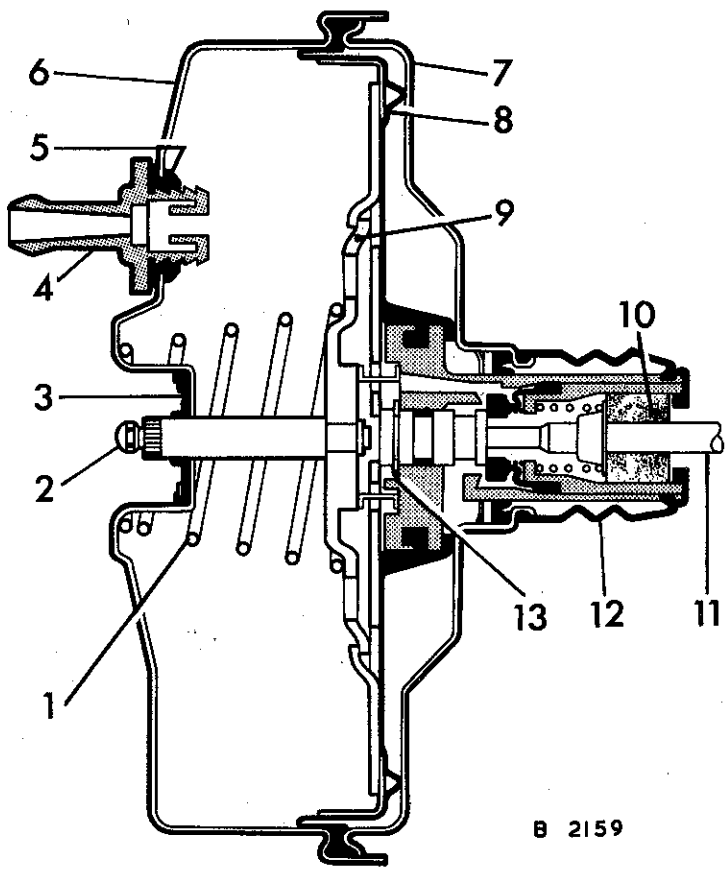
SERVO-GIRLING TYPE 65

Introduction

The Girling Servac (Fig. 1) is a mechanical servo unit designed to provide controlled assistance to the effort applied by the driver's foot to the brake pedal.

Power supplied by the unit is obtained from vacuum created either in the engine inlet manifold or by an exhauster unit. The vacuum is applied to both sides of a flexing diaphragm and by admitting atmospheric pressure to one side of the diaphragm, the power is obtained.

Mounted between the brake pedal and the master cylinder, the unit is connected to these parts by push rods. Should a vacuum failure occur, the two push rods act as a single rod and the brakes will therefore work in the conventional manner; but more effort will be required on the brake pedal.



1. DIAPHRAGM SPRING
2. OUTPUT ROD
3. SEAL
4. VACUUM CONNECTION
5. GROMMET
6. FRONT SHELL
7. REAR SHELL
8. DIAPHRAGM
9. FULCRUM PLATE
10. FILTER
11. INPUT ROD
12. DUST COVER
13. PISTON STOP

Fig. 1 *Sectional view of servo unit Type 65*

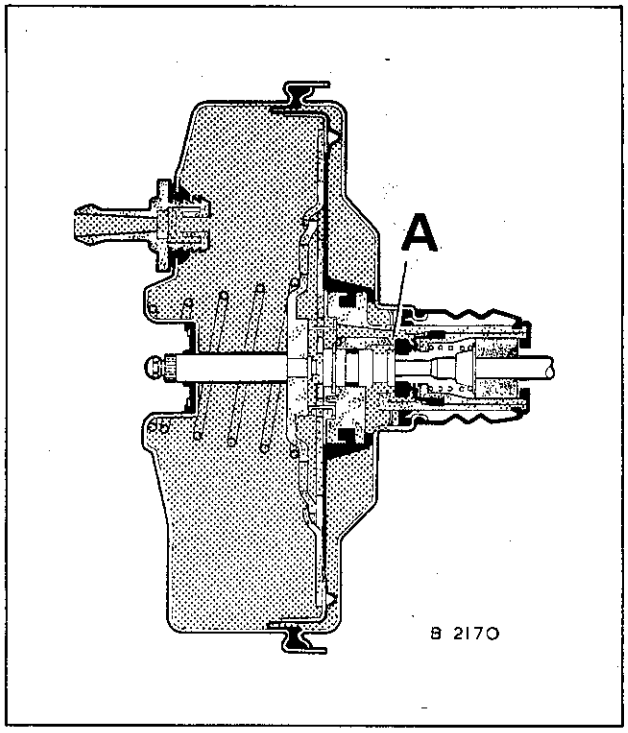


Fig. 2 *Operation – Brakes off*

VACUUM
AIR

Brake off

The diaphragm is fully recuperated and held against the rear shell by the diaphragm return spring. The input rod is also fully recuperated within the valve body by the return springs, as far as the piston stop will allow. With the input rod in this position the vacuum port (A) is open and there is a vacuum each side of the diaphragm.

