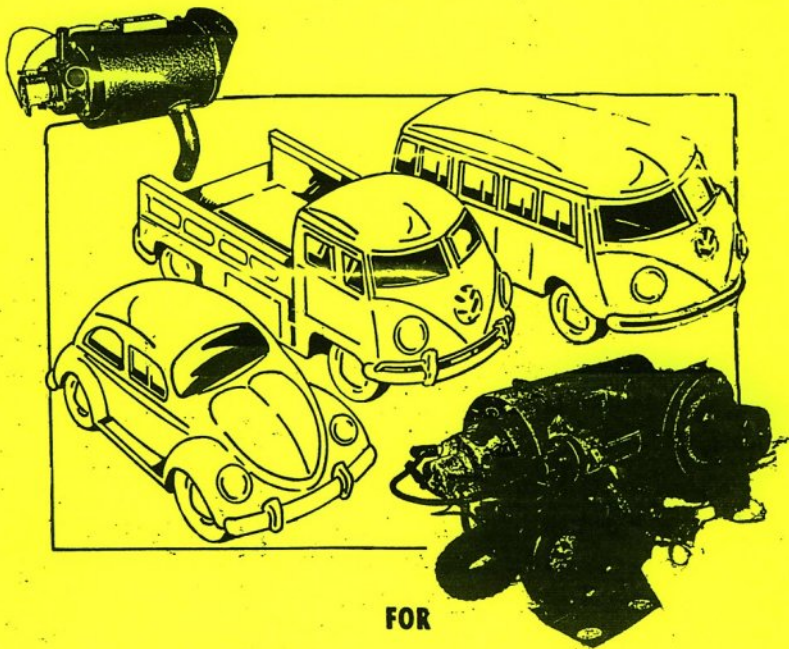


SERVICE MANUAL

South Wind GASOLINE HEATER



FOR

VOLKSWAGEN VEHICLES



South Wind
DIVISION

STEWART-WARNER CORPORATION

South Wind

SERVICE MANUAL AND PARTS CATALOG

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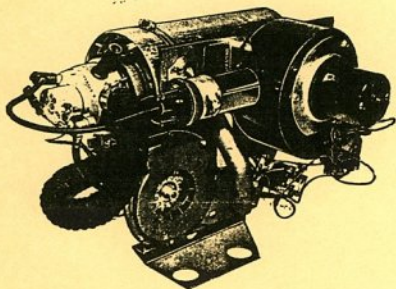
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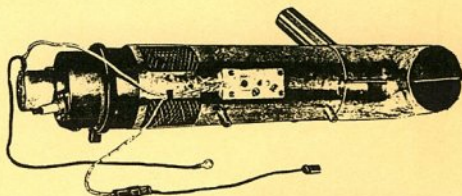
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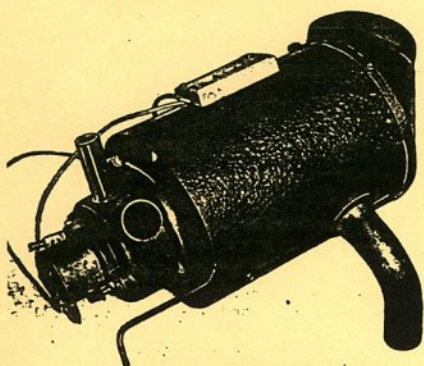
HEATER ASSEMBLIES USED IN KITS



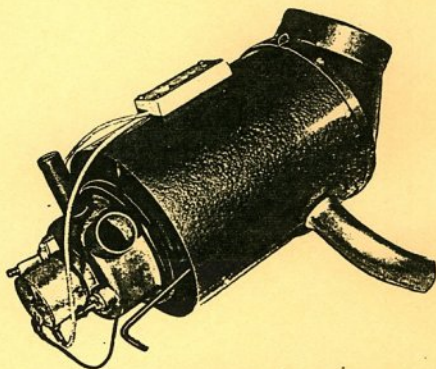
**KIT 8330 - 8331 - 8332
8333 and 736076**



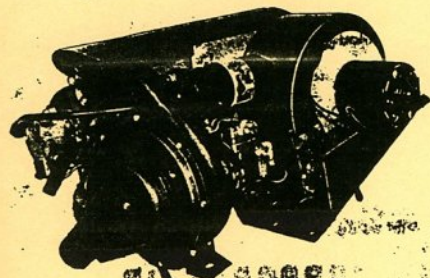
KIT 8341 and 735900



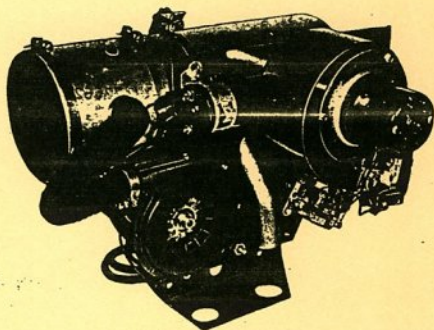
KIT 8342 and 8343



KIT 8345 and 8346



KIT 8345-B



KIT 8334

PART NO.	DESCRIPTION	REMARKS
735054	Gasket - Coil Cup	Use 736009 Burner Kit
735059	Gasket - Valve Seat	Use 736009 Burner Kit
735060	Nozzle - Fuel	
735061	Gasket - Burner	Also in 736009 Kit
735062	Spark Plug	Use 736008 Spark Plug Kit
735063	Washer - Spark Plug	Also in 736008 Kit
735091	Clamp - Control Cable	
735100	Connector - Fuel Pump	Use 735405 Coupling Kit
735101	Coupling - Fuel Pump	Use 735405 Coupling Kit
735125	Retainer - Spark Plug	
735127	Retainer - Valve Seat	
735221	Screw - No. 8 - 32 x 3/8	
735317	Disc - Sealing	Use 736009 Burner Kit
735329	Spacer	Use 736009 Burner Kit
735407	Screw - No. 10 x 5/8	
735413	Valve - Fuel	Use 736009 Burner Kit
735450	Cover - Breaker Points	
735451	Cam - Breaker Points	Also included with pump
735454	Wire Assembly	Make from bulk
735494	Cup - Solenoid Coil	
735496	Cover - Solenoid Coil	
735509	Screw - No. 6 x 3/4	
735550	Clamp	
735558-8	Duct - Combustion Air (16")	Use 735558-2 (18")
735591-1	Clamp - Fuel Line	For fuel line in kit
735591-2	Clamp - Fuel Line	For V-W fuel line
735592	Connector - Fuel (Push-on)	
735593-1	Fuel Line (36")	
735769-3	Base - Burner	
735832	Clamp - Duct Support	
735860	Wire Assembly	Make from bulk
735876	Gasket - Exhaust	
735877	Switch - Overheat	
735901	Bracket - Switch Mounting	
735905-6	Tube - Flexible Exhaust (19")	Use 735905-1 (21")

