Instructions Created by an:

Automotive Service Excellence
MASTER AUTO TECHNICIAN

Suzuki 180 Degree Fahrenheit, 82 Degree Celsius Thermostat (SKU# SER-T)

Installation Instructions

CAUTION: Safety glasses should be worn at all times when working with vehicles and related tools and equipment.

FOR ADDITIONAL COPIES OF THESE AND OTHER INSTRUCTIONS GO TO:
www.lowrangeoffroad and click on the "INSTRUCTIONS" tab.

Suggested Tools:

- Drain Pan
- Brake Cleaner (aerosol best)
- Gasket Scraper
- Coolant (Full Strength, Green, 1gallon) (Optional)
- Phillips Screwdriver
- Channel Lock Pliers (Optional)
- 10 mm socket and ratchet.
- Hook Tool (Optional)
- Pocket Knife (Optional)
- Utility Knife (Optional)
- Wire Brush (Optional)
- Tap 6X1.0 mm (Optional)
- File (or Angle Grinder) (Optional)
- Permatex® RTV "Gasket Maker"

Thermostat and Related Parts

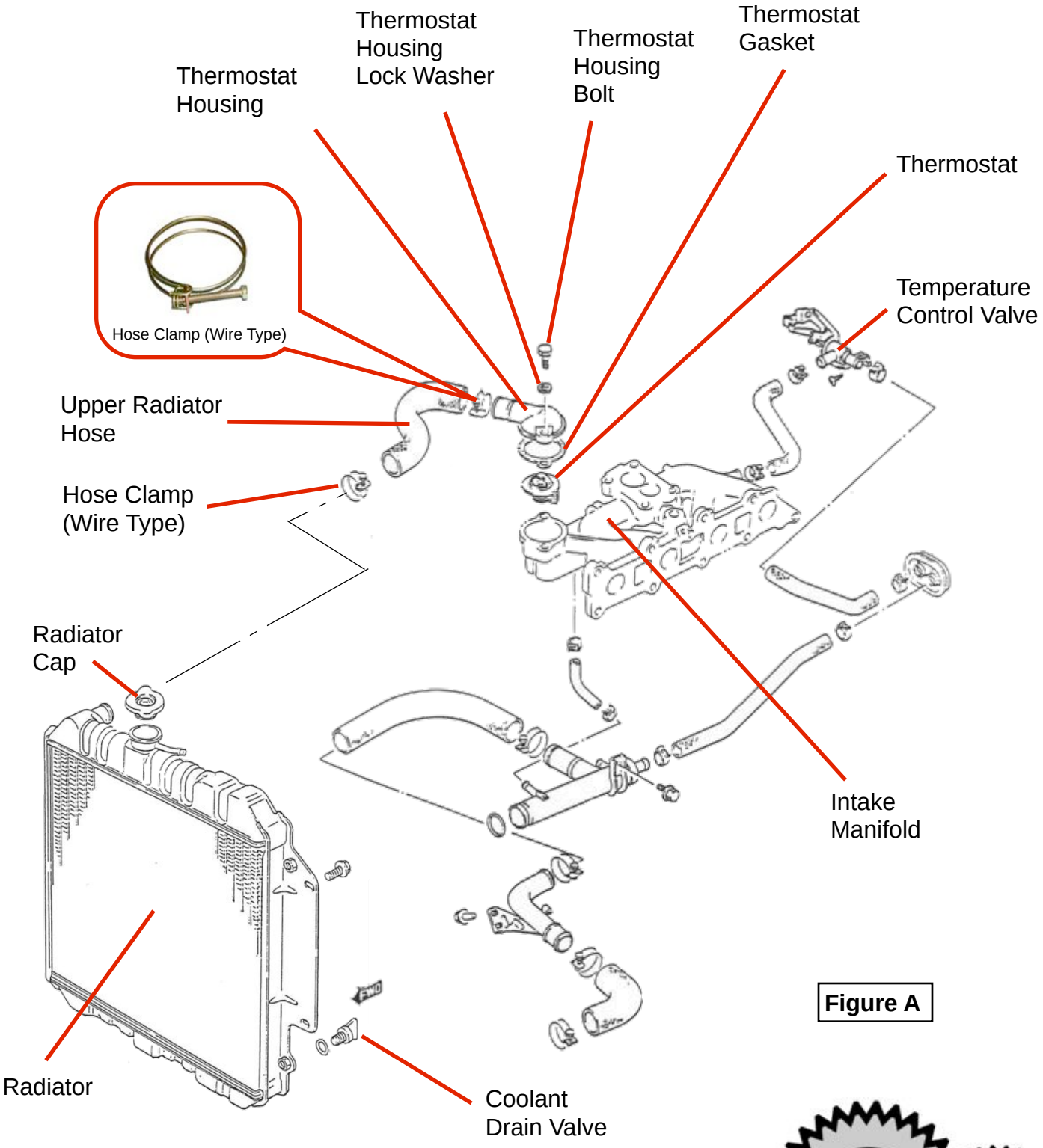
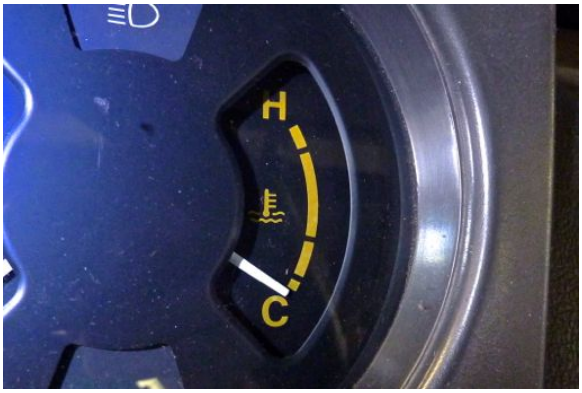


