

OPERATION, MAINTENANCE, PARTS MANUAL



Doosan Infracore
Portable Power

VHP400CMH-1700 (871)
VHP500CMH-2100 (866)
VHP550CMH-2100 (872)
VHP550CMH-2300 (873)
HP600CMH-2300 (875)
XP650CMH-2500 (876)

COMPRESSOR MODULE MODELS

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This manual contains important safety information.

Do not destroy this manual.

This manual must be available to the personnel who operate and maintain this machine.

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Quality Policy

We will supply products and services that consistently meet the requirements of our customers and each other.

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SECTION 1 – SAFETY

General Information

Never operate unit without first observing all safety warnings and carefully reading the operation and maintenance manual shipped from the factory with this machine.

Ensure that the operator reads and understands the decals and consults the manuals before maintenance or operation.

Ensure that maintenance personnel are adequately trained, competent and have read the Maintenance Manuals.

Make sure that all protective covers are in place and that the canopy/doors are closed during operation.

The specification of this machine is such that the machine is not suitable for use in flammable gas risk areas. If such an application is required then all local regulations, codes of practice and site rules must be observed. To ensure that the machine can operate in a safe and reliable manner, additional equipment such as gas detection, exhaust spark arrestors, and intake (shut-off) valves may be required, dependant on local regulations or the degree of risk involved.

A weekly visual check must be made on all fasteners/fixing screws securing mechanical parts. In particular, safety-related parts such as coupling hitch, drawbar components, road-wheels, and lifting bail should be checked for total security.

All components which are loose, damaged or unserviceable, must be rectified without delay.

Air discharged from this machine may contain carbon monoxide or other contaminants which will cause serious injury or death. Do not breathe this air.

This machine produces loud noise with the doors open or service valve vented. Extended exposure to loud noise can cause hearing loss. Always wear hearing protection when doors are open or service valve is vented.

Never inspect or service unit without first disabling to prevent accidental starting.

Do not use petroleum products (solvents or fuels) under high pressure as this can penetrate the skin and result in serious illness. wear eye protection while cleaning unit with compressed air to prevent debris from injuring eye(s).

Rotating fan blade can cause serious injury. Do not operate without guard in place.

Use care to avoid contacting hot surfaces (engine exhaust manifold and piping, air receiver and air discharge piping, etc.).

Compressed Air

Compressed air can be dangerous if incorrectly handled. Before doing any work on the unit, ensure that all pressure is vented from the system and that the machine cannot be started accidentally.

Ensure that the machine is operating at the rated pressure and that the rated pressure is known to all relevant personnel.

All air pressure equipment installed in or connected to the machine must have safe working pressure ratings of at least the machines safety valve setting.

If more than one compressor is connected to one common downstream plant, effective check valves and isolation valves must be fitted and controlled by work procedures, so that one machine cannot accidentally be pressurized/over pressurized by another.

High Pressure Air can cause serious injury or death. Relieve pressure before removing filler plugs/caps, fittings or covers.

Air pressure can remain trapped in air supply line which can result in serious injury or death. Always carefully vent air supply line at tool or vent valve before performing any service.

The discharged air contains a very small percentage of compressor lubricating oil and care should be taken to ensure that downstream equipment is compatible.

If the discharged air is to be ultimately released into a confined space, adequate ventilation must be provided.

When using compressed air always use appropriate personal protective equipment.

All pressure containing parts, especially flexible hoses and their couplings, must be regularly inspected, be free from defects and be replaced according to the Manual instructions.

Avoid bodily contact with compressed air.

The safety valve located in the separator tank must be checked periodically for correct operation.

Whenever the machine is stopped, air will flow back into the compressor system from devices or systems downstream of the machine unless the service valve is closed. Install a check valve at the machine service valve to prevent reverse flow in the event of an unexpected shutdown when the service valve is open.

Disconnected air hoses whip and can cause serious injury or death. Always attach a safety flow restrictor to each hose at the source of supply or branch line in accordance with OSHA Regulation 29CFR Section 1926.302(b).

Never allow the unit to sit stopped with pressure in the receiver-separator system.

IMPORTANT SAFETY INSTRUCTIONS

Following are typical decals on machines, which point out potential hazards and tells how to avoid the Hazard. Read and understand thoroughly. Heed warnings and follow instructions.

If you do not understand, inform your supervisor.



(Red background)

Indicates the presence of a hazard which **WILL** cause *severe* injury or death, if ignored.



(Orange background)

Indicates the presence of a hazard which **CAN** cause *severe* injury or death, if ignored.



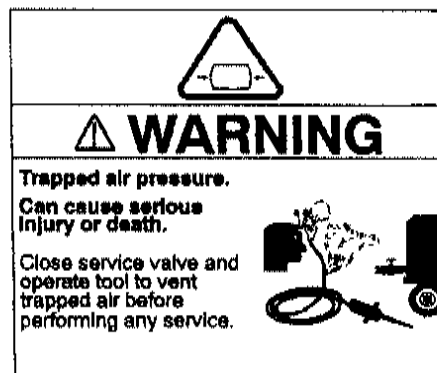
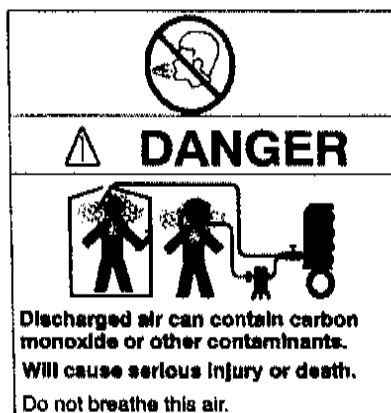
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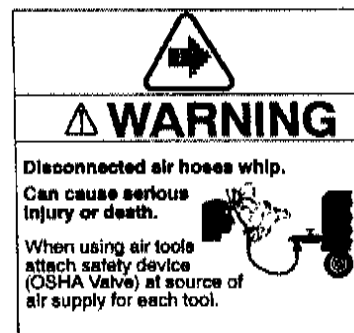
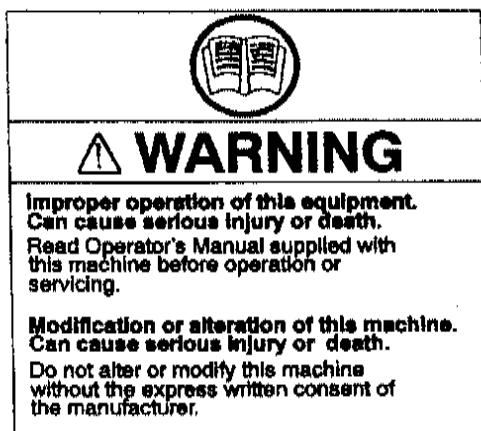
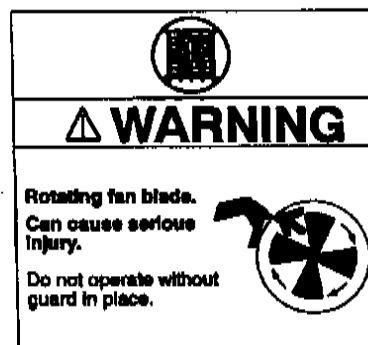
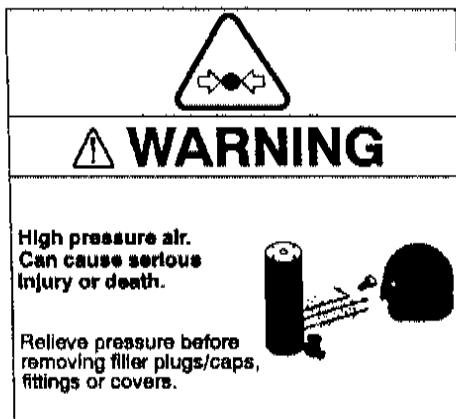
Indicates the presence of a hazard which **WILL** or **CAN** cause minor injury or property damage, if ignored.



(Blue background)

Indicates important setup, operating or maintenance information.





MARKINGS AND DECALS

Do not paint over safety warnings or instructional decals. If safety warning decals become illegible, immediately order replacements from the factory.

Part numbers for original individual decals and their mounting locations are shown within Parts List. These are available as long as a particular model is in production.

Afterwards, service sets of exterior decals and current production safety warning decals are available. Contact the Product Support Group at Mocksville for your particular needs and availability.

FREE SAFETY DECALS

Safety Decals are available **free** of charge.

Safety decals are identified by the decal heading:

DANGER, WARNING or CAUTION.

Decal part numbers are on the bottom of each decal and are listed in the parts manual. Help promote product safety! Assure that decals are present on the machines. Replace decals that are not readable.

SECTION 2 - WARRANTY

Ingersoll-Rand, through its distributors, warrants to the initial user that each portable air compressor manufactured by it, will be free of defects in material and workmanship for a period of the earlier of twelve (12) months from shipment to or the accumulation of 2,000 hours of service by the initial user.

Portable compressor airends will be free of defects in material and workmanship for a period of the earlier of twenty four months from shipment to or the accumulation of 4,000 hours of service by the initial user. The warranty against defects will include replacement of the complete airend, provided the original airend is returned assembled and unopened.

Portable Compressor Airend Limited Optional Warranty - The earlier of sixty (60) months from shipment to or the accumulation of 10,000 hours of service. The optional warranty is limited to defects in rotors, housings, bearings and gears and provided all the following conditions are met:

1. The original air end is returned assembled and unopened.
2. Continued use of genuine Ingersoll-Rand parts, fluids, oil and filters.
3. Maintenance is performed at prescribed intervals.

Oil-Free airends are fee-based and may require a maintenance agreement. Formal enrollment is required.

Ingersoll-Rand will provide a new part or repaired part, at its election, in place of any part, which is found upon its inspection to be defective in material and workmanship during the period prescribed above. Such part will be repaired or replaced without charge to the initial user during normal working hours at the place of business of an Ingersoll-Rand distributor authorized to sell the type of equipment involved or other establishment authorized by Ingersoll-Rand. User must present proof of purchase at the time of exercising warranty.

The above warranty does not apply to failures occurring as a result of abuse; misuse, negligent repairs, corrosion, erosion and normal wear and tear, alterations or modifications made to the product without express written consent of Ingersoll-Rand; or failure to follow the recommended operating practices and maintenance procedures as provided in the product's operating and maintenance publications.

Accessories or equipment furnished by Ingersoll-Rand, but manufactured by others, including, but not limited to, engines, shall carry whatever warranty the manufacturers have conveyed to Ingersoll-Rand and which can be passed on to the initial user.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, (EXCEPT THAT OF TITLE), AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

SECTION 3 - WARRANTY REGISTRATION

Complete Machine Registration

Machines shipped to locations within the United States do not require a warranty registration unless the machine status changes (i.e. change of ownership).

Machines shipped outside the United States require notification be made to initiate the machine warranty.



Fill out the Warranty Registration Form in this section, keep a copy for your records and mail form to:

Ingersoll-Rand Company
Portable Compressor Division
P.O. Box 668
Mocksville, North Carolina 27028

Attn: Warranty Department

Note: Completion of this form validates the warranty.

INGERSOLL-RAND®

AIR COMPRESSORS

Warranty Registration Form

Completion of this form validates the warranty

Selling Distributor		Servicing Distributor		WARRANTY REGISTRATION	
Name	_____	Name	_____	Owner/User Name	_____
Address	_____	Address	_____	Address	_____
City	_____	City	_____	City	_____
County	_____	County	_____	County	_____
State	_____	State	_____	State	_____
Zip Code	_____	Zip Code	_____	Zip Code	_____
Telephone	_____	Telephone	_____	Telephone	_____

Complete the Applicable Blocks

Owner/User Type of Business (check one only)

☐ Construction-Heavy (highway, excavation, etc.)	☐ Asphalt Contractor	☐ Coal Mining	☐ Other Mining
☐ Construction-Light (carpentry, plumbing, pools mason, etc.)	☐ Government (municipal, state, county, etc.)	☐ Quarry	☐ Shallow Oil & Gas
☐ Rental (rental center, rental fleet, etc.)	☐ Building Contractor	☐ Waterwell	☐ Utility Company (gas, electric, water, etc.)
☐ Industrial (plant use)	☐ Other specify _____	☐ Exploration	☐ Utility Contractor

Model _____	Unit S/N _____	Engine S/N _____	Date Delivered _____
Unit-Hours _____	Airend S/N _____	Truck S/N _____	Truck Engine S/N _____

SERVICING DISTRIBUTOR/USER ACKNOWLEDGMENT

- 1 The Purchaser has been instructed and/or has read the manual and understands proper preventative maintenance, general operation and safety precautions.
- 2 The warranty and limitation of liability has been reviewed and understood by the owner/user.
- 3 In the event that this unit is to be used within a nuclear facility, the owner/user shall notify Ingersoll-Rand of such use so that Ingersoll-Rand may arrange for appropriate nuclear liability protection from the owner-licensee of the facility.
- 4 Ingersoll-Rand reserves the right to make design changes or modifications of Ingersoll-Rand products at anytime without incurring any obligation to make similar changes or modifications on previously sold units.

I hereby acknowledge acceptance of above.

Owner/User _____ Date _____

I hereby certify that the above is accurate and complete.

Distributor/I-R Rep. _____ Date _____

Attention: Warranty Department

Ingersoll-Rand Company
Portable Compressor Division
P. O. Box 868
Mocksville, NC 27028

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SECTION 4 – SYSTEM DESCRIPTION

General

The CMH air compressors are semi-packaged, air cooled units designed for power take-off applications. Each unit is designed to operate at ambient temperatures from - 10°F to 125°F (-23.3°C to 51.7°C). For the actual delivery of each unit at its rated operating pressure, refer to the typical General Data Decal supplied with each unit, and to the table in Section 5.

The unit includes an oil flooded, rotary, screw-type air compressor, a compressor inlet system, a capacity control system, a compressor lubricating oil system, a compressor discharge system as well as basic instrumentation. The compressor inlet system includes an air intake cleaner with a service indicator. The capacity control system includes a pressure regulator linked to a compressor inlet unloader valve. The compressor lubricating oil system includes an air-cooled type oil cooler, an oil filter, and oil control valve and an oil separator tank and air receiver. The oil cooler is of the fin and tube-type construction that requires forced draft cooling air. Basic instrumentation includes compressor discharge air pressure and temperature gauges, and air cleaner restriction indicator.

The enclosure cabinet, in which most of the components are mounted, is of heavy gauge sheet steel and is equipped with easy opening access panels for performing routine maintenance functions. Most routine service can be performed without removing any panels.

Compression in the screw-type air compressor is created by the meshing of two sets of helical rotors (male and female) on parallel shafts enclosed in a heavy-duty cast iron housing with air inlet and outlet ports located at opposite ends. The male rotor has four lobes, 90 degrees apart and the female rotor has six grooves 60 degrees apart. The grooves of the female rotor mesh with and are driven by the male rotor. Thrust taper roller bearings at the rear of the air end prevent longitudinal movement of the rotors. As rotation of the compressor occurs, the rotors unmesh and free air is drawn into the cavities or pockets between the male rotor lobes and the grooves of the female rotor. The air is trapped in these pockets and follows the direction of rotation of each rotor. As soon as the inlet port is closed, the compression cycle begins and the trapped air is directed to the opposite or discharge side of the rotor housing. As the rotors mesh, the normal free volume of air is decreased and the pressure increased until the closing pocket reaches the discharge port. Cooled lubricating oil is admitted to the compressor by being injected, in metered amounts, directly into the rotor housing so that it passes on with the air being compressed. This removes the heat of compression to a large degree and results in a relatively low, final discharge air temperature.