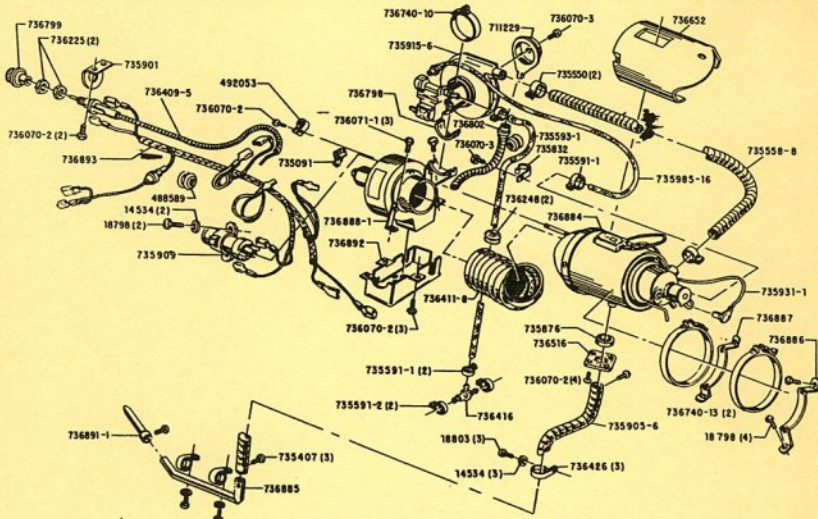


Figure 3 - Kit Model 8347

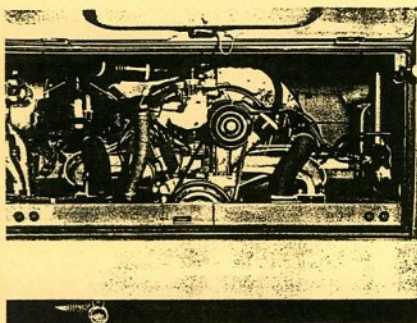


FIG.2 - HEATER INSTALLED IN 1500CC TRANSPORTER

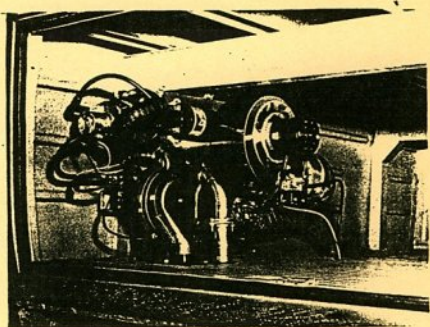


FIG.5 - HEATER SHOWN WITHOUT COVER SHIELD - KIT MODEL 8331



FIG.3 - AIR DISTRIBUTOR INSTALLED IN STATION WAGON

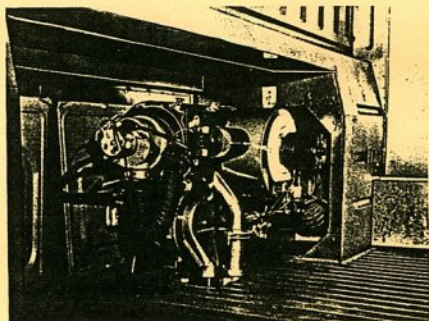


FIG.6 - DOUBLE-CAB PICK-UP TRUCK HEATER INSTALLATION - KIT MODEL 8330

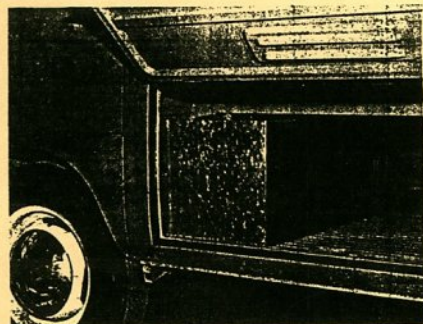


FIG.4 - SINGLE CAB PICK-UP TRUCK HEATER INSTALLATION--KIT MODEL 8331

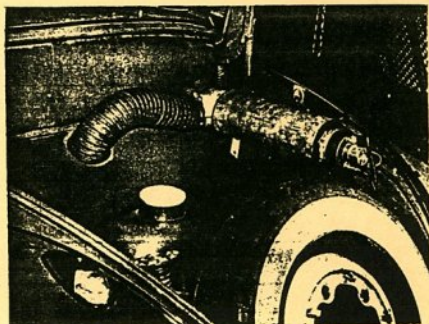


FIG.7 - SEDAN HEATER INSTALLATION - KIT MODEL 735900

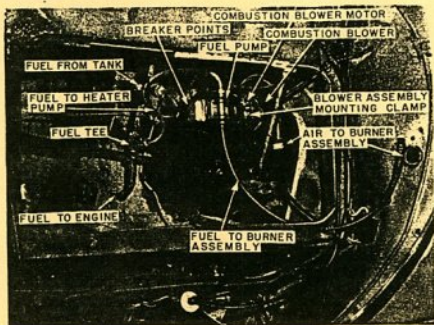


FIG. 8 - COMBUSTION AIR BLOWER
INSTALLATION - KIT MODEL 735900

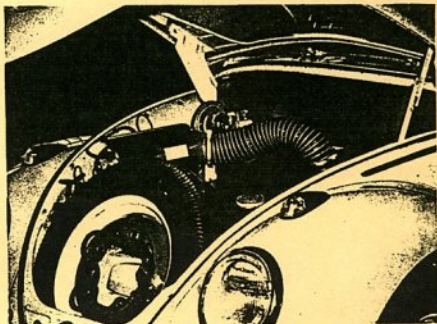


FIG. 11 - SEDAN HEATER INSTALLATION
KIT MODEL 8345

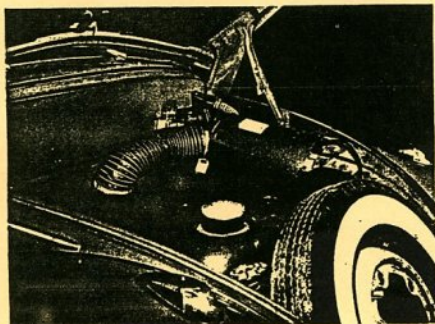


FIG. 9 - SEDAN HEATER INSTALLATION -
KIT MODEL 8343

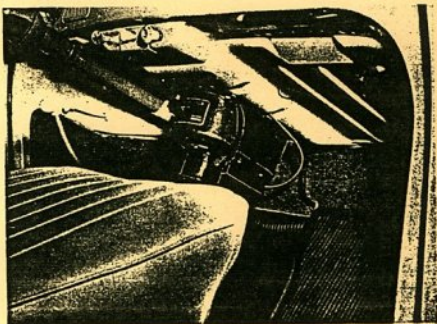


FIG. 12 - VENT BLOWER INSTALLED
IN SEDANS

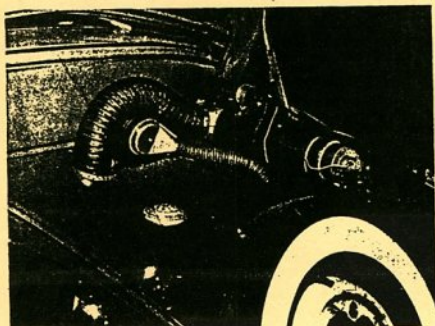


FIG. 10 - SEDAN HEATER INSTALLATION -
KIT MODEL, 8341

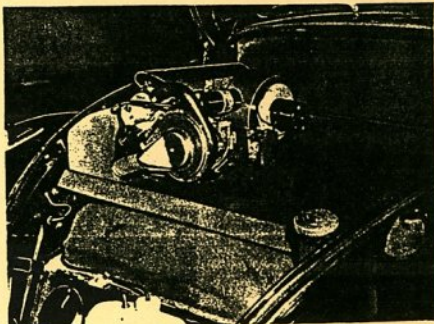


FIG. 13 - SEDAN HEATER INSTALLATION
KIT MODEL 8345-B

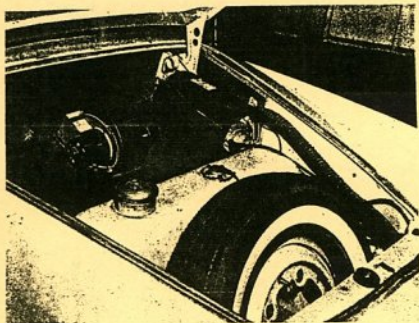


FIG.14 - KARMANN GHIA HEATER
INSTALLATION - KIT MODEL 8342

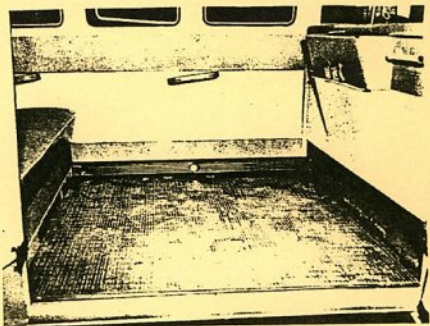


FIG.17 - AIR DISTRIBUTOR INSTALLATION
KIT MODEL 736410

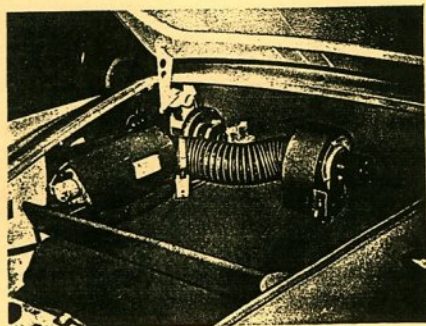


FIG.15 - KARMANN GHIA HEATER
INSTALLATION - KIT MODEL 8346

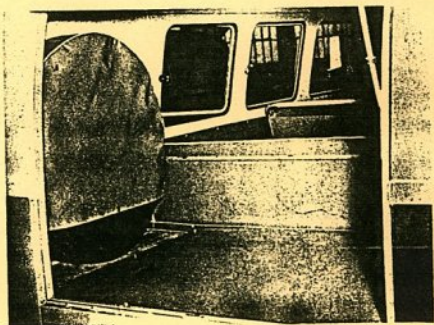


FIG.18 - WHEEL WELL COVER KIT
736490 INSTALLED

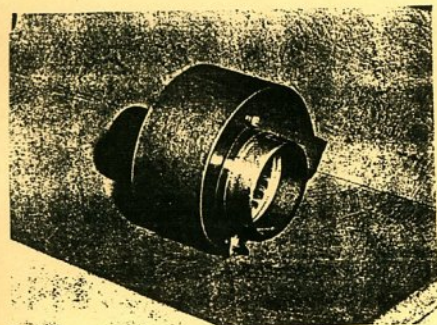


FIG.16 - KARMANN GHIA VENT BLOWER
INSTALLATION - KIT MODEL 8342

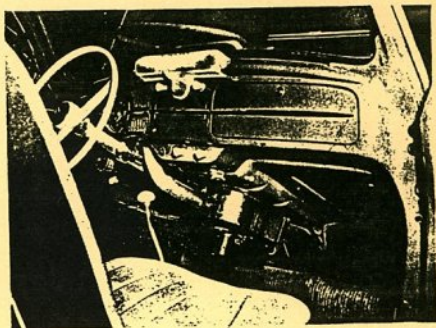


FIG.19 - DEFROSTER KIT INSTALLED -
KIT 736470

SECTION I

GENERAL DESCRIPTION

Principles of operation are the same for all heaters. 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. 20) 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 ducted into the car.

A thermostat is provided to interrupt fuel and ignition, thereby stopping combustion within the heater at a given temperature determined by the thermostat setting which is controlled by the user in response to his heating requirements.

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 with heaters bearing the approval of Underwriter's Laboratories.

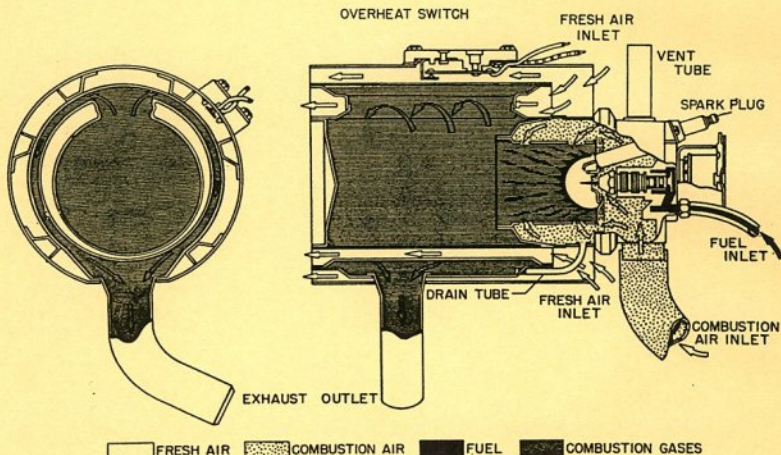


FIGURE 20 - FLOW SYSTEM

SECTION II

HEATER COMPONENTS

1. Heat Exchanger and Burner Assembly

All exchanger and burner assemblies (Figs. 52-53) are functionally the same; the difference lies in physical characteristics governed by the application.

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

The burner assembly (Fig. 61), 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 heater switch, thermostat, and overheat switch depending upon the circumstances. (See wiring diagrams.) When the heater switch is on and the thermostat is calling for heat, the fuel solenoid coil is energized through the thermostat and overheat switch, and the resultant magnetic field lifts the spring-loaded valve from the valve seat. This

lows 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 lower plate of the mixer and then through the small holes in the side of the mixer. The louvers and holes are of 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 burner assembly.

4. Combustion Air Blower Assembly

The combustion air blower (Figs. 21 and 60) provides the correct amount of air to mix with the fuel to maintain a balanced fuel-air ratio. A 1-1/4 inch diameter duct is used to deliver combustion air to the burner assembly. Motor speed is 4000 RPM.

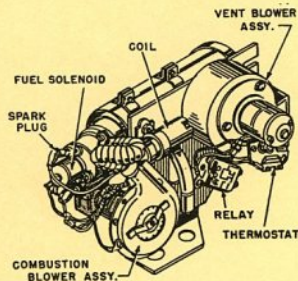


FIG. 21 - SKETCH OF TRANSPORTER HEATER

5. Ventilating Air Blower Assembly

The ventilating air blower (Figs. 12 and 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.

6. 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 5.5 to 9.5 PSI, is a spring-loaded diaphragm type with fixed internal pressure regulation. (See Figs. 22 and 60)

7. 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

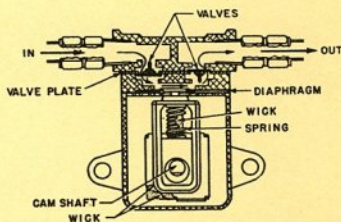


FIG. 22 - HEATER FUEL PUMP - SECTIONAL VIEW

in an automobile. The coil resembles a standard automotive coil and supplies the high voltage required for the spark plug. The breaker points assembly consists of a set of points and a condenser installed on a base assembly (Fig. 60). The assembly 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.

