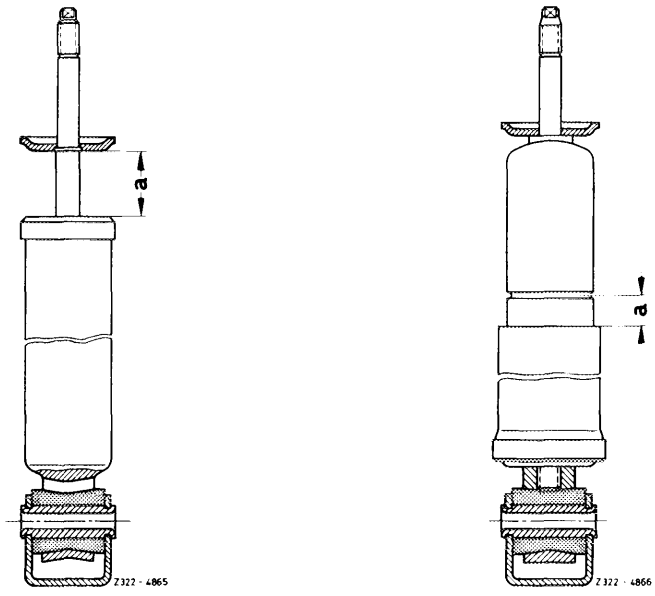
Test values for shock absorbers

Designation	Part no.	Color code (on housing for front shock absorber, on lower suspension eye for rear shock absorber)	Adjustment in N at 100/min and 50 mm stroke for new or exchange shock absorber		Check of oil reserve in shock absorber	
					Piston rod exposure „a"	
					Adjustments for new shock absorbers	Max. perm. values
			Extension	Compression	mm	mm
Front shock absorbers						
Gas pressure shock absorbers **with** separating piston[1]), Bilstein and F & S[3])						
Bilstein	116 323 19 00	1 lengthwise line green	1040	480	6 ± 2	38
	116 323 21 00	2 lengthwise lines green	1100	630		
F & S	116 323 30 00	1 crosswise line green	1040	480		
	116 323 31 00	2 crosswise lines green	1100	630		
Gas pressure shock absorbers **without** separating piston[2]), F & S						
F & S	116 323 17 00	1 crosswise line green	1040	480	22 ± 2	0
	116 323 20 00	2 crosswise lines green	1100	630		
	116 323 25 00	1 crosswise line green	1050	580		
	116 323 26 00	2 crosswise lines green	1000	630		

[1]) After exceeding max. length of exposed piston rod, the shock absorber will lose its effect.
[2]) After dropping below max. length of exposed piston rod, the shock absorber will lose its effect.
[3]) F & S shock absorbers available starting approx. November 1980.



Front shock absorbers

a Length of exposed piston rod

Shock absorber with separating piston

Shock absorber without separating piston

Designation	Part no.	Color code (on housing for front shock absorber, on lower suspension eye for rear shock absorber)	Adjustment in N at 100/min and 50 mm stroke for new or exchange shock absorber		Check on oil reserve in shock absorber	
					Piston rod exposure „a"	
					Adjustments for new shock absorbers	Max. perm. values
			Extension	Compression	mm	mm

Rear shock absorbers

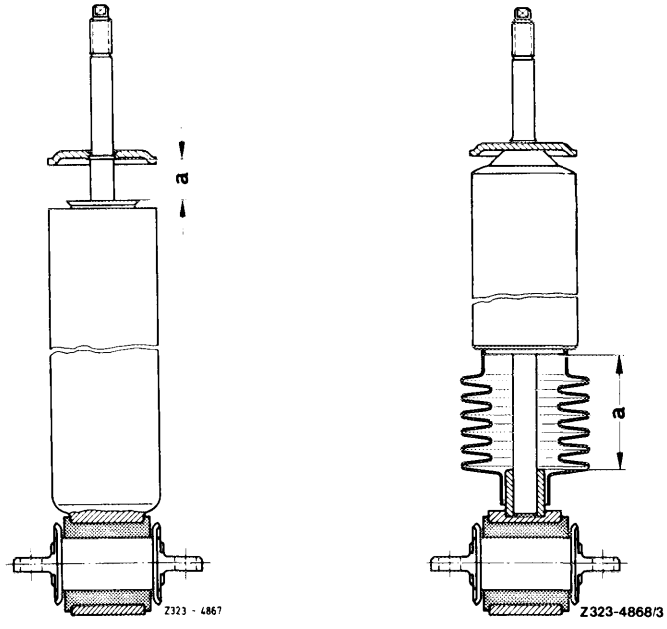
Gas pressure shock absorbers **with** separating piston[1]), Bilstein and F & S

Bilstein	116 326 02 00	1 lengthwise line green	2350	1070	0 + 2	32
	116 326 03 00	2 lengthwise lines green	3000	1050		
	116 326 06 00	2 lengthwise lines green	2920	1250		
F & S	126 326 09 00	1 crosswise line blue	1300	540		
	126 326 10 00	2 crosswise lines blue	1600	690		

Gas pressure shock absorber **without** separating piston[2]), made by F & S

F & S	116 326 04 00	1 crosswise line, green	2350	1100	105 ± 2	82
	116 326 05 00	2 crosswise lines, green	3050	1100		
	116 326 10 00	1 crosswise line, green	2450	1180		
	116 326 11 00	2 crosswise lines, green	2950	1280		

[1]) If the max. length of exposed piston rod is exceeded, the shock absorber loses its effectiveness.
[2]) If the max. length of exposed piston rod is not met, the shock absorber loses its effectiveness.



