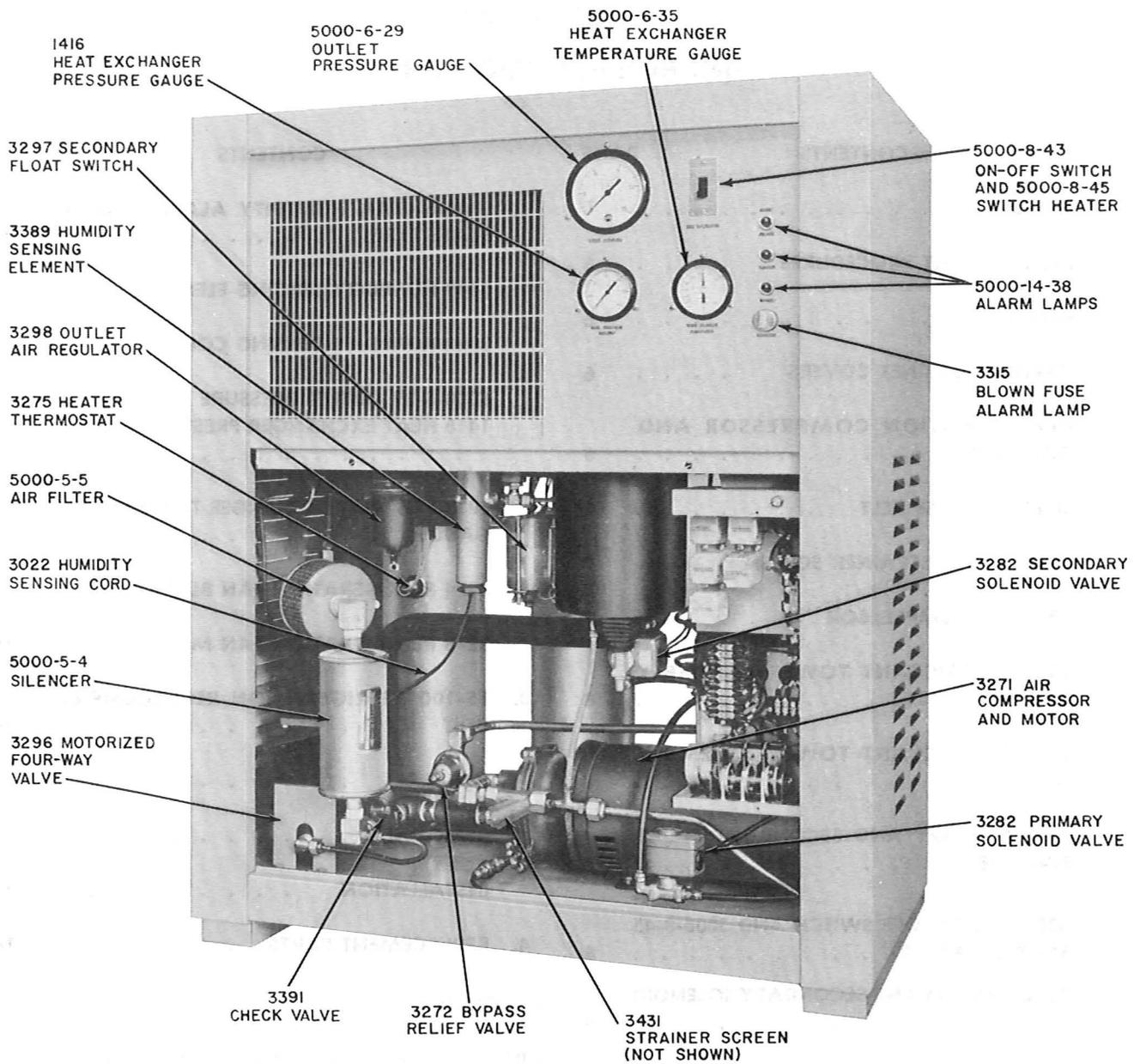


**KS-20336 L1 AIR DRYER  
MAINTENANCE  
AND REPLACEMENT PARTS**

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shown by their part number and name in Fig. 1, 2, 3, and 4. No attempt should be made to replace parts not designated in the illustrations or text.



