

Steering Gears

AMERICAN MOTORS RACK & PINION

Pacer

DESCRIPTION

Steering gear is a rack and pinion design with integral steering linkage. Steering gear consists of tube and housing assembly containing pinion shaft and steering rack. Two thrust bearings and two nylon bushings are used to support pinion shaft in housing. Two nylon bushings support rack in tube and housing. A preload spring maintains pinion bushing location to compensate for bushing wear. Rubber boots are used to seal tie rod ends at tube and housing. A breather tube is used to equalize pressure within boots during steering maneuvers.

REMOVAL & INSTALLATION

PROTECTIVE BOOT

Raise and support vehicle. Cut off boot clamps and mark position of tubes and tie rods for reassembly reference. Loosen tie rod adjusting tube clamps and unthread tube from inner and outer tie rods. Remove boot. To install boot, slip boot into position aligning hole in boot with breather tube. Install clamps. Install adjuster tube and tighten clamps as required, and adjust toe-in. See *Wheel Alignment Specifications & Procedures* in **WHEEL ALIGNMENT** Section.

MOUNTING CLAMP & GROMMET

Remove protective boot. Remove mounting clamp bolts, clamp and grommet. To install grommet, align boot breather tube hole in grommet before installing over housing. Install mounting clamp and tighten bolts as required. Reinstall boot.

FLEXIBLE COUPLING

Remove nuts connecting coupling to intermediate shaft flange and compress shaft to obtain clearance. Remove coupling pinch bolt and remove coupling. Install replacement coupling (flat-to-flat) and tighten pinch bolt as required. Connect shaft to coupling and tighten nuts as required.

STEERING GEAR

NOTE – In the following procedure, later models refer to vehicles built after VIN number A6XXXXX173022 and sequence number E052941.

Removal – 1) Raise and support vehicle and unlock steering column. On later models, remove screws attaching reinforcement brace to crossmember and left engine support bracket. Remove brace. On all models, remove nuts from flexible coupling.

2) Disconnect tie rod ends as follows: Turn wheels to stop in direction of tie rod end to be disconnected. Place jack under lower control arm and raise arm about 2". Remove tie rod end cotter pin and nut. Disconnect tie rods from steering arm using suitable tool (J-3295).

3) On early models, remove steering gear mounting bolts and remove gear. On later models, remove right side mounting clamp bolts. Remove steering gear housing-to-crossmember nuts and, using blunt punch, remove bolts, washers, sleeves and grommets from steering gear housing.

4) Rotate bottom of housing towards front until pinion shaft is about parallel with skid plate. Slide assembly toward right side of vehicle until housing and tube clear mounting plate and remove assembly.

Installation – 1) On later models, assemble grommets, sleeves and washers on gear in sequence shown in *Fig. 2*. Sleeves will retain grommets. Position gear assembly on crossmember and install tube and housing from right side.

2) When installing, keep pinion shaft about parallel with mounting plate. On early models, position gear on crossmember. On all models, tighten mounting bolts. Connect tie rod ends to steering arms, tighten bolts and install new cotter pins.

3) Install nuts on flexible coupling and tighten. On later vehicles, install reinforcement brace and left engine support bracket. On all vehicles, lower vehicle, check and adjust toe-in if required. See *Wheel Alignment Specifications & Procedures* in **WHEEL ALIGNMENT** Section.