Since the CMH Series compressor is of the positive displacement type, an air flow control system must be provided to regulate the volume of air passing through the compressor to match the amount of service air required by the customer.

Constant speed control unloads the compressor at a predetermined pressure while the driving unit continues to operate at full speed. This is accomplished by an air operated regulator closing off the intake to the compressor in an infinitely variable or stepless manner through the inlet unloader valve.

The discharge air pressure can be controlled between 77 and 200 psig (531 to 1379 kPa) by simple readjustment of the speed and pressure regulator adjusting screw.

SECTION 5 - INSTALLATION

Location

After the type of drive is determined, satisfactory installation depends upon the ability of the installer. Refer to the appropriate foundation plan for the dimensions of the compressor package and the appropriate separator foundation plan for the dimensions of the combination primary oil separator tank-air receiver and the secondary separator tank (hereafter called the receiver separator).

Choose a clean, relatively cool location for the compressor package, and provide ample space around the unit for general accessibility and to ensure effective heat dissipation. Extreme care must be taken in locating an air-cooled unit of this type so there is an unrestricted supply of air to the cooling fan, which pulls air over the oil cooler core. The fan discharge air must flow away from the unit so that it may be readily dissipated to atmosphere without recirculating hot air to the fan intake. Any recirculation of the cooling air may result in an excessively high compressor operating temperature. The compressor package must be located so the compressor discharge temperature gauge and the air cleaner service indicator will be fully visible. Included with the compressor package is a compressor discharge pressure gauge and a discharge temperature gauge.

For the installation of the receiver separator, choose a location that is on the same level as or lower than the compressor package. Ample space must be provided around the receiver to ensure the proper installation of all piping connections. In addition, the receiver separator must be located so that the separator element may be removed for inspection and service. Refer to the appropriate separator foundation plan.

A condensate drain valve is factory supplied with the receiver separator. When installing the receiver separator, provision should be made for easy access to this drain valve as it will be necessary to drain the condensate daily before starting the unit.

NOTE

The condensate drain valve and line must be located as the lowest point in the lubricating and cooling oil system for proper condensate removal.

The valve may also be used as a service valve for draining the lubricating and cooling oil at periodic change intervals.

Exact level is not absolutely necessary, but it is recommended the unit be leveled with a sight glass or a carpenter's level set on the compressor housing. Leveling may be accomplished by shimming the unit near the unit's bolting holes. Be sure to use steel shims. Mounting holes are provided on the bottom of the base and weld nuts are provided on the sides of the frame. Either may be used for mounting.

Inlet Piping

Each unit is supplied with standard air cleaners to protect the compressor from normal air-borne dust and dirt. If necessary, the air cleaners may be removed and remotely mounted for ease in accessibility.

PIPING

General

As CMH Series compressors are comprised of two modules (compressor and separator), there is necessarily interconnecting piping between the two. These hoses are not provided with the units, as the required lengths of the hoses are dependent on the relative location of the two modules in their installed location. It is left to the installer to obtain hoses of the correct type and length for each installation.

The following hoses will be needed:

LOCATION	SIZE	HOSE TYPE
Compressor Module to Oil Temp Bypass Valve Outlet (Filter)	-12 JIC	Parker-Hannifin 213, or Aeroquip FC350, or equivalent
Compressor Module to Hydraulic Supply	-12 JIC	Parker-Hannifin 301 or equivalent
Compressor Module to Hydraulic Return	-12 JIC	Parker-Hannifin 301 or equivalent
Compressor Module to Case Drain Return	-6 JIC	Parker-Hannifin 213, or Aeroquip FC350, or equivalent
Compressor Module to Separator Scavenge	-4 JIC	Parker-Hannifin 213, or Aeroquip FC350, or equivalent
Compressor Module to Air Pressure Regulator Outlet	-6 JIC	Parker-Hannifin 213, or Aeroquip FC350, or equivalent
Compressor Module to Separator Discharge	-6 JIC	Parker-Hannifin 213, or Aeroquip FC350, or equivalent
Compressor Module to Oil Cooler Drain	-6 JIC	Parker-Hannifin 213, or Aeroquip FC350, or equivalent
Oil Cooler to Oil Temp Bypass Valve Port "B"	-24 JIC	Parker-Hannifin 206, or Aeroquip FC300, or equivalent
Oil Cooler to Oil Temp Bypass Valve Port "C"	-24 JIC	Parker-Hannifin 206, or Aeroquip FC300, or equivalent
Airend Discharge to Receiver/Separator Inlet	-32 JIC	Parker-Hannifin 206, or Aeroquip FC300, or equivalent

NOTES:

1. All hoses terminate at marked bulkhead fittings on drive end of machine, except oil cooler connections, which are on the cooler side of the compressor module.
2. All hoses terminate in Type I (SAE J516 female swivel straight), 37° JIC flare fittings on each end.
3. Ports "B" and "C" on oil temperature bypass valve can be connected to either port on the oil cooler. Oil cooler performance is not sensitive to flow direction.
4. 2 inch NPT to -32 JIC adapter and fitting for airend discharge pipe is customer supplied.

Compressor Discharge Piping

The connection between the compressor package and the receiver separator must be furnished by the customer. It is recommended the customer use a flexible line with an inside diameter of the same size, or larger than the compressor package discharge connection. All piping must be certified safe for the pressures and temperatures involved.

Receiver separator Discharge Piping

The receiver separator discharge piping must be furnished by the customer. Refer to the appropriate separator fitting location for a typical piping arrangement for these units. A minimum pressure valve and a manual shut-off valve is supplied with each unit and must be piped into the customer's system as indicated. The minimum pressure valve is supplied to maintain approximately 77 psig (531 kPa) in the air receiver tank to ensure proper oil circulation and also to prevent excessive oil carryover into the customer's air service system. The manual shut-off valve must be installed between the minimum pressure valve and the customer's air service system to serve as an isolation valve.

In addition, whenever this unit is connected to a high volume customer's service air system, a terminal check valve must also be installed downstream of the minimum pressure valve and the isolation valve to prevent air from the system from bleeding back into the compressor system on shutdown.

Wiring

The compressor is protected against overheating by a thermal-type discharge air temperature switch located in the compressor discharge piping. A "normally-closed" type thermal switch, factory set at 248°F (120°C), is supplied as standard equipment on these units. This switch is supplied for 12/24 volt DC. As an option, this switch may be supplied for 125 volt AC. A thermal sensor switch, also set at 248°F (120°C), normally closed, is provided as extra protection in the receiver separator. It is to be wired in series with the airend temperature switch by the user. This switch is supplied for 12/24 volts DC, with optional AC switches available as an option.

Driver

The installation of a CMH Series Compressor with any drive such as a power take-off drive or a hydraulic motor drive is very flexible. The proper rotation of the compressor is clockwise when viewed from the driver end.

NOTE

Because the compressor is of the axial screw type, the rotation cannot be changed.

MODELS	CAPACITY		TORQUE REQUIRED		POWER REQUIRED		INPUT RPM	PRESSURE PSI
	CFM	M ³ /MIN.	POUND - FEET	NM	BHP	KILOWATTS		
VHP400CMH	400	11.3	454	616	147	110	1700	200
VHP500CMH	500	14.2	460	624	184	137	2100	200
VHP550CMH	550	15.6	483	654	193	144	2100	175
VHP550CMH	550	15.6	441	598	193	144	2300	175
HP600CMH	600	17.0	413	560	181	135	2300	150
XP650CMH	650	18.4	376	510	179	133	2500	125

This unit is normally driven by a hydraulic motor directly mounted to the SAE adapter attached to the airend. The standard interface is for 1.75", 13 tooth, 8-16 DP/30° splined shaft. Mounting flange is SAE "D". Alternatively, SAE "C" is available.

A drive shaft from the source of power take-off can alternatively be used to drive the compressor. It is extremely important that the angularity of the drive shaft, including the universal joints, be within the limits specified by the manufacturer. The power take-off shaft and the compressor rotor drive shaft must always be parallel. This gives the same angle at each universal joint and prevents excessive wear. The forks of the universal joint on the drive end must be installed parallel to the forks on the driven and universal. There are many types of universal joints that can be used. However, a constant velocity universal joint as previously described will reduce the possibility of torsional vibration. If a slip joint or spline is used on the drive system, it should be placed between the two universal joints for best results.

Regulation

The standard regulation system supplied with CMH Series Compressors is designed to provide capacity control for the compressor only. Variable speed control of a driver engine is possible with additional equipment. Consult Ingersoll-Rand Company, Specialty Products Department for technical assistance for these applications.

The adjustment and operation of the standard regulation system is described in Section 6, Operating Instructions.

SECTION 6 - OPERATING INSTRUCTIONS

SETTING-UP

- Place the unit in an open, well-ventilated area. Position as level as possible. The design of these units permits a 15 degree limit on out-of-level operation.
- When the unit is to be operated out-of-level, it is important to have the compressor oil level gauge show no more than mid-scale (with the unit running at full load). Do not overfill either the engine crankcase or the compressor lubricating oil system.

PROCEDURE FOR AIREND OIL PRIMING

(TO BE PERFORMED PRIOR TO INITIAL START-UP)

AIREND SIZE	QUANTITY OF OIL INJECTED (GALLONS/LITERS)	
	METHOD A	METHOD B
85MM	0.5 / 2	1.0 / 4
CF75	0.5 / 2	1.0 / 4
100MM	0.5 / 2	1.0 / 4
CF90	0.5 / 2	1.0 / 4
127.5MM	0.5 / 2	1.0 / 4
178.5MM	1.0 / 4	2.0 / 8
226MM	1.8 / 7	3.6 / 14
285MM	3.0 / 11	6.0 / 23
350MM	4.0 / 15	8.0 / 30

Notes:

- All airends are to be primed with oil before the first start of the unit. The prime oil quantity is part of the total fill quantity of the unit.

The priming of single stage airends can be done by either of the two following methods:

- Disconnect main oil supply hose that goes from the oil filter outlet to the airend and inject oil directly into this hose to the airend.
- Disconnect the separator tank scavenge hose that leads to the oil filter and inject oil into the filter.

- The chart shows minimum fill requirements.
- HR2: Disconnect the hose going to the seal and inject 7 gallons (26L) into the manifold tubing.

--HR2.5: Remove cap on manifold tube between pump and filter and inject 7 gallons (26L) into the manifold tubing.

BEFORE STARTING

CAUTION

Do not connect the air discharge on this unit into a common header with any other unit of any description, or any other source of compressed air, without first making sure a check valve is used between the header and the unit. If this unit is connected in parallel with another unit of higher discharge pressure and capacity, a safety hazard could occur in a back-flow condition.

Safety valve setting is 250 psig (1724 kPa). Assure external air system is safe under all operating conditions to prevent serious hazard to operations personnel.

WARNING

Unrestricted air flow from a hose will result in a whipping motion of the hose which can cause severe injury or death. A safety device must be attached to the hose at the source of supply to reduce pressure in case of hose failure or other sudden pressure release. Reference: OSHA regulation 29 CFR Section 1926.302 (b).

- Open manual blow-down valve to ensure pressure is relieved in receiver separator system. Close valve in order to build up full air pressure and ensure proper oil circulation.
- Check the compressor lubricating oil level. The proper oil level is mid-way on the sight gauge. Add oil if the level falls to the bottom of the sight gauge. Do not overfill.

WARNING

This machine produces loud noise. Extended exposure to loud noise can cause hearing loss. Wear hearing protection when valve(s) are open.

Always operate this equipment with all enclosure panels installed to avoid recirculation of hot air. This will maximize the life of the compressor. Be sure no one is IN or ON the compressor unit.

WARNING

Do NOT operate machine with guards removed.

CAUTION

Do NOT operate machine with safety shutdown switches bypassed.

STARTING/OPERATING

- Close service valve.
- Engage hydraulic fan.
- Engage main driver.
- Allow compressor to run unloaded five (5) to ten (10) minutes.
- Compressor is now ready to furnish compressed air when service valve is opened.

STOPPING

- Close air service valve(s).
- Allow the unit to run at "no load" for 3 to 5 minutes to reduce the compressor temperature.
- Disengage main driver.
- Disengage hydraulic fan.

NOTE: Once the drive motor stops, the automatic blow-down valve will begin to relieve all pressure from the receiver separator system.

CAUTION

1). Never allow the unit to sit stopped with pressure in the receiver separator system. As a precaution, after the automatic blow-down period (2 minutes), open the manual blow-down valve.

EQUIPMENT PROTECTION

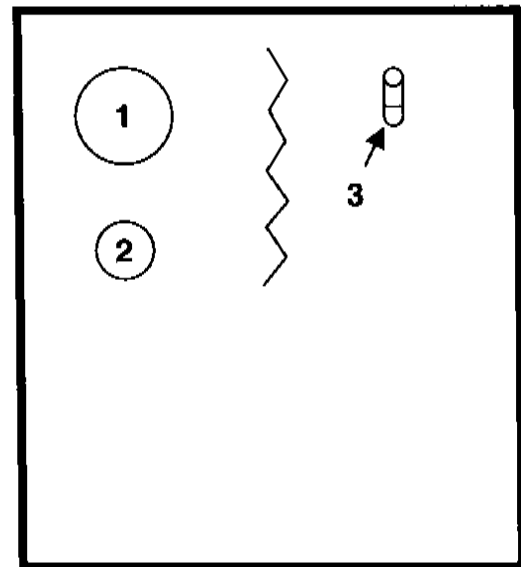
NOTE: Do NOT wire around or bypass a shutdown sensor or switch.

This unit is protected by two (2) shutdown switches at the following locations:

High Discharge Air Temperature-

- (1) At the air end outlet.
- (2) In the safety valve connection on the separator tank.

GAUGE PANEL



Operating Instruments

1. Compressor Discharge Pressure Gauge

Indicates pressure in receiver tank, psig (kPa).

2. Discharge Air Temp. Gauge

Indicates discharge air temperature in °F and °C. Normal operating range: 185°F/85°C to 248°F/120°C.

3. Air Filter Restriction Indicator

Indicates compressor air cleaner restriction. Normal operation (<25 in. H₂O), green flag. Needs service, (≥25 in. H₂O), red flag.

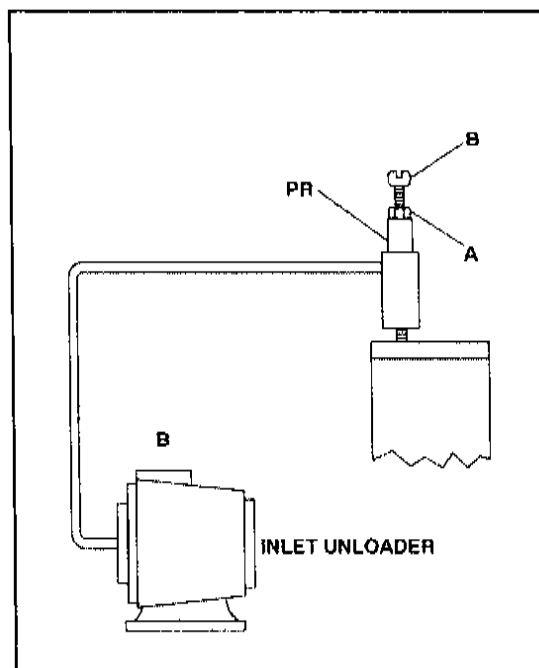
PRESSURE REGULATION ADJUSTING INSTRUCTIONS

Before Starting Unit:

1. Atop separator cover at pressure regulator (PR) loosen locknut (A) counterclockwise. Turn adjusting screw (B) counterclockwise one full turn.