**Fig. 1—KS-20336 L1 Air Dryer—Front View**

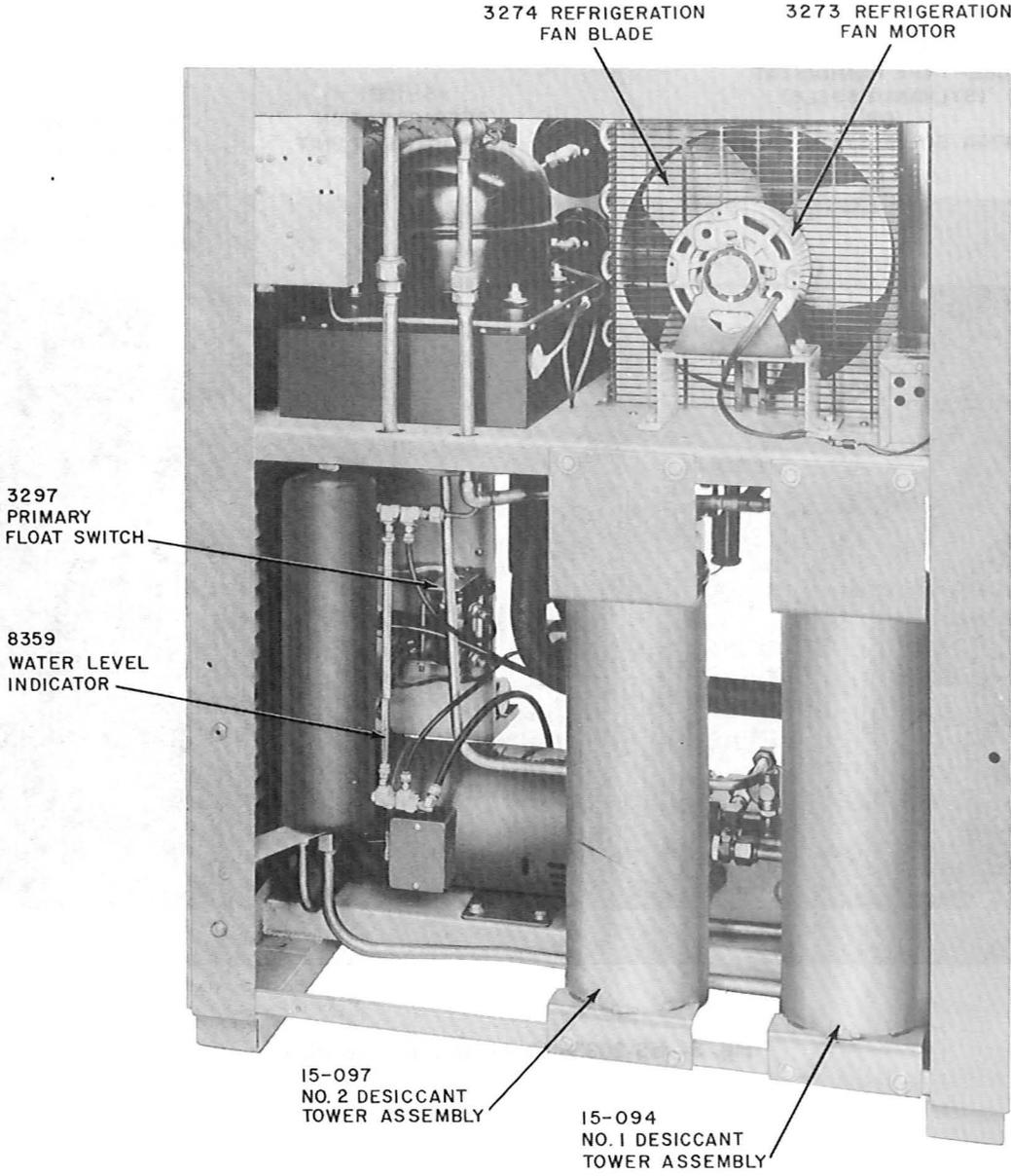


Fig. 2—KS-20336 L1 Air Dryer—Rear View

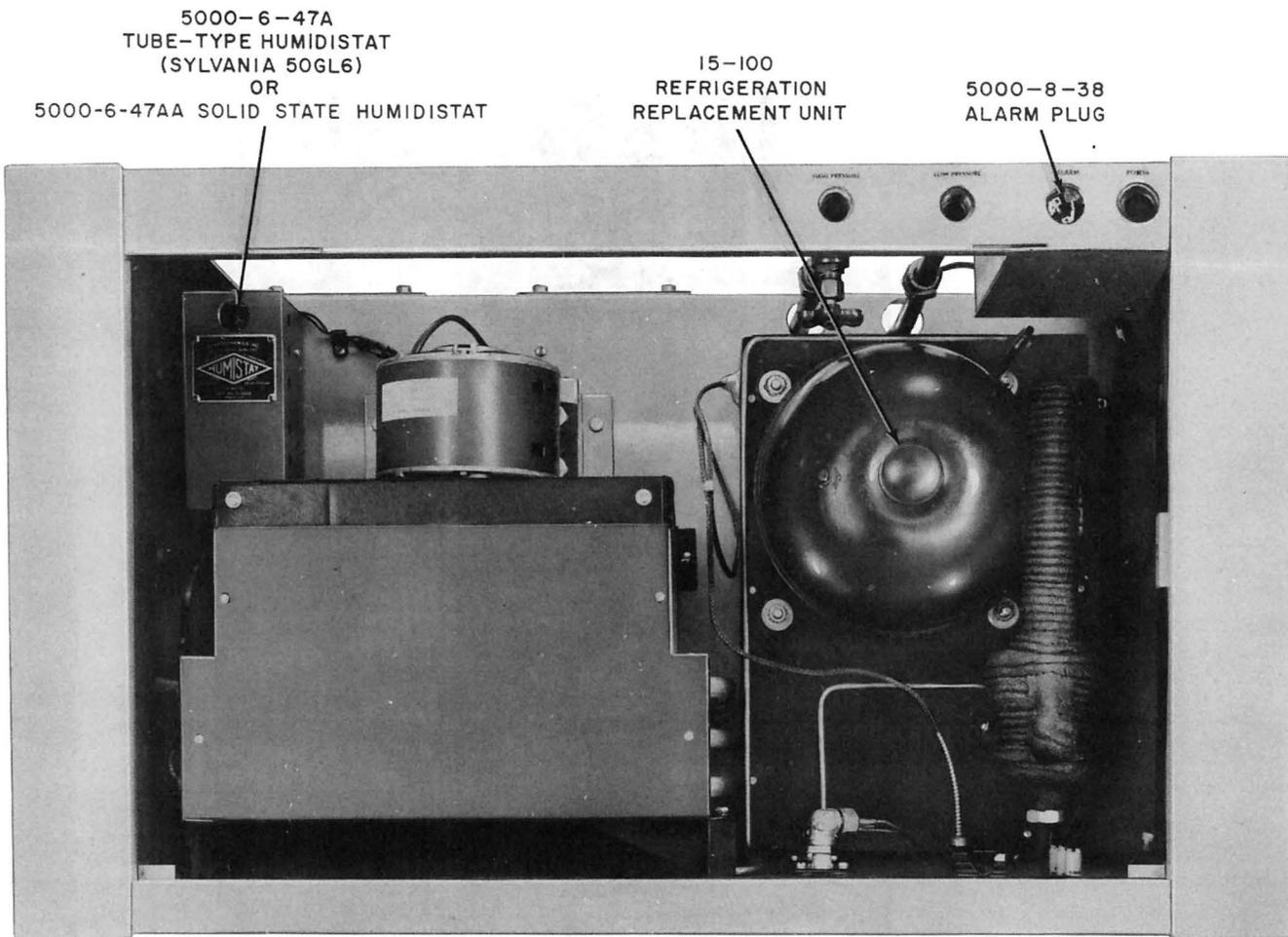


Fig. 3—KS-20336 L1 Air Dryer—Top View

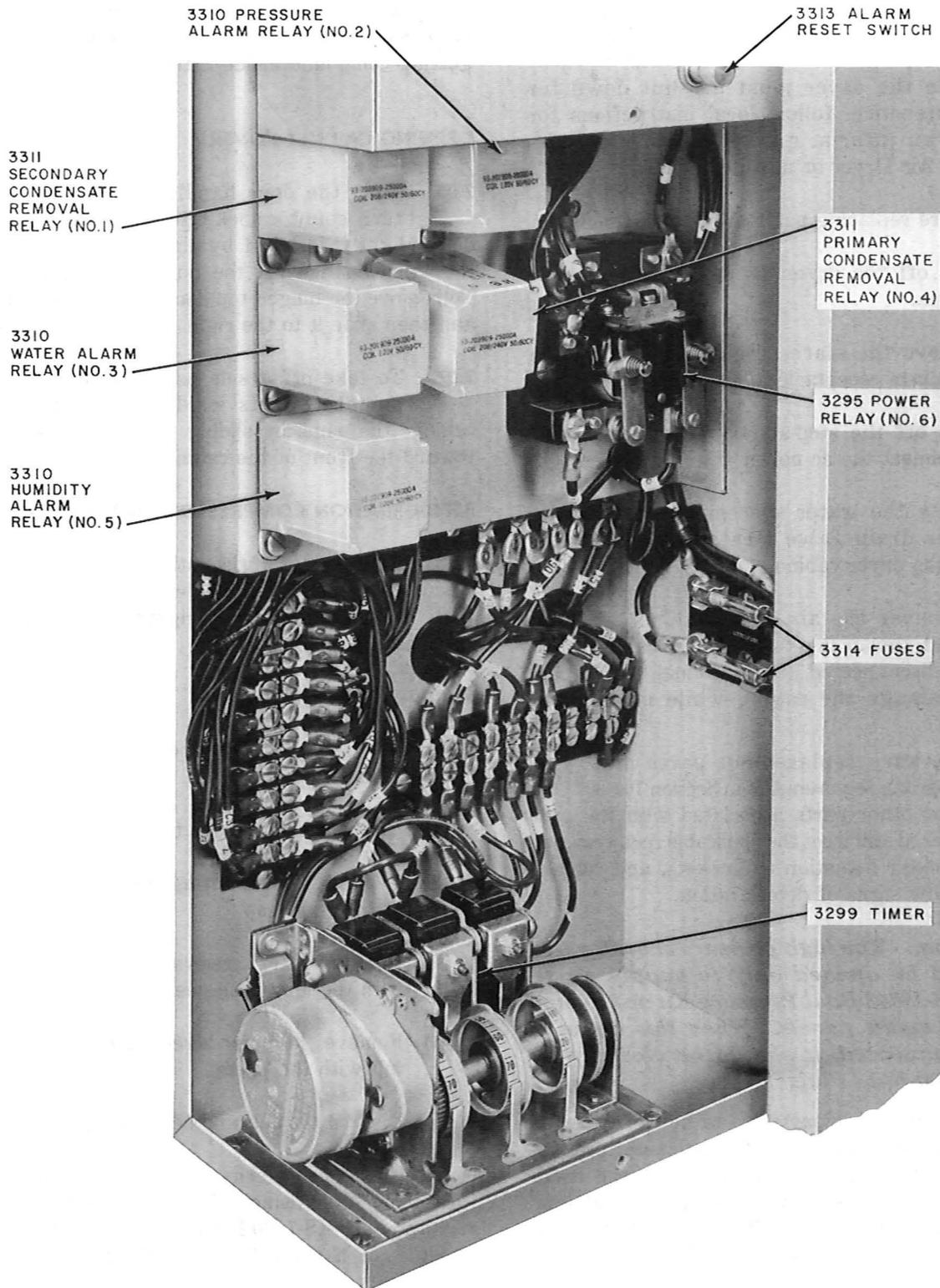


Fig. 4—KS-20336 L1 Air Dryer—Electrical Box

## 2. REPLACEMENT PROCEDURES

### GENERAL

**2.01** When the dryer must be shut down for maintenance, follow local instructions for supplying an interim gas source such as the Emergency Air Dryer or nitrogen cylinders.

