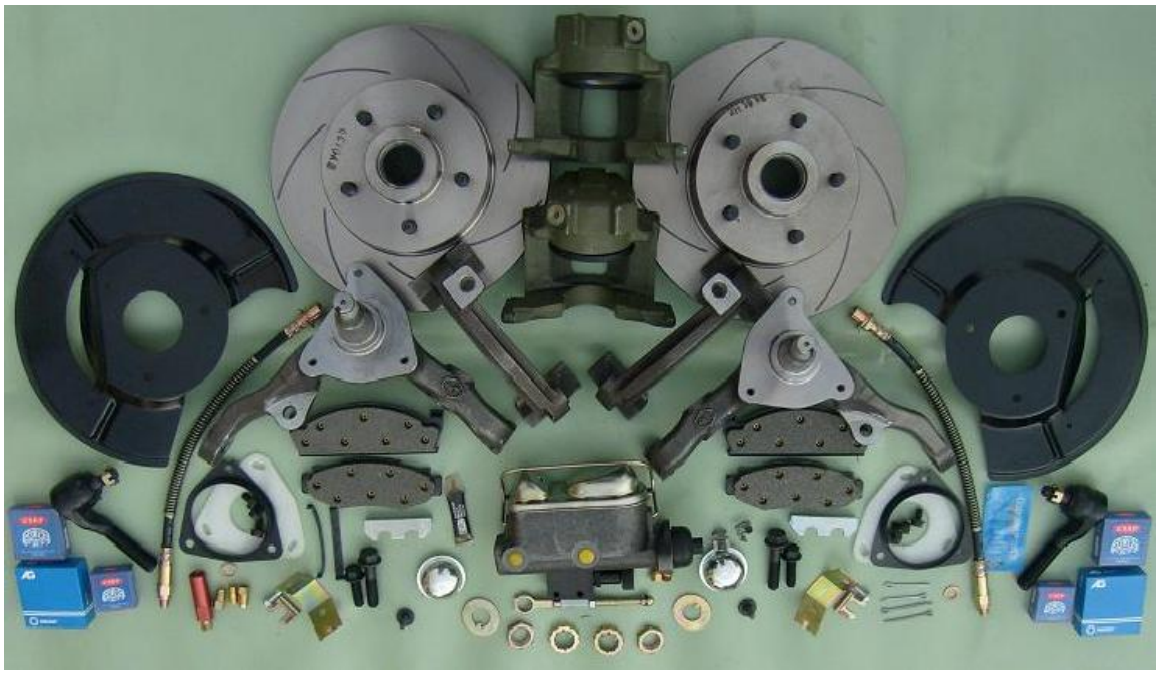
CLASSIC SERVICES RESTORATION PARTS

# The Granada Front Disc Brake Swap Installation Guide For Mustang, Falcon, and Equivalent Applications

**SECOND EDITION**



**The Granada swap contents**

## I. INTRODUCTION

### Why use Granada spindles?

The chassis on which Mustang is based was first introduced for Falcon/Comet in 1960. This basic chassis grew to encompass the Mustang, Cougar, Fairlane, Ranchero, Econoline, Torino, Montego, Maverick, Granada, Monarch, and

Versailles and was retired after the 1980 model year to be replaced by the Fox chassis.

During this time, the suspension remained basically the same. Minor year model changes resulted in three families of steering knuckles (spindles) which had unique geometries. The first was the pre 63, the second was 63-65 Falcon and 65-66 Mustang, and a third family starting with 66 Falcon and including 67-73 Mustang and 74-80 Mavericks, Granadas, and Monarchs. For our purposes we will discuss the 65-66 Mustang type, and the 67-73 Mustang /Maverick/Granada type. The 67-73 Mustang and the Maverick/Granada type have identical ball joint and steering geometries. The steering geometry of the 65-66 differs from the others by a small amount. The outer tie rod geometries remained the same for the entire series with model year differences in the tie rod stud diameter.

Most pre 1973 small and midsized Fords were equipped with standard front drum brakes. Most of these models were available with optional disc brakes. The 65-67 models equipped with disc brakes used a drum brake knuckle with an add-on bracket and caliper. The 68-73 and the later Maverick/Granada use purpose built disc brake knuckles.

The reason that the Maverick/Granada knuckle/bracket/caliper is so popular is because it is so common and replacement parts are available and inexpensive. About 3 million front disc brake equipped Maverick/Comet and Granada/Monarch model cars were built during 1975-80. Another couple million of the Pinto/Mustang II models from the same period was equipped with the same caliper as the Maverick/Granada. This far surpasses the number of 65-73 disc brake knuckle and caliper cores produced. Granada system parts are less expensive than the 68-73 Mustang system. For example, the brake hose for 68-73 disc brake cost over $40 per side, while the Granada one is about $10 per side.

Until recently, Mustang and Falcon owners interested in upgrading their front brakes to disc brake type were presented with the choice of an expensive commercial kit or scrounging junkyards for Granada or Mustang type systems. Some people enjoy the challenge of working in the weeds on a greasy old rust bucket, some don’t. More recently, more commercial choices have presented themselves, and the supply of Granada donor cars has greatly diminished. The huge increase in scrap iron and steel prices in the last few years have changed the car salvage industry. No urban recycler will hold on to a rust bucket 30 year old car when they can get $275 or more per ton for its scrap value.

CSRP realized this vacuum created by the lack of knuckle cores and set out to reproduce the knuckle, caliper bracket, splash shields, and shield mounting hardware. They are now available NEW at a reasonable cost.

**What does the swap involve?**

The swap involves replacing everything connected to the ball joints and inner tie rod sleeve, as well as the soft brake hoses, the master cylinder, and installing a proportioning valve. Many installers will also replace suspension components at this time. This discussion is limited to the swap itself. The swap will require a set of serviceable basic tools. A tie rod separator or a 3 lb. hammer, and a floor jack make the job easier.

## II. DISASSEMBLY

1. Jack the front of the car off the ground and place jack stands on a chassis hard point just to the rear of the front wheels. Perform steps 2-11 on one wheel at a time.
2. Remove the wheel.
3. Have a jar or basin ready. Cut the brake hose near the wheel cylinder. Direct the flow of brake fluid to the container.
4. Turn the steering wheel as to maximize access to the steering knuckle area.
5. Place a jack under the lower control arm and raise it to compress the spring a bit.
6. Remove the sway bar and strut rod bolts.
7. Remove the cotter pins on the ball joints and the outer tie rod. This may prove difficult. Carefully straighten the pins and pull them out with pliers. If they break off, you may be able to drive them out with a nail.
8. Loosen but don't remove the ball joint and tie rod bolts.
9. Loosening the tie rod and ball joint studs from their tapered mount holes requires technique. There are three main accepted methods. You can use a suspension fork to separate the studs from their mount, but you will invariably do damage to the rubber boots and or tie rod. You could use a ball joint separator tool (these are like a bearing puller and can be rented or loaned from auto parts stores). An alternate method is to pound the end of the mounting bosses that the mount holes are bored into, with a 3 lb. hammer. One has to really whale on the boss. It is hard to get the required angle and clearance to hit it hard enough unless the car is on a rack. Persistence is required. Don't worry about breaking the knuckle. The stud will eventually break loose.
10. Break the tie rod loose first, then the ball joints.
11. Manipulate the knuckle/brake assembly from the suspension.
12. Separate the old hose from the hard line. It's best to use a flare wrench when tightening or loosening brake fittings. It helps to apply penetrating oil prior to the attempt to remove flare fittings.

