295-3894

PRICE $3.95

COLDSTAR

SERVICE MANUAL

Same as Ins. Classic
GL6 T-couples
Base Bath conversion Kits
Junkers 330329

GL15 Same as Classic series.

GL-4, SL-6/GL-6, CS-8

CS-4, CS-6, & CS-10

TWO WAY and THREE WAY RV REFRIGERATORS

10 70 90

9-15-80

COLDSTAR CORPORATION, 29240 Phillips Street, Elkhart, Indiana. 46514
Area Code 219/264-7593

SERVICE INSTRUCTIONS FOR "COLDSTAR" RV ABSORPTION REFRIGERATORS

Service instructions cover installation, trouble shooting, servicing, and technical details dealing with electric and L.P. gas operations of COLDSTAR'S absorption type refrigerators designed for installation in Travel Trailers and Motor Homes.

TABLE ON CONTENTS

FEATURES OF COLDSTAR REFRIGERATORS

COLDSTAR three-way refrigerators offer numerous advantages and innovations which make them the most desirable RV refrigerator on the market.

To mention a few:

1. Model for model, COLDSTAR'S line of refrigerators are the largest refrigerators on the market today.

2. All COLDSTAR refrigerators have a full length door, doing away with bothersome kick plates, kick plate locks, etc.

3. All COLDSTAR refrigerators have a full width, insulated freezer.

4. All COLDSTAR refrigerators will accept ½ gallon milk cartons in the lower door shelf and all are equipped with flip-flop shelves to accomodate tall bottles in the cabinet.

5. All electrical and gas control components in COLDSTAR refrigerators are made in the U.S.A. and are completely assembled and 100% tested at our facility.

6. Because we strongly feel that a refrigerator without a crisper is incomplete, we offer a crisper in every COLDSTAR refrigerator as standard equipment, at no extra charge.

7. Lids on COLDSTAR crispers are specially designed to catch any spillage within the refrigerator cabinet.

These are but a few special features you will find ONLY in COLDSTAR refrigerators. Standard features include polyurethane foam insulation, magnetic door gasket, Piezo ignition, left and right hand door swing, travel latch, etc.

GENERAL INSTRUCTION:

COLDSTAR refrigerators are design certified by the American Gas Association for installation in Recreational Vehicles or Mobile Homes. To meet this certification, installation will normally be done by the vehicle manufacturer or your dealer.

The installation must conform with the following American National Standards:

1. Mobile Homes, A119.1-1975
2. Recreational Vehicles, A119.2-1975
3. National Electrical Code, ANSI CI-1975

If installation is made in Canada, it must conform to applicable Canadian Standards.

1. Gas Installation Code, B149
2. Gas Equipped Recreational Vehicles and Mobile Homes, B210.1
3. Electrical Installation Code, C22.1

INSTALLATION:

Since considerable weight must be supported while in transit the refrigerator must be installed on a solid floor and secured in place by running screws through holes provided in the base support rails into the floor. The platform on which the refrigerator is set must be level with the floor of the recreational vehicle. The gasket and clearance holes have been provided in the body flange to insure complete sealing of the refrigerator combustion system from the interior of the vehicle.

Methods of installation are shown in Fig. 1. The refrigerator must be installed with the ventilation air kit supplied with the refrigerator. The lower service door, #10 must be placed so that the bottom of the cut-out is even with the base of the refrigerator. This vent frame is provided with vent holes which must not be plugged or closed. These louvers provide ventilation for heavier than air fuel gases.

VENT KITS

Each refrigerator is approved with a certain combination of vent kits assembled as follows:

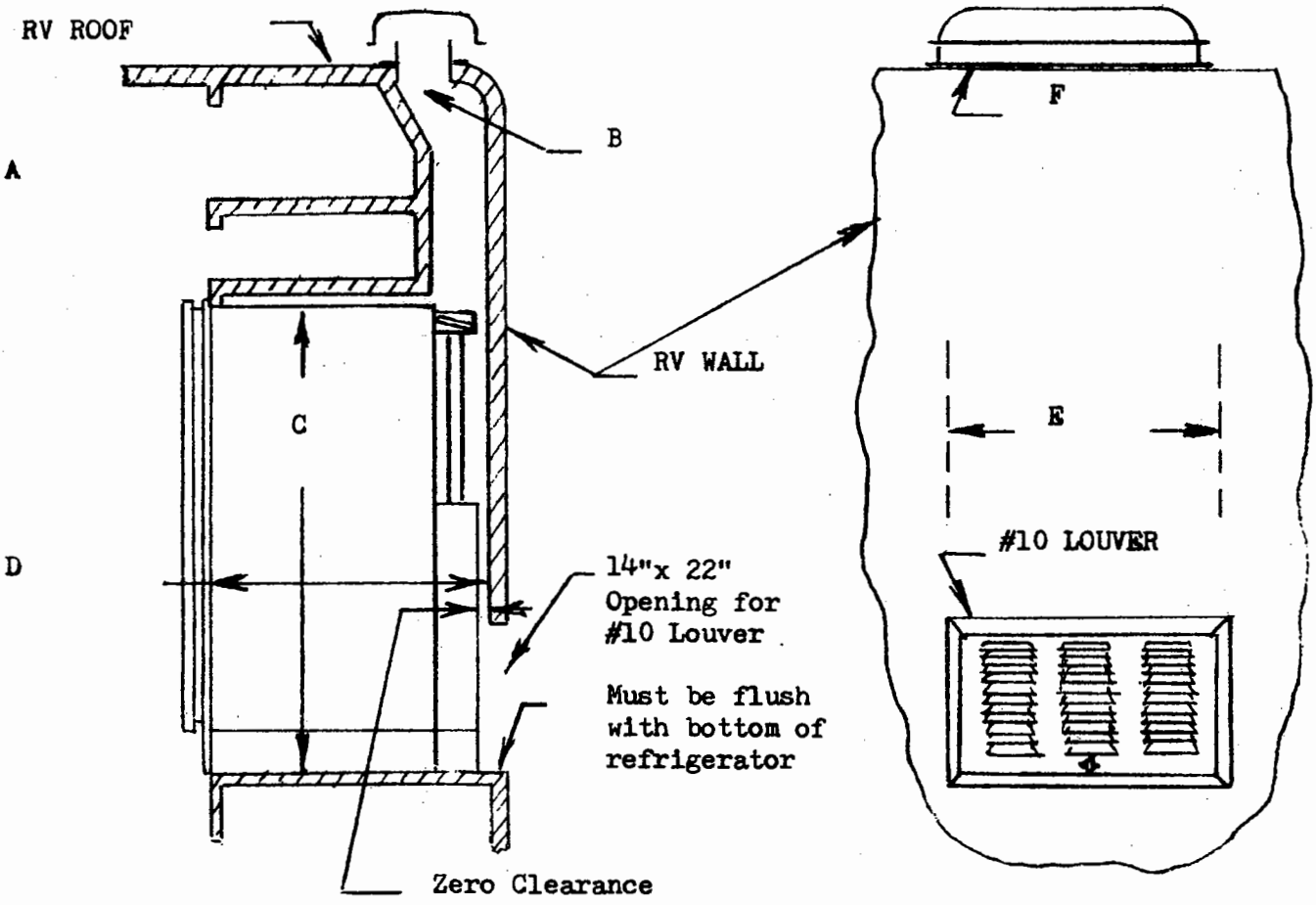
KIT NO. 1

Service Door #10 (Fig. 2)
Roof Vent #20 (Fig. 3)

KIT NO. 2

Service Door #10 (Fig. 2)
Roof Vent #30 (Fig. 4)

CS-3, CS-4, CS-6 AND CS-10 INSTALLATION INSTRUCTIONS:



MODEL NO.	MIN. FOR DIM. "A"	DIM "B"	H DIM "C"	D DIM "D"	W DIM "E"	ROOF VENT
CS-3	2¼"	4¼ x 20½	31-1/8"	21-1/4"	21-9/16"	Coldstar #20
CS-4	2¼"	4¼ x 20½	33-5/8"	23-3/4"	21-9/16"	Coldstar #20
CS-6	2¼"	4¼ x 20½	41-1/4"	23-3/4"	21-9/16"	Coldstar #20
CS-10	2¼"	5 x 24	56-7/8"	23-1/16"	23-7/16"	Coldstar #30

FIGURE 1

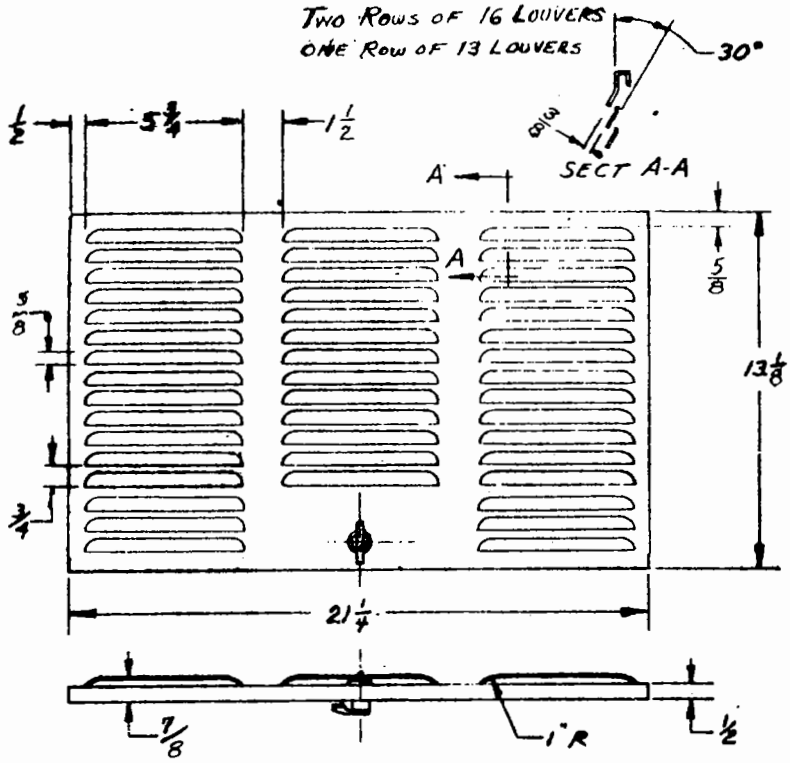


FIG. 2 SERVICE DOOR #10

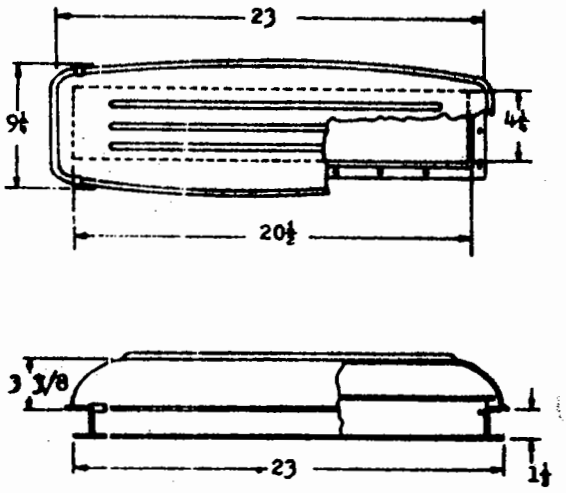


FIG. 3 ROOF VENT #20

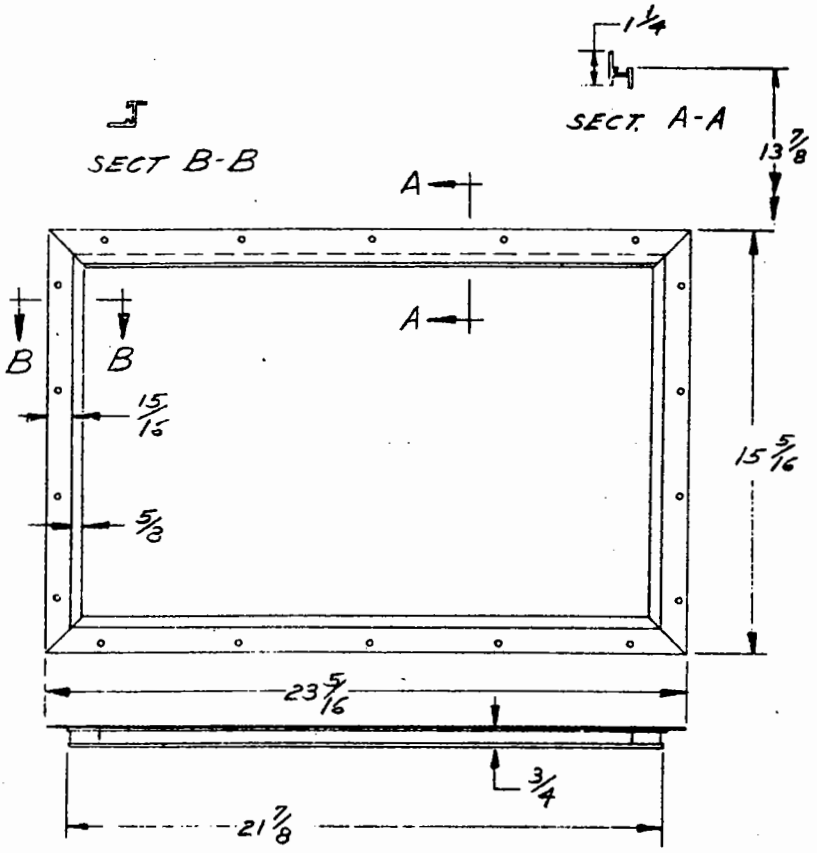


FIG. 2A service door frame

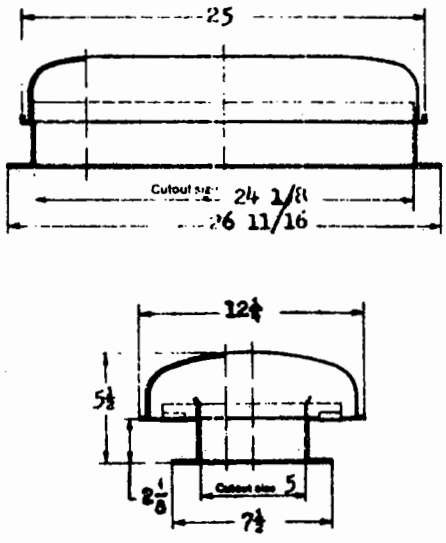


FIG. 4 ROOF VENT #30

REFRIGERATOR	#CS-3	Uses Vent Kit #1
	#CS-4	Uses Vent Kit #1
	#CS-6	Uses Vent Kit #1
	#CS-10	Uses Vent Kit #2

