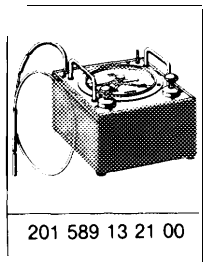
# 43-023 Testing check valve

## Data

| | |
|---|---|
| Test vacuum in bar | 0.75-0.8 |
| Duration of test | 30 s |
| Pressure loss in bar vacuum | 0.2 |

## Special tool



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## Self-made tool

| | |
|---|---|
| Measuring connection | refer to fig. item 2, note |

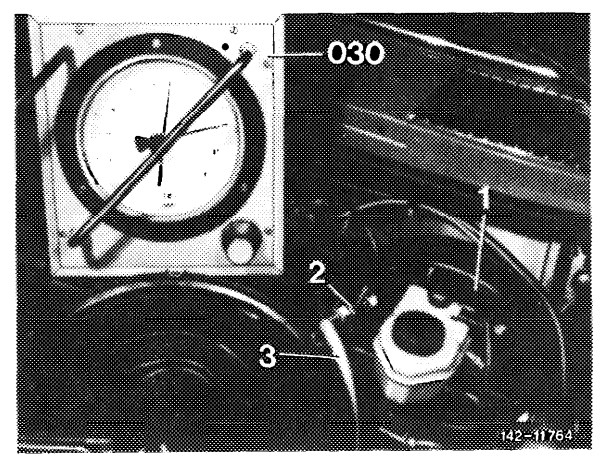
## Note

Each time when renewing brake unit, test check valve in vacuum line for leaks.

## Testing

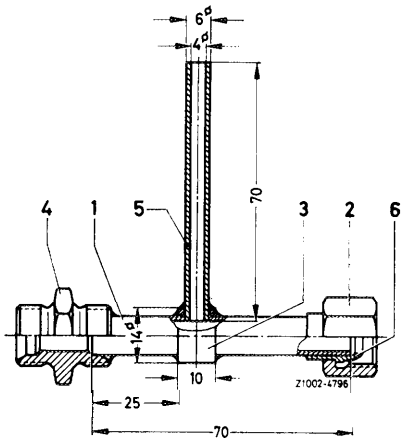
1 Loosen vacuum line (3) on brake unit (1) and connect measuring connection (2) between brake unit and line.

2 Connect tester for vacuum (030) to measuring connection (2).



Note: Make measuring connection yourself according to specified dimensions, part 1, 3, 4, 5 and 6 are brazed to each other. For connection to brake unit, the pipe member including coupling nut of an old vacuum line may be used. Connection to vacuum line is by way of a screw connection.

3 Run engine and generate a vacuum of 0.75-0.8 bar by accelerating and suddenly releasing accelerator pedal.




4 Test check valve for leaks. The available vacuum should not drop by more than 0.2 bar within 30 seconds, if the vacuum loss is higher, renew check valve including vacuum line.

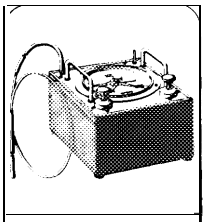
Note: Upon installation of a new vacuum line, repeat leak test. If the pressure loss is still too high, the leak may be caused by damaged screw connections or a leaking brake unit.

# 43-325 Checking brake unit

## Data

| Force at brake pedal N | bar vacuum | Line pressure bar gauge pressure Girling LSC 50 DBA Isovac 8" single | Teves 52/4A/225–210 8''/9'' double |
|---|---|---|---|
| 50 | | 5-11 | 10 |
| 100 | | 20-31 | 25 |
| 150 | 0.75-0.8 | 35-50 | 42 |
| 200 | | 54-65 | 59 |
| 250 | | 70-76 | 75 |
| 300 | | 80-82 | 90 |

## Special tool



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## Conventional tools

| | |
|---|---|
| Pressure tester | e.g. Teves, D-6000 Frankfurt/M.<br>Order No. 3 9305-1020.4 |
| Pedal force meter | e.g. Bosch Prüftechnik<br>D-7000 Stuttgart<br>Order No. 0681 148015 EFSV 57 B |

