

REAR PARKING BRAKE BIG BRAKE KIT 14-16645



Thanks for purchasing our rear parking brake big brake kit! This is a pretty straightforward install, but be aware that it does require significant dust shield trimming. If you have any questions during installation or suggestions for improvement to the product or the instructions, please don't hesitate to 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 and supplies:

- Metric socket set
- Metric box wrench set
- 1/4" box wrench
- 7/16" flare wrench
- 1/2" box wrench
- 7/32" Allen wrench
- 3/8" Allen wrench
- 6mm Allen wrench
- 10mm flare wrench
- Tin snips and/or pneumatic hacksaw
- Hammer
- Needle nose pliers (preferably long with an angled end)
- Bench vice

Required supplies:

- Red Loctite 271
- Hydraulic fluid-safe thread sealant
- Stock parking brake cables
- Brake pad anti-squeal - tacky, not greasy. We recommend CRC Disc Brake Quiet pt# 05016

Torque specs

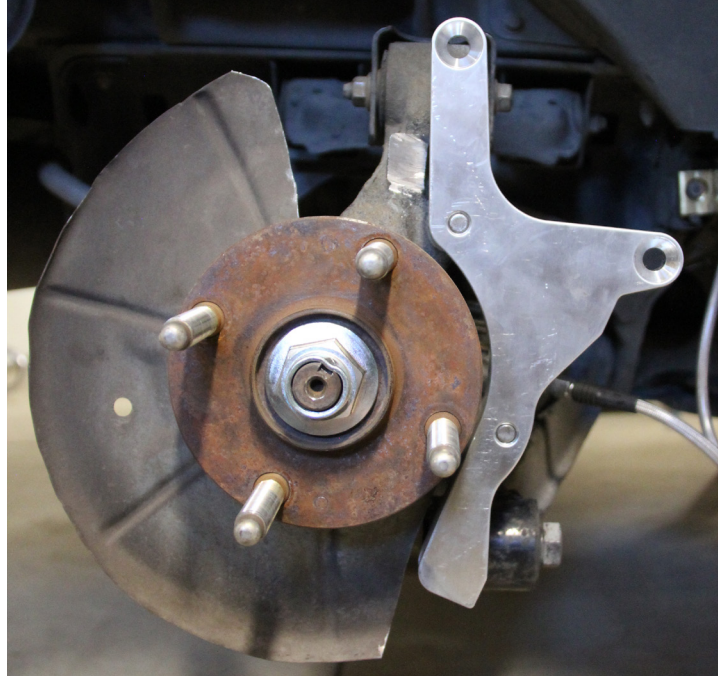
- M10x1.5 bolts: 33 lb-ft
- 3/8-24 bolts: 40 lb-ft
- 1/8" NPT adapter: hand tight + 1.5 turns
- Brake line fittings: hand tight + 1 turn
- PB caliper lock nut (on adjustment stud): 80-120 IN-lb

