Tilton HD Master Cylinder Install Guide for 370Z/G37S (Aug 2018 Preliminary)

Required Items:

- Metric Flare Nut Wrenches (just 10mm size is used for factory lines)
- Standard Flare Nut Wrenches for –AN Fittings (7/16", 1/2" and 9/16" used)
- Needle Nose Pliers to remove clips/clamps.
- Jack + Jack Stand (Post Style Vehicle Lift Not recommended - initial portions of install require under dash access to remove and re-install clutch pedal assembly.)
- Small and Medium Size Flat Blade Screw Drivers (to remove body push-pin clips)
- Philips Screw Driver (Medium Tip Size)
- 10mm Standard Socket.
- 12mm Deep, 1/2" Deep & 9/16" Deep sockets + 3/8 Ratchet and extension bars.
- Shop Towels, Disposable Rags or Paper Towels
- Large Syringe, Turkey Baster, or other suction device to remove old fluid from reservoir.
- (1) Pint Bottle of DOT 3, DOT4 or DOT 5.1 Brake Fluid (DO NOT USE DOT 5 Silicone Fluid)

Installation Procedure:

(Park on a level and solid surface with clear access around the front driver side)

1) Jack the front left side of the car up from the lift point (under the driver's door post).
2) Remove the front left wheel and set aside.
3) Place a Jack Stand under lower control arm just behind the lower ball joint and carefully lower the car onto the stand. Make sure the stand is stable and standing level with all 4 feet on the ground before removing the lack.
4) Next locate and remove the plastic (push-pin) body clips holding the rear half of the inner fender liner in place. Use a small flat blade screw driver to carefully lift the center of pop-up buttons and then carefully pull the body of the clip out of the fender liner. (See Photo #1 Below)
5) Locate and Remove the Philips screws where the liner meets the lower side molding along with the small 10mm bolt. (See photo #2 Below)
6) Locate and remove the plastic pin that is hidden where the liner wraps under the car near the jacking point. (See Photo #3 Below)
7) Carefully work the liner out of the wheel well and set it aside with the fasteners.

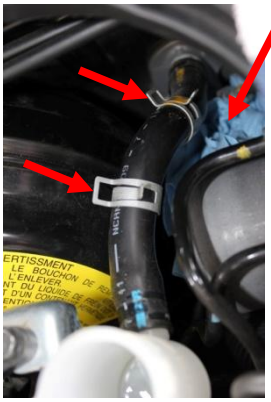
#1

#2

#3

8) Next go under the hood and remove the access cover over the clutch/brake area along with the trim that surrounds the cover. This trim surround is held with several more pop-up clips and once removed will lift out allowing much greater access to the master cylinder area.

9) Open the clutch fluid reservoir and use a suction tool remove as much of the old fluid as possible to prevent large amounts fluid leaking out when removing the reservoir hose.

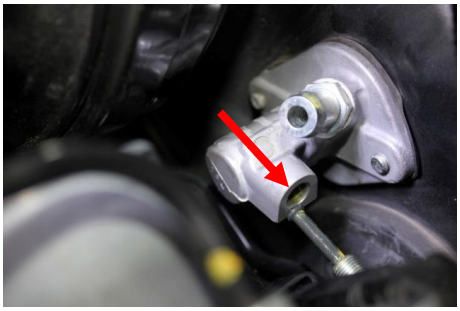


10) Using pliers squeeze the tabs on the reservoir line clamps to release them and move them towards the center of the line.

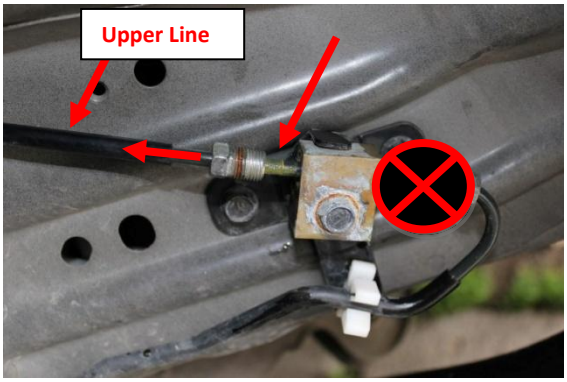
11) Pack lots of shop towels, rags or paper towels under/around the master cylinder to catch any remaining fluid as you pull the reservoir line off the master cylinder end first.

12) Finish by carefully working the hose from the reservoir side as well. Careful not to crack the plastic reservoir nipple. Remove both of the clamps for reuse on the new fluid line later.

