

# Power Steering Gears

## 1965-72 IHC (ROSS) SEMI-INTEGRAL POWER STEERING

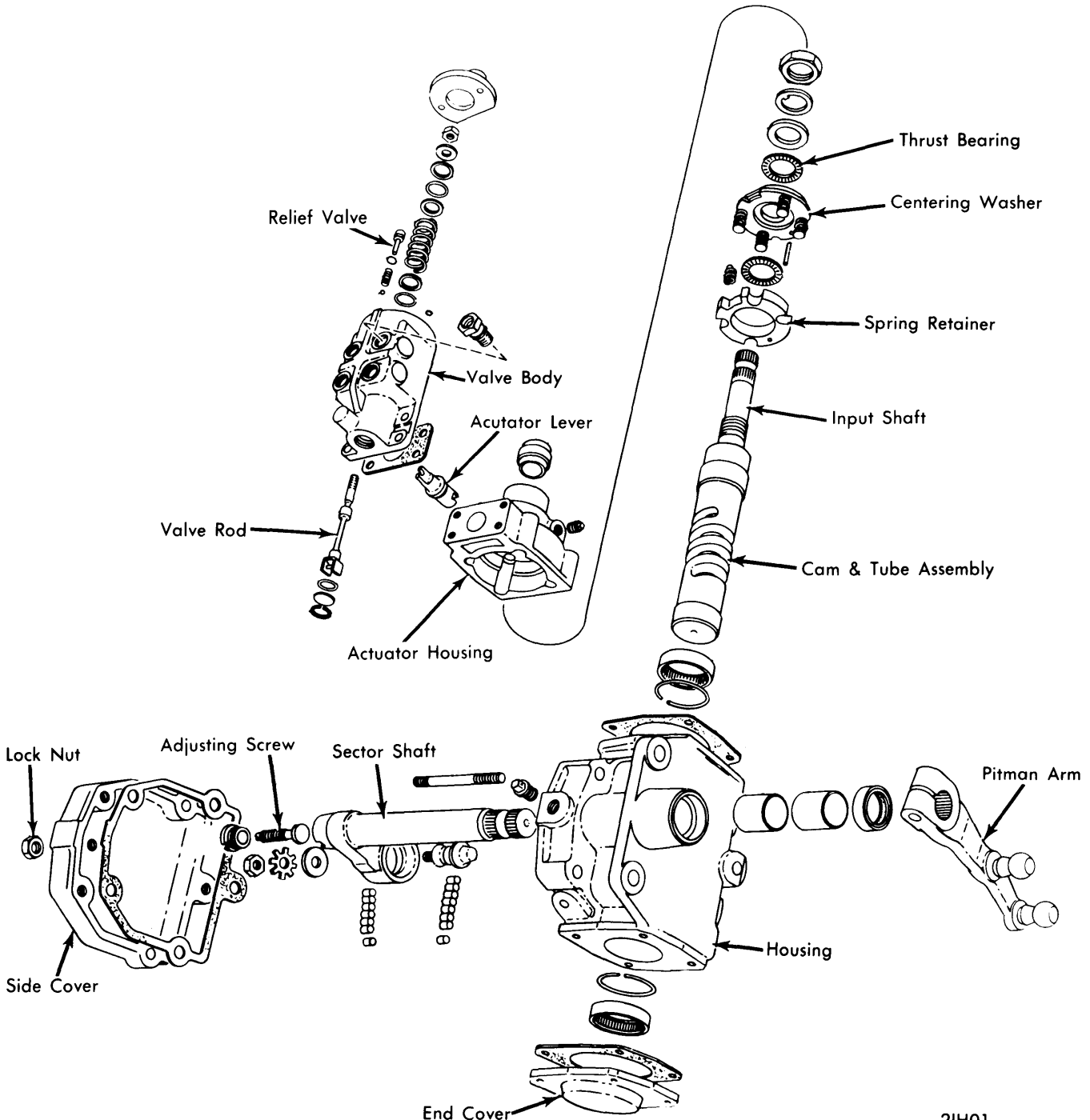
International Harvester (1965-72)

NOTE — Some models use other units. See IHC (Saginaw) Power Steering in this Section.

### DESCRIPTION

Semi-integral type power steering incorporates a hydraulic control valve, mounted to a single stud cam and lever type mechanical steering gear. Rotational effort applied to steering

shaft through steering wheel actuates control valve, which directs fluid from power steering pump to power cylinder located in the steering linkage. When rotational effort at the steering wheel overcomes valve centering springs, valve spool is moved axially, restricting one return passage to the outlet port, which in turn increases hydraulic pressure in one end of power cylinder. The increased pressure in power cylinder actuates cylinder piston which transmits force to portion of the steering linkage to which cylinder is attached.



STEERING GEAR ASSEMBLY

2IH01

## 1965-72 IHC (ROSS) SEMI-INTEGRAL POWER STEERING (Cont.)

### LUBRICATION

Check fluid level in pump reservoir and in steering gearbox every 6,000 miles. Steering gear and fluid should be at normal operating temperature. If necessary, add power steering fluid at pump reservoir to bring level to proper mark on dipstick. Use ONLY SAE-90W multi-purpose type gear lubricant in steering gearbox.

### ADJUSTMENT

#### THRUST BEARING PRELOAD

*NOTE* — It is preferable to have gear removed from vehicle during adjustment. If gear is readily accessible in vehicle, it may only be necessary to disassemble those parts which will permit removal of actuator housing.