After Starting Unit:

2. Allow unit to warm up.
3. Operate compressor at rated speed with service valve closed. Loosen locknut A. Adjust screw B. until discharge pressure gauge reads rated pressure + 20 psi (138kPa). Turn B. clockwise to *increase* pressure, counter clockwise to *decrease* pressure.
4. At pressure regulator (PR) tighten locknut (A).
5. To obtain maximum CFM at any pressure between 77 PSI (531kPa) and the rated operating pressure. Proceed as in step 3, substituting desired pressure for rated pressure, adding 20 psi (138kPa) as before. Always lock and protect pressure setting of adjusting screw (B) with locknut (A).



TROUBLESHOOTING

INTRODUCTION

Troubleshooting for a portable air compressor is an organized study of a particular problem or series of problems and a planned method of procedure for investigation and correction. The troubleshooting chart that follows includes some of the problems that an operator may encounter during the operation of a portable compressor.

The chart does not attempt to list all of the troubles that may occur, nor does it attempt to give all of the answers for correction of the problems. The chart does give those problems that are most apt to occur. To use the trouble shooting chart:

- A. Find the "complaint" depicted as a bold heading.
- B. Follow down that column to find the potential cause or causes. The causes are listed in order (1,2,3 etc.) to suggest an order to follow in trouble shooting.

ACTION PLAN

A. Think Before Acting

Study the problem thoroughly and ask yourself these questions:

- (1) What were the warning signals that preceded the trouble?
- (2) If the compressor will still operate, is it safe to continue operating it to make further checks?
- (3) Has similar trouble occurred before?
- (4) What previous maintenance work has been done?

B. Do the Simplest Things First

Most troubles are simple and easily corrected.

Always check the easiest and most obvious things first; following this simple rule will save time and trouble.

C. Double Check Before Disassembly

The source of most compressor troubles can be traced not to one component alone, but to the relationship of one component with another. Too often, a compressor can be partially disassembled in search of the cause of a certain trouble and all evidence is destroyed during disassembly. Check again to be sure an easy solution to the problem has not been overlooked.

D. Find And Correct Basic Cause

After a mechanical failure has been corrected, be sure to locate and correct the cause of the trouble so the same failure will not be repeated. A complaint of "premature breakdown" may be corrected by repairing any improper wiring connections, but something caused the defective wiring. The cause may be excessive vibration.

TROUBLESHOOTING CHART

Bold Headings depict the COMPLAINT - Subheadings depict the CAUSE

Note: Subheadings suggest order to follow in cause of troubleshooting.

Short Air Cleaner Life:

Dirty Operating Conditions
Inadequate Element Cleaning
Defective Service Indicator
Incorrect Stopping Procedure
Wrong Air Filter Element

Excessive Oil In Air:

High Oil Level
Out of Level > 15 degrees
Clogged Scavenge Orifice
Scavenge Tube Blocked
Defective Scavenge Check Valve
Sep. Tank Blown Down Too Quickly
Defective Minimum Pressure Valve

Will Not Unload:

Leaks in Regulator Piping
Incorrect Pressure Regulator Adjustment
Malfunctioning Pressure Regulator
Malfunctioning Inlet Unloader/Butterfly Valve
Ice in Regulation Lines/Orifice

Oil In Air Cleaner:

Incorrect Stopping Procedure

Safety Valve Relieves:

Leaks in Regulator Piping
Incorrect Pressure Regulator Adjustment
Malfunctioning Pressure Regulator
Malfunctioning Inlet Unloader/Butterfly Valve
Defective Separator Element
Ice in Regulation Lines/Orifice

Excessive Compressor Oil Temperature:

Ambient Temperature Too High
Out of Level > 15 degrees
Low Oil Level
Dirty Cooler
Dirty Operating Conditions
Operating Pressure Too High
Malfunctioning Thermostat
Defective Minimum Pressure Valve
Blocked or Restricted Oil Lines
Airend Malfunctioning
Compressor Oil Cooler Fan Running Too Slowly

Excessive Vibration:

Out of Balance Fan
Airend Malfunctioning
Damaged Motor to Airend Coupling

Low CFM:

Low Motor RPM
Dirty Air Filter
Incorrect Pressure Regulator Adjustment
Malfunctioning Inlet Unloader/Butterfly Valve
Defective Minimum Pressure Valve
Defective Separator Element

Unit Shutdown:

Compressor Oil Temp. Too High
Loose Wire Connection
Defective Discharge Air Temp. Switch
Airend Malfunctioning
Compressor Drive Motor Malfunctioning
Compressor Oil Cooler Fan Not Running or Running Too Slowly

Won't Start/Run

Malfunctioning Start Switch
Compressor Oil Temp. Too High
Compressor Drive Motor Malfunctioning
Airend Malfunctioning

SECTION 7 – GENERAL DATA

Models:

VHP400CMH	VHP500CMH	VHP550CMH	VHP550CMH	HP600CMH	XP650CMH
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Rated Delivery – CFM (litres/sec.)

400 (189)	500 (236)	550 (260)	550 (260)	600 (283)	650 (307)
-----------	-----------	-----------	-----------	-----------	-----------

Rated Pressure – PSI (kPa)

200 (1379)	200 (1379)	175 (1207)	175 (1207)	150 (1034)	125 (862)
------------	------------	------------	------------	------------	-----------

Input Power Requirements:

Horsepower
Speed (RPM)

152	189	198	198	186	184
1700	2100	2100	2300	2300	2500

Compressor Lube Capacity (Refill) – U.S. gal. (litres).....	10 (37.9)
Compressor Oil Filter Element	36860336
Compressor Oil Separator Element.....	36845469
Air Cleaner Element (Primary).....	35326230
Air Cleaner Element (Safety).....	35377696
Overall Length (Compressor Module) – inch (mm)	51.0 (1295)
Overall Height (Compressor Module) – inch (mm)	42.0 (1067)
Overall Width (Compressor Module) – inch (mm)	40.3 (1024)
Overall Length (Air Receiver Module) – inch (mm)	25.0 (635)
Overall Height (Air Receiver Module) – inch (mm)	48.6 (1234)
Overall Width (Air Receiver Module) – inch (mm)	22.5 (572)
Weight (Compressor Module) – pounds (kilograms)	1540 (699)
Weight (Air Receiver Module) – pounds (kilograms)	260 (118)
Weight (System with lubricants) – pounds (kilograms).....	1875 (850)

Mounting Interface – SAE “D” Flange

- 1.75 inch 13 tooth
- -8-16 DP/30° PA Splined Shaft

Cooling Fan Power Requirements:

- Hydraulic - 13.2 GPM @ 600 PSI (4.7 HP @ 1750 R.P.M.)
- (50.0 L.P.M. @ 4140 kPa)

Built by **INGERSOLL-RAND** Company, Mocksville, N.C. 27028 USA

SECTION 8 - MAINTENANCE

CAUTION

Any unauthorized modification or failure to maintain this equipment may make it unsafe and out of factory warranty.

WARNING

If performing more than visual inspections, disconnect driver engine battery cables and open manual blow-down valve.

Use extreme care to avoid contacting hot surfaces (heat exchange and piping, air receiver and air discharge piping, etc.).

Never operate this machine with any guards removed.

Inch and metric hardware was used in the design and assembly of this unit. Consult the parts manual for clarification of usage.

GENERAL

In addition to periodic inspections, many of the components in this unit require periodic servicing to provide maximum output and performance. Servicing may consist of pre-operation and post-operation procedures to be performed by the operating or maintenance personnel. The primary function of preventive maintenance is to prevent failure, and consequently, the need for repair. Preventive maintenance is the easiest and the least expensive type of maintenance. Maintaining your unit and keeping it clean at all times will facilitate servicing.

SCHEDULED MAINTENANCE

The maintenance schedule is based on normal operation of the unit. In the event unusual environmental operating conditions exist, the schedule should be adjusted accordingly.

COMPRESSOR OIL LEVEL

The oil level should be checked before the unit is operated. The optimum operating level is midway of the sight tube on the side of the receiver tank. See the decal beside the sight tube. If the oil level is not in the "OK" range, make appropriate corrections (Add or Drain). A totally filled sight tube in which the level is not visible indicates an over-full condition and requires that oil be drained.

AIR CLEANER

This unit is equipped with AIR FILTER RESTRICTION INDICATOR on the front panel, serving both compressor inlet air cleaners.

This should be checked daily during operation. If the indicator shows (red) with the unit operating at full speed, servicing of the cleaner element is necessary.

Also weekly, squeeze the rubber valve (pre-cleaner dirt dump) on each air cleaner housing to ensure that they are not clogged.

If flagged, the air filter restriction indicator must be reset after unit is shut down and the air cleaners are serviced. Reset by pushing button on top of indicator.

To service the air cleaners on all units proceed as follows:

1. Loosen outer wing nut and remove cover. Remove element.
2. Inspect air cleaner housing for any condition that might cause a leak and correct as necessary.
3. Wipe inside of air cleaner housing with a clean, damp cloth to remove any dirt accumulation, especially in the area where the element seals against the housing.
4. Inspect element by placing a bright light inside and rotating slowly. If any holes or tears are found in the paper, discard this element. If no ruptures are found, the element can be cleaned.
5. If a new air filter element is to be used check it closely for shipping damage.

6. Install cleaned or new elements in the reverse order to the above. Tighten wing nuts firmly and replace cotter pin.
7. Inspect to ensure that the end cap seals tightly 360 degrees around the air cleaner body.

In the event that the filter element must be reused immediately, compressed air cleaning (as follows) is recommended since the element must be thoroughly dry. Direct compressed air through the element in the direction opposite to the normal airflow through the element.

Move the nozzle up and down while rotating the element. Be sure to keep the nozzle at least one inch (25.4mm) from the pleated paper.

NOTE: To prevent damage to the element, never exceed a maximum air pressure of 100 psi (700 kPa).

In the event the element is contaminated with dry dirt, oil or greasy dirt deposits, and a new element is not available, cleaning can be accomplished by washing, using the air cleaner element manufacturer's recommendations.

NOTE: It is recommended that replacement elements be installed in the unit. The elements just removed for cleaning can be washed and stored as future replacement elements.

In addition, the air cleaner system (housing and piping) should be inspected every month for any leakage paths or inlet obstructions. Make sure the air cleaner mounting bolts and clamps are tight. Check the air cleaner housing for dents or damage which could lead to a leak. Inspect the air transfer tubing from the air cleaner to the compressor and the engine for leaks.

Make sure that all clamps and flange joints are tight.

GAUGES

The instruments or gauges are essential for safety, maximum productivity and long service life of the machine. Inspect the gauges prior to start-up. During operation observe the gauges for proper functioning. Refer to Operating Instructions, for the normal readings.

COMPRESSOR OIL COOLERS

The compressor lubricating and cooling oil is cooled by means of two fin and tube-type oil coolers. The lubricating and cooling oil, flowing internally through the core section, is cooled by the air stream from the cooling fan flowing past the core section. When grease, oil and dirt accumulate on the exterior surfaces of the oil cooler, its efficiency is impaired.

Each month it is recommended that the oil coolers be cleaned by directing compressed air which contains a nonflammable safety solvent through the core of the oil cooler. This should remove the accumulation of grease, oil and dirt from the exterior surfaces of the oil cooler cores so that the entire cooling area can transmit the heat of the lubricating and cooling oil to the air stream.

In the event foreign deposits, such as sludge and lacquer, accumulate in the oil coolers to the extent that cooling efficiency is impaired, a resulting high discharge air temperature is likely to occur, causing shut down of the unit.

To correct this situation it will be necessary to clean the coolers using a cleaning compound in accordance with the manufacturer's recommendations.

HOSES

Each month it is recommended that all of the intake lines to and from the air cleaners and flexible hoses used for air and oil be inspected.

To ensure freedom from air leaks, all rubber hose joints and the screw-type hose clamps must be absolutely tight. Regular inspection of these connections for wear or deterioration is necessary.

Premature wear of the compressor is ASSURED whenever dust-laden air is permitted to enter the compressor intake.

The flexible hoses used in the oil and air lines on these units are primarily used for their ability to accommodate relative movement between components. It is important they be periodically inspected for wear and deterioration. It is also important the operator does not use the hoses as convenient hand holds or steps. Such use can cause early cover wear and hose failure.

NOTICE

Piping systems operating at less than 150 psi (1050 kPa) may use a special nylon tubing. The associated fittings are also of a special "push-in" design. If so, features are as follows:

Pulling on the tubing will cause the inner sleeve to withdraw and compress, thus tightening the connection. The tubing can be withdrawn only while holding the sleeve against the fitting. The tubing can be removed and replaced numerous times without losing its sealing ability.

To install the nylon tubing, make a mark (with tape or grease pencil) approximately 7/8 inch from the end of the tubing. Insert the tubing into the sleeve and "push-in" past the first resistance to the button. The mark should be approximately 1/16 inch from the sleeve, for the 3/8 inch O.D. tubing; 1/8 inch for the 0.25 inch O.D. tubing. This will ensure that the tubing is fully engaged in the sealing mechanism.

NOTICE

The oil filter must be replaced every 500 hours of operation or three (3) months, whichever comes first. On new or overhauled units, replace the element after the first 50 and 150 hours of operation; thereafter, service the oil filter every 500 hours.

To service the oil filters it will first be necessary to shut the unit down. Wipe off any external dirt and oil from the exterior of the filter to minimize any contamination from entering the lubrication system. Proceed as follows:

WARNING

High pressure air can cause severe injury or death from hot oil and flying parts. Always relieve pressure before removing caps, plugs, covers or other parts from pressurized air system.

- Open the service air valve(s) to ensure that system is relieved of all pressure. Close the valve(s).
- Turn the spin-on filter element counterclockwise to remove it from the filter housing. Inspect the filter.

NOTICE

If there is any indication of formation of varnishes, shellacs or lacquers on the oil filter element, it is a warning the compressor lubricating oil has improper characteristics and should be immediately changed.

- Inspect the oil filter head to be sure the gasket was removed with the oil filter element. Clean the gasket seal area on the oil filter head.

NOTICE

Installing a new oil filter element when the old gasket remains on the filter head will cause an oil leak and can cause property damage.

- Lubricate the new filter gasket with the same oil being used in the machine.
- Install new filter by turning element clockwise until gasket makes initial contact. Tighten an additional 1/2 to 3/4 turn.
- Start unit and allow to build up to rated pressure. Check for leaks before placing unit back into service.

FASTENERS

Visually check entire unit in regard to bolts, nuts and screws being properly secured. Spot check several capscrews and nuts for proper torque. If any are found loose, a more thorough inspection must be made. Take corrective action.

COMPRESSOR OIL

The lubricating and cooling oil must be replaced every 1000 hours of operation or six (6) months, whichever comes first.

RECEIVER SEPARATOR SYSTEMS

WARNING

High pressure air can cause severe injury or death from hot oil and flying parts. Always relieve pressure before removing caps, plugs, covers or other parts from pressurized air system.

- **Open service valve.**
- **Ensure pressure is relieved, with BOTH:**
 - Discharge air pressure gauge reading zero (0).**
 - No air discharging from service valve.**

When draining oil, open valve at bottom of separator tank.

When adding oil, remove and replace (make tight) plug on side of separator tank.

