OPERATING, MAINTENANCE, PARTS MANUAL

COMPRESSOR MODEL

VHP90CMH

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.

Portable Power
P.O. Box 868 - 501 Sanford Ave
Mocksville, N.C. 27028
Revised (01-13)

Manual P/N 22189203 (08/03)

QUALITY POLICY

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

TABLE OF CONTENTS

SECTION 1 . . . . . SAFETY

SECTION 2 . . . . . WARRANTY/REGISTRATION

SECTION 3 . . . . . INSTALLATION

SECTION 4 . . . . . GENERAL DATA

SECTION 5 . . . . . OPERATION

SECTION 6 . . . . . MAINTENANCE

SECTION 7 . . . . . LUBRICATION

SECTION 8 . . . . . TROUBLESHOOTING

SECTION 9 . . . . . PARTS ORDERING

SECTION 10 . . . . . PARTS LIST

SECTION 1– SAFETY

SAFETY PRECAUTIONS

General Information

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

Ensure that the Operation and Maintenance manual, and the manual holder if equipped, are not removed permanently from the machine.

Ensure that maintenance personnel are adequately trained, competent and have read the 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, dependent on local regulations or the degree of risk involved.

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

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 or over pressurized by another.

Compressed air must not be used for a feed to any form of breathing apparatus or mask.

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.

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

Never operate the engine of this machine inside a building without adequate ventilation. Avoid breathing exhaust fumes when working on or near the machine. Do not alter or modify this machine.

A battery contains sulfuric acid and can give off gases which are corrosive and potentially explosive. Avoid contact with skin, eyes and clothing. In case of contact, flush area immediately with water.

Exercise extreme caution when using booster battery. To jump battery, connect ends of one booster cable to the positive (+) terminal of each battery. Connect one end of other cable to the negative (–) terminal of the booster battery and other end to a ground connection away from dead battery (to avoid a spark occurring near any explosive gases that may be present). After starting unit, always disconnect cables in reverse order.

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

This machine may include such materials as oil, diesel fuel, antifreeze, brake fluid, oil/air filters and batteries which may require proper disposal when performing maintenance and service tasks. Contact local authorities for proper disposal of these materials.

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

Never operate the engine of this machine inside a building without adequate ventilation. Avoid breathing exhaust fumes when working on or near the machine.

A battery contains sulfuric acid and can give off gases which are corrosive and potentially explosive. Avoid contact with skin, eyes and clothing. In case of contact, flush area immediately with water.

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.

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 disconnecting battery cable(s) to prevent accidental starting.

Do not remove the pressure cap from a HOT radiator. Allow radiator to cool down before removing pressure cap.

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).

Disconnect 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).

Hot pressurized fluid can cause serious burns. Do not open radiator while hot.

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.).

Ether is an extremely volatile, highly flammable gas. USE SPARINGLY! If too much is injected, it may result in costly damage to the engine.

Never allow the unit to sit stopped with pressure in the receiver–separator system. As a precaution, open the manual blowdown valve.

Never operate unit with guards, covers or screens removed. Keep hands, hair, clothing, tools, blow gun tips, etc. well away from moving parts.

Make sure wheels, tires and tow bar connectors are in safe operating condition and tow bar is properly connected before towing.

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.

Hazardous Substance Precaution

The following substances are used in the manufacture of this machine and may be hazardous to health if used incorrectly.

Precaution: Avoid ingestion, skin contact and breathing fumes for the following substances: Antifreeze, Compressor Oil, Engine Lubricating Oil, Preservative Grease, Rust Preventative, Diesel Fuel and Battery Electrolyte.

The following substances may be produced during the operation of this machine and may be hazardous to health:

Avoid build–up of Engine Exhaust Fumes in confined spaces.

Avoid breathing Exhaust Fumes.

Avoid breathing Brake Lining Dust during maintenance.

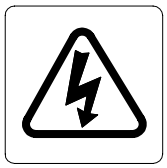
SAFETY LABELS

Look for these signs on machines shipped to international markets outside North America, which point out potential hazards to the safety of you and others. Read and understand thoroughly. Heed warnings and follow instructions. If you do not understand, inform you supervisor.

Corrosion risk

Hot Surface

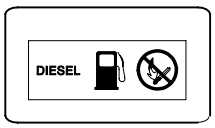
Lifting point



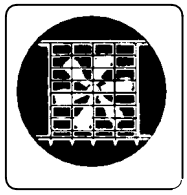
WARNING: Electrical shock risk.

Parking Brake

No open flame



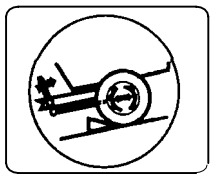
Diesel Fuel.
No open flame.



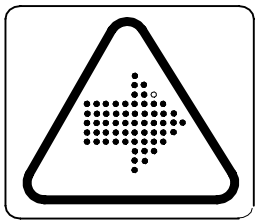
Do not operate the machine without guard being fitted.

Lifting point

WARNING – Flammable liquid.



When parking use prop stand, handbrake and wheel chocks.



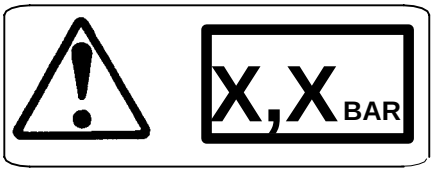
Air/gas flow or Air discharge.

WARNING – Hot and harmful exhaust gas.

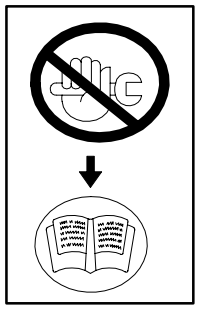
Tie down point

Do not breathe the compressed air from this machine.

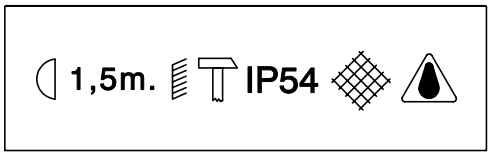
Read the Operation and Maintenance manual before operation or maintenance of this machine is undertaken.



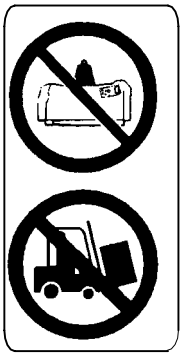
WARNING – Maintain correct tire pressure. (Refer to the *GENERAL INFORMATION* section of this manual).



WARNING: Consult the operation and maintenance manual before performing any maintenance.

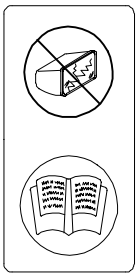


Rough Service Designation
Wet Location Operation

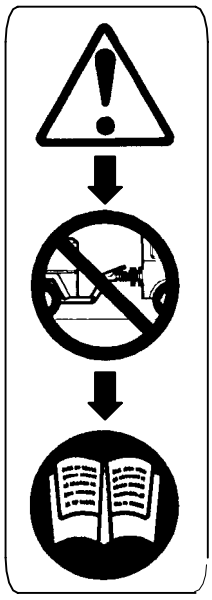


Do not stack

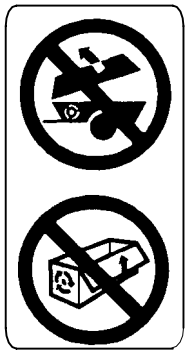
Do not use fork lift truck from this side



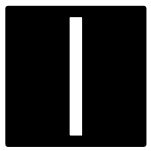
Replace any cracked protective shield.



WARNING – Before connecting the tow bar or when preparing to tow, consult the operation and maintenance manual.

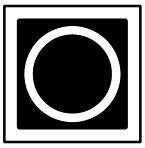


Do not operate with the doors or enclosure open.

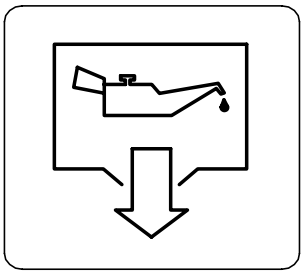


On (power).

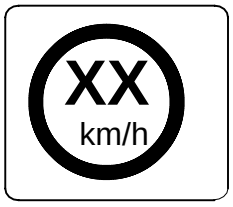
Off (power).



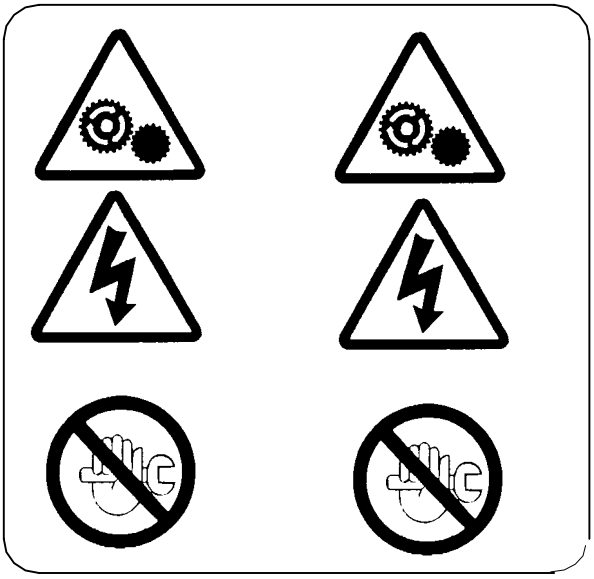
Emergency stop.



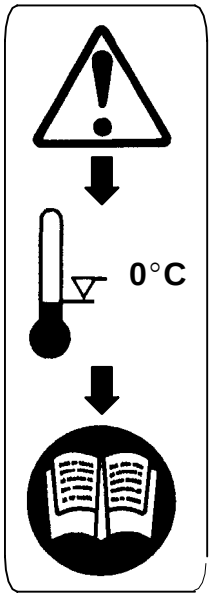
Oil Drain



Do not exceed the speed limit.



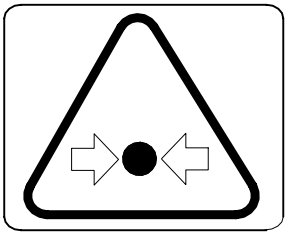
WARNING – Do not undertake any maintenance on this machine until the electrical supply is disconnected and the air pressure is totally relieved.



WARNING – For operating temperature below 0°C, consult the operation and maintenance manual.

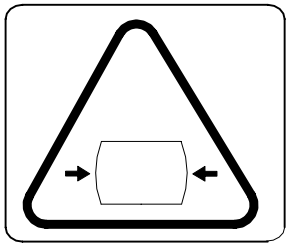
Read the Operation and Maintenance manual before operation or maintenance of this machine is undertaken

Do not remove the Operating and Maintenance manual and manual holder from this machine.



Pressurized vessel.

Use fork lift truck from this side only.



Pressurized component or system.

Look for these signs on machines shipped to markets in North America, which point out potential hazards to the safety of you and others. Read and understand thoroughly. Heed warnings and follow instructions. If you do not understand, inform you supervisor.

⚠DANGER

(Red Background)

Indicates the presence of a hazard which WILL cause serious injury, death or property damage, if ignored.

⚠WARNING

(Orange Background)

Indicates the presence of a hazard which CAN cause serious injury, death or property damage, if ignored.

⚠CAUTION

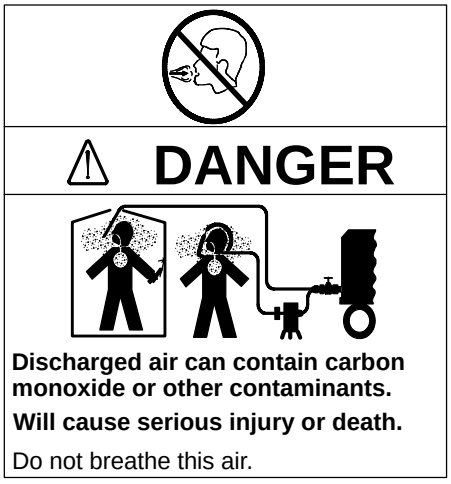
(Yellow Background)

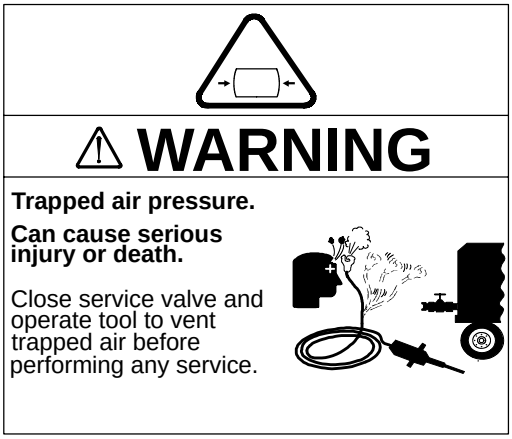
Indicates the presence of a hazard which WILL or can cause injury or property damage, if ignored.

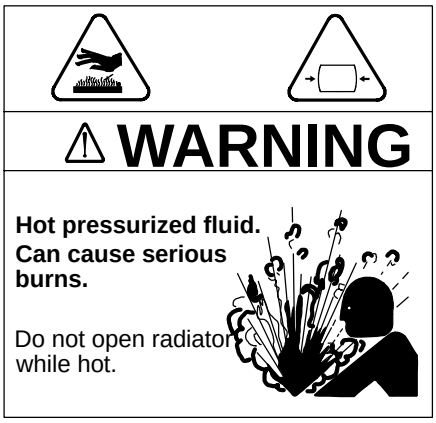
NOTICE

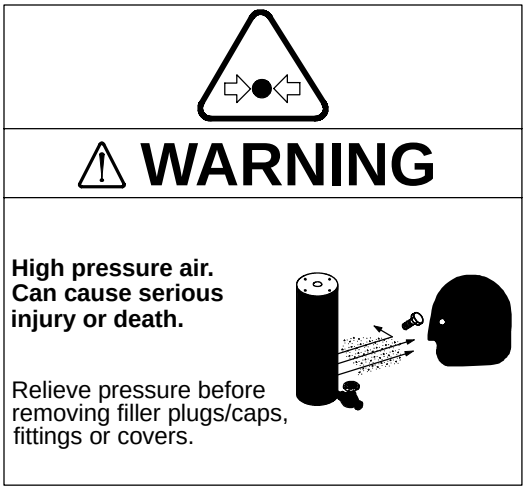
(Blue Background)

Indicates important set–up, operating or maintenance information.









⚠ WARNING

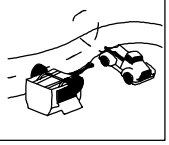
Improper operation of this equipment.
Can cause serious injury or death.
Read Operator's Manual supplied with this machine before operation or servicing.

Modification or alteration of this machine.
Can cause serious injury or death.
Do not alter or modify this machine without the express written consent of the manufacturer.

⚠ WARNING

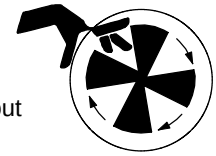
Collapsing jackstand.
Can cause serious injury.
Insert locking pin completely.

