INGERSOLL-RAND®

EP 20/25/30 - ESP

OPERATORS/
INSTRUCTION MANUAL
PARTS LIST
RECOMMENDED SPARES

Before installation or starting the compressor for the first time, this manual should be studied carefully to obtain a clear knowledge of the unit and of the duties to be performed while operating and maintaining the unit.

RETAIN THIS MANUAL WITH UNIT.
This Technical manual contains IMPORTANT SAFETY DATA and should be kept with the air compressor at all times.

APDD 655B
September 1996

AIR COMPRESSOR GROUP
BONDED WARRANTY & REGISTERED START UP

Warranty

The Company warrants that the equipment manufactured by it and delivered hereunder will be free of defects in material and workmanship for a period of twelve months (see extended airend warranty) from the date of placing the Equipment in operation or eighteen months (see extended airend warranty) from the date of shipment from Davidson, NC, whichever shall first occur. The Purchaser shall be obligated to promptly report any failure to conform to this warranty, in writing to the Company in said period, whereupon the Company shall, at its option, correct such nonconformity, by suitable repair to such equipment or, furnish a replacement part F.O.B. point of shipment, provided the Purchaser has stored, installed maintained and operated such Equipment in accordance with good industry practices and has complied with specific recommendations of the Company. Accessories or equipment furnished by the Company, but manufactured by others, shall carry whatever warranty the manufacturers have conveyed to the Company and which can be passed on to the Purchaser. The Company shall not be liable for any repairs, replacements, or adjustments to the Equipment or any costs of labor performed by the Purchaser or others without Company's prior written approval.

The effects of corrosion, erosion and normal wear and tear are specifically excluded. Performance warranties are limited to those specifically stated within the Company's proposal. Unless responsibility for meeting such performance warranties are limited to specified tests, the Company's obligation shall be to correct in the manner and for the period of time provided above.

THE COMPANY MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED.

Correction by the Company of nonconformities whether patent or latent, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of the Company for such nonconformities whether based on contract, warranty negligence, indemnity, strict liability or otherwise with respect to or arising out of such Equipment.

The purchaser shall not operate Equipment which is considered to be defective, without first notifying the Company in writing of its intention to do so. Any such Equipment will be at Purchaser's sole risk and liability.

Limitation or Liability

The remedies of the Purchaser set forth herein are exclusive, and the total liability of the Company with respect to this contract or the Equipment and services furnished hereunder, in connection with the performance or breach thereof, or from the manufacture, sale, delivery, installation, repair or technical direction covered by or furnished under this contract, whether passed on contract, warranty negligence, indemnity, strict liability or otherwise, shall not exceed the purchase price of the unit of Equipment upon which such liability is based.

The Company and its suppliers shall in no event be liable to the Purchaser, any successors in interest or any beneficiary or assignee of this contract for any consequential, incidental, indirect, special or punitive damages arising out of this contract or any breach thereof, or any defect in, or failure of, or malfunction of the Equipment hereunder, whether based upon loss of use, lost profits or revenue, interest, lost goodwill, work stoppage, impairment of other goods, loss by reason of shutdown or non-operation, increased expenses of operation, cost of purchase of replacement power or claims of Purchaser or customers of Purchaser for service interruption whether or not such loss or damage is based on contract, warranty, negligence, indemnity, strict liability or otherwise.

ROTARY SCREW AIR COMPRESSOR

This unit was purchased from

_____

_____

_____

Ingersoll-Rand Company reserves the right to make changes or add improvements without notice and without incurring any obligation to make such changes or add such improvements to products sold previously.

No. of units on order: _____

Customer Order No: _____

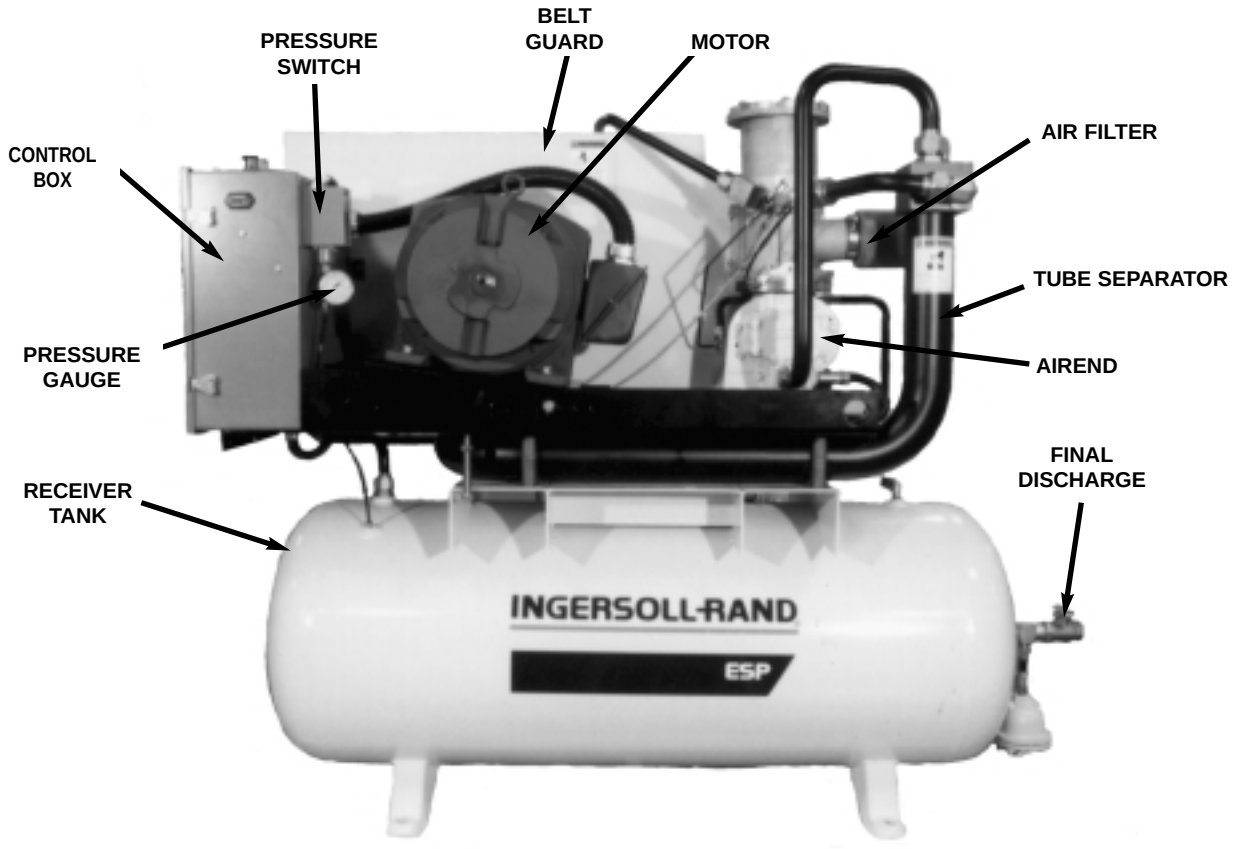
Ingersoll-Rand Co. Order No.: _____

For ready reference:

Record the serial number and model number of your unit here.

Serial Number: _____

Model Number: _____



TYPICAL ESP UNIT

TABLE OF CONTENTS

GENERAL INFORMATION

Cooling Air Flow:

60 Hz:	1800 cfm	(51.0 m^3/min.)
50 Hz:	1500 cfm	(42.6 m^3/min.)

Ambient Temperature Limit: 35°F to 115°F (2°C to 46°C)

Coolant: Factory Filled ROTALUBE™ 1000 COOLANT

Coolant Change: 1,000 hours or one year, whichever comes first, when using ROTALUBE™ 1000 COOLANT

Coolant Capacity: 1.6 GAL (6L)

Discharge Temperature Limit: 228°F (109°C)

Tools: U.S. Standard and metric are required to perform maintenance

***This product is produced under license from Cash Engineering Research Pty. Ltd. United States and foreign patents pending.**

0.0 SAFETY AND WARNINGS

0.1 SAFETY INSTRUCTIONS

Before you install this air compressor you should take the time to carefully read all the instructions contained in this manual.

Electricity and compressed air have the potential to cause severe personal injury or property damage.

Before installing, wiring, starting, operating or making any adjustments, identify the components of the air compressor using this manual as a guide.

The operator should use common sense and good working practices while operating and maintaining this unit. Follow all codes, pipe adequately, understand the starting and stopping sequence. Check the safety devices by following the procedure contained in this manual.

Maintenance should be done by qualified personnel, adequately equipped with proper tools. Follow the maintenance schedules as outlined in the operators manual to ensure problem free operation after start up.

Safety instructions in the operators manual are bold-faced for emphasis. The signal words DANGER, WARNING and CAUTION are used to indicate hazard seriousness levels as follows:

⚠ DANGER — **Danger is used to indicate the presence of a hazard which *will cause severe* personal injury, death, or substantial property damage if the warning is ignored.**

⚠ WARNING — **Warning is used to indicate the presence of a hazard which *can cause severe* personal injury, death, or substantial property damage if the warning is ignored.**

⚠ CAUTION — **Caution is used to indicate the presence of a hazard which *will or can cause minor* personal injury or property damage if the warning is ignored.**

NOTICE — **Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.**

0.2 SAFETY PRECAUTIONS

SAFETY PRECAUTIONS

BEFORE PROCEEDING, READ CAREFULLY BEFORE INSTALLING THE COMPRESSOR OR PERFORMING ANY MAINTENANCE

WARNING

COMPRESSED AIR AND ELECTRICITY ARE DANGEROUS.

BEFORE DOING ANY WORK ON THIS UNIT, BE SURE THE ELECTRICAL SUPPLY HAS BEEN CUT OFF–LOCKED & TAGGED AND THE ENTIRE COMPRESSOR SYSTEM HAS BEEN VENTED OF ALL PRESSURE.

1. Do not remove the covers, loosen or remove any fittings, connections or devices when this unit is in operation. Hot liquid and air under pressure that are contained within this unit can cause severe injury or death.

2. The compressor has high and dangerous voltage in the motor starter and control box. All installations must be in accordance with recognized electrical codes. Before working on the electrical system, be sure to remove voltage from the system by use of a manual-disconnect-switch. A circuit breaker or fuse safety switch must be provided in the electrical supply line leading to the compressor.

Those responsible for installation of this equipment must provide suitable grounds, maintenance clearance and lightning arrestors for all electrical components as stipulated in O.S.H.A. 1910.308 through 1910.329.

3. Do not operate the compressor at higher discharge pressure than those specified on the Compressor Nameplate or motor overload will occur. This condition will result in compressor motor shutdown.

4. Use only safety solvent for cleaning the compressor and auxiliary equipment.

5. Install a manual shut off valve (isolation type) in the discharge line. A pressure relief valve, with sufficient capacity to relieve full compressor capacity, must be installed between the compressor and the isolation valve.

6. Whenever pressure is released through the pressure relief valve, it is due to excessive pressure in the system. The cause for the excessive pressure should be investigated immediately.

7. Before doing any mechanical work on the compressor:

a.) Shut the unit down.

b.) Electrically isolate the compressor by use of the manual disconnect switch in the power line to the unit. Lock and tag the switch so that it cannot be operated.

c.) Vent pressure from the compressor and isolate the unit from any other source of air.

8. There can be adverse effects if compressor lubricants are allowed to enter plant air systems.

Air line separators, properly selected and installed, will minimize any liquid carryover.

The use of plastic bowls on line filters without metal guards can be hazardous. From a safety standpoint, metal bowls should be used on any pressurized system. Review of your plant air line system is recommended.

9. When a receiver is installed, it is recommended that occupational safety and health standards as covered in the Federal Register, Volume 36, number 105, part 11, paragraph 1910.169 be adhered to in the installation and maintenance of this receiver.

10. Before starting the compressor, its maintenance instructions should be thoroughly read and understood.

11. After maintenance functions are completed, covers and guards must be replaced.

⚠ SAFETY SHUTDOWN CHECK HIGH AIR TEMPERATURE

There is a high discharge air temperature shutdown function built into the control on each compressor. It is factory pre-set at 228°F (109°C). This function should be checked at regular intervals for proper operation, once a month Is recommended.
PROCEDURE:

1. Block off the cooling air discharge.

2. The compressor discharge temperature will rise at a rapid rate. Shutdown should occur when the discharge temperature reaches the pre-set maximum discharge air temperature setting.

⚠ WARNING

Failure to adhere to these recommendations can result in mechanical failure, property damage and serious injury or death.

All air and water inlet, and air and water discharge pipework to and from the inlet and discharge port connections must take into account vibration, pulsations, temperature, maximum pressure applied, corrosion and chemical resistance. In addition, it should be noted that lubricated compressors will discharge some oil into the air stream; therefore, compatibility between discharge piping, system accessories and software must be assured.

For the foregoing reasons, the use of plastic piping, soldered copper fittings and rubber hose as discharge piping is not recommended. In addition, flexible joints and/or flex lines can only be considered for such purposes if their specifications fit the operating parameters of the system.

It is the responsibility of the installer and owner to provide the appropriate service pipework to and from the machine.

⚠ WARNING

STATEMENT CONCERNING THE USE OF THIS EQUIPMENT FOR BREATHING AIR AND/OR AQUA LUNG SERVICE

If the model number on this air compressor contains letters “BAP”, the compressor is suitable for use in breathlng air services. In the absence of such a designation, the compressor is NOT considered as capable of producing air of breathing quality. For a compressor to be capable of use In breathing air services It must be fitted with additional specialized equipment to property filter and/or purify the air to meet all applicable federal, state and local laws, rules, regulations and codes, such as, but not limited to, OSHA 29 CFR 1910.134, Compressed Gas Association Commodity Specification G-7, 1-1966, Grade D Breathing Air and/or Canadian Standards Association. Should the purchaser and/or User fail to add such specialized equipment and proceeds to use the compressor for breathing air service, the purchaser/User assumes all liability resulting therefrom without any responsibility or liability being assumed by Ingersoll-Rand Company.

The Purchaser is urged to include the above provision in any agreement for any resale of this compressor.

⚠ WARNING

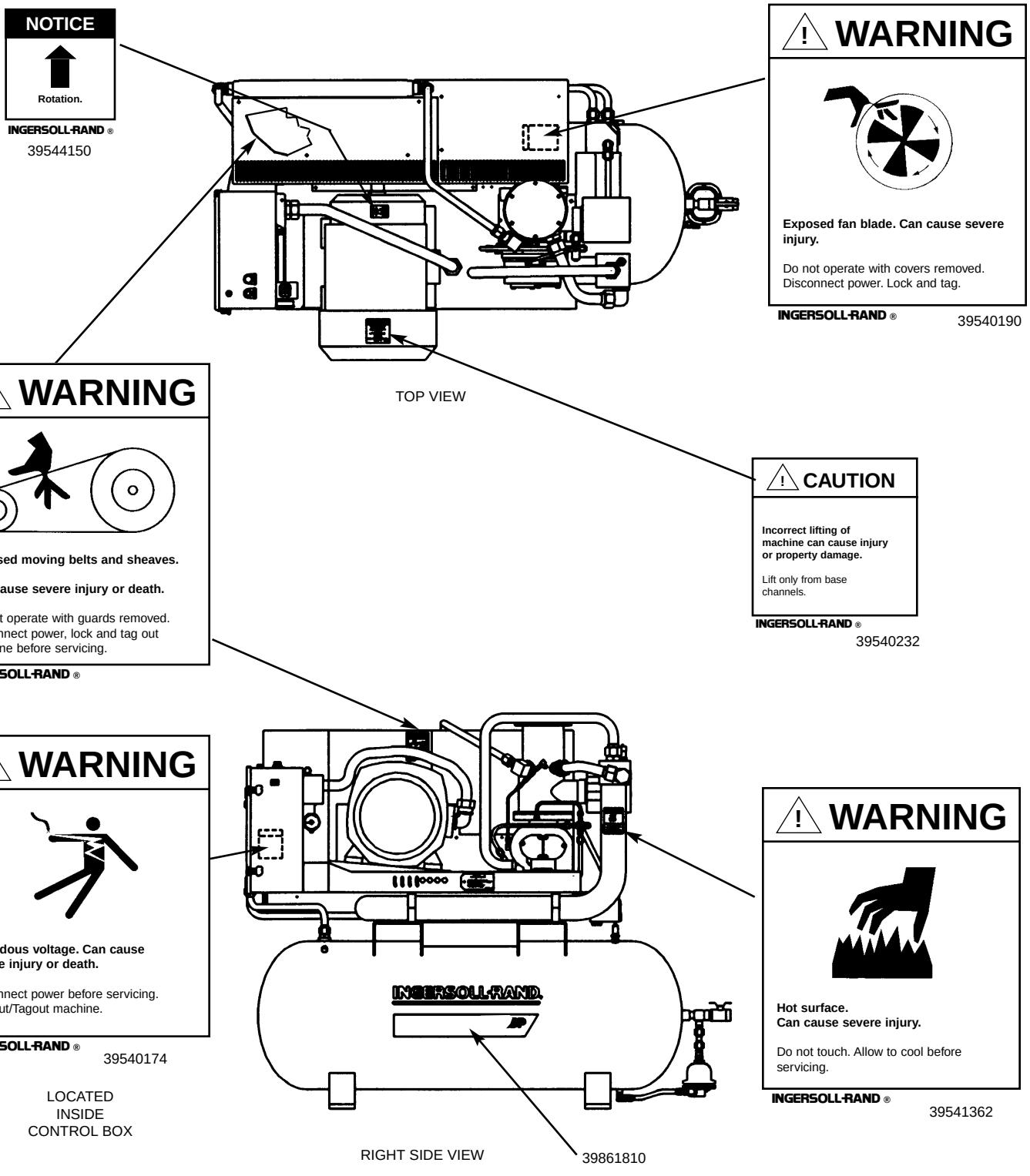
STATEMENT CONCERNING THE INADVERTENT BREATHING OF COMPRESSED AIR EXHAUST

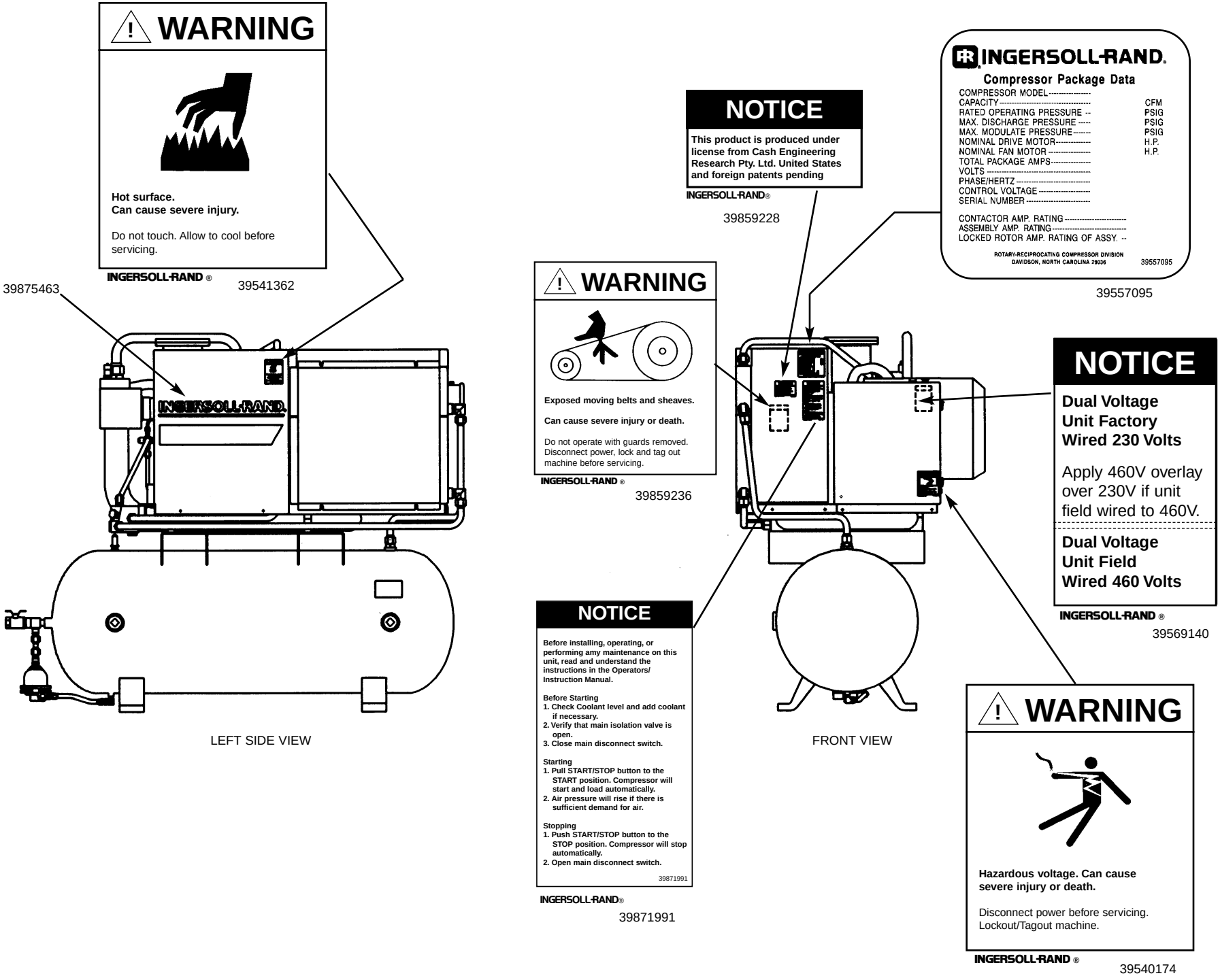
“The purchaser/user shall insure that adequate ventilation and make up air are provided if a non BAP designated compressor supplies air in a confined area to air consuming devices such as air motors, air tools, solenoids, air cylinders, air guns, nozzles, etc. The compressed air discharge stream may contain residual coolants/lubricants/carbon monoxide/condensable hydrocarbons or other materials which may be hazardous to health with prolonged inhalation.”

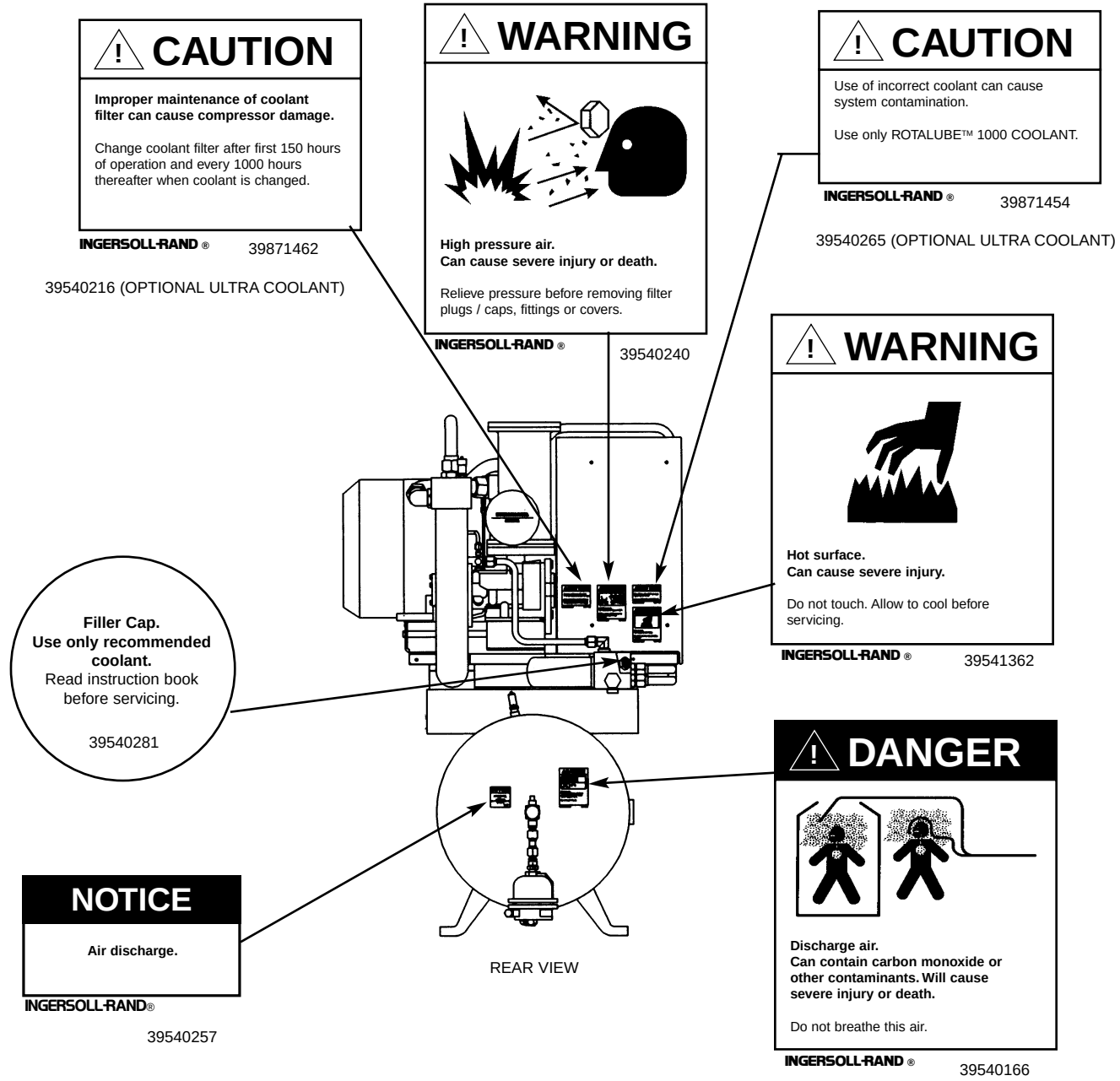
0.3 DECALS

This section contains representative examples of decals which will be appearing throughout this manual and are applied to the compressor unit.

