use color cover dated 11/02
add 4 coupons

use color cover dated 11/02
add 4 coupons

use color cover dated 11/02
add 4 coupons

use color cover dated 11/02
add 4 coupons

use color cover dated 11/02
add 4 coupons

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.

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:

CE

EC DECLARATION OF CONFORMITY WITH EC DIRECTIVES

98/37/EC, 93/68/EEC, 89/336/EEC

We

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

Represented In EC By:

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

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

7/120 (P425WIR) 9/110 (XP375WIR) 10/105 (HP350WIR)
14/85 (VHP290WIR)

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

EN29001 : EN292, EN60204-1, EN1012-1, PN8NTC2, EN50081, EN50082

Issued at Mocksville on
1-1-2001

Ric Lunsford
Quality Control Manager

Issued at Hindley Green on
1-1-2001

H. Seddon
Quality Assurance Manager

ABBREVIATIONS & SYMBOLS

####	Contact Ingersoll-Rand for serial number
->####	Up to Serial No.
####->	From Serial No.
*	Not illustrated
†	Option
AR	As required
D	Germany
DK	Denmark
E	Spain
F	France
GB	Great Britain
HA	High ambient machine
I	Italy
N	Norway
NL	Netherlands
P	Portugal
S	Sweden
SF	Finland
F.H.R.G.	Fixed height running gear
V.H.R.G.	Variable height running gear

FOREWORD

The contents of this manual are considered to be proprietary and confidential to Ingersoll-Rand and should not be reproduced without the prior written permission of Ingersoll-Rand.

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 authorised Ingersoll-Rand service department.

The design specification of this machine has been certified as complying with EC directives. As a result:

(a) Any machine modifications are strictly prohibited, and will invalidate EC certification.

(b) A unique specification for USA/Canada is adopted and tailored to the territory.

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 / lubricants / fluids 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.

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.

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

IF IN DOUBT CONSULT SUPERVISION.

This machine has been designed and supplied for use only in the following specified conditions and applications:
. Compression of normal ambient air containing no known or detectable additional gases, vapours. or particles
. Operation within the ambient temperature range specified in the *GENERAL INFORMATION* section of this manual.

. Generation of electricity at 110v (1ph) with centre tap earth, 230v (1ph), 230v (3ph) and 400v (3ph) / 230v (1ph) nominal at 50 Hertz.
(WDG)

The use of the machine in any of the situation types listed in table 1:-
a) Is not approved by Ingersoll-Rand,
b) May impair the safety of users and other persons, and
c) May prejudice any claims made against Ingersoll-Rand.

TABLE 1
Use of the machine to produce compressed air for: a) direct human consumption b) indirect human consumption, without suitable filtration and purity checks.
Use of the machine outside the ambient temperature range specified in the *GENERAL INFORMATION SECTION* of this manual.
Use of the machine where there is any actual or foreseeable risk of hazardous levels of flammable gases or vapours.
Use of the machine fitted with non Ingersoll-Rand approved components / lubricants / fluids.
Use of the machine with safety or control components missing or disabled.
Use of the machine for storage or transportation of materials inside or on the enclosure except when contained within the toolbox.

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

WARRANTY

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 (air-end 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 installation

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

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

Accessories or equipment furnished by Ingersoll-Rand, but manufactured by others, including, but not limited to, engines, 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 FORA PARTICULAR PURPOSE.

GENERAL WARRANTY INFORMATION

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

Portable Genset 8kW, 11KW, 20KVA thru 575KVA	Package	1 yr/2000 hrs	None
	Generator	2 yrs/4000 hrs	None

Portable Genset 3.5KW thru 7.0KW and 10KW	Package	1 yr/2000 hrs (parts only)	None
	Generator	1 yrs/2000 hrs (parts only)	None

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

ENGINES			
CATERPILLAR	**Months**	**Hours**	**Extended Coverage**
	12	unlimited	Available at dealer
CUMMINS	24	2000	Major components 3 yrs/10,000 hrs Available at dealer
JOHN DEERE (in compressors)	24	2000	5 yrs/5000 hrs using OEM fluids and filters with $250 deductible
(in generators as of 1/1/01)	24	2000	2 yrs/4000 hrs using IR fluids and filters
DEUTZ	24	2000	Available at dealer
INGERSOLL-RAND	24	4000	5 yrs/10,000 hrs when using genuine Ingersoll-Rand fluids and parts. Refer to operator's manual.
KUBOTA (North America only)	24	2000	Major components 36 mo/3000 hrs (parts only)
(Western Europe & Oceania)	24	2000	None
(Central & South America, Asia, Middle East & Africa)	12	1000	None
MITSUBISHI	24	2000	2 yrs/4000 hrs using IR fluids & filters
VOLVO	24	2000	2 yrs/4000 hrs using ir fluids & filters
HONDA	12	unlimited	None
VANGUARD	24	unlimited	None

PARTS			
	Months	**Hours**	**Coverage**
Ingersoll-Rand	6	No Limit	Parts Only

AIREND EXCHANGE			
	Months	**Hours**	**Extended Coverage**
Airend	12	2000 hours	2 yrs/4000 hrs - 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 coloured fluid specially formulated for Portable Compressors and is being provided as the factory filled fluid for all machines except [1] XHP650/900/1070

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

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

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 and bearings), and is automatically available when the following 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. Submissions of proof that maintenance intervals have been followed.

WARRANTY	TIME	*BARE AIREND	**AIREND COMPONENTS
STANDARD	2YRS / 4,000HRS	100% PARTS & LABOUR	100% PARTS & LABOUR
OPTIONAL	5YRS / 10,000HRS	100% PARTS & LABOUR	0%

*BARE AIREND - pertains to major airend parts (rotors, housings, gears and bearings).

**AIREND COMPONENTS - pertains to auxiliary attachments to the bare airend (seals, pumps, valves, tubes, hoses, fittings and filter housing).

Pro-Tec™ and XHP505 Compressor Fluids are available from your local Ingersoll-Rand branch or distributor.

For units operating within the USA & Canada, call the Mocksville Product Support Department on 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

FOR UNITS SOURCED FROM HINDLEY GREEN, UK

Complete Machine Registration

To initiate the machine warranty, fill out the ”Warranty Registration” form 83242 11/99 supplied as part of the machine documentation, keep a copy for your records and mail the original to:

Ingersoll Rand European Sales Ltd
Portable Power Business
Swan Lane
Hindley Green
Wigan
Lancashire
WN2 4EZ
U.K.

Attn: Customer Service Department

Note: Completion of this form validates the warranty.

Engine Registration:

I-R powered machines do not require separate engine registration.

Deutz require a separate engine registration form to be completed and mailed direct to their Cologne office. The form is supplied as part of the machine documentation for Deutz powered machines.

Caterpillar, Cummins and Perkins do not require a separate registration form but they stipulate that any new engine should be registered with their local dealer to initiate warranty.

You MUST provide proof of the “in-service” date when requesting engine warranty repairs.

WARRANTY REGISTRATION

FOR UNITS SOURCED FROM MOCKSVILLE, USA

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
P.O. Box 868
Mocksville, North Carolina 27028

Attn: Warranty Department

Note: Completion of this form validates the warranty.

Engine Registration:

I-R powered machines do not require separate 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	☐ Water well	☐ Utility Company (gas, electric, water, etc.)
☐ Industrial (plant use)	☐ Other specify _____	☐ Exploration	☐ Utility Contractor

Model S/N	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.

DECALS

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

Corrosion risk

Hot Surface

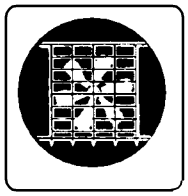
Lifting point

WARNING: Electrical shock risk.

Parking Brake

No open flame

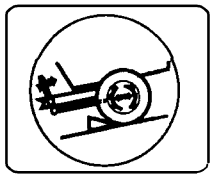
Diesel Fuel.
No open flame.



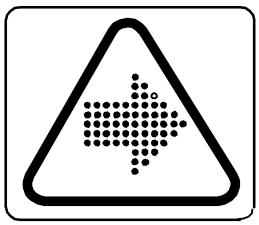
Do not operate the machine without guard being fitted.

Lifting point

WARNING – Flammable liquid.



When parking use prop stand, handbrake and wheel chocks.



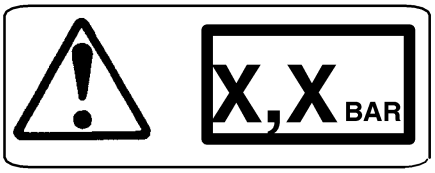
Air/gas flow or Air discharge.

WARNING – Hot and harmful exhaust gas.

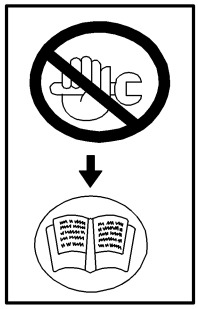
Tie down point

Do not breathe the compressed air from this machine.

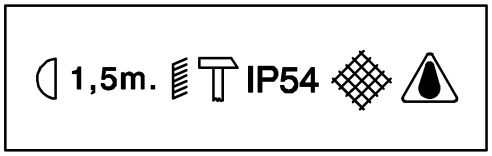
Read the Operation and Maintenance manual before operation or maintenance of this machine is undertaken.



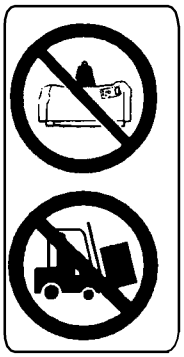
WARNING - Maintain correct tire pressure. (Refer to the *GENERAL INFORMATION* section of this manual).



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

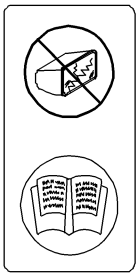


Rough Service Designation
Wet Location Operation

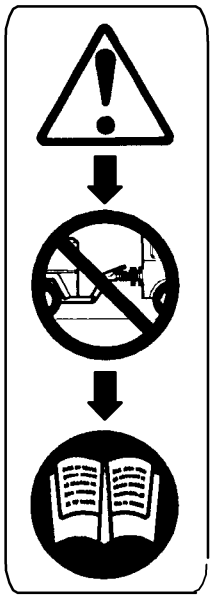


Do not stack

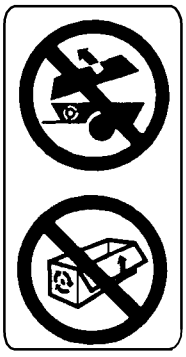
Do not use fork lift truck from this side



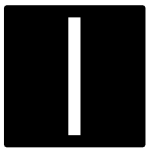
Replace any cracked protective shield.



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

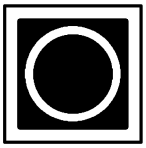


Do not operate with the doors or enclosure open.

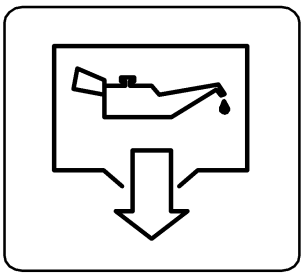


On (power).

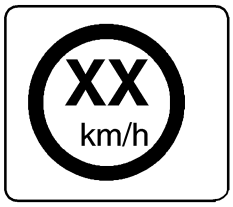
Off (power).



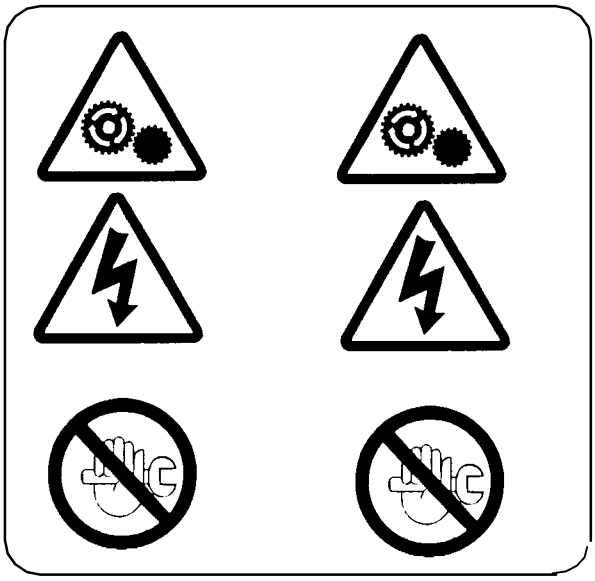
Emergency stop.



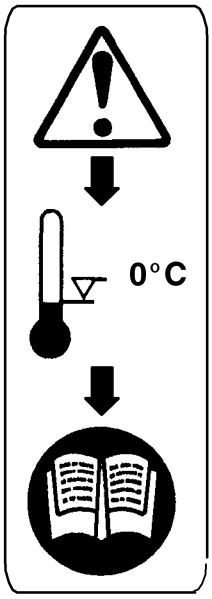
Oil Drain



Do not exceed the speed limit.



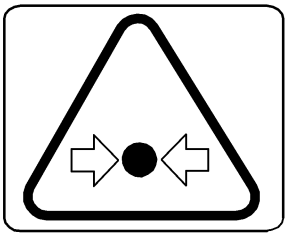
WARNING - Do not undertake any maintenance on this machine until the electrical supply is disconnected and the air pressure is totally relieved.



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

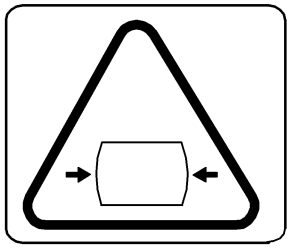
Read the Operation and Maintenance manual before operation or maintenance of this machine is undertaken

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



Pressurized vessel.

Use fork lift truck from this side only.



Pressurized component or system.

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

⚠ DANGER

(Red Background)

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

⚠ WARNING

(Orange Background)

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

⚠ CAUTION

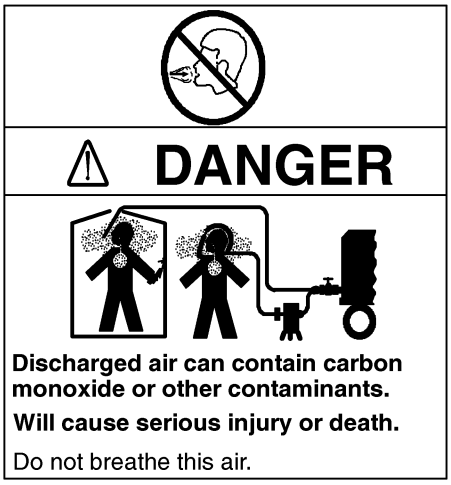
(Yellow Background)

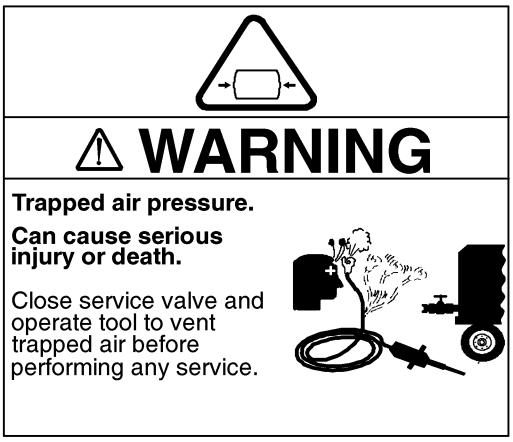
Indicates the presence of a hazard which WILL or can cause injury or property damage, if ignored.

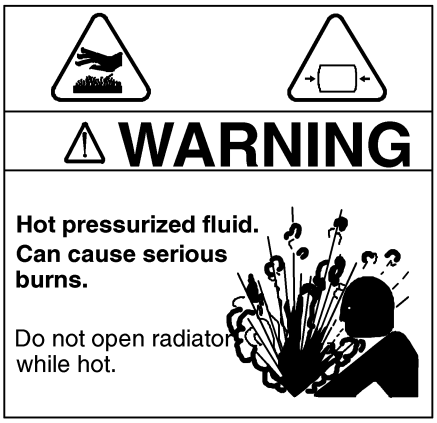
NOTICE

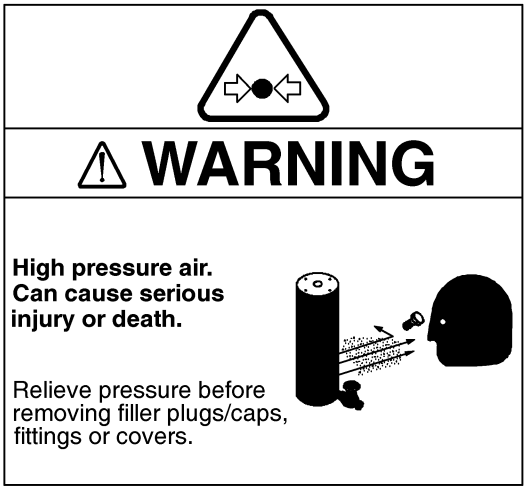
(Blue Background)

Indicates important set-up, operating or maintenance information.









⚠ WARNING

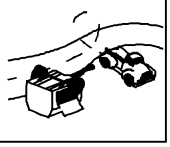
Improper operation of this equipment.
Can cause serious injury or death.
Read Operator's Manual supplied with this machine before operation or servicing.

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

⚠ WARNING

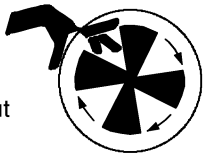
Collapsing jackstand.
Can cause serious injury.
Insert locking pin completely.

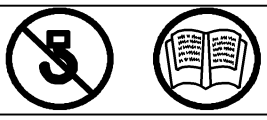
Excessive towing speed.
Can cause serious injury or death.
Do NOT exceed 65 mph (105 km/hr.)



⚠ WARNING

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





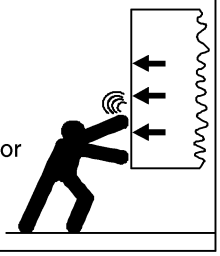
⚠ WARNING

Falling off machine.
Can cause serious injury or death.

Access lifting bail from inside machine.

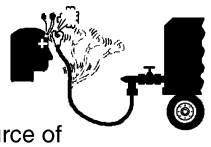
⚠ WARNING

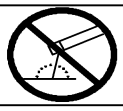
Door under pressure.
Can cause serious injury.
Use both hands to open door when machine is running.



⚠ WARNING

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





CAUTION

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

⚠ WARNING

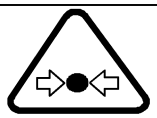
Combustible gas.
Can cause serious burns, blindness or death.
Keep sparks and open flames away from batteries.

CAUTION

DO NOT USE ETHER.

ENGINE DAMAGE WILL OCCUR.

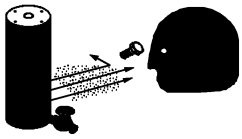
This engine is equipped with an electric heater starting aid.



⚠ WARNING

High pressure air. Can cause serious injury or death.

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



USE DIESEL FUEL ONLY

NOTICE

COOLANT FILL INSTRUCTIONS

Adding:

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

Replacing:

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

FREE SAFETY DECALS!

To promote communication of Safety Warnings on products manufactured by the Portable Compressor Division in Mocksville, N.C., Safety Decals are available **free** of charge. Safety decals are identified by the decal heading: **DANGER, WARNING or CAUTION.**

Decal part numbers are on the bottom of each decal and are also listed in the compressor's parts manual. Submit orders for Safety Decals to the Mocksville Parts Service Department. The no charge order should contain only Safety Decals. Help promote product safety! Assure that decals are present on the machines. Replace decals that are not readable.

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:

1. 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

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

3. 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
ENGINE MAKE & MODEL: _____
SERIAL NO.: _____
PURCHASER OR OWNER: _____
ADDRESS: _____
_____

DEALER OR DISTRIBUTOR FROM WHOM PURCHASED:
_____
_____

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 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 a 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. (40FR204.58-1).

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 below 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. Detailed instructions on the maintenance items below are given on the 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 sealing 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 systems 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 OR COMMENTS	HOURMETER READING	MAINT/INSPECT DATE	LOCATION CITY/STATE	WORK DONE BY (NAME)

SAFETY

WARNINGS
Warnings call attention to instructions which must be followed precisely to avoid injury or death.

CAUTIONS
Cautions call attention to instructions which must be followed precisely to avoid damaging the product, process or its surroundings.

NOTES
Notes are used for supplementary information.

General Information

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

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

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

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

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

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

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

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

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

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

Never inspect or service unit without first disconnecting battery cable(s) to prevent accidental starting.

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

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

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

Ether is an extremely volatile, highly inflammable gas. When it is specified as a starting aid, use sparingly. DO NOT USE ETHER IF THE MACHINE HAS GLOW PLUG STARTING AID OR ENGINE DAMAGE WILL RESULT.

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

Compressed air

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

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

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

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 accidently be pressurised / over pressurised by another.

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

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

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

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

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

When using compressed air always use appropriate personal protective equipment.

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

Avoid bodily contact with compressed air.

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

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

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

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

Materials

The following substances *may* be produced during the operation of this machine:

. brake lining dust
. engine exhaust fumes

AVOID INHALATION

Ensure that adequate ventilation of the cooling system and exhaust gases is maintained at all times.

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

. anti-freeze
. compressor lubricant
. engine lubricant
. preservative grease
. rust preventative
. diesel fuel
. battery electrolyte

AVOID INGESTION, SKIN CONTACT AND INHALATION OF FUMES

Should compressor lubricant come into contact with the eyes, then irrigate with water for at least 5 minutes.

Should compressor lubricant come into contact with the skin, then wash off immediately.

Consult a physician if large amounts of compressor lubricant are ingested.

Consult a physician if compressor lubricant is inhaled.

Never give fluids or induce vomiting if the patient is unconscious or having convulsions.

Safety data sheets for compressor and engine lubricants should be obtained from the lubricant supplier.

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

Battery

A battery contains sulphuric 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.

DO NOT ATTEMPT TO SLAVE START A FROZEN BATTERY SINCE THIS MAY CAUSE IT TO EXPLODE.

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.

Radiator

Hot engine coolant and steam can cause injury. Ensure that the radiator filler cap is removed with due care and attention.

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

Keep the towing vehicle or equipment carrier, generator set, connecting cables, tools and all personnel at least 3 metres from all power lines and buried power cables, other than those connected to the generator set.

Attempt repairs only in clean, dry, well lighted and ventilated areas.

Connect the generator set only to loads and/or electrical systems that are compatible with its electrical characteristics and that are within it's rated capacity.

Transport

When loading or transporting machines ensure that the specified lifting and tie down points are used.

When loading or transporting machines ensure that the towing vehicle, its size, weight, towing hitch and electrical supply are all suitable to provide safe and stable towing at speeds either, up to the legal maximum for the country in which it is being towed or, as specified for the machine model if lower than the legal maximum.

Ensure that the maximum trailer weight does not exceed the maximum gross weight of the machine (by limiting the equipment load), limited by the capacity of the running gear.

Note:
Gross mass (on data plate) is for the basic machine and fuel only, excluding any fitted options, tools, equipment and foreign materials.

Before towing the machine, ensure that:-

. the tyres and towing hitch are in a serviceable condition.
. the canopy is secure.
. all ancillary equipment is stored in a safe and secure manner.
. the brakes and lights are functioning correctly and meet necessary
road traffic requirements.
. break-away cables/safety chains are connected to the towing vehicle.

The machine must be towed in a level attitude in order to maintain correct handling, braking and lighting functions. This can be achieved by correct selection and adjustment of the vehicle towing hitch and, on variable height running gear, adjustment of the drawbar.

To ensure full braking efficiency, the front (towing eye) section must always be set level.

When adjusting variable height running gear:-

Ensure front (towing eye) section is set level

When raising towing eye, set rear joint first, then front joint.

When lowering towing eye, set front joint first, then rear joint.

After setting, fully tighten each joint by hand and then tighten further to the next pin. Refit the pin.

When parking always use the handbrake and, if necessary, suitable wheel chocks.

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

Safety chains / connections and their adjustment

The legal requirements for the joint operation of the breakaway cable and safety chains are as yet unidentified by 71/320/EEC or UK regulations. Consequently we offer the following advice / instructions.

Where brakes only are fitted:

a) Ensure that the breakaway cable is securely coupled to the handbrake lever and also to a substantial point on the towing vehicle.

b) Ensure that the effective cable length is as short as possible, whilst still allowing enough slackness for the trailer to articulate without the handbrake being applied.

Where brakes and safety chains are fitted:

a) Loop the chains onto the towing vehicle using the towing vehicle hitch as an anchorage point, or any other point of similar strength.

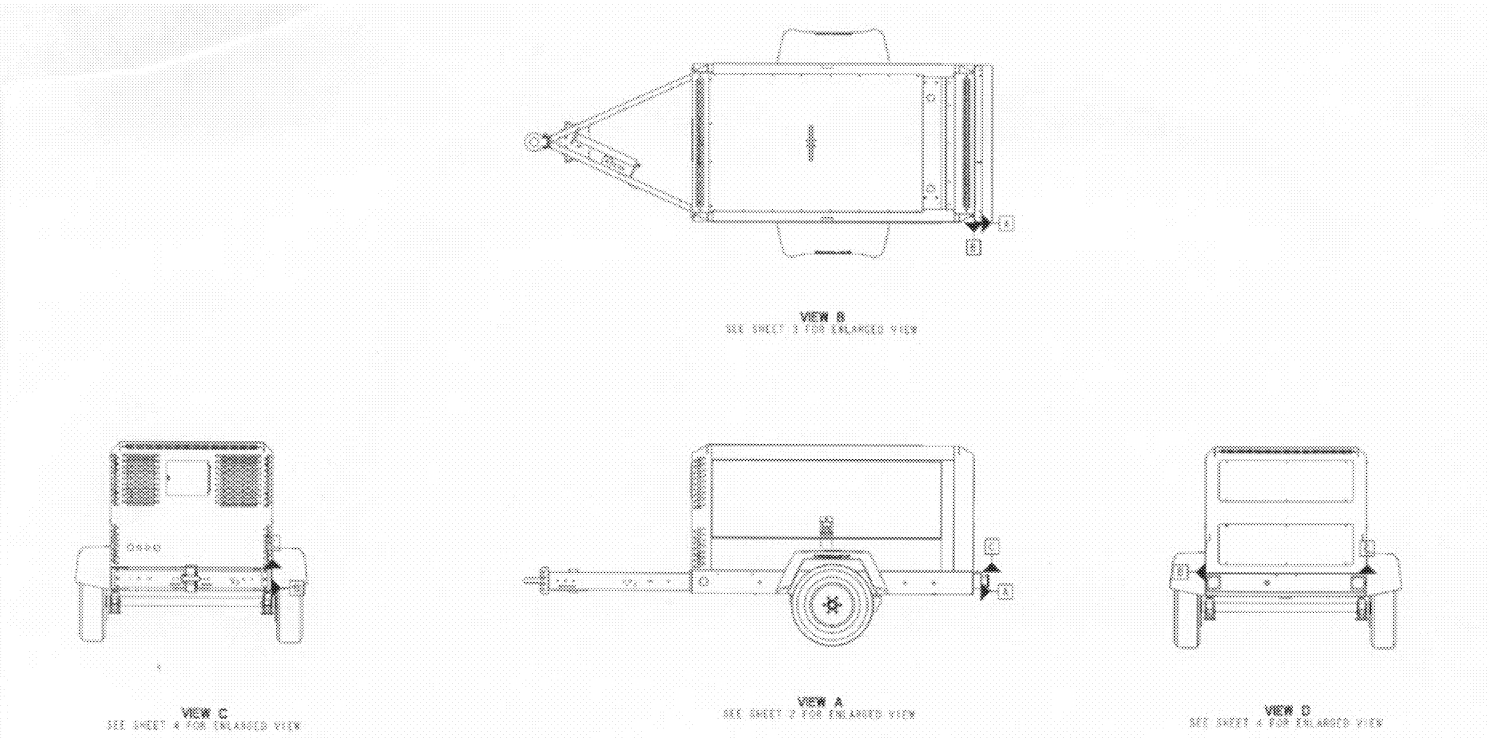
b) Ensure that the effective chain length is as short as possible whilst still allowing normal articulation of the trailer and effective operation of the breakaway cable.

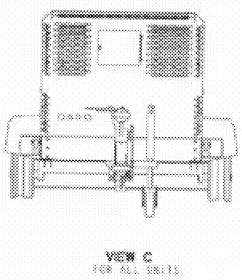
Where safety chains only are fitted:

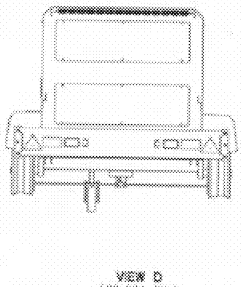
a) Loop the chains onto the towing vehicle using the towing vehicle hitch as an anchorage point, or any other point of similar strength.

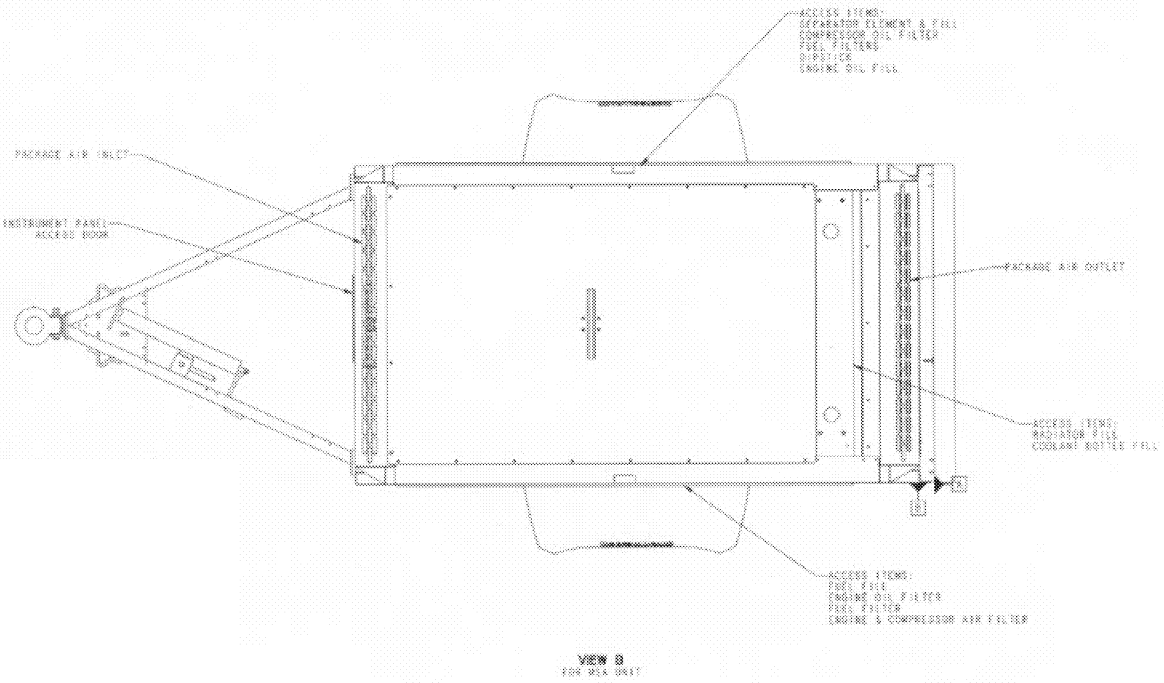
b) When adjusting the safety chains there should be sufficient free length in the chains to allow normal articulation, whilst also being short enough to prevent the towbar from touching the ground in the event of an accidental separation of the towing vehicle from the trailer.

General Arrangement

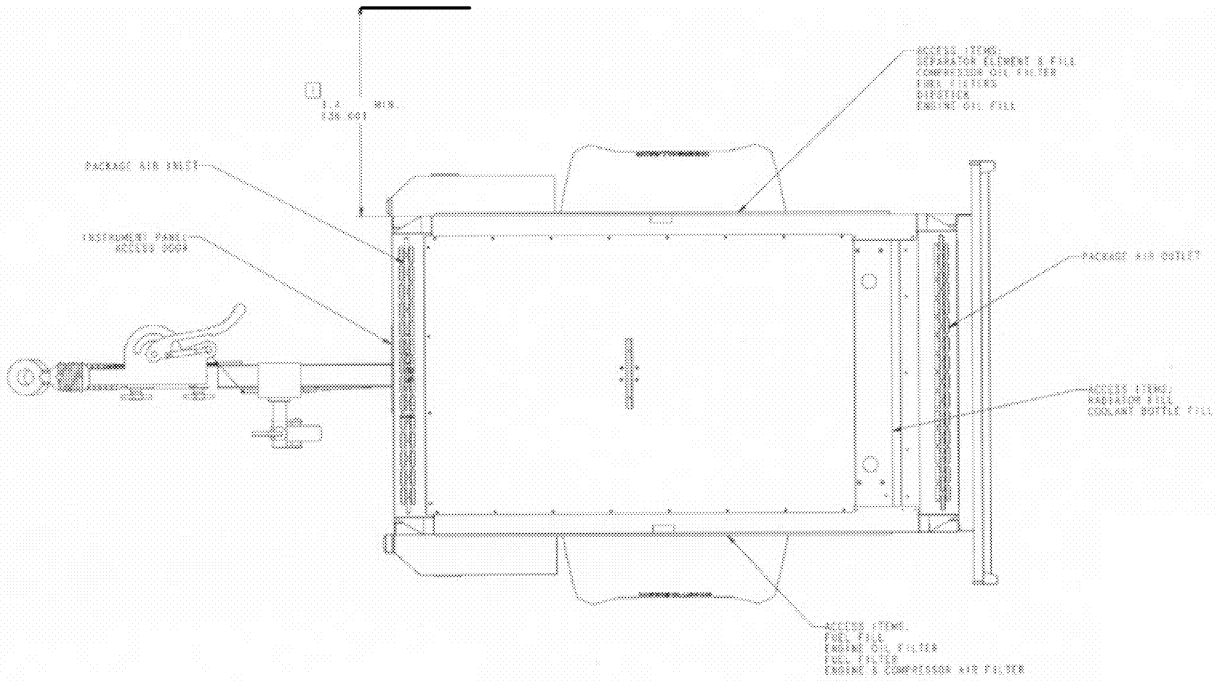




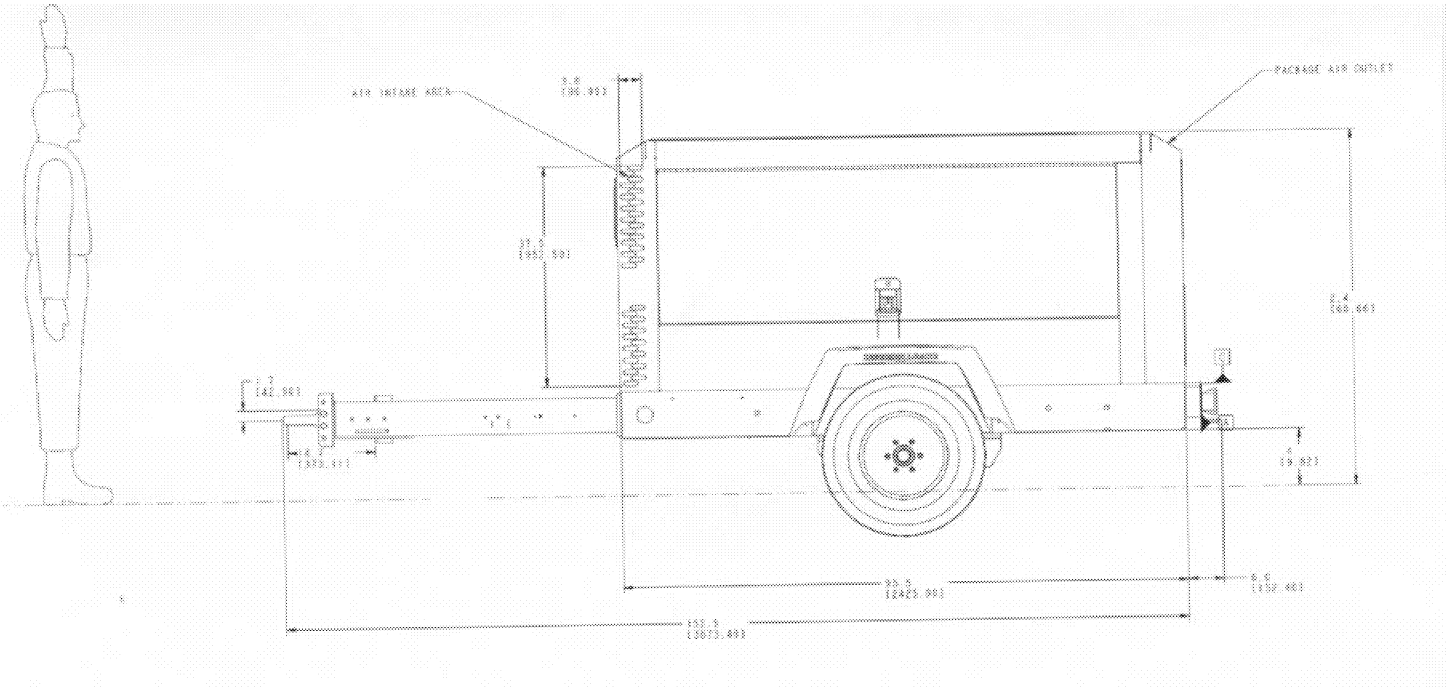




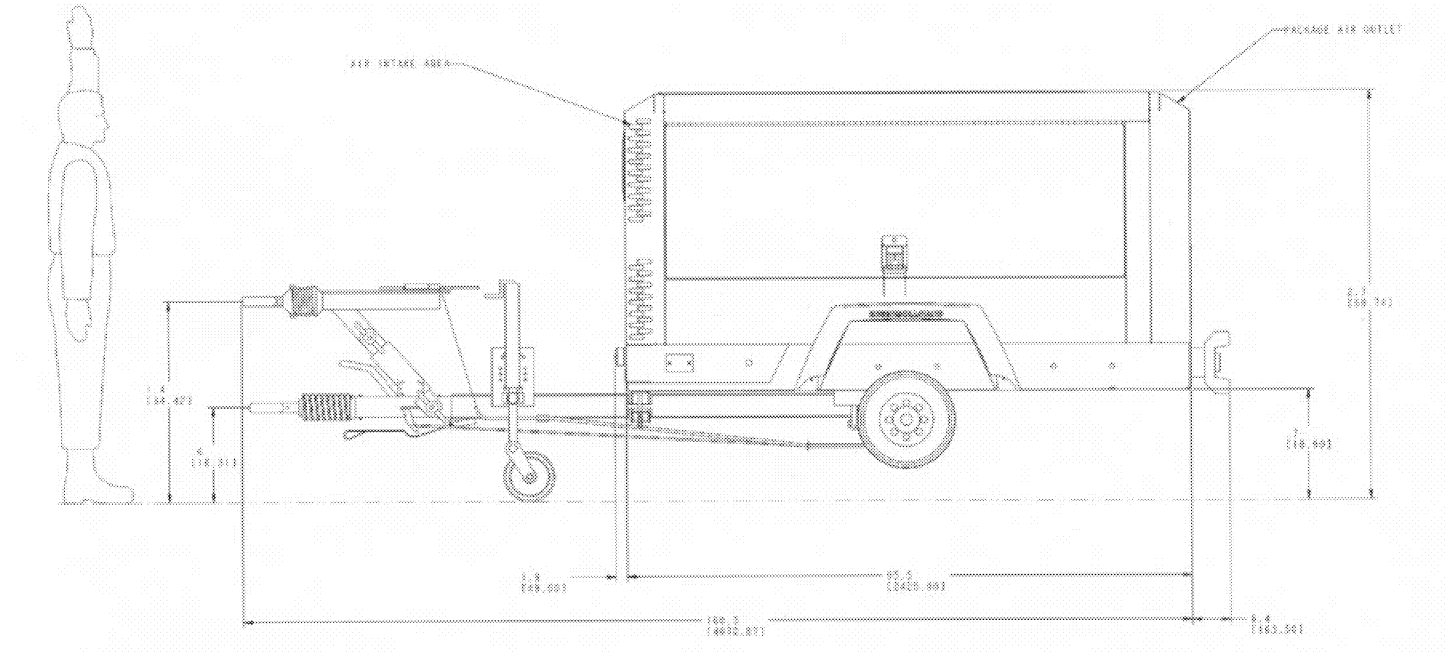
VIEW B
FOR DCA UNIT



VIEW B
FOR DCA UNITS



VIEW A
FOR MSA ONLY



VIEW A
FOR ESA ONLY

COMPRESSOR

Actual free air delivery. (7/120) (P425WIR)	12,0 m^3 min^{-1} (425 CFM)
Actual free air delivery. (9/110) (XP/ 375WIR)	10,5 m^3 min^{-1} (375 CFM)
Actual free air delivery. (10/105) (HP365WIR)	10,0 m^3 min^{-1} (350 CFM)
Actual free air delivery. (14/85) (VHP300WIR)	8,0 m^3 min^{-1} (290 CFM)
Normal operating discharge pressure. (7/120) (P425WIR)	7 bar (100 PSI)
Normal operating discharge pressure. (9/110) (XP/ 375WIR)	8,6 bar (125 PSI)
Normal operating discharge pressure. (10/105) (HP365WIR)	10,3 bar (150 PSI)
Normal operating discharge pressure. (14/85) (VHP300WIR)	14 bar (200 PSI)
Maximum allowable pressure. (7/120) (P425WIR)	8,6 bar (125 PSI)
Maximum allowable pressure. (9/110) (XP/ 375WIR)	10.3 bar (150 PSI)
Maximum allowable pressure. (10/105) (HP365WIR)	12.1 bar (175 PSI)
Maximum allowable pressure. (14/85) (VHP300WIR)	15.5 bar (225 PSI)
Safety valve setting. (7/120) (P425WIR)	10 bar (150 PSI)
Safety valve setting. (9/110) (XP/ 375WIR)	10 bar (200 PSI)
Safety valve setting. (10/105) (HP365WIR)	14 bar (200 PSI)
Safety valve setting. (14/85) (VHP300WIR)	17 bar (250 PSI)
Maximum pressure ratio (absolute). (7/120) (P425WIR)	7 ,9 : 1
Maximum pressure ratio (absolute). (9/110) (XP/ 375WIR)	9, 6 : 1
Maximum pressure ratio (absolute). (10/105) (HP365WIR)	11, 3 : 1
Maximum pressure ratio (absolute). (14/85) (VHP300WIR)	14, 8 : 1

Operating ambient temperature.
Whisperized -10°C TO +46°C (14°F TO 120°F)

Maximum discharge temperature.	120°C (248°F)
Cooling system.	Oil injection
Oil capacity. (7/120, 9/110, 10/105, (14/85) (P425WIR, XP375WIR, HP365WIR, VHP300WIR)	36 litres (9.5 GAL)
Maximum oil system temperature.	120°C (248°F)
Maximum oil system pressure. (7/120) (P425WIR)	8,6 bar (125 PSI)
Maximum oil system pressure. (9/110) (XP/ 375WIR)	10.3 bar (150 PSI)
Maximum oil system pressure. (10/105) (HP365WIR)	12.1 bar (175 PSI)
Maximum oil system pressure. (14/85) (VHP300WIR)	15.5 bar (225 PSI)

LUBRICATING OIL SPECIFICATION
(for the specified ambient temperatures).

ABOVE -23°C(-9°F)
Recommended: Pro-Tec™
Approved: SAE 10W, API CF-4/CG-4

BELOW -23°C(-9°F)
Mandatory: IR Performance 500

Ingersoll-Rand Pro-Tec™ compressor fluid is factory-fitted, for use at all ambient temperatures above -23°C(-9°F).

NOTE: Warranty may be extended only by continuous use of Pro-Tec™ and Ingersoll-Rand oil filters and separators.

No other oil/fluids are compatible with Pro-Tec™

No other oils/fluids should be mixed with Pro-Tec™ because the resulting mixture could cause damage to the airend.

In the event that Pro-Tec™ is not available and / or the end user needs to use an approved single grade engine oil, the complete system including separator / receiver, cooler and pipework must be flushed clear of the first fill fluid and new Ingersoll-Rand oil filters installed.
When this has been completed, the following oils are approved:

a) for ambient temperatures above -23°C(-9°F),
SAE 10W, API CF-4/CG-4

b) for ambient temperatures below -23°C(-9°F),
I-R Performance 500 only.

Safety data sheets can be obtained on request from the lubricant supplier.

For temperatures outside the specified ambient range, consult Ingersoll-Rand.

ENGINE
P425WIR (7/120) XP375WIR (9/110), HP365WIR (10/105), VHP300WIR (14/85)

Type/model.	Ingersoll-Rand
Number of cylinders.	4
Oil capacity.	13.2 litres (3.5 GAL)
Speed at full load.	2500 revs min^{-1} (RPM)
Speed at idle.	1700 revs min^{-1} (RPM)
Electrical system.	12V negative earth
Power available at 2500 revs min^{-1}	91.7 kW (123 HP)
Fuel tank capacity	219.5 litres (58 GAL)
Oil specification	Refer engine section
Coolant capacity	20.8 litres (5.5 GAL)

SOUND LEVEL DATA ('W' model)

A) To Pneurop code PN8NTC2.
Equivalent continuous sound pressure level.*

. Rated load	85 dB(A)
(Operator position :-1m from machine)	
Sound power level (84/533/EEC)	101 dB(A)

B) In compliance with 86/188/EEC.

Average sound pressure level at 10m to 79/113/EEC.*	73 dB(A)

(*Machine only :- at maximum load in open site conditions)

C) EPA Noise	76 dB(A)

FIXED HEIGHT RUNNING GEAR (European Only)
Braked version
(7/120) (9/110), (10/105), (14/85)

Shipping weight.	kg (Lbs)
Maximum weight.	2200kg (4850Lbs)
Maximum horizontal towing force.	kg (Lbs)
Maximum vertical coupling load (nose weight).	100 kgf (220 Lbs)

VARIABLE HEIGHT RUNNING GEAR (European Only)
Braked version
(7/120) (9/110), (10/105), (14/85)

Shipping weight.	kg (Lbs)
Maximum weight.	2200kg (4850Lbs)
Maximum horizontal towing force.	kg (Lbs)
Maximum vertical coupling load (nose weight).	100 kgf (220 Lbs)

WHEELS AND TIRES - P425WIR, XP375WIR, HP365WIR , VHP300WIR)

Number of wheels.	2 x 5.5
Tyre Size	ST225/75R15(D)
Tire Pressure	= 65 psi (4.5 bar)

WHEELS AND TYRES - 7/120, 9/110, 10/105, 14/85 (European)

Number of wheels.	2 x 5.5
Tyre size.	205/75 R16
Tyre pressure.	4.5 bar (65 psi)

Further information may be obtained by request through Ingersoll-Rand customer services department.

COMMISSIONING

Upon receipt of the unit, and prior to putting it into service, it is important to adhere strictly to the instructions given below in *PRIOR TO STARTING.*

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

Ensure that the position of the *emergency stop* device is known and recognised by its markings. Ensure that it is functioning correctly and that the method of operation is known.

Running gear drawbar (European Area) - Machines are shipped to some areas with the drawbar removed. Fitting involves four nuts / bolts to secure the drawbar to the axle and two bolts to fit the drawbar to the front of the machine with the saddle and spacer block.

Support the front of the machine, fit the wheel chocks to stop the machine moving and attach the drawbar. Refer to the torque value table in the *MAINTENANCE* section of this manual for the correct torque values.

CAUTION:
This is a safety critical procedure. Double check the torque settings after assembly

Fit the propstand and coupling. Remove the supports and set the machine level.

Before towing the unit, ensure that the tyre pressures are correct (refer to the *GENERAL INFORMATION* section of this manual) and that the handbrake is functioning correctly (refer to the *MAINTENANCE* section of this manual). Before towing the unit during the hours of darkness, ensure that the lights are functioning correctly (where fitted).

Ensure that all transport and packing materials are discarded.

Ensure that the correct fork lift truck slots or marked lifting / tie down points are used whenever the machine is lifted or transported.

When selecting the working position of the machine ensure that there is sufficient clearance for ventilation and exhaust requirements, observing any specified minimum dimensions (to walls, floors etc.).

Adequate clearance needs to be allowed around and above the machine to permit safe access for specified maintenance tasks.

Ensure that the machine is positioned securely and on a stable foundation. Any risk of movement should be removed by suitable means, especially to avoid strain on any rigid discharge piping.

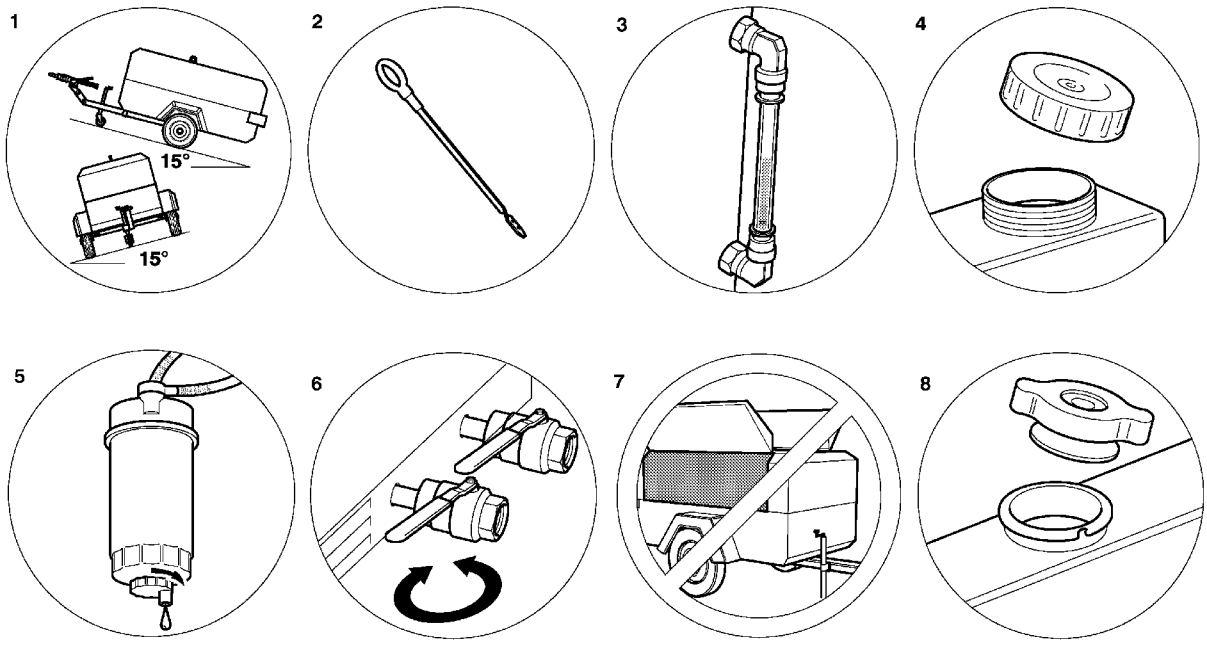
Attach the battery cables to the battery(s) ensuring that they are tightened securely. Attach the negative cable before attaching the positive cable.

WARNING: All air pressure equipment installed in or connected to the machine must have safe working pressure ratings of at least the machine rated pressure, and materials compatible with the compressor lubricant (refer to the *GENERAL INFORMATION* section).

WARNING: 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 accidently be pressurised / over pressurised by another.

WARNING: If flexible discharge hoses are to carry more than 7 bar pressure then it is recommended that safety retaining wires are used on the hoses.

OPERATING INSTRUCTIONS



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PRIOR TO STARTING

1. Place the unit in a position that is as level as possible. The design of the unit permits a 15 degree lengthways and sideways limit on out of level operation. It is the engine, not the compressor, that is the limiting factor.

When the unit has to be operated out of level, it is important to keep the engine oil level near the high level mark (with the unit level).

CAUTION: *Do not overfill either the engine or the compressor with oil.*

2. Check the engine lubrication oil in accordance with the operating instructions in the *Engine Operator's Manual.*

3. Check the compressor oil level in the sight glass located on the separator tank.

4. Check the diesel fuel level. A good rule is to top up at the end of each working day. This prevents condensation from occurring in the tank.

CAUTION: *Use only a No. 2-D diesel fuel oil with a minimum octane number of 45 and a sulphur content not greater than 0,5%.*

CAUTION: *When refuelling:-*
- *switch off the engine.*
- *do not smoke.*
- *extinguish all naked lights.*
- *do not allow the fuel to come into contact with hot surfaces.*
- *wear personal protective equipment.*

5. Drain the fuel filter water separator of water, ensuring that any released fuel is safely contained.

6. Open the service valve(s) to ensure that all pressure is relieved from the system. Close the service valve(s).

7. ***CAUTION:*** *Do not operate the machine with the canopy/doors in the open position as this may cause overheating and operators to be exposed to high noise levels.*

8. Check the radiator coolant level (with the unit level).

Check the air restriction indicator(s). Refer to the *MAINTENANCE* section of this manual.

When starting or operating the machine in temperatures below or approaching 0°C, ensure that the operation of the regulation system, the unloader valve, the safety valve, and the engine are not impaired by ice or snow, and that all inlet and outlet pipes and ducts are clear of ice and snow.

IQ System When Fitted

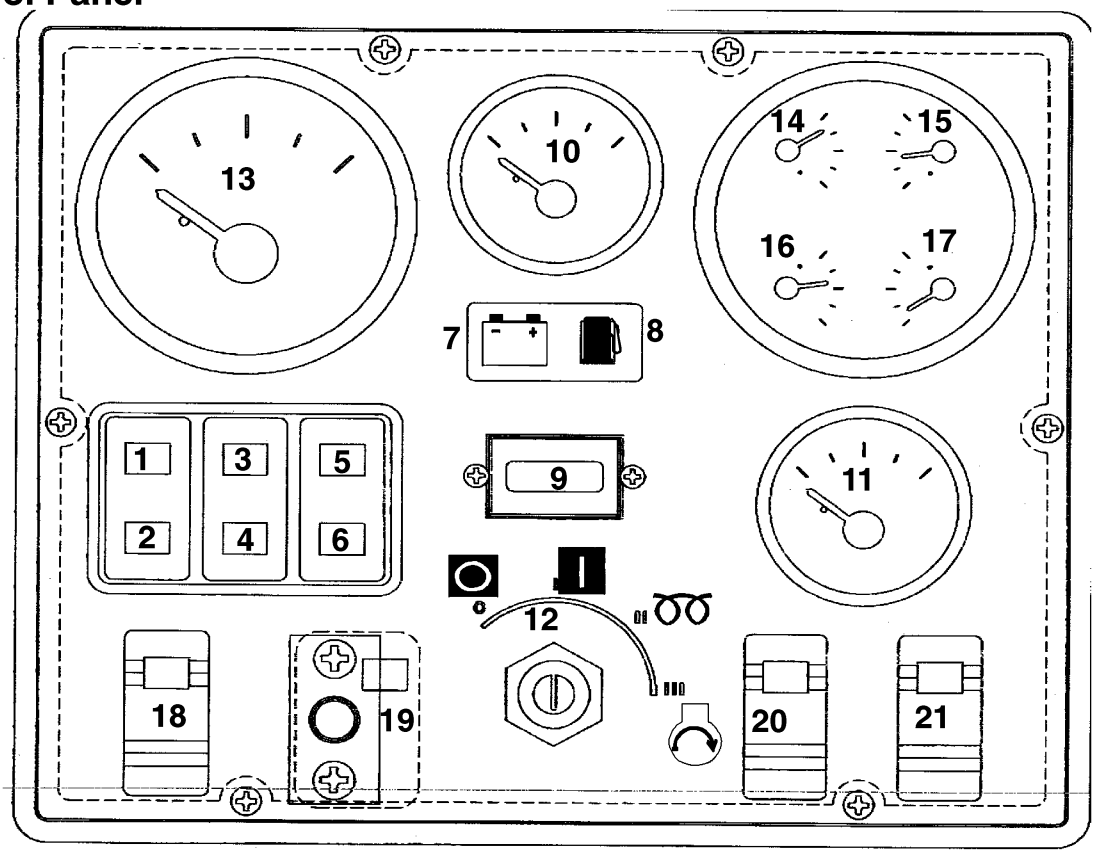
9. Position 3-way valve on top of separator tank.

For IQ operation, the 3-way valve handle should point toward the minimum pressure valve. This routes air through the IQ System before exiting at the service valve.

For standard operation, the 3-way valve handle should point away from the minimum pressure valve. This routes air direct to the service valve, blocking flow to the IQ System.

Do not operate the IQ System below 32°F (0°C). Freezing will occur and prevent proper operation or damage IQ components.

Control Panel



DIAGNOSTIC/AUTO SHUTDOWN (OPTIONAL)

1. **High Engine Temperature** - Coolant above 220°F (104°C).

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

3. **High Compressor Temperature** -248°F (120°C)

4. **Air Filters Restricted** - Needs Servicing.

5. **Spare**

6. **Spare**

DIAGNOSTIC/AUTO SHUTDOWN (STANDARD)

7. **Alternator Not Charging** - Needs attention.

8. **Low Fuel Level** - Must add fuel to operate.

9. **Hourmeter** - Records running time for maintenance.

10. **Compressor Discharge Pressure Gauge** - Indicates pressure in receiver tank, psi (kPa).

11. **Fuel Level Gauge** - Indicates amount of fuel in tank.

CONTROLS (STANDARD)

12. **Power Switch** - Flip "ON" to activate systems prior to Starting. Flip "OFF" to stop engine.

19. **Service Air Button** - After warm-up, PUSH. Provides full air pressure at the service outlet.

OPTIONAL CONTROLS

13. **Engine Speed Gauge** - Indicates engine speed.

14. **Discharge Air Temp. Gauge** - Indicates in °F and °C. Normal operating range: 185°F/85°C to 248°F /120°C.

15. **Engine Oil Pressure Gauge** - Indicates engine oil pressure (psi (kPa).

16. **Engine Water Temp Gauge** - Indicates coolant temperature, with normal operating range from 180°F/82°C to 210°F /99°C.

17. **Voltmeter** - Indicates battery condition.

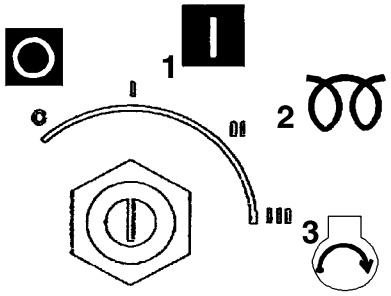
18. **Ether Inject Button** - Injects a measured shot. USE SPARINGLY.

20. **Spare**

21 **Spare**

STARTING THE MACHINE

WARNING: Under no circumstances should volatile liquids such as Ether be used for starting this machine.



All normal starting functions are incorporated in the key operated switch.

. Turn the key switch to position *2* and hold for 5 seconds to allow the glow plugs to reach working temperature.

. Turn the key switch to position *3* (engine start position). Hold until engine starts.

At temperatures below 0° C or if there is difficulty starting first time:

. Open the service valve fully, with no hose connected.

. Complete starting sequence above.

. Close service valve as soon as engine runs freely.

. Do not allow machine to run for long periods with service valve open.

. Allow the engine to reach operating temperature.

. At this point in the operation of the machine it is safe to apply full load to the engine.

NOTE: Wear hearing protection at all times when the engine is started with the service valve open and air is flowing from the valve.

PUSH AFTER WARM UP

NOTE: In order to allow the machine to start at a reduced load, a valve, which is operated by a button located on the instrument panel, is incorporated in the regulation system. (The valve automatically returns to the start position when the machine is switched off and air pressure relieved from the system).

. Allow the engine to reach its operating temperature - then press the button (19).

. At this point in the operation of the machine it is safe to apply *full load* to the engine.

DUAL PRESSURE WHEN FITTED

Machines which operate in excess of 7 bar (100 psi) can optionally be fitted with a dual pressure switch inside the unit. This switch selects between 7 bar (100 psi) and the machine rated pressure, cfm remains nominally constant.

Starting and stopping are unaffected by the selection and during normal running the selector switch may be safely operated. Precaution must be taken to ensure that downstream equipment is rated to suit the available pressure.

The pressure gauge indicates which setting has been selected.

GENERATOR OPERATION WHEN FITTED

This unit will operate in three modes, depending on the position of the generator control switch (located on the front of the generator control panel).

• In "GENERATOR" position , the engine will maintain idle speed and the generator will give a constant voltage and frequency output, for use with sensitive equipment like computers, welders, etc. No compressed air is available at the service valve in this mode.

• In "AIR" position , the generator provides no electrical power.

• In "GEN/AIR" position , voltage and frequency will vary as engine speed changes to meet air demand and should only be used for lights and hand tools.

The generator system is designed to deliver power over a wide range of alternator speeds. As a result a variety of conditions arise which need consideration.

Alternator Underspeed - Below 3000 rpm very little power is developed. As a result, the voltage across the load will reduce. Once below 60 volts the unit switches itself off. But will re-start automatically.

Alternator Overspeed - Above 5000 rpm the alternator is capable of providing more than 6kW. If a greater loader is applied, the increased current will cause both overheating of the unit and the alternator.

Alternator Over-temperature - Excessive loading, restricted air flow or high ambient temperature will cause the alternator to overheat. The increased temperature of the alternator rotor is effectively monitored and the output voltage reduced until it drops below 60 volts. This protects the alternator rotor.

Unit Overloaded - Applying excessive loading will cause both a reduction in output voltage and an increase in internal temperature. Depending upon the alternator speed, the equipment will either shutdown due to overtemperature or limit its output at 60 volts.

Unit Overheating - Applying excessive loading or restricting the air flow, or using the unit in too high an ambient temperature (above 130 degrees F. at full output) will cause the unit to protect itself. As the internal temperature rises, the unit will reduce the output power in an attempt to reduce the internal dissipation. If the temperature continues to rise, the unit will shut itself down and will have to be manually turned off and on when it has cooled down.Indication of the above conditions is displayed on the STATUS INDICATOR PANEL as follows:

LED 1

Green LED which indicates the equipment status
OFF - Equipment OFF
FLASHING - Equipment in STANDBY mode
STEADY - Equipment ON

LED 2

Red LED which indicates the overload condition
OFF - Equipment running normally
FLASHING - Output voltage less than 90 volts
STEADY - Output voltage dropping below 60 volts

LED 3

Red LED which indicates the overload condition
OFF - Equipment running normally
FLASHING - Output voltage less than 90 volts
STEADY - Output voltage dropping below 60 volts

STOPPING THE MACHINE

. Close the service valve.

. Allow the machine to run unloaded for a short period of time to reduce the engine temperature.

. Turn the start switch to the *0* (off) position.

NOTE: As soon as the engine stops, the automatic blowdown valve will relieve all pressure from the system.

If the automatic blowdown valve fails to operate, then pressure must be relieved from the system by means of the service valve(s).

CAUTION: *Never allow the machine to stand idle with pressure in the system.*

EMERGENCY STOPPING

In the event that the unit has to be stopped in an emergency, **TURN THE KEY SWITCH LOCATED ON THE INSTRUMENT PANEL TO THE *0* (OFF) POSITION.**

RE-STARTING AFTER AN EMERGENCY

If the machine has been switched off because of a machine malfunction, then identify and correct the fault before attempting to re-start.

If the machine has been switched off for reasons of safety, then ensure that the machine can be operated safely before re-starting.

Refer to the *PRIOR TO STARTING* and *STARTING THE UNIT* instructions earlier in this section before re-starting the machine.

MONITORING DURING OPERATION

Should any of the safety shut-down conditions occur, the unit will stop. These are:

. Low engine oil pressure

. High air discharge temperature

. High engine water temperature

CAUTiON: *To ensure an adequate flow of oil to the compressor at low temperature, never allow the discharge pressure to fall below 3,5 bar* (50 psi)

IQ System

The IQ System is a complete, self-contained system which provides cooler, cleaner air than from a standard portable compressor. The system utilizes an integral aftercooler, high-efficiency filtration, and a patented condensate disposal system to provide the cool, clean air. The condensate disposal system injects all liquid condensed from the moisture separator and filters into the engine exhaust system where it is vaporized by heat. This eliminates the need for collecting the condensate, and the added cost of disposing of the condensate, which is often regulated by local, state, and/or federal regulations.

Theory of Operation

The compressed air exits the separator tank through the top cover piping, and can then travel along one of two paths, selectable via manual valving. Refer to Illustration 36535177.

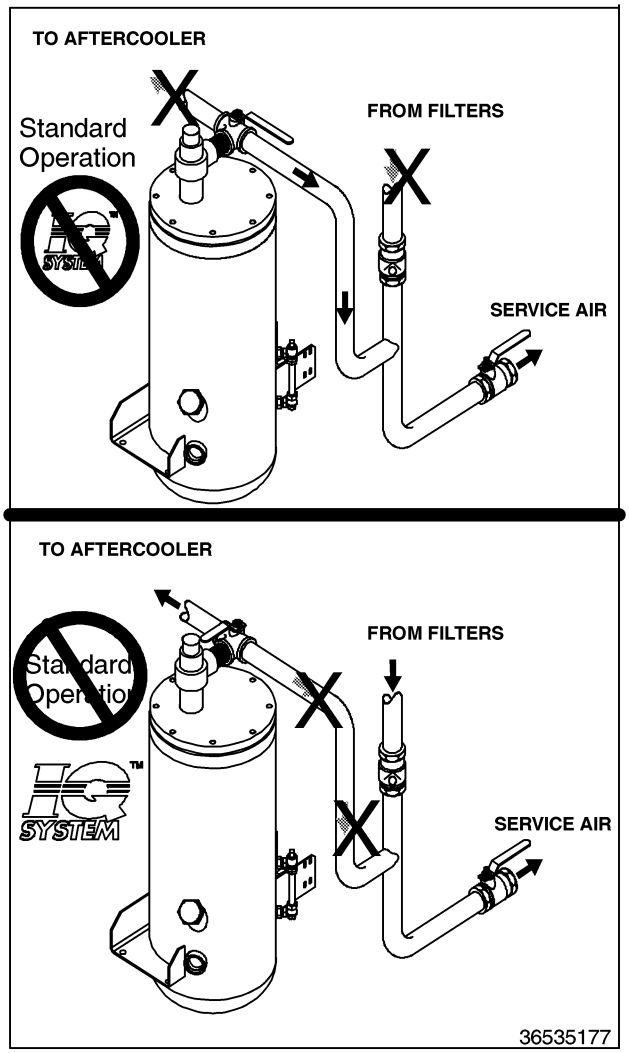
One path allows Standard Operation, which bypasses the IQ System, and delivers air quality equivalent to a standard oil-flooded portable compressor. If the IQ System is enabled by proper setting of the 3-way valve, the compressed air first enters the aftercooler.

The aftercooler is cooled by the incoming compressor package air. The compressed air and condensate (water with a small amount of compressor lubricant) exits the aftercooler and enters the moisture separator, where most of the condensate is removed.

The compressed air then flows through two stages of filtration, where the aerosol water and oil is removed down to approximately 0.01 ppm, and all particulates are removed down to 0.01 micron.

At the bottom of the moisture separator and both filters are condensation lines.

These condensate lines are piped together, and the condensate is injected at a single point into the exhaust system. The compressed air then travels through the minimum pressure valve, and out through the service air valve.



The air pressure gauge on the instrument panel indicates the pressure inside the separator tank. The air pressure gage located at dual filters on lifting bail indicates delivered air pressure of the IQ System.

If the IQ System is bypassed (Standard Operation selected), the delivered air pressure will be approximately equal to the separator tank pressure. If the IQ System operation is selected, the delivered air pressure will be slightly less than separator tank pressure depending on the restriction of the filters, depending on the restriction of the filters.

DECOMMISSIONING

When the machine is to be permanently decommissioned or dismantled, it is important to ensure that all hazard risks are either eliminated or notified to the recipient of the machine. In particular:-

. Do not destroy batteries or components containing asbestos without containing the materials safely.

. Do not dispose of any pressure vessel that is not clearly marked with its relevant data plate information or rendered unusable by drilling, cutting etc.

. Do not allow lubricants or coolants to be released into land surfaces or drains.

. Do not dispose of a complete machine without documentation relating to instructions for its use.

MAINTENANCE

	Initial 500 miles /850 km	Daily	Weekly	Month	3 Month 250 hrs.	6 Month. 500 hrs	12 Month. 1000 hrs
Compressor Oil Level		C					
Engine Oil Level		C					
*Radiator Coolant Level		C					
Gauges/Lamps		C					
*Air Cleaner Service Indicators		C					
Fuel Tank (Fill at end of day)		C				D	
*Fuel/Water Separator Drain		C					
Oil Leaks		C					
Fuel Leaks		C					
Drain Water From Fuel Filters		D					
Coolant Leaks		C					
Radiator Filler Cap		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				C			
Air Cleaner System				C			
Compressor Oil Cooler Exterior				C			
*Engine Rad/Oil Cooler Exterior				C			
Fasteners, Guards					C		
Air Cleaner Elements						R/WI	

*Disregard if not appropriate for this particular machine.

(1) or 3000 miles/5000km whichever is the sooner

(2) or as defined by local or national legislation

C = Check (adjust, clean or replace as necessary)

CBT =check before towing.

CR = Check and report

D = Drain

G = Grease

R=Replace

T = Test

W I =or when indicated if earlier.

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

	Initial 500 miles /850 km	Daily	Weekly	Month	3 Month. 250 hrs.	6 Month. 500 hrs	12 Month. 1000 hrs	18 Month. 1500 hrs
*Fuel/Water Separator Element						R		
Compressor Oil Filter Element						R		
Compressor Oil						R		
Engine Oil Change						R		
Engine Oil Filter						R		
*Water Pump Grease.							R	
*Wheels (Bearings, Seals, etc.)						C		
*Engine Coolant						C	R	
Fuel Filter Element						R		
*Injection Nozzle Check								C
Shutdown Switch Settings							T	
Scavenger Orifice & Related Parts							C	
Oil Separator Element							R	
*Feed Pump Strainer Cleaning.							C	
Coolant Replacement							R	
*Valve Clearance Check							C	
Lights (running, brake, & turn)		CBT						
Pintle Eye Bolts		CBT						
*Brakes	C				C			
*Brake linkage	C							
Emergency stop		T						
Fasteners		C						
Running gear linkage				G				
Safety valve					C			
Running gear bolts(1)					C			
IQ filter elements							R	

*Disregard if not appropriate for this particular machine.

(1) or 3000 miles/5000km whichever is the sooner

(2) or as defined by local or national legislation

C = Check (adjust, clean or replace as necessary)

CBT =check before towing.

CR = Check and report

D = Drain

G = Grease

R=Replace

T = Test

W I =or when indicated if earlier.

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

	Initial 500 miles /850 km	Daily	Weekly	Monthly	3 Month. 250 hrs.	6 Month 500 hrs	12 Monthly. 1000 hrs
Scavenge line						C	
Pressure system						C	
Engine breather element							C
Pressure gauge							C
Pressure regulator							C
Separator tank (2) exterior							CR
Lubricator (Fill)		C					

	2 Yrs	4 Yrs	6 Yrs				
Safety valve	C						
Hoses		R					
Separator tank (2) interior			C				

*Disregard if not appropriate for this particular machine.

(1) or 3000 miles/5000km whichever is the sooner

(2) or as defined by local or national legislation

C = Check (adjust, clean or replace as necessary)

CBT =check before towing.

CR = Check and report

D = Drain

G = Grease

R=Replace

T = Test

W I =or when indicated if earlier.

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

ROUTINE MAINTENANCE

This section refers to the various components which require periodic maintenance and replacement.

The *SERVICE/MAINTENANCE CHART* indicates the various components' descriptions and the intervals when maintenance has to take place. Oil capacities, etc., can be found in the *GENERAL INFORMATION* section of this manual.

For any specification or specific requirement on service or preventative maintenance for the engine, refer to the *Engine Manufacturer's Manual*.

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.

If the automatic blowdown fails to operate, then pressure must be gradually relieved by operating the manual blowdown valve. Suitable personal protective equipment should be worn.

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

Prior to attempting any maintenance work, ensure that:-

. all air pressure is fully discharged and isolated from the system. If the automatic blowdown valve is used for this purpose, then allow enough time for it to complete the operation.

. the discharge pipe / manifold area is depressurised by opening the discharge valve, whilst keeping clear of any airflow from it.

MINIMUM PRESSURE VALVE - WHEN FITTED

NOTE: Pressure will always remain in the part of the system between the minimum pressure valve and the discharge valve after operation of the auto blowdown valve.

This pressure must be relieved by carefully:

(a) Disconnecting any downstream equipment.

(b) Opening the discharge valve to atmosphere.

(Use hearing protection if necessary).

. the machine cannot be started accidently or otherwise, by posting warning signs and/or fitting appropriate anti-start devices.

. all residual electrical power sources (mains and battery) are isolated.

Prior to opening or removing panels or covers to work *inside* a machine, ensure that:-

. anyone entering the machine is aware of the reduced level of protection and the additional hazards, including hot surfaces and intermittently moving parts.

. the machine cannot be started accidently or otherwise, by posting warning signs and/or fitting appropriate anti-start devices.

Prior to attempting any maintenance work on a *running* machine, ensure that:-

. the work carried out is limited to only those tasks which require the machine to run.

. the work carried out with safety protection devices disabled or removed is limited to only those tasks which require the machine to be running with safety protection devices disabled or removed.

. all hazards present are known (e.g. pressurised components, electrically live components, removed panels, covers and guards, extreme temperatures, inflow and outflow of air, intermittently moving parts, safety valve discharge etc.).

. appropriate personal protective equipment is worn.

. loose clothing, jewellery, long hair etc. is made safe.

. warning signs indicating that *Maintenance Work is in Progress* are posted in a position that can be clearly seen.

Upon completion of maintenance tasks and prior to returning the machine into service, ensure that:-

. the machine is suitably tested.

. all guards and safety protection devices are refitted.

. all panels are replaced, canopy and doors closed.

. hazardous materials are effectively contained and disposed of.

PROTECTIVE SHUTDOWN SYSTEM

Comprises:

. Low engine oil pressure switch

. High discharge air temperature switch

. High engine water temperature switch

. Alternator/drive belt failure circuit.

. Low engine fuel level switch.

Low engine oil pressure switch.

At three month intervals, test the engine oil pressure switch circuit as follows:

. Start the machine.

NOTE: Do not press the load button.

. Remove a wire from one terminal of the switch. The machine should shutdown.

At twelve month intervals, test the engine oil pressure switch as follows:

. Remove the switch from the machine.

. Connect it to an independent low pressure supply (either air or oil).

. The switch should operate at 1,0 bar.

. Refit the switch.

Temperature switch(es).

At three month intervals, test the temperature switch circuit(s) as follows:

. Start the machine.

NOTE: Do not press the load button.

. Disconnect each switch in turn. The machine should shutdown.

. Re-connect the switch.

High discharge air temperature switch(es).

At twelve month intervals, test the air discharge temperature switch(es) by removing it from the machine and immersing in a bath of heated oil. The switch should operate at 120°C. Refit the switch.

High water temperature switch

At twelve month intervals, test the water temperature switch by removing it from the machine and immersing in a bath of heated oil. The switch should operate at 105°C. Refit the switch.

Alternator/drive belt failure circuit.

At twelve month intervals test the alternator drive belt failure circuit as follows:

. Remove the drive belt from the machine.

. Turn the key switch to position *1*, the alternator charge light will illuminate.

. Turn the key switch to position *3* (engine start position).

. The machine should shutdown when the key switch is returned to position *1*.

Low engine fuel level switch.

At three month intervals, test the low engine fuel level switch circuit as follows:

. Start the machine.

Note: Do not press the load button.

. Disconnect the switch, the machine should shutdown.

. Re-connect the switch.

At twelve month intervals, test the low engine fuel level switch by removing and operating the float manually.

CAUTION: *Never remove or replace switches when the machine is running.*

SCAVENGE LINE

The scavenge line runs from the combined orifice/drop tube in the separator tank, to the orifice fitting located in the airend.

Examine the orifice, check valve and hoses at every service or in the event of oil carryover into the discharge air.

It is good preventative maintenance to check that the scavenge line and tube are clear of any obstruction each time the compressor lubricant is changed as any blockage will result in oil carryover into the discharge air.

COMPRESSOR OIL FILTER

Refer to the *MAINTENANCE CHART* in this section for the recommended servicing intervals.

Removal

WARNING: Do not remove the filter(s) without first making sure that the machine is stopped and the system has been completely relieved of all air pressure. (Refer to *STOPPING THE UNIT* in the *OPERATING INSTRUCTIONS* section of this manual).

Clean the exterior of the filter housing and remove the *spin-on* element by turning it in a counter-clockwise direction.

Inspection

Examine the filter element.

CAUTION: *If there is any indication of the formation of varnishes, shellacs or lacquers on the filter element, it is a warning that the compressor lubricating and cooling oil has deteriorated and that it should be changed immediately. Refer to LUBRICATION later in this section.*

Reassembly

Clean the filter gasket contact area and install the new element by screwing in a clockwise direction until the gasket makes contact with the filter housing. Tighten a further $^{1}/_{2}$ to $^{3}/_{4}$ of a revolution.

CAUTION: *Start the machine (refer to PRIOR TO STARTING and STARTING THE UNIT in the OPERATING INSTRUCTIONS section of this manual) and check for leakage before the machine is put back into service.*

COMPRESSOR OIL SEPARATOR ELEMENT

Normally the separator element will not require periodic maintenance provided that the air and oil filter elements are correctly maintained.

If, however, the element has to be replaced, then proceed as follows:

Removal

WARNING: Do not remove the filter(s) without first making sure that the machine is stopped and the system has been completely relieved of all air pressure. (Refer to *STOPPING THE UNIT* in the *OPERATING INSTRUCTIONS* section of this manual).

Disconnect all hoses and tubes from the separator tank cover plate. Remove the drop-tube from the separator tank cover plate and then remove the cover plate. Remove the separator element.

Inspection

Examine the filter element. Examine all hoses and tubes, and replace if necessary.

Reassembly

Thoroughly clean the orifice/drop tube and filter gasket contact area before reassembly. Install the new element.

WARNING

Do not remove the staple from the anti-static gasket on the separator element since it serves to ground any possible static build-up. Do not use gasket sealant since this will affect electrical conductance.

Reposition the cover plate, taking care not to damage the gasket, and replace the cover plate screws tightening in a *criss-cross* pattern to the recommended torque (refer to the *TORQUE SETTING TABLE* later in this section).

Engage the adaptor in the cover plate with the drop-tube integral with the filter, reconnect all hoses and tubes to the separator tank cover plate.

Replace the compressor oil (refer to *LUBRICATION* later in this section).

CAUTION: *Start the machine (refer to PRIOR TO STARTING and STARTING THE UNIT in the OPERATING INSTRUCTIONS section of this manual) and check for leakage before the machine is put back into service.*

COMPRESSOR OIL COOLER AND ENGINE RADIATOR

When grease, oil and dirt accumulate on the exterior surfaces of the oil cooler and radiator, the efficiency is impaired. It is recommended that each month the oil cooler and radiator be cleaned by directing a jet of compressed air, (carrying if possible a non-flammable cleaning solvent) over the exterior core of the cooler/radiator. This should remove any accumulation of oil, grease and dirt from the exterior core of the cooler so that the entire cooling area can radiate the heat of the lubricating and cooling oil/water into the air stream.

WARNING: Hot engine coolant and steam can cause injury. When adding coolant or antifreeze solution to the engine radiator, stop the engine at least one minute prior to releasing the radiator filler cap. Using a cloth to protect the hand, slowly release the filler cap, absorbing any released fluid with the cloth. Do not remove the filler cap until all excess fluid is released and the engine cooling system fully depressurised.

