INGERSOLL-RAND®

OPERATING, MAINTENANCE, PARTS MANUAL

COMPRESSOR MODELS

P250WJD

Code: B

HP300WJD
P375WJD

Code:

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.

Doosan purchased Bobcat Company from Ingersoll-Rand Company in 2007. Any reference to Ingersoll-Rand Company or use of trademarks, service marks, logos, or other proprietary identifying marks belonging to Ingersoll-Rand Company in this manual is historical or nominative in nature, and is not meant to suggest a current affiliation between Ingersoll-Rand Company and Doosan Company or the products of either.

INGERSOLL-RAND®
AIR COMPRESSORS
Portable Air Compressor Division
P.O. Box 868 - 501 Sanford Ave
Mocksville, N.C. 27028

Book 35390095 (9/00) **Revised (09-12)**

QUALITY POLICY

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

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Foreword

Machine models represented in this manual may be used in various locations worldwide. Machines sold and shipped into European common market countries requires that the machine display the EC Mark and conform to various directives. In such cases, the design specification of this machine has been certified as complying with EC directives. Any modification to any part is absolutely prohibited and would result in the CE certification and marking being rendered invalid. A declaration of that conformity follows:

Declaration of Conformity

WITH EC DIRECTIVE

98/37/EC

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

We

Represented In EC By:

Ingersoll-Rand Company Limited
Standard Products Division
Swan Lane
Hindley Green
Wigan WN2 4EZ
United Kingdom

Declare that, under our sole responsibility for manufacture and supply, the product(s)

HP1300WCU	VHP825WCU	XHP900WCAT	VHP750WCAT	XHP1070CAT
XP1400WCU	HP935WCU	XHP650WCAT	VHP850WCAT	NXP1300WCU
P1600WCU	XP1050WCU	XHP750WCAT	HP900WCAT	
XP900WCU	HP825WCU	XHP825WCAT	XP1000WCAT	

To which this declaration relates, is (are) in conformity with the provisions of the above directives using the following principal standards

EN1012-1, EN29001, EN202, EN60204-1
PN8NTC2, EN 50081, EN50082

Issued at Mocksville on 1-1-95

Ric Lunsford
Manager of Quality Control

Issued at Hindley Green on 1-1-95

H. Seddon, Q.A. Manager

Nothing contained in this document is intended to extend any promise, warranty or representation, expressed or implied, regarding the Ingersoll-Rand products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request.
This manual contains instructions and technical data to cover all routine operation and scheduled maintenance tasks by operation and maintenance staff. Major overhauls are outside the scope of this manual and should be referred to an authorized Ingersoll-Rand service department.

All components, accessories, pipes and connectors added to the compressed air system should be:

- of good quality, procured from a reputable manufacturer and, wherever possible, be of a type approved by Ingersoll-Rand.
- clearly rated for a pressure at least equal to the machine maximum allowable working pressure.
- compatible with the compressor lubricant/coolant.
- accompanied with instructions for safe installation, operation and maintenance.

Details of approved equipment are available from Ingersoll-Rand Service departments.
The use of repair parts other than those included within the Ingersoll-Rand approved parts list may create hazardous conditions over which Ingersoll-Rand has no control. Therefore, Ingersoll-Rand cannot be held responsible for equipment in which non-approved repair parts are installed.

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

The intended uses of this machine are outlined below and examples of unapproved usage are also given. However, Ingersoll-Rand cannot anticipate every application or work situation that may arise. **If in doubt, consult supervision.**

This machine has been designed and supplied for above ground operation to be used for compression of normal ambient air containing no additional gases, vapors or particles within the ambient temperature range specified in the general data section of this manual.

This machine should not be used:

A. For direct or indirect human consumption of the compressed air.

B. Outside the ambient temperature range specified in the general data section of this manual.

C. When an actual or foreseeable risk of hazardous levels of flammable gases or vapors exists.

D. With other than Ingersoll-Rand approved components.

E. With guards, or controls or switches missing or disabled.

F. For storage or transportation of materials inside or on the enclosure.

This company accepts no responsibility for errors in translation of this manual from the original English version.

TABLE OF CONTENTS

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.

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).

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

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! Do NOT use ETHER if unit has GLOW Plug starting aid. Engine damage will result.

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

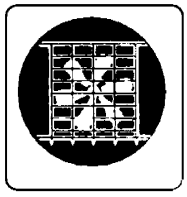
Lifting point

WARNING: Electrical shock risk.

Parking Brake

No open flame

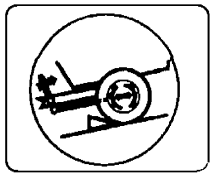
Diesel Fuel.
No open flame.



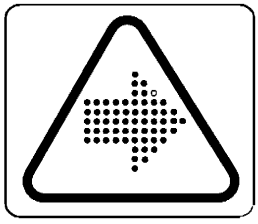
Do not operate the machine without guard being fitted.

Lifting point

WARNING - Flammable liquid.



When parking use prop stand, handbrake and wheel chocks.



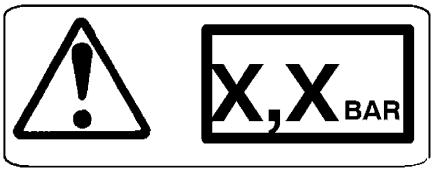
Air/gas flow or Air discharge.

WARNING - Hot and harmful exhaust gas.

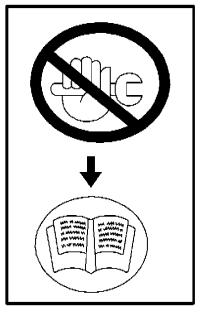
Tie down point

Do not breathe the compressed air from this machine.

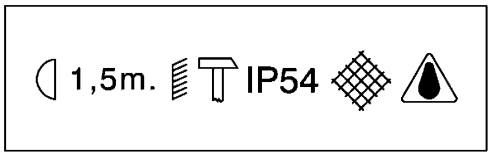
Read the Operation and Maintenance manual before operation or maintenance of this machine is undertaken.



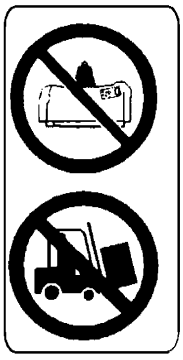
WARNING - Maintain correct tire pressure. (Refer to the *GENERAL INFORMATION* section of this manual).



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



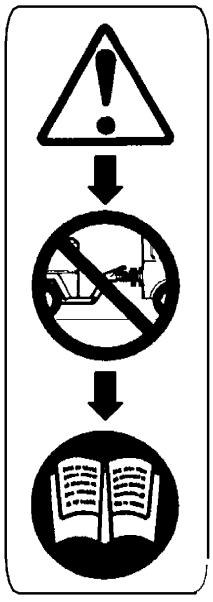
Rough Service Designation
Wet Location Operation



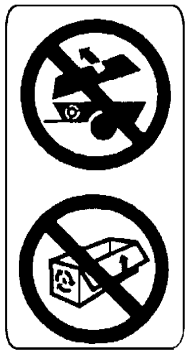
Do not stack

Do not use fork lift truck from this side

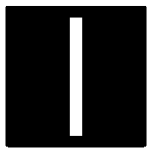
Replace any cracked protective shield.



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

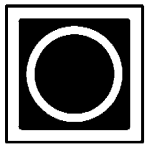


Do not operate with the doors or enclosure open.

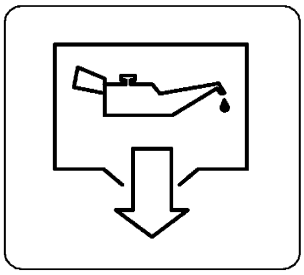


On (power).

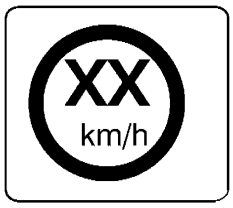
Off (power).



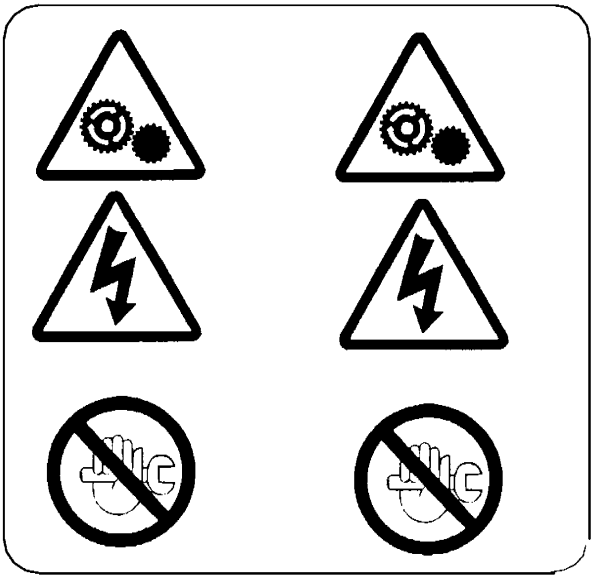
Emergency stop.



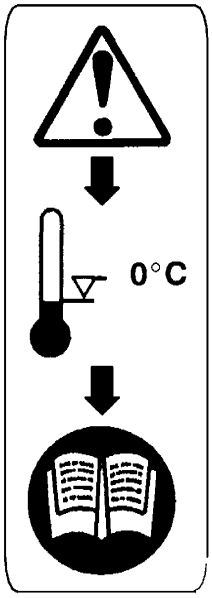
Oil Drain



Do not exceed the speed limit.



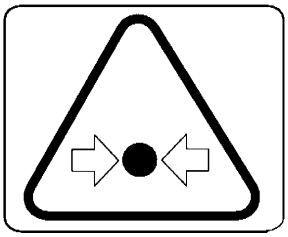
WARNING - Do not undertake any maintenance on this machine until the electrical supply is disconnected and the air pressure is totally relieved.



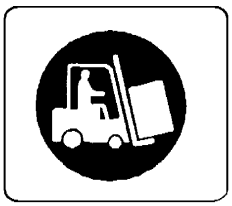
WARNING - For operating temperature below 0°C, consult the operation and maintenance manual.

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

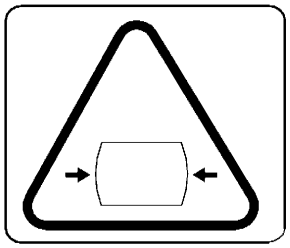
Do not remove the Operating and Maintenance manual and manual holder from this machine.



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)

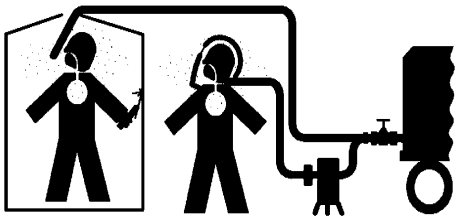
Indicates the presence of a hazard which WILL or can cause injury or property damage, if ignored.

NOTICE

(Blue Background)

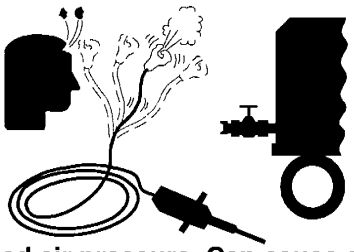
Indicates important set-up, operating or maintenance information.

DANGER



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

WARNING



Trapped air pressure. Can cause serious injury or death.

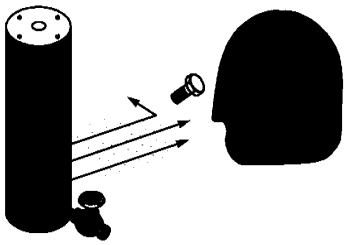
Close service valve and operate tool to vent trapped air before performing any service.

WARNING

Hot pressurized fluid.
Can cause serious burns.

Do not open radiator while hot.

WARNING



High pressure air. Can cause serious injury or death.

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

WARNING

Improper operation of this equipment. CAN cause serious injury or death.

Read Operator's Manual supplied with this machine before operation or servicing.

WARNING

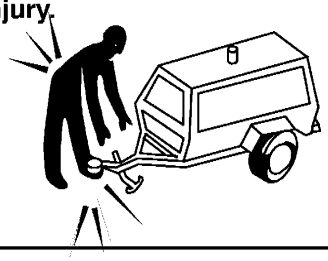
Modification or alteration of this machine. CAN cause serious injury or death.

Do NOT alter or modify this machine without the express written consent of the manufacturer.

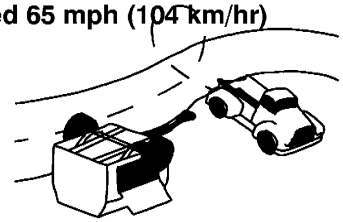
WARNING

Collapsing jack stand. Will cause serious injury.

Insert locking pin completely.

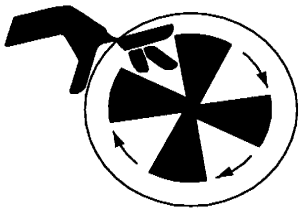


Excessive towing speed. Can cause serious injury or death. Do NOT exceed 65 mph (104 km/hr)



For Highway Towable Units

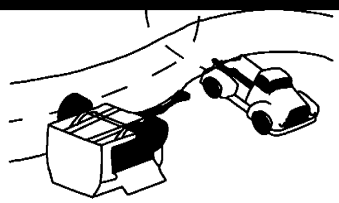
WARNING



Rotating Fan Blade. CAN cause serious injury.

Do NOT operate with guard removed.

WARNING

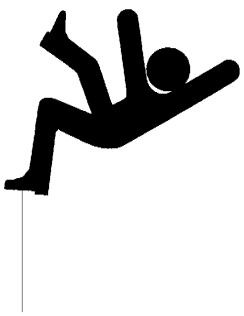


Excessive Towing Speed. CAN cause serious injury or death.

Do NOT Tow on Highway.
Do NOT exceed 20 mph (32 km/h)

For Non-Highway Towable Machines

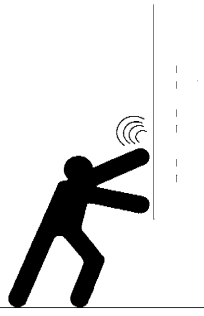
WARNING



Falling off machine. CAN cause serious injury or death.

Access Lifting Bail from inside machine.

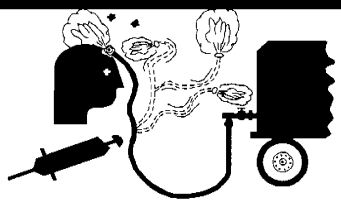
WARNING



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.

WARNING

Combustible Gas. CAN cause serious burns, blindness or death.

Keep sparks and open flames away from batteries.

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), Portable Light Towers and Air Dyers** - The earlier of twelve (12) months from shipment to or the accumulation of 2,000 hours of service by the initial 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:

The original airend is returned assembled and unopened.

Continued use of genuine Ingersoll-Rand parts, fluids, oils and filters.

Maintenance is performed at prescribed intervals.

D. **Genset Generators -** The earlier of twenty-four (24) months from shipment to or the accumulation of 4,000 hours of service by the initial user.

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:

The original airend is returned assembled and unopened.

Continued use of genuine Ingersoll-Rand parts, fluids, oil and filters.

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.

H. **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.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

EMISSION RELATED SYSTEM DEFECT WARRANTY

Ingersoll-Rand Company warrants to the initial owner and subsequent owner of a certified non-road diesel engine (powering non-road machines and equipment), that the engine is:

1. Designed, built, and equipped so as to conform, at the time of sale, with all applicable regulations adopted by the United States Environmental Protection Agency (EPA) and the California Air Resource Board.

2. Free from defects in materials and workmanship in specific emission related parts for a period of five (5) years or 3,000 hours of operation whichever occurs first, after date of delivery to the initial owner.

If an emission related part fails during the warranty period, it will be repaired or replaced. Any such part repaired or replaced under warranty is warranted for the remainder of the warranty period.

During the term of this warranty, Ingersoll-Rand Company will provide repair or replacement of any warranted part at no charge to the non-road engine owner.

In an emergency, repairs may be performed at any service establishment, or by the owner, using any replacement part.

Ingersoll-Rand Company will reimburse the owner for their expenses, including diagnostic charges for such emergency repair. These expenses shall not exceed Ingersoll-Rand Company suggested retail price for all warranted parts replaced, and labor charges based on Ingersoll-Rand Company recommended time allowance for the warranty repair and the geographically appropriate hourly labor rate.

A part not being available within 30 days constitutes an emergency.

As a condition of reimbursement, replaced parts and receipted invoices must be presented at a place of business of Ingersoll-Rand Company or other establishment authorized by Ingersoll-Rand Company.

This warranty covers the following emission related parts and components.

Charge Air Cooling System (If Equipped)
Fuel Injection System
Intake Manifold
Exhaust Manifold
Turbocharger System
Miscellaneous hoses, clamps, connectors and sealing devices used in the above systems.

If failure of one of these components results in failure of another part, both will be covered by this warranty. Any Replacement part may be used for maintenance or repairs. The owner should ensure that such parts are equivalent in design and durability to genuine INGERSOLL-RAND parts.
Use of non-genuine INGERSOLL-RAND parts does not invalidate the warranty.
However, Ingersoll-Rand Company is not liable for parts which are not genuine INGERSOLL-RAND parts.

LIMITATIONS AND RESPONSIBILITIES

These warranties are subject to the following:

INGERSOLL-RAND COMPANY RESPONSIBILITIES

During the emission warranty period, if a defect in material or workmanship of a warranted part or component is found, Ingersoll-Rand Company will provide:

New, Remanufactured, or repaired parts and/or components required to correct the defect.

Note: *Items replaced under this warranty become the property of Ingersoll-Rand Company*

Labor, during normal working hours, required to make the warranty repair. This includes diagnosis and labor to remove and install the engine, if necessary.

OWNER RESPONSIBILITIES

During the emission warranty period, the owner is responsible for:

The performance of all required maintenance. A warranty claim will not be denied because the scheduled maintenance was not performed. However, if the lack of required maintenance was the reason for the repair, then the claim will be denied.

Premium of overtime labor costs.

Costs to investigate complaints which are not caused by a defect in Ingersoll-Rand Company material or workmanship.

Providing timely notice of a warrantable failure and promptly making the product available for repair.

LIMITATIONS

Ingersoll-Rand Company is not responsible for resultant damages to an emission related part or component resulting from:

Any application or installation Ingersoll-Rand Company deems improper as explained in the Instruction Manual.

Attachments, accessory items, or parts not authorized for use by Ingersoll-Rand Company

Improper off-road engine maintenance, repair, or abuse.

Owner's unreasonable delay in making the product available after being notified of a potential product problem.

This warranty is in addition to Ingersoll-Rand Company standard warranty, applicable to the off-road engine product involved.

Remedies under this warranty are limited to the provision of material and services as specified herein. Ingersoll-Rand Company is not responsible for incidental or consequential damages such as downtime or loss-use of engine powered equipment.

CALIFORNIA EMiSSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board (CARB) and Ingersoll-Rand Company are please to explain the emission control system warranty on your 1996 and later certified heavy duty off-road engine. In California, new heavy-duty off-road engines must be designed, built and equipped to meet the state's stringent anti-smog standards. Ingersoll-Rand Company must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect, or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system, air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, an authorized INGERSOLL-RAND Dealer will repair the heavy-duty off-road engine at no cost to the owner including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

The 1996 and later heavy-duty off-road engines are warranted for a period of five (5) years, or 3000 hours of operation which ever occurs first. If any emission-related part on your engine is defective, the part will be repaired or replaced by an authorized INGERSOLL-RAND Dealer.

OWNER'S WARRANTY RESPONSIBILITIES:

As the heavy-duty off-road engine owner, you are responsible for the performance of the required maintenance listed in owner's manual (Instruction Manual). Ingersoll-Rand Company recommends that you retain all receipts and records covering the maintenance on your engine, but Ingersoll-Rand Company cannot deny warranty solely for the lack of receipts and records or for your failure to ensure the performance of all scheduled maintenance.

As the heavy-duty off-road engine owner, you should however be aware that Ingersoll-Rand Company may deny you warranty coverage if your heavy-duty off-road engine, or part has failed due to abuse, neglect, improper maintenance, or unapproved modifications.

Your engine is designed to operate on commercial diesel fuel only. Use of any other fuel may result in our engine no longer operation in compliance with California's emission requirements.

You are responsible for initiating the warranty process. The CARB suggests that you present your heavy-duty off-road engine to an authorized INGERSOLL-RAND Dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

If you have any questions regarding your warranty rights and responsibilities, you should contact Ingersoll-Rand Company, at P.O. Box 868, Mocksville, NC 27028 or the State of California Air Resources Board, Mobile source Operation Division, P.O. Box 8001, at El Monte, CA 91731-2990.

MAINTENANCE RECOMMENDATION:

Some Ingersoll-Rand Company non-road engines are certified by the United States Environmental Protection Agency and California Air Resource Board to comply with smoke and gaseous emission standards prescribed by Federal laws at the time of manufacture.

The engine is certified if it has a special certification label. An INGERSOLL-RAND Dealer can also inform you if the engine is certified.
Efficiency of emission control and engine performance depends on adherence to proper operation and maintenance recommendations and use of recommended fuels and lubrication oils. It is recommended that major adjustments and repair be made by your authorized INGERSOLL-RAND Dealer.

Various chemical fuel additives, which claim to reduce visible smoke, are available commercially. Although additives have been used by individuals to solve some isolated smoke problems in the field, they are not recommended for general use.
Federal smoke regulations require that engines be certified without smoke depressants.

The corrective steps taken immediately on discovery of worn parts, which may affect emission levels, will help assure proper operation of emission control systems. The use of genuine INGERSOLL-RAND parts is recommended. Suppliers of non-INGERSOLL-RAND parts must assure the owner that the use of such parts will not adversely affect emission levels.

Regular maintenance intervals, along with special emphasis on the following items, are necessary to keep exhaust emissions within acceptable limits for the useful life of the engine. Refer to the Maintenance Section of this manual. If the engine is operating under severe conditions, adjust the maintenance schedule accordingly. See your authorized INGERSOLL-RAND Dealer to help analyze your specific application, operating environment and maintenance schedule adjustments.

The following is an explanation of maintenance for emission-related components.
See the Maintenance Schedule for the specific interval for the following items.

FUEL INJECTION PUMPS OR NOZZLES – Fuel injection pumps or nozzles are subject to tip wear as a result to fuel contamination. This damage can cause an increase in fuel consumption, the engine to emit black smoke, misfire or run rough. Inspect, test and replace if necessary. Fuel injection pumps can be tested by an authorized INGERSOLL-RAND Dealer.

TURBOCHARGER – Check for any unusual sound or vibration in the turbocharger. Inspect inlet and exhaust piping and connections. Check bearing condition and perform maintenance as described in the Maintenance Schedule.

Slow engine response and low power may indicate a need for adjustment or repair. Your INGERSOLL-RAND Dealer is equipped with the necessary tools, personnel, and procedures to perform this service.

Owner is encouraged to keep adequate maintenance records, but the absence of such, in and of itself, will not invalidate the warranty.

The machine or equipment owner may perform routine maintenance, repairs and other non-warranty work or have it done at any repair facility. Such non-warranty work need not e performed at a designated warranty station in order for the warranty to remain in force.

CUSTOMER ASSISTANCE – EMISSION CONTROL SYSTEM WARRANTY:

Ingersoll-Rand Company aims to ensure that the Emission Control Systems Warranty is properly administered. In the event that you do not receive the warranty service to which you believe you are entitled under the Emission Control Systems Warranty, call or write:

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

Tel.: 336-751-3561

Authorized Dealers are recommended for major maintenance and repair work as they are staffed with trained personnel, proper tools and are aware of the latest maintenance methods and procedures. Owners and others who desire to perform their own work should purchase a Service Manual and obtain current service information from their INGERSOLL-RAND Dealer.

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	Package	1 year/2000 hours	
	Generator	2 years/4000 hours	

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	24	2000	Available at dealer
Deutz	24	2000	Available at dealer
Kubota	24	2000	Major components 36 months/3000 hours - parts only
Ingersoll-Rand	24	4000	5 years/10,000 hours when using genuine Ingersoll-Rand fluids and parts. Refer to operator's manual.

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.

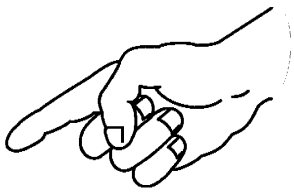
[1] XHP650/900/1070 will continue to use XHP505 and will have the extended warranty when above conditions are met.

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.

Engine Registration:

John Deere requires a separate engine registration be completed and mailed direct to John Deere.
Separate engine registration material is included with this literature package for John Deere powered machines.
All other engine manufacturers do not require a separate engine registration.
You MUST present proof of in-service date at time of requesting engine warranty service.

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.

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

Attention: Warranty Department

SECTION 3 - NOISE EMISSION

This section pertains only to machines distributed within the United States.

WARNING

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof:

(1) The removal or rendering inoperative by any persons, other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new compressor for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; or (2) the use of the compressor after such device or element of design has been removed or rendered inoperative by any person.

Among those acts included in the prohibition against tampering are these:

4. Removal or rendering inoperative any of the following:
   a. the engine exhaust system or parts thereof
   b. the air intake system or parts thereof
   c. enclosure or parts thereof

5. Removal of any of the following:
   a. fan shroud
   b. vibration mounts
   c. sound absorption material

6. Operation of the compressor with any of the enclosure doors open.

Compressor Noise Emission Control Information

A. The removal or rendering inoperative, other than for the purpose of maintenance, repair, or replacement of any noise control device or element of design incorporated into this compressor in compliance with the noise control act;

B. The use of this compressor after such device or element of design has been removed or rendered inoperative.

Note: the above information applies only to units that are built in compliance with the U.S. Environmental Protection Agency.

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

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

NOISE EMISSION CONTROL MAINTENANCE LOG

COMPRESSOR MODEL	
SERIAL NO.	
USER UNIT NO.	

UNIT IDENTIFICATION	**DEALER OR DISTRIBUTOR FROM WHOM PURCHASED:**
Engine Make & Model:	
Serial No.:	
Purchaser or Owner:	
Address:	Date Purchased:

The Noise Control Act of 1972 (86 Stat. 1234) prohibits tampering with the noise control system of any compressor manufactured and sold under the above regulations, specifically the following acts or the causing thereof:

(1) the removal or rendering inoperative by any persons, other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into new compressor for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; or (2) the use of the compressor after such device or element of design has been removed or rendered inoperative by any person.

NOISE EMISSION WARRANTY

The manufacturer warrants to the ultimate purchaser and each subsequent purchaser that this air compressor was designed, built and equipped to conform at the time of sale to the first retail purchaser, with all applicable U.S. EPA Noise Control Regulations.

This warranty is not limited to any particular part, component, or system of the air compressor. Defects in the design, assembly or in any part, component, or system of the compressor which, at the time of sale to the first retail purchaser, caused noise emissions to exceed Federal Standards are covered by this warranty for the life of the air compressor.

INTRODUCTION

The unit for which this Maintenance Log is provided conforms to U.S. E.P.A. Regulations for Noise Emissions, applicable to Portable Air Compressors.

The purpose of this book is to provide (1) the Maintenance Performance Schedule for all required noise emission controls and (2) space so that the purchaser or owner can record what maintenance was done, by whom, where and when. The Maintenance Schedule and detailed instructions on the maintenance items are given on following page.

MAINTENANCE SCHEDULE

ITEM	AREA	PERIOD
A.	Compressed Air Leaks	As Detected
B.	Safety and Control Systems	As Detected
C.	Acoustic Materials	Daily
D.	Fasteners	100 hours
E.	Enclosure Panels	100 hours
F.	Air Intake & Engine Exhaust	100 hours
G.	Cooling Systems	250 hours
H.	Isolation Mounts	250 hours
I.	Engine Operation	See Operator's Manual
J.	Fuels & Lubricants	See Operator's Manual

A. Compressed Air Leaks

Correct all compressed air leaks during the first shutdown period after discovery. If severe enough to cause serious noise problems and efficiency loss, shut down immediately and correct the leak(s).

B. Safety and Control Systems

Repair or replace all safety and control systems or circuits as malfunction occurs. No compressor should be operated with either system bypassed, disabled, or nonfunctional.

C. Acoustic Materials

In daily inspections, observe these materials. Maintain all acoustic material as nearly as possible in its original condition. Repair or replace all sections that have: 1) sustained damage, 2) have partially separated from panels to which they were attached, 3) are missing, or have otherwise deteriorated due to severe operating or storage conditions.

D. Fasteners

All fasteners such as hinges, nuts, bolts, clamps, screws, rivets, and latches should be inspected for looseness after each 100 hours of operation. They should be retightened, repaired, or if missing, replaced immediately to prevent subsequent damage and noise emission increase.

E. Enclosure Panels

Enclosure panels should also be inspected at 100 hour operational intervals. All panels that are warped, punctured, torn, or otherwise deformed, such that their noise containment function is reduced, should be repaired or replaced before the next operation interval. Doors, access panels, and hatch closures especially, should be checked and adjusted at this time to insure continuous seating between gasket or acoustic material and the mating frame.

F. Air Intake and Engine Exhaust

Engine and compressor air intake and engine exhaust systems should be inspected after each 100 hours of operation for loose, damaged, or deteriorated components. Repairs or replacements should be made before the next period of use.

G. Cooling Systems

All components of the cooling system for engine water and compressor oil should be inspected every 250 hours of use. Any discrepancies found should be corrected before placing the unit back in operation. Unrestricted airflow over the radiator and oil cooler must be maintained at all times during operation.

H. Isolation Mounts

Engine/airend isolation mounts should be inspected after each 250 hours of operation. Those mounts with cracks or splits in the molded rubber, or with bent or broken bolts due to operation or storage in severe environments, all should be replaced with equivalent parts.

I. Engine Operation

Inspect and maintain engine condition and operation as recommended in the manuals supplied by the engine manufacturer.

J. Fuels and Lubricants

Use only the types and grades of fuels and lubricants recommended in the Ingersoll-Rand Company and Engine Manufacturer's Operator and Maintenance Manuals.

MAINTENANCE RECORD FOR NOISE EMISSION CONTROL AND EXTENDED WARRANTY

ITEM NO.	DESCRIPTION OF WORK	HOURMETER READING	MAINT/ INSPECT DATE	LOCATION CITY/ STATE	WORK DONE BY (NAME)

SECTION 4 - GENERAL DATA

Compressor Model	P 250WJD	HP 300WJD	P 375WJD
Rated Delivery - cfm (litres/sec)	250 (118)	300 (141)	375 (177)
Rated Pressure - psi (kPa)	100 (689)	150 (1034)	100 (689)
Engine - (Model)	John Deere	John Deere	John Deere
Engine - (Diesel)	4045D-80	4045T-115	4045T-115
Speed - No Load (Full Load) - rpm	1400 (2500)	1400 (2500)	1400 (2500)
Electrical / Starting System - Volts	12	12	12
Unit Weight (all fluids) - pounds (kilograms)	3495 (1585)	4070 (1846)	4070 (1846)
Eng. Lube, incl. filter, Capacity - U.S. gal. (litres)	3.5 (13.2)	3.5 (13.2)	3.5 (13.2)
Eng. Coolant Capacity - U.S. gal. (litres) nominal	5.5 (20.8)	5.8 (22.0)	5.8 (22.0)
Compressor Lube Capacity (Refill) - U.S. gal. (litres)	5.0 (18.9)	9.5 (36.0)	9.5 (36.0)

FLUID CAPACITIES - U.S. gallons (litres)

Fuel Tank (Use clean DIESEL fuel) 42 (159)

UNITS MEASUREMENTS/WEIGHTS

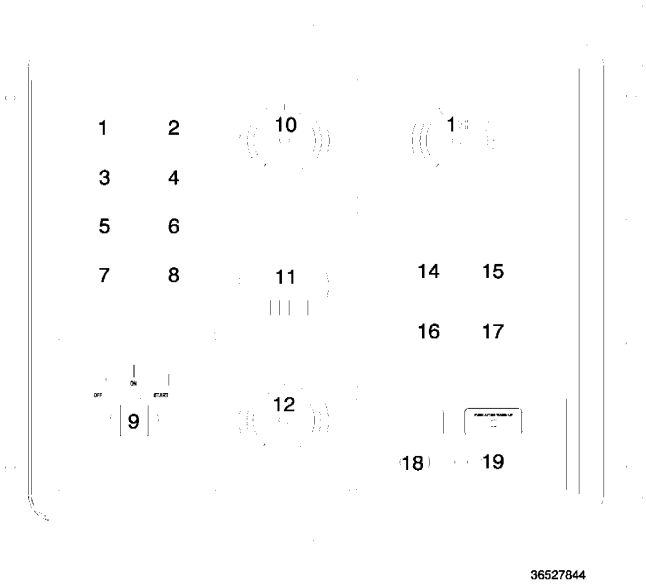
Overall Length - inches (mm) 149 (3785)
Overall Height - inches (mm) 68.5 (1740)
Overall Width - inches (mm) 77 (1955)
Track Width - inches(mm) 65 (1651)

RUNNING GEAR

Tire Size (Load Range) . . . . . ST225/75 R15 (D)
Inflation Pressure (Cold) . . . . . 65 psi (448 kPa)
Towing Speed (Maximum) . . . . . 65 mph (105 km/hr)

SECTION 5 - OPERATING INSTRUCTIONS

CONTROL PANEL



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DIAGNOSTICS/AUTO SHUTDOWN

1. **High Compressor Temperature -**

   248°F (120°C) or more.

2. **Low Engine Oil Pressure** - 12 psi or less

3. **High Engine Temperature -**

   Coolant above 220°F (104°C).

4. **Alternator Not Charging -** needs attention.

5. **Low Fuel Level -**

   Must add fuel to operate.

6. **Air Filters Restricted -**

   Needs Servicing.

7. **Low Coolant Level -**

   Must add coolant.

8. **Needs Servicing -**

Operating Controls/Instruments (Standard)

10. Compressor Discharge Pressure Gauge -

Indicates pressure in receiver tank, psi (kPa).

14. Discharge Air Temp. Gauge - (Optional)

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

15. Engine Oil Pressure Gauge (Optional) -

Indicates engine oil pressure (psi (kPa).

13. Engine Speed Gauge (Optional) -

Indicates engine speed.

11. Hourmeter -

Records running time for maintenance.

16. Engine Water Temp. Gauge (Optional) -

Indicates coolant temperature, with normal operating range from 180°F (82°C) to 210°F (99°C).

17. Voltmeter (Optional) -

Indicates battery condition.

CONTROLS

9. Power Switch -

Flip "ON" to activate systems prior to Starting.
Flip "Off" to stop engine.

OPTIONAL CONTROLS

12. Fuel Level Gauge -

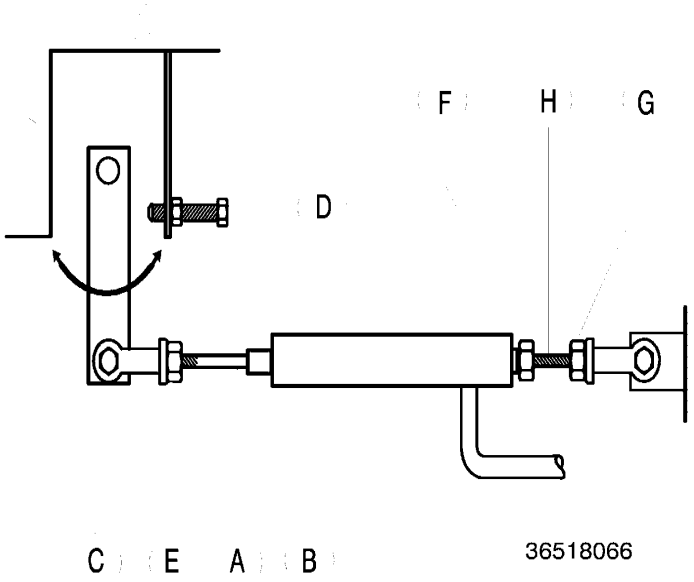
Indicates amount of fuel in tank.

18. Ether Inject Button -

Injects a measured shot. **USE SPARINGLY.**

19. Service Air Button -

After warm up, PUSH. Provides full air pressure at the service outlet.



Normally, regulation requires no adjusting, but if proper adjustment is lost, proceed as follows:

Note: Refer to general data for machine rated speeds and pressure.

Before Starting Unit:

1. Atop separator tank cover at pressure valve, loosen locknut counterclockwise. Turn adjustment screw and locknut counterclockwise until no tension is felt at the screw. turn screw clockwise one full revolution.

After Starting Unit:

2. Allow unit to warm up. Then at control panel, push "Service Air" Button, if equipped.

3. Open and adjust service valve (on outside of the unit) to obtain the rated operating pressure on the discharge pressure gauge.

Note: If the rated operating pressure cannot be maintained with engine at full load speed and rod (A) of air cylinder (B) fully retracted, turn regulator adjustment screw clockwise until throttle airm (C) moves against full speed governor stop (D).

4. Insure that pressure is maintained at rated pressure, then turn regulator adjustment screw counterclockwise until throttle arm (C) just begins to move.

Note: Turning regulator adjustment screw clockwise will raise pressure at full speed.

5. Close service valve (engine will slow to idle speed). Loosen jam nut (E) on rod (A). Rotate rod (A) to adjust speed to obtain idle rpm.

6. If necessary, repeat steps 3 and 4.

7. At pressure regulator, tighten lock nut.

8. Limit full load engine speed by loosening jam nut (F) and (G) and rotating rod (H). When proper speed is reached, tighten jam nuts.

9. To obtain maximum CFM at any pressure between 80 PSI (550kPa) and the rated operating pressure, turn adjustment screw of pressure regulator to obtain desired discharge pressure at full load engine speed. Always lock pressure setting of adjusting screw.

BEFORE TOWING

WARNING

Failure to follow these instructions can cause severe injury or death.

CAUTION

- Position the tow vehicle to align its hitch with the pintle eye or coupler of the compressor.

- Engage the parking brake and chock the wheels of the tow vehicle.

- Stand to the side and ensure pin is FULLY inserted (secure) in tube of jack. Crank jack to seat pintle eye or coupler onto hitch. Latch and lock hitch. Cross safety chain(s) under drawbar. Attach to vehicle.

- Crank jack to raise pad off the ground. Pull pin from tube of jack. Fold jack handle down and forward. Swing up jack tube and FULLY insert pin in tube.

Units equipped with hydraulic brakes:

- Check brake fluid level. Top off as required with DOT 3 brake fluid.

- Check condition of brake lines, hoses and cables. Repair or replace damaged parts.

- Attach brake actuator break-a-way chain above hitch or towing vehicle.

SETTING - UP

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

When the unit is to be operated out-of-level , it is important: (1) to keep the engine crankcase oil level near the high level mark (with the unit level), and (2) to have the compressor oil level gauge show no more than mid-scale (with the unit running at full load). Do not overfill either the engine crankcase or the compressor lubricating oil system.

TOWING

WARNING

Failure to follow these instructions can cause severe injury or death.

- Ensure that tires, wheels and running gear are in good condition and secure.

- Ensure that tires are inflated to 75 psi (520kPa).

- Do not tow this unit in excess of 50 mph (80 km/hr).

- Use a tow vehicle whose towing capacity is greater than the gross weight of this unit.

DISCONNECT

- Set the vehicle parking brake. Chock wheels of unit.

- Standing to the side, remove pin from tube of jack. As jack tube swings down, FULLY insert pin in the tube.

- Disconnect safety chains. Crank jack to raise eye or coupler from hitch. Tow vehicle can be moved.

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.

WARNING

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

Open manual blowdown 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 battery for proper connections and condition.

Check the compressor lubricating oil level. The proper oil level is mid-way on the sight gauge. Add oil if the level falls to the bottom of the sight gauge. Do not overfill.

Check the engine lubricating oil level. Add oil if low on dipstick.

WARNING

Do not remove the cap from a HOT engine radiator. The sudden release of pressure from a heated cooling system can cause severe injury or death.

CAUTION

The use of water alone in this engine can result in major engine failure.

At overflow reservoir (plastic bottle) check coolant level and, if necessary, top off to "cold" mark.

• Roof access door has retaining pins on each side. After servicing cooling system, pins must be replaced for proper operation.

Check the fuel level. Add only CLEAN DIESEL fuel for maximum service from the engine.

Note: To minimize condensation (water) in the fuel tank, fill the tank at the end of each day.

WARNING

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

Close the side doors to maintain a cooling air path and to avoid recirculation of hot air. This will maximize the life of the engine and compressor and protect the hearing of surrounding personnel. Be sure no one is IN or ON the compressor unit.

STARTING

WARNING

Do NOT operate machine with guards removed.

CAUTION

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

In freezing weather and if so equipped, flip HEATERS switch "On" and wait sixty (60) seconds. This applies heat to the control system components for easier starting. Leave this switch "On" while operating at these temperatures.

Flip the POWER switch to "On". If so equipped, all DIAGNOSTICS lamps will light (glow) for two (2) seconds. Then all lamps should go off except for ALTERNATOR NOT CHARGING and LOW ENGINE OIL PRESSURE.

CAUTION

Ether is an extremely volatile, highly flammable gas. Use sparingly! If too much is injected, the uncontrolled explosion may result in costly damage to the engine.

In cold weather, open manual blow down valve and, if so equipped, press the ETHER INJECT button once and release. Then, while cranking, press release button once every five (5) seconds. This injects a measured amount of ether to the engine.

Press both the START and the BY PASS buttons to crank the engine. DO NOT OPERATE THE STARTER MOTOR FOR MORE THAN TEN (10) SECONDS WITHOUT ALLOWING AT LEAST ONE MINUTE COOLING TIME BETWEEN START ATTEMPTS.

Release the START button when the engine starts and sustains running. If the engine does not start after a couple of attempts, refer to Trouble Shooting Section.

Release the BYPASS button after two (2) to three (3) seconds.

All Diagnostic lamps should be off. If not, stop the machine and investigate. If opened above, close manual blowdown valve.

Observe the gauges while the unit warms up for five (5) to ten (10) minutes or until the coolant temperature reaches 140 degrees F (60°C).

If so equipped, Push the SERVICE AIR button. The engine should go to full speed and the discharge pressure rise to slightly over rated pressure. The compressor will unload (intake be throttled or closed) and the engine speed will drop to the idle speed.

Compressor is now ready to furnish air when the 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 engine temperatures.

Flip all toggle switches to "Off".

Note: Once the engine stops, the automatic blowdown 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 blowdown period (2 minutes), open the manual blowdown valve.

EQUIPMENT PROTECTION

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

This unit is protected by sensors or switches at the following locations:

(1) High engine COOLANT temperature in the engine.

(2) Low engine oil pressure, in the engine.

(3) Low Fuel Level.

High Discharge AIR Temperature -

(4) At the airend outlet.

(5) In the safety valve connection on the separator tank.

AUTOMATIC SHUTDOWN / DIAGNOSTICS

Should any of these problem situations occur, the unit will automatically shutdown and stop. BEFORE restarting the unit or flipping the POWER switch to "Off", check the DIAGNOSTICS area on the instrument panel.

The upper four (4) lamps are electronically "latched" to only respond to the first or primary signal for a shutdown. In other words, if the automatic shutdown is the result of one of these four problems, only that particular problem lamp will be lit. And the lamp will remain lit as long as the batteries provide power.

Refer to OPERATING CONTROLS AND INSTRUMENTS, for the various problem signal criteria (F, psi, etc.). The indicated problem area should be inspected for a physical cause (low fluid, broken fan belt, evidence of excessive heat, etc.) and corrections made.

The shutdown will automatically reset when the problem condition is corrected.

Other possible causes for an unexpected shutdown are listed on the Trouble Shooting Chart.

SECTION 6 - MAINTENANCE

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.

Correct engine speed is critical to the operation of this machine. Check the idle and full load rpm every three months and adjust in accordance with the speed and pressure adjustment instructions in this manual and included on a decal on the machine. Correct speeds are on the general data decal.

SCHEDULED MAINTENANCE

The maintenance schedule is based on normal operation of the unit. This page can be reproduced and used as a checklist by the service personnel. In the event unusual environmental operating conditions exist, the schedule should be adjusted accordingly.

COMPRESSOR OIL LEVEL

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

Compressor Oil

This machine was factory filled with Ingersoll-Rand Pro Tec® Compressor Fluid (Ingersoll-Rand XHP505 for XHP900 models).

By continued use of Ingersoll-Rand compressor fluids and filters, optional warranty will be extended for the base airend (rotors, housings, gears and bearings) when substantiated with proof of conformance to recommended maintenance intervals and purchase of OEM Ingersoll-Rand filters and fluids.

Optional Warranty - The earlier of 60 months from shipment to, or the accumulation of 10,000 hours of service by the initial user. The optional warranty is limited to defects in major components (rotors, housings and bearings), and is automatically available to the original user when he meets the following three conditions:

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 3 yrs/5000 hrs (100-185 CFM only)	100% parts and labor 100% parts and labor	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, and bearings).

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

The compressor oil must be replaced every 500 hours of operation or six (6) months, whichever comes first for models HP600 - P1600.

Refer to the fluids and lubricants chart for ambient temperature ranges and specifications, in the lubrication section of this manual.

The compressor oil must be replaced every 500 hours of operation or six (6) months, whichever comes first for models P100-P600. The compressor oil must be replaced every 1000 hours of operation or six (6) months, whichever comes first for models HP600-P1600.

Refer to the fluids and lubricants chart for ambient temperature ranges and specifications in the lubrication section of this manual.

AIR CLEANER

This unit is equipped with an AIR FILTERS RESTRICTED lamp on the instrument panel, covering both the engine and the compressor.

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

Also weekly squeeze the rubber valve (precleaner dirt dump) on each air cleaner housing to ensure that they are not clogged. NOTICE: Holes or cracks downstream of the air cleaner housing will cause the restriction indicators to be ineffective.

The air filters restricted sensor will automatically reset after the main power switch is flipped to "OFF."

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

1. Loosen outer wing nut and remove with outer element. Inspect red window on special inner wing nut to find small dot. If dot is not visible, remove cotter pin and special wing nut and inner (safety) element.

2. Inspect air cleaner housing for any condition that might cause a leak and correct as necessary.

3. Wipe inside of air cleaner housing with a clean, damp cloth to remove any dirt accumulation, especially in the area where the element seals against the housing.

4. Inspect element by placing a bright light inside and rotating slowly. If any holes or tears are found in the paper, discard this element. If no ruptures are found, the element can be cleaned by one of the following procedures.

5. If a new air filter element is to be used check it closely for shipping damage. To reset the signal indicator in the special wing nut, apply suction to the red window.

6. Install cleaned or new elements in the reverse order to the above. Tighten wing nuts firmly and replace cotter pin.

7. Inspect to ensure that the end cap seals tightly 360 degrees around the air cleaner body.

In the event 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.

NOTICE

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

NOTICE

It is highly recommended that new replacement elements be installed in the unit immediately in order that the unit be returned to service in the shortest possible time. In this manner, the elements just removed for cleaning can be washed and stored as future replacement elements.

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

GAUGES

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

FUEL TANK

This unit is equipped with dual tanks that can be filled from either side. Using clean fuel in the fuel tanks is vitally important and every precaution should be taken to ensure that only clean fuel is either poured or pumped into the tank. When filling the fuel tank on this unit, by methods other than a pump and hose, use a CLEAN non-metallic funnel.

Every six months the drain plugs should be removed from the tanks so that any sediment or accumulated condensate may be drained. When replacing the drain plugs, make sure they are tightened securely.

BATTERY

Heavy-duty, diesel cranking type batteries were installed at the factory and these should be inspected weekly. Keep the battery posts-to-cable connections clean, tight and lightly coated with a grease. Also the electrolyte level in each cell should cover the top of the plates. If necessary, top-up with clean distilled water.

TIRES

A weekly inspection is recommended. The proper inflation pressure for the tires is listed on General Data. Tires that have cuts or cracks or little tread should be repaired or replaced. Monthly check the wheel lug nuts for tightness.

AUTOMATIC SHUTDOWN SYSTEM

The high discharge air temperature switches will require approximately 248 F (120 C) to actuate. The engine coolant temperature switch will require approximately 220 F (104 C) to actuate. Replace any defective switch before continuing to operate the unit.

A low oil pressure switch may be tested by removing it and connecting it to a source of controlled pressure while monitoring an ohmmeter connected to the switch terminals. As pressure is applied slowly from the controlled source, the switch should close at 12 psi (.84 kgf per cm 2) and show continuity through the contacts. As the pressure is slowly decreased to 8 psi (0.56 kgf per cm2) the contacts should open and the ohmmeter should show lack of continuity (infinite ohms) through the contacts. Replace a defective switch before continuing to operate the unit.

COMPRESSOR OIL COOLER

The compressor lubricating and cooling oil is cooled by means of the fin and tube-type oil cooler, located beside the radiator. 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. Use only a dependable cleaning compound. This is of prime importance because different cleaners vary in concentration and chemical composition. After completing the cleaning procedure, the oil cooler must be flushed before returning to service.

RADIATOR

WARNING

Do not remove the cap from a HOT engine radiator. The sudden release of pressure from a heated cooling system can result in a loss of coolant and possible severe personal injury.

The engine cooling system is filled at the factory with a 50/50 mixture of water and ethylene glycol. This permanent type antifreeze contains rust inhibitors and provides protection to -35 F (-37 C).

The use of such a mixture is recommended for both summer and winter operation. When using water alone, be sure to add a reputable brand of rust inhibitor to prevent internal corrosion.

It is recommended to test the freezing protection of the coolant every six months or prior to freezing temperatures. Replenish with a fresh mixture every twelve months. A drain for the system is located in the bottom radiator tank. An alternate method would be to disconnect a bottom radiator hose.

Each month, inspect the radiator exterior for obstructions (dirt, bugs, etc.). If present, blow water or compressed air containing a nonflammable solvent between the fins in a direction opposite the normal air flow. Should the radiator be clogged internally, standard automotive practices should be followed.

HOSES

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

To ensure freedom from air leaks, all rubber hose joints and the screw-type hose clamps must be absolutely tight. Regular inspection of these connections for wear or deterioration is a definite "must" if regulator servicing of the air cleaners is not to prove futile.

Premature wear of both the engine and compressor is ASSURED whenever dust-laden air is permitted to enter the engine's combustion chamber or the compressor intake practically unfiltered.

The flexible hoses used in the fuel, oil and air lines on these units are primarily used for their ability to accommodate relative movement between components. It is extremely important they be periodically inspected for wear and deterioration. Clamps are used to prevent hose cover abrasion through vibration. This abrasion may occur when two hose lines cross, or when a hose line rubs against a fixed point; therefore, it is necessary that all clamps be replaced if missing. 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 150 psi (1050 kPa) may use a special nylon tubing. The associated fittings are also of a special "push-in" design. If so, features are as follows:

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

To install the nylon tubing, make a mark (with tape or grease pencil) approximately 7/8 inch from the end of the tubing. Insert the tubing into the sleeve and "push-in" past the first resistance to the 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.

COMPRESSOR OIL FILTERS

The compressor lubrication and cooling oil system includes dual spin-on, throw away type oil filters, each with an internal bypass valve. With a clean, new filter element, all of the oil flows through the full element area, from the outside/inside. As each element becomes contaminated with dirt, a pressure differential is created in the filter housing between the oil inlet and outlet ports. As this differential approaches 25 psi (175 kPa), the bypass valve starts to open, thus permitting a small quantity of oil to bypass the filter. As the contaminants continue to build up, more and more of the oil bypasses the filter media itself.

This bypass does not provide any filtration but does allow a maximum flow of compressor lubricating and cooling oil to preclude any possible damage from loss of oil. Also the design of the filter prevents any washing-off of any dirt during oil bypassing.

NOTICE

The oil filter must be replaced every 500 hours of operation. 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(s) to ensure that system is relieved of all pressure. Close the valve(s).

2. Turn the spin-on filter element counterclockwise to remove it from the filter housing. Inspect the filter element and then discard.

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 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.

Installing a new oil filter element when the old gasket remains on the oil 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.

FASTENERS

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

COMPRESSOR OIL

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

RUNNING GEAR

Every month or 500 miles, tighten the wheel lug nuts to 85 - 95 lbs.-ft. Every six months the wheel bearings, grease seals and axle spindles should be inspected for damage (corrosion, etc.) or excessive wear. Replace any damaged or worn parts. Repack wheel bearings. Use a wheel bearing grease conforming to specification MIL-G-10924 and suitable for all ambient temperatures.

Grease can be replaced in a wheel bearing using a special fixture or by hand as follows.

Place a spoonful of grease in the palm of one hand and take the bearing in the other hand. Push a segment of the wider end of the bearing down into the outer edge of the grease pile closest to the thumb. Keep lifting and pushing the bearing down into the edge of the grease pile until grease oozes out both from the top and from between the rollers. Then rotate the bearing to repeat this operation on the next segment. Keep doing this until you have the entire bearing completely filled with grease.

Before installing bearing, place a light coat of grease on the bearing cups which are pressed in the hub.

NOTICE

Excessive grease in the hub or grease cap serves no purpose due to the fact that there is no way to force the grease into the bearing. The manufacturer's standard procedure is to thoroughly pack the inner and outer bearing with grease and then to apply only a very small amount of grease into the grease cap.

If bearing adjustment is required or the hub has been removed for any reason, the following procedure must be followed to ensure a correct bearing adjustment of 0.001 to .012 free play.

1. While rotating hub slowly to seat the bearings, tighten spindle nut to approximately 15 lbs.-ft. Grasp the tire at the top and bottom and rock, in and out. There should be no evidence of looseness (free play) at the bearing.

2. Loosen nut to remove preload torque. Do not rotate hub.

3. Finger tighten nut until just snug. Loosen nut until the first nut castellation lines up with cotter pin hole in spindle. Insert cotter pin.

4. Ensure a definite but minimal amount of free play by rocking the tire.

5. Bend over cotter pin legs to secure nut and clear grease cap.

6. Nut should be free to move with only restraint being the cotter pin.

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 at end of machine.**

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

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

In the compressor lubricating and cooling system, separation of the oil from the compressed air takes place in the receiver-separator tank. As the compressed air enters the tank, the change in velocity and direction drop out most of the oil from the air.
Additional separation takes place in the oil separator element which is located in the top of the tank.
Any oil accumulation in this separator element is continuously drained off by means of a scavenge tube which returns the accumulated oil to the system.

SCAVENGE LINE

WARNING

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

The scavenge line originates at the receiver-separator tank cover and terminates at the compressor air-end through an orifice (.063 inch/1.6 mm). 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, any orifice and check valve.
3. Assure minimum pressure valve (if so equipped) has proper setting.
4. Run unit at rated operating pressure for 30 to 40 minutes to permit element to clear itself.

COOLING FAN DRIVE

The heat exchanger or cooling fan is driven by a multiple V-belt arrangement from the engine. Inspect the cooling fan belts weekly or at 50 hour intervals. These V-belts should be maintained at the proper tension. Fan belts that are too tight impose an undue load on the fan shaft bearings and shorten the life of the belts. Fan belts that are too loose allow slippage and lower the fan speed, cause excessive belt wear, and can lead to overheating of the cooling systems.

BRAKE SYSTEMS

This compressor may be equipped with mechanical parking brakes or electric brakes. The maintenance of these brake systems is required to ensure safe operation of this compressor.

Parking Brakes:
Every six months check the brake shoes for proper operation and deterioration. The common automotive standards and procedures would apply in replacing the brake shoes.

When replacing brake cables it is necessary to adjust the brake shoes before adjusting the parking brake system. To adjust the shoes, remove the rubber hole plug in the brake backing plate and rotate the star adjusting nut until you cannot rotate the wheel by hand. Then back off the adjustment ten to twelve (10-12) notches. Note: always rotate wheel in direction of forward travel only. Replace hole plug and proceed to next wheel and repeat procedure.

Adjust parking brakes after all brake shoes have been adjusted by:

1. Turning knob on brake lever until lever is perpendicular to bracket when in "OFF" position. Wheels should turn freely.

2. With lever in "OFF" position, adjust brake cables until each has approximately the same tension. Wheels should turn freely.

3. Move lever to "ON" position. Check each wheel to see that it will not rotate. If all wheels will rotate, adjust knob on lever until brakes are fully applied. If one or two wheels will still rotate, adjust the cables for those wheels and recheck.

4. After brakes are adjusted, move lever to "ON" position and apply grease to cable strands from conduit six inches toward lever. This is to prevent dirt from getting into the conduit.

NOTE: New cables will stretch and therefore should be readjusted after the first week of use.

Every six months, apply a multi-purpose grease to the fittings on the brake actuator.

Electric Brake Adjustment:

Brakes should be adjusted (1) after the first 200 miles of operation when the brake shoes and drums have "seated", (2) at 3000 mile intervals, (3) or as use and performance requires. The brakes should be adjusted in the following manner:

1. Jack up trailer and secure on adequate capacity jack stands. Check that the wheel and drum rotate freely.

2. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.

3. With a screwdriver or standard adjusting tool, rotate the starwheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.

4. Then rotate the starwheel in the opposite direction until the wheel turns freely with a slight lining drag.

5. Replace the adjusting hole cover and lower the wheel to the ground.

6. Repeat above procedures on all brakes.

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.

* Disconnect the hose from the scavenge tube.

* Remove scavenge tube from tank cover.

* Disconnect service line from cover.

* Remove (16) cover mounting screws.

* Remove cover, element and inner shell.

* Remove any gasket material left on cover or tank.

* Install new gasket, inner shell and new element.

*Place a straightedge across top of element and measure from bottom of straightedge to bottom of element (See Fig. 4.1).

*Replace scavenge tube in cover (cover is still off of tank).

*Measure from bottom of cover to end of scavenge tube (See Fig. 4.2). Measurement should be from 1/8" to 1/4" less than the element measurement. If not, cut to size.

*Remove scavenge tube.

*Reposition cover (use care not to damage gaskets).

*Replace cover mounting screws: tighten in a criss-cross pattern to 100 lbs.-ft.

*Reconnect service line. Replace scavenge tube. Reconnect hose.

*Close service valve. Start unit and look for leaks.

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

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

Figure No. 4.1 Element Measurement

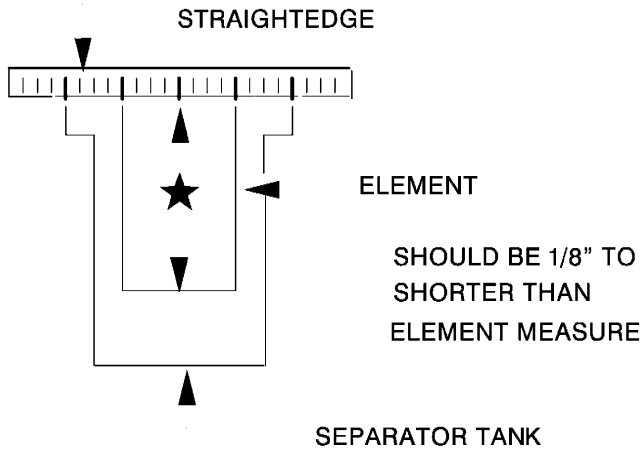
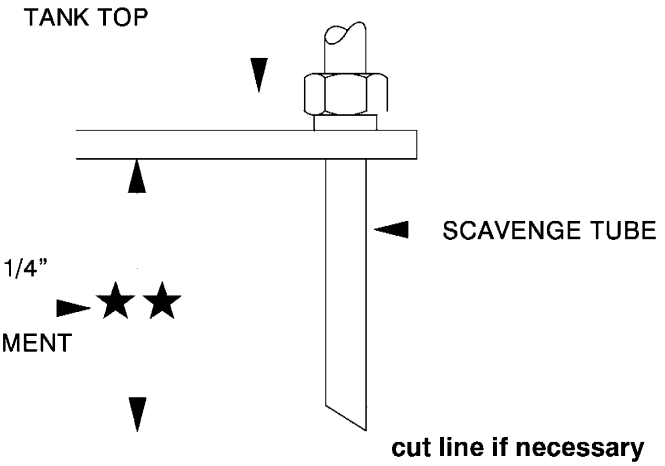


Figure No. 4.2 Tube Measurement



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.**

8. **Apply 2 medium - wet coats of Duponts 222S Adhesion Promoter over the entire area to be painted, with a 5 minute flash in between coats.**

9. **To apply the texture coat, use Duponts 1854S Tuffcoat Primer. The proper technique to do this is to spray the Tuffcoat Primer using a pressure pot and use about 2-5 pounds of air pressure. This will allow the primer to splatter causing the textured look. Note: you must be careful not to put too much primer on at one time, this will effect the amount of texture that you are trying to achieve. Allow the texture coat to flash for 20 minutes or until dry to touch.**

10. **Apply any of Duponts Topcoat Finishes such as Imron™ or Centari™ according to the label instructions.**

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

CAUTION

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

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

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

•Never operate this machine with any guards removed.

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

Notice: Disregard any maintenance pertaining to components not provided on your machine.

MAINTENANCE SCHEDULE

		Daily	Weekly	Monthly	3 MOS . 250 hrs.	6 MOS. 500 hrs	12 MOS. 1000 hrs
Compressor Oil Level		C					
Engine Oil Level		C					
*Radiator Coolant Level		C					
Gauges/Lamps		C					
Fuel Tank (fill at end of day)		C				DRAIN	
*Fuel/Water Separator Drain		C					
Air Cleaner Precleaner Dumps			C				
Fan/Alternator Belts			C				
Battery Connections/Electrolyte			C				
Tire Pressure and Surface			C				
*Wheel Lug Nuts				C			
Hoses (oil, air, intake, etc.)				C			
Automatic Shutdown System	Test			C			
Air Cleaner System	Visual			C			
Compressor Oil Cooler	Exterior			C	CLEAN		
*Engine Rad/Oil Cooler	Exterior			C	CLEAN		
Fasteners, Guards					C		
Air Cleaner Elements						WI	
*Fuel/Water Separator Element						R	
Compressor Oil Filter Element						R	
Compressor Oil						R	
*Wheels (bearings, seals, etc)						C	
*Engine Coolant	Test					C	R
Shutdown Switch Settings	Test						C
Scavenger Orifice & Related Parts							CLEAN
Oil Separator Element							R
Lights (running, brake, & turn)		CBT					
Pintle Eye Bolts		CBT					
Engine (oil changes, filters, etc)		Refer to Engine Operator Manual in this book.					

*Disregard if not appropriate for this particular machine.

R=replace, **C**=check (adjust if necessary), **WI**=OR when indicated, **CBT** = check before towing.

Refer to specific sections of the operator's manual for more information.

SECTION 7 - LUBRICATION

GENERAL INFORMATION

Lubrication is an essential part of preventive maintenance, affecting to a great extent the useful life of the unit. Different lubricants are needed and some components in the unit require more frequent lubrication than others. Therefore, it is important that the instructions regarding types of lubricants and the frequency of their application be explicitly followed. Periodic lubrication of the moving parts reduces to a minimum the possibility of mechanical failures.

The Preventive Maintenance Schedule shows those items requiring regular service and the interval in which they should be performed. A regular service program should be developed to include all items and fluids. These intervals are based on average operating conditions. In the event of extremely severe (hot, cold, dusty or wet) operating conditions, more frequent lubrication than specified may be necessary. Details concerning lubrication of the running gear are in Maintenance Section.

All filters and filter elements for air and compressor lubricant must be obtained through Ingersoll-Rand to assure the proper size and filtration for the compressor.

COMPRESSOR OIL CHANGE

These units are normally furnished with an initial supply of oil sufficient to allow operation of the unit for approximately 6 months or 1000 hours, whichever comes first. If a unit has been completely drained of all oil, it must be refilled with new oil before it is placed in operation. Refer to specifications in Lubrication Table.

NOTICE

Some oil types are incompatible when mixed and result in the formation of varnishes, shellacs, or lacquers which may be insoluble. Such deposits can cause serious troubles including clogging of the filters. Where possible, do NOT mix oils of different types and avoid mixing different brands. A type or brand change is best made at the time of a complete oil drain and refill.

If the unit has been operated for the time/ hours mentioned above, it should be completely drained of oil. If the unit has been operated under adverse conditions, or after long periods in storage, an earlier change period may be necessary as oil deteriorates with time as well as by operating conditions.

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. Ensure the following conditions are met:

- Discharge air pressure gauge reads zero (0).
- No air discharging from an "open" manual blowdown valve.

An oil change is good insurance against the accumulation of dirt, sludge, or oxidized oil products.

Completely drain the receiver- separator, piping, and oil cooler. If the oil is drained immediately after the unit has been run for some time, most of the sediment will be in suspension and, therefore, will drain more readily. However, the fluid will be hot and care must be taken to avoid contact with the skin or eyes.

After the unit has been completely drained of all old oil, close the drain valve. Add oil in the specified quantity at the filler plug. Tighten the filler plug and run the machine to circulate the oil. Check the oil level WHEN RUNNING AT FULL LOAD. If not near the middle of the sight tube, stop the unit and make corrections. DO NOT OVERFILL.

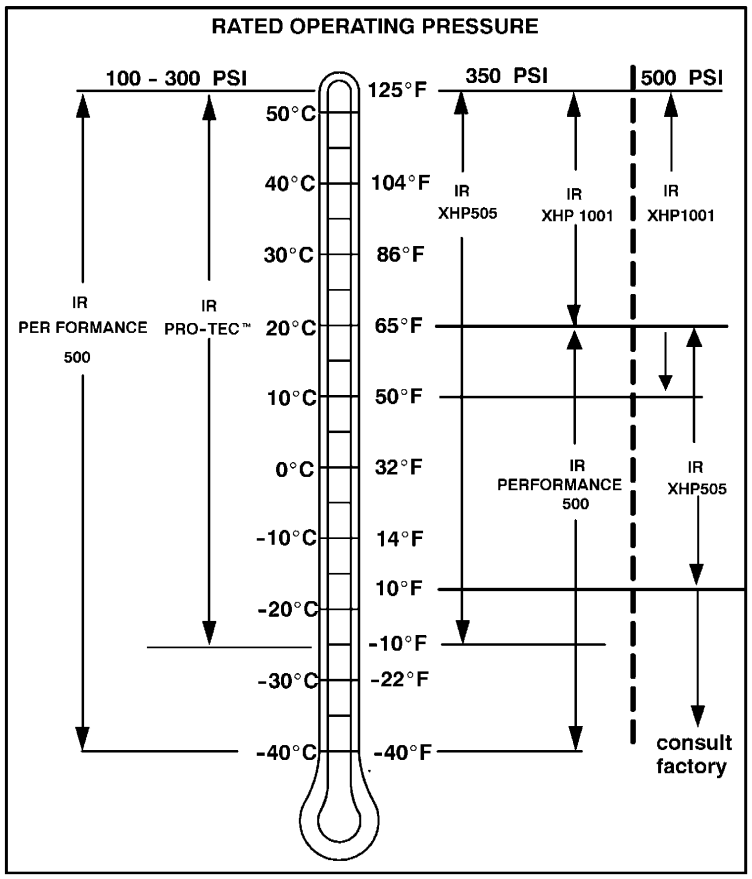
NOTICE

Ingersoll-Rand provides compressor oil specifically formulated for Portable Compressors and requires the use of these fluids in order to obtain extended limited airend warranty.

SECTION 7 - COMPRESSOR LUBRICATION

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

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		35365188	35365170
IR Performance 500	35382928	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.

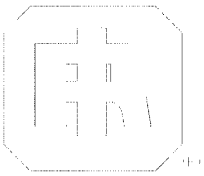
Note: For trouble shooting electrical problems, refer to the Wiring Diagram Schematic found in Parts List Section.

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.

	1. Unit Shutdown:	**Corrective Action**
	Out of Fuel	Add CLEAN diesel Fuel
	Compressor Oil Temp. Too High	See Complaint 10
	Engine Water Temp. Too High	Check coolant level. If necessary, Add.
	Engine Oil Pressure Too Low	See Complaint 3 and Complaint 4.
	Broken Engine Fan Belt	Replace fan belt.
	Loose Wire Connection	Wiggle wires at switches & connector blocks. Make repairs.
	Low Fuel Level Shutdown Switch	Replace switch.
	Defective Discharge Air Temp. Switch	Replace switch.
	Defective Engine Oil Pressure Switch	Replace switch.
	Defective Shutdown Solenoid	Replace solenoid.
	Malfunctioning Relay	Replace relay.
*	< 16 Volts at Shutdown Solenoid	Check battery and alternator. Make repairs.
	Blown Fuse	Replace fuse.
	Engine Malfunctioning	See Trouble Shooting in Engine Manual.
	Airend Malfunctioning	See Complaint 10.

	2. Won't Start/Run:	
	Low Battery Voltage	Check electrolyte level. Check connections.
*	<16 Volts at Shutdown Solenoid	Charge battery and alternator. Make repairs.
	Blown Fuse	Replace fuse.
	Malfunctioning Start Switch	Replace switch.
	Defective Safety Bypass Switch	Replace switch.
	Clogged Fuel Filters	Service filters. See Engine Operator's Manual.
	Out of Fuel	Add CLEAN fuel.
	Compressor Oil Temp. Too High	See Complaint 10.
	Engine Water Temp. Too High	Check fluid level. If necessary, Add.
	Engine Oil Pressure Too Low	See Complaint 3 and Complaint 4.
	Loose Wire Connection	Repair or replace connection.
	Defective Discharge Air Temp. Switch	Replace switch.
	Defective Engine Oil Pressure Switch	Replace switch.
	Defective Shutdown Solenoid	Replace solenoid.
	Malfunctioning Relay	Replace relay.
	Engine Malfunctioning	See Trouble Shooting in Engine Manual.
	Airend Malfunctioning	See Complaint 10.

	3. Engine Temperature Lamps Stays On:	
	Broken Engine Fan Belt	Replace fan belt set.
	Malfunctioning Circuit Board	Replace circuit board.
*	Ambient Temp. >125°F (52°C)	Above spec limit.
	Dirty Operating Conditions	Move unit to cleaner environment.
	Dirty Cooler	Clean exterior of cooler.
*	Out of Level >15 degrees	Relocate or reposition unit.
	Operating Pressure Too High	Reduce pressure to spec.
	Recirculation of Cooling Air	Close side doors.
	Loose Wire Connection	Repair or replace.
	Malfunctioning circuit board.	Replace circuit board.

