Checking and Repairing of Steering

Perfect functioning of the steering is particularly important for safety in traffic. Repair work should therefore be carried out with the greatest care. When deciding whether or not to reinstall steering assembly parts, very strict standards of examination should be applied.

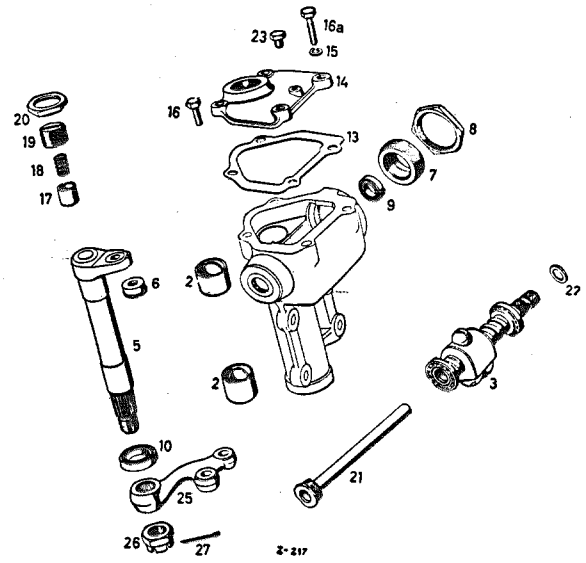

Fig. 46 — 5/1

2 Upper and lower bearing bushing
3 Steering worm with nut and taper-roller bearing
5 Steering shaft with ball-cup
6 Ball-cup
7 Adjusting ring
8 Hexagon nut
9 Sealing ring B 20 × 32 × 7 for the steering worm
10 Grease seal for the steering shaft
13 Gasket
14 Steering housing cover
15 Lock washer B 8
16 Hexagon screw M 8 × 20
16a Hexagon screw M 8 × 25
17 Pressure sleeve
18 Compression spring
19 Set screw
20 Hexagon nut
21 Cable guide tube
22 Sealing ring
23 Screw plug
25 Steering gear arm
26 Castle nut M 22 × 1.5
27 Cotter pin 5 × 40

A. Steering Worm and Steering Nut

The steering worm should be checked to see if it turns true. The steering worm and steering nut ball-races should be examined for scoring, denting or damage, particularly after an accident. The steering nut should also be checked to ensure that the ball guide tubes are not bent and that the ball pin is not damaged.

If any of these defects are present, the steering nut must be replaced, together with balls and steering worm.

This is necessary because at the factory, steering worm, steering nut and balls are matched so that the prescribed clearance is obtained and the steering functions perfectly. The matched steering worm and steering nut are always marked with a serial number.

The complete assembly as supplied also includes the taper-roller bearings.

B. Taper-Roller Bearings

The bearing races and the taper-rollers together with the taper-roller bearing retainer should be checked for scoring and damage.

If it is necessary to replace the taper-roller bearings, they should be selected to yield the prescribed oversize fit of 0.010 to 0.015 mm between the inner race and the bearing bed of the steering worm.

Dimensions and Tolerances of the Taper-Roller Bearings and Steering Worm

in mm

Taper-roller bearing				Steering worm	Steering housing
Part No.	Internal diameter	External diameter	Width	Bearing bed diameter	Base bore diameter
000 981 03 18	19.590 / 19.600	44.475 / 44.450	14.180 / 14.448	19.615 / 19.602	44.470 / 44.495

C. Steering Shaft

The steering shaft should be examined for wear, distortion and damage.

The ball-cup in the steering shaft arm should be examined for scoring, cracks and damage. If necessary, the ball-cup can be pressed out. When installing a new ball-cup, care must be taken to ensure that the prescribed oversize fit of 0.01 mm is obtained.

Similarly, the two stop faces (a) at the side of the steering shaft arm should be checked for wear (Fig. 46 — 5/2).

If any damaged parts or considerable wear is found, the steering shaft should be replaced.

