

Thermo-Bob™ Installation Manual: KLR650E (2008 and newer)



Thank you for purchasing the Thermo-Bob™ radiator bypass system for the KLR650. Since the KLR already has a *doohickey*, it seemed that this *thingamabob* for the KLR needed a name too.

Proper installation is critical: if you are not familiar with or feel uncomfortable with heated, pressurized liquid cooling systems, you should have a professional install the kit. Improper installation can cause engine overheating and possible engine damage.

Read through these instructions completely to familiarize yourself with the hardware names and installation procedure. This will also allow the bike to cool off if ridden recently. The installation

process is easier with low fuel as the fuel tank will be lighter and therefore easier to remove.

Other than basic tools (small wrenches / slotted screwdriver), gather the following items that you will need but are not included in the kit:

- Box cutter or sharp knife
- ~48 oz. of 50/50 coolant

The Thermo-Bob is already assembled, but if you ever plan to disassemble it, you will need a 4mm (or 5/32 inch) allen wrench.

Familiarize yourself with the parts in the kit per **Figure 1**:

(1) Thermo-Bob, assembled from:

Housing
Cap
Six screws
Thermostat
Large, skinny o-ring
Brass hose barb with 90° bend

(1) Tee Fitting with 45° 'bypass' hose barb

(2) Small hose clamps

(1) Piece of bypass hose

(4) Large hose clamps

(1) Small, fat o-ring

(1) Tie-wrap

PREPARE THE AREA

- 1) Turn the fuel petcock off. Remove the skid plate, side covers and seat. Remove the black cover from the coolant overflow tank (two Phillips-head screws).
- 2) Remove the left and right fairing shrouds that are an extension of the fuel tank (3 bolts with 8mm heads and one Phillips-head screw each) – don't lose the spacer under each Phillips-head screw.
- 3) Remove the fuel tank (don't forget; there are two 10 mm head bolts at the rear of the tank, 2 rubber lines at the petcock, plus rubber evaporative / vent line(s) at the rear of the tank as well). If you do this with the engine still hot, there is a fire risk – so wait until the engine has cooled off.
- 4) Carefully remove the radiator cap after the engine is cool and pressure has been relieved from the cooling system. **If you do this while the coolant is still hot, you will burn yourself.**
- 5) Drain the coolant into a suitable container, remembering to keep it away from children and pets due to the toxicity. The drain plug (8mm head) is in bottom of the water pump housing as shown in **Figures 2 and 3**. Approximately one quart of coolant will drain. Reinstall the drain plug with its sealing washer, and torque to 70 inch-pounds (that's only 5.75 ft-lb).
- 6) OK. Now you have a good view of where you're going to work. Viewing from the left side of the bike, **Figure 4** shows a finished installation to help you visualize the final product. The three main hoses involved in the installation have been colored to help in identification. The upper hose (red/purple) will have the Thermo-Bob installed in it. The lower hose (blue) will have the tee fitting installed in it. The bypass hose (gold) connects to barb fittings; one on the Thermo-Bob (in the red/purple hose), the other on the tee fitting in the blue hose.

There are no references to a **Figure 5, 6 or 7** at this time for the 2008 and newer models.

ASSEMBLE THE THERMO-BOB

(Steps 7 through 10 have already been completed for you but are spelled out below if you ever take the Thermo-Bob apart in the future.)

7) Locate the thermostat from the kit and verify that the retention tabs have been cut off as shown in **Figures 8 and 9**. The thermostat will not fit in the housing until the tabs are removed.

8) Lubricate the outside diameter of the thermostat's rubber seal and the inside of the Thermo-Bob housing with a thin film of coolant as shown in **Figure 10**. Then push the thermostat into the housing as shown in **Figure 11**. Before pushing it in, orient the thermostat in the housing as shown in **Figure 12**. It is important to push it in firmly until it bottoms squarely in the housing and does not protrude more than 0.005" above the edge as shown in **Figure 13**.

9) Lubricate the large, skinny o-ring with coolant and install it in the housing cap as shown in **Figures 14 and 15**. Be sure it is down in the groove all the way around. Then install the cap onto the housing - **Figure 16** reminds you that the o-ring will slightly separate the housing and cap. Install the six housing screws. They should spin in easily: if one does not, back the screw out a turn and try again. Install them finger tight, *then* tighten them in a cross-pattern, ½ turn at a time to seat the cap against the housing as shown in **Figure 17**. Finally, torque the screws to 45 to 50 in-lb.

10) Place a thin layer of pipe dope (not provided) around the threaded end of the 90° brass hose barb and thread it into the bypass port on the Thermo-Bob. The hose barb and housing use tapered pipe thread, so the effort required to continue turning the fitting will increase as you continue - snug it up good and orient the brass nipple as shown in **Figure 18**.

Study **Figure 18** and note how water moves through the Thermo-Bob, so that you can install it properly.

UPPER HOSE MODIFICATION AND OLD THERMOSTAT REMOVAL

11) Remove the upper (red/purple) radiator hose first. To do this, loosen and remove clamp U1 in **Figure 4**. Then work on the opposite side of the engine by removing the three bolts (8mm head) on the factory thermostat housing – the bolts are circled in red in **Figure 19**. Lift the factory thermostat housing away from the cylinder head and remove the upper radiator hose (red/purple) from the motorcycle. In the side of the cylinder head, you'll see the original thermostat and gasket as shown in **Figure 20**. Remove them as shown in **Figure 21**.