DIMENSIONS

REFRIGERATOR	OVERALL DIMENSIONS			RECESS DIMENSIONS		
MODEL NO.	HEIGHT	WIDTH	DEPTH	HEIGHT	WIDTH	DEPTH
CS-3	31-5/16	22-13/16	23-5/8	31-1/8	21-9/16	21-1/4
CS-4	33-7/8	22-13/16	25-13/16	33-5/8	21-9/16	23-3/4
CS-6	41-1/2	22-13/16	25-13/16	41-1/4	21-9/16	23-3/4
CS-10	57-3/8	24-11/16	25-5/16	56-7/8	23-7/16	23-1/16

PANEL DIMENSIONS

Max. Thickness - 3/16"

REFRIGERATOR	HEIGHT		WIDTH	
MODEL NO.	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
CS-3	28-3/8	28	22	21-3/4
CS-4	30-3/4	30-1/4	22	21-3/4
CS-6	39	38-3/8	22	21-3/4
CS-10 Top -	14-1/8	13-1/2	24	23-3/4
Bottom -	38	37-1/2	24	23-3/4

STORAGE VOLUMES

REFRIGERATOR MODEL NO.	TOTAL STORAGE VOLUME IN CU. FT.
CS-3	3.0
CS-4	3.9
CS-6	5.6
CS-10	8.0

The minimum clearances to combustible materials as certified by the American Gas Association and the Canadian Gas Association are as follows:

Top: 0 inches: Sides: 0 inches: Back: 0 inches: Floor: 0 inches

The back clearance is measured between the rearmost part of the refrigerator and the wall behind the refrigerator.

Since an absorption type refrigerator depends upon air circulation through the cooling unit for good operation, it is necessary that it be installed so that the air behind and above the unit is unrestricted. The refrigerator must be enclosed at the bottom, top and sides to exclude any pockets of hot air. All joints in the enclosure must be tight to assure that no combustion products enter the living area. This is an ANSI-119.2 requirement that must be adhered to. Before the outside vent is installed look at the back of the refrigerator to make sure there is "0" clearance at the sides and top of the refrigerator cabinet. Any gaps should be filled with coulking compound or fiberglass insulation. Be sure that the area around the condenser fins is completely clear. The roof vent must be located directly above the condenser fins and flue system of the refrigerator. Roof cut-out openings must be exactly the same as the roof vent opening. This will induce a chimney action which enables the hot air to escape while permitting cool air to be drawn in through the lower vent.

NOTE: Failure to comply with these instructions or use of Vent Kits other than those prescribed in these installation instructions may result in red tagging by the Recreational Vehicle Institute Inspector.

COLDSTAR'S SLIDE OUT CONTROL TRAY

All COLDSTAR refrigerators are equipped with a unique slide out control tray, which affords servicing of most components from the inside of the coach, eliminating the necessity for removal and replacement of the refrigerator. All control parts are totally interchangable between all models of COLDSTAR refrigerators.

To service control tray from inside the coach:

1. Disconnect gas connection to the burner, loosen thermocouple nut & remove thermocouple sensing bulb from the receptacle, loosen piezo igniter bracket screw & remove piezo igniter tip from within burner bracket.

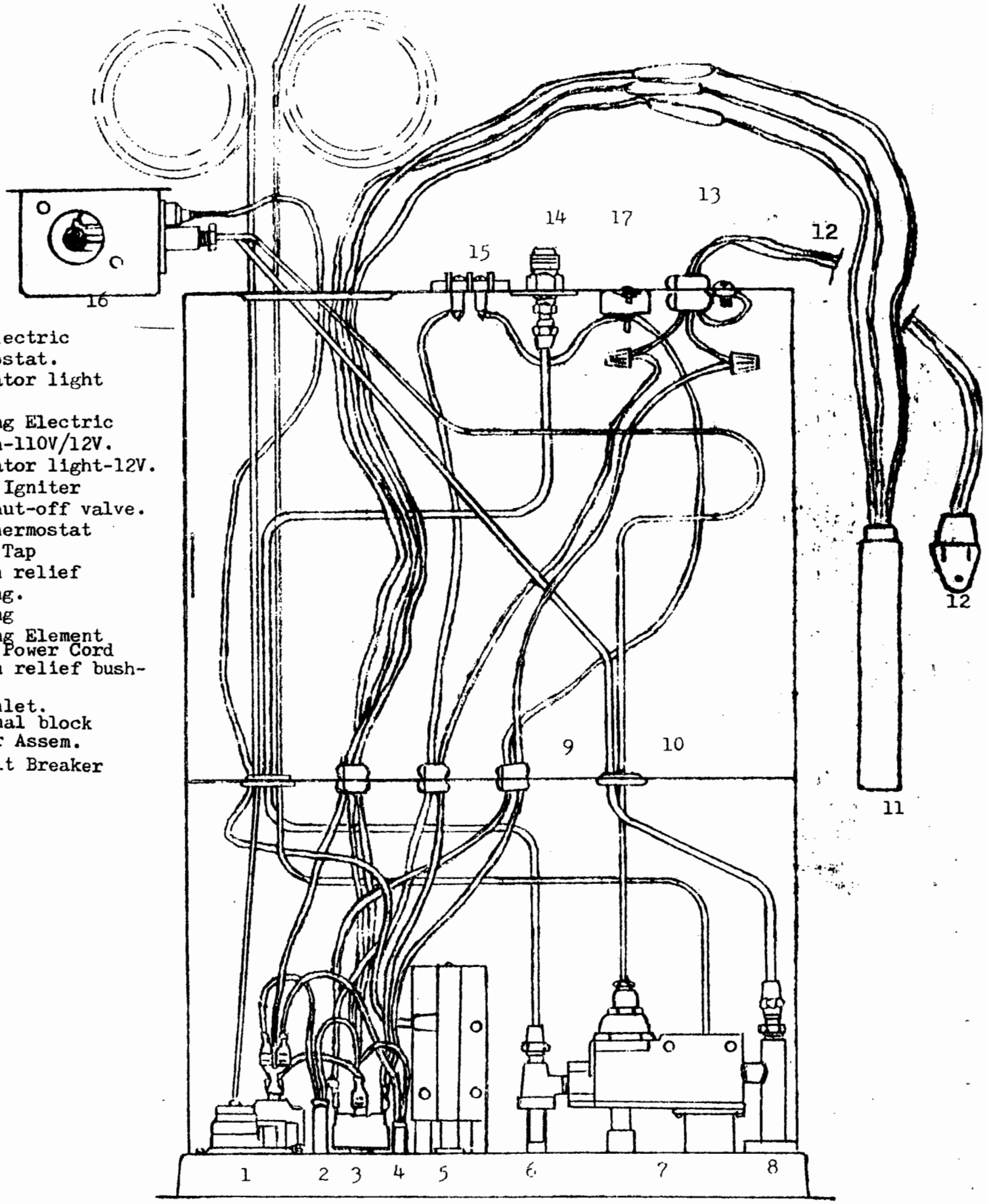
2. Disconnect color coded heating element wires between the heating element and the control panel assembly.

3. From the front of the refrigerator, remove (2) control panel screws and slide out the control panel forward approximately 8 to 10 inches.

4. Remove control knobs from gas and electric thermostats and remove bezel from control panel.

5. All controls with the exception of gas & electric thermostats can now be inspected and replaced if necessary.

6. Replacement of either the gas or electric thermostats necessitates removal of the refrigerator from enclosure for access to the thermostat capillary tubes. Slide out control tray from CS-3 refrigerator may be used on all models of COLDSTAR refrigerators and CS-4 and CS-6 control trays are directly interchanable.



1. G/E Electric Thermostat.
2. Indicator light 110v.
3. Carling Electric Switch-110V/12V.
4. Indicator light-12V.
5. Piezo Igniter
6. Gas shut-off valve.
7. Gas Thermostat
8. Pres. Tap
9. Strain relief bushing.
10. Bushing
11. Heating Element
12. A. C. Power Cord
13. Strain relief bushing.
14. Gas Inlet.
15. Terminal block
16. Burner Assem.
17. Circuit Breaker

Fig. 5

I. GENERAL INSTRUCTION:

These refrigerators are design certified by the American Gas Association and Canadian Gas Association for installation in Recreational Vehicles or Mobile Homes. To meet this certification installation will normally be done by the vehicle manufacturer or your dealer.

The installation must confirm with the following American National Standards:

1. Mobile Homes, A119.1-1975
2. Recreational Vehicles, A119.2-1975
3. National Electrical Code, ANSI CI-1975
4. National Fuel Gas Code, ANSI Z223.1-1974
5. Any applicable local code.

The unit must be electrically grounded in accordance with the National Electrical Code, ANSI CI-1975 when installed if an external alternating current electrical source is utilized.

If installation is made in Canada, it must conform to applicable Canadian Standards.

1. Gas Installation Code, B149
2. Gas Equipped Recreational Vehicles and Mobile Homes, B210.1
3. Electrical Installation Code, C22.1

II. INSTALLATION:

Because considerable weight must be supported while in transit the refrigerator must be installed on a solid floor and secured in place by running screws through holes in the base support rails into the floor. The platform on which the refrigerator is set must be level with the floor of the recreational vehicle. The gasket and clearance holes have been provided in the body flange to insure complete sealing of the refrigerator combustion system from the interior of the vehicle.

Methods of installation are shown in Fig. 1. The refrigerator must be installed with the ventilation air kit supplied with the refrigerator. The lower vent, #10 must be placed so that the bottom of the cut-out is even with the base of the refrigerator. This vent frame is provided with vent holes which must not be plugged or closed. These holes provide ventilation for heavier than air fuel gases.

REINSTALLATION:

When refrigerator is removed for servicing and reinstalled again, the seal around the refrigerator cabinet flange must be thoroughly checked to insure complete separation of the combustion system from the interior of the Recreational Vehicle. If any portion of the seal is damaged or out of position, it must be replaced with comparable sealing material.

VENT KITS

Each refrigerator is approved with a certain combination of vent kits assembled as follows:

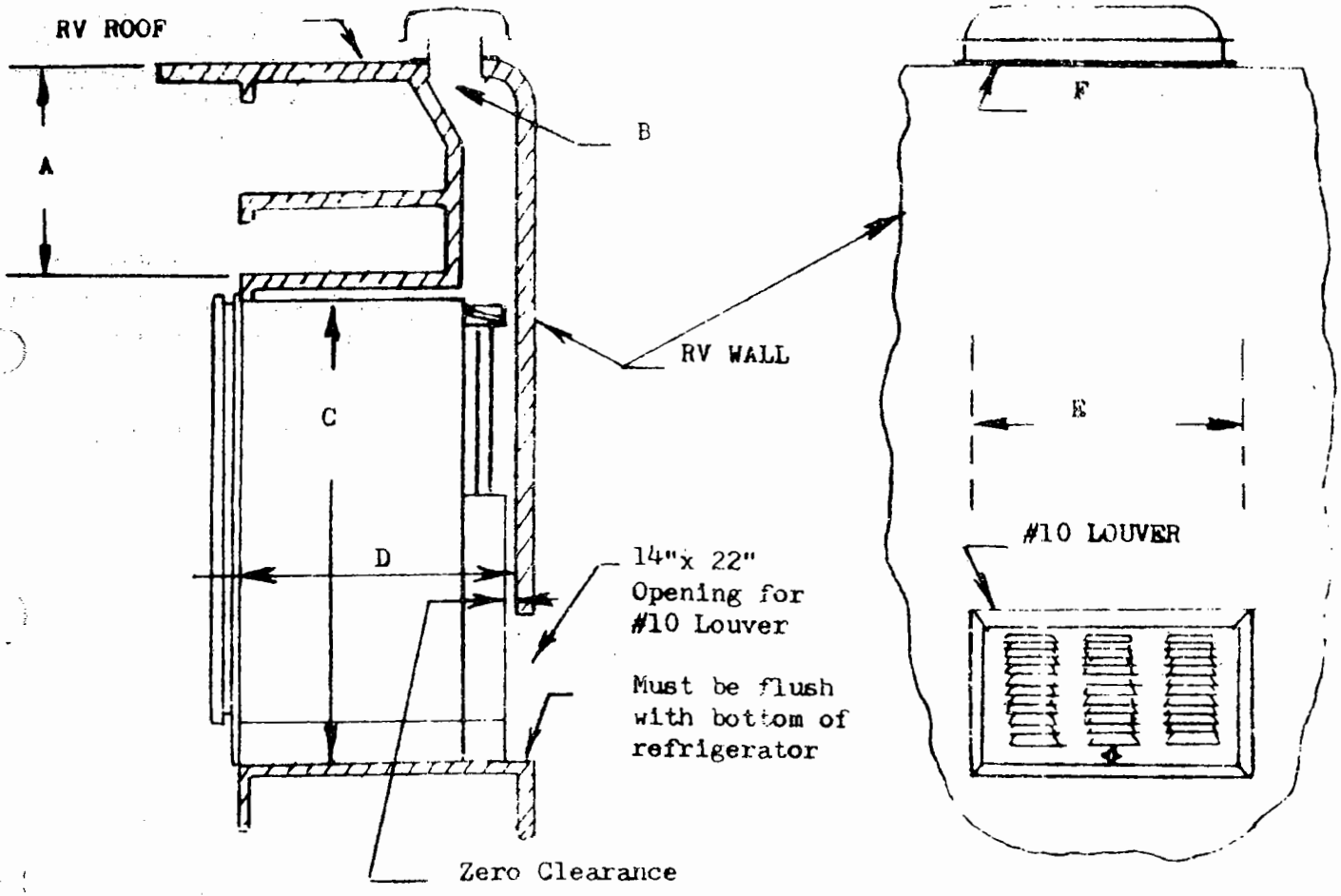
KIT NO. 1

Service Door #10 (Fig. 2)
Roof Vent #20 (Fig. 3)

