

14065 SERVICE MANUAL

HU-60-1065

OIL-FIRED HUMIDAIRE UNIT

This machine produces warm humid air which is used to humidify cotton in ginning plants. Includes an oil-fired burner and a stainless steel combustion chamber inside the water spray chamber. Combustion gases are vented outside building and do not mix with the water or humid air. Burner output is modulated by the operator from a remote manual control station.

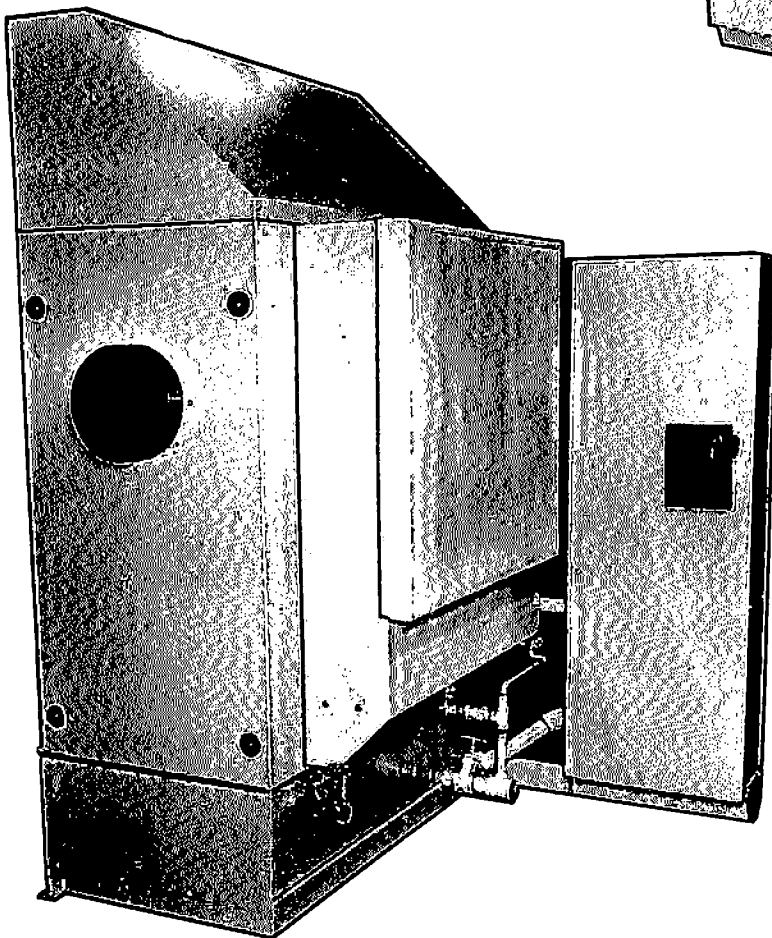
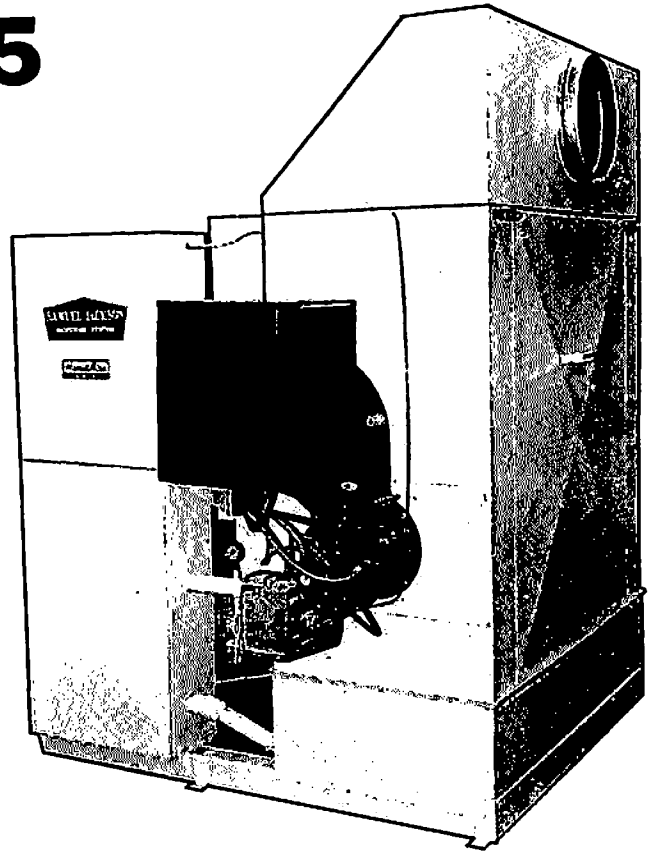
SAMUEL JACKSON MANUFACTURING CORP.
P.O. BOX 16587
LUBBOCK, TEXAS 79490

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The HU-60-1065 Humidaire Unit produces warm humid air which is used to humidify cotton in ginning plants. It includes an oil-fired burner and a stainless steel combustion chamber which is inside the water spray chamber. Combustion gases are vented outside the building and do not mix with the water or humid air. Burner output is modulated by the operator from a remote manual control station.

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SECTION 2

INSTALLATION

HOISTING

If necessary to hoist the Humidaire unit, or to lift it with a fork lift, leave it bolted to the plywood bottom of its shipping box for stability. Unbolt it when it is in place.

LOCATION

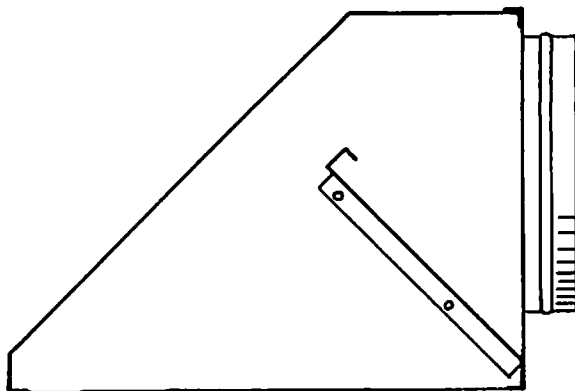
If the location of the Humidaire unit has not been specified on gin plans, it should be located in a clean place fairly close to the point of application of humid air. If the pipes are insulated (lagged), the humid air pipe can be run 80 to 100 feet (25 to 30m) without difficulty.

Outside the USA, some insurance companies or government authorities may require the Humidaire unit to be located in a room separate from cotton processing operations. In gins where it is necessary to install the HU-60 overhead, ask us for construction details of a suitable platform.

Refer to Drawing 14-2252 (p. 1-3) for space and other requirements. Be sure to leave 800 mm clearance to remove mist eliminator from spray chamber.

HOOD ASSEMBLY

The air discharge hood which goes on top of the spray chamber is shipped disassembled. Assemble it as shown below, paying particular attention not to get the internal baffle backwards. Note that the discharge opening can face either direction.



WATER SCREEN

The water screen is shipped in the spray chamber. It goes in the bottom of the water tank, at the extreme left (Ref. 15, page 6-4), covering the pump intake pipe. Notice the notches in the screen frame which correspond to the tank openings. Extra screens may be ordered as Part No. 13260A.

AIR PIPES

Connect air pipes in accordance with installation drawings. Joints should be taped to prevent air leakage before draw bands are applied to joints. The pipe which conducts the humid air to the point of application is often insulated or lagged to prevent condensation. If the insulation has an outer covering which is impervious, then it should not be applied to the pipe joints. Otherwise, slight leaks of vapor through the pipe joints will fill the insulation with water vapor which will cause condensation. Interrupting the insulation at the pipe joints allows this vapor to escape.

SMOKE STACK

Using 12-inch (305 mm) diameter sheet metal pipe, vent the flue connection shown on page 1-3 outside the gin building. This is for the combustion gases and is likely to be hot in operation. Provide an insulating sleeve where gin trash or other combustibles might contact it. Leave a small peep hole with a view of the inside of the combustion chamber to help in adjusting the fuel-air ratio.

FUEL OIL

Diesel oil or kerosene fuel may be used. Connect the fuel oil supply to the fuel shut-off valve (Ref. 37, page 6-2) with tubing about 10 to 12 mm (3/8-inch) diameter. Although not a necessity, we recommend using a fuel return line of the same diameter. It should be connected to the plugged opening in the tee above the fuel return cock (Ref. 36, page 6-2). Turn the cock handle crossways only if the return line is used. There should be no valve in the return line as this could damage the fuel pump.

COMPRESSED AIR

A supply of compressed air at a pressure of about 5 to 10 bars (75 to 150 psi) is necessary to atomize the fuel. Connect the air supply line to the compressed air shut-off valve (Ref. 21, page 6-2).

ELECTRICAL

For making electrical connections, appropriate instructions are attached which you can give to your electrician.

WATER SUPPLY

Connect a 1/2-inch water supply pipe to the connection at the float valve in the water tank. We have provided a hydrant at this point for convenience in washing out the unit. Supply pressure should be at least 20 psi (1.4 bars).

Maximum water consumption at full throttle will be about 220 gal/hr (850 liters/hr) of which about 85 per cent is evaporated and the remainder is bled off to the drain. Average water consumption will be much less than this, perhaps as little as 50 gal/hr when the unit supplies humid air only to the Lint Slide Grid.

Some users have found it advantageous to soften the water supplied to the HU-60 or to use powdered acid to remove scale deposits. These are good practices, but will not eliminate the need for water bleed-off described below.