Excessive towing speed.
Can cause serious injury or death.
Do NOT exceed 65 mph (105 km/hr.)



⚠ WARNING

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



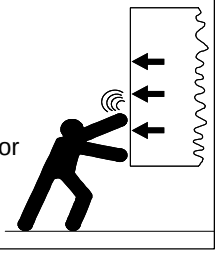
⚠ WARNING

Falling off machine.
Can cause serious injury or death.

Access lifting bail from inside machine.

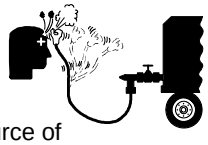
⚠ WARNING

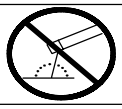
Door under pressure.
Can cause serious injury.
Use both hands to open door when machine is running.



⚠ WARNING

Disconnected air hoses whip.
Can cause serious injury or death.
When using air tools attach safety device (OSHA Valve) at source of air supply for each tool.





CAUTION

DO NOT WELD.
ELECTRONIC DAMAGE WILL OCCUR.
This engine is equipped with an electronic engine controller and other electronic components.

⚠ WARNING

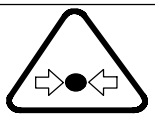
Combustible gas.
Can cause serious burns, blindness or death.
Keep sparks and open flames away from batteries.

CAUTION

DO NOT USE ETHER.

ENGINE DAMAGE WILL OCCUR.

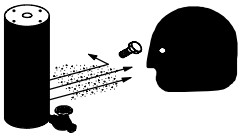
This engine is equipped with an electric heater starting aid.

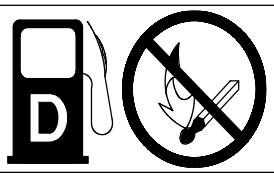


⚠ WARNING

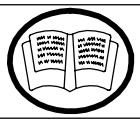
High pressure air. Can cause serious injury or death.

Relieve pressure before removing filler plugs/caps, fittings or covers.





USE DIESEL FUEL ONLY



NOTICE

COOLANT FILL INSTRUCTIONS

Adding:

Do NOT remove radiator cap. Top off at overflow reservoir. Use same anti–freeze mixture as in radiator.

Replacing:

With system cool, removeradiator cap. Drain coolant and close drain. At radiator, refill system. Replace radiator cap. At reservior, fill to "Hot" level. Run for 30 minutes. Stop and allow to cool. At reservoir, add coolant as necessary to reach "Cold" level.

FREE SAFETY DECALS!

To promote communication of Safety Warnings on products manufactured by the Portable Compressor Division in Mocksville, N.C., 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 also listed in the compressor's parts manual. Submit orders for Safety Decals to the Mocksville Parts Service Department. The no charge order should contain only Safety Decals. 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 distributor, warrants that each item of equipment manufactured by it and delivered hereunder to the initial user will be free of defects in material and workmanship for a period of three (3) months from initial operation or six (6) months from the date of shipment to the initial user, whichever occurs first.

With respect to the following types of equipment, the warranty period enumerated below will apply in lieu of the foregoing warranty period.

A. **Aftercoolers** – The earlier of nine (9) months from date of shipment to or six (6) months from start up by initial user.

B. **Portable Compressors, Portable Generator Sets (GENSET) 8KW, 11KW, 20KVA thru 575KVA, Portable Light Towers and Air Dryers** – The earlier of twelve (12) months from shipment to or the accumulation of 2,000 hours of service by the initial user.
3.5KW thru 7.0KW and 10KW– The earlier of twelve (12) months from shipment to or the accumulation of 2,000 hours of service by the initial user, whichever occurs first. Ingersoll–Rand will provide a new part or repaired part, at it's election, in place of any part which is found to be defective in material or workmanship during the period described above. Labor cost to replace the part is the responsibility of the user.

C. **Portable Compressor Air Ends –** The earlier of twenty–four (24) months from shipment to or the accumulation of 4,000 hours of service by the initial user. For Air Ends, the warranty against defects will include replacement of the complete Air End, provided the original Air End is returned assembled and unopened.

C.1 **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.

D. **Genset Generators 8KW, 11KW, 20KVA thru 575KVA –** The earlier of twenty–four (24) months from shipment to or the accumulation of 4,000 hours of service by the initial user.
3.5KW thru 7.0KW and 10KW – The earlier of twelve (12) months from shipment to or the accumulation of 2,000 hours of service.

E. **Portable Light Tower Generators–** The earlier of twelve (12) months from shipment to or the accumulation of 2,000 hours of service by the initial user. Light Source model only, the earlier of twenty–four (24) months from shipment to or the accumulation of 4,000 hours of service.

F. **Ingersoll–Rand Engines –** The earlier of twenty–four (24) months from shipment to or the accumulation of 4,000 hours of service.

G. **Ingersoll-Rand Platinum Drive Train Warranty (Optional)** – Platinum drive train pertains to the Ingersoll-Rand Engine and Airend combination. The earlier of sixty (60) months from shipment to, or the accumulation of 10,000 hours of service. The starter, alternator, fuel injection system and all electrical components are excluded from the extended warranty. The airend seal and drive coupling are included in the warranty (airend drive belts are not included). The optional warranty is automatically available when meeting the following conditions:

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

It is the obligation of the user to provide verification that these conditions have been satisfied when submitting warranty claims.

F. **Spare Parts**– Six (6) months from date of shipment.

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 warrantees do 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, tires, batteries, engine electrical equipment, hydraulic transmissions, carriers, 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.

GENERAL WARRANTY INFORMATION

GENERAL WARRANTY			Extended Coverage
Portable Compressor	Package	1 year/2000 hours	
	Airend	2 years/4000 hours	5 years/10,000 hours Limited warranty, major components (refer to operator's manual).

Portable Genset 8KW, 11KW, 20KVA thru 575KVA	Package	1 year/2000 hours	None
	Generator	2 years/4000 hours	None

Portable Genset 3.5KW thru 7.0KW and 10KW	Package	1 year/2000 hours PARTS ONLY	None
	Generator	1 year/2000 hours PARTS ONLY	None

Light Tower	Package	1 year/2000 hours	
	Generator	1 year/2000 hours	2 years/4000 hours, for Lightsource introduced 8/16/99.

ENGINES			
Caterpillar	**Months**	**Hours**	**Extended Coverage**
	12	No Limit	Available at dealer
Cummins	24	2000	Major components 3 yrs/10,000 hours – available at dealer
John Deere			
(IN COMPRESSORS)	24	2000	5 yrs/5000 hours using OEM fluids & filters with $250 deductible.
			2 yrs/4000 hours using IR fluids & filters
(IN GENERATORS AS OF 1/1/01)	24	2000	
Deutz	24	2000	Available at dealer
Ingersoll–Rand	24	4000	5 years/10,000 hours when using genuine Ingersoll–Rand fluids and parts. Refer to operator's manual.
Kubota (North America Only)	24	2000	Major components 36 months/3000 hrs – parts only
(Western Europe & Oceania)	24	2000	None
(Central & South America, Asia, Middle East & Africa)	12	1000	None
Mitsubishi	24	2000	2 years/4000 hours using IR fluids and filters
Volvo	24	2000	2 years/4000 hours using IR fluids and filters
Honda	12	unlimited	None
Vanguard	24	unlimited	None

PARTS			
	Months	**Hours**	**Coverage**
Ingersoll–Rand	6	No Limit	Parts Only
AIREND EXCHANGE			
	Months	**Hours**	**Extended Coverage**
Airend	12	2000 hours	2 years/4000 hours – available from IR.

Note: Actual warranty times may change. Consult the manufacturer's warranty policy as shipped with each new product.

Extended Limited Airend Warranty

Ingersoll–Rand Portable Compressor Division is pleased to announce the availability of extended limited airend warranty. Announcement of the extended warranty coincides with the introduction of PRO•TEC™ Compressor Fluid. PRO•TEC™ Compressor Fluid is an amber colored fluid specially formulated for Portable Compressors and is being provided as the factory filled fluid for all machines except [1] XHP650/900/1070 models.

All machines have the standard airend warranty – *The earlier of 24 months from shipment to, or the accumulation of 4000 hours of service.*

The warranty against defects will include replacement of the complete airend, provided the original airend is returned assembled and unopened.

The optional limited warranty is the earlier of 60 months from shipment to, or the accumulation of 10,000 hours of service. The optional warranty is limited to defects in major components (rotors, housings, gears, bearings), and is automatically available when the following three conditions are met:

1. The original airend is returned assembled and unopened.
2. Submissions of proof that Ingersoll–Rand fluid, filters and separators have been used. Refer to the Operation and Parts manual for the correct fluids, filters and separator elements required.
3. Submission of proof that maintenance intervals have been followed.

WARRANTY	TIME	*BARE AIREND	* * AIREND COMPONENTS
STANDARD	**2 yrs/4000 hrs**	**100% parts and labor**	**100% parts and labor**
OPTIONAL	**5 yrs/10,000 hrs**	**100% parts and labor**	**0%**

* Bare Airend – pertains to major airend parts (rotors, housings, gears and bearings).

** Airend Components – pertains to auxiliary attachments to the bare airend (drive coupling, seals, pumps, valves, tubes, hoses, fittings and filter housing).

PRO•TEC™ and XHP505 Compressor Fluids are available from the Mocksville Product Support department by calling 1–800–633–5206.

[1] XHP650/900/1070 will continue to use XHP505 and will have the extended warranty when above conditions are met.

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 868
Mocksville, North Carolina 27028

Attn: Warranty Department

Note: 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 ACKNOWLEDGEMENT

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.

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

Attention: Warranty Department

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SECTION 3 – INSTALLATION INSTRUCTIONS

System Description – General

The CM 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 General Data Decal supplied with each unit.

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 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, hourmeter, and air restriction indicator.

The enclosure cabinet, in which the components are mounted, is of heavy gauge sheet steel and is equipped with easy opening access panels for performing routine maintenance functions.

Compression in the screw–type air compressor is created by the meshing of two 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 airend 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 CM 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 80 and 175 psig (552 to 1206 kPa) by simple readjustment of the speed and pressure regulator adjusting screw. Unit is shipped set at 100 psig (804 kPa).

Mounting Unit

Satisfactory installation depends upon the ability of the installer. Refer to the appropriate foundation plan for the dimensions of the compressor package.

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 instrument panel will be fully visible.

NOTE: Instruments and control switch may be moved to opposite side of unit by customer or his agent, if desired. To move, switch the instruments and switch with hole plugs on opposite side. Duplicate panel decal is already installed.

The package has openings for cooling air intake on the rear and one end. While it is desirable that all five surfaces be open to admit air, the design of the product recognizes the practicality of various mounting arrangements. Excess cooling openings and cooling capacity of the fan and cooler combination has therefore been provided. The package will cool to at least the specified ambient limits if the rear OR the open end is totally blocked by walls, equipment, etc. It is NOT permissible to block the front of the unit, where the fan flow exits.

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.

Sufficeint space must be provided at the top of the unit to service the air cleaner, oil filter, and separator element. The spin–on separator requires the most clearance – 177 mm from the roof surface. The oil filter and air filter are both shorter. For installations such as under the bed of a truck, it may be desirable to provide a sliding mount tray for the compressor to facilitate servicing. For this type mounting care must be exercised to provide adequate piping and wiring slack to allow the unit to move for service.

It is normally not necessary to mount the unit to the vehicle or machine with "soft" isolators. This is especially true with trucks and other equipment mounted on rubber tires. Drilling equipment installations also normally work well with direct hard mounting. For some applications where shock and/or vibration is significant, such as an excavator or other track mounted machine, it may be desirable to soft mount the unit for its protection. In this case, isolators should be placed at each corner of the compressor, using the supplied mounting holes. The static weight on each isolator will be approximately 85 Ibs. Appropriate mounts should be rated in the 125 to 150 Ib. static range.

Compressor noise levels will not benefit from using isolators on low shock and vibration applications such as a truck, due to the inherent low vibration signature of this compressor.

Inlet Piping

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

PIPING – General

CM Series Compressors will require customer provided piping from the compressor module to the hydraulic supply and the air service piping. These hoses are not provided with the units, as the required lengths of the hoses are dependent on the relative locations of modules in its installed location. It is left to the installer to obtain hoses of the correct type and length for each installation.

LOCATION	FITTING SIZE	HOSE SIZE	HOSE TYPE
Compressor Module to Hydraulic Supply	–12 JIC	1" (–16)	Parker–Hannifin 301 or equivalent
Compressor Module to Hydraulic Cooler and Tank Return	–12 JIC	1" (–16)	Parker–Hannifin 301 or equivalent
Compressor Module to Discharge	–12 JIC	3/4" (–12)	Parker–Hannifin 213, or Aeroquip FC350, or equivalent
Motor Case Drain	–6 JIC	3/8"–6	Parker–Hannifin 213, or Aeroquip FC350, or equivalent

All hoses terminate at marked bulkhead fittings.

All hoses terminate in Type 1 SAE J516 (female swivel), 37° JIC flare fittings.

3/4 inch NPT to –JIC adapter and fitting for airend discharge pipe is customer supplied.

Note: While hydraulic connectors on module are –12, it is recommended customers obtain –16 (1 inch) hoses terminated at compressor end with –12 fittings for optimum performance and low hydraulic pressure drop.

Compressor Discharge Piping

The connection between the compressor package and the customer air system must be furnished by the customer. It is recommended the customer use a flexible line of 3/4 inch or larger. All piping must be certified safe for the pressures and temperatures involved.

Wiring

The customer must connect a 12 volt supply to the compressor to run the cooling fan, solenoid divertor valve, and the instruments. The fan, hourmeter, and discharge temperature gage will start and stop automatically on signal from a pressure switch internal to the compressor. No action by the customer is required. The 12 volt power source must be capable of providing at least 27 amps continuously. The 12 volt supply to the compressor must be no smaller that AWG size 10 wire. Larger wire should be used if the total wiring length exceeds 12 feet. This is critical as the fan motor is sensitive to wiring voltage drop. Insufficient fan speed and overheating of the compressor will result with undersized wiring.

The compressor is protected against overheating by a thermal–type discharge air temperature switch located in the compressor receiver/separator. 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 volt DC. As an option, this switch may be supplied for 125 volt AC.

The safety shutdown function of the unit is completely internal to the module, and operates by de–energizing the hydraulic diverter valve to make the hydraulic flow bypass the motor.

Regulation

The standard regulation system supplied with CM 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 Aftermarket Department for technical assistance for these applications.

The adjustment and operation of the standard regulation system described in the operating instructions.

As noted therin, the unit is shipped from the factory adjusted to 100 psig discharge pressure. The operator may adjust for operation from 80 to 175 psig.

Hydraulic Cooling Requirements

Every hydraulic system generates waste heat due to normal mechanical (friction) and volumetric (slippage) losses. In a typical circuit used to operate the air compressor, losses occur in the compressor hydraulic motor, customer's hydraulic pump used to drive the motor, and the piping pressure drops.