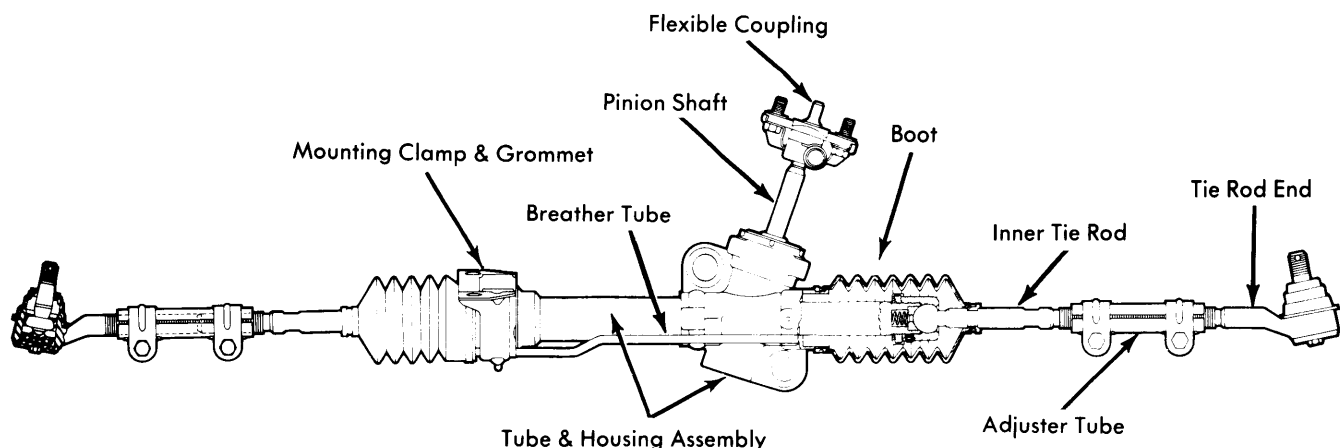


Fig. 1 Pacer Steering Gear & Linkage Assembly

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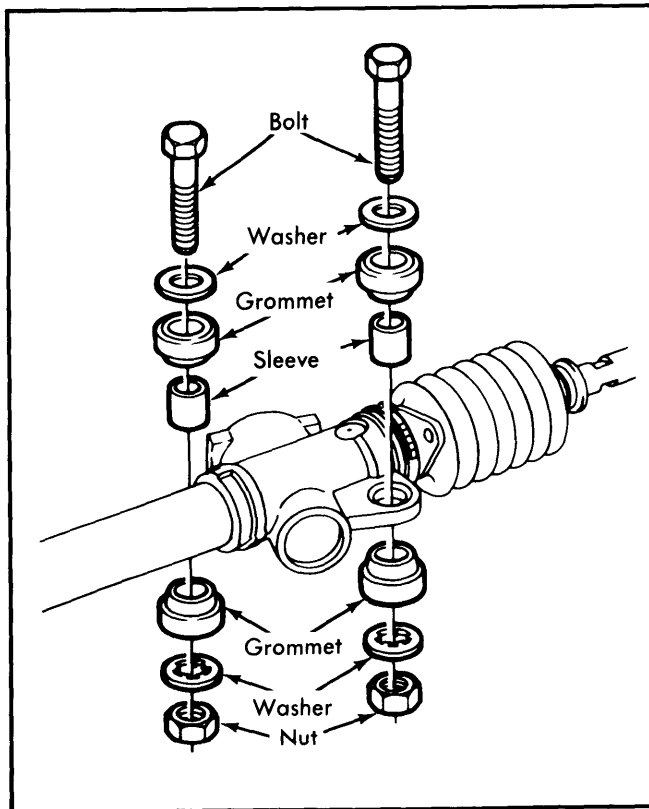


Fig. 2 Steering Gear Attachment
(Later Models)

OVERHAUL

PRE-DISASSEMBLY INSPECTION

Mount steering gear in a vise, do not clamp any part of tube, clamp housing only, using a soft jaw vise. Cut large boot clamp and slide boot away from housing to expose rack teeth. Turn gear shaft to expose as many rack teeth as possible, clean and inspect teeth. If rack teeth are chipped, cracked, worn or show any signs of tooth flaking, replace steering gear assembly. **NOTE** — Do not replace gear if rack teeth have machining marks or appear bright or shiny, these conditions are normal. Remove coupling and adjuster plug lock nut. Remove pinion shaft from housing by pulling out and rotating counterclockwise. Clean and inspect shaft teeth for wear and broken conditions. Replace gear assembly if pinion shaft is worn.

DISASSEMBLY

1) Remove contraction plug from housing using a brass rod inserted through pinion bushings to drive out plug. Remove lower pinion bushing and preload spring using a brass rod. Move rack to center position and install pinion shaft and adjuster plug in housing. Hand tighten plug only. Loosen adjuster tube clamp nuts and remove tubes and tie rod end assemblies from inner tie rods. **NOTE** — Mark tubes on inner tie rods for reassembly reference.

2) Mark breather tube and housing for reassembly in same position. Remove boot clamps being careful not to puncture boots and remove boots. Remove breather tube from grommet, but do not disturb grommet or clamp unless replacement is necessary.

