## JEEP (GEMMER/ROSS) CAM & LEVER

**"J" Models (1965-68)**
**"CJ" & "DJ" Models (1965-71)**

*NOTE – Some "J" models use other units. See Jeep (Gemmer/Ross) Worm & Roller or Jeep (Saginaw) Recirculating Ball in this Section.*

### DESCRIPTION

Unit is of two types. "J" models unit consists of cam and single lever shaft with cam follower mounted in roller bearings on inner side of lever shaft and engaged in grooves of cam follower. "CJ" and "DJ" models use a unit in which the cam is mounted in steering column shaft and engages two tapered pins mounted on inner end of lever shaft. The cam is supported by ball thrust bearings at the ends.

### ADJUSTMENT

**"J" MODELS**

With steering gear assembly removed and lubricant at proper level, make the following checks and adjustments in sequence, as follows:

1) Check lever shaft torque using a suitable tool (SP-3616) and an inch pound torque wrench. Maximum torque allowable at pitman arm is 12 INCH pounds. If torque is over the maximum limit, loosen lever shaft adjusting screw. Readjust the screw while cam follower is set on high point of cam. If a low enough torque cannot be obtained, proceed as follows:

2) Remove side cover and lever shaft. Adjust cam follower roller bearing preload to 1-2 INCH pounds. Adjust the preload at the cam follower stud nut. *NOTE – If tangs on locking washer are turned down against thrust washer, a proper adjustment cannot be made. Bend tangs up slightly as necessary.*

3) Adjust cam bearing preload to 1-5 INCH pounds by removing or adding shims between top cover and housing. Install lever shaft so cam follower is engaged with high point of cam. Back off lever shaft adjusting screw on cover and reinstall side cover. Turn adjusting screw in until there is no end play. Recheck lever shaft torque *NOTE – When gear is installed in vehicle, it may have a slight roughness. Running through ten to fifteen complete turn cycles should eliminate roughness.*

**"CJ" & "DJ" MODELS**

Before making adjustments, disconnect drag link from pitman arm. Loosen instrument panel bracket and steering gear-to-frame bolts to allow steering post to correctly align itself. Tighten all bolts and proceed as follows:

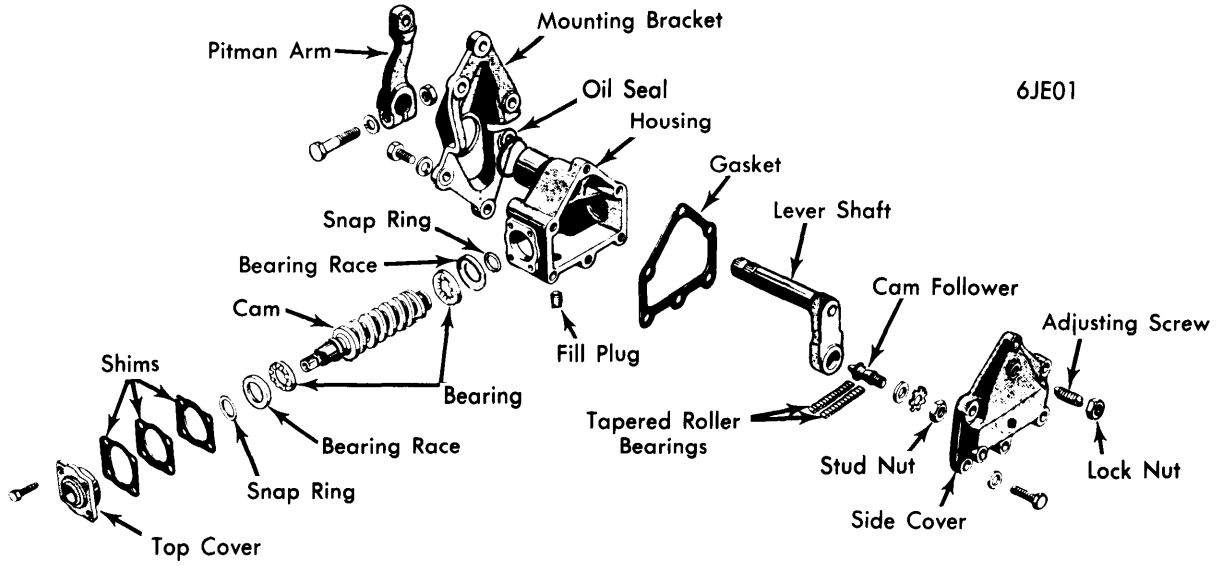
1) To eliminate up and down play of the steering shaft, adjustment of the ball thrust bearings is necessary. Loosen side cover adjusting screw to free the two tapered pins in cam groove. Loosen upper cover attaching bolts to allow clearance for cutting and removal of shims as required. Tighten upper cover attaching bolts. Adjustment should be made to have a slight drag but still allow steering wheel to turn freely with thumb and forefinger lightly gripping the steering wheel rim. Shims are available in thicknesses of .002", .003" and .010".

