



1989 Ford Truck F 250 4WD Pickup V8-445 7.3L DSL

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M/T - Clutch Fluid Leaks/Incomplete Release

90ford23

Article No. 90-16-7

^ CRACKS - DASH (ENGINE COMPARTMENT BULKHEAD) - [CLUTCH MASTER CYLINDER AREA](#) - VEHICLES BUILT BEFORE 6/15/90

^ [CLUTCH](#) - HIGH EFFORT - DASH CRACKED IN [CLUTCH MASTER CYLINDER AREA](#) - VEHICLES BUILT BEFORE 6/15/90

LIGHT TRUCK: 1984-90 BRONCO, F-150, F-250, F-350 1988-90 F SUPER DUTY

PART NUMBER	PART NAME	CLASS
E3TZ-7K509-A	Small Reinforcement Kit (1983-87)	B
E8TZ-7K509-A	Small Reinforcement Kit (1988-91)	B
E3TZ-7K509-B	Large Reinforcement Kit (1983-1991 Severely Damaged Units)	B



ISSUE: Incomplete [clutch](#) release and/or hydraulic fluid leaking into the cab from the [clutch master cylinder](#) may be caused by the reinforcement plate on the clutch master cylinder separating from the dash panel. The separation of the reinforcement plate reduces the clutch master cylinder pushrod travel. Reinforcement plate separation can also cause deflection of the clutch master cylinder that results in a misalignment of the pushrod to the clutch master cylinder. Misalignment causes the "O" ring in front of the secondary seal to leak hydraulic fluid.

ACTION: Inspect the truck and, if necessary, use the following service procedure to install a reinforcement kit.

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PART NUMBER	PART NAME	CLASS
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. ■ **Inspection Procedure**

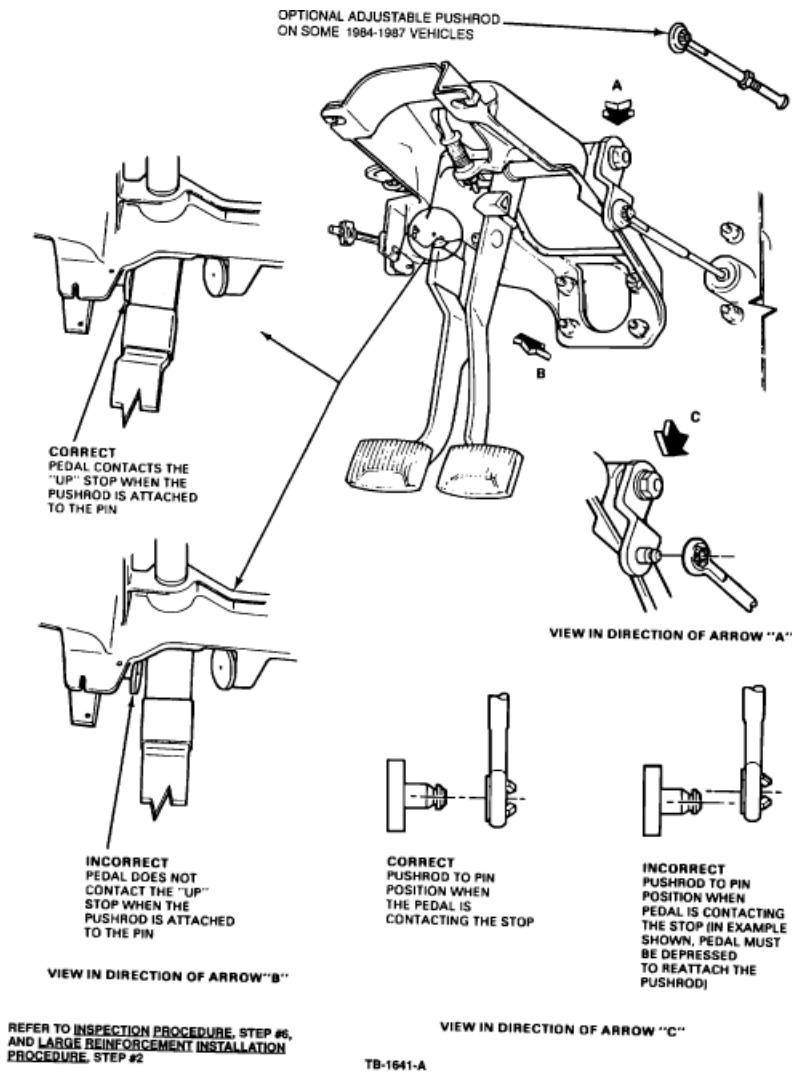


[Notes](#)

Inspection Procedure

1. If the truck is a 1988 or later model, confirm that the starter interlock switch operates (the engine can be started) with the clutch pedal at least 0.5" (12.7 mm) from the floor.
2. Test drive the truck and check for good [clutch](#) release. There should be no grinding of the gears, particularly when shifting from neutral to reverse [gear](#).
3. If the truck passes these tests, go to the Small Reinforcement Installation Procedure Section of this article.
4. If either of the above conditions are not met, check the hydraulic system for air. Refer to the Suggested Bleeding Procedure at the end of this article.
5. Test drive the truck and check for improved [clutch](#) release.
6. If there is no improvement, proceed as follows:
 - a. Remove the [clutch master cylinder](#) pushrod from the release lever pin on the release lever.

