MERCEDES-BENZ RECIRCULATING BALL

230
240D

NOTE – All other Mercedes-Benz models have power steering as standard equipment. See Mercedes-Benz under POWER STEERING in this section.

▶ CHANGES, CAUTIONS, CORRECTIONS

MID-YEAR STEERING LINKAGE MODIFICATION – As of January, 1974 production, a modified center link has been installed. This center link uses a hex bolt in the welded steering damper bracket. Also, the steering damper is now secured to the drag link and frame rail by two all-steel lock nuts. These lock nuts may be used only once.

DESCRIPTION

The mechanical steering gear used on these models is a recirculating ball type. The gear is connected to the steering column by a coupling flange and to the steering linkage through the pitman arm. The linkage consists of two adjustable tie rods, a center link, idler arm, pitman arm, and steering damper.

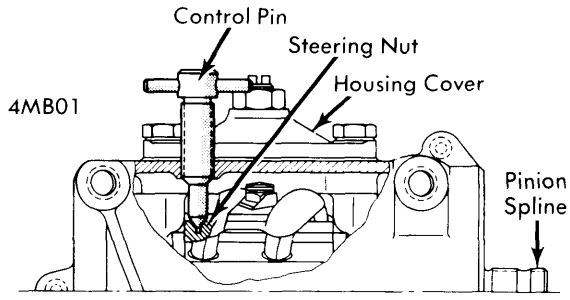
REMOVAL & INSTALLATION

STEERING GEAR

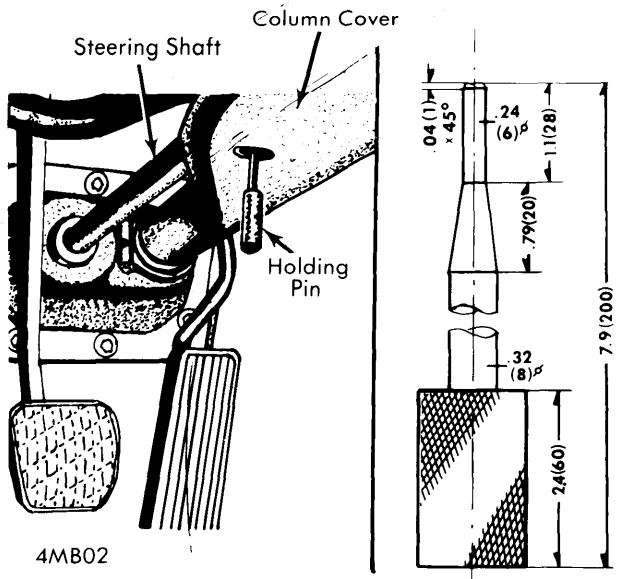
Removal – Unscrew socket head bolt on upper flange of steering coupling. Detach center link and inner end of tie rod, from pitman arm. Loosen steering damper from vehicle frame. Unbolt gear assembly from frame, push gear down from flange connection, and pull assembly from vehicle. Inspect steering coupling and remove for repairs, if required.

Installation – **1)** Ensure steering gear box is filled with suitable fluid. Set gear in center position (turn worm until center of steering nut is directly below oil filler hole in housing cover). Locate nut by screwing in on center position control screw (see illustration). Attach steering coupling, while holding gear in vertical position, such that the two flats on the coupling are exactly horizontal.

2) Turn steering wheel to center position (spokes horizontal). If necessary, remove horn pad and check that notch on column shaft is straight up. Lock shaft in this center position by inserting holding pin (see illustration) through hole in column cover. *NOTE – This pin may be manufactured according to given specifications. The use of this pin is necessary to prevent axial displacement of the telescoping column during installation of gear.*



INSTALLING CENTER POSITION CONTROL PIN



STEERING SHAFT HOLDING PIN

3) Position steering gear and attach to frame with new locking screws. Unscrew center position control screw, and replace cover hole screw in housing. Remove holding pin from steering column. Replace socket head screw in upper flange of coupling.

4) Attach pitman arm, aligning reference notches on arm and gear shaft. Use new lock nut. Install center link and tie rod to pitman arm, then secure steering damper to frame. Turn steering to full left, then to full right, checking to be sure that steering knuckle rests against stops at each extreme position. Check all wheel alignment settings. *See Mercedes-Benz in WHEEL ALIGNMENT section.*

OVERHAUL

STEERING GEAR

Disassembly – **1)** Attach steering gear assembly to a suitable holding device. Remove adjusting screw lock nut, then unscrew housing cover attaching bolts. Turn adjusting screw in to free cover from housing.

2) Using suitable puller, detach pitman arm from sector shaft and withdraw shaft from gear housing. Remove locking ring, threaded ring, and adjusting ring from pinion side of housing. Remove worm assembly from housing. Knock sealing ring out of lower end of housing. Extract lower bearing outer race. Remove sealing ring and outer bearing race from adjusting ring.

Assembly & Adjustment – **1)** Press outer race of lower bearing into housing, then press outer race of upper bearing into adjusting ring. If removed, heat inner races of bearings to approximately 176°F (80°C) and press onto worm. Place ball cage into lower bearing outer race. Insert worm assembly into housing. Press new sealing ring into adjusting ring. Coat steering housing threads with sealing compound, then screw threaded ring into steering housing.

MERCEDES-BENZ RECIRCULATING BALL (Cont.)

2) Using an INCH lb. torque wrench attached to the pinion splines, measure force required to turn worm. It should be 7-8 INCH lbs. (6-7 cmkg). If not, tighten adjusting ring until worm begins to feel snug but can still be easily rotated. Tighten threaded ring while holding adjusting ring in position. Recheck torque measurement. If not within specified range, repeat adjustment.

3) Insert adjusting screw, spacer, and locking ring into slotted end of sector. Ensure that adjusting screw is free of end play when installed in slot; use suitable spacer for this purpose.

4) Insert sector shaft into gear housing, aligning center tooth of sector with center of ball nut. Place new housing cover gasket in position. Bring housing cover into place by turning adjusting screw counterclockwise. Install and tighten cover bolts. Coat adjusting screw with sealing compound, and screw on lock nut.

5) Use suitable protective sleeve to cover splines of pitman shaft while installing new seal in lower side of housing. Fill steering housing with .75 pint (350 cc) of SAE 90 gear oil. Screw filler plug into housing.

6) Set gear in center position (if in doubt about position, remove filler plug and visually check that center of ball nut is directly under filler hole). Attach flexible rubber coupling to pinion with torque wrench affixed to coupling. Check torque required to turn steering through center position. This measurement should be 12-14 INCH lbs. (10-12 cmkg). If not, set to specification by turning adjusting screw. Install filler plug.

7) Clean spline of sector shaft and install pitman arm, making sure alignment marks are in line. Install new self-locking nut and tighten as required.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Pitman Arm-to-Gear	101-130 (14.0-18.0)
Housing Cover Bolts	18 (2.49)
Gear-to-Frame	43 (5.95)
Coupling Pinch Bolt	18 (2.49)
Threaded Ring	130-145 (18.0-20.0)
Adjusting Screw Lock Nut	22-29 (3.04-4.01)