



STi TIMING BELT INSTRUCTIONS

Thank you for your purchase of SPT Performance Parts.

The following instructions have been provided to you as a courtesy of Subaru of America, Inc.

Installation instructions are intended only for certified trained automotive technicians or those with the necessary automotive knowledge to properly complete the job. In some cases, special tools may be required. Installation should never be undertaken by unqualified persons or by those lacking the necessary tools and facilities.

Subaru of America, Inc. reserves the right to alter these installation instructions at any time without prior notification to customers.

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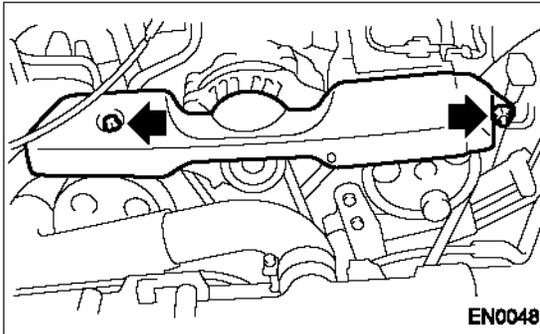
STi PERFORMANCE TIMING BELT

Timing Belt Installation Instructions

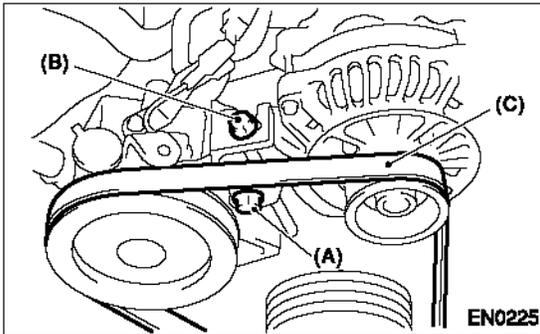
Remove the serpentine belts

ALTERNATOR / POWER STEERING BELT

- 1) Remove the belt cover.

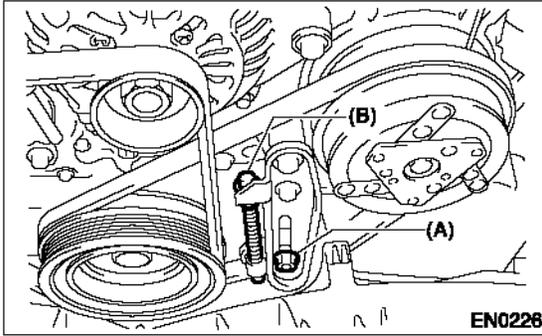


- 2) Loosen the lock bolt (A).
- 3) Loosen the slider bolt (B).
- 4) Remove the Alternator / Power Steering belt (C).

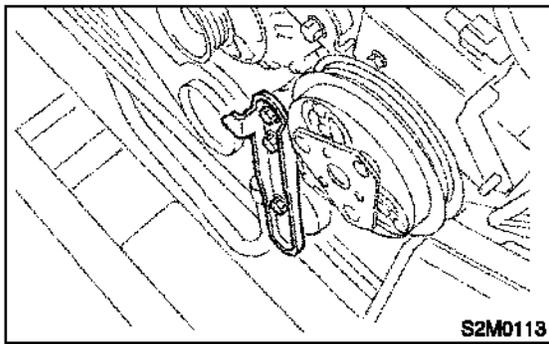


AIR CONDITIONING COMPRESSOR BELT

- 1) Loosen the lock nut (A).
- 2) Loosen the slider bolt (B).



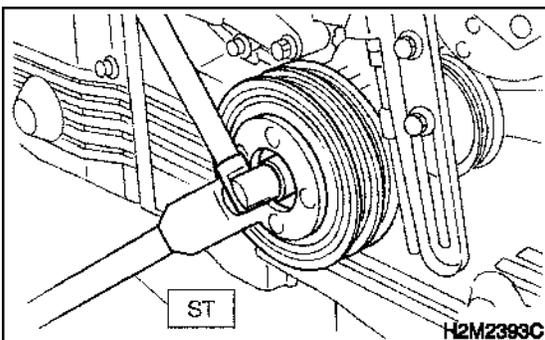
- 3) Remove the A/C belt.
- 4) Remove the A/C belt tensioner.