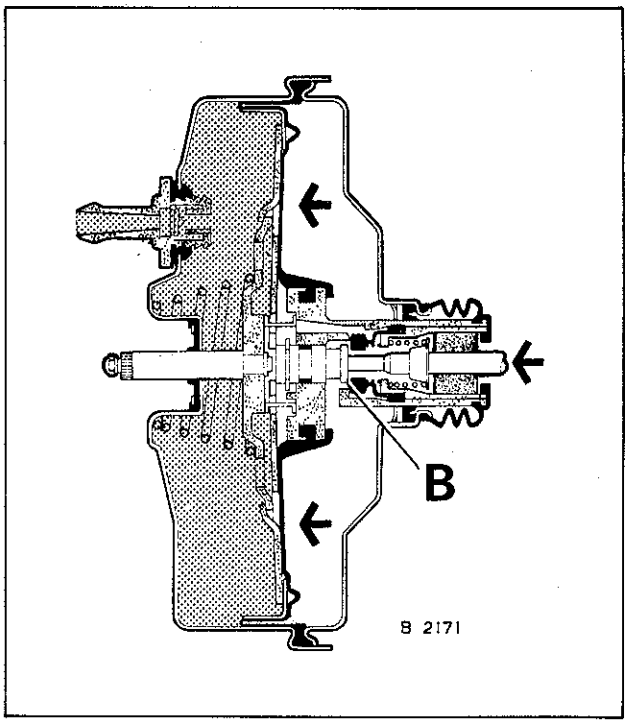


Fig. 3 *Operation – Brakes applied*

Brake applied

When the brake pedal is depressed, the input rod assembly moves forward within the valve body until the poppet valve closes the vacuum port; at this juncture vacuum is still present on each side of the diaphragm. As the input rod continues to move forward, the control piston moves away from the poppet valve, opening the atmospheric port B, which is formed between these two parts. Atmospheric pressure then enters the rear shell behind the diaphragm and assists the input rod in pushing the fulcrum plate, fingers and output rod forward, thereby actuating the master cylinder.

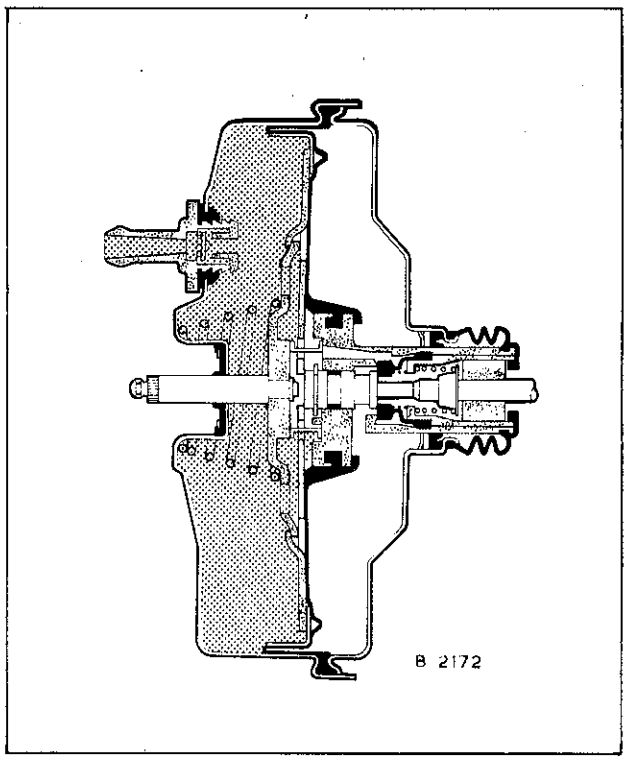


Fig. 4 *Operation – Brakes held on*

Brake held on

When the brake is held on, the diaphragm will momentarily continue to move forwards and this movement causes the fingers to pivot on the fulcrum plate and close the atmospheric valve. Further movement of the brake pedal either opens the vacuum port or the atmospheric port, depending on whether the brake pedal is released or depressed.

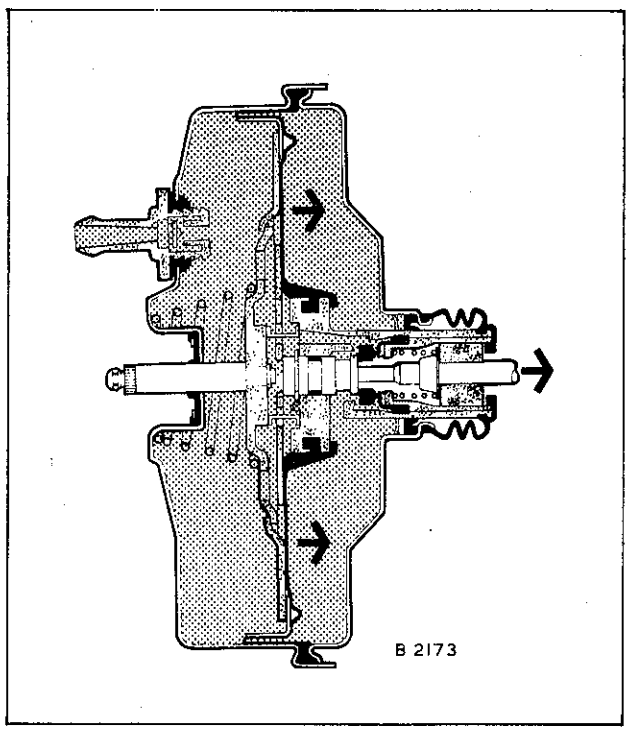


Fig. 5 *Operation – Brakes released*

Brake released

Immediately the brake pedal is released, the vacuum port is opened and the atmospheric pressure in the rear chamber is extracted into the front chamber and from there to the inlet manifold via the non-return valve. The atmospheric port remains closed whilst the input rod returns to its original position, as shown on Fig. 2, assisted by the diaphragm return spring. The diaphragm is then again 'suspended' in vacuum until the brake pedal is depressed.