WATER DRAINAGE FACILITY

Connect the 2-inch water drain fitting to a sewer or soakage pit to receive the water periodically released by draining and cleaning the unit as well as that continuously bled off while the unit is running. The purpose of bleed-off is to reduce maintenance by getting rid of the minerals in the water. The water evaporated

by the HU-60 is distilled water. All mineral are left behind in the machine. This stream of bleed-off water provides the only way to get rid of them. A water softener only exchanges sodium ions for harder ions, so some bleed-off is still necessary to avoid scale.

SECTION 3

OPERATION

THEORY OF OPERATION

This unit produces warm humid air for moistening cotton by drawing the air through a water spray chamber. Since heat is necessary to vaporize the water, the heat is introduced by burning oil inside a stainless steel combustion chamber which is located inside the water spray chamber. As the air passes upward through zig zag baffles at the top of the water spray chamber, the water drops impinge on the baffles and are pulled back into the spray chamber by gravity allowing only humid air to pass upward into the air discharge hood. The fan draws the air from an opening in the hood and blows it to the appropriate places in the gin plant where humidification is desired. A smoke stack takes the fumes of combustion from the combustion chamber out through the roof of the gin building.

The oil-fired burner has a modulating motor which turns it up and down. The controls are programmed so that the modulating motor must turn the burner down before it will attempt to ignite. The modulating motor will not turn the burner up unless ignition has taken place, as indicated by the protectorelay turning on the red "Flame" indicator light at both the local and remote control stations. The water circulating pump must also be on before the burner will be turned up.

As more heat is put into the spray chamber, more water is evaporated, the air temperature and relative humidity are both increased and more moisture will be put into the cotton by the air which is produced. The shaft at one end of the modulating motor is connected to the throttle mechanism of the oil burner. The shaft at the other end of the modulating motor has a mechanism which opens a valve in the top of the combustion chamber allowing hot gases to escape into the humidified air when the modutrol motor is throttled below 30% of its travel. This is to insure that the relative humidity of the air will be sufficiently reduced when the unit is throttled down to the minimum setting.

CONTROLS

This Humidaire unit can be manually controlled from two locations. A local control station is located in the upper cabinet on the side of the unit. A remote control station is furnished with the unit. It can be located for operation from the console of the ginning plant. At this time, the only automatic control to be used in conjunction with this Humidaire unit is the 13290 condenser air switch control. This simply turns the water pump on and off in response to the presence of cotton in the battery condenser. It is usually used with the lint slide grid application.

To operate the unit from the local station, the bottom toggle switch should be flipped to the left or local position with the other two toggle switches initially in the center or "off" position. The local control knob with its 0 to 100 scale is now connected to the modulating motor. This knob can be used to throttle the burner output. If the fan is moving air through the Humidaire unit, the burner can now be ignited by flipping the top burner toggle switch to the left "on" position. When this is done, the modutrol motor will begin to move to the low fire position. When it reaches this position, it will then energize the protectorelay which will apply power to the ignitor plug, as indicated by the amber "Spark" indicator light. If flame is not established within about 15 seconds, the protectorelay will time out and must be reset by pushing its purple push button. Normally, the establishment of flame will be indicated by the red "Flame" indicator light. A timer maintains ignition spark for about 5 seconds after flame is established to insure proper ignition.

The water pump can be turned on by flipping the middle toggle switch to the left. This will allow the modulating motor to turn the burner up to a position corresponding to the knob setting. The water pressure gauge should read about 15 psi on 50 HZ power and about 22 psi on 60 HZ power. If pressure is considerably different from this, see maintenance instructions, Section 4.

To operate the unit from the remote control station all three toggle switches on the local station should be flipped to the extreme right hand position.

NORMAL OPERATING PROCEDURE

The Humidaire unit should be one of the first machines started when the gin plant is placed in operation. It should be allowed to run with only its burner on while all the other machinery is started up. It will thus heat up its fan and piping and the machines in which it is applied so that when the water pump is turned on and humidification begins, there will be no problem with moisture condensing on cold metal surfaces. In lint slide grid installations, the water pump toggle switch can be left on and the water pump will be turned on automatically by the 13290 condenser air switch control.

To find the proper manual control setting for best operation, some experimentation will be necessary. In most applications, the general rule to be followed is to run it at as high a setting as possible without causing chokeups. Remember that preheating the system solves most problems involving condensation. No special procedure is recommended in turning off the unit.

SECTION 4

ADJUSTMENT AND MAINTENANCE

— ADJUSTMENT —

(These adjustments will be made at the factory, but are included for the convenience of those who wish to readjust the unit in the field.)

ELECTRICAL

1. Check voltage. Should be from 380 to 415 volts across terminals 1-2, 2-3 and 1-3 in the disconnect switch on the back of the control box. Voltage should be about 220 volts from any of the three phase terminals to the neutral terminal. On recent units, the neutral terminal will have a white wire and be insulated from ground. On the first units, the neutral terminal will be grounded and have a green wire. Where supply neutral is not at ground potential, it will be necessary to insulate the neutral conductor.
2. Check to see if voltage of secondary of the control transformer is 100 to 125 volts. Note whether this voltage falls excessively when large motors in the gin plant are started. If so, it will be necessary to correct this electric supply problem or start the Humidair unit after all the other machinery is started.
3. In checking controls, all voltage measurements are made with respect to Terminal 24, which is grounded. See if Terminal 1 is energized (100 to 125 volts). If not, check 5-amp fuse.
4. See if Terminal 2 is energized. If not, check air flow switch (Ref. 8, page 6-2). Air flow may be inadequate. On older units which have 1823-1 switch, it may be necessary to change the red spring to an orange spring as in the 1823-0. A decal on the switch will indicate if this change has been made.
5. Turn on water pump using local toggle switch. Check rotation direction of water pump, observing slinger disc on motor shaft. If wrong, interchange any two 3-phase wires in the disconnect switch box. Recheck direction.
6. Turn on burner local switch. Partially remove a combustion air filter pad and observe rotation direction of combustion air fan. It should now be correct as both water pump and fan are wired for correct rotation before shipment. If wrong, interchange two wires at bottom of burner fan starter (Ref. 12 page 6-2).
7. Flip local toggle switches to "remote" position and check to see if remote station toggle switches will turn on water pump and burner. If they will not, check to see that fan safety relay in remote control station has been connected to the indicator light of the humid air fan and that the relay has pulled in. This relay insures that the burner goes off instantly when fan stops.
8. Using "hook-on" ammeter, check current in all leads of all motors. Compare current values to motor nameplate values. Current in all leads of each 3-phase motor must be substantially equal. If not, check supply voltages and motor connections.

9. See that high temperature limit switch is adjusted to bottom of scale (Ref. 5, page 6-2). Use large screw on top of switch.

COMPRESSED AIR

10. See that compressed air supply of about 5 to 10 bars pressure (75 to 150 psi) is connected to the compressed air shut-off valve (Ref. 21, page 6-2) and that the valve is open.
11. On atomizing air pressure switch (Ref. 24, page 6-2), set upper pointer to 55 and lower pointer to 45.
12. Temporarily jumper Terminal 20 to Terminal 1 to open atomizing air solenoid valve (Ref. 25, page 6-2)
13. Adjust regulator (Ref. 23, page 6-2) until air pressure gage (Ref. 7, page 6-6) reads 60 psi.

DIESEL OIL OR KEROSENE

14. See that fuel oil supply is connected to fuel shut-off valve (Ref. 37, page 6-2) with tubing about 10 to 12 mm diameter. If a return line is used (and this is recommended), it should be the same size and connected to the plugged opening in the tee above the fuel return cock (Ref. 36, page 6-2). Turn the cock handle crossways only if the return line is used. There should be no valve in the return line as this could damage the fuel pump.
15. With temporary jumper of Step 12 in place to open fuel solenoid valve, push in fuel pump relay (Ref. 13, page 6-2) with an insulated screw driver to run fuel pump motor (Ref. 29, 6-2). Observe oil pressure gage (Ref. 34, 6-2). It should read 60 psi. If not, it may be necessary to purge air from supply line and fuel filter, 38. To do this, disconnect oil hose (Ref. 18, page 6-6) from burner until oil runs clear of entrained air while running fuel pump. Pressure should be about 20 psi with hose disconnected. Reconnect hose and remove jumper.
16. Run pump to adjust fuel pressure to 60 psi. Pressure adjusting screw is under cap of fuel pressure relief valve (Ref. 35, page 6-2).

WATER SUPPLY

17. See that water supply line is connected to tee under hose cock (Ref. 18, page 6-4). Valve 17 must be open.
18. Adjust float valve (Ref. 12, 6-4) until water level is about 10 to 15 mm below overflow opening. Float rod (Ref. 13, 6-4) may be bent upward only to adjust this level. Check to see that water screen (Ref. 15, 6-4) is in proper position.

MODUTROL MOTOR

19. On motor (Ref. 12, page 6-6) terminal, move lead from 160° to 90°. Remove plate from auxiliary shaft end and bring travel limit spurs together for 90° travel. Adjust extra limit switch cam so roller of limit switch drops into depression at low-fire position.

20. Temporarily remove yellow wire from left side of Terminal 18. This prevents delivery of fuel or ignition of burner. Turn on burner switch, and modutrol motor will go to low fire position.

21. With motor at low-fire position, set motor crank arm at about 45° from vertical. Position rod clamp bolt at about 100 mm (4") from motor shaft center. Leave rod loose.

