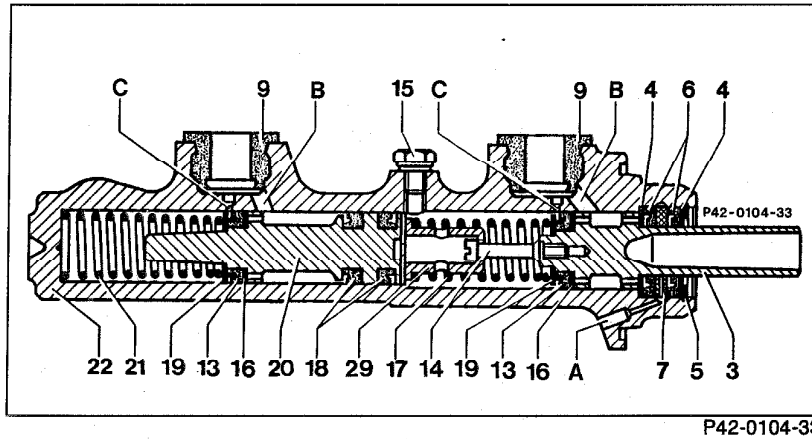


42-0315 Reconditioning master cylinder

Preliminary work:
Remove stepped tandem master brake cylinder (42-0310).

A. Without central valve



- | | |
|---|--|
| Brake fluid reservoir and reservoir plugs (9) | pull out of tandem master brake cylinder. Coat reservoir plugs (9) lightly with brake cylinder paste before inserting. |
| Stop screw (15) | screw out. |
| Piston (3), stop plates (4), secondary and vacuum sleeve (6), intermediate ring (7) | remove from housing (22).
Install (see steps 13-23). |
| Piston (floating circuit) (20) | knock out by tapping housing (22) lightly on wooden surface.
Install (see steps 8-12). |
| Housing (22) | clean, check for damage (see steps 6-7). |
| Brake fluid reservoir | clean with new brake fluid. |

42-0315 Reconditioning master cylinder

Data

		Push rod circuit	Floating circuit
Diameter	Inches	15/16	3/4
	mm	23.81	19.05
Housing bore dia.		<u>23.81</u>	<u>19.05</u>
		23.86	19.10
Wear limit		23.92	19.16
Permissible out-of-round of bore		0.03	0.03
Piston dia.		<u>23.77</u>	<u>19.01</u>
		23.72	18.96
Wear limit		23.66	18.90
Piston clearance		0.02-0.15	0.02-0.15
Stroke		15	17

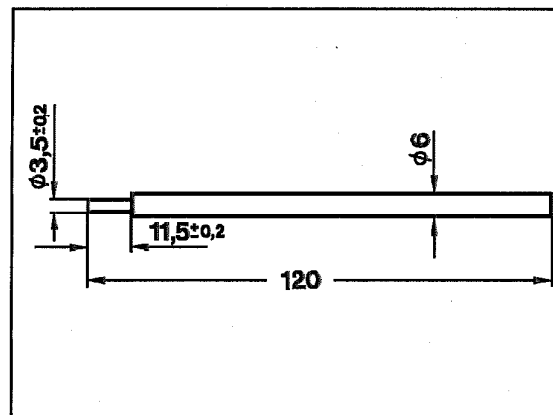
Lubricants

Silicone grease

Brake cylinder paste

Self-made tool

Assembly pin (045) (made of steel).



P100-0033-13

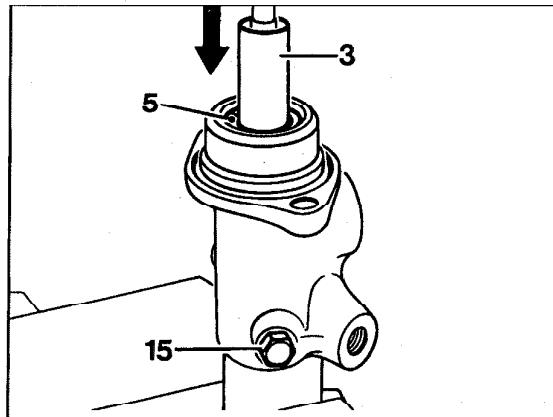
Note

When reconditioning assure that the repair kit and housing are from the same manufacturer.

42-0315 Reconditioning master cylinder

Disassembly

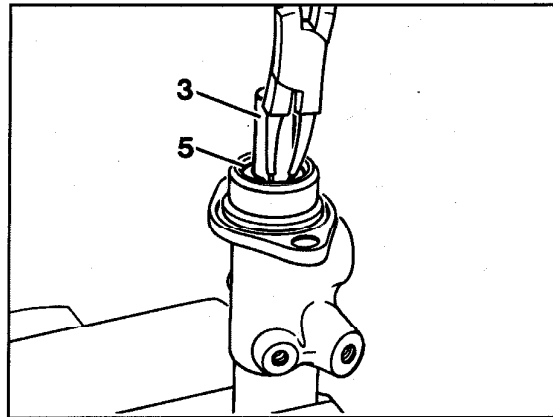
- 1 Pull brake fluid reservoir and reservoir plugs out of tandem master brake cylinder.
- 2 Press piston (3) in slightly with punch, then screw stop screw (15) out of housing and remove together with sealing ring.



P42-2225-13

- 3 Remove retaining ring (5) from housing. Then remove piston (3) together with the two stop plates for the secondary and vacuum sleeves and the intermediate ring from the housing.

- 4 Tap housing lightly against wooden surface to knock out complete piston for floating circuit.

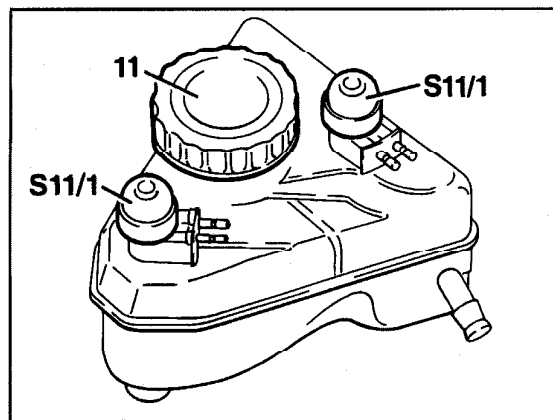


P42-2226-13

- 5 Screw off cover plate (11) and remove sieve.

Note

The contact insert (S11/1) cannot be removed.



