

# Ranger*Ware*



**WPS-104  
Heater  
Installation  
Instructions  
For  
500EFI, 700 XP, & Crew  
Applications**

ORDER OF INSTALLATION FOR A  
COMPLETE ENCLOSURE OF A  
RANGERWARE WPS (Weather Protection  
System) IS AS FOLLOWS:

1. Heater
2. Steel Door Thresholds - Passenger & Driver
3. Windshield - Fixed or Tip-out
4. Soft Side Door Hinge Bracket
5. WPS Enclosure System
6. Doors – Passenger & Driver

➔ Note: Crew Door System Instructions need to be followed in the proper order.

# Vehicle Preparation

**Review the photos before beginning the installation, and refer to them for help with each step of the installation.**

1. Unplug the headlights and remove the hood.
2. Remove the under hood storage basket (some models only).
3. Remove the (2) air inlet filters and covers the hoses to keep out debris. If you have a storage basket it is advisable to cut a hole in the end of the passenger side inlet box as you will have to turn it sideways and it may block the air flow.
4. Hose Routing Hole
  - Option A - (Recommended on models with a storage basket) Under the plastic panel surrounding the air inlet hoses is a steel plate which has a 2 ¼" hole directly centered between the inlets. Using a hole saw, (2 7/8" approximate) or a utility knife, cut away the plastic to reveal the hole (hoses will run through here).
  - Option B – Locate and remove the rubber access panel in front of the air inlet hoses. Along the rear edge of the hole, cut a 2 ½" x 2 ½" hole for the hoses.
5. To make room for the heater core you will need to relocate the relays and wiring from the center part of the dash support cross member. Mount the flat 4 hole bracket provided in the kit under the bottom screw in the fuse panel and mount the 2 relays and the diagnostic harness (with the 9 volt battery plug in) to the bracket. The single dash harness relay (some models only) should be mounted under the top screw in the fuse panel. Unplug and re-route other harnesses as necessary.
6. Inside the drivers front wheel well, remove the inside plastic panel to access the back side of the radiator.



# Defrost Vent

1. The defrost vent is located in the dash area in front of the shift and parking brake levers (differential lock lever on some models). This location is critical as the hose and distribution box must fit in the space between the brackets and linkage under the dash. Cover this area of the dash with masking tape. Place the defroster grate on the tape and align the edge closest to the levers with the edge of the ledge; it needs to be close to the edge without overhanging. The end of the grate closest to the steering column should be just at the beginning of the radius going up from the ledge. Carefully mark the mounting holes on each end of the grate. Draw a center line connecting the 2 holes. The distance between the hole centers should be 6 3/8". **NOTE: To ensure the proper location of the defroster opening, complete the following: Drill a 1/8" hole at the center point (3 3/16") between the mount holes. Insert a long drill bit, rod, or wire straight down through the hole. Under the hood make sure the hole is centered between the brackets and linkage of the shift and brake. If necessary, hold the distribution box in place under the dash to check clearances.** If the position is correct, drill the (2) mount holes – 3/16".
2. Measure in 11/16" from the center of each hole and mark the centerline. Use a 7/8" hole saw or spade bit to drill through the dash on each mark. After both holes are drilled, remove the material between the holes maintaining the 7/8" width.
3. Attach the supplied short piece of 2" air duct to the distribution box and secure with a cable tie. Mount the grate (above) and box (below) to the dash using the (2) phillips oval pan head screws.



# Heater Vents

The heater vents may be located in the front kick panels or in the optional WPS-120 under dash panels. Installation procedures are the same for either location except for the hose routing. Check for proper clearance behind the under dash panels before cutting holes. **Note: If WPS-112 or WPS-132 Doors are to be installed, consult the instructions for bolt replacement or trimming before reinstallation of the kick panels.**

1. Locate the position for the outlets (a template is provided for the kick panels). Remove the kick panel or under dash panel and use a 2 1/16" hole saw to make the openings for the 2" outside diameter outlets. Push the outlet through the panel and install (1) Phillips flat head screw per vent to keep it from rotating.
2. Cut the longer piece of 2" air duct hose into 2 equal lengths. Attach one end to each outlet and secure with cable ties. Route the hoses under the dash to the center where the heater core will be installed. Secure the hose under the dash with cable ties as necessary. **Note: From the driver's side kick panel, route the hose under the small storage box. From the passenger side, route the hose over the top of the glove box. Remove the cup holder, push the hose in place and then replace the cup holder to hold the hose in place.** Reinstall the kick panels or under dash panels.



