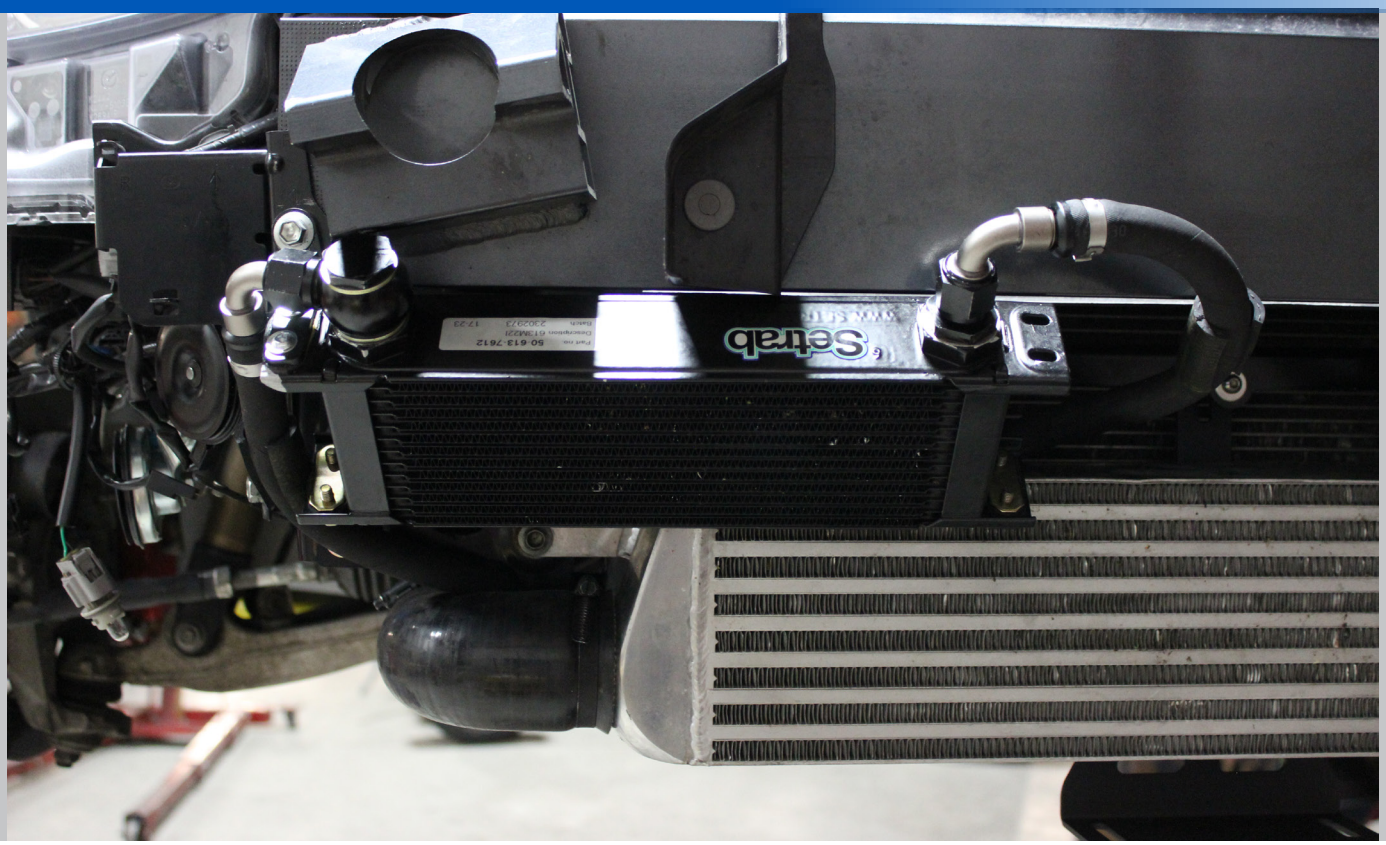
Flyin' Miata INSTALLATION INSTRUCTIONS

ND ENGINE OIL COOLER KIT
04-37240



Thanks for purchasing our ND engine oil cooler kit. This kit will keep your oil temps in check without over-cooling, thanks to the thermostat. The install might seem intimidating because of the bumper removal, but it's actually pretty easy. If you have any questions or suggestions on the kit or instructions please get in touch with us.