Figure 1



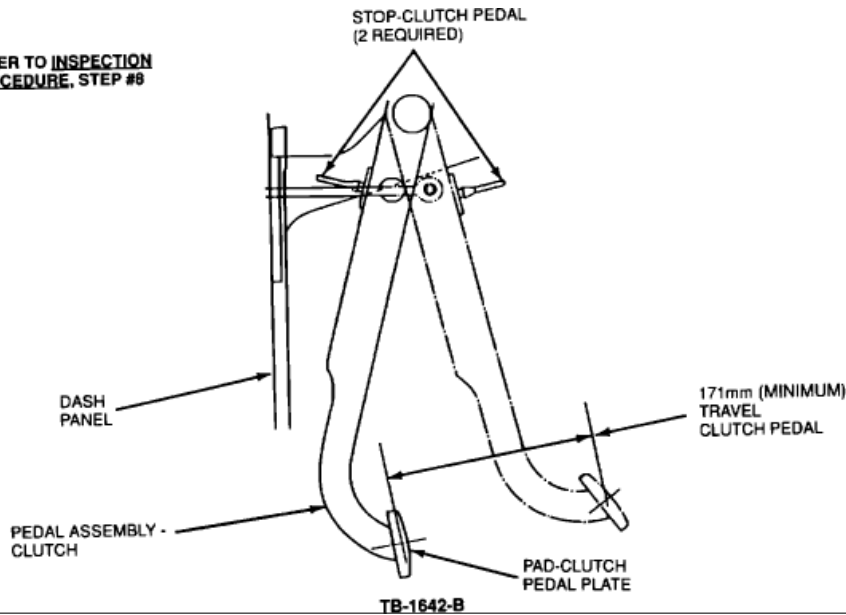
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- b. Make sure the hole in the pushrod lines up with the pin, for those units requiring a minimal force for installation, Figure 1.
 - c. If it does not line up correctly, install an adjustable pushrod (except 1988 and later models) or replace the clutch release lever (required on 1988 and later models), cutting a new seat on the cross shaft splines.
7. Test drive the truck again, checking for improved [clutch](#) release.

Figure 2

REFER TO INSPECTION
PROCEDURE, STEP #8

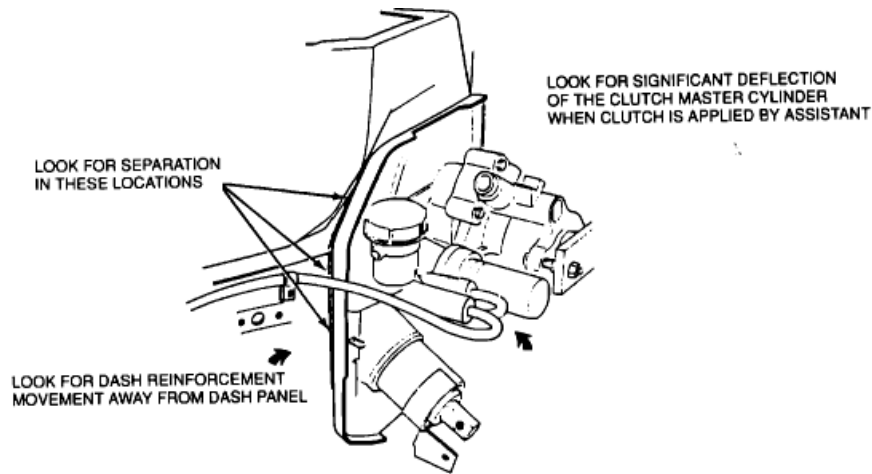


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8. If there is no improvement, inspect the truck for adequate release bearing travel.
 - ^ It should be 11 mm or greater for full pedal travel.
 - ^ Pedal travel at the center of the pedal pad should be 6.75" (171 mm minimum) or more, Figure 2.
9. Release bearing travel and [gear](#) grinding noise may indicate the following concerns.
 - ^ If the release bearing is 11 mm or greater and there is grinding of one or two gears only, the concern is probably with the transmission.
 - ^ If all gears grind, the concern may be with the [clutch](#) and/or [pilot bearing](#) which will need replacing.
 - ^ If the release travel is less than 11 mm, check the clutch hydraulic system for air and bleed as necessary.
10. If the release travel is still less than 11 mm, with all of the above items eliminated, proceed as follows:
 - a. Raise the hood, while an assistant operates the clutch pedal.
 - b. Watch the [clutch master cylinder](#) for significant deflection.