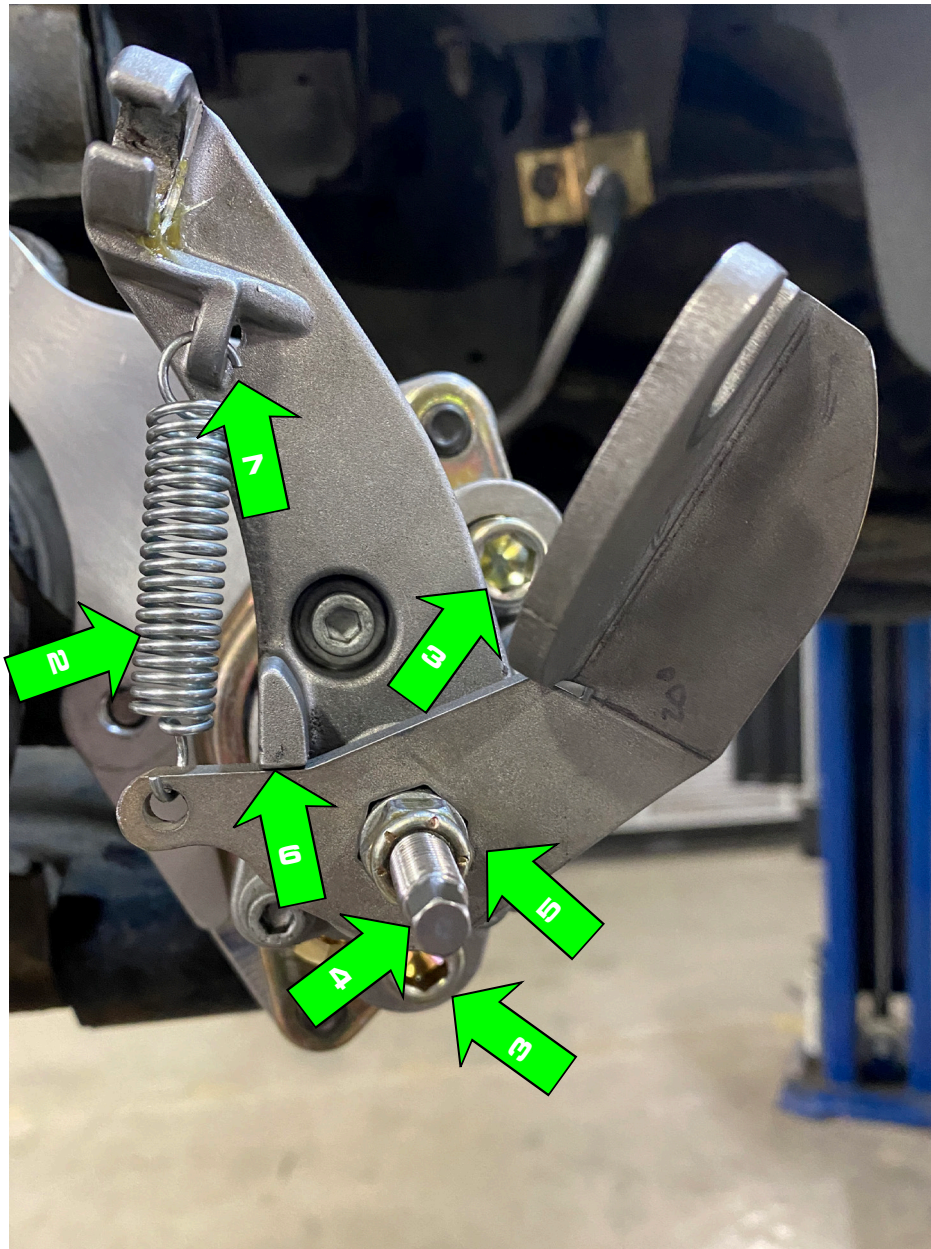
Be careful not to damage the coating on the supplied brake caliper brackets. The anodizing helps to avoid corrosion, which is especially important for cars driven in harsh environments.

1. Start by getting the car in the air and removing the wheels (even if you're not swapping the fronts you should probably bleed them). Be sure the car is properly supported with jackstands or a lift - never get under a car supported by only a jack. Once the car is in the air, release the parking brake.
2. **If you have the stock rear brakes**, remove the entire caliper + bracket + pads assembly as one piece. Start by disconnecting the parking brake cable, then remove the entire assembly, but *don't* disconnect the hydraulic brake line. It's typically easiest if you disconnect the hydraulic line only when you have the new caliper in place and ready to connect.
3. **If you have FM stage 2 (Wilwood Powerlite caliper) rear big brakes** with a parking brake (two arms in the caliper), and you intend to reuse the caliper, you'll first need to remove the old parking brake arms. While it might seem easiest to unscrew the tiny brackets that hold the arms in place, don't bother - they're Loctited in and virtually guaranteed to strip. So, with the caliper still bolted into place, use a hammer to tap the arms down and out of the caliper - this will deform the small brackets enough to allow the pins holding the arms to drop out. Once that's done, unbolt the caliper and set it on the control arm (no need to disconnect the hydraulic line at this point). If you'd like, you can reshape the metal brackets, but as long as they don't interfere with the pads it doesn't really matter. Remove the original bracket, it (and its hardware) won't be reused.



