



RACK & PINION CONVERSION KIT

88-98 CHEVY C1500



PART NUMBER:
FR371KTPWNC



**IF YOU HAVE ANY QUESTIONS
CONTACT US AT:**

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INSTRUCTIONS LAYOUT

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INTRODUCTION:

Thank you for purchasing our C1500 Cradle rack and pinion kit. It is important for your to know that the 1988 to 98 C1500 2WD. This kit is a complete replacement for the original steering box system. It bolts in place of the steering box and drag link using those holes for mounting. We built it so the original power steering pump will integrate with the Flaming River rack and pinion. Upgrade your system with new technology and it is all bolt in – no grinding or welding. The Bill of Material lists all parts included in the kit. Please read instructions thoroughly. If you have any questions, call us at 1-800-648-8022. We appreciate your business.

FOR YOUR SAFETY:

Disconnect battery cables and ensure that the vehicle is properly supported by jack stands.

IMPORTANT NOTES:

- A front end alignment is necessary after installation.
- Flaming River recommends that you use synthetic or high grade power steering fluid.

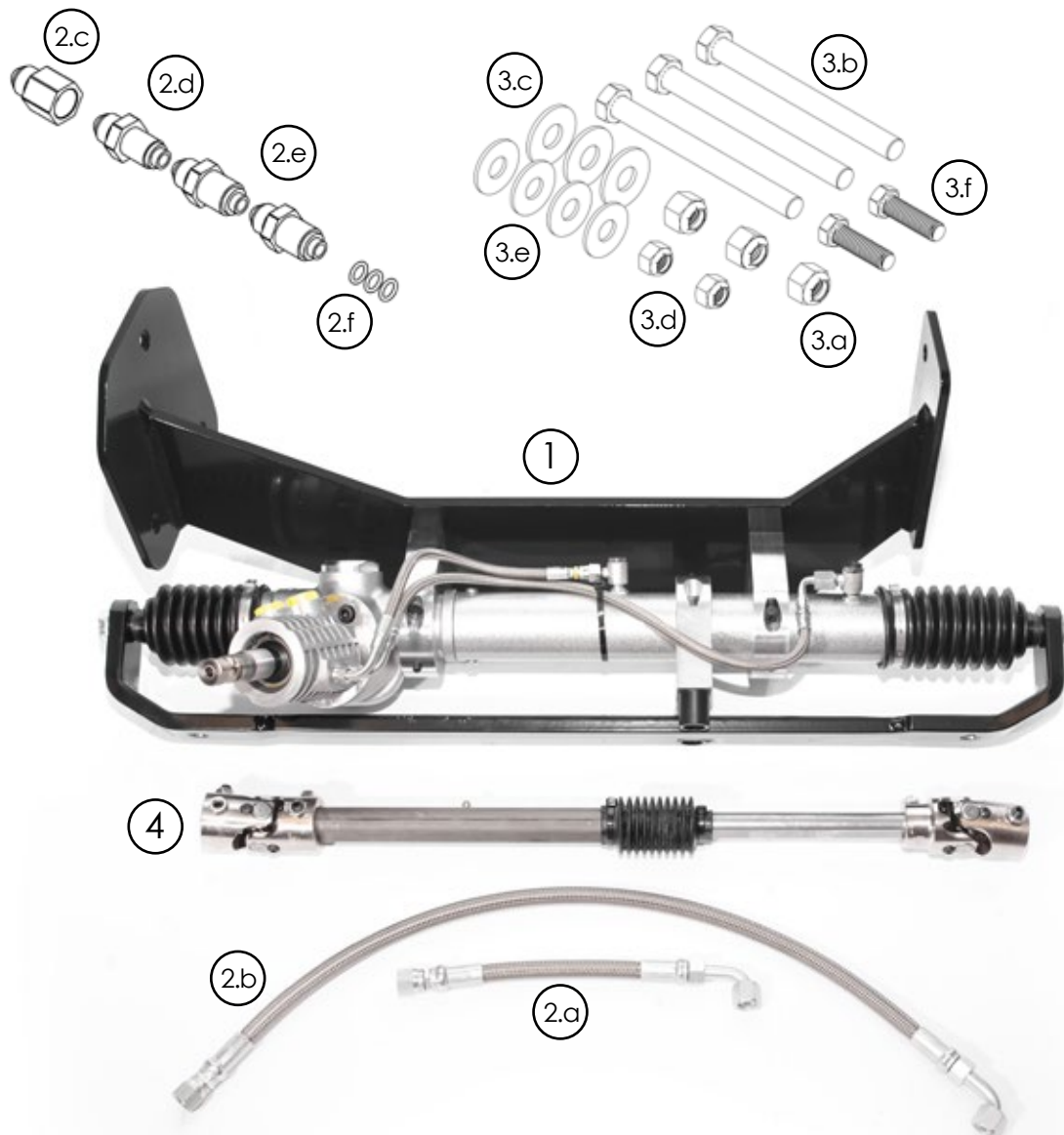
WARRANTY DISCLAIMER: FLAMING RIVER'S LIMITED WARRANTY

