Doosan Infracore
Portable Power

OPERATION and MAINTENANCE MANUAL

COMPRESSOR MODELS
XHP1170WCU-T4F (F77)
XHP1170WCU-T4F (F78)

This manual contains important safety information.
Do not destroy this manual.
This manual must be available to the personnel who operate and maintain this compressor.

Doosan Infracore Portable Power
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DoosanPortablePower.com

Book: 46669613 (05-2015) Rev B

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Foreword

Information

The contents of this manual are considered to be proprietary and confidential to Doosan Infracore Portable Power (herein referred to as “Portable Power”), and should not be reproduced without the prior written permission of Portable Power.

Nothing contained in this document is intended to extend any promise, warranty or representation, expressed or implied, regarding the Portable Power products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request.

This manual contains instructions and technical data to cover all routine operation and scheduled maintenance tasks by operation and maintenance staff. Major overhauls are outside the scope of this manual and should be referred to an authorized Portable Power Service department.

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

- of good quality, procured from a reputable manufacturer and, wherever possible, be of a type approved by Portable Power.
- clearly rated for a pressure at least equal to the compressor safety valve setting.
- compatible with the compressor oil.
- accompanied with instructions for safe installation, operation, and maintenance.

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

Portable Power 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 compressor are outlined below and examples of unapproved usage are also given. However, Portable Power cannot anticipate every application or work situation that may arise. **If in doubt, consult supervision**.

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

This compressor should NOT be used:

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

B. Outside the ambient temperature range specified in the General Data Section of this manual.

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

D. With other than Portable Power approved components.

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

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

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

You, as the customer, are expected to provide certain service and maintenance items. Your Portable Power dealer will provide all other more detailed service and maintenance items on a special preventive maintenance schedule for each compressor. It is very important that the minimum service and maintenance requirements explained in this manual be performed at the required intervals. Exceeding these intervals may reduce the reliability of the compressor.

The purpose of this manual is to train the operator with functions, operation, and basic service and maintenance requirements of the compressor. During the preparation of this manual, every effort was made to ensure the accuracy and adequacy of the contents.

Your Portable Power dealer will assist with setup and initial startup of the compressor and will also provide brief operating and service instructions. Before starting the compressor, this manual and instructions should be carefully read to obtain a thorough knowledge of the duties to be performed. Please take pride in the compressor, keep it clean and in good mechanical condition.

To enable proper maintenance records, Portable Power provides a Noise Emission Control Maintenance Log in the Noise Emission Section of this manual. The Noise Emission Section contains a recommended Maintenance schedule and provides space in the log for the technician to note what service and maintenance was done, by whom, where, and when.

Safety

Safety Precautions

Never operate the compressor without first observing all safety warnings and carefully reading the Operation and Maintenance Manual shipped from the factory with this compressor.

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

Ensure all maintenance personnel are adequately trained, competent, and have read the manuals.

Ensure all protective covers are in place and the canopy/doors are closed during operation.

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

A weekly visual check must be made of all fasteners/fixing screws securing mechanical parts. In particular, safety-related parts such as coupling hitch, drawbar components, wheels, tires, 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 compressor may contain carbon monoxide or other contaminants which will cause serious injury or death. Do not breathe discharged air.

This compressor 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 the compressor 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 the compressor with compressed air to prevent debris from injuring eye(s).

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

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

Ether is an extremely volatile, highly flammable gas. When it is specified as a starting aid, use sparingly. Do not use Ether if the engine has glow plugs or inlet heater starting aids. Engine damage will result.

Never operate the compressor 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. Prior to performing maintenance or service on the compressor, ensure all pressure is vented from the system and the compressor cannot be started accidentally.

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

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

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

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

Compressed 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 or maintenance.

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

If 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 compressor is stopped, air will flow back into the compressor from downstream devices or systems unless the service valve is closed. Install a check valve at the compressor 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 compressor to sit stopped with pressure in the separator tank or piping.

Exhaust System

Hot engine exhaust gas and hot exhaust system surfaces are produced during and after compressor operation. Avoid contact with exhaust gas and hot exhaust system surfaces. Keep flammable and combustible materials away. Do not operate compressor on, under, or near flammable or combustible materials.

The potential for higher temperatures is present when the exhaust aftertreatment system undergoes regeneration. Refer to Engine Manual for further safety instructions and information on the exhaust aftertreatment system and controls.

Materials

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

- brake lining dust
- engine exhaust fumes

⚠ WARNING

Avoid inhalation of material substances.

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 compressor and may be hazardous to health if used incorrectly:

- antifreeze
- compressor oil
- engine oil
- preservative grease, lubricating grease
- rust preventative
- diesel fuel
- battery electrolyte
- diesel exhaust fluid (DEF)
- thread sealant
- thread locking compound
- brake fluid

⚠ WARNING

Avoid ingestion, skin contact, and inhalation of fumes.

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

Should compressor oil come into contact with the skin, wash off immediately. Consult a physician if large amounts of compressor oil are ingested or if compressor oil is inhaled. Never give fluids or induce vomiting if the patient is unconscious or having convulsions.

Safety data sheets for compressor and engine oils should be obtained from the oil supplier.

Do NOT start or operate this compressor in a confined area. Avoid breathing exhaust fumes when working on or near the compressor.

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

Battery

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

⚠ WARNING

Do not attempt to jumpstart a frozen battery since this may cause it to explode.

Exercise extreme caution when using an external method to jumpstart a unit. Verify the electrical systems on the weak battery system and the external jump system are the same voltage type system, 12VDC or 24VDC. Connect the Positive (+) terminal of the external system to the Positive (+) terminal on the weak system. Connect the Negative (-) terminal of the external system to the Negative (-) terminal of the weak system. Always disconnect the two systems in reverse order.

Radiator

Hot engine coolant and steam can cause injury. Ensure the Radiator Pressure Cap is removed with due care and attention.

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

⚠ WARNING

Hot engine coolant and steam can cause injury. When adding coolant or antifreeze solution to the engine radiator, stop the engine and allow radiator to cool prior to releasing the Radiator Pressure Cap. Using a cloth to protect the hand, slowly release the pressure cap, absorbing any released fluid with the cloth. Do not remove the pressure cap until all excess fluid is released and the engine cooling system fully depressurized.

⚠ 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.

Transport

When loading or transporting the compressor, ensure the specified lifting and tie down points are used.

When loading or transporting the compressor, ensure 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 compressor model if lower than the legal maximum. Do not exceed gross vehicle weight rating.

Before towing the compressor, ensure:

- the tires and towing hitch are in a serviceable condition and tires are properly inflated.
- 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.
- breakaway cables/safety chains are connected to the towing vehicle.

The compressor 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.

1. Ensure wheels, tires, and drawbar connectors are in safe operating condition and drawbar is properly connected before towing.
2. When parking, always use the handbrake and, if necessary, suitable wheel chocks.

Safety chains/breakaway cable and their adjustment (where fitted).

Ensure breakaway cable is securely coupled to the towed compressor and also to a substantial anchorage point on the towing vehicle.

Ensure cable length is as short as possible, while still allowing enough slackness for the towed compressor to articulate without the brake being applied.

Attach safety chains to the towing vehicle at substantial anchorage points of suitable strength.

Ensure effective chain length is as short as possible while still allowing normal articulation of the towed compressor and proper operation of the breakaway cable.

Decals

Decals are located on the compressor to point out potential safety hazards. Read and follow these instructions. If you do not understand these instructions, inform your supervisor.

(Red Background)

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

(Orange Background)

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

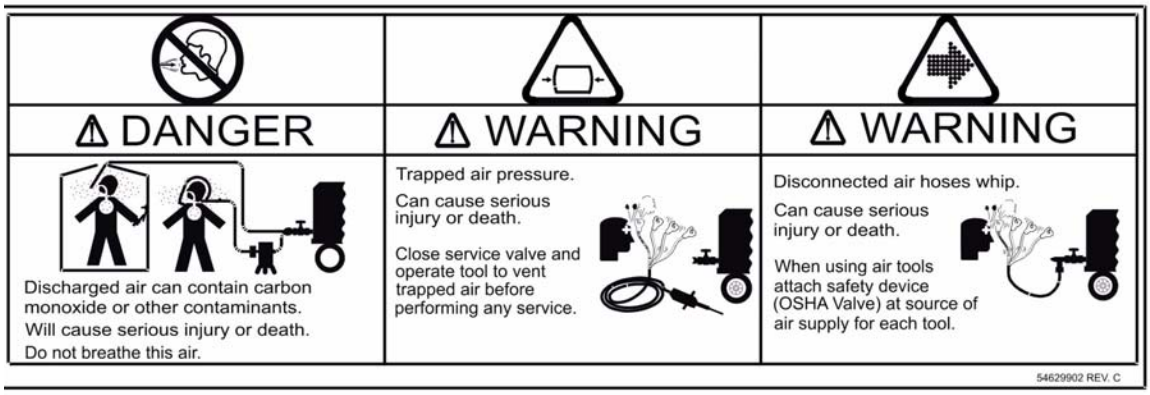
(Yellow Background)

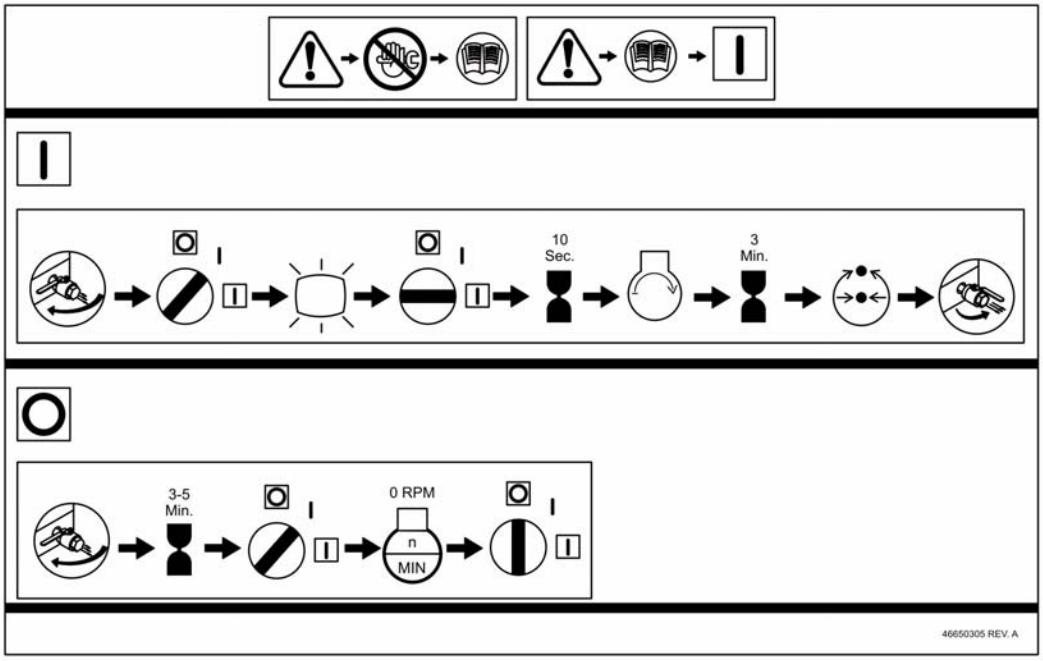
Indicates the presence of a hazard which WILL or CAN cause injury or property damage, if ignored.

(Blue Background)

Indicates important set-up, operating, or maintenance information.

Free Safety Decals
To promote communication of Safety Warnings on products manufactured by the Portable Power Division in Statesville, N.C., Safety Decals are available FREE of charge. Safety Decals are identified by the decal heading: DANGER, WARNING, CAUTION, NOTICE.
Decal part numbers are located in the lower right hand corner of each decal and are also listed in the compressor Parts Manual. Submit orders for Safety Decals to the Statesville Parts Service Dept. The no charge order should contain only Safety Decals.
Help promote product safety! Ensure decals are present on the compressor. Replace decals that are not readable.


⚠ DANGER
Discharged air can contain carbon monoxide or other contaminants.
Will cause serious injury or death.
Do not breathe this air.
⚠ WARNING
Trapped air pressure.
Can cause serious injury or death.
Close service valve and operate tool to vent trapped air before performing any service.
⚠ WARNING
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.
54629902 REV. C

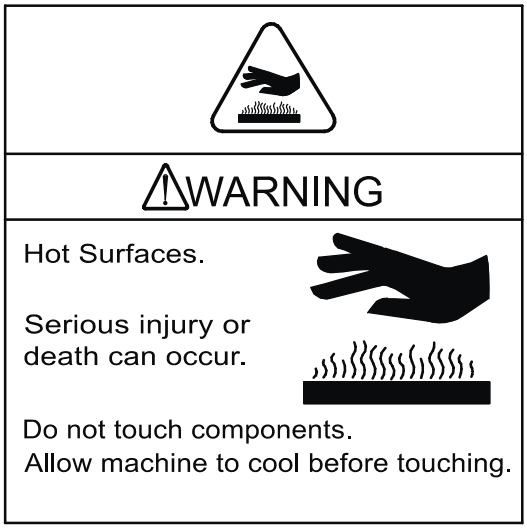

10 Sec.
3 Min.
3-5 Min.
0 RPM
n
MIN
46650305 REV. A

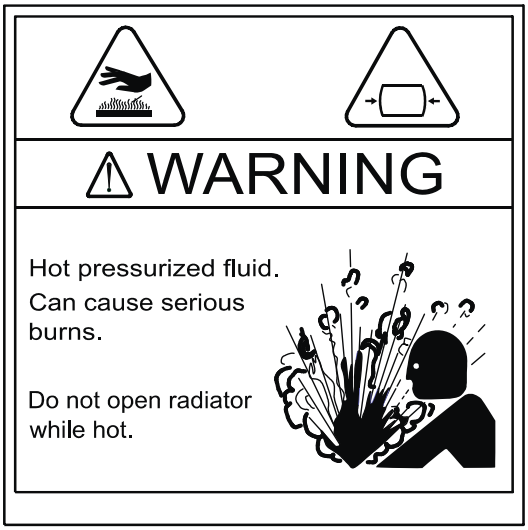

⚠ WARNING
High pressure air.
Can cause serious injury or death.
Relieve pressure before removing filler plugs/caps, fittings or covers.
54568795 REV. C


⚠ WARNING
Hot Exhaust Gas. Hot Surfaces.
Risk of Ignition.
Can cause serious injury or death.
Do NOT Operate Machine on, under or near flammable materials.
46559883 REV. A

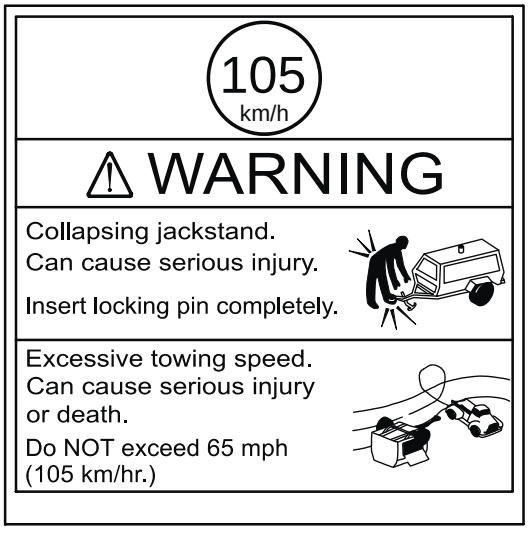

NOTICE
DIESEL EXHAUST FLUID (DEF)
ONLY
USE API-CERTIFIED DEF
WHICH MEETS ISO 22241
46652201 REV. A

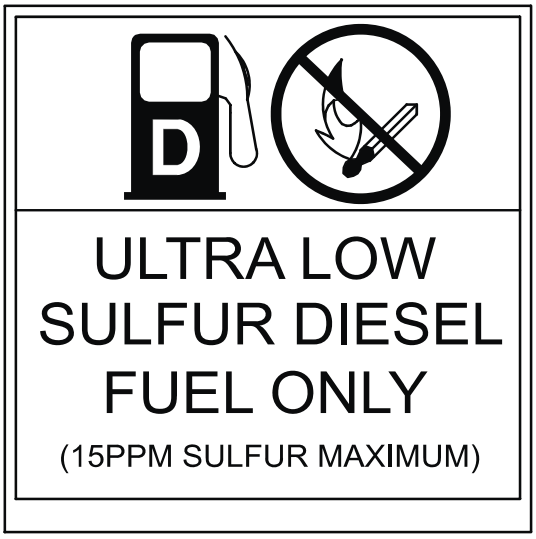

WARNING
Rotating fan blade.
Can cause serious injury.
Do not operate without guard in place.


WARNING
Hot Surfaces.
Serious injury or death can occur.
Do not touch components.
Allow machine to cool before touching.


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


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

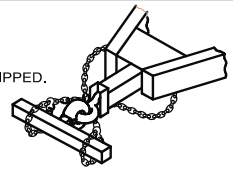

105
km/h
WARNING
Collapsing jackstand.
Can cause serious injury.
Insert locking pin completely.
Excessive towing speed.
Can cause serious injury or death.
Do NOT exceed 65 mph (105 km/hr.)


D
ULTRA LOW SULFUR DIESEL FUEL ONLY
(15PPM SULFUR MAXIMUM)

NOTICE

BEFORE TOWING

- ENSURE TOW VEHICLE HAS TOWING CAPACITY FOR WEIGHT OF THIS UNIT.
- CHOCK WHEELS AND SET PARKING BRAKE IF EQUIPPED.
- CHECK PINTLE EYE BOLTS FOR ANY LOOSENESS OR WEAR.
  - TIGHTEN OR REPLACE AS REQUIRED.
- POSITION TOW VEHICLE TO ALIGN HITCH WITH PINTLE EYE.
- STAND ASIDE WHILE :
  - OPERATING JACKS TO SEAT PINTLE EYE ON TO HITCH.
  - SECURE HITCH.
  - ATTACHING SAFETY CHAINS PER ILLUSTRATION.
  - ATTACHING BRAKE ACTUATOR BREAKAWAY CHAIN / CABLE (IF APPLICABLE).
  - CONNECTING LIGHTING PLUG (IF APPLICABLE).
  - CONNECT ELECTRIC BRAKE PLUG (IF APPLICABLE).
  - REMOVE WHEEL CHOCKS AND RELEASE PARKING BRAKE IF EQUIPPED.
  - TEST BRAKES.



DISCONNECT

- CHOCK WHEELS AND SET PARKING BRAKE IF EQUIPPED.
- STAND ASIDE WHILE :
  - DISCONNECTING SAFETY CHAINS.
  - DISCONNECTING BRAKE ACTUATOR BREAKAWAY CHAIN / CABLE (IF APPLICABLE).
  - DISCONNECTING LIGHTING PLUG (IF APPLICABLE).
  - DISCONNECTING ELECTRIC BRAKE PLUG (IF APPLICABLE).
  - OPERATING JACKS TO RAISE PINTLE EYE FROM HITCH.
- MOVE TOW VEHICLE.
- LEVEL MACHINE.

⚠ WARNING

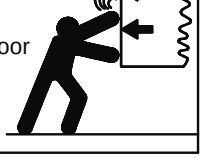
DO NOT OPERATE UNIT WITHOUT GUARDS IN PLACE SERIOUS INJURY CAN OCCUR

⚠ WARNING

Door under pressure.

Can cause serious injury.

Use both hands to open door when machine is running.



⚠WARNING

FALLING OFF MACHINE CAN CAUSE SERIOUS INJURY OR DEATH.

USE LADDER AND HAND HOLDS TO ACCESS LIFTING BAIL.

⚠ NOTICE

LIFT POINT

CAUTION

DO NOT WELD.

ELECTRONIC DAMAGE WILL OCCUR.

This engine is equipped with an electronic engine controller and other electronic components.

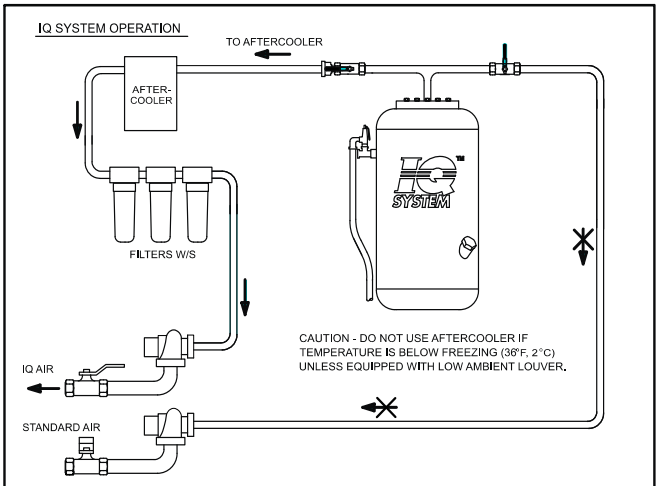
NOTICE

1. THIS UNIT EQUIPPED FOR EITHER IQ SYSTEM OR STANDARD OPERATION.
2. FOR THE IQ SYSTEM , MAKE SURE THE IQ SYSTEM VALVING IS IN THE IQ SYSTEM OPERATION POSITION.
3. SEE THE VALVE POSITION INSTRUCTION DECAL LOCATED ON SEPARATOR TANK TO VERIFY VALVING IS IN THE CORRECT POSITION PRIOR TO OPERATION.

⚠ WARNING

Risk of electric shock.
Hazardous voltage.
Can cause serious injury or death.

Disconnect power before servicing.
Lockout / tagout machine.



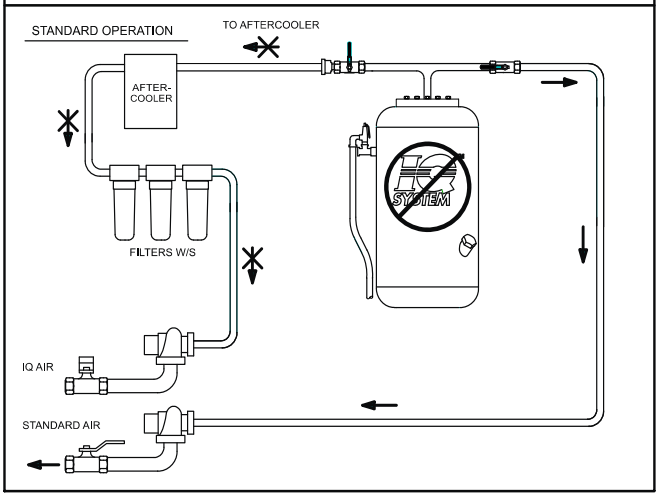
⚠ WARNING

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

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

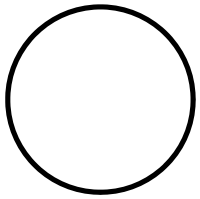
Modification or alteration of this machine. Can cause serious injury or death.

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

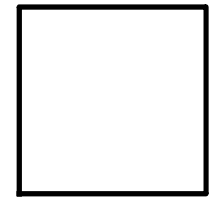


Decals

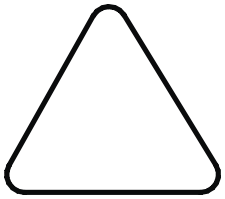
Graphic Form and Meaning of ISO Symbols



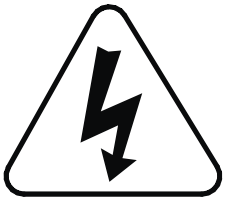
Prohibition / Mandatory



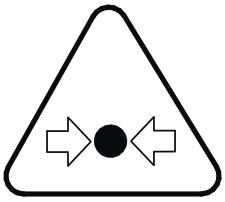
Information / Instructions



Warning

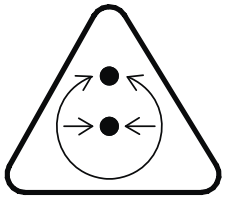


WARNING: Electrical Shock Risk



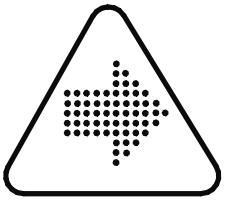
WARNING: Pressurized Component or System

WARNING: Hot Surface

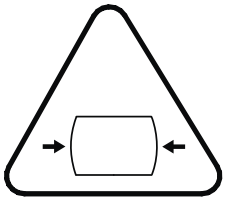


WARNING: Pressure Control

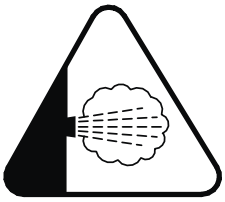
WARNING: Corrosion Risk



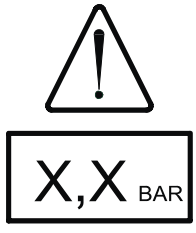
WARNING: Air/Gas Flow or Air Discharge



WARNING: Pressurized Vessel



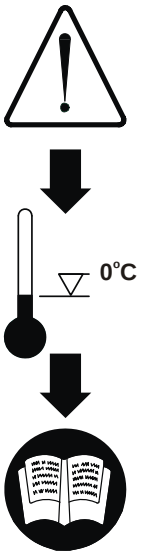
WARNING: Hot and harmful exhaust gas



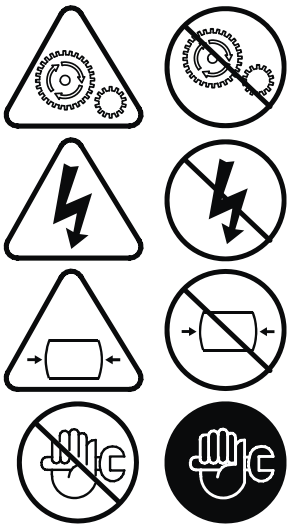
WARNING: Maintain correct tire pressure (Refer to the GENERAL INFORMATION section of this manua

WARNING: Flammable Liquid

WARNING: Before connecting the tow bar or commencing to tow consult the Operation and Maintenance Manual



WARNING: For operating temperature below 0°C, consult the Operation and Maintenance Manual



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

WARNING: Consult the Operation and Maintenance manual before commencing any maintenance

Do not Breathe the compressed air from this machine

Do not remove the Operation and Maintenance manual and manual holder from this machine

Do not stack

Do not operate the machine without the guard being fitted

Do not stand on any service valve or other parts of the pressure system

Do not operate with doors or enclosure open

Do not use fork lift truck from this side

Do not exceed trailer speed limit

No open flames

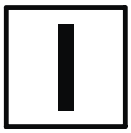
Do not open service valve before the air hose is attached

Use fork lift truck from this side only

Emergency stop

Tie down point

Lifting point



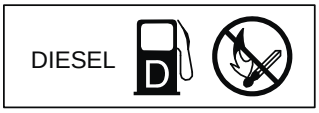
ON (power)

OFF (power)

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

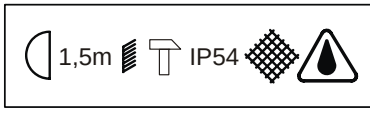
When parking use prop stand, handbrake, and wheel chocks

Compressor oil filling

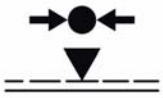


Diesel fuel
No open flames

Parking Brake



Rough Service Designation
Wet Location Operation

  Replace any cracked protective shield	 Oil drain	 Engine Oil
 Fuel level / point	 Pressure control	 Malfunction
 Battery charging condition	 Low pressure	 High pressure
 Engine malfunction	 High Compressor Temperature	 Compressor malfunction
 Low engine oil pressure	 Engine high temperature	 Diesel Exhaust Fluid (DEF)

Noise Emission

Noise Emission

This section pertains only to compressors 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 compressors that are built in compliance with the U.S. Environmental Protection Agency.

Portable Power 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.

Maintenance Log

COMPRESSOR MODEL_____

SERIAL NO. _____

USER UNIT NO. _____

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

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

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

Noise Emission Warranty

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

This warranty is not limited to any particular part, component, or system of the air compressor. Defects in the design, assembly or in any part, component, or system of the compressor which, at the time of sale to the first retail purchaser, caused noise emissions to exceed Federal Standards are covered by this warranty for the life of air compressor.(40CFR204.58-1)

Introduction

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

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

Maintenance Schedule

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

A. Compressed Air Leaks

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

B. Safety and Control Systems

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

C. Acoustic Materials

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

D. Fasteners

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

E. Enclosure Panels

Enclosure panels should 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 ensure continuous seating between gasket or acoustic material and the mating frame.

F. Air Intake and Engine Exhaust

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

G. Cooling Systems

All components of the cooling system for engine water and compressor oil should be inspected every 250 hours of use. Any discrepancies found should be corrected before placing the compressor 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 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 Operator and Maintenance Manual and Engine Manual.