- 1) Remove control valve to actuator housing attaching bolts, and remove control valve. Pull actuator lever from actuator housing. Remove actuator housing attaching bolts, and remove actuator housing.
- 2) Unstake and remove adjusting nut. Remove tongued washer, upper thrust washer, and needle bearing. Wash all parts in clean solvent and coat with light oil. Reassemble thrust bearing parts and install adjusting nut.
- 3) Turn steering gear off center position to free levershaft stud in cam groove. Tighten adjusting nut to 10 ft. lbs., then back nut off 10-20°. Restake lip of adjusting nut in slot of camshaft. Reinstall actuator housing and control valve parts to steering gearbox.

#### OVERCENTER POSITION

With steering gear in center position, turn adjusting screw, mounted in side cover, until a slight drag is felt while rotating steering gear through center position. Tighten adjusting screw lock nut.

### TESTING

#### PUMP PRESSURE

With fluid at correct level in reservoir, belt tension properly adjusted, and power steering fluid at normal operating temperature, install suitable gauge and valve assembly between pump and high pressure hose. With engine idling at 600-800 RPM, and gauge valve open, note pressure reading while turning wheels from steering stop to steering stop. If maximum pressure reading is below 950 psi, temporarily close gauge valve and note maximum pressure reading obtained. *CAUTION* — Never close gauge valve for more than five seconds at a time. If this pressure reading is below 950 psi, power steering pump is faulty. If reading is 950 psi or more, control valve or power cylinder are faulty.

## REMOVAL & INSTALLATION

#### STEERING GEARBOX

**Removal (W/Solid Steering Column)** — Remove horn button from steering wheel, then remove base plate and steering wheel attaching nut. Using suitable puller, remove steering wheel. Loosen steering column clamp bolts at instrument panel. Remove seat cushion, and steering column weatherstrip at cowl. Disconnect shaft rods at steering column, and battery

cables at battery. Remove battery from vehicle. Loosen steering column clamp bolt at bottom of steering column, and disconnect hydraulic lines at control valve. *NOTE* — Mark location of hydraulic lines at control valve for reassembly reference. Remove pitman arm from sector shaft, and remove gearbox attaching bolts. Raise steering gear and slide column toward cab, then pull gear and shaft from column over front end sheet metal.

**Removal (W/Jointed Steering Column)** — Loosen coupling clamp bolt on input shaft. Using suitable puller, remove pitman arm from sector shaft. Remove gearbox attaching bolts, and slide gearbox assembly free of coupling. Remove gearbox from vehicle.

**Installation (W/Solid Steering Column)** — Insert steering shaft into column jacket, and slide steering gear into chassis over front end sheet metal. Install steering gearbox attaching bolts, then install pitman arm. Install control valve assembly to steering gear, and reconnect hydraulic lines in same order in which they were removed. Tighten lower steering column clamp bolt, reinstall battery, and connect battery cables. Attach shift rods at steering column, and column clamp bolt. Install steering wheel, wheel attaching nut, base plate and horn button. Fill steering gear and pump reservoir with suitable lubricant, and bleed system. See *POWER STEERING PUMPS* in this section.

**Installation (W/Jointed Steering Column)** — Position input shaft in column coupling, and install gearbox attaching bolts. Install pitman arm to sector shaft. Tighten coupling clamp bolt, then fill pump reservoir and gearbox with suitable lubricant. Bleed hydraulic system. See *POWER STEERING PUMPS* in this Section.

### OVERHAUL

*NOTE* — If complete gearbox assembly is not to be overhauled, remove unit to be serviced and proceed to disassembly and reassembly of that unit.

#### STEERING GEAR

**Disassembly** — Remove sector shaft adjusting screw lock nut and adjusting screw from sector shaft cover. Slide sector shaft and cover assembly from housing, and remove gasket. Remove control valve attaching screw, and remove control valve from housing. Pull actuator lever from actuator housing, and remove actuator housing attaching screws. Remove actuator housing from gearbox. Remove input shaft and centering washer assembly from gearbox housing.

**Reassembly** — Install cam and tube assembly into housing. Position new gasket on top of housing, and assemble actuator housing and pin to housing. Assemble side cover to sector shaft and install assembly in housing. Install adjusting screw lock nut. Install control valve assembly. Adjust steering gear overcenter position. See *Overcenter Position Adjustment*.

#### CONTROL VALVE

**Disassembly** — Remove retaining ring, cover plate, and "O" ring seal. Remove end cover and seals from valve body. Remove stop nut and washer from end of valve rod, then remove valve rod from control valve. Remove valve spool, centering washers, "O" ring, and centering spring from control

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valve. Remove "O" ring from valve spool. Remove pressure relief valve, washer, spring, and check ball from control valve.

**Reassembly** - Install relief valve parts in control valve housing. Position new "O" ring on valve spool, and install valve spool in valve body, making sure "O" ring end is toward clevis end of valve. Install centering washer, spring, second centering washer, "O" ring, and third centering washer into housing. Install valve rod in valve spool, and install nut and washer onto rod. Install actuator lever in actuator housing, with slot in lever over centering washers. Install actuator housing to control valve assembly, and install cover plate and end cover to control valve housing.

### CAM & TUBE ASSEMBLY

**Disassembly & Reassembly** - Unstake lip of cam adjusting nut, and remove adjusting nut from cam. Remove tongued spacer washer and upper thrust washer. Remove needle bearing from cam. Remove centering washer assembly, and bearing, then remove spring retainer, using care not to lose springs. To reassemble, reverse disassembly procedure.

TIGHTENING SPECIFICATIONS	
Application	Torque
Control Valve Rod Nut.....	125-150 in. lbs.
Pitman Arm Clamp.....	70-75 ft. lbs.
Pitman Arm Nut .....	125 ft. lbs.