13. Evaluate if the tubes are serviceable. Replace or repair any corroded or crimped tubes, or any bad fittings.
14. Remove the one or two hard lines from the master cylinder. Label these lines front and rear port. A flare wrench makes the job much neater. You may find that the fittings will not come off or that the nut becomes stripped. In this case clamp a vise-grip onto the fitting snugly and strike it with a hammer in order to break the threads loose. It is possible that you will destroy the fitting or tube. The most important tube is the rear brake lead, the next important are the front leads.
15. Remove the two bolts that connect the master cylinder to the firewall.
16. Try to pull the master cylinder straight out from the firewall. Sometimes the master cylinder push rod is mechanically retained in the master cylinder. If so, you will be required to wedge yourself under the dash and disconnect the push rod from the brake pedal. Remove the master cylinder. Be careful not to spill brake fluid on the paint. Immediately remove any spills from the paintwork.

## III. ASSEMBLY

### A. Mounting the knuckle

1. Reassembly requires attention to detail. Use a decent torque wrench to make final tightening. Work methodically.
2. Mount the caliper bracket to the knuckle. Use the #271 loctite thread locker included in the kit on the threads. Don't over do the thread locker. The kit includes a small vial for the 4 bolts.
3. Alternate the tightening of the bolts until they reach their ultimate torque of 55-75 ft-lb for the 7/16" bolt and 90-120 ft-lb for the ½" bolt.
4. Lightly lube the ball joint and tie rod mount holes with anti-seize lube.
5. Mount the lower ball joint boss of the knuckle to the lower ball joint and thread the nut on a few threads. Raise or lower the knuckle/lower control arm until you can get the upper ball joint stud in its mount and screw on its' nut.
6. Torque the ball joint nuts such that the hole in the ball joint stud lines up to one of the nut castleations at a torque between 75-95 ft-lb.
7. Insert the supplied cotter pin and bend to secure.
8. Reconnect the strut rod and sway bar mounts to the lower control arm. Torque the strut rod to 90-115 ft-lb and the sway bar mounts to 6-12 ft-lb.

B. Mounting tie rod ends

1. Loosen the nut on the end of the adjusting sleeve for the outer tie rod end.
2. Measure and record the distance from the end of the sleeve, where the tie rod end threads go in, to the center point of the tie rod mounting stud.
3. Remove the old tie rod end.
4. Thread the new tie rod into the sleeve. Note that some applications have driver and passenger side specific outer tie rods.
5. Adjust the depth that the tie rod is threaded such that the distance from the sleeve to center point of the stud matches the original.
6. Lightly grease the tie rod ball stud and mount with anti-seize lube.
7. Center the steering wheel.
8. Fit the tie rod stud into the mount on the steering arm.
9. Torque the tie rod stud nuts such that the hole in the stud lines up to one of the nut castellations at a torque between 35-47 ft-lb.
10. Insert the supplied cotter pin and bend to secure.

C. Some kits come with an outer tie rod adapter bushing. Use these instructions for installing the bushing.

1. Clean the ball stud of the tie rod with brake cleaner.
2. Apply a light coating of anti-seize to the tie rod mount hole.
3. Apply a light coating of #271 thread locker on the taper of the tie rod ball stud.
4. Slip the tie rod adapter bushing supplied with the kit onto the taper. The bushing will not fit neatly onto the taper. It will slide into conformance on the taper when the stud nut is tightened.
5. Center the steering wheel.
6. Fit the tie rod stud into the mount on the steering arm.
7. Torque the tie rod stud nuts such that the hole in the stud lines up to one of the nut castellations at a torque between 35-47 ft-lb.
8. Insert the supplied cotter pin and bend to secure.

D. Mounting the splash shield

1. Place one of the foam gaskets supplied in the GSH.3 kit onto the spindle and against the shield mounting surface. See the photo below.

2. Identify the correct shield. The cut out on the shield will frame the caliper bracket. Mount the shield.
3. Place the triangular mounting flange over the shield.
4. Apply a small amount of the #242 thread locker supplied with the kit to the shield mounting bolts.
5. Orient the mounting flange such that the triangle corner with a circular piece cut out of it faces as seen in the photo below.

6. Thread the bolts and torque to 9-12 ft-lb.

E. Assembly of the brakes

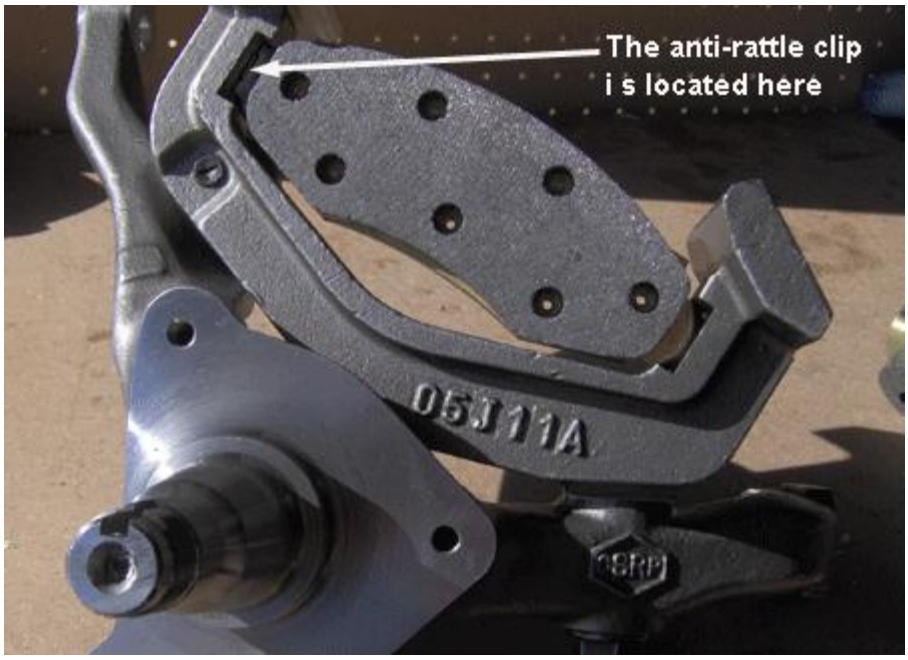
1. Pack the wheel bearings with Disc Brake Service type wheel bearing grease. This author makes a mess of himself and my surroundings every time I pack bearings. The least messy method I know of is to put a bearing in a baggie along with a small quantity of grease and knead the grease into the bearing for a few minutes. Repeat with all four bearings. Make sure to add some more grease after each bearing. Stage the bearings on a clean piece of paper until they are used.
2. Prepare the rotor. Apply a thick layer of the disc brake wheel bearing grease to the inside of the rotor hub and the bearing races. Careful, there are likely to be sharp casting flash inside the hub.
3. Insert the inside (larger bearing) into the inside of the rotor hub such that it seats onto its race. See the photo below.