Remove the crankshaft pulley

- 1) Remove the crankshaft pulley bolt. To lock crankshaft, use:

ST 499977300 CRANKSHAFT PULLEY WRENCH

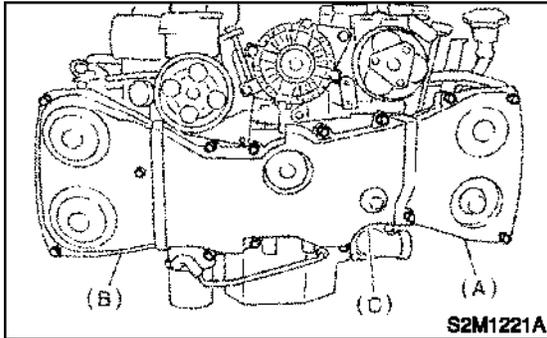


- 2) Remove the crankshaft pulley.

Remove the timing belt cover

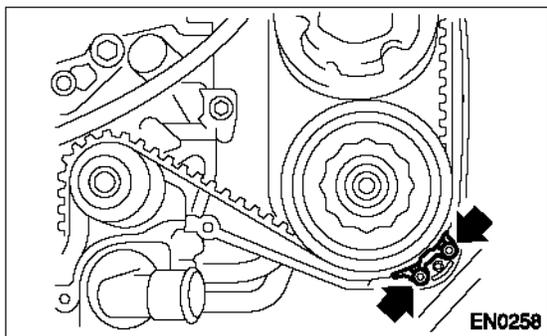
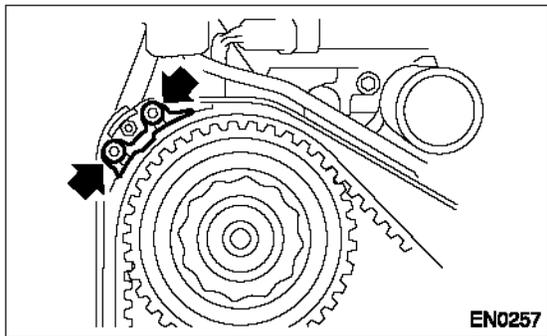
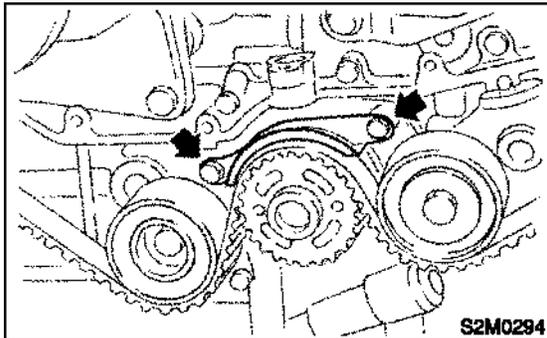
- 1) Remove the left-hand belt cover (A).

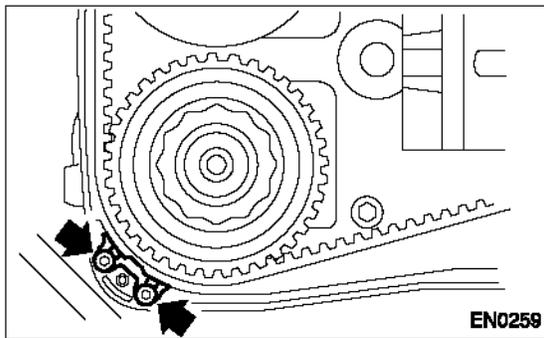
- 2) Remove the right-hand belt cover (B).
- 3) Remove the front belt cover (C).



Remove the timing belt

- 1) Remove the timing belt guides. (MT vehicle)

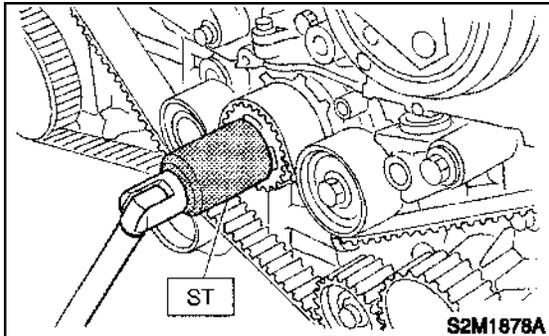




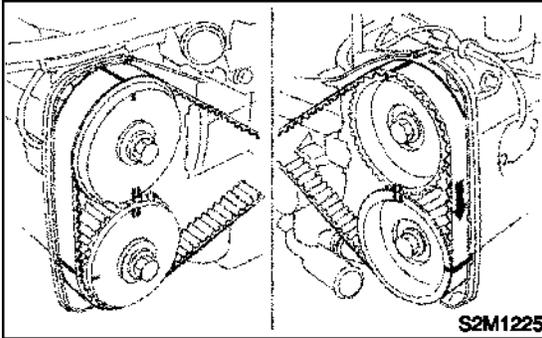
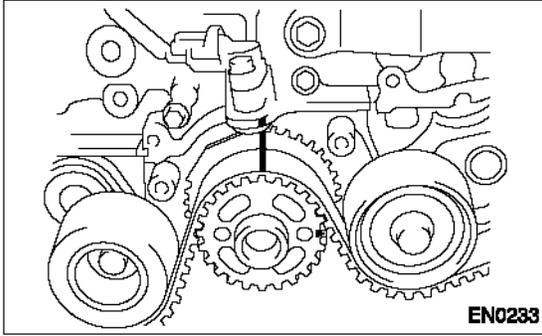
2) If the alignment mark and/or arrow mark (which indicates rotation direction) on timing belt fade away, put new marks before removing the timing belt as follows:

(A) Turn the crankshaft using ST 499987500 and align alignment marks on crankshaft sprocket, lefthand 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.

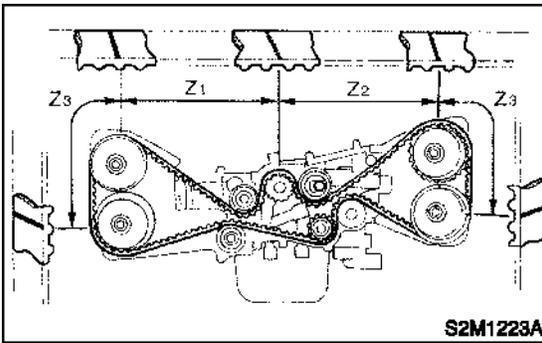
ST 499987500 CRANKSHAFT SOCKET



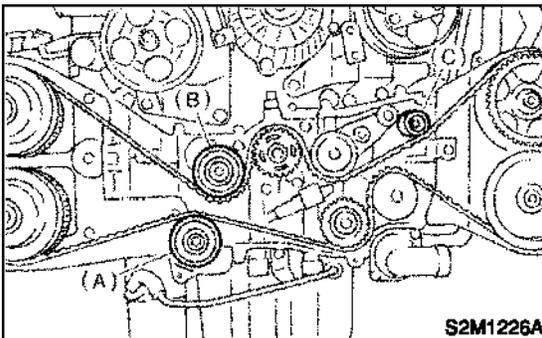
(B) Using white paint, put alignment and/or arrow marks on the timing belts in relation to the sprockets.



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



3) Remove the belt idler (A).



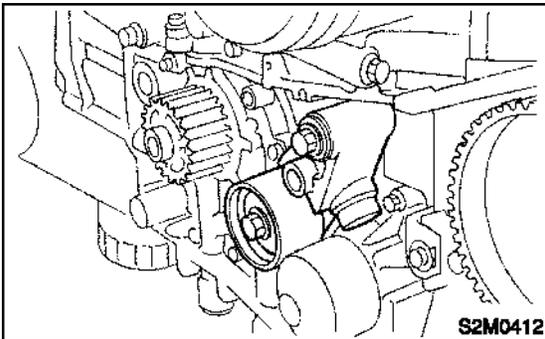
4) Remove the timing belt.

CAUTION:

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

Remove the automatic belt tension adjuster assembly

1) Remove the automatic belt tension adjuster assembly.



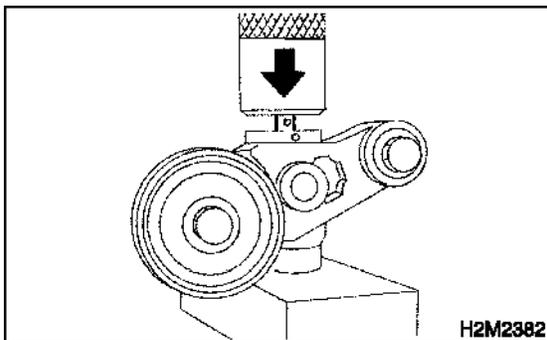
Install the automatic belt tension adjuster assembly and belt idler

CAUTION:

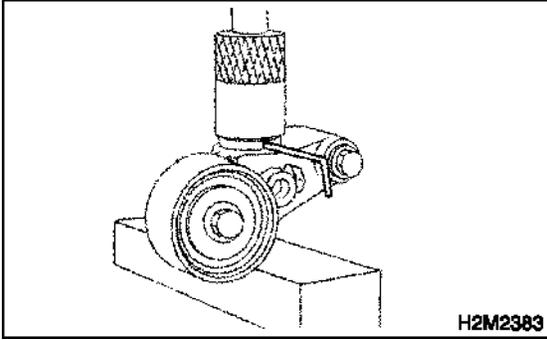
- Always use a vertical type pressing tool to move the adjuster rod down.
- Do not use a lateral type vise.
- Push the adjuster rod vertically.
- Be sure to slowly move the adjuster rod down applying a pressure of 294 N (30 kgf, 66 lb).
- Press-in the push adjuster rod gradually taking more than three minutes.
- Do not allow press pressure to exceed 9,807 N (1,000 kgf, 2,205 lb).
- Press the adjuster rod as far as the end surface of the cylinder. Do not press the adjuster rod into the cylinder. Doing so may damage the cylinder.
- Do not release the press pressure until stopper pin is completely inserted.

