

Flyin' Miata

ND Little Big Brake kit 14-16XXX



Congrats on purchasing our ND little big brake kit! These instructions cover the front and rear kits. If you're installing the front or rear kits (not both), only follow the relevant instructions for your parts. If you have any questions, comments, or suggestions, please call or email.

WARNING: Not everyone can perform every installation. It is critical that you be honest with yourself in regards to your ability. We're more than happy to help, but there are only so many things we can do from the other end of a phone / computer. If in doubt, discuss the install with us before you dive in. Improper installation could cause injury and / or death!

Required tools:

- Standard tool kit: sockets, Allens, screwdrivers, razor blade, etc.
- 10mm flare wrench
- Torque wrench
- Blue Loctite
- Jack and jackstands or a lift
- Thread sealant (NAPA's BK 7652648)

Torque specs

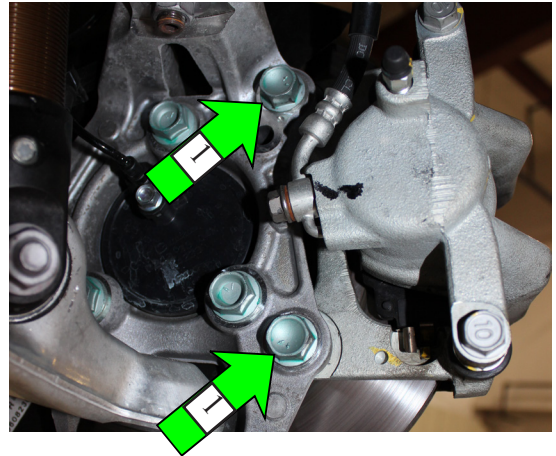
- Caliper to purple bracket 33 lb-ft (front and rear)
- FRONT ONLY purple bracket to knuckle 50 lb-ft
- REAR ONLY purple bracket to knuckle 33 lb-ft
- Stock brake line fitting 10-16 lb-ft

1. The first step is to get the car in the air. Be sure that the car is appropriately supported - never get underneath a car supported only by a jack, either use jackstands or a lift. Remove the necessary wheels and set them aside.



Front brake Installation

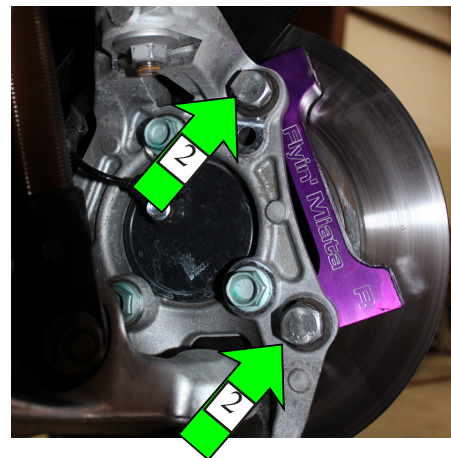
2. Unbolt the caliper bracket from the upright (1) and set it down. You won't reuse the brake line, but try not to put too much strain on it. Don't disconnect the brake line yet.



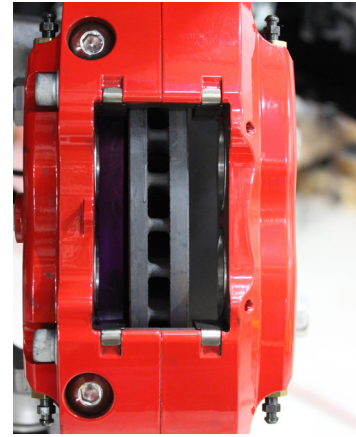
3. If you're replacing the rotor, remove the old one (this kit works with stock rotors). If your rotor won't come off, thread an M8x1.25 bolt into the threaded hole on the face of the rotor. It should pop off of the hub once you thread it in a little way. Thoroughly clean the new rotor with brake cleaner (oil / grease will destroy pads), then slip it onto the studs.