4. Place a wheel grease seal onto its recess on the inside of the hub. Carefully tap the edge of the seal until it becomes secured into place. Tap around the seal to insure it is completely seated. See the photo below.

5. Apply a scant amount of grease to the wheel seal's sealing surface on the spindle. Carefully insert the rotor onto the spindle. Don't scrape the seal over the threads on the end of the spindle. You should be able to feel the seal slip over the sealing surface on the spindle.
6. Insert the outer (smaller) wheel bearing onto the spindle until it seats upon the hub race. The smaller ends of the two tapered bearings should be facing each other.
7. Fit the bearing retainer (large washer) onto the spindle.
8. Fit the wheel nut onto the spindle. Hand tighten the nut.
9. Using a properly calibrated torque wrench, torque the wheel nut, while spinning the rotor, to 17-25 ft-lb. Spin the rotor several revolutions. The wheel bearings are now pre-loaded and subsequent retightening will torque accurately.
10. Back off the wheel nut a half turn.
11. Retighten the nut such that it torques to 10-15 ft-lb with the retainer fit over the nut such that the cotter pin can fit through both the hole in the spindle and through a castellation on the retainer.
12. Insert a cotter pin and bend the exposed end to make it secure.
13. The rotor should rotate freely and should not scrape against the shield.
14. Coat the inside of the dust cap with grease. Don't fill the cap like Dad tells you to.
15. Fitting the dust cap can be a very frustrating ordeal. It is made easier if you have some form of mandrel to aid in the pressing. The mandrel can be a short length of 1.5" pipe or similar devise that will fit over the hemispherical part of the cap, but not the flat flange part.

16. Ever so slightly crimp the skirt of the dust cap at three places at 120 degree intervals. Don't over do it or the crimped spot will interfere against the bearing retainer.
17. Using three or four hands, place the dust cap in place and put the mandrel on top of the dust cap. Strike the mandrel with a big hammer.
18. The cap will tend to go on crooked. Aim the hammer blows to even out the progress.
19. Once the cap goes in a bit, the progress will even out. Drive it home.
20. Wash your hands.
21. Wipe everything with a clean cloth, and clean the rotor with brake cleaner.
22. Fit an anti-rattle clip on the trailing edge of the inner pad. See photo below.

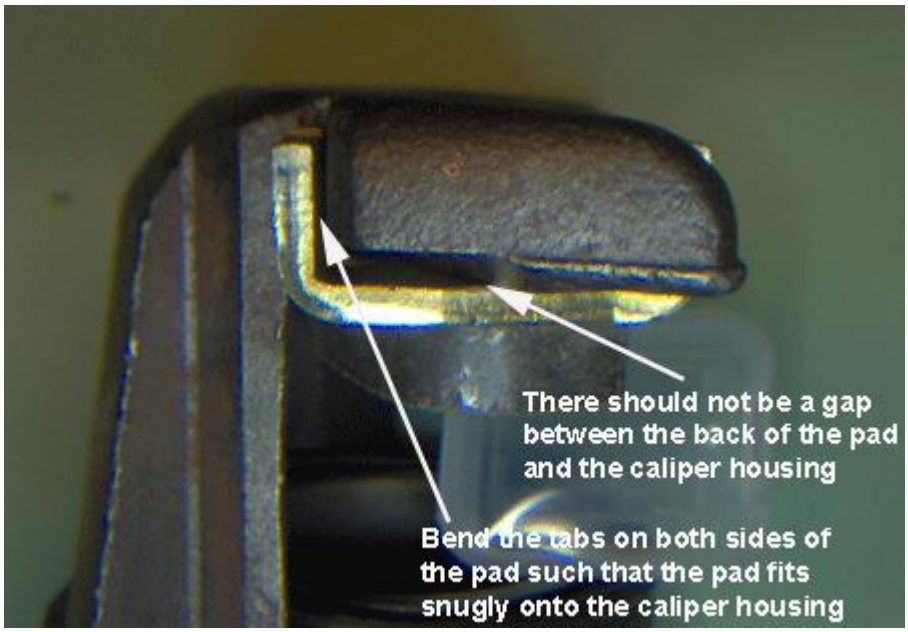

23. Turn the steering wheel to provide access to the inside of the caliper bracket. Insert the inner pad into its place, anti-rattle clip end first on the rearward end of the bracket. Press the friction surface against the rotor. See the photo below for a guide to the pad orientation. The anti-rattle clip is located at the left side in the photo. THE CLIP AND PAD WILL FIT, BE PERSISTANT!



