

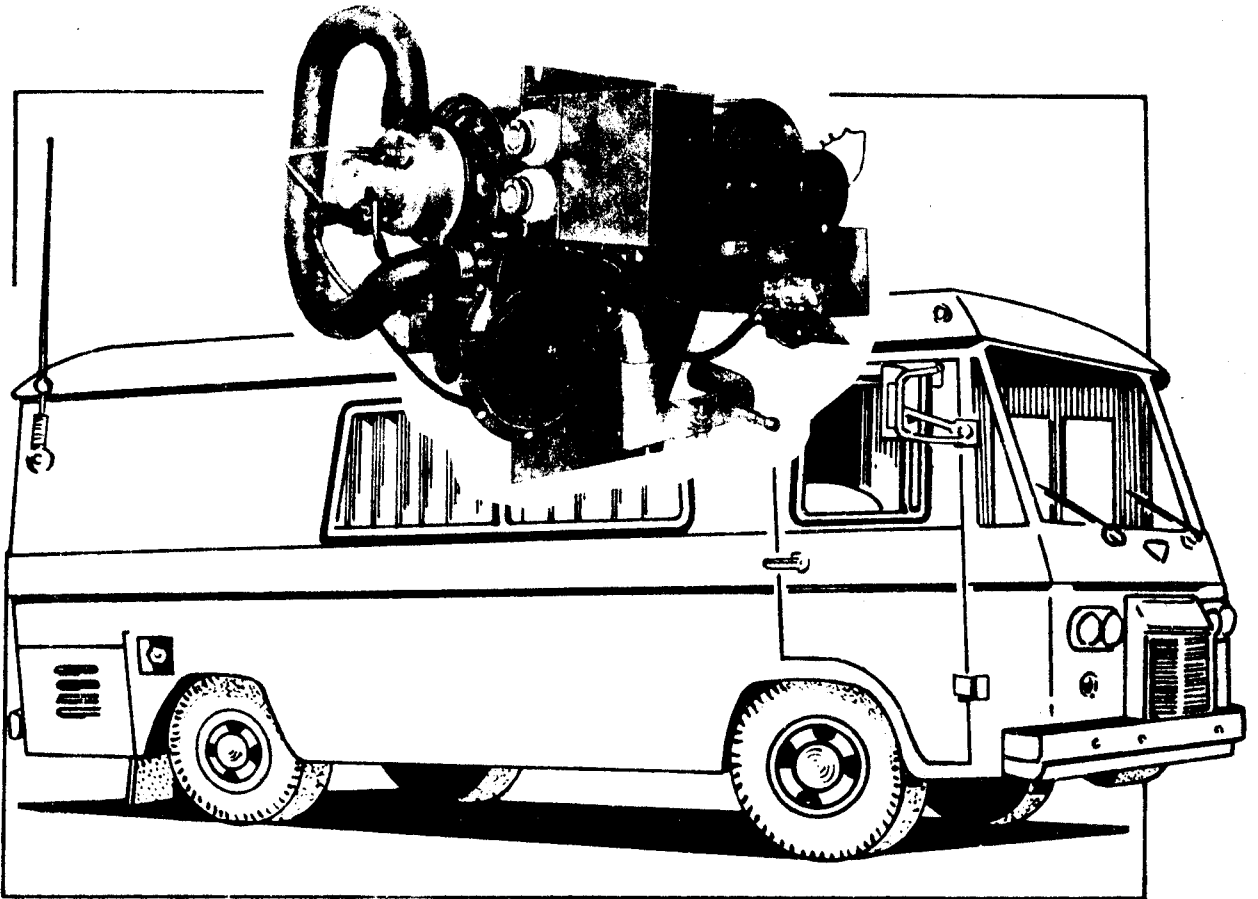
Parts From: Stark Automotive  
1975 Hollywood Ave.  
Salt Lake City, Utah 84105  
801/467-1596

← from  
32 Cortez Highway

# SERVICE MANUAL

## *South Wind*

## HEATER MODEL 8337-A



### FOR CORTEZ MOTOR HOME



*South Wind*  
DIVISION

**STEWART-WARNER CORPORATION**

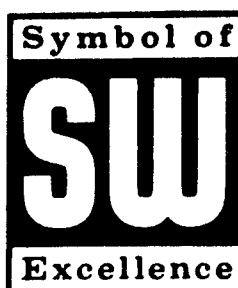
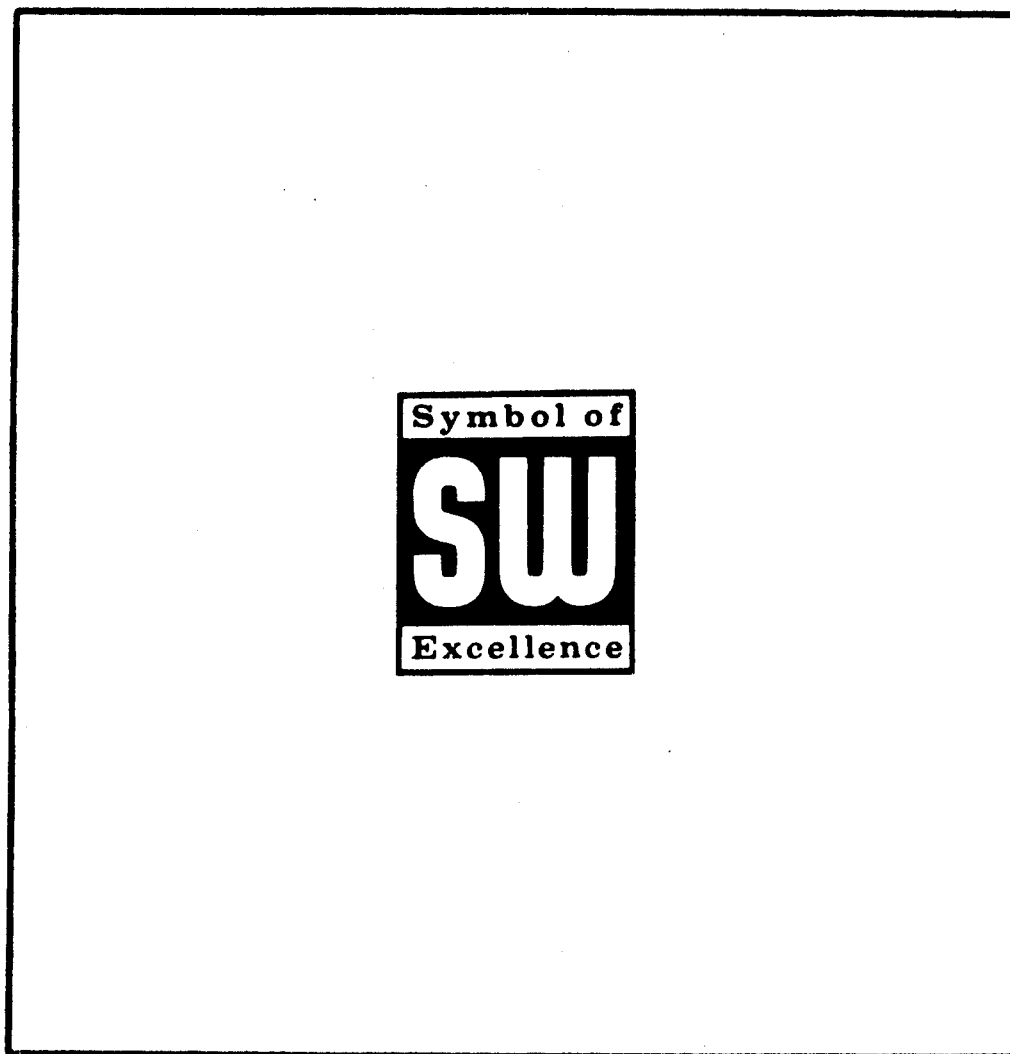
1514 Drover Street • Indianapolis - Indiana, 46207

FORM NO. 05-1205 (APRIL 1966)

Printed in U.S.A.