4. Remove the rotor. If need be, use the threaded hole on its hat (typically an M8x1.25) to pull it off the hub.
5. Grab the new brackets and find the correct one for that side (they're labeled based on the driver's perspective). Hold it in place to get an idea of what needs to be trimmed on the dust shield and get to work - carefully, that sheet metal can get sharp. A pneumatic hacksaw is typically best, although tin snips can also be used. If you're also upgrading to 11" rotors now, you'll need to trim the horizontal edge (that overlaps the rotor axially) off of the dust shield. (The dust shield in the picture has been trimmed more than is necessary.)
6. Once you think you have enough of the dust shield trimmed, temporarily bolt the bracket into place (on the rotor side of the upright), using the hex head M10x1.5x35 bolts (36-10442) and M10 washers (36-30140). Hold each caliper in place to check the dust shield trimming and trim more as needed.
7. Temporarily bolt the main (four-piston) caliper on using the M10x1.5x50 bolts (36-15785). Check to be sure there's no interference between the lower caliper mounting point and the bracket (1). If there's any contact, clearance the upright (not the caliper) as necessary - be careful to not damage the bracket, remove if necessary. Leave the caliper off once you're done.
8. With the rotor still missing, bolt the parking brake (PB) caliper into place using the two 3/8-24 flathead screws and a 7/32" Allen wrench. **Use red Loctite 271** and torque to 40 lb-ft.
9. We now need to work on the backside of the PB caliper. This is best done by securing the bracket into a bench vice with the back side of the caliper facing you as shown. Be sure to add sufficient padding, such as rags, to prevent marring the brackets finish.

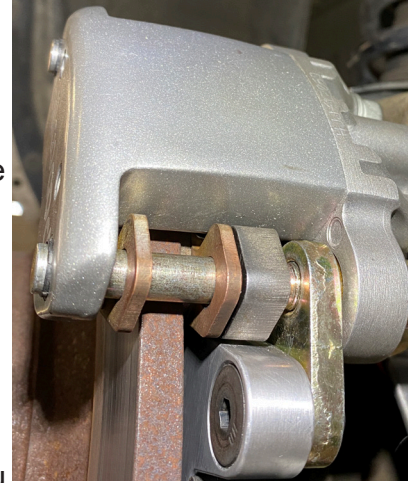




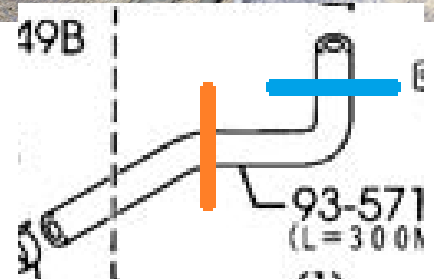
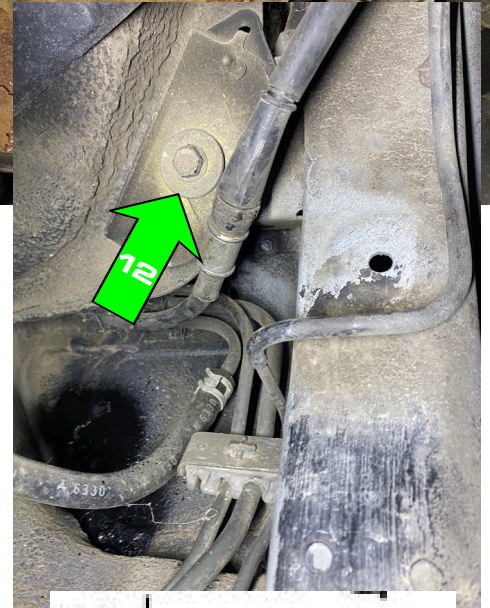
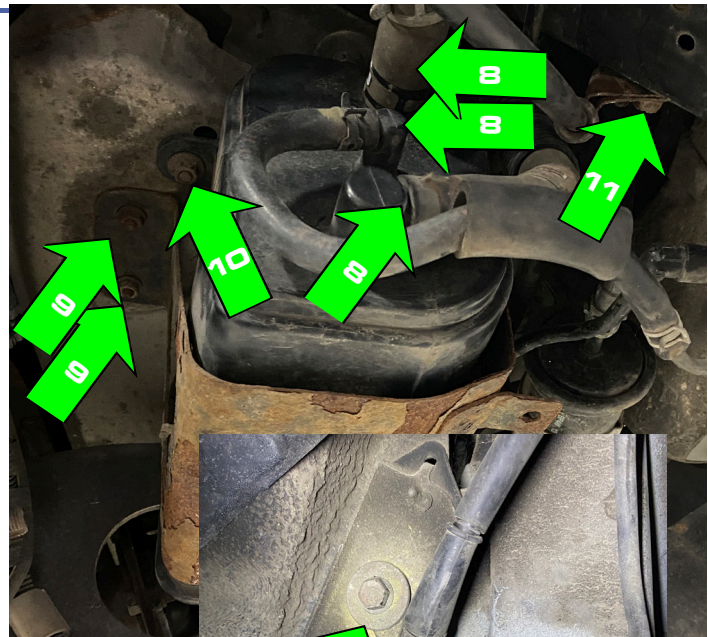
10. Remove the spring (2) from the arm on the back of the PB caliper - ideally it would stay hooked on the caliper, but just be sure to not lose it.
11. Remove the two long, yellow zinc bolts (3) from the PB caliper with a 3/8" Allen wrench. The bolts we're removing hold the pads in place, as well as the PB caliper to the bracket, so be prepared to catch all of the parts as you remove the bolts. The bolts don't need to come all the way out, just enough to get the pads off.
12. Once the pads are off, use brake pad anti-squeal (tacky, not greasy) on the non-friction surfaces of the pads and spacer (both sides of the spacer). This will help the pads retract back from the rotor.
13. Slip the new pad spacer on first (as shown), slip the pads back into place (with the friction material towards the rotor), line up the ends of the bolts so they'll slip into their holes in the PB caliper, then tighten them back down to 40 lb-ft.