KIT NO. 2

Service Door #10 (Fig. 2)
Roof Vent #30 (Fig. 4)

SL-4 G/E & SL-4 T/N, SL-6 G/E & SL-6 T/N, CS-8 G/E & CS-8 T/N, CS-3, CS-4, CS-6 AND CS-10 INSTALLATION INSTRUCTIONS



MODEL NO.	MIN. FOR DIM. "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	"F" ROOF VENT
CS-3	2¼"	4¼ x 20½	31-1/8"	21-1/4"	21-9/16"	Coldstar #20
CS-4	2¼"	4¼ x 20½	33-5/8"	23-3/4"	2 -9/16"	Coldstar #20
CS-6	2¼"	4¼ x 20½	41-1/4"	23-3/4"	21-9/16"	Coldstar #20
CS-10	2¼"	5 x 24	56-7/8"	23-1/16"	23-7/16"	Coldstar #30
SL-4 G/E & SL-4 T/N	2¼"	4¼ x20½	33-3/4"	22-¼"	20-½"	Coldstar #20
SL-6 G/E & SL-6 T/N	2¼"	4¼ x20½	39-½"	22-3/4"	22"	Coldstar #20
CS-8 G/E & CS-8 T/N	2¼"	4¼ x20½	52-7/16"	22-3/4"	22"	Coldstar #20

Figure 1

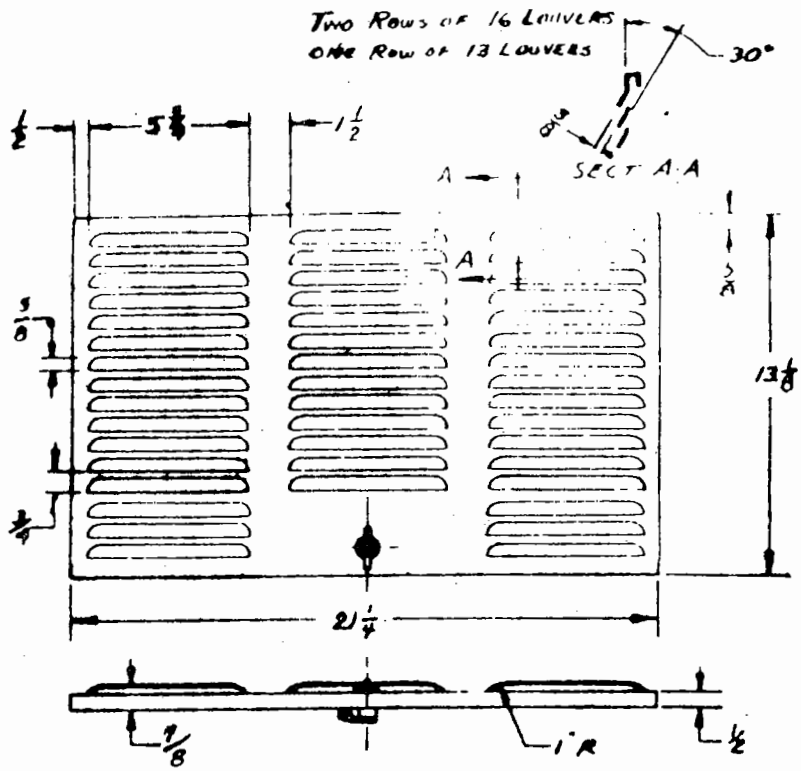


FIG. 2 SERVICE DOOR #10

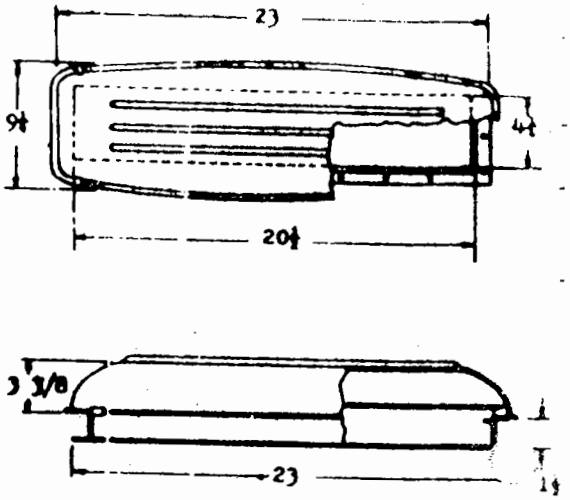


FIG. 3 ROOF VENT #20

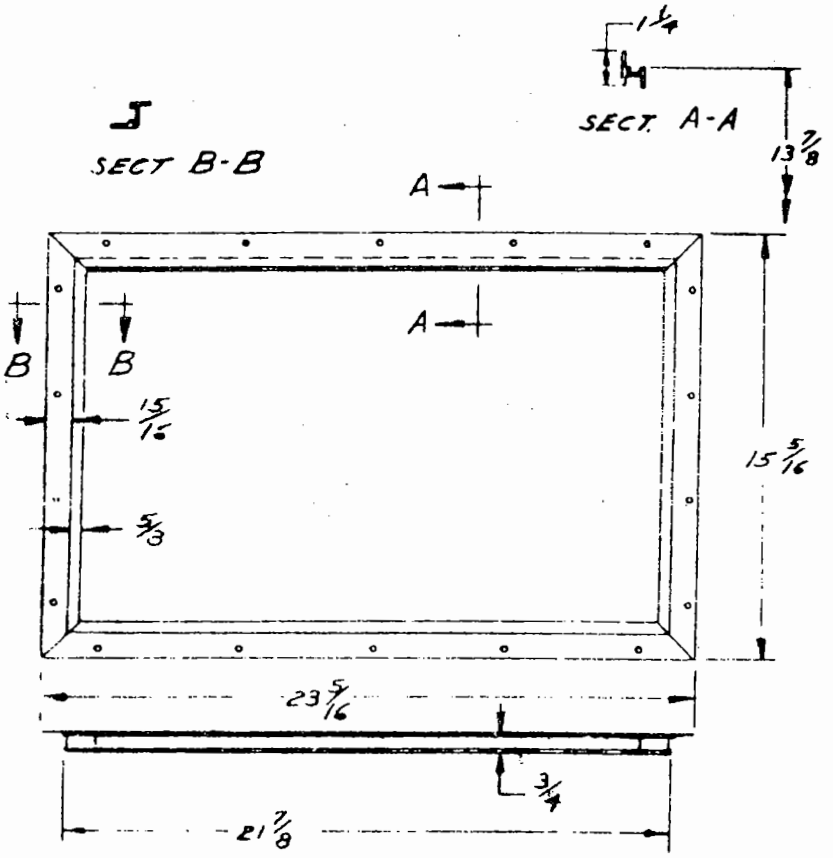


FIG. 2A service door frame

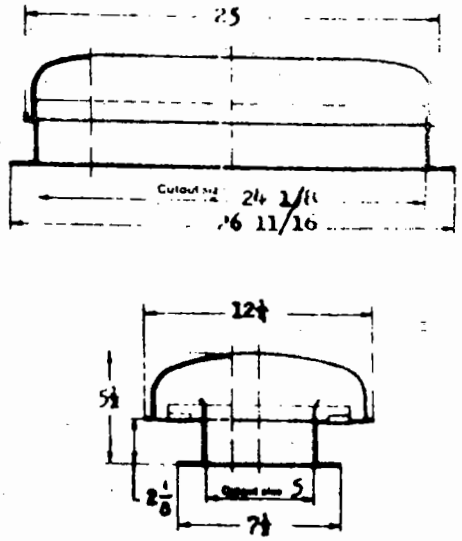


FIG. 4 ROOF VENT #30

REFRIGERATOR # SL4 Uses Vent Kit #1
SL6 Uses Vent Kit #1
CS8 Uses Vent Kit #1

DIMENSIONS

REFRIGERATOR MODEL NO.	OVERALL DIMENSIONS HEIGHT	WIDTH	DEPTH	RECESS DIMENSIONS HEIGHT	WIDTH	DEPTH
SL 4	34	21 1/4	24 5/16	33 3/4	20 1/2	22 1/4
SL 6	39 3/4	22 3/4	24 15/16	39 1/2	22	22 3/4
CS 8	52 11/16	23 1/8	25 3/16	52 7/16	22	22 3/4

PANEL DIMENSIONS
Max. Thickness = 3/16"

REFRIGERATOR MODEL NO.		HEIGHT MAXIMUM	HEIGHT MINIMUM	WIDTH MAXIMUM	WIDTH MINIMUM
SL 4		32 7/8	32 1/8	21 1/8	20 3/4
SL 6		38 5/8	37 7/8	22 5/8	22 1/4
CS 8	Top	12 5/8	12 1/8	22 5/8	22 1/4
	Bottom	36 1/4	35 3/4	22 5/8	22 1/4

STORAGE VOLUMES

REFRIGERATOR MODEL NO.	TOTAL STORAGE VOLUME IN CU.FT.
SL 4	3,2
SL 6	4,2
CS 8	5,98

REFRIGERATOR #CS-3 Uses Vent Kit #1
#CS-4 Uses Vent Kit #1
#CS-6 Uses Vent Kit #1
#CS-10 Uses Vent Kit #2

DIMENSIONS

REFRIGERATOR MODEL NO.	OVERALL DIMENSIONS HEIGHT	WIDTH	DEPTH	RECESS DIMENSIONS HEIGHT	WIDTH	DEPTH
CS-3	31-5/16	22-13/16	23-5/8	31-1/8	21-9/16	21-1/4
CS-4	33-7/8	22-13/16	25-13/16	33-5/8	21-9/16	23-3/4
CS-6	41-1/2	22-13/16	25-13/16	41-1/4	21-9/16	23-3/4
CS-10	57-3/8	24-11/16	25-5/16	56-7/8	23-7/16	23-1/16

PANEL DIMENSIONS

Max. Thickness = 3/16"

REFRIGERATOR MODEL NO.		HEIGHT MAXIMUM	HEIGHT MINIMUM	WIDTH MAXIMUM	WIDTH MINIMUM
CS-3		28-3/4	28	22	21-3/4
CS-4		31-1/4	30-1/2	22	21-3/4
CS-6		38-7/8	38-1/4	22	21-3/4
CS-10	Top -	14-1/8	13-1/2	24	23-5/8
	Bottom -	38	37-1/2	24	23-5/8

STORAGE VOLUMES

REFRIGERATOR MODEL NO.	TOTAL STORAGE VOLUME IN CU.FT.
CS-3	3.0
CS-4	3.9
CS-6	5.6
CS-10	8.0

The minimum clearances to combustible materials as certified by the American Gas Association and the Canadian Gas Association are as follows:

Top: 0 inches; Sides: 0 inches; Back: 0 inches; Floor: 0 inches

The back clearance is measured between the rearmost part of the refrigerator and the wall behind the refrigerator.

Since an absorption type refrigerator depends upon air circulation through the cooling unit for good operation, it is necessary that it be installed so that the air behind and above the unit is unrestricted. The refrigerator must be enclosed at the bottom, top and sides to exclude any pockets of hot air. All joints in the enclosure must be tight to assure that no combustion products enter the living area. This is an AN51-119.2 requirement that must be adhered to. Before the outside vent is installed look at the back of the refrigerator to make sure there is "0" clearance at the sides and top of the refrigerator cabinet. Any gaps should be filled with caulking compound or fiberglass insulation. Be sure that the area around the condenser fins is completely clear. The roof vent must be located directly above the condenser fins and flue system of the refrigerator. Roof cut-out openings must be exactly the same as the roof vent opening. This will induce a chimney action which enables the hot air to escape while permitting cool air to be drawn in through the lower vent.

NOTE: Failure to comply with these instructions or use of Vent Kits other than those prescribed in these installation instructions may result in red tagging by the Recreational Vehicle Institute Inspector.

GAS CONNECTIONS

The gas inlet is a 3/8" SAE. Male flare tube fitting. It is recommended that 3/8" copper tubing be used for the gas supply line. The gas line must be free of kinks and sharp bends and it should be positioned in such a way that it will not be damaged when the refrigerator is slid in or out of the recess. LP gas is highly flammable and all joints in piping from the LP tank to the appliance must be absolutely tight.

After installation the gas should be turned on and all joints checked for leaks up to the burner with a solution of soap and water. Do not use a match or open flame to test for gas leaks. Occasionally connections become loose during shipment or from vibration while in transit and this method of testing with soap and water should be done periodically on all the gas fittings. The gas pressure at the burner must be 11 in water column. The burner must be lit after the manometer has been connected to the pressure tap. The manometer must be removed after checking and the 1/8" pipe plug put back in.

NOTE:

Any work involving gas piping must be done by the trailer manufacturer or by an authorized service dealer. If you feel that something is wrong with the gas performance, go to your authorized service dealer. The customer must not attempt any job that involves the loosening of a gas connection.

ELECTRICAL CONNECTION - 115 VOLTS

This refrigerator is equipped with a three-prong grounding plug for your protection against shock hazards and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from the plug. See Figure 6 electrical wiring diagram for 115V and 12V.

ELECTRICAL CONNECTION - 12 VOLT DC

The wiring must be heavy enough to handle the current rating shown on the nameplate. Connections must be made to the terminal block marked 12V DC, at the back of the refrigerator.

The wire gauge should be chosen with consideration, to the wire length in accordance with the following table. The wire must be stranded copper wire with a minimum of 30 mils (1/32") thermoplastic insulation rated at least 60° C.