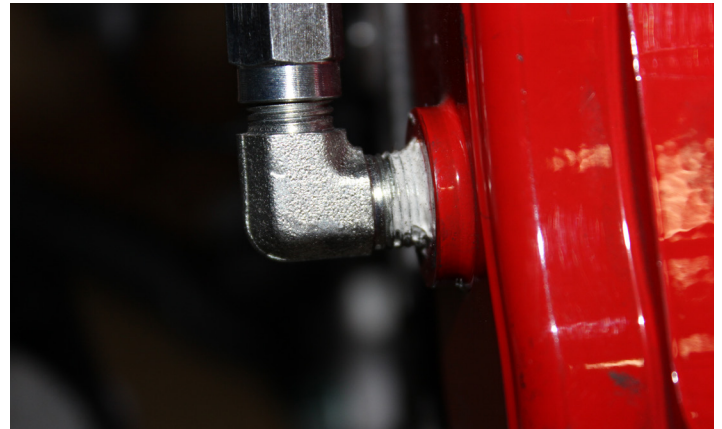
4. Put a few drops of blue Loctite on the M12 (35mm long) bolts, and bolt the purple front bracket to the upright, as shown (2) - "Flyin' Miata" must be visible from the inside (car side) not outside (wheel side). The brackets are specific to the front, and to left and right, so be sure you're using the correct one - the fronts have an "L" or "R" engraved on them, the rears don't. Tighten these to 50 lb-ft.



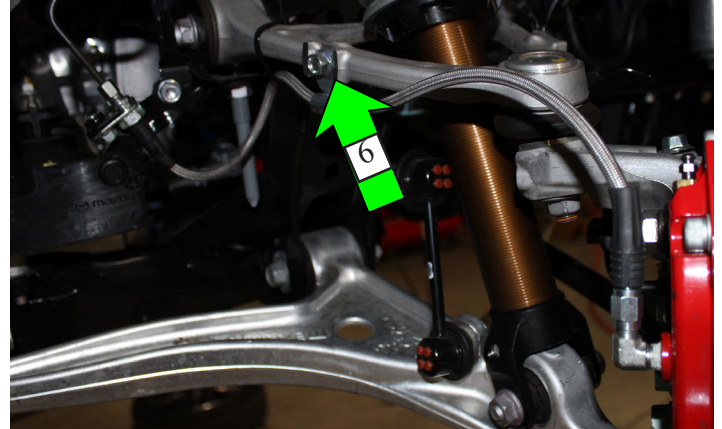
5. Bolt the caliper (14-46105, both fronts are the same) into place using the 50mm long Allen head bolts. If you got the rear brakes as well, the pistons in the rear calipers (14-4630X) are much smaller in diameter. Use Loctite here as well, and torque to 33 lb-ft, NOT 50 lb-ft.



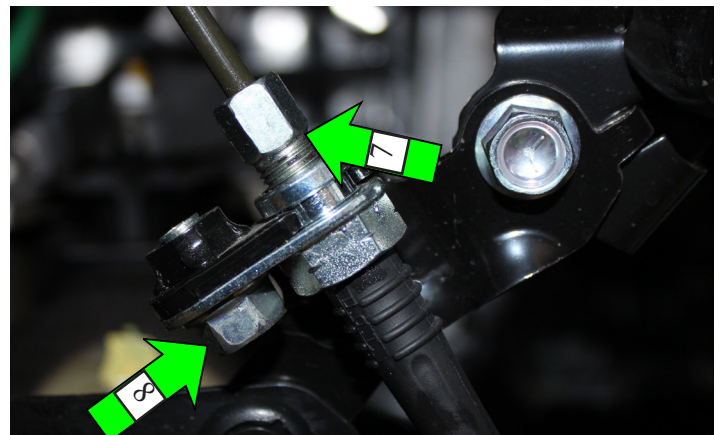
6. Smear a little thread sealant on the fitting that threads into the caliper (don't get any on the first two threads). Thread the fitting into the caliper until it's finger tight, then go 1.5 - 3 turns farther. These are tapered threads, so don't expect it to visibly bottom out on anything (the fitting in the picture is tight). Be sure the fitting points straight up when tightened. Don't overtorque!



