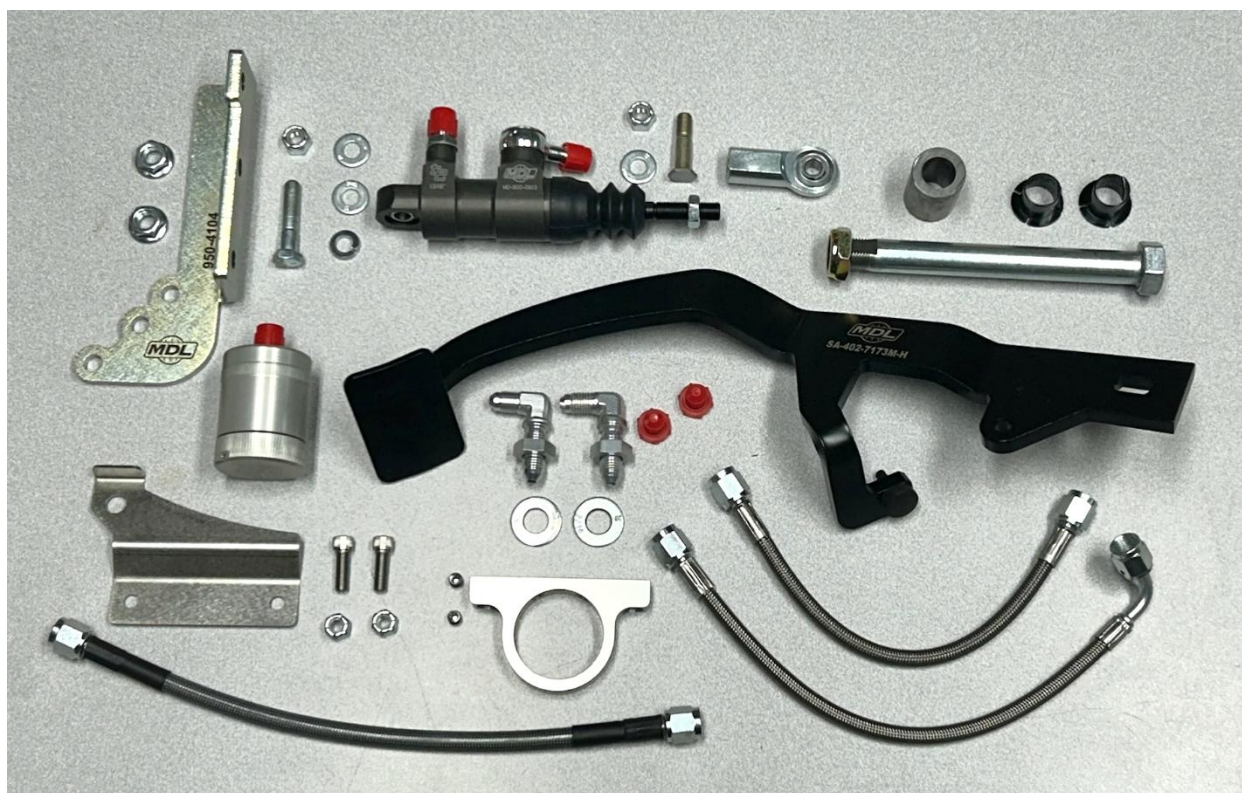




Installation Instructions



MD-910-3004-C Kit Shown

Thank you for purchasing the Modern Driveline *Stealth Series* Master Cylinder Kit.

This kit is designed to attach to the pedal hanger, leaving only the small premium billet reservoir exposed in the engine compartment for servicing and aesthetic appeal. Braided lines and bulkhead fittings seal the deal on this one!

Modern Driveline Stealth Series... This Kit is Out of Sight!