(1) Attach the automatic belt tension adjuster assembly to the vertical pressing tool.

(2) Slowly move the adjuster rod down with a pressure of 294 N (30 kgf, 66 lb) until the adjuster rod is aligned with the stopper pin hole in the cylinder.



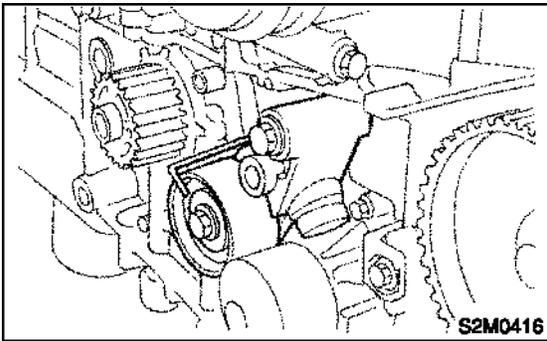
(3) With a 2 mm (0.08 in) dia. stopper pin or a 2 mm (0.08 in) (nominal) dia. hex bar wrench inserted into the stopper pin hole in the cylinder, secure the adjuster rod.



4) Install the automatic belt tensioner assembly.

Tightening torque:

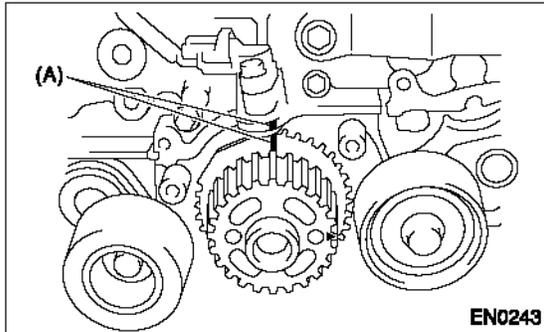
39 N·m (4.0 kgf·m, 28.9 ft·lb)



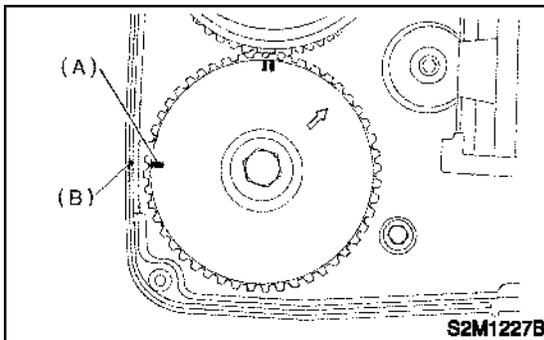
Install the timing belt

Crankshaft and camshaft sprocket alignment

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

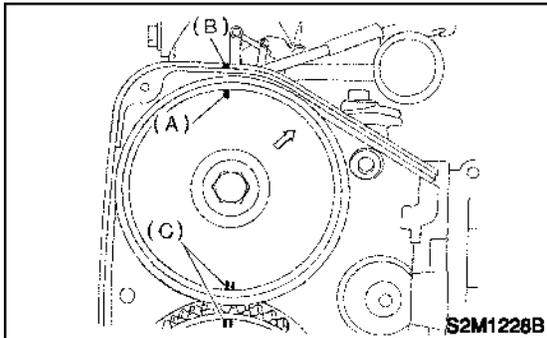


(2) Align single line mark (A) on the right-hand exhaust camshaft sprocket with notch (B) on belt cover.

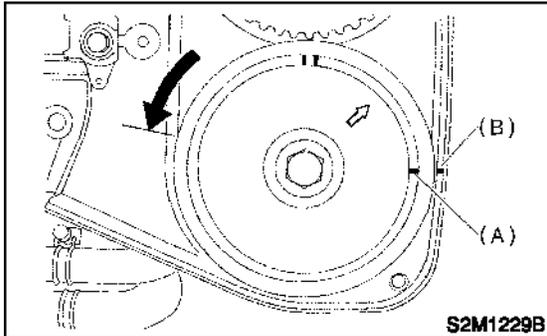


(3) Align single line mark (A) on the right-hand intake camshaft sprocket with notch (B) on belt cover.
(Make sure double lines (C) on intake camshaft