13) Next with the packing still under/around the master cylinder use a 10mm Flare Nut Wrench remove the factory hard line from the right side of the master cylinder. (Note: paper towel packing has been removed for photo clarity)



14) Locate the brass junction point in the fender well and remove the **Upper** hard line using a 10mm Flare Nut Wrench (Tip- Use shop towels underneath the fitting to catch any fluid that leaks). **Do Not** Disconnect the Lower Line running to the transmission.



15) Use two small flat blade screw drivers or pliers to carefully release the **Upper** hard line from the white plastic clip holding the line to the fender. This is located about half way up the line from the fitting you just removed. Do not pry on the line as this will break the clips, the white tabs need to be compressed outwards away from the tube to allow it to release.

Removing the Clutch Pedal – Follow RJM 370Z/G37 Rev3.1 AFP Pedal Install Guide Steps #1 to #14 for Removal of OEM Pedal Assebly.

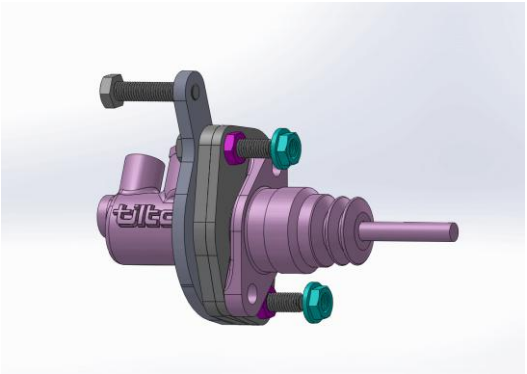
16.) Go under the hood and guide the factory master cylinder off the firewall and out of the car. You may need to maneuver it around to find the correct path for removal so it clears everything coming out.
NOTE: For G35 Sedans 07-08 and G37's with original master cylinder you may have a slightly different style master to those found on the 370Z. This odd MC has a protrusion on the bottom which hits the ABS bracket when you attempt to remove it. If you run into this early style factory master cylinder you'll need to remove the master cylinder studs from the interior side of the firewall and remove the clevis fork before you can pull the master cylinder from the car. To do this you'll need either a stud puller tool (follow instructions with the tool) or two of the master cylinder nuts using the following procedure:

Thread two MC nuts onto the stud you want to remove. Tighten the two nuts into each other using both a 12mm wrench and your 12mm socket combined very firmly. Now use your 12mm wrench on the bottom nut and turn the stud counter clockwise. The stud should break free and start turning out of the master cylinder. Once the stud is out use your wrench and ratchet again to get the nuts back off. Repeat this process for the 2nd stud.
Photo is for Reference Only – Shown out of the car for clarity.

17.) 17.) With the master cylinder out you can carefully pull the upper hard line up and out of the car from the top side where the master cylinder is. Pull the line carefully up thru the frame and work it carefully out. It may take a bit to work all the kinks/bends thru the frame but it should come out fairly easily. A little bending or flexing of the line may be required to get past certain points which is perfectly OK, just be gentle and don't kink or cut the tube getting it out.
Not Note: the rubber grommet will likely pop out of the fender as the line is pulled out. If not then at pop it out at this time. This grommet needs to be removed so you can reinstall it over the new braided clutch line later. Simply set it aside for now.

Installation of the New Tilton Cylinder

Unpack the new Tilton Master Cylinder you received and at this point you'll need to remove a few items before installation into the car. (Note the Tilton rubber boot is not included in the kits as they were found to make a notchy ratcheting sound as the threaded rod moves in/out.)



– Remove the (2x) Serrated Flange Nuts from the studs (Shown in Teal in illustration to Right.)

– Remove the (2x) Thin Hex Nuts from the studs (Shown in Pink in illustration to Right.)

– Remove the Rear Firewall Clamping Plate (Grey) which has a (2x) main studs welded in and a smaller bolt facing the opposite way. The smaller bolt is an installation aid to help in holding and positioning the Clamping plate during install. After installation this bolt can be left in or simply removed.

– Remove the Brass Barbed Fitting from the cylinder which may be loosely installed into to the Top Rear inlet port of the cylinder for shipping (alternately this item may be in the hardware bag on later shipments, if that's the case please disregard this step). This fitting will get installed and tightened down at a later time.

18.) Unlike factory the new cylinder will install from under the dash with the braided line and body of the cylinder passed thru the opening in the firewall.

