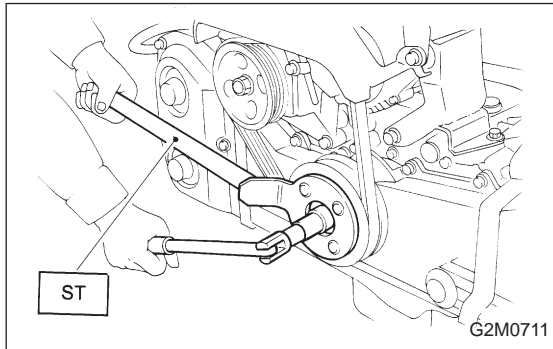
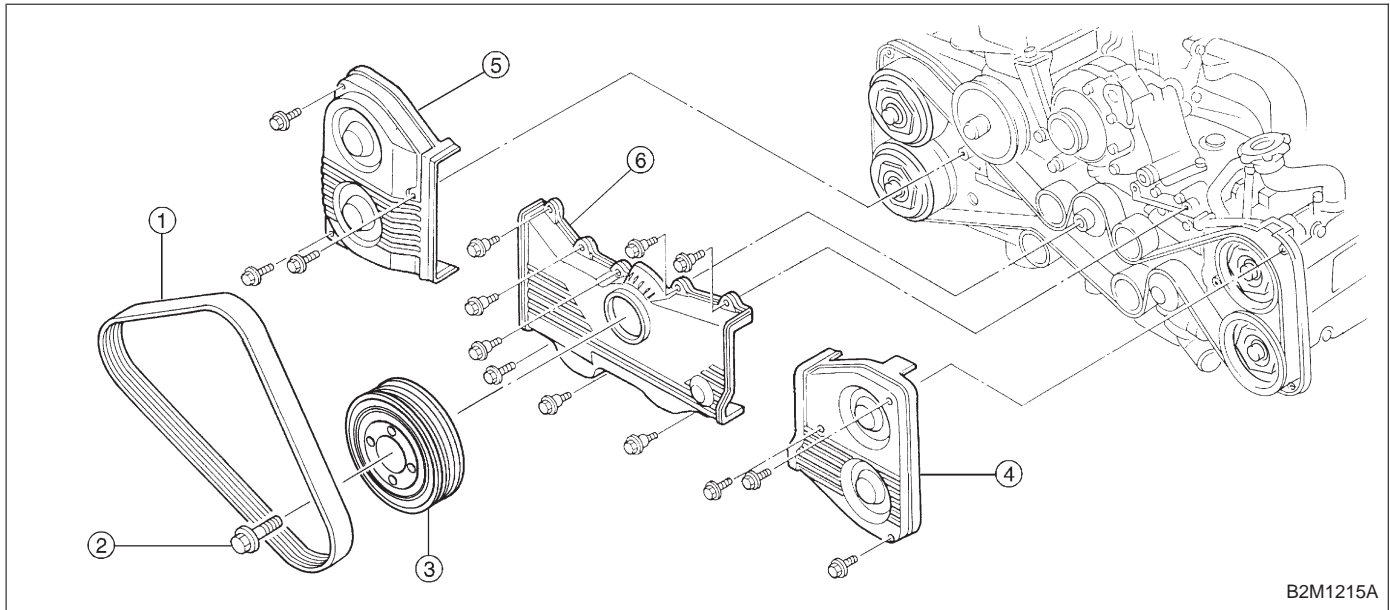


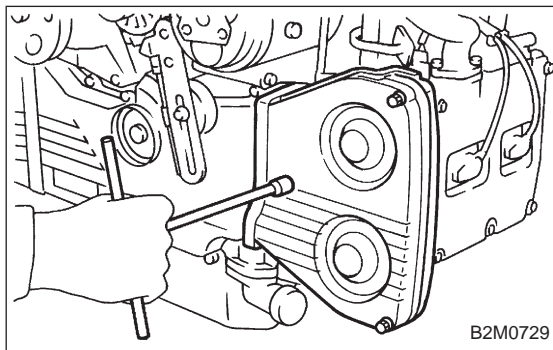
2. Timing Belt

A: REMOVAL

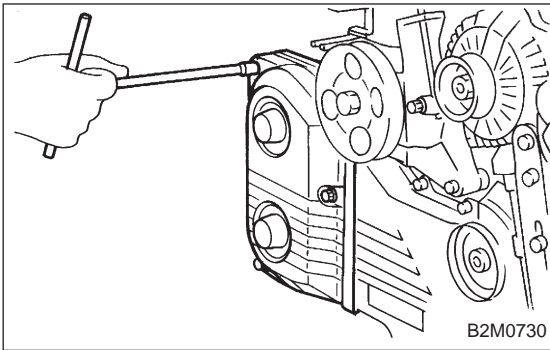
1. CRANKSHAFT PULLEY AND BELT COVER



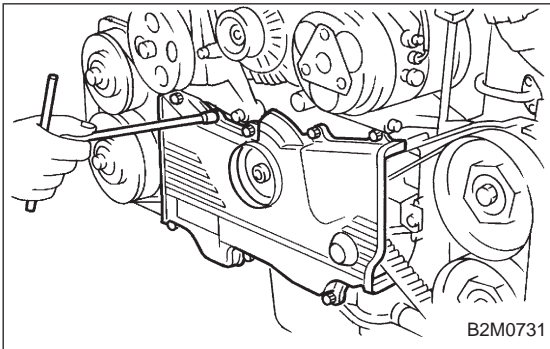
- 1) Remove V-belt cover, V-belt and air conditioning compressor drive belt tensioner. <Ref. to 1-5 [01A0].>
- 2) Remove pulley bolt. To lock crankshaft, use ST.
ST 499977100 CRANKSHAFT PULLEY WRENCH
- 3) Remove crankshaft pulley.



- 4) Remove left-hand belt cover.

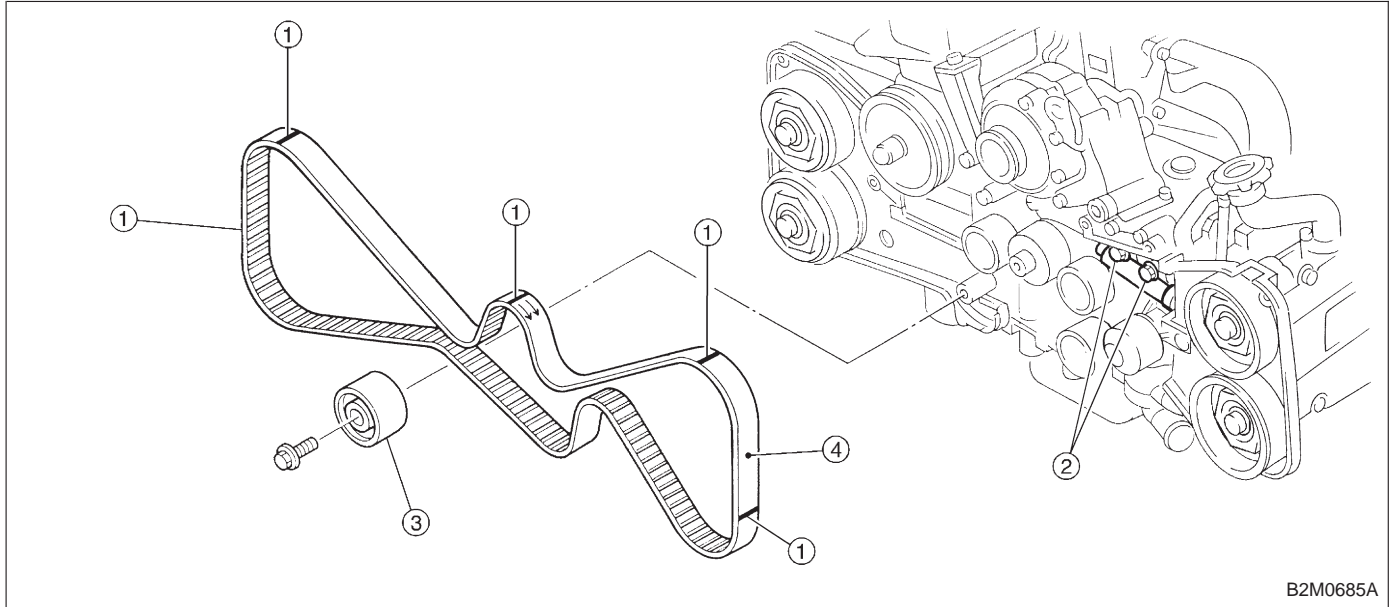


5) Remove right-hand belt cover.