If for some reason a decal is defaced, parts are replaced or painted over, we recommend that you obtain a replacement (See Recommended Spare Parts List for Decal Kit Number).




WARNING
Hot surface.
Can cause severe injury.
Do not touch. Allow to cool before servicing.
INGERSOLL-RAND ®
39541362
39875463
INGERSOLL-RAND
LEFT SIDE VIEW
NOTICE
This product is produced under license from Cash Engineering Research Pty. Ltd. United States and foreign patents pending
INGERSOLL-RAND®
39859228
INGERSOLL-RAND
Compressor Package Data
COMPRESSOR MODEL
CAPACITY CFM
RATED OPERATING PRESSURE PSIG
MAX. DISCHARGE PRESSURE PSIG
MAX. MODULATE PRESSURE PSIG
NOMINAL DRIVE MOTOR H.P.
NOMINAL FAN MOTOR H.P.
TOTAL PACKAGE AMPS
VOLTS
PHASE/HERTZ
CONTROL VOLTAGE
SERIAL NUMBER
CONTACTOR AMP. RATING
ASSEMBLY AMP. RATING
LOCKED ROTOR AMP. RATING OF ASSY.
ROTARY-RECIPROCATING COMPRESSOR DIVISION
DAVIDSON, NORTH CAROLINA 28036
39557095
39557095
WARNING
Exposed moving belts and sheaves.
Can cause severe injury or death.
Do not operate with guards removed. Disconnect power, lock and tag out machine before servicing.
INGERSOLL-RAND ®
39859236
NOTICE
Dual Voltage Unit Factory Wired 230 Volts
Apply 460V overlay over 230V if unit field wired to 460V.
Dual Voltage Unit Field Wired 460 Volts
INGERSOLL-RAND ®
39569140
NOTICE
Before installing, operating, or performing amy maintenance on this unit, read and understand the instructions in the Operators/ Instruction Manual.
Before Starting
1. Check Coolant level and add coolant if necessary.
2. Verify that main isolation valve is open.
3. Close main disconnect switch.
Starting
1. Pull START/STOP button to the START position. Compressor will start and load automatically.
2. Air pressure will rise if there is sufficient demand for air.
Stopping
1. Push START/STOP button to the STOP position. Compressor will stop automatically.
2. Open main disconnect switch.
39871991
INGERSOLL-RAND®
39871991
FRONT VIEW
WARNING
Hazardous voltage. Can cause severe injury or death.
Disconnect power before servicing. Lockout/Tagout machine.
INGERSOLL-RAND ®
39540174



NOTE: DECALS 39540257 AND 39540166 ARE LOCATED ON THE END OF THE COOLER BOX ON BASE MOUNTED UNITS.

1.0 RECEIPT OF EQUIPMENT

1.1 INSPECTION

When you receive the compressor please inspect it closely. Any indication of careless handling by the carrier should be noted on the delivery receipt especially if the compressor will not be immediately un-crated. Obtaining the delivery man's signed agreement to any noted damages will facilitate any future insurance claims.

1.2 UNPACKING AND HANDLING

The compressor package has been mounted on a wooden shipping base which will allow fork lifting under the compressor base to facilitate handling during shipment. Care in positioning the forklift is important because the location of the center of gravity is strongly affected by the location of the airend and drive motor.

The wooden base must be removed prior to installation.

2.0 INSTALLATION

2.1 VENTILATION

Air cooled air compressors produce large amounts of heat. Because of this large heat production, the compressor must be placed in a room with adequate ventilation.

If heated air from the compressor exhaust is allowed to re-circulate back to the compressor, the compressor will overheat and shut down. This heat must be exhausted from the room. You should take this into consideration when deciding where to place the compressor within the building. Sufficient clearance must be allowed around the compressor to perform the required maintenance.

Ambient temperatures higher than 115°F (46°C) should be avoided as well as areas of high humidity.

External ducting, to and from the compressor, that is installed in the field must be sized so that no excessive back pressure is exerted on the fan. Maximum allowable is 0.25 inches (6.4mm) of water column air resistance total for inlet and exhaust ducting.

Also consider the environment near the compressor.

DUST, CHEMICALS, METAL FILINGS, PAINT FUMES, and OVERSPRAY should be avoided as well as any other conditions which might be detrimental to the proper operation of the compressor.

2.2 FOUNDATION REQUIREMENTS

The compressor can be installed on any level floor that is capable of supporting the weight.

When sound transmission is of particular importance, it is often helpful to install a sheet of rubber-fabric-matting, under the compressor baseplate or receiver tank feet to reduce the possibility of resonant sounds being transmitted or amplified through the floor.

2.3 OUTDOOR INSTALLATIONS

When a compressor must be installed outside, there are certain items that should be incorporated into the installation to help assure trouble free operation. These items have been listed below plus Figure 2.31 has been included to show a typical outdoor protected installation. The unit must be purchased with NEMA 4 option to provide watertight electric's.

• The compressor should be on a concrete pad designed to drain water away. If the concrete pad is sloped, then the compressor must be leveled.

• The roof of the shelter should overhang the compressor a minimum of 4 feet (1.2m) on all sides to prevent direct rain and snow from falling on the unit.

• The unit must be arranged under the shelter in a way that prevents air recirculation (i.e. hot exhaust back to the package inlet).

• If the installation includes more than one compressor, the hot air exhaust should not be directed towards the fresh air intake of the second unit or an Air Dryer.

• If a standard machine is to be installed outside, the ambient temperature must never drop below 35°F (2°C) or freezing of condensate will result.

• Power disconnect switch must be within the compressor operator's line of sight and should be in close proximity to the unit.

• Condensate drains must never be allowed to dump on the ground. Pipe to a suitable sump for future collection, disposal or separation of lubricant and water mixture.

• Incoming power connections must use suitable connectors for outdoor weather tight service.

• Sufficient clearance must be allowed on all four sides of the unit for service access. If possible, access by a fork lift and/or an overhead beam hoist should be kept in mind (for eventual service to airend or motor).

• If the area around the installation contains fine airborne dust or lint and fibers etc., then the unit should be purchased with the TEFC motor option.

• Some type of protection such as a fence or security system, should be provided to prevent unauthorized access.

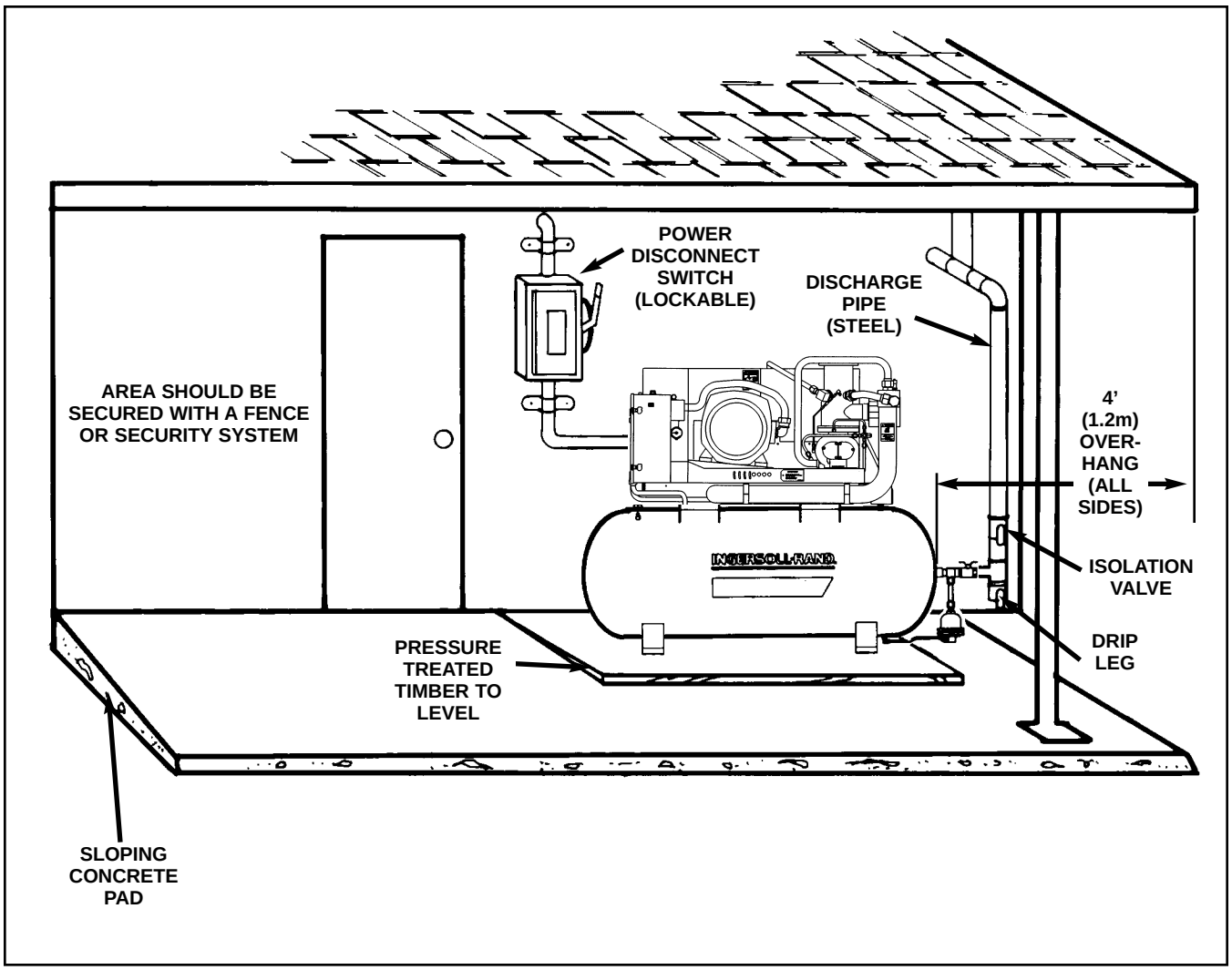


FIGURE 2.3-1 TYPICAL OUTDOOR SHELTERED INSTALLATION 35°F (2°C) AND ABOVE

2.4 PIPING

It is essential when installing a new compressor to review the total plant air system. This is to insure a safe and effective total system.

The use of plastic bowls on line filters without metal guards can be hazardous. Their safety can be affected by either synthetic lubricants or the additives used in mineral oils. From a safety standpoint, metal bowls should be used on any pressurized system.

⚠ WARNING

Do not use plastic pipe, soldered copper fittings or rubber hose for discharge piping.

Condensed water occurs naturally in air lines as a result of compression. Moisture vapor in ambient air is concentrated when pressurized and condenses when cooled in downstream air piping.

Moisture in compressed air is responsible for costly problems in almost every application that relies on compressed air. Some common problems caused by moisture are: rusting and scaling in pipelines, clogging of instruments, sticking of control valves, and freezing of outdoor compressed air lines. Any of these could result in partial or total shutdown of the compressed air system.

The compressed air discharging from this compressor will be at some elevated temperature and will therefore contain amounts of water vapor. As this air cools the vapor will condense within the piping system.

IMPORTANT: The drain line must slope downward from the trap to work properly.

NOTE: For ease of inspection of the automatic drain trap operation, the drain piping should include an open funnel or some type of sight flow indicator.

It is possible that additional condensation can occur if the downstream piping cools the air even further. Therefore, low points in the piping system should be provided with driplegs and traps.

Compressed air dryers reduce the water vapor concentration and prevent liquid water formation in compressed air lines. Dryers are a necessary companion to filters, aftercoolers, and automatic drains for improving the productivity of compressed air systems. Two types of dryers, refrigerated or desiccant , are used to correct moisture related problems in a compressed air system. Refrigerated dryers are normally specified where compressed air pressure dew points of 33°F to 39°F (.5°C to 4°C) are adequate. Desiccant dryers are required where pressure dew points must be below 33°F to 39°F (.5°C to 4°C) are adequate. Desiccant dryers are required where pressure dew points must be below 33°F (.5°C). Figure 2.4-1 indicates the approximate moisture content in compressed air at various operating points.

Contact your local Ingersoll-Rand Distributor or Air Center for assistance in selecting correct Ingersoll-Rand filtration or drying products.

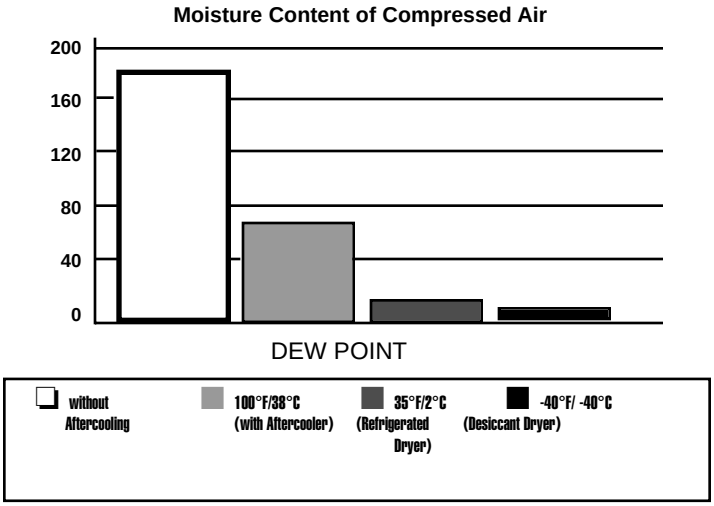


FIGURE 2.4-1 MOISTURE CONTENT OF COMPRESSED AIR

IMPORTANT: Discharge piping should be at least as large as the discharge connection at the compressor. All piping and fillings must be suitably rated for the discharge pressure and temperature.

A careful review of piping size from the compressor connection point is essential. Length of pipe, size of pipe, number and type of fittings and valves must be considered for minimum air pressure drop and optimum efficiency of your compressor.

NOTE: Screw type compressors should not be installed in air systems with reciprocating compressors without a means of pulsation isolation, such as a common receiver tank. We recommend both types of compressor units be piped to a common receiver utilizing individual air lines. See Figure 2.4-2.

When two rotary units are operated in parallel, provide an isolation valve and drain trap for each compressor before the common receiver.
See Figure 2.4-3

To assure long trouble free operation of a compressor operating with On-line/ Off-line and Auto Stop/Start control, the system volume must be large enough to keep the load/unload cycles to a minimum. This may require the installation of a receiver down stream of the compressor. Baseplate mounted units must be piped to a receiver if installed in a system with insufficient volume to keep compressor cycling to a minimum. If equipment such as filters or air dryers, is installed in the main piping system, they must be sized to handle the entire flow of the compressor and an air receiver must be placed in the system between the compressor discharge and the equipment, regardless of system volume.

This will prevent quick cycling of the compressor which results in large fluctuations in system pressure.

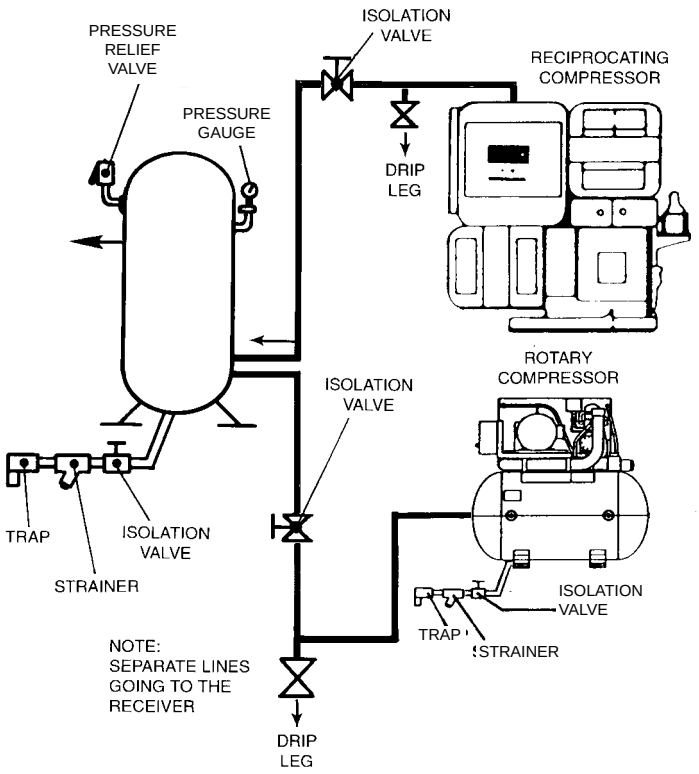


FIGURE 2.4-2 ROTARY-RECIP IN PARALLEL

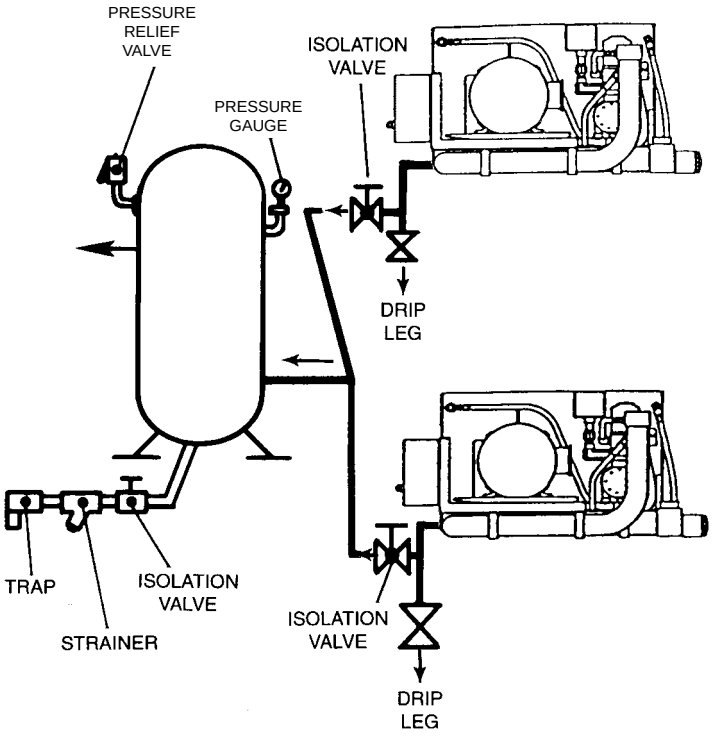


FIGURE 2.4-3 ROTARY-TWO COMPRESSOR SYSTEM

2.5 ELECTRICAL INSTALLATION

Before proceeding further, we recommend that you review the safety data in the front of this manual.

Locate the compressor data plate on the left end of the cooler box next to the control box.

The data plate lists the rated operating pressure, the maximum discharge pressure, the electric motor characteristics and power.

Confirm that the line voltage and compressor nameplate voltage are the same.

The standard control box meets the intent of NEMA 1 guidelines.
It will be necessary to make a hole in the control box for the incoming power connection. Care should be taken to not allow metal shavings to enter the starter and other electrical components within the box. After making the power inlet hole, all shavings and debris must be removed from inside of control box before power is turned on.

Incoming power should be connected per the electrical schematic at the rear of this manual (See Section 6.0). Confirm that all electrical connections are made and tightened. Confirm that the control transformer is wired correctly for supply voltage (See Figures 2.6-1 / 2.6-2).

Inspect the motor and control wiring for tightness. Close the panel front.

2.6 VOLTAGE CONVERSION

IMPORTANT: This procedure should only be carried out by a qualified electrician, electrical contractor or your local Ingersoll Rand Distributor or Air Center.

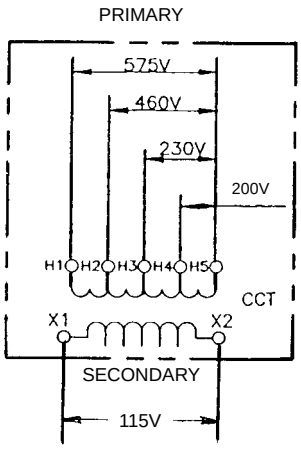


FIGURE 2.6-1 CONTROL TRANSFORMER CONNECTIONS - 60HZ

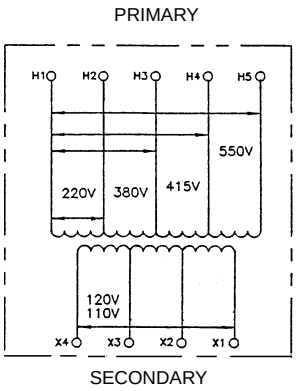


FIGURE 2.6-2 CONTROL TRANSFORMER CONNECTIONS - 50 HZ

NOTE: This procedure applies only to units manufactured to multi-voltage specifications. Motor nameplate must indicate multiple voltages.

PROCEDURE:

Put main disconnect in the OFF position, lock and tag (See Figure 2.6-3).

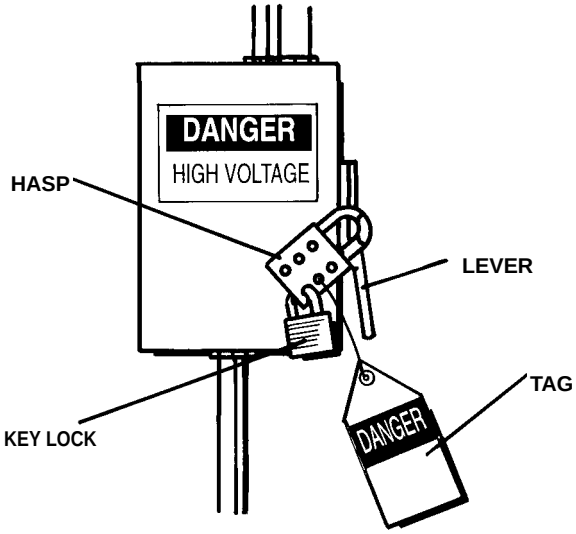


FIGURE 2.6-3 MAIN DISCONNECT LOCKED AND TAGGED

Open the motor junction box on the side of the motor.

Reconnect the motor to the desired voltage. Use the connection decal provided on the motor as a guide.

Reconnect the primary side of the control transformer for the desired voltage, as shown on the control transformer wiring decal.

After referring to the heater chart decal located in the starter box panel, remove the original heater packs and replace them with the appropriate heater packs based on horsepower and voltage.

Again referring to the heater chart, set the dial position of the overload relay to the appropriate setting.

Make sure all wiring connections are tight.

Put main disconnect in the ON position and check motor rotation, as outlined in Section 2.7 of this manual.

2.7 SHIPPING BOLT REMOVAL

The unit is shipped with a bolt in the motor support to prevent possible belt damage caused by bouncing during shipment. This bolt must be removed prior to checking motor rotation or operating the unit.

In addition, a jackscrew is located under the base and offers support to the motor during shipment. This jackscrew must be loosened as far as possible without removing it prior to operating unit. A locknut is provided to keep the jackscrew in place.

Locate the shipping bolt and jackscrew in the motor support as shown in Figure 2.7-1 and remove the shipping bolt.

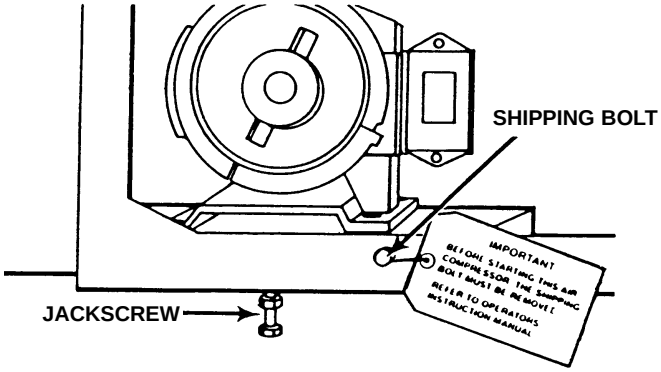


FIGURE 2.7-1 SHIPPING BOLT LOCATION

2.8 ROTATION CHECK

Locate the rotation decal on the motor and check for correct rotation. The correct rotation when viewed from opposite the drive end on the motor is clockwise.

If compressor is operated in the opposite direction of rotation, airend damage can result and is not warrantable.

For the compressor motor rotation check, the motor jogging should be as short a time as possible.

1. Assure that the Start/Stop button is in the stop (depressed) position.

2. Check coolant level. To check coolant level, slowly loosen the fill plug one complete turn. As the fill plug is unscrewed approximately one turn, a small amount of pressure may be released. **Do not remove the fill plug until all pressure has been vented.** Once pressure is vented, finish removing the fill plug. The proper coolant level is when the coolant is at the top of the fill port. Add coolant if necessary.