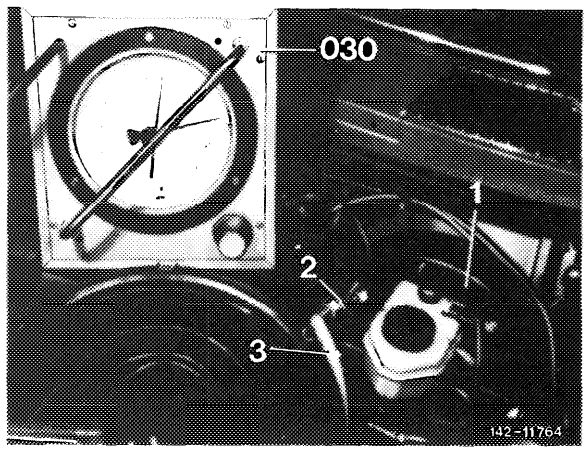
## Self -made tool

| | |
|---|---|
| Measuring connection | refer to Fig. item 2, Note |

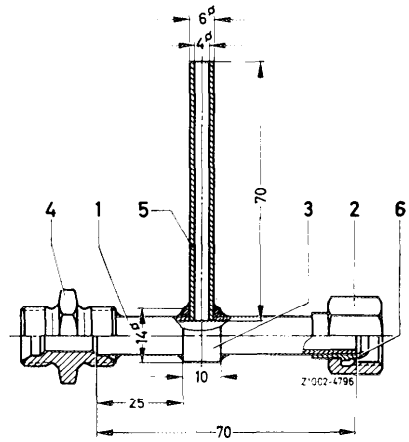
**Testing**

1 Loosen vacuum line (3) on brake unit (1) and connect measuring connection (2) between line and brake unit.

2 Connect tester for vacuum (030) to measuring connection (2).



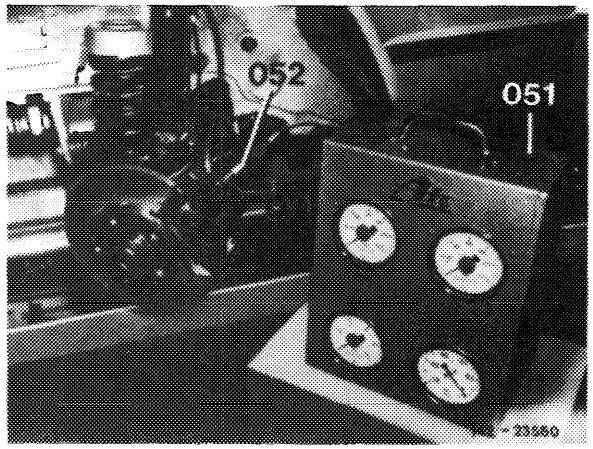

**Note:** The measuring connection is self-made according to specified dimensions, (parts 1, 3, 4, 5 and 6 are brazed to each other). For connection to brake unit, the pipe member including coupling nut of an old vacuum line may be used. Connection to vacuum line is by way of a screw connection.




3 Connect pressure tester (051) to a caliper. For this purpose, unscrew vent screw and screw in connection (052). Then bleed pressure tester.

4 Attach pedal force meter to brake pedal.

5 Run engine and generate a vacuum of 0.75-0.8 bar by accelerating and suddenly releasing accelerator pedal.




If only a substantially lower vacuum is obtained or if the vacuum is immediately again decreasing, the following cause may be responsible:

a) Leaking vacuum line or leaking connection points.

b) Test defective check valve (43-023).

c) Damaged sealing ring between brake booster and tandem main cylinder.

d) Damaged sealing ring on control housing of brake unit. The sealing ring cannot be renewed with shop equipment and the brake unit should therefore be renewed.

6 Run engine until a vacuum of 0.75-0.8 bar is attained, then measure respective line pressure with specified force on brake pedal.

Note: If the measured line pressures deviate by more than ± 10 bar gauge pressure, renew brake unit.