Flaming River® warrants its products to be free from defects in material and workmanship for a period of one (1) year after the date of purchase, except that: All steering columns are warranted for a period of three (3) years from the date of purchase. The Big Switch (part number FR1005) is warranted for a period of three (3) years from the date of purchase, provided that it is not mounted with a steel bracket and provided further that it is adequately protected from environmental conditions. All electrical products other than the Big Switch are warranted for a period of ninety (90) days from the date of purchase. Flaming River's® warranty liability is limited to the replacement of defective products. Flaming River® is not liable for any labor costs associated with any warranty claim, or for any incidental or consequential damages. Improper installation, abuse, racing, and/or modification of the products voids this warranty. No warranty of merchantability or fitness for a particular purpose is made by Flaming River® with respect to any of its products. Warnings and Recommendations It is the customer's responsibility to determine the suitability of a given Flaming River® product for the customer's uses. Likewise, it is the customer's responsibility to install a Flaming River® product. Contact the vehicle manufacturer whenever installing a switch to confirm the appropriateness of using such a switch and the recommended placement of the switch on the vehicle. Use qualified chassis specialists for the installation of all steering related components. Be aware that the installation of certain Flaming River® products may adversely impact a manufacturer's warranty with respect to certain vehicles and other manufactured goods. Flaming River will repair or replace any product found to be defective in material or workmanship. Improper installation, abuse, racing and/or modification VOID WARRANTY. Flaming River® is not responsible for any labor costs associated with any warranty.