**2.02** Before replacing parts proceed as follows:

- (a) Shut off the dryer air supply to the cable system.
- (b) Remove the alarm circuit connector from the alarm receptacle in the cabinet.
- (c) Turn off the stop-start switch (Fig. 1) and disconnect the ac power from the dryer.
- (d) Empty the water system by opening the water drain valve located at the bottom front of the dryer cabinet.
- (e) Whenever the air dryer cabinet is to be moved, the air line tubing to the cable system must be disconnected at the cabinet. Take care not to damage the tubing while moving the cabinet.
- (f) Make sure replacement parts meet the appropriate requirements in Section 161-307-701. Check that other parts associated with the part being replaced still meet the applicable requirements. Pay particular attention to gaskets, and replace if they show signs of deterioration.

**Caution:** *The high pressure shutoff valve should be opened only to supply air to the KS-16648 Dual Pressure Kit or the pipe alarm meter panels. When this outlet is not connected, it should be closed with the 5000-10-13 Plug.*

**2.03** When air dryer parts are to be cleaned with petroleum spirits near dc machinery, provide adequate ventilation beforehand. Use the least amount of spirits necessary and keep the container closed between cleanings. These precautions will prevent the fumes of the spirits from damaging the dc machinery.

**2.04** No replacement procedures are specified for screws, pipe fittings, grommets, pressure gauge glasses, or other easily replaced parts.

**2.05** When connecting pipe-threaded fittings, apply a small amount of sealing compound to the male threads using the KS-14164 Brush. Avoid getting compound inside fittings.

### OPENING CABINET COVERS

**2.06** Turn the door handles about one-quarter turn counterclockwise, pull the top of the door slightly forward by the latch rings to clear the latches, then lift the door out of the cabinet. To remove the hinged top door, raise it until vertical and then slide it to the right off the hinge pins.

**2.07** To take off a side panel, remove the panel mounting bolts inside the cabinet. Then remove the panel by sliding it slightly upward and toward the front of the cabinet.

### REFRIGERATION COMPRESSOR AND CONDENSER

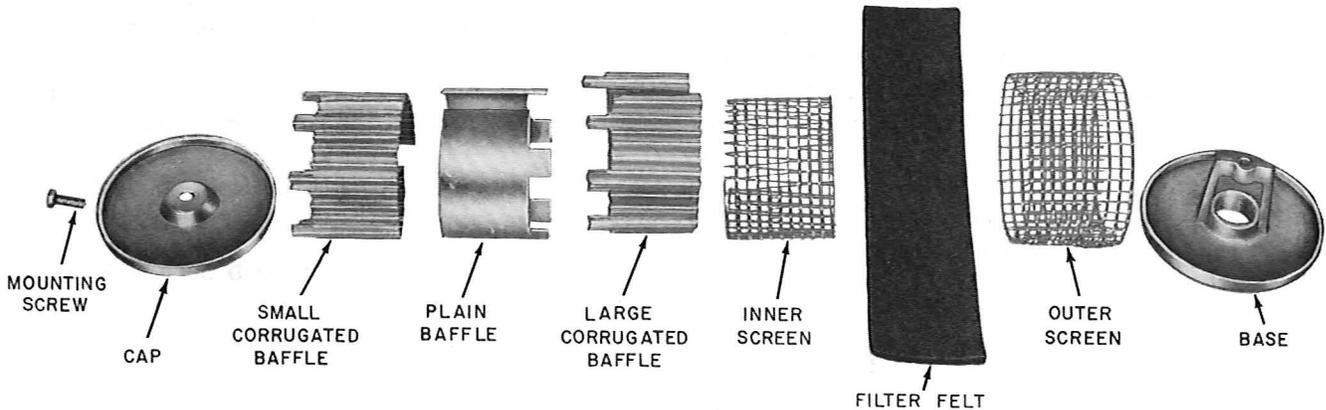
**2.08** Replacement of the entire refrigeration system can be made by telephone company personnel with the 15-100 RRU Refrigeration Replacement Unit (See Part 3).

### 5000-5-5 FILTER FELT

**2.09** Air compressor filter felts (Fig. 5) are replaced as follows:

- (1) Unscrew and remove the air inlet filter.
- (2) Remove the mounting screw in the center of the filter cap.
- (3) Hold the outer screen and pull out the baffles with the long-nose pliers.
- (4) Remove the inner screen and then the filter felt with the pliers.
- (5) Discard the felt and separate the baffles.
- (6) Clean the screens, baffles, cap, and base of the filter using a KS-14666 Cloth moistened with either KS-7860 Petroleum Spirits, B Cleaning Fluid, or a good detergent cleaner, and then a dry cloth.
- (7) Mount the new filter inside of the outer screen with the ends butting against each other.

- (8) Mount the inner screen with the ends overlapping.
- (9) Place the larger corrugated baffle against the inner screen.
- (10) Place the plain baffle inside of the corrugated baffle with the cutout portion at the opposite end from the cutout portion of the corrugated baffle.
- (11) Similarly, mount the remaining corrugated baffle with the cutout portion opposite to that of the plain baffle.
- (12) Place the assembly and the cap on the filter base, insert and tighten the screw in the cap.
- (13) Remount the filter on the compressor.