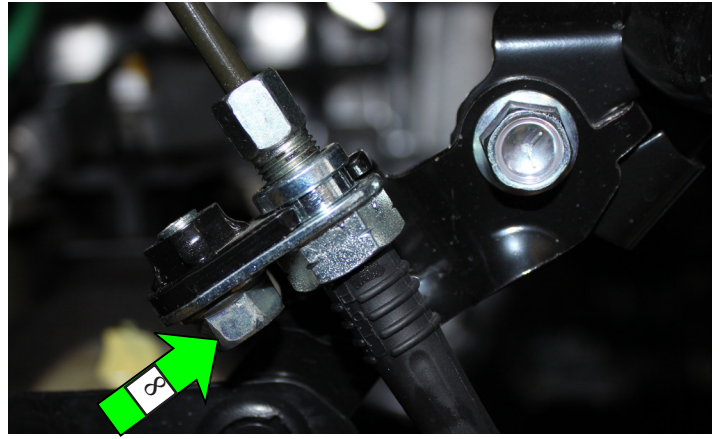
7. The front brake lines are NOT symmetrical - grab the brake line whose hose retainer will put the brake line slightly behind the control arm, not underneath. Thread the brake line onto the fitting installed in step 6. Orient it so that the natural curve of the brake line orients it nicely with the stock hard line, then get the fitting finger tight on the caliper. Use a wrench to turn it a 1/4 turn farther. Bolt the hose retainer onto the control arm as shown (6).



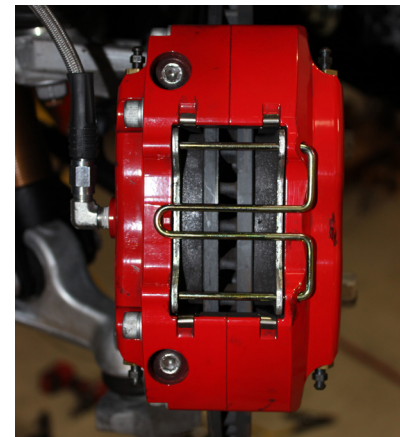
8. Using a 10mm flare wrench, loosen the fitting on the stock hard line where it attaches to the stock rubber soft line (7). Be very careful not to strip the hex on the fitting - this is especially true if you're not using a flare wrench. This junction will drip brake fluid, but it won't pour out. Remove the bolt (8), then slip the rubber hose out. Remove the stock caliper assembly.



9. Slip the new hose into the bracket and line it up with the fitting. Get the stock fitting finger-tight (or something close), then reinstall the bolt (8). Tighten the stock fitting to 10 - 16 ft-lb.



10. Be absolutely certain that there is no oil on the rotor. On stock rotors, there shouldn't be any oil unless there was a spill. On new rotors, this oil should've been cleaned in step 3. Once you're certain they're clean, first install the extra brake pad shims. The caliper has one shim pre-installed at each end of each pad slot, but we've found that it's best if you install an extra shim on one end of each pad - i.e., there will be three shims for each pad. Finally, remove the pin in the caliper, install the pads, and reinstall the pin.

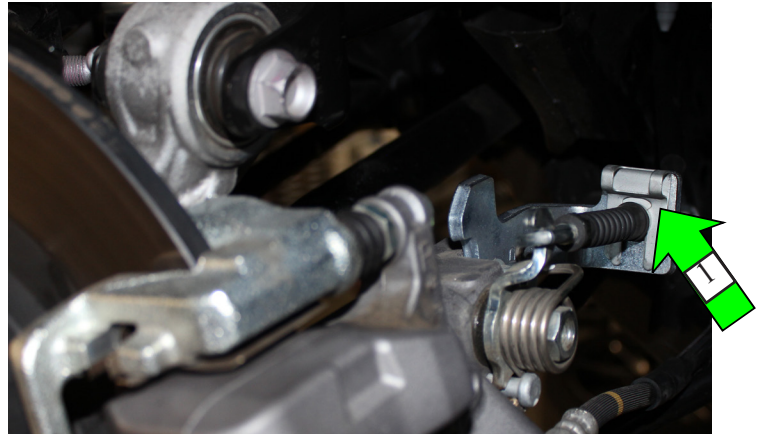


11. Check to be sure there's no interference between the calipers or brake lines and the wheels. Do this even if you "know" they'll clear. Swing the steering wheel back and forth to be sure there's no brake line interference at any location. Once that's good, repeat for the other side. Once that's done, the fronts are done. If that's all you're doing, you can move on to the bleeding instructions. If you're doing the rears as well (good call!), move on to the next section.

