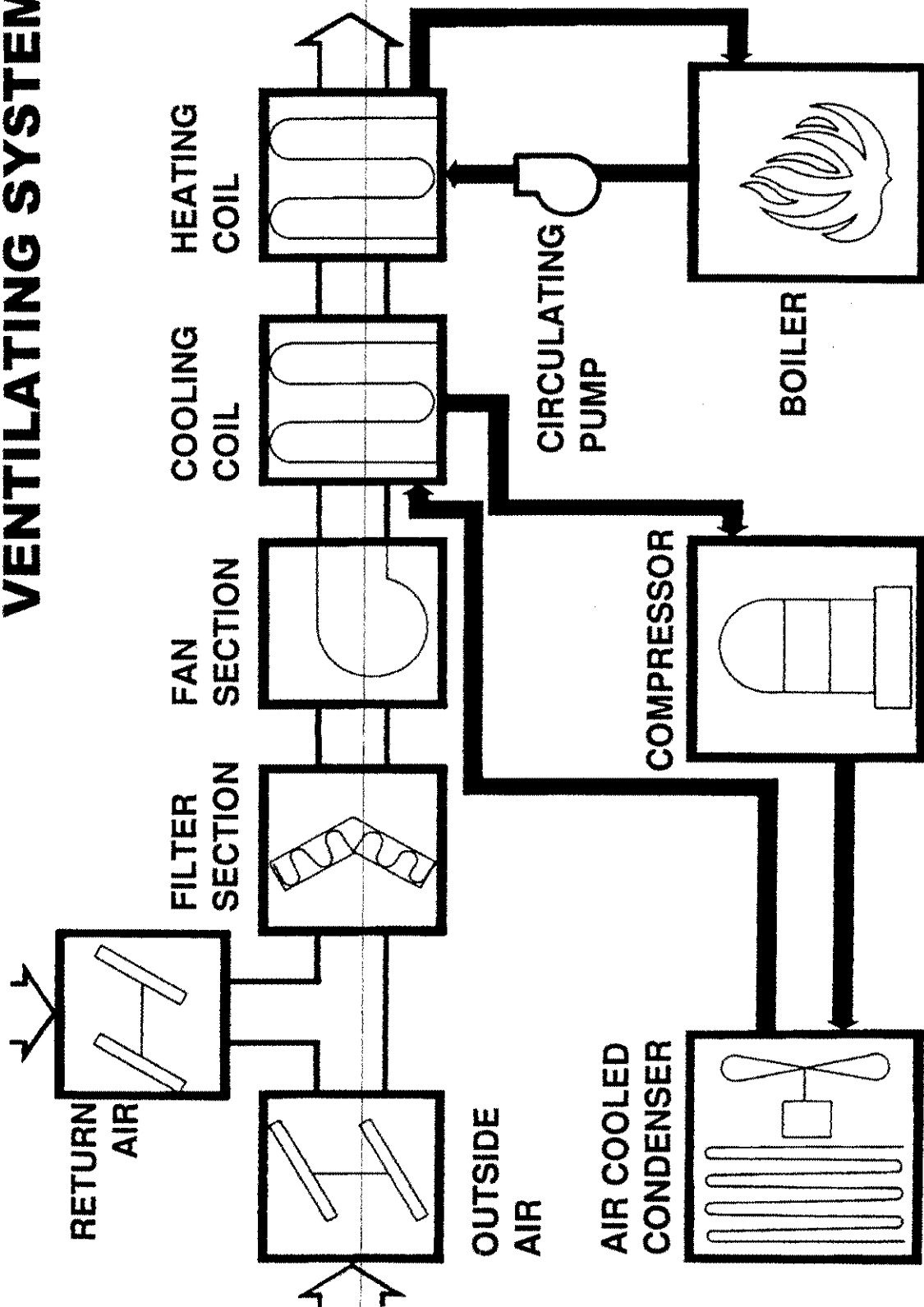
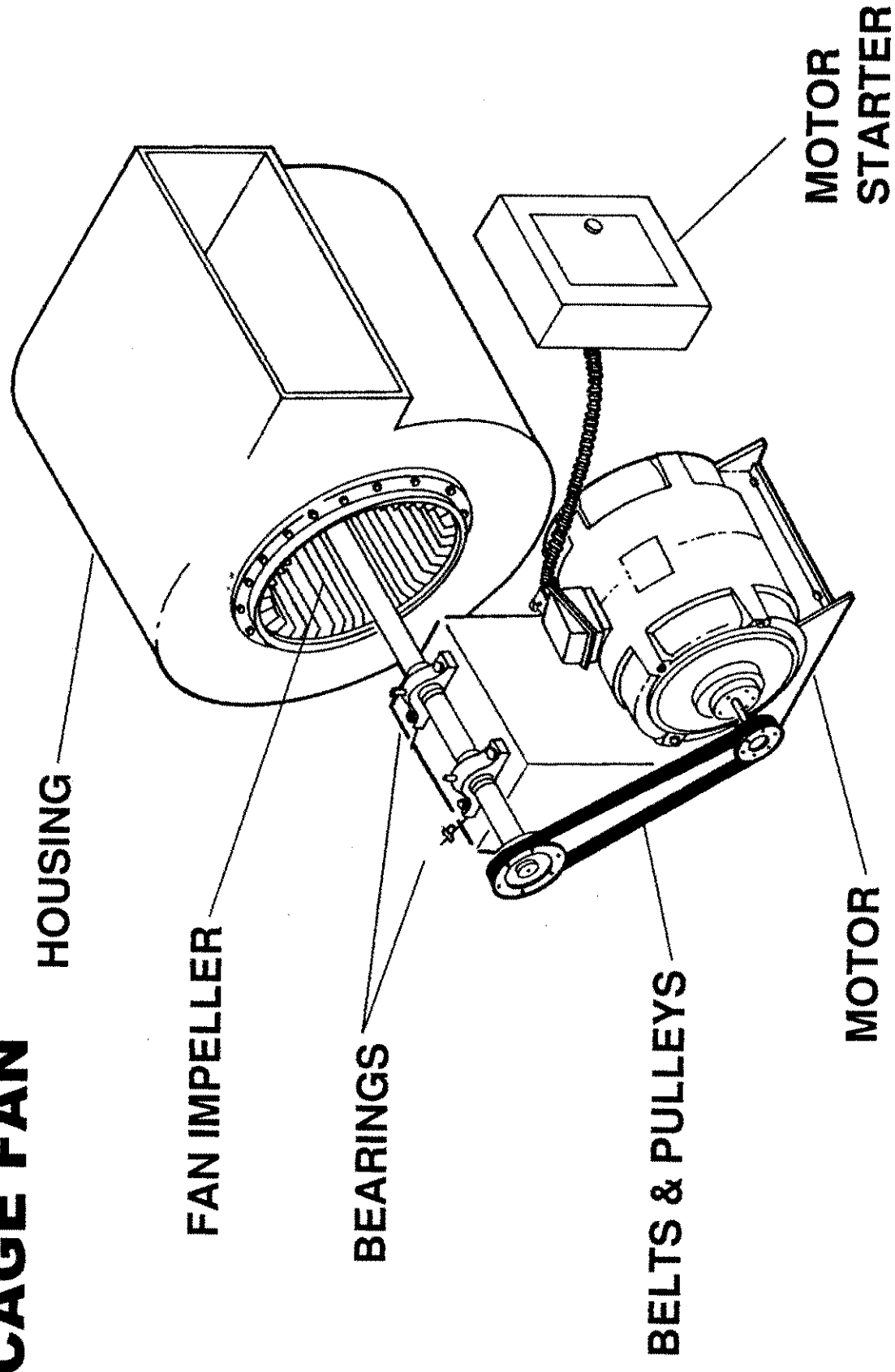


HEATING, COOLING AND VENTILATING SYSTEM



SQUIRREL CAGE FAN



COMPONENT

FUNCTION

MAINTENANCE

HOUSING

- Provides air direction and velocity.

- Check mounts for security and resiliency.
- Clean internal dirt accumulation.

FAN IMPELLER

- Circulates air in the system.

- Inspect and clean.
- Check for proper fan rotation.
- Perform vibration test for balance and play in bearings.

BEARINGS

- Supports fan impeller.

- Inspect for wear and excessive heat.
- Lubricate.
- Replace if worn.

BELTS & PULLEYS

- Provides linkage from motor to fan impeller.

- Check pulley for proper alignment.
- Check pulley for internal wear and security to shaft.
- Check belts for wear and deterioration.
- Check belt tension.
- Check rotation.

MOTOR

- Provides energy source for fan operation.

- Perform Vibration test.
- Check motor insulation resistance.
- Lubricate motor bearings.

MOTOR STARTER

- Controls on/off operation of motor.

- Inspect starter coils and contacts.
- Check current and heater size.

SECTIONAL BOILER

FLUE PIPE

RELIEF VALVE

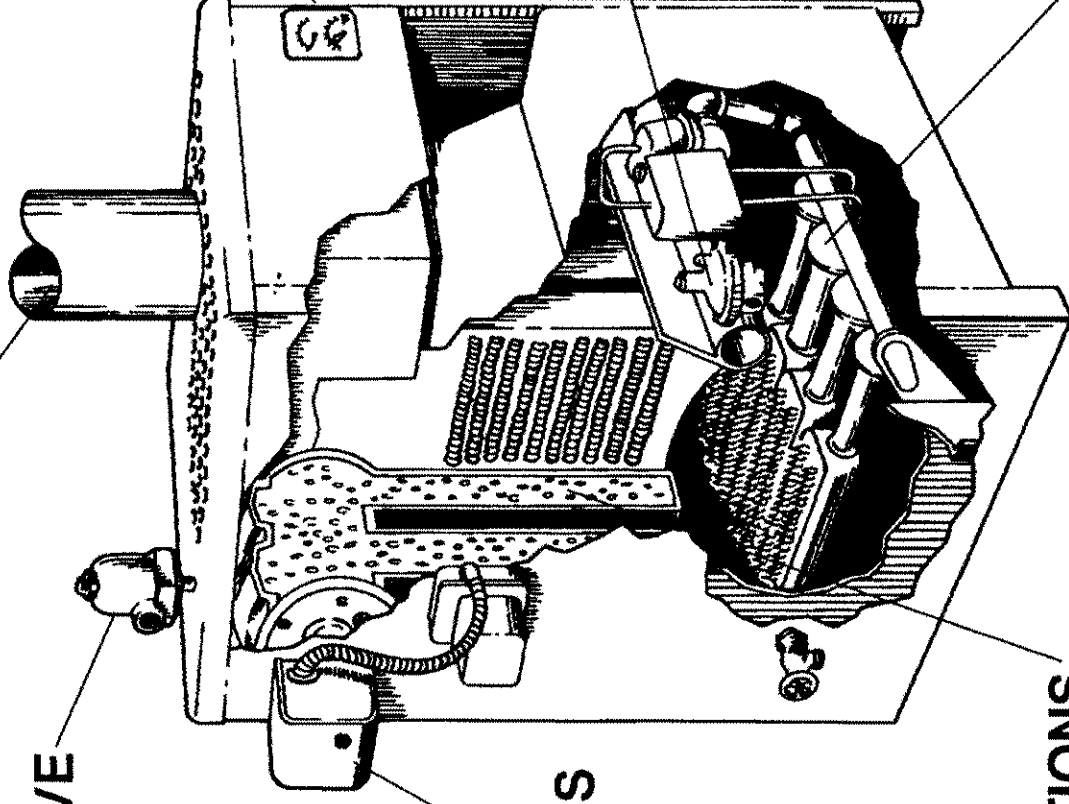
GAUGE

CONTROLS &
SAFETY SYSTEMS

GAS TRAIN

BOILER SECTIONS

BURNER SECTION



COMPONENT

FUNCTION

MAINTENANCE

FLUE PIPE

- Carries combustion by-products away from burner.
- Perform flue gas analysis.
- Inspect for soot and corrosion.

RELIEF VALVE

- Provides overpressure safety if other controls fail.
- Perform try lever test for proper operation.

CONTROLS & SAFETY LIMITS

- Controls fuel flow to maintain desired medium temperature and safety.
- Blow down low water fuel cut-off.
- Perform operational tests and assure proper settings:
 - operating control.
 - high temperature/pressure safety limit.
- flame failure safety.
- high/low gas pressure cut-off on gas burners.

BOILER SECTIONS

- Holds heating medium (water or steam) during heat transfer.
- Inspect for leakage and security.
- Clean fire passes and heating surfaces.
- Check condition of water, both visually and by chemical test.

BURNER SECTION

- Transfers heat from fuel to heating medium in boiler sections.
- Check flame composition and shape.
- Perform combustion and draft test.
- Inspect and clean orifices, passages and nozzles.
- Adjust fuel/air ratio.
- Check and clean pilot and igniters.