*3/10 gal / hr. to start up  
1/2 gal / hr. once under 6  
working*

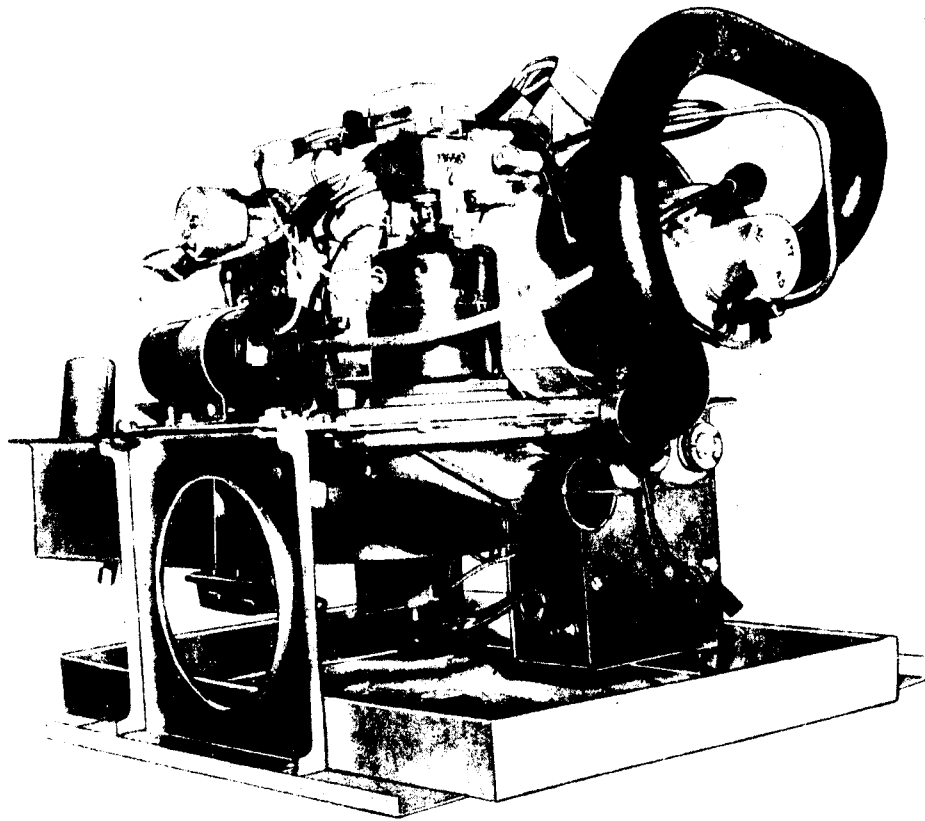
*South Wind*  
DIVISION



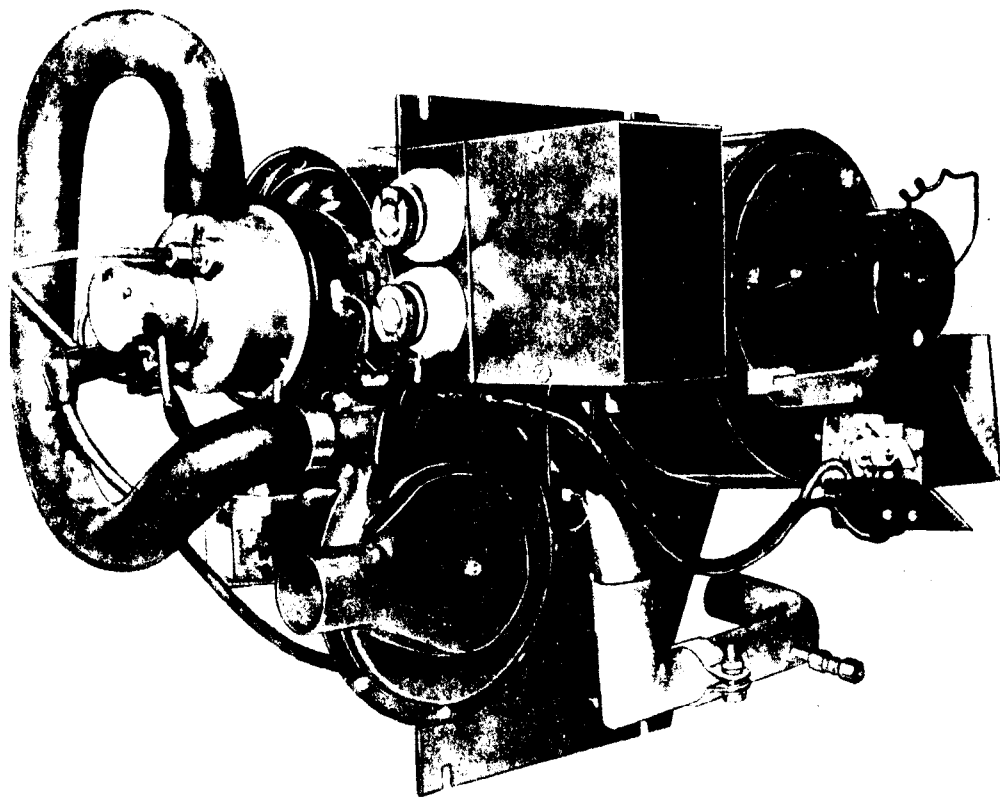
**STEWART-WARNER CORPORATION**

1514 Drover Street — Indianapolis, Indiana 46207

1158



MODEL 8337-A MOTOR HOME HEATER



# SECTION I. GENERAL DESCRIPTION

The South Wind Model 8337-A Heater is designed specifically for the Cortez Motor Home manufactured by Clark Equipment Company of Battle Creek, Michigan.

The heater bears approval of Underwriters' Laboratories (Gas & Oil Division) and conforms with requirements of the Division of Housing - State of California, for motor home use.

## PRINCIPLES OF OPERATION

A fuel pump delivers fuel (gasoline only) to a burner assembly in which it is mixed with air supplied by a combustion air blower. This mixture is ignited by a spark plug which obtains its high voltage through a system employing a coil and set of points in much the same manner as that in a car's ignition system. The ignited mixture creates hot gases which circulate through the passages of a heat exchanger and heat the exchanger walls before passing out the heater exhaust. (See Fig. 1) The heat from the exchanger is then absorbed by fresh air which is forced across the exchanger by a separate ventilating air blower. This hot fresh air is then discharged into the vehicle.

A ductstat is provided to interrupt ignition and fuel, thereby stopping combustion within the heater at a given temperature determined by the ductstat setting which is preset at the factory.

A wall thermostat is provided to cycle the complete heating system on and off.

A safety device known as an overheat switch is provided for the purpose of interrupting heater operation in the event the heater exchanger temperature becomes higher than a predetermined safe maximum. Additional safety controls such as a flame detector switch and a fuel safety valve are used to comply with requirements specified by Underwriters' Laboratories.

## SPECIFICATIONS -- MODEL 8337-A

Heat Output .....	20,000 BTU/HR
Voltage .....	12 VDC.....
Current (Amperes).....	7.5 - 8.5 AMP.
Fuel Pressure .....	7.5 - 9.5 PSIG
**Fuel Rate Gal/Hr ....	.3 .....
Combustion Air Motor...	4,000 RPM.....

\*\* This is maximum fuel rate with burner not cycling. Average Fuel Consumption is 1/3 this amount.

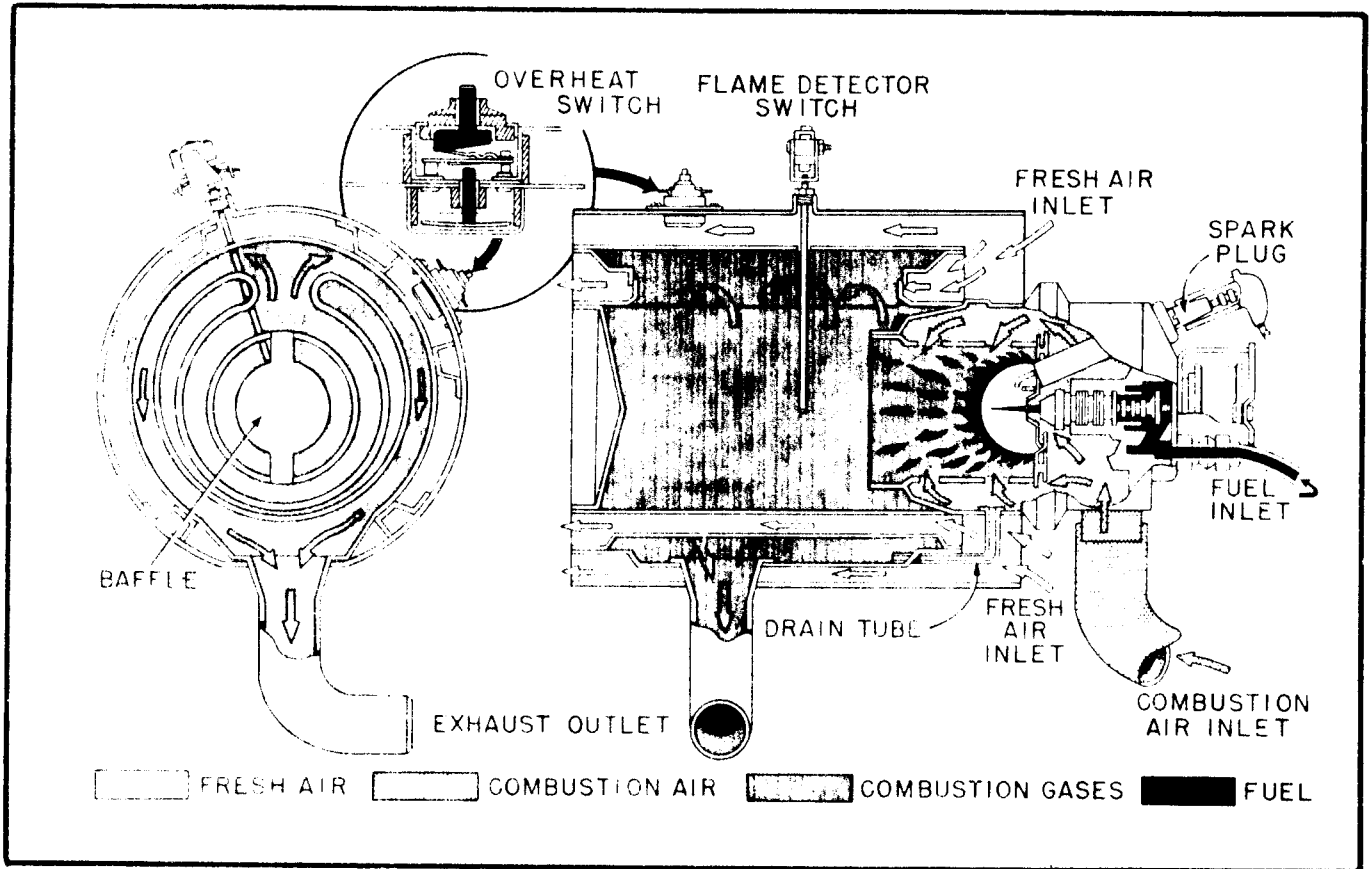


FIGURE 1 - FLOW SYSTEM

## SECTION II. HEATER COMPONENTS

### 1. Heat Exchanger and Burner Assembly

The heat exchanger is of all-welded stainless steel construction and is designed for maximum heat transfer.

The burner assembly (Fig. 14), which is secured to the exchanger by a clamp, consists of a casting into which is assembled a solenoid-operated on-off fuel valve, fuel nozzle, solenoid coil, mixer assembly, spark plug, and other components necessary for efficient burner operation.

The spring-loaded fuel valve is controlled by the solenoid coil which, in turn is controlled by the ductstat and overheat switch depending upon the circumstances. (See wiring diagram.) When the wall thermostat is calling for heat, the fuel solenoid coil is energized through the ductstat and overheat switch, and the resultant magnetic field lifts the spring-loaded valve from the valve seat. This allows fuel to flow to the nozzle which introduces fuel into the mixer assembly in a fixed conical spray.

Air to mix with the fuel is delivered by the combustion air blower which will be discussed later. In order to enter the mixer, the combustion air must pass through the louver plate of the mixer and then through the small holes in the side of the mixer. The louvers and holes are of a predetermined size to admit the correct quantity of air and should not be altered without specific instructions.