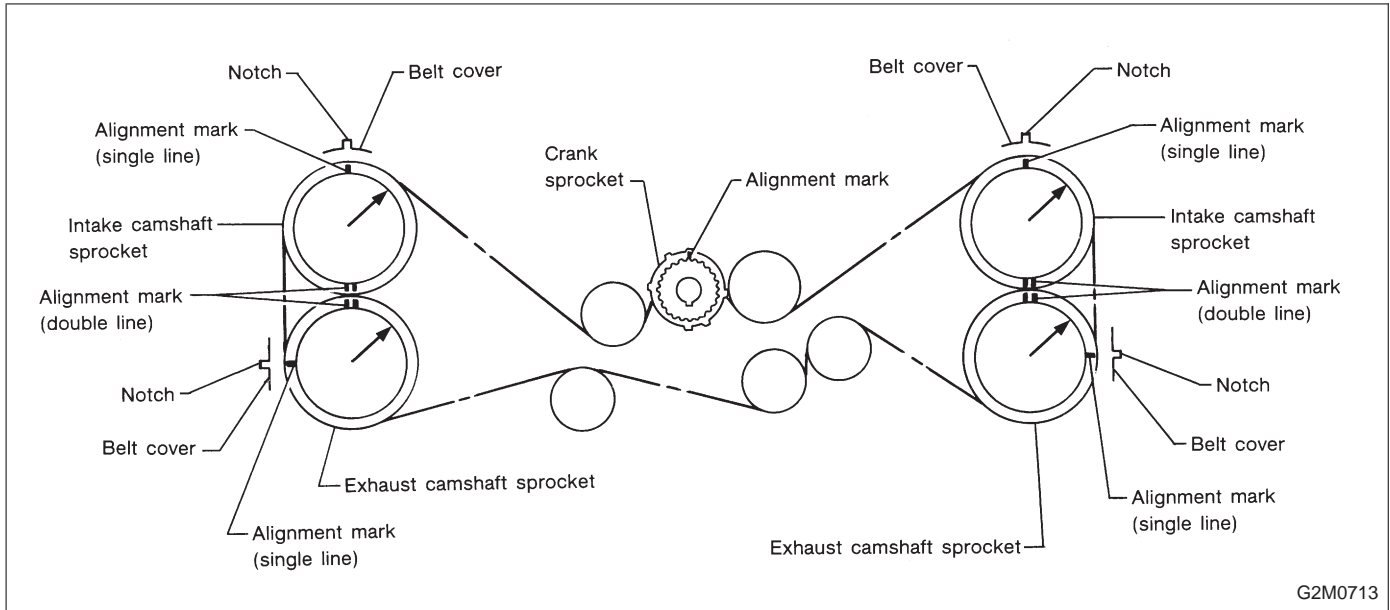


6) Remove front belt cover.

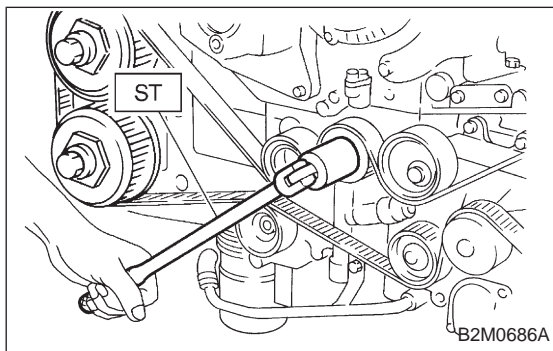
2. TIMING BELT



B2M0685A



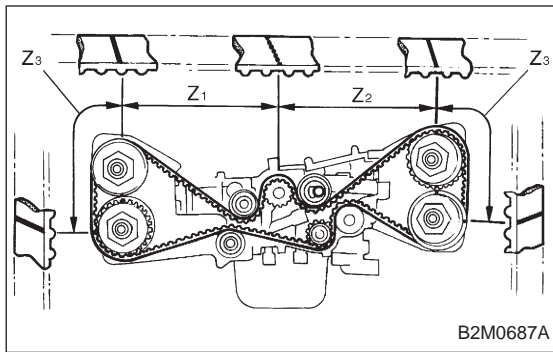
G2M0713



1) If alignment mark and/or arrow mark (which indicates rotation direction) on timing belt fade away, put new marks before removing timing belt as follows:

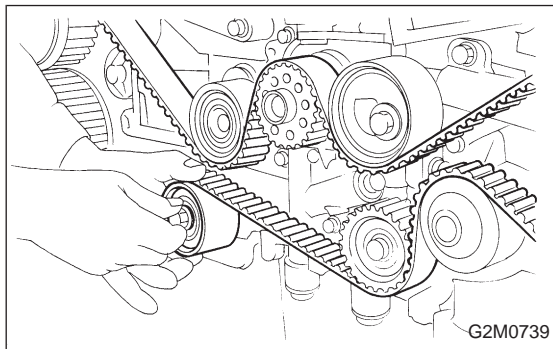
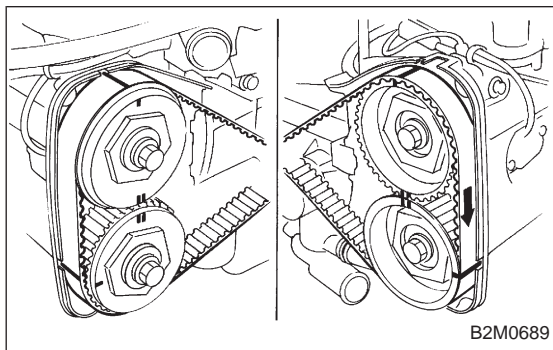
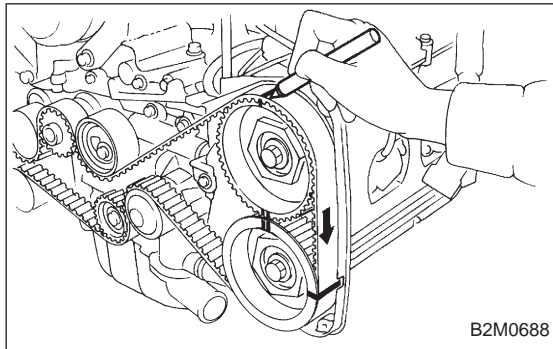
(1) Turn crankshaft using ST, and align alignment marks on crankshaft sprocket, left-hand intake camshaft sprocket, left-hand exhaust camshaft sprocket, right-hand intake camshaft sprocket and right hand exhaust camshaft sprocket with notches of belt cover and cylinder block.

ST 499987500 CRANKSHAFT SOCKET

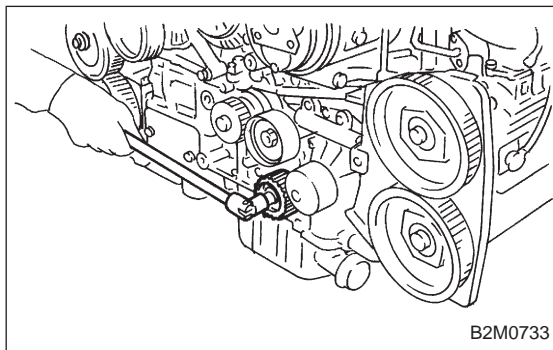


(2) Using white paint, put alignment and/or arrow marks on timing belts in relation to the sprockets.

- Z₁: 54.5 tooth length**
- Z₂: 51 tooth length**
- Z₃: 28 tooth length**



- 2) Loosen tensioner adjuster mounting bolts.
- 3) Remove belt idler.