MAINTENANCE RECORD FOR NOISE EMISSION CONTROL AND EXTENDED WARRANTY

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

General Data

General Data Information

MODELS	XHP1170WCU-T4F
COMPRESSOR	
Air Delivery - cfm (m^3/min)	1170 (33.1)
Rated Operating Pressure - psi (bar)	140-365 (9.7-25.2)
Safety Valve Setting - psi (bar)	440 (30.3)
ENGINE	
Manufacturer	Cummins
Model	QSX15
Rated Power at Full Load Speed - hp (kw)	580 (433)
Full Load Speed - rpm	1800
Idle Speed - rpm	1200
Idle Speed (warm-up) - rpm	1500
Electrical System	24VDC
FLUID CAPACITIES - U.S. Gallons (liters)	
Compressor Oil	55 (208)
Engine Oil, including filter	12 (46)
Engine Coolant	26.5 (100.3)
Fuel Tank (Tandem Frame)	222 (840)
Fuel Tank (Wagon Frame)	228.1 (863.4)
DEF (Diesel Exhaust Fluid)	15.6 (59)
AMBIENT TEMPERATURE RANGE - °F (°C)	
With Standard Features	10 to 120 (-12 to 49)
With Required Options	-20 to 120 (-28 to 49)
With Aftercooler or IQ System	Max. 115 (46)
OUT-OF-LEVEL	
Out-Of-Level Operating Limit	10° Angle in any direction

MEASUREMENTS/ WEIGHTS	Tandem	Tandem LRG	Wagon	Wagon LRG
Length - feet (meters)	24.5 (7.43)	19 (5.80)	18.8 (5.73)	18.8 (5.73)
Height - feet (meters)	8.3 (2.53)	8.2 (2.50)	8.5 (2.58)	7.3 (2.21)
Width - feet (meters)	7.51 (2.29	7.51 (2.29)	7.51 (2.29)	7.51 (2.29)
Weight, with fuel - lb (kg)*	18835 (8543)	17860 (8101)	18514 (8398)	17071 (7743)
Weight, less fuel - lb (kg)*	17355 (7872)	16169 (7334)	17331 (7861)	16432 (7453)
RUNNING GEAR				
Tire Size	ST 215/ 75R17.5H	N/A	ST 215/ 75R17.5H	N/A
Tire Inflation Pressure - psi (bar)	125 (8.62)	N/A	125 (8.62)	N/A
Max. Towing Speed - mph (km/hr)	65 (105)	N/A	20 (32)	N/A

*Note: Does not include options

SERVICE PARTS

Maintenance Interval Kits

46637399 ..... 500 hours
46637400 ..... 1000 hours
46656760 ..... 2000 hours

Part Number	Description	Where Used	Quantity
46671454	Filter, Oil Compressor	Airend	2
46555952	Separator, Oil Compressor	Airend	1
36864361	Filter Element, Air Inlet Primary	Engine & Airend	2
36864379	Filter Element, Air Inlet Safety	Engine & Airend	2
54662028	Filter, Oil Engine	Engine	1
46618460	Filter, Fuel Engine	Engine	1
46578120	Filter, Fuel-Water Separator	Engine	1
46610619	Element, Crankcase Breather	Engine	1
54662051	Filter, Eng. Coolant Conditioner	Engine	1
46594960	Filter, Fuel Tank Vent	Engine	1
46652904	Filter, DEF Supply Pump	Engine	1
54739032*	Filter Element, IQ Primary	IQ System	1
54739040*	Filter Element, IQ Secondary	IQ System	1

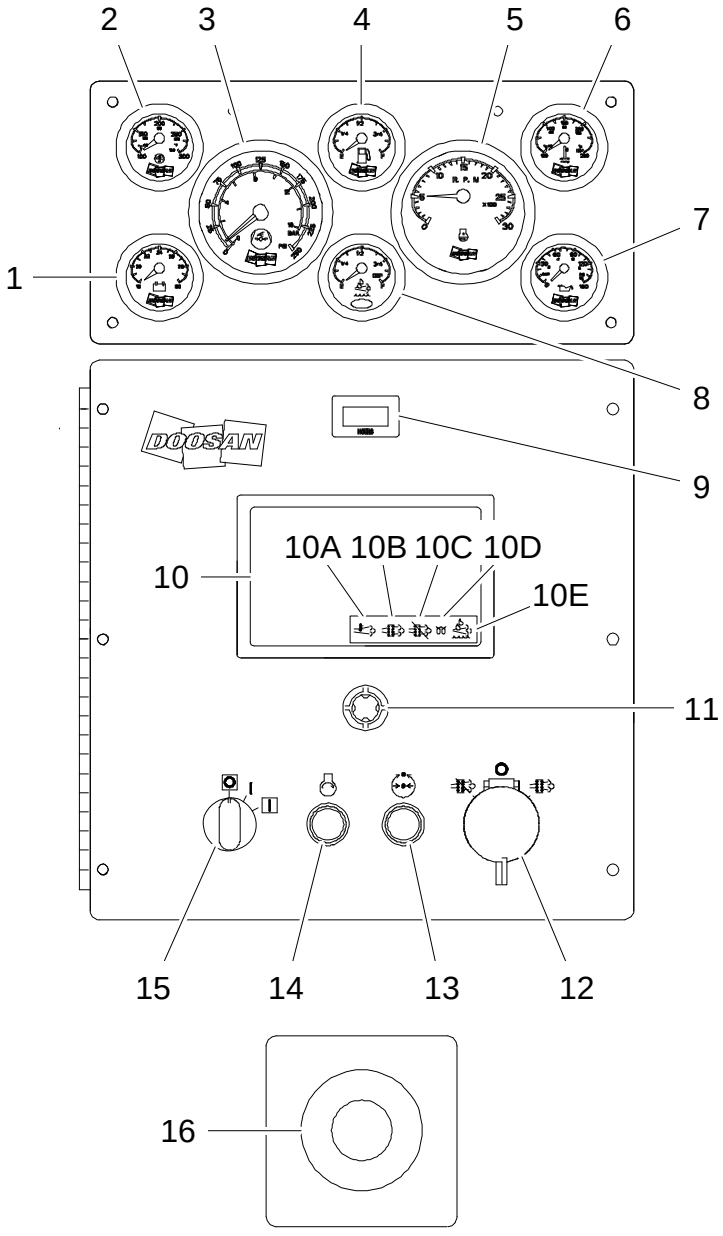
*Optional IQ System

⚠ CAUTION

Any departure from the specifications may make this equipment unsafe.

Operating Instructions

Control Panel

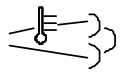


Gauge Panel

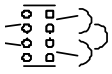
1. **Voltmeter:** Indicates electrical system voltage.
2. **Compressor Temperature Gauge:** Indicates airend discharge temperature.
3. **Air Pressure Gauge:** Indicates pressure in the separator tank.
4. **Fuel Level Gauge:** Indicates fuel level in fuel tank.
5. **Engine Tachometer:** Indicates engine speed (RPM).
6. **Engine Coolant Temperature Gauge:** Indicates engine coolant temperature.
7. **Engine Oil Pressure Gauge:** Indicates engine oil pressure.
8. **DEF Level Gauge:** Indicates DEF level in DEF Tank.

Control Panel

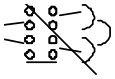
9. **Hourmeter:** Indicates compressor operating hours.
10. **ViewPort:** Displays compressor operating parameters and diagnostic codes.



10A. **High Exhaust System Temperature (HEST) Lamp:** Illuminates when exhaust temperatures are high due to cleaning of the Aftertreatment.



10B. **Exhaust System Cleaning Lamp:** Illuminates when Exhaust Aftertreatment System needs cleaning.



10C. **Exhaust System Cleaning Disabled Lamp:** Illuminates when cleaning is disabled by the Exhaust System Cleaning switch.

10D. **Wait to Start Lamp:** Illuminates when the operator should wait before starting the engine because the intake air heater is heating (if equipped with an air intake heater).

10E. **Diesel Exhaust Fluid Lamp:** Illuminates when the DEF level is low.

11. **Joystick:** Scrolls screen to view additional content. Selects display menus.

12. **Exhaust System Cleaning Switch:** Provides operator control of the Exhaust Cleaning System.

Normal Position: Allows automatic exhaust system cleaning to take place as needed.

Disable Position: Inhibits automatic and manual cleaning of the exhaust system.

Initiate Position: Requests manual (non-mission) cleaning of the exhaust system if entry conditions are within proper range. Momentary position.

13. **Service Air Button:** Allows operator to load compressor after warm-up.

14. **Start Button:** Initiates engine cranking.

15. **Main Control Switch :** Used for starting and stopping the compressor.

ON: Powers on compressor control system and ViewPort.

OFF: Shuts down the compressor.

RUN: Powers on engine control system.

16. **Emergency Stop:** Push to shut down compressor quickly in emergency situations.

Viewport

Navigation Button

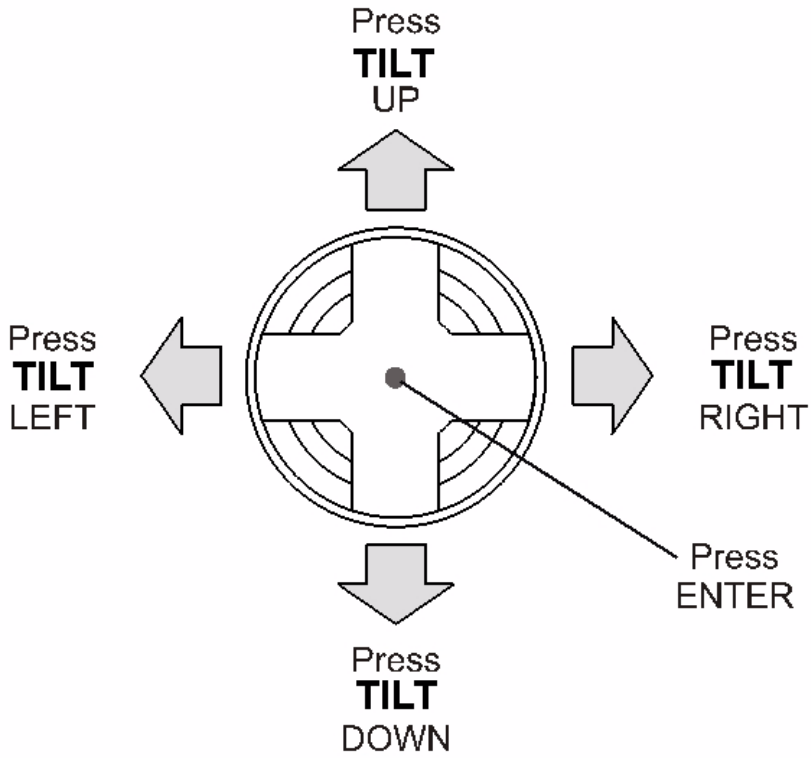


Figure 1

The Navigation Button is located directly below the Viewport LCD display. The button allows the user to navigate between and within screens, make selections, scroll gauges, manuals, and information. The available functions of the button are shown in Figure 1.

Throughout this description of the Viewport Screens and operation we will refer to TILT LEFT, TILT RIGHT, TILT UP, TILT DOWN, and ENTER. (Refer to Figure 1).

Default Screen

If at anytime you would need to return the Viewport to its Default settings, navigate to the Set Up screen and select Default in the Gauges Configuration panel. All previous changes to the Viewport will be reset with the exception of Machine ID and Date and Time.

Screen Definitions

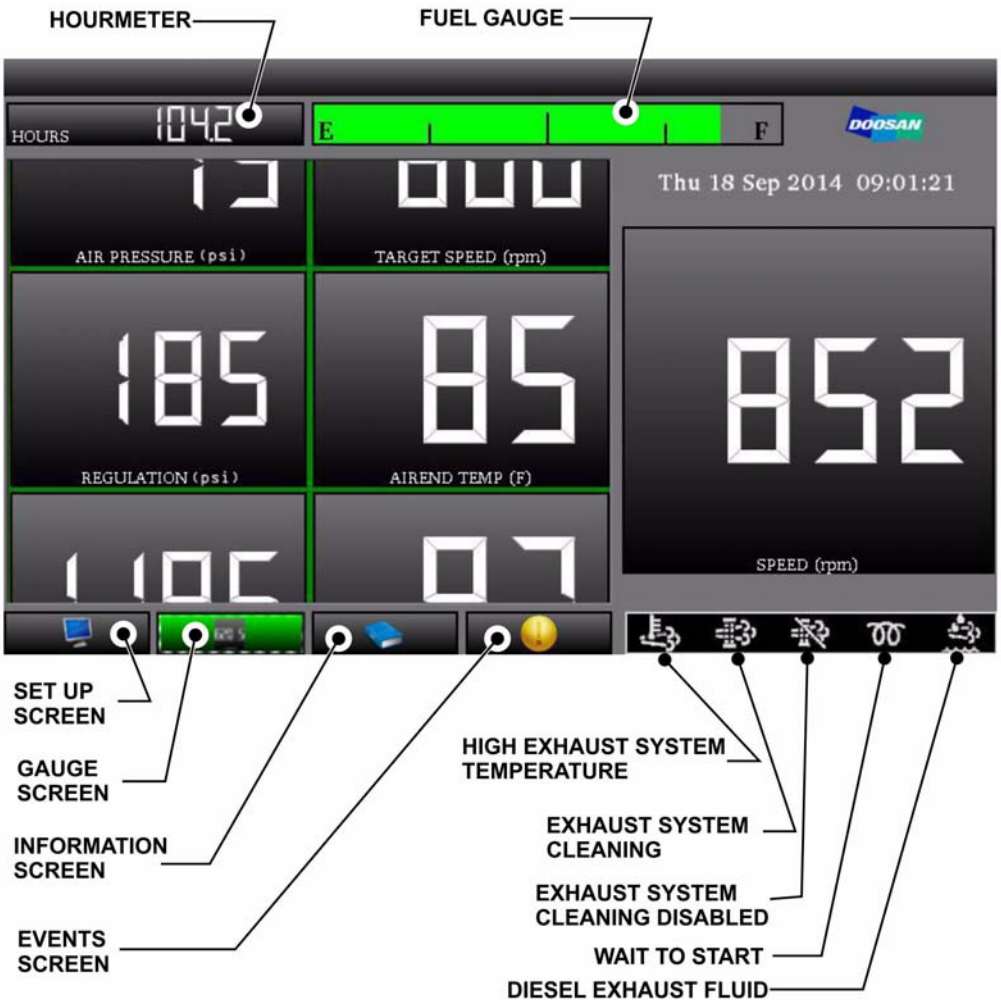


Figure 2

The available display screens are displayed along the bottom of the Viewport LCD display. Also, the Hourmeter which counts cumulative hours of machine operation and the Fuel Gauge which approximates the level of fuel remaining are displayed above the gauges. Along the lower right of the Viewport is a series of indicators of additional machine operation functions/ parameters.

During machine operation Figure 2 represents the Viewport screen required to monitor machine performance.

*** Note:** All of the following navigation instructions are based on starting from the Gauge Screen (Figure 2).

Setup Screen

TILT LEFT to highlight the Set Up Screen and press ENTER. The screen represented by Figure 3 will appear.

Figure 3

The Set Up Screen is comprised of 4 sections: Units, Language and Machine ID, System Configuration, and Gauges Configuration.

When the window opens, PRESSURE will be highlighted.

To navigate between available fields, TILT LEFT or TILT RIGHT. To change information to be displayed in highlighted field, TILT UP or TILT DOWN.

To exit screen, navigate to Quit button,TILT LEFT or RIGHT until Quit button is highlighted. Press ENTER.

Note: Changes to parameters in first 3 sections take effect immediately.

Units

Pressure - Allows user to select units of pressure measurement to be displayed on pressure gauge.

Temperature - Allows user to select units of temperature measurement to be displayed on temperature gauge.

Language and Machine ID

Language - Allows user to select language to display on available screens and Operation and Maintenance Manual. (Note: English is the default language).

Machine ID - Allows user to select Machine ID. Machine ID must match Unit Model Number as shown on the machine's Data Plate.

System Configuration

Alert Duration - Allows user to select the desired duration of ALERT notification. During machine operation, if an ALERT condition occurs, the EVENTS Screen will display (over-riding currently viewed screen) for a predetermined set time.

Save Data - Allows user to select length of time (in days) data will be stored internally and be available to copy.

Date and Time - Allows user to set correct date and time. Date and time will be displayed on the Gauges Screen and will be used to time/date stamp ALERTS, FAULTS, and saved information. (**Note:** Date and Time Settings are saved automatically).

Time Zone - Allows user to select appropriate time zone of machine operation. (**Note:** UTC-05 US/Eastern is the default setting).

Gauges Configuration - This panel shows the available gauges for the machine. The Scrolling Gauges are displayed in 2 columns, the Main Gauge is in the upper right corner. The order of the Scrolling Gauges and selection of the Main Gauge are set in this panel.

To arrange the order the Scrolling Gauges are displayed on the Gauge Screen do the following:

- Navigate to the desired gauge by TILTING LEFT and press ENTER. The gauge and its numeric display will be highlighted Green.

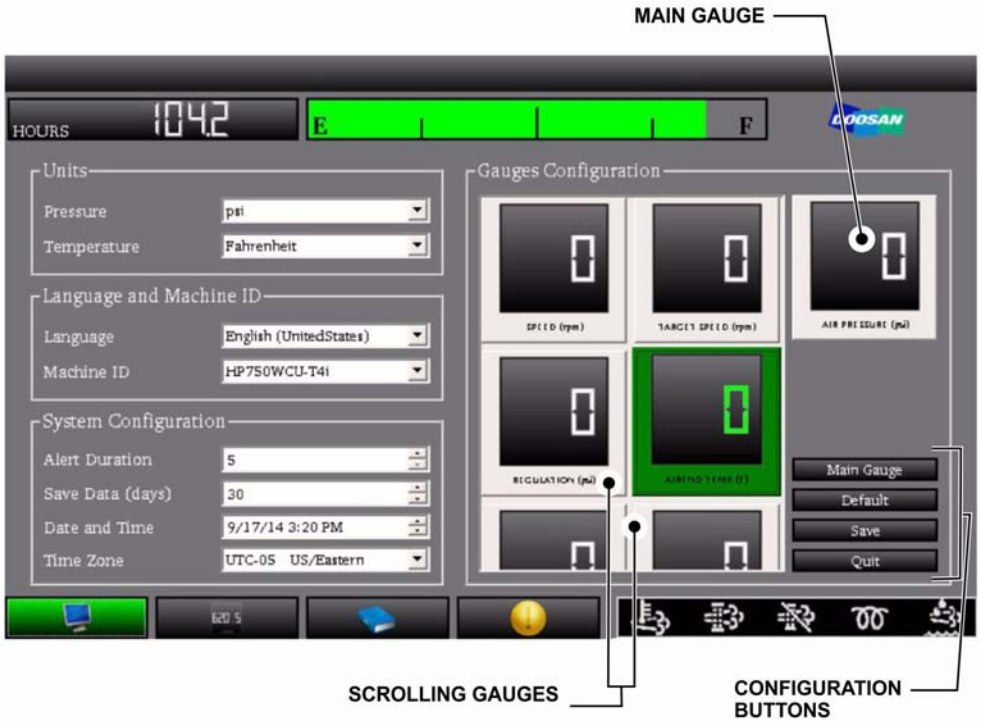


Figure 4

- If gauge in left column, TILT RIGHT or TILT UP/DOWN to reposition gauge to new location. Press ENTER to deselect.
- If gauge in right column, TILT LEFT or TILT UP/DOWN to reposition gauge to new location. Press ENTER to deselect.
- Repeat until desired layout is set.
- TILT right until Main Gauge Button is highlighted. Continue to TILT RIGHT until the Save Button is highlighted. Press ENTER to save set up.
- To exit, TILT RIGHT to highlight Quit Button and press ENTER.

The Main Gauge is the largest, most prominent gauge displayed on the Gauge Screen. Any of the available machine gauges can be set as the Main Gauge.

To set the Main Gauge, do the following:

- Navigate the Gauges Configuration area in the Set Up Screen.
- Navigate to the desired gauge and press ENTER. The selected gauge and its numeric display will be highlighted Green.
- If the highlighted gauge is in the left column, TILT LEFT to highlight the Main Gauge Button.
- If the highlighted gauge is in the right column, TILT RIGHT to highlight the Main Gauge Button.
- Press ENTER.

Figure 5

- TILT RIGHT to highlight Save Button and press ENTER.
- To exit, TILT RIGHT to highlight Quit Button and press ENTER.

Note: Gauge Configuration changes are immediate. However, to ensure settings are saved after a power cycle the Save Button must be pressed.

Gauge Screen

Figure 6

The Gauge Screen consists of the Main Gauge and Scrolling Gauges. These gauges allow the user to monitor machine operating and performance parameters.

The Main Gauge and the order of the Scrolling Gauges is defined in the Set Up Screen procedure.

To view gauges, Gauge Screen must be selected. To scroll gauges, TILT UP or TILT DOWN.

Information Screen

TILT RIGHT to navigate to the Information Screen. The Information Screen will open.

Figure 7

The Information Screen is comprised of 3 areas: Manuals, System Info, and Gauge Data.

Manuals

Press ENTER. The Engine Manual Button will be highlighted. **Note:** At this time the Engine Manual is not loaded.

TILT RIGHT. The Operation Button will be highlighted. Select Operation and the Operation and Maintenance Manual will open in a new screen. 4 buttons are located at the bottom of the screen. TOC (Table of Contents) button will be highlighted. Pressing ENTER will open the manual at the Table of Contents.

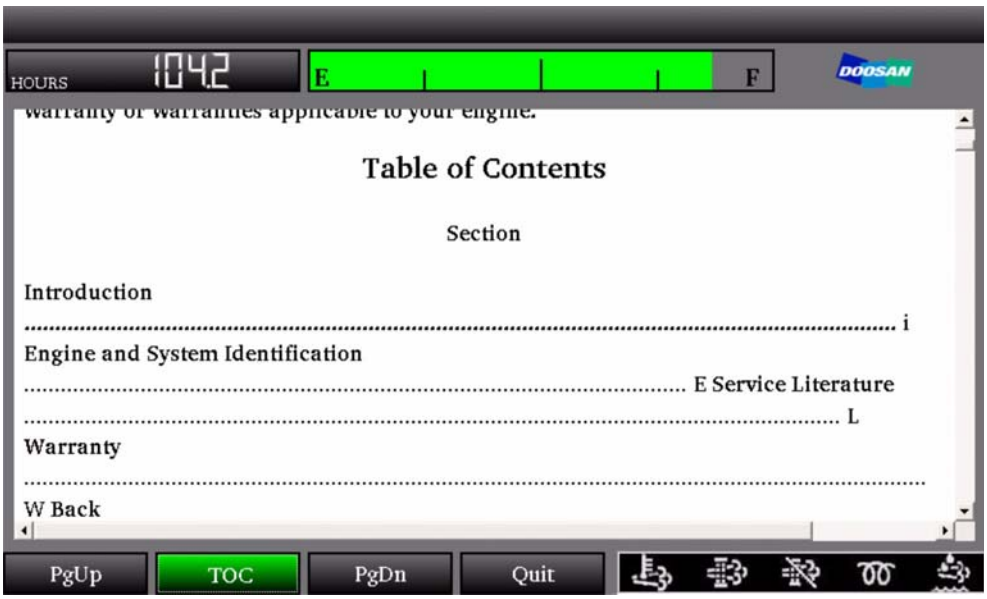


Figure 8

There are two methods of viewing displayed manuals. Use the PgUp and Pg Dn button on either side of the TOC Button. TILT LEFT or RIGHT from the TOC Button. Using the PgUp or PgDn will step through the manual page by page (approximately).

To scroll the chosen manual, TILT UP or TILT DOWN. Any button can be highlighted.

To exit, TILT RIGHT to highlight the Quit Button. Press ENTER. You will be returned to the Information Screen.

The procedure to view the Parts Manual and the Service Manual is the same as noted before.

System Info

Navigate by TILTING RIGHT until CAN Devices Button is highlighted. Press ENTER. A new screen will open displaying information for all devices attached to the machine's CAN Bus.

Figure 9

There are 4 buttons at the bottom of the screen. CAN Device Info will be highlighted.

TILT LEFT to highlight Save List Button. Press ENTER to save a snapshot of the displayed information. The snapshot will be stored internally for a predetermined length of time (see Set Up Screen) and available for retrieval.

To retrieve saved information, TILT RIGHT to highlight the Copy to USB Button. Press ENTER. A new smaller screen will open. The smaller screen consists of 2 buttons - Cancel and Save, and a status bar.

Figure 10

Cancel will close smaller screen and return the user to the CAN Devices Screen.

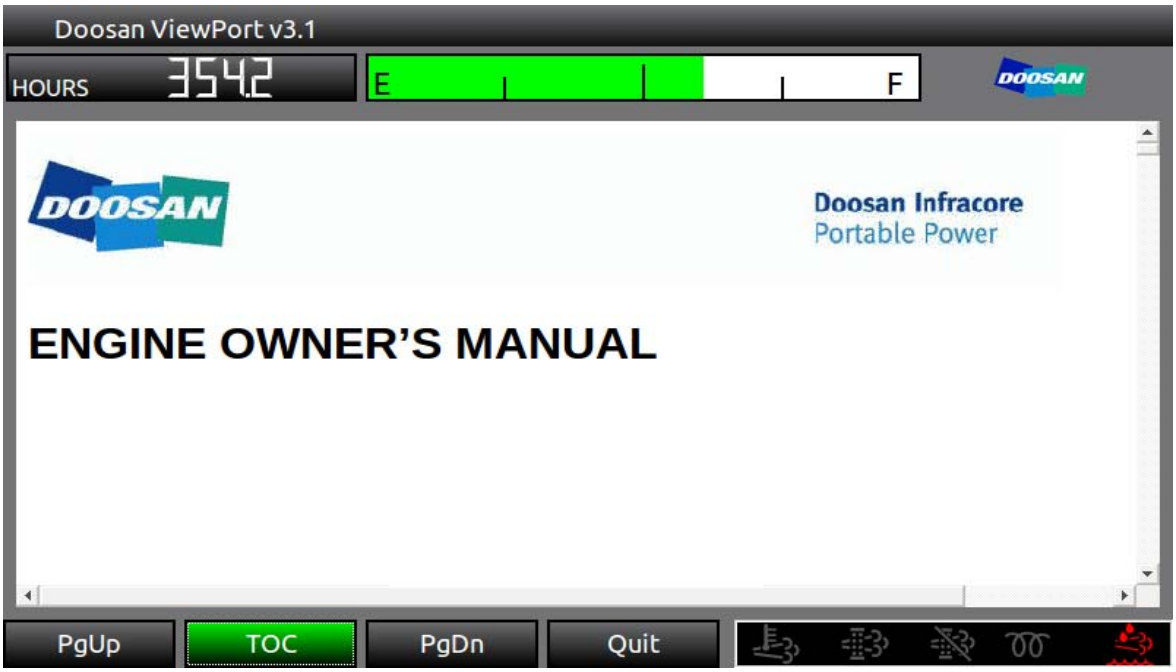
To save stored information, insert a removable data storage device into the USB port located on the back of the Viewport. Navigate to the Copy to USB Button and press ENTER. The status of the data download will be shown along the status bar. When download is complete, user will be returned to the CAN Devices Screen.

With the CAN Devices Info Button highlighted press ENTER. A new screen will open.

Figure 11

The new screen consists of 2 panels. The left panel lists all devices attached to the machines CAN Bus. TILT UP or TILT DOWN to highlight any of the devices. Press ENTER to select a drive.

The right panel shows all vital information of device selected. To scroll the information in the right panel, TILT RIGHT to enter panel and then TILT UP or TILT DOWN to scroll.



To save displayed information, TILT RIGHT until Save Data Button is highlighted, press ENTER. Data will be stored internally for retrieval.

To retrieve stored information, insert removable data storage device to USB port located on the back of the Viewport. Navigate to the Copy to USB button and press ENTER. A new smaller screen will open. The smaller screen consists of 2 buttons - Cancel and Save - and a status bar.

