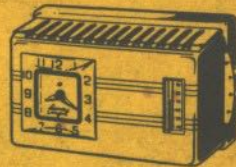


*Sid Harvey's*  
**TROUBLE  
SHOOTING  
GUIDE**



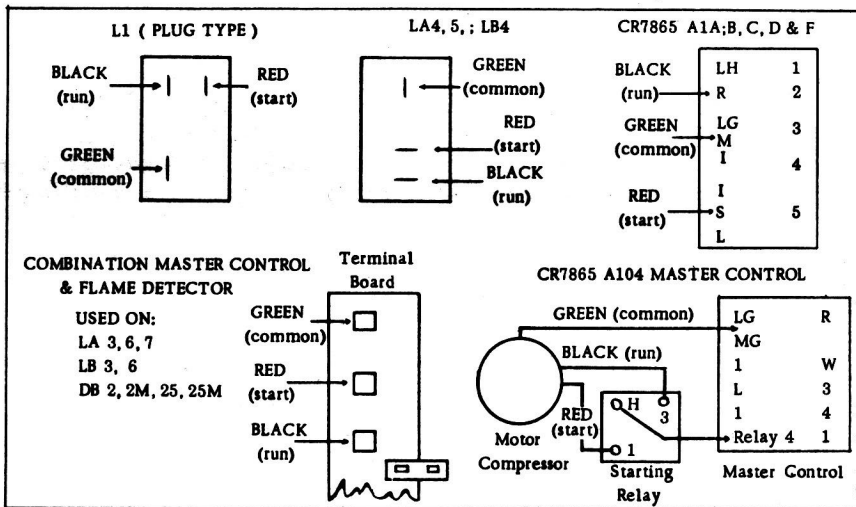
*Revised April 1966*

**PRACTICAL  
SERVICE & INSTALLATION  
INFORMATION ON  
DOMESTIC OIL BURNERS**

*Fifty Cents*

## G-E COMPRESSOR TEST PROCEDURE

### WIRING HOOK-UPS FROM G-E COMPRESSORS TO 5 DIFFERENT TYPES OF G-E MASTER CONTROLS.



1. Disconnect oil valve coil leads from Master Control to prevent oil from being accidentally discharged in the firebox.
2. **SUMP PRESSURE TEST:** Remove 1/8" pipe plug from the air outlet tee on compressor and install pressure gage. Start unit (see \*below). Pressure gage will show sump pressure (see page 51 for sump pressure on different units). Adjust pressure regulating valve if necessary.
3. **VACUUM TEST:** Disconnect oil suction line to compressor. Remove 1/8" pipe plug from suction line tee on compressor and install vacuum gage. Vacuum can only be checked with empty sump. To empty sump, loosen oil line fitting to nozzle. Start unit (see \*below). Oil will flow out of loosened fitting (catch in can). When oil stops flowing, hold finger over inlet port of tee. Read vacuum which should be 19" or more. Tighten oil line fitting.
4. **BACK PRESSURE TEST** to check float setting. Remove pressure gage. Run a short length of tubing (about 3 feet) from suction port to a can of fuel oil (quart can is enough). Start unit (see \* below) and allow compressor to pull as much oil from can it will take (this will take about 30 seconds). Then hold finger over air outlet port. Air should bubble out of suction line in can, indicating a back pressure in suction line.

### ★ TO START UNIT FOR TEST PURPOSES

#### WHEN UNIT HAS A1F2 MASTER CONTROL (telechron type)

- Open line switch.
- Open thermostat and domestic hot water control contacts.
- Disconnect oil valve coil.
- Install jumper between "L" and "R" terminals.
- Compressor will now start and stop from line switch.

NOTE: The Master Control is also the starting switch for the compressor. When the line switch is closed, the starting contacts in the Master Control must be closed manually for a few seconds, to start the unit.

#### WHEN UNIT HAS A104 MASTER CONTROL (new type)

- Open line switch.
- Open thermostat and domestic hot water control contacts.
- Disconnect oil valve coil.
- Install jumper between "L" and "Relay 4" terminals.
- Compressor will now start and stop from line switch.