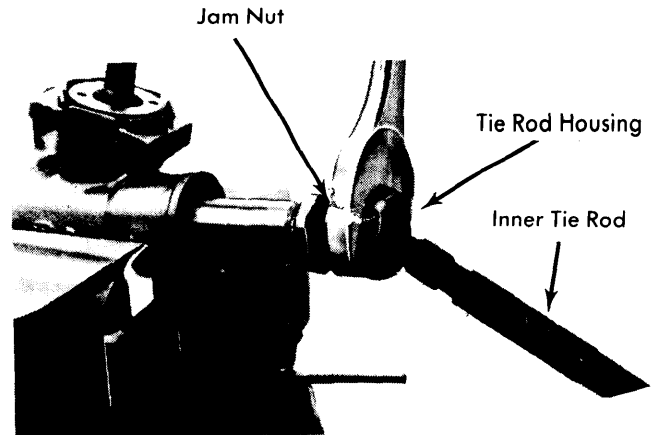


Fig. 3 Inner Tie Rod & Housing
Removal or Installation

3) Remove shock damper rings from jam nuts. Clamp inner tie rod housing in vise and loosen jam nut. **CAUTION** — Tie rod housing must be clamped when jam nut is loosened or tightened to prevent internal steering gear damage. Loosen tie rod housing set screw and repeat procedure for other tie rod assembly. Reinstall housing in vise and remove inner tie rod housing, seats, springs, jam nuts, and shock damper rings from rack.

4) Remove adjuster plug and pinion shaft and lower thrust bearing and race. Remove upper pinion bushing from housing. Pull steering rack from tube and housing (from either end). Remove rack bushings by slipping a knife blade under bushing edge and pulling out with pliers. Replace both bushings at the same time. Remove pinion shaft seal by threading adjuster plug into housing and prying seal out with a screwdriver.

CLEANING & INSPECTION

Wash all parts, except nylon bushings and rubber boots, in solvent. Check all parts for cracks, porosity, dents, distortion, chipped or worn teeth. If tube or housing are damaged, replace entire gear assembly less linkage. Examine pinion and rack, if either needs replacing, replace complete gear assembly. Replace bushing and thrust bearings as required.

REASSEMBLY

1) Press a new pinion shaft seal into adjuster plug flush with face of plug. Replace rack bushings if removed. Compress leading end with fingers and force into housing or tube opening. Bushing will snap back into original shape once past seal lip. Apply EP lithium base chassis lubricant to rack teeth and install rack in housing. Install upper pinion bushing in housing.

2) Lubricate pinion shaft lower race and thrust bearing and install in housing with flanged edge of race facing up. Center rack in housing so distance between rack end and housing is four inches (see Fig. 5). Install pinion shaft with flat on splined end of pinion at about 10 o'clock position (see Fig. 5). Turn pinion and push down until shaft race bottoms on thrust bearing. Again center steering rack, flat on pinion should now be at 3 o'clock position. If flat on pinion is not at 3 o'clock position,

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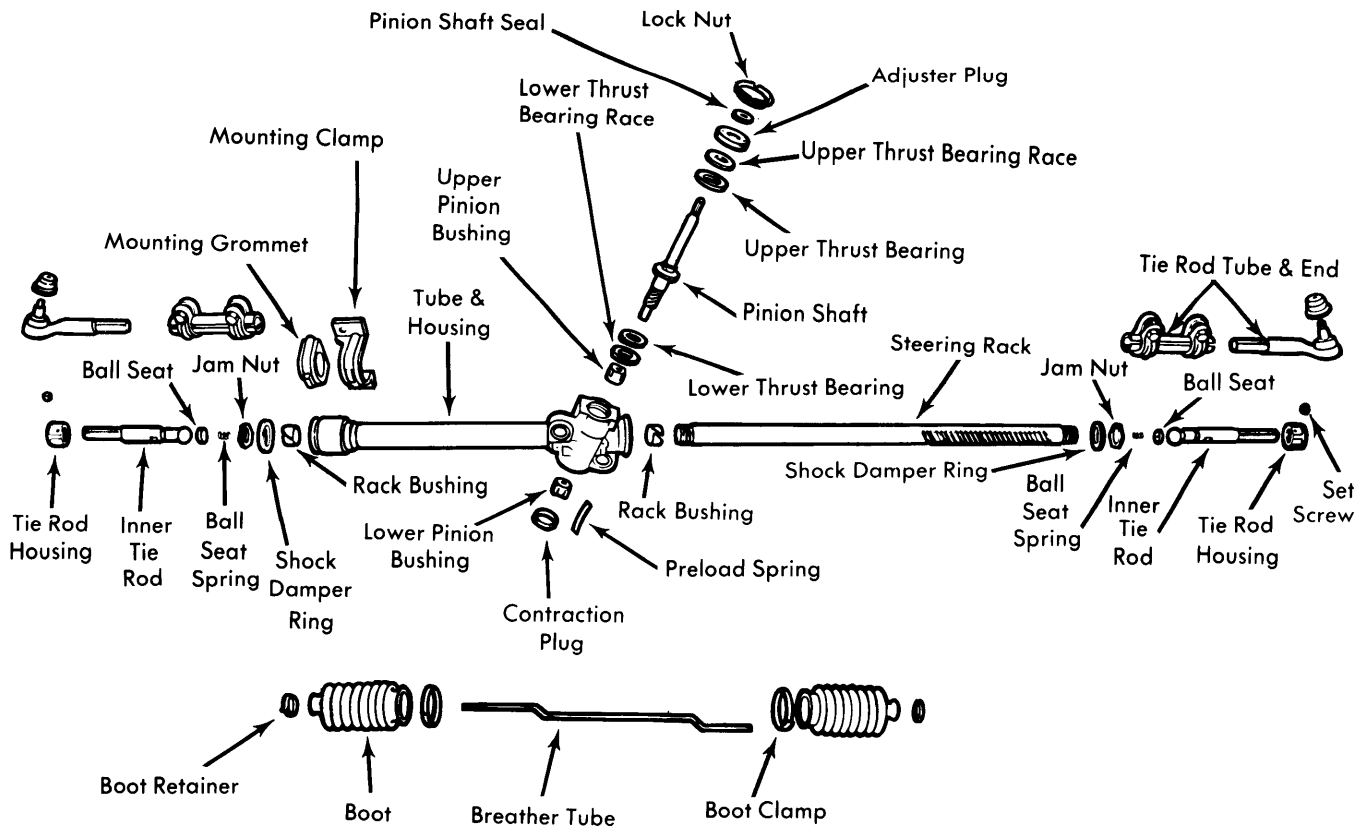