Figure 3



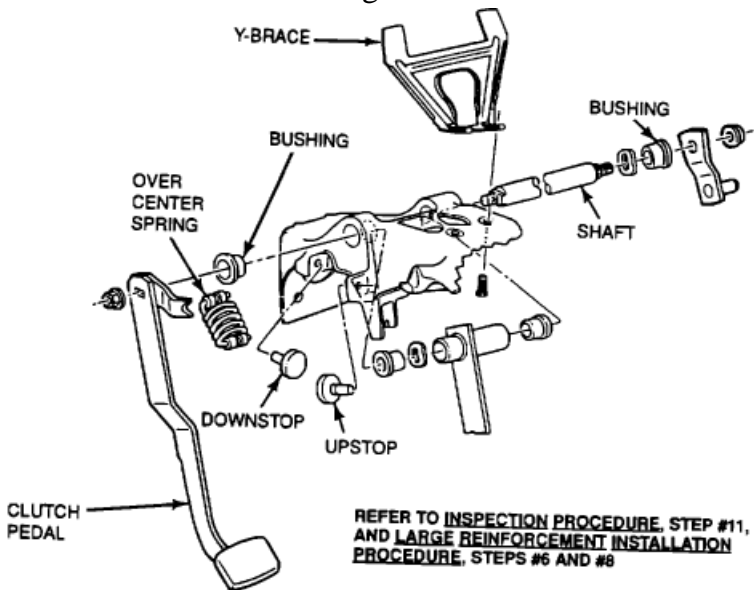
REFER TO INSPECTION PROCEDURE, STEP #10

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- c. Look for the dash reinforcement moving away from the dash, Figure 3.
 - d. On 1987 and earlier models, look down inside the cowl cover at the cowl where it is attached to the dash reinforcement. Check for pulled spot welds.
11. If there is significant movement of the dash or [clutch master cylinder](#), proceed as follows:
- a. Remove the steering column and its dash toe plate and seal. Refer to the appropriate Light Truck Shop Manual, Section 13-07 for service details.
 - b. Inspect the dash inside the cab and look for:
 - ^ Pulled spotwelds and cracked or torn sheet metal.
 - ^ Cracks in the brake and clutch pedal support

Figure 4



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^ Missing Y-brace fasteners and a broken or detached Y-brace, Figure 4.

12. Check the cross shaft bushings for wear if the brake pedal moves when the [clutch](#) is depressed and vice versa. Replace them as required.

NOTE: GENERALLY, TRUCKS WITH SIGNIFICANTLY LESS THAN 11 MM [CLUTCH RELEASE BEARING](#) TRAVEL (AFTER COMPLETING THE INSPECTION PROCEDURE AND CORRECTING WHERE NECESSARY) WILL HAVE SIGNIFICANT DASH DAMAGE FROM PULLED SPOTWELDS AND TORN METAL. THESE TRUCKS WILL REQUIRE EXTENSIVE REPAIR. THEREFORE, GO TO THE LARGE REINFORCEMENT INSTALLATION PROCEDURE.

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..... ■ [Small Reinforcement Installation Procedure](#)

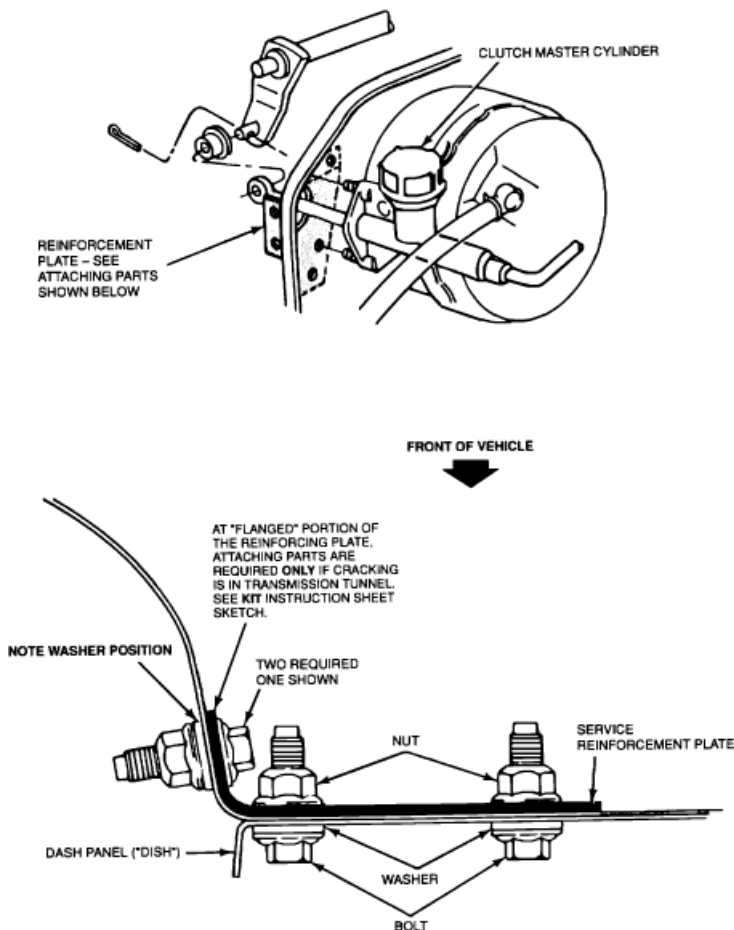
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[Notes](#)

Small Reinforcement Installation Procedure

Figure 5

REINFORCEMENT PLATE INSTALLATION TO DASH PANEL

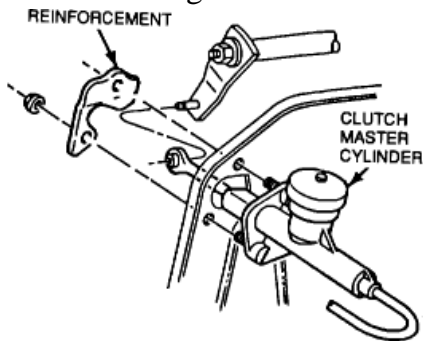


REFER TO SMALL REINFORCEMENT INSTALLATION PROCEDURE (1987 AND PRIOR VEHICLES)

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Figure 6



REFER TO SMALL REINFORCEMENT INSTALLATION PROCEDURE, 1988 AND LATER VEHICLES, STEP #3

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There are two small reinforcement kits. One for 1988 and later models and one for 1987 and prior models. This is necessary because a new hydraulic [clutch master cylinder](#) mounting pattern was introduced for 1988 models.

1987 And Prior Trucks

Use reinforcement kit E3TZ-7K509-A on these trucks, Figure 5. Comprehensive installation instructions are included in this kit.

