## FIAT 124 WORM & ROLLER

**124 Spider**

### DESCRIPTION

#### STEERING GEAR

The steering gear is a worm and roller type, having a gear ratio of 16.4-1. The steering gear box is mounted on the crossmember inside the firewall.

#### STEERING LINKAGE

The pitman arm, mounted to roller shaft, actuates the center cross link which is connected to the idler arm at other end. Tie rods are connected to steering knuckle on outer ends and pitman arm or idler arm on inner ends. Idler arm is supported on crossmember opposite steering box. Tie rods are adjustable, through sleeves, for setting toe-in.

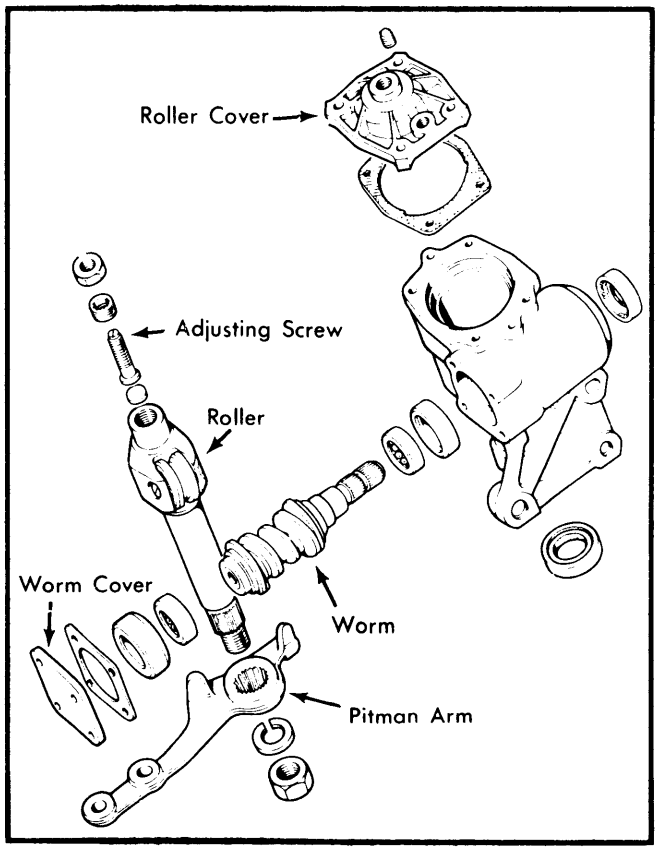


*Fig. 1 Exploded View of Worm & Roller Steering Gear*

### ADJUSTMENT

NOTE – *Adjustments are performed as part of gear reassembly. See Overhaul as outlined below.*

### REMOVAL & INSTALLATION

#### STEERING GEAR

**Removal – 1) Disconnect battery cables, then pry off horn button, disconnect horn cable and slide horn switch out of steering column. Unscrew steering wheel nut and remove steering wheel. Remove four screws retaining turn signal switch cover. Remove turn signal switch and wiring.**

**2) Loosen steering column-to-instrument panel mounting bracket. Disconnect ignition switch from column bracket, then remove mounting bracket. Remove gearshift and steering column support as an assembly.**

3) Using suitable puller, detach center cross link from pitman arm. Remove steering column hole cover pad from instrument panel, if necessary. If column-mounted gearshift has been removed, detach two gearshift control rod levers and pull out gearshift control main rod, after unhooking rod return spring. Unbolt steering gear box from body and withdraw from vehicle.

**Installation** – 1) Insert steering column from inside vehicle. Working from engine compartment, enter end of worm shaft into steering column. NOTE – *If vehicle has an anti-theft key switch, arrange pitman arm on steering box at half-travel (front wheels in straight-ahead position) and fit steering shaft with keyway on left side.* Lock end of steering shaft to worm shaft with clamp and washers.

2) Reconnect gearshift rods and position column support bracket (and gearshift lever, if removed), attaching loosely to instrument panel. Reconnect steering linkage to pitman arm, torquing nuts as specified. Temporarily replace steering wheel and turn two or three times from side to side, to settle shaft to steering gear. Torque steering gear retaining bolts to specification.

3) Position turn signal switch to steering column and bracket. Torque column bracket-to-instrument panel bolts to specification. Position steering wheel with spokes horizontal (ensure front wheels are straight-ahead) and torque wheel nut. **Reconnect electrical wiring for signal switch, position and attach ignition switch. Fit turn signal switch cover. Replace horn button.**

#### STEERING LINKAGE

**Removal** – Using a suitable puller (A. 47044), detach tie rod ball joints from steering knuckles. Repeat procedure on inner end ball joints and separate tie rods from center link.

