FORD MOTOR CO. RACK & PINION

Pinto, Mustang

DESCRIPTION

Steering gear is rack and pinion type. Input shaft (steering wheel shaft) is connected to a pinion within the steering gear housing. This pinion meshes with a rack so that steering wheel and pinion rotation moves rack laterally from right to left. Tie rods are connected at each end of steering gear rack so that front wheels turn in unison with rack movement. Steering gear is sealed at each end with a rubber bellows, and gear case is filled with approximately 7 oz. of hypoid gear lube. Checking and refilling is not required unless there is fluid leakage or gear is disassembled for repair.

ADJUSTMENT

Rack and pinion gear provides two means of service adjustment. Steering gear must be removed from vehicle to perform these adjustments.

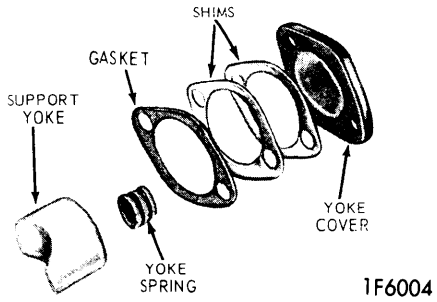
SUPPORT YOKE-TO-RACK CLEARANCE

1) Clean exterior of steering gear thoroughly and mount gear in a soft-jawed vise or suitable holding fixture.

2) Remove yoke cover, gasket, shims and yoke spring (see illustration). Clean cover and housing flange areas thoroughly. Reinstall yoke and cover **without** gasket, spring, and shims. Tighten cover bolts lightly until cover just touches the yoke.

3) Measure gap between cover and housing flange, then select shims which, together with cover gasket, are .0005-.006" thicker that the measured gap.

4) Remove cover, assemble gasket on housing flange, then install shim pack, spring and cover. Install and tighten bolts evenly. Check steering gear for binding or looseness and smooth operation.

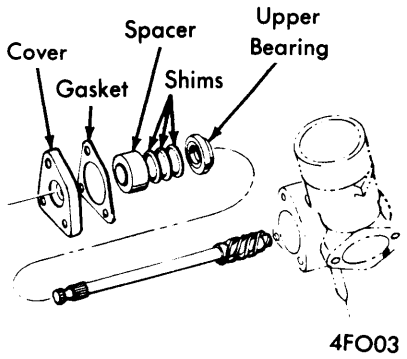


SUPPORT YOKE & RACK ADJUSTMENT

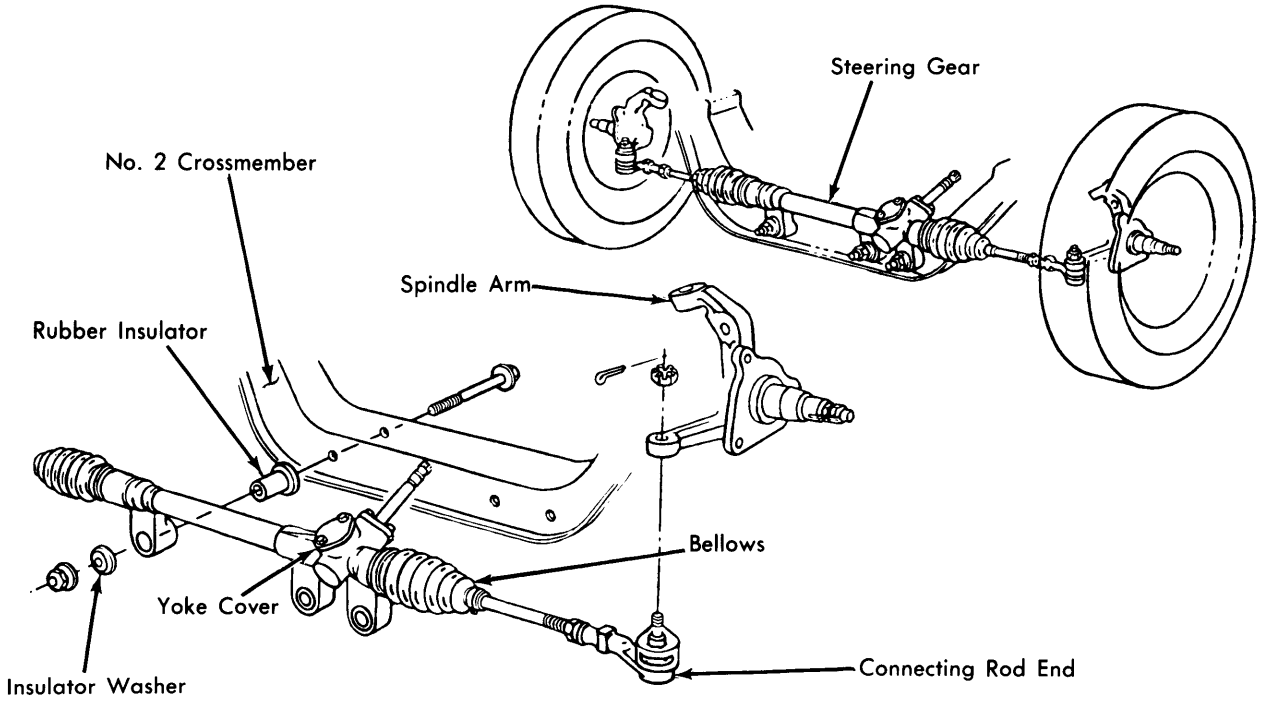
PINION BEARING PRELOAD

1) Clean exterior of steering gear thoroughly and mount gear in a soft-jawed vise or suitable holding fixture.

2) Loosen yoke cover bolts to relieve spring pressure on rack. Remove pinion cover and clean cover flange area thoroughly, then remove cover gasket, spacer and shims.