1988 And Later Trucks

Use reinforcement kit E8TZ-7K509-A on these trucks. The only part in this kit is the special reinforcement for these trucks. To install it, proceed as follows:

1. Remove the two [clutch master cylinder](#) attaching nuts (13 mm) from inside the truck.
2. Position the reinforcement in place over the [clutch master cylinder](#) studs.
3. Re-install the two master cylinder nuts, Figure
6. Tighten to 9.5 - 14.9 N-m.

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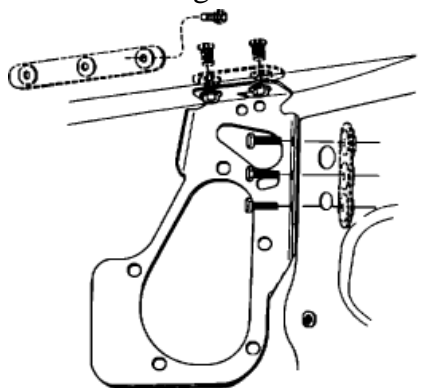
■ **Large Reinforcement Installation Procedure**



[Notes](#)

Large Reinforcement Installation Procedure

Figure 7



REFER TO LARGE REINFORCEMENT
INSTALLATION PROCEDURE

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Use reinforcement kit E3TZ-7K509-B on all 1983-1991 Bronco/F-Series trucks with hydraulic clutch controls. The kit consists of the following items:

^ A main reinforcement or doubler, with a plate having two studs to clamp the doubler through the cowl inner

^ Two additional pieces with three threaded holes:

One plate helps attach the main doubler through the dash inner tunnel. The other large piece is placed inside the front of the cowl, with bolts driven through from the engine compartment side of the dash reinforcement, see Figure 7.

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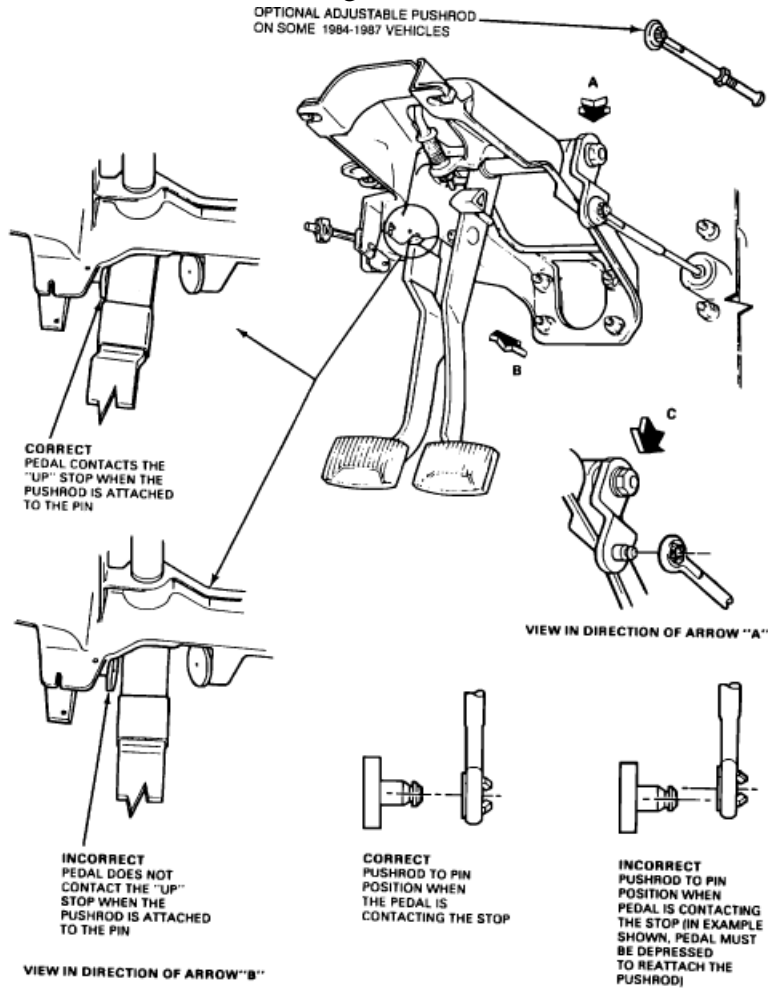
■ **Installation**

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Installation

Figure 1



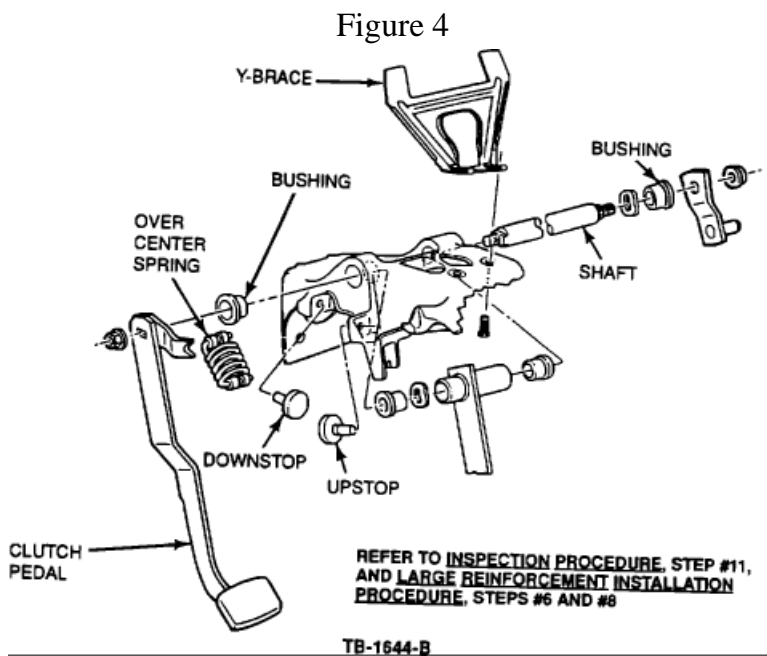
REFER TO INSPECTION PROCEDURE, STEP #6, AND LARGE REINFORCEMENT INSTALLATION PROCEDURE, STEP #2