**Installation** – Reverse removal procedure and readjust toe-in.

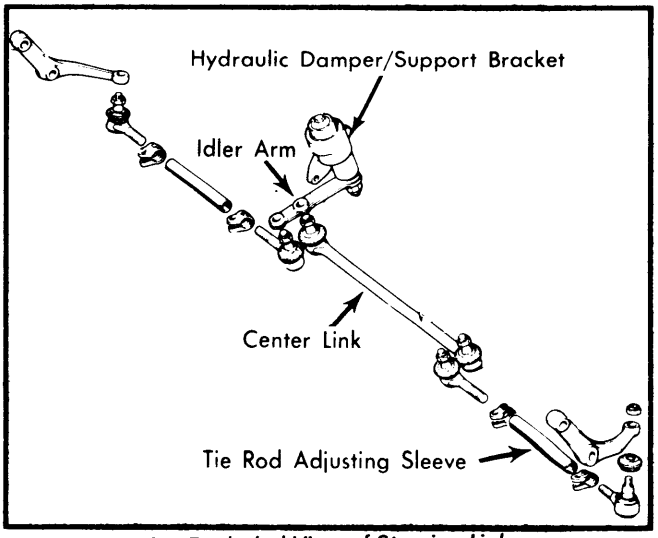


*Fig. 2 Exploded View of Steering Linkage*

## FIAT 124 WORM & ROLLER (Cont.)

### OVERHAUL

#### STEERING GEAR

**Disassembly** – 1) Unscrew oil plug and drain gear oil, then mount assembly on suitable overhaul stand (A. 74076/1 with adaptor A. 74076/2). Detach pitman arm from roller shaft, using suitable puller (A. 47043).

2) Remove nuts and washers attaching roller shaft cover to gear box, then take off cover with roller shaft adjusting screw, adjusting disc, lock washer, and lock nut. Extract roller shaft assembly from gear housing.

3) Unbolt thrust cover from worm shaft and remove adjusting shims. Turn worm shaft and withdraw bearing. Using a suitable puller (A. 47004), extract rear bearing race from worm shaft; this releases shims under the race. NOTE – *Service shims are available in .0039-.0050" (.10-.15 mm) thicknesses.* Remove roller shaft oil seal. Roller shaft bushings may be removed using suitable puller (A. 74105).

**Inspection** – Check all contact surfaces for pitting or scoring. Also ensure contact faces of worm and roller mesh at center position. Check clearance between roller shaft and bushings. It should be .0003-.0020" (.008-.051 mm). Check for correct alignment of steering shaft to worm. Maximum allowable misalignment is .0020" (.05 mm).

**Assembly & Adjustment** – 1) Remount steering box on suitable stand and adaptor (A. 74076/1/2). If installing new roller shaft bushings, drive into place with suitable drift (A. 74105), then pass a suitable reamer through bushings (A. 90336). Replace shims and bearing race for rear worm shaft bearing. NOTE – *Same number of shims must be installed as were removed, if proper center mesh position was found during Inspection. If not, install a different number of shims.*

2) Fit worm bearing races and install worm into gear box. Drive front ball bearing race into gear box and replace thrust cover with shims. Using a suitable dynamometer (A. 95697), check starting torque of worm shaft. It must not exceed 4.3 INCH lbs. If torque is higher than specified, shimming must be increased; if less than specified, reduce shimming.

3) Insert roller shaft oil seal, roller shaft, and cover plate with gasket and adjusting plate. NOTE – *Thrust cover adjusting plates are available in the following service thicknesses: .0768", .0787", .0807", .0827", .0846", .0866".*

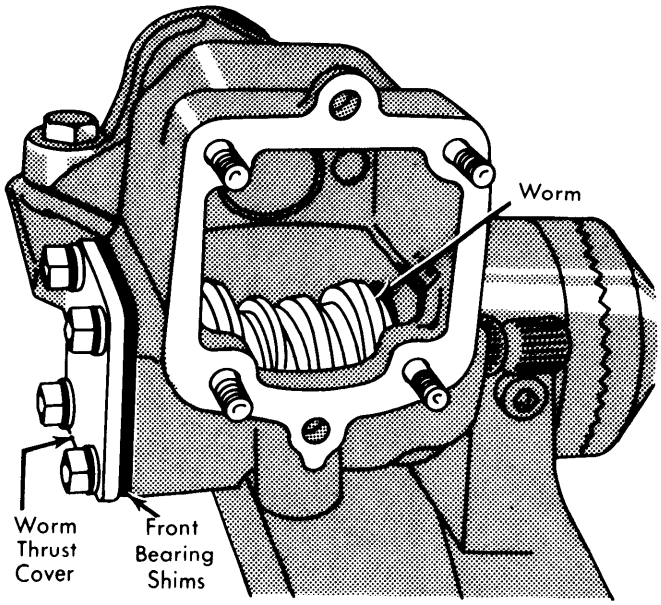


*Fig. 3 View Showing Installation of Worm Thrust Cover & Location of Adjusting Shims*

4) Replace pitman arm temporarily to roller shaft. The roller shaft should be free to rotate through 30.5° on either side of central position. If any clearance is noticed between roller and worm, use adjusting screw to eliminate it. Check turning torque of worm shaft, using suitable dynamometer (A. 95697): torque should be 7.8-10.4 INCH lbs.

5) When adjustments are completely and satisfactory, tighten pitman arm retaining nut to specification. Fill steering box with 7.5 oz. of suitable grease.

### TIGHTENING SPECIFICATIONS

| Application | Ft. Lbs. (mkg) |
|---|---|
| Steering Column Bracket Bolts | 11 (1.52) |
| Linkage-to-Pitman Arm | 22 (3.04) |
| Steering Gear-to-Body | 29 (4.01) |
| Steering Wheel Nut | 36 (4.98) |
| Pitman Arm-to-Gear | 174 (24.1) |