Rear shock absorbers

a Length of exposed piston rod

Shock absorber with separating piston

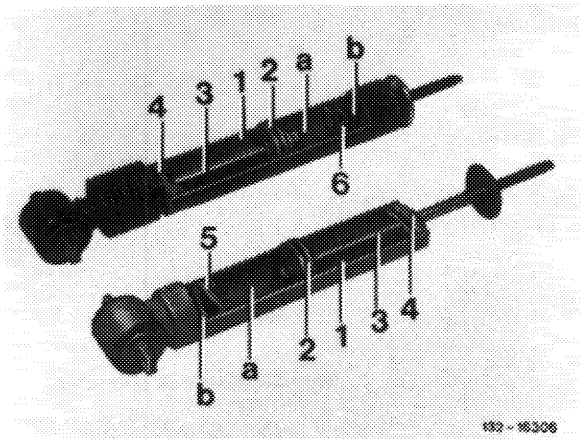
Shock absorber without separating piston

Notes

For testing and evaluation of gas pressure shock absorbers, the fundamental difference between two designs must be observed. The difference refers to extension and the separation of oil and gas chamber.

Gas pressure shock absorber with separating piston between oil and gas chamber (Bilstein and F & S).
Installation position of shock absorber with **piston rod in upward direction.**

Gas pressure shock absorber without separating piston between oil and gas chamber (made by F & S).
Installation position of shock absorber with **piston rod in downward direction.**



1 Cylinder
2 Operating piston with spring washers
3 Piston rod
4 Closing package with piston rod seal and piston rod guide
5 Separating piston
6 Baffle plate
a Oil chamber
b Gas chamber

Oil reserve in shock absorber

The oil reserve in the shock absorber is determined by the length of exposed piston rod „a".

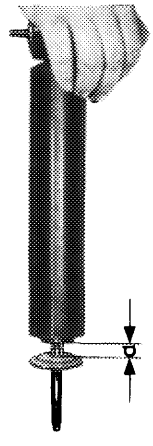
While measuring the oil reserve, the temperature of the shock absorber should amount to approx. 20° C.

In the event of an oil loss, the piston rod exposure on shock absorber with separating piston increases; it will decrease on shock absorbers without separating piston.

If permissible exposure is above or below specified data, renew shock absorber since it will lose in effect.

Shock absorber with separating piston

Push-in piston rod up to stop of operating piston on separating piston. Then measure dimension "a" of piston rod exposure.



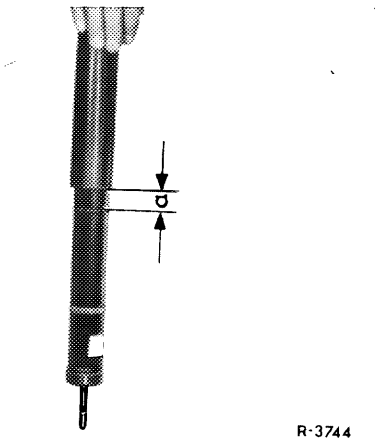
Shock absorber with separating piston
a Length of exposed piston rod

R-3743

Shock absorber without separating piston

Compress shock absorber – with piston rod in upward direction – until a clearly noticeable, additional resistance is felt, i.e. until piston encounters the oil column. Then measure length of piston rod exposure "a".

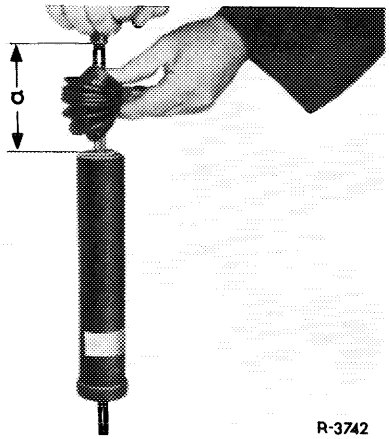
Note: When testing oil reserve on shock absorber without separating piston (F & S), any occurring **hissing noises are without significance.**



R-3744

Front F & S shock absorber

a = Length of exposed piston rod



R-3742

Rear F & S shock absorber

a = Length of exposed piston rod

Sight test

Check piston rod carefully for surface damage.

Check piston rod for bends. A bent piston rod is recognized by binding when inserted into guide bushing.

Note: For lubricating guide bushing outside piston rod seal, the piston rod is designed to provide a slight oil film.

The alignment of the suspension points is important for the correct function of the piston rod seal. In the event of leaks on piston rod seal, be sure to check whether alignment of suspension points is in order.

Rumbling and knocking noises

Check upper suspension for correct assembly, lower suspension for tight seat of fastening bracket and rubber mount in housing eye.

Measure oil reserve. At very high oil losses, shock absorbers with separating piston have a tendency toward knocking, since during deflection the piston rod may knock against compensating piston. On rear shock absorbers, check alignment of upper suspension point on frame floor in relation to lower suspension point on semitrailing arm (32–126).

A loose operating piston may be responsible for the knocking.
To check, push piston rod inwards in installation position of shock absorber, release and push-in again. If the operating piston is loose, a change between pushing and pulling will be noticed by a knocking noise.

Hissing noises

With a leaking compensating piston, shock absorbers with separating piston have a tendency toward hissing noises, since gas enters the oil system and foaming will occur. Such shock absorbers may still be operational, but they should nevertheless be replaced.

Attention!
Shock absorbers without separating piston, in which the oil and the gas chamber are not absolutely separated, the noise etc. can be checked in installation position, that is, with the piston rod downwards. If prior to checking for noise, the oil reserve has been checked (with the piston rod upwards) or if the shock absorber has been stored with the piston rod in upward direction or in horizontal position, the oil has been mixed up with gas. **Noises can be evaluated only after pushing the piston rod several times inwards.**