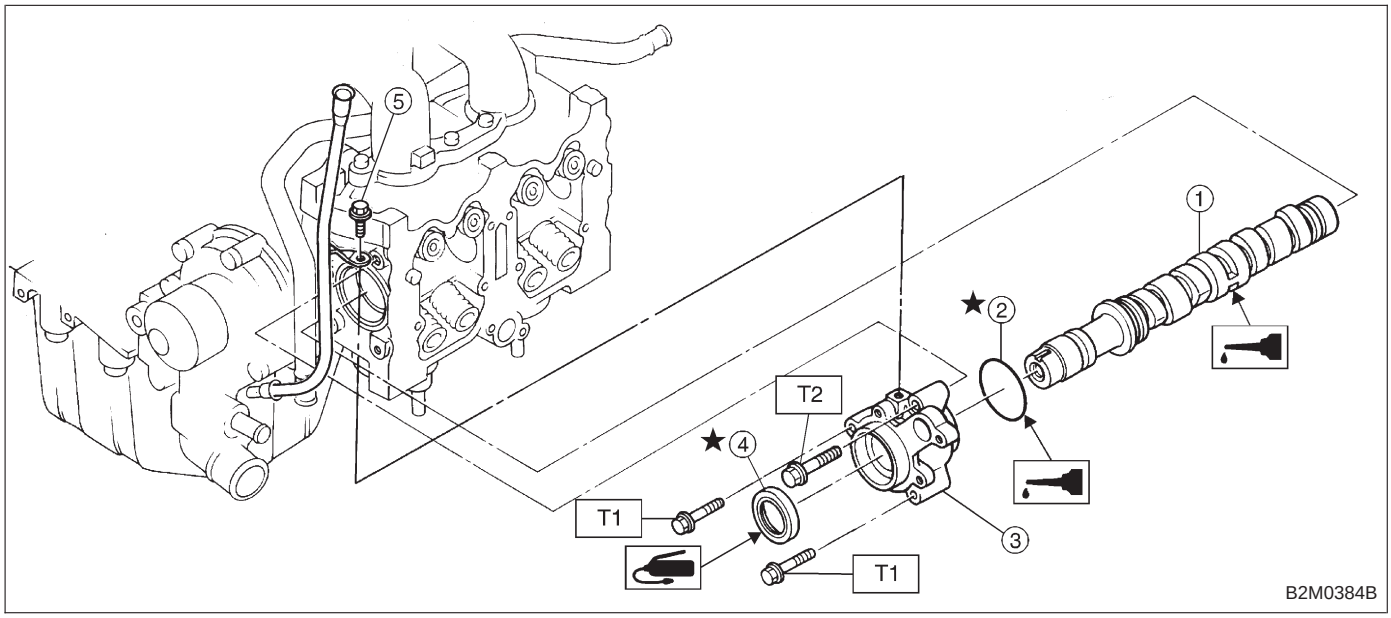
0.030 — 0.260 mm (0.0012 — 0.0102 in)

Limit:

0.35 mm (0.0138 in)

C: INSTALLATION

1. CAMSHAFT LH

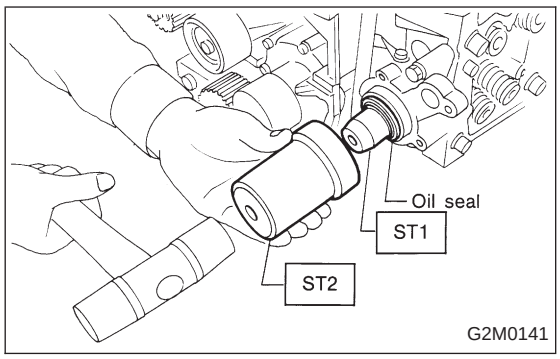


Tightening torque: N·m (kg-m, ft-lb)
T1: 10 (1.0, 7)
T2: 16 (1.6, 12)

1) Apply a coat of engine oil to camshaft journals and install camshaft LH.
2) Apply a coat of engine oil or grease to O-ring.
3) Install O-ring to camshaft support.

