

BRUCE COUTURE'S **MODERN DRIVELINE**

"FIVE AND SIX SPEED CONVERSION SPECIALISTS"

Fairlane 63-65 Hydraulic Clutch Master Cylinder Installation Instructions



Read These Instructions Completely Before Beginning

These instructions are for hydraulic master cylinder installations using an external slave cylinder or a hydraulic throw-out bearing. If your car has been modified from a stock configuration, certain steps may not apply. Existing alterations to your vehicle are your responsibility.

1.0 Tools and Notes

- 1.1 Drill motor, abrasive sanding disc, cut-off wheel, #7 drill bit, 1/4" & 21/64" drill bits, Sharpie marker, 5/16" 7/16" 1/2" 9/16" 5/8" wrenches and/or socket/ratchet, small & medium flat-tip screw drivers, pliers, tin snips, silicone sealant, vise, a second person.
- 1.2 Safety Equipment – Always wear ANSI approved safety goggles/glasses when working with metal and fluids. Wear proper gloves when working with hot surfaces and corrosive fluids.

2.0 Optional Parts

- 2.1 Firewall Steering Column Gasket
- 2.2 Nylon Pedal Bushings – Available from Modern Driveline

- 3.0 **Disassembly** - If your Fairlane is already disassembled, skip to the Assembly Instructions. If you are converting an automatic car, some disassembly steps do not apply.

- 3.1 Remove the brake master cylinder and power brake booster for power brake equipped cars. Plug/cap all open lines to prevent contamination and fluid leakage.
- 3.2 Remove all clutch linkage or automatic linkage from engine, transmission, frame and clutch pedal. From the clutch pedal, retain the keeper pin and spring washer. These two parts will be used on re-assembly.
- 3.3 Warning: Clutch pedal spring is under pressure. Use caution when removing. Remove the clutch pedal spring and all associated hardware. Do not remove the clutch pedal stop. The spring and spring attaching hardware will not be reinstalled. You may remove the clutch pedal for easier access.
- 3.4 Peel back your insulation, carpeting and steering column boot as required and remove the steering column block-off plates and retain. These will be trimmed later.



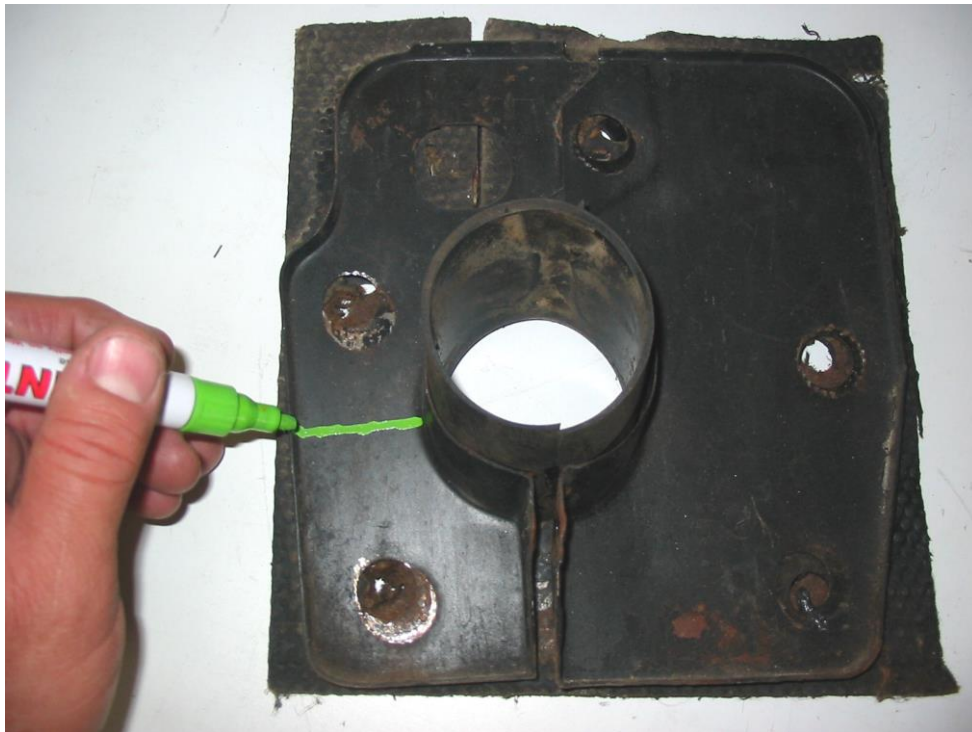
- 3.5 Take a mental note the position of the emergency brake cable housing and how far it sits away from the firewall. The cable housing will need to be pushed forward to touch the firewall by bending the emergency brake lever so it clears the actuation of the hydraulic clutch lever. Remove the emergency brake lever. To do this, remove dash mounting hardware and firewall hardware. Slip the lever aft, clearing the studs from the firewall. Shift the lever at an angle and push forward to clear the dash bracket. Remove the retainer clip holding the cable housing to the bracket. Remove the hair pin, wheel pin and wheel. Near the handle there is a spring loaded stop. Lift the stop and push the brake handle in and rotate counter-clockwise to expose the cable end swaged ball. Remove brake lever assembly from the car. This will be bent later.

