PORSCHE

SERVICE BULLETIN - all dealers 9/58 abroad

Subject: Adjustment and Installation Instructions for ZF One-Finger Steering Gear (Ross System)

Type: 356 A

As of Serial No.

Coupé	101 693
Hardtop, Convertible	150 005
Speedster	83 792

Effective date: September 1st 1957

Technical data

Type:	ZF one-finger gear type 7 155, gear left, left-handed thread worm
Steering gear ratio:	1:16.50:17.50:14 (arithmetical mean ratio 1:16,70) 2.70 steering wheel revolutions correspond to moving the pitman arm by 58° (steering removed)
Oil:	Commercial quality transmission oil SAE 90
Capacity:	About 1/4 US quart

Technical instructions

Adjustment:

The hard point adjustment is carried out by the manufacturer. Only in special cases it should be corrected. Generally it should rather be set too loose than too hard. Admissible clearance when the steering wheel is in straight-ahead position: 0.394 in. If there is more clearance adjust by means of the adjusting screw and adjusting nut.

Attention! Contrary to the previous worm gear the ZF one-finger gear is so designed that only in straight-ahead position within a range of about ± 2° steering movement there is no clearance. If the angle of steering movement is greater than 3° to the left or right clearance must be noticeable.

This design allows a perfect adjustment and secures equal wear without clamping of the steering finger at any other point. When checking the steering clearance the wheels must be exactly in straight-ahead position. The intermediate position of the steering gear is marked at the steering gear by notches.

Location of the hard point

The hard point is to be found half way between the left and right stop and is marked at the journal of the steering worm by a line and at the steering gear case by a notch (fig. "C"). These marks can also be made coincide outside the hard point.

In order to avoid errors, turn steering wheel as far as it will go (left or right), from this position back it off about one turn, then coincide marks.

For the correct adjustment of the hard point a torque measuring device is available; it will be supplied on special order.

A Adjustment and readjustment of the hard point

1. Remove tie rods and steering damper from the pitman arm.
2. Loosen adjusting nut at the steering gear.
3. Tighten adjusting screw (right-handed thread) until a slight resistance is felt when moving the steering wheel in straight-ahead position.
4. Tighten adjusting nut.
5. Replace tie rods and steering damper.

When driving the hard point should not be felt.
Attention! Do not try to remove steering shocks by too hard adjustment of the hard point!
(If measuring device available, hard point 5 - 7 cmkg)

B Optical measuring of the car

Toe-in adjustment:

1. Align car.
2. Adjust steering to hard point (mark).
3. Adjust short tie rod so that left wheel has +10' toe-in (pressed).
4. Adjust long tie rod so that right wheel has +10' toe-in (pressed).
5. Check difference angle.

Attention! A difference angle error cannot be corrected by adjusting the tie rods. Errors within the tolerance range as shown in the measuring card must be put up with. In case of great difference angle errors, the rod arm at the stub axle, tie rods, stub axles or frame are deformed.

C Adjustment of the toe-in without optical measuring device

1. Adjust toe-in .0394 - .1182 in. (pressed) with toe-in measuring device at the front wheels.

2. Adjust steering gear to hard point (mark) and arrest.

   After these operations the steering wheel should be in straight-ahead position. If necessary take off steering wheel and bring it to the correct position. Tighten steering wheel nut.

3. Push car along a straight line of about 17 feet until front wheels are in straight-ahead position (level ground).

4. Adjust left and right tie rod uniformly by the same distance (but in opposite directions) until steering wheel will be again in straight-ahead position.

5. Check toe-in and adjust if necessary.

D Adjustment of the clearance in the ball bearing (steering worm bearing application)

General:

Contrary to the worm gear of the previous types steering worm, steering finger and sector shaft can be exchanged separately on this type of steering gear.

New steering gears and those which have been overhauled by the manufacturer are provided with a lead seal. In case of complaints concerning steering gears with broken lead seals the manufacturer will not assume guarantee. We therefore recommend to send steering gears requesting repair to the factory for overhauling. This specially applies if steering gears have been damaged in an accident or if the accident has been such that it must be expected that parts of the steering gear are damaged.

Re-adjustment

1. Remove steering gear, drain out oil, clean steering gear.

2. Remove adjusting flange.

3. Remove distance plate until there is no clearance noticed.

4. Fix flange.

If a torque measuring device is available the power required to move the steering worm outside the hard point is to be measured.

The measuring result should lie between the tolerance of 2 - 3 mkg. If at the same time a new oil seal was installed the tolerance should lie between 3 - 5 cmkg.

Besides the above instructions the following hints should be observed:

1. Do not loosen pitman arm from the steering gear in straight-ahead position by hammer blows; use puller P 72.

2. Correct position of the pitman arm at the sector shaft is marked by a notch (fig. "D").

3. Try to adjust toe-in with optical measuring device equally left and right.

4. The fixing screws of the steering gear are tightened with 3 mkg (four M 10 screws).

5. The nuts fixing the pitman arm must be well tightened and fixed with a splint pin.

Dr.Ing.h.c.F.Porsche K.-G.

