

General Description

To change the position of the steering wheel, pull the lever upward and move the steering wheel to the desired position. Release the lever to lock. The steering wheel can also be tilted up to provide easier exit and re-entry. See **Fig. 1** and **Fig. 2**.

If the vehicle is equipped with a telescoping steering column, push the lever down and extend or retract the steering column as desired.

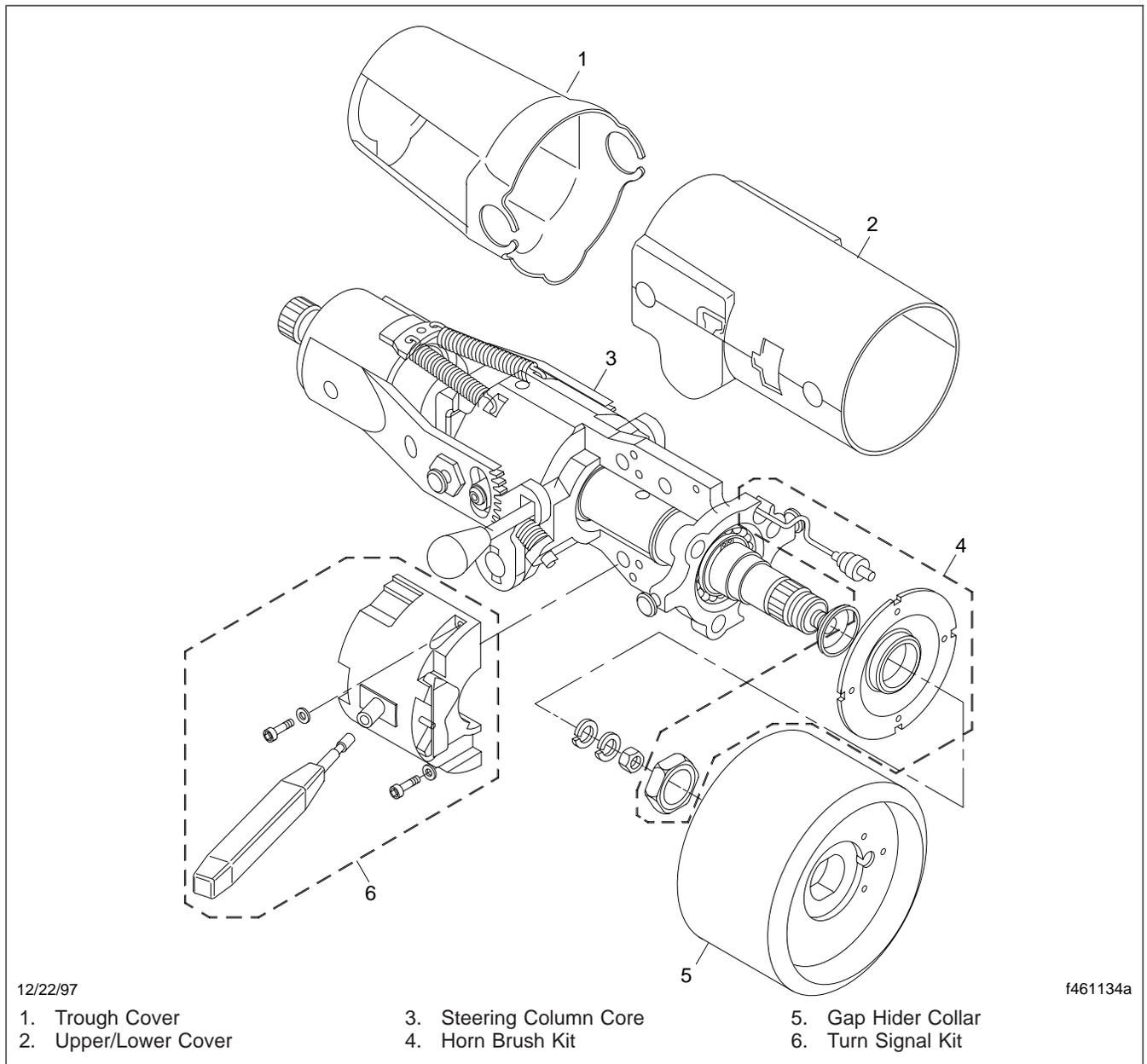


Fig. 1, Tilt Steering Column Assembly

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General Information

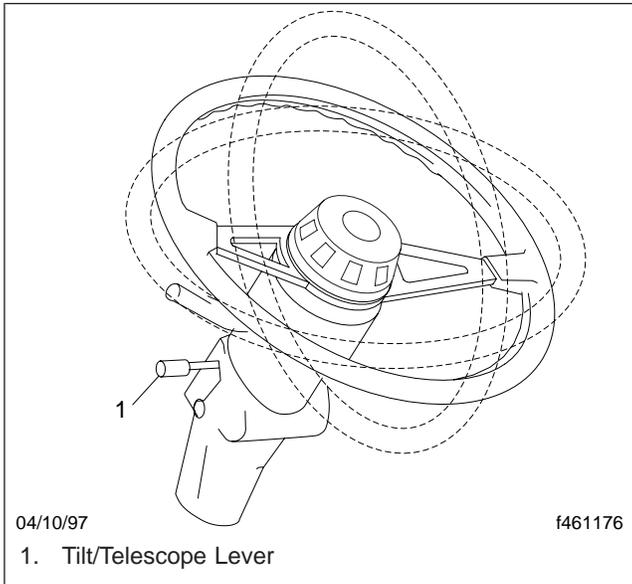


Fig. 2, Tilt/Telescoping Steering Column

Steering Wheel Removal and Installation

Removal