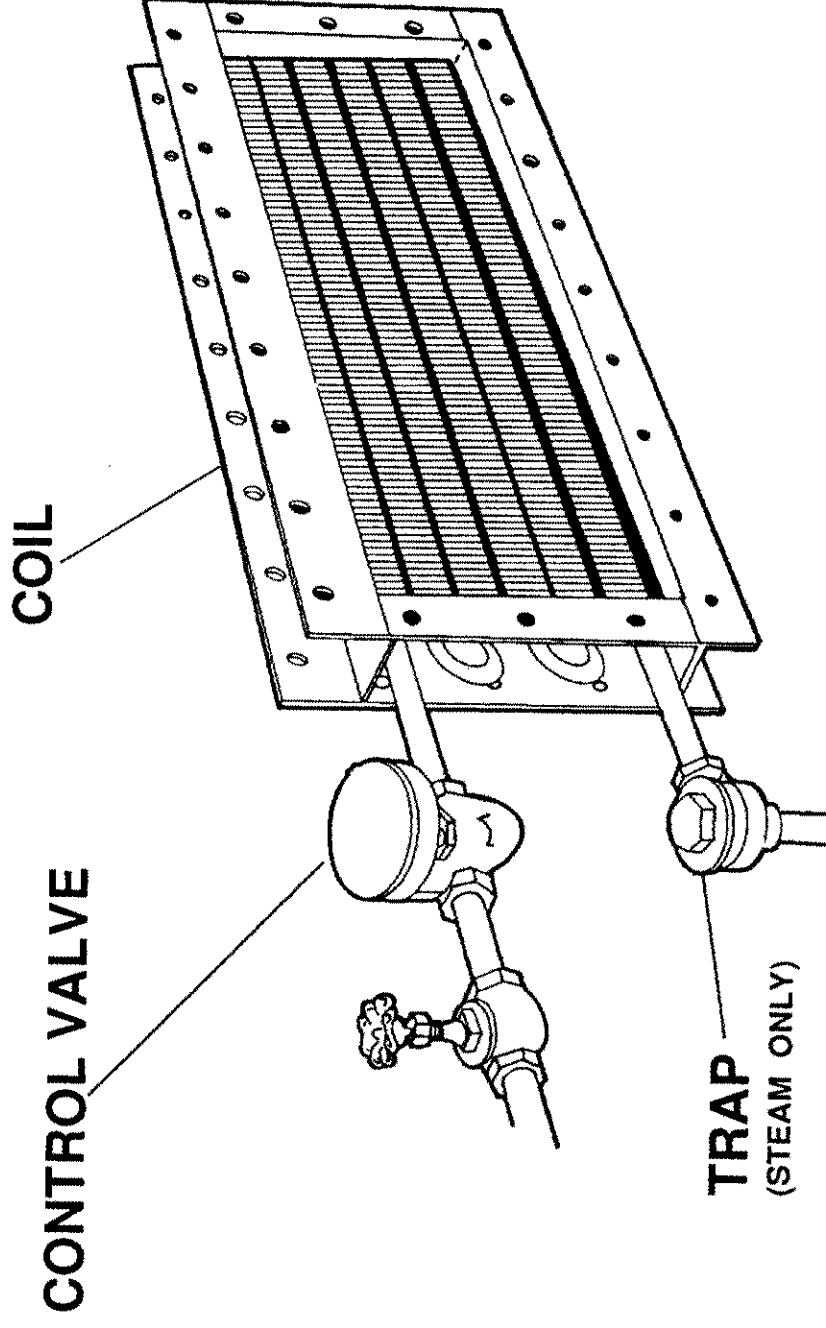
GAS TRAIN

- Regulates flow of fuel to burner.
- Check for proper operation of main and safety shutoff valves.
- Check for leaks and overall security.
- Assure gas valve shutoff.
- Check gas pressure regulator setting.

GAUGE

- Indicates medium temperature and pressure.
- Check for accuracy.

HEATING COIL*



COMPONENT

FUNCTION

MAINTENANCE

TRAP

(steam only)

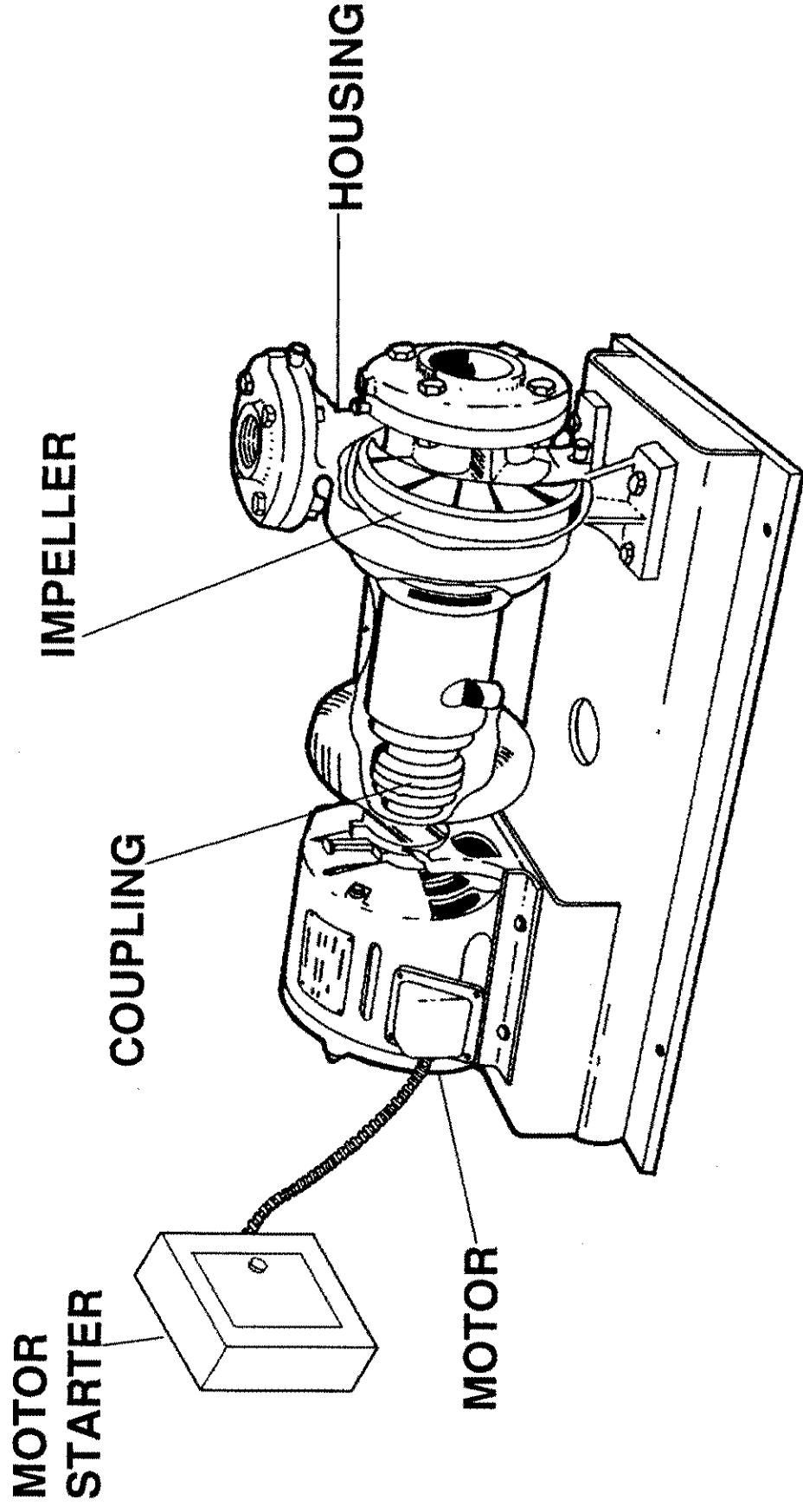
- Provides economic use of steam.
- Check element, seat, float and needle valve.
- Clean as required.
- Repair or replace maintainable items.

CONTROL VALVE

- Controls steam/water flow according to building heat requirements.
- Check for proper operation, close off and bonnet leakage.
- Repack, redisc, lubricate and reseal.

COIL

- Provides for heat transfer between air and hot water/ steam.
- Check condition of finned surfaces.
- Check for blockage.
- Clean as required.
- Straighten fins.
- Check for corrosion and leaks.
- Inspect casing for rust and security.
- Check temperature pick-up for efficiency.



BASE MOUNTED CIRCULATING PUMP

COMPONENT

FUNCTION

MAINTENANCE

MOTOR

- Provides energy for pump operation.
- Perform Vibration test.
- Lubricate motor bearings.

MOTOR STARTER

- Controls on/off operation of motor.
- Inspect starter coils and contacts.
- Check current and heater size.

COUPLING

- Provides linkage between motor and impeller.
- Check proper alignment and condition.
- Inspect for wear and shaft security.
- Replace if worn.

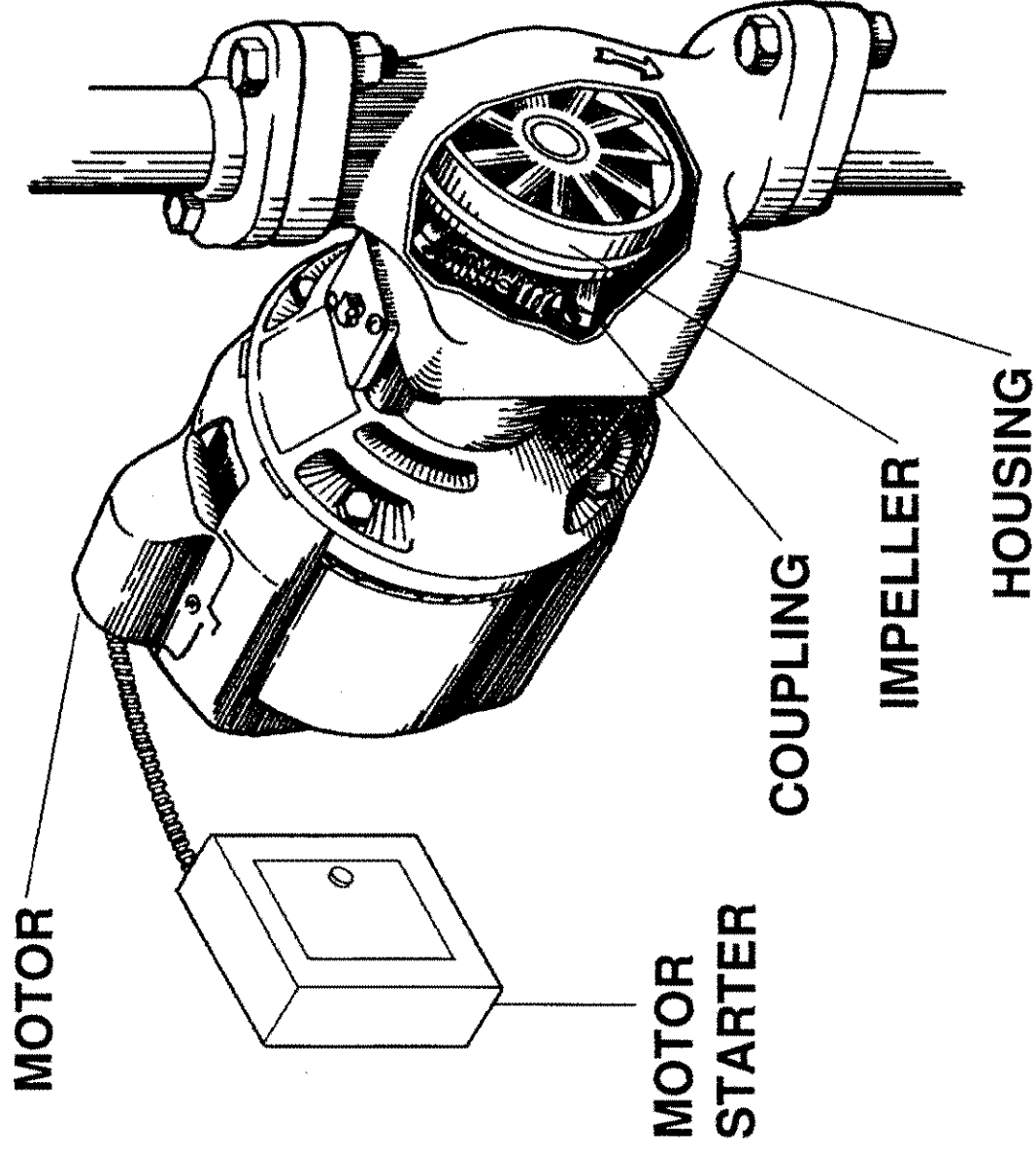
IMPELLER

- Moves medium through piping system.
- Replace as required.

HOUSING

- Provides physical link with piping system.
- Check packing and mechanical seals for leakage.
- Inspect gaskets for leakage and deterioration.
- Lubricate driven shaft bearings.
- Perform Vibration test.

IN LINE CIRCULATING PUMP



COMPONENT

FUNCTION

MAINTENANCE

MOTOR

- Provides energy for pump.
- Check motor mount resiliency.
- Lubricate motor bearings.

MOTOR STARTER

- Controls on/off operation of motor.
- Inspect starter coils and contacts.
- Check current and heater size.

COUPLING

- Provides physical link between piping system and motor.
- Check proper alignment and condition.
- Inspect for wear and shaft security.
- Replace if worn.