The fuel-air mixture is ignited by a spark plug having a gap of .085. The plug has only one electrode and the ground electrode is welded to the mixer assembly.

### 2. Combustion Air Blower Assembly

The combustion air blower (Figs. 13 & 15) provides the correct amount of air to mix with the fuel to maintain a balanced fuel-air ratio. A duct is used to deliver combustion air to the burner assembly. Motor speed is 4000 RPM.

### 3. Ventilating Air Blower Assembly

The ventilating air blower (Figs. 13 & 16) is required for the purpose of supplying air across the heat exchanger to remove heat resulting from combustion within the exchanger. This heated air is then delivered to the space to be heated.

### 4. Heater Fuel Pump

Each heater is equipped with a fuel pump which is driven by the combustion air motor. This is accomplished by a coupling network consisting of a metal connector on the extended shafts of the motor and pump with a rubber coupling between the connectors. The fuel pump, which is designed to deliver fuel at a pressure of 7.5 to 9.5 PSI, is a spring-loaded diaphragm type with fixed internal pressure regulation. (See Figs. 2 & 15.)

### 5. Ignition Coil, Breaker Points and Cam

These components, in combination with the spark plug described in Paragraph 1, result in an ignition system very similar to that used

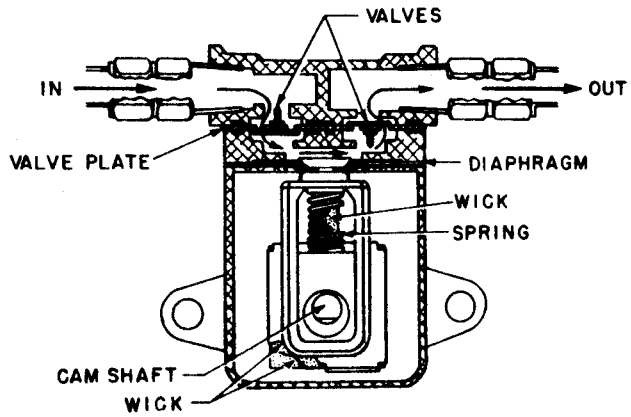


FIGURE 2 - HEATER FUEL PUMP SECTIONAL VIEW

in an automobile. The coil resembles a standard automotive coil and supplies the high voltage (Approx. 8,000 Volts) required for the spark plug. The breaker points assembly consists of a set of points and a condenser installed on a base assembly (Figs. 3 and 15). The assembly

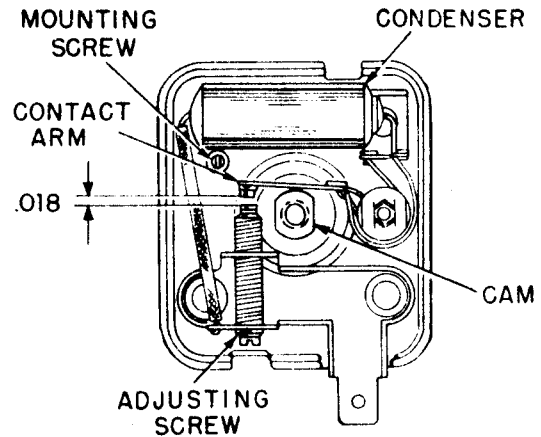


FIGURE 3 - BREAKER POINTS

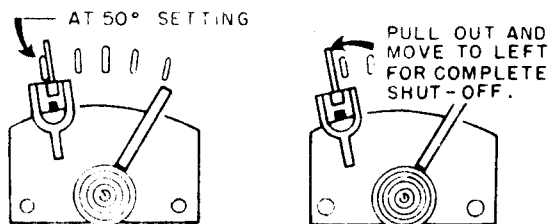
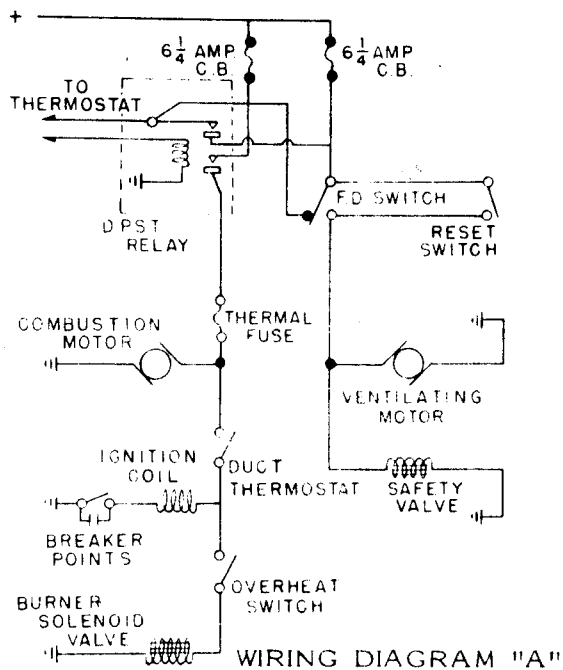
is installed on the fuel pump housing. A two-lobed cam which is threaded (left-hand threads) on the extended shaft of the fuel pump rotates with the shaft and actuates the points thereby producing the necessary interruption of current flow in the primary winding of the ignition coil. The breaker points gap is .018.

### 6. Thermostat (Wall Type)

All heater circuits are controlled by this thermostat which actuates a relay through which all power for the heater must pass. When the thermostat is calling for heat, the relay is energized and power is supplied to the heater. (See Wiring Diagram "A" on page 3.)

The thermostat is calibrated and marked with a range of 50°F. to 90°F. On-Off position is also incorporated in the thermostat. To place the thermostat on "OFF" move the control lever to the left, pull out slightly, and move to the left as far as it will go. This will prevent heater operation under all circumstances. (see page 3)

As with a home furnace thermostat, it will open and close in response to temperature of



**"OFF" - POSITION OF THERMOSTAT**

surrounding air and will cycle the heater on and off.

**7. Overheat Switch**

The overheat switch is connected electrically in series with the fuel solenoid coil (see wiring diagrams) and will shut off the fuel if the air temperature at the location of the overheat switch is higher than a predetermined safe maximum. The switch (Fig. 1) contains a bimetal disc which will have enough deflection at a given temperature (approximately 205°F.) to open a set of contacts thereby breaking the circuit to the fuel solenoid coil. Should this happen the switch has to be manually reset before heater will operate. Push down on the reset button to close the contacts.

**8. Ductstat (On Heater)**

A ductstat (See Figs. 6 & 13) is located on the heater assembly and is set at 170°F.). This ductstat controls only the fuel and ignition circuits (See wiring diagrams.), and is used to control the temperature of the air discharging from the heater. If a lower duct temperature is desired loosen the set screw and move control linkage swivel further out on the wire.

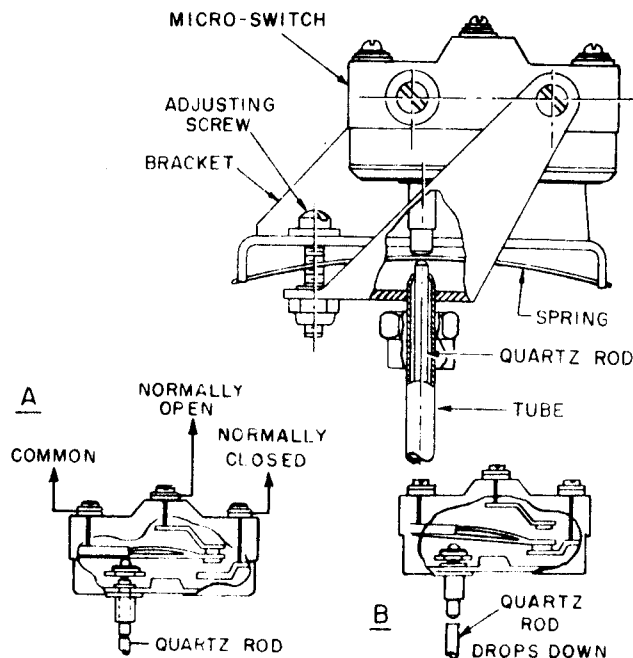
**9. Heater Relay**

The relay was referred to in Item 6 above and is actuated by the wall thermostat. The relay is used to provide a simple means of obtaining electrical power for the heater as dictated by the action of the thermostat. See wiring diagram.

**10. Flame Detector Switch & Fuel Safety Valve**

The flame detector switch and fuel safety valve

(Figs. 4 & 5) prevent fuel from entering the burner if an ignition failure occurs.



**FIGURE 4 - FLAME DETECTOR SWITCH**

**A. Start.**

When the heater is first started current flows through the common and normally open contacts of the micro switch. In about 15 seconds after combustion is established in the heat exchanger the steel tube will expand causing the quartz rod to drop down releasing tension on the micro switch button and the contacts transfer to the normally closed terminal completing a circuit to the safety valve and the ventilating air blower.

**B. Purge.**

When the wall thermostat opens, combustion in heat exchanger stops immediately. However, the ventilating air blower continues to operate to cool the heat exchanger. The steel tube on the flame detector switch will contract forcing the quartz rod up against micro switch button transferring the contacts back to the normally open terminal cutting off the current to the ventilating air blower and safety valve. All components of the heater are now de-energized.

The safety valve consists of two cup shaped castings separated by a flexible diaphragm. An integral solenoid valve connects the cavities on each side of the diaphragm. A light spring moves the diaphragm to the end of one of the cavities when the pressure on each side of the diaphragm is equal.

The flame detector switch consists of a closed end steel tube containing a quartz rod. A bracket supporting a microswitch is fastened to the tube. A spring keeps the quartz rod under compression and also provides a flat surface for the tip of the microswitch. When heated the steel tube has a high degree of expansion whereas the quartz rod has practically no expansion. The relative motion between these two is therefore used to sense flame temperature and actuate the microswitch. When heated the flame detector switch completes the circuit to the solenoid on the safety valve

and the ventilating air motor.

The initial supply of fuel for starting is supplied by the safety valve which accumulates fuel in a reservoir section during previous operation of the heater. Fuel pressure on the inlet side of the diaphragm forces the fuel from the reservoir side into the burner. If the heater fails to ignite, only the fuel in the reservoir section enters the burner because the flame detector switch did not transfer to energize the solenoid of the safety valve.

