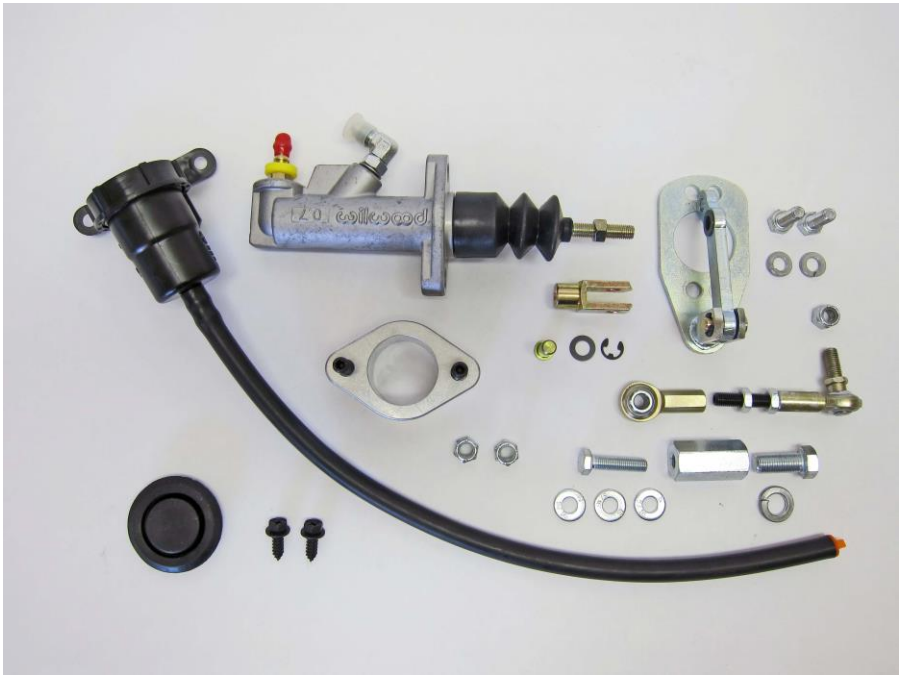
BRUCE COUTURE'S MODERN DRIVELINE

"FIVE AND SIX SPEED CONVERSION SPECIALISTS"

Mustang 65-66, 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, #7 drill bit, 1/4" & 21/64" drill bit, Sharpie marker, 3/8" 7/16" 1/2" 9/16" 5/8" wrenches and/or socket/ratchet, 1 3/8" hole saw, small & medium flat-tip screw drivers, pliers, silicone sealant, loc-tite, tubing cutter, double-flare flaring tool, masking tape, razor blade, ball point pen, a second person.

1.2 This Hydraulic Master Cylinder Kit does not utilize the stock clutch push-rod hole location. For your vehicle a new location was chosen to eliminate interference with multiple brake configurations that are available in both stock and aftermarket applications. This Kit will require you to re-locate your stock *front* brake line distribution block.

1.3 Safety Equipment – Always wear approved ANSI approved safety goggles/glasses when working with metal and fluids. Wear proper gloves when working with hot surfaces and corrosive fluids.

2.0 Disassembly

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

2.1 Remove brake master cylinder and brake booster as required. Disconnect brake lines from distribution block. Note: you may only need to remove the brake lines from the master cylinder and line routing to the passenger side of the car. Carefully lower the distribution block approximately 2". Do not kink brake lines. Do not re-attach at this time.

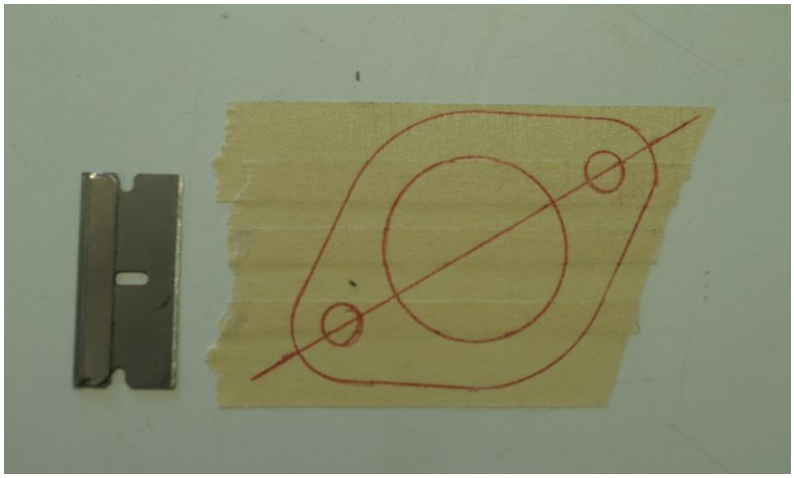
2.2 Do not remove the clutch pedal or clutch fork. Remove all clutch linkage or automatic linkage from engine, transmission, frame and clutch pedal.