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**
- **Phillips head screwdriver**
- **Extra oil, roughly one quart**
- **Tough scissors**
- **Drain pan(s)**
- **7/8" open-end wrench**
- **1-1/16" open-end wrench / large Crescent wrench**
- **Blue Loctite**
- **Pliers**

Torque specs:

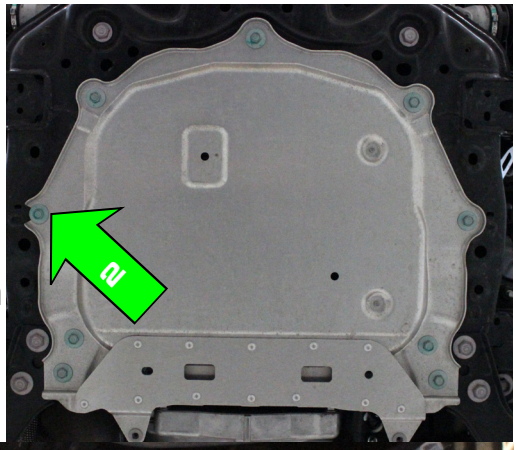
- **Cooler fittings: 29 lb-ft max, support hex on cooler**
- **M8 bolts: 8.5 lb-ft**
- **M6 bolts: 3.5 lb-ft / 42 lb-in**
- **AN-8 fittings: hand tight + one turn, max of 29 lb-ft**
- **Oil filter and oil thermostat adapter: 107-141 lb-INs / 9-12 lb-ft**
- **Aluminum cover bolts: 24-28 lb-ft**
- **Oil thermostat fittings: 29 lb-ft max**

Disassembly

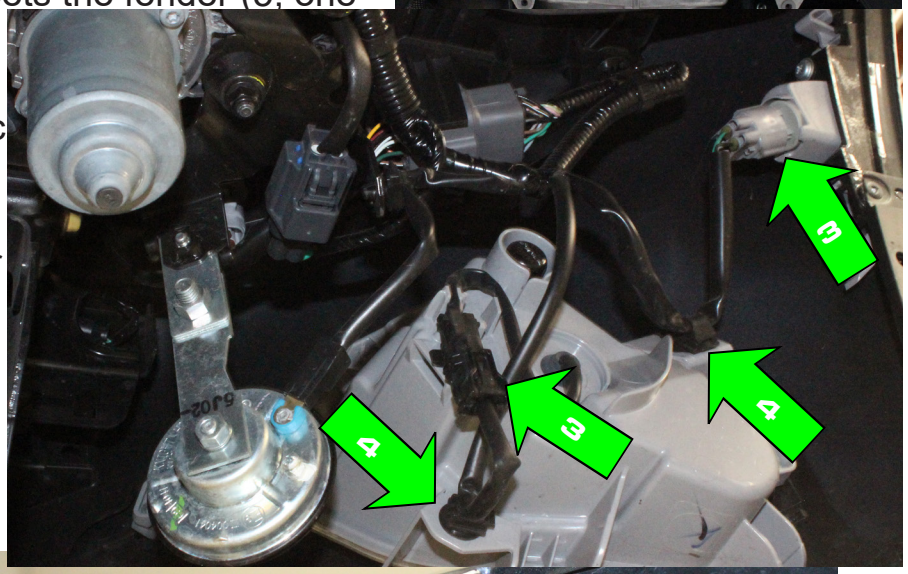
1. Get the front of the car in the air and support it with jack stands or a lift. You need at least enough room to perform an oil change, but the more room the better. Remove both front wheels as well. NEVER get underneath a car supported by only a jack.
2. Remove both front wheel well liners. There are four screws (8mm head) and eight plastic fasteners (pull the center out about 3/16" / 4mm then pull the entire fastener out) per side. Don't remove the plastic fasteners holding the small spoiler in place. Remove the upper outer plastic fastener (1) as well (this doesn't hold the forward liner in but needs to be removed for step 5).

3. Remove the center fabric splash pan. There are two 8mm head bolts on the front edge, eight 10mm head bolts (three on each of the upper sides, two in the rear), and two plastic fasteners at the rear. Pay attention to how the front edge overlaps the bumper cover for installation. The plastic fasteners are different than the wheel well fasteners but their centers still pull out the same distance.