In the compressor lubricating and cooling system, separation of the oil from the compressed air takes place in the receiver separator tank. As the compressed air enters the tank, the change in velocity and direction drop out most of the oil from the air.

Additional separation takes place in the oil separator element, which is located in the top of the tank.

Any oil accumulation in this separator element is continuously drained off by means of a scavenge tube which returns the accumulated oil to the system.

The life of the oil separator element is dependent upon the operating environment (soot, dust, etc.) and should be replaced every twelve months or 2000 hours. To replace the element proceed as follows:

- Ensure the tank pressure is zero.
- Disconnect the hose from the scavenge tube.
- Remove scavenge tube from tank cover.
- Disconnect service line from cover.
- Remove cover mounting screws.
- Remove cover and element.
- Remove any gasket material left on cover or tank.

- Install new element.

NOTICE: Do not remove staples from the element/gasket connection.

- Place a straightedge across top of element and measure from bottom of straightedge to bottom of element. (See drawing below)
- Replace scavenge tube in cover (cover is still off of tank).
- Measure from bottom of cover to end of scavenge tube. Measurement should be from 1/8" to 1/4" less than the element measurement. If not, cut to size.
- Remove scavenge tube.
- Reposition cover (use care not to damage gaskets).
- Replace cover mounting screws:
 - Tighten in a crisscross pattern.
 - Reconnect service line. Replace scavenge tube. Reconnect hose.
- Close service valve. Start unit and look for leaks.

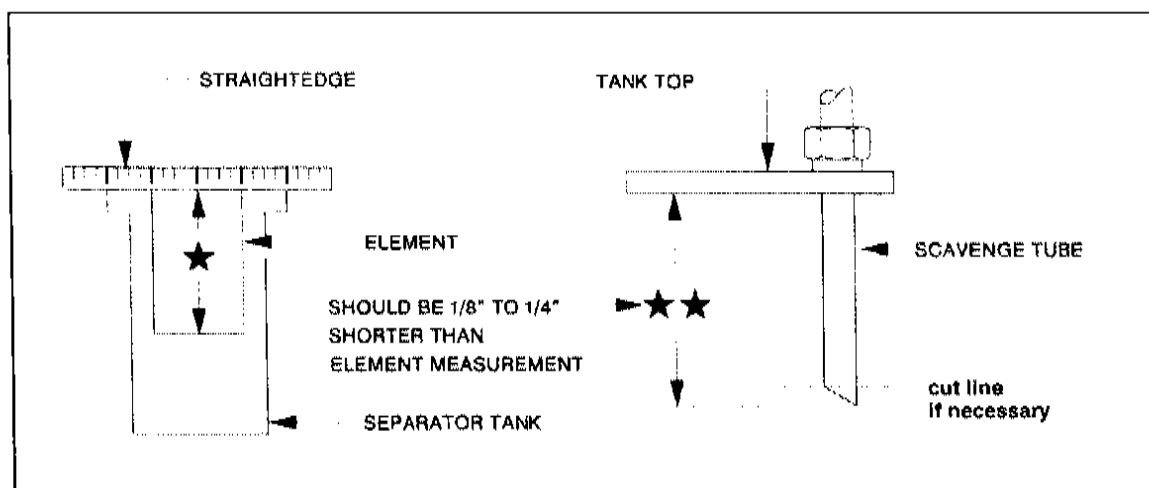
When replacing the element, the scavenge lines, orifice, filter and check valve should be thoroughly cleaned and the oil changed.

SCAVENGE LINE

WARNING

High pressure air can cause severe injury or death from hot oil and flying parts. Always relieve pressure before removing caps, plugs, covers or other parts from pressurized air system.

The scavenge line originates at the receiver separator tank cover and terminates at the compressor airend through an orifice. Once a year or every 2000 hours of operation, whichever comes first, remove this line and the orifice, thoroughly clean, then reassemble.



Excessive oil carry-over may be caused by an oil-logged separator element. Do not replace element without first performing the following maintenance procedure:

1. Check the oil level. Maintain as indicated earlier in this section.
2. Thoroughly clean scavenge line, any orifice and check valve.
3. Assure minimum pressure valve (if so equipped) has proper setting.
4. Run unit at rated operating pressure for 30 to 40 minutes to permit element to clear itself.

EXTERIOR FINISH CARE

The unit was painted and heat cured at the factory with a high quality, thermostat polyester powder coating. The following care will ensure the longest possible life from this finish.

1. If necessary to remove dust, pollen, etc. from housing, wash with water and soap or dish washing liquid detergent. Do not scrub with a rough cloth, pad, etc.
2. If grease removal is needed, a fast evaporating alcohol or chlorinated solvent can be used.
3. If the paint has faded or chalked, the use of a commercial grade, non-abrasive car wax may partially restore the color and gloss.

Note: This may cause some dulling of the paint finish.

1. Clean and remove all grease and wax from the area to be painted using Duponts 3900S Cleaner prior to sanding.
2. Use 320 grit sanding paper to repair any scratches or defects necessary.
3. Scuff sand the entire area to be painted with a red scotch brite pad.
4. Wipe the area clean using Duponts 3900S.
5. Blow and tack the area to be painted.
6. Apply a smooth coat of Dupont 1854S Tuffcoat Primer to all bare metal areas and allow to dry.
7. Apply 2 medium, wet coats of Dupont 222S Adhesion Promoter over the entire area to be painted, with a 5 minute flash in between coats.
8. To apply the texture coat, use Dupont 1854S Tuffcoat Primer. The proper technique to do this is to spray the Tuffcoat Primer using a pressure pot and use about 2-5 pounds of air pressure. This will allow the primer to splatter causing the textured look. Allow the texture coat to flash for about 20 minutes or until dry to touch.
9. Apply any of Dupont's Topcoat Finishes such as Imron™ or Centari™ according to the label instructions.

NOTE: To re-topcoat the texture surfaces when sheet metal repairs are not necessary, follow steps 1,2,4,5,6,8 and 10.

Field Repair of Texture Paint

PREVENTIVE MAINTENANCE SCHEDULE

If operating in extreme environments (very hot, cold, dusty or wet), these time periods should be reduced.

	Daily	Weekly	Monthly	500 hrs /3 mos.	1000 hrs /6 mos.	2000 hrs /12 mos.
Compressor Oil Level	C					
Gauges/Lamps	C					
*Air Cleaner Service Indicators	C					
Air Cleaner Precleaner Dumps		C				
Hoses (Oil, Air, Intake Hydraulic)			C			
Automatic Shutdown System Test			C			
Air Cleaner System Visual			C			
Compressor Oil Cooler Exterior			C	Clean		
Fasteners				C		
Air Cleaner Elements				WI		
Compressor Oil Filter Element				R		
Compressor Oil					R	
Shutdown Switch Settings Test						C
Scavenger Orifice & Related Parts						Clean
Oil Separator Element						R

* Disregard if not appropriate for this particular machine

R = Replace C = Check (adjust or replace if necessary)
L = Lubricate WI = Or when indicated

LUBRICATION

Both compressor lubrication and cooling are accomplished by the compressor lubricating oil. The oil is forced from the oil storage reservoir, under system pressure, through an oil cooler and an oil filter directly to the compressor. When the compressor is operating at low capacity, some of the oil may bypass the cooler through a thermostatically controlled bypass valve. This valve bypasses varying amounts of oil, depending upon the temperature, until the oil being circulated reaches a temperature of 185°F (85°C) thus maintaining a higher average oil temperature thereby reducing the possibility of water vapor condensation in the oil.

Relatively cool lubricating oil is admitted under pressure to the compressor bearings and is also injected in metered amounts, directly to the rotor chamber. All of the oil thus introduced mixes with, and passes on with the air being compressed, thus removing the heat of compression to a large degree.

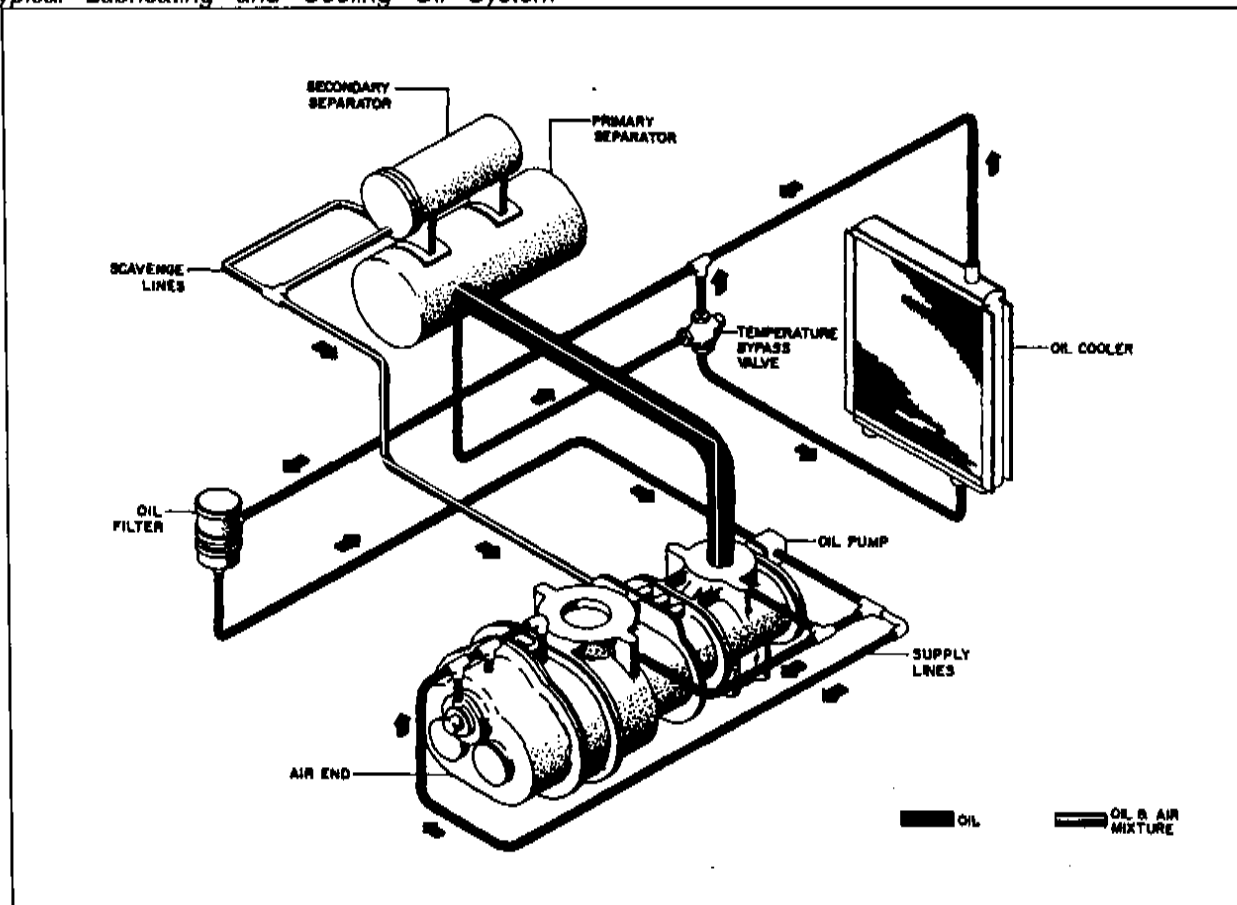
On its way to the final discharge connection, the air passes through a receiver/separator. A scavenger line returns any remaining separated oil back to the inlet of the compressor.

Fill the oil storage reservoir in the receiver/separator with new oil before operating the unit. Recharge the compressor by first removing the air filter and pouring about two gallons (7.57 liters) of oil into the compressor inlet.

NOTE

Recharging of the compressor with oil is absolutely necessary on units that have been placed in extended storage (6 months or more).

Typical Lubricating and Cooling Oil System



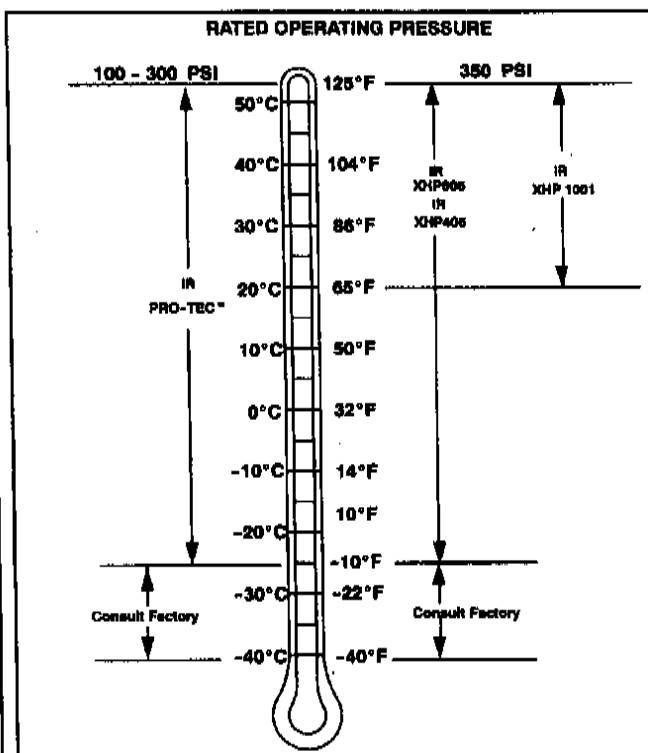
Portable Compressor Fluid Chart

Refer to these charts for correct compressor fluid required. Note that the selection of fluid is dependent on the design operating pressure of the machine and the ambient temperature expected to be encountered before the next oil change.

Note: Fluids listed as "preferred" are required for extended warranty.

Compressor oil carryover (oil consumption) may be greater with the use of alternative fluids.

Design Operating Pressure	Ambient Temperature	Specification
100 psi to 300 psi	-10°F to 125°F (-23°C to 52°C)	Preferred: IR Pro-Tec™ Alternate: ISO Viscosity Grade 48 with rust and oxidation inhibitors, designed for air compressor service.
350 psi	(-23°C to 52°C) -10°F to 125°F 65°F to 125°F (-18°C to 52°C)	Preferred: IR XHP 605 Alternate: IR XHP405 ISO Viscosity Grade 68 Group 3 or 5 with rust and oxidation inhibitors designed for air com- pressor service. Preferred: XHP605 IR XHP1001



Preferred Ingersoll-Rand Fluids - Use of these fluids with original I-R filters can extend airtend warranty. Refer to operator's manual warranty section for details or contact your I-R representative.

Ingersoll-Rand Preferred Fluids	1 gal. (3.8 Litre)	5 gal. (19.0 Litre)	55 gal. (208.2 Litre)	220 gal. (836 litre)
Preferred:				
IR Pro-Tec™	36899698	36899706	36899714	36899722
IR XHP605	-	22252076	22252050	22252068
IR XHP1001	-	35612738	35300516	-
XHP405	-	22252126	22252100	22252118
Engine Oil	54480918	36875938	36866903	

SECTION 9 - PARTS ORDERING

GENERAL

This publication, which contains an illustrated parts breakdown, has been prepared as an aid in locating those parts which may be required in the maintenance of the unit. Always insist on genuine Ingersoll-Rand Company parts for your compressor.

NOTICE

Ingersoll-Rand Company can bear no responsibility for injury or damages resulting directly from the use of non-approved repair parts.

Ingersoll-Rand Company service facilities and parts are available worldwide. Consult local yellow pages or visit:
www.portablepower.irco.com.