IMPELLER

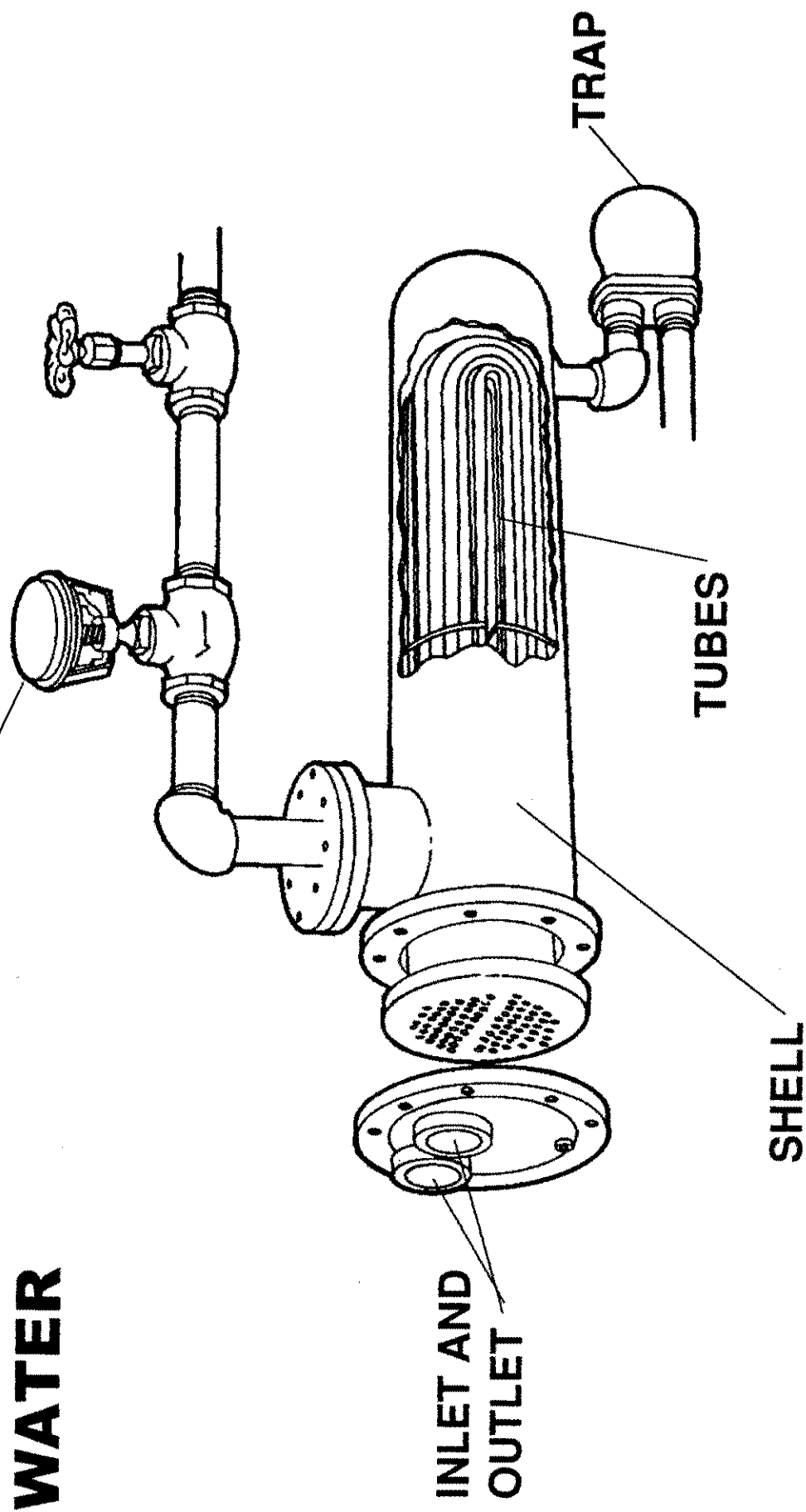
- Moves medium through piping system.
- Replace as required.

HOUSING

- Provides linkage between motor and impeller.
- Check packing and mechanical seals for leakage.
- Inspect gaskets for leakage and deterioration.
- Lubricate driven shaft bearings.
- Perform Vibration test.

HEAT EXCHANGER- STEAM TO HOT WATER

CONTROL VALVE



COMPONENT

FUNCTION

MAINTENANCE

INLET AND OUTLET

- Provides connections to the hot water system.
- Check for leaks.
- Measure temperature pick-up for efficiency.

CONTROL VALVE

- Modulates steam according to system demands.
- Check for proper operation, close off and bonnet leakage.
- Repack, redisc, reseal and lubricate.

TRAP

- Provides economic use of steam.
- Check element, seat, float and needle valve.
- Clean as required.
- Repair or replace maintainable items.

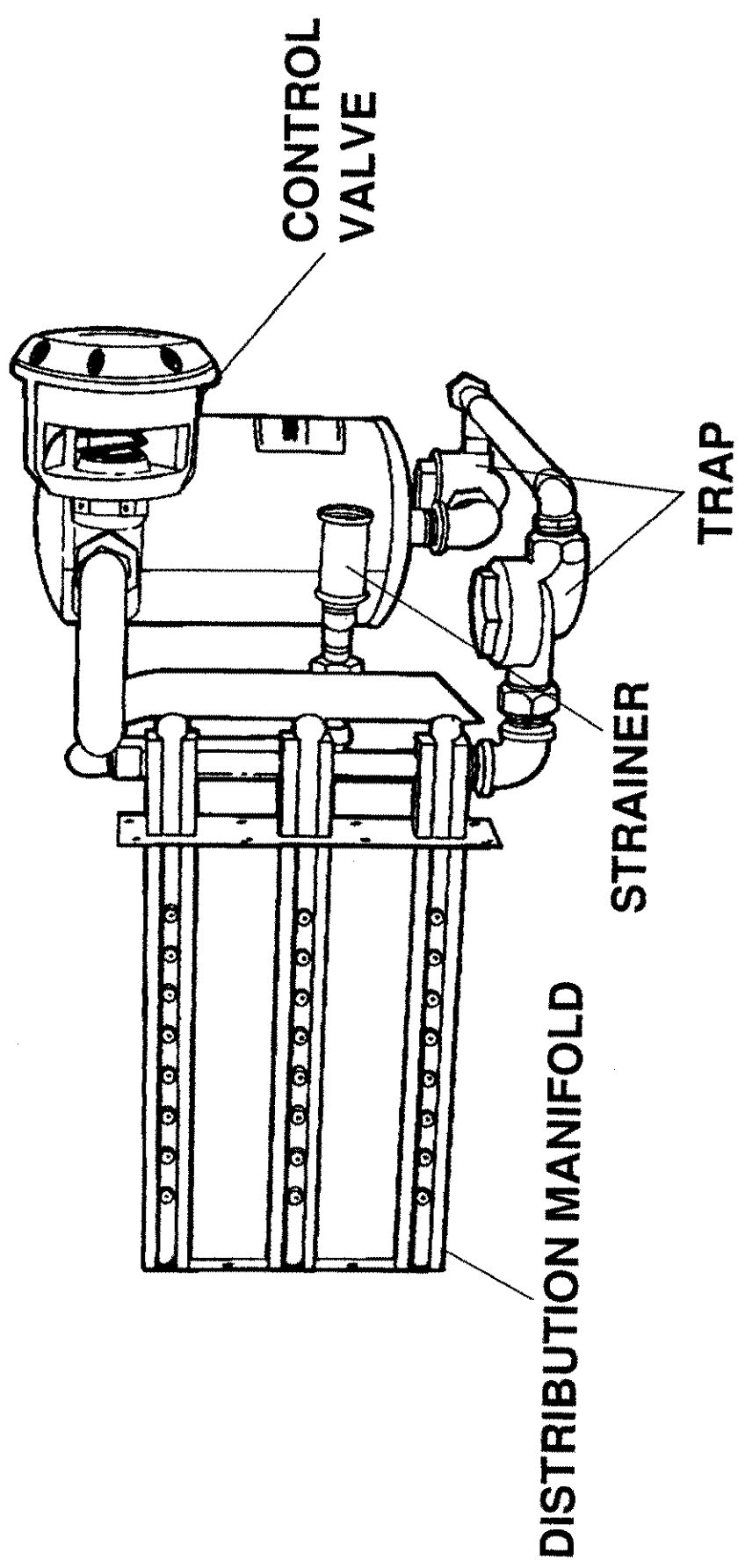
TUBES

- Separates steam and hot water and provides heat transfer surface from the steam to the hot water.
- Inspect for leaks or damage.
- Clean as required.

SHELL

- Provides housing for tubes and steam.
- Inspect for damage or leaks.
- Clean and paint as required.

STEAM HUMIDIFIER



COMPONENT

FUNCTION

MAINTENANCE

STRAINER

- Removes particles from supply steam.
- Pull strainer and clean.
- Check for leaks.
- Check for corrosion.

DISTRIBUTION

MANIFOLD

- Distributes steam to space.
- Check for proper steam flow around manifold.
- Check security to duct.
- Check and clean manifold slots.

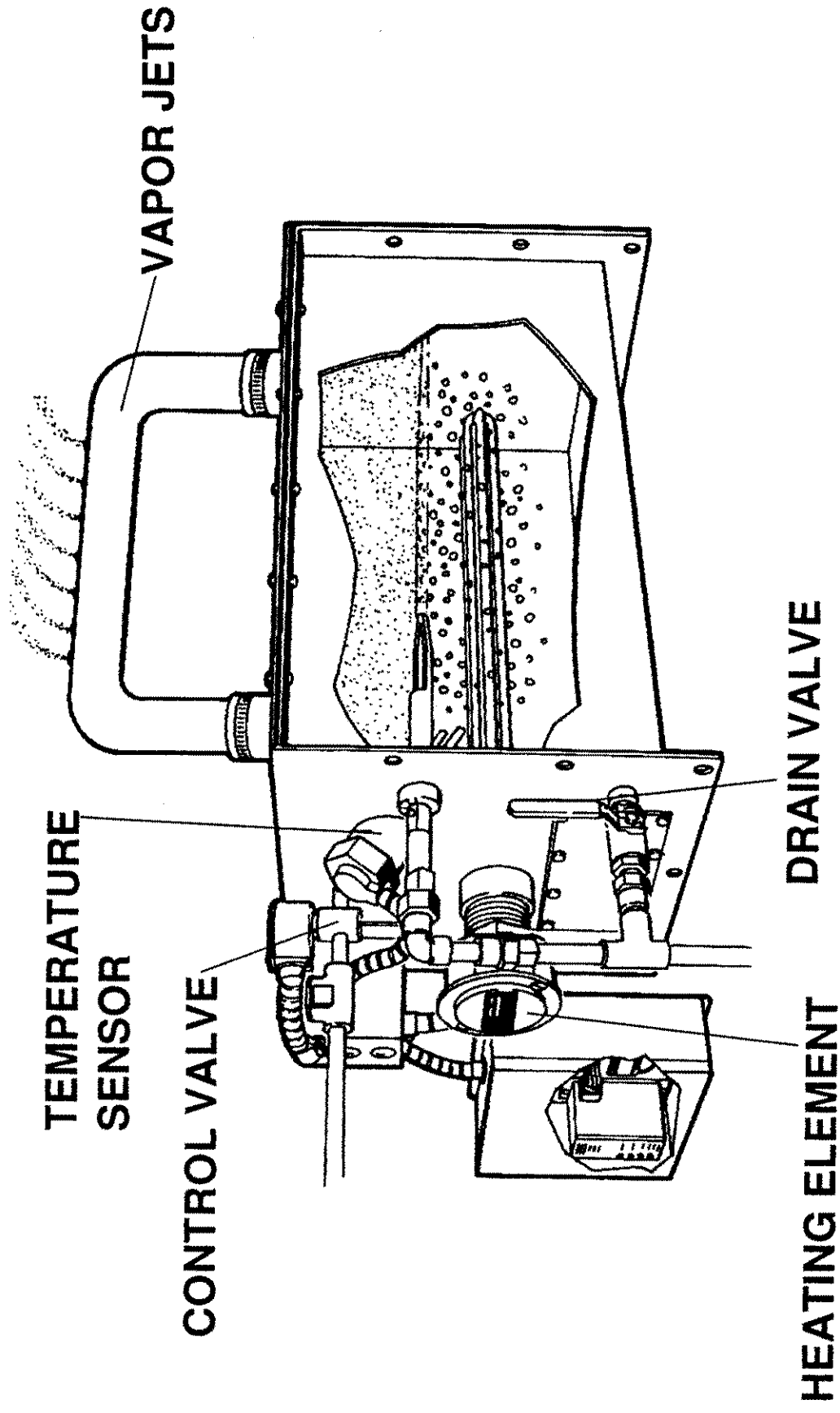
CONTROL VALVE

- Modulates humidity to system according to space demands.
- Check for proper operation, close-off and bonnet leakage.
- Repack, redisc, reseal and lubricate.

TRAP

- Provides economic use of steam.
- Check element, seat, float and needle valve.
- Clean as required.
- Repair or replace maintainable items.

ELECTRIC STEAM HUMIDIFIER



COMPONENT**FUNCTION****MAINTENANCE****CONTROL VALVE**

- Modulates humidity to system according to space demands.

- Check for proper operation, close-off and bonnet leakage.
- Repack, redisc, reseal and lubricate.

**TEMPERATURE
SENSOR**

- Prevents unit from starting cold.

- Check operation.

HEATING ELEMENT

- Vaporizes water.

- Clean as required.

DRAIN VALVE

- Provides outlet for concentrated water.