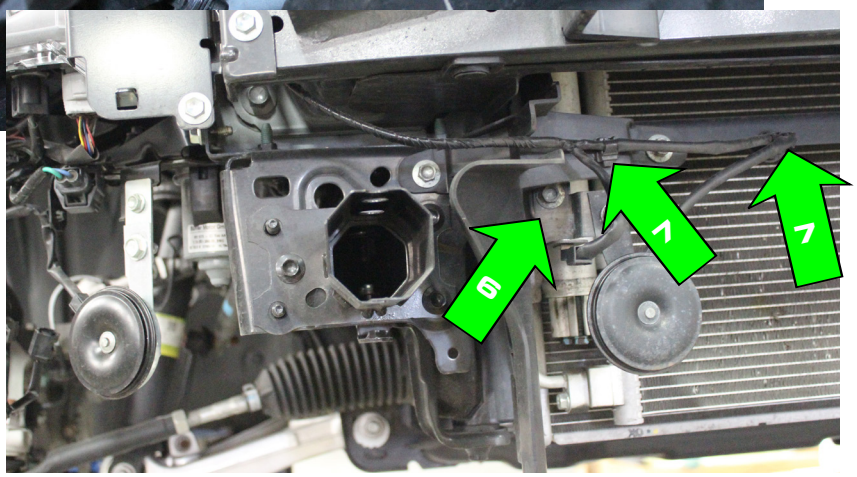
4. Remove the aluminum panel underneath the oil pan. One of the screw holes (2) is slotted to ease removal and installation.



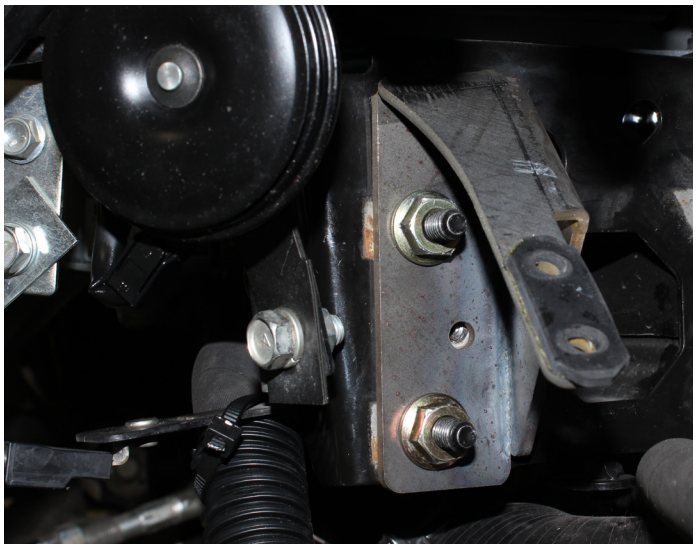
5. Unplug the corner markers and daytime running lights (3) on both sides of the bumper cover. Remove the anchors (4) as well, using thin needle-nose pliers or your fingers to pinch the tabs on the backside together. Remove the screws (8mm head) at the top outside corner of the bumper cover, where the cover meets the fender (5, one screw per side). Remove the two Phillips head screws and the four plastic fasteners at the top edge of the cover close to the hood latch. Give the upper outside corner (where the single screw was) a quick tug straight out (90° to the surface), then slip your fingers behind the bumper cover and pull it straight out (always 90° to the surface you're pulling against). Repeat for the other side. The bumper cover should now slip off. Set it aside, being careful to make sure it won't be damaged.

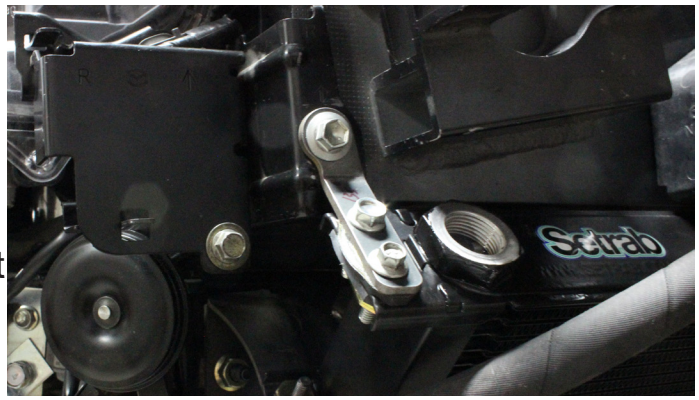


6. Remove the right frame horn. (Remember that all left/right references are from the driver's perspective, so the right side of the car is always the passenger's side (in the US).) You can reuse this hardware or use the provided hardware. Remove the noisy horn (6, remove it along with its bracket) and the air deflector as well. Release the two anchors for the horn wiring (7) and let the horn hang for the time being. The air deflector won't be reinstalled.