These losses can be reduced by specifying efficient (both mechanically and volumetrically for pumps and motors) components for the hydraulic system. The compressor motor was chosen in great part due to high efficiency. Using large hoses helps (–16 hoses instead of–12.)

It is usually NOT practical to operate the VHP90CMH without a hydraulic cooler. With a typical 40 gallon tank, depending on beginning hydraulic oil temperature, testing demonstrates that the unit is limited to 20 minutes of full load operation in an eight hour period. Tanks cool very slowly –12 hours are generally needed for the oil to cool to within 30 deg. F. of the surrounding air temperature.

At full load, with a typical hydraulic pump, approximately 15– 16 HP, or about 40,000 BTU/hr, is generated as waste heat by the hydraulic system, and must be removed with a suitable oil cooler. Reduction of compressor speed and/or discharge pressure will diminish this heat load. Running at 100 psig vs. 175 psig, for instance, decreases the heat load by approximately 23%.

Ingersoll–Rand has available a remote oil cooler with a 12VDC electric fan that is sized for this application. This cooler (or similar customer supplied unit) should be installed into the return line between the compressor and the oil tank. When specifying a cooler ensure that pressure drop does not exceed 30 psi at 30 GPM at operating temperature. Cooler manufacturers typically show pressure drop plotted with viscosity. For this application assume a viscosity range from 10cSt (59 SSU) to 750 cSt (3409 SSU), and select cooler based on 30 psi at 20 cSt (100 SSU.) If cooler is available with pressure bypass, select this option and set bypass between 30 and 40 psig.

Coolers should be chosen so as to limit the hydraulic oil temperature to 175 deg. F. in the warmest environment that the unit will operate in. If an ambient of 100 deg. F. is anticipated, for example, a cooler that will handle the maximum heat load of the unit at an Entering Temperature Differential (ETD) of 75 deg. F. would be a good choice.

The cooler selected will usually have an electric fan included. This fan can be switched from the electrical circuit of the VHP90CMH. Connect the (+) fan wire to terminal #7 and the (–) wire to terminal #4. The connected fan must have a suitable fuse installed in its wiring and must be limited to 30 amp current draw. With this arrangement, the hydraulic oil cooler fan will switch on and off automatically with the compressor oil cooler fan.

Hydraulic Oil Requirements

Most premium grade petroleum based hydraulic fluids can be used with the VHP90CMH. Optimum operating viscosity is in the range of 16– 40 cSt (74– 185 SSU). Minimum operating viscosity is 10 cSt (59 SSU). Maximum operating viscosity is 750 cSt (3409 SSU). Maximum cold start viscosity is 2000 cSt (9240 SSU). Fluids should be chosen based on starting viscosity at lowest anticipated oil temperature. Normally, ISO 32 grade fluids are a good choice as they are usable for starting down to –10°F, and can operate up to about 175°F, which covers the range of hydraulic temperature with a cooler temperature on a 100°F day. For sustained operation in high ambient temperatures, ISO grade 46 fluid is a good choice.

The motor in the VHP90CMH can operate continuously at 200° F. and intermittently at 221°F. However, as previously stated it is desirable to limit the oil temperature to no more than 175°F. This will enhance the life of the hydraulic system, and less speed drop–off will occur at high ambient temperature.

Some speed decrease at higher temperatures is normal due to reduced volumetric efficiency of the pump and motor as they handle lower viscosity oil. This can be minimized by using higher viscosity grades of hydraulic oil for high ambient operation.

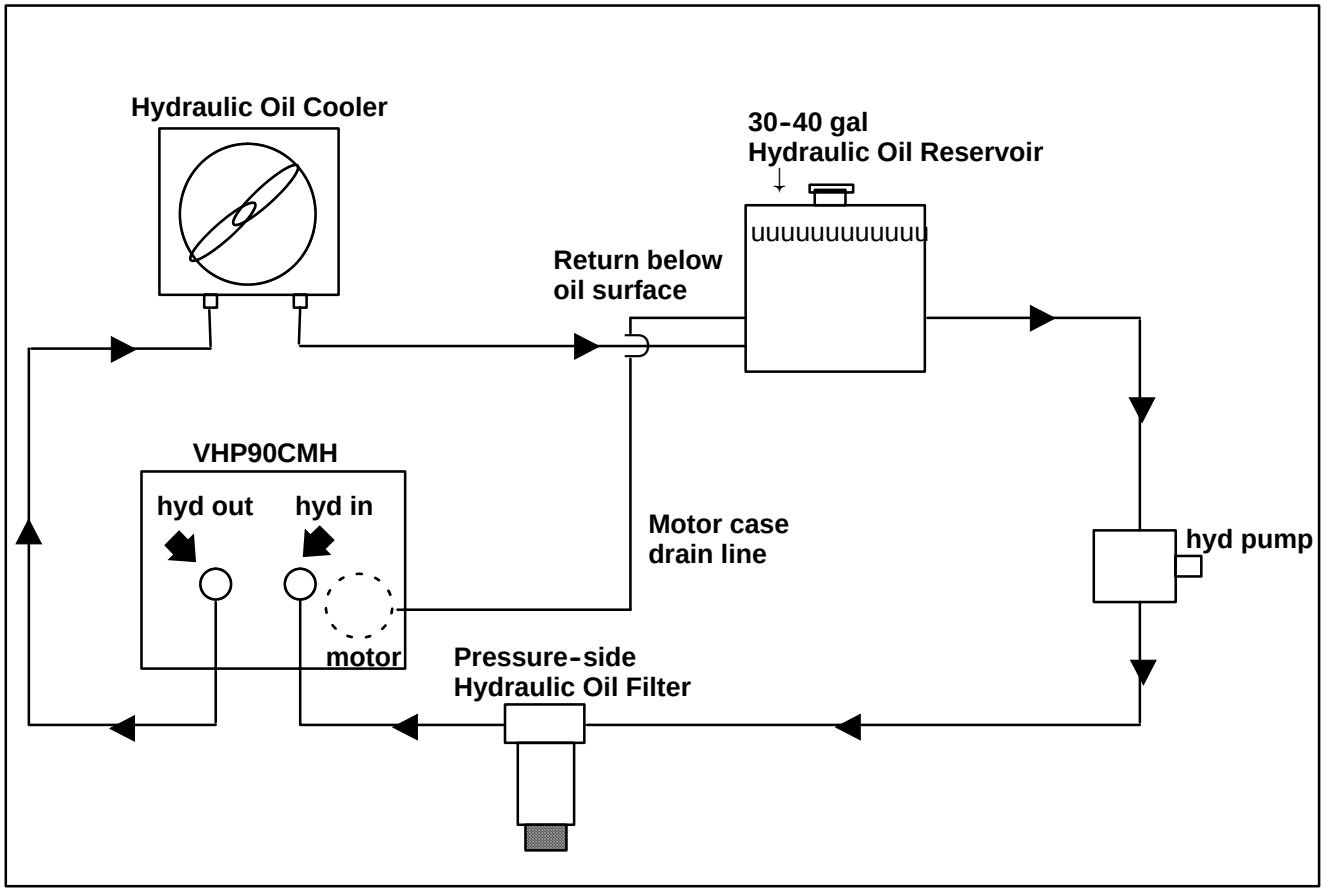
Hydraulic reservoir

Hydraulic reservoir for the compressor alone should be in the 30 –40 gallon size range at a minimum, and larger if space and weight considerations allow. If other motors feed simultaneously from the same tank, it should be sized proportionately larger to handle the additional flow. Follow established design practice for tank layout. Inlet and outlet connections should be well separated, and tank should be baffled. It is desirable that an outlet strainer be fitted. A cut off valve for service should be included, along with a clean out port. Tank must be vented to atmosphere and should include adequate expansion volume.

Hydraulic Filtration

In addition to a tank strainer, a hydraulic filter must be fitted either in the return line or in the pressure line. We highly recommend pressure side filtration to better protect the motor and spool–type diverter valve (both of which have close tolerance parts) from any particles that get through the tank strainer or are generated in the pump. Filter should have a nominal rating of 5–10 micron. Specifically, Absolute Rating per ISO 16889 (new) should be 5–10 for Bx(c)>200. Flow rating should be for a minimum of 30 GPM. Connect the filter inline with the pressure line going to the hydraulic oil inlet of the compressor.

VHP90CMH HYDRAULIC FLOW SCHEMATIC (Typical Application)



SECTION 4 – GENERAL DATA

UNIT MODEL VHP90CMH

Rated Delivery cfm (litres/sec) 90 (43)
Rated Pressure psi (kPa) 175 (1207)

Input Power Requirements @ full load:

Horsepower 36
Speed (RPM) 2800

Hydraulic Motor Requirements (at full load)

GPM @ psi 29.5 (2520)
LPM at kPa 111.7 (17379)

Cooling Fan Power Requirements:

12VDC Fan units at 18 amps each

Compressor Lube Capacity (Refill) U.S. gal (litres) 2 (7.6)

Unit Measurements/Weights:

Overall Length – inch (mm) 28.5 (724)
Overall Height – inch (mm) 22.1 (562)
Overall Width – inch (mm) 20.6 (524)
Weight – (Compressor Module) pounds (kilograms) 328 (149)
Weight – (system with lubricants) – pounds (kilograms) 342 (155)

Service Parts:

Compressor Oil Filter Element 39329602
Compressor Oil Separator Element 54720735
Air Cleaner Element 22173538

SECTION 5 – OPERATING INSTRUCTIONS

SET - UP

Place the unit in an open, well-ventilated area. Position as level as possible. The design of these units permits a 15 degree sidewise limit on out-of-level operation.

When the unit is to be operated out-of-level it is important:

(1) To have the compressor oil level gauge show no more than mid-scale.

(2) Do not overfill the compressor lubricating oil system.

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 220 psig (1517 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 serious 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 to low on the green zone of level gage. Add oil if the level falls to the red zone. Do NOT overfill.

WARNING

This machine produces loud noise. Extended exposure to loud noise can cause hearing loss. Wear hearing protection.

Be sure no one is IN or ON the compressor unit.

Always operate this equipment with all enclosure panels installed to avoid recirculation of hot air. This will maximize the life of the compressor.

WARNING

Do NOT operate machine with guards removed.

CAUTION

Do not operate machine with safety shutdown switches by-passed.

STARTING/OPERATING

- Close service valve.
- Engage hydraulic pump at lowest possible driver speed.

CAUTION

Do NOT engage compressor motor at driver speed above idle. Damage to compressor motor, pump, or other driveline components can occur.

- Flip RUN/STOP switch to RUN position.
- Increase driver speed to compressor operation rated speed.
- 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.
- Flip RUN/STOP switch to STOP position.
- Disengage hydraulic pump.

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

CAUTION

Never allow the unit to sit stopped with pressure in the receiver separator system. As a precaution, after the automatic blow-down period (3 minutes), open the manual blow-down valve.

EQUIPMENT PROTECTION

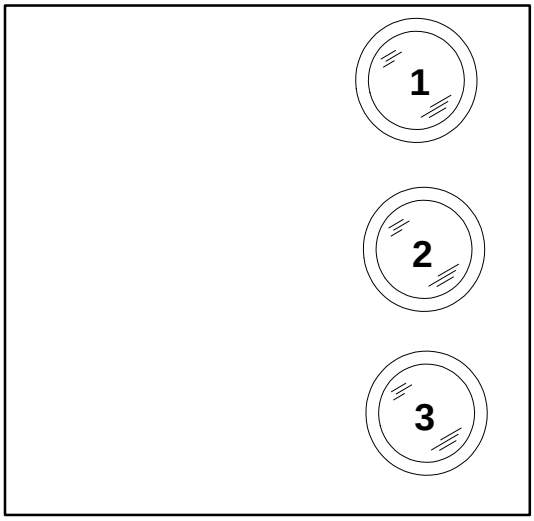
NOTE: Do NOT wire around or bypass a shutdown sensor or switch.

This unit is protected by a shutdown switch at the following location:

High Discharge Air Temperature

(1) In the end of the separator tank.

GAUGE PANEL



Operating Instruments

On Panel

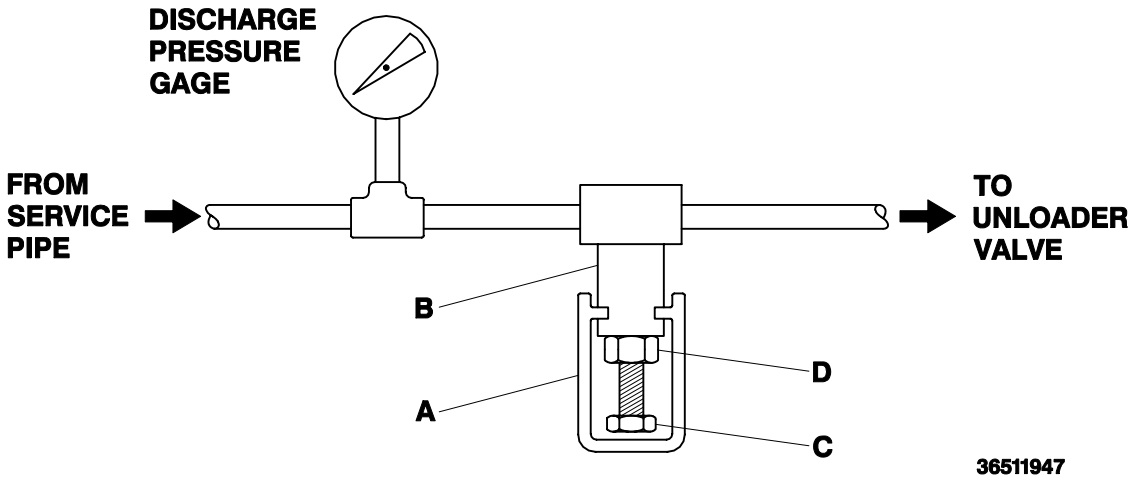
1. Compressor Discharge Pressure Gauge – Indicates pressure in receiver tank, psig (kPa).
2. Discharge Air Temperature Gauge – Indicates discharge air temperature in °F and °C. Normal operating range: 185°F/85°C to 248°F/120°C.
3. Hourmeter – Indicates elapsed unit operating time.

Inside

4. Air Filter Restriction Indicator – Indicates compressor air cleaner restriction.
   Normal operation (<20 in. H_20), green flag. Needs service, (>20 in. H_20), red flag.

   (Indicator located at base of inlet filter. Visible through grille at discharge end of machine).

Speed and Pressure Regulator Adjusting Instructions



Normally, speed and pressure regulation requires no adjusting, but if proper adjustment is lost, proceed as follows. Refer to the General Data table for proper engine speeds.

Before Starting

1. Remove regulator valve cover (A), (if equipped) on valve (B) to expose adjusting screw (C). Loosen jam nut (D) on adjusting screw (C) and turn screw counterclockwise until tension is no longer felt on screw. Now, turn screw clockwise one full turn.