P42-2186-13

42-0315 Reconditioning master cylinder

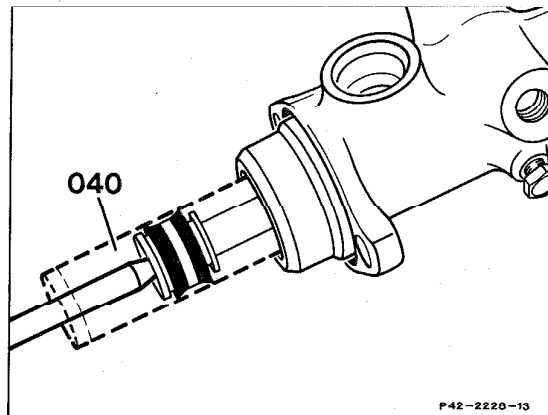
Checking

- 6 Clean all parts thoroughly in denatured alcohol assuring that all residues are rinsed out of the housing and compensation tank.
- 7 Check bore in housing for scoring and rust. Minor rust spots can be removed with crocus cloth.

Do not attempt to repair scored or highly rusted housings. In such cases replace complete tandem master brake cylinder.

Assembly

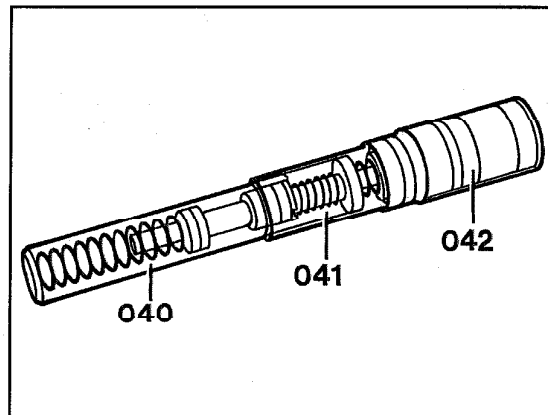
- 8 Coat bore in housing lightly with brake cylinder paste.
- 9 Remove secondary sleeve, vacuum sleeve, stop plates, intermediate ring, sealing ring and copper sealing ring from assembly sleeve.



P42-2228-13

P42-2228-13

- 10 Clamp housing at slight angle with bore pointing downwards. Remove assembly sleeve (040) together with floating piston (dia. 19.05) from assembly sleeve (041) for push rod piston (dia. 23.81). Insert assembly sleeve (040) into housing and press piston into housing against stop with punch.



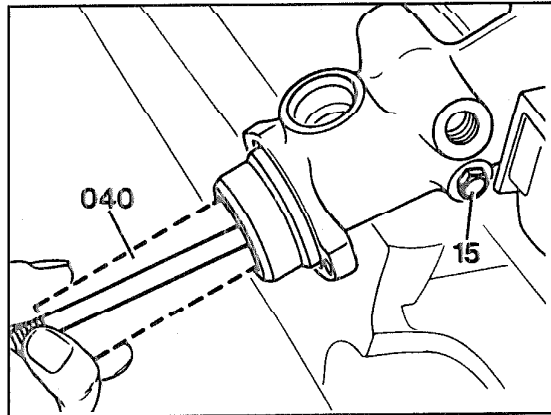
P42-2218-13

42-0315 Reconditioning master cylinder

11 Hold piston with punch, pull assembly sleeve (040) out until stop screw (15) can be screwed in with new copper sealing ring.

Tighten stop screw (15) to 5-8 Nm.

12 Remove assembly sleeve (040).

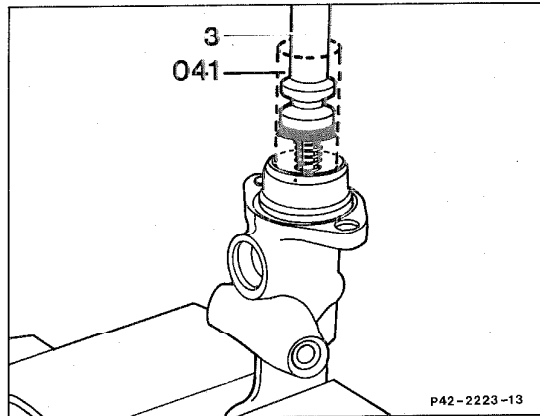


P42-2229-13

13 Clamp tandem master brake cylinder so that cylinder bore points upward.

14 Remove assembly sleeve (041) together with push rod piston (dia. 23.81) from assembly sleeve (042). Insert assembly sleeve (041) into housing and press piston (3) into housing with punch.

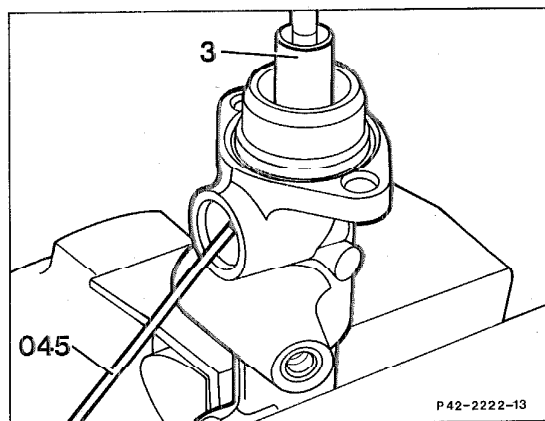
15 Remove assembly sleeve (041).



P42-2223-13

P42-2223-13

16 Push piston (3) in until second collar on push rod piston is located behind filling bore. Then insert assembly pin (045) into filling bore against stop. Assure that push rod piston is not damaged.



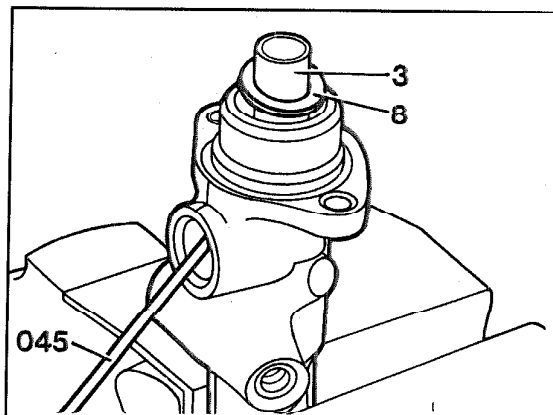
P42-2222-13

P42-2222-13

42-0315 Reconditioning master cylinder

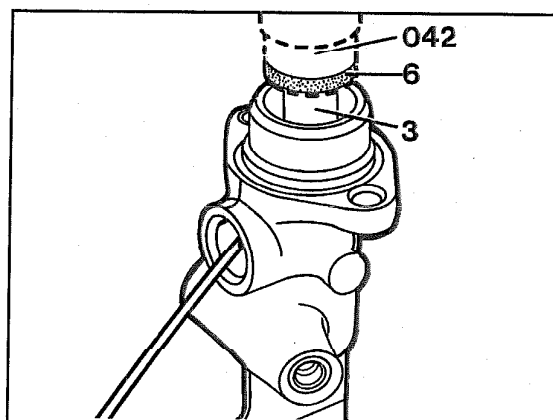
17 Position stop plate (8) on piston (3).