3. Replace and tighten fill plug.

4. Close the main disconnect switch (ON) position.

5. Verify that the main isolation valve is open.

6. Pull the Start/Stop button to start the unit and **immediately depress (push) the button to stop the unit.**

Observe the compressor drive motor shaft. The rotation should be in accordance with the directional arrow decal on the motor.

Should the motor rotation not be correct, put the main disconnect in the OFF position, lock and tag.

Interchange any two line connections (L1, L2, or L3) at the starter. Close the control box cover. Recheck for correct rotation.

2.9 BEFORE STARTING / STARTING / STOPPING

Read and understand the following instructions before operating or performing any maintenance on this unit.

Before Starting:

1. Assure that Start/Stop push button is in the OFF (depressed) position (See Figure 2.9-1).

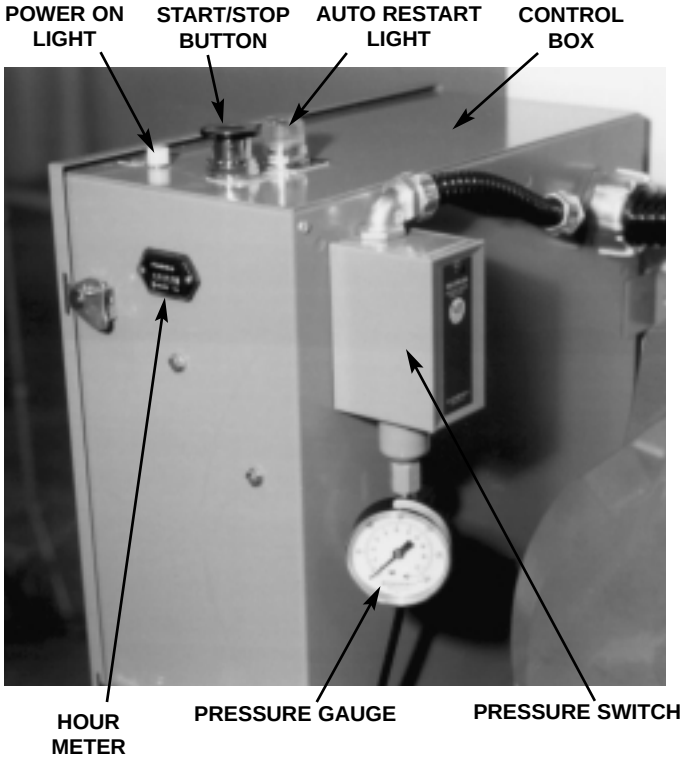


FIGURE 2.9-1 CONTROL BOX

2. Check coolant level. To check coolant level, slowly loosen the fill plug one complete turn. As the fill plug is unscrewed approximately one turn, a small amount of pressure may be released. Do not remove the fill plug until all pressure has been vented. Once pressure is vented, finish removing the fill plug. The proper coolant level is when the coolant is at the top of the fill port. Add coolant if necessary.

3. Replace and tighten the fill plug.

4. Close the main disconnect switch (ON position).

5. Verify that the main isolation valve is open.

Starting

1. Pull the Start/Stop button to the ON position and release. The compressor will start and then load automatically if line pressure is below the lower setting of the pressure switch.

Stopping

1. Depress the Start/Stop button to the OFF position. Compressor will stop immediately.

2. Open the main disconnect switch (OFF position).

3.0 SYSTEMS

3.1 GENERAL SYSTEM INFORMATION

The compressor is an electric motor driven, single stage, rotary screw compressor, complete with supporting components to make a fully functional unit. A standard compressor is composed of the following:
Inlet air filter
Drive motor
Airend
Pressurized coolant system with cooler & filter
Separation system
Capacity control
Instruments
Safety devices

Compression in the rotary screw type air compressor is created by the meshing of two helical rotors (male and female) on parallel shafts, enclosed in a heavy duty iron housing, with air inlet and outlet ports located on opposite ends. The grooves of the female rotor mesh with and are driven by the male rotor. Bearings on both ends of the rotors are used to support the rotor both laterally and axially.

3.2 COOLANT SYSTEM

The coolant system consists of a “L” shaped tube separator, thermostatic element, coolant filter, coolant cooler with fans, and a separator element. When the unit is operating, the coolant is pressurized and forced to the compressor bearings. The compressor is provided with a temperature switch which will shut the unit down in case of excessive temperature, 228°F (109°C). Effective coolant filtration is provided by the use of a screw on, automotive type, heavy duty coolant filter.

The compressor is designed for operation in an ambient range of 35°F to 115°F (2°C to 46°C).

COOLANT

Rotary screw compressor fluids have a triple function to perform. They lubricate the bearings and contacting surfaces of the rotors, seal internal clearances within the rotor chamber, and provide for the cooling of the compression process. The bulk of the fluid is actually used for cooling, with only small amounts used for lubrication and sealing.

ESP air compressors are factory filled with 1000 ROTALUBE™ 1000 COOLANT. ROTALUBE™ 1000 COOLANT is designed to operate for 1,000 hours or one year, whichever comes first. The coolant must be changed at these intervals to avoid breakdown and equipment damage.

CIRCULATION OF COOLANT

Coolant is forced by air pressure from the tube separator to the thermostatic element. The temperature rating of the element will determine whether the coolant circulates through the cooler, bypasses the cooler, or mixes the two paths together to maintain an optimum compressor injection temperature. This temperature is controlled to preclude the possibility of water vapor condensing. By injecting coolant at a sufficiently high temperature, the discharge air coolant mixture temperature will be kept above the dew point.

Before being injected into the airend, all coolant flows through the coolant filter. It is an automotive type full-flow filter with a single replacement spin-on element, rated at 10 micron. There is a differential-pressure bypass valve set to open in the event that the pressure drop across the filter rises to as high as 35 psi (2.5 bar), which indicates an excessively fouled element as well as poor maintenance practice.

COOLANT/AIR SEPARATION SYSTEM

The coolant/air separation system is composed of a tube separator with specially designed internals and a two stage, coalescing type separator element located in a housing above the inlet control valve on the airend.

The air-coolant mixture discharges from the airend into the tube separator. The majority of coolant is separated while in the tube separator and the coalescing separator filter element is used for final polishing of the air prior to the customer's system. The system removes nearly all of the coolant from the discharge air. The separated coolant is returned to the coolant system and the air passes to the compressed air system.

3.3 AIR SYSTEM

COMPONENTS AND FLOW

The air system is composed of:
Inlet air filter
Inlet control valve (ICV)
Airend
Coolant/Air separator
Minimum pressure valve (MPV)
Non-return check valve (NRV)
Aftercooler

The direction of flow is from the inlet filter to the aftercooler.

FUNCTIONS OF COMPONENTS

Inlet air filter, filters the incoming air, trapping 99% of particles 10 micron and larger.

Inlet valve opens full for on-line operation.

The valve closes in the off-line mode and at shutdown which prevents back flow of the compressed air.

The airend compresses the air.

The tube separator removes most of the coolant from the air.

The separator element performs the final separation of coolant and polishing of the air prior to leaving the compressor.

The minimum pressure check valve keeps the tube separator and separator element at a minimum pressure to ensure adequate oil flow and proper coolant/air separation.

The non-return check valve prevents line pressure from exhausting back through the airend at shutdown and during periods of unloaded operation.

The aftercooler cools the air prior to leaving the package.

3.4 CAPACITY CONTROL

ON LINE/OFF LINE WITH AUTOMATIC START/STOP CONTROL

The compressor will deliver air at full capacity, (the compressor maximum efficiency condition) or will operate at zero capacity with high receiver pressure (the compressor minimum power condition), while the unit continues to run.

When the compressor starts and line pressure is below the lower setting of the line pressure switch, control solenoid 1SV will be energized (close), inlet control valve ICV will open, and the compressor will load. When the line pressure reaches the upper setting of the pressure switch, the compressor will unload by de-energizing (opening) 1SV and closing ICV. Solenoid 1SV relieves the internal pressure of the compressor back to the inlet filter. The only adjustment required is setting of the pressure switch.

When the compressor unloads, a time delay relay is energized and begins to time out. The timer, mounted in the control box, is factory set at 10 minutes. It will continue to operate for as long as its time setting, after which a relay contact opens to de-energize the compressor starter coil. At the same time, an amber light (1LT) on the control box is lit to indicate the compressor has shut down automatically and will restart automatically. The automatic restart will take place when the line pressure drops to the lower setting of the pressure switch.

Adjusting the adjustable timer below the 10 minute factory setting may shorten the life of the compressor drive motor.

3.5 SETTING NEMA 1 PRESSURE SWITCH

1. Open isolation valve, allowing control system to sense “line” pressure.

2. Start the compressor.

The compressor should load if the line pressure is lower than then the maximum discharge pressure stated on the compressor data plate. It may be necessary to vent air from customer system load unit.

3. Slowly close the isolation valve allowing the air line pressure to rise to the maximum discharge pressure or “trip” setting of the pressure switch.

4. Remove cover from pressure switch (See Figure 3.5-1). Adjust as required by turning range adjustment screw clockwise to increase and counterclockwise to decrease trip setting (See Figure 3.5-2). When 1PS trips, the compressor will unload. When the line pressure falls to the reset point of 1PS (about 12 psig/.8 bar), the unit should reload. The pressure switch differential is adjustable and factory set at about 12 psig (.8 bar) to meet the requirements of the average application.

Limited receiver and line storage may require a wider differential. Sufficient receiver and line storage can accept a narrow differential. If adjustment is required, turn differential adjustment screw clockwise to decrease the differential and counter-clockwise to increase the differential.

CAUTION

When adjusting differential, adjust switch so that maximum discharge pressure does not exceed maximum discharge pressure stated on the compressor data plate.

5. Vent air from customer system to confirm switch operation is satisfactory.

6. Replace switch cover and place unit in service.

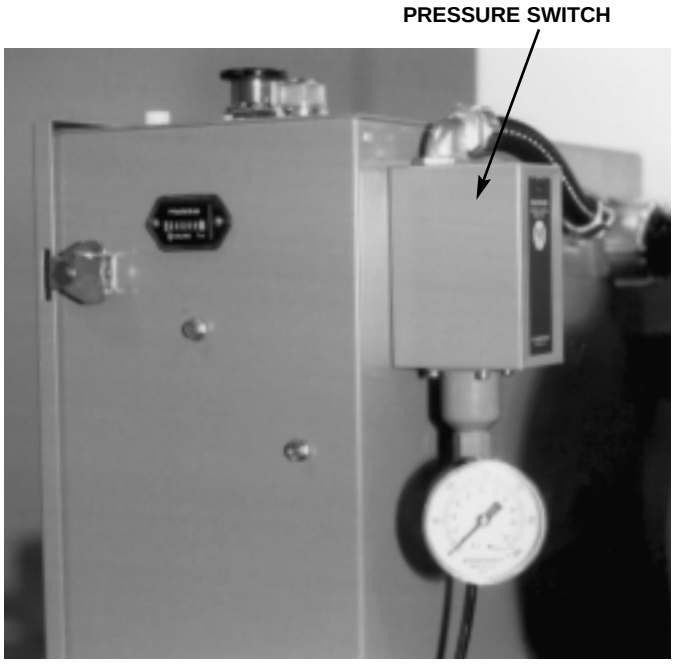


FIGURE 3.5-1 LOCATION OF PRESSURE SWITCH

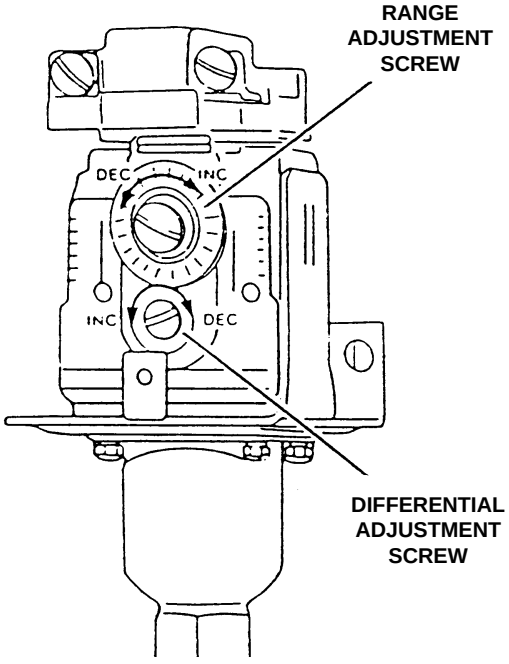


FIGURE 3.5-2 NEMA 1 PRESSURE SWITCH (1PS)

3.6 SETTING NEMA 4 PRESSURE SWITCH

1. Open isolation valve, allowing control system to sense “line” pressure.

2. Start the compressor.

The compressor should load if the line pressure is lower than then the maximum discharge pressure stated on the compressor data plate. It may be necessary to vent air from customer system load unit.

3. Slowly close the isolation valve allowing the air line pressure to rise to the maximum discharge pressure or “trip” setting of the pressure switch.

4. OPERATING RANGE ADJUSTMENT: Turn lock nut on adjustment screw “A” counterclockwise to loosen. Turn adjustment screw “A” clockwise to raise upper and lower pressure settings. To decrease the upper pressure settings, turn “A” counterclockwise. The approximate upper pressure setting is shown by an indicator in the left window between the calibration scales on the nameplate. When the proper setting is reached, tighten the lock nut on screw “A” clockwise.

5. DIFFERENTIAL ADJUSTMENT: Remove the front cover. When the differential screw “B” is flush with the enclosure base, the control will function at minimum differential. To increase the differential, turn adjustment screw “B” clockwise. This will decrease the lower setting only. The higher setting will not change. Similarly, to decrease the differential turn the differential adjustment screw “B” counterclockwise. This will raise the lower setting only.

Condensed instructions can be found on the inside of the front cover of the switch.

NOTE: The use of a pressure gauge is desirable when setting the control.

CAUTION

The adjustment screw “A” should not be forced beyond the range of the control indicated on the calibrated scale. The adjustment screw “B” should never extend above the base of the enclosure nor be adjusted beyond the maximum specified differential of the control.

6. After the desired setting has been accomplished, mount the cover and tighten the four cover screws 6-8 in. lbs. thereby compressing the gasket seal.

7. Vent air from customer system to confirm switch operation is satisfactory.

8. Place unit in service.

Operating variables in a system may cause changing pressure requirements. It is recommended that a periodic inspection of the gauge pressure be made and the pressure control adjusted to compensate when necessary for these changes.

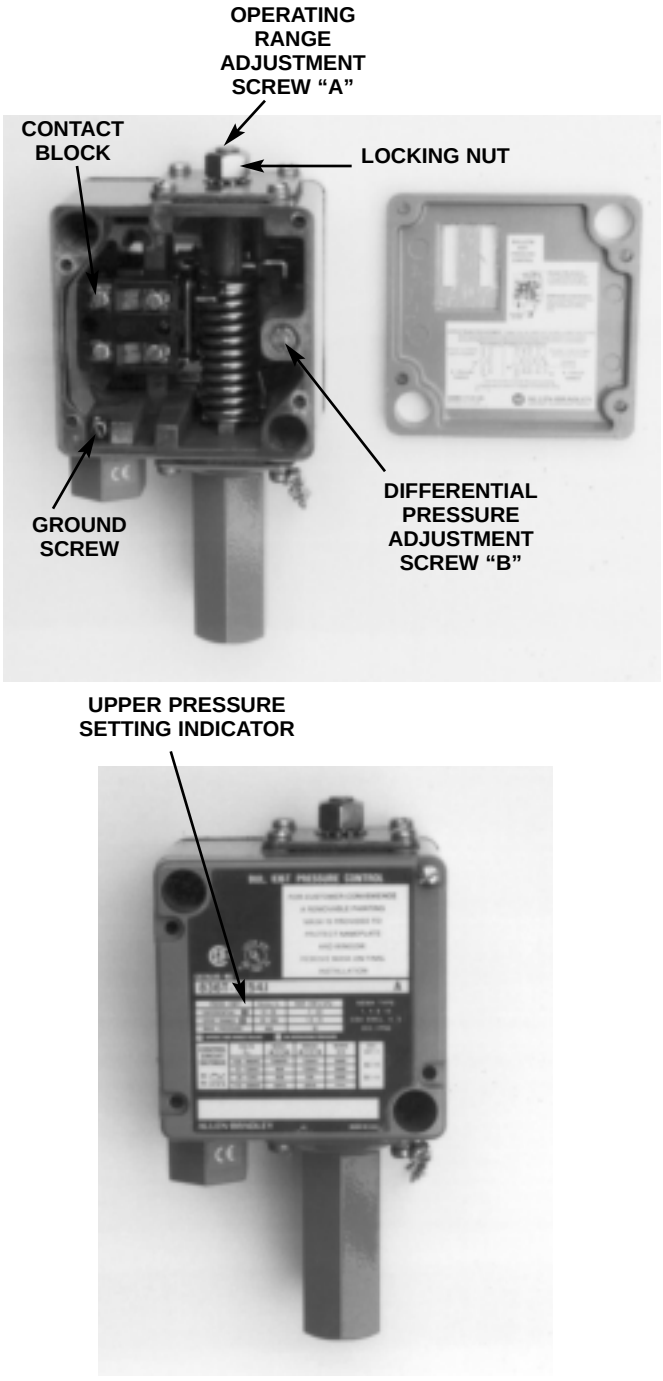


FIGURE 3.6-1 NEMA 4 PRESSURE SWITCH (1PS)

4.0 MAINTENANCE

4.1 MAINTENANCE SCHEDULE

THE MAINTENANCE SCHEDULE SPECIFIES ALL RECOMMENDED MAINTENANCE REQUIRED TO KEEP THE COMPRESSOR IN GOOD OPERATING CONDITION. SERVICE AT THE INTERVAL LISTED OR AFTER THAT NUMBER OF HOURS, WHICHEVER OCCURS FIRST.

		TIME INTERVAL (WHICHEVER COMES FIRST)						
ACTION	PART OR ITEM	HOURS	1 WK	1 MO	6 MO	9 MO	YEARLY	2 YR
INSPECT	COOLANT LEVEL VISIBLE IN FILL PORT (WHEN COLD)	WEEKLY	X					
INSPECT	AIR FILTER	WEEKLY	X					
REPLACE	COOLANT FILTER*	150	X	(INITIAL CHANGE ONLY)				
REPLACE	COOLANT FILTER*	1000			X	(SUBSEQUENT CHANGES)		
INSPECT	HOSES	1000			X			
INSPECT	DRIVE BELTS	500		X				
REPLACE	DRIVE BELTS	YEARLY					X	
CHECK	HIGH AIR TEMP. SWITCH	1000		X				
CHECK	OPERATE PRESSURE RELIEF VALVES	1000		X				
CLEAN	SEPARATOR SCAVENGE ORIFICE	1000					X	
CLEAN	COOLERS CORES**	4000			X			
REPLACE	AIR FILTER	2500			X			
REPLACE	SEPARATOR FILTER ELEMENT*	1000			X			
REPLACE	ROTALUBE ™ 1000 COOLANT*	1000					X	
REPLACE	ULTRA COOLANT* (OPTIONAL)	8000						X
REPLACE	SHAFT SEAL	8000						X
GREASE	ODP MOTOR	2000				X		
GREASE	TEFC MOTOR	1000				X		

ROTALUBE™ 1000 COOLANT IS A 1000 HOUR FLUID FOR ROTARY SCREW COMPRESSORS. THE COOLANT MUST BE CHANGED AT RECOMMENDED INTERVALS TO AVOID BREAKDOWN AND EQUIPMENT DAMAGE.

*IN VERY CLEAN OPERATING ENVIRONMENTS AND WHERE INLET AIR FILTER IS CHANGED AT THE ABOVE PRESCRIBED INTERVALS. IN EXTREME DIRTY ENVIRONMENT CHANGE COOLANT, FILTERS AND SEPARATOR ELEMENTS MORE FREQUENTLY.

**CLEAN COOLER CORES IF UNIT SHUTDOWN OCCURS ON HIGH AIR TEMPERATURE.

4.2 MAINTENANCE RECORDS

It is very important that you, the owner, keep accurate and detailed records of all maintenance work you or the Ingersoll-Rand Distributor or Air Center perform on your compressor. This includes, but is not limited to, coolant, coolant filter, separator element, inlet air filter, drive belts, shaft seals and so forth. This information must be kept by you, the owner, should you require warranty service work by your Ingersoll-Rand Distributor or Air Center. Maintenance record sheets are located at the back of this manual.

4.3 MAINTENANCE PROCEDURES

Before starting any maintenance, be certain the following is heeded.

Read Safety Instructions.
Have a well equipped mechanic's tool box with English and Metric sockets. (Special tools when needed will be listed under each appropriate procedure).
Have an OSHA approved air nozzle and compressed air. (International - local codes may apply).
Have recommended spare parts on hand (See listing in back of this manual).

⚠ WARNING

When the unit is shutdown, residual pressure can be trapped within the compressor system. This pressure must be vented from the system prior to beginning any service work.

Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Wait 2 minutes after stopping to allow internal pressure to dissipate. Vent residual pressure from the unit by slowly unscrewing the coolant fill plug one turn. Unscrewing the fill plug opens a vent hole, drilled in the plug, allowing the pressure to release to atmosphere (See Figure 4.31). A slight mist or oil droplets may be visible during venting. Do not remove fill plug until all pressure has vented from the unit. Also vent piping by slightly opening the drip leg valve . When opening the drain valve or removing the coolant fill plug, stand clear of the valve discharge, wear work gloves and appropriate eye protection.

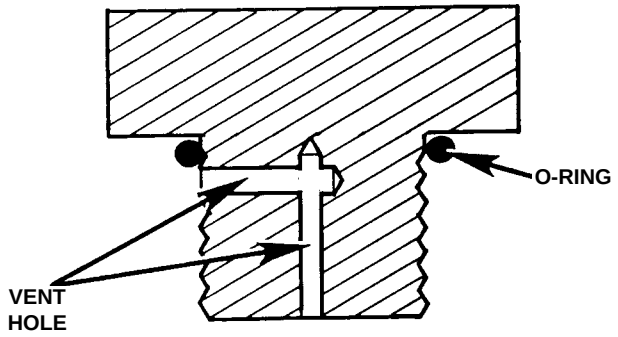


FIGURE 4.3-1 FILL PLUG WITH VENT HOLE

4.4 MANUAL PRESSURE RELIEF VALVE CHECK

Under normal operating condition a “try lever test” must be performed every month . Under severe service conditions, or if corrosion and/or deposits are noticed within the valve body, testing must be performed more often. A “try lever test” must also be performed at the end of any non-service period. CAUTION! High pressure air will discharge through the discharge ports of the valve during “try lever test”. Wear ample clothing, gloves, safety glasses and ear protection during valve testing. Run the compressor for about 10 minutes by venting air from the system to let the unit warm up. With the unit running, test at or near maximum operating pressure by holding the test lever fully open for at least 5 seconds to flush the valve seat free of debris. Then release lever and permit the valve to snap shut. If lift lever does not activate, or there is no evidence of discharge, discontinue use of equipment immediately and contact a licensed contractor or qualified service personnel.

4.5 SHEAVE ALIGNMENT

Any degree of sheave misalignment will result in a reduction of belt life. Misalignment of belt drive should not exceed 1/16 in. (1.6 mm).

Parallel misalignment occurs when the drive and driven shafts are parallel, but the two sheaves lie in different planes (See Figure 4.5-1).

Angular misalignment occurs when the two shafts are not parallel (See Figure 4.5-2).

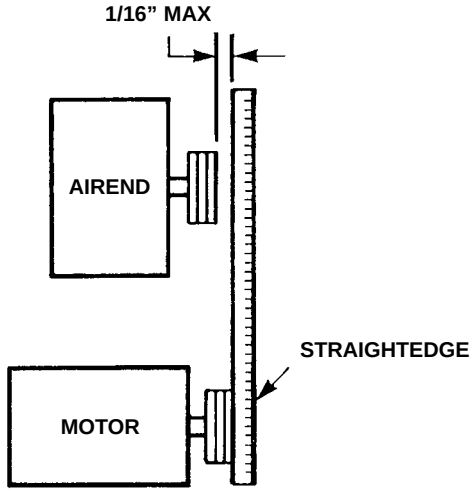


FIGURE 4.5-1 PARALLEL MISALIGNMENT

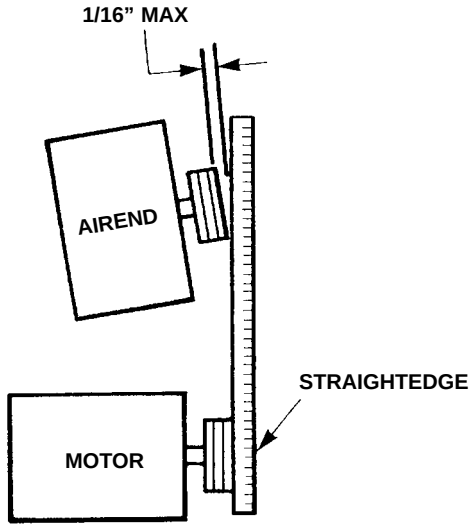


FIGURE 4.5-2 ANGULAR MISALIGNMENT

ALIGN SHEAVES

Insure that the compressor is isolated from the compressed air system by closing the isolation valve and venting pressure from the drip leg. Insure that the main power disconnect switch is locked and tagged.