Arrows 4-6 are on the previous page.

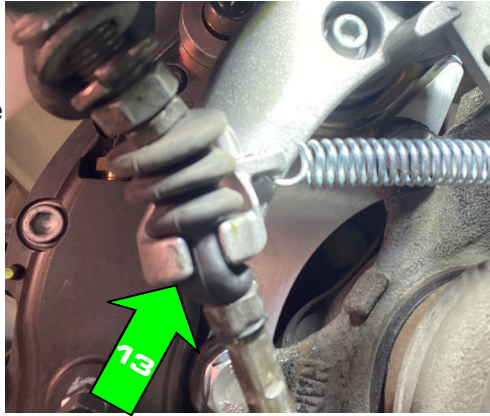
14. Using a 6mm socket to keep the “stud” (4) in place and a 1/2” box wrench on the nut, remove the nut and washer (5). Slip the original arm off and unscrew the “stud” all the way until it stops (it won’t come out, don’t force it). Be sure the gold shaft with the hex stays in its original orientation - put another way, slip the new arm into place such that it’s sitting against the stop (6), don’t rotate the arm (after it’s on the hex) so that it’s sitting against the stop. The hex might be a tiny bit tight, use a file to open it up (on the arm) *slightly* if need be. We want this to be a tight fit, so don’t take too much off. Slip the washer back into place, spin the nut back down (be sure the stud doesn’t spin), then hold the stud stationary with a 6mm socket as you tighten the nut with a 1/2” box wrench. We’ll adjust this later, so for now just be sure that the arm won’t fall off of the hex.
15. Hook the spring back up. Be sure the open end of the hook faces up on the caliper (7, as shown), then connect the other end to the end of the new arm. Remove the bracket and PB caliper from the upright as a single piece and set it to the side. Be careful of the finish on the caliper.
16. Slip the rotor into place on the hub. If it’s new (or got dirty) be sure to carefully clean its friction surface with brake cleaner. Any oil contaminants will destroy your brake pads.
17. Slip the PB caliper over the rotor, being sure one pad is on each side of the rotor, then permanently bolt the bracket into place. Use the same hex head M10s with washers and **red Loctite 271**, and torque to 33 lb-ft.
18. If you’re upgrading from our rear big brake kit with Wilwood caliper and an integrated parking brake, you’ll need to reinstall your stock parking brake cables. Do so now. There are unique part numbers for right and left (N10-444410A and ...20A, respectively). Attach their housings to the bar near the balance bar using the two retaining clips (W02343635A), then attach the cables to the balance bar. Route them towards the calipers, but bear in mind that they cross - the cable that’s attached to the right side of the balance bar goes to the left caliper and vice versa. Let them dangle near their respective wheelwells for now - don’t reconnect the anchors (refer to next step).
19. Remove the wheel well shield (helpful on all Miatas but required on NBs).