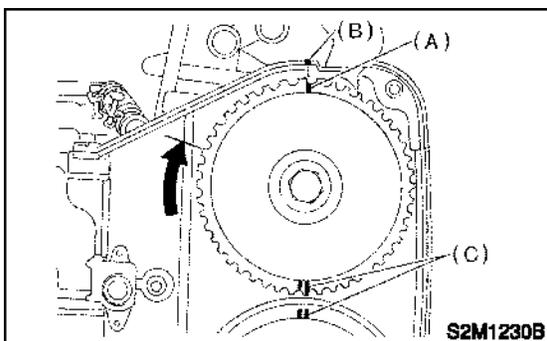
and exhaust camshaft sprockets are aligned.)



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



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

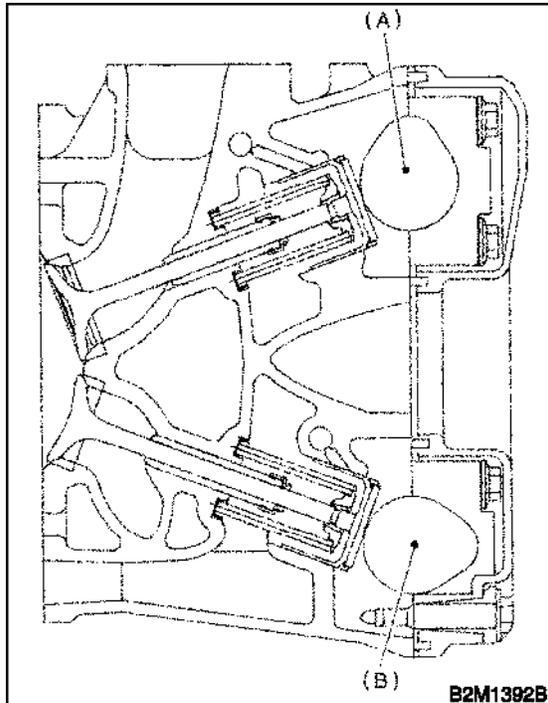


(6) Ensure camshaft and crankshaft sprockets are positioned properly.

CAUTION:

- Intake and exhaust camshafts for this DOHC

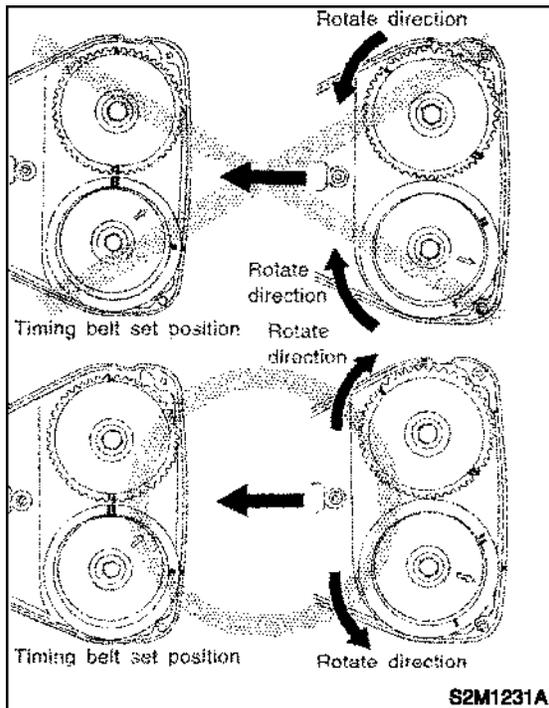
engine can be independently rotated with the timing belts removed. As can be seen from the figure, if the intake and exhaust valves are lifted simultaneously, their heads will interfere with each other, resulting in bent valves.



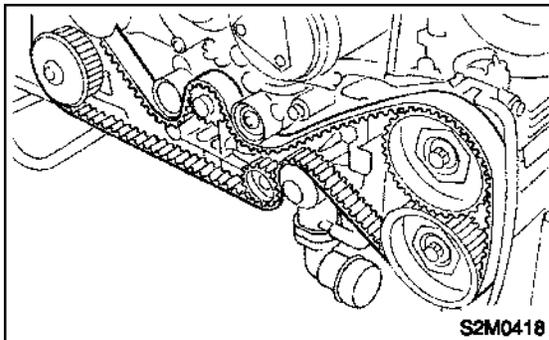
(A) Intake camshaft
(B) Exhaust camshaft

- When the timing belts are not installed, four camshafts are held at the “zero-lift” position, where all cams on camshafts do not push the intake and exhaust valves down. (Under this condition, all valves remain unlifted.)
- When the camshafts are rotated to install the 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 the 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 the camshafts to rotate in the direction shown in the figure as this causes both

intake and exhaust valves to lift simultaneously, resulting in interference with their heads.



