G. Revised brake-force distribution between front and rear axles Model 124.036 from 02/93, 129.076 and 140.04/05/07

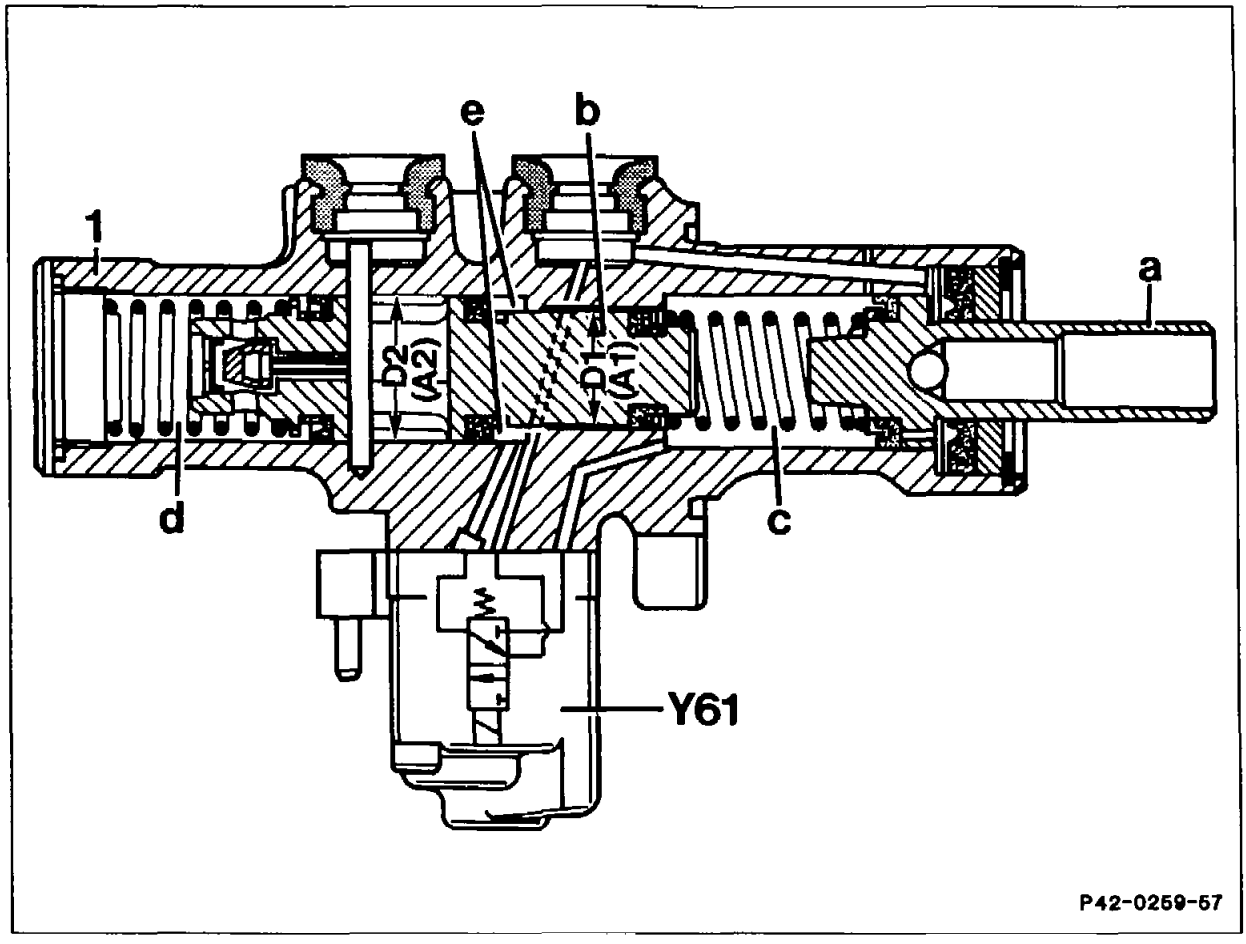
The propertion of total braking force applied at the rear axle has been substantially increased in order to reduce both thermal loads and brake wear at the front.

To enhance stability under braking, active ABS control begins earlier at the rear axle. The revised brake-force distribution is provided by a newly-developed, tandem master cylinder with variable duistribution.

