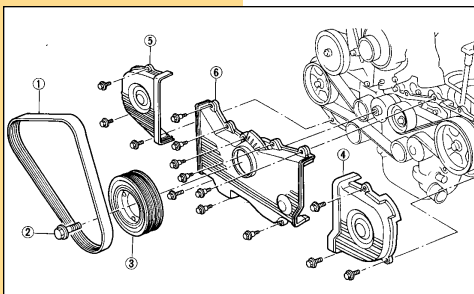


2.2 Liter Single Overhead Cam Timing Belt Replacement

In the last issue of *The End Wrench* (Fall, 2000), we covered the timing belt replacement procedures for the 2.5 liter twin cam engine. As we mentioned, the 2.5 is an interference engine, which is why it's so important to properly remove and reinstall the timing belt. Anything short of total accuracy could cause serious engine damage.

Another very common Legacy engine is the 2.2 liter single overhead cam engine. In fact, this was the *only* Legacy engine from its introduction in 1990 until the 2.5 liter engine came along several years later. Unlike the 2.5, the 2.2 engine is not an interference engine. If the belt breaks or jumps timing, the engine probably will not sustain any internal damage.

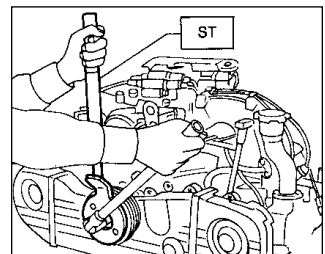
Regular maintenance should eliminate the possibility of the above scenario. Because it's such a popular engine, your likelihood of doing a timing belt replacement on the 2.2 is probably greater than on the 2.5 twin cam. While it's certainly not a complicated procedure, there are several steps (which we'll detail on the following pages) that must be completed in the proper sequence to assure success and to provide a long service life from the replacement belt.

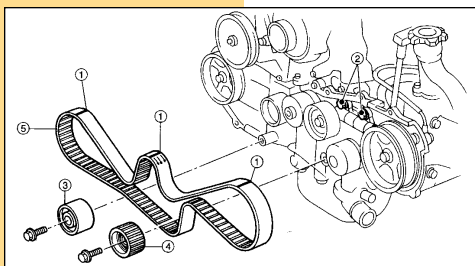


Timing Belt Removal

Crankshaft Pulley And Belt Cover

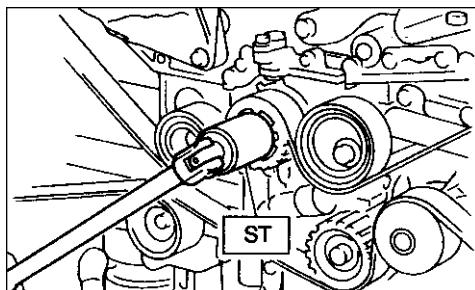
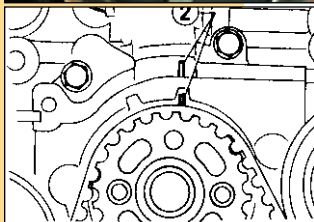
1. Remove V-belt and A/C belt tensioner.
2. Remove pulley bolt. To lock the crankshaft use ST 499977000 Crankshaft Pulley Wrench.
3. Remove the crankshaft pulley.
4. Remove the left side belt cover.
5. Remove the right side belt cover.
6. Remove the front belt cover.





Timing Belt

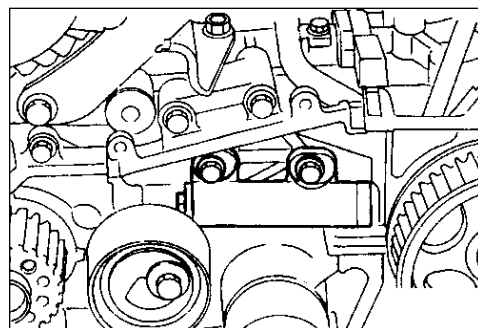
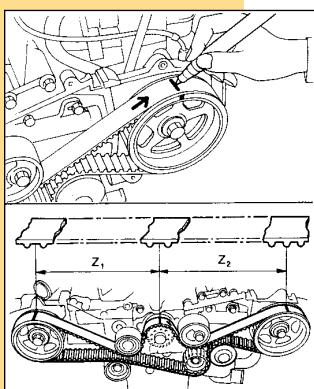
1. If alignment mark 2 and/or arrow mark (which indicates rotation direction) on the timing belt have faded, make new marks before removing timing belt as follows:



- Turn crankshaft, and align alignment marks 2 on crankshaft sprocket, and left and right camshaft sprockets with notches 1 of belt cover and cylinder block.
- Using white paint, put alignment and/or arrow marks on timing belt in relation to the sprockets.

Z1 = 44 tooth length
Z2 = 40.5 tooth length

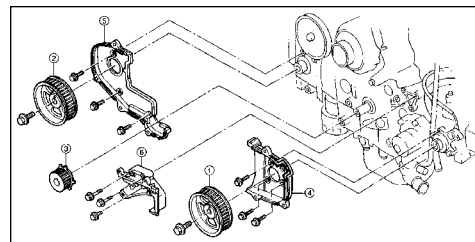
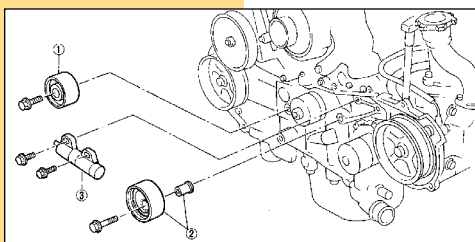
2. Loosen the tensioner adjuster mounting bolts.



3. Remove the belt idler.
4. Remove belt idler No. 2.
5. Remove the timing belt.
6. Remove the tensioner adjuster.

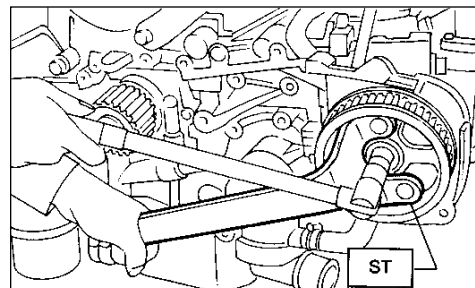
Belt Tensioner and Idler

1. Remove the belt idler.
2. Remove the belt tensioner and spacer.
3. Remove the belt tensioner adjuster.



Sprocket

1. Remove the left side camshaft sprocket.



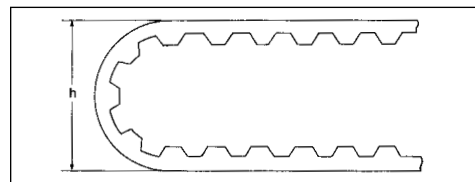
2. Remove the right side camshaft sprocket. To lock the camshaft, use ST 499207100 Camshaft Sprocket Wrench.
 3. Remove the crankshaft sprocket.
 4. Remove the left side belt cover No. 2.
 5. Remove the right side belt cover No. 2.
- Caution: Do not damage or lose the seal rubber when removing belt covers.*
6. Remove the tensioner bracket.

Inspection

Timing Belt

1. Check the timing belt teeth for breaks, cracks and wear. If any fault is found, replace the belt.
2. Check the condition of the back side of the belt. If any cracks are found, replace the 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. The bending radius should be 60 mm (2.36 inch) or more.



Belt Tension Adjuster

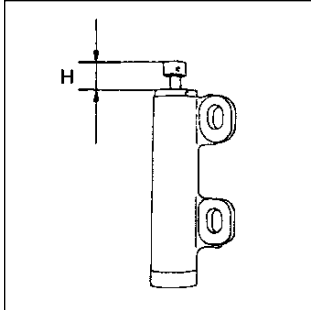
1. Visually check oil seals for leaks and rod ends for abnormal wear or

scratches. If necessary, replace the belt tension adjuster.

Caution: Slight traces of oil at the rod's oil seal do not indicate a problem.