8. Thermostat

The thermostat contains a bimetal coil which is affected by temperature changes and which controls a micro switch through a cam and adjustable linkage. (See Fig. 23). The thermostat, acting in response to the temperature of the air passing across the bimetal coil, cycles the fuel and ignition circuits "on" and "off" as required. The cycling temperature (70°F - 190°F) is dependent upon the positioning of the thermostat control linkage which is controlled by a Bowden cable manipulated by the user. The thermostat does not cycle the two blowers; they operate as long as the heater switch is on (See wiring diagrams.)

9. Overheat Switch

The overheat switch is connected electrically in series with the fuel solenoid coil (see wiring diagrams) and will cycle the fuel if the air temperature at the location of the overheat switch is higher than a predetermined safe maximum. The switch (Fig. 20) contains a bimetal blade which will have enough deflection at a given

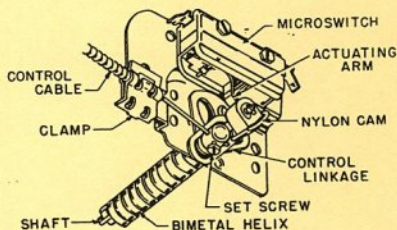


FIG. 23 - HEATER THERMOSTAT

temperature to open a set of contacts thereby breaking the circuit to the fuel solenoid coil. As the air cools due to loss of combustion, the switch will automatically reset and the heater will cycle on the overheat switch until the cause of malfunction is corrected.

8. Heater Relay

The relay (Fig. 21) is used only on transporter-type heaters for the purpose of eliminating excessive voltage drop in the hot lead of the heater by providing a means of connecting to a power point nearer the heater. Therefore, the heater switch in this instance is used only to energize the coil of the relay and close the relay contacts to complete the circuit to the heater. (See wiring diagrams, Figs. 30 and 31.)

9. Flame Detector Switch & Fuel Safety Valve.

The flame detector switch and fuel safety valve (Figs. 24 and 25) are used with Model 8334 which is approved by Underwriters Laboratories. These two parts prevent fuel from entering the burner if an ignition failure occurs.

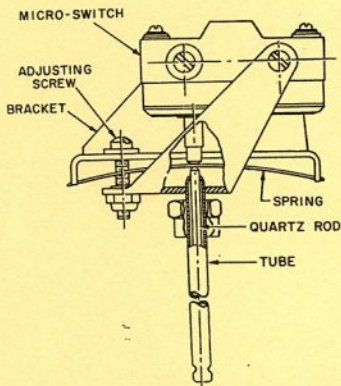


FIG. 24 - FLAME DETECTOR SWITCH

The safety valve consists of a solenoid and a casting which houses a spring-loaded diaphragm. The solenoid is controlled by the flame detector switch which consists of a tube and bracket assembly into which is assembled a quartz rod, a microswitch, and a leaf spring which is installed between the tip of the rod and

the button of the switch. The flame detector switch is installed so that the tube with the quartz rod is inserted into the flame inside the exchanger. When the tube of the flame detector switch is cold, the tube is contracted and forces the rod against the spring which, in turn, depresses the microswitch button which opens the switch so no current flows to the safety valve solenoid. When hot, the tube expands and the quartz rod, which is not affected by temperature, is forced by the spring to follow the tube. This action releases the switch button, the switch closes, and the circuit is completed to the solenoid of the safety valve.

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. The spring-loaded diaphragm forces the fuel out of the valve housing and 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.

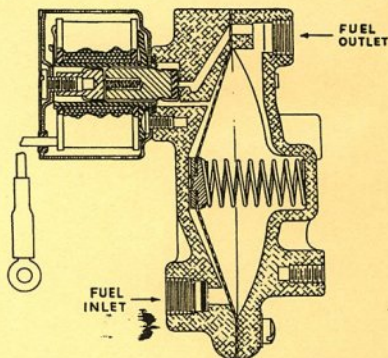


FIG. 25 - SECTIONAL VIEW OF FUEL SAFETY VALVE

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.

SECTION III SERVICE AND REPAIR

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, three things

are required for correct heater operation. These are: FUEL, AIR, and IGNITION. 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.

TROUBLE SHOOTING CHART

POSSIBLE CAUSE

COMPLAINT

POSSIBLE CAUSE	COMPLAINT							
	Heater Inoperative; Combustion Air Blower Inoperative	Heater Inoperative; Combustion Air Blower Operates	Heater Operates; No Warm Air Delivered	Popping or Backfiring 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	X	X	X	
Incorrect wiring	X	X	X	X	X	X	X	
Low voltage		X		X	X	X		
Kinked or restricted fuel lines		X		X			X	
Defective fuel pump		X		X	X		X	
Broken pump coupling		X		X			X	
Defective pump check valves		X		X			X	
Air lock in fuel line		X					X	
Open fuel solenoid coil		X						
Fuel valve sticking on seat		X						
Clogged nozzle		X					X	
Defective overheat switch		X					X	
Defective thermostat		X					X	
Leaking fuel valve				X	X			
Incorrect spray from nozzle		X		X				
High fuel pressure					X	X		
Incorrect fuel nozzle					X	X		
Leaking fuel lines						X	X	
Leak at coil cup						X		
Leak between nozzle and casting				X				
Leaking heat exchanger						X		
Loose burner clamp					X	X		
Slow combustion air motor				X	X	X		
Combustion air motor not grounded	X			X	X	X		
Damaged or disconnected combustion air duct		X		X	X	X		
Restricted exhaust		X		X	X	X		
Pitted breaker points		X		X				
Poor condenser solder joint		X		X				
Worn points cam		X		X				
Incorrect points gap		X		X				
Damaged spark plug		X		X				
Incorrect spark gap		X		X				
Defective ignition coil		X		X				
Open flame detector switch		X						
Open safety valve coil		X						
Defective relay	X			X	X	X		
Defective control switch	X			X				
Incorrect control cable installation								X
Damaged or restricted air duct			X					X
Ventilating air motor defective			X					X
Incorrect installation		X	X			X	X	
Incorrect customer operation						X	X	
Leak at vehicle tank or engine						X		

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 a deposit of 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, a 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 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 disconnected. It may be necessary to supply a separate length of fuel line in order to prevent fuel from being sprayed on the car 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 should be used. The ground electrode should lie flat against the shoulder of the gauge (Fig.26). Replacement 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. Spark Plug Kit, Part No. 736008, contains the plug and gasket and is used for service.

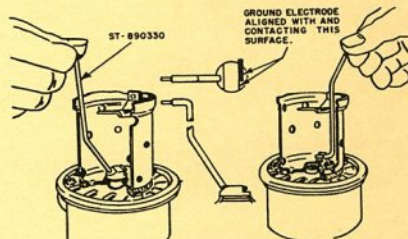


FIG.26 - CHECK PLUG ALIGNMENT AND GAP

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

amage. Motor speed should be approximately 3000 RPM. Check to see that the motor is grounded and that sufficient voltage is available to the motor. Minimum voltage at the motor should be approximately 5.5 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 8 of this section.

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, or restricted or loose duct.

Fuel Pump

Fuel pump pressure should be 5.5 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 using 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, of 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. 22 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. Two different part numbers are used for the fuel pumps because the location of the pump governs which side will be the outlet. The two pumps are the same except for positioning of the top casting and check valves. Therefore, they may be interchanged by reversing the casting and check valve plate as required.

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, turn the heater switch on, 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.

6. Thermostat

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.

Most complaints traced to the thermostat are the result of improper control cable installation at the thermostat linkage. With the heater control knob pushed all the way in, the thermostat linkage should travel to its full counter-clockwise position. With the heater control out as far as it will go, the linkage should have full clockwise travel. This results in use of the full 70-190 degree temperature range. A set screw secures the control cable to the linkage.

To determine if the thermostat is defective proceed as follows. With heater switch on and heater control pulled out to its extreme position, connect a test light between the cold terminal of the thermostat and ground. If the test light glows, the thermostat switch is closed which indicates that the thermostat is completing the circuit as it should. If the light does not glow and wiring connections are good, the thermostat should be re-

placed. If a shorted thermostat is suspected, depress the metal actuating arm of the thermostat with the test light as above and heater switch on. If the light continues to glow, the thermostat is shorted and should be replaced.

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 ohmmeter, buzzer, or test light after referring to the wiring diagram. A defective overheat switch should be replaced and no field adjustment is recommended.

8. Heater Relay

With the heater switch on, power should be present at the "switch", "battery", and "load" terminals of the relay. This can be determined by placing a test light between ground and the terminal to be checked. Power should be present at the "battery" terminal at all times since this is connected to the hot terminal of the voltage regulator. If the test light fails to glow when placed on the "switch" terminal, the heater switch or related switch, wiring is defective. If the light glows when placed on the "battery" and "switch" terminals but does not glow on the "load" terminal, either the fuse or relay is defective and should be replaced.

If the light glows when placed on the "load" terminal but is dim, it indicates excessive voltage drop across the relay contacts or poor fuse contact. The voltage drop between the "battery" terminal and "load" terminal should not exceed .2 volt with the heater operating. Check for good wiring and fuse connections. If voltage drop is still excessive, replace the relay.

9. Flame Detector Switch and Fuel Safety Valve

As previously explained, the flame detector switch and safety valve are safety controls used

with the Model 8334 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 ohmmeter, buzzer, or a test light. Loosen the two screws holding the microswitch in place so that the button of the switch is released. Then check for continuity with an ohmmeter or buzzer. If a test light is used, turn the heater switch on and check to see if the light glows when placed between ground and each of the terminals. If the light does not glow on both terminals, the switch is defective and the entire flame detector switch assembly 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 3/4 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 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.

10. 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. 27) is necessary for heater service and is used not only for obtaining the correct gap of .085 but also for locating the ground electrode

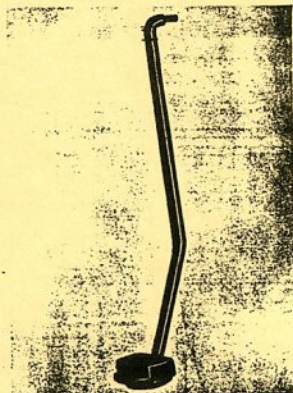


FIG. 27 - SPARK PLUG GAGE - SW No. ST-890330
VW No. ZVW 257 855



FIG. 28 - FUEL PRESSURE GAGE - SW No. ST-890332
VW No. ZVW 257 853

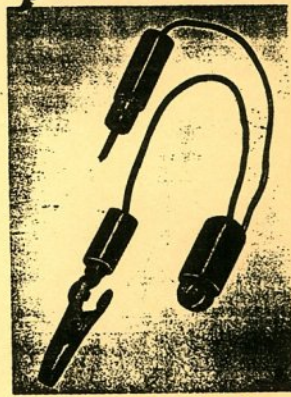


FIG. 29 - TEST LIGHT
SW No. ST-890325
VW No. ZVW 257 854

the proper relationship to the fuel nozzle orifice.