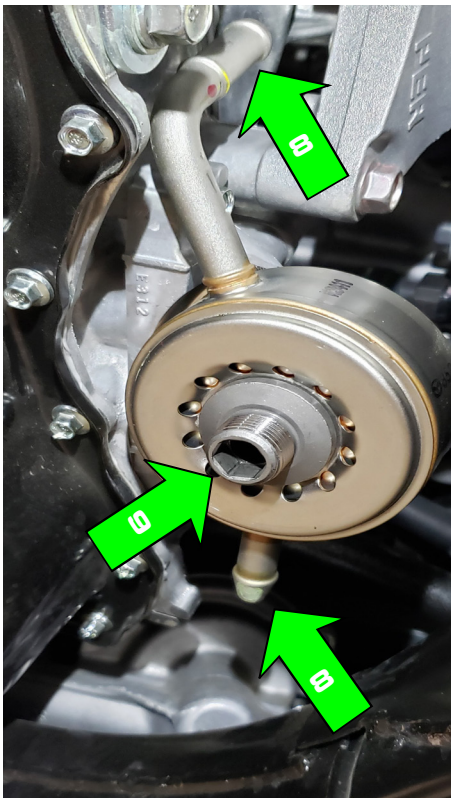
Assembly

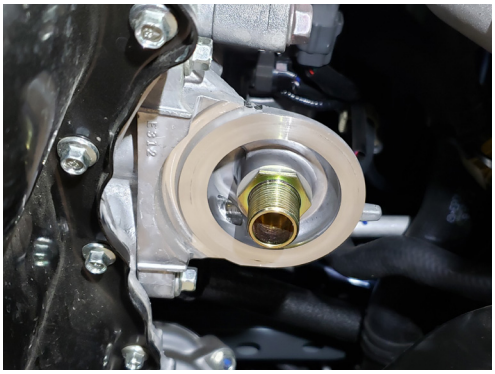


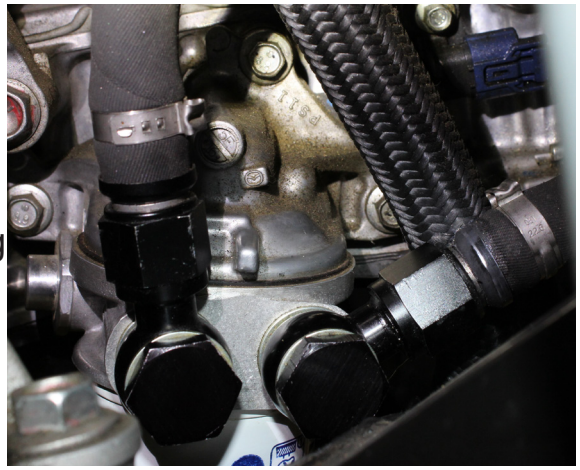


1. Loosely install the outboard oil cooler bracket. Use two M8 nuts (36-20240) with two M8 washers (36-30130) and one M6 bolt (36-10617). Leave loose so its position can be adjusted as needed.
2. Install the inboard bracket as shown. Use two M6 bolts (36-10617) along with one M6 nut (36-20137). The inboard location needs a nut, the outboard location doesn't. Again, leave loose for now.
3. Stick the rubber pads to the flattest side of the threaded backing plate (04-37932). Be careful to line up the holes and not the profile, as the hole-profile relationship is not necessarily the same on the pads and backing plates.
4. Use the M6 bolts (36-10617) to bolt the cooler to the brackets. Use a drop of blue Loctite on each bolt. Install the small upper bracket as shown - reuse the existing bolt. The black sheet metal piece should be sandwiched between the car and the oil cooler bracket. Leave this bolt loose to allow some movement. Bolt the cooler to this bracket, using the M6 button head screws (36-15730, unlike what's shown) and threaded backing plate.
5. Once everything's located appropriately (try to orient everything as low as possible), fully tighten (3.5 lb-ft / 42 lb-**IN**) all of the cooler-to-bracket and bracket-to-car bolts. Fill the cooler with oil as well.
6. Install the M22 -> AN-8 male adapter (27-16395) into the inboard cooler fitting. Smear some oil or grease on the O-rings to prevent damage. **BE SURE TO SUPPORT THE HEX ON THE COOLER AS YOU TIGHTEN THE FITTINGS.** Failure to support the hex on the cooler could destroy the cooler. Tighten to no more than 29 lb-ft.