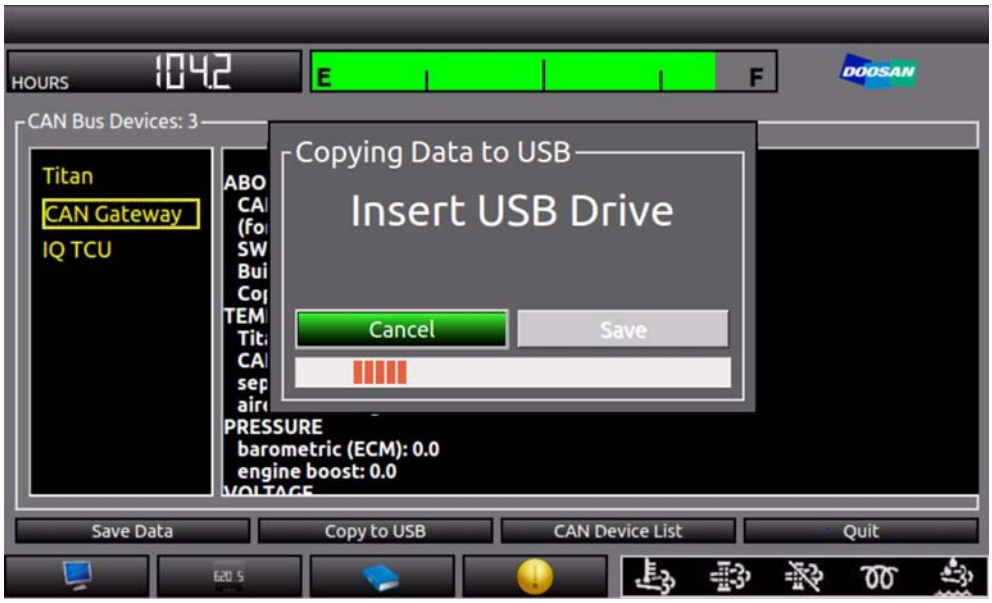


Figure 12

Cancel will close the smaller screen and return the user to the CAN Devices info screen.

To save stored information, insert a removable data storage device into the USB port located on the back of the Viewport. Navigate to the Copy to USB Button and press ENTER. The status of the download will be displayed along the status bar. When download is complete, user will be returned to the CAN Devices Info Screen.

Navigate to the Fault Log Button. Once button is highlighted, press TILT UP or TILT DOWN to view available Fault Logs arranged by date. To view Fault Log, highlight date desired and press ENTER.

The Fault Log retains all Faults/Alerts generated for the time duration set in the Set Up Screen. If at any time data is copied to a USB device, the Fault Log is included in the saved data.

TILT DOWN to highlight Information Screen Button to exit Fault Log.

Navigate to the Gauge Data Section. The Gauge Data Section consists of a Strip Chart Information panel and 5 buttons.

Figure 13

The Strip Chart Information panel allows the user to select information to be displayed on Strip Chart and to define time interval points for data displayed.

The 5 buttons are:

Clear All - allows user to deselect information selected (if any) from previous data gathering. Navigate to select Clear All button and press ENTER.

View Data - allows user to view data selected in the form of a Strip Chart. Select desired channel(s), then navigate to View Data and press ENTER.

A new screen will open displaying chart of selected data in the left panel. On the right is the color-code legend of the data. Navigating to any of the legend buttons and pressing ENTER allows the user to toggle ON/OFF selected information.

Navigate to the Information Screen button and press ENTER to return to Information Screen. Navigate to the Gauge Data Section and select Save Data.

Save Data - Allows user to save a snapshot of Strip Chart. Press ENTER.

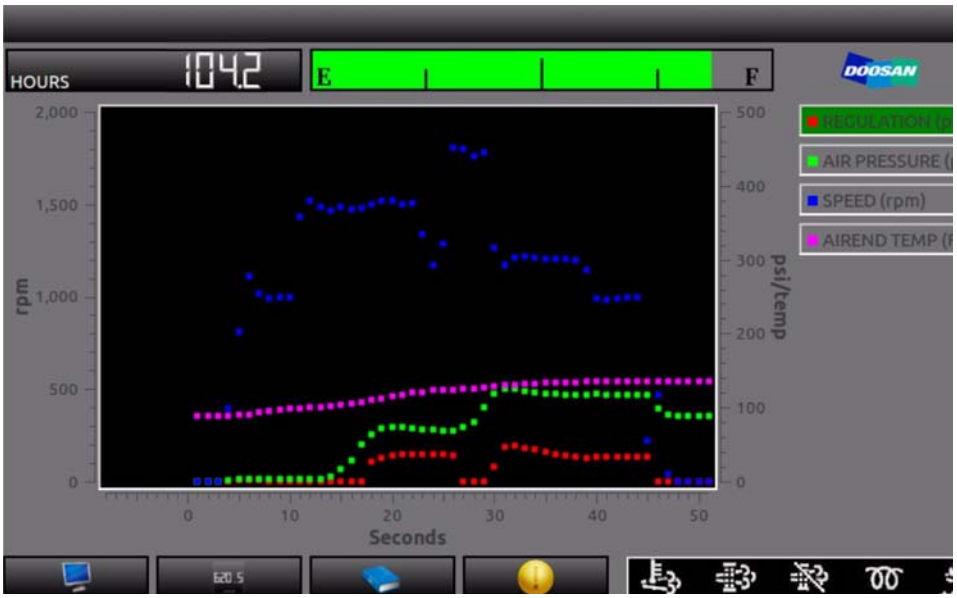


Figure 14

Quit - Press ENTER. Highlights System Info Button.

Copy Data - To save stored information, insert a removable data storage device into the USB port located on the back of the Viewport. Navigate to the Copy to USB button and press ENTER. The status of the data download will be shown along the status bar. When download is complete, user will be returned to the System Info screen.

Figure 15

Events Screen

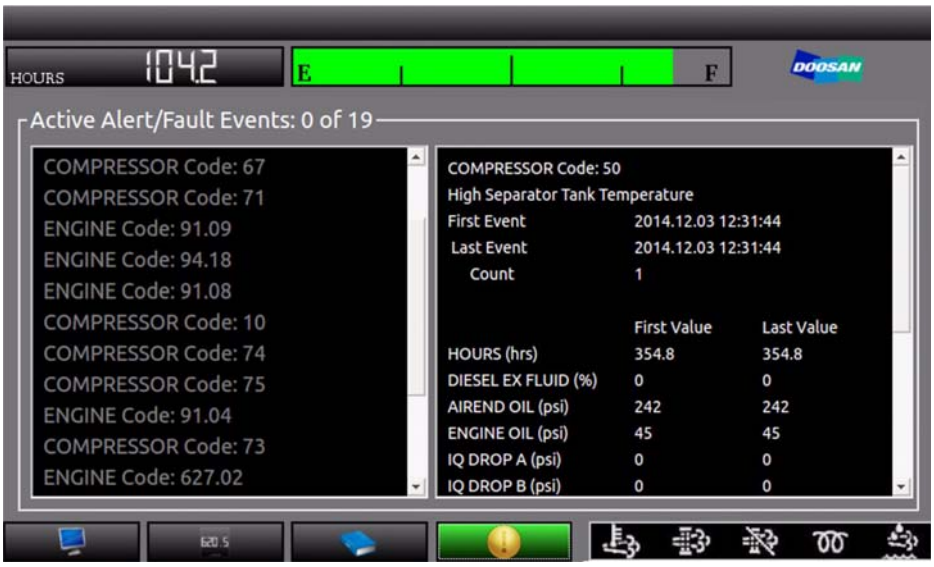


Figure 16

TILT Right to highlight Events Screen. Press ENTER. The Events Screen opens and consists of 2 panels. The left panel lists ALERTS and FAULTS and the right panel displays information for ALERTS and FAULTS.

FAULTS and ALERTS are color-coded as follows:

FAULT - Red - Will shut down machine until user investigates and corrects issue. A FAULT will never time-out.

ALERT - Yellow - An active ALERT. Will not immediately shut down machine but may become a FAULT if not investigated and corrected.

ALERT - Gray - An inactive ALERT. Either the user has intervened and corrected the ALERT or the machine has determined the original ALERT reading data point has returned to within acceptable operational parameters.

To view detailed information for a particular ALERT/FAULT, TILT UP or DOWN within left panel. An ALERT will be highlighted with a Yellow bounding box while a FAULT will be highlighted by a Red bounding box.

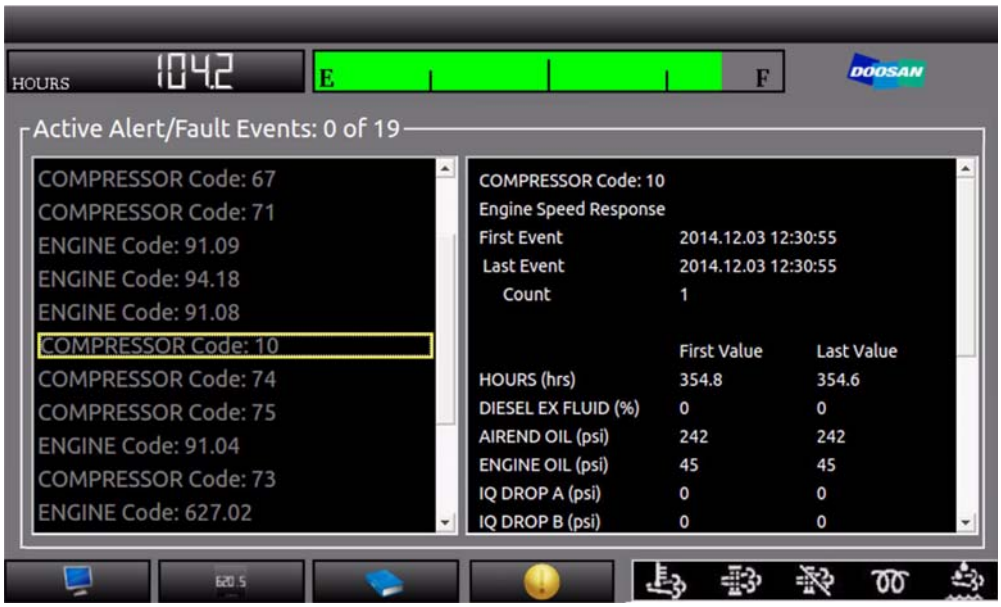


Figure 17

TILT RIGHT to enter right panel and then TILT UP or DOWN to scroll information. Information displayed includes first event, last event, relevant values, and operational data readings at time of events.

Press ENTER to return to ALERT/FAULT list to select another ALERT/FAULT to view. To exit, TILT LEFT from ALERT/FAULT lists. Gauge Screen will open.

Lifting

The central lifting bail can be reached through the roof door only from inside the unit. Use hoist or crane capable of lifting machine gross weight.

Before Towing

1. Ensure towing vehicle's towing capacity is greater than the weight of the compressor and is equipped with electric brake and lighting harness connections.
2. Place wheel chocks (located inside of front drawbar) and/or set parking brake before connecting to the tow vehicle.
3. Ensure tires, wheels, and running gear are in good condition and secure.
4. Check pintle eye bolts for any looseness or wear.
5. Stand safely to one side of drawbar when using the jack to raise or lower drawbar
6. Position tow vehicle to align hitch with pintle eye. Lower drawbar and secure hitch.
7. Cross safety chains under the drawbar and attach to towing vehicle.
8. Attach breakaway cable for brake actuator to towing vehicle.
9. Connect plug for electric brakes and lighting to the tow vehicle.
10. Remove wheel chocks and release parking brake if equipped.
11. Test brakes before towing onto roadway.
12. Do not tow compressor in excess of the maximum rated towing speed.

Setting Up

Place the compressor in an open, well-ventilated area. Ensure there is sufficient clearance for ventilation and exhaust requirements. Adequate clearance needs to be allowed around and above the compressor to permit safe access for specified maintenance tasks.

Position compressor as level as possible. Do not exceed the out-of-level operating limit.

When the compressor is to be operated out-of-level, it is important: (1) to keep the engine oil level near the High level mark (with the compressor level), and (2) to have the Compressor Oil Level Gauge show no more than mid-scale (with the compressor running at full load). Do not overfill either the engine oil or the compressor oil.

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

Disconnecting from Tow Vehicle

1. Chock wheels and set parking brake if equipped.
2. Stand safely to one side of the drawbar and:
    - Disconnect safety chains
    - Disconnect brake, light harness connection
    - Disconnect breakaway actuator cable
    - Operate jack to raise pintle eye from hitch
3. Move tow vehicle away from compressor.

Compressor Mounting

Portable compressors, which are modified to remove the running gear and mount the compressor directly to trailers, truck beds, or frames, etc. may experience failure of the enclosure, frame, and/or other components. It is necessary to isolate the compressor package from the carrier base with a flexible mounting system. Such a system must also prevent detachment of the package from the carrier base in the event the isolators fail. Contact your Portable Power representative for flexible mounting kits.

Warranty does not cover failures attributable to mounting of the compressor package to the carrier base unless it is a Portable Power provided system.

Service Air Connection(s)

All air pressure equipment installed, in or connected to, the compressor must have safe working pressure ratings of at least the safety valve setting and materials compatible with the compressor oil.

⚠ WARNING

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

⚠ WARNING

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

Air Hose Restraint Installation

Safety devices such as hose restraints (whipchecks) must be used to prevent hose whipping if a connection fails. Whipchecks are to be constructed of woven stainless steel, galvanized steel wire rope, or chain with a minimum strength adequate for the supplied pressure and hose diameter. Whipchecks must be fastened to suitable mounting points or shackles.

The mounts and/or shackles are to be of the same or greater strength as the whipchecks. An engineer should be consulted about suitability of whipchecks, mounts, mounting points, shackles, and fittings as well as strength rating of materials. Whipchecks must be used at the hose origination, termination, and each hose to hose connection.

Hoses can fail in areas other than at connecting points and require daily inspection for:

- Cuts, cracks, or kinks
- Weakened clamps due to rust and corrosion
- Damaged connections
- Deformity
- Incorrect or incompatible components or fittings
- Any visual damage

Hoses must be selected that are rated for the application and equal to the maximum pressure and temperature to be encountered as well as compatible with the materials being conveyed inside the hose. Hoses must be compatible with the compressor oil.

Before Starting

Open manual blowdown valve to ensure the separator tank has been vented of all pressure. Close the valve before starting. Inspect the complete installation including remote fuel lines (if any) and air hose routing and connections. Check battery for proper connections and condition.

⚠ WARNING

Combustible gas can cause severe burns, blindness, or death. Keep sparks and open flame away from battery.

Check the compressor oil level. Maintain the oil level between bottom and midway of the sight glass on the separator tank.

Check engine oil level. The proper level is labeled on the engine dipstick. Add oil when required. Do not overfill.

⚠ WARNING

Do not attempt to jumpstart a frozen battery since this may cause it to explode.

Exercise extreme caution when using an external method to jumpstart a unit. Verify the electrical systems on the weak battery system and the external jump system are the same voltage type system, 12VDC or 24VDC. Connect the Positive (+) terminal of the external system to the Positive (+) terminal on the weak system. Connect the Negative (-) terminal of the external system to the Negative (-) terminal of the weak system. Always disconnect the two systems in reverse order.

⚠ WARNING

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

⚠ WARNING

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

Check coolant to ensure coolant level is at or above minimum level when the engine is cold. Check engine coolant level at radiator pressure cap. Add coolant as required. Ensure pressure cap is installed properly and tightened.

NOTICE

If the appropriate mixture of antifreeze is not used during freezing temperatures, failure to drain the engine may cause costly engine damage. Never use water only, as corrosion inhibitors are required in engine coolant fluid.

⚠ CAUTION

No smoking, sparks, or open flame near fuel.

Check the fuel level and add fuel as necessary. Ultra-low sulfur diesel fuel (ULSD), with a maximum sulfur content of 15 ppm is required. If ultra-low sulfur diesel is not used, the engine could possibly not meet emissions regulations and the engine or aftertreatment system may be damaged. Refer to the Engine Manual for fuel specifications.

NOTICE

To minimize condensation (water) in the fuel tank, it is recommended to fill the tank at the end of each day.

NOTE: This compressor will not allow engine starting if the fuel level is below the minimum fuel shut off level.

⚠ WARNING

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

Close the doors to maintain a cooling air path and to avoid recirculation of hot air. This will maximize the life of the engine and compressor and protect the hearing of surrounding personnel.

Make sure no one is IN or ON the compressor.

Ensure that the location of the Emergency Stop is known and recognized by its markings. Ensure that it is functioning correctly and that the method of operation is known.

⚠ WARNING

Ensure that the access panels for heat exchanger cleaning are closed and secure before starting the compressor. Rotating fan blades can cause serious injury or death. Do not operate without all guards in place.

Starting

NOTICE

This engine is equipped with 115VAC electric heaters for preheating the engine coolant, engine lube oil, and battery heating pads.

The heating system is controlled by a thermostat to disconnect power when the engine reaches 120°F coolant temp.

A pressure switch disconnects power to the heaters when the engine oil pressure reaches 20 psig.

⚠ CAUTION

This engine is equipped with automatic Ether starting fluid injection. This system injects a measured amount of Ether for each cold start attempt.

Do not use any external source of Ether or other starting fluid. Externally applied fluids can cause an explosion, fire and serious engine damage.

NOTICE

This compressor is equipped with a Battery Disconnect Switch which disconnects power for long term storage. The switch is located near the battery.

This switch must be in the ON position to provide power to the Control Panel for starting the compressor.

1. Close the service valve(s) to isolate the compressor.
2. Move the Main Control Switch to the ON position. The ViewPort and compressor control system will power-up. When the ViewPort is ready, it will show compressor operating parameters and any active diagnostic codes.
3. Move the Main Control Switch to the RUN position. The engine control system will power-up.

4. Press the Start button.The engine starter motor will engage. Hold this position until the engine starts and runs freely. Release the button. Do not operate the engine starter for more than 15 seconds before waiting at least 1 minute between start attempts. Compressor control system will limit starter operation.

5. Following a successful start, the engine will accelerate to idle speed and separator tank pressure will rise to the start pressure (approximately 60 psi). If necessary for warm-up, the engine will accelerate to the warm-up idle speed (1500 RPM) and then return to idle speed (1200 RPM) after warming up.

6. When ready for full pressure, and after the compressor has warmed up, press the Service Air Button. The engine may accelerate to full load speed until the rated operating pressure is reached.

7. Open the service valve(s) to supply air from the compressor and begin normal operation.

⚠ CAUTION

To ensure an adequate flow of oil to the airend, never allow the discharge pressure to fall below 50 psi.

Normal Operation

The Operator may observe and monitor operating parameters using the ViewPort and gauge(s). In the event the compressor controller detects a parameter outside normal operating limits, the compressor will alert and/or shutdown and display a diagnostic code.

In the event the compressor controller detects a parameter at a dangerously high or low level, the compressor will automatically shutdown with the cause of the shutdown shown on the ViewPort.

Delivered air volume at load point pressure is accomplished by two methods, which work together:

1. The compressor is loaded (inlet valve fully open or modulated partially open) or unloaded (inlet valve fully closed).

2. Engine speed varies between idle speed and full load speed while compressor is loaded to match the required volume flow.

Operation - Loaded

Assume engine has been started and is running in the unload state at idle speed. If there is air demand (pressure falls below the load point pressure), compressor will load at idle speed by opening the inlet valve. As air demand rises and falls, engine speed is controlled between idle speed and full load speed to match the required flow while maintaining load point pressure.

Operation - Unloaded

If there is no air demand at idle speed (pressure rises above the unload point pressure), the compressor will unload by closing the inlet valve. The compressor then runs at idle speed unloaded with no air delivery. If air demand increases (pressure falls below the load point pressure), the compressor reloads to meet the required air demand.

Shut Down

1. Close the service valve(s).
2. Allow the compressor to run at idle speed for 3 to 5 minutes to allow cool-down.
3. Move the Main Control Switch to the ON position (second position). This will shut down the engine. The ViewPort will remain active. Operating parameters and any active diagnostic codes may be viewed, if desired.
4. Move the Main Control Switch to the OFF position (first position). This will shut down the ViewPort and compressor control system.

NOTICE

Failure to allow turbocharger cool down prior to shut down can cause turbocharger damage.

⚠ CAUTION

Use the Emergency Stop only for emergency conditions. Do not use for normal shut down. Emergency Stop must be reset before starting can be accomplished.

NOTICE

Once the engine is shut down, the automatic blowdown valve will relieve pressure from the separator tank. If the automatic blowdown valve fails to operate, pressure must be relieved from the system by means of the manual blowdown valve.

⚠ WARNING

Even after pressure is relieved from the piping system, any air supply line from the compressor to a tool or another compressor could remain pressurized and cause serious personal injury or death. After the compressor stops, carefully open a valve at any tool or compressor to exhaust the pressure in any line prior to removal or servicing.

⚠ CAUTION

Never allow the compressor to sit shut down with pressure in the separator tank or piping.

Decommissioning

When the compressor is to be permanently decommissioned or dismantled, it is important to ensure that all hazard risk are either eliminated or recipient of the compressor notified. 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, water, or drains.
- Do not dispose of a complete compressor without documentation relating to instructions for its use.

Fan Clutch Operation

The fan clutch is controlled by the engine ECM and utilizes engine oil to lubricate and control fan speed. Engine oil circulates continuously to the clutch and drains back into the engine oil pan. Engine oil pressure is also metered to the fan clutch through a solenoid that adjusts the flow of oil to a pilot on the clutch, controlling fan speed. The solenoid is mounted on the top of the engine next to the thermostat housing.

If at any time the electrical connection to the solenoid is interrupted or disconnected, the fan will default to full speed.

During shutdown the ECM sends a 24VDC signal to the fan clutch solenoid causing the fan to fully unlock. This allows the fan to freewheel at shutdown reducing stress on the fan belt and drive system.

During standard air operation, the engine ECM modulates the fan clutch speed based on Engine Coolant temperature, Charge Air Cooler temperature, and Airend Discharge temperature. The system requiring the most cooling of the three at any given time controls the fan clutch.

When the machine is equipped with an IQ or AC system, the fan will run at 100% speed when the IQ or AC system is pressurized. If at any time the IQ VAC system is turned off and the machine returned to standard air operation, the fan will resume modulation based on Engine Coolant temperature, Charge Air Cooler temperature, and Airend Discharge temperature when the pressure in the IQ or AC system falls below 12 psi.

If the aftercooler outlet temperature falls below 50 deg F during operation with the IQ or AC system active, the fan speed command from the IQ or AC system will slow down proportionally from 100% to 0% between 50 deg F and 40 deg F. If at any time the Engine Coolant temperature, Charge Air Cooler temperature, or Airend Discharge temperature requires more fan speed for cooling than is commanded by the IQ or AC system, control of fan speed will be relinquished to the system requiring the most cooling.

If at any time the engine ECM fails to receive temperature data from the the Engine Coolant temperature, Charge Air Cooler temperature, or Airend Discharge temperature sensors, an engine fault code will be displayed on the Viewport and the fan will default to 100% speed until the fault is corrected.

Maintenance

General Information

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

The Maintenance Schedule indicates the various components' descriptions and the intervals when maintenance has to take place. Fluid capacities can be found in the General Data Section of this manual. For any specification or specific requirement on service or preventative maintenance for the engine, refer to the Engine Manual.

Compressed air can be dangerous if incorrectly handled. Review all maintenance precautions listed below before attempting any maintenance work on the compressor.

Maintenance Precautions

Prior to attempting any maintenance work, ensure:

1. The compressor is disconnected from any other machinery which could consume or supply compressed air.
2. All pressure is vented from the system and the compressor cannot be started accidentally.
3. If the Automatic Blowdown Valve fails to operate, pressure must be gradually relieved by operating the Manual Blowdown Valve.
4. The discharge pipe/manifold area is depressurized by opening the Discharge Valve, while keeping clear of any airflow from it.
5. Maintenance personnel are adequately trained, competent, and have read the Operation and Maintenance Manual.

⚠ WARNING

Pressure will remain in the system between the Minimum Pressure Valve and the Service Valve after shutdown and operation of the Automatic Blowdown Valve. This pressure must be relieved by disconnecting any downstream equipment and opening the Discharge Valve to atmosphere.

Prior to opening or removing panels or covers inside a compressor, ensure:

1. Anyone entering the compressor is aware of the reduced level of protection and the additional hazards, including hot surfaces and intermittently moving parts.
2. The compressor cannot be started. Post warning signs and/or fit anti-start devices.
3. Battery cables are disconnected.

Prior to attempting any maintenance work on a running compressor, ensure:

1. The work carried out is limited to only those tasks which require the compressor to run.
2. The work carried out with safety protection devices disabled or removed is limited to only those tasks which require the compressor to be running with safety protection devices disabled or removed.
3. All hazards present are known (e.g. pressurized components, electrically live components, removed panels, covers, and guards, extreme temperatures, inflow and outflow of air, intermittently moving parts, safety valve discharge etc.).
4. Appropriate personal protective equipment is worn.
5. Loose clothing, jewelry, long hair, etc. is made safe.
6. Maintenance Work in Progress warning signs are posted in a position that can be clearly seen.

Upon completion of maintenance task and prior to returning the compressor to service, ensure:

1. The compressor is suitably tested.
2. All guards and safety protection devices are refitted.
3. All panels are replaced, canopy and doors closed.
4. Hazardous materials are effectively contained and disposed of.

NOTICE

The maintenance schedule in this manual describes the service intervals that should be followed for "normal" applications of this compressor. The maintenance schedule may be reproduced and used as a checklist by service personnel.

In more severe applications, such as, sandblasting, quarry drilling, well drilling, and oil and gas drilling, more frequent service intervals will be required to ensure long component life.

Dust and dirt, high humidity, and high temperatures will affect lubricant life and service intervals for components, such as, inlet air filters, oil separation elements, and oil filters.

SERVICE PARTS

Maintenance Interval Kits	
46637399	500 Hours
46637400	1000 Hours
46656760	2000 Hours

Consumables	
46671454	Compressor Oil Filter Element
46555952	Compressor Separator FIlter Element
36864361	Primary Air Filter Element
36864379	Secondary Air Filter Element
54662028	Engine Oil Filter Element
46618460	Engine Fuel FIlter Element
46578120	Fuel / Water Separator Filter Element
46610619	Engine Crankcase Breather Element
46643008	Engine Fan Belt
46615382	Engine Alternator Belt
46594960	Fuel Tank Vent Filter Element
54662051	Coolant Conditioner
46652904	Filter, DEF Supply Pump

Airends	
36066025	Assembly, Remanufactured Airend (HR 2.5)
36039519	Kit, Airend Rebuild (HR 2.5)
46667040	Assembly, AIrend (HR 350, RA11)

RECOMMENDED DOOSAN FLUIDS:

Use of these fluids with original Doosan filters can extend warranty. Refer to warranty brochure for details or contact your Doosan Representative.

COMPRESSOR FLUID	1 Gal. (3.8 Litre)	5 Gal. (19.0 Litre)	55 Gal. (208.2 Litre)	220 Gal. (836 Litre)
Doosan XHP405	—	22252126	22252100	22252118
*Doosan XHP605	—	22252076	22252050	22252068

ENGINE OIL	1 Gal. (3.8 Litre)	5 Gal. (19.0 Litre)	55 Gal. (208.2 Litre)	220 Gal. (836 Litre)
Doosan Tier 4	46557017	46557016	46557015	—

*Extended Warranty 5 years / 10K hours.

For Parts, Service & Nearest Distributor Call: 1-800-633-5206

PREVENTIVE MAINTENANCE SCHEDULE

For a complete maintenance schedule refer to Operation & Maintenance Manual. If operating in extreme conditions (very hot, cold, dusty or wet), these time periods should be reduced.

XHP1170WCU-T4F

INITIAL 500 Miles / 800 km	
Brakes	C
Brakes LInkage	C

	DAILY	WKLY	MO. 250 Hrs	3 MOS. 500 Hrs	6 MOS. 1000 Hrs	12 MOS. 2000 Hrs	18 MOS. 3000 Hrs	30 MOS. 5000 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			
DEF Tank (Fill At End Of Day)	C							
Fuel / Water Separator Drain	C							
Oil Leaks	C							
Fuel Leaks	C							
Coolant Leaks	C							
Radiator Filler Cap	C							
Emergency Stop	T							
Air Cleaner Precleaner Dumps		C						
Fan / Alternator Belts		C						
Battery Connection / Electrolyte		C	C					
Hoses (Oil, Air, Intake, Etc.)			C					
Automatic Shutdown System			C					
Air Cleaner System			C					
Compressor Oil Cooler Exterior			C					
Engine Radiator Exterior			C					
Engine Charge Air Cooler Exterior			C					
Aftercooler Exterior			C					
Safety Valve				C				
Fasteners, Guards				C				
Air Cleaner Elements				R / WI				

Legend:

CBT = Check Before Towing
G = Grease
C = Check (Adjust or Replace If Necessary)
R = Replace
T = Test
D = Drain
WI = or When Indicated
CR = Check & Report

(Continued On Back)

PREVENTIVE MAINTENANCE SCHEDULE

For a complete maintenance schedule refer to Operation / Maintenance manual. If operating in extreme conditions (very hot, cold, dusty or wet), these time periods should be reduced.