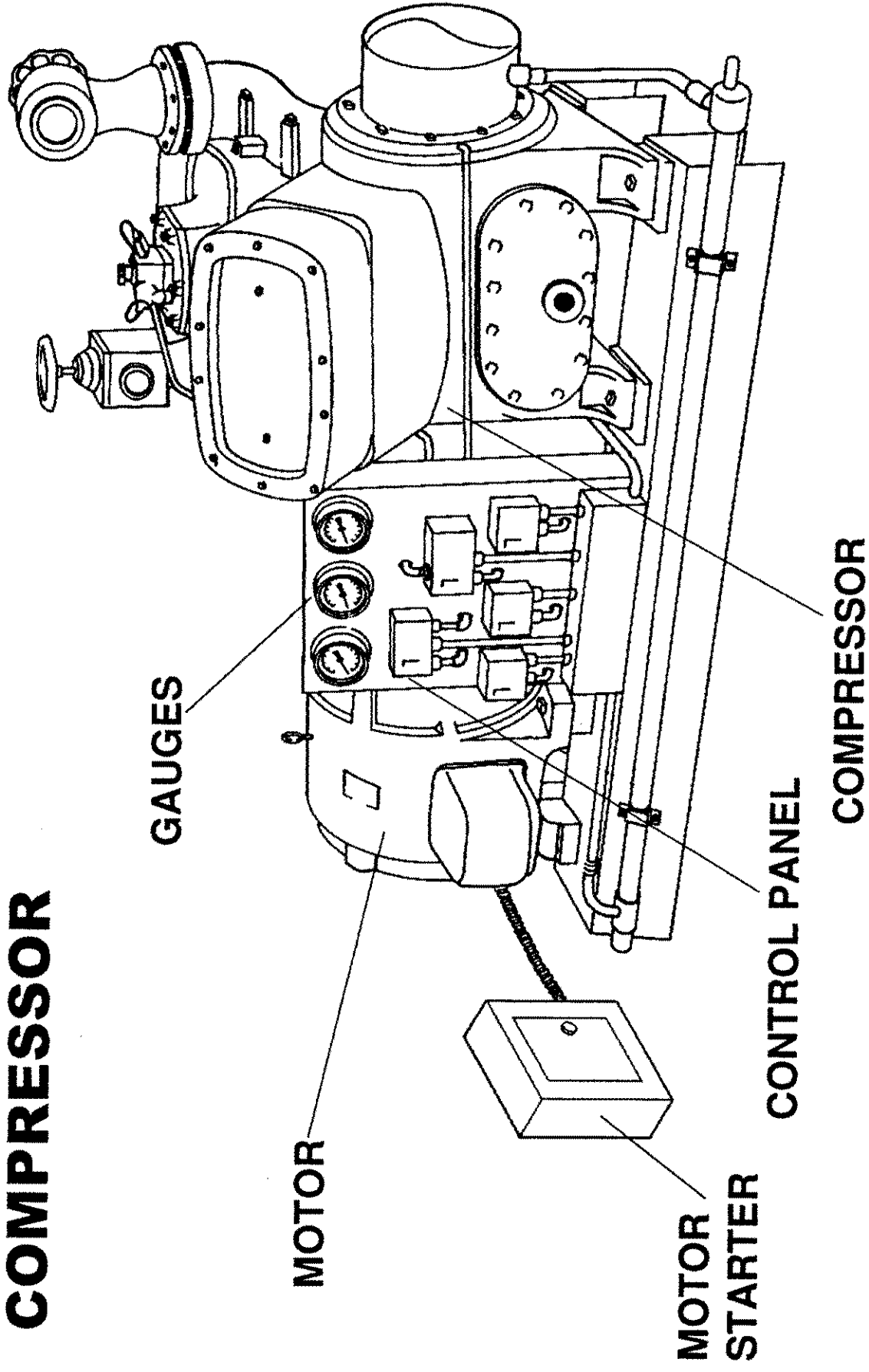
- Check operation.

VAPOR JETS

- Provides steam outlet.

- Clean as required.

RECIPROCATING COMPRESSOR



COMPONENT

FUNCTION

MAINTENANCE

GAUGES

- Provides indication for compressor monitoring.

- Clean, calibrate and check for proper operation.
- Check for leaks and tighten fittings.

MOTOR

- Provides energy for compressor.

- Lubricate motor bearings.
- Check motor insulation resistance.
- Measure vibration.
- Check condition and alignment of drive section.

MOTOR STARTER

- Controls on/off operation of motor.

- Check operating current and heater size.
- Inspect starter coils and contacts.

CONTROL PANEL

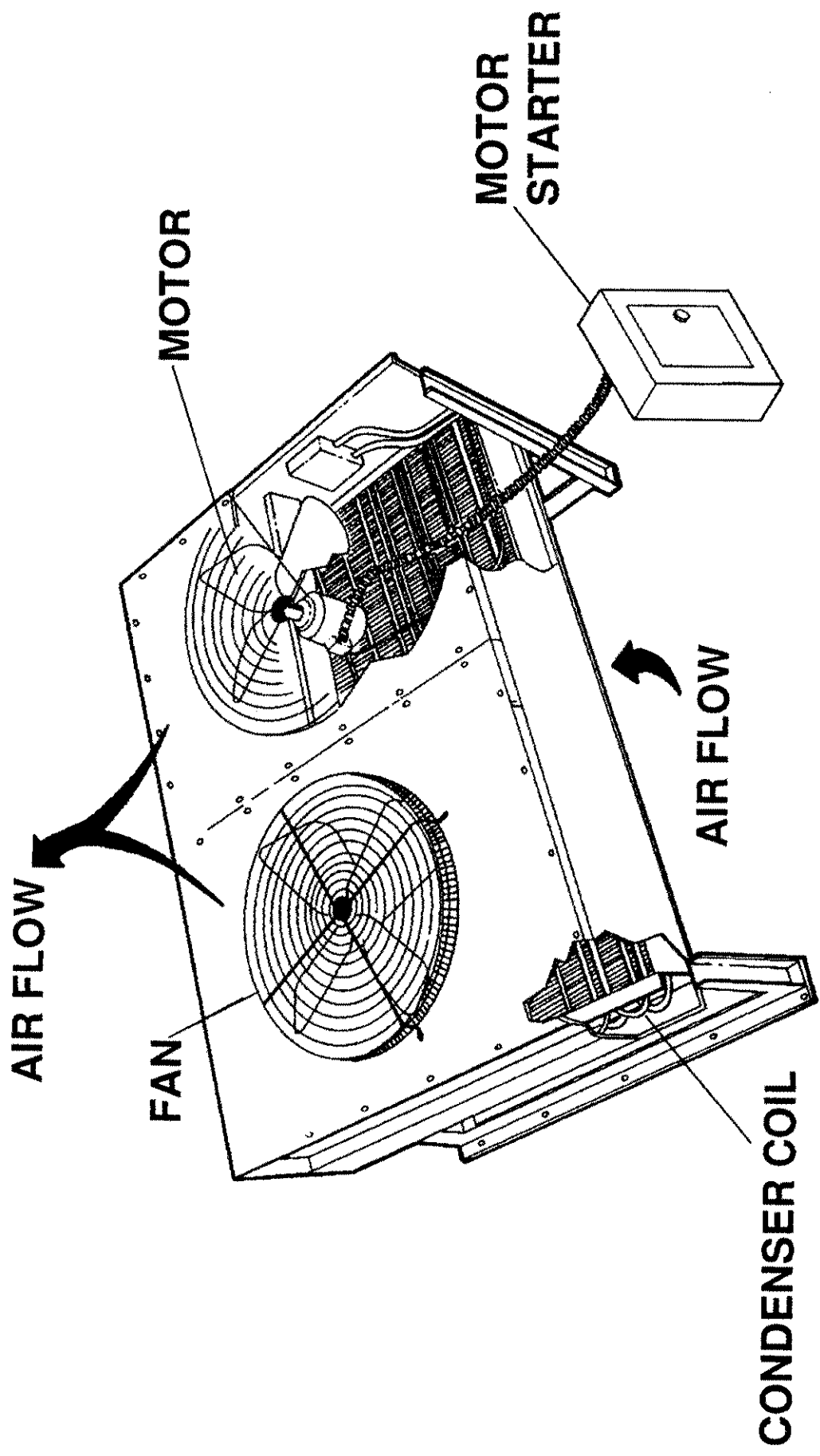
- Provides safety interlocks and controls for compressor operation.

- Sequence test all controls.
- Calibrate and clean controllers and safety controls.
- Check setpoint of controls and limits.

COMPRESSOR

- Prepares refrigerant to be condensed and reused at the evaporator.

- Check crankcase heater operation.
- Check refrigerant charge.
- Check for refrigerant and oil leaks.
- Test for efficiency.
- Check oil level and condition.
- Perform acid test.
- Observe bearing and operating surface temperatures.
- Measure vibration.
- Sequence cylinder unloaders.
- Check high pressure safety control.



AIR COOLED CONDENSER

COMPONENT

FUNCTION

MAINTENANCE

FAN

- Circulates air through condenser coil.
- Check for alignment, balance and security to shaft.
- Check for corrosion and wear.
- Lubricate bearings and check for end play, excessive bearing temperature and unusual bearing wear.
- Check condition of drive couplings and belts.
- Check fan blades and clean dirt accumulation.
- Check and tighten mounting bolts.

CONDENSER COIL

- Converts refrigerant from high temp./high pressure gas to low temp./high pressure liquid.
- Provides efficient heat transfer.
- Clean finned surfaces.
- Check for damage or leaks.
- Straighten bent fins.
- Check pipe clamps for security and vibration.
- Measure wet bulb temperature at inlet and outlet for efficiency.

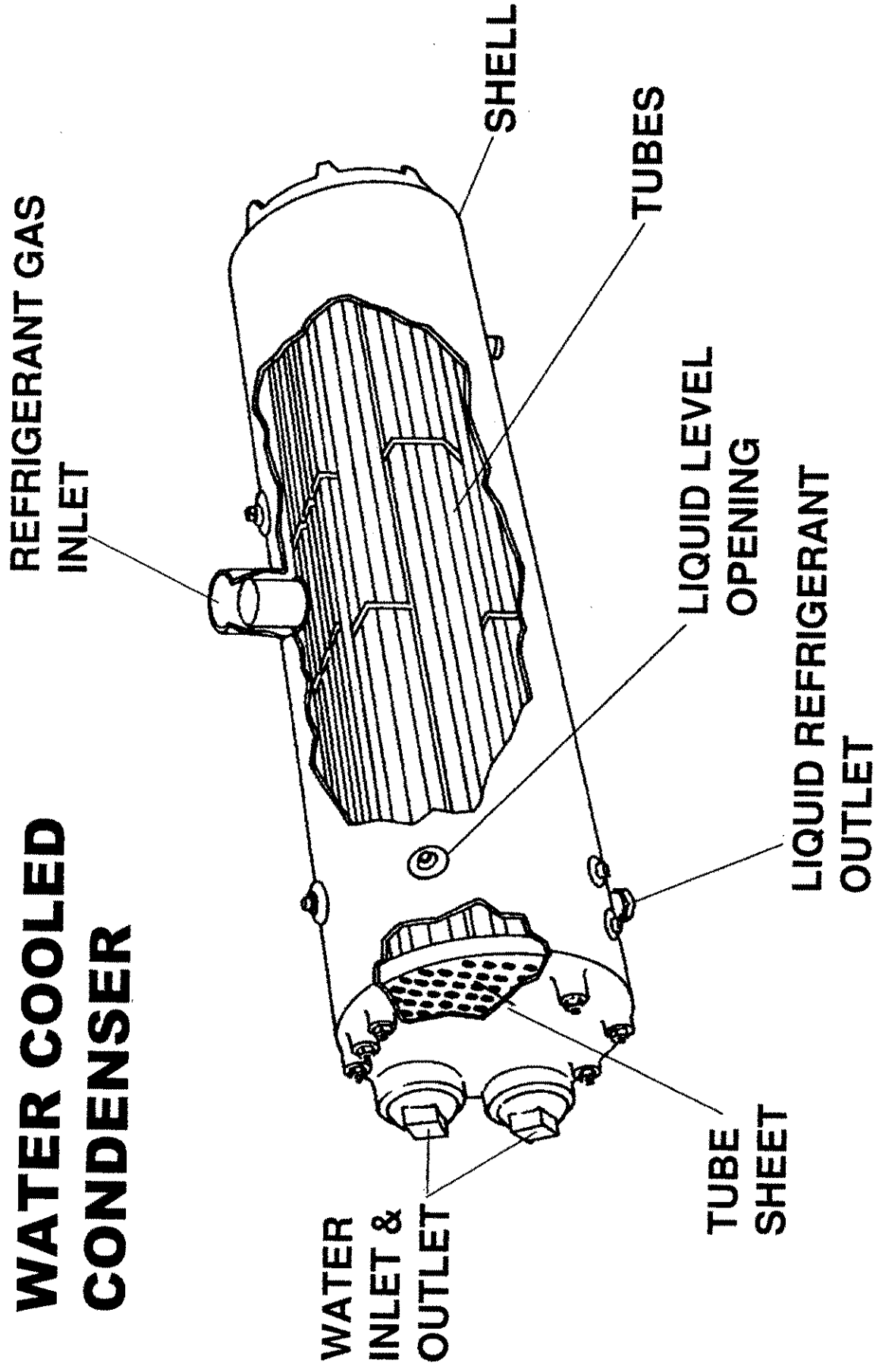
MOTOR

- Provides energy source for fan.
- Lubricate motor bearings.
- Examine motor mount resiliency.

MOTOR STARTER

- Controls on/off operation of motor.
- Inspect starter coils and contacts.
- Tighten all electrical connections.
- Check current and heater size.

WATER COOLED CONDENSER



COMPONENT

FUNCTION

MAINTENANCE

WATER INLET & OUTLET

- Provides connections for condenser water supply and return.
- Measure inlet and outlet temperature for efficiency.
- Inspect and check for leaks.
- Clean as required.
- Replace gaskets.

LIQUID LEVEL OPENING

- Provides means to check liquid refrigerant level in condenser.
- Inspect and check for leaks.

REFRIGERANT GAS INLET

- Provides refrigerant gas connection.
- Inspect and check for leaks.

SHELL

- Provides housing for tubes and refrigerant gas.
- Inspect for leaks.
- Clean as required.

TUBES

- Separates condenser water and refrigerant gas and provides heat transfer surface from refrigerant gas to condenser water.
- Open end bell if efficiency is low.
- Inspect for scale, corrosion and foulants.
- Brush tubes.
- Replace gaskets.