Special order parts may not be included in this manual. Contact the Mocksville Parts Department with the unit serial number for assistance with these special parts.

DESCRIPTION

The illustrated parts breakdown illustrates and lists the various assemblies, subassemblies and detailed parts which make up this particular machine. This covers the standard models and the more popular options that are available.

In referring to the rear, the front or to either side of the unit, always consider the **drawbar end** of the unit as the **front**. Standing at the rear of the unit facing the drive end (front) will determine the right and left sides.

FASTENERS

Both SAE/inch and ISO/metric hardware have been used in the design and assembly of these units. In the disassembly and reassembly of parts, extreme care must be taken to avoid damaging threads by the use of wrong fasteners.

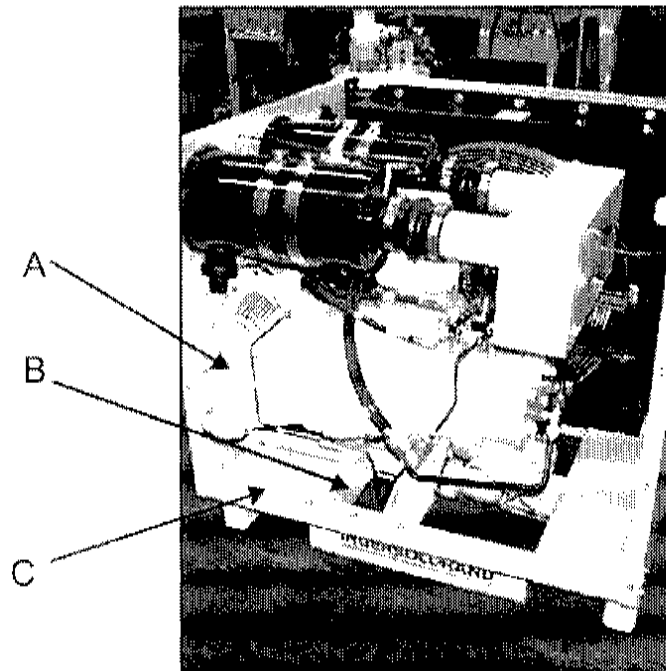
HOW TO ORDER

Always specify the model and serial number of the unit.

Specify the part number and description.

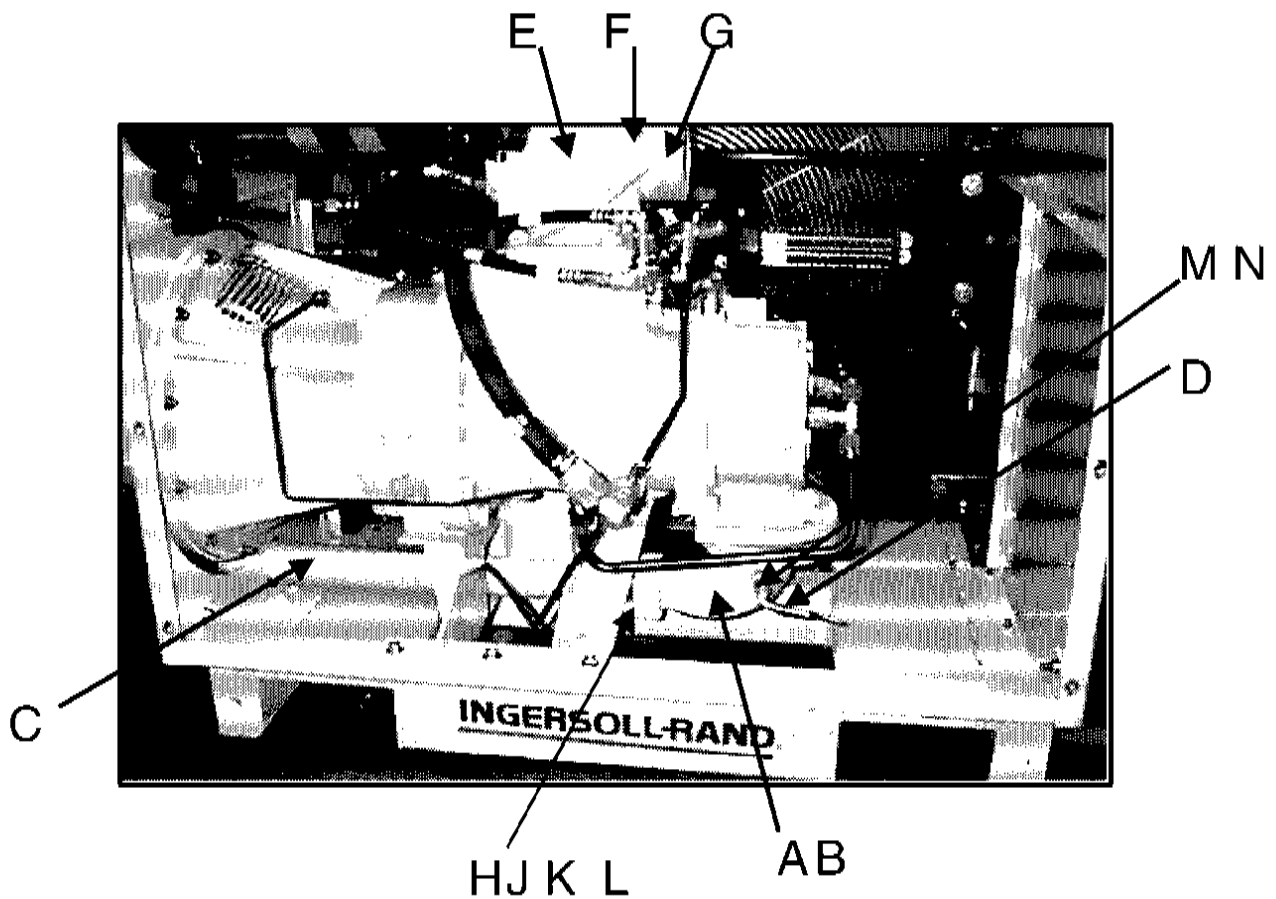
SECTION 10 – PARTS LIST

COMPRESSOR MOUNTING



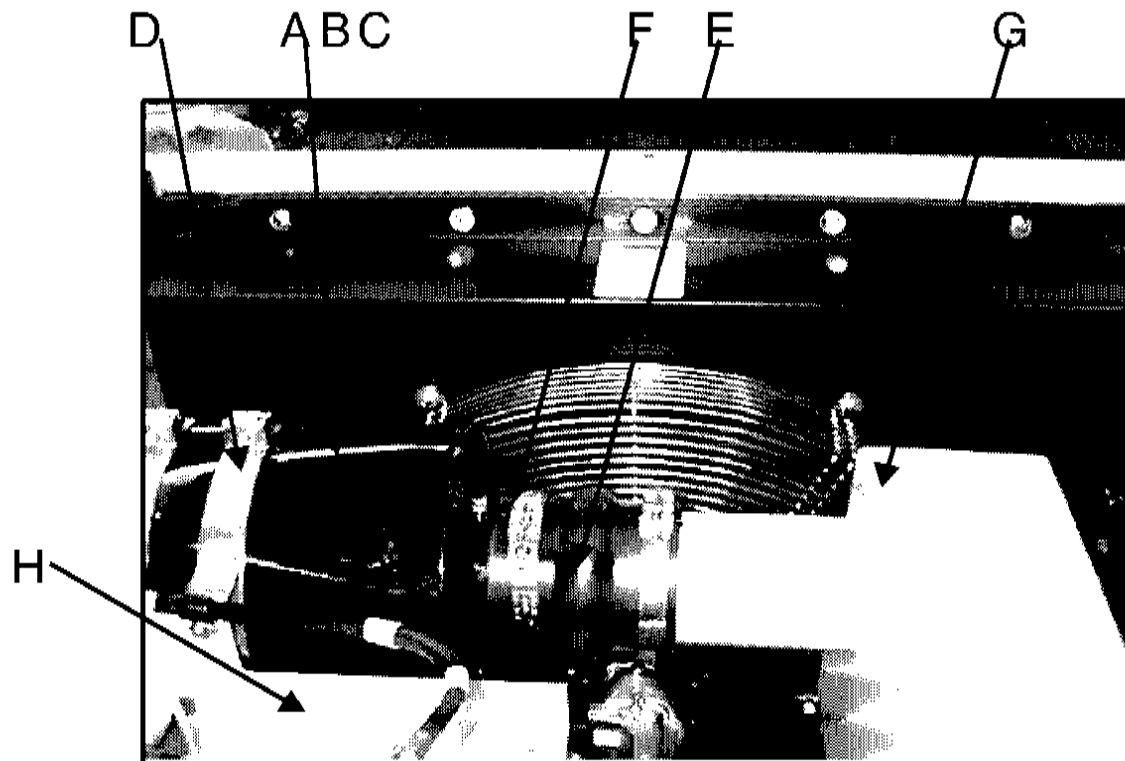
ITEM	PART NUMBER	DESCRIPTION
A	35093665	Compressor Assembly VHP400CMH @ 1700 RPM VHP500CMH @ 2100 RPM VHP550CMH @ 2300 RPM
	36010254	VHP550CMH @ 2100 RPM HP600CMH @ 2300 RPM XP650CMH @ 2500 RPM
B	43210392	Mount, Compressor
C	43210384	Base

COMPRESSOR ACCESSORIES



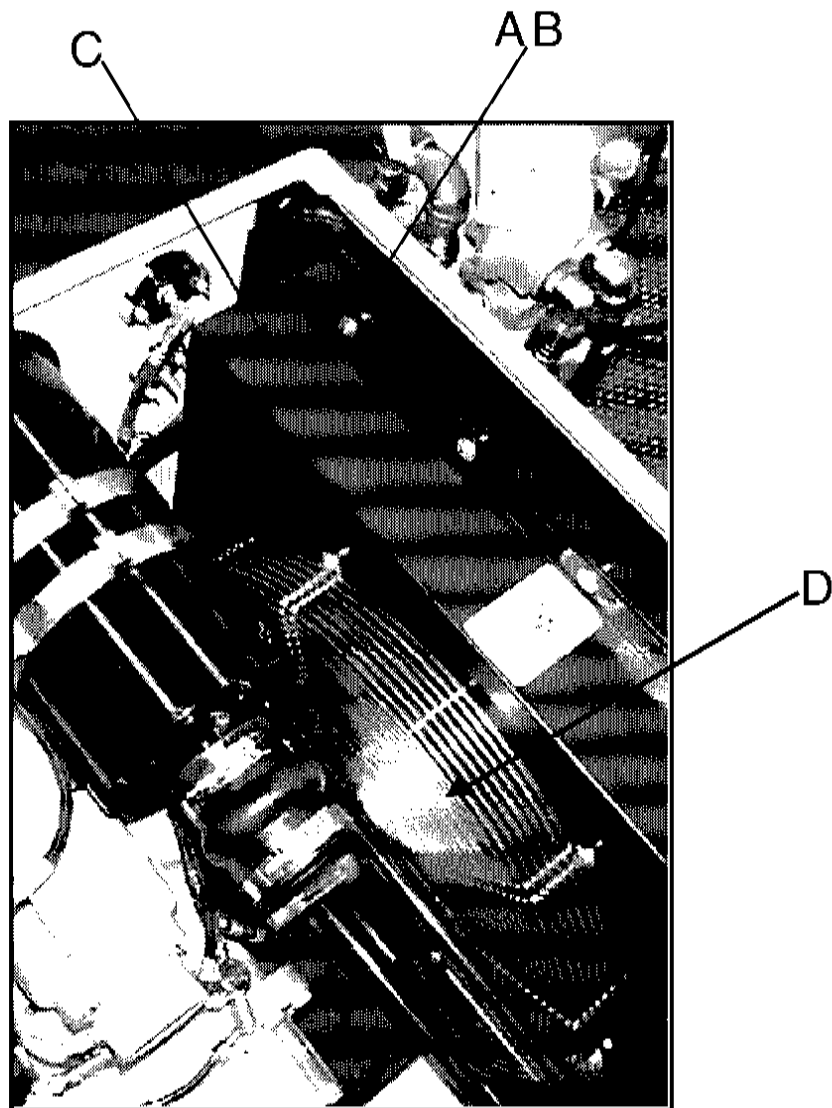
ITEM	PART NUMBER	DESCRIPTION
A	43203165	Elbow, Discharge
B	35575570	Gasket, Elbow to Discharge
C	43210509	Pipe, Discharge
D	36765790	Gauge, Discharge Temperature (gauge & sensor assembly)
E	36011567	Unloader Valve Assembly
F	35588318	Gasket, Unloader Inlet
G	35843168	Flange, Unloader Inlet
H	35292143	Flange Half (2x)
J	95934683	Washer (4x)
K	35291640	Screw (4x)
L	95357976	O-ring
M	35371681	Connector
N	95953949	Bushing

AIR FILTERS & PIPING



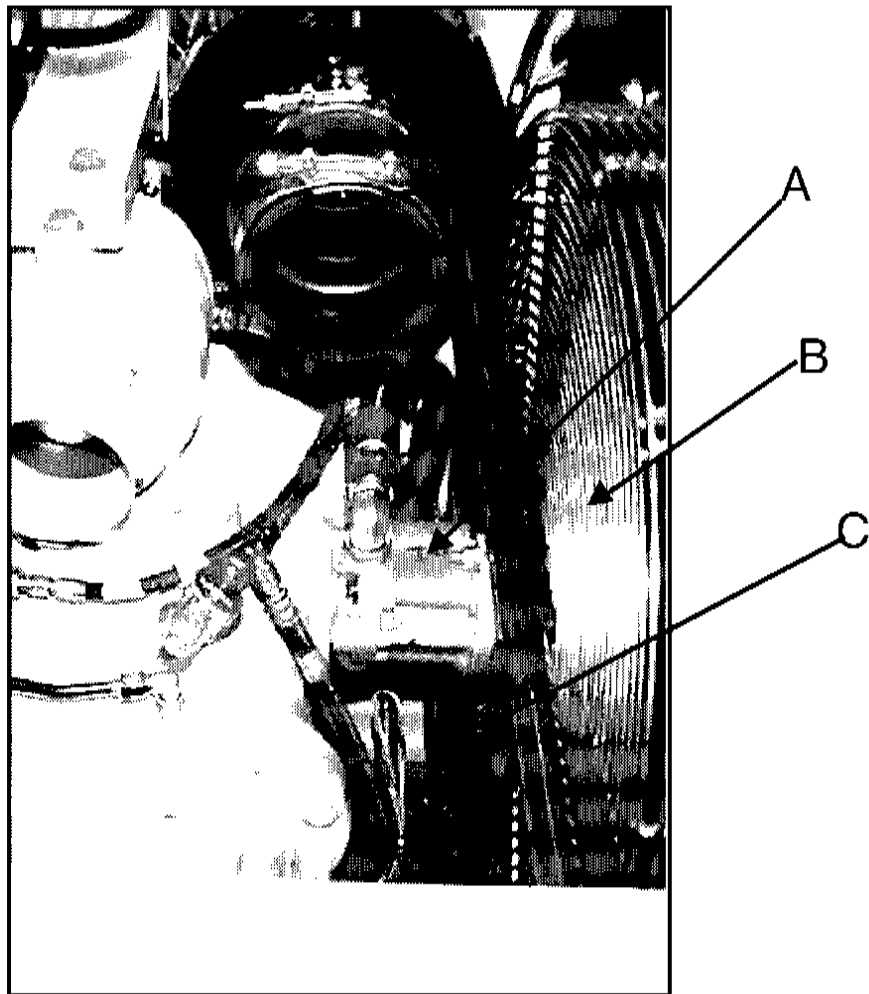
ITEM	PART NUMBER	DESCRIPTION
A	36863900	Filter Assembly, Air (2x)
B	35326230	Element, Outer (primary)
C	35377696	Element, Inner (safety)
D	35294974	Mounting Band (4x)
E	35287358	Hose (3x)
F	35279553	Clamp, T-Bolt (6x)
G	43210541	Manifold, Air Inlet
H	43210533	Bracket, Air Filter Mounting

