’70-74 Dodge Challenger/Cuda

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

- Drill motor, 5/16 drill bit, Sharpie marker, 5/16” 7/16” 1/2” 9/16” wrenches and/or socket/ratchet, silicone sealant, loc-tite, a second person.

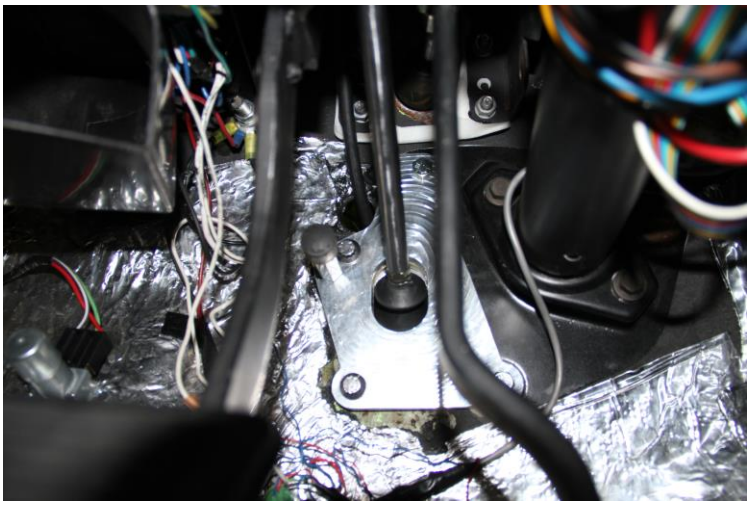
- This Hydraulic Master Cylinder Kit utilizes existing opening in the firewall.
- Safety Equipment – Always wear approved ANSI approved safety goggles/glasses when working with metal and fluids. Wear proper gloves when working with hot surfaces and corrosive fluids.

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

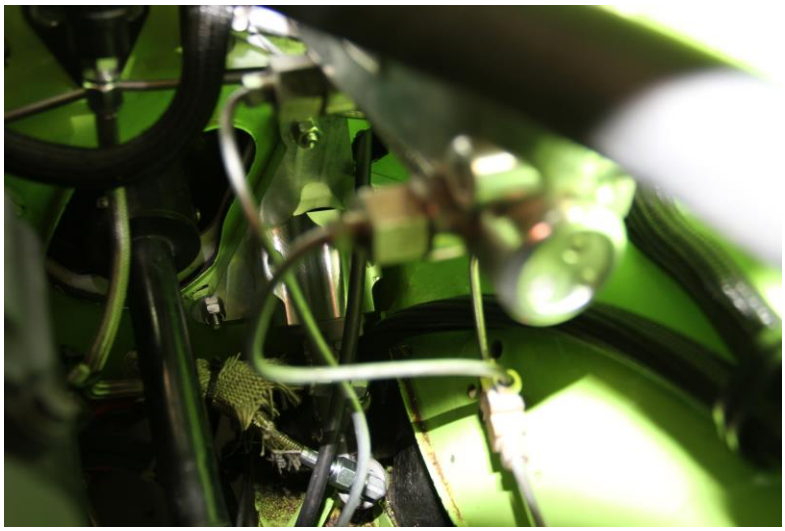
- Do not remove the clutch pedal. Remove all clutch linkage or automatic linkage from engine, transmission, frame and clutch pedal.
- Remove the 2 bolts on the left side of the steering column floor bracket. (These bolts will NOT be reused)

3.0 Assembly

- Note: our mock-up vehicle has certain items removed for clarity.
- Place interior bracket aligned with 2 bolt holes on steering column bracket.
- Install 2 supplied bolts finger tight.
- Trace bracket with sharpie.



- Remove all components and clean mating surfaces.
- Install interior bracket with supplied bolts. (Place a small amount of blue loc-tite on each bolt)
- Drill 2 remaining holes with 5/16 drill bit.
- Install outer firewall bracket over 2 studs sticking out using supplied lock washers & nuts.