7 Remove pedal force meter and test equipment.

8 Bleed brake system only at caliper to which the pressure tester has been connected **(42–010).**

# 43-350 Removal and installation of brake unit

**Data**

| Model | | 201.023/024/028/122/126 | 201.029/034/128 |
|---|---|---|---|
| Brake unit | | Girling LSC 50<br>DBA Isovac | ATE 52/4A/225–2 10 |
| Dia. | Inch | 8 | 8/9 |
| | mm | 203 | 203/228.6 |
| Amplification factor | | 3.4 | 4.5 |

| Tightening torques | Nm |
|---|---|
| Hex. nuts for fastening brake unit to front end | 15-25 |
| Coupling nut of vacuum line on brake unit | 30 |

**Attention!**
**In the event of a loss of brake fluid, which cannot be observed visually, check whether brake fluid has entered the brake booster through a leaking secondary seal in tandem main cylinder. If so, proceed as follows:**

**1. Do not remove brake booster.**

**2. Draw off brake fluid.**

**3. Change brake booster if there are more than 100 cc of brake fluid in unit.**

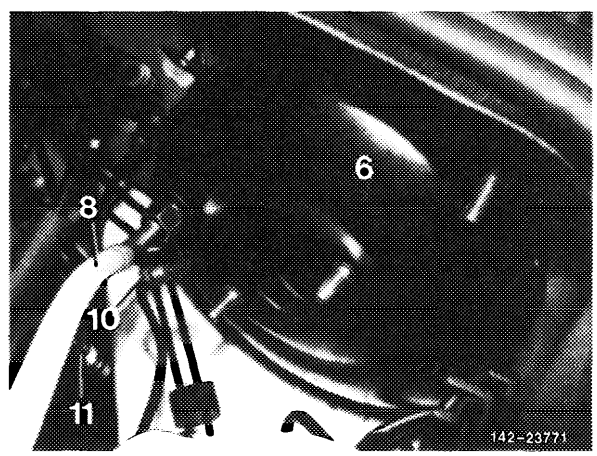
**Note: The flexible diagphragm is resistant to brake fluid, while the reaction disk and the plate valve in control member are not. For this reason, draw off brake fluid only with the brake booster installed. With the brake booster installed, no brake fluid can reach the reaction disk or the plate valve up to 100 cc.**

## Removal

1 **On vehicles with manual transmission, remove connecting hose to master cylinder.**

**2 Remove tandem main cylinder (42-310).**

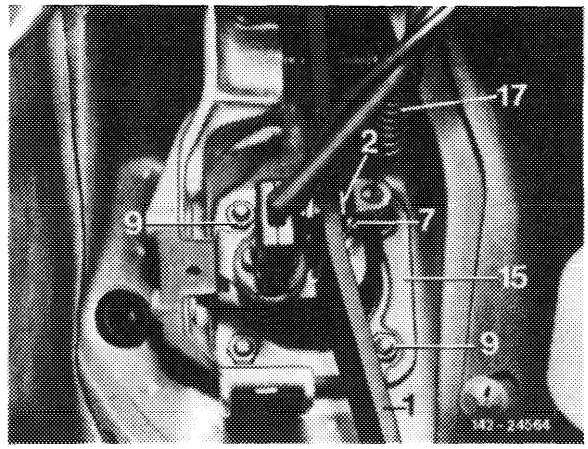
**3 Loosen vacuum line (8) on brake unit (6).**