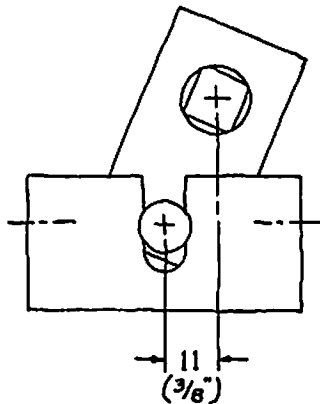
22. Adjust linkage rod so Micro ratio valve is in "L0" position with about 3 mm (1/8") clearance between stop lug on bottom of valve and allen cap screw on valve sector. Lightly tighten set screw holding linkage rod.

23. Temporarily jumper Terminal 15 to Terminal 21 and turn local control knob to 100. Carefully watch sector so cap screw at high end does not hit stop. If it is necessary to turn control knob back to avoid this, move rod clamp in toward motor shaft and repeat steps 22 and 23 until about 3 mm (1/8") clearance is left at each end of travel.

24. When adjustment is correct, tighten set screws, remove jumper and reconnect yellow wire to Terminal 18.

HOT GAS VALVE

25. Temporarily loosen shaft set screw of crank arm of hot gas valve actuator assembly (Ref. 20, 6-6). Position lower pin 11 mm (3/8") to left of motor shaft centerline as shown on page 6-6 and below.



26. Loosen compression clamp fitting (Ref. 22, 6-4), and move push wire sleeve until hot gas plug (Ref. 24, 6-4) just contacts valve seat. At assembly, form hook in push wire to accomplish same adjustment.

27. Remove nameplate from sector arm of Micro-ratio valve. This exposes a series of adjustment screws which increase the flow of fuel oil when turned clockwise.

28. Rotate the sector arm through its travel using the local control knob. At each numbered position, adjust the screw which is aligned with the lug on the bottom of the valve until the flame is neither smoky (too much fuel) nor odorous (too lean).

IGNITION TIMER

29. The ignition time delay relay (Ref. 1, 6-2) keeps the ignition spark on and the combustion air fan off for about 4 to 5 seconds after ignition starts in order to assure a good flame start. Observe the time interval from the lighting of the red flame indicator light until the amber spark light goes out. Remove the protective sleeve from the adjustment shaft of the delay relay and turn the shaft until the desired timing is achieved.

WATER BLEED-OFF

30. With water pump running, adjust the water bleed valve (Ref. 48, page 6-2) so that a stream of water about 5 or 6 mm in diameter (3/16-1/4 inch) is passed into the drain. The reason for this is explained in Section 2.

SPARK ELECTRODE

31. The insulator of the spark electrode should protrude from the locking bushing 31 mm (1-7/32 inch) as shown in small sketch on page 6-6. If replacement is shipped with a long electrode extension, it should be cut to 5 mm (3/16 inch) as shown in sketch. The spark radiates outward across end of insulator to body of burner. Any accumulation of soot on end of insulator should be removed. A crack in the insulator can prevent sparking at the end so ignition will not take place.

— MAINTENANCE —

The most important maintenance procedure is to keep the Humidaire unit clean. The water tank should be drained daily and all dirt and lint removed from the spray chamber, especially from the water screen. This screen covers the water pump inlet and prevents trash from clogging the pump impeller and spray nozzles. Many gins use two screens so they can be exchanged daily. The screen is available as Part No. 13260A.

If the spray nozzles and nozzle header pipes should need cleaning, the nozzles can be unscrewed. Access to the inside of the header pipes is by removing the rubber plugs (Ref. 6 & 7, page 6-4). The pipes can be flushed by running the water pump with plugs 6 removed.

To remove scale deposits, put about 5 kilos (10 pounds) of powdered acid in the water and continue to operate the unit. After about a day, the scale will be dissolved. This treatment should be performed at the first sign of scale formation. Powdered acid is available from the factory as Part No. 14000 in 50-pound pails.

Check water bleed-off and adjust in accordance with step 30, page 4-2.

If the water pressure gage (Ref. 45, page 6-2) reads more than about 15 psi on 50HZ (22 psi on 60HZ) this is an indication that some nozzles may be clogged. If it reads less, check the water screen, or the water pump impeller may be clogged. To inspect the pump impeller, simply leave the pump bowl connected to the pipes and remove the four cap screws which hold the pump bowl to the adapter cover plate. The motor and impeller can be removed from the pump bowl for inspection.

If water is seen to leak from the space between the motor and pump during operation, the shaft seal needs replacement. See page 4-5 for instruction. Remember, never use a wheel puller on the impeller. Unscrew it from the shaft. Keep the shaft from turning by means of the slot in the motor end of the shaft. Also the sealing surfaces are hard and smooth. Do not scratch or crack them. One is black plastic or carbon. The other is ceramic. One slides on the other, and not on the rubber surface.

Periodically, inspect and replace the filter cartridge in the fuel filter (Ref. 38, page 6-2).

Periodically, drain the compressed air filter (Ref. 22, page 6-2) by pressing the valve stem at its bottom.

Periodically, clean or replace the sponge combustion air filter elements (Ref. 5, page 6-6).

WATER PUMP

INSPECTION & REPLACING SHAFT SEAL

DISASSEMBLY

1. Remove four bolts (A) using 9/16" short end wrench. The pump casing (B) can usually be left connected to the pipes. Pry casing (B) from adapter (C). At this point, inspection and cleaning (steps 6-9) can be performed. Steps 2-5 are necessary to replace shaft seal.

2. Hold pump impeller (D) and remove impeller nut (E) using 3/8" socket wrench. Take care not to lose the impeller lockwasher (F).

3. Hold shaft from rotating by means of slot in motor end of shaft, and UNSCREW impeller from shaft. **DO NOT USE A WHEELPULLER ON IMPELLER.**

4. Remove rotating portion (G) of shaft seal from shaft.

5. Remove stationary portion (H) of shaft seal from adapter. Removal will usually destroy it, so never remove it unless you have a replacement available.

INSPECTION AND CLEANING

6. Make sure internal passages of impeller (D) are not clogged.

7. Make sure close-fitting surfaces (J) of impeller and casing are clean so impeller will not be jammed.

8. If steps 2 to 4 have been performed, inspect mating surfaces of shaft seal. If they are not flat and smooth, replace the seal.

9. If body gasket (K) has been damaged, replace it.

REPLACING SHAFT SEAL

10. Thoroughly clean shaft and recess for stationary portion (H) of seal.

11. Apply grease to shaft, to recess and to outside rubber part of stationary portion of seal.

12. Install stationary portion in recess with smooth ceramic surface out and rubber part in. Press firmly into place with fingers. **DO NOT SCRATCH SEALING SURFACE.**

13. Install rotating portion (G) of seal on shaft with smooth carbon sealing face next to stationary portion.

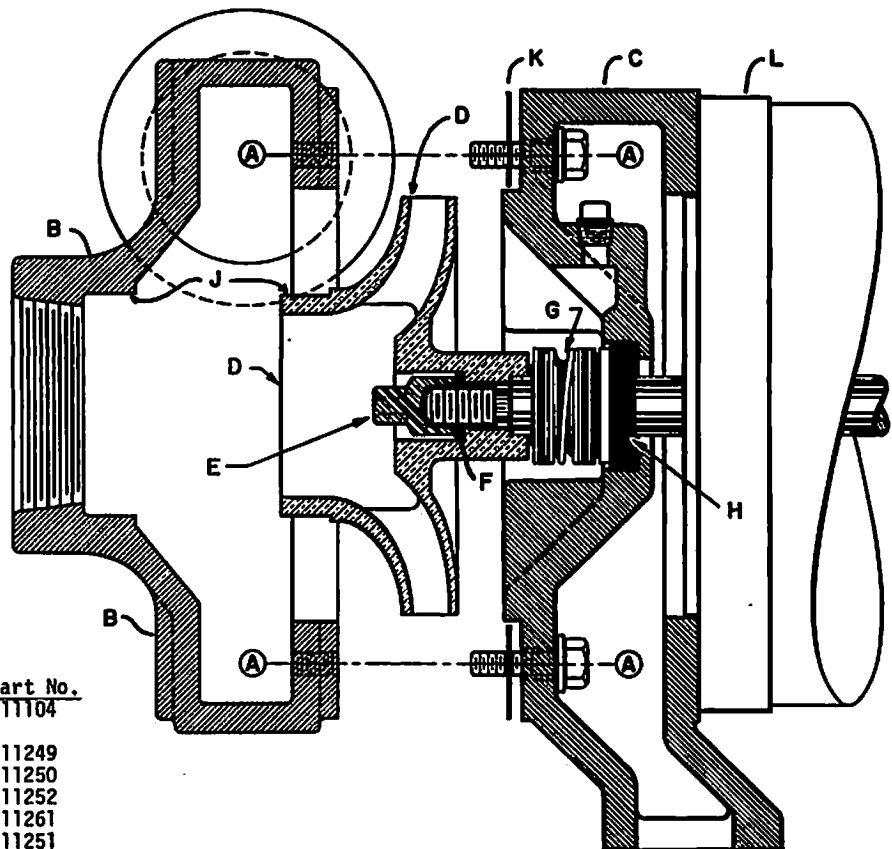
REASSEMBLY

14. Replace impeller (D), lockwasher (F) and impeller nut (E). Tighten securely.

15. Bolt adapter and casing together using new gasket if necessary.

16. Using stub screwdriver in slotted motor end of shaft, make sure shaft turns freely before applying power to motor.

17. If it was necessary to disconnect electrical wires, check rotation and motor current.



- PARTS -

Complete Water Pump Assembly:

	Part No.
D	11249
E	11250
F	11252
G & H	11261
K	11251
L	13540

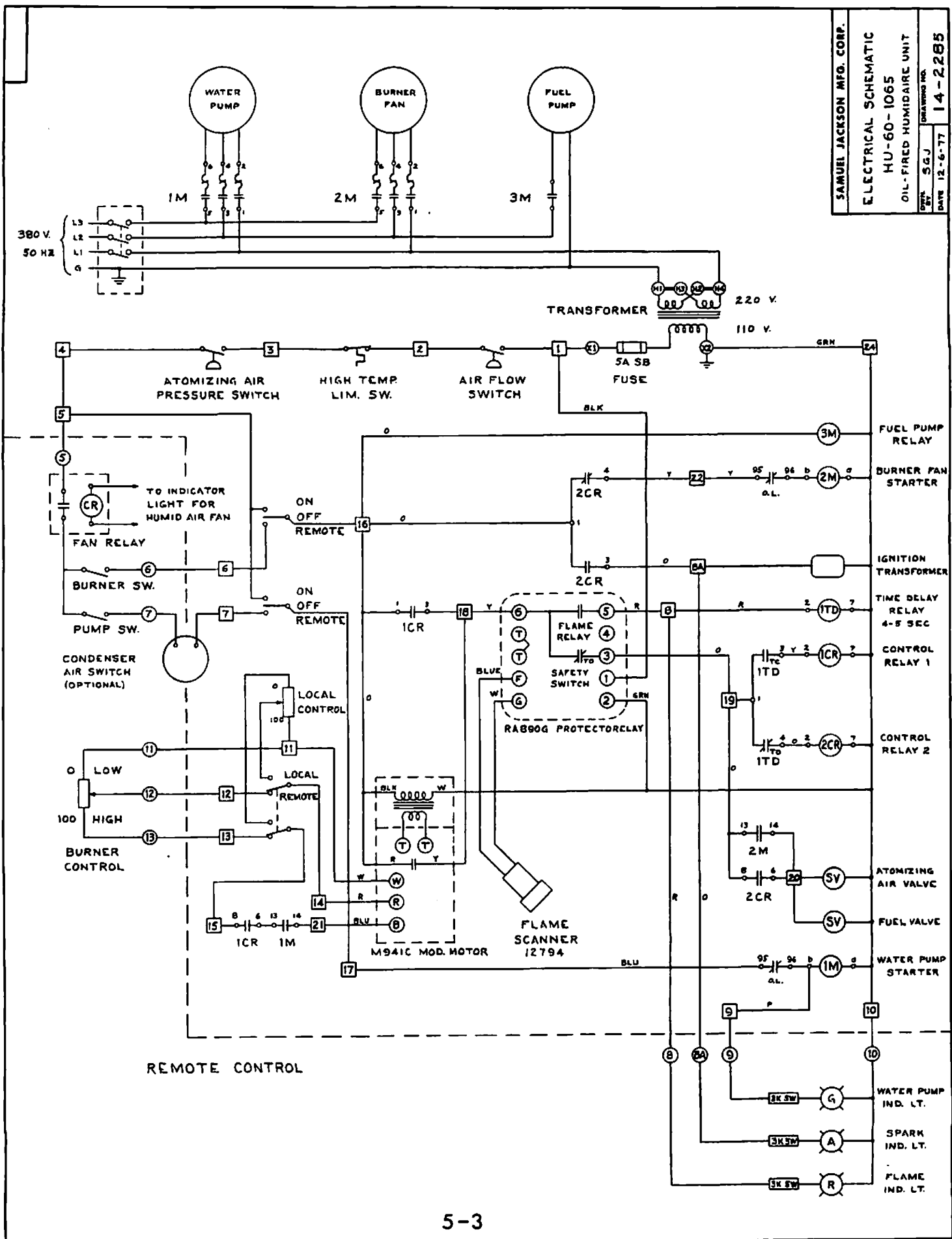
SECTION 5

TROUBLESHOOTING

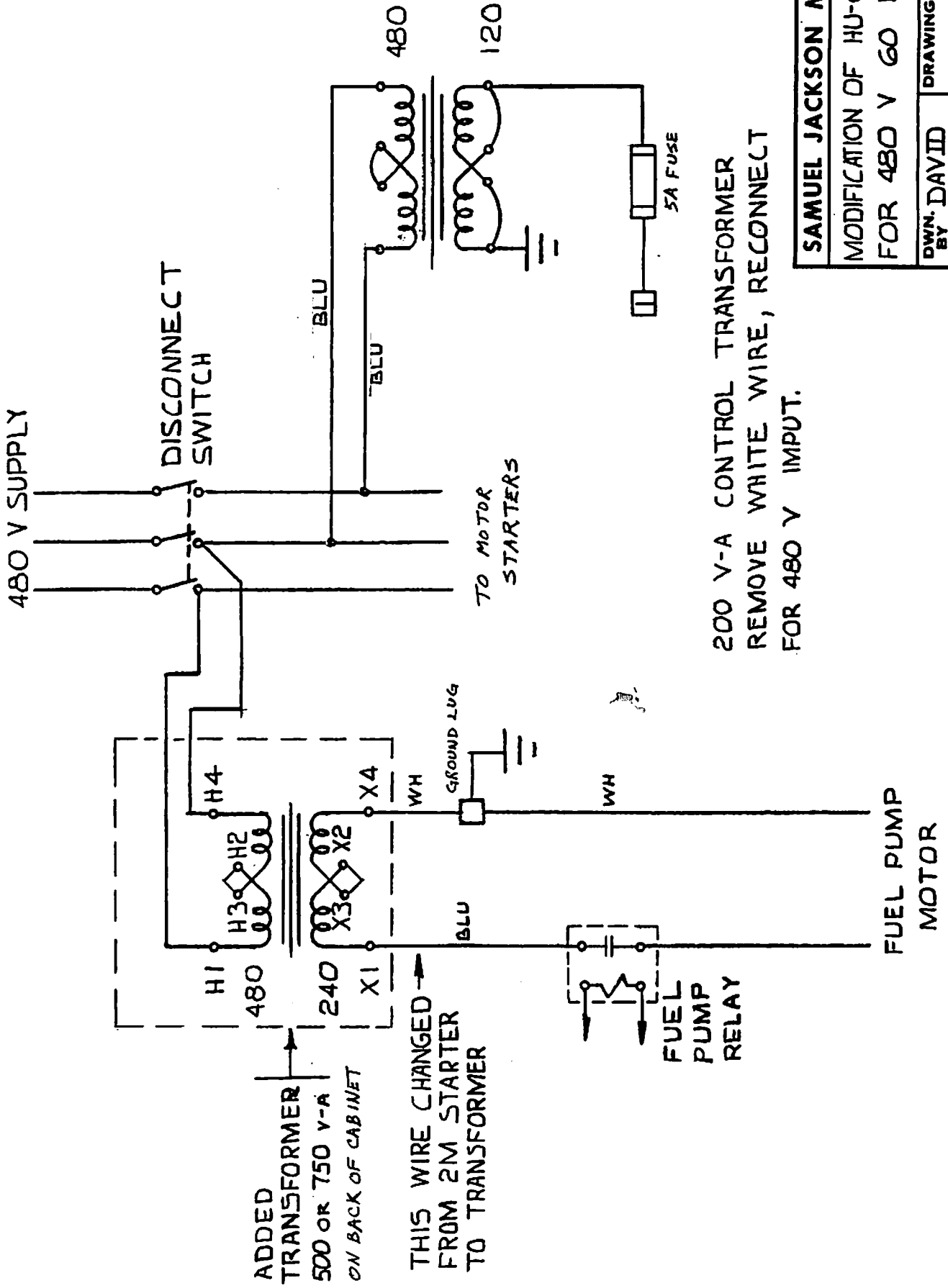
<u>PROBLEM</u>	<u>POSSIBLE CAUSES AND REMEDIES</u>	<u>REF. / PAGE</u>
1. Humidaire unit completely dead	Humid air fan not on. Air flow choked off. Air flow switch not functioning. If not, drain any condensed water from tube leading to spray chamber, then make sure drain cock is closed. Make sure tube is not clogged. If unit will operate on local control, but not remote, check fan relay in remote control. Electric power supply off. Check control voltage and 5-amp fuse. Check compressed air supply and atomizing air pressure switch.	 4 / 4-1 7 / 4-1 3 / 4-1 10 & 11 / 4-1
2. Burner will not light	See if Problem 1 applies. Press reset button on protectorelay. Check fuel pressure at 60 psi. Check spark electrode. Make sure combustion air fan operates, but starter 2M drops out while amber "Spark" light is on. Press reset button on starter 2M. Check operation of ignition timer.	 14 / 6-2 34 / 6-2 31 / 4-2 12 / 6-2 29 / 4-2
3. Burner goes off and relights	Voltage fluctuations may affect protectorelay. Check flame scanner for carbon on lens. Water in fuel. Check fuel filter. Air in fuel. Check fuel flowmeter.	 2 / 4-1 19 / 6-6 38 / 6-2 9 / 6-6
4. Burner lights, but will not turn up	Water pump is off. Defective time delay relay. Defective control relay 1CR. Defective Modutrol motor or cover transformer.	 1 / 6-2 6 / 6-2 12 & 13 / 6-6
5. Water pump will not run	See if Problem 1 applies. Motor end of water pump shaft is slotted. Using stub screwdriver, see if it turns freely. If not: A. Blow lint and dirt from motor. B. Check for rust and scale jamming pump impeller in pump bowl. Inspect as prescribed in 5th paragraph, p. 4-3. C. If shaft still is not free, check motor armature and bearings. Where condenser air switch control is used, cotton may not be coming from battery condenser. Press reset button on starter 1M. Check voltage and motor current.	 4-3 1-5 11 / 6-2 1 & 8 / 4-1