NOTE: If too frequent starts and stops are made, overload contacts in starting relay may open, stopping the compressor; contacts will automatically re-set when heater cools. Safety switch on Master Control may open, push re-set button before leaving the job.

## G-E MOTOR COMPRESSOR STATORS

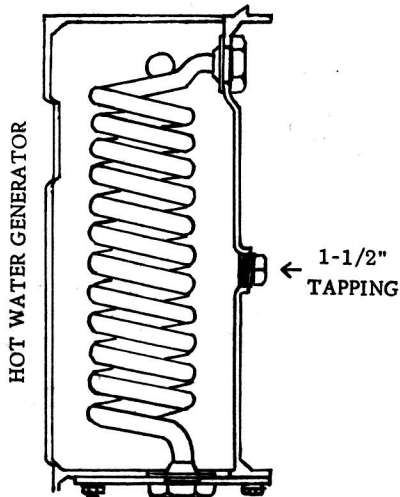
Stators on G-E Motor Compressors usually burn out because of a defect in the Master Control or starting relay. A bound compressor pump will not cause the stator to burn out, if the Master Control is operative. The Master Control will go on safety before a stator will burn out. However, the Master Control can have a defect that will show up only once a week or even less frequently, and not show up in the field test. Therefore, it is recommended that the starting relay or Master Control be replaced along with a burned out stator or motor compressor with burned out stator.

## G.E. INFORMATION

## TO REPLACE DEFECTIVE DOMESTIC HOT WATER BELLOWS IN THE MASTER CONTROL ON LA4 &amp; 5 STEAM OR HOT WATER UNITS

A defective domestic hot water bellows in the Master Control cannot be replaced with a new bellows, it must be replaced with a replacement hot water control, either immersion or strap-on type. Use Harvey Package **NO. C293** immersion hot water control or Harvey Package **NO P513-1** strap-on hot water control with bracket. In either case the defective bellows does not have to be removed, however, the domestic hot water contacts in the Master Control must be held open for the replacement hot water control to function. To do this, turn the bellows adjusting screw, located over the inoperative bellows, all the way down.

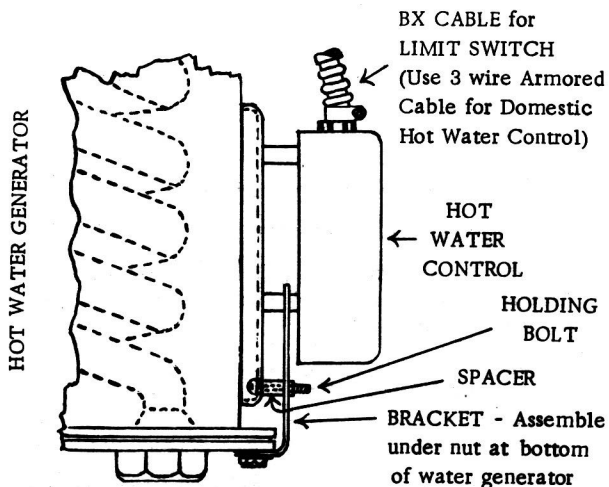
## Immersion Type



Install replacement immersion hot water control in 1-1/2" tapping in the back of the hot water generator as shown above.

Use 1-1/2" close nipple and a 1/2" x 1-1/2" reducing coupling, to mount replacement immersion hot water control.