Part No. ST-890322, Fuel Pressure Gage, 1-30 PSI) (Fig.28) and Part No. ST-890325, est Light, (Fig.29) are also available.

Wiring Diagram

The following wiring diagrams represent all variants discussed in this manual and are reproduced in a manner to simplify tracing of wire id connections.

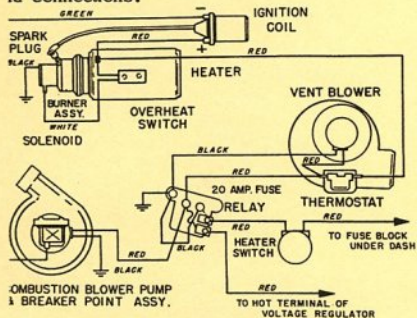


FIG. 30 - KIT MODEL 736076
8330-8331-8332-8333

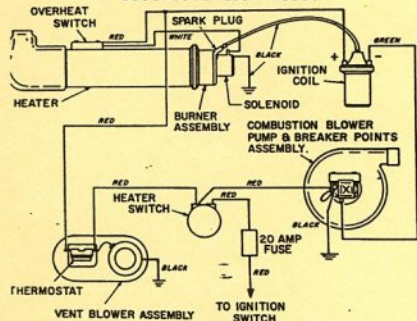


FIG. 32 - KIT MODEL 735900-8341

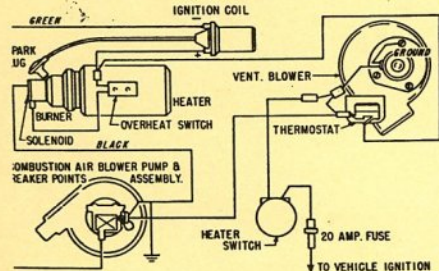


FIG. 34 - KIT MODEL 8345-B

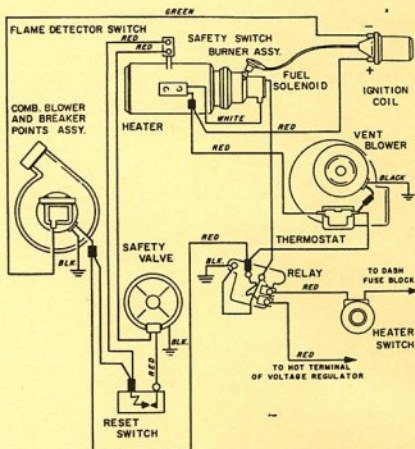


FIG. 31 - KIT MODEL 8334

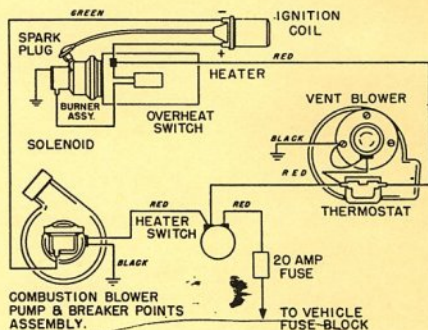


FIG. 33 - KIT MODEL 8342-8346

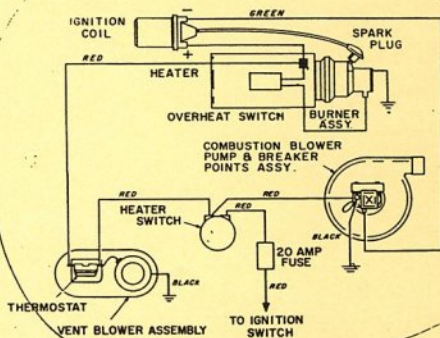
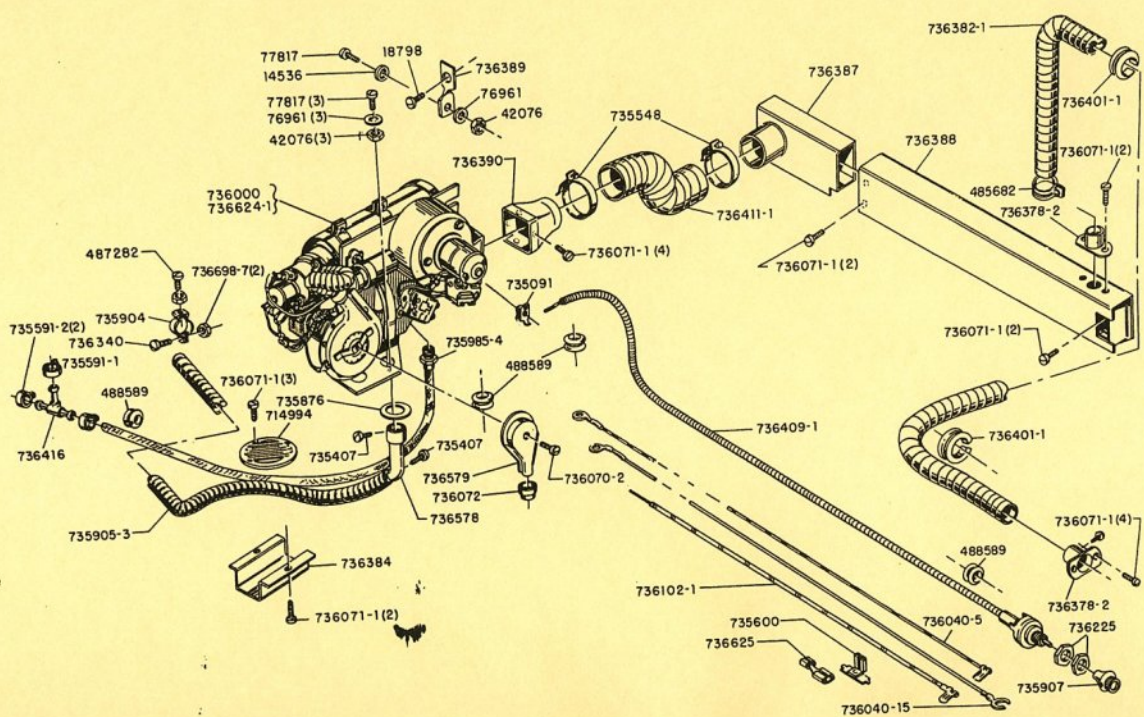


FIG. 35 - KIT MODEL 8343-8345

FIGURE 38 - KIT MODEL 8330



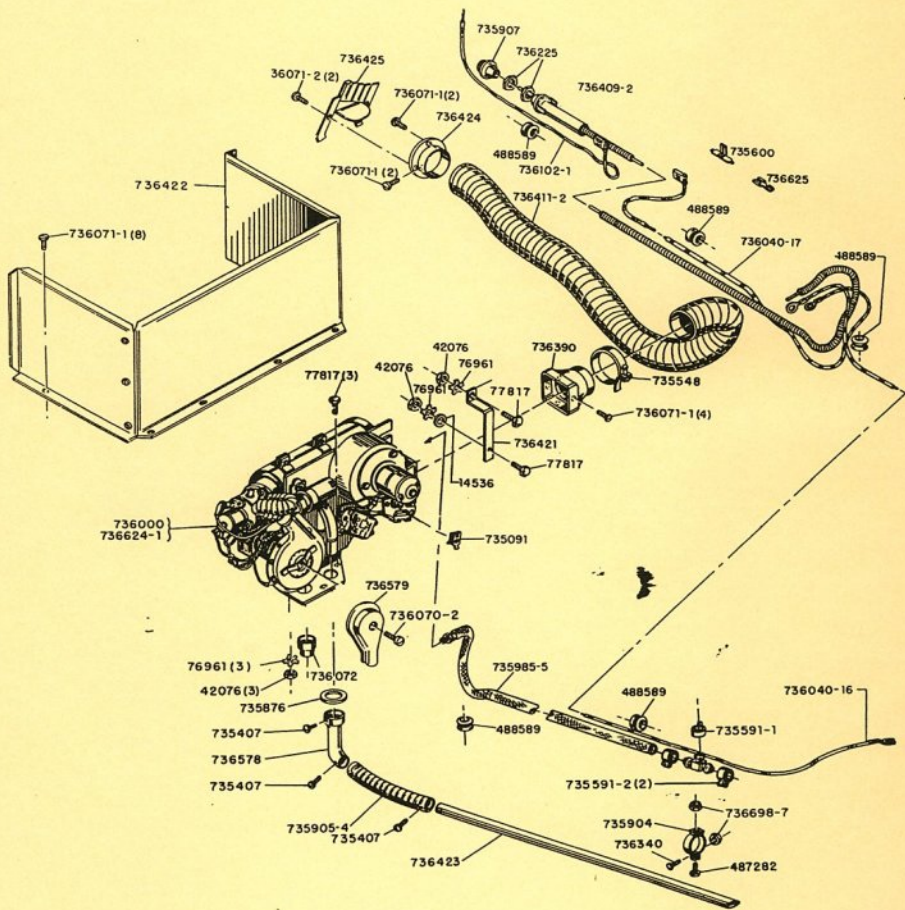
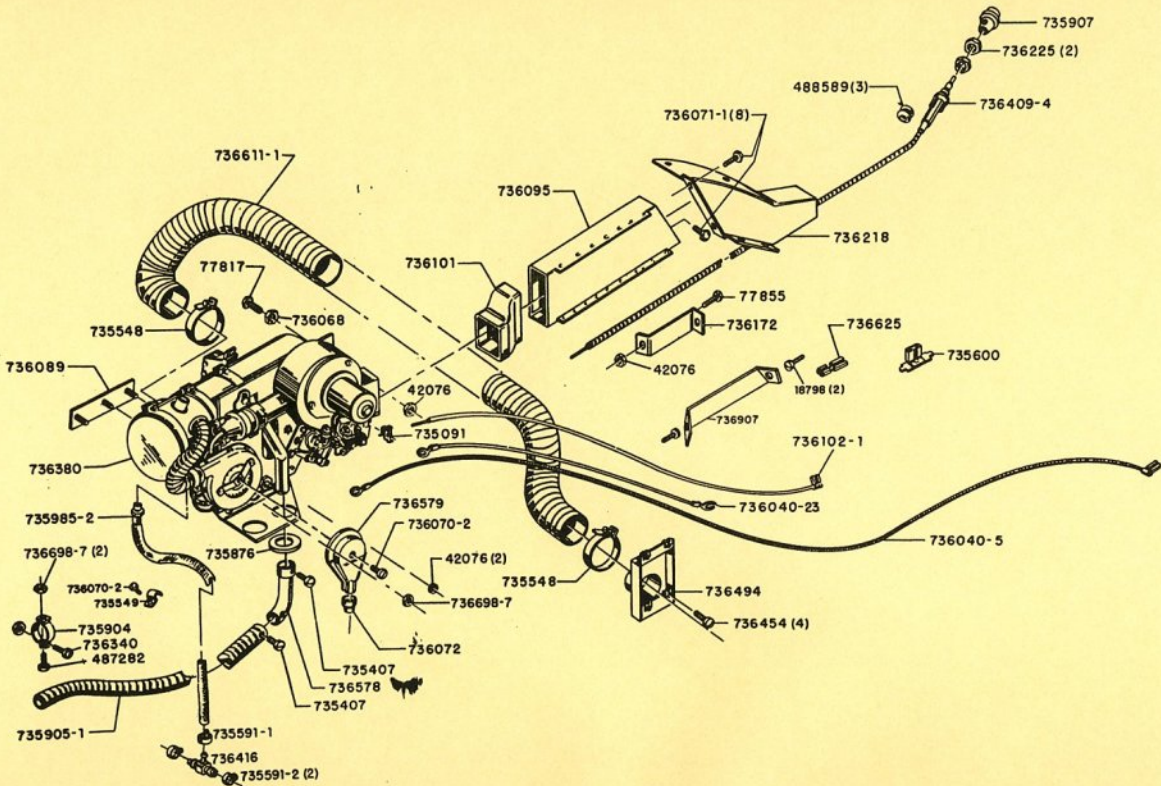