OIL COOLER ASSEMBLY



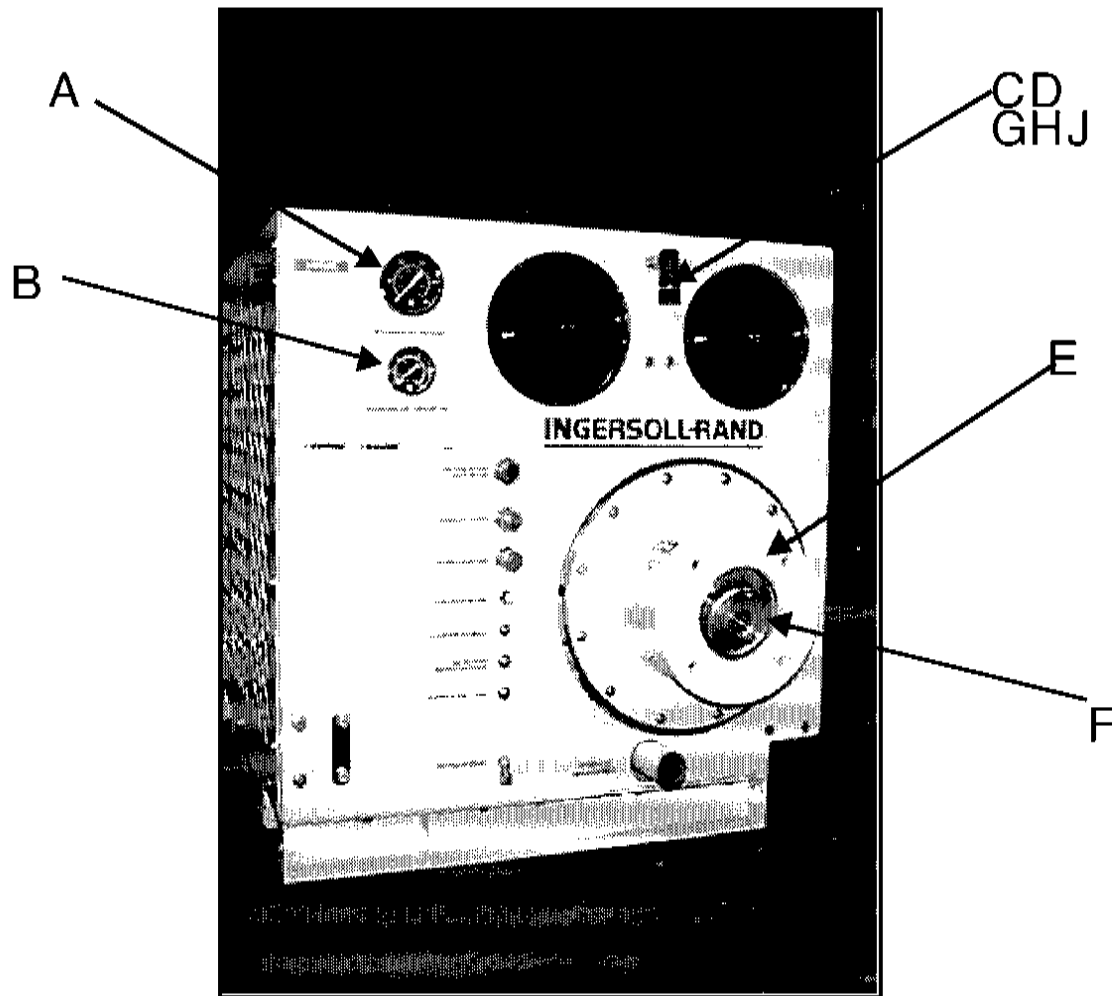
ITEM	PART NUMBER	DESCRIPTION
A	43210632	Oil Cooler Assembly (complete package)
B	43210640	Oil Cooler (core module)
C	43210673	Shroud, Fan
D	43210681	Guard, Finger

OIL COOLER ASSEMBLY



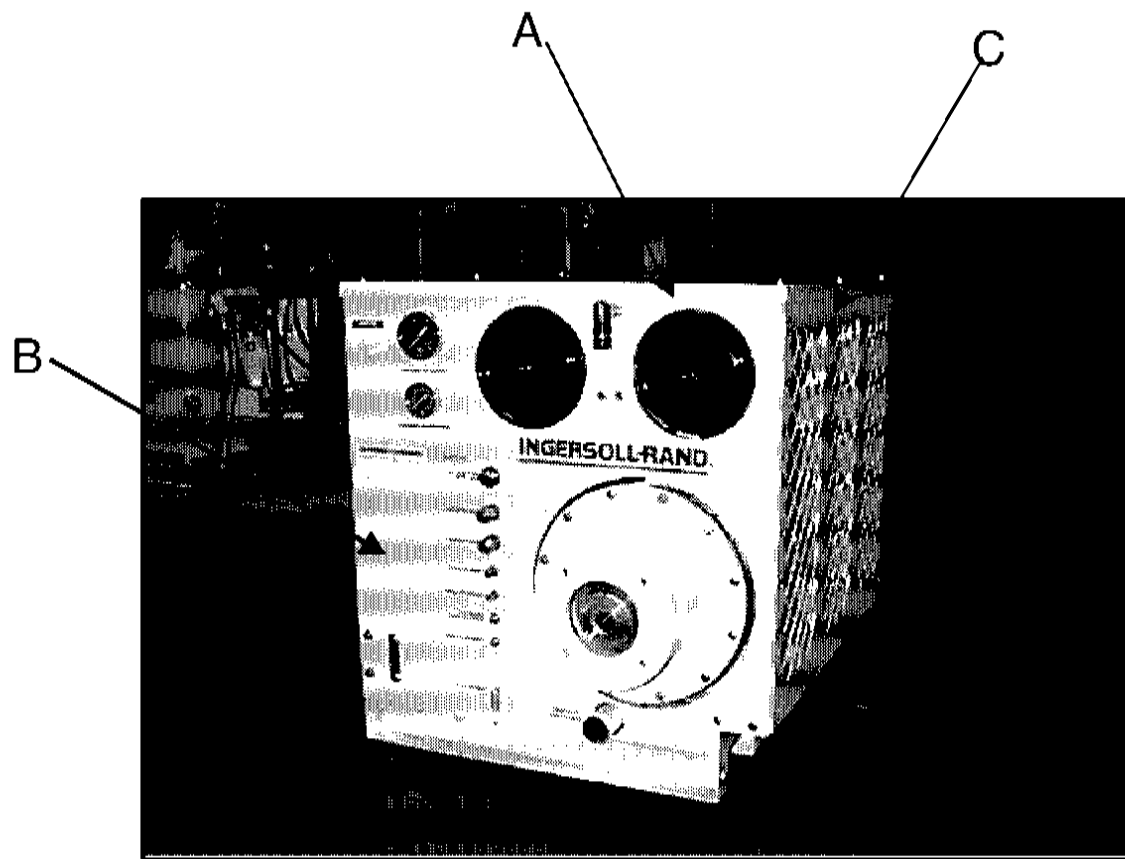
ITEM	PART NUMBER	DESCRIPTION
A	43210657	Motor, Hydraulic
B	43210665	Fan (not visible)
C	43210699	Motor Mount Assembly

INSTRUMENT/DRIVE COMPONENTS



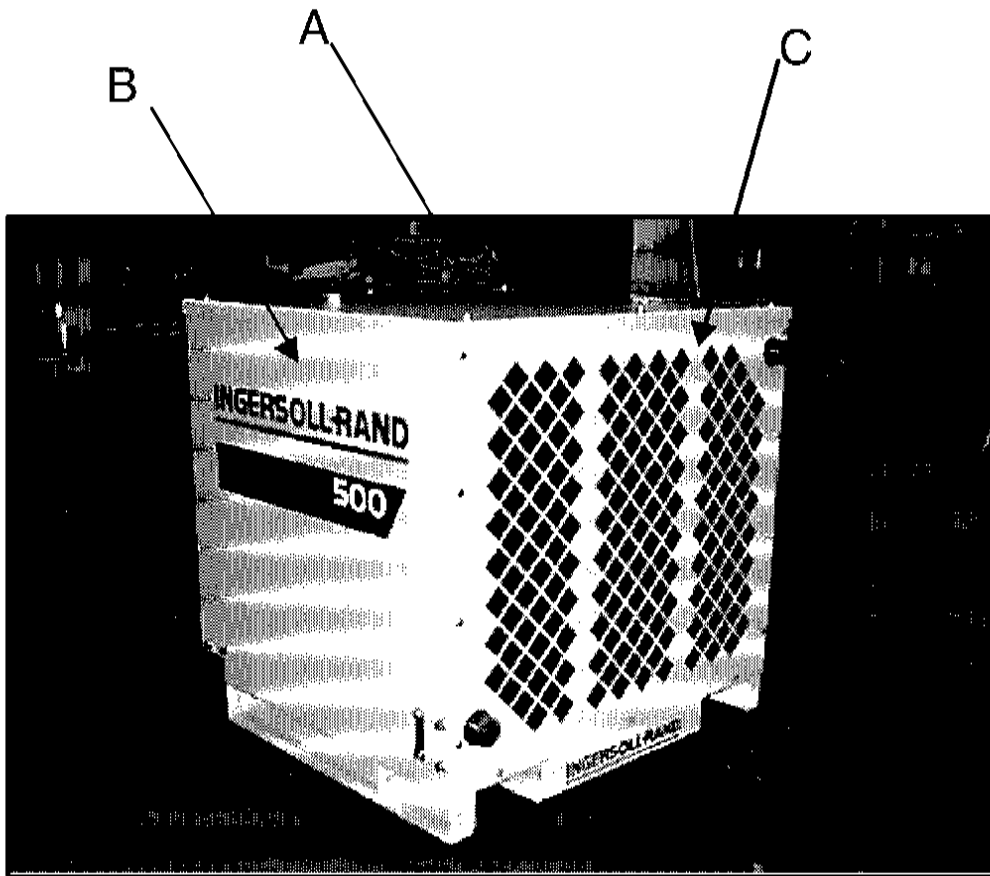
ITEM	PART NUMBER	DESCRIPTION
A	36765782	Gauge, Discharge Pressure
B	36765790	Gauge, Discharge Temperature
C	35107390	Indicator, Air Filter Restriction
D	35107480	Flange, Restriction Indicator
E	43210624	Adapter, Hydraulic Motor
F	43210616	Coupling, Drive
<u>Following Items Not Shown</u>		
G	35315407	Hose, Filter Indicator
H	95287629	Adapter, 1/8DX-4JIC (hose to filter indicator) (2x)
J	95916243	Coupling, 1/8 NPT (on air filter outlet)

ENCLOSURE



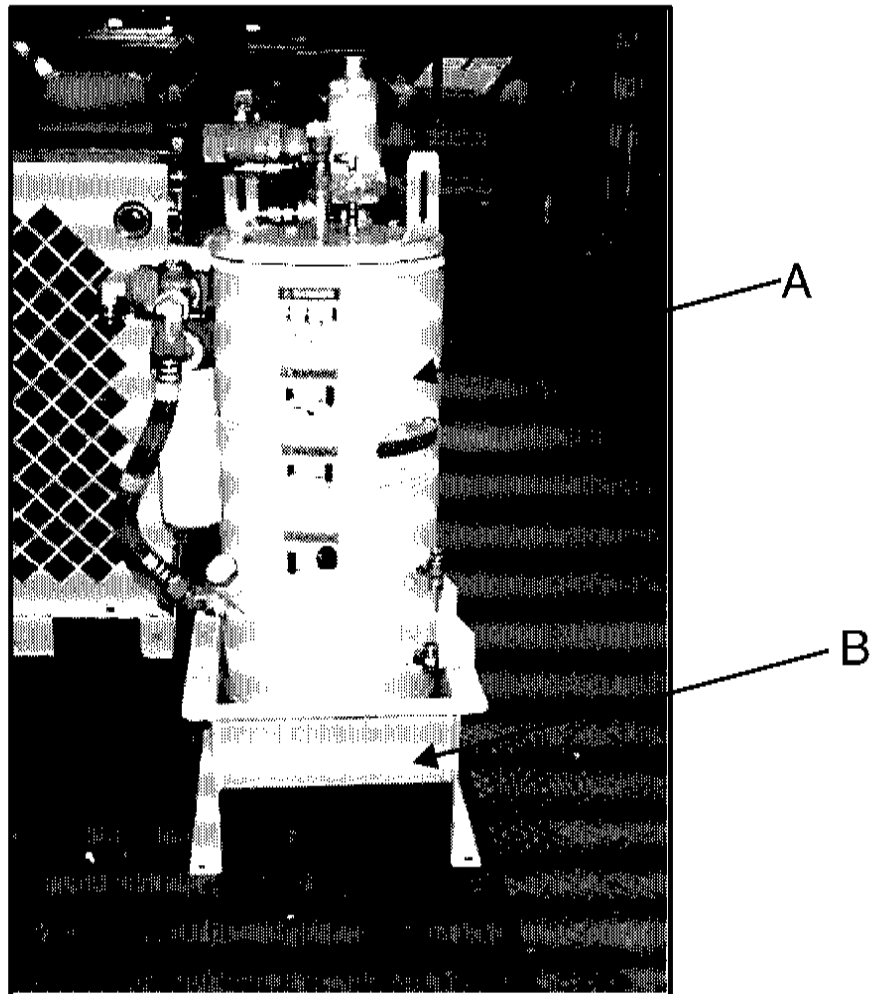
ITEM	PART NUMBER	DESCRIPTION
A	43210442	Panel, Top
B	43210434	Panel, Front
C	43210400	Panel, Compressor Side

