



Hard Water Lines and Oil Drain Installation

Revision 1.1
1-15-09

Congratulations on your purchase of our hard water/oil line kit! This kit will all but eliminate the maintenance headaches of replacing standard water and oil lines. These instructions will help you correctly install the lines. If you have any questions, feel free to call us on our tech line at 970.464.5600. If you have suggestions on improvements that can be made, please call or email the suggestions to tech@flyinmiata.com.



- 1) Drain the cooling system by removing the plug in the bottom of the radiator. Be sure to remove the radiator cap in order to promote flow.
- 2) Remove the heatshield from the turbo, if so equipped.
- 3) Remove any zip-ties/clamps/etc that are holding the water lines, then remove the banjo bolts from the turbo. You'll re-use the banjo bolts, but the kit includes new copper washers. Pull the lines off of the thermostat neck and water pump, then remove them from the car.
- 4) Remove the two bolts that hold the flange for the oil drain, and pull the flange/barb/hose assembly off. We use sealant to help seal the flange onto the turbo, so it may take some effort to pull off. There's also a gasket on between the flange and turbo, so be sure that comes off entirely. Look at the flange, if there are chunks of gasket or no gasket at all, you'll need to scrape the bits off of the turbo. Try to look at the oil drain on the turbo to be sure that there is a clean surface. This definitely falls into the "easier said than done" category, but it needs to be done to ensure a leak free seal.
- 5) Take the hose off of the barb in the oil pan (it may need to be cut off), then remove the barb. Be sure that you don't apply any side load to the fitting, as you don't want to damage the threads in the oil pan.
- 6) Install the new 1/2" hose barb into the oil pan. Smear some sealant or JB-Weld onto the threads to ensure a seal. Be sure that none of it gets into the pan. Do not use thread tape, as a small piece of tape could potentially seal up an oil passage and cause big problems. Be certain that you thread the new barb in straight.

NOTE: If this is a new turbo kit install, and you are drilling the hole in the oil pan, you will want to first install the oil drain line finger tight and let its location determine exactly where to drill the hole in the pan for the barb.

7) Smear a small amount of sealant onto both sides of the oil drain gasket. Then slip the 1/2" hose and two 1/2" hose clamps onto the end of the drain line - don't tighten either hose clamp yet. Push the hose onto the steel drain line as far as possible, in order to give the most clearance between the hose and hose barb. Then weave the drain line down towards the barb. This could be a little tricky, but it is do-able. Refer to the picture for clarification. Be certain not to put too much stress on the braid, as it will crimp if it's twisted. Once the line is in place, bolt the new drain line onto the turbo using the gasket, two bolts, and washers.

8) Push the hose from the drain line onto the hose barb, again being very careful not to twist the braid too much. Once it's all lined up, tighten down both hose clamps. Be sure to put the hose clamp on the outside of the bump on the oil drain line. The order should be hose clamp then bump, when moving in towards the oil pan. Also be certain that the drain line isn't contacting anything. It may need to be held out slightly by the hose in order to ensure this.

9) Now it's time to move onto the water lines. You'll want to install the outboard (closer to the driver's fender) water line first. Weave it into place, then hold the banjo fitting flush against the machined surface on the turbo. Check the fitment of the line.

NOTE: Bear in mind that while the lines will be very close, they may require slight tweaking. It's okay to bend the lines slightly, but be sure that you don't put any stress on the brazing/"weld" at the banjo fitting. You should also be very careful about crimping the tube. Be absolutely certain that any bending you do won't crimp the tube.



10) Once the line has been test-fitted, slip half of the 5/16" silicone line onto the end of the water line. Push it on as far as possible, as this will cause the least amount of interference during installation. Also slip the hose clamps on now. You can snug them to ensure that they don't fall off, but they'll be repositioned once the line is in place.

11) Install the outboard water line, being sure to use a new copper washer on either side of the banjo fitting. Push the silicone hose onto the nipple on the water pump and tighten both hose clamps. Tighten the banjo fitting at the turbo. This is a hollow bolt, so you don't need to prove how strong you are here. Do be sure to get it tight though.

12) Repeat steps 9 - 11 for the inboard water line.

13) That's it, the lines have now been installed! The only maintenance that will need to be done is the periodic replacement of the short pieces of hose. Since they're very far away from the turbo (a significant heat source), they should last a long time.