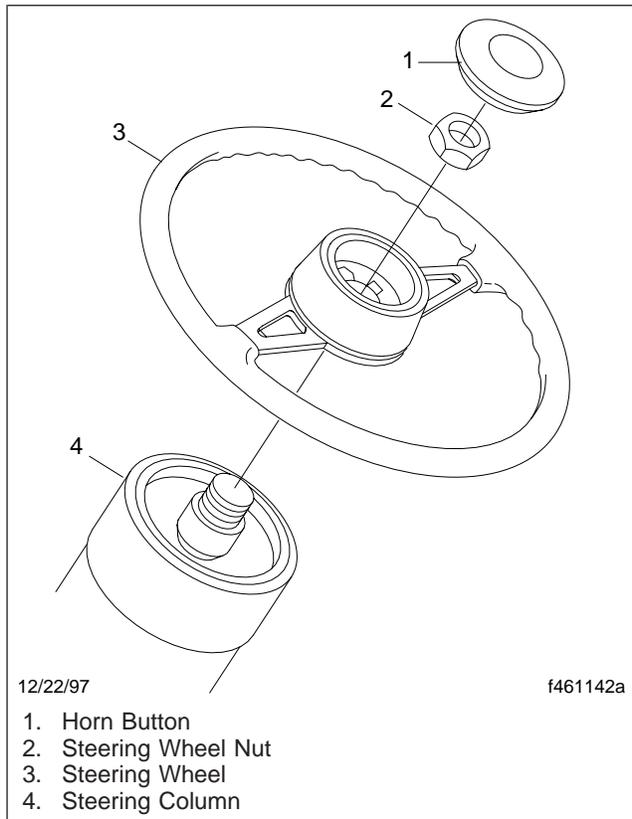


Fig. 1, Steering Wheel Assembly

1. Put the front wheels in the straight ahead position. If possible, drive the vehicle in a straight line for a short distance, stopping at the place where the work will be done.
Don't turn the steering wheel at any time during the removal procedure.
2. Apply the parking brake and chock the tires.
3. Disconnect the batteries at the negative terminal.
4. Using a small screwdriver, carefully pry out the horn button. Disconnect the two wires from it. See Fig. 1.
5. Using a deep socket to avoid damaging the wires, remove the steering wheel nut.
6. Using a steering wheel puller, remove the steering wheel from the steering column.