Figure A



Step 1

Let the engine cool down.

Step 2

Place a clean drain pan under the driver side of the radiator.

Step 3

Drain the cooling system by turning the drain valve counter-clockwise several turns.

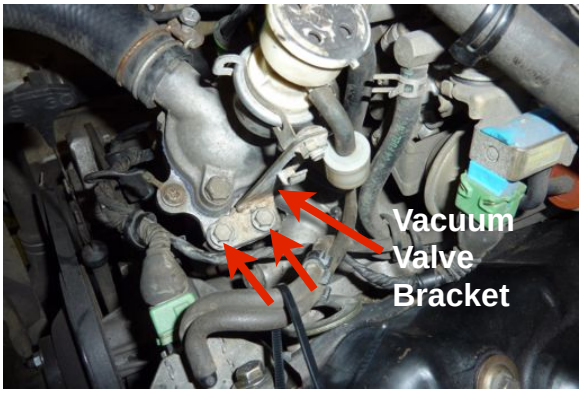
Step 4

Allow coolant to drain until it is about half way down in the radiator.

Note: If the coolant is over 2 years old or is dirty, it is highly advisable to replace it. If you are replacing it, go ahead and drain as much as you can.

Tech Tip 4

Removing the radiator cap will allow the coolant to drain faster.



Step 5

Remove the vacuum valve bracket by removing (2) bolts using a 10 mm socket.

Caution: When we attempted to remove these (2) bolts, both of the heads snapped off. It may be better **NOT** to remove these bolts and simply work around them and the bracket. **The thermostat can be replace without removing these bolts.**

Tech Tip 5

This picture shows the head of the bracket bolts snapped off.

Step 6

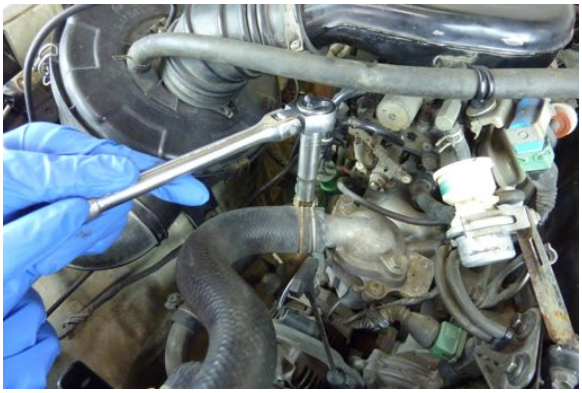
If you removed the bolts shown in step 5, lay the bracket and vacuum valve back out of the way.

Note: It is best to leave the vacuum hoses connected to reduce the risk of misrouting them.