* : > = greater than, < = less than

4. Engine Oil Pressure Lamp Stays On:

	Corrective Action
Low Oil Level	Add oil.
Out of Level >15 degrees	Relocate or reposition.
Wrong Lube Oil	See Engine Oil Spec. Change oil.
Clogged Oil Filter Element(s)	Replace element(s).
Engine Malfunctioning	See Trouble Shooting in Engine Manual.
Loose Wire Connection.	Repair or replace.
Malfunctioning circuit board	Replace circuit.

5. Engine Temperature Lamps Stays Off:

Bulb Burned Out	Replace circuit board.
Malfunctioning circuit board	Replace circuit board.

6. Engine Oil Pressure Lamp Stays Off:

Bulb Burned Out	Replace circuit board.
Malfunctioning circuit board	Replace circuit board.

7. Alternator Lamp Stays On:

Loose or Broken Belts	Tighten or replace belt set.
Loose Wire Connection	Repair or replace connection.
Low Battery Voltage	Check electrolyte level. Add if necessary. Check connectors. Clean & tighten. Recharge battery.
Malfunctioning Alternator	Repair or replace alternator.
Malfunctioning circuit board	Replace circuit board.

8. Alternator Lamp Stays Off:

Bulb Burned Out	Replace circuit board.
Loose Wire Connection	Repair or replace connector.
Malfunctioning circuit board	Replace circuit board.

9. Unit Fails To Shutdown:

Defective Low Fuel Shutdown Switch	Pull wire off shutdown solenoid. Replace switch.
Defective Discharge Air Temperature Switch	Pull wire off. Replace switch.
Defective Engine Oil Pressure Switch	Pull wire off. Replace switch.
Defective Shutdown Solenoid	Carefully block air inlet to stop engine. Replace solenoid.
Malfunctioning Relay	Pull wire off shutdown solenoid. Replace relay.
Defective Safety Bypass Switch	Pull wire off shutdown solenoid. Replace defective item.

10. Excessive Compressor Oil Temperature:

	Corrective Action
Ambient Temp. > 125°F (52°C)	Above spec limit.
Out of Level > 15 degrees	Relocate or reposition unit.
Low Oil Level	Add oil. Look for any leaks.
Wrong Lube Oil	Check spec in this manual.
Dirty Cooler	Clean exterior surfaces.
Dirty Operating Conditions	Move unit to cleaner environment.
Clogged Oil Filter Elements	Replace elements. Change oil.
Loose or Broken Belts	Tighten or replace belt set.
Operating Pressure Too High	Reduce pressure to spec.
Recirculation Of Cooling Air	Close side doors. Replace belly pan.
Malfunctioning Thermostat	Replace thermostat in bypass valve.
Malfunctioning Fan	Check fan belt tension. Tighten or replace belt set.
Defective Oil Cooler Relief Valve	Replace valve.
Defective Minimum Pressure Valve	Repair or replace valve.
Blocked or Restricted Oil Lines	Clean by flushing or replace.
Airend Malfunctioning	See Complaint 11, 12, 13, 15, 16 or 18.

11. Engine RPM Down:

Clogged Fuel Filter	Clean primary filter. Replace final filter. Drain tanks. Add CLEAN fuel.
Operating Pressure Too High	Reduce pressure to spec limit.
Incorrect Pressure Regulator Adjustment	See Section 6 in this manual.
Malfunctioning Pressure Regulator	Replace regulator.
Incorrect Linkage Adjustment	See Section 6 in this manual.
Dirty Air Filter	Clean or replace elements.
Malfunctioning Air Cylinder	Replace air cylinder and adjust per Section 6.
Wrong Air Filter Element	Install correct element.
Defective Separator Element	Install new element per page 21.
Engine Malfunctioning	See Trouble Shooting in Engine Manual.
Airend Malfunctioning	Refer to Airend Rebuild Manual.

12. Excessive Vibration:

Rubber Mounts, Loose or Damaged	Tighten or replace.
Defective Fan	Replace fan.
Drive Coupling Defective	Replace coupling.
Engine Malfunctioning	See Trouble Shooting in Engine Manual.
Airend Malfunctioning	See Complaint 15 and 17.
Anti-rumble valve not working.	Repair or Replace.
Engine idle speed too low.	Raise "No Load" speed per Section 6.

13. Low CFM:

Dirty Air Filter	Clean or replace elements.
Incorrect Linkage Adjustment	See Section 6 in this manual.
Incorrect Pressure Regulator Adjustment	See Section 6 in this manual.
Malfunctioning Pressure Regulator	Replace regulator.
Malfunctioning Inlet Unloader/Butterfly Valve	Inspect valve. Make adjustment per Section 6.
Malfunctioning Air Cylinder	Replace air cylinder.
Defective Minimum Pressure Valve	Repair or replace valve.
Defective Separator Element	Install new element per Page 21.
Wrong Air Filter Element	Install correct element.

14. Short Air Cleaner Life:

	Corrective Action
Dirty Operating Conditions	Move unit to cleaner environment.
Inadequate Element Cleaning	Install new element.
Incorrect Stopping Procedure	Read Page 13 in this manual.
Wrong Air Filter Element	Install proper element.
Oil Pump Drive Coupling	Inspect coupling. If necessary, replace coupling.

15. Excessive Oil In Air:

High Oil Level	Read Page 15 in this manual.
Out of Level > 15 degrees	Relocate or reposition unit.
Clogged Scavenge Orifice	Remove scavenge orifice. Clean and Replace.
Scavenge Tube Blocked	Remove scavenge tube. Clean and Replace.
Defective Scavenge Check Valve	Remove check valve. Replace with new valve.
Sep. Tank Blow Down Too Quickly	Allow unit to blow down automatically.
Defective Minimum Pressure Valve	Remove valve. Repair valve and replace.

16. Oil Seal Leak:

Contaminated Lube Oil	Drain and flush system. Add new CLEAN oil per Page 24.
Blocked or Restricted Oil Line(s)	Remove, clean and replace line(s).
Malfunctioning Seal	Refer to Airened Rebuild Manual.
Scored Shaft	See instructions in new seal kit.

17. Will Not Unload:

Leak in Regulator Piping	Find and repair leak(s).
Incorrect Pressure Regulator Adjustment	Refer to Section 6 in this manual.
Malfunctioning Pressure Regulator	Replace regulator.
Malfunctioning Inlet Butterfly Valve	Inspect valve fit. Readjust per Section 6.
Ice in Regulation Lines/Orifice	Apply heat to line(s) and or orifice.

18. Oil In Air Cleaner:

Incorrect Stopping Procedure	Read Page 15 in this manual.
Oil Pump Drive Coupling	Inspect coupling. Replace if necessary.
Discharge Check Valve Faulty	Replace.

19. Safety Valve Relieves:

Operating Pressure Too High	Reduce pressure to spec limit.
Leak In Regulator Piping	Repair leak(s).
Incorrect Pressure Regulator Adjustment	Refer to Section 6 in this manual.
Malfunctioning Pressure Regulator	Replace regulator.
Malfunctioning Inlet Unloader/Butterfly Valve	Inspect valve fit. Readjust per Section 6.
Defective Safety Valve	Replace safety valve.
Defective Separator Element	Remove element. Install new.
Ice in Regulation Lines/Orifice	Apply heat to lines and/or orifice.

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.

NOTICE

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

Ingersoll-Rand Company service facilities and parts are available worldwide. 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

NOTICE

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 Section. 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.

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 AND 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.

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.

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.

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, are 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.

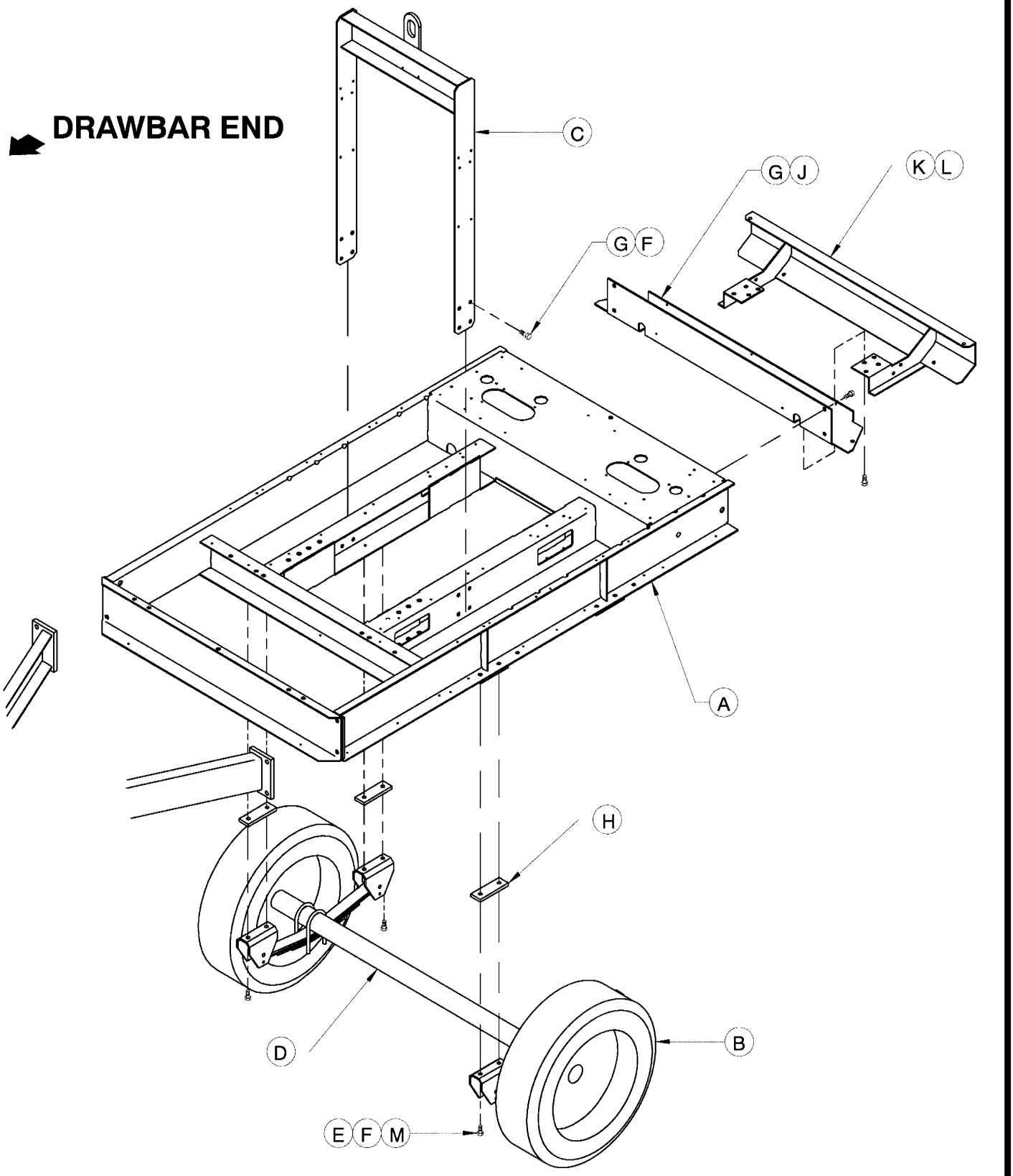
Category "C": The airend must be over five years old.

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 cancelled. The warranty on an exchange or factory rebuilt airend is 365 days.

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

CONTENTS

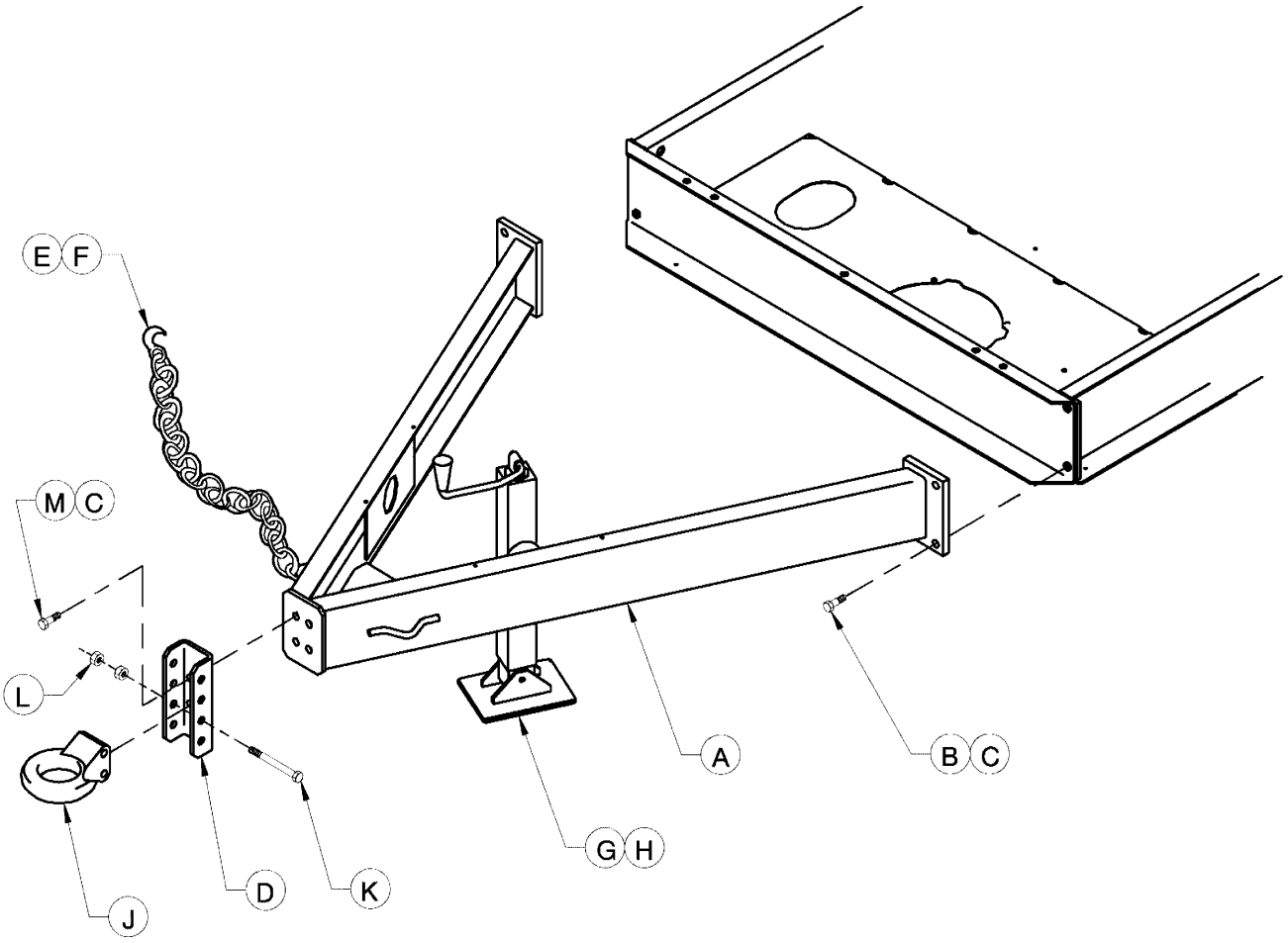


INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
11/27/95 bd	FRAME & RUNNING GEAR	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-02	7/00 C

ITEM	C.P.N.	QTY	DESCRIPTION	
A	36876670	1	FRAME	
B	36026268	2	TIRE ASSEMBLY	
C	36877942	1	LIFTING BAIL	
D	36877173	1	AXLE ASSEMBLY	
E	96730395	8	SCREW, HEX HD M12 X 50	
F	36879203	8	NUT, HEX NYLOC M12	
G	36879492	12	SCREW,FLG HD M12 X 25	
H	36880599	4	SPACER, RUNNING GEAR	
J	36885937	1	EXTENSION, FRAME (P250)	**{PRIOR TO S/N 296791}**
	36921153	1	EXTENSION, FRAME (HP300 - P375)	**{BEGIN WITH S/N 296791}**
K	36776649	1	BUMPER	
L	35148030	6	SCREW, TAPPING 1/2-13 X 1	
M	95935003	16	WASHER, FLAT	

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
11/27/95 bd	FRAME & RUNNING GEAR	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-03	7/00 E

DRAWBAR END

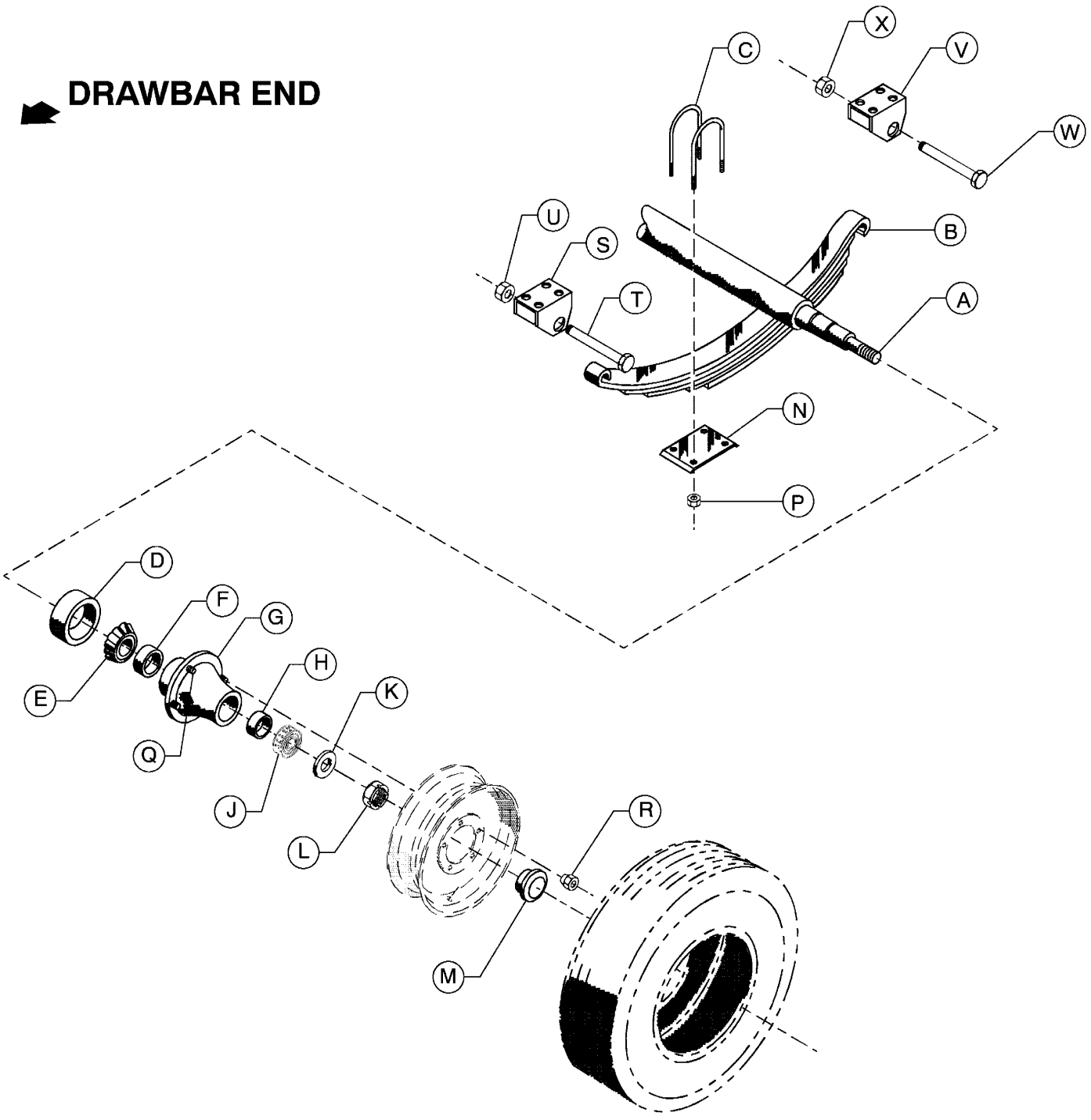


INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 11/27/95 bd	DESCRIPTION DRAWBAR COMPLETE	
MODEL NO. P250WCU/JD P375WCU/JD	MANUAL NO. 35390095-04	DATE/REV: 4/96 B

ITEM	C.P.N.	QTY	DESCRIPTION	
A	36876621	1	DRAWBAR	
B	36879302	4	SCREW, FLG HD M16 X 50	
C	36879211	8	NUT, HEX FLG M16	
D	36757284	1	CHANNEL, 3POS MTG	
E	35610377	2	CHAIN, SAFETY	
F	35372432	2	LINK, COUPLING	
G	36752228	1	JACK ASSEMBLY	**{PRIOR TO S/N 309681}**
	54443577	1	JACK ASSEMBLY	**{BEGIN WITH S/N 309681}**
H	35609544	1	PIN, QUICK RELEASE	
J	35605187	1	PINTLE EYE	
K	35376094	2	SCREW, HEX M16 X 200	
L	96700885	4	NUT, HEX M16	
M	39179072	4	SCREW, HEX M16 X 50	

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
11/27/95 bd	DRAWBAR COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-05	4/00 C

DRAWBAR END



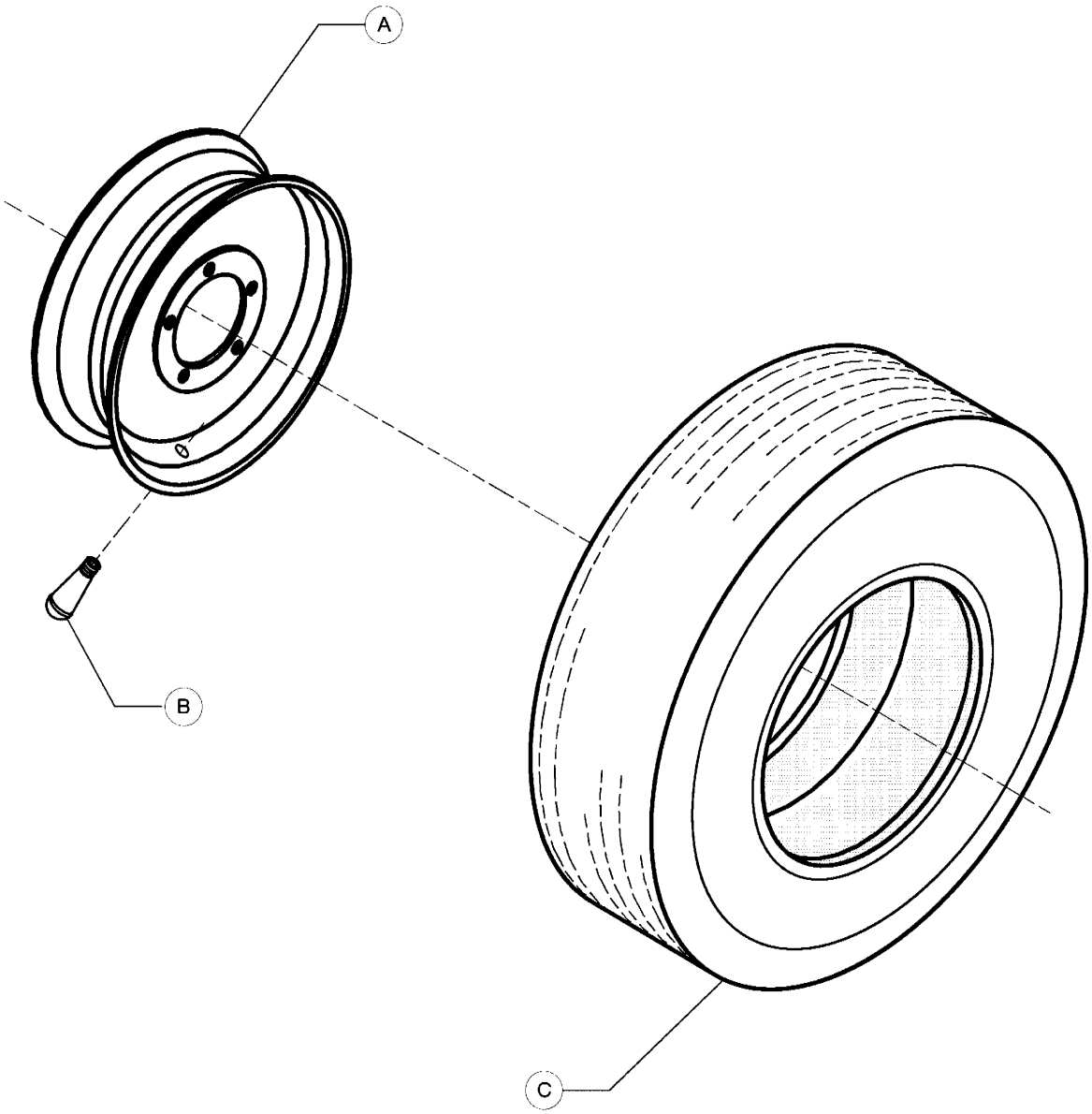
RUNNING GEAR COMPLETE
PART NO. 36877173
DEXTER 6-LUG

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/11/95 bd	RUNNING GEAR COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-06	2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	35390004	1	AXLE
B	35315126	2	SPRING
C	35360734	4	U-BOLT
D	35316868	2	GREASE SEAL
E	35316876	2	BEARING CONE
F	35316884	2	BEARING CUP
G	35318823	2	HUB with CUPS & STUDS
H	35318831	2	BEARING CUP
J	35318849	2	BEARING CONE
K	35315209	2	SPINDLE WASHER
L	35315217	2	SPINDLE NUT
M	35379395	2	GREASE CAP
N	35315241	2	TIE PLATE
P	35315258	8	NUT
Q	35361898	12	WHEEL STUD
R	35315274	12	WHEEL NUT
S	35326958	2	FRONT HANGER
T	35315340	2	SHACKLE BOLT
U	35315357	2	SHACKLE NUT
V	35326966	2	REAR HANGER
W	35315365	2	KEEPER BOLT
X	35315373	2	KEEPER NUT

RUNNING GEAR COMPLETE
PART NO. 36877173
DEXTER 6-LUG

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/11/95 bd	RUNNING GEAR COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-07	2/96 A



TIRE AND WHEEL ASSEMBLY 36026268

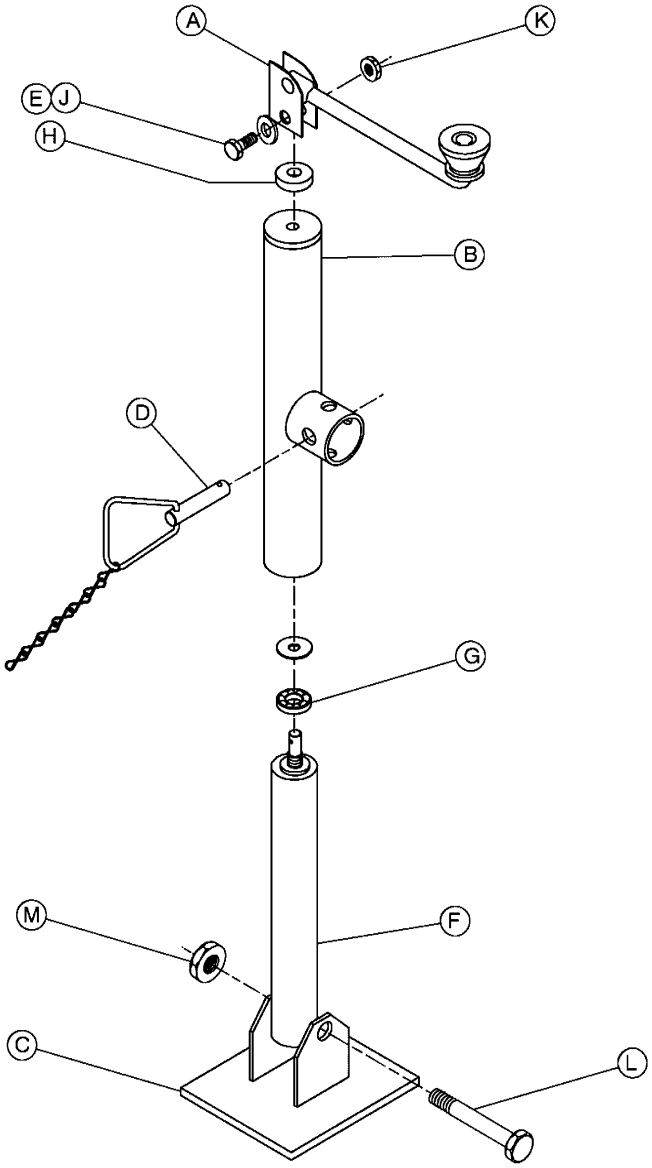
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/23/95 bd	DESCRIPTION TIRE AND WHEEL ASSY.	
MODEL NO. P250WCU/JD P375WCU/JD	MANUAL NO. 35390095-08	DATE/REV: 2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	35318757	1	WHEEL
B	35382565	1	VALVE STEM
C	36846319	1	TIRE

TIRE AND WHEEL ASSEMBLY 36026268

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/23/95 bd	TIRE AND WHEEL ASSY.	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-09	2/96 A

{PRIOR TO S/N 309681}



JACK ASSEMBLY 36752228

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 7/29/93 bd	DESCRIPTION JACK ASSEMBLY	
MODEL NO. P250WCU/JD P375WCU/JD	MANUAL NO. 35390095-10	DATE/REV: 2/96 B

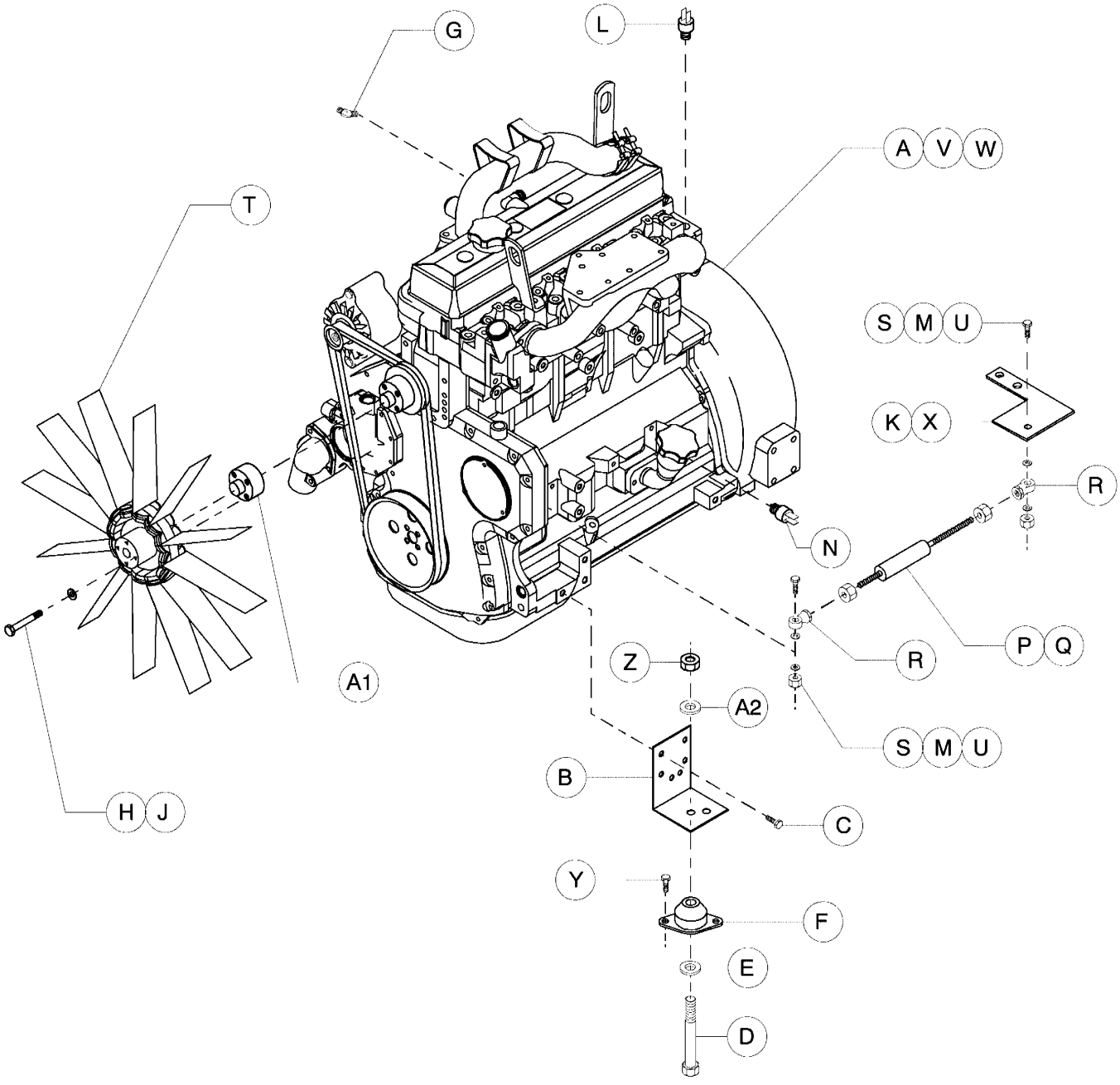
ITEM	C.P.N.	QTY	DESCRIPTION
A	36856383	1	CRANK ASSEMBLY
B	36856409	1	OUTER TUBE ASSEMBLY
C	36856359	1	BASE
D	35609544	1	PIN AND CHAIN ASSEMBLY
E	36856375	1	FLAT WASHER
F	36856391	1	INNER TUBE ASSEMBLY
G	36856367	1	BEARING
H	95935003	1	WASHER
J	95934857	1	SCREW
K	95923298	1	NUT
L	95844213	1	SCREW
M	35324409	1	NUT

{PRIOR TO S/N 309681}

JACK ASSEMBLY 36752228

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
7/29/93 bd	JACK ASSEMBLY	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-11	2/96 B

DRAWBAR END



FOR P250 UNITS ONLY

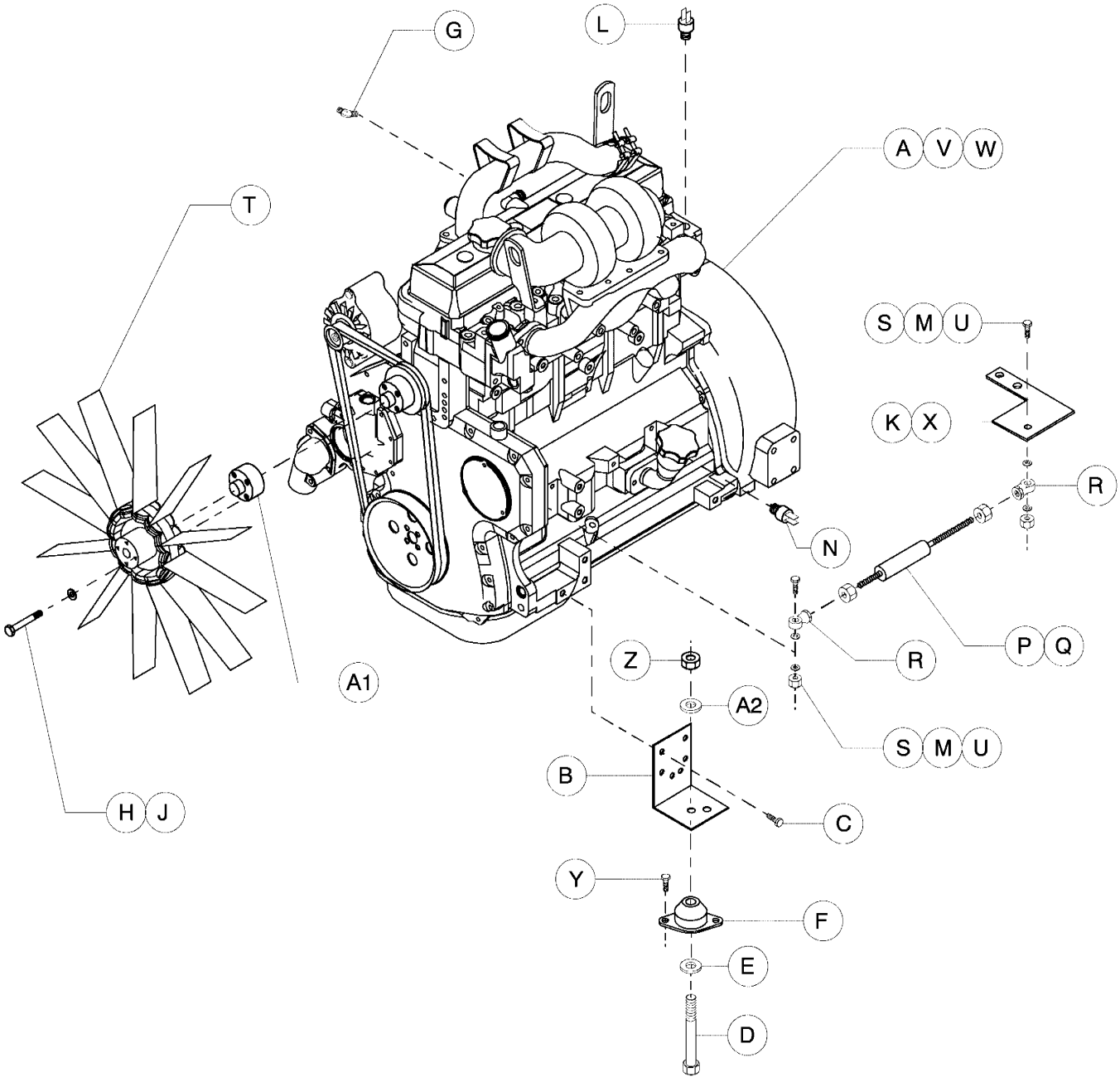
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 2/28/96 bd	DESCRIPTION ENGINE COMPLETE	
MODEL NO. P-250WJD	MANUAL NO. 35390095-12	DATE/REV: 4/00 C

ITEM	C.P.N.	QTY	DESCRIPTION	
A	36876571	1	ENGINE	**{PRIOR TO S/N 297221}**
	36899995	1	ENGINE	**{BEGIN WITH S/N 297221}**
B	36876308	2	MOUNT, ENGINE	**{PRIOR TO S/N 308296}**
	54444989	2	MOUNT, ENGINE	**{BEGIN WITH S/N 308296}**
C	96701495	8	SCREW, HEX M12-175 X 25	
D	36766343	2	SCREW, HEX M10-150 X 60	**{PRIOR TO S/N 308296}**
	96739958	2	SCREW, HEX M12-1.75 X 70	**{BEGIN WITH S/N 308296}**
E	36766319	2	WASHER, SNUBBER	**{PRIOR TO S/N 308296}**
	54429295	2	WASHER, SNUBBER	**{BEGIN WITH S/N 308296}**
F	36876274	2	ISOLATOR, ENGINE	**{PRIOR TO S/N 308296}**
	54429303	2	ISOLATOR, ENGINE	**{BEGIN WITH S/N 308296}**
G	36895977	1	ADAPTER, FUEL LINE	
H	96726435	4	SCREW, M08-125 X 100	
J	96701396	4	WASHER, FLAT M08	
K	36877223	1	SUPPORT, AIR CYLINDER	
L	36880706	1	SWITCH, WATER TEMPERATURE	
M	96705199	2	WASHER, FLAT M06	
N	36878379	1	SWITCH, OIL PRESSURE	
P	35592435	1	CYLINDER	
Q	95923074	2	JAM NUT	
R	35328467	2	RODEND	
S	96701461	2	SCREW, HEX M06-100 X 25	
T	36878171	1	FAN	
U	36769032	1	NUT,HEX LOCK M06-100	
V	35389527	1	FUEL ELEMENT WITH WATER SEPARATOR	**{PRIOR TO S/N 297221}**
	36534659	1	FUEL ELEMENT	**{BEGIN WITH S/N 297221}**
W	36881696	1	OIL FILTER ELEMENT	
X	96701479	2	SCREW, HEX M10-150 X 16	
Y	35279025	4	SCREW, TAPPING M8-125 X 20	
Z	35273366	2	NUT, NYLOCK M10	**{PRIOR TO S/N 308296}**
	35304047	2	NUT, NYLOCK M12-1.75	**{BEGIN WITH S/N 308296}**
A1	36877959	1	SPACER, FAN	
A2	95935037	2	WASHER, FLAT	**{PRIOR TO S/N 308296}**
	54429295	2	WASHER, SNUBBER	**{BEGIN WITH S/N 308296}**

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
2/28/96 bd	ENGINE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WJD	35390095-13	4/00 F

DRAWBAR END



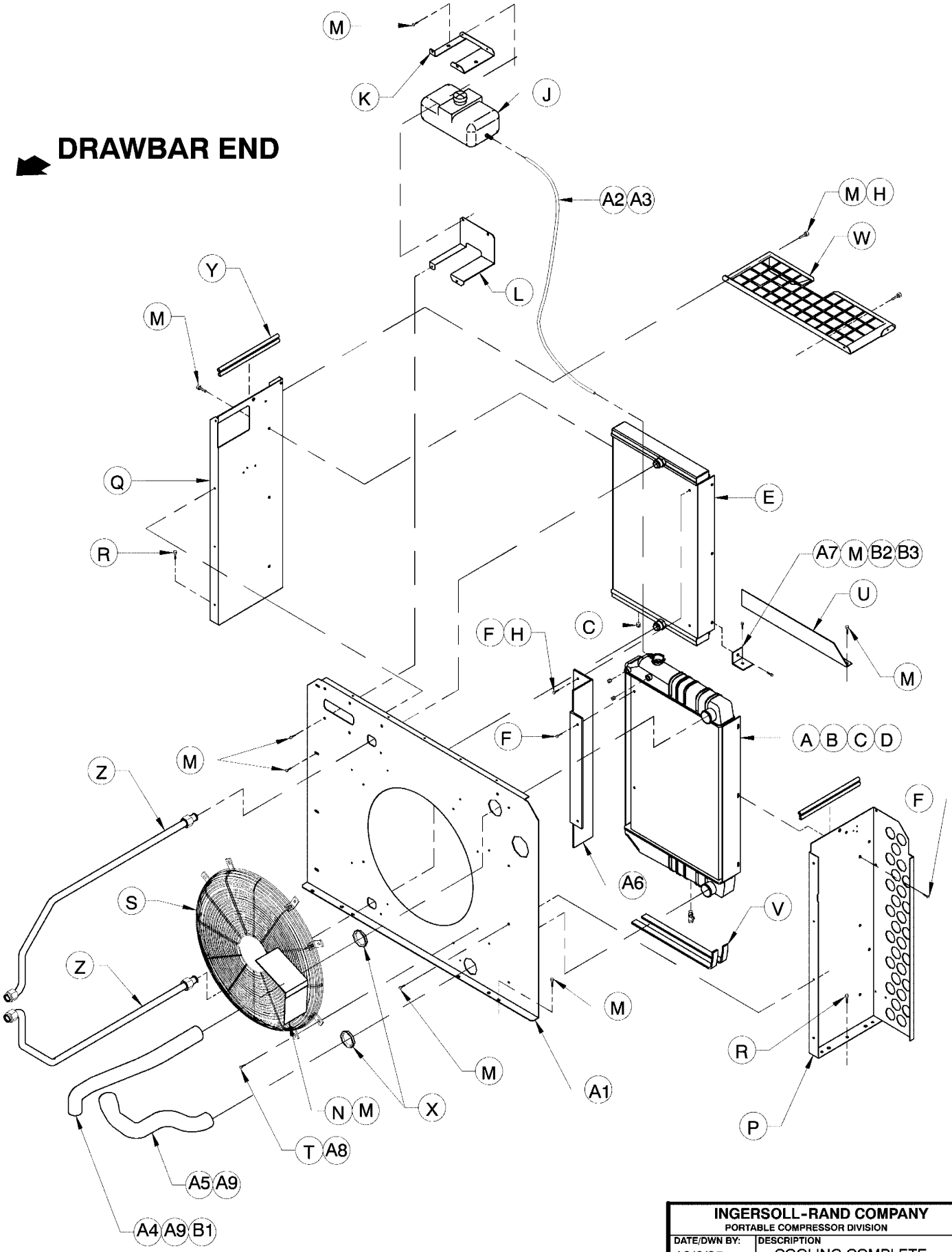
FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 2/28/96 bd	DESCRIPTION ENGINE COMPLETE	
MODEL NO. P-375WJD HP-300WJD	MANUAL NO. 35390095-14	DATE/REV: 4/00 C

ITEM	C.P.N.	QTY	DESCRIPTION	
A	36876589	1	ENGINE	**{PRIOR TO S/N 296037}**
	36899987	1	ENGINE	**{BEGIN WITH S/N 296037}**
B	36876308	2	MOUNT, ENGINE	**{PRIOR TO S/N 308296}**
	54444989	2	MOUNT, ENGINE	**{BEGIN WITH S/N 308296}**
C	96701495	8	SCREW, HEX M12-175 X 25	
D	36766343	2	SCREW, HEX M10-150 X 60	**{PRIOR TO S/N 308296}**
	96739958	2	SCREW, HEX M12-1.75 X 70	**{BEGIN WITH S/N 308296}**
E	36766319	2	WASHER, SNUBBER	**{PRIOR TO S/N 308296}**
	54429295	2	WASHER, SNUBBER	**{BEGIN WITH S/N 308296}**
F	36876274	2	ISOLATOR, ENGINE	**{PRIOR TO S/N 308296}**
	54429303	2	ISOLATOR, ENGINE	**{BEGIN WITH S/N 308296}**
G	36895977	1	ADAPTER, FUEL LINE	
H	96726435	4	SCREW, M08-125 X 100	
J	96701396	4	WASHER, FLAT M08	
K	36877223	1	SUPPORT, AIR CYLINDER	
L	36880706	1	SWITCH, WATER TEMPERATURE	
M	96705199	2	WASHER, FLAT M06	
N	36878379	1	SWITCH, OIL PRESSURE	
P	35592435	1	CYLINDER	
Q	95923074	2	JAM NUT	
R	35328467	2	RODEND	
S	96701461	2	SCREW, HEX M06-100 X 25	
T	36878163	1	FAN	
U	36769032	1	NUT,HEX LOCK M06-100	
V	35389527	1	FUEL ELEMENT WITH WATER SEPARATOR	
W	36881696	1	OIL FILTER ELEMENT	
X	96701479	2	SCREW, HEX M10-150 X 16	
Y	35279025	4	SCREW, TAPPING M8-125 X 20	
Z	35273366	2	NUT, NYLOCK M10	**{PRIOR TO S/N 308296}**
	35304047	2	NUT, NYLOCK M12-1.75	**{BEGIN WITH S/N 308296}**
A1	36877959	1	SPACER, FAN	
A2	95935037	2	WASHER, FLAT	**{PRIOR TO S/N 308296}**
	54429295	2	WASHER, SNUBBER	**{BEGIN WITH S/N 308296}**

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 2/28/96 bd	DESCRIPTION ENGINE COMPLETE	
MODEL NO. P-375WJD HP-300WJD	MANUAL NO. 35390095-15	DATE/REV: 4/00 F

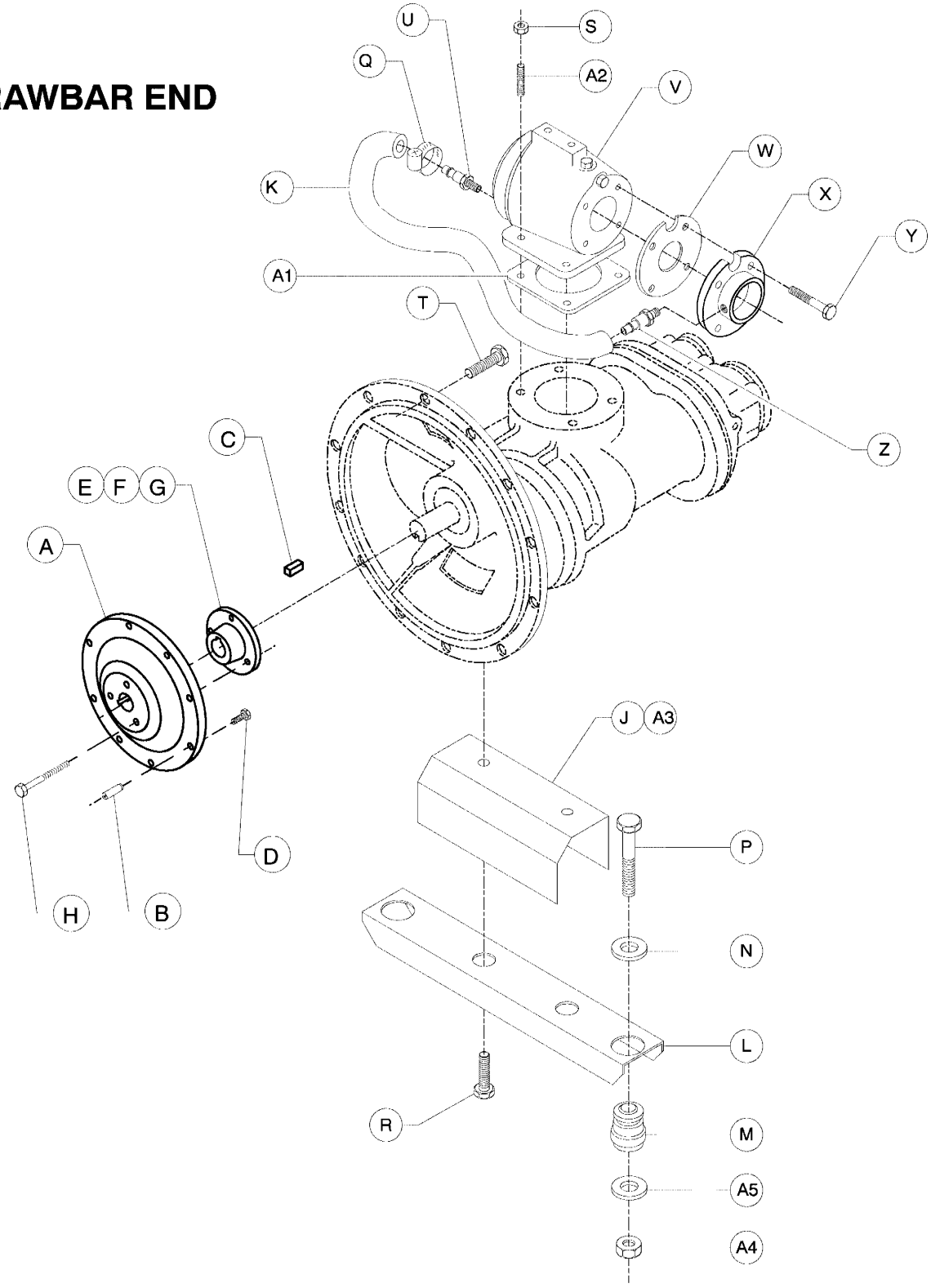


INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/6/95 bd	DESCRIPTION COOLING COMPLETE	
MODEL NO. P250WCU/JD P375WCU/JD	MANUAL NO. 35390095-16	DATE/REV: 3/97 B

ITEM	C.P.N.	QTY	DESCRIPTION
A	36876233	1	RADIATOR [P250 ONLY]
	36887651	1	RADIATOR [P300 & P375 ONLY]
B	36769560	1	CAP, RADIATOR
C	95928230	3	PLUG
D	30641278	1	COCK, DRAIN 1/4NPT
E	36876241	1	COOLER, OIL [P250 ONLY]
	36887669	1	COOLER, OIL [P300 & P375 ONLY]
F	96702055	10	SCREW, HEX M8-125 X 20
G	96700869	3	NUT, HEX M8
H	95934998	5	WASHER, FLAT 3/8"
J	36782043	1	BOTTLE, OVERFLOW
K	36877009	1	SUPPORT, TOP BOTTLE
L	36877157	1	SUPPORT, BOTTOM BOTTLE
M	36797652	27	SCREW, TAPPING M6-100 X 12
N	36881126	1	GUARD, BELT
P	36877215	1	SUPPORT, RADIATOR SIDE
Q	36876977	1	SUPPORT, OIL COOLER SIDE
R	35279025	6	SCREW, TAPPING M8-125 X 20
S	36878262	1	GUARD, FAN
T	35300771	8	SCREW, TAPPING M6-100 X 20
U	36878205	1	PLATE, BAFFLE [P250 ONLY]
V	35140409	42.5 in.	FOAM (2 PCS @ 21.25") [P250 ONLY]
	35140409	143 in.	FOAM (4 PCS @ 35.75") [P300 & P375 ONLY]
W	36879179	1	GUARD, COOLER
X	36878221	2	GROMMET, RADIATOR HOSE
Y	36879765	2	STRIP, SEAL
Z	36877652	2	TUBE, OIL [P250 ONLY]
	36887917	2	TUBE, OIL [P300 & P375 ONLY]
A1	36876985	1	PLATE, FAN ORIFICE P250
	36876993	1	PLATE, FAN ORIFICE P300/P375
A2	35360775	17 in.	HOSE, OVERFLOW
A3	35296342	2	CLAMP
A4	36877884	1	HOSE, TOP RADIATOR (WCU ONLY)
	36877892	1	HOSE, TOP RADIATOR (WJD ONLY)
A5	36877900	1	HOSE, BOTTOM RADIATOR (WCU ONLY)
	36877918	1	HOSE, BOTTOM RADIATOR (WJD ONLY)
A6	36888261	1	BRACKET, RAD TO O/C [P300 & P375 ONLY]
A7	36888105	2	BRACKET, RESTRAINING [P300 & P375 ONLY]
A8	95935029	8	WASHER, FLAT
A9	35221639	4	CLAMP
B1	35222017	1	CLAMP [P300 & P375 WCU ONLY]
B2	35144336	1	SCREW, LOCKING 5/16-18 X 3/4 [P300 & P375 ONLY]
B3	35252600	1	NUT, LOCK 5/16-18 [P300 & P375 ONLY]

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/6/95 bd	DESCRIPTION: COOLING COMPLETE	
MODEL NO.: P250WCU/JD P375WCU/JD	MANUAL NO.: 35390095-17	DATE/REV.: 3/97 C

DRAWBAR END



FOR P250 UNITS ONLY

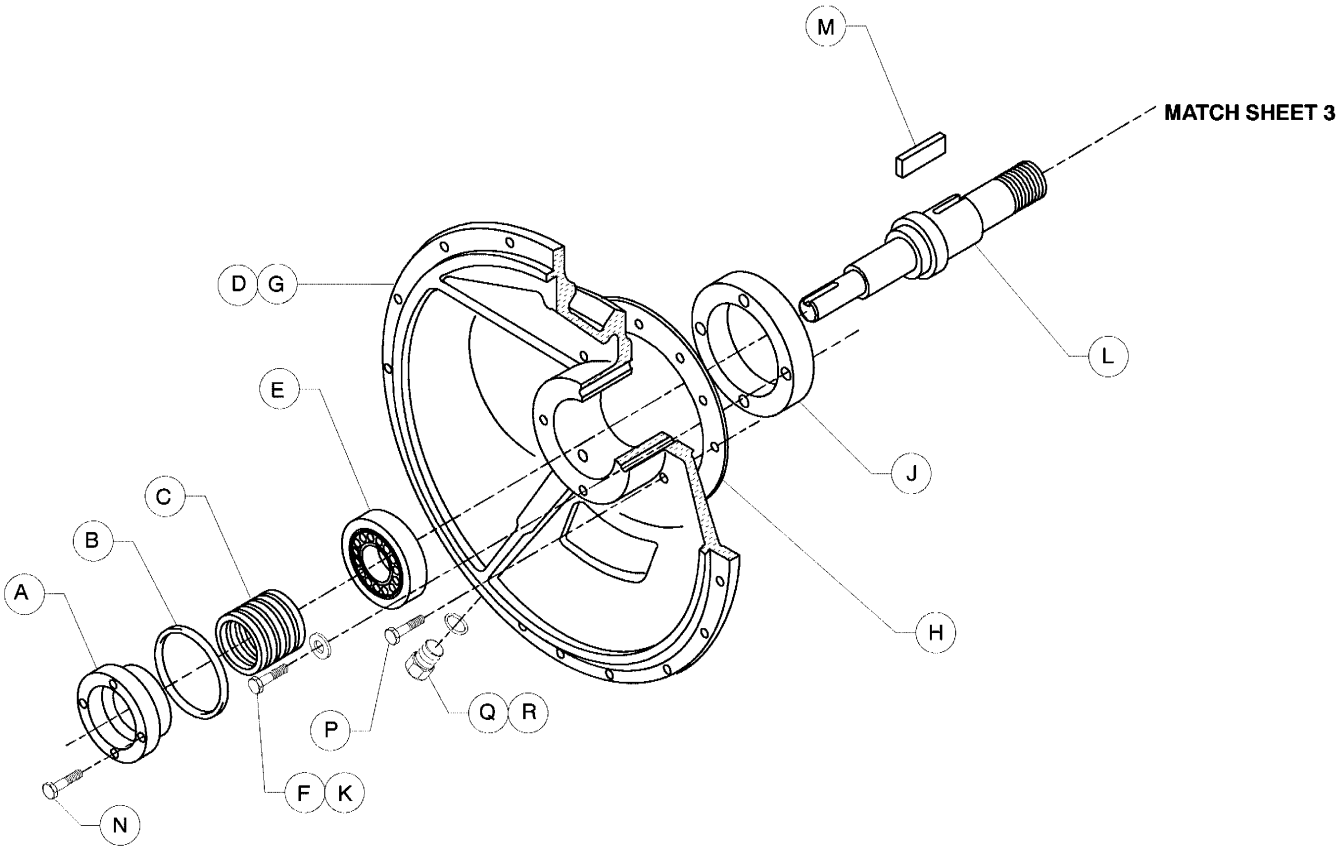
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/11/95 bd	DESCRIPTION AIR END COMPLETE	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-18	DATE/REV: 2/97 B

ITEM	C.P.N.	QTY	DESCRIPTION
A	36774321	1	COUPLING
B	35329887	8	COUPLING, DRIVE
C	35321421	1	KEY
D	95055307	8	SCREW, CAP 3/8-16 X 2
E	36863389	1	BUSHING
F	95065660	3	SCREW, SET 1/4-20 X 1/2
G	95065538	1	SCREW, SET 5/16-18 X 1/2
H	95934840	3	SCREW,HEX 5/16-18 X 2 3/4
J	35279025	6	SCREW, TAPPING M08-125 X 20
K	35282292	14"	TUBING
L	36877199	1	A/E SUPPORT BRACKET
M	35318229	2	MOUNT
N	35327212	2	WASHER
P	96701503	2	SCREW, HEX M16-200 X 90
Q	35377621	2	CLAMP
R	35375591	2	SCREW, HEX M16-200 X 30
S	96700885	4	NUT, HEX M16
T	35374842	12	SCREW, HEX M10-150 X 25 (WCU ONLY)
	95920682	12	SCREW, HEX 3/8-16 X 1 1/4 (WJD ONLY)
U	35323542	1	FITTING
V	35060631	1	UNLOADER ASSEMBLY
W	35588318	1	GASKET
X	35588532	1	INLET FLANGE
Y	96702048	4	SCREW, HEX M08-125 X 16
Z	35316587	1	FITTING
A1	35589589	1	GASKET
A2	35323450	4	STUD
A3	36877249	1	SUPPORT, AIR END
A4	96704630	2	NUT, NYLOCK M16
A5	95935052	2	WASHER, FLAT

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/11/95 bd	DESCRIPTION AIR END COMPLETE	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-19	DATE/REV: 2/97 B

DRAWBAR END



127.5 mm AIREND ASSEMBLY 36006005
FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/24/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-20	DATE/REV: 2/96 D

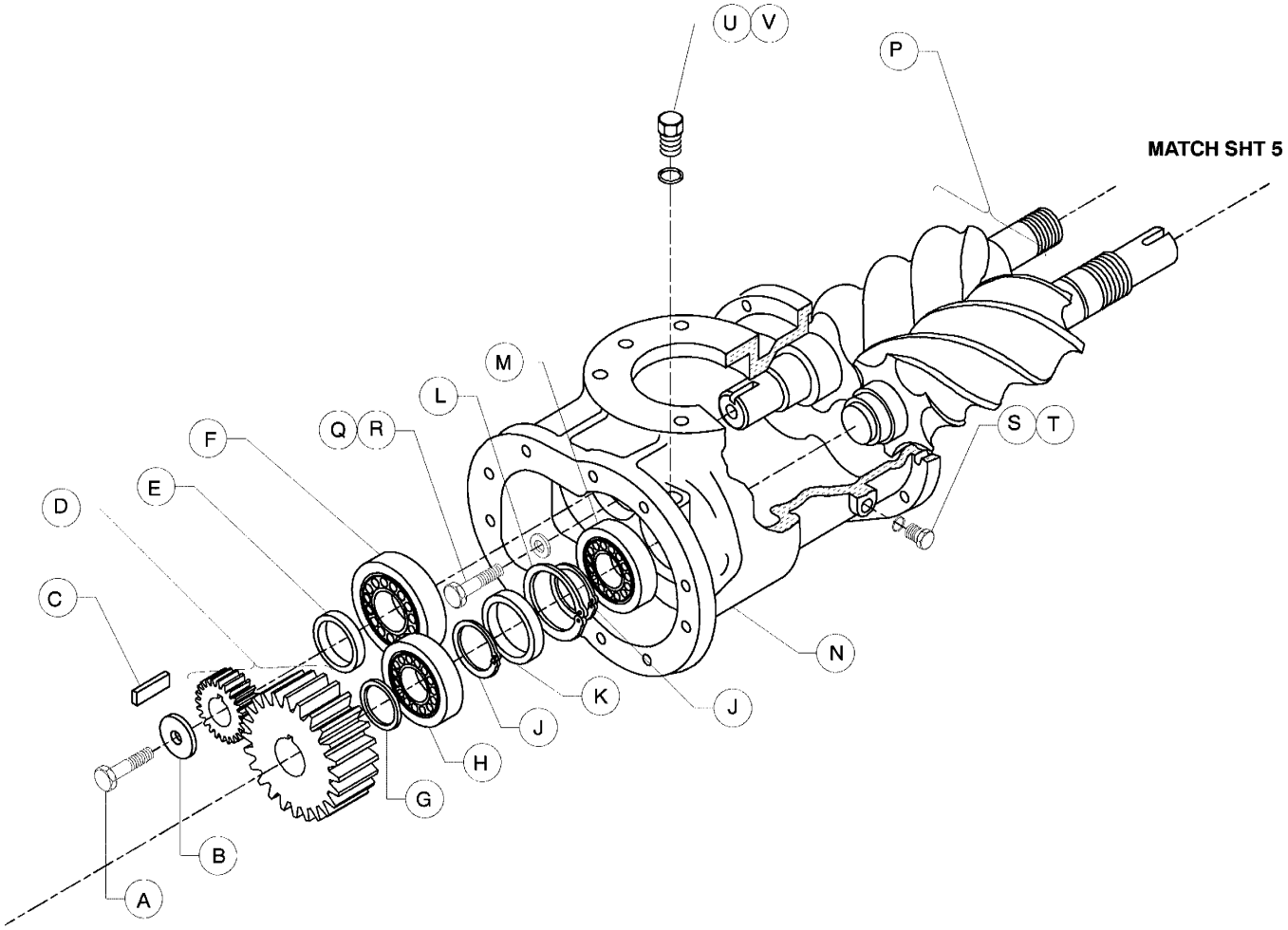
ITEM	C.P.N.	QTY	DESCRIPTION
A	35328475	1	COVER, SHAFT SEAL
B	20A11C2M234	1	O-RING
C	35593490	1	OIL SEAL
D	36798346	2	GUARD
E	35327543	1	BEARING, BALL
F	35317148	4	SCREW
G	36736148	1	CASE, GEAR
H	35849066	1	GASKET, GEAR CASE
J	35599596	1	PLATE, RETAINING
K	X1026T45	4	WASHER
L	35853001	1	SHAFT, DRIVE
M	35317361	1	KEY, DRIVE GEAR
N	34M2AB412	4	SCREW
P	35272533	10	SCREW
Q	35289057	1	PLUG
R	35279959	1	O-RING

127.5 mm AIREND ASSEMBLY 36006005
FOR P250 UNITS ONLY

*** EXCHANGE AIREND OPTION:** INGERSOLL-RAND OFFERS FACTORY REMANUFACTURED AIRENDS THAT ARE BUILT TO THE LATEST DESIGNS. MEANING IT WILL REFLECT ALL THE ENGINEERING UPGRADES AND PERFORMANCE ENHANCEMENTS MADE TO THAT SIZE UNIT. ALL EXCHANGE AIRENDS COME WITH A ONE YEAR WARRANTY. THESE BENEFITS MAKE A FACTORY REBUILT AIREND THE ONLY COST EFFECTIVE OPTION. CALL YOUR LOCAL IR DEALER FOR MORE DETAILS. PLEASE PROVIDE YOUR AIREND SERIAL NUMBER.

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/24/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-21	DATE/REV: 2/96 C

DRAWBAR END



MATCH SHEET 1

127.5 mm AIREND ASSEMBLY 36006005
FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/24/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-22	DATE/REV: 2/96 D

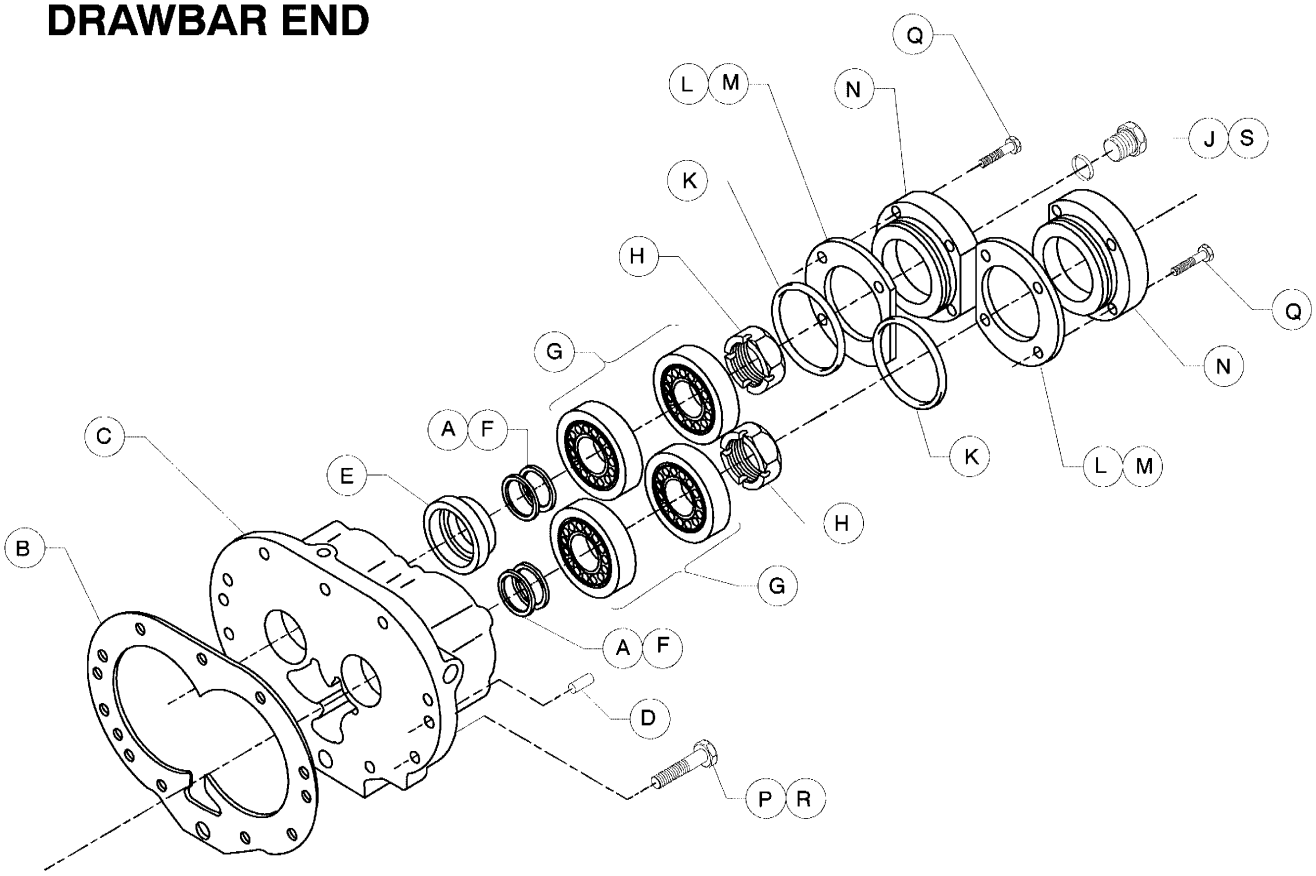
ITEM	C.P.N.	QTY	DESCRIPTION
A	34M2AB411	1	SCREW
B	35317155	1	PLATE, CLAMP
C	35317379	1	KEY, DRIVEN GEAR
D	35317387	1	SET, GEAR
E	35316801	1	SPACER
F	35317395	1	BEARING, ROLLER
G	35287614	1	SPACER
H	35289180	1	BEARING, ROLLER
J	164A13S156	2	RING, RETAINING
K	35316819	1	RING, SPACER
L	161A13S315	1	RING, RETAINING
M	35313527	1	BEARING, ROLLER
N	36785111	1	HOUSING, ROTOR
P	36005999	1	SET, ROTOR
Q	35317106	2	SCREW
R	35317114	2	WASHER
S	35289057	1	PLUG
T	35279959	1	O-RING
U	39101449	2	PLUG
V	35278589	1	O-RING

127.5 mm AIREND ASSEMBLY 36006005
FOR P250 UNITS ONLY

*** EXCHANGE AIREND OPTION:** INGERSOLL-RAND OFFERS FACTORY REMANUFACTURED AIRENDS THAT ARE BUILT TO THE LATEST DESIGNS. MEANING IT WILL REFLECT ALL THE ENGINEERING UPGRADES AND PERFORMANCE ENHANCEMENTS MADE TO THAT SIZE UNIT. ALL EXCHANGE AIRENDS COME WITH A ONE YEAR WARRANTY. THESE BENEFITS MAKE A FACTORY REBUILT AIREND THE ONLY COST EFFECTIVE OPTION. CALL YOUR LOCAL IR DEALER FOR MORE DETAILS. PLEASE PROVIDE YOUR AIREND SERIAL NUMBER.