12) **Figure 22** shows the upper hose before modification. With a sharp knife, remove a 2 inch section from the hose as outlined in the figure.

13) After viewing **Figures 23 and 24**, slide one end of the supplied piece of bypass hose onto the Thermo-Bob's brass barb, and insert the Thermo-Bob into the upper hose as shown in the figures. Install clamps TB1, TB2 and B1 as shown, noting the orientation of not only the Thermo-Bob, but each of the three clamps. Tighten clamp B1 but leave clamps TB1 and TB2 a little loose.

14) Dip the free end of the bypass hose in some coolant and wipe off the outside. This will leave coolant on the inside of the bypass hose which will assist in final installation. Take the upper hose assembly and thread it through the frame in front of the engine as shown in **Figures 25 and 26**. The assembly shows color-coded hoses to help you identify what is being installed. Slide the upper end of the hose onto the upper nipple of the radiator. Reinstall and tighten clamp U1 (**Figure 4**).

15) It is time to install the small, fat o-ring as shown in **Figure 27**. Lubricate the o-ring with coolant and place the factory thermostat housing over the o-ring. **IMPORTANT: Be careful installing this – run the bolts down finger tight, then turn each bolt ½ turn at a time in succession to slowly seat the housing against the cylinder head, then torque to 70 INCH-pounds (only 5.75 ft-lb). If you don't do this 'shared' method of tightening the housing bolts and crank only one bolt all the way down first, you will damage or break an ear off the factory thermostat housing.**

LOWER HOSE MODIFICATION

16) Remove clamp L1 in **Figure 4**, and clamp WP1 in **Figure 28**, and remove the lower hose. After viewing **Figures 29 and 30**, mark the hose accordingly and remove a one-inch section of the lower hose. Note that the measurements in **Figure 30** are taken from the completion of the bend in the hose in the 'radiator end', not the 'water pump end'.

17) Place the supplied tee fitting in the lower hose with clamps Tee1 and Tee2 (supplied) as shown in **Figure 31**. Try to match the tee and clamp orientations shown, and do not tighten the clamps yet. Reinstall the lower hose on the bike and tighten hose clamps WP1 (**Figure 28**) and L1 (**Figure 4**). Rotate the tee fitting in the lower hose for best alignment to the bypass hose which will soon be installed. Tighten clamps Tee1 and Tee2.

18) Using **Figure 32** as a reference, install small clamp B2 onto the loose end of the bypass hose then slide the loose end of the bypass hose onto the Tee's brass hose barb. Tighten clamp B2.

19) Inspect for interference between hoses and metal parts that could rub a hole in them. Rotate the Thermo-Bob in the upper hose so that clearances are maximized between the frame and Thermo-bob lugs as shown in **Figure 33**. Be sure the outer diameter of the fan cannot contact the Thermo-Bob. Tighten hose clamps TB1 and TB2 (**Figure 23**). Rotate the radiator fan by hand to verify that the Thermo-Bob is at least ¼" away from the rotating fan shroud. To maximize clearance between the brass fitting on the Thermo-Bob and the radiator, the tie wrap provided can be used to apply tension in the direction you wish, with an example shown in **Figure 34**.

20) Verify that all hose clamps are tight one final time.

REFILL THE COOLING SYSTEM

21) The cooling system typically holds about 34 fluid oz. of 50/50 coolant, but without a bleed hole in the thermostat, filling the cooling system is a little more complex. Fill the radiator nearly to the top by pouring in 50/50 coolant – this will take 24 to 34 fluid oz. If the bike was ridden in the last week or less, there will be enough fuel in the carburetor fuel bowl to start the engine and let the bike idle with the radiator cap off. (Others will have to reinstall the fuel tank first). By running the engine between 1000 and 2000 rpm for less than 30 seconds, the air should be purged in the system and the coolant level will drop in the radiator. Shut off the engine and you then should be able to complete the fill to 34 fluid oz. total. Replace the radiator cap, being sure it is on correctly. Reinstall the fuel tank only (no shrouds yet) and reconnect the fuel line, vacuum hose, and the vent/overflow hose(s) and turn the petcock back on. Torque the restraining bolts to Kawasaki specification. Start the engine and let the bike continue to run and heat up for a few more minutes until the radiator fan operates once, implying that the thermostat has opened for the first time. This will also allow the cooling system to heat and pressurize itself so you can conduct leak checks. Then shut off the engine, and after the bike cools completely you should remove the radiator cap and top off the coolant. Be sure to re-install the radiator cap correctly.

22) Replace the left and right fairing shrouds, black coolant overflow tank cover, seat, side covers, and skid plate, and torque all bolts to Kawasaki specification.

Installation is complete. If you have any comments or questions, contact me at watt-man@cox.net .

REPLACEMENT PARTS

(Recommended replacement frequency: every 5 years or 40,000 miles, whichever comes first)

The replacement thermostat is produced by STANT, and four different thermostats will fit. Due to the fact that Stant has two different ways to reference a particular part (the catalog usually uses the “box” number) these four thermostats can be referenced with eight different part numbers. The photos below clarify the Stant numbering scheme.

Unless special ordered, your Thermo-Bob was shipped with a STANT 29829 which is a 195°F thermostat. Do not try to cross-reference the part number to a different brand, they typically will not fit properly. If you are unable to find parts locally, replacement thermostats are available below and include shipping fees to the US or Canada:



Thermostat: \$12

O-ring kit: \$5 (includes both o-rings from the kit – one ‘large/skinny’ and one ‘small/fat’).