CAUTION:
Use a new O-ring.

4) Install camshaft support.



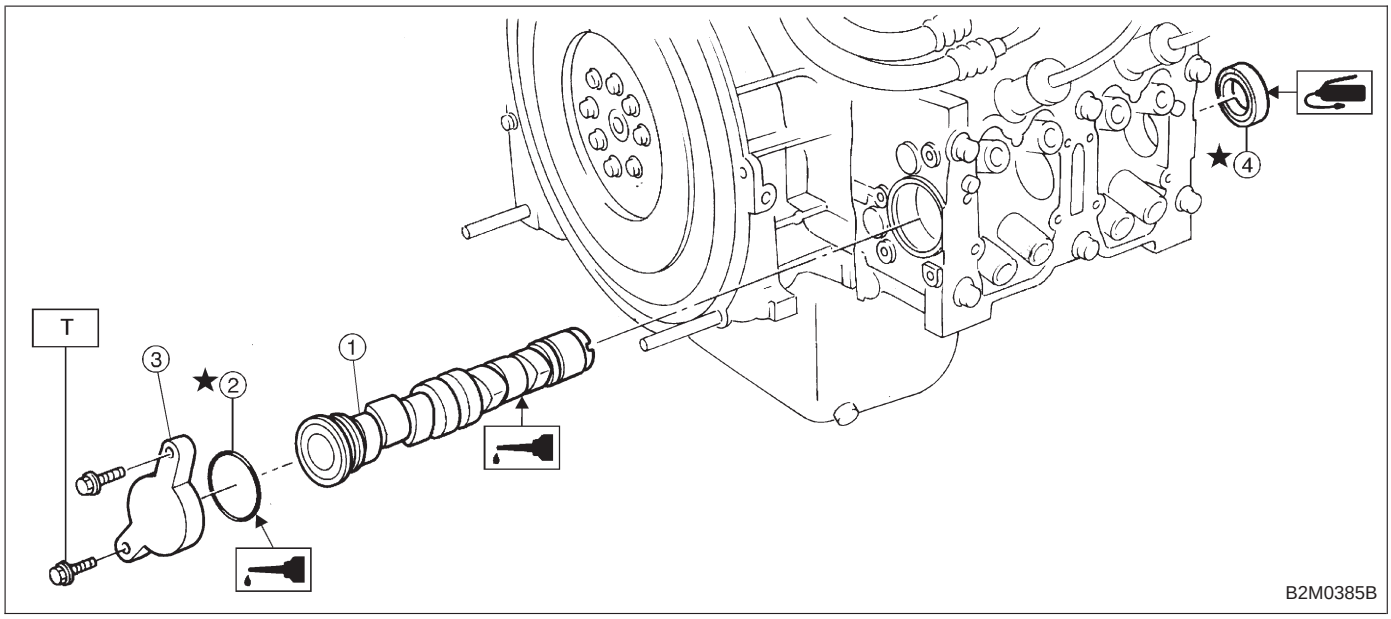
5) Apply a coat of grease to oil seal lips and install oil seal on camshaft support by using ST1 and ST2.

CAUTION:
Use a new oil seal.

ST1 499597000 OIL SEAL GUIDE
ST2 499587100 OIL SEAL INSTALLER

6) Install oil level gauge guide bolt.

2. CAMSHAFT RH

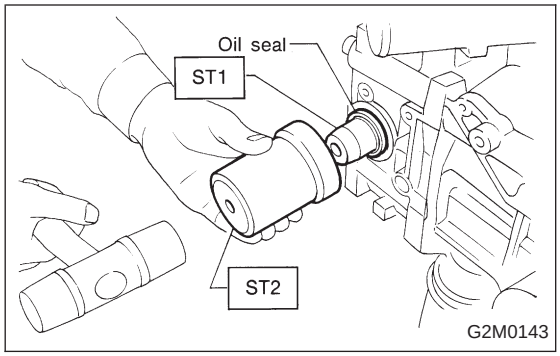


Tightening torque: N·m (kg-m, ft-lb)
T: 16 (1.6, 12)

1) Apply a coat of engine oil to camshaft journals and install camshaft RH.
2) Apply a coat of engine oil or grease to O-ring.
3) Install O-ring to camshaft support.

