RJM HD Master Cylinder Install Guide

Required Items:

- Metric Flare Nut Wrenches (just 10mm size is used for factory lines)
- Standard Flare Nut Wrenches for –AN Fittings (7/16" and 9/16" used)
- Needle Nose Pliers
- Small length of shipping tape (~4" or so)
- Jack + Standard height Jack Stand
- Small and Medium Size Flat Blade Screw Drivers (to remove body push-pin clips)
- Philips Screw Driver
- 10mm Standard Socket.
- 12mm Deep Socket, Ratchet and extensions.
- Shop Towels, Disposable Rags or Paper Towels
- Large Syringe, Turkey Baster, etc to remove old fluid from reservoir.
- Bottle High Temp DOT 3 or DOT 5.1 Brake Fluid (Not DOT 5 which is Silicone based)

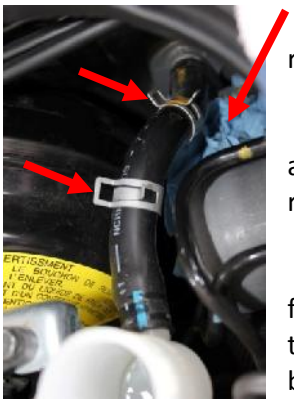
This MC is DOT 4 compatible but requires more frequent fluid changes to maintain the higher boil point advantage as DOT4 degrades faster than a comparable DOT 3 over time.

Instructions are written for DIY install without a lift. Kindly disregard any lifting/jacking instructions when performing work with the aid of a shop lift.

Getting Started:

1) Working on a level surface park so there is plenty of access around the front driver side wheel and engage the parking brake firmly.
2) Jack the front left side of the car from the lift point just behind the front wheel (under the door). You may need to roll up on something to lift the car an extra couple inches to get your jack under if you're lowered or don't have a low profile jack.
3) Remove the front left wheel and set aside.
4) Place a Jack Stand under the front 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.
5) Now you can locate and remove all the plastic push-pin body clips holding the rear half of the inner fender line in place using the small flat blade screw driver to carefully lift the center pop-up buttons and then carefully pull the body of the clip out of the fender liner. There will also be (2) Philips screws where the liner meets the lower body molding, a couple of 10mm bolts and one last plastic pin that is hidden where the liner wraps under the car near the jacking point. Once you've gotten these out you can carefully work the liner out of the wheel well and set it aside along with all the fasteners removed.

6) Next go under the hood and open the clutch fluid reservoir. Using a large Syringe, turkey baster or other suction tool remove as much of the old fluid as possible to prevent large amounts fluid leaking out later.



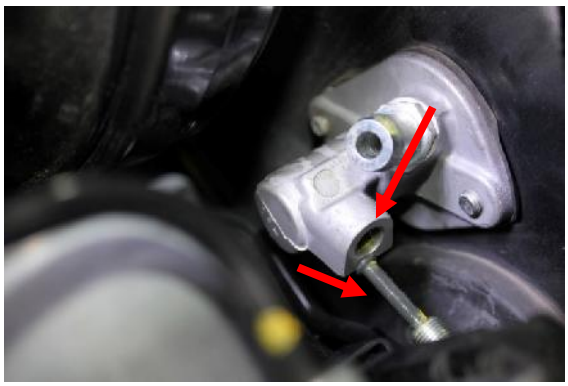
7) Using pliers squeeze the tabs on the reservoir line clamps to release them and move them towards the center of the line.

8) Place lots of shop towels, rags or paper towels packed under and around the master cylinder to catch any remaining fluid as you pull the reservoir line off the master cylinder.

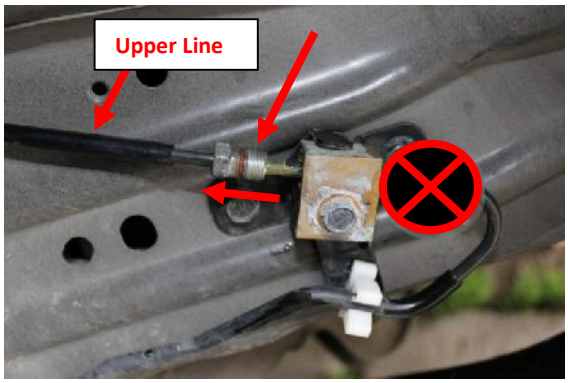
9) Finish by carefully pulling the hose from the reservoir side as well. Remove the two fluid clamps and set them aside to be reused later.