Fig. 4 Rack & Pinion Steering Gear Exploded View

tion with rack set to four inches, repeat procedure. **CAUTION** — Rack must be centered or an unequal steering wheel travel and turning radius will result.

to extend about 1/4" from end of housing. Hold top of preload spring against housing with pliers and install bushing with chamfered end facing down.

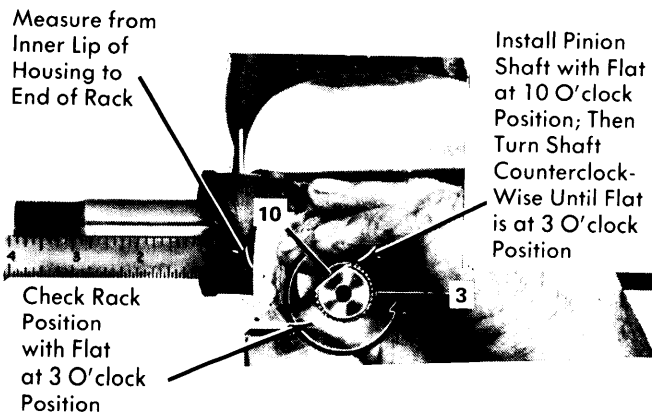


Fig. 5 Pinion Shaft Installation

3) Install adjuster plug and tighten until it bottoms. Mark plug and housing. Measure counterclockwise 3/16 to 1/4" and remark housing. Back adjuster off to second mark and install lock nut. Tighten lock nut while holding adjuster plug. Turn gear over and mount in vise. Fill pinion cavity with EP lithium base chassis lubricant, but do not overfill as bushing and spring must be installed. Install preload spring in housing with center hump of spring bearing against housing. Allow spring