XHP1170WCU-T4F	DAILY	WKLY	MO.	3 MOS.	6 MOS.	9 MOS.	12 MOS.	18 MOS.	30 MOS.
			250 Hrs	500 Hrs	1000 Hrs	1500 Hrs	2000 Hrs	3000 Hrs	5000 Hrs
Fuel Tank Vent Filter				R					
Fuel / Water Separator Element			R						
Fuel Filter Element (High Pressure)				R					
Engine (Oil Changes, Oil Filters)				R					
Compressor Oil Filter Elements				R					
Engine Coolant Conditioner Element						R			
Compressor Oil					R				
Oil Separator Element							R		
Separator Tank Exterior							CR		
Engine Coolant								R	
Engine Crankcase Breather Element							R		
DEF Pump Filter Element							R		
Waterpump Grease							G		
Shutdown Switch Settings							T		
Scavenge Orifice & Related Parts							C		
Scavenge Line							C		
Feed Pump Strainer Cleaning				C			C		
Atertreatment Injection Nozzle						C			
Brakes & Linkage				C					
Lights (Running, Brake, & Turn)	CBT								
Pintle Eye Bolts	CBT								
Tire Pressure & Condition		C							
Wheel Lug Nuts			C						
Running Gear Linkage			G						
Running Grear Bolts				C					
Wheels (Bearings, Seals, Etc.)					C		G		
Valve Clearance Check									C

Legend:

CBT = Check Before Towing	R = Replace	WI = or When Indicated
G = Grease	T = Test	CR = Check & Report
C = Check (and Adjust or Replace If Necessary)	D = Drain	

Scavenge Line

The scavenge line runs from the combined orifice/check valve at scavenge tube in the separator tank to the fitting located in the Airend.

Ensure the scavenge line and scavenge tube are clear of any obstruction. Refer to the Maintenance Schedule for recommended servicing intervals. Any blockage will result in oil carryover into the discharge air.

Compressor Oil Filter

Refer to the Maintenance Schedule for the recommended servicing intervals.

Removal

⚠ WARNING

Do not remove the filter(s) without first verifying the compressor has shutdown and the system has been completely relieved of all air pressure. (Refer to SHUTDOWN in the Operating Instructions Section in this manual).

Clean the exterior of the filter housing and remove the spin-on element.

Inspection

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

⚠ 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 the oil should be changed immediately. Refer to Lubrication Section in this manual.

NOTICE

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

Reassembly

Clean the filter gasket contact area and install the new element. Tighten until the gasket makes contact with the filter housing. Tighten an additional 1/2 to 3/4 of a revolution.

⚠ CAUTION

Start the compressor (refer to Before Starting and Starting in the Operating Section in this manual) and check for leakage before the compressor is returned to service.

Compressor Oil Separator Element

Refer to the Maintenance Schedule in this section for the recommended servicing intervals. If element is to be replaced, proceed as follows:

Removal

⚠ WARNING

Do not remove the filter(s) without first verifying the compressor has stopped and the system has been completely relieved of all air pressure. (Refer to Shut Down in the Operating Instructions Section in this manual).

Disconnect all hoses and tubes from the Separator Tank Cover Plate. Remove the Scavenge Tube from the Separator Tank Cover Plate and then remove the cover plate. Remove the separator element.

A Davit Arm Assembly is installed on the tank to assist in removing the cover. To remove the cover:

1. Remove the Discharge Air Pipe Assembly from the cover.
2. Remove the Scavenge Tube and the 1.25” x 0.50” NPT bushing.
3. Disconnect flexible hoses and remove the cover bolts.
4. Turn the Davit jack screw to raise the cover from the tank.
5. Rotate the cover out of the service door.

Inspection

Replace the separator element. Examine all hoses and tubes. Replace if necessary.

Reassembly

Thoroughly clean the orifice/check valve, 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. Lower the cover plate onto the tank ensuring the jack screw is not supporting the plate. Replace the cover plate screws. Tighten in a criss-cross pattern to the recommended torque (refer to the Torque Values in this section).

Reconnect all hoses and tubes to the Separator Tank Cover Plate. Replace the Scavenge Tube.

Replace compressor oil (refer to Lubrication Section).

⚠ CAUTION

Start the compressor (refer to Before Starting and Starting in the Operating Section in this manual) and check for leakage before the compressor is returned to service.

Compressor Oil Cooler, Engine Radiator, and other Heat Exchangers

When grease, oil, and dirt accumulate on the exterior surfaces of the heat exchangers, the efficiency is impaired. It is recommended the heat exchangers be cleaned per the Maintenance Schedule in this manual. Directing a jet of compressed air should remove any accumulation of oil, grease, and dirt from the exterior cores of the cooler so the entire cooling area can radiate heat into the air stream. Access doors are located on each side of the compressor to aid in cleaning the heat exchangers.

⚠ WARNING

Ensure the heat exchanger access doors are closed and secure before starting the engine.

⚠ WARNING

Hot engine coolant and steam can cause injury. When adding coolant or antifreeze solution to the engine radiator, stop the engine and allow radiator to cool prior to releasing the Radiator Pressure Cap. Using a cloth to protect the hand, slowly release the pressure cap, absorbing any released fluid with the cloth. Do not remove the pressure cap until all excess fluid is released and the engine cooling system fully depressurized.

⚠ WARNING

Follow the instructions and precautions provided by the antifreeze supplier when adding or draining the antifreeze solution. Wear personal protective equipment to prevent skin and eye contact with the antifreeze solution.

Air Filter Elements

The air filter elements should be replaced regularly (refer to the Maintenance Schedule) or when indicated on the control panel, whichever comes first. The air cleaner precleaner dumps should be cleaned as indicated in the Maintenance Schedule (more frequently in dusty operating conditions).

Removal

⚠ CAUTION

Never remove and replace element(s) when the compressor is in operation.

Clean the exterior of the filter housing of dirt and debris and remove the Primary Filter Element by releasing the retaining wing nut.

If the Safety Element is to be replaced, thoroughly clean the interior of the filter housing prior to removing the Safety Element.

Inspection

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

⚠ CAUTION

If inspection reveals damage to the main element, the Safety Element must also be replaced.

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

Reassembly

Assemble the new Primary Filter Element into the filter housing ensuring the seal seats properly. Secure element by tightening retaining wing nut.

Before starting the compressor, ensure all clamps are tight.

Ventilation

Ensure the air inlets and outlets are clear of debris etc.

Cooling Fan Drive

Check periodically to ensure 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. Tighten to the torque value shown in the Torque Values in this section.

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

Fuel System

The fuel tank(s) should be filled daily or every eight hours. To minimize condensation in the fuel tank(s), it is advisable to top up after the compressor is shut down or at the end of each working day. Drain any sediment or condensate that may have accumulated in the tank(s). Refer to Maintenance Schedule.

Diesel Exhaust Fluid

Check the DEF level and add fluid as necessary. Use API certified DEF which meets ISO 22241. The DEF pump contains a filter that should be replaced at regular intervals (See Maintenance Schedule).

Fuel Filter Water Separator

The fuel filter water separator contains a filter element which should be replaced at regular intervals. Refer to Maintenance Schedule.

Charge Air Cooler Pipework

Foreign particles can damage the engine and turbocharger. Maintain internal cleanliness and integrity of the air filtration, intake piping, and charge air cooler piping to help avoid damage. Regularly inspect systems for leaks and verify hoses, clamps, and connections are sealed. Check for damaged or deteriorated components. Pay careful attention to keep the internal surfaces clean, particularly when parts are removed for inspection or service.

Hoses

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

At the recommended intervals, 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

Disconnect the battery cables before performing any maintenance or service.

Check the security of electrical devices and sensors to ensure terminals and/or connectors are tight. Loose connections may cause local hot spot oxidation.

When removing connectors from electrical devices and sensors, inspect the terminals to ensure they have electrical grease on them. If electrical grease is not present or very minimal, then add a small amount of Doosan Part No. 22409114 electrical grease to the terminals.

Dirty and/or corroded electrical terminals can be cleaned using electrical contact cleaner.

Inspect the components and wiring for signs of overheating (i.e. discoloration, 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 battery restraint should be kept tight enough to prevent the battery from moving.

Pressure System

Regularly inspect the external surfaces of the system, from the airend through to the service 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 compressor is put back in service.

Tire Pressure

See the General Data Section of this manual.

Running Gear/Wheels

Check the wheel nut torque 20 miles (30 kilometers) after refitting wheels. Refer to the Torque Values in this section.

Place jack under or near trailer spring attachment.

The bolts securing the running gear to the chassis should be checked for tightness (refer to the Maintenance Schedule for frequency) and re-tighten where necessary. Refer to the Torque Values in this section.

Running Gear Wheel Bearings

Wheel bearings should be greased per the Maintenance Schedule in this manual. The type of grease used should conform to specifications below:

Grease	
Thickener Type	Lithium Complex
Dropping Point	215°C (419°F) Minimum
Consistency	NLGI No.2
Additives	EP, Corrosion & Oxidation Inhibitors
Viscosity Index	80 Minimum

Lubrication

⚠ CAUTION

Always check the oil levels before a compressor is put into service.

Engine Oil

The engine oil and oil filter element should be changed at the engine manufacturer's recommended intervals. Refer to the Engine Operator Manual.

The Tier 4 engine in this compressor requires specific engine lubricating oil to ensure proper aftertreatment system operation and engine durability. Doosan Tier 4 Premium Engine Oil meets the engine manufacturer’s requirements. Refer to Engine Operator Manual for engine oil specifications.

Compressor Oil

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

Refer to the Maintenance Schedule in this section for service intervals.

NOTE: If the compressor 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 compressor is shut down and the system has been completely relieved of all air pressure. Refer to Shut Down in the Operating Instructions Section of this manual.

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

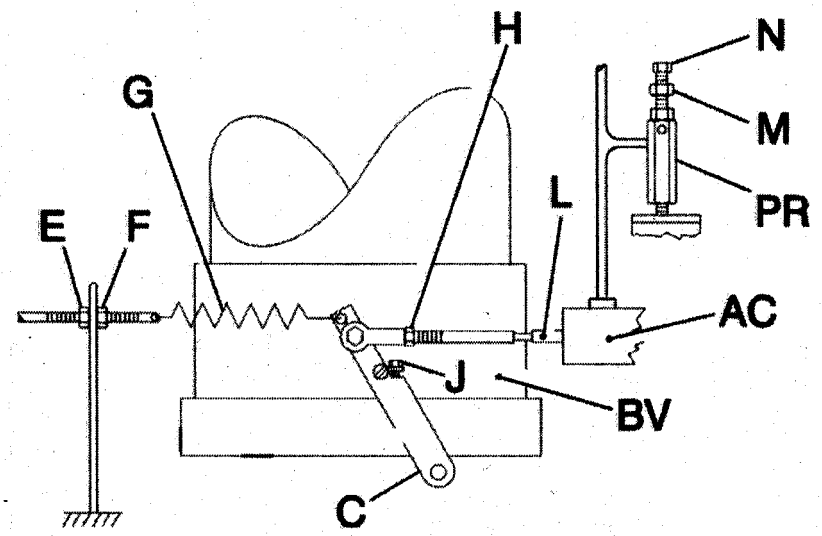
Replace the drain plug(s) ensuring that each is secure.

NOTE: If the oil is drained immediately after the compressor 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. Refer to the Portable Compressor Oil Chart in the Lubrication Section in this manual.

Pressure Regulation for XHP1170



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

Adjustment Instructions for XHP units

The operating pressure of this unit was set at the factory to the maximum rating (at full speed).

See General Data. Perform these steps prior to starting the unit:

1. Disconnect one end of the tension spring (G) by loosening nut (E).
2. With the Butterfly Valve in the fully closed position, adjust the bracket and linkage so rod (L) hits the bottom of the air cylinder (AC).
3. Secure all components while in this position.
4. Release the linkage to the open position.
5. Loosen jam nut (H) on rod end bearing.
6. With the rod end bearing secure, turn rod (L) in air cylinder one full turn clockwise (CW) as viewed from rod end. This opens the Butterfly Valve slightly.
7. Secure jam nut (H) against rod end bearing.
8. Move linkage (C) to closed position and verify that travel is positively stopped by rod (L) reaching the bottom of the air cylinder. The Butterfly Valve should not seat closed.
9. Release linkage (C) to open position. Re-attach spring (G) and adjust nuts (E & F) so there is zero tension on the spring (but no slack either).
10. Rotate linkage open and closed several times. Ensure linkage is not binding. Start unit and monitor separator tank pressure.
11. The target pressure is 50 to 80 psi while operating at start pressure.

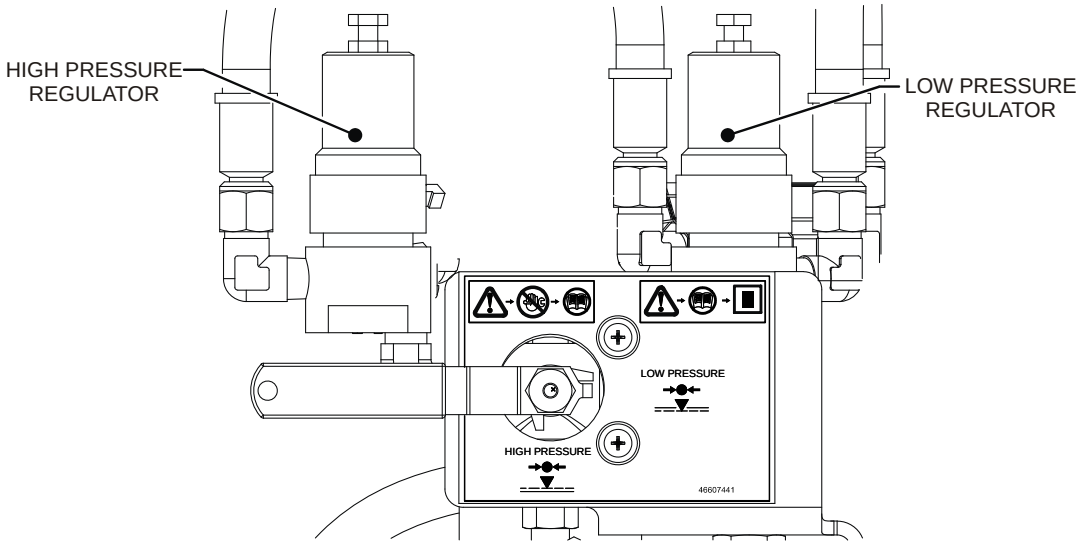
12. If the pressure exceeds 80 psi: Loosen jam nut (H), turn rod (L) 1/8 to 1/4 turn CCW (as viewed from rod end) to lightly close butterfly. Secure jam nut (H). Use the Manual Blowdown Valve to bleed pressure down to 60 psi (close M BVD). After 2 minutes, if the pressure is between 50 and 80 psi adjustment complete.
13. If the pressure drops below 50 psi: Loosen jam nut (H), turn rod 1/8 to 1/4 turn CW (as viewed from rod end) to slightly open the butterfly. Secure jam nut (H). After 2 minutes, if the pressure is between 50 and 80 psi adjustment complete.
14. If the pressure is not between 50 and 80 psi after two minutes, repeat steps 12 and/or 13 as needed.
15. Push Service Air Button on Control Panel.
16. With Service Air Valve closed, adjust Pressure Regulator (PR) to rated pressure (365 psi) plus 10 psi as follows:
17. Loosen locknut (M) counterclockwise. Turn adjustment cap (N) clockwise to increase pressure, counterclockwise to decrease pressure.
18. Open Service Air Valve and observe full load engine speed (1800). Adjust regulator to give rated operating pressure (365 psi). Tighten locknut (M).
19. Repeat steps 16,17 and 18 to set secondary pressure regulator.
20. To regulate any pressure between 150 psi and maximum rating (365 psi), make adjustment at the Pressure Regulator.

Refer to General Data Section.

Dual Pressure Regulation Control

The compressor is fitted with a dual pressure control valve. The valve selects between 200 psi and the rated operating pressure on XHP models. Flow remains nominally constant.

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



Cummins Outlet NOx Sensor Control Module

Outlet NOx Sensor Replacement

The Cummins Outlet NOx Sensor Control Module is located on a bracket attached to the bottom of the streetside baffle in the discharge plenum. Cummins supplies the module mounted to the SCR assembly. In the event the SCR assembly has to be replaced, the new SCR will be supplied with the NOx Sensor Control Module mounted to the sensor table on the SCR. When installing a replacement SCR, the NOx Sensor Control Module must be removed from the SCR sensor table and mounted to the bracket in the discharge plenum per the following instructions.

Removal of NOx Sensor Control Module from SCR:

1. Disconnect the slide-lock connector from the NOx Sensor Module.
2. Remove the two retaining capscrews and washers. See Figure 1.
3. Re-install capscrews and washers into the sensor table. One of the screws retains a wiring P-clip to the sensor table. Torque screws to 10 N-m (89 in-lb). See Figure 2, Item A.

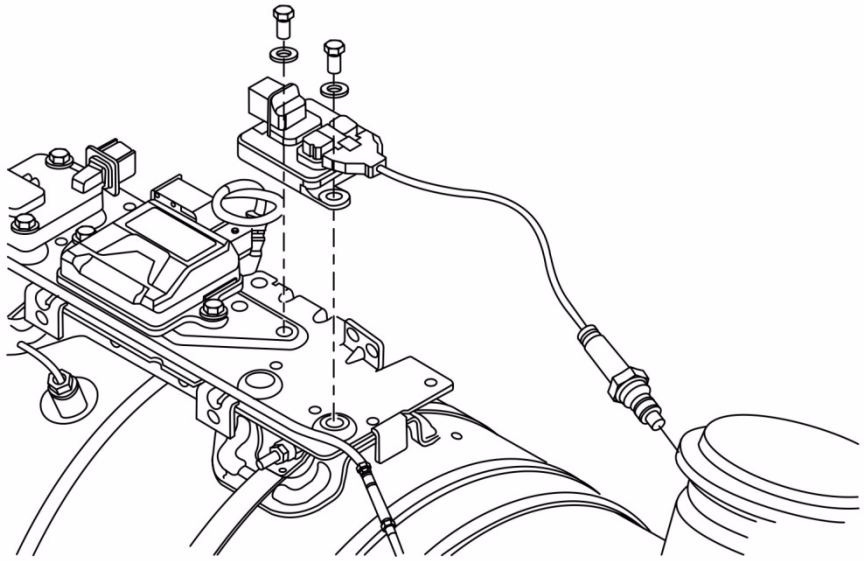


Figure 1

CAUTION

Do not clean the NOx sensor with any kind of fluid.

CAUTION

Do not immerse the NOx sensor in water or any kind of chemical wash.

CAUTION

Do not jet-wash or steam clean the NOx sensor.

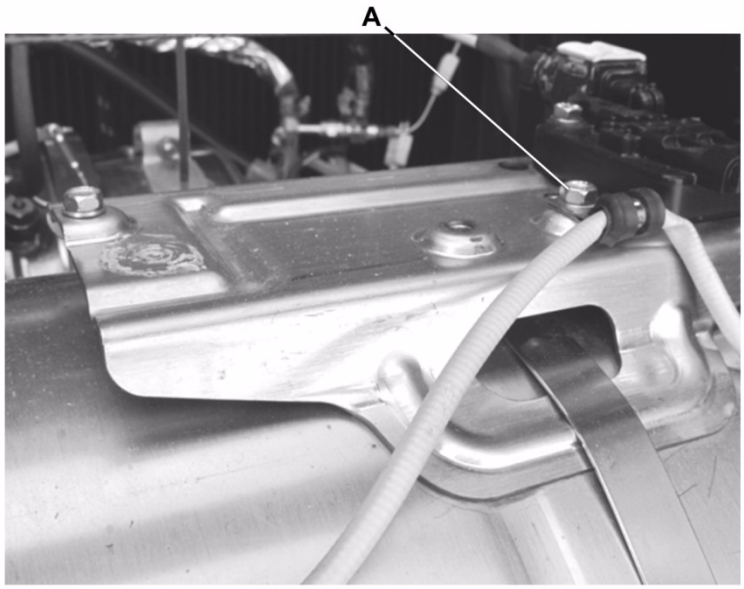


Figure 2

Installation of NOx Sensor Control Module to bracket on bottom of Discharge Baffle

1. Mount NOx Sensor Control Module to bracket using 2 (two) M06 capscrews and nuts. See Figure 3, Item A.
2. The capscrew nearest the SCR will also retain a P-Clip to support the wire to the sensor from the engine wiring harness. See Figure 3, Item B.
3. Torque capscrews to 10 N-m (89 in-lb).
4. Loosen capscrew holding wire from NOx Sensor Probe to support on SCR outlet. Rotate P-clip 90° clockwise to route wire in direction of control module (see Figure 3, Item C). Retorque capscrew to 10 N-m (89 in-lb).
5. Secure wire from sensor probe to rear step support using 2 (two) M08 capscrews and P-Clips. See Figure 3, Item D).
6. Ensure service work and wire routing is per the following guidelines:

The outgoing cable from the NOx Sensor Control Module and NOx Sensor Probe must exit at an angle of 0° ± 15°.

The permitted twisting angle of the NOx Sensor Cable is 180°.

The minimum bend radius of the NOx sensor cable must be greater than 20 mm.

The NOx Sensor Cable must be fixed between the control module and the sensor probe.

The NOx Sensor Cable must remain a minimum of 25 mm (1 in) off the surface of the SCR assembly.

The NOx Sensor Cable must be protected from sharp edges and abrasive surfaces.

The wiring between the probe and the module must not be modified.

Do not connect or disconnect the sensor while power is available in the harness to the sensor.

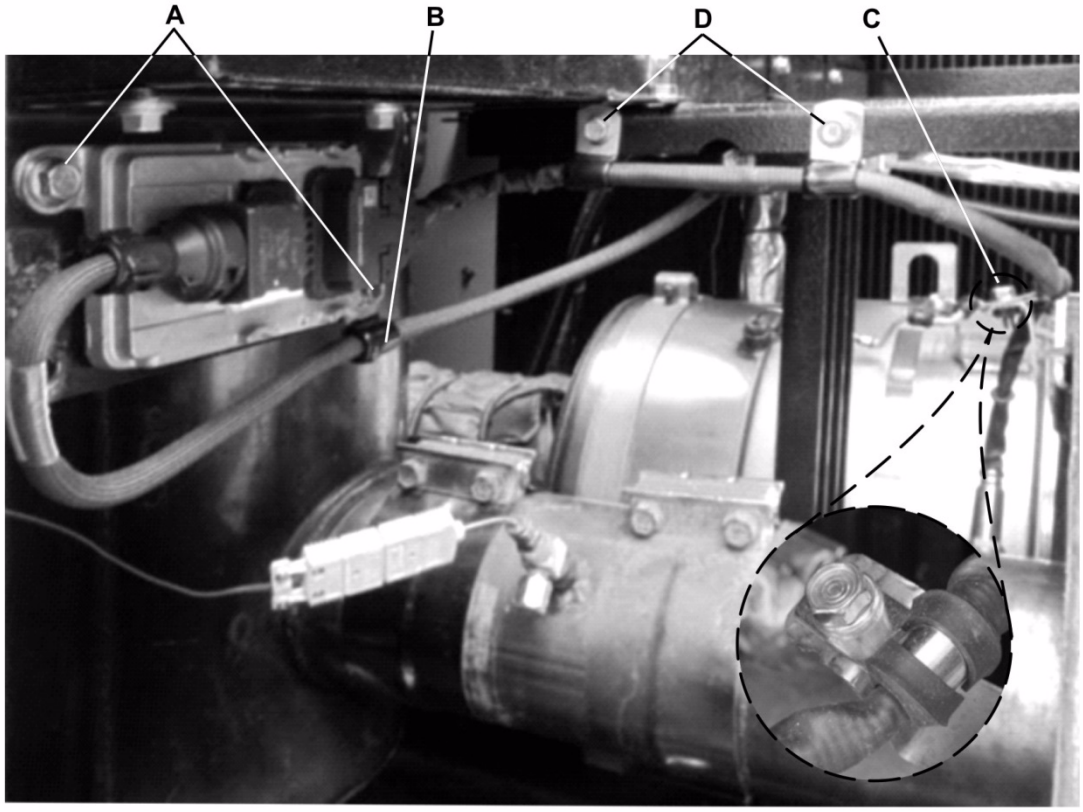
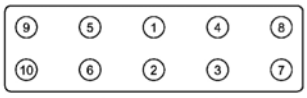


Figure 3

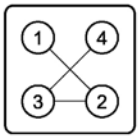
Torque Values

TABLE 1 INCH FASTENERS

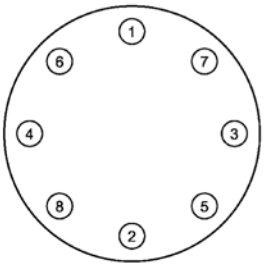
CAPSCREW OR NUT THREAD SIZE AND PITCH	NOMINAL DESIGN TORQUE			
	SAEJ249 GRADE 5 (HEAD MARKING)		SAEJ249 GRADE 8 (HEAD MARKING)	
	(Nm.)	(FT-LBF)	(Nm.)	(FT-LBF)
1/4 - 20	11	8	16	12
5/16 - 18	24	17	33	25
3/8 - 16	42	31	59	44
7/16 - 14	67	49	95	70
1/2 - 13	102	75	144	106
9/16 - 12	148	109	208	154
5/8 - 11	203	150	287	212
3/4 - 10	361	266	509	376



TYPICAL RECTANGULAR TORQUE PATTERN



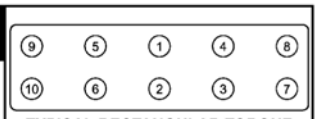
TYPICAL SQUARE TORQUE PATTERN



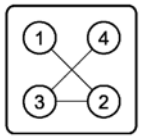
TYPICAL CIRCULAR TORQUE PATTERN

TABLE 2 METRIC FASTENERS

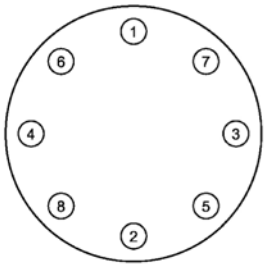
CAPSCREW OR NUT THREAD SIZE AND PITCH	NOMINAL DESIGN TORQUE					
	PROPERTY GRADE 8.8 (HEAD MARKING)		PROPERTY GRADE 10.9 (HEAD MARKING)		PROPERTY GRADE 12.9 (HEAD MARKING)	
	(Nm.)	(FT-LBF)	(Nm.)	(FT-LBF)	(Nm.)	(FT-LBF)
M6 X 1.0	11	8	15	11	18	13
M8 X 1.25	26	19	36	27	43	31
M10 X 1.5	52	38	72	53	84	62
M12 X 1.75	91	67	126	93	147	109
M14 X 2	145	107	200	148	234	173
M16 X 2	226	166	313	231	365	270
M20 X 2.5	441	325	610	450	713	526



TYPICAL RECTANGULAR TORQUE PATTERN



TYPICAL SQUARE TORQUE PATTERN



TYPICAL CIRCULAR TORQUE PATTERN

TABLE 3

Wheel Torque Chart - Inch	
1/2” lug nuts	**Torque (Ft-Lbs)**
13” Wheel	80-90
15” Wheel	105-115
16” Wheel	105-115
16.5” Wheel	105-115
5/8” Lug Nuts	
16” Wheel	190-210
17” Wheel	190-210
9/16” Clamp nuts/Demountable Wheels	
14.5” Wheel	105-115

Wheel Torque Chart - Metric		
	Torque (N-m)	**Torque (ft-Lbs)**
M12 Bolts	85-95	62-70
M14 Bolts	145-155	107-115
M16 Bolts	175-185	129-137
M18 Bolts	205-215	151-159

Lubrication

General Information

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

The Maintenance Schedule shows those items requiring regular service and the interval in which they should be performed. A regular service program should be developed to include all items and fluids. The intervals are based on normal operating conditions. In the event of extreme (hot, cold, dusty, or wet) operating conditions, more frequent lubrication may be necessary.

All filters and filter elements for air and compressor oil must be obtained through Portable Power to ensure the proper size and filtration for the compressor.

Compressor Oil Change

The compressor is normally furnished with an initial supply of oil sufficient to allow operation until the first service interval indicated in the Maintenance Schedule. If a compressor has been completely drained of all oil, it must be refilled with new oil before it is placed in operation. Refer to specifications in the Portable Compressor Oil Chart in this section.

NOTICE

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

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

⚠ CAUTION

In severe applications, such as, sandblasting, quarry drilling, well drilling, and oil and gas drilling, more frequent service intervals will be required to ensure long component life.

⚠ WARNING

High pressure air can cause severe injury or death from hot oil and flying debris. Always relieve pressure before removing caps, plugs, covers, or other parts from pressurized air system. Ensure the Air Pressure Gauge reads zero (0) pressure and ensure there is no air discharge when opening the manual blowdown valve.