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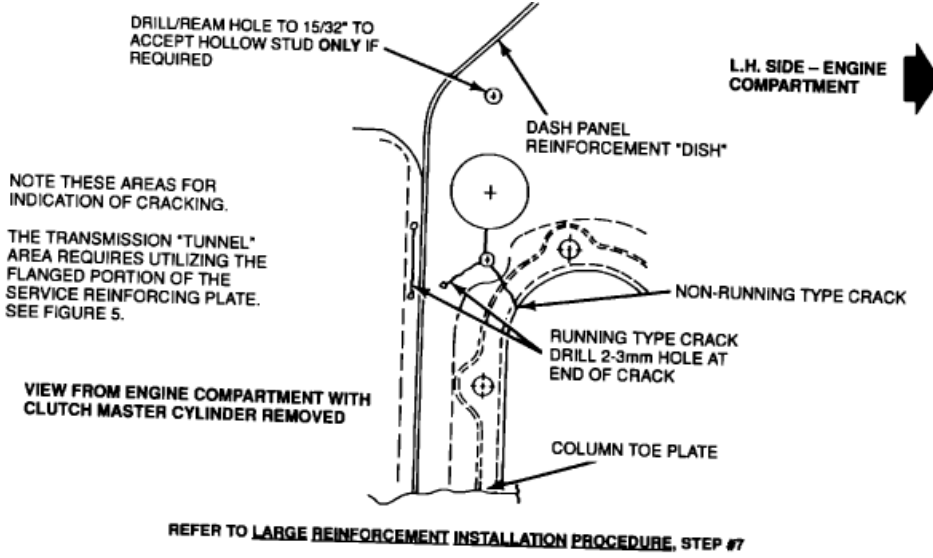
1. Remove the insulating material.

- a. On earlier models, remove the instrument panel lower sound insulator assembly.
 - b. For later diesel powered trucks, remove the fasteners holding the engine compartment dash insulation in place.
 - c. Pull the dash insulation back out of the way.
 - d. Disconnect the battery ground cable.
2. Disconnect the [clutch master cylinder](#) pushrod from the lever, removing the pushrod retention clip on older models, Figure 1.
 3. Remove the two nuts attaching the [clutch master cylinder](#) to the dash panel.
 - a. Pull the master cylinder into the engine compartment.
 - b. For, 1988 and later trucks, it will be necessary to disconnect the wiring harness connector from the pushrod switch.
 - c. Rotate the master cylinder to get it past the switch through the dash opening.
 4. Remove the steering column and dash toe plate by removing the five (5) fasteners.
 5. Disconnect the brake master cylinder pushrod from the brake pedal.
 6. On F-Super Duty, proceed to Step 7. On all units except F-Super Duty, proceed as follows:
 - a. Remove the four brake booster attaching nuts.
 - b. Move the brake booster to one side.



- c. Loosen the two (2) fasteners attaching the brake and clutch pedal support to the Y-brace, Figure 4.
7. Check for cracks.
 - a. Pull back the floor covering and dash sound insulator. (it may be helpful to remove the accelerator pedal.)
 - b. Inspect the area for pulled welds and torn dash sheet metal.

Figure 8



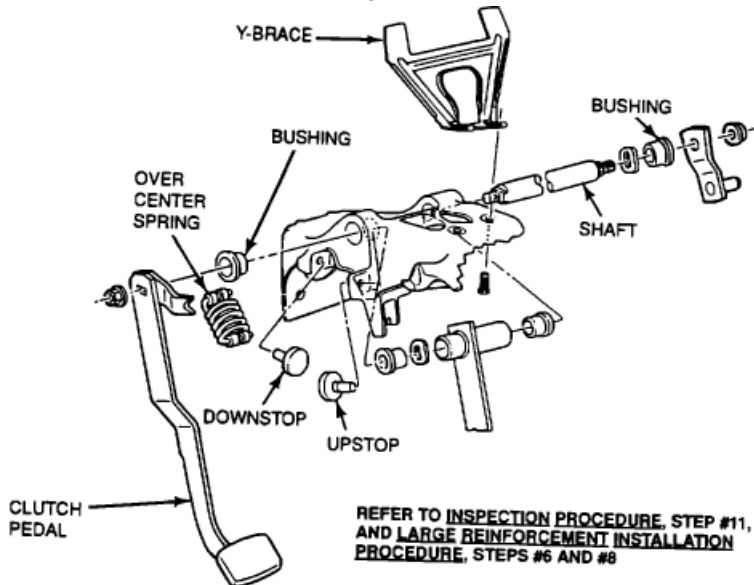
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- c. If there are cracks that have not run out, stop them by drilling a 2-3 mm hole at the end, Figure 8.
NOTE: WELDING OR BRAZING IS NOT RECOMMENDED, BECAUSE IT COULD BE A SOURCE OF FUTURE BLIND SIDE CORROSION.