There are two methods to provide payment:

1) A personal check or money order to:
Watt-man LLC
6501 E. Greenway Pkwy
#103-296
Scottsdale, AZ 85254

and at the same time, send an e-mail to watt-man@cox.net so I'll be able to box up your order and wait for your check.

2) PayPal to watt-man@cox.net

If you need other parts (brass fittings, aluminum housing pieces etc.) contact me as well. Same e-mail address as above.

IM08 V9c

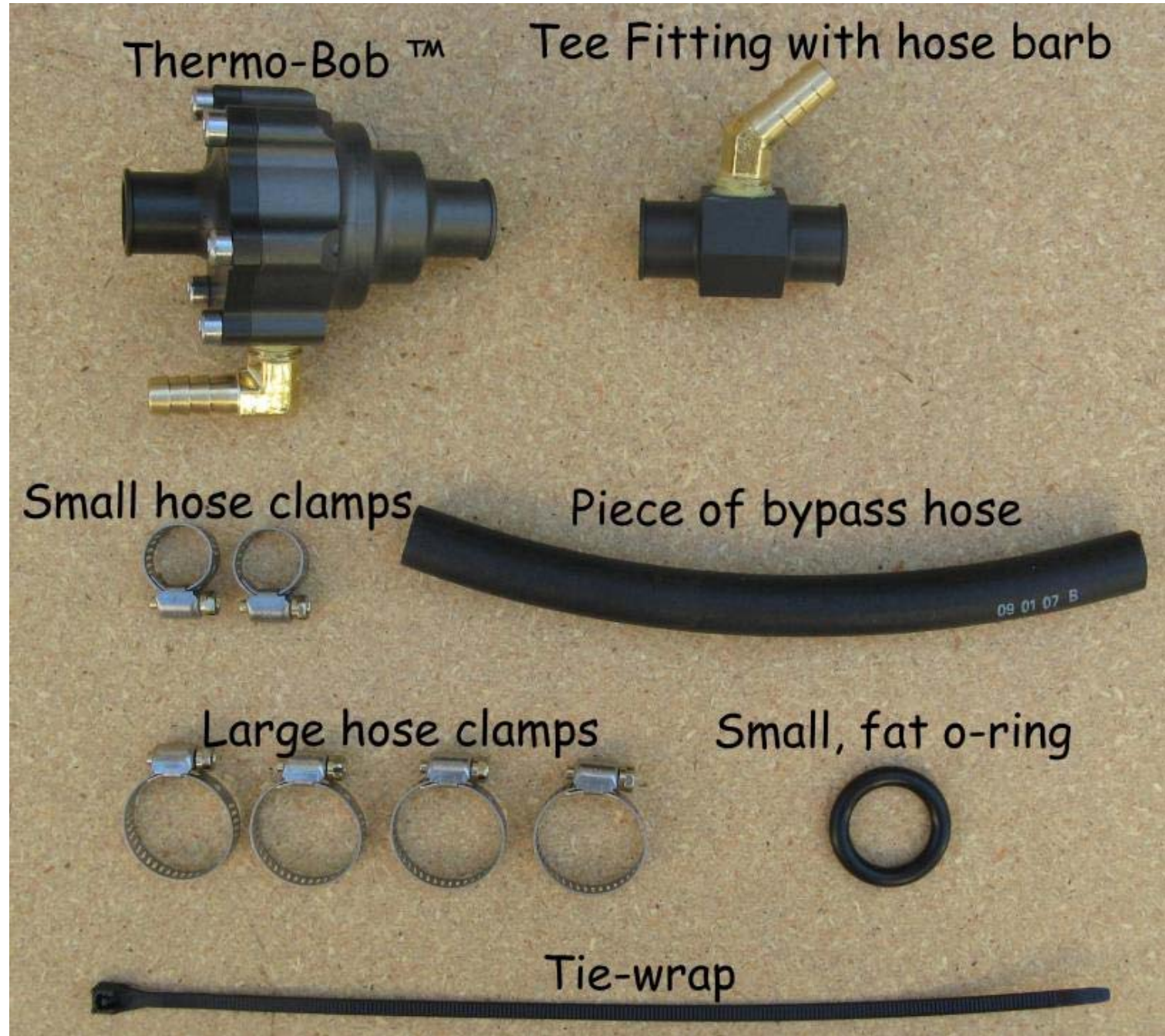


Figure 1: Thermo-Bob™ kit contents.