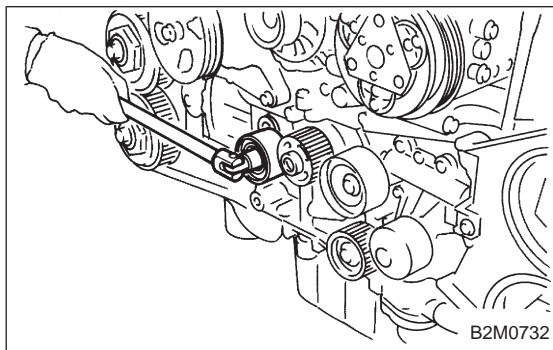
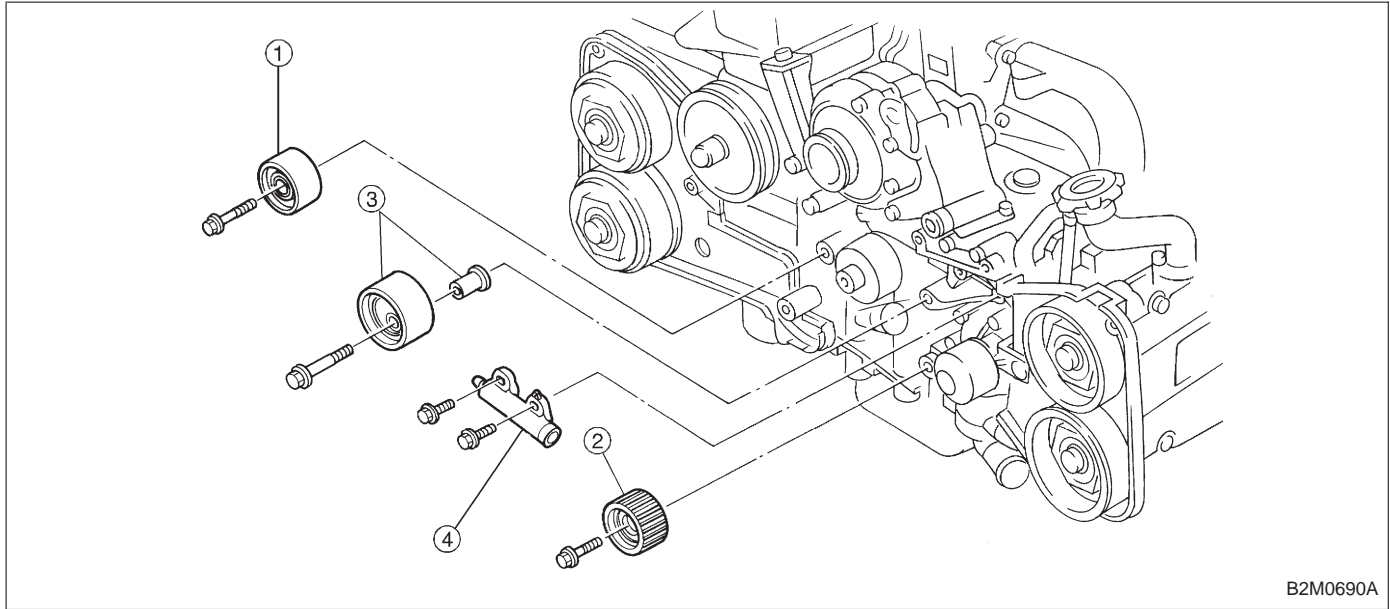


- 4) Remove timing belt.
- 5) Remove belt idler No. 2.

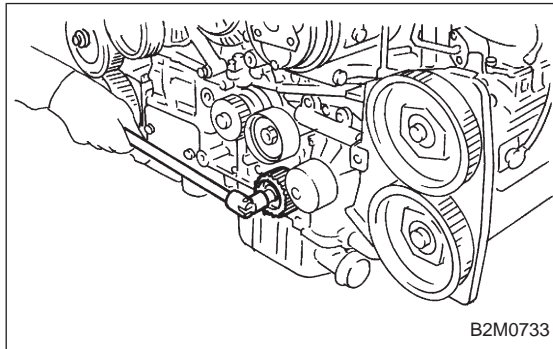
CAUTION:

After timing belt has been removed, never rotate intake and exhaust, camshaft sprocket. If camshaft sprocket is rotated, the intake and exhaust valve heads strike together and valve stems are bent.

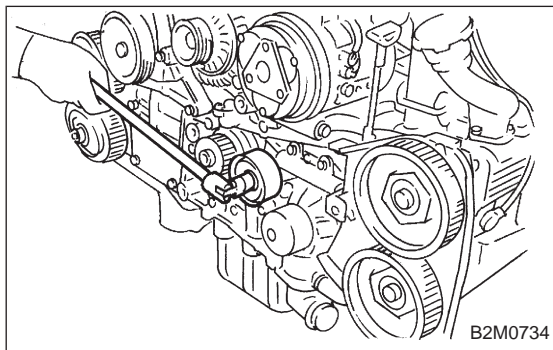
3. BELT TENSIONER AND IDLER



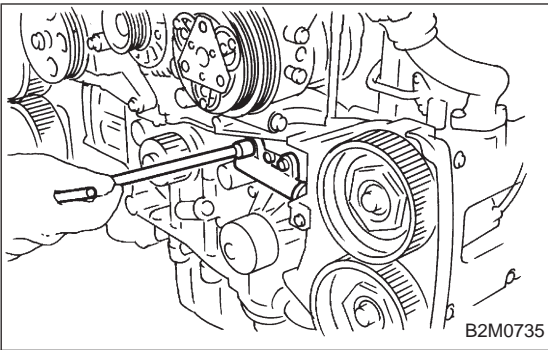
1) Remove belt idler.



2) Remove belt idler No. 2.

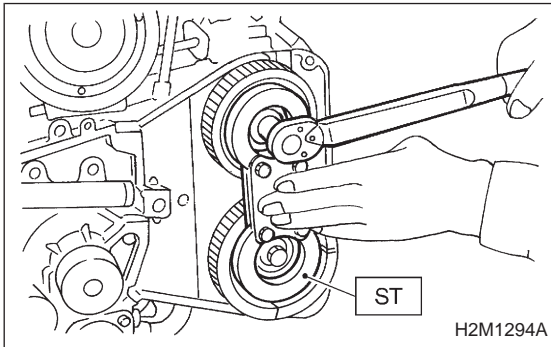
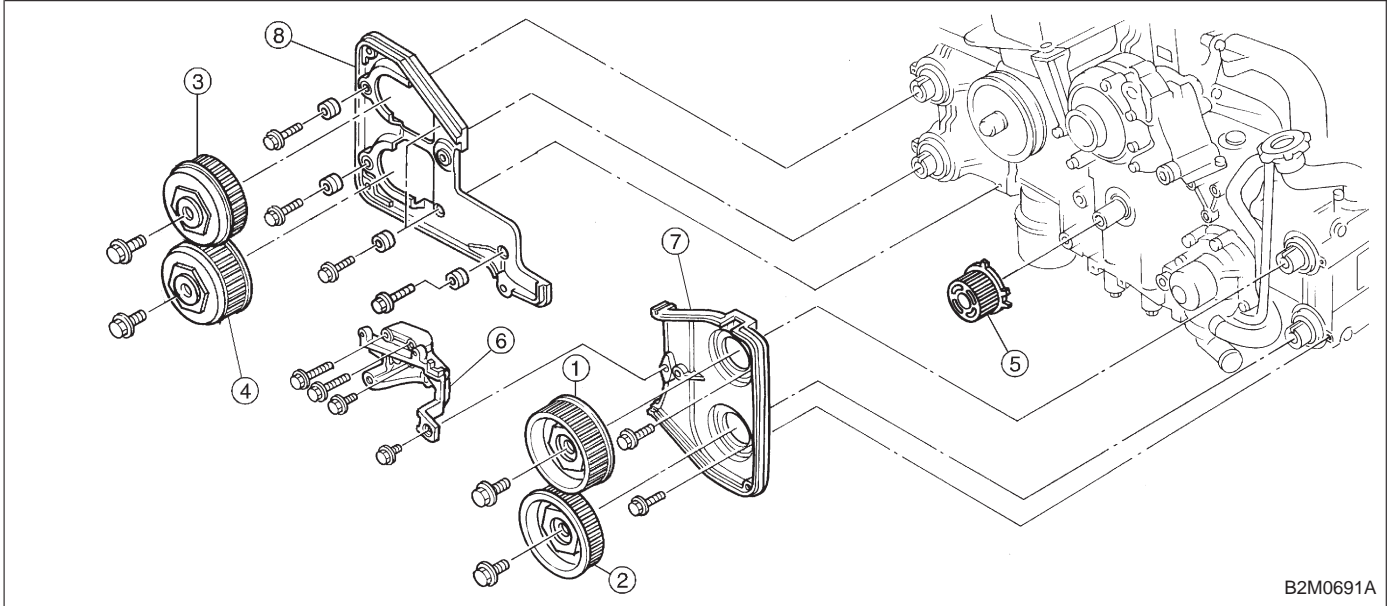


3) Remove belt tensioner and spacer.

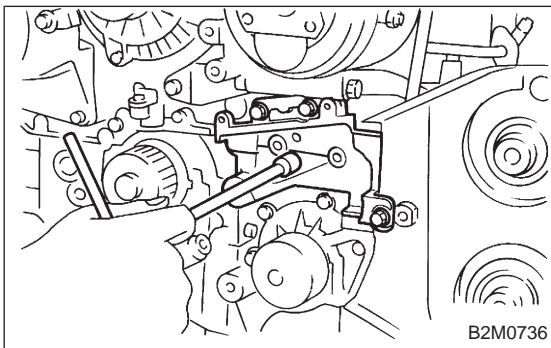


4) Remove belt tension adjuster.

