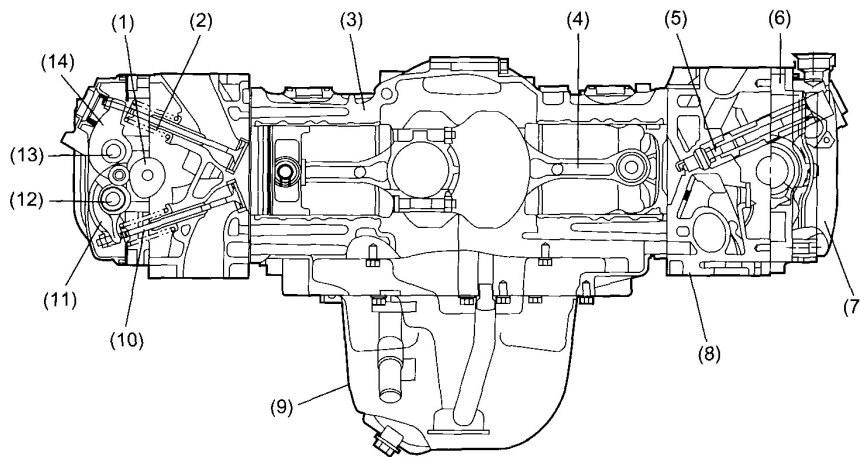


**2006 ENGINE****Mechanism & Function - Mechanical (H4SO)****GENERAL**

The engine used in this vehicle is of a horizontally opposed, four-cylinder design. This four-stroke-cycle, water-cooled, SOHC engine uses a total of 16 valves and its main components are made of aluminum alloy. It is fueled by a multiple fuel injection system.

The engine's major structural and functional features are as follows:

- The cylinder head forms pent roof combustion chambers, each having a spark plug located at its center and two each of intake and exhaust valves (four valves per cylinder). The intake and exhaust ports are located in a cross-flow arrangement.
- There are a screw and nut at the valve end of each rocker arm. They are used for adjusting the valve clearance.
- A single timing belt drives two camshafts on the left and right banks and the water pump on the left bank. A belt tension adjuster automatically adjusts the belt tension and eliminates the need for manual adjustments.
- The crankshaft is supported at five journals with high rigidity and strength.
- The cylinder block is made of aluminum die-casting, and cast iron cylinder liners are cast in.



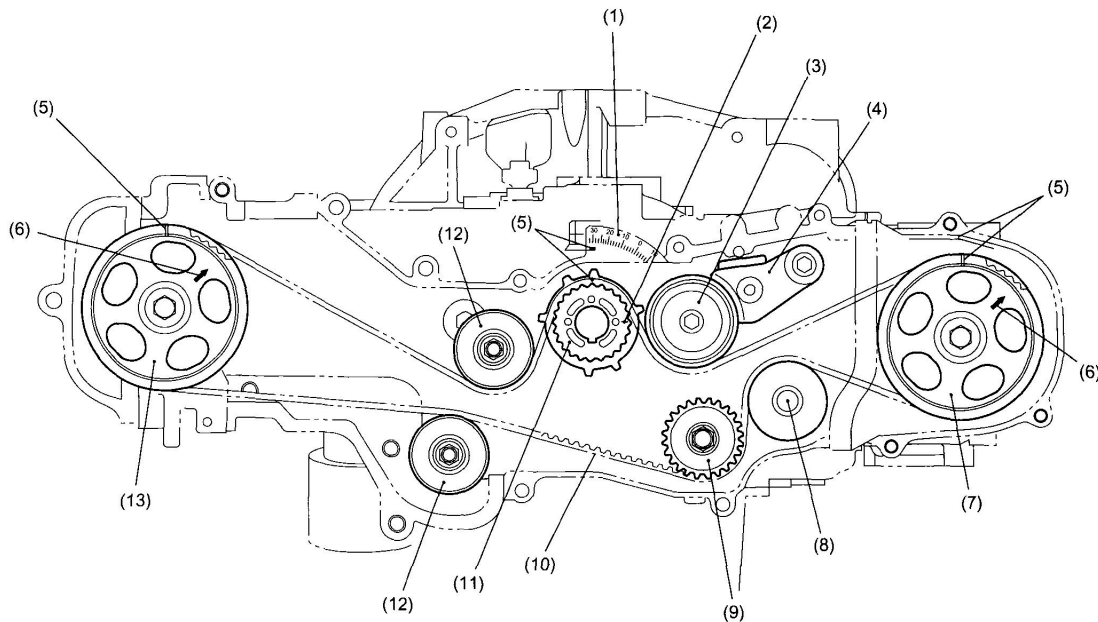
- |                    |                        |                           |
|--------------------|------------------------|---------------------------|
| (1) Camshaft       | (6) Camshaft cap       | (11) Exhaust rocker arm   |
| (2) Intake valve   | (7) Valve rocker cover | (12) Exhaust rocker shaft |
| (3) Cylinder block | (8) Cylinder head      | (13) Intake rocker shaft  |
| (4) Connecting rod | (9) Oil pan            | (14) Intake rocker arm    |
| (5) Spark plug     | (10) Exhaust valve     |                           |

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**Fig. 1: Sectional View Of Engine Assembly**  
Courtesy of SUBARU OF AMERICA, INC.