10) Next while you still have packing under/around the master cylinder use a 10mm Flare Nut Wrench loosen and remove the factory hard line from the right side of the master cylinder.

(Note: paper towel packing has been removed for photo clarity after both lines were disconnected)



11) Now locate the brass union in the fender well where the upper and lower factory hard lines meet. Using your 10mm Flare Nut Wrench loosen and remove the **Upper** hard line from the brass union. Upper Line is shown on Left side of this photo and runs upwards to a grommet where it goes into the engine bay. Do Not Disconnect the Lower Line running to the transmission. Use a rag or shop towels to catch any fluid that leaks as you loosen the fitting.



12) Finally you can use you small flat blade screw driver to release the **Upper** hard line from the white plastic clip holding the line to the fender half way between the brass block and where the line enters the frame above you. Try not to break the clip as this can be used to help secure the new braided SS line later but is not required should it accidentally break it.

Remove Clutch Pedal : Follow Steps Specific to Your Pedal Assembly Below

For all pedal assemblies start by lifting the left side door sill trim up near where it meets the kick panel. Pop out the clips holding the kick panel along the door edge and remove the plastic nut down by the firewall to remove the kick panel. This will gain you more access to remove the clutch pedal assembly. Once the kick panel is out lay the door trim back down so it doesn't get damaged while working or by closing the door.

For Factory Pedal Assembly

-Start by using a 12mm wrench and loosen the lock nut on the clutch rod, located directly behind the gold clevis fork that connects the pedal arm to the master cylinder.
- Remove the pin from the gold clevis and set it + the hairpin clip aside.
-Unplug both the upper and lower clutch switches (Depress the blue tabs and pull plugs out.)
-Use pliers to release the clip holding the wiring to the RH side of the pedal assembly.
-Use a 12mm deep socket to remove the two nuts holding the assembly to the firewall.
-Use a 12mm socket to remove the upper dash bolt and the pedal assembly can now be guided out from under the dash and set aside for now with the nuts & bolt you removed.
Go To >Master Cylinder Installation Continued

For RJM Rev 1 or Rev 2 Pedal Assembly

-Start by using a 12mm wrench and loosen the lock nut on the clutch rod, located directly behind the black clevis fork that connects the pedal arm to the master cylinder.
- Loosen the AFP lock bolt using a 3/16 Allan Key located on the RH side of AFP adjuster mechanism just behind the spring hold down tab.
-Remove the clip, pin, washers and small bearings from the black clevis. Set them aside.
-Unplug both the upper and lower clutch switches (Depress the blue tabs and pull plugs out.)
-Use pliers to cut the zip tie holding the wiring to the RH side of the pedal assembly.
-Use a 7/16 socket to loosen the two side tension bolts that lock the center section of the bracket just enough that you can move the center section (don't remove them completely)
- Now remove the large hairpin clip on the RH side and push/pull the large pivot pin out of the pedal assembly to remove the pedal arm from the bracket.
- Next push the center sliding section fully upwards so you can better access the firewall nuts.
-Use a 12mm deep socket to remove the two nuts holding the assembly to the firewall.
-Use a 12mm socket to remove the upper dash bolt and the pedal assembly can now be guided out from under the dash and set aside for now with the nuts & bolt you removed.
- Take the two white spacers off the master cylinder studs and set them with the assembly to be reinstalled later.
Go To >Master Cylinder Installation Continued

For RJM Rev 3.x Pedal Assembly

-Start by using a 12mm wrench and loosen the lock nut on the clutch rod, located directly behind the gold clevis fork that connects the pedal arm to the master cylinder.
- Remove the pin from the gold clevis and set it + the hairpin clip aside.
-Unplug both the upper and lower clutch switches (Depress the blue tabs and pull plugs out.)
-Use a 7/16 socket to loosen the two side tension bolts that lock the center section of the bracket just enough that you can move the center section (don't remove them completely)
- Push the center sliding section fully upwards so you can better access the firewall nuts.
-Use a 12mm deep socket to remove the two nuts holding the assembly to the firewall.
-Use a 12mm socket to remove the upper dash bolt and the pedal assembly can now be guided out from under the dash and set aside for now with the nuts & bolt you removed.
- Take the two white spacers off the master cylinder studs and set them with the assembly to be reinstalled later.