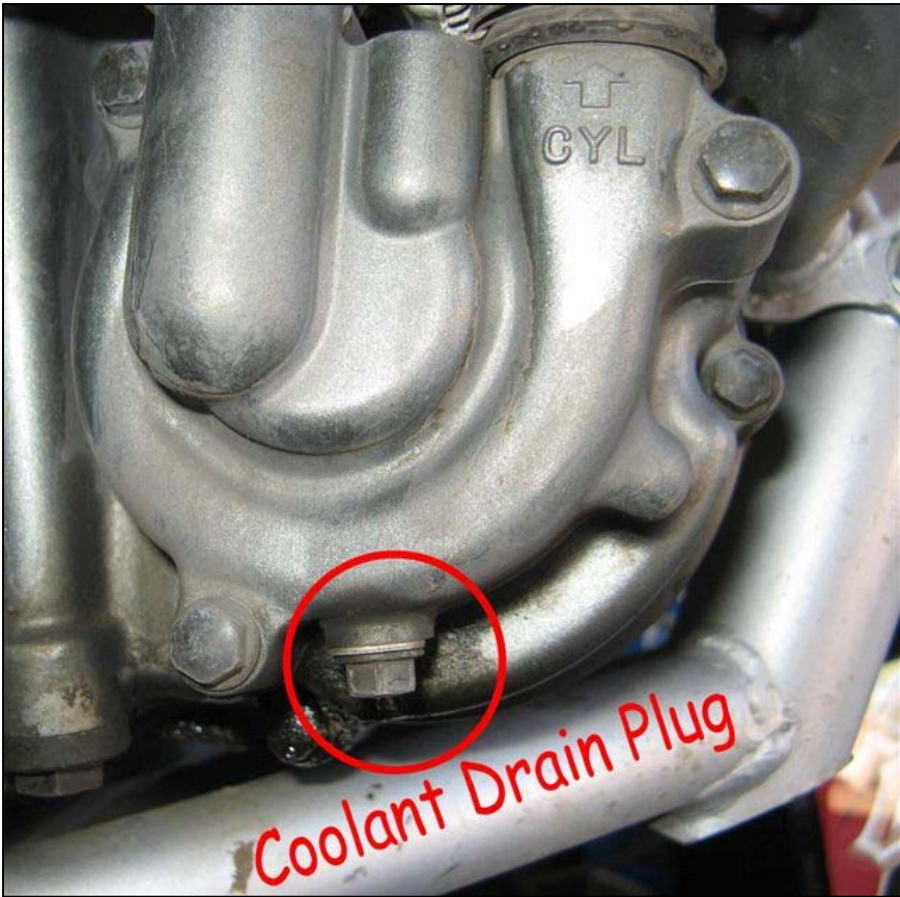


Figure 2



Figure 3



Figure 4: Completed Installation. Hoses have been color coded to help in identification; red/purple is upper radiator hose, blue is lower radiator hose, gold is new bypass hose.

There are no Figures 5, 6, or 7 in this Installation Manual.

T-stat with full
tabs still in place



Figure 8

T-stat with
tabs cut off



Figure 9

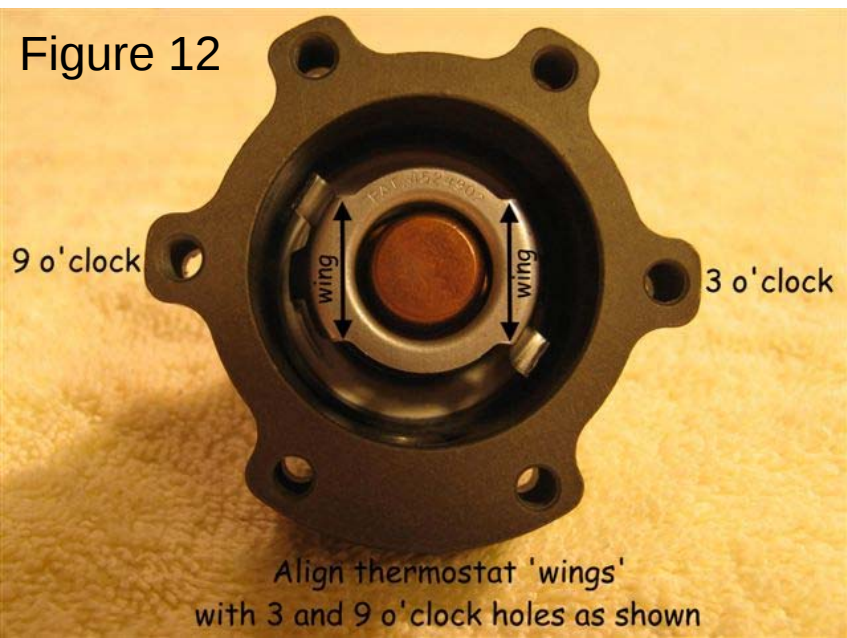
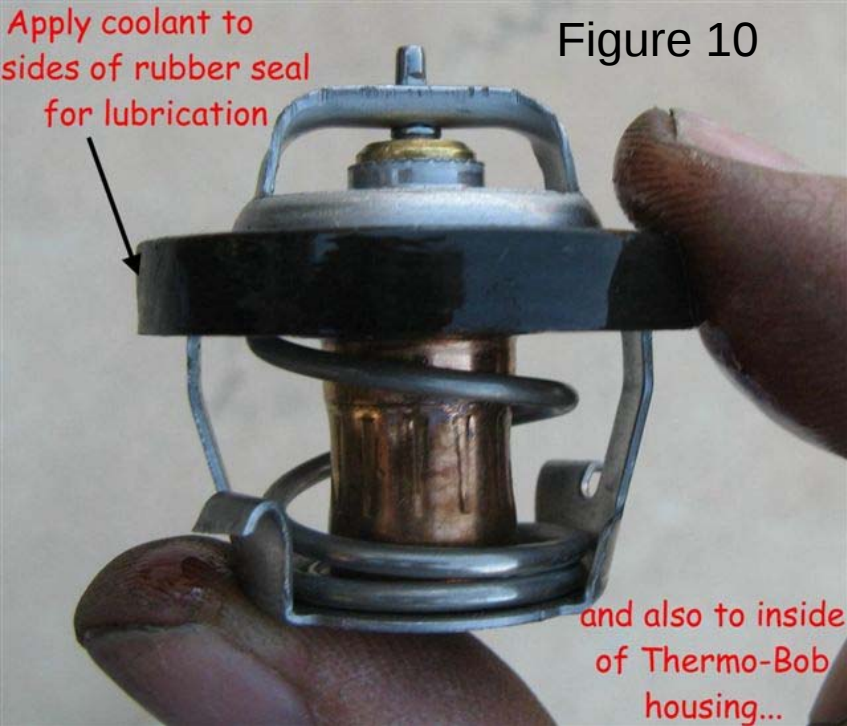