**Fig. 5—Air Intake Filter—Dismantled**

### 3431 WATER STRAINER SCREEN

**2.10** The water strainer screen is removed and replaced quarterly as follows:

- (1) Shut off the air supply to the cable system.
- (2) Move the ON-OFF switch to the OFF position and disconnect the dryer from the ac power supply.
- (3) Open the water drain valve and drain the water system.
- (4) With an adjustable wrench, loosen and remove the hexagonal fitting at the bottom of the water strainer.
- (5) Pull the old screen from the fitting and insert a new screen furnished with the 3741 Annual Maintenance Kit (4.02).
- (6) Reinstall and tighten the hexagonal water strainer fitting.

(7) Reconnect the dryer to the ac power supply.

(8) Fill the water system as covered in 3.05.

(9) When the alarms have cleared, resume supplying air to the cable system.

### 3271 AIR COMPRESSOR AND MOTOR

**2.11** Defective air compressors are removed and replaced as follows:

- (1) Shut off the air supply to the cable system.
- (2) Turn the ON-OFF switch to OFF and disconnect the air dryer from the ac power supply.
- (3) Remove the air intake filter assembly.
- (4) Open the water drain valve and drain the dryer water system.

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- (5) Remove the motor conduit box cover and disconnect the external leads to the motor.
- (6) Loosen the cord clamp screw and remove the external leads from the conduit box.
- (7) Disconnect the four (4) flare nuts at the eductor, bypass valve, elbow fitting going into the check valve, and the air compressor discharge line. Disconnect the 1/4-inch clear plastic tubing at the eductor.
- (8) Remove the following parts from the air compressor in this order: Check valve, eductor and water strainer, flow control valve, bypass relief valve, water drain valve, and the 1/2-inch flare fitting on the air compressor discharge port.
- (9) Remove the four mounting bolts and pull the compressor from the cabinet.
- (10) Mount the new compressor by following the removal procedure in reverse order.
- (11) Connect the external leads to the compressor motor in accordance with the motor connection diagram on the motor nameplate.
- (12) Reconnect the dryer to the ac power supply.
- (13) Fill the water system as covered in 3.04.
- (14) When the alarms have cleared, turn on the air supply to the cable system.

### 15-094 DESICCANT TOWER ASSEMBLY NO. 1

### 15-097 DESICCANT TOWER ASSEMBLY NO. 2

**2.12** Desiccant tower assemblies are removed and replaced as follows:

- (1) Shut off the air supply to the cable system.
- (2) Turn the ON-OFF switch to OFF and disconnect the dryer from the ac power supply.

**Warning:** *If the tower to be replaced is in the heating portion of the reactivation cycle, delay the replacement until the tower has cooled.*

- (3) Pull the heater thermostat from the thermostat well in the side of the tower.
- (4) Remove the protective screen, if present.
- (5) Disconnect both the tubing connections at the top and bottom of the tower and the wiring connections at the top of the tower.
- (6) Remove the four bolts holding the tower mounting brackets to the frame of the dryer.
- (7) Install the new tower assembly by following steps (3) through (5) in reverse order.
- (8) Reconnect the dryer to the ac power supply and turn ON the ON-OFF switch.
- (9) After all alarms have cleared, turn on the air supply to the cable system.

### 5000-8-43 ON-OFF SWITCH AND 5000-8-45 SWITCH HEATER

**2.13** The ON-OFF switch and switch heater are replaced as follows:

- (1) Disconnect the unit from the ac power supply.
- (2) Support the switch inside the cabinet and remove the switch mounting screws and faceplate.
- (3) If the heater is to be replaced, pull out the old heater, mounted beneath the switch lever, and insert the new heater. If the switch is to be replaced, tag and disconnect the leads. If the heater is satisfactory, transfer it to the new switch. Connect the leads to the new switch. Mount the switch and faceplate.
- (4) Reconnect the ac power supply.

### 3297 PRIMARY AND SECONDARY FLOAT SWITCHES

**2.14** The primary and secondary float switches are identical. To replace either switch, proceed as follows:

- (1) Shut off the air supply to the cable system.
- (2) Move the ON-OFF switch to the OFF position and disconnect the dryer from the ac power supply.

- (3) Open the water drain valve and drain the water system.
- (4) Disconnect the two (2) 1/4-inch plastic tubing connections from the switch.
- (5) Disconnect the two (2) wire leads from the switch.
- (6) Remove the two (2) nuts that secure the float switch to the mounting bracket.
- (7) Remove the two (2) 1/4-inch plastic connectors from the float switch and mount them on the new float switch. ***Do not use a wrench to mount the connectors, hand tighten only.***
- (8) Install the new float switch in the reverse order of removal (6) through (4).
- (9) Reconnect the dryer to the ac power supply.
- (10) Fill the water system as covered in 3.04.
- (11) When the alarms have cleared, resume supplying air to the cable system.

### **3282 PRIMARY AND SECONDARY SOLENOID VALVES**

**2.15** The primary and secondary solenoid valves are identical; to replace either valve, proceed as follows:

- (1) Shut off the air supply to the cable system.
- (2) Move the ON-OFF switch to the OFF position and disconnect the dryer from the ac power supply.
- (3) Open the water drain valve and drain the water system.
- (4) Disconnect the two (2) 3/8-inch plastic tubing connections.
- (5) Disconnect the two (2) wire leads from the solenoid.
- (6) Remove the two (2) nuts from the primary solenoid bracket, or two (2) screws from the secondary solenoid bracket, and remove the bracket and attached solenoid valve.
- (7) Remove the 3/8-inch plastic connector fittings securing the valve to the bracket.