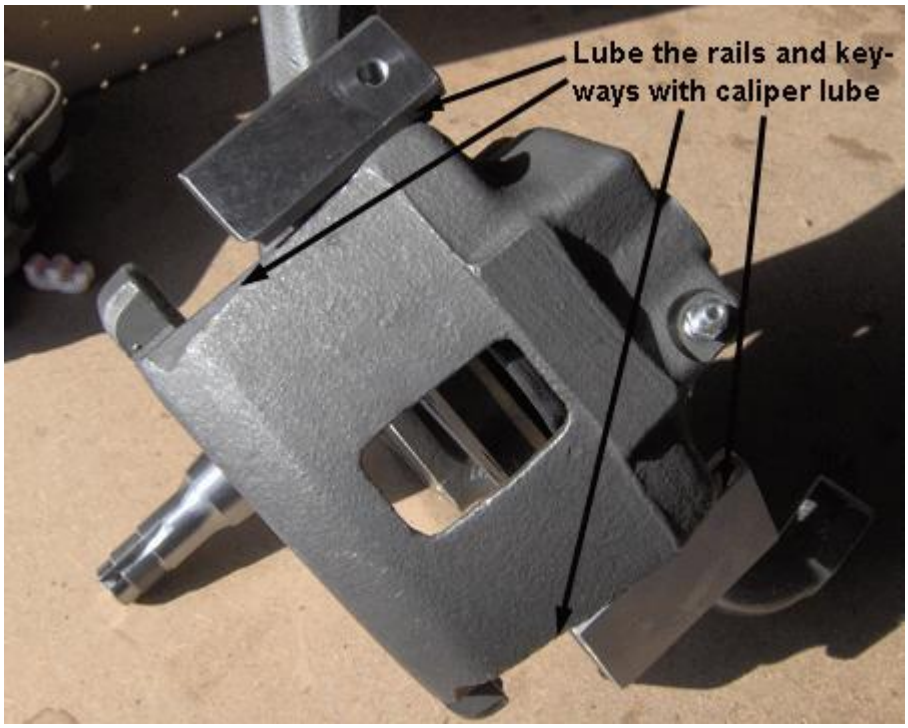

24. Select the caliper to mount to this side. The part number for the right side is 4069 and the left is 4070. This is probably meaningless to you since you have most likely already removed the calipers from their boxes to admire them, and now have no idea which box they belong in. The caliper that results in the bleeder being in the forward higher position is the correct one. Note the position of the bleeder screws in the photo.

25. Place the outer pad into its place on the front inside of the caliper. Notice the tabs, on the pad, that wrap around the protrusion in the caliper. The

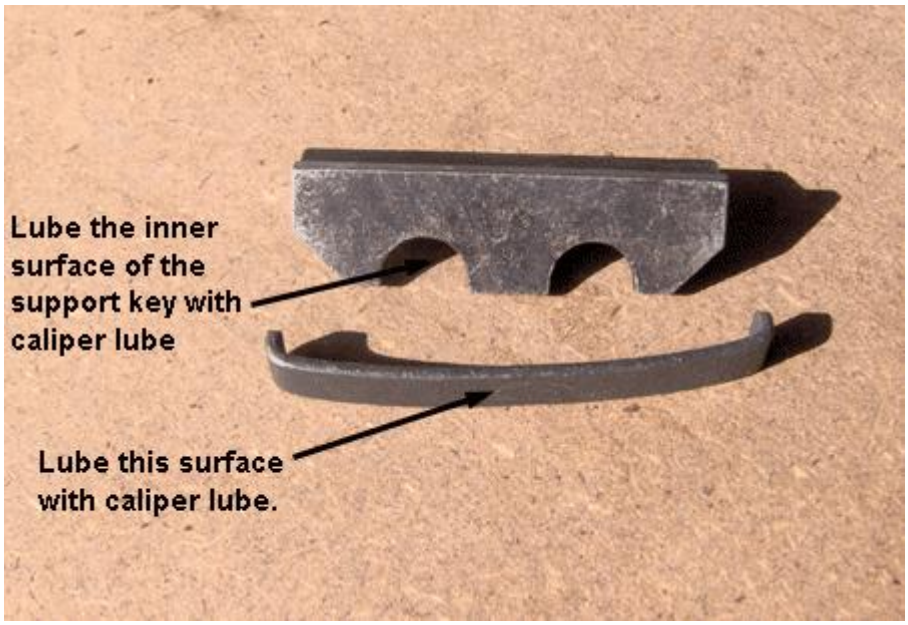
tabs should be tapped with a hammer to make them fit tightly against the protrusion, but at the same time have the rear side of the pad flush against the front inside of the caliper. This fitting procedure will prevent rattling of the pad. You can also use some RTV type sealer on the rear of the pad to secure it to the caliper.



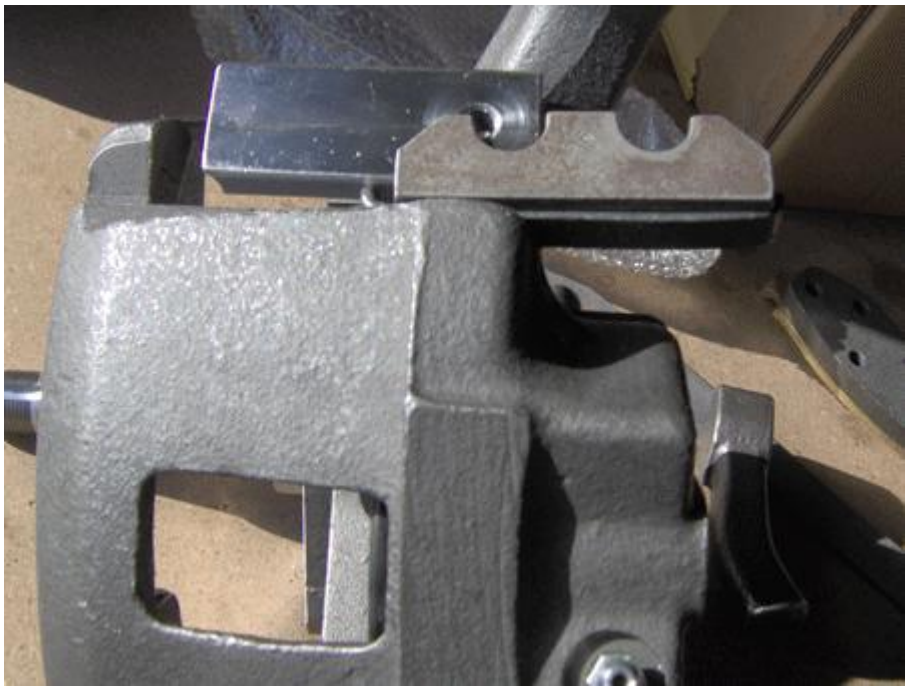

26. Apply a thin coating of brake caliper lube to the bracket rails and the caliper keyways. Slip the caliper onto its bracket. Insure that the rails on the bracket seat onto the keyways on the caliper and the brake pads are correctly positioned on each side of the rotor.




27. Apply a thin coating of caliper lube to the inner surface of the support key and the outer surface of the support key spring.




28. Using at least two hands and a foot, hold the caliper in place and insert a support key-support key spring assembly. Use a hammer (and one of your other hands) to drive the support key assembly into place between the bracket rail and the caliper keyway. The key will seat very tightly. This is correct. See the photos below.



Lube the moving parts.

29. The key is properly positioned when the caliper retainer bolt can nest into the circular recess in the key.

30. Thread the caliper retainer bolt into the bracket and torque it to 12-16 ft-lb. Thread locker has been pre-applied to this bolt.
31. Fit a brake hose with a copper crush washer and thread it into the caliper.
32. Torque the hose to caliper nut to 10-15 ft-lb.