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/24/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-23	DATE/REV: 2/96 C

DRAWBAR END



MATCH SHEET 3

127.5 mm AIREND ASSEMBLY 36006005
FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/24/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-24	DATE/REV: 2/96 D

ITEM	C.P.N.	QTY	DESCRIPTION
A	35323708	6	SHIM (.127)
B	35849058	1	GASKET, REAR BEARING HSG
C	36842458	1	HOUSING, REAR BEARING
D	35323617	2	PIN, DOWEL
E	35588185	1	PISTON, BALANCE
F	35317353	6	SHIM (.05)
G	39124391	4	BEARING, TAPER ROLLER
H	35323112	2	LOCKNUT, BEARING
J	35278555	2	PLUG
K	20A11C2M236	2	O-RING
L	35317643	6	SHIM (.05)
M	35317635	12	SHIM (.127)
N	35588672	2	COVER, BEARING
P	35272533	9	SCREW
Q	34M2AB412	8	SCREW
R	92304450	1	SCREW
S	35278589	2	O-RING

127.5 mm AIREND ASSEMBLY 36006005
FOR P250 UNITS ONLY

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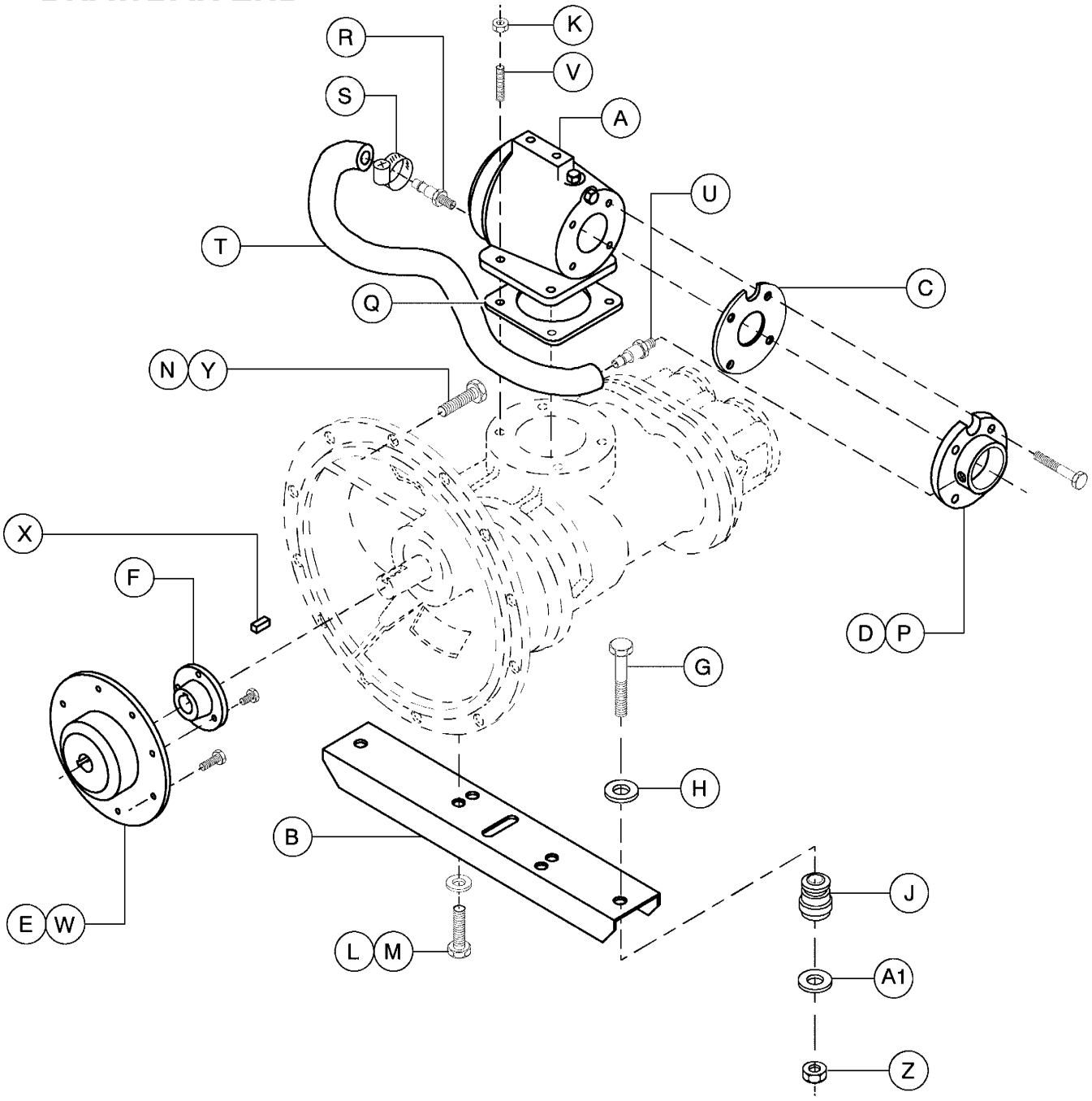
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/24/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-25	DATE/REV: 2/96 C

DRAWBAR END



FOR P375 and HP300 UNITS ONLY

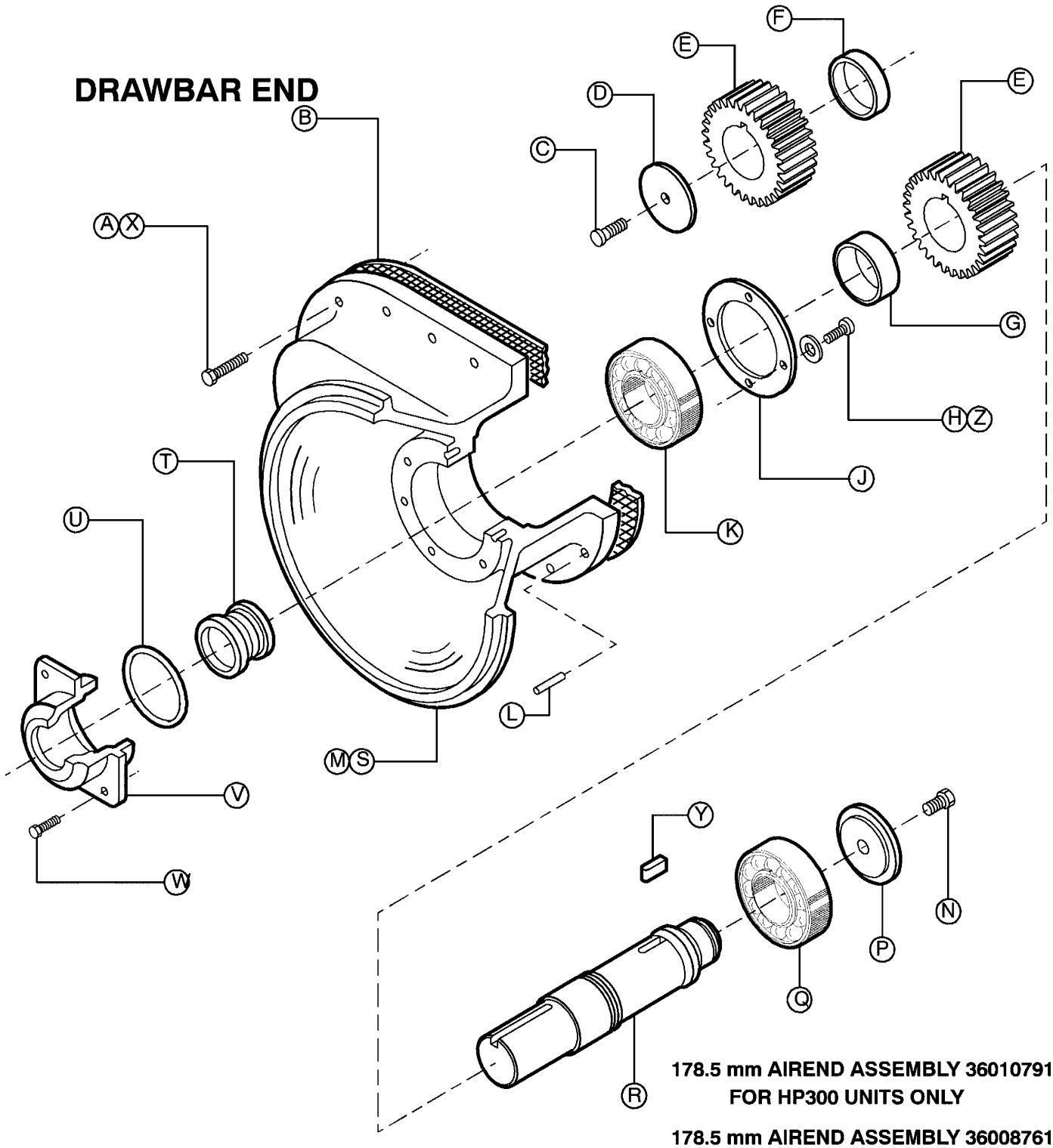
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/11/95 bd	DESCRIPTION AIR END COMPLETE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-26	DATE/REV: 2/97 B

ITEM	C.P.N.	QTY	DESCRIPTION
A	35060631	1	UNLOADER ASSEMBLY
B	36877199	1	AIR END SUPPORT
C	35588318	1	GASKET
D	35843168	1	UNLOADER INLET
E	35834779	1	COUPLING
F	35589621	1	BUSHING
G	96701503	2	SCREW, HEX M16-200 X 90
H	35327212	2	WASHER, SNUBBER
J	35318229	2	MOUNT
K	96700885	4	NUT, HEX M16
L	35375591	2	SCREW, HEX M16-200 X 30
M	95934923	2	WASHER, FLAT
N	35374842	10	SCREW, HEX M10-150 X 25
P	96702048	4	SCREW, HEX M08-125 X 16
Q	35589589	1	GASKET
R	35323542	1	ADAPTER
S	35377621	2	CLAMP
T	35282292	14"	TUBING
U	35316587	1	BARBED FITTING
V	35323450	4	STUD
W	95937330	8	SCREW
X	35321421	1	KEY
Y	35271154	2	SCREW, SOCKET HEAD 3/8-16 X 3/4
Z	96704630	2	NUT, NYLOCK M16
A1	95935052	2	WASHER, FLAT

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/11/95 bd	DESCRIPTION AIR END COMPLETE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-27	DATE/REV: 2/97 B

DRAWBAR END



178.5 mm AIREND ASSEMBLY 36010791
FOR HP300 UNITS ONLY

178.5 mm AIREND ASSEMBLY 36008761
FOR P375 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/3/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-28	DATE/REV: 12/96 D

ITEM	C.P.N.	QTY	DESCRIPTION
A	35375385	8	SCREW
B	39437637	1	GASKET
C	35108372	1	SCREW
D	35255827	1	CLAMP PLATE
E	35327063	1	GEAR SET (P375WCU)
	35277599	1	GEAR SET (HP300WCU)
F	35262716	1	SPACER
G	35327626	1	SPACER BEARING
H	35327550	4	SCREW
J	35326602	1	RETAINING PLATE
K	35327543	1	BEARING
L	17A13A287	2	DOWEL PIN
M	36723641	1	GEAR CASE
N	35336304	1	SCREW
P	36764785	1	GUIDE CAP
Q	35313568	1	BEARING
R	36764827	1	GEAR SHAFT
S	36798346	2	GUARD
T	35593490	1	OIL SEAL
U	20A11C2M234	1	O-RING
V	35328475	1	OIL SEAL COVER
W	35374842	4	SCREW
X	35300623	4	SCREW
Y	35329192	1	KEY
Z	X1026T45	4	WASHER

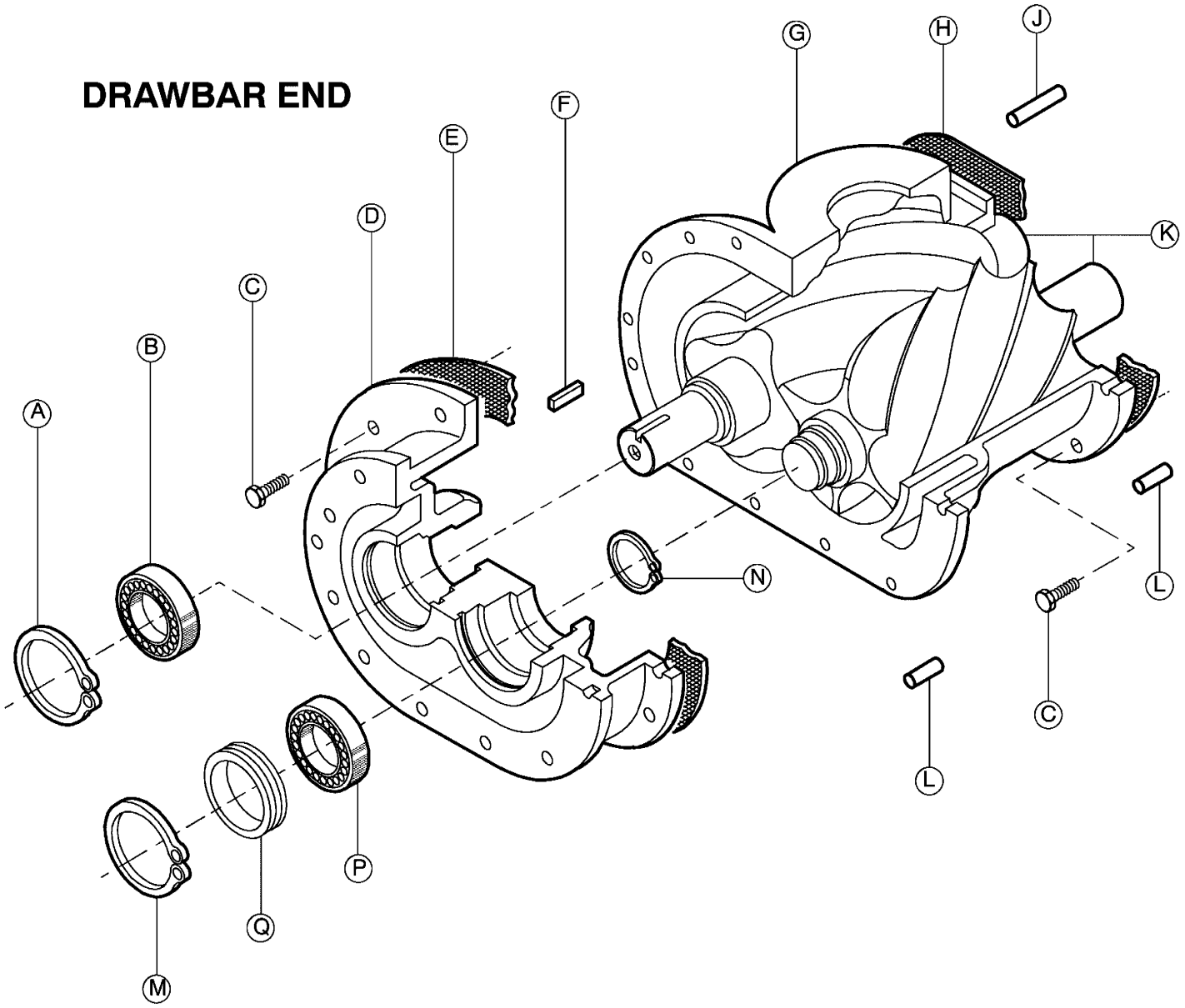
*** 178.5 mm AIREND ASSEMBLY 36010791**
FOR HP300 UNITS ONLY

*** 178.5 mm AIREND ASSEMBLY 36008761**
FOR P375 UNITS ONLY

*** EXCHANGE AIREND OPTION:** INGERSOLL-RAND OFFERS FACTORY REMANUFACTURED AIRENDS THAT ARE BUILT TO THE LATEST DESIGNS. MEANING IT WILL REFLECT ALL THE ENGINEERING UPGRADES AND PERFORMANCE ENHANCEMENTS MADE TO THAT SIZE UNIT. ALL EXCHANGE AIRENDS COME WITH A ONE YEAR WARRANTY. THESE BENEFITS MAKE A FACTORY REBUILT AIREND THE ONLY COST EFFECTIVE OPTION. CALL YOUR LOCAL IR DEALER FOR MORE DETAILS. PLEASE PROVIDE YOUR AIREND SERIAL NUMBER.

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/3/91 bd	DESCRIPTION: AIR END ASSEMBLY	
MODEL NO.: P-375WCU P-375WJD	MANUAL NO.: 35390095-29	DATE/REV: 12/96 E

DRAWBAR END



178.5 mm AIREND ASSEMBLY 36010791
FOR HP300 UNITS ONLY

178.5 mm AIREND ASSEMBLY 36008761
FOR P375 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/3/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-30	DATE/REV: 12/96 D

ITEM	C.P.N.	QTY	DESCRIPTION
A	161A13S475	1	SNAP RING
B	35313535	1	ROLLER BEARING
C	35375385	25	SCREW
D	39703921	1	FRT BEARING HOUSING
E	35518497	1	GASKET
F	12A9C135	1	KEY
G	39748942	1	ROTOR HOUSING
H	39437629	1	GASKET
J	95239927	2	DOWEL PIN
K	35085042	1	ROTOR SET
L	35332915	2	DOWEL PIN
M	95223178	1	SNAP RING
N	164A13S215	1	SNAP RING
P	35609361	1	ROLLER BEARING
Q	35270131	1	BEARING SPACER

178.5 mm AIREND ASSEMBLY 36010791
FOR HP300 UNITS ONLY

178.5 mm AIREND ASSEMBLY 36008761
FOR P375 UNITS ONLY

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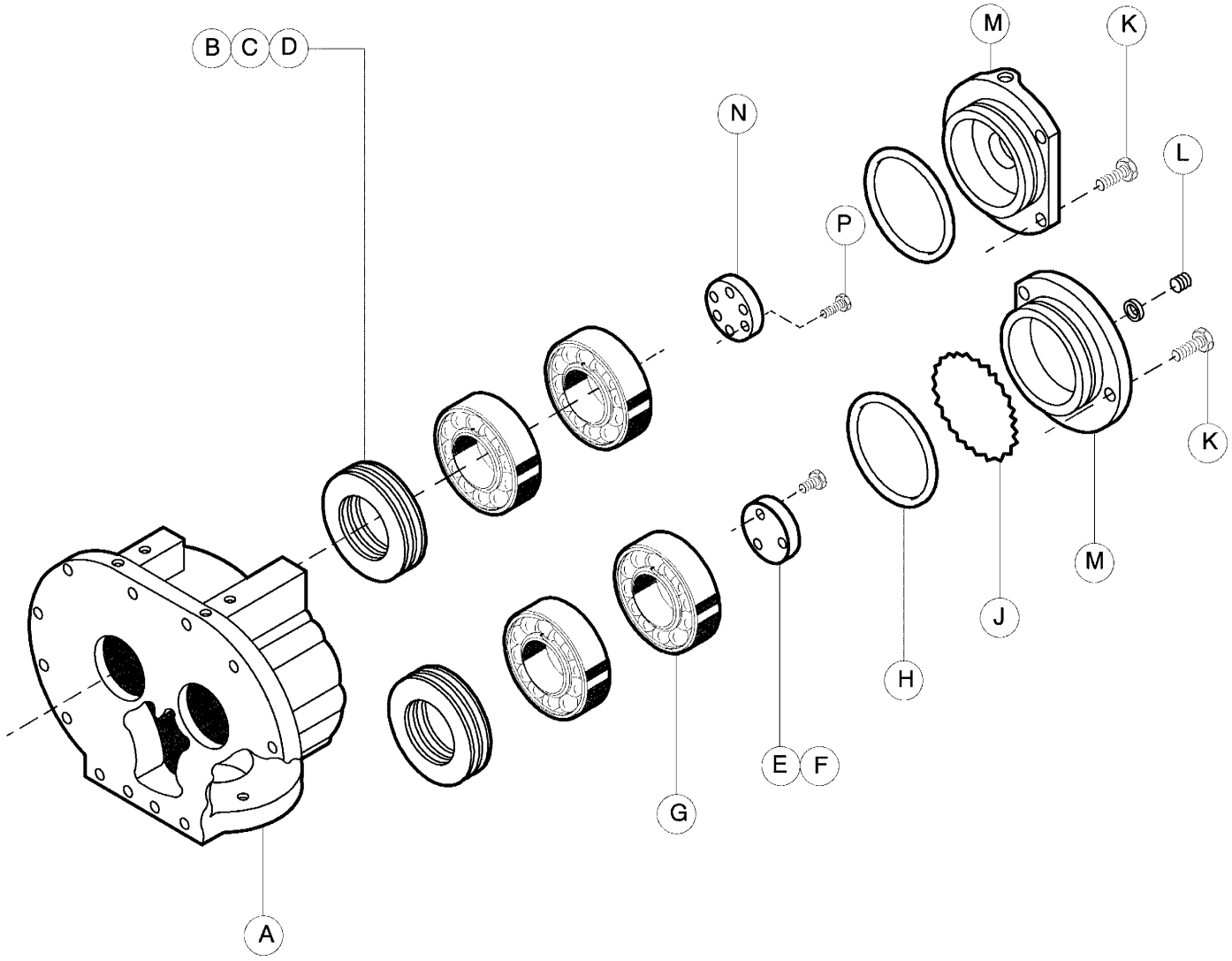
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
12/3/91 bd	AIR END ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-31	DATE/REV: 12/96 D

DRAWBAR END



178.5 mm AIREND ASSEMBLY 36010791
FOR HP300 UNITS ONLY

178.5 mm AIREND ASSEMBLY 36008761
FOR P375 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/3/91 bd	DESCRIPTION AIR END ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-32	DATE/REV: 12/96 D

ITEM	C.P.N.	QTY	DESCRIPTION
A	36769404	1	REAR BEARING HOUSING
B	35313600	4	SHIM, .002
C	35313618	4	SHIM, .003
D	35364769	2	SHIM, .010
E	35262690	1	CLAMP PLATE
F	35104108	3	SCREW
G	39437595	4	BALL BEARING
H	20A11C2M249	2	O-RING
J	35354448	1	SHIM SET
K	36763704	6	SCREW
L	35287556	2	PLUG
M	35600832	2	REAR BEARING COVER
N	39435441	1	CLAMP PLATE
P	119A2A177N	8	SCREW

178.5 mm AIREND ASSEMBLY 36010791
FOR HP300 UNITS ONLY

178.5 mm AIREND ASSEMBLY 36008761
FOR P375 UNITS ONLY

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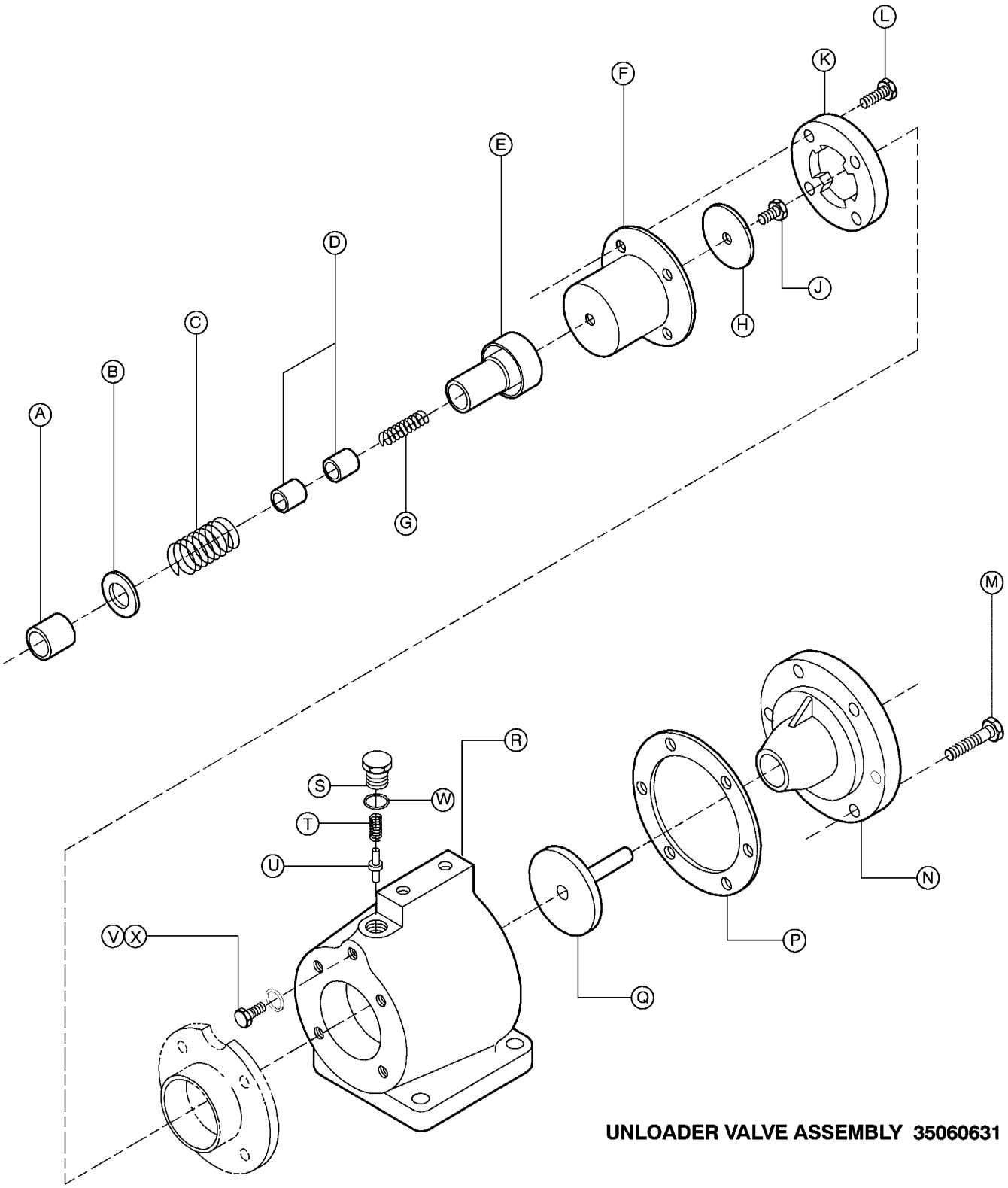
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
12/3/91 bd	AIR END ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-33	DATE/REV: 12/96 D

BEGINNING WITH SERIAL NUMBER 300624



UNLOADER VALVE ASSEMBLY 35060631

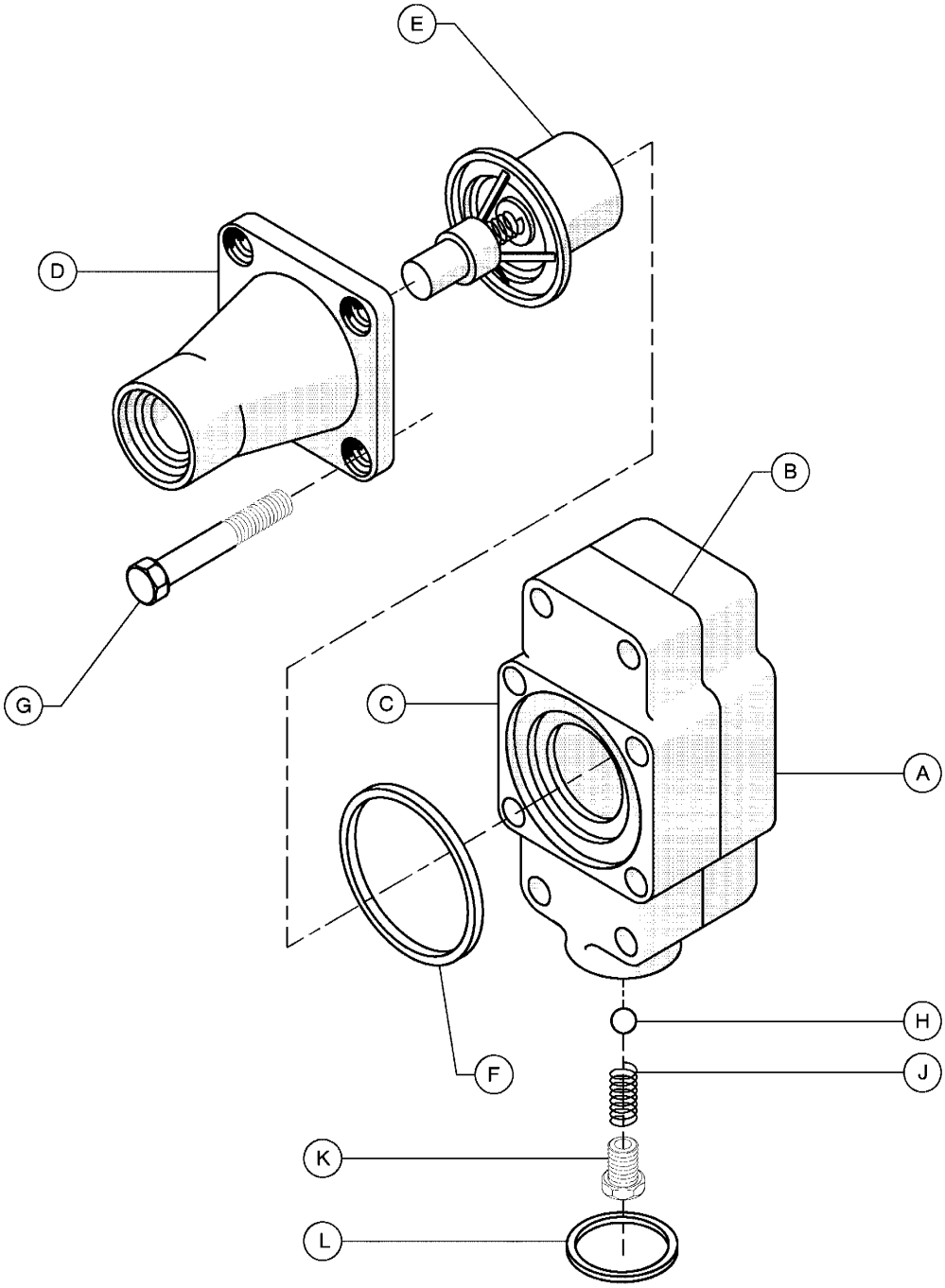
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
9/30/92 bd	UNLOADER ASSEMBLY	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-34	5/99 D

ITEM		C.P.N.	QTY	DESCRIPTION	
A	★	35318013	1	HOUSING BUSHING	
B	★	35317205	1	WASHER	
C	★	35322767	1	PISTON SPRING	
D	★	35318005	2	PISTON BUSHING	
E		35588193	1	PISTON UNLOADER	
F	★	35317197	1	DIAPHRAGM	
G	★	35321603	1	SPRING	
H	★	35317239	1	PISTON WASHER	
J	★	35321595	1	CAP SCREW	
K		35836949	1	PISTON COVER	
L		35271162	4	SCREW	
M		35374842	6	SCREW	**{PRIOR TO S/N 300624}**
		96702287	6	SCREW, HEX M10-1.50 X 25	**{BEGIN WITH S/N 300624}**
N		35833227	1	PISTON HOUSING	
P	★	35588300	1	PISTON GASKET	
Q		35591122	1	VALVE PLATE	
R		36718427	1	UNLOADER BODY	
S	★	35278555	1	PLUG	
T	★	35318914	1	PIN SPRING	
U	★	35317213	1	UNLOADER PIN	
V		35289057	1	PLUG	
W		35278589	1	O-RING	
X		35279959	1	O-RING	

★ ITEMS INCLUDED IN REPAIR KIT 35088798

UNLOADER VALVE ASSEMBLY 35060631

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 9/30/92 bd	DESCRIPTION: UNLOADER ASSEMBLY	
MODEL NO.: P250WCU/JD P375WCU/JD	MANUAL NO.: 35390095-35	DATE/REV: 5/99 D



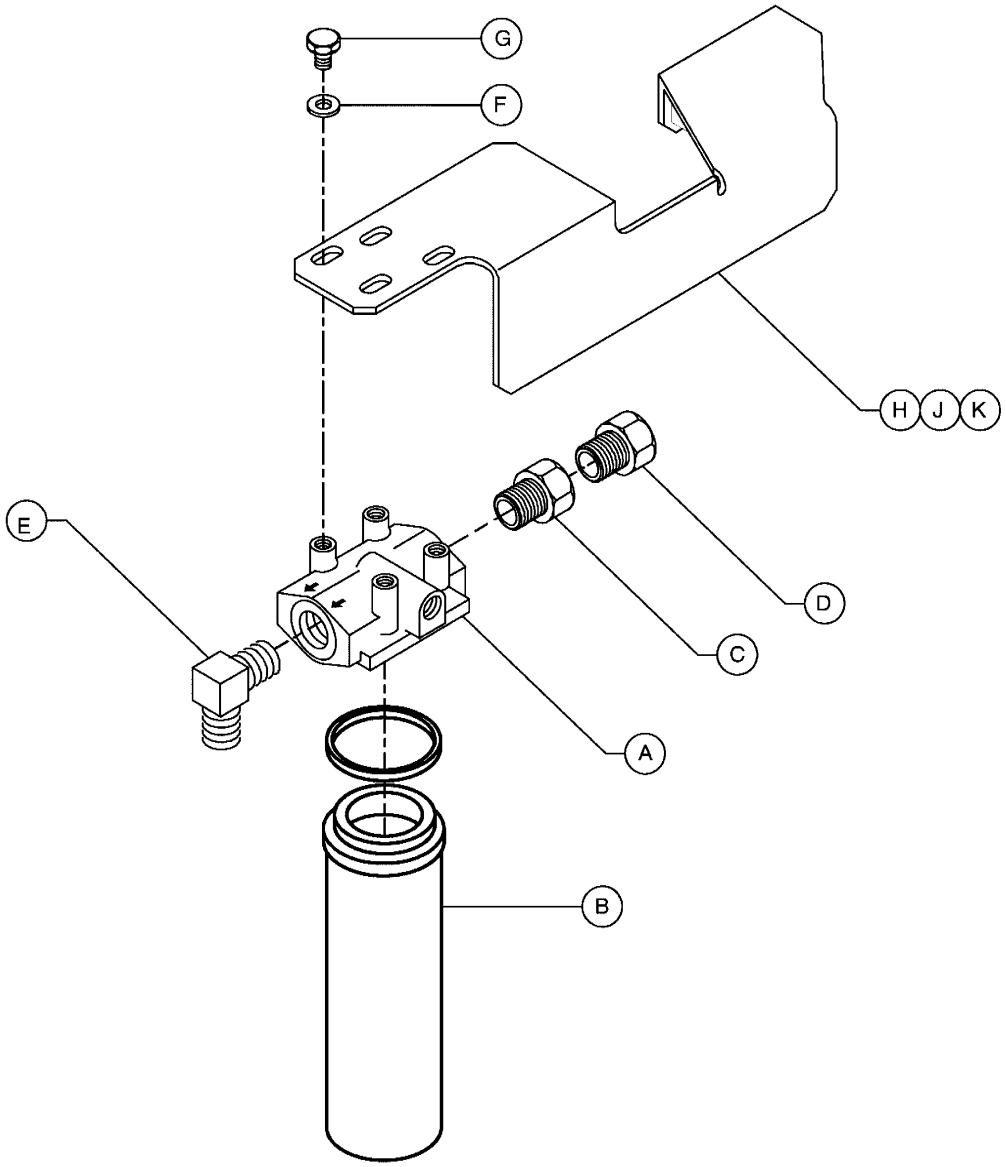
OIL TEMPERATURE BYPASS VALVE
ASSEMBLY 36876787

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/11/95 bd	OIL TEMP BYPASS VALVE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-36	2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	36876753	1	BODY
B	35584242	1	GASKET
C	36876761	1	BODY
D	36876779	1	COVER
E	36782019	1	ELEMENT
F	20A11EM231	1	O-RING
G	36786382	8	SCREW
H	35288448	1	BALL
J	35379940	1	SPRING
K	36788164	1	PLUG
L	36788172	1	SEAL

OIL TEMPERATURE BYPASS VALVE
ASSEMBLY 36876787

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/11/95 bd	OIL TEMP BYPASS VALVE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-37	2/96 A



FOR P250 UNITS ONLY

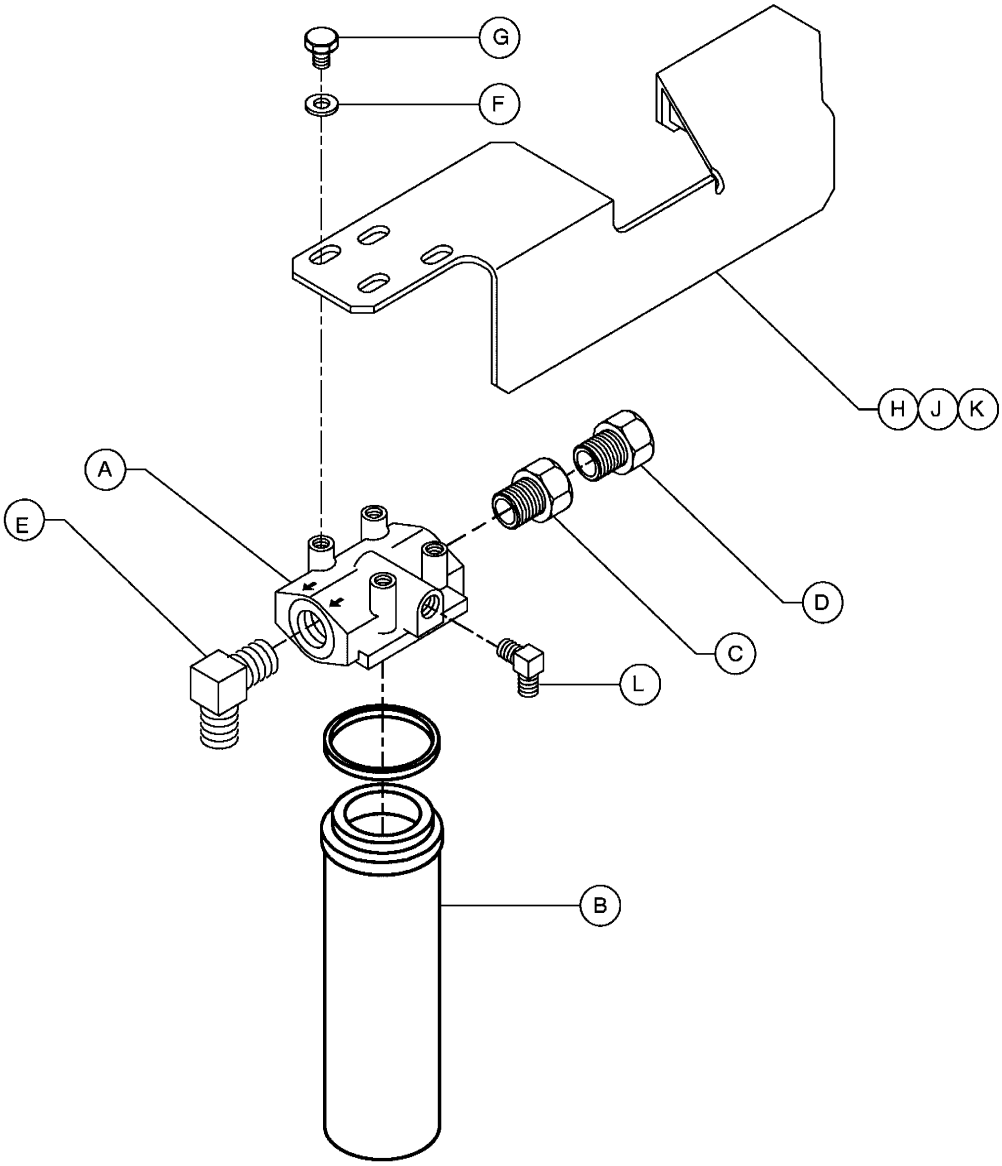
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/12/95 bd	DESCRIPTION OIL FILTER ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-38	DATE/REV: 2/96 A

ITEM		C.P.N.	QTY	DESCRIPTION	
A	*	35355460	1	HEAD ASSEMBLY	**{PRIOR TO S/N 300624}**
	*	36897445	1	HEAD ASSEMBLY	**{BEGIN WITH S/N 300624}**
B	*	36897353	1	OIL FILTER ELEMENT	
C		550A10S073P	1	REDUCER	
D		550A10S060P	1	UNION, FITTING	
E		35294750	1	ELBOW	
F		95934907	2	WASHER, FLAT	
G		35376953	2	SCREW, HEX M10-150 X 20	
H		36880367	1	BRACKET, OIL FILTER	
J		35273408	2	SCREW, HEX M08-125 X 20	
K		96700869	2	NUT, HEX M08	

* INCLUDED IN OIL FILTER ASSEMBLY 36897387

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/12/95 bd	OIL FILTER ASSEMBLY	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WCU P-250WJD	35390095-39	5/99 C



FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/12/95 bd	DESCRIPTION OIL FILTER ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-40	DATE/REV: 2/96 A

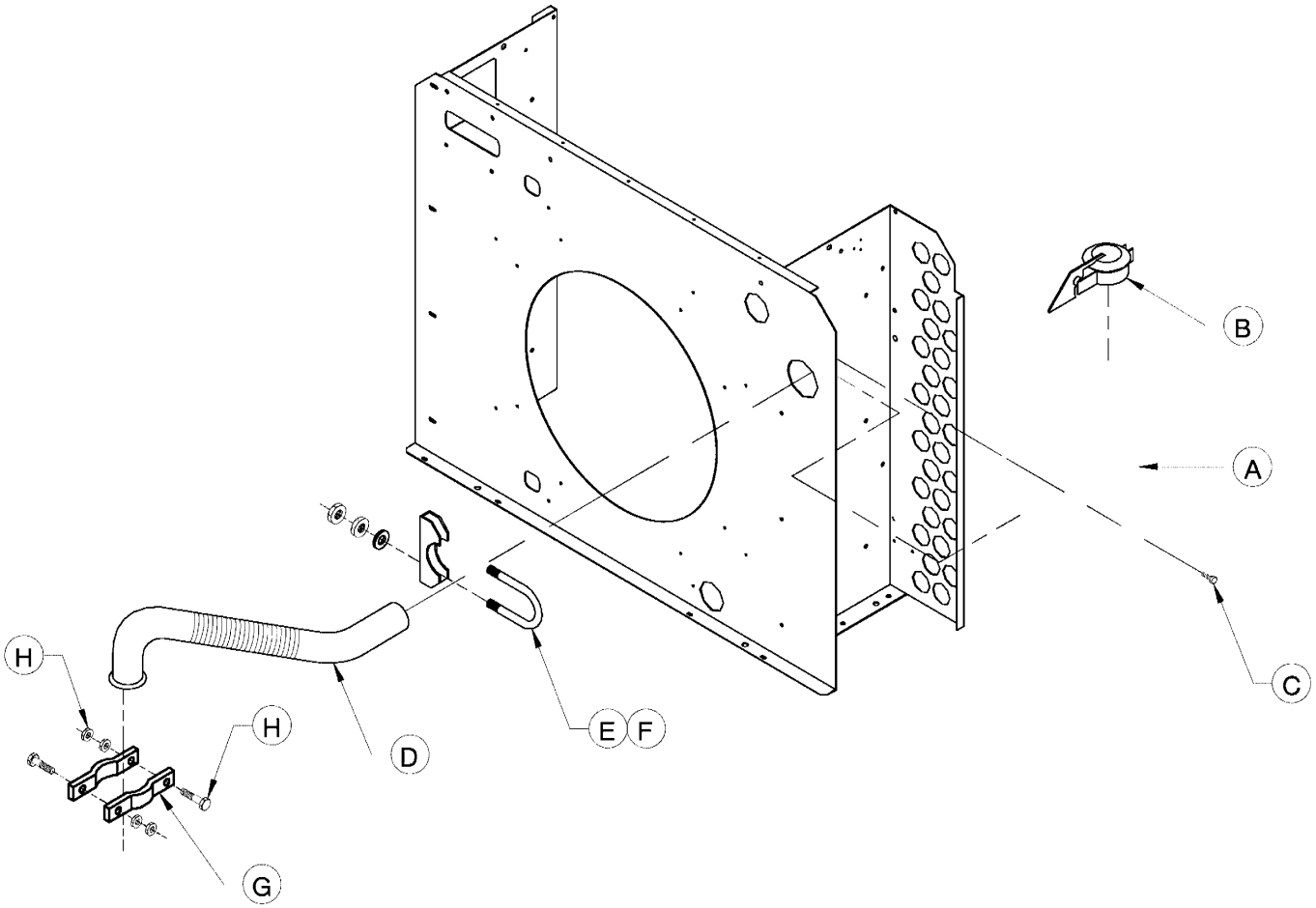
ITEM	C.P.N.	QTY	DESCRIPTION	
A	36877371	1	HEAD ASSEMBLY	**{PRIOR TO S/N 300624}**
*	36897473	1	HEAD ASSEMBLY	**{BEGIN WITH S/N 300624}**
B	36897353	1	OIL FILTER ELEMENT	**{PRIOR TO S/N 300624}**
*	36897346	1	OIL FILTER ELEMENT	**{BEGIN WITH S/N 300624}**
C	552A10S102P	1	REDUCER	
D	552A10S080P	1	UNION, FITTING	
E	95376133	2	ELBOW, 90° 1 5/8-12	
F	95934907	2	WASHER, FLAT	
G	95920674	2	SCREW, HEX 3/8-16 X 1	
H	36880367	1	BRACKET, OIL FILTER	
J	35273408	2	SCREW, HEX M08-125 X 20	
K	96700869	2	NUT, HEX M08	
L	95365094	1	ELBOW, 90° 9/16	

* INCLUDED IN OIL FILTER ASSEMBLY 36897429 **{BEGIN WITH S/N 300624}**

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/12/95 bd	OIL FILTER ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-41	DATE/REV: 5/99 E

DRAWBAR END



FOR P250WJD ONLY

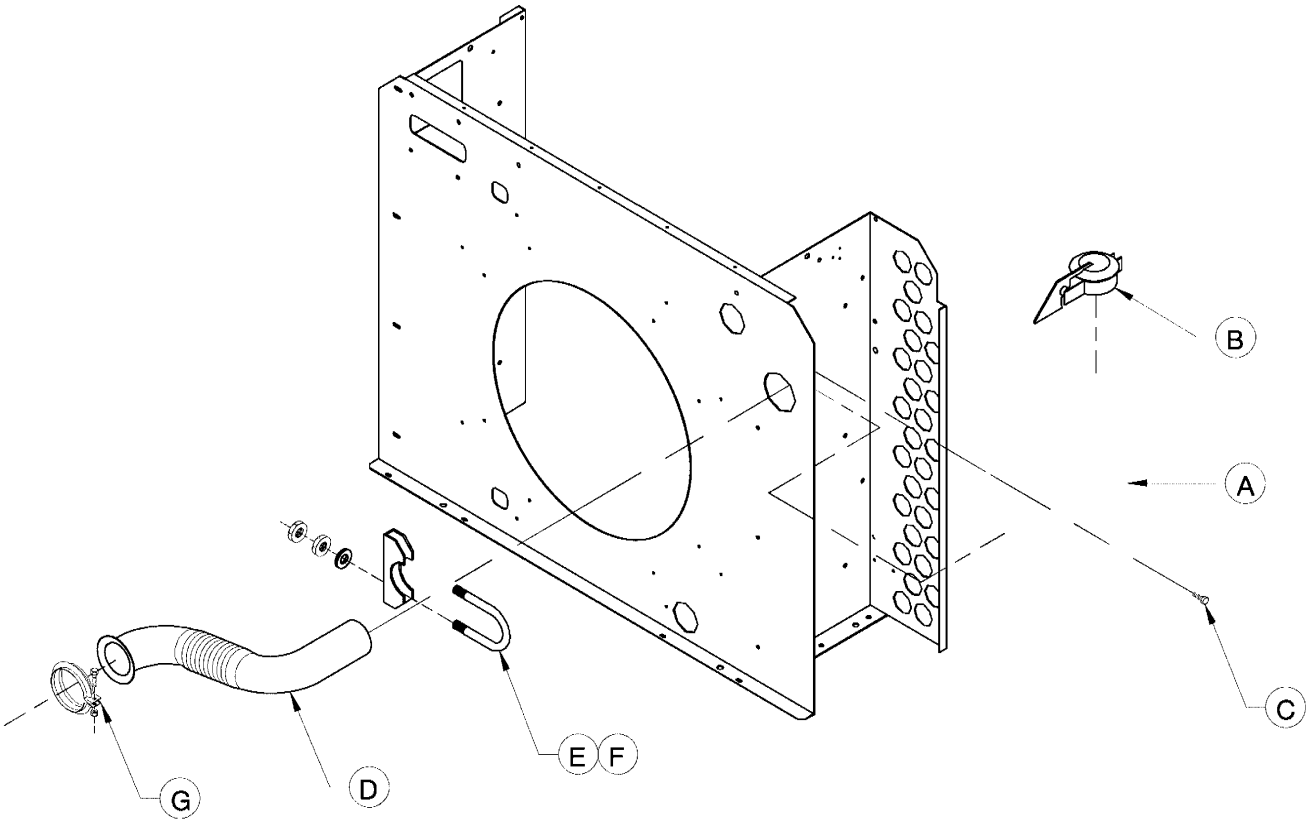
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
2/29/96 bd	EXHAUST COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WJD	35390095-42	2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	36877348	1	MUFFLER
B	36879021	1	CAP, RAIN
C	96702055	4	SCREW, HEX M8-125 X 20
D	36877819	1	TUBE, EXHAUST
E	35209048	1	CLAMP, SADDLE
F	95922894	4	NUT 3/8-16
G	36845378	1	GASKET
H	95935227	2	SCREW, HEX 5/16-18 X 1 1/4
J	36796845	2	CLAMP, MUFFLER
K	95922894	4	NUT 3/8-16

FOR P250WJD ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
2/29/96 bd	EXHAUST COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WJD	35390095-43	2/96 A

DRAWBAR END



FOR HP300AWJD & P375AWJD ONLY

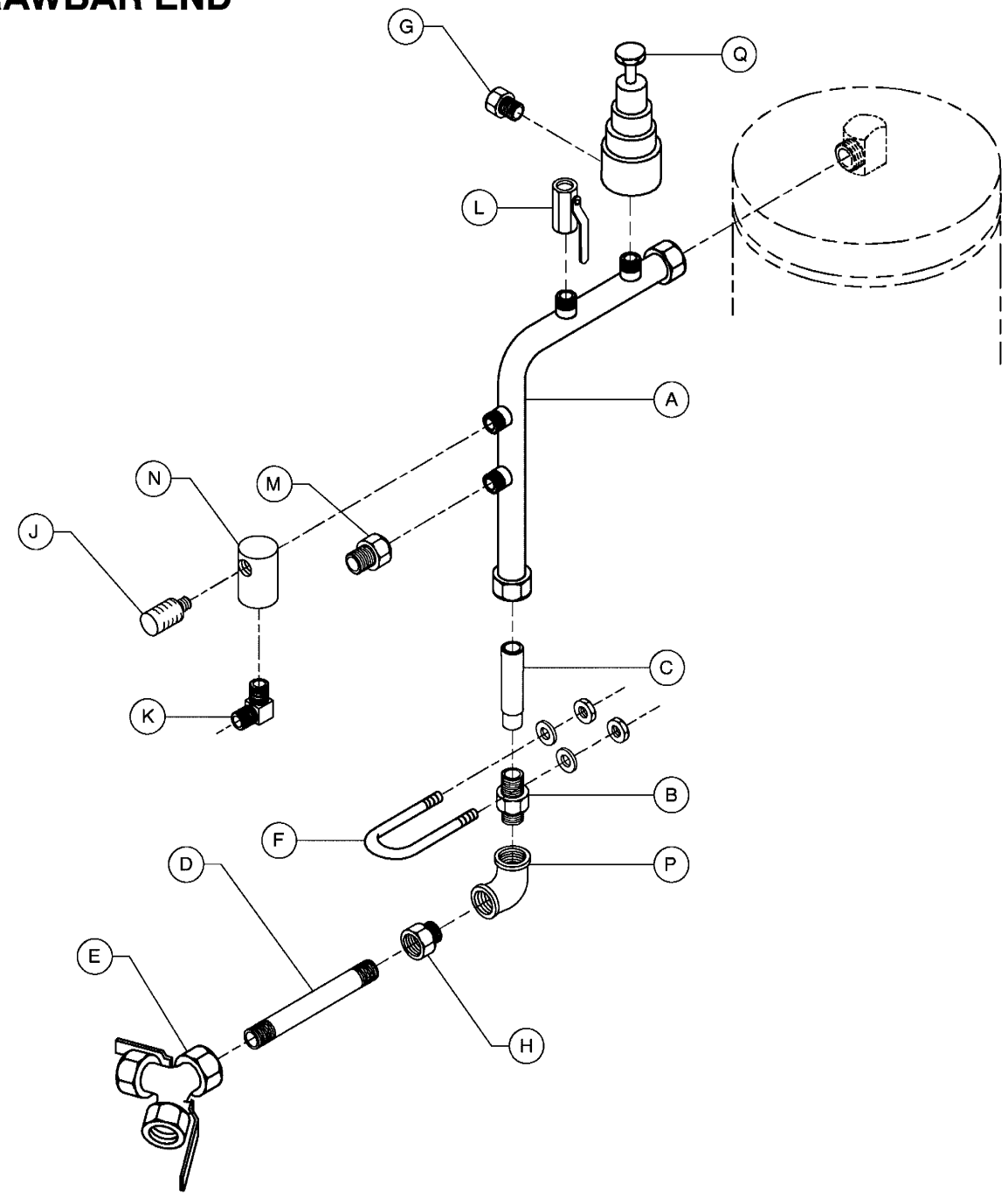
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
2/29/96 bd	EXHAUST COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
HP300AWJD P375AWJD	35390095-44	2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	36877300	1	MUFFLER
B	36846484	1	CAP, RAIN
C	96702055	4	SCREW, HEX M8-125 X 20
D	36877835	1	TUBE, EXHAUST
E	35113646	1	CLAMP, SADDLE
F	95922894	4	NUT 3/8-16
G	36881175	1	CLAMP, V-BAND EXHAUST

FOR HP300AWJD & P375AWJD ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
2/29/96 bd	EXHAUST COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
HP300AWJD P375AWJD	35390095-45	2/96 A

DRAWBAR END



FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/12/95 bd	AIR SERVICE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WCU P-250WJD	35390095-46	2/96 A

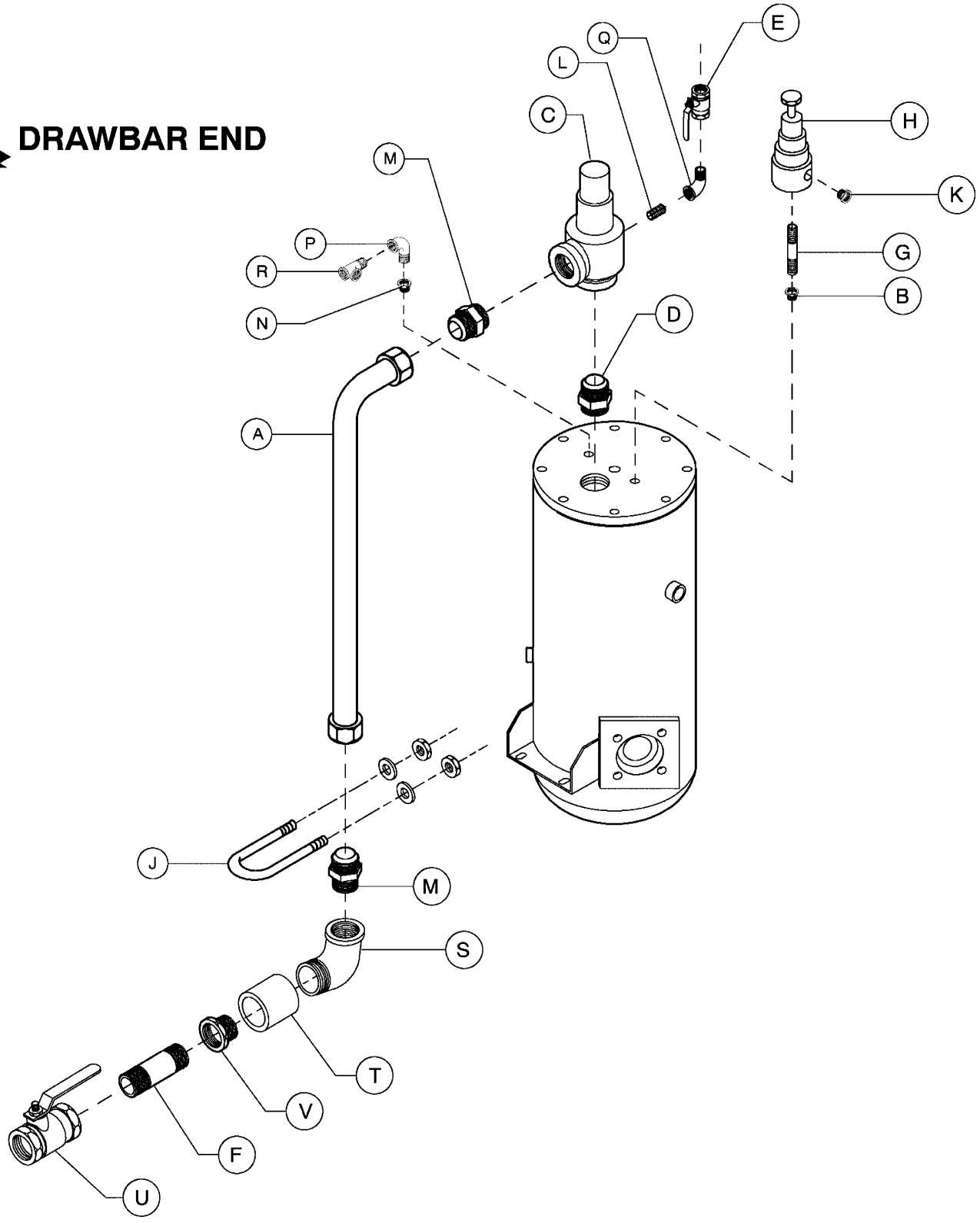
ITEM		C.P.N.	QTY	DESCRIPTION	
A		36879039	1	TUBE, SERVICE AIR	
B		95219770	1	ADAPTER	
C		36865434	1	SONIC NOZZLE	**{PRIOR TO S/N 305271}**
		36923928	1	SONIC NOZZLE	**{BEGIN WITH S/N 305271}**
D		19A7S55Z1	1	NIPPLE	
E		36779056	1	WYE VALVE	
F		35261155	2	CLAMP	
G		35369347	1	CONNECTOR, MALE	
H		95933451	1	COUPLING	
J		36766756	1	MUFFLER ORIFICE	
K		35369354	1	ELBOW	
L		35324839	1	BALL VALVE	
M		35369339	1	CONNECTOR, FEMALE	
N	★	35322379	1	BLOWDOWN VALVE	
P		95944104	1	ELBOW, STREET	
Q		36854149	1	REGULATOR VALVE	

★	35379064		BLOWDOWN VALVE REPAIR KIT

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/12/95 bd	AIR SERVICE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WCU P-250WJD	35390095-47	11/99 B

DRAWBAR END



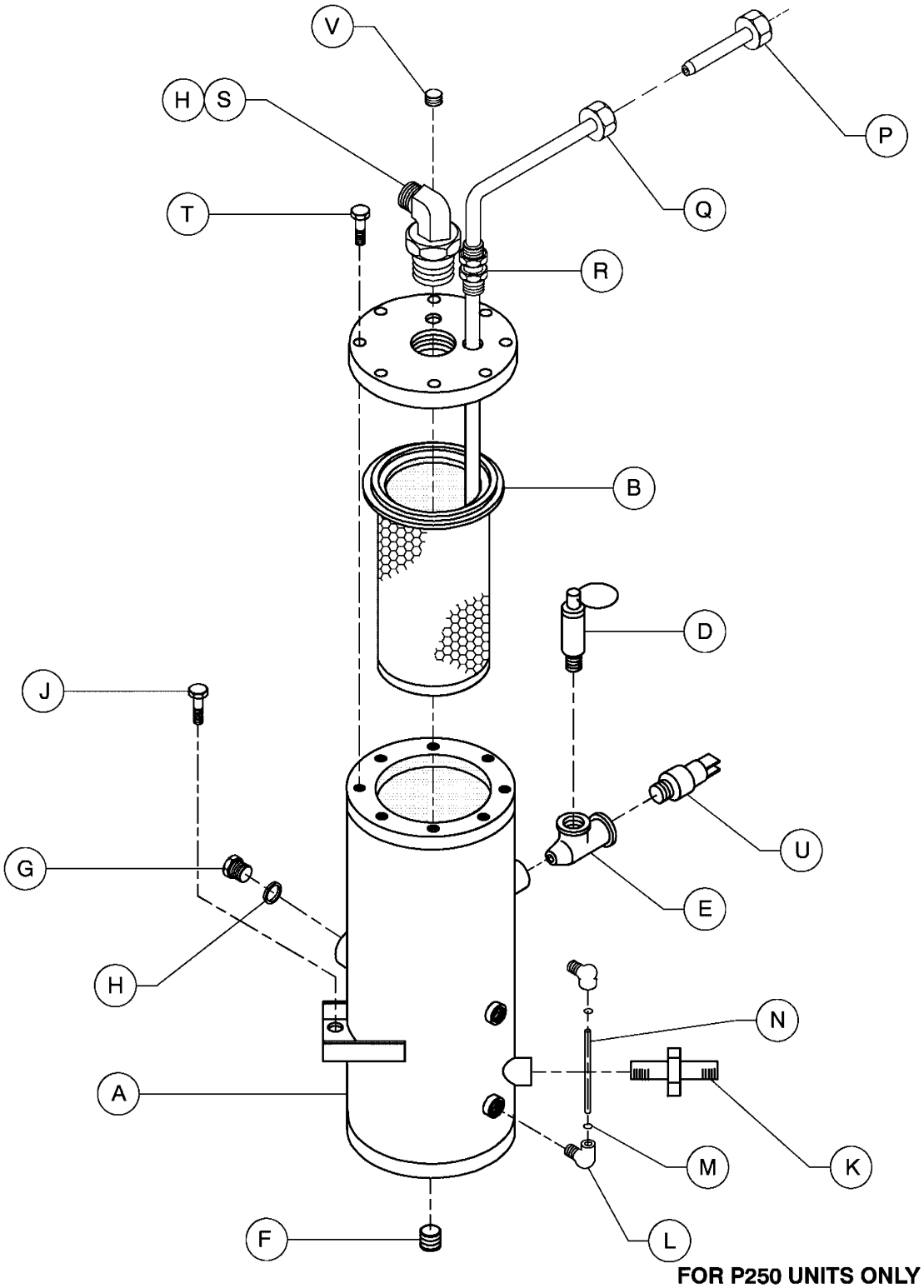
FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/12/95 bd	AIR SERVICE COMPLETE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-48	DATE/REV: 2/96 A

ITEM		C.P.N.	QTY	DESCRIPTION
A		36879047	1	TUBE, SERVICE AIR
B		95944625	1	BUSHING, REDUCING 1/2 - 1/4
C		36789550	1	MIN PRESSURE VALVE
D		36881068	1	CONNECTOR
E		35576115	1	VALVE, BALL
F		95928032	1	NIPPLE
G		19A7J2Z1	1	NIPPLE, CLOSED 1/4 NPT X 15/16
H	*	36847952	1	REGULATOR, PRESSURE (HP300 ONLY)
		36854149	1	REGULATOR, PRESSURE (P375 0NLY)
J		35192178	2	CLAMP
K		35369347	1	CONNECTOR, MALE
L		95928040	1	NIPPLE, CLOSED
M		95208682	2	ADAPTER
N		95940748	1	BUSHING, REDUCING 3/8 - 1/4
P		95944666	1	ELBOW, STREET 1/4 NPT
Q		34A7S3Z1	1	PLUG
R		35369503	1	TEE, MALE
S		95953311	1	ELBOW, STREET
T		95937454	1	COUPLING, 1 1/2
U		35612126	1	VALVE, BALL
V		95953824	1	BUSHING, REDUCING 1 1/2 - 1 1/4
	*	35387919		KIT, DIAPHRAGM REPAIR

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/12/95 bd	AIR SERVICE COMPLETE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-49	DATE/REV: 2/96 A



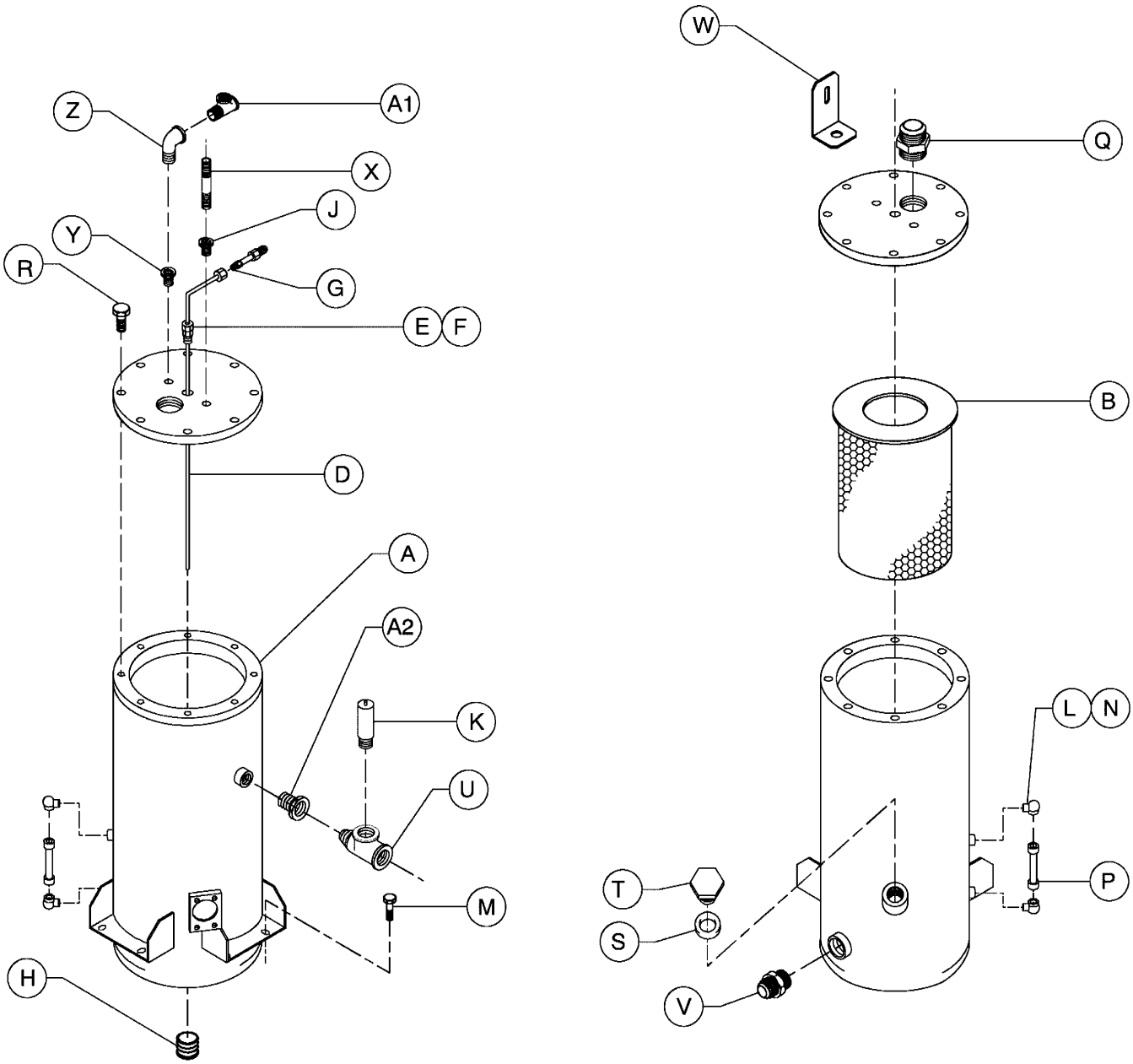
FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/26/95 bd	SEP TANK COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WCU P-250WJD	35390095-50	7/00 B

ITEM	C.P.N.	QTY	DESCRIPTION
A	54465992	1	SEPARATOR TANK
B	54447313	1	SEPARATOR ELEMENT
C	~	~	~
D	35325224	1	SAFETY VALVE
E	95944708	1	STREET TEE
F	95280541	1	PLUG
G	35579630	1	FILLER PLUG
H	35279942	2	O-RING
J	36877793	4	SCREW, HEX FLANGE M12-175 X 40
K	35292069	1	CONNECTOR, 1 5/8-12
L	36860468	1	FITTING
M	35324649	2	GASKET
N	92121532	1	GLASS TUBE
P	36840437	1	VALVE, CHECK
Q	36781227	1	SCAVENGE TUBE
R	35329309	1	FITTING
S	35279777	1	ELBOW
T	36877793	8	SCREW, HEX FLANGE M12
U	36865756	1	SWITCH, TEMPERATURE
V	95928230	1	PLUG, HEX CSK 1/4NPT

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/26/95 bd	SEP TANK COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WCU P-250WJD	35390095-51	7/00 D