# Heater Unit

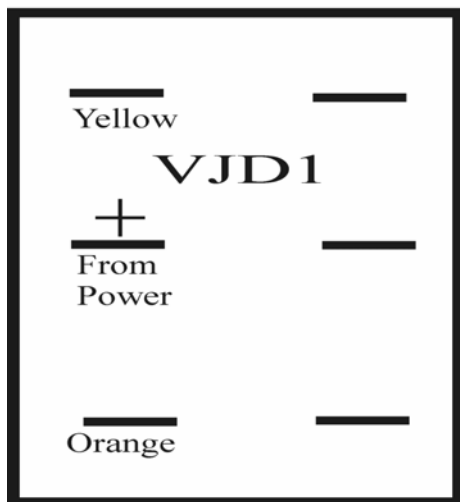
1. Place the carriage bolts through the holes in the short flange of the mounting plates and attach the plates (flange pointing in) to the heater sides. **Note: For ease of installation, connect the air duct hoses to the outlets on the back of the heater before mounting the heater unit.**
2. Position the heater close to its mounting location (below cross member – center) and attach the (3) air duct hoses to the heater box. Cut off excess hose to maximize efficiency. Use the center hole for the defroster.
3. Position the heater under the cross member with one carriage bolt on either side and use the steel straps and nylock nuts to clamp the heater to the square channel.
4. Locate the coolant hoses coming from the radiator behind the access cover removed earlier. Cut the hoses (avoid the 90° bend) and splice in the tee fittings. Attach a length of hose to each fitting and route the hose through the access hole cut in vehicle preparation (Step 4). The tee from the lower radiator hose will go to the top heater core connection and the tee from the upper radiator hose will go to the bottom heater core connection. Use a piece of spring support over the hoses to avoid kinking at sharp bends. **Attach the bottom heater core connection only!**
5. Cut a 2” piece of hose and attach to the top heater core connection. Attach the filler/bleeder to the 2” piece of hose (cap upright) and then attach the hose from the lower radiator to the filler/bleeder.
6. Tighten all hose clamps.



# Wiring

1. The blower motor will be wired for 2 speed operation – orange wire for low, yellow wire for high. The red wire (medium) coming from the blower motor should be cut off at the motor and used to run the power supply to the dash switch.
2. Determine an appropriate power and ground source. You can use the lugs on the terminal block. Run the length of red wire (positive) and black wire (ground) from the blower motor to the power source. Attach the appropriate ends to the wires but do not connect to the power source. If the power (positive) source is not fuse protected, you will have to install the in-line fuse holder in the red wire (15 amp fuse). The black wire terminates at the blower, the red wire will continue, with the orange and yellow wire, to the dash switch.
3. Select an open spot on the dash for the switch and remove the blank. Run the orange, yellow, and red wires under the dash and through the opening. Cut the wires to length (leave a little extra) and crimp a female spade connector to each wire. Connect the wires to the back of the switch as shown in the diagram.

## Back of Switch



Red from heater is Medium  
and won't be used.  
Black from heater is Ground

4. Connect the wires to the power source and check the fan for proper operation. If working correctly, place all wiring in the protective split loom plastic.
5. Press the dash switch into the opening.