2.3 **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.

3.0 Assembly

3.1 Note: our mock-up vehicle has certain items removed and cut away for clarity. The fender apron is the guide for locating the holes for the spacer block and firewall plate. Create a template by applying masking tape in overlapping strips onto a removable surface that you can cut on. Trace the outside of the spacer block and the large hole using a ball point pen. Remove the spacer block and draw a line running from tip to tip (centered). Lay the firewall plate on top and add the two 5/16" fastener holes to the template.

3.2 Apply masking tape to the firewall in the engine compartment where the spacer block will be installed. Position the spacer block about 1/8" below the bottom of the wire harness connector. Holding the block in place with the firewall plate setting on the studs and the plate positioned against/next to the fender apron, trace a line around the block.



3.3 Cut-out the template created in step 3.1, inside the lines, and position over the outline on the firewall. Make sure the area inside the car is clear and drill two 21/64” holes.

3.4 Using a second person, position the spacer block and temp install fasteners thru the firewall. The firewall plate should be butted against the bottom of the wire harness connector. Note: If the firewall plate does not sit flat on the firewall, grind the edge of the firewall plate at an angle so it will.

3.5 With the spacer block temp installed and secured to the firewall, back drill thru the center of the spacer block using a 1 3/8” hole-saw or equivalent. Some marring may occur on the inside of the spacer block.

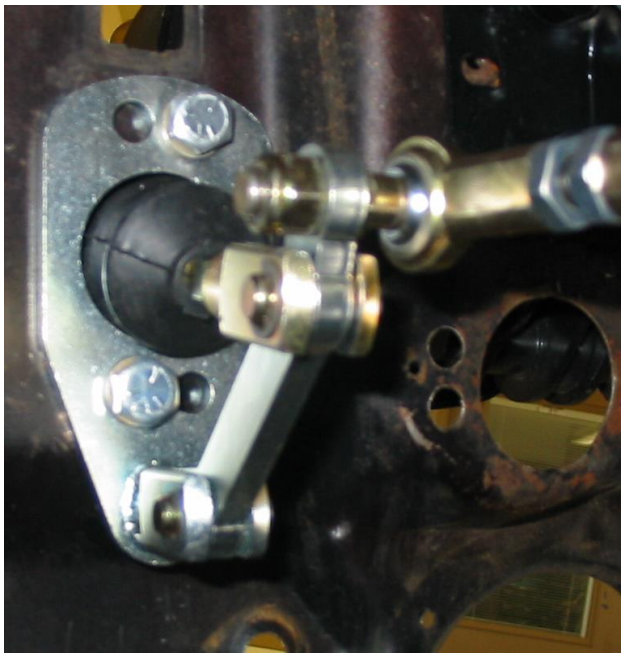
3.6 Remove master cylinder spacer block. Touch-up and deburr firewall as required.

3.7 Clean surfaces of supplied plate, firewall and spacer block. Apply a thin layer of silicone sealant around edges of body plug, plate and spacer block. Install spacer block and plate using 5/16 x ¾" bolts and lock washers. Install body plug in old clutch rod hole as required.

3.8 Re-attach brake lines and distribution block to inner fender wall *below* the bottom of the spacer block. Note: bending the brake line going to the driver's side may eliminate the need to cut and modify the passenger side brake line. Brake master cylinder line will vary based on configuration (power/non-power). Be careful not to kink brake lines.

