

INSTRUCTIONS FOR REMOVING & REINSTALLING SUBURBAN PROPANE FURNACE 1973 CORTEZ

The following set of instructions was written by Bill Townsend (1973 Cortez) of Ventura, California, and would apply to other year model Cortez's which use the Suburban gas heater.

The 1973 Cortez Motorhome uses the Suburban Dyna-Trail propane heater NT-22 with other variations such as the NT-22A, NT-22CA, 22AD, 22CS, NT-30, 30A, and 30CS. All are rated at 22,000 BTU's and use the same combustion chamber. Other parts may vary in size and use.

The most significant difference is in the case and front panel. Some cases are securely fastened to the floor with phillips head wood or sheet metal screws. In other coaches, the outer case is not fastened to the floor and it is quite easy to remove the case and complete unit.

Separate the unit from the case after removal from the coach.

After taking the front panel off, check the name plate, which is located to the right of the combustion chamber, for model and serial number, before trying to remove and repair the heater.

If you have the operating and service instructions manual, read and decide what needs to be done to make the unit work. If you do not have the manual, one can be obtained from the Suburban Mfg., Co., Box 399, Dayton, Tennessee, 37321, or the Western Division of Suburban Mfg., Co., 1181 Kraemer Place, Anaheim, Calif., 92806, (714) 630-4890.

If, after studying the manual, it is determined that the heater has to be removed to correct the problem, the following steps may help in removing the heater.

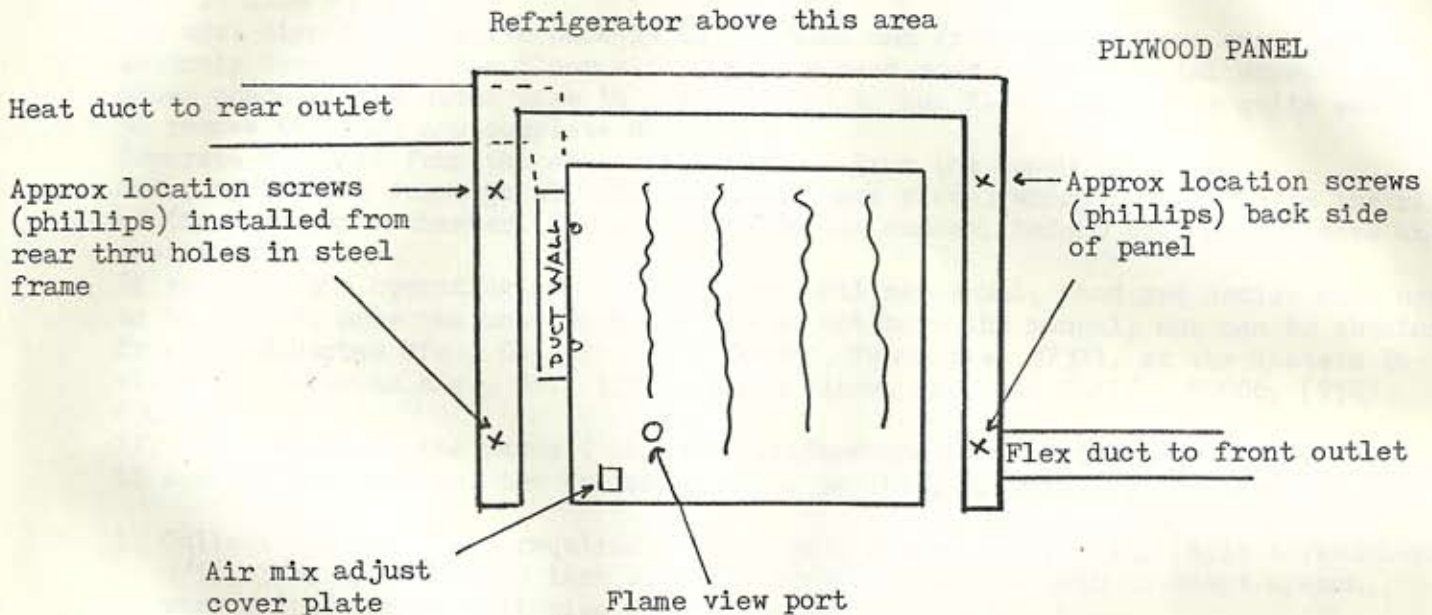
1. Collect all the tools required for the job. Common and phillips type screwdrivers, 9/16, 5/8, 3/4, and 7/8 inch open end wrenches, a #8 or #10 crescent wrench, vise grips, and a small pipe wrench.
2. Turn off propane main supply valve at the gas bottle.
3. Remove plywood door to the heater cabinet and remove drawer under cook stove.
4. With a flashlight, check to see if the small metal legs are secured to the floor on both sides of the heater case. If case is fastened to the floor, it may be easier to extract the heater combustion chamber and assembly from the case as follows.
5. Remove the 4 corner screws from the outside vent cap located on the outer wall of the coach.
6. Remove vent cap by prying off with screwdriver blade, then remove 2 more long screws that hold the inner vent cap adaptor. Remove the inner adaptor from the heater exhaust pipe and air intake tube.
7. Remove the 4" flexible heater duct located below the storage drawer that was removed in Step #3 above. It may be necessary to remove the hose clamp.
8. Remove the 3 phillips sheet metal screws from the sheet metal duct work that the 4" hose came from. Don't forget the screw in the center of the 4" collar.
9. With screws removed, carefully remove the galvanized duct work from the side of the heater case to gain better access to gas valve and supply pipe.
10. Unscrew copper gas line flare nut at the gas valve, holding a wrench on the valve and using another wrench on the flare nut to loosen. Bend copper gas line back out of the way.