4.0 Assembly

- 4.1 The pedal hangar must be installed in the vehicle to position the firewall plate correctly. The firewall has alignment holes for the pedal hangar assembly. These must be lined up to correctly position the firewall plate prior to drilling any holes.
- 4.2 Note: You may install the clutch pedal after firewall plate is completely installed. Re-install the clutch pedal with all previously removed nylon bushings. Re-install the spring washer and keeper pin on the end of the clutch pedal. Actuate clutch pedal for freedom of movement and press on brake pedal to verify smooth operation.
- 4.3 Position the supplied plate inside the car, butting the top of the plate against the bottom of the pedal hangar assembly. To install the plate, the easiest way is to install from the passenger side of the steering column, behind the emergency brake cable but in front of the speedometer cable, moving the speedometer cable around the edge of the plate after positioning. With the top of the plate horizontal, slide the plate left to right so the clearance to the steering column is less than 1/4" (just enough room for the steering column boot). Mark the top and bottom hole with a Sharpie and drill (2) 21/64" holes in the firewall.
- 4.4 Position the spacer block (backwards – studs in spacer block going thru holes) aligning the holes. Using a Sharpie, mark the firewall steering column cut-out to trim off the upstanding lip so the spacer block will sit flat when installed and mark the 1 3/8" hole to be cut out where the master cylinder push rod will go thru. Do not cut away the flat part of the firewall you drilled the two 5/16" holes thru. Note: Do not be alarmed - the spacer block does not sit completely on the firewall. Use a 1 3/8" hole saw or a nibbler to create the hole for the master cylinder pushrod and boot. Trim the upstanding lip of the firewall to clear the spacer block. Deburr all holes.



- 4.5 Temporarily install the plate and spacer block. Make sure the spacer block does not interfere with the upstanding lip of the firewall. Make sure the 1 3/8" hole for the master cylinder has no interference so the boot will not get cut.
- 4.6 Back inside the vehicle, verify the top of the supplied plate is horizontal. Drill the 1/4" holes to support the plate. Remove and deburr. You may drill additional holes for support including the clevis attached to the plate and install a 5/16"-24 short bolt.
- 4.7 Clean surfaces of steering column boot, supplied plate and spacer block. Apply a thin layer of silicone sealant around edges of plate and surface of spacer block. Install spacer block using 5/16 bolts. Install 1/4" hardware in remaining holes in plate. From engine compartment side, press gasket against plate to seal gasket and plate together. Squeeze sealant into small gap between spacer block and steering column boot to fill void. Do not over fill, it will protrude into the 1 3/8" hole for the master cylinder.
- 4.8 Take your existing steering column block-off plates and trim to the bottom of the supplied plate. Install with silicone sealant and exiting removed fasteners. You may add holes and fasteners to these plates if you wish. Note: the passenger side plate may not need trimming based on fastener direction. Evaluate before trimming.