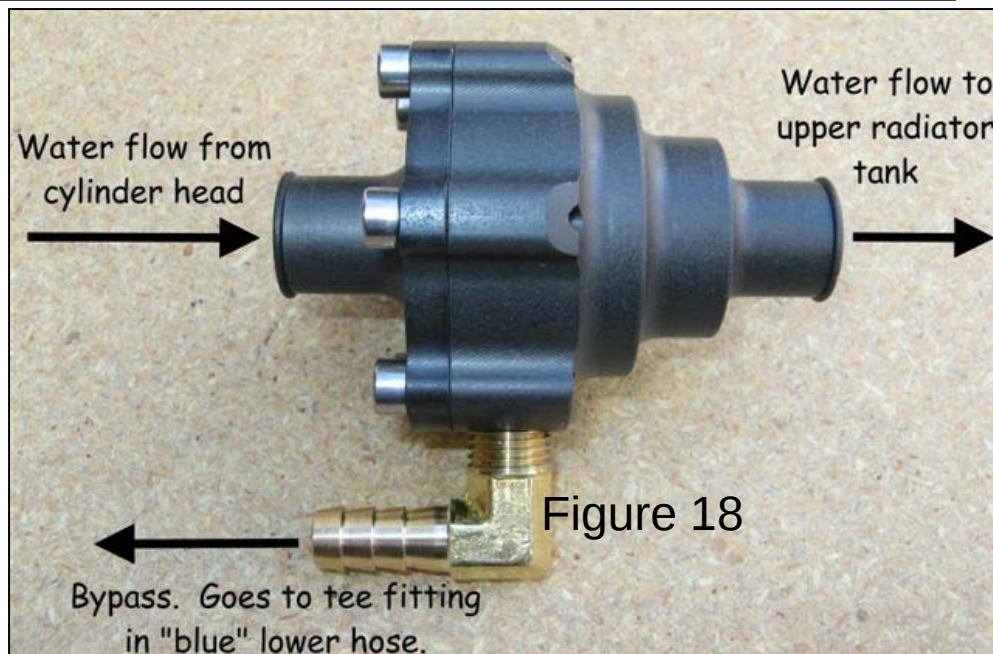
Figure 14



Figure 15



Figure 17



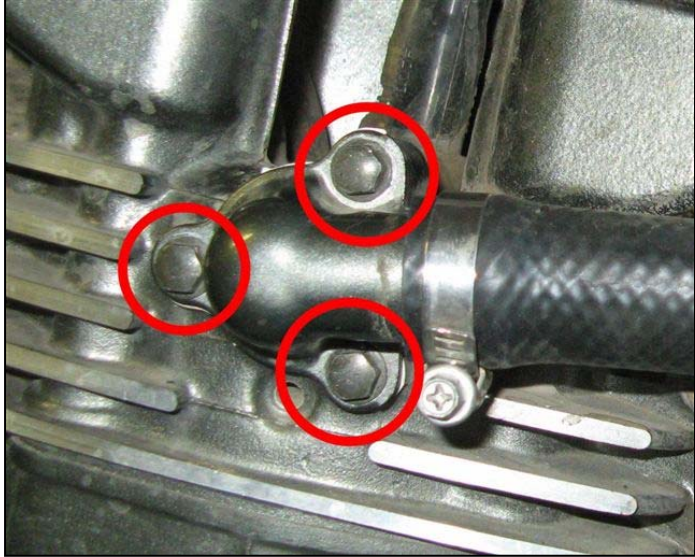


Figure 19: Three bolts on factory thermostat housing.



Figure 20: Factory thermostat.

Figure 21: Remove factory thermostat and gasket.



Figure 22: Remove 2 inch section from upper hose.