Read These Instructions Completely Before Beginning

1. Before You Begin

- 1.1. This kit will require some disassembly of the vehicle to install.
- 1.2. General vehicle mechanical knowledge and an understanding of the terminology are required to install this kit.
- 1.3. **DO NOT VACUUM OR PUMP BLEED THIS SYSTEM.** It is not brakes. Single seal push-pull systems will create micro bubbles in the fluid and in some instances harm the seals internally. The preferred method is to pressure bleed from the top down. Modern Driveline offers a hydraulic clutch system “bleeder kit”. The bleeder kit comes standard in all Modern Driveline master cylinder kits and is also available separately as a purchase item.
- 1.4. These systems are DOT 3 or DOT 4 brake fluid compatible. Do not use DOT 5 silicone based, or any high temperature resistant brake fluids designed for more than 550°F as some brands will cause the seals to swell.
- 1.5. If you are converting an automatic car this kit requires a roller bearing kit to be installed. The roller bearing kit is sold separately. Modern Driveline offers this roller bearing kit under part number MD-411-1081.

2. Pedal Height Matters

- 2.1. Our Master kit has 3 adjustable positions for fine-tune adjustments. It is always recommended the pedal uses full-travel: Up-stop, down to carpet/floor. This will prevent damage to the cylinder.
- 2.2. All parts in this kit are designed with nominal clutch pedal height in mind. The ideal clutch pedal position will re-engage the clutch about 1/3 to 1/2 total pedal travel, up from the carpet.
- 2.3. It is not necessary for this master cylinder to use all the travel of the piston to release the clutch.