Master Cylinder Installation Continued:

12.) Once the pedal assembly is out you can go under the hood again and guide the factory master cylinder off the firewall and out of the car. You may need to maneuver it around a bit to find the correct path for removal so it clears everything on the way out.

NOTE: For G35 Sedans 07-08 and early 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.

13.) With the master cylinder out you can carefully pull the upper hard line up and out of the car from the top where the master cylinder is. Pull the line carefully up thru the frame and out. It may take a bit to work all the kinks/bends thru the frame but it should come out fairly easily.

14.) Next take the new braided SS line that came in your kit along with about 4-5" of standard clear packing tape and tightly wrap it around one end of the line starting about an inch or two from the fitting.

Twist the tape tightly around the hose and fitting, then twist it up to make a thread or string with the remaining tape that you can use to pull the line thru the rubber grommet in the frame. This will also prevent any contaminants from getting into the line as it's pushed thru the grommet in the frame.

15.) Apply a little white lithium grease to the grommet in the frame from the fender well side and then push the line up thru it towards the engine bay. Once it's pushed up as far as you can go you can use some pliers on the engine bay side to grab the tape and firmly pull the line thru the grommet. Getting the fitting to go thru will be a tight fit. A second person to help push up from the fender side while you pull up from the engine bay can be helpful.

- Remove all tape after it passes thru into the engine bay.

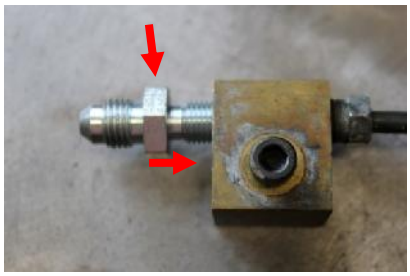
16.) Next get the new master cylinder and remove the rubber shipping cap on the lower outlet port (small cap) and the upper fluid inlet port (large cap). Some assembly fluid may leak out once the covers are off so grab a rag if needed to catch any drips and don't pump the rod. Take the new master cylinder to the where you just pulled the new braided SS line up for the next step.

17.) Now grab the end of the braided SS line you just pulled thru the frame and thread it onto the lower outlet port of the new master cylinder which is on the bottom left side of the master cylinder. Tighten the line fitting firmly with a 7/16" Flare nut wrench. Do not use a Metric wrench as it can strip the fitting.

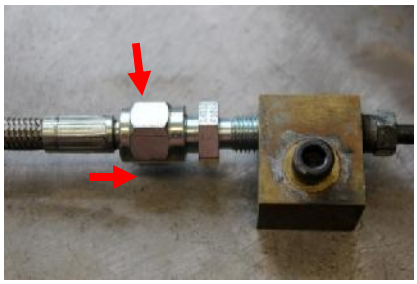
18.) Next unthread the **Lower Right** master cylinder stud from the unit to remove it (as viewed from the front where the clutch rod exits) and then guide the new master cylinder down into place and thru the firewall in the same manner as the old one was removed. Now with a helper holding the master cylinder in place from the engine side, go under the dash, line the unit up with the stud hole in the firewall and thread the previously removed stud back into the Lower Right stud hole as viewed from under the dash.

19.) Find the new Red reservoir hose from the kit and slide the factory reservoir hose clamps on using some pliers to open them up. About 1-2" in from each end is good.

20.) Now push one end of the hose fully over the new master cylinder's inlet port and using some pliers slide the clamp down to hold it. Then finish by pushing the line fully over the outlet port of the factory fluid reservoir and slide the clamp up to hold it as well.



21.) Next find the Earls -3AN to 10mm Metric Adapter in the master cylinder kit and thread the 10mm inverted flare end it into the top port of the brass union in the fender well. Tighten it firmly with a 9/16" Flare Nut Wrench - Do not use a Metric wrench as it can strip the fittings.
Photo for Reference Only – Shown out of the car.



22.) Now thread the other end of braided SS line onto the adapter fitting just installed in the brass block. Thread it down until its almost finger tight and then back it off a turn. You don't want this line sealed up yet or it'll hinder the initial bleeding process later.
Photo for Reference Only – Shown out of the car.

Install Clutch Pedal : Follow Steps Specific to Your Pedal Assembly Below

NOTE: If changing over to a new RJM Pedal Assembly that was not previously installed in this vehicle please follow the appropriate RJM Pedal install guide in its entirety to install the new pedal assembly at this point. The following instructions are ONLY for re-install of an existing and previously setup RJM Pedal. This abbreviated set of instructions assumes your familiar with the RJM Pedal and does not cover tuning or setup of a new pedal system here.