- 

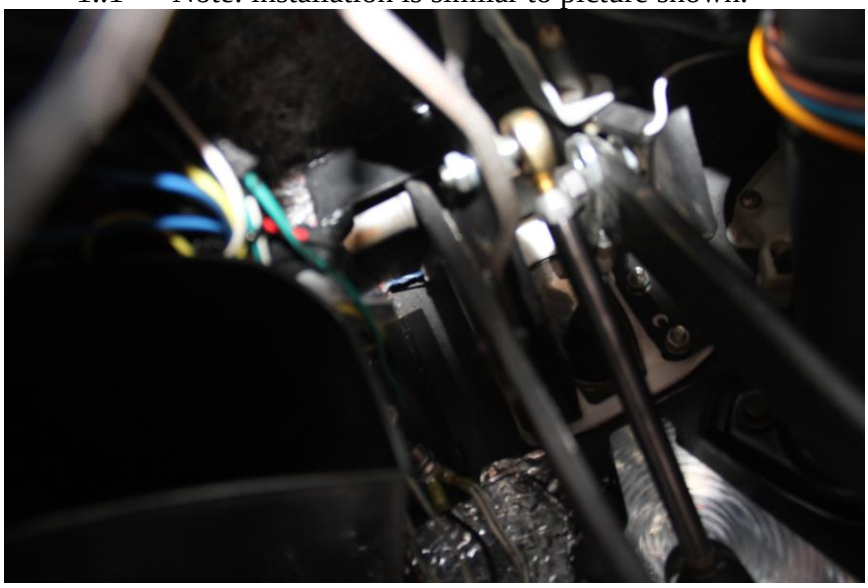
- Install 2 remaining bolts on interior bracket. (Place a small amount of blue loc-tite on each bolt)

- Install clutch master cylinder over 2 studs in bracket adapter. Secure & tighten nuts.

- Install linkage to master cylinder rod.

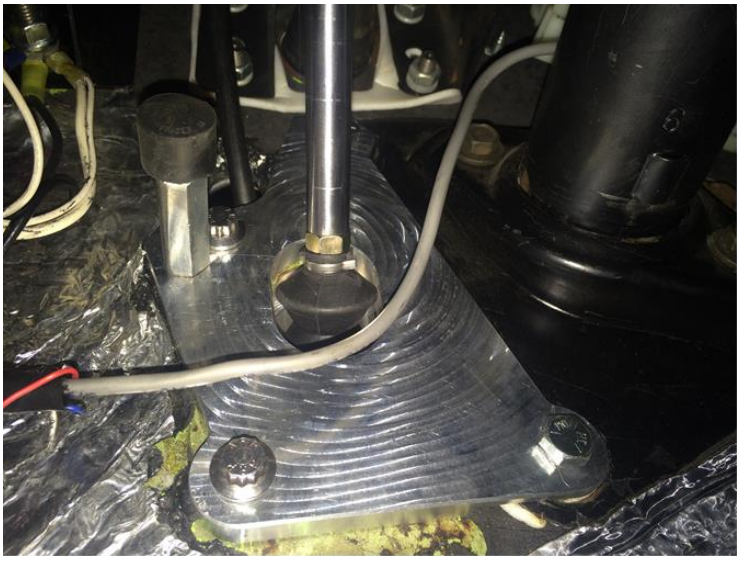
- The rod-end may have been pre-adjusted to the correct height for the clutch pedal. If adjustments are made, make sure there are atleast 5 full threads penetrating the rod end. Note: There is no adjustment on the rod/ladder joint, this has been put together with loc-tite.

- Install hardware thru rod end, washer and clutch pedal bracket and tighten.
  1..1 Note: installation is similar to picture shown.



- Verify actuation – the clutch pedal should bottom out on the pedal stop at the same time the master cylinder bottoms out. If the pedal bottoms out on the pedal stop 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 pedal stop, adjust male rod end to lower the clutch pedal. Adjust pedal stop as necessary and know the pedals may not be at the same height. Verify no binding of rod-end and clutch pedal. Verify parallel alignment of all the components. Actuation should be smooth. Verify the master cylinder rod travels the full stroke of 1.2" for proper clutch release.



- If you find the clutch pedal does not have enough travel… the "up stop" end of the bracket may be trimmed to accommodate more pedal stroke.

- Locate and mount the reservoir anywhere above the master cylinder. You may shorten the reservoir hose as needed. 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. Make sure reservoir line does not interfere with any moving parts.

- 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.

- 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.

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Important information regarding setting pedal stop, free play, and height adjustment.

Note that this information is specific to the Tilton 6000 series hydraulic release bearing used by Bowler Performance Transmissions. If you are using a hydraulic release bearing by another manufacturer please refer to their instructions on setting up the clutch pedal.