Installation

1. Make sure the front tires are pointed straight ahead and the steering gear is centered.
 2. Put the steering wheel on the steering column so that the spokes are within 10 degrees of the 3 o'clock and 9 o'clock positions.
 3. Thread the two horn wires through the steering wheel nut, then install the nut. Tighten it 60 lbf-ft (81 N·m).
 4. Connect the two wires to the horn button. Pack the horn wires with dielectric grease.
- NOTE: The horn wires may be connected to either terminal.
5. Install the horn button in the steering wheel hub so the logo on it is aligned with the steering wheel spokes. See Fig. 2.

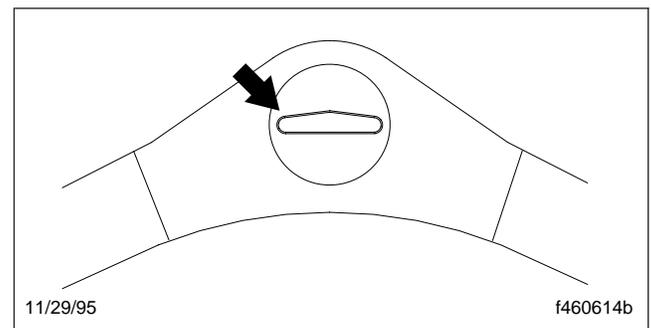


Fig. 2, Align the Logo

6. Take the vehicle for a test drive to make sure the steering wheel is on correctly. If it isn't, remove it and install it again.

Steering Column Removal and Installation

Removal

1. Position the front wheels in the straight ahead position. If possible, drive the vehicle in a straight line for a short distance, stopping at the place where the work will be done. Don't turn the steering wheel at any time during this procedure.
2. Apply the parking brakes, and chock the tires.
3. Press the column tilt switch and allow the column to move to the neutral (center) position.
4. Remove the steering wheel. For Instructions, see [Subject 100](#).
5. Remove the trough cover and the upper/lower cover.
6. Remove and discard the pinch bolt and nut from the steering driveline yoke at the lower end of the steering column.
7. Disconnect the steering column from the steering driveline U-joint yoke.
8. Remove the four 9/16-inch capscrews that secure the column to its mounting bracket.
9. Remove the steering column from the vehicle.

Installation

1. Position the steering column in its mounting bracket. Install the four capscrews and tighten them 146 lbf-ft (198 N·m).
2. Slide the upper steering driveline yoke onto the column shaft, then install a new end yoke pinch bolt. Before installing the pinch-bolt nut, make sure the pinch bolt is centered in the steering column shaft notch. The pinch bolt is centered if it can slip in and out of the end yoke with ease. Install a new pinch-bolt nut, and tighten it 37 lbf-ft (50 N·m).
3. Install the trough cover and the upper/lower cover.
4. Install the steering wheel. For instructions, refer to [Subject 100](#).
5. Remove the tire chocks. Test drive the vehicle and make sure that the steering column assembly operates smoothly; if not, repeat the service operations.

Torque Values	
Description	Torque lbf-ft (N·m)
Steering Column Mounting Capscrews	146 (198)
Steering Wheel Nut	60 (81)
Steering Driveline Pinch Bolt	37 (50)

Table 1, Torque Values

General Description

The Ross TAS55, TAS65 and TAS85 integral power steering gears use pressurized hydraulic fluid to help the driver turn the front wheels. All three models mount on the left frame rail, and all operate in the same way.

The difference between the three gears is size. The TAS55 is for front axle capacities up to 12,000 lbs (5448 kg), and the TAS65 is for front axle capacities up to 14,300 lbs (6500 kg). The TAS85 is for front axle capacities up to 18,000 lbs (8200 kg).