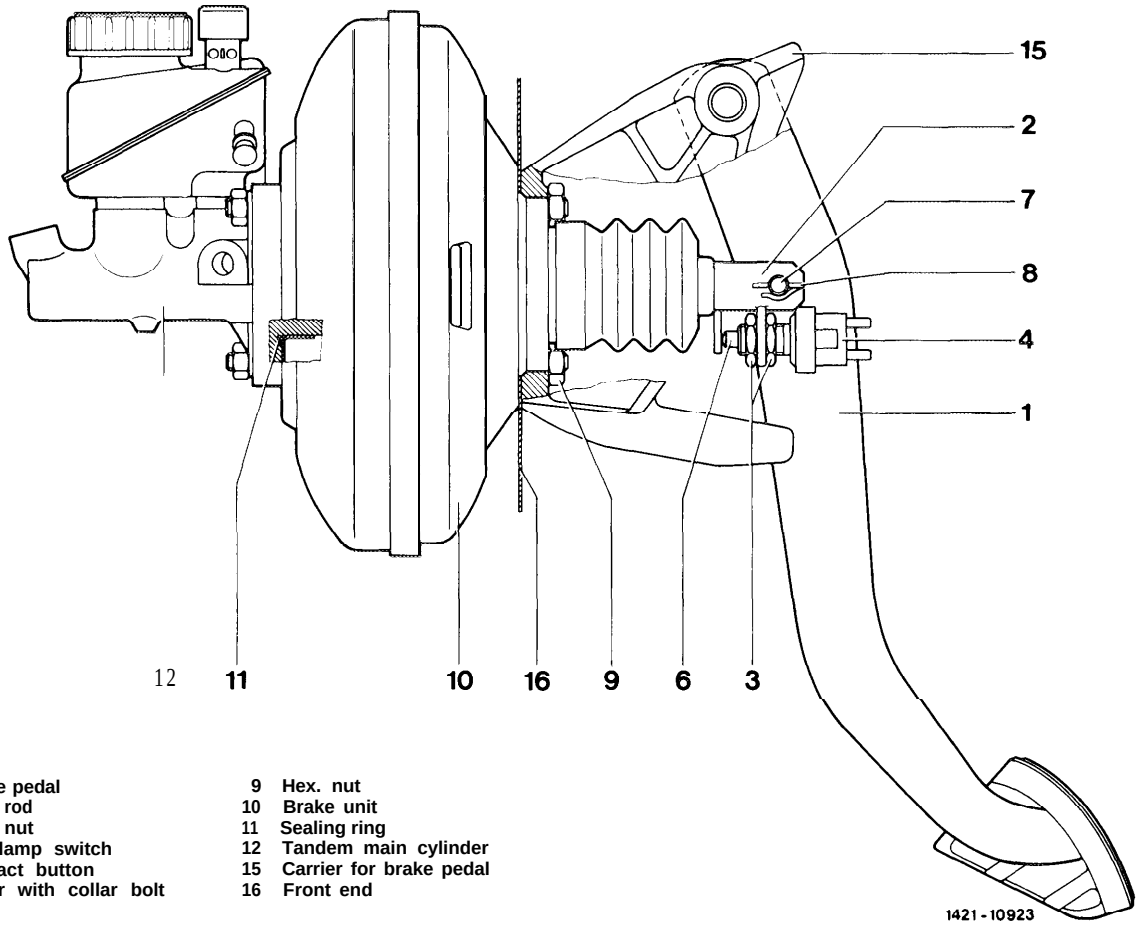


4 Remove cover below instrument panel in legroom.

5 Loosen pushrod (2) of brake unit on brake pedal (1), disconnecting return spring (17) for this purpose, pull out lock and remove holder to which the collar bolt (7) is attached.

6 Unscrew the two hex. nuts (9) from carrier (15).

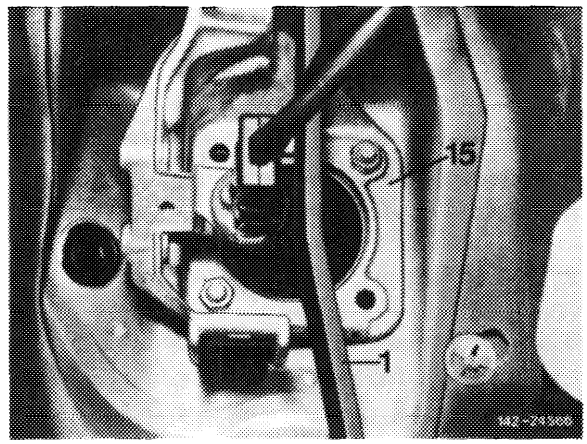



1 Brake pedal
2 Push rod
3 Hex. nut
4 Stop lamp switch
6 Contact button
7 Holder with collar bolt
8 Lock
9 Hex. nut
10 Brake unit
11 Sealing ring
12 Tandem main cylinder
15 Carrier for brake pedal
16 Front end

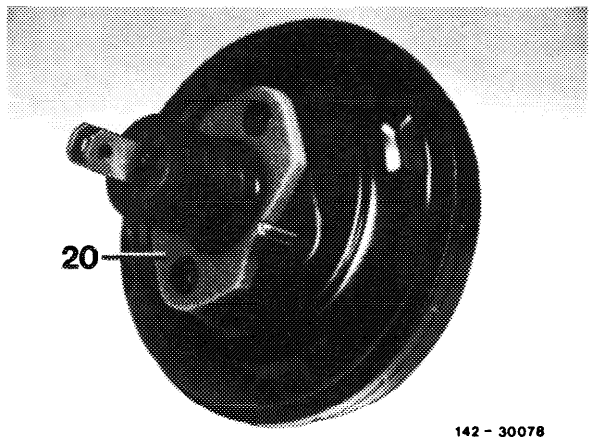
7 Remove brake unit.