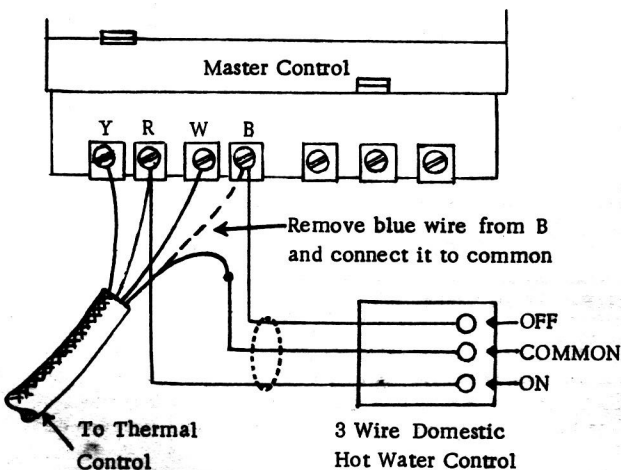
## Strap-On Type



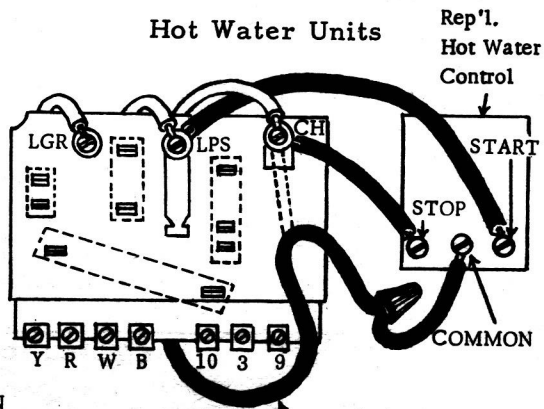
Install replacement strap-on hot water control w/bracket on lower section of the domestic hot water generator, located in back of boiler. Use lower bolt on generator to fasten bracket.

## HOW TO CONNECT A REPLACEMENT HOT WATER CONTROL TO A MASTER CONTROL

## Steam Units



## Hot Water Units



Disconnect "A" relay coil lead from C-H terminal and connect to common (terminal) of replacement hot water control.

### G-E INFORMATION

## TO REPLACE DEFECTIVE LIMIT BELLOWS IN THE MASTER CONTROL ON THE LA4 & 5 STEAM OR HOT WATER UNITS

A defective limit bellows in the Master Control cannot be replaced with a new bellows, it must be replaced with a replacement pressure control on steam units and a replacement limit control on hot water units. It is not necessary to remove the defective bellows. However, the limit contact of the Master Control must be held closed for the replacement limit or pressure controls to function. To do this, turn the limit bellows adjusting screw all the way out, counter-clockwise. If the limit bellows is leaking the flexible part of the bellows must be cut off (without unscrewing) and the small hole in the heavy brass body filled with solder.

### ON STEAM UNITS

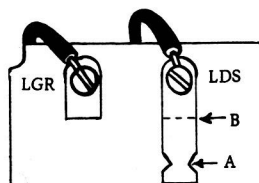
On steam units a replacement pressure control, Harvey Package NO. C354 may be installed in the upper side tapping of the domestic hot water generator in back of boiler. Use wiring diagram below.

### ON HOT WATER UNITS

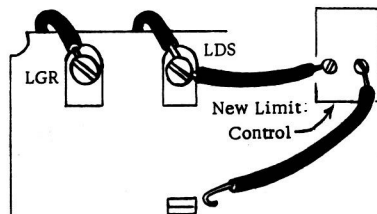
On hot water units the same upper side tapping may be used to install a replacement hot water limit control, Harvey Package NO. C290, or a strap-on hot water limit control Harvey Package NO. P513-1.

See illustration on previous page for method of attaching the strap-on control. Use wiring diagram below.

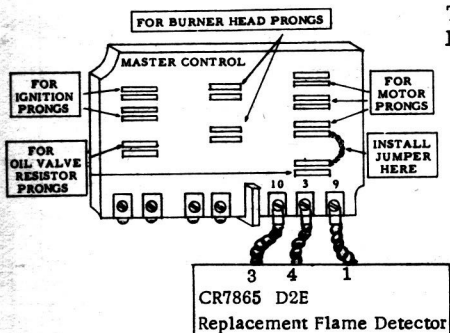
### HOW TO CONNECT A REPLACEMENT PRESSURE OR LIMIT CONTROL TO THE MASTER CONTROL



Grip bottom of LDS terminal bar at "A" with pliers and pull out of socket. Cut off at "B" and discard bottom piece.