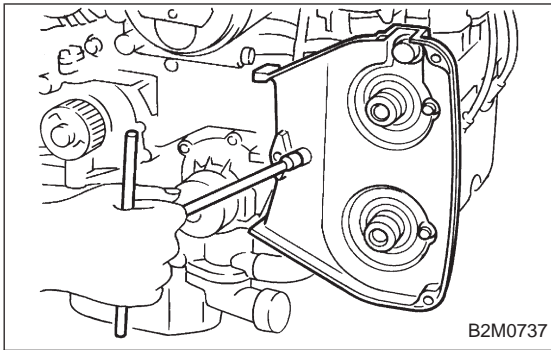
4. SPROCKET



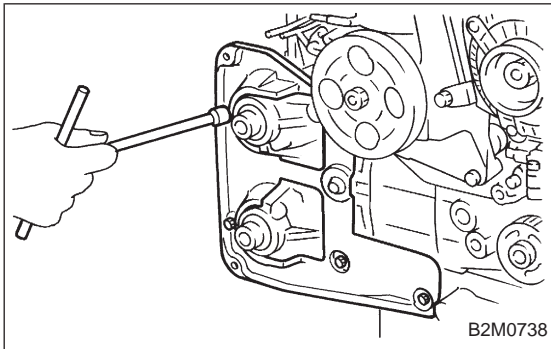
- 1) Remove left-hand intake camshaft sprocket.
 - 2) Remove left-hand exhaust camshaft sprocket.
 - 3) Remove right-hand intake camshaft sprocket.
 - 4) Remove right-hand exhaust camshaft sprocket.
- ST 499207300 CAMSHAFT SPROCKET WRENCH
- 5) Remove crankshaft sprocket.



6) Remove tensioner bracket.



7) Remove left-hand belt cover No. 2.



8) Remove right-hand belt cover No. 2.

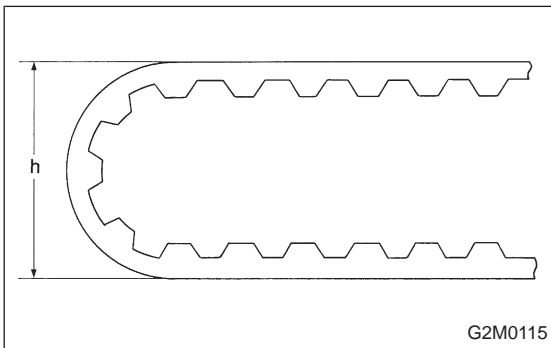
B: INSPECTION

1. TIMING BELT

- 1) Check timing belt teeth for breaks, cracks, and wear. If any fault is found, replace belt.
- 2) Check the condition of back side of belt; if any crack is found, replace belt.

CAUTION:

- Be careful not to let oil, grease or coolant contact the belt. Remove quickly and thoroughly if this happens.



- Do not bend the belt sharply.

Bending radius: h
60 mm (2.36 in) or more

2. BELT TENSION ADJUSTER

1) Visually check oil seals for leaks, and rod ends for abnormal wear or scratches. If necessary, replace belt tension adjuster.

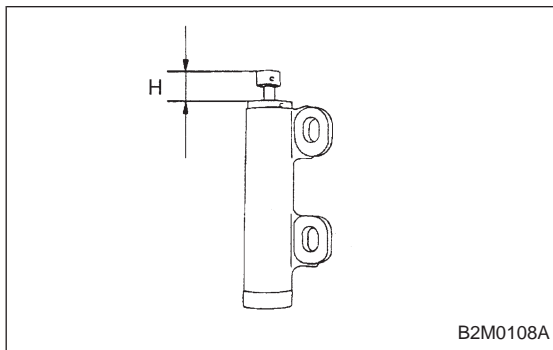
CAUTION:

Slight traces of oil at rod's oil seal does not indicate a problem.

2) While holding tensioner with both hands, push the rod section against floor or wall ensuring the rod section will react as follows:

(1) When applying a force of 147 N (15 kg, 33 lb), the rod section should not sink.

(2) When applying a force of 147 to 490 N (15 to 50 kg, 33 to 110 lb), the rod section should maintain a projectionally acting force and should not sink within 8.5 seconds.



3) Measure the extension of rod beyond the body. If it is not within specifications, replace with a new one.

Rod extension: H

15.4 — 16.4 mm (0.606 — 0.646 in)

3. BELT TENSIONER

1) Check mating surfaces of timing belt and contact point of tension adjuster rod for abnormal wear or scratches. Replace belt tensioner if faulty.

2) Check spacer and tensioner bushing for wear.

3) Check tensioner for smooth rotation. Replace if noise or excessive play is noted.

4) Check tensioner for grease leakage.

4. BELT IDLER

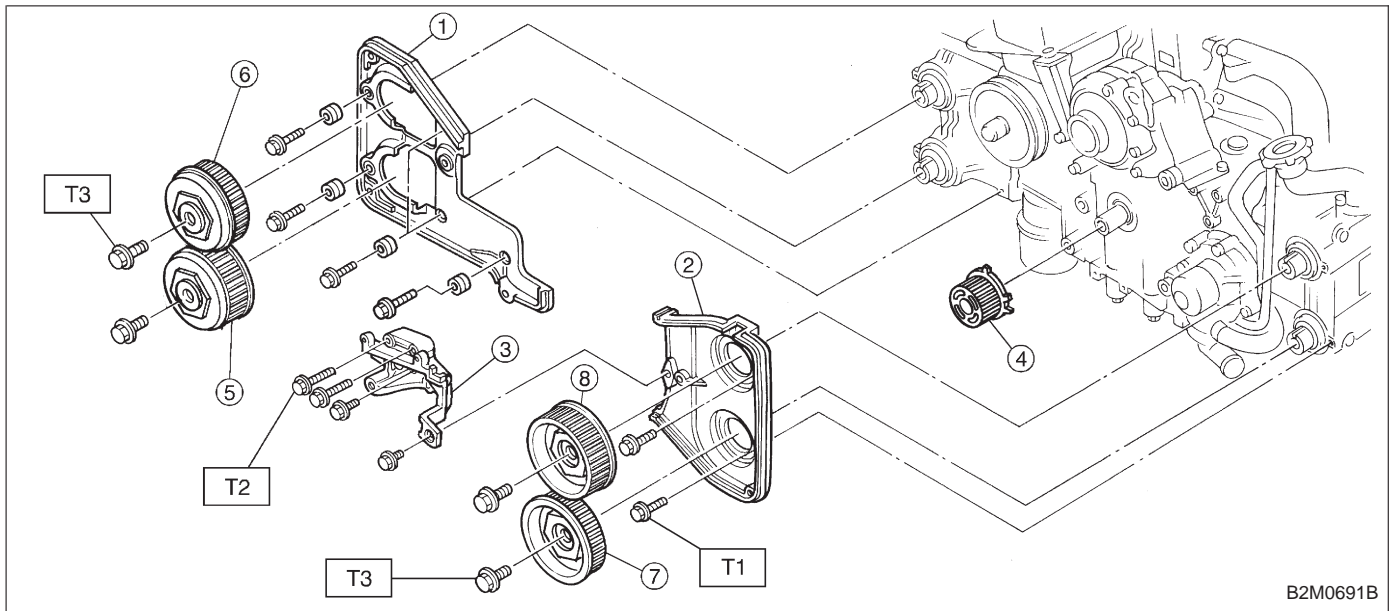
1) Check idler for smooth rotation. Replace if noise or excessive play is noted.

2) Check outer contacting surfaces of idler pulley for abnormal wear and scratches.

3) Check idler for grease leakage.

5. SPROCKET

- 1) Check sprocket teeth for abnormal wear and scratches.
- 2) Make sure there is no free play between sprocket and key.
- 3) Check crankshaft sprocket notch for sensor for damage and contamination of foreign matter.