2. Close service valve(s).

After Starting Unit

3. Allow unit to warm up at least five minutes, then if equipped, place the Start–Run Valve Switch in the “AIR” position to obtain full service air pressure.

4. With Service Air Valve closed, turn the adjusting screw (C) clockwise until the discharge pressure reaches 185 psi (range =10psi). Tighten jam nut (D).

5. Replace regulator valve cover (A), if equipped.

6. To select any pressure range fro 80 to 150 psi, change adjusting screw (C) to obtain a “closed” service valve pressure that is 10 psi greater than the desired “working” service pressure. Always lock and protect pressure setting of adjusting screw (C) with jam nut (D) and regulator valve cover (A).

Note: Unit is adjusted at factory for operation at 100 psi.

SECTION 6 – MAINTENANCE/LUBRICATION

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 exchanger and piping, air receiver and air discharge piping).

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 these units 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

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

COMPRESSOR OIL LEVEL

The oil level should be checked before the unit is operated. The optimum operating level is between mid and low level of the green selector of the level gauge in the end of the tank. If the oil level is not in the correct range, make appropriate corrections (add or drain).

Note: It is NOT possible to accurately read oil level in tank while compressor is running.

AIR CLEANER

This unit is equipped with an AIR FILTER RESTRICTION INDICATOR on the clean air side of the compressor air inlet.

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.

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 cleaner on all units proceed as follows:

1. Remove access cover on top of housing.
2. Remove air cleaner top, rotating counter clockwise by hand. Remove element.
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 the 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. Check new air filter elements for any shipping damage.
6. Install cleaned or new elements in the reverse order to the above. Tighten cover until it snaps into locked position.

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 air flow through the element.

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

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 clamps are tight. Check the air cleaner housing for damage which could lead to a leak.

GAUGES

The instruments or gauges are essential for safety, maximum productivity and long service life of the machine. Inspect the gauges and test any diagnostic lamps prior to start–up. During operation observe the gauges and any lamps for proper functioning. Refer to Operating Controls & Instruments for the normal readings.

COMPRESSOR OIL COOLER

The compressor lubricating and cooling oil is cooled by means of the fin and tube–type oil cooler. 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 cooler 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 core 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 cooler to the extent that its 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 it using a cleaning compound in accordance with the manufacturer's recommendations. After completing the cleaning procedure, the oil cooler must be flushed before returning to service.

HOSES

Each month it is recommended that the air cleaner clamps be checked for tightness.

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

The flexible hoses, 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 hold or steps. Such use can cause early cover wear and hose failure.

NOTICE

Piping systems operating at less than 200 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 bottom. 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.

1. Open the service air valve and manual blowdown valve to ensure that system is relieved of all pressure. Close the valve.

2. 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.

3. 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

4. Lubricate the new filter gasket with the same oil being used in the machine.

5. Install new filter by turning element clockwise until gasket makes initial contact. Tighten an additional 1/2 to 3/4 turn.

6. Start unit and allow to build up to rated pressure. Check for leaks before placing unit back into service.

AIREND/MOTOR

The unit is designed so that the hydraulic motor and the airend can each be removed from the mounting bracket independently. The coupling slides apart in the center when removing either. Both the airend and motor pilot into bores, maintaining critical shaft alignment set at the factory with removal and replacement of either.

It is critical that removal of the drive motor be done with the two motor mount bolts ONLY. Do NOT disturb the eight (8) motor mount plate retaining bolts. To do so destroys the shaft alignment, which can be aligned only with factory tooling.

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.

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 and manual blowdown valve.

Ensure pressure is relieved, when BOTH:
- -Discharge air pressure gauge reads zero (0).
- -No air discharging from service valve.

When draining oil, open manual blowdown valve to allow venting the system. Close blowdown valve prior to re-starting compressor.

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 spin-on oil separator element which is located on the top of the tank.

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

SCAVENGE LINE

WARNING

High pressure air can cause serious 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 base of the spin-on separator element head, and terminates at the compressor airend inlet valve through an orifice/check valve.

Once a year or every 2000 hours of operation, whichever comes first, remove this line and any orifice, thoroughly clean, then reassemble.

NOTICE

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 oil level. Maintain as indicated earlier in this section.
2. Thoroughly clean scavenge line, orifice and check valve.
3. Assure minimum pressure valve is holding 80-90 psi.
4. Run unit at rated operating pressure for 30 to 40 minutes to permit element to clear itself.

OIL SEPARATOR ELEMENT

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.

1. Remove roof access cover.
2. Using strap wrench if necessary, remove spin-on separator unit by rotating counterclockwise.

NOTE: 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.

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

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

4. Lubricate the new filter gasket with the same oil being used in the machine.

5. Install new separator by turning element clockwise until gasket makes initial contact. Tighten an additional 1/2 to 3/4 turn.

6. Adjust oil level if necessary.

7. Start unit and allow to build up to rated pressure. Check for leaks before placing unit back into service.

EXTERIOR FINISH CARE

This unit was painted and heat cured at the factory with a high quality, thermoset 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. Note: This may cause some dulling of the paint finish.

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.

Field Repair of Texture Paint

1. The sheet metal should be washed and clean of foreign material and then thoroughly dried.

2. Clean and remove all grease and wax from the area to be painted using Duponts 3900S Cleaner prior to sanding.

3. Use 320 grit sanding paper to repair any scratches or defects necessary.

4. Scuff sand the entire area to be painted with a red scotch brite pad.

5. Wipe the area clean using Duponts 3900S.

6. Blow and tack the area to be painted.

7. Apply a smooth coat of Duponts 1854S Tuffcoat Primer to all bare metal areas and allow to dry.

WARNING

If performing more than visual inspections, disconnect battery cables and open manual blowdown valve.

Never operate this machine with any guards removed.

CAUTION

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

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

MAINTENANCE SCHEDULE

	Daily	Monthly	3 MOS . 500 hrs.	6 MOS. 1000 hrs	12 MOS. 2000 hrs
Compressor Oil Level	C				
Gauges/Lamps	C				
*Air Cleaner Service Indicators	C				
Hoses (oil, air, intake, hydraulic, etc.)		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 if necessary), **WI**=OR when indicated, **L** = Lubricate

SECTION 7 – LUBRICATION

GENERAL INFORMATION

Both compressor lubrication and cooling are accomplished by the compressor lubricating oil. The oil is forced from the oil storage resevoir, 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 resevoir in the receiver/separator with new oil before operating the unit. Recharge the compressor by first removing the air filter and pouring about one pint (0.55 litre) 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

COMPRESSOR OIL CHANGE

If the unit has been operated for 1000 hours, it should be completely drained of oil. If the unit has been operated under adverse conditions or under long shutdown periods, an earlier change may be necessary as oil deteriorates with time as well as by operating conditions.

Complete replacement of the old oil with clean oil every 500 to 1000 hours, depending upon operating conditions is recommended. This will also prevent accumulation of dirt, sludge or oxidized oil products.

Completely drain the receiver/separator and the piping. If the oil is drained immediately after the unit has been run for some time, most of the sediment will be in suspension and will drain more readily.

CAUTION

Shorter oil change intervals may be necessary if unit is operated under adverse conditions.

WARNING

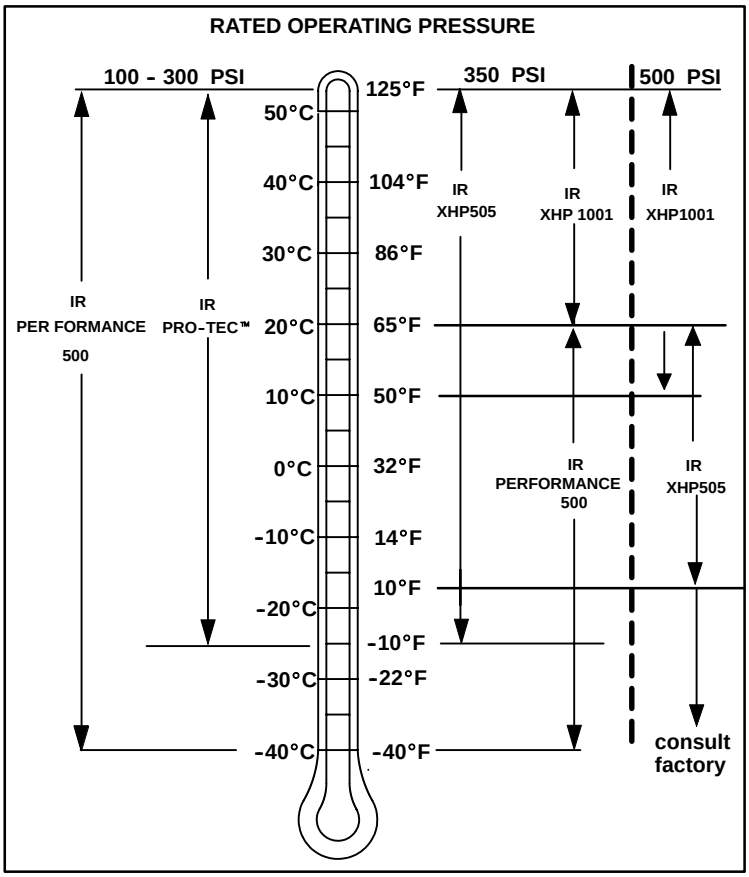
Do not under any circumstances, open any drain cocks, remove any plugs or the oil filler plug from the compressor lubricating and cooling oil system without making sure the air receiver system has been completely relieved of all air pressure.

CAUTION

Some oil mixtures are incompatible with each other and result in the formation of varnishes, shellacs or lacquers, which may be insoluble. Such deposits can cause serious trouble including clogging of the filter. Where possible, try to avoid mixing oils of the same type but different brands. A brand change is best made at the time of complete oil change. Refer to Fluid and Lubricants Chart for oil recommendations.

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.



Design Operating Pressure	Ambient Temperature	Specification
100 psi to 300 psi	-10°F to 125°F (-23°C to 52°C)	IR Pro-Tec™ Mil –PRF 2104G SAE 10W
100 psi to 300 psi	-40°F to 125°F (-40°C to 52°C)	IR Performance 500 Mil-L-46167
350 psi	-10°F to 125°F (-23°C to 52°C)	IR XHP 505
	65°F to 125°F (18°C to 52°C)	IR XHP1001
	-40°F to 65°F (-40°C to 18°C)	IR Performance 500 Mil-L-46167
500 psi	50°F to 125°F (10°C to 52°C)	IR XHP1001
	10°F to 65°F (-12°C to 18°C)	IR XHP 505
	below 10°F (-12°C)	Consult Factory

Hydraulic Lube System Specifications

Item	Fluid	Ambient Temp.	Specification
Hydraulic System	Hydraulic	-10°F to 125°F	Exxon Teresitic SHP32 Synthetic Hydraulic Fluid
Running Gear			
Wheel bearings	Grease	All	MIL-G-10924
Other	Grease	All	Multi-Purpose
Hydraulic Brakes	Fluid	All	Dot 3 or 4
Hydraulic Fan Motor	Grease	All	NLGI #1 or #2

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

Recommended Fluid	1 Gal. (3.8 Litre)	5 Gal. (19.0 Litre)	55 Gal. (208.2 Litre)
IR Pro-Tec™	36899698	36899706	36899714
IR XHP 505	35382928	35365188	35365170
IR Performance 500		35382936	35382944
IR XHP1001		35612738	35300516

SECTION 8 – Trouble Shooting

INTRODUCTION

Trouble shooting 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 trouble shooting 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) Has a similar trouble occurred before?
(3) What previous maintenance work has been done?
(4) If the compressor will still operate, is it safe to continue operating it to make further checks?

B. Do The Simplest Things First

Most troubles are simple and easily corrected. For example, most complaints are "low capacity" which may be caused by too low an engine speed or "compressor over– heats" which may be caused by low oil level.

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

Note: For trouble shooting electrical problems, refer to the Wiring Diagram Schematic found in Parts List Section.

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.

TROUBLE SHOOTING CHART

Bold Headings depict the COMPLAINT – Subheadings suggest the CAUSE

Note: Subheadings suggest sequence to follow 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:

- Leak 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:

- Operating Pressure Too High
- Leak In Regulator Piping
- Incorrect Pressure Regulator Adjustment
- Malfunctioning Pressure Regulator
- Malfunctioning Inlet Unloader/Butterfly Valve
- Defective Safety Valve
- Defective Separator Element
- Ice in Regulation Lines/Orifice

Fan(s) Will Not Run:

- Clogged with ice, snow, debris
- Defective Pressure Switch
- Defective Relay
- Defective Wiring
- Blown Fuse
- Defective Fan Motor

Excessive Compressor Oil Temperature:

- Ambient Temperature Too High
- Out of Level > 15 degrees
- Low Oil Level
- Wrong Lube Oil
- Dirty Cooler
- Dirty Operating Conditions
- Clogged Oil Filter Elements
- Malfunctioning Fan
- Defective Oil Cooler Relief Valve
- Defective Minimum Pressure Valve
- Blocked or Restricted Oil Lines
- Airend Malfunctioning

Excessive Vibration:

- Defective Fan
- Drive Coupling Defective
- Airend Malfunctioning

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.
- Running to Fast

Will Not Start/Run:

- Compressor Oil Temp. Too High
- Compressor Drive Motor Malfunctioning
- Airend Malfunctioning

> = greater than, < = less than

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. All of the compressor parts, listed in the parts breakdown, are manufactured with the same precision as the original equipment. For the greatest protection always insist on genuine Ingersoll–Rand Company parts for your compressor.

The unit covered by the manual has been custom designed and built to satisfy our customer s unique specifications by the Portable Compressor Division (PCD) Customer 1 Process Team.

Some of the unique, special order components may not be included in the illustrated parts breakdown. Supplemental pages with photo illustrations have been added to assist in identifying special order parts when required for service orders.

Contact the PCD Parts Department for assistance when ordering these special parts. Include the unit serial number with all orders.

NOTE: 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. There are Ingersoll–Rand Company Construction Equipment Group Sales Offices and authorized distributors located in the principal cities of the United States. In Canada our customers are serviced by the Canadian Ingersoll–Rand Company, Limited. There are also Ingersoll–Rand International autonomous companies and authorized distributors located in the principal cities throughout the free world.

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. A series of illustrations show each part distinctly and in location relative to the other parts in the assembly. The part number, the description of the part and the quantity of parts required are shown on each illustration or on adjacent page.

The quantities specified are the number of parts used per one assembly and are not necessarily the total number of parts used in the machine. Where no quantity is specified the quantity is assumed to be one.

Each description of a part is based upon the “noun first” method, i.e., the identifying noun or item name is always the first part of the description. The noun name is generally followed by a single descriptive modifier. The descriptive modifier may be followed by words or abbreviations such as upper, lower, inner, outer, front, rear, RH, LH, etc. when they are essential.