19.) Go under the dash with the new Tilton Cylinder and stretch/pull the carpet away from the opening in the firewall sufficient to fit the flange of the new cylinder flat against the firewall. Alternately you may loosely position the cylinder and mark around it with a marker so you can cut a little of the padding away in the shape of the flange with a razor knife.

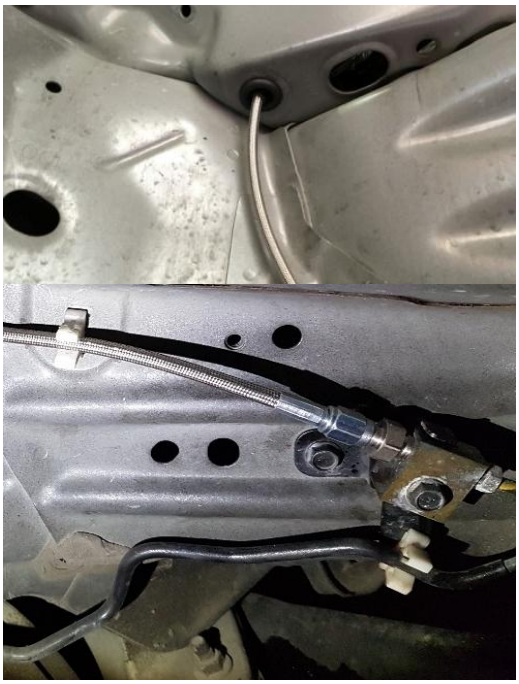
20.) At this point it's easiest to have someone assist you in the next couple steps – Grab them now.

21.) Have your helper stand at the engine bay to help guide the black pre-tightened braided stainless line into the engine bay as you pass the cylinder thru the firewall from under the dash. You'll need to tip the cylinder up to get the front fitting and line thru the opening, then rotate the cylinder clockwise slightly to fit the large bulge in the cylinder thru the opening, finish by turning it slightly back counter clockwise so the holes in the flange line up with the holes in the firewall.

22.) While still holding the Tilton cylinder lined up with the holes in the firewall have your helper take the stainless firewall clamping plate, guide it in with the two stud facing the firewall using the extra bolt as a handle to help hold it. Maneuver the clamping plate so the studs pass thru the holes in firewall and on thru the matching holes in the Tilton adapter plate. The upper right stud is slightly longer then the other so you can get it started thru the hole first and then guide the second stud into alignment after to make install easier.

23. Once both studs have come thru the firewall and the flange plate on the Tilton cylinder you can thread the 2x thin nuts (pink in earlier illustration) onto the studs. Run them down fully to clamp the cylinder to the firewall. Tighten with them both firmly and evenly with a ½" or 13mm Deep socket and ratchet.

24. Back under the hood you can route the black braided stainless line down thru the hole in the fender well where the OEM line previously exited and pull the line thru into the wheel well area ready for connection.



25. Take the end of the new line and push the rubber line grommet you removed from the OEM line over the end of the line and work it upwards to the hole in the fender. Snap the grommet back thru the opening so it protects the line just as it did for the OEM line. (Note the line is silver in this photo, the black coated lines are new to the Tilton Kits.)

26.) Thread the Line Fitting adapter into the top port of the brass junction where the factory hard line was removed (this adapter fitting came in the hardware kit supplied). Tighten the adapter fitting firmly into the brass block with a 9/16" Flare Nut Wrench.

27.) Next thread the braided hose fitting down just finger tight. You don't want this line sealed up yet or it'll hinder the initial bleeding process.

28.) Finish by sliding the (2x) hose clamps removed from the OE inlet hose onto the stubby end of the new RJM hose assembly. Push one to the end where the larger hose meets the ¼" hose. Position the second one at the end to clamp. Squeeze the end one open with pliers and press the large end onto the nipple of the fluid reservoir.

29.) Take the Brass Barbed Fitting you removed from the Tilton Cylinder earlier and thread it into the Top Rear Port of the new cylinder. Tighten snug + ¼ turn with a 1/2" box end wrench or flare nut wrench. Finish by pushing the small end of the new fluid line firmly down onto the barbed fitting. Both ends of the small line are barbed connections that Do Not require additional clamps to seal.

At this Point you can begin installing the RJM Rev3.2T Pedal System the same as you would a regular Rev3.1 Unit starting from Step#15 of the RJM 370Z/G37 Rev3.1 Pedal Installation Guide. There is only a couple things to note that are different.

