

# Steering Gears & Linkage

## FIAT BRAVA, STRADA & X1/9 RACK & PINION

### DESCRIPTION

Rack and pinion steering gear is mounted in rubber insulators and attached to body. Gear is attached to steering shaft through universal joints. Adjustments are provided for pinion bearing play and rack yoke free play. At each end of steering rack, tie rods connect steering mechanism to front wheels.

### ADJUSTMENT

**NOTE** — Adjustments of the pinion bearing and rack yoke are performed during rebuilding. See Overhaul procedure.

### REMOVAL & INSTALLATION

#### STEERING GEAR

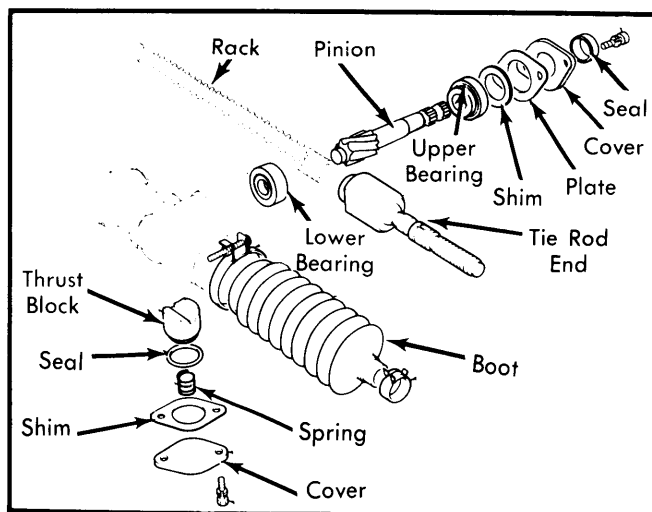
**Removal** — 1) Center steering wheel and front wheels. Raise and support front of vehicle and remove front wheels. On Strada models, it may be necessary to remove spare tire.

2) Disconnect drive pinion from lower steering column section by detaching universal joint inside vehicle. Using a suitable puller, remove tie rods from steering knuckles.

3) Remove stone shield if necessary. Unbolt and remove steering gear assembly by sliding out from right-hand side of vehicle.

**Installation** — 1) Set wheels in straight-ahead position. Connect drive pinion to steering column and tighten pinch bolt to 19 ft. lbs. (26 N·m). Remount steering gear to body. Connect tie rods to steering knuckle and tighten to 25 ft. lbs. (34 N·m).

2) If steering gear has been disassembled, perform pinion and rack adjustments, and replace front wheels. Lower vehicle to ground and turn steering wheel fully to the right. Raise vehicle on left side and loosen clamp on left boot. Fill steering gear with 4.4 ounces lithium-base grease containing molybdenum disulphide.



**Fig. 1 Exploded View of Steering Gear Components**

### OVERHAUL

#### STEERING GEAR

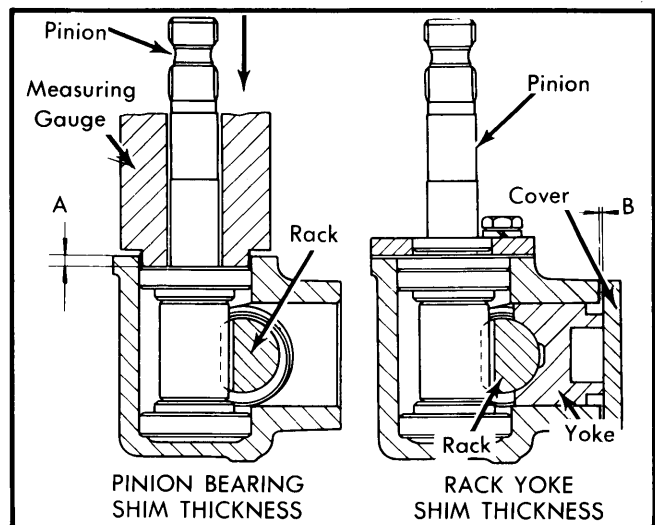
**Disassembly** — 1) With steering gear removed from vehicle, remove rubber boots from steering gear. Disconnect tie rod end ball joints from rack (inner ends of tie rods).

2) Remove cover, shim, spring, seal and thrust block from bottom of housing. Remove cover, seal, plate, shim, upper bearing, and drive pinion from housing. See Fig. 1. Slide rack from housing. Remove lower bearing from housing.

**Inspection** — 1) Clean all metal parts in a suitable degreaser and blow dry. Inspect rack, pinion, upper bearing and housing for wear or damage. Replace entire steering box if damaged.

2) Inspect boots for tears or breaks. Replace if necessary. Inspect bushing, spring, lower bearing and thrust block for wear or damage. Replace if necessary.

3) Check that ball joints are free to move in all directions. They should not fall under their own weight. Replace if worn.



**Fig. 2 Measurement of Rack Yoke Shim Thickness and Pinion Bearing Shim Thickness**

**Reassembly and Adjustment** — 1) Coat all bearings and gear surfaces with molybdenum disulphide grease. Reassemble in reverse order of disassembly.

2) Remove cover, plate and seal from drive pinion side of rack housing. Using suitable driver, make sure upper bearing is firmly seated. Measure distance "A" from top of bearing to pinion cover facing. See Fig. 2. Add  $.003 \pm .002$ " ( $.078 \pm .053$  mm) to dimension "A" and install shims centered on pinion to make up new dimension. Install plate, cover and seal.

3) Center rack in its travel. Remove cover, shims and spring to gain access to rack thrust block. While holding rack thrust block against rack, turn pinion through  $180^\circ$  in both directions. Measure dimension "B" from top of rack thrust block to cover facing. See Fig. 2. To "B" add  $.0035 \pm .0015$ " ( $.09 \pm .04$  mm). Combine shims to make up new dimension. Install spring, shims and cover.

**NOTE** — Lubricate dust boots with silicon spray and be sure they are not twisted after installation.