18 Coat shaft of piston (3) lightly with silicone grease.



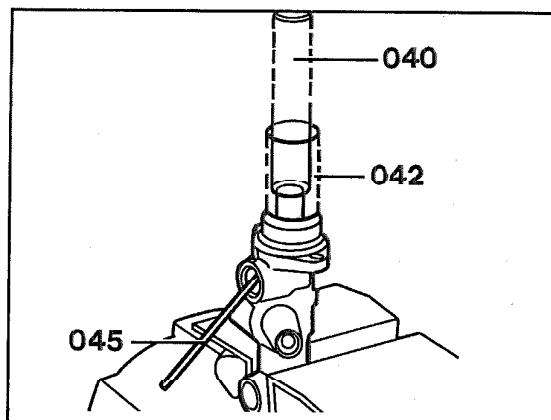
P42-2221-13

19 Coat secondary sleeve (6) with silicone grease, then position on piston shaft with sealing lip pointing toward piston, hold in place and slide assembly sleeve (042) over sleeve against stop.



P42-2220-13

20 Slide assembly sleeve (042) into bore in housing together with secondary sleeve (6). Press secondary sleeve downward with blunt section of assembly sleeve (040). First pull assembly sleeve (042) up to height of sleeve, then remove both sleeves.



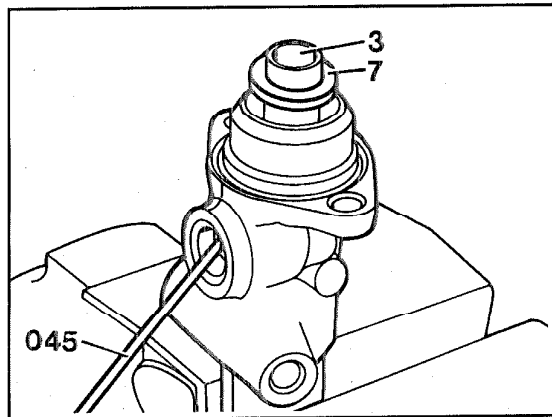
P42-2224-13

42-0315 Reconditioning master cylinder

21 Insert intermediate ring (7) into housing assuring that bore in intermediate ring points towards leak bore (A) in housing and press in with sleeve (040).

22 Install vacuum sleeve (6) as described in steps 19 and 20.

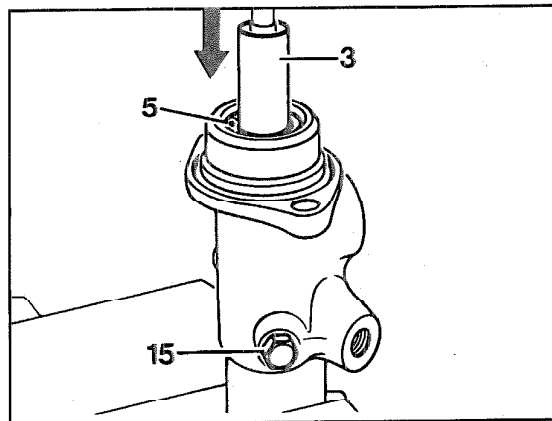
23 Position stop plate (8) as described in step 17.



P42-2219-13

24 Insert retaining ring (5) assuring that ring is seated properly in groove in housing.

Then press piston downwards and pull out assembly pin.

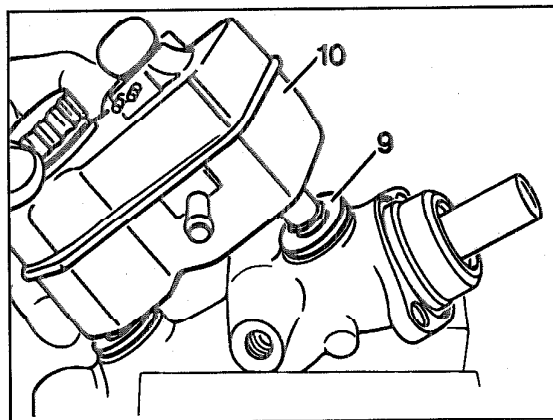


P42-2225-13

25 Insert sieve into reservoir and screw on cap.

26 Coat reservoir plugs (9) lightly with brake cylinder paste and press into housing.

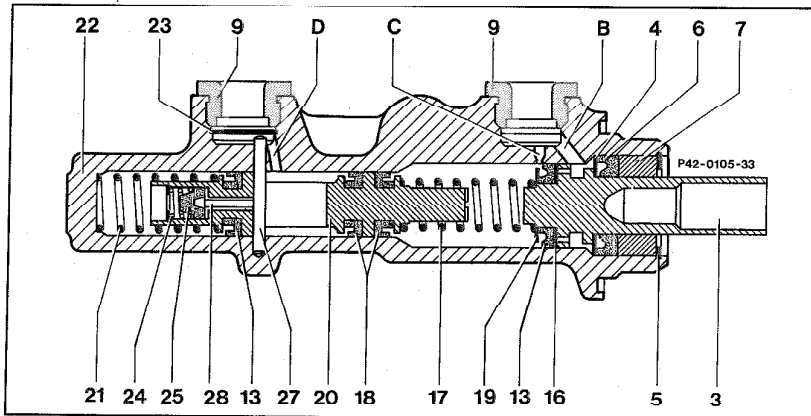
27 First insert brake fluid reservoir (10) into housing with pipe fitting, turn 180° and then press second pipe fitting into housing. Pay attention to proper seating.



P42-2227-13

42-0315 Reconditioning master cylinder

B. With central valve (grey cast iron)



P42-0105-33

Brake fluid reservoir and reservoir plugs (9)	pull out of tandem master brake cylinder. Coat reservoir plugs (9) lightly with brake cylinder paste before inserting.
Plate (23)	remove, install.
Cylindrical pin (27)	press out of housing (22), for this purpose press piston (3) in slightly.
Retaining ring (5)	remove, install.
Piston (3)	remove from housing together with sealing packing. Install (see steps 13-20).
Piston (floating circuit) (20)	knock out by tapping housing (22) lightly on wooden surface. Install (see steps 9-12).
Housing (22)	clean, check for damage (see steps 7-8).
Brake fluid reservoir	clean with new brake fluid.