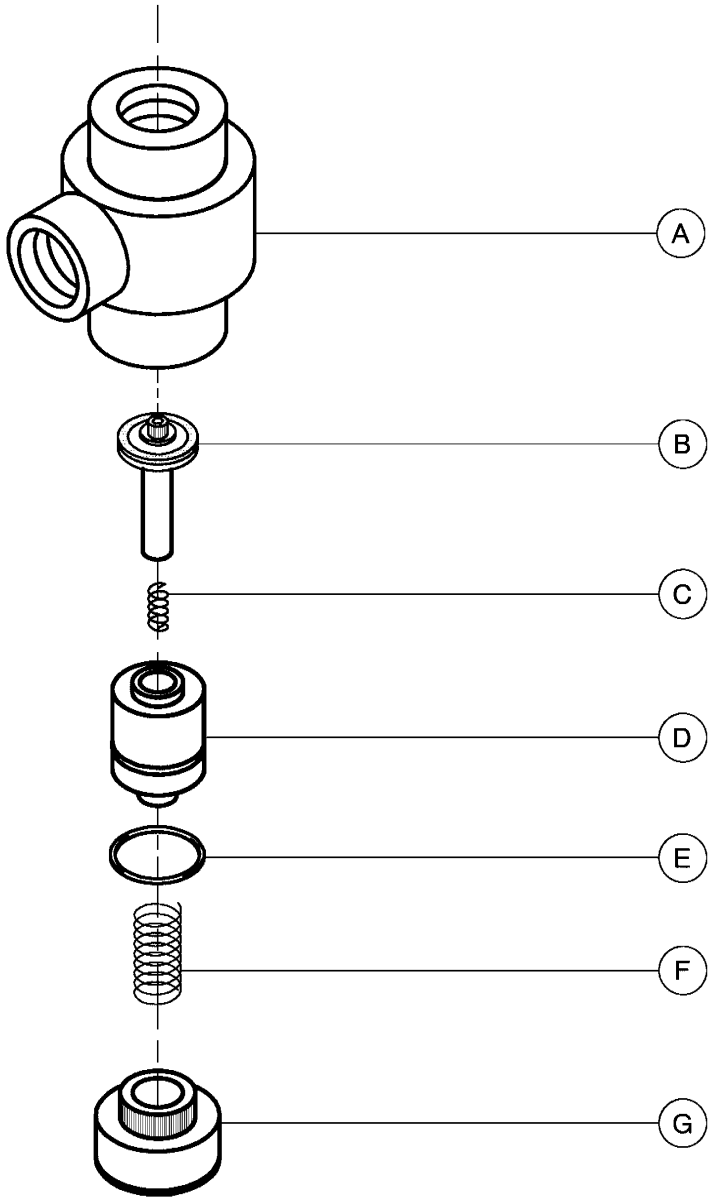
FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/26/95 bd	SEP TANK COMPLETE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-52	DATE/REV: 7/00 B

ITEM	C.P.N.	QTY	DESCRIPTION	
A	54465968	1	SEPARATOR TANK	
B	36876472	1	ELEMENT	
C	~	~	~	
D	36781227	1	SCAVENGE TUBE	
E	35329309	1	LENZ TUBE	
F	95953956	1	BUSHING, 3/4 - 3/8 REDUCING	
G	36840411	1	CHECK VALVE	
H	95280541	1	PLUG	
J	95944625	1	BUSHING, 1/2- 1/4 REDUCING	
K	35325232	1	SAFETY VALVE (P375WCU)	
	36784114	1	SAFETY VALVE (HP300WCU)	**{PRIOR TO S/N 297429}**
	36920254	1	SAFETY VALVE (HP300WCU)	**{BEGIN WITH S/N 297429}**
L	35324649	2	GASKET	
M	36877793	4	SCREW, HEX FLANGE HEAD M12 X 40	
N	36860468	1	FITTINGS	
P	92121532	1	SIGHT GLASS	
Q	36881068	1	ADAPTER, 1 7/8 - 1 1/2	
R	36789302	8	SCREW, FLANGE HD M16 X 50	
S	35279942	1	O-RING	
T	35579630	1	PLUG, OIL FILL	
U	95944708	1	STREET TEE	
V	35292069	1	CONNECTOR, 1 5/8	
W	36785012	2	BRACKET, SEPERATOR TANK LIFT	
X	19A7J2Z1	1	NIPPLE	
Y	95940748	1	BUSHING, 3/8 - 1/4 REDUCING	
Z	95944666	1	ELBOW, STREET 1/4NPT	
A1	35369503	1	TEE, REDUCING	
A2	95953949	1	BUSHING, REDUCING 3/4 - 1/2	

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/26/95 bd	SEP TANK COMPLETE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-53	DATE/REV: 7/00 D



FOR P375 and HP300 UNITS ONLY

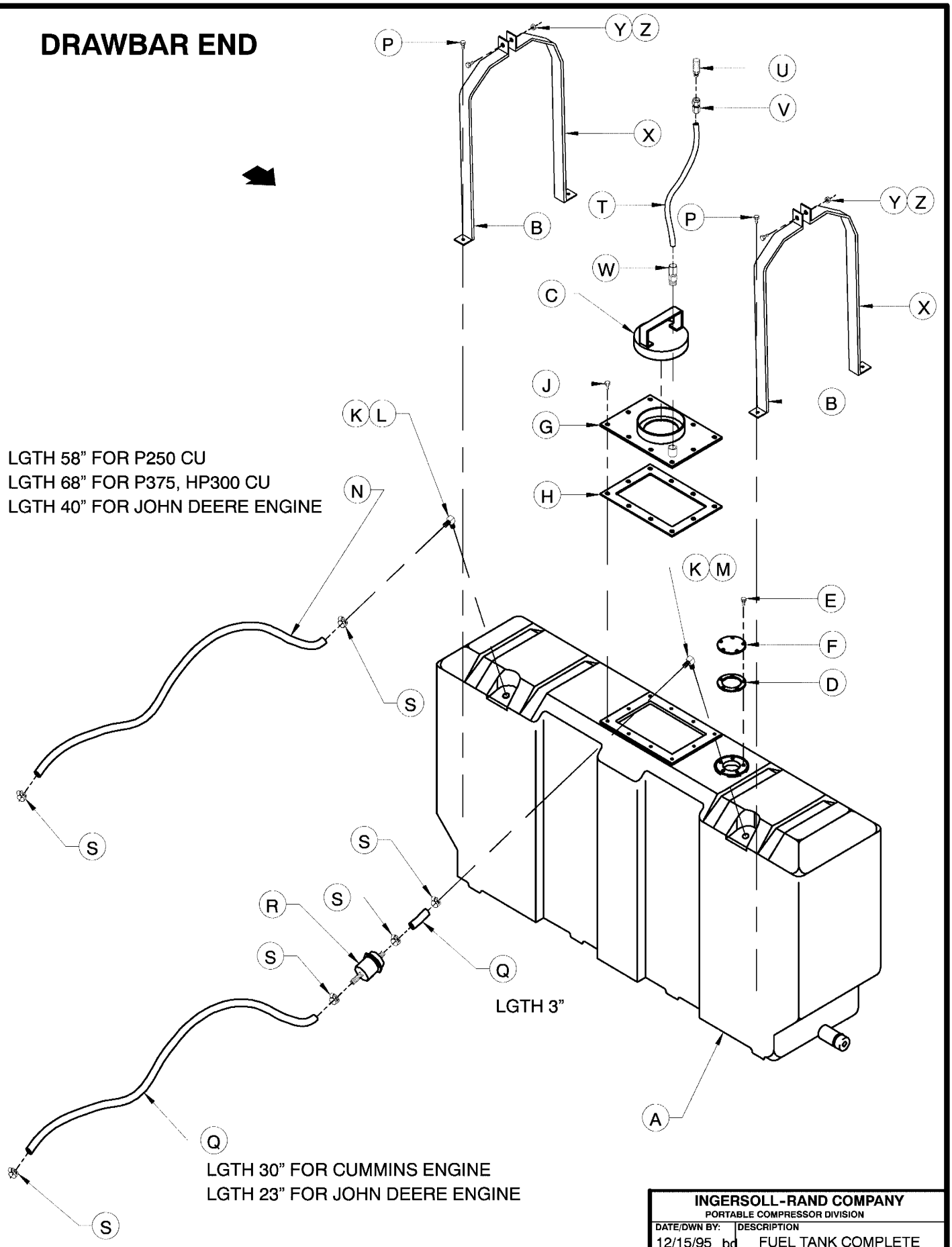
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/23/92 bd	DESCRIPTION MIN PRESS VALVE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-54	DATE/REV: 2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	35379973	1	MIN PRESS VALVE BODY
B	35380708	1	CV ASSEMBLY
C	35380732	1	SPRING
D	35380716	1	PISTON
E	35380724	1	O-RING
F	35380740	1	SPRING
G	35380757	1	CAP
	36789550	1	MIN PRESS VALVE ASSEMBLY

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/23/92 bd	DESCRIPTION MIN PRESS VALVE	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-55	DATE/REV: 2/96 A

DRAWBAR END



INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
12/15/95 bd	FUEL TANK COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-56	4/98 C

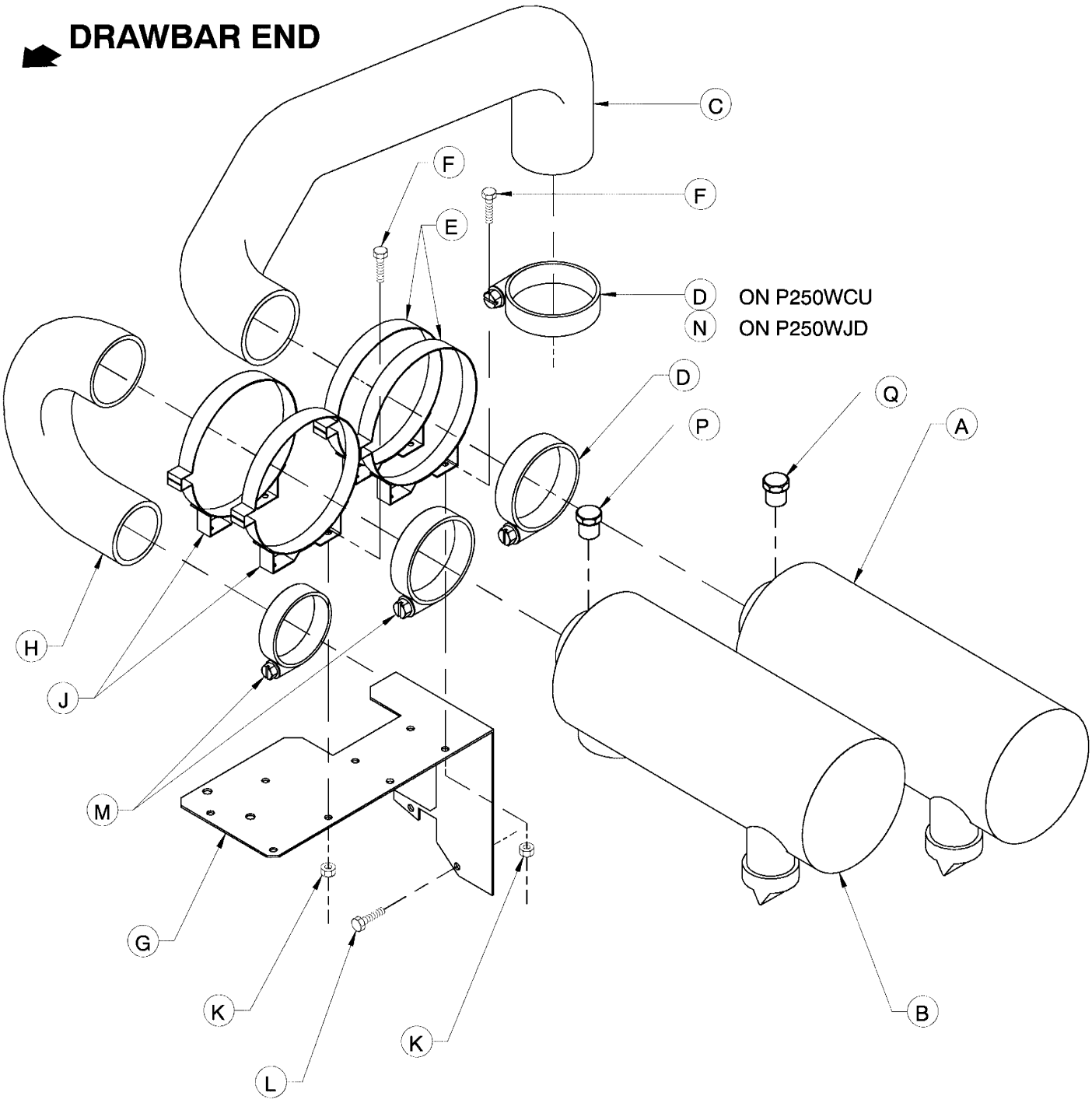
ITEM		C.P.N.	QTY	DESCRIPTION
A		36876514	1	TANK, FUEL
B		36897239	2	STRAP, FUEL TANK
C	*	36845014	1	CAP, FUEL FILLER
D	*	35361849	1	GASKET, FUEL SENDER
E	*	95916532	5	SCREW, FILLISTER HEAD 10-32 X 1/2
F	*	36792828	1	PLATE, FUEL TANK COVER
G	*	35389972	1	COVER, FUEL FILL
H	*	35389964	1	GASKET, FUEL FILL COVER
J	*	35144328	10	SCREW, LOCK 1/4-20 X 5/8
K	*	35384577	2	BUSHING
L	*	35389980	1	STANDPIPE ASSEMBLY
M	*	35390111	1	STANDPIPE ASSEMBLY
N		35282078	**	HOSE, FUEL 1/4" (CUMMINS ONLY)
		35363498	**	HOSE, FUEL 5/16" (J. DEERE ONLY)
P		35300771	4	SCREW, TAPPING M06-100 X 20
Q		35363498	**	HOSE, FUEL 5/16"
R		36845493	1	FILTER, FUEL
S		35296342	6	CLAMP, WORM GEAR
T		35356484	16"	TUBING, VENT 3/8"
U		35369339	1	CONNECTOR, FEMALE 1/4NPT X 3/8 TUBE
V		35322395	1	SILENCER, PNEUMATIC 1/4NPT
W		35369347	1	CONNECTOR, MALE 1/4NPT X 3/8 TUBE
X		36897221	2	STRAP, FUEL TANK
Y		35271170	2	SCREW, HEX M08-1.25 X 40
Z		35278530	2	NUT, NYLOC M08-1.25

* INCLUDED WITH FUEL TANK

** SEE ILLUSTRATION FOR HOSE LENGTH

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
12/15/95 bd	FUEL TANK COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-57	7/98 C

DRAWBAR END



FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 1/4/96 bd	DESCRIPTION AIR INTAKE COMPLETE	
MODEL NO. P-250WCU	MANUAL NO. 35390095-58	DATE/REV: 6/96 B

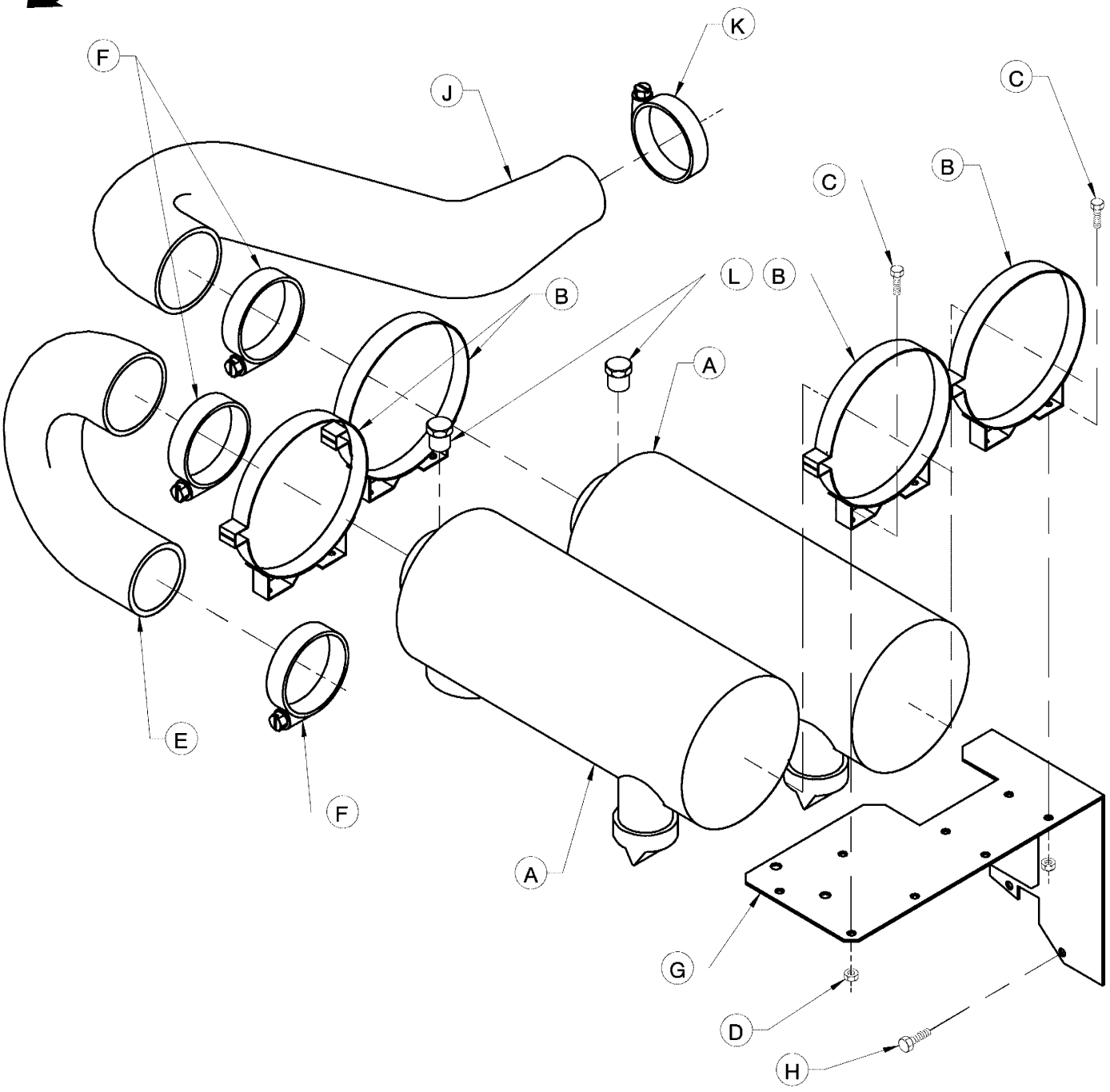
ITEM	C.P.N.	QTY	DESCRIPTION
A	36862829	1	CLEANER, ENGINE AIR
B	36863835	1	CLEANER, A/E AIR
C	36878346	1	HOSE, ENGINE AIR INLET (P250WCU)
	36878320	1	HOSE, ENGINE AIR INLET (P250WJD)
D	35374073	*	CLAMP, 3.62" DIA.
E	35585009	2	BAND, AIR CLEANER MOUNTING
F	96702055	8	SCREW, HEX M08-125 X 20
G	36879591	1	BRACKET, AIR FILTER
H	35588524	1	ELBOW, 180□ RUBBER
J	35587468	2	BAND, 8" MOUNTING
K	96700869	8	NUT, HEX M08
L	96701495	2	SCREW, HEX M12-175 X 25
M	35165802	2	CLAMP, 4" DIA.
N	35314996	*	CLAMP, 3.12" DIA.
P	35314939	1	INDICATOR, FILTER RESTRICTION
Q	35300615	1	INDICATOR, FILTER RESTRICTION

* SEE ILLUSTRATION FOR LOCATIONS

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/4/96 bd	AIR INTAKE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WCU	35390095-59	8/96 C

DRAWBAR END



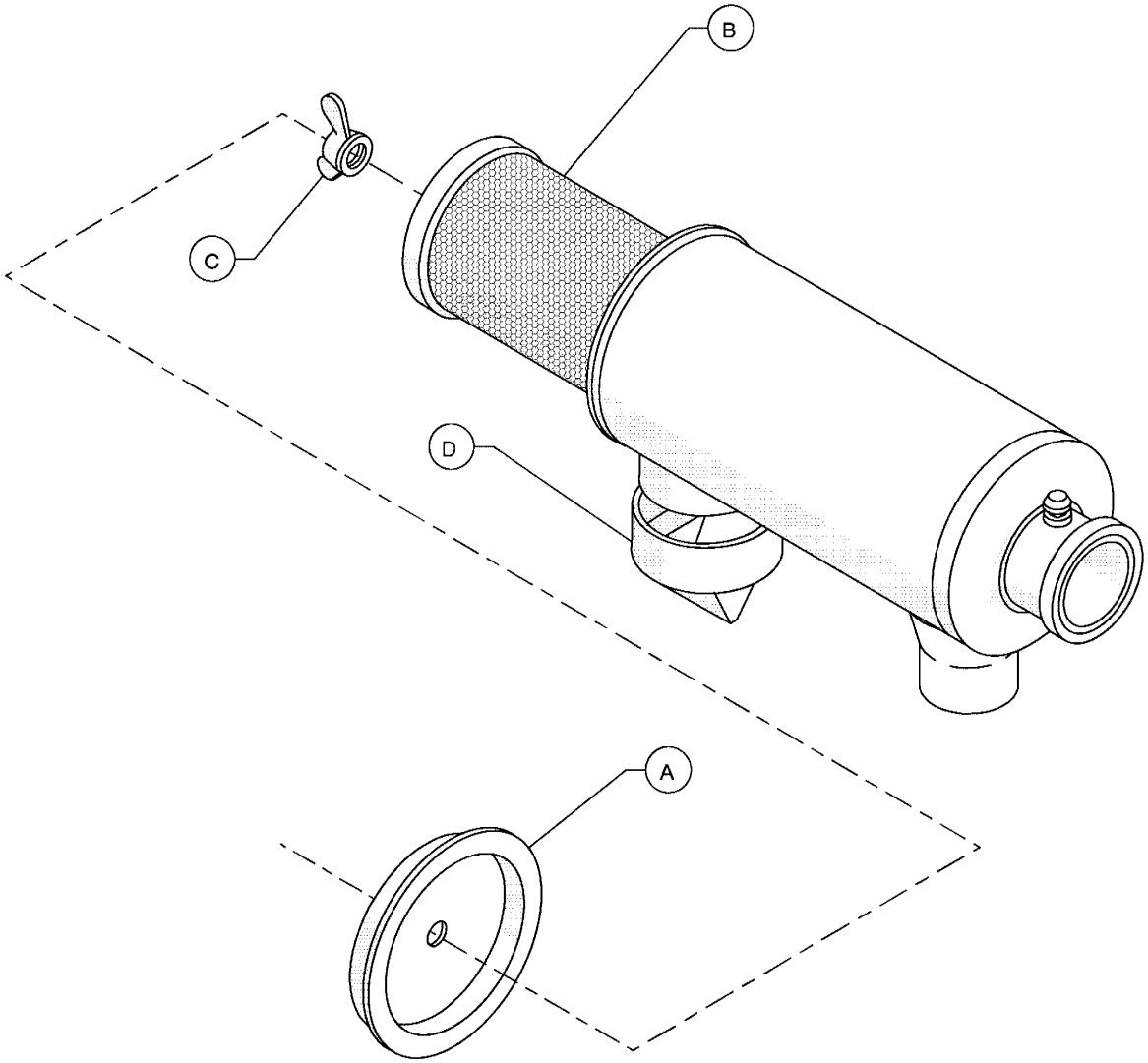
FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/13/95 bd	DESCRIPTION AIR INTAKE COMPLETE	
MODEL NO. P-375WCU	MANUAL NO. 35390095-60	DATE/REV: 6/96 B

ITEM	C.P.N.	QTY	DESCRIPTION	
A	36863900	2	CLEANER, AIR ASSEMBLY	
B	35294974	4	BAND, MOUNTING	
C	96702055	8	SCREW, HEX M8-125 X 20	
D	96700869	8	NUT, HEX M8	
E	36899649	1	ELBOW, 180□ 4"	
F	36897668	3	CLAMP, 4.5"	
G	36845915	1	BRACKET, AIR CLEANER	
H	96701495	2	SCREW, HEX M12-175 X 25	
J	36878338	1	HOSE, ENGINE AIR INLET	**PRIOR TO S/N 317538**
	54609797	1	HOSE, ENGINE AIR INLET	**BEGINING WITH S/N 317538**
K	35374073	1	CLAMP, 3.62"	
L	35314939	2	INDICATOR, FILTER RESTRICTION	

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 12/13/95 bd	DESCRIPTION AIR INTAKE COMPLETE	
MODEL NO. P-375WCU	MANUAL NO. 35390095-61	DATE/REV: 1/01 E



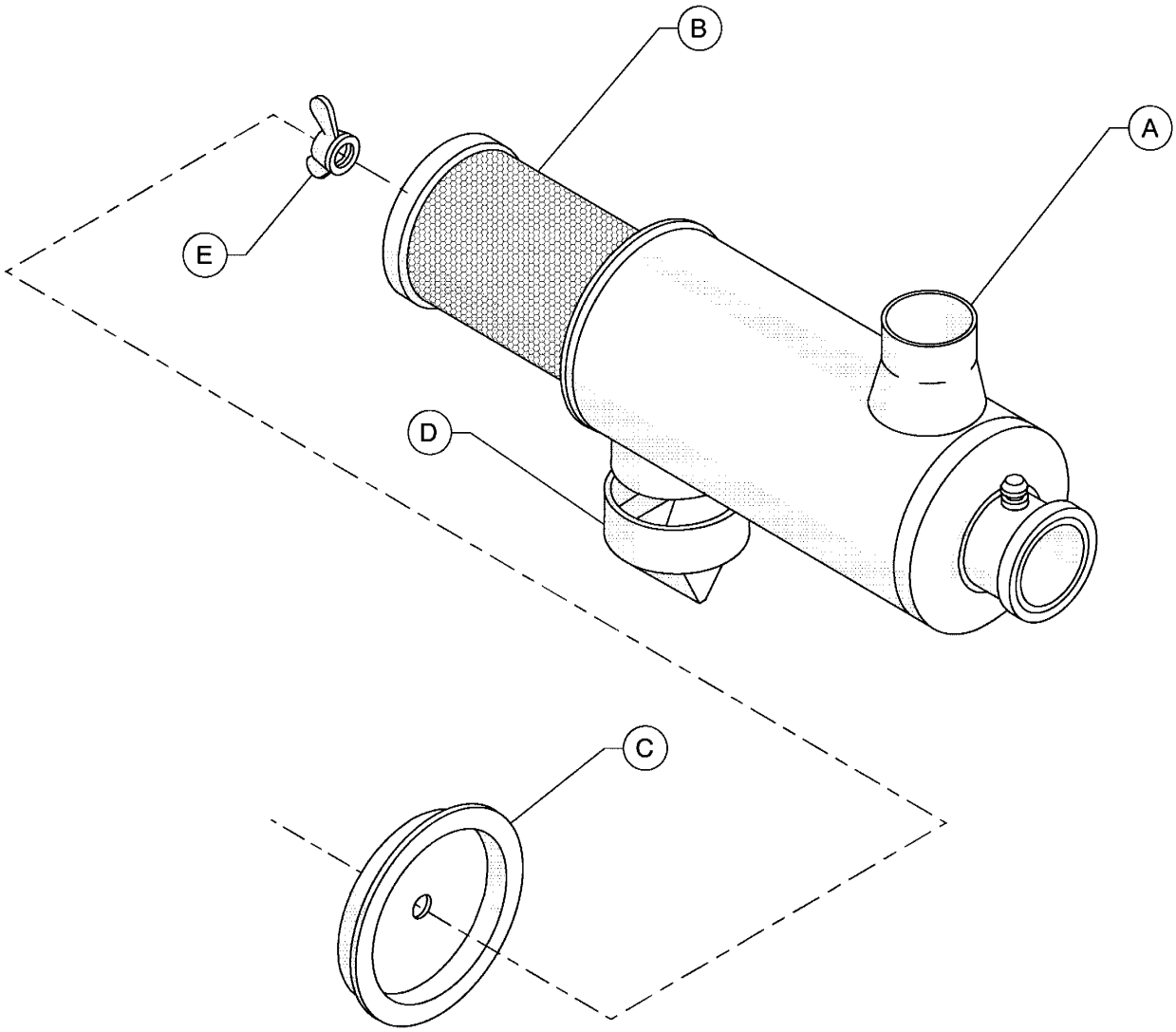
A/E AIR CLEANER ASSEMBLY 36863835
FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/27/93 bd	DESCRIPTION AIR CLEANER ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-62	DATE/REV: 2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	35326057	1	COVER
B	35318252	1	AIR CLEANER ELEMENT
C	35291475	1	NUT
D	35318245	1	VACUATOR VALVE

A/E AIR CLEANER ASSEMBLY 36863835
FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/27/93 bd	DESCRIPTION AIR CLEANER ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-63	DATE/REV: 2/96 A



ENGINE AIR CLEANER ASSEMBLY 36862829
FOR P250 UNITS ONLY

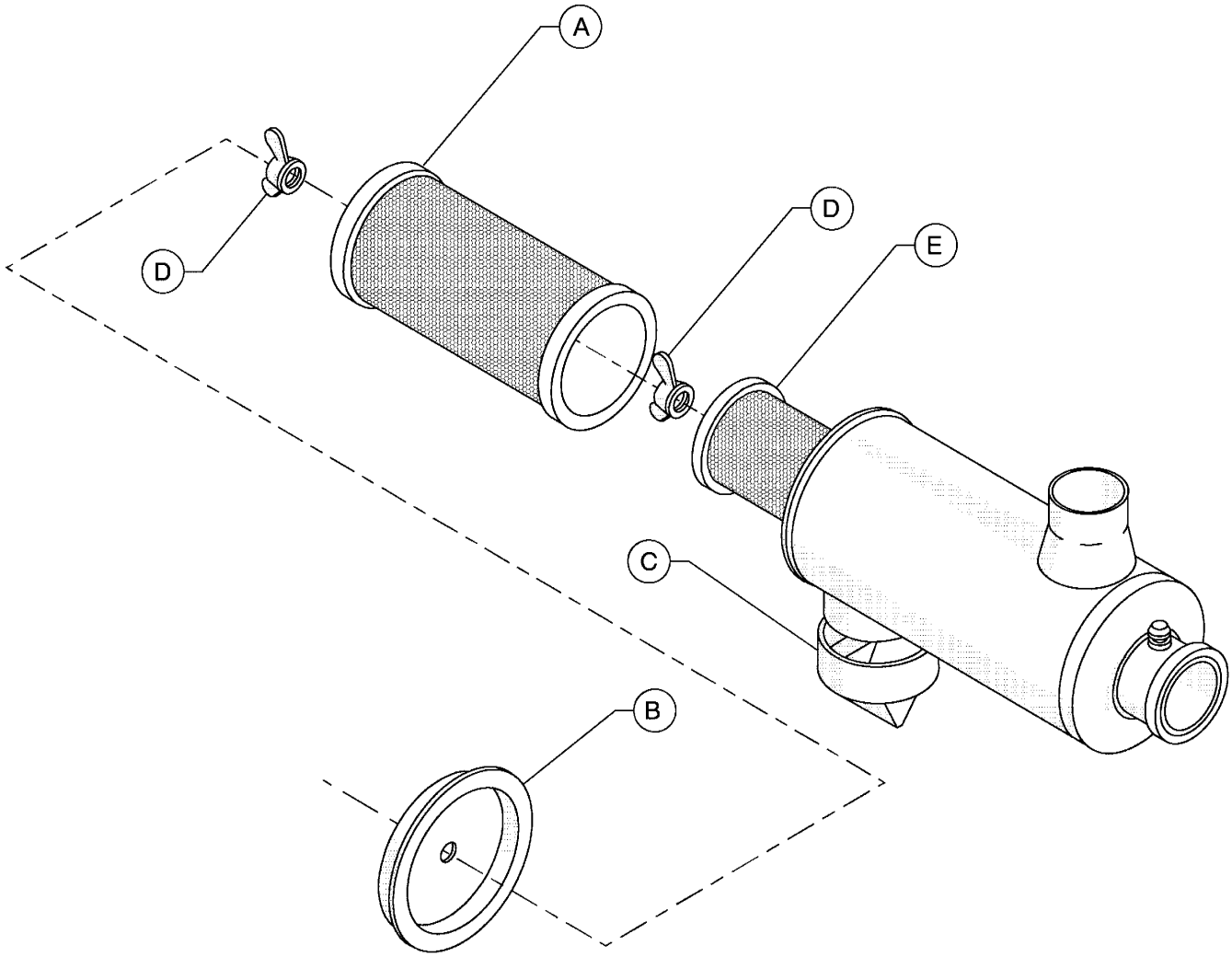
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/27/93 bd	DESCRIPTION AIR CLEANER ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-64	DATE/REV: 2/96 B

ITEM	C.P.N.	QTY	DESCRIPTION
A	35388883	1	AIR CLEANER BODY
B	36876423	1	AIR CLEANER ELEMENT
C	35326032	1	COVER
D	35388891	1	VACUATOR VALVE
E	35291475	1	NUT
F			

ENGINE AIR CLEANER ASSEMBLY 36862829

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 10/27/93 bd	DESCRIPTION AIR CLEANER ASSEMBLY	
MODEL NO. P-250WCU P-250WJD	MANUAL NO. 35390095-65	DATE/REV: 2/96 B



A/E AIR CLEANER ASSEMBLY 36863900
FOR P375 and HP300 UNITS ONLY

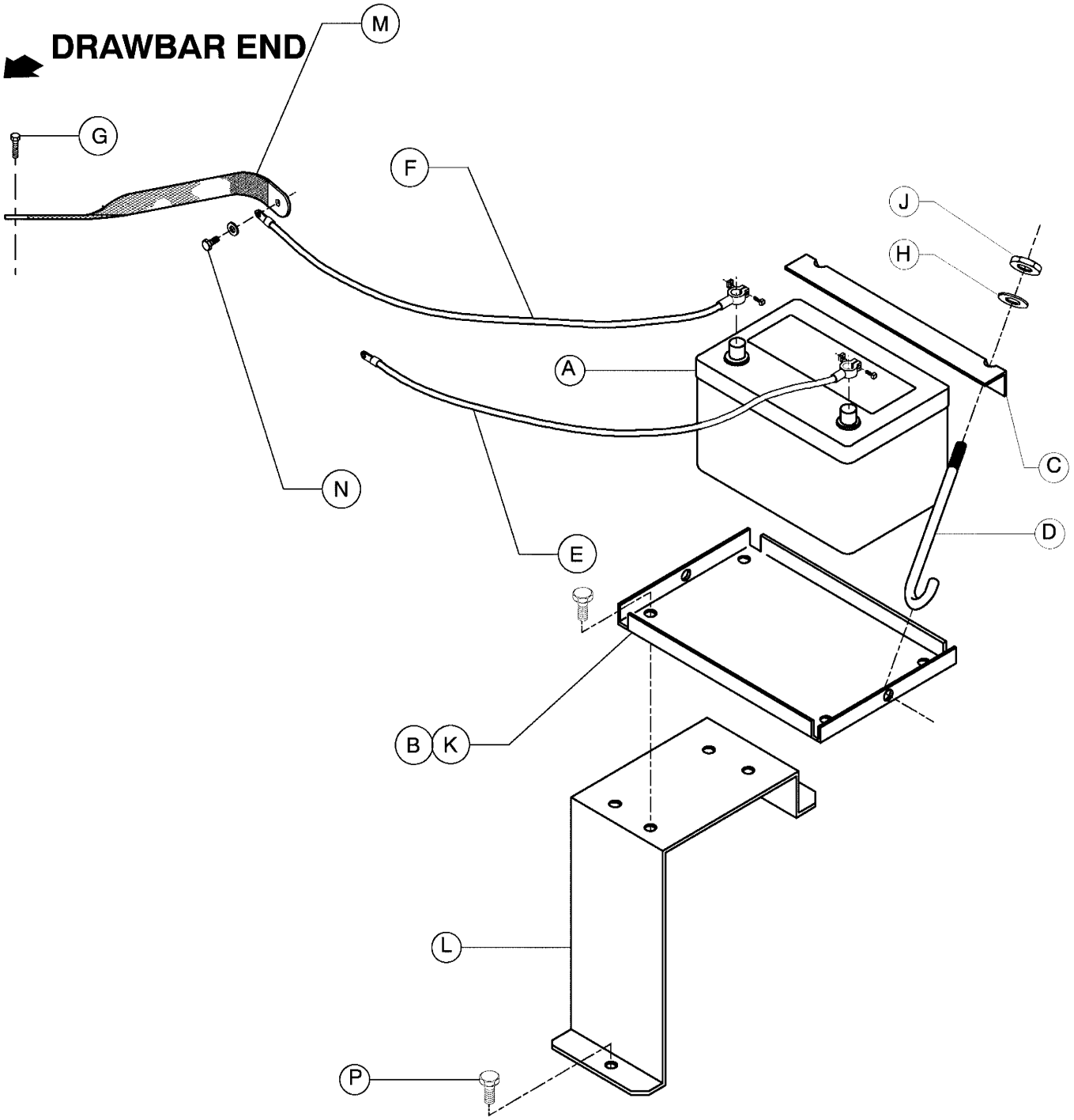
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 2/27/92 bd	DESCRIPTION AIR CLEANER ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-66	DATE/REV: 2/96 B

ITEM	C.P.N.	QTY	DESCRIPTION
A	35326230	1	ELEMENT
B	35326222	1	COVER
C	35326214	1	VACUATOR VALVE
D	35291475	2	NUT
E	35377696	1	SAFETY ELEMENT

A/E AIR CLEANER ASSEMBLY 36863900

FOR P375 and HP300 UNITS ONLY

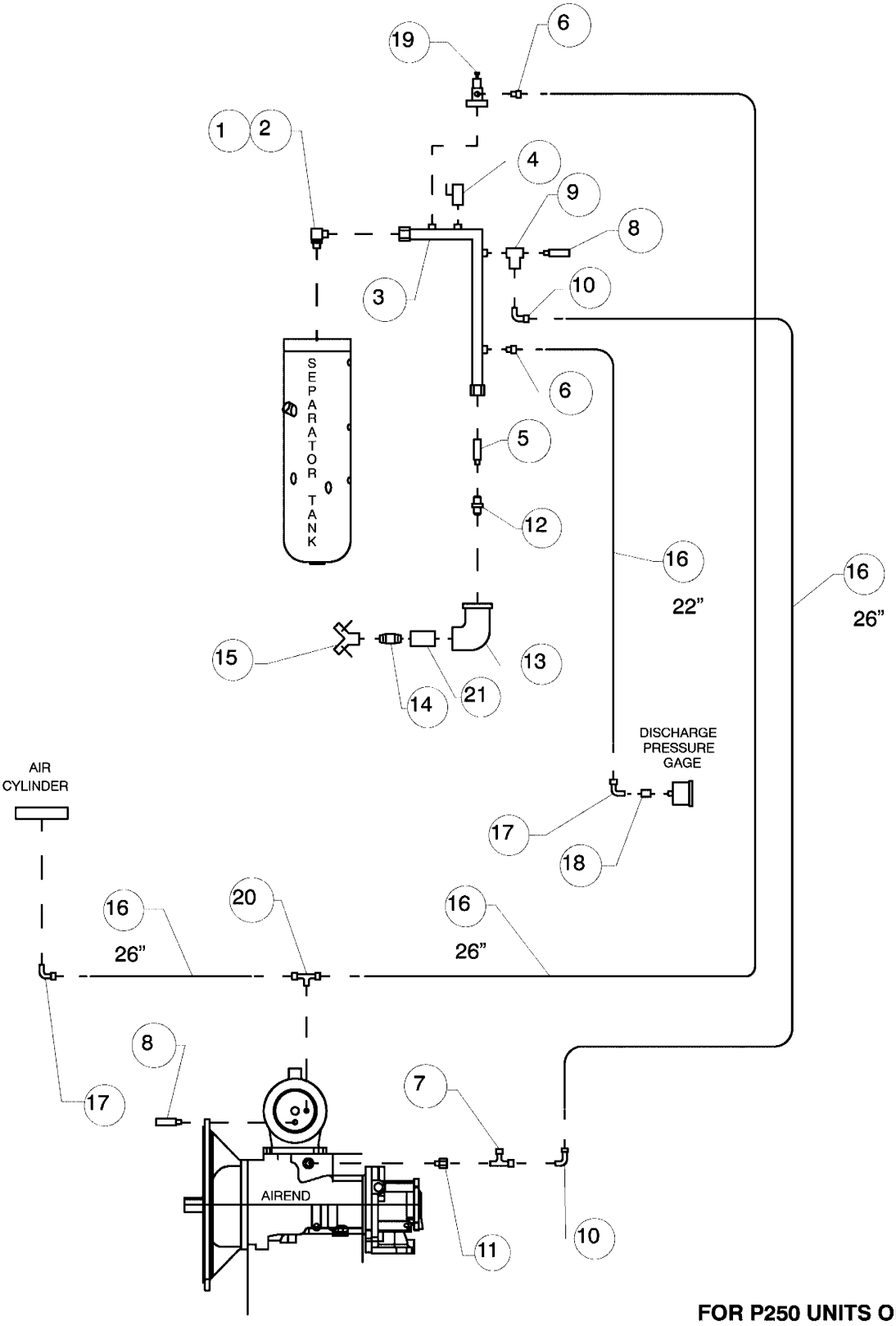
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 2/27/92 bd	DESCRIPTION AIR CLEANER ASSEMBLY	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-67	DATE/REV: 2/96 B



INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/24/95 bd	BATTERY ASSEMBLY	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-68	2/96 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	36844264	1	BATTERY, 12 VDC
B	36853232	1	BATTERY TRAY
C	36853257	1	HOLD-DOWN ANGLE
D	36853240	2	BATTERY HOOK
E	35516582	1	POSITIVE BATTERY CABLE
F	36870609	1	NEGATIVE BATTERY CABLE
G	35130293	1	SCREW, TAPPING 3/8-16 X 3/4
H	36853265	2	WASHER, PLASTIC
J	35144492	2	NUT, LOCK 1/4-20
K	92368687	4	SCREW, TAPPING M06-100 X 14
L	36879096	1	BRACKET, BATTERY MOUNTING
M	35293075	1	GROUND STRAP
N	35295757	1	SCREW, HEX M12-175 X 20
P	36797652	2	SCREW, TAPPING M06-100 X 12

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
10/11/95 bd	BATTERY ASSEMBLY	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-69	2/96 A



FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/1/96 bd	DESCRIPTION: AIR PIPING	
MODEL NO.: P-250WCU, P-250WJD	MANUAL NO.: 35390095-70	DATE/REV: 2/96 A

ITEM	C.P.N.	DESCRIPTION	
1	35279777	ELB 90 1-5/8-12 X -20JIC	
2	35279942	O-RING	
3	36879039	TUBE SERVICE AIR	
4	35324839	VALVE, BALL 1/4 NPT	
5	36865434	NOZZLE, .453 ORIFICE SONIC	**{PRIOR TO S/N 305271}**
	36923928	NOZZLE, .453 ORIFICE SONIC	**{BEGIN WITH S/N 305271}**
6	35369347	CONN ML 1/4NPT X 3/8TB	
7	35114545	TEE STREET 1/4 NPT	
8	36766756	ORIFICE MUFFLER .140	
9 *	35322379	BLOWDOWN VALVE	
10	35369354	ELBOW ML 1/4NPT X 3/8TB	
11	353O2314	ADAPTER	
12	95219770	ADAPTER 1-1/4NPT X 1-1/4JIC	
13	95944104	ELB ST 1-1/4NPT X 90	
14	19A7S55Z1	NIPPLE 1-1/4 X 3 LG	
15	36779056	VALVE WYE 1-1/4 X 3/4 X 3/4	
16 **	35356484	TUBING 3/8 OD SYNFLEX	
17	35370386	ELB ML 1/8NPT X 3/8TB	
18	95930319	COUPLING 1/8NPT	
19 ***	36854149	VALVE PRESS REG 100PSI	
20	35373976	TEE 1/4NPT X 3/8TB	
21	95953451	COUPLING 1-1/4 NPT	

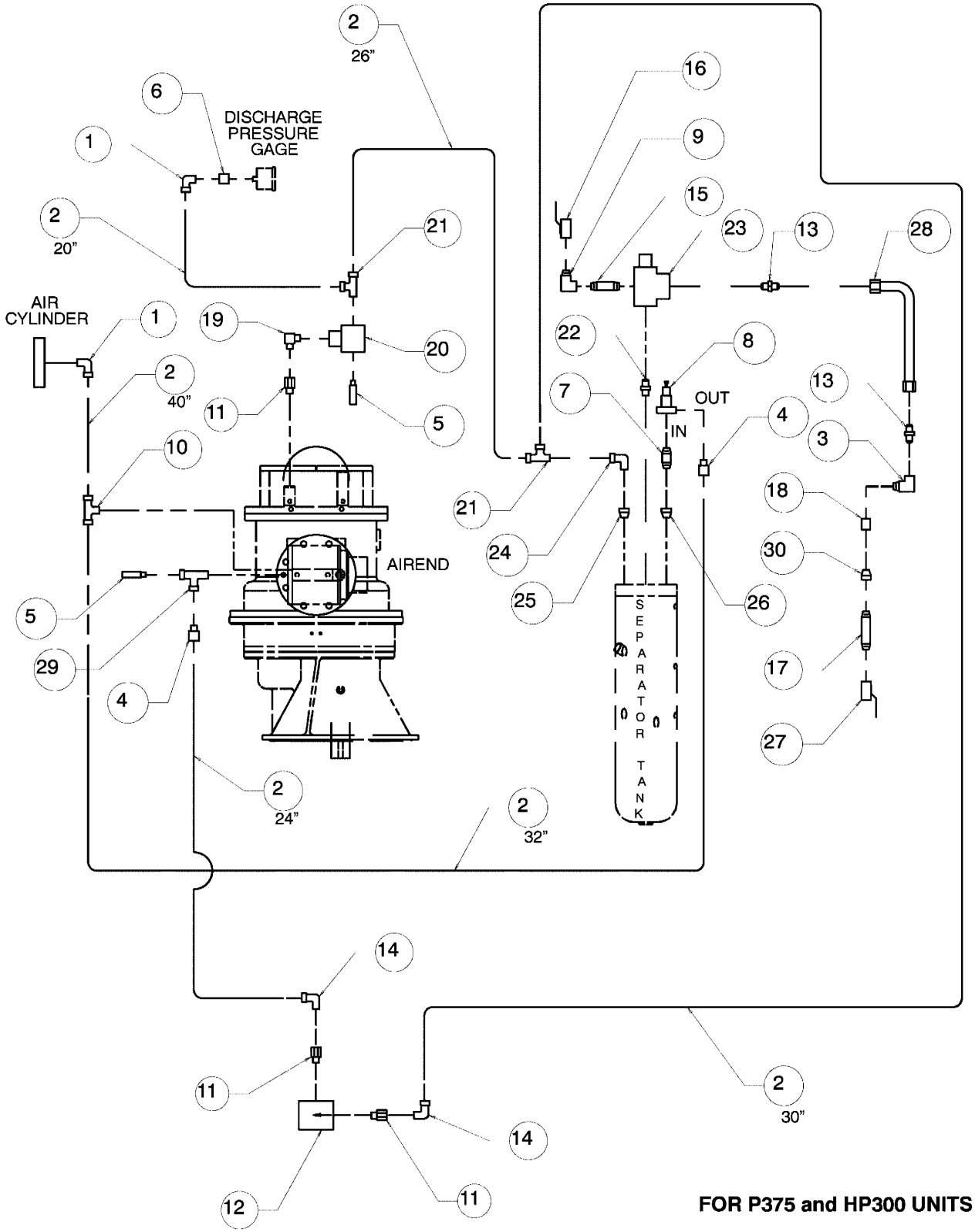
* 35379064 REPAIR KIT BLOWDOWN VALVE

** SPECIFY LENGTH WHEN ORDERING

*** 35387919 REPAIR KIT DIAPHRAM

FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/1/96 bd	DESCRIPTION: AIR PIPING	
MODEL NO.: P-250WCU, P-250WJD	MANUAL NO.: 35390095-71	DATE/REV: 11/99 B



FOR P375 and HP300 UNITS ONLY

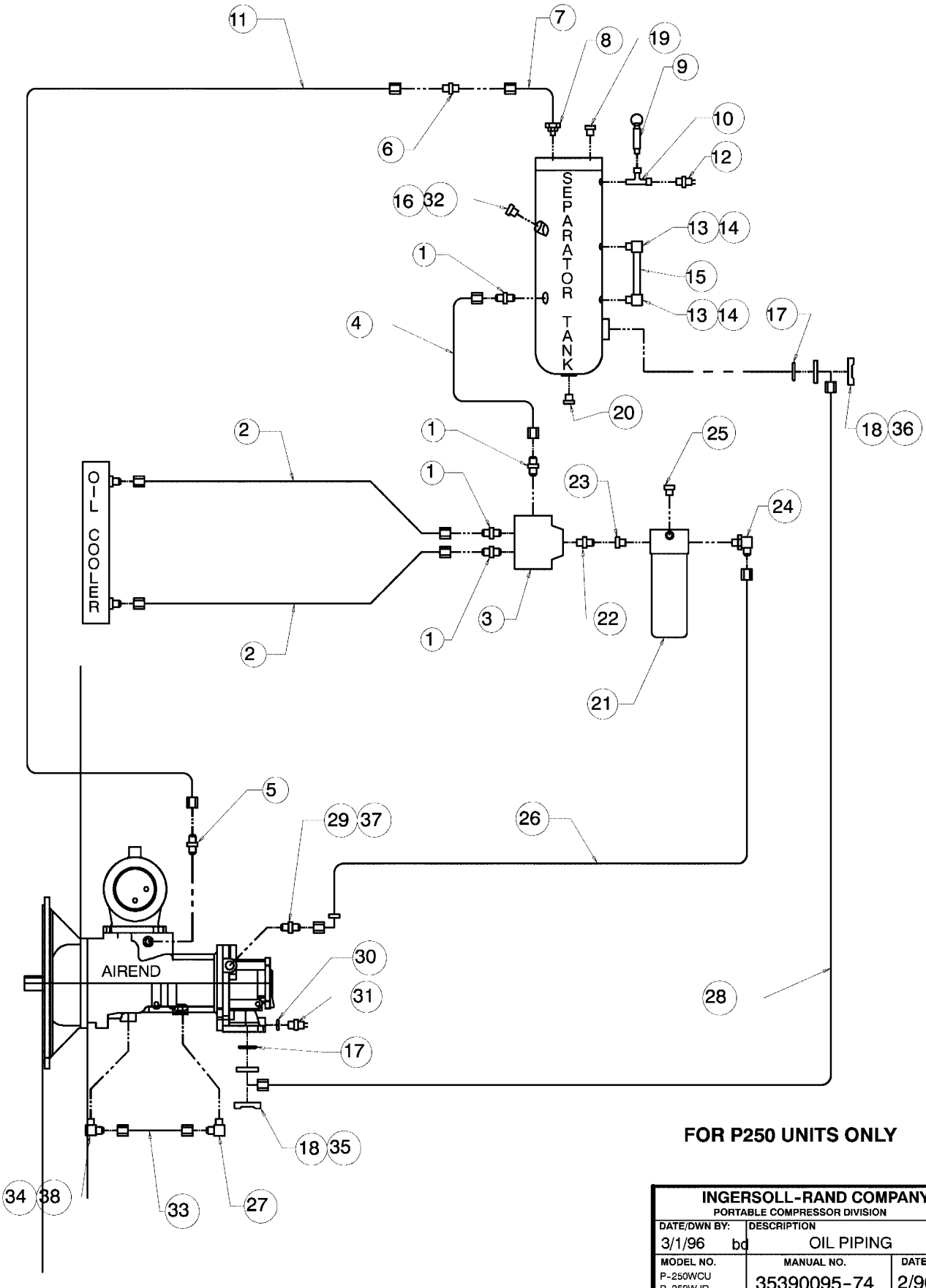
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/1/96 bd	DESCRIPTION: AIR PIPING	
MODEL NO.: P-375WCU, P-375WJD	MANUAL NO.: 35390095-72	DATE/REV: 2/96 A

ITEM		C.P.N.	DESCRIPTION
1		35370386	ELB ML 1/8NPT X 3/8TB
2		35356484	TBG 3/8 OD SYNFLEX
3		95953311	ELB ST 1-1/2NPT
4		35369347	C0NN ML 1/4NPT X 3/8TB
5		36766756	ORF MUF .140
6		95930319	CPLG 1/8NPT
7		19A7J2Z1	NIP 1/4NPT X 7/8 LG
8		36854149	VLV, PRESS REGULATOR (P375)
	*	36847952	VLV, PRESS REGULATOR (HP300)
9		95928172	ELB ST 3/4NPT
10		35373976	TEE ML 1/4NPT X 3/8TB
11		35302314	ADAPTER
12		36783439	VLV, 2 WAY START/RUN
13		95208682	ADAPTER, 1-1/2 NPT X 1-1/2 JIC
14		35369354	ELB ML 1/4NPT X 3/8TB
15		95928040	NIP CL 3/4NPT
16		35576115	VLV, BALL 3/4NPT
17		95242988	NIP CL 1-1/4NPT
18		95937454	CPLG 1-1/2NPT
19		95364469	ELB 1/4MPT X 1/4MPT
20		35322379	VLV, BLOWDOWN
21		35369503	TEE ML 1/4NPT X 3/8TB
22		36881068	ADAPTER 1-1/2NPT X 1-7/8 O-RING
23		36789550	VLV, MIN PRESS 80 PSI
24		95944666	ELB ST 1/4 NPT
25		95940748	BSHG 3/8NPT X 1/4NPT
26		95944625	BSHG 1/2NPT X 1/4NPT
27		35612126	VLV, BALL 1-1/4NPT VENTED
28		36879047	TUBE, SERVICE AIR
29		35114545	TEE ST 1/4NPT
30		95953824	BSHG 1-1/2 NPT X 1-1/4 NPT

* 35387919 DIAPHRAGM REPAIR KIT

FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/4/96 bd	DESCRIPTION AIR PIPING	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-73	DATE/REV: 2/96 A

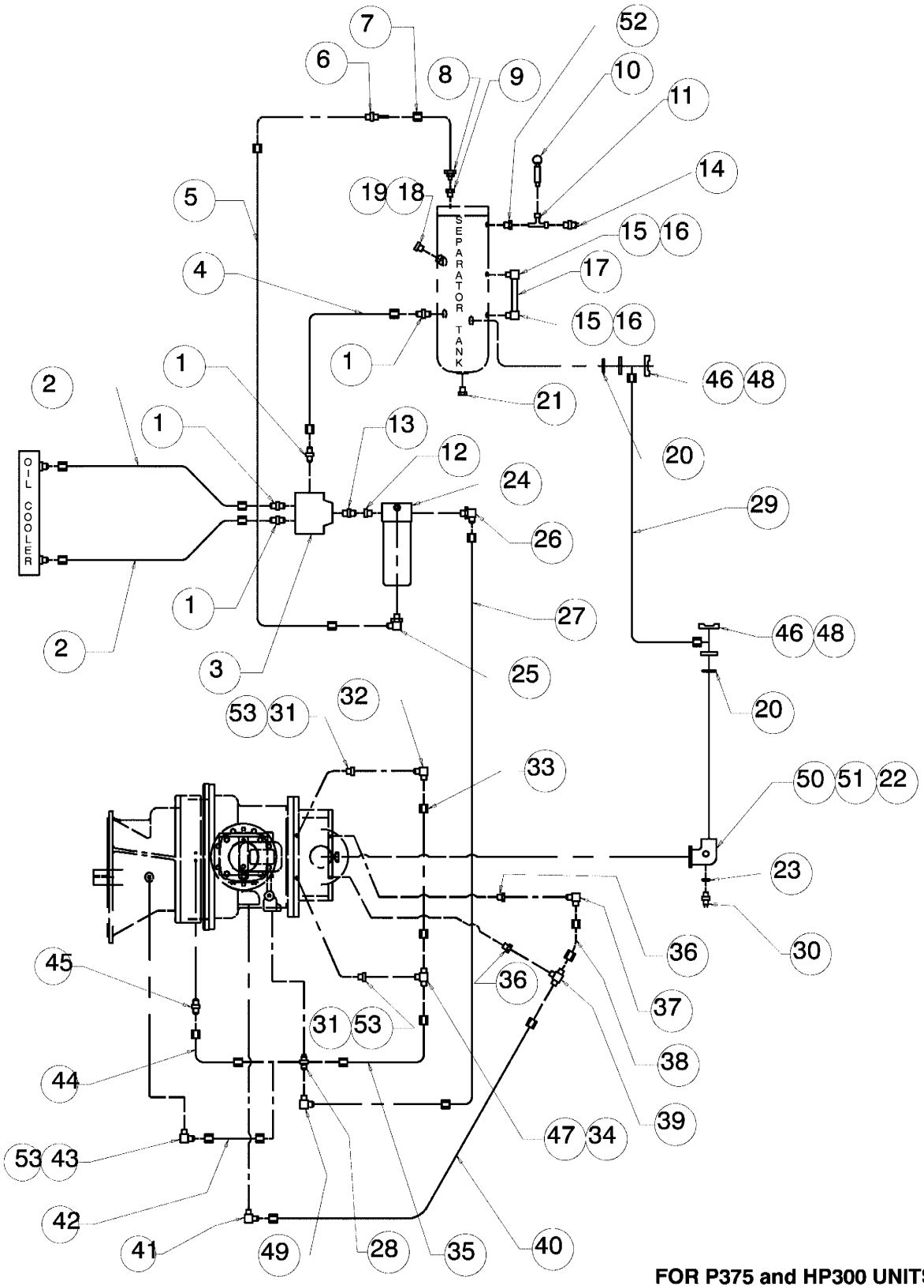


FOR P250 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/1/96 bd	DESCRIPTION: OIL PIPING	
MODEL NO.: P-250WCU, P-250WJD	MANUAL NO.: 35390095-74	DATE/REV.: 2/96 A

ITEM	C.P.N.	DESCRIPTION	
1	95955993	ST. CONN - 1.312 -12 X -16 JIC W/O-RING	
2	36877652	TUBE ASSY	
3	36876787	OIL TEMP BYPASS VALVE	
4	35227909	HOSE ASSY -16 JIC X 25.0	
5	35283472	CONNECTOR .25NPT X -4 JIC	
6	36840437	IN LINE ORIFICE/CHK VLV	
7	36781227	TUBE SCAVENGE LINE	
8	35329309	LENZ FITTING	
9	35325224	VALVE, SAFETY	
10	95944708	ST TEE .50 NPT	
11	35315407	HOSE ASSY -4 JIC	
12	36865756	SW. SHUTDOWN	
13	36860468	SIGHT TUBE FITTING	
14	35324649	GASKET	
15	92121532	TUBE ,SIGHT	
16	35579630	PLUG, VENTED 1.625 O-RING	
17	95357976	O-RING	
18	35292143	FLANGE HALF (2 REQD)	
19	95928230	PLUG, .25 NPT	
20	95280541	PLUG, .75NPT	
21	36739514	FILTER ASSY, OIL	**{PRIOR TO S/N 300624}**
	36897387	FILTER ASSY, OIL	**{BEGIN WITH S/N 300624}**
22	552A10S073P	REDUCER 16 -12	
23	550AI0S060P	UNION FIG -12 W/O-RING	
24	35294750	ELB CONN 1.06 -12 W/O-RING	
25	35288679	PLUG, .562 -18 W/O-RING	
26	36773216	HOSE ASSY -12 JIC	
27	95365094	ELBOW 90□ .56 -18 X -4 JIC	
28	36877926	HOSE ASSY -32 (CU)	
	36877934	HOSE ASSY (JD)	
29	95303392	ADAPTOR .875-14 X -12 JIC	
30	39404165	O-RING	
31	35596436	SW. SHUTDOWN	
32	35279942	O-RING	
33	35589803	TUBE ASSY	
34	35279876	ELBOW 90□ .437 -20 W/O-RING	
35	36877793	SCR FLG HD M12-1.75 X 40 LG (4 REQD)	
36	35291640	SCR M14-2.0 X 40 LG (4 REQD)	**FOR P250 UNITS ONLY**
37	35286533	O-RING	
38	35279959	O-RING	

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
3/1/96 bd	OIL PIPING	
MODEL NO.	MANUAL NO.	DATE/REV:
P-250WCU P-250WJD	35390095-75	5/99 C

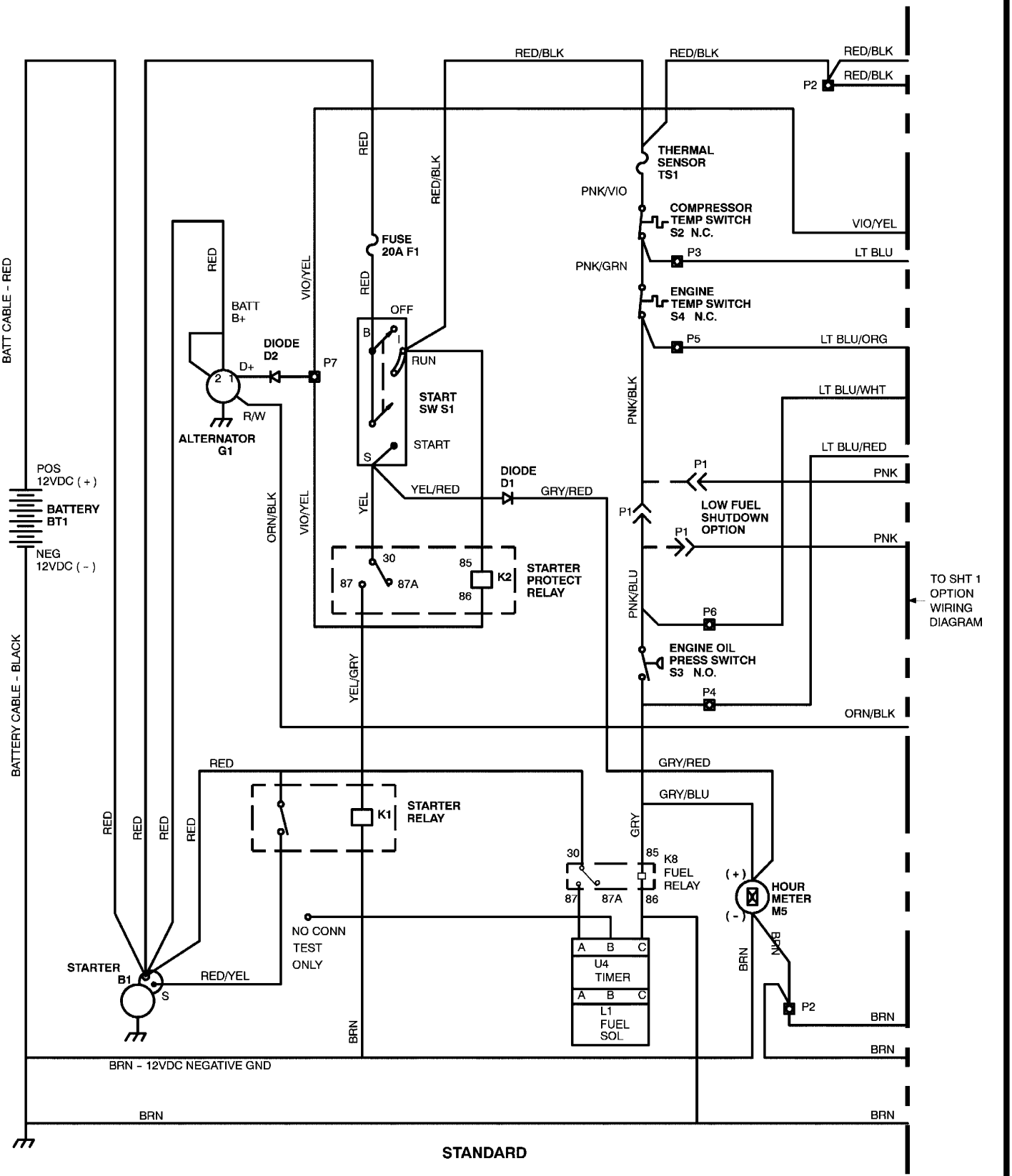


FOR P375 and HP300 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/1/96 bd	DESCRIPTION: OIL PIPING	
MODEL NO. P-375WCU P-375WJD	MANUAL NO. 35390095-76	DATE/REV: 2/96 A

ITEM	C.P.N.	DESCRIPTION	
1	95955993	ST. CONN. 1/312-12 X -16 JIC W/O-RING	**{PRIOR TO S/N 296791}**
	95469128	ELBOW 45° 1 5/16 TO -16	**{BEGIN WITH S/N 296791}**
2	36877652	TUBE ASSY	
3	36876787	OIL TEMP BYPASS VALVE	
4	35227909	HOSE ASSY -16 X 25.0	
5	35315407	HOSE ASSY	
6	36840411	CHECK VALVE	
7	36781227	TUBE SCAVENGE LINE	
8	35329309	LENZ FITTING	
9	95953956	BUSHING .75 NPT - .375 NPT	
10	35325232	VALVE SAFETY (P375)	
	36784114	VALVE SAFETY (HP300)	**{PRIOR TO S/N 296791}**
	36920254	VALVE SAFETY (HP300)	**{BEGIN WITH S/N 296791}**
11	95944708	ST. TEE .50 NPT	
12	552A10S102P	REDUCER 20 -16	
13	550A10S080P	UNION FTG -16 O-RING	
14	36865756	SW. SHUTDOWN	
15	36860468	SIGHT TUBE FITTING	
16	35324649	GASKET	
17	92121532	TUBE, SIGHT	
18	35579630	PLUG, VENTED 1.625	
19	35279942	O-RING	
20	95357976	O-RING	
21	95280541	PLUG HEX .75 NPT X 1.06-12	
22	35375385	SCREW M 16 -2 C 40 LG. (4 REQ'D)	
23	39404165	O-RING	
24	36877363	OIL FILTER	**{PRIOR TO S/N 300624}**
	36897387	OIL FILTER	**{BEGIN WITH S/N 300624}**
25	95365094	ELBOW, 90° .562 -47 W/O-RING	
26	95376133	ELBOW, 90° 1.625 -12 X 1.312 -12 JIC W/O-RING	
27	36792000	HOSE ASSY -32	
28	36845154	OIL MANIFOLD	
29	36877934	HOSE ASSY (JD UNITS)	
	36881084	HOSE ASSY -32 (CU UNITS)	
30	35596436	SW. SHUTDOWN	
31	35287945	EXPANDER .437-20 X .562-18 W/O-RING	
32	35279827	ELBOW, 90° .562-18 W/O-RING	
33	36795482	TUBE ASSY	
34	35279843	TEE BRANCH .562-18 W/O-RING	
35	36846087	TUBE ASSY	
36	36846095	EXPANDER .75-16 X .875-14 W/O-RING	
37	35286491	ELBOW, 90° .875-14 W/O-RING	
38	36846111	TUBE ASSY	
39	36846129	TEE BRANCH .875-14 W/O-RING	
40	36846103	TUBE ASSY	
41	35305622	ELBOW, 90° .75-16 X -10 JIC W/O-RING	
42	36846152	TUBE ASSY	
43	35279884	ELBOW, 45° .437-20 W/O-RING	
44	36879013	TUBE ASSY	
45	95402806	ST. CONN. .437-20 X -6 JIC W/O-RING	
46	35292143	FLANGE HALF (2 REQ'D)	
47	35278571	O-RING	
48	35291640	SCREW M 14-2 X 40 LG. (4 REQ'D)	
49	35292051	ELBOW 90° SW NUT 1.312-12 X -16 JIC	
50	35575570	GASKET	**FOR P375 and HP300 UNITS ONLY**
51	35842160	ELBOW	
52	95953949	BUSHING .75 NPT - .50 NPT	
53	35279959	O-RING	

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 3/1/96 bd	DESCRIPTION: OIL PIPING	
MODEL NO.: P-375WCU, P-375WJD	MANUAL NO.: 35390095-77	DATE/REV: 1/99 C

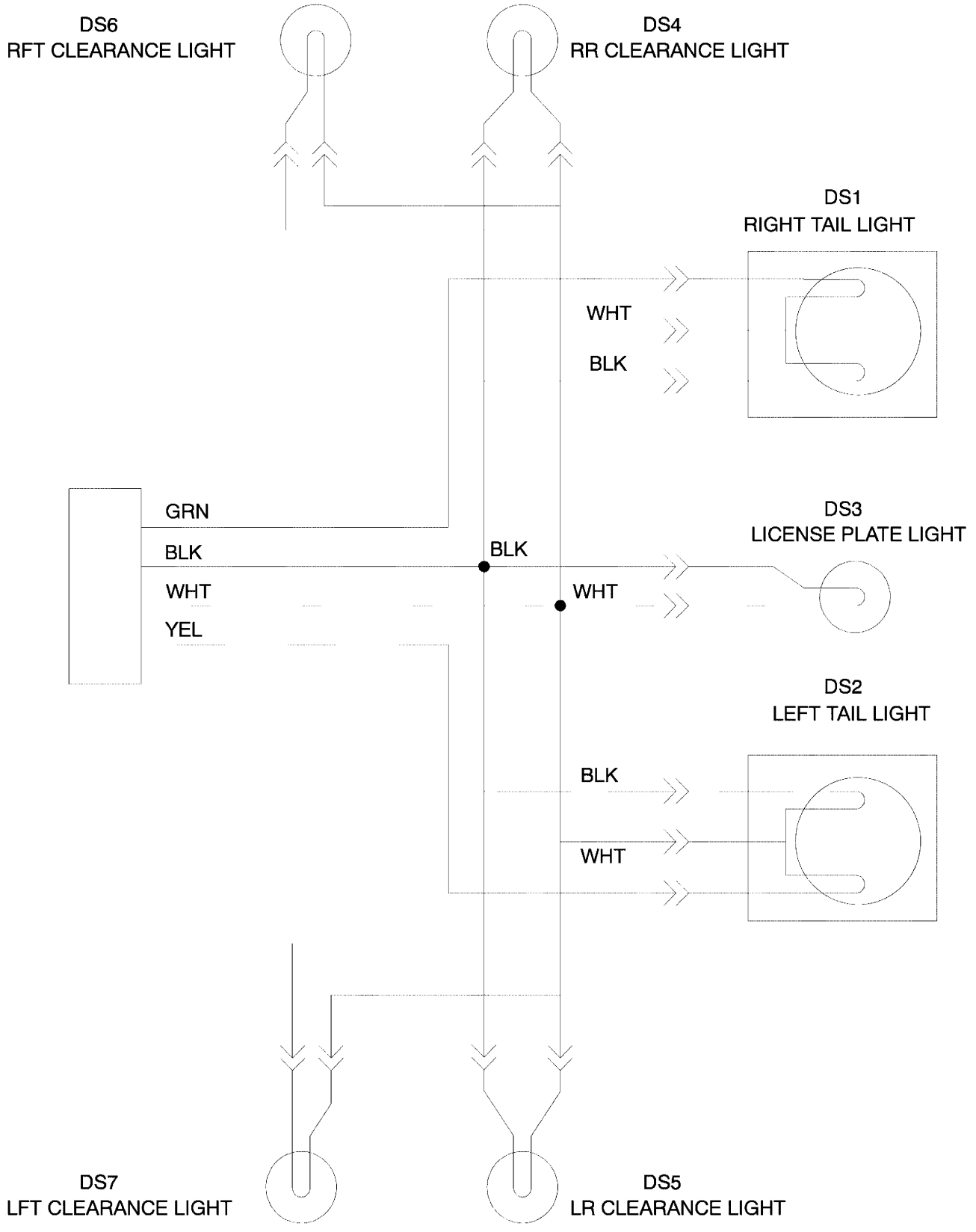


INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 11/12/97 bd	DESCRIPTION STD WIRING DIAGRAM	
MODEL NO. OMEGA	MANUAL NO. 35390095-78	DATE/REV: 11/97 A

ITEM	C.P.N.	DESCRIPTION
B1	*	STARTER
BT1	36844264	BATTERY
D1	35376169	DIODE
D2	36887776	DIODE
F1	36792083	FUSE, 20A
G1	*	ALTERNATOR
K1	36878361	RELAY, STARTER
K2	36856250	RELAY, SHUT-DOWN
K4	36878361	RELAY, FUEL
L1	*	SOLENOID, FUEL
M5	36879880	HOURMETER
S1	36884211	SWITCH, START
S2	35596436	SWITCH, CPRSR TEMP
S3	36878379	SWITCH, ENGINE OIL
S4	36880706	SWITCH, ENGINE TEMPERATURE
TS1	36865756	SENSOR, THERMAL
U4	36887321	TIMER
W1	36884682	HARNESS, ENGINE
W2	36886265	HARNESS, ADAPTER EPA

* FURNISHED BY ENGINE MANUFACTURER

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
11/12/97 bd	STD WIRING DIAGRAM	
MODEL NO.	MANUAL NO.	DATE/REV:
OMEGA	35390095-79	1/99 B



NOTE:
WHITE WIRE MAY BE FRAME GROUND.