2) To adjust tapered pins in cam groove, unlock adjusting screw and turn it in until a slight drag is felt through the mid-position when turning steering wheel slowly from one extreme position to the other. Backlash of pins in groove may show up as end play of lever shaft or as backlash of pitman arm. *NOTE – Adjustment must be made with unit components in same position as for straight ahead driving.*

### REMOVAL & INSTALLATION

**STEERING GEAR**

**Removal – "J" Models (1965-68)** – Disconnect steering gear from column by removing flexible coupling-to-gear Allen head clamping screw. Disconnect drag link from pitman arm. Remove steering gear-to-frame attaching bolts. Remove steering gear by sliding assembly forward and to the right. Lift assembly from engine compartment.




**"J" MODELS STEERING GEAR ASSEMBLY**

## JEEP (GEMMER/ROSS) CAM & LEVER (Cont.)

**Installation** – Check all adjustments, then position steering gear assembly against frame while guiding gear into flexible coupling. Install gear-to-frame attaching bolts and coupling-to-gear clamping screw. Check gear to steering column alignment and adjust as necessary. Attach drag link to pitman arm.

**Removal – "CJ" & "DJ" Models (1965-67)** – 1) *NOTE – See Removal – All Other "CJ" & "DJ" Models (1965-71) for removal and installation of units on late CJ5 and CJ6 models.* Remove left front fender. On DJ3 models with remote control, disconnect remote control rods from transmission control levers. Remove horn button and steering wheel. Remove steering post bracket at instrument panel. Remove gear shift lever on DJ3 models with remote control.

2) Remove exhaust pipe from manifold and steering column cover plate on floor board. On DJ3 models with remote control, remove control housing-to-steering column attaching screws and lower remote control assembly down through the floor. Disconnect the horn wire. Disconnect drag link from pitman arm and remove steering gear-to-frame attaching bolts. Remove gear assembly by bringing it down though the floor pan and over outside of frame side rail.

**Installation** – Reverse removal procedure and check adjustment of the remote control shift rods if equipped.

**Removal – All Other "CJ" & "DJ" Models (1965-71)** – 1) Remove directional signal unit from steering column and steering column bracket attached at the instrument panel. Remove upper section of floor pan and disconnect shift rods from shift levers at lower end of steering column. Disconnect horn wire at lower end of steering gear assembly.

2) Disconnect drag link from pitman arm and remove pitman arm from lever shaft. Remove steering gear housing-to-frame attaching bolts. Remove steering gear assembly by bringing it up through floor pan opening.

**Installation** – Reverse removal procedure while noting the following: With steering gear in mid-position and wheels in straight ahead position, install the pitman arm on the lever shaft with ball end down. When installed, line across face of arm and end of shaft should be aligned.

**Removal – "CJ" & "DJ" Models W/V6 Engine (1971)** – 1) Remove oil pan skid plate and left exhaust pipe. Disconnect drag link from pitman arm. Remove steering gear-to-frame attaching bolts. Remove steering wheel from steering column.

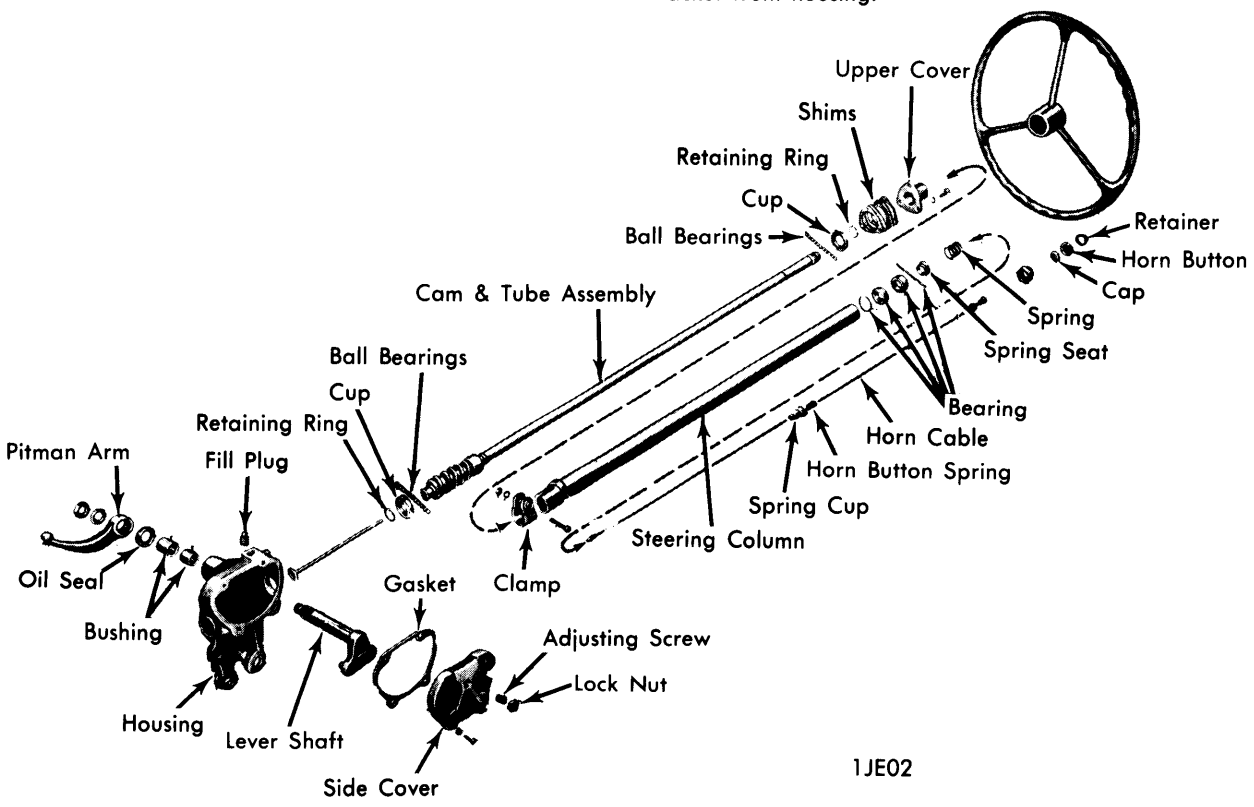
2) Disconnect accelerator linkage and remove upper floor pan assembly. Disconnect directional signal switch. Raise vehicle and remove steering gear and column assembly down through floor pan opening and out from under the vehicle.