11. Remove the short $\frac{1}{2}$ " gas pipe that connects the gas valve and elbow to the heater. It will be necessary to hold the union nut, at the heater end, with a $\frac{7}{8}$ " open end or crescent wrench while unscrewing the valve and elbow.
12. Remove the large round head sheet metal screw below the name plate, to the right of the combustion chamber.
13. Lock the vise grip pliers securely to one of the crimped seams of the combustion chamber near the center and carefully pull the combustion chamber and heater from the outer heater case, about a foot, or until the 4 connecting wires become accessible.
14. Before separating the wires, mark both ends of the wires with marking tape so that they may be reconnected properly. Although the wires are color coded, 2 of them are blue. Make sure you do not cross switch the blue leads. NOTE: Wires are connected by bullet connectors, commonly used in automotive wiring, and are simply pulled apart and pushed together.
15. Carefully remove the combustion chamber and heater assembly, which includes the blower and motor, from the case and place on workbench. Thoroughly clean all external surfaces with a brush and vacuum cleaner.
16. Disassemble unit as directed by the service manual, checking relays, switches, and other component values with a good multimeter to confirm good or bad conditions. An electrician or electronic technician friend could help you with this step.
17. The thermocouple is the most common trouble found with these heaters, if the pilot won't stay lit. To test the thermocouple, disconnect and remove from the heater. Apply some heat to the end of the thermocouple (end which goes in the combustion chamber) with a torch or hold over a gas burner. After applying heat for about a minute, a DC voltage of 80 to 100 millivolts should be present on the terminal ends that connect to the gas valve. NOTE: Voltage range on the multimeter should be set at 1 volt or less to measure this small voltage. Replacement thermocouples are sometimes available in heating and plumbing supply stores. Look for a Jade B-80 thermocouple or order directly from Suburban.
18. Carefully replace defective parts. NOTE: If gas valves are replaced or any fittings in the gas supply line are removed and reassembled, use a good pipe thread sealer or 2 turns of teflon thread tape. Do not use anything on the connector at the end of the thermocouple, just tighten securely.
19. Make sure you remove the main burner and blower and thoroughly clean. Also clean out the combustion chamber by turning upside down and tapping or using a vacuum cleaner or air hose. A lot of rust scale collects inside the combustion chamber.
20. Reassemble and reinstall in reverse order of steps given here. NOTE: In reinstalling the main burner in the combustion chamber, make sure the air mixture adjusting screw aligns properly with the holes (one on combustion chamber is covered by a plate) so that future adjustments, if necessary, can be made. Adjustment is not needed unless a new burner is installed or the old burner was not properly adjusted in the first place. Consult the operating and service manual for adjusting procedures. Also, when reinstalling combustion chamber and heater assembly back in case (reversing of Step #13) use extreme caution to avoid any damage. Don't forget wire hookup.

WARNING: All work must be done carefully to avoid gas leaks. Be particularly careful in replacing the gas pipe and valve back in the union in the side of the heater. I used a little Permatex #2 sealer on the union or end of pipe that goes into union nut. Make sure the gas valve handle is in the up position. If needed, turn elbow to accomplish this. This is necessary to prevent the bottom of the gas valve, with the spring, from pressing against the duct work, which could cause a gas leak. When

connecting the gas line to the elbow with the flare nut, align properly, so that the threads match and can be tightened several turns with the fingers. This will avoid cross threading and gas leakage. Before lighting, turn on propane main supply valve at the gas bottle, with heater valve off, and check for gas leaks. If there are no leaks, turn heater valve on and check for leaks again. If there are no gas leaks over the entire system, light heater and check for proper operation.

NOTE: If you have a heater that will not come out of the case, as in Step #13, chances are that it won't be secured to the floor. It may be necessary to remove the plywood panel to which the plywood door is attached. The following drawing will help in locating the screws that hold it in place.



Heat duct must be removed by loosening clamp and pushing flex hose up out of the way. Heater case may be pushed to either side to gain access to screws holding galvanized metal duct work. After all duct work is removed, remove 4 phillips head screws and remove plywood panel. After panel and duct work is removed, slide case to allow enough room to disconnect 4 wires as discribed previously in Step #14. NOTE: Some cases may have a plate on the bottom with 2 sheet metal screws that must be removed before the combustion chamber can be removed from the outer case. After this, continue with the rest of the steps.