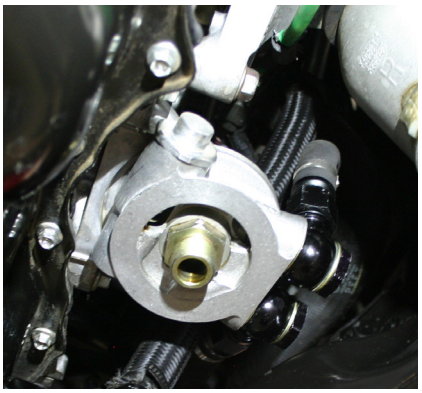
7. Using the 22mm banjo fitting (27-16443), the 22mm banjo bolt (36-16322) and two 22mm crush washers (36-31222, one on either side of the banjo fitting), create an assembly as shown and thread it into the outboard port of the cooler. The hose shouldn't be connected yet. Point the outlet generally outboard. Snug the bolt but don't tighten it yet, we'll probably need to tweak its orientation.
8. Move underneath the car and remove the oil filter. This is a convenient time to do an oil change, but it's not necessarily required. You'll need to be prepared to catch the oil that will leak out of the filter, though.
9. **2019+ (ND2) cars only:** To make the ND oil cooler kit fit an ND2, the additional parts kit (04-37249) is required. It components are referenced in this step of the instructions. The factory oil cooler is not compatible with the FM oil cooler so it must be removed. Start by either draining the cooling system or clamping the coolant lines near the cooler. Now remove the two coolant hoses that attach to the factory cooler (8). Route the rearmost hose out from behind the engine mount and then join them together using the supplied union and factory hose clamps. Use zipties to keep the hoses from being in contact with sharp or abrasive objects. Using the supplied 12mm Allen tool removed the adapter holding the factory cooler in place (9). Install the supplied fitting with the shorter threads installing into the engine plate and tighten to 107-141 lb-IN.