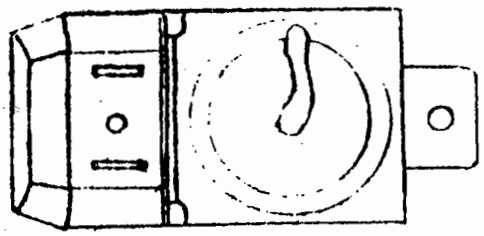
MAXIMUM TWO CONDUCTOR WIRE LENGTH IN FEET

AWG	CS-3 140 WATTS	CS-4 160 WATTS	CS-6 180 WATTS	CS-10 290 WATTS	GL-4 TW 170 WATTS
14	9	8	7	4	8
12	15	14	12	7	14
10	25	23	19	12	23
8	40	38	31	19	38
6	64	60	49	31	60

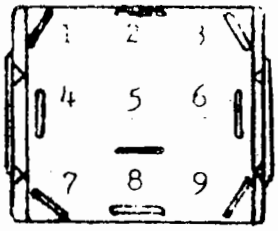
AWG	SL-6TW 240 WATTS	CS-8TW 250 WATTS
14	6	5
12	10	9
10	17	15
8	28	26
6	45	40

The body or chassis of the vehicle should not be used as a substitute for either of the two conductors. No other electrical equipment should be connected to the refrigerator circuit.

G/E Electric
Thermostat
Top Terminal
Black/black/white
Bottom terminal
White



Carling Electric Switch
grooved side
of shaft is
on this side



1. White
2. Black/yellow
3. None
4. None
5. Black/red
6. Red
7. White
8. White
9. Red

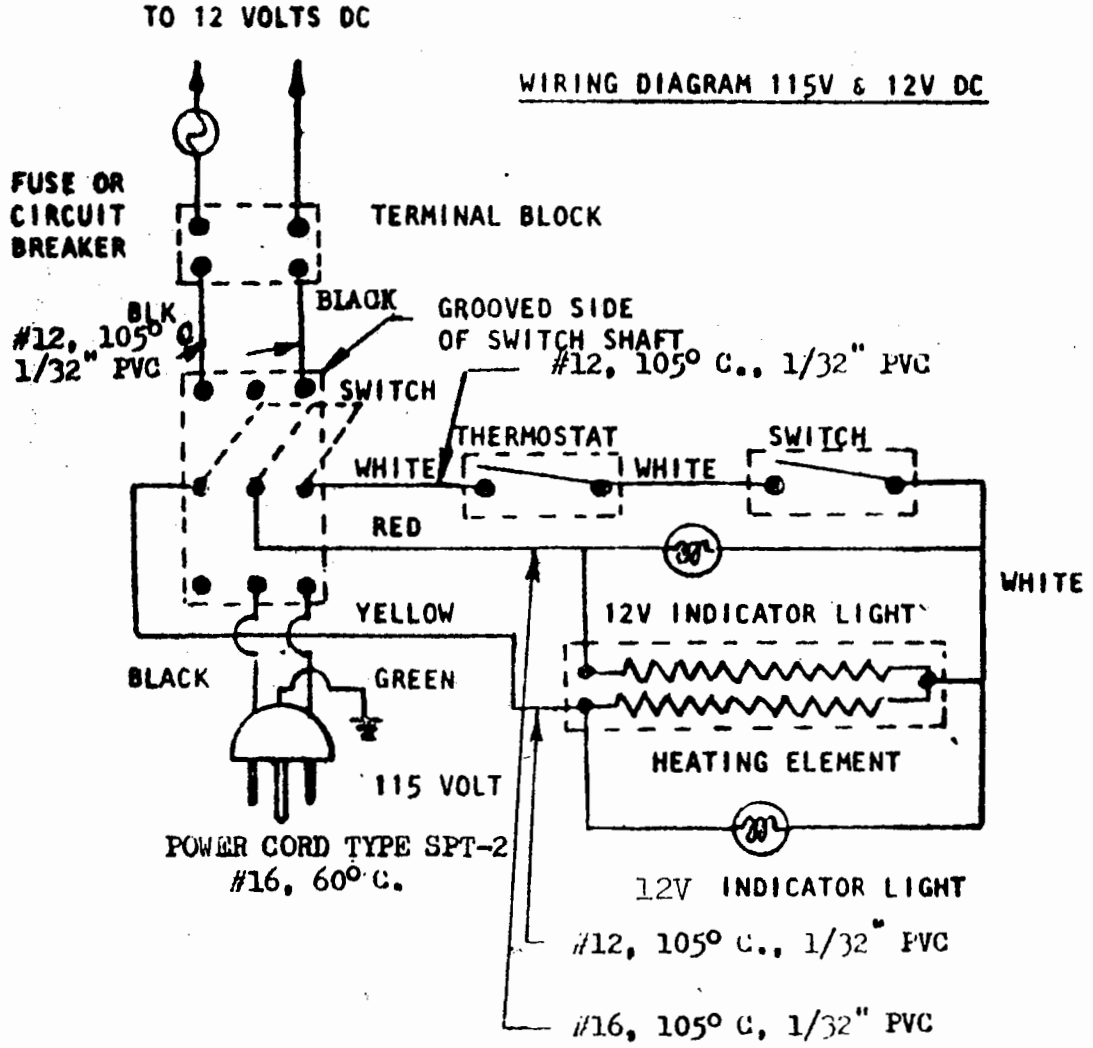


Fig. 12

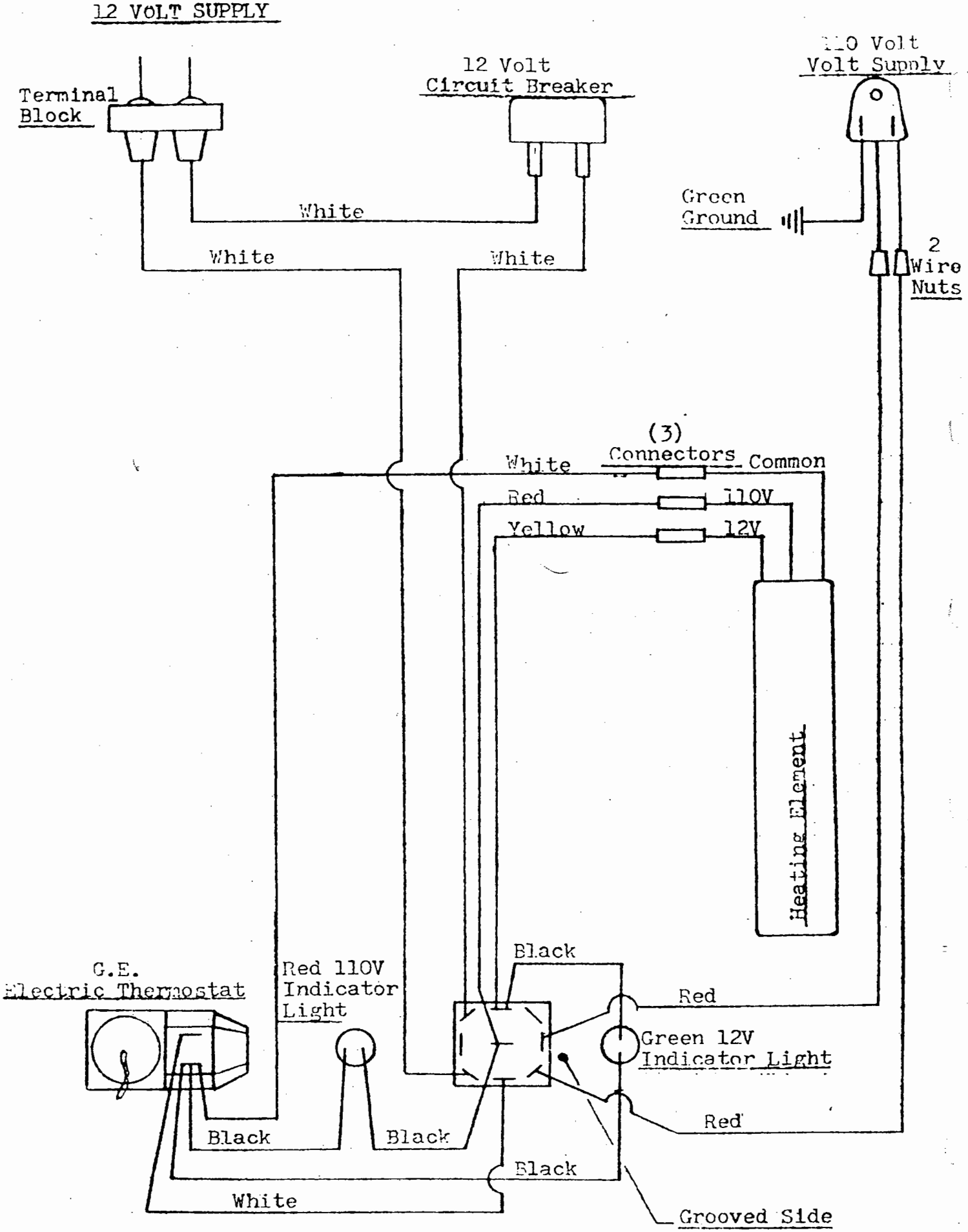

12 VOLT SUPPLY
Terminal Block
12 Volt Circuit Breaker
110 Volt Volt Supply
White
Green Ground
White
White
2 Wire Nuts
(3) Connectors
White
Common
Red
110V
Yellow
12V
Heating Element
G.E. Electric Thermostat
Red 110V Indicator Light
Black
Red
Green 12V Indicator Light
Red
Black
Black
Black
White
Grooved Side

Fig. 13

ELECTRICAL EQUIPMENT

All wiring in COLDSTAR refrigerators is color coded. Color coding is uniform throughout all models.

To operate COLDSTAR refrigerators on electrical mode of operation, flip the selector switch to either 110V or 12V position, as desired, and set the G.E. electric thermostat to desired temperature. Red indicator light (green on 12V) should be on when the 110V mode of operation is selected. Electric thermostat in "off" position will shut off the whole circuit, turning off the indicator lights. If the indicator light stays on while the electric thermostat is in "off" position it is an indication of either shorted wires or defective electric thermostat. If the indicator lights will not go on while the electric thermostat is in any position, except "off", it is an indication of either a loose wire or defective indicator light.

Low line voltage or an undercharged battery will result in a poor performance of the refrigerator, therefore, before doing anything else, line voltage and battery charge must be checked. If the refrigerator performs well on gas and 110V, but the performance is poor on 12V, cause may be insuffieient gauge of 12V lead in wires.

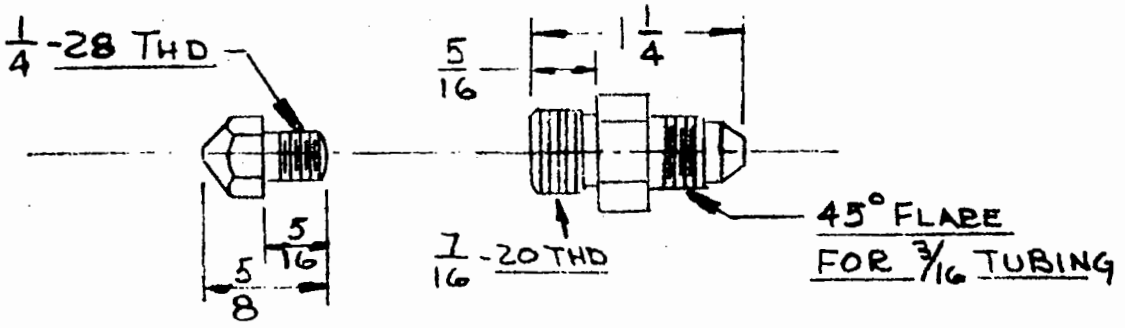
Despite popular belief, the absorption type refrigerator will perform equally well on gas, 110V or 12V, everything else being equal. After all, different sources of energy are used for exactly the same purpose, namely to heat the generator section of the cooling unit, and the cooling unit can not distinguish weather it is being heated by gas, 110V or 12V!

To gain access to all controls, remove bezel from control panel by removing gas & electric thermostat knobs. When working on electrical equipment, color coding of wires must be strictly observed. Replacement of any part of gas equipment must be followed by pressure gas leak check, as specified by RVIA.

Older models of COLDSTAR refrigerators were equipped with an automotive type 12 volt 20 amp. fuse holder & fuse. Fuse holder & fuse were replaced in newer models with automatic circuit breaker, which resets itself, once the short or an overload in the 12 volt system has been eliminated.

Gas orifice and holder;

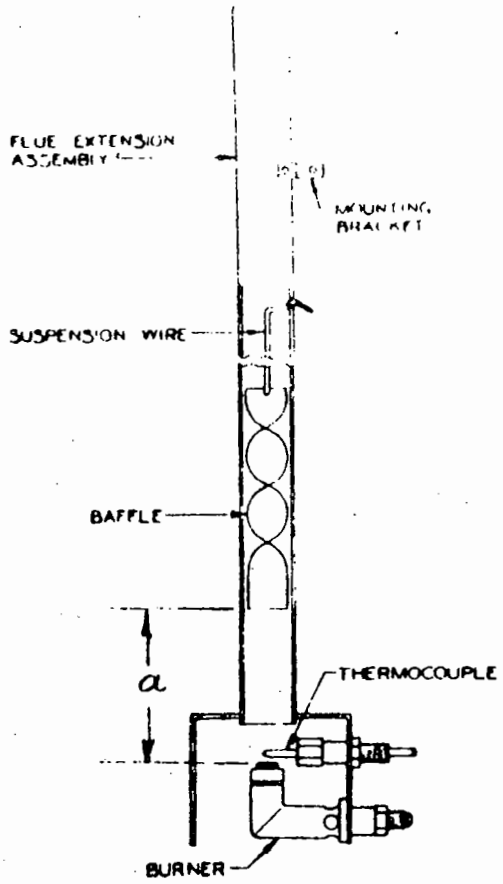
Gas orifice and holder are accessable through the louvered service door, from the outside of the coach. It is not necessary to remove the flame shield in order to remove and replace the orifice. When removing or re-installing orifice always use (2) wrenches - 9/16" for the orifice and ½" for the gas line brass nut. Orifice may be soaked in alcohol and blown out with compressed air. Under no circumstances should the orifice be subject to cleaning with a needle, wire or the like as this will permanently alter the rate of flow of propane gas through the orifice.