CAUTION:
Use a new O-ring.

4) Install camshaft support.



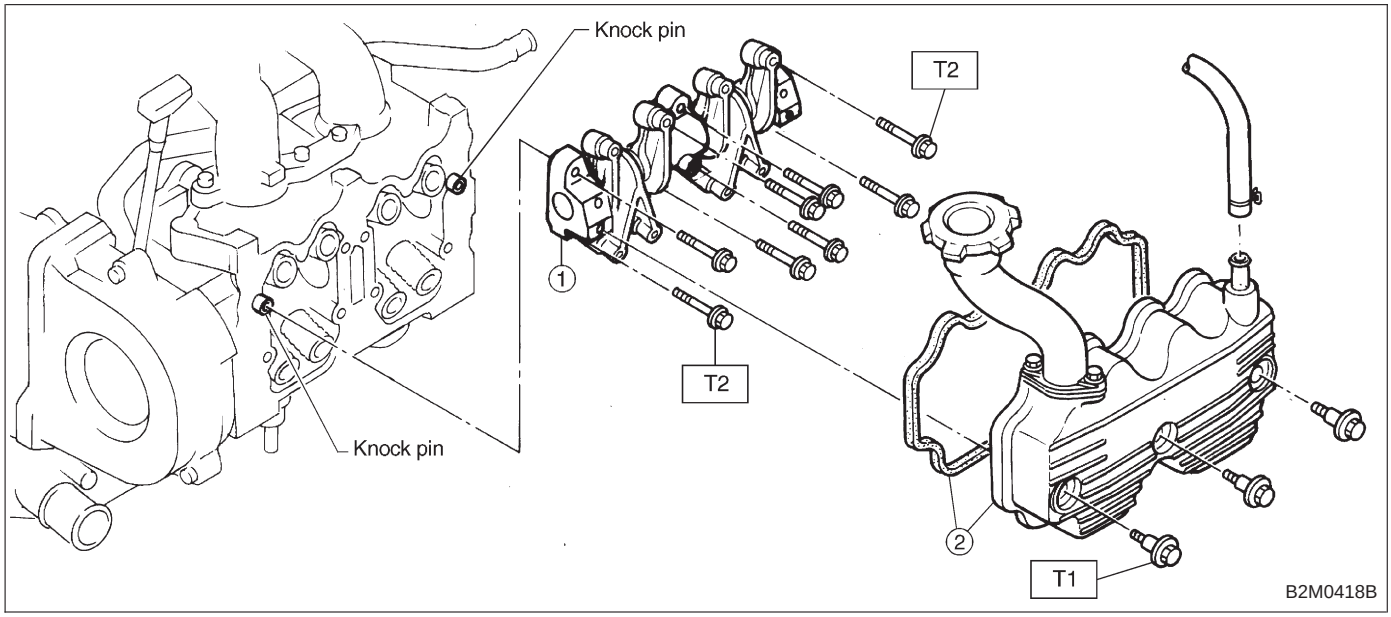
5) Install oil seal by using ST1 and ST2.

CAUTION:
Use a new oil seal.

ST1 499597000 OIL SEAL GUIDE
ST2 499587100 OIL SEAL INSTALLER

3. RELATED PARTS

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



Tightening torque: N·m (kg-m, ft-lb)
T1: 5±1 (0.5±0.1, 3.6±0.7)
T2: 12±1 (1.2±0.1, 8.7±0.7)

2) Install timing belt, camshaft sprockets and related parts.
<Ref. to 2-3 [W3C0].>

6. Cylinder Head

A: REMOVAL

1. INTAKE MANIFOLD

1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
2) Drain engine coolant. <Ref. to 2-5 [W1A0].>
3) Remove intake manifold. <Ref. to 2-7 [W4A0].>
4) Remove engine coolant pipe.