To prevent the application of excessive braking force at the rear axle under special circumstances, the unit incorporates a switchover valve to return to standard brake-force distribution at high cornering speeds or when an ABS fault has been recognized.

Revised brake-force distribution
Ratio, front to rear axle:
Model 124.036 from 02/93 and 129.076 = 65.6:34.4
Model 140.04/05/07 = 63:37

Standard brake-force distribution
Ratio, front to rear axle:
Model 124.036 from 02/93 and 129.076 = 74.3:25.7
Model 140.04/05/07 = 72:28



1	Tandem master cylinder	A1	Smaller effective area
a	Pushrod piston	A2	Larger effective area
b	Floating piston	D1	Small diameter
c	Pressure chamber for front circuit	D2	Large diameter
d	Pressure chamber for rear circuit	Y61	Master cylinder switchover valve
e	Supplementary pressure chamber (ring chamber)		

Tandem master cylinder with variable distribution

Diameter of pressure piston: 1 1/16"
Floating diameter: 1"
Diameter of floating piston: 13/16"

The basic design corresponds to that of a conventional master cylinder with pressure (a) and floating piston (b). The master cylinder switchover valve (Y61) enlarges the effective area (A1) of the floating piston (b) to the larger area (A2) to achieve a hydraulic pressure ratio of 1:1 between front and rear axles.

Operation with ABS in ready state (normal operation)

The master cylinder switchover valve (Y61) is triggered **only** when the brakes are applied; the control circuit runs from the brake-light switch and through the ABS control unit (N30).
When the valve is activated, it establishes a connection between the pressure chamber (c) for the front brake circuit and the supplementary pressure chamber (ring chamber, e) while simultaneously blocking the return line to the brake fluid reservoir. The pressure on the floating piston (b) for the rear circuit is exerted against the smaller effective area (A1) + supplementary pressure chamber (ring chamber, e) = larger effective surface A2.

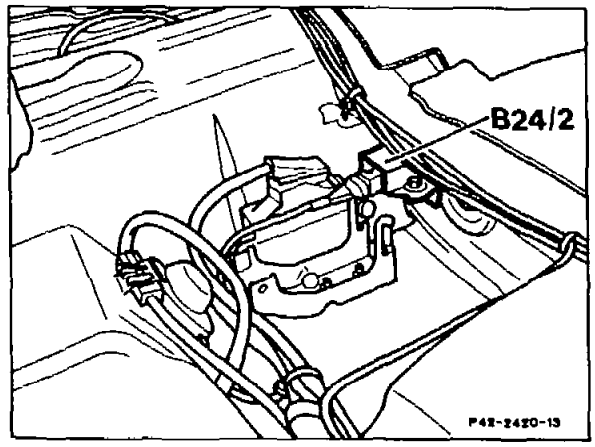
Operation with ABS in ready state and high lateral acceleration or after recognition of ABS fault

In order to prevent excessive brake force at the rear axle at immoderate cornering speeds or when an ABS fault has been recognized, the switchover valve responds to these conditions by switching the master cylinder to standard brake-force distribution.
When the lateral acceleration rises to in excess of 0.4 g, or an ABS error is recognized, no signal is transmitted to the master cylinder's switchover valve (Y61) and the master cylinder remains in its basic position.
When the ABS is operational, the brake-force distribution on the Model 140 is regulated to 72:28, with 74,3:25.7 on the Models 124.036 and 129.076.

When an ABS error is present, the brake-force distribution remains the same for unregulated braking.
Pressure is bled from the supplementary pressure chamber (ring chamber, e) via the passage to the fluid reservoir.
Pressure is exerted only against the smaller effective area (A1) of the floating piston (b), that is, the brake pressure applied at the rear is reduced in proportion to the reduction in effective pressurized area; the proportion of total braking force applied at the rear sinks into a range correspondingg to standard distribution.

ABS lateral-acceleration sensor

The ABS lateral-acceleration sensor (BN24/2) installed under the rear seat provides the ABS (or ASR) control unit with information on the lateral forces that occur during cornering. At high rates of lateral acceleration it triggers the change in brake-force distribution.



The ABS control unit (N30) processes the signals from the lateral-acceleration sensor (B24/2) and transmits control signals to the switchover valve in the master cylinder (Y61). Operating voltage is supplied by the basic module (N16/1). The control units are installed in the module box.