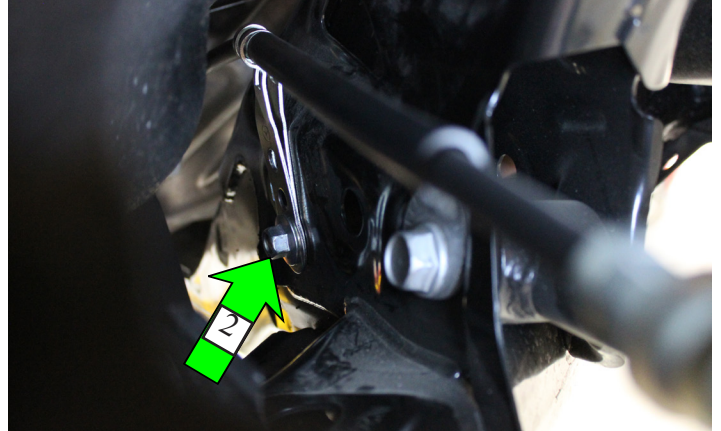


Rear brake Installation

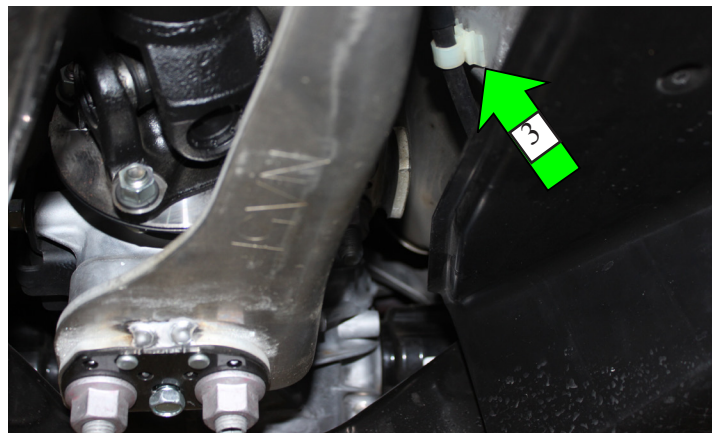
1. If they aren't already, get the rear wheels in the air and remove them. Release the parking brake (from inside the car), then disconnect the parking brake cable from the caliper. Remove the clip (1), then pull back on the housing to disengage it from the U-shaped bracket. Weave the end of the cable off the hook on the caliper, and set the cable aside.



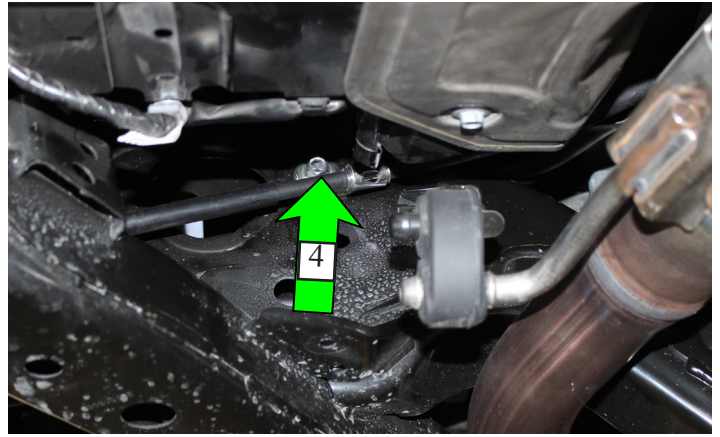
2. **Driver's side:** Remove the bracket (2) that holds the cable to the subframe - just chase the parking brake cable into the car to find the bracket. This bracket will need to be flexed open to allow the housing to pull through.



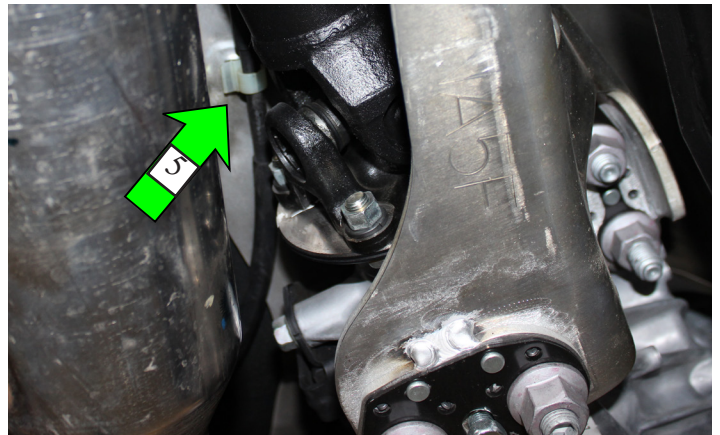
3. **Driver's side:** Pop the plastic retainer out of the heatshield (3). On the underside of the plastic piece, pull the two sides apart, then spin them around the housing in opposite directions to remove it from the housing. Kits without parking brakes should remove the cables altogether.