#1- the Rev3.2T sits on top of the new Tilton Cylinder and therefore Does Not require any white firewall spacers. It bolts directly down overtop the cylinder so disregard that step.

#2 – the Rev3.2T unit comes Pre-Set with the AFP to 0% for Best Bleeding using the manual method. As such when you install the pedal don't fuss too much with initial setup as all fine tuning will be done after the bleeding. Just get the pedal firmly on the firewall, get the clevis installed and threaded high so the pedal gets max stroke for bleeding. Set the clutch rod angle so that with the pedal up the rod just slightly angles upward towards the clevis end as it will drop lower as the linkage rotates thru its motion.

#3 – After you have the system bled you can set the pedal to the recommended initial setup point of 75% (4th tooth from bottom on the scale) to do this simply loosen the 2x Allen head bolts and slide the AFP plate upwards to the 75% mark. Once you do that you will need to re-adjust the clutch rod angle by loosening the side tension bolts and moving the center section downwards to compensate. Again set the rod angle so the rod is angle just slightly upwards towards the clevis. Don't over tighten the two side tension bolts as that will cause binding of the pedal bearings. Follow install guides setup of these bolts for reference.

Bleeding the System

Refill the clutch reservoir to the Max line with a performance oriented high temp brake fluid of DOT3/4/5.1 spec. Keep adding fluid until the air bubbles stop and the reservoir is full. Set the lid upside down to cover the reservoir to prevent any dirt/debris from falling in but not seal it. Sealing the cap will prevent proper bleeding.

Manual Quick Bleed Proceedure – To Junction Point

The **Quick Bleed** procedure applies only to stand alone installations of the master cylinder where no other components in the clutch system have been opened up below the brass union block.

Starting with the braided line in the wheel well lightly tightened:
Step 1.) Have a partner push the clutch pedal in and hold it fully down until they are told to release it.
Step 2.) Once they have pumped the pedal – Crack the fitting open with rags or paper towel around the area to collect any fluid that sprays/leaks out. You should immediately hear air and fluid escaping the line. Once it stops lightly tighten the fitting again.
Step 3.) Tell your partner they can release the pedal and allow it to come up fully for a few seconds.
Step 4.) Top off Reservoir if necessary. Do Not Allow it to go below the Min Line at any Point.
Repeat Steps 1 to 4 until you no longer see air/bubbles escaping and are getting only fresh fluid out.
Step 5.) Firmly tighten the line, top off the reservoir a final time and install the reservoir cap.
Step 6.) To make sure any remaining air is purged out to the reservoir you'll need to slowly and deliberately pump the clutch pedal a few times. At this point the pedal should feel like it's building good pressure while pumping.
Pump and Hold Fully Down for 5 seconds. Release at normal clutch speed after the 5 Count.
Stop with the Pedal Fully Up (foot right off the pedal) for a 10 count between pumps.
Repeat 5-10 Times.

At this point if everything went well you should have a nice firm clutch pedal with no softness at the top for OEM pedal units and no more than ½"to ¾" of soft travel at the top for RJM Pedal Units. Please note if you've just installed a new RJM Pedal along with the new master cylinder then the pedal feel at the top will be softer then you were used to. With the design of the RJM HD Master Cylinder any small amount of air left in the upper lines after this procedure will quickly and automatically get purged from the system as you start driving it or continue to slowly pump it.

Finishing Up:

30.) After ensuring all fittings are tight you can work the inner fender liner back into the wheel opening.

31.) Maneuver the liner around so that everything lines up with their respective holes and start re-installing the push pin fasteners first to hold it in place. Follow with the 10mm bolts and finally install the two Philips screws.

32.) Lift the car with your jack at the front left lift point and remove your jack stand.

33.) Re-Install the wheel and properly torque the lug nuts to factory spec.
(Retighten all lugs a second time after 50-100 miles of driving)

34.) Finish by Adjusting the RJM Rev3.2T Pedal back to 75% AFP, adjust clutch rod so pedal is roughly level with brake pad or ½" higher, reset upper cruise control switch. At that point you're good for a test drive and final pedal tuning to get everything dialed in to your liking. Reference the tuning section of the Rev3.1 Pedal Install guide for specific steps.

Thank you for your Purchase of an RJM Performance Product. Should you encounter any issues or have any questions please don't hesitate to contact us for support. Please send all emails to Ryan@RJMPerformance.com and I'll get back to you as soon as possible.