GOVERNOR VALVE

Description

The governor valve controls the compressor output to the sensing tank, operating the unloader mechanism to "cut-out" the compressor when the predetermined air pressure is reached. When the air pressure falls the governor valve releases the unloader to "cut-in" the compressor and recharge the system.

The differential between the cut-out and cut-in pressures is about 1.25 bar (18lbf/in^2) and is not adjustable. The cut-out pressure can be adjusted within small limits by the adjusting screw on the unit.

Operation

The upper port is connected to the sensing tank and the lower port to the unloader in the cylinder head of the compressor. When the air system is being charged air at sensing tank pressure enters the valve body and is led to the underside of the diaphragm. Air pressure also enters the hollow plunger, the bottom of which is closed by the inlet valve disc. The plunger is holding the disc valve away from the exhaust seat so that the unloader line is open to atmosphere through the base of the exhaust nut on the valve.

As air pressure increases, the diaphragm lifts against the graduating spring, lifting the plunger. The spring under the disc valve will keep the inlet closed until the disc is on the exhaust seat, isolating the unloader from atmosphere. Further upward movement of the plunger because of further increase in air pressure will lift the plunger from the disc valve supplying air pressure to the unloader line. This pressure will also bear on the underside of the plunger, increasing the lifting force on plunger and diaphragm to fully open the inlet and operate the unloader in the compressor.

When the air pressure in the sensing tank falls approximately 1.25 bar (18 lbf/in^2) the upward pressure on the diaphragm is reduced sufficiently for the graduating spring to force the diaphragm and plunger down until the open end of the plunger seats on the disc valve. Further downward movement will force the disc valve off the exhaust seat, opening the lower port and unloader line to atmosphere through the exhaust nut. The sudden drop in pressure below the plunger reduces the upward force and fully opens the exhaust port. The unloader will cut-in the compressor to recharge the system and repeat the cycle.

Maintenance

Check the securing nuts for tightness. Check the pipeline union for tightness. Check that the pipelines are not chafed or kinked.

Check that the vent hole in the cover is clear and that the locknut of the adjusting screw is tight.

At the time stated in the Maintenance Schedule remove and dismantle the unit, renew all rubber parts, re-assemble, refit and check the cut-out pressure.

Governor Valve — Operational Test

Charge the air system and check the pressure on the vehicle air gauges at which the compressor "cuts-out". If this is very different from the required pressure given in Data insert a reliable test gauge into the system.

If there is a small difference in cut-out pressure it can be corrected by adjustment of the screw on top of the valve unit. Moving the screw in will increase the cut-out pressure. Securely tighten the locknut when adjustment is completed.

With the engine running reduce the pressure in the system slowly and note the pressure at which the compressor "cuts-in". This should be compared with the figure in Data. If it differs very much from that specified, the governor valve, the air line between valve and the unloader, or the unloader, must be checked.

Note: The difference between cut-out and cut-in pressures of the governor valve is fixed and cannot be adjusted.

Governor Valve — Leak Test

Drain the air system by repeatedly operating the brake pedal.

Coat the valve and connections with soap solution. Charge the system to cut-out pressure, observing the exhaust of the valve. If leakage occurs during charging, the inlet seat at the base of the plunger or the disc valve is faulty. Leakage must not exceed a 25 mm (1 in) bubble in ten seconds.

If leakage occurs after cut-out pressure has been reached the exhaust seat in the body or the disc valve is faulty. Leakage must not exceed a 25 mm (1 in) bubble in ten seconds.

Leakage from the vent hole in the cover indicates a faulty diaphragm which must be replaced.

Leakage from any other part of the valve or from pipe connections is not permissible.

Governor Valve — To Remove

Drain the air system by operating the footbrake repeatedly.

Identify the connections and release the union nuts securing the pipelines to the valve.

Remove the nuts and washers securing the valve to the bracket.

To Dismantle

Before dismantling the governor valve, carefully measure the exposed length of the adjusting screw, so that the unit can be re-assembled to the same valve setting.

