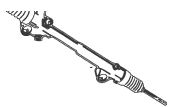


# POWER AND MANUAL RACK AND PINION STEERING

## Step-By-Step Instructions

# CARDONE



Make these three checks to Avoid Warranty Problems!

1. Make sure you flush the system to get rid of contamination.
2. Make sure you fill the system with the correct fluid.
3. Make sure you check the toe-in after installation.

**Important:** You are urged to refer to a suitable service manual before attempting to make repairs. If you do not have such a manual, or lack the experience, you should seek the services of a qualified technician.

### BEFORE YOU BEGIN, READ THIS:

It is easy to install a replacement rack and pinion steering unit. However, you must take proper precautions to assure a safe, trouble-free installation. Park the vehicle in a level, well-ventilated area. Set the parking brake to avoid inadvertent movement. Rack and pinion mounting designs and hardware will vary among vehicle manufacturers. You must consider those detailed design differences but the general procedures for removing the original unit and installing the replacement remain the same. Read the instructions before beginning the installation. If added information is needed, refer to a suitable repair manual.

### REMOVING ORIGINAL UNIT

1. Remove the cable from the negative battery terminal.
2. Raise the vehicle and support it safely. Remove the front wheels.
3. Disconnect the tie rod ends from the steering knuckles.

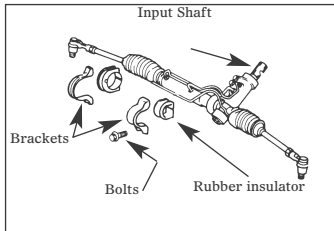
4. Separate the input shaft from the steering column or intermediate shaft. In some cases, this requires removing a pinch bolt. In others, a roll pin must be driven out.

**CAUTION:** On Air Bag equipped cars, DO NOT allow the steering shaft to spin freely as this will cause damage to air bag coil located in the steering column.

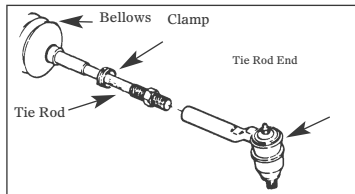
**NOTE:** In some vehicle designs the intermediate shaft must be removed from the vehicle along with the steering unit.

**NOTE:** If you are removing a power rack and pinion unit, perform step #5.

5. Remove the fluid pressure and return lines from the steering unit. Cap the lines to keep dirt out and to reduce fluid spills.
6. Unbolt the steering unit from the chassis. Be sure to note the position of washers, rubber insulators and mounting shims.



7. If the steering unit cannot be lowered, slide it out through a wheel well.
8. If the outer tie rod ends are to be reused, remove them from the inner tie rods.  
**NOTE:** Count the number of turns when removing the outer tie rod ends. Be careful not to twist the bellows (boots) or damage the threads.



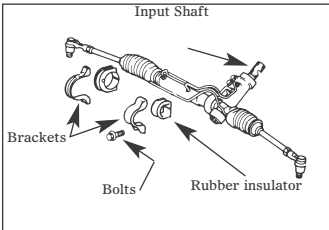
**NOTE:** On some vehicles it will be necessary to unbolt and lower a chassis cross-member or engine cradle to remove the original steering unit. In such cases, be sure to support the cross-member or cradle with a suitable jack. Also, sometimes you will have to disconnect the exhaust pipe or other component to gain access to the steering unit.

**NOTE:** If the replacement unit is a Short Rack, that is a unit supplied without tie rods and without tie rod ends (neither inner nor outer), refer to "Installing Short Rack Type Units."

## INSTALLING REPLACEMENT UNIT

1. Place the steering unit in position on the vehicle making sure the input shaft and steering column engage properly. Secure the input shaft/steering column connection making sure that the grooves for pinch bolts or roll pins are aligned during installation.

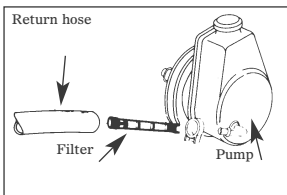
**NOTE:** Install cross-member, cradle or other parts previously removed.



2. Install the mounting brackets, shims, bolts, nuts, washers and insulators in correct position. Torque fasteners to the original vehicle manufacturer's specifications.

**NOTE:** If you are installing a power steering rack and pinion, perform the following step:

3. Being very careful to keep dirt out of the system, attach the fluid pressure and return lines.



**CAUTION:** Do not use Teflon tape to seal fluid fittings or lines as this will void the warranty.

**NOTE:** Always install a power steering filter when replacing a power rack and pinion unit. This should be installed in the return hose at the power steering pump.