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 11/12/97 bd	DESCRIPTION STD WIRING DIAGRAM	
MODEL NO. OMEGA	MANUAL NO. 35390095-80	DATE/REV: 11/97 A

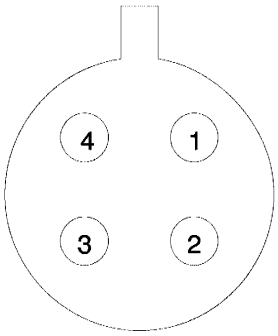
ITEM	C.P.N.	DESCRIPTION
DS1	36788081	LAMP ASSEMBLY
DS2	36788081	LAMP ASSEMBLY
DS3	36895860	LIGHT, LICENSE
DS4	35367044	LAMP, RED CLEARANCE
DS5	35367051	LAMP, YELLOW CLEARANCE
DS6	35367044	LAMP, RED CLEARANCE
DS7	35367051	LAMP, YELLOW CLEARANCE
W2	36895852	HARNESS, 2-LIGHT SYSTEM

AVAILABLE FROM I-R:

PLUG	SOCKET
35288760	35288752

NOTE:

STANDARD MACHINE IS SUPPLIED WITHOUT PLUG ON LIGHT HARNESS.

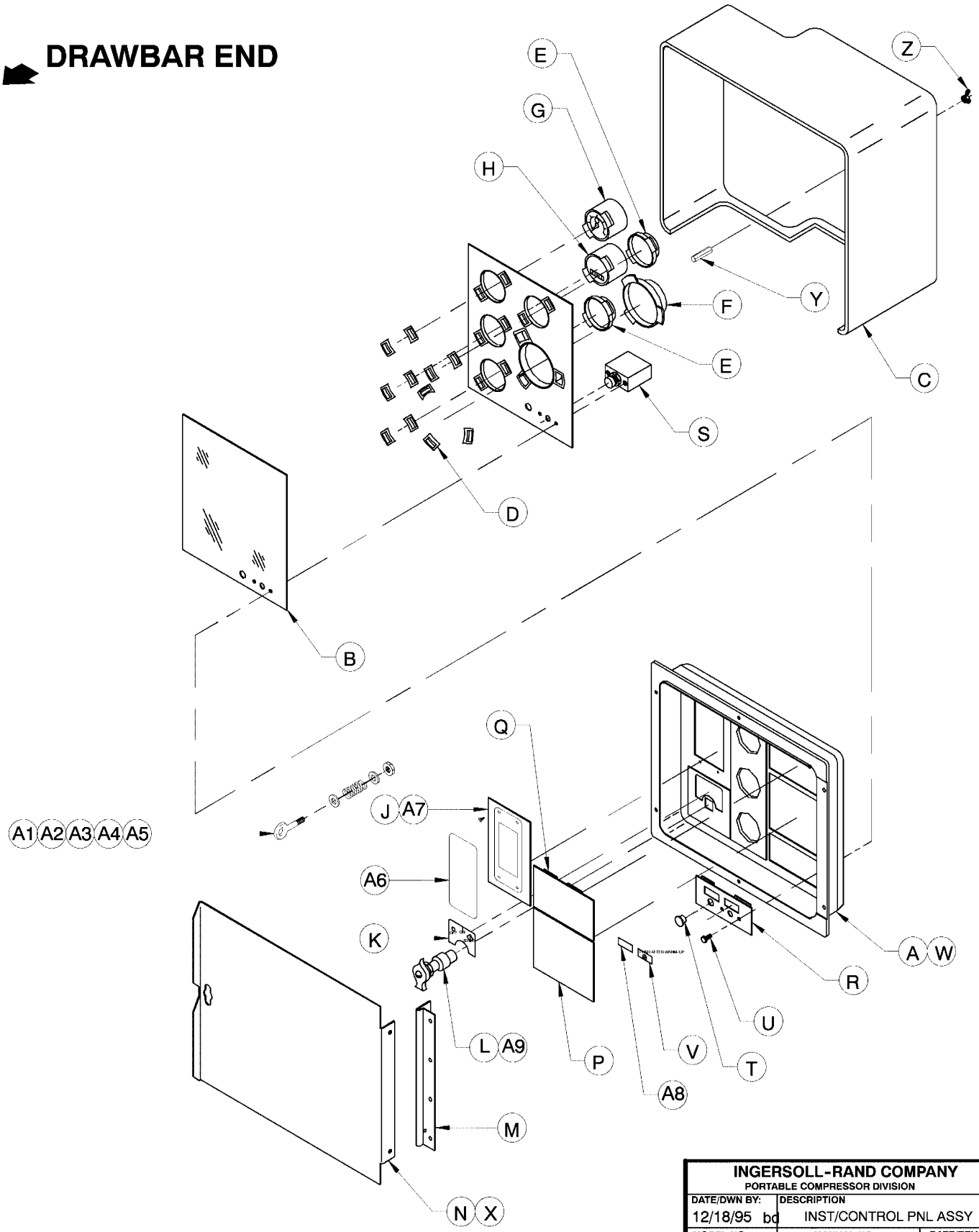


PLUG / SOCKET WIRING CONNECTIONS

1 YELLOW - LEFT TURN AND STOP-LIGHT
2 BLACK - TAIL LIGHTS
3 WHITE - GROUND
4 GREEN- RIGHT TURN AND STOP-LIGHT

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 11/12/97 bd	DESCRIPTION: STD WIRING DIAGRAM	
MODEL NO.: OMEGA	MANUAL NO.: 35390095-81	DATE/REV: 11/97 A

DRAWBAR END



INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
12/18/95 bd	INST/CONTROL PNL ASSY	
MODEL NO. P250WCU/JD P375WCU/JD	MANUAL NO. 35390095-82	DATE/REV: 12/96 C

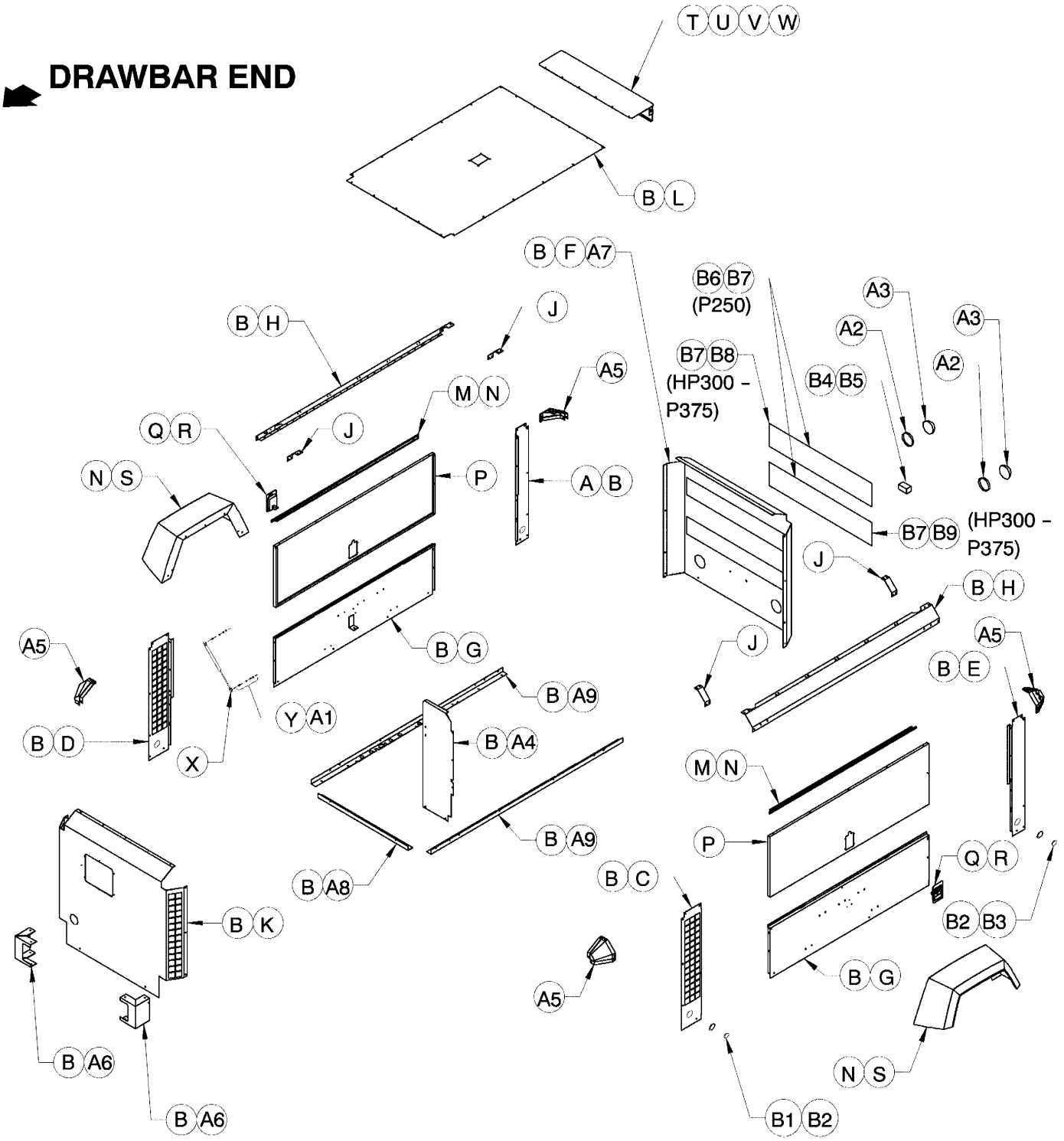
ITEM		C.P.N.	QTY	DESCRIPTION	
A		36884492	1	RECESSED FRAME ASSEMBLY	
B		35390368	1	PANEL, ACRYLIC	
C		36879948	1	COVER, REAR CONTROL PANEL	
D		36880730	11	CLIP, GAUGE RETAINING	
E		35390319	2	CAP, 2" GAUGE	
F		35390301	1	CAP, 3.38" GAUGE	
G		36879898	1	GAUGE, 150 PSI PRESSURE (P250, P375)	
		36879906	1	GAUGE, 250 PSI PRESSURE (HP300)	
H		36879880	1	HOURMETER	
J		35390343	1	COVER, WARNING MODULE	
K		36879971	1	DECAL, SWITCH	
L		36884211	1	SWITCH, IGNITION	
M		36879930	1	HINGE, CONTROL PANEL	
N		36879922	1	DOOR, INSTRUMENT PANEL	
		54523618	1	DOOR, GALVANNEAL INST PANEL	
P		35390293	1	COVER, 3.38" BEZEL	
Q		35390285	1	COVER, 2.06" BEZEL	
R		35390327	1	COVER, SWITCH PANEL (P250 ONLY)	
	*	36879708	1	BEZEL, SWITCH PANEL (HP300 & P375 ONLY)	
S	*	36783439	1	VALVE, 2-WAY START-RUN (HP300 & P375 ONLY)	
T	*	35390335	1	PLUG (HP300 & P375 ONLY)	
U	*	36882207	2	SCREW, HEX HD M06-100 X 14 (HP300 & P375 ONLY)	
V	*	36879963	1	DECAL, START-RUN (HP300 & P375 ONLY)	
W		36881118	6	RIVET	**{PRIOR TO S/N 296411}**
		36920486	6	RIVET 3/16 SS	**{BEGIN WITH S/N 296411}**
X		36877587	2	RIVET	
Y		36879849	1	STANDOFF, M06	
Z		36881167	1	WINGNUT, M06	
A1		35607829	1	EYEBOLT	
A2		95935029	1	WASHER, FLAT	
A3		36772028	1	WASHER, PLASTIC	
A4		35607837	1	SPRING	
A5		95923298	1	NUT, HEX 1/4-20	
A6		36882173	1	LABEL, BLANK WARNING MODULE	
A7		35390400	2	SCREW, FLAT PH #6 X 3/8	
A8	*	36879955	1	DECAL, ETHER	
A9		36884229	1	KEY	

* ITEMS ON HP300 AND P375 UNITS ONLY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/4/96 bd	INST/CONTROL PNL ASSY	
MODEL NO. P250WCU/JD P375WCU/JD	MANUAL NO. 35390095-83	DATE/REV: 7/00 F

BEGINNING WITH SN 296791

DRAWBAR END



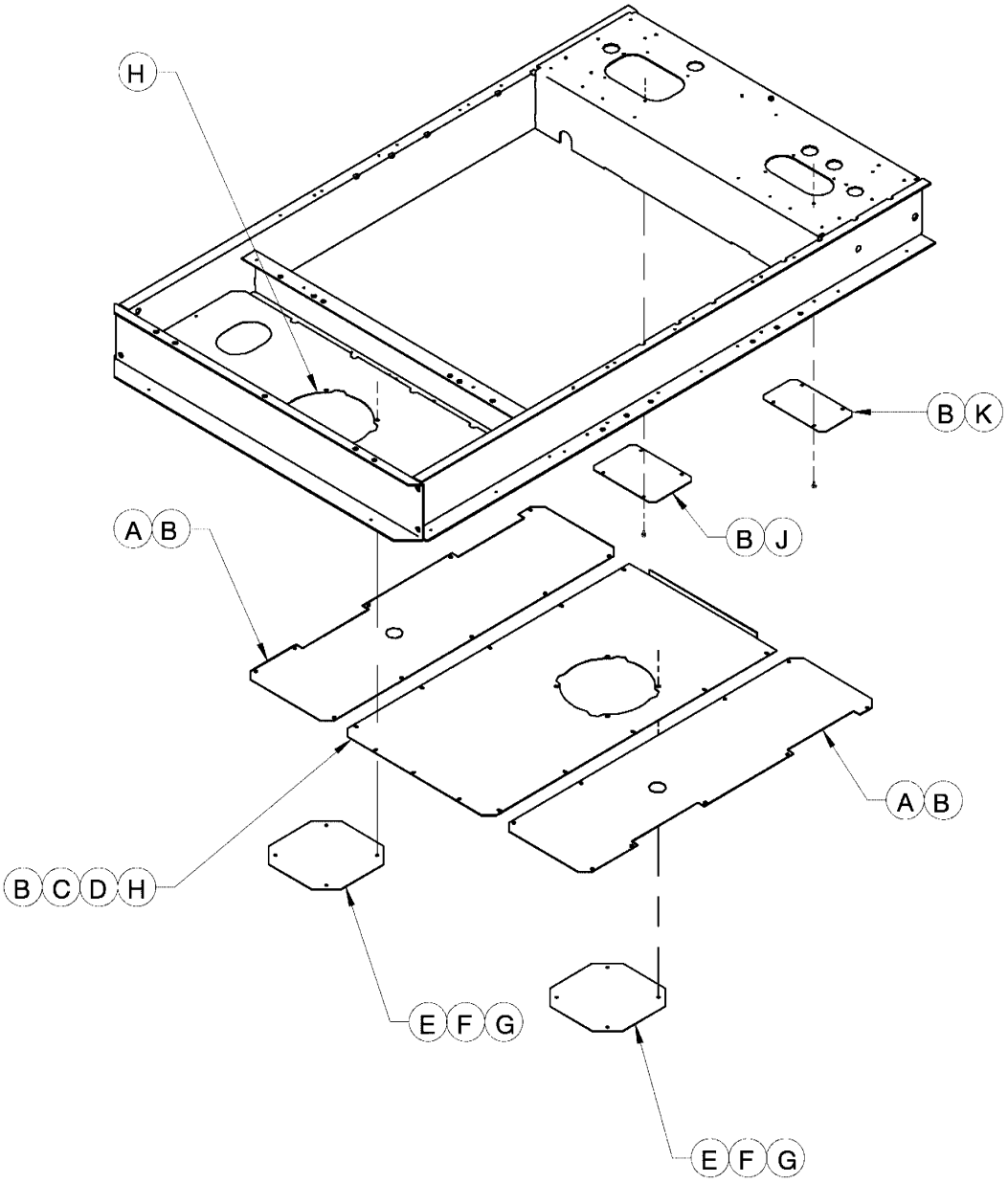
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/16/96 bd	ENCLOSURE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-84	12/98 H

ITEM		C.P.N.	QTY	DESCRIPTION	
A		36894319	1	PANEL, CRBSD REAR SIDE	
B		36797652	76	SCREW, TAPPING M06-100 X 12	
C		36894327	1	PANEL, STSD FRONT SIDE	
D		36894335	1	PANEL, CRBSD FRONT SIDE	
E		36894301	1	PANEL, STSD REAR SIDE	
F		36897205	1	PANEL, REAR END CAP	
G		36897544	2	PANEL, LOWER SIDE	
H		36877066	2	RAIL, TOP	
J		36755742	4	SRRIP, CONNECTOR	
K		36877132	1	PANEL, FRONT END CAP (P375 & HP300)	
		36885929	1	PANEL, FRONT END CAP (P250)	
L		36877090	1	PANEL, FRONT ROOF	
M		36883437	2	HINGE, SIDE DOOR	
N		92368687	60	SCREW, TAPPING M06-100 X 14	
P		36879161	2	DOOR, SIDE	
Q		36793602	2	LATCH, DOOR SLAM	
R		36794816	8	RIVET	
S		36877579	2	FENDER	
T		36877082	1	PANEL, REAR ROOF	
U		36877181	1	HINGE, ROOF	
V		36843282	11	RIVET	
W		35278720	2	PIN, QUICK RELEASE	
X		35600261	4	SPRING, GAS	
Y		35337328	8	STUD, BALL M08-125	
Z		~		~	
A1		36881886	8	NUT, HEX M08-1.25	
A2		36787968	2	GROMMET	
A3		36788081	2	LIGHT	
A4		36877165	1	BAFFLE, AIR INTAKE	
A5	*	36755981	4	PIECE, END CAP CORNER	
A6		36879062	2	COVER, FRONT CORNER	
A7		36794774	18	GROMMET, SCREW	
A8		36879138	1	SUPPORT, FRONT ENCLOSURE	
A9		36879146	2	SUPPORT, SIDE ENCLOSURE	
B1		35367051	2	LIGHT, YELLOW CLEARANCE	
B2		36893634	4	GROMMET, CLEARANCE LIGHT	
B3		35367044	2	LIGHT, RED CLEARANCE	
B4		36895860	1	LIGHT, LICENSE	
B5		36782837	2	SCREW, HEX SHT MTL #10 X 1	
B6		36885952	2	PANEL, ACCESS (P250)	**{BEGIN WITH S/N 296791}**
B7		36885085	16	SCREW, TAPPING 1/4-10 X 3/4	
B8		36921161	1	LOUVER, TOP ACCESS (HP300-P375)	**{BEGIN WITH S/N 296791}**
B9		36921179	1	PANEL, ACCESS (HP300-P375)	**{ FROM S/N 296792 TO 300870}**
		36885952	1	PANEL, ACCESS (HP300-P375)	**{BEGIN WITH S/N 300871}**

* FURNISHED WITH END CAPS.

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/16/96 bd	ENCLOSURE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-85	7/00 K

DRAWBAR END

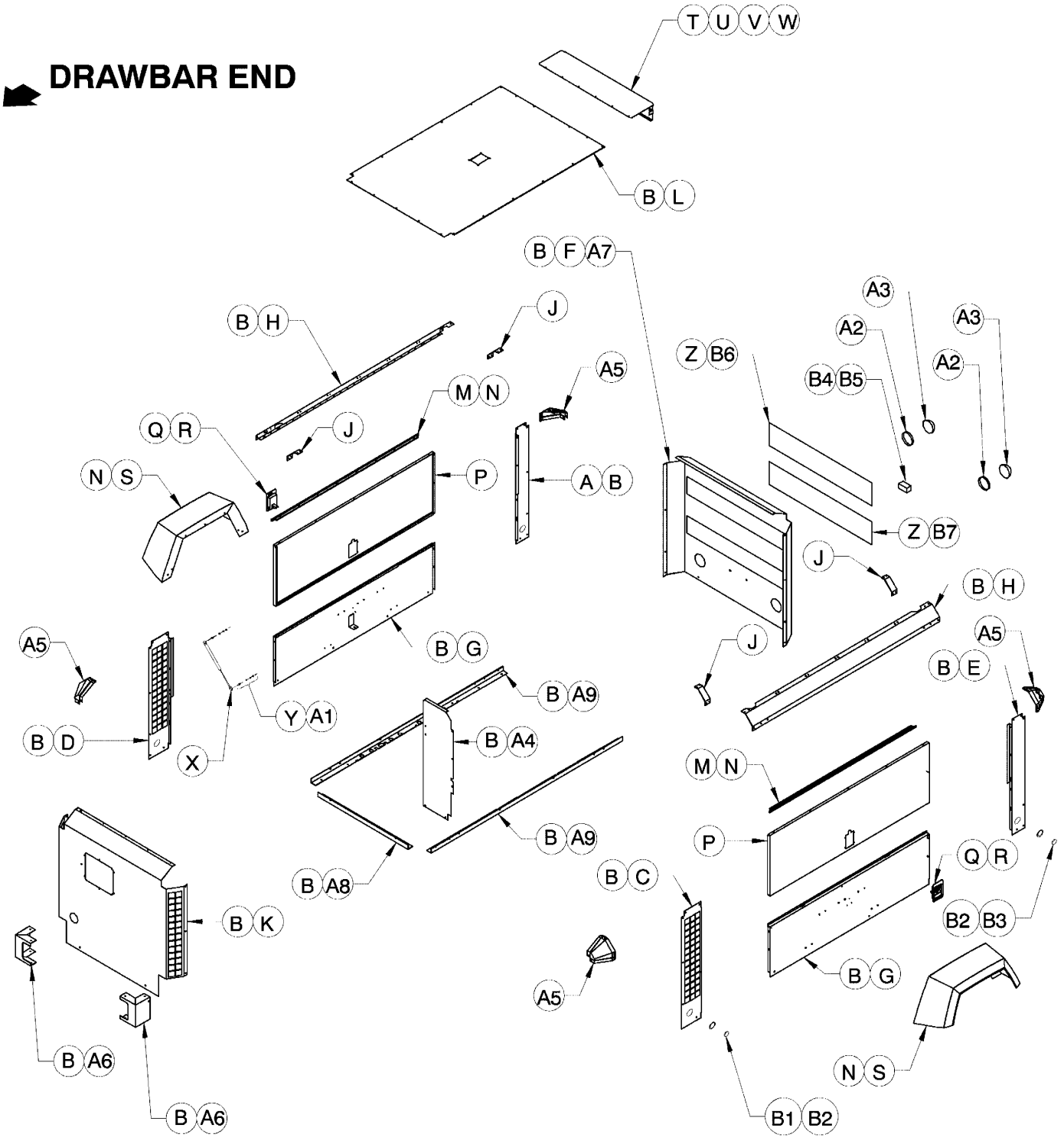


INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/16/96 bd	ENCLOSURE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-86	7/00 D

ITEM	C.P.N.	QTY	DESCRIPTION
A	36879112	2	PAN,BELLY
B	36797652	21	SCREW, TAPPING M06-100 X 12
C	36879385	1	PAN, ENGINE-AIR END BELLY
D	35300771	10	SCREW, TAPPING M06-100 X 20
E	35279413	2	COVER, BELLY PAN
F	35256445	8	RETAINER
G	35256429	8	STUD, SHORT
H	35256452	8	RECEPTACLE, CLIP-ON
J	36879104	1	COVER, COOLER DRAIN
K	36867174	1	COVER, ENGINE OIL DRAIN

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/16/96 bd	ENCLOSURE COMPLETE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-87	7/00 D

DRAWBAR END



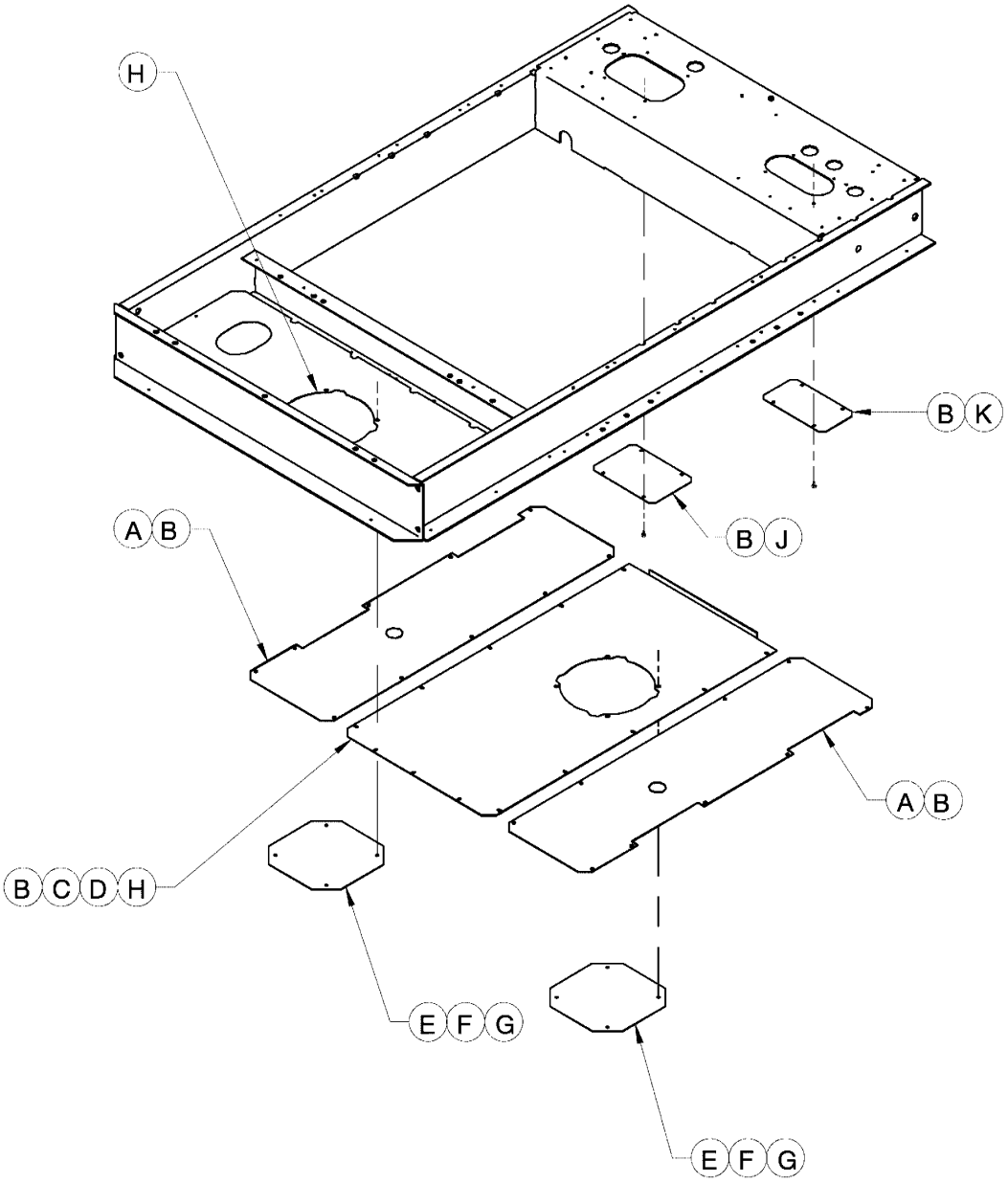
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
7/04/00 bd	GALVANNEAL ENCLOSURE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-88	7/00 A

ITEM		C.P.N.	QTY	DESCRIPTION
A		54523675	1	PANEL, CRBSD REAR SIDE
B		36797652	76	SCREW, TAPPING M06-100 X 12
C		54523717	1	PANEL, STSD FRONT SIDE
D		54523725	1	PANEL, CRBSD FRONT SIDE
E		54523659	1	PANEL, STSD REAR SIDE
F		54523733	1	PANEL, REAR END CAP
G		54523758	2	PANEL, LOWER SIDE
H		54523196	2	RAIL, TOP
J		54523782	4	SRRIP, CONNECTOR
K		54523238	1	PANEL, FRONT END CAP
L		54523212	1	PANEL, FRONT ROOF
M		36883437	2	HINGE, SIDE DOOR
N		92368687	60	SCREW, TAPPING M06-100 X 14
P		54523337	2	DOOR, SIDE
Q		36793602	2	LATCH, DOOR SLAM
R		36794816	8	RIVET
S		36877579	2	FENDER
T		54523204	1	PANEL, REAR ROOF
U		36877181	1	HINGE, ROOF
V		36843282	11	RIVET
W		35278720	2	PIN, QUICK RELEASE
X		35600261	4	SPRING, GAS
Y		35337328	8	STUD, BALL M08-125
Z		36885085	16	SCREW, TAPPING 1/4-10 X 3/4
A1		36881886	8	NUT, HEX M08-1.25
A2		36787968	2	GROMMET
A3		36788081	2	LIGHT
A4		54523253	1	BAFFLE, AIR INTAKE
A5	*	36755981	4	PIECE, END CAP CORNER
A6		54523261	2	COVER, FRONT CORNER
A7		36794774	18	GROMMET, SCREW
A8		54523311	1	SUPPORT, FRONT ENCLOSURE
A9		54523329	2	SUPPORT, SIDE ENCLOSURE
B1		35367051	2	LIGHT, YELLOW CLEARANCE
B2		36893634	4	GROMMET, CLEARANCE LIGHT
B3		35367044	2	LIGHT, RED CLEARANCE
B4		36895860	1	LIGHT, LICENSE
B5		36782837	2	SCREW, HEX SHT MTL #10 X 1
B6		54523766	1	LOUVER, TOP ACCESS (HP300-P375)
B7		54523626	1	PANEL, ACCESS (P375)
		54523774	1	PANEL, ACCESS (HP300)

* FURNISHED WITH END CAPS.

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
7/4/00 bd	GALVANNEAL ENCLOSURE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-89	7/00 A

DRAWBAR END



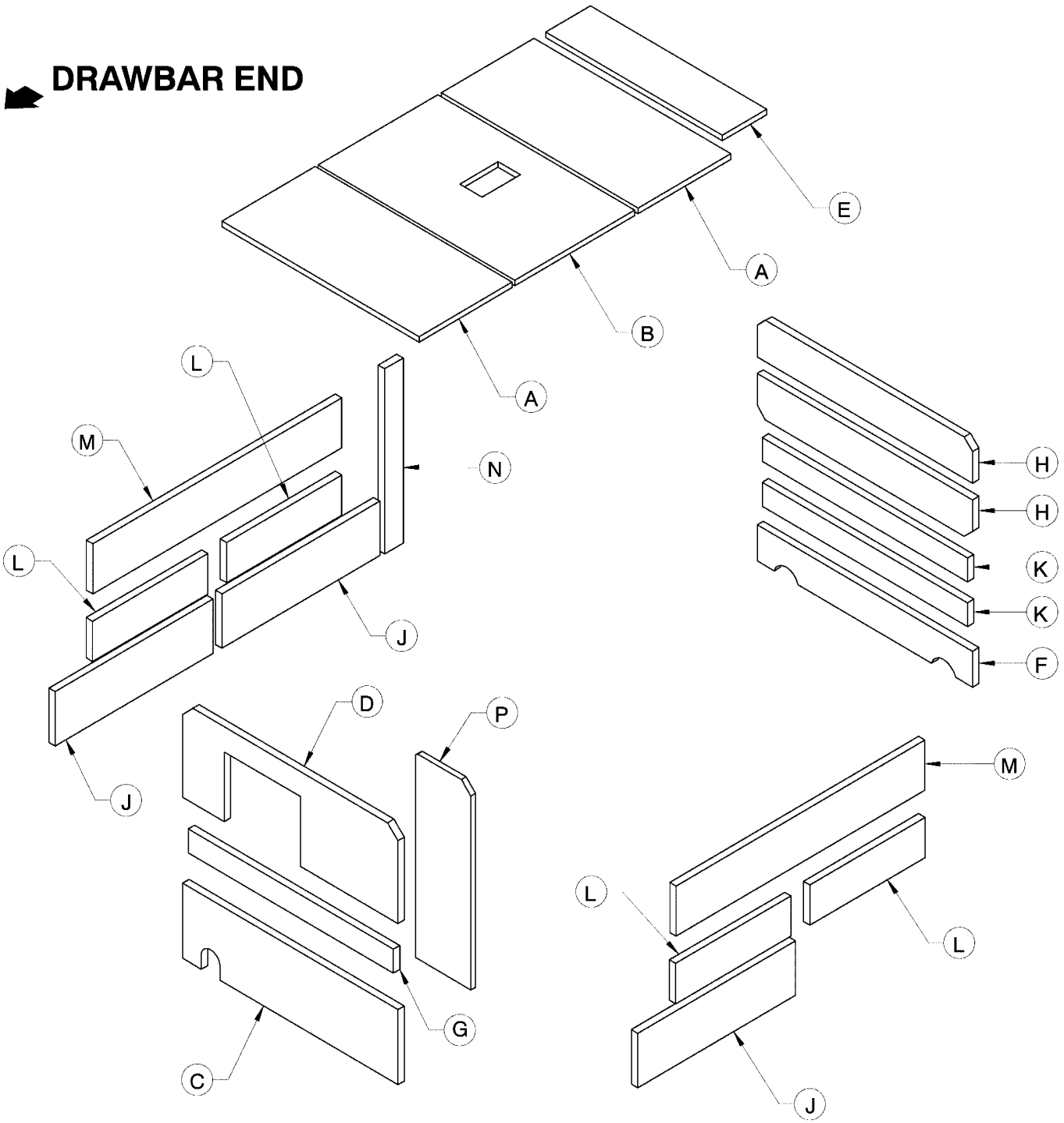
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 7/4/00 bd	DESCRIPTION: ENCLOSURE COMPLETE	
MODEL NO.: P250WCU/JD P375WCU/JD	MANUAL NO.: 35390095-86	DATE/REV: 7/00 A

ITEM	C.P.N.	QTY	DESCRIPTION
A	54523303	2	PAN,BELLY
B	36797652	21	SCREW, TAPPING M06-100 X 12
C	54523345	1	PAN, ENGINE-AIR END BELLY
D	35300771	10	SCREW, TAPPING M06-100 X 20
E	35279413	2	COVER, BELLY PAN
F	35256445	8	RETAINER
G	35256429	8	STUD, SHORT
H	35256452	8	RECEPTACLE, CLIP-ON
J	54523295	1	COVER, COOLER DRAIN
K	54523170	1	COVER, ENGINE OIL DRAIN

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
7/4/00 bd	GALVANNEAL ENCLOSURE	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-91	7/00 A

BEGINNING WITH SN 296791

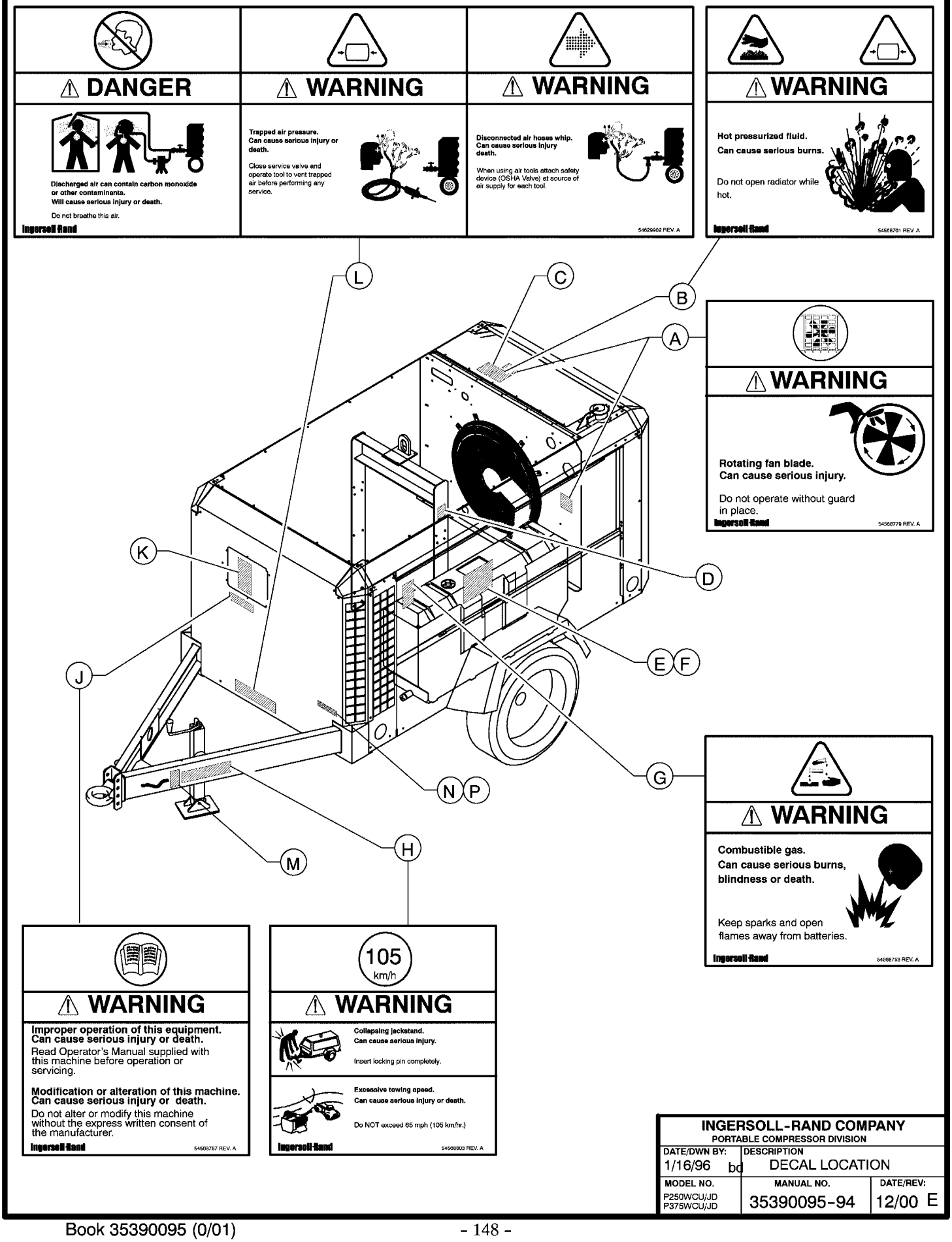
DRAWBAR END



INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/5/96 bd	FOAM INSULATION COMPL	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-92	1/99 C

ITEM	C.P.N.	QTY	DESCRIPTION	
A	36879419	2	PANEL, ROOF ACST	
B	36879401	1	PANEL, MIDDLE ROOF ACST	
C	36879229	1	PANEL, BOTTOM FRONT END ACST	
D	36879237	1	PANEL, TOP FRONT END ACST	
E	36879377	1	PANEL, RADIATOR DOOR ACST	
F	36879252	1	PANEL, BOTTOM REAR END ACST	
G	36879260	1	PANEL, MIDDLE REAR END ACST	
H	36879278	2	PANEL, TOP REAR END ACST	
J	36879294	3	PANEL, BOTTOM SIDE DOOR ACST	
K	36879260	2	PANEL, MIDDLE REAR END ACST (P250)	**{PRIOR TO S/N 296791}**
	36921294	2	PANEL, ACCESS ACST (HP300 - P375)	**{BEGIN WITH S/N 296791}**
L	36879450	4	PANEL, MIDDLE SIDE DOOR ACST	
M	36879468	2	PANEL, TOP SIDE DOOR ACST	
N	36879427	1	PANEL, RIGHT REAR SIDE ACST	
P	36879435	1	PANEL, FRONT INTERIOR BAFFLE ACST	

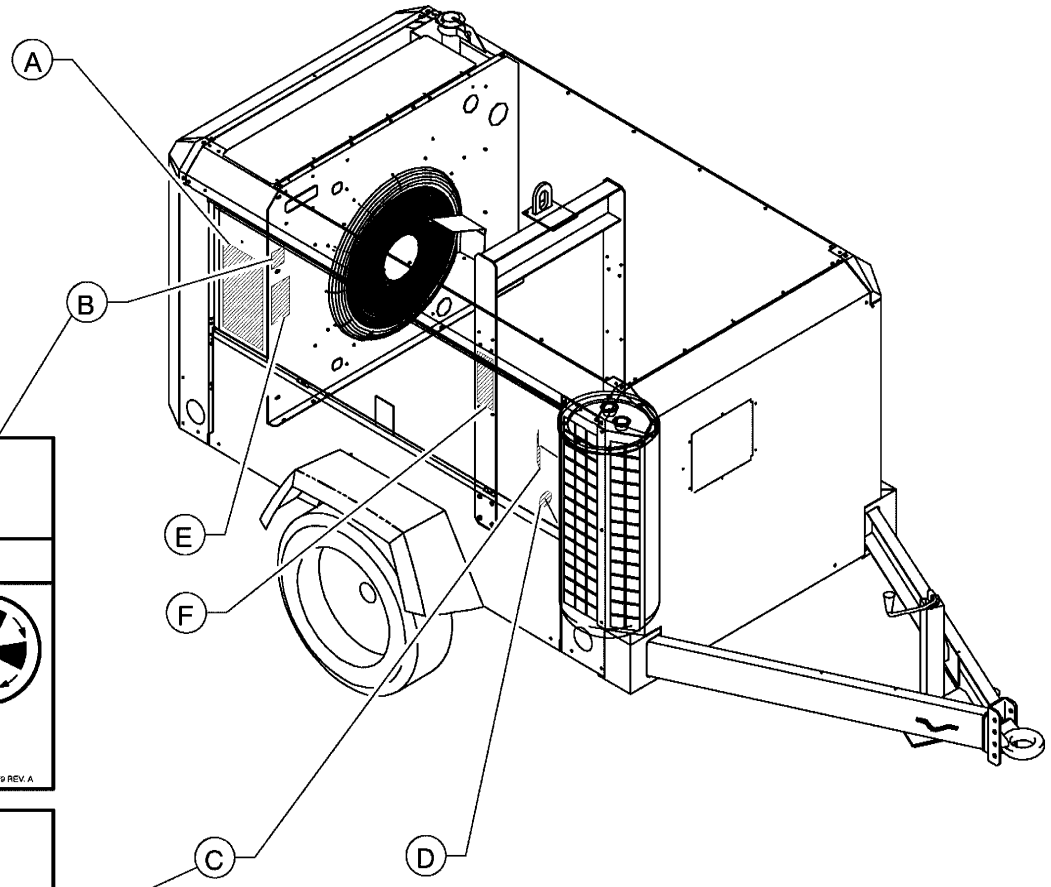
INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/5/96 bd	FOAM INSULATION COMPL	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-93	1/99 C



INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/16/96 bd	DECAL LOCATION	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-94	12/00 E

ITEM	C.P.N.	DESCRIPTION
A	54568779	WARNING, ROTATING FAN
B	54568761	WARNING, HOT FLUID
C	54604962	NOTICE, RADIATOR FILL
D	54625207	DIESEL FUEL
E	36522290	SAFETY CARD
F	36847861	CABLE TIE
G	54568753	WARNING, BATTERY
H	54568803	WARNING, TOWING
J	54568787	WARNING, IMPROPER OPERATION
K	36879054	OPERATING INSTRUCTIONS
L	54629902	DANGER/WARNING, COMBO
M	54604921	NOTICE, TOW CHAINS
N	36531176	V.I.N.
P	36533081	V.I.N. OVERLAY

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/16/96 bd	DECAL LOCATION	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-95	12/00 E



INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY: 1/16/96 bd	DESCRIPTION DECAL LOCATION	
MODEL NO. P250WCU/JD P375WCU/JD	MANUAL NO. 35390095-96	DATE/REV: 12/00 D

ITEM	C.P.N.	DESCRIPTION
A	54496559	WIRING DIAGRAM
B	54568779	WARNING, ROTATING FAN
C	54568795	WARNING, HIGH PRESSURE
D	54604970	OIL FILL
E	54435086	GENERAL DATA
F	36529394	REGULATION ADJUSTMENT

INGERSOLL-RAND COMPANY PORTABLE COMPRESSOR DIVISION		
DATE/DWN BY:	DESCRIPTION	
1/16/96 bd	DECAL LOCATION	
MODEL NO.	MANUAL NO.	DATE/REV:
P250WCU/JD P375WCU/JD	35390095-97	12/00 E

SECTION 12

John Deere Operation & Maintenance Manual

Bulletin# OMRG18293 Issue H4)

Reproduced by Permission of John Deere Inc.

Series 300
3029, 4039, 4045, 6059, and 6068
OEM Diesel Engines

Deere Power Systems Group
OMRG18293 Issue H4

(This manual replaces OMRG18293 C3)

LITHO IN U.S.A.
ENGLISH

Introduction

READ THIS MANUAL CAREFULLY to learn how to operate and service your engine corectly. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your engine and should remain with the engine when you sell it.

MEASUREMENTS IN THIS MANUAL are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by standing at the drive or flywheel end (rear) of the engine and facing toward the front of the engine.

WRITE ENGINE SERIAL NUMBERS and the option codes in the spaces indicated in the Specifications section. Accurately record all the numbers. Your dealer also needs these numbers when parts are ordered. File the identification numbers in a secure place off the engine.

SETTING FUEL DELIVERY beyond published factory specifications or otherwise overpowering will result in loss of warranty protection for this engine.

CERTAIN ENGINE ACCESSORIES such as radiator, air cleaner, and instruments are optional equipment on John Deere OEM Engines. These accessories may be provided by the equipment manufacturer instead of John Deere. This operator's manual applies only to the engine and those options available through the John Deere distribution network.

Engine Owner

JOHN DEERE ENGINE OWNER:

Don't wait until you need warranty or other service to meet your local John Deere Engine Distributor or Service Dealer.

Learn who he is and where he is. At your first convenience, go meet him. He'll want to get to know you and to learn what your needs might be.

UTILISATEURS DE MOTEURS JOHN DEERE:

N'attendez pas d'être obligé d'avoir recours a votre Concessionnaire ou Point de Service le plus proche pour vous adresser a lui.

Renseignez-vous des que possible pour l'identifier et le localiser. A la premiere occasion, prenez contact avec lui et faites-vous connaître. Il sera lui aussi heureux de faire votre connaissance et de savoir que vous pourrez compter sur lui le moment venu.

AN DEN BESITZER DES JOHN DEERE MOTORS:

Warten Sie nicht auf einen evt. Reparaturfall um den nächstgelegenen John Deere Händler kennen zu lernen.

Machen Sie sich bei ihm bekannt und nutzen Sie sein "Service Angebot".

PROPRIETARIO DEL MOTORE JOHN DEERE:

Non aspetti fino a quando ha bisogno della garanzia o di un altro tipo di assistenza per incontrarsi con il Suo Concessionario che fornisce l'assistenza tecnica.

Impari a conoscere chi è e dove si trova. Alla Sua prima occasione cerchi d'incontrarlo. Egli desidera farsi conoscere e conoscere le Sue necessità.

PROPIETARIO DE EQUIPO JOHN DEERE:

No espere hasta necesitar servicio de garantía o de otro tipo para conocer a su Distribuidor de Motores John Deere o al Concesionario de Servicio.

Entérese de quién es, y dónde está situado. Cuando tenga un momento, vaya a visitarlo. A él le gustará conocerlo, y saber cuáles podrían ser sus necesidades.

JOHN DEERE MOTORÄGARE:

Vänta inte med att besöka Din John Deere återförsäljare till dess att Du behöver service eller garanti reparation.

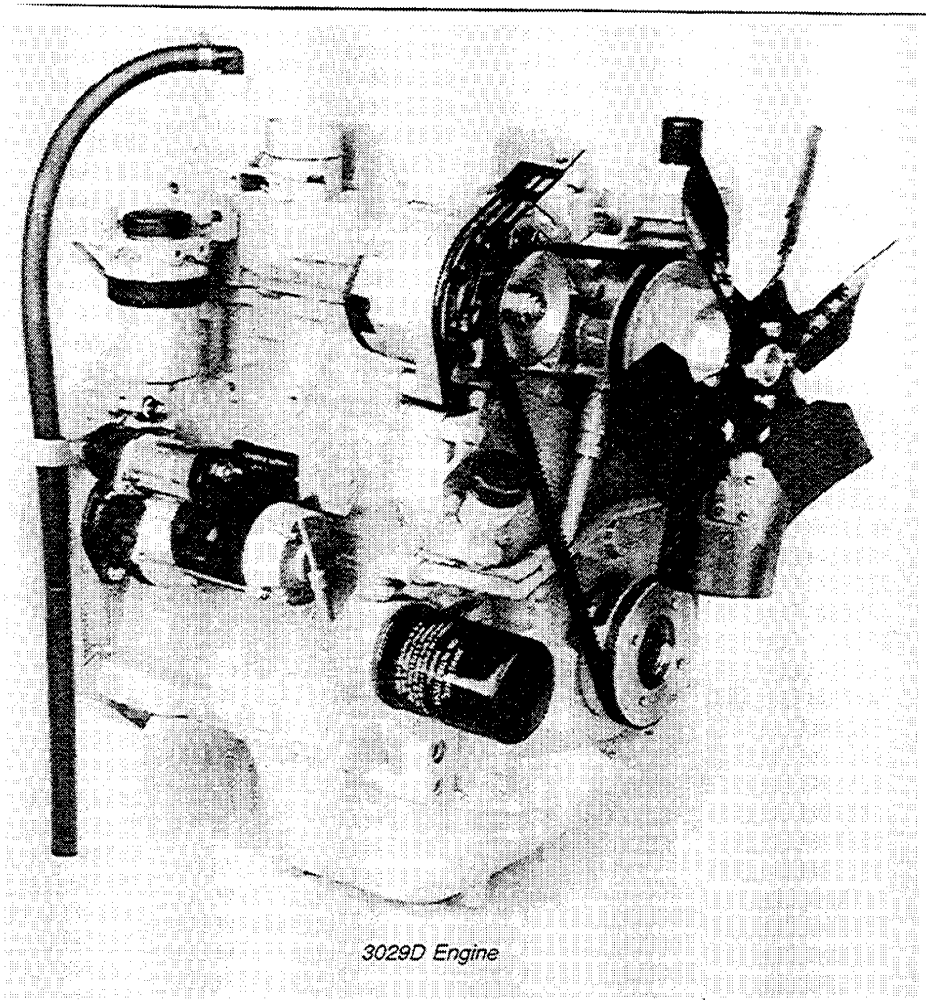
Bekanta Dig med var han är och vem han är. Tag första tillfälle att besöka honom. Han vill också träffa Dig för att få veta vad Du behöver och hur han kan hjälpa Dig.

RG6656 -UN-22FEB93

RG,OWNER -19-18FEB93

110894

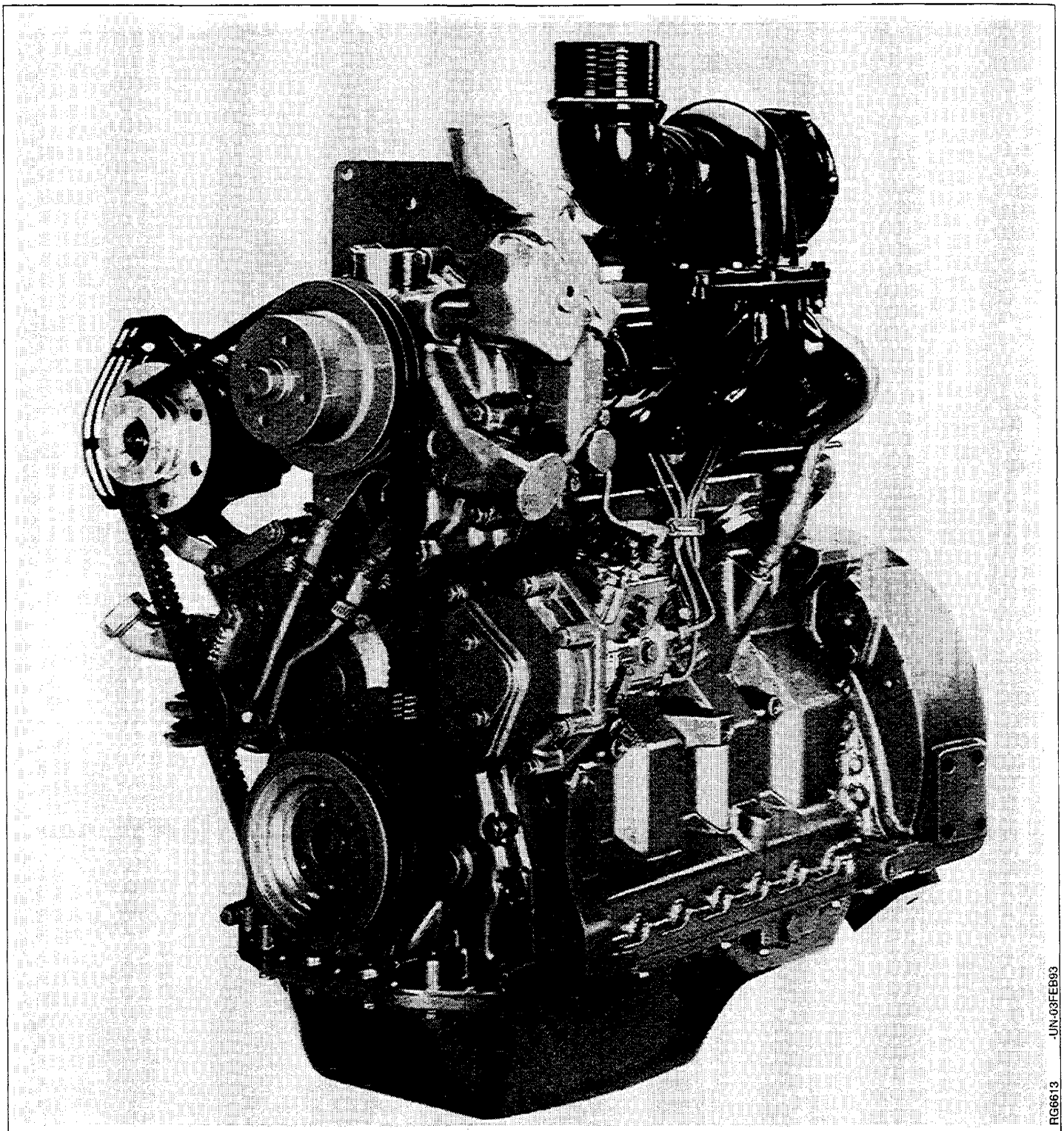
Identification Views



3029D Engine

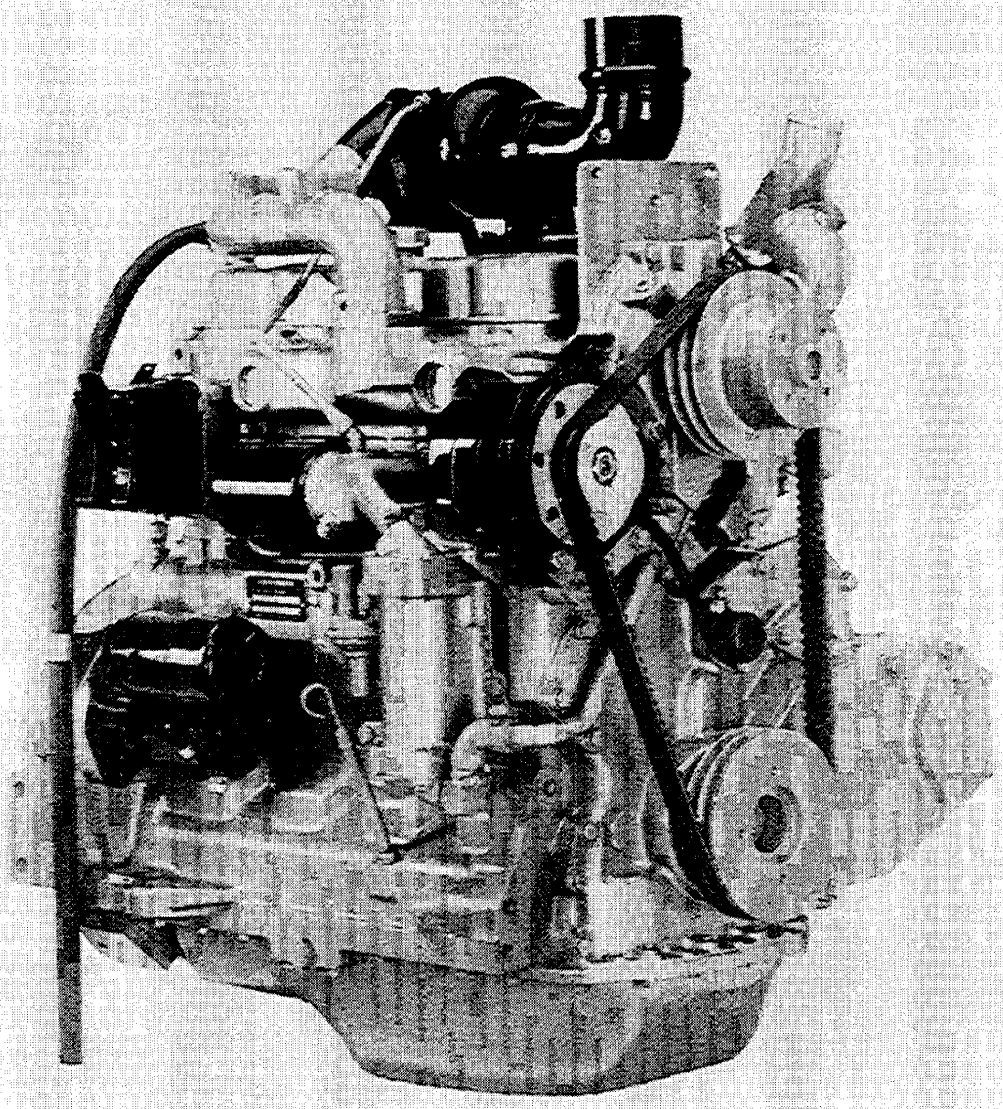
CD30356 -UN-03FEB93

S11,CONT,L3 -19-17FEB93



4039T Engine

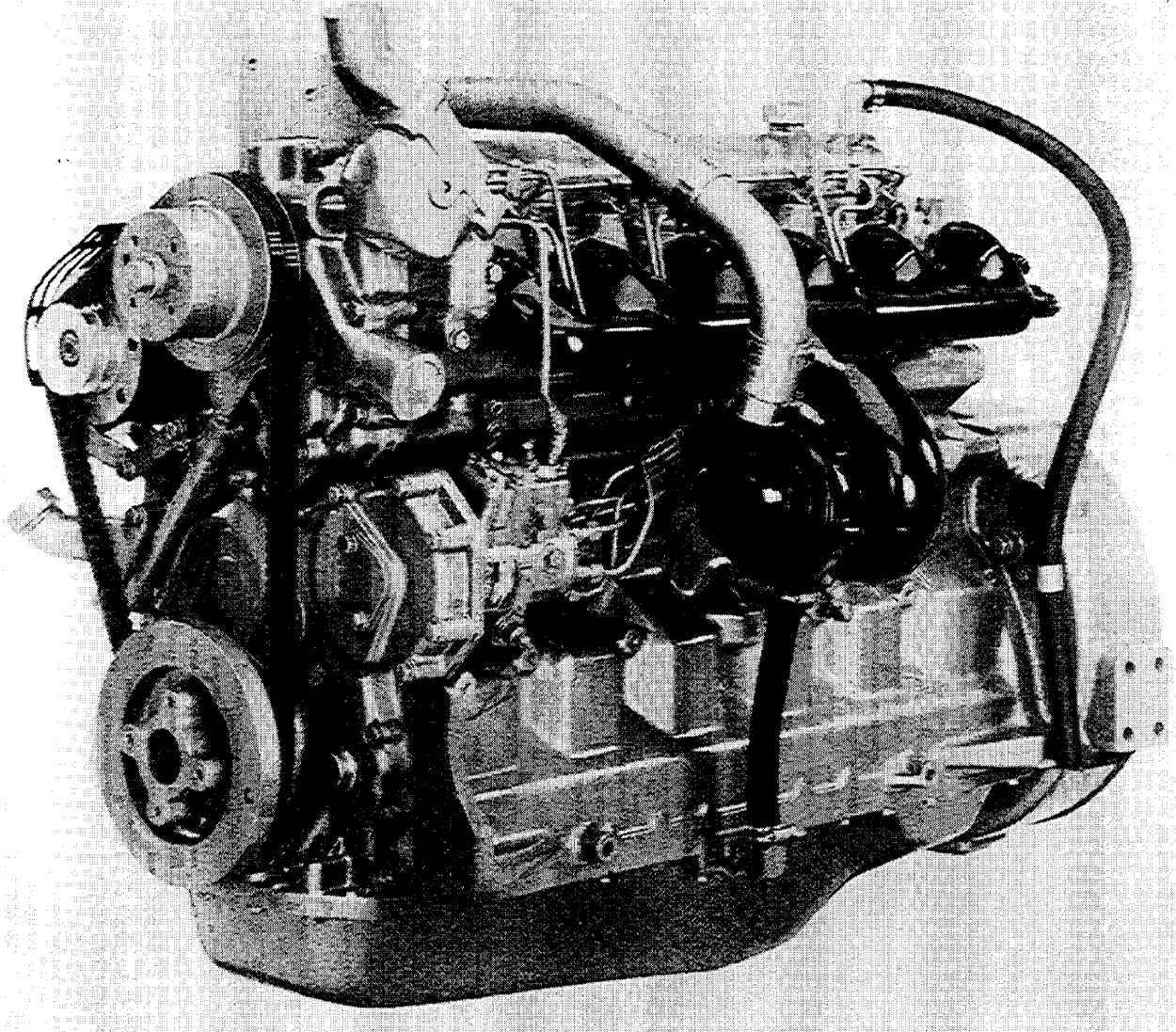
S11,CONT,L4 -19-17FEB93



4045T Engine

RG5603 -UN-30NOV89

S11,CONT,L1 -19-08FEB91



6068T Engine

RG5604 -UN-30NOV89

S11,CONT,L2 -19-08FEB91

Contents

Continued on next page

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

OMRG18293 H4-19-11AUG94

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Moline, Illinois
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A John Deere ILLUSTRUCTION™ Manual

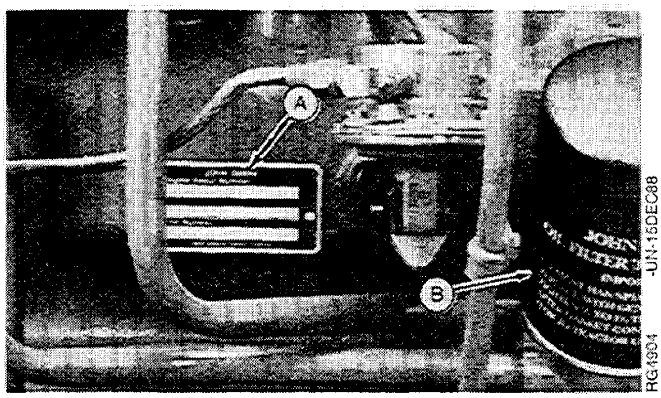
Record Keeping

ENGINE SERIAL NUMBER PLATE

Each engine has a 13-digit John Deere engine serial number. The first two digits identify the factory that produced the engine:

"T0" indicates the engine was built in Dubuque, Iowa
"CD" indicates the engine was built in Saran, France

Your engine's serial number plate (A) is located on right-hand side of cylinder block near the oil filter housing (B).



RG,18293,SNPLTE-19-09AUG94

RECORD ENGINE SERIAL NUMBER

Your engine will have a serial number plate.

Record all of the numbers and letters found on your engine serial number plate in the spaces provided below.

This information is very important for repair parts or warranty information.

Engine Serial Number (A)

_____

Application Data (B)

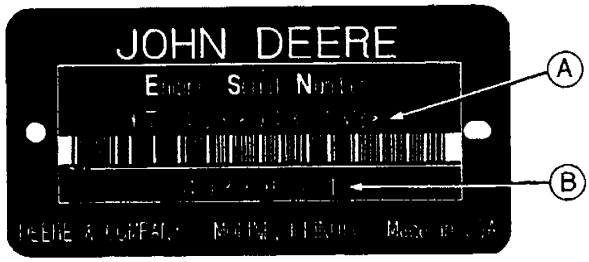
_____

European Customer Model/Application Data (C)

_____

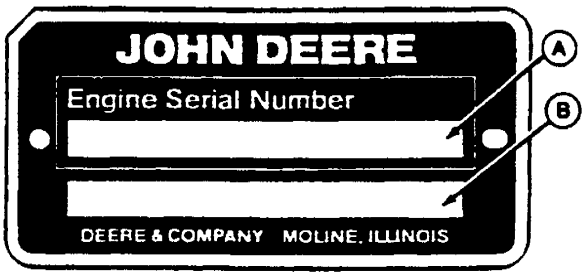
Coefficient of Absorption Value (D)

_____



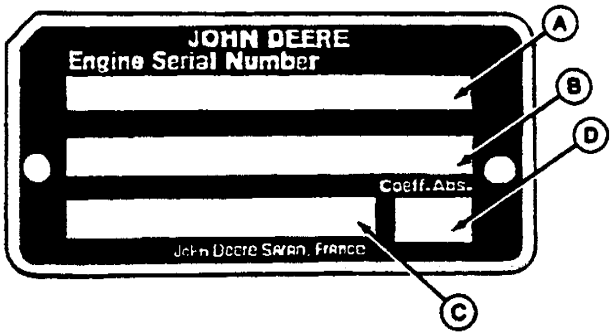
RG7225 -UN-07JUL94

Dubuque Bar Coded Serial Number Plate



RG5609 -UN-09JAN90

Dubuque Serial Number Plate



RG5610 -UN-09JAN90

Saran Serial Number Plate

S55,OMSN,B -19-02AUG94

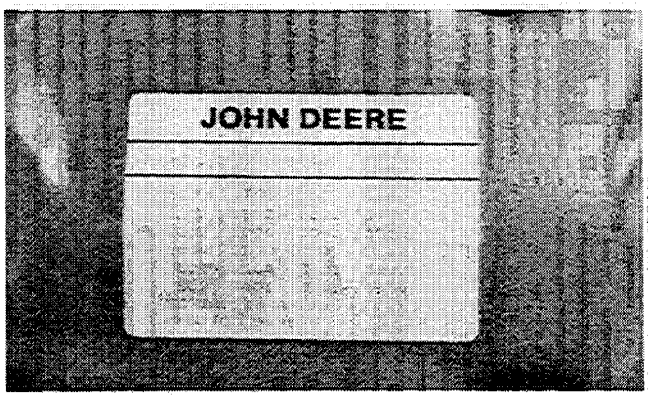
ENGINE OPTION CODES

```
J O H N   D E E R E                              11/05/94

Commande: 182838760   Base code: 147AA   Load: 654150
   -    18  1101- 1202- 1301- 1406- 1501- 1603- 1701-
1902- 2004- 2109- 2204- 2403- 2802- 2902- 3001- 3115-
3519- 3601- 3703- 3901- 4005- 4199- 4398- 4499- 4599-
4603- 4708- 47AA  4802- 4901- 5001- 5101- 5299- 5525-
5601- 5906- 6206- 6699- 6903- 7699- 9801-
Controle par (inspected by):                    ***
```

RG7222 -UN-21JUN94

Saran Option Code Label



Dubuque Option Code Label

In addition to the serial number plate, OEM engines have an engine option code label affixed to the rocker arm cover. These codes indicate which of the engine options were installed on your engine at the factory. When in need of parts or service, furnish your authorized servicing dealer or engine distributor with these numbers.

On Saran-built engines, the engine option code label includes an engine base code. This base code must also be recorded along with the option codes. At times it will be necessary to furnish this base code to differentiate two identical option codes for the same engine model.

The first two digits of each code identify a specific group, such as alternators. The last two digits of each code identify one specific option provided on your engine, such as a 12-volt, 55-amp alternator.

If an engine is ordered without a particular component, the last two digits of that functional group option code will be nines (99). The following list shows only the first two digits of the code numbers. For future reference such as ordering repair parts, it is important to have these code numbers available. To ensure this availability, enter the third and fourth digits shown on your engine option code label in the spaces provided on the following page.