ORIFICE & HOLDER Fig. 11

ORIFICE SIZES BY MODELS

MODEL NO.	BTU/H
CS-3	1100
CS-4	1020
CS-6	1075
CS-8	1500
CS-10	1600
GL-4	1100
SL/GL-6	1445



FLUE ASSEMBLY Fig. 10

FLUE BAFFLE HEIGHT CHART

MODEL NO.	DIM. A
CS-3	5-3/4"
CS-4	3"
CS-6	5-3/4"
CS-10	6"

It is absolutely essential for efficient gas operation to have the flue baffle positioned in exact location for respective models of refrigerators as specified in above chart. Flue baffle should never be permitted to slip down and rest on the burner as this will produce incomplete combustion and deadly carbon monoxide gas.

Periodic cleaning of flue assembly is also essential to the safe and efficient operation of an absorption type refrigerator and is an owner's responsibility.

TO CLEAN FLUE ASSEMBLY:

1. Remove burner bracket flame guard, and wrap a piece of plastic (Saran Wrap) over the burner, thermocouple & Piezo igniter tip.

2. Remove mounting bracket screw, lift off flue extension assembly and remove baffle from the flue.

3. With suitable wire brush clean the flue from the top.

4. Clean the baffle with wire brush before replacing into flue.

5. Check to ascertain that the burner is centrally located in respect to the flue tube.

PIEZO IGNITER TIP:

Replacement of piezo igniter tip becomes necessary if either the ceramic part of the tip is broken or the wire electrode is loose in the ceramic.

To replace the piezo igniter tip, remove the flame shield. Loosen the piezo igniter tip bracket screw and swing the bracket away, pulling the piezo igniter tip through the slot in the burner bracket. Examine the ceramic part for cracks. The wire electrode should be firmly imbedded in the ceramic. If the defect is found, cut off piezo electrode lead wire as close to the piezo igniter tip as possible and remove the defective piezo igniter tip from the lead wire by unscrewing it from the wire. Place 1½" length of shrink tape over the lead wire and screw the new igniter tip into the center of the wire, until the ceramic shoulder is tight against the end of the lead wire. Slide shrink tape so as to cover both the ceramic and a portion of the lead wire and shrink the tape by applying heat all around the shrink tape. (Caution - applying too intense a heat to the shrink tape will melt it).

During the re-installation care must be taken to place the igniter tip into proper place so as to have igniter tip bracket lip located within the grove in the ceramic part. Adjust position of igniter tip to obtain maximum spark (wire electrode tip should be located approximately 1/16" away from the burner).

PENN CONTROLS

INSTALLATION AND OPERATION INSTRUCTIONS

TYPE G81FR

FORM 20007-400

GAS REFRIGERATOR VALVE

APPLICATION

This valve thermostatically controls gas-fired refrigerators used in mobile homes, camping trailers, etc. The temperature is regulated by high-low flame action with no OFF position. A separate "A" valve must be installed to manually shut off the gas supply. The BASO® safety valve closes if the burner flame is extinguished and provides 100% shutoff of all gas.

INSTALLATION

The G81FR valve may be mounted in any position. Do not install where it will be subjected to operating ambient temperatures below 32° F (0° C) or above 150° F (66° C). The maximum operating pressure is 0.5 psig. Nominal inlet to be 11" W.C.

Check gas type and pressure to be sure that correct valve is being installed. See Table 3.

When installing the valve on the manifold, be sure the gas flow through the valve is in the direction indicated on the body. Do not exert pressure on any part of the valve except on wrench flats at inlet.

A thread lubricant to prevent galling has been factory applied to the first two or three threads of valve inlet and outlet. Use an approved pipe-joint sealing compound on male threads before assembling. Take care to see that excess compound does not work into valve and get onto valve seats. Threads of pipe and nipples must be smooth and free of tears and burrs.

Attach thermocouple to burner securely and screw terminal end on valve. Be sure this electrical connection is clean and tight.

Insert the free end of the sensing element into the designated receptacle in the refrigerator. *A minimum of 6" of the sensing element must be in the controlled area.*

CHECKOUT PROCEDURE

After installation is completed, test for gas leaks with soap solution.

1. Close "A" valve, turn thermostat to the coldest setting and wait five minutes or more to permit unburned gas to dissipate, then reopen "A" valve.
2. Apply lighted match to main burner. Push reset button in and hold. The burner should ignite immediately. Continue to hold button down for 30 seconds. Burner should remain lighted when button is released.
3. Turn thermostat knob CCW to defrost position. The main burner should now be on low fire. There should be a stable blue flame which surrounds the tip of the thermocouple.

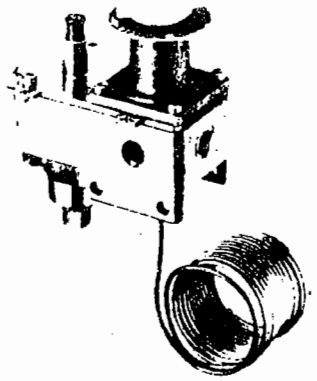


Fig. 1 — View of Type G81FR.

4. Turn thermostat to a position directly opposite defrost to obtain the approximate normal operating range.
5. To turn system off, close "A" valve and set thermostat to coldest setting.

Before leaving the installation, a complete operating cycle should be observed to see that all components are functioning properly.

SERVICE

Field servicing of this valve is limited to the replacement of the BASO power unit. Check replacement power unit number. Do not install a unit that is not specified for replacement.

To Replace Power Unit

1. Close "A" valve.
2. Disconnect thermocouple lead from power unit.
3. Remove power unit. When using a wrench on the power unit assembly, strike end of wrench with the heel of the hand in short, sharp blows until it loosens. Do not use a sustained heavy pull on the wrench.

   Make sure no dirt gets into valve body.
4. Install the replacement unit. Use a small amount of good thread lubricant to prevent galling when replacing assembly.
5. Check millivoltage output of the thermocouple and milliamp dropout range of the BASO power unit to see that they meet the values given in Table 1 and Table 2. Step-by-step procedures for these checks are included with Test Kit Y99AB-3.
6. Connect thermocouple lead to power unit.

After a replacement, check for gas leaks with soap solution. See "Checkout Procedure" for relighting burner.

SERVICE GUIDE

Problem	Probable Cause	Correction Needed
No burner flame or flame does not stay on.	Thermocouple out of position.	Reposition thermocouple properly.
	Thermocouple lead connection dirty or loose.	Clean and tighten thermocouple lead connection.
	Defective thermocouple.	Check thermocouple output per Table 1.
	Defective BASO power unit.	Check drop out range per Table 2.
	Defective orifice.	Clean or replace orifice.
	Unusually strong drafts.	Baffle secondary air or shield burner.
Burner remains on low fire.	Defective thermostat.	Replace entire control.
	Main gas pressure too low.	Check gas supply pressure.
	"A" valve partially closed.	Open "A" valve all the way.
	Defective orifice.	Clean or replace orifice.
	Valve gasways clogged.	Clean valve gasways
Burner remains on high flame.	Sensing element not properly located.	Insert at least 6" of sensing element.
	Defective thermostat.	Replace entire control.
Burner flame soft or yellow.	Burner air passage clogged.	Clean air passage.
	Flue clogged.	Clean flue.
	Defective or improper orifice.	Clean or replace orifice.
	Refrigerator not level.	Level refrigerator.
	Burner not centered under flue.	Reposition burner.
	Improper burner.	Replace burner.
Burner flame hard noisy or lifting	Defective or improper orifice.	Clean or replace orifice.
	Baffle missing in refrigerator flue.	Replace baffle.
	Improper burner.	Replace burner.

If BASO power unit is operative but control does not function properly, replace entire control. DO NOT ATTEMPT TO REPAIR.

TABLE 1 — THERMOCOUPLE OUTPUT

Thermocouple Lead Type	Turn Down	MV Range	
		Normal	Not Less Than
K15D (88D)	4MV	20-28	15
K16B (87D)	4MV	25-35	17

TABLE 2 — DROPOUT RANGE

Type Number	MA Range of Power Unit Assembly		Thermocouple Lead Type and Lengths
	Low	High	
G81FR	100	300	K15D(88D) up to 48" incl. K16B(87D) 60" to 72" incl.

TABLE 3 — VALVE APPLICATION

Type Number	For Use With
G81FR	2500 BTU/Cu. Ft., 1.53 Sp. Gr. LP or Propane Only.

REPAIRS AND REPLACEMENT

Field replaceable parts are listed in the following table. Other field repairs must not be made. If the entire valve needs servicing or repair, return it to the factory. When ordering a replacement valve, specify Product Number and Serial Number shown on the valve.

REPLACEMENT PARTS

Product Number	*BASO Power Unit Assembly Part Number
G81FR-1, -2	R43329-4

*Any attempt to repair this assembly voids the manufacturer's guarantee.

THESE DESIGNS TESTED TO

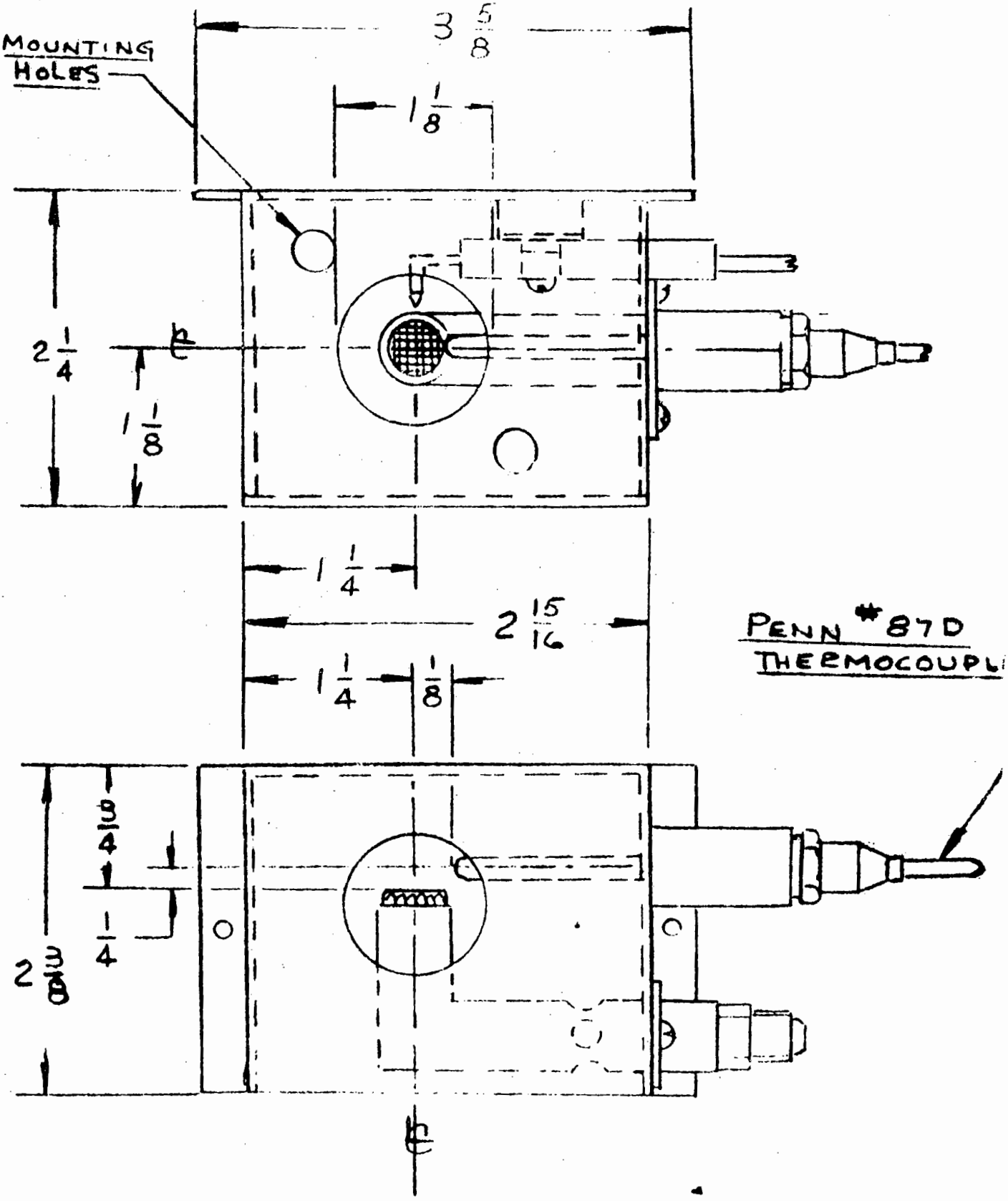
ANS Z21.20 AUTO. IGNITION SYSTEMS
ANS Z21.21 AUTO. VALVES
ANS Z21.23 THERMOSTATS

NOTE: This unit should be used only in applications which are within the limitations and provisions of the applicable American National and/or U.L. standards.

BASO | PENN CONTROLS
A DIVISION OF JOHNSON SERVICE COMPANY
4000 WEST BURNHAM STREET • MILWAUKEE • WISCONSIN 53215

Litho in U.S.A.

20007-400 10-5-75



BURNER BRKT. Fig. 9

GAS BURNER ASSEMBLY

Gas Burner assembly consists of following:

1. Burner bracket.
2. Flame shield.
3. Piezo igniter tip holding bracket.
4. Piezo bracket screw.
5. Gas burner.
6. Piezo igniter tip.
7. Thermocouple.
8. Burner holding screws.
9. Gas orifice and holder.