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 drawbar (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. In order to clarify the proper usage and for exact replacement parts, all standard fasteners have been identified by part number, size and description. This will enable a customer to obtain fasteners locally rather than ordering from the factory. These parts are identified in tables that will be found at the rear of the parts illustrations. Any fastener that has not been identified by both part number and size is a specially engineered part that must be ordered by part number to obtain the exact replacement part.

MARKINGS AND DECALS

NOTE: 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.

HOW TO USE PARTS LIST

a. Turn to Parts List Section.

b. Locate the area or system of the compressor in which the desired part is used and find illustration page number.

c. Locate the desired part on the illustration by visual identification and make note of part number and description.

HOW TO ORDER

The satisfactory ordering of parts by a purchaser is greatly dependent upon the proper use of all available information. By supplying your nearest sales office, autonomous company or authorized distributor, with complete information, you will enable them to fill your order correctly and to avoid any unnecessary delays.

In order that all avoidable errors may be eliminated, the following instructions are offered as a guide to the purchaser when ordering replacement parts:

a. Always specify the model number of the unit as shown on the general data decal attached to the unit.
b. Always specify the serial number of the unit. THIS IS IMPORTANT. The serial number of the unit will be found stamped on a plate attached to the unit. (The serial number on the unit is also permanently stamped in the metal of the frame side rail.)
c. Always specify the number of the parts list publication.
d. Always specify the quantity of parts required.
e. Always specify the part number, as well as the description of the part, or parts, exactly as it is given on the parts list illustration.

In the event parts are being returned to your nearest sales office, autonomous company or authorized distributor, for inspection or repair, it is important to include the serial number of the unit from which the parts were removed.

TERMS/CONDITIONS ON PARTS ORDERS

Acceptance: Acceptance of an offer is expressly limited to the exact terms contained herein. If purchaser's order form is used for acceptance of an offer, it is expressly understood and agreed that the terms and conditions of such order form shall not apply unless expressly agreed to by Ingersoll–Rand Company ("Company") in writing. No additional or contrary terms will be binding upon the Company unless expressly agreed to in writing.

Taxes: Any tax or other governmental charge now or hereafter levied upon the production, sale, use or shipment of material and equipment ordered or sold is not included in the Company's price and will be charged to and paid for by the Purchaser.

Delivery: Shipping dates are approximate. The Company will use best efforts to ship by the dates specified; however, the Company shall not be liable for any delay or failure in the estimated delivery or shipment of material and equipment or for any damages suffered by reason thereof.

Shipping dates shall be extended for delays due to acts of God, acts of Purchaser, acts of Government, fires, floods, strikes, riot, war, embargo, transportation shortages, delay or default on the part of the Company's vendors, or any other cause beyond the Company's reasonable control.

Should Purchaser request special shipping instruction, such as exclusive use of shipping facilities, including air freight when common carrier has been quoted and before change order to purchase order can be received by the Company, the additional charges will be honored by the Purchaser.

Warranty: The Company warrants that parts manufactured by it will be as specified and will be free from defects in materials and workmanship. The Company's liability under this warranty shall be limited to the repair or replacement of any part which was defective at the time of shipment provided Purchaser notifies the Company of any such defect promptly upon discovery, but in no event later than three (3) months from the date of shipment of such part by the Company. The only exception to the previous statement is the extended warranty as it applies to the special airend exchange program.

Repairs and replacements shall be made by the Company F.O.B. point of shipment. The Company shall not be responsible for costs of transportation, removal or installation.

Warranties applicable to material and equipment supplied by the Company but wholly manufactured by others shall be limited to the warranties extended to the Company by the manufacturer which are able to be conveyed to the Purchaser.

The company makes no other warranty or representation of any kind whatsoever, expressed or implied, except that of title, and all implied warranties, including any warranty of merchantability and fitness for a particular purpose, and hereby disclaimed.

Limitation of Liability: The remedies of the Purchaser set forth herein are exclusive, and the total liability of the Company with respect to this order whether based on contract, warranty, negligence, indemnity, strict liability or otherwise, shall not exceed the purchase price of the part upon which such liability is based.

The Company shall in no event be liable to the Purchaser, any successors in interest or any beneficiary of this order for any consequential, incidental, indirect, special or punitive damages arising out of this order or any breach thereof, or any defect in, or failure of, or malfunction of the parts 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 or claims of customers of Purchaser for service interruption whether or not such loss or damage is based on contract, warranty, negligence, indemnity, strict liability or otherwise.

AIREND EXCHANGE PROGRAM

Your Ingersoll-Rand Company Construction Equipment Group Sales Offices and authorized distributors as well as Ingersoll-Rand International autonomous companies and authorized distributors now have an airend exchange program to benefit portable compressor users.

On the airend exchange program the exchange price is determined by the age and condition of the airend and may be classified by one of the following categories.

Category "A": The airend must not be over two years old and must have reusable rotor housing(s) and rotor(s).

Category "B": The airend must be between two and five years old and returned with two or more reusable major castings.

Category "C": The airend must be over five years old.

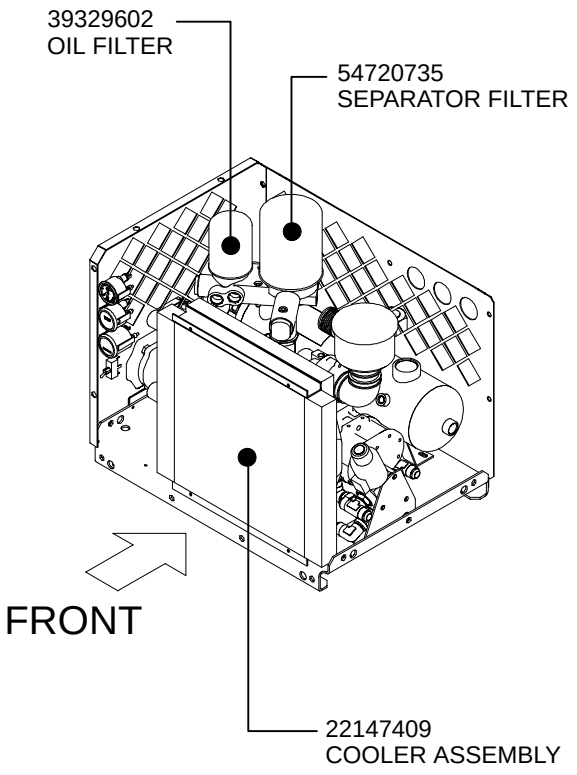
Your nearest sales office, autonomous company or authorized distributor must first contact the Parts Service Department at the factory at which your portable air compressor was manufactured for an airend exchange number. The airend must be tagged with this preassigned number and returned to the factory prepaid. The airend must be intact, with no excluded parts, otherwise the exchange agreement may be canceled. The warranty on an exchange or factory rebuilt airend is 365 days.

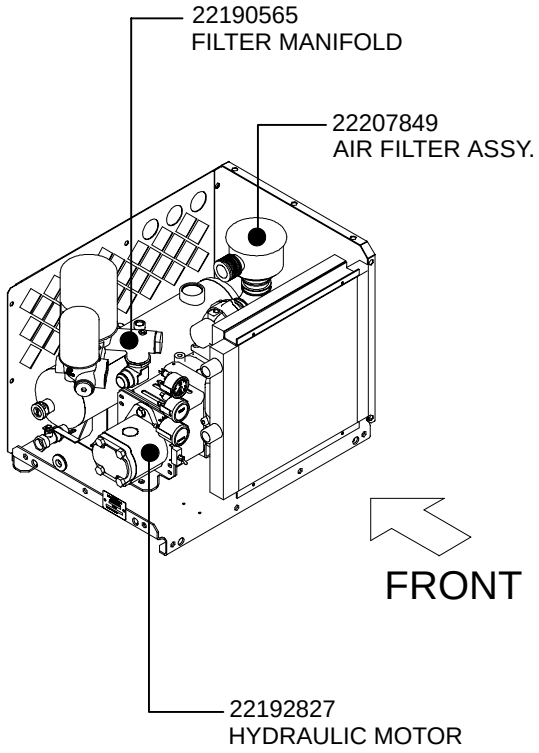
NOTE: Airends being returned to the factory in connection with a WARRANTY CLAIM must be processed through the Customer Service Department. If returned without a Warranty MRR (Material Return Request) Number, no warranty claim will be considered.

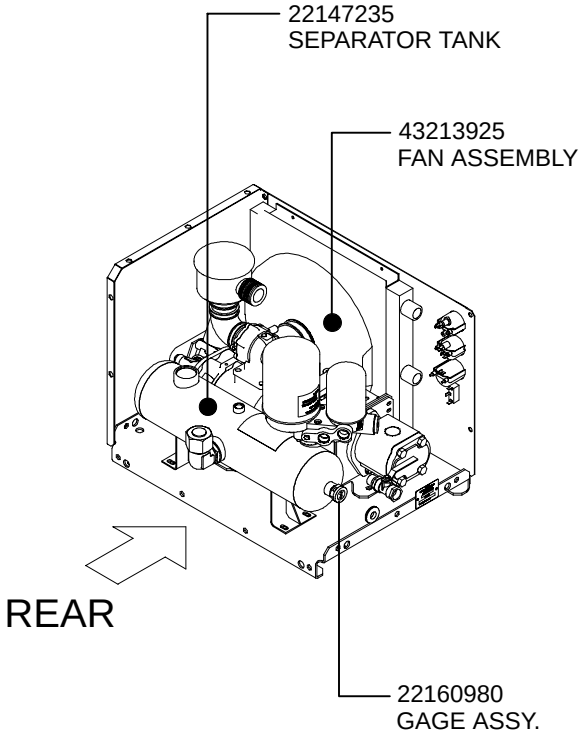
SECTION 10

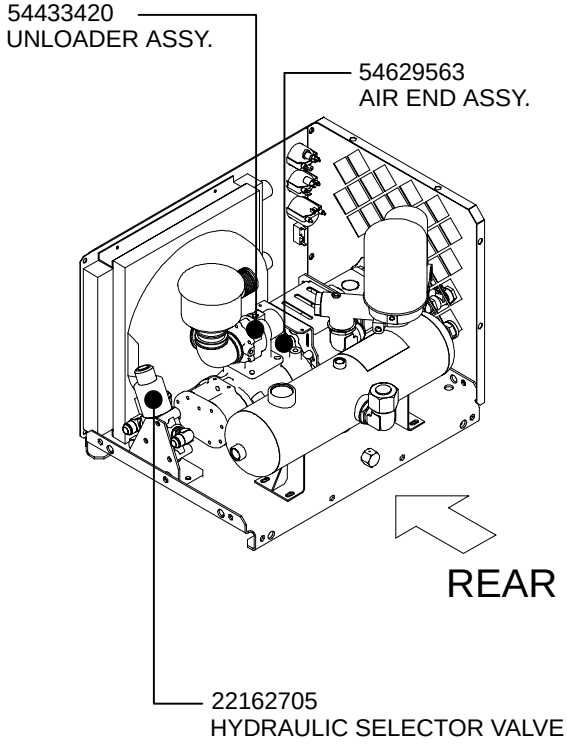
PARTS LIST INDEX

GENERAL ARRANGEMENT
FILTERS AND COOLER
MOTOR AND AIREND
UNLOADER ASSEMBLY
SEPARATOR TANK ASSEMBLY
INSTRUMENT PANEL ASSEMBLY
ENCLOSURE AND BASE
AIR PIPING
WIRING DIAGRAM
DECAL LOCATION