WARNING: Follow the instructions provided by the antifreeze supplier when adding or draining the antifreeze solution. It is advisable to wear personal protective equipment to prevent skin and eye contact with the antifreeze solution.

AIR FILTER ELEMENTS

The air filter should be inspected regularly (refer to the *SERVICE/MAINTENANCE CHART*) and the element replaced when the restriction indicator shows red or every 6 Months (500 hours), whichever comes first. The dust collector box(es) should be cleaned daily (more frequently in dusty operating conditions) and not allowed to become more than half full.

Removal

CAUTION: *Never remove and replace element(s) when the machine is running.*

Clean the exterior of the filter housing and remove the filter element by releasing the nut.

Inspection

Check for cracks, holes or any other damage to the element by holding it up to a light source, or by passing a lamp inside.

Check the seal at the end of the element and replace if any sign of damage is evident.

Reassembly

Assemble the new element into the filter housing ensuring that the seal seats properly.

Reset the restriction indicator by depressing the rubber diaphragm.

Assemble the dust collector box parts, ensuring that they are correctly positioned.

Before restarting the machine, check that all clamps are tight.

VENTILATION

Always check that the air inlets and outlets are clear of debris etc.

CAUTION: *NEVER clean by blowing air inwards.*

COOLING FAN DRIVE

Periodically check that the fan mounting bolts in the fan hub have not loosened. If, for any reason, it becomes necessary to remove the fan or re-tighten the fan mounting bolts, apply a good grade of commercially available thread locking compound to the bolt threads and tighten to the torque value shown in the *TORQUE SETTING TABLE* later in this section.

The fan belt(s) should be checked regularly for wear and correct tensioning.

FUEL SYSTEM

The fuel tank should be filled daily or every eight hours. To minimise condensation in the fuel tank(s), it is advisable to top up after the machine is shut down or at the end of each working day. At six month intervals drain any sediment or condensate that may have accumulated in the tank(s).

FUEL FILTER WATER SEPARATOR

The fuel filter water separator contains a filter element which should be replaced at regular intervals (see the *SERVICE/MAINTENANCE CHART*).

HOSES

All components of the engine cooling air intake system should be checked periodically to keep the engine at peak efficiency.

At the recommended intervals, (see the *SERVICE/MAINTENANCE CHART*), inspect all of the intake lines to the air filter, and all flexible hoses used for air lines, oil lines and fuel lines.

Periodically inspect all pipework for cracks, leaks, etc. and replace immediately if damaged.

ELECTRICAL SYSTEM

WARNING: Always disconnect the battery cables before performing any maintenance or service.

Inspect the safety shutdown system switches and the instrument panel relay contacts for evidence of arcing and pitting. Clean where necessary.

Check the mechanical action of the components.

Check the security of electrical terminals on the switches and relays i.e. nuts or screws loose, which may cause local hot spot oxidation.

Inspect the components and wiring for signs of overheating i.e. discolouration, charring of cables, deformation of parts, acrid smells and blistered paint.

BATTERY

Keep the battery terminals and cable clamps clean and lightly coated with petroleum jelly to prevent corrosion.

The retaining clamp should be kept tight enough to prevent the battery from moving.

PRESSURE SYSTEM

At 500 hour intervals it is necessary to inspect the external surfaces of the system (from the airend through to the discharge valve(s)) including hoses, tubes, tube fittings and the separator tank, for visible signs of impact damage, excessive corrosion, abrasion, tightness and chafing. Any suspect parts should be replaced before the machine is put back into service.

TYRES/TYRE/TIRE PRESSURE

See the *GENERAL INFORMATION* section of this manual.

RUNNING GEAR/WHEELS

Check the wheel nut torque 20 miles (30 kilometres) after refitting the wheels. Refer to the *TORQUE SETTING TABLE* later in this section.

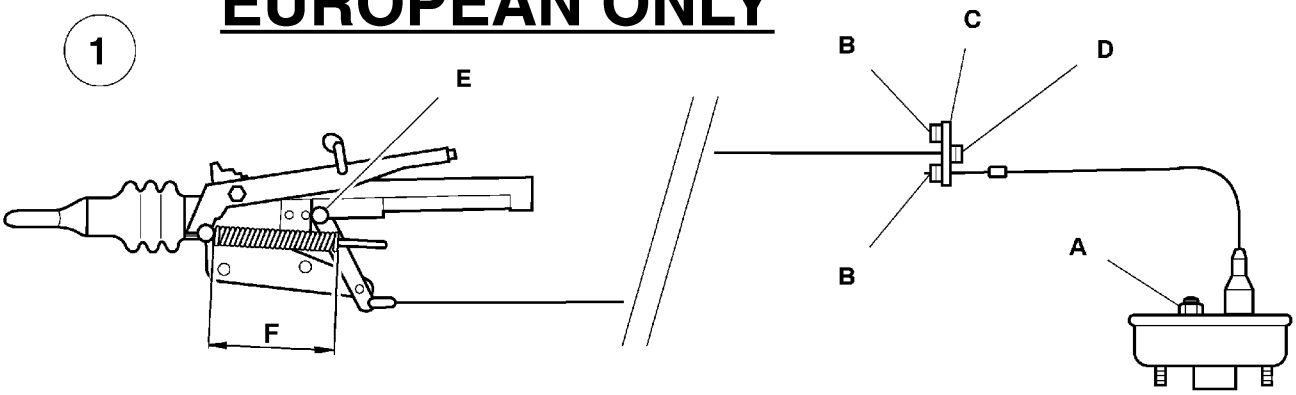
Lifting jacks should only be used under the axle.

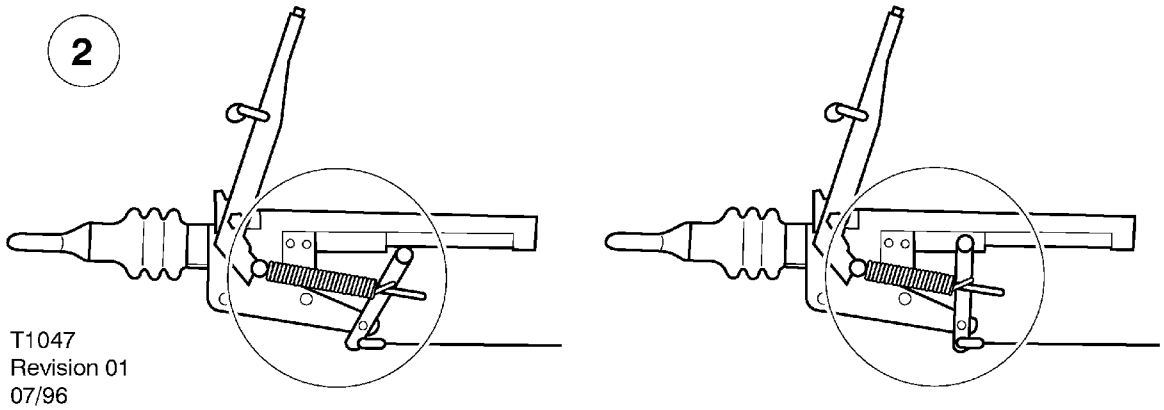
The bolts securing the running gear to the chassis should be checked periodically for tightness (refer to the *SERVICE/MAINTENANCE CHART* for frequency) and re-tightened where necessary. Refer to the *TORQUE SETTING TABLE* later in this section.

BRAKES

Check and adjust the brake linkage at 500 miles (850Km) then every 3000 miles (5000Km) or 3 months (whichever is the sooner) to compensate for any stretch of the adjustable cables. Check and adjust the wheel brakes to compensate for wear.

EUROPEAN ONLY





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WHEEL BRAKE ADJUSTMENT (European ONLY)

Ensure that the handbrake lever is fully released and that the coupling head is fully extended.

Each wheel brake must be adjusted in turn whilst rotating the wheel in the forward towing direction.

Refer to the diagram above.

1: Adjust the brakes until they *lock-up* by using adjuster **A.**

Release adjuster **A** until only a slight resistance is felt during wheel rotation.

Adjust nuts **B** and lock with the equaliser **C** parallel to the axle.

Take up the play with nut **D** behind the equaliser but without pre-loading the brakes (the wheels should rotate freely). Ensure that all locknuts are secured. The overrun lever play dimension **E** should not be greater than 14mm (fixed height running gear) or 16mm (variable height running gear). The spring free length dimension **F** should be 190mm.

2: When the unit is pushed backwards whilst parked, the brakes adopt their reverse mode and the spring store extends to maintain the parked condition. The handbrake will then feel less tensioned but the unit will remain stationary.

CAUTION: *Check the wheel nut torque 20 miles (30 kilometres) after refitting the wheels (Refer to the TORQUE SETTING TABLE later in this section).*

LUBRICATION

The engine is initially supplied with engine oil sufficient for a nominal period of operation (for more information, consult the Engine section of this manual).

CAUTION: *Always check the oil levels before a new machine is put into service.*

If, for any reason, the unit has been drained, it must be re-filled with new oil before it is put into operation.

ENGINE LUBRICATING OIL

The engine oil should be changed at the engine manufacturer's recommended intervals. Refer to the Engine section of this manual.

ENGINE LUBRICATING OIL SPECIFICATION

Refer to the Engine section of this manual.

ENGINE OIL FILTER ELEMENT

The engine oil filter element should be changed at the engine manufacturer's recommended intervals. Refer to the Engine section of this manual.

COMPRESSOR LUBRICATING OIL

Refer to the *SERVICE/MAINTENANCE CHART* in this section for service intervals.

NOTE: If the machine has been operating under adverse conditions, or has suffered long shutdown periods, then more frequent service intervals will be required.

WARNING: DO NOT, under any circumstances, remove any drain plugs or the oil filler plug from the compressor lubricating and cooling system without first making sure that the machine is stopped and the system has been completely relieved of all air pressure (refer to *STOPPING THE UNIT* in the *OPERATING INSTRUCTIONS* section of this manual).

Completely drain the receiver/separator system including the piping and oil cooler by removing the drain plug(s) and collecting the used oil in a suitable container.

Replace the drain plug(s) ensuring that each one is secure.

NOTE: If the oil is drained immediately after the machine has been running, then most of the sediment will be in suspension and will therefore drain more readily.

CAUTION: *Some oil mixtures are incompatible and result in the formation of varnishes, shellacs or lacquers which may be insoluble.*

NOTE: Always specify INGERSOLL-RAND Pro-Tec™ oil for use at all ambient temperatures above -23°C.

COMPRESSOR OIL FILTER ELEMENT

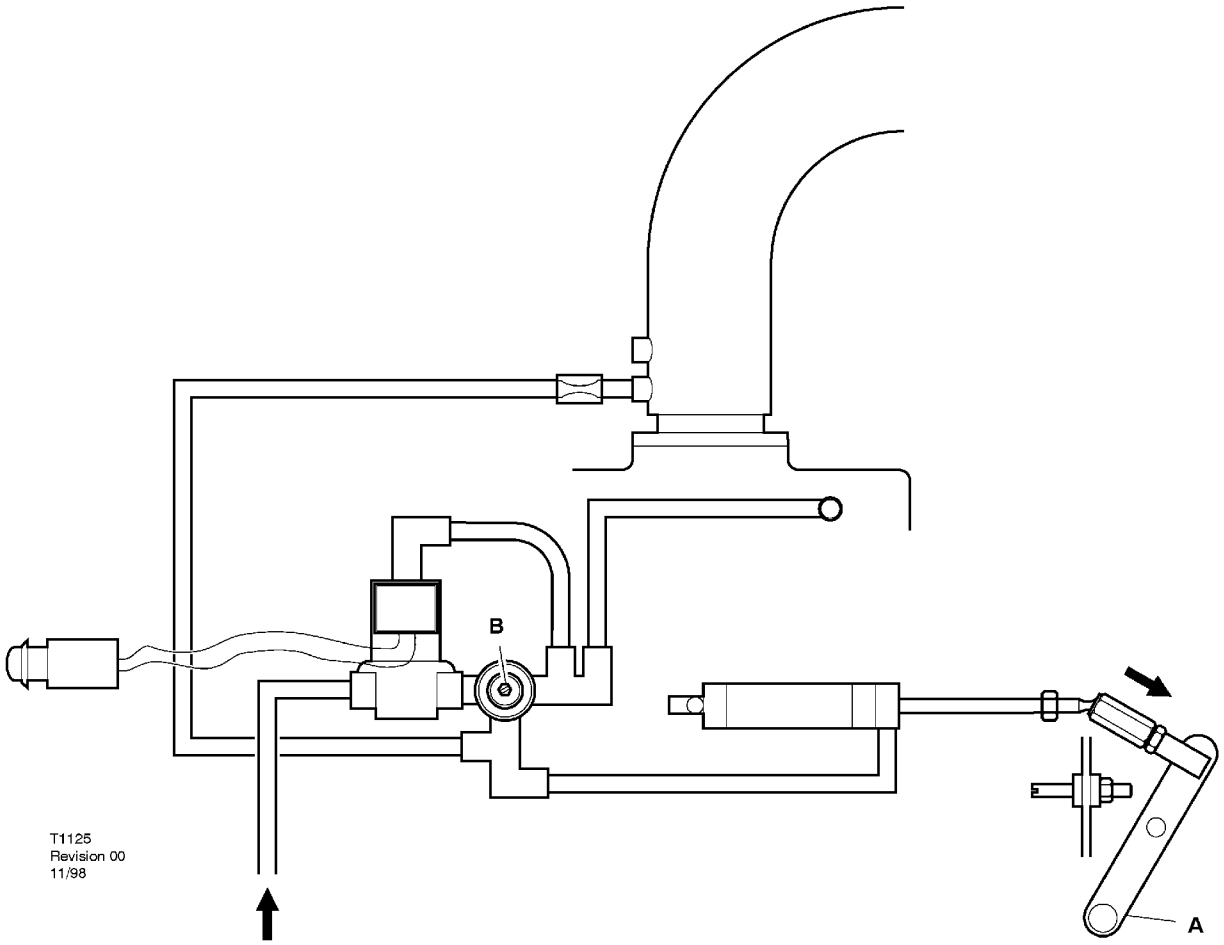
Refer to the *SERVICE/MAINTENANCE CHART* in this section for service intervals.

RUNNING GEAR WHEEL BEARINGS

Wheel bearings should be packed with grease every 6 months. The type of grease used should conform to specification *MIL-G-10924.*

IQ Filters

Refer to the Service/Maintenance Chart in this section for service intervals.



SPEED AND PRESSURE REGULATION ADJUSTMENT

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

Refer to the diagram above.

A: Throttle arm
B: Adjusting screw

Start the machine (Refer to *STARTING INSTRUCTIONS* in the *OPERATING INSTRUCTIONS* section of this manual*).*

Inspect the throttle arm on the engine governor to see that it is extended in the full speed position when the engine is running at *full-load* speed and the service valve is fully open. (Refer to the *GENERAL INFORMATION* section of this manual).

Adjust the service valve on the outside of the machine to maintain 7 bar (100 psi) without the throttle arm moving from the full speed position. If the throttle arm moves away from the full speed position before 7 bar (100 psi) is attained, then turn the adjusting screw clockwise to increase the pressure. Optimum adjustment is achieved when the throttle arm just moves from its full speed position and the pressure gauge reads 7,2 bar (bar for).

Close the service valve. The engine will slow to idle speed.

CAUTION: *Never allow the idle pressure to exceed 8,6bar (125 psi) on the pressure gauge, otherwise the safety valve will operate.*

TORQUE VALUES

	ft lbf	Nm
Airend to engine	29-35	39-47
Air filter to bracket	16-20	22-27
Autella clamp to exhaust	9-11	12-15
Baffle to frame	9-11	12-15
Blowdown solenoid valve	21-26	28-35
Discharge manifold to frame	29-35	39-47
Drive pins to engine flywheel	57-69	77-93
Drop Leg	53-63	72-85
Engine/airend to chassis	54-58	73-78
Euro-Loc adaptor to separator tank	58-67	78-91
Exhaust flange to manifold	17-21	23-28

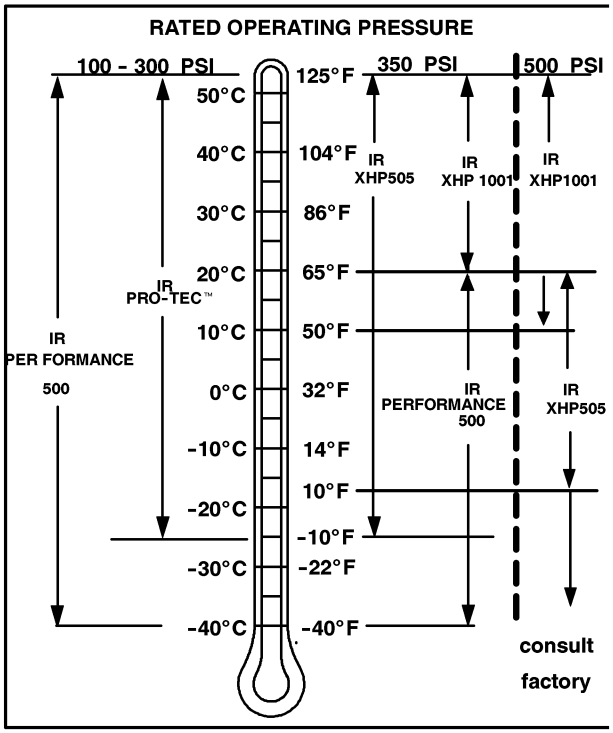
	ft lbf	Nm
Fan guard	9-11	12-15
Fan to hub	12-15	16-20
Lifting bail bracket to engine	29-35	39-47
Oil pipe (-12jic)	71-88	96-119
Radiator/Cooler to baffle	9-11	12-15
Running gear front to chassis	63-69	82-93
Running gear rear to chassis	63-69	82-93
Running gear drawbar to axle	29-35	39-47
Separator tank cover	180-190	244-258
Separator tank to frame	18-22	24-30
Service pipe (-20jic)	106-133	143-180
Sight glass	40-50	54-68
Wheel nuts	50-80	67-109

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) 65°F to 125°F (18°C to 52°C) -40°F to 65°F (-40°C to 18°C)	IR XHP 505 IR XHP1001 IR Performance 500 Mil-L-46167
500 psi	50°F to 125°F (10°C to 52°C) 10°F to 65°F (-12°C to 18°C) below 10°F (-12°C)	IR XHP1001 IR XHP 505 Consult Factory



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

Compressor Recommended Fluid	1 Gal.	5 Gal.	55 Gal.	275 Gal. Tote	Europe 20 Litre	Europe 208 Litre
Pro-Tec™	36899698	36899706	36899714	36899722	89292973	89292981
XHP 505	NA	54418835	54418843	54418827	___	---
Performance 500	35382928	35382936	35382944	NA	___	---
XHP1001	NA	35612738	35300516	NA	___	___
Engine Oil	54480918	36875938	36866903	NA	89311716	89311724

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, 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

Ingersoll-Rand offers 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.

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.

For parts, service or information regarding your local U.S, Latin America or Asia Pacific distributor, please contact:

Facility:	Telephone:	Fax:
Ingersoll-Rand Company	800-633-5206 (US & Canada)	336-751-1579 (US & Canada)
501 Sanford Avenue	305-222-0835 (Latin America)	336-751-4325 (Latin America)
P.O. Box 868	65-860-6863 (Asia Pacific)	336-751-4325 (Asia Pacific)
Mocksville, N.C. 27028		

Office hours: Monday - Friday 8:00 a.m. to 5:30 p.m. (EST)

For information on how to order parts or information regarding your local distributor (Europe, Middle East, Africa) please contact:

Facility:

Portable Power Aftermarket ESA
Ingersoll-Rand European Sales Ltd
Swan Lane, Hindley Green
Wigan WN2 4 EZ
United Kingdom

Telephone: +44 (0) 1942 257 171

Emergency order telephone # +44 (0) 777 617 0921

Fax: +44 (0) 1942 523 417

Office hours: Monday - Friday 8:00 a.m. to 4:30 p.m. (GMT)

SECTION 9- ENGINE

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.

1. ENGINE EXTERNAL VIEWS

1. EXTERNAL VIEW (LH) 4IRB7T

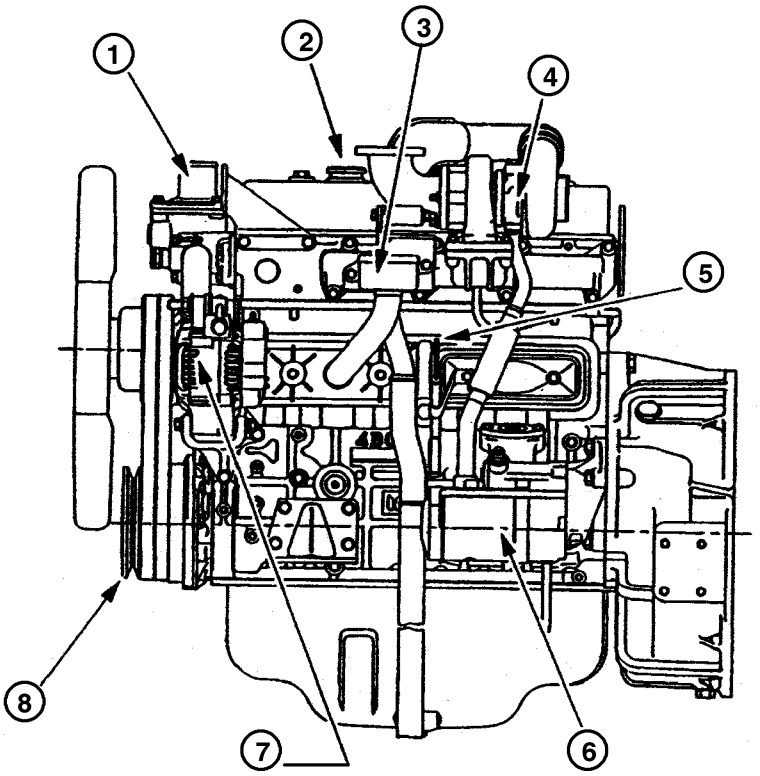
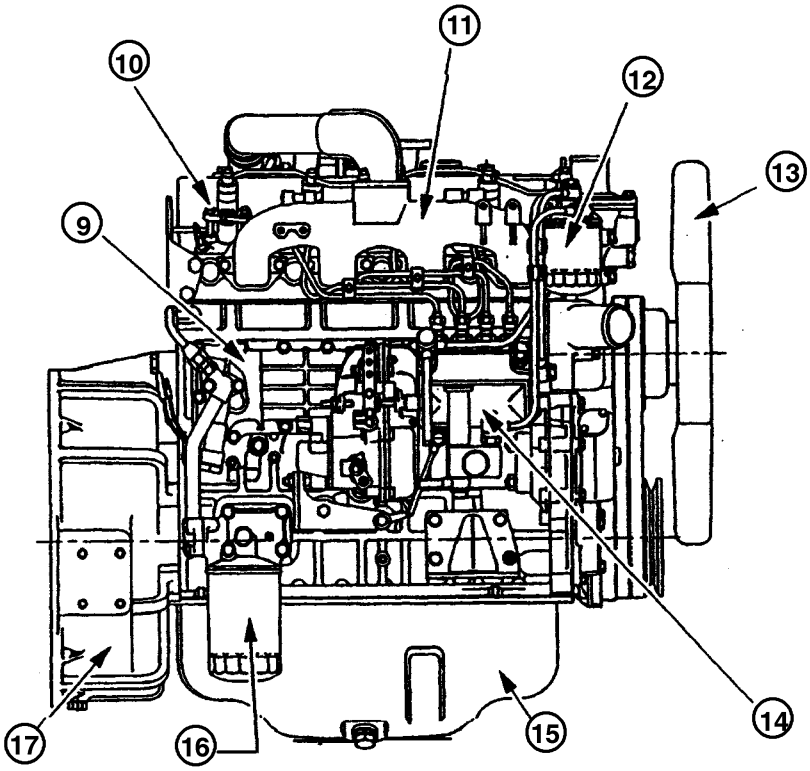


Fig. 1

Note: Engine details may vary depending on the specifications.

1. Outlet pipe
2. Oil filler cap
3. Air breather
4. turbocharger
5. Dipstick
6. Starter
7. Alternator
8. Crank pulley

2. EXTERNAL VIEW (RH)



Note: Engine details may vary depending on the specifications

9. Oil cooler

10. Nozzle holder

11. Inlet Manifold

12. Fuel filter

13. Cooling fan

14. Injection pump

15. Oil pan

16. Oil filter

17. Flywheel housing

2. GENERAL INFORMATION

1. STANDARD ENGINE DATA AND SPECIFICATIONS

(1) Model 4IRB7T (IN-LINE INJECTION PUMP TYPE)

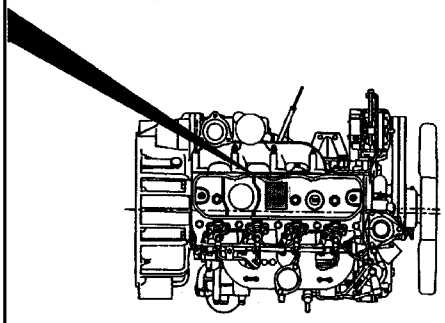
Ingersoll-Rand engine model name		**4IRB7T**
Engine type		Water-Cooled, four cycle, in-line overhead valve type
Combustion type		Direct Injection
No. of cylinders - bore x stroke mm (in)		4 -105 x 125 (4.13 x 4.92)
Engine displacement L (cid)		4.329 (264.2)
Compression ratio		17.0 to 1
Firing order		1-3-4-2
Max. rated power: SAE NET (hp)/min^{-1}		123 @ 2500 RPM
Exhaust emission control system		Engine modification
Injection pump		Bosch A type
Governor		Variable speed, Mechanical type
Injection nozzles		Multi-hole type
Specified fuel		Diesel fuel (ASTM D975 No. 2-D)
Starter (V-kW)		12 - 2.5
Alternator (V-A)		12 - 60
Specified engine oil (API grade)		CD
Lub. oil volume (Oil pan) L(qts)		Lou Tiso (14)
Coolant volume (Engine only) lit(qts)		8.5 (9.0)
Engine dry weight kg(lb)		TBD
Engine dimensions	Overall length mm (in)	878.0 (34.57)
	Overall width mm (in)	686.0 (27.01)
	Overall height mm (in)	855.0 (33.66)
Valve clearance (cold) mm (in)		0.4 (0.0157)
Nozzle injection pressure MPa (psi)		18.1 (2,625)

EMISSION CONTROL LABEL: ENGINE LABEL (FOR EPA) - TYPE A

Emission control label is attached on the center, upper side of cylinder head cover. But the same emission control label is attached at a visible point on the equipment when the label that is attached to the engine is not visible due to the structure of the equipment.

The following is the sample of a label required for engine emission control information, along with location.

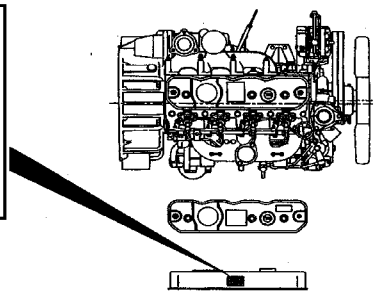
IMPORTANT ENGINE INFORMATION	
ENGINE FAMILY :XXXXXXX.XXXX	* ENGINE SPECIFICATION ADVERTISED MAX.POWER.
ENGINE CODE :XXXX	SAE NET (FAN DISENGAGED) XXkW/XXXX min^{-1} XXHP/XXXX RPM
MODEL :XXXX	FUEL RATE XX mm^3/st
ENGINE DISPLACEMENT :XXXXcm^3 (:XXX $IN^{3)}$:	VALVE LASH (COLD) IN X.X mm. EXH X.X mm
EXHAUST EMISSION CONTROL SYSTEM :EM	INITIAL INJECTION TIMING XX° BTDC
DATE OF ENGINE MANUFACTURE :XX / XX	CURB IDLE: XXXmin^{-1}/RPM
THIS ENGINE IS CERTIFIED TO OPERATE ON DIESEL FUEL	(*MODEL SPECIFICATION SEE SERVICE MANUAL)
THIS ENGINE CONFORMS TO U.S. EPA	P.NO. X—XXXXX—XXX—X
REGULATIONS APPLICABLE TO 1999 MODEL YEAR LARGE NONROAD COMPRESSION-IGNITION ENGINES.	



EC EMISSION CONTROL LABEL: ENGINE LABEL

Emission control label is attached on the right side of cylinder head cover.
The following is the sample of a label required for engine emission control information, along with location.

ENGINE FAMILY NAME	XXXX
ENGINE TYPE	XXXX
ENGINE I.D. NUMBER	XXXX-XXXXX
TYPE APPROVAL NUMBER	e9*97/68CA*00/000XX*3005*00 p.NO.X-XXXXX-XXX-X



2. ENGINE IDENTIFICATION

(1) Position of Display

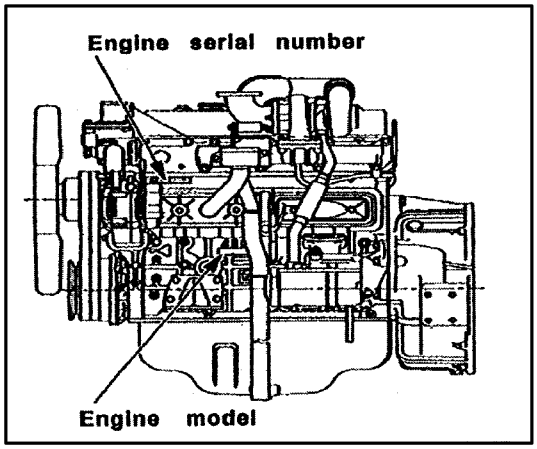


Fig. 3

The engine serial number is stamped on the upper left side of the cylinder body near the fan, and the engine model is cast on the center left side of cylinder body. Further, engine model is described also on an ID label on the top of the cylinder head cover.

Confirmation of Engine Serial Number

It is advisable to check the engine serial number, engine model name and type of machine together with the equipment manufacturer's name, as it is required when you contact the distributor for repair service or parts ordering.

CAUTION: *Conduct confirmation of engine serial number with the engine stopped. To avoid being injured, DO NOT check when engine is still hot.*

3. FUEL, LUBRICANTS, AND COOLANT

1. FUEL

(1) Fuel Selection

The following specific advantages are required for the diesel fuel.

1) Must be free from minute dust particles.
2) Must have adequate viscosity.
3) Must have high cetane value.
4) Must have high fluidity at low temperature.
5) Must have low sulfur content.
6) Must have little residual carbon.

Diesel fuels

APPLICABLE STANDARD	RECOMMENDATION
JIS (JAPANESE INDUSTRIAL STANDARD)	NO.2
DIN (DEUTSCHE INDUSTRIE NORMEN)	DIN 51601
SAE (SOCIETY OF AUTOMOTIVE ENGINEERS) Based on SAE-J-313C	NO.2-D
BS (BRITISH STANDARD) Based on BS/2869-1970	Class A-1

If fuel other than the specified one is used, engine function will be affected.

(2) Fuel Requirements

NOTICE:
The fuel injection pump, injector or other parts of the fuel system and engine can be damaged if you use any fuel or fuel additive other than those specifically recommended by Ingersoll-Rand.

Such damage is not Ingersoll-Rand's responsibility and is not covered by the warranty To help avoid fuel system or engine damage, please heed the following:

- *Some service stations mix used engine oil with diesel fuel. Some manufacturers of large diesel engines allow this; however, for your diesel engine, do not use diesel fuel which has been contaminated with engine oil. Besides causing engine damage, such fuel can also affect emission control. Before using any diesel fuel, check with the service station operator to see if the fuel has been mixed with engine oil.*
- *Do not use any fuel additive (other than as recommended under "Biocide" in this section). At the time this manual was printed, no other fuel additive was recommended.*
(See your authorized dealer to find out if this has changed.)

Your engine is designed to use either Number 1-D or Number 2-D diesel fuel. However, for better fuel economy, use Number 2-D diesel fuel whenever possible. At temperatures less than—7°C, (20°F), Number 2-D fuel may pose operating problems (see "Cold Weather Operation" which follows). At colder temperatures, use Number 1-D fuel (if available) or use a "winterized" Number 2-D (a blend of Number 1-D and Number 2-D). This blended fuel is usually called Number 2-D also, but can be used in colder temperatures than Number 2-D fuel which has not been "winterized." Check with the service station operator to be sure you get the properly blended fuel.Note that diesel fuel may foam during a fill-up. This can cause the automatic pump nozzle to shut off even though your tank is not full.

NOTICE:
Do not use home heating oil or gasoline in your diesel engine; either may cause engine damage.

(3) Handling of the Fuel

Fuel containing dust particles or water will cause engine failure. Therefore;

1) Prevent dirt or water from entering the fuel tank.
2) Always fully fill the fuel tank. Drain the fuel tank frequently.

(4) Water in Fuel

During refueling, it is possible for water (and other contaminants) to be pumped into your fuel tank along with the diesel fuel. This can happen if a service station does not regularly inspect and clean its fuel tanks, or if a service station receives contaminated fuel from its supplier(s). To protect your engine from contaminated fuel, there is a fuel filter system on the engine which allows you to drain excess water.

CAUTION:
The diesel fuel is flammable, and could be hot. To help avoid personal injury and/or property damage, do not touch the fuel coming from the drain valve, and do not expose the fuel to open flames or sparks. Be sure you do not overfill the tank. Heat (such as from the engine) can cause the fuel to expand. If the tank is too full, fuel could be forced out. This could lead to a fire and the risk of personal injury and/or vehicle or equipment damage.

(5) Biocides

In warm or humid weather, fungus and/or bacteria may form in diesel fuel if there is water in the fuel.

NOTICE:
Fungus or bacteria can cause fuel system damage by plugging the fuel lines, fuel filters or injector. They can also cause fuel system corrosion.

If fungus or bacteria has caused fuel system problems, you should have your authorized dealer correct these problems. Then, use a diesel fuel biocide to sterilize the fuel system (follow the biocide manufacturer's instructions). See your authorized dealer for advice on using biocides in your area and for recommendations on which biocides you should use.

(6) Smoke Suppressants

Because of extensive testing of treated fuel versus untreated fuel, the use of a smoke suppressant additive is not recommended because of the greater possibility of stuck rings and valve failure, resulting from excessive ash deposits.

2. LUBRICANT

The quality of engine oil will affect engine performance, startability and engine life.

Use of unsuitable engine oil will result in piston ring, piston and cylinder seizure and accelerate the sliding surface wear causing increased oil consumption, lowered output and, finally engine failure. To avoid this, use the specified engine oil.

(1) Engine Oil Selection

API, CC or CD grade

(2) Oil Viscosity

Engine oil viscosity affects engine startability, performance, oil consumption, speed of wearing and occurence of seizure, etc. Using lubricants whose viscosity selected according to the atmospheric temperature is important.

NOTICE:
1) Using a mixture of different brand or quality oils will adversely affect the original oil quality; therefore, never mix different brand or different type oils.

2) Don't use API, CA, CB grade and reconstituted engine oil.

3) Engine damage due to improper maintenance, or using oil of the improper quality and/or viscosity, is not covered by the warranty.

Must use Ingersoll-Rand Pro-Tec™ for optional Platinum Extended Engine Warranty.

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

Recommended Fluid	1 Gal.	5 Gal.	45 Gal.
Pro-tec Engine Fluid (15W-40)	54480918	36875938	36866903

4. ENGINE OPERATION

Engine Exhaust Gas Caution (Carbon Monoxide)

CAUTION:
Do not breath exhaust gas because it contains carbon monoxide, which by itself has no color or odor. Carbon monoxide is a dangerous gas. It can cause unconsciousness and can be lethal.

Do not run the engine in confined areas. Keep the exhaust tailpipe area clear of snow and other material to help reduce the buildup of exhaust gases.

1. CHECK BEFORE OPERATION

CAUTION:
For Safety's sake, conduct the inspection before start-up with the engine stopped.

(1) Engine Oil Level

Insert-type dipstick

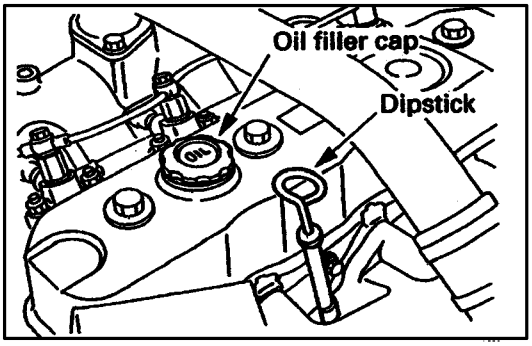


Fig. 6

1) Check with machine in level position.

2) Remove the dipstick from the crankcase, wipe it with a cloth. Insert fully and remove again.

Check the oil level by the level marks on the dipstick. The oil level must be between the "Max" level mark and the "Mm" level mark as illustrated.

Take care not to add too much engine oil.

- Drain oil to the max. oil level if oil level is above the max. level mark.
- Add oil to the max. oil level if oil level is below the mm. level mark.

Engine oil replenishment

Oil is poured through the oil filler at the front of the cylinder head cover.

A certain period of time is required before the engine oil completely flows down from the oil filler to the crankcase. Check the oil level ten or twenty minutes after oil replenishment.

NOTICE:
If the engine oil is splashed on the fan drive belt, it causes belt slippage or slackness; therefore, take care to avoid it.

CAUTION:
In adding oil, take care not to spill it. If you spill oil on engine or equipment, wipe it properly, or this could lead to a fire and the risk of personal injury and/or equipment damage.

(2) Fan Belt Check

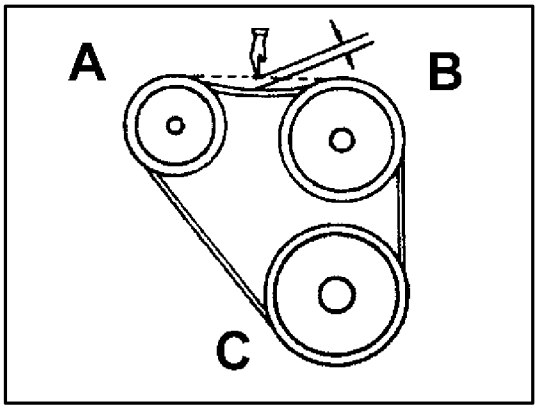


Fig. 8

A Alternator pulley

B Fan pulley

C Crank pulley

Check the fan belt for tension and abnormalities.

1) When the belt is depressed **about 8 to 12 mm (0.31 to 0.47 in)** with the thumb [about 98 N (10 kgf/22 lb) pressure] at midway between the fan pulley and alternator pulley, the belt tension is correct.

When the belt tension is too high, it will result in alternator failure. Contrarily, loose belt will cause belt slipage which may result in damaged belt and abnormal noise.

2) Check the belts. Replace them if any damage is found.

NOTICE:
Replace all belts as a set even when one is not usable. Single belt of similar size must not be used as a substitute for a matched belt set. Otherwise, premature belt wear would result because of uneven belt length.

(3) Coolant Level Check

1) Remove the radiator filler cap, and check the coolant level.

CAUTION:
When removing the radiator filler cap while the engine is still hot, cover the cap with clothing, then turn it slowly to gradually release the internal steam pressure.

2) Use clean drinking water as coolant. When an anti-freeze solution is required, keep to the specified mixing ratio.

(4) Radiator Cap Condition

After adding coolant, install the radiator cap. Make sure the cap is securely installed.

(5) Battery Cable Connection

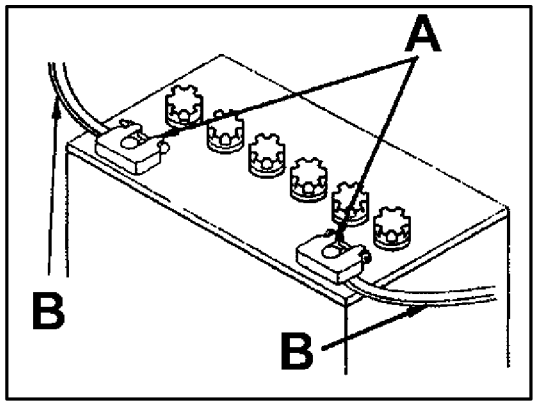


Fig. 9

A Connections

B Battery cable

Check the battery cable connections for looseness or corrosion. The loosened cable connection will result in hard engine starting or insufficient battery charge.

The battery cables must be tightened securely.

Never reverse "+" and "—" terminals when reconnecting cables after disconnection.

Even a short period of reverse connection will damage the electrical parts.

(6) Battery Electrolyte Level

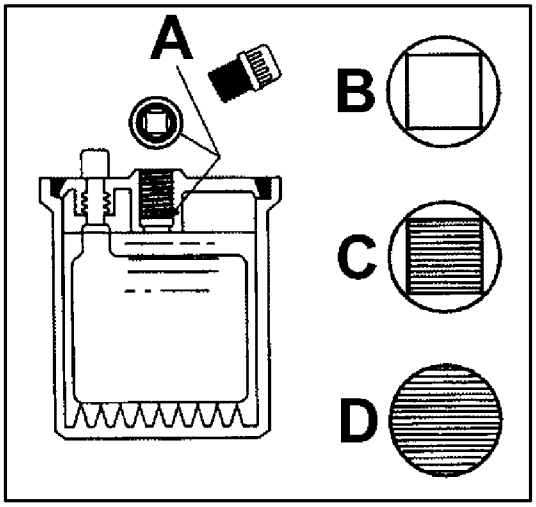


Fig. 10

A Regular position

B Shortage

C Proper

D Excess

The amount of electrolyte in the batteries will be reduced after repeated discharge and recharge.

Check the electrolyte for the level in the batteries, replenish with a commercially available electrolyte such as distilled water, if necessary.

The battery electrolyte level checking procedure will vary with battery type. Follow the equipment manufacturer's instructions.

NOTICE:
Do not replenish with dilute sulfuric acid in the daily service.

2. CHECK AND OPERATION AFTER THE ENGINE START-UP

(1) Warm-up Operation

Allow engine to warm about ten minutes after the engine has started.

(2) Check after the Engine Start-up

Check the following items in the engine warm-up operation.

Engine oil pressure (Gauge Optional)

Although the engine oil pressure gauge readings vary depending on ambient temperature or type of oil, the gauge registers around 392 to 490 kPa (4 to 5kgf/cm^2/57 to 71 psi) during warm-up.

In the oil pressure warning lamp type, make sure that the lamp is off.

Charge Condition (Ammeter Optional)

Gauge should read in normal range shortly after starting.

Engine noise and exhaust smoke colour

Pay attention to engine noise and, if any abnormal noise is heard, check the engine to detect the cause.

Check the fuel combustion condition by exhaust smoke colour. The exhaust smoke colour after engine warming-up and at no-load operation:

Colourless or light blue	Normal (Perfect combustion)
Black colour	Abnormal (Imperfect combustion)
White colour	Abnormal (Imperfect combustion)

NOTICE:
Engine noise after start-up might be noisy than that of warmed-up engine and, the exhaust smoke colour also being more blackish than the normal condition. However. it will be normalized after warming-up engine.

Leakage in the systems

Check the following items:

- Lube oil leakage

Check both sides and bottom of the engine assembly for lube oil leaks, paying particular attention to the lube oil pressure gauge pipe joint, lube oil filter and lube oil pipe joints.

- Fuel leakage

Check the fuel injection pump, fuel lines and fuel filter for leakage.

- Coolant leakage

Check the radiator and water pump hose connections also the water drain cocks on the radiator and cylinder body for leakage.

- Exhaust smoke or gas leakage

Checking coolant level

The coolant level could drop because air is expelled about 5 minutes after the engine started.

Stop the engine, remove radiator cap, and add coolant.

CAUTION:
Hot steam will rush out and you could get burnt, if the radiator cap is removed when the engine is hot. Cover the radiator cap with a thick cloth and loosen the cap slowly to reduce the pressure, then remove the cap.

3. CARE IN THE ENGINE OPERATION

In the engine operation, always pay attention to the following items if the engine indicates any sign of abnormalities.

(1) Engine Oil Pressure

Engine oil pressure is normal when the oil pressure gauge shows 294 to 392 kPa (3 to 4 kgf/cm^2/43 to 57 psi) in the engine warmed-up condition.

In the continuous engine operation, engine oil pressure is slightly lower than the pressure at start-up time. When the engine oil pressure gauge shows the following abnormal conditions, stop the engine immediately and check the engine oil amount in the oil sump and look for oil leakage:

- The engine oil pressure gauge shows below 196 kPa (2 kgf/cm^2/28 psi) though the engine speed is raised.
- The oil pressure gauge indicator oscillates greatly in the engine low speed range.

When no lack of engine oil or no oil leakage is found, contact your equipment supplier to determine the cause of the abnormal reading.

(2) Coolant Temperature

The engine performance will be adversely affected if engine coolant temperature is too hot or too cold.

The normal coolant temperature is 75 to 85°C (167 to 185°F).

Overheating

The engine cooling system may overheat if the engine coolant level is too low, if there is a sudden loss of engine coolant (such as hose splitting), or if other problems occur.

Overcooling

The engine operation at low coolant temperature will not only increase the oil and fuel consumption but also will lead to premature parts wear which may result in engine failure.

(3) Engine Hourmeter (Engine Operation Hour Indicating)

This meter indicates the engine operation hours. Make sure that the meter is always working during engine operation. Periodical engine maintenance is scheduled on the operation hours indicated on the hourmeter.

(4) Liquid and Exhaust Smoke Leakage

Be careful with lubricant, fuel, coolant and exhaust smoke leakage.

(5) Abnormal Engine Noise

Pay attention to the noise from the engine or other related parts, checking if the noise is normal.

(6) State of the Exhaust Smoke

Be careful with exhaust smoke colour, check if it is whitish or blackish.

4. OPERATION AND CARE FOR NEW ENGINE

Your Ingersoll-Rand engine is carefully tested and adjusted in the factory, however, further, thorough run-in (i.e. break-in) operation is necessary.

If the new engine is harshly operated, lubricating oil film will be reduced leading to abnormal wear or seizure. Particularly, avoid a harsh engine operation within the initial 100 operation hours observing the following notice.

(1) Do the warming-up operation continuously until the engine is warmed-up. In this operation, do not race the engine.

(2) Also do not operate the engine with rapid acceleration, rapid machine starting and continuous high speed operation

5. ENGINE CARE FOR OVER-COOLING

Engine over-cooling causes premature wear and increased fuel consumption. Maintain the coolant temperature 75 to 85°C(167 to 185°F).

6. STARTING THE ENGINE AFTER BEING LEFT UNUSED FOR A LONG PERIOD OF TIME

When the vehicle or equipment is left unused for “more than three months” without running the engine (warming up), conduct a thorough inspection of the vehicle before starting the engine. After starting the engine, be sure to warm it up for more than ten minutes.

7. OPERATION AND CARE FOR TURBOCHARGED ENGINE

The warm-up operation of the engine should be done in the way separately described. In addition, ensure the bearings supporting the rotating parts of the turbocharger are sufficiently lubricated.

Do not race cold engine.

When starting the engine after a long period (more than one month) of standing, proceed as follows:

Pour engine oil into the turbocharger through the oil inlet port with the air intake duct and oil inlet side pipe removed. Then with the air intake duct and oil inlet side pipe removed. Turn the impeller by hand to thoroughly lubricate the bearings.

When pouring oil in, do not allow dirt and other foreign materials to enter through the opening.

On completion of this operation, securely install the oil pipe and air intake duct.

Engine Stopping .

Whenever stopping the engine, the last 3 minutes of operation should be at idle. After hard operation (at least 5 minutes) of operation should be at idle until the turbocharger cools down. This allows the turbocharger to return to idle speed while engine oil pressure is available for lubrication.

CAUTION:
Failure to cool down turbocharger at idle could result in insufficient lubrication of its bearings and their shortened life.

5. PERIODICAL INSPECTION AND MAINTENANCE

1. LUBRICATING SYSTEM

Servicing of the engine oil or the oil filter element will affect on the engine performance as well as the engine life. Change the engine oil and the oil filter element periodically with the specified ones.

(1) Engine Oil and Oil Filter Element Change

Engine oil change and oil filter element change must be made according to the following change schedule.

Change interval

Engine Oil	Initial 50 and thereafter every 500 operating hours
Oil Filter Element	Initial 50 and therefore every 500 operating hours

Engine oil draining

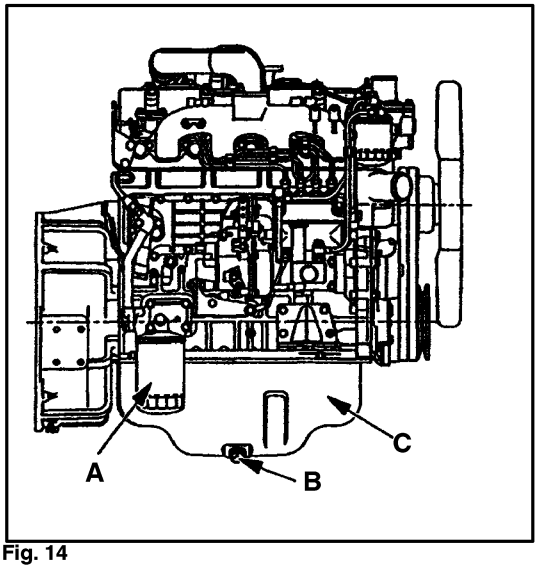


Fig. 14

A Oil filter

B Drain plug

C Oil pan

CAUTION:
To help avoid the damage of being burned, do not drain oil while the engine is still hot.

1) Wipe the oil filler cap taking care to remove foreign particles. Remove the filler cap.

Remove the following drain plugs to drain the engine oil completely.

a. Drain plug at the oil pan.

b. Drain plug at the main oil filter.

It is advisable that draining be done while the engine is warm. to minimize the draining time.

Oil filter element removal - Center Bolt Type

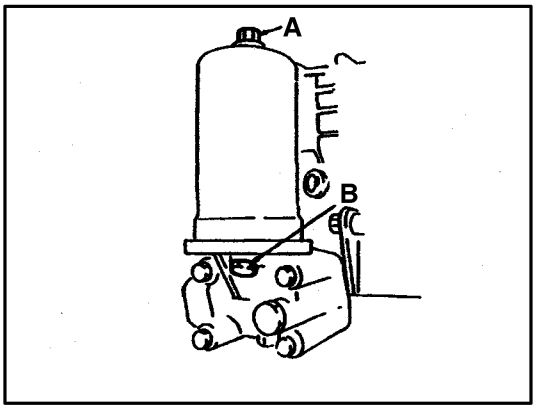


Fig. 15

A Center Bolt

B Chain Plug

1) Warm the engine to or near normal operating temperature.

2) Loosen the center bolt.

3) Remove the element together with the filter body..

Oil filter element installation

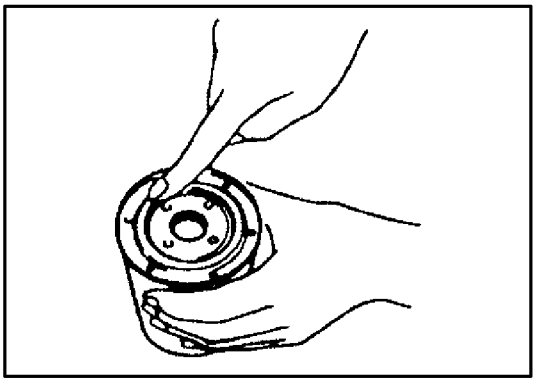


Fig. 16

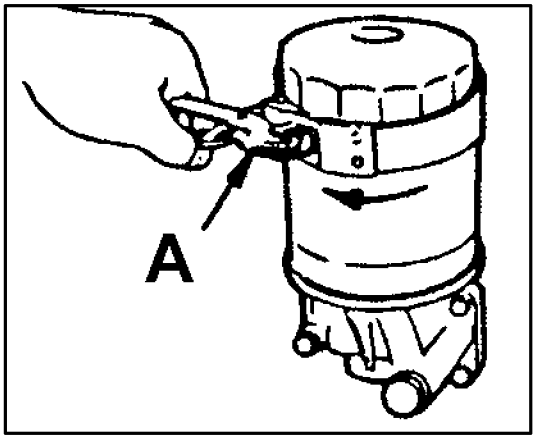


Fig. 17 (Cartridge Type)

A Filter wrench

1) Apply engine oil to the O-ring.

2) Rotate new cartridge until its sealed face comes in contact with the O-ring.

3) Use a filter wrench, tighten the cartridge 1 1/4 turns.

Engine oil refilling

1) Reinstall the drain plugs.

2) Fill with new engine oil at the oil filler port.

Wait about fifteen minutes until the oil gets down to the oil pan.

Then cheek the oil level.

(2) Check after Oil and Filter Changes

Oil leakage check

Idle the engine to raise the oil pressure, then check for oil leakage.

Oil level recheck

Stop the engine. Use the dipstick to recheck the oil level.

Replenish with engine oil, if necessary, to the specified level.

NOTICE:
When the engine is started, the oil level will drop slightly from the initial level as the oil fills the entire oil circuit.

(3) Engine Oil Additives

Engine oils contain a variety of additives. Your engine should not need any extra additives if you use the recommended oil quality and change intervals.

(4) Used Oil Disposal

Do not dispose of used engine oil (or any other oil) in a careless manner such as pouring it on the ground, into sewers, or into streams or bodies of water, Instead, recycle it by taking it to a used oil collection facility which may be found in your community. If you have a problem disposing of your used oil, it is suggested that you contact your dealer or service station.

(5) Used Engine Oil

CAUTION:
Used engine oil contains harmful contaminants that have caused skin cancer in laboratory animals. Avoid prolonged skin contact. Clean skin and nails thoroughly using soap and water - not mineral oil, fuels, or solvents. Launder or discard clothing, shoes, or rags containing used engine oil.

Discard used engine oil and other oil properly.

2. COOLING SYSTEM

(1) Fan Belt Tension Adjustment

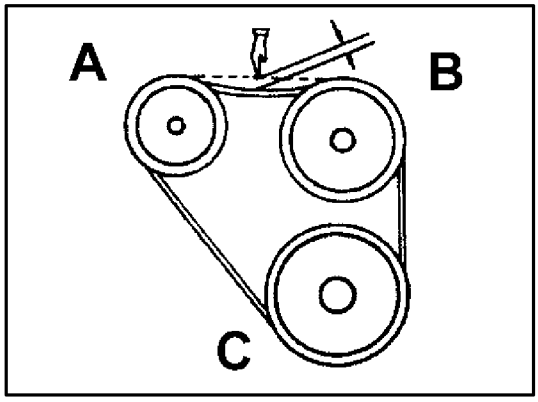


Fig. 18

A Alternator pulley

B Fan pulley

C Crank pulley

Adjust fan belt tension when belt slackness is greater than the specified amount and when the belts are replaced.

CAUTION:
To help avoid injury, check and adjust fan belt tension with engine stopped.

Belt tension

Belt tension is normal when it is depressed 8 to 12 mm (0.31 to 0.47 in) with the thumb at the midway between the fan pulley and alternator pulley. [about 98 N (10 kgf/22 lb) depressing force.]

Fan belt slackness : **About 8 - 12 mm (0.31 - 0.47 in)**

Adjusting procedure

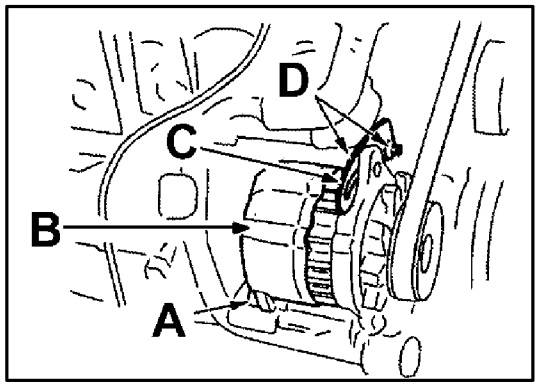


Fig. 19

A loosen

B Alternator

C Adjust plate

D loosen

Belt tension adjustment is made by pivoting the alternator at the alternator mounting bolt.

1) Loosen the alternator adjusting plate bolt and the alternator mounting bolt.

2) Pivot the alternator at the mounting bolt toward the engine left or right hand side as required.

3) Tighten the mounting bolt and the adjusting bolt.

NOTICE:
Belt tension may vary slightly after the alternator is fixed. Therefore, recheck the belt tension after tightening the bolts.

4) After the adjustment, operate the engine about five minutes at a low idle speed and recheck the belt tension. Particularly, pay attention to this matter when installing new belts. Belt tension may vary due to the initial belt conforming.

(2) Fan Belt Change

Use of fan belt with poor quality will result in premature belt wear or belt elongation leading to engine damage such as overheat. Therefore use of the Ingersoll-Rand genuine fan belts are recommended.

(3) Coolant Change

The coolant must be changed at intervals of **six months.** If the coolant is being fouled greatly, it will lead to engineoverheat or coolant blow-off from the radiator.

Coolant draining

1) Remove the radiator cap.

Open the drain cock on the radiator to drain the coolant in the radiator.

CAUTION:
When removing the radiator filler cap while the engine is still hot, cover the cap with a rag, then turn it slowly to release the internal steam pressure. This will prevent a person from scalding with hot steam spouted out from the filler port.

2) Drain away the coolant from the engine by loosening the water drain plug under the injection pump on the left side of cylinder body.

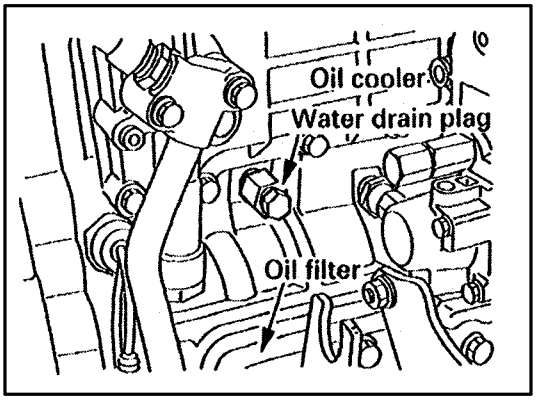


Fig. 20

Filling with coolant

1) Close or tighten the coolant drain plug.

2) Use clean drinking water as a coolant. Fill up the radiator with the coolant until the level comes up to the filler port neck.
Fill gradually to prevent air entry.

Coolant volume (Engine only)

Refer to “Main Data Specifications”

3) Operate the engine about five minutes at a low idle speed, then the air contained in the coolant circuit is bled. The coolant level will drop.

Stop the engine to replenish with the coolant.

(4) Cleaning outside of Radiator

Mud or dried grass caught between radiator fins will block the air flow, resulting in lower cooling efficiency.

Clean the radiator fins with steam or compressed water.

(5) Cooling System Circuit Cleaning

When the cooling system circuit is fouled with water scales or sludge particles, cooling efficiency will be lowered.

Periodically clean the circuit interior with a cleaner.

Refer to the **“Engine Maintenance Schedule”**.

3. FUEL SYSTEM

The fuel injection pump and fuel injection nozzles are precisely manufactured, and therefore, using the fuel which contains water or dust particles will result in either injection pump plunger seizure or injection nozzle seizure, and the fouled fuel filter element with sludge or dust particles lead to decreased engine output.

In addition, clogged filter element can cause low output or automatic air bleeding failure.

Perform inspection and maintenance periodically as follows:

(1) Removal of Water from the Fuel

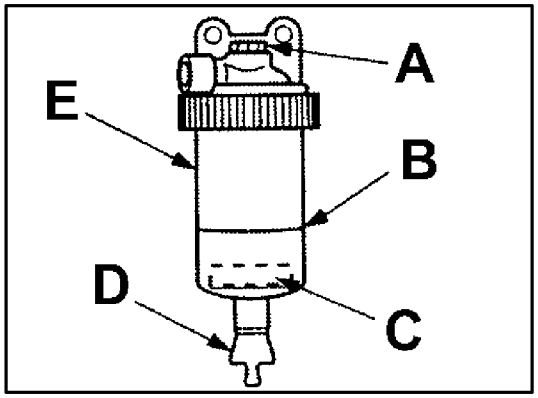


Fig. 21

A Plug

B Warning level line

C Float

D Drain plug

E Water sedimentor

The fuel system with the water sedimentor.

The water sedimentor is provided to separate the water contained in the fuel.

The sedimentor housing contains a float which moves up and down in accordance with level change of the sedimented water. Be sure to drain the sedimented water when the float has come up to the warning level line marked on the transparent sedimentor housing.

Draining procedure:

Loosen the drain plug and drain the sedimented water. Be sure to tighten the drain plug on completion of draining.

A packing of the “plug” which is provided at the upper portion of the water sedimentor is not reusable. When the “plug” is loosened, be sure to replace the packing with a new one.

The fuel system without the water sedimentor

Drain the sedimented water in the fuel filter body every 250 operating hours

1) Loosen the cartridge

2) Drain the fuel in the cartridge with the mixed water.

3) Installation the cartridge. (Refer to fuel filter element change)

NOTICE:
1. The cartridge and cup contains fuel. Take care not to spill it during disassembly

2. Perform the “fuel system air bleeding” after the water in the fuel is drained.

(2) Fuel System Air Bleeding

The entry of air into the fuel system will cause hard engine starting or engine malfunction. When servicing the fuel system, be sure to perform air bleeding procedure.

Air bleeding procedure:

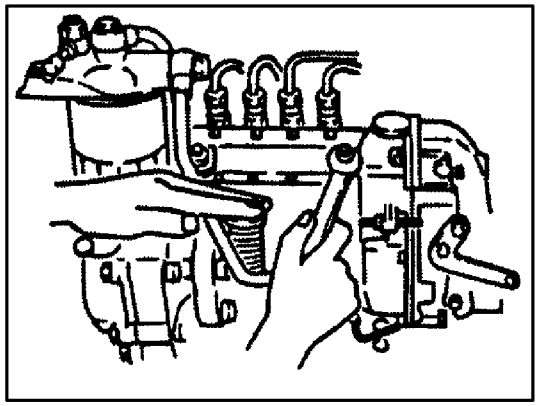


Fig. 22

1) Loosen the bleeding screws on the fuel injection pump.

2) Turn the feed pump knob counter clockwise until the pump knob is forced up by spring.

3) Depressing the pump knob will cause air mixed fuel to drain from the loosened bleeding screws.

4) Repeat the pumping action until no bubbles are visible in the flowing fuel.

No more bubble in the fuel indicates that air bleeding is completed.

Tighten the bleeding screws and the feed pump knob.

5) Start the engine and check the fuel system for fuel leaks.

(3) Fuel Filter Element Change Change interval

Every 500 operating hours

Change Procedure

NOTICE:
1 Be careful not to spill out the fuel remaining in the fuel filter when the filter is removed.

2. After draining the water from the fuel, conduct fuel air bleeding.

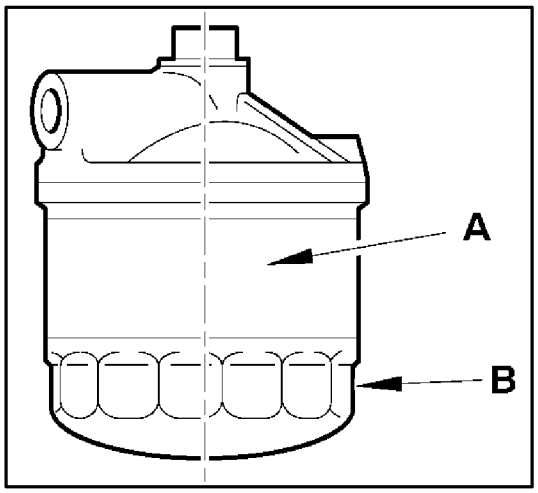


Fig. 23

A Cartridge.

B Set a filter wrench here.

1) Loosen the fuel filter turning it counterclockwise with a filter wrench. Discard the used fuel filter.

2) Clean the fitting face on the upper cover, so that new fuel filter can be seated properly.

3) Lightly oil the O-ring. To reinstall, turn the filter assembly clockwise carefully to prevent the fuel from spilling until the O-ring is fitted against the sealing face of the filter cover. Turn 2/3 turn further with the filter wrench.

Air bleeding

Do air bleeding on completion of fuel filter element change referring the description Fuel System Air Bleeding.

Feed Pump Strainer Cleaning

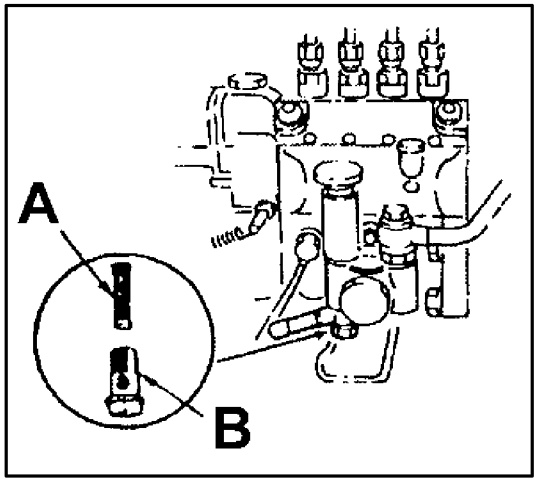


Fig. 24

A Strainer

B Joint bolt

Clean the feed pump strainer every 1000 operating hours. The strainer is incorporated in the feed pump inlet side joint bolt. Clean the strainer with compressed air and rinse it in fuel oil.

4) Fuel Injection Pump Control Seals

As the fuel injection pump is precisely adjusted, most of the controls are sealed, do not break them. When adjustment is necessary, contact you Ingersoll-Rand dealer.

NOTICE:
The manufacturer does not warrant the engine with the broken governor seals.

4. AIR INTAKE SYSTEM

(1) Air Cleaner

Engine performance and life vary with the air intake conditions. A dirty air cleaner element reduces the amount of intake air, causing reduced engine output.

A damaged element leads to abrasion of cylinders and valves, resulting in increased oil consumption, reduced output and shortened engine life.

NOTICE:
Shorten the cleaning or change interval when the equipment is used in dusty areas.

Change the element if element damage is found during air cleaner cleaning. .

5. ENGINE ELECTRICAL

The engine uses a 12 volt negative ground electrical system.

(1) Battery Servicing

Gravity of the batteries

The battery charge condition is judged by the electrolyte gravity measurement.

Periodically measure the electrolyte gravity of the batteries.

For the internal check follow the equipment manufacturer's standard.

The relationship between the electrolyte specific gravity and the battery conditions are as follows:

Electrolyte Specific Gravity	Battery Conditions
Over 1.300	Over 100% (Over charged)
1.290 - 1.270	100%
1.260 -1.240	75%
Below 1.230	Below 50% (Insufficiently charged)

NOTICE:
The battery electrolyte is dilute sulfuric acid. So. be careful not to stain your body and clothes with it. If stained, rinse portion in clean water.

Gravity conversion

The specified electrolyte temperature for the gravity measurement is 20°C (68°F).

Measure the electrolyte temperature and do the conversion in accordance with the following formula when the temperature does not fall to the specified temperature.

S_{20} = St + 0.0007 (t -20)

S_{20} ; gravity at 20°C

St ; gravity measured

t ; electrolyte temperature when measured
Battery terminal connections

Battery terminal connections

Periodically, check the battery terminals for loose connection and corrosion.

For the check interval, follow the machine manufacturer's standard. Loose connection will cause hard engine starting or deficient battery charging.

If the terminals are excessively corroded, disconnect the battery cables and polish them with a wire brush or sandpaper.

Never reverse the "+" and "—" terminals when reconnecting the cables. Even a short period of reverse connection could damage the electrical parts.

Cleaning of Battery

When the battery is fouled clean it with clean water or tepid water and wipe them with a dry cloth to remove the water. Apply a light coat of vaseline or a grease to the battery post.

(2) Alternator Servicing

1) The polarity of the alternator is negative grounding type. When an inverted circuit connection take place, the circuit will be in short circuit instantaneously resulting in alternator failure.

2) Do not put water directly on the alternator. Entry of water into the alternator leads an electrolyte corrosion causing a alternator failure. Pay attention particularly when cleaning the engine.

3) When the battery is charged with a external electric source, be sure to disconnect the battery cables.

(3) Wiring Connections

Check all of the electric wiring connections for looseness and damage.

6. ENGINE ASSEMBLY AND OTHERS

To continue trouble free engine operation over a long period of time, the servicing items need a skilled maintenance technican, therefore, consult your machine supply source on the following items when necessary.

(1) Fuel Injection Nozzle

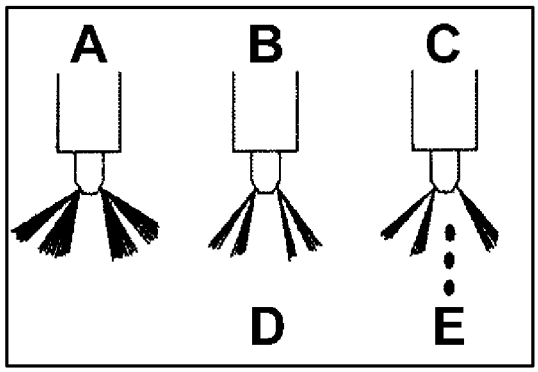


Fig. 28

A Good

B No good

C No good

D Thin Clogging

E Dripping

Use an injection nozzle tester to check the static injection starting pressure and the fuel spray conditions.

Injection nozzle pressure test interval:

Every 500 operating hours.

When the injection starting pressure is too high or too low or the fuel spray pattern is improper, an abnormal fuel combustion take place in the engine causing lowered output and blackish exhaust smoke. Further, it causes a piston seizure or piston damage etc. In such cases, the injection nozzle test or the nozzle replacement is required.

Injection starting pressure 18.1 MPa (2630 psi)

NOTICE:
While using a nozzle tester, it may happen that high pressure blow off the light oil and injure the worker. Keep off the nozzle end.

(2) Valve Clearance Adjustment

The valve clearance must be adjusted every 1200 operating hours, or whenever the valve rocker is abnormally noisy.

Valve clearance : 0.40 mm (0.0157 in) (When the engine is cold.)

Adjustment Procedure

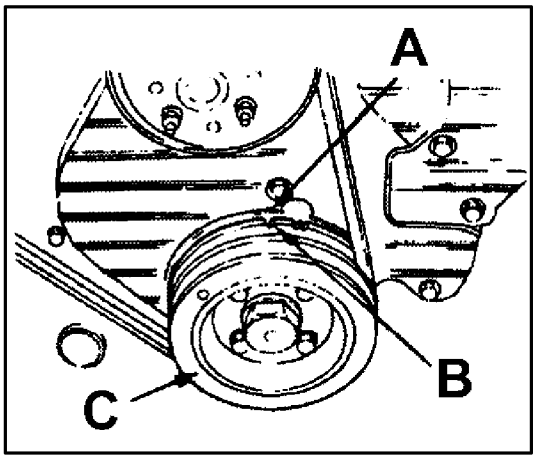


Fig. 29

A Pointer

B T D C Mark

C Pulley

1) In order to bring No.1 or No. 4 cylinder to the top dead center in the compression stroke, align the TDC mark on the crank pulley with the pointer on the timing gear case.

2) Do the adjustment on the circle marked valves in the below table where No. 1 cylinder is in the top dead center in the compression stroke.

After the above steps, do the adjustment on the double circle marked valves where No. 4 cylinder is on the top dead center in the compression stroke.

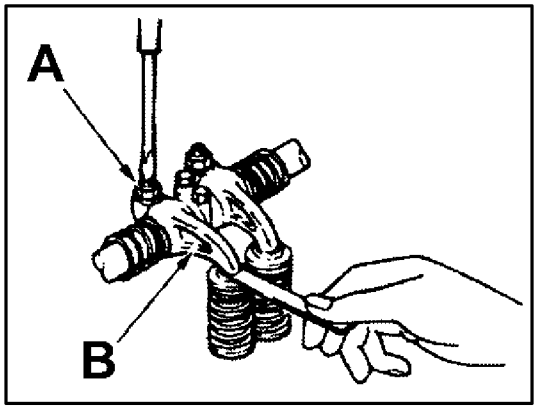


Fig. 30

A Adjust screw

B Rocker Arm

I ; Inlet
E ; Exhaust

Cylinder No.	1		2		3		4	
Valve arrangement	I	E	I	E	I	E	I	E
When No.1 cylinder is at TDC in the compression stroke	X	X	X			X		
When No.4 cylinder is at TDC in the compression stroke				X	X		X	X

Fig. 31

3) After the adjustment started from either piston top dead center, turn the crankshaft 360° to align the TDC mark and the pointer to do the adjustment again on the remaining valve.

(3) Injection Timing Check and Adjust

Improper injection timing causes serious engine failure such as blackish exhaust smoke, poor engine output and engine breakage etc.

In normal servicing, this check and adjustment is unnecessary, however, it might be necessary in conjunction with a related works.

Check procedure

1. Bring No. 1 cylinder to the top dead center on the compression stroke.

Turn the crankshaft pulley clockwise (viewed at engine front) and align the notched line on the crank pulley with the TDC mark on the timing gear case cover.

Remove the timing check hole cover at the front of injection pump to check the alignment between the pointer “a” on the injection pump gear lock plate and the projected area mark “b” on the timing gear case. If “a” and “b” are in alignment, the timing is set correctly. If they are in alignment, No. 1 cylinder is at the TDC on the compression stroke. If it is misaligned, re-check by turning the crankshaft pulley one more turn to repeat the previous procedure to make sure that it is in alighment.

Inspect the crank angle position of the injection starting.

2. Reversely turn the crankshaft pulley counterclockwise viewed at the engine front about 30 degrees crank angle.

3. Remove No. 1 injection pipe from the engine.

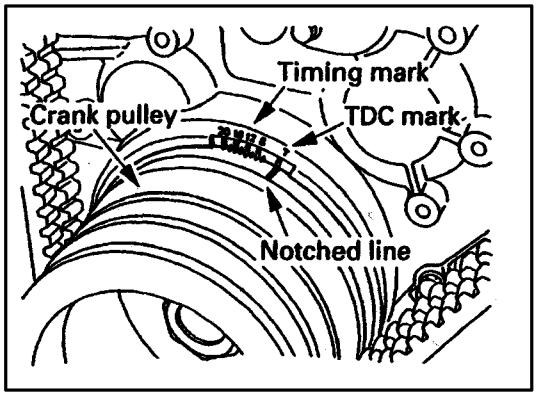


Fig. 32

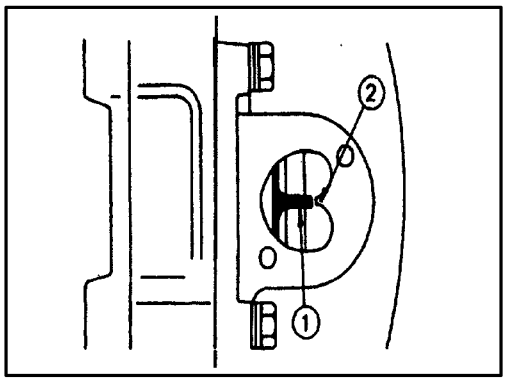


Fig. 33

4. Remove the injection pump No. 1 delivery valve holder, delivery valve and spring and reinstall the delivery valve holder.

Delivery valve holder tightening torque : 4.0~4.5 kg-m (28.9~ 32.5 lbft).

5. Slowly turn the crankshaft pulley clockwise and at the same time, continue to feed the fuel while pumping the feed pump. When the fuel starts to flow out from No. 1 delivery valve holder, stop the pumping.

6. Observe and make sure which mark (injection starting angle line) on the timing gear case cover is aligning with the notched line on the crank pulley. The timing line shows the injection starting crank angle on the engine model.

The injection starting crank angle differs depending on the engine model. Refer to “Main Data and Specifications” on the injection timing angle for the respective model engine.

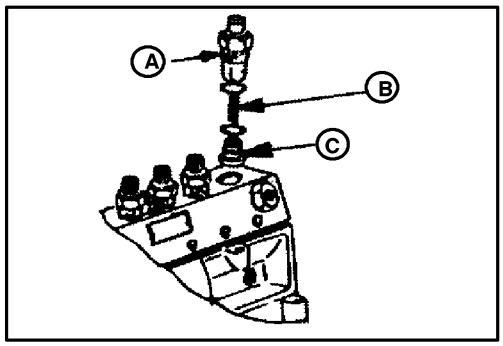


Fig. 34

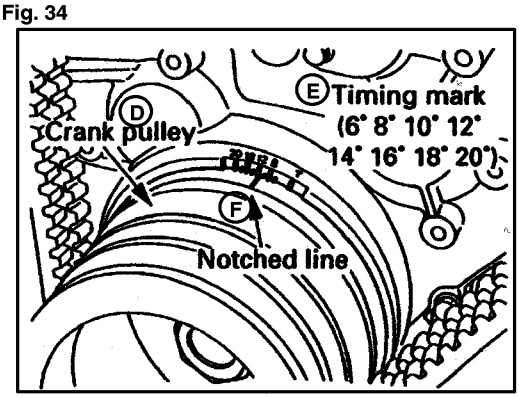


Fig. 35

A Delivery holder

B Spring

C Delivery valve

D Crank pulley

E Timing mark

F Notched line

4) Remove the injection pump No. 1 delivery valve holder, delivery valve and spring and reinstall the delivery valve holder.Delivery valve holder tightening torque : 4.0~4.5 kg-m (28.9~ 32.5 lbft) .

5) Slowly turn the crankshaft pulley clockwise and at the same time, continue to feed the fuel while pumping the feed pump. When the fuel starts to flow out from No. 1 delivery valve holder, stop the pumping.

6) Observe and make sure which mark (injection starting angle line) on the crankshaft pulley is aligning with the notched line on the crank pulley. The timing line shows the injection starting crank angle of the engine.

The injection starting crank angle differs depending on the engine model. Refer to the main data and specifications on the injection timing angle for the respective model engine.

Adjustment procedures

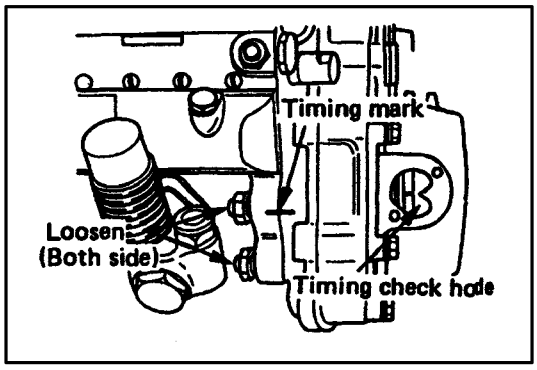


Fig. 36

A Timing mark

B Timing check hole

B Loosen (both side)

1) Align the notched line on the crank pulley and the specified timing mark on the gear case cover.

(Refer to the injection timing angle shown in the main data and specifications.)

2) Loosen the four injection pump fixing nuts.

3) To advance the timing.
Pivot the injection pump at the pump drive shaft toward out.

To retard the timing.
Pivot the injection pump at the pump drive shaft toward in (toward the cylinder block).

The 1 mm (0.039 in) misalignment between the two setting mark lines corresponds to about 2° in crank angle.

4) Do a fine injection pump position adjustment, while continuing the pumping operation to feed the fuel, and stop to pivot the injection pump when the fuel stop to flow out from No. 1 delivery valve holder.

5) Tighten the four injection pump fixing nuts.

6) Once remove No. 1 delivery valve holder, and reinstall thedelivery valve, spring and the valve holder.