ENCLOSURE



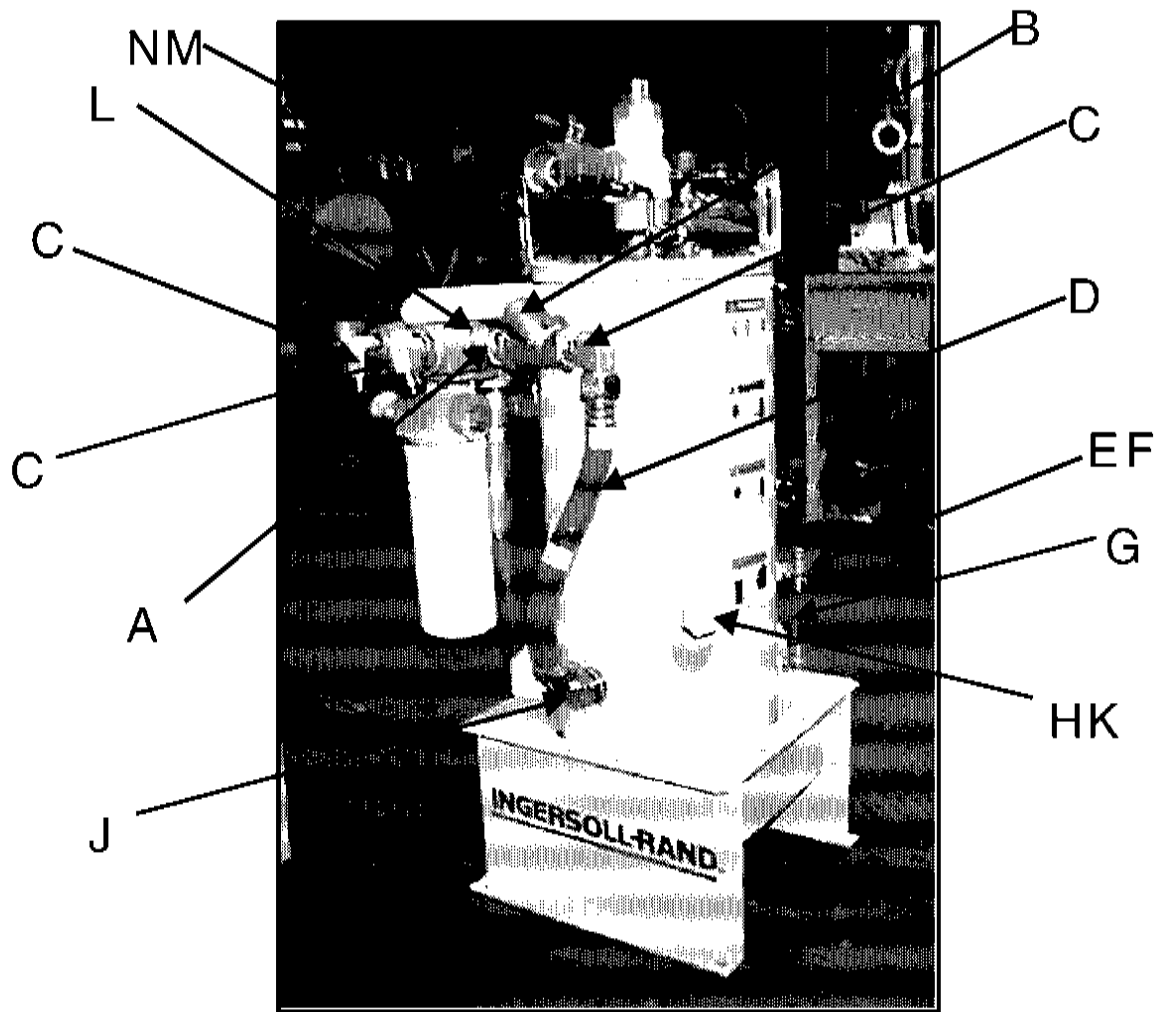
ITEM	PART NUMBER	DESCRIPTION
A	43210442	Panel, Top
B	43210426	Panel, Rear
C	43210418	Panel, Cooler Side

AIR RECEIVER TANK ASSEMBLY



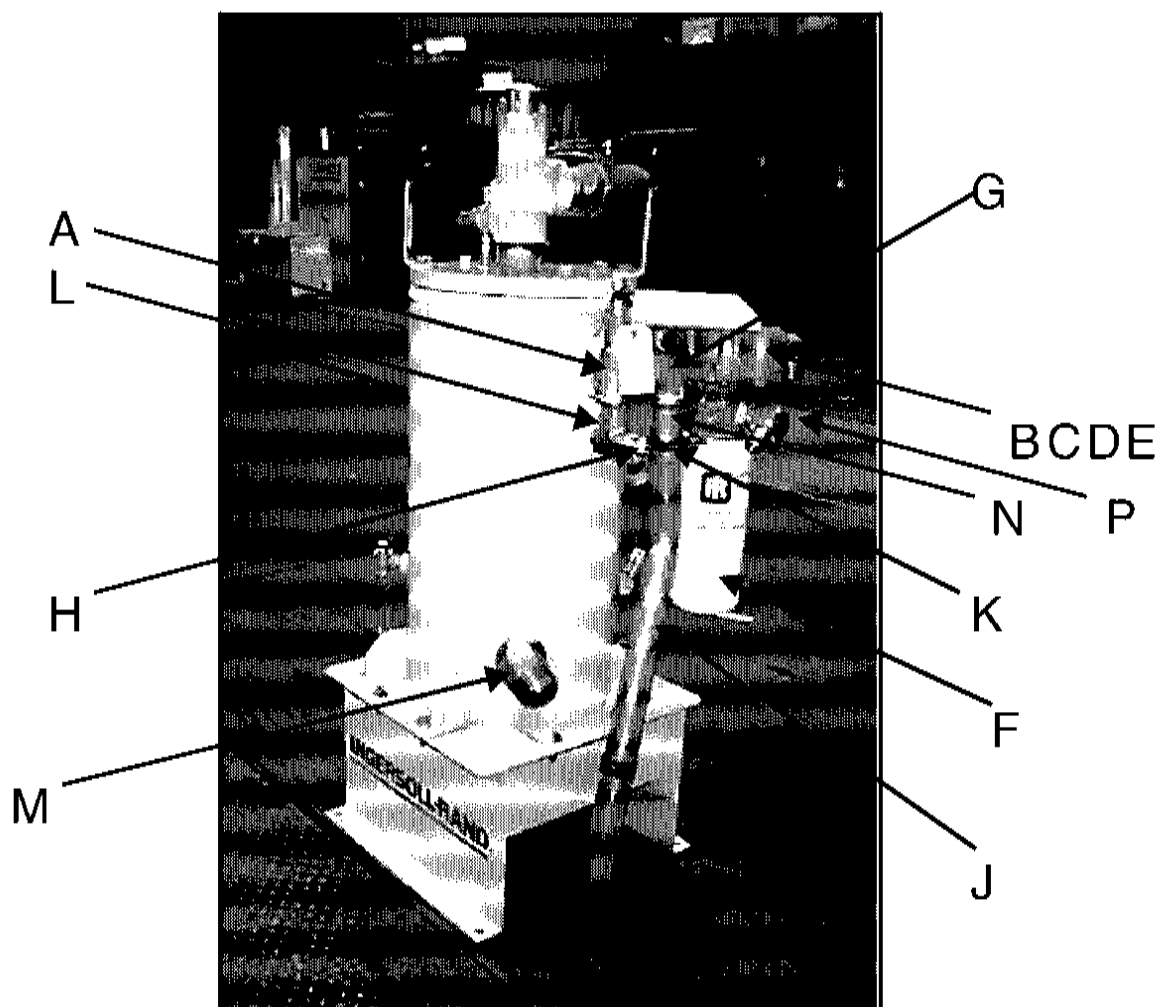
ITEM	PART NUMBER	DESCRIPTION
A	54466735	Tank/Cover Assy
B	43210491	Stand, Air Tank
(not shown)	36845469	Element

AIR RECEIVER TANK ASSEMBLY



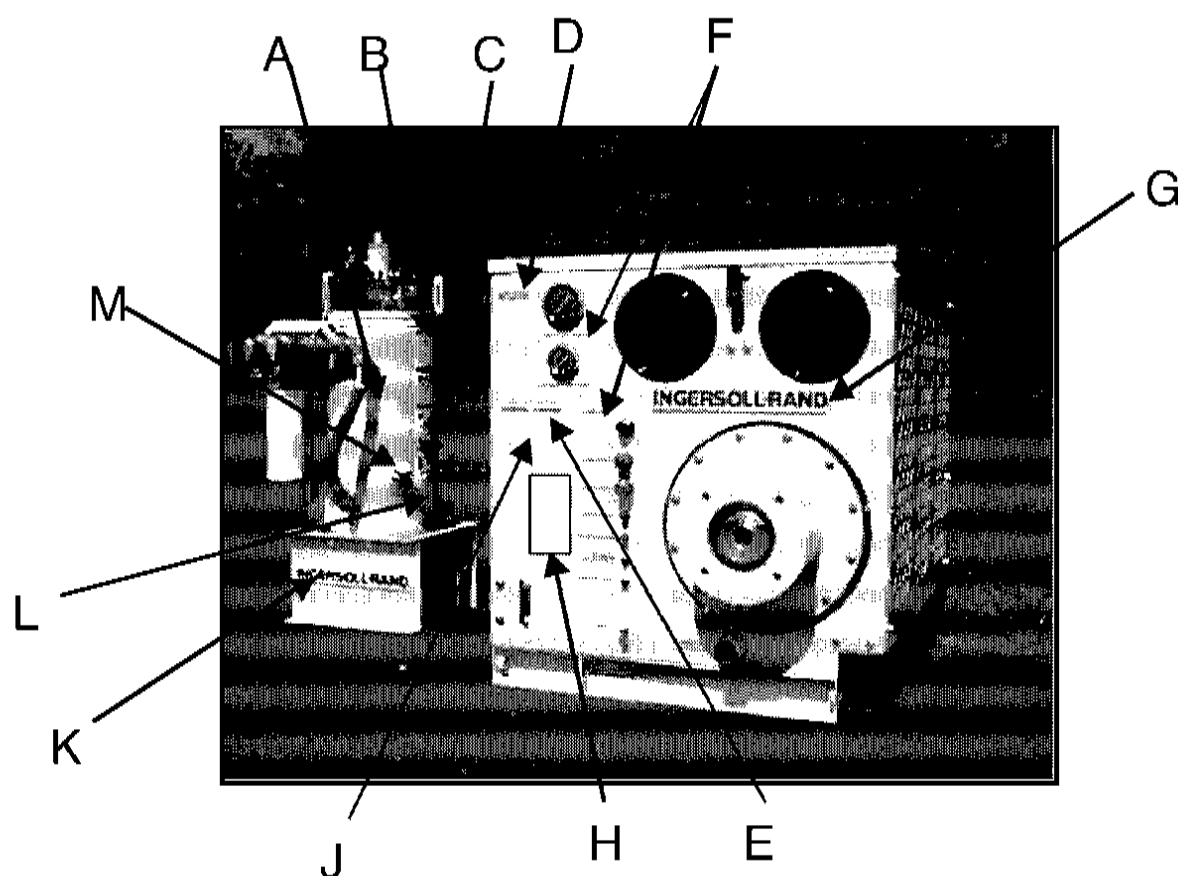
ITEM	PART NUMBER	DESCRIPTION
A	95953709	Nipple
B	95279667	Check Valve
C	35279777	Elbow, 90°
D	35108638	Hose
E	35324649	Gasket (2x)
F	36860468	Fittings, Sight Glass
G	92121532	Sight Glass
H	35579630	Plug, Filler
J	35283191	Elbow, 45°
K	35279942	O-ring
L	35290154	Adapter
M	36785012	Lifting Lug
N	95930723	Screw 5/8-11 x 2.0 CVR to Tank

AIR RECEIVER TANK ASSEMBLY



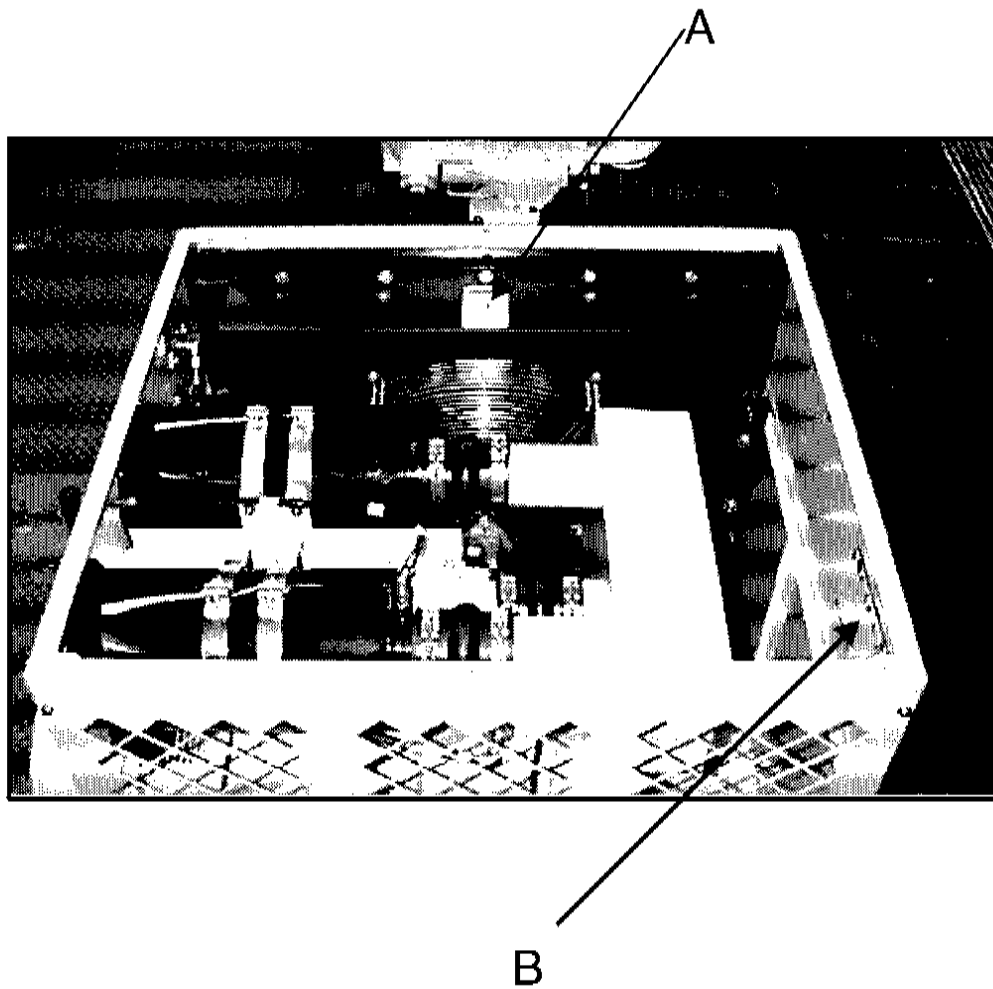
ITEM	PART NUMBER	DESCRIPTION
A	35596972	Safety Valve
B	36871689	Bypass Valve
C	35388024	Relief Valve Kit (in bypass valve)
D	35388032	Element Repair Kit (in bypass valve)
E	35388040	O-ring Repair Kit (in bypass valve)
F	36860336	Filter Element
G	95953311	Elbow, 90°
H	36865756	Switch, Shutdown
J	35764868	Tube
K	35261155	Clamp (tube in pipe)
L	35305275	Tee, Street
M	95944732	Elbow, 45°
N	36762821	Nipple
P	95376133	Elbow, 90°

DECALS & MARKINGS



ITEM	PART NUMBER	DESCRIPTION
A	NA	
B	54629944	Danger/ Warning Decal
C	54568795	High Pressure Air Decal
D	36520310	Notice Dropping Decal
E	54568787	Improper Operation Decal
F	43210558	Interface Markings Decal
G	54640388	Signature Decal (3x)
H	22110910	General Data Decal
J	36534832	Service/ Distributor Decal
K	54640388	Signature Decal
L	36512739	Oil Level Decal
M	54604970	Oil Fill Plug Decal
Not Shown	54638333	IR Swoosh

DECALS & MARKINGS



ITEM	PART NUMBER	DESCRIPTION
A	54568779	Rotating Fan Decal
B	36522290	Safety Card