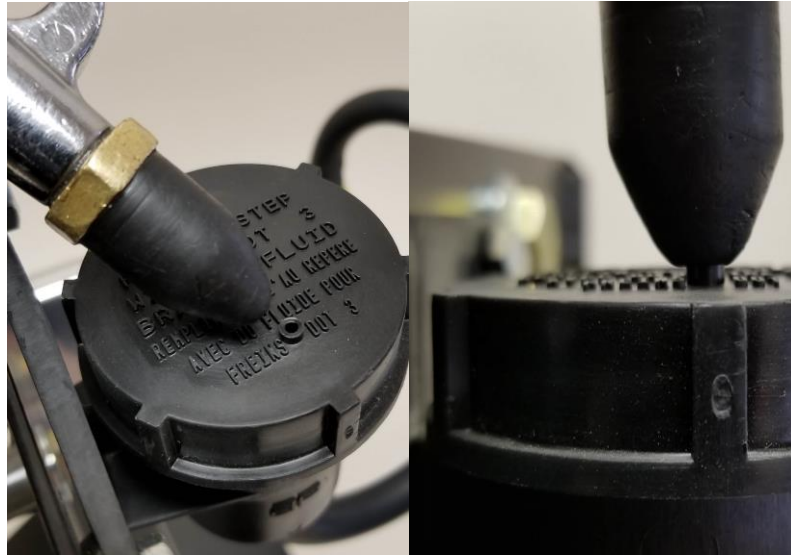
- 4.9 Reset your insulation and carpeting, trimming to clear the new master cylinder location as required.
- 4.10 Adjust your clutch pedal stop to the top of the pedal hangar, making sure the stop is level. Note: If your vehicle is equipped with factory power brakes, the pedals will not sit evenly.

- 4.11 Re-install clutch pedal if not already installed from prior step. Apply a thin layer of silicone to the mating surface of the master cylinder and spacer block. Install master cylinder thru hole in spacer block and tighten nuts. Install clevis on master cylinder to the end of the threads. Temporarily install pin thru master cylinder clevis. Install studded rod-end on lever. Install non-studded rod end on pedal using 5/16-24 x 1.25" bolt and nylon lock nut.



- 4.12 Verify actuation – the clutch pedal should bottom out on the carpeting at the same time the master cylinder bottoms out, or the pedal will bottom out on the cowl at the end of the pedal stroke. If you have no carpeting or insulation under the clutch pedal or the pedal has been modified, a stop block is recommended so the master cylinder will not be damaged. If the pedal bottoms out on the carpeting without bottoming out the master cylinder no further adjustments are necessary until the hydraulic system is activated with the clutch. If the pedal stops before hitting the carpeting, loosen the stop nut on the master cylinder clevis, remove the rod-end from the clutch pedal and pin from the clevis. Checking in ½ turn increments, adjust the master cylinder clevis until the pedal stops against the carpeting, reattaching hardware and adjusting the clutch pedal rod-end as required. Once adjustments are complete, install plastic washer between lever and clevis and install C-clip on dowel pin. Tighten all nuts. Verify no binding of rod-end and clevis against lever and clutch pedal. Actuation should be smooth. Re-install brake master cylinder and bleed brakes as required. **Note: to keep from having an “over-center” pedal pressure condition, the rod ends may be no lower than parallel to the steering column with the pedal in the returned position.** Because there are multiple ways to adjust your clutch pedal and master cylinder, you may find the clutch pedal stop does not need to be all the way to the top of the hangar. Adjust as necessary to maintain the parallel relationship of the rod ends to the steering column. Verify the master cylinder rod travels the full stroke of 1.35” to 1.4” for proper clutch release.