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

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

After the compressor has been completely drained of all old oil, close the drain valves and/or plugs and install new oil filter elements. Add oil in the specified quantity at the filler plug. Tighten the filler plug and run the compressor to circulate the oil. Check the oil level. DO NOT OVERFILL.

NOTICE

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

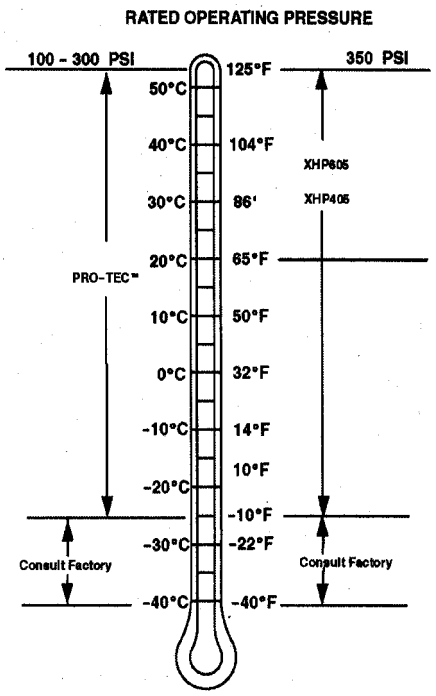
Portable Compressor Oil Chart for XHP1170

Refer to this chart for the required compressor oil. Note that the selection of oil is dependent on the rated operating pressure of the compressor and the ambient temperature expected to be encountered before the next oil change.

NOTE: Oils listed as "preferred" are required for extended warranty.

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

Design Operating Pressure	Ambient Temperature	Specification
350 psi to 500 psi	-10°Fto125°F (-23°C to 52°C)	Preferred: **XHP 605** Alternate: XHP405 ISO Viscosity Grade 68 Group 3 or 5 with rust and oxidation inhibitors designed for air compressor service. Preferred: **XHP605**
	65°Fto125°F (18°C to 52°C)	
	Below -10°F (Below -23°C)	Consult Factory



Preferred Oils - Use of these oils with Doosan branded filters can extend airend warranty. Refer to the Warranty Policy for details or contact your representative.

Preferred Oils	1 gal. (3.8 Liter)	5 gal. (19.0 Liter)	55 gal. (208 Liter)	275 gal. (1041 Liter)
XHP605	-	22252076	22252050	22252068
XHP405	-	22252126	22252100	22252118

Troubleshooting

Introduction

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

The chart does not attempt to list all of the complaints that may occur, nor does it attempt to give all of the solutions for correction of the complaints. The chart does list the complaints that are most likely to occur. To use the Troubleshooting Chart:

A. Find the complaint depicted as a bold heading.

B. Follow down that column to find the potential cause or causes. The causes are listed in order to suggest an order to follow in troubleshooting.

Think Before Acting

Study the problem thoroughly and ask yourself these questions:

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

Do the Simplest Things First

Most problems are simple and easily corrected. For example, most complaints are “low capacity” which may be caused by too low an engine speed or “compressor overheats” which may be caused by low oil level.

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

Double Check Before Disassembly

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

Find and Correct Basic Cause

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

Troubleshooting Chart

Complaint	Cause	Correction
1. Compressor has stopped unexpectedly	Out of fuel.	Add clean fuel.
	Compressor oil temperature too high.	See Complaint #6.
	Engine coolant temperature too high.	Check coolant level. If low, add coolant. See Complaint #3.
	Engine oil pressure too low.	See Complaint #4.
	Loose or broken belts.	Tighten or replace belt set.
	Loose wire connection.	Check wires at switches and connectors to find loose connection. Make repairs. See Electronic Service Manual.
	Low fuel level fault.	If adequate fuel in the tank, check fuel level sender device. Replace if determined faulty. See Electronic Service Manual.
	Defective sensor.	Identify and check sensor. Replace if necessary. See Electronic Service Manual.
	Malfunctioning relay.	Identify and check relay. Replace if necessary. See Electronic Service Manual.
	Blown fuse.	Identify and replace fuse. See Electronic Service Manual.
	Engine malfunctioning.	See troubleshooting in Engine Manual.
	Airend malfunctioning.	See Complaint #6.
2. Compressor won't start or run	Battery disconnect switch off.	Check switch position and operation.
	Emergency stop pushed.	Check emergency stop switch position and operation.
	Low battery voltage.	Check battery condition; recharge if necessary. Check electrolyte level; add if necessary. Check cable connections; clean and tighten as needed.
	Blown fuse.	Identify and replace fuse. See Electronic Service Manual.
	Malfunctioning main power switch.	Check switch. Replace if necessary. See Electronic Service Manual.
	Clogged fuel filters.	Service fuel filters. See Engine Manual.
	Out of fuel.	Add clean fuel.
	Compressor oil temperature too high.	See Complaint #6.
	Engine coolant temperature too high.	Check coolant level. If low, add coolant. See Complaint #3.
	Engine oil pressure too low.	See Complaint #4.
	Loose wire connection.	Check wires at switches and connectors to find loose connection. Make repairs. See Electronic Service Manual.

Complaint	Cause	Correction
(continued) **2. Compressor won't start or run**	Defective sensor.	Identify and check sensor. Replace if necessary. See Electronic Service Manual.
	Malfunctioning relay.	Identify and check relay. Replace if necessary. See Electronic Service Manual.
	Engine malfunctioning.	See troubleshooting in Engine Manual.
	Airend malfunctioning.	See Complaint #6.
3. High engine Coolant Temperature	Low coolant level.	Check coolant level. If low, add coolant.
	Loose or broken belts.	Tighten or replace belt set.
	Ambient temperature above rated ambient temperature range.	Operate in cooler environment.
	Dirty operating conditions.	Move compressor to cleaner environment.
	Dirty cooler(s).	Clean exterior of cooler(s).
	Compressor tilted beyond out-of-level operating limit.	Reposition or relocate compressor to be more level.
	Operating pressure too high.	Reduce pressure to rated operating pressure.
	Recirculation of cooling air.	Close enclosure doors. Close and secure access panels. Check for loose or missing belly pans.
	Loose wire connection.	Check wires at switches and connectors to find loose connection. Make repairs. See Electronic Service Manual.
4. Low Engine Oil Pressure	Low engine oil level.	Check oil level. If low, add oil.
	Compressor tilted beyond out-of-level operating limit.	Reposition or relocate compressor to be more level.
	Wrong engine oil.	Change engine oil. Review engine oil specification.
	Clogged engine oil filter.	Replace engine oil filter.
	Engine malfunctioning.	See troubleshooting in Engine Manual.
	Loose wire connection.	Check wires at switches and connectors to find loose connection. Make repairs. See Electronic Service Manual.
5. Low electrical system voltage	Loose or broken belts.	Tighten or replace belt set.
	Loose wire connection.	Check wires at switches and connectors to find loose connection. Make repairs. See Electronic Service Manual.
	Low battery voltage.	Check battery condition; recharge if necessary. Check electrolyte level; add if necessary. Check cable connections; clean and tighten as needed.
	Malfunctioning alternator.	Repair or replace alternator.

Complaint	Cause	Correction
6. High compressor oil temperature	Ambient temperature above rated ambient temperature range.	Operate in cooler environment.
	Compressor tilted beyond out-of-level operating limit.	Reposition or relocate compressor to be more level.
	Low compressor oil level.	Add compressor oil. Look for and repair any leaks.
	Incorrect compressor oil.	Change compressor oil. Review compressor oil specification.
	Dirty cooler(s).	Clean exterior of cooler(s).
	Dirty operating conditions.	Move compressor to cleaner environment.
	Clogged compressor oil filter(s).	Replace compressor oil filter(s) and change compressor oil.
	Loose or broken belts.	Tighten or replace belt set.
	Operating pressure too high.	Reduce pressure to rated operating pressure.
	Recirculation of cooling air.	Close enclosure doors. Close and secure access panels. Check for loose or missing belly pans.
	Malfunctioning compressor oil thermostat.	Replace thermostat element in conventional bypass valve, if equipped.
	Loose or broken belts.	Tighten or replace belt set.
	Malfunctioning oil cooler pressure relief valve.	Replace valve.
	Malfunctioning minimum pressure valve.	Repair or replace valve.
	Blocked or restricted oil lines.	Clean by flushing, or replace lines.
	Airend malfunctioning.	See Complaints #11, #12.
7. Low engine speed	Clogged fuel filters.	Service fuel filters. See Engine Manual. Drain and clean fuel tanks. Add clean fuel.
	Operating pressure too high.	Reduce pressure to rated operating pressure.
	Clogged air filter element(s).	Clean or replace air filter element(s).
	Wrong air filter element(s).	Install correct air filter element(s).
	Engine malfunctioning.	See troubleshooting in Engine Manual.
	Airend malfunctioning.	See Complaints #11, #12.
8. Excessive vibration	Rubber mounting isolators loose or damaged.	Tighten or replace.
	Defective or imbalanced fan.	Replace fan.
	Defective airend drive coupling.	Replace coupling.
	Engine malfunctioning.	See troubleshooting in Engine Manual.
	Airend malfunctioning.	See Complaints #7, #11, #12.
	Engine idle speed too low.	See Complaint #7. See Engine Manual.

Complaint	Cause	Correction
9. Low air delivery / low cfm	Clogged air filter element(s).	Clean or replace air filter element(s).
	Incorrect pressure regulation adjustment.	Make adjustments per this manual.
	Malfunctioning inlet unloader / butterfly valve.	Inspect valve. Make adjustments per this manual.
	Incorrect air filter element(s).	Install correct air filter element(s).
	Low engine speed	See Complaint #7. See Engine Manual.
	Compressed air leaks.	Locate and repair leaks.
10. Short air filter life	Dirty operating conditions.	Move compressor to cleaner environment.
	Incorrect air filter element(s).	Install correct air filter element(s).
	Inadequate air filter element cleaning.	Install new air filter element(s).
	Incorrect stopping procedure.	Comply with procedure in this manual.
11. Compressor will not unload	Malfunctioning inlet unloader / butterfly valve.	Inspect valve. Make adjustments per this manual.
	Malfunctioning pressure regulator.	Check pressure regulator. Check regulation lines for leaks.
	Ice in regulation lines and/or regulation orifice.	Apply heat to lines and/or orifice. Check operation of DC electric heaters, if equipped.
	Load solenoid leak or malfunction.	Replace load solenoid.
	Plugged vent leak.	Clean and/or replace.
12. Safety valve opens	Operating pressure too high.	Reduce pressure to rated operating pressure.
	Malfunctioning inlet unloader / butterfly valve.	Inspect valve. Make adjustments per this manual.
	Defective safety valve.	Replace safety valve.
	Compressor will not unload fast enough.	Check pressure regulator. Check regulation lines for leaks.
	Ice in regulation lines and/or regulation orifice.	Apply heat to lines and/or orifice. Check operation of DC electric heaters, if equipped.
13. Excessive carryover (compressor oil in the compressed air)	Blocked separator scavenge line.	Check scavenge line, drop tube, and orifice. Clean and replace as needed.
	Deteriorated separator element.	Replace separator element.
	Separator tank pressure too low.	Check the minimum pressure valve. Repair or replace as necessary.

Diagnostic Codes

The ViewPort displays diagnostic codes for the compressor system and the engine. Listings of these codes are provided in this section.

The engine diagnostic codes can also be read with the engine manufacturer's service tool. A service tool connector is provided in the electrical harness, providing access to the J1939 CAN network. For advanced engine troubleshooting, it is recommended that the manufacturer's service tools and service literature be used.

Compressor Diagnostic Codes

Code	Display Name	Description	Code Type
1	Low Engine Speed	Engine speed less than 900 RPM for 30 seconds.	FAULT
2	High Engine Speed	Engine speed greater than 1900 RPM for 30 seconds.	FAULT
3	Engine Crank Timeout	Engine crank attempt longer than 15 seconds.	ALERT
4	Out of Fuel	Fuel level in tank below usable limit.	FAULT
9	Engine Diagnostic Code	Engine diagnostic code present in ViewPort history log.	ALERT
10	Engine Speed Response	Engine target idle speed not met within 10 seconds after loading compressor.	ALERT
11	AutoStart Attempts Exceeded	Compressor not started after 3 crank attempts.	FAULT
12	Low Fuel Level	Fuel level in tank approaching empty.	ALERT
29	Engine Shutdown Unknown	Engine stopped without an engine diagnostic code.	FAULT
30	High Airend Discharge Temperature	Airend discharge temperature greater than or equal to 248°F.	FAULT
31	Low Airend Oil Pressure	Airend oil pressure below 10 psi.	FAULT
32	Airend Discharge Temperature	Airend discharge temperature sensor reading out of range.	FAULT
33	Separator Tank Pressure Sensor	Separator tank pressure sensor reading out of range.	FAULT
34	High Separator Tank Pressure at Start	Separator tank pressure greater than 20 psi at crank attempt.	ALERT

Code	Display Name	Description	Code Type
35	High Separator Tank Pressure	Air pressure in the separator tank exceeded limit.	FAULT
36	Safety Valve Open	Safety relief valve on separator tank opened.	FAULT
38	Intake Air Filters Restricted	Intake filters restricting air flow.	ALERT
39	Low System Voltage	Electrical system voltage below 25.5 VDC.	ALERT
41	Airend Oil Pressure Sensor	Airend oil pressure sensor reading out of range.	FAULT
42	Fuel Level Sensor	Fuel level sensor reading out of range.	ALERT
43	Low Separator Tank Pressure	Separator tank pressure below 40 psi after compressor is loaded.	FAULT
44	High IQ Filter Restriction	IQ filters restricting air flow.	ALERT
50	High Separator Tank Temperature	Separator tank temperature greater than or equal to 248°F.	FAULT
51	Compressor ID Invalid	The Titan controller and ViewPort do not have a valid compressor ID.	FAULT
52	IQ Filters Restricted	IQ filters restricted past usable level.	FAULT
53	Separator Tank Temperature Sensor	Separator tank temperature sensor reading out of range.	FAULT
54	Regulation System Pressure Sensor	Regulation system pressure sensor reading out of range.	FAULT
55	Emergency Stop Activated	Emergency Stop button has been activated.	FAULT
56	Low Start Pressure	Separator tank pressure below 50 psi 20 seconds after start.	ALERT
58	Ambient Temperature Sensor	Ambient temperature sensor reading out of range.	ALERT
61	IQ Filter Pressure Error	IQ filter outlet pressure reading higher than inlet pressure.	ALERT
62	IQ System Louvers Malfunction	Louvers or louver actuator not operating properly.	ALERT
63	Primary IQ Differential Pressure Sensor	IQ differential pressure sensor reading out of range.	ALERT

Code	Display Name	Description	Code Type
64	Secondary IQ Differential Pressure Sensor	IQ differential pressure sensor reading out of range.	ALERT
66	IQ Aftercooler Temperature Sensor	IQ Aftercooler Temperature reading out of range.	ALERT
67	IQ Actuator Position Sensor	IQ louver actuator position sensor reading out of range.	ALERT
71	Engine ECM Communication	Communication between Titan controller and engine ECM not functional.	FAULT
73	AutoStart Controller Communication	Communication between Titan controller and AutoStart controller not functional.	ALERT
75	IQ TCU Controller Communication	Communication between Titan controller and IQ TCU controller not functional.	ALERT
76	Titan Controller Communication	Communication between Titan controller and ViewPort not functional.	ALERT

Engine Diagnostics Codes

The Engine Diagnostic Codes can also be read with the engine manufacturer’s service tool. A service tool connector is provided in the electrical harness, providing access to the J1939 CAN network. For advanced engine troubleshooting, it is recommended that the manufacturer’s service tools and service literature be used.

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
27	2	1228	Engine Exhaust Gas Recirculation 1 Valve Position	Data Erratic, Intermittent or Incorrect	EGR Valve Position - Data erratic, intermittent or incorrect
27	4	2272	Engine Exhaust Gas Recirculation 1 Valve Position	Voltage Below Normal or Shorted to Low Source	EGR Valve Position Circuit - Voltage below normal, or shorted to low source
81	16	2754	Engine Diesel Particulate Filter Intake Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Diesel Particulate Filter Intake Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
84	2	241	Wheel-Based Vehicle Speed	Data Erratic, Intermittent or Incorrect	Wheel-Based Vehicle Speed - Data erratic, intermittent or incorrect
84	9	3526	Wheel-Based Vehicle Speed	Abnormal Update Rate	Wheel-Based Vehicle Speed - Abnormal update rate
84	10	242	Wheel-Based Vehicle Speed	Abnormal Rate of Change	Wheel-Based Vehicle Speed Sensor Circuit tampering has been detected - Abnormal rate of change
84	19	3525	Wheel-Based Vehicle Speed	Received Network Data in Error	Wheel-Based Vehicle Speed - Received Network Data In Error
91	0	148	Accelerator Pedal Position 1	Data Valid but Above Normal Operational Range - Most Severe Level	Accelerator Pedal or Lever Position Sensor 1 - Data valid but above normal operational range - Most Severe Level
91	1	147	Accelerator Pedal Position 1	Data Valid but Below Normal Operational Range - Most Severe Level	Accelerator Pedal or Lever Position 1 Sensor Circuit Frequency - Data valid but below normal operating Range
91	2	1242	Accelerator Pedal Position 1	Data Erratic, Intermittent or Incorrect	Accelerator Pedal or Lever Position Sensor 1 - Data erratic, intermittent or incorrect
91	3	131	Accelerator Pedal Position 1	Voltage Above Normal or Shorted to High Source	Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal, or shorted to high source
91	4	132	Accelerator Pedal Position 1	Voltage Below Normal or Shorted to Low Source	Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal, or shorted to low source
91	9	3326	Accelerator Pedal Position 1	Abnormal Update Rate	SAE J1939 Multiplexed Accelerator Pedal or Lever Sensor System - Abnormal update rate
91	19	1515	Accelerator Pedal Position 1	Received Network Data in Error	SAE J1939 Multiplexed Accelerator Pedal or Lever Sensor System - Received Network Data In Error
93	2	528	Engine Net Brake Torque	Data Erratic, Intermittent or Incorrect	Auxiliary Alternate Torque Validation Switch - Data erratic, intermittent or incorrect
94	0	4615	Engine Fuel Delivery Pressure	Data Valid but Above Normal Operational Range - Most Severe Level	Engine Fuel Delivery Pressure - Data Valid but Above Normal Operational Range - Most Severe Level
94	3	546	Engine Fuel Delivery Pressure	Voltage Above Normal or Shorted to High Source	Fuel Delivery Pressure Sensor Circuit - Voltage above normal, or shorted to high source
94	4	547	Engine Fuel Delivery Pressure	Voltage Below Normal or Shorted to Low Source	Fuel Delivery Pressure Sensor Circuit - Voltage below normal, or shorted to low source
94	15	2261	Engine Fuel Delivery Pressure	Data Valid but Above Normal Operating Range - Least Severe Level	Fuel Pump Delivery Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
94	17	2262	Engine Fuel Delivery Pressure	Data Valid but Below Normal Operating Range - Least Severe Level	Fuel Pump Delivery Pressure - Data Valid But Below Normal Operating Range - Least Severe Level
94	18	2215	Engine Fuel Delivery Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Fuel Pump Delivery Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
95	16	2372	Engine Fuel Filter Differential Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Fuel Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
97	3	428	Water In Fuel Indicator	Voltage Above Normal or Shorted to High Source	Water in Fuel Indicator Sensor Circuit - Voltage above normal, or shorted to high source
97	4	429	Water In Fuel Indicator	Voltage Below Normal or Shorted to Low Source	Water in Fuel Indicator Sensor Circuit - Voltage below normal, or shorted to low source
97	15	418	Water In Fuel Indicator	Data Valid but Above Normal Operating Range - Least Severe Level	Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Least Severe Level

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
97	16	1852	Water In Fuel Indicator	Data Valid but Above Normal Operating Range - Moderately Severe Level	Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Moderately Severe Level
98	0	688	Engine Oil Level	Data Valid but Above Normal Operational Range - Most Severe Level	Engine Oil Level - Data valid but above normal operational range - Most Severe Level
98	1	253	Engine Oil Level	Data Valid but Below Normal Operational Range - Most Severe Level	Engine Oil Level - Data valid but below normal operational range - Most Severe Level
98	17	471	Engine Oil Level	Data Valid but Below Normal Operating Range - Least Severe Level	Engine Oil Level - Data Valid But Below Normal Operating Range - Least Severe Level
100	1	415	Engine Oil Pressure	Data Valid but Below Normal Operational Range - Most Severe Level	Engine Oil Rifle Pressure - Data valid but below normal operational range - Most Severe Level
100	2	435	Engine Oil Pressure	Data Erratic, Intermittent or Incorrect	Engine Oil Rifle Pressure - Data erratic, intermittent or incorrect
100	3	135	Engine Oil Pressure	Voltage Above Normal or Shorted to High Source	Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage above normal, or shorted to high source
100	4	141	Engine Oil Pressure	Voltage Below Normal or Shorted to Low Source	Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage below normal, or shorted to low source
100	18	143	Engine Oil Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Engine Oil Rifle Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
101	0	556	Engine Crankcase Pressure	Data Valid but Above Normal Operational Range - Most Severe Level	Crankcase Pressure - Data valid but above normal operational range - Most Severe Level
101	2	1942	Engine Crankcase Pressure	Data Erratic, Intermittent or Incorrect	Crankcase Pressure - Data erratic, intermittent or incorrect
101	3	1843	Engine Crankcase Pressure	Voltage Above Normal or Shorted to High Source	Crankcase Pressure Circuit - Voltage above normal, or shorted to high source
101	4	1844	Engine Crankcase Pressure	Voltage Below Normal or Shorted to Low Source	Crankcase Pressure Circuit - Voltage below normal, or shorted to low source
101	15	1974	Engine Crankcase Pressure	Data Valid but Above Normal Operating Range - Least Severe Level	Crankcase Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
101	16	555	Engine Crankcase Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Crankcase Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
102	2	2973	Engine Intake Manifold #1 Pressure	Data Erratic, Intermittent or Incorrect	Intake Manifold 1 Pressure - Data erratic, intermittent or incorrect
102	3	122	Engine Intake Manifold #1 Pressure	Voltage Above Normal or Shorted to High Source	Intake Manifold 1 Pressure Sensor Circuit - Voltage above normal, or shorted to high source
102	4	123	Engine Intake Manifold #1 Pressure	Voltage Below Normal or Shorted to Low Source	Intake Manifold 1 Pressure Sensor Circuit - Voltage below normal, or shorted to low source
102	10	3361	Engine Intake Manifold #1 Pressure	Abnormal Rate of Change	Intake Manifold 1 Pressure - Abnormal rate of change
102	16	124	Engine Intake Manifold #1 Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Intake Manifold 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
102	18	125	Engine Intake Manifold #1 Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Intake Manifold 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
103	2	686	Engine Turbocharger 1 Speed	Data Erratic, Intermittent or Incorrect	Turbocharger 1 Speed - Data erratic, intermittent or incorrect
103	15	2288	Engine Turbocharger 1 Speed	Data Valid but Above Normal Operating Range - Least Severe Level	Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - Least Severe Level
103	16	595	Engine Turbocharger 1 Speed	Data Valid but Above Normal Operating Range - Moderately Severe Level	Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - Moderately Severe Level
103	18	687	Engine Turbocharger 1 Speed	Data Valid but Below Normal Operating Range - Moderately Severe Level	Turbocharger 1 Speed - Data Valid But Below Normal Operating Range - Moderately Severe Level