Tech Tip 7

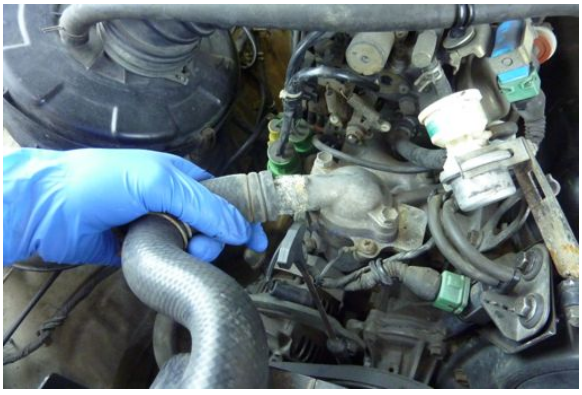
These hose clamps are removed using a screwdriver or a socket. It is best to thread the screw all the way loose as is shown here. Inspect the clamp and replace if needed.

Important Notice: If you are not replacing the upper radiator hose, skip to Step 9. If you are replacing the radiator hose or simply want to remove the upper radiator hose from the thermostat housing, continue to Step 7.



Step 7

Loosen the radiator hose clamp using a 10 mm socket.



Step 8

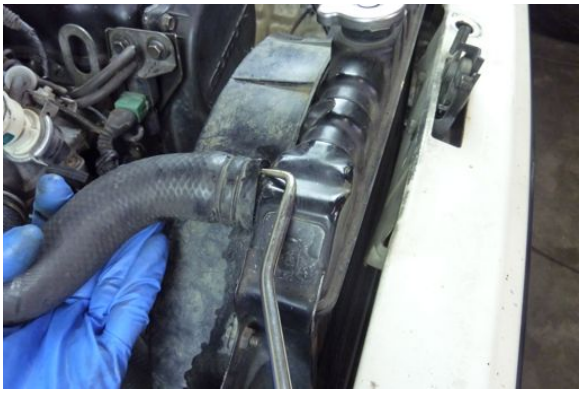
Slide the hose clamp back on the hose and remove the upper radiator hose.

Note: If the hose is seized on the thermostat housing, it may help to use one of the methods shown in the next 4 Tech Tips.

Tech Tip 8

Use a pair of channel lock pliers to twist the hose as shown here.

Caution: If you plan on reusing the hose this could damage it. So be careful.



Tech Tip 8.1

You could also use a hook tool to break loose a seized hose as shown here.

Tech Tip 8.2

If you plan on replacing the hose, you could cut the hose using a sharp pocket knife or . . . .

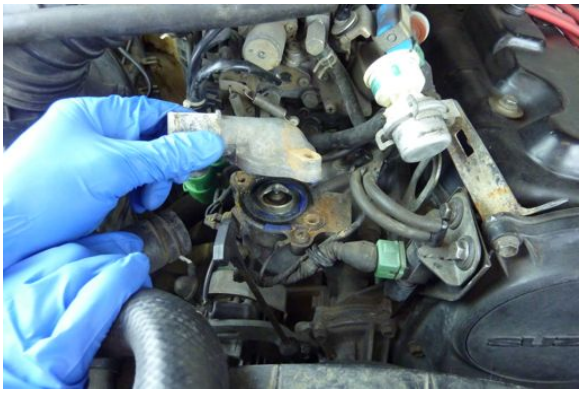
Tech Tip 8.3

. . . . split the hose using a utility knife.

Step 9

Remove the two thermostat housing mounting bolts using a 12 mm socket.

Note: The upper radiator hose could remain connected to the thermostat housing.

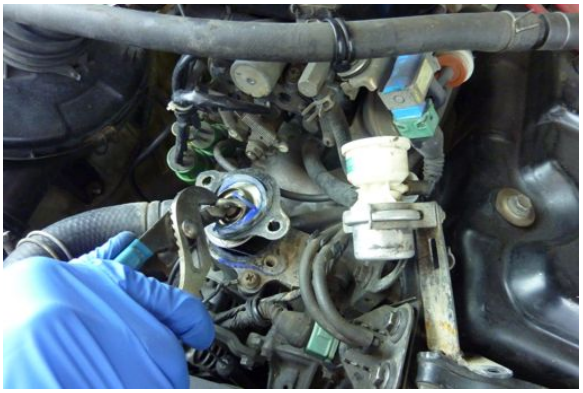


Step 10

Remove the thermostat housing from the engine and set it aside.