FIGURE 39 - KIT MODEL 8331

FIGURE 40 - KIT MODEL 8334



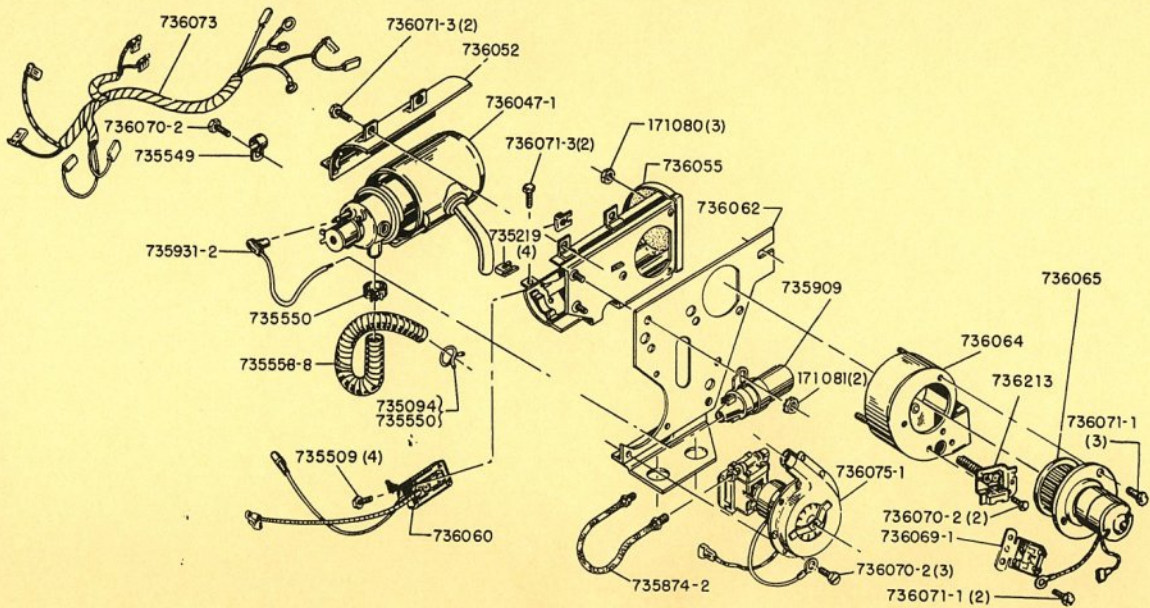


FIGURE 41 - HEATER & BRACKET ASSEMBLY 736000
 USED ON KIT MODELS 736076-8330-8331-8332

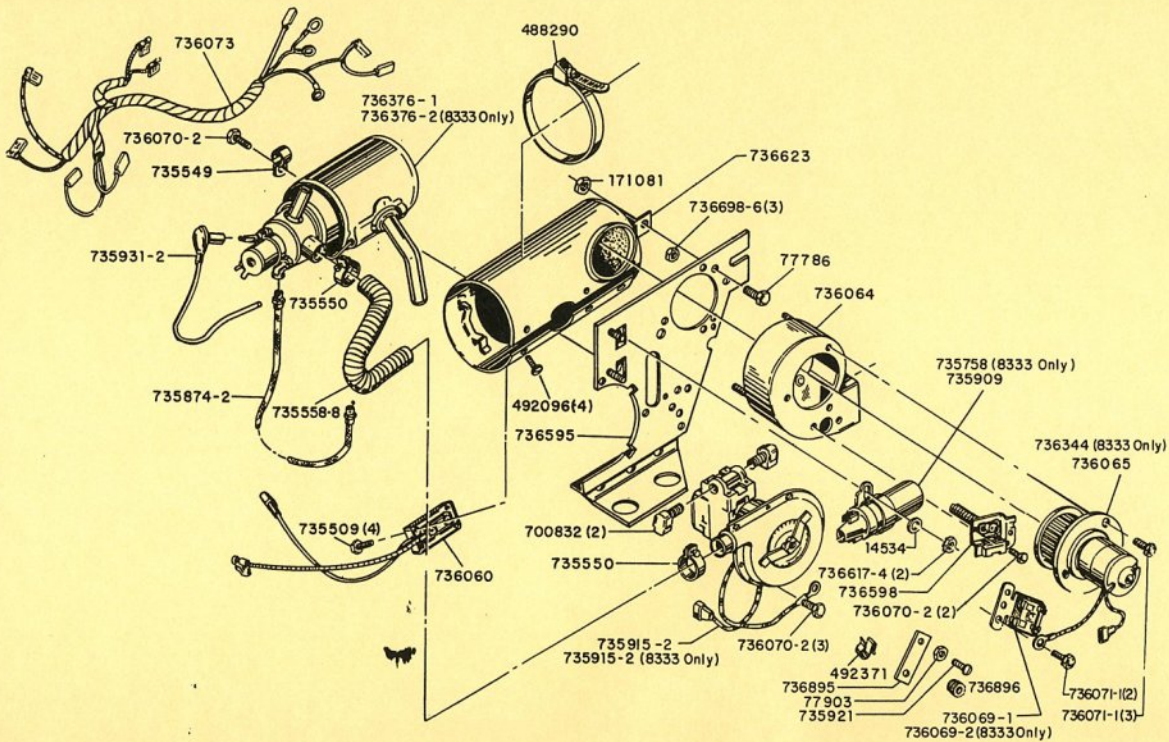


FIGURE 42 - HEATER & BRACKET ASSEMBLY 736624-1 & 736624-2

USED ON KIT MODELS 8330-8331-8332-8333

FIGURE 44 - KIT MODEL 736900

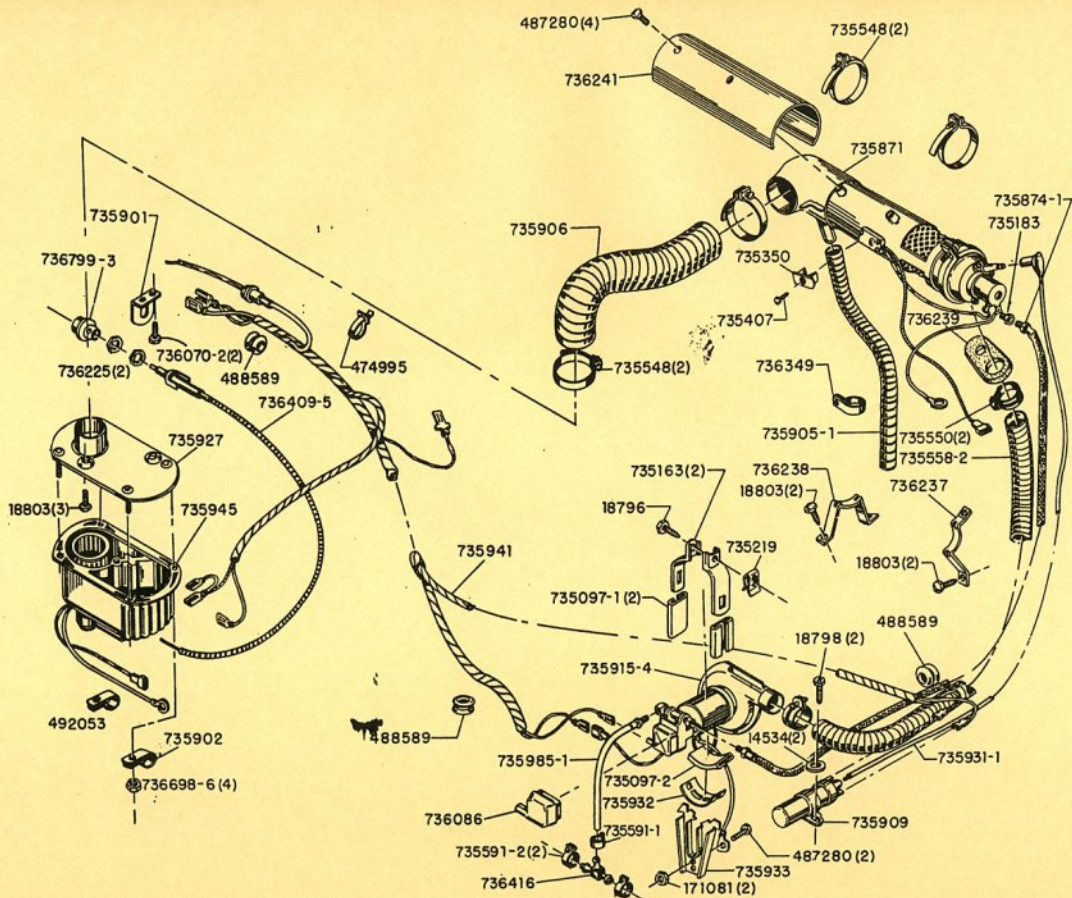


FIGURE 46 - KIT MODEL 8342

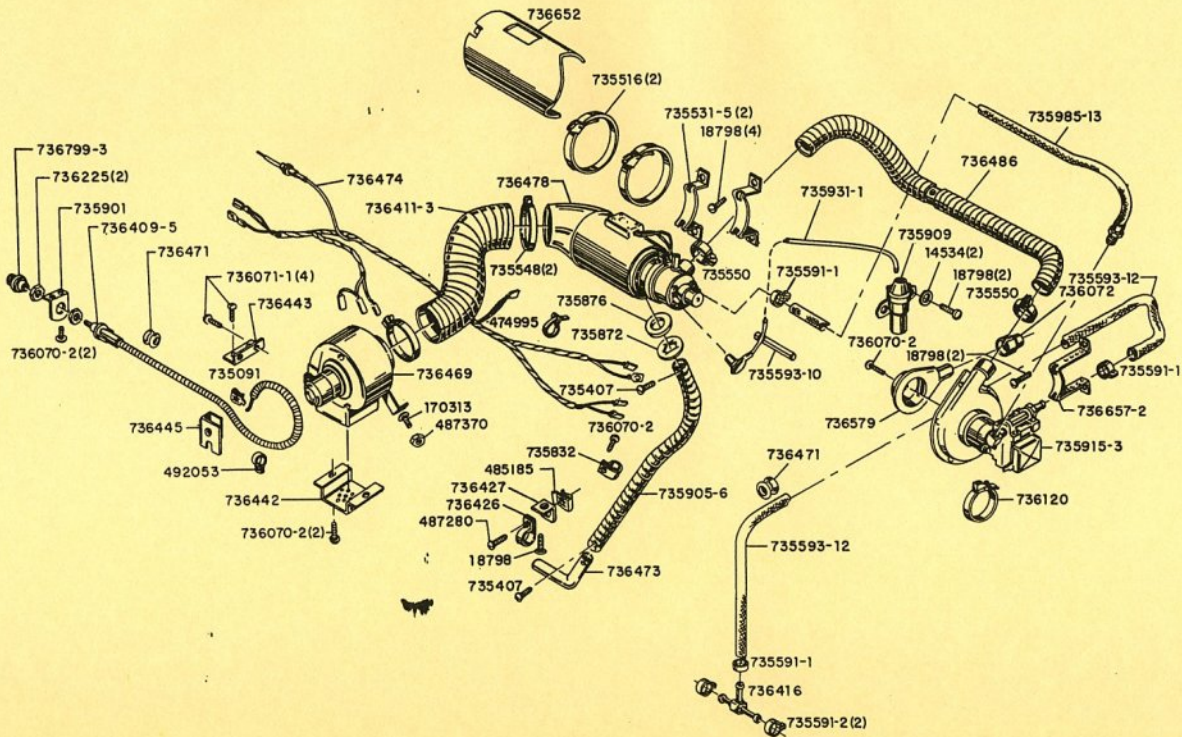
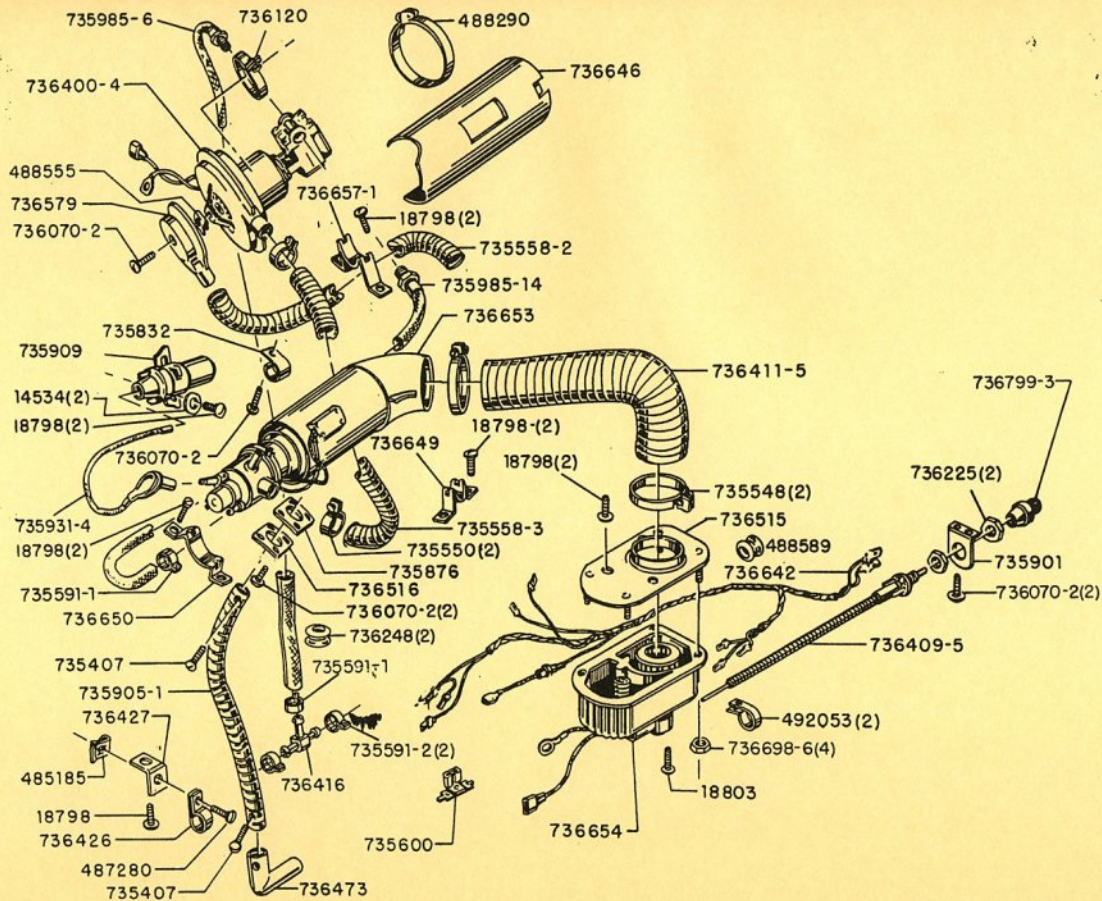


FIGURE 48 - KIT MODEL 8345



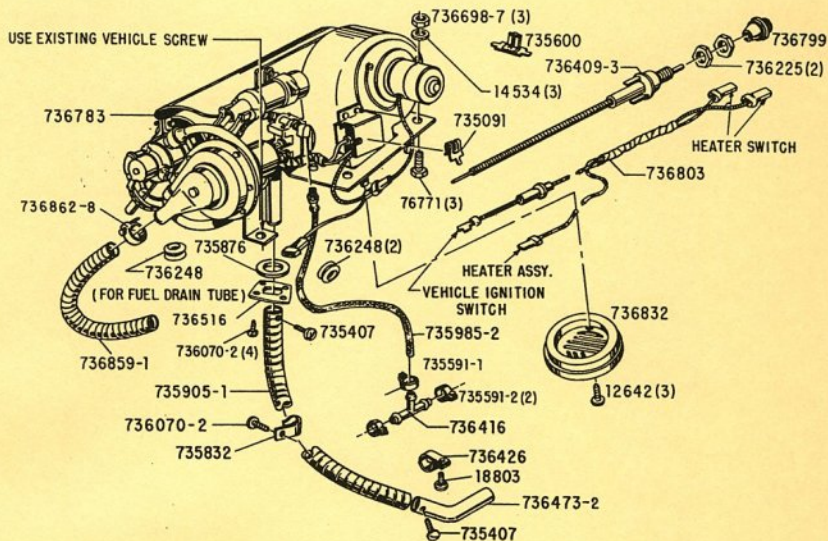


FIGURE 49 - KIT MODEL 8345-B