When a flame detector switch and safety valve are used with a heater, a safety valve reset switch is also included. After first installing a heater, or perhaps after maintenance, it is necessary to depress the spring-loaded reset switch (with heater switch on) and release it approximately 10 seconds after the heater ignites. This is required for priming the safety valve. The valve is self-priming during normal operation.

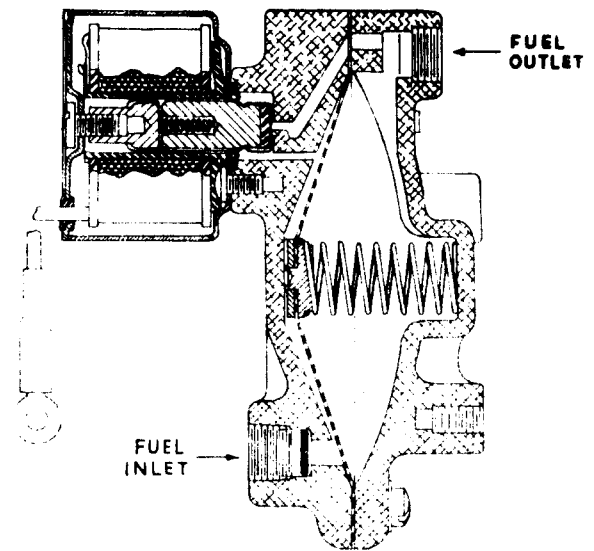


FIGURE 5 - SECTIONAL VIEW OF FUEL SAFETY VALVE

## SECTION III.

### SERVICE AND REPAIRS

This section consists of a Trouble Shooting Chart and other information to assist the service man in locating the cause of malfunction in a defective heating system. Basically, four things are required for correct heater operation. These are: FUEL, COMBUSTION AIR, IGNITION and VENTILATING AIR. The most obvious causes of malfunction should be investigated before disassembling major assemblies. Before conceding that the heater is defective, make certain the customer understands how to operate the heater. Then operate the heater to determine if the complaint is justified before proceeding with inspection.

#### 1. Heat Exchanger and Burner Assembly

The heat exchanger should last for several years. However, if a complaint of exhaust fumes arises and inspection of the exchanger reveals leakage, it should be replaced. Leaks will be indicated by red, yellow, and orange deposits surrounding the leak or a hole caused by a "burn-through".

The burner assembly is not a service part and should be repaired by replacing the defective parts only. If the burner assembly is removed for service, a thorough inspection prior to disassembly can sometimes reveal the cause of malfunction. The nozzle and inside of the mixer will normally be coated with a medium layer of black carbon, and the nozzle should have a small gray opening at the orifice. The outer end of the mixer will usually be burned to a gray or reddish color and some scaling or loose particles may be present. These should not be considered as defects. Indications of improper operation are uneven build-up of black, sooty carbon or an excessively burned or eroded spot on the mixer. All air holes in the mixer must be open to allow entry of combustion air to mix

with the fuel. Also check for evidence of fuel leakage around the fuel inlet fitting and between the solenoid coil cup and burner casting. In a complaint of popping or backfiring, check the fuel valve for leakage by applying fuel (under pressure) to the burner with the solenoid coil de-energized. If the valve does not seat properly on the valve seat because of dirt or other foreign matter or a missing valve spring, fuel will enter the burner at all times regardless of thermostat setting. This condition is usually indicated by excessive black smoke from the exhaust when the heater is first turned on with gradual clearing of the smoke as the heater continues to operate. However, when the heater cycles off and then on again, pop or backfire can and usually does occur. In this instance, Part No. 736009, Burner Service Kit, which contains gaskets, valve, valve seat, and other parts assembled in the burner casting, should be used after disassembly of the burner.

A leak between the nozzle and burner casting can also result in improper combustion and occasional popping. First determine if a leak is present at this point by holding your thumb over the nozzle orifice with the solenoid coil energized and fuel applied to the burner under pressure. If a leak is present, check to see if the nozzle is tight. If it is tight, remove it and check the nozzle seating surface of the burner casting for scoring or unevenness. If the surface is damaged, the burner casting should be replaced.

The fuel solenoid coil seldom fails. The coil can be checked by holding a screwdriver blade near the coil cover screw while energizing and de-energizing the coil. A good coil will attract the blade when the coil is energized. A magnetized screwdriver should not be used for this

## TROUBLE SHOOTING CHART

<div style="text-align: center;">●</div> <b>POSSIBLE CAUSE</b>	<b>COMPLAINT</b>	Ventilating Air..... Blower Runs..... Continuously.....	Heater Inoperative; .. Combustion Air..... Blower Inoperative ..	Heater Inoperative; .. Combustion Air..... Blower Operates .....	Heater Operates;..... No Warm Air .....Delivered .....	Popping or Back- firing When Heater Cycles.....	Excessive Exhaust Smoke.....	Gasoline and / or Exhaust Odors in Car .....	Intermittent Operation; Heat Too Low .....
Burned out fuse .....		.....	..X..	.....	.....	.....	.....	.....	.....
Loose or defective wiring .		.....	..X..	.....	.....	..X..	.....	.....	.....
Incorrect wiring .....	..X..	..X..	.....	.....	..X..	..X..	.....	.....	.....
Low voltage.....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Kinked or restricted fuel lines	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Defective fuel pump .....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Broken pump coupling.....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Defective pump check valves	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Air lock in fuel line.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Open fuel solenoid coil ....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fuel valve sticking on seat ..	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clogged nozzle .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Defective overheat switch...	.....	.....	.....	.....	.....	.....	.....	.....	.....
Defective Ductstat.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leaking Fuel Valve .....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Incorrect spray from nozzle.	.....	.....	.....	.....	.....	..X..	.....	.....	.....
High fuel pressure.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Incorrect fuel nozzle .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leaking fuel lines.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leak at coil cup.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leak between nozzle & casting	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Leaking heat exchanger ...	.....	.....	.....	.....	.....	.....	.....	.....	.....
Loose burner clamp .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Slow combustion air motor..	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Combustion air motor not grounded.....	.....	.....	..X..	.....	.....	..X..	.....	.....	.....
Damaged or disconnected Combustion air duct....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Restricted exhaust .....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Pitted breaker points.....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Poor condenser solder joint (at breaker points) ....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Worn points cam.....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Incorrect points gap.....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Damaged spark plug .....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Incorrect spark gap.....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Defective ignition coil.....	.....	.....	.....	.....	.....	..X..	.....	.....	.....
Open flame detector switch..	.....	.....	.....	.....	.....	.....	.....	.....	.....
Open safety valve coil.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Defective relay .....	.....	.....	..X..	.....	.....	..X..	.....	.....	.....
Defective control switch ...	.....	.....	..X..	.....	.....	..X..	.....	.....	.....
Defective wall thermostat ..	.....	.....	..X..	.....	.....	.....	.....	.....	.....
Damaged or restricted air duct	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ventilating air motor defective	.....	.....	.....	.....	.....	.....	.....	.....	.....
Incorrect installation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Incorrect customer operation	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leak at vehicle tank or engine	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quartz rod broken.....	..X..	..X..	.....	.....	.....	.....	.....	.....	.....
Defective F. D. switch ...	..X..	.....	.....	.....	.....	.....	.....	.....	.....

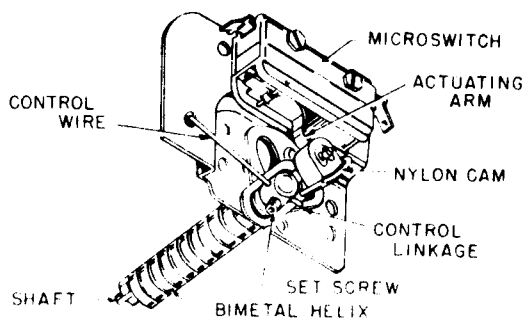


FIGURE 6 - HEATER DUCTSTAT

test. Another quick method of checking is by listening for a click as the coil is energized. The click is the valve being attracted to the bottom of the coil cup.

Many fuel nozzles are replaced in a routine manner when the real difficulty lies elsewhere. The nozzle should emit an even conical-shaped spray and should not be directed to one side. The nozzle may be checked by supplying fuel under pressure to the burner with the solenoid coil energized and the spark plug cable and combustion air duct if disconnected. It may be necessary to supply a separate length of fuel line in order to prevent fuel from being sprayed on the vehicle or the test can be conducted at a bench. A slight dribbling of fuel may be noted when the solenoid coil is de-energized. This is permissible; however, continuous flow indicates a leaking valve which should be corrected. Never attempt to remove the screen in the nozzle nor clean the nozzle orifice with a sharp instrument. The best method of cleaning the face of the nozzle is by rubbing your thumb over the face while fuel is being emitted under pressure.

The spark plug is another item which is replaced quite often without cause. The plug housing protruding into the mixer will normally be coated with a medium layer of carbon. As previously explained, the ground electrode is welded to the mixer. Therefore, adjustment of the .085 gap is made by moving only the ground with the spark plug electrode located in the center of the plug housing. It is very important that the ground electrode be positioned correctly with respect to the nozzle orifice and Service Tool No. ST-890330 (Fig. 8) should be used. The ground electrode should lie flat against the shoulder of the gauge (Fig. 7). Replacement

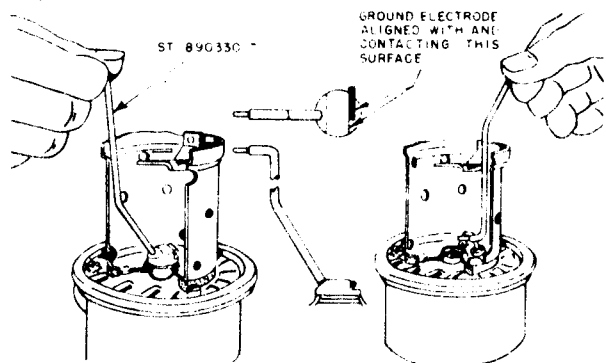


FIGURE 7 - CHECK PLUG ALIGNMENT AND GAP

of the plug should be required only when it is broken or the electrode is burned excessively. Before reinstalling the burner assembly, check for an arc at the gap. During the test, the fuel solenoid leads should be disconnected, the burner assembly grounded, the heater switch on, and the thermostat on high.