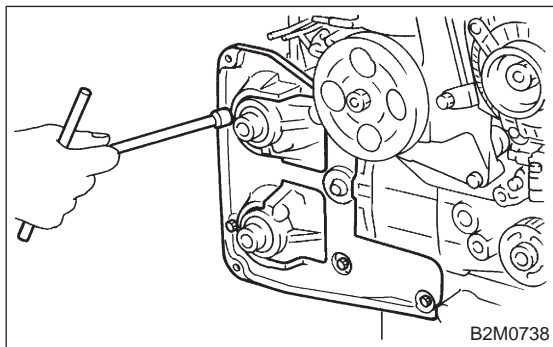
C: INSTALLATION**1. SPROCKET**

Tightening torque: N·m (kg·m, ft·lb)

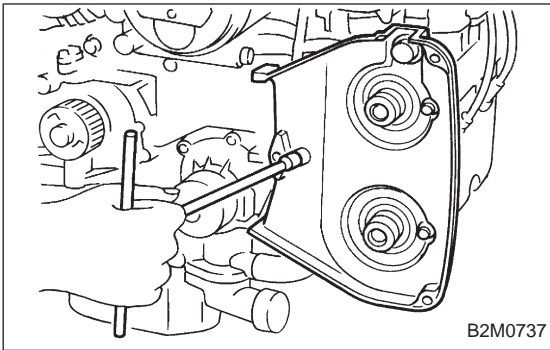
T1: 4.9±0.5 (0.5±0.05, 3.6±0.4)

T2: 25±2 (2.5±0.2, 18±1.4)

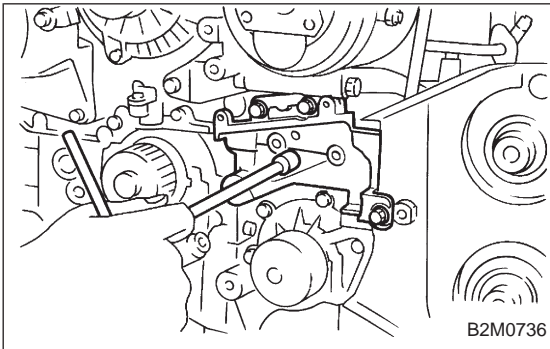
T3: 78±5 (8.0±0.5, 58±3.6)



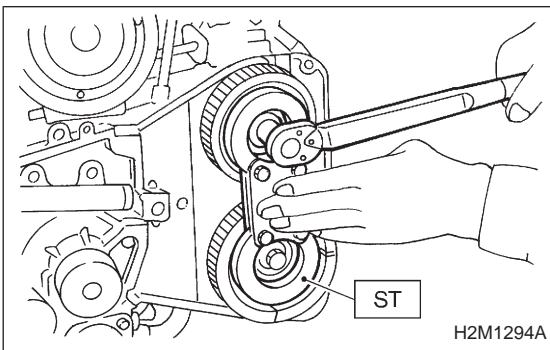
- 1) Install right-hand belt cover No. 2.



2) Install left-hand belt cover No. 2.

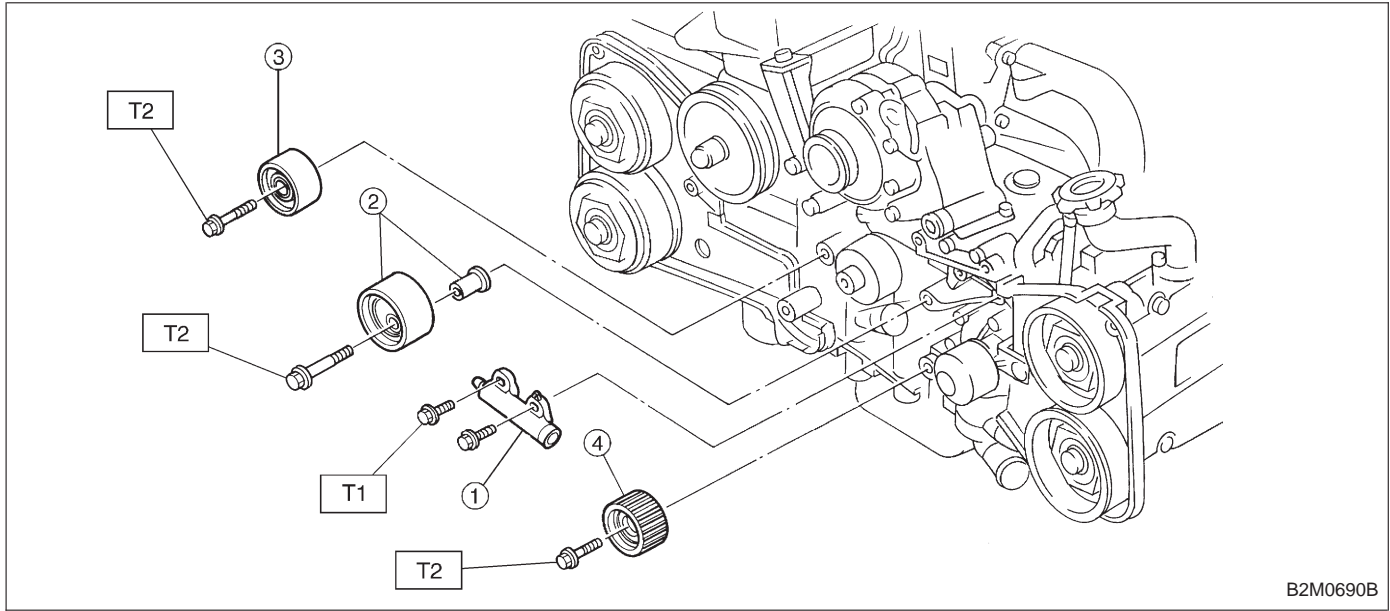


3) Install tensioner bracket.
4) Install crankshaft sprocket.

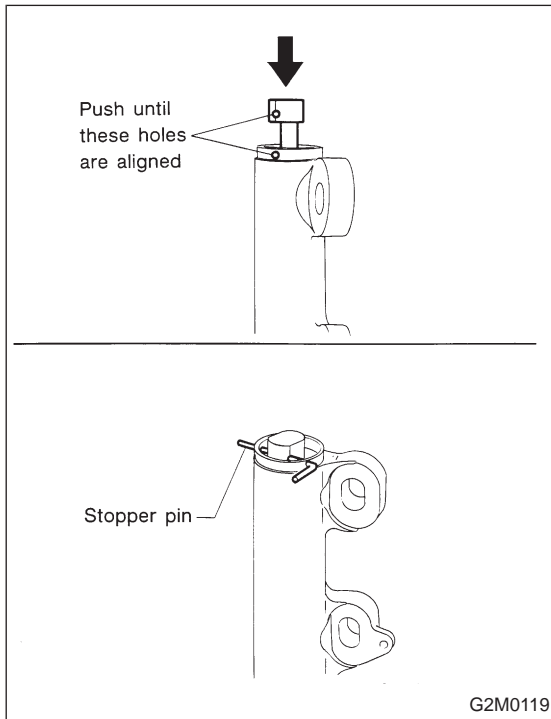


5) Install right-hand exhaust camshaft sprocket. To lock camshaft, use ST.
6) Install right-hand intake camshaft sprocket using ST.
7) Install left-hand exhaust camshaft sprocket using ST.
8) Install left-hand intake camshaft sprocket using ST.
ST 499207300 CAMSHAFT SPROCKET WRENCH

2. BELT TENSIONER AND IDLER



Tightening torque: N·m (kg·m, ft·lb)
T1: 25±2 (2.5±0.2, 18±1.4)
T2: 39±4 (4.0±0.4, 29±2.9)

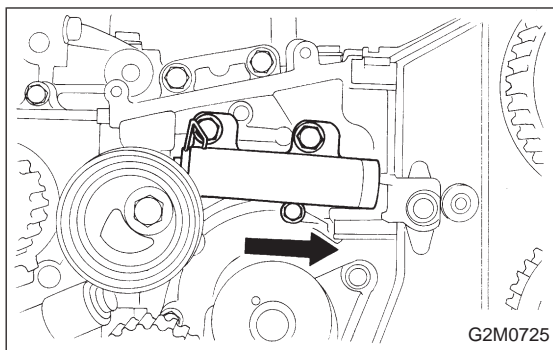


1) Installation of belt tensioner adjuster

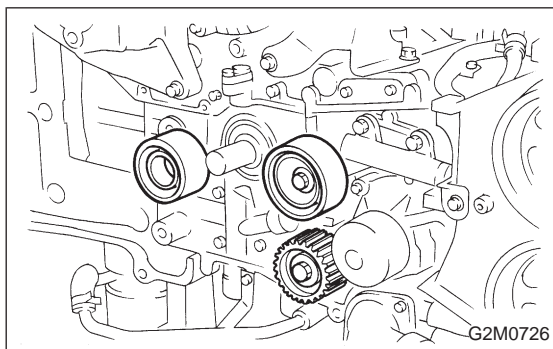
(1) Insert stopper pin 1.5 mm (0.059 in) dia. into place while pushing tension adjuster rod into body using a press.