BILL OF MATERIALS

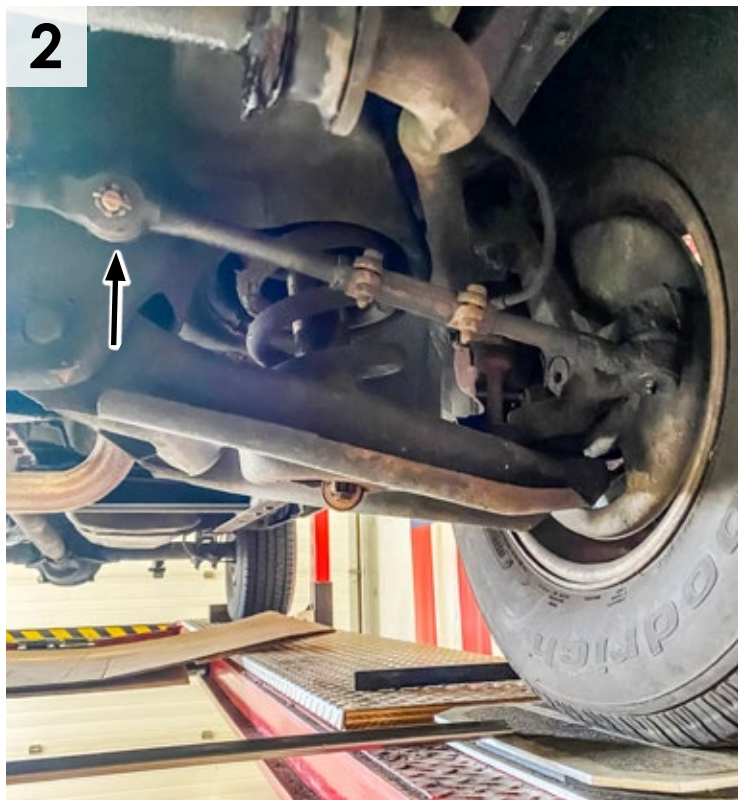
| ITEM NO. | PART NO. | DESCRIPTION | QTY |
|----------|------------------|---------------------------------------|-----|
| 1 | 103733 | POWER RACK & CRADLE | 1 |
| 2 | 103746 | POWER RACK HOSE KIT | 1 |
| 2.a | HOSE-SHORT | POWER RACK RETURN HOSE | 1 |
| 2.b | HOSE-LONG | POWER RACK PRESSURE HOSE | 1 |
| 2.c | 103737 | RETURN LINE ADAPTER | 1 |
| 2.d | 101297 | PRESSURE LINE FITTING | 1 |
| 2.e | FRM16X6AN | RETURN LINE FITTING | 2 |
| 2.f | O-RINGS | FITTINGS O-RINGS | 3 |
| 3 | 103747 | POWER RACK & CRADLE MOUNTING HARDWARE | 1 |
| 3.a | 101629 | NUT, 1/2-13 NYLOCK | 3 |
| 3.b | 103749 | BOLT, 1/2-13 X 5.25 HEX GR8 | 3 |
| 3.c | WASH-1/2" | WASHER, FLAT Ø.53 X Ø1.13 X .13 | 3 |
| 3.d | NUT-7/16-14 | NYLOCK LOCK NUT 7/16-14 | 2 |
| 3.e | WASH-7/16" | 7/16 FLAT WASHER GRADE 8 EQU | 4 |
| 3.f | BOLT-7/16-14X1.5 | 7/16-14 GRADE 8 BOLT 1.5" LONG | 2 |
| 4 | 103748 | POWER RACK & CRADLE SLIPT SHAFT | 1 |



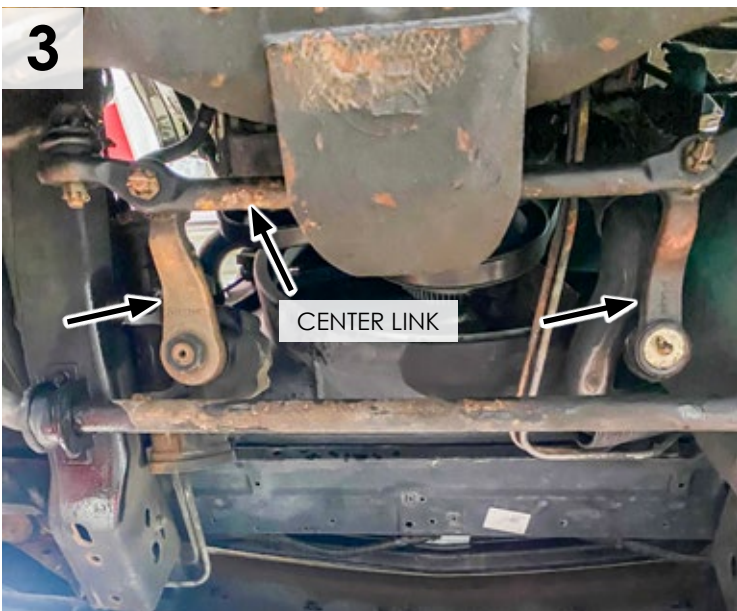
FACTORY STEERING SYSTEM REMOVAL



1 Disconnect and remove the factory intermediate shaft.



2 Disconnect the Passenger and Driver side tie rod ends from the connected Center Link.



3 Disconnect both pitman arm and idle arm from the steering linkage system as well as the connecting Center Link.



4 Disconnect the pressure and return line from the steering box. Next, remove the bolts that attached the steering box to the frame. Then remove the steering box from the truck.

CRADLE KIT INSTALLATION

DRIVER'S
SIDEPASSENGER
SIDE

TRAVEL BAR



- 1 Hold the cradle in place aligning the 3 mounting holes on the driver side. Using the 3 long bolts (ITEM NO: 3.b), 3 washers (ITEM NO: 3.c), and 3 Nylock nuts (ITEM NO: 3.a), connect the driver side cradle mount to the chassis of the truck.