SERVICE OF GAS BURNER ASSEMBLY

1. Gas burner normally requires very little attention with the exception of periodic cleaning of the stainless steel screen. Burner must be replaced only if it is cracked or the stainless steel screen is damaged. To replace the burner, remove (2) screws holding the flame shield to the burner bracket and remove flame shield. Unscrew and remove orifice from gas burner. Unscrew and remove (2) brass screws holding the burner to the burner bracket and remove the burner from the assembly. During re-installation make sure that the burner is centrally located in respect to the flue tube. Shim if necessary.

2. Thermocouple: Proper position of the thermocouple sensing bulb is shown in Fig. #9. To replace thermocouple, break the connection at the gas burner by loosening and sliding the brass nut away from the burner. Next loosen and slide the brass nut away from the gas thermostat, pull thermocouple out from either end of the control panel.

OPERATION

All COLDSTAR cooling units are designed for a three-way operation, namely - propane gas, 115 volt or 12 volt electric current. Absorption type refrigerators have no compressors, motors, mechanical pumps or any moving parts at all, resulting in a dependable and totally silent operation. Fundamentals of any refrigeration are evaporation and condensation of liquids and gases. An absorption cycle has another phenomenon, characteristic to absorption refrigeration. Certain liquids and solids have properties to absorb gases at a low temperature and to expel them again at a higher temperature.

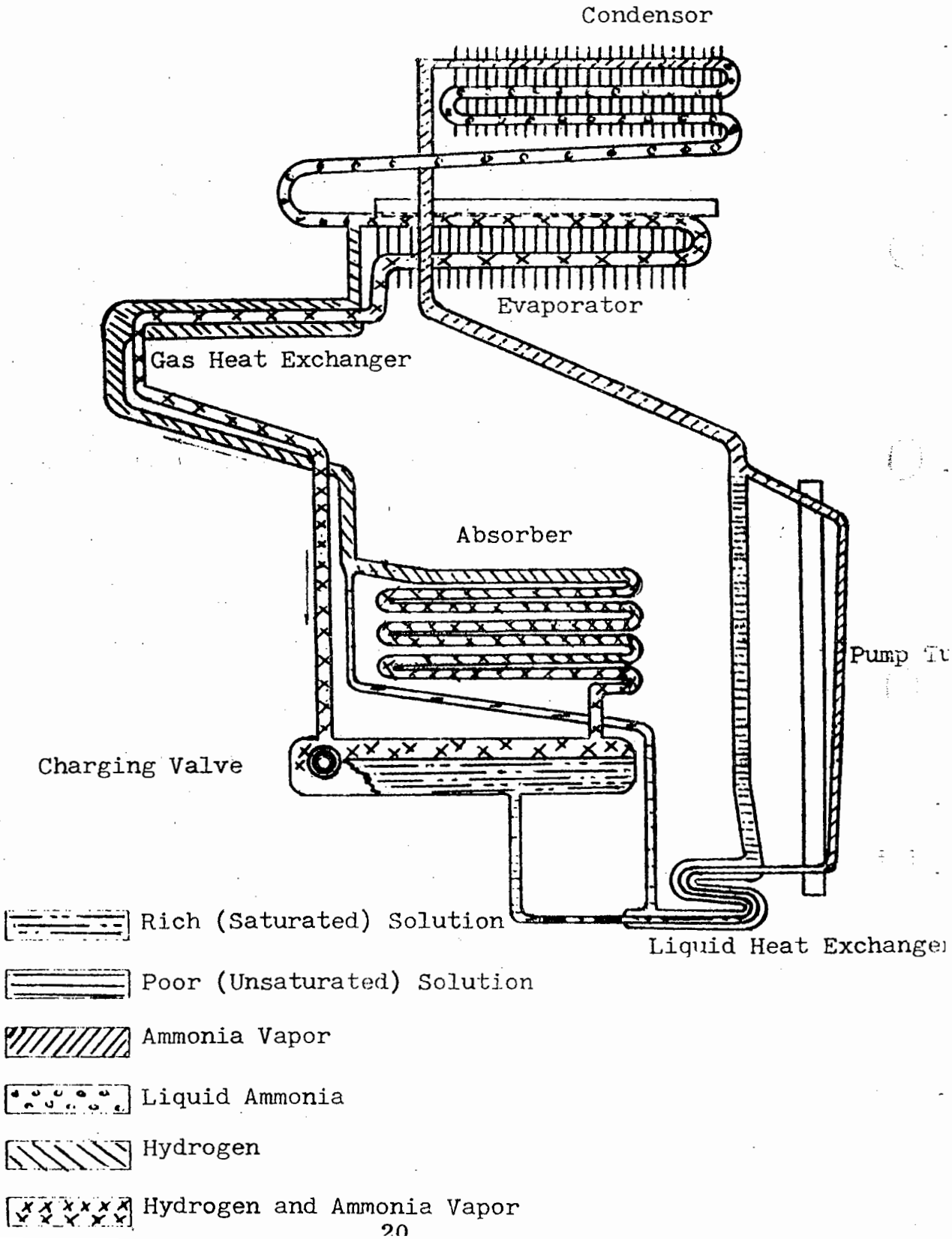
In an absorption cycle the refrigerant is ammonia and the absorbent medium is water for which ammonia has a great affinity. The entire system is pressurized with hydrogen gas. It must be noted here that some substances, ammonia for one, boil at a very low temperatures. Thus, the heat necessary for boiling of liquid ammonia is continously extracted from the freezer and food storage compartments of refrigerators, and a low temperature is maintained.

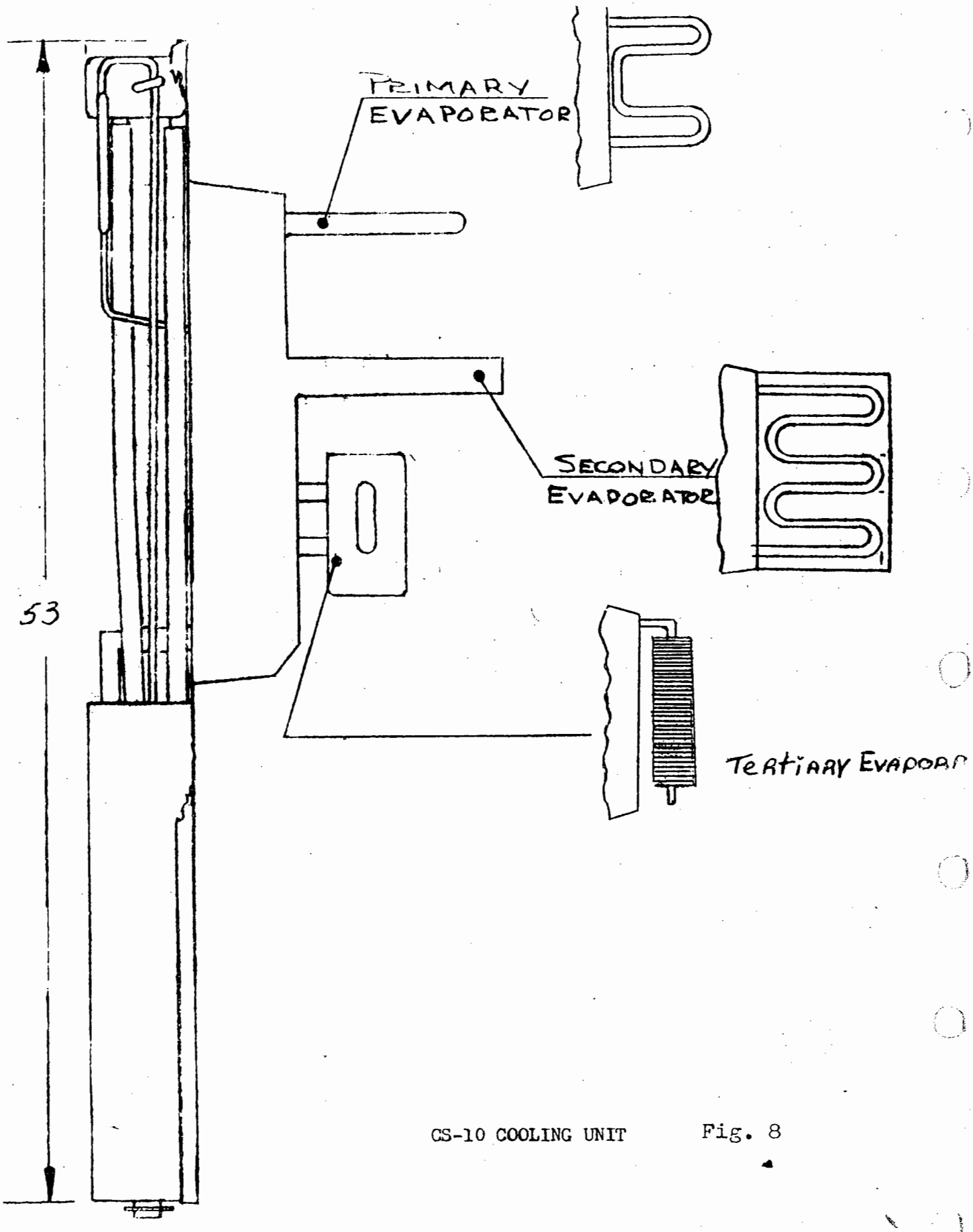
Basically, the absorption cooling cycle consists of expelling the ammonia in the form of gas out of the generator section by applying heat, condensing the ammonia gas into liquid in the condenser, liquid ammonia boiling in the evaporator section by absorbing heat within the freezer and food storage compartment, producing freezing and cooling effects.

Expanded ammonia gas in a mixture with hydrogen gas descends into the absorber tank and then rises back through absorber, while the weak solution from the generator is pumped into the uppermost part of the absorber coils. At this point ammonia gas is absorbed by weak solution (water) and ammonia water solution descends back into the generator through the absorber, while hydrogen, liberated by the absorption of ammonia by water, rises back into the evaporator section, thus completing the cycle. Propulsion of liquids and gases within an absorption type cooling unit depends on heat application and gravity, which necessitates leveling of the absorption type unit.

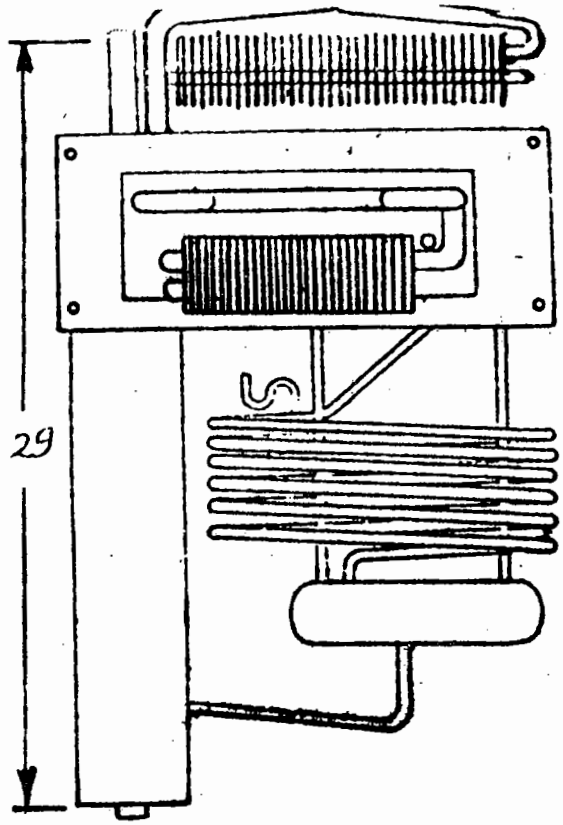
ABSORPTION COOLING UNIT DIAGRAM

Fig. 6

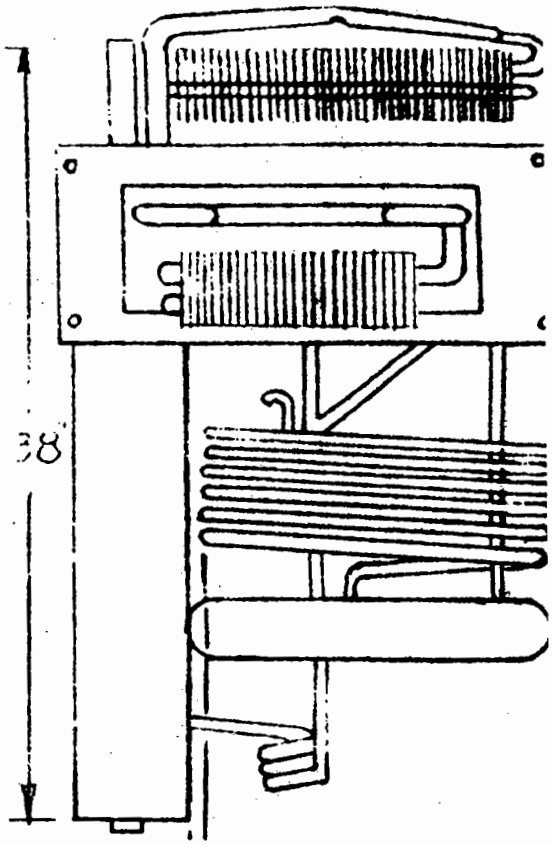




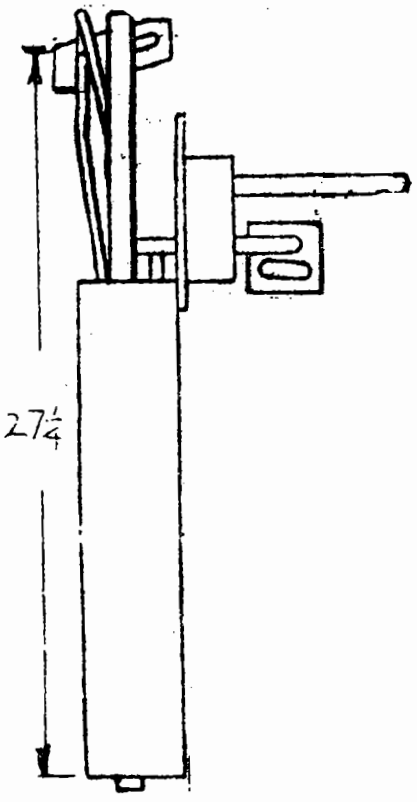
CS-10 COOLING UNIT Fig. 8



CS-4



CS-6



CS-3

COLDSTAR COOLING UNITS Fig. 7

TROUBLE SHOOTING

Absorption type cooling units are activated by applying heat to the pump tube of the unit. In as much as COLDSTAR'S cooling units are designed with a single pump tube, which is common to all three modes of operation, satisfactory performance on any one mode of operation even though the refrigerator does not work on the other two modes of operation, indicates soundness of the cooling unit.