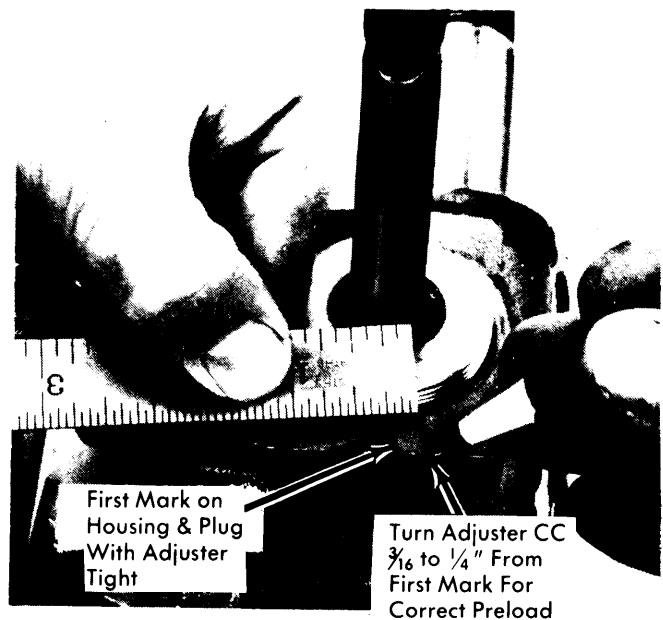


Fig. 6 Pinion Shaft Preload Adjustment

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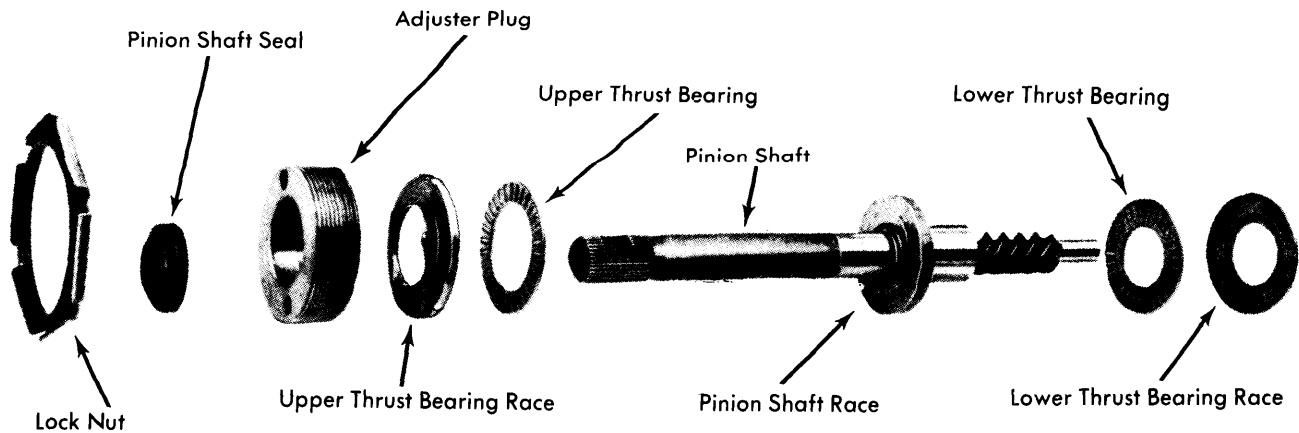


Fig. 7 Exploded View of Pinion Shaft Assembly

4) Install contraction plug using a socket. Install shock damper rings on rack ends with open sides facing tie rods, then install jam nuts. Apply lubricant to inner tie rod wear surfaces and pack tie rod housings with lubricant. Install inner tie rod assemblies on rack and tighten tie rod housing while rocking inner tie rod to relieve grease lock. Now loosen tie rod housing and torque to specification. Tighten set screw as required. Clamp tie rod housing in a vise and tighten jam nuts to

specification using a crow-foot type adapter on torque wrench. Slip damper rings over jam nuts. To install remaining components, reverse removal procedure.

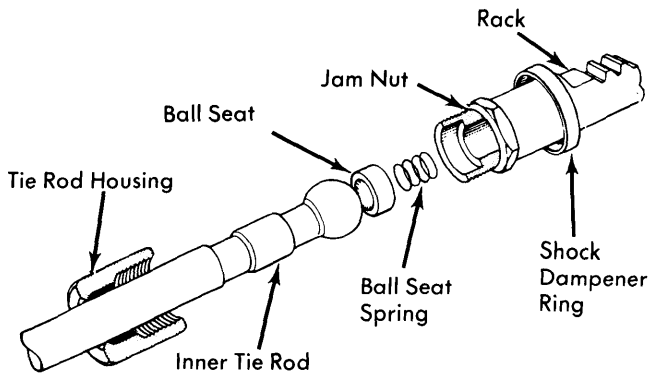


Fig. 8 Inner Tie Rod Assembly

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Adjuster Plug Lock Nut	85
Adjuster Tube Clamp Nuts	14
Flexible Coupling Pinch Bolt	30
Inner Tie Rod Housing-to-Rack	①
Tie Rod Housing Set Screw	9
Tie Rod Housing Jam Nuts	60
Tie Rod End Nuts	50
Gear Mounting Clamp Bolt	50
Gear Mounting Bolt at Housing	60
Tie Rod-to-Steering Arm	50
Reinforcement Brace-to-Crossmember	30
Engine Support Bracket	30

① — Hand tighten only.