An easy and effective method of checking alignment in both directions between the driver and driven sheaves utilizes an accurate straightedge.

Lay the straightedge across the face of the driver (motor) sheave and check alignment of the driven (airend) sheave. Then lay the straightedge across the driven sheave and check that the driver sheave is aligned.

Alignment should be within 1/16” (1.6 mm) maximum when measuring the gap between the straightedge and the rim of the opposite sheave in each direction.

This alignment is factory set and should only require resetting if the drive motor or airend is removed.

The following steps should be taken to insure proper alignment of all components.

1. Remove the cooler corners and air deflector.

2. Holding the straightedge against the front of the airend sheave, measure the amount of misalignment seen on the motor sheave. If misalignment is less than 1/16” (1.6 mm) then reinstall cooler box outer panel prior to operating unit.

3. If misalignment is more than 1/16” (1.6 mm), the motor sheave bushing must be loosened for repositioning.

To reposition the motor sheave:

1. Remove drive belts (See Section 4.6).

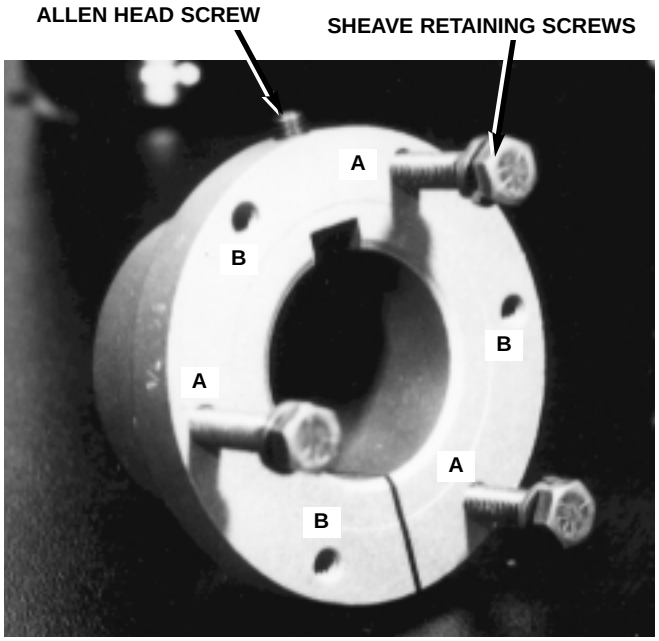
2. Remove the three hex head screws that hold motor sheave to sheave bushing. See Figure 4.5-3.

3. Lubricate the thread and end of screws that were just removed.

4. Reinstall all three screws in the holes of the bushing that are threaded.

5. Slowly tighten the three screws evenly until the sheave is pressed from the bushing. (Light tapping on bushing may assist removal.)

6. Remove the screws from the holes.



“A” - Clearance Holes
“B” - Threaded Holes

FIGURE 4.5-3 MOTOR SHEAVE BUSHING

7. Loosen allen screw in sheave bushing.

8. Move the bushing either in or out on the motor shaft depending upon the measurement taken earlier.

9. Tighten allen screw in sheave bushing.

10. Being careful to not move the bushing on the shaft, align sheave so that the three threaded holes in the sheave line up with the three clearance holes in the bushing.

11. Insert all three screws through clearance holes in the bushing and thread into sheave.

12. Slowly and evenly tighten all sheave retaining screws. Torque to 180 lb-in. (2.1 kg-m).

13. Tap against large end of bushing using hammer and block or sleeve to avoid damage. Continue to torque screws until the specified wrench torque no longer turns the screw after tapping.

14. Install belts as shown in Section 4.6.

15. Recheck for proper alignment.

16. Reinstall cooler box air deflector and corners.

4.6 DRIVE BELTS

Insure that the compressor is isolated from the compressor air system by closing the isolation valve and venting pressure from the drip leg. Insure that the main power disconnect switch is locked open and tagged.

If installing or removing the belts on a new unit at start-up, the motor support shipping bolt must first be removed. This bolt is only used to brace the motor during shipment and will not be reinstalled once the belts are put into place. Locate the motor support shipping bolt as shown in Figure 2.7-1 and remove. Locate the motor support jackscrew on the underside of the base. Loosen the locknut and turn the jackscrew counter-clockwise to set the motor down onto the belts. Be sure to back the jackscrew down as far as possible since the belt will stretch after initial run-in, and motor support will stretch after initial run-in, and the motor support will be lowered as a result. Retighten the locknut.

REPLACEMENT PARTS

Belts (See Recommended Spare Parts Section 7.0). Be sure to use only Ingersoll Rand Genuine parts to assure proper belt size and length. Incorrectly sized belts can lead to overloading of bearings and eventual airend or motor failure.

DISASSEMBLY

Belt tension is maintained due to a pivoting motor support. The weight of the motor holds the belt tight.

1. Remove the cooler box corner from the airend side of the machine.

2. Lift the back of the motor support plate by turning the jackscrew (located on the underside of the base) clockwise. Retighten the locknut.

3. Remove belts from the airend sheave and the motor sheave.

INSTALLATION/INSPECTION

Inspect sheave grooves for foreign material or rubber build-up. Clean and degrease sheaves before installing drive belts to insure long belt life.

1. Lift the back of the motor support plate by turning the jackscrew (located on the underside of the base) clockwise. Retighten the locknut.

2. Install belts on the airend sheave and the motor sheave. When installing a new belt, do not pry or force the belt over the sheave grooves.

3. Lower the motor support plate by loosening the jackscrew locknut and turning the jackscrew counter-clockwise. Be sure to back the jackscrew down as far as possible since the belts will stretch after initial run-in, and the motor support will be lowered as a result. Retighten the locknut.

4.7 BELT TENSION

This unit has been designed with a unique self tensioning system for the drive belts. There is no adjustment required to insure proper belt tensioning. Be sure to use only Ingersoll-Rand Genuine parts to assure correct belt tension.

4.8 SHAFT SEAL REPLACEMENT

There are two lip type seals on the compressor. **They are wearable parts and should be replaced at 8,000 hour intervals.** While it is advisable to have your local Ingersoll-Rand Distributor or Air Center perform this work, the task can be accomplished by a good mechanic following these instructions.

Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Wait 2 minutes after stopping to allow internal pressure to dissipate. Vent residual pressure from the unit by slowly unscrewing the coolant fill plug one turn. Unscrewing the fill plug opens a vent hole, drilled In the plug, allowing the pressure to release to atmosphere (See Figure 4.3-1). A slight mist or oil droplets may be visible during venting. Do not remove fill plug until all pressure has vented from the unit. Also vent piping by slightly opening the drip leg valve. When opening the drain valve or removing the coolant fill plug, stand clear of the valve discharge, wear work gloves and appropriate eye protection.

SPECIAL TOOLS

A clean work bench

REPLACEMENT PARTS

20-25 HP Units
Shaft seal kit (42370353)
Loctite® 242
Loctite® 609
Loctite® 515

30 HP Units
Shaft seal kit (39699418)
Seal retainer O-ring (95358024)
Loctite® 609

INSTALLATION (20-25 HP)

1. Remove both doors and the top of the enclosure, (if so equipped).

2. Remove both guards, V-belts, and airend sheave. Note airend sheave is heat shrink fit to shaft and puller required to remove.

3. Remove seal housing from airend assembly.

4. Drive both seals out of seal housing, being careful not to damage seal housing bore.

5. Discard seals.

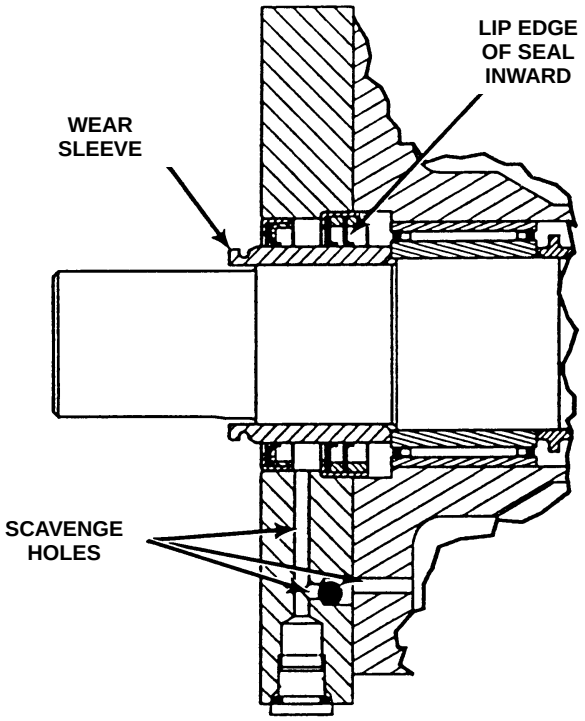
6. Remove check valve ball and plug from seal housing.

7. Inspect wear sleeve. If damage or excessive wear is present the wear sleeve must be replaced.

8. Using a wide bladed scraper, remove all traces of flange sealant from the seal housing and rotor housing, being careful not to scratch the surfaces.

9. Thoroughly clean and degrease the seal housing and wear sleeve journal on the rotor.

10. Clean scavenge holes in seal housing and in the rotor housing (See Figure 4.8-1).



4.8-1 SHAFT SEAL ASSEMBLY (20-25 HP)

11. The term “inboard side” will refer to the large machined face of the seal housing. The term “outboard side” will refer to the unmachined side next to the sheave.

12. Be certain to install the seals from the proper side and in the proper orientation. Carefully follow instructions for seal assembly. Protect seal elements from inadvertent damage during installation. Be sure all tools are free of contaminants before installation.

13. Put a thin continuous coat of Loctite® 609 on the outer diameter of the double lip seal.

14. Remove the seal from the assembly sleeve and position it in the seal housing from the inboard side. The seal should be oriented such that the edge of the lip of the seal is toward the installer.

15. Using a bar or plate larger than the seal housing bore diameter, press the double lip seal into the seal housing until it locates against the shoulder.

16. Remove any excess Loctite® 609 with a clean cloth.

17. Put a thin continuous coat of Loctite® 609 on the outer diameter of the single lip seal.

18. Remove the seal from the assembly sleeve. From the outboard side, position the seal such that the edge of the seal is inserted first.

19. Using a bar or plate larger than the seal housing bore diameter, press the seal into the seal housing from the outboard side. The seal will stop in the housing in the flush position. To avoid blocking the scavenge hole, the seal should never be pushed beyond flush position.

20. Remove any excess Loctite® 609 from the seals, from the seal housing bore, and from the seal scavenge holes.

21. Install the plug in the bottom of the seal housing.

22. Place a thin bead of Loctite® 515 on the machined surface of the seal housing as shown in Figure 4.8-2. Do not over apply.

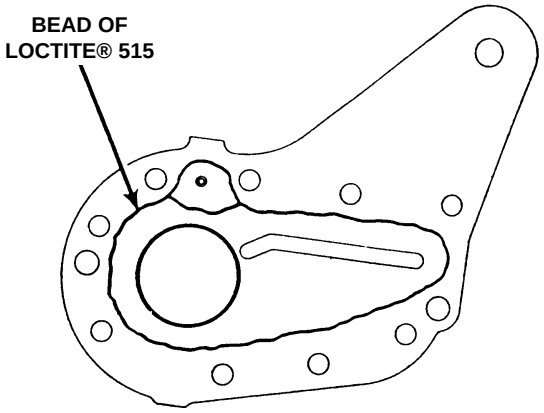


FIGURE 4.8-2 SEAL HOUSING (20-25 HP)

23. Lubricate the assembly sleeve lightly with clean coolant.

24. Slide the sleeve into the seal housing assembly, starting from the outboard side of the housing. Install a new check valve ball in the seal housing.

25. Lubricate the wear sleeve lightly with clean coolant.

26. Slide the seal housing with the assembly sleeve installed over the shaft until it locates against the wear sleeve.

27. Make sure the check valve ball is in place and carefully slide the seal housing assembly off the assembly sleeve and onto the wear sleeve on the rotor. (A small amount of grease can be used to hold the check valve ball in place for assembly).

28. Push the rotor seal housing assembly against the rotor housing.

29. Remove assembly sleeve.

30. Attach the seal housing to the rotor housing with nine screws and tighten to 18 Ibs. ft. (2.5 kg. m).

31. Reinstall sheave and sheave-retaining hardware, apply Loctite® 242 to clamp screw and tighten to 32 Ibs. ft. (4.4 kg. m).

32. Reinstall belts.

33. Reinstall belt guards and enclosure.

INSTALLATION(30 HP)

1. Remove enclosure, (if so equipped).

2. Remove V-belts and airend sheave. Note airend sheave is heat shrink fit to shaft and puller is required to remove.

3. Remove seal housing from airend assembly.

4. Drive both seals out of seal housing, being careful not to damage seal housing bore.

5. Discard seals.

6. Remove and save retaining ring from seal housing.

7. Remove check valve ball and plug from seal housing.

8. Inspect wear sleeve. If damage or excessive wear is present the wear sleeve must be replaced.

9. Thoroughly clean and degrease the seal housing and wear sleeve journal on the rotor.

10. Clean scavenge holes in seal housing and in the rotor housing (See Figure 4.8-3).

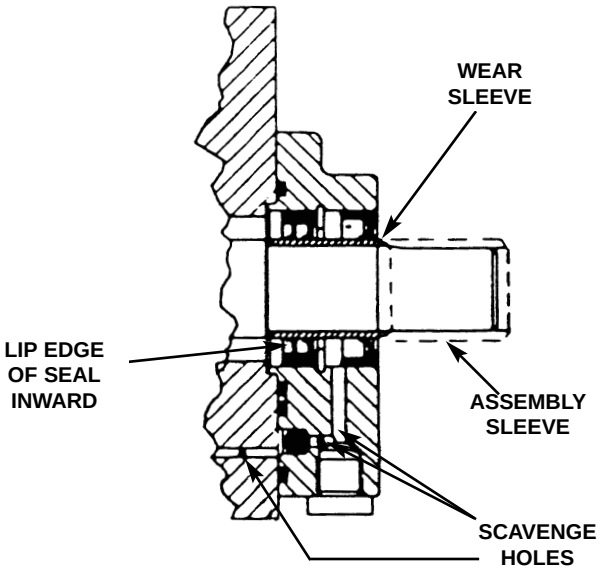


FIGURE 4.8-3 SHAFT SEAL ASSEMBLY (30 HP)

11. The term “inboard side” will refer to the large machined face of the seal housing. The term “outboard side” will refer to the unmachined side next to the sheave.

12. Be certain to install the seals from the proper side and in the proper orientation. Carefully follow instructions for seal assembly. Protect seal elements from inadvertent damage during installation. Be sure all tools are free of contaminants before installation.

13. Install retaining ring in seal housing.

14. Put a thin continuous coat of Loctite® 609 on the outer diameter of the double lip seal.

15. Remove the seal from the assembly sleeve, and using the Seal Installation Tool, (See Figure 4.8-4) press the double lip seal into the seal housing from the inboard side until it “locates” against the retaining ring. The seal should be oriented such that the edge of the lip of the seal is toward the installer (See Figure 4.8-3).

16. Remove any excess Loctite® 609.

17. Put a thin continuous coat of Loctite® 609 on the outer diameter of the single lip seal.

18. Remove the seal from the assembly sleeve and, using the Seal Installation Tool, press the seal into the seal housing from the outboard side until the seal is flush with the surface of the seal housing. Do **not** push the seal beyond the flush position. The seal should be oriented such that the edge of the lip of the seal is inserted first (See Figure 4.8-3).

19. Remove any excess Loctite® 609 from the seals, from the seal housing bore, and from the seal scavenge holes.

20. Install the plug in the bottom of the seal housing.

21. Lubricate the assembly sleeve lightly with clean coolant.

22. Slide the sleeve into the seal housing assembly, starting from the outboard side of the housing. Install new o-rings and a new check valve ball in the seal housing.

23. Lubricate the wear sleeve lightly with clean coolant.

24. Slide the assembly sleeve over the shaft until it “locates” against the wear sleeve.

25. Make sure the o-rings and check valve ball are in place and carefully slide the seal housing assembly off the assembly sleeve and onto the wear sleeve on the rotor.

26. Push the seal housing assembly against the rotor housing.

27. Remove assembly sleeve.

28. Attach the seal housing to the rotor housing with four screws and tighten to 18 lbs. ft. (2.5 kg. m).

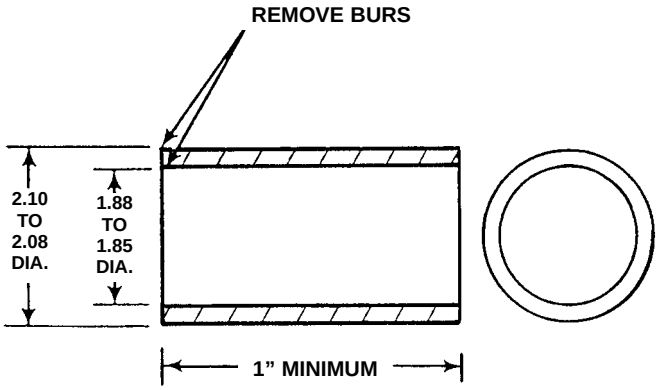


FIGURE 4.8-4 SEAL INSTALLATION TOOL

4.9 INLET AIR FILTER ELEMENT

The inlet air filter should be changed at the interval shown in the maintenance chart or any time the filter becomes dirty.

The filter element is not washable and must be replaced. Remove the filter by loosening the clamp on the filter assembly located on the Inlet Control Valve. Remove and discard the old filter element. Install a new filter element. Tighten clamp (See Figure 4.9-1).

FIGURE 4.9-1 INLET AIR FILTER

4.10 COOLANT FILTER

Time of change - after the first 150 hours and every 1000 hours thereafter, or when the coolant is being changed. In dirty operating environments, the filter should be changed more frequently.

Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Wait 2 minutes after stopping to allow internal pressure to dissipate. Vent residual pressure from the unit by slowly unscrewing the coolant fill plug one turn. Unscrewing the fill plug opens a vent hole, drilled in the plug, allowing the pressure to release to atmosphere (See Figure 4.3-1). A slight mist or oil droplets may be visible during venting. Do not remove fill plug until all pressure has vented from the unit. Also vent piping by slightly opening the drip leg valve . When opening the drain valve or removing the coolant fill plug, stand clear of the valve discharge, wear work gloves and appropriate eye protection.

SPECIAL TOOLS

Suitable clean drain pan or container to hold coolant drained from unit.

A quantity of proper coolant sufficient to top off the coolant level in the compressor.

One genuine IR replacement coolant filter of the proper type for the unit.

1. Place a clean pan under the coolant filter.

2. Using a filter wrench, remove the coolant filter. Remember that the filter and coolant may be hot!

3. Discard the old filter.

4. Wipe the sealing surface of the filter head with a clean lint-free rag to prevent entry of dirt into the system.

5. Remove the replacement filter from its protective package.

6. Apply a small amount of clean coolant on the rubber seal of the filter.

7. Screw filter on until the seal makes contact with the seat on the filter header. Tighten approximately one half to three quarters turn additional.

8. Remove coolant fill plug (See Figure 4.10-1).

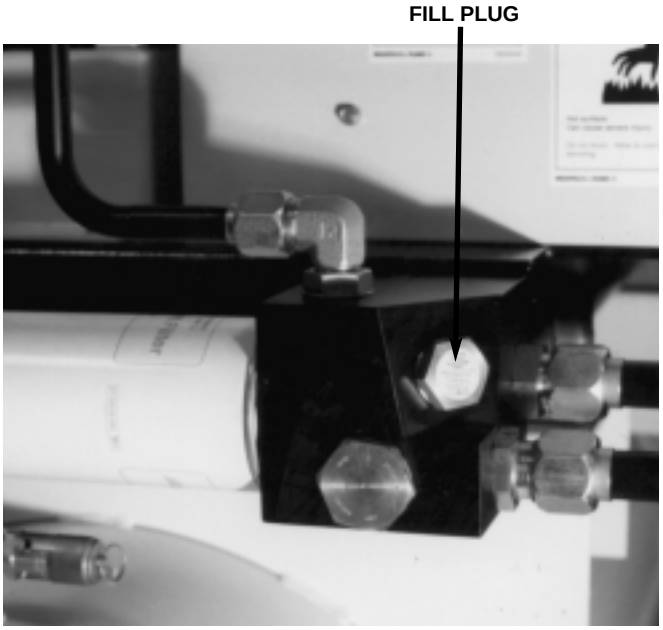


FIGURE 4.10-1 FILL PLUG

9. Using a funnel, top off the level with new coolant. The proper level is at the top of the fill port.

10. Replace fill plug.

11. Start unit and check for leaks.

Do not add coolant through the intake of the compressor, as this can result in overfilling, saturation of the separator filter element, and coolant carry-over downstream.

4.11 COOLANT CHANGE

Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Wait 2 minutes after stopping to allow internal pressure to dissipate. Vent residual pressure from the unit by slowly unscrewing the coolant fill plug one turn. Unscrewing the fill plug opens a vent hole, drilled in the plug, allowing the pressure to release to atmosphere (See Figure 4.3-1). A slight mist or oil droplets may be visible during venting. Do not remove fill plug until all pressure has vented from the unit. Also vent piping by slightly opening the drip leg valve . When opening the drain valve or removing the coolant fill plug, stand clear of the valve discharge, wear work gloves and appropriate eye protection.

SPECIAL TOOLS

Suitable clean drain pan or container to hold approximately 3.6 gal. (13.5 L) of coolant drained from unit.

A quantity of proper coolant sufficient to refill the coolant level in the compressor.

One genuine IR replacement coolant filter of the proper type for the unit.

The coolant should be drained soon after the compressor has been shut down. When the coolant is warm, the drainage will be more complete and any particles in suspension in the coolant will be carried out with the coolant.

1. Place a clean pan under the drain plug.

2. Remove drain plug (See Figure 4.11-1) and allow coolant to drain from the tube separator.

3. Using a filter wrench, remove the coolant filter. Remember that the filter and coolant may be hot!

4. Discard the old filter.

5. Wipe the sealing surface of the filter head with a clean lint-free rag to prevent entry of dirt into the system.

6. Remove the replacement filter from its protective package.

7. Apply a small amount of clean coolant on the rubber seal of the filter.

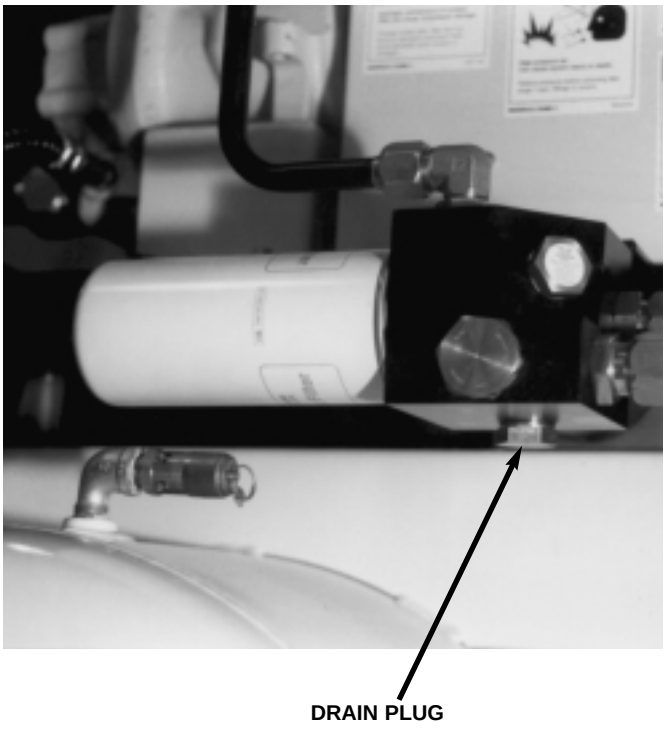


FIGURE 4.11-1 DRAIN PLUG

8. Screw element on until the seal makes contact with the seat on the filter header. Tighten approximately one half to three quarters turns additional.

9. Install and tighten the coolant drain plug.

10. Remove coolant fill plug (See Figure 4.10-1).

11. Using a funnel, fill unit with new coolant. The proper level is even with the top of the fill port.

12. Replace fill plug.

13. Start unit and check for leaks.

Do not add coolant through the intake of the compressor as this can result in overfilling, saturation of the separator filter element and coolant carry-over downstream.

4.12 COOLANT TYPE CHANGE

OBJECTIVE

To drain coolant from compressor as completely as possible when changing types of coolant to avoid contamination or dilution of new fluid.

CAUTION

If optional Ultra Coolant is used, it is not compatible with certain "Compressor Conditioner" fluids often utilized to remove varnish deposits from machines running on petroleum products. Addition of these products to Ultra Coolant can lead to plugged filters and bearing lines, potentially leading to severe mechanical problems. Therefore, do not flush the compressor system with a "Compressor Conditioner" prior to filling with Ultra Coolant.

ITEMS REQUIRED

In addition to the tools normally found in any reasonably equipped serviceman's toolbox, the following items should be available at the work site:

Suitable clean drain pan or container to hold approximately 3.6 gal. (13.5 L) of coolant drained from unit.