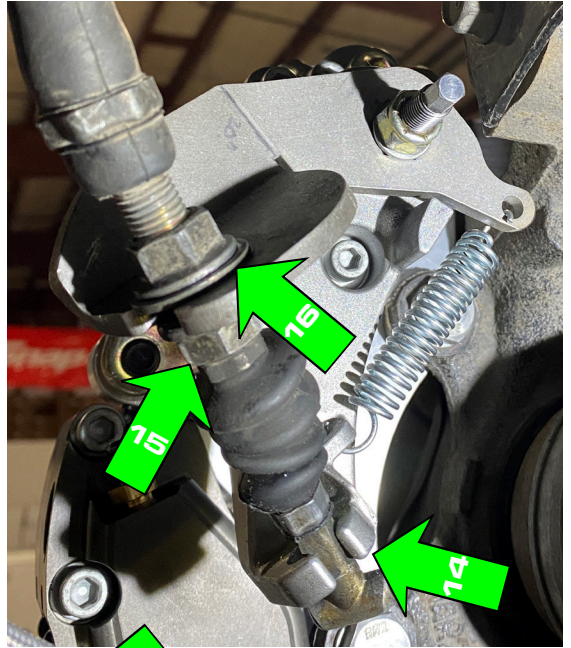
20. We need to gain access to the parking brake cable on the passenger side. First, remove the fuel filter cover by removing the five plastic screw anchors - unthread the screw with *as little force as possible* pushing down into the screw (the threads aren't strong and it's easy to push the screw back in while you're unthreading it). On an NA, that's it. On an NB, we need to remove the charcoal canister as well. First, disconnect the three hoses (8). You'll be greeted by a pretty strong gas smell, so be prepared. Then, remove the metal bracket by removing the four nuts holding it in place (9, two are invisible in the picture). Finally, unbolt the canister itself (10).
21. Unbolt the parking brake cable anchor from the chassis (11). We need to flip the anchors over, so pry the anchor bracket apart to remove it from the cable, flip it over, and reinstall the bracket. Flatten the tab that originally located the anchor.
22. Route the cable over the hard brake line (passenger side only, 19 on the next page). Remove the bolt holding the fuel tank in (12), put the cable anchor over the hole, then reinstall the bolt. Orient the cable so it points towards the PB caliper, but make sure the cable isn't resting against the edge of the tank - the forward end of the cable should be close to the tank, but not touching. Giving it too much room can adversely affect its alignment. On an NB, reinstall the charcoal canister and its bracket now.
23. **99-05 only:** The vent hose for the charcoal canister needs to be shortened. Take the hose off and shorten it as shown - take one inch off where the blue line is and cut *just* before the bend at the orange hose. Reverse its orientation (i.e., put the vent on the opposite end of the hose, as shown), and install as shown. Zip-tie the wire to it, as shown, to keep the wire from chafing.



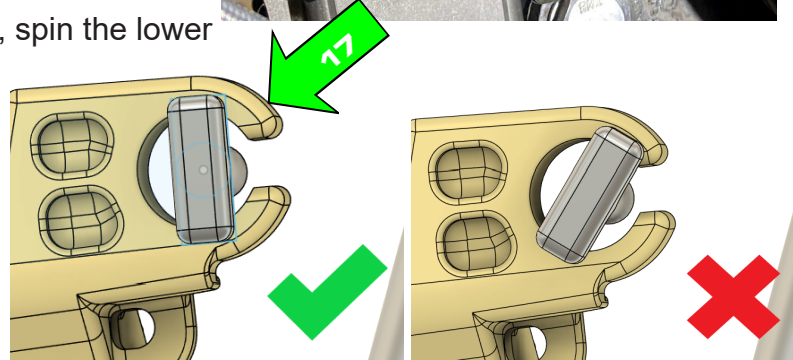
24. Slip the cable end onto the caliper (NOT the arm). You'll need to smear some grease on the rubber boot (so it's not torn), squish the boot, then slip the internally narrowest portion through the slot (13). Then work the cable up so the "T" on the end of