Delivery valve holder tightening torque 39~44 Nm (28.9~ 32.5ft.lb)

7) Install No. 1 injection pipe.

NOTICE:
Take care to prevent entry of dust or foreign particles into the pump interior when timing adjustment is made.

(4) Cylinder Compression Pressure Measurement

The cylinder compression pressure measurement must be done **every 1200** operation hours, or whenever the engine output is reduced.

Compression pressure 3.04 MPa (441 psi)

Test condition:
Cranking speed 200 rpm
Coolant temperature 75°C (167°F)

Repair the engine and/or replace some parts of engine if compression pressure is lower than 2.15 MPa (313 psi)

(5) Starter and Alternator Servicing

Do the starter and the alternator servicing every 1500 operating hours on the following items.

- Starter commutator cleaning.
- Alternator slip ring cleaning.
- Carbon brushes and the brush contact check.

(6) Radiator Pressurization Valve Check

A pressurization valve is incorporated in the radiator cap assembly. Check the valve actuating pressure with a radiator compression tester. For the pressurization valve actuating pressure and the check interval, follow the equipment manufacturer's standards.

(7) Water Pump Grease Replacement

Grease packed in the water pump must be replaced every 1500 operating hours, (BESCO GREASE L-2).

6. ENGINE CARE IN COLD SEASON

1. FUEL

(1) Fuel Selection

In the cold zone, the fuel might be frozen resulting in hard engine starting; therefore, select a suitable fuel for such engine operation.

Use ASTM 975 No. 2-D fuel if you expect temperature above-7°C (20°F).

Use Number 1-D if you expect temperatures below -7°C (20°F). If Number 1-D is not available, a "winterized" blend of 1-D and 2-D is available in some areas during the winter months.

Check with the service station operator to be sure you get the properly blended fuel.

2. COOLANT

Where the atmospheric temperature falls below freezing point, the cooling system should be drained after engine operation, but to eliminate the need for repeated draining and refilling, the use of anti-freeze solution is highly recommended.

A 50/50 Ethylene glycol base antifreeze/water mix.

Concentrations over 65% adversely affect freeze protection, heat transfer rates, and silicate stability which may cause water pump leakage.

Never exceed a 60/40 antifreeze/water mix. (which provides protection to about -50°C (-58°F).

CAUTION:
Under some conditions the ethylene glycol in the engine coolant is combustible. To help avoid being burned when adding engine coolant, do not spill it on the exhaust system or engine parts that may be hot. If there is any question, have this service performed by a qualified technician.

NOTICE:
1. Methyl alcohol base antifreeze is not recommended because of its effect on the non-metallic components of the cooling system and because of its low boiling point.

2. High silicate antifreeze is not recommended because of causing serious silica gelation problems.

3. Usage and mixing ratio etc. should be followed to the antifreeze manufacture's recommendations.

3. ENGINE OIL

Engine oil viscosity largely affects engine startability, so the use of lubricant with selected viscosity according to the atmospheric temperature is important.

At low atmospheric temperature, engine oil viscosity will increase to cause hard engine starting.

4. BATTERY

1) Always pay attention to charging the batteries completely in cold season.

As the discharge current from the battery is large in cold engine starting, it takes a comparatively long while to recharge the batteries than the recharge after the normal engine starting.

Particularly, as the gravity of the insufficiently charged battery's electrolyte is low, it will easily be frozen.Pay attention to keep the batteries warm in the cold season.

2) To replenish the battery with distilled water, do it immediately before the engine operation.

If the work is done after the engine has already been in an operation, the distilled water replenished will not be mixed with the original electrolyte, allowing the danger of freezing the not mixed distilled water staying in the battery cell upper part.

NOTICE:
Do not use starting "aids" in the air in take system. Such aids can cause immediate engine damage.

7. ENGINE MAINTENANCE SCHEDULE

Refer to Maintenance Schedule in Section 6 MAINTENANCE.

8. SIMPLE ENGINE TROUBLESHOOTING

This item contents a simple troubleshooting. When a failure takes place on your Ingersoll-Rand engine, diagnose the cause referring this troubleshooting. Should the cause of failure cannot be detected or you are unable to manage the failure consult to your machine supply source or nearest Ingersoll-Rand engine service outlet.

Engine does not start	Starter does not turn.	Battery discharged	
		Imperfect cable connections.	
		Starter or starter switch failure.	
		Safety relay failure.	
	Starter turns but engine does not ignite.	No fuel injection.	No fuel in the fuel tank.
			Clogged fuel filter element.
			Air in the fuel system.
			Control rack is stuck at no fuel position.
			Feed pump malfunction.
		Fuel is injected but engine does not ignite.	Incorrect preheating operation.
			Glow plug malfunction.
			Incorrect injection timing.
			Low cylinder compression pressure.
			Wrong engine oil viscosity.
	Engine ignite but stalls immediately.	Air in the fuel system.	
		Incorrect low idle speed adjustment.	
		Feed pump is restricted.	

Unstable engine running	Unstable low idling	Incorrect control lever adjustment	
		Crack in injection pipe.	
		Injection nozzle failure.	
		Engine stop button restricted at stop position.	
		Uneven compression pressure between cylinders.	
	Too high low idling speed.	Incorrect control lever adjustment.	
		Governor interior malfunction.	
	Engine hunting in medium speed range.	Governor spring deteriorated.	
	Malfunction in engine at high speed range.	Insufficient fuel supply.	Air in the fuel system
			Clogged fuel filter element
			Fuel leaked from overflow valve.
		Uneven fuel injection amount between plungers.	
		Deteriorated governor spring.	
		Incorrect valve clearance adjustment.	
		Deteriorated valve spring.	
	Engine speed does not be lowered.	Engine control restriction or seizure.	
Engine overheat.	Cooling system defect	Insufficient coolant amount.	
		Fan belt slippage.	
		Thermostat malfunction.	
		Radiator filler cap malfunction.	
		Cooling system interior fouled.	
		Radiator clogging.	
	Improper servicing	Engine over-loaded.	
		Air cleaner element clogged.	
		Insufficient ventilator.	
		Restricted coolant flow (high concentration of antifreeze, etc.)	
Low oil pressure	Lack of oil	Oil leakage	
		Excessive oil consumption	
	Improper oil	Wrong selection of kind and viscocity.	
	High coolant temperature.	Over heat.	
	Clogged filter and strainer.		
	Worn bearings and oil pump.		
	Faulty relief valve.		

Lack engine output	Incorrect injection pump adjustment	Incorrect injection timing	Too far advanced.
			Too far retarded.
		Injection nozzle malfunction	Incorrect injection pressure adjustment.
			Incorrect spray condition.
		Insufficient fuel supply to the injection pump	Lack of fuel in tank.
			Air mixing in injection pump.
			Fuel filter clogged.
			Overflow valve malfunction.
		Governor malfunction	Incorrect engine control adjustment.
			Deteriorated governor spring.
	Poor cylinder compression pressure	Cylinder compression pressure leakage	Incorrect valve clearance adjustment.
			Nozzle holder misalignment.
			Cylinder bore wear.
		Insufficient air intake volume.	Air cleaner clogging.
			Such as inferior ventilation.
Excessive oil consumption	Improper oil	Wrong selection of kind and viscosity.	
		Too much oil quantity.	
	Oil coming up.	Wrong selection of cylinder liner and piston ring.	
	Oil coming down.	Faulty valve stem seal.	
	Oil leakage	Damaged packing.	
		Improper tightening.	
		Improper installation of filter and piping.	
Excessive fuel consumption	Fuel leakage	Damaged packing.	
		Improper installation or tightening.	
	Too much injection amount.	Injection pump misadjustment.	
	Excessive mechanical loads		

Improper exhaust	Excessive black smoke	Clogged air cleaner.
		Nozzle damage.
		Nozzle misadjustment.
		Injection timing failure.
		Injection amount misadjustment.
		Improper fuel.
	Excessive white smoke	Oil coming up or down..
		Water mixing in fuel.
		Low compression pressure.
		Injection timing failure.
		Low coolant temperature.
Battery overdischarge	Low electrolyte level	Crack in battery body.
		Natural consumption.
	Charging failure	Loose or damaged belt.
		Faulty alternator.
		Damaged wiring or contact failure.
		Low speed driving.
	Excessive electrical loads	Insufficient battery capacity.

Machine Models: VHP300WIR, HP365WIR, XP375WIR, P425WIR

Part Number	Description	1 Machine 2 Years	5 Machines 2 Years
54443577	Jack Assy.	0	1
35609544	Jack Pin	1	2
35316868	Grease Seal	2	4
35379395	Dust Cap	2	4
54756697	Engine Mount	0	2
49844160	Temp. Switch	1	2
54757935	Pressure Switch	1	2
35592435	Air Cylinder	1	2
35328467	Rod End Brg	1	2
54659008	Radiator Hose	0	2
54659016	Radiator Hose	0	2
35318229	Mount	0	2
35593490	Shaft Seal	1	2
95022356	O-Ring	1	2
35088798	Unloader Repair Kit	1	2
35317197	Diaphragm	1	2
35278589	O-Ring	2	4
35279959	O-Ring	2	4
36782019	Thermostat	1	2
36788172	Seal	1	2
95022307	O-Ring	1	2
35584242	Gasket	1	2
36897346	Lube Element	12	48
36789550	Min. Pressure Valve	0	1
35576115	Ball Valve	0	1
36896892	Pressure Regulator (HP365,VHP300)	1	2
36854149	Pressure Regulator (P425, XP375)	1	2
54721345	Sep. Element	3	12
36840411	Check Valve	1	2
54731435	Safety Valve (P425)	1	2
54731443	Safety Valve (XP375,HP365)	1	2
54731450	Safety Valve (VHP300)	2	4
54627799	Fitting	1	2
54629464	Plastic Tube	1	2
35279942	O-Ring	2	4
54660089	Fuel Cap	1	2
35384577	Bushing	2	4
54468178	Water/Fuel Filter	12	48
35322395	Silencer	1	2
54717145	Air Element	6	24
54717152	Air Element	6	24
35393677	Vaculator Valve	1	2
36766756	Orifice Muffler	1	2
36783439	2-Way Valve	1	2
54764964	Temp. Switch a/e	1	2
54764956	Temp. Switch Tank	1	2
35376169	Diode	1	2

36782456	Fuse	1	2
54368048	Relay	1	2
36856250	Relay	1	2
54766704	Hourmeter	1	2
36884211	Switch	1	2
35604065	Pressure Gauge 150psi	1	2
36891216	Pressure Gauge 250psi	1	2
36793602	Door Latch	2	4
35600261	Gas Spring	2	4
35322379	Blow Down Valve	1	2
35379064	Repair Kit	1	2
36899706	Pro Tec Comp. Fluid	3	7
35364413	OSHA Valve (300cfm)	1	5
35363829	OSHA Valve (365/375cfm)	1	5
35364439	OSHA Valve (425cfm)	1	5
35371251	Lubricator	1	5
35380880	Air Hose	2	10
36875938	Pro Tec Eng. Fluid	3	7

Engine Spares

54565197	Eng. Fuel Ele.	12	48
54565205	Eng. Lube Ele.	12	48
49849177	Cap, Oil Filler	0	2
49809023	PCV Valve	1	2
49807860	Thermostat	1	2
49807035	Thermostat Gasket	1	2
54565213	Belt, Fan	1	3
54747548	Inj. Noz Assembly	0	2
54747555	Gasket, Inj. Noz.	1	5
54747563	Starter	0	2
54747571	Generator	0	2
54385992	Solenoid, stop	0	2
54385893	Glow Plug	1	2

Maintenance Interval and Filter Kits

36064673 Kit, Filter Change

Contains	Description	Qty.
36897346	Lube Element	1
54717152	Air Element	2
54717145	Air Element	2
54565205	Eng. Lube Ele.	1
54565197	Eng. Fuel Ele.	1
54468178	Water/Fuel Filter	1

36064681 Kit, Filter

Contains	Description	Qty.
36897346	Lube Element	2
54717152	Air Element	2
54717145	Air Element	2
54565205	Eng. Lube Ele.	4
54565197	Eng. Fuel Ele.	6
54468178	Water/Fuel Filter	6

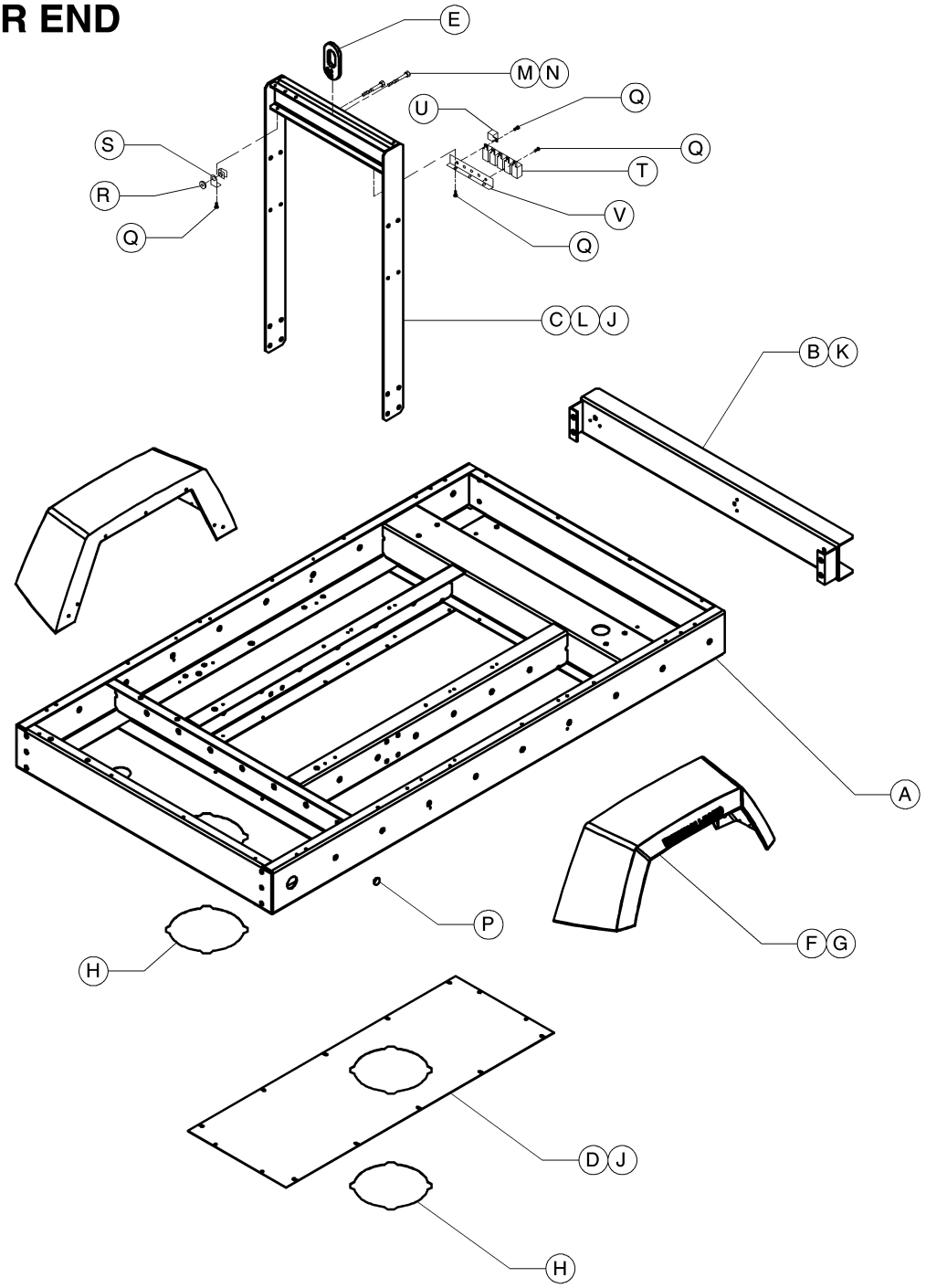
36064699 Maintenance Interval

Contains	Description	Qty.
36897346	Lube Element	1
54717152	Air Element	2
54717145	Air Element	2
54565205	Eng. Lube Ele.	1
54565197	Eng. Fuel Ele.	1
54468178	Water/Fuel Filter	1
54721345	Element, Separator	1

MANUAL NO. - ILLUST. NO. 54720784-001

DATE/REV: 10/01 B

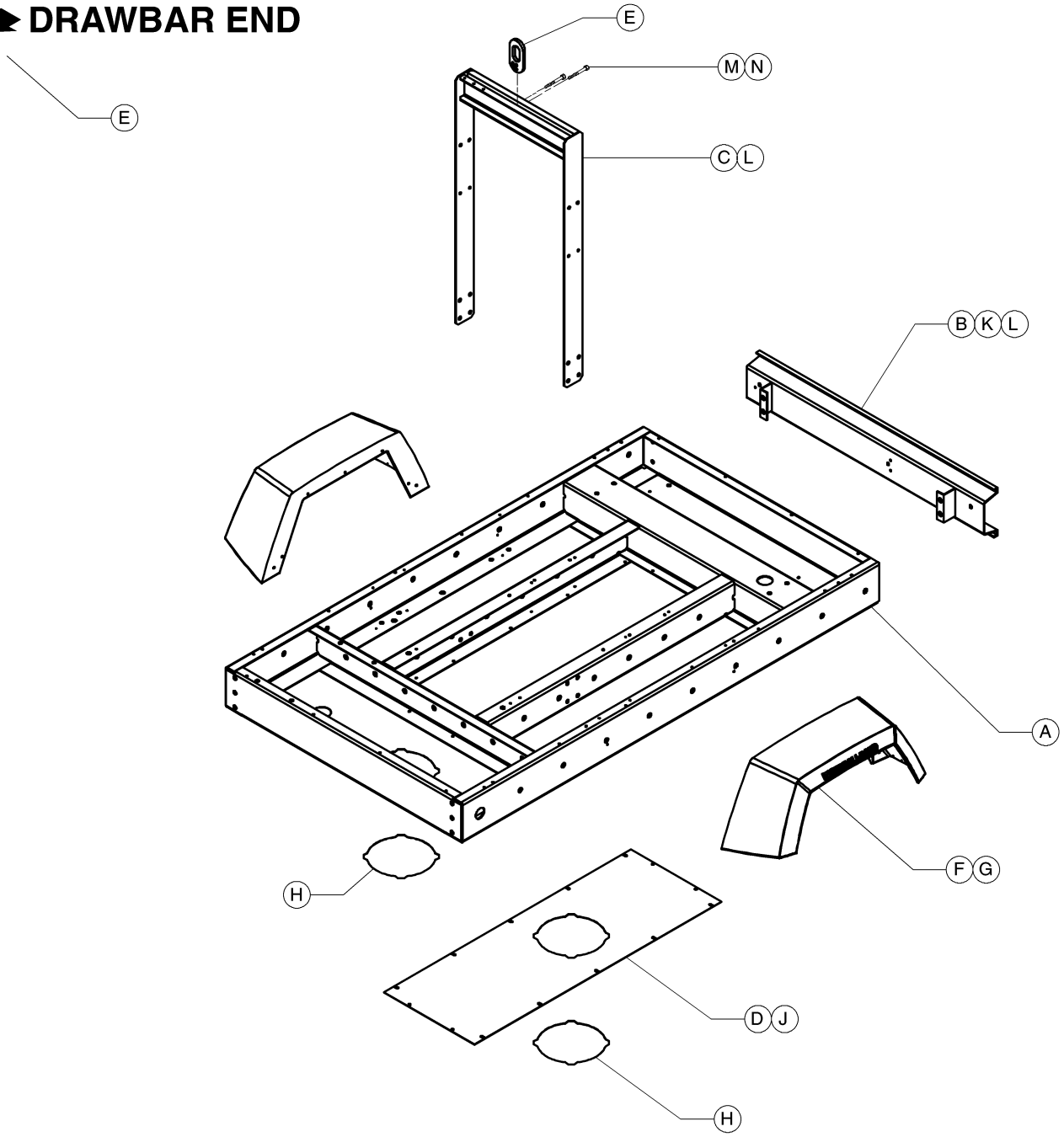
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54615208	1	FRAME ASSEMBLY	L	36879492	8	SCREW, HEX FLANGE M12-1.75 X 25
B	54667902	1	BUMPER	M	35290113	2	SCREW, HEX M16-2.0 X 75
C	54742010	1	LIFTING BAIL	N	96701630	2	NUT, NYLOC M16
D	54641840	1	PAN, MIDDLE BELLY	P	54772041	12	PLUG, SNAP-IN HOLE
E	54759113	1	EYE, LIFTING BAIL	Q	92368687	8	SCREW, TAPPING M06-1.0 X 12
F	36877579	2	FENDER	R	49841836	1	RESISTOR, GLOW PLUG
G	36797652	10	SCREW, TAPPING M06-1.0 X 12	S	54756226	1	BRACKET, GLOW PLUG MOUNTING
H	36880623	2	COVER, FLEXIBLE	T	54368048	5	RELAY
J	35279025	18	SCREW, TAPPING M08-1.25 X 20	U	49808777	1	SAFETY UNIT
K	36888055	4	SCREW, HEX FLANGE M12-1.75 X 30	V	54756200	1	BRACKET, RELAY MOUNTING

MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-002 10/01 C

DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54741673	1	FRAME ASSEMBLY	J	35279025	14	SCREW, TAPPING M08-1.25 X 20
B	54737630	1	BUMPER	K	36888055	4	SCREW, HEX FLANGE M12-1.75 X 30
C	12346578	1	LIFTING BAIL	L	54614870	2	BUMPER, END STOP
D	54641840	1	PAN, MIDDLE BELLY	M	36784056	2	SCREW, HEX M16-2.0 X 75
E	54742028	1	EYE, LIFTING BAIL	N	36879211	2	NUT, HEX FLANGE M16
F	36877579	2	FENDER	P	87654321	1	GASKET SET, HEAD OVERHAUL
G	36797652	10	SCREW, TAPPING M06-1.0 X 12	Q	12346578	1	GASKET SET, ENGINE OVERHAUL
H	36880623	2	COVER, FLEXIBLE	R	87654321	1	GASKET SET, HEAD OVERHAUL

MANUAL NO. - ILLUST. NO. 54720784-003
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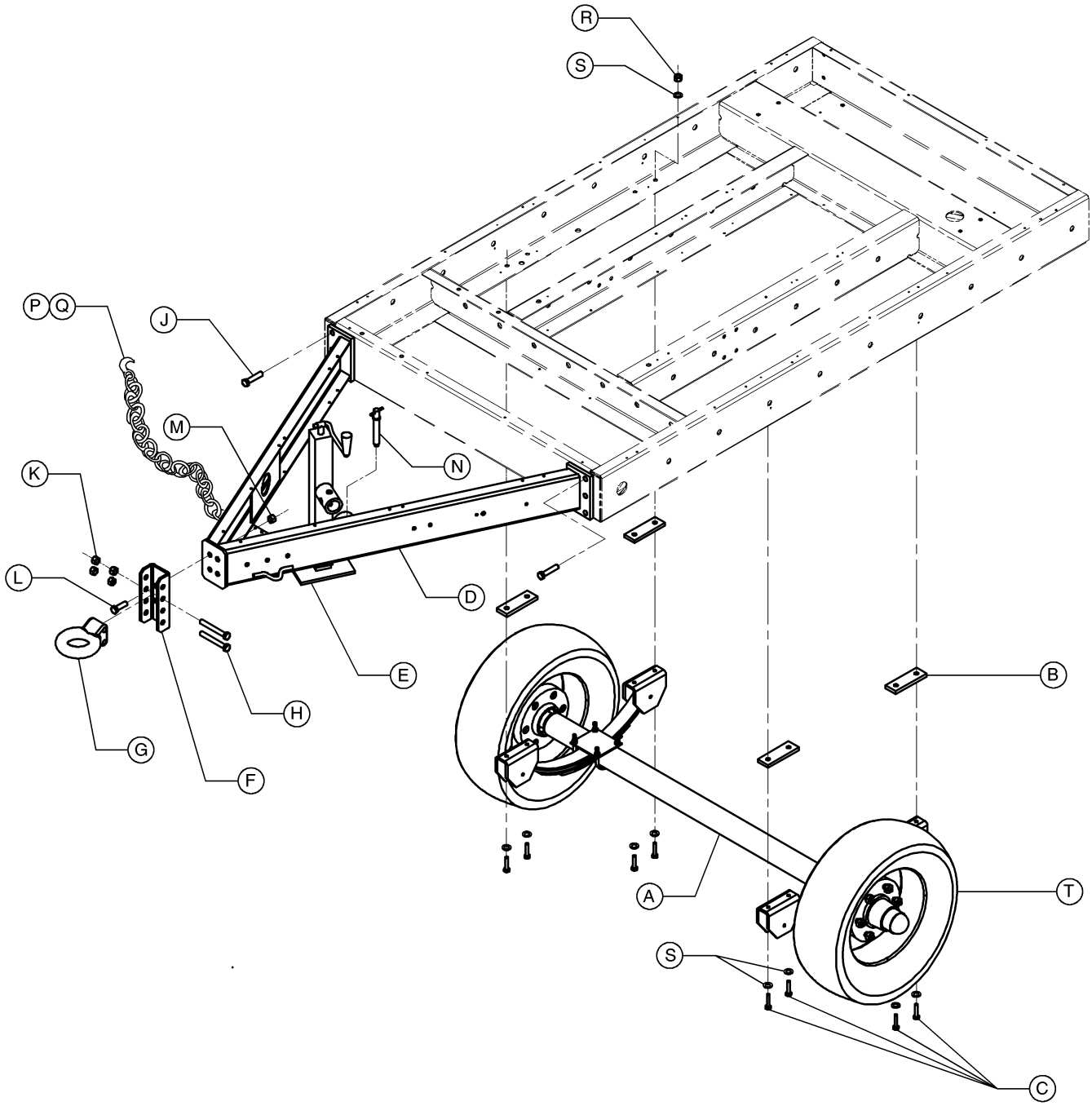
DRAWBAR & RUNNING GEAR



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54625322	1	RUNNING GEAR	K	96701750	4	NUT HEX M16-2.0
B	36880599	4	SPACER, RUNNING GEAR	L	39179072	4	BOLT, M16-2.0 X 50
C	96730395	8	SCREW, HEX M12-1.75 X 50	M	36879211	4	NUT, HEX FLANGE M16-2.0
D	36876621	1	DRAWBAR	N	35609544	1	PIN, QUICK RELEASE
E	54443577	1	JACK, SCREW	P	35610377	2	CHAIN ASSEMBLY
F	36757284	1	CHANNEL, PINTEL MTG 3-POSITION	Q	35372432	2	LOCK, COUPLING
G	35605187	1	PINTEL EYE 3”	R	35304047	8	NUT, NYLOC M12-1.75
H	35376094	2	SCREW, HEX M16-2.0 X 12	S	95935003	16	WASHER, FLAT
J	36879302	6	SCREW, HEX FLANGE M16-2.0 X 50	T	36026268	2	TIRE ASSEMBLY

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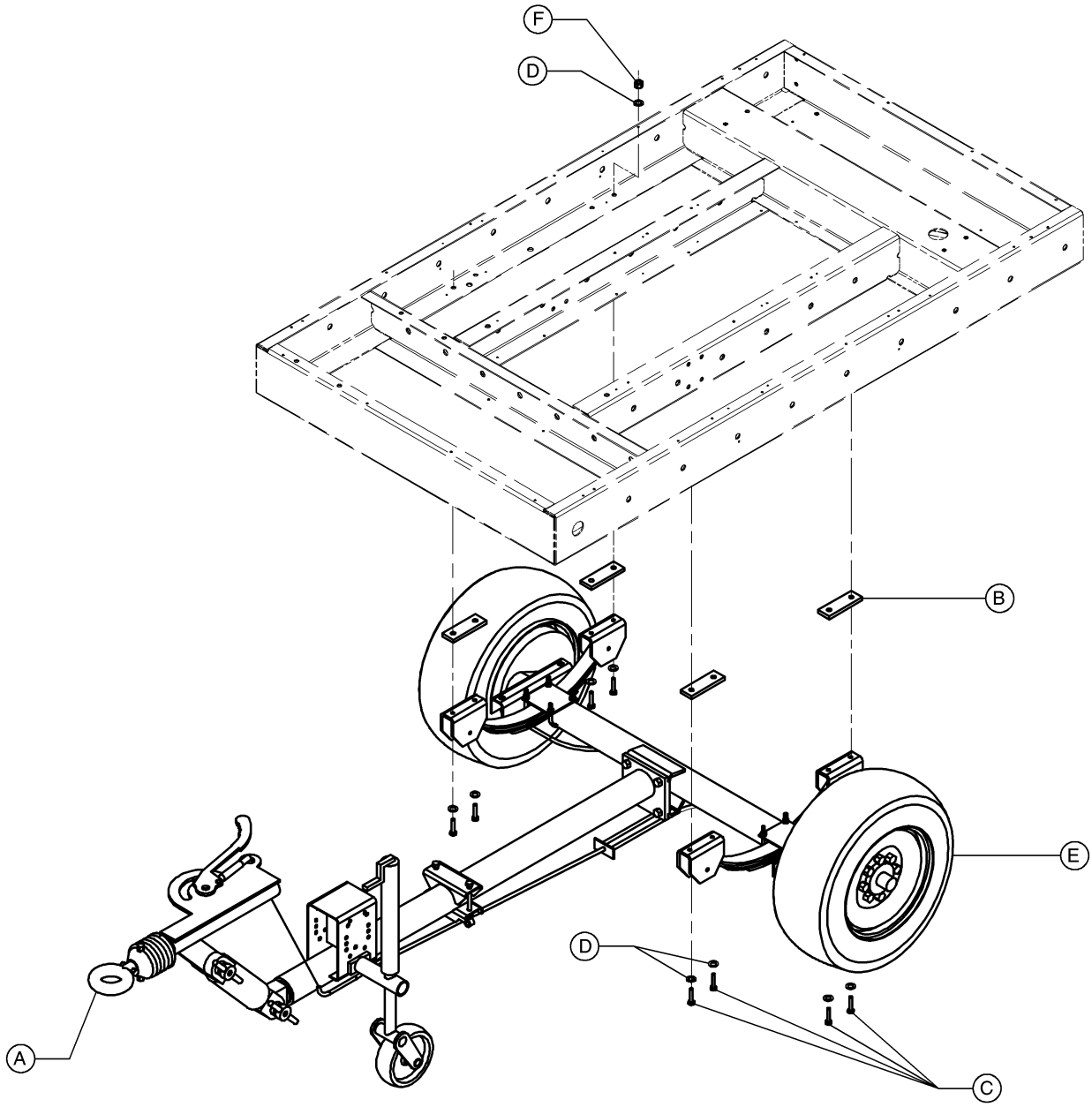
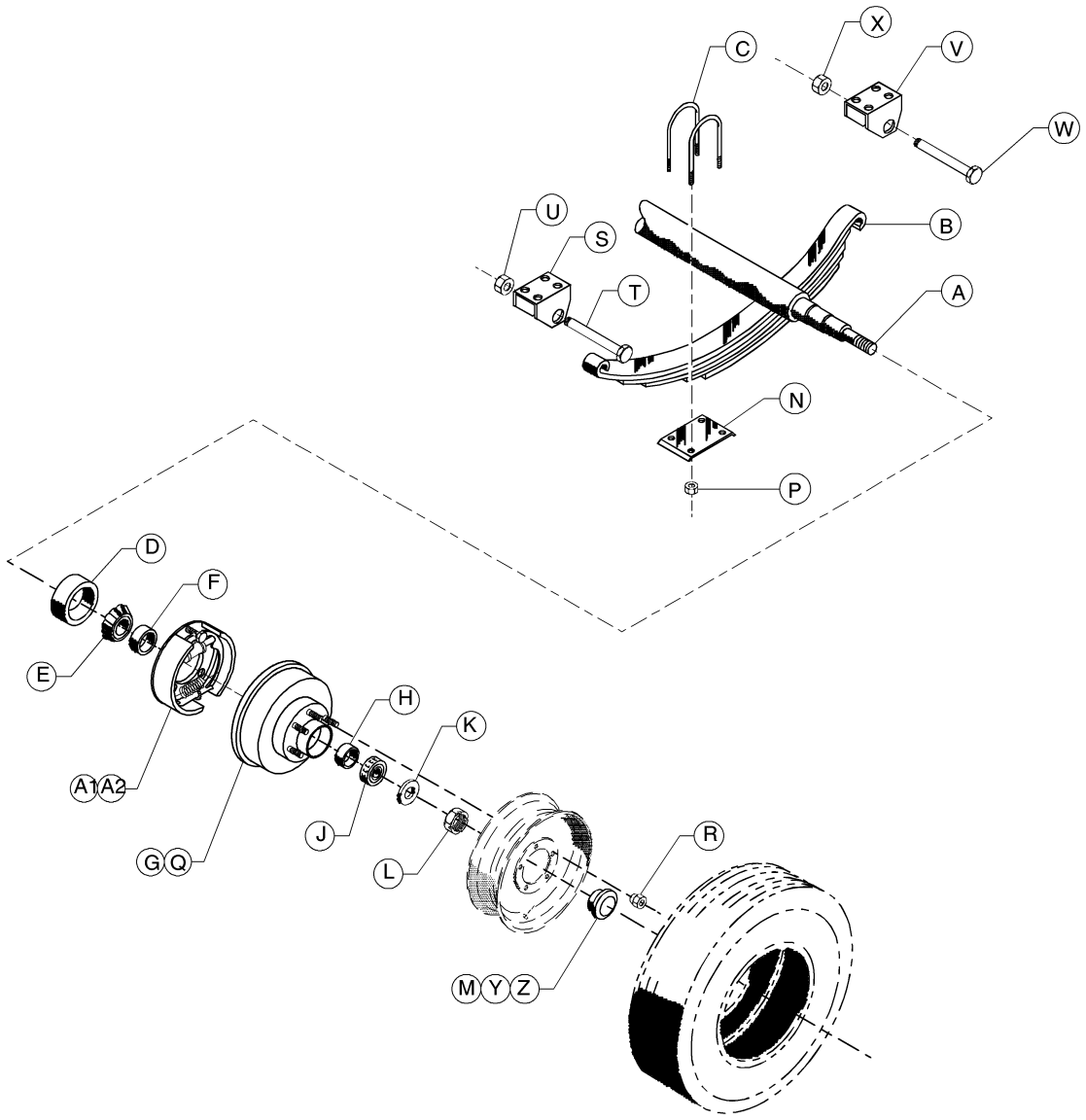


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54625322	1	RUNNING GEAR	N	35609544	1	PIN, QUICK RELEASE
B	36880599	4	SPACER, RUNNING GEAR	P	35610377	2	CHAIN ASSEMBLY
C	96730395	8	SCREW, HEX M12-1.75 X 50	Q	35372432	2	LOCK, COUPLING
D	36876621	1	DRAWBAR	R	35304047	8	NUT, NYLOC M12-1.75
E	54443577	1	JACK, SCREW	S	95935003	16	WASHER, FLAT
F	36757284	1	CHANNEL, PINTEL MTG 3-POSITION	T	36026268	2	TIRE ASSEMBLY
G	35605187	1	PINTEL EYE 3”				
H	35376094	2	SCREW, HEX M16-2.0 X 12				
J	36879302	6	SCREW, HEX FLANGE M16-2.0 X 50				
K	96701750	4	NUT HEX M16-2.0				
L	39179072	4	BOLT, M16-2.0 X 50				
M	36879211	4	NUT, HEX FLANGE M16-2.0				

RUNNING GEAR COMPLETE



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54750997	1	BEAM, AXLE	Q	35361898	12	STUD
B	35315126	2	SPRING, SLIPPER	R	35315274	12	NUT, WHEEL
C	35360734	4	U-BOLT	S	35326958	2	HANGER, FRONT
D	35316868	2	SEAL, GREASE	T	35315340	2	BOLT, SHACKLE
E	35316876	2	CONE, INNER BEARING	U	35315357	2	NUT, TOP LOCK
F	35316884	2	CUP, INNER BEARING	V	35326966	2	HANGER, REAR
G	35390459	2	HUB, STUDDED	W	35315365	2	BOLT, KEEPER
H	35318831	2	CUP,OUTER BEARING	X	35315373	2	NUT, KEEPER
J	35318849	2	CONE, OUTER BEARING	Y	35379387	2	PLUG, GREASE CAP
K	35315209	2	WASHER, SPINDLE	Z	35390012	2	WASHER, TANG
L	35315217	2	NUT, SPINDLE	A1	35390814	1	BRAKE ASM., LH ELECTRIC
M	35379395	2	CAP, GREASE DUST	A2	35390822	1	BRAKE ASM., RH ELECTRIC
N	35315241	2	PLATE, TIE				
P	35315258	4	NUT, U-BOLT				

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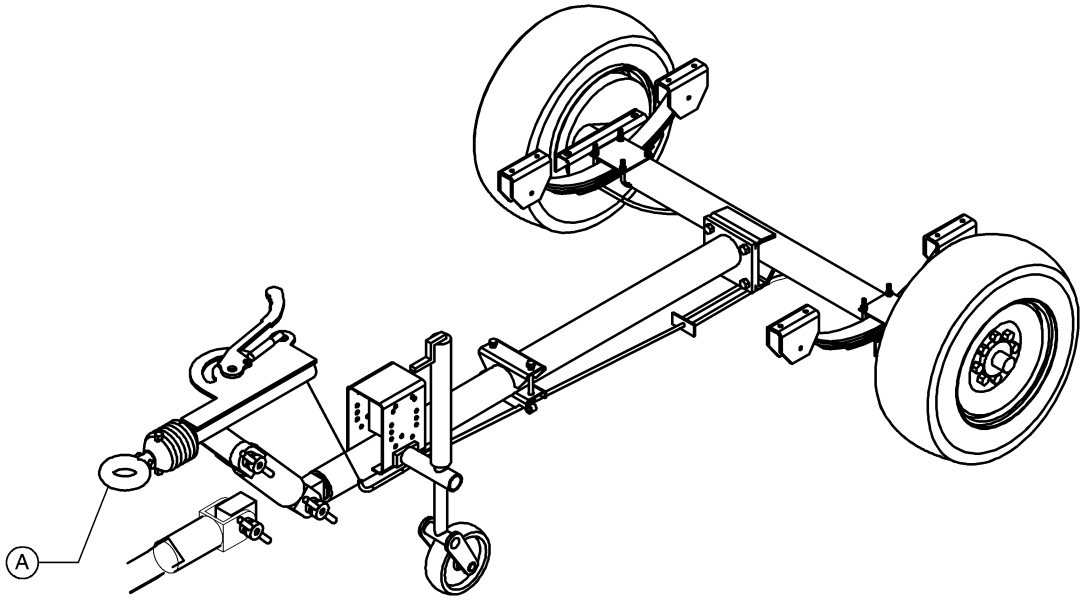
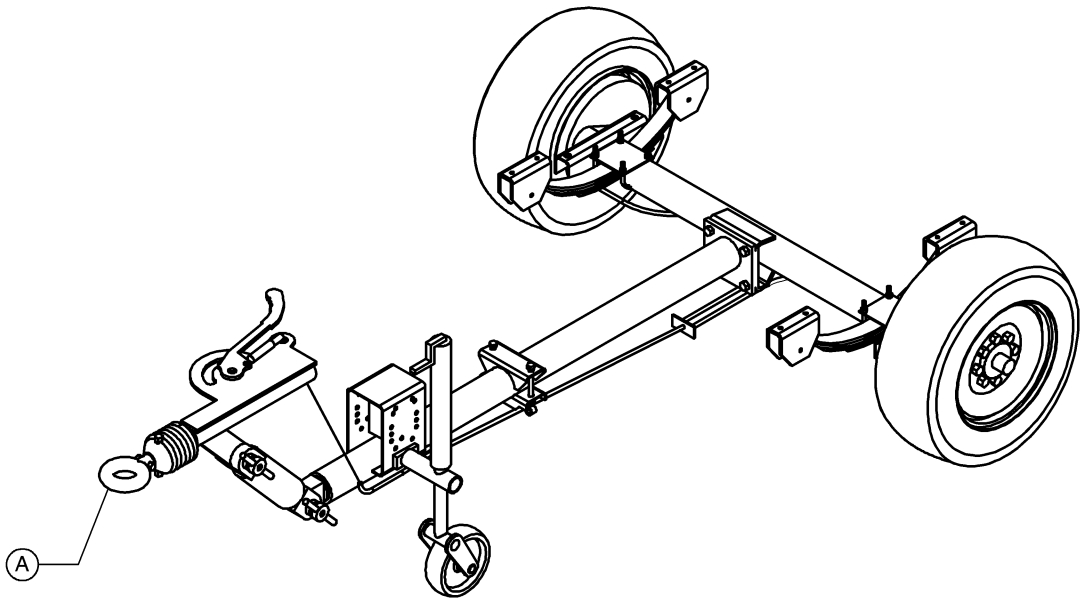
54720784-006 03/01 A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54625322	1	RUNNING GEAR	N	35609544	1	PIN, QUICK RELEASE
B	36880599	4	SPACER, RUNNING GEAR	P	35610377	2	CHAIN ASSEMBLY
C	96730395	8	SCREW, HEX M12-1.75 X 50	Q	35372432	2	LOCK, COUPLING
D	36876621	1	DRAWBAR	R	35304047	8	NUT, NYLOC M12-1.75
E	54443577	1	JACK, SCREW	S	95935003	16	WASHER, FLAT
F	36757284	1	CHANNEL, PINTEL MTG 3-POSITION	T	36026268	2	TIRE ASSEMBLY
G	35605187	1	PINTEL EYE 3”				
H	35376094	2	SCREW, HEX M16-2.0 X 12				
J	36879302	6	SCREW, HEX FLANGE M16-2.0 X 50				
K	96701750	4	NUT HEX M16-2.0				
L	39179072	4	BOLT, M16-2.0 X 50				
M	36879211	4	NUT, HEX FLANGE M16-2.0				

CE MARK ADJUSTABLE HEIGHT RUNNING GEAR COMPLETE



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54625322	1	RUNNING GEAR	N	35609544	1	PIN, QUICK RELEASE
B	36880599	4	SPACER, RUNNING GEAR	P	35610377	2	CHAIN ASSEMBLY
C	96730395	8	SCREW, HEX M12-1.75 X 50	Q	35372432	2	LOCK, COUPLING
D	36876621	1	DRAWBAR	R	35304047	8	NUT, NYLOC M12-1.75
E	54443577	1	JACK, SCREW	S	95935003	16	WASHER, FLAT
F	36757284	1	CHANNEL, PINTEL MTG 3-POSITION	T	36026268	2	TIRE ASSEMBLY
G	35605187	1	PINTEL EYE 3”				
H	35376094	2	SCREW, HEX M16-2.0 X 12				
J	36879302	6	SCREW, HEX FLANGE M16-2.0 X 50				
K	96701750	4	NUT HEX M16-2.0				
L	39179072	4	BOLT, M16-2.0 X 50				
M	36879211	4	NUT, HEX FLANGE M16-2.0				

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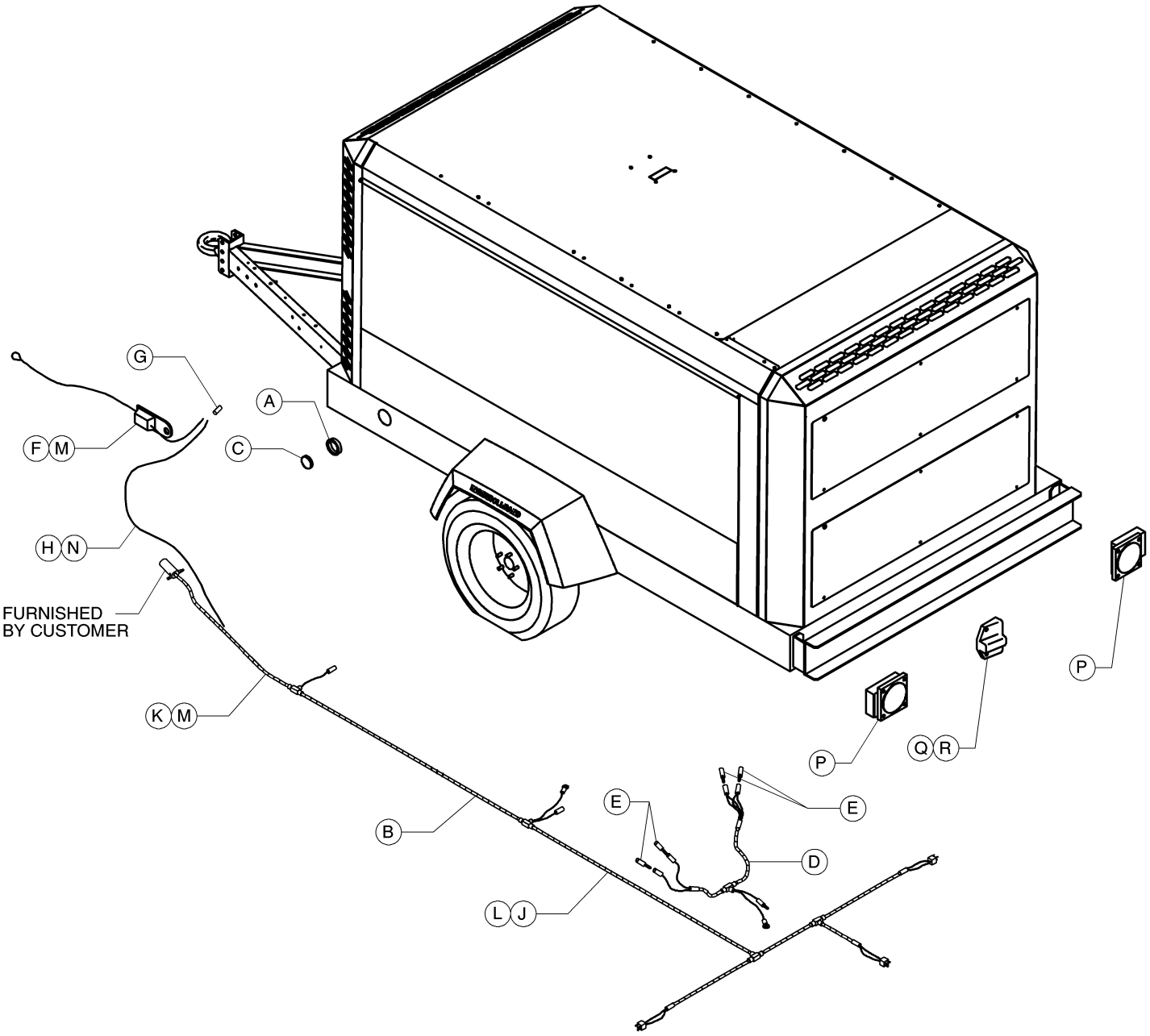

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36893634	2	GROMMET, SIDE LIGHT	J	35253038	4	CLAMP, 3/8
B	54761101	1	HARNESS, LIGHTING	K	37001252	1	CLAMP, SUPPORT
C	35367051	2	LIGHT, YELLOW CLEARANCE	L	92368687	5	SCREW, TAPPING M06-1.0 X 14
D	36895282	1	HARNESS, ELECTRIC BRAKES	M	36797652	2	SCREW, TAPPING M06-1.0 X 12
E	35375427	5	TERMINAL, SNAP	N	35120005	40”	WIRE, 14 GA BLACK
F	35315944	1	SWITCH, BREAKAWAY	P	54671557	2	LIGHT, STOP/TAIL/TURN
G	37140365	1	SPLICE, INSULATED	Q	36895860	1	LIGHT, LICENSE
H	35346337	1	LUG, TERMINAL	R	36782837	2	SCREW, HEX SHEETMETAL #10 X 1.0

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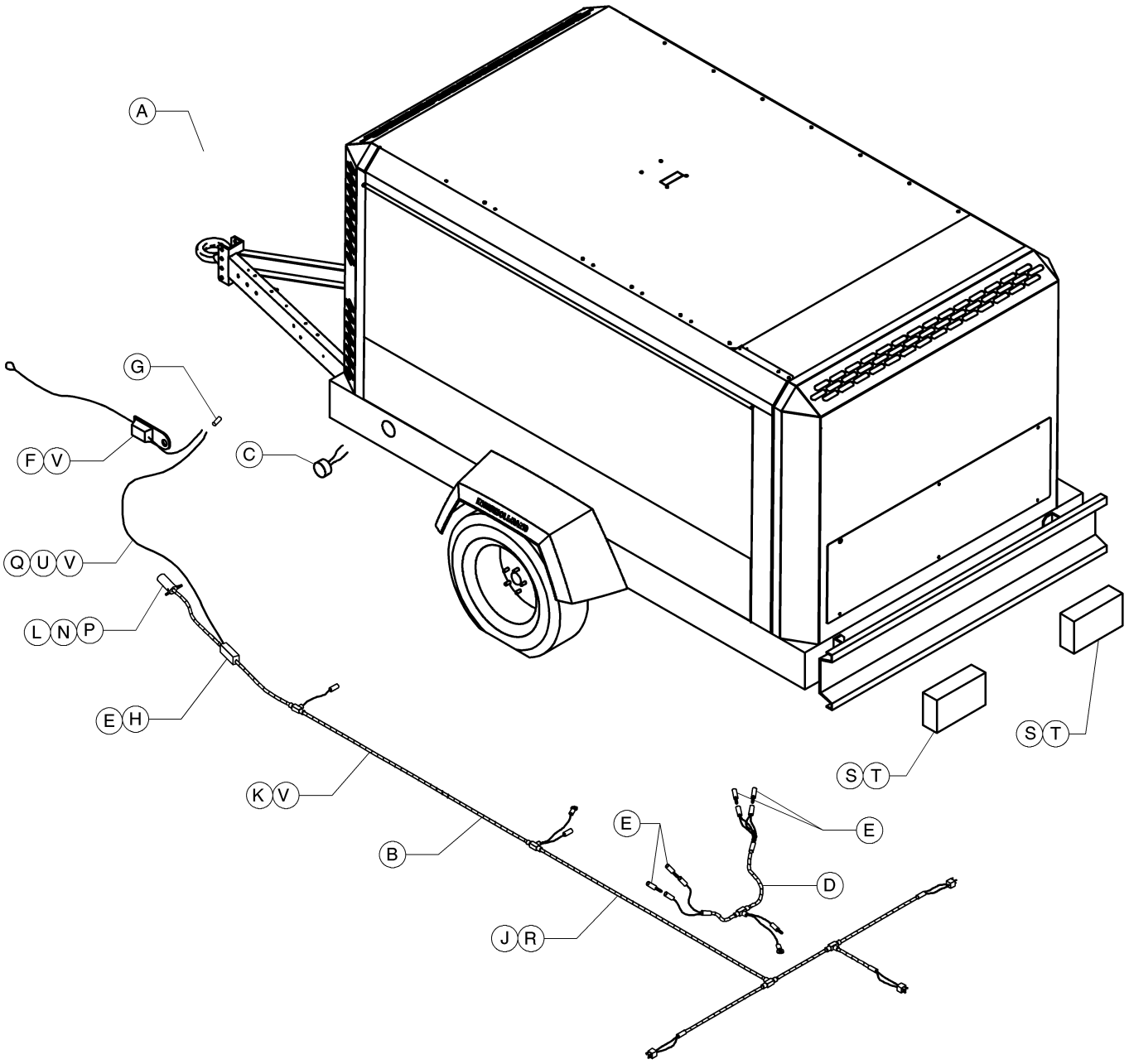
DATE/REV: 10/01 B

CE MARK BRAKE WIRING



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54625322	1	RUNNING GEAR	L	12346578	1	GASKET SET, ENGINE OVERHAUL
B	36895282	1	HARNESS, ELECTRIC BRAKES	M	87654321	1	GASKET SET, HEAD OVERHAUL
C	54717509	2	LAMP	N	12346578	1	GASKET SET, ENGINE OVERHAUL
D	87654321	1	GASKET SET, HEAD OVERHAUL	P	87654321	1	GASKET SET, HEAD OVERHAUL
E	35375427	5	TERMINAL, SNAP	Q	35120005	40”	WIRE, 14 GA BLACK
F	35315944	1	SWITCH, BREAKAWAY	R	87654321	1	GASKET SET, HEAD OVERHAUL
G	37140365	1	SPLICE, INSULATED	S	54717517	2	LAMP
H	35346337	1	LUG, TERMINAL	T	36888055	4	SCREW, HEX FLANGE M12-1.75 X 30
J	12346578	1	GASKET SET, ENGINE OVERHAUL	U	37001252	1	CLAMP, SUPPORT
K	87654321	1	GASKET SET, HEAD OVERHAUL	V	36797652	2	SCREW, TAPPING M06-1.0 X 12

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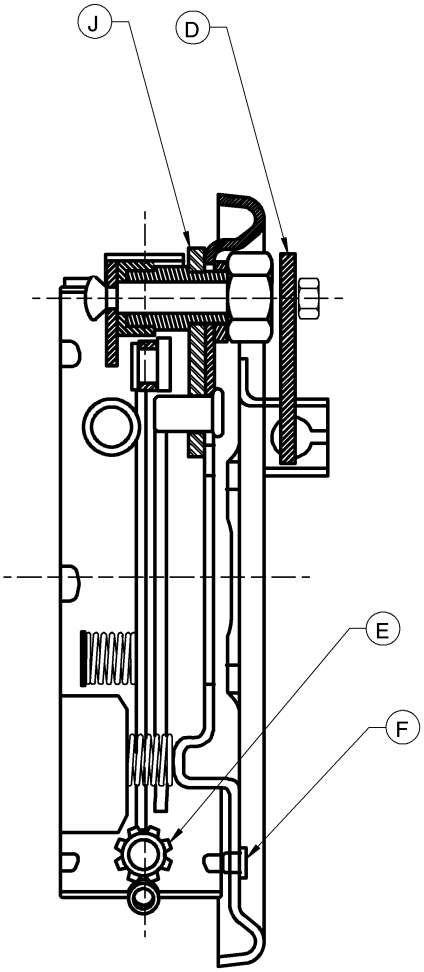
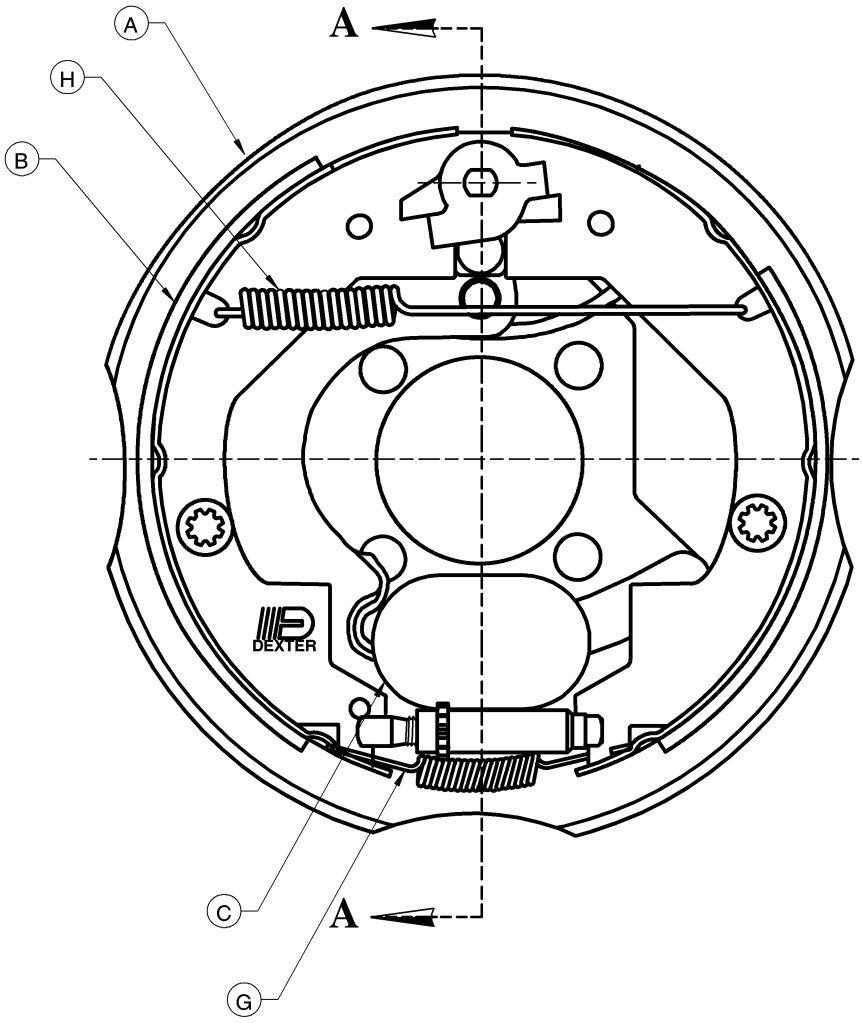


SECTION A - A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35390830	1	PLATE ASM., LH BACKING	F	35391069	2	PLUG, ADJUSTING SLOT
	35390848	1	PLATE ASM., RH BACKING	G	35393727	2	SPRING KIT, ADJ. SCREW &
B	36895803	1	SHOE KIT, BRAKE	H	35391002	2	SPRING, RETRACTOR
C	36895811	2	MAGNET KIT	J	36895829	1	LEVER KIT, LH ACTUATING
D	35390913	2	LEVER, PARKING BRAKE		36895837	1	LEVER KIT, RH ACTUATING
E	35391010	2	SCREW ASM., ADJUSTING				

DRAWING NOT AVAILABLE

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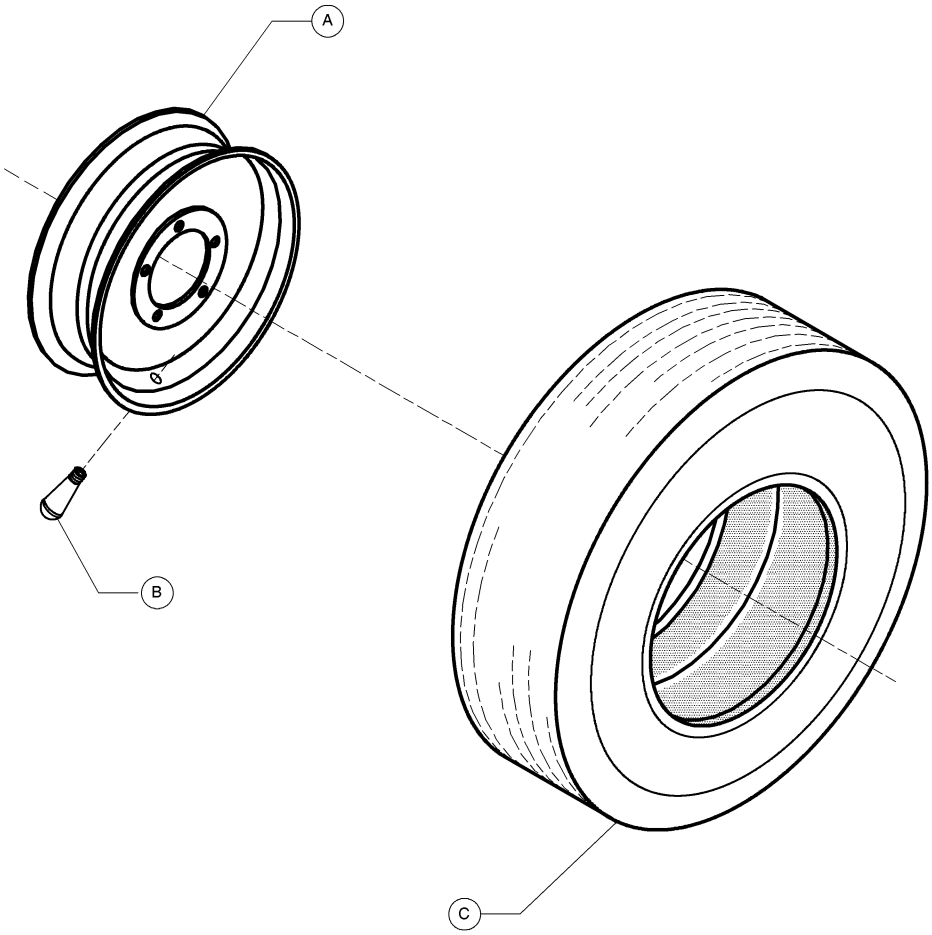
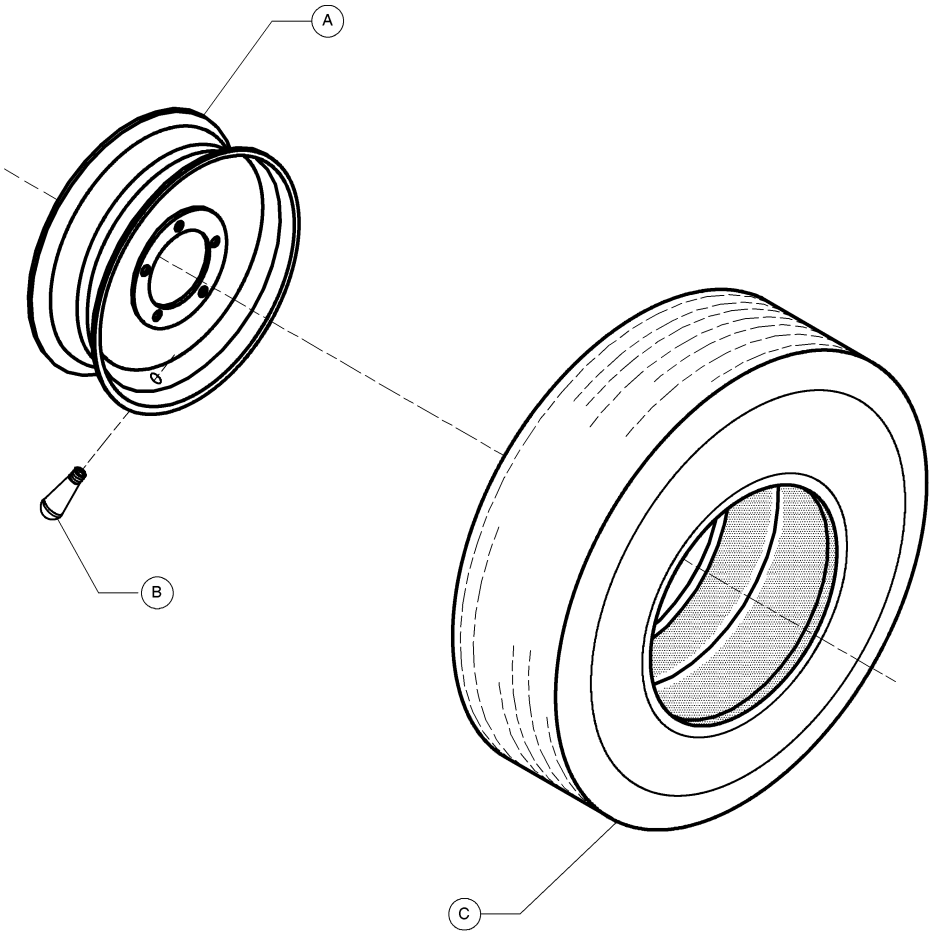
54720784-012 09/01 A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35318757	1	WHEEL,15 X 6				
B	35282565	1	VALVE STEM				
C	36846319	1	TIRE, ST225/75R15D				

CE MARK TIRE & WHEEL ASSEMBLY



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35318757	1	WHEEL,15 X 6				
B	35282565	1	VALVE STEM				
C	36846319	1	TIRE, ST225/75R15D				

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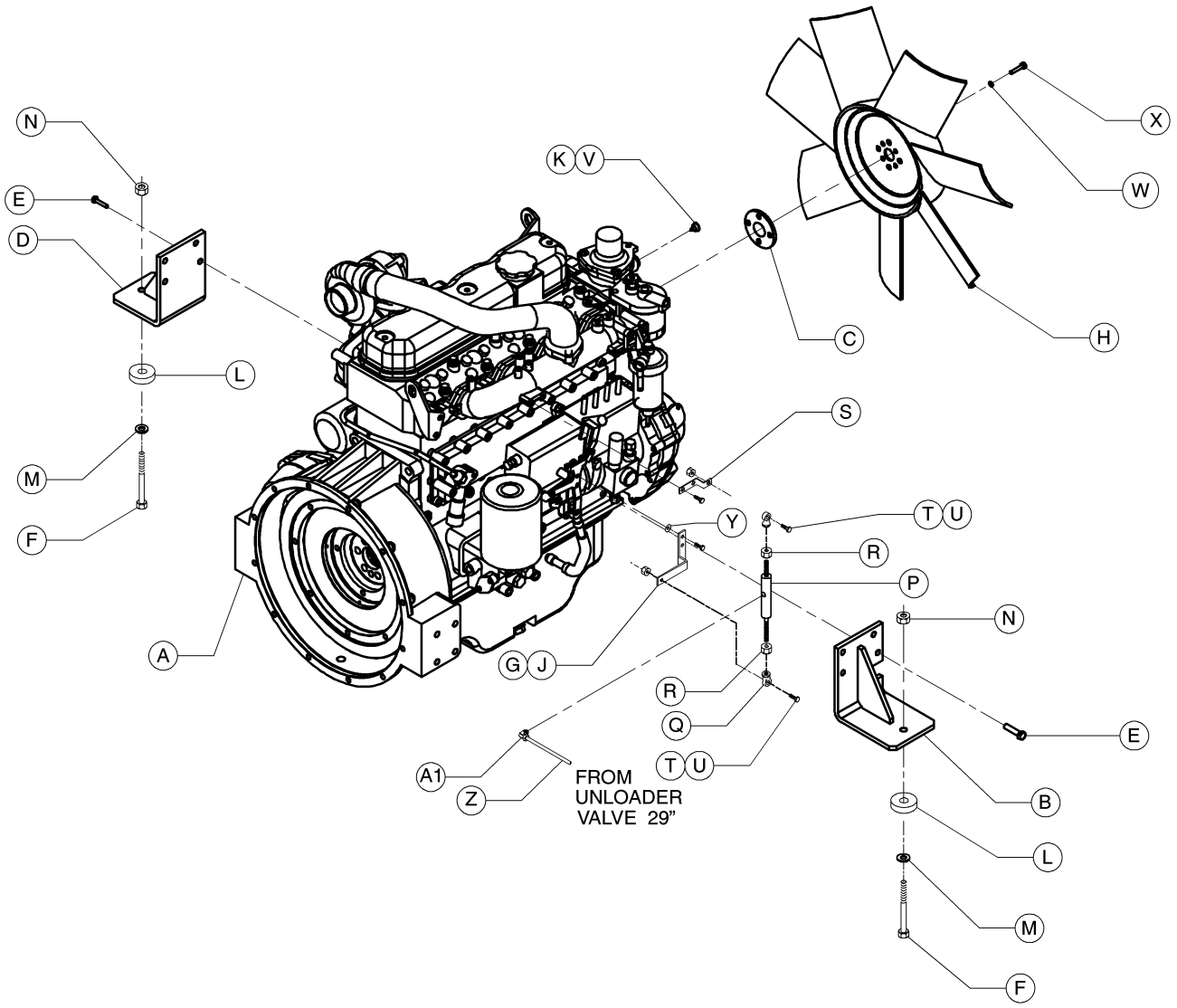
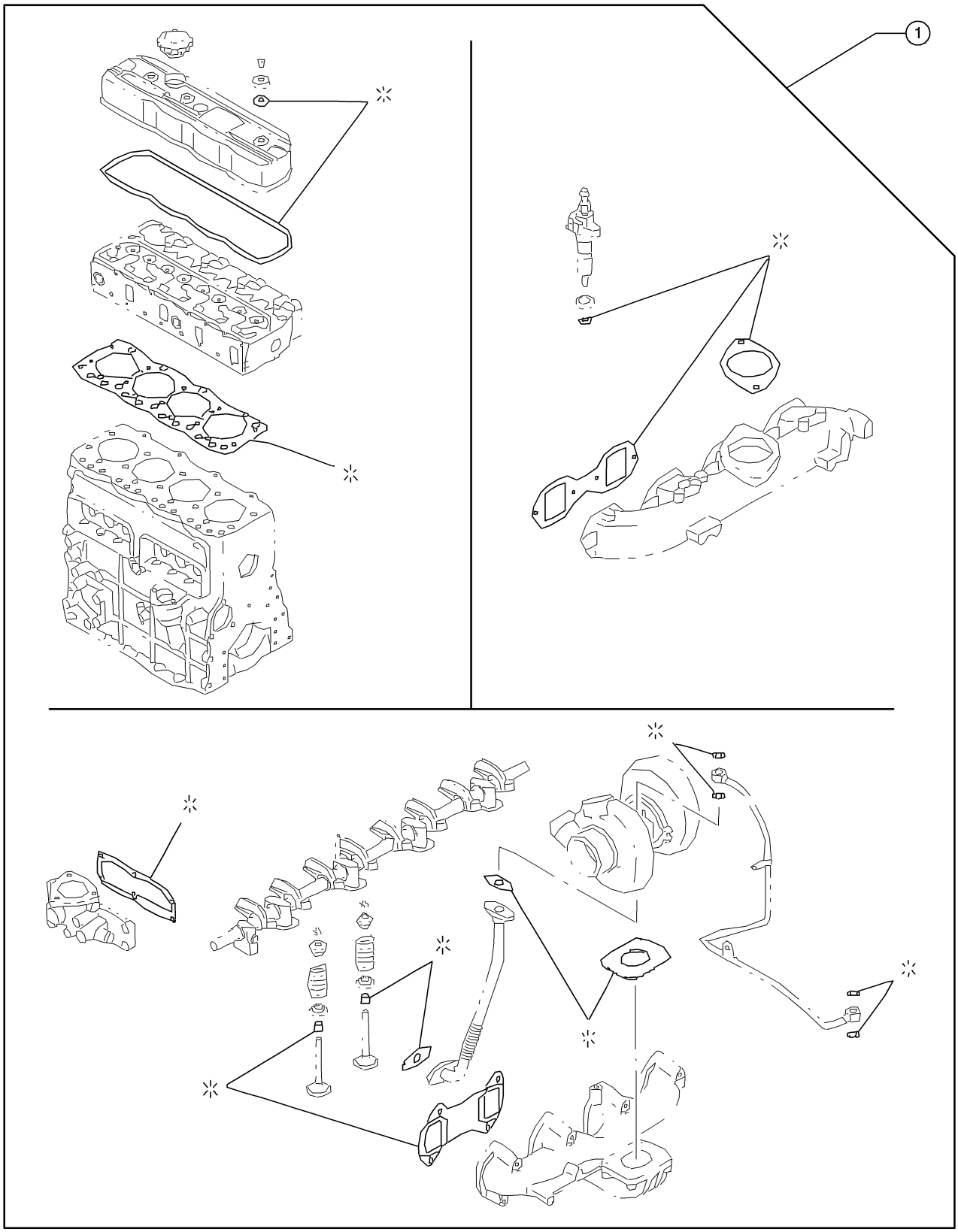
DRAWBAR END



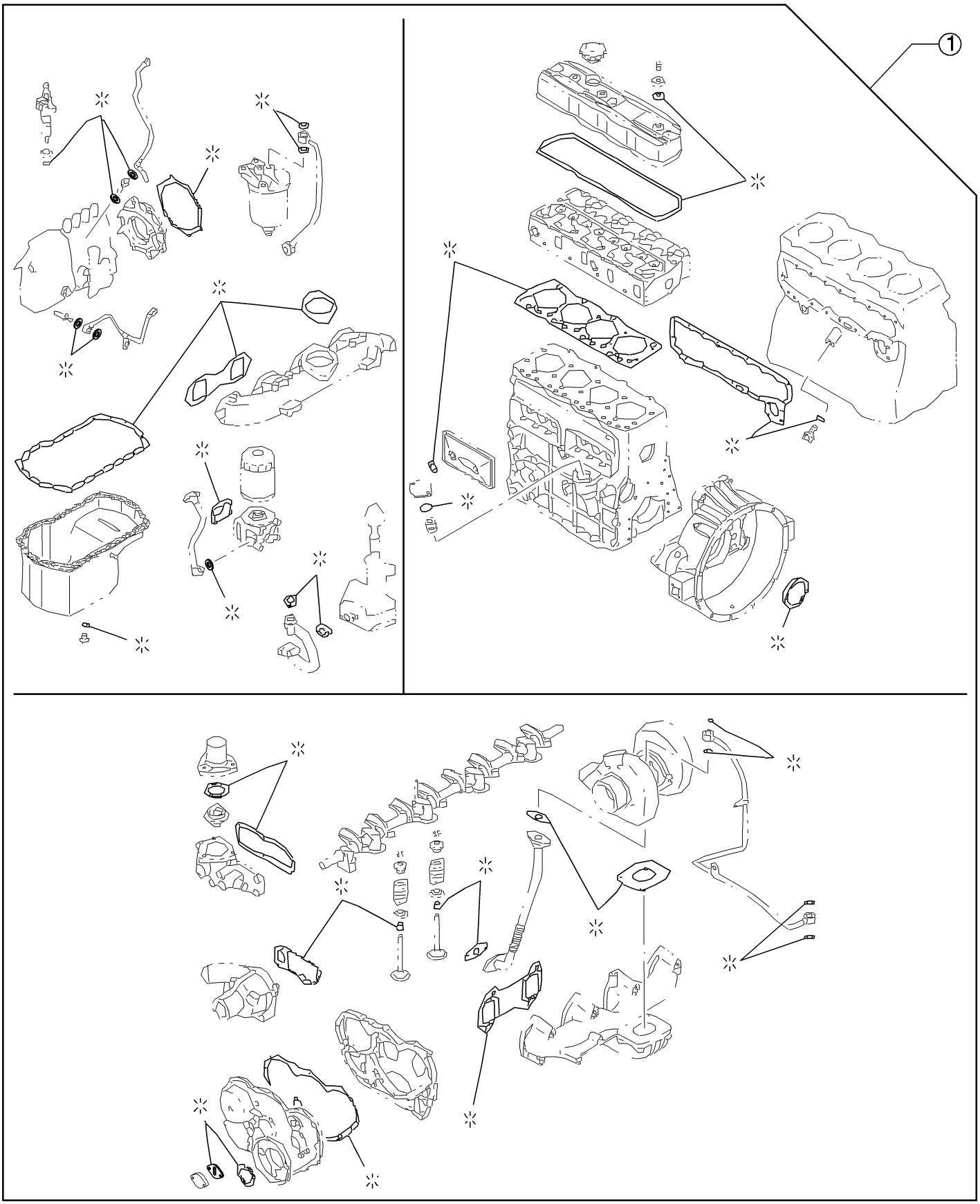
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54661087	1	ENGINE	P	35592435	1	CYLINDER, PNEUMATIC
B	54756481	1	BRACKET, STSD ENGINE	Q	35328467	2	BEARING, ROD END
C	49843204	1	SPACER, FAN	R	95923074	2	NUT, JAM 5/16-24
D	54756499	1	BRACKET, CRBSD ENGINE	S	54720313	1	LEVER, SPEED CONTROL
E	96741970	8	SCREW, HEX FLANGE M10-1.25 X 30	T	95934857	2	SCREW, HEX .25-20 X 1.25
F	96739958	2	SCREW, HEX M12-1.75 X 70	U	95923298	2	NUT, HEX.25-20
G	54720305	1	BRACKET, SPEED CONTROL	V	49844160	1	SWITCH, WATER TEMPERATURE
H	54731468	1	FAN	W	49843188	4	WASHER, FLAT ID=8
J	96702048	2	SCREW, HEX M08-1.25 X 10	X	49843196	4	BOLT, M8 X 105 HEX
K	35126663	2	TAB, MALE SLIP-ON	Y	95934998	1	WASHER, FLT
L	54756697	2	ISOLATOR, CENTER BOND	Z	35356484	*	TUBING, 3/8 SYNFLEX
M	54429295	2	WASHER, SNUBBING	A1	35370386	1	ELBOW, MALE 1/8NPT X 3/8 TUBE
N	35304047	2	NUT, NYLOC M12-1.75				

GASKET SET (HEAD OVERHAUL)



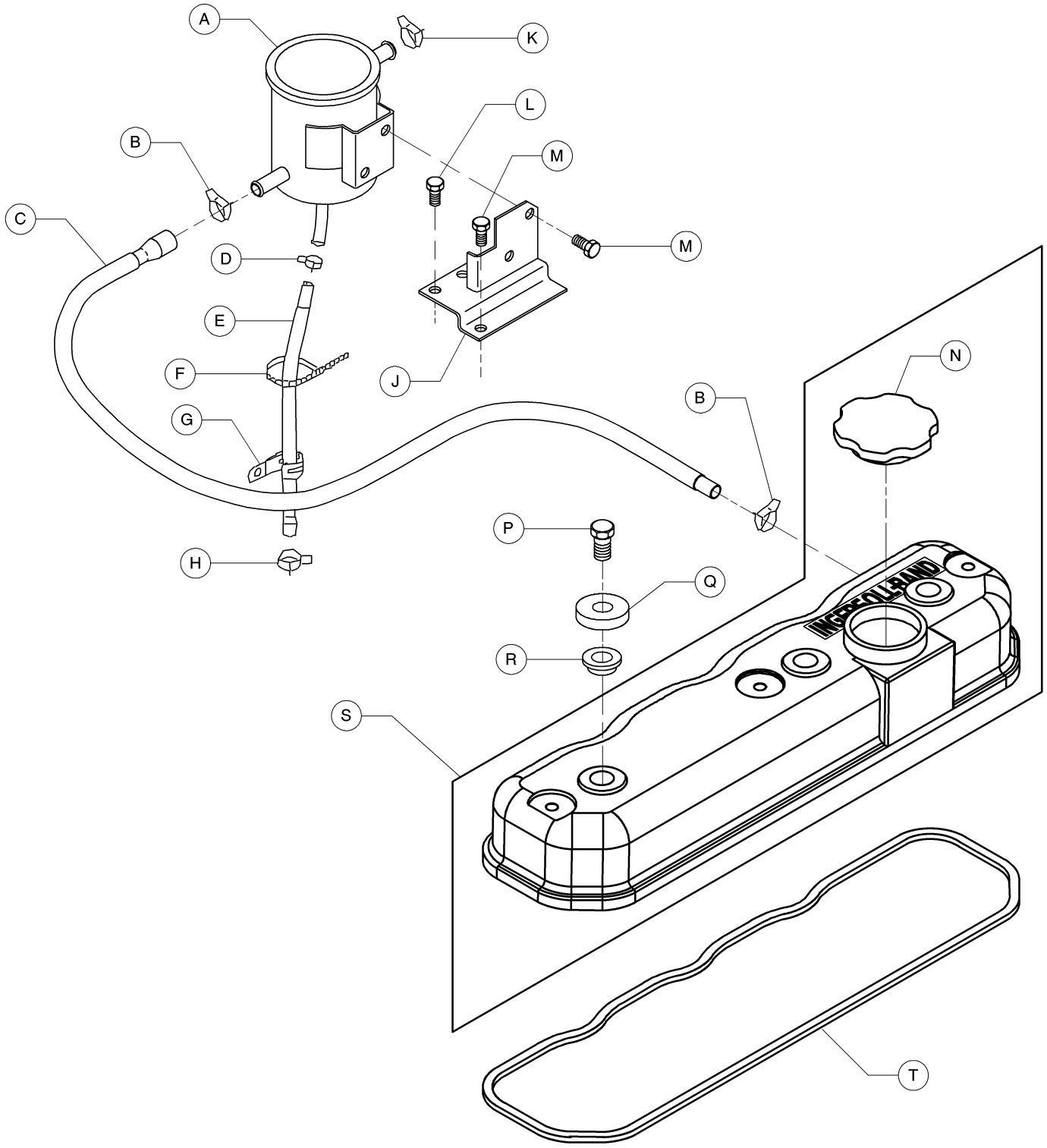
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54573183	1	GASKET SET, HEAD OVERHAUL				