- (8) Place the new solenoid valve into the bracket and secure with the 3/8-inch plastic connector fittings.
- (9) Secure the solenoid valve assembly to the dryer with the two (2) nuts, or screws. Make certain that the valve is in the proper position so that the 3/8-inch plastic tubing from the float switch will connect to the valve port marked INLET. Connect the remaining tubing to the other valve port.
- (10) Reconnect the wire leads to the solenoid.
- (11) Reconnect the dryer to the ac power supply.
- (12) Fill the water system as covered in 3.04.
- (13) When the alarms have cleared, resume supplying air to the cable system.

### **3296 MOTORIZED FOUR-WAY VALVE**

**2.16** The motorized four-way valve is removed and replaced as follows:

- (1) Shut off the air supply to the cable system.
- (2) Move the ON-OFF switch to the OFF position and disconnect the dryer from the ac power supply.
- (3) Disconnect the four (4) flare nuts.
- (4) Disconnect the electrical leads.
- (5) Remove the four (4) mounting bolts securing the assembly to the cabinet frame and remove the assembly from the dryer.
- (6) Loosen the four (4) bolts securing the valve to the mounting bracket and remove the bracket from the valve.
- (7) Remove the four (4) flare fittings from the base of the valve and install them on the new valve in the same order in which they were removed.
- (8) Place the mounting bracket on the new valve and install the valve in the reverse order of removal.

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(9) Reconnect the dryer to the ac power supply and move the ON-OFF switch to the ON position.

(10) Resume supplying air to the cable system.

### 3298 OUTLET AIR PRESSURE REGULATOR

**2.17** The outlet air regulator is removed and replaced as follows:

- (1) Shut off the air supply to the cable system.
- (2) Move the ON-OFF switch to the OFF position and disconnect the unit from the ac power supply.
- (3) Disconnect the tubing fittings from the regulator ports.
- (4) Remove the regulator from the mounting bracket.
- (5) Install the replacement regulator on the mounting bracket.
- (6) Reconnect the tubing fittings to the corresponding regulator ports.
- (7) Reconnect the dryer to the power supply and move the ON-OFF switch to the ON position.
- (8) Turn on the air supply to the cable system.

### 5000-6-33C HIGH LOW PRESSURE ALARM

**2.18** The high-low pressure alarm is removed and replaced as follows:

- (1) Shut off the air supply to the cable system.
- (2) Disconnect the dryer from the ac power supply and move the ON-OFF switch to the OFF position.
- (3) Disconnect the pressure alarm leads and the tubing attached to the pressure alarm. Remove the mounting screws and remove the alarm. Remove the fitting from the alarm.
- (4) Remove the plug sealing the port in the bottom of the new alarm and substitute the

fitting removed from the replaced alarm. Position the alarm and install it with the mounting screws. Reconnect the tubing and wiring to the alarm.

(5) Reconnect the dryer to the ac power supply and turn the ON-OFF switch to ON.

(6) Turn on the air supply to the cable system.

### 5000-6-47A HUMIDITY ALARM (VACUUM TUBE TYPE)

### 5000-6-47AA HUMIDITY ALARM (SOLID STATE TYPE)

**2.19** The humidity alarm is removed and replaced as follows:

- (1) Disconnect the dryer from the ac power supply and turn the ON-OFF switch to OFF.
- (2) Shut off the air supply to the cable system.
- (3) Remove the alarm cover. Remove the sensing element cable plug from the receptacle. Push out the grommet associated with this cable and withdraw the cable and plug from the housing. Tag, disconnect, and withdraw all of the leads from the housing. Remove the panel which mounts the alarm parts from the housing by removing the panel mounting screws at each side of the housing.

*Note:* The replacement alarm may be a 5000-6-47AA Humidity Alarm (Solid State). If so, remove the old housing from the dryer cabinet and follow the installation instructions that will be included with the replacement alarm.

- (4) Remove the cover of the new alarm and remove the panel which mounts the alarm parts. Mount the panel in the housing which was left in the air dryer. Insert the leads into the housing and connect them to the proper terminals. Make sure that the 110-volt leads are connected to the L1 and L2 Terminals. Insert the sensing element cable and place the plug in the receptacle. Mount the grommet on the cable in the housing. Mount the cover.
- (5) Reconnect the dryer to the ac power supply and turn the ON-OFF switch to ON.
- (6) Resume supplying air to the cable system.

**3389 HUMIDITY SENSING ELEMENT (VACUUM TUBE TYPE)****5000-6-47D Humidity Sensing Element (Solid State)**

**2.20** The humidity sensing element is removed and replaced as follows:

- (1) Disconnect the dryer from the ac power supply and turn the ON-OFF switch to OFF.
- (2) Shut off the air supply to the cable system.
- (3) Remove the hexagonal nut in the end of the manifold using the R-2652 9-inch monkey wrench. Remove the sensing element carefully from the manifold by pulling on the cable. Be careful not to lose the O-ring behind the molded retaining ring on the cable. Remove the sensing element mounting screw from the bottom of the axial hole in the element using the 3-inch C Screwdriver. Remove the element from its socket and substitute the new element. If the dryer has a solid state humidity alarm (5000-6-47AA), check the decal to ensure that the proper sensing element (5000-6-47D) is used. Tighten the mounting screw.
- (4) Carefully insert the element into the manifold, seat the O-ring on the molded retaining ring, and push the retaining ring into the manifold. Mount and tighten the nut at the end of the manifold.
- (5) Reconnect the dryer to the ac power supply and turn the ON-OFF switch to ON.
- (6) Resume supplying air to the cable system.