## 2. Combustion Air Blower Assembly

Combustion air is taken from outside the vehicle. Therefore, in an instance of excessive exhaust smoke with insufficient combustion air suspected, inspect all combustion air ducts for restrictions caused by kinking, obstructions, or damage. Motor speed should be approximately 4000 RPM. Check to see that the motor is grounded and that sufficient voltage is available at the motor. Minimum voltage at the motor should be approximately 11 volts. If voltage is lower than this and heater is unsatisfactory, check all wiring connections, vehicle battery, vehicle charging circuit, and heater relay as outlined in Paragraph 9 of this section.

## 3. Ventilating Air Blower Assembly

A complaint of insufficient or no heat with the heater operating can be due to a defective ventilating air motor, wiring, flame detector switch or restricted or loose duct.

## 4. Fuel Pump

Fuel pump pressure should be 7.5 to 9.5 PSI with the heater operating. A slight rise in pressure will be noted when the heater cycles off. Since the fuel pump is driven by the combustion air motor, make sure the motor is operating during a pressure check. If the coupling or one of the metal connectors which serve as the coupling network between the shafts of the pump and motor is broken, Part No. 735405, Pump Coupling, should be used for service. The package contains two connectors, one coupling, and two flat washers. It is very important that the washers be installed behind the connectors to prevent the connectors from overriding the threads on the shafts. If there is no pressure or pressure is intermittent, it is very possible that the pump check valves are defective. The valves are installed in a brass plate beneath the pump top casting and are serviced by Part No. 735736, Fuel Pump Valve Kit, containing the valves installed in the plate and four gaskets. If the pump is defective for other reasons, it should be replaced. When installing new check valves, refer to Fig. 2 so that the valves will be installed correctly with respect to fuel flow as indicated on the pump casting marked "IN" and "OUT". The flap of the check valve should be down on the inlet side and up on the outlet side.

Whenever the top casting of the pump is removed for pump service, always make certain that the pump shaft is on the down portion of the stroke before reinstalling the top casting. This is an added precaution against high fuel pump pressure. A fuel pump with excessive pressure or binding shaft can sometimes be corrected by removing the top casting of the pump to expose the diaphragm, pressing down vigorously with the thumb (with the pump shaft on the down portion of the stroke), and reassembling without

rotating pump shaft.

The pump shaft must rotate freely as a binding pump will overload the combustion air motor and cause excessive exhaust smoke due to lack of combustion air. A pump that binds, particularly in only one part of the rotation, usually indicates an improperly seated diaphragm.

#### 5. Ignition Coil, Breaker Points, and Cam

The ignition coil resembles a standard automotive coil; however, if replacement is required, only the recommended service part should be used.

The breaker points are serviced by replacing the entire base assembly which includes the points and condenser. The adjustment of .018 is obtained by an adjusting screw which has the stationary contact on the end. When the proper gap is reached, solder the adjusting screw in place making certain that it is secure and that the condenser lead is also soldered. Do not use acid core solder since the acid will cause corrosion. Use rosin core solder only. If the adjusting screw is not soldered or a cold solder joint exists at the condenser and screw, backfiring will usually occur because of intermittent spark.

The two lobed cam has left hand threads and should be replaced if wear is noted. When adjusting points, rotate the cam so that a lobe of the cam raises the movable contact arm and adjust for .018 gap. Then rotate the cam to the other lobe and check for a gap of .012 to .021. With .018 on one lobe, .012 to .021 is permissible on the other lobe.

The coil, points, and cam can be functionally checked as follows. Remove the spark plug cable from the heater spark plug and insert a standard automotive plug gapped to approximately .085. Disconnect the fuel solenoid lead to prevent fuel from entering the burner, ground the automotive plug and place the thermostat on high heat. If all ignition parts are good, a steady spark will be noted. No spark indicates trouble in the coil, points, cam, wiring, or thermostat on heater. This check is made only if power is available to heater which indicates that wall thermostat and relay are operating.

#### 6. Thermostat (Wall Type)

The thermostat will very seldom require service, and it is serviced by replacing the entire thermostat rather than just the defective part because of possible inaccuracy of field adjustment. However, it can be inspected for poor wiring connections and dirty contacts.

#### 7. Overheat Switch

The overheat switch should have continuity through it during normal heater operation. If a defective overheat switch is suspected, it can be checked out with an ohmeter, buzzer, or test light after referring to the wiring diagram. A defective overheat switch should be replaced.

#### 8. Ductstat (On Heater)

To determine if the ductstat is defective proceed as follows: Make certain that wall thermostat is calling for heat. Combustion blower will be operating under this condition. (See wiring diagram.) Connect a test light between

the cold terminal of the Ductstat and ground. If test light glows, the Ductstat switch is closed which indicates the circuit is being completed as it should. If the light does not glow and all wiring connections are good and the ductstat linkage is clockwise as far as it will go, the Ductstat should be replaced. If a shorted Ductstat is suspected depress the metal arm of the microswitch with test light connected as above. If switch is shorted, light will continue to glow and Ductstat should be replaced.

#### 9. Heater Relay

With the wall thermostat contacts closed power should be present at the following components: Combustion motor, ductstat, overheat switch, Fuel solenoid coil, and ignition coil. This can be checked by placing a test light between ground and the terminal to be checked. Voltage can be checked across the relay by placing the test light between #6 and #2 on the terminal block. The voltage drop should not exceed .2 volt with the heater operating. Check for good wiring and fuse connections. If voltage drop is excessive, replace the relay.

#### 10. Flame Detector Switch & Fuel Safety Valve

As previously explained, the flame detector switch and safety valve are safety controls used for the purpose of preventing fuel flow to the burner in the event the heater does not start. If the heater does not continue to operate after starting, it is possible that the microswitch of the flame detector switch is defective or the switch is out of adjustment. The switch can be checked for continuity with an ohmeter, buzzer, or a test light. Loosen the two screws holding the microswitch in place. Also loosen the adjustment screw so that the button of switch is released. Then check for continuity with an ohmeter or buzzer between common terminal and "NO" (Normally Open) terminal. Continuity should not be present. Then place probes between common and "NC" (Normally Closed) terminal. Continuity should be present. Depress microswitch button and continuity will be present between common and "NO" (Normally Open) terminals. Continuity will not be present between common and "NC" (Normally Closed) terminal. If the microswitch checks out differently from above procedure, the switch is defective and the entire flame detector switch should be replaced. If adjustment only is required, loosen the adjusting screw (with the microswitch free in the bracket) until the switch clicks. Next turn the adjusting screw in until the switch clicks again; then turn the screw in an additional 1-1/4 of a turn. Hold the microswitch firmly in place and then tighten the two mounting screws. This adjustment should be made with the switch at room temperature.

If the quartz rod is broken, it should be replaced since it is the controlling part of the safety feature. The quartz rod (Part No. 486901) is a service item.

The fuel safety valve can be checked the same as any solenoid operated valve for electrical continuity of the solenoid coil and fuel flow through the valve.

## SERVICE TOOLS

Three service tools are available at nominal cost to aid in servicing South Wind Heaters. Part No. ST-890330, Spark Plug Gage, (Fig.8) is necessary for heater service and is

used not only for obtaining the correct gap of .085 but also for locating the ground electrode in the proper relationship to the fuel nozzle orifice.

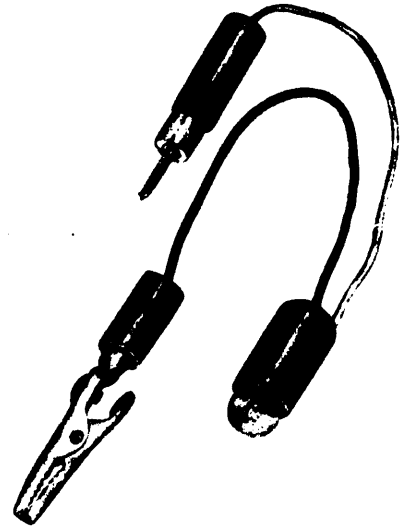
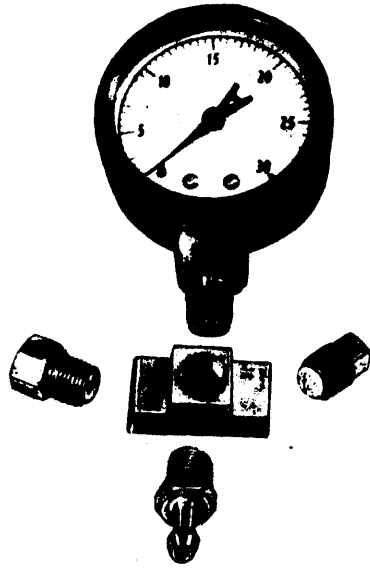


FIG. 8 - SPARK PLUG GAGE - SW No. ST-890330

FIG. 9 - FUEL PRESSURE GAGE - SW No. ST-890322

FIG. 10 - TEST LIGHT SW No. ST-890325

Part No. ST-890322, Fuel Pressure Gage, (0-30 PSI) (Fig. 9) and Part No. ST-890325, Test Light, (Fig. 10) are also available.