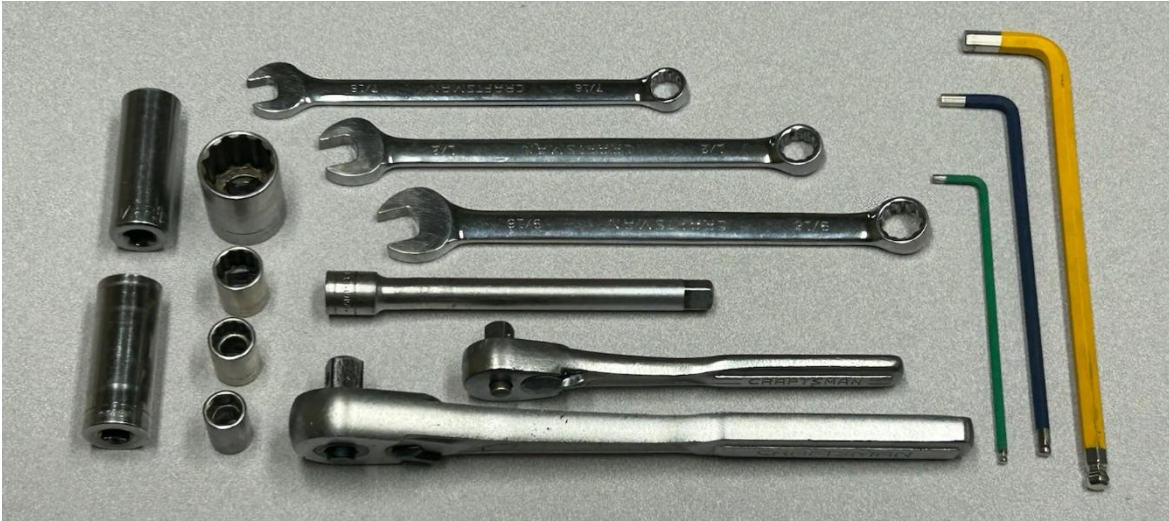
3. Information about this kit

- 3.1 This cylinder can travel **up to** 1.25”. Most installations will not use all the travel of this cylinder.
- 3.2 This cylinder has a 0.812” bore.
- 3.3 .812” bore x 1” stroke = .52 cu/in fluid volume requirement.
- 3.4 .812” bore x 1.2” stroke = .62 cu/in fluid volume requirement.
- 3.5 The existing aftermarket slave cylinders typically use 0.52” cu/in fluid volume and are considered compatible with this master cylinder kit.
- 3.6 Our mock-up firewall has certain items removed for clarity.
- 3.7 Three braided lines are provided in this kit. The coated line is for the reservoir. The two uncoated lines are for under the dash; This allows for greater flexibility.
- 3.8 If installed... the black ends on the coated line may be removed.
- 3.9 **No kit substitutions.** Additional or different parts may be purchased if you choose.
- 3.10 **Do not remove** the **red baffle** inside the reservoir.
- 3.11 The stainless-steel reservoir bracket attaches to the brake master cylinder mounting fastener and may be bent for appearance after installation.
- 3.12 This kit does not use the original clutch rod linkage hole/grommet location on the firewall.
- 3.13 There will be additional parts in the reservoir kit that are not used.

4. **NON-Warrantable Conditions.**

- 4.1. Do not over-torque parts.
- 4.2. Do not over-tighten parts (non-torque valued locations).
- 4.3. Do not add parts to our kit.
- 4.4. Use all parts of this kit unless instructions are provided not to do so.
- 4.5. Do not substitute parts in this kit, contact MDL for assistance if necessary.
- 4.6. Required vehicle components are your responsibility.
- 4.7. Always check/test threads prior to installation into the vehicle. **Damaged threads are not warrantable.**

5. Tools, Shop Supplies, and Notes



- 5.1. Standard shop tools, 1/8" & 5/16" Allen Wrench, 11/16" & 3/4" Deep Sockets.
- 5.2. Aluminum AN Fitting Wrenches (optional) for bulkhead fittings.
- 5.3. DOT 3 brake fluid.
- 5.4. Dielectric grease (typically used on spark plug wires).
- 5.5. Anti-seize lubricant.
- 5.6. Silicone sealant.
- 5.7. Soapy water in a spray bottle (brake fluid clean-up).
- 5.8. 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.
- 5.9. A ground strap from the engine to the body, and body to frame, must be used.

Failure to install a ground strap from the engine to the body and frame will result in braided line failure. The braided line cannot be used as a ground strap.

6. Provisional Parts– Some parts may not be required depending on pedal hanger and brake pedal configuration.

- 6.1. MDL provides (2) new pedal shaft bushings in this kit for the clutch pedal cross shaft which may not be used if you have a roller bearing kit installed. It is recommended to replace the pedal bushings. Cheap plastic pedal bushings may cause installation difficulty. You may repurpose these nylon pedal bushings for the brake pedal if a roller bearing kit is already installed.

7. Options

7.1. Alternate routing of braided lines and firewall bulkhead fitting location may be used for customized firewalls. Consider reservoir placement on firewall. This kit provides parts for a factory firewall installation. Optional items may be purchased separately. No kit substitutions.

8. Disassembly – If your vehicle is already disassembled, verify all disassembly steps have been performed and skip to the Assembly Instructions. If you are converting from an automatic vehicle, some disassembly steps do not apply.

8.1. Remove the driver's seat and lay down some cardboard for convenience.

8.2. Remove the driver's side fresh air vent (duct).



8.3. This step applies to a vehicle with an existing mechanical linkage system. Remove the clutch fork spring, Z-bar spring @ firewall (if equipped), frame fulcrum pivot and hardware, Z-bar, upper and lower Z-bar rods, engine fulcrum pivot and hardware. Remove the spring attached to the clutch pedal under the dash (if equipped). Retain the *clutch fork spring* if using MDL's Eliminator Slave system.

8.4. Disconnect and remove the brake pedal.

8.5. For automatic cars, trim down the brake pedal pad area to match the rubber pad, sold separately.

9. **Installation** - Clean as you go, use soapy water on spilled brake fluid, general cleanliness for all fitting and line-end ports.

Caution: There is specific hardware required at the pedal location. Do not skip this step. As you follow the instructions pay attention to inboard to outboard and outboard to inboard instructions.