**3022 HUMIDITY SENSING CORD**

**2.21** To replace the cord which includes the plug on one end and the socket on the other, proceed as follows:

- (1) Disconnect the dryer from the ac power supply and turn the ON-OFF switch to OFF
- (2) Shut off the air supply to the cable system.
- (3) Remove the sensing element cable plug from the receptacle in the humidity alarm. (First remove the alarm cover on vacuum tube alarms.) Push out the humidity alarm grommet and

withdraw the cable and plug from the alarm housing. Remove this grommet from the cable.

- (4) Remove the sensing element from the manifold; remove the sensing element mounting screw, and the sensing element from the cable socket. Remove the nut from the cable.
- (5) Slide the nut and then the humidity alarm grommet over the plug end of the new cable. Position the nut adjacent to the retaining ring molded on the cable. Place a new O-ring on the retaining ring from the socket end of the cable. Mount the sensing element in the cable socket, tighten the mounting screw, and insert the element and socket into the manifold.
- (6) Mount the plug in the alarm receptacle. For vacuum tube-type only, insert the plug and cable through the hole in the humidity alarm housing and mount the plug in the alarm receptacle. Mount the humidity alarm grommet. Remount the alarm cover.
- (7) Reconnect the dryer to the ac power supply and turn the ON-OFF switch to ON.
- (8) Resume supplying air to the cable system.

**5000-6-29 OUTLET PRESSURE GAUGE AND 1416 HEAT EXCHANGER PRESSURE GAUGE**

**2.22** To replace either pressure gauge proceed as follows:

- (1) Disconnect the dryer from the ac power supply and turn the ON-OFF switch to OFF.
- (2) Shut off the air supply to the cable system.
- (3) Disconnect the tubing from the back of the gauge by applying a wrench to the square portion of the gauge and turning the tubing fitting with a second wrench.

**Caution:** *To avoid damage to the gauge mechanism, do not put any strain on the gauge when removing or connecting tubing to the gauge.*

- (4) Remove the three mounting screws and take the gauge from the dryer panel.

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- (5) Mount the new gauge by reversing the preceding steps.
- (6) Reconnect the dryer to the ac power supply and turn the ON-OFF switch to ON.
- (7) Turn on the air supply to the cable system.

### 5000-6-35 HEAT EXCHANGER TEMPERATURE GAUGE

**2.23** To remove and replace the temperature gauge proceed as follows:

- (1) Disconnect the dryer from the ac power supply and turn the ON-OFF switch to OFF.
- (2) Close the air supply to the cable system.
- (3) The temperature gauge is connected by metallic braid covered tubing to the bulb in the temperature well (in the back of the air dryer). Remove the insulating plastic from the temperature well. Grasp the temperature indicator tubing at the edge of the well and pull out the bulb. Remove the gauge from the inside of the cabinet.
- (4) Mount the new indicator. Insert the bulb as far as possible into the temperature well and mount the insulating plastic on the well.

### 3274 REFRIGERATION FAN BLADE

**2.24** To remove and replace the refrigeration fan blade, proceed as follows:

- (1) Disconnect the dryer from the ac power supply and turn the ON-OFF switch to ON.
- (2) Close the air supply to the cable system.
- (3) Remove the protective shroud.
- (4) The fan hub is attached to the motor shaft with a socket-head set screw. Loosen this screw and pull the fan from the shaft.
- (5) Slide the new fan over the motor shaft and align the outer edges of the fan hub and the motor shaft. Tighten the set screw on the flat of the shaft.
- (6) Replace the protective shroud.

- (7) Reconnect the dryer to the ac power supply and turn the ON-OFF switch to ON.
- (8) Turn on the air supply to the cable system.

### 3273 REFRIGERATION FAN MOTOR

**2.25** To remove and replace the refrigeration fan motor, proceed as follows:

- (1) Disconnect the dryer from the ac power supply and move the ON-OFF switch to the OFF position.
- (2) Shut off the air supply to the cable system.
- (3) Remove the protective shroud.
- (4) Disconnect the leads to the motor.
- (5) Remove the motor mounting screws from the mounting bracket and remove the motor and fan blade.
- (6) Remove the fan blade from the motor shaft as covered in 2.24.
- (7) Mount the fan blade on the new motor shaft as covered in 2.24.
- (8) Mount the new motor on the mounting bracket.
- (9) Connect the motor leads to the proper terminals.
- (10) Replace the protective shroud and check the fan blade for clearance.
- (11) Reconnect the dryer to the power supply, move the ON-OFF switch to ON, and resume supplying air to the cable system.

## 3. 15-100 REFRIGERATION REPLACEMENT UNIT

### GENERAL

**3.01** The following tools are recommended for removal and replacement of the refrigeration unit:

- Screwdriver
- 5/32 in. Hexagonal Key Wrench

7/16 in. Socket Wrench and Ratchet

7/16 in. Open End Wrench

8 in. Adjustable Wrench

10 in. Adjustable Wrench

**3.02** Before starting to replace the refrigeration unit, perform the following:

- (1) Shut off the dryer air supply to the cable system.
- (2) Move the ON-OFF switch to OFF and disconnect the dryer from the power supply.
- (3) Drain the water system by opening the drain valve.