Klauser Schmidt

February 25th 1958

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Anlage - Rundschreiben der Kundendienst-Abteilung Nr. 10/58 Inland
Enclosure - Service Bulletin No. 9/58 Abroad
Annexe - Lettre circulaire No. 9/58 Etranger
Anexo - Circular de la sección Servicio No. 9/58 Extrangero

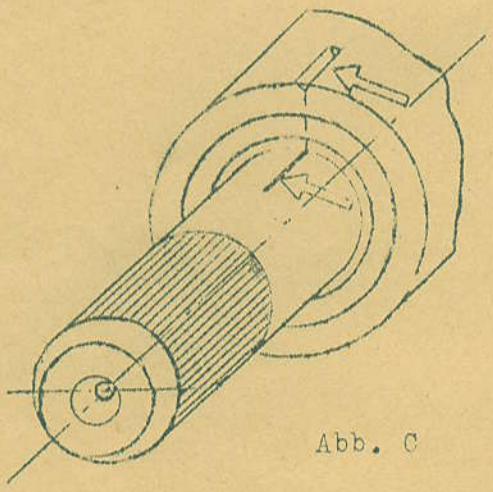

Abb. C

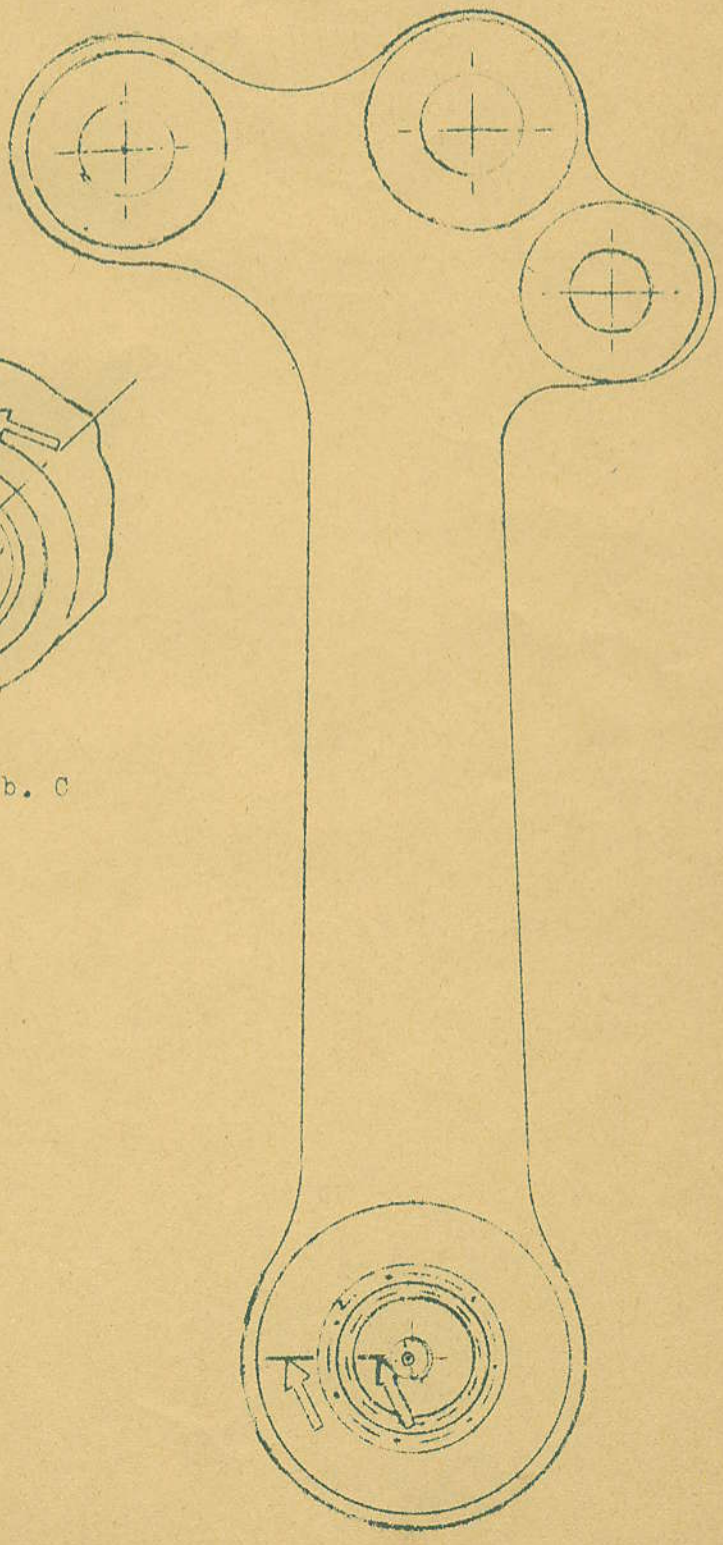

Abb. D

Enclosure - Service Bulletin No. 9/58 abroad

The numbers of the following section drawings "A-A" and "B-B" are:

1. Filler plug
2. Fixing nut for steering finger
3. Lock plate
4. Timken bearing
5. Steering finger
6. Steering gear case
7. Steering worm
8. Bearing bushing
9. Sector shaft
10. Castallated nut with splint pin
11. Adjusting nut
12. Adjusting screw
13. Cover for steering gear case
14. Intermediate disc
15. Spacer
16. Pressure spring
17. Spacer
18. Oil seal
19. Pitman arm
20. Oil seal
21. Ball bearing) for steering worm bearing
22. Ball bearing) application
23. Spacer
24. Distance plate
25. Adjusting flange

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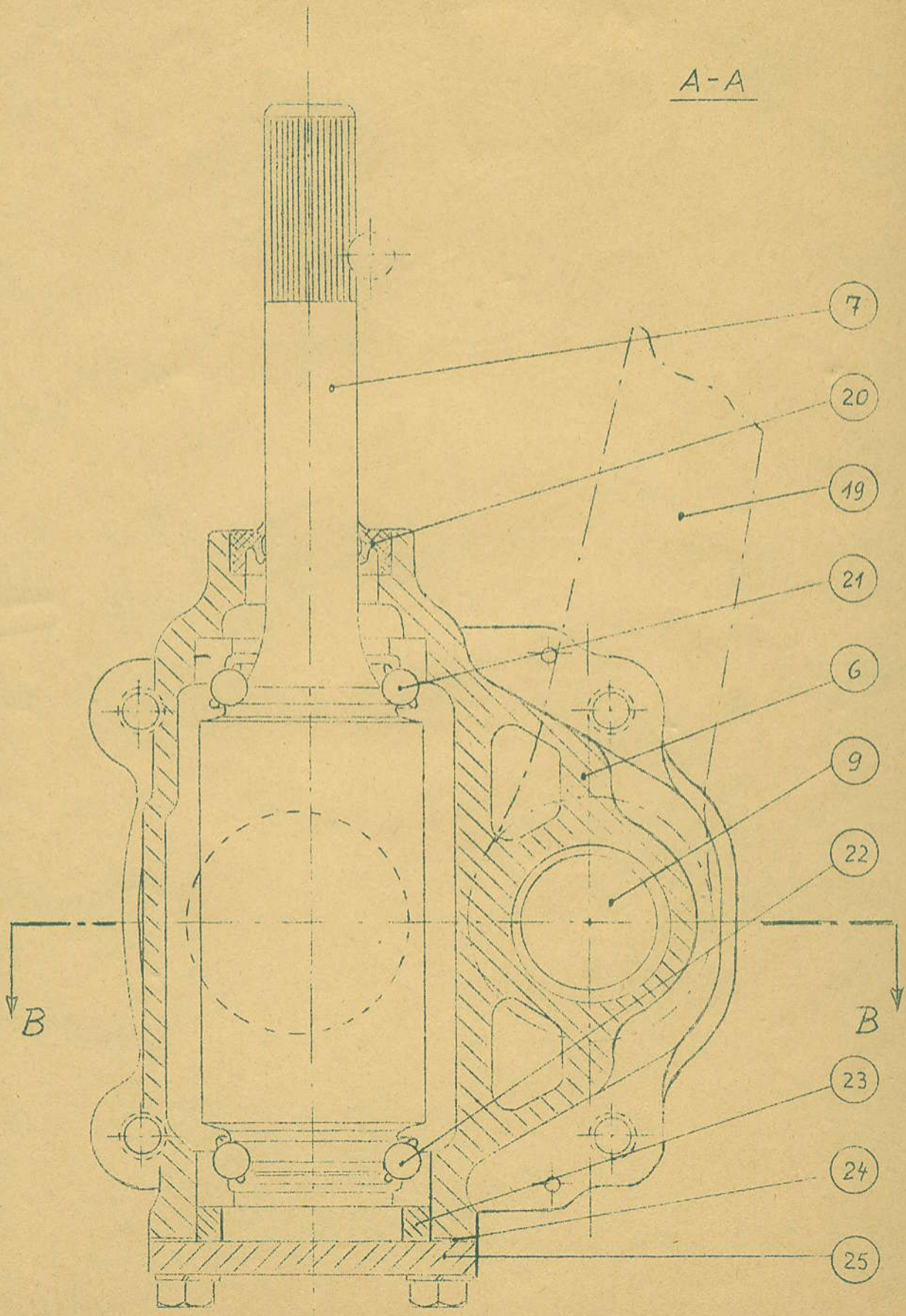

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