**Attention!**
The control housing of brake unit is made of plastics and may break-off if improperly handled.



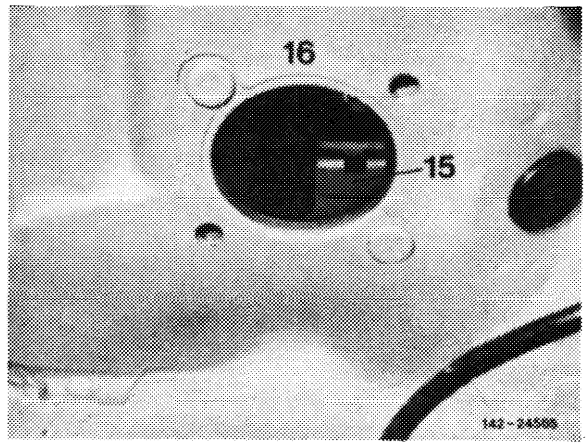
**Installation**

**Note:** Check glued-on gasket (20) on brake unit for damage and correct **seat,** renew gasket if required.




8 Prior to installation of a new brake unit, check whether separate check valve is in order. If in doubt, renew valve including plastic lines (43-023).

9 Fasten brake unit to front end (16) and carrier (15) of pedal assembly. Tighten hex. nuts to 15-25 Nm.

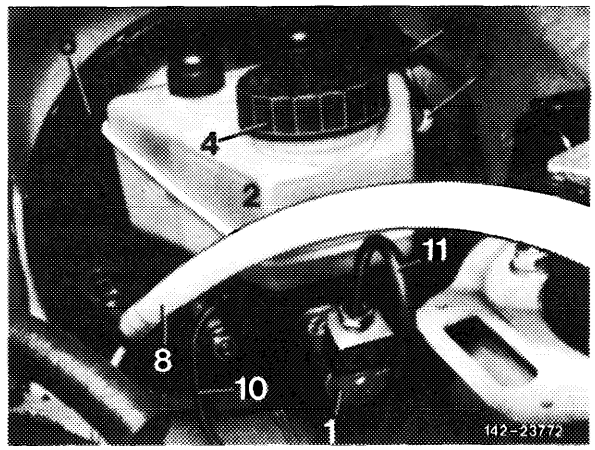



10 Fasten cover below instrument panel in legroom.

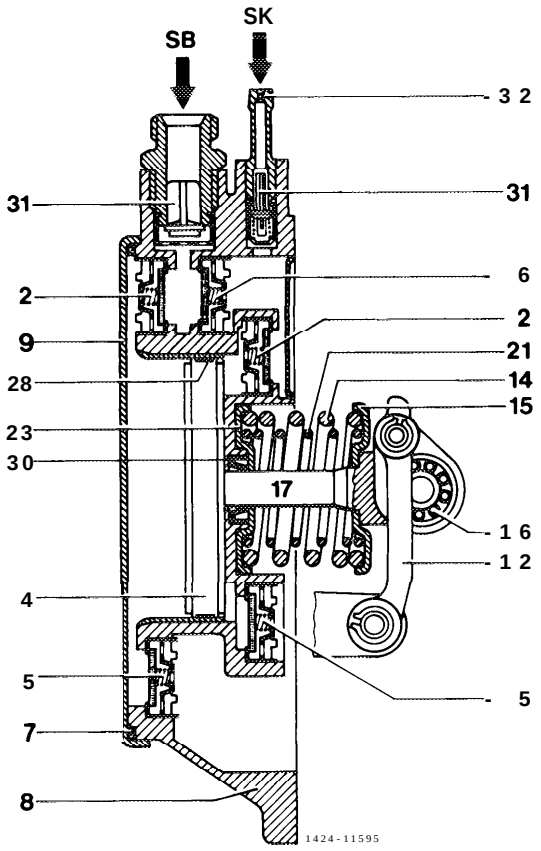
11 Connect vacuum line (8) to brake unit (6). Tighten coupling nut to 30 Nm.

