

# Steering Gears & Linkage

## 1965-73 TOYOTA LAND CRUISER

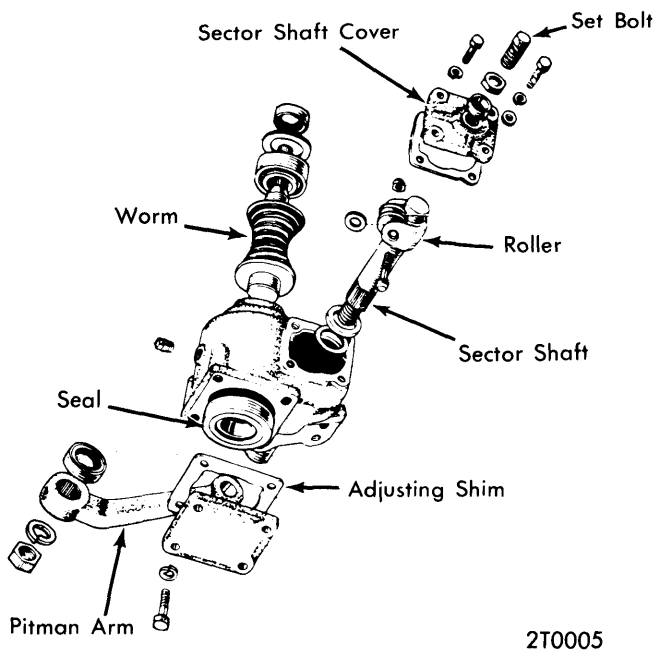
### Land Cruiser (1965-73) ①

① — After April 1972 vehicle incorporates recirculating ball type.

### DESCRIPTION

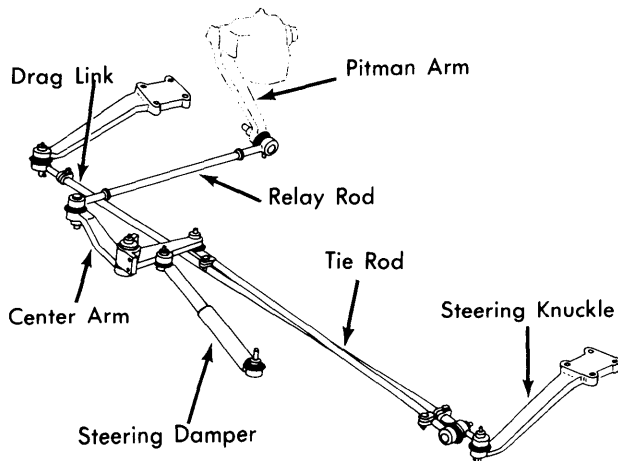
#### STEERING GEAR

Steering gear mechanism is of the worm and roller type with a gear ratio of 21:1. Gear housing is a unit-constructed housing. The gear housing is mounted onto frame with steering gear housing bracket. Worm and sector roller tooth backlash is controlled by adjusting shims and set bolt on sector shaft end cover.



2T0005

### WORM & ROLLER GEAR – LAND CRUISER



2T0004

### STEERING LINKAGE – LAND CRUISER

#### STEERING LINKAGE

Linkage consists of pitman arm, drag link assembly, steering center arm, relay rod, tie rod, two steering knuckles, and steering damper. The length of the relay rod and tie rod is variable to allow adjustment of front end alignment.

#### ADJUSTMENT

#### STEERING GEAR

See *Overhaul procedures in this article.*

#### REMOVAL & INSTALLATION

##### STEERING GEAR

**Removal** — Raise and support front of vehicle. Remove front wheels. Unbolt steering worm yokes from worm and steering main shaft. Remove intermediate steering shaft. Mark relative position of pitman arm to sector shaft, then remove arm using suitable puller (09610-55010). Unbolt steering gear housing from bracket.

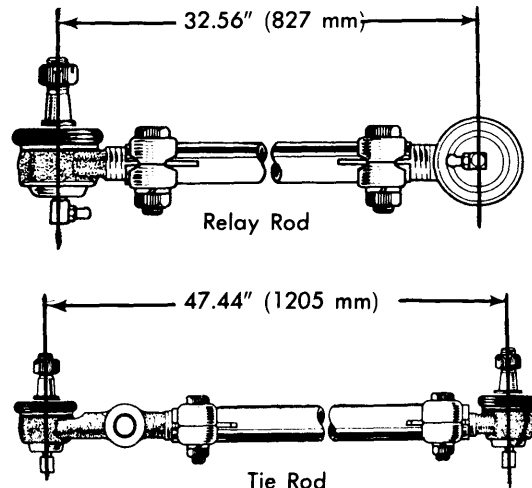
**Installation** — Reverse removal procedure, torquing pitman arm retaining nut to 119-141 ft. lbs.