A quantity of new coolant sufficient to refill the compressor.

A minimum of one replacement coolant filter. One separator element.

PROCEDURE

1. Operate the unit to bring the complete system up to operating temperature.

2. Shut compressor down by depressing the Start/Stop push button to the OFF position.

Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Wait 2 minutes after stopping to allow internal pressure to dissipate. Vent residual pressure from the unit by slowly unscrewing the coolant fill plug one turn. Unscrewing the fill plug opens a vent hole, drilled in the plug, allowing the pressure to release to atmosphere (See Figure 4.3-1). A slight mist or oil droplets may be visible during venting. Do not remove fill plug until all pressure has vented from the unit. Also vent piping by slightly opening the drip leg valve . When opening the drain valve or removing the coolant fill plug, stand clear of the valve discharge, wear work gloves and appropriate eye protection.

3. Place drain pan under coolant drain plug.

4. Remove drain plug and allow coolant to drain from the tube separator.

5. Remove coolant filter.

⚠ WARNING

HOT COOLANT CAN CAUSE SEVERE INJURY USE CARE WHEN DRAINING

6. Allow to drain thoroughly.

7. Drain all hoses and low points within the system.

8. Install a new coolant filter (See Section 4.10).

9. Install a new separator element (See Section 4.14).

10. Install and tighten coolant drain plug.

11. Remove coolant fill plug (See Figure 4.10-1).

12. Using a funnel, refill unit with the new coolant to be used. Exercise care to prevent entry of any contaminants.

13. Replace fill plug.

14. Start unit and check for leaks.

15. Install proper decals for the fluid now installed in the compressor.

4.13 COOLANT SEPARATOR FILTER ELEMENT

The separator filter element should be replaced every year or after 1000 hours of operation, whichever comes first, to prevent excessive coolant carryover into the plant's air piping system.

The element is located in the cylindrical portion on top of the Inlet Control Valve (See Figure 4.14-1).

Before beginning any work on the compressor, open, lock and tag the main electrical disconnect and close the isolation valve on the compressor discharge. Wait 2 minutes after stopping to allow internal pressure to dissipate. Vent residual pressure from the unit by slowly unscrewing the coolant fill plug one turn. Unscrewing the fill plug opens a vent hole, drilled in the plug, allowing the pressure to release to atmosphere (See Figure 4.3-1). A slight mist or oil droplets may be visible during venting. Do not remove fill plug until all pressure has vented from the unit. Also vent piping by slightly opening the drip leg valve. When opening the drain valve or removing the coolant fill plug, stand clear of the valve discharge, wear work gloves and appropriate eye protection.

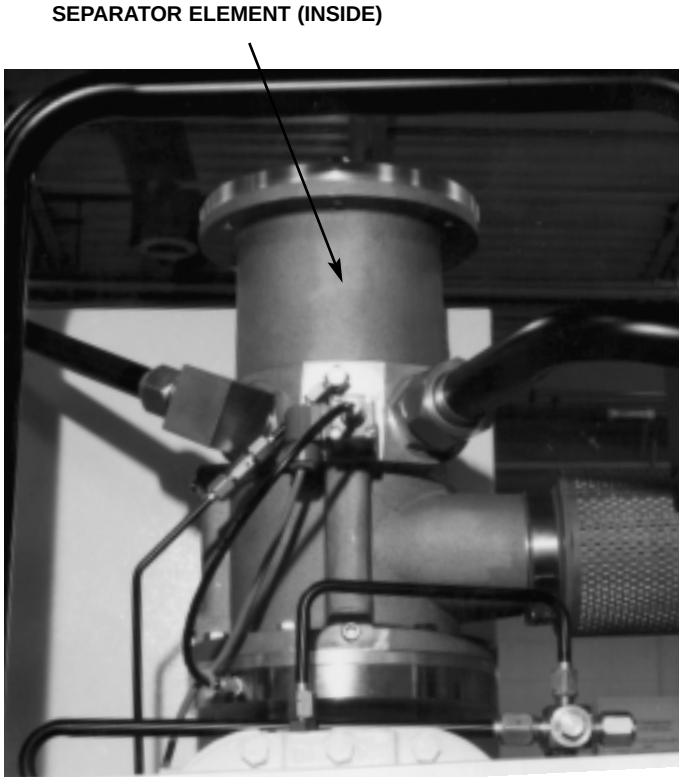


FIGURE 4.13-1 SEPARATOR ELEMENT LOCATION

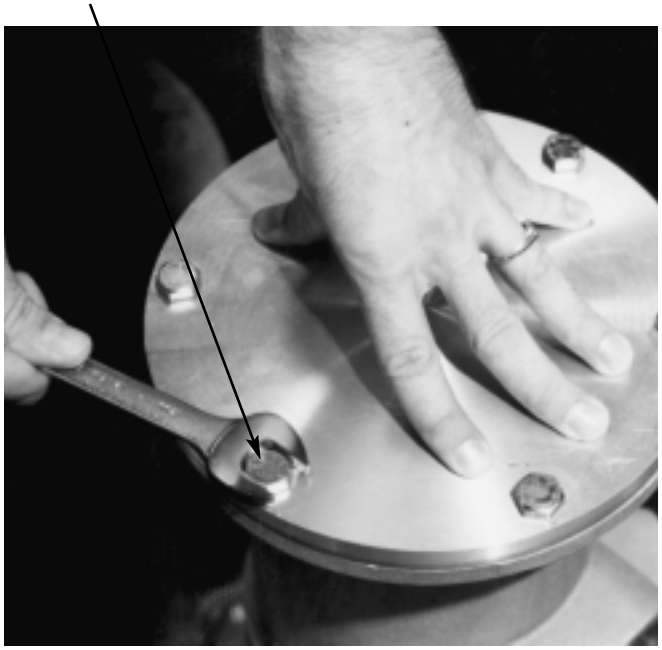


FIGURE 4.13-2 COVER REMOVAL

Procedure:

1. The cover has a spring holding the element in place, so be careful when loosening the bolts. Place downward force, on the cover while removing the 6 bolts and then carefully release the force allowing the cover to be removed (See Figure 4.13-2).

2. Lift cover from the top of element.

3. Remove the cover sealing o-ring and discard.

4. Remove the spring from the top of the element.

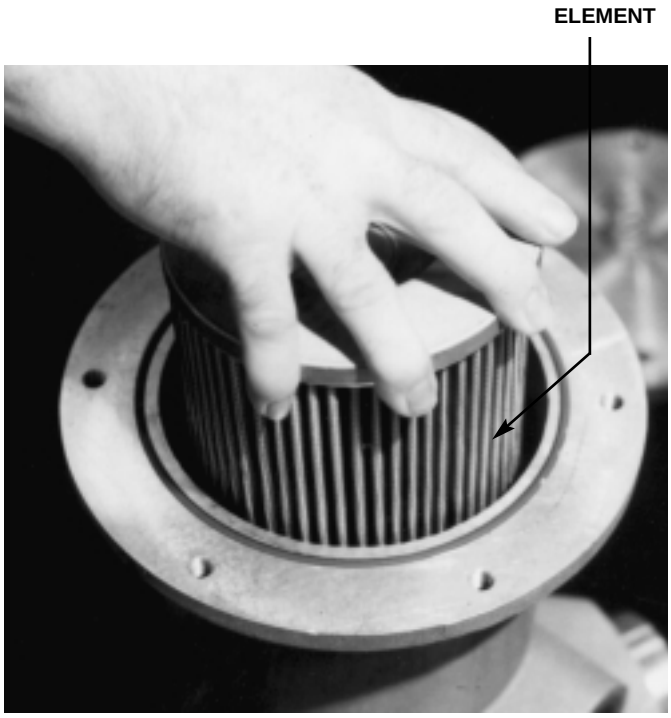


FIGURE 4.13-3 ELEMENT REMOVAL

5. Lift element from housing and discard (See Figure 4.13-3).

6. Remove element sealing o-ring from the housing.

7. Verify that the drain hole in the inlet control valve is clean (See Figure 4.3-4).

8. Install new element sealing o-ring in housing. Make sure o-ring is properly seated in groove.

9. Install new element.

10. Install new cover sealing o-ring. Make sure o-ring is properly seated in groove.

11. Place spring on top of element, followed by the retainer cover.

12. Insert and start retaining bolts.

13. Place downward force on cover and finish screwing bolts in evenly.

14. Torque bolts evenly to 220 in-lbs. (2.57 kg-m).

15. Start unit and check for leaks.

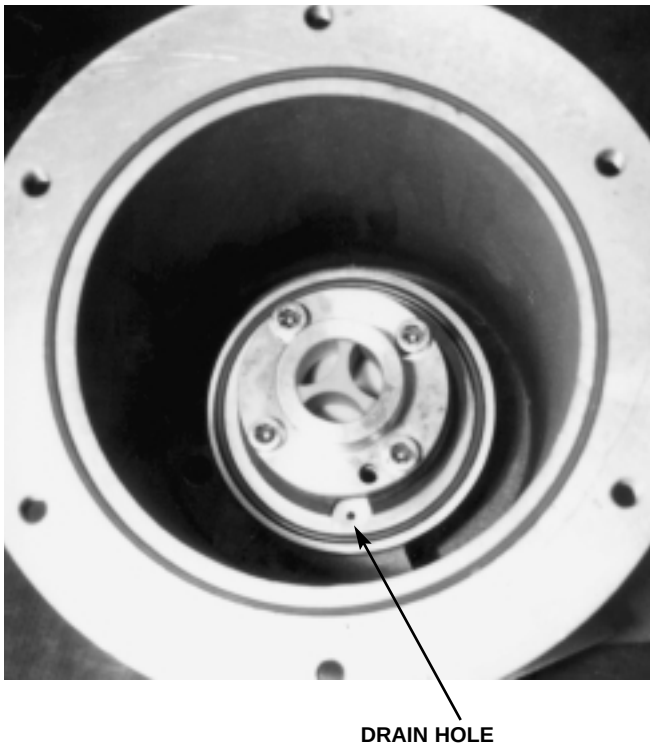


FIGURE 4.13-4 DRAIN HOLE LOCATION

4.14 SEPARATOR TANK SCAVENGE CHECK VALVE/SCREEN/ORIFICE

TOOLS REQUIRED

Open end wrench
Screwdriver

PROCEDURE

Disconnect tubing at each end of check valve/screen/orifice assembly.

Check orifice and clean if required. Use suitable small screwdriver or knife and press screen retainer orifice from its mating fitting (See Figure 4.14-1). Be careful not to damage flared end of fitting or o-ring. Wash screen and housing in safety solvent and blow dry.

Press the check valve/screen/orifice into fitting block.

Assemble the check valve/screen/orifice assembly to the tubing lines. The fitting must be re-installed with the screen on the upstream side of the orifice as indicated by the flow arrow (See Figure 4.15-1).

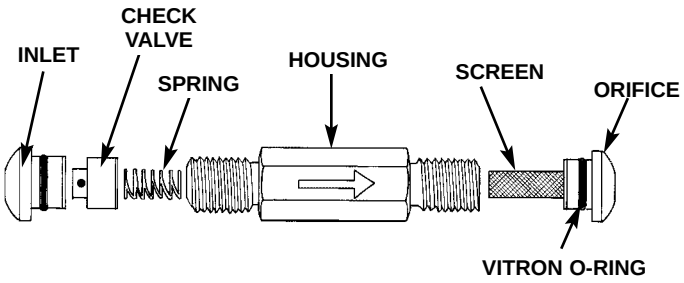


FIGURE 4.14-1 SEPARATOR TANK SCAVENGE CHECK VALVE/SCREEN/ORIFICE

4.15 COOLER CORES

INSPECTION

Visually check the cooler cores for build up of dirt, dust, lint or other foreign material.

Using an OSHA approved air gun, blow air through the cooler cores in the opposite direction of normal air flow.

Remove cooler box outer panel and clean all loose material that blew from the coolers into the fans.

Reinstall the cooler box outer panel.

Start unit and verify proper operation.

4.16 MOTOR GREASING

The induction-type squirrel cage motor has antifriction ball bearings, front and rear. At periodic intervals they require re-lubrication.

Re-lubrication Interval (or 9 mos., whichever comes first)

1000 hours all TEFC drive motors
2000 hours all ODP drive motors

Re-lubrication Amount:

Motor Frame Size	Lubricant Amount cu in	cc	oz	grams
254-286	1.0	16	.8	23

Improper lubrication can be a cause of motor bearing failure. The quantity of grease added should be carefully controlled. The smaller motors must be greased with a lesser amount of grease than larger motors.

When re-greasing, stop motor. Disconnect power: lock out and tag. Remove outlet plugs (or spring-loaded grease relief plugs if present). The outlet plug may not be accessible on the fan end of some TEFC motors. Grease relief along shaft can occur, precluding necessity of removing this plug if inaccessible. Remove the plug from the top of the housing on each end of the motor and install grease fittings. The inlet grease gun fittings and outlet plugs (or spring-loaded relief's) are located at each end of the motor housing.

1. Clean drain hole of any hard grease (use piece of wire if necessary).

2. Use a hand lever type grease gun. Determine in advance the quantity of grease delivered with each stroke of the lever. A graduated cylinder showing cubic centimeters (cc) may be used, or a 35mm film canister can give a close approximation for 2 cubic inches of volume when filled.

3. Add the recommended volume of the recommended lubricant. Do not expect grease to appear at the outlet, but if it does, discontinue greasing at once.

4. Run motor for about 30 minutes before replacing outlet plugs or reliefs. **BE SURE TO SHUT MOTOR DOWN, DISCONNECT POWER, LOCK OUT AND TAG, AND REPLACE THESE DRAIN FITTINGS TO PRECLUDE LOSS OF NEW GREASE AND ENTRANCE OF CONTAMINANTS!**

Recommended Motor Grease

Most motors require:

Mobilith SHC 220 . . . . . .Mobil

Use the grease as indicated on a special grease information nameplate on the motor. Use of alternative greases can result in shortened motor life due to incompatibility of greases. If there is not a grease nameplate on the motor use:

Chevron Black Pearl #2
(Preferred) . . . . . .Standard Oil of California

Chevron SRI 2 . . . . . .Standard Oil of California

MOTOR BEARING MAINTENANCE-STORED UNITS

To ensure that complete contact is maintained between the motor bearings and the bearing grease on units to be placed in storage for extended intervals, the following motor maintenance procedure should be adhered to:

1. Prior to placing a unit in storage, rotate the motor several revolutions by hand in the proper direction of rotation.

2. Thereafter, rotate the motor as described in Step 1 at three month intervals until such time as the unit is placed in service.

3. The storage time should not exceed a total of nine (9) months duration.

5.0 TROUBLE SHOOTING

TROUBLE	CHECK POINT NUMBERS
Compressor Fails to Start	1,2,3
Repeat Shutdowns	3,4,5,2
High Amp Draw	8,9,6,7
Low Amp Draw	1,10,12
High Discharge Pressure	13,15,18
Low Air System Pressure	21,19,16,17,13,15,14,18,7
Unit Running Hot	21,20,22,23,6
High Coolant Consumption	27,26,24,25
Excessive Noise Level	16,17,30,29,28
Shaft Seal Leak	31
Pressure Relief Valve Opens	6,13,15,14,18
Black Residue on Belt Guard/Cooler Box	16,32,33

CHECK POINT NUMBERS	TROUBLE CAUSE
1.	Control Voltage Not Available
2.	Defective Starter
3.	Motor Overload
4.	Incorrect Overload Heater Size
5.	Line Voltage Variation
6.	Compressor Operating Above Rated Pressure
7.	Dirty Separator Filter Element
8.	Low Voltage
9.	Unbalanced Voltage
10.	Dirty Air Filter
11.	Compressor Operating Unloaded
12.	High Voltage
13.	Incorrect Pressure Switch Setting
14.	Faulty Minimum Pressure Valve
15.	Load Solenoid Valve Defective
16.	Drive Belt Slipping
17.	Air System Leaks
18.	Inlet Valve Malfunction
29.	System Demand Exceeds Compressor Delivery
20.	Coolant Cooler Core Dirty
21.	Low Coolant Level
22.	High Ambient Temperature
23.	Restricted Cooling Air Flow
24.	Separator Filter Element Leak
25.	Plugged Separator Filter Drain
26.	Compressor Operating Below Rated Pressure
27.	Coolant System Leak
28.	Airend Defective
29.	Motor Defective
30.	Loose Components
31.	Worn or Defective Shaft Seal
32.	Sheaves Misaligned
33.	Worn Sheaves

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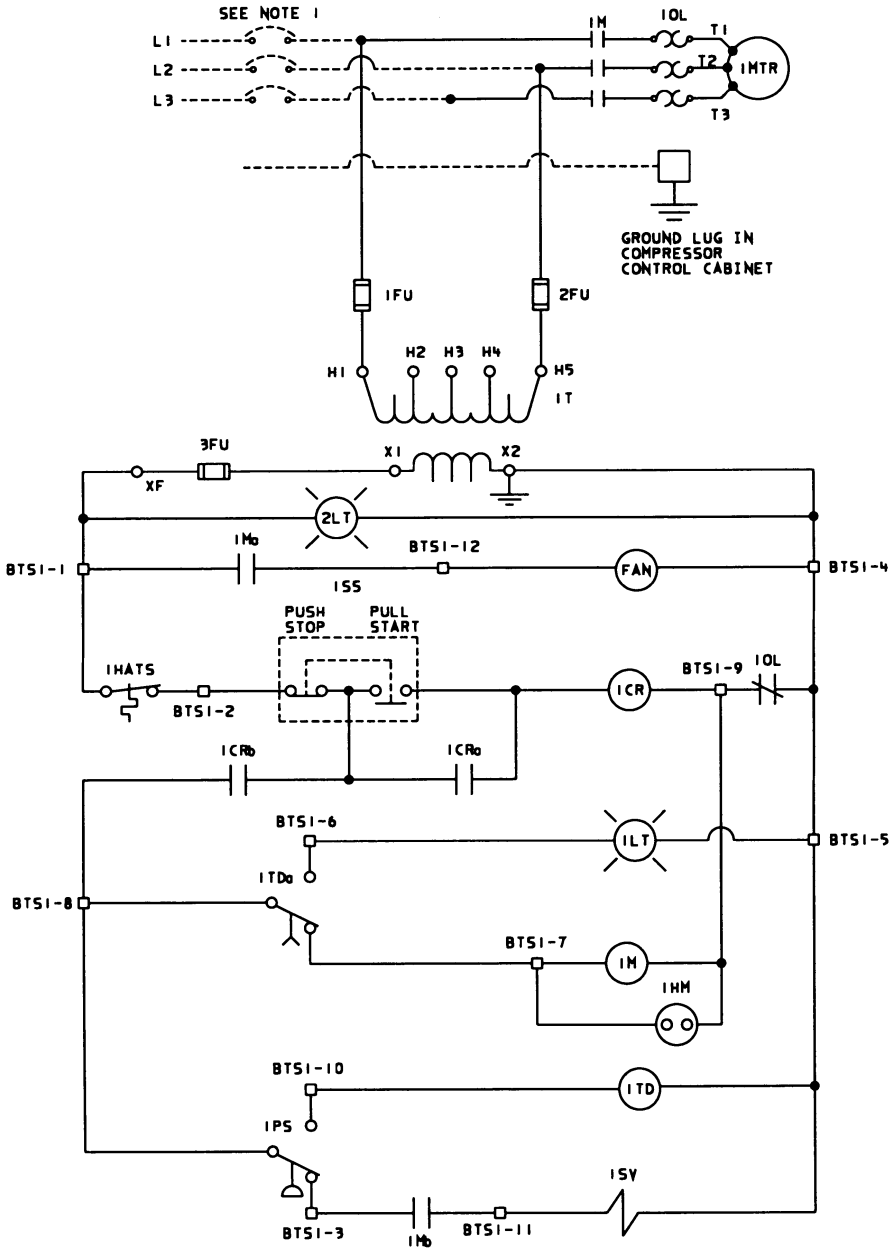

COMPONENTS SUPPLIED AND WIRED BY I-R:

1MTR ----- COMPRESSOR MOTOR
1HATS ---- HIGH AIR TEMPERATURE SWITCH
1PS ------ PRESSURE SWITCH
1SV ------ SOLENOID VALVE
FAN ------ FAN MOTOR(S)

COMPONENTS SUPPLIED AND WIRED BY STARTER MFG.:

1FU, 2FU - PRIMARY VOLTAGE FUSES
3FU ------ SECONDARY VOLTAGE FUSE (115VAC)
1M ------- MOTOR STARTER COIL
1HM ------ HOURMETER
1OL ------ MOTOR OVER LOAD RELAY
1SS ------ START/STOP SWITCH
1T ------- TRANSFORMER
BTS1 ----- BARRIER TERMINAL STRIP
1LT ------ AUTO RESTART LIGHT (AMBER)
2LT ------ POWER ON INDICATOR LIGHT
1CR ------ CONTROL RELAY
1CRa,b ---- CONTROL RELAY CONTACTS
1TD ------ AUTO RESTART TIME DELAY RELAY
1TDa ----- AUTO RESTART TIME DELAY RELAY CONTACT
1Ma,b ----- STARTER AUXILIARY CONTACTS

TRANSFORMER RATING (VA)	1FU & 2FU PRIMARY FUSES (AMPS)	3FU SECONDARY FUSE (AMPS)
350	3.0	3.2
750	6.25	8.0

NOTES:

1. APPROVED FUSED DISCONNECT OR CIRCUIT BREAKER PER N.E.C. REQUIREMENTS MUST BE PROVIDED BY CUSTOMER.
2. DASHED LINES REPRESENT WIRING BY CUSTOMER.
3. SIZING OF ELECTRICAL COMPONENTS NOT SUPPLIED BY INGERSOLL-RAND IS THE RESPONSIBILITY OF THE CUSTOMER AND SHOULD BE DONE IN ACCORDANCE WITH THE INFORMATION ON THE COMPRESSOR DATA PLATE. N.E.C. AND LOCAL ELECTRICAL CODES.

6.0 REFERENCE DRAWINGS

6.1 ELECTRICAL SCHEMATIC - FULL VOLTAGE

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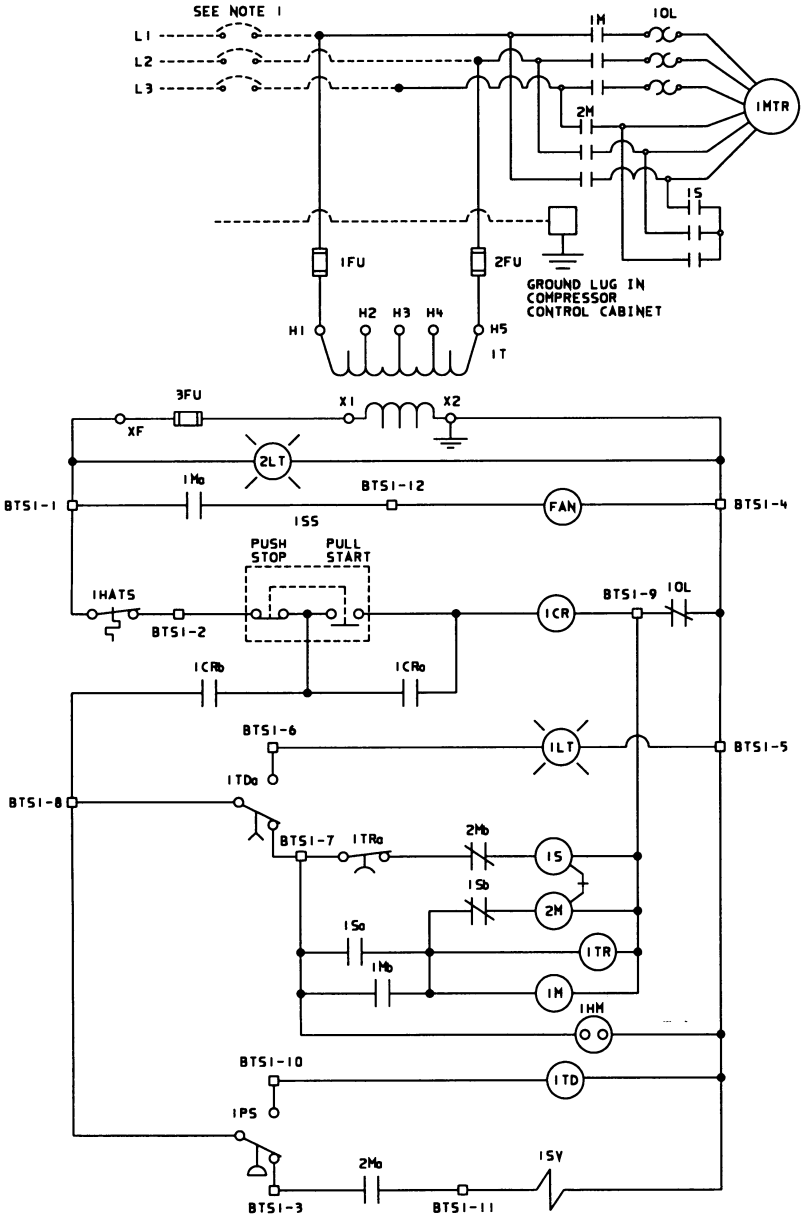

COMPONENTS SUPPLIED AND WIRED BY I-R:

1MTR ----- COMPRESSOR MOTOR
1HATS ---- HIGH AIR TEMPERATURE SWITCH
1PS ------ PRESSURE SWITCH
1SV ------ SOLENOID VALVE
FAN ------ FAN MOTOR(S)

COMPONENTS SUPPLIED AND WIRED BY STARTER MFG.:

1FU, 2FU - PRIMARY VOLTAGE FUSES
3FU ------ SECONDARY VOLTAGE FUSE (115VAC)
1M ------- START-RUN CONTACTOR
1Ma,b ----- STARTER AUXILIARY CONTACT (1M CONTACTOR)
2M ------- RUN CONTACTOR
2Ma,b ----- STARTER AUXILIARY CONTACT (2M CONTACTOR)
1S ------- START CONTACTOR
1Sa,b ----- STARTER AUXILIARY CONTACT (1S CONTACTOR)
1HM ------ HOURMETER
1OL ------ MOTOR OVER LOAD RELAY
1SS ------ START/STOP SWITCH
1T ------- TRANSFORMER
1TR ------ STAR DELTA TIMER
1TRa ----- STAR DELTA TIMER CONTACT
BTS1 ----- BARRIER TERMINAL STRIP
1LT ------ AUTO RESTART LIGHT (AMBER)
2LT ------ POWER ON INDICATOR LIGHT
1CR ------ CONTROL RELAY
1CRa,b ---- CONTROL RELAY CONTACTS
1TD ------ AUTO RESTART TIME DELAY RELAY
1TDa ----- AUTO RESTART TIME DELAY RELAY CONTACT

TRANSFORMER RATING (VA)	1FU & 2FU PRIMARY FUSES (AMPS)	3FU SECONDARY FUSE (AMPS)
350	3.0	3.2
750	6.25	8.0

NOTES:

1. APPROVED FUSED DISCONNECT OR CIRCUIT BREAKER PER N.E.C. REQUIREMENTS MUST BE PROVIDED BY CUSTOMER.
2. DASHED LINES REPRESENT WIRING BY CUSTOMER.
3. SIZING OF ELECTRICAL COMPONENTS NOT SUPPLIED BY INGERSOLL-RAND IS THE RESPONSIBILITY OF THE CUSTOMER AND SHOULD BE DONE IN ACCORDANCE WITH THE INFORMATION ON THE COMPRESSOR DATA PLATE, N.E.C. AND LOCAL ELECTRICAL CODES.