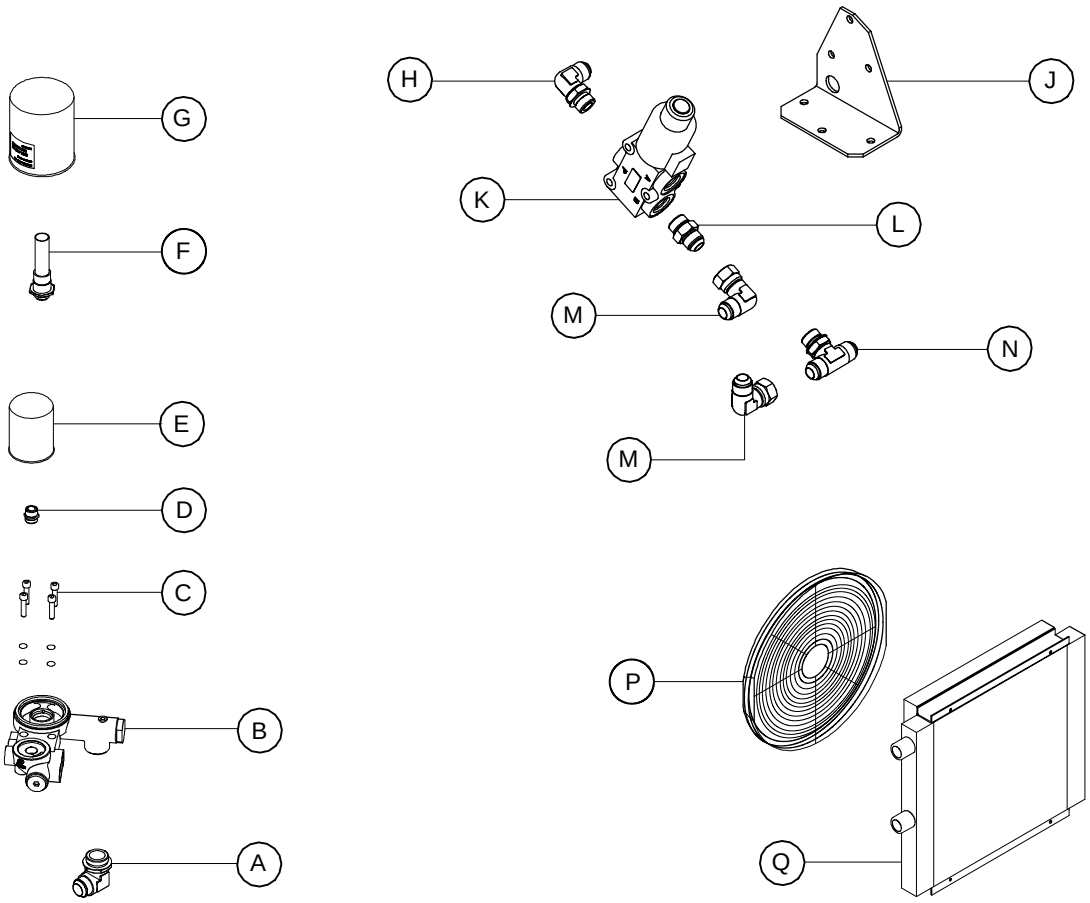








MANUAL NO.— DRAWING NO. DATE / REV:
22189203 1 11/02 A

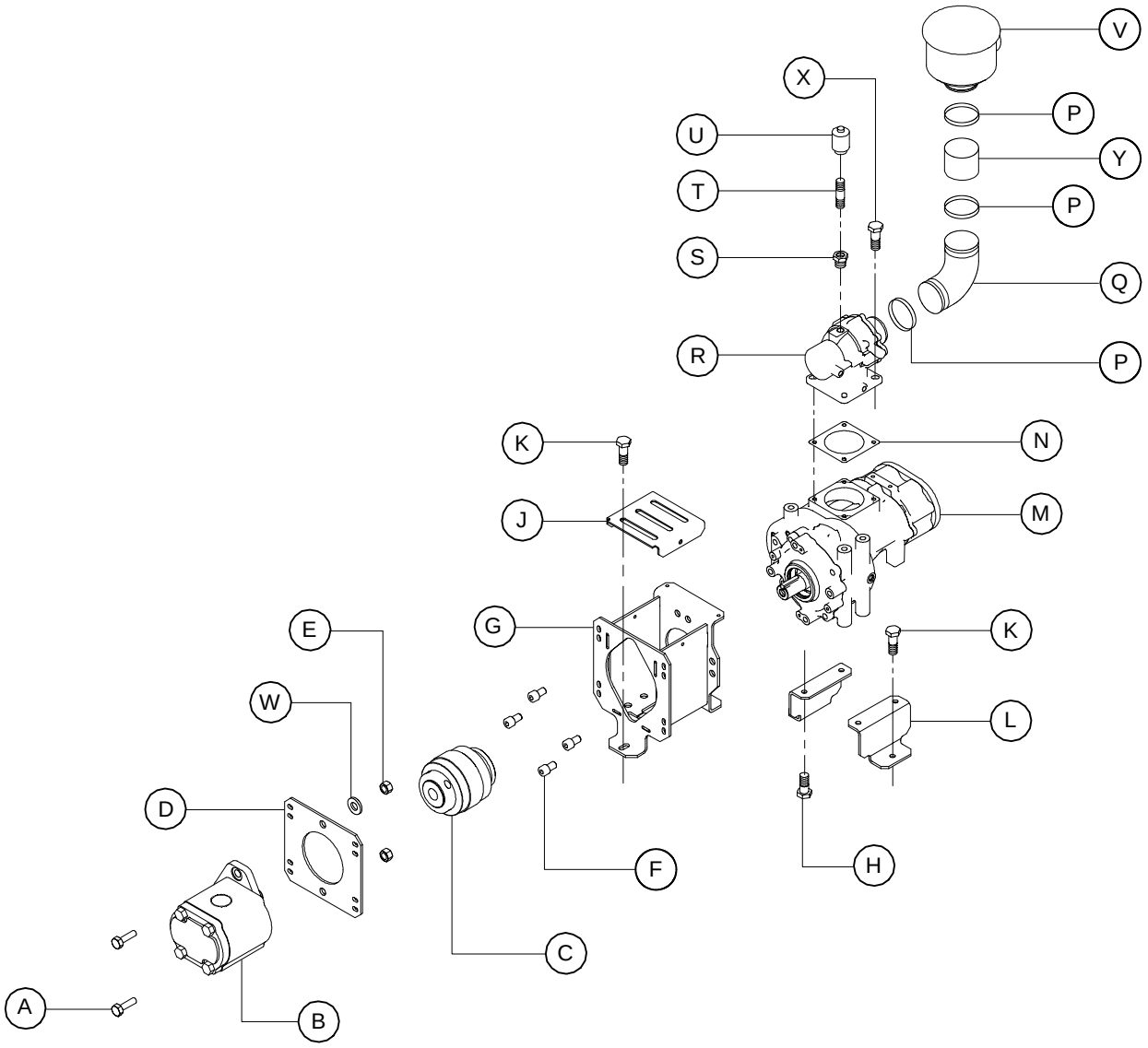


ITEM	CPN	QTY	DESCRIPTION	ITEM	CPN	QTY	DESCRIPTION
A	95952727	1	ELBOW				
B	22190565	1	MANIFOLD , FILTER				
	22189468	1	KIT , MINIMUM PRESSURE CHECK VALVE				
	22064687	1	KIT , THERMAL VALVE REPAIR				
C	39125000	4	SCREW				
	35374826	4	WASHER , COPPER				
D	54749221	1	NIPPLE				
E	39329602	1	FILTER , OIL				
F	22050405	1	NIPPLE				
G	54720735	1	FILTER , AIR / OIL SEPARATOR				
H	35294750	1	ELBOW				
J	22162713	1	BRACKET , VALVE MOUNTING				
	96738802	3	SCREW (BRACKET TO BASE)				
	96710488	3	SCREW (VALVE TO BRACKET)				
	96738802	3	NUT (VALVE TO BRACKET)				
K	22162705	1	HYDRAULIC SELECTOR VALVE				
L	35295880	1	BUSHING				
M	35301506	1	ELBOW				
N	95469169	1	TEE				
P	43213925	1	FAN ASSEMBLY				
Q	22147409	1	COOLER ASSEMBLY				

SEE AIR / OIL / HYDRAULIC PIPING DRAWING FOR OTHER FITTINGS

MANUAL NO.— DRAWING NO. DATE / REV:
22189203 2 11/02 A

MOTOR / AIREND ASSEMBLY

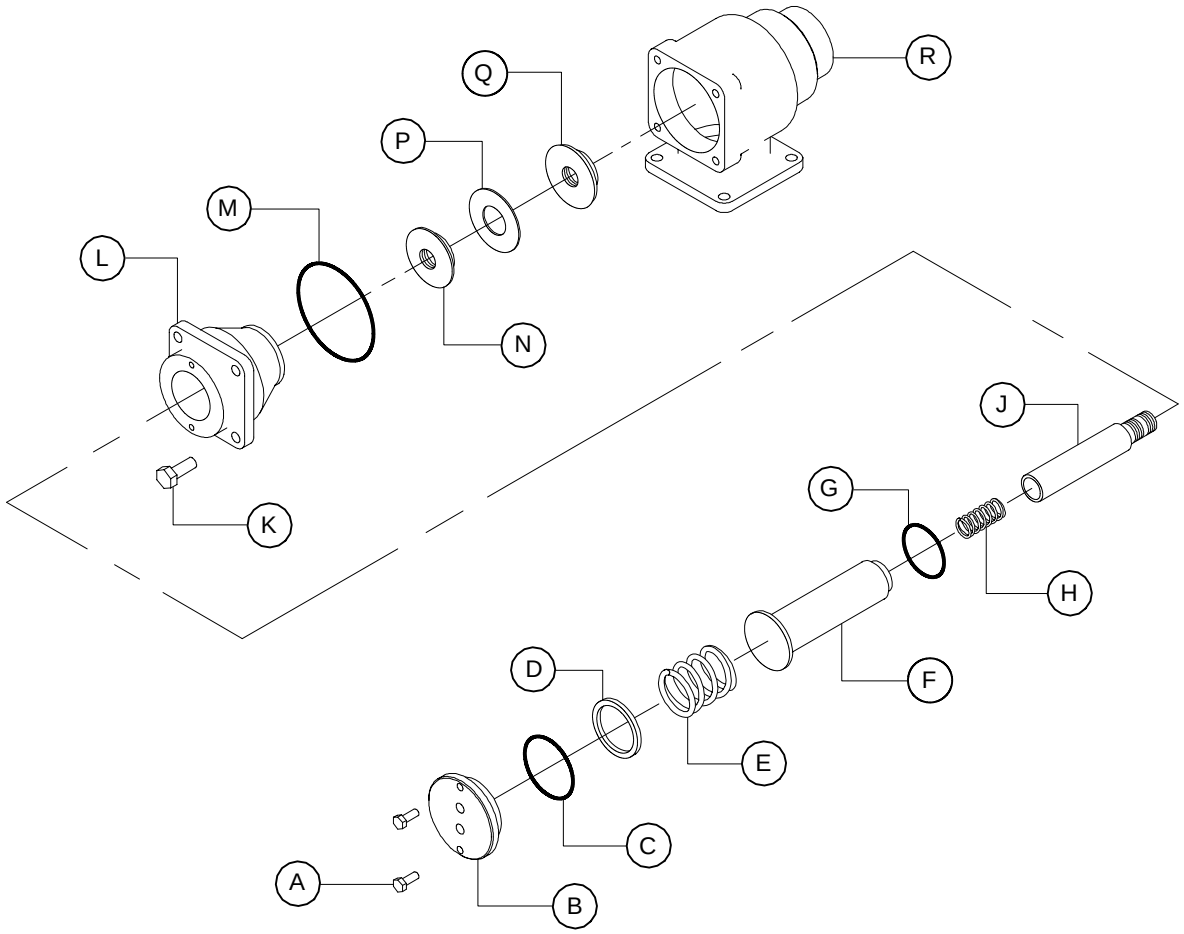


ITEM	CPN	QTY	DESCRIPTION	ITEM	CPN	QTY	DESCRIPTION
A	95920708	2	SCREW	W	95935003	2	WASHER
B	22192827	1	MOTOR , HYDRAULIC	X	96702055	4	SCREW
C	22153803	1	COUPLING	Y	22207864	1	TUBE
D	22153407	1	PLATE , MOTOR MOUNTING				
E	35252618	2	NUT				
F	96719851	4	SCREW				
G	22153399	1	SUPPORT , MOTOR				
H	96705850	4	SCREW				
J	22153415	1	COVER , SUPPORT				
K	96738802	3	SCREW				
L	22153381	2	SUPPORT , AIR END				
M	54629563	1	AIR END ASSEMBLY				
N	39313879	1	GASKET				
P	35221662	1	CLAMP				
Q	22207856	1	ELBOW , RUBBER				
R	54433420	1	UNLOADER ASSEMBLY				
S	95930301	1	BUSHING				
T	95953493	1	NIPPLE				
U	35300615	1	INDICATOR , RESTRICTION				
V	22207849	1	AIR FILTER ASSEMBLY				
	22173583	1	ELEMENT				

SEE AIR / OIL / HYDRAULIC PIPING DRAWING FOR OTHER FITTINGS

MANUAL NO.— DRAWING NO. DATE / REV:
22189203 3 11/02 A

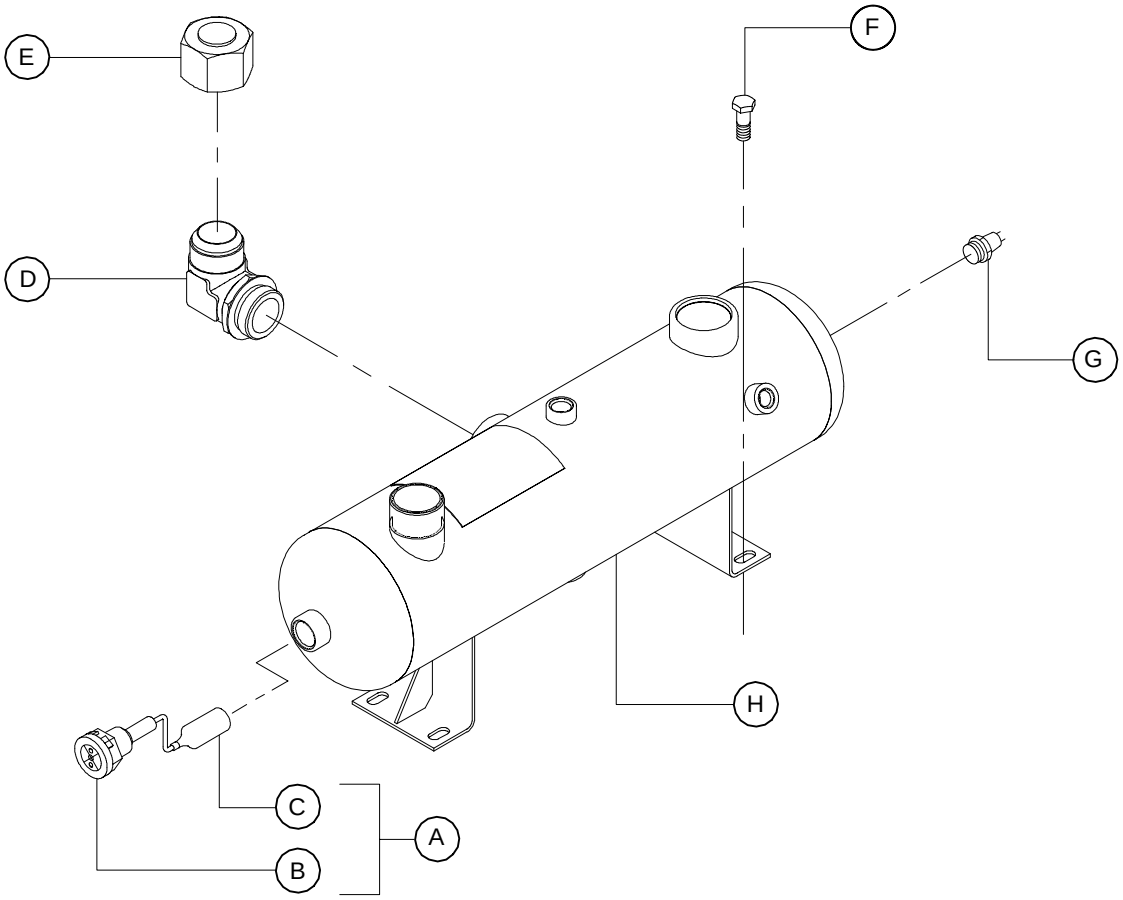
UNLOADER ASSEMBLY



ITEM	CPN	QTY	DESCRIPTION
A	92096031	2	SCREW
B	54519772	1	CAP
C	95087045	1	O-RING
D	54519723	1	SEAL , U-RING
E	54519822	1	SPRING
F	54519905	1	PISTON
G	54519806	1	O-RING
H	54519830	1	SPRING
J	54519863	1	STEM , CHECK VALVE
K	92304344	4	SCREW
L	54519921	1	HOUSING , PISTON
M	54519798	1	O-RING
N	54519871	1	PLATE , CLAMP
P	54519889	1	VALVE , FLAPPER
Q	54519897	1	PLATE , VALVE
R	54519939	1	BODY