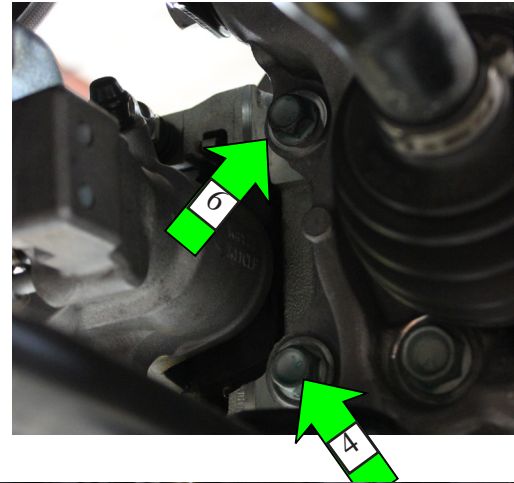
4. Passenger's side: Remove the bracket (4) that holds the cable to the sub-frame - just chase the parking brake into the car to find the bracket. This bracket is similar to the one removed from the driver's side. Remove the plastic sleeve as well.



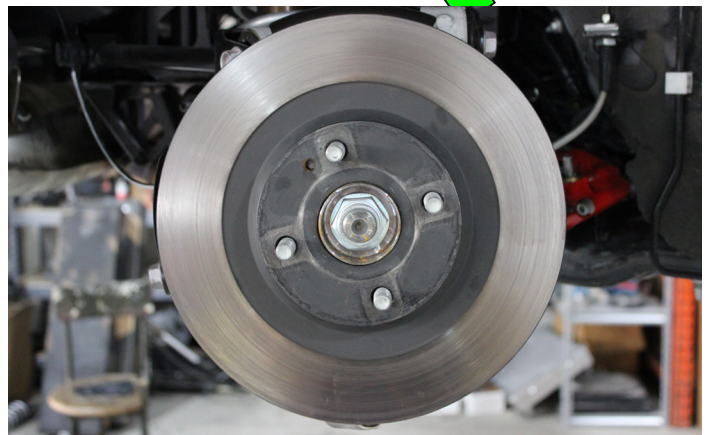
5. Passenger's side: Like on the driver's side, pop the plastic retainer out of the heatshield (5) and remove it from the cable. Kits without parking brakes should remove the cables altogether.



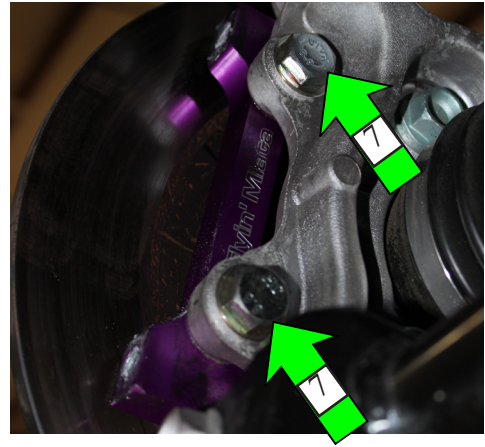
6. Remove the rear calipers by unbolting them (6). As with the fronts, don't disconnect the hose yet, but do set the caliper in a way that won't put any stress on the hose.



7. If you're replacing the rotor, remove the old one (this kit works with stock rotors). If your rotor won't come off, thread an M8x1.25 bolt into the threaded hole on the face of the rotor. It should pop off of the hub once you thread it in a little way. Clean the new rotor with brake cleaner, then slip it onto the studs.