For Factory Pedal Assembly Re-Install

- Thread the OE gold clevis fork onto the new MC rod about half way down on the available threads.
- Maneuver the pedal assembly back into place on the firewall making sure the gold clevis fork slots over the pedal arm so it's lined up and ready to install the pin later. ***Failing to slot the clevis over the arm at this point means you'll be removing the pedal assembly again as it can't be forced into place later without damaging the master cylinder.***
- Now install the two stud nuts finger tight to hold the pedal assembly in place on the firewall.
- Next install the upper dash bolt loosely using a 12mm socket and extensions.
- Using your 12mm deep socket go back and tighten the two master cylinder nuts firmly.
- Followed by tightening the upper dash bolt firmly.
- Plug the two clutch switches back into their respective switches and clip the wiring back into the RH side of the assembly.
- Now check how the clevis lines up with the hole in the pedal arm. You need to adjust the clutch rod to where the clevis pin can simply slip in place without any tension on it. Thread turn the clutch rod counter clockwise to make the linkage longer or turn it clockwise to make the linkage shorter as needed. ***Failure to adjust the clutch rod correctly will cause issues with the new master cylinder not balancing fluid correctly to the reservoir and will make bleeding the system difficult or impossible later.***
- Once the rod is adjusted correctly slip the clevis pin in place and install the hairpin clip to hold it.
- **Spin the lock nut behind the clevis until it meets the clevis and tighten firmly with a 12mm wrench.**

Go To > Bleeding the System

For RJM Rev 1 or Rev 2 Pedal Assembly Re-Install

(For a more detailed instruction set with photos for these following steps please reference the RJM 370Z/G37 Rev2 Pedal Install Guide)

- Thread the black clevis fork onto the new MC rod about half way down on the available threads.
- Install a white firewall spacer over each of the master cylinder studs.
- Maneuver the pedal bracket back into place on the firewall and install the two stud nuts finger tight to hold the pedal assembly in place on the firewall.
- Next install the upper dash bolt loosely using a 12mm socket and extensions.
- Using your 12mm deep socket go back and tighten the two master cylinder nuts firmly.
- Followed by tightening the upper dash bolt firmly.
- Line up the pedal arm (with spring) for reinstallation into the bracket making sure the black clevis fork slots over the pedal arm so it's lined up and ready to install the pin later. ***Failing to slot the clevis over the arm at this point means you'll be removing the arm again as it can't be forced into place later without damaging the master cylinder.***
- If you still have the short install pin used as a tool to aid holding the pedal arm in place from the right side you can install it now. While holding the pedal arm lined up slide the large pivot pin in from the left side so it goes thru the assembly, thru the arm and out the other side of the assembly. Reinstall the large hairpin clip on the right side to hold the pivot pin.
- Plug the two clutch switches back into their respective switches and zip tie the wiring back onto the RH side of the assembly.

- Adjust the center sliding section of the bracket up or down as needed to where the clevis hole is lined up vertically with the clevis pin hole in the pedal arm so the master cylinder gets a straight push in/out. While holding the height where it needs to be tighten each of the two side tension bolts lightly until the sliding section is locked. Now check the side-side play in the pedal arm. Tighten the two bolts together evenly while checking the side-side play in the pedal arm. When the side play just disappears you want to back off by ¼ turn each to ensure the pedal arm is still moving freely. **Too tight will pinch the bearings and cause problems with the pedal not returning fully.**

- Slip a clevis bearing into each side of the clevis fork and now check how the clevis lines up with the hole in the pedal arm. You need to adjust the clutch rod to where the clevis pin can simply slip in place without any tension on it with the pedal fully up. Turn the clutch rod counter clockwise to make the linkage longer or turn it clockwise to make the linkage shorter as needed. ***Failure to adjust the clutch rod correctly will cause issues with the new master cylinder not balancing fluid correctly to the reservoir and will make bleeding the system difficult or impossible later.***
- Once the rod is adjusted correctly slip the clevis pin in place with a washer on each side and install the hairpin clip to hold it all together.
- Press the pedal arm down about half way and tighten the AFP Lock Bolt on the right side of the upper arm assembly to lock the AFP setting from changing and to reduce linkage slack to a minimum.
- Spin the lock nut behind the clevis until it meets the clevis and tighten firmly with a 12mm wrench.