MANUAL NO.—DRAWING NO. DATE / REV:
22189203 4 11/02 A

SEPARATOR TANK

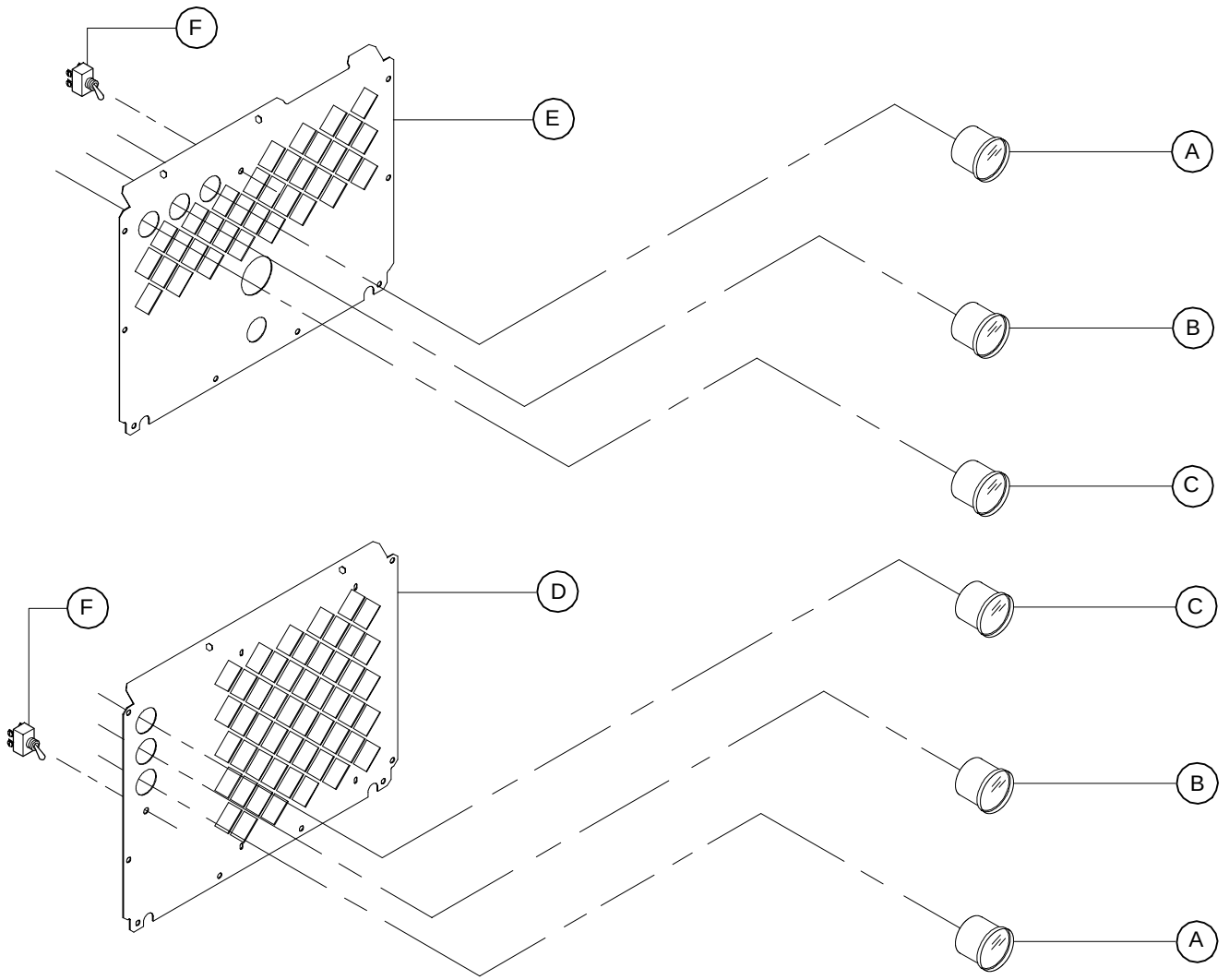


ITEM	CPN	QTY	DESCRIPTION	ITEM	CPN	QTY	DESCRIPTION
A	22160980	1	GAGE ASSEMBLY				
B	22160972	1	GAGE , ROTARY				
C	36891489	1	POINTER ASSEMBLY				
D	35374867	1	ELBOW , FILLER				
E	35596691	1	CAP , FILLER				
F	36889608	4	SCREW				
G	35596436	1	SWITCH , TEMPERATURE				
H	22147235	1	TANK ASSEMBLY				

SEE AIR / OIL / HYDRAULIC PIPING DRAWING FOR OTHER FITTINGS

MANUAL NO.— DRAWING NO. DATE / REV:
22189203 5 11/02 A

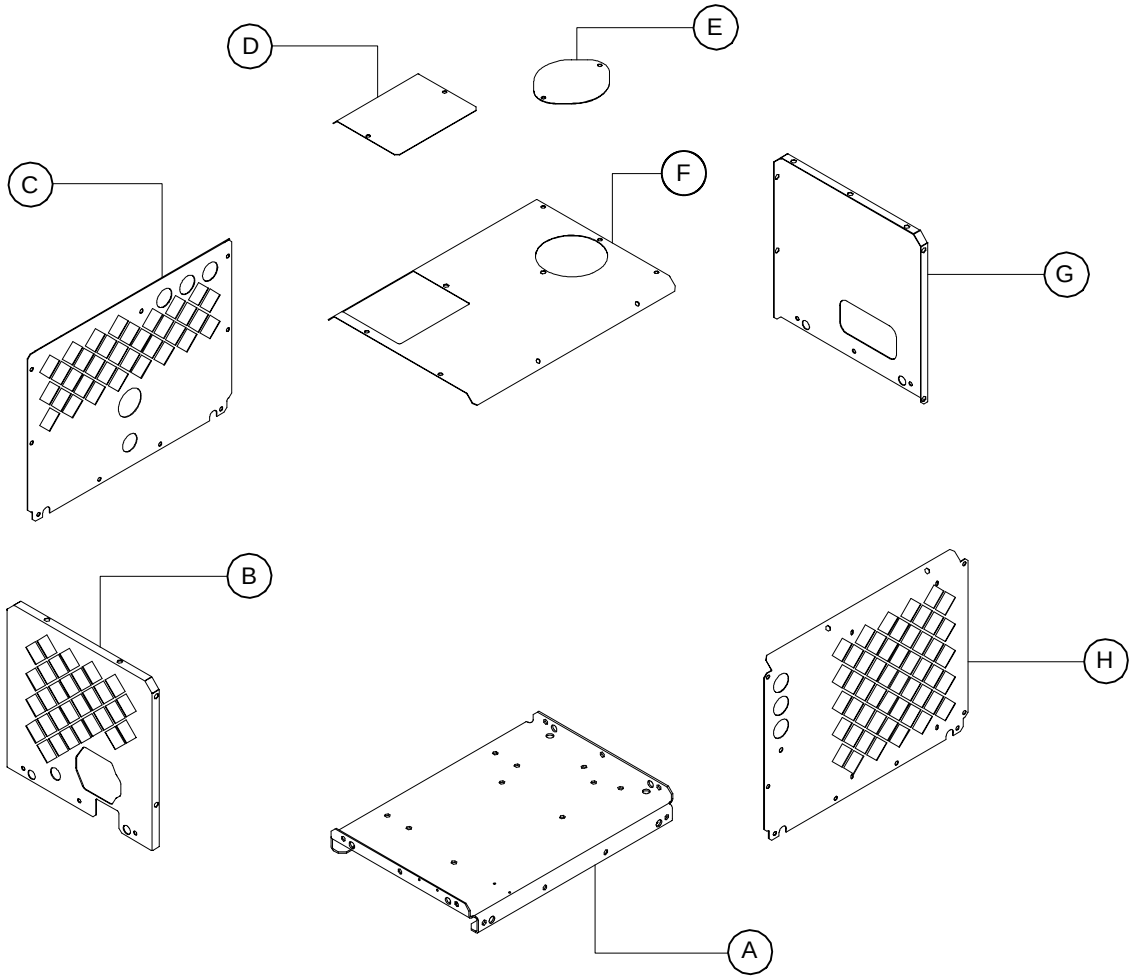
INSTRUMENT PANEL ASSEMBLY



ITEM	CPN	QTY	DESCRIPTION	ITEM	CPN	QTY	DESCRIPTION
A	36841245	1	HOURMETER				
B	35604115	1	GAGE , TEMPERATURE				
C	36891216	1	GAGE , PRESSURE				
D	22164636	1	PANEL , CURB SIDE				
E	22164268	1	PANEL , STREET SIDE				
F	36895449	1	SWITCH , TOGGLE				
	39104765	1	BOOT , RUBBER				

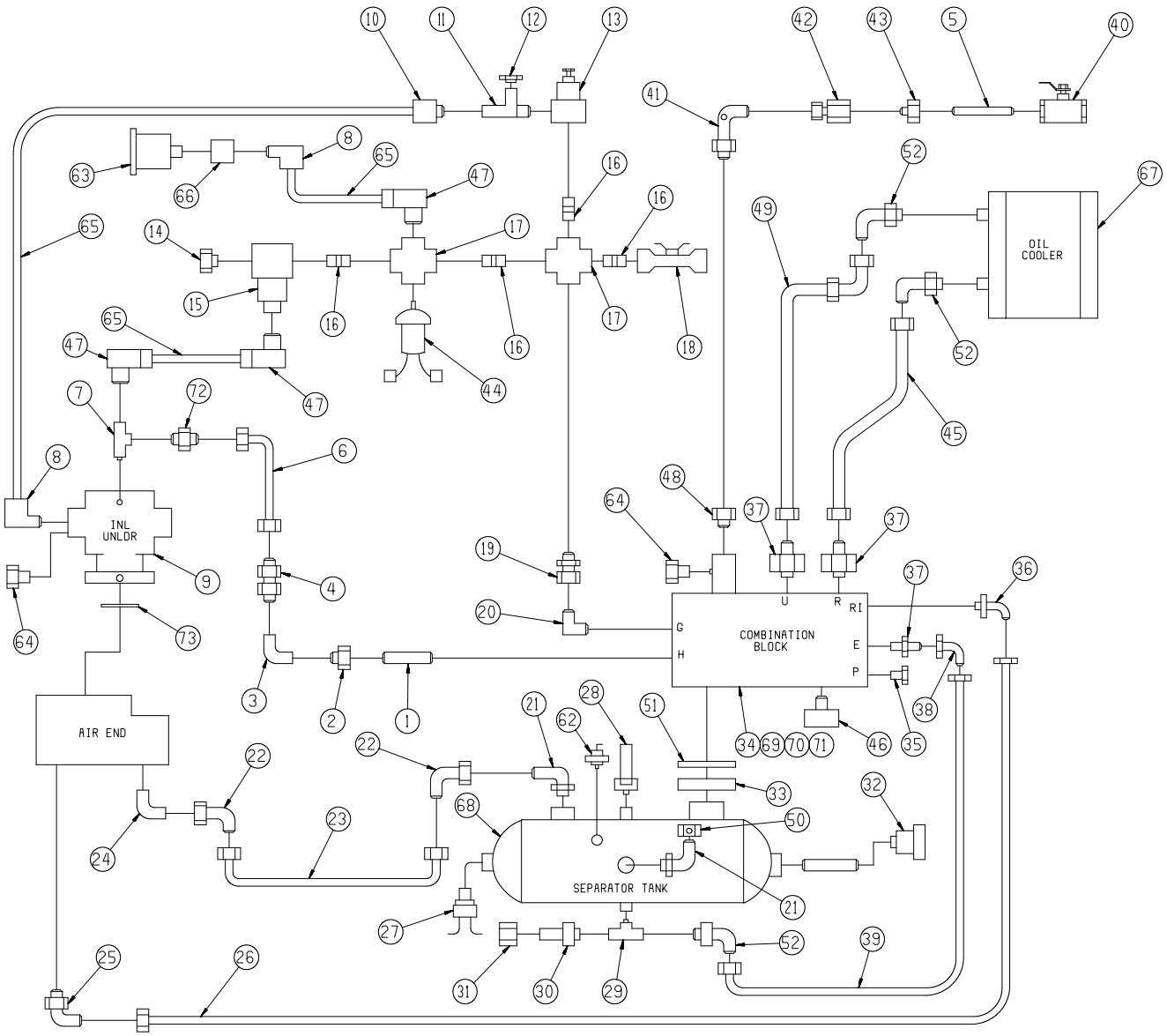
MANUAL NO.— DRAWING NO. DATE / REV:
22189203 6 11/02 A

ENCLOSURE AND BASE



ITEM	CPN	QTY	DESCRIPTION	ITEM	CPN	QTY	DESCRIPTION
A	22149975	1	BASE , ENCLOSURE				
B	22191985	1	PANEL , LEFT SIDE				
C	22164268	1	PANEL , BACK				
D	22173264	1	COVER , FILTER				
E	22184295	1	COVER , AIR FILTER				
F	22164644	1	PANEL , TOP				
G	22164602	1	PANEL , RIGHT SIDE				
H	22164636	1	PANEL , FRONT				
	96738802		SCREW				
	36895746		NUTSERT				

MANUAL NO.— DRAWING NO. DATE / REV:
22189203 7 11/02 A



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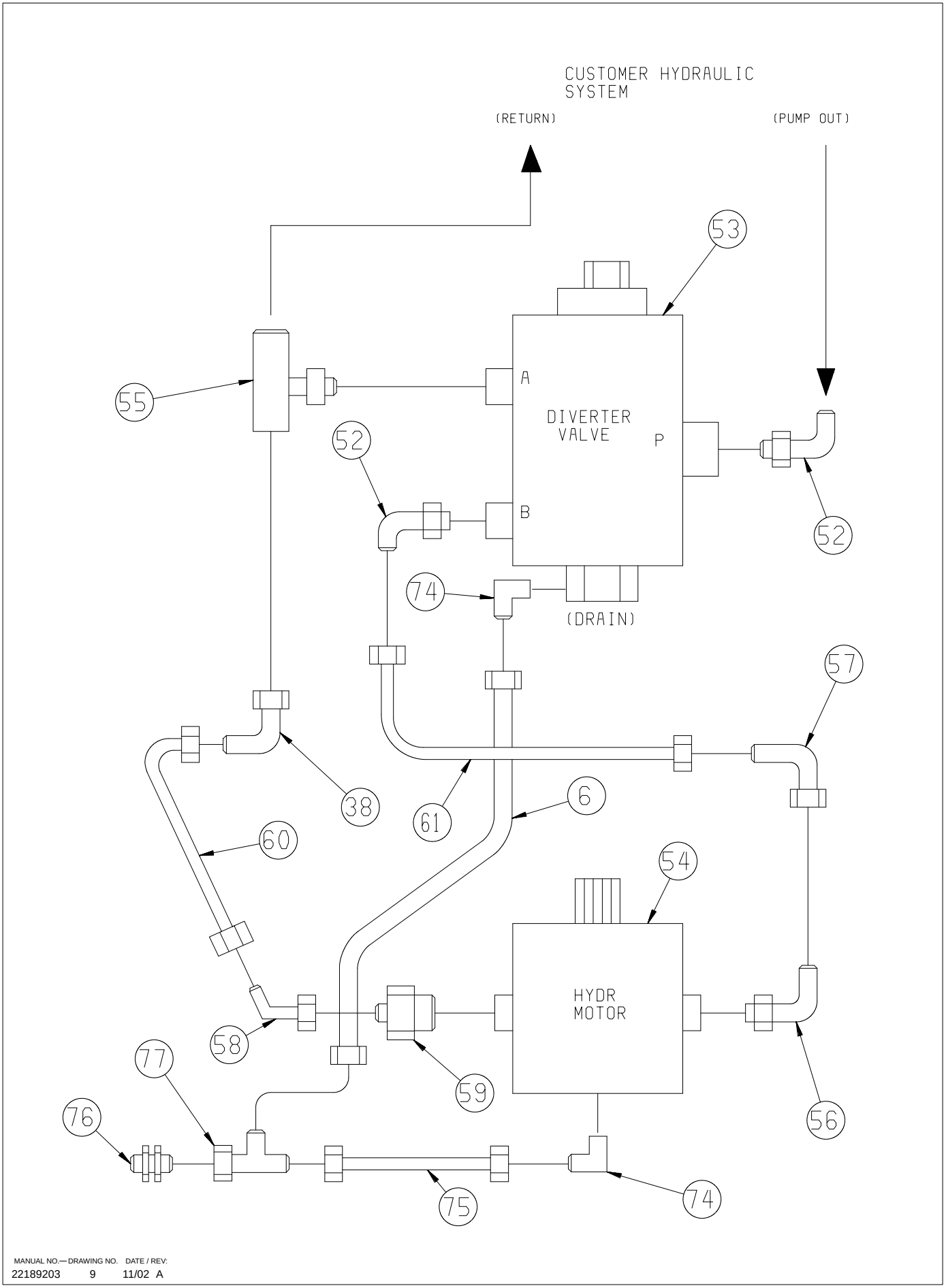
22189203 8 11/02 A