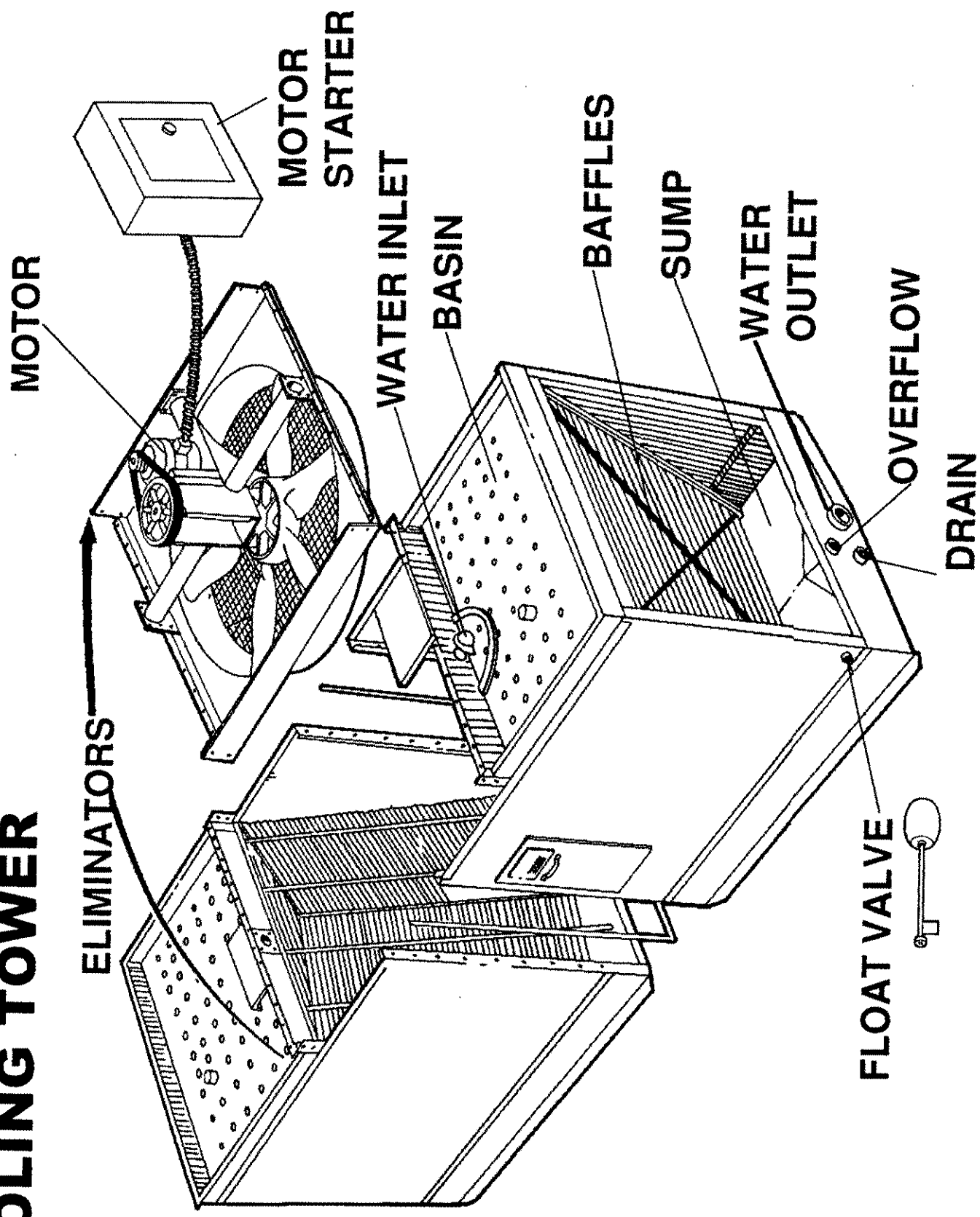
LIQUID REFRIGERANT OUTLET

- Provides liquid refrigerant connection.
- Inspect and check for leaks.

TUBE SHEET

- Provides support for tubes and separation between refrigerant gas and condenser water.
- Inspect and clean as required.

COOLING TOWER



COMPONENT

FUNCTION

MAINTENANCE

MOTOR

- Provides energy source for fan.
- Perform Vibration test.
- Lubricate bearings.
- Examine motor mount resiliency.
- Check motor insulation resistance.

MOTOR STARTER

- Controls on/off operation of motor.
- Inspect starter coils and contacts.
- Tighten all electrical connections.
- Check operating current, voltage and heater size.

FAN

- Circulates air through tower.
- Check blades and clean dirt accumulation.
- Lubricate bearings and check for end play, excessive bearing temp. and wear.
- Check condition of drive couplings, pulleys and belts. Adjust as required.
- Check for corrosion and wear.

ELIMINATORS

- Reduces amount of condenser water being thrown from unit.
- Inspect and check for corrosion and wear.

BASIN

- Provides distribution area for condenser water flow through tower.
- Inspect for corrosion.
- Clean as required.

BAFFLES

- Provides evaporative cooling surface for condenser water.
- Inspect for corrosion and wear.
- Clean or replace as required.

(continued)

COMPONENT	FUNCTION	MAINTENANCE
SUMP	<ul style="list-style-type: none"> • Provides storage area for tower water. 	<ul style="list-style-type: none"> • Inspect and clean as required.
WATER OUTLET	<ul style="list-style-type: none"> • Provides connection for condenser water return. 	<ul style="list-style-type: none"> • Inspect and check for leaks.
OVERFLOW	<ul style="list-style-type: none"> • Provides safety outlet for excessive tower water. 	<ul style="list-style-type: none"> • Inspect for obstructions. • Clean as required.
FLOAT VALVE	<ul style="list-style-type: none"> • Maintains proper water level in tower. 	<ul style="list-style-type: none"> • Inspect for corrosion and wear. • Check proper operation and closer off.
DRAIN	<ul style="list-style-type: none"> • Allows tower to be emptied and cleaned. 	<ul style="list-style-type: none"> • Inspect for obstructions.
WATER INLET	<ul style="list-style-type: none"> • Provides connection for condenser water supply. 	<ul style="list-style-type: none"> • Inspect and check for leaks.

EVAPORATOR COIL

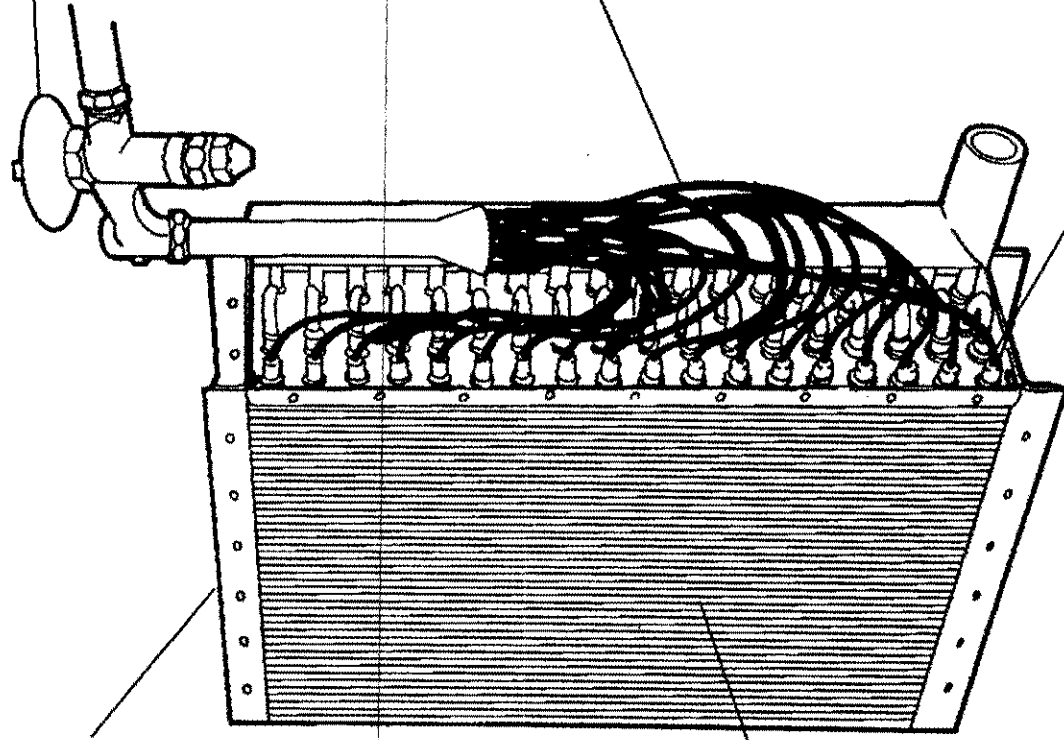
THERMAL
EXPANSION
VALVE

DISTRIBUTOR
TUBES

COIL TUBES

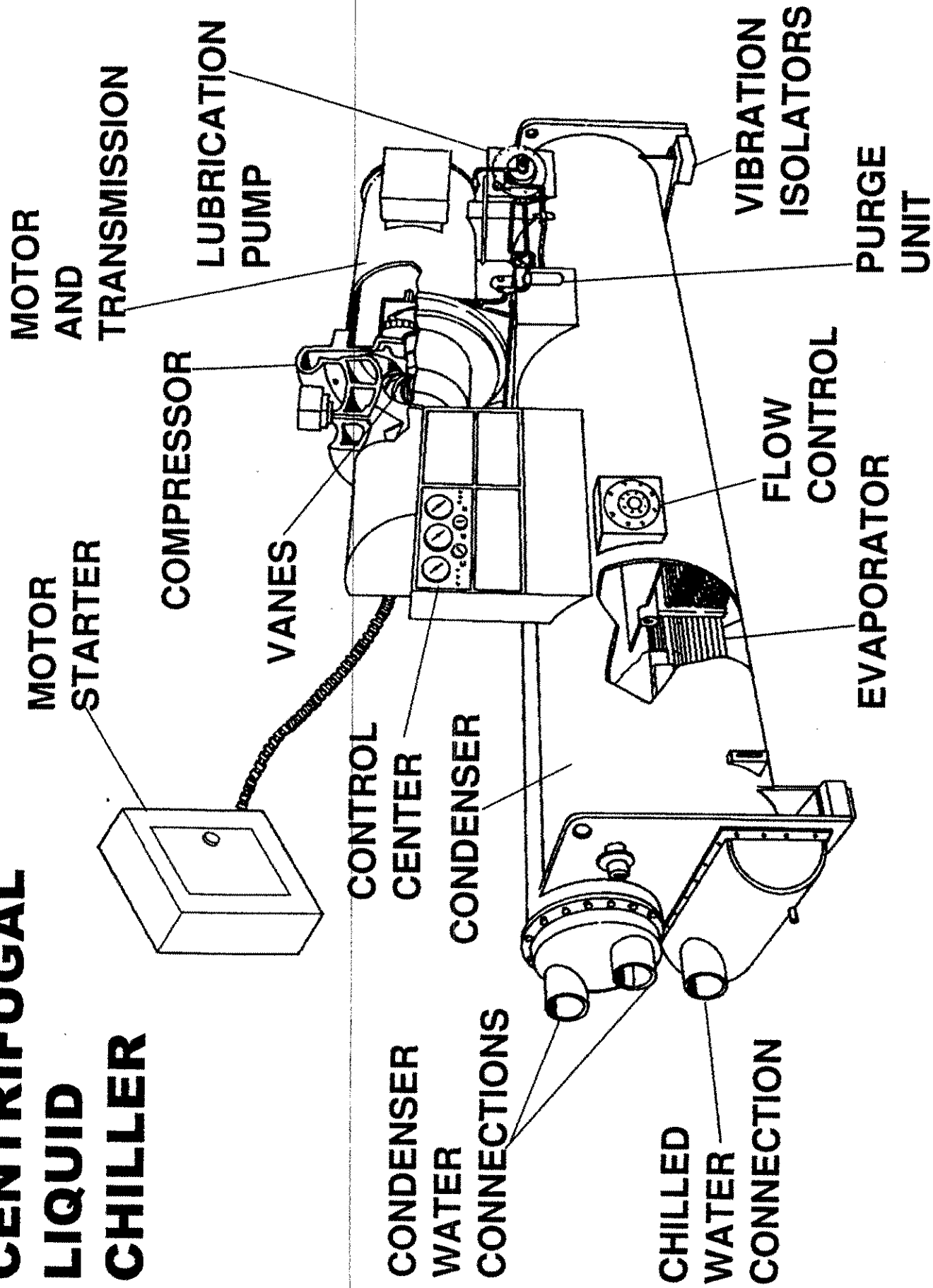
FRAME

FINS



COMPONENT	FUNCTION	MAINTENANCE
THERMAL EXPANSION VALVE	<ul style="list-style-type: none"> Regulates liquid refrigerant flow according to load conditions. 	<ul style="list-style-type: none"> Inspect thermal bulb for security. Check thermal bulb insulation. Check and adjust superheat. Check valve operation.
FRAME	<ul style="list-style-type: none"> Holds all tubing and fins. Provides support for mounting. 	<ul style="list-style-type: none"> Check for damage, rust, and corrosion. Check for security in duct or system. Clean drain pan. Check condensate drain piping.
FINS	<ul style="list-style-type: none"> Extends surface area of coil tubes to provide efficient heat transfer. 	<ul style="list-style-type: none"> Straighten fins with coil comb and clean all surfaces as required.
DISTRIBUTOR TUBES	<ul style="list-style-type: none"> Assures even distribution of refrigerant throughout coil. 	<ul style="list-style-type: none"> Check for leaks with electronic detector or halide torch.
COIL TUBES	<ul style="list-style-type: none"> Provides for heat transfer between refrigerant and air. 	<ul style="list-style-type: none"> Check for leaks with electronic detector or halide torch.