4. Clean the tie rod threads. Then thread the tie rod ends onto the tie rods to the depth noted at disassembly. **Be careful not to twist or damage the bellows (boots).**

**NOTE:** Make sure you install the boot clamp correctly over the boot and over the tie rod groove.

5. Attach the tie rod ends to the steering knuckles. **Tighten the tie rod end nuts to the original vehicle manufacturer's specifications and secure with new cotter pins.**
6. Turn the ignition switch off. Then secure the cable to the negative battery terminal. If so equipped, turn the suspension system on.

**NOTE:** If you are installing a power steering rack and pinion, perform the following steps:

7. Install the wheels. Lower the vehicle and reset wheel toe. **To avoid twisting the bellows (boots), loosen the tie rod boot clamps before toe adjustment. Then tighten clamps after toe adjustment.**
8. Fill the pump reservoir with the approved power steering fluid and bleed the system as follows:

- A. Start the engine
- B. Turn the steering wheel gently from stop to stop several times

- C. Recheck fluid level and top off as required.

9. Road test the vehicle. If the steering feels loose, makes noise, surges or kicks back or exhibits other problems, there may still be air trapped in the system. Purge as follows:

- A. Detach the fluid return line from the steering unit and place the end in a container.

- B. Disable the ignition. Crank the engine in short bursts to avoid overheating the starter. Continue to fill the pump reservoir until bubble-free fluid flows from the return line into the container and the fluid is clear.

- C. Reattach the fluid return line and refill the reservoir.

## INSTALLING SHORT RACK TYPE UNITS

This replacement is supplied without tie rods and without either the inner or the outer tie rod ends. You must transfer the tie rods and the tie rod ends from the original unit to the replacement unit. A kit containing the necessary component parts is supplied to ensure correct installation.

1. After the rack and pinion assembly is removed from the vehicle, remove the bellows from the housing. Use side cutters to cut the large clamp. **CAUTION:** Do not puncture or damage the bellows. A punctured bellows must be replaced to prevent dirt, water and debris from entering the unit and destroying it.

2. Remove the tie rod assemblies by removing the inner tie rod housing.

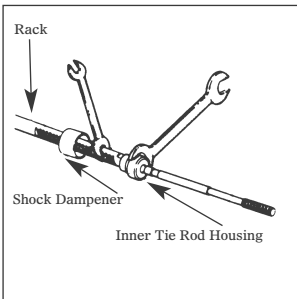
**NOTE:** Ford units require drilling out a pin or removing a roll pin before the inner tie rod can be detached.

A. If a solid pin is used drill it out using a 4/32" drill bit. Do not drill deeper than 3/8". Remove with an Easy-Out.

B. If a roll pin is used drilling is not needed. Simply use an Easy-Out to remove it.

3. Remove the shock dampener (if so equipped) from the inner tie rod housing and slide it back on the rack.
4. Use a wrench on the rack flat to hold that rack from turning while using another wrench to unscrew the inner tie rod housing.

**CAUTION:** Do Not apply force to the rack housing or pinion gear. Always use a wrench to hold the rack.



5. Install the tie rod assemblies on the replacement unit being careful to install the right side tie rod on the right and the left side on the left.
6. After tightening, make certain that the inner tie rod end swivels freely, without excess play.

7. Secure the inner tie rod housings. For GM and Chrysler units, stake the housing. For Ford units, install the lock pins supplied in the installation kit.
8. Install the shock dampeners, breather tube and bellows. Be sure to insert the breather tube into the bellows before securing the bellows with the clamp provided.
9. Continue with the installation instructions for the standard replacement unit.

**USE CORRECT FLUID TO FLUSH AND FILL SYSTEM**

Unless the fluid specified by the vehicle manufacturer is used in the power steering system, it may not function properly and it may be damaged. **If the wrong fluid is used, the warranty is void.**

Troubleshooting Chart

Possible Problem	Symptom				
No Power Assist	Check for collapsed hoses. Replace hoses; Pump is defective. Replace; Replace or tighten belt; Lacks fluid. Fill Reservoir.	X			
Shudder When Wheel Is Turned		X			
Wheel Does Not Return or Pulls			X		
Steering Gear Rattles				X	
Fluid Leaks					X