MANUAL NO. - ILLUST. NO. 54720784-016 DATE/REV: 08/01 A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54573175	1	GASKET SET, ENGINE OVERHAUL				

CYLINDER HEAD COVER



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49809023	1	SEPARATOR, PVC OIL	K	49842974	1	CLIP, 11mm HOSE
B	4942982	2	CLIP, 19mm HOSE	L	49843030	2	BOLT, M6 X 16 HEX FLANGE
C	49843055	1	HOSE, COVER-PVC	M	49806797	3	BOLT, M8 X 16 HEX FLANGE
D	49843014	1	CLIP, 13mm HOSE	N	49849177	1	CAP, OIL FILLER
E	49843022	1	HOSE, PVC-OIL PAN	P	49841752	3	NUT, HEAD COVER CAP
F	49842990	1	CLIP, 12mm HOSE	Q	49841745	3	WASHER, HEAD COVER CAP NUT
G	49843006	1	CLIP, HOSE	R	49841737	3	GASKET, CAP NUT
H	49807175	1	CLIP, 14mm HOSE	S	54650791	1	COVER, CYLINDER HEAD
J	49843048	1	BRACKET, OIL SEPARATOR	T	54385778	1	GASKET, HEAD

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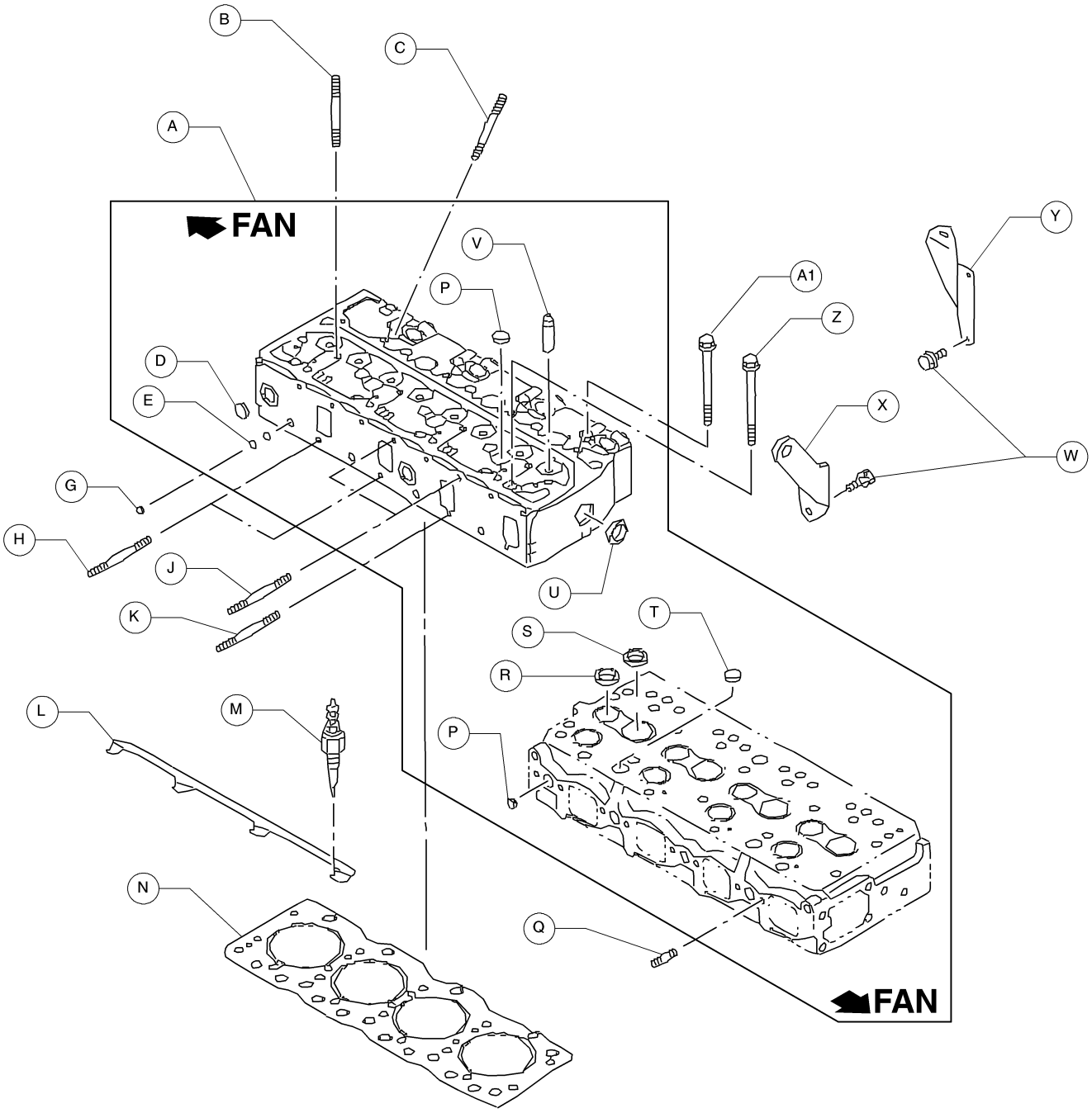
54720784-018 08/01 A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49841760	1	HEAD ASM., CYLINDER	P	49841844	7	CUP, 25mm SEALING
B	49807092	3	STUD, ROCKER ARM	Q	88082276	4	STUD, INTAKE MANIFOLD
C	49841927	8	STUD, INJECTOR NOZZEL	R	49841810	4	SEAT, EXHAUST VALVE INSERT
D	88080569	2	CUP, 32mm SEALING	S	49841802	4	SEAT, INTAKE VALVE INSERT
E	49841828	4	PLUG, 11.9mm PLATE	T	49841851	2	CUP, 20mm SEALING
F	88080486	4	CUP, 12.3mm SEALING	U	88080353	1	CUP, 45mm SEALING
G	49841877	4	CUP, WATER JACKET SEALING	V	49841794	8	GUIDE, VLAVLE
H	49841919	2	STUD, M10 X 85 L=100	W	49841893	2	BOLT, HANGER
J	48941901	2	STUD, M8 X 87	X	49841885	1	HANGER, REAR ENGINE
K	49840814	1	STUD, M8 X 60 L=72	Y	49841935	1	HANGER, FRONT ENGINE
L	54747589	1	CONNECTOR, GLOW PLUG	Z	49841786	14	BOLT, M12 X 113 HEX
M	54385893	4	PLUG, GLOW	A1	49841778	4	BOLT, M12 X 100 HEX
N	49840473	1	GASKET, CYLINDER HEAD				

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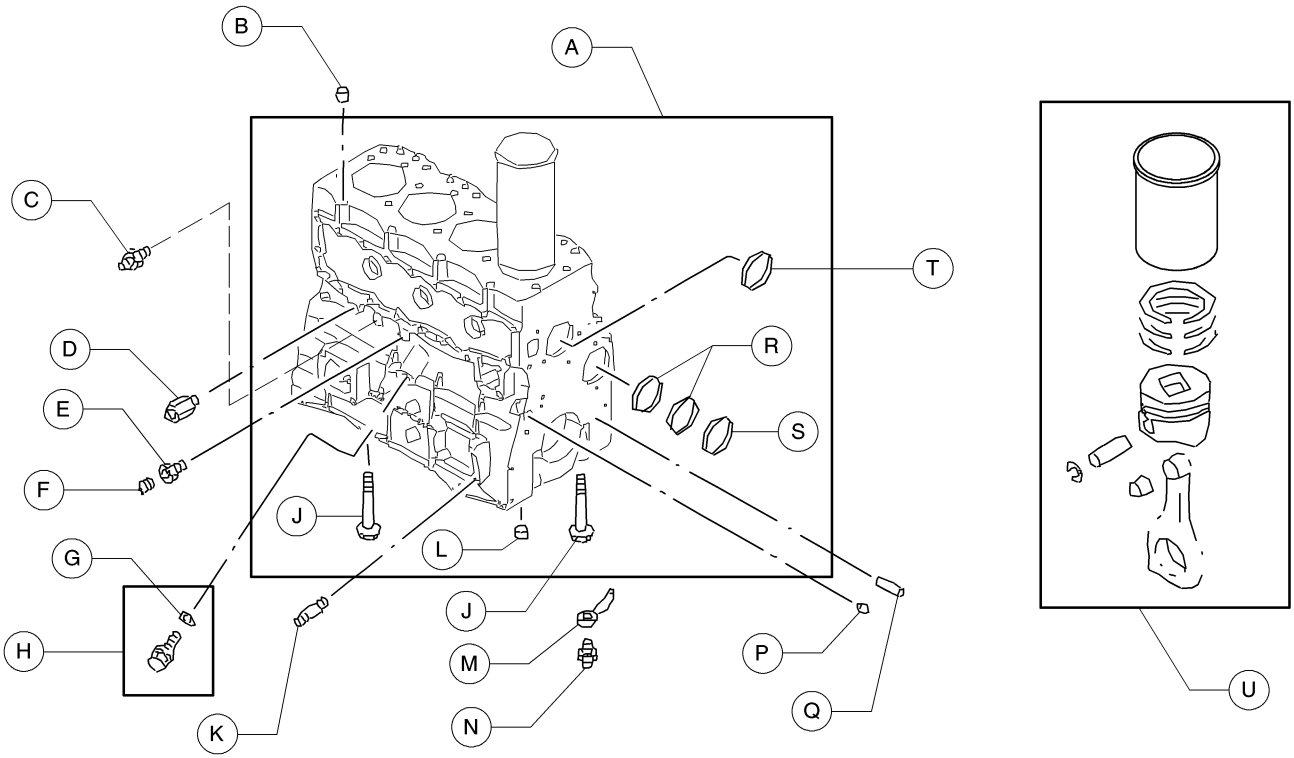
CYLINDER BLOCK



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49841943	1	BLOCK ASM., CYLINDER	M	49842107	4	JET, PISTON COOLING OIL
B	49842008	2	DOWEL, CYL BLOCK/HEAD	N	49842180	4	VALVE, OIL CHECK
C	49842214	1	NIPPLE, INJECTION PUMP	P	49842073	2	PLUG, OIL GALLEY
D	49809056	1	COCK, WATER DRAIN	Q	49842081	1	PIN, TIMING GEAR CASE
E	49841729	1	ADAPTER, OIL PRESSURE SWITCH	R	49842032	2	METAL, INNER CRANKSHAFT
F	54757935	1	SWITCH, OIL PRESSURE	S	49842040	1	METAL, OUTER CRANKSHSFT
G	49842065	1	GASKET, RELIEF VALVE	T	49842115	1	CUP, SEALING
H	49842057	1	VALVE, OIL RELIEF	U	49841950	4	LINER SET, GRADE 1 CYLINDER
J	49841992	10	BOLT, BEARING CAP		49841968	4	LINER SET, GRADE 2 CYLINDER
K	49842222	1	STUD, M10 L1=30		49841676	4	LINER SET, GRADE 3 CYLINDER
L	49842172	1	DOWEL, BEARING CAP		49841984	4	LINER SET, GRADE 4 CYLINDER

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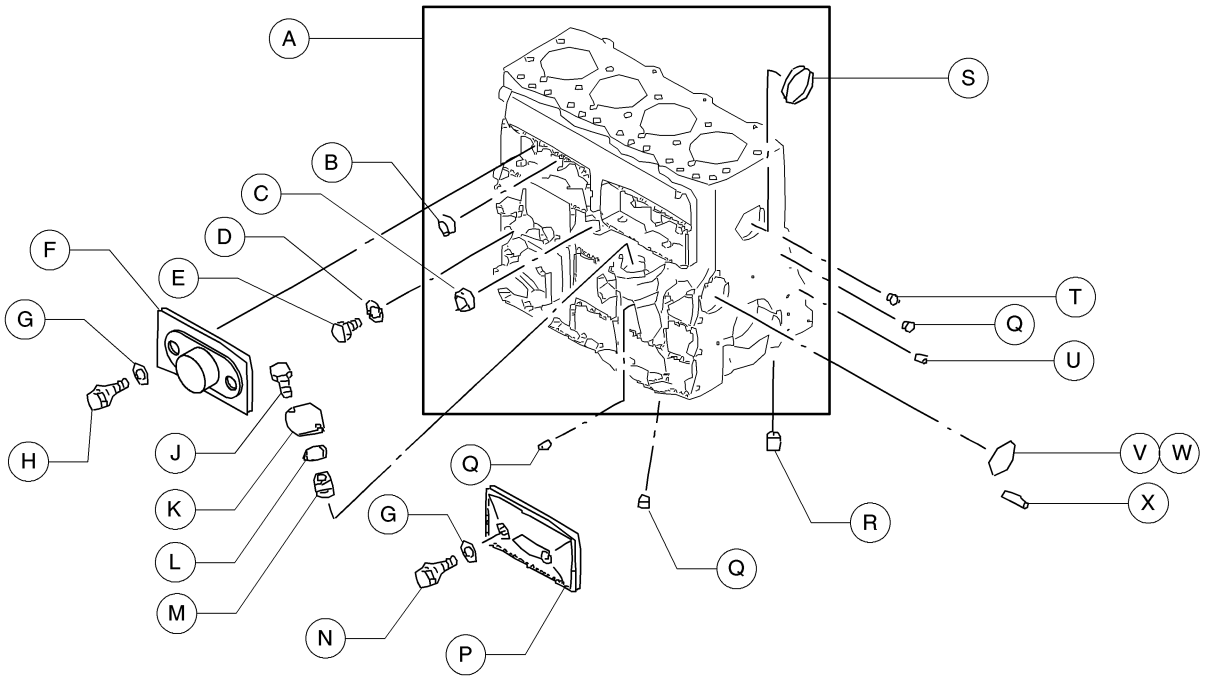

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49841943	1	BLOCK ASM., CYLINDER	M	49842206	1	BUSHING, OIL PUMP DRIVE SHAFT
B	88080569	2	CUP, TAPPET CHAMBER SEALING	N	49842156	1	STUD, M8 X 56
C	49842024	1	CUP, SEALING	P	49842123	1	COVER, TAPPET CHAMBER
D	88082607	1	GASKET, CYL BLOCK SIDE PLUG	Q	49842016	7	PLUG, 1/8 NPT SQ HEAD
E	49849284	1	PLUG, OIL GALLEY	R	88080494	1	PLUG, 3/8 NPT
F	49842131	1	COVER, TAPPET CHAMBER	S	49842115	1	CUP, SEALING
G	88082599	4	GASKET, TAPPET BOLT	T	49842073	2	PLUG, OIL GALLEY
H	49842149	3	BOLT, M8 X 56 HEX FLANGE	U	49849037	2	PIN, OIL SEAL RETAINING
J	88080213	2	BOLT, OIL PUMP COVER	V	49842099	1	CUP, REAR SEALING
K	49842198	1	COVER, OIL PUMP	W	49849318	1	PLUG, PLATE
L	54429733	1	GASKET, OIL PUMP COVER	X	49842164	2	PIN, FLYWHEEL HOUSING

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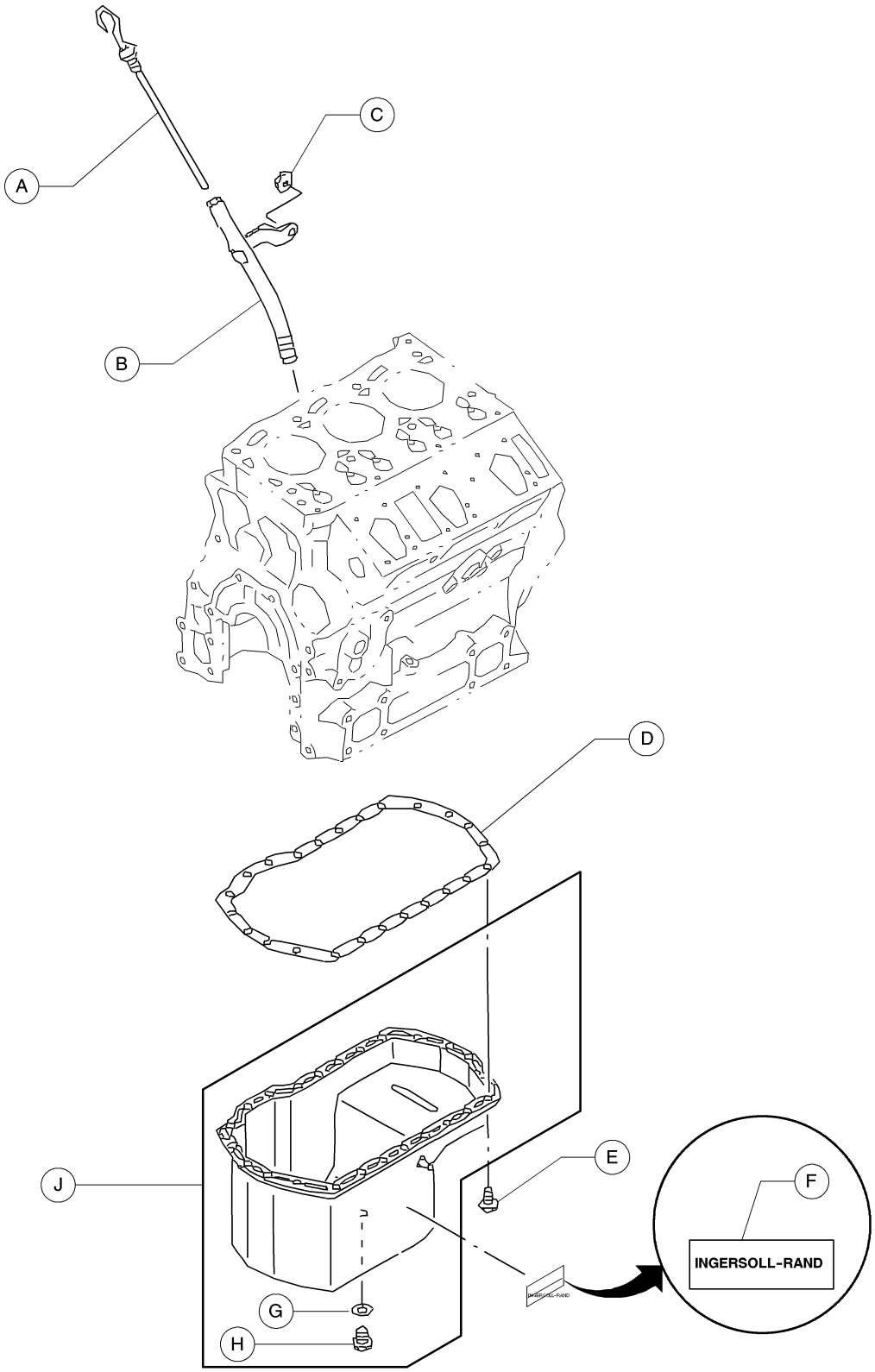
OIL PAN



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49842248	1	DIPSTICK	F	49842271	1	PLATE, NAME
B	49842255	1	GUIDE, DIPSTICK	G	88080395	1	GASKET, DRAIN PLUG
C	88080312	1	NUT, DIPSTICK GUIDE	H	88082656	1	PLUG, OIL PAN DRAIN
D	49842263	1	GASKET, OIL PAN	J	49842230	1	PAN ASM., OIL
E	88080205	24	BOLT, M8 X 18 HEX LOCK WASHER				

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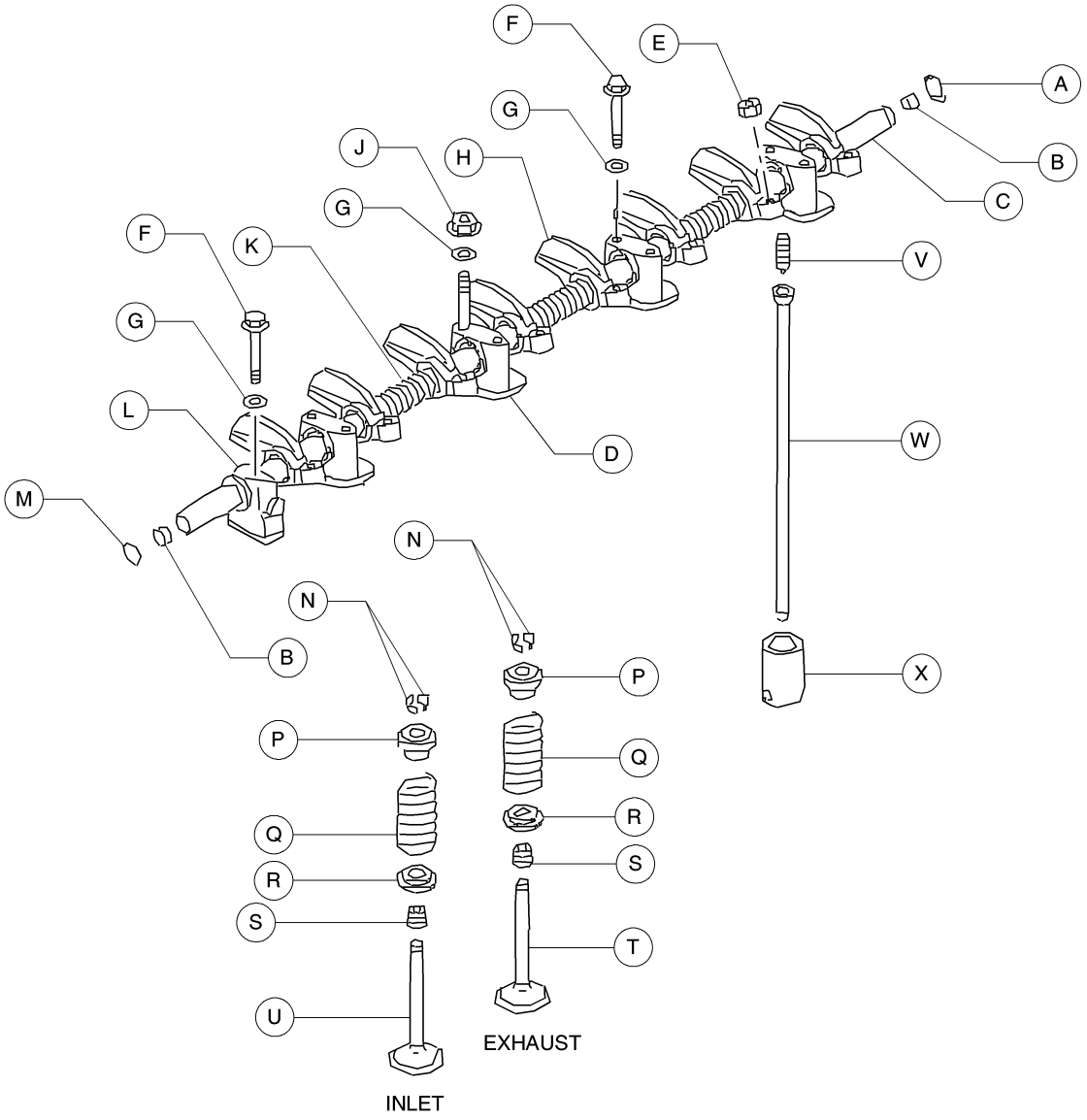
FAN



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	88082516	1	RING, SNAP	M	49842388	1	GASKET, ROCKER SHAFT
B	88082680	2	PLUG, ROCKER SHAFT END	N	49842396	16	COLLAR, SPLIT
C	49842362	1	SHAFT, ROCKER ARM	P	49842412	8	SEAT, UPPER SPRING
D	49842461	4	BRACKET, INTERIOR SHAFT	Q	49842404	8	SPRING, VALVE
E	88082383	1	NUT, ADJ SCREW LOCK	R	88080627	8	SEAT, LOWER SPRING
F	49842479	6	BOLT, BRACKET	S	49842420	8	SEAL, VALVE GUIDE
G	49842438	9	WASHER, ROCKER ARM	T	49842305	4	VALVE, EXHAUST
H	49842446	8	ARM, ROCKER	U	49842297	4	VALVE, INTAKE
J	49842503	3	NUT, BRACKET	V	49842453	8	SCREW, ROCKER ARM ADJ.
K	49842511	3	SPRING, ROCKER SHAFT	W	49842487	8	ROD, PUSH
L	49842370	1	BRACKET, FRONT ROCKER ARM SHAFT	X	49842495	8	TAPPET, VALVE

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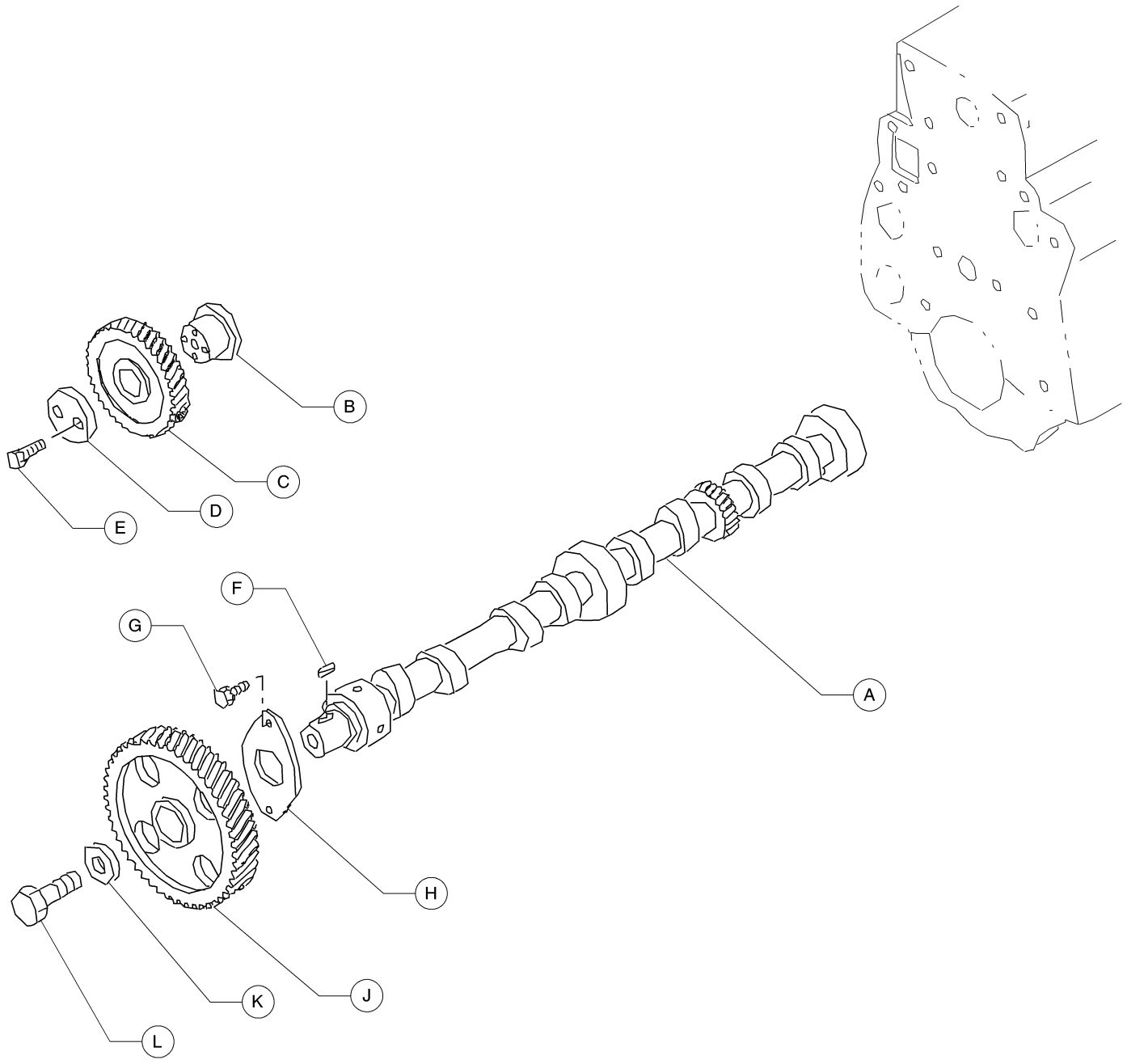
CAMSHAFT



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49842289	1	CAMSHAFT	G	88082219	2	BOLT, THRUST PLATE
B	49842537	1	SHAFT, IDLE GEAR	H	49842339	1	PLATE, THRUST
C	49842552	1	GEAR, IDLE	J	49842321	1	GEAR, CAMSHAFT
D	49842545	1	COLLAR, IDLE GEAR THRUST	K	49842354	1	WASHER, CAMSHAFT GEAR
E	49842529	2	BOLT, M10 X 55 HEX	L	49842313	1	BOLT, M14 X 39 HEX
F	49842347	1	KEY, CAM GEAR SHAFT				

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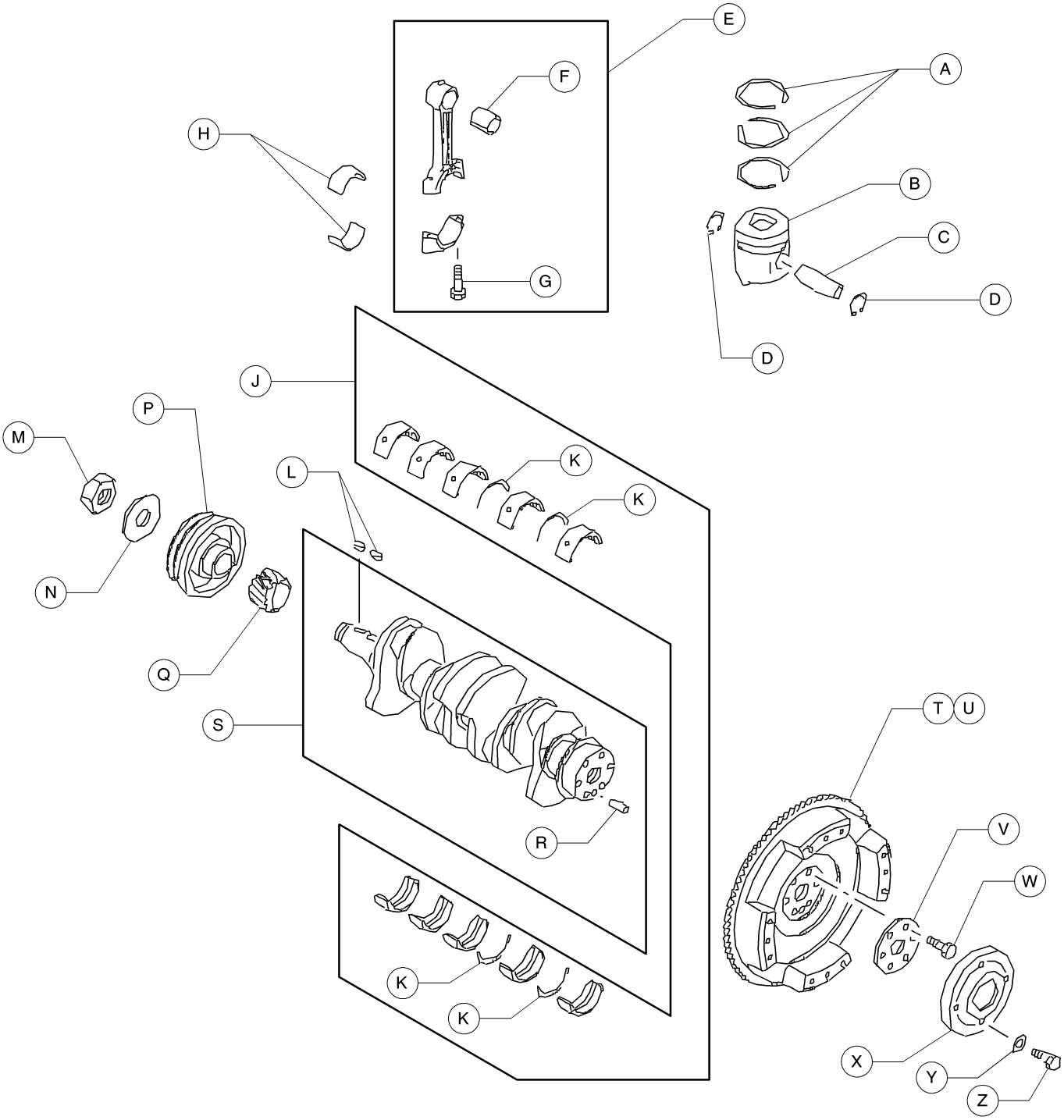

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49842719	4	RING SET, STD. PISTON	N	49842685	1	WASHER, CRANKSHAFT PULLEY
B	49842693	4	PISTON, GRADE AX	P	49842677	1	PULLEY, CRANKSHAFT
	49842701	4	PISTON, GRADE CX	Q	49842594	1	GEAR, CRANKSHAFT
C	49842735	4	PIN, PISTON	R	49842602	1	PIN, FLYWHEEL
D	49842792	8	RIING, PISTON PIN SNAP	S	49842560	1	CRANKSHAFT
E	49842743	4	ROD ASM., CONNECTING	T	49842586	1	FLYWHEEL
F	49842750	4	BUSHING, CONNECTING ROD	U	49842610	1	GEAR, RING
G	49842768	4	BOLT, CONNECTING ROD	V	49842628	1	WASHER, FLYWHEEL
H	49842727	8	METAL SET, STD. CONNECTING ROD	W	49842636	6	BOLT, M14 X 36 HEX
J	49842578	1	METAL SET, CRANKSHAFT	X	49842776	1	HOLDER, FLYWHEEL BEARING
K	49842644	2	WASHER, CRANKSHAFT THRUST	Y	49842784	4	WASHER, 10.5 ID
L	49842669	2	KEY, CRANKSHAFT	Z	49806854	4	BOLT, M10 X 30 HEX
M	49842651	1	NUT, FRONT CRANKSHAFT				

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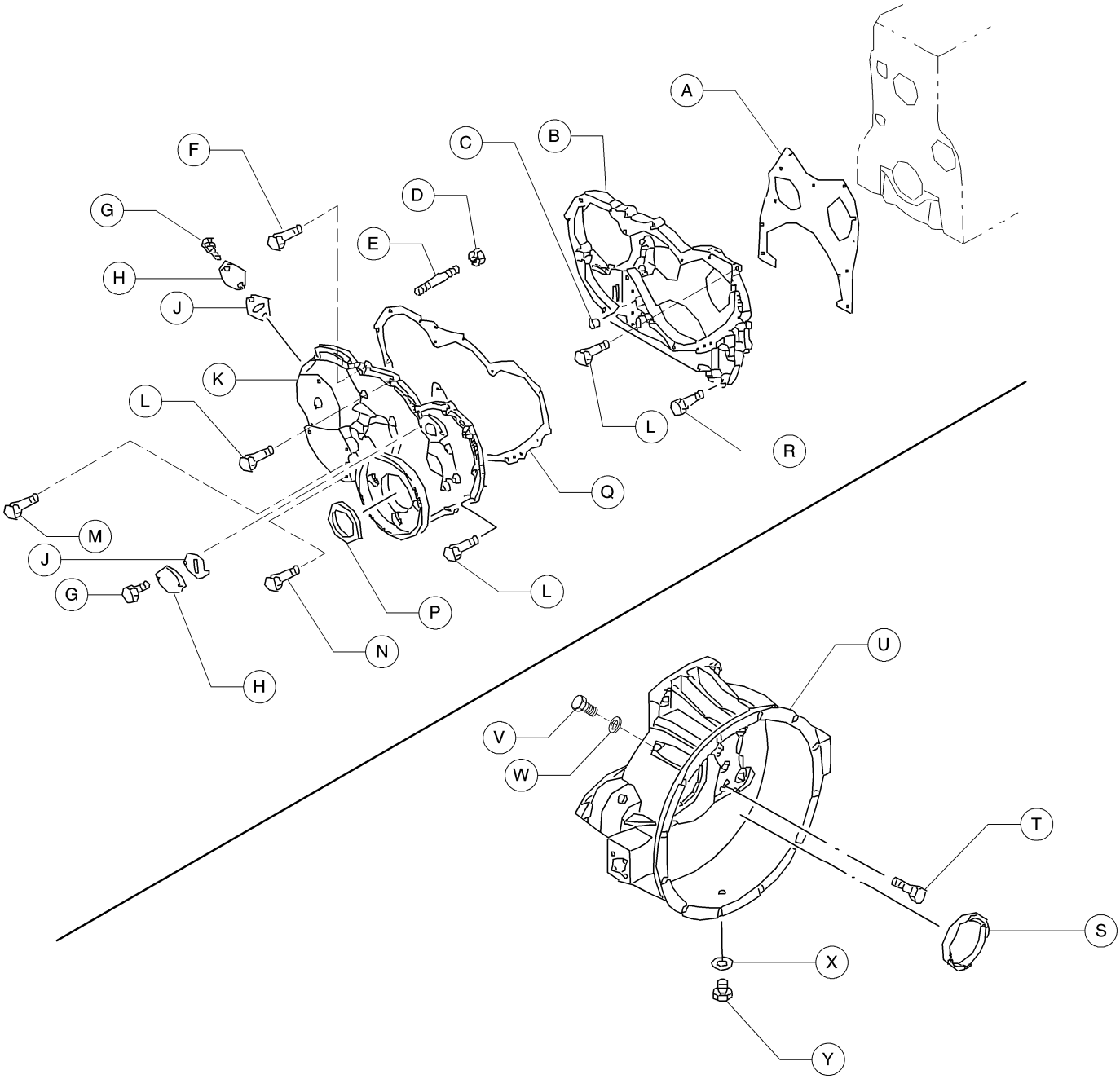
TIMING GEAR CASE



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49842859	1	GASKET, TIMIMNG CASE-CYL BLOCK	N	49842867	3	BOLT, M10 X 50 HEX FLANGE
B	49842800	1	CASE, TIMING GEAR	P	49842875	1	SEAL, FRONT CRANKSHAFT OIL
C	49849227	1	DOWEL, GEAR CASE	Q	49842834	1	GASKET, GEAR CASE-COVER
D	88080312	2	NUT, M8 HEX FLANGE	R	49806805	2	BOLT, M8 X 40 HEX FLANGE
E	48942891	2	STUD, M8 X 55 L=67	S	49842883	1	SEAL, REAR CRANKSHFT OIL
F	88080338	4	BOLT, M8 X 55 HEX FLANGE	T	88082219	7	BOLT, M8 X 25 HEX LK WASHER
G	88080023	4	BOLT, M8 X 12 HEX FLANGE	U	49842818	1	HOUSING, FLYWHEEL
H	88080593	2	COVER, TIMING CHECK HOLE	V	88080387	1	PLUG, SENSOR
J	88081807	2	GASKET, TIMING HOLE COVER	W	88082581	1	GASKET, 20.5 ID
K	49842842	1	COVER, TIMING GEAR CASE	X	88082573	1	GASKET, 16.2 ID
L	49842826	12	BOLT, M8 X 22 HEX FLANGE	Y	88082748	1	PLUG, M16 X 12
M	49806847	1	BOLT, M8 X 80 HEX FLANGE				

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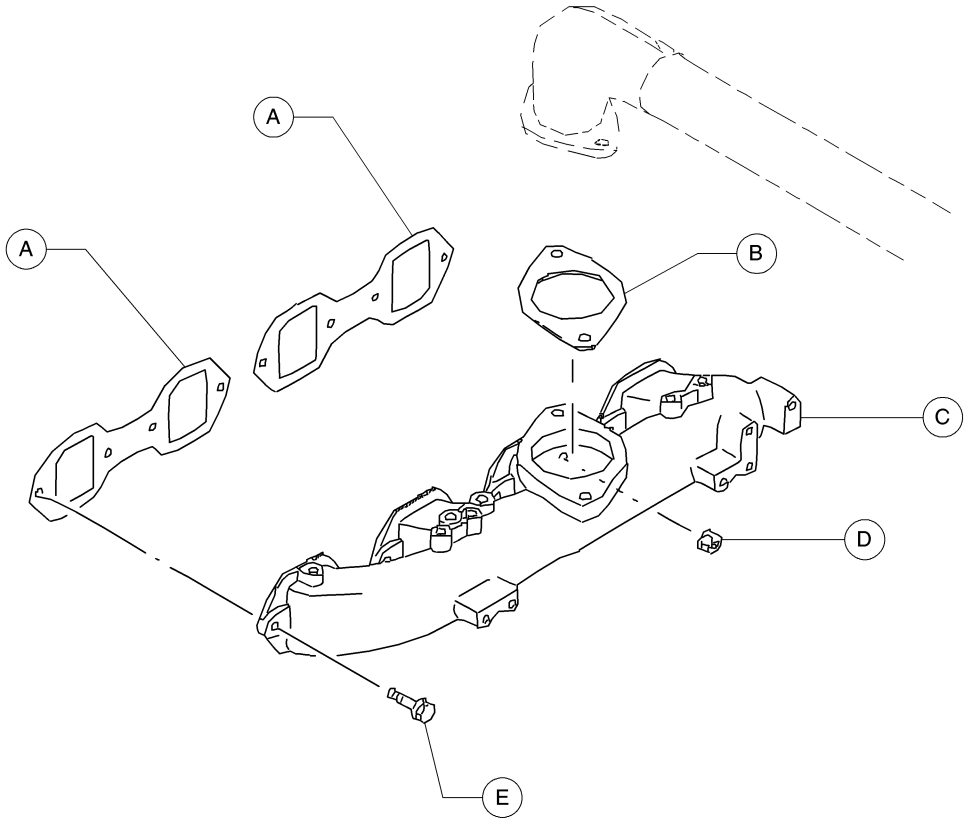
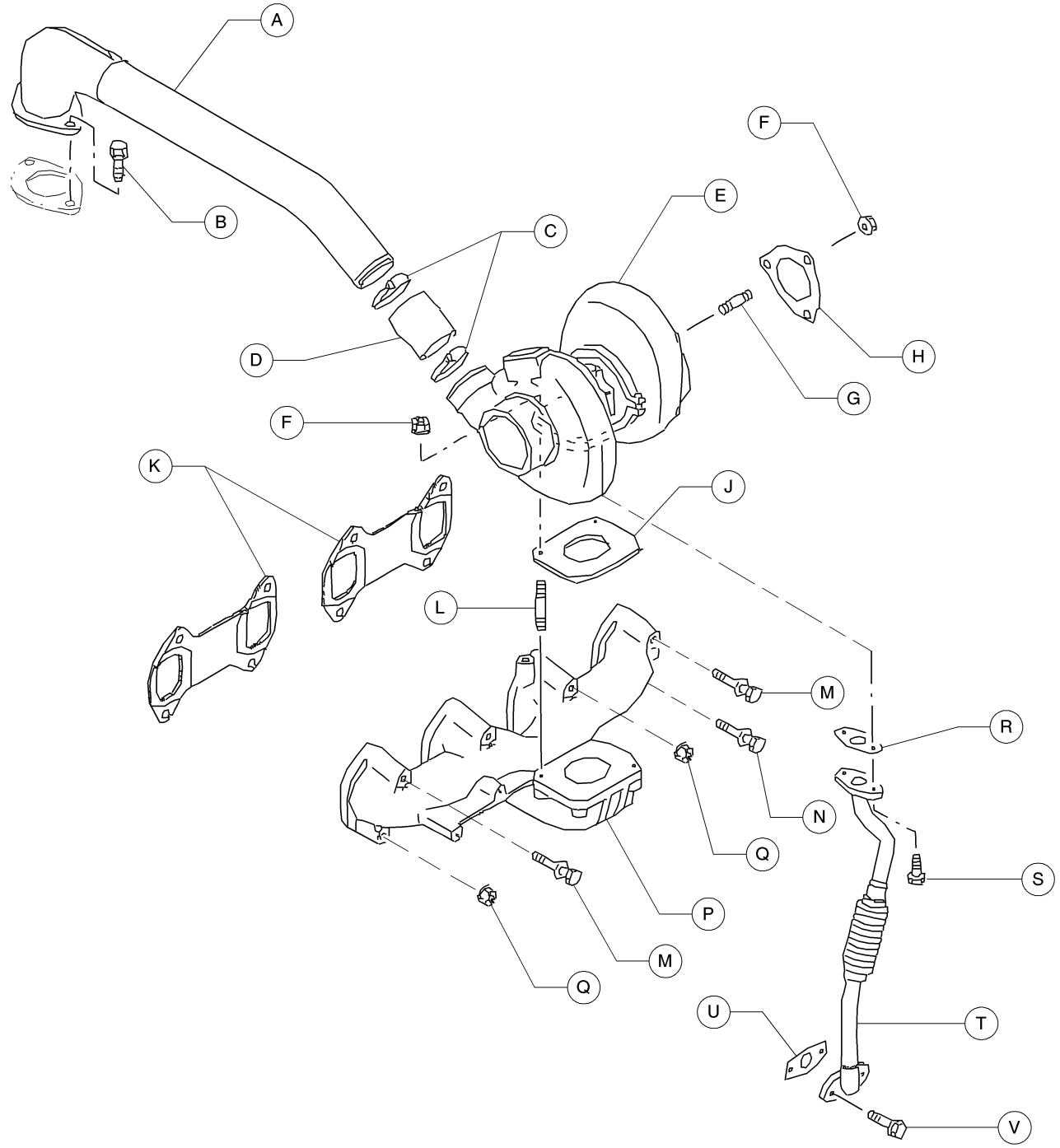


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49842917	2	GASKET, INTAKE MANIFOLD				
B	49842925	1	GASKET, INTAKE DUCT				
C	49842909	1	MANIFOLD, INTAKE				
D	88080312	4	NUT, INTAKE				
E	88080056	4	BOLT, INTAKE MANIFOLD				

EXHAUST MANIFOLD & TURBO



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49843279	1	PIPE, TURBO OUT	L	49840234	4	STUD, MANIFOLD-TURBO
B	49843287	2	BOLT, INLET DUCT	M	49842958	2	BOLT, M8 X 63 HEX WASHER
C	49843295	2	CLIP, TURBO HOSE	N	49842966	1	BOLT, M8 X 75 HEX WASHER
D	49843329	1	HOSE, TURBO	P	49842933	1	MANIFOLD, EXHAUST
E	88082359	1	TURBO ASM.	Q	49840135	5	NUT, EXHAUST MANIFOLD
F	49843303	7	NUT, M8 HEX FLANGE	R	88080122	1	GASKET, TURBO OIL PIPE
G	49842361	3	STUD, TURBOCHARGER	S	49843030	2	BOLT,M6 X16 HEX
H	49840630	1	GASKET,TURBO ADAPTER	T	49843311	1	PIPE, TURBO OIL DRAIN
J	88080460	1	GASKET, TURBO EXHAUST	U	88080080	1	GASKET, ENG-TURBO OIL PIPE
K	49842941	2	GASKET, EXHAUST MANIFOLD	V	88080049	2	BOLT, M8 X 20 HEX

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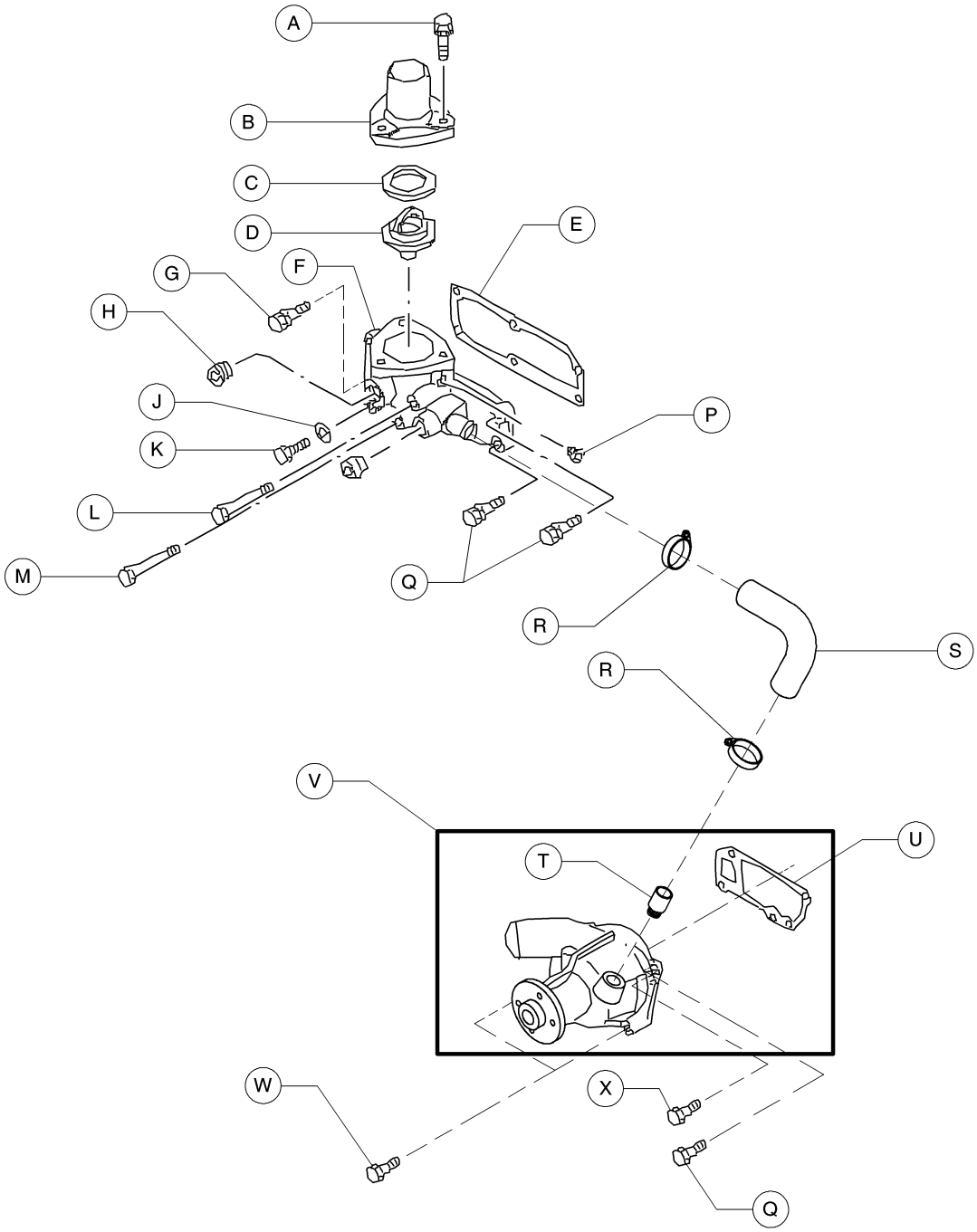

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49842826	3	BOLT, M8 X 22 HEX FLAGE	M	49843139	1	BOLT, M10 X 80 HEX
B	49843154	1	PIPE, WATER OUTLET	N	49843113	1	PLUG, M25
C	49843162	1	GASKET, PIPE-OUTLET HSG.	P	88080494	1	PLUG, 3/8 NPT
D	48907860	1	THERMOSTAT	Q	49840389	3	BOLT, M10 X 35 HEX WASHER
E	49807035	1	GASKET, THERMOSTAT HOUSING	R	49843170	2	CLIP, BYPASS HOSE
F	49843105	1	HOUSING, THERMOSTAT	S	88082391	1	HOSE, BYPASS WATER
G	49806854	1	BOLT, M10 X 30 HEX WASHER	T	49843071	1	PIPE, INLET SUCTION
H	49843121	1	PLUG, 3/4 NPT	U	49808033	1	GASKET, PUMP-CYL BLOCK
J	88082573	1	GASKET, SW	V	49808629	1	PUMP ASM., WATER
K	88082649	1	BOLT, M10 X 90 HEX WASHER	W	49843097	2	BOLT M10 X 45 HEX FLANG
L	49843147	2	BOLT M10 X 80 HEX	X	49806862	1	BOLT, M10 X 70 HEX FLANGE

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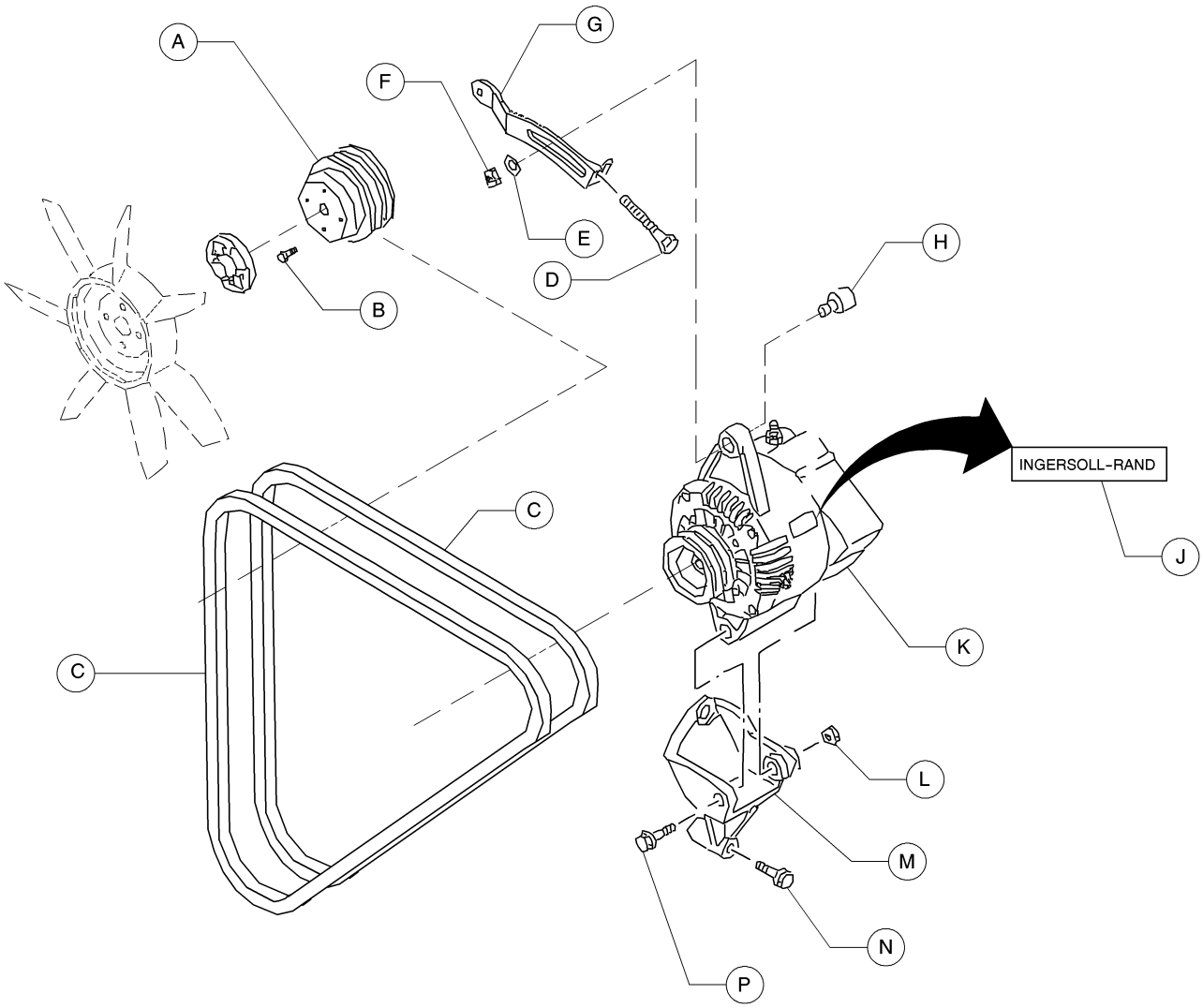
FAN & ALTERNATOR



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49843063	1	PULLEY, 2-GROOVE WATER PUMP	H	49843238	1	PIECE, SLIDING
B	88082243	2	SCREW, M6 X 10	J	49844210	1	PLATE, ALTERNATOR
C	54565216	2	BELT, FAN	K	54747571	1	ALTERNATOR
D	49843253	1	BOLT, ADJUSTING	L	88080320	1	NUT, M10 HEX FLANGE
E	49843212	1	WASHER, ADJ PLATE	M	49844152	1	BRACKET, ALTERNATOR
F	49843246	1	NUT, ADJ PLATE	N	49842876	1	BOLT, M10 X 50 HEX FLANGE
G	49843220	1	PLATE, ADJUSTING	P	49844145	1	BOLT, M10 X 100

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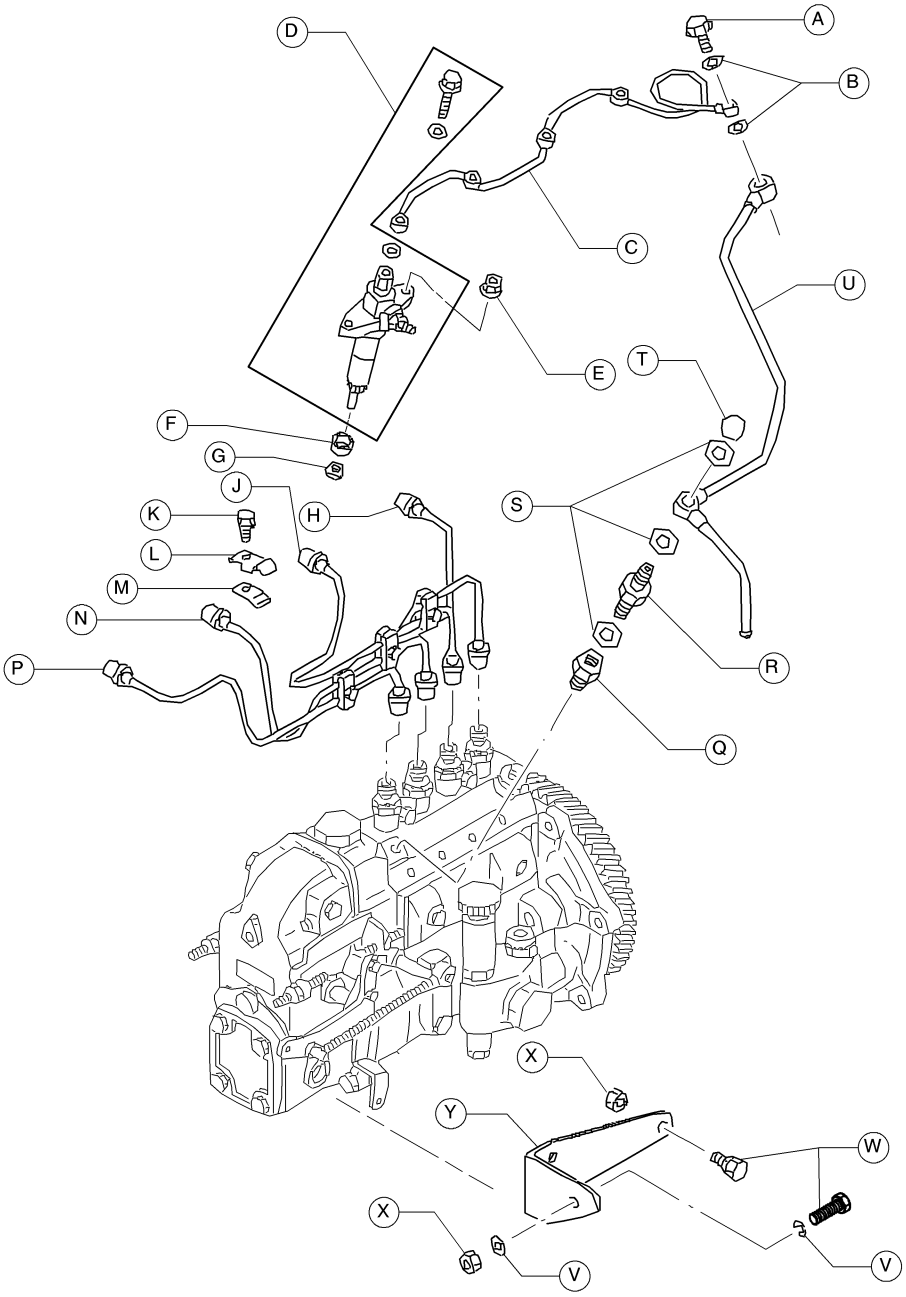

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49843378	1	BOLT, LEAK OFF PIPE	N	88080668	1	PIPE, INJECTOR NO.3
B	88082557	2	GASKET, LEAK OFF PIPE	P	88080361	1	PIPE, INJECTOR NO.4
C	49843485	1	PIPE, FUEL LEAK OFF	Q	49844244	1	ADAPTER, FUEL FEED
D	54747548	4	NOZZLE ASM.	R	49843592	1	VALVE, OVERFLOW
E	88080312	8	NUT, NOZZLE HOLDER	S	49843527	3	GASKET, OVERFLOW VALVE
F	49843477	4	COVER, NOZZLE HOLDER DUST	T	88080346	1	NUT, OVERFLOW VALVE CAP
G	54747555	4	GASKET, INJECTOR NOZZLE	U	49843519	1	PIPE, INJ NOZZLE LEAK KOFF
H	49840390	1	PIPE, INJECTOR NO.1	V	88082441	2	WASHER, BRACKET-INJ PUMP
J	49806730	1	PIPE, INJECTOR NO.2	W	49841893	2	BOLT, M10 X 20 FLANGE
K	49806920	1	BOLT, CLIP	X	88080320	2	NUT, M10
L	49843576	1	CLIP, INJECTOR PIPE	Y	49843493	1	BRACKET, PUMP
M	49843584	1	CLIP, INJECTOR PIPE				

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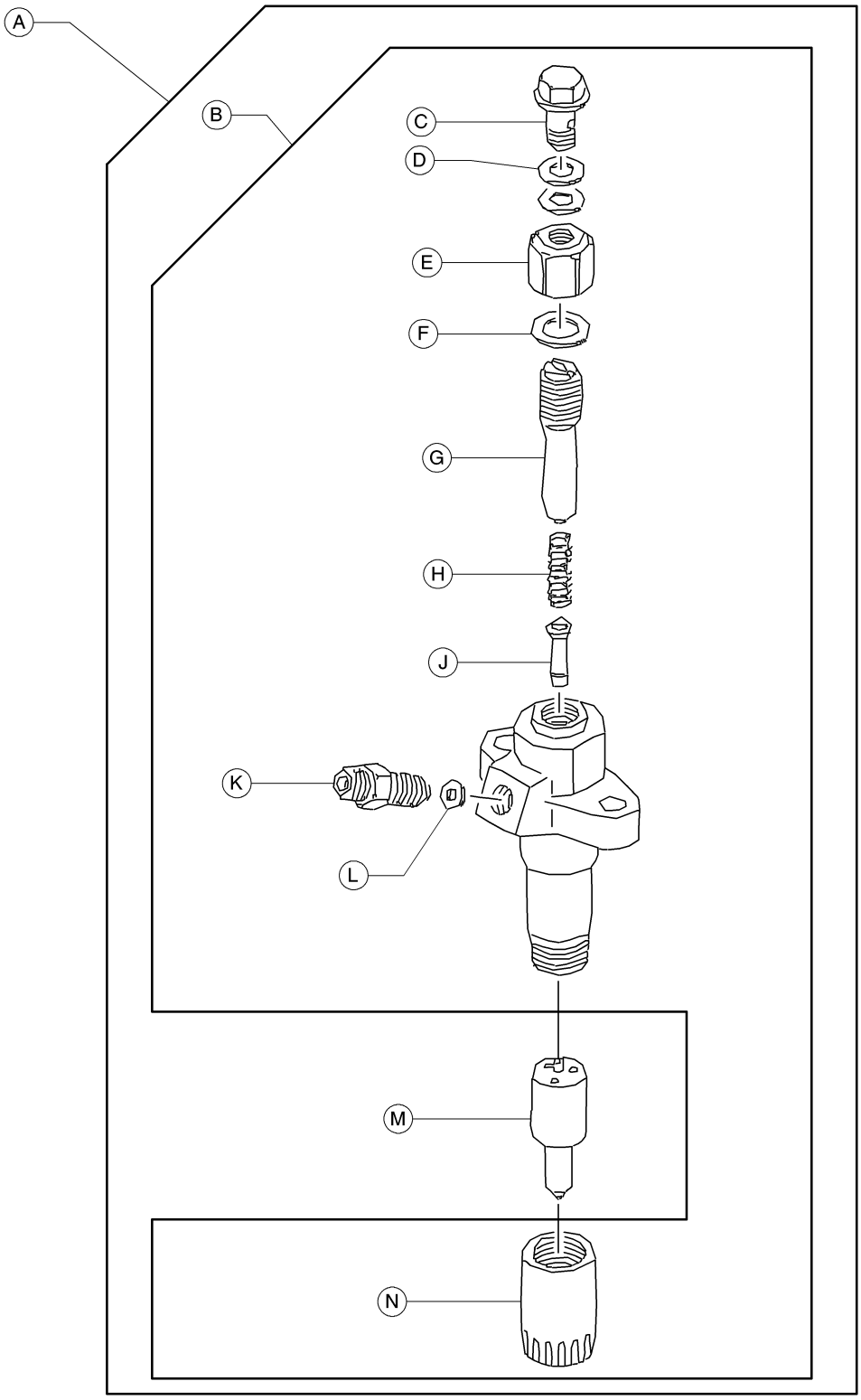
FUEL INJECTOR



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54747548	4	NOZZLE ASM., INJECTOR	H	49843451	1	SPRING, NOZZLE HOLDER
B	49843352	1	HOLDER ASM.	J	49843469	1	ROD, NOZZLE HOLDER PUSH
C	49843378	1	BOLT, NOZZLE HOLDER EYE	K	49843436	1	CONNECTOR, NOZZLE HOLDER FUEL
D	49843394	2	GASKET, NOZZLE HOLDER	L	49843444	1	GASKET, NOZZLE CONNECTOR
E	49843402	1	NUT, NOZZLE HOLDER CAP	M	49843360	1	NOZZLE, INJECTOR
F	49843410	1	GASKET, NOZZLE HOLDER CAP NUT	N	49843386	1	NUT, NOZZLE HOLDER RETAINING
G	49843428	1	SCREW, NOZZLE SPRING AJD				

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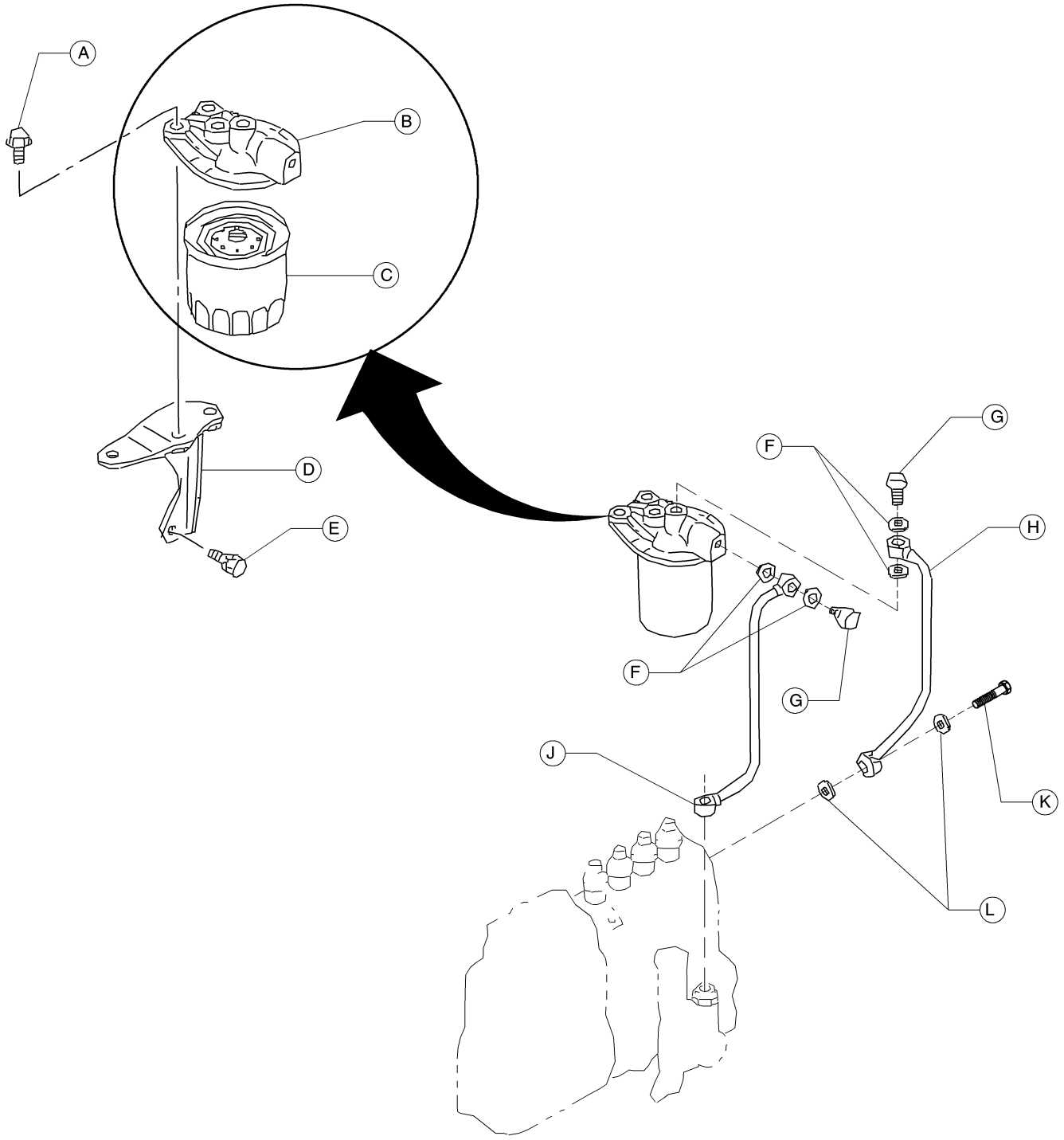

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49806854	2	BOLT, FUEL FILTER	G	88082672	2	BOLT, FUEL FILTER EYE
B	49807415	1	COVER, FUEL FILTER	H	49843568	1	PIPE, FUEL FILTER-INJ PUMP
C	54565197	1	ELEMENT, FUEL FILTER	J	49843550	1	PIPE, FEED PUMP-FUEL FILTER
D	49843543	1	BRACKET, FUEL FILTER	K	54488283	1	BOLT, FUEL INLET EYE
E	49841893	2	BOLT, FUEL FILTER BRACKET	L	54488267	2	GASKET, EYE BOLT
F	88082607	4	GASKET, FUEL FILTER				

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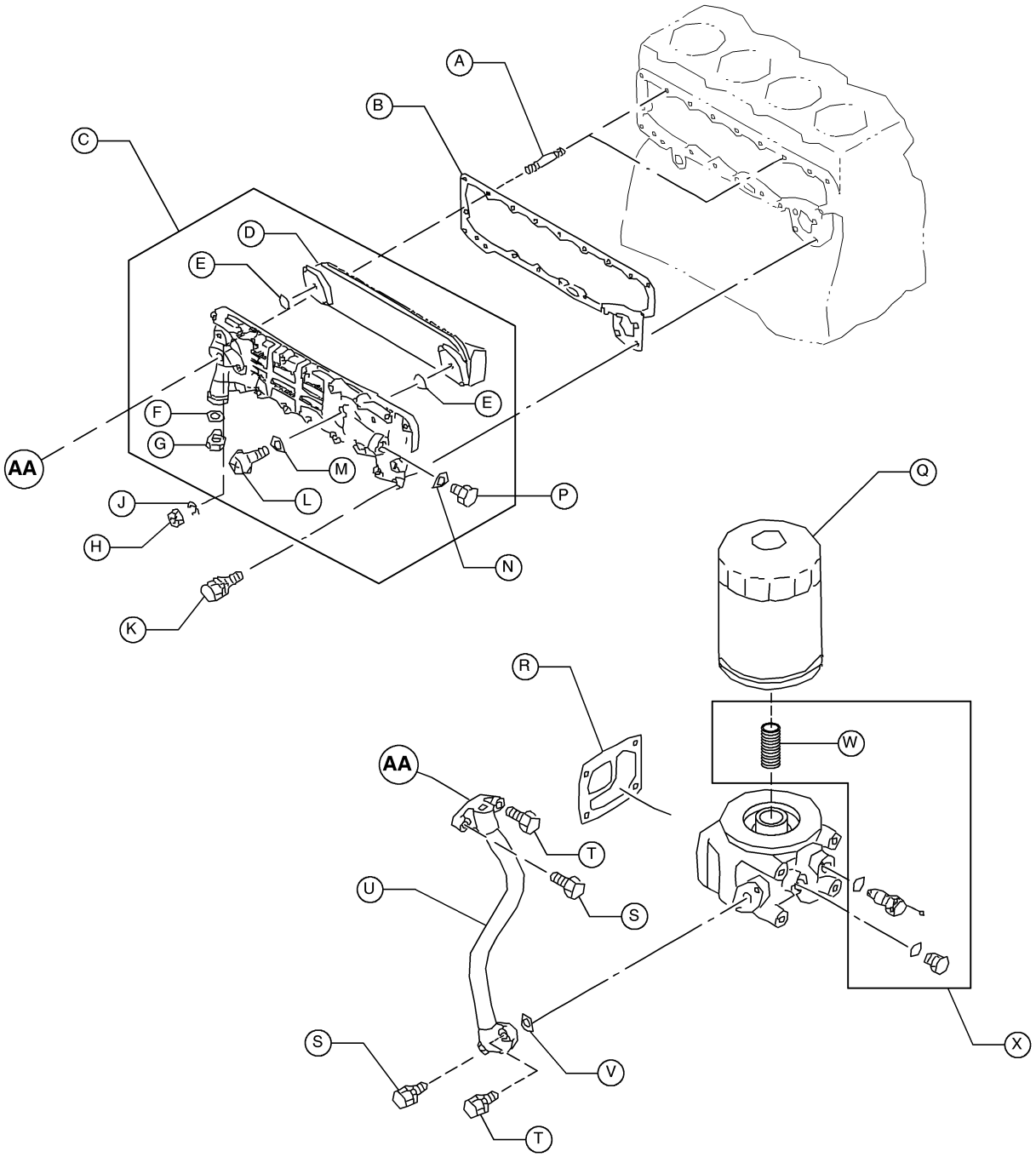
OIL FILTER & COOLER



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49843642	2	STUD, OIL COOLER	N	49843683	1	GASKET, OIL COOLER CASE
B	49843840	1	GASKET, OIL COOLER-CYL BLOCK	P	49843675	1	PLUG, OIL COOLER CASE
C	49843634	1	COOLER ASM., OIL	Q	54565205	1	ELEMENT, OIL FILTER
D	49843667	1	CORE, OIL COOLER	R	49843741	1	GASKET, OIL FILLER-CYL BLOCK
E	49843832	2	GASKET, ELEMENT TO BODY	S	88080064	2	BOLT, M8 X 30 FLANGE
F	49843717	1	GASKET, OIL COOLER	T	88080254	2	BOLT, M08 X 35 FLANGE
G	49843600	1	VALVE, OVERFLOW	U	49843964	1	PIPE, FILTER-COOLER OIL
H	88080312	2	NUT, OIL COOLER	V	49844004	1	GASKET, OIL PIPE
J	88082441	2	WASHER, LOCK	W	49843865	1	NIPPLE, OIL FILTER
K	88080254	5	BOLT, OIL COOLER-BODY	X	49843998	1	KIT, FILTER HSG OIL PORT
L	49843618	4	BOLT, ELEMENT TO CASE				
M	49843626	4	GASKET, OIL COOLER BOLT				

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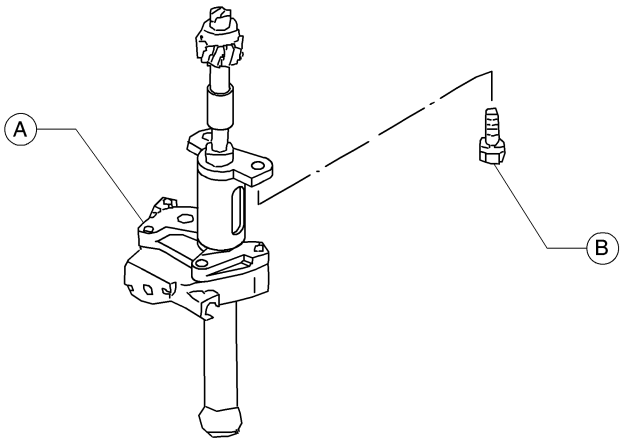
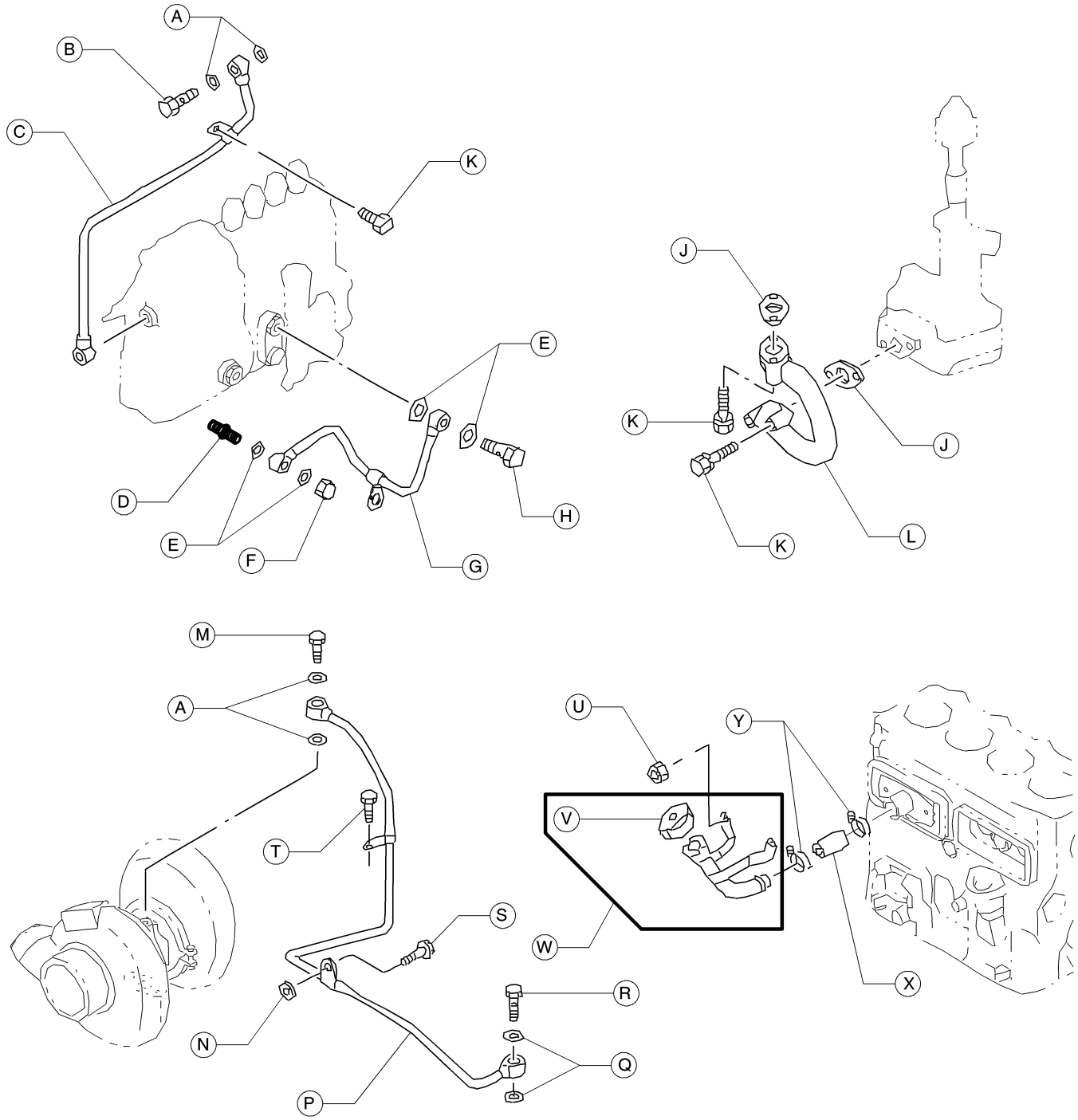