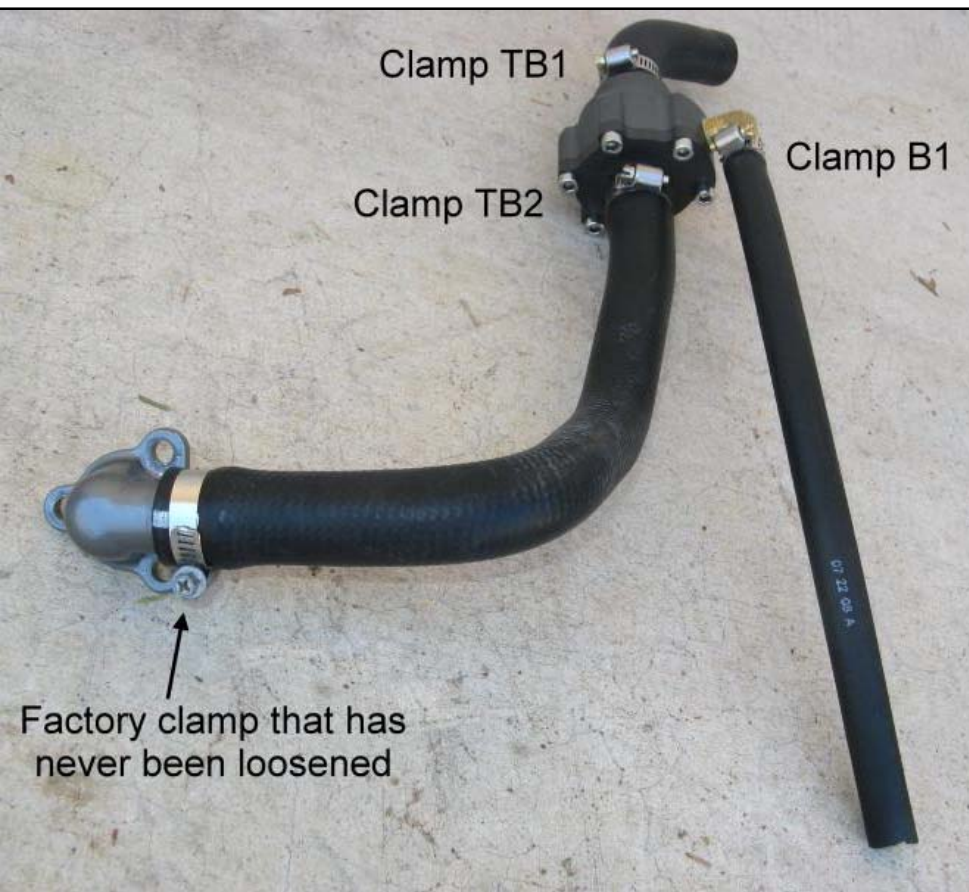


Figure 23

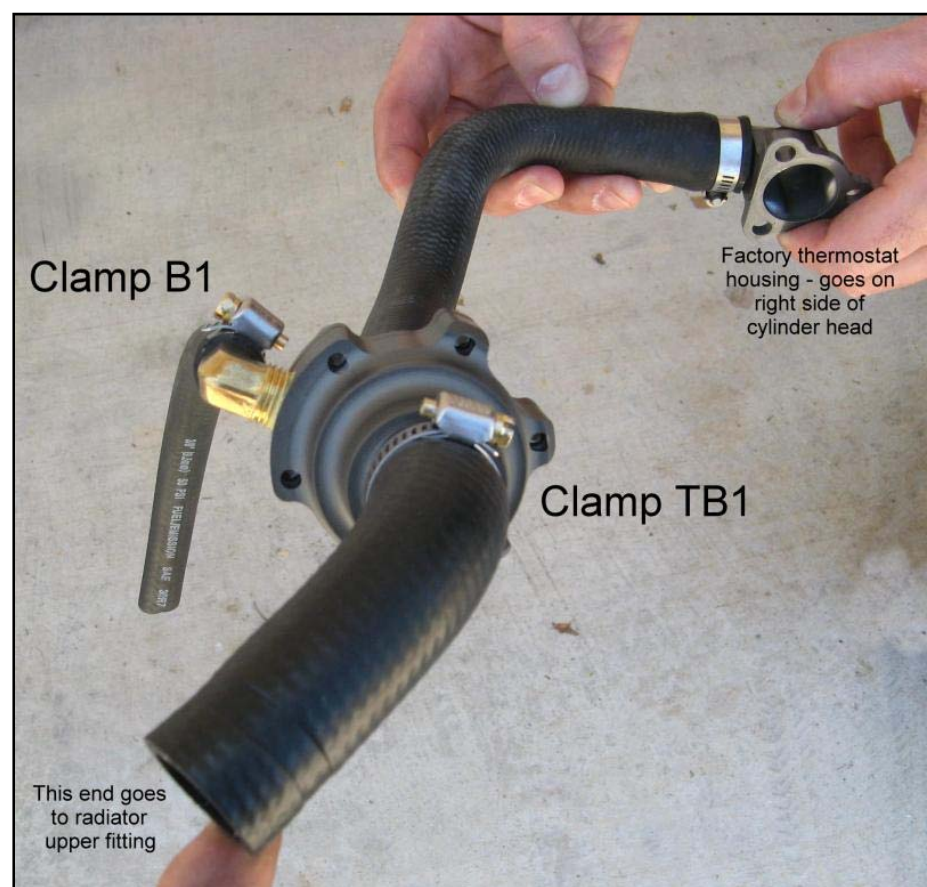


Figure 24

Upper hose assembly with Thermo-Bob and bypass hose in place

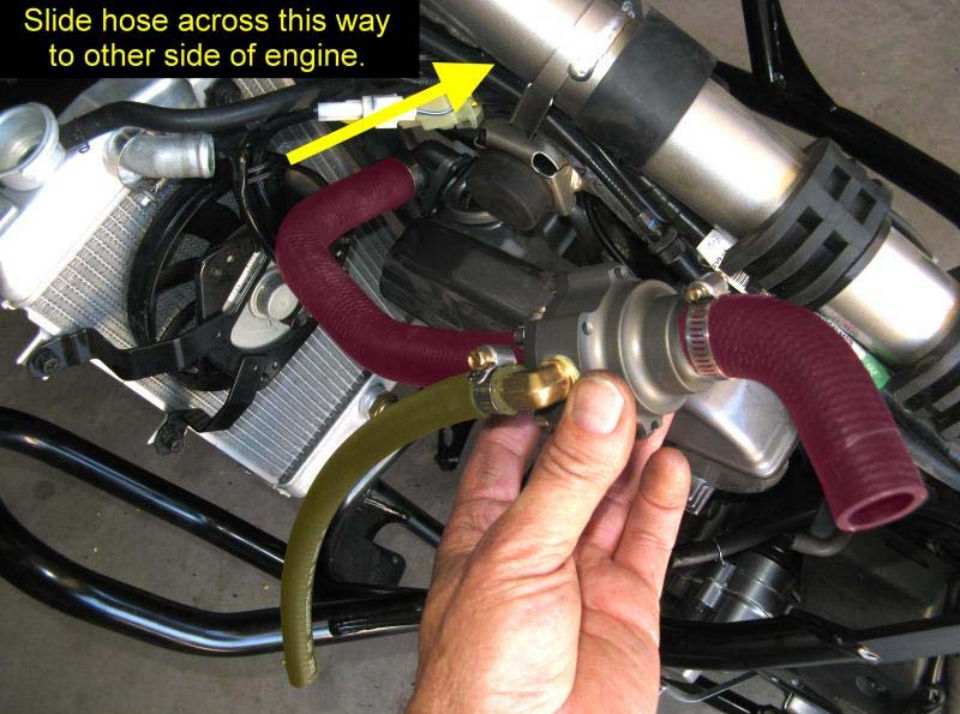


Figure 25



Figure 26

Installing upper hose assembly: hoses are color-coded to help in visualizing placement. The gold hose is hidden from view in Figure 26, see Figure 4 for placement.