42-0315 Reconditioning master cylinder

Data

		Push rod circuit up to July 1983	starting July 1983	Floating circuit
Diameter	Inches	15/16	1	3/4
	mm	23.81	25.40	19.05
Housing bore dia.		<u>23.81</u>	<u>25.40</u>	<u>19.05</u>
		23.86	25.45	19.10
Wear limit		23.92	25.51	19.16
Permissible out-of-round of bore		0.03	0.03	0.03
Piston dia.		<u>23.77</u>	<u>25.36</u>	<u>19.01</u>
		23.72	25.33	18.96
Wear limit		23.66	25.25	18.90
Piston clearance		0.02-0.15	0.02-0.15	0.02-0.15
Stroke		15		17

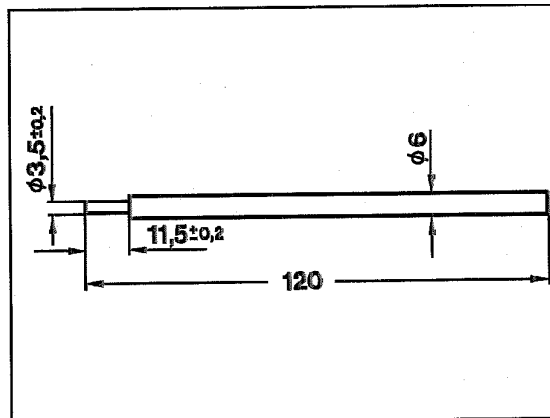
Lubricants

Silicone grease

Brake cylinder paste

Self-made tool

Assembly pin (045) (made of steel).



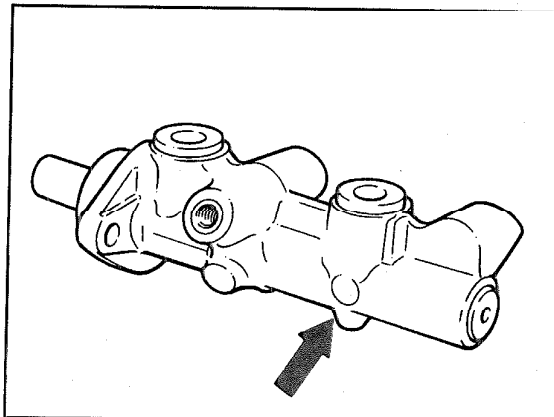
P100-0033-13

42-0315 Reconditioning master cylinder

Note

The tandem master brake cylinder with central valve does not have a stop screw. It is also distinguished by a raised section on the housing (arrow).

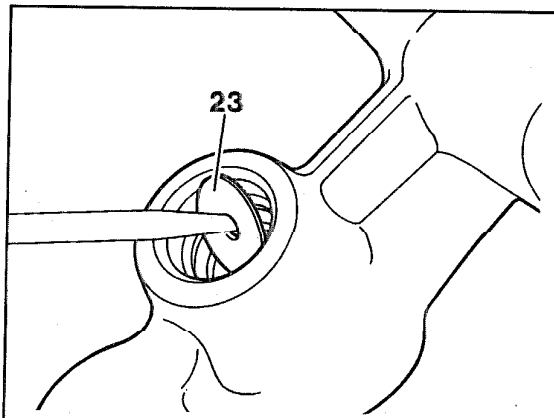
When reconditioning assure that the repair kit and housing are from the same manufacturer.



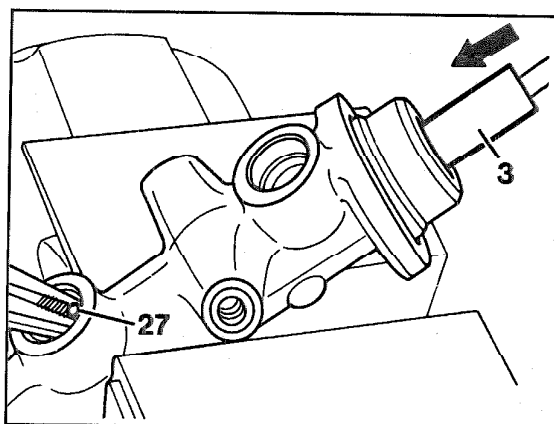
P42-2170-13

Disassembly

- 1 Pull brake fluid reservoir and reservoir plugs out of tandem master brake cylinder.
- 2 Remove plate (23) from reservoir connection bore for floating circuit.
- 3 Press piston (3) in slightly with punch and remove cylindrical pin (27) from housing with suitable pliers.



P42-2163-13

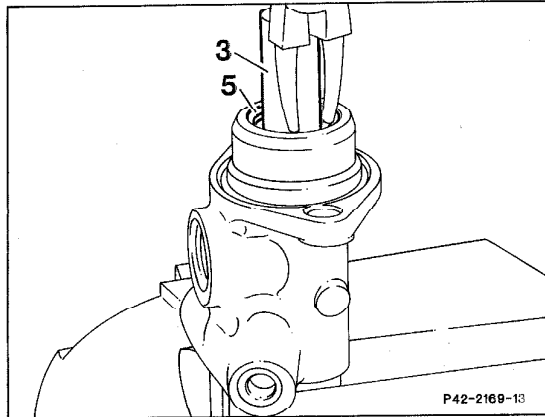


P42-2191-13

42-0315 Reconditioning master cylinder

4 Remove retaining ring (5), then remove piston (3) from housing together with secondary sealing packing.

5 Tap housing lightly against wooden surface to knock out complete piston for floating circuit.

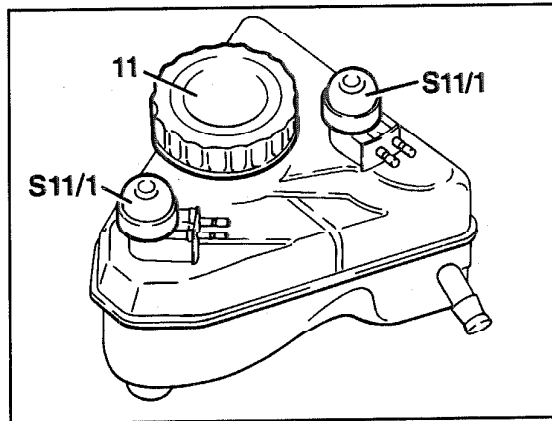


P42-2169-13

6 Screw off cover plate (11) and remove sieve.

Note

The contact insert (S11/1) cannot be removed.