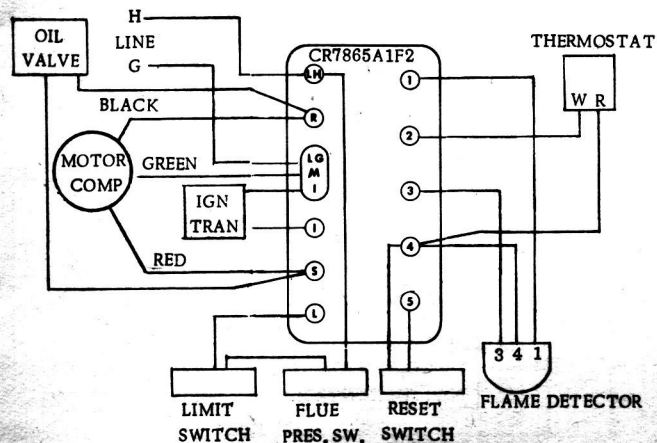


1. Connect one lead from replacement limit control to screw at LDS terminal.
2. Skin 1-1/2" of second lead from replacement limit control and bend to form a "U", 3/4" long, insert in socket from which bar was removed.
3. Set limit control to proper setting.



### TO REPLACE OLD STYLE FLAME DETECTOR ON LA4 & 5 UNITS WITH HARVEY PACKAGE NO. P521 (CR7865 D2E Flame Detector with Bracket)

1. Install a jumper of 2" bare wire in Master Control, between the lowest opening for the motor prong and the opening for oil valve resistor prong, directly below it. Do this before the motor and oil resistor leads are plugged in. The CR7865 Flame Detector has a wiping action on the cold contacts and the jumper prevents them from opening before the required four second delay.
2. Wire CR7865 D2E flame detector to the Master Control as shown in diagram.



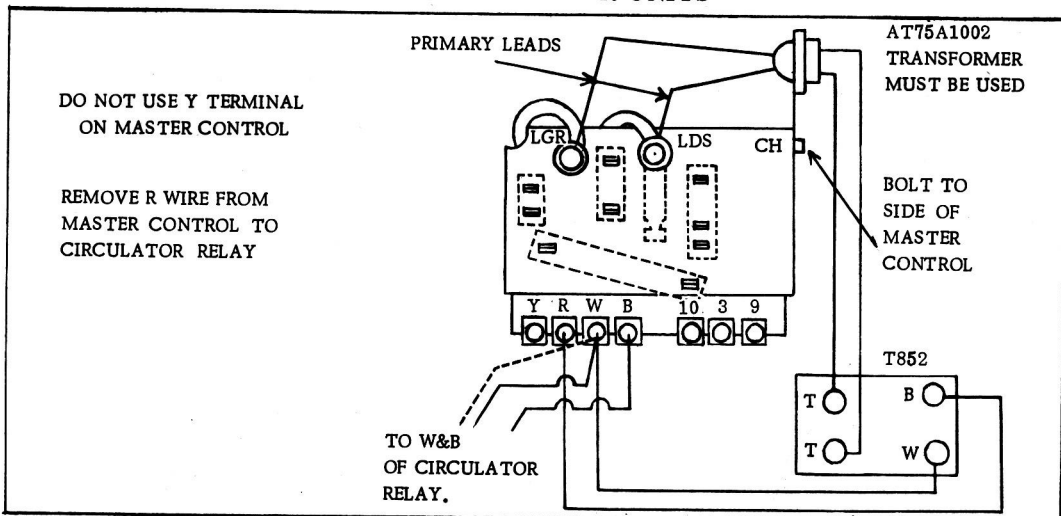
### TO REPLACE THE G-E 104 SEALED MASTER CONTROL WITH THE A1F2

Discard the starting relay and use the diagram shown at left.