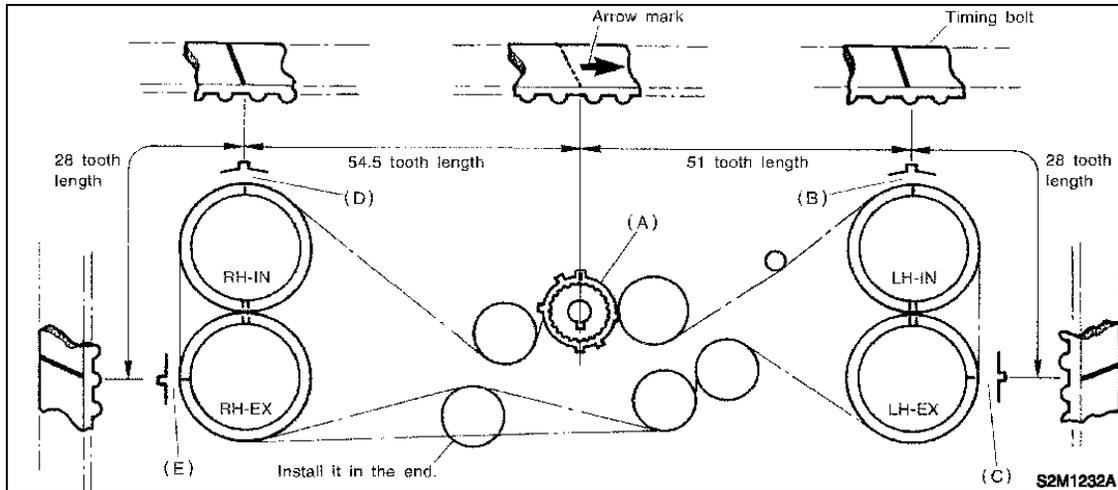
7) Installation of timing belt:



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

CAUTION:

- Disengagement of more than three timing belt teeth may result in interference between the valve and piston.
- Ensure the belt's rotating direction is correct.



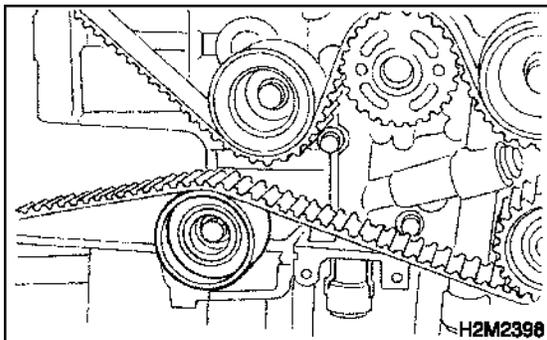
8) Install the belt idlers.

Tightening torque:

39 N·m (4.0 kgf-m, 28.9 ft-lb)

CAUTION:

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



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

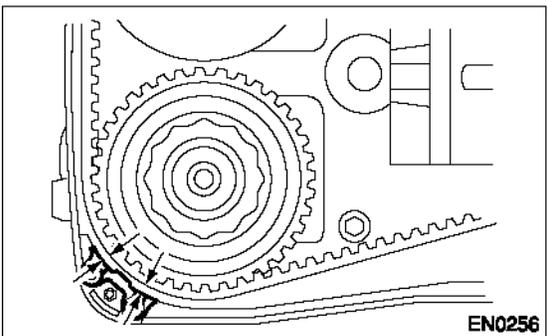
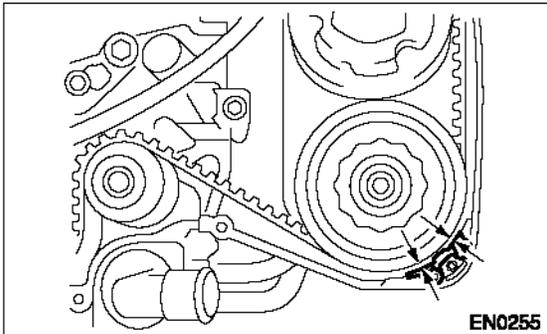
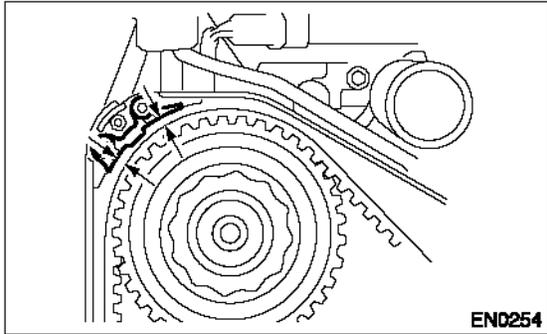
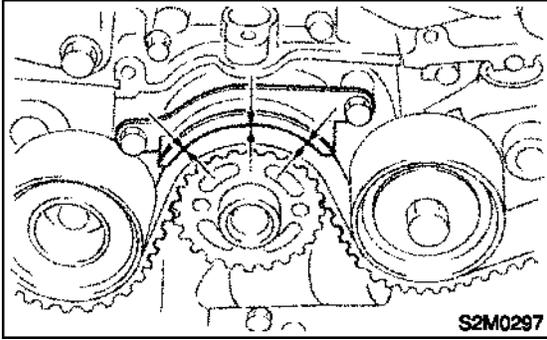
10) Install the timing belt guide. (MT vehicle)