If for example, a refrigerator works on 110V but does not work on gas or 12V, it is a definite indication that the cooling unit is sound and the trouble lies in 12V and gas equipment. Consequently, before deciding the cooling unit is defective, the refrigerator should be tested on all 3 modes of operation.

An incorrect heat distribution caused by partial insertion of the heating element into heating element receptacle will result in an excessive vaporization of ammonia in the generator section which will cause a partial or complete stoppage of refrigerant circulation throughout the cooling unit and consequently, poor refrigeration or no refrigeration at all.

Excessive vaporization of ammonia can also be caused by incorrect input on either the gas or electric operations.

To offset the blockage, refrigerator or the cooling unit must be removed complete, cooled down and turned upside down several times, thus permitting mixing of refrigerant in the absorber vessel with the refrigerant in the generator, restoring the liquid balance in the entire system. After this operation the refriterator should be started on maximum setting of gas or electric thermostat.

If the above procedure does not produce desired results and the tube between the generator and the condensor overheats, resulting in discoloration and blistering of the paint, the cooling unit is defective and must be replaced.

Before condemning the cooling unit, refrigerator should be operated for at least 12 hours on maximum setting of thermostat, making sure that the gas or electric input is correct. If the refrigerator performs satisfactory on maximum setting after 12 hours, but performance is marginal on any other setting, the fault lies with the thermostat rather than with the cooling unit. Of course, the ambient temperature must be taken into consideration.

A leak in a cooling unit may be detected either by ammonia smell inside the refrigerator or a visible trace of yellow deposit at the point of leakage. A leaking cooling unit must be replaced.

REMOVAL & REPLACEMENT OF COOLING UNITS CS-3, CS-4, CS-6 & CS-10

CS-10 ONLY

Remove screws holding aluminum freezer shelf to the freezing coils and pull the freezer shelf out of the freezer compartment.

ALL MODELS

1. Remove two screws holding the decorative aluminum grille from secondary evaporator and remove grille from cabinet.
2. Remove capillary (sensing) tubes of gas & electric thermostats from the secondary evaporator and through the back of the refrigerator, taking care not to damage them.
3. Unscrew and remove screws from the freezer compartment.
4. Unscrew and remove cooling unit back plate.
5. Disconnect gas line and thermocouple nuts from the burner orifice and burner bracket.
6. Remove burner bracket flame guard from burner bracket.
7. Loosen the piezo igniter bracket screw and remove piezo igniter tip from the burner bracket.
8. Disconnect three wire leads from the heating element to the control tray, noting color coding of wires.
9. Pull cooling unit out of the refrigerator cabinet.

TO RE-INSTALL COOLING UNIT INTO CABINET, REVERSE ABOVE PROCEDURE.

FILLING VALVE

Unit filling valve is sealed with an aluminum cap. Removal of cap or any tampering with unit filling valve will automatically void COLDSTAR'S warranty of the refrigerator.

Stuff any gaps between the cooling unit and the cabinet tightly with fiberglass.

COLDSTAR'S SLIDE OUT CONTROL TRAY

All COLDSTAR refrigerators are equipped with a unique slide out control tray, which affords servicing of most components from the inside of the coach, eliminating the necessity for removal and replacement of the refrigerator. All control parts are totally interchangable between all models of COLDSTAR refrigerators.

To service control tray from inside the coach:

1. Disconnect gas connection to the burner, loosen thermocouple nut & remove thermocouple sensing bulb from the receptacle, loosen piezo igniter bracket screw & remove piezo igniter tip from within burner bracket.

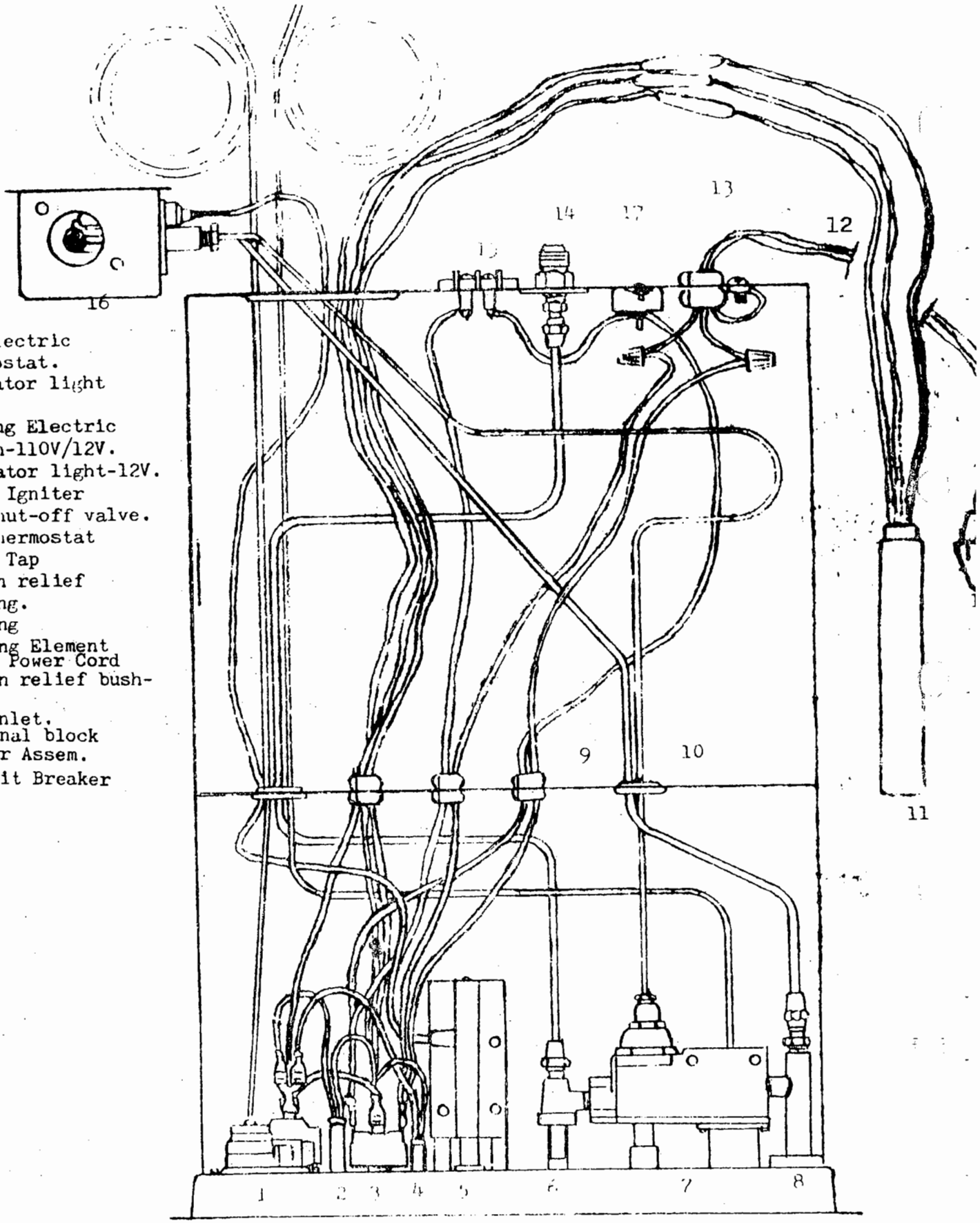
2. Disconnect color coded heating element wires between the heating element and the control panel assembly.

3. From the front of the refrigerator, remove (2) control panel screws and slide out the control panel forward approximately 8 to 10 inches.

4. Remove control knobs from gas and electric thermostats and remove bezel from control panel.

5. All controls with the exception of gas & electric thermostats can now be inspected and replaced if necessary.

6. Replacement of either the gas or electric thermostats necessitates removal of the refrigerator from enclosure for access to the thermostat capillary tubes. Slide out control tray from CS-3 refrigerator may be used on all models of COLDSTAR refrigerators and CS-4 and CS-6 control trays are directly interchanable.



. G/E Electric Thermostat.
. Indicator light 110v.
. Carling Electric Switch-110V/12V.
. Indicator light-12V.
. Piezo Igniter
. Gas shut-off valve.
. Gas Thermostat
. Pres. Tap
. Strain relief bushing.
10. Bushing
11. Heating Element
12. A. C. Power Cord
13. Strain relief bushing.
14. Gas Inlet.
15. Terminal block
16. Burner Assem.
17. Circuit Breaker

Fig. 5

REMOVAL & REPLACEMENT OF REFRIGERATOR

Following procedure must be observed during the removal and replacement of refrigerator:

1. Empty the refrigerator of all contents, remove vegetable basket with cover and remove smoked door shelf retainers.

2. Unscrew the hinge bolt from the top hinge, lift and remove door from refrigerator.

3. Turn off gas bottle and disconnect gas line from gas inlet. Care must be taken not to twist either the gas line or the inlet valve.

4. Remove (4) plastic screw hole plugs from the cabinet frame with a small screwdriver and remove (4) screws holding cabinet frame to the woodwork.

5. From the rear of the refrigerator, remove (1) each screws holding the base legs of the refrigerator to the floor. Check for any additional screws which the RV manufacturer may have used to fasten the refrigerator to the coach.

6. Unplug the 110V A/C line from the outlet and disconnect 12 volt lead in wires from the terminal block.

7. Slide the refrigerator straight out from it's recess.

To replace refrigerator into coach, reverse the above procedure.

WARNING: All gas conections must be checked for leaks after re-installation with soapy water - not an open flame.

When refrigerator is removed for servicing and re-installed again, the seal around the refrigerator cabinet flange must be throughly checked to insure complete separation of the combustion system from the interior of the recreational vehicle. If any portion of the seal is damaged or out of position, it must be replaced with comparable sealing material.

CHANGING OF DOOR SWING

CS-3; CS-4; CS-6

Unscrew and remove the upper hinge screw. Tilt the door outward and lift off. Be careful not to lose the nylon bushings. The lower hinge screw should then be moved to the opposite side. Refit the door and upper hinge screw. Remove travel latch and move to opposite side. Inspect door gasket and adjust top hinges, if necessary to insure tight seal.

CS-10

Unscrew and remove upper hinge screw (A). Tilt freezer door outward and lift off. Be careful not to lose the nylon bushings. Remove middle hinge pin (B), tilt cabinet door outward and lift off. Remove lower hinge pin (C) and replace to the opposite side. Replace cabinet door onto lower hinge pin. Insert middle hinge pin into middle hinge and door. Replace freezer door onto middle hinge pin and replace upper hinge pin. Remove travel latch and move to opposite side. Inspect door gasket for tight seal.

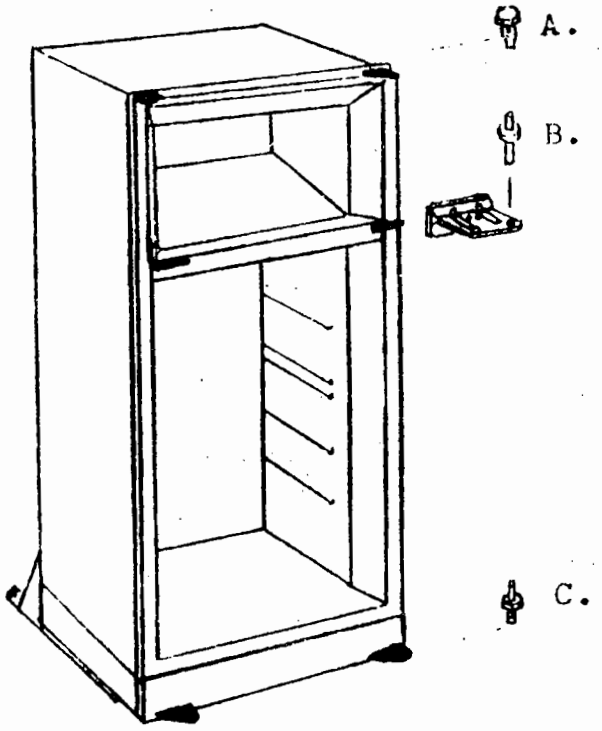


Fig. 14

FREEZER DOOR REPLACEMENT MODELS CS-3, CS-4, & CS-6

Above (3) models have identical freezer doors and shutter mechanisms.

To remove freezer door proceed as follows:

a. Push spring retainer pin (A) inwards with a pin and remove freezer door.

b. With a small blade type screwdriver pry the spring housing (B) away from body liner, permitting it to snap out and turn downwards.

c. Place new freezer door in closed position, one side at at time, making sure the cross on spring retainer pin (A) engages with the cross on the hinge plate (C).

d. Turn the spring housing around and up until the small tab (A in fig. 18) snaps into the slot in the body liner.