CONTINUED ON NEXT PAGE

<u>PROBLEM</u>	<u>POSSIBLE CAUSES AND REMEDIES</u>	<u>REF. / PAGE</u>
6. Water in humid air coming from unit-- As condensation	System should be preheated per "Normal Operating Procedure". Air flow from Humidaire unit choked down too much. Cold air may be blowing on uninsulated pipes.	3-1
Not as condensation	Mist eliminator clogged with lint or scale. Air hood internal baffle assembled backwards.	2 / 6-4 2-1
7. Not enough humidification	See Problem 8 below. Too much air being drawn from Humidaire unit. Air not being properly applied to cotton. Not enough heat input. See Problem 4. Water spray nozzles may be clogged.	
8. Water pressure not normal	See 5th paragraph of Maintenance section. Check for air leak on suction side of water pump. Water level in tank may be so low that water pump sucks air. Water pump may be running backwards.	4-3 18 / 4-1 5 / 4-1



REMOTE CONTROL



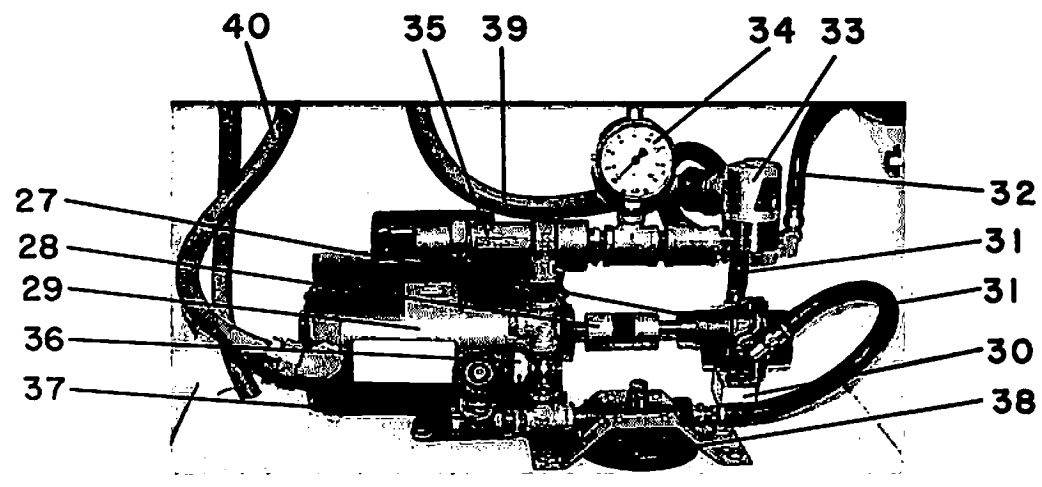
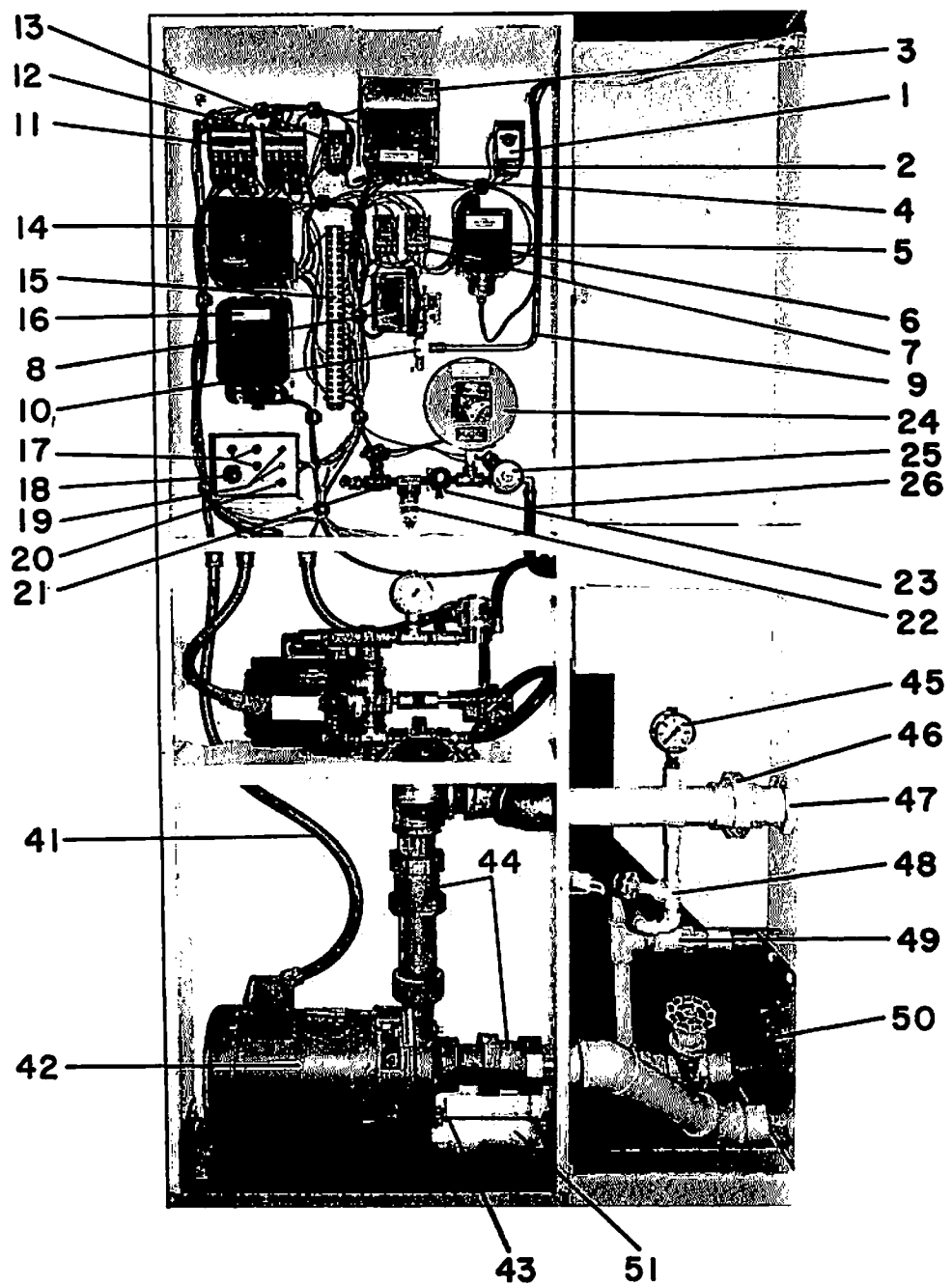
SAMUEL JACKSON MFG. CORP.	
MODIFICATION OF HU-60-1065	
FOR 480 V 60 HZ	
DWN. BY	DAVID
DATE	8-25-61
DRAWING NO. 11-2352	