NOTE: Your engine option code label may not contain all option codes if an option has been added after the engine left the producing factory.

ENGINE OPTION CODES—CONTINUED

Engine Base Code:_____

Option Codes	Description	Option Codes	Description
11 _____	Rocker Arm Cover	40 _____	Dipstick
12 _____	Oil Filler	41 _____	Belt Driven Front Auxiliary Drive
13 _____	Crankshaft Pulley	43 _____	Air Inlet Heater
14 _____	Flywheel Housing	44 _____	Timing Gear Cover With Gears
15 _____	Flywheel	45 _____	Balancers For 4-Cylinder Engines
16 _____	Injection Pump	46 _____	Cylinder Block With Liners and Camshaft
17 _____	Air Inlet	47 _____	Crankshaft and Bearings
18 _____	Air Cleaner	48 _____	Connecting Rods and Pistons
19 _____	Oil Pan	49 _____	Valve Actuating Mechanisms
20 _____	Water Pump	50 _____	Oil Pumps
21 _____	Thermostat Cover	51 _____	Cylinder Head With Valves
22 _____	Thermostat	52 _____	Auxiliary Gear Drive
23 _____	Fan Drive	55 _____	Shipping Stand
24 _____	Fan Belt	56 _____	Paint Option
25 _____	Fan	59 _____	Oil Cooler and Filter
27 _____	Radiator	62 _____	Alternator Mounting
28 _____	Exhaust Manifold	64 _____	Exhaust Elbow
29 _____	Ventilator System	65 _____	Turbocharger
30 _____	Starting Motor	66 _____	Temperature Switch
31 _____	Alternator	69 _____	Engine Serial Number PLate
32 _____	Instrument Panel	75 _____	Air Restriction Indicator
35 _____	Fuel Filter	76 _____	Oil Pressure Switch
36 _____	Front Plate	91 _____	Special Equipment (Factory Installed)
37 _____	Fuel Transfer Pump	97 _____	Special Equipment (Field Installed)
39 _____	Thermostat Housing	98 _____	Shipping

S11,OMSN,Q -19-09JUN94

RECORD PTO SERIAL NUMBER

Serial number and model number are located on cover plate (Bold Arrow) of PTO housing. Record the numbers in the following spaces:

Serial Number _____

Model Number _____

S11,OMSN,N -19-26FEB93

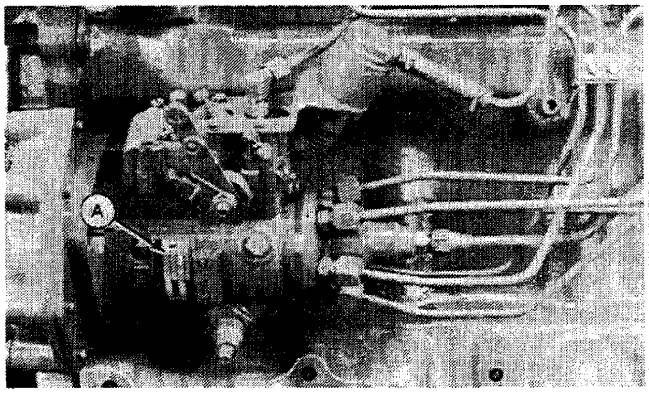
RECORD FUEL INJECTION PUMP MODEL NUMBER

Record the fuel injection pump model and serial information found on the serial number plate (A).

Model No. _____ RPM _____

Manufacturer's No. _____

Serial No. _____



S11,OMSN,O -19-02JUL86

Safety

RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

TS1389 -UN-07DEC88

DX,ALERT -19-03MAR93

UNDERSTAND SIGNAL WORDS

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

⚠ DANGER

⚠ WARNING

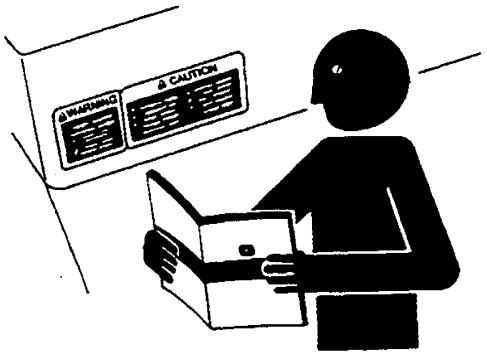
⚠ CAUTION

TS187 -19-30SEP88

DX,SIGNAL -19-03MAR93

FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.



TS201 -UN-23AUG88

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

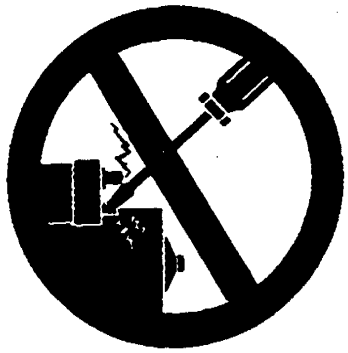
DX,READ -19-03MAR93

PREVENT BYPASS STARTING

Avoid possible injury or death from engine runaway.

Do not start engine by shorting across starter terminal. Engine will start with PTO engaged if normal circuitry is bypassed.

Start engine only from operator's station with PTO disengaged or in neutral.



RG5419 -UN-28FEB89

RG,BYPAS1 -19-19MAR91

HANDLE FUEL SAFELY—AVOID FIRES

Handle fuel with care: it is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.

Always stop engine before refueling machine. Fill fuel tank outdoors.

Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.

TS202 -UN-23AUG88

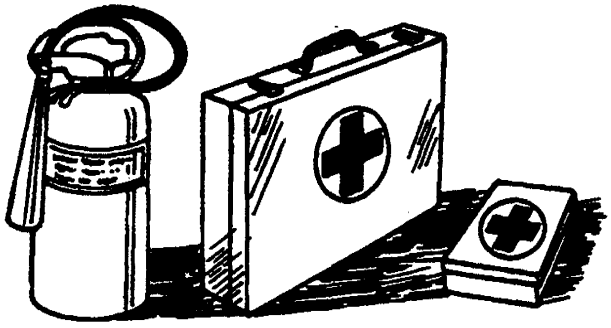
DX,FIRE1 -19-03MAR93

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



TS291 -UN-23AUG88

DX,FIRE2 -19-03MAR93

HANDLE STARTING FLUID SAFELY

Starting fluid is highly flammable.

Keep all sparks and flame away when using it. Keep starting fluid away from batteries and cables.

To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.

Do not incinerate or puncture a starting fluid container.

TS1356 -UN-18MAR92

DX,FIRE3 -19-16APR92

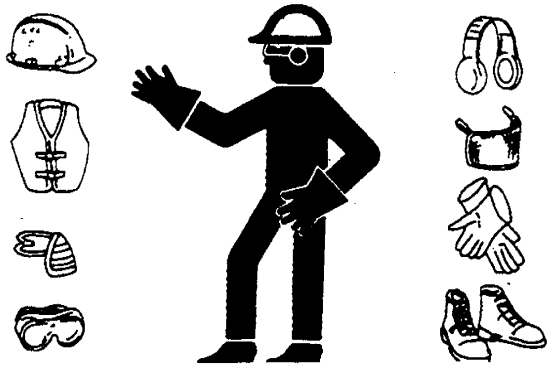
WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



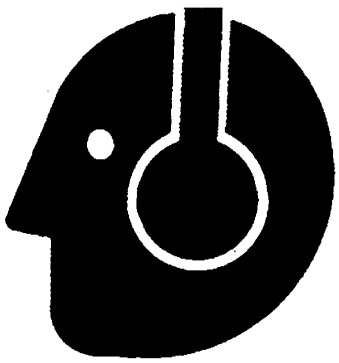
TS206 -UN-23AUG88

DX,WEAR -19-10SEP90

PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



TS207 -UN-23AUG88

DX,NOISE -19-03MAR93

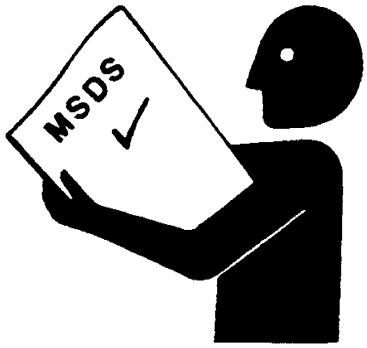
HANDLE CHEMICAL PRODUCTS SAFELY

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)



TS1132 -UN-26NOV90

DX,MSDS,NA -19-03MAR93

STAY CLEAR OF ROTATING DRIVELINES

Entanglement in rotating driveline can cause serious injury or death.

Keep master shield and driveline shields in place at all times. Make sure rotating shields turn freely.

Wear close fitting clothing. Stop the engine and be sure the PTO driveline is stopped before making adjustments or performing any type service on the engine or PTO-driven equipment.

TS198 -UN-23AUG88

RG21891,3 -19-25JAN93

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet , and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

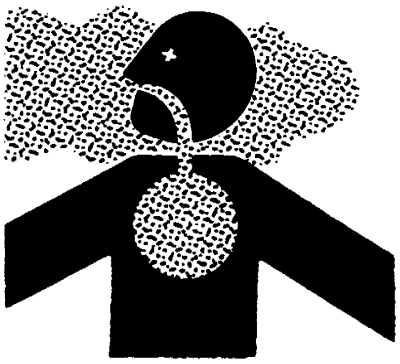
TS218 -UN-23AUG88

DX,SERV -19-03MAR93

WORK IN VENTILATED AREA

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

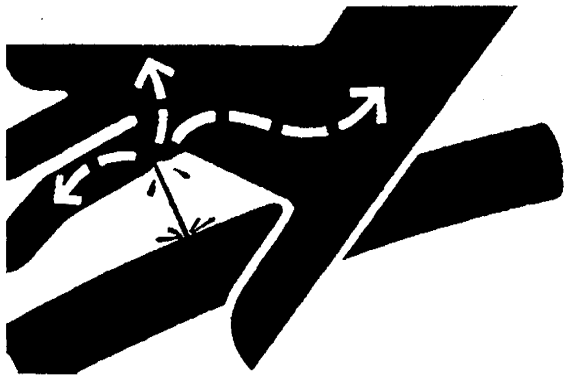
If you do not have an exhaust pipe extension, open the doors and get outside air into the area.



TS220 -UN-23AUG88

DX,AIR -19-04JUN90

AVOID HIGH-PRESSURE FLUIDS



X9811 -UN-23AUG88

Escaping fluid under pressure can penetrate the skin causing serious injury.

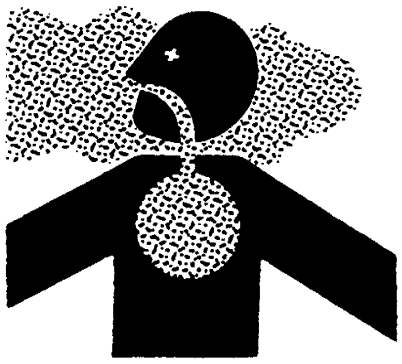
Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

DX,FLUID -19-03MAR93

REMOVE PAINT BEFORE WELDING OR HEATING



TS220 -UN-23AUG88

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.

- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

DX,PAINT -19-03MAR93

AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

TS953 -UN-15MAY90

DX,TORCH -19-03MAR93

SERVICE COOLING SYSTEM SAFELY

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281 -UN-23AUG88

DX,RCAP -19-04JUN90

DISPOSE OF WASTE PROPERLY

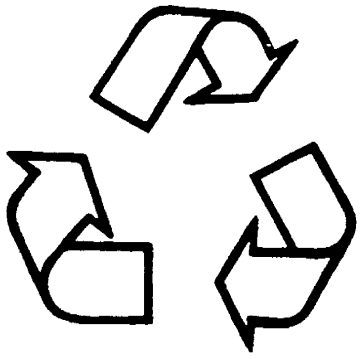
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133 -UN-26NOV90

DX,DRAIN -19-03MAR93

DIESEL FUEL

Consult your local fuel distributor for properties of the diesel fuel available in your area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed. Recommended standard grades are shown on the temperature charts.

In North America, diesel fuels meeting Military Specification VV-F-800E are preferred. In most European countries, diesel fuel is specified to EN 590. If diesel fuel specified to ASTM D975 is used or EN 590 is not available, the fuel must meet the following properties:

• Cetane Number 40 minimum.
Cetane number greater than 50 is preferred, especially for temperatures below -20°C (-4°F) or elevations above 1500 m (5000 ft).

• Cold Filter Plugging Point (CFPP) below the expected low temperature OR Cloud Point at least 5°C (9°F) below the expected low temperature

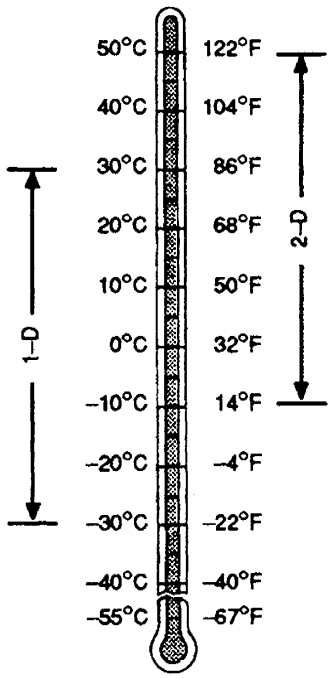
• Sulfur content:
— Sulfur content should not exceed 0.5% Sulfur content less than 0.05% is preferred.
— If diesel fuel with sulfur content greater than 0.5% sulfur content is used, reduce the service interval for engine oil and filter by 50%
— DO NOT use diesel fuel with sulfur content greater than 1.0%

• Lubricity
— Fuel lubricity must pass the BOCLE scuffing test at 3300 gram minimum load level.
— If fuel of low or unknown lubricity is used, add John Deere All-Season Diesel Fuel Conditioner at specified concentration.

Bio-diesel fuels with these properties and meeting an appropriate specification may be used as an alternative to petroleum-based diesel fuel.

Arctic fuels (such as Military Specification VV-F-800E, Grade DF-A) may be used at temperatures below -30°C (-22°F).

CAUTION: Handle fuel carefully. Do not fill the fuel tank when engine is running. DO NOT smoke while you fill the fuel tank or service the fuel system.



North America ASTM D975

RG,FUEL1 -19-10AUG94

DIESEL FUEL STORAGE

Proper fuel storage is critically important. Use clean storage and transfer tanks. Periodically drain water and sediment from bottom of tank. Store fuel in a convenient place away from buildings.

IMPORTANT: DO NOT store diesel fuel in galvanized containers. Diesel fuel stored in galvanized containers reacts with zinc coating on container to form zinc flakes. If fuel contains water, a zinc gel will also form. The gel and flakes will quickly plug fuel filters, damage injection nozzles and injection pump.

DO NOT use use brass-coated containers for fuel storage. Brass is an alloy of copper and zinc.

Store diesel fuel in plastic containers, aluminum containers, and specially coated steel containers made for diesel fuel storage.

Avoid storing fuel over long periods of time. If there is a very slow turnover in fuel tank or supply tank, it may be necessary to add John Deere TY22030 All Season Diesel Fuel Conditioner to prevent water condensation. TY22030 Conditioner also reduces fuel gelling and controls wax separation during cold weather.

Consult your John Deere Parts Network for local availability and always follow manufactuter's directions on label.

RG21891,5 -19-02MAR93

FILLING FUEL TANK

CAUTION: Be careful when handling fuel. Never fill tank while engine is hot or running. DO NOT smoke while filling fuel tank.

IMPORTANT: The fuel tank should be vented through filler cap. If new filler cap is required, always replace it with a vented cap.

Fill fuel tank at end of each day's operation. This prevents condensation in tank as moist air cools.

TS202 -UN-23AUG88

S11,OMFL,C -19-02MAR93

MINIMIZING THE EFFECT OF COLD WEATHER ON DIESEL ENGINES

John Deere diesel engines are designed to operate effectively in cold weather. However, for effective starting and cold weather operation, a little extra care is necessary. The information below outlines steps that can minimize the effect that cold weather may have on starting and operation of your engine. See your authorized engine distributor or servicing dealer for additional information and local availability of cold weather aids.

Use Grade No. 1-D Fuel

When temperatures fall below 5° C (40° F), Grade No. 1-D fuel is best suited for cold weather operation. Grade No. 1-D fuel has a lower cloud point and a lower pour point.

Cloud point is the temperature at which wax will begin to form in the fuel and this wax causes fuel filters to plug. Pour point is the temperature at which fuel begins to thicken and become more resistant to flow through fuel pumps and lines.

NOTE: On an average, Grade No. 1-D fuel has a lower BTU (heat content) rating than Grade No. 2-D fuel. When using Grade No. 1-D fuel you may notice a drop in power and fuel efficiency, but should not experience any other engine performance effects. Check the grade of fuel being used before troubleshooting for low power complaints in cold weather operation.

Diesel Fuel Flow Additive

IMPORTANT: Treat fuel before temperature drops to 0°C (32° F). For best results, use with untreated fuel. Follow all recommended instructions on label.

Use John Deere TY22030 All Season Diesel Fuel Conditioner to treat Grade No. 2-D fuel if No. 1-D is not readily available during the cold weather season.

NOTE: John Deere TY22030 Diesel Fuel Conditioner can also be used to treat No. 1-D fuel.

John Deere TY22030 Diesel Fuel Conditioner will:

—Reduce the formation of wax to improve fuel flow through filters by reducing fuel gelling.

—Lower the pour point of untreated fuel from 5° C (40° F) to less than -40° C (-40° F). Allowing the burning of Grade No. 2-D fuel year-round which provides more BTU per gallon than No. 1-D fuel and reduces fuel costs.

Coolant Heaters

Engine block heaters (coolant) are an available option to aid cold weather starting.

Seasonal Viscosity Oil and Proper Coolant Concentration

Use seasonal grade viscosity engine oil based on expected air temperature range between oil changes and a proper concentration of low silicate antifreeze as recommended later in this group. See ENGINE OIL and ENGINE COOLANT REQUIREMENTS later in this section.

RG,23321,3 -19-09MAY94

ENGINE BREAK-IN OIL

This engine is filled at the factory with John Deere Engine Break-In Oil. This break-in oil should be drained and the oil filter changed after the first 100 hours of operation.

During the break-in period, add John Deere Engine Break-In Oil as needed to maintain the specified oil level.

A second 100-hour service interval with John Deere Engine Break-In Oil may be required if the engine is operated under light loads during the first 100-hour break-in period.

After the break-in period, use John Deere TORQ-GARD SUPREME© PLUS-50™ or other heavy-duty diesel engine oil as recommended in this manual.

IMPORTANT: Do not use TORQ-GARD SUPREME PLUS-50 engine oil during the first 100 hours of operation after an engine rebuilt. TORQ-GARD SUPREME PLUS-50 will not allow the engine to wear properly during the break-in period.

DX,ENOIL4 -19-20JUL94

ENGINE OIL

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oil is preferred:

- John Deere TORQ-GARD SUPREME PLUS-50™

The following oils are also recommended:

- John Deere TORQ-GARD SUPREME®
- John Deere UNI-GARD™

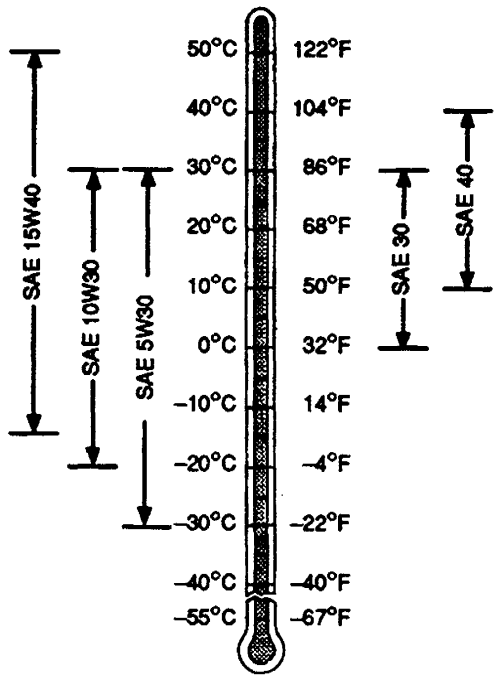
Other oils may be used if they meet one or more of the following:

- API Service Classification CE
- API Service Classification CD
- CCMC Specification D5
- CCMC Specification D4

If John Deere TORQ-GARD SUPREME PLUS-50™ engine oil and a John Deere oil filter are used, the oil and filter service interval may be extended by 50 hours.

If diesel fuel with sulfur content greater than 0.5% is used, reduce the service interval for engine oil and filter by 50%.

Arctic oils (such as Military Specification MIL-L-46167B) may be used at temperatures below -30°C (-22°F).



TS1411 -UN-31JAN94

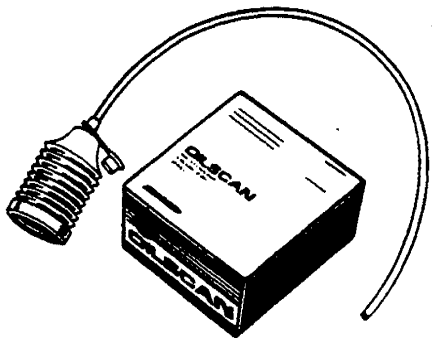
DX,ENOIL -19-01FEB94

OILSCAN® AND COOLSCAN™

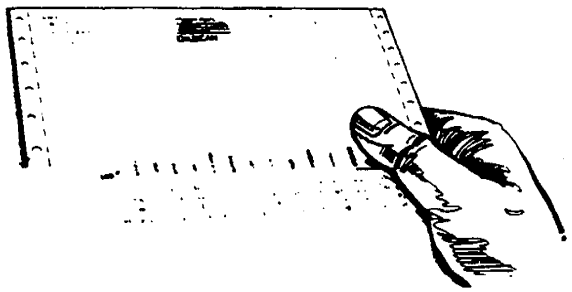
OILSCAN and COOLSCAN are John Deere sampling programs to help you monitor machine performance and identify potential problems before they cause serious damage.

Oil and coolant samples should be taken from each system prior to its recommended change interval.

Check with your John Deere dealer for the availability of OILSCAN and COOLSCAN kits.



T6828AB -UN-15JUN89



T6829AB -UN-18OCT88

DX,OILSCAN -19-16APR92

ALTERNATIVE AND SYNTHETIC LUBRICANTS

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual. Some John Deere lubricants may not be available in your location. Consult your John Deere dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements listed in this manual.

DX,ALTER -19-01FEB94

GREASE

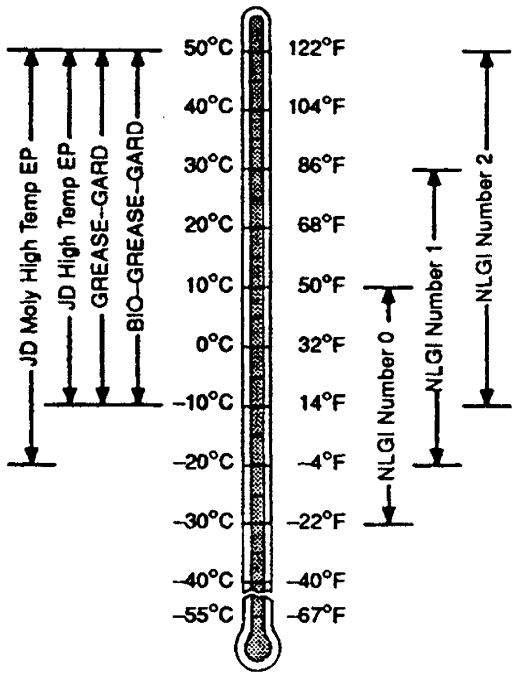
Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

The following greases are preferred:

- John Deere MOLY HIGH TEMPERATURE EP GREASE
- John Deere HIGH TEMPERATURE EP GREASE
- John Deere GREASE-GARD™
- John Deere BIO-GREASE-GARD™[1]

Other greases may be used if they meet **both** of the following:
- NLGI Performance Classification GC
- NLGI Performance Classification LB

Arctic greases (such as Military Specification MIL-G-10924F) may be used at temperatures below -30°C (-22°F).



TS1417 -UN-31JAN94

[1]BIO-GREASE-GARD meets or exceeds the minimum biodegradability of 80% within 21 days according to CEC-L-33-T-82 test method.

DX,GREA1 -19-01FEB94

LUBRICANT STORAGE

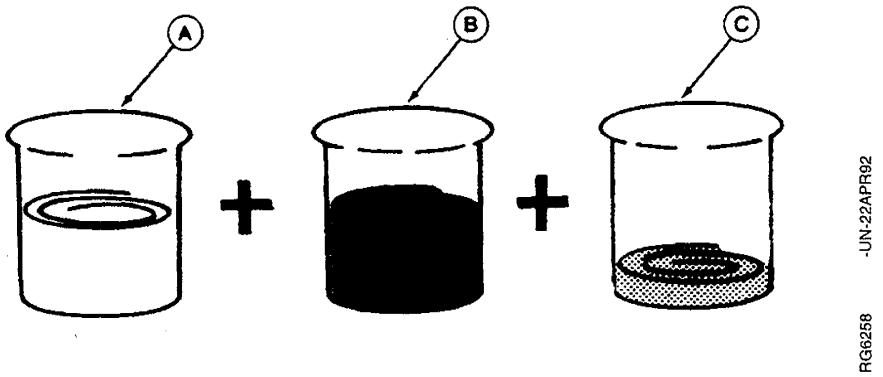
Your equipment can operate at top efficiency only if clean lubricants are used.

Use clean containers to handle all lubricants.

Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

DX,LUBST -19-01FEB94

ENGINE COOLANT REQUIREMENTS



A—Quality Water

B—Ethylene Glycol Concentrate (Antifreeze)

C—Supplemental Coolant Additives (SCA's)

Engine Coolant

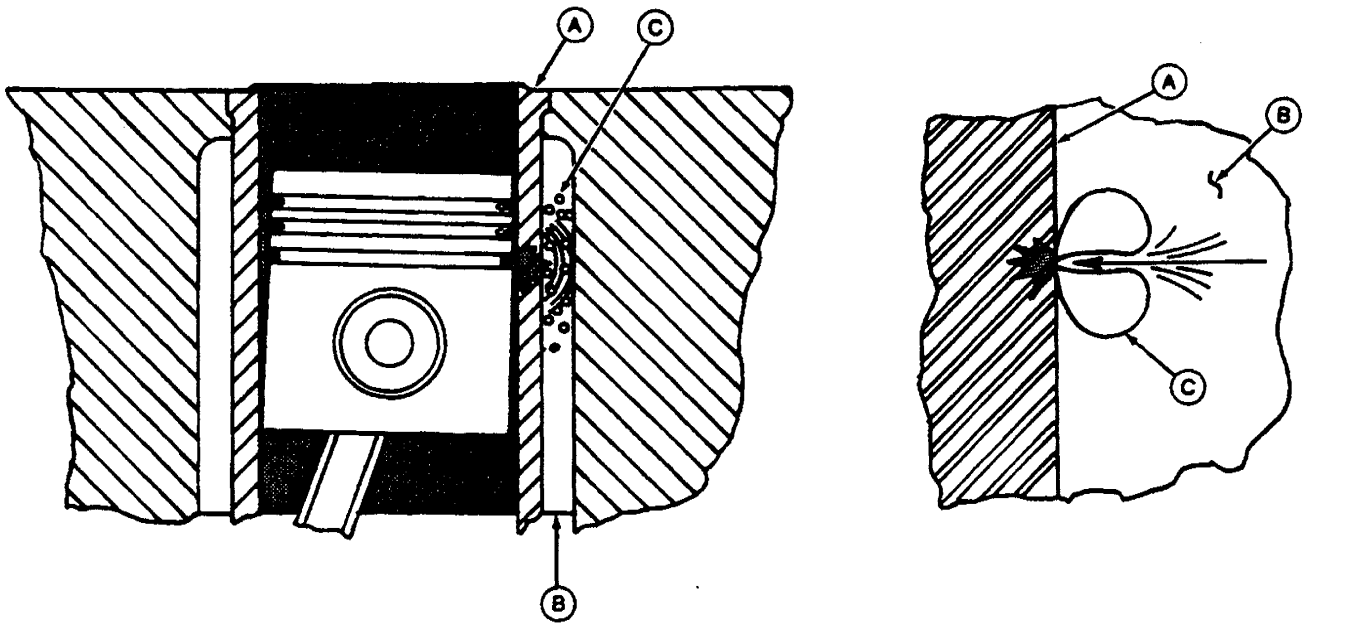
To meet cooling system protection requirements, the coolant MUST consist of a 50/50 mixture of quality water and ethylene glycol concentrate (antifreeze). Add to the mixture 3% (by volume) supplemental coolant additives (SCA's). See ENGINE COOLANT SPECIFICATIONS, later in this section, for further definition.

Makeup of the coolant between changes MUST consist of the same requirements as during a complete change. Performing a COOLSCAN analysis is the recommended method for determining the amount of quality water, ethylene glycol concentrate, and supplemental coolant additives that should be added.

IMPORTANT: Supplemental coolant additives MUST be added to the coolant solution. Ethylene glycol concentrate (antifreeze) DOES NOT contain chemical inhibitors needed to control liner pitting or erosion, rust, scale, and acidity.

RG,18293,REQ1AA-19-09AUG94

ENGINE COOLANT REQUIREMENTS—CONTINUED



RG6263 -UN-22APR92

A—Cylinder Liner Walls **B—Engine Coolant** **C—Vapor Bubbles**

Coolant solutions of ethylene glycol concentrate (antifreeze), quality water, and supplemental coolant additives (SCA's) MUST be used year-round to protect against freezing, boil-over, liner erosion or pitting, and to provide a stable, non-corrosive environment for seals, hoses, and metal engine parts.

Water pump impellers and cylinder liner walls (A) which are in contact with engine coolant (B) can be eroded or pitted unless the proper concentration and type of SCA's are present in the coolant solution.

Vapor bubbles (C) are formed when piston impacts against liner ID causing walls to vibrate; sending compression waves into the coolant.

Erosion or pitting is caused by the formation and collapse of tiny vapor bubbles in the coolant on the surface of metal parts. Over a period of time, this pitting will progress completely through the metal. Generally, the most critical erosion occurs in the cylinder liner area of wet-sleeve, heavy-duty engines. If coolant is allowed to enter the combustion chamber, engine failure or other serious damage will result.

Use of SCA's will reduce the effects of erosion and pitting. The chemicals in the additives form a protective film on cylinder liner surface. This film acts as a barrier against collapsing vapor bubbles and also reduces the quantity of bubbles formed.

RG,COOL,REQ10 -19-12JUL94

RECOMMENDED ENGINE COOLANT

Solutions of antifreeze and supplemental coolant additives MUST be used year-round for freeze protection, boil-over protection, and to provide a stable, non-corrosive environment for seals, hoses and metal engine parts.

John Deere Prediluted Antifreeze/Summer Coolant and John Deere Antifreeze/Summer Coolant Concentrate are recommended. John Deere Low Silicate Antifreeze and John Deere COOL-GARD™, where available, may also be used. Supplemental coolant additives MUST be added to John Deere Low Silicate Antifreeze.

• JOHN DEERE PREDILUTED ANTIFREEZE/SUMMER COOLANT

This product contains all the necessary ingredients that make up the proper coolant solution: (chemically pure water, ethylene glycol (antifreeze), and supplemental coolant additives (SCA's). It is ready to use; no mixing is required.

• JOHN DEERE ANTIFREEZE/SUMMER COOLANT CONCENTRATE

This product contains ethylene glycol (antifreeze) and supplemental coolant additives (SCA's). It must be mixed with quality water, as described later in this group, before adding to the engine cooling system. The proportion of water to be used depends upon the lowest freeze protection temperature desired according to the following table:

% CONCENTRATE	FREEZE PROTECTION LIMIT
40	-24° C (-12° F)
50	-37° C (-34° F)
60	-52° C (-62° F)

• JOHN DEERE LOW SILICATE ANTIFREEZE

This ethylene glycol coolant concentrate MUST be mixed with proper concentration of quality water and 3% (by volume) supplemental coolant additives (SCA's) before adding to the cooling system. The proportion of water to be used depends upon the lowest freeze protection temperature desired according to the following table:

% CONCENTRATE	FREEZE PROTECTION LIMIT
40	-24° C (-12° F)
50	-37° C (-34° F)
60	-52° C (-62° F)

• JOHN DEERE COOLGARD™ FLUID

In certain geographical areas, John Deere Engine COOL-GARD is marketed for use in the engine cooling system. This product contains all the necessary ingredients that make up the proper coolant solution: chemically pure water, ethylene glycol (low silicate antifreeze) and supplemental coolant additives (SCA's). It is ready to add to cooling system as is; no mixing or supplemental coolant additives required. Contact your John Deere Parts Network for local availability.

RG,COOL,18293 -19-04AUG94

ENGINE COOLANT SPECIFICATIONS

If John Deere coolant products are not used, ethylene glycol concentrate (antifreeze) can be used when mixed with quality water and supplemental coolant additives (SCA's), as described below and later in this section. Use an ethylene glycol concentrate meeting ASTM D5345 (prediluted coolant) or ASTM D4985 (coolant concentrate) mixed 50% with quality water.

Water Quality:

Distilled, de-ionized, or soft water is preferred for use in cooling systems. Mineral (hard/tap) water should NEVER be put in a cooling system unless first tested. However, water that meets the following water quality specifications is acceptable.

Water Quality Specifications

Item	Parts Per Million	Grains Per Gallon
Chlorides (maximum)	40	2.5
Sulfates (maximum)	100	5.9
Total Dissolved Solids (maximum).	340	20
Total Hardness (maximum)	170	10
pH Level	5.5—9.0	

If Chlorides, Sulfates, or Total Dissolved Solids are higher than the above given specifications, the water must be distilled, de-mineralized, or de-ionized before using in cooling system.

If Total Hardness is higher than the above given specification and all other parameters are within the given specifications, the water must be softened before using in cooling system.

Ethylene Glycol Concentrate (Antifreeze):

IMPORTANT: DO NOT use methyl alcohol or methoxy propanol base concentrate. This concentrate is not compatible with additives used in supplemental coolant additives. Damage can occur to rubber seals on cylinder liners which are in contact with coolant.

DO NOT use ethylene glycol concentrate containing sealer or stop-leak additives.

DO NOT use concentrate containing less than 10% ethylene glycol.

DO NOT use concentrate containing more than 0.1% anhydrous metasilicate. This type of concentrate, which is intended for use in aluminum engines, may cause a gel-like deposit to form that reduces heat transfer and coolant flow. Check container label or consult with supplier before using.

RG,18293,COOL4 -19-09AUG94

ENGINE COOLANT SPECIFICATIONS—CONTINUED

Supplemental Coolant Additives (SCA's):

IMPORTANT: DO NOT over-inhibit antifreeze solutions, as this can cause silicate-dropout. When this happens, a gel-type deposit is created which retards heat transfer and coolant flow.

DO NOT use soluble oil.

NOTE: John Deere Prediluted Antifreeze/Summer Coolant, John Deere Antifreeze/Summer Coolant Concentrate, and John Deere Engine COOL-GARD contain supplemental coolant additives (SCA's). However, as the coolant solution loses its effectiveness, additives will need to be added.

ALWAYS inhibit the antifreeze-coolant mix with a non-chromate inhibitor such as John Deere Liquid Coolant Conditioner. Follow the supplier's recommendations printed on the container.

John Deere Liquid Coolant Conditioner is available in the following sizes:

—TY16004 473 mL (16 oz) container
—TY16005 3.8 L (1 US gal) container

IMPORTANT: John Deere Liquid Coolant Conditioner does NOT protect against freezing.

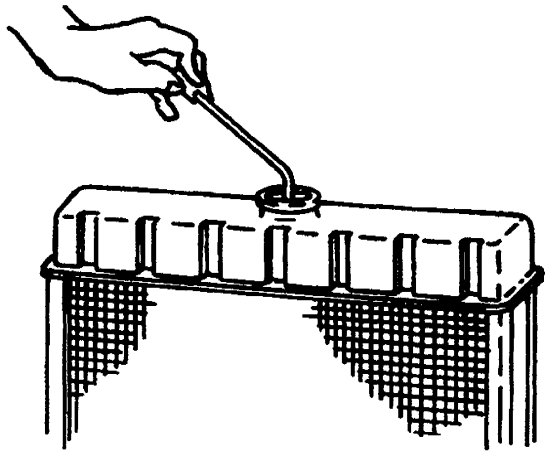
In tropical areas where antifreeze or John Deere Engine COOL-GARD is not available, it is acceptable to use water meeting the quality specifications on the previous page and John Deere Liquid Coolant Conditioner. The recommended concentration of John Deere Liquid Coolant Conditioner must be doubled to 6% (60 mL per Liter of cooling system capacity) by volume when used with water only (no antifreeze).

Additives eventually lose their effectiveness and must be recharged with additional liquid coolant conditioner. See label on container for recommended service intervals and concentration rates. See REPLENISHING SUPPLEMENTAL COOLANT ADDITIVES (SCA'S) BETWEEN COOLANT CHANGES, later in this section.

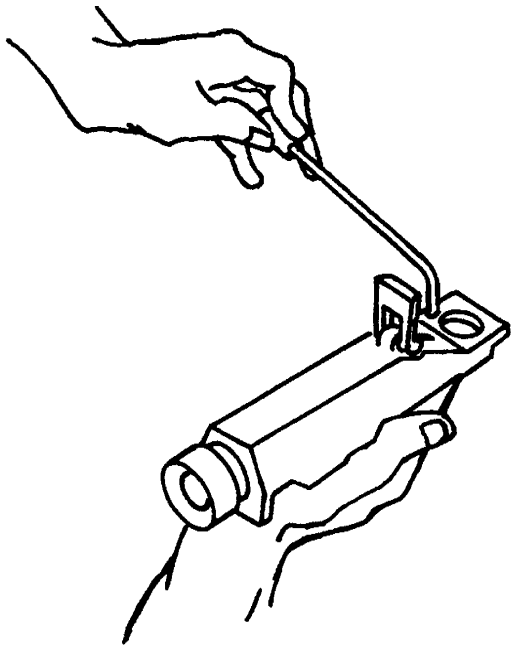
Contact your authorized servicing dealer or engine distributor, if there are further questions.

RG,COOL,182932 -19-15JUN94

REPLENISHING SUPPLEMENTAL COOLANT ADDITIVES (SCA'S) BETWEEN COOLANT CHANGES



RG6261 -UN-22APR92



RG6262 -UN-22APR92

Through time and use, original additives eventually lose their effectiveness and must be recharged with additional supplemental coolant additives available in the form of liquid coolant conditioner.

NOTE: Service intervals listed are a recommended engineering guideline. Refer to your vehicle operator's manual for a specific service interval.

Perform a COOLSCAN analysis after 900 hours or 1-1/2 years of operation when using John Deere Prediluted Antifreeze/Summer Coolant, and after 600 hours or 6 months of operation when using all other John Deere coolant products. If a COOLSCAN analysis is not available, recharge system per instructions printed on label of TY16004 John Deere Liquid Coolant Conditioner.

IMPORTANT: ALWAYS maintain coolant at correct level and concentration. DO NOT operate engine without coolant for even a few minutes.

If frequent coolant make-up is required, the glycol concentration should be checked with JT05460 Refractometer to assure that the desired freeze point is maintained. Follow manufacturer's instructions provided with refractometer.

See ENGINE COOLANT SPECIFICATIONS earlier in this section for proper mixing of coolant ingredients before adding to the cooling system.

RG,18293,REQ4A -19-09AUG94

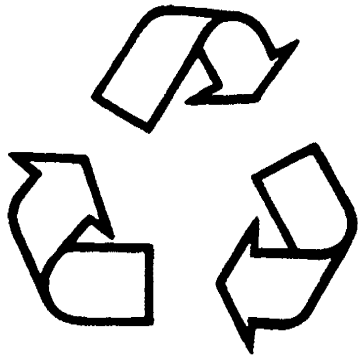
DISPOSING OF COOLANT

Improperly disposing of engine coolant can threaten the environment and ecology.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133 -UN-26NOV90

RG,COOL,REQ5 -19-12JUL94

INSTRUMENT (GAUGE) PANEL

All controls and gauges are optional equipment for John Deere OEM Engines. They may be provided by the equipment manufacturer instead of John Deere. The following information applies only to those controls and gauges provided by John Deere.

IMPORTANT: Any time an electric gauge or meter does not register correctly, replace it with a new one. Do not attempt to repair it.

Following is a brief description of the components on the John Deere instrument (gauge) panel:

A—Electric Hour Meter—Indicates the operating hours of the engine while key switch is in the "ON" position. The hourmeter should be used as a guide for scheduling periodic service.

B—Coolant Temperature Gauge—Indicates the engine coolant temperature.

C—Tachometer—Indicates engine speed in revolutions per minute (rpm).

NOTE: A combination tachometer and hour meter is also an available option. See your authorized servicing dealer or engine distributor.

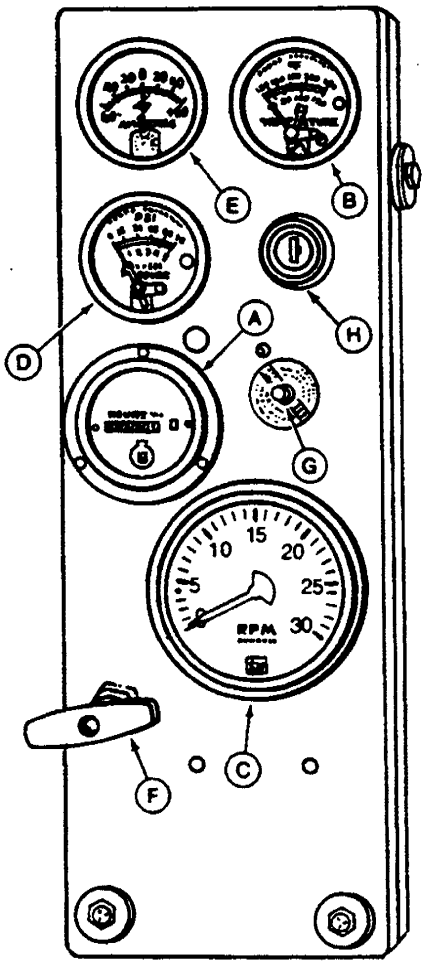
D—Oil Pressure Gauge—Indicates engine oil pressure.

E—Ammeter—Indicates charging current within electrical system.

F—Hand Throttle—Controls engine speed.

G—Reset (Safety) Switch—Overrides safety shutdown switch when depressed and held in during engine startup. Hold button in until engiine oil pressure is at a safe operating level.

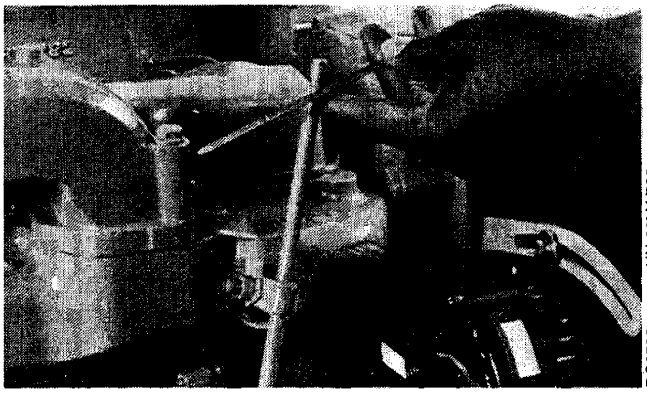
H—Key Switch—The four position key switch controls the electrical system.



RG4477A -UN-11FEB93

A—Electric Hour Meter
B—Coolant Temperature Gauge
C—Tachometer
D—Oil Pressure Gauge
E—Ammeter
F—Hand Throttle
G—Reset Switch
H—Key Switch

BREAK-IN SERVICE

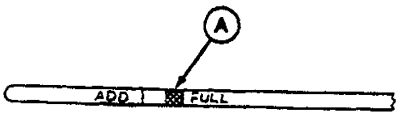

RG6702 -UN-26MAR93

The engine is ready for normal operation, however, extra care during the first 100 hours will result in a more satisfactory long-term engine performance and life. DO NOT exceed 100 hours of operation with break-in oil.

1. This engine is factory-filled with John Deere Break-in Oil. See ENGINE BREAK-IN OIL in Fuels, Lubricants, and Coolant section. Run the engine the first 100 hours with break-in oil.

IMPORTANT: If the engine is run at constant speed and/or light load usage, a longer break-in period maybe required. In these situations, an additional 100 hour break-in period is recommended using a new change of John Deere Engine Break-In oil.

When operating a new engine in extreme (high temperature or dusty) conditions, break-in oil MUST be drained after the first 50 hours of operation.



RG5420 -UN-15DEC88

IMPORTANT: DO NOT operate engine when oil level is below ADD mark on dipstick. ALWAYS keep oil level within the crosshatch pattern (A) or at the FULL mark, whichever is present. Oil levels anywhere within crosshatch are considered full.

2. Check oil more frequently during engine break-in period. If oil must be added during this period, use John Deere Engine Break-In Oil. See ENGINE BREAK-IN OIL, in Fuels, Lubricants, and Coolant Section.

ENGINE SPECIFICATIONS*

Minimum Oil Pressure at 850 rpm (except 3-cylinder)	103 kPa (1.03 bar) (15 psi)
Minimum Oil Pressure at 850 rpm (3-cylinder engines)	140 kPa (1.4 bar) (20 psi)
Coolant Temperature Range	82°—94°C (180°—202°F)

** At normal operating temperature of 105°C (220°F) sump.*

S11,OMBI,I -19-03AUG94

110894

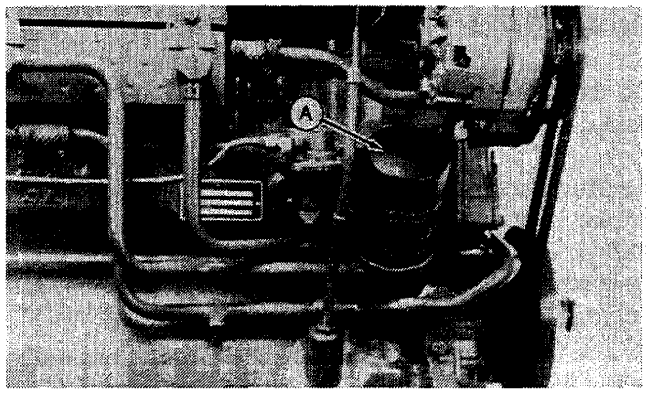
3. During the first 20 hours, avoid prolonged periods of engine idling or sustained maximum load operation.

4. If engine will idle longer than 5 minutes, stop engine.

5. After the first 100 hours maximum, drain engine oil and change engine oil filter (A). (See CHANGE ENGINE OIL AND FILTER in Lubrication and Maintenance/250 Hour section.) Fill with seasonal viscosity grade oil. (See ENGINE OIL, in Fuels, Lubricants, and Coolant Section.)

NOTE: Some increase in oil consumption may be expected when low viscosity oils are used. Check oil levels more frequently.

If air temperature is below —10°C (14F), use an engine heater.

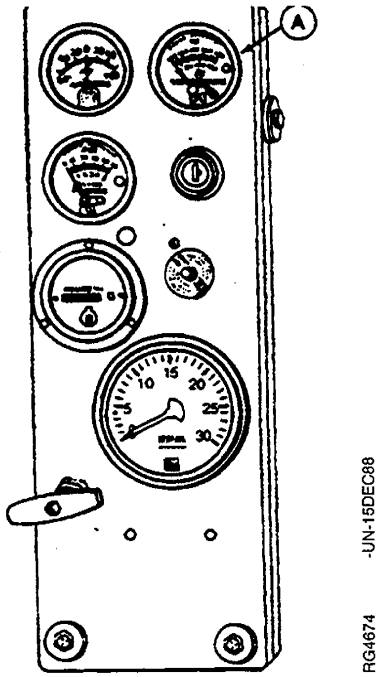


S11,OMBI,J -19-09AUG94

6. Watch coolant temperatures (A) closely. If coolant temperature rises above 99°C (210°F), reduce load on engine. Unless temperature drops quickly, stop the engine and determine the cause before resuming operation.

NOTE: When the coolant temperature gauge reads approximately 104°C (220°F), the engine will shutdown automatically, if equipped with safety controls.

7. The tension on newly installed V-belts should be checked daily for the first few days of operation because of the initial stretching. Also, check belts for proper seating in pulley grooves.



S11,OMBI,K -19-19MAR91

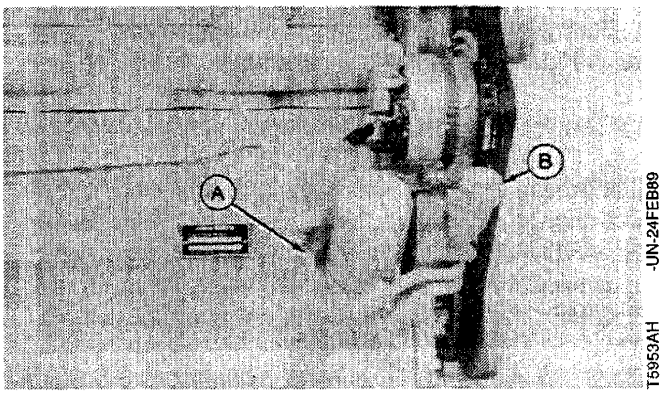
DAILY PRESTARTING CHECKS

Do the following before starting the engine for the first time each day:

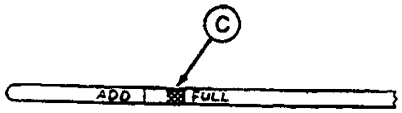
1. Check engine oil level on dipstick (A). Do not operate engine when oil level is below the ADD mark on dipstick. Add oil at filler cap (B), as required, using seasonal viscosity grade oil. (See ENGINE OIL in Fuels, Lubricants, and Coolant Section for oil specifications.)

Some engines may have the oil filler cap on rocker arm cover, while others will have the filler cap on the timing gear cover.

NOTE: ALWAYS keep oil level within the crosshatch pattern (C) on dipstick when operating engine. Oil levels anywhere within crosshatch are considered full.



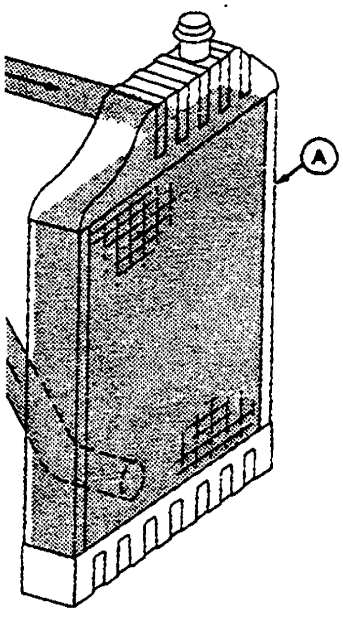
T5953AH -UN-24FEB89



RG5421 -UN-15DEC88

S11,OMPC,O -19-09AUG94

2. Check the coolant level when engine is cold. Coolant level should be at bottom of filler neck. Fill radiator (A) with appropriate coolant. (See RECOMMENDED ENGINE COOLANT in Fuels, Lubricants, and Coolant Section.)



RG4675 -UN-14DEC88

S11,OMPC,P -19-17JUN94

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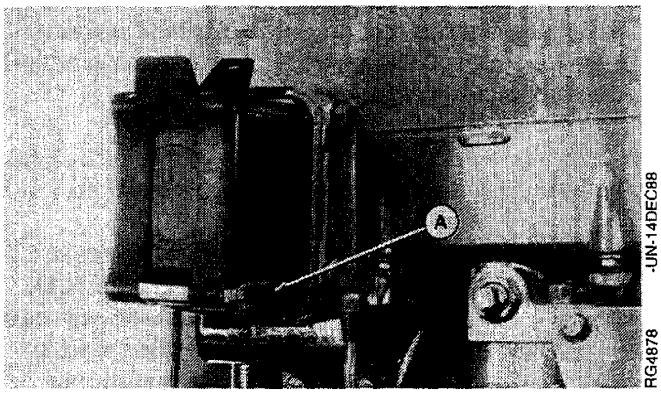
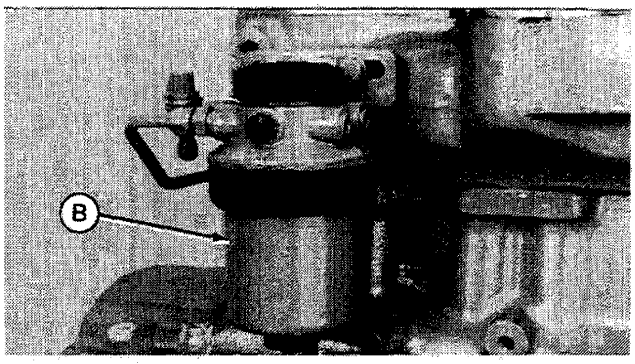
3. Check the glass sediment chamber of the rectangular fuel filter (A) for water or debris. If present, drain the filter. (See REPLACE FUEL FILTER ELEMENT in Lubrication and Maintenance/600 Hours/1-Year Section.)

NOTE: Some engines may be equipped with metal rectangular fuel filter(s) or a round fuel filter (B). If so, periodically drain to remove water or debris and bleed the fuel system, as outlined later in Service Section.



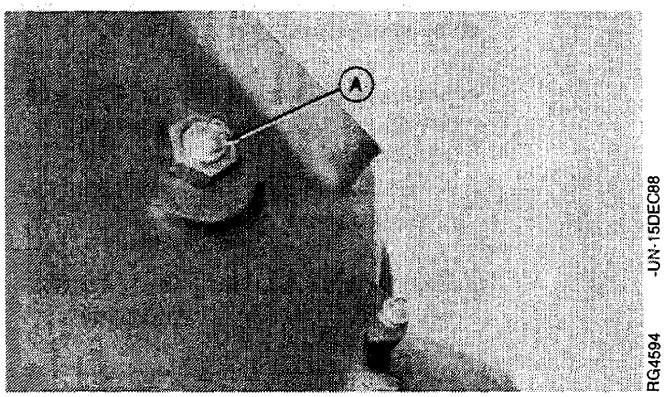
RG4878 -UN-14DEC88



CD30351 -UN-03FEB93

RG18293,1 -19-17FEB93

4. Apply one shot of John Deere Multi-Purpose Lubricant or its equivalent at PTO release bearing grease fitting (A). DO NOT over lubricate.



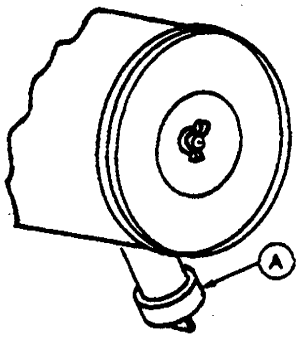
RG4594 -UN-15DEC88

S11,OMPC,S -19-07JUN91

5. If the air cleaner has an automatic dust unloader valve (A), squeeze the unloader valve on air cleaner assembly to clear away any dust buildup.

If equipped with restriction indicator gauge, check gauge to determine if air cleaner needs to be serviced.

IMPORTANT: Maximum air intake restriction is 6.22 kPa (0.06 bar) (1.0 psi) (25 in. H_2O). A clogged air cleaner element will cause excessive intake restriction and a reduced air supply to the engine.



RG4676 -UN-20DEC88

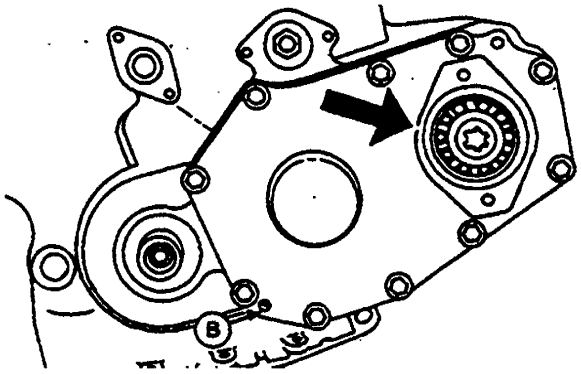
S11,OMPC,R -19-03JUL86

AUXILIARY GEAR DRIVE LIMITATIONS

IMPORTANT: When attaching an air compressor, hydraulic pump, or other attachment to be driven by the auxiliary gear drive (engine timing gear train at front of engine), power requirements of the accessory must be limited to:

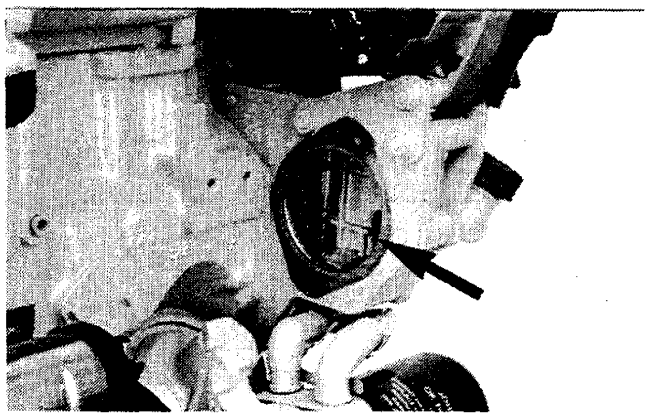
- **Left-Hand Auxiliary Gear Drive:**
  - **— 30 kW (40 hp) Continuous Operation**
  - **— 37 kW (50 hp) Intermittent Operation**

- **Right-Hand Auxiliary Gear Drive:**
  - **— 11 kW (15 hp) Continuous Operation**
  - **— 19 kW (26 hp) Intermittent Operation**



RG5213 -UN-14DEC88

Left-hand auxiliary drive



CD30354 -UN-03FEB93

Right-hand auxiliary drive

RG18293,2 -19-22FEB93

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STANDBY POWER UNITS

To assure that your engine will deliver efficient standby operation when needed, start engine and run at rated speed (with 50%—70% load) for 30 minutes every 2 weeks. DO NOT allow engine to run extended period of time with no load.

S55,OMOE,BE -19-04AUG93

STARTING THE ENGINE

The following instructions apply to the optional controls and instruments available through the John Deere Parts Distribution Network. The controls and instruments for your engine may be different from those shown here; always follow manufacturer's instructions.

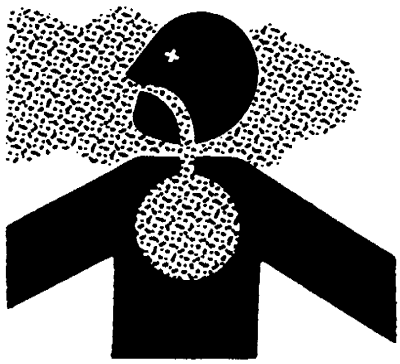
CAUTION: Before starting engine in a confined building, install proper outlet exhaust ventilation equipment. Always use safety approved fuel storage and piping.

NOTE: If temperature is below 0°C (32°F), it may be necessary to use cold weather starting aids (See COLD WEATHER OPERATION, later in this section).

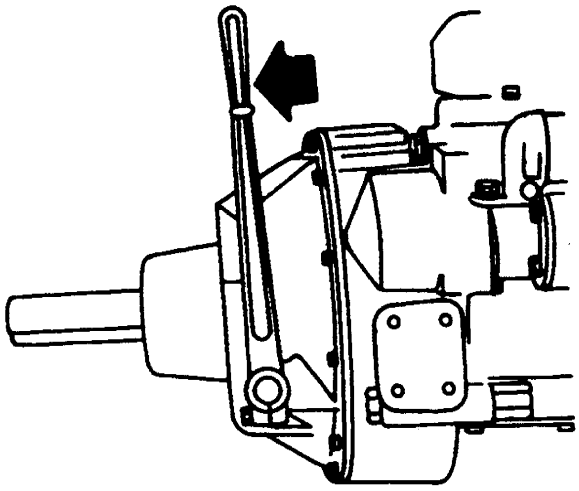
1. Perform all prestarting checks outlined in previous section.

2. Open the fuel supply shut-off valve, if equipped.

3. If equipped with PTO clutch, pull lever (arrow) rearward (away from engine) to disengage PTO clutch.



TS220 -UN-23AUG88



RG5602 -UN-30NOV89

S11,OMOE,AS -19-09JUN94

4. Pull hand throttle (A) 1/3 of the way out. Turn the handle in either direction to lock it in place.

5. If equipped, depress and hold reset button (B) while starting.

IMPORTANT: Do not operate the starter for more than 30 seconds at a time. To do so may overheat the starter. If the engine does not start the first time, wait at least 2 minutes before trying again. If engine does not start after four attempts, see Troubleshooting Section.

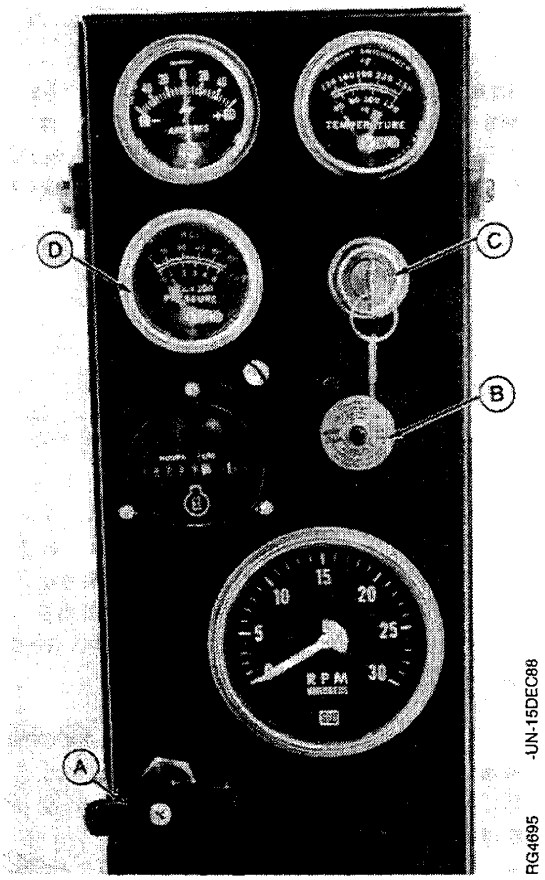
6. Turn the key switch (C) clockwise to crank the engine. When the engine starts, release the key so that it returns to the "ON" position.

IMPORTANT: If the key switch is released before the engine starts, wait until the starter and the engine stop turning before trying again. This will prevent possible damage to the starter and/or flywheel.

7. After the engine starts, continue to hold the reset button in until the oil pressure gauge (D) reads at least 103 kPa (1.03 bar) (15 psi). The safety controls will not allow the engine to run at a lower oil pressure unless the reset button is held in.

IMPORTANT: Should the engine die when operating under load, immediately disengage PTO and restart the engine to prevent overheating of turbocharged parts, caused when the flow of oil for cooling and lubrication is stopped.

8. Check all gauges for normal engine operation. If operation is not normal, stop the engine and determine the cause.



A—Hand Throttle
B—Reset Button
C—Key Switch
D—Oil Pressure Gauge

S11,OMOE,AT -19-17FEB93

COLD WEATHER OPERATION

TS1356 -UN-18MAR92

Additional information on cold weather operation is available from your authorized servicing dealer.

Some engines are equipped with an air intake heater which will make starting the engine easier in cold weather. If equipped, follow steps 1—4 as listed under STARTING THE ENGINE, earlier in this section. Switch on the air intake heater for 30 seconds and then proceed to operate the starter. Follow remaining steps 5—8.

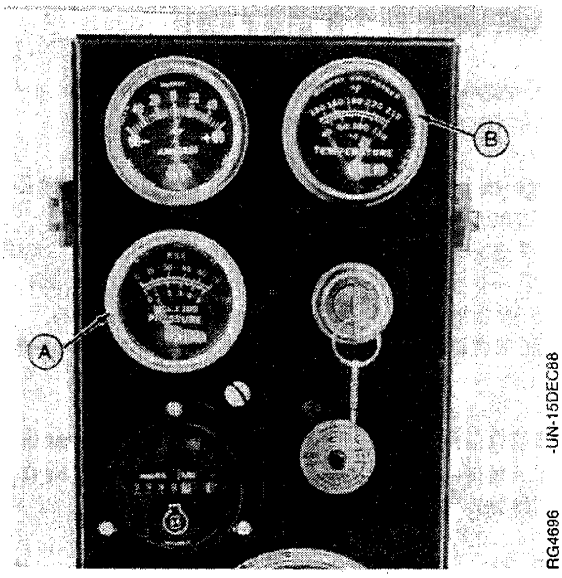
CAUTION: Starting fluid is highly flammable. DO NOT use starting fluid on engines equipped with air intake heaters.

DO NOT use starting fluid near fire, sparks, or flames. DO NOT incinerate or puncture a starting fluid container.

RG18293,13 -19-02AUG94

WARMING ENGINE

IMPORTANT: To assure proper lubrication, operate engine at 1200 rpm with no load for 1—2 minutes. Extend this period 2—4 minutes when operating at temperatures below freezing.



1. Check oil pressure gauge (A) as soon as engine starts. If gauge needle does not rise above minimum oil pressure specification of 103 kPa (1.03 bar) (15.0 psi) within 5 seconds, stop the engine and determine the cause. Normal engine oil pressure is 380 ± 103 kPa (3.80 bar ± 1.03 bar) (55 ± 15 psi) at rated full load speed (1800—2500 rpm) with oil at normal operating temperature of 105°C (220°F).

NOTE: On certain engines, the oil pressure and coolant temperature gauges are replaced by indicator warning lights. The lights must be "OFF" when engine is running.

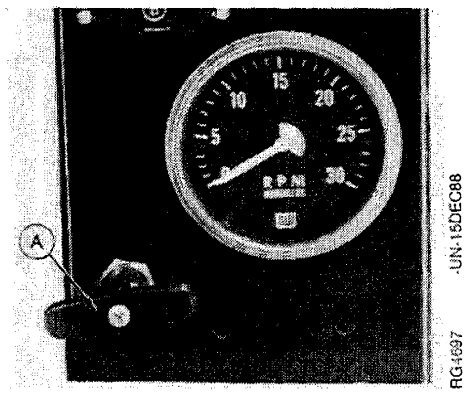
2. Watch coolant temperature gauge (B). Do not place engine under full load until it is properly warmed up. The normal engine coolant temperature range is 82°—94°C (180°—202°F).

NOTE: It is a good practice to operate the engine under a lighter load and at lower speeds than normal for the first few minutes after start-up.

S11,OMOE,AU1 -19-22FEB93

CHANGING ENGINE SPEED—STANDARD (MECHANICAL) GOVERNOR

To increase engine speed, turn handle (A) to the horizontal position and pull out until desired engine speed is obtained. Turn the handle in either direction to lock throttle position. The handle is pushed inward to decrease engine speed.



S11,OMOE,M -19-08FEB91

110894

IDLING ENGINE

Avoid unnecessary engine idling. Prolonged idling may cause the engine coolant temperature to fall below its normal range. This, in turn, causes crankcase oil dilution, due to incomplete fuel combustion, and permits formation of gummy deposits on valves, pistons, and piston rings. It also promotes rapid accumulation of engine sludge and unburned fuel in the exhaust system.

Slow idle speed for this engine is 800—850 rpm at factory. If engine must be left running more than 3 or 4 minutes, minimum engine speed should be 1200 rpm. DO NOT allow engine to idle longer than 5 minutes.

NOTE: Generator set applications where the governor is locked at a specified speed may not have a slow idle function. These engines will idle at no load governed speed (high idle).

S11,OMOE,G -19-02MAR93

STOPPING THE ENGINE

1. Pull PTO clutch lever (arrow) rearward (away from engine) to disengage clutch.

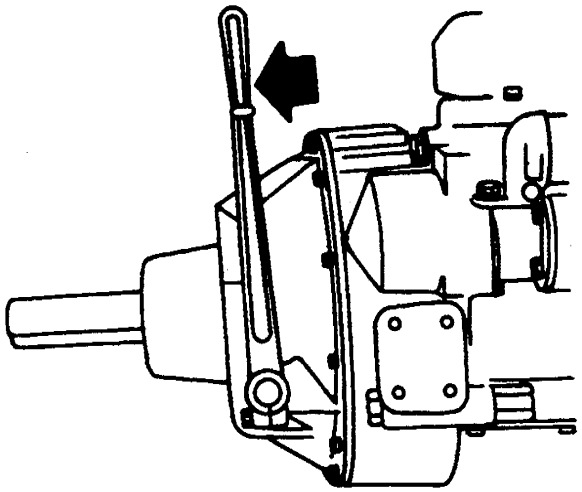
2. Move the throttle lever (A) to slow idle on standard (mechanical) governor engines.

IMPORTANT: Before stopping an engine that has been operating at working load, idle engine at least 2 minutes at 1000—1200 rpm to cool hot engine parts.

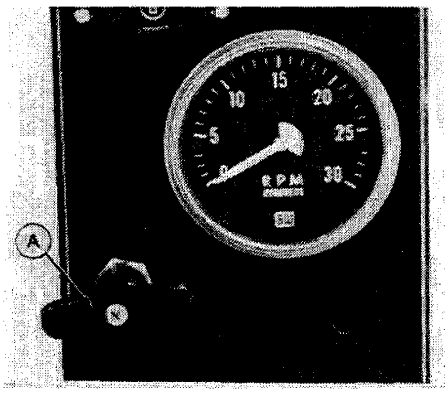
Engines in generator set applications, where the governor is locked at a specified speed and no slow idle function is available, should be unloaded and idled for at least 2 minutes at high idle.

3. Turn key switch to "OFF" position to stop the engine. Remove ignition key.

IMPORTANT: Make sure that exhaust stack cap (rain cap) is installed when engine is not running. This will prevent water and dirt from entering engine.



RG5602 -UN-30NOV89



RG4697 -UN-15DEC88

S11,OMOE,AW -19-09JUN94

USING A BOOSTER BATTERY OR CHARGER

A 12-volt booster battery can be connected in parallel with battery(ies) on the unit to aid in cold weather starting. ALWAYS use heavy duty jumper cables.

CAUTION: Gas given off by battery is explosive. Keep sparks and flames away from battery. Before connecting or disconnecting a battery charger, turn charger off. Make last connection and first disconnection at a point away from battery. Always connect NEGATIVE (-) cable last and disconnect this cable first.

IMPORTANT: Be sure polarity is correct before making connections. Reversed polarity will damage electrical system. Always connect positive to positive and negative to ground. Always use 12-volt booster battery for 12-volt electrical systems and 24-volt booster battery(ies) for 24-volt electrical systems.