6.2 ELECTRICAL SCHEMATIC - STAR DELTA

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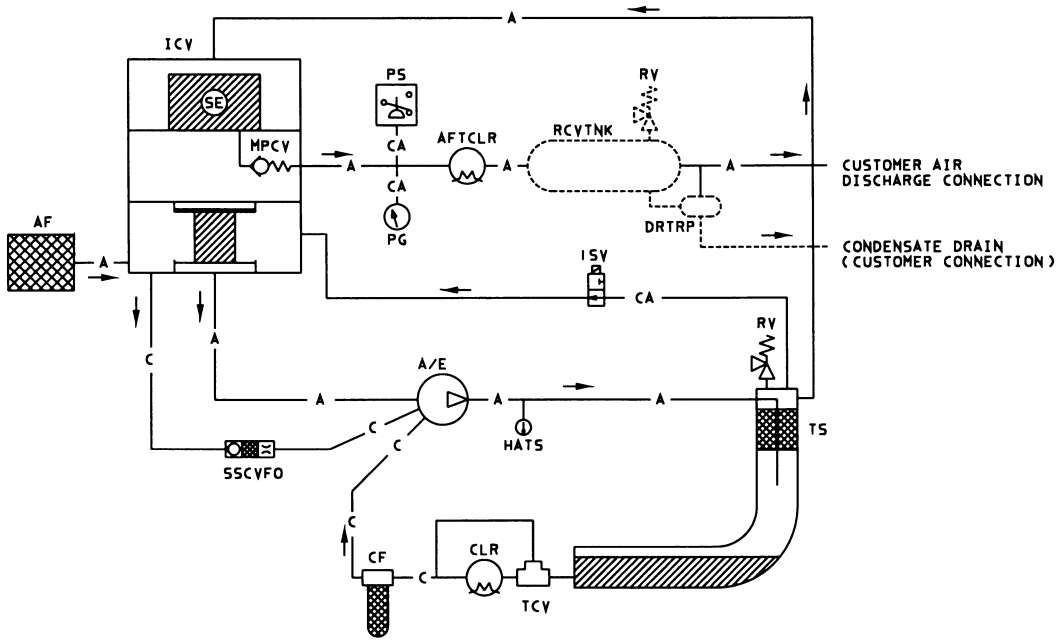
REV 02

LEGEND

ABBR	NAME	DESCRIPTION
AF	INLET AIR FILTER	DRY TYPE. DISPOSABLE ELEMENT
ICV	INLET CONTROL VALVE	MULTI PURPOSE INLET VALVE
A/E	AIR END	ROTARY SCREW AIREND
RCVTNK	RECEIVER TANK (OPTIONAL)	AIR RECEIVER TANK
HATS	HIGH AIR TEMPERATURE SWITCH	TEMPERATURE SWITCH LOCATED AT A/E DISCHARGE
RV	SAFETY RELIEF VALVE	RELIEVES AIR PRESSURE IN CASE OF OVER-PRESSURE
AFTCLR	AFTERCOOLER	AIR-COOLED COMPRESSED AIR HEAT EXCHANGER
PS (SEE NOTE 3)	PRESSURE SWITCH	AUTOMATICALLY LOADS & UNLOADS COMPRESSOR
PG (SEE NOTE 3)	PRESSURE GAUGE	INDICATES SYSTEM AIR PRESSURE
CLR	COOLANT COOLER	AIR-COOLED COOLANT HEAT EXCHANGER
CF	COOLANT FILTER	SPIN-ON TYPE. DISPOSABLE ELEMENT
ISV	CONTROL SOLENOID VALVE	2-WAY NORMALLY-OPEN
DRTRP	DRAIN TRAP (OPTIONAL)	FLOATING TYPE
SE	SEPARATOR ELEMENT	REMOVES COOLANT FROM COMPRESSED AIR (INTERNAL TO ICV)
SSCVFO	SEPARATOR SCAVENGE CHECK VALVE/ FILTER/ORIFICE	SCAVENGE & FILTER COOLANT RETURNED TO AIREND
TS	TUBE SEPARATOR	COOLANT SUMP & PRE-SEPARATION
MPCV	MINIMUM PRESSURE CHECK VALVE	(INTERNAL TO ICV)
TCV	THERMOSTATIC CONTROL VALVE	COOLANT MIXING VALVE



PIPING LEGEND

A- AIR PIPING
C- COOLANT PIPING
CA- CONTROL AIR PIPING

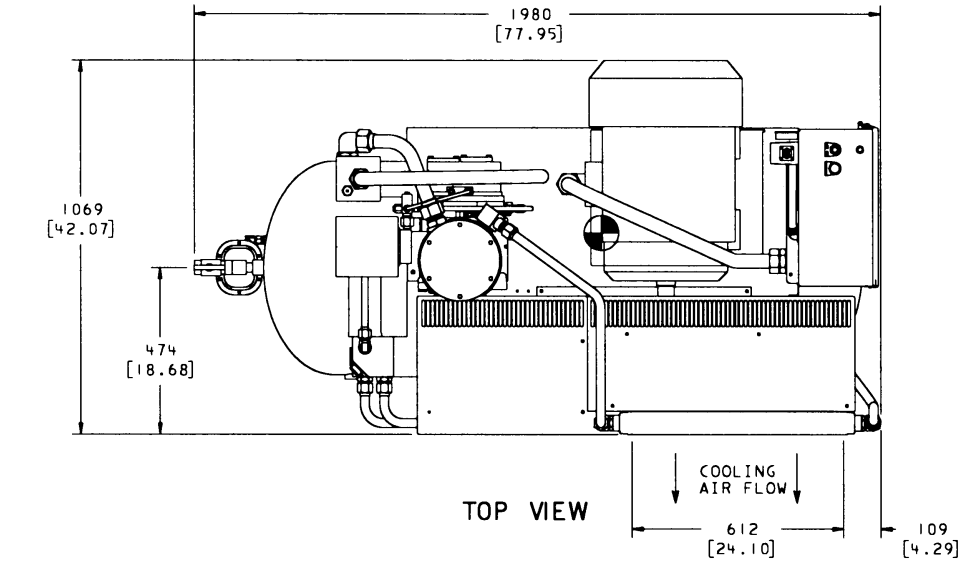
NOTES:
1. FOR CUSTOMER CONNECTIONS SEE FOUNDATION PLAN OF UNIT.
2. DASHED ITEMS ARE OPTIONAL.
3. PRESSURE SWITCH & PRESSURE GAUGE ARE CONNECTED TO RECEIVER TANK ON TANK-MOUNTED UNITS.

6.4 FOUNDATION PLAN - TANK MOUNTED (CONTINUED)

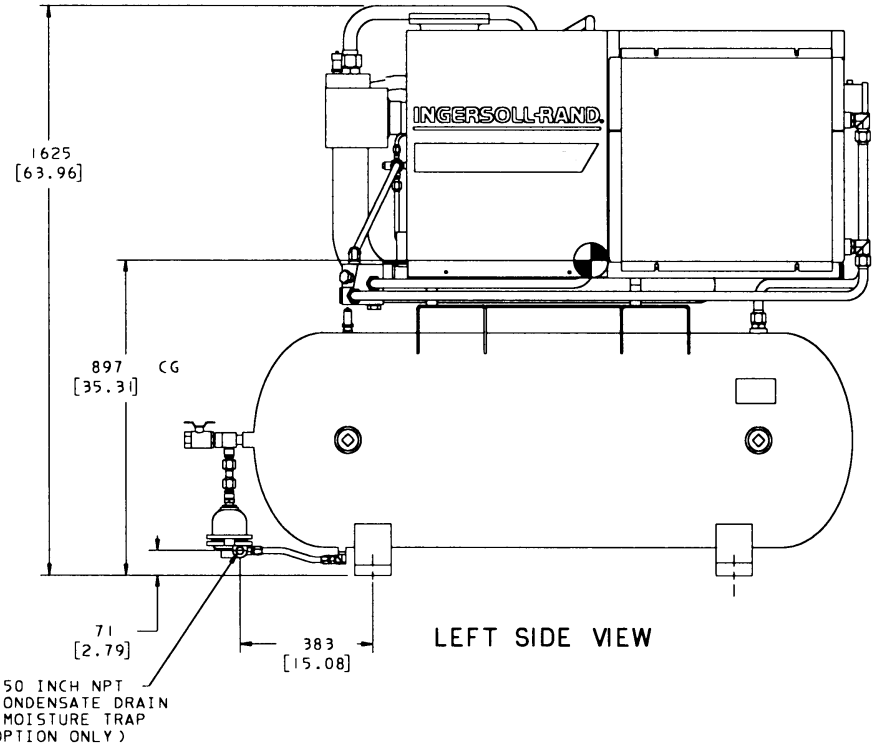
39871975
REV 03

NOTES:

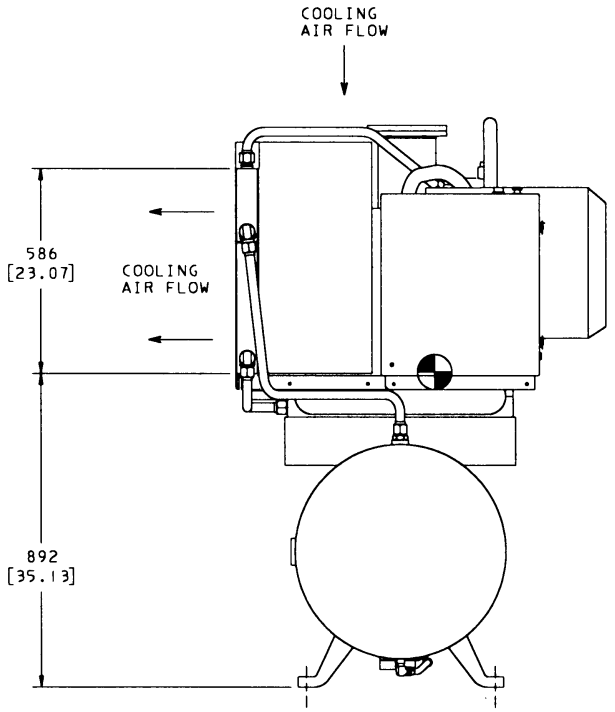
1. WEIGHT (APPROXIMATELY): 684 KG., (1504 LB)
2. COOLANT-LUBRICANT FILL QUANTITY (APPROX.): 13.6 L, (3.6 GAL).
3. TOLERANCE ON ALL DIMENSIONS = ±3 MM (±.12 INCH)
4. ALL DIMENSIONS IN MILLIMETERS (INCH).
5. AIR FLOW: 1800 CFM.
6. RECOMMENDED CLEARANCE ON THREE SIDES 914 (36.0); 1067 (42.0) IN FRONT OF CONTROL PANEL OR MINIMUM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE OR APPLICABLE LOCAL CODES.
7. EXTERNAL PIPING SHALL NOT EXERT ANY UNRESOLVED MOMENTS OR FORCES ON THE UNIT.
8. THERE SHOULD BE NO PLASTIC PIPING ATTACHED TO THIS UNIT OR USED FOR ANY LINES DOWNSTREAM.



TOP VIEW

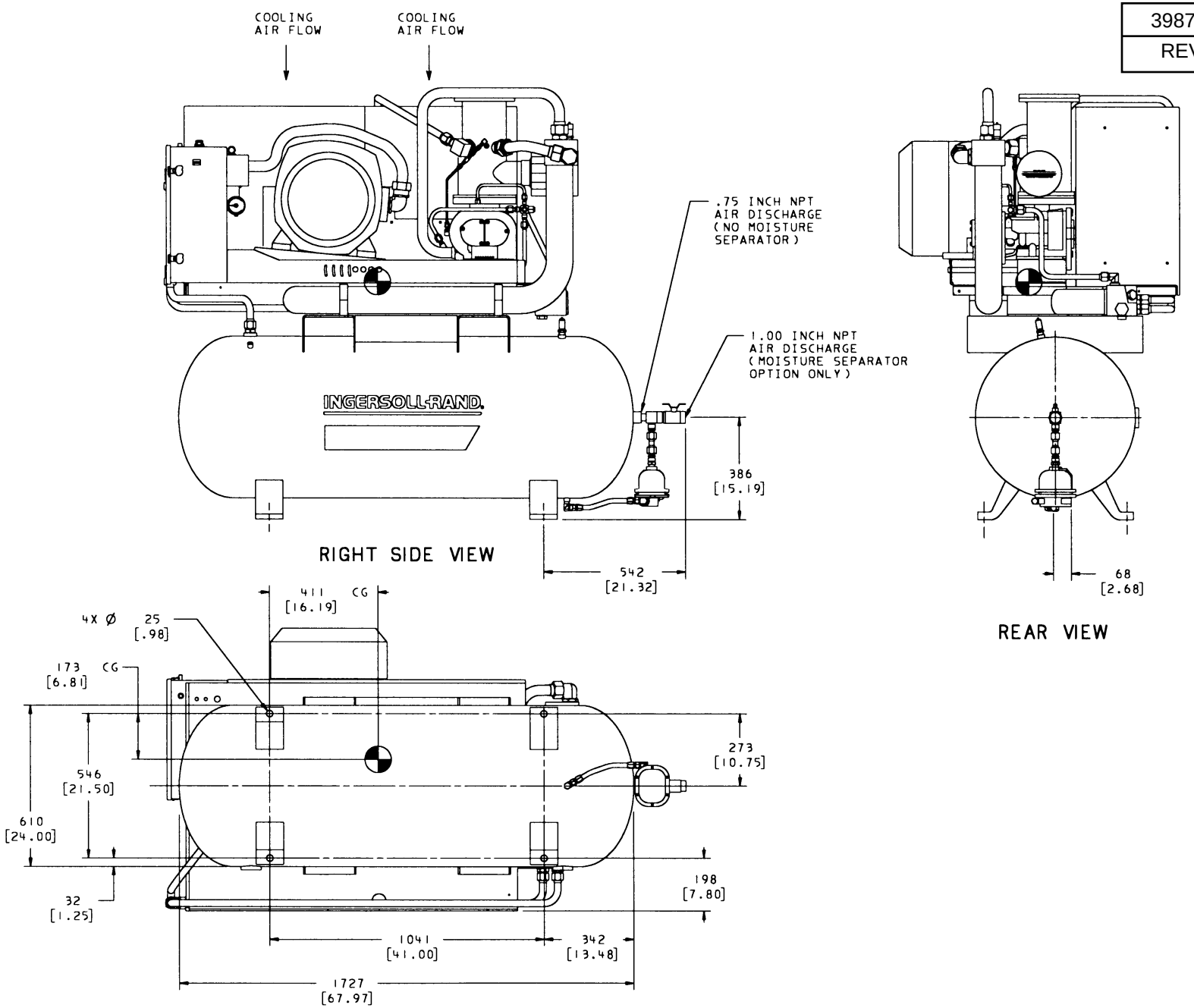


LEFT SIDE VIEW



FRONT VIEW

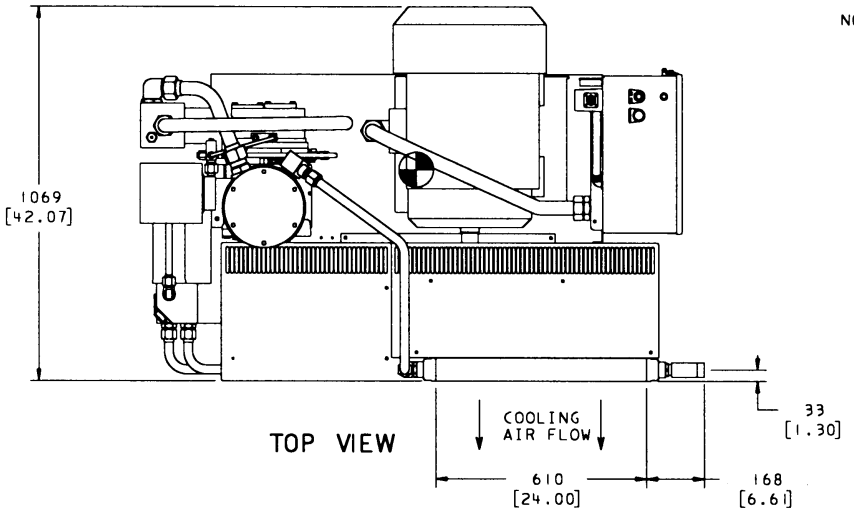
39871975
REV 03



6.4 FOUNDATION PLAN - TANK MOUNTED

6.5 FOUNDATION PLAN - BASE MOUNTED (CONTINUED)

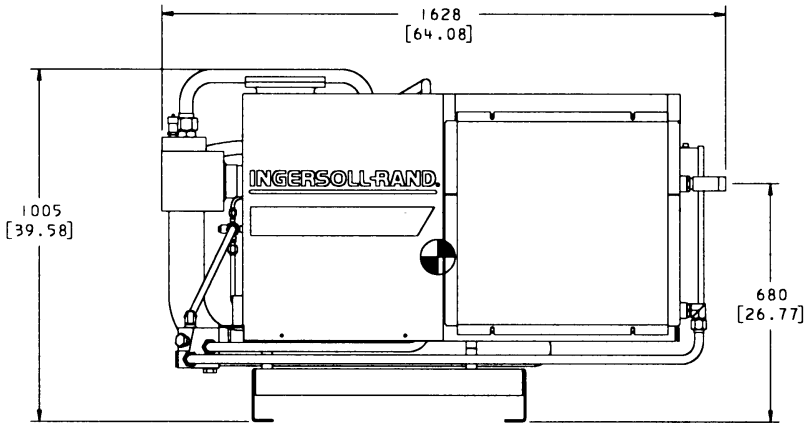
39872835
REV 03



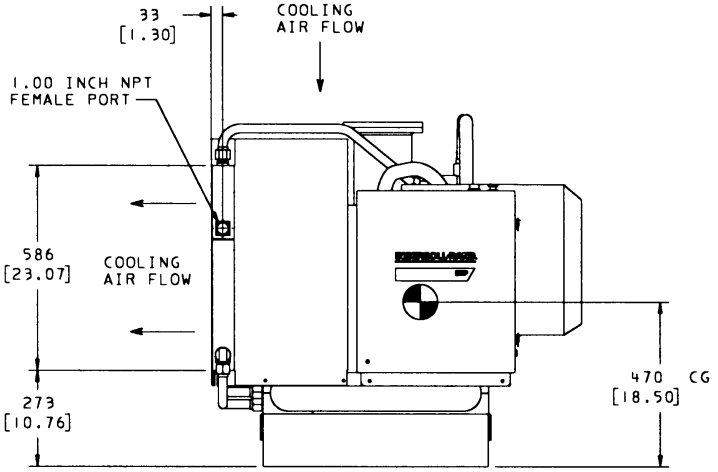
TOP VIEW

NOTES:

1. WEIGHT (APPROXIMATELY): 502 KG. (1104 LB.).
2. COOLANT-LUBRICANT FILL QUANTITY (APPROX.): 13.6 L. (3.6 GAL).
3. TOLERANCE ON ALL DIMENSIONS = ±3 MM (±.12).
4. ALL DIMENSIONS IN MILLIMETERS (INCH).
5. AIR FLOW: 1800 CFM.
6. RECOMMENDED CLEARANCE ON THREE SIDES 914 (36.0): 1067 (42.0) IN FRONT OF CONTROL PANEL OR MINIMUM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE OR APPLICABLE LOCAL CODES.
7. EXTERNAL PIPING SHALL NOT EXERT ANY UNRESOLVED MOMENTS OR FORCES ON THE UNIT.
8. THERE SHOULD BE NO PLASTIC PIPING ATTACHED TO THIS UNIT OR USED FOR ANY LINES DOWNSTREAM.