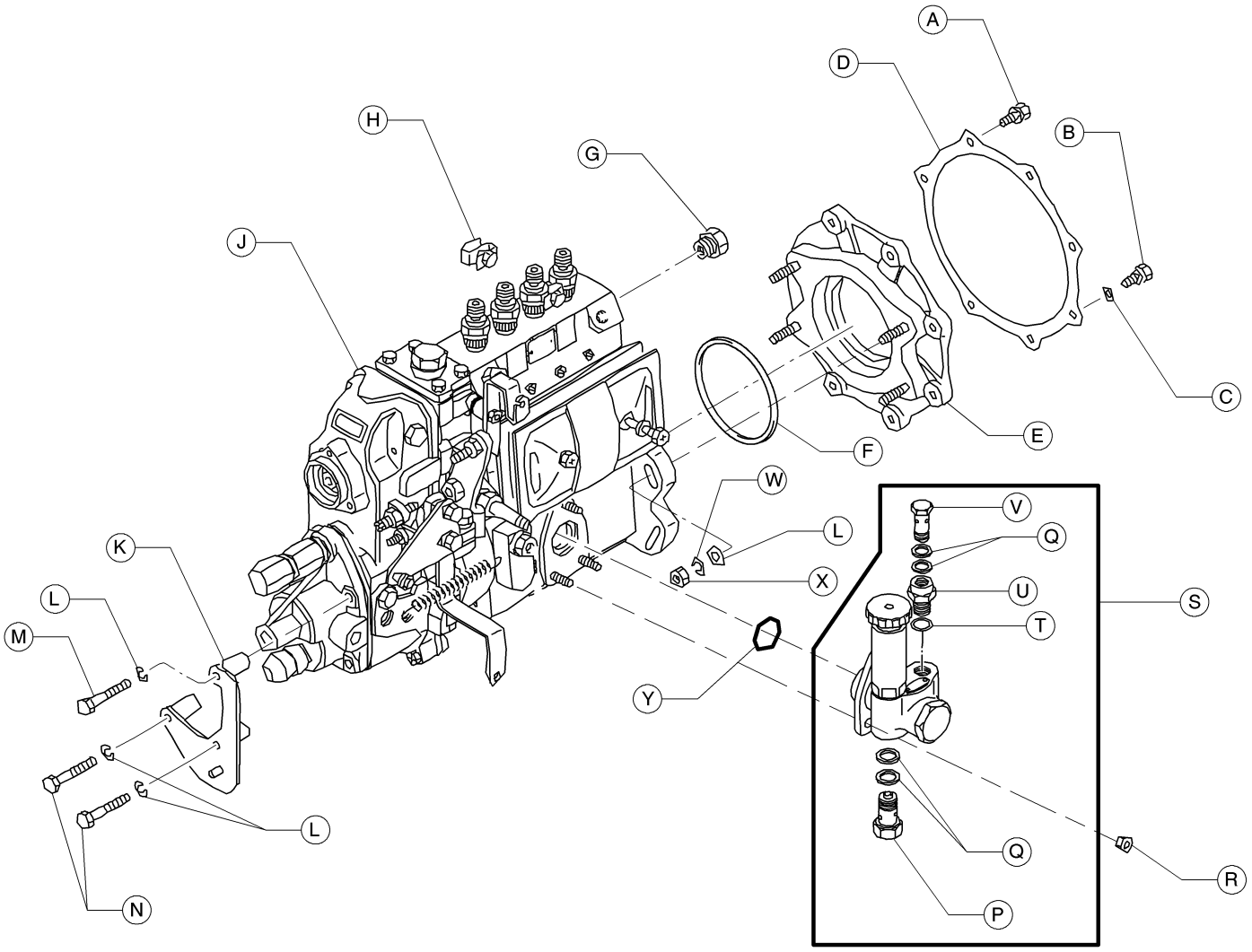
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49843899	1	PUMP ASM., OIL				
B	88080114	2	BOLT, OIL PUMP				

OIL PIPING



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49840507	4	GASKET, JOINT BOLT	N	49844046	1	SPACER, OIL PIPE CLIP
B	49844087	1	BOLT, JOINT	P	49844020	1	PIPE, TURBO OIL FEED
C	49844103	1	PIPE, VACUUM BOOST	Q	49843931	2	GASKET, OIL PIPE EYE BOLT
D	49842214	1	NIPPLE, INJ PUMP	R	49843923	1	BOLT, OIL PIPE EYE
E	54518980	4	GASKET, OIL PIPE CAP NUT	S	49806854	1	BOLT, M10 X 30 LK WASHER
F	49844038	1	NUT, OIL PIPE CAP	T	49843980	1	BOLT, M08 X 12 FLANGE
G	49843907	1	PIPE, INJ PUMP-CYL BLK OIL	U	88080312	2	NUT, M8 FLANGE
H	49844228	1	BOLT, OIL FEED EYE	V	49844053	1	CAP, OIL FILLER
J	49843956	2	GASKET, OIL PIPE	W	49844095	1	FILLER, OIL
K	88080254	4	BOLT, OIL PIPE	X	49844079	1	HOSE, RUBBER
L	49843949	1	PIPE, PUMP-CYL BLOCK OIL	Y	49844061	2	CLIP, RUBBER HOSE
M	49843915	1	BOLT, OIL PIPE EYE				

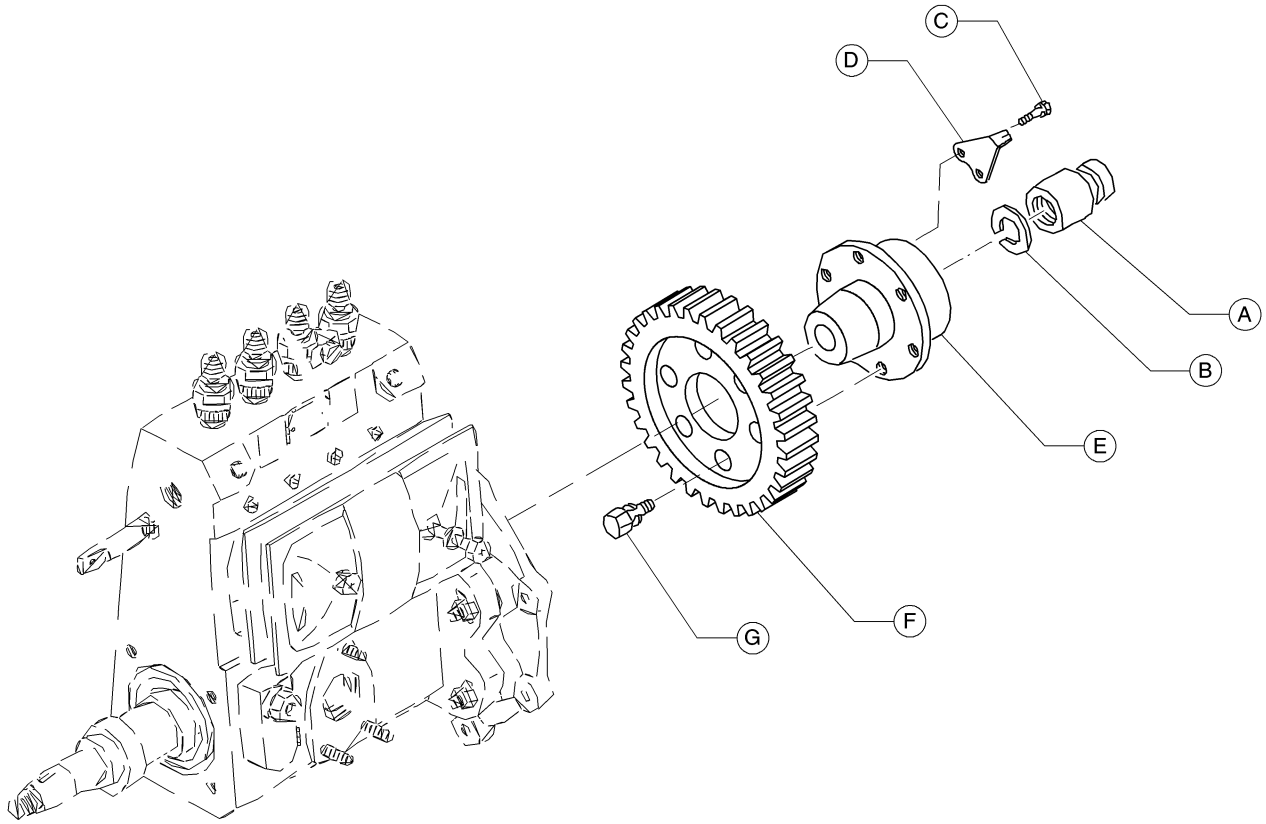
MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-036 09/01 A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	88080338	6	BOLT, INJ PUMP	N	49844251	2	BOLT, GOV COVER
B	49844327	1	BOLT, INJ PUMP	P	54488291	1	BOLT, FUEL FEED PUMP EYE
C	88082599	1	GASKET, INJ PUMP	Q	54488267	4	GASKET, FEED PUMP EYE BOLT
D	49844335	1	GASKET, INJ PUMP BRACKET	R	54519087	3	NUT, FUEL FEED PUMP
E	49844293	1	BRACKET, INJ PUMP TO TIMER	S	49844285	1	PUMP ASM., FUEL FEED
F	49844483	1	GASKET, INJ PUMP BRACKET	T	54488325	1	GASKET, FEED PUMP PLUG
G	54488259	1	ADAPTER, EYE BOLT	U	54488309	1	ADAPTER, FEED PUMP EYE BOLT
H	54519129	2	PLATE, VLV HOLDER LOCK	V	54488283	1	BOLT, FEED PUMP OUTLET EYE
J	49840499	1	PUMP ASM., INJECTION	W	49844376	4	WASHER, TIMER BRACKET LOCK
K	49844277	1	BRACKET, GOVERNOR COVER	X	49844368	4	NUT, TIMER BRACKET
L	88082425	7	WASHER, COVER	Y	54519053	1	GASKET, FEED PUMP TO INJ PUMP
M	49844277	1	BOLT, GOV COVER				

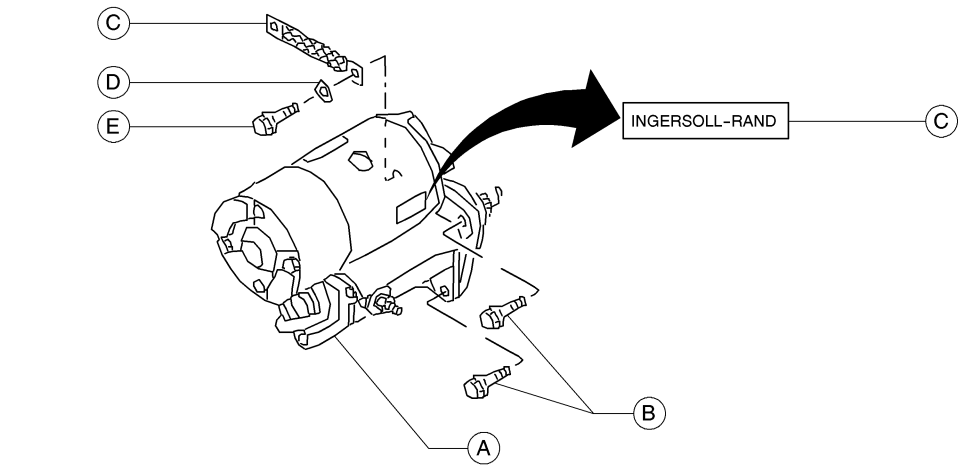
MANUAL NO. - ILLUST. NO. 54720784-037
DATE/REV: 09/01 A

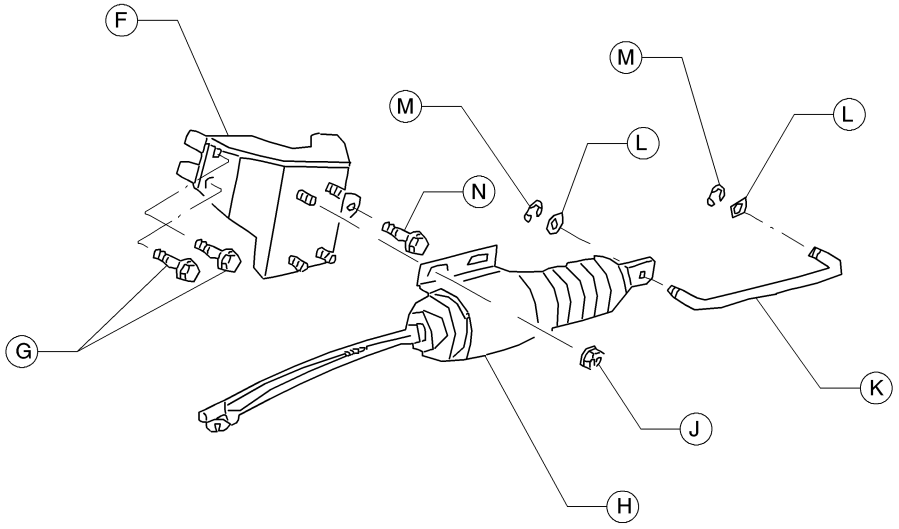
INJECTION PUMP COUPLING



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	49844392	1	NUT, COUPLING				
B	49844400	1	WASHER, COUPLING				
C	88080171	2	BOLT, COUPLING POINTER				
D	49844434	1	POINTER, COUPLING				
E	49844384	1	COUPLING, INJ PUMP DRIVE				
F	49844418	1	GEAR, COUPLING				
G	49844426	6	BOLT, GEAR TO COUPLING				

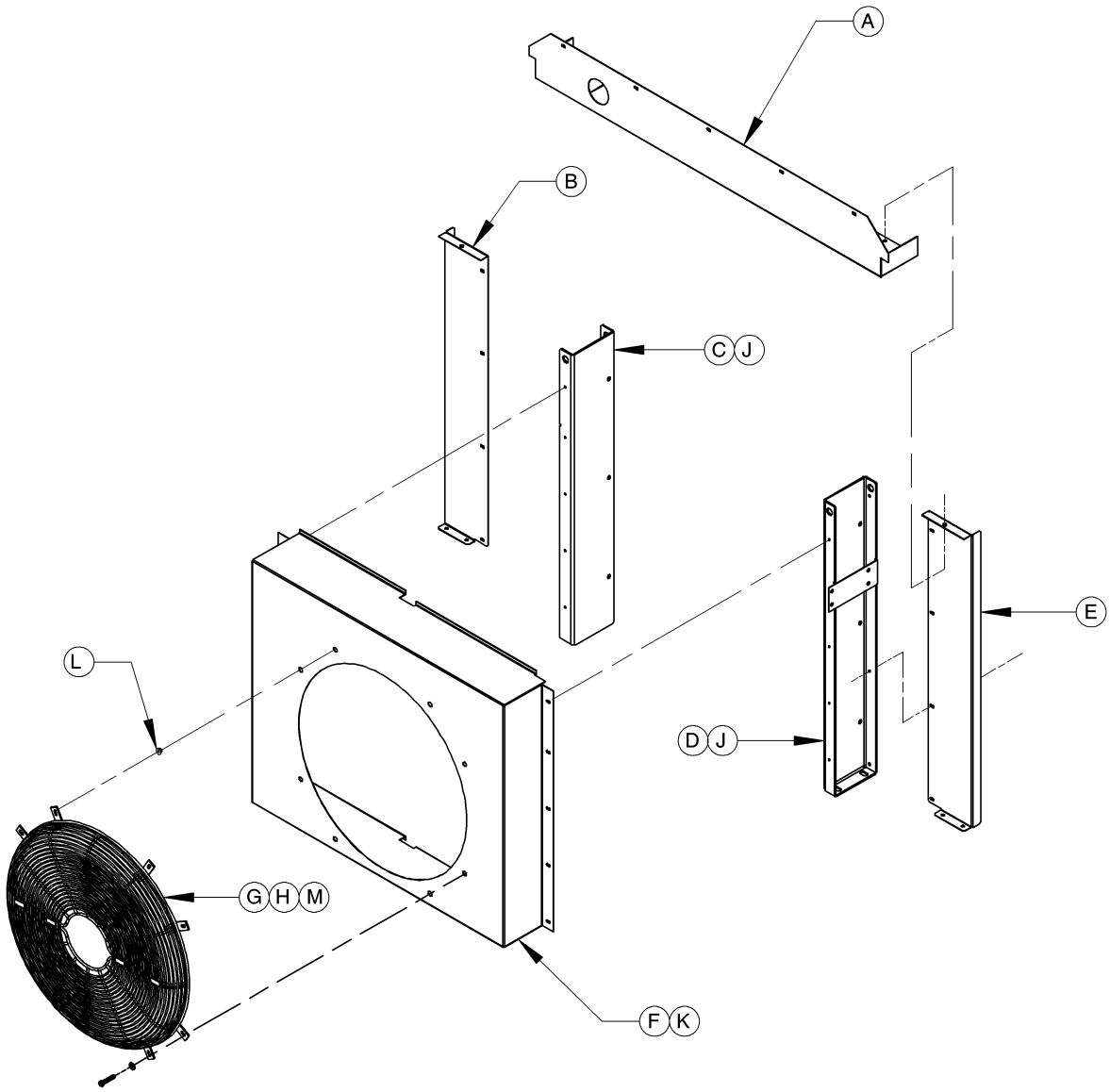
MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-038 09/01 A





Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54747563	1	STARTER	H	54385992	1	SOLENOID, ENGINE STOP
B	88080163	2	BOLT, M12 X 35 FLANGE HD	J	49849060	4	NUT, M6 HEX
C	49844202	1	PLATE, SOLENOID	K	49844343	1	ROD, LINK
D	49841513	1	CABLE, EARTH GROUND	L	49844350	2	WASHER, FLAT
E	49844129	1	BOLT, M12 X 28	M	88082524	2	RING, SNAP
F	49844178	1	BRACKET, SOLENOID	N	49844191	1	BOLT, M8 X 75 FLANGE
G	49844186	2	BOLT, M10 X 60 FLANGE HD				

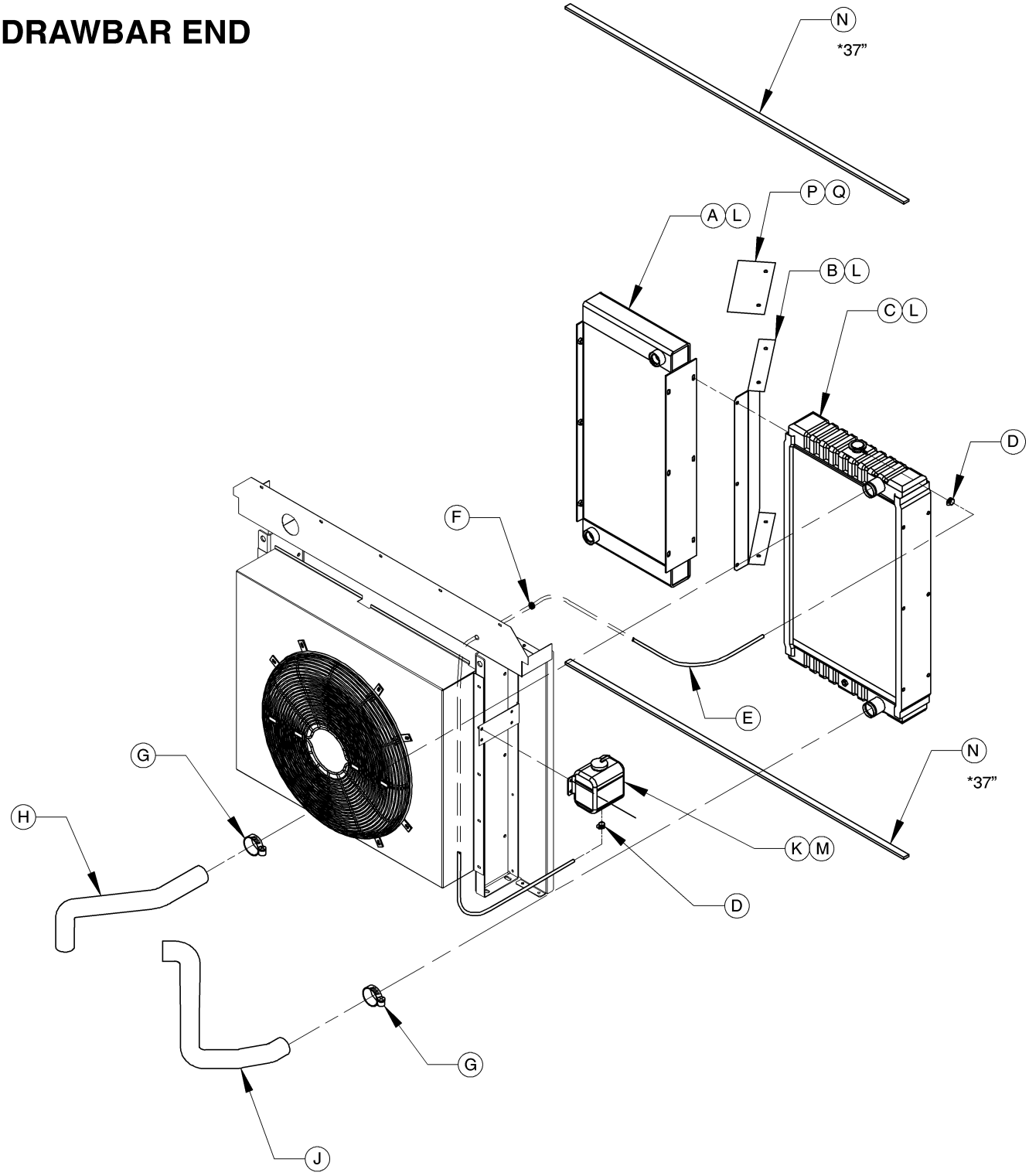
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54656749	1	BAFFLE, TOP	H	95934998	8	WASHER, FLAT
B	54703566	1	BAFFLE, RH COOLER	J	36879492	4	SCREW, HEX FLANGE M12-1.75 X 25
C	54637111	1	SUPPORT, OIL COOLER	K	92368687	10	SCREW, TAPPING M06-1.0 X 12
D	54637103	1	SUPPORT, RADIATOR	L	36895746	8	NUTSERT, M08
E	54703558	1	BAFFLE, LH COOLER	M	96702055	8	SCREW, HEX M08-1.25 X 20
F	54632708	1	SHROUD, FAN				
G	54716360	1	GUARD, FAN				

MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-040 03/01 A

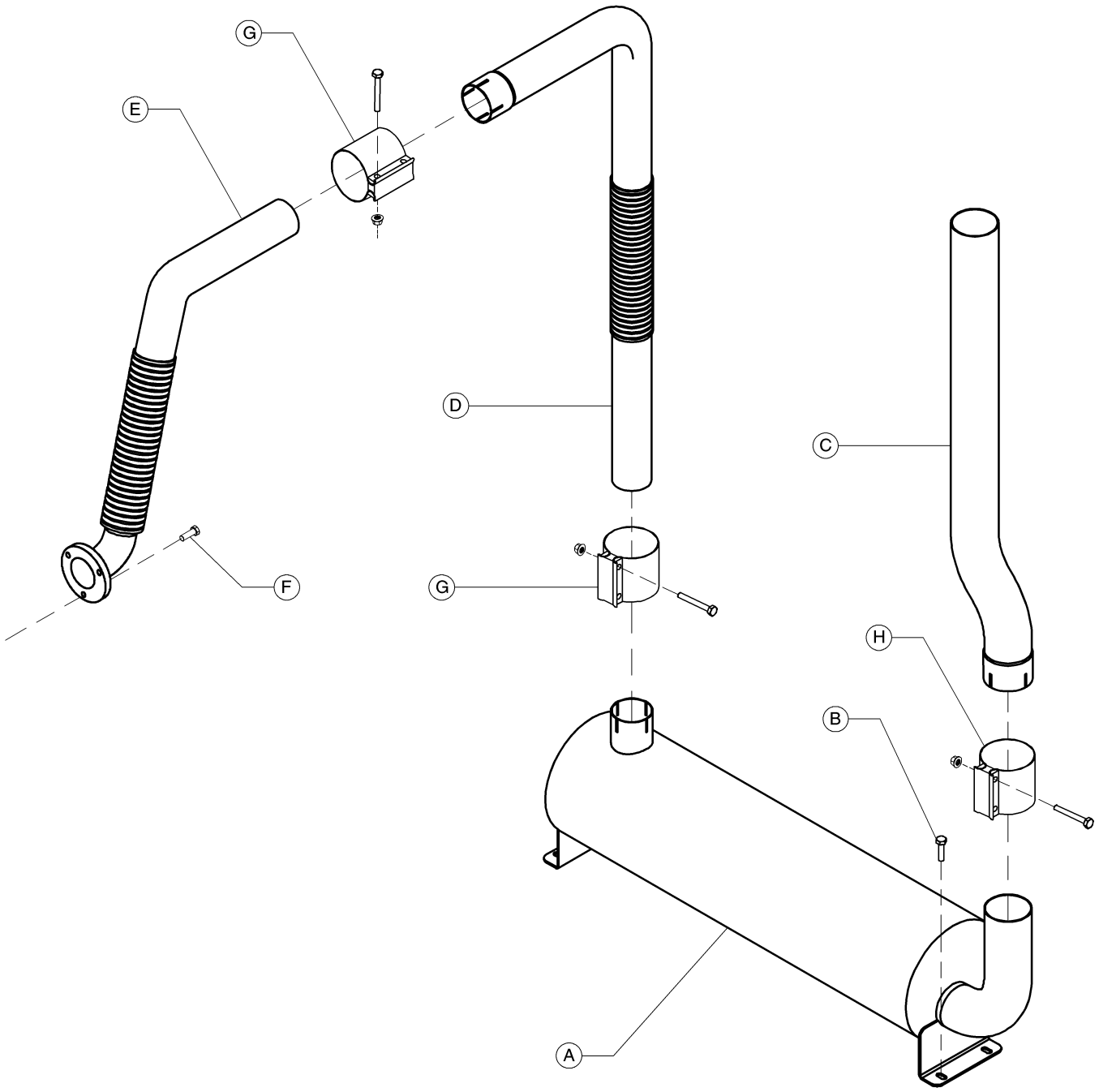
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54616164	1	OIL COOLER (P425, XP375)	H	54659008	1	HOSE, TOP RADIATOR
	54738893	1	OIL COOLER (VHP300, HP365)	J	54659016	1	HOSE, BOTTOM RADIATOR
B	54738737	1	BAFFLE, SPLITTER	K	36884948	1	BOTTLE, COOLANT RECOVERY
C	22056386	1	RADIATOR	L	96702279	18	SCREW, HEX M10-1.50 X 20
D	35296342	2	CLAMP, WORM GEAR	M	92368687	4	SCREW, TAPPING M06-1.0 X 12
E	35360775	42"	TUBING, 5/16"	N	35140409	*	FOAM
F	35285162	1	GROMMET	P	22060503	1	PLATE, BAFFLE
G	35221639	4	CLAMP, HOSE	Q	36797652	2	SCREW, TAPPING M06-1.0 X 12

MANUAL NO. - ILLUST. NO. 54720784-041
DATE/REV: 10/01 C

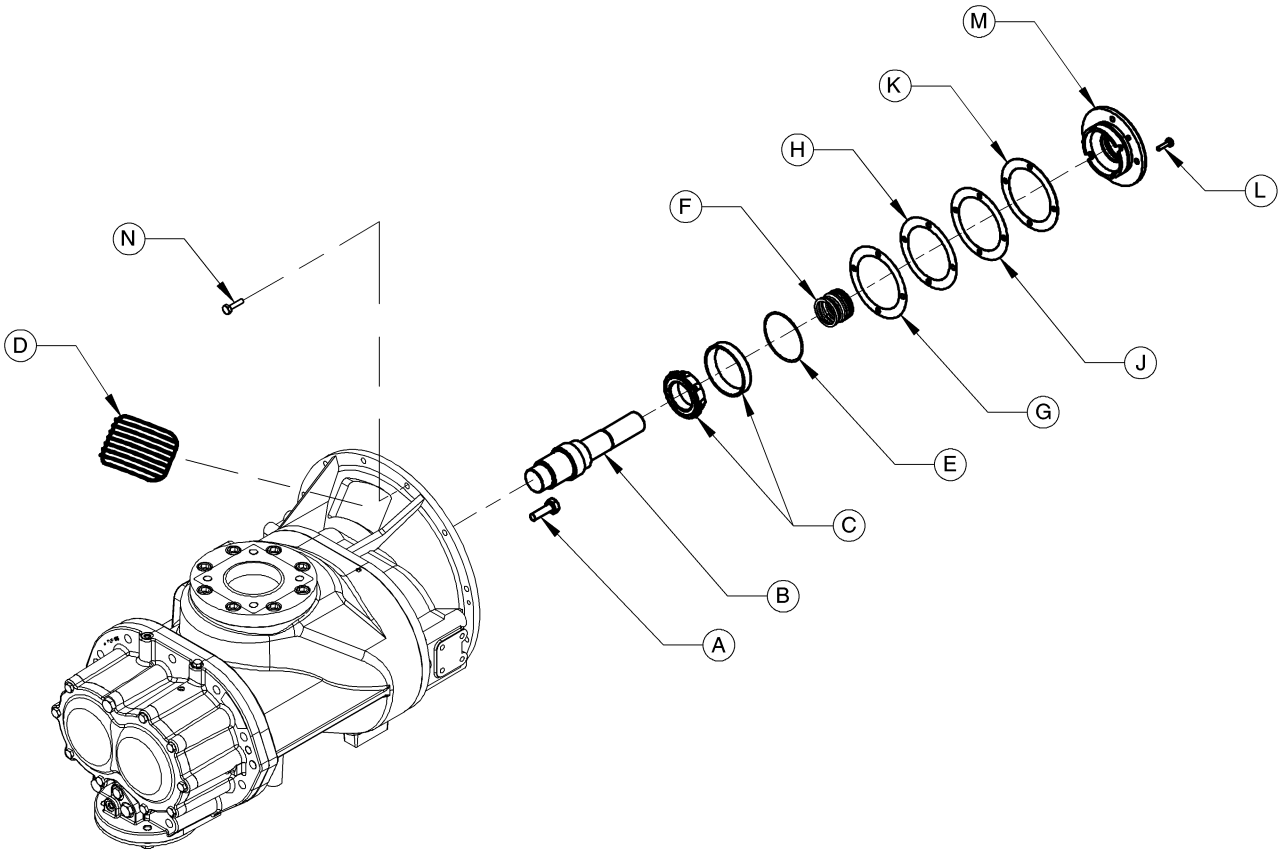
EXHAUST COMPLETE



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54619549	1	MUFFLER				
B	35279025	4	SCREW, TAPPING M08-1.25 X 20				
C	54738760	1	PIPE, EXHAUST				
D	54685433	1	TUBE, EXHAUST				
E	54665773	1	EXHAUST PIPE ASM.				
	22053292	1	EXHAUST PIPE ASM.				
F	96702055	3	SCREW, HEX M08-1.25 X 20				
G	35296060	2	CLAMP, EXHAUST SEAL				
H	35293059	1	CLAMP, EXHAUST SEAL				

MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-042 09/01 B

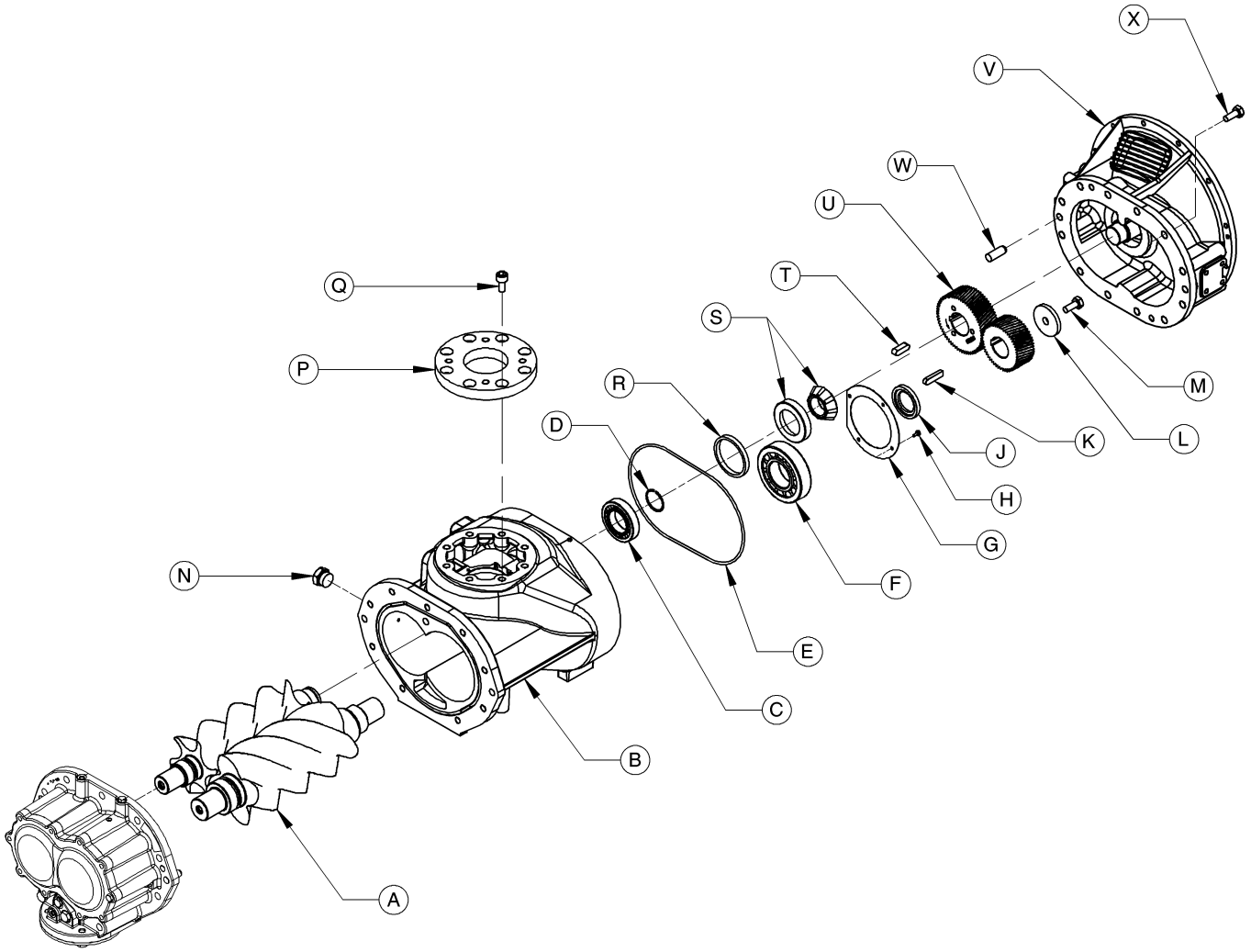
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	96707377	4	SCREW, HEX HD M16 X 150	H	54690037	1	SHIM, .25mm
B	54665237	1	SHAFT, DRIVE	J	54690011	1	SHIM, .50mm
C	35610203	1	BEARING, TAPER ROLLER	K	54690003	1	SHIM, 1.01mm
D	36798346	2	GUARD, HAND	L	96702253	4	SCREW, HEX HD M8 X 25
E	95022356	1	O-RING	M	54653514	1	HOUSING, SEAL
F	35593490	1	SEAL, SHAFT	N	96701917	12	SCREW, HEX FALNGE M10-1.5 X 30
G	54690045	6	SHIM, .05mm				

MANUAL NO. - ILLUST. NO. 54720784-043
DATE/REV: 03/01 A

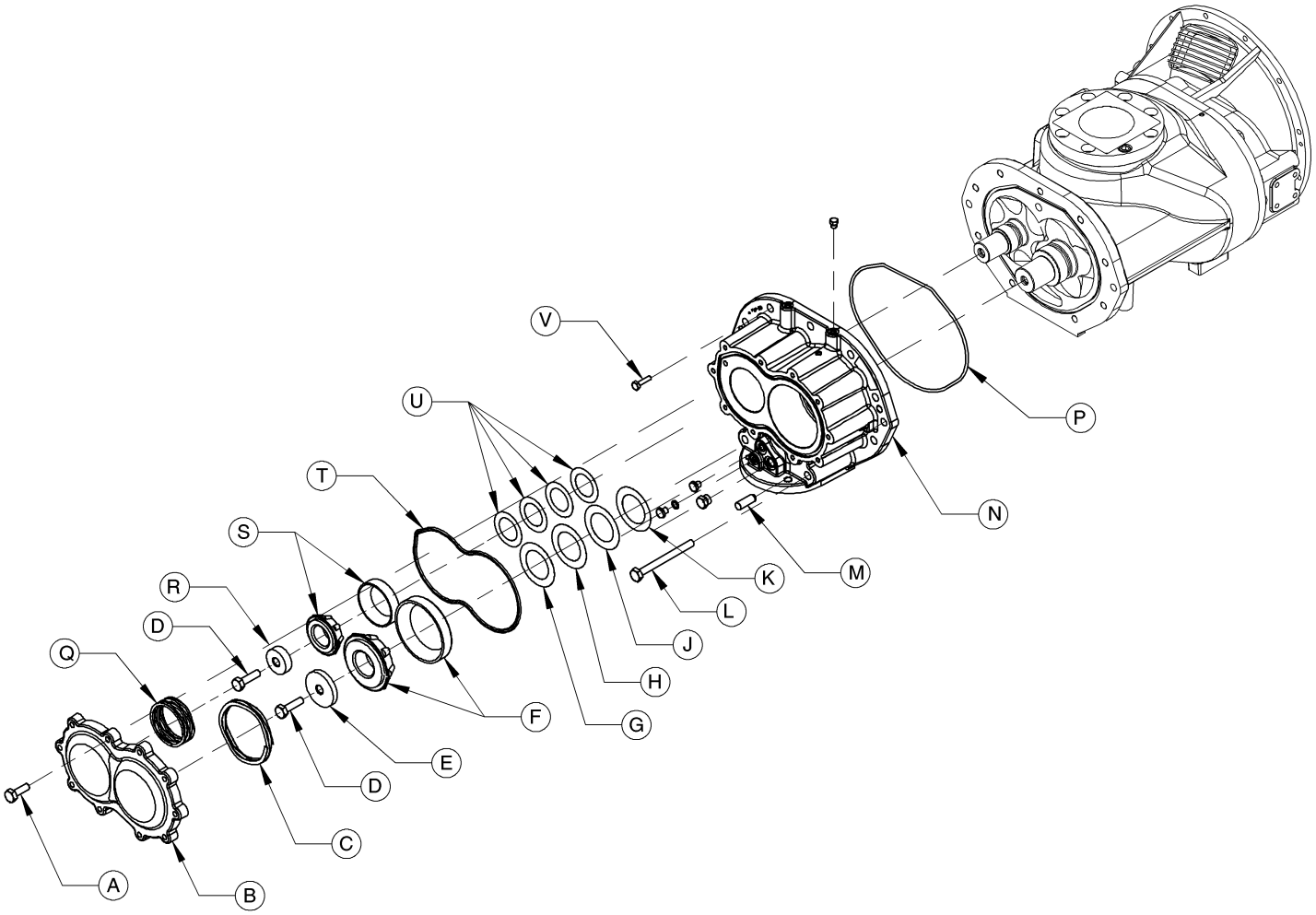
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	42495101	1	SET, ROTOR JACKSHAFT	Q	35358274	8	SCREW, SOC HD M16-2.0 X 25
B	54509187	1	HOUSING, ROTOR	R	54643432	1	SPACER
C	35609361	1	BEARING, CYLINDRICAL	S	54469242	1	BEARING, TAPER ROLLER
D	95223806	1	RING, EXTERNAL RETAINING	T	95688289	1	KEY, SQUARE FR
E	54680939	1	O-RING, ROTOR HOUSING INLET END	U	54670070	1	SET, GEAR P425
F	35313550	1	BEARING, CYLINDRICAL		54610209	1	SET, GEAR XP375
G	54654819	1	RETAINER, BEARING MR INLET		54610761	1	SET, GEAR HP365
H	96716105	4	SCREW, HEX HD M6 X 12		54639984	1	SET, GEAR VHP300
J	54686936	1	SPACER, GEAR MR	V	54611918	1	GEARCASE
K	96741459	1	KEY, MR RECTANGULAR	W	35295336	2	PIN, DOWEL M16 X 40
L	35255819	1	CLAMP, PLATE	X	96706262	8	SCREW, HEX HD M16 X 45
M	96706254	1	SCREW, HEX HD M16 X 35				
N	95939856	1	PLUG, HEX 1 5/16”				
P	54642921	1	ADAPTER, INLET				

MANUAL NO. - ILLUST. NO. 54720784-044
DATE/REV: 10/01 B

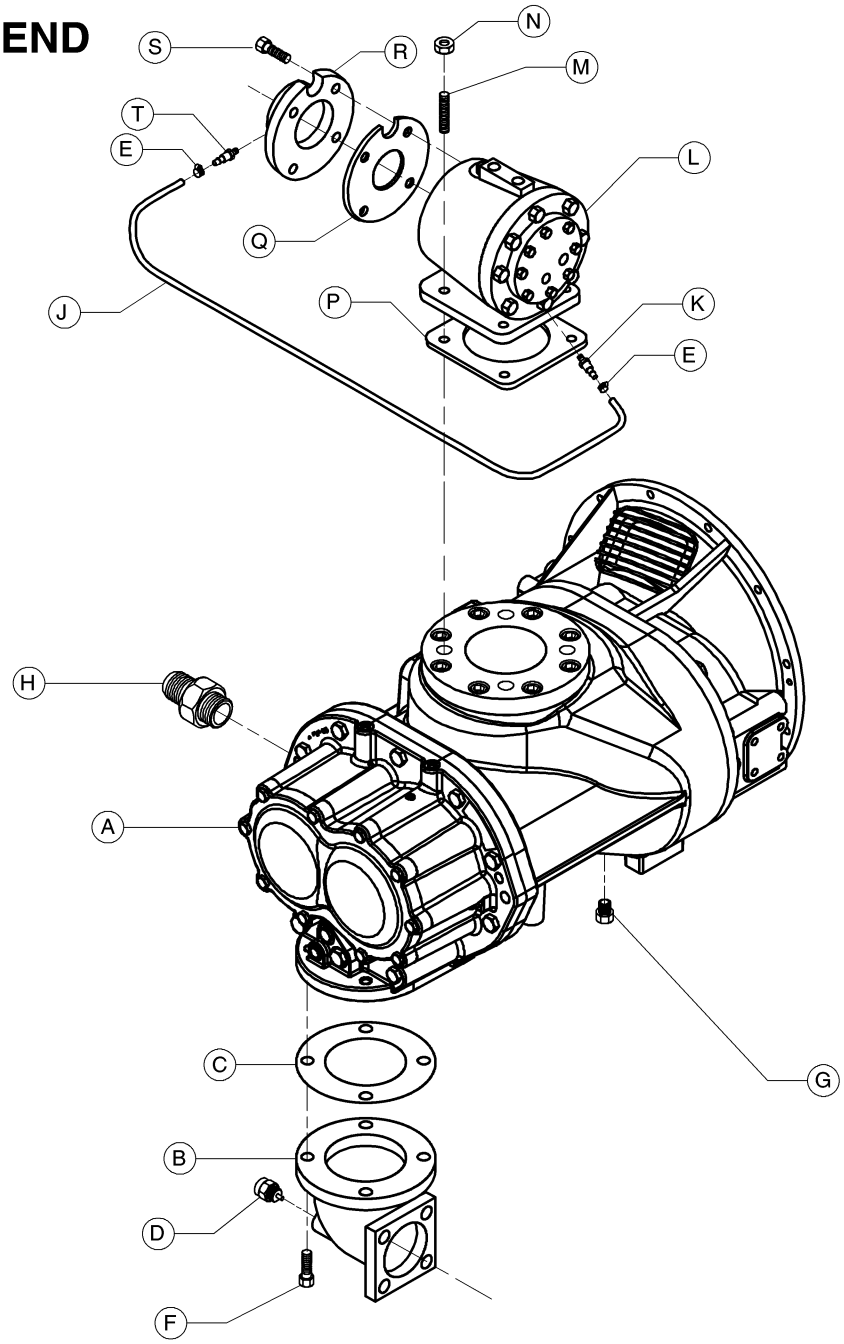
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	96705983	10	SCREW, HEX HD M10 X 35	L	96707377	2	SCREW, HEX HD M16 X 150
B	54523980	1	COVER, REAR BEARING	M	35295336	2	PIN, DOWEL M16 X 40
C	54643895	1	SPRING, WAVE	N	54509203	1	HOUSING, REAR BEARING
D	96710553	2	SCREW, HEX HD M16 X 50	P	54680921	1	O-RING, RH TO BH
E	54635644	1	RETAINER, MR BEARING	Q	54643903	1	SPRING, WAVE
F	39309117	2	BEARING, TAPER ROLLER	R	54635651	1	RETAINER, FR BEARING
G	39312079	1	SHIM, ROTOR END CLEARENCE .05	S	35600113	2	BEARING, TAPER ROLLER
H	39312293	1	SHIM, ROTOR END CLEARENCE .25	T	95643383	1	O-RING, BEARING CVR TO BH
J	39312301	1	SHIM, ROTOR END CLEARENCE .50	U	35355874	1	SET, DISCHG END CLEAR SHIM
K	39312319	1	SHIM, ROTOR END CLEARENCE 1.01	V	96716162	7	SCREW, HEX HD M16 X 45

MANUAL NO. - ILLUST. NO. 54720784-045
DATE/REV: 03/01 A

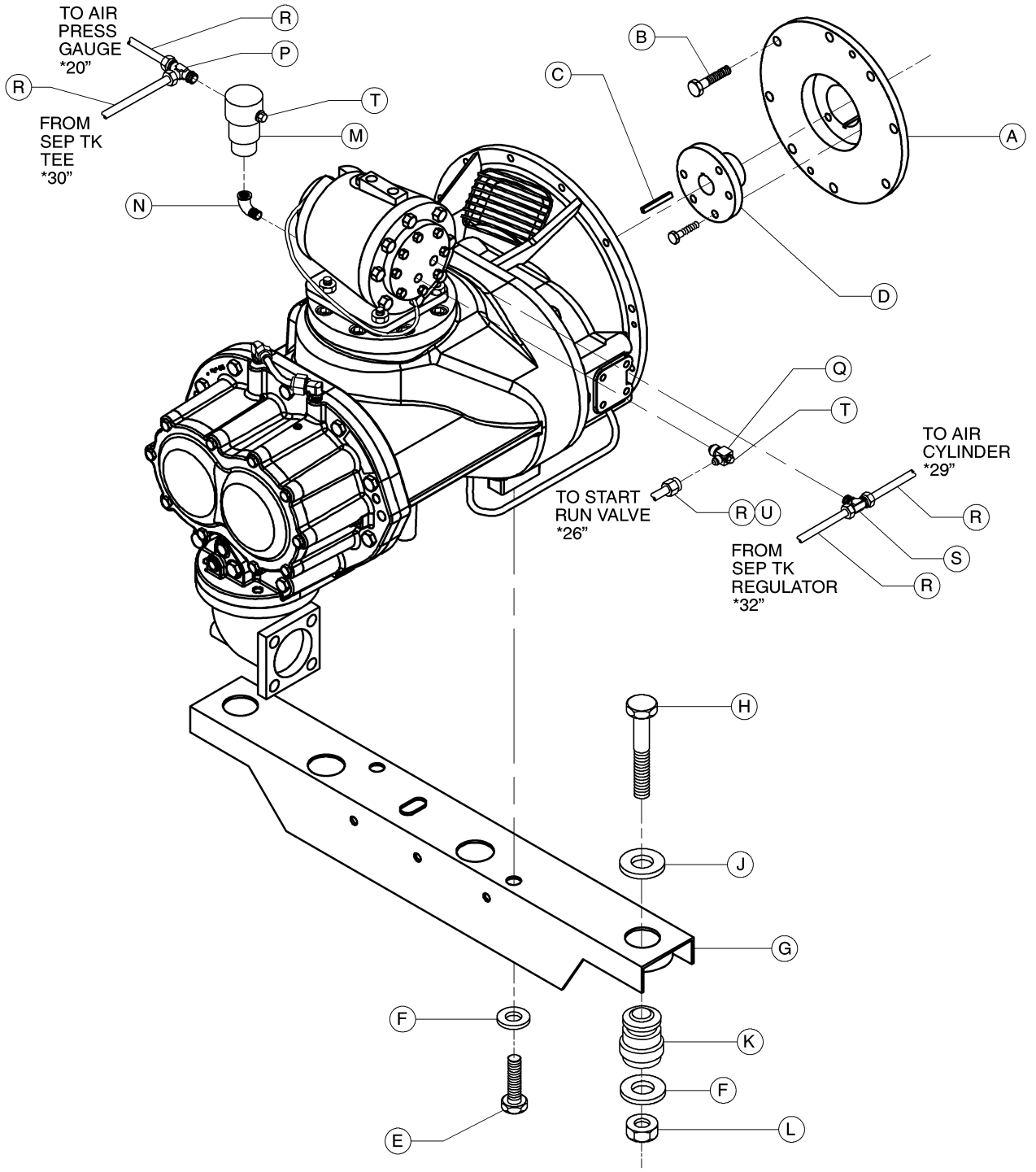
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	42514489	1	AIREND ASM., P425	J	35282292	14”	TUBING, TYGON
	42514497	1	AIREND ASM., XP375	K	54642921	1	ADAPTER, UNLOADER
	42514513	1	AIREND ASM., HP365	L	35060631	1	VALVE, UNLOADER
	42514521	1	AIREND ASM., VHP300	M	35323450	4	STUD, M16-2.0 X 55
B	35842160	1	ELBOW, DISCHARGE	N	96701750	4	NUT, HEX M16-2.0
C	35575570	1	GASKET, AIREND DISCHARGE	P	35589589	1	GASKET, UNLOADER / A-E
D	54764964	1	SWITCH, ALARM	Q	35588318	1	GASKET, UNLOADER INLET
E	35377621	2	CLAMP, SPRING	R	35843168	1	FLANGE, UNLOADER INLET
F	35375385	4	SCREW, HEX M16-2.0 X 40	S	96702048	4	SCREW, HEX M08-1.25 X 16
G	54636584	1	ORIFICE INJECTION	T	35316587	1	ADAPTER, BARBED 1/8 X 1/8 NPT
H	95955993	1	CONNECTOR, 1.31 SAE X -16 JIC				

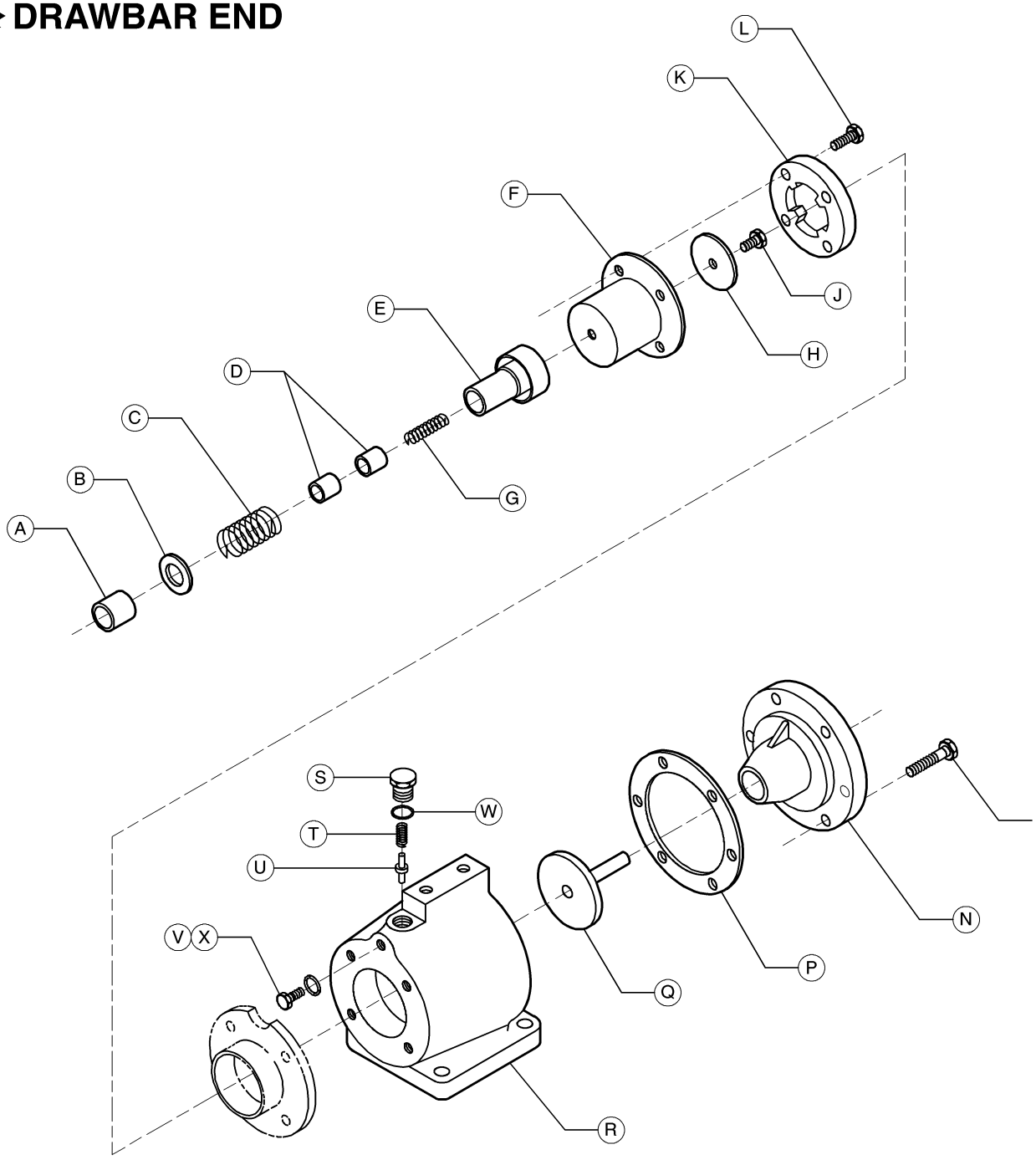
MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-046 10/01 C

DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35834779	1	COUPLING, CLUTCH	L	96704630	2	NUT, NYLOC M16-2.0
B	95220604	8	SCREW, SOCKET HEAD 3/8-16 X .75	M	35322379	1	VALVE, BLOWDOWN
C	35321421	1	KEY, 3/8 SQ X 2.75	N	95364469	1	ELBOW, 1/4
D	35589621	1	BUSHING, CLUTCH	P	35369503	1	TEE, 1/4NPT X 3/8 TUBE
E	35375591	2	SCREW, HEX M16-2.0 30	Q	35114545	1	TEE, STREET 1/4NPT
F	95935052	4	WASHER, FLAT	R	35356484	*	TUBING, 3/8 SYNFLEX
G	43208511	1	SUPPORT, AIREND	S	35373976	1	TEE, 1/4 NPT X 3/8 TUBE
H	96701503	2	SCREW, HEX M16-2.0 X 90	T	36766756	2	ORIFACE, MUFFLER .140
J	35327212	2	WASHER, SNUBBER	U	35369347	1	CONN, MALE 1/4NPT X 3/8 TUBE
K	35318229	2	ISOLATOR, CENTER BOND MOUNT				

DRAWBAR END

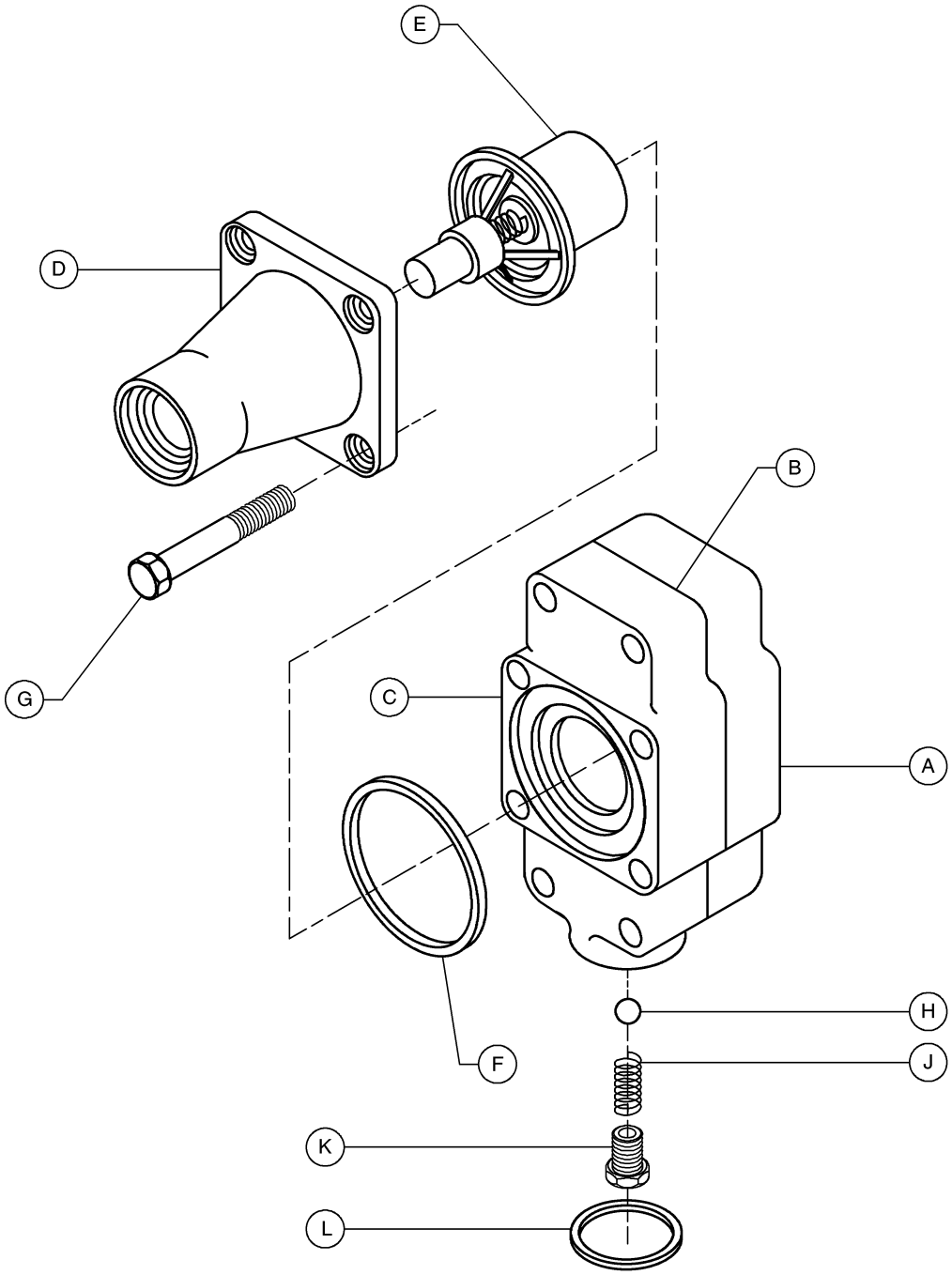


Item		CPN	Qty	Description	Item		CPN	Qty	Description
A	*	35318013	1	BUSHING, HOUSING	N		35833227	1	HOUSING, PISTON
B	*	35317205	1	WASHER	P	*	35588300	1	GASKET, PISTON
C	*	35322767	1	PIOSTON, SPRING	Q		35591122	1	PLATE, VALVE
D	*	35318005	2	BUSHING, PISTON	R		36718427	1	BODY, UNLOADER
E		35588193	1	PISTON, UNLOADER	S	*	35278555	1	PLUG
F	*	35317197	1	DIAPHRAGM	T	*	35318914	1	SPRING, PIN
G	*	35321603	1	SPRING	U	*	35317213	1	PIN, UNLOADER
H	*	35317239	1	WASHER, PISTON	V		35289057	1	PLUG
J	*	35321595	1	SCREW, CAP	W		35278589	1	O-RING
K		35836949	1	COVER, PISTON	X		35279959	1	O-RING
L		35271162	4	SCREW					
M		96702287	6	SCREW					

* ITEMS INCLUDED IN REPAIR KIT 35088798

MANUAL NO. - ILLUST. NO. 54720784-048
DATE/REV: 05/01 A

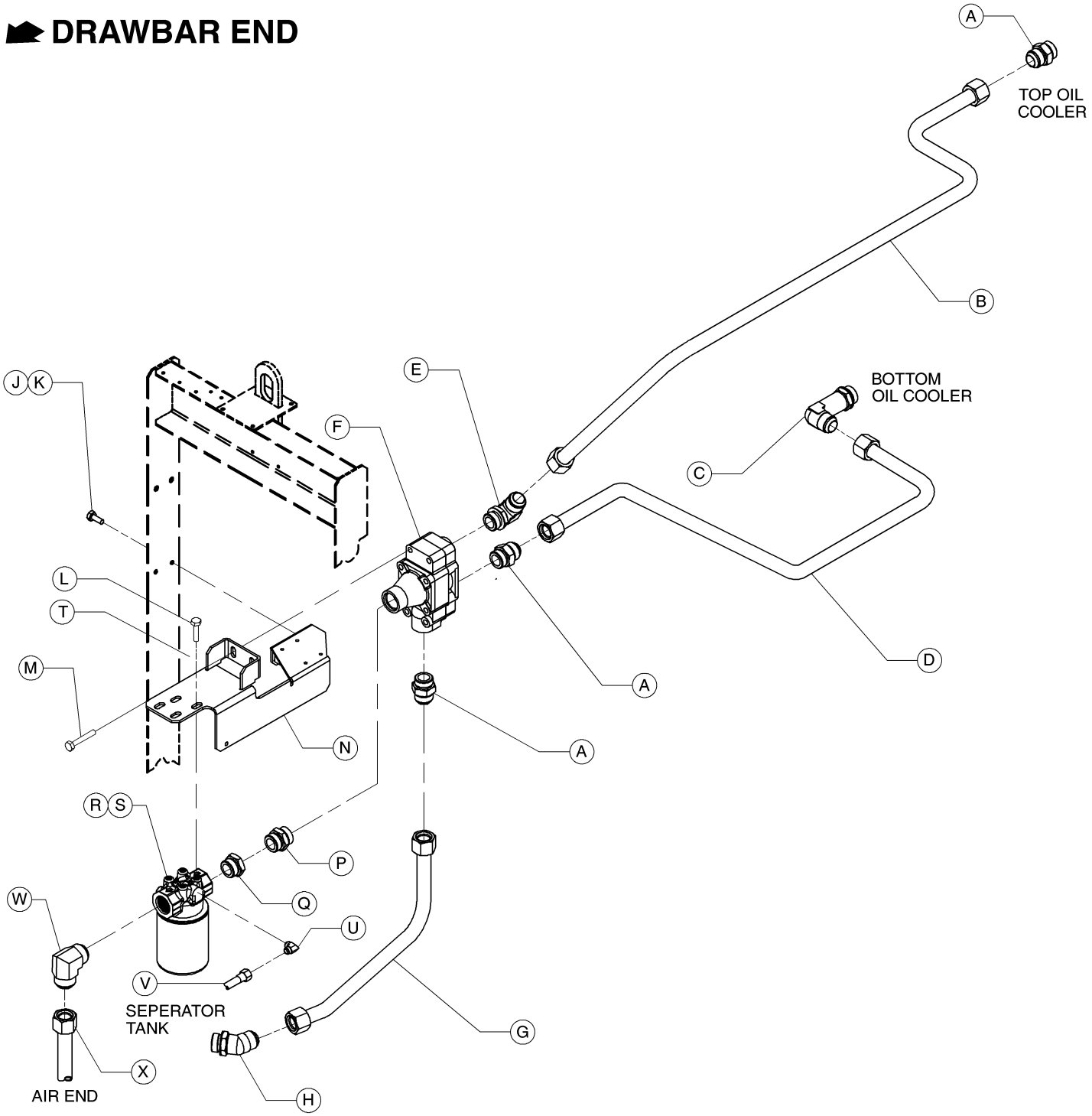
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36876753	1	BODY	G	36786382	8	SCREW
B	35584242	1	GASKET	H	35288448	1	BALL
C	36876761	1	BODY	J	35379940	1	SPRING
D	36876779	1	COVER	K	36788164	1	PLUG
E	36782019	1	ELEMENT	L	36788172	1	SEAL
F	95022307	1	O-RING				

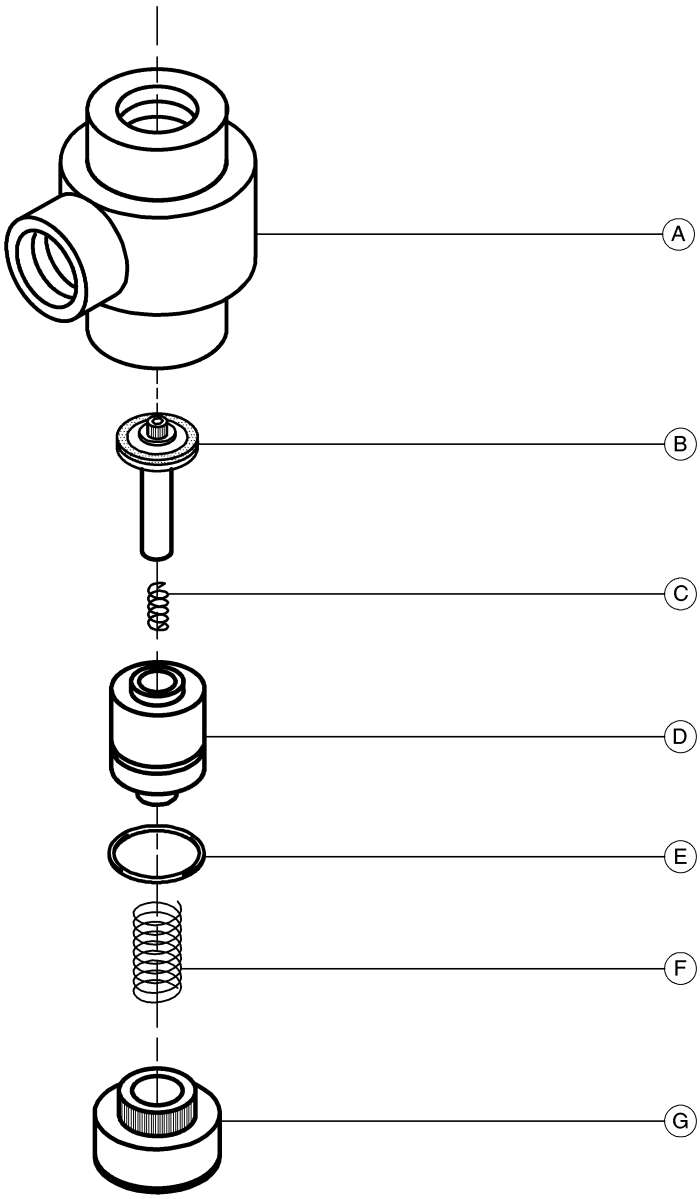
MANUAL NO. - ILLUST. NO. 54720784-049
DATE/REV: 05/01 A

DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	95955993	3	CONNECTOR, 1.31 SAE	M	36786382	2	SCREW, M08-1.25 X 70
B	54679998	1	TUBE, OIL COOLER TOP	N	36880367	1	SUPPORT, OIL FILTER
C	95992848	1	ELBOW, 90 DEGREE	P	95954921	1	UNION, 1.31 SAE
D	54755731	1	TUBE, OTBV TO OIL COOLER	Q	95954913	1	REDUCER, 1.62 SAE X 1.31FEM SAE
E	95938171	1	ELBOW, 90 1.31 SAE	R	36897437	1	HEAD, SINGLE FILTER
F	36876787	1	OTBV, 1.31 SAE	S	36897346	1	ELEMENT, OIL FILTER
G	35227909	1	HOSE, -16 X 25”	T	95935037	2	WASHER, FLAT
H	95992632	1	ELBOW, 45 1.31 SAE	U	95365094	1	ELBOW, 9/16 X -4 JIC
J	35279025	2	SCREW, TAPPING M08-1.25 X 20	V	35227909	1	HOSE
K	36881886	2	NUT, HEX FLANGE M08-1.25	W	95376133	1	ELBOW, 1.63-12
L	35252493	2	SCREW, LOCKING 3/8-16 X 3/4	X	35324177	1	HOSE ASM.

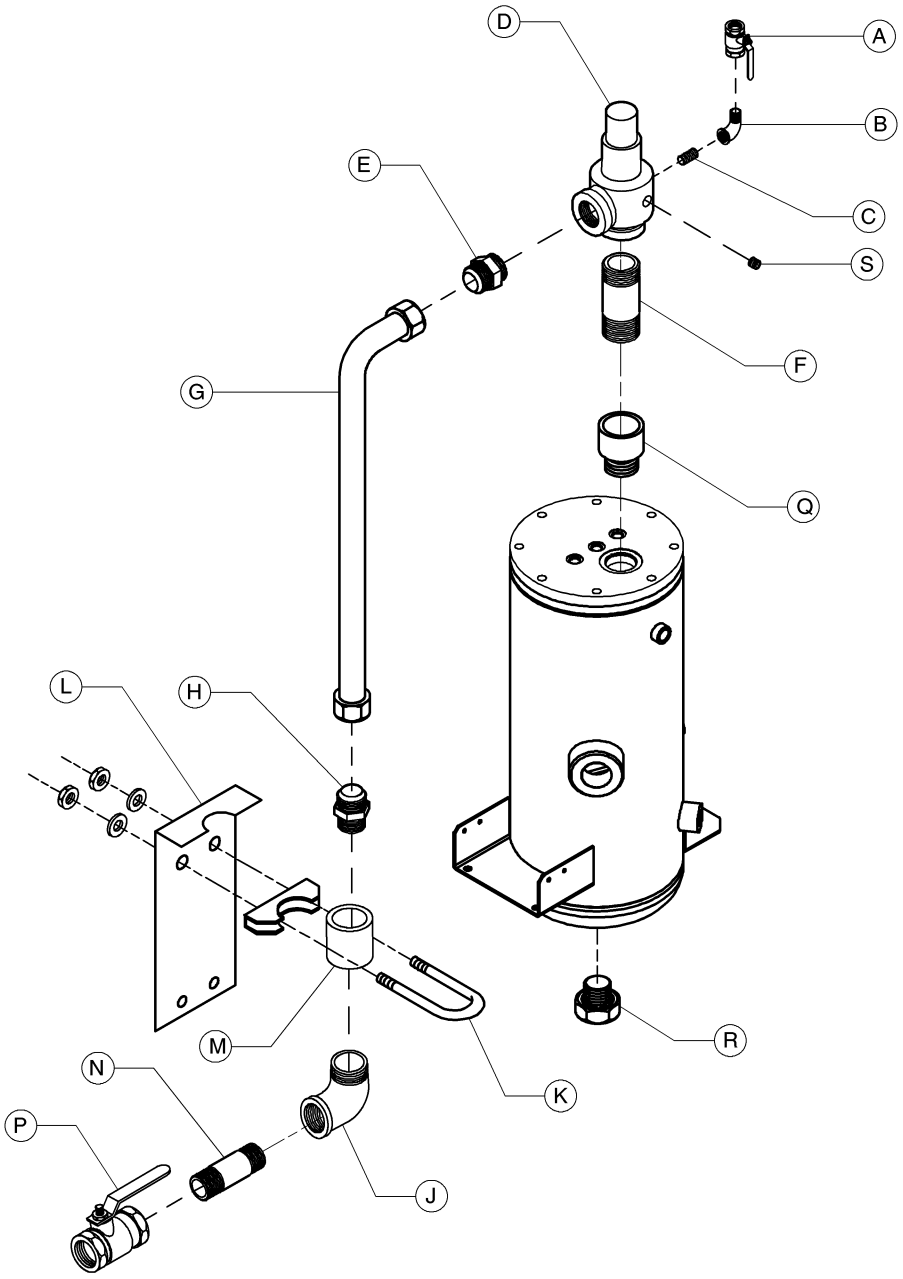
MANUAL NO. - ILLUST. NO. 54720784-050
DATE/REV: 10/01 C



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35379973	1	BODY, MIN PRESS VALVE				
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		MIN PRESS VALVE ASM.				