F. Mounting the master cylinder

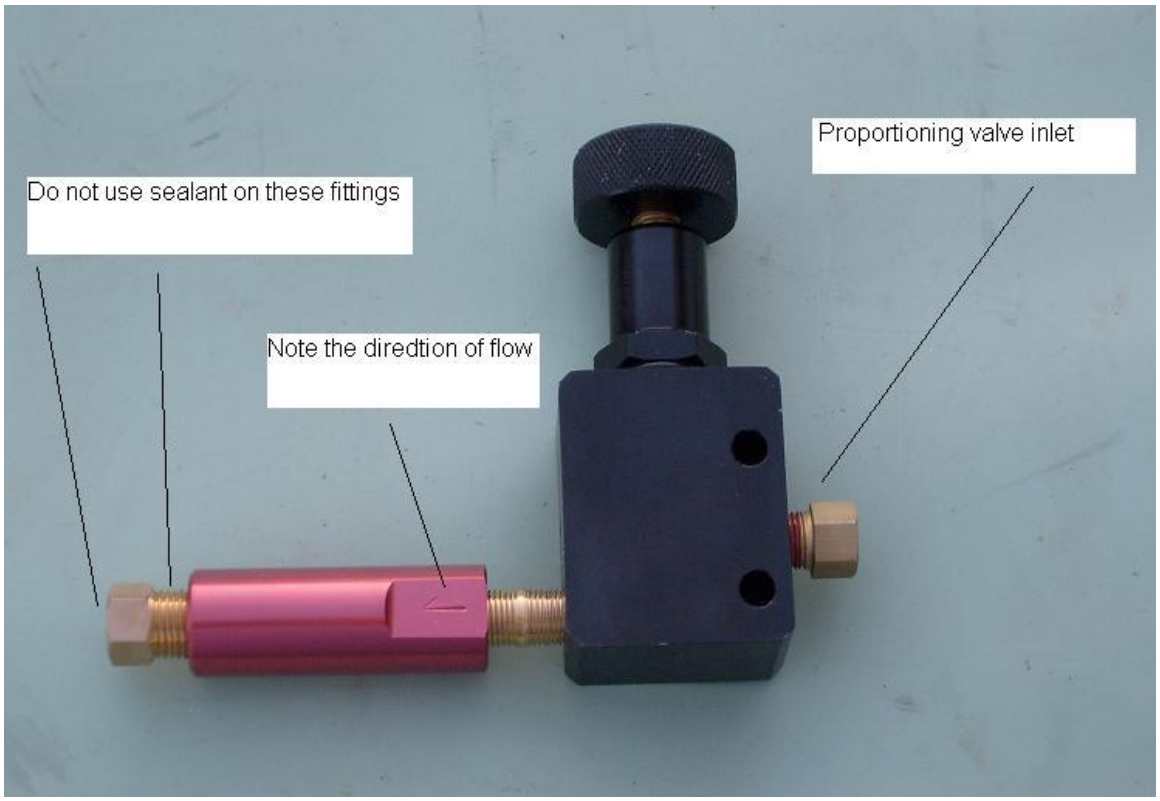
1. Bench bleed the master cylinder.
2. Secure the master cylinder in a vise.
3. If a vise isn't available you can build a wood jig comprised of a 6" length of 1" X 4" nailed vertically into the end of a horizontal12" piece of 2" X 4". You will have made an L piece with the 1" X 4" being the small leg. Bore a 1 ¼" hole into the center of the 1" X 4" about 2 ½" from its bottom. The master cylinder can now be mounted to the 1" X4" through the hole and secured with 1" long ¼" lag bolts.
4. Following the instructions supplied with the bench bleeding kit, bleed the master cylinder. Cover the reservoir and cap off the outlets. Some master cylinders come with a bench bleeding kit. If not, they are available for a few dollars.
5. Mount the master cylinder to the firewall or booster. Use the adjustable push rod supplied with the kit for a manual brake application, and the one with the booster for a power application.
6. Be aware of any spills of brake fluid on the painted surfaces of the car. It is a strong solvent and will damage the paint if allowed to stand.

G. Mounting an adjustable proportioning valve onto a 65-66 Mustang or 63-65 Falcon or equivalent

1. Connect the brake tube which formerly connected the distribution block to the original master cylinder to the rearward port of the new master cylinder. An adapter is included if required. If the line doesn't reach the master cylinder outlet, replace or adapt it. Use pre-made brake lines that are available in lengths of 8", 12", 20", and in 8" longer increments up to 72". Make 1 ½"-2" diameter loops or U's in the line to use up extra line. It is, in fact, good practice to put a loop into short tubes to provide flex relief. The distribution block is the brass block that interconnects the front and rear brake lines to the master cylinder.
2. Disconnect the brake tube going to the rear brakes at the distribution block.
3. Plug the resulting hole in the distribution block with the 3/8-24" flare plug provided for this purpose. Do not use sealant on this or any flare type fitting.
4. Connect a short length of brake tube from the forward outlet of the master cylinder to the inlet of the proportioning valve-residual pressure valve assembly.
5. Connect the outlet of the residual pressure valve to the brake line coming from the rear brakes. Space is limited, so plan ahead. Do not use sealant on the flare connections.
6. Adapt or re-fabricate the front brake lines (recommend re-fabrication) so that they terminate at a point on the frame rail below and centered on the upper control arm.
7. Working one wheel at a time. Remove the old L-bracket from the inner fender.
8. Slip the old or new L-bracket over the end of the hard line.
9. Securely connect the hard line to the brake hose such that the hose is not twisted.
10. Fit the L-bracket onto the brake hose such that the bracket is correctly oriented and secure it with a C-clip.
11. Establish the correct location for the L-bracket on the frame rail. Secure the L-bracket with the drill point hex head screw provided.
12. Manipulate the hard line to make it tidy.
13. Check all connections.
14. Repeat steps 7-13 on the other side.