Figure 4



TB-1644-B

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8. Thoroughly inspect the brake and [clutch](#) support again for cracks in the casting and worn bushings. Also, inspect the "Y" brace for cracks and missing fasteners. Replace as necessary, Figure 4.
9. Remove excess body sealer in the area of the [clutch master cylinder](#), inside the dash.
10. Carefully remove the cowl top cover 12 fasteners (7 in front, 5 in rear).

NOTE: IT MAY BE NECESSARY TO REMOVE THE RADIO ANTENNA AND REPOSITION THE HOOD TO ACHIEVE THIS. IF THE HOOD IS REMOVED, MARK THE LOCATION OF THE HINGES WITH A WAX PENCIL, PRIOR TO LOOSENING.

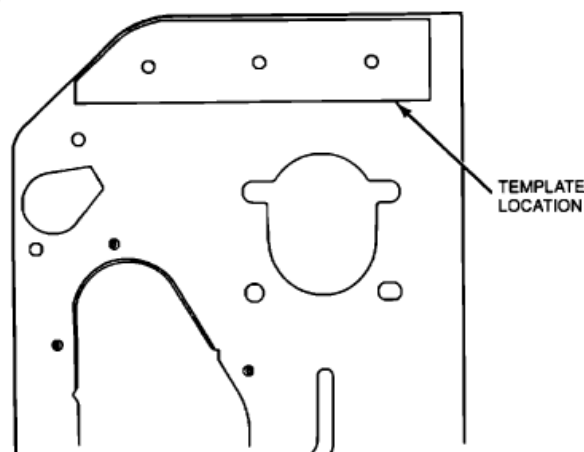
11. Place the main reinforcement in position.
 - a. Locate positively, using the lower steering column toe plate fastener and a bolt and nut (8 mm or 5/16") through the upper [clutch master cylinder](#) stud hole.

NOTE: THE SHEET METAL VARIES FROM TRUCK TO TRUCK AND IT MAY BE NECESSARY TO BEND THE REINFORCEMENT TO GET A GOOD FIT.

- b. Tighten the upper nut and bolt securely to compress any distortion in the four sheet metal laminations in this area.
12. Drill the holes for the reinforcement plate.
 - a. Using a 3/8" (9.5 mm) drill bit, with the reinforcement as a template, drill two holes up into the cowl inner and three holes into the inner side of the dash.
 - b. De-burr the outside of the holes as necessary.
 - c. Remove any excess sealant in the area and clean up the drill chips inside the truck and cowl.
13. Attach the smaller plate via the three threaded holes into the engine compartment side of the dash inner panel.
 - a. Use three 8 mm bolts passed through the main reinforcement, from inside the cab.
 - b. Install the rubber cap (N804118) onto the end of the uppermost screw from under the dash.
 - c. Position the plate with the two studs attached inside the cowl, through the two holes drilled from below.
 - d. Attach two 8 mm nuts from the inside of the cab.
14. Using the paper template provided in the kit, proceed as follows:

Figure 9

TEMPLATE LOCATION FOR DASH



REFER TO LARGE REINFORCEMENT
INSTALLATION PROCEDURE, STEP #14

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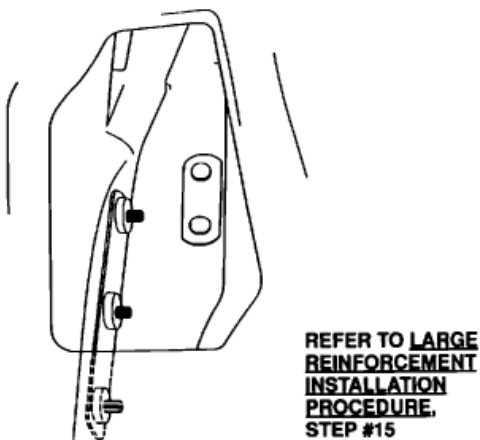
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- a. Center punch and drill three 3/8" (9.5 mm) holes into the dash reinforcement and through the cowl, from the engine compartment side, Figure 9.

NOTE: DRILLING WILL BE EASIER IF THERE ARE NO SPOTWELDS VISIBLE THROUGH THE THREE HOLES.

- b. If necessary, move the pattern outboard slightly to avoid any visible spotwelds.
- c. De-burr the holes inside the cowl as necessary and clean up the drill chips inside the cowl.