# System Filling and Bleeding

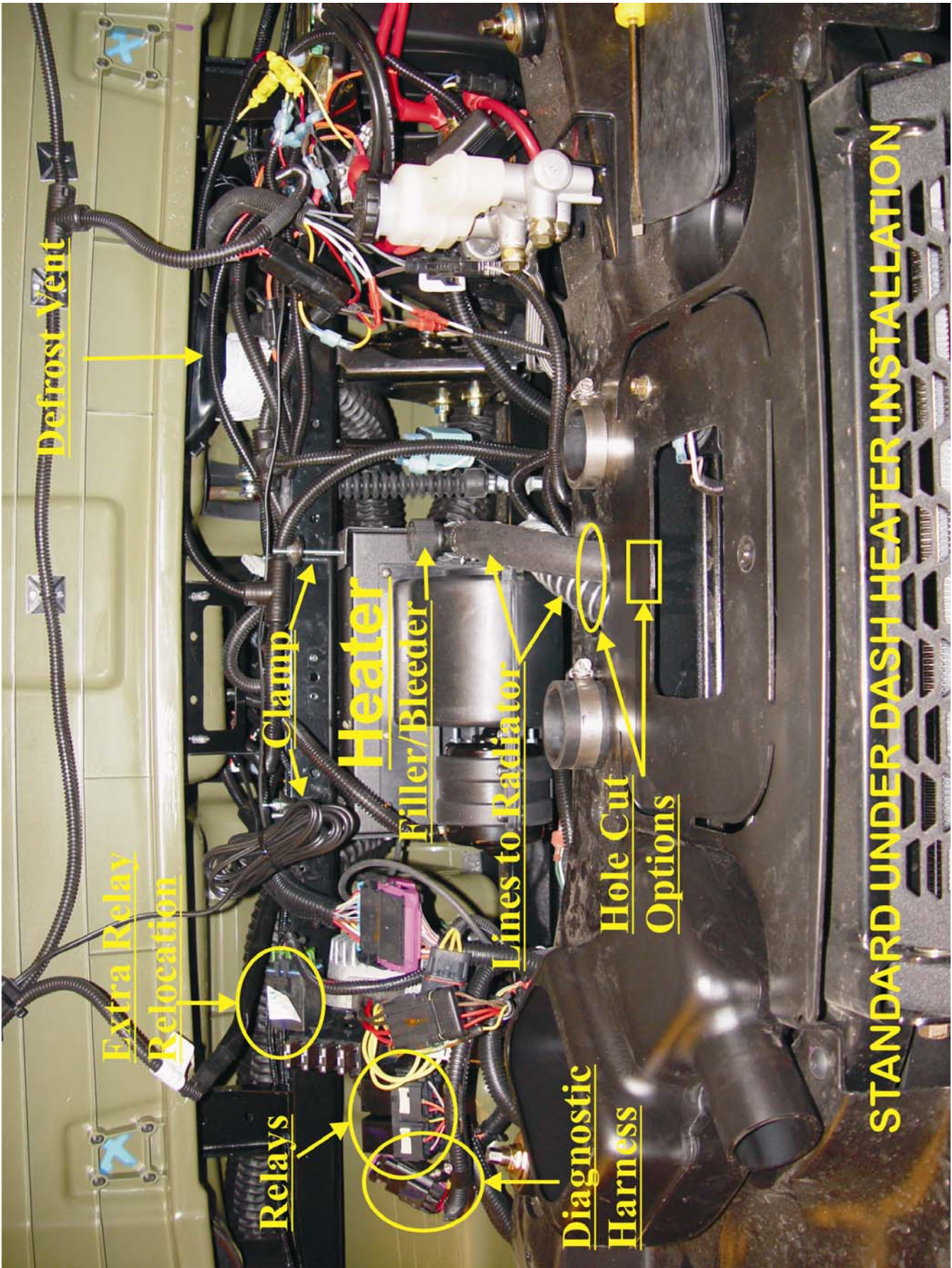
1. With all hose clamps tight and drain valves closed, remove the radiator cap and the filler/bleeder cap. Slowly fill the system with coolant through the filler/bleeder until the radiator is full. Quickly replace the radiator cap. Hold up slightly on the filler/bleeder and continue filling until the heater core and hoses are full. Pause often to allow air to exit thru the filler. Replace the filler cap.
- ➔ **Caution: Coolant level is now above the radiator cap. NEVER OPEN THE RADIATOR CAP. Fill the system only through the filler/bleeder and overflow reservoir. This information must be passed on to the customer!!!**
2. Replace the air intake filters to their original location and start and run the vehicle for 2 minutes. With engine off, open the filler/bleeder and add coolant as necessary. Wait several minutes and repeat as needed until coolant level remains full. Check the system for leaks.
3. Start and run the vehicle until the thermostat on the engine opens. A warm upper radiator hose will indicate the thermostat is open and the coolant is circulating. Operate the fan and check for warm air at the vents. If you do not have heat at the vents or in the upper radiator hose, allow the vehicle to cool and repeat steps 2 and 3.
4. Replace the wheel well access cover.