Note: It may be necessary to “tap” gently on the housing to jar it loose.

Caution: The thermostat housing is made of cast aluminum and is easily broken. Do not pound or wedge a tool between the thermostat housing and intake manifold.



Step 11

Remove the thermostat and the existing gasket.

Step 12

Remove any remaining gasket or gasket sealer using a razor blade or putty knife.

Caution: Do NOT gouge the metal. It could result in a leak after reassembly.

Step 13

Clean the thermostat housing using a razor blade or putty knife.

Caution: Again, do not gouge the metal.

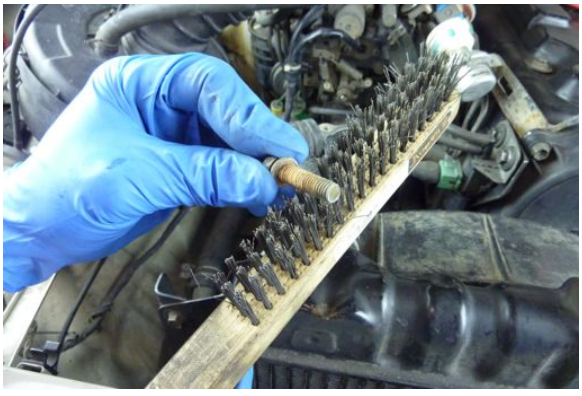
Step 14

Be sure the recessed groove in the intake manifold is free of any debris, such as gasket material or gasket sealer.

Caution: This is a very important step. If this groove is not clean, the new thermostat will not sit low enough and will likely cause a leak.

Step 15

Clean both gasket surfaces with brake cleaner so the gasket sealer will make a good seal.



Step 16

Clean the threads of both bolts of any rust or corrosion using a wire brush.

Step 17 (Optional)

If the upper radiator hose was disconnected (or removed) earlier, clean the hose connection area with a wire brush to insure a good smooth sealing surface and set the housing aside.

Step 18

Install the new thermostat with the spring side down as shown.

Tech Tip 18

Insure that the thermostat frame sits down in the groove. We have found in some cases that the frame of the thermostat is a little bit larger than the groove and will not fit down into the groove as it should. If this happens, it becomes necessary to reduce the overall diameter of the thermostat frame using a file or grinding wheel.

Tech Tip 18.1

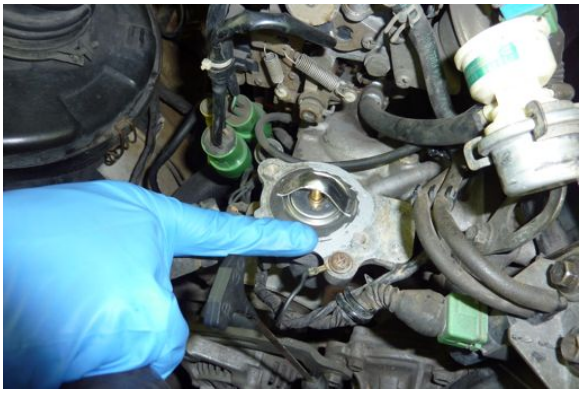
Remove a small amount of metal from the outside diameter of the thermostat frame using a hand file or angle grinder if need to fit down in the groove.

Tech Tip 18.2

Some thermostats do not come with a gasket. You could either purchase a gasket, make one or use a good quality RTV “gasket maker”. Our favorite is Permatex Ultra Gray®. Even if you choose to use a gasket, you will need to apply a thin layer (about 1/32”) of gasket sealer to both sides of the gasket just before installation.

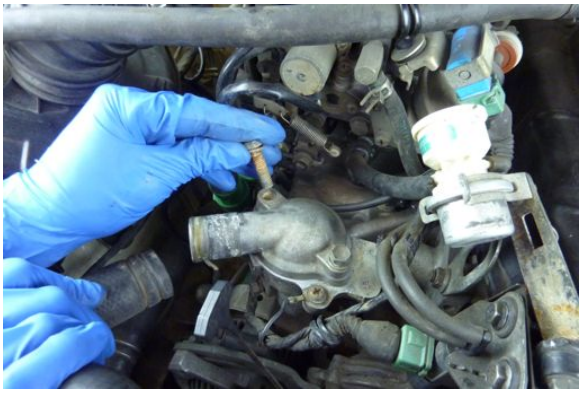
Step 20

Position the thermostat housing over the thermostat with the bolt holes aligned.