12 Install tandem main cylinder (42-310).

13 On vehicles with manual transmission, plug connecting hose on connection (7) for master cylinder to expansion tank.



Model 201.1



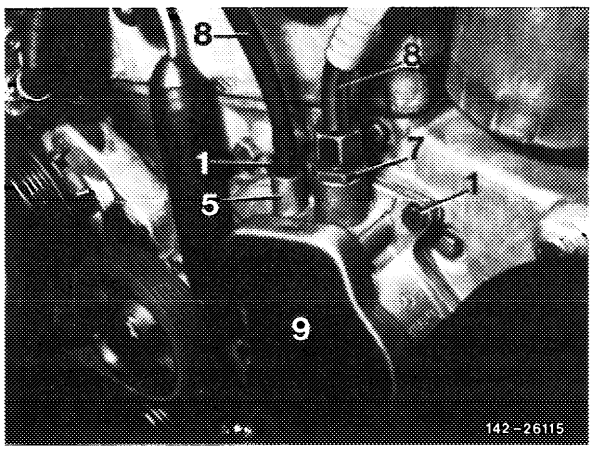

2 Plate valve (suction end)
4 Piston
5 Plate valve (pressure end)
6 Separating valve
7 Gasket
8 Pump housing
9 Pump cover
12 Swivel arm
14 Outer compression spring
15 Lower spring plate
16 Race
17 Piston rod
21 Inner compression spring
23 Upper spring plate
28 Piston ring
30 Radial sealing ring
31 Oil retaining valve
32 Orifice

**Removal**

1 **Remove fan cover and fan. Take off V-belt (13–342).**

2 **Loosen vacuum line on screw connection (7), while applying counterhold to screw connection.**

**Note: An oil retaining valve is located in screw connection (7). With the pump stopped and in the presence of a vacuum, the valve prevents the penetration of engine oil into brake booster.**




**3 Unscrew hex. head screws (1) from crankcase and remove vacuum pump including gasket.**

4 Fasten vacuum pump with a new gasket to crankcase. Make sure that the lift curve of drive flange is at BDC.

Note: The thickness of the gasket between crankcase and vacuum pump is 0.5 mm.

5 Connect vacuum line to vacuum pump.

6 Install V-belt, fan and fan cover (13-342).

7 Check vacuum pump for function (42–660).

# 43-660 Testing piston vacuum pump

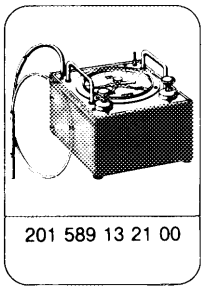
Data

The suction time is measured in seconds at 0.5 bar vacuum at an engine speed of 700/min.
The following value applies:

| Brake booster and vacuum pump | |
|---|---|
| 8" single-diaphragm brake booster and double-acting piston vacuum pump | 3 seconds |
| 8''/9'' double diaphragm brake booster and double acting piston vacuum pump | 5 seconds |

With engine stopped, a vacuum drop of 0.2 bar within 30 seconds is permitted.

**Special tool**



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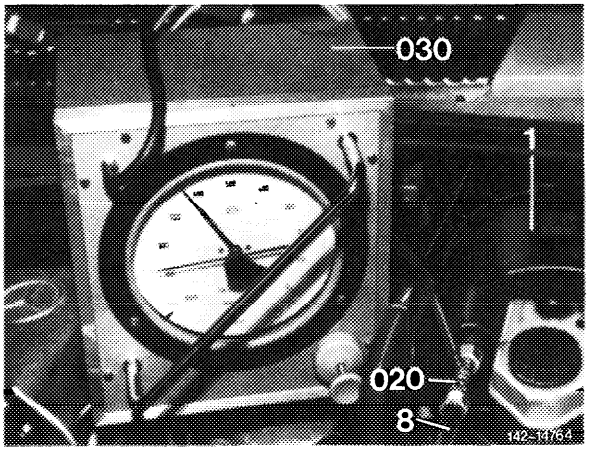
**Self-made tool**

| | |
|---|---|
| Measuring connection | refer to Fig. item 1, Note |

**Testing**

1 Connect tester (030) with measuring connection (020) to vacuum line (8) between check valve and brake booster (1).



Note: The measuring connection is self-made according to given dimensions (parts 1, 3, 4, 5 and 6 are brazed to each other). For connection to brake booster the pipe section including coupling nut of an old vacuum line may be used. Connection to vacuum line is made by means of a screw connection.

2 Run engine at 700/min and measure the time required to establish a vacuum of 0.5 bar.

Note: If the specified values are not attained and the vacuum drop is larger than 0.2 bar in 30 seconds, check vacuum system for leaks. If no fault shows up, recondition vacuum pump or renew.