MANUAL NO. - ILLUST. NO. 54720784-049 DATE/REV: 05/01 A

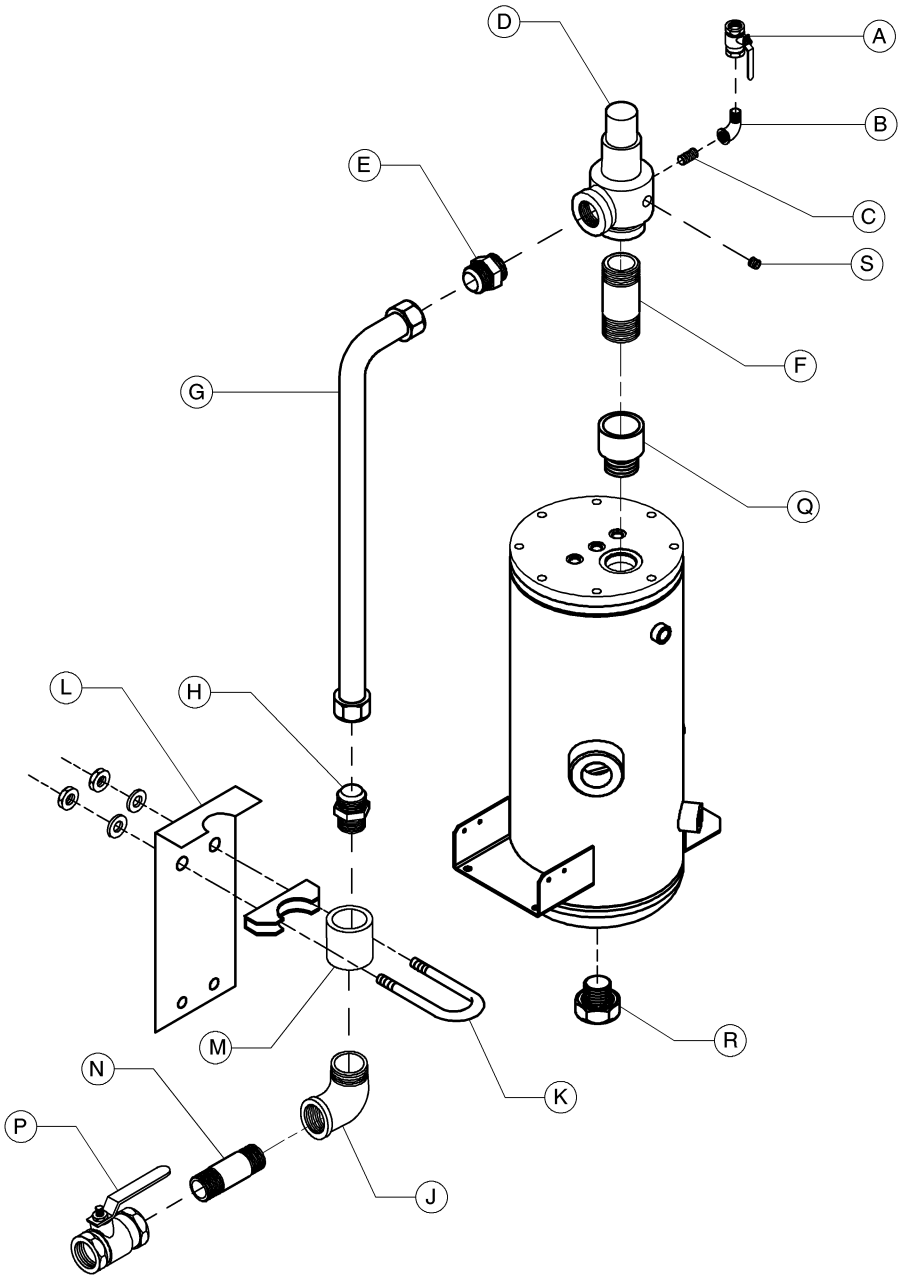
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35576115	1	VALVE, 3/4 NPT BALL	K	35192178	1	CLAMP, SADDLE
B	95928172	1	ELBOW, STREET 3/4 NPT	L	54698667	1	SUPPORT, SERVICE PIPE
C	95928040	1	NIPPLE, CLOSED 3/4NPT	M	95953451	1	COUPLING, 1.25 NPT
D	36789550	1	VALVE, MINIMUM PRESSURE	N	95950275	1	NIPPLE, PIPE 1.25 NPT X 4.0
E	95208682	1	ADAPTER, 1.50 NPT X 1.50	P	35612126	1	VALVE, BALL 1.25 NPT
F	95242996	1	NIPPLE, CLOSE 1.50 NPT X 2.0	Q	95741088	1	ADAPTER, FEMALE
G	54698659	1	TUBE, SERVICE	R	95280541	1	PLUG, HEX O-RING 1.06-12
H	95279345	1	CONNECTOR,1.25 NPT	S	95928230	1	PLUG, HEX SOCKET 1/4 NPT
J	95944104	1	ELBOW, STREET 1.25 NPT				

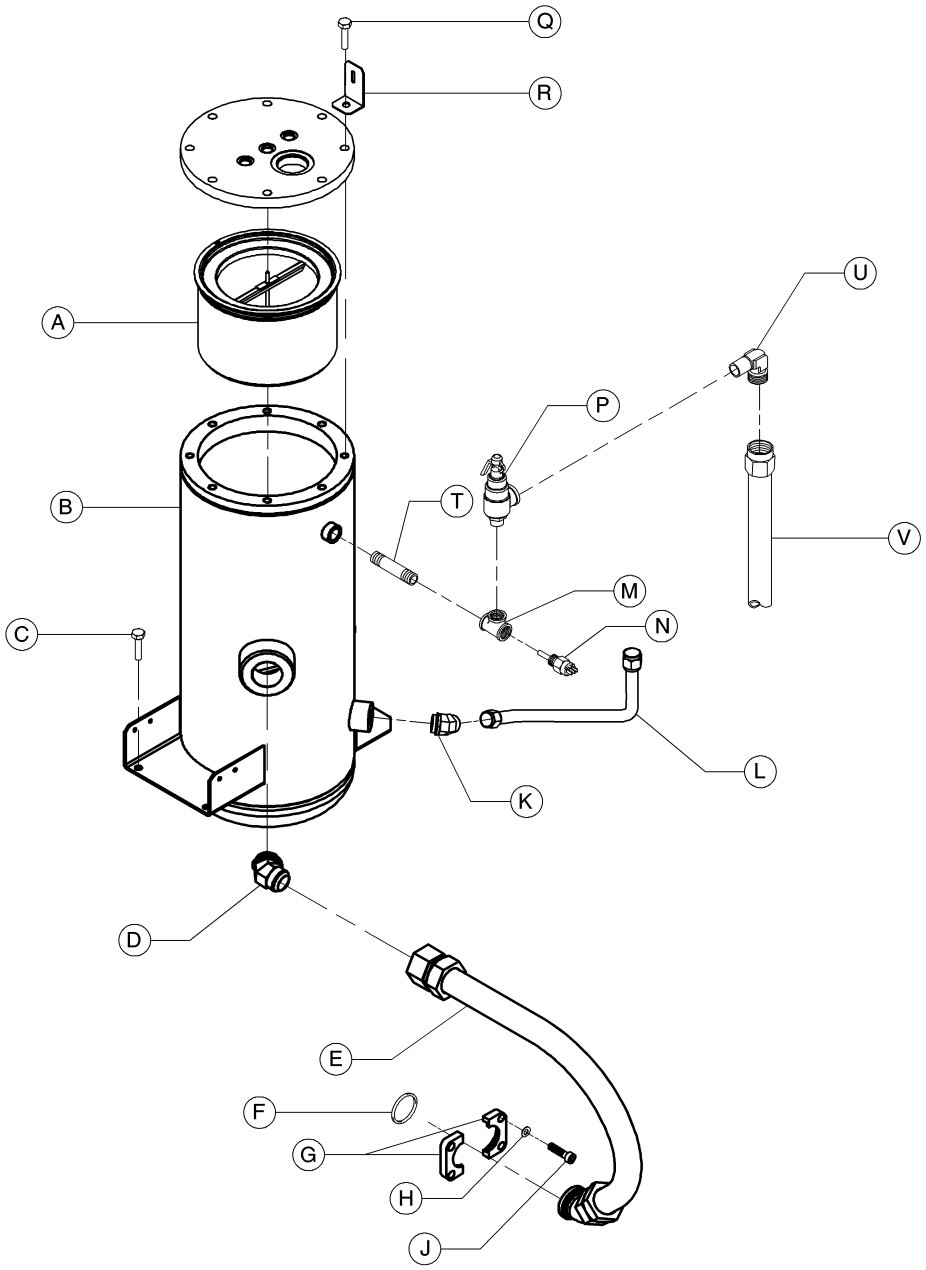
MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-052 10/01 B

DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35576115	1	VALVE, 3/4 NPT BALL	K	35192178	1	CLAMP, SADDLE
B	95928172	1	ELBOW, STREET 3/4 NPT	L	54698667	1	SUPPORT, SERVICE PIPE
C	95928040	1	NIPPLE, CLOSED 3/4NPT	M	95953451	1	COUPLING, 1.25 NPT
D	36789550	1	VALVE, MINIMUM PRESSURE	N	95950275	1	NIPPLE, PIPE 1.25 NPT X 4.0
E	95208682	1	ADAPTER, 1.50 NPT X 1.50	P	35612126	1	VALVE, BALL 1.25 NPT
F	95242996	1	NIPPLE, CLOSE 1.50 NPT X 2.0	Q	95741088	1	ADAPTER, FEMALE
G	54698659	1	TUBE, SERVICE	R	95280541	1	PLUG, HEX O-RING 1.06-12
H	95279345	1	CONNECTOR,1.25 NPT	S	95928230	1	PLUG, HEX SOCKET 1/4 NPT
J	95944104	1	ELBOW, STREET 1.25 NPT				

SEPARATOR TANK COMPLETE



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54721345	1	ELEMENT, SEPARATOR	M	95954210	1	TEE, 3/4 NPT
B	54620604	1	TANK, SEPARATOR	N	54764956	1	SWITCH, ALARM
C	36888055	4	SCREW, HEX FLANGE M12-1.75 X 30	P	54731435	1	VLAVE, SAFETY 150PSI (P425)
D	95944732	1	ELBOW, 45 2.50 SAE		54731443	1	VLAVE, SAFETY 200PSI (HP365, XP375)
E	54688015	1	HOSE, DISCHARGE		54731450	1	VLAVE, SAFETY 250PSI (VHP300)
F	95357976	1	O-RING	Q	96727557	8	SCREW, HEX FLANGE M16 X 60
G	35295143	2	FLANGE, HALF	R	36785012	2	BRACKET, SEPERATOR TANK LIFT
H	95934683	4	WASHER, LOCK	S	95049359	1	PLUG, 1/8 NPT
J	96719810	4	SCREW, HEX M14-2.0 X 40	T	95928040	1	NIPPLE, 3/4 NPT CLOSED
K	95992632	1	ELBOW, 45 1.31SAE	U	95219853	1	ELBOW, 1.0 NPT X -16 JIC
L	54680012	1	TUBE, OTBV TO SEPTK	V	22060073	1	TUBE, DISCHARGE

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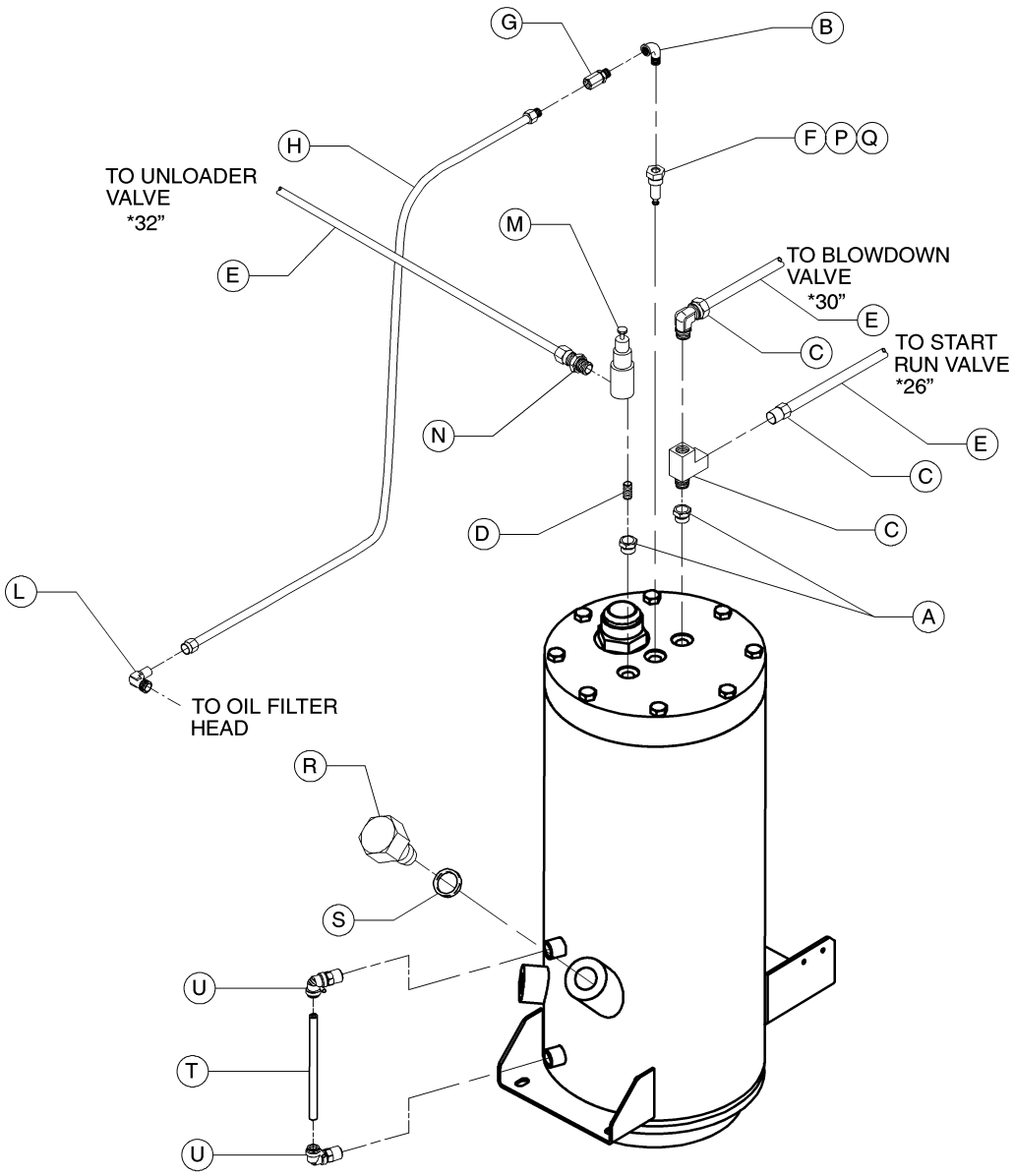
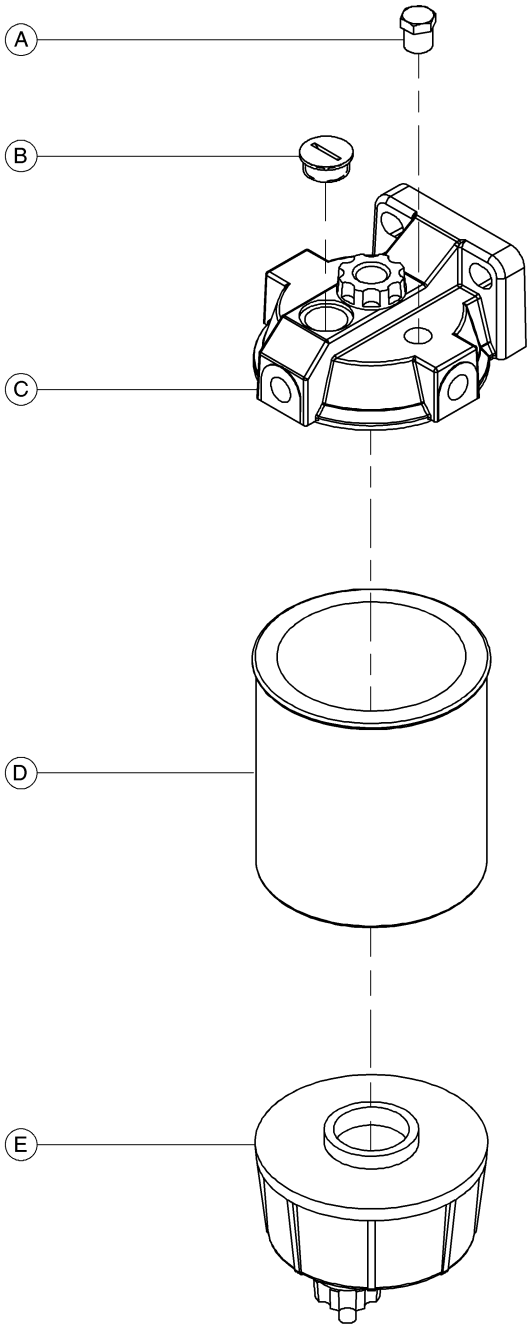
54720784-054 10/01 C



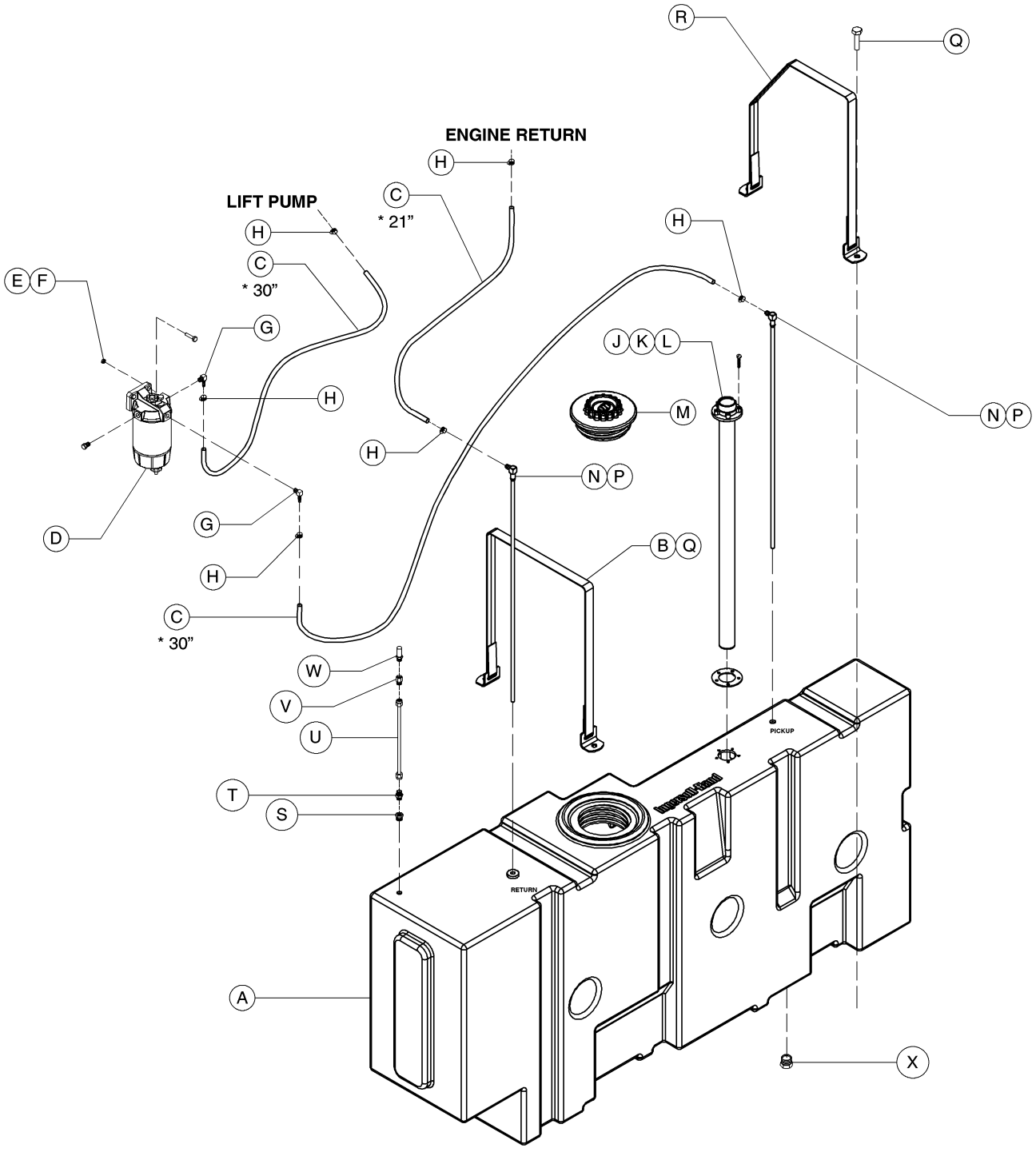
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	95773032	2	ADAPTER, .88 SAE	L	95365094	1	ELBOW, 9/16 X -4 JIC
B	35283464	1	ELBOW, 1/4 NPT X -4 JIC	M	36896892	1	VLV, PRESS REG 200PSI
C	35373976	1	TEE, 1/4 NPT X 3/8 TUBE	N	35369347	1	CONN, MALE 1/4 NPT X 3/8 TUBE
D	95944575	1	NIPPLE, CLOSED 1/4 NPT	P	92877620	1	O-RING
E	35356484	*	TUBING, 3/8" SYNFLEX	Q	95973228	1	O-RING
F	54721337	1	ADAPTER, OIL SCVANGE TUBE	R	35579630	1	PLUG, 1.62"
G	36840411	1	VALVE, CHECK	S	35279942	1	O-RING
H	35282920	1	HOSE, -4 JIC X 30"	T	54629464	1	TUBE, SIGHT
J	35369347	1	CONNECTOR, MALE 1/4 NPT X 3/8 TUBE	U	54627799	2	ELBOW, SIGHT TUBE
K	35369354	1	ELBOW MALE 1/4 NPT X 3/8 TUBE				

FUEL / WATER SEPARATOR



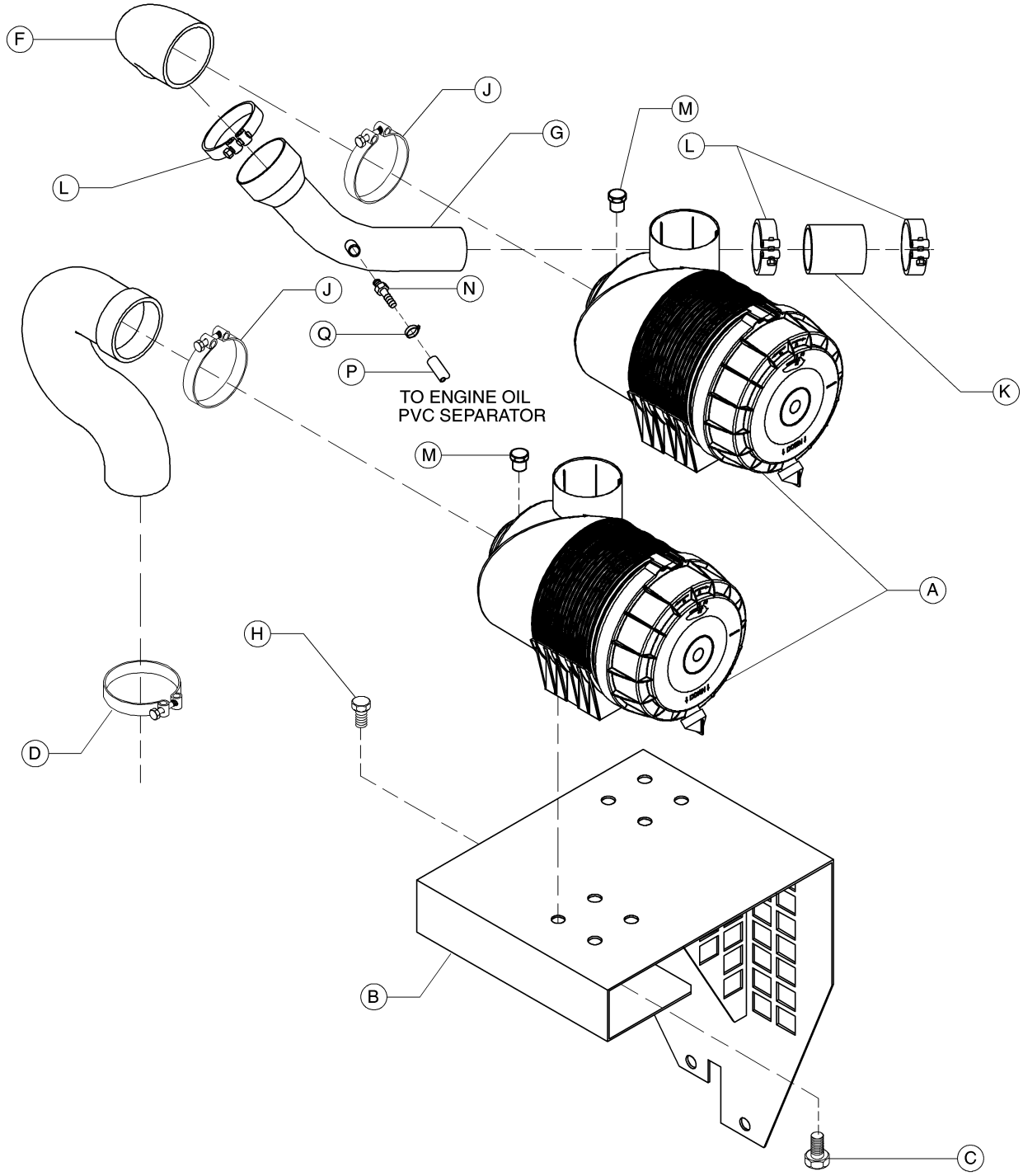
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54480520	1	PLUG, VENT				
B	35358381	1	COVER, CHECK BALL				
C	54480512	1	HEAD				
D	54468178	1	ELEMENT ASM.				
E	54480504	1	BOWL, POLYCARBONATE				

MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-056 05/01 A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54633938	1	TANK, FUEL	M	54660089	1	CAP, FUEL
B	54720727	1	STRAP, FUEL TANK	N	54675863	2	STANDPIPE ASM.
C	35363498	*	HOSE, .31 FUEL	P	35384577	2	BUSHING, NITRILE
D	54468160	1	SEPARATOR, FUEL / WATER	Q	35279025	4	SCREW, TAPPING M08-1.25 X 20
E	36889608	2	SCREW, HEX FLANGE HD M08-1.25 X 25	R	54721170	1	STRAP, FUEL TANK
F	36881886	2	NUT, HEX FLANGE M08-1.25	S	95940748	1	BUSHING, REDUCING 3/8 NPT X 1/4
G	35378538	2	ELBOW, BARBED .31 X .25NPT	T	35369347	1	CONN, MALE 1/4 NPT X 3/8 TUBE
H	35296342	6	CLAMP, WORMGEAR M06 - 16	U	35356484	8.5	TUBING, 3/8 SYNFLEX
J	54731427	1	SENDER, FUEL LEVEL	V	35369339	1	CONN, FEMALE 1/4 NPT X 3/8 TUBE
K	35361849	1	GASKET, FUEL SENDER	W	35322395	1	SILENCER, PNEUMATIC 1/4 NPT
L	95916532	5	SCREW, FILLISTER HEAD 10-32 X .50	X	95280541	1	PLUG, HEX 1.06-16 SAE

DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54661889	2	AIR CLEANER ASM.	J	35368477	3	CLAMP, T-BOLT
B	54747977	1	SUPPORT, AIR CLEANER	K	22056725	1	HOSE, A/C TO TURBO
C	96702048	8	SCREW, HEX M08-1.25 X 16	L	32595773	2	CLAMP, T-BOLT
D	36897668	1	CLAMP, T-BOLT	M	35314939	2	INDICATOR, RESTRICTION
E	54756044	1	HOSE, AIR INTAKE	N	35310598	1	ADAPTER, BARBED
F	54685474	1	ELBOW, REDUCING	P	35360775	21”	TUBING, 5/16”
G	54543707	1	TUBE, AIR INTAKE	Q	95220844	1	CLAMP, HOSE 9/16
H	96719851	2	SCREW, HEX M12-1.75 X 16				

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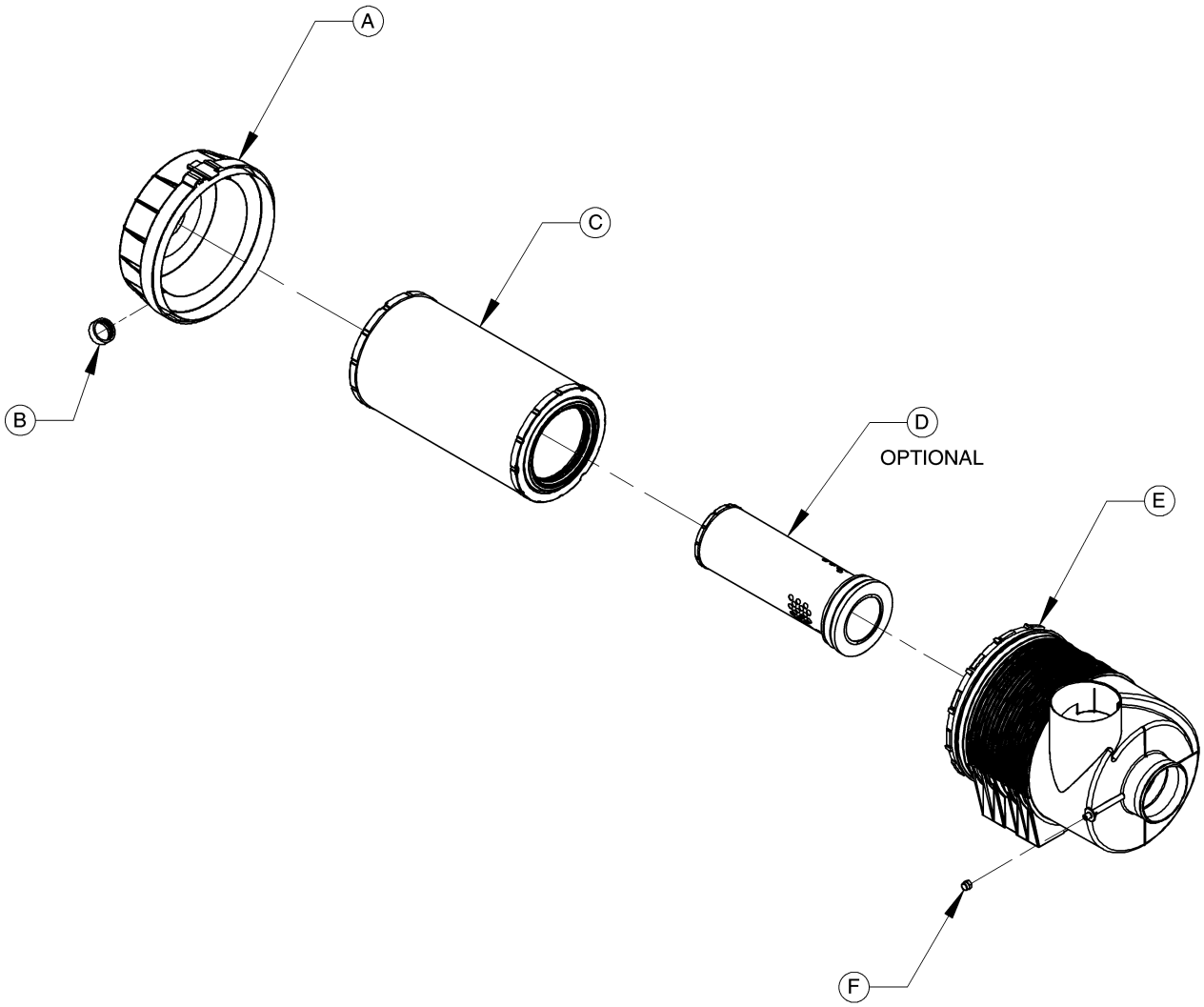
54720784-058 10/01 C

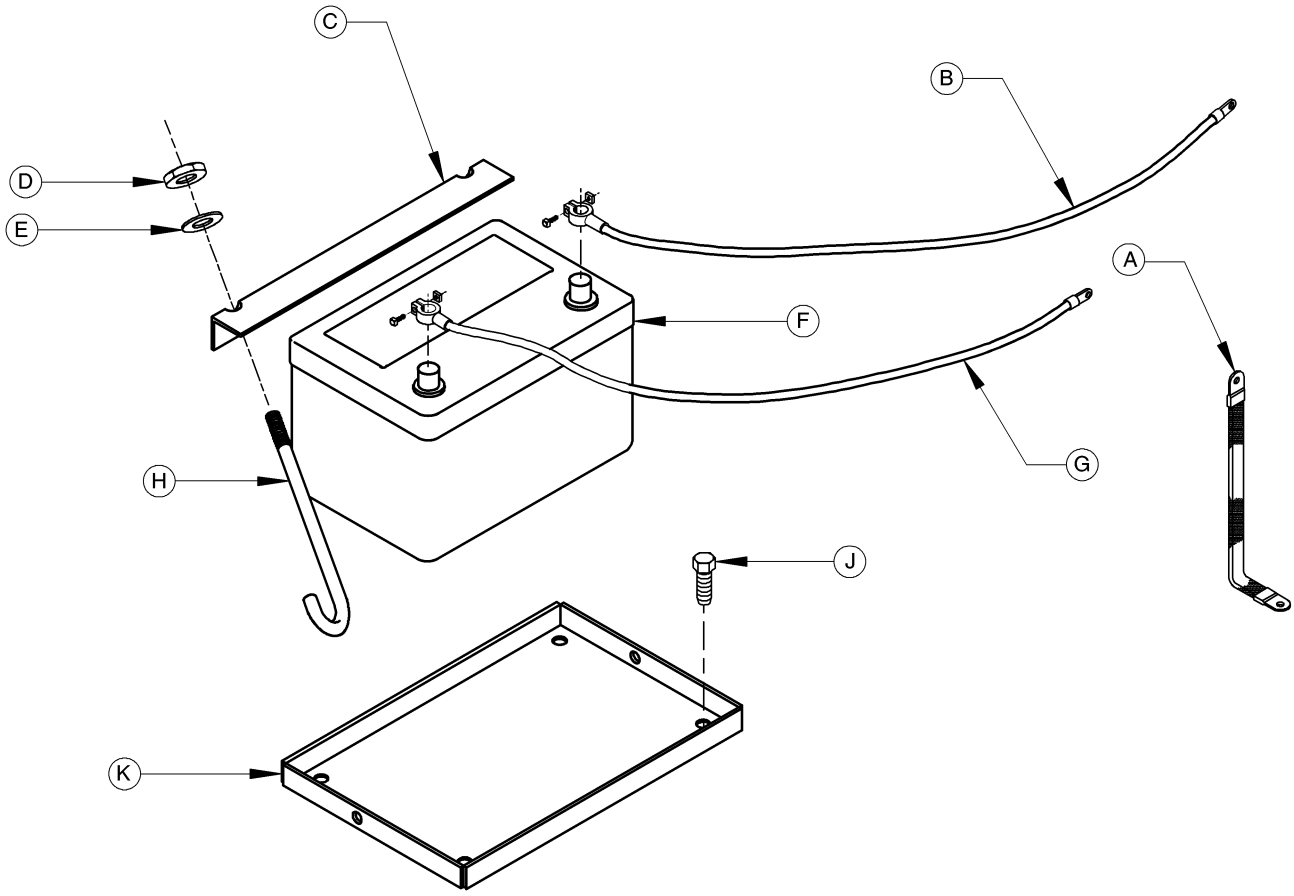


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54692975	1	COVER, AIR CLEANER	D	54717152	1	ELEMENT, SAFETY (OPTIONAL)
B	35393677	1	VALVE, DUST EJECTOR	E	54692967	1	BODY, AIR CLEANER
C	54717145	1	ELEMENT, PRIMARY	F	35393719	1	CAP, PLUG

MANUAL NO. - ILLUST. NO. 54720784-059

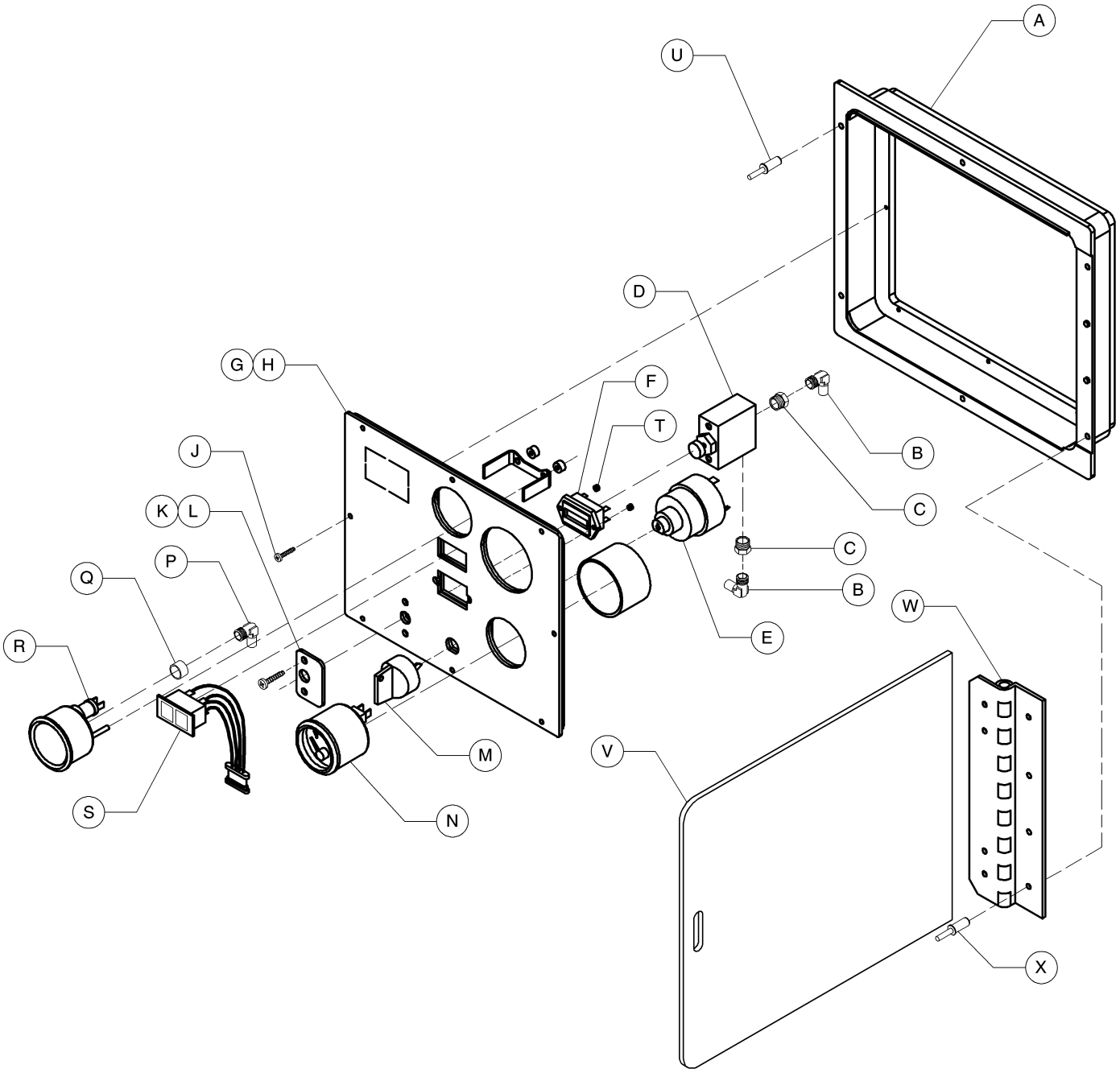
DATE/REV: 05/01 A

DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35284801	1	CABLE, GROUND	F	36844264	1	BATERY 12 V
B	35579150	1	CABLE, POSITIVE BATTERY	G	35506419	1	CABLE, NEGATIVE BATTERY
C	36853257	1	ANGLE	H	36860005	2	BOLT, J
D	95923298	2	NUT, HEX LOCK .25-20	J	92368687	4	SCREW, TAPPING M06-1.0 X 12
E	36853265	2	WASHER, PLASTIC	K	36853232	1	TRAY, BATTERY

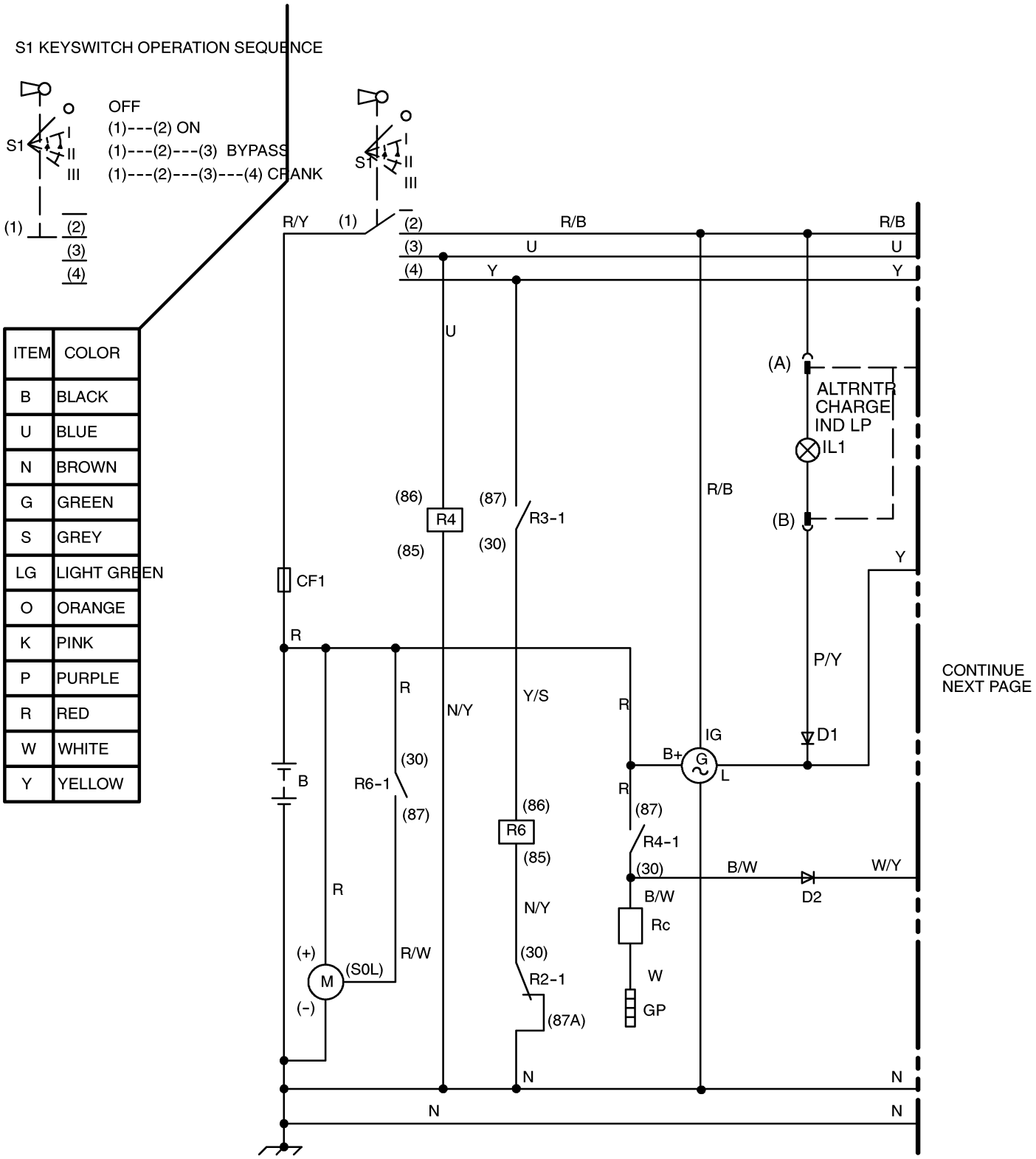
MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-060 05/01 A



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54749601	1	FRAME, WW INST PANEL	N	54774096	1	GAUGE, FUEL LEVEL
B	35369354	2	ELBOW, MALE 1/4 NPT X 3/8 TUBE	P	35370386	1	ELBOW, MALE 1/8 NPT X 3/8 TUBE
C	35302314	2	ADAPTER	Q	95935599	1	COUPLING, 18 NPT X 3/4
D	36783439	1	VALVE, 2-WAY START-RUN	R	36882207	1	GAUGE, PRESSURE 150 PSI
E	92086719	1	SWITCH, KEY		36891216	1	GAUGE, PRESSURE 250 PSI
F	54766704	1	HOURMATER	S	54774112	1	MODULE, 2-LIGHT WARNING
G	54749619	1	PANEL, INSTRUMENT	T	22054159	2	NUT, 4-40 PLASTIC
H	54746845	1	DECAL, WW INST PANEL	U	36920486	4	RIVET, SS .19 DIA
J	22070494	8	SCREW, PLASTIC TAPPING	V	54743265	1	DOOR, CONTROL PANEL
K	54774146	1	DECAL, PUSH AFTER WARM-UP	W	36890085	1	HINGE, CONTROL PANEL
L	36882207	1	SCREW, PAN HEAD M6-1.0 X 20	X	36877587	4	RIVET, .19 DIA
M	54774104	1	KNOB, NON-REMOVABLE KEY				

MANUAL NO. - ILLUST. NO. 54720784-061

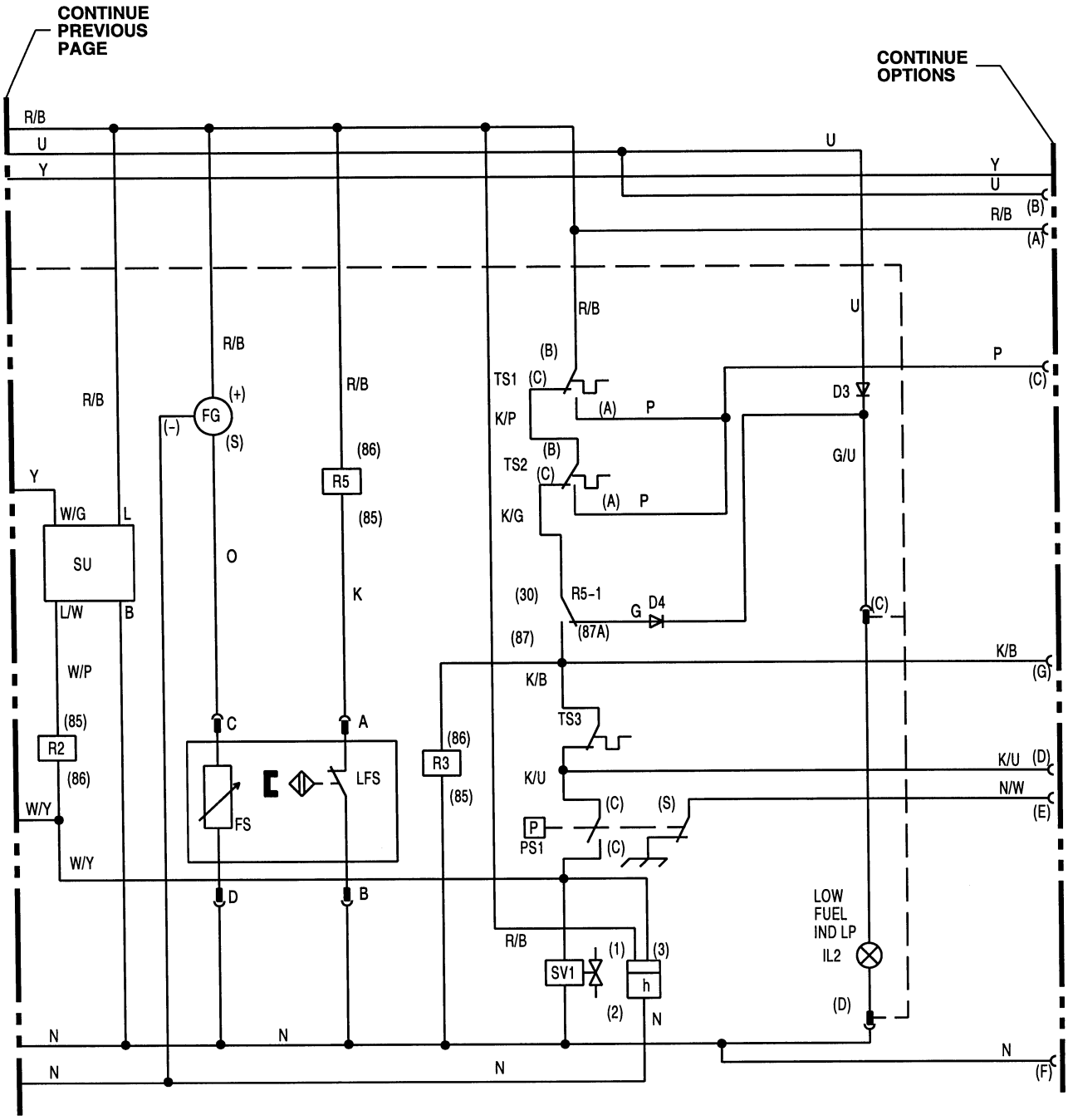
DATE/REV: 10/01 C



Item	CPN	Qty	Description	Item	CPN	Qty	Description
B	36782456	1	BATTERY	Rc	49841836	1	RESISTOR, CONTROL (GLOW PLUGS)
CF1	36782456	1	FUSE, 10A	R2	54368048	1	RELAY, START PROTECT
D1	35676169	1	DIODE	R3	54368048	1	RELAY, START INHIBIT
D2	35676169	1	DIODE	R4	54368048	1	RELAY, GLOW PLUG
G	54747571	1	ALTERNATOR	R6	54368048	1	RELAY, CRANK
GP	54385893	4	PLUG, GLOW	S1	36884211	1	SWITCH, KEY
IL1	54774112	1	LAMP, ALTERNATOR CHARGE	W1	54757992	1	HARNESS, ENGINE CONTROL
M	54747563	1	STARTER				

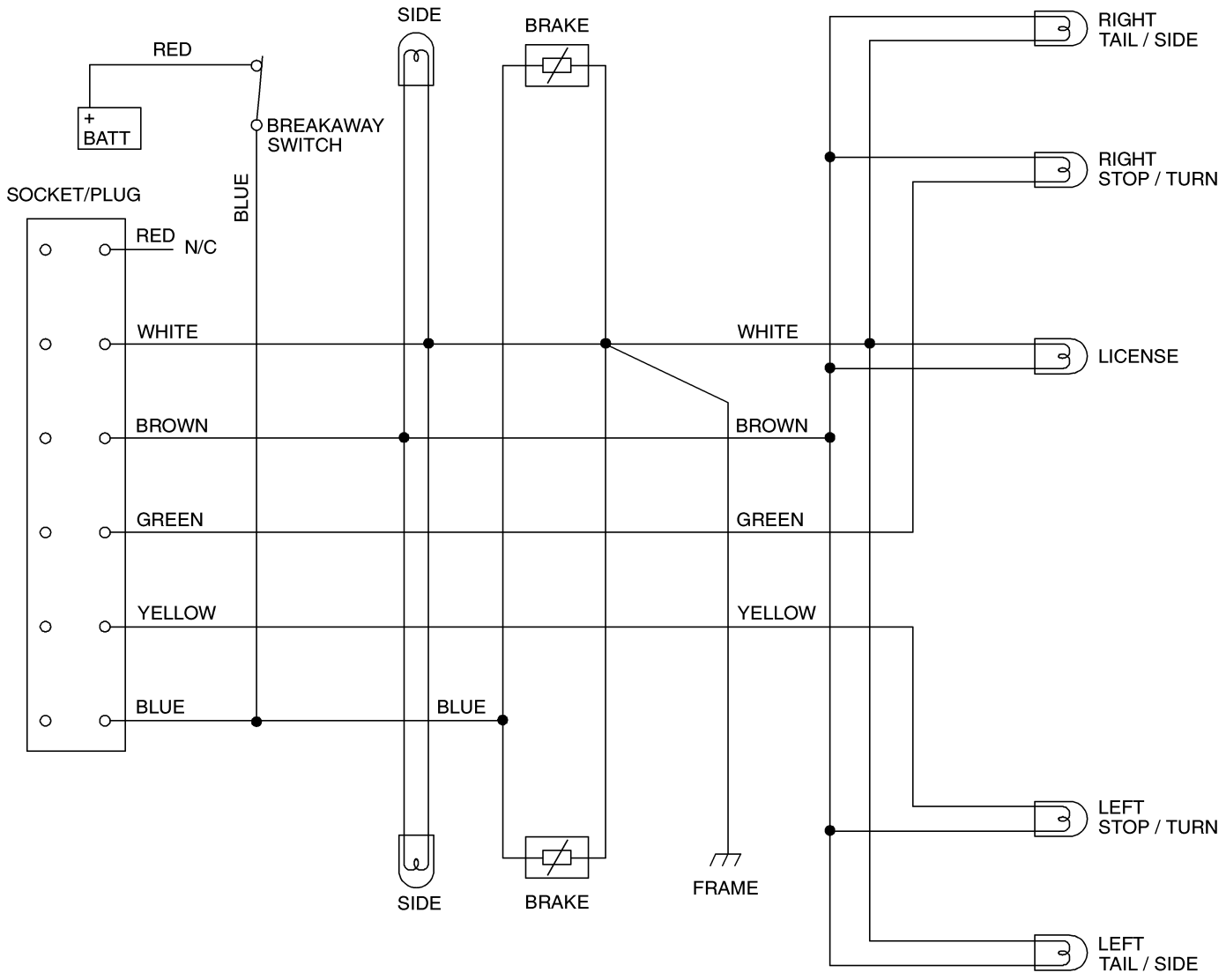
MANUAL NO. - ILLUST. NO. 54720784-062
DATE/REV: 10/01 C

ITEM	B	U	N	G	S	LG	O	K	P	R	W	Y
COLOR	BLK	BLU	BRN	GRN	GRY	LT GRN	ORG	PNK	PUR	RED	WHT	YEL

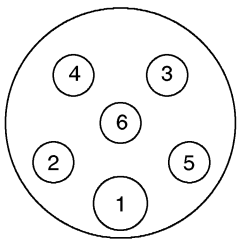


Item	CPN	Qty	Description	Item	CPN	Qty	Description
D3	35676169	1	DIODE	R3	54368048	1	RELAY, START INHIBIT
D4	35676169	1	DIODE	R5	54368048	1	RELAY, LOW FUEL SHUTDOWN
FG	54774096	1	GAUGE, FUEL	SU	49808777	1	SAFETY UNIT
FS	54731427	1	SENDER, FUEL	SV1	54385992	1	SOLENOID, FUEL
H	54766704	1	HOURMETER	TS1	54764964	1	SWITCH, A/E HIGH AIR TEMP
IL2	54774112	1	LAMP, LOW FUEL	TS2	54764956	1	SWITCH, DISCRG HIGH AIR TEMP
LFS	54731427	1	SWITCH, LOW FUEL	TS3	49844160	1	SWITCH, HIGH ENGINE TEMP
PS1	54757935	1	SWITCH, ENGINE OIL PRESSURE	W1	54757992	1	HARNESS, ENGINE CONTROL
R2	54368048	1	RELAY, START PROTECT				

TRAILER WIRING



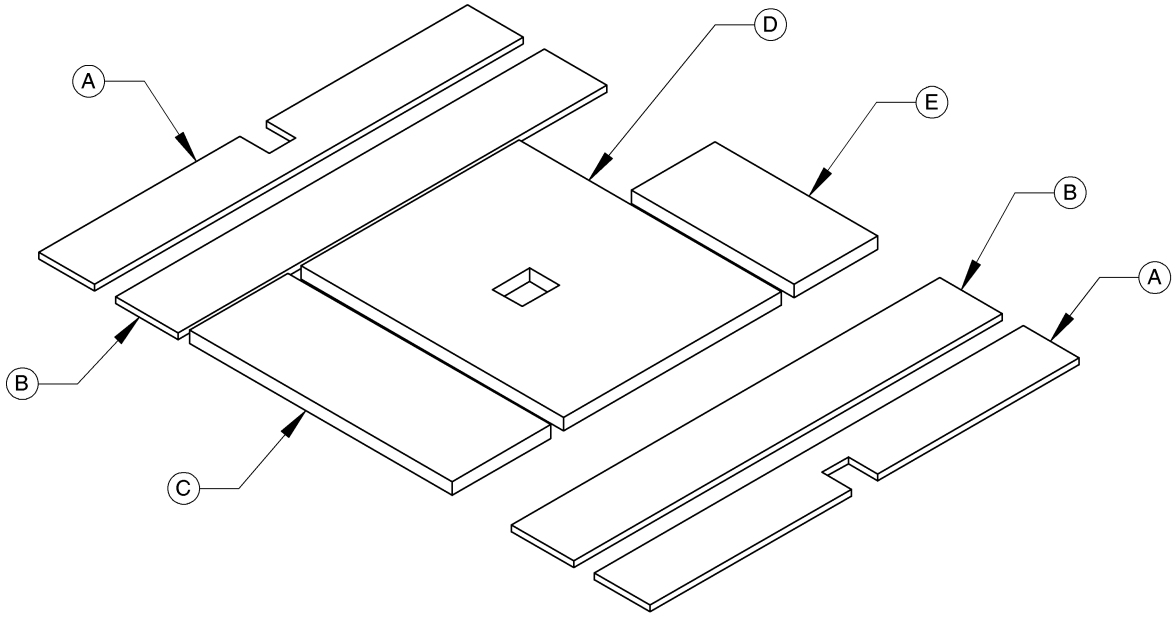
PLUG / SOCKET WIRING CONNECTIONS

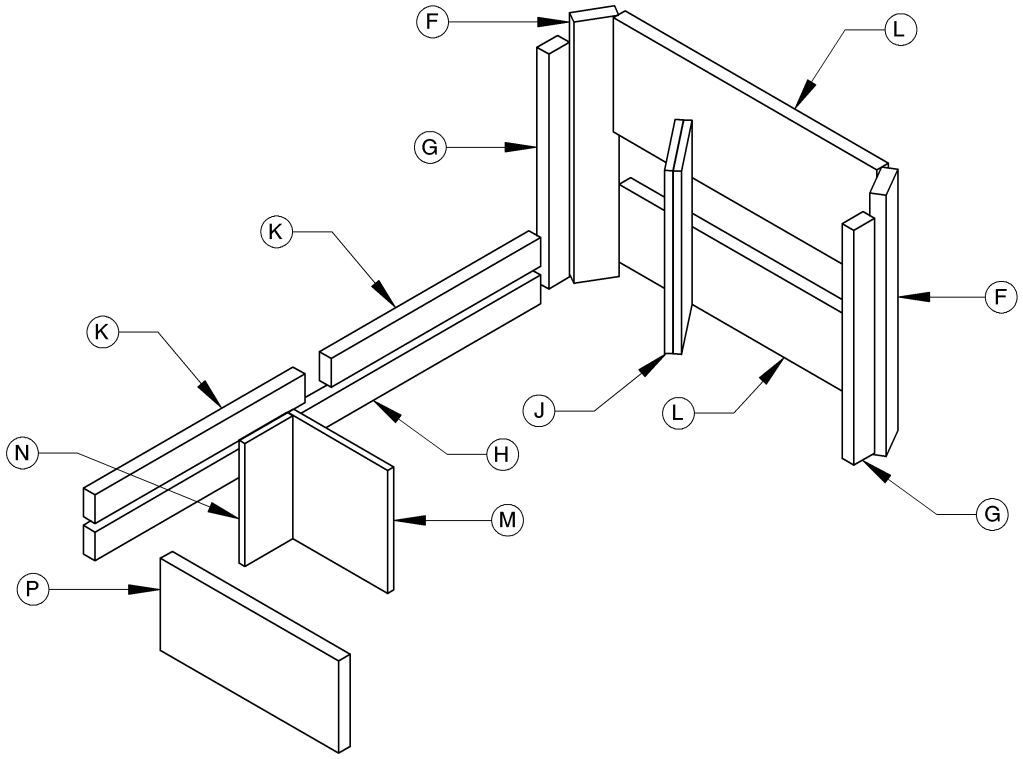


1 WHITE - GROUND
2 YELLOW - LEFT STOP/TURN SIGNAL
3
4 GREEN - RIGHT STOP/TURN SIGNAL
5 BROWN - TAIL / CLEARANCE LIGHTS
6 BLUE - ELECTRIC BRAKES

Item	CPN	Qty
BATT	36844264	1
BRAKEAWAY SW.	35315944	1
HARNESS	54761101	1
LICENSE	54726468	1
BULB	54772157	1
SIDE	35367051	2
TAIL / STOP	54671557	2
BULB	54772157	2
BULB	54772140	2

MANUAL NO. - ILLUST. NO. 54720784-064
DATE/REV: 09/01 B

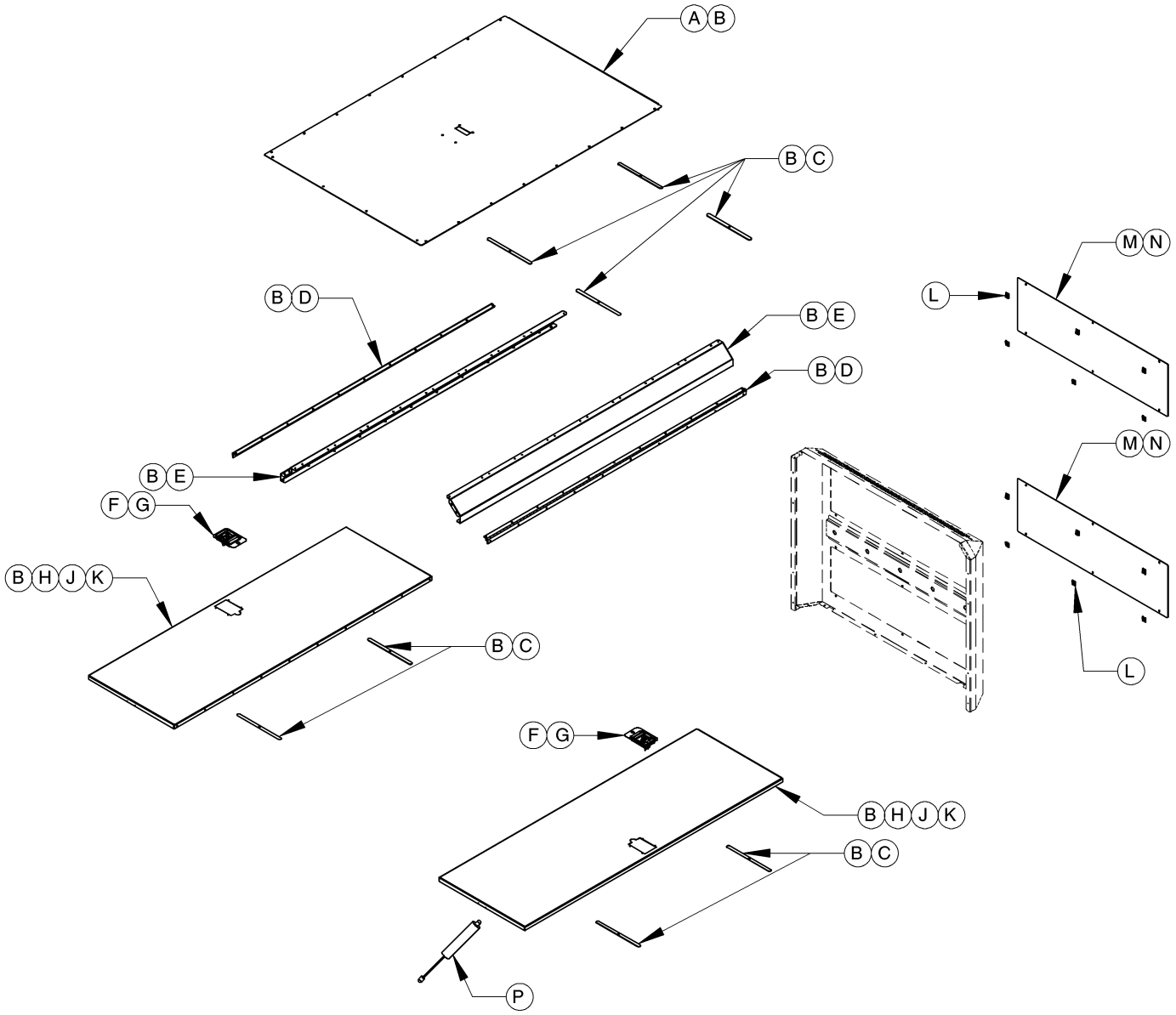




Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54675020	2	PANEL, LOWER DOOR ACOUSTIC	H	54770524	1	PANEL, LWR SIDE ACOUSTIC
B	54675046	2	PANEL, UPPER DOOR ACOUSTIC	J	54745518	2	PANEL, REAR SPLITTER ACOUSTIC
C	54675053	1	PANEL, FRONT ROOF ACOUSTIC	K	54770490	2	PANEL, TOP LWR SIDE ACOUSTIC
D	54675079	1	PANEL, MIDDLE ROOF ACOUSTIC	L	54674957	2	PANEL, BOT REAR END CAP ACOUSTIC
E	54675061	1	PANEL, REAR ROOF ACOUSTIC	M	54744826	1	PANEL, INTR BAFFLE FRONT ACOUSTIC
F	54674973	2	PANEL, REAR CORNER ACOUSTIC	N	54744818	1	PANEL, INTR BAFFLE SIDE ACOUSTIC
G	54746516	2	PANEL, REAR SIDE ACOUSTIC	P	54674916	1	PANEL, FRONT END CAP ACOUSTIC

MANUAL NO. - ILLUST. NO. 54720784-065
DATE/REV: 10/01 B

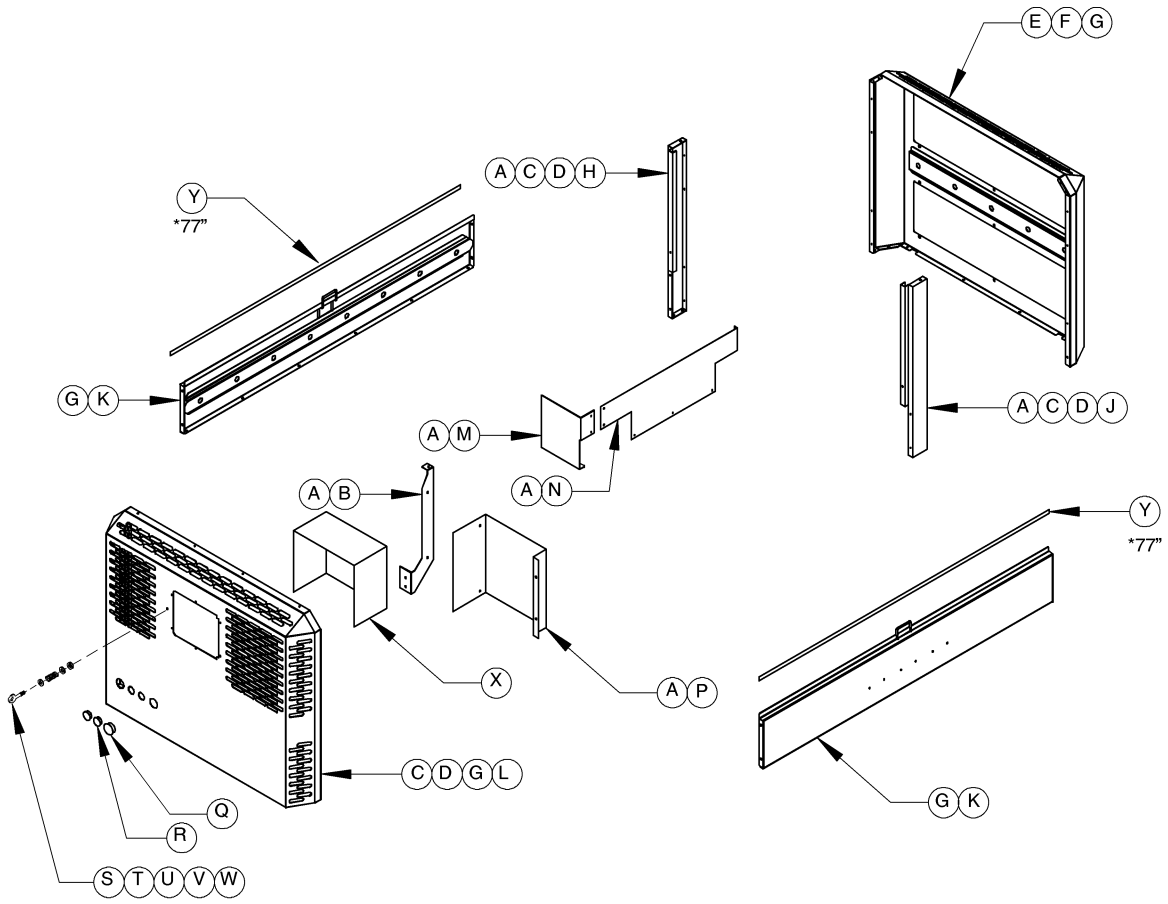
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54642905	1	ROOF	H	54629993	2	DOOR, SIDE
B	36797652	101	SCREW, TAPPING M06-1.0 X 12	J	35337328	8	STUD, BALL
C	54718184	8	STRAP, FOAM RETAINING	K	36881886	8	NUT, HEX FLANGE M08-1.25
D	54639174	2	HINGE, SIDE DOOR	L	35256445	12	RETAINER, PUSHON 1/4 TURN
E	54697495	2	RAIL, LH TOP	M	54694831	2	PANEL, REAR ACCESS
F	36793602	2	LATCH, SLAM DOOR	N	35256429	12	STUD, 1/4 TURN
G	36794816	8	RIVET, 3/16	P	35600261	4	SPRING, GAS

MANUAL NO. - ILLUST. NO. 54720784-066
DATE/REV: 10/01 B

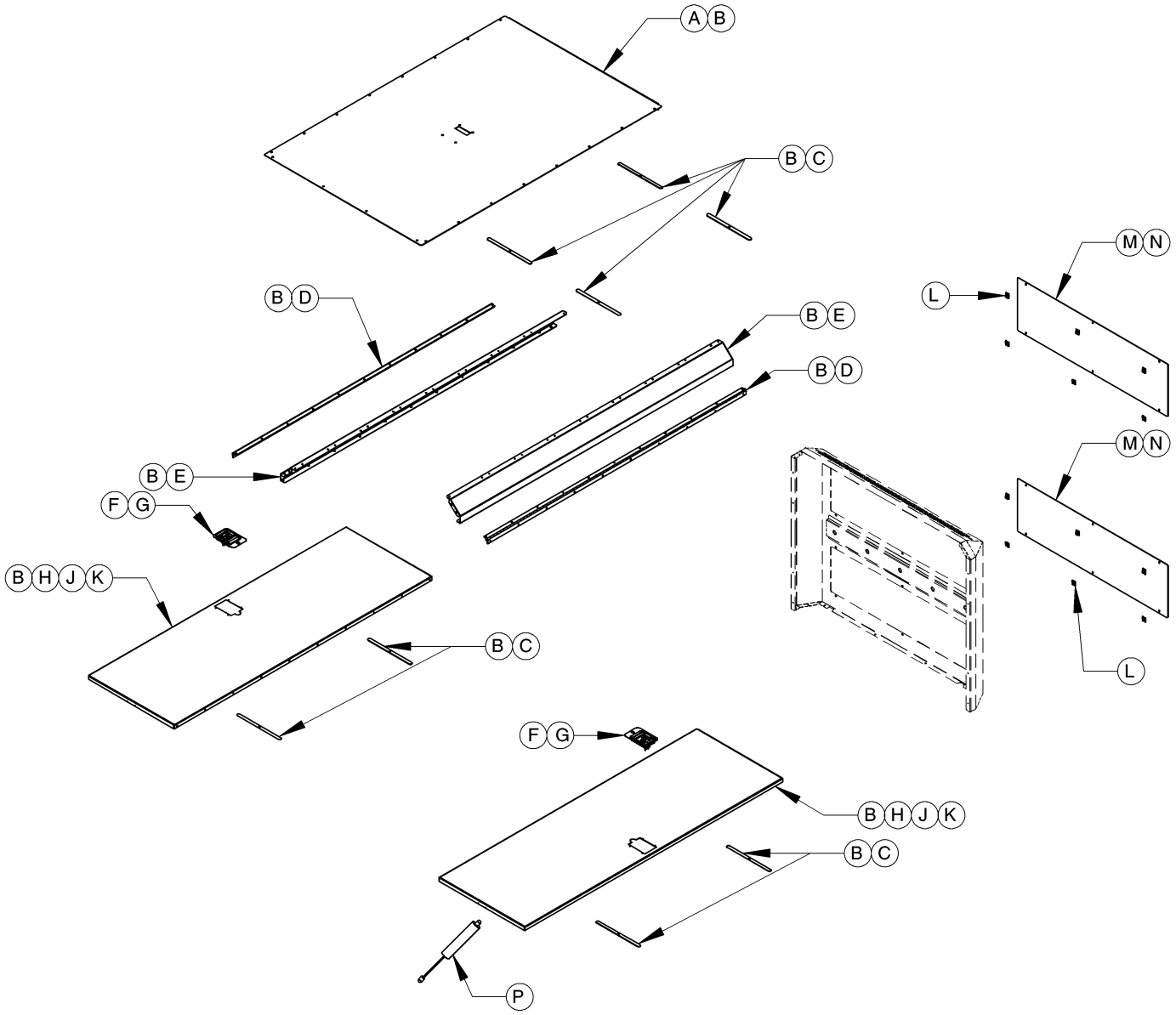
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36797652	101	SCREW, TAPPING M06-1.0 X 12	N	54719778	1	PANEL, TOOLBOX
B	54737622	1	BRACKET, FRONT INTAKE	P	54720834	1	BAFFLE, FRONT INTAKE
C	35337328	8	STUD, BALL	Q	35310622	1	PLUG, 2.0 DIA HOLE
D	36881886	8	NUT, HEX FLANGE M08-1.25	R	35285543	2	PLUG, 1.5 DIA HOLE
E	54688254	1	PANEL, REAR END CAP	S	35607829	1	EYEBOLT
F	35256452	12	RECEPTACLE, 1/4 TURN	T	36772028	1	WASHER, NYLON
G	35279025	28	SCREW, TAPPING M08-1.25 X 20	U	35607837	1	SPRING
H	54686167	1	PANEL, RH SIDE	V	95935029	1	WASHER, FLAT
J	54692751	1	PANEL, LH SIDE	W	95923298	1	NUT, 1/4-20 HEX LOCK
K	54694823	2	PANEL, LOWER SIDE	X	22058325	1	COVER, REAR INST. PANEL
L	54686209	1	PANEL, FRONT END CAP	Y	22068373	*	SEAL, DOOR
M	54719786	1	PANEL, SMALL TOOLBOX				

MANUAL NO. - ILLUST. NO. 54720784-067
DATE/REV: 10/01 A

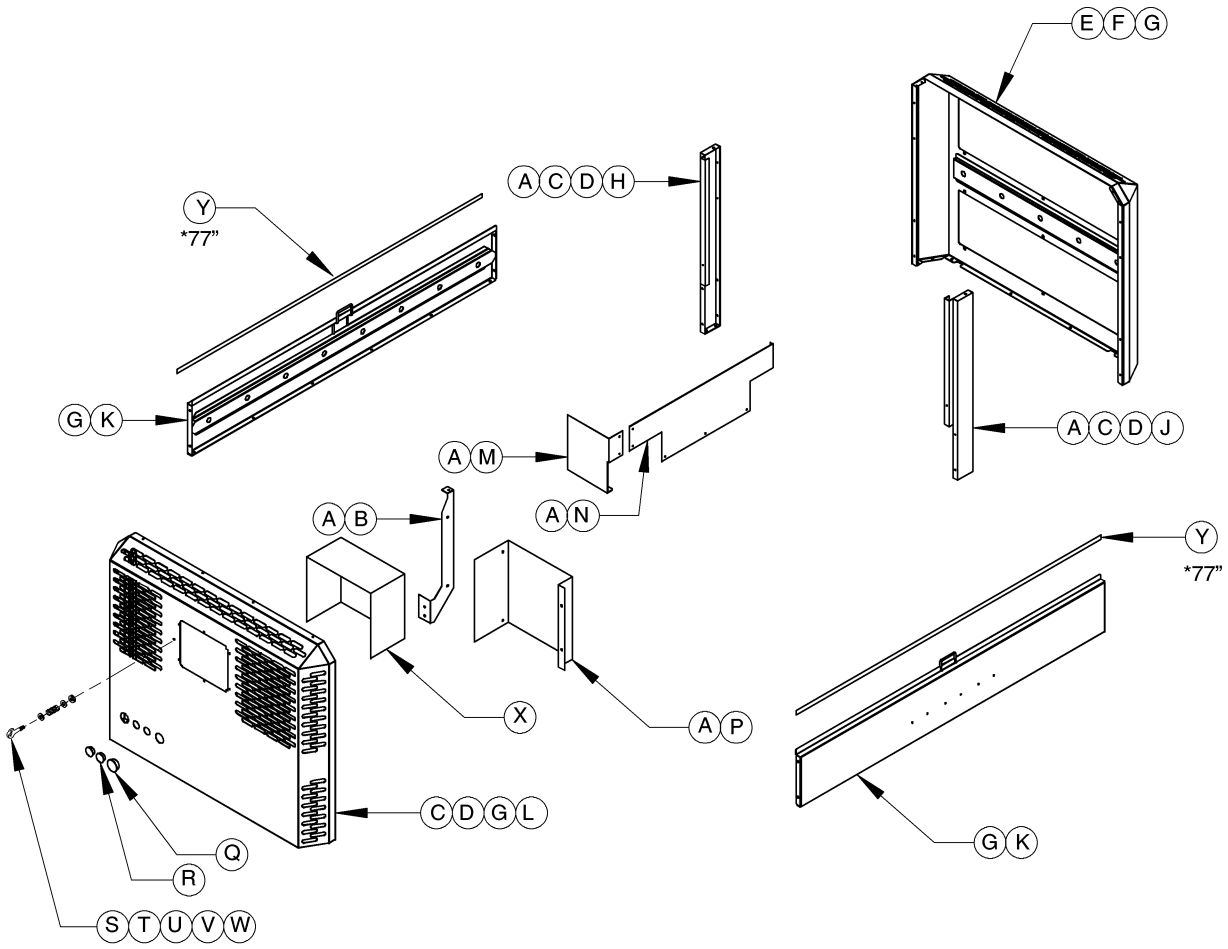
DRAWBAR END



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54746240	1	ROOF	H	54743257	2	DOOR, SIDE
B	36797652	101	SCREW, TAPPING M06-1.0 X 12	J	35337328	8	STUD, BALL
C	54718184	8	STRAP, FOAM RETAINING	K	36881886	8	NUT, HEX FLANGE M08-1.25
D	54639174	2	HINGE, SIDE DOOR	L	35256445	12	RETAINER, PUSHON 1/4 TURN
E	54743273	2	RAIL, LH TOP	M	54694831	2	PANEL, REAR ACCESS
F	36793602	2	LATCH, SLAM DOOR	N	35256429	12	STUD, 1/4 TURN
G	36794816	8	RIVET, 3/16	P	35600261	4	SPRING, GAS

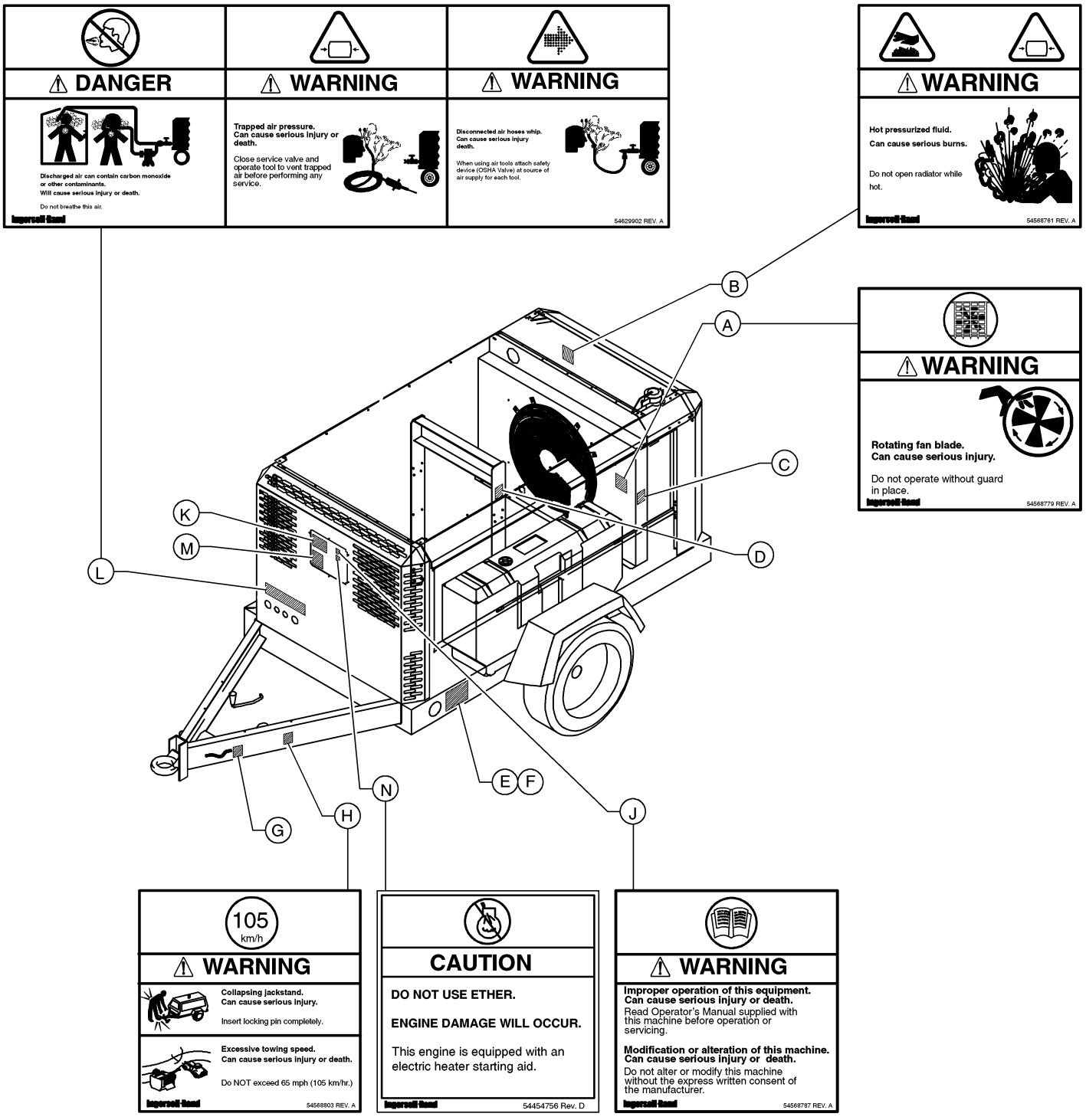
MANUAL NO. - ILLUST. NO. 54720784-068
DATE/REV: 10/01 B