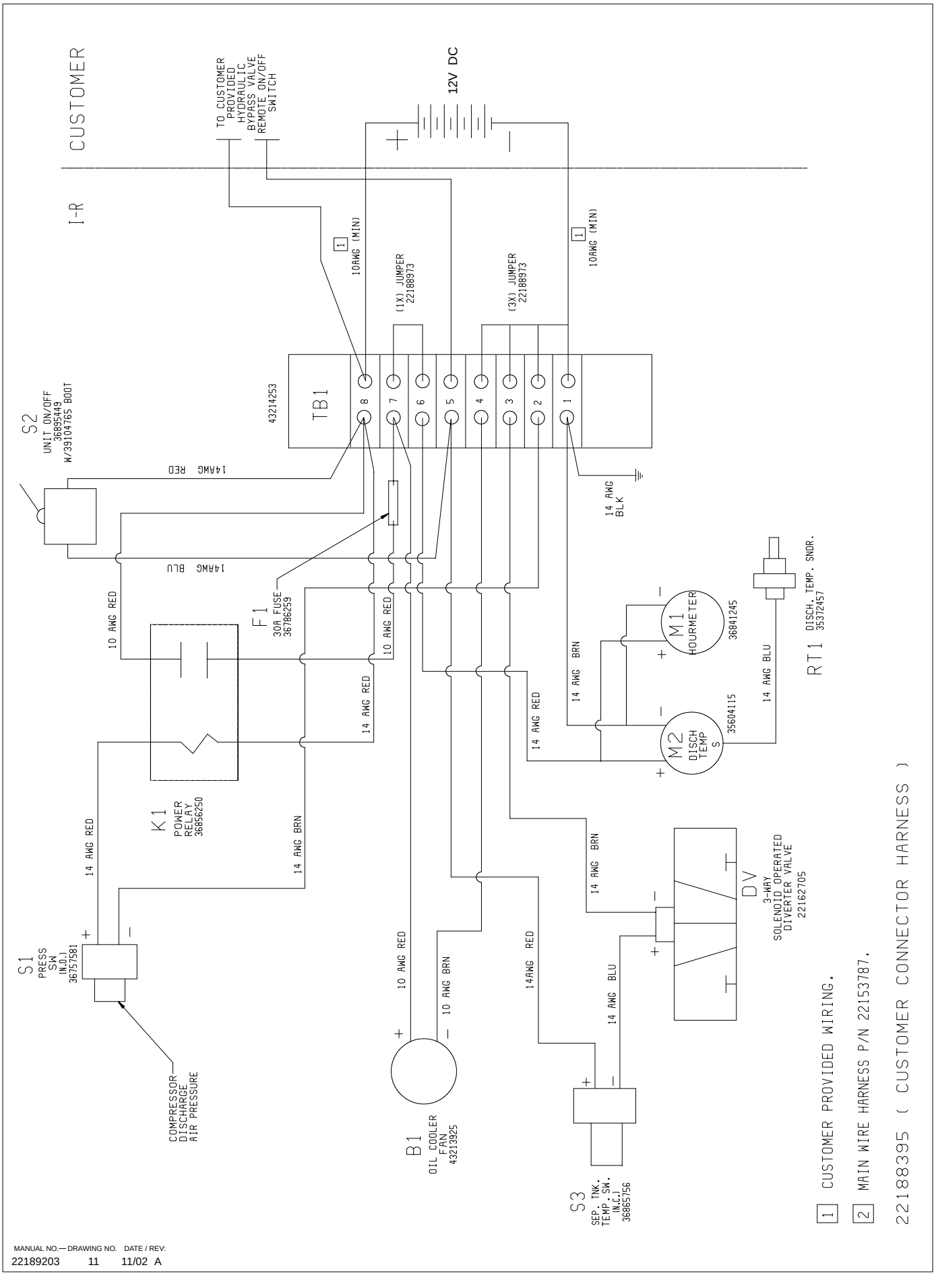


MANUAL NO.— DRAWING NO. DATE / REV:
22189203 9 11/02 A

PARTS LIST

ITEM NO	PART NO.	DESCRIPTION
1	95946059	1/8 NIPPLE
2	95930301	BSHG RDCNPT025X012
3	95954095	ELB, .25 NPT
4	22184717	V CHK, .041 ORF
5	95942785	NIP LGNPT075X800
6	35310960	HOSE ASSY, -4 X 10
7	35114545	TEE 1/4 RUN
8	35301126	ELB 90 DEG 1/8NPT X -6
9	22164784	UNLOADER VALVE
10	35369347	CONN ML 1/4NPTX3/8TB
11	35114545	TEE STREET 1/4 NPT
12	36766756	ORIFICE MUFFLER .140
13	36854495	REGULATOR, 150-200 PSLG CAPABLE
14	22184725	ORIFICE MUFFLER .041
15	35322379	BLOWDOWN VALVE
16	95944575	NIP CLNPT025X088
17	95954293	CROSS NPT025
18	35324839	1/4" BALL VALVE
19	35367846	CONN, 1/4NPT X -6JIC SWV
20	35279934	EL, 90 DEG 1/4NPT X -6JIC
21	35374867	ELB 1 7/8-12 X 20JIC
22	35279918	ELBOW, SWIVEL, -20JIC
23	22179386	HOSE, -20 X 10.75"
24	35324185	ELB 90 DEG 1-1/4 BSPT-20
25	39310800	AIR END INJECTION ELBOW
26	35283308	HOSE, JIC -8 X 26
27	35596436	248 DEG TEMP SWITCH (TANK MOUNT), SAE
28	39193339	SAFETY VALVE
29	22179410	BRANCH TEE,1.06-12,1.06-12,1.06 SAE
30	35322825	CONN, LG 1-1/16 X -12
31	35608694	CAP SAFE VENT -12JIC
32	22160980	ROTARY SEP TANK GAGE
33	22174544	SPECIAL FLANGE FOR COMBINATION BLOCK
34	22190565	COMBINATION MPV,THERMOSTAT,SCAV,SEP
35	95954038	PLUG 1/4 NPT
36	22179428	ELB 90 DEG 1.06-12 SAE X -8
37	35295880	CONN 1-1/16SAE X 12JIC
38	35301506	ELB 90 DEG SWIV NUT-12
39	22180889	HOSE ASSY -12X22 JIC
40	35576115	3/4" SERVICE BALL VALVE
41	95992848	ELBOW, 90 DEG
42	22179436	CONN, SWIVEL, -16JIC X 1.0 FNPT
43	95944617	BSHG RDCNPT100X075
44	36757581	DISCHARGE PRESSURE SWITCH, 12 PSIG
45	36882975	HOSE ASSY -12X10
46	35379932	PL HEX 1/2-20UNF
47	35369354	ELB ML 1/4NPTX3/8TB
48	95954913	REDUCER 1-5/8 SAE X 1-5/16 FEMALE SAE
49	54764261	HOSE ASSY, -12 X 11.00
50	35596691	CAP OIL FILL -20
51	54740378	COMBINATION VALVE GASKET
52	35294750	EL 1.06 SAE X -12JIC PARKER C50X-S
53	22162705	HYDRAULIC SELECTOR VALVE
54	22192827	MOTOR 2.013 CU.IN.
55	36779999	T -12-12S W/ORING
56	35291384	ELBOW, 90, 1-5/16-12-16JIC
57	35292051	ELB 90 DEG SWIV NUT -16
58	35307206	ELBOW 45 DEG -16 SWIVEL
59	35292069	CONN 1-5/8-12 X -16
60	22179394	HYDRAULIC HOSE -16X35
61	22179402	HYDRAULIC HOSE -16X21.5
62	35372457	TEMP SENDER, 12V
63	36891216	PRESSURE GAGE, 250 PSIG FULL SCALE
64	95928214	PLUG, 1/8 NPT
65	35356484	SYNFLEX TUBING FOR REGULATION
66	95935599	CPLG NPT012X075
67	22147409	OIL COOLER WITH FAN
68	22147235	SEPARATOR TANK
69	22064687	THERMAL ELEMENT KIT (SERVICE PART FOR ITEM 34)
70	22189468	MIN PRESS VALVE KIT (SERVICE PART FOR ITEM 34)
71	22050405	ADAPTER KIT, SEPARATOR (SERVICE PART FOR ITEM 34)
72	35283472	CONN, 1/4PX -4JIC
73	39313879	GASKET
74	35279876	ELB 90 DEG 7/16-20 X -4 JIC
75	35283258	HOSE ASSY, -4 X 34
76	35320209	CONN, BLKHD -4 JIC
77	35302124	TEE, RUN SWIV. -4 JIC

MANUAL NO.— DRAWING NO. DATE / REV:
22189203 10 11/02 A



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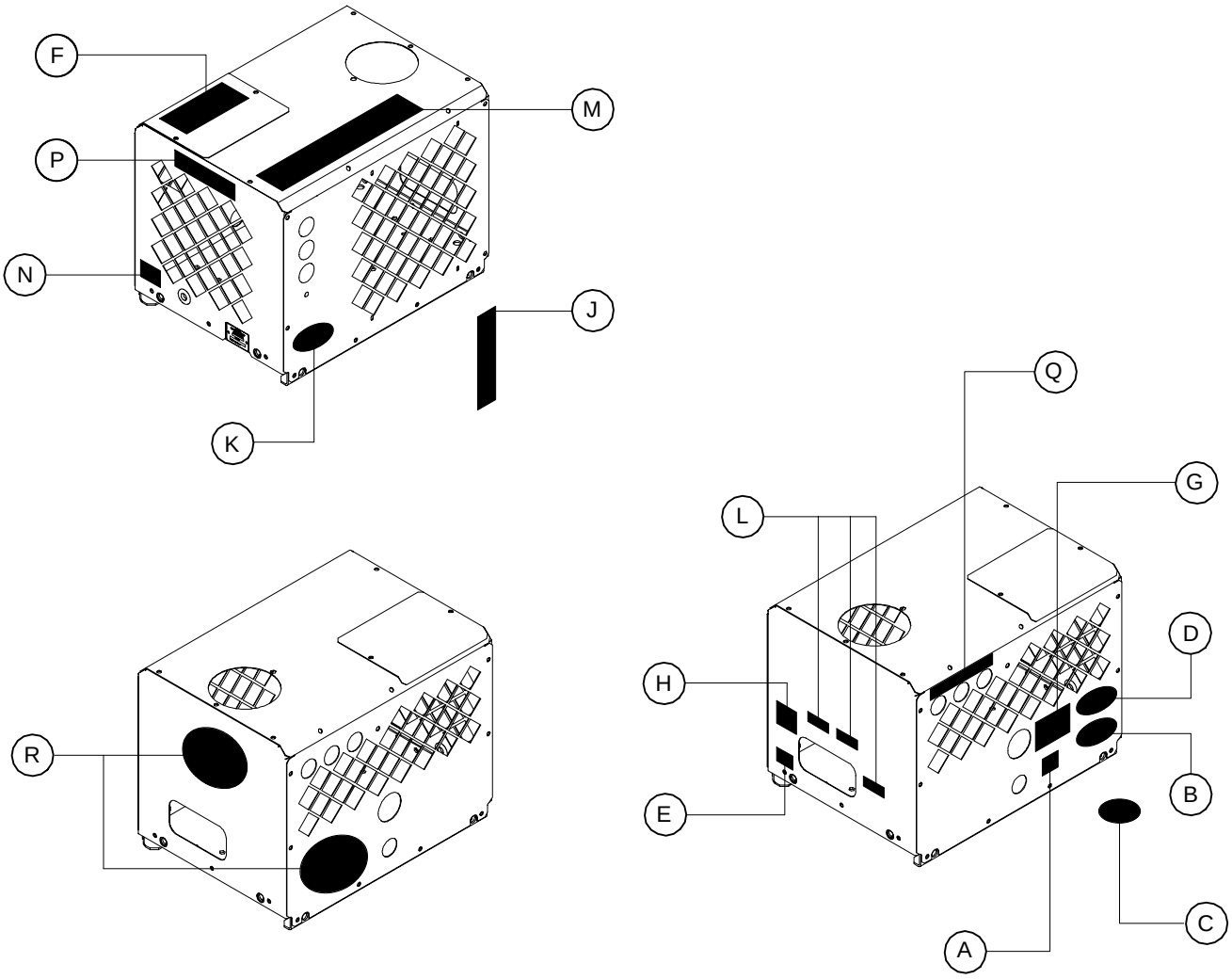
22189203 11 11/02 A

DECAL LOCATION



ITEM	CPN	QTY	DESCRIPTION
A	54629977	1	DECAL , OIL DRAIN
B	54640024	1	DECAL , GENUINE PARTS
C	54604970	1	DECAL , FILL PLUG
D	54640164	1	DECAL , AIREND WARRANTY
E	22182315	8	DECAL , LIFT POINT
F	22191720	1	DECAL , GENERAL DATA
G	54568795	1	DECAL , HIGH PRESSURE AIR
H	43215037	1	DECAL , MAXIMUM SPEED
J	22207872	1	DECAL , VERTICAL GAGE LOCATION
K	54672175	1	DECAL , SWOOSH
L	22184261	1	DECAL , HYDRAULIC SUPPLY & RETURN
M	54640388	1	DECAL , 20” IR MONOGRAM
N	54568787	1	DECAL , IMPROPER OPERATION
P	54629902	1	DECAL , 3–PART SAFETY
Q	22197065	1	DECAL , HORIZONTAL GAGE LOCATION

MANUAL NO.— DRAWING NO. DATE / REV:
22189203 12 11/02 A