P42-2186-13

Checking

7 Clean all parts thoroughly in denatured alcohol assuring that all residues are rinsed out of the housing and compensation tank.

8 Check bore in housing for scoring and rust. Minor rust spots can be removed with crocus cloth.

Note

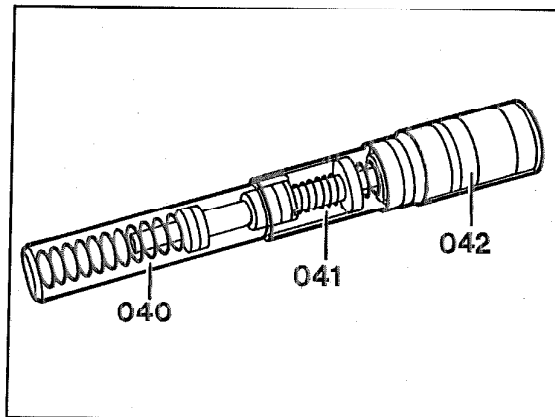
Do not attempt to repair scored or highly rusted housings. In such cases replace complete tandem master brake cylinder.

42-0315 Reconditioning master cylinder

Assembly

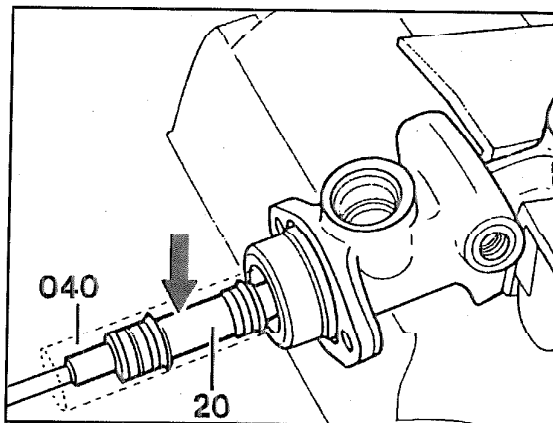
9 Coat bore in housing lightly with brake cylinder paste.

10 Remove secondary sleeve, plastic bushing, stop plate, cylindrical pin, sealing ring and silicone bag from assembly sleeve.



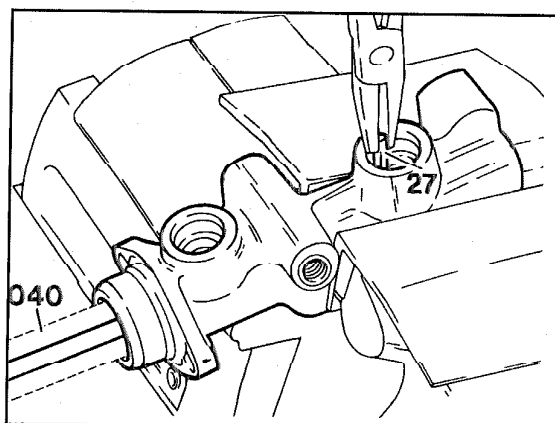
P42-2218-13

11 Clamp housing at slight angle with bore pointing downwards. Remove assembly sleeve (040) together with floating piston (dia. 19.05) from assembly sleeve (041) for push rod piston (dia. 23.81 or dia. 25.40). Insert assembly sleeve (040) into housing and press piston into housing against stop with punch. Assure that guide slot in piston (see arrow) coincides exactly with the bore for the cylindrical pin.



P27-2315-13

12 Hold piston with punch. Insert cylindrical pin (27) into bore against stop beveled end first. The cylindrical pin should only extend 2-3 mm. Remove punch and assembly sleeve (040).

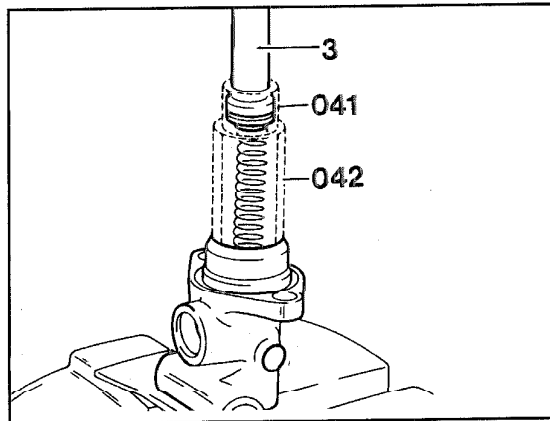


P42-2168-13

42-0315 Reconditioning master cylinder

13 Clamp tandem master brake cylinder so that cylinder bore points upwards.

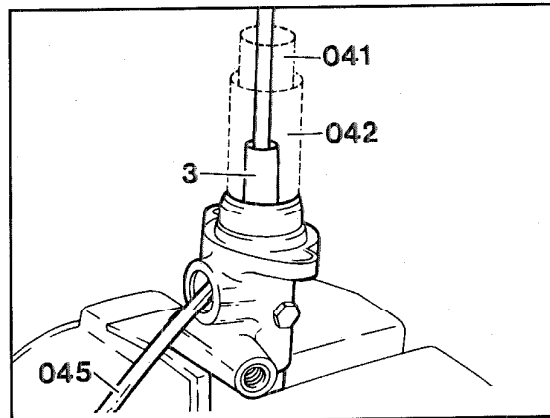
Move assembly sleeve (042) on assembly sleeve (041) until the two ends of the sleeves coincide. Insert both sleeves into housing with push rod piston (3) and press push rod piston (3) into housing with punch.



P42-2167-13

14 Push piston (3) in until second collar on push rod piston is located behind filling bore. Then insert assembly pin (045) into filling bore against stop. Assure that push rod piston is not damaged.

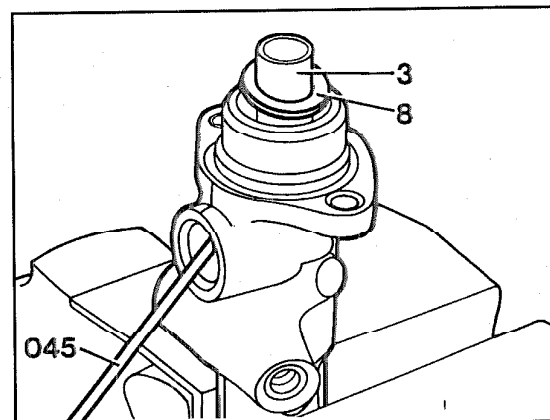
15 Remove both assembly sleeves (041 and 042).



