

Job No.
46-5

Checking and Repairing of Steering Assembly

A. DB Re-Circulating Ball Steering Type LO (Previous Version)

On Models 180 and 180 D the checking and repair procedures for the previous version of the re-circulating ball steering are essentially the same as on Model 190. The dimensions and tolerances of individual components are different, however.

a) Steering Worm and Steering Nut

As in the case of the standard re-circulating ball steering there are 62 ± 2 balls in the ball-races of the steering nut.

b) Angular Contact Bearing

Contrary to the annular ball bearings on the standard re-circulating ball steering the angular contact bearings for the steering worm have no internal race and the balls run in a race-way on the steering worm.

Dimensions and Tolerances of Steering Worm Bearing in mm

Angular contact bearing		Steering housing	
consisting of	Ball race		Base bore diameter
	External ϕ	Width	
Ball race Part No. 120 462 04 27	39.700	7.5	43.000
Ball retainer Part No. 000 981 04 84	39.689		43.025

c) Steering Shaft

The original diameter of 25.4 mm of the bearing surfaces of the steering shaft was changed to 28.5 mm and later to 30.0 mm as on the standard re-circulating ball steering (see Section d).

d) Steering Housing

The base bore for the bearing bushings in the steering housing varies in accordance with the type of steering shaft installed.

Dimensions and Tolerances of Steering Shaft Mounting in mm

Steering shaft version	Steering shaft Bearing surfaces ϕ	Upper and lower bearing bushing			Steering housing base bore ϕ
		Internal ϕ Rough-turning dimension	Internal ϕ Finished dimension	External ϕ	
1 st	$\frac{25.380}{25.359}$	$\frac{25.2}{25.3}$	$\frac{25.400}{25.421}$	$\frac{27.548}{27.535}$	$\frac{27.500}{27.525}$
2 nd	$\frac{28.480}{28.459}$	$\frac{28.0}{28.1}$	$\frac{28.500}{28.521}$	$\frac{30.548}{30.535}$	$\frac{30.500}{30.525}$
3 rd	$\frac{29.993}{29.980}$	$\frac{29.5}{29.6}$	$\frac{30.000}{30.013}$	$\frac{32.059}{32.043}$	$\frac{32.000}{32.025}$

e) Pressure Block Assembly

Dimensions and Tolerances of Pressure Block Assembly in mm

Pressure Spring

Connection ϕ mm	Wire gage mm	Free length mm	Length under load mm	kg
13.0 + 0.1	3.5	$18.0 \pm \begin{smallmatrix} 0.1 \\ 0.3 \end{smallmatrix}$	16.0	$80 \pm \begin{smallmatrix} 10 \\ 5 \end{smallmatrix}$

Pressure Sleeve

External ϕ	Internal ϕ	Length
$\frac{17.139}{17.128}$	$\frac{13.1}{13.2}$	19.5

Set Screw

External ϕ	Internal ϕ	Tightening of set screw
Thread M 24 x 1.5	$\frac{17.2}{17.3}$	In dead center position screw in till tight and then back out 2-4 mm, measured at the circumference of the set screw

B. DB Standard Re-Circulating Ball Steering Type LO

On Models 180 to 220 SE the checking and repair procedures for the standard re-circulating ball steering are the same as on Model 190. The dimensions and tolerances are also the same. In addition the following points require attention:

New Mounting of Steering Shaft

On recent cars of Models 180 a, 180 b, 180 D, 180 Db, 190, 190 b, 190 D, 190 Db, 190 SL, 219, 220 S, and 220 SE a longer upper bearing bushing has been installed for the steering shaft in the steering housing (see Table).

Bearing bushing	Version	Part No.	Length in mm
top and bottom	1 st	120 462 05 50	30.0
top	2 nd	120 462 06 50	37.0
bottom		120 462 05 50	30.0

The steering housing with the longer upper bearing bushing has the Part No. 186 460 13 02.

The steering shaft has also been modified at the upper bearing surface and has the Part No. 186 460 03 11 (Fig. 46-5/1).

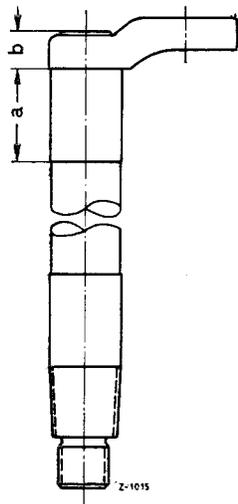


Fig. 46-5/1

Steering shaft Part No.	Length "a" mm	Shoulder "b" mm
120 460 03 11	35	19
186 460 01 11		
186 460 02 11		
186 460 03 11	39	15

The steering shafts Part No. 186 460 01 11 and 120 460 03 11 had ball cups with shoulder whereas on the recent versions the ball cup is secured by a snap ring.

When repairs are carried out, the steering shafts 186 460 02 11 and 01 11 can be replaced by the steering shaft 186 460 03 11 even on 1st version steering housings with the 30 mm long bearing bushings.

However, it is not possible to install the steering shafts 180 460 02 11 and 01 11 into the 2nd version steering housing with the longer upper bearing bushing.