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

- When applying a force of 147 Nm (33 lbs), the rod section should not sink.
 - When applying a force of 147 to 490 Nm (33-110 lbs), the belt tensioner rod section should maintain resistance and should not sink within 8.5 seconds.
3. Measure the extension of the rod beyond the body. If it is not within specifications, replace with a new tensioner. Rod extension H = 15.4-16.4 mm (0.606 – 0.646 in).



Belt Tensioner

1. Check the mating surfaces of the timing belt and contact point of the tension adjuster rod for abnormal wear or scratches. Replace the tensioner if it is defective.
2. Check the spacer and tensioner bushing for wear.
3. Check the tensioner bearing for smooth rotation. Replace it if noise or excessive play are noted.
4. Check the tensioner for grease leakage.

Belt Idler

1. Check the idler bearing for smooth rotation. Replace the idler if noise or excessive play are noted.
2. Check the other contacting surfaces of the idler pulley for abnormal wear and scratches.
3. Check the idler for grease leakage.

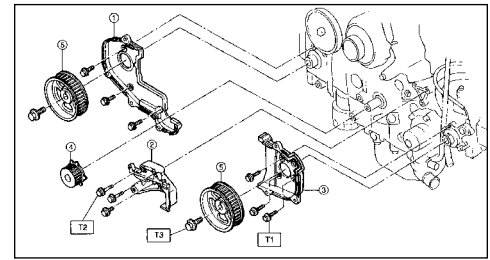
Sprocket

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

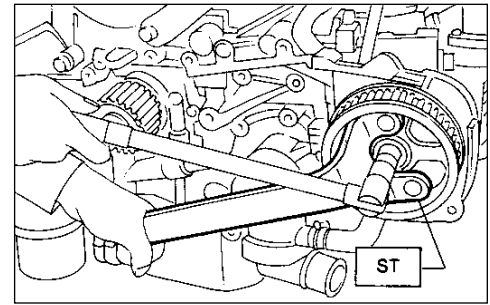
Installation

Sprocket

1. Install the right side belt cover No. 2.



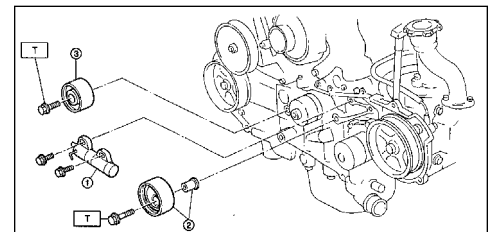
2. Install the tensioner bracket.
3. Install the left side belt cover No. 2.
4. Install the crankshaft sprocket.
5. Install the right side camshaft sprocket and left side camshaft sprocket. Use the ST 499207100 Camshaft Sprocket Wrench to lock the camshaft.



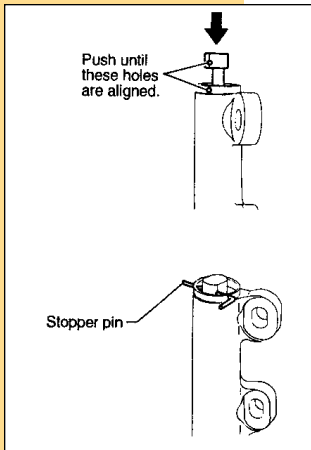
Caution: Do not confuse the left and right side camshaft sprockets during installation. The left side camshaft sprocket can be identified by a projection used by the cam angle sensor to monitor camshaft position.

Belt Tensioner and Idler

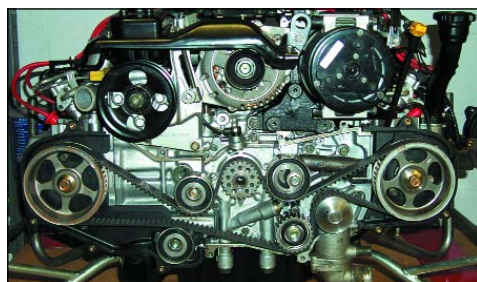
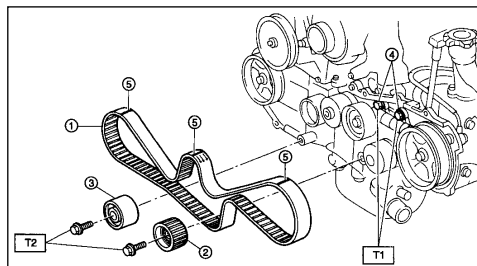
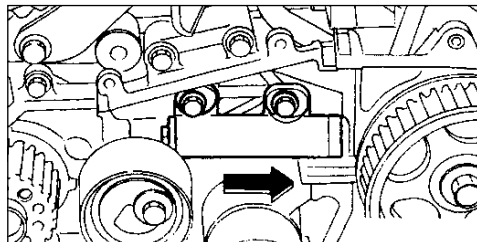
1. To install the belt tensioner, use a press to push the tension adjuster rod into the tensioner body until a 1.5 mm stopper pin can be inserted through the holes in the tensioner body and adjuster rod.