Both gears use more pressurized fluid when the driver turns the steering wheel quickly than when the driver turns the steering wheel slowly, but the minimum amount of power steering fluid is different for each model. With the driver turning the steering wheel 1-1/2 turns per second, the TAS55 needs 2.6 gpm (9.8 Lpm), the TAS65 needs 3.0 gpm (11.4 Lpm), and the TAS85 needs 3.6 gpm (13.6 Lpm)

CAUTION

Never steam clean or high-pressure wash the steering gear. Internal damage to gear seals and ultimately the steering gear can result.

Principles of Operation

When the driver turns the steering wheel, that force travels down through the steering driveline to the steering gear input shaft. See [Fig. 1](#). The input shaft turns the worm shaft which moves the rack piston forward or backward in the gear housing by means of a series of recirculating balls in the spiral channels of the worm shaft. See [Fig. 2](#).

Grooves in the rack piston mesh with teeth in the sector shaft and as the piston slides back and forth, it turns the sector shaft. See [Fig. 2](#), Ref. 16. The sector shaft swings the pitman arm. The pitman arm pulls or pushes the drag link, and the drag link moves the axle steering arm, steering the vehicle.

Pressurized power steering fluid helps the worm shaft slide the rack piston forward or backward in the gear housing.

The input shaft is not connected directly to the worm shaft. Instead, a thin bar, the torsion bar holds the input shaft to the wormshaft. See [Fig. 2](#), Ref. 8. The outside end of the torsion bar is fastened to the input

shaft, and the inside end is fastened to the worm shaft; thus, the force of the driver turning the steering wheel travels from the input shaft to the worm shaft through the torsion bar.

With the force of the driver alone, the front axle would be difficult to steer. The weight on the front wheels, the friction of the tires against the road, and the inertia of the vehicle traveling in its current direction all combine to hold the sector shaft and the rack piston in place.

To overcome this resistance, the steering gear has a valve for directing pressurized hydraulic fluid either in front of the rack piston or behind it, thus using the fluid to push the rack piston in the direction the worm shaft is trying to slide it.

The torsion bar controls the hydraulic fluid. As the driver turns the steering wheel to turn the input shaft, and the front wheels resist turning and hold the rack piston and worm shaft in place, the torsion bar connecting the input shaft and worm shaft twists slightly. That twisting aligns holes in the hydraulic control valve with channels that carry hydraulic fluid. See [Fig. 2](#), Ref. 9. Depending on the direction the driver turns the steering wheel—the direction the torsion bar twists—the valve aligns the channels to direct hydraulic fluid in front of the rack piston or behind it. The fluid provides the extra force the worm shaft needs to overcome the resistance from the front wheels, and the worm shaft can then slide the rack piston in the gear housing.

The rack piston slides, and turns the sector shaft. The sector shaft swings the pitman arm. The pitman arm pulls or pushes the drag link. The drag link moves the axle steering arm, and the front wheels turn.

As the front wheels reach the axle stop—the farthest the wheels can turn in that direction—a poppet (unloading valve) in the rack piston trips to prevent steering gear damage. The tripped poppet reduces steering fluid pressure, heat generated by the power steering fluid pump, and outside forces from acting on the steering linkage. See [Fig. 2](#), Ref. 3.