Step 19

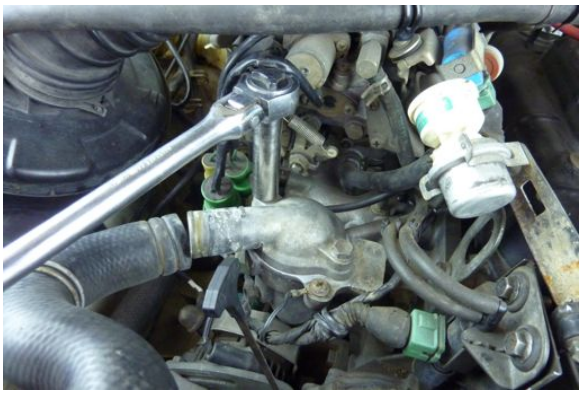
Apply a thin layer of gasket sealer (about 1/16”) to the intake manifold side where the thermostat housing will sit.



Step 21

Install the (2) bolts as shown.

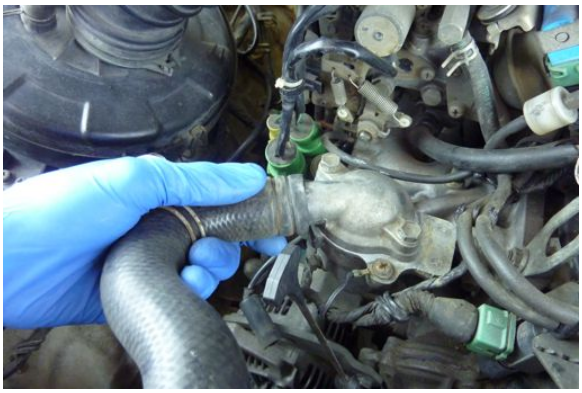
Caution: If you did not use a gasket and used only RTV gasket maker, the bolts may bottom-out in the holes before the thermostat housing is drawn tight against the manifold. If this happens it is very likely there will be a coolant leak. One solution would be to add flat washers on the bolt under the existing lock washer. Another solution would be to thread the correct size tap (6X1.0mm) down the (2) holes to clean and extend the threads.



Step 22

Snug the bolts in a progressively tighter back-and-forth pattern until 7.5 ft. lb. is reached.

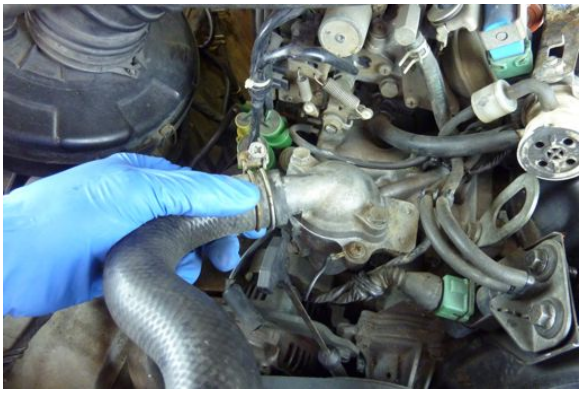
Note: Gasket sealer should be observed being pushed out from under the entire circumference of the thermostat housing to ensure a good seal.



Step 23

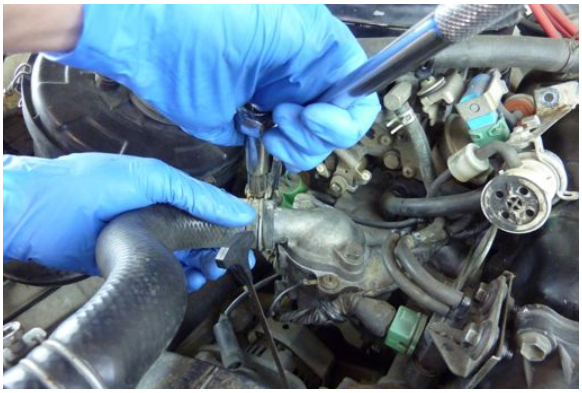
If the upper radiator hose was not removed earlier, skip to Step 27.

If the upper radiator hose was removed earlier, connect the radiator hose as shown.



Step 24

Reposition the hose clamp.