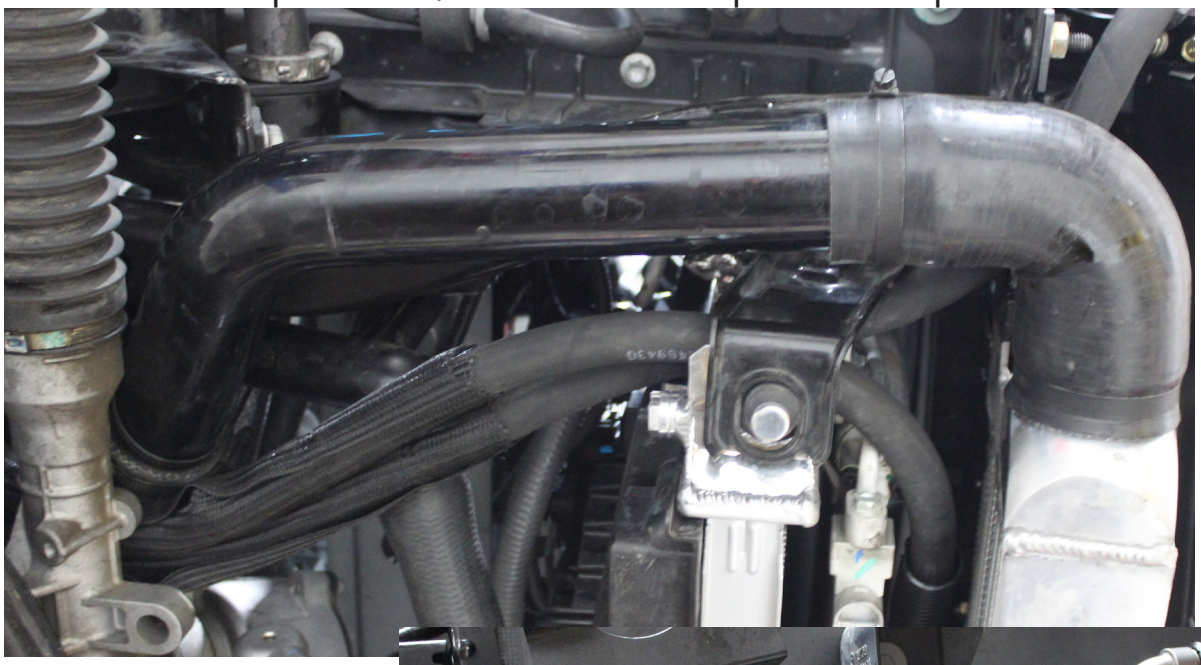


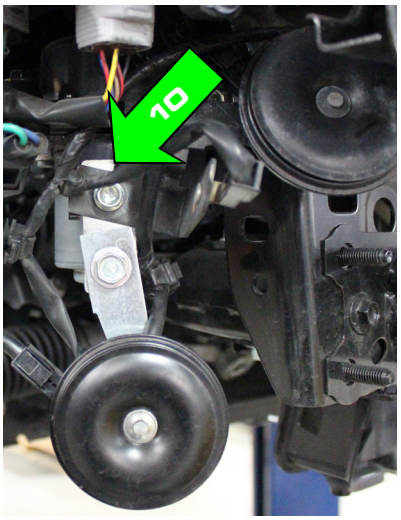


10. Install the hoses on the oil thermostat before installing the thermostat in the car. The longer hose should be attached to the rearward fitting on the thermostat. Be sure to oil the faces (tapers) and threads of the fittings before installing. Tighten the hoses to 29 lb-ft, or hand-tight plus one turn. The forward hose should be at roughly 2 o'clock, the rearward hose should be around noon. Tighten the banjo bolts to no more than 29 lb-ft.



11. Smear some oil on the rubber gasket on top of the oil thermostat and slip it onto the threaded stud for the oil filter. Route the hoses as you're slipping the oil thermostat into place. Try to route them such that there will be as little rubbing as possible, but it's impossible to avoid all of it. Be certain to carefully orient the thermostat such that it clears the oil filter base on the engine and sits perfectly flush. Use the gold adapter that's included with the thermostat to hold it in place. Tighten this to 107-141 lb-**IN**. Install the oil filter and tighten it to the same torque. If this is a new filter, be sure to smear some oil on the O-ring on the top of the oil filter and pre-fill the filter before installing.
12. Complete the routing of the hoses to the cooler as shown below. Feel free to deviate if you find a routing that works better for you.
13. Connect the hoses to the cooler. Tighten hand-tight plus one turn to a max of 29 lb-ft. Be sure to route the inboard hose inboard then behind the cooler, there isn't enough room to route it on top of the cooler. Tighten the banjo completely as well (**support the cooler hex!**). Try to orient everything as far from the bumper cover / close to the bumper itself as possible.





14. Re-install the noisy horn as shown (8), re-using the bolt that holds the horn we didn't move.
15. Cut the woven loom to length and install onto the hoses as necessary to buffer any rubbing. The stainless steel braided hoses will easily rub through nearly anything, so be diligent about your routing and protection (prototype hoses shown). **BE ESPECIALLY CAREFUL AROUND THE RADIATOR AND CONDENSER.** The stainless hoses will easily chafe through both of these, so use wire loom, route the hoses to lessen the contact as much as possible, and secure as needed. Ensure the wire loom won't move; secure with zip-ties if necessary. Zip-tie the hoses in place as needed.
16. If you've drained the oil from the engine, refill it now (4.5 US qts). If you haven't, check the dipstick to see if it's relatively close to full. If it is, start the engine and let it idle as you check for leaks. If there are leaks, fix them - you can tighten fittings a little more, but be careful about over-tightening. Once everything's dry, shut the car off and let it sit for five minutes. Re-check the oil level, now that we've filled up the additional plumbing, and top it off.
17. Reinstall the bumper cover, splash pan, wheel well liners, and aluminum cover under the oil pan. Bumper fitment will most likely be very tight, carefully check for interference as you install. It's possible that you'll need to carefully trim plastic in order to get the bumper cover to fit. Light contact is okay as long as the bumper isn't being held out of position. You may need to loosen hoses or banjos to tweak their locations. The order of installation should be bumper cover, splash pan, then wheel well liners (don't over-tighten the screws!). Adjust the gap between the bumper cover and hood before tightening the screws at the top. The aluminum pan can be done whenever (tighten bolts to 24-28 lb-ft). Installation of each is the reverse of removal (it's easiest to pop the plastic fasteners back in first).
18. Done! Enjoy your more thoroughly cooled car. This kit should be transparent in operation, you'll simply need to drive the car. We typically don't drain the cooler at each oil change, but you can do so if you want to be especially thorough. You do need to be more diligent about checking the oil level after each change due to the extra plumbing, so give it a second check each time.