P42-2166-13

16 Position stop plate (8) on piston (3).

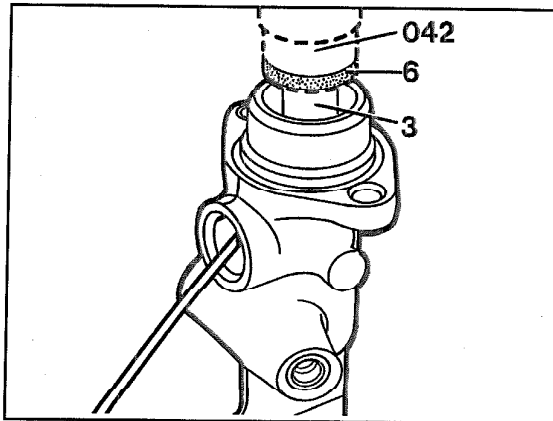
17 Coat shaft of piston (3) lightly with silicone grease.



P42-2221-13

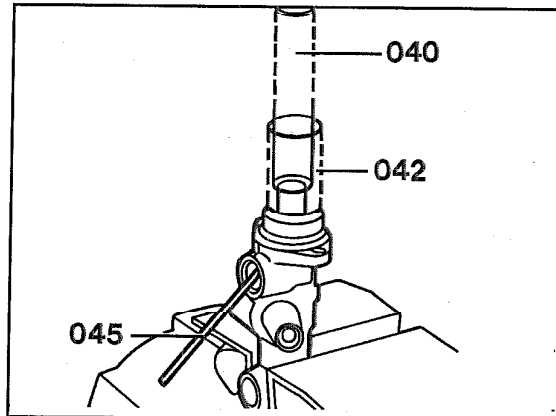
42-0315 Reconditioning master cylinder

18 Coat secondary sleeve (6) with silicone grease, then position on piston shaft with sealing lip pointing toward piston, hold in place and slide assembly sleeve (042) over sleeve against stop.



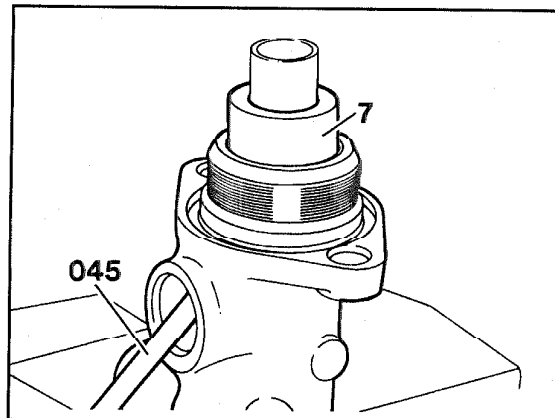
P42-2220-13

19 Slide assembly sleeve (042) into bore in housing together with secondary sleeve (6). Press secondary sleeve downward with blunt section of assembly sleeve (040). First pull assembly sleeve (042) up to height of sleeve, then remove both sleeves.



P42-2224-13

20 Insert plastic bushing (7) into housing.

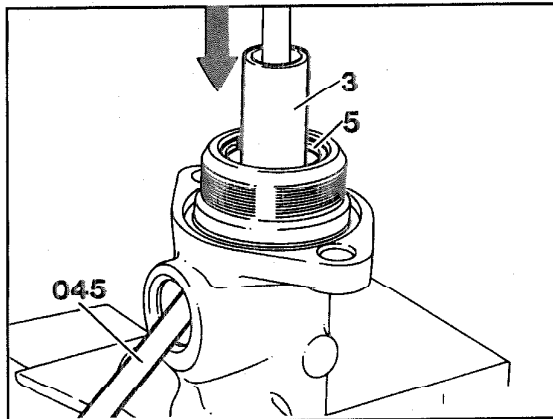


P42-2165-13

42-0315 Reconditioning master cylinder

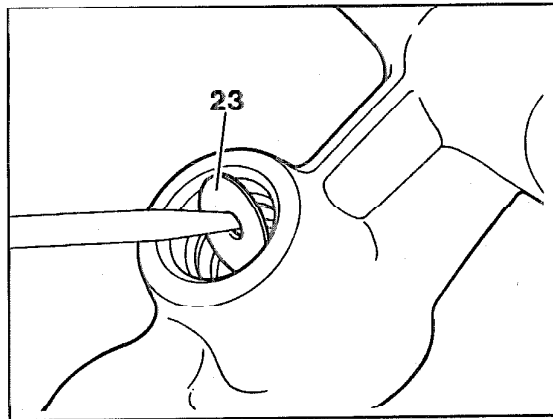
21 Insert retaining ring (5) assuring that ring is seated properly in groove in housing.

Then press piston downwards and pull out assembly pin.