Shank bolt is for the pedal and the regular bolt is for the bracket.

- 9.1. Test bolts in all holes prior to installation. Ensure fasteners go through all holes properly.
- 9.2. Install MDL supplied Pedal Hanger Bracket on the pedal hanger using supplied 3/8"-16 serrated nuts. Torque the bolts at this location to 20-25 ft/lbs, wrist tight.

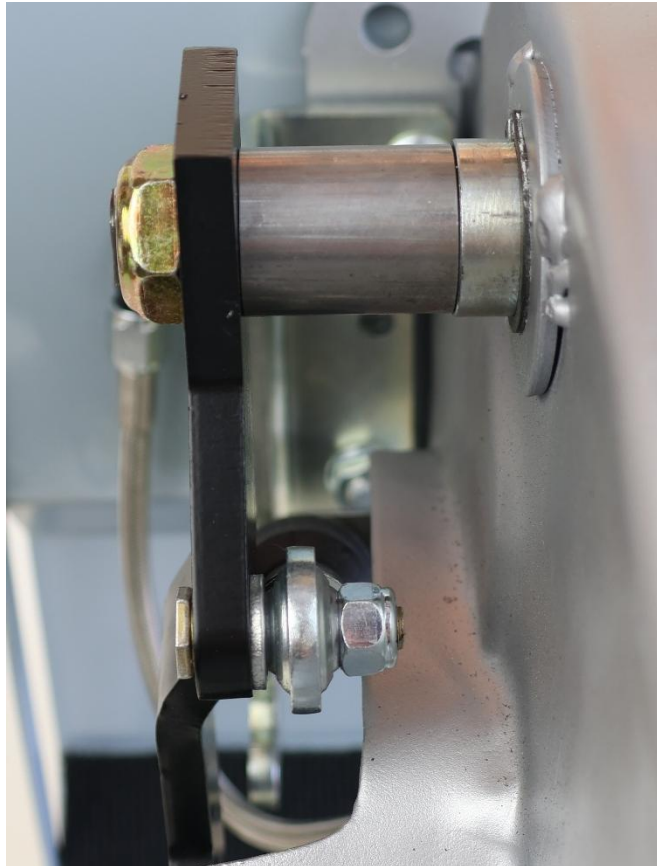


Left Picture: Pedal hanger with two brake booster nuts removed.



Right Picture: MDL bracket installed with supplied serrated nuts.

- 9.3. Install the pedal bushings in the hanger, as required, and install the cross shaft bolt from the passenger side through the pedal hanger. Install the pedal spacer.
- 9.4. Preassemble the master cylinder with jamb nut and rod end to the clutch pedal. The order of washer stack-up is very important.
M/C at pedal - from outboard to inboard... shank bolt head, pedal, one flat washer, rod-end, nylok nut.



MDL supplied clutch pedal shown installed.

- 9.5. Torque the bolt/nut at this location to 15-18 ft/lbs, light wrist tight.
- 9.6. Install the MDL supplied clutch pedal and nylok nut to the cross-shaft. Holding the pedal with your hand, use a 15/16" socket to tighten the nylok nut. Once the nut bottoms out, tighten up to an additional 1/8 turn. The clutch pedal should hang freely and not be loose to the cross shaft.
- 9.7. Re-install and re-attach the brake pedal components per vehicle requirements.
- 9.8. There are three positions on the bracket. **We recommend starting with the center position which is typically used for V-8 street-use applications.** The upper and lower positions are used for smaller pressure plates, upper, or racing, lower, quicker release.
- 9.9. See the picture below. Attach master cylinder to the bracket with fitting ports pointed towards the right side of the vehicle. The order of washer stack-up is very important.
M/C at bracket - from outboard to inboard... Bolt head, bracket, flat washer, lock washer, cylinder, flat washer, nylok nut.



Master cylinder shown in UPPER mounting hole location.