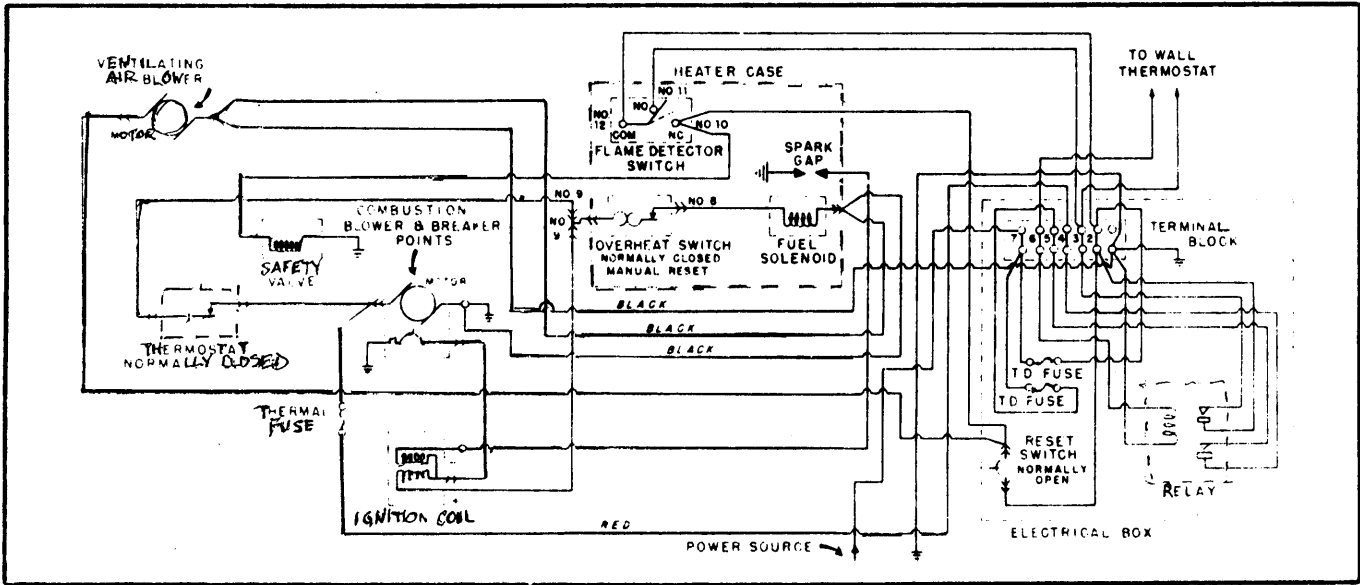


FIGURE 11 - WIRING DIAGRAM

## SECTION IV. PARTS CATALOG

This section contains listing of all parts, assemblies, and service tools used with heaters described in this manual. The parts list shows all parts whether they are service parts or not.

Therefore, it is important that the "Remarks" column of the parts list be consulted before ordering the part since another part may be used for service. The reason for this is to minimize, as much as possible, the inventory of service

parts. Some parts listed are assemblies which are not service parts and, therefore, should be serviced by replacing the defective part only. An example is the 737191-1 Blower Assembly which is serviced by replacing only the defective part of the assembly. Some items are also con-

tained in kits and the "Remarks" column will indicate which kit is to be used. An example is 735413 Valve, available only in 736009. In summary, only the parts which have a price indicated on the Service Parts List are available as service parts.

PART NO.	DESCRIPTION	REMARKS
14534	Washer 1/4 Flat.....	.....
18781	Screw #6 x 1/2.....	.....
76784	Nut #6 - 32.....	.....
77204	Washer.....	Also in 735405 Kit.....
79369	Lockwasher #10.....	.....
85040	Screw #6 x 1/4.....	.....
170174	Screw # 10 - 32 x 3/8.....	.....
170567	Screw 1/2 - 20 x 1/2.....	.....
474695	Screen - Inlet.....	Also in 736009 Kit.....
475130	Wheel - Combustion air blower.....	.....
476229	Washer.....	.....
476623	Nut - Compression.....	.....
476624	Sleeve - Ball.....	.....
476627	Connector, Male.....	.....
476339	Spring - Valve.....	Also in 736009 Kit.....
484140	Strip - Terminal.....	.....
484141	Strip - Marker.....	.....
485153	Elbow 90° Male 3/16 T to 1/8 P.....	.....
486901	Rod - Quartz.....	.....

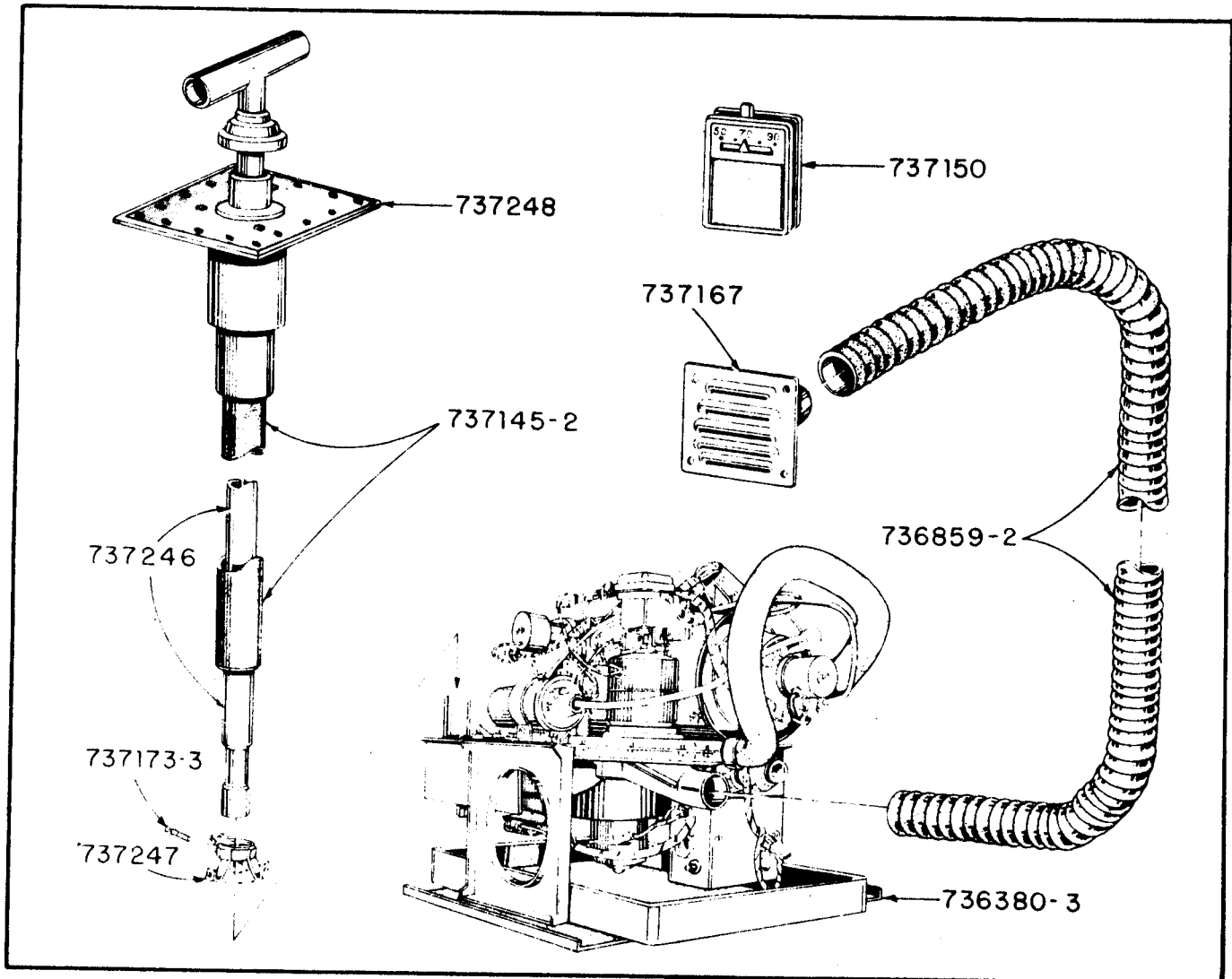


FIGURE 12 - KIT MODEL 8337-A



PART NO.	DESCRIPTION	REMARKS
487359	Screw 1/4 - 20 x 1.....	.....
488066	Screw #6 - 32 x 5/16.....	.....
488155	Nut #6 Speed.....	.....
488290	Clamp.....	Alternate for 736740-13.....
488555	Nut #8.....	.....
488756	Nut #6 - 32.....	.....
711229	Adapter Assembly.....	.....
735045	Clamp - Burner.....	.....
735054	Gasket.....	Use 736009 Kit.....
735059	Gasket - Valve Seat.....	Use 736009 Kit.....
735061	Gasket - Burner.....	Also in 736009 Kit.....
735062-2	Spark Plug.....	.....
735063	Washer.....	.....
735100	Connector - Fuel Pump.....	Use 735405 Kit.....
735101	Coupling - Fuel Pump.....	Use 735405 Kit.....
735125	Cap - Spark Plug Retainer.....	.....
735127	Retainer - Valve Seat.....	.....
735196	Coil - Fuel Solenoid.....	Use 735481.....
735221	Screw #8 - 32 x 3/8.....	.....
735317	Disc, Sealing.....	Use 736009 Kit.....
735329	Spacer.....	Use 736009 Kit.....
735405	Kit - Fuel Pump Coupling.....	.....
735407	Screw #10 x 5/8.....	.....
735413	Valve-Fuel.....	Use 736009 Kit.....
735450	Cover - Breaker Points.....	.....
735451	Cam - Breaker Points.....	.....
735481	Coil - Fuel Solenoid.....	Used for 735196.....
735494	Cup - Coil.....	.....
735496	Cover - Coil.....	.....
735550	Clamp.....	.....
735600	Terminal - 3 Way.....	.....
735736	Fuel Pump Valve Kit.....	.....
735758-5	Coil Assembly - Ignition 12 V.....	Use 735758.....
735769	Base - Burner.....	.....
735904	Clamp.....	.....
735911	Blower Housing.....	.....
735912	Housing - Blower (Half).....	.....
735913	Spacer - Motor.....	.....
735921	Screw - #8 - 32 x 5/8.....	.....
735923	Breaker Points.....	.....
735931-4	Cable - Spark Plug.....	.....
735989	Seat - Valve.....	Use 736009 Kit.....
736005	Gasket.....	.....
736009	Kit - Burner Service.....	.....
736070-1	Screw #8 x 1/4.....	.....
736070-2	Screw #8 x 3/8.....	.....
736071-1	Screw #10 x 3/8.....	.....
736093	Nozzle - Fuel.....	.....
736122	Motor - Combustion Air.....	Alternate for 736677.....
736292	Mixer Assembly.....	.....

