1965-73 VOLKSWAGEN TYPE 3

Type 3 (1965-73)

DESCRIPTION

STEERING GEARS

Steering gear is of worm and roller type. Gear housing contains shaft to which roller is mounted. Roller is held in bronze bushing. Spindle is adjusted with screw on housing cover. Due to design feature, roller steering is only play-free in certain central range. When vehicle is in motion, play between roller and spindle increases, however play is not noticed because of self-centering action of the front wheels. Steering column is connected to gear through coupling disc.

STEERING LINKAGE

Vehicles have two maintenance-free tie rods located behind front axle. Both tie rods are adjustable. Movements of pitman arm are transmitted to wheels by tie rods. Road shocks are absorbed by hydraulic steering damper. Damper is attached to front axle and pitman arm.

ADJUSTMENT – OFF VEHICLE

1) Insert measuring head of suitable adjusting tool (VW 280) in mounting tube. Ensure feeler plate contacts worm spindle. Slide setting plate until pitman arm number (311 415 371) is under mark.

2) Turn pitman arm 9-13° right or left. *NOTE – 9-13° range is applicable only if pitman arm shaft and/or worm spindle is replaced, otherwise use 5°.* Turn adjusting screw in until no further play is felt. Simultaneously move pitman arm slightly while holding worm. Torque lock nut to specification. Check play-free range at opposite lock. If play is felt within specified range, dismantle gear and replace shim: If play-free angle is greater than specified, use thicker shim; if less than specified, use thinner shim.

3) When adjustment is set, press worm spindle oil seal in place. Remove housing cover and fill with 5.4 oz. suitable lubricant. Fill adjusting screw hole with same lubricant. Install new plastic plugs in housing. Replace cover with gasket, torquing bolts to specifications. Recheck pitman adjustment. Mark center position with paint and secure with new ring.

ADJUSTMENT – ON VEHICLE

Align wheels in straight-ahead position. Move steering wheel lightly, holding outer end of spoke, until resistance is felt. Movement of wheel must not exceed 1.0", measured at wheel circumference. Excessive play may be caused by axial play of worm spindle, play between worm and roller, or axial play of roller. Check in the following order:

AXIAL PLAY OF WORM SPINDLE

Turn wheel to full left or right position. Loosen lock nut on worm spindle adjuster and turn spindle while tightening adjuster until no play is felt at coupling. Hold adjuster and torque lock nut. There should be no tight spots when spindle is turned.

2) Turn steering wheel 90° left or right. Loosen pitman arm shaft screw lock nut and turn screw out approximately one turn. *NOTE – Adjusting screw is accesible through hole in luggage pan.* Turn screw in until roller can be felt contacting worm. Hold screw and tighten lock nut.

3) With vehicle on ground, turn steering wheel 90° to each side and check play. If excessive play is present on one side, repeat adjustment to that side. Check toe-in and set, if necessary. Road test by cornering at 10-12 MPH. If steering wheel does not return to approximately 45° of center (unassisted), adjustment is too tight.

AXIAL PLAY OF ROLLER

If play cannot be eliminated by adjustments previously described, gear must be dismantled and axial play of roller checked. For procedure, *see Overhaul in this article.*

REMOVAL & INSTALLATION

STEERING GEAR

Removal – Remove fuel tank and spare tire wheel well. Disconnect horn ground cable and upper flange from coupling. Disconnect gear ground strap from axle retainer. Remove pitman arm from shaft (turn wheels to suitable angle). Unclamp and remove steering gear.

Installation – To install, reverse removal procedure, noting the following: Use new lock plates and self-locking nuts. Check and set toe-in. *NOTE – Position of steering gear on axle housing is controlled by two welded stops and cutouts in mounting clamp.* Note position of clamp prior to removal and replace in same position.

OVERHAUL

Disassembly – 1) Position and bolt steering gear onto mounting tube (in vise). Remove lock nut on roller shaft adjusting screw. Remove cover plate. Protect pitman shaft splines, turn steering worm to center position and push shaft out of housing.

2) Empty housing of lubricant. Remove circlip, adjusting screw and shim for pitman arm shaft adjustment. Screw out worm spindle adjuster and remove marking ring. Tap out worm spindle and lower bearing. Remove upper bearing and seal by driving inward.

NOTE – When assembling gear, worm and roller must be adjusted with equal play-free range on either side of center position. Adjustment is made using shims on worm spindle.

Assembly – 1) Insert worm spindle into housing with upper bearing and medium thickness shim (for initial adjustment). *NOTE – Do not install oil seal until final adjustment is made.* Install lower bearing.

2) Install worm adjuster and tighten enough to seat bearings. Slacken adjuster and retighten until 8-14 INCH lbs. torque is required to turn worm. Tighten adjuster lock nut. Assemble pitman arm shaft.

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3) Check axial play of roller with feeler gauge. Maximum allowable play is .0015". If a .0019" feeler gauge blade can be fully inserted between roller and washer, pitman arm shaft must be replaced.

4) Place adjusting screw and shim (secure with circlip) into shaft. Shim should allow screw to be turned without lateral play. Attach pitman shaft to housing cover. Insert assembly in housing at right angle to roller. Torque cover bolts. Install and torque pitman arm. *NOTE — Do not fill housing with lubricant until adjustment is complete.*

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Steering Damper-to-Pitman Arm	18 (2.5)
Gear-to-Axle	20 (2.8)
Flange-to-Disc	11 (1.5)
Coupling-to-Worm Shaft	18 (2.5)
Pitman Arm-to-Shaft	51 (7.1)
Gear Housing Cover	16 (2.2)
Pitman Arm Shaft Adjusting Screw Lock Nut	18 (2.5)
Worm Spindle Adjusting Screw Lock Nut	39 (5.4)