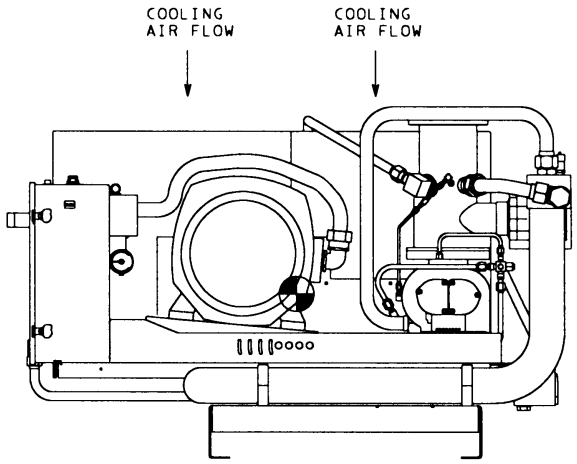


LEFT SIDE VIEW

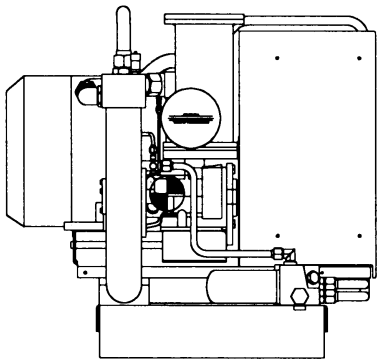


FRONT VIEW

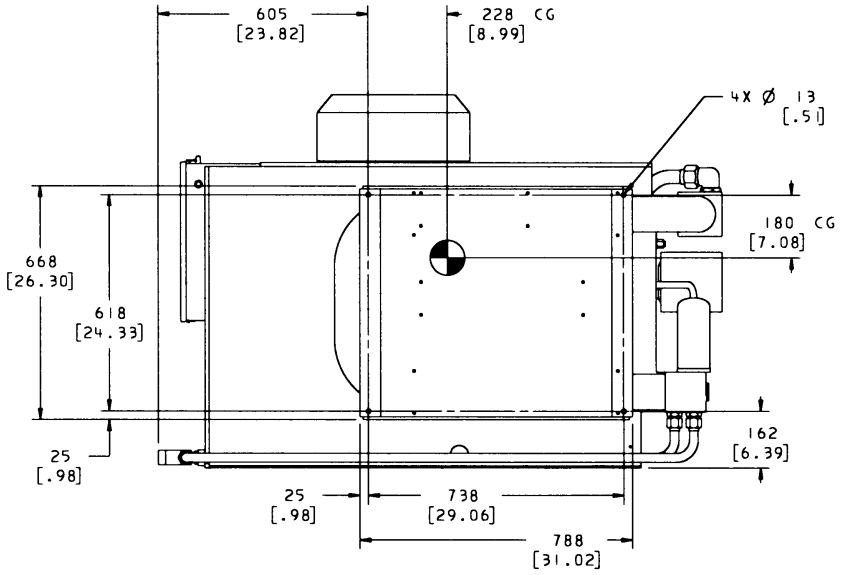
39872835
REV 03



RIGHT SIDE VIEW

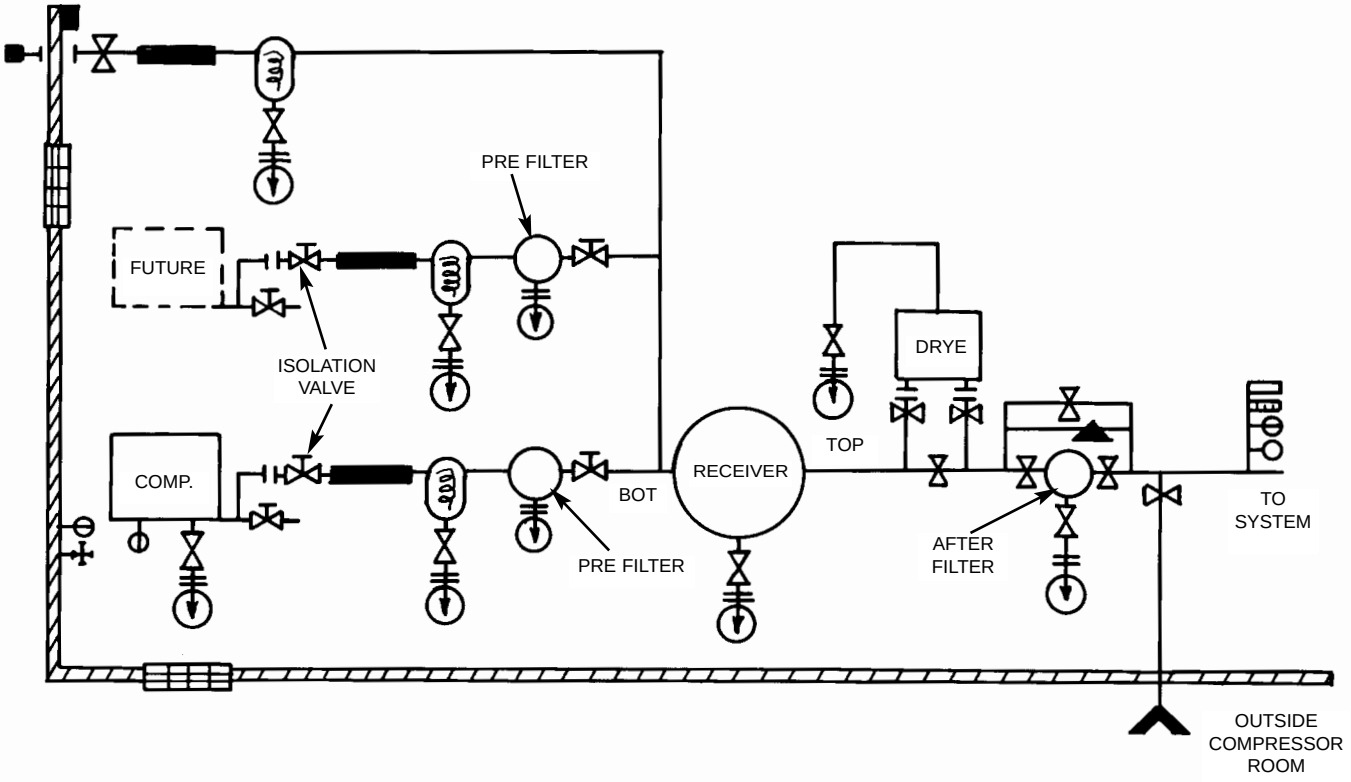


REAR VIEW



BOTTOM VIEW

6.5 FOUNDATION PLAN - BASE MOUNTED



	GLADHAND	Emergency Standby Air Hook Up. Complete with Necessary Fitting For Portable or IR Rental Air Unit From Local IR Distributor
	VALVE	Water, Or Ball Type Valve
	UNION	Aids in Disconnecting Compressor From The System
	PRESSURE GAUGE	
	THERMOMETER	
	DRIP LEG	
	MANOMETER	
	DIFFERENTIAL PRESSURE INDICATOR	
	I-R AUTOMATIC DRAIN VALVE	
	FALSE LOADER	Blows Off Air Outside Of Compressor Room
	SYSTEM INSTRUMENTATION INCLUDES Nephelometer; Hygrometer; Pressure; Temperature	
	VENTILATION	Moisture Louvers, Exhaust Fans
	AFTERCOOLER/SEPARATOR, ISOLATION VALVE, UNION, STRAINER AND TRAP	

6.6 TYPICAL SYSTEM FLOW DIAGRAM (TWO BASE PLATED MOUNTED UNITS)

7.0 PARTS LIST

7.1 INTRODUCTION

GENERAL

This manual, which contains an illustrated parts breakdown, has been prepared as an aid in identifying and ordering parts for the ESP compressor. All of the compressor parts, listed in the parts breakdown, are manufactured with the same precision as the original equipment.

Ingersoll-Rand Company service facilities and parts are available worldwide. There are Ingersoll-Rand Company Branch Offices and authorized distributors located in the principle cities of the United States. In Canada, our customers are serviced by the Canadian Ingersoll-Rand Company, Limited. There are also Ingersoll-Rand Company subsidiaries and authorized distributors located in the principle cities throughout the world.

DESCRIPTION

The illustrated parts breakdown illustrates the various assemblies, sub-assemblies and detailed parts which make up this particular ESP compressor. A series of illustrations show each part clearly and in it's correct location relative to the other parts in the illustration. Each part of an illustration is referenced with a number. The number, description and quantity needed per assembly are listed in numerical order on the following pages.

Items with a description of NSS are not sold separately and must be purchased as an assembly. Items with a description of Ref. indicate that the item is located elsewhere in the parts list.

HOW TO USE THIS PARTS MANUAL

1. Turn to the Parts Section to locate desired illustrations.

2. Locate the part on the illustration by visual identification and the reference number.

3. Find the reference number on the Tabulated page, along with the Part Number and Description.

SERIAL NUMBER BREAK

When a part is changed and it doesn't supersede the previous part, this change must be documented by a serial number break. By using the last six (6) digits of the serial number, as outlined below, this change is recorded in the parts list.

→≫ U95102 indicates part is used on units up to and including serial number ending in U95102.

U95103 →≫ indicates part is used on units with serial number ending in U95103 or higher.

HOW TO ORDER PARTS

In order that all avoidable errors be eliminated when ordering parts, please specify the following:

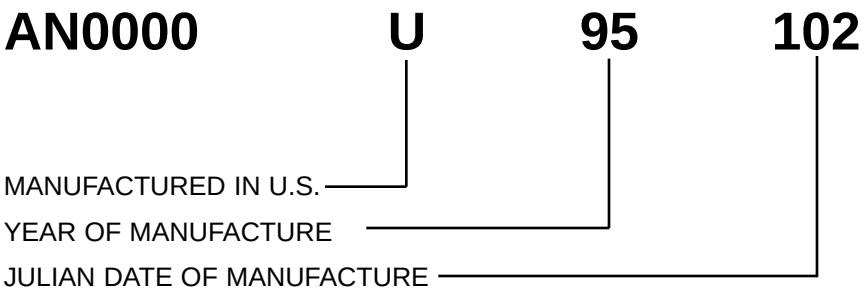
1. The model number of the unit as shown on the Compressor Data Plate.

2. The serial number of the unit as shown on the Compressor Data Plate.

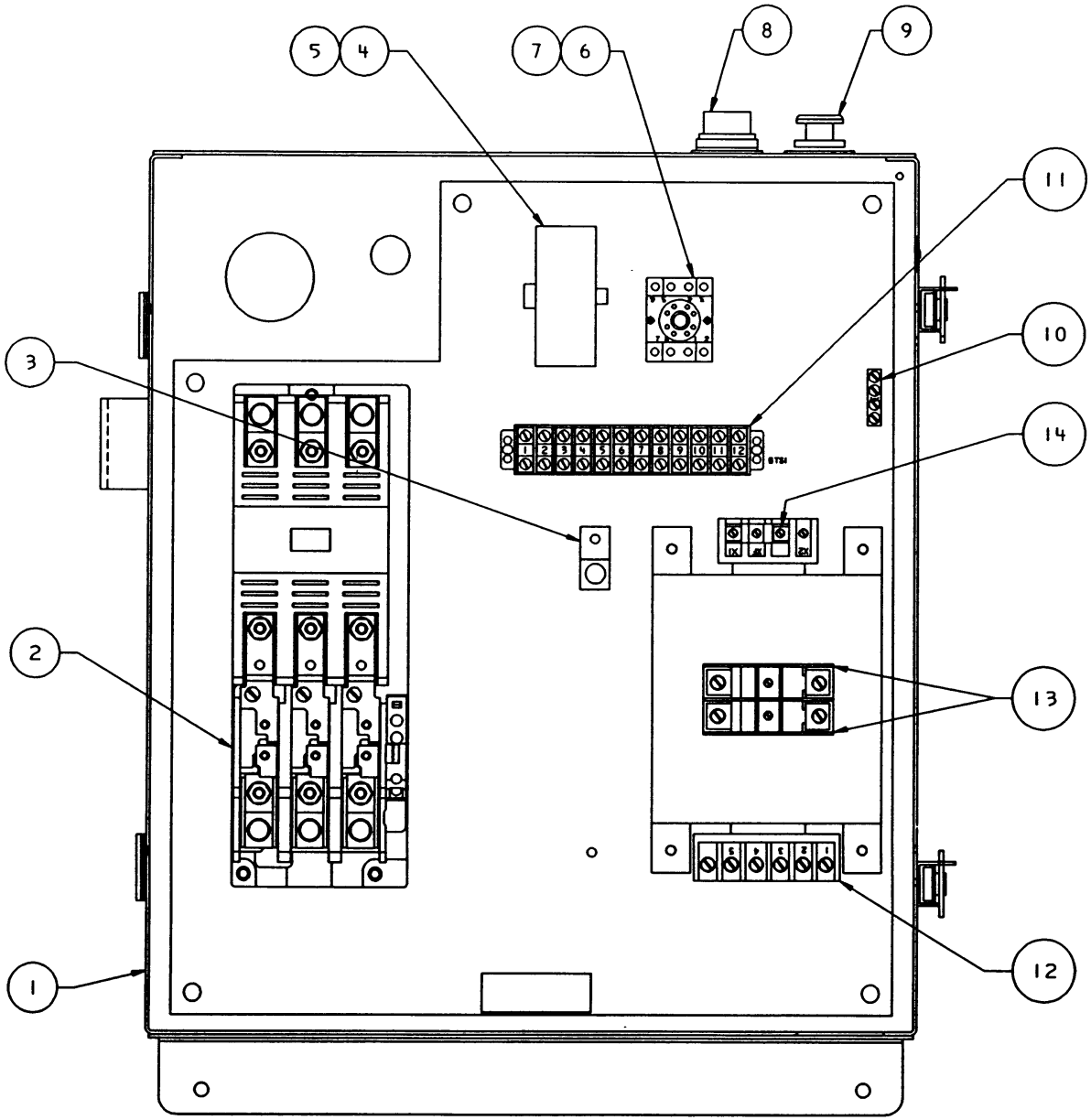
3. The form number of this manual.

4. The reference number, part number, description and quantity needed exactly as listed.

5. The motor data code shown on the motor data plate.



39876461
REV 02

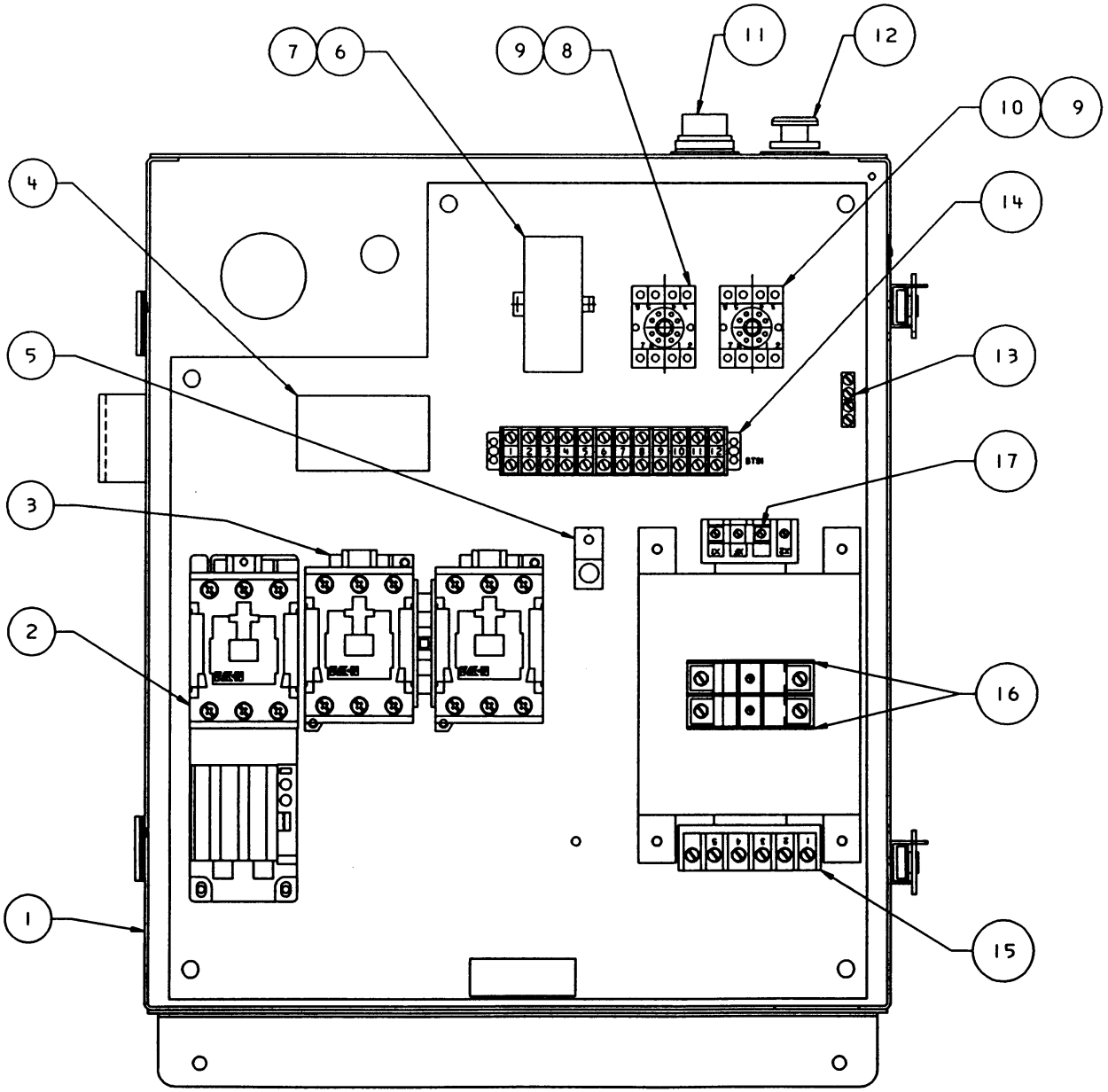


Starter Assembly - Full Voltage

Ref. No.	Part Number	Qty.	Description
1	39881032	1	ENCLOSURE, STARTER BOX (NEMA 1)
	39881040	1	ENCLOSURE, STARTER BOX (NEMA 4)
2	39237193	1	CONTACTOR, STARTER (SIZE K)
	39237219	1	CONTACTOR, STARTER (SIZE N)
2A	39240064	1	CONTACTS, AUXILIARY 2NO (SIZE K)
	39245337	1	CONTACTS, AUXILIARY 1NO (SIZE N)
3	39190939	1	LUG, GROUND
4	39403290	1	RELAY, CONTROL (1CR)
5	39125091	1	SOCKET, CONTROL RELAY
6	35258508	1	RELAY, AUTO RESTART TIME DELAY
7	35245224	1	SOCKET, TIMER RELAY
8	39242268	1	LIGHT, AMBER INDICATOR (AUTO RESTART)
9	39219332	1	SWITCH, START/STOP
10	39239983	1	BAR, EARTH
11	39180898	1	BLOCK, TERMINAL
12	39318845	1	TRANSFORMER, CONTROL (200/230/460/575V 60HZ)
	39318852	1	TRANSFORMER, CONTROL (200/380/415/550V 50/60HZ)
13	39231915	2	FUSE, PRIMARY (6.25 A)
14	39231899	1	FUSE, SECONDARY (8.0 A)
X	39244751	1	DECAL, POWER ON

X - NOT ILLUSTRATED

39880844
REV 01

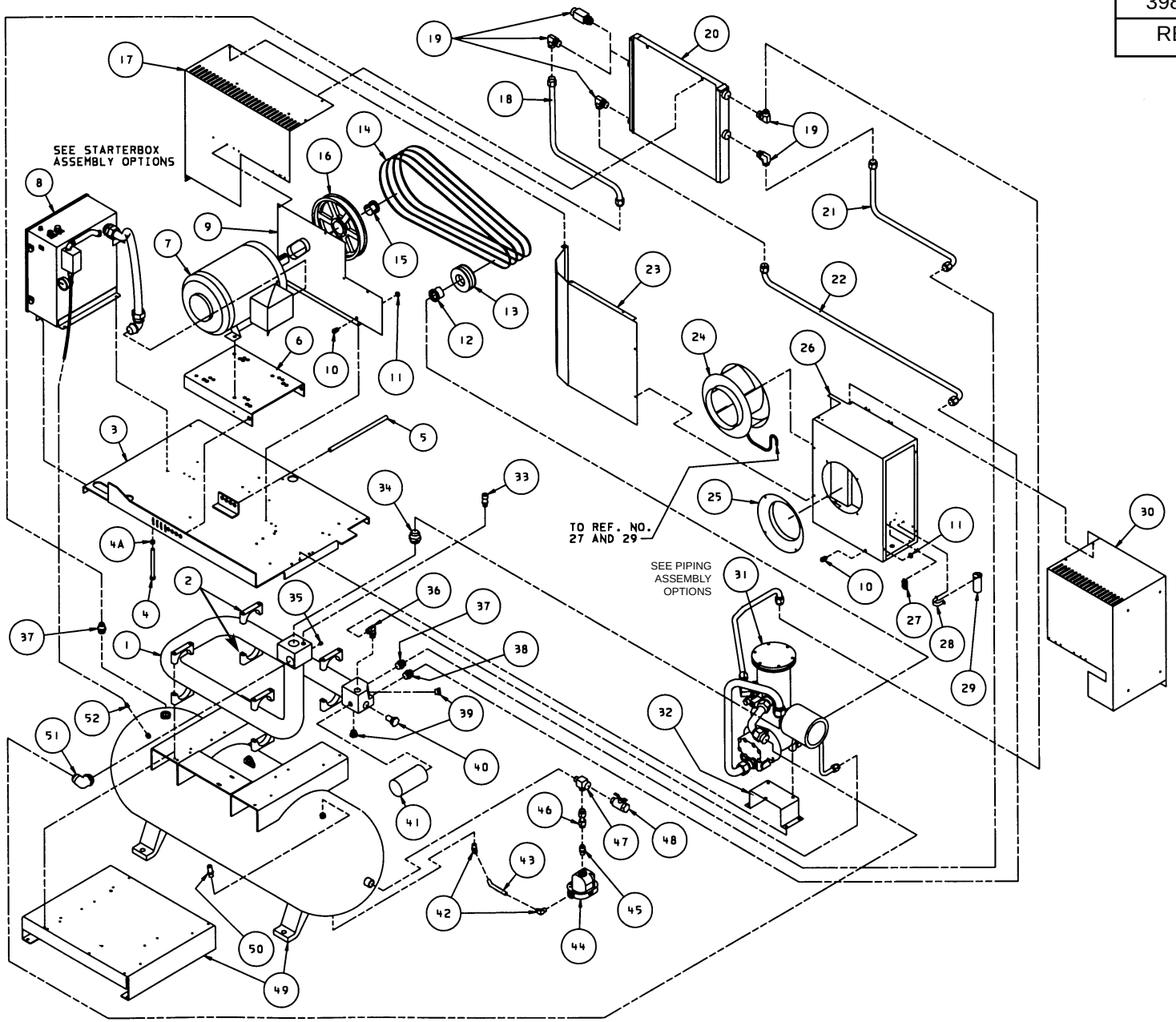


Starter Assembly - Star Delta

Ref. No.	Part Number	Qty.	Description
1	39881032	1	ENCLOSURE, STARTER BOX (NEMA 1)
	39881040	1	ENCLOSURE, STARTER BOX (NEMA 4)
2	39243597	1	CONTACTOR, STARTER (SIZE F)
	39237193	1	CONTACTOR, STARTER (SIZE K)
2A	39240064	1	CONTACTS, AUXILIARY 2NO (SIZE F)
	39240064	1	CONTACTS, AUXILIARY 2NO (SIZE K)
3	39239868	1	CONTACTS, REVERSING (SIZE F)
	39237227	1	CONTACTS, REVERSING (SIZE K)
4	39239975	1	BLOCK, TERMINAL
5	39190939	1	LUG, GROUND
6	39403290	1	RELAY, CONTROL (1CR)
7	39125091	2	SOCKET, CONTROL RELAY
8	35258508	1	RELAY, AUTO RESTART TIME DELAY (1TD)
9	35245224	1	SOCKET, TIMER RELAY
10	35249754	1	RELAY, STAR-DELTA TIMER
11	39242268	1	LIGHT, AMBER INDICATOR (AUTO RESTART)
12	39219332	1	SWITCH, START/STOP
13	39239983	1	BAR, EARTH
14	39180898	1	BLOCK, TERMINAL
15	39318845	1	TRANSFORMER, CONTROL (200/230/460/575V 60HZ)
	39318852	1	TRANSFORMER, CONTROL (220/380/415/550V 50/60HZ)
16	39231915	2	FUSE, PRIMARY (6.25 A)
17	39231899	1	FUSE, SECONDARY (8.0 A)
X	39244751	1	DECAL, POWER ON