##### STEERING LINKAGE

**Removal** — 1) Raise and support front of vehicle. Remove front wheels. Mark relative position of pitman arm to sector shaft and remove arm, using suitable puller (09610-55010). Disconnect steering drag link from steering center arm.

2) Disconnect tie rod ends from both sides of tie rod. Disconnect steering relay rod end from steering center arm, then remove tie rod assembly with relay rod assembly. Disconnect end of steering damper from bracket on crossmember. Loosen and remove center arm from bracket (with steering damper). Remove engine stone shield and remove steering center arm bracket from frame.

**Installation** — Install in reverse of removal procedure, adjusting relay rod and tie rod to specifications shown in illustration.



2T0003

### ADJUSTING RELAY ROD & TIE ROD

## 1965-73 TOYOTA LAND CRUISER (Cont.)

### OVERHAUL

#### STEERING GEAR

**Disassembly** – Drain gear lubricant, then secure gear housing in vise. Remove sector shaft end cover and gasket from gear housing. Tap end of sector shaft lightly with a mallet and drive sector shaft assembly out of gear housing. **CAUTION** – *Adjusting shims and plate are installed on the sector shaft, thus care should be taken not to lose shims during removal.* Remove gear housing end cover and gasket. Tap end of steering worm shaft with mallet and drive out worm and bearings.

**Inspection** – Assemble sector shaft into gear housing and check sector shaft to bushing oil clearance. Also check sector shaft to sector shaft end cover bushing oil clearance. Specified clearance should be .00035-.00027" (.009-.007 mm).

**Reassembly & Adjustment** – **NOTE** – *It is recommended that all oil seals and gaskets be replaced when assembling. Apply liquid sealer to gaskets and coat lips of oil seals with grease.*

1) Before reassembly of the gear housing, perform a worm centering adjustment: Assemble steering worm into gear housing. Install steering worm front bearing race and end cover (with gasket). Tighten end cover bolts to 11-14 ft. lbs. Install adjusting shims and end plate on sector shaft, as were originally removed, then assemble to gear housing. Push sector shaft against worm and hold this position. Adjust backlash to minimum by installing shims as necessary. Install set bolt temporarily into sector shaft end cover. Install pitman arm temporarily and eliminate backlash between worm and roller by turning set bolt (gear at center position).

2) Turn steering worm clockwise as far as possible, attach plunger of dial gauge onto pitman arm and check pitman arm end play. Then turn worm counterclockwise as far as possible and recheck end play. If end play values differ, adjust by changing worm shims behind rear bearing race. After adjustment is complete, remove end cover, sector shaft, and pitman arm.

3) Before assembling steering worm, lubricate with suitable grease, then check worm bearing preload: Install worm assembly into gear housing, then install end cover with gasket. Tighten cover bolts to 11-14 ft. lbs. Wind a cord on the steering shaft, then hook a pull scale to cord and check turning torque. It should be 8.67-14.43 lbs. Replace end cover gasket with a different thickness gasket until pull is within specification.

4) Check backlash between steering worm and roller: Install sector shaft, end cover, and gasket in housing and tighten cover bolts to 11-14 ft. lbs. Screw in set bolt until sector shaft end play is eliminated. Do not over-tighten. Set steering gear at center point (turn worm from one stop to the other, counting number of turn required; turn back to one half the total). Move worm against roller groove, checking for excessive backlash. If necessary to make an adjustment, select a sector shaft adjusting shim in a .012" (.31 mm) or .020" (.50 mm) thickness. Check for smooth operation.

5) After adjustment, install new sector shaft oil seal and steering worm oil seal into housing. Refill gear housing with suitable gear lubricant.

#### STEERING LINKAGE

**Disassembly** – After removal of steering linkage assembly from vehicle, as previously described, remove steering damper from center arm and relay from tie rod. Secure center arm in vise, remove bolt on center arm shaft nut, then loosen and remove center arm shaft nut. Carefully press end of center arm shaft, with lock plate and spring, out of bracket.

**Reassembly** – Install center arm lower dust seal into bracket. Install center arm bushing in bracket, then bend bushing tab. Pack center arm shaft with suitable grease. Tighten shaft nut firmly and back off 1/4 turn. Install and tighten shaft bolt.