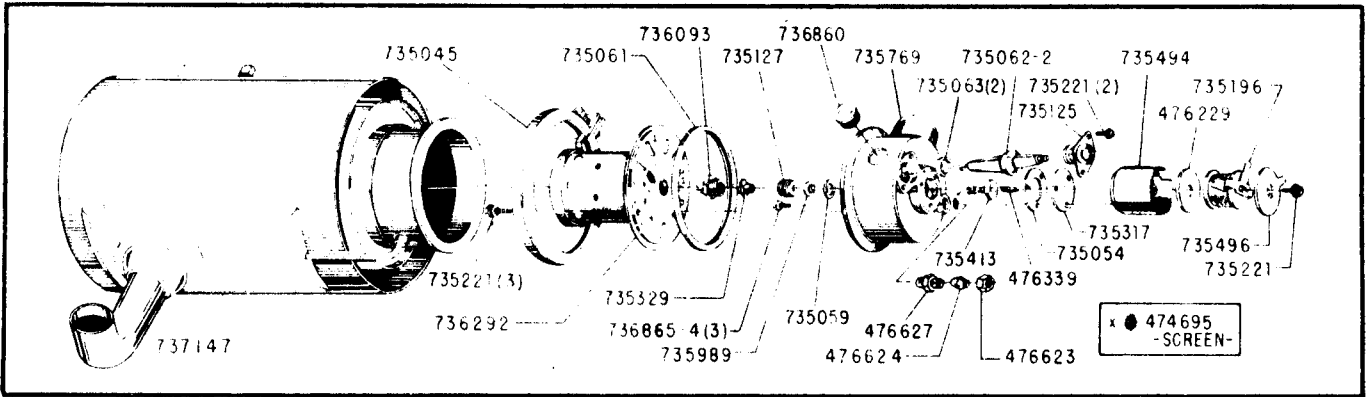


FIGURE 14 - BURNER & EXCHANGER ASSEMBLY 737142-1

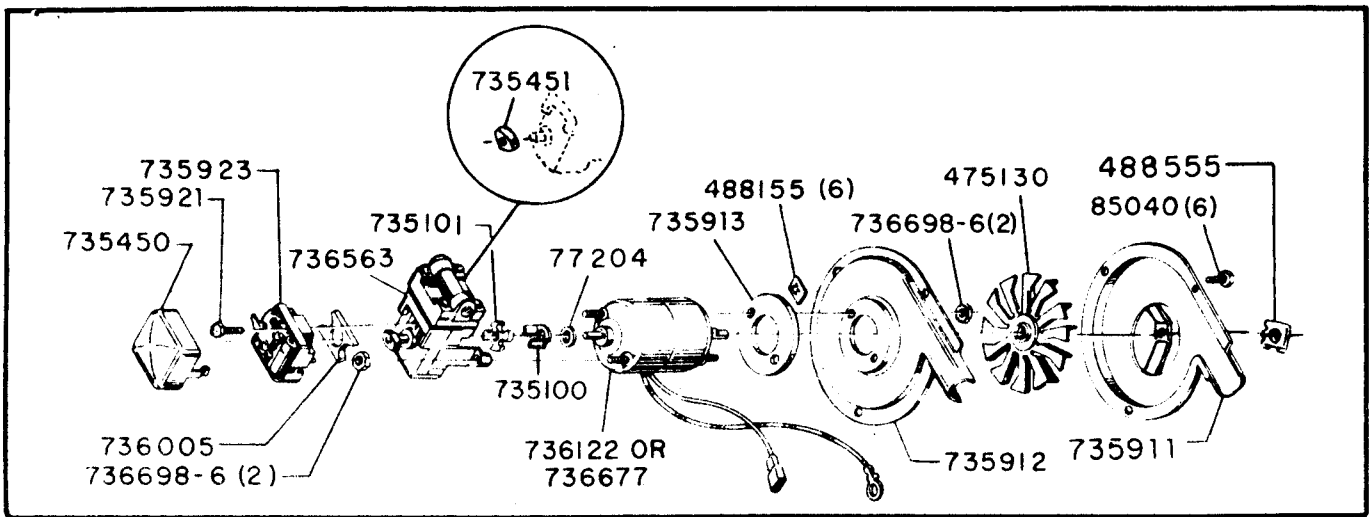


FIGURE 15 - COMBUSTION AIR BLOWER ASSEMBLY 737191-1

PART NO.	DESCRIPTION	REMARKS
736321	Motor - Ventilating Air.....	.....
736380-3	Heater Assembly.....	Ref. only; See Fig. 13.....
736563	Pump - Fuel.....	.....
736617-4	Nut 1/4 - 20.....	.....
736677	Motor - Combustion Air.....	Alternate for 736122.....
736698-6	Nut #10 - 32.....	.....
736698-7	Nut 1/4 - 20.....	.....
736740-13	Clamp.....	Alternate is 488290.....
736859-2	Duct, Combustion Air Inlet.....	.....
736860	Plug.....	.....
736865-4	Screw #6 - 32 x 5/8.....	.....
736914-2	Wheel, Vent Blower.....	.....
736919-2	Plate, Mounting.....	.....
736966	Duct - Combustion Air.....	.....
736983-3	Ventilating Blower and Mounting Plate Assy.....	Ref. only; See Fig. 16.....
737140	Union.....	.....
737141	Elbow & Drain Tube.....	.....
737142-1	Heat Exchanger & Burner.....	Ref. only; See Fig. 14.....
737145-2	Shroud.....	.....
737147	Heat Exchanger.....	.....
737148	Bracket - Safety Valve.....	.....
737149	Gasket.....	.....
737150	Thermostat - (Wall).....	.....
737151	Gasket, Insulating.....	.....
737167	Adapter, Inlet Air, Louvered.....	.....
737173-3	Screw #8 Hex Hd.....	.....
737191-1	Pump & Blower Assembly.....	Ref. only; See Fig. 15.....
737192	Switch, Overheat.....	.....
737193	Heater Housing & End Plate.....	.....
737195	Switch Assembly - Flame Detector.....	.....
737199	Support & Drip Pan - Heater.....	.....
737204	Bracket Mtg. & Blower Housing.....	.....
737205	Box, electrical.....	.....
737206	Cover - Electrical Box.....	.....
737213	Valve Assembly - Safety (12V).....	.....
737216	Locknut - Electrical.....	.....
737217	Nipple - Electrical.....	.....
737218	Switch, Reset.....	.....
737225	Tube, Fuel.....	Fuel Pump to Safety Valve.....
737228	Tube, Fuel.....	Safety Valve to Burner.....
737239	Cable.....	.....
737244	Box Assembly - Electrical.....	Ref only; See Fig. 13 (Insert).....
737246	Exhaust Stack.....	.....
737247	Clamp Assembly.....	.....
737248	Flashing Assembly - Shrouded.....	.....

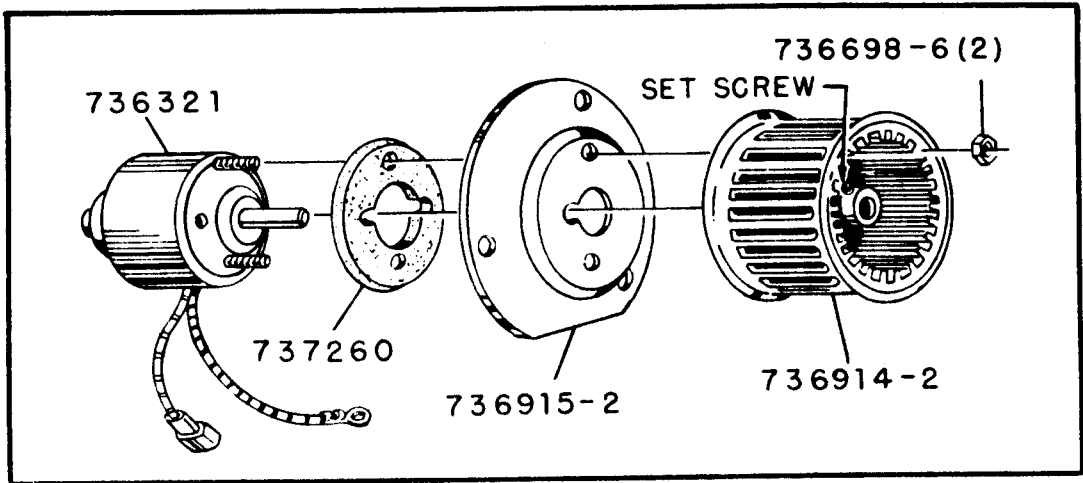


FIGURE 16 - VENTILATING AIR BLOWER ASSEMBLY 736983-3

PARTS NO.	DESCRIPTION	REMARKS
737250-2	Screw 1/4 - 14.....	.....
737251	Fuse - Time Delay 6 1/4 Amp.....	.....
737252	Adapter, Fuse.....	.....
737254-1	Receptacle.....	.....
737254-2	Receptacle.....	.....
737255	Wiring Harness.....	.....
737260	Spacer.....	.....
737261	Shield.....	.....
737268	Relay Assembly.....	.....
737271	Gasket - Ignition Coil.....	.....
737279	Ductstat Assembly.....	.....
737281-1	Cable Spark Plug.....	.....



FORM NO. 05-1205

Printed in U.S.A.



*South Wind*  
DIVISION  
**STEWART-WARNER CORPORATION**

1514 Drovers Street - Indianapolis, Indiana 46207

WSE

11/10/92

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PM35983

INSTALLATION INSTRUCTIONS

Fuel Pump Valve and Seat Plate Kit, Part No. 6735735

Fuel Pump Repair

Fuel Pump failure may be caused by defective valves or gaskets within the Fuel Pump. At every overhaul or at each valve or gasket failure, replacement of gaskets with valve and seat plate shall be accomplished using Fuel Pump Valve and Seat Plate Kit Part No. 6735736.

NOTE: The Fuel Pump could be assembled to pump from right to left or left to right. When reassembling the pump, be sure that both the valve plate and cover are positioned correctly. The valve at the inlet side of the cover (marked "in") must have the pointed side up. The outlet side valve is in reversed position.