The hydraulic fluid around the rack piston also prevents road shocks from moving the steering wheel. When the vehicle hits an obstacle, the shock travels up through the front tires and the steering linkage to the steering gear. There, the sector shaft would transmit the shock to the rack piston, but the power steering fluid helps to hold the piston in place and

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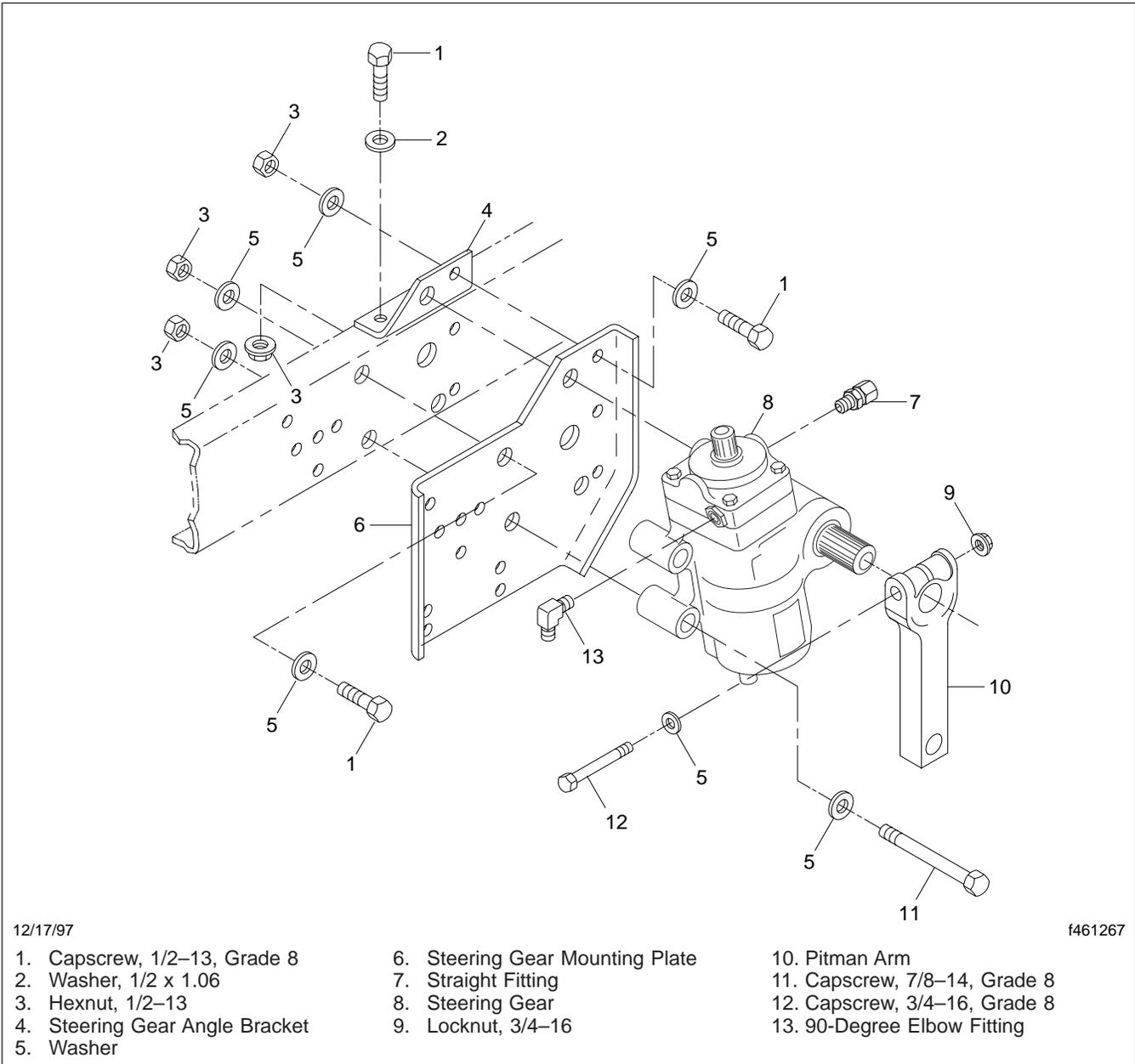


Fig. 1, Power Steering Gear Installation

dampen the shock before it can move up the worm shaft to the steering driveline and the steering wheel.