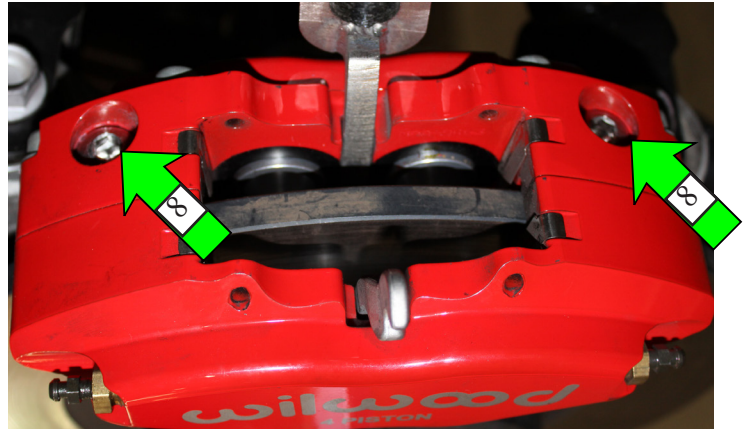
8. Bolt the purple brackets into place using the hex head bolts, as shown (7). Use blue Loctite and torque them to 33 lb-ft. The rear brackets are identical from side to side, but make sure they're installed as shown. "Flyin' Miata" should be visible from the inside.



9. Install the parking brake arms using the included pieces. The arm with the hook goes on the outside (towards the wheel), the large U-shaped arm goes on the inside of the caliper. Slip the pin through the arm, slip the silver pieces over the pin, then bolt them into the caliper. Use blue Loctite on the bolts and be careful tightening them - it's easy to strip the heads.



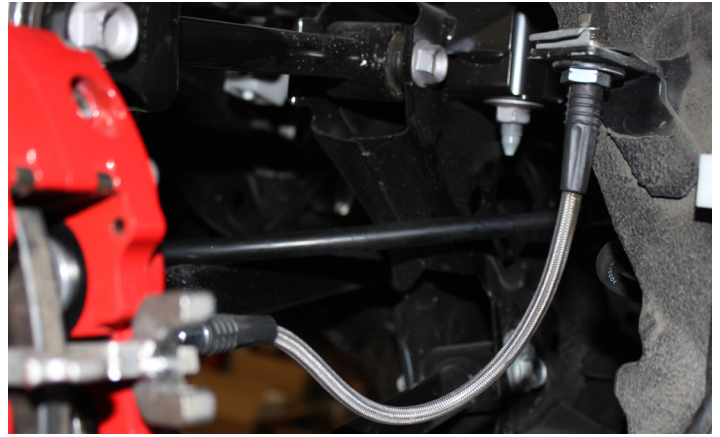
10. Bolt the calipers into place, using the rounded-head Allen key bolts (8). Again, use blue Loctite and tighten to 33 lb-ft.



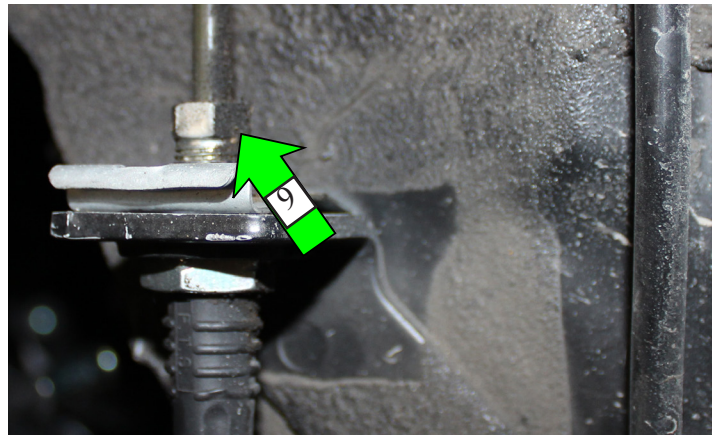
11. Smear a little thread sealant on the fitting that threads into the caliper (don't get any on the first two threads). Thread the fitting into the caliper until it's finger tight, then go 1.5 - 3 turns farther. These are tapered threads, so don't expect it to visibly bottom out on anything (the fitting in the picture is tight). Don't overtorque! (The brake line shouldn't be installed yet.)