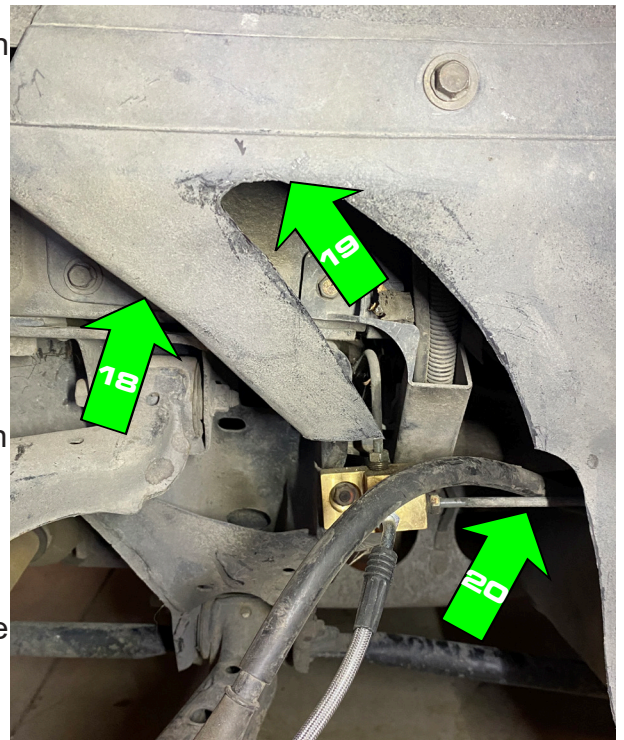
the cable is located as shown (14). This shouldn't be especially difficult, if it is, check to be sure the parking brake is released in the cabin. Note that the end of the cable will be floating but can't come out of the caliper once the cable's housing is secured.



25. On the threaded end of the cable's housing, spin the lower nut as close to the boot as possible (15). Spin the other nut up to allow generous room, then slip the threaded portion in between the nuts into the slot on the arm. On NAs, be sure the two washers (16, lock and flat) are both on the bottom of the arm. NBs do not have washers. When tightening the cable housing to the bracket, rotate the housing so that the "T" of the cable end is perpendicular to the slot in the caliper arm (17). Tighten the top nut down while holding the lower nut stationary - it's important that the lower nut stay as close to the boot as possible (15, no need to force anything).

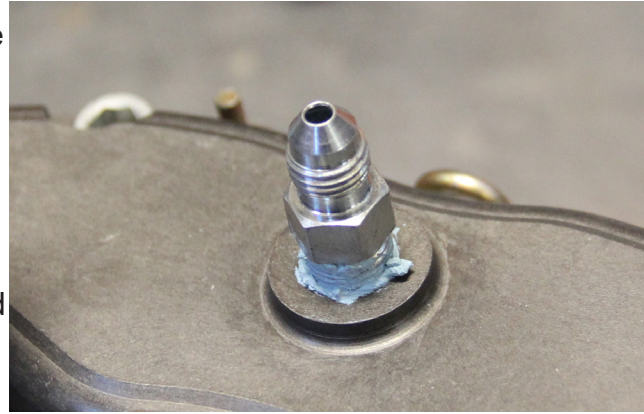


26. The new routing of the parking brake cable means that it's going to rub on the inner wheel well shield. Most (but not all) of that rubbing can be eliminated by trimming the shield appropriately, as shown. Unless your car is rusty, it's typically easiest to remove the shield and cut it with tin snips out of the car. Mark where the parking brake cable contacts the shield, then cut a roughly 1-1/2" wide slot (3/4" on either side of your mark). The slot should be roughly parallel to the rear edge (18) and go all the way to where that angled face turns vertical (as installed in the car, 19). When in doubt, trim more - there's nothing rearward of the brake line that needs to be protected. (Those with eagle eyes will notice that the area to the right of arrow 20 has been trimmed, that's not necessary.)



27. Bolt the main (four-piston) caliper onto the bracket, using **red Loctite 271**. Use the same M10x1.5x50 button head bolts from before, torqued to 33 lb-ft. If you're reusing your Wilwood calipers, you'll still need to swap the brake line to the included (and longer) one. You should be able to reuse the adapter (step 28) if you'd like, though.

28. Install the brake line adapter (pre-installed in the brake line) into the caliper. The adapter has NPT threads, so it won't bottom out on anything. The side of the adapter *without* the male flare goes into the caliper. Put some thread sealant on the caliper side of the adapter and tighten it into place. This side of the adapter is the **ONLY** place thread sealant is used. Get the adapter finger tight, then tighten it another turn and a half. Don't overtighten - again, it won't visibly bottom out on anything, instead, the male and female threads tighten down onto each other.