P42-2164-13

22 Insert plate (23) into reservoir connection bore for floating circuit.

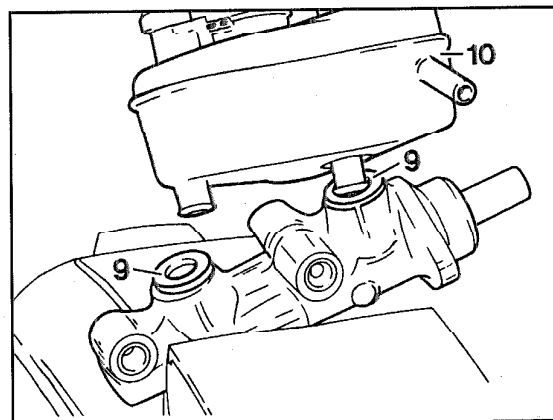


P42-2163-13

23 Insert sieve into reservoir and screw on cap.

24 Coat reservoir plugs (9) lightly with brake cylinder paste and press into housing.

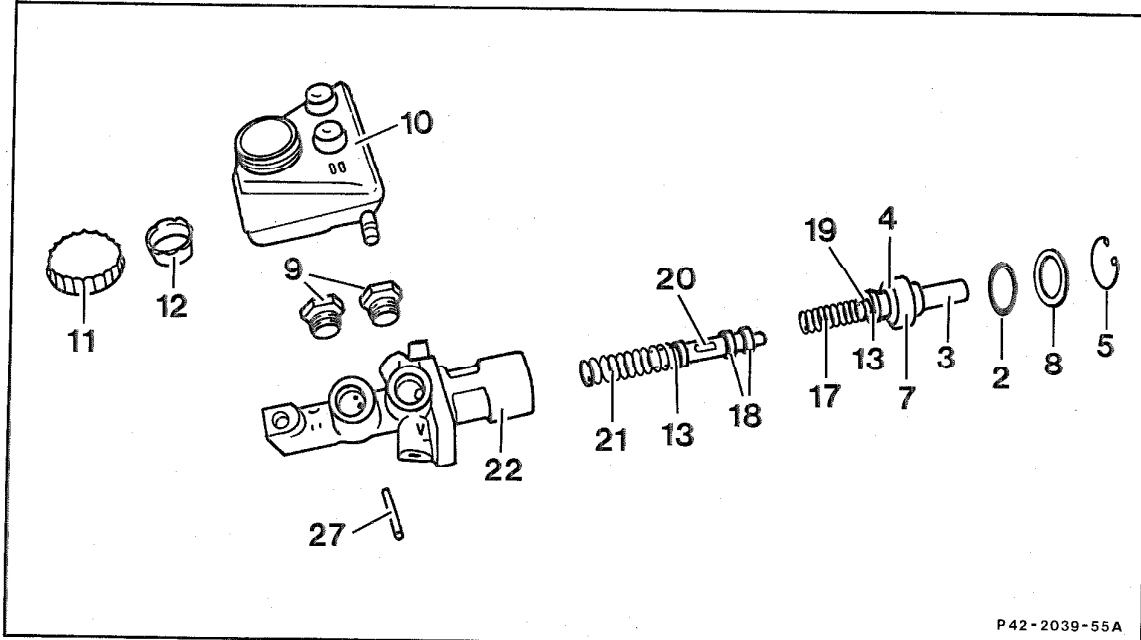
25 First insert brake fluid reservoir (10) into housing with pipe fitting, turn 180° and then press second pipe fitting into housing. Pay attention to proper seating.



P42-2162-13

42-0315 Reconditioning master cylinder

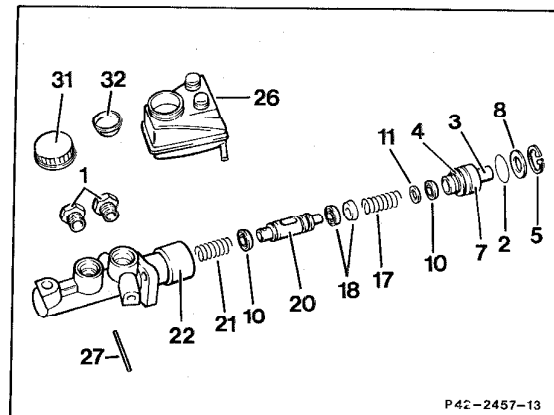
C. With central valve (light alloy) starting 09/85



P42-2039-55A

P42-2039-55A

Girling tandem master brake cylinder



Teves tandem master brake cylinder

P42-2457-13

P42-2457-13

42-0315 Reconditioning master cylinder

Brake fluid reservoir (10)	remove, clean (see Installation note following step 5).
Reservoir plugs (9)	remove.
Cylindrical pin (27)	remove, for this purpose press in piston (3) until piston (20) no longer contacts cylindrical pin (step 2).
Retaining ring (5)	remove (step 3).
Pistons (3 and 20)	remove (steps 3 and 4).
Housing (22)	clean, check for damage (see Installation note following step 4).
Repair kit	install (see Installation note following step 4).

Data

Brand		Teves/Girling	Teves/Girling
		Push rod circuit	Floating circuit
Housing	Nominal dia.	Inches 1	3/4
		mm 25.40	19.05
	Dia. in new condition	25.40	19.05
		25.45	19.10
	Wear limit	25.51	19.16
	Out-of-round tolerance	0.03	0.03
Piston	Dia. in new condition	25.36	19.01
		25.33	18.96
	Wear limit	25.25	18.90
	Clearance	0.02-0.15	0.02-0.15
	Stroke	15	17

Lubricant

ATE brake cylinder paste

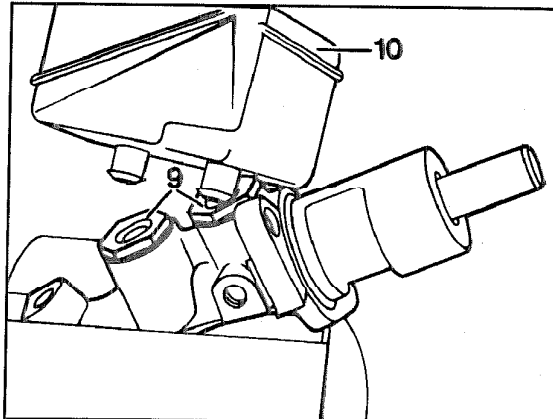
Note

It is possible to use repair kits and housings from different manufacturers.

42-0315 Reconditioning master cylinder

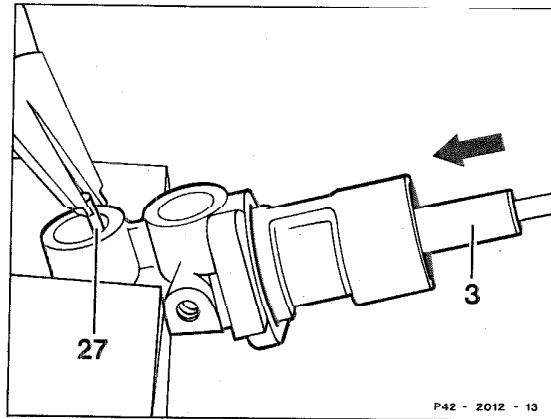
Removal

1 Pull brake fluid reservoir (10) and reservoir plugs (9) out of tandem master brake cylinder.



P42-2014-13

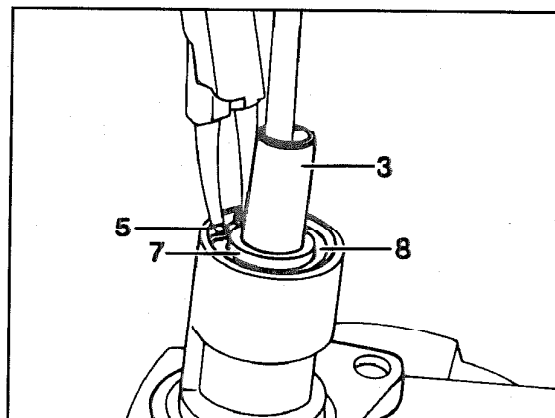
2 Press piston (3) in slightly with punch and remove cylindrical pin (27) from housing with suitable pliers.