D. Steering Housing

The steering housing should be checked for damage and the bearing bushings for wear. In doing this, particular care must be taken to check whether the housing is damaged at the steering shaft arm safety stop faces (b) (Fig. 46 — 5/2).

If this is the case, the steering housing should be replaced. The angle of left and right lock of the steering shaft, measured from the center position, is 35° 30′ on each side (Fig. 46 — 5/2).

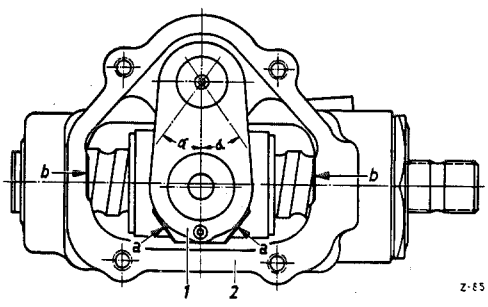

Fig. 46 — 5/2

1 Steering shaft arm
2 Steering housing
a Stop faces at the steering shaft arm
b Safety stop faces at the housing
Angle of lock α = 35° 30′

If wear or chafed spots are found at the bearing bushings, the bushings should be replaced. When installing the new bushings, care must be taken to ensure that the open end of the oil groove is facing upward. To prevent displacement the upper bearing bushing is locked by flaring (expanding) the upper edge (Fig. 46 — 5/3). When the bushings have been pressed in, they should be reamed out to the finished dimensions.

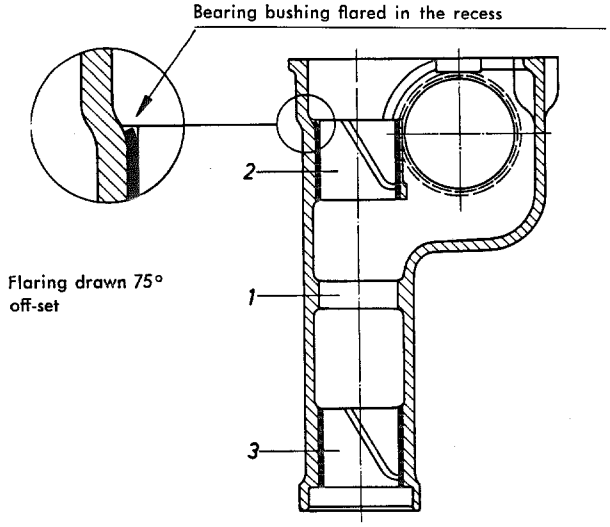

Fig. 46 — 5/3

1 Housing
2 Upper bearing bushing
3 Lower bearing bushing

Dimensions and Tolerances of the Steering Housing
in mm

Steering shaft	Upper and lower bearing bushing			Steering housing
Bearing surfaces diameter	Internal diameter Rough-turning dimension	Internal diameter Finished dimension	External diameter	Base bore diameter
$\frac{29.993}{29.980}$	$\frac{29.5}{29.6}$	$\frac{30.000}{30.013}$	$\frac{32.059}{32.043}$	$\frac{32.000}{32.025}$

E. Pressure Block Assembly

Examine the pressure sleeve, compression spring and set screw to see whether they are still serviceable. As a rule, if the parts in question are damaged, they should be replaced. As an expedient, the pressure face of the pressure sleeve can be reground if slight scoring is found.

Dimensions and Tolerances
in mm

Compression Spring

External diameter mm	Gage of wire mm	Free lenght mm	Length under load mm	kg
17.5	3.5	23.6 ± 0.2	18.7	$80 \pm \frac{10}{5}$

Pressure Sleeve

External diameter	Internal diameter	Length
$\frac{22.048}{22.035}$	$\frac{17.6}{18.0}$	22

Set Screw

External diameter	Internal diameter	Tightening of set screw in cover
M 28×1.5	$\frac{22.2}{22.3}$	Screw in till tight and then turn out 3 — 4 mm, measured at the circumference of the set screw