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
104	18	3917	Engine Turbocharger Lube Oil Pressure 1	Data Valid but Below Normal Operating Range - Moderately Severe Level	Engine Turbocharger Lube Oil Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
105	0	155	Engine Intake Manifold 1 Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Intake Manifold 1 Temperature - Data valid but above normal operational range - Most Severe Level
105	2	436	Engine Intake Manifold 1 Temperature	Data Erratic, Intermittent or Incorrect	Intake Manifold 1 Temperature - Data erratic, intermittent or incorrect
105	3	153	Engine Intake Manifold 1 Temperature	Voltage Above Normal or Shorted to High Source	Intake Manifold 1 Temperature Sensor Circuit - Voltage above normal, or shorted to high source
105	4	154	Engine Intake Manifold 1 Temperature	Voltage Below Normal or Shorted to Low Source	Intake Manifold 1 Temperature Sensor Circuit - Voltage below normal, or shorted to low source
105	15	2964	Engine Intake Manifold #1 Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Intake Manifold 1 Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
105	16	488	Engine Intake Manifold Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Intake Manifold 1 Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
105	18	3385	Engine Intake Manifold 1 Temperature	Data Valid but Below Normal Operating Range - Moderately Severe Level	Intake Manifold 1 Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level
107	15	5576	Engine Air Filter 1 Differential Pressure	Data Valid but Above Normal Operating Range - Least Severe Level	Engine Air Filter Differential Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
107	16	3341	Engine Air Filter 1 Differential Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Air Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
108	2	295	Barometric Pressure	Data Erratic, Intermittent or Incorrect	Barometric Pressure - Data erratic, intermittent or incorrect
108	3	221	Barometric Pressure	Voltage Above Normal or Shorted to High Source	Barometric Pressure Sensor Circuit - Voltage above normal, or shorted to high source
108	4	222	Barometric Pressure	Voltage Below Normal or Shorted to Low Source	Barometric Pressure Sensor Circuit - Voltage above normal, or shorted to low source
109	3	231	Engine Coolant Pressure	Voltage Above Normal or Shorted to High Source	Coolant Pressure Sensor Circuit - Voltage above normal, or shorted to high source
109	4	232	Engine Coolant Pressure	Voltage Below Normal or Shorted to Low Source	Coolant Pressure Sensor Circuit - Voltage below normal, or shorted to low source
109	18	233	Engine Coolant Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Coolant Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
110	0	151	Engine Coolant Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Engine Coolant Temperature - Data valid but above normal operational range - Most Severe Level
110	2	334	Engine Coolant Temperature	Data Erratic, Intermittent or Incorrect	Engine Coolant Temperature - Data erratic, intermittent or incorrect
110	3	144	Engine Coolant Temperature	Voltage Above Normal or Shorted to High Source	Engine Coolant Temperature 1 Sensor Circuit - Voltage above normal, or shorted to high source
110	4	145	Engine Coolant Temperature	Voltage Below Normal or Shorted to Low Source	Engine Coolant Temperature 1 Sensor Circuit - Voltage below normal, or shorted to low source
110	14	1847	Engine Coolant Temperature	Special Instructions	Engine Coolant Temperature - Special Instructions
110	15	2963	Engine Coolant Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
110	16	146	Engine Coolant Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
110	18	2789	Engine Coolant Temperature	Data Valid but Below Normal Operating Range - Moderately Severe Level	Engine Coolant Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
110	31	2646	Engine Coolant Temperature	Not Available or Condition Exists	Engine Coolant Temperature - Condition Exists
110	31	2659	Engine Coolant Temperature	Not Available or Condition Exists	Engine Coolant Temperature - Condition Exists
111	1	235	Engine Coolant Level	Data Valid but Below Normal Operational Range - Most Severe Level	Coolant Level - Data valid but below normal operational range - Most Severe Level
111	2	422	Engine Coolant Level	Data Erratic, Intermittent or Incorrect	Coolant Level - Data erratic, intermittent or incorrect
111	3	195	Engine Coolant Level	Voltage Above Normal or Shorted to High Source	Coolant Level Sensor 1 Circuit - Voltage above normal, or shorted to high source
111	4	196	Engine Coolant Level	Voltage Below Normal or Shorted to Low Source	Coolant Level Sensor 1 Circuit - Voltage below normal, or shorted to low source
111	9	3613	SAE J1939 Multiplexing PGN Timeout	Abnormal Update Rate	SAE J1939 Multiplexing PGN Timeout Error - Abnormal update rate
111	17	2448	Engine Coolant Level	Data Valid but Below Normal Operating Range - Least Severe Level	Coolant Level - Data Valid But Below Normal Operating Range - Least Severe Level
111	17	5167	Engine Coolant Level	Data Valid but Below Normal Operating Range - Least Severe Level	Coolant Level - Data Valid But Below Normal Operating Range - Least Severe Level
111	18	197	Engine Coolant Level	Data Valid but Below Normal Operating Range - Moderately Severe Level	Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
111	18	3366	Engine Coolant Level	Data Valid but Below Normal Operating Range - Moderately Severe Level	Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
111	19	3614	SAE J1939 Multiplexing PGN Timeout	Received Network Data in Error	Coolant Level Sensor - Received Network Data in Error
157	1	2249	Engine Injector Metering Rail 1 Pressure	Data Valid but Below Normal Operational Range - Most Severe Level	Injector Metering Rail 1 Pressure - Data valid but below normal operational range - Most Severe Level
157	2	554	Engine Injector Metering Rail 1 Pressure	Data Erratic, Intermittent or Incorrect	Injector Metering Rail 1 Pressure - Data erratic, intermittent or incorrect
157	3	451	Engine Injector Metering Rail 1 Pressure	Voltage Above Normal or Shorted to High Source	Injector Metering Rail 1 Pressure Sensor Circuit - Voltage above normal, or shorted to high source
157	4	452	Engine Injector Metering Rail 1 Pressure	Voltage Below Normal or Shorted to Low Source	Injector Metering Rail 1 Pressure Sensor Circuit - Voltage below normal, or shorted to low source
157	7	755	Engine Injector Metering Rail 1 Pressure	Mechanical System not Responding or Out of Adjustment	Injector Metering Rail 1 Pressure - Mechanical system not responding or out of adjustment
157	15	4727	Engine Injector Metering Rail 1 Pressure	Data Valid but Above Normal Operating Range - Least Severe Level	Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
157	16	553	Engine Injector Metering Rail 1 Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
157	18	559	Engine Injector Metering Rail 1 Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Injector Metering Rail 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
168	16	442	Battery Potential / Power Input 1	Data Valid but Above Normal Operating Range - Moderately Severe Level	Battery 1 Voltage - Data Valid But Above Normal Operating Range - Moderately Severe Level
168	17	3724	Battery Potential / Power Input 1	Data Valid but Below Normal Operating Range - Least Severe Level	Battery 1 Voltage - Data Valid But Below Normal Operating Range - Least Severe Level
168	18	441	Battery Potential / Power Input 1	Data Valid but Below Normal Operating Range - Moderately Severe Level	Battery 1 Voltage - Data Valid But Below Normal Operating Range - Moderately Severe Level
171	2	2398	Ambient Air Temperature	Data Erratic, Intermittent or Incorrect	Ambient Air Temperature - Data erratic, intermittent or incorrect
171	3	249	Ambient Air Temperature	Voltage Above Normal or Shorted to High Source	Ambient Air Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
171	4	256	Ambient Air Temperature	Voltage Below Normal or Shorted to Low Source	Ambient Air Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
171	9	3531	Ambient Air Temperature	Abnormal Update Rate	Ambient Air Temperature - Abnormal update rate
171	19	3532	Ambient Air Temperature	Received Network Data in Error	Ambient Air Temperature - Received Network Data In Error
174	0	266	Engine Fuel Temperature 1	Data Valid but Above Normal Operational Range - Most Severe Level	Engine Fuel Temperature - Data valid but above normal operational range - Most Severe Level
174	2	535	Engine Fuel Temperature 1	Data Erratic, Intermittent or Incorrect	Engine Fuel Temperature - Data erratic, intermittent or incorrect
174	3	263	Engine Fuel Temperature 1	Voltage Above Normal or Shorted to High Source	Engine Fuel Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
174	4	265	Engine Fuel Temperature 1	Voltage Below Normal or Shorted to Low Source	Engine Fuel Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source
174	16	261	Engine Fuel Temperature 1	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Fuel Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
175	0	214	Engine Oil Temperature 1	Data Valid but Above Normal Operational Range - Most Severe Level	Engine Oil Temperature - Data valid but above normal operational range - Most Severe Level
175	2	425	Engine Oil Temperature 1	Data Erratic, Intermittent or Incorrect	Engine Oil Temperature - Data erratic, intermittent or incorrect
175	3	212	Engine Oil Temperature 1	Voltage Above Normal or Shorted to High Source	Engine Oil Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
175	4	213	Engine Oil Temperature 1	Voltage Below Normal or Shorted to Low Source	Engine Oil Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source
175	16	421	Engine Oil Temperature 1	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Oil Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
188	16	3715	Engine Speed At Idle, Point 1 (Engine Configuration)	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Speed At Idle - Data Valid But Above Normal Operating Range - Moderately Severe Level
188	18	3716	Engine Speed At Idle, Point 1 (Engine Configuration)	Data Valid but Below Normal Operating Range - Moderately Severe Level	Engine Speed At Idle - Data Valid But Below Normal Operating Range - Moderately Severe Level
190	0	234	Engine Speed	Data Valid but Above Normal Operational Range - Most Severe Level	Engine Crankshaft Speed/Position - Data valid but above normal operational range - Most Severe Level
190	2	689	Engine Speed	Data Erratic, Intermittent or Incorrect	Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
190	2	2321	Engine Speed	Data Erratic, Intermittent or Incorrect	Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
190	16	1992	Engine Speed	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Crankshaft Speed/Position - Data Valid But Above Normal Operating Range - Moderately Severe Level
190	16	2468	Engine Speed	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Crankshaft Speed/Position - Data Valid But Above Normal Operating Range - Moderately Severe Level
191	9	3328	Transmission Output Shaft Speed	Abnormal Update Rate	Transmission Output Shaft Speed - Abnormal update rate
191	16	349	Transmission Output Shaft Speed	Data Valid but Above Normal Operating Range - Moderately Severe Level	Transmission Output Shaft Speed - Data Valid But Above Normal Operating Range - Moderately Severe Level
191	18	489	Transmission Output Shaft Speed	Data Valid but Below Normal Operating Range - Moderately Severe Level	Transmission Output Shaft Speed - Data Valid But Below Normal Operating Range - Moderately Severe Level
191	19	3418	Transmission Output Shaft Speed	Received Network Data in Error	Transmission Output Shaft Speed - Received Network Data In Error
237	2	4722	Vehicle Identification Number	Data Erratic, Intermittent or Incorrect	Vehicle Identification Number - Data erratic, intermittent or incorrect
237	13	4517	Vehicle Identification Number	Out of Calibration	Vehicle Identification Number - Out of Calibration
237	31	4721	Vehicle Identification Number	Not Available or Condition Exists	Vehicle Identification Number - Condition Exists

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
251	2	319	Real Time Clock	Data Erratic, Intermittent or Incorrect	Real Time Clock - Data erratic, intermittent or incorrect
411	2	1866	Engine Exhaust Gas Recirculation 1 Differential Pressure	Data Erratic, Intermittent or Incorrect	Exhaust Gas Recirculation Differential Pressure - Data erratic, intermittent or incorrect
411	3	2273	Engine Exhaust Gas Recirculation 1 Differential Pressure	Voltage Above Normal or Shorted to High Source	Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage above normal, or shorted to high source
411	4	2274	Engine Exhaust Gas Recirculation 1 Differential Pressure	Voltage Below Normal or Shorted to Low Source	Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage below normal, or shorted to low source
412	2	1867	Engine Exhaust Gas Recirculation 1 Temperature	Data Erratic, Intermittent or Incorrect	Exhaust Gas Recirculation Temperature - Data erratic, intermittent or incorrect
412	3	2375	Engine Exhaust Gas Recirculation 1 Temperature	Voltage Above Normal or Shorted to High Source	Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage above normal, or shorted to high source
412	4	2376	Engine Exhaust Gas Recirculation 1 Temperature	Voltage Below Normal or Shorted to Low Source	Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage below normal, or shorted to low source
412	15	2961	Engine Exhaust Gas Recirculation 1 Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
412	16	2962	Engine Exhaust Gas Recirculation 1 Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
441	3	293	Auxiliary Temperature 1	Voltage Above Normal or Shorted to High Source	Auxiliary Temperature Sensor Input 1 Circuit - Voltage above normal, or shorted to high source
441	4	294	Auxiliary Temperature 1	Voltage Below Normal or Shorted to Low Source	Auxiliary Temperature Sensor Input 1 Circuit - Voltage below normal, or shorted to low source
441	14	292	Auxiliary Temperature 1	Special Instructions	Auxiliary Temperature Sensor Input 1 - Special Instructions
442	3	3765	Auxiliary Temperature 2	Voltage Above Normal or Shorted to High Source	Auxiliary Temperature Sensor Input 2 Circuit - Voltage above normal, or shorted to high source
442	4	3766	Auxiliary Temperature 2	Voltage Below Normal or Shorted to Low Source	Auxiliary Temperature Sensor Input 2 Circuit - Voltage below normal, or shorted to low source
521	2	4526	Brake Pedal Position	Data Erratic, Intermittent or Incorrect	Brake Pedal Position - Data erratic, intermittent or incorrect
558	2	431	Accelerator Pedal 1 Low Idle Switch	Data Erratic, Intermittent or Incorrect	Accelerator Pedal or Lever Idle Validation Switch - Data erratic, intermittent or incorrect
558	9	3528	Accelerator Pedal 1 Low Idle Switch	Abnormal Update Rate	Accelerator Pedal or Lever Idle Validation Switch - Abnormal update rate
558	13	432	Accelerator Pedal 1 Low Idle Switch	Out of Calibration	Accelerator Pedal or Lever Idle Validation Switch Circuit - Out of Calibration
558	19	3527	Accelerator Pedal 1 Low Idle Switch	Received Network Data in Error	Accelerator Pedal or Lever Idle Validation Switch - Received Network Data In Error
563	9	3488	Anti-Lock Braking (ABS) Active	Abnormal Update Rate	Anti-Lock Braking (ABS) Controller - Abnormal update rate
563	31	4215	Anti-Lock Braking (ABS) Active	Not Available or Condition Exists	Anti-Lock Braking (ABS) Active - Condition Exists
596	2	3841	Cruise Control Enable Switch	Data Erratic, Intermittent or Incorrect	Cruise Control Enable Switch - Data erratic, intermittent or incorrect
596	7	3839	Cruise Control Enable Switch	Mechanical System not Responding or Out of Adjustment	Cruise Control Enable Switch - Mechanical system not responding or out of adjustment
596	13	3842	Cruise Control Enable Switch	Out of Calibration	Cruise Control Enable Switch - Out of Calibration
597	3	769	Brake Switch	Voltage Above Normal or Shorted to High Source	Brake Switch Circuit - Voltage above normal, or shorted to high source

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597	4	771	Brake Switch	Voltage Below Normal or Shorted to Low Source	Brake Switch Circuit - Voltage below normal, or shorted to low source
599	2	2721	Cruise Control Set Switch	Data Erratic, Intermittent or Incorrect	Cruise Control Set Switch - Data erratic, intermittent or incorrect
611	2	523	System Diagnostic Code #1	Data Erratic, Intermittent or Incorrect	Auxiliary Intermediate (PTO) Speed Switch Validation - Data erratic, intermittent or incorrect
612	2	115	System Diagnostic Code #2	Data Erratic, Intermittent or Incorrect	Engine Magnetic Speed/Position Lost Both of Two Signals - Data erratic, intermittent or incorrect
625	9	291	Proprietary Datalink	Abnormal Update Rate	Proprietary Datalink Error (OEM/Vehicle Datalink) - Abnormal update rate
626	3	2738	Engine Start Enable Device 1	Voltage Above Normal or Shorted to High Source	Start Enable Device 1 Circuit (Ether Injection) - Voltage above normal, or shorted to high source
626	4	2739	Engine Start Enable Device 1	Voltage Below Normal or Shorted to Low Source	Start Enable Device 1Circuit (Ether Injection) - Voltage below normal, or shorted to low source
626	18	487	Engine Start Enable Device 1	Data Valid but Below Normal Operating Range - Moderately Severe Level	Start Enable Device 1 Canister Empty (Ether Injection) - Data Valid But Below Normal Operating Range
629	12	111	Controller #1	Bad Intelligent Device or Component	Engine Control Module Critical Internal Failure - Bad intelligent device or component
629	12	343	Controller #1	Bad Intelligent Device or Component	Engine Control Module Warning Internal Hardware Failure - Bad intelligent device or component
629	31	2661	Controller #1	Not Available or Condition Exists	At Least One Unacknowledged Most Severe Fault - Condition Exists
629	31	2662	Controller #1	Not Available or Condition Exists	At Least One Unacknowledged Moderately Severe Fault - Condition Exists
630	12	3697	Engine Control Module Calibration Memory	Bad Intelligent Device or Component	Engine Control Module Calibration Memory - Bad intelligent device or component
633	31	2311	Engine Fuel Actuator 1 Control Command	Not Available or Condition Exists	Electronic Fuel Injection Control Valve Circuit - Condition Exists
639	2	426	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	Data Erratic, Intermittent or Incorrect	J1939 Network #1 - Data erratic, intermittent or incorrect
639	9	285	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	Abnormal Update Rate	SAE J1939 Multiplexing PGN Timeout Error - Abnormal update rate
639	9	427	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	Abnormal Update Rate	SAE J1939 Datalink - Abnormal update rate
639	13	286	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	Out of Calibration	SAE J1939 Multiplexing Configuration Error - Out of Calibration
640	14	599	Engine External Protection Input	Special Instructions	Auxiliary Commanded Dual Output Shutdown - Special Instructions
641	7	2387	Engine Variable Geometry Turbocharger Actuator #1	Mechanical System not Responding or Out of Adjustment	VGT Actuator Driver Circuit (Motor) - Mechanical system not responding or out of adjustment
641	9	2636	Engine Variable Geometry Turbocharger Actuator #1	Abnormal Update Rate	VGT Actuator Driver Circuit - Abnormal update rate
641	11	2198	Engine Variable Geometry Turbocharger Actuator #1	Root Cause Not Known	VGT Actuator Driver Circuit - Root Cause Not Known
641	12	2634	Engine Variable Geometry Turbocharger Actuator #1	Bad Intelligent Device or Component	VGT Actuator Controller - Bad intelligent device or component
641	13	1898	Engine Variable Geometry Turbocharger Actuator #1	Out of Calibration	VGT Actuator Controller - Out of Calibration

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
641	13	2449	Engine Variable Geometry Turbocharger Actuator #1	Out of Calibration	VGT Actuator Controller - Out of Calibration
641	15	1962	Engine Variable Geometry Turbocharger Actuator #1	Data Valid but Above Normal Operating Range - Least Severe Level	VGT Actuator Driver Over Temperature (Calculated) - Data Valid But Above Normal Operating Range - Least Severe Level
641	31	2635	Engine Variable Geometry Turbocharger Actuator #1	Not Available or Condition Exists	VGT Actuator Driver Circuit - Condition Exists
644	2	237	Engine External Speed Command Input	Data Erratic, Intermittent or Incorrect	External Speed Command Input (Multiple Unit Synchronization) - Data erratic, intermittent or incorrect
647	3	2377	Engine Fan Clutch 1 Output Device Driver	Voltage Above Normal or Shorted to High Source	Fan Control Circuit - Voltage above normal, or shorted to high source
647	4	245	Engine Fan Clutch 1 Output Device Driver	Voltage Below Normal or Shorted to Low Source	Fan Control Circuit - Voltage below normal, or shorted to low source
649	3	5271	Engine Exhaust Back Pressure Regulator Control Circuit	Voltage Above Normal or Shorted to High Source	Engine Exhaust Back Pressure Regulator Control Circuit - Voltage Above Normal, or Shorted to High Source
649	4	5272	Engine Exhaust Back Pressure Regulator Control Circuit	Voltage Below Normal or Shorted to Low Source	Engine Exhaust Back Pressure Regulator Control Circuit - Voltage Below Normal, or Shorted to Low Source
649	5	5273	Engine Exhaust Back Pressure Regulator Control Circuit	Current Below Normal or Open Circuit	Engine Exhaust Back Pressure Regulator Control Circuit - Current Below Normal or Open Circuit
651	5	322	Engine Injector Cylinder #01	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 1 Circuit - Current below normal or open circuit
651	7	1139	Engine Injector Cylinder #01	Mechanical System not Responding or Out of Adjustment	Injector Solenoid Driver Cylinder 1 - Mechanical system not responding or out of adjustment
652	5	331	Engine Injector Cylinder #02	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 2 Circuit - Current below normal or open circuit
652	7	1141	Engine Injector Cylinder #02	Mechanical System not Responding or Out of Adjustment	Injector Solenoid Driver Cylinder 2 - Mechanical system not responding or out of adjustment
653	5	324	Engine Injector Cylinder #03	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 3 Circuit - Current below normal or open circuit
653	7	1142	Engine Injector Cylinder #03	Mechanical System not Responding or Out of Adjustment	Injector Solenoid Driver Cylinder 3 - Mechanical system not responding or out of adjustment
654	5	332	Engine Injector Cylinder #04	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 4 Circuit - Current below normal or open circuit
654	7	1143	Engine Injector Cylinder #04	Mechanical System not Responding or Out of Adjustment	Injector Solenoid Driver Cylinder 4 - Mechanical system not responding or out of adjustment
655	5	323	Engine Injector Cylinder #05	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 5 Circuit - Current below normal or open circuit
655	7	1144	Engine Injector Cylinder #05	Mechanical System not Responding or Out of Adjustment	Injector Solenoid Driver Cylinder 5 - Mechanical system not responding or out of adjustment
656	5	325	Engine Injector Cylinder #06	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 6 Circuit - Current below normal or open circuit
656	7	1145	Engine Injector Cylinder #06	Mechanical System not Responding or Out of Adjustment	Injector Solenoid Driver Cylinder 6 - Mechanical system not responding or out of adjustment
657	5	1548	Engine Injector Cylinder #7	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 7 Circuit - Current below normal or open circuit
658	5	1549	Engine Injector Cylinder #8	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 8 Circuit - Current below normal or open circuit
659	5	1622	Engine Injector Cylinder #9	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 9 Circuit - Current below normal or open circuit

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
660	5	1551	Engine Injector Cylinder #10	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 10 Circuit - Current below normal or open circuit
661	5	1552	Engine Injector Cylinder #11	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 11 Circuit - Current below normal or open circuit
662	5	1553	Engine Injector Cylinder #12	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 12 Circuit - Current below normal or open circuit
663	5	1554	Engine Injector Cylinder #13	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 13 Circuit - Current below normal or open circuit
664	5	1555	Engine Injector Cylinder #14	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 14 Circuit - Current below normal or open circuit
665	5	1556	Engine Injector Cylinder #15	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 15 Circuit - Current below normal or open circuit
666	5	1557	Engine Injector Cylinder #16	Current Below Normal or Open Circuit	Injector Solenoid Driver Cylinder 16 Circuit - Current below normal or open circuit
677	3	584	Engine Starter Motor Relay	Voltage Above Normal or Shorted to High Source	Starter Relay Driver Circuit - Voltage above normal, or shorted to high source
677	4	585	Engine Starter Motor Relay	Voltage Below Normal or Shorted to Low Source	Starter Relay Driver Circuit - Voltage below normal, or shorted to low source
697	3	2557	Auxiliary PWM Driver #1	Voltage Above Normal or Shorted to High Source	Auxiliary PWM Driver 1 Circuit - Voltage above normal, or shorted to high source
697	4	2558	Auxiliary PWM Driver #1	Voltage Below Normal or Shorted to Low Source	Auxiliary PWM Driver 1 Circuit - Voltage below normal, or shorted to low source
701	14	4734	Auxiliary I/O #01	Special Instructions	Auxiliary Input/Output 1 - Special Instructions
702	3	527	Auxiliary I/O #02	Voltage Above Normal or Shorted to High Source	Auxiliary Input/Output 2 Circuit - Voltage above normal, or shorted to high source
702	5	4724	Auxiliary I/O #02	Current Below Normal or Open Circuit	Auxiliary Input/Output 2 Circuit - Current below normal or open circuit
702	6	4725	Auxiliary I/O #02	Current Above Normal or Grounded Circuit	Auxiliary Input/Output 2 Circuit - Current above normal or grounded circuit
703	3	529	Auxiliary I/O #03	Voltage Above Normal or Shorted to High Source	Auxiliary Input/Output 3 Circuit - Voltage above normal, or shorted to high source
723	2	778	Engine Speed 2	Data Erratic, Intermittent or Incorrect	Engine Camshaft Speed / Position Sensor - Data erratic, intermittent or incorrect
723	2	2322	Engine Speed 2	Data Erratic, Intermittent or Incorrect	Engine Camshaft Speed / Position Sensor - Data erratic, intermittent or incorrect
723	7	731	Engine Speed 2	Mechanical System not Responding or Out of Adjustment	Engine Speed / Position Camshaft and Crankshaft Misalignment - Mechanical system not responding or out of adjustment
729	3	2555	Engine Intake Air Heater Driver #1	Voltage Above Normal or Shorted to High Source	Engine Intake Air Heater 1 Circuit - Voltage above normal, or shorted to high source
729	4	2556	Engine Intake Air Heater Driver #1	Voltage Below Normal or Shorted to Low Source	Engine Intake Air Heater 1 Circuit - Voltage below normal, or shorted to low source
748	9	3641	Transmission Output Retarder	Abnormal Update Rate	Transmission Output Retarder - Abnormal update rate
862	3	3733	Crankcase breather Heater Ciruit	Voltage Above Normal or Shorted to High Source	Crankcase Breather Filter Heater Circuit - Voltage above normal, or shorted to high source
862	4	3734	Crankcase breather Heater Ciruit	Voltage Below Normal or Shorted to Low Source	Crankcase Breather Filter Heater Circuit - Voltage below normal, or shorted to low source
974	3	133	Remote Accelerator Pedal Position	Voltage Above Normal or Shorted to High Source	Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal, or shorted to high source

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
974	4	134	Remote Accelerator Pedal Position	Voltage Below Normal or Shorted to Low Source	Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal, or shorted to low source
974	19	288	Remote Accelerator Pedal Position	Received Network Data in Error	SAE J1939 Multiplexing Remote Accelerator Pedal or Lever Position Sensor System - Received Network Data In Error
1072	3	2182	Engine (Compression) Brake Output #1	Voltage Above Normal or Shorted to High Source	Engine Brake Actuator Driver 1 Circuit - Voltage above normal, or shorted to high source
1072	4	2183	Engine (Compression) Brake Output #1	Voltage Below Normal or Shorted to Low Source	Engine Brake Actuator Driver 1 Circuit - Voltage below normal, or shorted to low source
1073	3	2367	Engine (Compression) Brake Output #2	Voltage Above Normal or Shorted to High Source	Engine Brake Actuator Driver Output 2 Circuit - Voltage above normal, or shorted to high source
1073	4	2363	Engine (Compression) Brake Output #2	Voltage Below Normal or Shorted to Low Source	Engine Brake Actuator Driver Output 2 Circuit - Voltage below normal, or shorted to low source
1075	3	2265	Engine Electric Lift Pump for Engine Fuel Supply	Voltage Above Normal or Shorted to High Source	Electric Lift Pump for Engine Fuel Supply Circuit - Voltage above normal, or shorted to high source
1075	4	2266	Engine Electric Lift Pump for Engine Fuel Supply	Voltage Below Normal or Shorted to Low Source	Electric Lift Pump for Engine Fuel Supply Circuit - Voltage below normal, or shorted to low source
1081	7	3494	Engine Wait to Start Lamp	Mechanical System not Responding or Out of Adjustment	Engine Wait to Start Lamp - Mechanical system not responding or out of adjustment
1081	9	3555	Engine Wait to Start Lamp	Abnormal Update Rate	Engine Wait to Start Lamp - Abnormal update rate
1081	19	3556	Engine Wait to Start Lamp	Received Network Data in Error	Engine Wait to Start Lamp - Received Network Data In Error
1081	31	4252	Engine Wait to Start Lamp	Not Available or Condition Exists	Engine Wait to Start Lamp - Condition Exists
1109	0	3931	Engine Protection System Approaching Shutdown	Data Valid but Above Normal Operational Range - Most Severe Level	Engine Protection System Approaching Shutdown - Data valid but above normal operational range - Most
1112	3	2368	Engine (Compression) Brake Output #3	Voltage Above Normal or Shorted to High Source	Engine Brake Actuator Driver 3 Circuit - Voltage above normal, or shorted to high source
1112	4	2365	Engine (Compression) Brake Output #3	Voltage Below Normal or Shorted to Low Source	Engine Brake Actuator Driver Output 3 Circuit - Voltage below normal, or shorted to low source
1127	7	3683	Engine Turbocharger 1 Boost Pressure	Mechanical System not Responding or Out of Adjustment	Engine Turbocharger 1 Boost Pressure - Mechanical system not responding or out of adjustment
1136	2	699	Engine ECU Temperature	Data Erratic, Intermittent or Incorrect	Engine ECU Temperature - Data erratic, intermittent or incorrect
1136	3	697	Engine ECU Temperature	Voltage Above Normal or Shorted to High Source	Engine ECU Temperature Sensor Circuit - Voltage above normal, or shorted to high source
1136	4	698	Engine ECU Temperature	Voltage Below Normal or Shorted to Low Source	Engine ECU Temperature Sensor Circuit - Voltage below normal, or shorted to low source
1172	2	693	Engine Turbocharger 1 Compressor Intake Temperature	Data Erratic, Intermittent or Incorrect	Turbocharger 1 Compressor Intake Temperature - Data erratic, intermittent or incorrect
1172	3	691	Engine Turbocharger 1 Compressor Intake Temperature	Voltage Above Normal or Shorted to High Source	Turbocharger 1 Compressor Intake Temperature Circuit - Voltage above normal, or shorted to high source
1172	4	692	Engine Turbocharger 1 Compressor Intake Temperature	Voltage Below Normal or Shorted to Low Source	Turbocharger 1 Compressor Intake Temperature Circuit - Voltage below normal, or shorted to low source
1172	9	3369	Engine Turbocharger 1 Compressor Intake Temperature	Abnormal Update Rate	Turbocharger 1 Compressor Intake Temperature Sensor - Abnormal update rate
1172	19	3371	Engine Turbocharger 1 Compressor Intake Temperature	Received Network Data in Error	Turbocharger 1 Compressor Intake Temperature Sensor - Received Network Data In Error
1176	1	3348	Engine Turbocharger 1 Compressor Intake Pressure	Data Valid but Below Normal Operational Range - Most Severe Level	Turbocharger 1 Compressor Intake Pressure - Data valid but below normal operational range - Most Severe Level

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
1176	2	743	Engine Turbocharger 1 Compressor Intake Pressure	Data Erratic, Intermittent or Incorrect	Turbocharger 1 Compressor Intake Pressure - Data erratic, intermittent or incorrect
1176	3	741	Engine Turbocharger 1 Compressor Intake Pressure	Voltage Above Normal or Shorted to High Source	Turbocharger 1 Compressor Intake Pressure Circuit - Voltage above normal, or shorted to high source
1176	4	742	Engine Turbocharger 1 Compressor Intake Pressure	Voltage Below Normal or Shorted to Low Source	Turbocharger 1 Compressor Intake Pressure Circuit - Voltage below normal, or shorted to low source
1176	9	3372	Engine Turbocharger 1 Compressor Intake Pressure	Abnormal Update Rate	Turbocharger 1 Compressor Intake Pressure - Abnormal update rate
1176	18	629	Engine Turbocharger 1 Compressor Intake Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Turbocharger 1 Compressor Intake Pressure - Data Valid But Below Normal Operating Range - Moderately
1176	19	3373	Engine Turbocharger 1 Compressor Intake Pressure	Received Network Data in Error	Turbocharger 1 Compressor Intake Pressure - Received Network Data In Error
1194	13	3298	Anti-theft Encryption Seed Present Indicator	Out of Calibration	Anti-theft Encryption Seed - Out of Calibration
1195	2	269	Anti-theft Password Valid Indicator	Data Erratic, Intermittent or Incorrect	Antitheft Password Valid Indicator - Data erratic, intermittent or incorrect
1209	2	2554	Engine Exhaust Gas Pressure 1	Data Erratic, Intermittent or Incorrect	Exhaust Gas Pressure 1 - Data erratic, intermittent or incorrect
1209	3	2373	Engine Exhaust Gas Pressure 1	Voltage Above Normal or Shorted to High Source	Exhaust Gas Pressure Sensor 1 Circuit - Voltage above normal, or shorted to high source
1209	4	2374	Engine Exhaust Gas Pressure 1	Voltage Below Normal or Shorted to Low Source	Exhaust Gas Pressure Sensor 1 Circuit - Voltage below normal, or shorted to low source
1209	16	2764	Engine Exhaust Gas Pressure 1	Data Valid but Above Normal Operating Range - Moderately Severe Level	Exhaust Gas Pressure 1 - Data Valid But Above Normal Operating Range - Moderately Severe Level
1213	9	3535	Malfunction Indicator Lamp	Abnormal Update Rate	Malfunction Indicator Lamp - Abnormal update rate
1231	2	3329	J1939 Network #2	Data Erratic, Intermittent or Incorrect	J1939 Network #2 - Data erratic, intermittent or incorrect
1235	2	3331	J1939 Network #3	Data Erratic, Intermittent or Incorrect	J1939 Network #3 - Data erratic, intermittent or incorrect
1239	16	4726	Engine Fuel Leakage 1	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Fuel Leakage - Data Valid But Above Normal Operating Range - Moderately Severe Level
1267	3	338	Idle Shutdown Vehicle Accessories Relay Driver Circuit	Voltage Above Normal or Shorted to High Source	Idle Shutdown Vehicle Accessories Relay Driver Circuit - Voltage above normal, or shorted to high source
1267	4	339	Idle Shutdown Vehicle Accessories Relay Driver Circuit	Voltage Below Normal or Shorted to Low Source	Idle Shutdown Vehicle Accessories Relay Driver Circuit - Voltage below normal, or shorted to low source
1322	31	1718	Engine Misfire for Multiple Cylinders	Not Available or Condition Exists	Engine Misfire for Multiple Cylinders - Condition Exists
1323	31	1654	Engine Misfire Cylinder #1	Not Available or Condition Exists	Engine Misfire Cylinder 1 - Condition Exists
1324	31	1655	Engine Misfire Cylinder #2	Not Available or Condition Exists	Engine Misfire Cylinder 2 - Condition Exists
1325	31	1656	Engine Misfire Cylinder #3	Not Available or Condition Exists	Engine Misfire Cylinder 3 - Condition Exists
1326	31	1657	Engine Misfire Cylinder #4	Not Available or Condition Exists	Engine Misfire Cylinder 4 - Condition Exists
1327	31	1658	Engine Misfire Cylinder #5	Not Available or Condition Exists	Engine Misfire Cylinder 5 - Condition Exists
1328	31	1659	Engine Misfire Cylinder #6	Not Available or Condition Exists	Engine Misfire Cylinder 6 - Condition Exists
1347	3	272	Engine Fuel Pump Pressurizing Assembly #2	Voltage Above Normal or Shorted to High Source	Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage above normal, or shorted to high source
1347	4	271	Engine Fuel Pump Pressurizing Assembly #1	Voltage Below Normal or Shorted to Low Source	Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage below normal, or shorted to low source
1347	7	281	Engine Fuel Pump Pressurizing Assembly #3	Mechanical System not Responding or Out of Adjustment	Engine Fuel Pump Pressurizing Assembly 1 - Mechanical system not responding or out of adjustment