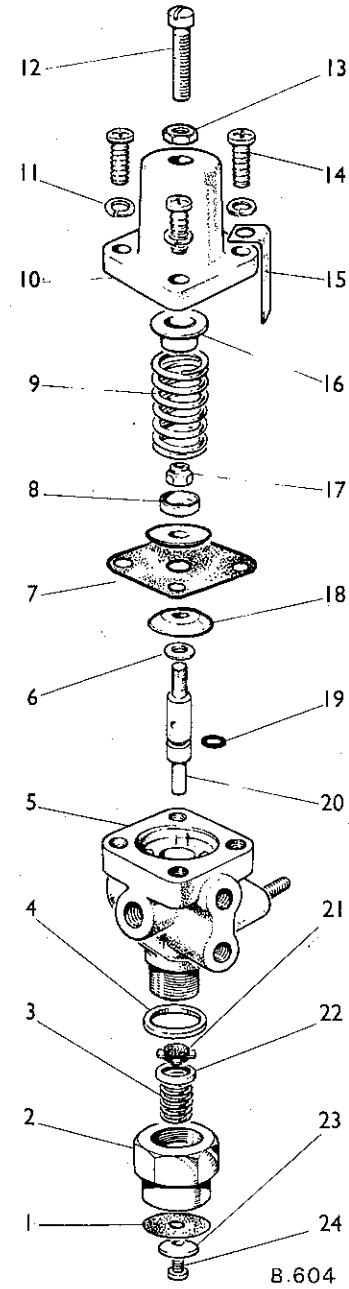
Mark the cover relative to the body to ensure correct re-assembly.

Loosen the adjusting screw locknut and remove the screw.

Progressively remove the four screws attaching the cover to the body and remove the spring washers, identification tag, cover, pressure setting spring and spring seat.

Withdraw the diaphragm assembly from the body and remove the plunger sealing ring.

Dismantle the diaphragm assembly by holding the plunger with a length of 3 mm (0.125 in) rod inserted in the cross hole and unscrew the nut. Separate the nut, spring guide, followers, diaphragm, washer and plunger.



1. DIAPHRAGM
2. EXHAUST NUT
3. VALVE SPRING
4. ALUMINIUM WASHER
5. BODY
6. WASHER
7. DIAPHRAGM
8. SPRING GUIDE
9. SPRING
10. TOP COVER
11. LOCKWASHER
12. ADJUSTING SCREW
13. LOCKNUT
14. SCREW
15. IDENTIFICATION TAB
16. SPRING GUIDE
17. NUT
18. FOLLOWER
19. "O" RING PLUNGER STEM
20. PLUNGER
21. VALVE
22. SPRING RETAINER
23. DIAPHRAGM PLATE
24. SCREW

Fig. 1 *Details of governor valve*

Unscrew the exhaust check valve retaining screw and remove the plate and diaphragm.

Unscrew the exhaust nut and remove the washer, spring, spring retainer and inlet/exhaust valve.

Examination

Clean all metal parts in cleaning solvent and blow dry with compressed air.

Ensure that the passages in the body and the vent in the cover are clear and clean.

Wipe the rubber parts with clean cloth.

Examine the body and cover for cracks and damage, renewing if evident.

Check the threads in the body for damage, also the diaphragm, fabric washer, exhaust check valve diaphragm, inlet/exhaust valve and plunger sealing ring for wear and deterioration. The face of the inlet/exhaust valve should be flat and smooth.

To Re-Assemble

Place the inlet/exhaust valve spring, spring retainer and inlet/exhaust valve in the exhaust nut and screw the nut, complete with washer, on to the body and tighten securely.

Refit the exhaust diaphragm and plate on the exhaust nut and screw the nut, complete with washer, on to the body and tighten securely.

Position the exhaust diaphragm and plate on the exhaust nut, securing with the small setscrew.

Re-assemble the diaphragm assembly with the diaphragm fitted between the chamfered sides of the followers and the fabric washer positioned against the plunger shoulder. Position the spring guide, replace the nut and tighten securely.

Fit the sealing ring on to the plunger. Lightly smear the plunger and plunger bore in the body with the recommended lubricant and carefully insert the plunger into the bore.

Position the pressure setting spring seat and spring in the cover, and place the cover on the body, aligning the marks made prior to dismantling.

Refit the adjusting screw, complete with locknut, in the top of the cover and set the screw to the original length measured before dismantling.

To Refit

Mount the valve on the bracket and tighten the nuts.

Reconnect the pipelines to the correct ports.

Charge the air system and check the pressure at which the compressor cuts out. Check the governor valve for air leaks.