CAUTION:

- Do not allow press pressure to exceed 9,807 N (1,000 kg, 2,205 lb).
- Do not release press pressure until stopper pin is completely inserted.
- Push tension adjuster rod vertically.
- Press-in the push rod gradually, taking three minutes or more.

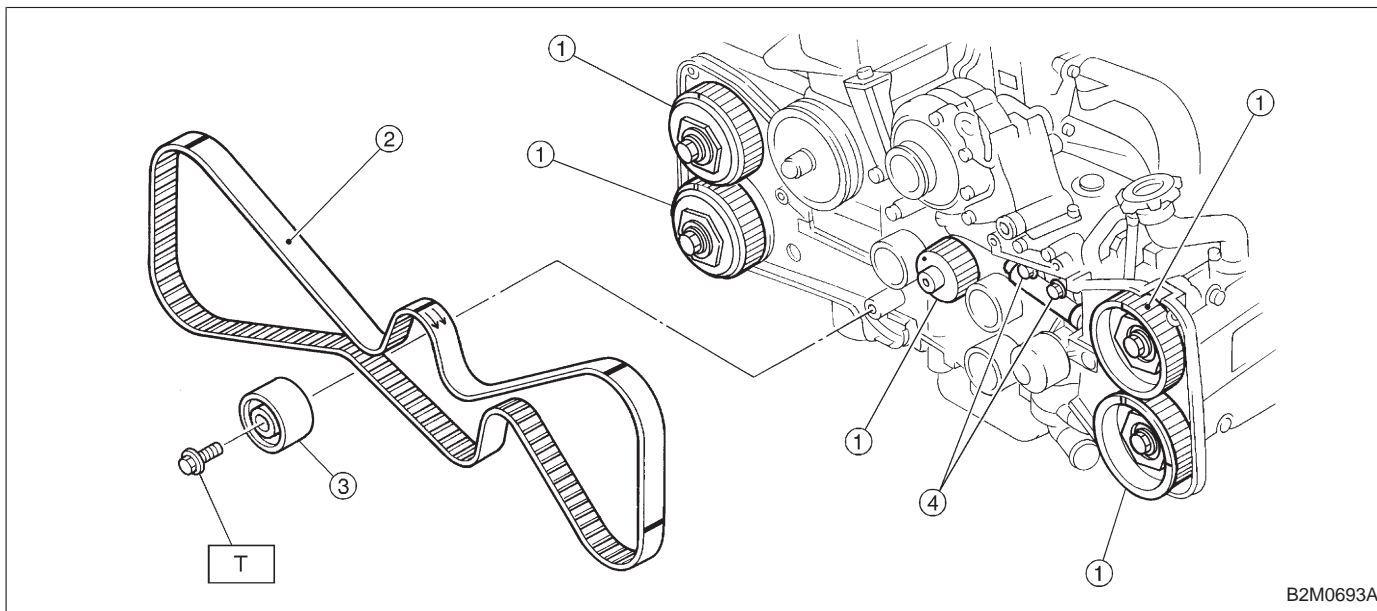


(2) Temporarily tighten bolts while tension adjuster is pushed all the way to the right.

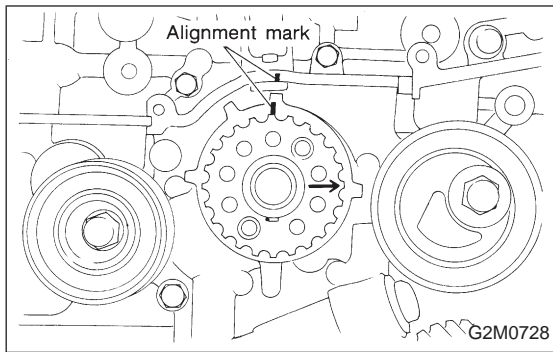


- 2) Install belt tensioner.
- 3) Install belt idler.
- 4) Install belt idler No. 2.

3. TIMING BELT

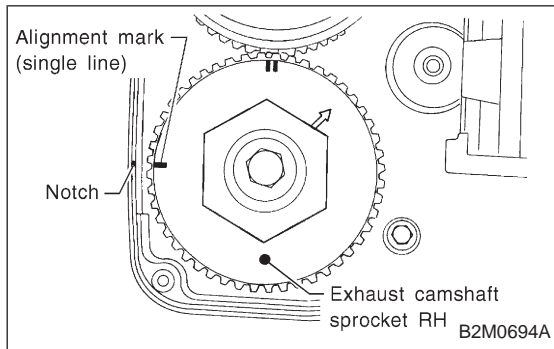


Tightening torque: N·m (kg·m, ft·lb)
T: 39±4 (4.0±0.4, 29±2.9)

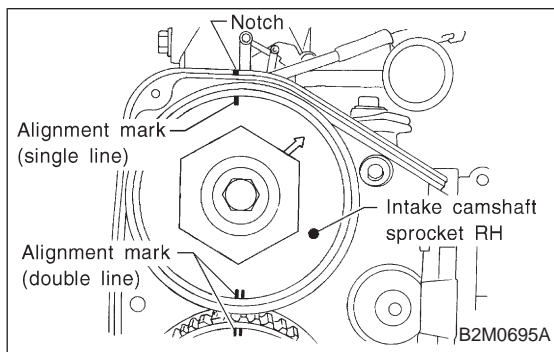


1) Crankshaft and camshaft sprocket alignment

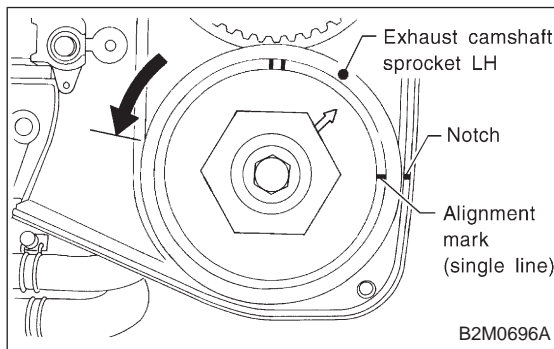
(1) Align mark on crankshaft sprocket with mark on the oil pump cover at cylinder block.



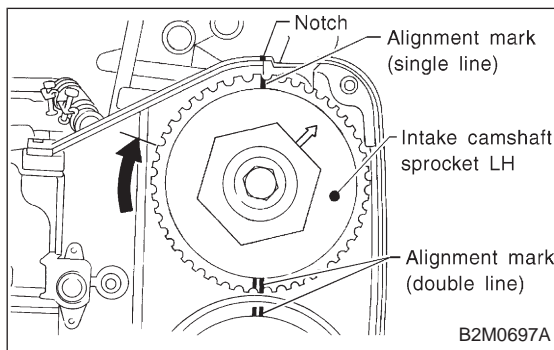
(2) Align single line mark on right-hand exhaust camshaft sprocket with notch on belt cover.



(3) Align single line mark on right-hand exhaust camshaft sprocket with notch on belt cover. (Make sure double lines on intake camshaft and exhaust camshaft sprockets are aligned.)

