GEMMER/ROSS WORM & ROLLER

International Harvester
Scout II, Terra & Traveler

DESCRIPTION

The worm and roller type manual steering gear consists of a worm gear, a sector shaft assembly and steering linkage. The worm gear, which is part of the input shaft, rotates on ball bearings. The roller, which rides on the worm gear, is mounted to the sector shaft. The sector shaft and roller assembly rotates as a unit in bushings mounted in the lower part of the housing. Rotation of the worm gear is transmitted to the sector shaft through the roller assembly and is then relayed to the steering linkage through the pitman arm.

ADJUSTMENT

WORM BEARING PRELOAD

1) Disconnect steering linkage from pitman arm. Loosen worm and roller mesh preload screw lock nut and turn screw counterclockwise one turn. Turn steering wheel to center of travel. Attach an INCH lb. torque wrench to steering wheel nut. Rotate steering wheel ½ turn and check torque required to turn.

2) If preload is not within specifications, remove or add enough shims between worm shaft end cover and steering gear housing. Tighten cover bolts. Recheck preload and adjust as necessary. Adjust worm and roller mesh preload. *See Worm & Roller Mesh Preload adjustment in this article.* Install steering linkage and check lubricant level in steering gear.

Worm Bearing Preload

Application	INCH Lbs.
International Harvester	
Scout II, Terra & Traveler	2-8

WORM & ROLLER MESH PRELOAD

NOTE – *Worm Bearing Preload must be adjusted before Worm and Roller Mesh Preload is adjusted.*

1) Center sector shaft by rotating worm shaft through full travel while counting number of turns. Rotate worm shaft half way back.