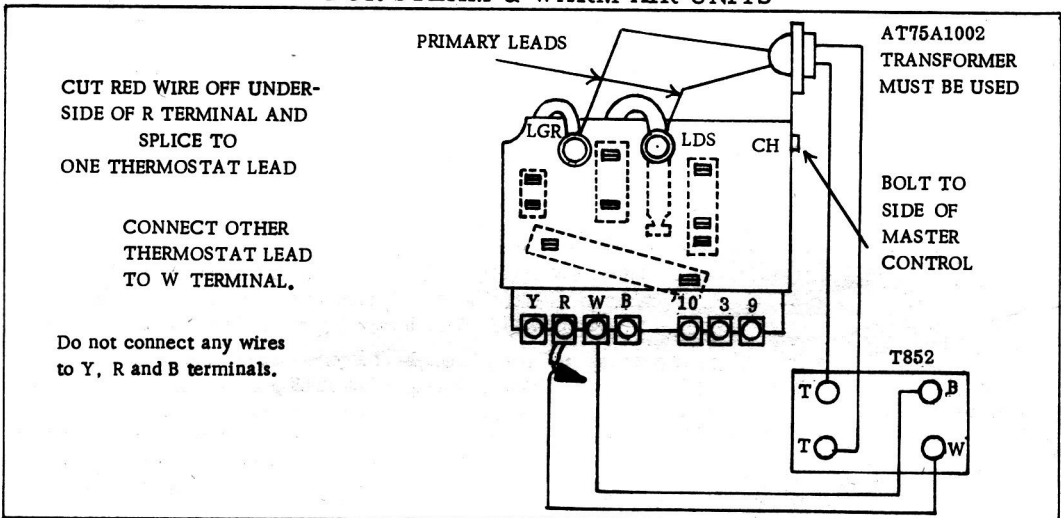
## G-E INFORMATION

TO REPLACE THERMAL CONTROL ON LA4 & 5 UNITS WITH M-H T852  
THE EXISTING 4 WIRE THERMOSTAT CABLE MAY BE USED

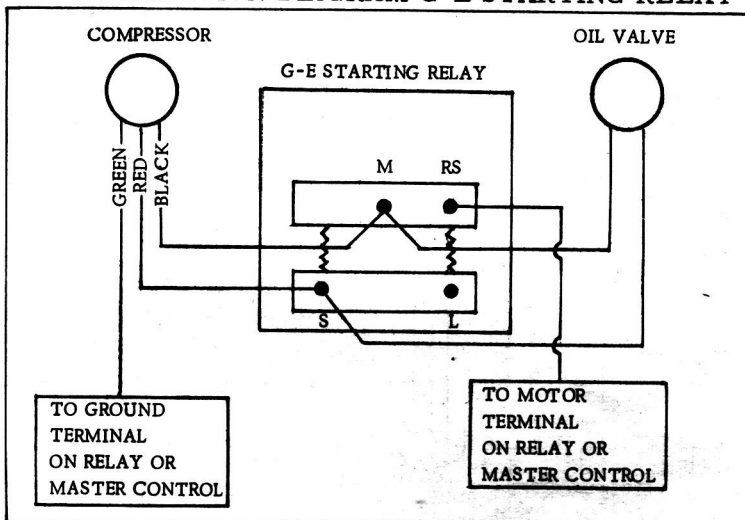
FOR HOT WATER UNITS



FOR STEAM & WARM AIR UNITS



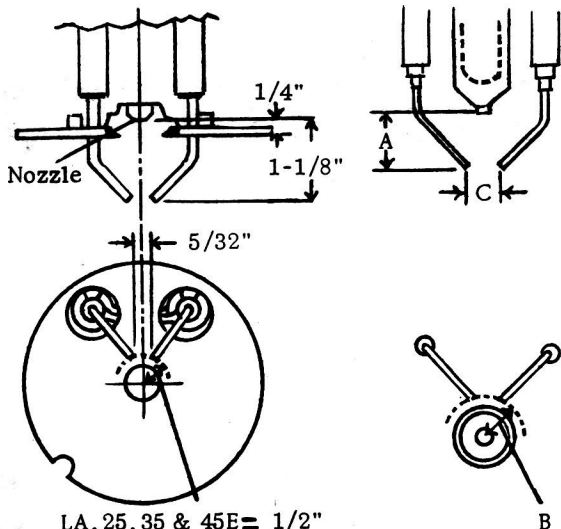
### CONNECTION DIAGRAM G-E STARTING RELAY