P42 - 2012 - 13
P42-2012-13

3 Remove retaining ring (5), then remove piston (3) from housing together with secondary sealing packing.

4 Tap housing lightly against wooden surface to knock out complete piston for floating circuit.



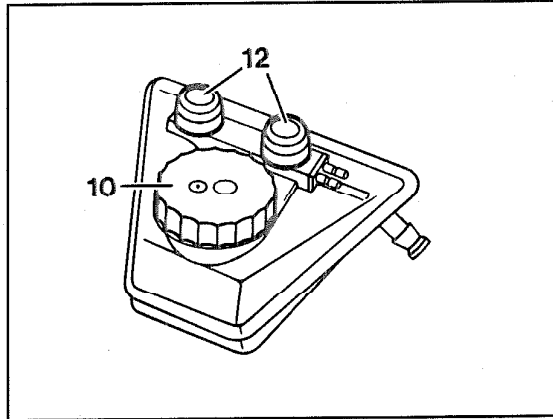
P42-2013-13

42-0315 Reconditioning master cylinder

5 Clean housing. Check bore for scoring and damage. Do not attempt to repair housings scored or damaged.

6 Screw off cap (10) and remove sieve. The contact insert (12) cannot be removed.

7 Clean all parts thoroughly in denatured alcohol assuring that all residues are rinsed out of compensation tank.



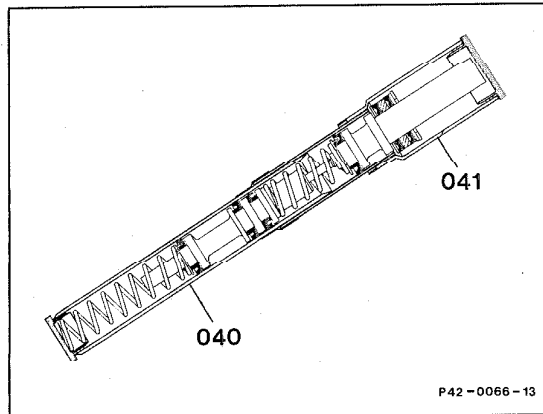
P42-2009-13

Installation

8 Coat housing bore lightly with brake cylinder paste. Separate packing sleeves (040) from sleeve (041). Remove secondary sealing packing and piston for push rod circuit from sleeve (041).

Note

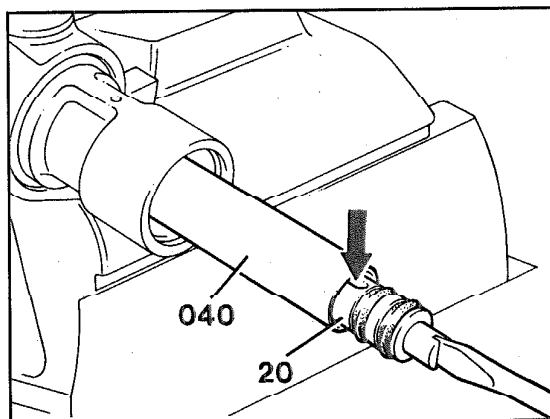
It is possible to use repair kits and housings from different manufacturers.



P42-0066-13

P42-0066-13

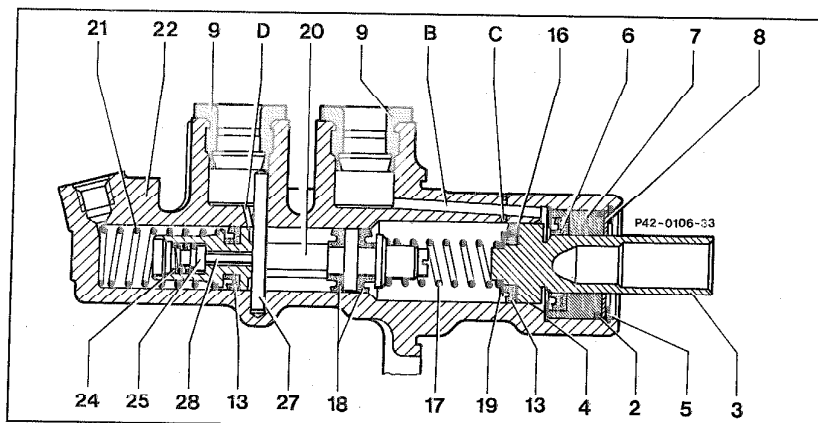
9 Clamp housing at slight angle with bore pointing downwards. Insert packing sleeve (040) into bore, then press spring and floating piston (20) into housing against stop with screwdriver. Assure that guide slot in piston (see arrow) is perpendicular. The piston position can be corrected as required with a screwdriver.



P42-2049-13

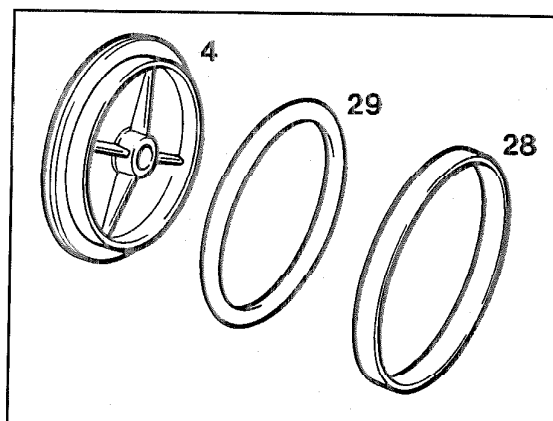
42-0315 Reconditioning master cylinder

10 Insert cylindrical pin (27) into housing and into guide slot in floating piston.



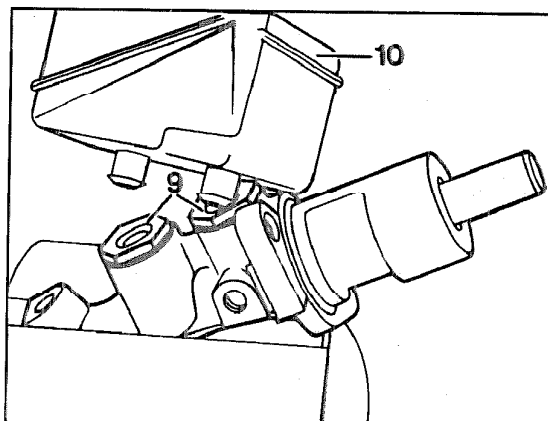
P42-0106-33

11 Clamp tandem master brake cylinder so that cylinder bore points downwards. Insert secondary sealing packing together with push rod piston and spring (17) into cylinder housing and press downward with punch. Hold piston and install retaining ring (5). Assure that the retaining ring is properly seated in the groove in the housing.



P43-2013-13

12 Coat reservoir plugs (9) lightly with brake cylinder paste and press into housing. First insert brake fluid reservoir (10) into housing with pipe fitting, turn 180° and then press second pipe fitting into housing. Pay attention to proper seating.



P42-2014-13