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
1349	3	483	Engine Injector Metering Rail 2 Pressure	Voltage Above Normal or Shorted to High Source	Injector Metering Rail 2 Pressure Sensor Circuit - Voltage above normal, or shorted to high source
1349	4	484	Engine Injector Metering Rail 2 Pressure	Voltage Below Normal or Shorted to Low Source	Injector Metering Rail 2 Pressure Sensor Circuit - Voltage below normal, or shorted to low source
1377	2	497	Engine Synchronization Switch	Data Erratic, Intermittent or Incorrect	Multiple Unit Synchronization Switch - Data erratic, intermittent or incorrect
1378	31	649	Engine Oil Change Interval	Not Available or Condition Exists	Engine Oil Change Interval - Condition Exists
1383	31	611	Engine was Shut Down Hot	Not Available or Condition Exists	Engine Shut Down Hot - Condition Exists
1387	3	1539	Auxiliary Pressure #1	Voltage Above Normal or Shorted to High Source	Auxiliary Pressure Sensor Input 1 Circuit - Voltage above normal, or shorted to high source
1387	4	1621	Auxiliary Pressure #1	Voltage Below Normal or Shorted to Low Source	Auxiliary Pressure Sensor Input 1 Circuit - Voltage below normal, or shorted to low source
1388	3	297	Auxiliary Pressure #2	Voltage Above Normal or Shorted to High Source	Auxiliary Pressure Sensor Input 2 Circuit - Voltage above normal, or shorted to high source
1388	4	298	Auxiliary Pressure #2	Voltage Below Normal or Shorted to Low Source	Auxiliary Pressure Sensor Input 2 Circuit - Voltage below normal, or shorted to low source
1388	14	296	Auxiliary Pressure #2	Special Instructions	Auxiliary Pressure Sensor Input 2 - Special Instructions
1563	2	1256	Incompatible Monitor/Controller	Data Erratic, Intermittent or Incorrect	Control Module Identification Input State Error - Data erratic, intermittent or incorrect
1563	2	1257	Incompatible Monitor/Controller	Data Erratic, Intermittent or Incorrect	Control Module Identification Input State Error - Data erratic, intermittent or incorrect
1569	31	3714	Engine Protection Torque Derate	Not Available or Condition Exists	Engine Protection Torque Derate - Condition Exists
1590	2	784	Adaptive Cruise Control Mode	Data Erratic, Intermittent or Incorrect	Adaptive Cruise Control Mode - Data erratic, intermittent or incorrect
1623	9	3186	Tachograph output shaft speed	Abnormal Update Rate	Tachograph Output Shaft Speed - Abnormal update rate
1623	13	5248	Tachograph Output Shaft Speed	Out of Calibration	Tachograph Output Shaft Speed - Out of Calibration
1623	19	3213	Tachograph output shaft speed	Received Network Data in Error	Tachograph Output Shaft Speed - Received Network Data In Error
1632	14	2998	Engine Torque Limit Feature	Special Instructions	Engine Torque Limit Feature - Special Instructions
1632	31	5193	Engine Torque Limit Feature	Not Available or Condition Exists	Engine Torque Limit Feature - Condition Exists
1639	0	4789	Fan Speed	Data Valid but Above Normal Operational Range - Most Severe Level	Fan Speed - Data Valid but Above Normal Operational Range - Most Severe Level
1639	1	4791	Fan Speed	Data Valid but Below Normal Operational Range - Most Severe Level	Fan Speed - Data Valid but Below Normal Operational Range - Most Severe Level
1668	2	4437	J1939 Network #4 - Data erratic	Data Erratic, Intermittent or Incorrect	J1939 Network #4 - Data erratic, intermittent or incorrect
1675	31	3737	Engine Starter Mode	Not Available or Condition Exists	Engine Starter Mode Overcrank Protection - Condition Exists
1761	1	1673	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Data Valid but Below Normal Operational Range - Most Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data valid but below normal operational range -Most Severe Level
1761	2	1699	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Data erratic, intermittent or incorrect
1761	3	1669	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage above normal, or shorted to high source
1761	4	1668	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage below normal, or shorted to low source

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
1761	5	4679	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Current Below Normal or Open Circuit	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Current below normal or open circuit
1761	6	4738	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Current Above Normal or Grounded Circuit	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Current above normal or grounded circuit
1761	10	4769	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Abnormal Rate of Change	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Abnormal Rate of Change
1761	11	4739	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Root Cause Not Known	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Root Cause Not Known
1761	13	4732	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Out of Calibration	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Out of Calibration
1761	17	3497	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Data Valid but Below Normal Operating Range - Least Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Least Severe Level
1761	18	3498	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
1800	16	2263	Battery 1 Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Battery Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
1800	18	2264	Battery 1 Temperature	Data Valid but Below Normal Operating Range - Moderately Severe Level	Battery Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level
1818	31	3374	ROP Brake Control active	Not Available or Condition Exists	Roll Over Protection Brake Control Active - Condition Exists
2006	9	5133	Source Address 6	Abnormal Update Rate	Source Address 6 - Abnormal Update Rate
2623	3	1239	Accelerator Pedal #1 Channel 2	Voltage Above Normal or Shorted to High Source	Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage above normal, or shorted to high source
2623	4	1241	Accelerator Pedal #1 Channel 2	Voltage Below Normal or Shorted to Low Source	Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage below normal, or shorted to low source
2629	15	2347	Engine Turbocharger 1 Compressor Outlet Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Turbocharger Compressor Outlet Temperature (Calculated) - Data Valid But Above Normal Operating Range
2630	2	3478	Engine Charge Air Cooler 1 Outlet Temperature	Data Erratic, Intermittent or Incorrect	Engine Charge Air Cooler Outlet Temperature - Data erratic, intermittent or incorrect
2630	3	2571	Engine Charge Air Cooler 1 Outlet Temperature	Voltage Above Normal or Shorted to High Source	Engine Charge Air Cooler Outlet Temperature - Voltage above normal, or shorted to high source
2630	4	2572	Engine Charge Air Cooler 1 Outlet Temperature	Voltage Below Normal or Shorted to Low Source	Engine Charge Air Cooler Outlet Temperature - Voltage below normal, or shorted to low source
2633	7	3616	Engine Variable Geometry Turbocharger (VGT) 1 Nozzle Position	Mechanical System not Responding or Out of Adjustment	Engine VGT Nozzle Position - Mechanical system not responding or out of adjustment
2634	3	1776	Power Relay	Voltage Above Normal or Shorted to High Source	Power Relay Driver Circuit - Voltage above normal, or shorted to high source
2634	4	1777	Power Relay	Voltage Below Normal or Shorted to Low Source	Power Relay Driver Circuit - Voltage below normal, or shorted to low source
2789	15	2346	Engine Turbocharger 1 Calculated Turbine Intake Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe
2789	16	2451	Engine Turbocharger 1 Calculated Turbine Intake Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
2791	5	2349	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	Current Below Normal or Open Circuit	EGR Valve Control Circuit - Current below normal or open circuit

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2791	6	2353	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	Current Above Normal or Grounded Circuit	EGR Valve Control Circuit - Current above normal or grounded circuit
2791	7	2357	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	Mechanical System not Responding or Out of Adjustment	EGR Valve Control Circuit - Mechanical system not responding or out of adjustment
2791	9	1893	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	Abnormal Update Rate	EGR Valve Control Circuit - Abnormal update rate
2791	13	1896	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	Out of Calibration	EGR Valve Controller - Out of Calibration
2791	15	1961	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	Data Valid but Above Normal Operating Range - Least Severe Level	EGR Valve Control Circuit Over Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
2797	13	2765	Engine Injector Group 1	Out of Calibration	Engine Injector Bank 1 Barcodes - Out of Calibration
2884	9	3735	Engine Auxillary Governor Switch	Abnormal Update Rate	Engine Auxiliary Governor Switch - Abnormal update rate
2978	9	3838	Estimated Engine Parasitic Losses - Percent Torque	Abnormal Update Rate	Estimated Engine Parasitic Losses - Percent Torque - Abnormal update rate
3031	2	1679	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Data erratic, intermittent or incorrect
3031	3	1678	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor - Voltage above normal, or shorted to high source
3031	4	1677	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor - Voltage below normal, or shorted to low source
3031	5	4682	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Current Below Normal or Open Circuit	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor Circuit - Current below normal or open circuit
3031	6	4736	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Current Above Normal or Grounded Circuit	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor Circuit - Current above normal or grounded circuit
3031	9	4572	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Abnormal Update Rate	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Abnormal Update Rate
3031	11	4737	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Root Cause Not Known	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Root Cause Not Known
3031	13	4731	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Out of Calibration	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor - Out of Calibration
3060	18	3243	Engine Cooling System Monitor	Data Valid but Below Normal Operating Range - Moderately Severe Level	Engine Cooling System Monitor - Data Valid But Below Normal Operating Range - Moderately Severe Level
3216	2	3228	Aftertreatment 1 Intake NOx	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Intake NOx Sensor - Data erratic, intermittent or incorrect
3216	4	1885	Aftertreatment 1 Intake Nox	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Intake NOx Sensor Circuit - Voltage below normal, or shorted to low source
3216	9	3232	Aftertreatment 1 Intake NOx	Abnormal Update Rate	Aftertreatment 1 Intake NOx Sensor - Abnormal update rate
3216	10	3725	Aftertreatment 1 Intake NOx	Abnormal Rate of Change	Aftertreatment 1 Intake NOx Sensor - Abnormal rate of change
3216	13	3718	Aftertreatment 1 Intake NOx	Out of Calibration	Aftertreatment 1 Intake NOx - Out of Calibration
3216	16	3726	Aftertreatment 1 Intake NOx	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Intake NOx - Data Valid But Above Normal Operating Range - Moderately Severe Level
3216	20	3748	Aftertreatment 1 Intake NOx	Data not Rational - Drifted High	Aftertreatment 1 Intake NOx Sensor - Data not Rational - Drifted High
3217	2	1861	Aftertreatment 1 Intake O2	Data Erratic, Intermittent or Incorrect	Aftertreatment Intake Oxygen Sensor - Data erratic, intermittent or incorrect

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3218	2	3682	Aftertreatment 1 Intake Gas Sensor Power Status	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Intake NOx Sensor Power Supply - Data erratic, intermittent or incorrect
3226	2	1694	Aftertreatment 1 Outlet NOx	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Outlet NOx Sensor - Data erratic, intermittent or incorrect
3226	4	1887	Aftertreatment 1 Outlet NOx	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Outlet NOx Sensor Circuit - Voltage below normal, or shorted to low source
3226	9	2771	Aftertreatment 1 Outlet NOx	Abnormal Update Rate	Aftertreatment 1 Outlet NOx Sensor - Abnormal update rate
3226	10	3545	Aftertreatment 1 Outlet NOx	Abnormal Rate of Change	Aftertreatment 1 Outlet NOx Sensor - Abnormal rate of change
3226	13	3717	Aftertreatment 1 Outlet NOx	Out of Calibration	Aftertreatment 1 Outlet NOx Sensor - Out of Calibration
3226	20	3749	Aftertreatment 1 Outlet NOx	Data not Rational - Drifted High	Aftertreatment 1 Outlet NOx Sensor - Data not Rational - Drifted High
3227	9	2683	Aftertreatment 1 Outlet O2	Abnormal Update Rate	Aftertreatment Outlet Oxygen Sensor Circuit - Abnormal update rate
3228	2	3681	Aftertreatment 1 Outlet Gas Sensor Power Status	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Outlet NOx Sensor Power Supply - Data erratic, intermittent or incorrect
3242	0	3311	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data valid but above normal operation
3242	2	3318	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data erratic, intermittent or incorrect
3242	3	3317	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
3242	4	3316	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
3242	15	3254	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range
3242	16	3253	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range
3246	0	3312	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data valid but above normal operation
3246	2	3322	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data erratic, intermittent or incorrect
3246	3	3319	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source
3246	4	3321	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source
3246	15	3256	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range
3246	16	3255	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range

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3249	17	2742	Aftertreatment 1 Exhaust Gas Temperature 2	Data Valid but Below Normal Operating Range - Least Severe Level	Aftertreatment Exhaust Gas Temperature 2 - Data Valid But Below Normal Operating Range - Least Severe Level
3249	18	2743	Aftertreatment 1 Exhaust Gas Temperature 2	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment Exhaust Gas Temperature 2 - Data Valid But Below Normal Operating Range - Moderately Severe Level
3251	0	1922	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment Diesel Particulate Filter Differential Pressure - Data valid but above normal Operating Range
3251	2	1883	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Data Erratic, Intermittent or Incorrect	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor - Data erratic, intermittent or incorrect
3251	3	1879	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Voltage Above Normal or Shorted to High Source	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage above normal
3251	4	1881	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Voltage Below Normal or Shorted to Low Source	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage below normal
3251	15	2639	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment Diesel Particulate Filter Differential Pressure - Data valid but above normal Operating Range
3251	16	1921	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range
3255	9	4145	Aftertreatment 2 Intake NOx	Abnormal Update Rate	Aftertreatment 2 Intake Nox Sensor - Abnormal update rate
3265	9	3988	Aftertreatment 2 Outlet NOx	Abnormal Update Rate	Aftertreatment 2 Outlet NOx - Abnormal Update Rate
3353	3	4953	Alternator 1 Status	Voltage Above Normal or Shorted to High Source	Alternator 1 Status - Voltage Above Normal, or Shorted to High Source
3353	4	4954	Alternator 1 Status	Voltage Below Normal or Shorted to Low Source	Alternator 1 Status - Voltage Below Normal, or Shorted to Low Source
3361	2	2976	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Temperature - Data erratic, intermittent or incorrect
3361	3	3558	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage above normal, or shorted to high source
3361	4	3559	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage below normal, or shorted to low source
3362	31	1682	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Input Lines	Not Available or Condition Exists	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Input Lines - Condition Exists
3363	3	1683	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage above normal, or shorted to high source
3363	4	1684	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage below normal, or shorted to low source
3363	7	3242	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Mechanical System not Responding or Out of Adjustment	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Mechanical system not responding or out of adjustment
3363	16	1713	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Above Normal Operating Range - Moderately Severe Level
3363	18	1712	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Below Normal Operating Range - Moderately Severe Level
3364	1	3866	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Data Valid but Below Normal Operational Range - Most Severe Level	Aftertreatment Diesel Exhaust Fluid Quality - Data valid but below normal operational range - Most Severe Level
3364	2	3878	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Data Erratic, Intermittent or Incorrect	Aftertreatment Diesel Exhaust Fluid Quality - Data erratic, intermittent or incorrect

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3364	3	1686	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Voltage Above Normal or Shorted to High Source	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Voltage above normal, or shorted to high source
3364	4	1685	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Voltage Below Normal or Shorted to Low Source	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Voltage below normal, or shorted to low source
3364	5	4741	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Current Below Normal or Open Circuit	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Current below normal or open circuit
3364	6	4742	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Current Above Normal or Grounded Circuit	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Current above normal or grounded circuit
3364	7	3876	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Mechanical System not Responding or Out of Adjustment	Aftertreatment Diesel Exhaust Fluid Quality Sensor - Mechanical system not responding or out of adjustment
3364	9	3868	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Abnormal Update Rate	Aftertreatment Diesel Exhaust Fluid Quality - Abnormal update rate
3364	10	4277	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Abnormal Rate of Change	Aftertreatment Diesel Exhaust Fluid Quality - Abnormal Rate of Change
3364	11	1715	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Root Cause Not Known	Aftertreatment Diesel Exhaust Fluid Quality - Root Cause Not Known
3364	12	3877	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Bad Intelligent Device or Component	Aftertreatment Diesel Exhaust Fluid Quality Sensor - Bad intelligent device or component
3364	13	1714	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Out of Calibration	Aftertreatment Diesel Exhaust Fluid Quality - Out of Calibration
3364	15	4842	Aftertreatment Diesel Exhaust Fluid Quality	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment Diesel Exhaust Fluid Quality - Data Valid But Above Normal Operating Range - Least Severe Level
3364	18	3867	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment Diesel Exhaust Fluid Quality - Data Valid But Below Normal Operating Range - Moderate Severe Level
3364	19	4241	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Received Network Data in Error	Aftertreatment Diesel Exhaust Fluid Quality - Received Network Data In Error
3480	2	1926	Aftertreatment Fuel Pressure	Data Erratic, Intermittent or Incorrect	Aftertreatment Fuel Pressure Sensor - Data erratic, intermittent or incorrect
3480	3	1927	Aftertreatment Fuel Pressure	Voltage Above Normal or Shorted to High Source	Aftertreatment Fuel Pressure Sensor Circuit - Voltage above normal, or shorted to high source
3480	4	1928	Aftertreatment Fuel Pressure	Voltage Below Normal or Shorted to Low Source	Aftertreatment Fuel Pressure Sensor Circuit - Voltage below normal, or shorted to low source
3480	17	2881	Aftertreatment Fuel Pressure	Data Valid but Below Normal Operating Range - Least Severe Level	Aftertreatment Fuel Pressure Sensor - Data Valid But Below Normal Operating Range - Least Severe Level
3481	16	2778	Aftertreatment 1 Fuel Rate	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Fuel Rate - Data Valid But Above Normal Operating Range - Moderately Severe Level
3482	2	1925	Aftertreatment 1 Fuel Enable Actuator	Data Erratic, Intermittent or Incorrect	Aftertreatment Fuel Shutoff Valve - Data erratic, intermittent or incorrect
3482	3	1923	Aftertreatment 1 Fuel Enable Actuator	Voltage Above Normal or Shorted to High Source	Aftertreatment Fuel Shutoff Valve Circuit - Voltage above normal, or shorted to high source
3482	4	1924	Aftertreatment 1 Fuel Enable Actuator	Voltage Below Normal or Shorted to Low Source	Aftertreatment Fuel Shutoff Valve Circuit - Voltage below normal, or shorted to low source
3482	7	1963	Aftertreatment 1 Fuel Enable Actuator	Mechanical System not Responding or Out of Adjustment	Aftertreatment Fuel Shutoff Valve - Mechanical system not responding or out of adjustment
3482	13	2741	Aftertreatment 1 Fuel Enable Actuator	Out of Calibration	Aftertreatment Fuel Shutoff Valve Swapped - Out of Calibration
3482	16	4568	Aftertreatment 1 Fuel Enable Actuator	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Fuel Shutoff Valve - Data Valid But Above Normal Operating Range - Moderately Severe

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3490	3	3224	Aftertreatment 1 Purge Air Actuator	Voltage Above Normal or Shorted to High Source	Aftertreatment Purge Air Actuator Circuit - Voltage above normal, or shorted to high source
3490	4	3223	Aftertreatment 1 Purge Air Actuator	Voltage Below Normal or Shorted to Low Source	Aftertreatment Purge Air Actuator Circuit - Voltage below normal, or shorted to low source
3490	7	3225	Aftertreatment 1 Purge Air Actuator	Mechanical System not Responding or Out of Adjustment	Aftertreatment Purge Air Actuator - Mechanical system not responding or out of adjustment
3509	3	386	Sensor supply voltage 1	Voltage Above Normal or Shorted to High Source	Sensor Supply 1 Circuit - Voltage above normal, or shorted to high source
3509	4	352	Sensor supply voltage 1	Voltage Below Normal or Shorted to Low Source	Sensor Supply 1 Circuit - Voltage below normal, or shorted to low source
3510	3	227	Sensor supply voltage 2	Voltage Above Normal or Shorted to High Source	Sensor Supply 2 Circuit - Voltage above normal, or shorted to high source
3510	4	187	Sensor supply voltage 2	Voltage Below Normal or Shorted to Low Source	Sensor Supply 2 Circuit - Voltage below normal, or shorted to low source
3511	3	239	Sensor supply voltage 3	Voltage Above Normal or Shorted to High Source	Sensor Supply 3 Circuit - Voltage above normal, or shorted to high source
3511	4	238	Sensor supply voltage 3	Voltage Below Normal or Shorted to Low Source	Sensor Supply 3 Circuit - Voltage below normal, or shorted to low source
3512	3	2185	Sensor supply voltage 4	Voltage Above Normal or Shorted to High Source	Sensor Supply 4 Circuit - Voltage above normal, or shorted to high source
3512	4	2186	Sensor supply voltage 4	Voltage Below Normal or Shorted to Low Source	Sensor Supply 4 Circuit - Voltage below normal, or shorted to low source
3513	3	1695	Sensor supply voltage 5	Voltage Above Normal or Shorted to High Source	Sensor Supply 5 - Voltage above normal, or shorted to high source
3513	4	1696	Sensor supply voltage 5	Voltage Below Normal or Shorted to Low Source	Sensor Supply 5 - Voltage below normal, or shorted to low source
3514	3	515	Sensor supply voltage 6	Voltage Above Normal or Shorted to High Source	Sensor Supply 6 Circuit - Voltage above normal, or shorted to high source
3514	4	516	Sensor supply voltage 6	Voltage Below Normal or Shorted to Low Source	Sensor Supply 6 Circuit - Voltage below normal, or shorted to low source
3515	2	4242	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 - Data erratic, intermittent or incorrect
3515	3	4233	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Voltage above normal, or shorted to high source
3515	4	4234	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Voltage below normal, or shorted to low source
3515	5	4743	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Current Below Normal or Open Circuit	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Current below normal or open circuit
3515	6	4744	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Current Above Normal or Grounded Circuit	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Current above normal or grounded
3515	10	4243	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Abnormal Rate of Change	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 - Abnormal Rate of Change
3515	11	4745	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Root Cause Not Known	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 - Root Cause Not Known
3521	11	4768	Aftertreatment 1 Diesel Exhaust Fluid Property	Root Cause Not Known	Aftertreatment 1 Diesel Exhaust Fluid Property - Root Cause Not Known

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3521	31	4235	Aftertreatment 1 Diesel Exhaust Fluid Property	Not Available or Condition Exists	Aftertreatment 1 Diesel Exhaust Fluid Property - Condition Exists
3555	17	1943	Ambient Air Density	Data Valid but Below Normal Operating Range - Least Severe Level	Ambient Air Density - Data Valid But Below Normal Operating Range - Least Severe Level
3556	2	1932	Aftertreatment Hydrocarbon Doser	Data Erratic, Intermittent or Incorrect	Aftertreatment Doser - Data erratic, intermittent or incorrect
3556	5	1977	Aftertreatment Hydrocarbon Doser	Current Below Normal or Open Circuit	Aftertreatment Doser Circuit - Current below normal or open circuit.
3556	7	1964	Aftertreatment Hydrocarbon Doser	Mechanical System not Responding or Out of Adjustment	Aftertreatment Doser - Mechanical system not responding or out of adjustment
3556	18	3167	Aftertreatment Hydrocarbon Doser	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment Doser - Data Valid But Below Normal Operating Range - Moderately Severe Level
3597	2	1117	ECU Power Output Supply Voltage #1	Data Erratic, Intermittent or Incorrect	Power Supply Lost With Ignition On - Data erratic, intermittent or incorrect
3597	3	1939	ECU Power Output Supply Voltage #1	Voltage Above Normal or Shorted to High Source	ECU Power Output Supply Voltage 1 - Voltage above normal, or shorted to high source
3597	4	1941	ECU Power Output Supply Voltage #1	Voltage Below Normal or Shorted to Low Source	ECU Power Output Supply Voltage 1 - Voltage below normal, or shorted to low source
3597	12	351	ECU Power Output Supply Voltage #1	Bad Intelligent Device or Component	Injector Power Supply - Bad intelligent device or component
3597	18	1938	ECU Power Output Supply Voltage #1	Data Valid but Below Normal Operating Range - Moderately Severe Level	ECU Power Output Supply Voltage 1 - Data Valid But Below Normal Operating Range - Moderately Severe Level
3610	2	3135	Aftertreatment Diesel Particulate Filter Outlet Pressure	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure - Data erratic, intermittent or incorrect
3610	3	3133	Aftertreatment Diesel Particulate Filter Outlet Pressure	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage above normal, or shorted to high source
3610	4	3134	Aftertreatment Diesel Particulate Filter Outlet Pressure	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage below normal, or shorted to low source
3667	2	5221	Engine Air Shutoff Status	Data Erratic, Intermittent or Incorrect	Engine Air Shutoff Status - Data erratic, intermittent or incorrect
3667	3	3139	Engine Air Shutoff Status	Voltage Above Normal or Shorted to High Source	Engine Air Shutoff Circuit - Voltage above normal, or shorted to high source
3667	4	3141	Engine Air Shutoff Status	Voltage Below Normal or Shorted to Low Source	Engine Air Shutoff Circuit - Voltage below normal, or shorted to low source
3667	7	4484	Engine Air Shutoff	Mechanical System not Responding or Out of Adjustment	Engine Air Shutoff - Mechanical System Not Responding or Out of Adjustment
3695	2	4213	Diesel Particulate Filter Regeneration Inhibit Switch	Data Erratic, Intermittent or Incorrect	Aftertreatment Diesel Particulate Filter Regeneration Inhibit Switch - Data erratic, intermittent or incorrect
3703	31	2777	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch	Not Available or Condition Exists	Particulate Trap Active Regeneration Inhibited Due to Inhibit Switch - Condition Exists
3713	31	3753	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout	Not Available or Condition Exists	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout - Condition Exists
3750	31	3396	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration	Not Available or Condition Exists	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration - Condition Exists