# G-E INFORMATION

## IGNITOR SETTINGS

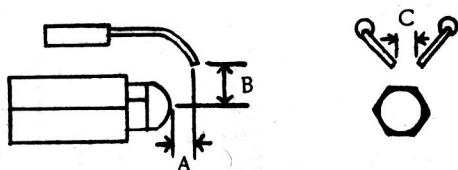
### LA Boilers



LA, 25, 35 & 45E = 1/2"  
 LA 60 & 70 = 21/32"

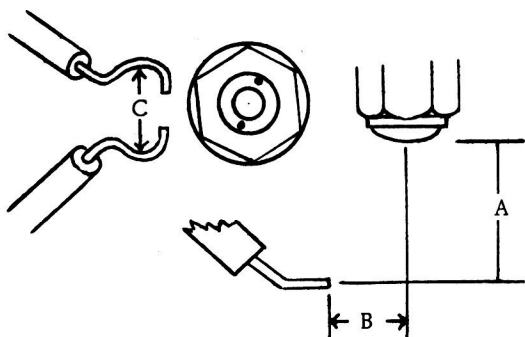
Boiler Model	A	B	C
L1	7/8"	11/16"	1/4"
LA4, 5; LB4	1-1/8"		
LA3, 6, 7		9/16"	3/16"
LA20 to 22			
LA32 to 54			

### DB Burners



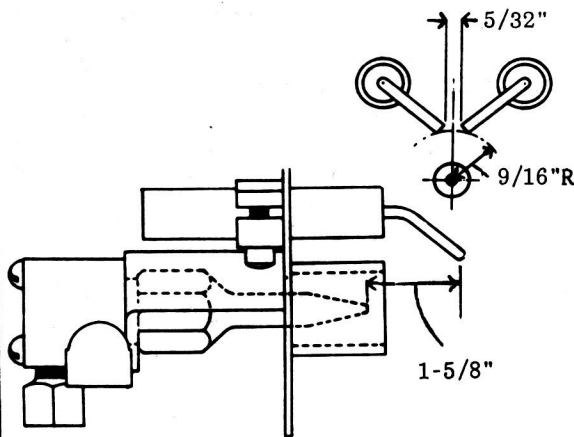
Burner Model	A	B	C
DB2, 20, 25, 26	5/16"	5/8"	5/32"
DB20B, 26B		3/4"	

### LB Furnaces





Furnace Model	A	B	C
LB4	See LA4, 5 (LA Boilers)		
LB3 to 6	1-1/4"	9/16"	3/16"
LB22, 32, 34			
LB22C, 30C			5/32"
LB form D	1-5/8"		

LB Furnaces - Form J and JD  
 LA Boilers - Form J only



## G-E WARM AIR FURNACE BELT REPLACEMENTS TYPE "A" 1/2" V BELTS

G-E Unit	Belt Length	Use  Belt No.
LB3	54	A240-54
LB4	46	A240-46
LB6	54	A240-54
LB15D	39	A240-39
LB20 D1	37	A240-37
LB22	54	A250-54