- 4.13 With the emergency brake lever still removed from the car, position the cable housing end of the bracket in a vice. Bend bracket so the cable (when re-attached/installed) will be closer to the firewall. Reinstall emergency brake lever in reverse order as removal, noted in the last step of the disassembly instructions. Verify clearance. There is also a supplied “P Clamp” you may use to hold the emergency brake cable housing closer to the firewall if you choose not to bend the bracket. Position the P clamp so it does not interfere with the actuation of the clutch master cylinder components. Use an existing removed block off plate fastener for P clamp installation, or equivalent.
- 4.14 Locate and mount the reservoir anywhere above the master cylinder. Mark the hole locations with a Sharpie. Using ¼” sheet metal screws, pre-drill holes using a #7 drill bit prior to attaching reservoir. Install reservoir using 3/8” wrench or socket/ratchet. Do not over-tighten. Attach the reservoir line to the barbed inlet fitting on the master cylinder cutting reservoir line to proper length as required. Make sure reservoir line does not interfere with any moving parts.
- 4.15 Do not over tighten fittings – this will cause damage to the seat of the hose end and fittings. Attach the steel braided line to the 90 degree elbow on the master cylinder and slave cylinder or hydraulic throw out bearing making sure line has clearance to exhaust system and will not interfere with any moving parts. Once steel braided line is positioned for routing and clearance, tighten jam nut on the 90 degree fitting in the master cylinder. Note: There is an o-ring under the jam nut. **Do not adjust 90 degree elbow more than ½ turn in either direction.**
- 4.16 Close the bleed screw on the slave cylinder or hydraulic throw out bearing. Remove the bladder & fill reservoir with DOT 3 brake fluid. Do not install bladder at this time. Install cap tightly.
- 4.17 **Caution: Always wear ANSI approved goggles/glasses when working with fluids. Wear proper gloves when working with corrosive fluids.** Purging of air and filing the hydraulic system. Pressure bleeding is the only way to remove all the air from the system. Pedal pumping will not work as it causes air bubbles to be trapped in the line and will not pass.
- 4.17.1 Loosen the bleed screw on the slave cylinder or hydraulic throw-out bearing. Allow gravity to fill the system until fluid comes out the bleed screw then close. Top-off reservoir and re-install cap.
- 4.17.2 Using a second person, open the bleed screw and apply 5-10 psi thru the vent hole in the reservoir cap using a rubber tipped air nozzle. **Air pressure must be regulated to ~10 psi for safety.**



- 4.17.3 Since the reservoir is small, the bleed screw should only be open for about 5 seconds. You will see a solid stream of fluid come out, followed by air bubbles, followed by another solid stream of fluid. Immediately close the bleed screw when you see the second solid stream of fluid to prevent draining the reservoir.
- 4.17.4 Top off fluid to the step line in the reservoir and install bladder and cap. Do not overfill or brake fluid will spill over.
- 4.18 With the **NOT** running and system full of fluid, cycle the clutch pedal a few times. You should have clutch *feel* but it will not be a *heavy clutch*. If the slave cylinder does not move at the beginning of the clutch pedal movement, there is still air in the system. Repeat the above process as necessary.
- 4.19 Position rear wheels on jack stands (free to rotate). With transmission in neutral, start car. Push in clutch pedal. Transmission should go into 1st gear easily. Slowly release clutch pedal. Pedal should start to engage the clutch at a comfortable level of the pedal travel (about 1.0"-1.5" from floor). Adjust slave cylinder first, master cylinder second, to change clutch engage/release point. A new or rebuilt transmission should have all the gears run thru (in the driveway, partially releasing clutch) before road testing the new hydraulic clutch.
- 4.20 Remove jack stands and test drive. Upon return, verify steel braided line clearance and support. The line should never come in contact with the exhaust.
- 4.21 If the clutch feels spongy or releases too close to the floor, repeat step 4.17. FYI – micro bubbles may be present in the system due to actuation, accumulation on rubber parts, and machining marks within the system. Repeating step 4.17 is recommended, before or after test driving.
- 4.22 Further assistance and tech support is available by calling Modern Driveline at 208-453-9800 M-F 8-5 Mountain time or E-mail Tech@moderndriveline.com

4.23 Enjoy your new hydraulic system and Thank You for “Making it Modern” We appreciate your business.

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