The Tilton 6000 hydraulic release bearing assembly is self-adjusting in that the bearing stays close to the clutch spring at all times, even though the spring changes position with clutch wear. There is no extra return spring that pulls the piston back all the way to the bottomed position. In this respect, the piston in the hydraulic bearing assembly works like the piston in a disc brake caliper, returning only as far as forced. This is why with a Tilton hydraulic release bearing assembly the clutch pedal feel does not change with clutch wear allowing the driver to make more consistent shifts. The piston of this assembly has .700" of total stroke. Precision measurement of clearances and the correct adjustment of the pedal stop are extremely important to the correct function of this unit.

RELEASE BEARING FREE PLAY AND HEIGHT ADJUSTMENT

At this point of the installation you should already have the flywheel, clutch and bellhousing onto the engine. Tighten all components in place following their respective manufacturer's instructions. Do not install the transmission at this time. Using a pair of dial calipers or a depth micrometer, measure the distance from the transmission face of the bellhousing to the bearing contact point of the clutch spring. Record this distance as Dimension A. Subtract .125" from Dimension A. This new number will be Dimension B. This should be the installed distance (with the bearing and piston completely compressed into the hydraulic base) from the face of the release bearing to the face of the transmission where it contacts the bellhousing. Install the supplied threaded sleeve into the bearing base and push these onto the bearing retainer sleeve or bolt on the threaded base to the front of your transmission. A small amount of petroleum jelly may be used during assembly. (For slip on adjusters, the o-ring end of the sleeve should be towards the transmission.) Thread the bearing onto the threaded sleeve until Dimension B is achieved. There is a small ear and slot machined into the hydraulic base. The supplied stud fits through this slot to prevent rotation. Once the correct height of the HRB has been determined, locate and remove the transmission bearing retainer bolt closest to the ear. The removed bolt will be replaced by the anti-rotation stud provided. Remove HRB and threaded sleeve from bearing retainer, being careful not to change HRB height adjustment on the threaded sleeve. Install anti-rotation stud through the slot on the hydraulic base and reinstall HRB and sleeve onto bearing retainer. Using Loctite 272 (red) thread locking compound, install anti-rotation stud into hole that original retainer bolt was removed. Torque to 16 lb-ft. DO NOT OVERTIGHTEN. Note: If anti-rotation stud is too long and extends past face of release bearing, cut shorter to avoid any interference with clutch. If you have a bolt on bearing adjuster use one of the supplied bolts and utilize one of the threaded holes provided in the bolt on adjuster to prevent bearing rotation. The hydraulic lines supplied have been installed at the factory using the proper tooling and assembly lubricant. They are designed to rotate once while installed. There is no need to remove these prior to assembly. Double check that the bearing to clutch clearance is .125" (tolerance +/- .025").

DRIVELINE ASSEMBLY

While installing the transmission, carefully route both lines through either the release fork window or holes that have been drilled to accommodate the lines. Ensure that the lines do not interfere with the clutch or flywheel. A string may be used to help guide the lines around any obstacles during installation. Once the transmission is seated, confirm that all parts of the release bearing clear the clutch and flywheel. Complete the driveline installation.

HYDRAULIC LINES

This bearing is supplied with two identical lines installed for the supply and bleed ports. Both lines are sized AN-4 and should only be used with AN type fittings. It is important that whichever line is on the bottom is used as the supply line (connected to the master cylinder) and whichever line is on top is used as the bleeder. 1. Attach the supply line to the master cylinder using supplied stainless braided line and fittings. If using a Tilton master cylinder (which have AN-3 outlets) you will need a AN-3 male to AN-4 male adapter that is supplied in the master cylinder kit. Attach the supplied bleed adapter and bleed fitting to the bleed line.

HYDRAULIC RELEASE BEARING BLEEDING

1. Fill the master cylinder reservoir with DOT3 or DOT 4 brake fluid. **Do not use DOT 5, silicone based or high temperature resistant brake fluids designed for more than 550ºF as some will cause the seals to swell.** 2. Apply light force on the clutch pedal. You want enough force to hold the bearing out against the clutch diaphragm spring, but not enough to compress the clutch diaphragm spring. 3. Open the bleedscrew that is attached to the bleed line on the hydraulic release bearing. 4. Completely stroke the pedal and hold the pedal down. 5. Close the bleed screw that is attached to the bleed line on the hydraulic release bearing. 6. Let the pedal return to its relaxed position and wait a few seconds. Repeat Steps 2 through 6 until all air is removed from the system. **Note: Do not stroke the pedal again before the pedal stop is set.**