DRAWBAR END



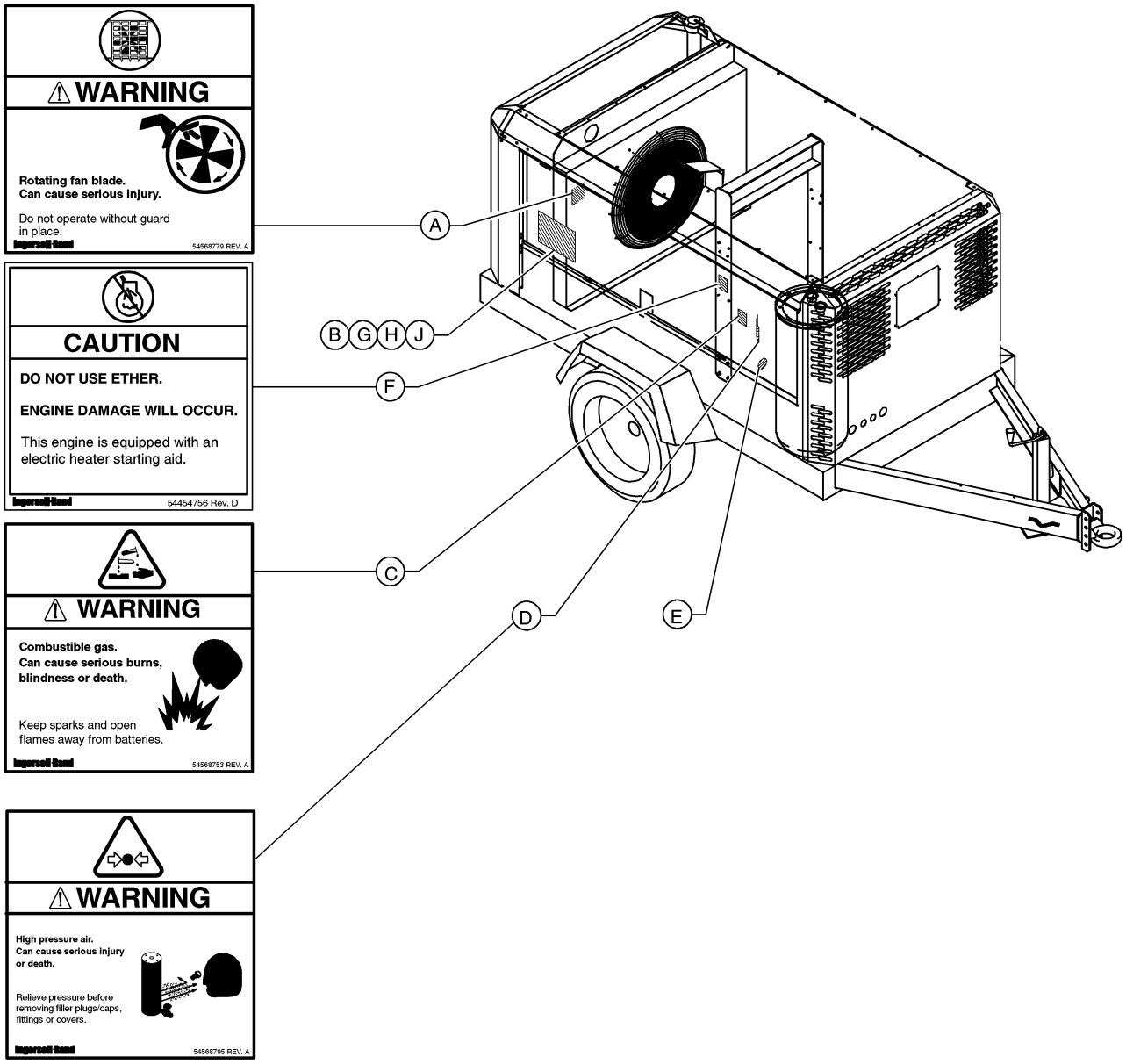
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36797652	101	SCREW, TAPPING M06-1.0 X 12	N	54719778	1	PANEL, TOOLBOX
B	54737622	1	BRACKET, FRONT INTAKE	P	54720834	1	BAFFLE, FRONT INTAKE
C	35337328	8	STUD, BALL	Q	35310622	1	PLUG, 2.0 DIA HOLE
D	36881886	8	NUT, HEX FLANGE M08-1.25	R	35285543	2	PLUG, 1.5 DIA HOLE
E	54688254	1	PANEL, REAR END CAP	S	35607829	1	EYEBOLT
F	35256452	12	RECEPTACLE, 1/4 TURN	T	36772028	1	WASHER, NYLON
G	35279025	28	SCREW, TAPPING M08-1.25 X 20	U	35607837	1	SPRING
H	54756515	1	PANEL, RH SIDE	V	95935029	1	WASHER, FLAT
J	54756523	1	PANEL, LH SIDE	W	95923298	1	NUT, 1/4-20 HEX LOCK
K	54743232	2	PANEL, LOWER SIDE	X	22058325	1	COVER, REAR INST. PANEL
L	54686209	1	PANEL, FRONT END CAP	Y	22068373	*	SEAL, DOOR
M	54719786	1	PANEL, SMALL TOOLBOX				

DECAL LOCATION



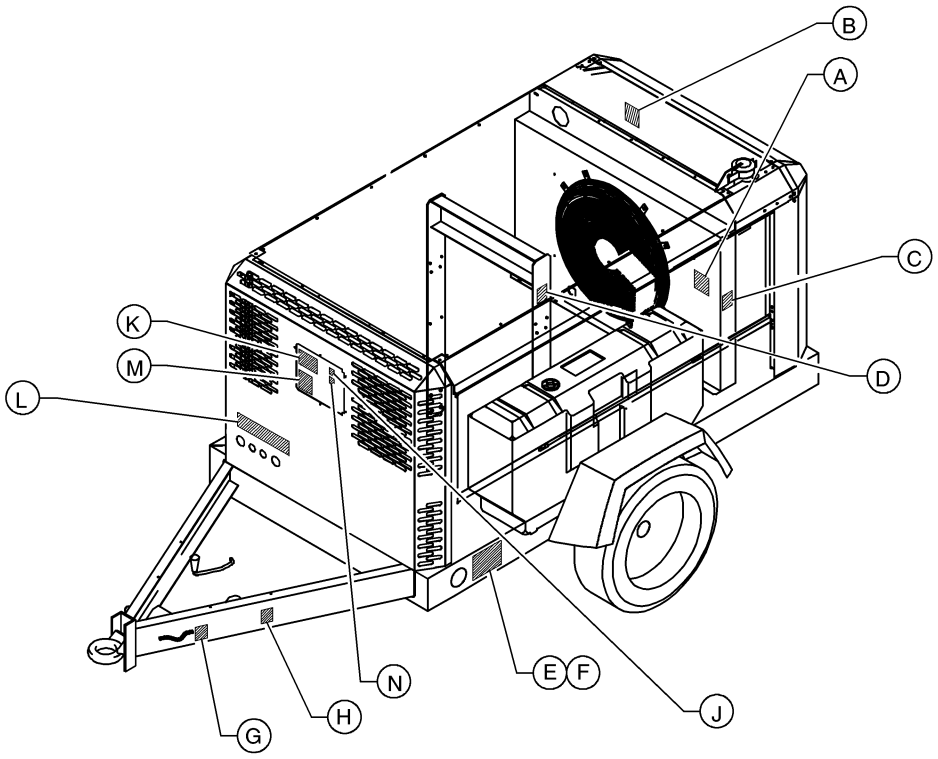
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54568779	2	WARNING, ROTATING FAN	H	54568803	1	WARNING, TOWING
B	54568761	1	WARNING, HOT FLUIDS	J	54568787	1	WARNING, IMPROPER OPERATION
C	54604962	1	NOTICE, RADIATOR FILL	K	54749163	1	DECAL, OPERATING INSTRUCTIONS
D	54625207	1	DECAL, DIESEL FUEL	L	54629902	1	DANGER/WARNING, 3-PART COMBO
E	36531176	1	DECAL, V.I.N.	M	54761572	1	DECAL, SYMBOL INTERPERTATION
F	36533081	1	OVERLAY, V.I.N.	N	54454756	1	DECAL, NO ETHER
G	54604921	1	NOTICE, TOW CHAINS				

MANUAL NO. - ILLUST. NO. 54720784-068
DATE/REV: 06/01 A



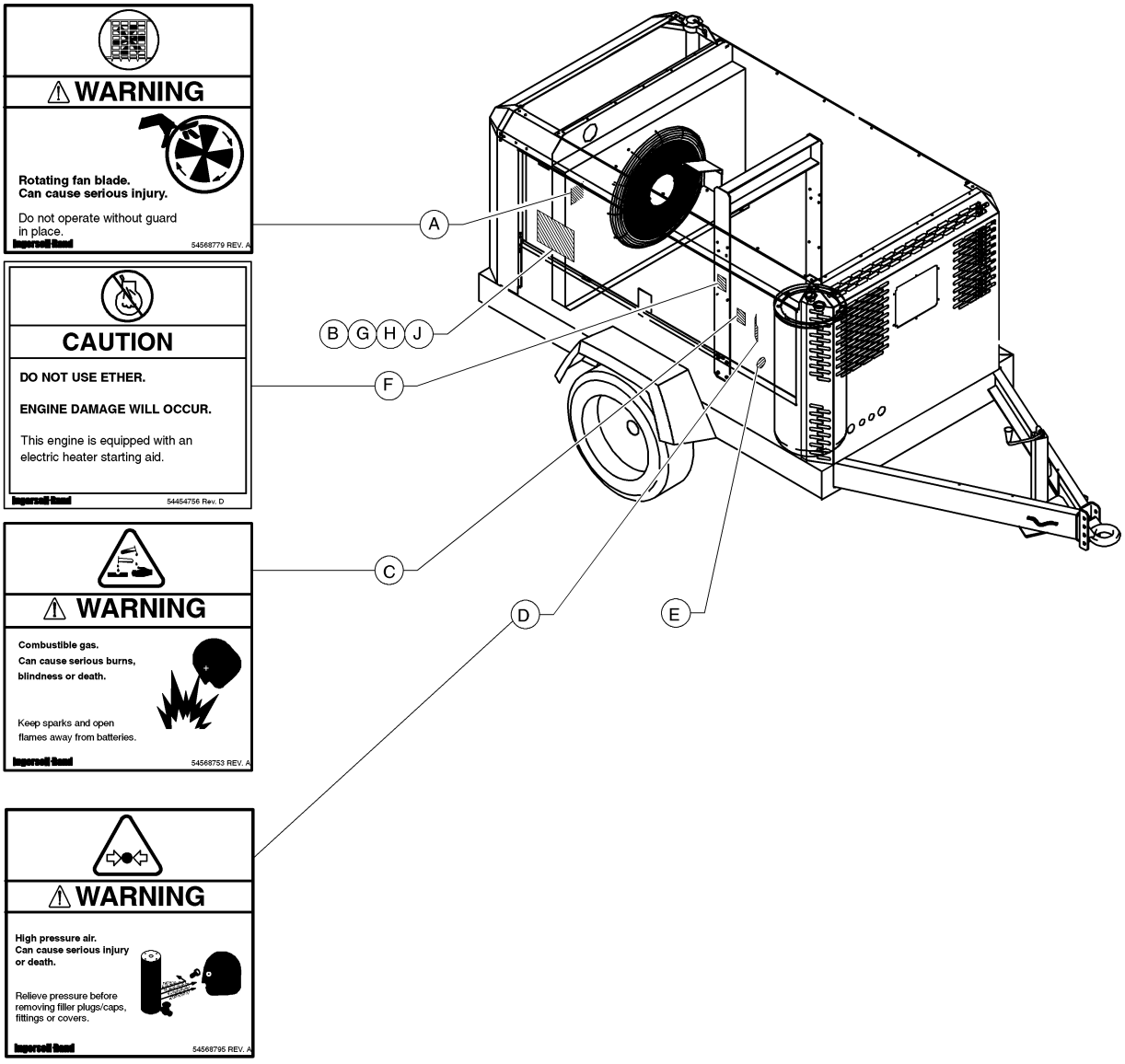
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54568779	1	WARNING, ROTATING FAN	F	54454756	1	DECAL, NO ETHER
B	54740259	1	LAMINATE, WIR STD WIRING DIAGRAM	G	54767900	1	LAMINATE, TRAILER WIRING
C	54568753	1	WARNING, BATTERY	H	36788982	1	BINDER, 3-RING
D	54568795	1	WARNING, HIGH PRESSURE	J	22068282	2	SCREW, #4 X .25 TAPPING
E	54604970	1	DECAL, OIL FILL				

CE MARK DECAL LOCATION



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54568779	2	WARNING, ROTATING FAN	H	54568803	1	WARNING, TOWING
B	54568761	1	WARNING, HOT FLUIDS	J	54568787	1	WARNING, IMPROPER OPERATION
C	54604962	1	NOTICE, RADIATOR FILL	K	54749163	1	DECAL, OPERATING INSTRUCTIONS
D	54625207	1	DECAL, DIESEL FUEL	L	54629902	1	DANGER/WARNING, 3-PART COMBO
E	36531176	1	DECAL, V.I.N.	M	54761572	1	DECAL, SYMBOL INTERPERTATION
F	36533081	1	OVERLAY, V.I.N.	N	54454756	1	DECAL, NO ETHER
G	54604921	1	NOTICE, TOW CHAINS				

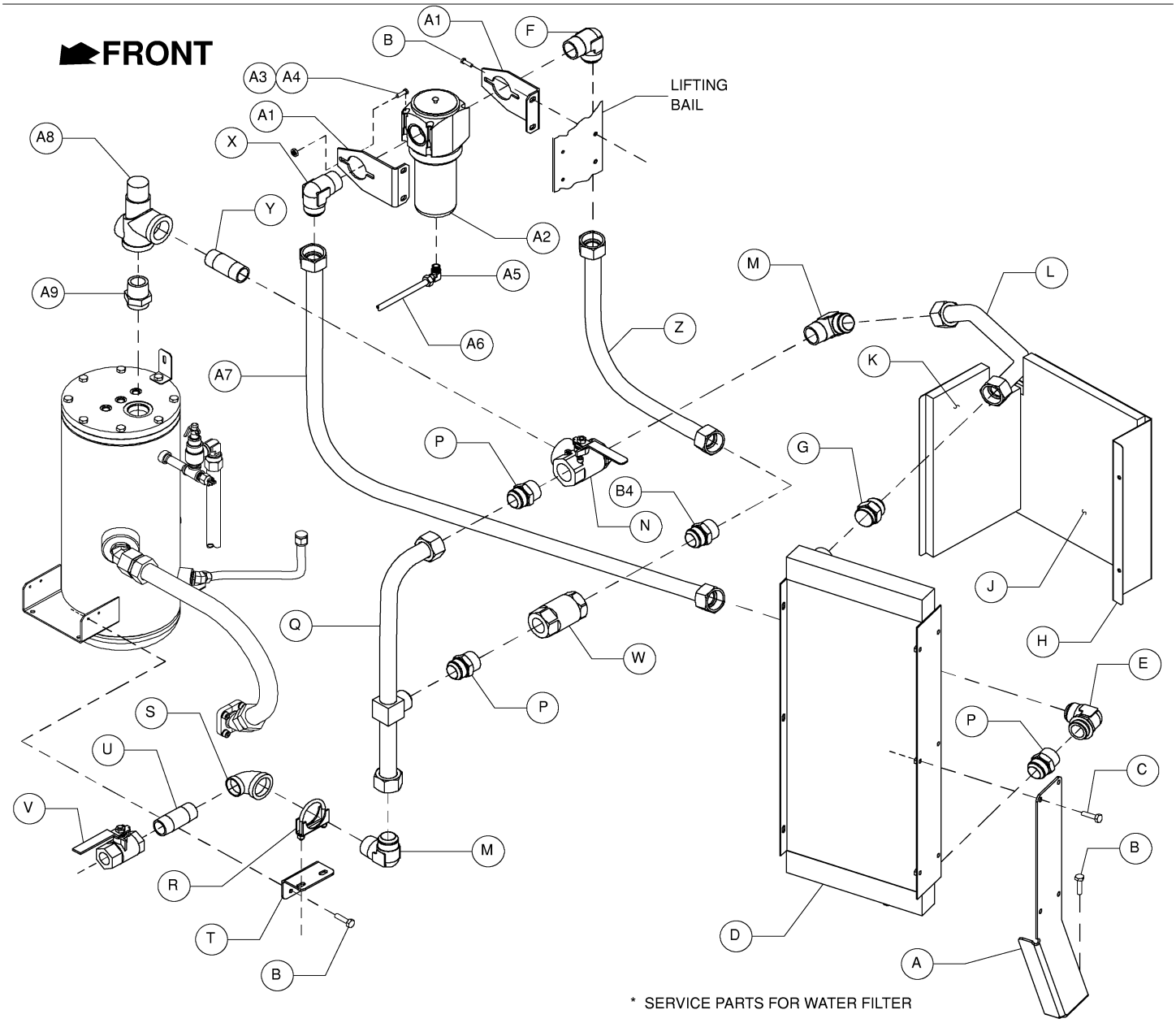
MANUAL NO. - ILLUST. NO. DATE/REV:
54720784-070 10/01 A



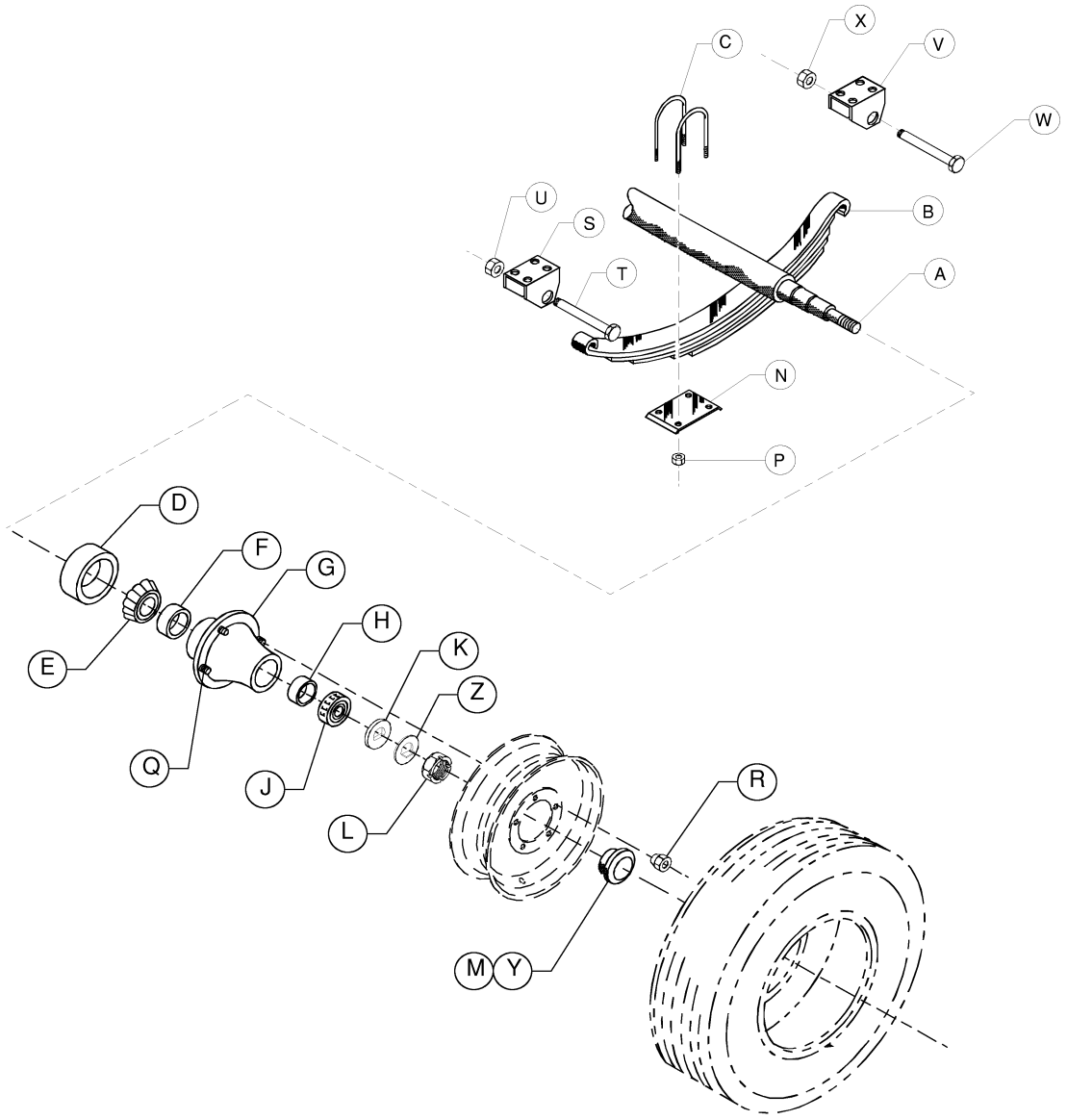
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54568779	1	WARNING, ROTATING FAN	F	54454756	1	DECAL, NO ETHER
B	22060420	1	LAMINATE, WIR STD WIRING DIAGRAM	G	54767900	1	LAMINATE, TRAILER WIRING
C	54568753	1	WARNING, BATTERY	H	36788982	1	BINDER, 3-RING
D	54568795	1	WARNING, HIGH PRESSURE	J	22068282	2	SCREW, #4 X .25 TAPPING
E	54604970	1	DECAL, OIL FILL				

MANUAL NO. - ILLUST. NO. 54720784-069
DATE/REV: 10/01 B

AFTERCOOLER with WATER SEPARATOR

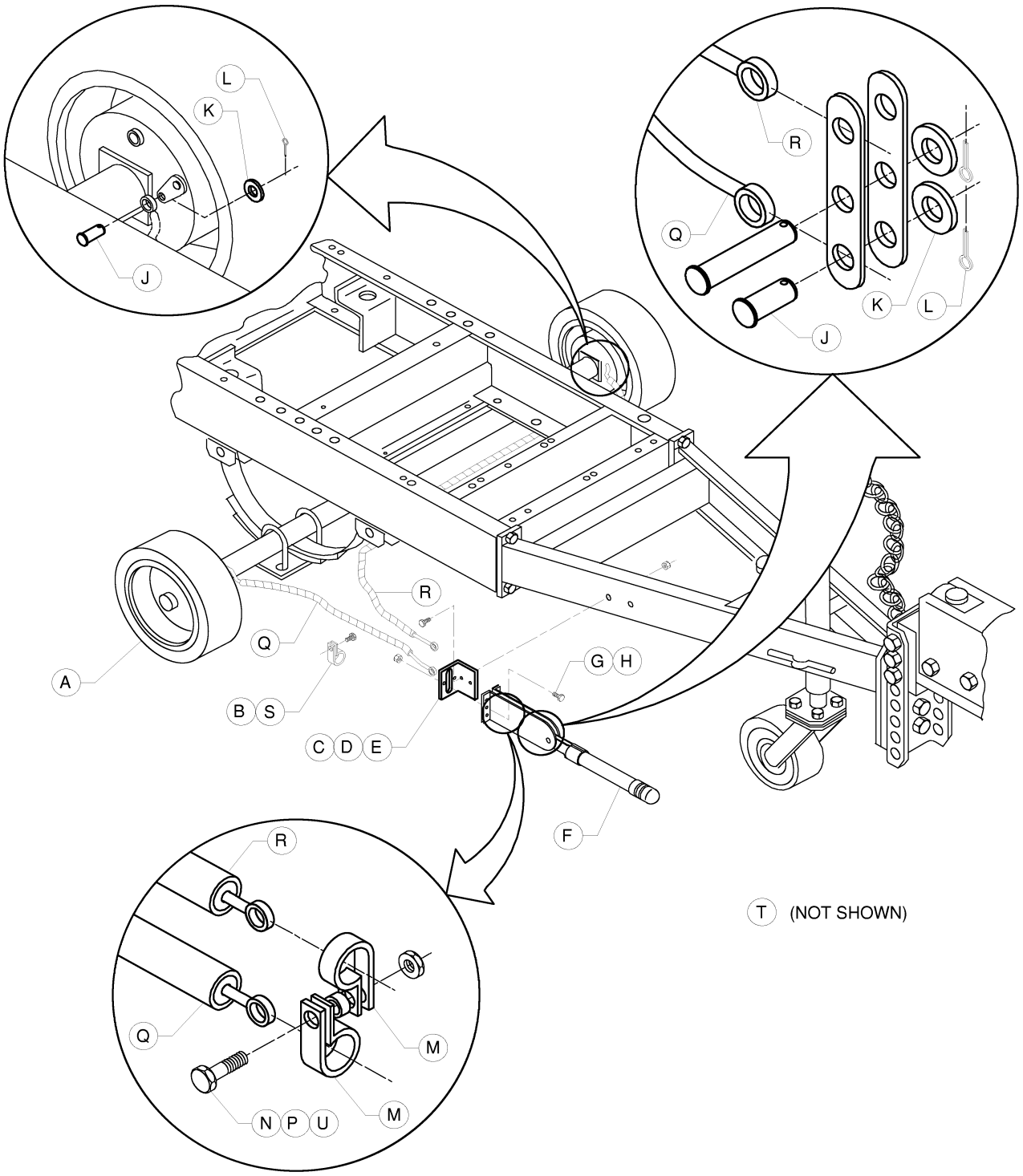


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54761622	1	BRACKET, AFTERCOOLER MTG.	V	35612126	1	VALVE, BALL 1.25NPT
B	35279025	8	SCREW, TAPPING M08-1.25 X 20	W	36786820	1	VALVE, CHECK 1.50NPT
C	96702279	2	SCREW, HEX M10-1.5 X 20	X	95279139	1	ELBOW, 45 1.50NPT TO-24JIC
D	54660162	1	AFTERCOOLER	Y	95487773	1	NIPPLE, CLOSED 1.5 X 1.75
E	95431292	1	ELBOW, 1.88-12 X -12JIC	Z	35130871	1	HOSE, -24JIC X 41.75
F	95949749	1	ELBOW, 1.5NPT	A1	36882884	2	BRACKET, FILTER MTG.
G	35296409	1	CONNECTOR, 1.88-12	A2	36882728	1	SEPARATOR, WATER 1.50NPT
H	22070908	1	BAFFLE, FRONT AFTERCOOLER	A3	36880995	8	SCREW, HEX FLANGE M10-1.5 X 30
J	22074504	1	PNL, ACTL INTERIOR BAFFLE	A4	36879195	8	NUT, HEX FLANGE M10-1.5
K	22074488	1	PNL, ACTL INTERIOR BAFFLE	A5	36783694	1	ELBOW, SWIVEL 12BSP X TUBE
L	54759691	1	TUBE, SEPT TK / AFCLR	A6	35356484	16”	TUBING, 3/8”
M	95279477	2	ELBOW, 1.5NPT X -24JIC	A7	35117472	1	HOSE, -24JIC X 62”
N	36921476	1	VALVE, 3-WAY 1.5NPT	A8	36789550	1	VALVE, MINIMUM PRESSURE
P	36883155	3	ADAPTER, 1.5NPT TO -24	A9	36881068	1	ADAPTER, 1.5NPT X 1.75
Q	54671135	1	TUBE, SEPT TK / SVC PIPE	B1	36883270	*	CAP, WATER SEPARATOR
R	35209048	1	CLAMP, SADDLE 2.50	B2	36883098	*	KIT, WATER SEPARATOR
S	95928024	1	ELBOW, REDUCING 1.5 X 25	B3	35378231	*	KIT, DRAIN
T	54761648	1	BRACKET, SVC PIPE	B4	95208682	1	ADAPTOR, 1.5NPT TO 1.50JIC
U	95950275	1	NIPPLE, PIPE 1.25NPT X 4.0				

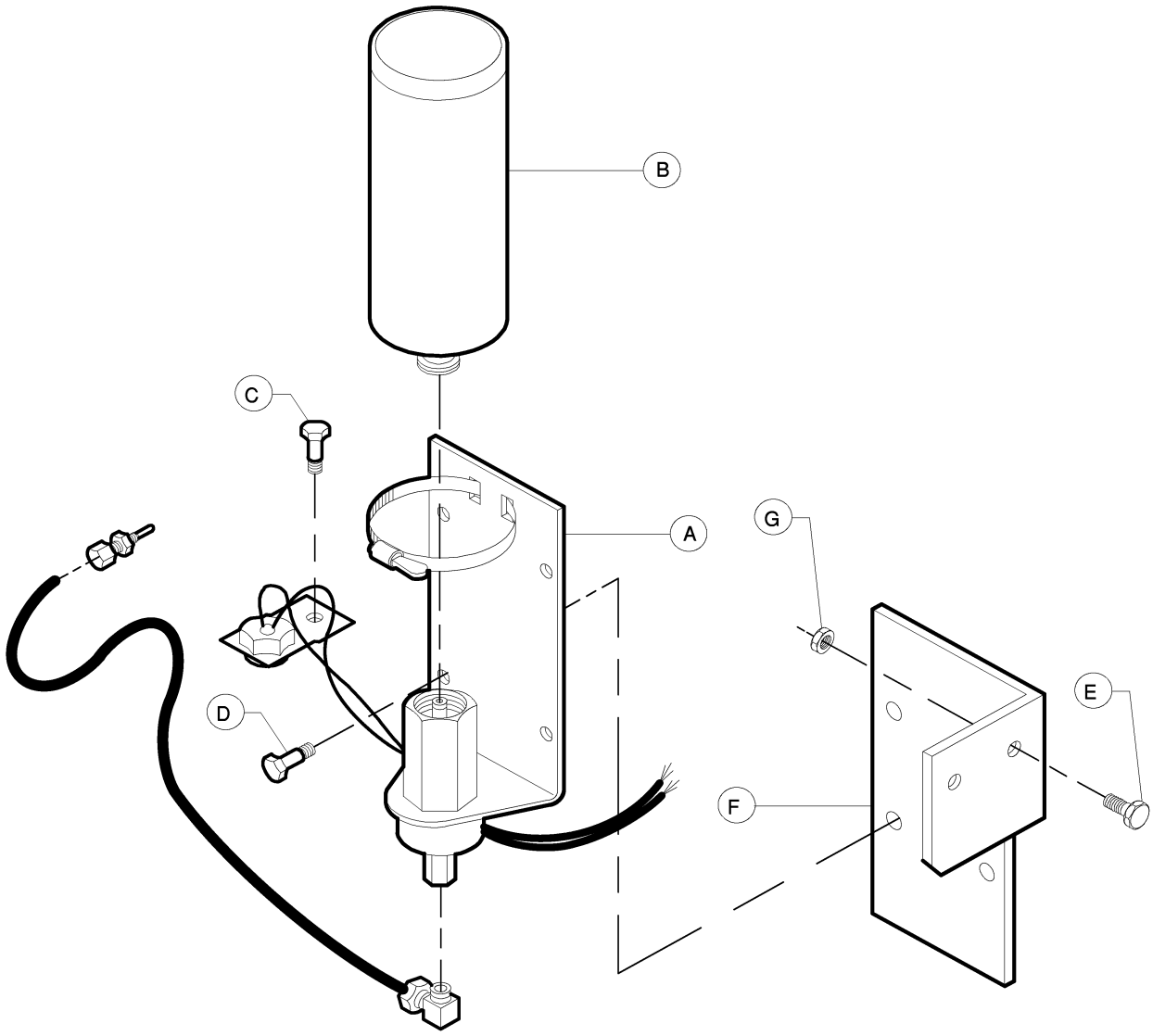


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54750997	1	BEAM, AXLE	N	35315241	2	PLATE, TIE
B	35315126	2	SPRING, SLIPPER	P	35315258	4	NUT, U-BOLT
C	35360734	4	U-BOLT	Q	35361898	12	STUD
D	35316868	2	SEAL, GREASE	R	35315274	12	NUT, WHEEL
E	35316876	2	CONE, INNER BEARING	S	35326958	2	HANGER, FRONT
F	35316884	2	CUP, INNER BEARING	T	35315340	2	BOLT, SHACKLE
G	35318823	2	HUB, STUDDED w/CUPS	U	35315357	2	NUT, TOP LOCK
H	35318831	2	CUP,OUTER BEARING	V	35326966	2	HANGER, REAR
J	35318849	2	CONE, OUTER BEARING	W	35315365	2	BOLT, KEEPER
K	35315209	2	WASHER, SPINDLE	X	35315373	2	NUT, KEEPER
L	35315217	2	NUT, SPINDLE	Y	35379387	2	PLUG, GREASE CAP
M	35379395	2	CAP, GREASE DUST	Z	35390012	2	WASHER, TANG

BRAKES, PARKING

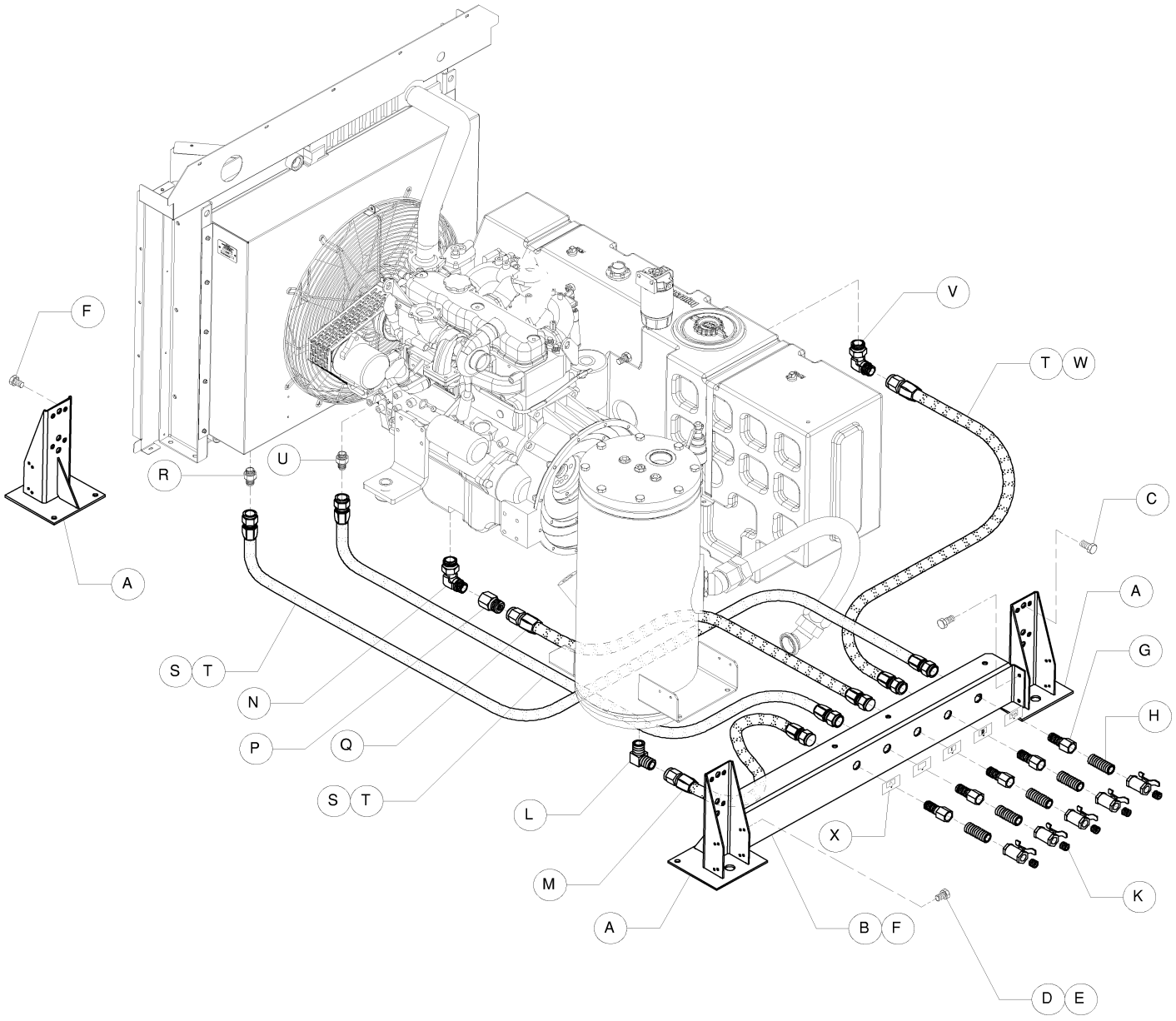


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36881324	1	RUNNING GEAR W/ BRAKES	L	95928867	4	PIN, COTTER .09
B	35134477	1	CLAMP, RUBBER COATED	M	35126325	2	CLAMP, CABLE
C	35116433	1	BRACKET, BRAKE LEVER	N	95929006	1	SCREW, HEX 5/16-18 X 1
D	36769297	2	SCREW, HEX M10-150 X 35	P	35126358	1	SPACER
E	96701529	2	NUT, HEX M10	Q	35589746	1	ASSEMBLY, BRAKE CABLE 78
F	35370055	1	LEVER, PARKING BRAKE	R	36503134	1	ASSEMBLY, BRAKE CABLE 108
G	35374834	2	SCREW, HEX M08-125 X 25	S	35300771	1	SCREW, TAPPING M06-100 X 20
H	96700869	2	NUT, HEX M08	T	35253038	4	CLAMP, RUBBER COATED
J	36846780	4	PIN, CLEVIS .31 X .75	U	35252600	1	NUT, LOCKING 5/16-18
K	95934998	4	WASHER, FLAT 3/8				

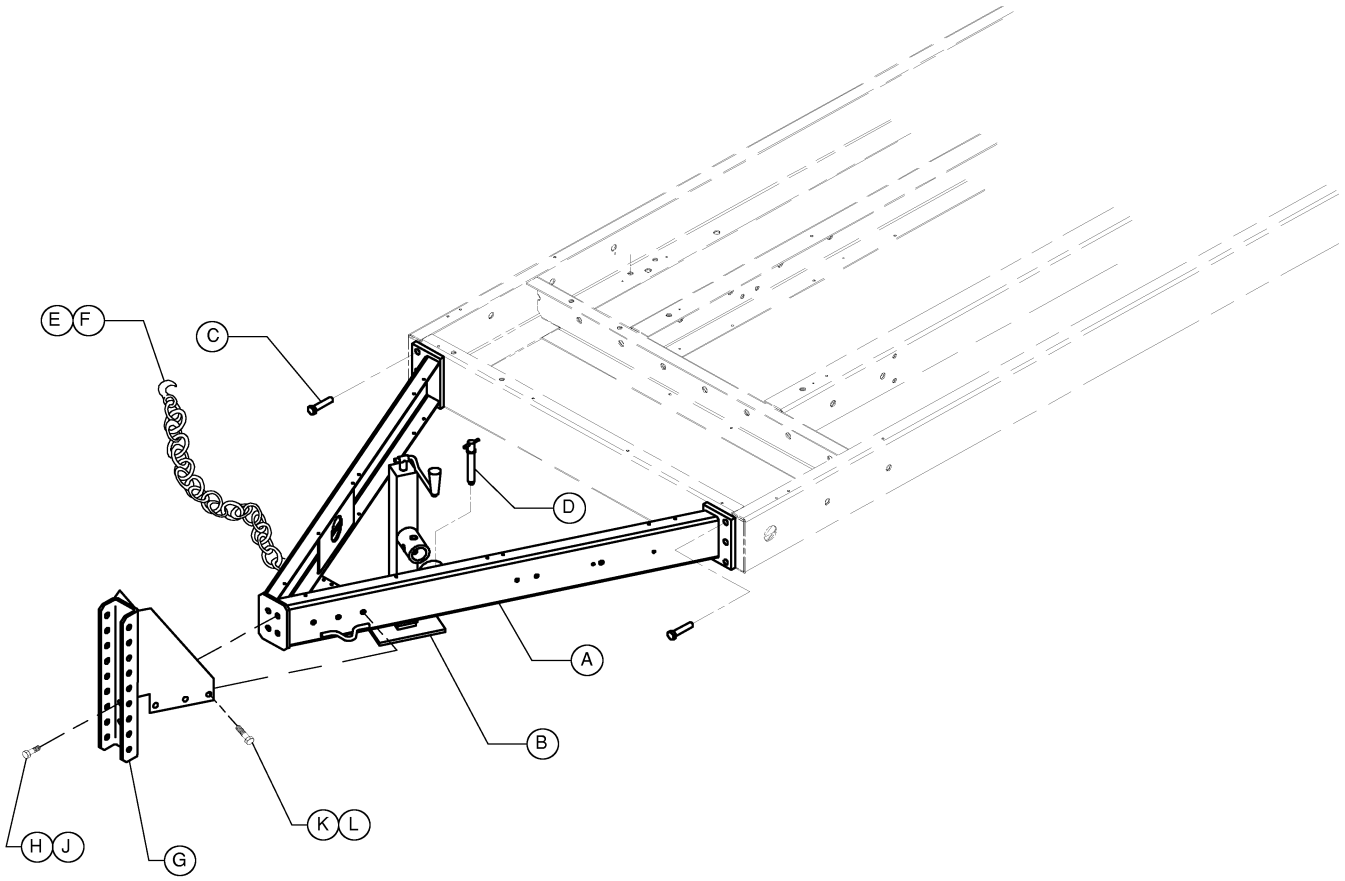


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35377266	1	KIT, COLD START				
B	36796910	1	CYLINDER, ETHER				
C	96716139	1	SCREW, HEX M10-1.5 X 20				
D	36797652	4	SCREW, TAPPING M06-1.0 X 12				
E	36889608	2	SCREW, HEX FLANGE M08-1.25 X 25				
F	22071070	1	BRACKET, ETHER MTG.				
G	36881886	2	NUT, HEX FLANGE M8-1.25				

CENTRAL DRAINS, IR

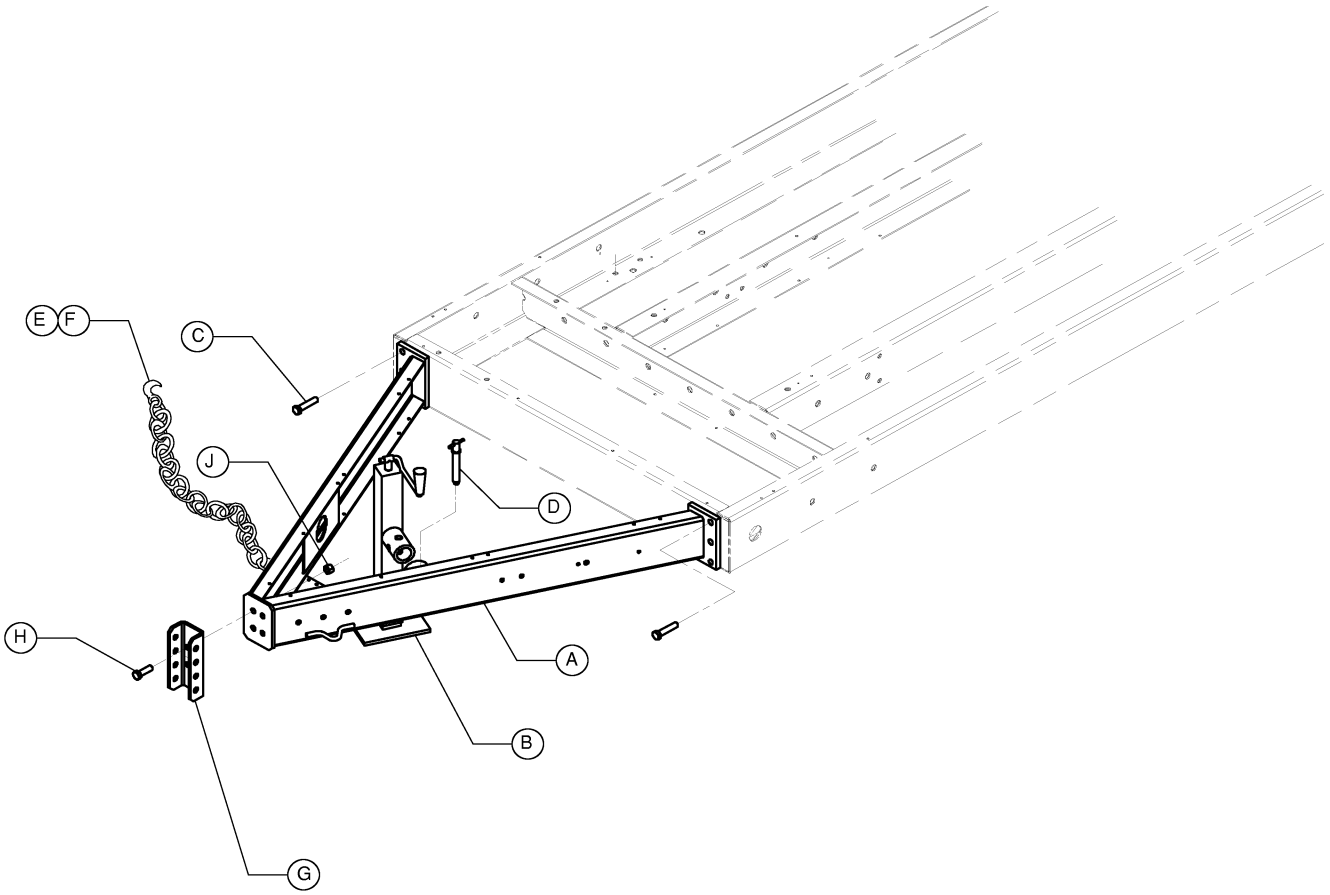


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36882355	4	SUPPORT, REAR	N	22104129	1	ELBOW, M20-2.5 X -20JIC (IR)
B	22072318	1	BRACKET, CENTRAL DRAINS		36883395	1	ELBOW, M18-1.5 (JD)
C	36879302	4	SCREW, HEX M16-2.0 X 50	P	22104111	1	REDUCER, -10 X -12 (IR)
D	36889608	4	SCREW, HEX FLANGE M12-1.75 X 25	Q	35323807	1	HOSE ASM., -12 X 68" (IR)
E	36881886	4	NUT, HEX FLANGE M12-1.75		35361898	1	HOSE ASM., -12JIC X 68" (JD)
F	36888055	8	SCREW, HEX FLANGE M12-1.75 X 30	R	35287895	1	CONNECTOR, 9/16-18 TO -8JIC
G	35287747	5	BULKHEAD FITTING	S	35305481	2	HOSE ASM., -8JIC X 88"
H	95928040	5	NIPPLE, CLOSE	T	35225093	12	CLAMP, 1/2" RUBBER SUPPORT
J	36777399	5	VALVE, BALL 3/4"	U	35283134	1	CONNECTOR, 1/4NPT TO -8JIC
K	95947149	5	PLUG, HEX COUNTERSINK 3/4NPT	V	35294750	1	ELBOW, 1.06SAE TO -12JIC
L	36885093	1	ELBOW, -12JIC O-RING	W	35376110	1	HOSE ASM., 12JIC X 54"
M	35323799	1	HOSE, -12JIC X 27"	X	54629977	1	DECAL, CENTRAL DRAINS



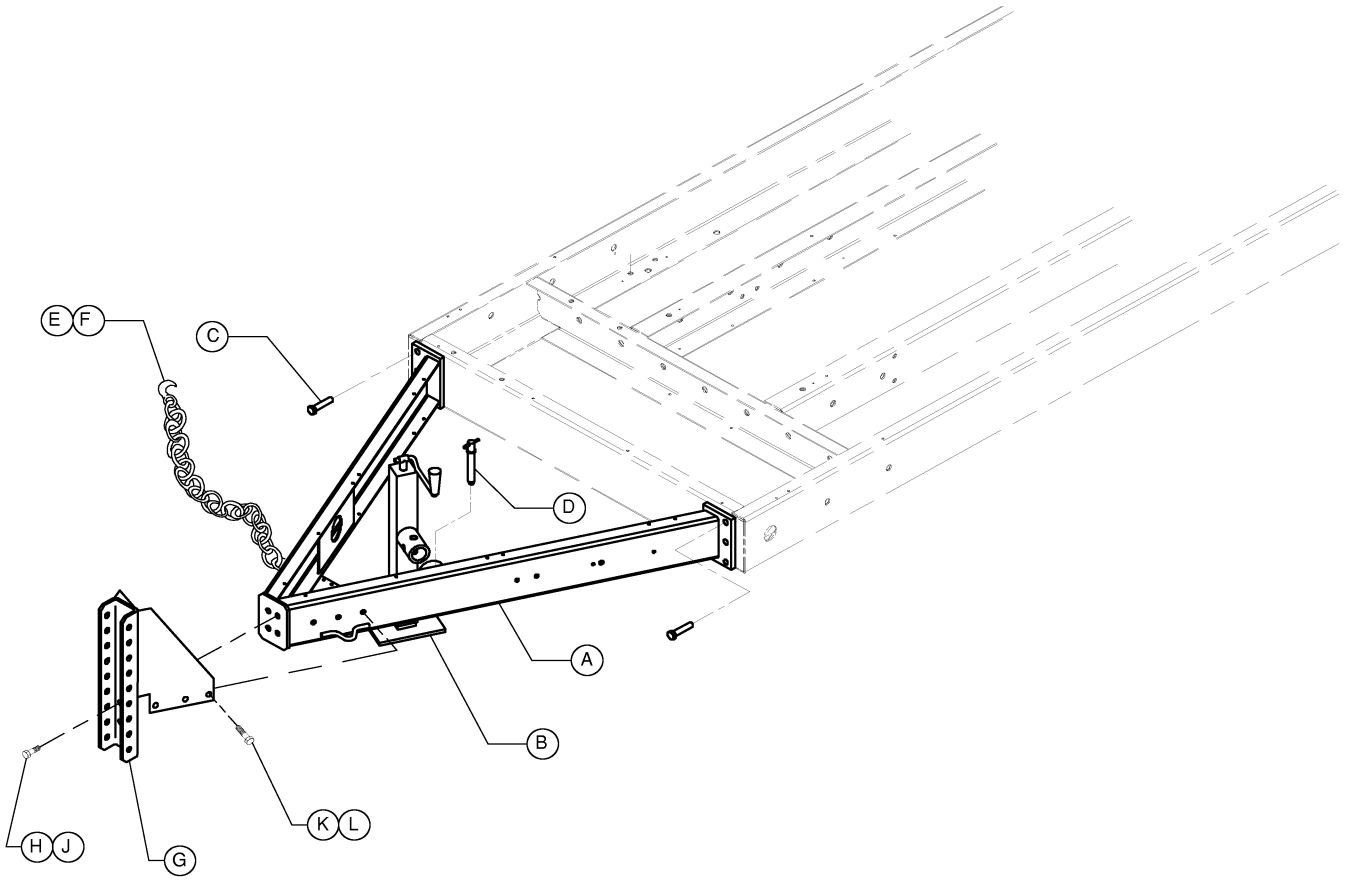
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36876621	1	DRAWBAR	G	36882017	1	CHANNEL, ADJ HEIGHT
B	54443577	1	JACK, SCREW	H	39179072	4	SCREW, HEX M16-2.0 X 50
C	36879302	6	SCREW, HEX FLANGE M16-2.0 X 50	J	36879211	4	NUT, HEX M16-2.0
D	35609544	1	PIN, QUICK RELEASE	K	35252758	6	SCREW, HEX LOCK 1/2-13 X 1.0
E	35610377	2	CHAIN ASSEMBLY	L	35252618	6	NUT, LOCK WASHER 1/2-13
F	35372432	2	LOCK, COUPLING				

DRAWBAR, EXTENDED



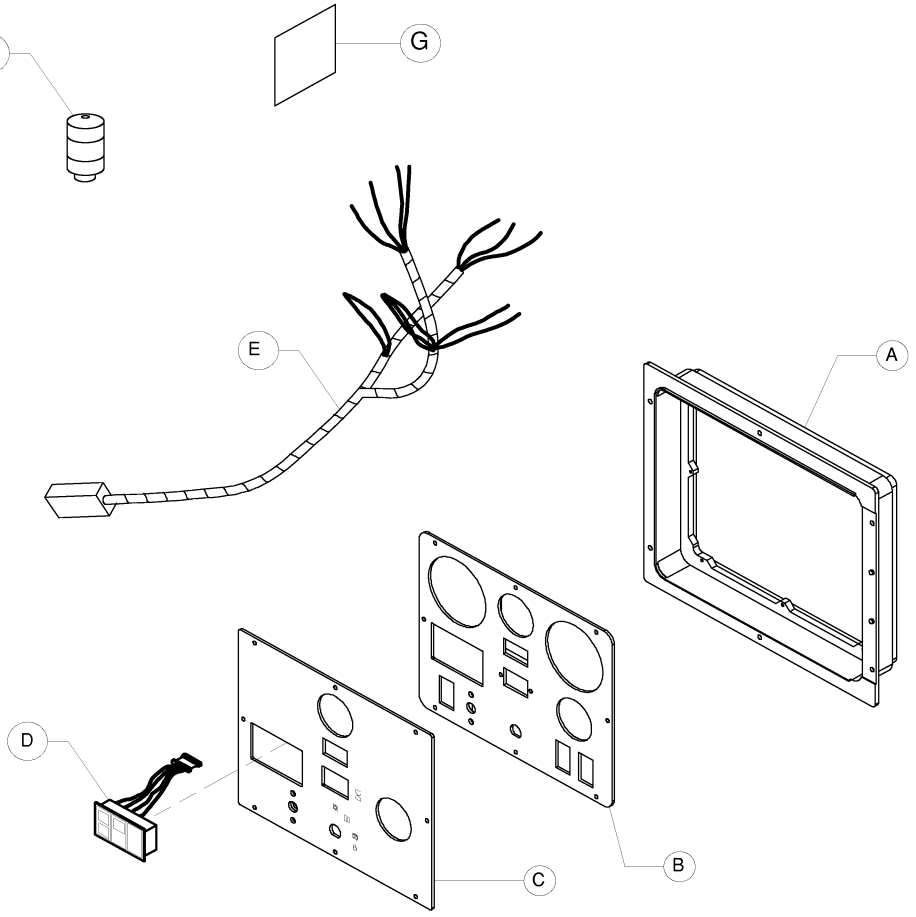
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36881191	1	DRAWBAR	F	35372432	2	LOCK, COUPLING
B	54443577	1	JACK, SCREW	G	36757284	1	CHANNEL, PINTEL EYE
C	36879302	6	SCREW, HEX FLANGE M16-2.0 X 50	H	39179072	4	SCREW, HEX M16-2.0 X 50
D	35609544	1	PIN, QUICK RELEASE	J	36879211	4	NUT, HEX M16-2.0
E	35610377	2	CHAIN ASSEMBLY				

DRAWBAR, EXTENDED/ADJUSTABLE HEIGHT

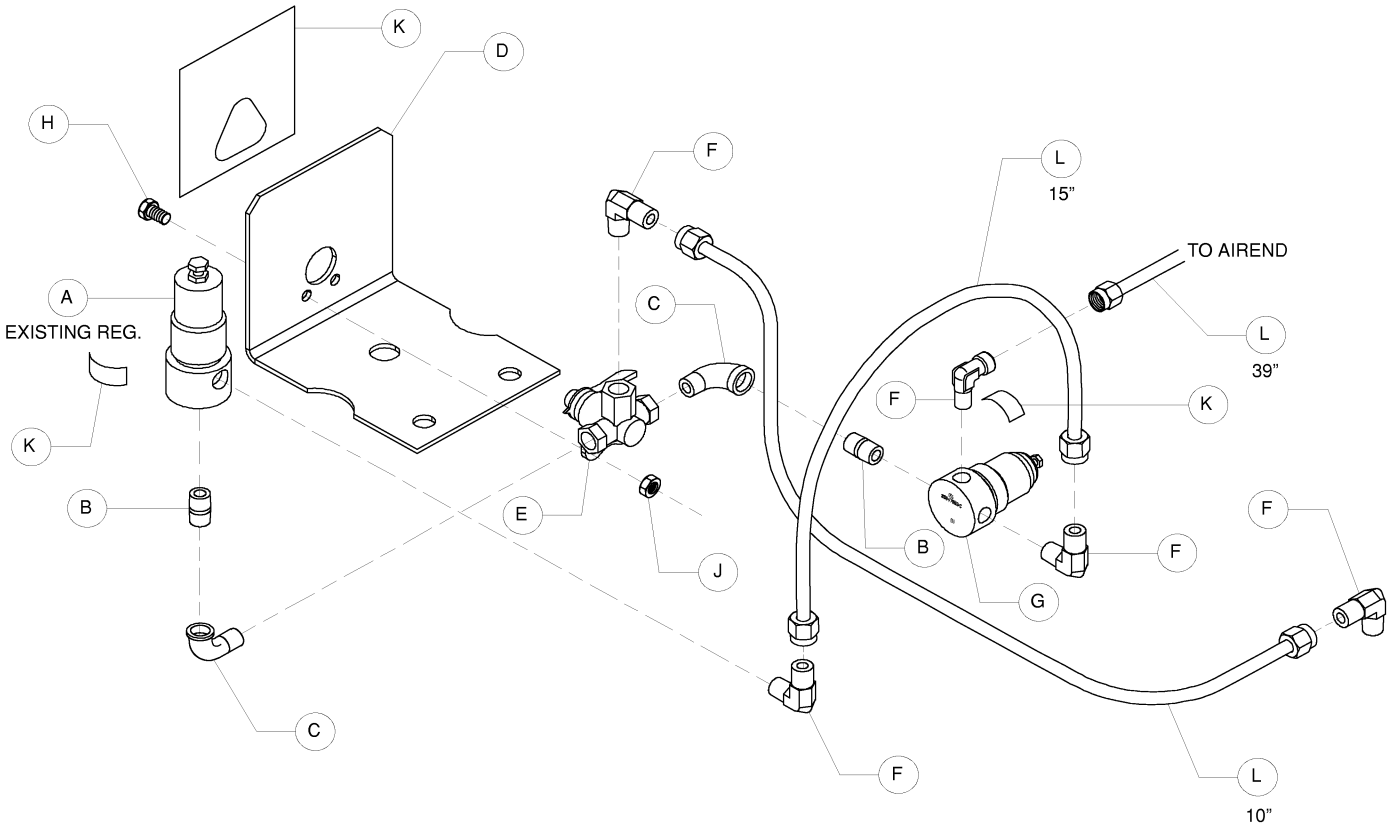


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36881191	1	DRAWBAR	G	36882470	1	CHANNEL, ADJ HEIGHT
B	54443577	1	JACK, SCREW	H	39179072	4	SCREW, HEX M16-2.0 X 50
C	36879302	6	SCREW, HEX FLANGE M16-2.0 X 50	J	36879211	4	NUT, HEX M16-2.0
D	35609544	1	PIN, QUICK RELEASE	K	35252758	6	SCREW, HEX LOCK 1/2-13 X 1.0
E	35610377	2	CHAIN ASSEMBLY	L	35252618	6	NUT, LOCK WASHER 1/2-13
F	35372432	2	LOCK, COUPLING				

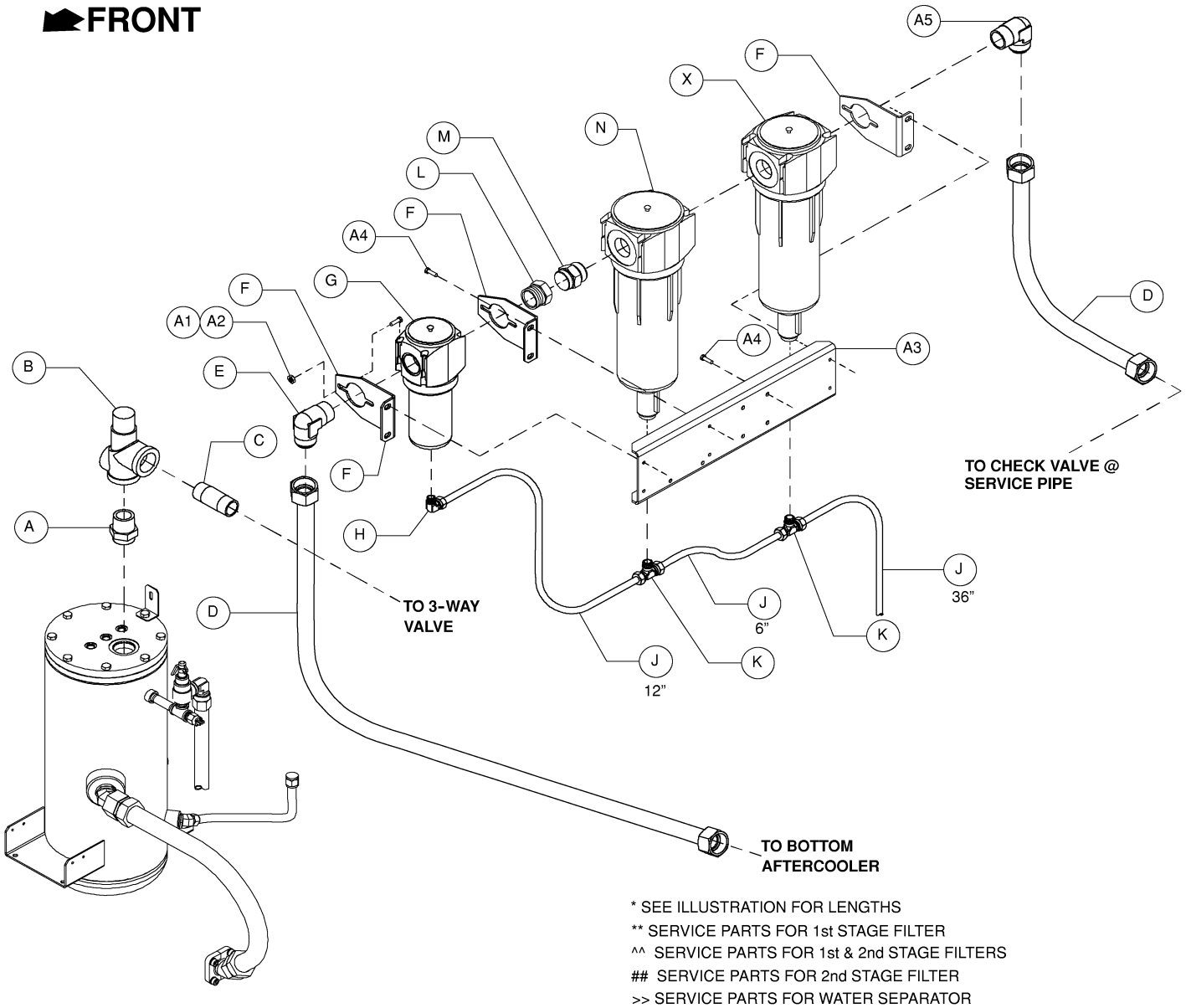
DIAGNOSTIC MODULE, 3-LIGHT



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54749601	1	FRAME, WW INSTRUMENT PANEL	E	54762943	1	HARNESS, IR OPTION
B	54749619	1	PANEL, INSTRUMENT		54762950	1	HARNESS, JD OPTION
C	54766845	1	DECAL, WW INSTRUMENT PANEL	F	35314939	2	INDICATOR, RESTRICTION
D	22055891	1	MODULE, 3 LIGHT WARNING	G	54761531	1	DECAL, OPT WIRING (IR)
					54761549	1	DECAL, OPT WIRING (JD)

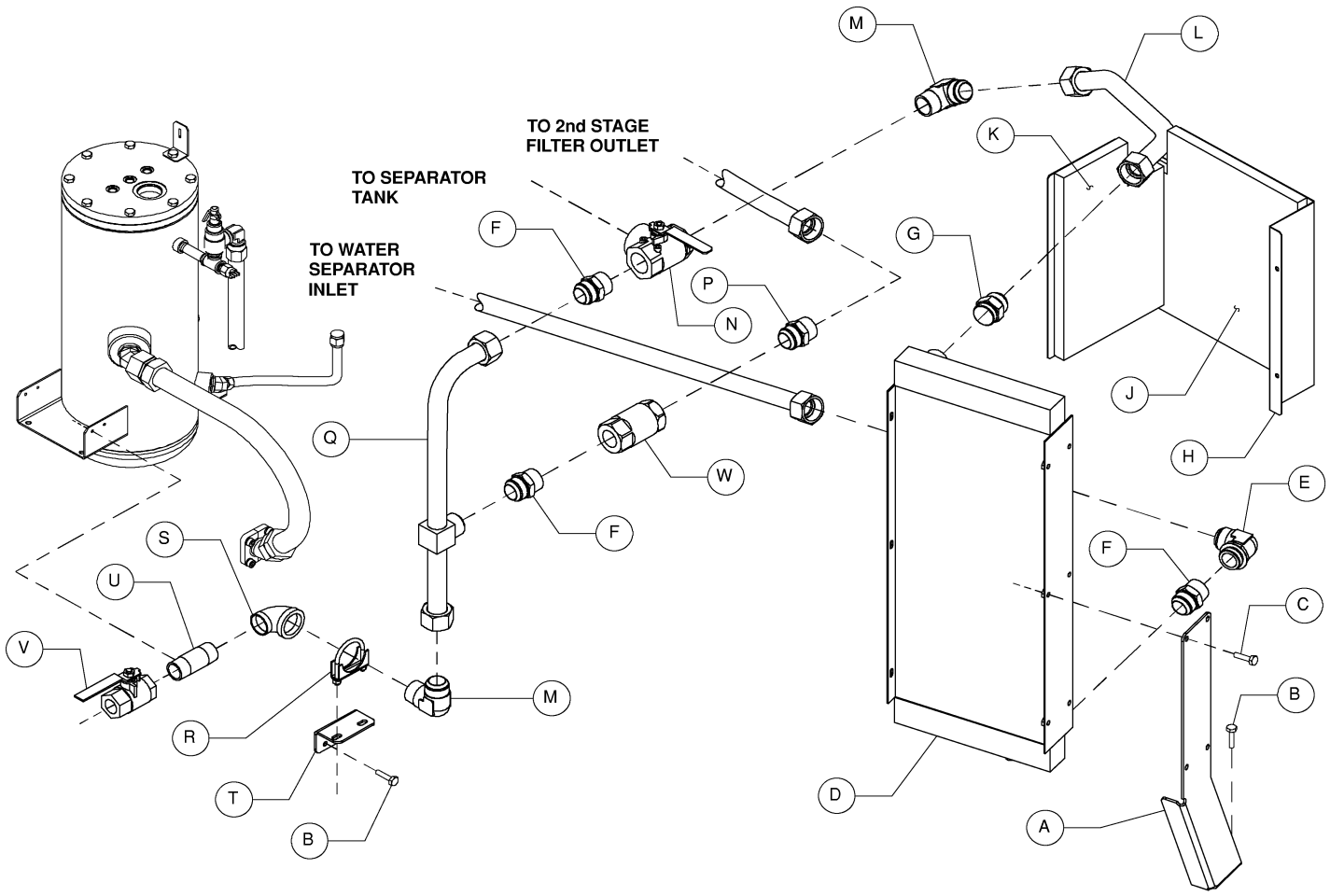


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36896892	1	VALVE, PRESS REG 200PSI	L	35356484	*	TUBE, 3/8” OD
B	95667341	2	NIPPLE, CLOSED 1/4NPT X .88				
C	95944666	2	ELBOW, STREET 1/4NPT				
D	36888881	1	BRACKET, DUAL REGULATION				
E	36864684	1	VALVE, 3-WAY				
F	35369354	5	ELBOW, MALE 1/4NPT X 3/8 TUBE				
G	36847952	1	VALVE, PRESS REG (LOW PRESSURE)		* SEE ILLUSTRATION FOR LENGTHS		
H	36769024	2	SCREW, HEX M06-1.0 X 20				
J	96703806	2	NUT, HEX M06-1.0		35387919		KIT, LOW PRESS REG REPAIR
K	54773791	1	DECAL, DUAL REG				



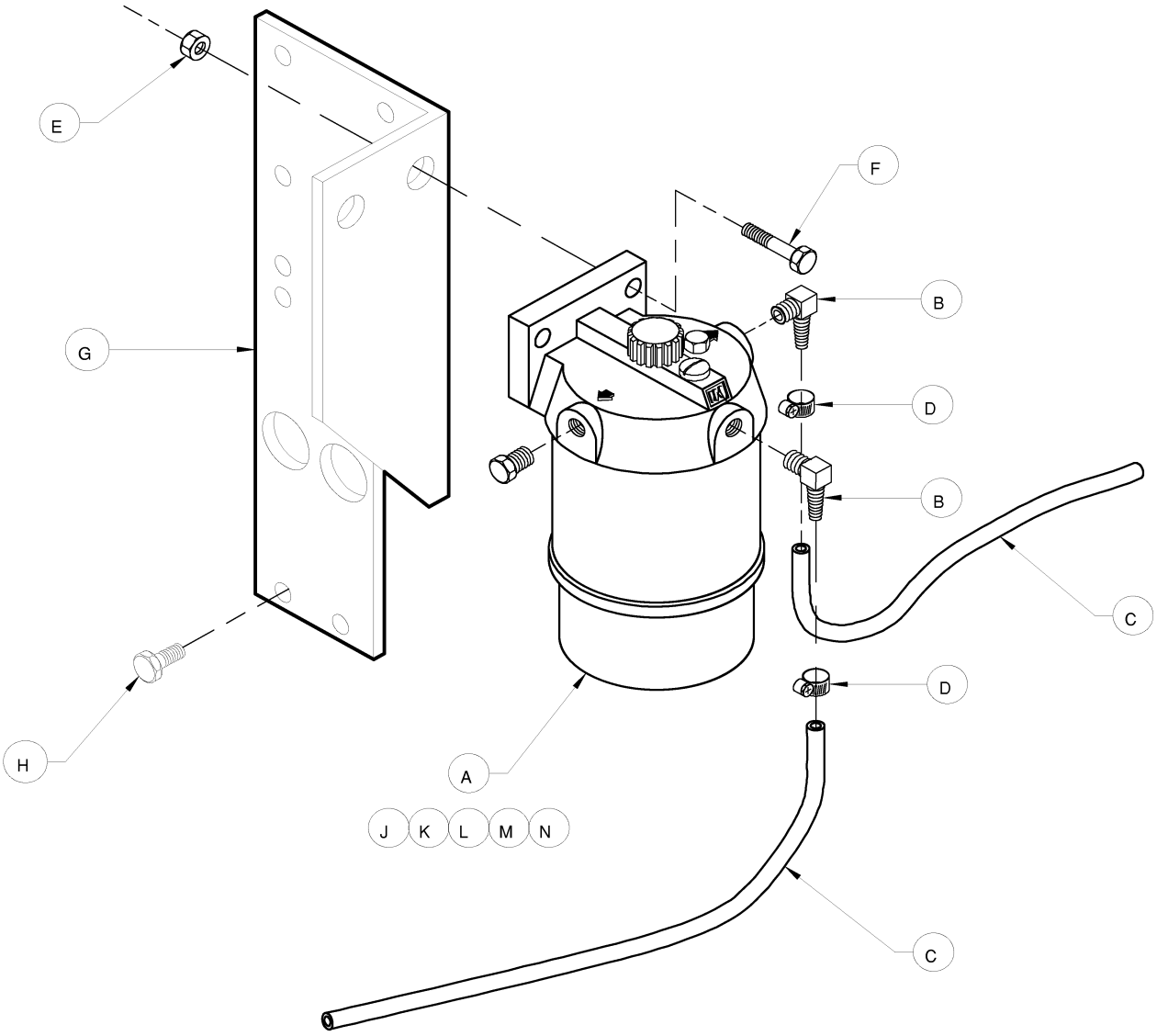
* SEE ILLUSTRATION FOR LENGTHS
** SERVICE PARTS FOR 1st STAGE FILTER
^^ SERVICE PARTS FOR 1st & 2nd STAGE FILTERS
SERVICE PARTS FOR 2nd STAGE FILTER
>> SERVICE PARTS FOR WATER SEPARATOR
$$ SERVICE PARTS FOR ALL 3 FILTERS

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36881068	1	ADAPTER, 1.5NPT X 1.75	S	36883015	**	ELEMENT, 1st STAGE
B	36789550	1	VALVE, MINIMUM PRESSURE	T	36883106	^^	KIT, AIR FILTER MAINT.
C	95487773	1	NIPPLE, CLOSED 1.5 X 1.75	U	35378231	$$	KIT, FILTER DRAIN
D	35130855	2	HOSE, -24 X 52”	V	35378264	^^	KIT, SIGHT GLASS
E	95279139	1	ELBOW, 45 1.50NPT TO-24JIC	W	36883080	**	KIT, WEDGE BOLT
F	36882884	3	BRACKET, FILTER MTG.	X	36882991	1	FILTER, 2nd STAGE
G	36882728	1	SEPARATOR, WATER 1.50NPT	Y	36883056	##	CAP, FILTER HSG 2nd STAGE
H	36783694	1	ELBOW, SWIVEL 12BSP X TUBE	Z	36883023	##	ELEMENT, 2nd STAGE
J	35356484	*	TUBING, 3/8”	A1	36880995	2	SCREW, HEX FLANGE M10-1.5 X 30
K	35369396	2	TEE, MALE 1/8NPT X 3/8 TUBE	A2	36879195	2	NUT, HEX FLANGE M10-1.5
L	36883155	1	ADAPTER, SWIVEL 1.50NPT X -24	A3	54761630	1	BRACKET, FILTER MOUNTING
M	35296409	1	CONNECTOR, 1.88-12 X -24	A4	35279025	10	SCREW, TAPPING M08-1.25 X 20
N	36882983	1	FILTER, 1st STAGE	A5	95949749	1	ELBOW, 1.5NPT X -24JIC
P	36883049	**	CAP, FILTER HSG. 1st STAGE	A6	36883270	>>	CAP, WATER SEPARATOR
Q	36883114	^^	ROD, ELEMENT RETAINING	A7	36883098	>>	KIT, WATER SEPARATOR
R	35378223	^^	INDICATOR, DIFFERENTIAL PRESSURE				



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54761622	1	BRACKET, AFTERCOOLER MTG.	M	95279477	2	ELBOW, 1.5NPT X -24JIC
B	35279025	4	SCREW, TAPPING M08-1.25 X 20	N	36921476	1	VALVE, 3-WAY 1.5NPT
C	96702279	2	SCREW, HEX M10-1.5 X 20	P	95208682	1	ADAPTOR, 1.5NPT TO 1.50JIC
D	54660162	1	AFTERCOOLER	Q	54671135	1	TUBE, SEPT TK / SVC PIPE
E	95431292	1	ELBOW, 1.88-12 X -12JIC	R	35209048	1	CLAMP, SADDLE 2.50
F	36883155	3	ADAPTER, 1.5NPT TO -24	S	95928024	1	ELBOW, REDUCING 1.5 X 25
G	35296409	1	CONNECTOR, 1.88-12	T	54761648	1	BRACKET, SVC PIPE
H	22070908	1	BAFFLE, FRONT AFTERCOOLER	U	95950275	1	NIPPLE, PIPE 1.25NPT X 4.0
J	22074504	1	PNL, ACTL INTERIOR BAFFLE	V	35612126	1	VALVE, BALL 1.25NPT
K	22074488	1	PNL, ACTL INTERIOR BAFFLE	W	36786820	1	VALVE, CHECK 1.50NPT
L	54759691	1	TUBE, SEPT TK / AFCLR				

FUEL / WATER FILTER

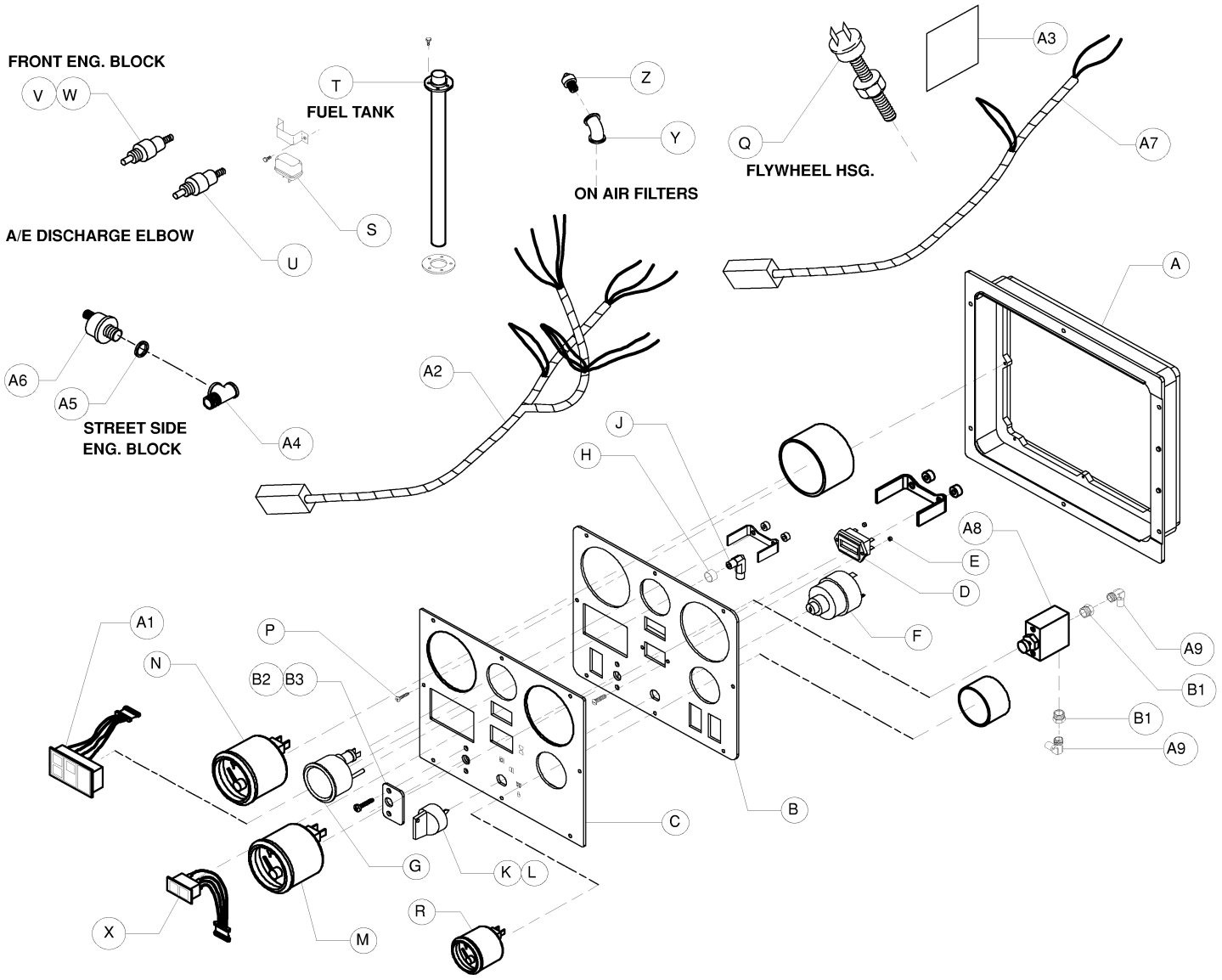


* CUT AS REQUIRED

** INCLUDED IN FUEL / WATER SEPARATOR FILTER 35858786

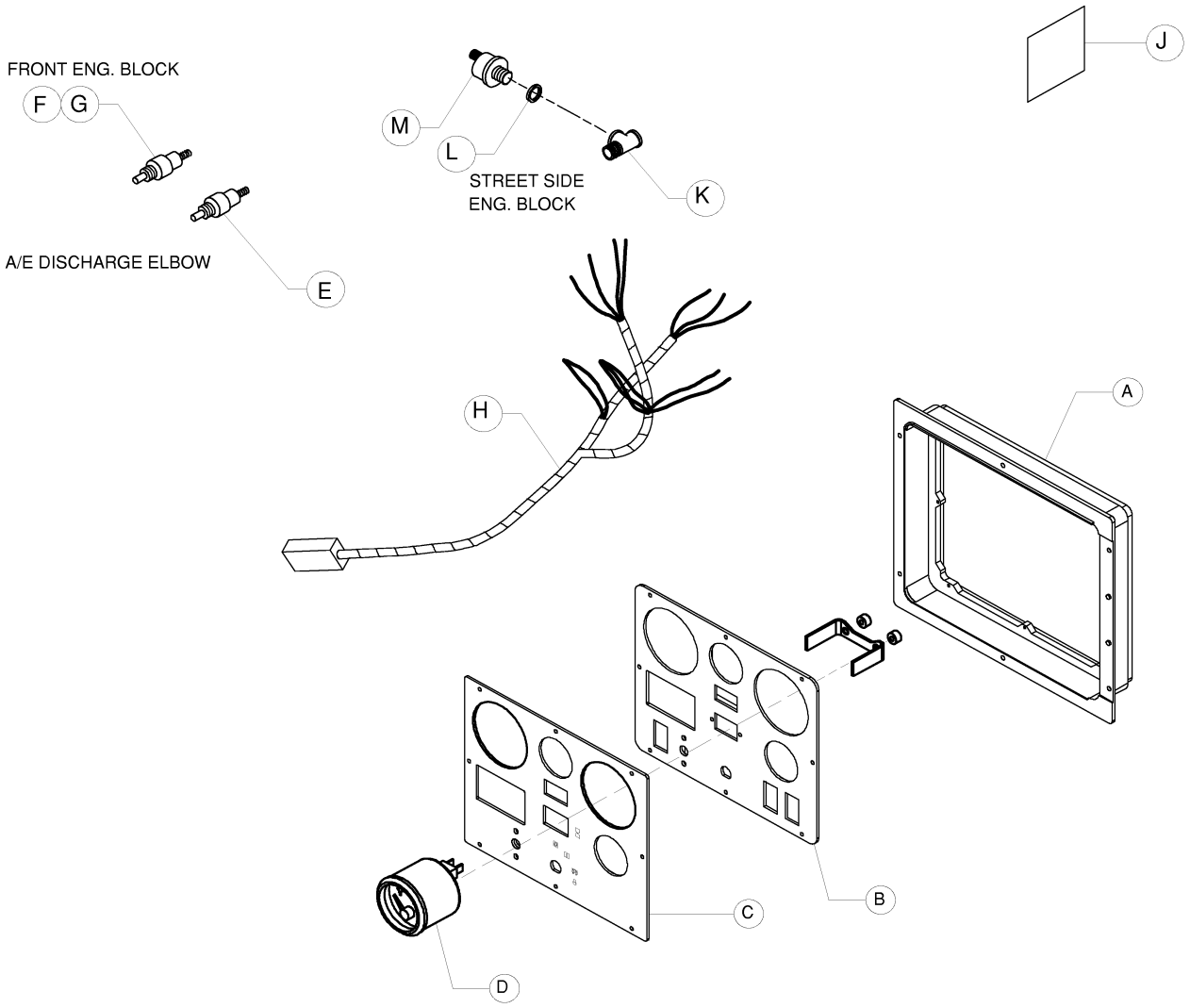
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	35858786	1	FILTER, FUEL/WATER SEPARATOR	H	35279025	2	SCREW, TAPPING M08-1.25 X 20
B	35378538	2	ELBOW, BARBED	J	35358332	**	ASSEMBLY, ELEMENT
C	35363498	* 22"	HOSE, 5/16 FUEL	K	35358340	**	BOWL
D	35296342	2	CLAMP	L	35358357	**	HEAD
E	35252600	2	NUT, LOCK 5/16-18	M	35358365	**	CAP, PRIMER PUMP
F	35321108	2	SCREW, LOCK 5/16-18 X 1	N	35358373	**	PULG, DRAIN
G	36883890	1	BRACKET, ETHER/FUEL FILTER				