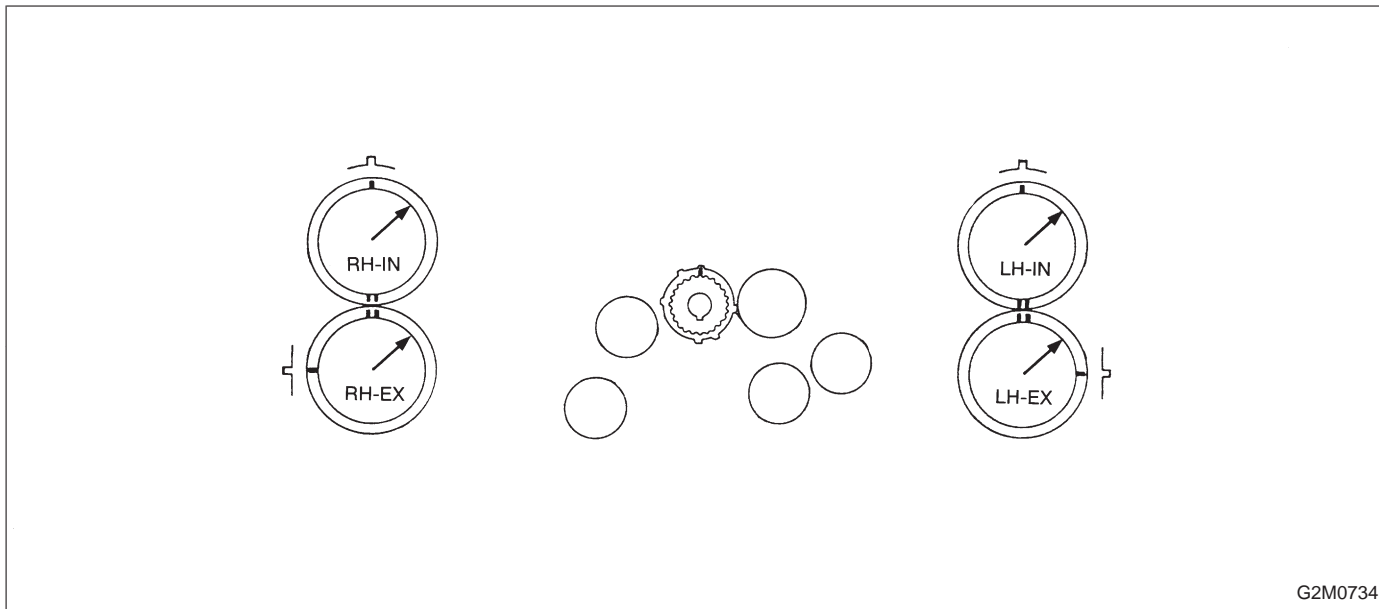


(4) Align single line mark on left-hand exhaust camshaft sprocket with notch on belt cover by turning sprocket counter-clockwise (as viewed from front of engine).

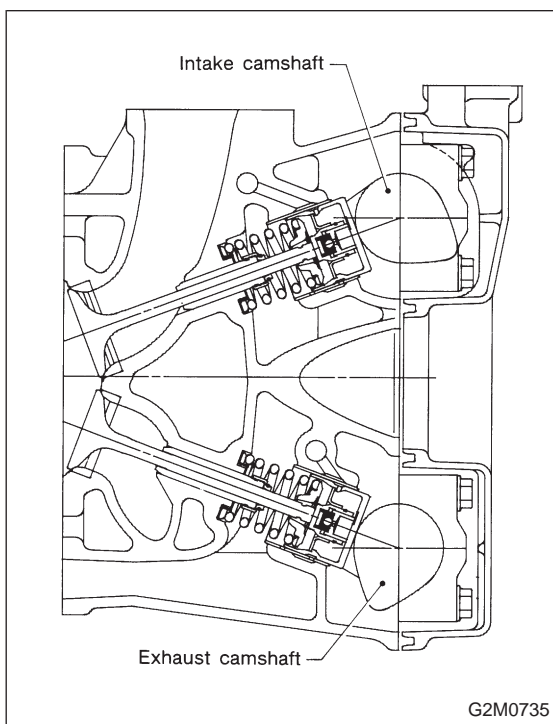


(5) Align single line mark on left-hand intake camshaft sprocket with notch on belt cover by turning sprocket clockwise (as viewed from front of engine). Ensure double lines on intake and exhaust camshaft sprockets are aligned.

(6) Ensure camshaft and crankshaft sprockets are positioned as shown.



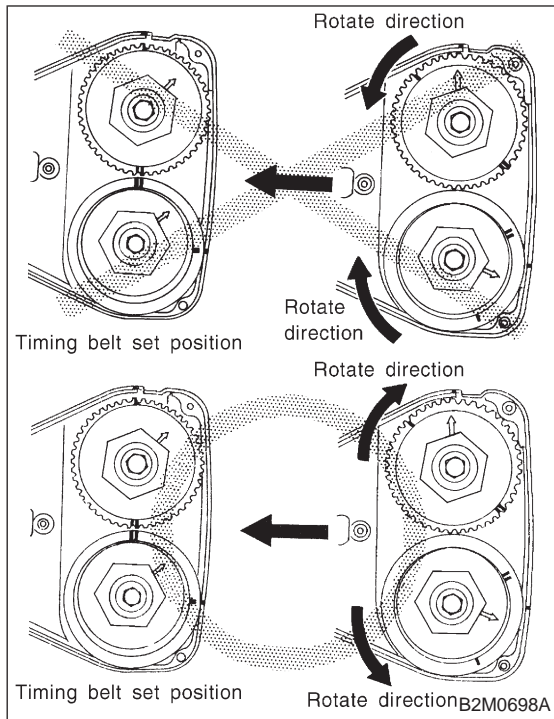
G2M0734



CAUTION:

- Intake and exhaust camshafts for this DOHC engine can be independently rotated with timing belts removed. As can be seen from the figure, if intake and exhaust valves are lifted simultaneously, their heads will interfere with each other, resulting in bent valves.

G2M0735

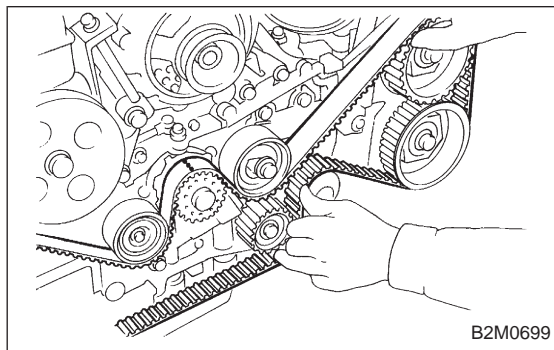


- When timing belts are not installed, four camshafts are held at the “zero-lift” position, where all cams on camshafts do not push intake and exhaust valves down. (Under this condition, all valves remain unlifted.)

- When camshafts are rotated to install timing belts, #2 intake and #4 exhaust cam of left-hand camshafts are held to push their corresponding valves down. (Under this condition, these valves are held lifted.) Right-side camshafts are held so that their cams do not push valves down.

- Left-hand camshafts must be rotated from the “zero-lift” position to the position where timing belt is to be installed at as small an angle as possible, in order to prevent mutual interference of intake and exhaust valve heads.

- Do not allow camshafts to rotate in the direction shown in the upper of figure as this causes both intake and exhaust valves to lift simultaneously, resulting in interference with their heads.

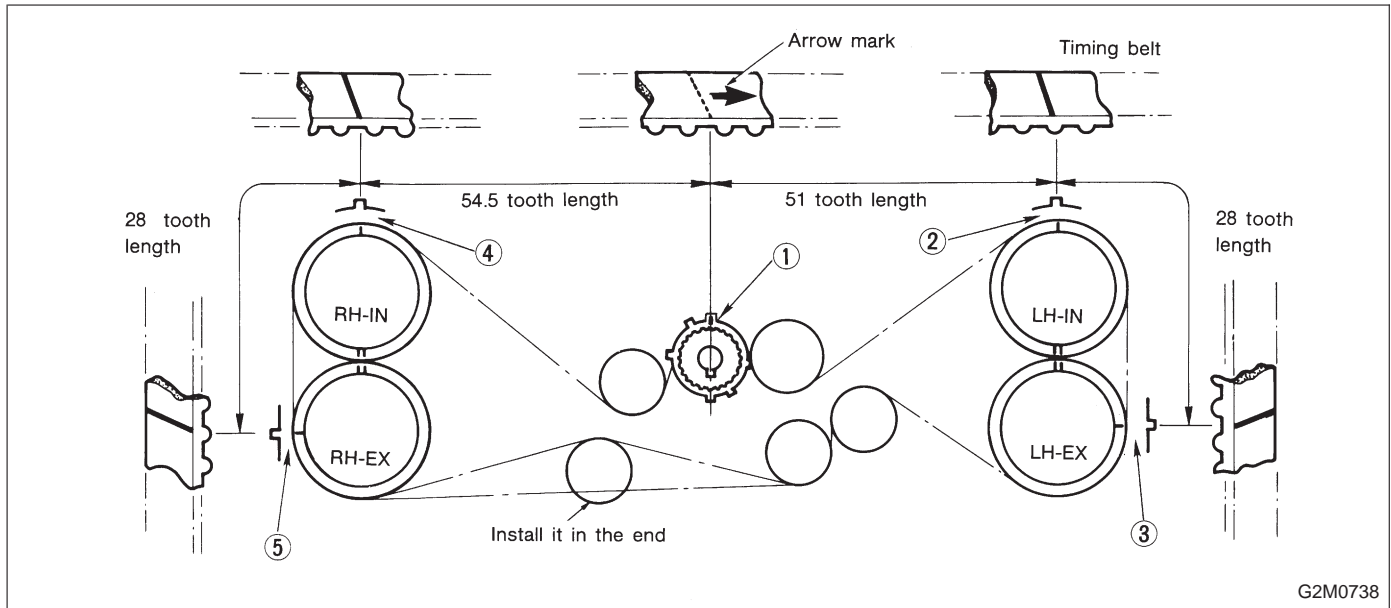


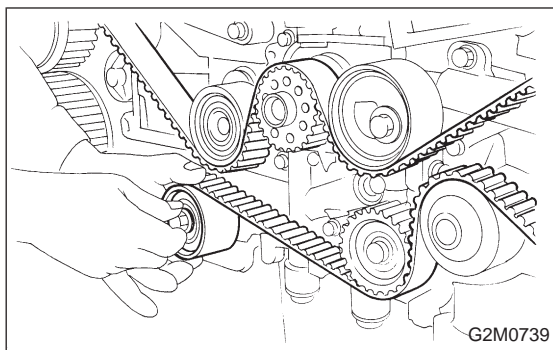
2) Installation of timing belt

Align alignment mark on timing belt with marks on sprockets in the numerical order shown in figure. While aligning marks, position timing belt properly.