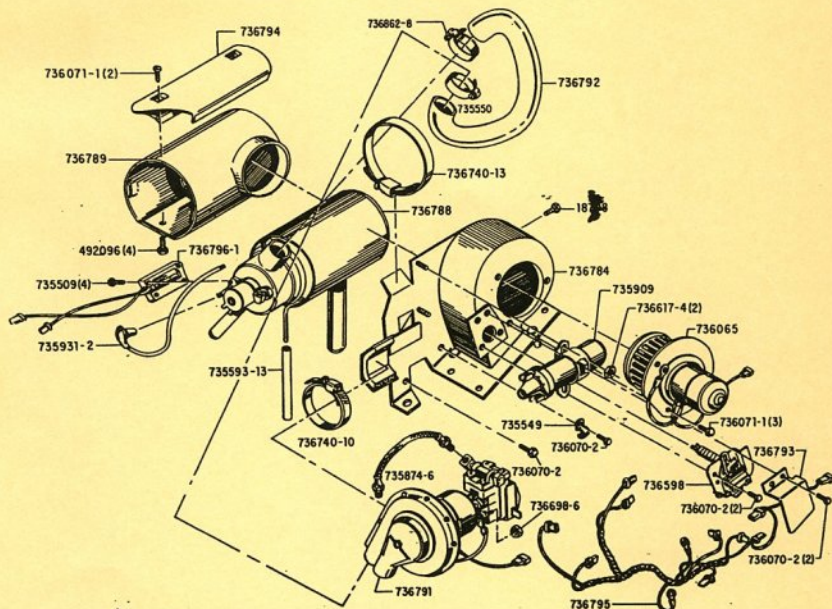


FIGURE 50 - HEATER ASSEMBLY 736783 USED ON KIT 8345-B



FLAME DETECTOR BUSHING
ADDED TO HEAT EXCHANGER
CHANGES ASSEMBLY NO.
FROM 736048 TO 736375

Heater Kit Model	*Heat Exchanger & Burner Assembly	Heat Exchanger	*Burner Assembly
**736076-8330 8331-8332	736047-1	736048	736190-1
*** 8330-8331 8332	736376-1	736048	736190-5
8334	736376-3	736375	736190-5
8333	736376-2	736048	736190-6

* Reference only.
** Using 736000 Heater Assembly.
*** Using 736524-1 Heater Assembly.

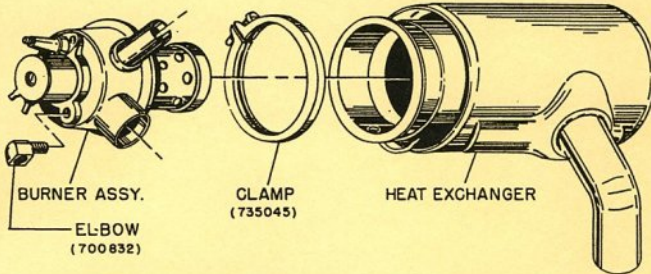
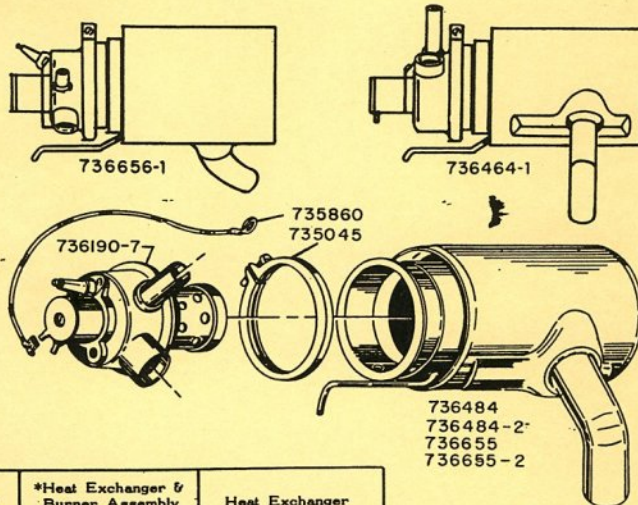