**TIMING BELT**

- A single timing belt drives two camshafts (one in the left bank and one in the right bank). The belt also drives the water pump by its non-toothed side.
- The timing belt teeth have a specially designed round profile, which contributes to quiet operation. The timing belt is made of strong and inflexible core cords, wear-resistant canvas and heat-resistant rubber material.
- A hydraulic automatic belt tension adjuster always keeps the belt taut to the specified tension. Any manual belt tension adjustment is unnecessary.



- |   |                           |
|---|---------------------------|
| (1) Timing indicator (for timing mark of crankshaft pulley) | (8) Water pump pulley     |
| (2) *Piston position mark                                   | (9) Idler No. 2           |
| (3) Belt tension pulley                                     | (10) Timing belt          |
| (4) Automatic belt tension adjuster                         | (11) Crankshaft sprocket  |
| (5) Alignment mark  | (12) Idler                |
| (6) **Piston position mark                                  | (13) Camshaft sprocket RH |
| (7) Camshaft sprocket LH                                    |                           |

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**Fig. 2: Identifying Components Of Timing Belt**

Courtesy of SUBARU OF AMERICA, INC.

**NOTE:**

**\*: The #1 piston is at TDC when the piston position mark on the crankshaft sprocket is aligned with the timing mark on the cylinder block.**

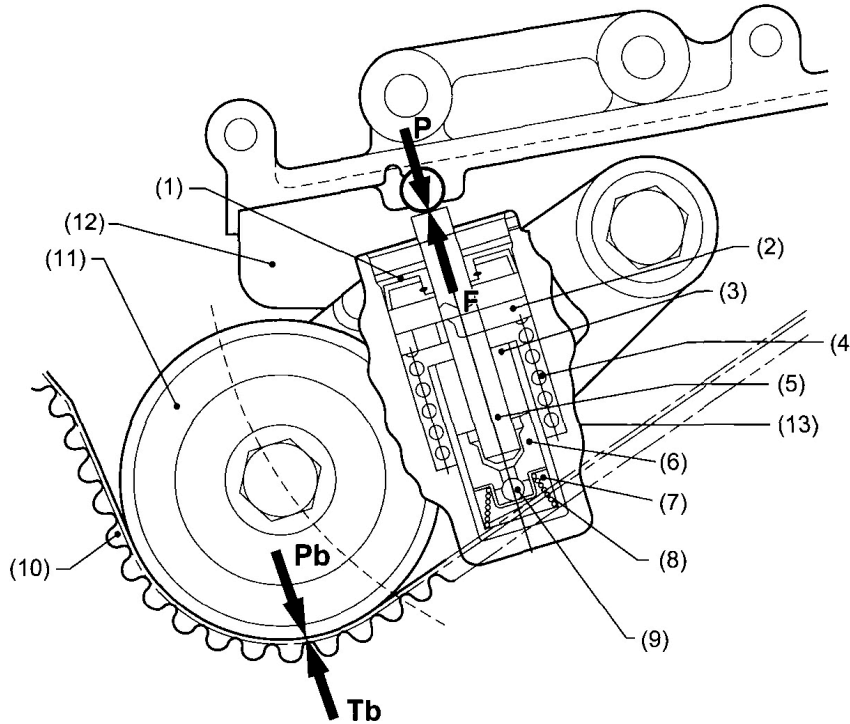
**\*\* : The #1 piston is at TDC on the compression stroke when the piston position mark on the camshaft sprocket is aligned with the timing mark on the belt cover.**

## AUTOMATIC BELT TENSION ADJUSTER

The automatic belt tension adjuster consists of a tensioner unit and a bracket. It maintains the timing belt tension automatically at a specified level to enable the belt to transmit power correctly, reduce operating noise and increase the life of the belt.

The cylinder of the tensioner unit incorporates an adjuster rod, wear ring, plunger spring, return spring, check ball and silicone oil.

The automatic belt tension adjuster gives tension to the belt by a levering action which is produced by the push force of the tensioner unit's adjuster rod. It operates in the process detailed below.



- |                           |                          |
|---------------------------|--------------------------|
| (1) Oil seal              | (8) Plunger spring       |
| (2) Wear ring             | (9) Check ball           |
| (3) Oil reservoir chamber | (10) Timing belt         |
| (4) Return spring         | (11) Belt tension pulley |
| (5) Adjuster rod          | (12) Tensioner bracket   |
| (6) Plunger               | (13) Cylinder            |
| (7) Oil pressure chamber  |                          |

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**Fig. 3: Identifying Components Of Automatic Belt Tension Adjuster**  
 Courtesy of SUBARU OF AMERICA, INC.

- Timing belt tensioning action

When the belt becomes slack, the adjuster rod is pushed upward by the return spring. The oil in the reservoir chamber, which is pressurized by the plunger spring to a certain level, pushes open the check ball and flows into the oil pressure chamber to keep the pressure constant. The thrust force  $F$  resulting from extension of the adjuster rod applies a counterclockwise torque to the tensioner bracket, which causes the belt tension pulley at its end to turn in the same direction. This applies tensioning pressure  $P_b$  to the timing belt.