CENTRIFUGAL LIQUID CHILLER



COMPONENT FUNCTION MAINTENANCE

CONTROL CENTER	<ul style="list-style-type: none"> Provides wiring connection point, safety interlocks, controls, and capacity control for compressor operation. 	<ul style="list-style-type: none"> Sequence test all controls. Calibrate and clean controls and safety devices. Inspect and clean electrical contacts. Check set point of controls and limits.
MOTOR	<ul style="list-style-type: none"> Provides energy for compressor operation. 	<ul style="list-style-type: none"> Lubricate motor bearings. Check motor insulation resistance. Check condition and alignment of drive section. Measure vibration. Examine motor mount resiliency.
MOTOR STARTER	<ul style="list-style-type: none"> Controls on/off operation of motor. 	<ul style="list-style-type: none"> Check operating current, voltage and heater size. Inspect starter coils and contacts.
TRANSMISSION	<ul style="list-style-type: none"> Provides mechanical link between motor and impeller. 	<ul style="list-style-type: none"> Check for proper lubrication.
COMPRESSOR	<ul style="list-style-type: none"> Prepares refrigerant to be condensed and reused at the evaporator. 	<ul style="list-style-type: none"> Check refrigerant charge. Check for refrigerant and oil leaks. Test for proper operation and efficiency. Observe bearing and operating surface temps. Check oil heater operation. Check oil level and condition. Perform acid test. Measure vibration on main bearings.

(continued)

COMPONENT	FUNCTION	MAINTENANCE
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VANES

- Regulates the amount of refrigerant vapor entering compressor.
- Repair as required.
- Lubricate vane linkages.
- Check vane control for proper operation.

PURGE UNIT

- Removes non condensables and water vapor from refrigerant system.
- Lubricate motor.
- Clean purge drum.
- Change purge unit oil.
- Check drive belt and adjust tension.

VIBRATION ISOLATORS

- Reduces noise transmission of unit to building structure.
- Check for security and resiliency.

EVAPORATOR

- Provides for heat transfer from chilled water to refrigerant.
- Inspect rupture disc for leaks.
- Inspect and clean tubes as required.

FLOW CONTROL

- Regulates refrigerant flow from the condenser to the evaporator.
- Check float control operation as required.

LUBRICATION PUMP

- Supplies oil to critical bearings in compressor.
- Inspect and check for proper operation.
- Change oil as required.

(continued)

COMPONENT**FUNCTION****MAINTENANCE****CONDENSER**

- Transfers heat from refrigerant to condenser water.
- Inspect and clean tubes as required.
- Inspect for corrosion, clean and paint as required.

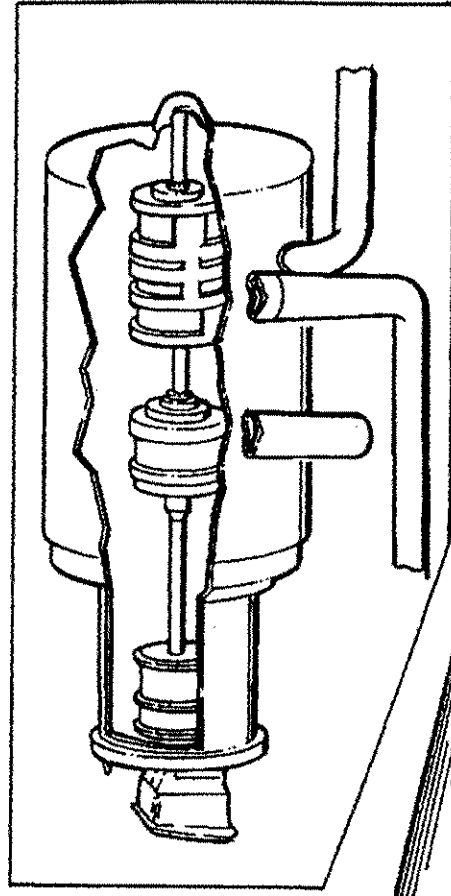
**CONDENSER
WATER
CONNECTIONS**

- Provides connections for condenser water supply and return.
- Inspect and check for leaks.
- Repair or tighten as required.

**CHILLED
WATER
CONNECTION**

- Provides connections for chilled water supply and return.
- Inspect and check for leaks.
- Repair or tighten as required.

ABSORPTION CHILLER



GENERATOR

CONDENSER

EVAPORATOR

ABSORBER

ECONOMIZER
(VALVE)

PURGE
MOTOR

PURGE
UNIT

PURGE
PUMP

ELECTRIC
CONTROL
PANEL

REFRIGERANT
ABSORBER
CONCENTRATOR

PURGE
SOLENOID
VALVE

PURGE
SHUT OFF
VALVE

ABSORBER
CONTROL
CENTER

COMPONENT	FUNCTION	MAINTENANCE
ABSORBER CONTROL CENTER	<ul style="list-style-type: none"> • Provides safety interlock and load control. 	<ul style="list-style-type: none"> • Sequence test all controls. • Clean controls, calibrate and adjust safety devices. • Check for air leaks and/or electrical connection.
PURGE UNIT (PURGE MOTOR, PURGE PUMP, PURGE SOLENOID VALVE, PURGE SHUT OFF VALVE)	<ul style="list-style-type: none"> • Removes non-condensables from system. 	<ul style="list-style-type: none"> • Lubricate motor. • Change purge unit oil. • Check drive belt and adjust tension.
REFRIGERANT PUMP	<ul style="list-style-type: none"> • Circulates refrigerant in evaporator. 	<ul style="list-style-type: none"> • Perform vibration test. • Lubricate motor and pump bearings. • Inspect gaskets and seals for leakage and deterioration.
ABSORBER PUMP	<ul style="list-style-type: none"> • Circulates refrigerant in absorber. • Pumps solution to concentrator. 	<ul style="list-style-type: none"> • Clean and paint as required. • Clean pump motor cooling water strainer.
CONCENTRATOR PUMP		
SOLUTION SERVICE VALVES	<ul style="list-style-type: none"> • Provides access to system solution. 	<ul style="list-style-type: none"> • Add octyl alcohol as required. • Draw solution sample and test to manufacturer's specification.
EVAPORATOR	<ul style="list-style-type: none"> • Provides for heat transfer between chilled water and refrigerant. 	<ul style="list-style-type: none"> • Inspect and clean water-side as necessary. • Inspect connections for leaks. • Repair or tighten access plate as required. • Inspect nozzles.

COMPONENT

FUNCTION

MAINTENANCE

ABSORBER

- Allows refrigerant vapor to be drawn out of the evaporator.
- Inspect and clean water-side as necessary.
- Inspect connections for leaks.
- Repair or tighten access plate as required.

ECONOMIZER (VALVE)

- Controls solution flow to concentrator.
- Check valve operation.
- Replace motor diaphragm.

ELECTRIC CONTROL PANEL

- Provides internal control and safety for unit.
- Check safety controls.
- Clean, calibrate and adjust.
- Inspect starters, replace worn contacts.
- Check current draw with amprobe.
- Perform megger test.

STEAM SUPPLY CONDENSATE TRAP RETURN

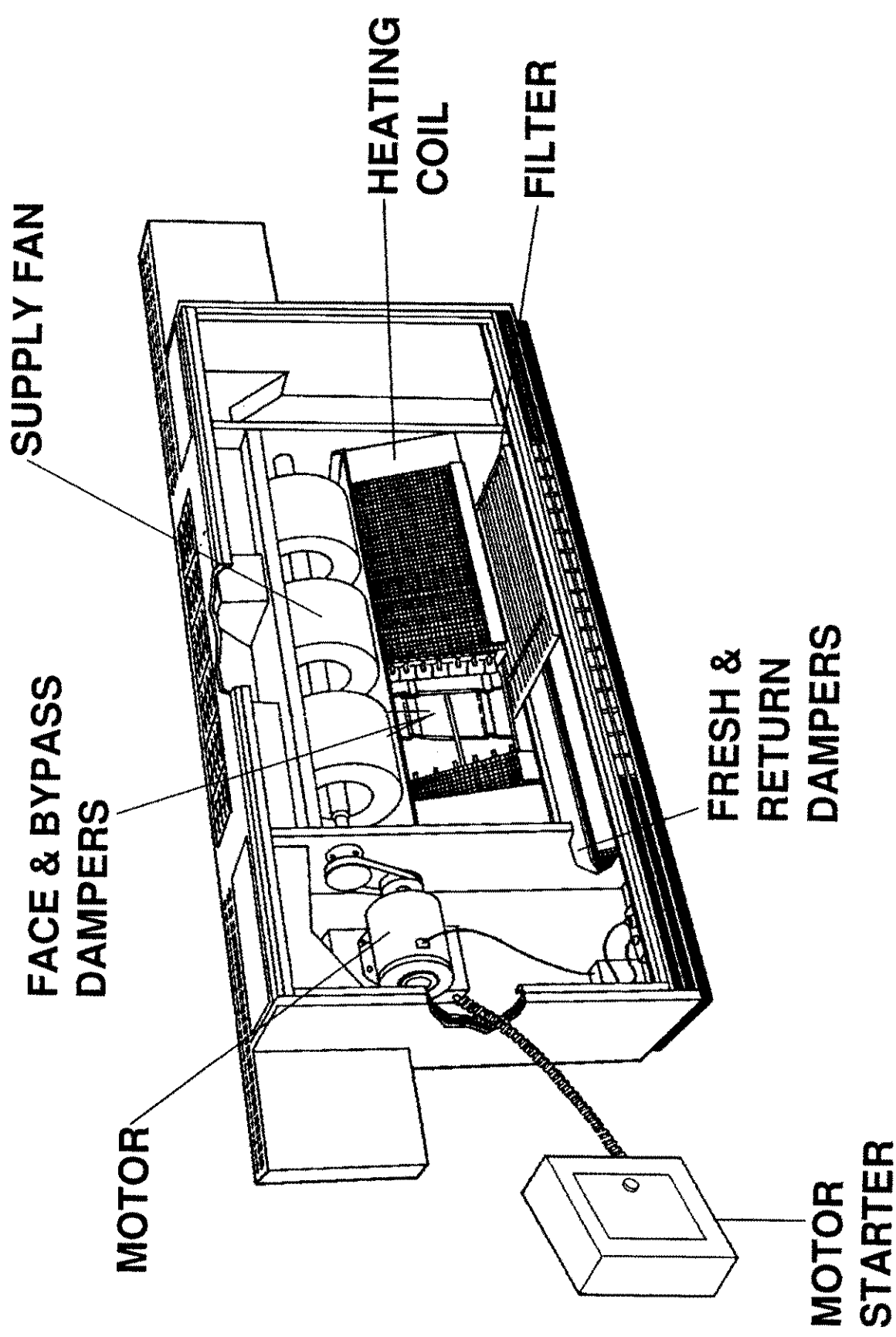
- Provides measured steam for operation and returns condensate to boiler.
- Check steam valve operation.
- Clean strainer.
- Replace diaphragm as required.
- Repair or replace maintainable trap items.
- Inspect connections.
- Clean and paint as required.

GENERATOR

- Adds heat in the form of steam or hot water to boil off the refrigerant from the absorbent to reconcentrate the solution.
- Inspect and clean water-side as necessary.
- Inspect connections for leaks.
- Repair or tighten access plate as required.

CONDENSER

- Condenser water vapor produced in the generator by circulating condenser water through the unit.
- Inspect and clean water-side as necessary.
- Inspect connections for leaks.
- Repair or tighten access plate as required.



UNIT VENTILATOR- HEATING & VENTILATING

COMPONENT**FUNCTION****MAINTENANCE****FRESH &
RETURN AIR
DAMPERS**

- Regulates the amount of outside and return air entering the unit.

- Check for proper operation and closure.
- Lubricate bearings.

MOTOR

- Provides energy source for fan operation.

- Inspect and clean as required.
- Lubricate bearings.
- Examine motor mount resiliency.

MOTOR STARTER

- Controls on/off operation of motor.

- Inspect starter coils and contacts.
- Check current and heater size.

**FACE & BYPASS
DAMPERS**

- Regulates air flow through or around heating coil or a combination of both.

- Check for proper operation and closure.
- Lubricate bearings.

SUPPLY FAN

- Circulates air to space being served.

- Inspect and clean.
- Check for proper rotation and clearance.
- Check security to motor shaft.

HEATING COIL

- Provides heat source for space being served.