Figure 27: Attach upper hose to cylinder head with o-ring in place (see Step 15 of instructions for fastener torquing process).



Figure 28: Lower hose is color-coded blue in this picture to identify it. Black hose will not be disturbed.



Figure 29

Remove 1 inch
section of lower
hose.

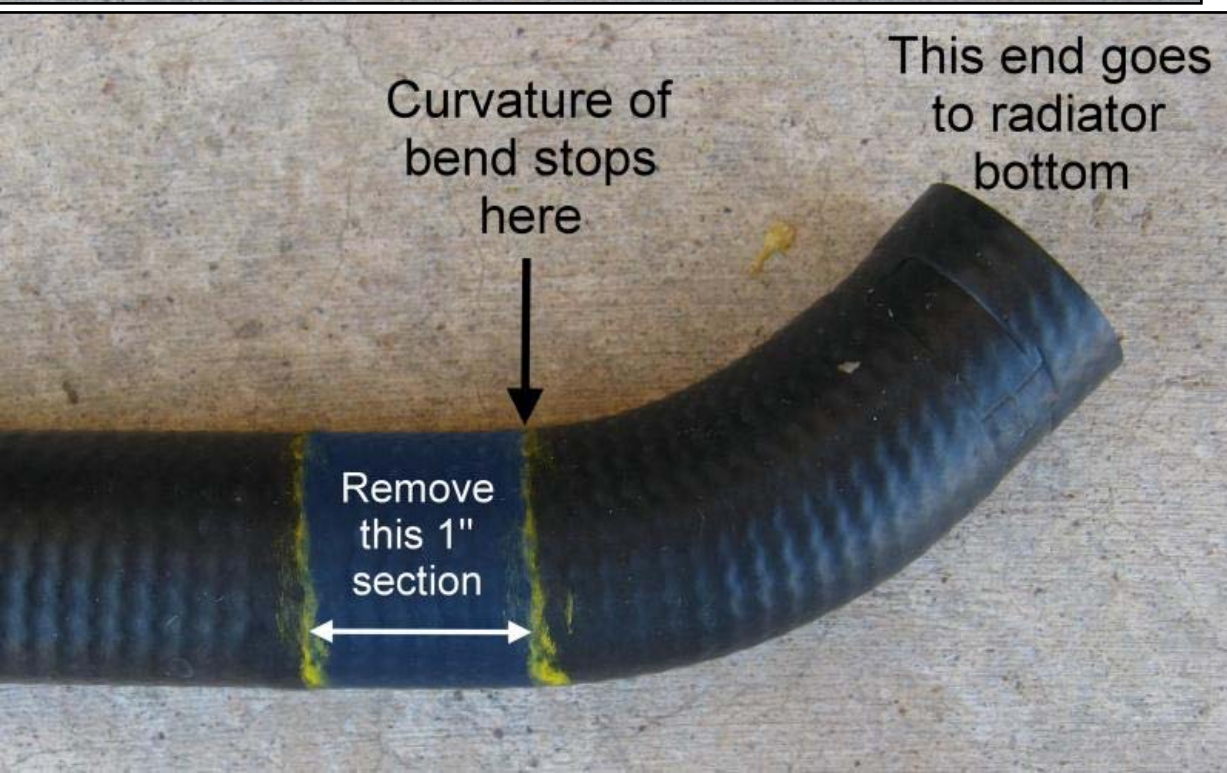


Figure 30



Figure 31:
Tee Installed in lower hose.

Figure 32:
Details of complete
installation of lower
radiator hose and
bypass hose
connection.