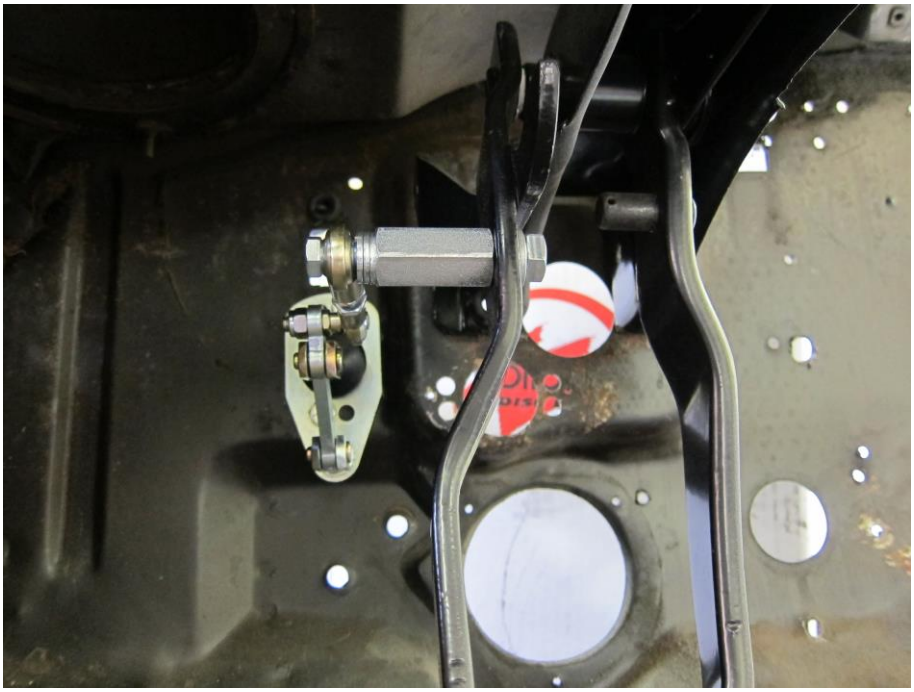
3.9 Reset your insulation and carpeting, trimming to clear the new master cylinder location as required.

3.10 Note: if you plan on making multiple fit-checks with the master cylinder, apply some grease to the dust boot – it fits snugly within the block and may be difficult to remove once installed. 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 fasteners. Temporarily install pin thru master cylinder clevis. Install Hex spacer on outboard side of clutch pedal using 7/16-20 bolt and lock washer. Attach the non-studded rod-end with 3 washers to the Hex spacer and temporarily tighten using 1/2" wrench. With the clutch pedal in the full up position, adjust and attach the other female rod end thru the top eye of the lever using 5/16"-24 nylon lock nut.



3.11 Verify actuation – the clutch pedal should bottom out on the carpeting at the same time the master cylinder bottoms out. If you have no carpeting or insulation under the clutch pedal, 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, loosen lock nut and remove the rod end on the lever. Checking in ½ turn increments, adjust the master cylinder clevis until the pedal stops against the carpeting, reattaching hardware and adjusting the rod-end as required. Once adjustments are complete, tighten clevis jam nut and install plastic washer between lever and clevis and install C-clip on dowel pin. Re-install rod-end hardware

and tighten jam nut between rod-ends. Verify no binding of rod-ends and clevis against lever and clutch pedal spacer. Actuation should be smooth. The rod-end attached to the hex spacer should push "straight" without side-loading. Adjust the amount of washers to achieve straight actuation. You'll want to use loc-tite on the threads of the rod-end, hex spacer and bolt threads, after determining the correct washer stack-up. Verify the master cylinder rod travels the full stroke of 1.35" to 1.4" for proper clutch release.



3.12 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. Make sure reservoir line does not interfere with any moving parts.

3.13 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.**

3.14 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.

3.15 **Caution: Always wear ANSI approved goggles/glasses when working with fluids. Wear proper gloves when working with corrosive fluids.** Purging the system – Pressure bleeding is the only way to remove all the air from the system. 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. 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 5-10 psi or you could damage components.** 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. Top off fluid to the step line in the reservoir and install bladder and cap. Do not overfill or brake fluid will spill over.

3.16 Do not start car at this time. With system full of fluid, test by actuating pedal a few times. You should have clutch *feel* but it will not be a *heavy clutch*. Repeat the above process if necessary.

3.17 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.

3.18 Remove jack stands and test drive. Upon return, verify steel braided line clearance and support. The hydraulic lines should keep away from the exhaust and clutch assembly.

3.19 If the clutch feels spongy or releases too close to the floor, repeat step 3.15. FYI – micro bubbles may be present in the system due to actuation, accumulation on rubber parts, and machining marks within the system. Repeating step 3.15 is recommended, before or after test driving.

3.20 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

3.21 Enjoy your new hydraulic system and Thank You for choosing Modern Driveline. We appreciate your business.

Modern DriveLine offers a complete line of **Vehicle Specific** Hydraulic Kits and we're adding more all the time.