CAUTION:

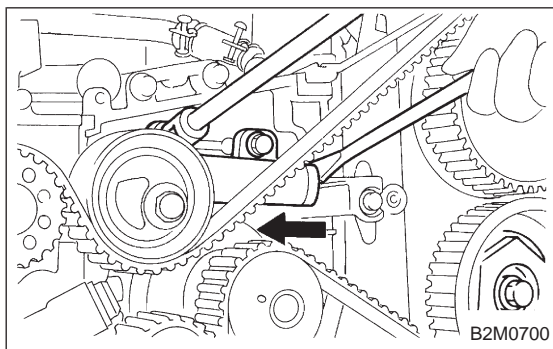
Ensure belt’s rotating direction is correct.



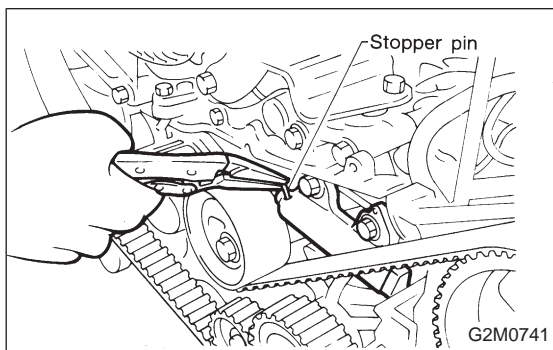


3) Install belt idler.

CAUTION:
Make sure that the marks on timing belt and sprockets are aligned.

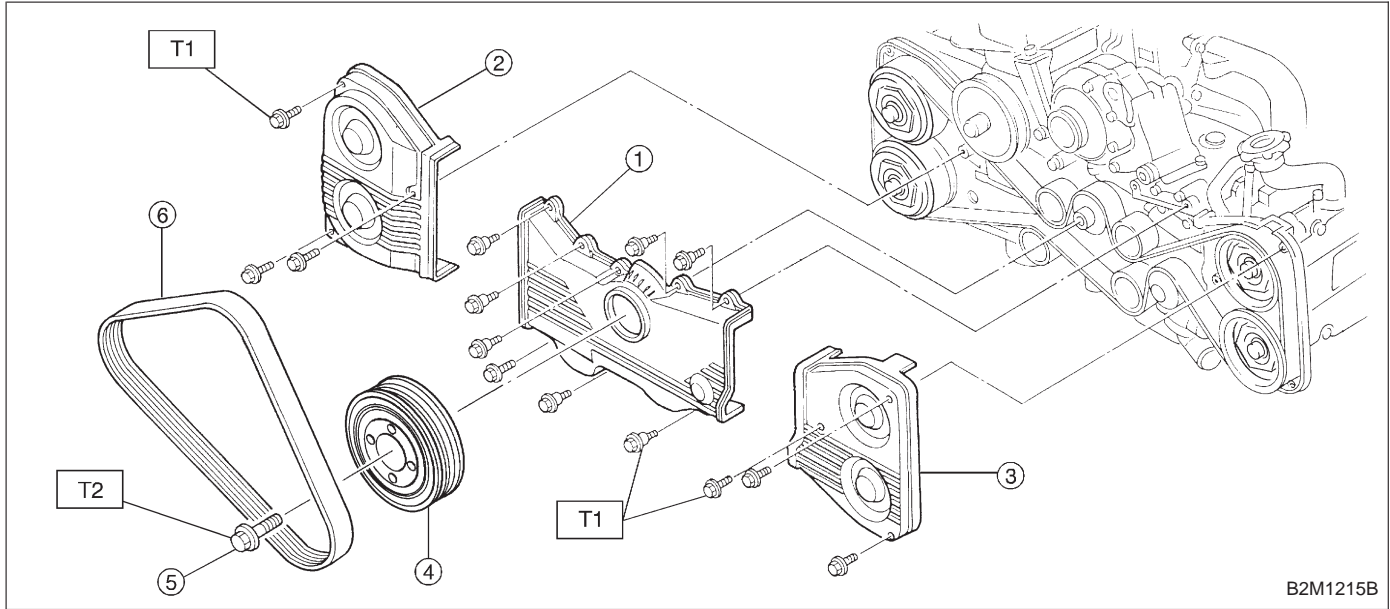


4) Loosen tension adjuster attaching bolts and move adjuster all the way to the left. Tighten the bolts.

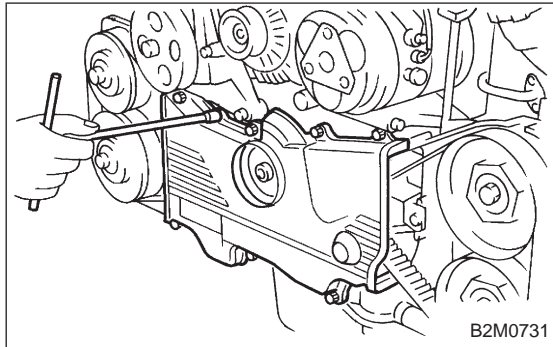


5) After ensuring that the marks on timing belt and sprockets are aligned, remove stopper pin from tension adjuster.

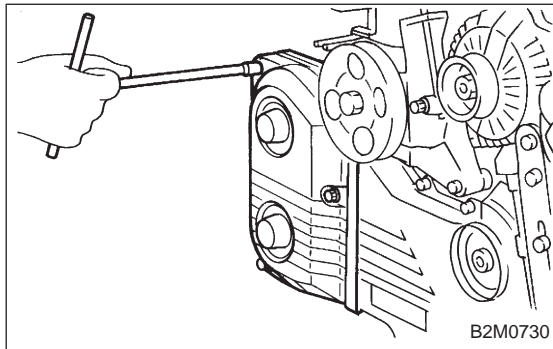
4. CRANKSHAFT PULLEY AND BELT COVER



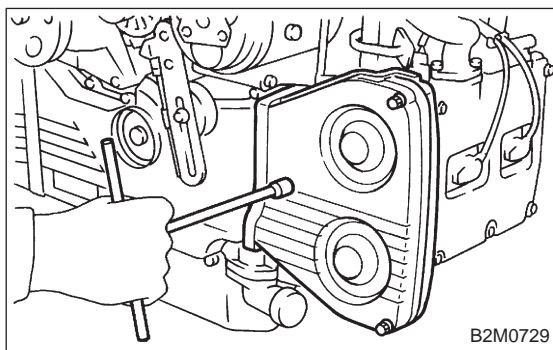
Tightening torque: N·m (kg·m, ft·lb)
T1: 5±0.5 (0.5±0.05, 3.6±0.4)
T2: 177±10 (18.0±1.0, 130±7)



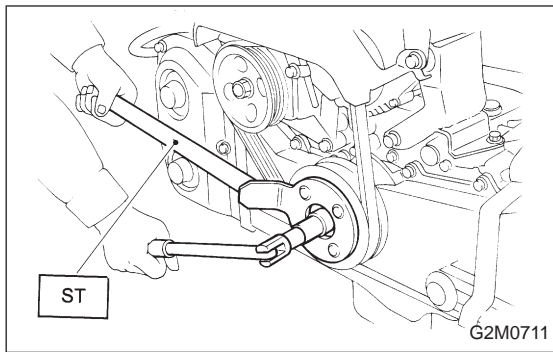
1) Install front belt cover.



2) Install right-hand belt cover.



3) Install left-hand belt cover.
 4) Install crankshaft pulley.



5) Install pulley bolt by using ST.

ST 499977100 CRANKSHAFT PULLEY WRENCH

6) Install V-belt.

CAUTION:

After installing V-belt, check and adjust V-belt tension.