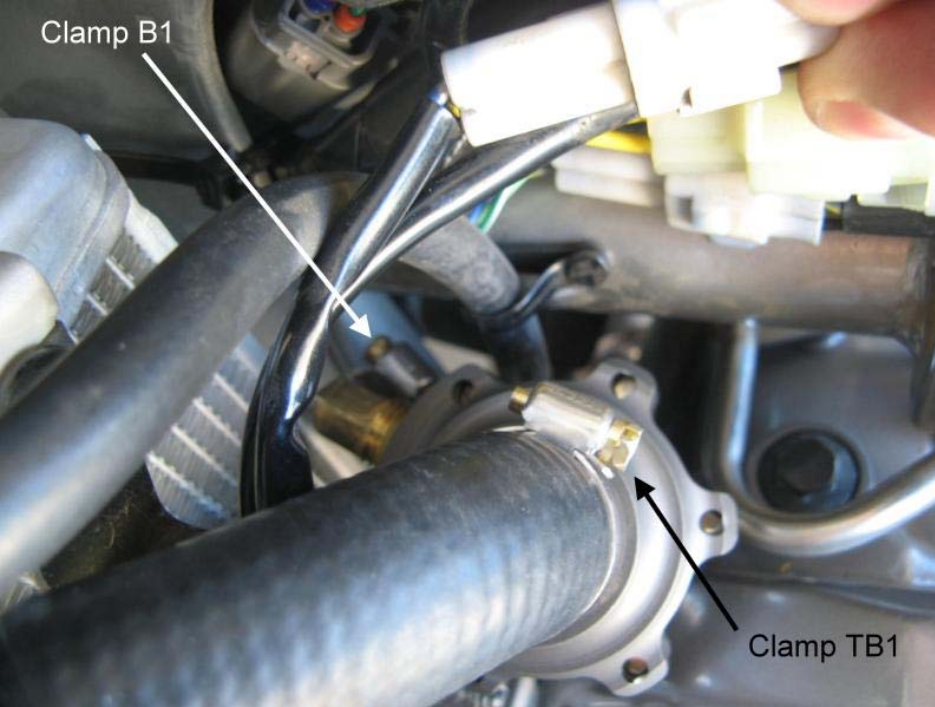


Figure 33: Verify Thermo-Bob housing and brass fitting orientation relative to upper frame tube and radiator.

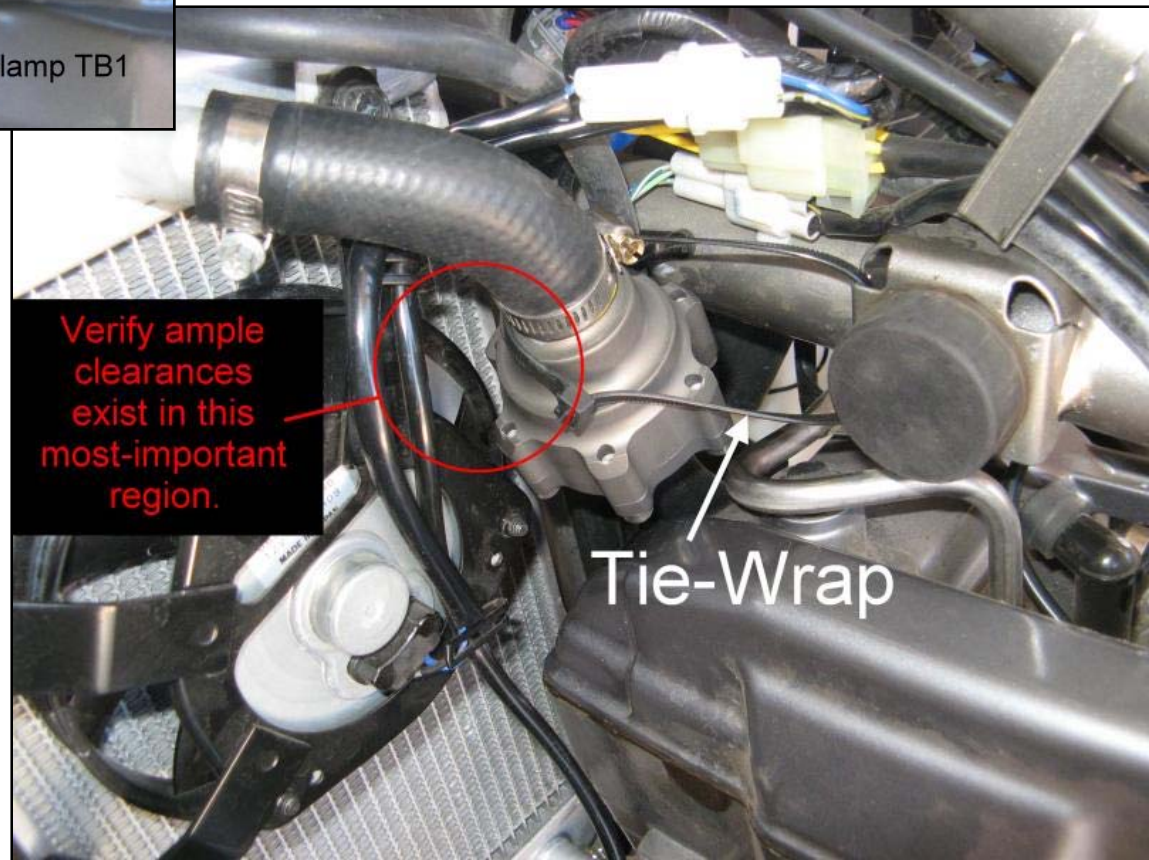


Figure 34: Verify that ample clearances exist.