Cautions: Do not allow pressure to exceed 9807 N (2205 lbs). Do not release the pressure until the stopper pin is completely inserted. Push the tension adjuster rod vertically. Press the push rod gradually, taking three minutes or more to fully retract the rod.



2. Install the belt tensioner and spacer.
3. Install the belt idler.
4. Temporarily tighten the bolts while the belt tension adjuster is pushed all the way to the right.

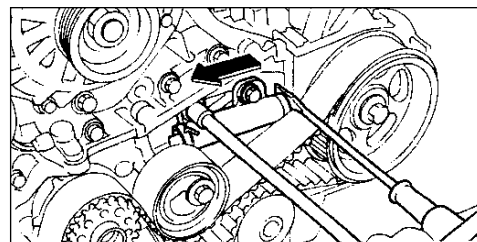
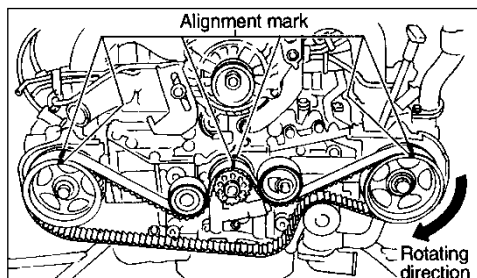


Timing Belt

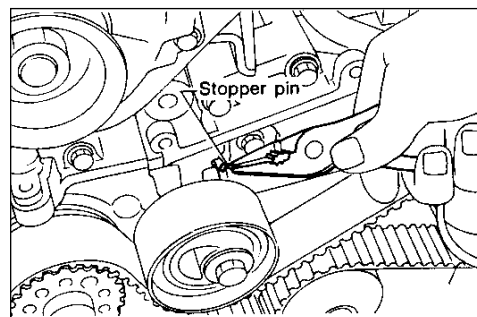
1. To install the timing belt:

- Use ST 499207100 Camshaft Sprocket Wrench to turn the left and right camshaft sprockets until their alignment marks come to the top positions.
- While aligning the alignment marks on the new timing belt with the marks on the sprockets, position the timing belt.

Caution: Ensure the belt's rotating direction is correct.

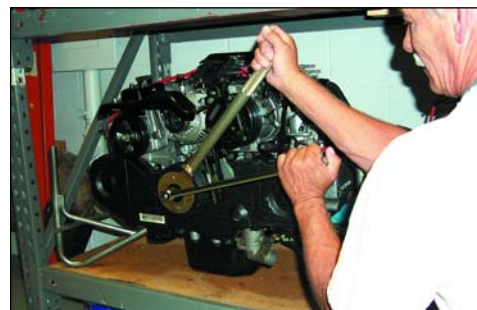


2. Install belt idler No. 2.
3. Install the belt idler.
4. Loosen the belt tensioner adjuster bolts and move the adjuster all the way to the left. Tighten the bolts.
5. After ensuring that the marks on the timing belt and camshaft sprockets are aligned, remove the stopper pin from the timing belt tension adjuster.



Crankshaft Pulley and Belt Cover

1. Install the front belt cover.
2. Install the right side belt cover.
3. Install the left side belt cover.
4. Install the crankshaft pulley.



5. Install the crankshaft bolt, using ST 499977000 Crankshaft Pulley Wrench to hold the crankshaft pulley stationary.
6. Install the v-belts and adjuster pulley.