- 9.10. Torque the bolt/nut at this location to 15-18 ft/lbs, light wrist tight.
- 9.11. **DO NOT PRELOAD THE MASTER CYLDINER ROD; doing so will not allow you to bleed the system.** Adjust the master cylinder using a 5/16" wrench on the two flats on the master cylinder rod at the end of the boot. Bring the pedal stop against the pedal hanger without compressing the master cylinder rod then tighten the jamb nut against the rod-end light wrist tight.



Pedal stop in pedal shown touching the pedal hanger and jamb nut loose on the master cylinder rod.

- 9.12. Cycle the clutch pedal **by hand** and check for freedom of movement. There should not be any binding and the pedal stroke freely. The cylinder will be able to teeter slightly about the axis, from the up position to almost completely down. This movement will be slight but free. The pedal should also return completely.



Teetering about the axis will be a slight rotation back and forth. This means the washers are also set up correctly.

- 9.13. See the picture below. Position the master cylinder fittings approximately as shown. The banjo fitting is the reservoir port, and the small elbow fitting is the pressure port. Do not completely torque at this time but do not leave loose.



- 9.14. The reservoir hose attaching to the banjo fitting will be positioned approximately as shown below. This allows for mounting the master cylinder in any of the (3) bracket mounting holes without breaking the hydraulic connection to re-route the hose.



Left Picture: View looking from above

Right picture: View looking up and inboard.

Also see display stand reference picture on page 11.

- 9.15. Positioning the bulkhead fittings: Before drilling holes consider the placement of the reservoir and the length of the reservoir line. Modern Driveline has the following recommended hole locations noted in the next few steps of these instructions.
- 9.16. For the reservoir hose drill a 7/16" hole next to the electrical grommet, above the steering column plate. Reference the yellow markings in the picture below for hole location and orientation.
- 9.17. Deburr the hole on both sides of the firewall and install the elbow fitting with supplied flat washer under the dash and nut in the engine compartment.



Under the dash



Engine compartment

- 9.18. Attach the reservoir hose to the elbow fitting.
- 9.19. For the pressure port holes drill a 7/16" hole next to the steering column plate. Reference the yellow markings in the picture below for hole location and orientation.
- 9.20. Deburr the hole on both sides of the firewall and install the elbow fitting with supplied flat washer under the dash and nut in the engine compartment.