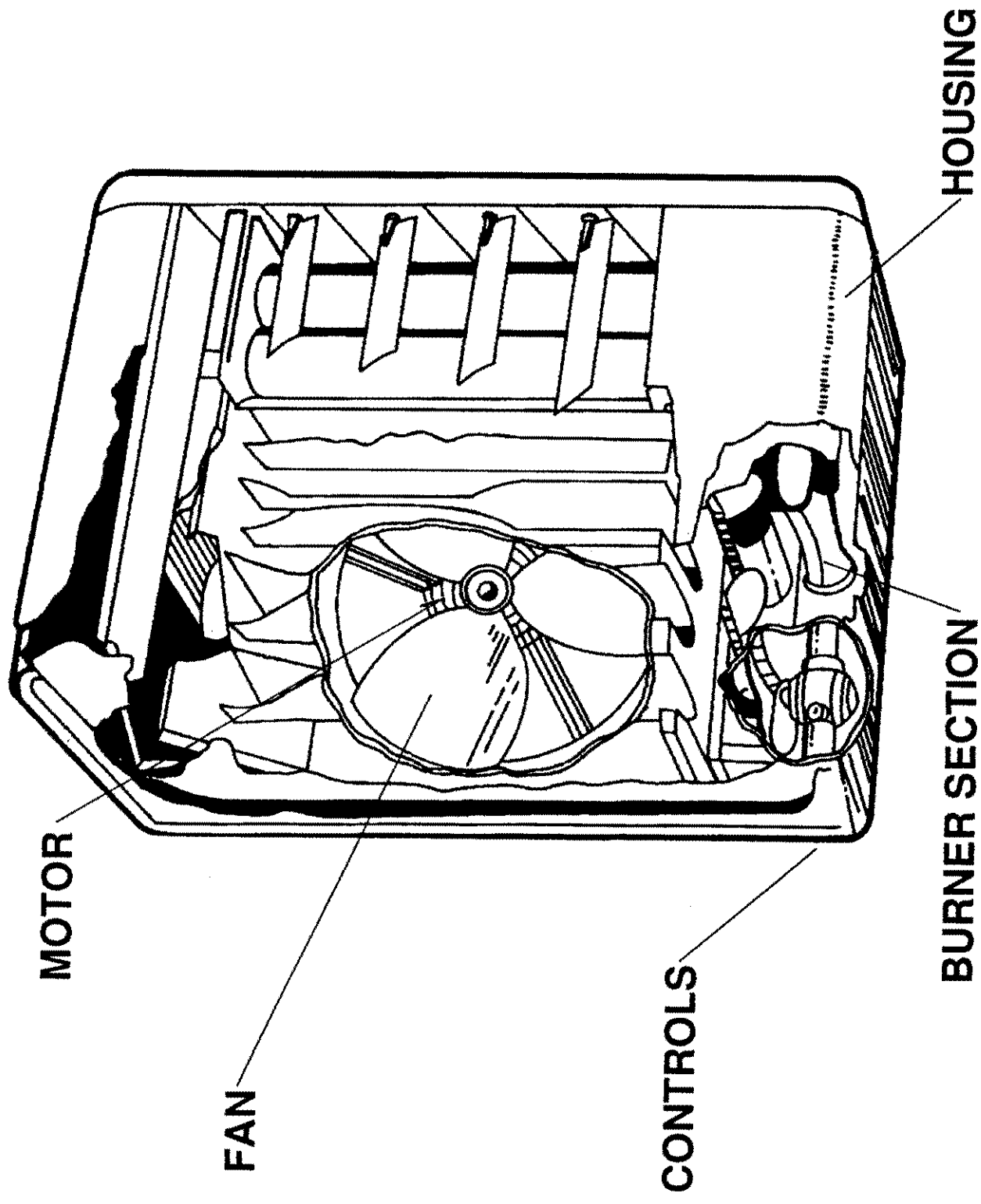
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.

FILTER

- Cleans the air entering the unit.

- Replace as required.

GAS FIRED UNIT HEATER



COMPONENT

FUNCTION

MAINTENANCE

HOUSING

- Provides air direction and velocity.
- Check mounts for security.
- Clean and remove external/internal dirt accumulation.

FAN

- Circulates air in the system.
- Inspect and clean.
- Check for proper rotation and alignment.
- Perform vibration test.

MOTOR

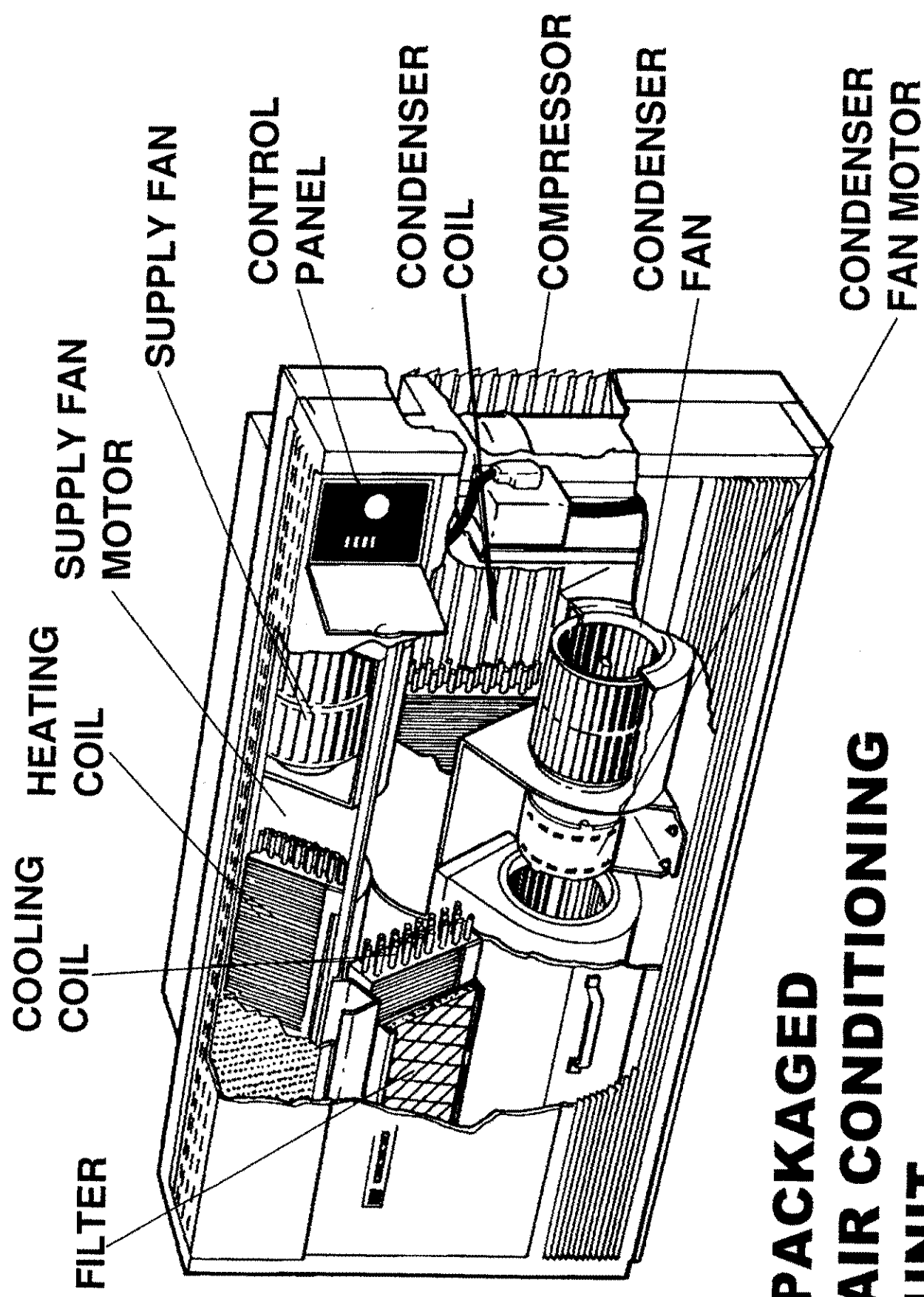
- Provides energy source for fan operation.
- Check current.
- Perform vibration test.
- Lubricate motor bearings.

BURNER SECTION

- Transfers heat from fuel to heating medium.
- Check flame composition and shape.
- Perform combustion and draft test.
- Inspect and clean orifices, passages and nozzles.
- Adjust fuel/air ratio.
- Check gas pressure regulator setting.

CONTROLS

- Controls temperature and provides safety measures.
- Perform operational tests and assure proper settings:
 - Operating controls.
 - High temperature safety control.
 - Flame failure safety limit.



PACKAGED AIR CONDITIONING UNIT

(INCREMENTAL UNIT)

COMPONENT**FUNCTION****MAINTENANCE****FILTER**

- Cleans the air entering the unit.
- Replace as required.

COOLING COIL

- Provides cooling source for space being served.
- Measure inlet and outlet temperature for efficiency.
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.
- Check drain pan and drain.

HEATING COIL

- Provides heat source for space being served.
- Measure inlet and outlet temperature for efficiency.
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.

SUPPLY FAN MOTOR

- Provides energy source for fan operation.
- Inspect and clean.
- Lubricate.
- Examine motor mount resiliency.

SUPPLY FAN

- Circulates conditioned air to space being served.
- Inspect and clean.
- Check for proper rotation and clearance.
- Check security to motor shaft.

CONTROL PANEL

- Provides selection and control for unit operation.
- Test for proper operation.

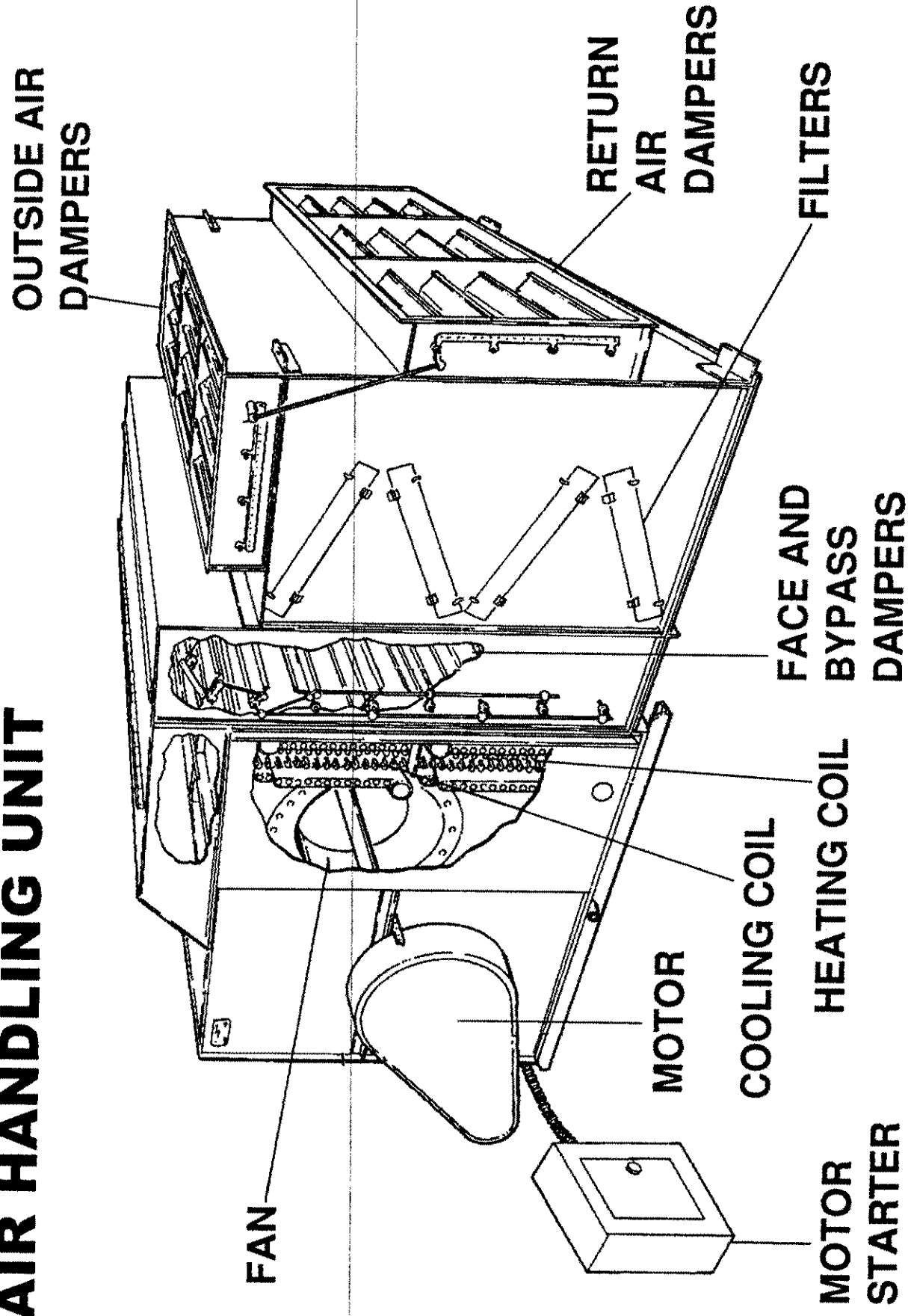
CONDENSER COIL

- Rejects room heat to outside air.
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.

(continued)

COMPONENT	FUNCTION	MAINTENANCE
COMPRESSOR	<ul style="list-style-type: none"> Prepares refrigerant to be condensed and reused at the evaporator. 	<ul style="list-style-type: none"> Check refrigerant charge. Check for refrigerant and oil leaks. Check crankcase heater operation. Perform acid test.
CONDENSER FAN	<ul style="list-style-type: none"> Circulates air through condenser coil. 	<ul style="list-style-type: none"> Inspect and clean. Check for proper rotation and clearance.
CONDENSER FAN MOTOR	<ul style="list-style-type: none"> Provides energy source for fan operation. 	<ul style="list-style-type: none"> Inspect and clean. Lubricate. Examine motor mount resiliency.

AIR HANDLING UNIT



COMPONENT**FUNCTION****MAINTENANCE****FAN**

- Moves conditioned air to area being served.

- Inspect and clean.
- Check for proper rotation.
- Perform vibration test.

MOTOR

- Provides energy source for fan operation.

- Perform vibration test.
- Lubricate.
- Examine motor mount resiliency.

MOTOR STARTER

- Controls on/off operation of motor.

- Inspect starter coils and contacts.
- Tighten electrical connections.
- Check current and heater size.

COOLING COIL

- Provides cooling source for area being served.

- Measure inlet and outlet temperature for efficiency.
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.

HEATING COIL

- Provides heat source for area being served.

- Measure inlet and outlet temperature for efficiency.
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.

**FACE AND
BYPASS DAMPERS**

- Regulates air flow through or around the heating and cooling coils.

- Lubricate bearings.
- Check for proper close off and operation.
- Tighten any loose linkage connections.

FILTERS

- Cleans the air entering the unit and area being served.

- Replace as required.