X - NOT ILLUSTRATED

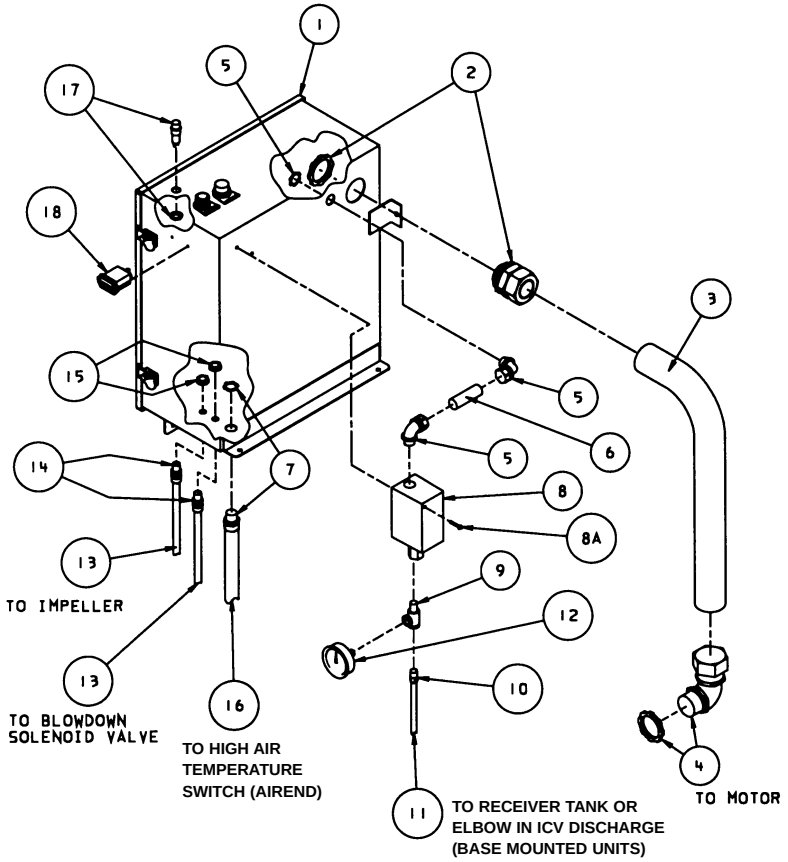
39872031
REV 01



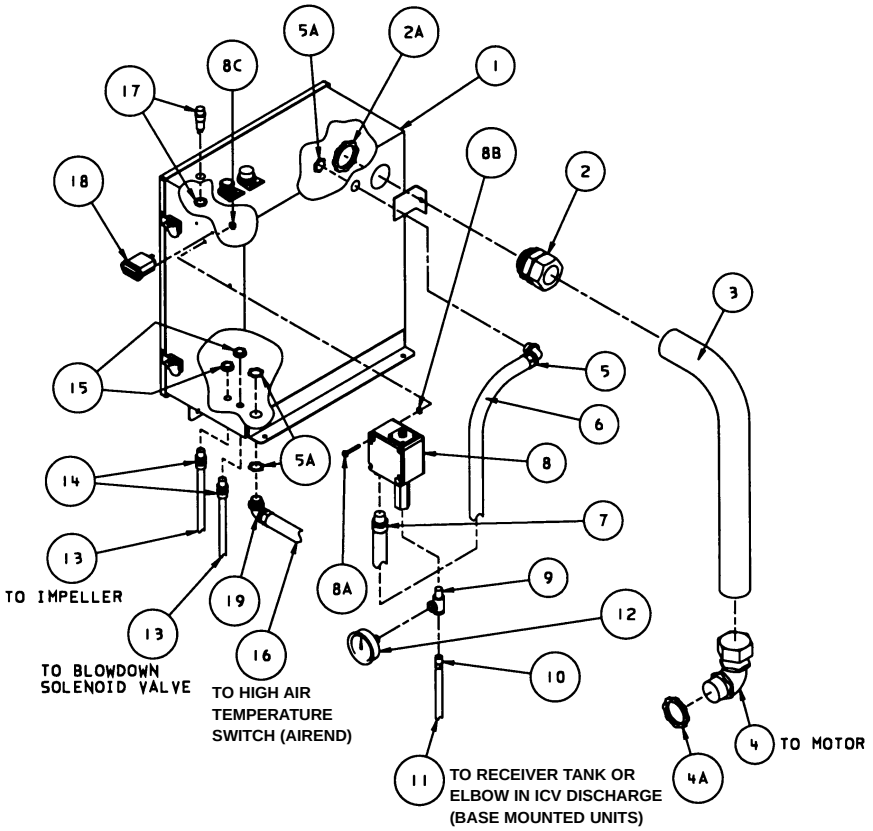
Major Components

Ref. No.	Part Number	Qty.	Description
1	39862222	1	ASSEMBLY, SEPARATOR TUBE
2	39313184	4	CLAMP, TUBE
2A	95953204	8	SCREW
2B	39128541	8	NUT
3	39876453	1	BASE, OPEN
4	39246335	1	SCREW, JACK
4A	95922910	1	NUT, JACK SCREW
5	39310792	1	SHAFT, MOTOR PIVOT
5A	95231494	2	PIN, COTTER
5B	39224209	2	WASHER, NYLON
6	39879150	1	SUPPORT, MOTOR (440 PIVOT)
	39879168	1	SUPPORT, MOTOR (470 PIVOT)
	39879176	1	SUPPORT, MOTOR (500 PIVOT)
	39879184	1	SUPPORT, MOTOR (530 PIVOT)
6A	39133152	1	SCREW (THRU REF. NO 4, INTO REF. NO. 7)
7	xxxxxxxx	1	MOTOR, (FRAME SIZES: 256T-286T)
7A	39128517	4	SCREW
7B	39116348	4	NUT
7	xxxxxxxx	1	MOTOR, (FRAME SIZE: 324TS)
7A	95930723	4	SCREW
7B	95929188	4	WASHER
7C	95423687	4	NUT
8	xxxxxxxx	1	ASSEMBLY, STARTERBOX
8A	39141809	4	SCREW
8B	95379392	1	WASHER, STAR
9	39879820	1	GUARD, BELT (38MM TRAVEL)
	39879838	1	GUARD, BELT (70MM TRAVEL)
9A	39133145	6	SCREW
10	39173927	2	GLAND, WIRE
11	39173935	2	LOCKNUT, WIRE GLAND
12	xxxxxxxx	1	BUSHING, SHEAVE
13	xxxxxxxx	1	SHEAVE, DRIVEN
14	xxxxxxxx		BELT, 80 INCHES
	xxxxxxxx		BELT, 90 INCHES
15	xxxxxxxx	1	BUSHING, SHEAVE
16	xxxxxxxx	1	SHEAVE, DRIVER
17	39879804	1	CORNER, RIGHT
17A	39133145	8	SCREW
18	39870563	1	TUBE, AFTERCOOLER-RECEIVER TANK
19	95938171	4	ELBOW, TUBE (TANK MOUNTED UNITS)
	95938171	3	ELBOW, TUBE (BASE MOUNTED UNITS)
	39581715	1	MANIFOLD, CUSTOMER AIR DISCHARGE (BASE MOUNTED UNTS)
20	39843735	1	COOLER, COMBINED OIL/AFTER
20A	39141809	4	SCREW
20B	39178660	4	WASHER
21	39870589	1	TUBE, OIL COOLER-SEPARATOR TUBE
22	39870571	1	TUBE, OIL COOLER-SEPARATOR TUBE
23	39881974	1	DEFECTOR, AIR
23A	39133145	4	SCREW
24	39878913	1	FAN, 50/60HZ
24A	96705082	4	SCREW
25	39872049	1	RING, FAN INLET
25A	39133145	4	SCREW
26	39869805	1	BOX, FAN/RING
26A	39133145	4	SCREW
27	39302260	1	BLOCK, TERMINAL DOUBLE 3 POSITION
27A	35249721	2	SCREW
28	39317268	1	CLAMP, CAPACITOR
28A	35249721	2	SCREW
29	39580857	1	CAPACITOR, FAN
29A	39236534	2	SCREW, TERMINAL
30	39879812	1	CORNER, LEFT
30A	39133145	8	SCREW
31	xxxxxxxx	1	ASSEMBLY, PIPING
31A	96702279	3	SCREW, (20-25HP AIREND)
	39177167	2	SCREW, (30HP AIREND)
31B	39183538	2	WASHER, LOCK (30HP AIREND)
31C	39110309	2	SCREW, (30HP AIREND-FRONT FLANGE)
31D	39128566	2	NUT, (30HP AIREND-FRONT FLANGE)
32	39870241	1	SUPPORT, (20-25HP AIREND)
	39870233	1	SUPPORT, (30HP AIREND)
32A	39178678	4	SCREW
33	39121256	1	VALVE, PRESSURE RELIEF (165 PSIG)
34	39128624	1	CONNECTOR, TUBE
35	39184510	1	PLUG
36	39152368	1	ELBOW, TUBE
37	39111752	1	CONNECTOR, TUBE (BASE MOUNT)
	39111752	2	CONNECTOR, TUBE (TANK MOUNT)
38	39111752	1	CONNECTOR, TUBE (30HP)
	39318613	1	CONNECTOR, ORIFICE TUBE (25HP)
	39494976	1	CONNECTOR, ORIFICE TUBE (20HP)
39	39310784	2	PLUG
40	39441944	1	ELEMENT, THERMAL WITH WASHER
41	92740950	1	FILTER, COOLANT
42	39155759	2	ELBOW, TUBE
43	39124821	15 “	TUBING
44	39137898	1	TRAP, MOISTURE
45	95279378	1	CONNECTOR, TUBE
46	39310958	1	TUBE, MOISTURE SEPARATOR
47	39316179	1	MANIFOLD
48	39105754	1	VALVE, BALL
49	39862230	1	TANK, RECEIVER 120 GAL (FOR TANK MOUNTED UNITS ONLY)
	39871223	1	BASE, (FOR BASE MOUNTED UNITS ONLY)
50	39121256	1	VALVE, PRESSURE RELIEF (FOR TANK MOUNTED UNITS ONLY)
51	39128673	1	ELBOW, TUBE
52	39156435	1	CONNECTOR, TUBE

39872882
REV 01



NEMA 1



NEMA 4

Starter Box With Pressure Switch Assembly

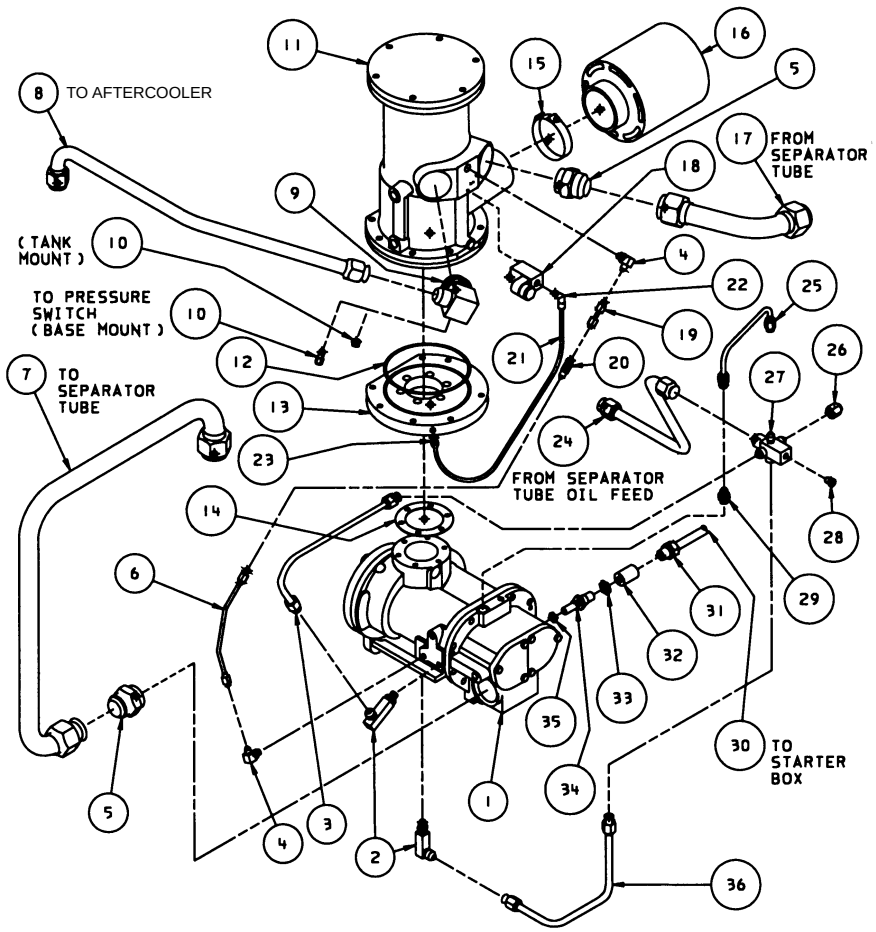
NEMA 1

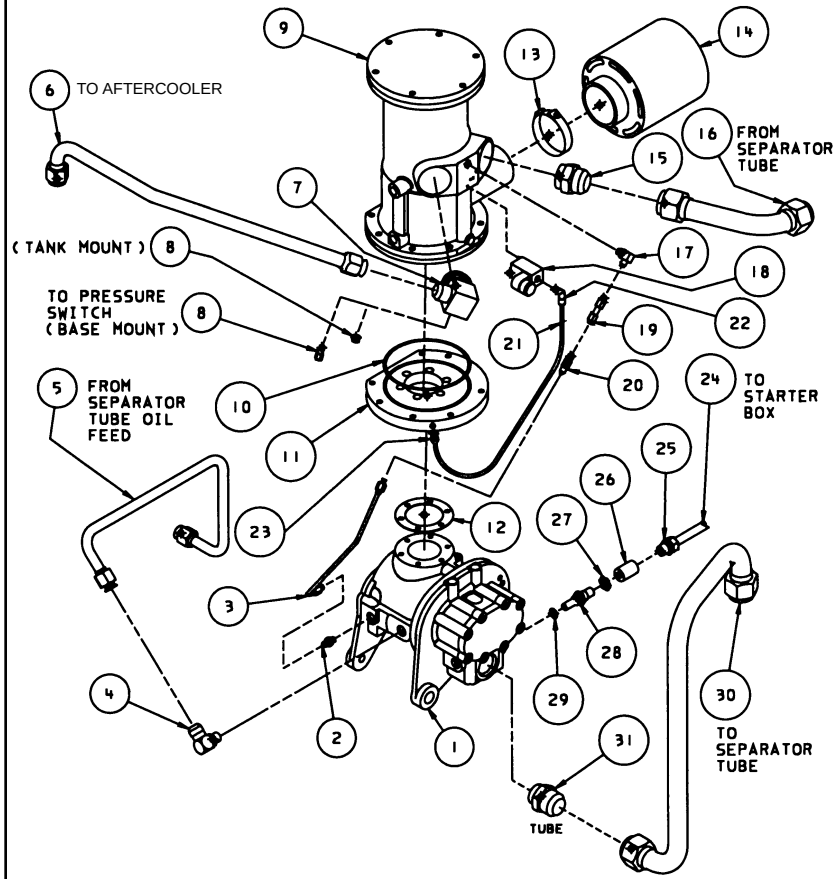
Ref. No.	Part Number	Qty.	Description
1	xxxxxxxx	1	ASSEMBLY, STARTERBOX
2	39301973	1	CONNECTOR, CONDUIT
3	39147186	30”	CONDUIT
4	39301965	1	ELBOW, CONDUIT
5	39479472	2	ELBOW, CONDUIT
6	39139332	2 “	CONDUIT
7	39479431	1	CONNECTOR, CONDUIT
8	39100029	1	SWITCH, PRESSURE
8A	39125133	2	SCREW
9	95952495	1	TEE
10	39156435	1	CONNECTOR
11	39124813	32 “	TUBING
12	95295986	1	GAUGE, PRESSURE (psig, Kg/CM2)
	39315700	1	GAUGE, PRESSURE (psig, KPa)
13	39204490	90 “	CABLE, 3-CONDUCTOR
14	39173927	2	GLAND, WIRE
15	39173935	2	LOCKNUT, WIRE GLAND
16	39139332	63 “	CONDUIT
17	39243985	1	LIGHT, WHITE INDICATOR (POWER ON)
18	39226618	1	HOURMETER (60 HZ ONLY)
	39233382	1	HOURMETER (50 HZ ONLY)
18A	39127295	2	SCREW

NEMA 4

Ref. No.	Part Number	Qty.	Description
1	xxxxxxxx	1	ASSEMBLY, STARTERBOX
2	95333266	1	CONNECTOR, CONDUIT
2A	39135355	1	LOCKNUT, CONDUIT SEAL
3	39132303	30 “	CONDUIT
4	95333373	1	ELBOW, CONDUIT
4A	39135355	1	LOCKNUT, CONDUIT SEAL
5	95361390	1	ELBOW, CONDUIT
5A	39108949	3	LOCKNUT, SEALING
6	39132261	28 “	CONDUIT
7	95245221	1	CONNECTOR, CONDUIT
8	39201884	1	SWITCH, PRESSURE
8A	95952511	2	SCREW, PAN HEAD
8B	39192000	2	GROMMET
8C	39128541	2	NUT
9	95952495	1	TEE
10	39156435	1	CONNECTOR
11	39124813	32 “	TUBING
12	95295986	1	GAUGE, PRESSURE (psig, Kg/CM2)
	39315700	1	GAUGE, PRESSURE (psig, KPa)
13	39204490	90 “	CABLE, 3-CONDUCTOR
14	39173927	2	GLAND, WIRE
15	39173935	2	LOCKNUT, WIRE GLAND
16	39132261	50 “	CONDUIT
17	39243985	1	LIGHT, WHITE INDICATOR (POWER ON)
18	39226618	1	HOURMETER (60HZ ONLY)
	39233382	1	HOURMETER (50HZ ONLY)
18A	39127295	2	SCREW
19	95361390	1	ELBOW, CONDUIT

39872023
REV 02





Piping Assembly

30 HP Piping

Ref. No.	Part Number	Qty.	Description
1	xxxxxxxx	1	AIREND
2	39317870	2	ELBOW, TUBE
3	39796479	1	TUBE, FEMALE INJECTION
4	39111703	2	ELBOW, TUBE
5	39128624	2	CONNECTOR, TUBE
6	39871926	1	TUBE, SCAVENGE
7	39870795	1	TUBE, AIREND-SEPARATOR
8	39870803	1	TUBE, INLET VALVE-AFTERCOOLER
9	39878053	1	ELBOW, TUBE
10	39156435	1	CONNECTOR (BASE MOUNT)
	39184510	1	PLUG (TANK MOUNT)
11	42410761	1	VALVE, INLET
11A	39139266	7	SCREW
12	95000089	1	O-RING, ADAPTER PLATE
13	39869045	1	ADAPTER, INLET VALVE TO AIREND
13A	39185293	6	SCREW
14	39496591	1	GASKET, AIREND
15	39304332	1	CLAMP, AIR FILTER
16	39582721	1	FILTER, AIR
17	39870829	1	TUBE, SEPARATOR TUBE-INLET VALVE
18	39316203	1	VALVE, LOAD SOLENOID
19	39871876	1	TUBE, SCAVENGE
20	39303219	1	ORIFICE, CHECK-VALVE-FILTER
21	39124813	10”	TUBING
22	39155577	1	ELBOW, TUBE
23	39156393	1	CONNECTOR, TUBE
24	39870811	1	TUBE, OIL FEED
25	39796453	1	TUBE, REAR BEARING FEED
26	39180872	1	CAP
27	39476817	1	MANIFOLD, OIL FEED
28	95938965	1	PLUG
29	39477005	1	CONNECTOR
30	39139332	60”	CONDUIT, FLEX (NEMA 1)
	39132261	60”	CONDUIT, SEALTITE (NEMA 4)
31	39479431	1	CONNECTOR, CONDUIT (NEMA 1)
	95361390	1	CONNECTOR, CONDUIT (NEMA 4)
32	95952388	1	COUPLING
33	39114079	1	LOCKNUT (NEMA 1)
	39108949	1	LOCKNUT (NEMA 4)
34	39416128	1	SWITCH, HIGH AIR TEMPERATURE
35	39404165	1	O-RING
36	39848148	1	TUBE, FRONT BEARING FEED

20-25 HP Piping

Ref. No.	Part Number	Qty.	Description
1	xxxxxxxx	1	AIREND
2	39111745	1	CONNECTOR, TUBE
3	39871884	1	TUBE, SCAVENGE
4	39171517	1	ELBOW, TUBE
5	39870886	1	TUBE, OIL FEED
6	39870894	1	TUBE, INLET VALVE-AFTERCOOLER
7	39878053	1	ELBOW, TUBE
8	39156435	1	CONNECTOR (BASE MOUNT)
	39184510	1	PLUG (TANK MOUNT)
9	42410761	1	VALVE, INLET
9A	39139266	7	SCREW
10	95000089	1	O-RING, ADAPTER PLATE
11	39869045	1	ADAPTER, INLET VALVE TO AIREND
11A	39185293	6	SCREW
12	39496591	1	GASKET, AIREND
13	39304332	1	CLAMP, AIR FILTER
14	39582721	1	FILTER, AIR
15	39128624	1	CONNECTOR, TUBE
16	39870878	1	TUBE, SEPARATOR TUBE-INLET VALVE
17	39111703	1	ELBOW, TUBE
18	39316203	1	VALVE, LOAD SOLENOID
19	39871876	1	TUBE, SCAVENGE
20	39303219	1	ORIFICE, CHECK-VALVE-FILTER
21	39124813	10”	TUBING
22	39155577	1	ELBOW, TUBE
23	39156393	1	CONNECTOR, TUBE
24	39139332	60”	CONDUIT, FLEX (NEMA 1)
	39132261	60”	CONDUIT, SEALTITE (NEMA 4)
25	39479431	1	CONNECTOR, CONDUIT (NEMA 1)
	95361390	1	CONNECTOR, CONDUIT (NEMA 4)
26	95952388	1	COUPLING
27	39114079	1	LOCKNUT (NEMA 1)
	39108949	1	LOCKNUT (NEMA 4)
28	39416128	1	SWITCH, HIGH AIR TEMPERATURE
29	39404165	1	O-RING
30	39870902	1	TUBE, AIREND-SEPARATOR TUBE
31	39317250	1	CONNECTOR, TUBE

O-Rings

Part No.	For SAE Thread Size	Tubing Size
39404157	7/16-20	1/4
39404132	9/16-18	3/8
39404165	3/4-16	1/2
39437074	7/8-14	5/8
39407531	1-1/16-12	3/4
39404173	1-5/16-12	1
39404140	1-5/8-12	1-1/4
39406996	1-7/8-12	1-1/2
39410279	2-1/2-12	2

7.3 RECOMMENDED SPARE PARTS

COMPRESSOR PART DESCRIPTION	I-R PART NO.	QTY PER UNIT
KIT, MAINTENANCE (W/ ROTALUBE 1000 COOLANT)	42413114	1
KIT, MAINTENANCE (W/ ULTRA COOLANT)	42420307	1
FILTER, AIR	39582721	1
FILTER, COOLANT	92740950	1
KIT, COOLANT SEPARATOR ELEMENT	42412452	1
COOLANT, ROTALUBE 1000 (4 X 1 GAL)	39236328	1
ULTRA COOLANT (5 GAL)	39433735	1
VALVE, INLET CONTROL (ICV3)	42410761	1
KIT, COMPLETE REBUILD (ICV3)	42421347	1
KIT, DIAPHRAGM REPLACEMENT (ICV3)	42421354	1
VALVE, LOAD SOLENOID (1SV)	39316203	1
DRIVE BELT, 80” (20,25 30 HP/60Hz; 20,30 HP/50Hz)	39236492	*
DRIVE BELT, 90” (25 HP/50Hz)	39243894	3
SWITCH, HIGH AIR TEMPERATURE (HATS)	39416128	1
COOLER, COOLANT / AFTERCOOLER	39843735	1
FAN, COOLING	39878913	1
ELEMENT, THERMOSTATIC CONTROL (170°F)	39441944	1
ORIFICE/FILTER/CHECK VALVE, SCAVENGE	39303219	1
SWITCH, START / STOP (1SS)	39219332	1
SWITCH, LINE PRESSURE (NEMA 1)	39100029	1
SWITCH, LINE PRESSURE (NEMA 4)	39201884	1
CONTACT, AUXILIARY (1Ma & 2Ma - FOR SIZE F & K CONTACTORS)	39240064	1
CONTACT, AUXILIARY (1Ma & 2Ma - FOR SIZE N CONTACTOR)	39245337	1
HOURMETER (60 HZ)	39226618	1
HOURMETER (50 HZ)	39233382	1
VALVE, PRESSURE RELIEF-SEPARATOR TUBE (EP/HP MODELS)	39121256	1
VALVE, PRESSURE RELIEF-RECEIVER TANK (EP/HP MODELS)	39121256	1
GAUGE, PRESSURE(psig, kg/cm2)	95295986	1
GAUGE, PRESSURE(psig, kPa)	39315700	1
VALVE, CONTROL SOLENOID (1SV)	39316203	1
FUSE, 6.25A (1FU/2FU)	39231915	2
FUSE, 8.0A (3FU)	39231899	1
TRANSFORMER, CONTROL CIRCUIT (200/230/460/575V-50/60Hz)	39318845	1
TRANSFORMER, CONTROL CIRCUIT (220/380/415/550V-50/60Hz)	39318852	1
RELAY, AUTO RESTART TIME DELAY (1TD)	35258508	1
SOCKET, RELAY (FOR 1TD)	35245224	1
RELAY, CONTROL(1CR)	39403290	1
SOCKET, RELAY(FOR 1CR)	39125091	1
LIGHT, AMBER INDICATOR (AUTO RESTART)	39242268	1
LIGHT, WHITE INDICATOR (POWER ON)	39243985	1
KIT, SHAFT SEAL REPLACEMENT (20/25 HP)	42370353	1
KIT, SHAFT SEAL REPLACEMENT (30 HP)	39699418	1
SET, DECAL ENGLISH	39235288	1
SPANISH	39239447	
PORTUGUESE	39239454	

*QUANTITY VARIES PER MACHINE. CONTACT YOUR LOCAL DISTRIBUTOR.

7.3 RECOMMENDED SPARE PARTS (CONTINUED)

COMPRESSOR PART DESCRIPTION	I-R PART NO.	QTY PER UNIT
FULL VOLTAGE STARTER PARTS		
SIZE K		
CONTACTOR, STARTER(1M) - SIZE K	39237318	1
KIT, STARTER CONTACT (SIZE K)	39237250	1
COIL STARTER (SIZE K)	39237292	1
RELAY, STARTER OVERLOAD (SIZE K)	39237342	1
SIZE N		
CONTACTOR, STARTER(1M) - SIZE N	39237334	1
KIT, STARTER CONTACT (SIZE N)	39237276	1
COIL STARTER (SIZE N)	39237300	1
RELAY, STARTER OVERLOAD (SIZE N)	39237367	1
STAR DELTA STARTER PARTS		
SIZE F		
CONTACTOR, STARTER(1M) - SIZE F	39239850	1
CONTACTOR, STARTER REVERSING (1S, 2M)	39239868	1
KIT, STARTER CONTACT (SIZE F)	**	1
COIL STARTER (SIZE F)	39226592	1
RELAY, STARTER OVERLOAD (SIZE F)	39214986	1
RELAY, STAR-DELTA TIMER(1TR)	35249754	1
SOCKET, RELAY (FOR 1TR)	35245224	1
SIZE K		
CONTACTOR, STARTER(1M) - SIZE K	39237318	1
KIT, STARTER CONTACT (SIZE K)	39237250	1
COIL STARTER (SIZE K)	39237292	1
RELAY, STARTER OVERLOAD (SIZE K)	39237342	1
RELAY, STARTER OVERLOAD (SIZE N)	39237367	1
RELAY, STAR-DELTA TIMER (1TR)	35249754	1
SOCKET, RELAY (FOR 1TR)	35245224	1

**PURCHASE COMPLETE CONTACTOR ASSEMBLY.

8.0 MAINTENANCE RECORD

DATE	RUN TIME (HOURS)	WORK DONE	QTY.	UNIT MEASURE	WORK BY

MAINTENANCE RECORD

DATE	RUN TIME (HOURS)	WORK DONE	QTY.	UNIT MEASURE	WORK BY