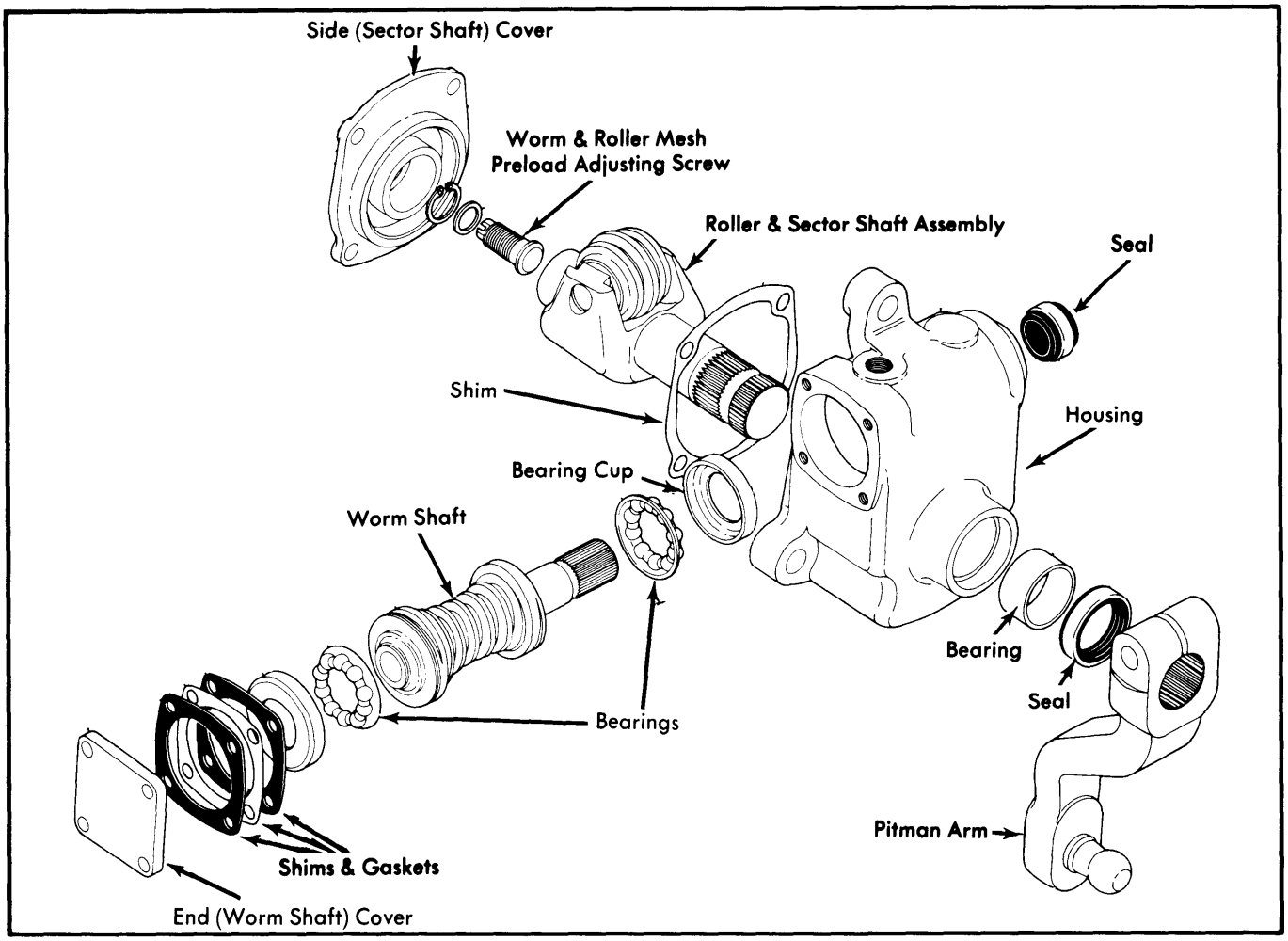

Fig. 1 Disassembled Gemmer/Ross Worm & Roller Steering Gear

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GEMMER/ROSS WORM & ROLLER (Cont.)

2) Turn adjusting screw clockwise until all lash is removed between worm shaft and sector shaft. Using an INCH lb. torque wrench, measure torque required to rotate worm shaft across center position. If torque is not within specifications, use adjusting screw to change worm and roller mesh until specified torque is reached. Tighten adjusting screw lock nut.

Worm & Roller Mesh Preload

Application	INCH Lbs.
International Harvester	
Scout II, Terra & Traveler	9-16

REMOVAL & INSTALLATION

STEERING GEAR

International Harvester – NOTE – *Information was not available from vehicle manufacturer at time of publication.*

OVERHAUL

DISASSEMBLY

1) Drain lubricant and remove pitman arm from sector shaft. Remove side cover attaching screws. Remove side cover with sector shaft from housing. Remove adjusting screw lock nut and turn adjusting screw clockwise until it is completely unthreaded from side cover which will release sector shaft from side cover.

2) Remove top cover attaching bolts, top cover and shims. DO NOT discard shims. Remove worm gear assembly from housing. Remove bearing cups and ball bearings from worm gear assembly.

INSPECTION

Use cleaning solvent to clean parts and dry with compressed air, taking care not to spin bearings. Inspect worm gear for chipping, scoring or binelling and condition of splines and threads. Check all bearings and bearing surfaces for wear. Check sector shaft for burrs on splines, twisted splines and wear on bearing surfaces. Check housing for strain at mounting flanges.

REASSEMBLY

1) Install new bearings and place upper bearing assembly over worm shaft. Install new bearing cup. Insert worm shaft in housing. Install lower bearing assembly over worm and insert lower bearing cup. Install shims, housing cover and cover bolts.

2) Install adjusting screw into side cover from inside and draw sector shaft into position until it bottoms in housing. Reverse adjusting screw one turn. Install gasket, side cover and cover bolts. Adjust sector shaft preload. Install new sector shaft and housing seals. Fill with lubricant and install filler plug. Install pitman arm.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Sector Shaft Adj. Screw Lock Nut	16-20
Sector Shaft Cover Bolts	
5/16" x 2"	18-22
3/8" x 2"	30-35
Worm Cover Bolts	18-22
Pitman Arm Retaining Nut	160-180
Steering Gear Attaching Bolt	①45-50

① – 1/2" Gear-to-Frame given. 1/2" Gear-to-Bracket is 60-80. 7/16" Gear-to-Frame is 35-40

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