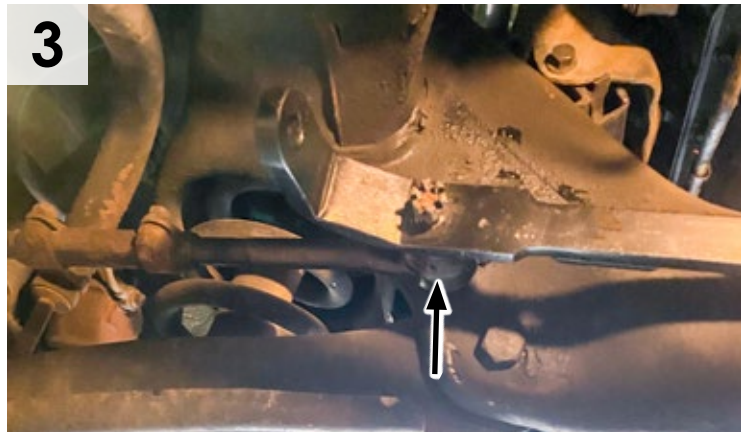
Flaming River recommends these 3.b 1/2-13 bolts be torqued to 80 ft-lb.



- 2 On the passenger side, align the 2 mounting holes. Using the 2 shorter bolts (ITEM NO: 3.f), 2 washers (ITEM NO: 3.e), and 2 Nylock nuts (ITEM NO: 3.d), connect the passenger side cradle mount to the chassis of the truck.

Flaming River recommends these 3.f 7/16-14 bolts be torqued to 52 ft-lb.

CRADLE KIT INSTALLATION CONTINUED



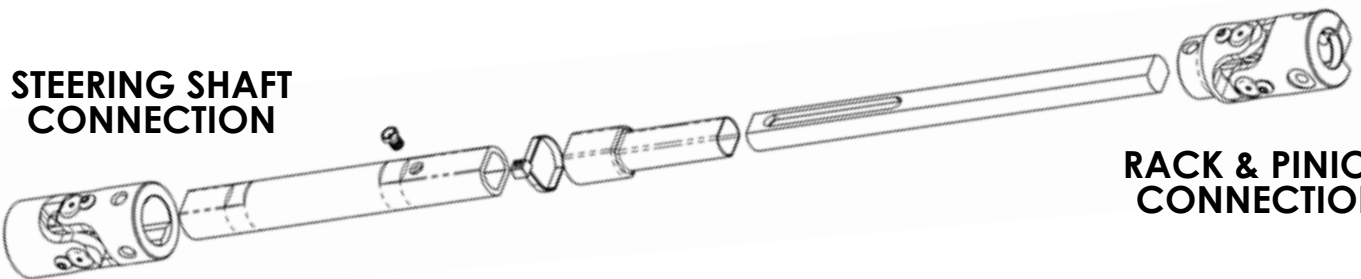
3 Connect the left and right factory tie rod ends to the new Flaming River travel bar.

NOTE: For better visualization the travel bar has been removed from the cradle in these photos. This is not necessary during installation.

SLIP SHAFT INSTALLATION

NOTE: Before installing your slip shaft into your steering system, be sure your truck steering is in the central position. Compare your new Flaming River shaft unit to the original steering shaft, visually compare the length.

STEERING SHAFT CONNECTION

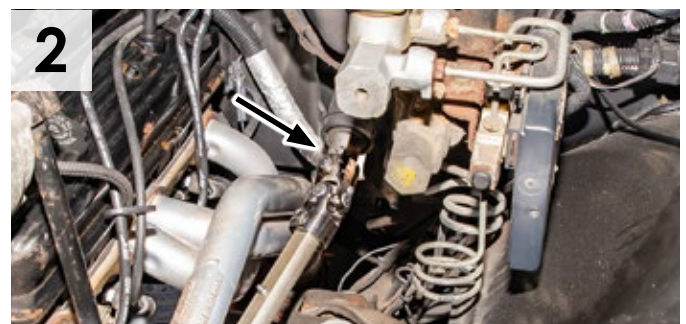


RACK & PINION CONNECTION

1. Position the Rack & Pinion connection side U-joint on the output of the power rack & pinion. Tighten the corresponding screw to secure the U-joint firmly in place on the rack & pinion output.