Figure 10
VIEW INSIDE COWL SHOWING
INSTALLATION OF PLATES



TB-1650-A

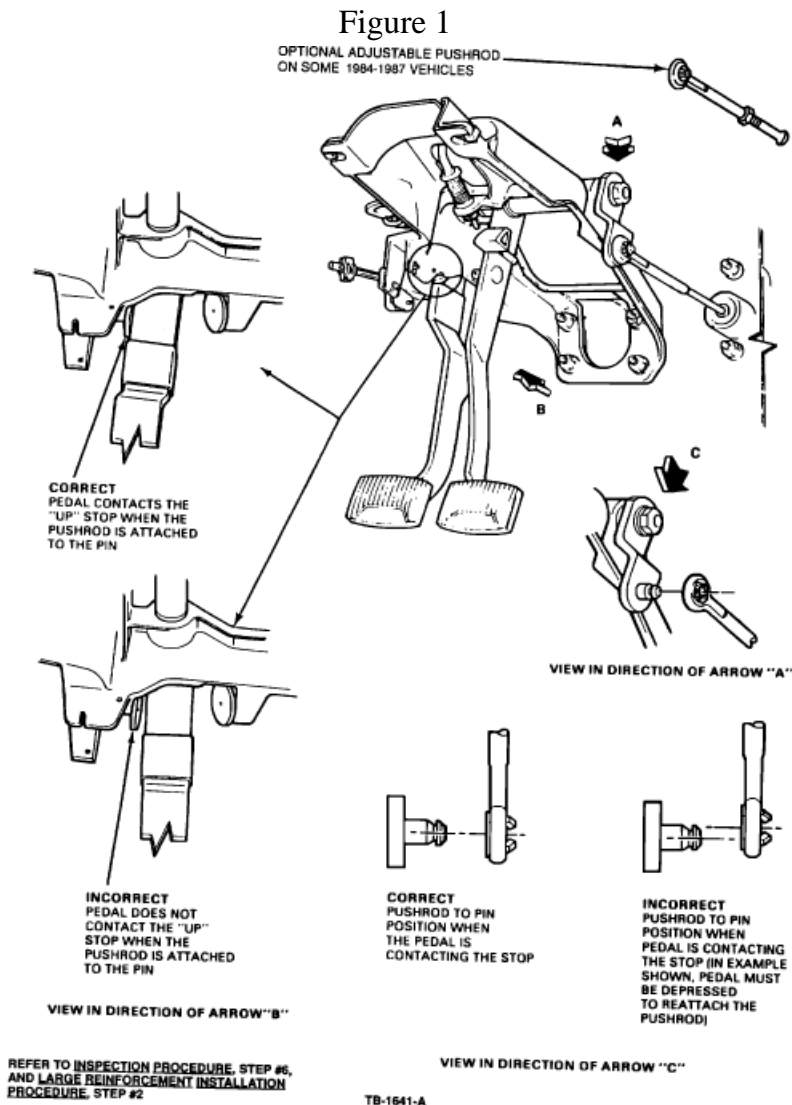
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15. Place the larger three holed plate from the kit inside the cowl. Attach it with three 8 mm bolts through the dash reinforcement, from the engine compartment side, Figure 10.
16. Inspect the seam between the cowl inner and outer, inside the cowl, for cracks in the sealant. If necessary, add sealant.
17. Replace the cowl top.
 - a. If the hood was removed, locate the hinges to the wax pencil marks and tighten the fasteners.
 - b. Replace the radio antenna and windshield washer tube.
18. Re-install the brake booster and stoplight switch, if removed. Tighten the brace bolts.
19. Install the [clutch master cylinder](#).
 - a. Inspect the [clutch master cylinder](#) for leaks in the area of the pushrod. Replace it if there is evidence of leaking.
 - b. Remove the nut and bolt from the top of the reinforcement.
 - c. Install the [clutch master cylinder](#).
 - d. Inspect the position of the [clutch master cylinder](#) pushrod hole. The pushrod hole should go onto the lever pin with no force required while the pedal is against the upstop.

NOTE: ALTHOUGH THIS WAS SPECIFIED IN THE INSPECTION PROCEDURE, REPAIR MAY HAVE CHANGED THE SETTING.

e. If the pushrod hole is not in position, install and adjust an adjustable [clutch master cylinder](#) pushrod (1987 and prior models) or install a new lever (7A554).



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NOTE: THE NEW LEVER IS TIGHTENED INTO PLACE WHILE THE MASTER CYLINDER PUSHROD IS ATTACHED, TO SET THE CORRECT POSITION, FIGURE 1.

20. Remove the toe plate fastener from the bottom of the reinforcement and reinstall the steering column and five (5) fasteners.

21. Complete reassembly.

- a. Re-install the dash sound deadener material and the instrument panel sound insulator.
- b. Re-install the engine compartment sound insulator on diesel models.
- c. Connect the battery ground terminal.

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. ■ **Final Inspection**



[Notes](#)

Final Inspection

If the truck has been driven for a long period of time with the broken dash and resulting poor [clutch](#) release, the [clutch disc](#) could be excessively worn or buckled.

Test drive the truck, evaluating the [clutch](#) for clean release. If the release is not satisfactory, measure the release bearing travel.

^ If it has the required 12 mm at full clutch pedal stroke, then the [clutch](#) may need to be replaced.

^ If the release bearing has less than the required release travel, then the hydraulic system probably needs to be bled.

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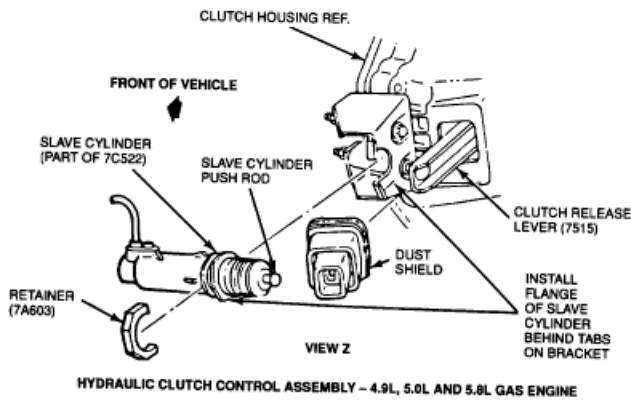
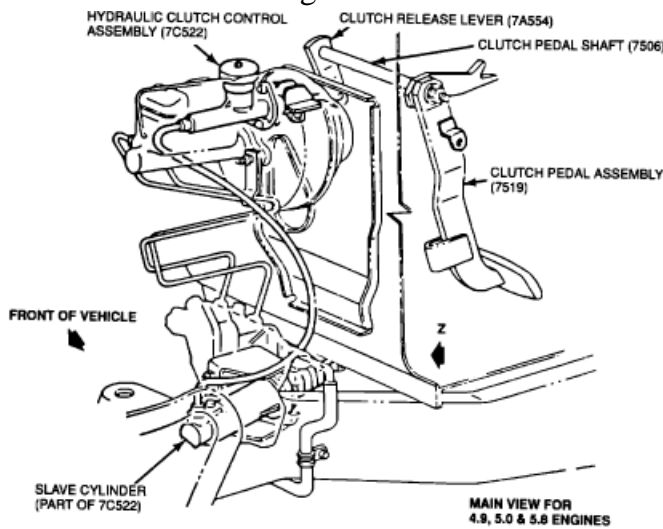
..... ■ [Suggested Bleeding Procedure - External Slave Cylinder](#)