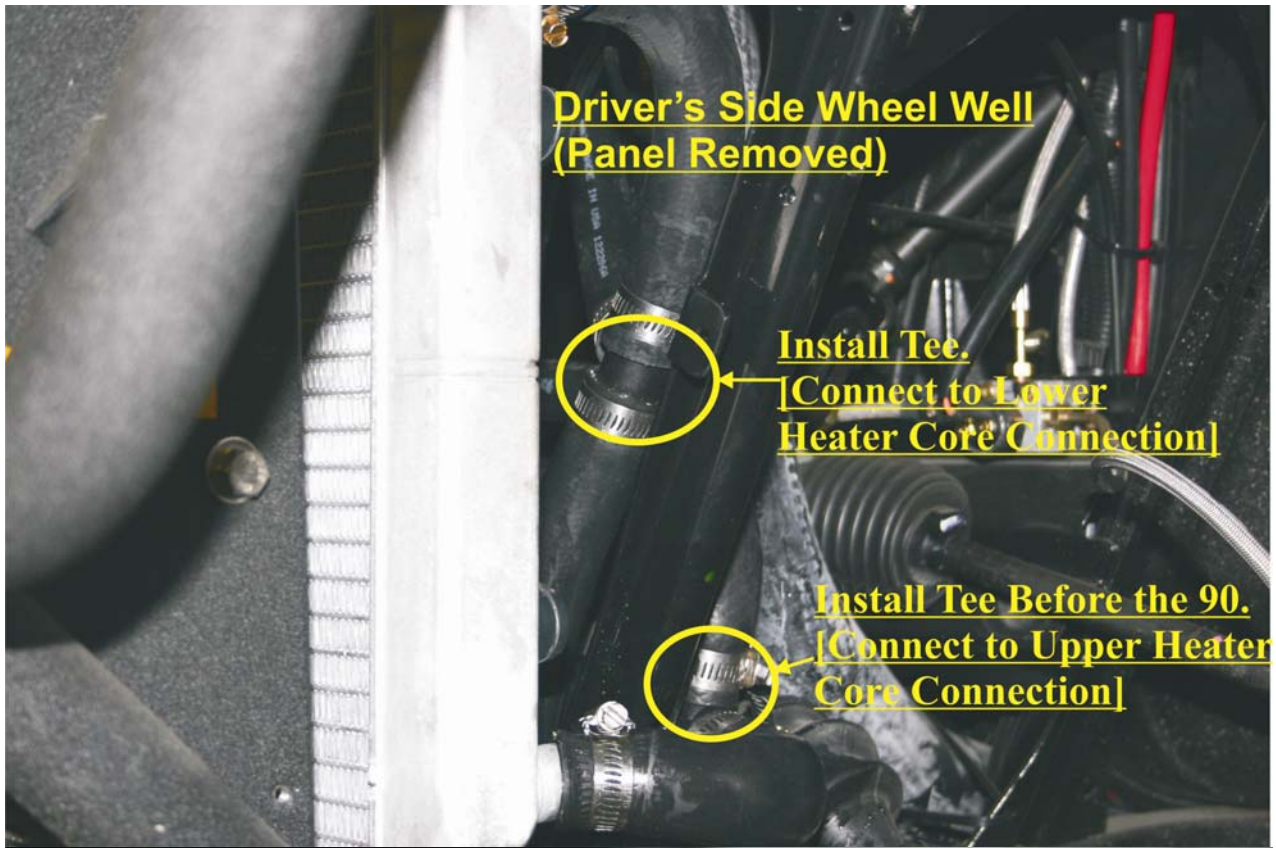


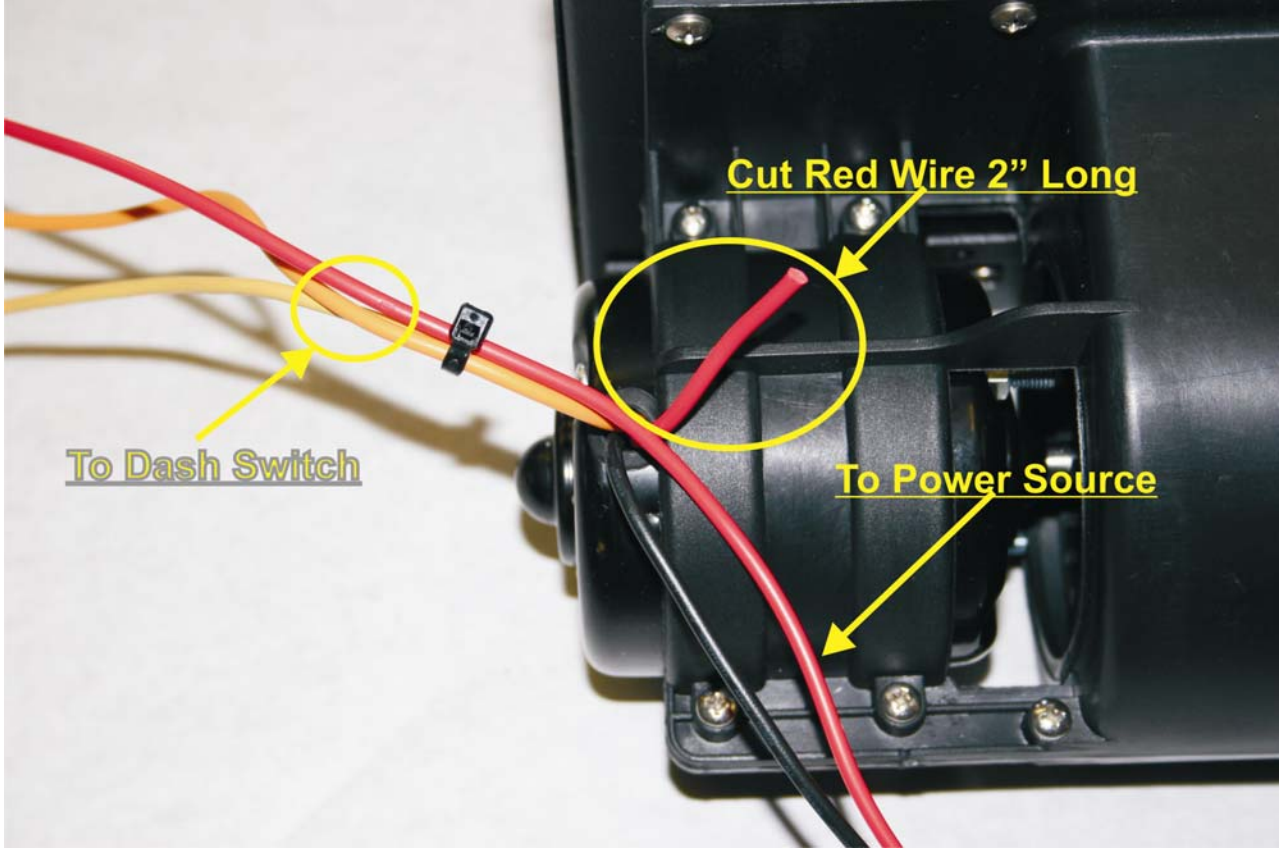
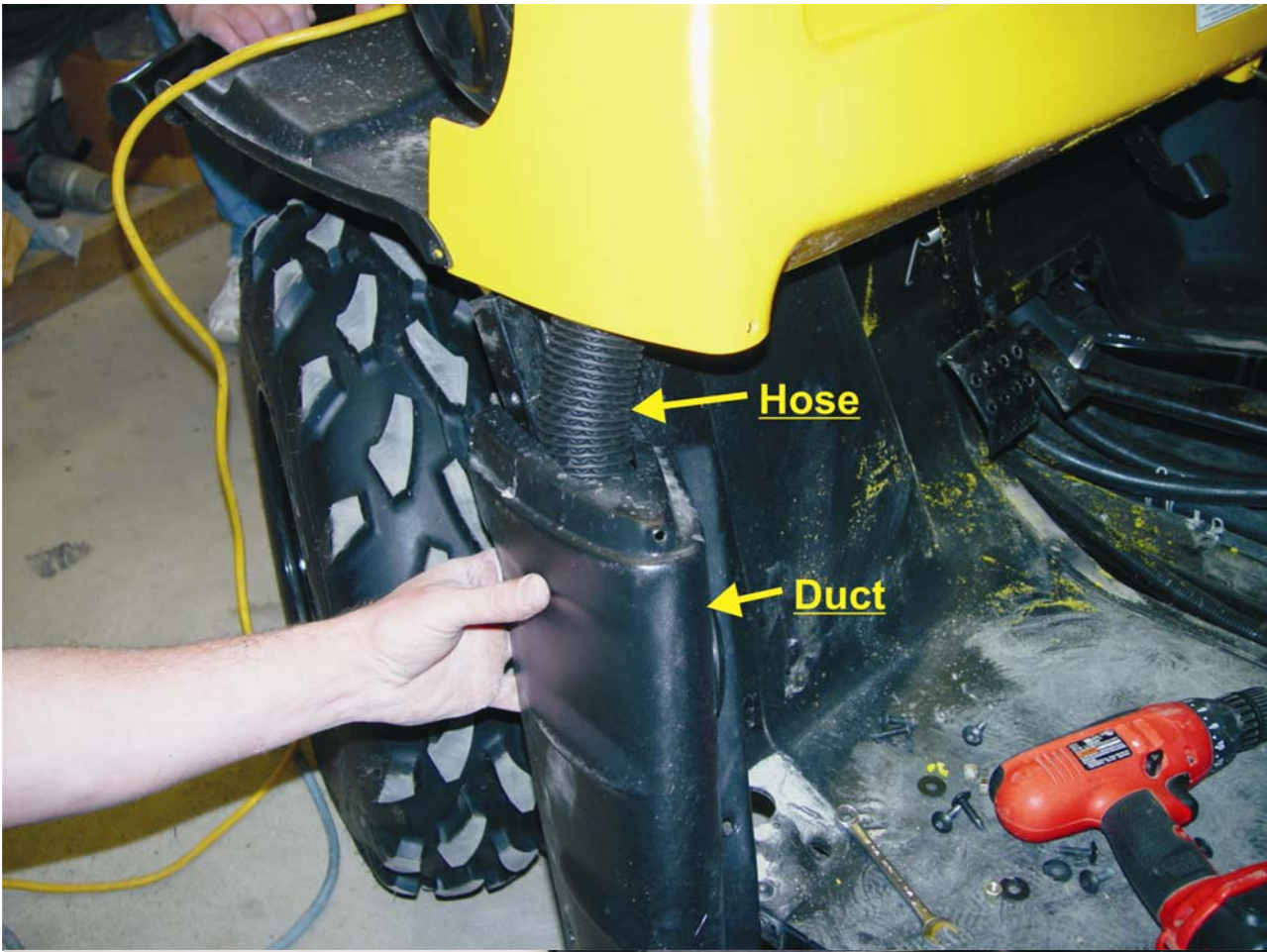
# Operation

1. 2 Speed Fan – High and Low.
2. The heater vents may be opened or closed and turned to direct air flow.
3. Check coolant level in the reservoir often and add as needed.
4. The efficiency of the heater and cooling system depends on all the air being out of the system. It is recommended that coolant level be checked often during the first few hours of operation. If need be, bleed the system again.
5. **NEVER** open the radiator cap as coolant will escape.
6. Open and check the fluid level at the filler/bleeder **ONLY** when the engine is off and cool.









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