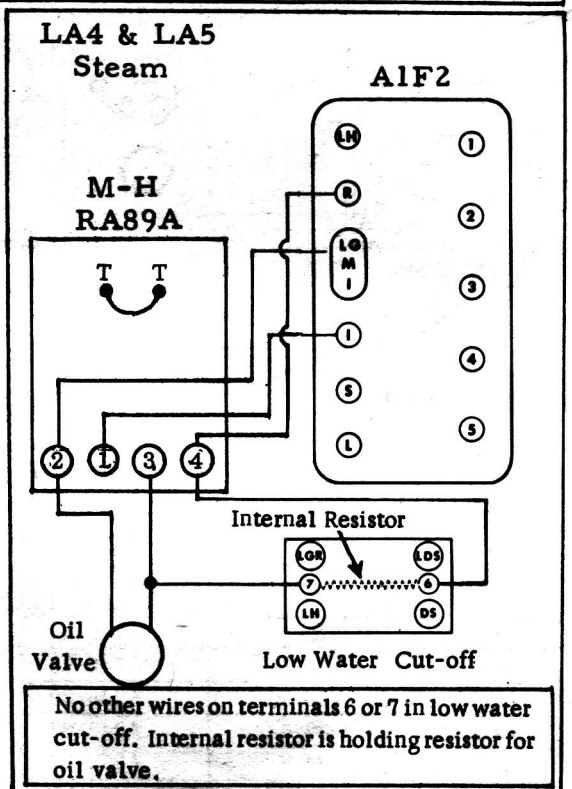
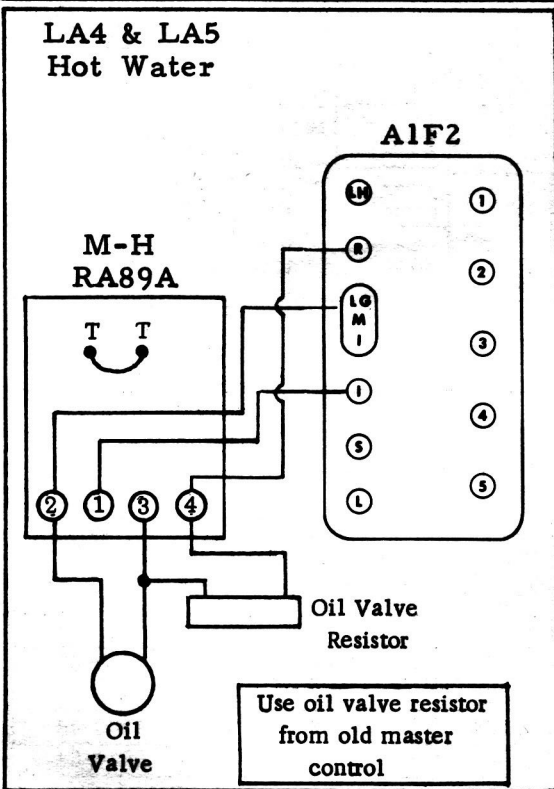
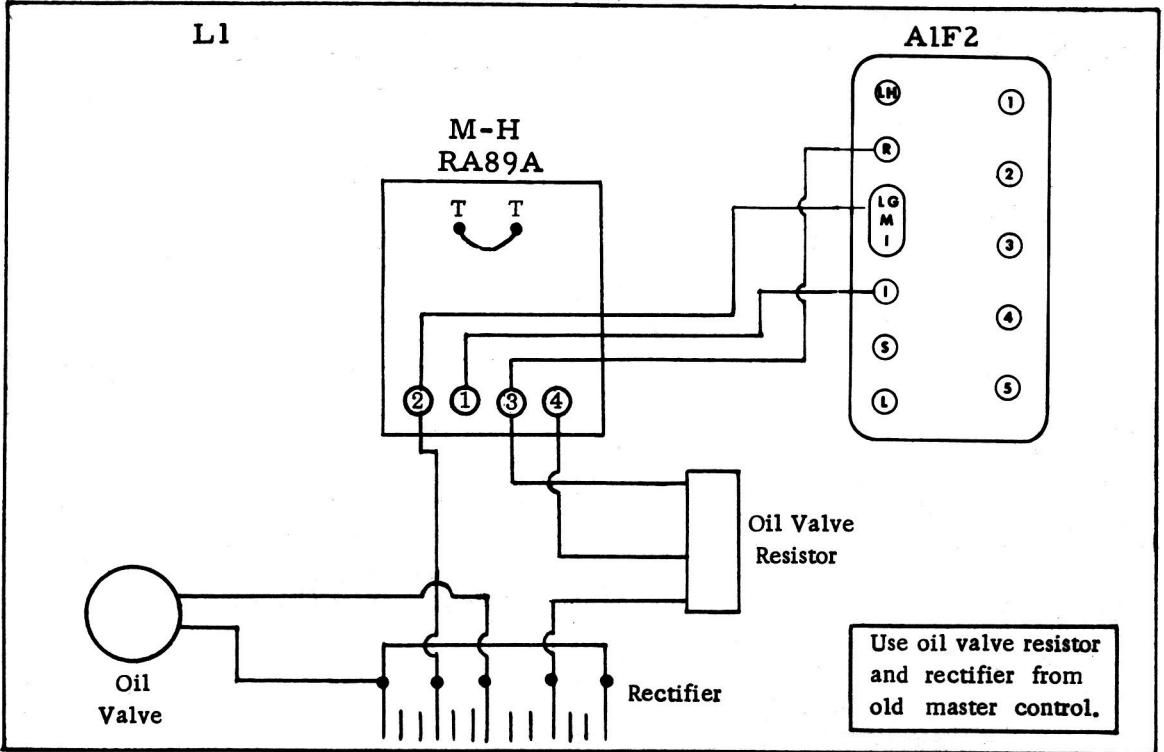
G-E Unit	Belt Length	Use  Belt No.
LB22C	44	A240-44
LB30	47	A240-47
LB30C	44	A240-44
LB32	52	A240-52
LB34	48	A240-48
LB40	54	A240-54