**REMOVAL**

**3.03** The refrigeration unit is removed from the dryer cabinet, as follows:

- (1) Remove the four (4) mounting bolts which secure the right and left side panels (two at the top and two at the bottom of each panel). Remove the socket-head screw from the top door hinge and remove the top door and side panels.
- (2) Tag and disconnect the wire leads from all of the quick disconnects located on the top shelf at the right side of the air dryer.
- (3) Remove the tank temperature gauge bulb from the well located at the left rear of the refrigeration unit.
- (4) Disconnect the flare nut from the outlet pressure gauge and the heat exchanger pressure gauge.
- (5) Remove the air compressor ON-OFF switch by removing the two (2) screws which secure it to the front gauge panel.
- (6) Remove the two (2) mounting bolts which secure the front gauge panel located at the top of the front gauge panel.

(7) Disconnect the 1/4-inch clear plastic tubing located between the eductor and the secondary separator.

(8) Disconnect the 1/4-inch black plastic tubing from the secondary float switch.

(9) Disconnect the 5/8-inch air outlet copper tubing at the rear of the secondary separator.

(10) Disconnect the 3/8-inch black plastic tubing from the secondary solenoid valve.

(11) Remove the secondary solenoid valve by removing the red plastic cap which holds the solenoid valve assembly.

(12) Remove the secondary separator assembly by holding and turning the assembly by hand.

**Caution:** *Do not attempt to use a wrench when removing the secondary separator.*

(13) Disconnect the 1/2-inch bypass copper tubing at the top of the primary separator.

(14) Disconnect the 3/8-inch black plastic tubing located at the elbow fitting at the bottom of the primary separator.

(15) Disconnect the 1/4-inch black plastic tubing located at the connector at the bottom of the primary separator.

(16) Disconnect the 1/4-inch high pressure copper tubing located at the top of the primary separator.

(17) Disconnect the 5/8-inch air and water copper tubing located at the bottom of the primary separator.

(18) Disconnect the 1/2-inch copper tubing located at the bottom of the primary separator.

(19) Remove the primary separator support bracket by removing the bolt which secures it to the rear frame.

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- (20) Remove the primary separator assembly by holding the assembly and turning by hand.
- (21) Remove the front gauge panel.
- (22) Remove the three (3) refrigeration unit retaining bolts at the underside of the shelf.
- (23) Remove the refrigeration replacement unit by sliding it forward and straight out of the air dryer.

### INSTALLATION

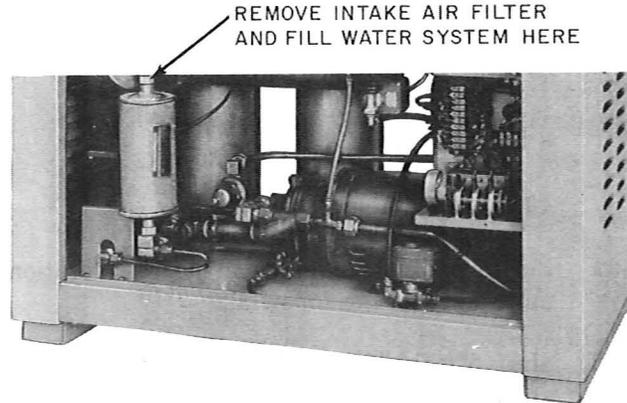
**3.04** The 15-100 Refrigeration Replacement Unit is installed as follows:

- (1) Slide the replacement unit into the cabinet and secure it with the three (3) retaining bolts removed previously, 3.03 (23).
- (2) Reconnect the parts, fittings, and wires in the reverse order of (1) through (22), 3.03.

**3.05** Refill the water system as follows:

- (1) Remove the intake air filter.
- (2) Turn the outlet air pressure regulator counterclockwise to the closed position.
- (3) Make certain the manual water drain valve is closed.
- (4) Using a funnel or beaker-type container, fill the inlet pipe assembly with water (Fig. 6).
- (5) Reconnect the power supply and turn the ON-OFF switch to ON. Immediately resume pouring water into the inlet pipe until excess water is discharged through the water drain. Water discharging from the drain indicates that the water system is full and the water control system is operating properly.
- (6) Reinstall the intake air filter.
- (7) Slightly open the outlet air pressure regulator.

**3.06** Using E Pressure Testing Solution, check the air fittings for leaks.



**Fig. 6—Intake Air Filter Removed for Filling Water System**

**3.07** A humidity alarm condition will exist temporarily. Depress the alarm reset button at approximately one minute intervals until the humidity alarm lamp is extinguished.

**3.08** When the humidity alarm is clear the dryer may be connected to the cable system.

**3.09** Readjust the outlet air pressure regulator to obtain the desired cable pressure. Depress the alarm reset button to clear the pressure alarm.

### 4. REPLACEMENT PARTS

**4.01** When ordering replacement parts give the part name and number as in the following example:

Switch, Float 3297, for KS-20336 L1 Air Dryer

#### 3741 ANNUAL MAINTENANCE KIT

**4.02** In addition to the parts shown in the illustrations, an annual maintenance kit is available for the KS-20336 L1 Air Dryer. The kit contains four (4) 5000-5-5 Air Filters and four (4) 3431 Water Strainer Screens, for quarterly replacement. The kit is ordered as follows:

Kit, Maintenance, Annual 3741, for KS-20336 L1 Air Dryer