(1) Temporarily tighten the remaining bolts.

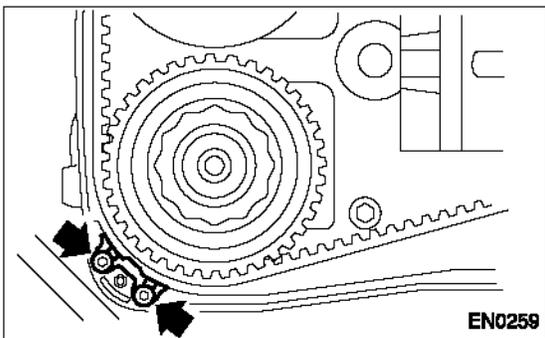
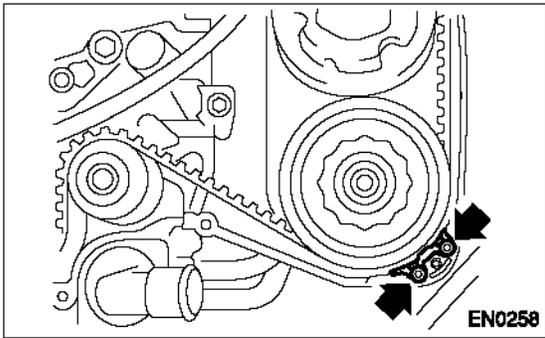
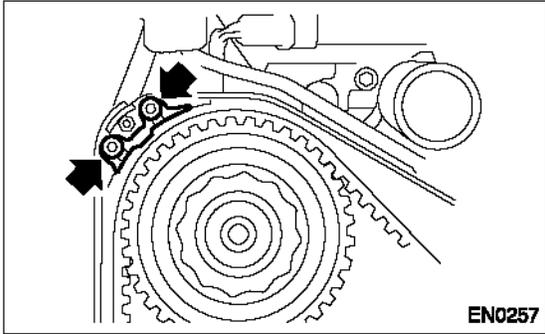
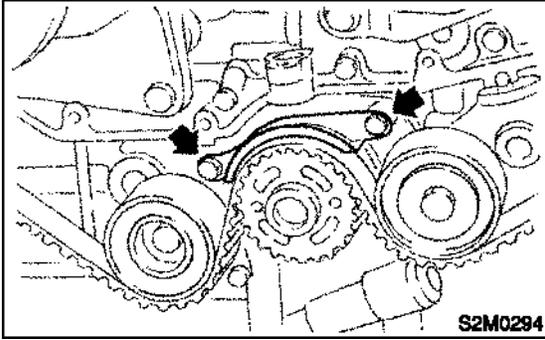
(2) Check and adjust clearance between the timing belt and timing belt guide.

Clearance:

1.0 +/- 0.5 mm (0.039 +/- 0.020 in)



(11) Tighten the remaining bolts.
Tightening torque:
9.8 N·m (1.0 kgf·m, 7.2 ft·lb)



Install the timing belt cover

1) Install the front belt cover (C).

Tightening torque:

5 N·m (0.5 kgf·m, 3.6 ft·lb)

2) Install the right-hand belt cover (B).

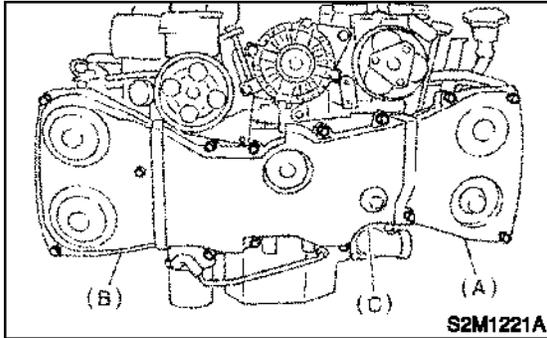
Tightening torque:

5 N·m (0.5 kgf-m, 3.6 ft-lb)

3) Install the left-hand belt cover (A).