Additional V Belts listed on page 73 in Sid Harvey's Catalog.

### G-E INFORMATION

#### Connection Diagram for Oil Valve on L1, LA4 & LA5 Boilers

When replacing the original Master Control use an M-H RA89A and a A1F2, the old burner head can be used. Connect oil valve as shown. All other wiring is conventional.



**G-E INFORMATION****BURNER SUMP PRESSURES**

FURNACE MODEL	PSI	EXPLANATION
L1, LA4-5; LA3-6-7, LA20-54, LA25-70 LB4, LB3-6, LB22-32-34, LB22C, LB30C	15	Pressures can be plus or minus 2 lbs. Oil rate will vary, but combustion will not be NOTICEABLY AFFECTED.
LB15J, LB15JD	12	
LB20-40J, LB20JD	15	
LB15D (.59 GPH) LB20D (.82 GPH)		Depends on the burnerhead. Set sump pressure to give rated oil rate by actual measurement.
LB30D	7-1/2	For burnerheads 5733051 G6 and G7
LB40D	13	

**MODELS DB2-25 & DB20A-26A**

OIL RATE GPH	SUMP PRESSURE PSIG			Stamping On Air Tee for Latest Nozzle
	Original DB2-25	Modified DB2-25	BB20-26, or DB2-25 with Latest Nozzle and Air Tee	
1	6	4-1/2	2-1/2	A1
1-1/4			3	
1-1/2			2-1/2	A2
2	9		5	
2-1/2			4	A3
3	12	5-1/2	7	

**MODEL DB20B-26B**

OIL RATE GPH	Sump Pressure PSIG	ORIFICES		Air Deflector Inside Diam.	
		Oil	Air		
3/4	3-1/4	5	None	2-1/4"	
1	4	4		Brass (Yellow)	2-1/4" or 3-1/8"
1-1/4	3				
1-1/2	3-1/2				
1-3/4	4-3/4				
2	3-1/4				
2-1/4	4	Plated (Grey)	3-1/8"		
2-1/2	4-3/4				
2-3/4	6				

**TANKLESS HEATERS**

To select the proper Gerstein & Cooper (all copper) tankless heater to supply adequate domestic hot water.

1. Add up the total demand factor required in accordance with chart A.
2. Select proper size tankless heater from chart B based on total demand factor.

**CHART A**

DOMESTIC HOT WATER REQUIREMENTS	DEMAND FACTOR
HOUSE or APARTMENT with one bath with tub or shower, kitchen sink, laundry tubs.	1
Each additional bathtub	1/2
Automatic dishwasher	1
Automatic clothes washer	1
BARBER SHOP, each chair	3
BEAUTY PARLOR, each operator	4
GOLF or COUNTRY CLUB or FACTORY, each shower	5
OFFICE BUILDING each single office	1
LUNCHEONETTE each 25' of counter space	15
RESTAURANT each 200 people served at peak period	15
ON ANY INSTALLATION each 2 hot water faucets	1
each multiple hot water faucet	1

**CHART B**

TOTAL DEMAND FACTOR	SIZE TANKLESS in G. P. M.
1	4
2 - 5	6
6 - 12	8
13 - 24	10
25 - 35	12
36 - 50	15
51 - 80	20