FIGURE 52 - HEAT EXCHANGER & BURNER ASSEMBLY
USED ON KIT MODELS 736076-8330-8331-8332-8333-8334



Heater Kit Model	*Heat Exchanger & Burner Assembly	Heat Exchanger
8342-8343	736464-1	736484 or 736484-2
8345-8346	736656-1	736655 or 736655-2

*Reference only

FIGURE 53 - HEAT EXCHANGER & BURNER ASSEMBLY
USED ON KIT MODELS 8342-8343-8345-8346

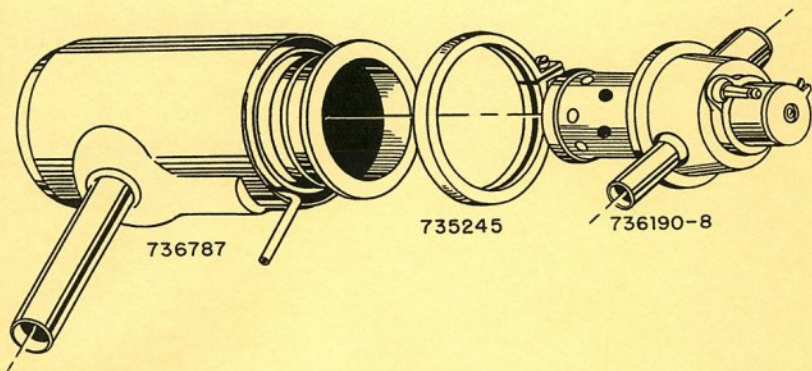


FIGURE 54 - HEAT EXCHANGER & BURNER ASSEMBLY 736788
 USED ON KIT MODEL 8345-B

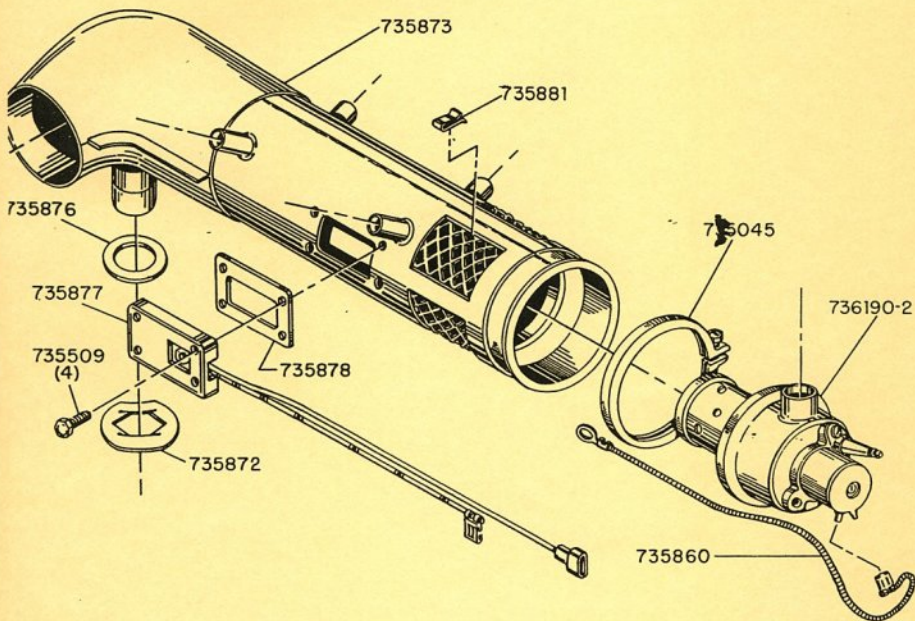


FIGURE 55 - HEATER ASSEMBLY FOR KIT MODELS 735900 & 8341

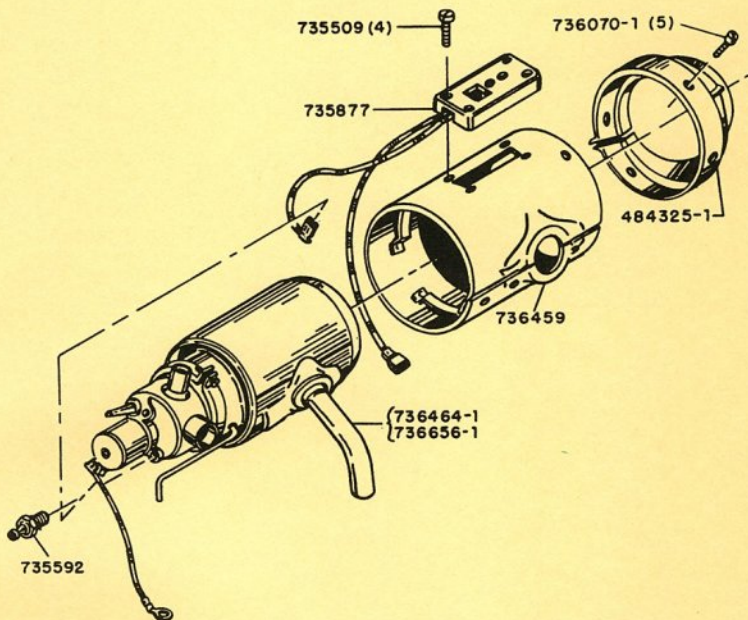


FIGURE 56 - HEATER ASSEMBLY FOR KIT MODELS 8342-8343 (736478)
8345-8346 (736653)

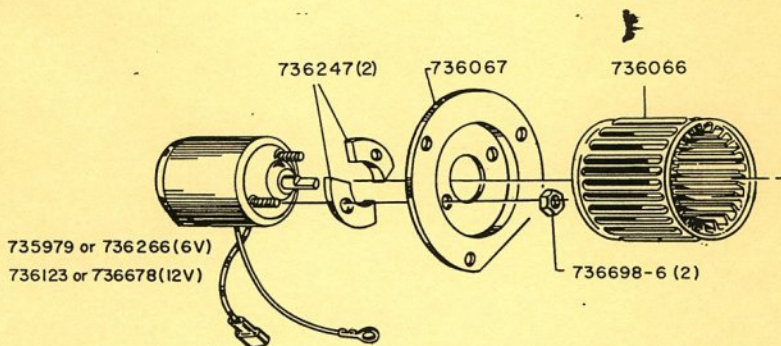


FIGURE 57 - VENTILATING AIR BLOWER & MOUNTING PLATE ASSEMBLY 736065
USED ON KIT MODELS 736076-8330-8331-8332-8333-8334

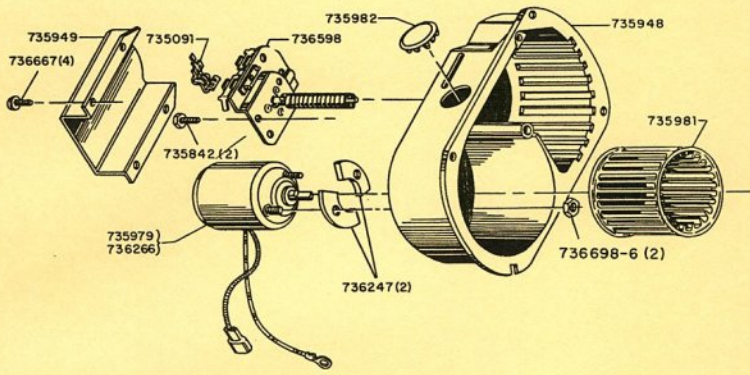


FIGURE 58 - VENT AIR BLOWER ASSEMBLY 735945-736488 & 736654
 USED ON KIT MODELS 735900-8341-8343-8345

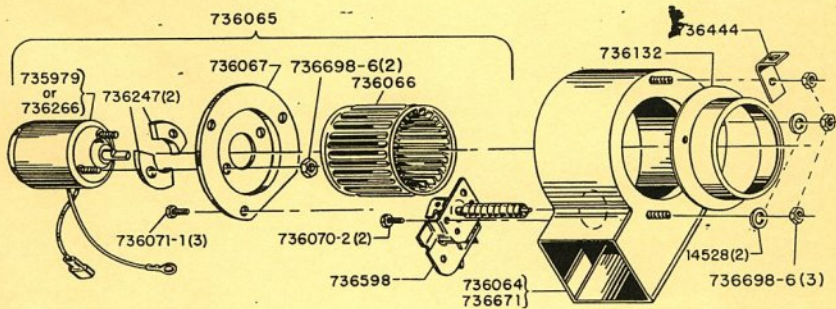


FIGURE 59 - VENTILATING AIR BLOWER ASSEMBLY 736469-736672
 USED ON KIT MODELS 8342-8346

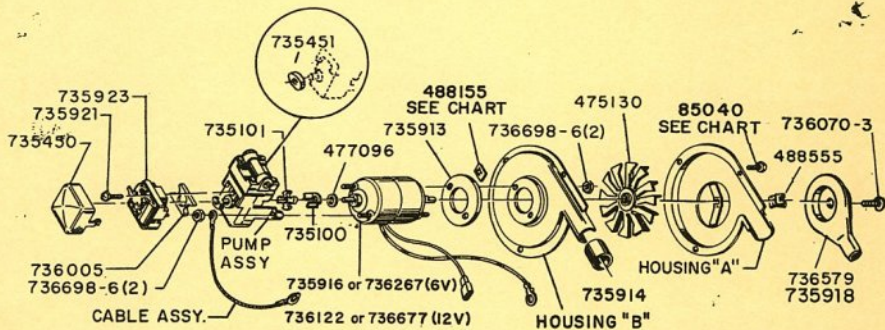


CHART FOR COMBUSTION AIR BLOWER ASSEMBLY FOR ALL MODELS

Heater Kit Model	*Blower Assembly	Wire Assembly	Blower Housing		Fuel Pump	Fittings		Quantity	
			A	B		Inlet	Outlet	488155	85040
**8330 - 8331	735911-1	735454	735911	735912	736563	--	--	6	6
8332 - 8334	735911-3	735454	735911	735912	736563	735992	700832	9	9
8342	735915-3	735454	735911	735912	736563	700832	700832	9	9
735900	735915-4	735454	735911	735912	736563	700832	700832	9	9
8343	735915-4	735454	735911	735912	736563	700832	700832	9	9
***736076 - 8330	736075-1	736040-13	736078	736080	736280	700832	735183	6	6
8331 - 8332	736075-1	736040-13	736078	736080	736280	700832	735183	6	6
8341	736400-1	735454	735911	735912	736563	--	--	9	9
8345	736400-4	735454	735911	735912	736563	700832	700832	9	9
8346	736400-4	735454	735911	735912	736563	700832	700832	9	9
8345-B	736791	--	735911	735912-2	736428	700832	700832	7	7
8333	735915-2	735454	735911	735912	736563	--	--	6	6

* Reference only.
 ** Using 736624-1 Heater Assembly except for 8334 which uses 736380 Heater Assembly.
 *** Using 73600 Heater Assembly.