Go To > Bleeding the System

For RJM Rev 3.x Pedal Assembly Reinstallation
(For a more detailed instruction set with photos for these following steps please reference the RJM 370Z/G37 Rev3 Pedal Install Guide)

- Thread the OE gold clevis or RJM HD Clevis fork onto the new MC rod about half way down on the available threads.
- Install a white firewall spacer over each of the master cylinder studs.
- Maneuver the pedal assembly back into place on the firewall making sure the clevis fork slots over the pedal arm so it's lined up and ready to install the pin later. ***Failing to slot the clevis over the arm at this point means you'll be removing the assembly again as it can't be forced into place later without damaging the master cylinder.***
- Install the two stud nuts finger tight to hold the pedal assembly in place on the firewall.
- Next install the upper dash bolt loosely using a 12mm socket and extensions.
- Using your 12mm deep socket go back and tighten the two master cylinder nuts firmly.
- Followed by tightening the upper dash bolt firmly.
- Adjust the center sliding section of the bracket up or down as needed to where the clevis hole is lined up vertically with the clevis pin hole in the pedal arm so the master cylinder gets a straight push in/out. While holding the height where it needs to be tighten each of the two side tension bolts lightly until the sliding section is just locked up + ½ turn each. **Check that pedal arm is still moving freely and springs back. Over tightening the two side bolts will pinch the bearings and cause problems with the pedal not returning fully or being very stiff. It takes very little to fully lock the sliding center section.**

- Now check how the clevis lines up with the hole in the pedal arm. You need to adjust the clutch rod to where the clevis pin can simply slip in place without any tension on it with the pedal fully up. Turn the clutch rod counter clockwise to make the linkage longer or turn it clockwise to make the linkage shorter as needed. ***Failure to adjust the clutch rod correctly will cause issues with the new master cylinder not balancing fluid correctly to the reservoir and will make bleeding the system difficult or impossible later.***
- Once the rod is adjusted correctly slip the clevis pin in place and install the hairpin clip to hold it.
- Spin the lock nut behind the clevis until it meets the clevis and tighten firmly with a 12mm wrench.
Go To > Bleeding the System

Bleeding the System

23.) 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 on lightly but don't press it down.

24.) Go to the wheel well with some shop towels or rags in hand and watch the end of the braided stainless line you left loose for fluid to appear. This may take a few minutes for fluid to gravity feed down to this point.

25.) Once you see fluid has made it down to the brass union you can very lightly tighten the braided line fitting with a 7/16" Flare Nut Wrench. You'll be cracking this fitting open and closed like a bleeder screw in the next steps. Top off the fluid reservoir and get a partner who can pump the pedal while you follow the **quick bleed procedure below**.

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. If this is being installed with a new clutch, new CSC, new Insulated clutch line etc then skip to **Full Clutch System Bleed**

Step 1.) Starting with the braided line fitting at the brass union snug have your partner slowly push in the clutch pedal in and hold it fully down until they are told to release it.
Step 2.) Once they have pumped the pedal down - Crack the fitting open with rags or paper towel around the area to collect any fluid that leaks. You should immediately hear air escape the line and once it stops lightly close the line again.
Step 3.) Tell your partner they can release the pedal slowly and allow it to come up fully for a few seconds.
Step 4.) Top off the Reservoir.
Repeat Steps 1 to 4 until you no longer hear any air escape and are solidly getting 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 up to the master cylinder and out to the reservoir you'll need to slowly and deliberately pump the clutch pedal down fully, **Hold for 3-5 seconds** and then slowly release it fully **stop at the top for 5-10 seconds between pumps**. **Repeat 10-15 Times.**

At this point if you followed the above correctly you should have a nice firm clutch pedal and will be ready for a test drive once the car is back in the ground. 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.

Full Clutch System Bleed: If you've installed other clutch components at the same time as installing the RJM HD CMC then you'll need to fully tighten all fittings in the RJM system, Set the AFP Setting on your RJM Pedal to 0% if so Equipped and then perform a complete clutch system bleed following the factory service manual procedure which is not covered by this guide.

Finishing Up:

26.) After ensuring all fittings are tight you can work the inner fender liner back into the wheel opening.
27.) 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.
28.) Lift the car with your jack at the front left lift point and remove your jack stand.
29.) 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)