H. Mounting an adjustable proportioning valve onto a 67-73 Mustang or 66-69 Falcon or equivalent

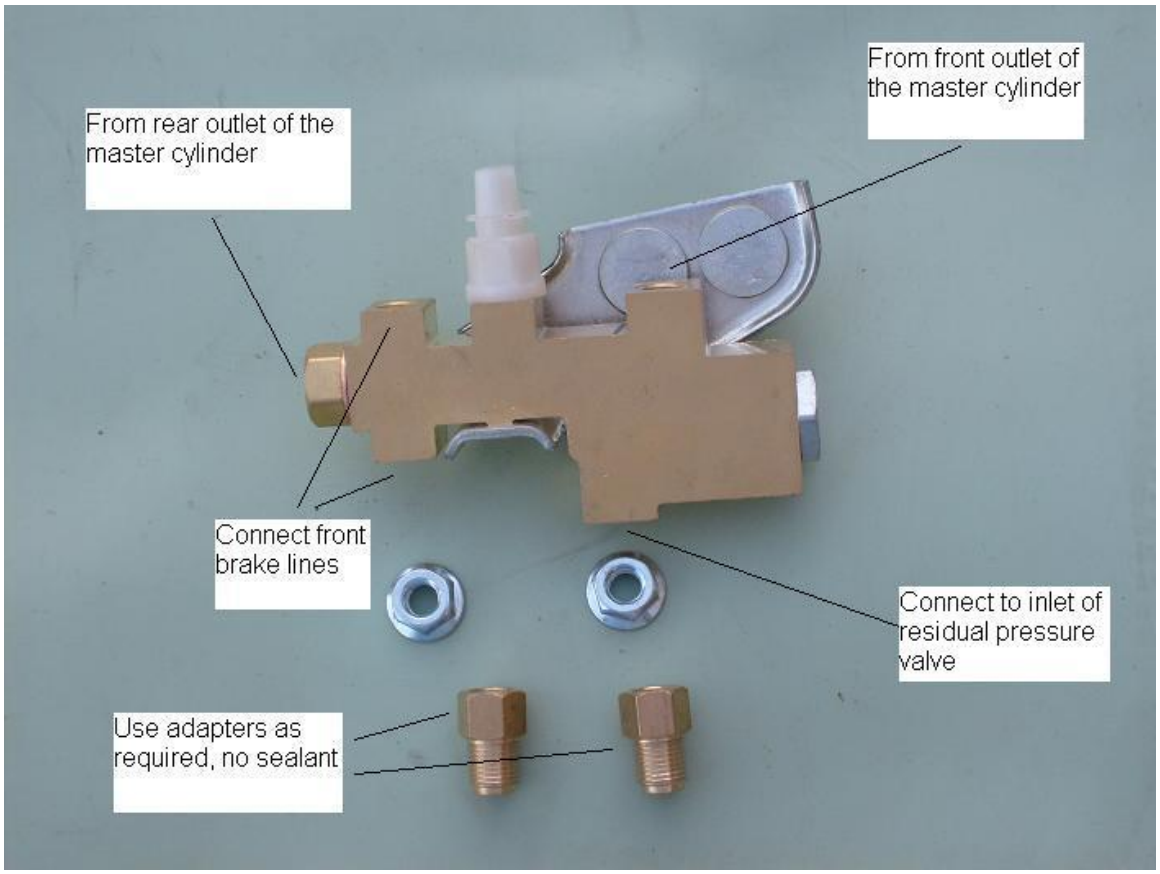
1. Connect the brake line which formerly connected to the rear outlet of the original master cylinder to the rear port of the new master cylinder. An adapter is supplied if required.
2. Connect the brake line which formerly connected to the front outlet of the original master cylinder to the front port of the new master cylinder. An adapter is supplied if required. If the lines don't reach the master cylinder port, fit a new one(s).
3. Disconnect the brake tube leading from the rear brakes at the distribution block. The distribution block is the brass block that interconnects the front and rear brake lines to the master cylinder line.
4. Connect a short length of brake tube from the rear brake outlet of the distribution block to the inlet of the proportioning valve-residual pressure valve assembly (see the picture below).
5. Connect the outlet of the residual pressure valve to the brake line coming from the rear brakes. Space is limited, so plan ahead. Make a loop(s) in the line if necessary to make the lines fit. Do not use sealant on the flare connections.
6. The front brake lines coming from the distribution block terminate centered under the upper control arms. They may be looped 180 degrees and point rearward. The lines are anchored with L-brackets. It would be optimal to re-fabricate these lines.
7. Working one wheel at a time, remove the L-bracket.
8. Carefully straighten the loop such that the end of the line points forward.
9. Slide the line straight back about 4" so that the end is below and centered under the upper control arm.
10. Slip the old or new L-bracket over the terminal end of the front hard brake line.
11. Securely connect the hard line to the brake hose such that the hose is not twisted.
12. Fit the L-bracket onto the brake hose such that the bracket is correctly oriented and secure it with a C-clip.
13. Establish the correct location for the L-bracket on the frame rail. Secure the L-bracket with the drill point hex head screw provided. \
14. Manipulate the hard line to make it tidy.
15. Check all connections.
16. Repeat steps 7-15 on the other wheel.




I. Mounting a combo valve onto a 65-66 Mustang or 63-65 Falcon or equivalent

1. Remove the distribution block. The distribution block is the brass block that interconnects the front and rear brake lines to the master cylinder line.
2. Noting the plumbing indications on the picture below, connect a short length of tubing from the combo valve's rear brake outlet to the inlet of the residual pressure valve.
3. Connect the rear brake line to the outlet of the residual pressure valve. Rearrange the rear line to make it tidy.
4. The line that originally led from the aft master cylinder outlet to the distribution block is plumbed from the aft port of the new master cylinder to the combo valve inlet for the front brakes. An adapter(s) may be required. If a line doesn't reach, make a new line from pre-made tubing.
5. The line that originally led from the forward master cylinder outlet to the distribution block is plumbed from the forward port of the new master cylinder to the combo valve inlet for the rear brakes. An adapter(s) may be required. If a line doesn't reach, make a new line from pre-made tubing. Working on one wheel at a time, remove the old front brake line L-bracket from the inner fender.

6. Adapt or re-fabricate the front brakes line (recommend re-fabrication) so that it terminates at a point on the frame rail below and centered on the upper control arm.
7. Slip the old or new L-bracket over the terminal end of the front hard brake line.
8. Securely connect the hard line to the brake hose such that the hose is not twisted.
9. Fit the L-bracket onto the brake hose such that the bracket is correctly oriented and secure it with a C-clip.
10. Establish the correct location for the L-bracket on the frame rail. Secure the L-bracket with the drill point hex head screw provided.
11. Manipulate the hard line to make it tidy.
12. Check all connections.
13. Repeat steps 4, 5 and 8-13 on the other side.