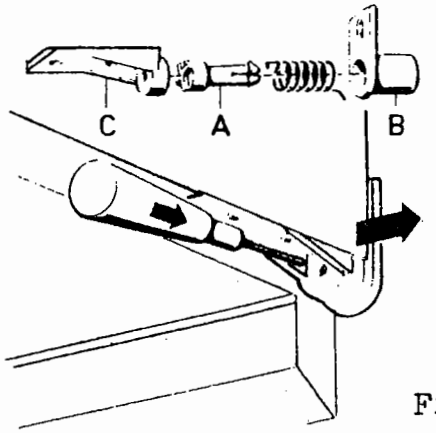


Fig. 17

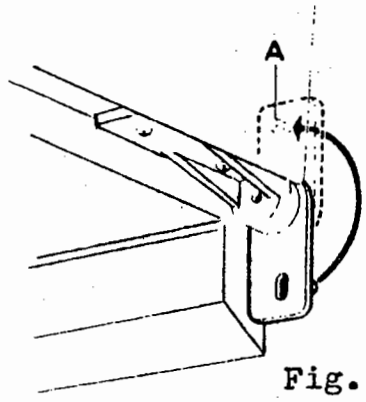


Fig. 18

FREEZER DOOR GASKET REPLACEMENT MODELS CS-3, CS-4 & CS-6

a. Remove freezer door as described above and unscrew hinge plates (A in fig. 19)

b. Place freezer door flat on workbench freezer door gasket up.

c. Insert blade type screwdriver between inner and outer pans of the freezer door and pry the outer pan away from the inner pan. NOTE: Screwdriver must be inserted in front of plastic tabs only, otherwise the plastic pans may be damaged.

d. Replace freezer door gasket around the inner door pan and snap inner panel into outer panel until plastic tabs snap into place.

e. Replace freezer door as described above.

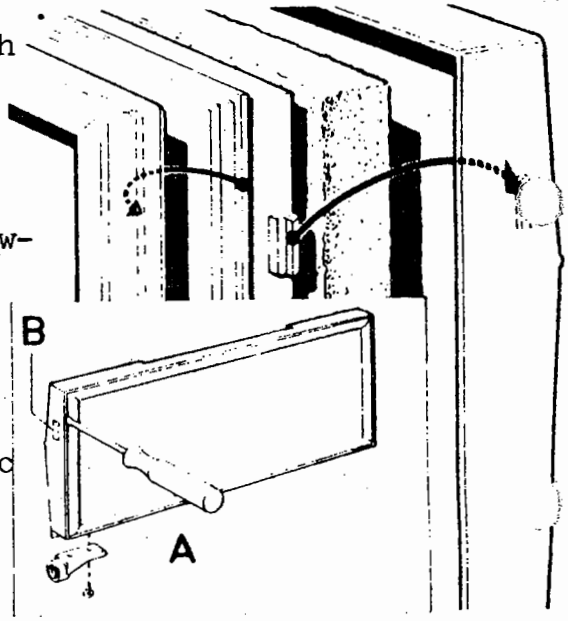


Fig. 19

CS-10 FREEZER DOOR

Remove the screws holding decorative aluminum side moulding to the door & remove moulding. Slide in an appropriate door panel, replace the side moulding and replace screws.

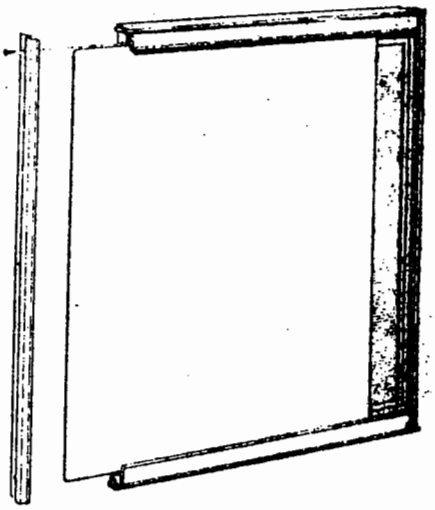
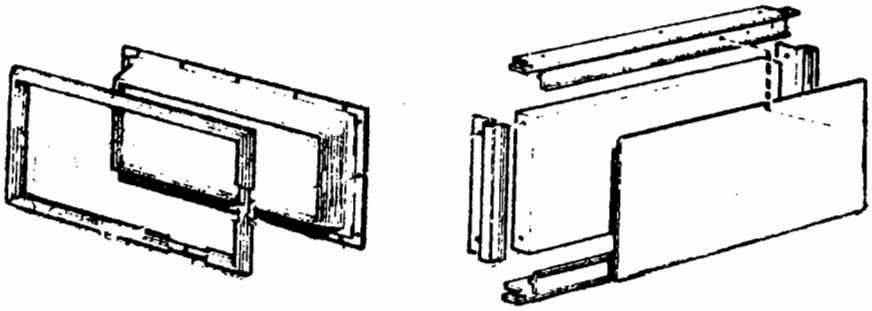


Fig. 15



CS-10 FREEZER DOOR

DOOR GASKET REPLACEMENT FOR MODELS CS-3, CS-4, CS-6, CS-10 & CS-10 FREEZER DOOR

1. Remove all smoked door shelf retainers from door.
2. Unscrew the upper hinge bolt & remove door from bottom hinge bolt.
3. Place door on flat workbench, door panel up, taking care not to damage decorative aluminium door moulding.
4. Pull the gasket out of the way and remove all screws "a" from the door plate.
5. Remove metal hold down strips and door gasket.
6. Door panel now can be lifted off and replaced, if necessary. To replace door panel and door gasket reverse above procedure.

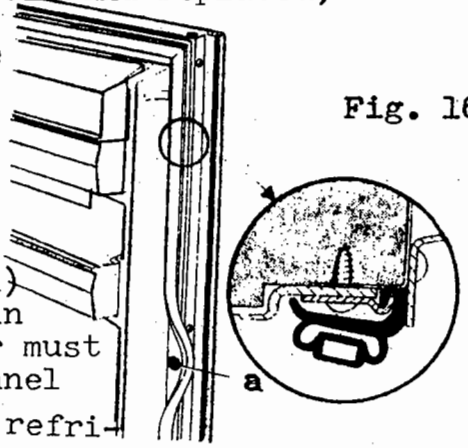


Fig. 16

CAUTION

The screws must be evenly tightened all the way around (do not overtighten the screws, as this will result in cracked door panel) After re-installation check for an even seal on all four sides. Door must close easily, without the door panel rubbing on the body liner of the refrigerator. Adjust door if necessary by loosening (3) screws holding the top door hinge and adding washers to the bottom door hinge pin.

IMPORTANT

This refrigerator is designed to provide maximum safety and good performance under all operating conditions but it is up to the owner to follow a simple maintenance program to keep the refrigerator in good condition. Inspect the refrigerator periodically, before re-use and after shut-down. After an extended trip check:

1. Fuel lines and gas connections for leaks using a solution of soap and water. Do not use a lighted match.

2. Inspect the flame for color: It should be a sharp blue - no yellow. Check for a high and low flame. This can only be observed after refrigerator is cold.

3. If flame is not blue or is odorous check interior of flue tube for possible soot deposits. Refer to paragraph on flue cleaning.

4. Refrigerators which are not used over a prolonged period of time must be checked at least once a year.

This refrigerator is manufactured by one of the largest absorption refrigerator manufacturers in the western hemisphere. Only the finest materials are used in assembly by skilled personnel dedicated to producing the finest refrigerator possible. This refrigerator is quality guaranteed by COLDSTAR Corporation but -- we are not responsible for failures or injury caused by owner tampering, misuse or improper installation.

TROUBLE SHOOTING HINTS

TROUBLE	PROBABLE CAUSE	REMEDIES
Gas burner will not stay lit.	Defective thermocouple or thermocouple does not make contact with flame.	Adjust or replace thermocouple.
Odors, smoke and discoloring of wall and ceiling.	1. Flame touches side of boiler due to dislocation of burner.	1. Relocate burner into central position with respect to chimney.
	2. Flame impinges on flue baffle.	2. Flue baffle too low. Correct position of baff See Fig. 10.
	3. Flue tube is coated with soot.	3. Refer to page 22.
Burner is hard to light.	1. Piezo electrode bent.	1. If there is no spark directly above burner electrode should be adjusted and lead wire checked for electrical leaks.
	2. Low gas pressure.	2. Check gas pressure at pressure tap and adjust to 11". If there is no reading be sure the refrigerator gas cock is turned on and the gas bottles are turned on and are not empty.

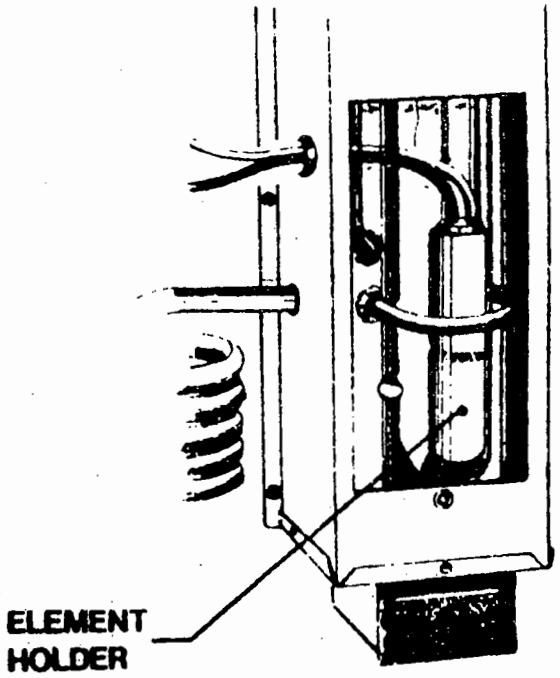


FIGURE 20 HEATING ELEMENT LOCATION

HEATING ELEMENT:

When operating electrically the energy is supplied by a heating element mounted in the boiler of the cooling unit inside the cover. If the heating element is defective and must be replaced, first disconnect the power cord and disconnect the 12 Volt leads at the terminal block. Remove cover and enough glass wool insulation around the heater to allow removal, Fig. 20. Bend aside the small wire clip that retains the element in position and disconnect the quick connect terminals from power supply. Remove heating element and when replacing with new one make sure it is fully inserted in the pocket. Replace the electrical connections noting the color coding. Pack insulation around the leads so they will not be in direct contact with hot tubes. Replace cover.

OPERATING INSTRUCTIONS

1. LEVELLING

When the trailer is parked, care should be taken that the refrigerator is properly levelled. A spirit level is supplied with each refrigerator and by placing it in the freezer compartment one can level the refrigerator both ways front to back and side to side. Whenever possible, the trailer should be parked so that the refrigerator side will be away from the afternoon sun.

2. CONTROLS

All controls are mounted on a panel at the base for easy access. A gas thermostat is used to control temperatures during gas operation and a separate electric thermostat is used for electric operation. These thermostats can control temperatures ranging from "defrost" to "very cold". The coldest setting may be useful for faster ice making and for starting up the refrigerator.

3. STARTING-UP

Gas operation:

a. Turn on gas at tank.
b. Before re-lighting, turn valve knob to "off" and wait 5 minutes.
c. Turn gas knob to "gas on" position.
d. Turn gas control knob to "coldest" position.
e. Holding the red gas button in, push in the ignition knob for ignition of the burner.
f. Release button in about 20 seconds.
g. If the cabinet gets too cold, turn gas control knob to a warmer setting.

IMPORTANT: As air may be present in the gas lines when first starting up, or after replacement of the LP tank, it may be necessary to repeat the ignition procedure.

ELECTRIC OPERATION - 115V

a. Plug in the power cord to the 115V supply receptacle.
b. Turn gas knob to "gas off" position.
c. Flip the electric selector switch to 115V.
d. Turn the electric thermostat knob to "coldest" setting.
e. If the cabinet temperature is too cold, turn the electric thermostat control knob to a warmer setting.

TROUBLE SHOOTING HINTS

TROUBLE	PROBABLE CAUSES	REMEDIES
Refrigerator does not freeze satisfactorily.	1. Incorrect Thermostat setting.	1. In warm weather turn Thermostat dial to a colder setting.
	2. Flame has gone out.	2. Check gas Supply
	3. Heavy frost.	3. Defrost refrigerator.
	4. Undersize flame.	4. Orifice or burner head clogged. Clean orifice and burner.
	5. Air circulation around coil restricted.	5. Check instructions for proper venting.
	6. Poor door seal.	6. The magnetic door gasket is self-adjusting. If gaps appear between cabinet and gasket, gasket is defective and should be replaced.
	7. Refrigerator not level.	7. Level both ways inside freezer compartment.
	8. Burner dislocated or damaged.	8. Check burner location. Burner should be centrally located with respect to chimney. (Fig. 10) If out of position, re-position. Shim if necessary.
	9. Wrong gas pressure.	9. Check pressure at presure tap on control panel. It should be 11" in water column when thermostat is on maximum.
	10. Thermostat defective.	10. Check position of capillary tube between evaporator fins. The end of the capillary tube must be in direct contact with one of the evaporator fins. If the position is incorrect, adjust accordingly. If no improvment is noticed, replace thermostat.

TROUBLE SHOOTING HINTS

TROUBLE	PROBABLE CAUSES	REMEDIES
Refrigerator too cold.	1. Thermostat set too cold.	1. Turn to a warmer setting.
	2. Room temperature abnormally cold.	2. Turn thermostat dial to a warmer position during cooler hours and return it to a colder setting during the day.
	3. Capillary sensing element not in receptacle.	3. Check that the end of the sensing tube from the gas thermostat is making a good contact with the fins of the evaporator.
	4. Defective gas control.	4. Check that the flame changes from high to low flame as the thermostat is turned from O to maximum. If not, the thermostat needs to be changed.
During electric operation refrigerator does not cool satisfactorily.	1. Thermostat at wrong setting.	1. Turn thermostat dial to a higher setting.
	2. Refrigerator not level.	2. Level both ways in freezer compartment.
	3. Air leakage into cabinet.	3. Check fit of door gasket.
	4. Freezer heavily coated with frost.	4. Defrost refrigerator.
	5. Heating element improperly located.	5. Heating element must be inserted all the way into receptacle. (Fig.
	6. Low voltage.	6. Supply voltage at refrigerator should be n less than 12 VDC or 110 VAC.
Burner flame is soft or yellow.	1. Burner primary air openings clogged.	1. Clean air openings.
	2. Flue clogged.	2. Clean flue, refer to paragraph on flue cleaning.
	3. Defective or clogged ofifice.	3. Clean or replace orifice.