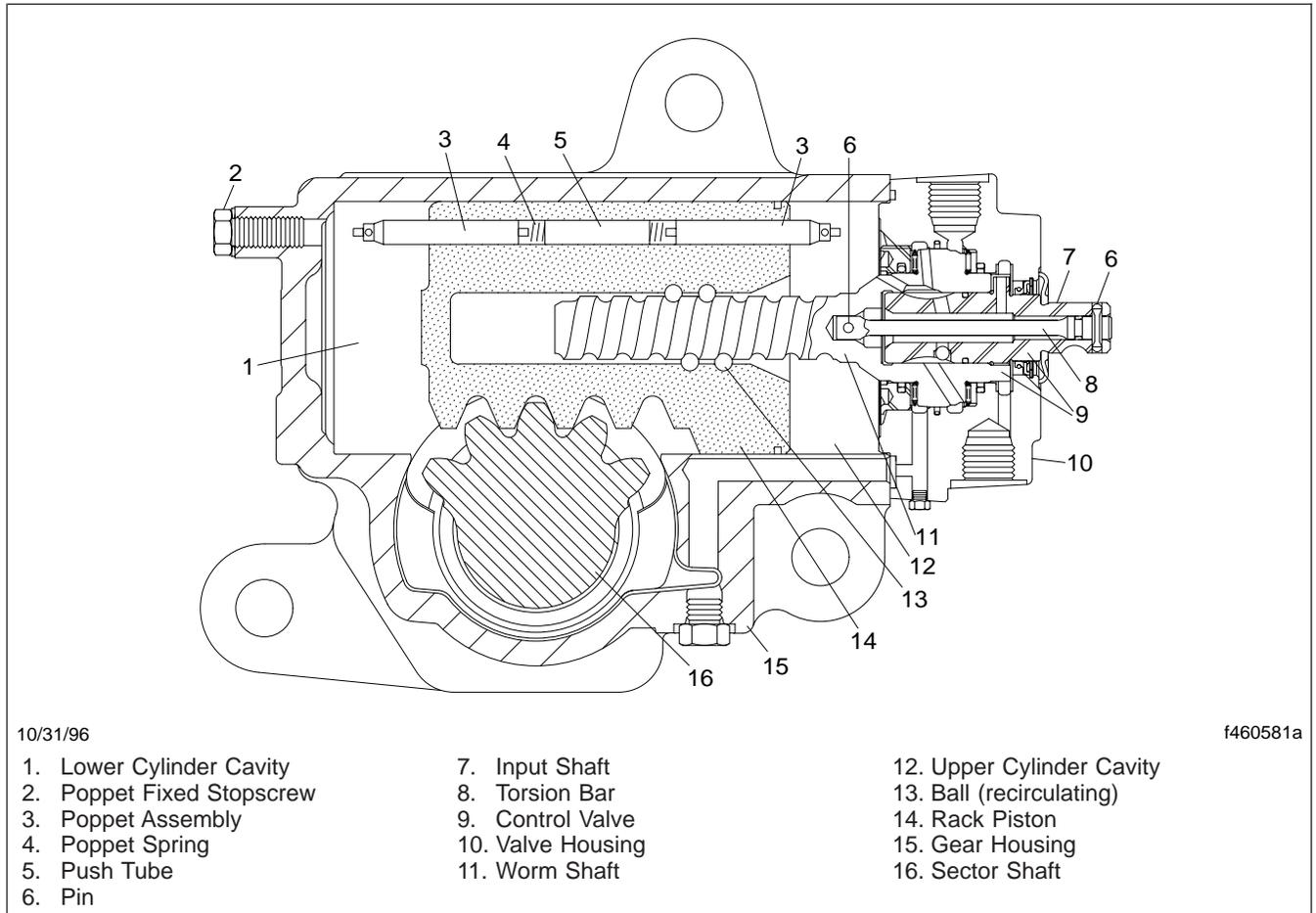


Fig. 2, Steering Gear Sectional View