

AUTOMATIC BELT TENSION ADJUSTER

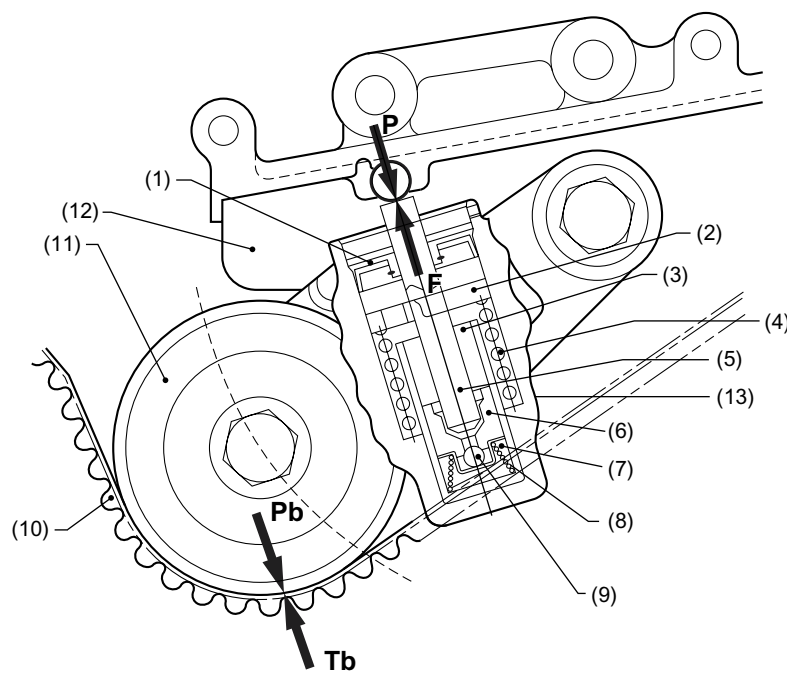
Mechanical

3. 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.



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|---------------------------|--------------------------|
| (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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Mechanical

- 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.

- Timing belt tension balancing action

When the belt tension pulley is pushed against the timing belt with pressure P_b , reaction force T_b of the timing belt generates the reaction force P at the point on which the adjuster rod force is acting. This force P pushes the adjuster rod until it balances with the sum of the thrust force F and the pressure of the oil in the oil pressure chamber. Therefore, the timing belt tension is kept constant.

- Overtension correction action

If the tension of the timing belt increases excessively, the force P becomes larger than the thrust force F and silicone oil is returned from the oil pressure chamber to the reservoir chamber little by little until the force P balances again with the thrust force F . Thus the timing belt tension is maintained at the specified level at all times.