**Installation** – Reverse removal procedure while noting the following: With steering gear in mid-position and wheels in straight ahead position, install the pitman arm on the lever shaft with ball end down. When installed, line across face of arm and end of shaft should be aligned.

### OVERHAUL

#### DISASSEMBLY

**"J" Models (1965-68)** – Drain lubricant from steering gear assembly. Remove side cover and gasket, pitman arm attaching bolt and pitman arm from lever shaft. Lift lever shaft from housing and remove shaft oil seal (if necessary). If cam follower must be replaced or serviced, loosen stud nut. Remove nut, washer and tapered bearings. Remove top cover and shims, then remove steering gear cam from housing. Remove snap rings and bearings from steering gear cam and mounting bracket from housing.




**"CJ" & "DJ" MODELS STEERING GEAR ASSEMBLY**

## JEEP (GEMMER/ROSS) CAM & LEVER (Cont.)

**"CJ" & "DJ" Models (1965-71)** – Remove pitman arm from lever shaft using a suitable puller (C-3646). Loosen lock nut and back adjusting screw out two turns. Remove side cover and gasket. Lift lever shaft from housing. Remove upper cover plate screws, cam, wheel tube and bearing assembly from the housing.

### INSPECTION

Clean all parts in suitable cleaning solvent. Inspect cam grooves for wear, chipping and scoring. Inspect tapered stud for flat spots and chipping. Inspect lever shaft for wear and test fit of shaft in housing bushings. Check oil seal and all bearings.

### REASSEMBLY

**"J" Models (1965-68)** – 1) Position bearings and races on cam and install snap rings. Position cam in housing, install shims and top cover. *NOTE – If a new cam is installed, correct directional cam (right or left hand) must be used.* Check cam bearing preload. See *Adjustments*.

2) Assemble cam follower and roller bearings on lever shaft. Install washer, locking washer and nut. *NOTE – Small diameter end of tapered bearings must face toward each other or into lever shaft arm.* Check cam follower bearing preload. See *Adjustments*.

3) Install lever shaft assembly into housing. Back off lever shaft adjusting screw on side cover. Install side cover and gasket. Turn adjusting screw in until there is no free play between cam follower and cam with the cam in center position. Check input shaft torque. See *Adjustments*. Install mounting bracket and fill with suitable lubricant.

**"CJ" & "DJ" Models (1965-71)** – 1) *NOTE – New plastic type retainer bearings are available for replacement and are interchangeable with lock ring type cam bearings on gears equipped with early type cams.* Reassemble all parts to wheel tube in reverse order of disassembly. Assemble cam, wheel tube and bearing assembly in housing and seat lower bearing ball cup in housing.

2) Install upper cover and shims to housing. Install lever shaft in housing. Install side cover and gasket, then set adjusting screw for a minimum backlash of the studs in cam groove with steering gear at center point of travel. Assemble upper bearing spring and spring seat in jacket tube and ensure that spring seat is installed with lengthwise flange down against bearing and not up inside of spring coil.

3) Install steering gear assembly in vehicle. Place front wheels in straight ahead position and temporarily install steering wheel to locate mid-position of steering gear. Turn wheel to right as far as possible and then left while noting the total number of turns from one stop to the other. Turn wheel back ½ of the total movement to place gear in mid-position. Install pitman arm on lever shaft with ball end down.