PINION BEARING PRELOAD ADJUSTMENT



RACK & PINION STEERING LINKAGE

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FORD MOTOR CO. RACK & PINION (Cont.)

3) Install new gasket on pinion cover flange, fit shims between upper bearing and spacer until shim pack is flush with top surface of gasket (check with light pressure on straight-edge placed on gasket face), then add one .005" shim to preload bearings.

4) Install shims with thinnest shims inward. *NOTE — Spacer must be assembled next to housing cover.* Install cover and bolts then tighten evenly. Tighten yoke cover bolts evenly.

PERFORMANCE

With front suspension in good condition and steering gear properly adjusted, free play measured at steering wheel rim should be no more than 3/8". When turning steering wheel from one stop to the other with vehicle stationary, steering gear should not knock (a knock indicates that steering gear adjustment is required). *NOTE — Do not turn steering wheel forcefully from stop to stop with front wheels off ground. Build-up of pressure within gear could cause damage or blow off bellows.*

REMOVAL & INSTALLATION

REMOVAL

Disconnect negative battery terminal, turn on ignition to unlock steering wheel and raise vehicle on hoist. Remove tie rod end retaining nuts and cotter pins. Using suitable separator tool (3290-C), separate studs from spindle arms. Remove bolt holding pinion shaft to flexible coupling and bolts holding gear to crossmember. Turn front wheels and remove gear assembly from left side of vehicle.

INSTALLATION

Install gear assembly on chassis and install and tighten bolt holding pinion shaft to flexible coupling. Install and tighten gear to crossmember attaching bolts. Connect tie rod ends to spindle arms, install nuts and tighten; install cotter pins. Lower vehicle, turn off ignition switch, connect battery terminal. Check wheel alignment and reset if necessary.

OVERHAUL

TIE ROD ENDS, BELLOWS & TIE ROD BALL JOINT SOCKETS

Disassembly — 1) Clean exterior of gear then mount in a suitable holding fixture. Loosen jam nuts on outer ends of tie rods adjacent to tie rod sockets, then remove sockets and jam nuts. Remove bellows clamps, then remove bellows. Using suitable drill fixture (T74P-3504-AA), install drill stop on a 5/32" drill bit to bore a 3/8" deep hole. Tape cloths around rack end on both ends of ball socket to prevent chip contamination.

2) Install drill fixture on ball socket so that pin in ball socket is in line with guide hole in drill fixture. Cone points of alignment and locking screws must be positioned between lock nut and ball socket and tightened firmly. Place drill in fixture guide hole and drill out retaining pin. Remove tie rod and ball socket using suitable wrench (T74P-3504-CC). Remove lock nut, inner thrust bearing (seat) and rack spring from recess in end of rack. Inspect all parts, replace if damaged.

Reassembly — 1) Install new rack spring in end of rack. Assemble ball socket to tie rod, then install a new inner thrust bearing (seat) in ball socket. Apply suitable lubricant to all parts. Thread ball joint lock nut on end of rack, then thread ball socket onto rack until tie rod articulation becomes stiff. Rotate tie rod at least seven times, then install a ball joint on tie rod end.

2) Place hook of suitable pull scale (T74P-3504-Y), through hole in threaded area of ball joint. With tie rod parallel to rack, adjust position of ball socket on rack until effort required to move tie rod with pull scale is 4-6 lbs. Secure unit by tightening lock nut against ball socket. Install drill fixture on ball socket, then drill a hole on line of contact of lock nut and ball socket.

3) Insert retaining pin in drilled hole and tap flush with ball housing and lock nut surfaces. Stake metal of ball housing and lock nut over pin to secure tie rod adjustment. To test pinning operation, apply a reverse torque of 35 ft. lbs. on lock nut. Joint must not loosen, repair as necessary. Install bellows, clamps retaining bellows to gear housing, then install 7 oz. of suitable lubricant into gear assembly and install remaining clamps. Install jam nuts and tie rod sockets on outer ends of tie rods.

INPUT SHAFT SEAL

Removal & Installation — Thoroughly clean input shaft and seal area, then pry pinion seal from bore taking care not to damage shaft. Lubricate new seal with suitable lubricant, then install over shaft. Using a piece of tubing, press or tap seal into bore until flange is flush with shoulder of bore.

PINION ASSEMBLY, BEARINGS, RACK & HOUSING

Disassembly — 1) Clean exterior of gear, then mount in a suitable holding fixture. Remove yoke cover, shims, spring and yoke. Remove tie rods. Move rack to either lock and note position of flat on input shaft. *NOTE — Flat must be aligned in this position during reassembly.*

2) Remove pinion cover, shaft, spacers, shims and upper bearing. Remove rack from housing. Remove lower bearing from pinion shaft bore. *NOTE — Access to bearing is easiest through support yoke bore.*

Reassembly — Install lower bearing in pocket at bottom of housing, then install rack. With rack moved to one lock, install pinion shaft, making sure end is engaged in lower bearing. Install upper bearing, shims, spacer, gasket and pinion cover. Check bearing preload, adjust as necessary. Install tie rods, then install support yoke, spring, shims, gaskets and cover. Tighten all bolts, then adjust yoke preload.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Support Yoke Cover-to-Housing Bolts	15-20
Pinion Cover-to-Gear Housing Bolts	15-20
Steering Gear-to-Crossmember Bolts	80-100
Tie Rod End-to-Spindle Arm Nut	① 35-47
Tie Rod End-to-Inner Tie Rod	35-50
Pinion Shaft-to-Flex Coupling Bolts	20-37

① — Tighten to nearest cotter pin slot after torquing to specification.

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