SECTION 6

REPAIR PARTS

HU-60-1065

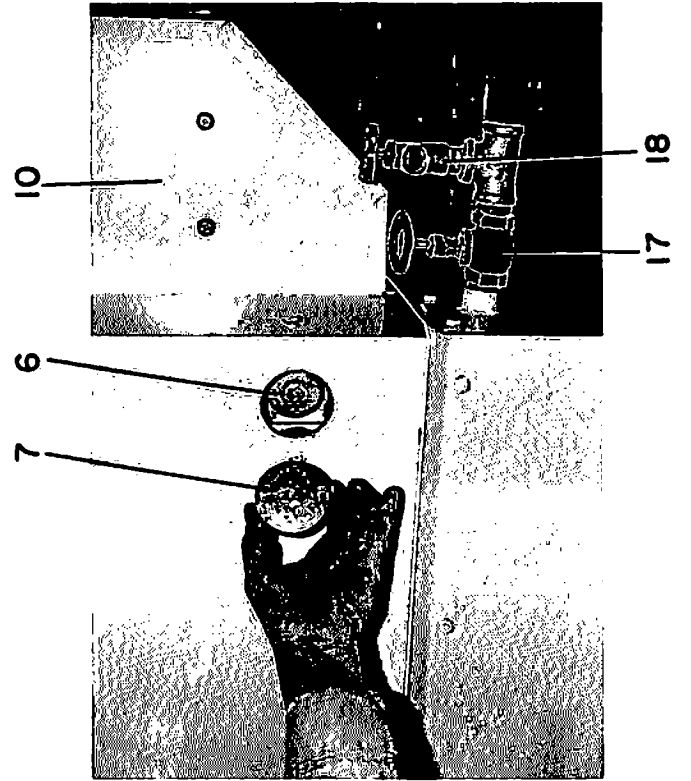
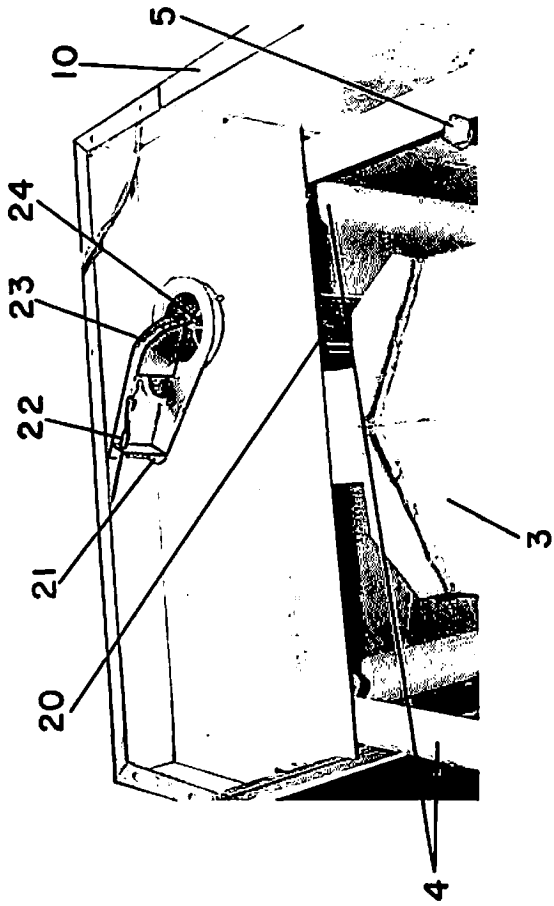
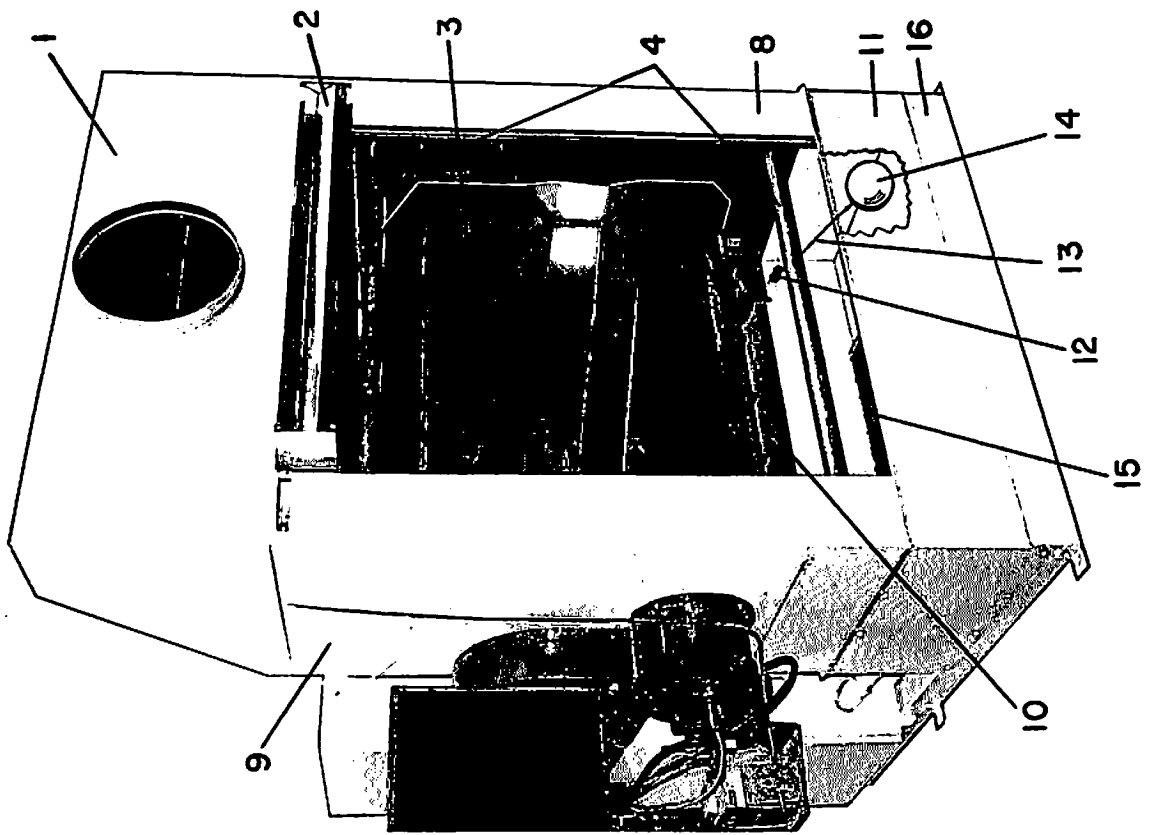
HUMIDAIRE UNIT