Step 25

Snug the hose clamp until the wires begin to compress the hose.

Caution: Do not over tighten these clamps.

Step 26

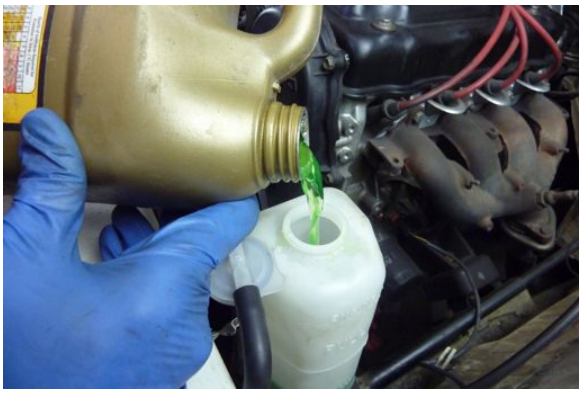
If removed earlier, reposition the vacuum control bracket and install the (2) bolts.

Note: Just snug these bolts. They do not need to be very tight.

Step 27

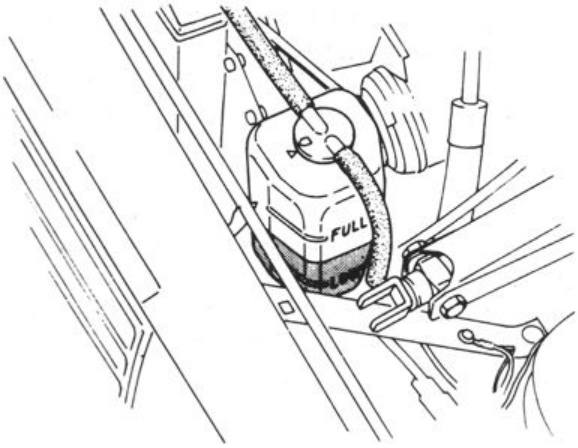
Close the radiator drain valve by turning it in a clockwise direction.

Cooling System Refill Procedures



Step 28

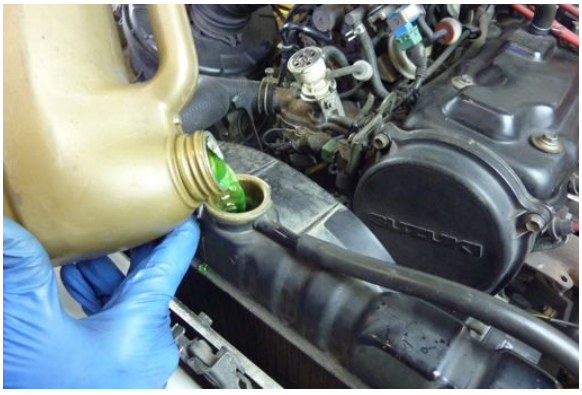
If you are replacing the fluid, empty the overflow tank and refill it with a 50/50 mix of full strength coolant and water to approximately half way between the “FULL” and “LOW” marks. See Figure A.



See Figure A

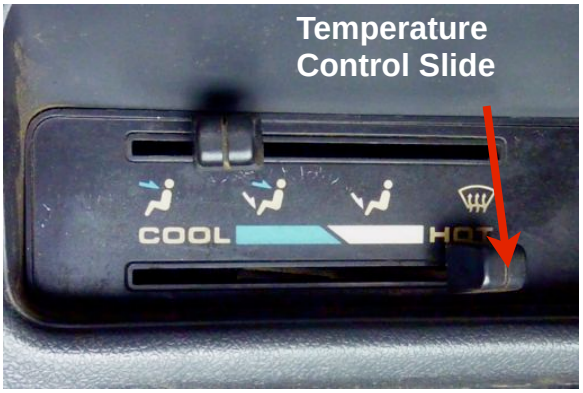
Step 29

If installed, remove the radiator cap.



Step 30

Add a 50/50 mix of full strength coolant and water to the radiator until it is full.