(continued)

COMPONENT

FUNCTION

MAINTENANCE

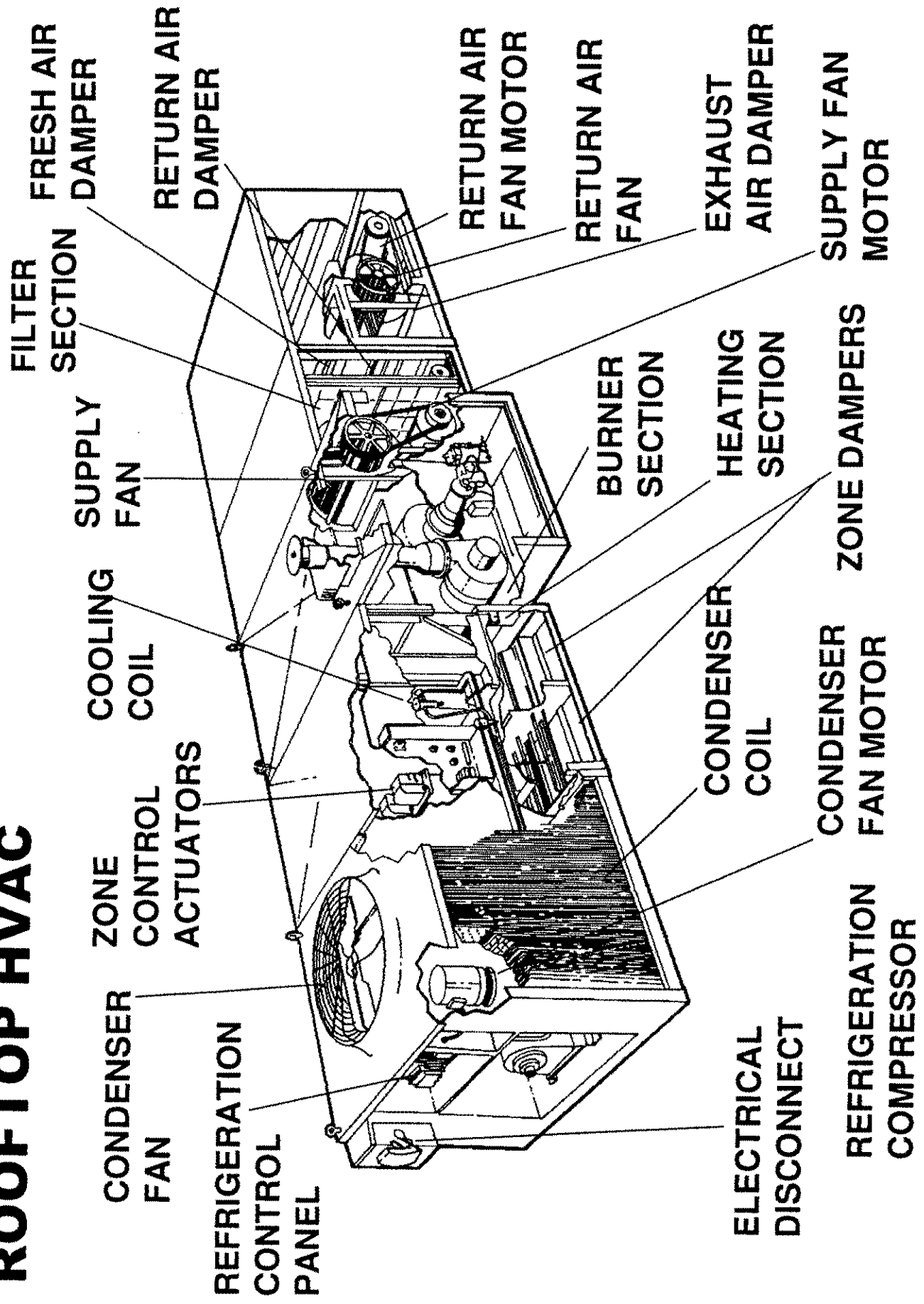
RETURN AIR DAMPERS

- Regulates the quantity of return air entering the unit.
- Lubricate bearings.
- Check for proper close off and operation.
- Tighten any loose linkage connections.

OUTSIDE AIR DAMPERS

- Regulates the quantity of outside air entering the units.
- Lubricate bearings.
- Check for proper close off and operation.
- Tighten any loose linkage connections.

ROOFTOP HVAC



COMPONENT**FUNCTION****MAINTENANCE****ELECTRICAL
DISCONNECT**

- Provides primary electrical power safety shutoff.

- Inspect contacts and loose connections.
- Check for proper operation.

**CONDENSER
FAN MOTOR**

- Provides energy source for fan.

- Perform vibration test.
- Lubricate bearings.
- Examine motor mount resiliency.
- Check motor insulation resistance.

MOTOR STARTER

- Controls on/off operation of motor.

- Inspect starter coils and contacts.
- Tighten all electrical connections.
- Check operating current, voltage and heater size.

**CONDENSER
FAN**

- Circulates air through condenser coil.

- Check fan wheel and clean dirt accumulation.
- Lubricate bearings and check for end play, excessive bearing temp. and wear.
- Check condition of drive couplings and belts. Adjust as required.
- Check for corrosion and wear.

**CONDENSER
COIL**

- Converts refrigerant from high temp./high press. gas to low temp./high press. liquid.
- Provides efficient heat transfer.

- Clean finned surfaces.
- Check for damage or leaks.
- Straighten bent fins.

**REFRIGERATION
CONTROL
PANEL**

- Provides safety interlocks and controls for compressor operation.

- Sequence test all controls.
- Calibrate and clean controllers and safety controls.
- Check setpoint of controls and limits.

(continued)

COMPONENT**FUNCTION****MAINTENANCE****REFRIGERATION
COMPRESSOR**

- Prepares refrigerant to be condensed and reused at the evaporator.
- Check crankcase heater operation.
- Check refrigerant charge.
- Check for refrigerant and oil leaks.
- Check oil level and condition.
- Perform acid test.
- Observe bearing and operating surface temperatures.
- Measure vibration.

**ZONE CONTROL
ACTUATORS**

- Operates zone dampers on demand from space control.
- Inspect, clean and calibrate.
- Adjust linkage as necessary.

**COOLING
COIL**

- Provides cooling for space being served.
- Inspect and clean as required.
- Check condition of finned surfaces and straighten if bent.
- Check for corrosion and leaks.

**FILTER
SECTION**

- Provides source of clean air for unit.
- Replace media as required.

**FRESH AIR
DAMPER**

- Provides source of outside air.
- Check for unrestricted and proper operation and close-off.
- Lubricate bearings as required.

**RETURN AIR
DAMPER**

- Provides source of recirculated air from the building.
- Check for unrestricted and proper operation.
- Lubricate bearings as required.

**EXHAUST
AIR DAMPER**

- Provides outlet for exhausted air from building.
- Check for unrestricted and proper operation and close-off.
- Lubricate bearings as required.

COMPONENT**FUNCTION****MAINTENANCE****RETURN
AIR FAN**

- Circulates return air from building.
- Lubricate bearings and check for end play, excessive bearing temp. and wear.
- Check blower and clean dirt accumulation.
- Check condition of drive couplings

SUPPLY FAN

- Circulates conditioned air to areas being served by unit.
- and belts.
- Check for alignment, balance and security to shaft.
- Check rotation.

**RETURN AIR
FAN MOTOR**

- Provides energy source for return air fan.
- Perform vibration test.
- Lubricate motor bearings.
- Check motor insulation resistance.
- Examine motor mount resiliency.

SUPPLY MOTOR

- Provides energy source for main fan.

**MOTOR
STARTER**

- Controls on/off operation of motor.
- Inspect starter coils and contacts.
- Tighten all electrical connections.
- Check operating current, voltage and heater size.

**BURNER
SECTION**

- Provides combustion controls, fuel regulating equipment, and safety controls for heating section.
- Perform combustion and draft tests.
- Inspect and clean nozzles.
- Inspect, clean and lube burner fan (gun type burners).
- Test safety controls.

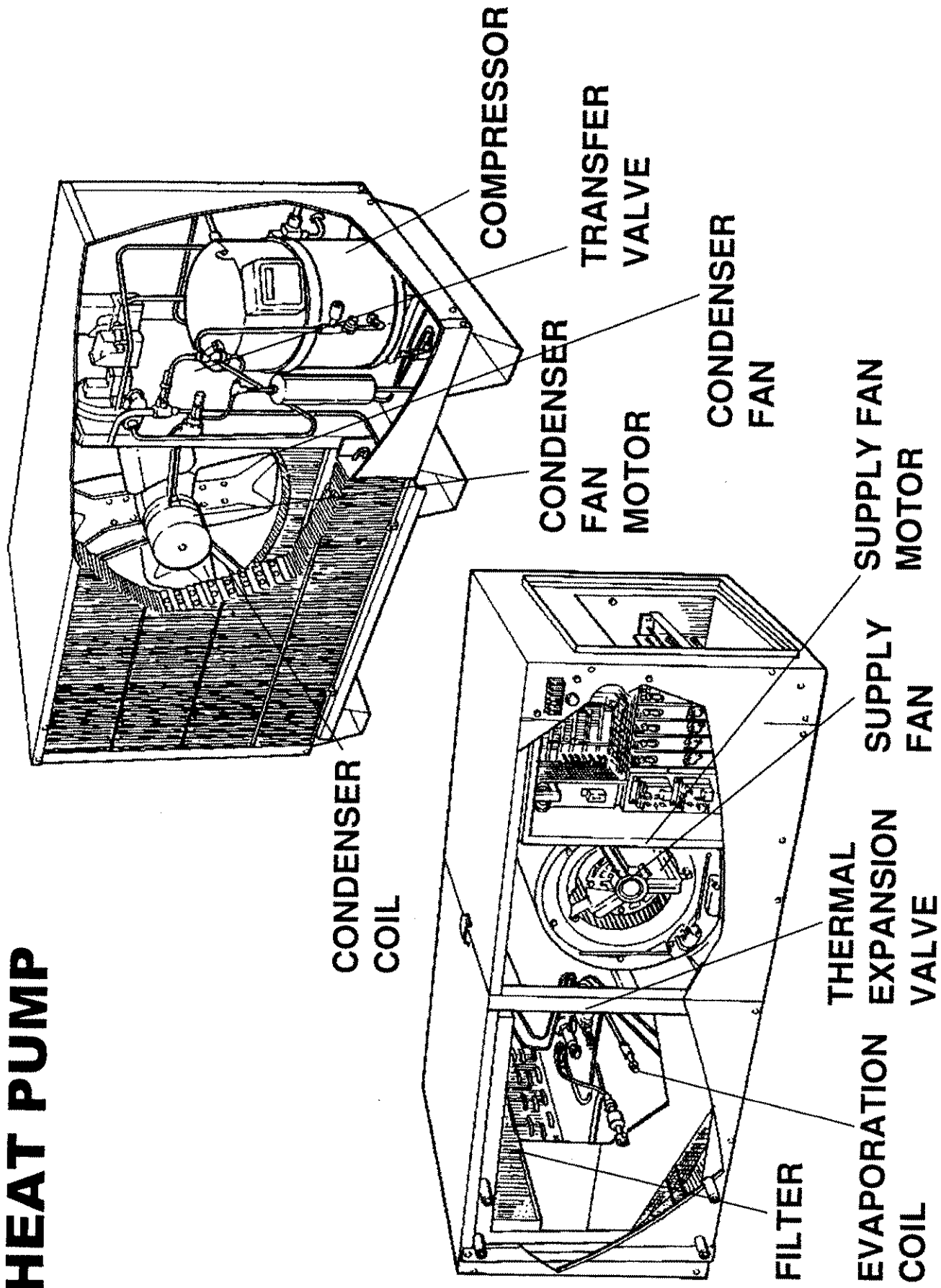
**HEATING
SECTION**

- Provides heat source for areas being served.
- Inspect and clean as required.
- Check for leaks in exchanger.

**ZONE
DAMPERS**

- Provides source for conditioned air being delivered to areas served by unit.
- Check for proper operation.
- Check linkage and adjust if required.
- Lubricate bearings as required.

HEAT PUMP



COMPONENT**FUNCTION****MAINTENANCE****FILTER**

- Cleans the air entering the unit.
- Replace as required.

**EVAPORATOR
COIL**

- Provides heating/cooling source for space being served.
- Measure inlet and outlet temperature for efficiency.
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.
- Inspect and clean drain pan and drain line.

**CONDENSER
COIL**

- Dissipates or absorbs heat to/from outside air.
- Inspect and clean.
- Straighten fins.
- Check for damage or leaks.

COMPRESSOR

- Prepares refrigerant to be condensed and reused at the evaporator.
- Check refrigerant charge.
- Check for refrigerant and oil leak.
- Check crankcase heater operation.
- Check compressor motor current.

SUPPLY FAN

- Circulates conditioned air to space being served.
- Inspect and clean.
- Check for proper rotation and clearance.
- Check security to motor shaft.

**SUPPLY FAN
MOTOR**

- Provides energy source for supply fan operation.
- Inspect and clean.
- Lubricate.
- Examine motor mount resiliency.

MOTOR STARTER

- Controls on/off operation of motor.
- Inspect starter coils and contacts.
- Check current and heater size.

(continued)

COMPONENT	FUNCTION	MAINTENANCE
CONDENSER FAN	<ul style="list-style-type: none"> • Circulates air through outside coil. 	<ul style="list-style-type: none"> • Inspect and clean. • Check for proper rotation and clearance. • Check security to motor shaft.
CONDENSER FAN MOTOR	<ul style="list-style-type: none"> • Provides energy source for fan operation. 	<ul style="list-style-type: none"> • Inspect and clean. • Lubricate. • Examine motor mount resiliency.
CONTROL PANEL	<ul style="list-style-type: none"> • Provides selection and control for unit operation. 	<ul style="list-style-type: none"> • Test for proper operation. • Tighten all electrical connections. • Sequence test all controls.
THERMAL EXPANSION VALVE	<ul style="list-style-type: none"> • Provides refrigerant flow control. 	<ul style="list-style-type: none"> • Check for proper operation. • Adjust as required.
TRANSFER VALVE	<ul style="list-style-type: none"> • Switches heat pump operation and flow of refrigerant between heating and cooling. 	<ul style="list-style-type: none"> • Check for proper operation. • Adjust as required.