J. Mounting a combo valve onto a 67-73 Mustang or 66-69 Falcon or equivalent

1. Remove the distribution block. The distribution block is the brass block that interconnects the front and rear brake lines to the master cylinder line.
2. Noting the plumbing indications on the picture above, connect a short length of tubing from the combo valve's rear brake outlet to the inlet of the residual pressure valve.
3. Connect the rear brake line to the outlet of the residual pressure valve. Rearrange the rear line to make it tidy.
4. Plumb the existing or replacement lines from the front brakes to the new combo valve. The line that originally led from the aft master cylinder outlet to the distribution block is plumbed from the aft port of the new master cylinder to the combo valve inlet for the front brakes. An adapter(s) may be required. If a line doesn't reach, make a new line. Use pre-made brake lines that are available in lengths of 8", 12", 20", and in 8" longer increments up to 72". Make 1 ½"-2" diameter loops or U's in the line to use up extra line. It is, in fact, good practice to put a loop into short tubes to provide flex relief.
5. The line that originally led from the forward master cylinder outlet to the distribution block is plumbed from the forward port of the new master cylinder to the combo valve inlet for the rear brakes. An adapter(s) may be required. If a line doesn't reach, make a new line from pre-made tubing.
6. The front brake lines formerly coming from the distribution block terminate centered under the upper control arms. They may be looped 180 degrees and point rearward. The lines are anchored with L-brackets. It would be optimal to re-fabricate these lines.
7. Working one wheel at a time, remove the L-bracket.
8. Carefully straighten the loop such that the end of the line points forward.
9. Slide the line straight back about 4" so that the end is below and centered under the upper control arm.
10. Slip the old or new L-bracket over the terminal end of the front hard brake line.
11. Securely connect the hard line to the brake hose such that the hose is not twisted.
12. Fit the L-bracket onto the brake hose such that the bracket is correctly oriented and secure it with a C-clip.
13. Establish the correct location for the L-bracket on the frame rail. Secure the L-bracket with the drill point hex head screw provided.
14. Manipulate the hard line to make it tidy.
15. Check all connections.
16. Repeat steps 7-15 on the other wheel.

K. Bleed the brakes

1. Follow the instructions included with the master cylinder or bleeding aid to bleed the brakes.
2. The task of brake bleeding is made easier if a vacuum or pressure bleeder is used. The use of speed bleeder screws also makes the task easier.
3. The brake pedal should be firm and high when the brakes are properly bled. A spongy feel at the pedal is indicative of the failure to bleed all of the air out of the system or the calipers being installed on the wrong sides.

L. Front wheel alignment and steering issues

1. Remove any jack stands or jacks.
2. Place the car on level ground.
3. Center the steering wheel.
4. Adjust the tie rod sleeves to align the front wheels straight forward.
5. You may stretch a line parallel to the rear and front wheel. It should be possible to roughly set the toe at 0 degree; that is, the wheels tracking straight forward.
6. Tighten the tie rod sleeve bolts.
7. **Be very careful** if you drive the car to the alignment shop, the camber and caster are likely to be way out of specification. The pads and rotor need "bedding-in" before the brakes will work well.
8. Have the front end aligned to specifications for toe (1/8" toe in), camber (0.0 to - 0.5 degree), and caster (+2.5 degree).
9. Remember to torque the sleeve bolts to 40-45 ft-lb upon returning from the alignment shop.

M. Pad and rotor bedding-in.

1. Perform the break-in in an area with no traffic or obstacles.
2. Accelerate car to approx. 35 mph.
3. Apply brakes using light to moderate effort to reduce speed to approximately 5 mph (DO NOT stop, if possible)**.**
4. Repeat 1 & 2 at least 10 times allowing 1/3 mile between cycles.
5. Allow pads to cool.

**The brake swap is complete. Carefully inspect all of the work.**

IV. CSRP BRAKE SWAP FAQ

Q. Does the kit come with a dual reservoir master cylinder?

A. Yes, the kit comes with the proper dual reservoir master cylinder. Specify manual or power brakes when ordering. Manual applications come with an adjustable push rod.

Q. What size are the rotors?

A. The slotted rotors supplied with the kit are 11.06” diameter 5 lug type.

Q. Can I use the outer tie rod ends from my car with the kit?

A. Ford changed the stud size on the outer tie rod ends several times during the 60’s and 70’s. The kit includes the proper adapter tie rods for nearly all applications.

Q. Why do I need to adapt my hard brake lines?

A. The brake line needs to be adapted or re-fabricated to fit in the proportioning valve and the new master cylinder. Rear lines can usually be used without major modification. It is often easier to fabricate new front lines, especially on 65-66 Mustang models where one also needs to adapt the line to accommodate the brake hose. Unless you possess a very good double flare tool, we recommend that you use pre-made straight lengths of lines that already have the proper fittings attached. These come in 8” or so increments from 8” to 72”. Put loops in the line to use up extra length. You can make a mock-up of the brake line using a coat hanger. The master cylinder may require the use of an adapter fitting at its’ outlet. These will be provided. Be certain that you use the master cylinder’s rearward outlet for the front brakes.

Q. What does the kit include?

A. The kit has all NEW parts including high strength disc brake spindles, caliper brackets, splash shields, an adjustable proportioning valve, performance 11" SLOTTED rotors, corrosion protection coated calipers, semi-metallic pads, hoses, master cylinder, outer adapter tie rods, bearings and seals, an adjustable push rod (manual applications), Wheel hardware, caliper hardware, grade 8 attachment bolts, blue and red thread locker, caliper lube, and our renown installation guide via download. You need only bolt the kit on and adapt or re-fabricate your hard lines to fit the proportioning valve, the master cylinder, and

brake hoses.  Bleed the system, mount the wheels, and the installation is complete.

Q. My car has power steering. Will the kit work?

A. Kits configured for 65-66 cars with power steering include a special driver side adapter outer tie rod. This tie rod alone retails for over $75 at a popular Mustang parts vendor. Six cylinder 65-66 Mustangs and certain 63-64 V8 Falcons MAY come with adapter sleeves, or other tie rod treatments. 67-73 Mustangs with power steering do not require special treatment.

Q. My 65-66 Mustang has power brakes (or I want power brakes). Will the master cylinder provided work with the SWAP.2 kit?

A. The original booster/bracket system used on 65-66 Mustangs is not compatible for use with a dual reservoir master cylinder. There is not enough space between this booster and the shock tower to mount one. This is because Ford located the mechanical clutch linkage in a place that interferes with the direct mounting of the booster to the firewall. In order to accommodate both manual and automatic transmission applications with one assembly type, a standoff bracket is employed. This bracket places the booster about 3” away from the firewall. In this position, it will not mechanically interfere with the operation of the clutch linkage. This works fine with the single reservoir master cylinder which is standard to the model, but will not allow the mounting of the dual reservoir master cylinder necessary for a safe modern brake system.

This presents the kit installer with a couple of options. In any case, the original booster/bracket must be removed. On an automatic transmission equipped car, CSRP offers a compatible booster/ bracket system that allows the use of the original pedal. One could also install the kit in manual brake mode. When purchasing the SWAP kit for these cars, the installer must specify a manual or power master cylinder, or a power brake upgrade kit which includes a proper master cylinder.

On a manual transmission car with original power brakes, the installer must still remove the original booster/bracket, but has fewer practical options for power brakes. CSRP offers a power brake upgrade for this application only if the clutch linkage has been replace with a cable or hydraulic type that eliminates the interference. Otherwise, the user must install the system as manual brakes or find other options.