29. **If you had stock calipers**, now's the time to completely remove the one on this side. Disconnect the line from the chassis (including the junction block on the right side of the car) and set the stock caliper assembly aside.
30. Install the brake line, starting with the chassis side. Bear in mind that there's a clip that holds the brake line in place on the chassis side of the driver side line. On that same side (driver, chassis) side, one corner of the hex is rounded off. The female receiver for that nut has a corresponding rounded corner, be sure they're lined up. For all of the fittings, spin the nut down by hand, then get it snug. Don't overtighten - these should be tightened to 8.75 lb-ft or hand tight plus one turn. When you're loosening the stock brake fittings, be careful not to strip them - we strongly recommend using a 10mm flare wrench.
31. Slip the pads into the caliper. Be sure the retaining spring is fully installed.
32. Repeat the same steps for the other side, then bleed the system. Start with the inside (closest to the center of the car) of the left rear caliper, then the outside of that caliper, then work counter- (or anti-) clockwise around the car (using the same "inside then outside" order at each caliper). Make a couple of laps and be absolutely sure you got all of the air bubbles out - if in doubt, keep bleeding. Be careful to not let the master cylinder go dry, check its level frequently.
33. Now that *both* PB calipers are installed, it's time to adjust the parking brake. Loosen the nut (1/2" wrench) holding the PB arm in place so it's almost off the threads (be sure to hold that stud (6mm socket) so it doesn't spin). Spin the stud all the way in (don't force / tighten anything, stop once it gets tougher to turn), then do the same for the other side. Once they're both good, back each stud off one turn. Hold the stud stationary and tighten the nut down for the final time (80-120 **IN-lb**). Bolt the rotor down with the lug nuts, then check for drag on each rotor - there will be some, but as long as you can turn the rotor easily by hand you're good (we'll check this again while driving so don't stress too much).
34. If you hear rattling from the calipers while driving, or a clunk each time you hit the brakes, the pads may be moving within the calipers. Use the extra included shims (14-90005 DL/PL) to take up extra space in the caliper and eliminate the noise.
35. You're done! Go find a hill and be sure the parking brake holds it in place properly. If it doesn't, first check to be sure the nut on the end of the housing is all the way against the boot and the other nut is fully tightened. If that's good, or if the lever moves up too much (it'll be a tick more than stock) or if you hear a dragging noise while you're driving, go through the adjustment procedure (step 33) again.

The stock parking brake can be adjusted at the caliper and the cable can be adjusted at the lever (in the cockpit). The adjustment in the cockpit, due to what we talked about in step 25,

Parking brake notes

isn't applicable here - don't use that adjustment, only use the adjustment at the caliper. If the parking brake isn't holding as well as it used to, adjust it at the caliper (step 33). It is not uncommon to require a readjustment after a few short drives. Conversely, if you notice a dragging noise while driving, you've adjusted the parking brake too far. Back it off just a little, then try again.

Note that the included pads are intended for static (not moving) friction, as opposed to normal pads. This means that they're a little noisier than normal pads if they're in contact with the rotor while it's spinning. If it's light contact it's not the end of the world, but be sure you use brake pad anti-squeal (adhesive, not grease) so that the pads retract appropriately.

The parking brake pads are thin on purpose - the rotor isn't spinning when the parking brake is applied (right?), so there's almost no wear. These pads aren't designed for dynamic (rotor spinning) use, so if you're using the parking brake when the rotor is spinning, be aware that you could go through pads quickly. If you hear a terrible metal-on-metal noise when you apply the parking brake (with the car moving), you've most likely waited too long and need to replace the pads.

To swap pads (Wilwood part # 150-7646K), you *might* be able to remove the studs (arrow 3, p. 4) with the caliper in place - this is tight and could work on some cars but not others. If you're not able to get the studs out with the caliper in place, you'll have to remove the entire assembly (bracket and both calipers as one), then remove the long yellow zinc bolts (with a 3/8" Allen) in order to swap the pads. It's best to break the studs loose before removing the caliper assembly, although you may need a shorter-than-normal 3/8" Allen to do so.