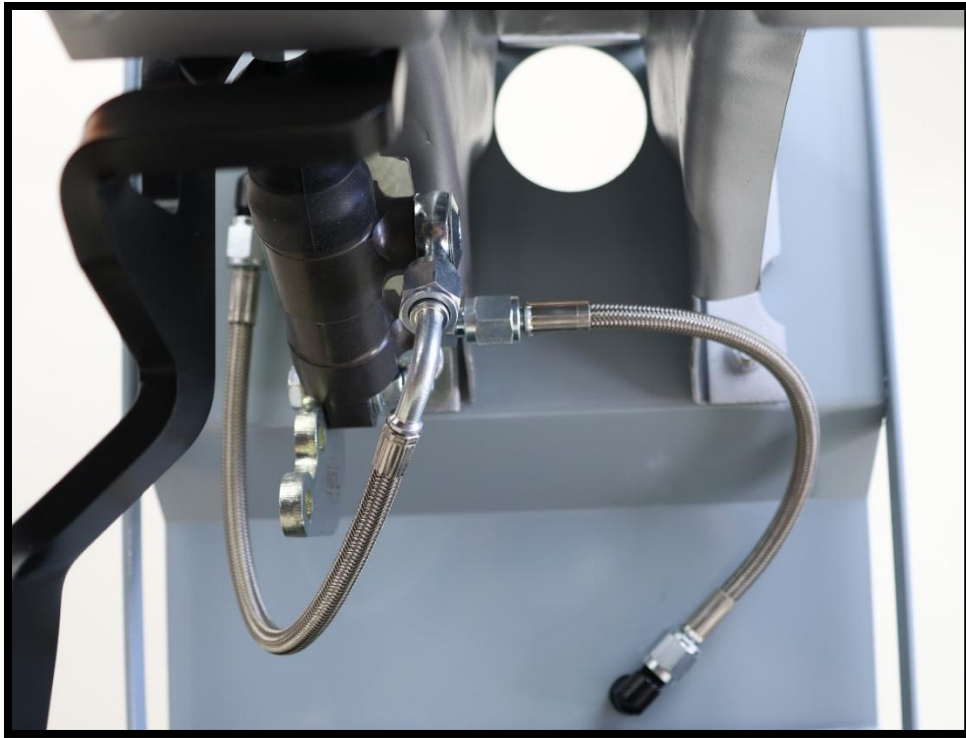


Under the dash



Engine compartment

- 9.21. Attach the pressure hose to the elbow fitting.
- 9.22. Holding the reservoir bulkhead fitting with a wrench under the dash, torque the jamb nut in the engine compartment 12 to 15 ft/lbs, light wrist tight, using an 11/16" or 3/4" socket.
- 9.23. Torque the line-end to elbow fitting at the firewall to 25 ft/lbs, wrist tight.
- 9.24. Torque the line-end to the banjo fitting to 25 ft/lbs, wrist tight.
- 9.25. Hold the line-end and banjo fitting by hand and tighten the 5/16" Allen head banjo fitting wrist tight.
- 9.26. Holding the pressure bulkhead fitting with a wrench under the dash, torque the jamb nut in the engine compartment 12 to 15 ft/lbs, light wrist tight, using an 11/16" or 3/4" socket.
- 9.27. Torque the line-end to fitting at the firewall to 25 ft/lbs, wrist tight.
- 9.28. Tighten the straight fitting in the master cylinder light wrist tight using a 1/2" wrench.
- 9.29. Holding the straight fitting, torque the line-end to the master cylinder fitting to 25 ft/lbs, wrist tight.



This display stand picture is reference only for hose routing and approximate position.

- 9.30. Cycle the clutch pedal **by hand** and check for freedom of movement. All fittings and hardware should be tight. Double-check the installation for any loose connections that may have been missed.

Finish the installation by mounting the reservoir, clamp assembly, and bracket to the brake master cylinder fastener. It is important the reservoir line in the engine compartment be attached to the matching fitting for the reservoir port under the dash. Use the bolt/nut combination to mount the clamp. The clamp can slide up and down the reservoir body to a location of your choosing.



Clear billet reservoir shown

- 9.31. Thread the 12" coated braided line onto the bottom of the reservoir and the bulkhead fitting. Locate the reservoir for appearance and convenience of servicing.
- 9.32. Tighten the clamp to body at the desired height using 1/8" Allen wrench. Cycle the set screws in the clamp to create an impression in the body which will help hold the body in-place. Once impressions are made, do not over-tighten as it can distort the body and make installing the cap difficult. Loosen cap slightly and re-snug to verify it is not bound up.
- 9.33. Install the clamp and reservoir to the bracket using a 3/16" Allen wrench on the socket head fasteners and nylok nuts, tighten light wrist tight, then remove the cap to make sure it will come on and off.
- 9.34. Hold the bulkhead fitting with a wrench under the dash, torque the line-end to 25 ft/lbs, wrist tight.
- 9.35. Torque the line-end to the reservoir 15-25 ft/lbs, wrist tight. Watch for reservoir body slipping in clamp.
- 9.36. You may carefully bend the stainless steel bracket so the reservoir sits more vertical.
- 9.37. At this point the installation of the Stealth master cylinder system is complete. You will be left with a single AN4 open port for the line going to the slave cylinder of choice. The same instructions must be performed for attaching the braided line to the bulkhead fitting. Use the supplied **red threaded cap** to cover the open port. The **red threaded plug** is not used but supplied for your convenience.
- 9.38. Re-assemble your vehicle for all components removed. Verify there is no interference of electrical wire or ducting to the Stealth system.
- 9.39. Remove the cardboard and re-install the seat.