Tightening torque:

5 N·m (0.5 kgf-m, 3.6 ft-lb)



Install the crankshaft pulley

1) Install the crankshaft pulley.

2) Install the pulley bolt.

To lock the crankshaft, use:

ST 499977300 CRANKSHAFT PULLEY
WRENCH

(3) Clean the crankshaft pulley thread using an air jet.

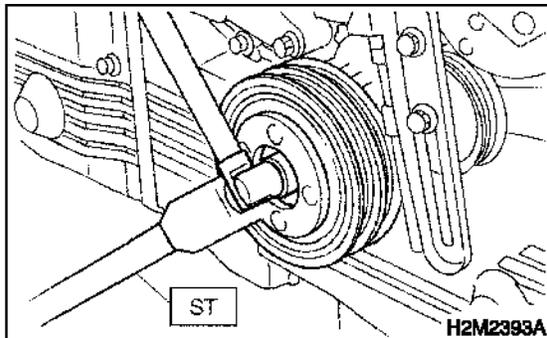
(4) Apply engine oil to the crankshaft pulley bolt seat and thread.

(5) Tighten the bolts temporarily with tightening torque of 44 N·m (4.5 kgf-m, 33 ft-lb).

(6) Tighten the crankshaft pulley bolts.

Tightening torque:

127 N·m (13 kgf-m, 94.0 ft-lb)



7) Confirm that the tightening angle of the crankshaft pulley bolt is 45 degrees or more. If not, conduct the following procedures (1) through (4).

CAUTION:

If the tightening angle of crankshaft pulley bolt is less than 45 degrees, the bolt should be damaged. In this case, the bolt must be replaced.

(8) Replace the crankshaft pulley bolts and clean them.

**Crankshaft pulley bolt:
12369AA011**

(9) Clean the crankshaft thread using an air jet.

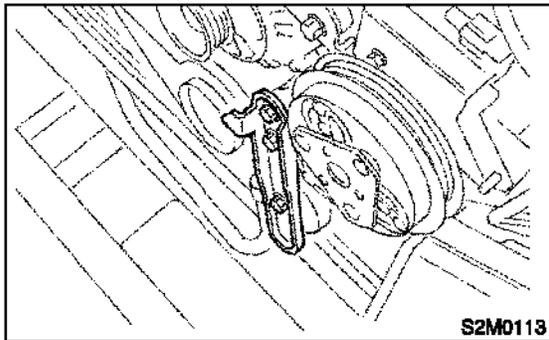
(10) Tighten the bolts temporarily with tightening torque of 44 N·m (4.5 kgf-m, 33 ft-lb).

(11) Tighten the crankshaft pulley bolts keeping them in an angle between 65 degrees and 75 degrees.

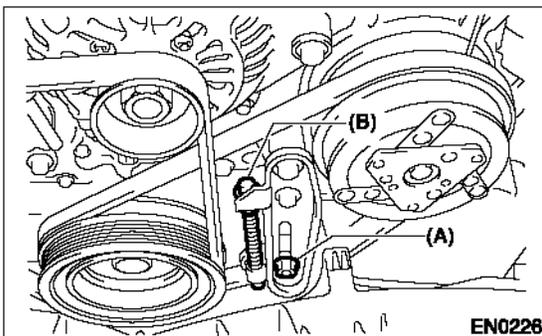
CAUTION:

Conduct the tightening procedures by confirming the turning angle of the crankshaft pulley bolt referring to the gauge indicated on the belt cover.

12) Install the A/C belt tensioner.



13) Install the A/C belt.

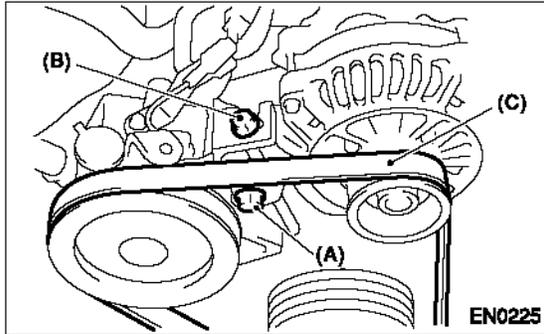


14) Install the Alternator / Power Steering belt.

15) Tighten the slider bolt (B) until belt is snug.

16) Tighten the lock bolt (A).

Tightening torque:
Lock bolt through bolt:
25 N·m (2.5 kgf-m, 18 ft-lb)
Slider bolt:
8 N·m (0.8 kgf-m, 5.5 ft-lb)



17) Install the belt cover.