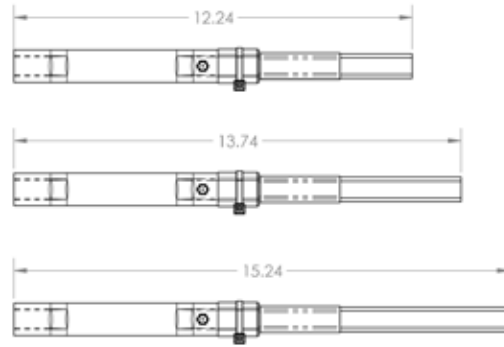


2. Position the Steering Shaft connection side U-joint on the output of the steering column protruding from the firewall. Tighten the corresponding screw to secure the U-joint firmly in place on the steering shaft output.



SLIP SHAFT INSTALLATION CONTINUED

NOTE: The included slip shaft can adjust in its length to fit between the steering shaft and rack & pinion output.



3. Place the rack & pinion connection shaft (3/4 DD) into the U-joint installed in step 1. Tighten the set screw to lock the 3/4 DD shaft into place.

Take the steering shaft connection side (1"DD) and slide it into the U-joint installed in step 2. Tighten the set screw to lock the 1"DD shaft into place.



IMPORTANT NOTE:

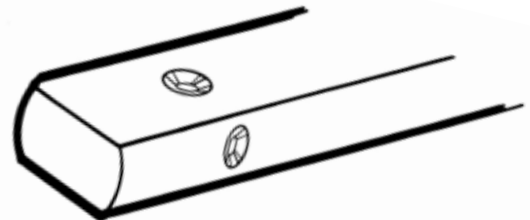
Flaming River **STRONGLY** recommends that once this process is complete, leaving the u-joints in their associated positions, remove the shafting portion of the slip shaft and create "dimples" where the set screws have marked the shafting.

A dimple can be created on the shafts using a 1/4" drill bit as shown in the figure to the right. The dimples should be relatively located in the 4 places shown below.

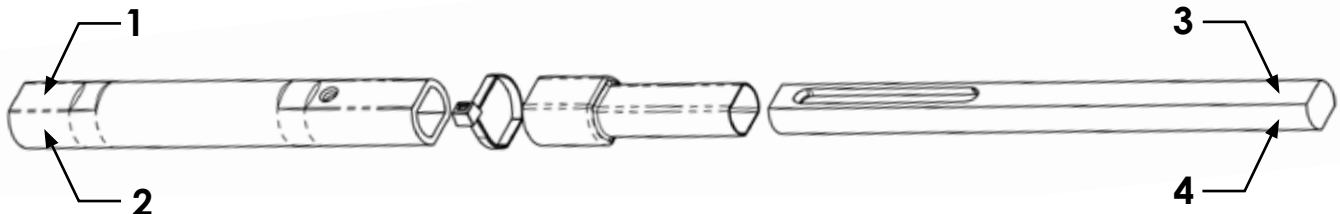
This process of creating dimples provides more security when locking the slip shaft into place in the complete steering system.

Without dimples the shaft can potentially slide out of the U-joints

Once the dimples are created repeat step 3.