FULL GAUGE PANEL

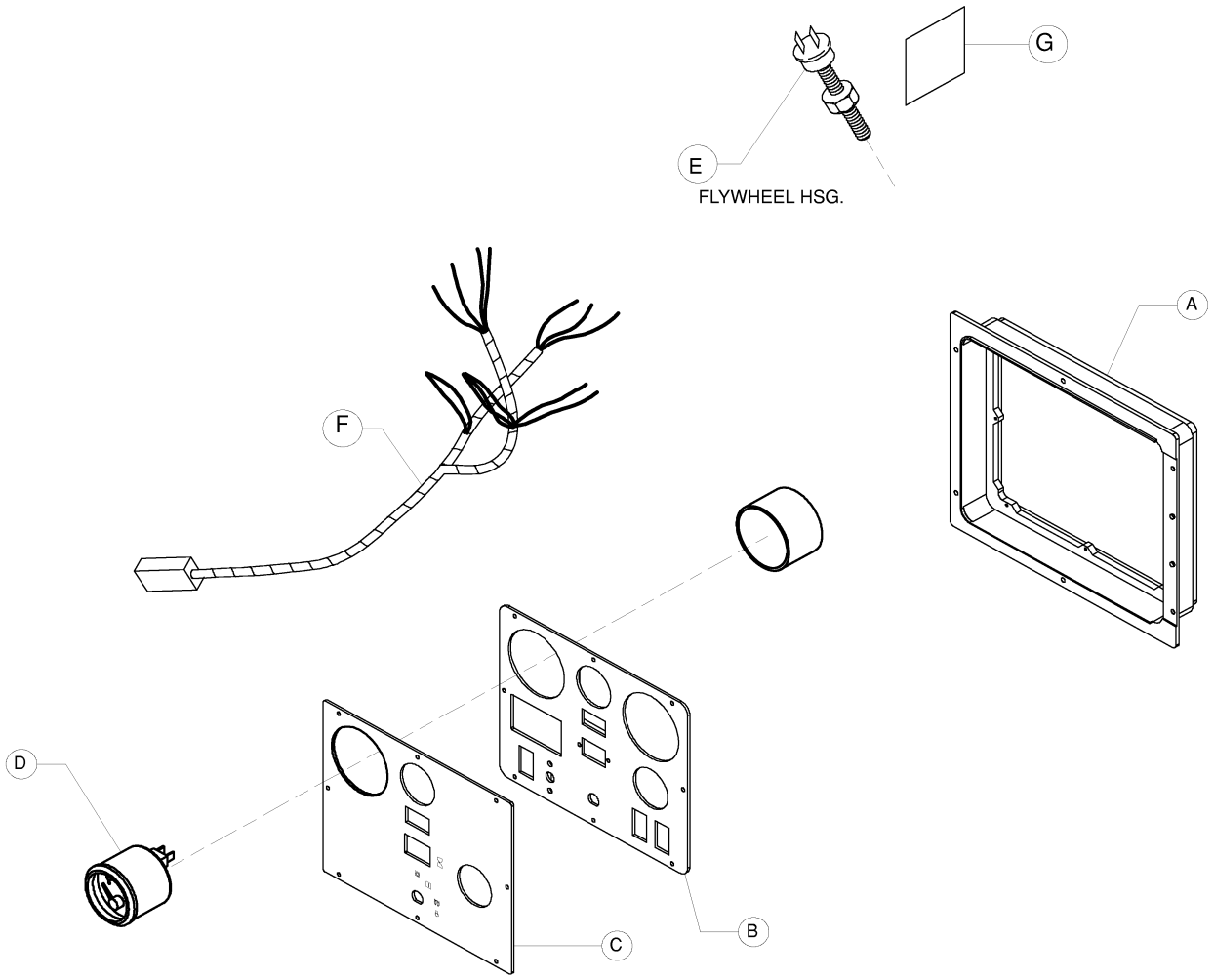


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54749601	1	FRAME, WW INSTRUMENT PANEL	V	54772124	1	SENDER, ENGINE TEMPERATURE (IR)
B	54749619	1	PANEL, INSTRUMENT		35604180	1	SENDER, ENGINE TEMPERATURE (JD)
C	54766845	1	DECAL, WW INSTRUMENT PANEL	W	35278589	1	O-RING (IR)
D	54766704	1	METER, ELECTRONIC HOUR		35278571	1	O-RING (JD)
E	22054159	2	NUT, PLASTIC 4-40	X	54774112	1	MODULE, 2 LIGHT WARNING
F	92086719	1	SWITCH, IGNITION	Y	95956199	2	ELBOW, STREET NPT 1/8 X 45
G	35604065	1	GAUGE, 150 PSI PRESSURE	Z	36847838	2	SWITCH, VACUUM
	36891216	1	GAUGE, 250 PSI PRESSURE	A1	22061493	1	MODULE, 4 LIGHT WARNING
H	95935599	1	COUPLING, STD 1/8 NPT X .75	A2	54762943	1	HARNESS, IR OPTION
J	35370386	1	ELBOW, 1/8 NPT X 3/8 TUBE		54762950	1	HARNESS, JD OPTION
K	22054167	*	KEY, REMOVABLE IGNITION	A3	54761531	1	DECAL, OPT WIRING (IR)
L	54774104	*	KEY, NON-REMOVABLE IGNITION		54761549	1	DECAL, OPT WIRING (JD)
M	22058291	1	GAUGE, 4 IN 1	A4	39127287	1	TEE, 1/8 STREET (IR)
N	22060198	1	TACHOMETER (IR)	A5	35278571	1	O-RING
	22055883	1	TACHOMETER (JD)	A6	36870608	1	SENDER, OIL PRESSURE
P	22070494	8	SCREW, PLASTIC TAPPING	A7	36842839	1	HARNESS, AIR FILTER RESTRICTION
Q	36772366	1	SENSOR, MAGNETIC PICKUP (IR)	A8	36783439	1	VALVE, START RUN
R	54774096	1	GAUGE, FUEL LEVEL	A9	35302314	2	ADAPTER,
S	54368048	1	RELAY, FUEL SHUTDOWN	B1	35369354	2	ELBOW, MALE 1/4 NPT
T	54731427	1	SENDER, FUEL LEVEL	B2	54774146	1	DECAL, PUSH AFTER WARM
U	35372457	1	SENDER, DISCHARGE TEMPERATURE	B3	22090898	2	SCREW, PAN HD M06-1.0 X 16

GAUGE, 4-in-1

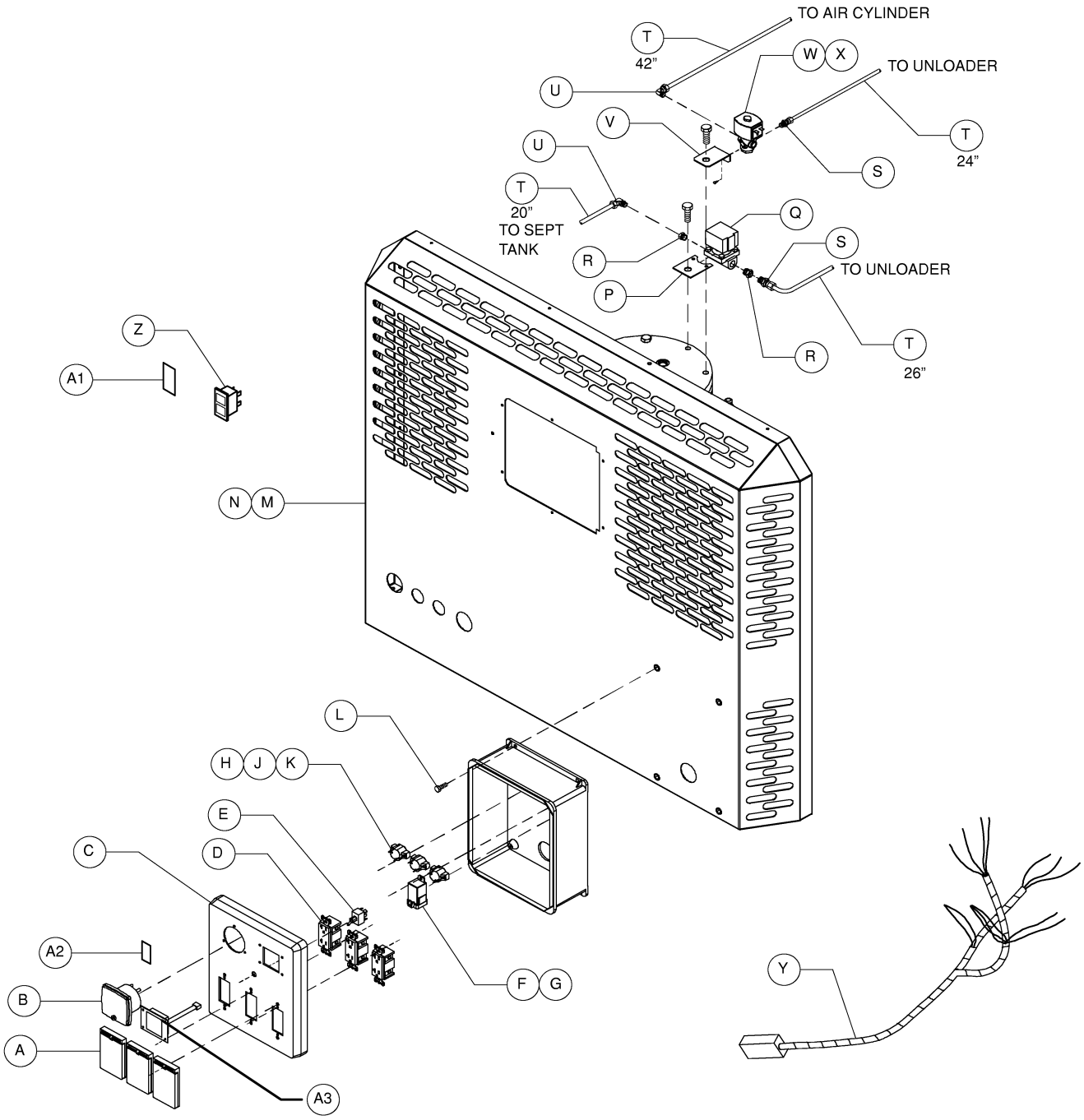


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54749601	1	FRAME, WW INSTRUMENT PANEL	H	54762943	1	HARNESS, IR OPTION
B	54749619	1	PANEL, INSTRUMENT		54762950	1	HARNESS, JD OPTION
C	54766845	1	DECAL, WW INSTRUMENT PANEL	J	54761531	1	DECAL, OPT WIRING (IR)
D	22058291	1	GAUGE, 4 IN 1		54761549	1	DECAL, OPT WIRING (JD)
E	35372457	1	SENDER, DISCHARGE TEMPERATURE	K	39127287	1	TEE, 1/8 STREET (IR)
F	54772124	1	SENDER, ENGINE TEMPERATURE (IR)	L	35278571	1	O-RING
	35604180	1	SENDER, ENGINE TEMPERATURE (JD)	M	36870608	1	SENDER, OIL PRESSURE
G	35278589	1	O-RING (IR)				
	35278571	1	O-RING (JD)				

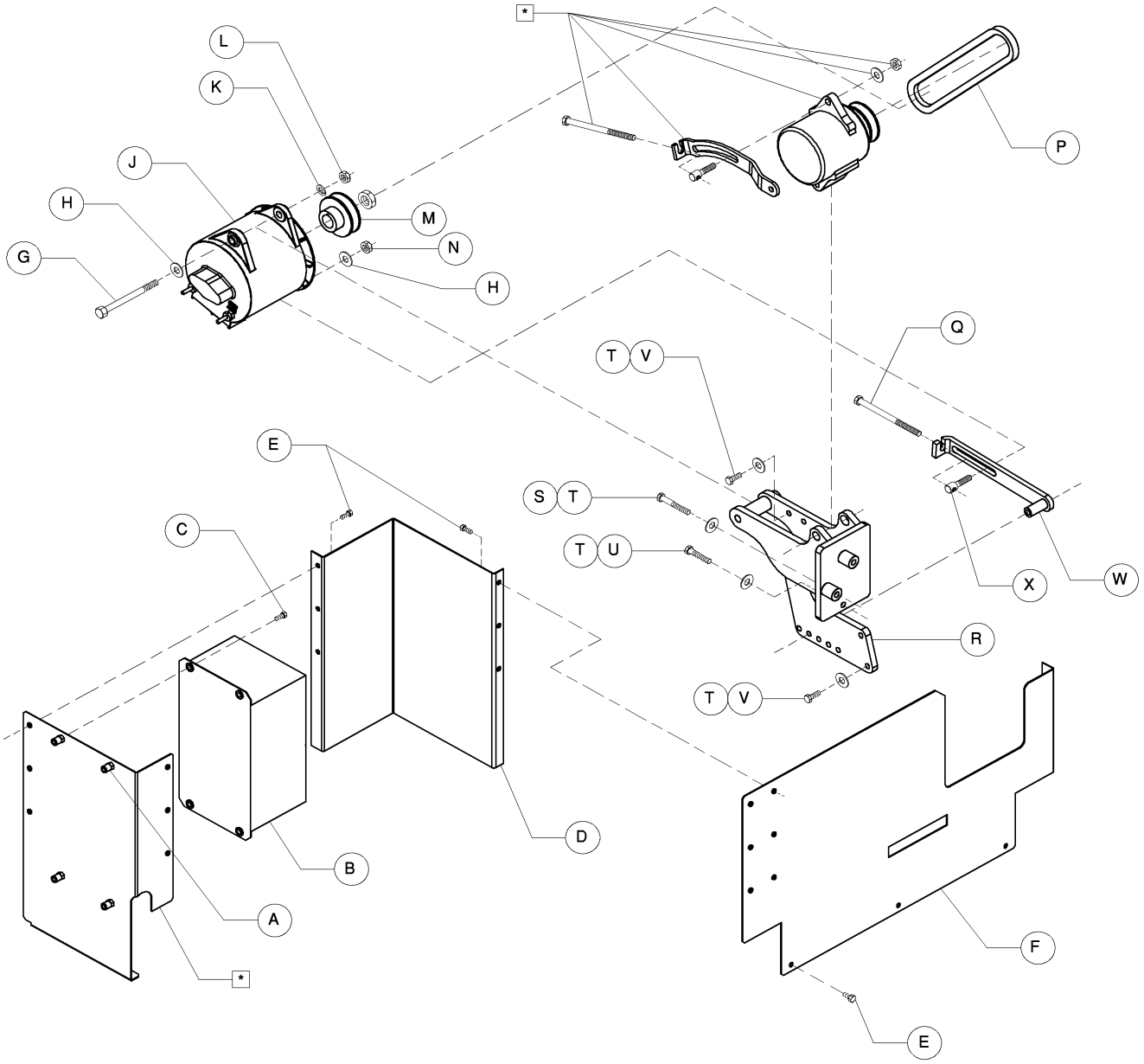


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54749601	1	FRAME, WW INSTRUMENT PANEL	E	36772366	1	SENSOR, MAGNETIC PICKUP (IR)
B	54749619	1	PANEL, INSTRUMENT	F	54762943	1	HARNESS, IR OPTION
C	54766845	1	DECAL, WW INSTRUMENT PANEL		54762950	1	HARNESS, JD OPTION
D	22060198	1	TACHOMETER (IR)	G	54761531	1	DECAL, OPT WIRING (IR)
	22055883	1	TACHOMETER (JD)		54761549	1	DECAL, OPT WIRING (JD)

GENERATOR, IR 6kW (cont. next pg.)



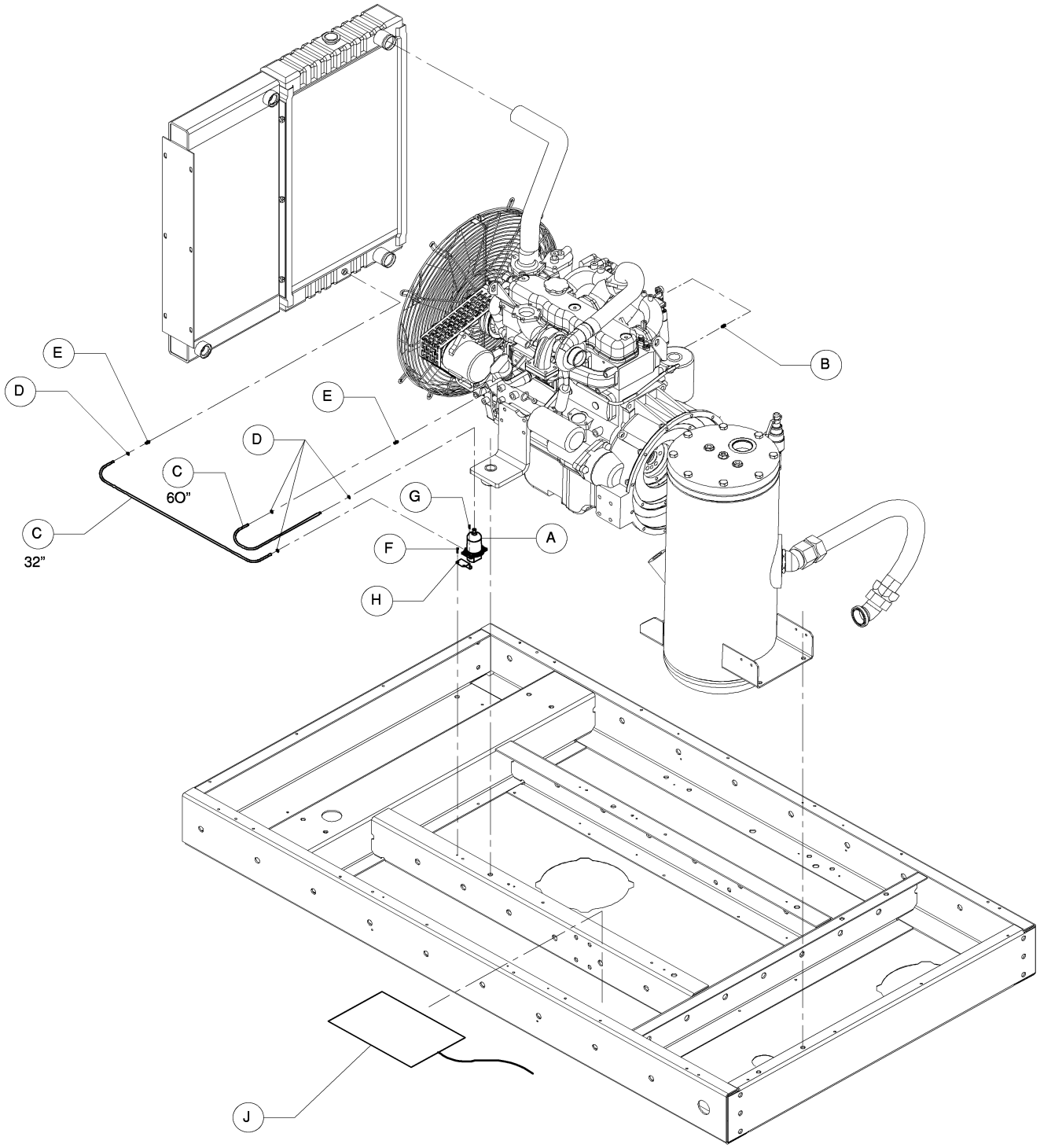
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36920932	3	COVER, WEATHERPROOF	P	36892669	1	BRACKET, SOLENIOD
B	36884435	1	METER, VOLT	Q	36843142	1	SOLENOID, 12VDC
C	22072300	1	BOX, GENERATOR CONTROL	R	95940748	2	BUSHING, REDUCER 3/8 TO 1/4
D	36848745	3	RECEPTACLE, DUPLEX 125V	S	35369347	2	CONNECTOR, MALE 1/4NPT X 3/8 TUBE
E	36892545	1	SWITCH, 3 POSITION	T	35356484	*	TUBING, 3/8" SYNFLEX
F	54368048	1	RELAY	U	35369354	2	ELBOW, MALE 1/4NPT X 3/8 TUBE
G	35300771	1	SCREW, TAPPING M06-1.0 X 20	V	22103337	1	BRACKET, SOLENOID
H	36884443	3	BREAKER, CIRCUIT	W	22060685	1	VALVE, 3-WAY
J	95942603	6	SCREW, PAN HD 10-32 X 3/4"	X	95287025	2	SCREW, SELF-TAPPING #10
K	95923124	6	NUT, HEX 10-32	Y	54631355	1	HARNESS, 6kW GENERATOR
L	35279025	4	SCREW, TAPPING M08-1.25 X 20	Z	22090278	1	SWITCH, ROCKER
M	36895746	4	NUTSERT, HEX M08	A1	22102727	1	DECAL, ON-BOARD GEN.
N	22102735	1	PANEL, FRONT END	A2	22140784	1	DECAL, GEN.-AIR-GEN/AIR
				A3	22099063	1	PANEL, STATUS



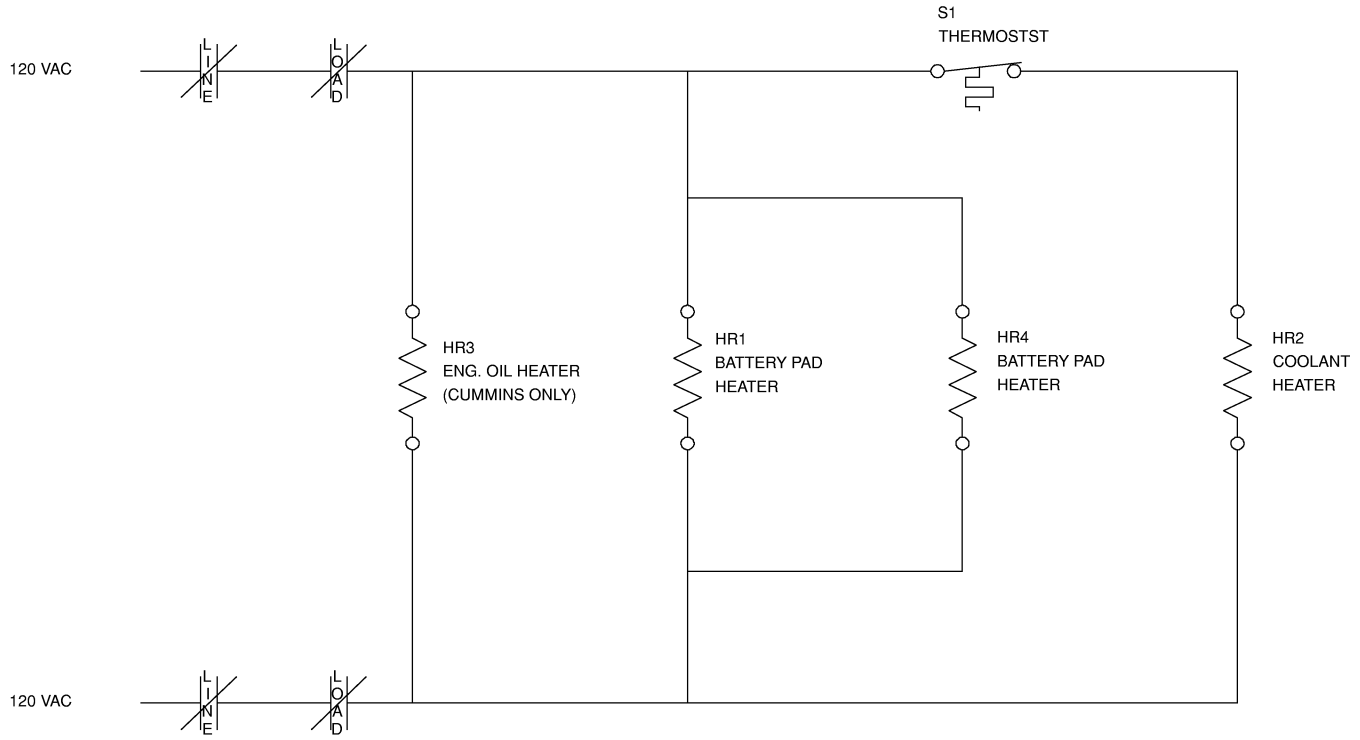
*** EXISTING PARTS**

Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36895746	4	NUTSERT, HEX M8	M	22103626	1	V-BELT
B	54629696	1	POWER CONVERSION UNIT	N	22097240	1	PULLEY, GENERATOR
C	35279025	4	SCREW, TAPPING M08-1.25 X 20	P	96742986	1	NUT, HEX M12-1.25
D	22101158	1	GUARD, PCU	Q	49843253	1	BOLT, M10 X 135
E	36797652	14	SCREW, TAPPING M06-1.0 X 12	R	22094460	1	BRACKET, GENERATOR
F	22097398	1	PANEL, TOOL BOX	S	96743661	2	BOLT, M10-1.25 X 70
G	95955548	1	SCREW, HEX 1/2-13 X 6.0	T	95935037	6	WASHER, FLAT 3/8
H	95935003	2	WASHER, FLAT 1/2"	U	96703848	1	BOLT, M10-1.25 X 50
J	54629746	1	GENERATOR, 6kW	V	96702360	3	BOLT, M10-1.25 X 25
K	95081824	1	WASHER, LOCK 1/2"	W	22096085	1	STRAP, ADJUSTING
L	95922902	1	NUT, HEX 1/2-13	X	49843238	1	PIECE, SLIDING

HEATER, IR BLOCK / BATTERY



Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54618103	1	HEATER ASM.	F	35279025	2	SCREW, TAPPING M08-1.25 X 20
B	22068233	1	ADAPTER, CONV 3/8BSP TO 1/4NPT	G	92368687	2	SCREW, TAPPING MO6-1.0 X 12
C	54738737	*	HOSE, HEATER 5/8”	H	54593967	1	BRACKET, HEATER
D	95220844	4	CLAMP, 5/8” HOSE	J	22065635	1	PAD, BATTERY HEATER
E	54618111	2	ADAPTER, 1/4NPT TO 5/8” HOSE				

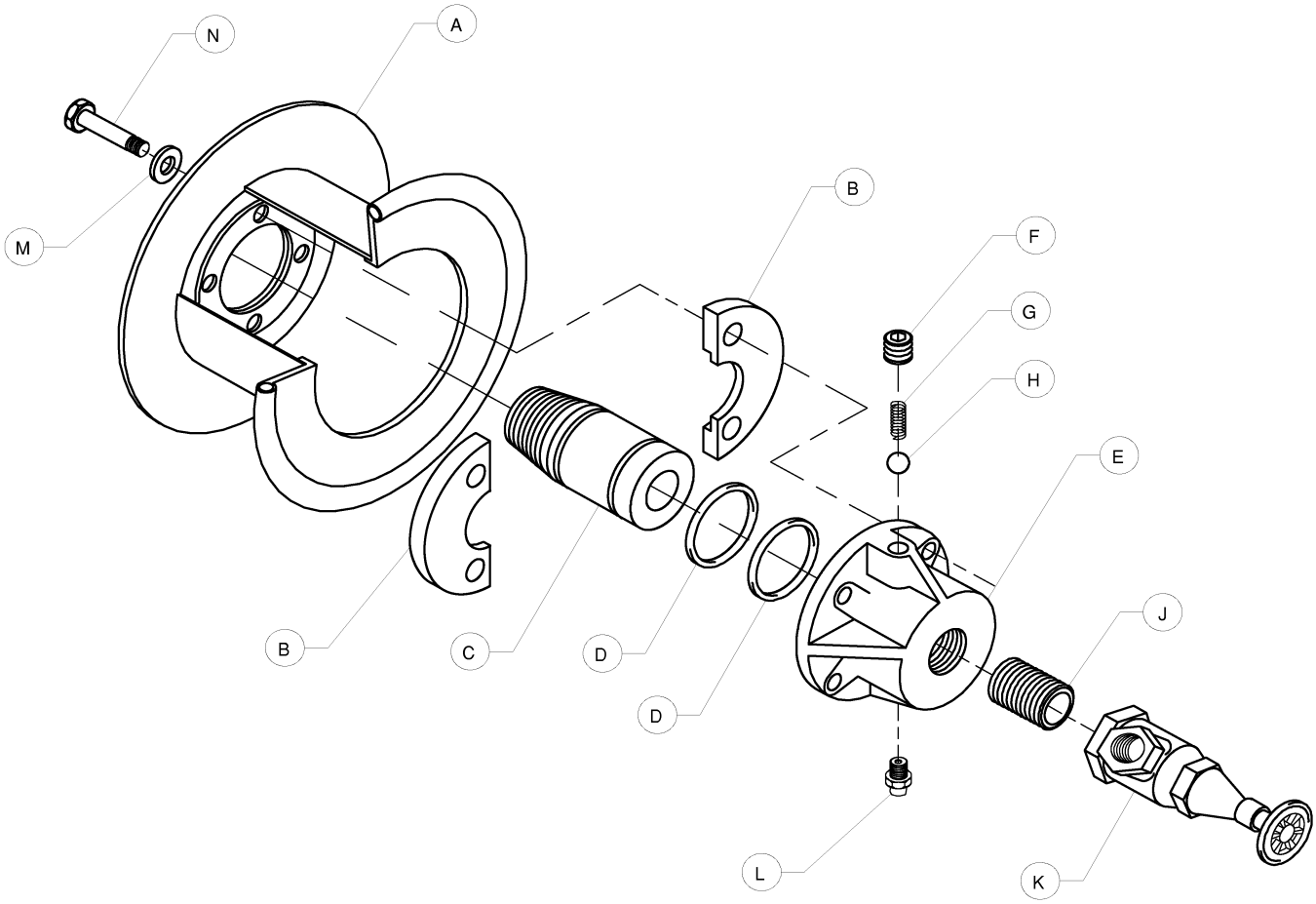


NOTE: REFER TO MODEL FOR LIST OF OPTIONAL HEATERS AVAILABLE

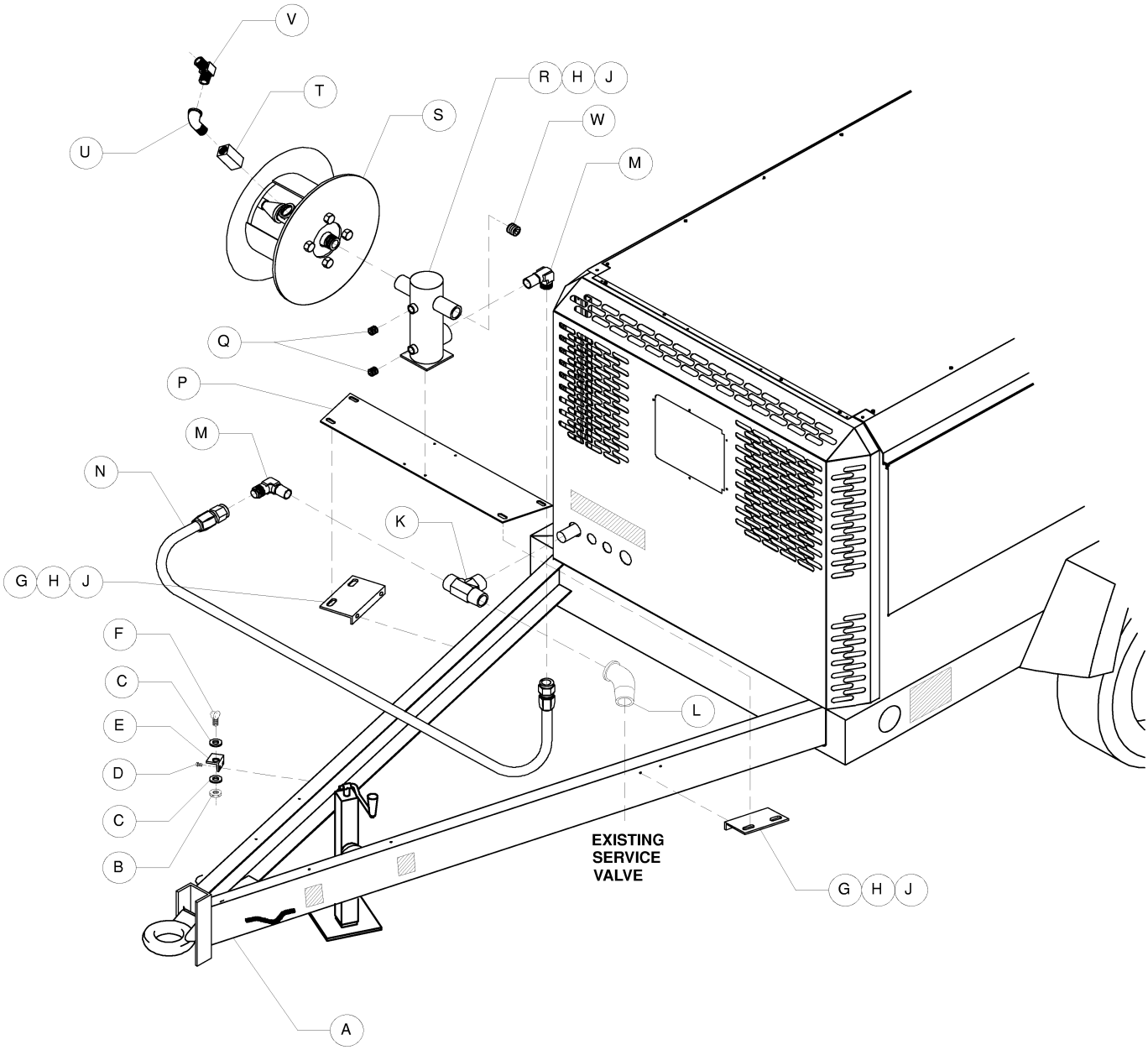
	P100-P160	P100-P160	J DEERE P175-XP185	J DEERE P250 - HP375	CUMMINS P250-P375 E25-E50	KUBOTA L5; L6-L8	CUMMINS VHP400-P600
HR1	~	~	36920387	22065635	36920387	36920387	36920379
HR2	36843563	35379221	36874659	35379221	36898971	36898252	36898971
HR3	~	~	~	~	~	~	~
HR4	~	~	~	~	~	~	36920387
S1	~	~	36858751	~	36858751	~	36858751
W1	~	~	36920361	~	36920361	36898245	36920361

	CUMMINS HP600-XP825	J DEERE HP600-XP825	CAT XHP600-XHP900	CUMMINS VHP825-XP1050	CAT VHP750-XP1000	CUMMINS HP100-P1600	
HR1	36920411	36920411	36920338	36920411	36920411	36920338	
HR2	36874642	36874659	36871325	36852614	36871283	36882520	
HR3	36874675	~	~	36869691	~	36882512	
HR4	36920429	36920429	36920346	36920429	36920429	36920346	
S1	36858751	36858751	36858751	36858751	36858751	36858751	
W1	36920437	36920403	36871317	36852598	36871275	36920320	

HOSE REEL ASSEMBLY

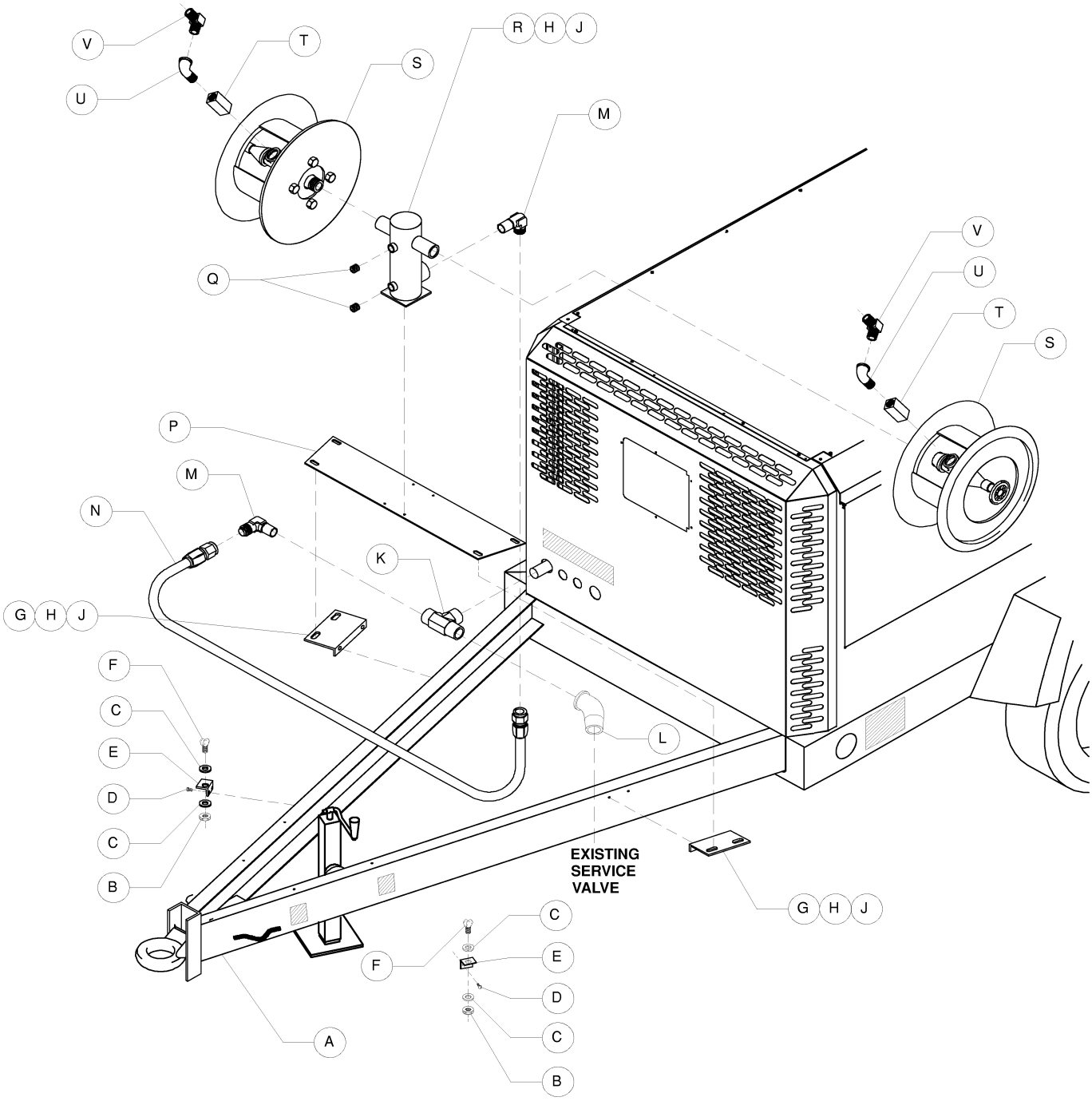


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36765212	1	HOSE REEL	H	35221902	1	BALL, RETARD
B	36765188	2	BEARING COVER	J	95928040	1	NIPPLE
C	36765196	1	BEARING SHAFT	K	95072971	1	GLOBE VALVE
D	95358297	2	O-RING	L	35221894	1	FITTING, LUBE 1/8
E	36762706	1	HOSE REEL BEARING	M	95937413	4	WASHER, LOCK 3/8
F	95928222	1	PLUG	N	95934584	4	SCREW, HEX 3/8-16 X 1
G	30671242	1	SPRING				



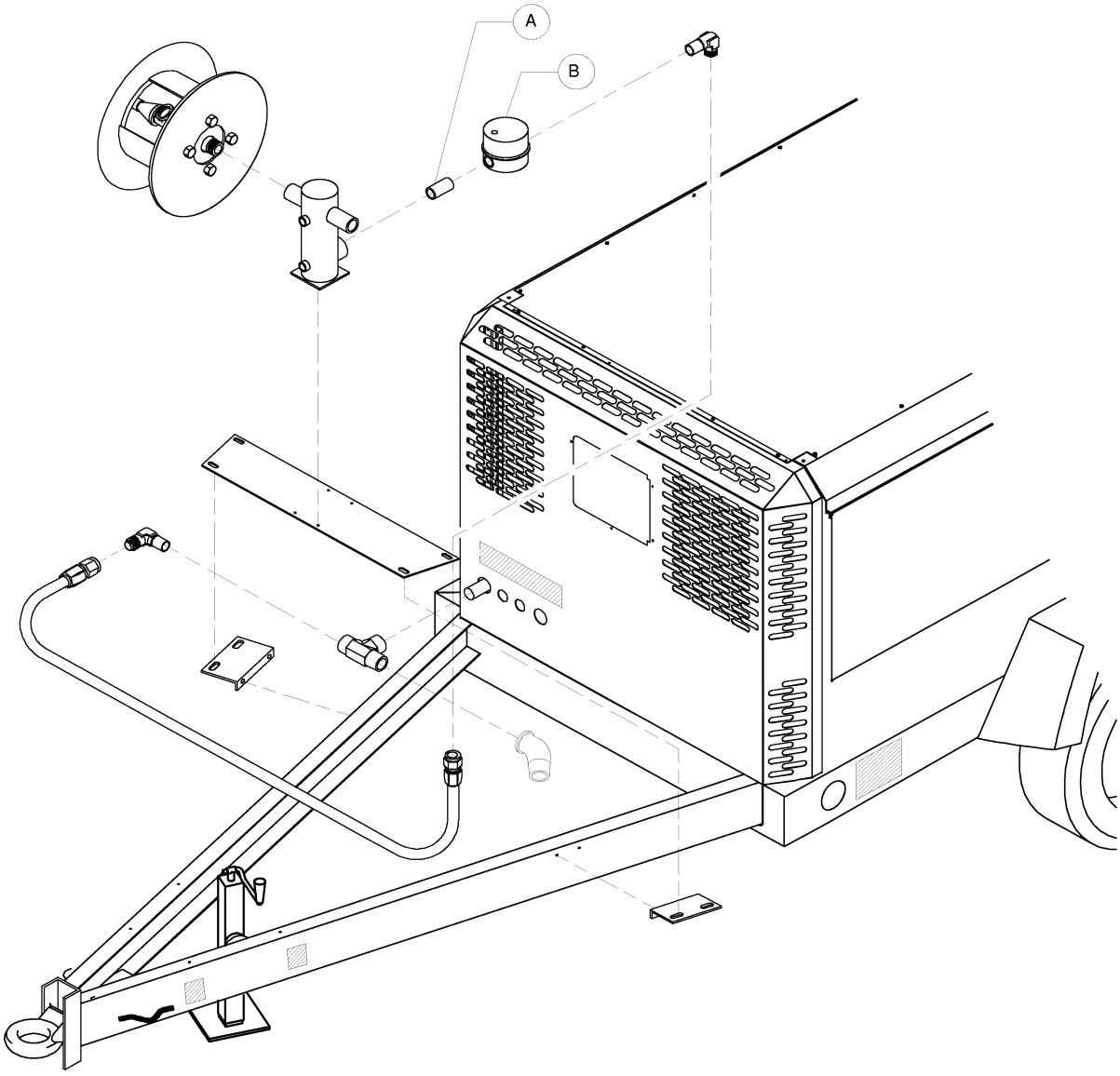
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36881191	1	DRAWBAR, EXTENDED LENGTH	M	95219861	2	ELBOW, 90 1.25NPT X -20JIC
B	35153972	1	CAP, HOSE LOCK	N	35228170	1	HOSE
C	95928321	2	WASHER, FLAT .88”	P	36882181	1	CHANNEL, HOSE REEL
D	92368687	2	SCREW, TAPPING M06-1.0 X 12	Q	95947149	2	PLUG, HEX CSK 3/4NPT
E	35296748	1	BRACKET, HOSE REEL LOCK	R	36755460	1	MANIFOLD, HOSE REEL
F	35221910	1	LOCK, COUPLING HOSE	S	35097914	1	HOSE REEL ASM.
G	35855238	2	BRACKET, CHANNEL MTG.	T	35364397	1	VALVE, CHECK
H	36880995	12	SCREW, HEX FLANGE M10-1.5 X 30	U	95928172	1	ELBOW, STREET 3/4NPT X 90
J	36879195	12	NUT, HEX FLANGE M10-1.5	V	95928198	1	ELBOW, STREET 3/4NPT X 45
K	95280087	1	TEE, STREET 1.25NPT	W	95928248	1	PLUG, HEX CSK 1.25”
L	95031522	1	ELBOW, STREET 1.25NPT X 45				

HOSE REEL, DOUBLE



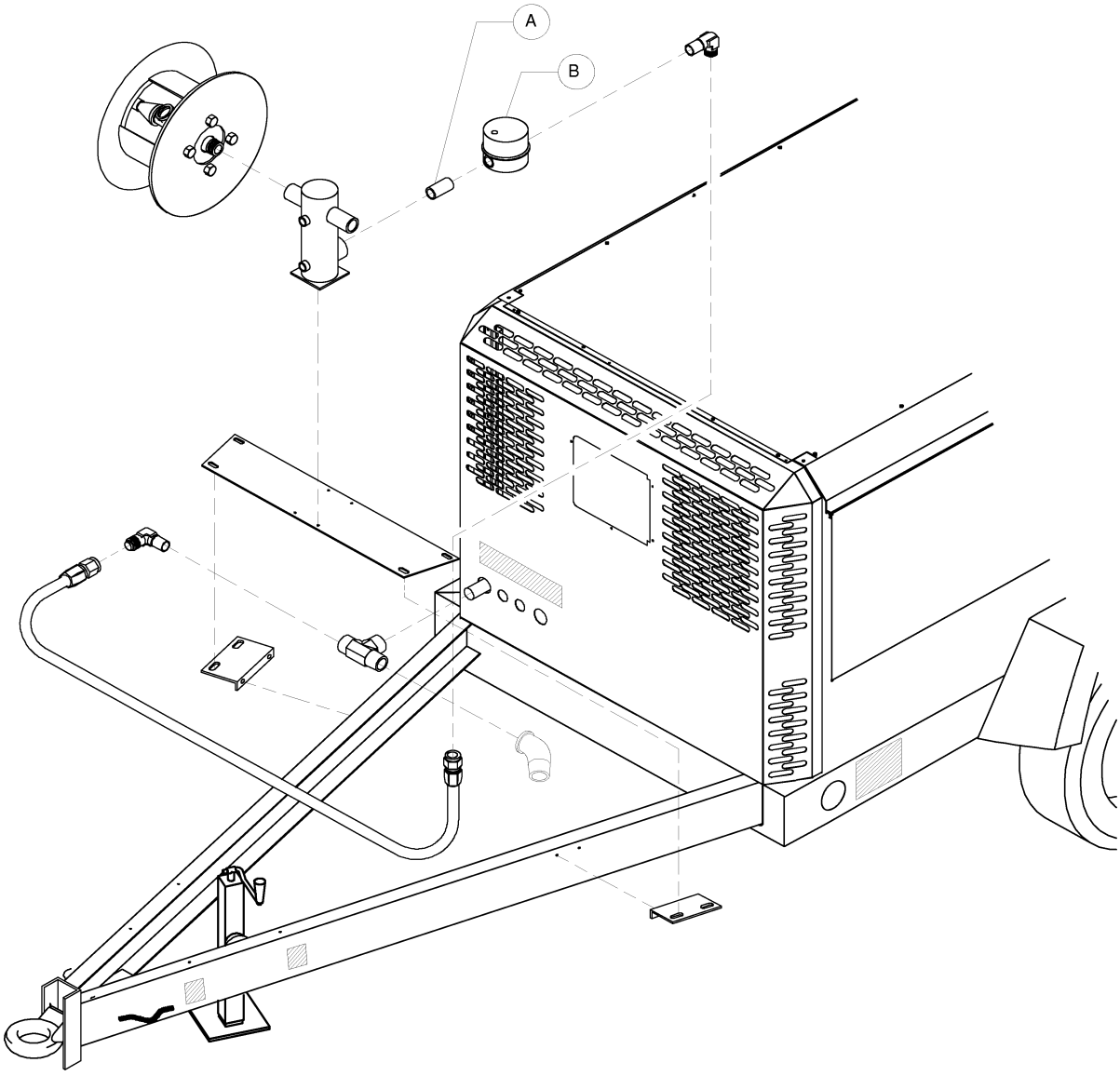
Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	36881191	1	DRAWBAR, EXTENDED LENGTH	M	95219861	2	ELBOW, 90 1.25NPT X -20JIC
B	35153972	2	CAP, HOSE LOCK	N	35228170	1	HOSE
C	95928321	4	WASHER, FLAT .88"	P	36882181	1	CHANNEL, HOSE REEL
D	92368687	4	SCREW, TAPPING M06-1.0 X 12	Q	95947149	2	PLUG, HEX CSK 3/4NPT
E	35296748	2	BRACKET, HOSE REEL LOCK	R	36755460	1	MANIFOLD, HOSE REEL
F	35221910	2	LOCK, COUPLING HOSE	S	35097914	2	HOSE REEL ASM.
G	35855238	2	BRACKET, CHANNEL MTG.	T	35364397	2	VALVE, CHECK
H	36880995	12	SCREW, HEX FLANGE M10-1.5 X 30	U	95928172	2	ELBOW, STREET 3/4NPT X 90
J	36879195	12	NUT, HEX FLANGE M10-1.5	V	95928198	2	ELBOW, STREET 3/4NPT X 45
K	95280087	1	TEE, STREET 1.25NPT				
L	95031522	1	ELBOW, STREET 1.25NPT X 45				

HOSE REEL OILER, 1 QUART

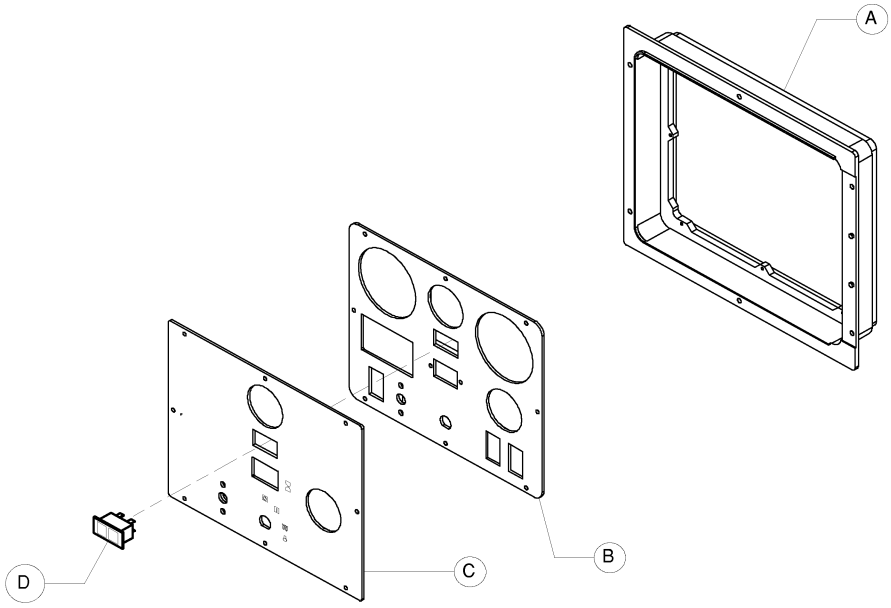


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	95953600	1	NIPPLE, 1.25 X 2				
B	35255025	1	LUBRICATOR, 1 QUART				

HOSE REEL OILER, 2 QUART

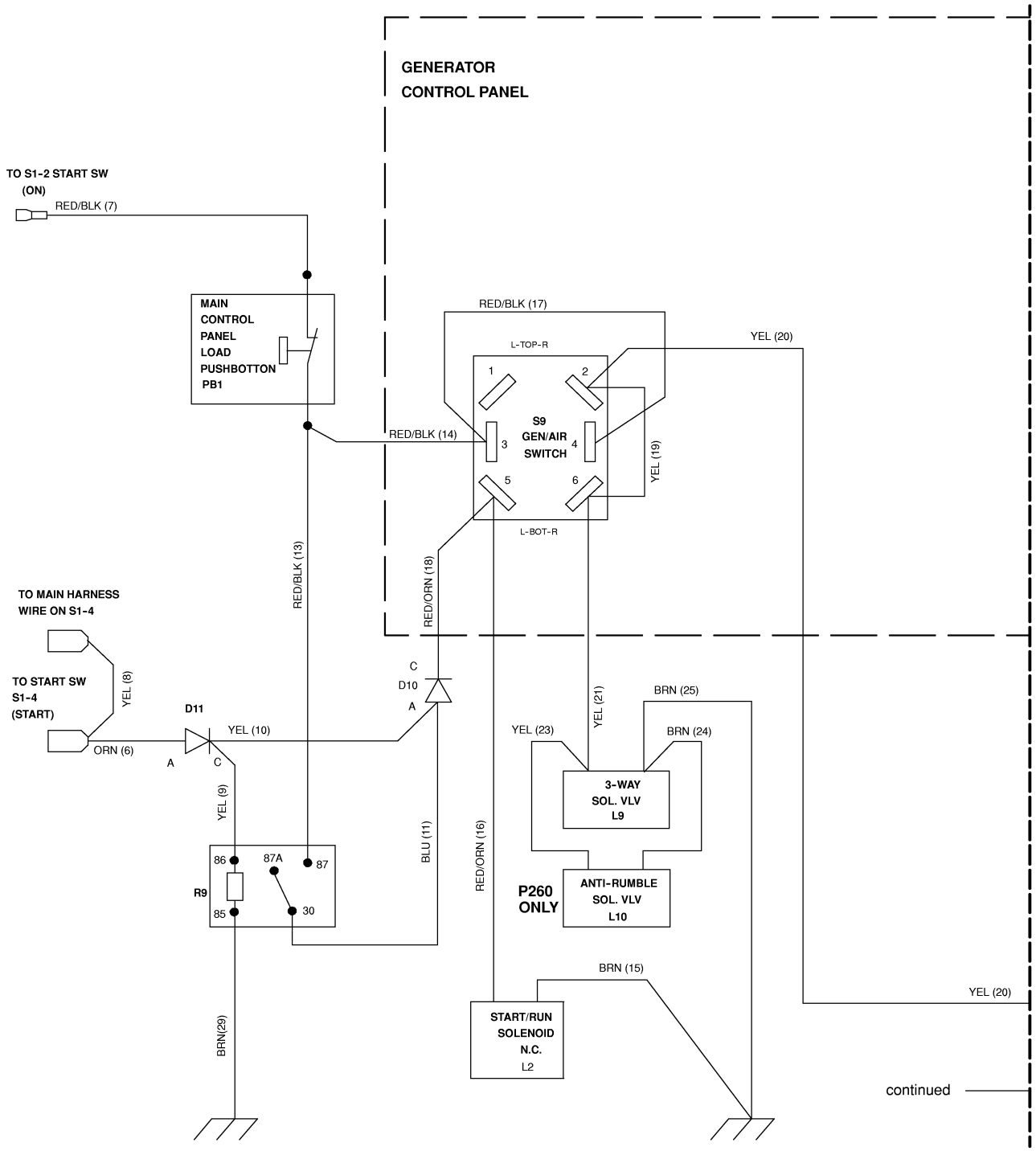


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	95953600	1	NIPPLE, 1.25 X 2				
B	35256252	1	LUBRICATOR, 2 QUART				

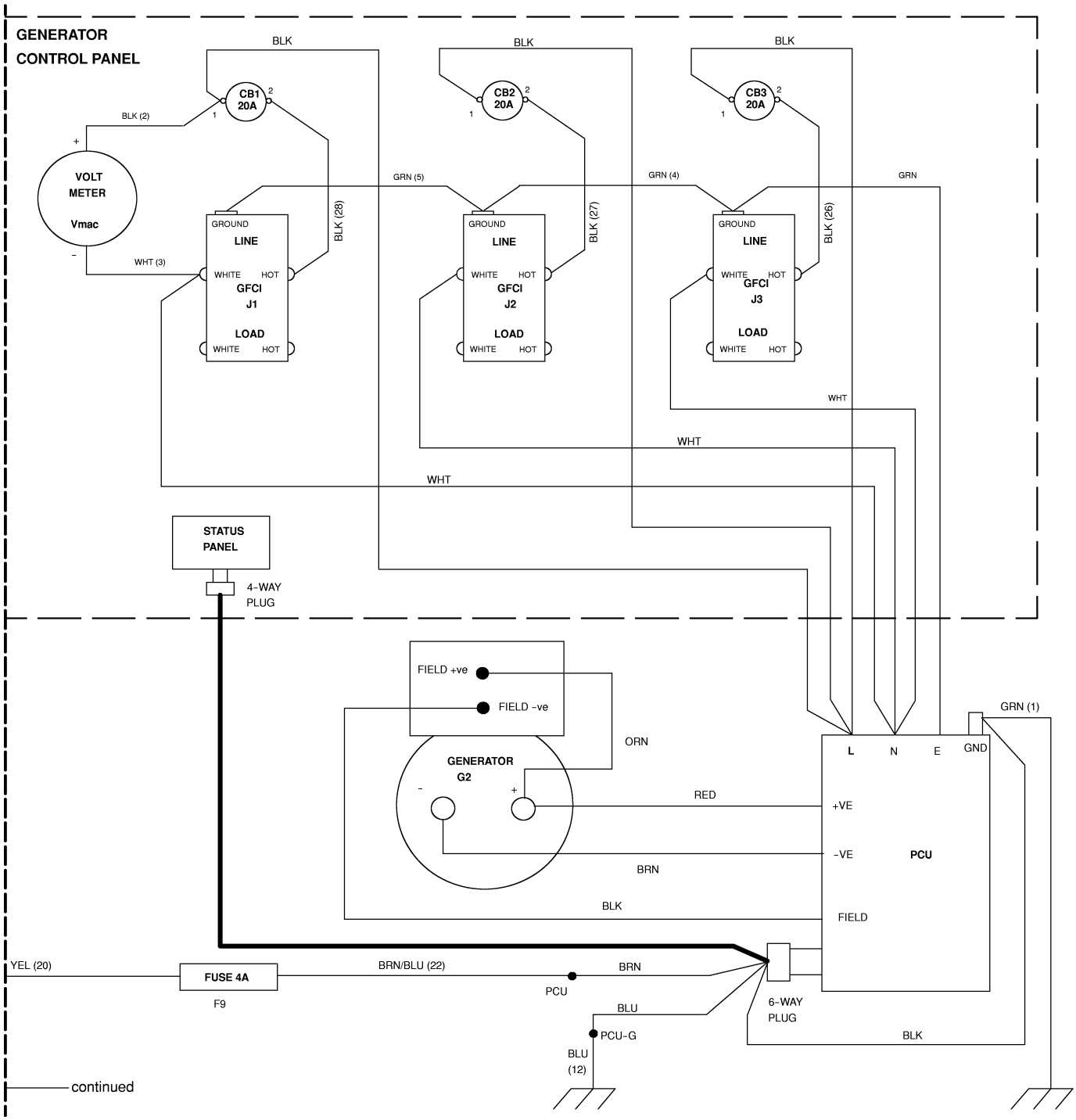


Item	CPN	Qty	Description	Item	CPN	Qty	Description
A	54749601	1	FRAME, WW INSTRUMENT PANEL				
B	54749619	1	PANEL, INSTRUMENT				
C	54766845	1	DECAL, WW INSTRUMENT PANEL				
D	22054175	1	HOURMETER, ELECTRO-MECHANICAL				

SCHEMATIC, IR 6kW(cont. next pg.)



Item	CPN	Qty	Description	Item	CPN	Qty	Description
D10	35676169	1	DIODE	L10	36843142	1	SOLENOID, 12V
D11	35676169	1	DIODE	PB1	22090278	1	SWITCH, ROCKER
L2	36843142	1	SOLENOID, 12V	R9	54368048	1	RELAY
L9	22060685	1	VALVE, 3-WAY	S9	36892545	1	SWITCH, 3-POSITION

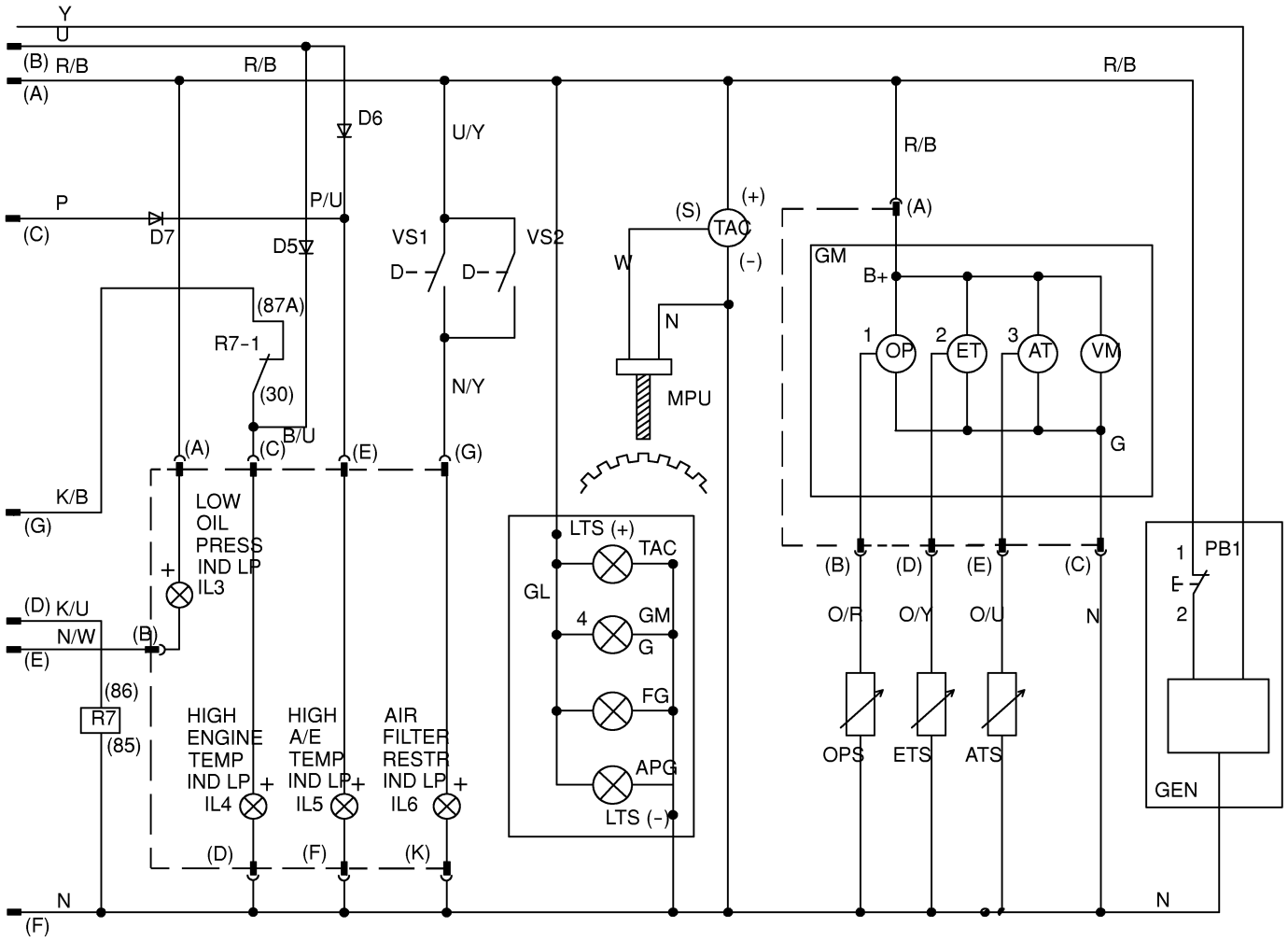


Item	CPN	Qty	Description	Item	CPN	Qty	Description
CB1	36884443	1	CIRCUIT, BREAKER 20A	J2	36848745	1	RECEPTACLE, DUPLEX
CB2	36884443	1	CIRCUIT, BREAKER 20A	J3	36848745	1	RECEPTACLE, DUPLEX
CB3	36884443	1	CIRCUIT, BREAKER 20A	PCU	54629696	1	POWER CONVERSION UNIT
F9	35363472	1	FUSE, 4A	Vmac	36884425	1	VOLTMETER
G2	54629746	1	GENERATOR, 6kW	W4	54631355	1	HARNESS, 6kW GENERATOR
J1	36848745	1	RECEPTACLE, DUPLEX				

SCHEMATIC, IR OPTION WIRING

WIRE	B	U	N	G	S	LG	O	K	P	R	W	Y
COLOR	BLK	BLU	BRN	GRN	GRY	LT GRN	ORG	PNK	PUR	RED	WHT	YEL

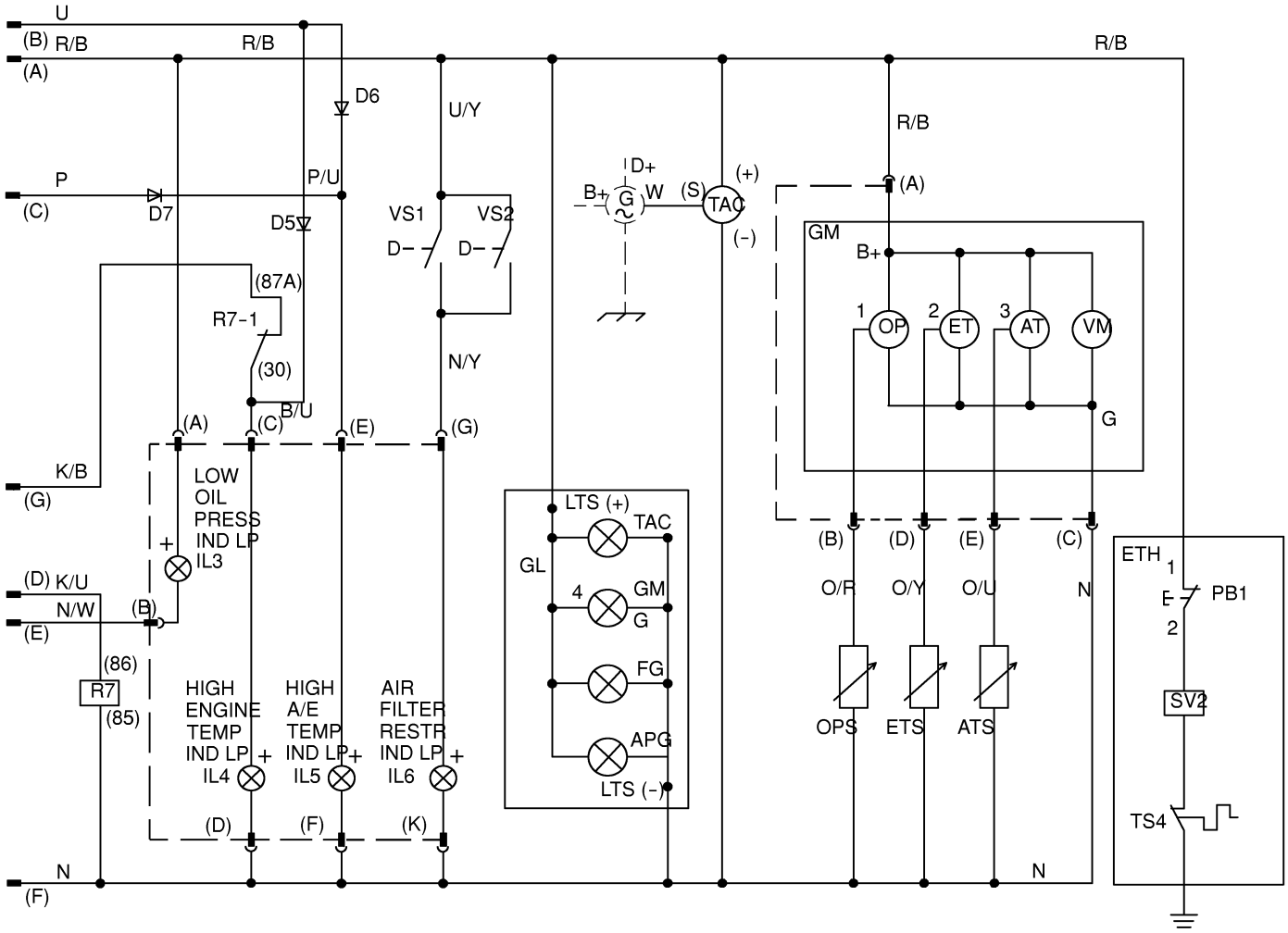
DASHED LINES INDICATE COMMON CONNECTIONS/CONNECTORS



Item	CPN	Description	Item	CPN	Description
ATS	54593843	AIREND TEMP SENDER	OPS	36870608	OIL PRESSURE SENDER
ETS	54772124	ENGINE TEMP SENDER	PB1	22090278	PUSH BUTTON SWITCH
D5	35676169	DIODE	R7	54368084	RELAY, HIGH ENG TEMP
D6	35676169	DIODE	TAC	22060198	TACHOMETER
D7	35676169	DIODE	VS1	36847838	SWITCH, AIR FILTER RESTRICTION
GEN	36066462	GENERATOR OPTION	VS2	36847838	SWITCH, AIR FILTER RESTRICTION
GL	36852622	GAUGE LIGHTS	W2	54762943	HARNESS, OPTION
	35333236	BULB, INCANDESCENT	W3	22074843	HARNESS, GAUGE ILLUM OPTION
GM	22061493	GAUGE MODULE	W4	36842839	HARNESS, AIR FILTER RESTR OPTION
IL3	22055891	LOW OIL PRESS INDICATOR LAMP	W5	54631355	HARNESS, 6KW GENERATOR
IL4	22055891	HIGH ENG TEMP INDICATOR LAMP	W6	22098727	HARNESS, ALTERNATOR (6kW GEN.)
IL5	22055891	HIGH A/E TEMP INDICATOR LAMP	W7	22098735	HARNESS, AC OUTLETS (6kW GEN.)
IL6	22055891	AIR FILTER RSTR INDICATOR LAMP	W8	22098743	HARNESS, STATUS PANEL (6kW GEN.)
MPU	36772366	MAGNETIC PICKUP			

WIRE	B	U	N	G	S	LG	O	K	P	R	W	Y
COLOR	BLK	BLU	BRN	GRN	GRY	LT GRN	ORG	PNK	PUR	RED	WHT	YEL

DASHED LINES INDICATE COMMON CONNECTIONS/CONNECTORS

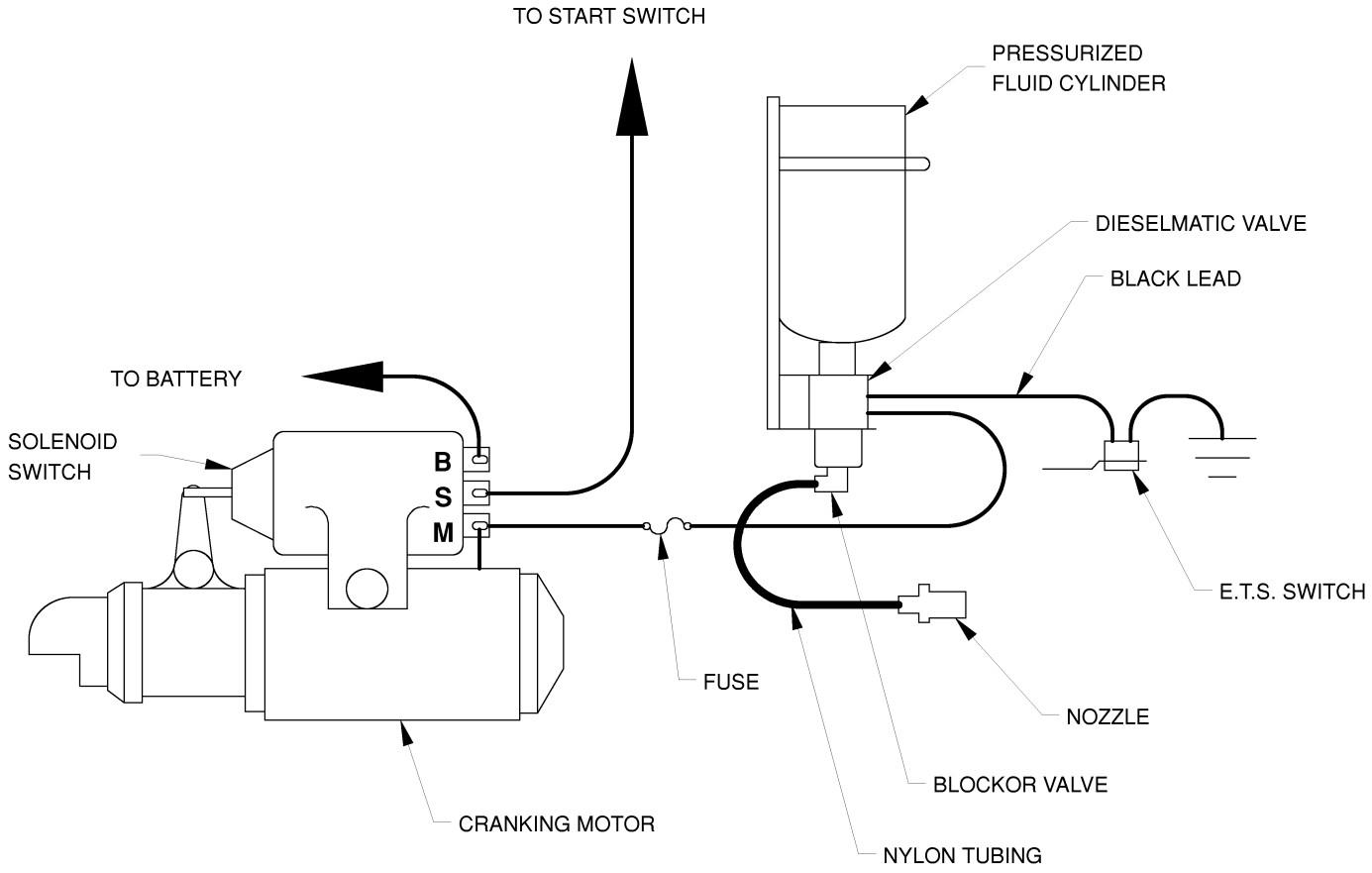


Item	CPN	Description	Item	CPN	Description
ATS	54593843	AIREND TEMP SENDER	OPS	36870608	OIL PRESSURE SENDER
ETS	54772124	ENGINE TEMP SENDER	PB1	22090278	PUSH BUTTON SWITCH
D5	35676169	DIODE	R7	54368084	RELAY, HIGH ENG TEMP
D6	35676169	DIODE	TAC	22060198	TACHOMETER
D7	35676169	DIODE	TS4	*	SWITCH, THERMAL
ETH	36066462	ETHER OPTION	VS1	36847838	SWITCH, AIR FILTER RESTRICTION
GL	36852622	GAUGE LIGHTS	VS2	36847838	SWITCH, AIR FILTER RESTRICTION
	35333236	BULB, INCANDESCENT	W2	54762943	HARNESS, OPTION
GM	22061493	GAUGE MODULE	W3	22074843	HARNESS, GAUGE ILLUM OPTION
IL3	22055891	LOW OIL PRESS INDICATOR LAMP	W4	36842839	HARNESS, AIR FILTER RESTR OPTION
IL4	22055891	HIGH ENG TEMP INDICATOR LAMP			
IL5	22055891	HIGH A/E TEMP INDICATOR LAMP			
IL6	22055891	AIR FILTER RSTR INDICATOR LAMP			

* PART OF COLD START ETHER KIT

NOTE:

1. WIRE FUSE INTO CIRCUIT AS CLOSE TO **M (MOTOR)** TERMINAL AS POSSIBLE.
2. **NOT** FOR USE WITH INGERSOLL ENGINES.



CPN	Description
DOOR KEY LOCK OPTION	
36794345	KEY LOCK CYLINDER
35612746	KEY (REPLACEMENT)
1000 CCA BATTERY OPTION	
36844975	BATTERY, 1000 CCA
1000 CCA DRY BATTERY OPTION	
36888758	BATTERY, DRY 1000 CCA
2” BALL COUPLER OPTION	
36509073	COUPLER ASM., 2” BALL
35131499 *	LIP
35131481 *	SPRING
35131457 *	NUT, LOOP HANDLE
35131465 *	BOLT
35376094	SCREW, HEX M16-2.0 X 120
96701750	NUT, HEX M16-2,0
SECURITY LIFTING OPTION	
54742028	EYE, SECURITY LIFTING
35290113	SCREW, HEX M16-2.0 X 75
96701750	NUT, HEX M16-2.0
CASTER WHEEL OPTION	
36866986	CASTER WHEEL ASM.
35366319 *	HANDLE, LOCK PLUNGER
35366327 *	SPRING, LOCK PLUNGER
35366335 *	PIN, HINGE
35366343 *	PLUNGER, LOCK
36866994 *	TIRE & WHEEL ASM.
35366368 *	BRACKET, FRAME
35366376 *	FORK
35366418 *	SWIVEL HEAD
35366426 *	PIN, COLLAR
35366434 *	FORK, SHAFT
35366442 *	FITTING, LUBE
35366459 *	BOLT, AXLE
35366467 *	NUT, AXLE BOLT
35366475 *	COLLAR
36877793	SCREW, HEX FLANGE M12-1.25 X 40
36879203	NUT, HEX FLANGE M12-1.25
SPARK ARRESTOR OPTION	
35604594	REDUCER EXHAUST 3.0” X 3.5”
35293059	SEALCLAMP 3.0”
36865285	ARRESTOR, SPARK
35293067	SEALCLAMP 3.5”
22065650	BRACKET, SPARK ARRESTOR
36797652	SCREW, TAPPING M06-1.0 X 12
35292333	CLAMP, EXHAUST 3.5”

* PART OF OPTION ASSEMBLY