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Suggested Bleeding Procedure - External Slave Cylinder

Figure 11

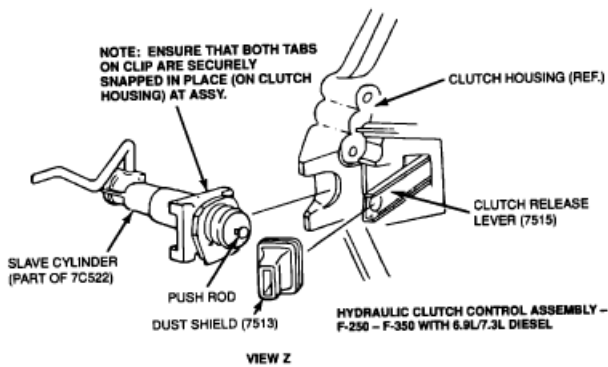
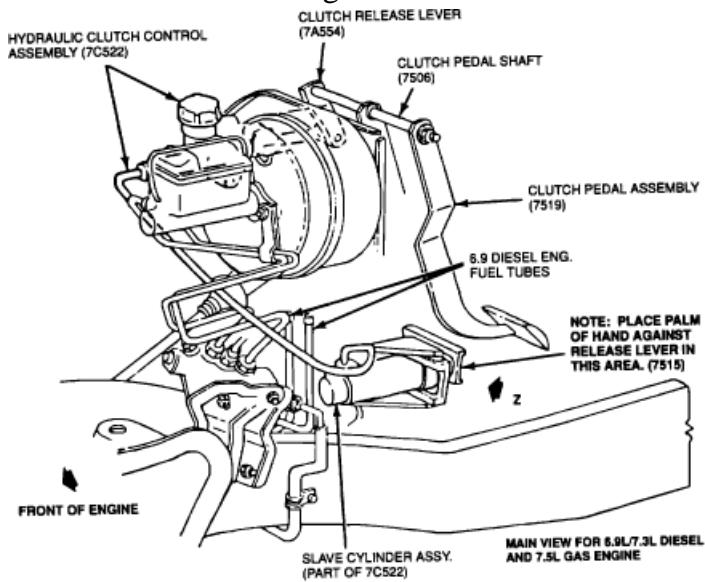


REFER TO SUGGESTED BLEEDING PROCEDURE
EXTERNAL SLAVE CYLINDER, STEP #3

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Figure 12



REFER TO SUGGESTED BLEEDING PROCEDURE - EXTERNAL SLAVE CYLINDER, STEP #3

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If the truck is a 1987 or prior model, 1988 model with a 7.3L Diesel, 7.5L EFI gas engine or the smaller family of engines with a Warner T-18 four speed transmission, proceed as follows:

1. Remove the master cylinder reservoir cap and diaphragm.
2. Check the fluid level to be sure it is at the step diameter of the reservoir. Do not over fill.
3. From below the truck, push the release lever slowly towards the front of the truck several times. Figures 11 & 12.
4. If it will not move, the master cylinder pushrod is not set correctly. See repair Step # 19.
5. Check the fluid level and replace the diaphragm and cap.

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..... ■ **Suggested Bleeding Proc - Internal Concentric Slave CYL.**

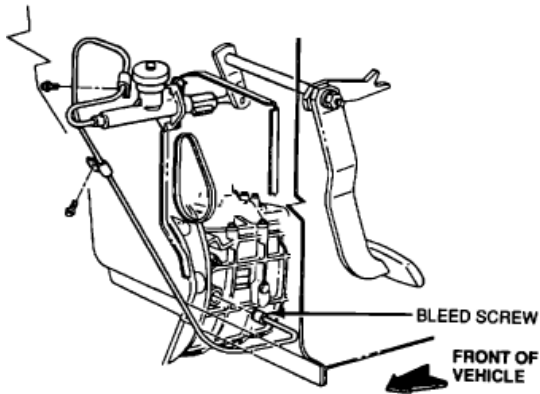
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Suggested Bleeding Proc - Internal Concentric Slave CYL.

Figure 13

1988 AND LATER MODELS WITH INTERNAL CLUTCH
CONCENTRIC SLAVE CYLINDER
4.9L/5.0L/5.8L ENGINES



REFER TO SUGGESTED BLEEDING PROCEDURE -
INTERNAL CONCENTRIC SLAVE CYLINDER, STEP #8

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If the truck has a concentric slave cylinder, proceed as follows:

1. Operate the clutch pedal at full stroke, 10-20 times.
2. Check the fluid level at the change in diameter part of the reservoir. Do not over fill.
3. Have an assistant depress the clutch pedal slowly and hold it down.
4. Open the slave cylinder bleed screw and watch for escaping air, Figure 13.
5. Close the bleed screw and have the assistant release pedal.
6. Repeat this cycle several times until there is no sign of air. Be sure to keep the reservoir topped to the correct level.
7. Replace the diaphragm and reservoir cover.

8. Operate the clutch pedal at full stroke 10-20 times.

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