HU-60-1065 OIL-FIRED HUMIDAIRE UNIT

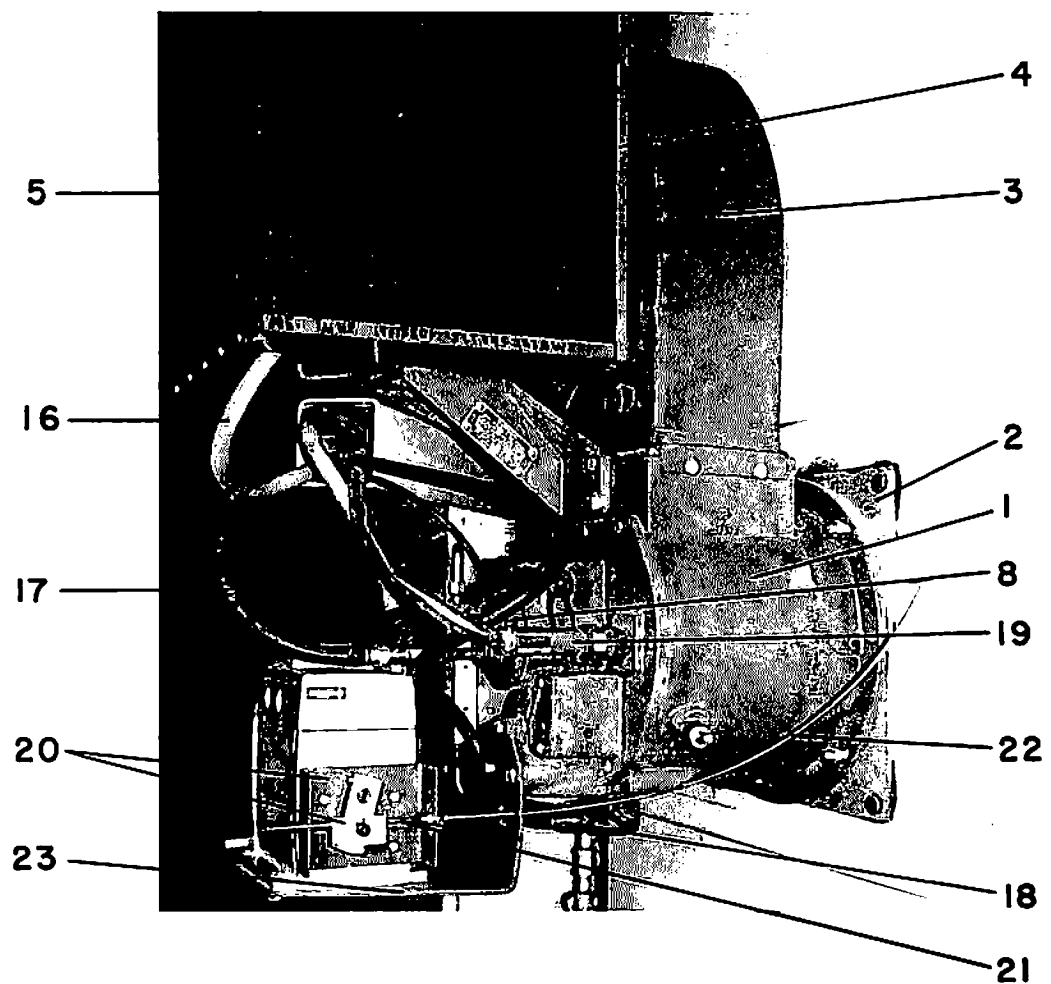
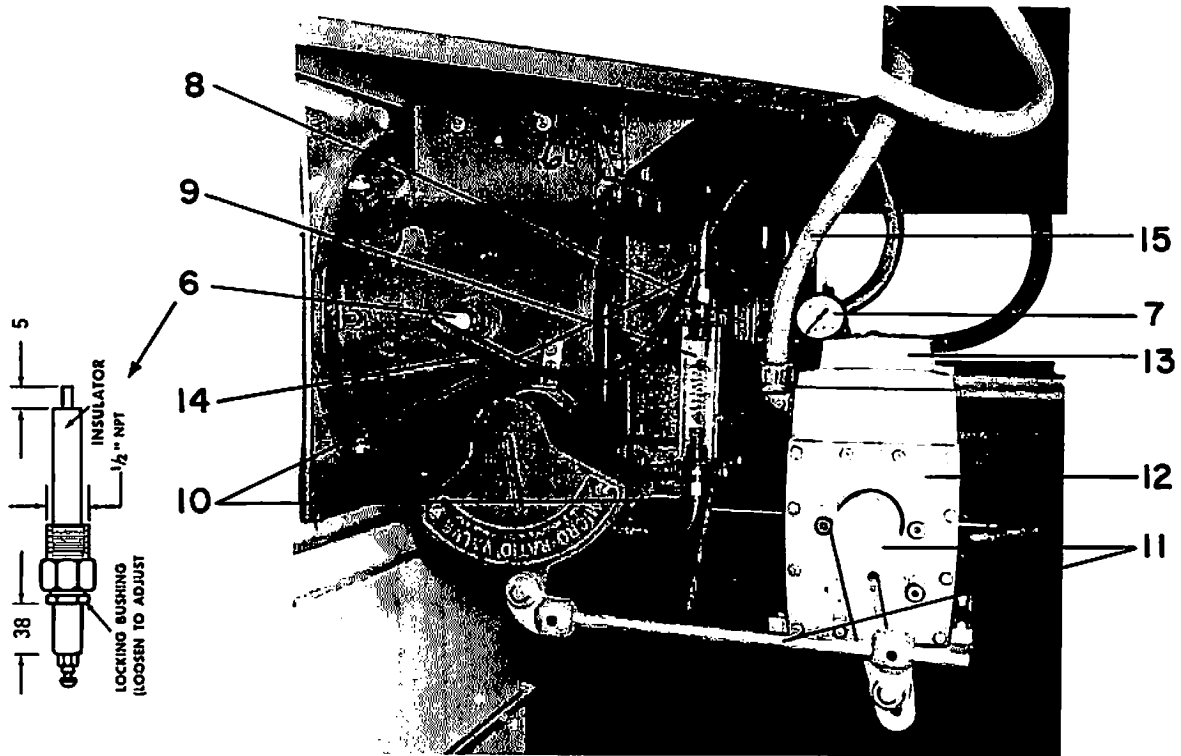
<u>Ref.</u>	<u>Quan.</u>	<u>Part No.</u>	<u>Description</u>
1	1	13619	Time-delay relay
2	1	11168	120-volt transformer
3	1	13308	Cover for transformer
4	1	12377	5-amp slow-blow fuse
5	1	12320	High-temperature limit switch
6	2	13146	Relay, KRP-11A
7	3	13167	Relay socket
8	1	12374A	Air flow switch
9	1	13627	Tube for air flow switch
10	1	13364	Drain cock for air flow switch tube
11	1	---	1M - Water pump starter
	1	13590	Size 0 contactor
	1	13591	Overload relay, 2-3 amp
12	1	---	2M - Burner fan starter
	1	13590	Size 0 contactor
	1	13592	Overload relay, 1.2-1.8 amp
13	1	13149	3M - Fuel pump relay
14	1	12792	Protectorelay RA 890G
15	25	11186	Wire terminal
	1	11187	End section for wire terminals
16	1	11172	Ignition transformer
17-20	1	13616	Local control panel, complete
17	3	13317	Indicator light socket only
	1	11676	Red lens
	1	11674	Green lens
	1	10099	Amber lens
	3	11227	Lamp only, 327
	3	11320	Resistor, 3500-ohm, 5-watt
	3	13143	Resistor bracket
18	1	11239	Potentiometer, 135-ohm
	1	11672	Pointer knob for potentiometer
19	2	09863	Toggle switch, SPDT, center off
20	1	13618	Toggle switch, DPDT
21	1	13626	Compressed air shut-off valve
22	1	13593	Compressed air filter
23	1	13594	Compressed air regulator
24	1	13613	Atomizing air pressure switch
25	1	13598	Atomizing air solenoid valve
26	1	13637	Atomizing air hose
27	1	09801	Fuel oil pump
28	1	09838	Pump shaft coupling
29	1	09840	Motor, 1/3 HP, 220V, 50 HZ, 1 phase
30	1	09827	Pump spacer
31	2	13636	Fuel pump hose, 12"
32	1	13638	Fuel hose to burner
33-38	1	13621	Fuel filter and valve assembly
33	1	13624	Fuel solenoid valve, 115/50
	1	12376	Coil for solenoid valve, 115/50
34	1	12313	Oil pressure gage
35	1	12385	Fuel pressure relief valve
36	1	13623	Fuel return cock
37	1	13625	Fuel shut-off valve
38	1	12790	Fuel oil filter housing only
	1	12791	Fuel filter cartridge
39	1	13634	Fuel valve conduit
40	1	13635	Fuel pump motor conduit
41	1	13633	Water pump conduit
42	1	11104	Water pump, complete with motor
	1	13540	Motor for water pump, specify voltage
	1	11251	Body gasket for water pump
	1	11261	Shaft seal for water pump
43	1	13363	Drain cock for water pump
44	2	10720	2-inch dresser coupling, complete
	4	13245	Rubber seal for 2-inch coupling
	4	13246	Metal cup ring for 2-inch coupling
45	1	11277B	Water pressure gage
46	1	10493	2-inch galv union
47	1	13368	2-inch pipe locknut
48	1	13625	Water bleed valve
49	1	13369	1-inch dresser coupling, complete
	2	13371	Rubber seal for 1-inch coupling
	2	13372	Metal cup ring for 1-inch coupling
50	1	13373	2-inch drain valve
51	1	13606	Water pump base pan

HU-60-1065



HU-60-1065 OIL-FIRED HUMIDAIRE UNIT

<u>Ref.</u>	<u>Quan.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref.</u>	<u>Quan.</u>	<u>Part No.</u>	<u>Description</u>
1	1	12029B	Air discharge hood		1	13330	Air inlet screen (not shown)
2	1	12150	Mist eliminator assembly	11	1	13052	Water tank
	2	12151	Mist eliminator end piece	12	1	11070	Float valve
	29	12152	Mist eliminator blade	13	1	11069	Float stem
	8	12089	Lock pin	14	1	11068	Float ball
	8	12392	8-32 x ½ RH MS SS	15	1	13260A	Water screen assy
3	1	12940	Combustion chamber	16	1	13051	Base frame assy
4	1	13652	Nozzle header assy, less nozzles	17	1	13374	Water shut-off valve, 3/4
5	24	11079	Brass water spray nozzle	18	1	13375	Hose cock, ½
6	4	13487	Rubber plug, 1½-inch	19	1	13670	Hot gas bypass apparatus
7	4	13489	Rubber plug, 2½-inch	20	1	13671	Hot gas pipe
8	1	13082	Panel, stack side	21	1	13674	Hot gas frame
9	1	13083	Panel, burner side	22	1	13668	Compression clamp fitting
	1	12148	Door panel (not shown)	23	1	13669	Chain and clevis bolt assy
10	1	13315	Air inlet duct assembly	24	1	13691	Hot gas plug



HU-60-1065 OIL-FIRED HUMIDIFIER UNIT

<u>Ref.</u>	<u>Quan.</u>	<u>Part No.</u>	<u>Description</u>
1	1	13681	Oil Burner Assembly, Size 525, less modutrol motor
2	1	13701	Burner discharge sleeve
3	1	13702	Blower housing
	1	13703	Blower impeller (not shown)
4	1	13705	Filter housing with two 13243 elements
5	2	13243	Filter element (330 x 510 x 51mm)
	1	13704	Blower motor (not shown)
6	1	12796	Spark electrode
7	1	13706	Air pressure gage
8	1	13244	Fuel Nozzle Sub-assembly
9	1	13319	Fuel Oil Flowmeter, 10-80 l/hr
10	1	13707	Set of tubes for flowmeter
11	1	13708	Linkage for modutrol motor
12	1	12793	Modutrol motor M941C
13	1	12333	Cover transformer
14	1	13639	Spark electrode wire
15	1	13631	Conduit for modutrol motor
16	1	13632	Conduit for blower motor
17	1	13637	Atomizing air hose
18	1	13638	Oil hose
19	1	12794	Minipeeper ultraviolet scanner
20	1	13710	Hot gas valve actuator assy
21	1	13720	Push wire
22	1	13721	Sleeve for push wire
23	1	12945A	Base for modutrol motor

IMPORTANT NOTE ON FUEL

Although this unit was designed to burn diesel fuel, and can do so, DO NOT USE DIESEL FUEL! The most important consideration is for the Humidaire Unit to produce enough high-humidity air to do its job. Using the 13646 Recirculation Duct (Ref 7-3) triples its output. If this duct is used with diesel fuel, which usually has a high sulfur content, sulfuric acid will form in the Humidaire Unit and destroy it the first season. Therefore, USE KEROSENE, NAPHTHA OR AVIATION JET FUEL of low sulfur content. Although its cost per liter may be higher, (it is sometimes lower!) the cost of operation per hour will be lower because you are using all the heat. To put fuel cost in its proper perspective, the value of the moisture added to the cotton at the lint slide is usually about 20 times the cost of the fuel used.

If one is using diesel-fired drying burners, it may not be necessary to install a separate fuel tank for the Humidaire Unit. Some gins simply use kerosene or naphtha in their drying burners. Using the cleaner-burning fuel for drying results in less cotton tinged gray by smoke.

If you absolutely must use diesel fuel, then do not use the 13646 Recirculation Duct. Pipe the hot gases outside. Reduce the air flow through the Humidaire Unit as much as possible. This will produce higher-humidity air.

Regardless of the fuel used, use the bleed-off valve provided to waste some water from the unit when it is running. This will minimize the build-up of either acids or minerals in the unit. Doing this and keeping the unit clean will be effort well spent.