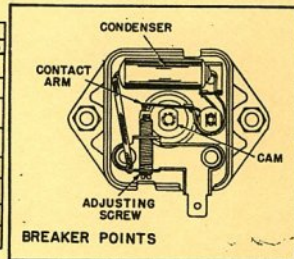
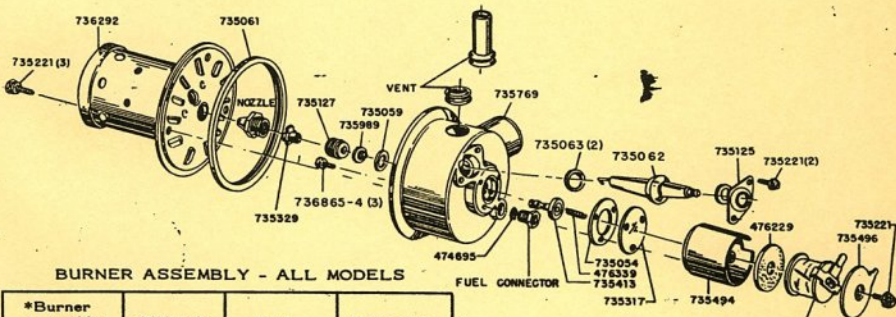


FIGURE 60 - COMBUSTION AIR BLOWER ASSEMBLY



BURNER ASSEMBLY - ALL MODELS

*Burner Assembly	**Nozzle	Vent	Connector
736190-1	736093	736191	735183
736190-2	735060	736191	--
736190-5	736093	735326	--
736190-6	736093	735326	--
736190-7	735060	735326	--
736190-8	735060	736695-1	--

* Reference only.
 ** All Transporter heaters use (736093) nozzle.
 All Sedan and Karmann Ghia heaters use 735060 nozzle.

FIGURE 61 - BURNER ASSEMBLY

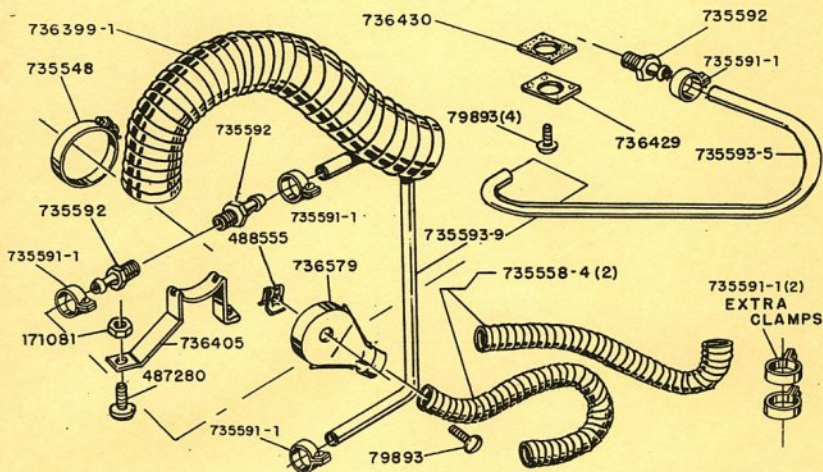


FIGURE 62 - CONVERSION KIT FOR MODEL 735900 (Part No.736679)

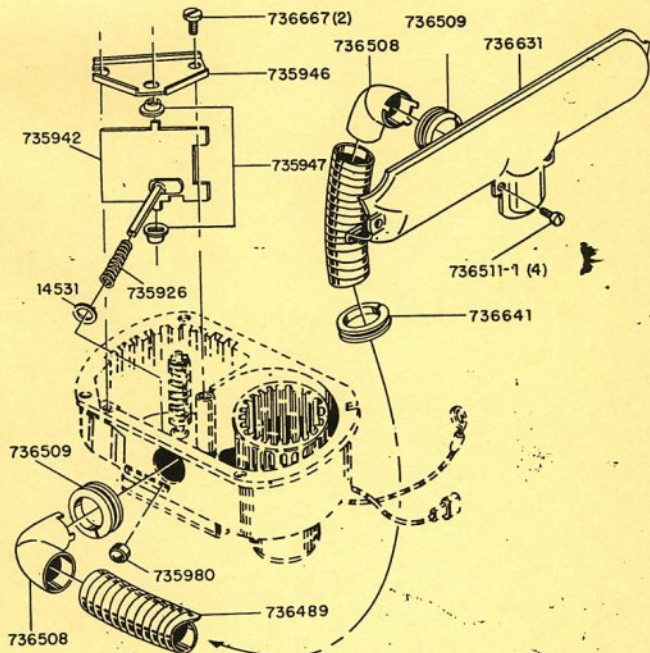


FIGURE 63 - DEFROSTER KIT (Part No.736470)

SUPPLEMENT TO PM-35020 INSTALLATION INSTRUCTIONS MODEL 8332 B-12V (ZVW 256269) HEATER

PM 35063

GENERAL

A metal plate or partition has been added between the vehicle engine and gasoline tank on Type II vehicles beginning with Chassis No. 238170000. Therefore, a hole must be cut in this partition for the heater outlet duct (Figure 1). In addition, only half of the spare tire wheelwell can be cut out. These steps **MUST** be completed before heater is installed.

NOTE: The (2) 7/32 dia. holes on Template PM-35035 should be 9/32 dia. holes to provide clearance for 1/4" bolts.

WHEELWELL

Figure 6 of PM-35020 Installation Instructions shows the wheelwell completely cut out. When the partition as described above is in the vehicle, all of the wheelwell cannot be cut out. Cut wheelwell out to partition and then alter the remaining portion (mainly the corners) so plate will fit flat. This can be done by cutting out or simply depressing the corners. See Figure 2.

PARTITION

Follow instructions on Template PM-35064 to locate and cut hole in the partition for the heater outlet. After drilling pilot hole noted on

template, cut template along dotted line, set in place again, and scribe location of larger hole to be cut with sheet metal shears.

CAUTION

Do not attempt use of hole saw on the edge of the cutout next to the fuel tank due to possibility of hitting fuel tank.

HEATER INSTALLATION

Insert the 3-1/2" flexible duct through the hole in the rear seat wall (Figure 5 of PM-35020), route duct along end of fuel tank, and pull about 6" of the duct through the hole in the partition into the engine compartment.

Place heater assembly, with ventilating air adapter attached, in approximate position and attach the 3-1/2" duct to the outlet adapter with clamp provided.

Push the adapter and duct through the hole in the plate as the heater is being placed in its mounting position. See Figure 3.

Pull the excess duct back through the hole in the rear seat wall and proceed with installation.

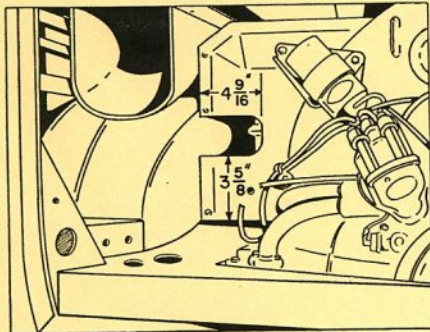


FIGURE 1

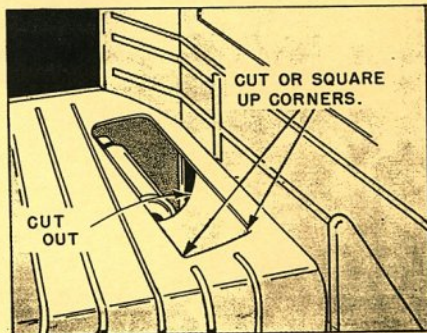


FIGURE 2

INTRODUCTION

All South Wind heaters designed for Volkswagen and Karmann Ghia Automobiles are similar in basic principle of operation, the primary difference being in the physical design characteristics required for adaptation to the various models of automobiles in which they are to be installed. The chart at the bottom of this page shows heater models, various specifications and applications.

In addition to the heaters, various accessory kits are also available as optional items:

Part No.	Description	Application
736410	Air Distribution Kit	Used with Model 8332 or 8334 Heaters in Transporter for added air distribution in passenger section.
736470	Defroster Kit	Used with Volkswagen Sedan heater Models 735900, 8341, 8343, and 8345 only. (Not recommended if the car has a radio.) This kit utilizes hot air delivered by the gasoline heater.
736490	Wheel Well Kit	Required to relocate spare tire when installing Model 8332 Heater in Transporter with spare tire in rear of vehicle.

736679 Conversion Kit Used to relocate combustion air blower (To convert kit Model 735900 to 8341, see Figures 8 and 10.)

All heaters and kits will be discussed in detail in this manual which contains all information necessary for service and parts identification. Figs. 1 through 19 show the aforementioned heater and accessory kits installed.

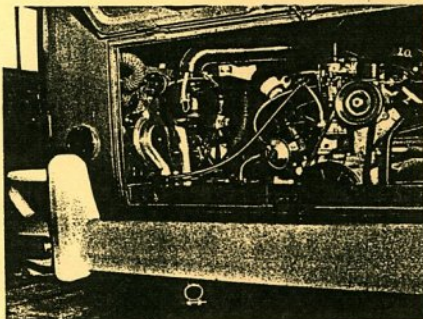


FIG.1 - HEATER INSTALLED IN 1200CC STATION WAGON - KIT MODELS 8332 & 8333

VOLKSWAGEN MODELS	Year	South Wind Heater Model No.	Heat Output Btu/Hr	Fresh Air Temperature Range °F	Volts	Current Amperes	Fuel Rate** Gal./Hr.
	SEDANS (Including Sun Roof & Convertible)	1956-60	8341	13,000	70-190	6	9-11
	1956-60	8343	13,000	70-190	6	9-11	.2
SEDANS (Including Sun Roof & Convertible)	1961-64	8345	13,000	70-190	6	9-11	.2
		8345-B					
KARMANN GHIA (Including Coupe & Convertible)	1956-60	8342	13,000	70-190	6	10-11	.2
KARMANN GHIA (Including Coupe & Convertible)	1961-64	8346	13,000	70-190	6	10-11	.2
KOMBI (All Models)	1956-64	8332	20,000	70-190	6	10-11	.3
STATION WAGON (All Models)	1956-64	8332	20,000	70-190	6	10-11	.3
PANEL TRUCKS (All Models)	1956-64	8332	20,000	70-190	6	10-11	.3
PICK-UP TRUCKS (Single Cab)	1956-64	8331	20,000	70-190	6	10-11	.3
PICK-UP TRUCKS (Double Cab)	1956-64	8330	20,000	70-190	6	10-11	.3
CAMPER	1960-64	8332	20,000	70-190	6	10-11	.3
KOMBI & STATION WAGONS Used as School Bus	1956-64	8334*	20,000	70-190	6	10-11	.3
KOMBI & STATION WAGONS	1956-64	8333	20,000	70-190	12	7-8	.3

*Approved by Underwriter's Laboratories.

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