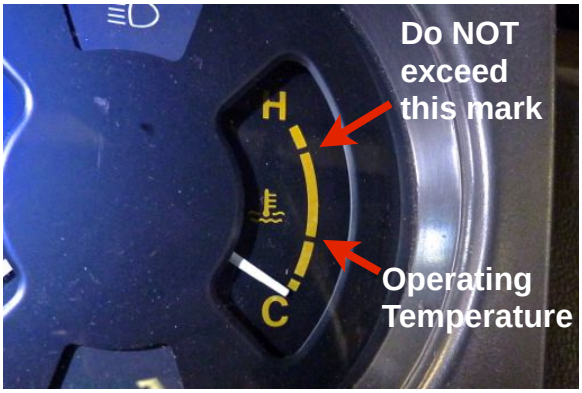
Step 31

Place the heater temperature control in the “HOT” position.

Note: This temperature control slide, opens and closes the temperature control valve (see **Figure A**) in the engine compartment. If this slide seems easy to move, have an assistant observe the valve while this slide is moved. If the valve is not moving the cable has become disconnected or is broken. Click HERE for instructions.

Caution:

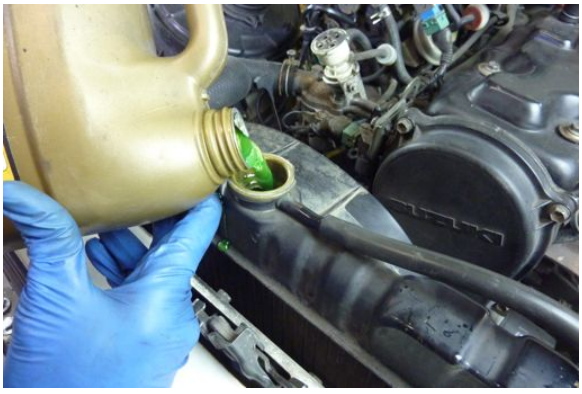
NEVER stand directly over the radiator at anytime during the refill procedure. Hot coolant can belch out unexpectedly.



Step 32

Start the engine and let it idle. While idling, monitor the temperature gage on the instrument cluster.

Caution: If the engine overheats at anytime during the refill procedure, turn the engine off and let it cool.



Step 33

When the engine reaches operating temperature (usually within 15 to 20 minutes) the thermostat will open and the coolant level in the radiator will drop. As the coolant level drops, add coolant, keeping the radiator full.

Step 34

When the coolant level remains constant, without dropping, install the cap.

Step 35

Leave the engine running and check all the hose connections and thermostat housing for leaks. If leaks are observed, turn the engine off and repair as needed. Small hose leaks can often be remedied by snugging the clamps.

Warning: If hoses have to be removed to make needed repairs, be sure to let the engine (and coolant) cool down (usually 30 to 45 minutes) before removing the cap or hoses.

Congratulations!!!

Once the radiator and overflow bottle is full and you are sure there are no leaks . . . you are done. Congratulations!!!!

One more thing. It is almost impossible to get all the air out of the system in the procedure outlined above. So, after several warm-up and cool-down cycles, check the overflow bottle (NOT THE RADIATOR) and add coolant if needed. This can be done with the engine hot. There should be no need of checking the radiator as it is kept full by the overflow bottle. However, if you think the radiator could be low, it is okay to check and add coolant if needed. Just be **sure the engine is cool** when you remove the radiator cap to check coolant level at the radiator.

We hope these instructions have been helpful. If you have suggestions on how we can improve our instructions (or products) please email us at sales@lowrangeoffroad.com.

As always, If you experience any difficulty during the installation of this product please contact Low Range Off-Road Technical Support at 801-805-6644 M-F 7:30am-5:30pm MST. Thank you for purchasing from Low Range Off-Road.

These instructions are designed as a general installation guide. Installation of many Low Range Off-Road products require specialized skills such as metal fabrication, welding and mechanical trouble shooting. If you have any questions or are unsure about how to proceed, please contact our shop at 801-805-6644 or seek help from a competent fabricator. Using fabrication tools such as welders, torches and grinders can cause serious bodily harm and death. Please operate equipment carefully and observe proper safety procedures.

Rock crawling and off-road driving are inherently dangerous activities. Some modifications will adversely affect the on-road handling characteristics of your vehicle. All products sold by Low Range Off-Road are sold for off road use only. Any other use or application is the responsibility of the purchaser and/or user. Some modifications and installation of certain aftermarket parts may under certain circumstances void your original dealer warranty. Modification of your vehicle may create dangerous conditions, which could cause roll-overs resulting in serious bodily injury or death. Buyers and users of these products hereby expressly assume all risks associated with any such modifications and use.