COMPRESSED AIR CONSUMPTION

The Humidaire Unit burner uses compressed air to atomize the fuel. Be sure your compressor is large enough to supply:

7½ cubic feet per minute at 60 pounds per square inch, or
215 liters per minute at 4 bars (kilograms/cm²)

INSTALLATION AT THE LINT SLIDE

Refer to Drawing 14-2355. The fan used to move the humid air may be an 18-inch (457 mm) diameter vaneaxial fan, as shown, with a 10 HP (7.5 KW) motor turning the fan at 1750 rpm. A regular centrifugal fan mounted on the floor can also be used. A number 25 fan turning 1200 rpm with a 10 HP (7.5 KW) motor is satisfactory.

It is important to install a slide valve to regulate the air flow through the Humidaire Unit. Up to a certain point, you can increase moisture added to the cotton by reducing the air flow. Normal air flow is from 1000 to 2000 cubic feet/minute (1800 to 3600 cubic meters/hour).

Although it is not necessary, the lint slide may be covered and a hood installed as shown to collect the used humid air and fragments of lint blown up out of the slide. This can be piped into the lint flue at a point at least 10 feet (3 meters) from the condenser screen.


If you encounter problems in installing your Humidaire Unit, we invite you to telephone us at 806-795-5218.

SECTION 7 -- SUPPLEMENTAL BULLETINS

HU-60-1065

BULLETIN 1 -- March 1, 1979. Begins with Serial 4502.

Earlier units should also be changed if they have a time delay relay (Ref 1, page 6-2).

CHANGE: Move the wire which is connected to terminal 1 of the time delay relay from terminal block contact 19 to contact 20. See symbol  on corrected electrical schematic on page 7-2.

REASON: If the burner fan starter is on overload, this change limits the time that fuel can be supplied to the burner without combustion air to the 4 to 5-second setting of the time delay relay.

SUPPLEMENTAL BULLETIN 2

HU-60-1065

13646 HOT GAS RECIRCULATION DUCT
March 1, 1979 -- Begins with Serial 4502

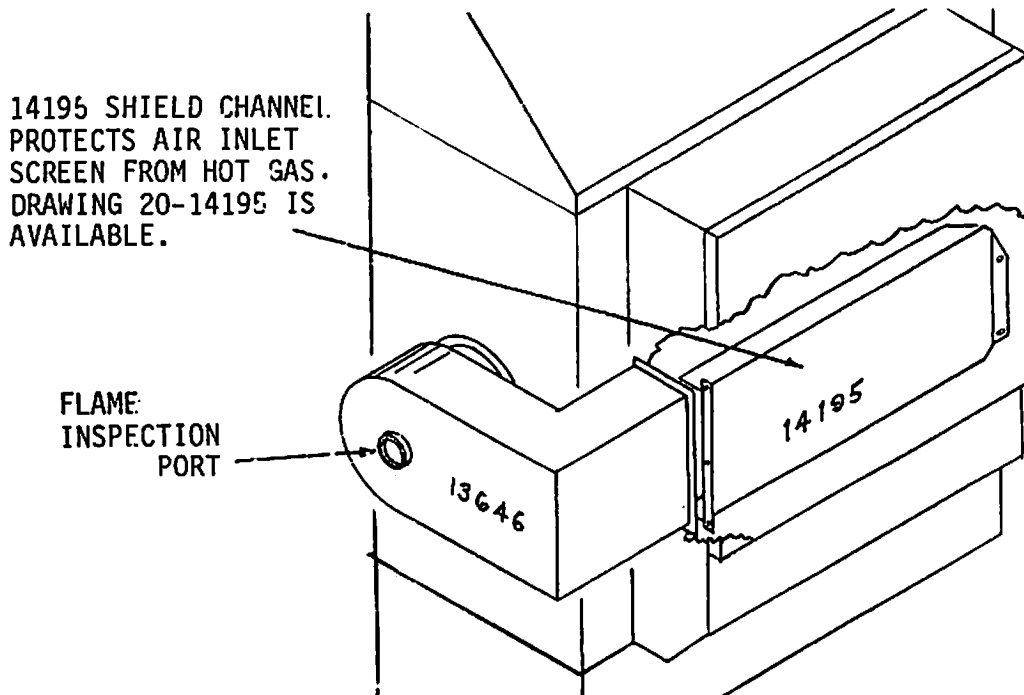
14195 SHIELD CHANNEL
Added Sep. 28, 1981

The HU-60-1065 Humidaire Unit is designed so the gases resulting from burning the fuel oil will not mix with the water spray. This is to keep sulfurous oxides from dissolving in the water and forming acids which would damage the Humidaire Unit.

In many places it is possible to obtain kerosene or jet aircraft fuel at a slightly higher cost than diesel fuel. Since this fuel burns cleaner, and usually has a low sulfur content, the fumes from the combustion chamber can be ducted into the air intake section of the Humidaire Unit instead of being vented outside the building. By conserving this heat energy, fuel consumption of the unit can be reduced about one half or its output of humidity doubled.

Humidaire Units with serial numbers beginning as shown above have been supplied with the 13646 Recirculation Duct, and an opening has been made for it in the air inlet section. The duct can be ordered separately for older units, but the opening must be cut. The duct fits over the vent from the combustion chamber.

CAUTION: Do not use the recirculation duct with high-sulfur fuel. Expensive corrosion damage to your Humidaire Unit will result.



SUPPLEMENTAL BULLETIN 3

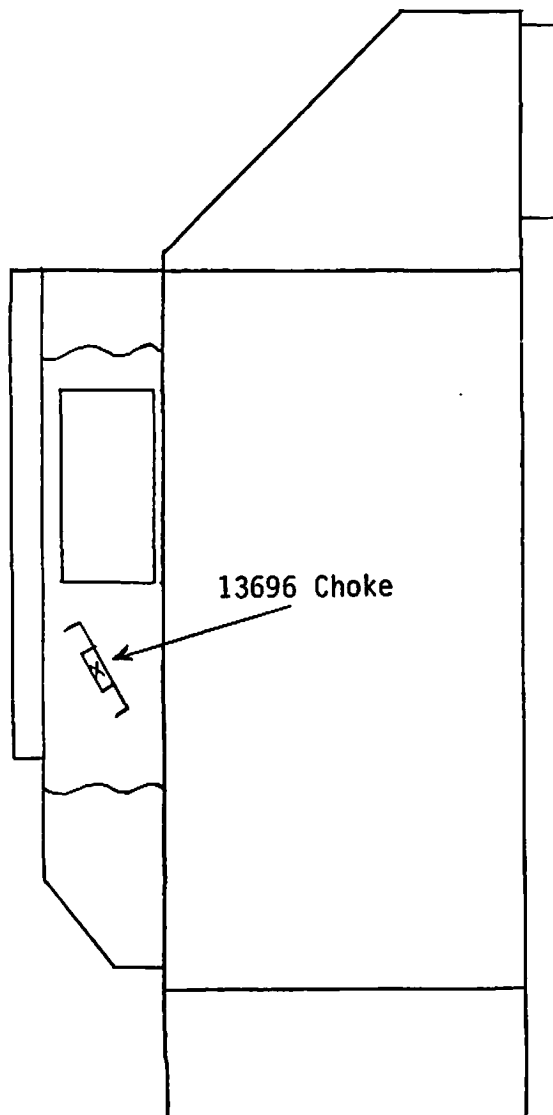
HU-60-1065

13696 CHOKE FOR AIR INTAKE

March 1, 1979 -- Begins with Serial 4502

Previously, when this unit was used in applications which required less than normal output of humid air, difficulty was experienced with the air flow switch. Starting with Serial 4502, this unit will be equipped with a choke in the air inlet duct. It can be adjusted by loosening the pivot screws at each side of the duct. Rotate the choke and retighten the pivot screws. Rotate the choke and retighten the pivot screws.

The opening should be closed until the air flow switch turns on the Humidaire Unit every time the fan is started. If it is closed too far, the switch may have difficulty in turning off the unit.



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INSTALLATION AT THE LINT SLIDE

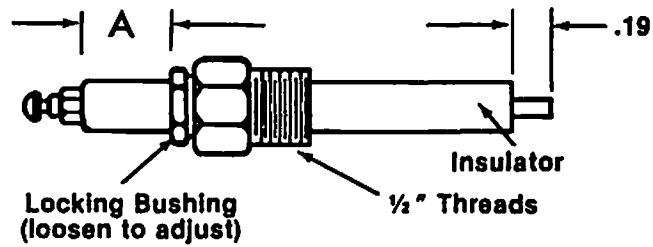
Refer to Drawing 14-2355. The fan used to move the humid air may be an 18-inch (457 mm) diameter vaneaxial fan, as shown, with a 10 HP (7.5 KW) motor turning the fan at 1750 rpm. A regular centrifugal fan mounted on the floor can also be used. A number 25 fan turning 1200 rpm with a 10 HP (7.5 KW) motor is satisfactory.

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ADJUSTMENT OF
12796 AND 14200 SPARK IGNITORS
 (MAXON 25663)



<u>SJMC</u> <u>PART NO.</u>	<u>FOR SAMUEL</u> <u>JACKSON MACHINES</u>	<u>DIMENSION A</u>	
		<u>MM</u>	<u>INCHES</u>
12796	HU-60-1065	25	1.00
	HO- 7-1114		
14200	HU-60-1105	40	1.56
	HO- 4-1112		
	HO- 4-1118		