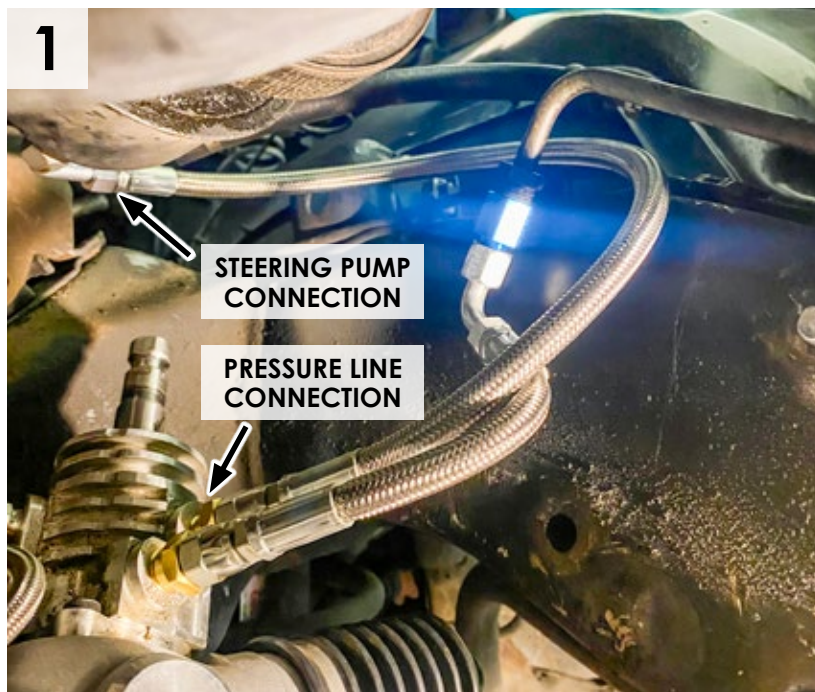
DIMPLE LOCATIONS:



POWER STEERING HOSE KIT INSTALLATION

NOTE: Prior to connecting your new hoses, flush your power steering pump and hoses with clean power steering fluid

1. Connect Pressure Line (Long Hose **2.b**) from steering pump to Top Pressure Port on the power rack using fitting **2.d**. Make sure that an O-RING (**2.f**) is added to the fitting shown by **FIGURE 1**.



2. Connect Return Line (Short Hose **2.a**) from rack & pinion (bottom port) using fitting **2.e** to Factory Power Steering cooler line using supplied adapter **2.c**. Make sure that an O-RING (**2.f**) is added to the fitting shown by **FIGURE 1**.

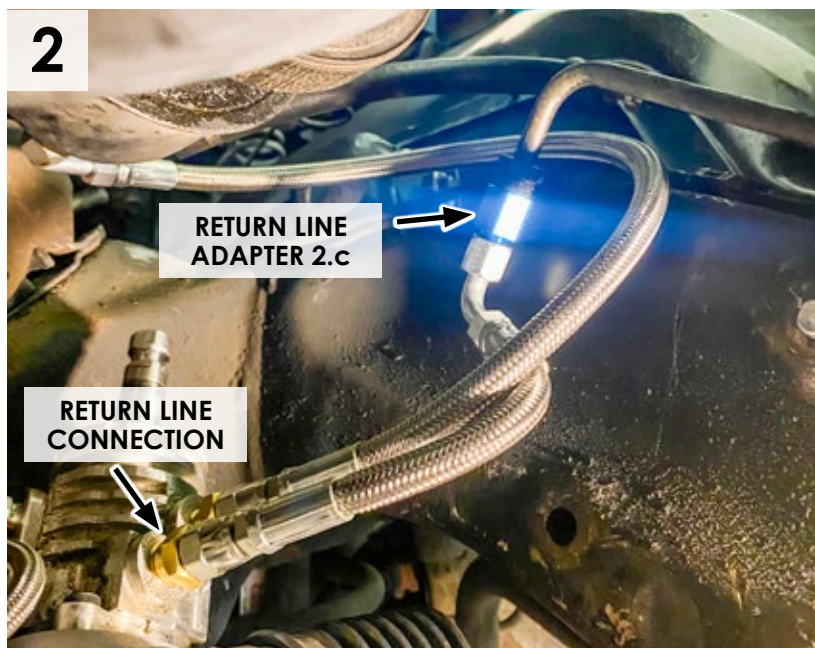


FIGURE 1:



3. Once hoses have been installed, follow this correct bleeding procedure for power rack & pinion systems on the next page.