1. Connect booster battery or batteries to produce the required system voltage for your engine application.

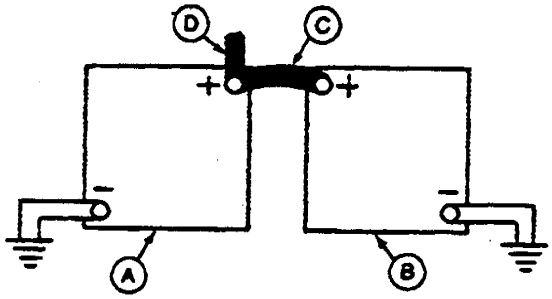
2. Connect one end of jumper cable to the POSITIVE (+) post of battery connected to the starting motor.

3. Connect the other end of the jumper cable to the POSITIVE (+) post of the booster battery.

4. Connect one end of the other jumper cable to the NEGATIVE (-) post of the booster battery.

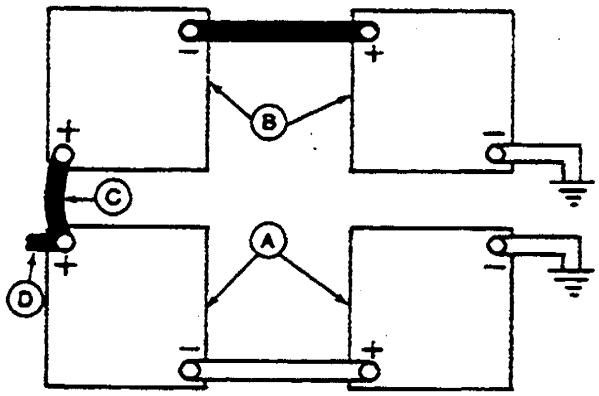
5. ALWAYS complete the hook-up by making the last connection of the NEGATIVE (-) cable to a good ground on the engine frame and away from the battery(ies). When disconnecting, make this the first connection to disconnect.

TS204 -UN-23AUG88



RG4678 -UN-14DEC88

12-Volt System



RG4698 -UN-14DEC88

24-Volt System

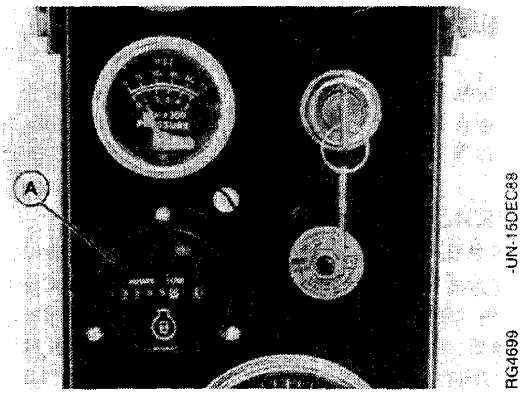
A—12-Volt Machine Battery(ies)
B—12-Volt Booster Battery(ies)
C—Booster Cable
D—Cable To Starting Motor

S11,OMOE,AX1 -19-07JUN91

OBSERVE SERVICE INTERVALS

Using hour meter (A) as a guide, perform all services at the hourly intervals indicated on following pages. At each scheduled maintenance interval, perform all previous maintenance operations in addition to the ones specified. Keep track of services performed in Lubrication and Maintenance Records Section.

IMPORTANT: Recommended service intervals are for normal operating conditions. Service MORE OFTEN if engine is operated under adverse conditions. Neglecting maintenance can result in failures or permanent damage to the engine.



S11,OMLM,BJ -19-09AUG94

USE CORRECT FUELS, LUBRICANTS, AND COOLANT

IMPORTANT: Use only fuels, lubricants, and coolants meeting specifications outlined in Fuels, Lubricants, and Coolant Section when servicing your John Deere Engine.

Consult your John Deere Servicing Distributor or your nearest John Deere Parts Network for recommended fuels, lubricants, and coolant. Also available are necessary additives for use when operating engines in tropical, arctic, or any other adverse conditions.

S11,OMLM,B1 -19-10AUG94

LUBRICATION AND MAINTENANCE SERVICE INTERVAL CHART

Item	Lubrication and Maintenance Service Intervals						
	Daily	100 Hour	250 Hour	400 Hour	600 Hour/ 1-Year	1200 Hour/ 2-Year	As Required
Check Engine Oil and Coolant Level	•						
Check Fuel Filter	•						
Lubricate PTO Release Bearing	•						
Check Air Cleaner Dust Unloader Valve	•						
Lubricate PTO Clutch Shaft Bearing		•					
Service Fire Extinguisher		•					
Service Battery			•				
Change Engine Oil and Filter*			•				
Check V-Belt Tension			•				
Check PTO Clutch Adjustment			•				
Initial Valve Clearance Adjustment**				•			
Lubricate PTO Clutch Levers & Linkage					•		
Clean Crankcase Vent Tube					•		
Check Air Intake Hoses and Connections					•		
Replace Fuel Filter Element					•		
Coolant Solution Analysis					•		
Service Air Intake System					•		
Check Cooling System					•		
Perform Engine Tune-Up						•	
Check and Adjust Engine Speeds						•	
Adjust Engine Valve Clearance						•	
Check Fuel Injection System						•	
Inspect Turbocharger						•	
Check Crankshaft Vibration Damper						•	
Flush Cooling System & Replace Thermostats						•	
Pressure Test Cooling System						•	
Inspect and Service Air Cleaner Elements							•

*** Change the oil for the first time after 100 hours maximum of operation, then every 250 hours thereafter. If TORQ-GARD SUPREME PLUS-50 oil is used along with a John Deere oil filter, the oil change interval may be extended by 50 hours.**

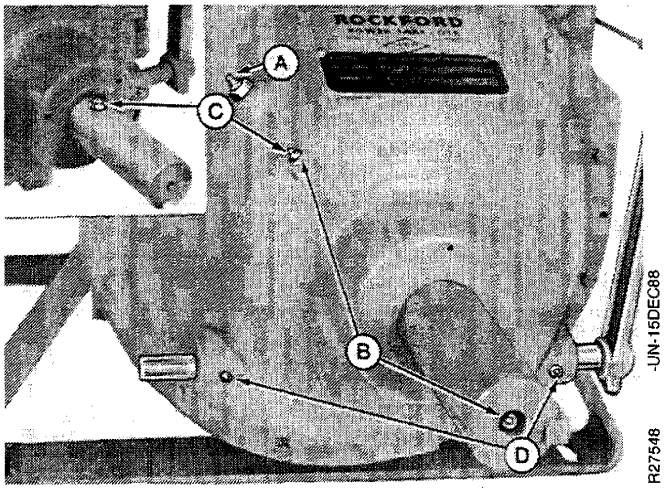
**** Have your authorized servicing dealer or engine distributor adjust valve clearance after the first 400 hours of operation. Then, have the valve clearance adjusted at 1200 hour/2-Year intervals thereafter.**

RG,OMLM,2 -19-02MAR93

LUBRICATE PTO CLUTCH SHAFT BEARINGS

Apply one or two shots of John Deere Multipurpose Lubricant or its equivalent at clutch drive shaft bearing fittings (B or C). DO NOT over-lubricate to avoid getting oil on clutch facings.

IMPORTANT: Lubricate release bearing fitting (A) daily or at 10 hour intervals for continuous operation. (See Prestarting Checks Section.) Lubricate shaft fittings (D) at 600 Hours or 1-Year intervals. (See LUBRICATE PTO CLUTCH SHAFT BEARINGS in 600 Hour/1-Year Service Section.)



R27548 -UN-15DEC88

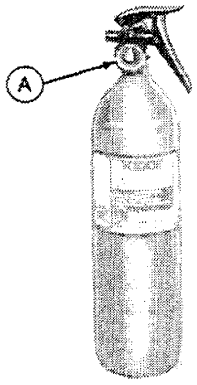
A—Release Bearing Grease Fitting
B—Fittings for Side-Loaded Drive
C—Fittings for In-Line Drive
D—Lever Shaft Fittings

S11,OMLM,C -19-09AUG94

SERVICING FIRE EXTINGUISHER

A fire extinguisher (A) is available from your authorized servicing dealer or engine distributor.

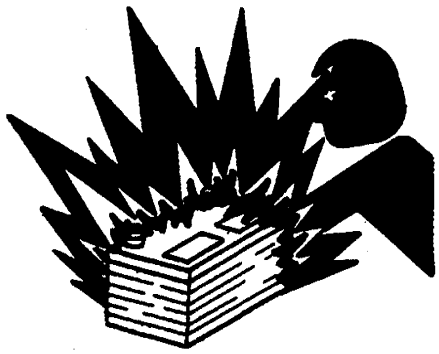
Read and follow the instructions which are packaged with it. The extinguisher should be inspected at least every 100 hours of engine operation or once a month. Once extinguisher is operated, no matter how long, it must be recharged. Keep record of inspections on the tag which comes with the extinguisher instruction booklet.



RW4918 -UN-15DEC88

S11,OMLM,AP -19-22FEB93

SERVICE BATTERY

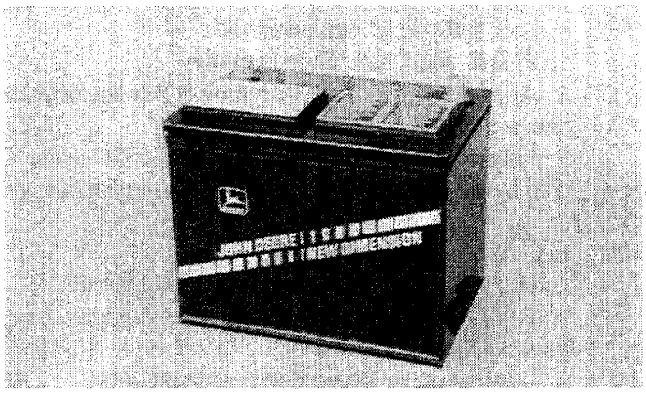


TS204 -UN-23AUG88

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded (-) battery clamp first and replace it last.



RG4694 -UN-15DEC88

In freezing weather, run engine at least 30 minutes to assure thorough mixing after adding water to battery.

1. On regular batteries, check electrolyte level. Fill each cell to bottom of filler neck with distilled water.

NOTE: Low-maintenance or maintenance-free batteries should require little additional service. However, electrolyte level can be checked by cutting the center section of decal on dash-line, and removing cell plugs. If necessary, add clean, soft water to bring level to bottom of filler neck.

2. Keep batteries clean by wiping them with a damp cloth. Keep all connections clean and tight. Remove any corrosion, and wash terminals with a solution of 1 part baking soda and 4 parts water. Tighten all connections securely.

NOTE: Coat battery terminals and connectors with a mixture of petroleum jelly and baking soda to retard corrosion.

3. Keep battery fully charged, especially during cold weather. If a battery charger is used, turn charger off before connecting charger to battery(ies). Attach POSITIVE (+) battery charger lead to POSITIVE (+) battery post. Then attach NEGATIVE (-) battery charger lead to a good ground.

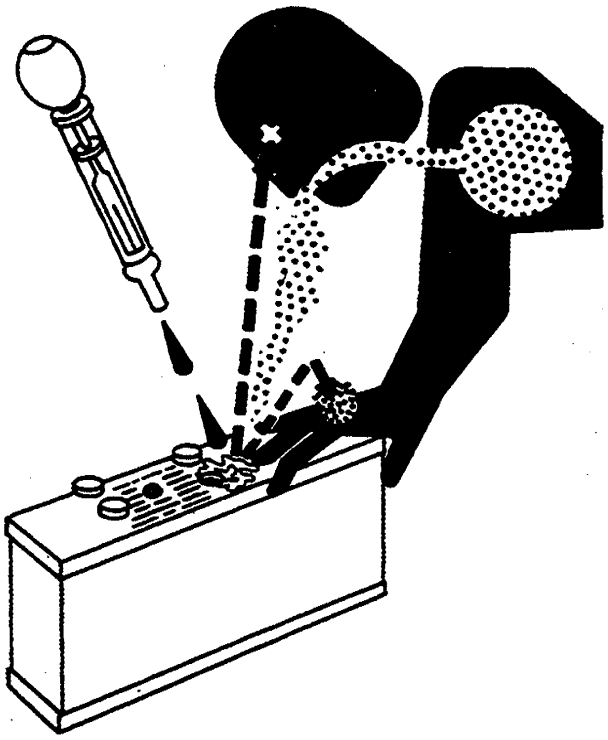
S55,OMLM,P -19-07JUN91

CAUTION: Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:
1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10—15 minutes. Get medical attention immediately.

If acid is swallowed:
1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.



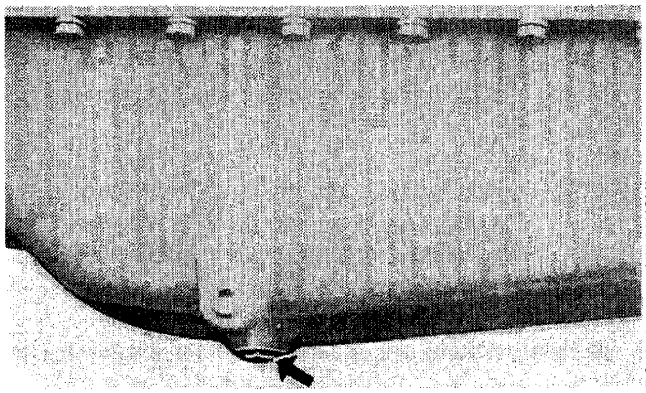
TS203 -UN-23AUG88

If necessary to replace battery(ies), replacements must meet or exceed the following recommended capabilities at -18° C (0° F):

Std. Duty Starter	640 Cold Cranking Amps
Heavy Duty Starter	800 Cold Cranking Amps

S55,OMLM,Q -19-19MAR91

CHANGE ENGINE OIL AND FILTER



NOTE: Change engine oil and filter for the first time after 100 hours maximum of operation, then every 250 hours thereafter.

If John Deere TORQ-GARD SUPREME PLUS-50 engine oil and a John Deere oil filter are used, the oil and filter change interval may be extended by 50 hours.

OILSCAN is a John Deere sampling program to help you monitor machine performance and identify potential problems before they cause serious damage. OILSCAN kits are available from your John Deere dealer. Oil samples should be taken prior to the oil change. Refer to instructions provided with kit.

1. Run engine approximately 5 minutes to warm up oil. Shut engine off.

2. Drain oil while warm.

3. Remove plug (arrow) and drain oil from engine crankcase.

NOTE: Drain plug location may vary, depending on the application.

S11,OMLM,CW -19-09JUN94

4. Remove and discard oil filter element (A).

5. Remove oil filter packing and clean filter mounting pad.

IMPORTANT: Filtration of oils is critical to proper lubrication. Always change filter regularly. Use filter meeting John Deere performance specifications.

6. Oil new packing and install new filter element. Hand tighten element according to values printed on filter element. If values are not provided, tighten element approximately one turn after packing contacts filter housing. DO NOT overtighten filter element.

7. Install drain plug with a new seal when equipped.

8. Fill engine crankcase with correct John Deere engine oil through rocker arm cover opening or on some engine applications, the timing gear cover opening. (See ENGINE OIL in Fuels, Lubricants, and Coolant Section for determining correct engine oil.)

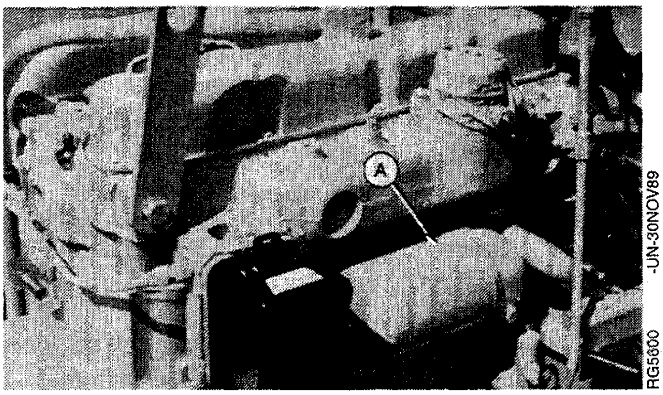
To determine the correct oil fill quantity for your engine, see ENGINE CRANKCASE OIL FILL QUANTITIES in the Specifications Section.

NOTE: Crankcase oil capacity may vary slightly. ALWAYS fill crankcase to full mark or within crosshatch on dipstick, whichever is present. DO NOT overfill.

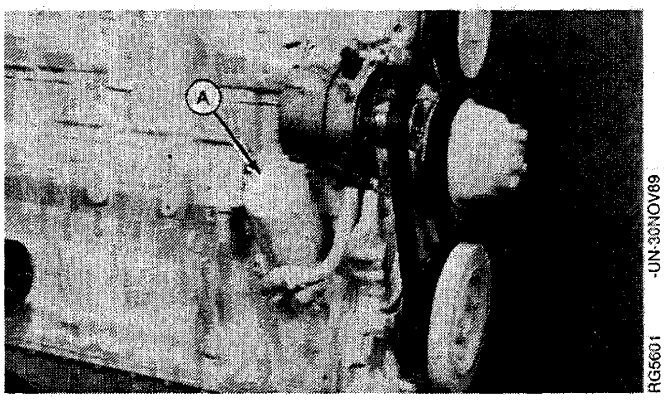
IMPORTANT: Immediately after completing any oil change, crank engine for 30 seconds without permitting engine to start. This will help insure adequate lubrication to engine components before engine starts.

9. Start engine and run to check for possible leaks.

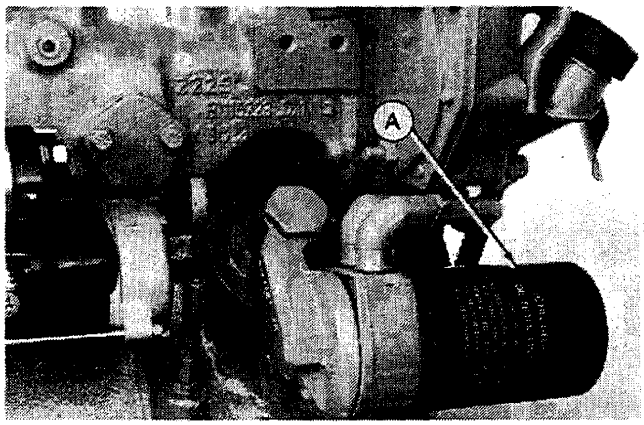
10. Stop engine and check oil level after 10 minutes. Oil level reading should be on upper mark of dipstick.



4045 and 6068 Engines



4039 and 6059 Engines



3029 Engines

S11,OMLM,CX1 -19-09AUG94

FAN AND ALTERNATOR BELTS TENSION OR REPLACEMENT

Low belt tension causes slippage resulting in excessive cover wear, burn spots, overheating, or "slip and grab", causing belt breakage.

High belt tension causes belt heating and excessive stretch, as well as damage to drive components such as pulleys and shafts. V-belts should ride on the sides of standard pulleys not on the bottom of the groove.

Standard V-Belt tension can be checked with JDG529 Tension Gauge (arrow) or equivalent gauge.

NOTE: On engines with dual belts, check tension of front belt only.

1. Inspect belts for cracks, fraying, or stretched out areas. Replace if necessary.

2. Using either JDG529 Tension Gauge (arrow) or belt tension tester (A) and straightedge (B), check tension of warm belts:

- For standard V-Belt, an 89 N (20 lb force) applied halfway between pulleys should deflect belt by 19 mm (3/4 in.).

- For Poly V-Belt, a 130 N (30 lb force) applied halfway between pulleys should deflect belt by 13 mm (1/2 in.).

3. If adjustment is necessary, loosen alternator bracket cap screw (C) and nut (D) on mounting bolt. Pull alternator frame outward until belts are correctly tensioned.

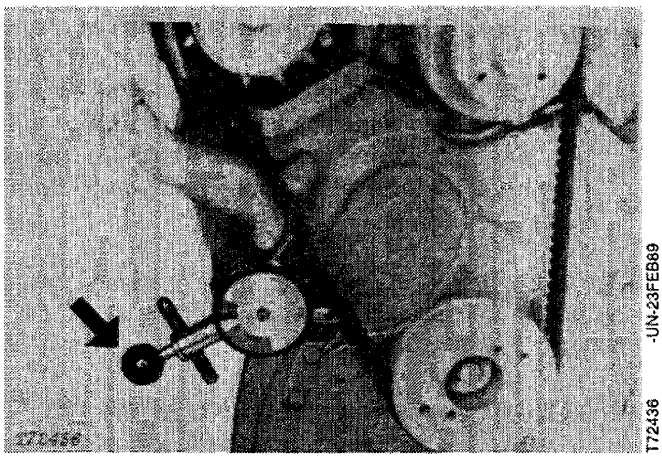
IMPORTANT: Do not pry against the alternator rear frame. Do not tighten or loosen belts while they are hot.

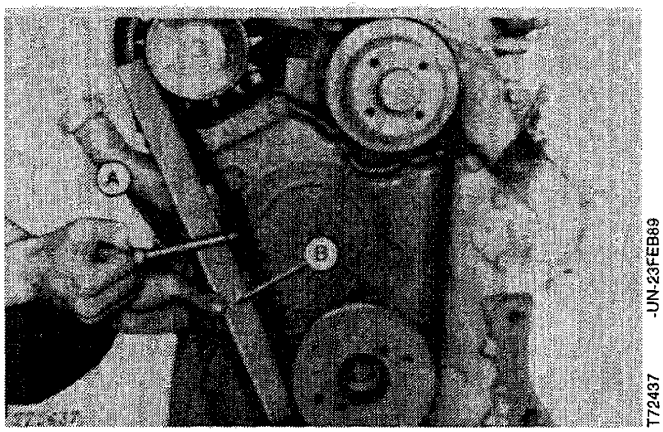
4. Tighten alternator bracket cap screw and nut firmly.

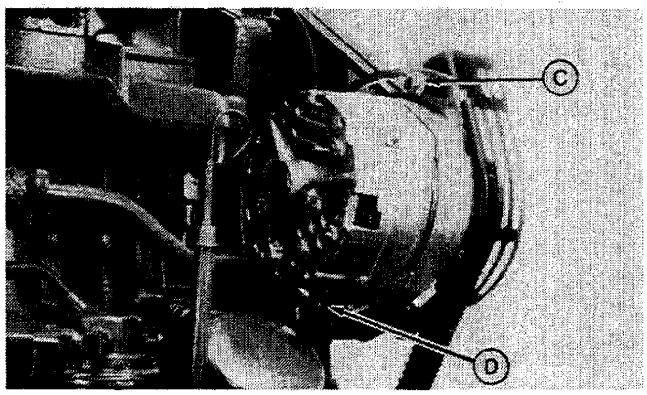
5. After a new or used belt has run for 10 minutes, recheck belt tension.

	Standard V-Belts	
	Tension New Belt	**Tension Used* Belt**
Single Belt	578—622 N (130—140 lb force)	378—423 N (85—94 lb force)
Dual Belt	423—467 N (95—104 lb force)	378—423 N (85—94 lb force)

** Belts are considered used after 10 minutes of operation.*







A—Tension Tester
B—Straightedge
C—Alternator Bracket Cap Screw
D—Nut on Mounting Bolt

RG,FANALT,A -19-11AUG94

110894

CHECK PTO CLUTCH ADJUSTMENT


-UN-23AUG88
TS198

CAUTION: Never attempt to service the PTO while it is in operation. Loose clothing could get caught in moving parts; keep clothing tight against body. Use extreme care when working around the PTO.

1. Measure clutch engagement force at handle grip using a spring scale. The engagement force should be 267—311 N (60—70 lb force).

IMPORTANT: Improper adjustments of the PTO clutch may shorten clutch life. Make sure adjustments are made properly.

2. If adjustments are needed, disengage clutch and stop engine. Remove cover plate from clutch housing (shown removed).

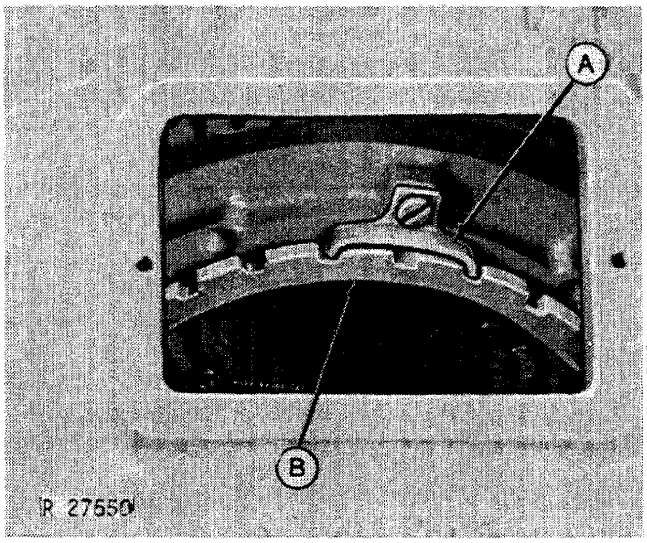
3. Remove adjusting lock (A).

4. Turn adjusting ring (B) to adjust clutch engagement pressure.

5. Measure engagement force at clutch handle with spring scale.

6. Install adjusting lock and tighten screw securely.

7. Install cover plate and recheck clutch engagement force.



-UN-14DEC88
R27550

S11,OMLM,CZ -19-02MAR93

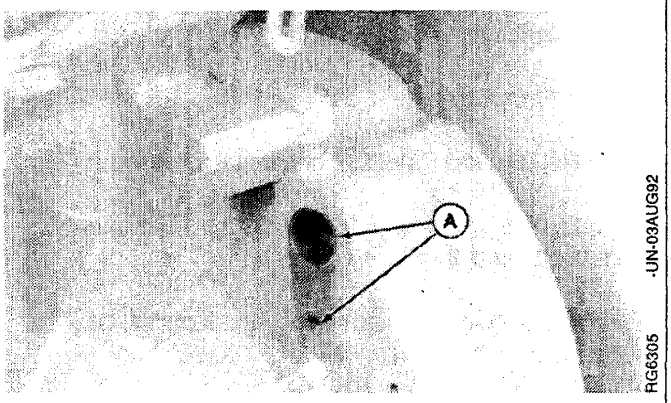
CHECK AND ADJUST ENGINE VALVE CLEARANCE

IMPORTANT: Any time air intake system is opened, it must be checked for leaks before machine is returned to service. (See CHECK AIR INTAKE HOSES in 600 Hour/1-Year Section.)

Engine valve clearance MUST BE checked and/or adjusted with engine COLD.

1. Remove rocker arm cover and crankcase ventilator hose.

2. Remove plugs or cover plate from flywheel housing timing holes (A).



RG18293,3 -19-11AUG94

3. Using JD281A, JDE83, or JDG820 Engine Rotation Tool and JDE81-4 Timing Pin, rotate engine in running direction (clockwise viewed from front) until No. 1 cylinder is at TDC Compression stroke. Insert timing pin in flywheel.

NOTE: Some engines are equipped with flywheel housings which do not allow use of an engine rotation tool.

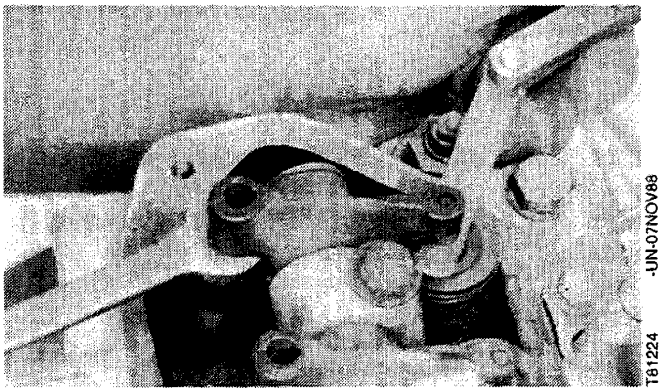
If No.1 cylinder rocker arms are loose, the engine is at No. 1 "TDC-Compression". If No. 1 cylinder rocker arms are not loose, rotate engine one full revolution (360°) to No. 1 "TDC-Compression".

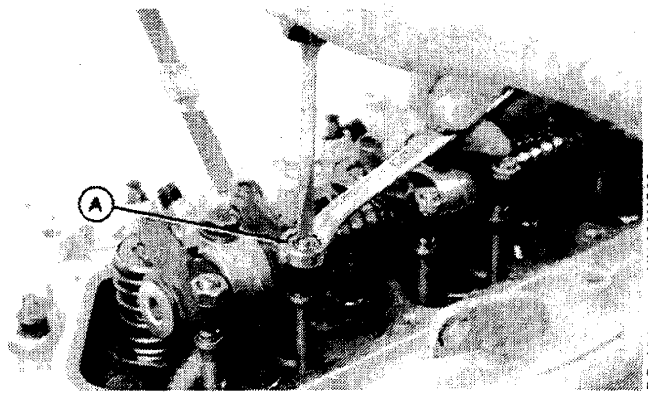
4. Check and adjust valve clearance to specifications, as directed in the following procedures for 3-, 4-, or 6-cylinder engines.

VALVE CLEARANCE (ROCKER ARM-TO-VALVE TIP) SPECIFICATION

Intake Valve	0.35 mm (0.014 in.)
Exhaust Valve	0.45 mm (0.018 in.)

5. If rocker arm is equipped with adjusting screw and jam nut (A), tighten jam nut to 27 N·m (20 lb-ft) after adjusting valve clearance.





RG18293,4 -19-09JUN94

- **3-Cylinder Engine:**

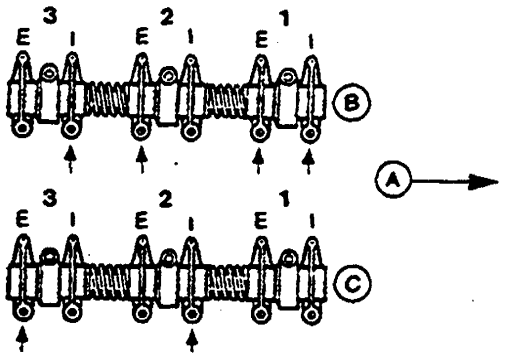
NOTE: Firing order is 1-2-3.

Lock No. 1 piston at TDC compression stroke (B).

Adjust valve clearance on No. 1 and 2 exhaust valves and No. 1 and 3 intake valves.

Turn crankshaft 360° and lock No. 1 piston at TDC exhaust stroke (C).

Adjust valve clearance on No. 3 exhaust valve and No.2 intake valve.



RG4775 -UN-06DEC88

A—Front of Engine
B—No. 1 Piston at TDC Compression Stroke
C—No. 1 Piston at TDC Exhaust Stroke
E—Exhaust Valve
I—Intake Valve

RG,CTM8,G05,67 -19-10JUL92

- **4-Cylinder Engine:**

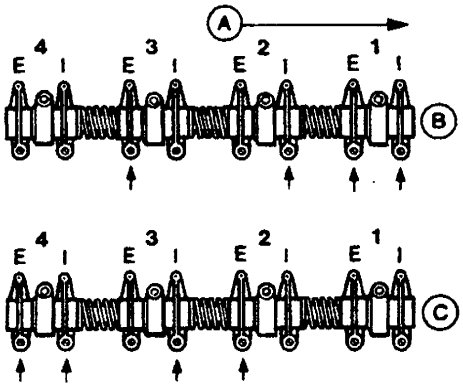
NOTE: Firing order is 1-3-4-2.

Lock No. 1 piston at TDC compression stroke (B).

Adjust valve clearance on No. 1 and 3 exhaust valves and No. 1 and 2 intake valves.

Turn crankshaft 360°. Lock No. 4 piston is at TDC compression stroke (C).

Adjust valve clearance on No. 2 and 4 exhaust valve and No. 3 and 4 intake valves.



RG4776 -UN-22SEP92

A—Front of Engine
B—No. 1 Piston at TDC Compression Stroke
C—No. 4 Piston at TDC Compression Stroke
E—Exhaust Valve
I—Intake Valve

RG,CTM8,G05,9 -19-10JUL92

- **6-Cylinder Engine:**

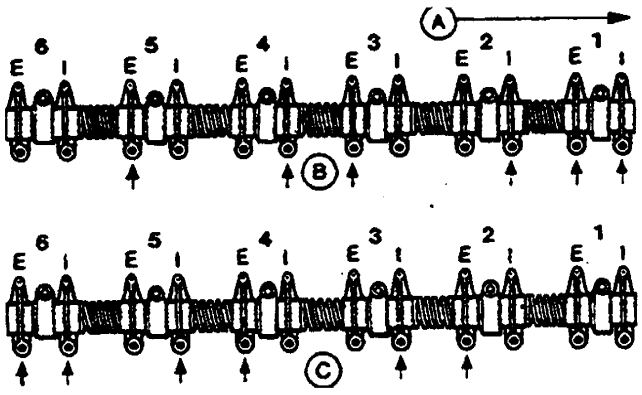
NOTE: Firing order is 1-5-3-6-2-4.

LocK No. 1 piston at TDC compression stroke (B).

Adjust valve clearance on No. 1, 3 and 5 exhaust valves and No. 1, 2 and 4 intake valves.

Turn crankshaft 360°. Lock No. 6 piston is at TDC compression stroke (C).

Adjust valve clearance on No. 2, 4 and 6 exhaust valve and No. 3, 5 and 6 intake valves.



A—Front of Engine
B—No. 1 Piston at TDC Compression Stroke
C—No. 6 Piston at TDC Compression Stroke
E—Exhaust Valve
I—Intake Valve

RG,CTM8,G05,10 -19-10JUL92

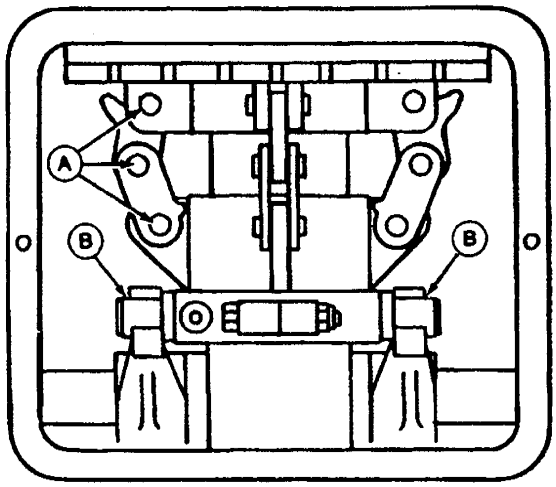
LUBRICATING PTO CLUTCH INTERNAL LEVERS AND LINKAGE

CAUTION: Never attempt to service the PTO while it is in operation. Loose clothing could get caught in moving parts; keep clothing tight against body. Use extreme care when working around the PTO.

TS198 -UN-23AUG88

1. Remove the PTO housing cover and apply one shot of John Deere Multipurpose Lubricant to the pivot points (A) of each clutch linkage.

2. Apply one shot of John Deere Multipurpose Lubricant to the two PTO release lever shaft fittings (B).



RG6641 -UN-18FEB93

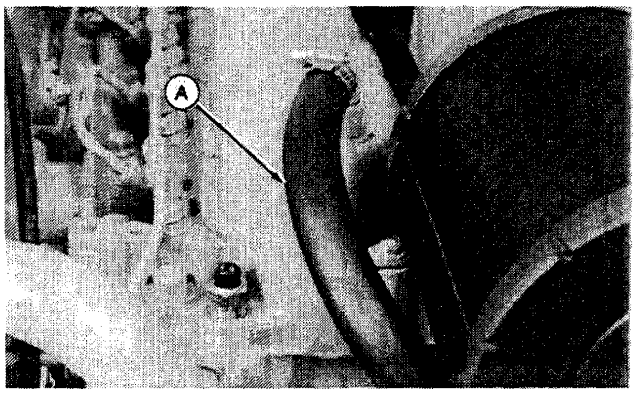
RG,21881,PTO4 -19-26FEB93

CLEAN CRANKCASE VENT TUBE

1. Remove and clean crankcase vent tube (A).

If you operate the engine in dusty conditions, clean the tube at shorter intervals.

2. Install the vent tube. Be sure the O-ring fits correctly in the rocker arm cover for elbow adapter. Tighten hose clamp securely.



RG6005 -UN-27JAN92

RG,20144,64 -19-17DEC91

CHECK AIR INTAKE HOSES

Check the clamps on the hoses which connect the air cleaner, engine and, if present, turbocharger. If necessary, tighten the hose clamps. Inspect the hoses for cracks.

IMPORTANT: The air intake system must not leak. Any leak, no matter how small, may result in engine failure due to abrasive dirt and dust entering the intake system.

S11,OMLM,DG -19-17DEC91

REPLACE FUEL FILTER ELEMENT

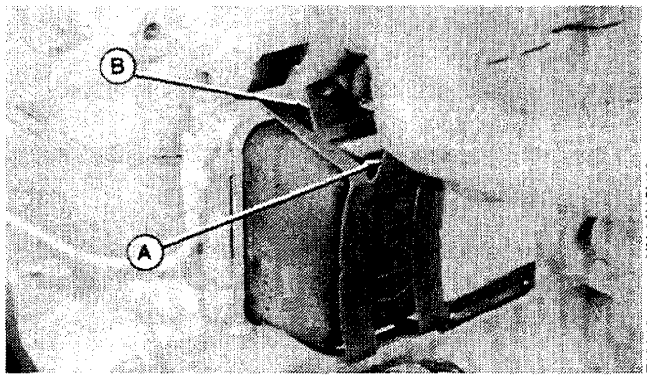
On Rectangular Fuel Filters:

1. Close the fuel shut-off valve at bottom of fuel tank, if equipped.

NOTE: Keep a small container under drain plug to catch draining fuel.

2. Loosen bleed plug on side of filter base. Remove drain plug from bottom of filter base to drain fuel from filter.

3. Push tab (A) inward while lifting tab (B) upward and release the retaining spring. Pull fuel filter off fuel filter base.



S11,3010,RF1 -19-17FEB93

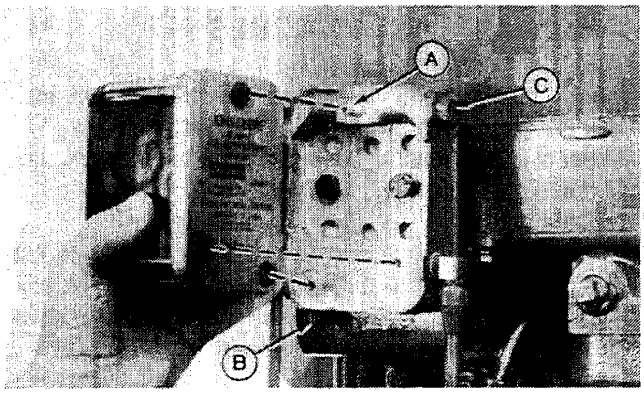
4. Place filter on filter base with upper seal over spring pin (A) on filter base.

5. Hook bottom end of retaining spring first; then hook the top end.

6. Install drain plug (B). Tighten drain plug securely.

7. Open fuel shut-off valve and bleed filters. (See BLEED FUEL SYSTEM in Service As Required Section.) Tighten bleed plug (C).

A—Spring Pin
B—Drain Plug
C—Bleed Plug



S11,OMLM,DK -19-17FEB93

On Round Fuel Filters:

1. When equipped, close the fuel shut-off valve.

2. Loosen retaining ring (A) and remove filter element (B).

3. When equipped with water separator, remove filter element from glass sediment bowl. Clean sediment bowl and reinstall a new element onto bowl.

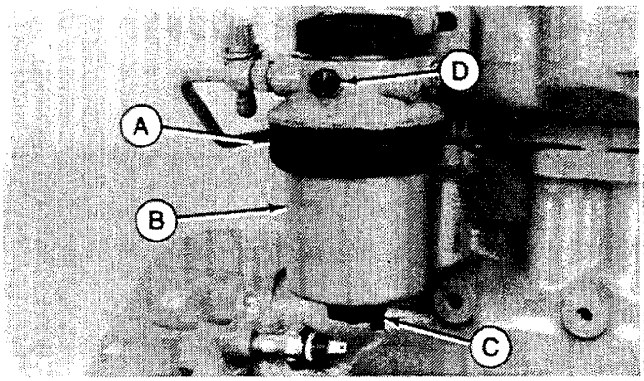
4. Align keys on filter element with slots in filter base.

5. Hand tighten until the retaining ring fits into the lock position.

NOTE: The proper installation is indicated when a "click" is heard and a release of the retaining ring is felt.

A plug is provided with the new element for plugging the used element.

6. Open fuel shut-off valve and bleed fuel system. (See BLEED FUEL SYSTEM in Service As Required Section.) Tighten bleed plug (D).



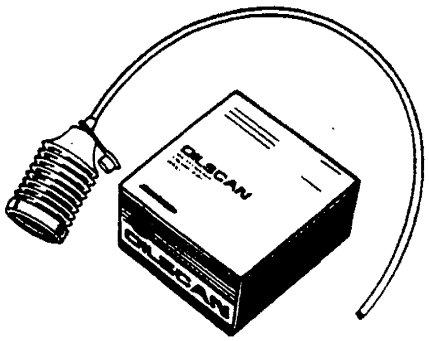
A—Retaining Ring
B—Filter element
C—Drain Plug
D—Bleed Plug

RG18293,5 -19-02AUG94

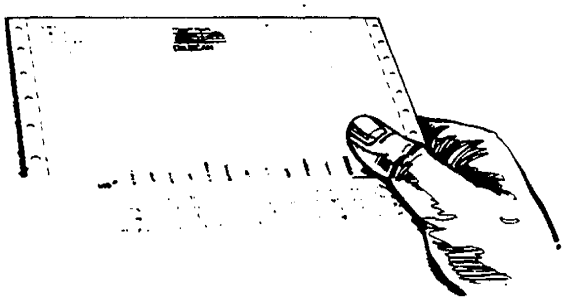
CHECK EFFECTIVENESS OF COOLANT SOLUTION

When your coolant has accumulated 600 hours of operating time, the effectiveness of your engine coolant should be evaluated by obtaining a coolant sample.

COOLSCAN is a John Deere sampling program to help you monitor the effectiveness of your engine's coolant solution and identify potential problems before they cause serious damage. COOLSCAN kits are available from your John Deere dealer. Refer to instructions provided with kit.



T6828AB -UN-15JUN89



T6829AB -UN-18OCT88

RG,OMLM,3 -19-17FEB93

REPLACE AIR CLEANER ELEMENTS

If equipped with this air cleaner, service as follows:

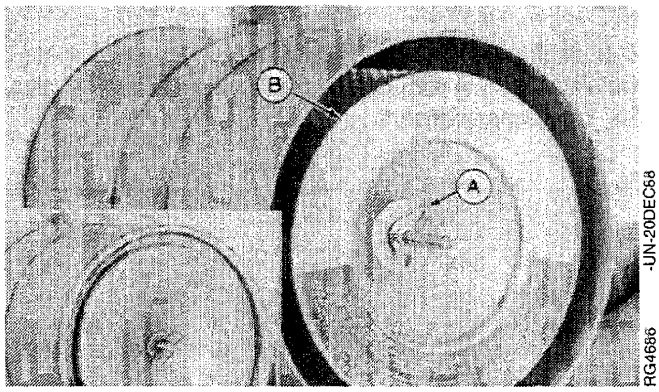
1. Remove wing nut and remove cover shown in small illustration inset.

2. Remove wing nut (A) and remove primary air cleaner assembly (B) from canister.

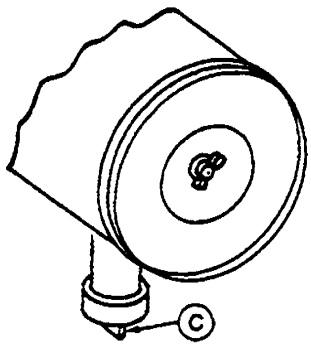
NOTE: Primary air cleaner element fits snugly in canister. It may be necessary to wiggle element as it is removed from canister.

3. Thoroughly clean all dirt from inside of canister.

4. If equipped, squeeze dust unloader valve (C) to discharge any trapped dirt particles. Inspect as instructed in Step 2 of CHECK AIR INTAKE SYSTEM, later in this section.



RG4686 -UN-20DEC88



RG4687 -UN-20DEC88

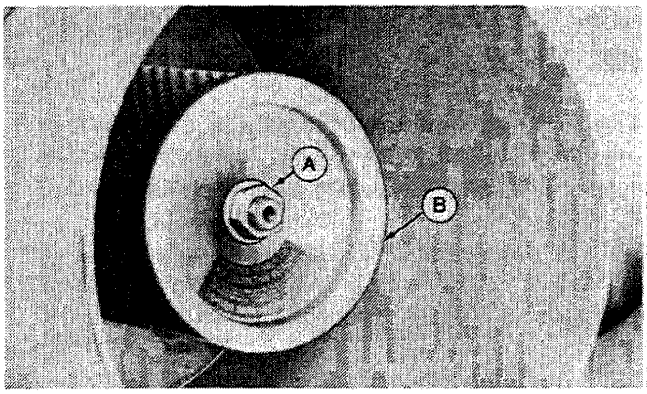
S55,OMLM,R -19-10MAY91

110894

IMPORTANT: Thoroughly clean all dirt from inside of canister before removing secondary element.

5. Remove retaining nut (A) and secondary element (B). Replace secondary element with new element immediately to prevent dust from entering air intake system.

6. Install new primary element and tighten wing nut securely. Install cover assembly and tighten retaining wing nut securely.

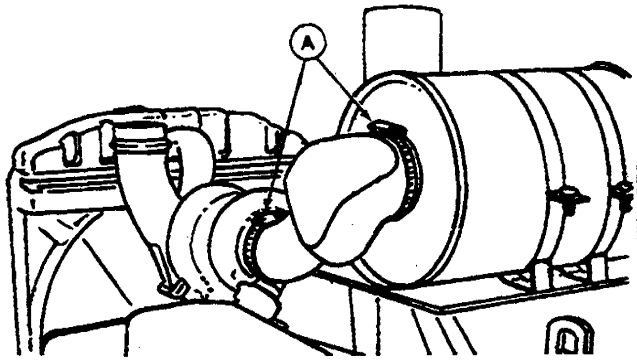


S55,OMLM,S -19-21DEC89

CHECK AIR INTAKE SYSTEM

1. Check the clamps (A) on the piping which connect the air cleaner to the engine. Tighten the clamps as necessary. This will help prevent dirt from entering the air intake system through loose connections causing internal engine damage.

2. If engine has a rubber dust unloader valve, inspect the valve on bottom of air cleaner for cracks or plugging. Replace as necessary.



S11,OMLM,DS -19-10MAY91

CHECK COOLING SYSTEM

TS281 -UN-23AUG88

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

IMPORTANT: Air must be expelled from cooling system when system is refilled. Loosen temperature sending unit fitting at rear of cylinder head or plug in thermostat housing to allow air to escape when filling system. Retighten fitting or plug when all the air has been expelled.

1. Check entire cooling system for leaks. Tighten all clamps securely.

2. Replace hoses when hard, flimsy, or cracked.

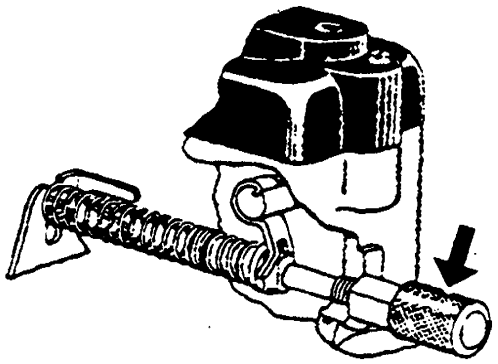
RG,COOL,CHK,SYS-19-16JUN94

CHECK AND ADJUST ENGINE SPEEDS

If equipped with a tachometer on the instrument panel, observe the tachometer to verify engine speeds. Refer to FUEL INJECTION PUMP SPECIFICATIONS in Specifications Section, later in this manual.

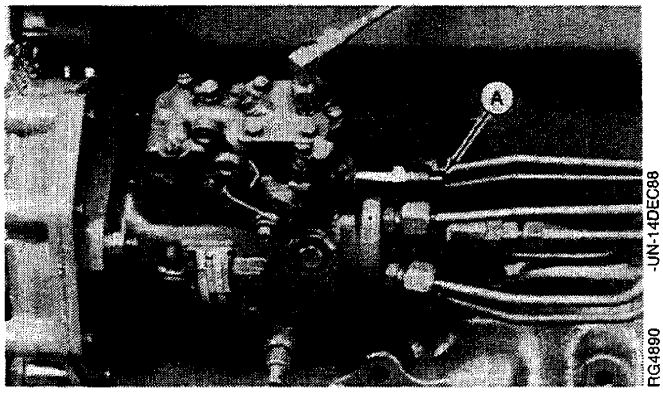
S11,OMOE,DL1 -19-09AUG94

ADJUST VARIABLE SPEED ON GENERATOR SET ENGINES (STANADYNE INJECTION PUMPS ONLY)



T86735 -UN-23FEB89

1. Warm engine to normal operating temperature.
2. Run engine at rated speed.
3. Apply full load.
4. Remove load.
5. Note the no-load speed or frequency.
6. If throttle is not spring-loaded type, disconnect throttle linkage or cable.
7. Turn knob (bold arrow) or screw (A) to adjust droop.
8. If necessary, adjust and connect throttle linkage or cables.



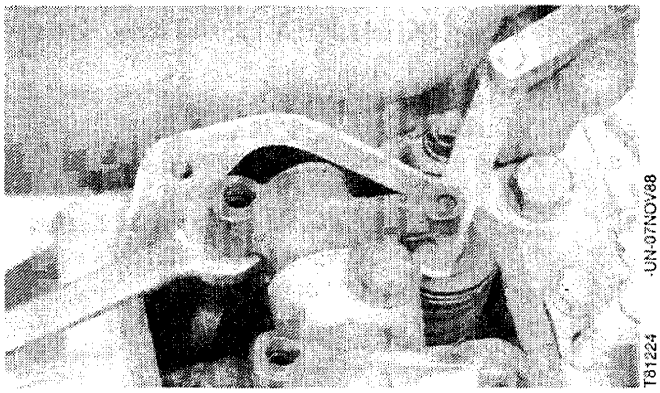
RG4890 -UN-14DEC88

S11,OMLM,DM -19-10MAY91

ADJUST ENGINE VALVE CLEARANCE

Adjust engine valve clearance. (See ADJUST ENGINE VALVE CLEARANCE in Lubrication and Maintenance/400 Hours Section or have your authorized servicing dealer or engine distributor adjust the valve clearance.)

IMPORTANT: Have valves adjusted after the first 400 hours of operation on new or rebuilt engines. Then, have them adjusted at 1200 Hr/2-Year interval thereafter.



S11,OMLM,DN -19-09AUG94

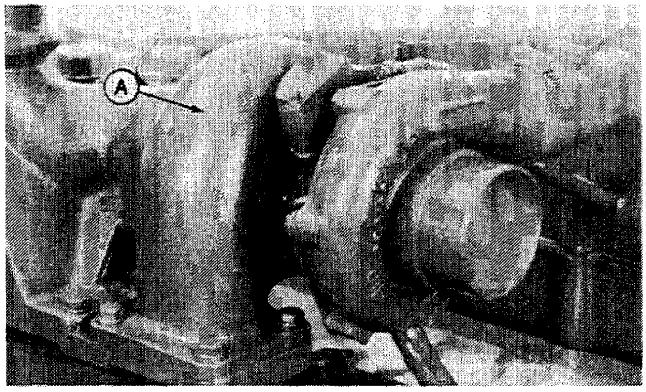
CHECK FUEL INJECTION SYSTEM

Check the overall fuel injection system. Also check the engine/injection pump timing, clean the injection nozzles, and adjust opening pressure. (See your authorized diesel injection repair station, servicing dealer, or engine distributor.)

S11,OMLM,DO -19-02MAR93

INSPECT TURBOCHARGER

On turbocharged engines, check for excessive radial or axial end play of compressor wheel (A) and turbocharger boost pressure. (See your authorized servicing dealer or engine distributor.)

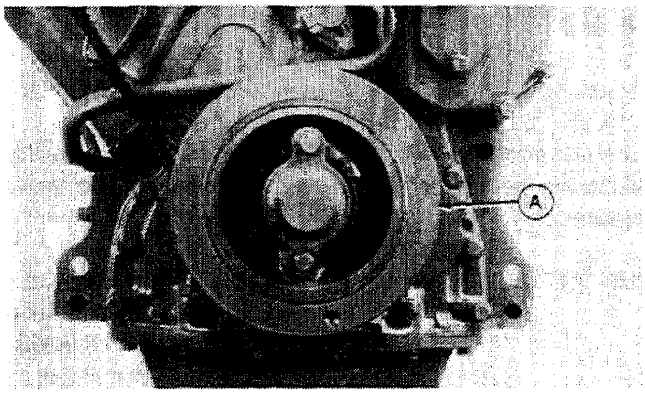


S11,OMLM,DP -19-07JUN91

CHECK CRANKSHAFT VIBRATION DAMPER

Grasp vibration damper (A) with both hands and attempt to turn it in both directions. If rotation is felt, damper is malfunctioning and should be replaced.

NOTE: The vibration damper assembly is not repairable and should be replaced every 4500 hours or 5-years, whichever occurs first.



S11,OMLM,DU -19-07JUN91

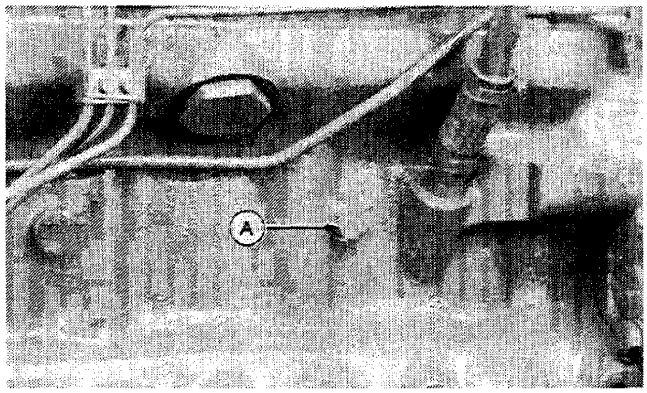
FLUSH COOLING SYSTEM AND REPLACE THERMOSTATS

TS281 -UN-23AUG88

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Drain old coolant, flush the entire cooling system, replace thermostats, and fill with recommended clean coolant.



RG4894 -UN-14DEC88

1. Slowly open the engine cooling system filler cap or radiator cap to relieve pressure and allow coolant to drain faster.

2. Open radiator drain valve. Drain all coolant from radiator.

3. On left side of engine, open drain valve or remove drain plug (A) from engine block. Drain all coolant from engine block.

4. Close all drain valves after coolant has drained.

5. Fill the cooling system with clean water. Run the engine about 10 minutes to stir up possible rust or sediment.

6. Stop engine and immediately drain the water from system before rust and sediment settle.

7. After draining water, close drain valves and fill the cooling system with clean water and TY15979 John Deere Heavy Duty Cooling System Cleaner or an equivalent cleaner such as Fleetguard® RESTORE™. Follow manufacturer's directions on label.

8. After cleaning the cooling system, fill with water to flush the system. Run the engine about 10 minutes, then drain out flushing water.

Fleetguard® is a registered trademark of Cummins Engine Company.

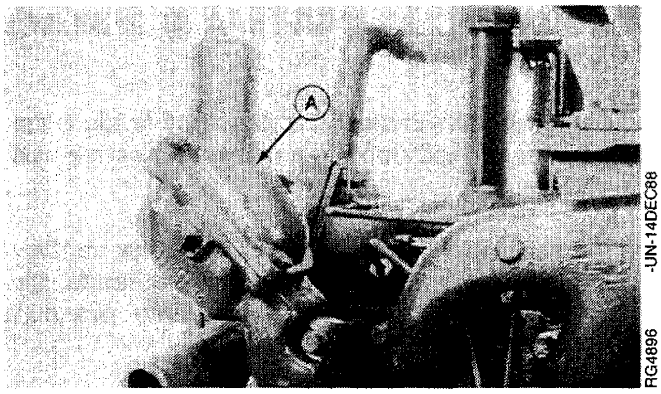
RESTORE™ is a trademark of Fleetguard.

S11,OMLM,DV1 -19-11AUG94

110894

9. For thermostat replacement, remove cap screws and thermostat cover (A).

NOTE: Some engines have only one thermostat. Illustration shows the two-thermostat engine.



S11,OMLM,DX1 -19-15NOV89

10. Remove and discard thermostats (A) and all gasket material (B).

11. Install new gasket.

12. Install new thermostats and cover. Tighten all cap screws to 27 N·m (20 lb-ft).

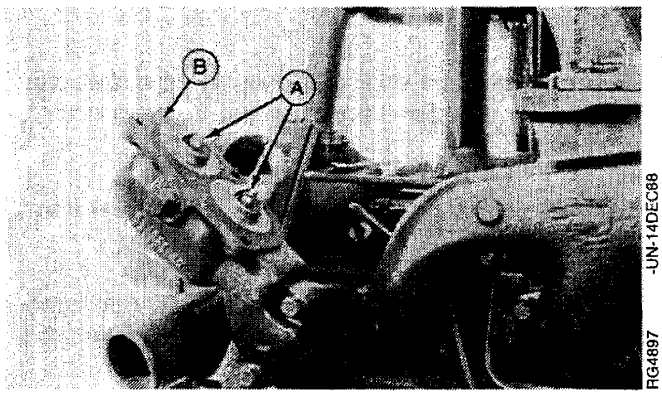
13. Close all drain valves on the engine and the radiator.

IMPORTANT: Air must be expelled from cooling system when system is refilled. Loosen temperature sending unit fitting at rear of cylinder head or plug in thermostat housing to allow air to escape when filling system. Retighten fitting or plug when all the air has been expelled.

14. Add coolant to radiator until coolant touches bottom of filler neck. (See RECOMMENDED ENGINE COOLANT in Fuels, Lubricants, and Coolant Section for determining appropriate coolant.)

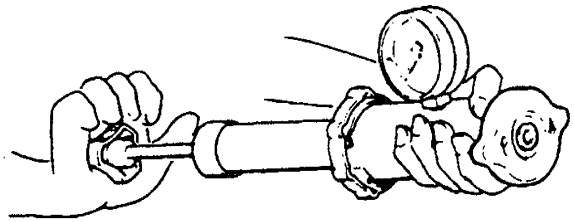
15. Run engine until it reaches operating temperature. This mixes coolant and water uniformly and circulates it through the entire system. The normal engine coolant temperature range is 82°—94°C (180°—202°F).

16. After running engine, check coolant level and entire cooling system for leaks.

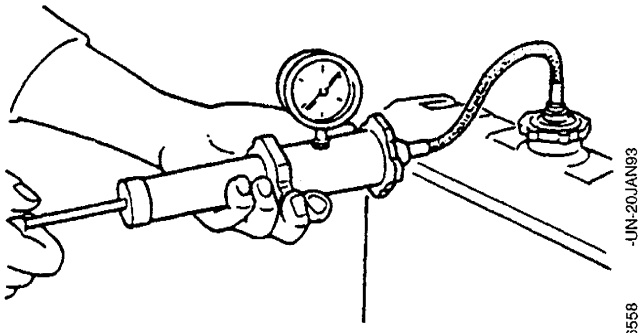


S11,OMLM,DY -19-09AUG94

PRESSURE TEST COOLING SYSTEM AND RADIATOR CAP



RG6557 -UN-20JAN93



RG6558 -UN-20JAN93

⚠ CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Test Radiator Cap:

1. Remove radiator cap and attach to an approved tester as shown.

2. Pressurize cap to 50 kPa (0.5 bar) (7 psi)*. Gauge should hold pressure for 10 seconds within the normal range if cap is acceptable.

If gauge does not hold pressure, replace radiator cap.

3. Remove the cap from gauge, turn it 180°, and retest cap. This will verify that the first measurement was accurate.

Test Cooling System:

NOTE: Engine should be warmed up to test overall cooling system.

1. Allow engine to cool, then carefully remove radiator cap.

2. Fill radiator with coolant to the normal operating level.

IMPORTANT: DO NOT apply excessive pressure to cooling system, doing so may damage radiator and hoses.

3. Connect gauge and adapter to radiator filler neck. Pressurize cooling system to 50 kPa (0.5 bar) (7 psi)*.

4. With pressure applied, check all cooling system hose connections, radiator, and overall engine for leaks.

If leakage is detected, correct as necessary and pressure test system again.

If no leakage is detected, but the gauge indicated a drop in pressure, coolant may be leaking internally within the system or at the block-to-head gasket. Have your servicing dealer or distributor correct this problem immediately.

**Test pressures recommended are for all Deere OEM cooling systems. On specific vehicle applications, test cooling system and pressure cap according to the recommended pressure for that vehicle.*

RG18293,6 -19-02AUG94

PERFORM ENGINE TUNE-UP

As a general guideline, an engine tune-up is recommended at 1200 Hour or 2-Year intervals (whichever comes first). However, a tune-up should be performed as often as needed to maintain optimum performance within the general condition limits of the engine. Some engine applications, such as generator sets, may require a different tune-up interval than given above. Have your authorized servicing dealer or engine distributor perform the following checks and services:

- Check, and adjust if necessary, engine valve clearance. (Lubrication and Maintenance/400 Hr and 1200 Hr/2-Yr.

- Change oil and filter. (Lubrication and Maintenance/250 Hr.)

- Check electrical system. (Lubrication and Maintenance/250 Hr.)

- Lubricate PTO clutch internal levers and linkage. (Lubrication and Maintenance/600 Hr/1-Yr)

- Clean crankcase vent tube. (Lubrication and Maintenance/600 Hr/1-Yr)

- Replace fuel filters. (Lubrication and Maintenance/600 Hr/1-Yr)

- Check air intake system and replace air cleaner elements. (Lubrication and Maintenance/600 Hr/1-Yr)

- Check, and adjust if necessary, engine speeds. (Lubrication and Maintenance/1200 Hr/2-Yr)

- Check fuel injection system: Check, and if necessary, adjust injection pump timing, clean injection nozzles and adjust opening pressure. (Lubrication and Maintenance/1200 Hr/2-Yr)

- Inspect turbocharger and check turbocharger boost pressure on turbocharged engines. (Lubrication and Maintenance/1200 Hr/2-Yr)

- Check crankshaft vibration damper. (Lubrication and Maintenance/1200 Hr/2-Yr)

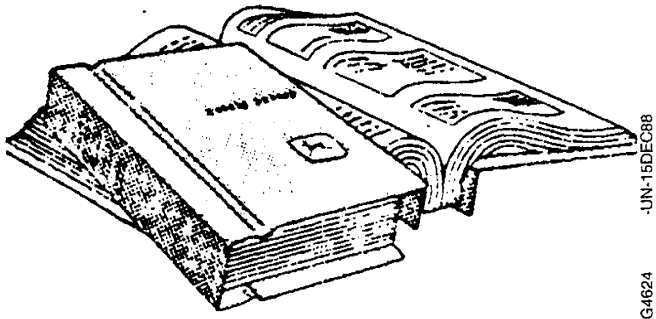
- Check and service engine cooling system. (Lubrication and Maintenance/1200 Hr/2-Yr)

- Check engine oil pressure. Adjust, if necessary. (See your authorized servicing dealer or engine distributor.

S55,OMTU,B -19-02MAR93

ADDITIONAL SERVICE INFORMATION

This is not a detailed service manual. If you want more detailed service information, use the form in the back of this manual to order a component technical manual.



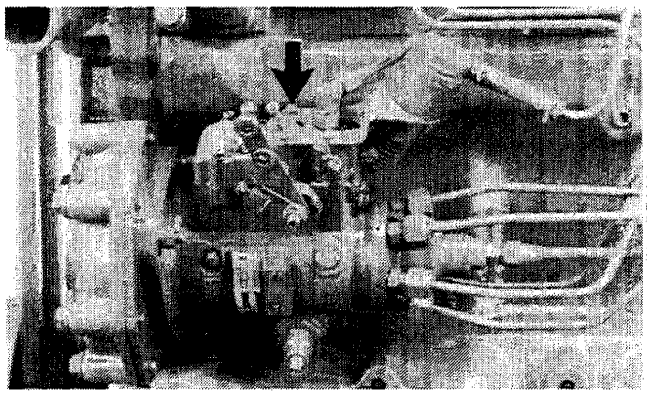
RG4624 -UN-15DEC88

S11,OMSE,AL -19-10JUN86

DO NOT MODIFY FUEL SYSTEM

IMPORTANT: Modification or alteration of the injection pump (arrow), the injection pump timing, or the fuel injectors in ways not recommended by the manufacturer will terminate the warranty obligation to the purchaser.

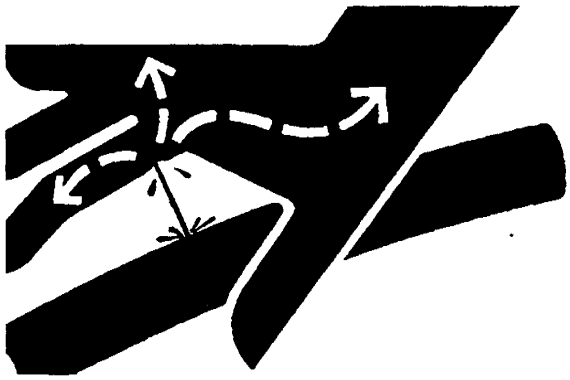
Do not attempt to service injection pump or fuel injectors yourself. Special training and special tools are required. (See your authorized servicing dealer or engine distributor.)



RG4898 -UN-14DEC88

S11,OMSE,AM -19-09AUG94

BLEED THE FUEL SYSTEM

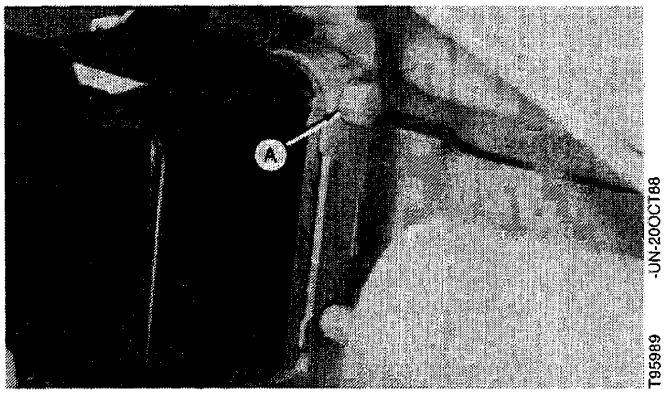


CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting fuel or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

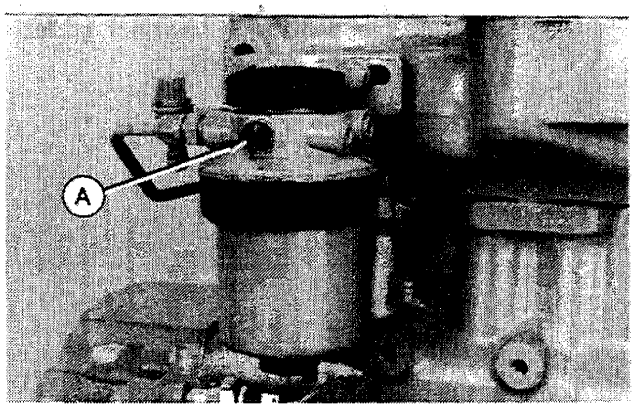
If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

Whenever the fuel system has been opened up for service (lines disconnected or filters removed), it will be necessary to bleed air from the system.

1. Loosen the air bleed plug or air bleed screw (A) on fuel filter base.



Rectangular Fuel Filter

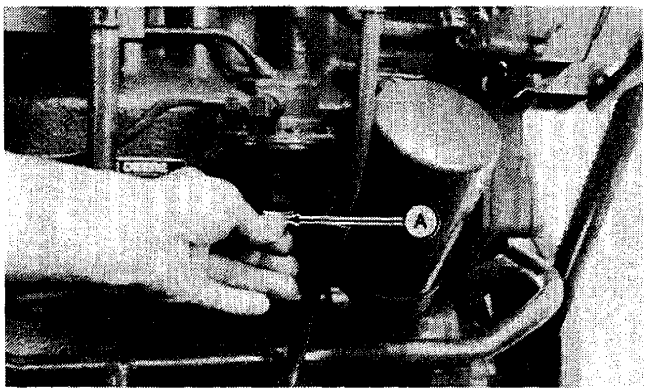


Round Fuel Filter

RG18293,7 -19-17FEB93

2. When equipped, operate supply pump primer lever (A) or switch on the ignition (electric supply pumps) so that supply pump is operating.

3. Wait until fuel flow is free from air bubbles. Tighten bleed plug or screw securely, continue operating hand primer until pumping action is not felt. Push hand primer inward (toward engine) as far as it will go.



S11,OMSE,AO1 -19-17FEB93

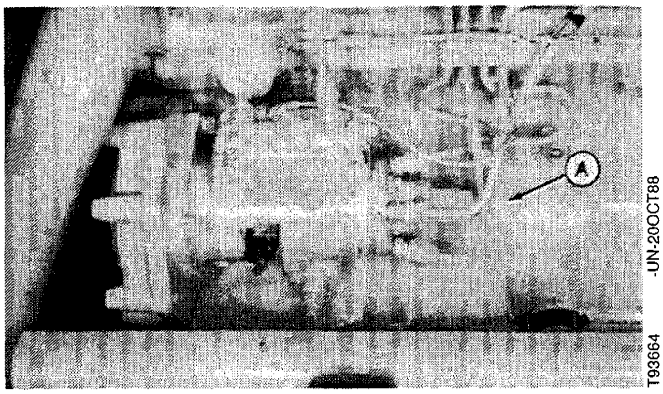
If the engine will not start:

4. Slightly loosen fuel supply line connector (A) at injection pump.

5. Pump hand primer lever until fuel, without air bubbles, flows from fuel supply line connection.

6. Tighten supply line connector to 27 N·m (20 lb-ft).

7. Leave hand primer in the inward position toward cylinder block.



S11,OMSE,AO2 -19-17FEB93

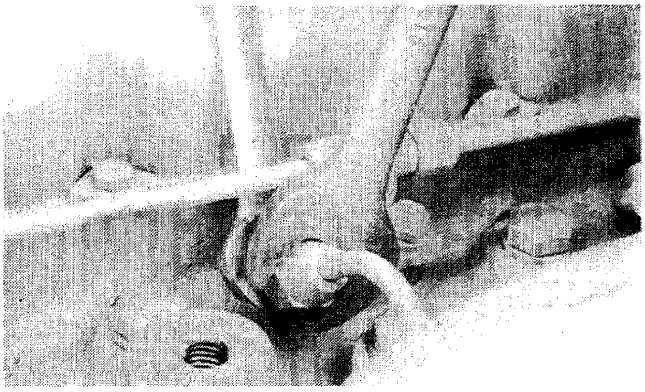
If the engine still will not start:

8. Move the speed control lever to slow idle.

9. While cranking engine with starting motor, loosen one fuel line connector slightly using two wrenches until fuel (free of air bubbles) flows from connector. Tighten connector while cranking engine.