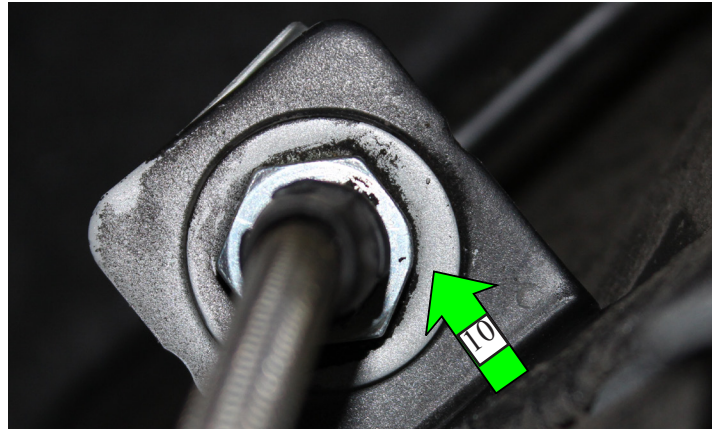
12. Thread the brake line onto the fitting installed in step 20. Position it so that the natural curve of the line orients it nicely with the stock hard line, then get the fitting finger tight. Use a wrench to turn it a 1/4 turn farther. (The hose shouldn't be connected to the stock hard line yet.)



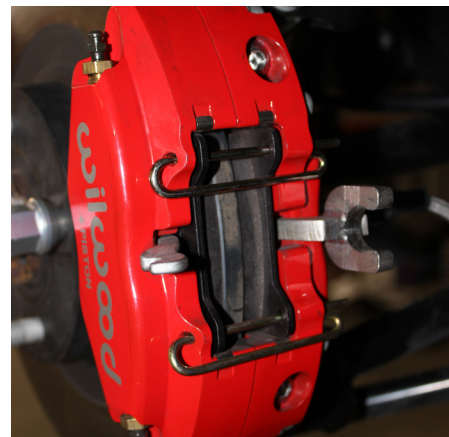
13. Using a 10mm flare wrench, loosen the fitting on the stock hard line where it attaches to the stock rubber soft line (9). Be very careful not to strip the hex on the fitting - this is especially true if you're not using a flare wrench. This junction will drip brake fluid, but it won't pour out. Remove the metal clip, then slip the rubber hose out.



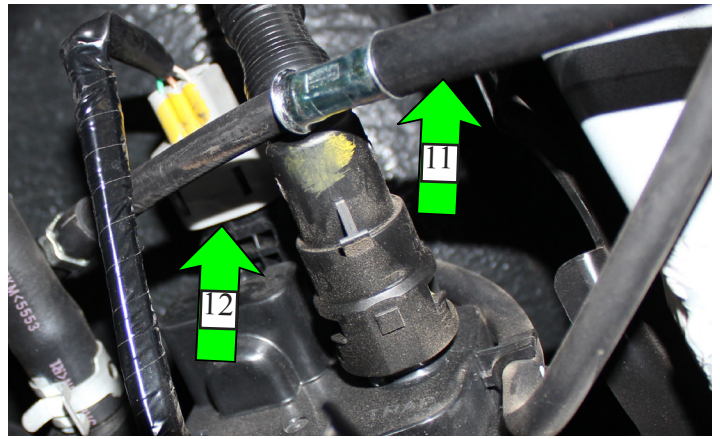
14. Slip the new hose into the bracket and line it up with the fitting. Make sure the large hex in the new line is seated into the cutout on the bottom of the bracket. One corner on both the nut and the receiver in the chassis are rounded, be sure to orient them correctly (10). Get the stock fitting finger-tight (or something close), then re-install the metal clip. Tighten the stock fitting to 10 - 16 lb-ft.



15. Check once more to make sure that no oil / brake fluid / contaminants have gotten onto the rotor. If it's clean, first install the extra brake pad shims. The caliper has one shim pre-installed at each end of each pad slot, but we've found that it's best if you install an extra shim on one end of each pad - i.e., there will be three shims for each pad. Finally, remove the pins in the caliper, install the pads, and reinstall the pins.



16. The passenger side cable (11) is a little awkward to route. It needs to go above the charcoal canister (large black box with multiple hoses) and all of the hoses towards the center of the car. You'll need to unplug the grey connector (12), then run the cable under the outermost connection. Finally, route the cable over the new braided brake line.



17. The driver's side is substantially easier to route. Run the cable under the fuel tank (13) and pull enough cable towards the wheel to properly route it to the caliper.



18. Slip the cable end over the hook (14), then pull the housing out and slip it into the other arm on the caliper (15). Use the new metal clip to hold it in place. Don't use the original one, it's too big. This clip may need to be trimmed (as shown) to fit your wheels. If needed, cut the lip off, don't hammer it. Hammering it can affect the bend that holds the clip in place.