SECTION 11 – COMMON FASTENERS

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Grade Identification	2		

TABLE 1
SAE/Inch Screws

Part Number	Size	Description			
109A2A311N	#10—24 UNC—3A x 1/2"	Hex Socket Head (Nylon Insert)	35A2D386	1/2"—10 UNC—2A x 4"	Hex Head
119A2A146	1/2"—20 UNC—3A x 1/2"	Hex Socket Head	35A2D388	1/2"—10 UNC—2A x 4 1/2"	Hex Head
119A2A148	1/2"—20 UNC—3A x 1/4"	Hex Socket Head	35A2D390	1/2"—10 UNC—2A x 5"	Hex Head
119A2A198N	1/2"—16 UNC—3A x 1/2"	Hex Socket Head (Nylon Insert)	35A2D4	1/2"—20 UNC—2A x 1/4"	Hex Head
119A2A206N	1/2"—16 UNC—3A x 2"	Hex Socket Head (Nylon Insert)	35A2D5	1/2"—18 UNC—2A x 3"	Hex Head
119A2A251	1/2"—13 UNC—3A x 1 1/2"	Hex Socket Head	35A2D54	1/2"—18 UNC—2A x 1/2"	Hex Head
121A2A175	1/2"—16 UNC—3A x 1"	Hex Socket Head	35A2D57	1/2"—18 UNC—2A x 1/4"	Hex Head
125A2C1012	#10—24 UNC—3A x 1 1/4"	Hex Socket Head	35A2D58	1/2"—18 UNC—2A x 1"	Hex Head
133A2C44	#4—40 UNC—3A x 1/2"	Hex Socket Head	35A2D60	1/2"—18 UNC—2A x 1 1/4"	Hex Head
35A2D110	1/2"—16 UNC—2A x 1/4"	Hex Head	35A2D62	1/2"—18 UNC—2A x 1 1/2"	Hex Head
35A2D111	1/2"—16 UNC—2A x 1"	Hex Head	35A2D64	1/2"—18 UNC—2A x 2"	Hex Head
35A2D112	1/2"—16 UNC—2A x 1 1/4"	Hex Head	35A2D7	1/2"—20 UNC—2A x 1 1/2"	Hex Head
35A2D113	1/2"—16 UNC—2A x 1 1/2"	Hex Head	35A2D8	1/2"—20 UNC—2A x 1 3/4"	Hex Head
35A2D117	1/2"—16 UNC—2A x 2"	Hex Head	35130293	1/2"—16 x 1/2"	Hex Head
35A2D118	1/2"—16 UNC—2A x 2 1/4"	Hex Head			Self-Tapping
35A2D119	1/2"—16 UNC—2A x 2 1/2"	Hex Head	35130301	1/2"—18 x 1/2"	Hex Head
35A2D120	1/2"—16 UNC—2A x 2 3/4"	Hex Head			Self-Tapping
35A2D122	1/2"—16 UNC—2A x 3 1/4"	Hex Head	35141365	1/2"—18 x 1/2"	Hex Head
35A2D127	1/2"—16 UNC—2A x 4 1/2"	Hex Head			Self-Tapping
35A2D131	1/2"—16 UNC—2A x 6"	Hex Head	35144328	1/2"—20 x 1/2"	Whiz-Lock®
35A2D168	1/4"—14 UNC—2A x 1 1/2"	Hex Head	35144336	1/2"—18 x 1/2"	Whiz-Lock®
35A2D174	1/4"—14 UNC—2A x 3"	Hex Head	35144344	1/2"—16 x 1"	Whiz-Lock®
35A2D215	1/2"—13 UNC—2A x 1/4"	Hex Head	35144484	1/2"—20 x 1"	Whiz-Lock®
35A2D216	1/2"—13 UNC—2A x 1/2"	Hex Head	35145242	1/2"—20 x 1 1/4"	Whiz-Lock®
35A2D217	1/2"—13 UNC—2A x 1"	Hex Head	35148030	1/2"—13 x 1"	Hex Head
35A2D219	1/2"—13 UNC—2A x 1 1/4"	Hex Head			Self-Tapping
35A2D221	1/2"—13 UNC—2A x 1 1/2"	Hex Head	35252451	1/2"—20 x 1"	Whiz-Lock®
35A2D223	1/2"—13 UNC—2A x 2"	Hex Head	35252493	1/2"—16 x 1/2"	Whiz-Lock®
35A2D229	1/2"—13 UNC—2A x 3 1/2"	Hex Head	35252568	1/2"—13 x 1 1/4"	Whiz-Lock®
35A2D231	1/2"—13 UNC—2A x 4"	Hex Head	35252741	1/2"—13 x 1 1/2"	Whiz-Lock®
35A2D232	1/2"—13 UNC—2A x 4 1/4"	Hex Head	35252758	1/2"—13 x 1"	Whiz-Lock®
35A2D3	1/2"—20 UNC—2A x 1/4"	Hex Head	35287119	1/2"—14 x 1/2"	Hex Head
35A2D323	1/2"—11 UNC—2A x 1 1/2"	Hex Head			Self-Tapping
35A2D325	1/2"—11 UNC—2A x 1 1/4"	Hex Head	35321108	1/2"—18 x 1"	Whiz-Lock®
35A2D326	1/2"—11 UNC—2A x 1 1/2"	Hex Head	35334879	1/2"—18 x 1"	Hex Head
35A2D327	1/2"—11 UNC—2A x 2"	Hex Head			Self-Tapping
35A2D328	1/2"—11 UNC—2A x 2 1/4"	Hex Head	36A2A275	1/2"—18 x 2"	Hex Head
35A2D329	1/2"—11 UNC—2A x 2 1/2"	Hex Head	B7A2C93P	10—24 x 1/2"	Round Head Phillips
35A2D330	1/2"—11 UNC—2A x 2 3/4"	Hex Head			
35A2D331	1/2"—11 UNC—2A x 1 1/2"	Hex Head	95095659	10—24 x 1/2"	Round Head Phillips
35A2D380	1/2"—10 UNC—2A x 2 1/2"	Hex Head			
35A2D382	1/2"—10 UNC—2A x 3"	Hex Head			
35A2D384	1/2"—10 UNC—2A x 3 1/2"	Hex Head			

Whiz-Lock® is a Registered T.M. of MacLean-Fogg Nut Co.
(Alternate Suppliers are Acceptable for this Part Number)

SAE/Inch Nuts			SAE/Inch Washers		
Part Number	Size	Description	Part Number	Size	Description
16A4C1	1/2"-20 UNC-2B	Hex	11ASC1	#10	Flat (Commercial)
16A4C2	3/4"-18 UNC-2B	Hex	11ASC2	1/2"	Flat (Commercial)
16A4C3	3/4"-16 UNC-2B	Hex	11ASC3	3/4"	Flat (Commercial)
16A4C5	1/2"-13 UNC-2B	Hex	11ASC4	3/4"	Flat (Commercial)
16A4C7	3/4"-11 UNC-2B	Hex	11ASC6	1/2"	Flat (Commercial)
16A4C8	1/2"-10 UNC-2B	Hex	11ASC8	3/4"	Flat (Commercial)
16A4H7	3/4"-11 UNC-2B	Hex	12ASC2	1/2"	Flat (SAE)
21A4C10	12-24 UNC-2B	Hex	12ASC3	3/4"	Flat (SAE)
21A4C5	4-40 UNC-2B	Hex	12ASC4	3/4"	Flat (SAE)
21A4C8	8-32 UNC-2B	Hex	12ASC6	1/2"	Flat (SAE)
21A4C9	10-24 UNC-2B	Hex	12ASC13	1.25"	Flat (SAE)
22A4C1	1/2"-28 UNC-2B	Hex	12ASC15	1.50"	Flat (SAE)
22A4C2	3/4"-24 UNF-2B	Hex	12ASD24	#10	Flat (SAE)
22A4C3	3/4"-24 UNC-2B	Hex	14ASC101	1/2"	Spring Lock
22A4C5	1/2"-20 UNC-2B	Hex	14ASC110	3/4"	Spring Lock
23A4C3	3/4"-24 UNC-2B	Hex	14ASC119	3/4"	Spring Lock
23A4C4	3/4"-20 UNC-2B	Hex	14ASC120	3/4"	Spring Lock
23A4C5	1/2"-20 UNC-2B	Hex	14ASC133	3/4"	Spring Lock
23A4C8	3/4"-16 UNC-2B	Hex	14ASC28	#8	Spring Lock
35144492	1/2"-20	Whiz-Lock®	14ASC36	#10	Spring Lock
35145077	3/4"-16	Whiz-Lock®	14ASC35	1/2"	Spring Lock
35252600	3/4"-18	Whiz-Lock®	14ASC55P	1/2"	Spring Lock, Cadmium Plate
35252678	1/2"-13	Whiz-Lock®	14ASC63	3/4"	Spring Lock
35265388	10-24	Whiz-Lock®	14ASC65P	3/4"	Spring Lock, Cadmium Plate
35321504	1/4"-11	Hex	14ASC76	1/2"	Spring Lock
35326420	1/4"-13	Hex	14ASC9	#4	Spring Lock
35332980	1/2"-13	Hex	14ASC91	3/4"	Spring Lock
35336700	3/4"-18	Torque/Grade 8	35326233	1/2"	Spring Lock
66A4C3	1/4"-24	Nyloc			
66A4C5	1/2"-20	Nyloc			
67A4C1	1/2"-20	Nyloc			
67A4C2	3/4"-18	Nyloc			
67A4C3	3/4"-16	Nyloc			
67A4C5	1/2"-13	Nyloc			

**SAE/Inch Capscrews
Grade Identification**

Grade identification markings are normally stamped on the heads of capscrews; however these marks may vary slightly from manufacturer to manufacturer.				
SAE Grade	1 or 2	5	6 or 7	8
		 	 	
QUALITY OF MATERIAL	MATERIAL INDETERMINATE	MINIMUM COMMERCIAL	MEDIUM COMMERCIAL	BEST COMMERCIAL
USAGE	UNACCEPTABLE	PREFERRED	ALTERNATE IF PREFERRED NOT AVAILABLE	*

* Due to their material and hardness, grade 8 capscrews are not suitable for use on the pressurized air systems on an Ingersoll-Rand Portable Air Compressor. On uses other than pressure applications, grade 8 capscrews are acceptable.

TABLE 2
ISO/Metric Screws

Part Number	Size (mm)	Description	Part Number	Size (mm)	Description
35271139	M12 x 1.75 x 40	Hex Head, Class 8.8	35330539	M12 x 1.75 x 100	Hex Head, Class 8.8
35271147	M12 x 1.75 x 30	Hex Head, Class 8.8	35333978	M10 x 1.25 x 50	Hex Head, Class 8.8
35271154	M10 x 1.50 x 30	Hex Head, Class 8.8	35356318	M20 x 2.5 x 90	Hex Head, Class 8.8
35271162	M8 x 1.25 x 30	Hex Head, Class 8.8	35358266	M10 x 1.5 x 140	Hex Head, Class 8.8
35271188	M10 x 1.5 x 25	Hex Head, Class 8.8	35358274	M16 x 2.25 x 25	Hex Head, Class 8.8
35272533	M12 x 1.75 x 35	Hex Head, Class 8.8	35361807	M16 x 2.25 x 120	Hex Head, Class 8.8
35272541	M16 x 2.25 x 40	Hex Head, Class 8.8	92304385	M10 x 1.5 x 16	Hex Head, Class 8.8
35273408	M8 x 1.25 x 20	Hex Head, Class 8.8	92304393	M10 x 1.5 x 20	Hex Head, Class 8.8
35273416	M8 x 1.25 x 25	Hex Head, Class 8.8	92304419	M10 x 1.5 x 40	Hex Head, Class 8.8
35273945	M10 x 1.5 x 35	Hex Head, Class 8.8	92304435	M12 x 1.75 x 25	Hex Head, Class 8.8
35275007	M6 x 1 x 25	Hex Head, Class 8.8	92304450	M12 x 1.75 x 50	Hex Head, Class 8.8
35279025	M8 x 1.25 x 20	Self-Tapping	92329309	M10 x 1.5 x 35	Hex Head, Class 8.8
35284678	M8 x 1.25 x 20	Hex Head, Class 8.8	92341219	M20 x 2.5 x 40	Hex Head, Class 8.8
35284791	M8 x 1.25 x 70	Hex Head, Class 8.8	92367663	M16 x 2.25 x 35	Hex Head, Class 8.8
35285584	M12 x 1.75 x 25	Hex Head, Class 12.9	92368687	M6 x 1 x 71	Hex Head, Class 8.8
35287648	M8 x 1.25 x 16	Hex Head, Class 8.8			
35288422	M8 x 1.25 x 60	Hex Head, Class 8.8			
35291640	M14 x 2 x 40	Hex Head, Class 8.8			
35290113	M16 x 2.25 x 75	Hex Head, Class 8.8			
35295013	M10 x 1.5 x 70	Hex Head, Class 8.8			
35295351	M10 x 1.5 x 25	Hex Head, Class 8.8			
35295484	M12 x 1.75 x 16	Hex Head, Class 8.8			
35295757	M12 x 1.75 x 20	Hex Head, Class 8.8			
35300623	M16 x 2.25 x 140	Hex Head, Class 8.8			
35300721	M6 x 1 x 70	Self-Tapping			
35301746	M12 x 1.75 x 35	Hex Head, Class 8.8			
35307816	M6 x 1 x 70	Hex Head, Class 8.8			
35309715	M16 x 2.25 x 25	Hex Head, Class 8.8			
35317106	M6 x 1 x 25	Hex Head, Class 8.8			
35317148	M6 x 1.25 x 60	Hex Head, Class 8.8			
35321520	M16 x 2.25 x 10	Hex Head, Class 8.8			
35322908	M6 x 1 x 20	Hex Head, Class 8.8			
35327550	M8 x 1.25 x 70	Hex Head, Class 8.8			

ISO/Metric Nuts

Part Number	Size (mm)	Description
35273366	M10 x 1.5	Lock, Nylon Insert
35275023	M8 x 1.25	Lock, Nylon Insert
35304047	M12 x 1.75	Lock, Nylon Insert
35356526	M20 x 2.5	Lock, Nylon Insert
35361815	M16 x 2.0	Lock, Nylon Insert
90101839	M16 x 2.0	Hex
90101854	M12 x 1.75	Hex
92304500	M6 x 1	Hex
92304526	M10 x 1.5	Hex

ISO/Metric Washers

Part Number	Size (mm)	Description
35317314	6	Flat
92304658	6	Spring Lock
92304674	10	Flat

ISO/Metric Capscrews
Grade Identification

Capscrews shall be identified with their property class symbol with the manufacturer's identification symbol at his option. Grade identification markings (8.8, etc.) are normally located at the top of the screw head, or alternatively, on the side of the head, and may either be raised or depressed at option of the manufacturer.						
CLASS	4.6	5.8	8.8	9.8	10.9	12.9
SAE EQUIVALENT	EQUIVALENT TO SAE GRADE 1	EQUIVALENT TO SAE GRADE 2	EQUIVALENT TO SAE GRADE 5	APPROXIMATELY 9 PER CENT STRONGER THAN SAE GRADE 5	EQUIVALENT TO SAE GRADE 8	NO EQUIVALENT SAE GRADE
USAGE	UNACCEPTABLE	UNACCEPTABLE	PREFERRED	ALTERNATE IF PREFERRED NOT AVAILABLE	*	*

* Due to the material and hardness, class 10.9 and 12.9 capscrews are not suitable for use on the pressurized air systems on an Ingersoll-Rand Portable Air Compressor. On uses other than pressure applications, class 10.9 and 12.9 capscrews are acceptable.



Doosan Infracore
Portable Power

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