10. Repeat procedure for remaining injection nozzles until engine starts and air has been removed from fuel system.

If engine still will not start, see your authorized servicing dealer or engine distributor.



S11,OMSE,AO3 -19-17FEB93

CHECKING COOLANT LEVEL

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281 -UN-23AUG88

Coolant should be maintained at bottom of filler neck. Fill radiator with appropriate coolant. (See RECOMMENDED ENGINE COOLANT in Fuels, Lubricants, and Coolant Section for determining appropriate coolant.) Check overall cooling system for leaks.

RG,OMSE,1 -19-09AUG94

ADDING COOLANT

TS281 -UN-23AUG88

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

IMPORTANT:

- **Never pour cold liquid into a hot engine, as it may crack cylinder head or block. DO NOT operate engine without coolant for even a few minutes.**
- **John Deere TY15161 Cooling System Sealer may be added to the radiator to stop leaks. DO NOT use any other stop-leak additives in the cooling system.**
- **Air must be expelled from cooling system when system is refilled. Loosen temperature sending unit fitting at rear of cylinder head or plug in thermostat housing to allow air to escape when filling system. Retighten fitting or plug when all the air has been expelled.**

Add coolant to radiator until coolant touches bottom of filler neck. (See RECOMMENDED ENGINE COOLANT in Fuels, Lubricants, and Coolant Section for determining appropriate coolant.)

Certain geographical areas may require special antifreeze or coolant practices. If you have questions, consult your authorized servicing dealer or engine distributor for the latest information and recommendations.

S11,OMLM,DZ1 -19-09AUG94

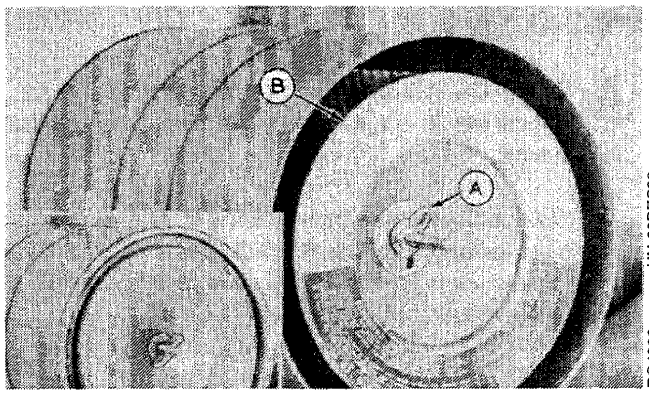
REMOVE AND INSPECT AIR CLEANER ELEMENTS

1. Remove wing nut and remove canister cover shown in small illustration inset.

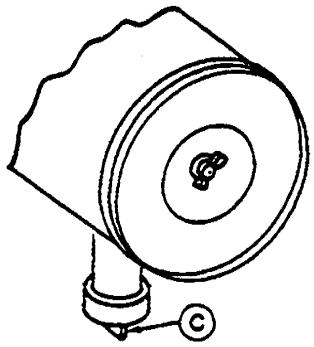
2. Remove wing nut (A) and remove primary element (B) from canister.

3. Thoroughly clean all dirt from inside canister.

NOTE: Some engines may have a dust unloader valve (C) on the air cleaner. If equipped, squeeze valve tip to release any trapped dirt particles.



RG4686 -UN-20DEC88

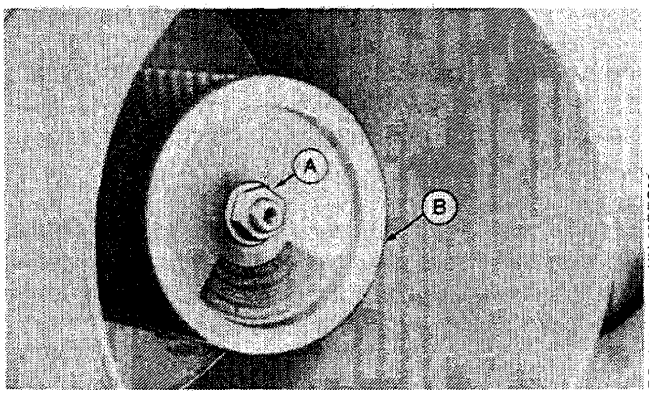


RG4687 -UN-20DEC88

S11,OMLM,FE -19-02MAR93

IMPORTANT: Remove secondary element (B) ONLY if it is to be replaced. DO NOT attempt to clean secondary element.

4. To replace secondary element, remove nut (A) and remove element. Immediately install a new element so dirt does not enter air intake system. (See REPLACE AIR CLEANER ELEMENTS in Lubrication and Maintenance/600 Hours/1-Year Section.)



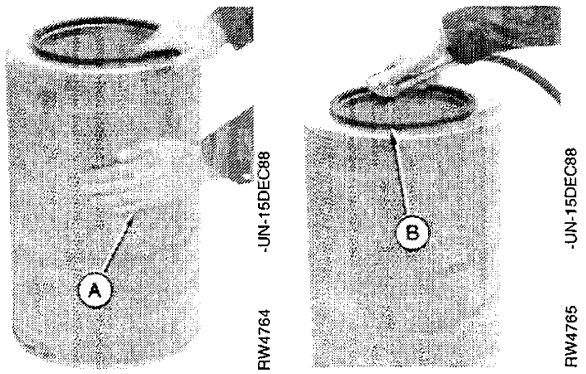
RG4688 -UN-20DEC88

S11,OMLM,FF -19-09AUG94

CLEANING PRIMARY FILTER ELEMENT

IMPORTANT: Always replace secondary (safety) filter elements. DO NOT attempt to clean them.

Do not blow air from outside portion of filter with air nozzle. Wear safety glasses and remove bystanders.



1. Gently pat sides of element with palm of hand (A) to loosen dirt. DO NOT tap element against a hard surface.

CAUTION: Only a special air cleaning gun (B) should be used. Concentrated air pressure from an ordinary air nozzle may severely damage filter element. Do not exceed 210 kPa (2.1 bar) (30 psi) when cleaning filter element.

2. Insert the cleaning gun into element, hold air nozzle about 25.4 mm (1.0 in.) from perforated metal retainer. Force air through filter from inside to outside and move air gun up and down pleats to remove as much dirt as possible.

3. Repeat steps 1 and 2 to remove additional dirt.

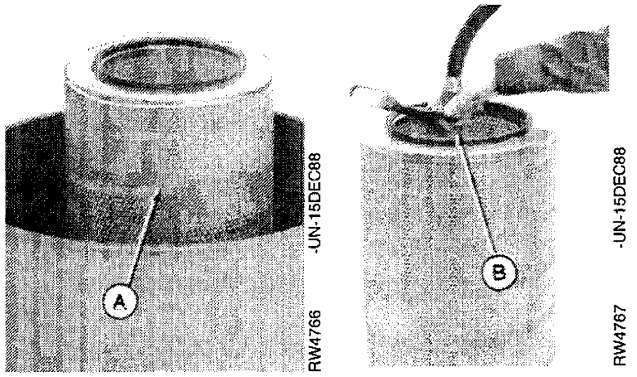
4. Inspect element for damage after cleaning. Replace element if any damage is found.

S11,OMLM,AF -19-22JUN94

WASHING PRIMARY FILTER ELEMENT

IMPORTANT: Never wash element in gasoline or any solvent. Never use compressed air on a wet element. Do not oil element.

Use extreme caution when washing filters as washing can damage filtering media which could result in failure.



Although filter elements can be washed, replacement is highly recommended. Wash oily or sooty filter only if you have a second clean filter available since it may take up to 3 days to dry after washing.

1. Blow dust from the filter with compressed air or flush with clean water.

2. Soak filter for at least 15 minutes in a solution of warm water and John Deere R36757 Filter Element Cleaner. Agitate the filter gently to flush out dirt after soaking.

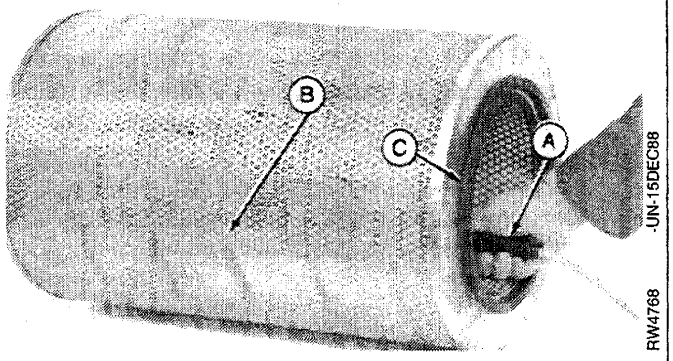
3. Rinse element thoroughly from inside (B) with clean water. Keep water pressure under 280 kPa (2.8 bar) (40 psi) to avoid damaging filtering pleats.

4. Allow element to dry completely before using. This usually takes from one to three days. Do not oven dry or use drying agents. Protect element from freezing until dry.

5. Inspect element before installing. (See INSPECTING PRIMARY FILTER ELEMENT, later in this section.)

S11,OMLM,AG -19-09AUG94

INSPECTING PRIMARY FILTER ELEMENT



Inspect filter for damage after cleaning or to determine if it is practical to clean filter.

1. Hold a bright light inside element (A) and check carefully for holes. Discard any element which shows the smallest hole or rupture.

2. Be sure outer screen (B) is not dented. Vibration would quickly wear a hole in filter.

3. Be sure filter gasket (C) is in good condition. If gasket is damaged or missing, replace element.

If the filter is to be stored for later use, place it in a plastic bag to protect it from dust and damage.

S11,OMLM,AH -19-17AUG93

ELEMENT STORAGE

Seal element in a plastic bag and store in shipping container to protect against dust and damage.

IMPORTANT: Air cleaner element MUST BE DRY before storing in plastic bag.

S11,OMLM,AI -19-19MAR91

REPLACE FAN AND ALTERNATOR BELTS

1. Inspect belts for cracks, fraying, or stretched out areas. Replace if necessary. (See FAN AND ALTERNATOR BELTS TENSION OR REPLACEMENT in Lubrication and Maintenance/250 Hour Section.)

S11,OMSE,AP -19-09AUG94

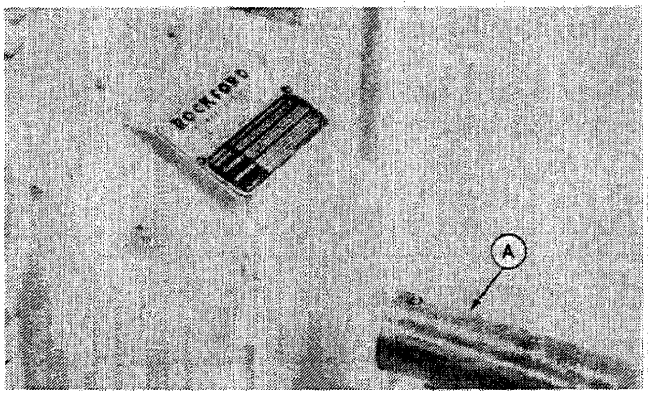
POWER TAKE-OFF (PTO) CLUTCH


TS198 -UN-23AUG88

CAUTION: Entanglement in rotating driveline can cause serious injury or death. Keep shield on PTO drive shaft (A) between the clutch housing and the engine driven equipment at all times during engine operation. Wear close fitting clothing. Stop the engine and be sure PTO driveline is stopped before making adjustments.

Proper performance of the power take-off unit will be related to the care it is given. Lubricate it periodically and keep the clutch properly adjusted. (See Lubrication and Maintenance/250 Hour Section.)

If the power take-off does not work properly after adjustment and lubrication, contact your authorized servicing dealer or engine distributor.



RG4693 -UN-14DEC88

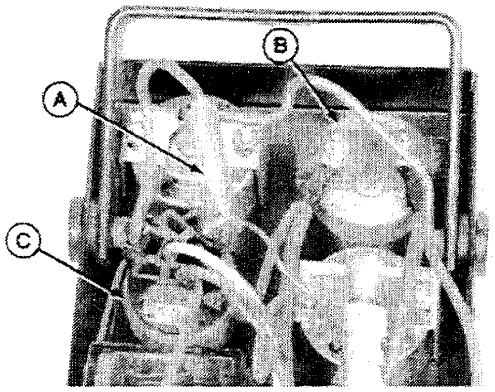
S11,OMSE,U -19-09AUG94

CHECK FUSES

The following instructions apply to engines equipped with a John Deere instrument panel.

On North American Sourced Instrument (Gauge) Panels:

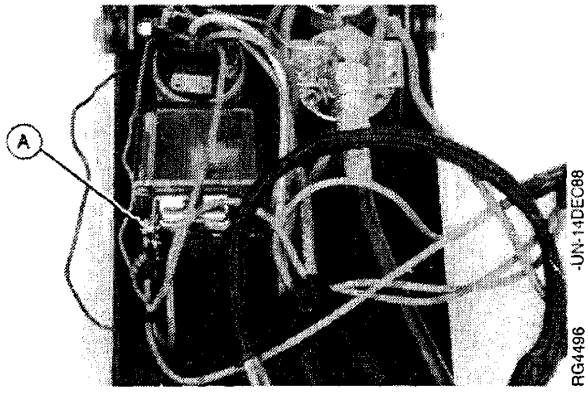
1. Check the fuse (A) between the ammeter (B) and key switch (C) located on back side of instrument panel. If defective replace with an MDL-25 fuse.



RG4493 -UN-14DEC88

S11,OMSE,AA -19-17FEB93

2. Check the fuse (A) mounted on the bottom of the magnetic safety switch. If defective, install an equivalent 14-amp fuse.



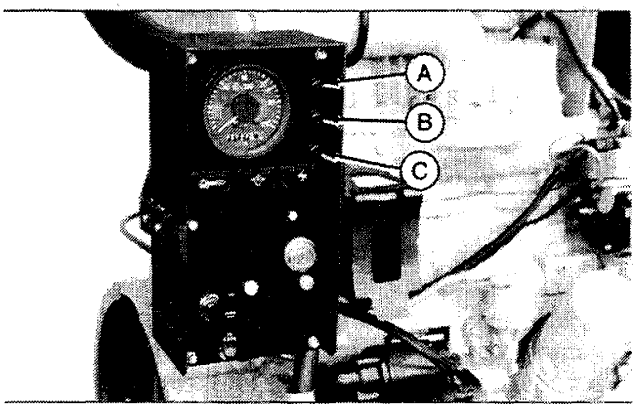
RG4496 -UN-14DEC88

S11,OMSE,W -19-26JUL93

On European Sourced Instrument (Gauge) Panels:

1. Check the following fuses and replace as necessary:

A—25 amp - Starting Circuit
B— 3 amp - Tachometer Light
C—10 amp - Safety Switch



RG18293,8 -19-17FEB93

GENERAL TROUBLESHOOTING INFORMATION

Troubleshooting engine problems can be difficult. An engine wiring diagram is provided in this section to help isolate electrical problems on power units using John Deere wiring harness and instrument (gauge) panel.

Later in this section is a list of possible engine problems that may be encountered accompanied by possible causes and corrections. The illustrated diagrams and troubleshooting information are of a general nature, final design of the overall system for your engine application may be different. See your engine distributor or servicing dealer if you are in doubt.

A reliable program for troubleshooting engine problems should include the following basic diagnostic thought process:

- Know the engine and all related systems.
- Study the problem thoroughly.
- Relate the symptoms to your knowledge of engine and systems.
- Diagnose the problem starting with the easiest things first.
- Double-check before beginning the disassembly.
- Determine cause and make a thorough repair.
- After making repairs, operate the engine under normal conditions to verify that the problem and cause was corrected.

RG18293,9 -19-02MAR93

ENGINE WIRING DIAGRAM LEGEND

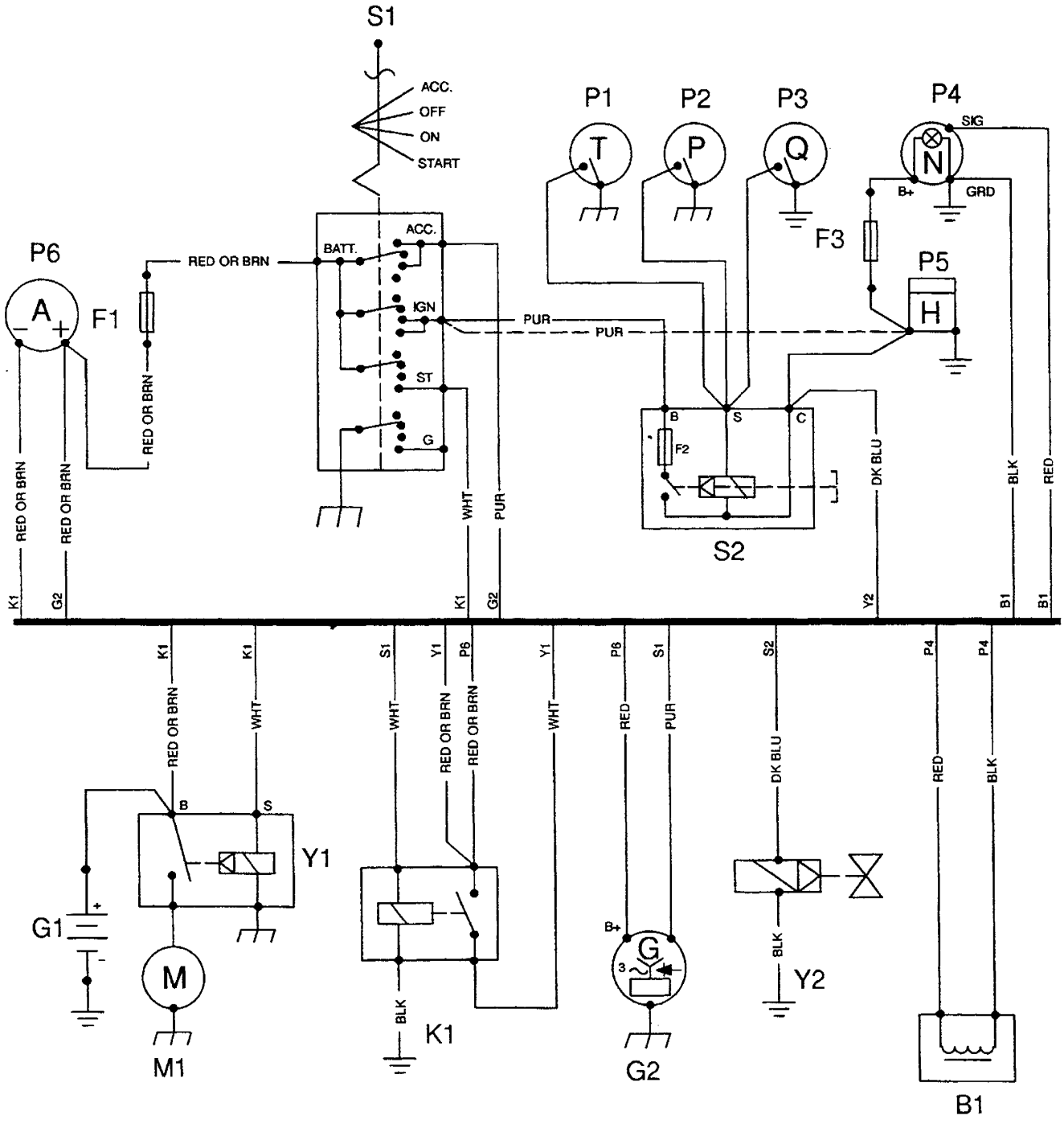
A1—Speed Control Unit
B1—Magnetic Speed Sensor
B2—Coolant Temperature Sensor
B3—Oil Pressure Sensor
F1—Starting Circuit Fuse (25 amp)
F2—Safety Switch Fuse (10 amp)
F3—Tachometer Fuse (3 amp)
G1—Battery
G2—Alternator
H1—Coolant Temperature Indicator Lamp
H2—Oil Pressure Indicator Lamp
H3—Alternator Indicator Lamp
K1—Starter Relay
K2—Fuel Shut-off Relay
M1—Starter Motor
P1—Coolant Temperature Gauge
P2—Oil Pressure Gauge
P3—Crankcase Oil Level Switch/Gauge
P4—Tachometer
P5—Hourmeter
P6—Ammeter
S1—Key Switch
S2—Magnetic Safety Switch—North American Auto Override Module—European (Saran)
Y1—Starter Solenoid
Y2—Fuel Shut-off Solenoid
Y3—Electric Fuel Pump
BLK—Black
BLU—Blue
BRN—Brown
GRN—Green
ORG—Orange
PUR—Purple
RED—Red
YEL—Yellow

NOTE: On North American Series 300 engines without electronic tachometer:
Early Units —A purple wire (shown as a dashed line in wiring diagram) connects between hourmeter "P5" and key switch "S1".
Later Units —The wire (shown as a solid line) connects between the hourmeter and magnetic safety switch "S2" (C terminal).

RG,18293,WIRE -19-09AUG94

WIRING DIAGRAM—NORTH AMERICAN SERIES 300 ENGINES

KEY SWITCH					
	B	G	ACC.	ON	ST.
OFF					
ACC.	•		•		
ON	•		•	•	
START	•	•		•	•



RG,DIAG,CTM67 -19-03AUG94

110894

ENGINE WIRING DIAGRAM LEGEND

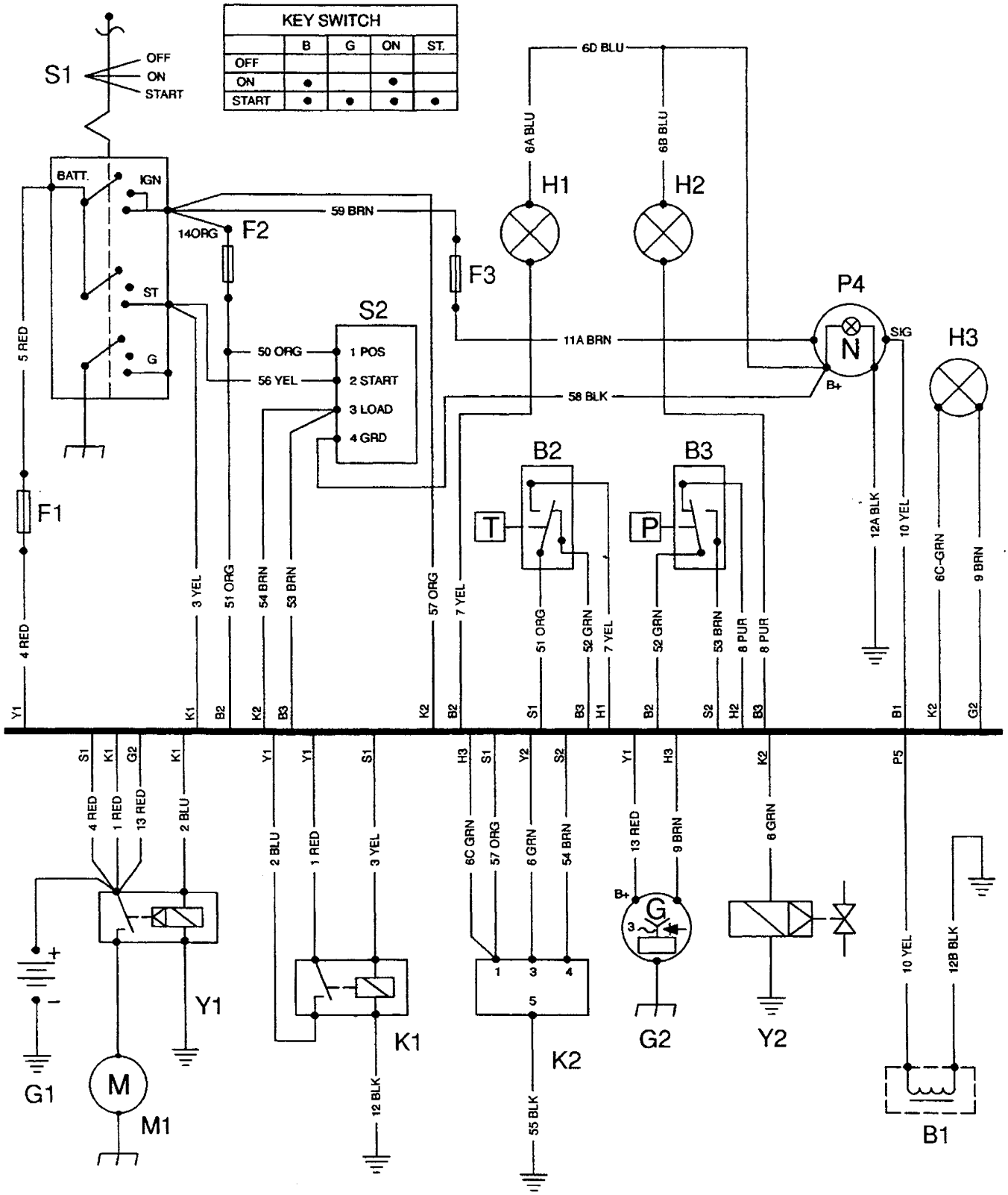
A1—Speed Control Unit
B1—Magnetic Speed Sensor
B2—Coolant Temperature Sensor
B3—Oil Pressure Sensor
F1—Starting Circuit Fuse (25 amp)
F2—Safety Switch Fuse (10 amp)
F3—Tachometer Fuse (3 amp)
G1—Battery
G2—Alternator
H1—Coolant Temperature Indicator Lamp
H2—Oil Pressure Indicator Lamp
H3—Alternator Indicator Lamp
K1—Starter Relay
K2—Fuel Shut-off Relay
M1—Starter Motor
P1—Coolant Temperature Gauge
P2—Oil Pressure Gauge
P3—Crankcase Oil Level Switch/Gauge
P4—Tachometer
P5—Hourmeter
P6—Ammeter
S1—Key Switch
S2—Magnetic Safety Switch—North American Auto Override Module—European (Saran)
Y1—Starter Solenoid
Y2—Fuel Shut-off Solenoid
Y3—Electric Fuel Pump
BLK—Black
BLU—Blue
BRN—Brown
GRN—Green
ORG—Orange
PUR—Purple
RED—Red
YEL—Yellow

NOTE: On North American Series 300 engines without electronic tachometer:
Early Units —A purple wire (shown as a dashed line in wiring diagram) connects between hourmeter "P5" and key switch "S1".

Later Units —The wire (shown as a solid line) connects between the hourmeter and magnetic safety switch "S2" (C terminal).

RG,18293,WIRE -19-09AUG94

WIRING DIAGRAM—EUROPEAN (SARAN) SERIES 300 ENGINES



RG,CTM67,G20,4 -19-03AUG94

110894

DIAGNOSING ENGINE MALFUNCTIONS

Symptom	Problem	Solution
Engine hard to start or will not start	Improper starting procedure.	Review starting procedure.
	No fuel.	Check fuel tank.
	Air in fuel line.	Bleed fuel line.
	Cold weather.	Use cold weather starting aids.
	Slow starter speed.	See "Starter Cranks Slowly".
	Crankcase oil too heavy.	Use oil of proper viscosity.
	Improper type of fuel.	Consult fuel supplier; use proper type fuel for operating conditions.
	Water, dirt, or air in fuel system.	Drain, flush, fill and bleed system.
	Clogged fuel filter.	Replace filter element.
	Dirty or faulty injection nozzles.	Have authorized dealer or engine distributor check injectors.
	Injection pump shut-off not reset.	Turn key switch to "OFF" then to "ON".
Engine knocks	Low engine oil level.	Add oil to engine crankcase.
	Injection pump out of time.	See your authorized servicing dealer or engine distributor.
	Low coolant temperature.	Remove and check thermostat.
	Engine overheating.	See "Engine Overheats".
Engine runs irregularly or stalls frequently	Low coolant temperature.	Remove and check thermostat.
	Clogged fuel filter.	Replace filter element.
	Water, dirt, or air in fuel system.	Drain, flush, fill, and bleed system.
	Dirty or faulty injection nozzles.	Have authorized dealer or engine distributor check injectors.
Below normal engine temperature	Defective thermostat.	Remove and check thermostat.
	Defective temperature gauge or sender.	Check gauge, sender, and connections.

Continued on next page

Symptom	Problem	Solution
Lack of power	Engine overloaded.	Reduce load.
	Intake air restriction.	Service air cleaner.
	Clogged fuel filter.	Replace filter elements.
	Improper type of fuel.	Use proper fuel.
	Overheated engine.	See "Engine Overheats".
	Below normal engine temperature.	Remove and check thermostat.
	Improper valve clearance.	See your authorized servicing dealer or engine distributor.
	Dirty or faulty injection nozzles.	Have authorized servicing dealer or engine distributor check injectors.
	Injection pump out of time.	See your authorized servicing dealer or engine distributor.
	Turbocharger not functioning. (Turbocharged engines only.)	See your authorized servicing dealer or engine distributor.
	Leaking exhaust manifold gasket.	See your authorized servicing dealer or engine distributor.
	Defective aneroid control line.	See your authorized servicing dealer or engine distributor.
	Restricted fuel hose.	Clean or replace fuel hose.
	Low fast idle speed	See your authorized servicing dealer or engine distributor.
Low oil pressure	Low oil level.	Add oil.
	Improper type of oil.	Drain, fill crankcase with oil of proper viscosity and quality.
High oil consumption	Crankcase oil too light.	Use proper viscosity oil.
	Oil leaks.	Check for leaks in lines, gaskets and drain plug.
	Restricted crankcase vent tube.	Clean vent tube.
	Defective turbocharger.	See your authorized servicing dealer or engine distributor.

Continued on next page

Symptom	Problem	Solution
Engine emits white smoke	Improper type of fuel.	Use proper fuel.
	Low engine temperature.	Warm up engine to normal operating temperature.
	Defective thermostat.	Remove and check thermostat.
	Defective injection nozzles.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
Engine emits black or gray exhaust smoke	Improper type of fuel.	Use proper fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	Reduce load.
	Injection nozzles dirty.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
	Turbocharger not functioning.	See your authorized servicing dealer or engine distributor.
Engine Overheats	Engine overloaded.	Reduce load.
	Low coolant level.	Fill radiator to proper level, check radiator and hoses for loose connections or leaks.
	Faulty radiator cap.	Have serviceman check.
	Loose or defective fan belts.	Adjust belt tension. Replace as required.
	Low engine oil level.	Check oil level. Add oil as required.
	Cooling system needs flushing.	Flush cooling system.
	Defective thermostat.	Remove and check thermostat.
	Defective temperature gauge or sender.	Check water temperature with thermometer and replace, if necessary.
	Incorrect grade of fuel.	Use correct grade of fuel.

Continued on next page

Symptom	Problem	Solution
High fuel consumption	Improper type of fuel.	Use proper type of fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	Reduce Load.
	Improper valve clearance.	See your authorized servicing dealer or engine distributor.
	Injection nozzles dirty.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
	Defective turbocharger.	See your authorized servicing dealer or engine distributor.
	Low engine temperature.	Check thermostat.

S11,OMTS,Z -19-17FEB93

DIAGNOSING ELECTRICAL SYSTEM MALFUNCTIONS

Symptom	Problem	Solution
Undercharged System	Excessive electrical load from added accessories.	Remove accessories or install higher output alternator.
	Excessive engine idling.	Increase engine rpm when heavy electrical load is used.
	Poor electrical connections on battery, ground strap, starter or alternator.	Inspect and clean as necessary.
	Defective battery.	Test battery.
	Defective alternator.	Test charging system.
Battery Uses Too Much Water.	Cracked battery case.	Check for moisture and replace as necessary.
	Defective battery.	Test Battery.
	Battery charging rate too high.	Test charging system.
Batteries will not charge	Loose or corroded connections.	Clean and tighten connections.
	Sulfated or worn-out batteries.	See your authorized servicing dealer or engine distributor.
	Loose or defective alternator belt.	Adjust belt tension or replace belts.
Starter will not crank	PTO engaged.	Disengage PTO.
	Loose or corroded connections.	Clean and tighten loose connections.
	Low battery output voltage.	See your authorized servicing dealer or engine distributor.
	Faulty start circuit relay.	See your authorized servicing dealer or engine distributor.
	Blown fuse (MDL-25)	Replace fuse.

Continued on next page

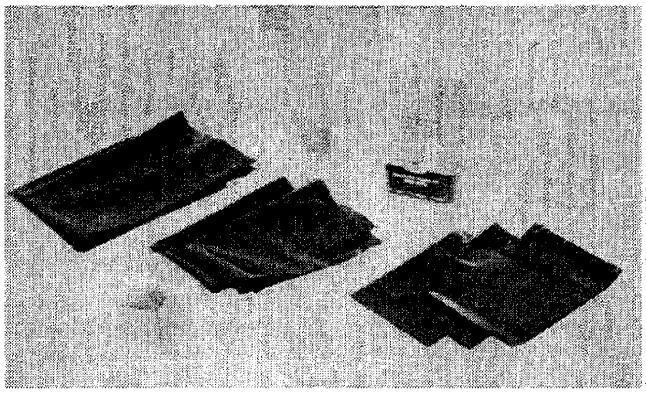
Symptom	Problem	Solution
Starter cranks slowly	Low battery output.	See your authorized servicing dealer or engine distributor.
	Crankcase oil too heavy.	Use proper viscosity oil.
	Loose or corroded connections.	Clean and tighten loose connections.
Starter and hour meter functions; rest of electrical system does not function	Blown fuse on magnetic switch	Replace fuse. (14 amp)
Entire electrical system does not function	Faulty battery connection.	Clean and tighten connections.
	Sulfated or worn-out batteries	See your authorized servicing dealer or engine distributor.
	Blown fuse (MDL-25)	Replace fuse.

S11,OMTS,AB -19-02MAR93

USE AR41785 ENGINE STORAGE KIT

See your John Deere servicing dealer or engine distributor for an AR41785 Engine Storage Kit. Closely follow instructions provided with this kit.

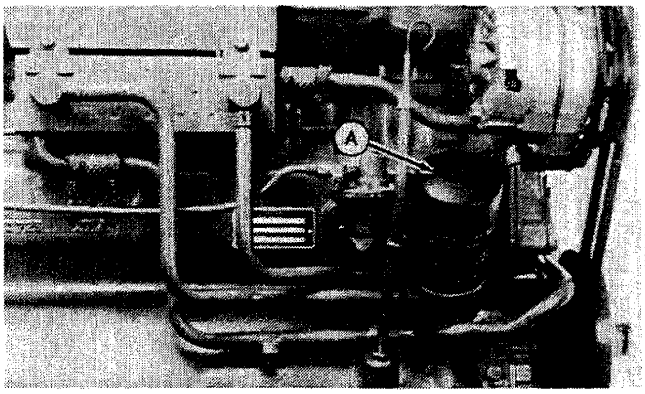
IMPORTANT: Inhibitors can easily change to gas. Seal or tape each opening immediately after adding inhibitor.



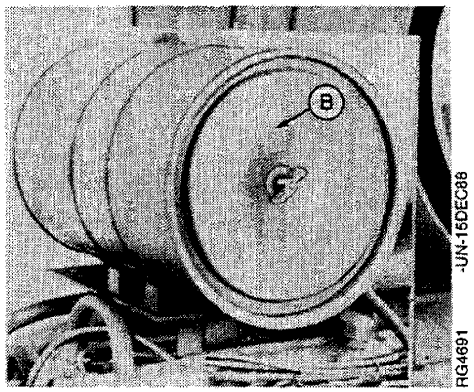
RG21891,58 -19-25JAN93

STORING THE ENGINE

IMPORTANT: Any time your engine will not be used for several months, the following recommendations for storing it and removing it from storage will help to minimize corrosion and deterioration. Use the AR41785 Engine Storage Kit. Follow recommended service procedure included with storage kit.



1. Change engine oil and replace filter (A). Used oil will not give adequate protection. (See CHANGE ENGINE OIL AND FILTER in Lubrication and Maintenance/250 Hour Service.)



2. Service air cleaner (B). (See REMOVE AND INSPECT AIR CLEANER ELEMENTS in Service As Required section.)

3. Draining and flushing of cooling system is not necessary if engine is to be stored for only several months. However, for extended storage periods of a year or longer, it is recommended that the cooling system be drained, flushed, and refilled with proper coolant solution. (See RECOMMENDED ENGINE COOLANT in Fuels, Lubricants, and Coolant Section and ADDING COOLANT in Service As Required Section.)

S11,OMST,H1 -19-09AUG94

4. Drain fuel tank and add 30 ml (1 oz) of inhibitor to the fuel tank for each 15L (4 U.S. gal) of tank capacity.

5. Add 30 ml (1 oz) of inhibitor to the engine crankcase for each 0.95 L (1 qt) of crankcase oil.

6. Disconnect air intake piping from the manifold. Pour 90 ml (3 oz) of inhibitor into intake system and reconnect the piping.

7. Crank the engine several revolutions with starter (do not allow the engine to start).

8. Loosen fan and alternator belts to relieve tension. Remove belts if desired.

9. Remove and clean batteries. Store them in a cool, dry place and keep them fully charged.

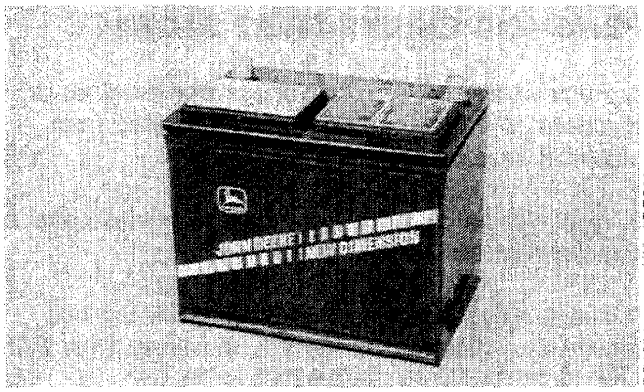
10. Disengage the PTO clutch.

11. Seal all openings on engine with plastic bags and tape supplied in storage kit. Follow instructions supplied in kit.

12. Coat all exposed metal surfaces with grease or corrosion inhibitor.

13. Clean the exterior of the engine and touchup any scratched or chipped painted surfaces.

14. Store the engine in a dry protected place. If engine must be stored outside, cover it with a waterproof canvas or other suitable protective material and use a strong waterproof tape.



RG4694 -UN-15DEC88

S11,OMST,G1 -19-19MAR91

REMOVING ENGINE FROM STORAGE

1. Remove all protective coverings from engine. Unseal all openings in engine and remove covering from electrical systems.

2. Remove the batteries from storage. Install batteries and connect the cables.

3. Install new fan and alternator belts. Adjust belt tensions to their appropriate specifications. (See FAN AND ALTERNATOR BELTS TENSION OR REPLACEMENT in Lubrication and Maintenance/250 Hour Section.)

4. Fill fuel tank.

5. Perform all appropriate prestarting checks. (See PRESTARTING CHECKS in Engine Operating Guidelines Section.)

6. Crank engine for 20 seconds with starter (do not allow the engine to start). Then start engine.

IMPORTANT: DO NOT operate starter more than 30 seconds at a time. Wait at least 2 minutes for starter to cool before trying again.

7. Operate engine at slow idle for several minutes. Warm up carefully and check all gauges before placing engine under load.

S11,OMST,J -19-09AUG94

GENERAL OEM ENGINE SPECIFICATIONS

Item	Unit Of Measure	3029D	3029T
Number of Cylinders	——	3	3
Fuel	——	Diesel	Diesel
Bore	mm (in.)	106.5 (4.19)	106.5 (4.19)
Stroke	mm (in.)	110.0 (4.33)	110.0 (4.33)
Displacement	L (cu.in.)	2.9 (179)	2.9 (179)
Compression Ratio	——	17.8:1	17.8:1
Rated Speed:			
Std. Governor	RPM	2500	2500
3—5% Governor	RPM	1500/1800	1500/1800
Fast Idle Speed	RPM	2710	2710
Slow Idle Speed (factory)	RPM	800—850	800—850
Industrial Power Rating—			
(maximum intermittent)	kW	43	59
@ Rated Speed w/o Fan	(hp)	(58)	(79)
Basic Weight (dry)	kg (lb)	315 (694)	330 (728)
Flywheel and Housing			
(SAE No.)	——	4	4
Injection Nozzles	mm	9.5	9.5
Fuel Filter Area	cm^2 ($in.^2$)	5162/2581 (800/400)	5162/2581 (800/400)
Physical Dimensions:			
Width	mm (in.)	519 (20.4)	519 (20.4)
Height	mm (in.)	820 (32.3)	927 (36.5)
Length	mm (in.)	716 (28.2)	716 (28.2)

See ENGINE CRANKCASE OIL FILL QUANTITIES with filter change later in this group.

RG18293,11 -19-09JUN94

GENERAL OEM ENGINE SPECIFICATIONS—CONTINUED

Item	Unit Of Measure	4039D	4039T	4045D	4045T
Number of Cylinders	——	4	4	4	4
Fuel	——	Diesel	Diesel	Diesel	Diesel
Bore	mm (in.)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)
Stroke	mm (in.)	110.0 (4.33)	110.0 (4.33)	127.0 (5.00)	127.0 (5.00)
Displacement	L (cu.in.)	3.9 (239)	3.9 (239)	4.5 (276)	4.5 (276)
Compression Ratio	——	17.8:1	17.8:1	17.8:1	17.2:1
Rated Speed:					
Std. Governor	RPM	2500	2500	2400	2400
3—5% Governor	RPM	1500/1800	1500/1800	1500/1800	1500/1800
Fast Idle Speed	RPM	2700	2700	2600	2600
Slow Idle Speed (factory)	RPM	800—850	800—850	800—850	800—850
Industrial Power Rating—					
(maximum intermittent)	kW	60	82	63	86
@ Rated Speed w/o Fan	(hp)	(80)	(110)	(85)	(115)
Basic Weight (dry)	kg (lb)	422 (929)	437 (962)	474 (1043)	487 (1071)
Flywheel and Housing					
(SAE No.)	——	2,3,4	2,3,4	2,3,4	2,3,4
Injection Nozzles	mm	9.5	9.5	9.5	9.5
Fuel Filter Area	cm^2 ($in.^2$)	5162/2581 (800/400)	5162/2581 (800/400)	5162/2581 (800/400)	5162/2581 (800/400)
Physical Dimensions:					
Width	mm (in.)	519 (20.4)	536 (21.1)	519 (20.4)	512 (20.1)
Height	mm (in.)	818 (32.2)	993 (39.1)	818 (32.2)	1029 (40.5)
Length	mm (in.)	844 (33.2)	869 (34.2)	844 (33.2)	869 (34.2)

See ENGINE CRANKCASE OIL FILL QUANTITIES with filter change later in this group.

S11,OMSP,K1 -19-17FEB93

GENERAL OEM ENGINE SPECIFICATIONS—CONTINUED

Item	Unit Of Measure	6059D	6059T	6068D	6068T
Number of Cylinders	——	6	6	6	6
Fuel Type	——	Diesel	Diesel	Diesel	Diesel
Cylinder Bore	mm (in.)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)	106.5 (4.19)
Engine Stroke	mm (in.)	110.0 (4.33)	110.0 (4.33)	127.0 (5.00)	127.0 (5.00)
Engine Displacement	L (cu.in.)	5.9 (359)	5.9 (359)	6.8 (414)	6.8 (414)
Compression Ratio	——	17.8:1	17.8:1	17.8:1	17.2:1
Rated Speed:					
Std. Governor	RPM	2500	2500	2400	2400
3—5% Governor	RPM	1500/1800	1500/1800	1500/1800	1500/1800
Fast Idle Speed	RPM	2700	2700	2600	2600
Slow Idle Speed (factory)	RPM	800—850	800—850	800—850	800—850
Industrial Power Rating—					
(maximum intermittent)	kW	89	123	97	129
@ Rated Speed w/o Fan	(hp)	(120)	(165)	(130)	(173)
Flywheel and Housing					
(SAE No.)	——	2,3,4	2,3,4	2,3,4	2,3,4
Injection Nozzles	mm	9.5	9.5	9.5	9.5
Fuel Filter Area	cm^2 ($in.^2$)	5162/2581 (800/400)	5162/2581 (800/400)	5162/2581 (800/400)	5162/2581 (800/400)
Basic Weight (dry)	kg (lb)	518 (1140)	525 (1155)	588 (1294)	602 (1324)
Physical Dimensions:					
Width	mm (in.)	569 (22.4)	569 (22.4)	513 (20.2)	513 (20.2)
Height	mm (in.)	936 (36.8)	1033 (40.7)	1017 (40.0)	1070 (42.1)
Length	mm (in.)	1125 (44.3)	1125 (44.3)	1125 (44.3)	1125 (44.3)

See ENGINE CRANKCASE OIL FILL QUANTITIES with filter change later in this section.

RG,18293,GNSPEC-19-11AUG94

FUEL INJECTION PUMP SPECIFICATIONS[1]

ENGINE MODEL	INJECTION PUMP OPTION CODES	POWER RATING @ RATED SPEED WITHOUT FAN kW (hp)	RATED SPEED[2] (rpm)	SLOW IDLE (rpm)	FAST IDLE[3] (rpm)
3029DF	1602,1650	43 (58)	2500	800	2750
	1603,1644	35 (47)	1800		1890
	1620,1641,1648	31 (41)	1500		1575
	1632	37 (50)	2200	800	2420
3029TF	1602,1632,1634,1640	59 (79)	2500	800	2750
	1633	46 (62)	2200	800	2420
	1645	48 (64)	2100	800	2310
4039DF	1602,1615,1623	60 (80)	2500	800	2750
	1603,1620,1621	49 (66)	1800	800	1890
	1609	58 (78)	2300	800	2530
	1614	60 (80)	2900	800	3190
	1641,1645	40 (54)	1500		1575
	1664	60 (80)	2500	1600	2750
4039TF	1601	69 (92)	1800	800	1890
	1602,1615,1619,1650,1651	82 (110)	2500	800	2750
	1603,1620	76 (102)	1800		1890
	1605	82 (110)	2900	800	3190
	1610	71 (95)	2300	800	2530
	1611	78 (105)	2200	800	2420
	1635,1641	63 (85)	1500		1575
4045DF	1602	63 (85)	2400	800	2640
	1623	55 (74)	2100	900	2310
	1626	61 (82)	2200	800	2420
4045TF	1601,1629,1630,1631,1632	90 (120)	2400	800	2640
	1602,1619	86 (115)	2400	800	2640
	1609,1628	84 (113)	1800		1890
	1620	70 (94)	1500		1575
	1625,1627	84 (113)	2200	800	2420
6059DF	1602,1615,1623	89 (119)	2500	800	2750
6059TF	1602,1615,1619,1652,1653	123 (165)	2500	800	2750
	1603,1624	111 (149)	1800		1890
	1636,1641	94 (126)	1500		1575
	1644,1645	123 (165)	1800		1890
	1646,1647	104 (139)	1500		1575
6068DF	1602,1619,1622,1623	97 (130)	2400	800	2640
6068TF	1610	94 (126)	2200	850	2420
	1602,1619,1642,1643	129 (173)	2400	800	2640

[1] Engine speeds listed are preset to factory specification. Slow idle speed may be reset depending upon specific vehicle application requirements. Refer to your machine operator's manual for engine speeds that are different from those preset at the factory.

[2] Generator set engines (3-5% governor) usually run at 1500 rpm (50Hz) or 1800 rpm (60Hz) when operating under load depending on cycles of AC current.

[3] For engines with standard governor, fast idle is 7-10% above rated speed. For engines with generator set governors, fast idle is 3-5% above rated speed.

RG,OPTCD,16 -19-11AUG94

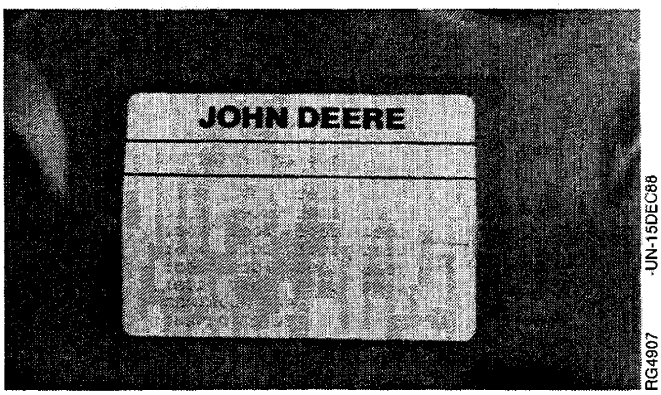
ENGINE CRANKCASE OIL FILL QUANTITIES

```
J O H N   D E E R E                                  11/05/94

Commande: 182838760   Base code: 147AA   Load: 654150
   -    18  1101- 1202- 1301- 1406- 1501- 1603- 1701-
1902- 2004- 2109- 2204- 2403- 2802- 2902- 3001- 3115-
3519- 3601- 3703- 3901- 4005- 4199- 4398- 4499- 4599-
4603- 4708- 47AA  4802- 4901- 5001- 5101- 5299- 5525-
5601- 5906- 6206- 6699- 6903- 7699- 9801-
Controle par (inspected by):                    ***
```

RG7222 -UN-21JUN94

Saran Option Code Label



Dubuque Option Code Label

Each engine has a 13-digit John Deere engine serial number. The first two digits identify the factory that produced the engine:

"T0" indicates the engine was built in Dubuque, Iowa
"CD" indicates the engine was built in Saran, France

In addition to the serial number plate, OEM engines have an engine option code label affixed to the rocker arm cover. These codes indicate which of the engine options were installed on your engine at the factory. When in need of parts or service, furnish your authorized servicing dealer or engine distributor with these numbers.

On Saran-built engines, the engine option code label includes an engine base code. This base code must also be recorded along with the option codes. At times it will be necessary to furnish this base code to differentiate two identical option codes for the same engine model.

To determine the option code for the oil fill quantity of your engine, refer to the engine option code label affixed to the rocker arm cover. The first two digits of the code (40) identify the dipstick tube group. The last two digits of each code identify the specific dipstick and tube assembly on your engine.

RG,OMSP,1 -19-10AUG94

Listed below are engine crankcase oil fill quantities:

• Saran-Built Engines

OEM Engine Model	Dipstick Tube Option Code(s)	Crankcase Oil Capacity
CD3029DF	4001,4002	6.0 L (6.5 qt)
CD3029DF	4003,4022	6.0 L (6.5 qt)
CD3029TF	4001,4003,4023	8.0 L (8.5 qt)
CD3029TF	4002	6.0 L (6.5 qt)
CD3029TF	4021	8.5 L (9.0 qt)
CD4039DF	4001,4002,4005	8.5 L (9.0 qt)
CD4039DF,TF	4003	12.0 L (12.5 qt)
CD4039DF	4004*	9.0 L (9.5 qt)
CD4039DF	4004	14.5 L (15.5 qt)
CD4039DF	4006,4010,4019	8.5 L (9.0 qt)
CD4039DF	4011	13.0 L (14.0 qt)
CD4039TF	4002	13.5 L (14.5 qt)
CD4039TF	4004,4013	14.5 L (15.5 qt)
CD4039TF	4005,4006,4020	12.5 L (13.0 qt)
CD4039TF	4007	13.0 L (14.0 qt)
CD4039TF	4008,4012	11.5 L (12.0 qt)
CD4045DF,TF	4003	12.0 L (12.5 qt)
CD4045DF	4004	9.0 L (9.5 qt)
CD4045TF	4007	15.0 L (16.0 qt)
CD4045TF	4020	12.5 L (13.0 qt)
CD6059DF,TF	4001,4004	17.0 L (18.0 qt)
CD6059DF,TF	4010,4012	17.0 L (18.0 qt)
CD6059DF	4005	14.0 L (15.0 qt)
CD6059DF,TF	4006,4008	20.0 L (21.0 qt)
CD6059DF,TF	4007,4011,4015	15.0 L (16.0 qt)
CD6059TF	4009	14.0 L (15.0 qt)
CD6068DF,TF	4010	17.0 L (18.0 qt)

• Dubuque-Built Engines

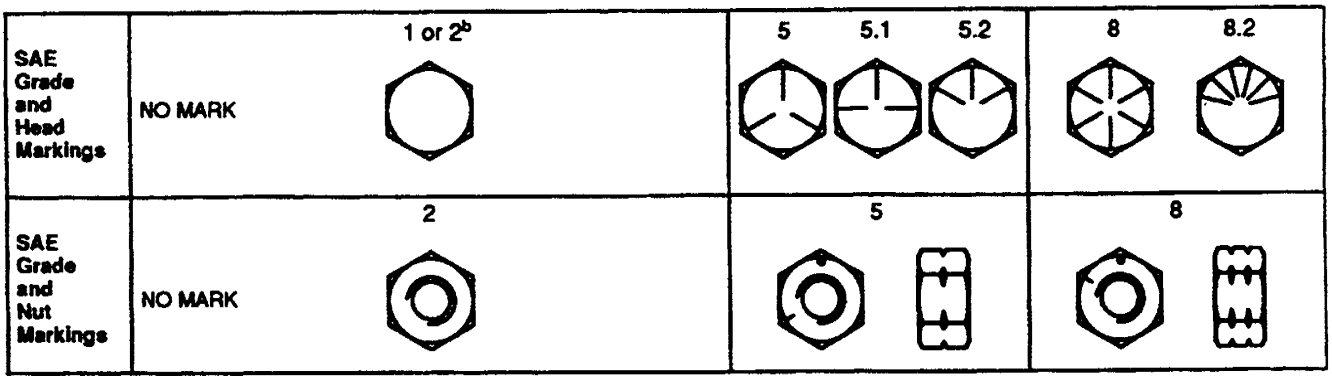
OEM Engine Model	Dipstick Tube Option Code(s)	Crankcase Oil Capacity
T04039DF	4001	9.5 L (10.0 qt)
T04039DF	4002	9.0 L (9.5 qt)
T04039DF,TF	4004	13.5 L (14.5 qt)
T04039DF,TF	4006	13.0 L (14.0 qt)
T04039DF	4007	8.5 L (9.0 qt)
T04039DF	4012	13.0 L (14.0 qt)
T04039DF,TF	4013,4014	11.5 L (12.0 qt)
T04039TF	4001	13.0 L (14.0 qt)
T04039TF	4007	12.5 L (13.0 qt)
T04045DF	4001,4002	9.0 L (9.5 qt)
T04045DF	4003	13.0 L (14.0 qt)
T04045DF,TF	4004	13.5 L (14.5 qt)
T04045TF	4005	13.0 L (14.0 qt)
T06059DF,TF	4001	19.5 L (21.0 qt)
T06059DF	4002	11.5 L (12.0 qt)
T06059DF,TF	4004	19.0 L (20.0 qt)
T06059DF,TF	4005	24.5 L (26.0 qt)
T06059TF	4007	17.0 L (18.0 qt)
T06068DF,TF	4001	19.0 L (20.0 qt)
T06068DF,TF	4004	19.0 L (20.0 qt)
T06068DF	4005	24.5 L (26.0 qt)

** For engine base code 1476F only*

Crankcase oil capacity may vary slightly from amount shown. ALWAYS fill crankcase to full mark or within crosshatch on dipstick, whichever is present. DO NOT overfill.

RG,OMSP,2 -19-03AUG94

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES



TS1162 -19-04MAR91

Size	Grade 1				Grade 2[b]				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	240	175	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	400	300	510	375	400	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

[b] Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

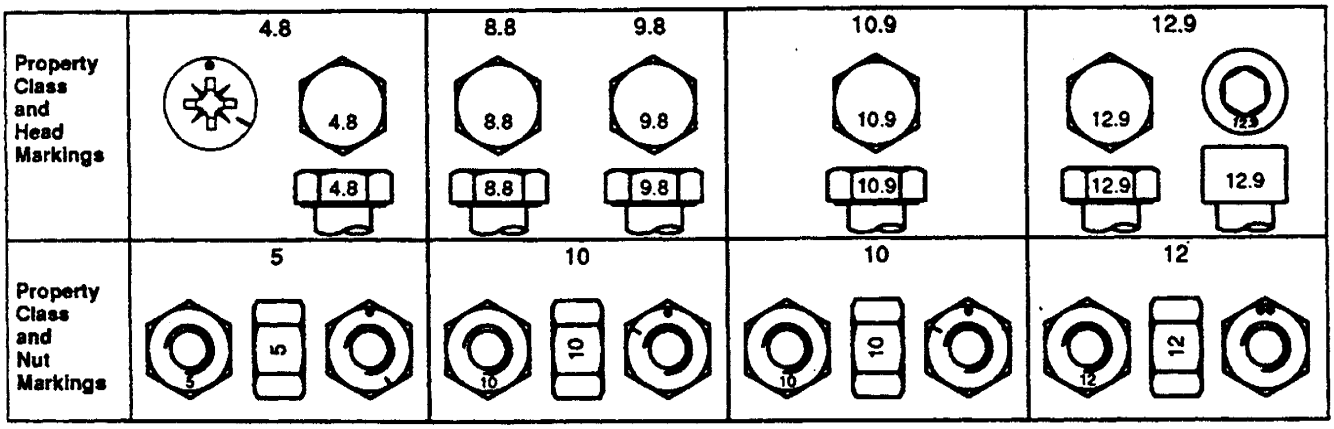
Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

DX,TORQ1 -19-20JUL94

110894

METRIC BOLT AND CAP SCREW TORQUE VALUES



TS1163 -19-04MAR91

Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.*

DX,TORQ2 -19-20JUL94

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Lubrication and Maintenance Records

USING LUBRICATION AND MAINTENANCE RECORDS

Refer to specific Lubrication and Maintenance Section for detailed service procedures.

1. Keep a record of the number of hours you operate your engine by regular observation of hour meter.

2. Check your record regularly to learn when your engine needs service.

3. DO ALL the services within an interval section. Write the number of hours (from your service records) and the date in the spaces provided. For a complete listing of all items to be performed and the service intervals required, refer to the quick-reference chart near the front of the Lubrication and Maintenance Section.

IMPORTANT: The service recommendations covered in this manual are for the accessories that are provided by John Deere. Follow manufacturer's service recommendations for servicing engine driven equipment not supplied by Deere.

RG21891,65 -19-09AUG94

DAILY (PRESTARTING) SERVICE

NOTE: Refer to DAILY PRESTARTING CHECKS in Engine Operating Guidelines Section for detailed procedures.

- Check engine oil level.
- Check coolant level.
- Lubricate PTO release bearing
- Check air cleaner dust unloader valve.
- Cecck fuel filter glass bowl for water.

S11,OMMR,I1 -19-17FEB93

100 HOUR SERVICE

- Lubricate PTO clutch shaft bearings.
- Service fire extinguisher

Hours									
Date									
Hours									
Date									
Hours									
Date									
Hours									
Date									

S11,OMMR,A1 -19-26JUL93

250 HOUR SERVICE

- *Change engine oil and filter.
- Service battery
- Check PTO clutch adjustment
- Check fan and alternator belt tension

Hours									
Date									
Hours									
Date									

**If TORQ-GARD SUPREME PLUS-50 oil is used along with a John Deere oil filter, the oil change interval maybe extended by 50 hours.*

S11,OMMR,AB -19-17FEB93

400 HOUR SERVICE

- *Initial valve clearance adjustment

Hours									
Date									

**Have your authorized servicing dealer or engine distributor adjust valve clearance after the first 400 hours of operation. Thereafter, have the valve clearance adjusted at 1200 Hour/2-Year intervals.*

S55,OMMR,BB -19-17FEB93

600 HOUR/1-YEAR SERVICE

- Clean crankcase vent tube
- Check air intake hoses and connections.
- Lubricate PTO clutch internal levers and linkage
- Replace fuel filter
- Coolant solution analysis - add inhibitor as needed
- Replace air cleaner elements
- Check air intake system
- Check cooling system

Hours									
Date									
Hours									
Date									

S11,OMMR,AD -19-17FEB93

1200 HOUR/2-YEAR SERVICE

NOTE: An engine tune-up is recommended every 1200 hours or two years, whichever comes first. If the engine tune-up is not performed at 1200 hours, the following checks must take place:

- Have your authorized servicing dealer or engine distributor check and adjust engine speeds
- Have you authorized servicing dealer or engine distributor adjust valve clearance
- Have you authorized servicing dealer or engine distributor check fuel injection system
- Have you authorized servicing dealer or engine distributor inspect turbocharger
- Check crankshaft vibration damper
- Flush cooling system
- Change thermostats
- Have your authorized servicing dealer or engine distributor test radiator and cap
- Perform engine tune-up

Hours									
Date									
Hours									
Date									

S11,OMMR,J -19-17FEB93

SERVICE AS REQUIRED

- Service air cleaner
- Replace V-belts.

Hours									
Date									

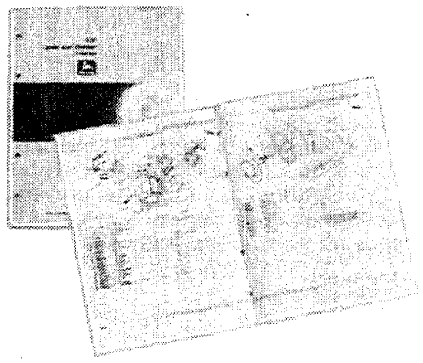
S11,OMMR,Z -19-22FEB93

Index

John Deere Service Literature Available

PARTS CATALOG

The parts catalog lists service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.



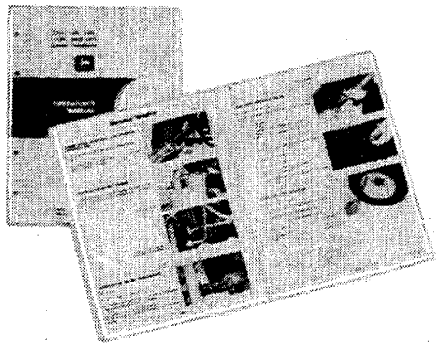
TS189 -UN-17JAN89

DX,PARTS -19-03MAR93

OPERATOR'S MANUAL

The operator's manual provides safety, operating, maintenance, and service information about John Deere machines.

An extra copy of the operator's manual is available. The operator's manual and safety signs on your machine may also be available in other languages. (See your John Deere dealer to order.)



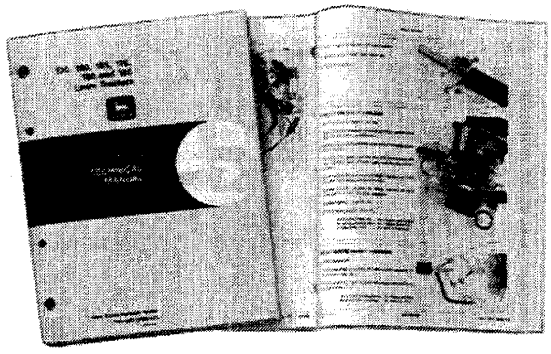
TS190 -UN-17JAN89

DX,OM -19-03MAR93

TECHNICAL AND SERVICE MANUALS

Technical and service manuals are service guides for your machine. Included in the manual are specifications, diagnosis, and adjustments. Also illustrations of assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

Component technical manuals are required for some products. These supplemental manuals cover specific components.



TS224 -UN-17JAN89

DX,TM -19-03MAR93

FMO AND FOS MANUALS

These are basic manuals covering most types and makes of machinery. FMO manuals tell you how to OPERATE agricultural machinery; FOS manuals tell you how to SERVICE machine systems. Each manual starts with basic theory and is fully illustrated with colorful diagrams and photographs. Both the "whys" and "hows" of adjustments and repairs are covered in this reference library.

TS195 -UN-02DEC88

DX,FMOFOS -19-03MAR93

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John Deere Service Literature Available

John Deere Distribution Service Center
Service Publications Department
P.O. Box 186, Moline, IL. 61266-0186

Name _____

Address _____

City _____

State _____ Zip _____

Phone ( ) _____

To order, fill out this form and mail it to the address above. Check for prices with your John Deere dealer or call **1-800-522-7448**. You may also place credit card orders by calling this number. Make checks payable to Deere & Co. Service Publications. Allow three weeks for delivery. No COD orders. Do not send cash or stamps. If you want manuals or catalogs for equipment not shown on this list, provide the model number, serial number, and name of the product.

Title	Order Number	Price Each	x Quantity	= Total
300 Series Liter Engines Parts Catalogs:				
3029 Saran-Built Engines	PC3194		x	=
4039 and 4045 Dubuque-Built Engines	PC2305		x	=
4039 Saran-Built Engines	PC3191		x	=
6059 and 6068 Dubuque-Built Engines	PC2294		x	=
6059 Saran-Built (100000—) Engines	PC3192		x	=
Operator's Manuals: English Version	OMRG18293		x	=
Component Technical Manuals: 3029, 4039, 4045, 6059, and 6068 Engines	CTM8		x	=
OEM Engine Accessories	CTM67		x	=
Alternators and Starting Motors	CTM77		x	=
			x	=
			x	=
			x	=
			x	=
			x	=
			x	=
			x	=
			x	=
			x	=
			x	=
FOS Manual—Hydraulics	FOS1005B		x	=
FOS Manual—Electrical Systems	FOS2006B		x	=
FOS Manual—Engines	FOS3007B		x	=
FOS Manual—Power Trains	FOS4006B		x	=
FOS Manual—Shop Tools	FOS5105B		x	=
FOS Manual—Welding	FOS5207B		x	=
FOS Manual—Belts and Chains	FOS5304B		x	=
FOS Manual—Bearings and Seals	FOS5405B		x	=
FOS Manual—Tires and Tracks	FOS5507B		x	=
FOS Manual—Air Conditioning	FOS5707B		x	=
FOS Manual—Fuels, Lubricants & Coolants	FOS5807B		x	=
FOS Manual—Fasteners	FOS6004B		x	=
FOS Manual—Iden. of Parts Failures	FOS6104B		x	=
1-in. 3-Ring Binder (400 pages max.)	SX2062		x	=
1-1/2-in. 3-Ring Binder (600 pages max.)	SX2063		x	=
1—1-1/2-in. 3-Post Binder (600 pages max.)	SX2066		x	=
2—3-1/2-in. 3-Post Binder (1400 pages max.)	SX2064		x	=
2-4-in. 4-Post Expandable (2000 pages max.)	SX2056		x	=
Catalog of Available Service Publications	DB1112	No Charge		
			Subtotal	

Method of Payment

- ☐ Check or Money Order enclosed
- ☐ John Deere ☐ Farm Plan
- ☐ MasterCard ☐ Discover
- ☐ Visa ☐ American Express

Credit Card Acct. No. (13 or 16 digits)

Expiration date: _____

Your Signature

Subtotal	Shipping & Handling
$ 0.50 to $ 24.99	$ 3.00
25.00 to 49.99	4.25
50.00 to 99.99	5.50
100.00 to 199.99	7.50
200.00 and over	4% of subtotal

Optional shipping available. Please check and add cost to normal shipping above.

- ☐ 1 day air $15.00
- ☐ 2 day air $10.00

Illinois state residents add 6.25% and Iowa state residents add 5% for Retail Occupation Tax or show tax exemption number. Other states excluded.

Total Shipping & Handling

Amount Due in U.S. Dollars (Prices subject to change without notice. MAY-94)

RG,SLIT,1 -19-11AUG94

John Deere Service Keeps You On the Job

JOHN DEERE PARTS

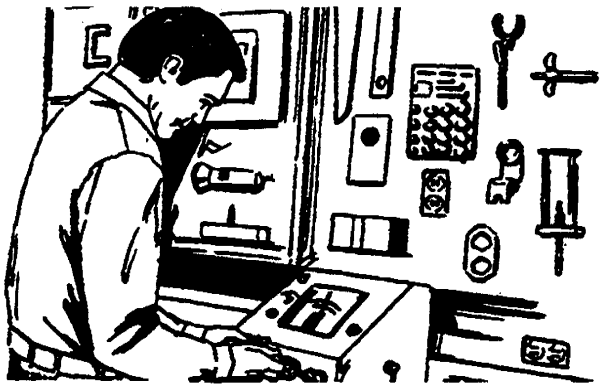
We help minimize downtime by putting genuine John Deere parts in your hands in a hurry.

That's why we maintain a large and varied inventory—to stay a jump ahead of your needs.

DX,IBC,A -19-04JUN90

THE RIGHT TOOLS

Precision tools and testing equipment enable our Service Department to locate and correct troubles quickly . . . to save you time and money.



DX,IBC,B -19-04JUN90

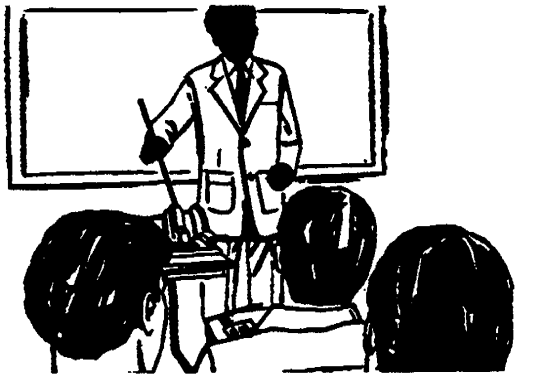
WELL-TRAINED TECHNICIANS

School is never out for John Deere service technicians.

Training schools are held regularly to be sure our personnel know your equipment and how to maintain it.

Result?

Experience you can count on!



DX,IBC,C -19-04JUN90

PROMPT SERVICE

Our goal is to provide prompt, efficient care when you want it and where you want it.

We can make repairs at your place or at ours, depending on the circumstances: see us, depend on us.

JOHN DEERE SERVICE SUPERIORITY: We'll be around when you need us.

DX,IBC,D -19-04JUN90

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This manual is available in the following languages:

English	35390095
Spanish	35391093