10. Bleeding the System

- 10.1. In the master cylinder kit is a Bleeder Kit. Follow the *bleeder kit* instructions. If you have lost the bleeder kit instructions, they can be found on our web site modern driveline.com.

Note: The RED BAFFLE in the reservoir is not a bladder, do not remove it.

You may take the red baffle out temporarily to perform the bleed operations but do not actuate the system without the red baffle and reservoir cap re-installed. Brake fluid will spill.

11. Driveway Test and Test Drive

- 11.1. Position rear wheels on jack stands (free to rotate). With transmission in neutral, start vehicle. Push in clutch pedal and apply brake pressure. 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). **It is okay if the clutch pedal releases close to the floor while on jack stands. It will release higher when the vehicle is on the ground.** A new or rebuilt transmission should have all the gears run through (in the driveway, partially releasing clutch) before road testing the new hydraulic clutch.

- 11.2. Remove jack stands and test drive. Upon return, verify steel braided line clearance and support. The hydraulic lines must be kept away from the exhaust and rotating clutch assembly.
- 11.3. If the clutch feels spongy or releases too close to the floor, repeat the bleed procedure. FYI – micro bubbles may be present in the system due to actuation, accumulation on rubber parts, and machining marks within the system.

12. Reminders

- 12.1. **DO NOT VACUUM OR PUMP BLEED THIS SYSTEM.**
- 12.2. Important: Once your new hydraulic system is active, the pedal will be immediately firm. It should not feel spongy or soft. Lack of immediate movement or a spongy feeling clutch pedal indicates air is still in the system.
- 12.3. Periodic adjustment is **not** required for this master cylinder system. The goal is for the clutch to re-engage in the bottom 1/3 to 1/2 of clutch pedal travel, otherwise, over-travel may occur. Once again, make sure the slave cylinder of choice is set up correctly.

13. Adjustments

- 13.1. Once you have confirmed all the air is out of the system it is time to discuss your adjustment options. NEVER do the steps below on jack stands; The behavior of clutch release is much different under driving conditions. Use the instructions above to make changes.
- 13.2. **If the pedal is re-engaging too high** up from the floor, move the clutch master cylinder attach location on the bracket to the upper hole. This will also make the pedal pressure a little softer.
- 13.3. **If the pedal is releasing too close to the floor**, or if you want assured release for racing applications, move the master cylinder attach location on the bracket to the lowest hole. This will also make the pedal pressure a little firmer.

Note: over-stroking a slave cylinder may occur so use a volume calculator to prevent component damage. A pedal stop may also be required to prevent damage to components. Always test the stroke of the pedal and set stops accordingly.

Further assistance and tech support is available by calling Modern Driveline at 208-453-9800 M-F 8-5 Mountain time. Email – Tech@ModernDriveline.com . Please contact us first for any issues.

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

ITEM NO.	DESCRIPTION	QTY.
1	Tilton Master Cylinder with fittings	1
2	Lock Nut-5/16-24 nylock	2
3	5/16" flat washer	3
4	5/16"-24 x 1.25 modified shank bolt	1
5	5/16-24 x 1.5 Hex Bolt	1
6	71-73 Mustang stealth bracket	1
7	71-73 Mustang Stealth clutch pedal assembly	1
8	Ball Joint Rod End	1
9	Lockwasher, 5/16"	1
10	Bushing-Clutch Pedal Shaft	2
11	71-73 Mustang pedal spacer	1
12	Reservoir, Clutch, Billet Aluminum	1
13	Reservoir bracket, Booster, Ford and GM	1
14	9.5" uncoated braided line AN4 F-F	1
15	11" uncoated braided line AN4 F-90F	1
16	AN 37 degree flared 90 deg fitting	2
17	7/16" flat washer	2