19. Check to be sure there's no interference between the calipers or brake lines and the wheels. Do this even if you "know" they'll clear. Once that's good, repeat the rear section of the instructions for the other rear wheel. Once that's done, the rears are done.



20. The parking brake cables should be relatively loose when the brake is released, and the lever should move up about 5 clicks (with moderate force) when you set the brake. If it's too tight or too loose, you'll need to adjust the cable. First, unscrew and remove the shift knob. Then, grip the rear of the shifter trim ring as shown and pull straight up. Once it's popped loose, slide it back and out.



21. Grip the infotainment control panel as shown and pull straight up. Once it's popped loose, set it aside (unplug if need be).



22. Using a 10mm wrench, spin the nut on the cable (16) and experiment until the parking brake is appropriately set (as described in step 20). Once that's set, pop the covers back into place (the rear panel must be first) and install the shift knob.



Bleeding hints (read these even if you already know how to bleed brakes):

First, a word of caution - FREQUENTLY CHECK THE FLUID LEVEL IN THE MASTER CYLINDER AS YOU'RE BLEEDING THE SYSTEM TO ENSURE YOU DON'T RUN IT DRY!! If you introduce air bubbles at the master cylinder, bleeding will become much more complicated. Now that we have that out of the way.. Even if you've only replaced calipers at one end, it's best to rebleed all four brakes. Start with the right rear wheel, then bleed the left rear, right front, and finally left front (all left / right labels are from the driver's perspective) - you start with the caliper farthest (by measure of brake line length) from the master cylinder and move to the closest. Bleed the inside (the side closest to the chassis / farthest from the spokes of the wheel) of each caliper, then bleed the outside, then move on to the next caliper. You'll never use the lower bleed screws, only the upper screws. You'll have to make a couple laps of the car. If the pedal feels soft after bleeding, keep bleeding. If the pedal feels soft after a drive, bleed again - sometimes it can be challenging to get all of the air bubbles out.

How to bleed:

Find a friend and your brake fluid, and make sure all of the wheels are off of the car. Find something to hold brake fluid - preferably clear and easy to fill with brake fluid. It's also easiest if there's a provision for holding a small vacuum hose in place. Put about an inch of fluid in the bottom of the bottle, then push the included hose into the bottle so that the end of the hose is under the level of the brake fluid. Be sure the master cylinder reservoir is full of fluid, and have a friend sit in the driver's seat. Have them pump the pedal 3± times, then hold the pedal down. Starting at the right (passenger side) rear wheel, push the hose onto the top bleeder screw on the inside of the caliper, then open the bleeder (unscrew it roughly a half-turn). Let the air / fluid come out of the caliper until it stops, then close the bleeder. The brake pedal should slowly push down to the end of its travel, and at that point, your friend should hold the pedal down. Once the bleeder is closed, have your friend pump the pedal a few more times, then hold it down. Repeat this process until the fluid flows with no bubbles. Again, frequently check to ensure that you don't fully drain the master cylinder reservoir. Once that's done, move to the outside of the caliper and repeat. Do this for all four wheels, in the sequence described in bleeding hints, then go around again. You want to be as thorough as possible, so run too much fluid as opposed to too little.

Bedding the pads:

First things first - make sure the wheels have been torqued to 65 - 87 ft-lb. If there's any question at all as to whether this has been done, check all nuts on all wheels. Wheels falling off isn't fun. Once you're driving, do six - ten moderate stops from 30 - 35 mph to warm up the rotors, then do at least two to three fairly hard stops from 50-55 mph. Be sure that you do not let the car come to a complete stop while applying the brakes. If you do, the pads can stick to the rotor and warp it. Do this until the brakes actually fade somewhat - the idea is to get the pads hot and keep them hot for a bit. Once you can smell hot brakes, drive back, letting the brakes cool off, and park the car **WITH THE HANDBRAKE OFF**, for an hour or so.

That's it, you're done! Bear in mind that while this kit does have a parking brake, it's not the strongest thing ever. Park intelligently (leave the car in gear, turn the wheels toward the curb, etc) as conditions dictate. Brake fluid should be changed annually, although different qualities / brands of fluid and different usage may have different service intervals. Follow the recommended interval on the bottle you used, but modify for your usage (e.g., frequent tracking requires more frequent brake fluid changes). If your fluid ever gets dark (assuming you're not starting with ATE Superblue or something similar), it's time to change it. Otherwise, drive the car and have fun!