IMPORTANT INFORMATION:

- Make sure that all hoses are connected to the proper location. Reversing the power steering lines will cause damage to the valve that is not covered by the Flaming River Warranty.
- Always use clean, new power steering fluid during installation.
- Only use Flaming River fittings during installation. Use of other fitting will damage this product and void the product warranty.
- Never use sealant on the threads of the Pressure and Return Fittings



CORRECT BLEEDING PROCEDURE

FLAMING RIVER RACK & PINION SYSTEMS



PRESSURE
14MM X 1.5

RETURN
16MM X 1.5

Make sure that all hoses (FR1610) are connected to the proper location. Reversing the power steering lines will cause damage to the valve that is not covered by the manufacturer's warranty.

All hose connections must be tight. (Loose connections might not leak but could allow air into the system)


IMPORTANT
POWER STEERING FLUID
USE CLEAN, NEW POWER STEERING FLUID ONLY.


PROCEDURE

1.  TURN IGNITION OFF.

2.  RAISE FRONT WHEELS OFF THE GROUND.

3.  TURN THE STEERING WHEEL FULL LEFT.

4.  FILL FLUID LEVEL TO "FULL COLD" LEVEL OR IF USING REMOTE RESERVOIR "T" OVER INNER TUBE.

5.  WITH ASSISTANT CHECKING FLUID LEVEL AND CONDITION, TURN STEERING WHEEL LOCK TO LOCK AT LEAST **20 TIMES**.

NOTE:
ON SYSTEMS WITH LONG RETURN LINES OR FLUID COOLERS, TURN STEERING WHEEL LOCK TO LOCK AT LEAST **40 TIMES**.

TRAPPED AIR MAY CAUSE FLUID TO OVERFLOW. THOROUGHLY CLEAN SPILLED FLUID TO ALLOW FOR LEAK CHECK.

6.  WHILE TURNING WHEELS CHECK FLUID LEVEL CONSTANTLY.

NOTE:
NO BUBBLES ARE ALLOWED.

FOR ANY SIGN OF BUBBLES, RECHECK CONNECTIONS THEN REPEAT STEP 5.

7.  START ENGINE. WITH ENGINE IDLING, MAINTAIN FLUID LEVEL. REINSTALL CAP.

8.  RETURN WHEELS TO CENTER. LOWER FRONT WHEELS TO THE GROUND.

9.  KEEP ENGINE RUNNING FOR TWO (2) MINUTES.

10.  TURN STEERING WHEEL IN BOTH DIRECTIONS.

VERIFY:

- SMOOTH POWER ASSIST
- NOISELESS OPERATION
- PROPER FLUID LEVEL
- NO SYSTEM LEAKS
- PROPER FLUID CONDITION
 - NO BUBBLES, NO FOAM, NO DISCOLORATION

11. IF ALL PROPER CONDITIONS APPLY, BLEEDING IS COMPLETE

12. IF ANY PROBLEM REMAINS SEE "SPECIAL CONDITIONS".

SPECIAL CONDITIONS:



> FOAM OR BUBBLES IN FLUID

Fluid must be completely free of bubbles. In step 5, be alert to periodic bubbles that could indicate a loose connection or leaky O-Ring seal in either the return hose or pressure hose.

> DISCOLORED FLUID (MILKY, OPAQUE, OR LIGHT TAN COLOR)

Switch ignition off. Wait two (2) minutes. Recheck hose connections. Repeat steps 7-10. If condition still exists, replace and check a possible cause:

- Return hose clamps
- Return hose o-ring
- Pressure hose o-ring
- Gear cylinder line o-rings

Fill system and repeat bleed procedure for each possible cause. Repeat steps 7-10 to verify whether noise has been eliminated.



> PUMP WHINE OR GROAN

With engine running, recheck hoses for possible contact with frame body or engine. If no contact is found, follow either method below to cool down fluid and re-pressurize system.

METHOD 1:

Normal Cool Down
Switch engine off.
Wait for system to cool.
Install reservoir cap.

METHOD 2:

Partial Fluid Replacement
Switch engine off. Use a suction device to remove fluid from the reservoir. Refill with cool, clean fluid. Install Reservoir cap.

After either method of cooling, start engine and allow engine to reach normal operating temperature. If noise persists, remove and replace power steering pump. Repeat bleed procedure following pump replacement.

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