- a. Remove the four screws securing the Fuel Pump cover to the Fuel Pump body and remove the cover. Remove and discard the valve plate and four gaskets. Carefully note their installed position to aid in re-assembly. Loosen the screw securing the bearing retainer. Remove the bearing with the bearing plug from the side of the pump opposite the exposed shaft.
b. Refer to Figure 1, Fuel Pump cross-section, and rotate the cam shaft until the flat on the shaft is facing away from the cover and toward the bottom of the pump. Refer to note above and install the new valve plate (valves installed) and four gaskets from the kit. Two gaskets are assembled in the cover and two in the diaphragm head.
c. Add 1 cc. (6-8 drops) of Windsor Lube No. L-245-X or equivalent to the wicks through the bearing opening. Replace the bearing (with plug) and secure the bearing retainer and screw.
d. Install the Fuel Pump cover with four attaching screws. Tighten the screws evenly to prevent cover warpage and leakage. Check that the grooves on the side of the pump are aligned from the cover down to the main body casting. This will ensure proper assembly.

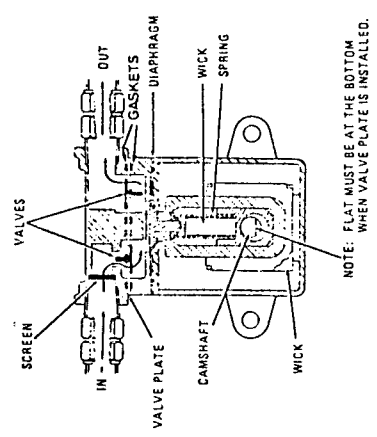


Figure 1. Cross Section of Fuel Pump showing proper valve installation.

The kit consists of the following:

Table with 3 columns: Part No., Description, Quantity. Rows include Gasket (4), Plate Assy. Valve (1), and Instruction Sheet (1).

South Wind #14

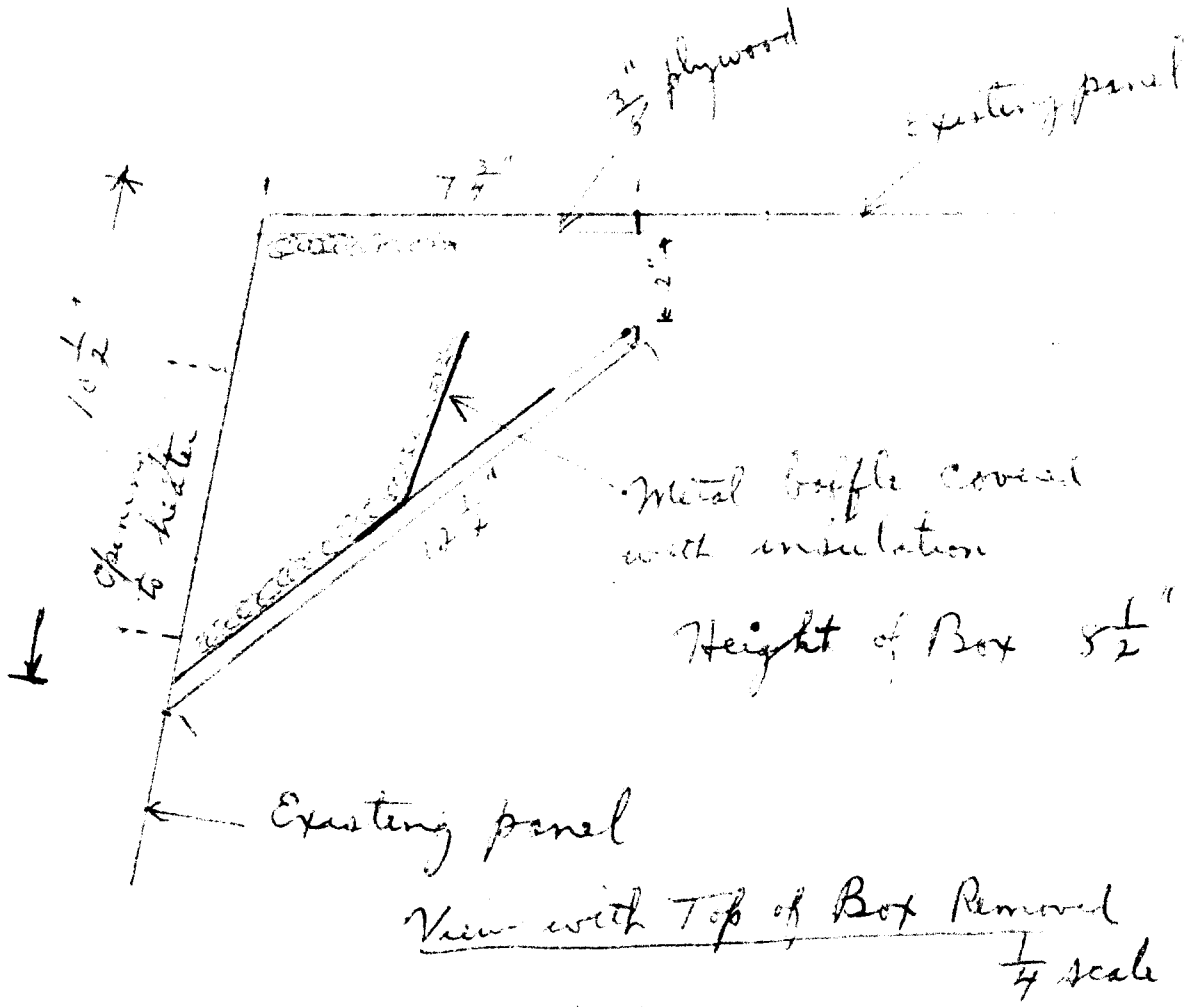
QUIETING THE SOUTHWIND HEATER

I have installed a device to reduce the noise level of the South-Wind Heater in my '66 Cortez. This is simply an open-ended box large enough at one end to cover the opening from the heater (register removed), tapering at the other end to an opening 2" wide x 8" high. A vertical baffle is installed to prevent sound from travelling in a direct path into the coach. A layer of fiberglass is cemented to the vertical surfaces to further attenuate the sound. Two pieces of 3/8" plywood are used for the front and back, with the top and bottom from 1/4" plywood. The box, held in place with wood screws, must fit snugly against the panel containing the opening to the heater.

While a pronounced reduction in noise level results from this device alone, even better results are obtained by combining it with a reduction in hot air blower speed. In my case a nichrome wire resistor was placed in series with the motor lead to reduce the voltage at the motor to 9.

A word of caution about this heater. After about 4 yrs, the exhaust elbow (Part No. 1654192) rusted out and somewhat later the heat exchanger (Part No. 896341) was replaced due to leaks caused by rust. The Parts Dept. at Kent reported that this was not uncommon. Since the pressure in the combustion chamber is higher than atmospheric, any leak will result in carbon monoxide entering the coach. In drier climates, rusting may not be a problem, but a periodic inspection would seem advisable.

Howard Swank - Wilmington, Del.



## CARE & FEEDING of the SOUTH WIND HEATER

This complicated but clever device is most modest in the use of space, and is especially appropriate for the Cortez, which is the epitome of compactness. Yet for all its bantam size it's a heavyweight when it comes to heating, and can throw out more B.T.U.'s per minute than a propane heater of three times its size. Also it has its troublous moments, and it behooves Cortezers to learn as much as possible about it. The CHIT CHAT has hoped that one of our more adaptable boys would address himself to the intricacies of this device. Some months back one of our better analytical minds, HAROLD PINCHES, got himself interested in the South Wind and was making real progress, -then he went off at a tangent and started building himself a right purty home on top of one of those scenerious hilltops in Green Valley....and, awe shucks, he done got lost in the wilderness. 'Twant quite all that bad, cause whilst mooning he did think to build a real nice home for his Cortez, so 'twant all down the drain. Anyhow, hope he gets that out of his system, and comes back and goes to work again....Nice to have him around!

Now in the meantime there's this fellow HOLLY FRANZEN, who has a yen for relays, coils, condensers, breaker points, and wiry things like that there, and he starts having trouble with his South Wind heater. Sometimes it will start and sometimes it won't. He fools around and finds that if he wiggles this or messes around with that it will start, so right in the middle of all this he ups and decides to fix the durned thing. So he goes and gets a screwdriver, a saw, axe, and stuff and starts to work.

He figures the trouble is with the relay, located underneath the power supply terminal block. You can hardly miss this block, because it is at the forward end of the device, and right behind the removable front panel, and also it has a fuse prominently located on it. He gets at the relay by bending up four metal clinching ears, allowing the block to be lifted off, which in turn discloses the relay right beneath. Sure enough, the points are badly pitted, so he dresses the points with a point file, resets them, puts everything back together, and then everything works fine. It's a grand feeling.

Good work, Holly....hope something else goes wrong with your South Wind so you can have the fun of fixing it. Then you can tell us about that too....Maybe someday we'll all get to be arm-chair South Wind experts!

## MORE INFORMATION ON THE SOUTH WIND HEATER

In the March issue of the CHIT CHAT, Page 2, this editor unwound some stuff about the South Wind, in a dithyrambic mood, mostly about HOLLY FRANZEN'S adventures in dressing the points etc.,....but I also mentioned that HAROLD PINCHES had at one time turned his analytical mind to the idiosyncrasies of the South Wind, but that this research had suffered a cerebral pause while he, Harold, stopped to build a home, incorporating therein a Cortez stall, complete with manger, overhead hay-feeding devices, and other apparatus to keep it in a contented state between times when not called upon to prance down the highway....

But I'm afraid I've somehow become unhinged along the line here; I started out to cover more completely the correction of a gasoline leakage which Harold discovered in the South Wind. At the last swap shop meeting (Gardner Canyon, April 1969) Harold gave us a detailed account of how he corrected this leak. It occurred in the fuel pump, which you will find illustrated in Figure 15, Page 11, of the January 1965 South Wind Manual, part 736563. This fuel pump is part of a complex that includes the points housing, and is bolted to the top of the combustion air blower motor, and can be readily seen from the bathroom side of the heater compartment. When he took this fuel pump apart he found that the central part, a plate about  $\frac{1}{4}$  inch thick, was so warped that the 'O'Rings could not function properly to make the unit gasoline tight. By attrition with fine emory he was able to remove sufficient material to permit the 'O'Rings to again make the pump gasoline tight.