Q. My 67-73 Mustang car has power brakes (or I want power brakes). Will the master cylinder provided work with the SWAP.2 kit?

A. The kit can be provided with a power type master cylinder at no extra cost when specified. This master cylinder will work with all existing boosters present

on 67-73 cars. Those users wishing to upgrade their manual brakes to power, can purchase our power brake upgrade kit for 67-70 cars. We do not offer power brake upgrades for 71-73 cars.

Q. Will the Granada type Swap give me bumpsteer? What is bumpsteer?

A. Bumpsteer is the change in steering output that occurs without driver input when the suspension moves. Basically, the wheels turn a little in response to going over bumps. This is a result of the fact that the radius of movement for the tie rods and the ball joints are different. Large deflections of the suspension cause different rates of movement of the control arms vs. the tie rods causing a small steering input. This affect is most noticeable, if at all, in performance situations.

All Mustangs and many other 60's and 70's cars are based on the Falcon chassis that Ford developed in the early 60's. The suspension and steering gear for all of these cars are very similar. The suspension mounting configuration for the class, including most years of Falcon, Comet, Mustang, Cougar, Fairlane, Torino, Montego, Maverick, Granada, and Monarch remains the same from 63-80. There were basically two steering geometries during the period. The 64-66 Mustang and 63-65 Falcon models have a slightly different geometry than the later models. The later models have identical geometry with Granada and the steering geometry is not affected by the swap.

CSRP manufactures 2 Granada spindle classes. One type has correct steering geometry for 63-65 Falcon/Comet and 65-66 Mustangs, and the second is identical to original Granada spindles.

It is generally recognized the Falcon class chassis had poor suspension geometry, especially the early applications. It is generally agreed that making major modifications to the suspension like using lowering coil springs, or cutting coil springs, or excessive lowering of the control arms in addition to the swap can exacerbate the inherent poor steering dynamics of the early Mustang.

Q. Can I use my original wheels with the swap?

A. In general, original 14" stamped steels wheels prior to 1969 will not fit onto the rotor hub of the swap. The bearing boss or snout of the Granada type rotor has a larger diameter than the hub hole on the early wheels. The disc brake caliper also tends to interfere with the inner surface of the wheels. Some people advise that you can grind down the calipers or turn down the snout to affect clearance. The availability of 14" tires is becoming increasingly poor and the change to 15" or greater aftermarket wheels is very popular. If you desire to maintain the original look, find 14" wheels from later Fords like Maverick or Granada. The 14" Magnum 500 wheels fit with the swap.

Q. Will the swap work with my 6 cylinder car, and will I need to change the steering gear?

A. This swap will mount to your existing 1960+ 6 cylinder suspension and steering gear. You will use adapter outer tie rod end provided with the kit for pre 67 cars. On pre 1963 Falcon/Comet, the control arms will need to be replaced with 1963-65 Falcon or Mustang type. 1967-73 6 and 8 cylinder cars use the same tie rods.

Q. Can I keep my 4 lug wheels with the swap?

A. The current version of this and nearly all other swaps have a 5 lug rotor included. This can make the selection of wheels awkward with 6 cylinder cars that have the original 4 lug wheels in the back. We have determined that providing a 4 lug kit is not feasible. The selection of suitable aftermarket 4 lug wheels is poor and it is difficult to provide a suitable rotor/caliper set that will fit standard 14” 4 lug wheels.

Q. My 65/66 Mustang car has power brakes (or I want power brakes). Will the master cylinder provided work with the SWAP.2 kit?

Q. How long does it take to do the swap?

A. The removal of the old parts and installation of the new ones can easily be done in one weekend. The refitting of the brake lines may take a part of another.

Q. What does a proportioning valve do?

A. A proportioning valve is a vital component of a disc brake system. It is a metering valve that controls the flow of brake fluid to the rear wheel cylinders. It functions to delay the full implementation of the rear brakes. Without the valve, the rear brakes would lock prematurely. There are 2 types of proportioning valves available with the kit, either an adjustable, or an OEM combo type. An adjustable type is the standard one included with the kit. It has an adjustment knob that functions much like a water faucet except that the flow of fluid is never stopped, just restricted. This valve is simple to plumb, but requires that the installer tune it by trial and error to give the desired rear braking performance.

One may elect to purchase the optional OEM type combo valve. This valve has the proportioning function along with a front brake metering function, as well as leak isolation and indication functions. The pressure switch is a hydraulic system that senses pressure loss in a circuit (front and back are plumbed separately) and isolates that circuit from the other circuit. This prevents the total loss of brakes in the event of a leak. This valve is plumb and forget.

Q. Will I need to buy anything else?

A. With the exception of parts necessary to adapt the hard brake lines to make the connections of the new master cylinder and proportioning valve, and hoses, all parts are included. Nothing from your drum system is used. You can sell your drum system on eBay.

Q. Does the kit include instructions?

A. The kit includes internet access to the installation guide. This guide goes through the history of the swap, and includes a complete installation guide.

Q. Is the swap safe?

A. The system is based on an original Ford OEM design. The components are the best available. The installer must be reasonably proficient in mechanics and must have the car realigned after the installation. Brakes are a **seriously** necessary component of the safety system of your car. Have the new system inspected by a qualified mechanic before driving the car.

**CSRP will not accept the liability that the owner assumes when making the swap.**

Q. I've heard that I won't be able to align the toe after the swap?

A. This problem occurs when using original Granada spindles on 65-66 Mustangs. The CSRP kit includes spindles with correct steering geometry and does not have this problem.

## IV. LEGAL NOTICE

This document is only a guide. It in no way represents the ultimate authority on the subject presented. The user must exercise good judgment in relying on its content. It is incumbent upon the user to verify the guidance contained within. The seller of these parts and the authors of this guide provide the service of compiling parts that are generally recognized, when properly assembled, to provide a safe and effective front disc brake substitute for the antiquated drum brakes originally present on certain classic Fords from the 60's and 70's. The buyer must determine if is appropriate or prudent to undertake this front disc brake swap using this kit and guide. The swap should only be undertaken by those who are competent in automotive brake system mechanics. The completed system must be installed or inspected by a certified mechanic, and any necessary adjustments made. The purchaser of the parts assumes all liability associated with their use. The seller does not accept liability associated with the use of these parts. The parts are warranted to be free of manufacturing defects for a period of 1 year from the time of purchase. This limited warranty is applied

to replacement of the defective part(s) only. The warranty does not apply to any labor associated with installation of the part(s). Please see our terms of purchase located at our website www.discbrakeswap.com. The provisions contained there apply to this install and the parts herein.

Thank you for purchasing the CSRP front disc brake conversion kit. Good luck and good motoring.