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
3826	18	4573	Aftertreatment 1 Diesel Exhaust Fluid Average Consumption	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Average Consumption - Data Valid But Below Normal Operating Range
3936	7	3245	Aftertreatment 1 Diesel Particulate Filter System	Mechanical System not Responding or Out of Adjustment	Aftertreatment 1 Diesel Particulate Filter System - Mechanical system not responding or out of adjustment
3936	14	4584	Aftertreatment Diesel Particulate Filter System	Special Instructions	Aftertreatment Diesel Particulate Filter System - Special Instructions
3936	15	1981	Aftertreatment Diesel Particulate Filter System	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment 1 Diesel Particulate Filter System - Data Valid But Above Normal Operating Range - Level
4094	31	3543	NOx limits exceeded due to Insufficient Diesel Exhaust Fluid Quality	Not Available or Condition Exists	NOx limits exceeded due to Insufficient Reagent Quality - Condition Exists
4096	31	3547	NOx limits exceeded due to Empty Diesel Exhaust Fluid Tank	Not Available or Condition Exists	Aftertreatment Diesel Exhaust Fluid Tank Empty - Condition Exists
4097	3	2732	Aftertreatment 1 Fuel Drain Actuator	Voltage Above Normal or Shorted to High Source	Aftertreatment Fuel Drain Valve Circuit - Voltage above normal, or shorted to high source
4097	4	2733	Aftertreatment 1 Fuel Drain Actuator	Voltage Below Normal or Shorted to Low Source	Aftertreatment Fuel Drain Valve Circuit - Voltage below normal, or shorted to low source
4097	7	2878	Aftertreatment 1 Fuel Drain Actuator	Mechanical System not Responding or Out of Adjustment	Aftertreatment Fuel Drain Valve - Mechanical system not responding or out of adjustment
4182	4	3695	Generator Output Frequency Adjust Potentiometer Circuit	Voltage Below Normal or Shorted to Low Source	Generator Output Frequency Adjust Potentiometer Circuit - Voltage below normal, or shorted to low source
4183	4	3696	Droop Adjust Potentiometer Circuit	Voltage Below Normal or Shorted to Low Source	Droop Adjust Potentiometer Circuit - Voltage below normal, or shorted to low source
4184	4	3694	Gain Adjust Potentiometer Circuit	Voltage Below Normal or Shorted to Low Source	Gain Adjust Potentiometer Circuit - Voltage below normal, or shorted to low source
4185	31	1427	Overspeed Shutdown Relay Driver	Not Available or Condition Exists	Overspeed Shutdown Relay Driver Diagnostic has detected an error - Condition Exists
4186	31	1428	Low Oil Pressure Shutdown Relay Driver	Not Available or Condition Exists	Low Oil Pressure (LOP) Shutdown Relay Driver Diagnostic has detected an error - Condition Exists
4187	31	1429	High Engine Temperature Shutdown Relay Driver	Not Available or Condition Exists	High Engine Temperature (HET) Shutdown Relay Driver Diagnostic has detected an error - Condition Exists
4188	31	1431	Pre-Low Oil Pressure Indicator Relay Driver	Not Available or Condition Exists	Pre-Low Oil Pressure Warning Relay Driver Diagnostic has detected an error - Condition Exists
4223	31	1432	Pre-High Engine Temperature Warning Relay Driver	Not Available or Condition Exists	Pre-High Engine Temperature Warning Relay Driver Diagnostic has detected an error - Condition Exists
4331	18	4658	Aftertreatment 1 Diesel Exhaust Fluid Actual Dosing Quantity	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment SCR Actual Dosing Reagent Quantity - Data Valid But Below Normal Operating Range - Mo
4334	2	3596	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data erratic, intermittent or incorrect
4334	3	3571	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage above normal, or shorted to high source
4334	4	3572	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage below normal, or shorted to low source
4334	16	3575	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Above Normal Operating Range
4334	18	3574	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Below Normal Operating Range
4337	2	4244	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Data erratic, intermittent or incorrect

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
4337	3	4174	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature Sensor	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature Sensor - Voltage Above Normal, or Shorted to High Source
4337	4	4175	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature Sensor	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature Sensor - Voltage below normal, or shorted to low source
4337	10	4249	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature	Abnormal Rate of Change	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Abnormal Rate of Change
4339	31	4586	Aftertreatment 1 SCR Feedback Control Status	Not Available or Condition Exists	Aftertreatment 1 SCR Feedback Control Status - Condition Exists
4340	3	3237	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 State	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage above normal, or shorted to high source
4340	4	3238	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 State	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage below normal, or shorted to low source
4340	5	3258	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 State	Current Below Normal or Open Circuit	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Current below normal or open circuit
4342	3	3239	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 State	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage above normal, or shorted to high source
4342	4	3241	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 State	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage below normal, or shorted to low source
4342	5	3261	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 State	Current Below Normal or Open Circuit	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Current below normal or open circuit
4344	3	3422	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 State	Voltage Above Normal or Shorted to High Source	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Voltage above normal, or shorted to high source
4344	4	3423	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 State	Voltage Below Normal or Shorted to Low Source	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Voltage below normal, or shorted to low source
4344	5	3425	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 State	Current Below Normal or Open Circuit	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Current below normal or open circuit
4360	0	3229	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment 1 SCR Intake Temperature - Data valid but above normal operational range - Most Severe Level
4360	2	3144	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 SCR Intake Temperature Sensor - Data erratic, intermittent or incorrect
4360	3	3142	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 SCR Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
4360	4	3143	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 SCR Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
4360	15	3164	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment 1 SCR Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe
4360	16	3231	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 SCR Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
4360	16	5247	Aftertreatment 1 SCR Intake Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 SCR Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
4363	0	3165	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment 1 SCR Outlet Temperature - Data valid but above normal operational range - Most Severe
4363	2	3148	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 SCR Outlet Temperature Sensor - Data erratic, intermittent or incorrect

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
4363	3	3146	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source
4363	4	3147	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source
4363	16	3235	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 SCR Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
4364	18	3582	Aftertreatment 1 SCR Conversion Efficiency	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment SCR Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level
4376	3	3577	Aftertreatment 1 Diesel Exhaust Fluid Return Valve	Voltage Above Normal or Shorted to High Source	Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage above normal, or shorted to high source
4376	4	3578	Aftertreatment 1 Diesel Exhaust Fluid Return Valve	Voltage Below Normal or Shorted to Low Source	Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage below normal, or shorted to low source
4376	7	4157	Aftertreatment 1 Diesel Exhaust Fluid Return Valve	Mechanical System not Responding or Out of Adjustment	Aftertreatment Diesel Exhaust Fluid Return Valve - Mechanical system not responding or out of adjust
4490	9	3367	Specific Humidity	Abnormal Update Rate	Specific Humidity Sensor - Abnormal update rate
4490	19	3368	Specific Humidity	Received Network Data in Error	Specific Humidity Sensor - Received Network Data In Error
4765	2	3315	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data erratic, intermittent or incorrect
4765	3	3314	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
4765	4	3313	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
4765	13	3325	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Out of Calibration	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Swapped - Out of Calibration
4765	16	3251	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data Valid But Above Normal Operating Range
4766	0	5387	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature - Data Valid But Above Normal Operating Range - Most Severe Level
4766	2	5386	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature - Data Erratic, Intermittent, or Incorrect
4766	3	4533	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
4766	3	4534	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
4766	15	5389	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
4766	16	5388	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
4792	7	3751	Aftertreatment SCR Catalyst System	Mechanical System not Responding or Out of Adjustment	Aftertreatment SCR Catalyst System - Mechanical system not responding or out of adjustment
4792	14	4585	Aftertreatment 1 SCR Catalyst System	Special Instructions	Aftertreatment 1 SCR Catalyst System - Special Instructions
4793	31	3158	Aftertreatment Warm Up Diesel Oxidation Catalyst	Not Available or Condition Exists	Aftertreatment Warm Up Diesel Oxidation Catalyst Missing - Condition Exists
4794	31	3151	Aftertreatment 1 SCR Catalyst System	Not Available or Condition Exists	Aftertreatment 1 SCR Catalyst System Missing - Condition Exists
4795	31	1993	Aftertreatment 1 Diesel Particulate Filter Missing	Not Available or Condition Exists	Aftertreatment 1 Diesel Particulate Filter Missing - Condition Exists
4796	31	1664	Aftertreatment 1 Diesel Oxidation Catalyst Missing	Not Available or Condition Exists	Aftertreatment 1 Diesel Oxidation Catalyst Missing - Condition Exists
4809	2	3154	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature - Data erratic, intermittent or incorrect
4809	3	3152	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage above normal
4809	4	3153	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage below normal
4809	13	3166	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Out of Calibration	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature Sensor Swapped - Out of Calibration
4809	16	3247	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature - Data Valid But Above Normal Operating Range
4810	0	3162	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data valid but above normal operating Range –Most Severe level
4810	2	3157	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data erratic, intermittent or incorrect
4810	3	3155	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Voltage Above Normal or Shorted to High Source	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature Sensor Circuit - Voltage above normal
4810	4	3156	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Voltage Below Normal or Shorted to Low Source	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature Sensor Circuit - Voltage below normal
4810	15	3249	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Data Valid but Above Normal Operating Range - Least Severe Level	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data Valid But Above Normal Operating Range
4810	16	3169	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data Valid But Above Normal Operating Range
5018	11	2637	Aftertreatment Diesel Oxidation Catalyst	Root Cause Not Known	Aftertreatment 1 Diesel Oxidation Catalyst Face Plugged - Root Cause Not Known
5019	2	3138	Engine Exhaust Gas Recirculation 1 Outlet Pressure	Data Erratic, Intermittent or Incorrect	Engine Exhaust Gas Recirculation Outlet Pressure - Data erratic, intermittent or incorrect
5019	3	3136	Engine Exhaust Gas Recirculation 1 Outlet Pressure	Voltage Above Normal or Shorted to High Source	Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage above normal, or shorted to high source
5019	4	3137	Engine Exhaust Gas Recirculation 1 Outlet Pressure	Voltage Below Normal or Shorted to Low Source	Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage below normal, or shorted to low source

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
5024	10	3649	Aftertreatment 1 Intake Gas NOx Sensor Heater Ratio	Abnormal Rate of Change	Aftertreatment 1 Intake NOx Sensor Heater - Abnormal rate of change
5031	10	3583	Aftertreatment 1 Outlet Gas NOx Sensor Heater Ratio	Abnormal Rate of Change	Aftertreatment 1 Outlet NOx Sensor Heater - Abnormal rate of change
5097	3	4293	Engine Brake Active Lamp Data	Voltage Above Normal or Shorted to High Source	Engine Brake Active Lamp - Voltage Above Normal, or Shorted to High Source
5097	4	4294	Engine Brake Active Lamp Data	Voltage Below Normal or Shorted to Low Source	Engine Brake Active Lamp - Voltage below normal, or shorted to low source
5125	3	3419	Sensor supply voltage 7	Voltage Above Normal or Shorted to High Source	Sensor Supply 7 Circuit - Voltage above normal, or shorted to high source
5125	4	3421	Sensor supply voltage 7	Voltage Below Normal or Shorted to Low Source	Sensor Supply 7 Circuit - Voltage below normal, or shorted to low source
5245	31	4863	Aftertreatment Selective Catalytic Reduction Operator Inducement Active	Not Available or Condition Exists	Aftertreatment SCR Operator Inducement Active - Condition Exists
5246	0	3712	Aftertreatment SCR Operator Inducement Severity	Data Valid but Above Normal Operational Range - Most Severe Level	Aftertreatment SCR Operator Inducement - Data valid but above normal operational range - Most Severe level
5298	18	1691	Aftertreatment 1 Diesel Oxidation Catalyst Conversion Efficiency	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Oxidation Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level
5319	31	3376	Aftertreatment 1 Diesel Particulate Filter Incomplete Regeneration	Not Available or Condition Exists	Aftertreatment Diesel Particulate Filter Incomplete Regeneration - Condition Exists
5357	31	4713	Engine Fuel Injection Quantity Error for Multiple Cylinders	Not Available or Condition Exists	Engine Fuel Injection Quantity Error for Multiple Cylinders - Condition Exists
5380	11	4936	Engine Fuel Valve 1	Root Cause Not Known	Engine Fuel Valve 1 - Root Cause Not Known
5380	13	4937	Engine Fuel Valve 1	Out of Calibration	Engine Fuel Valve 1 - Out of Calibration
5394	2	3755	Aftertreatment Diesel Exhaust Fluid Dosing Valve	Data Erratic, Intermittent or Incorrect	Aftertreatment Diesel Exhaust Fluid Dosing Valve - Data erratic, intermittent or incorrect
5394	5	3567	Aftertreatment Diesel Exhaust Fluid Dosing Valve	Current Below Normal or Open Circuit	Aftertreatment Diesel Exhaust Fluid Dosing Valve - Current below normal or open circuit
5394	7	3568	Aftertreatment Diesel Exhaust Fluid Dosing Valve	Mechanical System not Responding or Out of Adjustment	Aftertreatment Diesel Exhaust Fluid Dosing Valve - Mechanical system not responding or out of adjustment
5395	16	3337	Engine Idle Fuel Quantity	Data Valid but Above Normal Operating Range - Moderately Severe Level	Engine Idle Fuel Quantity - Data Valid But Above Normal Operating Range - Moderately Severe Level
5395	18	3338	Engine Idle Fuel Quantity	Data Valid but Below Normal Operating Range - Moderately Severe Level	Engine Idle Fuel Quantity - Data Valid But Below Normal Operating Range - Moderately Severe Level
5396	31	3377	Engine Crankcase Ventilation Hose Disconnected	Not Available or Condition Exists	Engine Crankcase Ventilation Hose Disconnected - Condition Exists
5397	31	3375	Aftertreatment 1 Diesel Particulate Filter Regeneration too Frequent	Not Available or Condition Exists	Aftertreatment Diesel Particulate Filter Regeneration too Frequent - Condition Exists
5484	3	3633	Engine Fan Clutch 2 Output Device Driver	Voltage Above Normal or Shorted to High Source	Engine Fan Clutch 2 Control Circuit - Voltage above normal, or shorted to high source
5484	4	3634	Engine Fan Clutch 2 Output Device Driver	Voltage Below Normal or Shorted to Low Source	Engine Fan Clutch 2 Control Circuit - Voltage below normal, or shorted to low source
5491	3	3562	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay	Voltage Above Normal or Shorted to High Source	Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage above normal, or shorted to high source
5491	4	3563	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay	Voltage Below Normal or Shorted to Low Source	Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage below normal, or shorted to low source
5491	7	3713	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay	Mechanical System not Responding or Out of Adjustment	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay - Mechanical system not responding or out of adjustment

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
5571	0	3741	High Pressure Common Rail Fuel Pressure Relief Valve	Data Valid but Above Normal Operational Range - Most Severe Level	High Pressure Common Rail Fuel Pressure Relief Valve - Data valid but above normal operational range
5571	3	4262	High Pressure Common Rail Fuel Pressure Relief Valve	Voltage Above Normal or Shorted to High Source	High Pressure Common Rail Fuel Pressure Relief Valve - Voltage Above Normal, or Shorted to High Source
5571	4	4263	High Pressure Common Rail Fuel Pressure Relief Valve	Voltage Below Normal or Shorted to Low Source	High Pressure Common Rail Fuel Pressure Relief Valve - Voltage below normal, or shorted to low source
5571	7	3727	High Pressure Common Rail Fuel Pressure Relief Valve	Mechanical System not Responding or Out of Adjustment	High Pressure Common Rail Fuel Pressure Relief Valve - Mechanical system not responding or out of adjustment
5571	11	4265	High Pressure Common Rail Fuel Pressure Relief Valve	Root Cause Not Known	High Pressure Common Rail Fuel Pressure Relief Valve - Root Cause Not Known
5571	15	5585	High Pressure Common Rail Fuel Pressure Relief Valve	Data Valid but Above Normal Operating Range - Least Severe Level	High Pressure Common Rail Fuel Pressure Relief Valve - Data Valid But Above Normal Operating Range - Least Severe Level
5571	31	4867	High Pressure Common Rail Fuel Pressure Relief Valve	Not Available or Condition Exists	High Pressure Common Rail Fuel Pressure Relief Valve - Condition Exists
5585	18	4691	Engine Injector Metering Rail 1 Cranking Pressure	Data Valid but Below Normal Operating Range - Moderately Severe Level	Engine Injector Metering Rail 1 Cranking Pressure - Data Valid But Below Normal Operating Range - Mo
5603	9	3843	Cruise Control Disable Command	Abnormal Update Rate	Cruise Control Disable Command - Abnormal update rate
5603	31	3845	Cruise Control Disable Command	Not Available or Condition Exists	Cruise Control Disable Command - Condition Exists
5605	31	3844	Cruise Control Pause Command	Not Available or Condition Exists	Cruise Control Pause Command - Condition Exists
5625	2	5274	Engine Exhaust Back Pressure Regulator Position	Data Erratic, Intermittent or Incorrect	Engine Exhaust Back Pressure Regulator Position - Data Erratic, Intermittent or Incorrect
5625	3	5275	Engine Exhaust Back Pressure Regulator Position Sensor Circuit	Voltage Above Normal or Shorted to High Source	Engine Exhaust Back Pressure Regulator Position Sensor Circuit - Voltage Above Normal, or Shorted to High Source
5625	4	5276	Engine Exhaust Back Pressure Regulator Position Sensor Circuit	Voltage Below Normal or Shorted to Low Source	Engine Exhaust Back Pressure Regulator Position Sensor Circuit - Voltage Below Normal, or Shorted to Low Source
5626	13	5277	Engine Exhaust Back Pressure Regulator	Out of Calibration	Engine Exhaust Back Pressure Regulator - Out of Calibration
5741	2	4451	Aftertreatment 1 Outlet Soot	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Outlet Soot - Data erratic, intermittent or incorrect
5741	3	4143	Aftertreatment 1 Outlet Soot Sensor	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Outlet Soot Sensor - Voltage Above Normal, or Shorted to High Source
5741	4	4144	Aftertreatment 1 Outlet Soot Sensor	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Outlet Soot Sensor - Voltage below normal, or shorted to low source
5742	3	4161	Aftertreatment Diesel Particulate Filter Temperature Sensor Module	Voltage Above Normal or Shorted to High Source	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage Above Normal, or Shorted to high source
5742	4	4162	Aftertreatment Diesel Particulate Filter Temperature Sensor Module	Voltage Below Normal or Shorted to Low Source	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage below normal, or shorted to low source
5742	9	4151	Aftertreatment Diesel Particulate Filter Temperature Sensor Module	Abnormal Update Rate	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Abnormal update rate
5742	11	4259	Aftertreatment Diesel Particulate Filter Temperature Sensor Module	Root Cause Not Known	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Root Cause Not Known
5742	12	4158	Aftertreatment Diesel Particulate Filter Temperature Sensor Module	Bad Intelligent Device or Component	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Bad intelligent device or component

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
5742	16	4163	Aftertreatment Diesel Particulate Filter Temperature Sensor Module	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Diesel Particulate Filter Temperature Sensor Module- Data Valid But Above Normal Operating Range
5743	3	4164	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module	Voltage Above Normal or Shorted to High Source	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage Above Normal, or Shorted to high source
5743	4	4165	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module	Voltage Below Normal or Shorted to Low Source	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage below normal, or Shorted to low source
5743	9	4152	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module	Abnormal Update Rate	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Abnormal update rate
5743	11	4261	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module	Root Cause Not Known	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Root Cause Not Known
5743	12	4159	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module	Bad Intelligent Device or Component	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Bad intelligent device or component
5743	16	4166	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Data Valid But Above Normal
5745	3	4168	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage Above Normal, or Shorted to High
5745	4	4169	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage below normal, or shorted to low source
5745	18	4171	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater	Data Valid but Below Normal Operating Range - Moderately Severe Level	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Data Valid But Below Normal Operating Range
5746	3	4155	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage Above Normal, or Shorted to high source
5746	4	4156	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage below normal, or shorted to low source
5747	3	4153	Aftertreatment 1 Outlet Soot Sensor Heater	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Outlet Soot Sensor Heater - Voltage Above Normal, or Shorted to High Source
5747	4	4154	Aftertreatment 1 Outlet Soot Sensor Heater	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Outlet Soot Sensor Heater - Voltage below normal, or shorted to low source
5747	10	4449	Aftertreatment 1 Outlet Soot Sensor Heater	Abnormal Rate of Change	Aftertreatment 1 Outlet Soot Sensor Heater - Abnormal rate of change
5793	9	4284	Desired Engine Fueling State	Abnormal Update Rate	Desired Engine Fueling State - Abnormal Update Rate
5797	3	4254	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module	Voltage Above Normal or Shorted to High Source	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Voltage Above Normal, or shorted to high source
5797	4	4255	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module	Voltage Below Normal or Shorted to Low Source	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Voltage below normal, or shorted to low source
5797	11	4258	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module	Root Cause Not Known	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Root Cause Not Known
5797	12	4253	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module	Bad Intelligent Device or Component	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Bad intelligent device
5797	16	4256	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Data Valid But Above Normal Operating Range – Moderately Severe Level
5798	2	4245	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature	Data Erratic, Intermittent or Incorrect	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Data erratic, intermittent or incorrect

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
5798	10	4251	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature	Abnormal Rate of Change	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Abnormal Rate of Change
5838	31	4485	EGR Valve Malfunction	Not Available or Condition Exists	EGR Valve Malfunction - Condition Exists
5839	31	4486	Diesel Exhaust Fluid Consumption Malfunction	Not Available or Condition Exists	Diesel Exhaust Fluid Consumption Malfunction - Condition Exists
5840	31	4487	Diesel Exhaust Fluid Dosing Malfunction	Not Available or Condition Exists	Diesel Exhaust Fluid Dosing Malfunction - Condition Exists
5841	31	4488	Diesel Exhaust Fluid Quality Malfunction	Not Available or Condition Exists	Diesel Exhaust Fluid Quality Malfunction - Condition Exists
5842	31	4489	SCR Monitoring System Malfunction	Not Available or Condition Exists	SCR Monitoring System Malfunction - Condition Exists
6301	3	4688	Water in Fuel Indicator 2 Sensor Circuit	Voltage Above Normal or Shorted to High Source	Water in Fuel Indicator 2 Sensor Circuit - Voltage above normal, or shorted to high source
6301	4	4689	Water in Fuel Indicator 2 Sensor Circuit	Voltage Below Normal or Shorted to Low Source	Water in Fuel Indicator 2 Sensor Circuit - Voltage below normal, or shorted to low source
6653	16	4841	Cold Start Injector Metering Rail 1 Pressure	Data Valid but Above Normal Operating Range - Moderately Severe Level	Cold Start Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Moderate Severe Level
6655	3	4951	ECU Power Lamp	Voltage Above Normal or Shorted to High Source	Maintain ECU Power Lamp - Voltage Above Normal, or Shorted to High Source
6655	4	4952	ECU Power Lamp	Voltage Below Normal or Shorted to Low Source	Maintain ECU Power Lamp - Voltage Below Normal, or Shorted to Low Source
6713	9	5177	VGT Actuator Driver Circuit	Abnormal Update Rate	VGT Actuator Driver Circuit - Abnormal update rate
6713	13	4956	Variable Geometry Turbocharger Actuator	Out of Calibration	Variable Geometry Turbocharger Actuator Software - Out of Calibration
6713	31	4957	Variable Geometry Turbocharger Actuator	Not Available or Condition Exists	Variable Geometry Turbocharger Actuator Software - Condition Exists
6881	9	5653	SCR Operator Inducement Override Switch	Abnormal Update Rate	SCR Operator Inducement Override Switch - Abnormal Update Rate
6881	13	5654	SCR Operator Inducement Override Switch	Out of Calibration	SCR Operator Inducement Override Switch - Out of Calibration
520199	3	193	Cruise Control	Voltage Above Normal or Shorted to High Source	Cruise Control (Resistive) Signal Circuit - Voltage above normal, or shorted to high source
520199	4	194	Cruise Control	Voltage Below Normal or Shorted to Low Source	Cruise Control (Resistive) Signal Circuit - Voltage below normal, or shorted to low source
520286	4	5394	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module	Voltage Below Normal or Shorted to Low Source	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module - Voltage Below Normal or Shorted to Low Source
520286	11	5395	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module	Root Cause Not Known	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module - Root Cause Not Known
520320	7	2699	Crankcase Depression Valve	Mechanical System not Responding or Out of Adjustment	Crankcase Depression Valve - Mechanical system not responding or out of adjustment
520332	3	2755	Cruise Control	Voltage Above Normal or Shorted to High Source	Cruise Control (Resistive) #2 Signal Circuit - Voltage above normal, or shorted to high source
520332	4	2756	Cruise Control	Voltage Below Normal or Shorted to Low Source	Cruise Control (Resistive) #2 Signal Circuit - Voltage below normal, or shorted to low source
520435	12	3222	Glow Plug Module	Bad Intelligent Device or Component	Glow Plug Module - Bad intelligent device or component
520595	2	4288	Closed Crankcase Ventilation System Pressure	Data Erratic, Intermittent or Incorrect	Closed Crankcase Ventilation System Pressure - Data erratic, intermittent or incorrect

J1939 SPN	J1939 FMI	Cummins Code	J1939 SPN Description	J1939 FMI Description	Cummins Description
520595	3	4286	Closed Crankcase Ventilation System Pressure Sensor	Voltage Above Normal or Shorted to High Source	Closed Crankcase Ventilation System Pressure Sensor - Voltage Above Normal, or Shorted to High Source
520595	4	4287	Closed Crankcase Ventilation System Pressure Sensor	Voltage Below Normal or Shorted to Low Source	Closed Crankcase Ventilation System Pressure Sensor - Voltage below normal, or shorted to low source
520668	31	4452	Aftertreatment 1 Outlet NOx Sensor Closed Loop Operation	Not Available or Condition Exists	Aftertreatment 1 Outlet NOx Sensor Closed Loop Operation - Condition Exists
520716	3	4752	Aftertreatment 1 Diesel Exhaust Fluid Dosing Valve 1 Heater	Voltage Above Normal or Shorted to High Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Valve 1 Heater - Voltage Above Normal, or Shorted to High Source
520716	4	4753	Aftertreatment 1 Diesel Exhaust Fluid Dosing Valve 1 Heater	Voltage Below Normal or Shorted to Low Source	Aftertreatment 1 Diesel Exhaust Fluid Dosing Valve 1 Heater - Voltage Below Normal, or Shorted to Low Source
520784	3	5183	Fan Blade Pitch Position Sensor Circuit	Voltage Above Normal or Shorted to High Source	Fan Blade Pitch Position Sensor Circuit - Voltage Above Normal, or Shorted to High Source
520784	4	5184	Fan Blade Pitch Position Sensor Circuit	Voltage Below Normal or Shorted to Low Source	Fan Blade Pitch Position Sensor Circuit - Voltage Below Normal, or Shorted to Low Source
520784	5	5185	Fan Blade Pitch	Current Below Normal or Open Circuit	Fan Blade Pitch - Mechanical system not responding or out of adjustment
520791	2	5215	Engine Boost Curve Selection	Data Erratic, Intermittent or Incorrect	Engine Boost Curve Selection - Data erratic, intermittent or incorrect
520808	31	5291	Engine Emergency Shutdown Switch Actived	Not Available or Condition Exists	Engine Emergency Shutdown Switch Actived - Condition Exists
520809	31	5292	Excessive Time Since Last Engine Air Shutoff Maintenance Test	Not Available or Condition Exists	Excessive Time Since Last Engine Air Shutoff Maintenance Test - Condition Exists
520826	3	5393	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module	Voltage Above Normal or Shorted to High Source	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module - Voltage Above Normal or Shorted to High Source
520826	9	5391	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module	Abnormal Update Rate	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module - Abnormal Update Rate
520826	12	5392	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module	Bad Intelligent Device or Component	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module - Bad Intelligent Device or Component
520826	16	5396	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module	Data Valid but Above Normal Operating Range - Moderately Severe Level	Aftertreatment Diesel Oxidation Catalyst Temperature Sensor Module - Data Valid But Above Normal Operating Range - Moderately Severe Level
524286	31	5617	Aftertreatment 1 Diesel Oxidation Catalyst System	Not Available or Condition Exists	Aftertreatment 1 Diesel Oxidation Catalyst System- Special Instruction
524286	31	9491		Not Available or Condition Exists	Reserved for temporary use - Condition Exists
524286	31	9999		Not Available or Condition Exists	Reserved for temporary use - Condition Exists

Options

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 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 and disposing of the condensate, which is often regulated by local, state, and/or federal regulations.

The IQ System automatically adjusts movable louvers to control airflow through the aftercooler, ensuring compressed air temperature always remains above freezing temperatures (typically 45°F (7°C) at any ambient temperature down to the low limit of the ambient temperature range. This eliminates the need for AC heat tracing systems or any manual adjustment to prevent freezing of the compressed air system. All drain points for the condensate handling system are heated with 24VDC heaters which are integral to the compressor heater system.

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. These valves can be locked to prevent unauthorized redirection of the discharge air between Standard and IQ Operation.

If the IQ System is enabled by proper setting of the selector valve, the compressed air first enters the aftercooler. The aftercooler is cooled by the incoming compressor package air, which is controlled by movable louvers mounted on the aftercooler. In most conditions, the louvers are fully open and maximum aftercooling is available. The compressed air and condensate (water with a small amount of compressor oil) 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 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 strainers and constant-bleed orifices which are sized to allow the maximum flow of condensate while minimizing compressed air loss. The condensate lines are then piped together and the condensate is injected at a single point into the engine exhaust piping.

After removing the condensate and filtering, the compressed air then travels through IQ Minimum Pressure Valve and out through the IQ Service Air Valve (see IQ System Configuration later in this section).

The Air Pressure Gauge on the instrument panel indicates the pressure inside the Separator Tank. 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, depending on the restriction of the filters.

⚠ CAUTION

The compressor regulation system is adjusted to maintain regulated pressure at the Separator Tank. DO NOT adjust regulation to provide full rated pressure at the service valve when the IQ System is enabled. This will result in operation at excessive horsepower levels, causing overheating, reduced engine life, and reduced airend life.

NOTICE

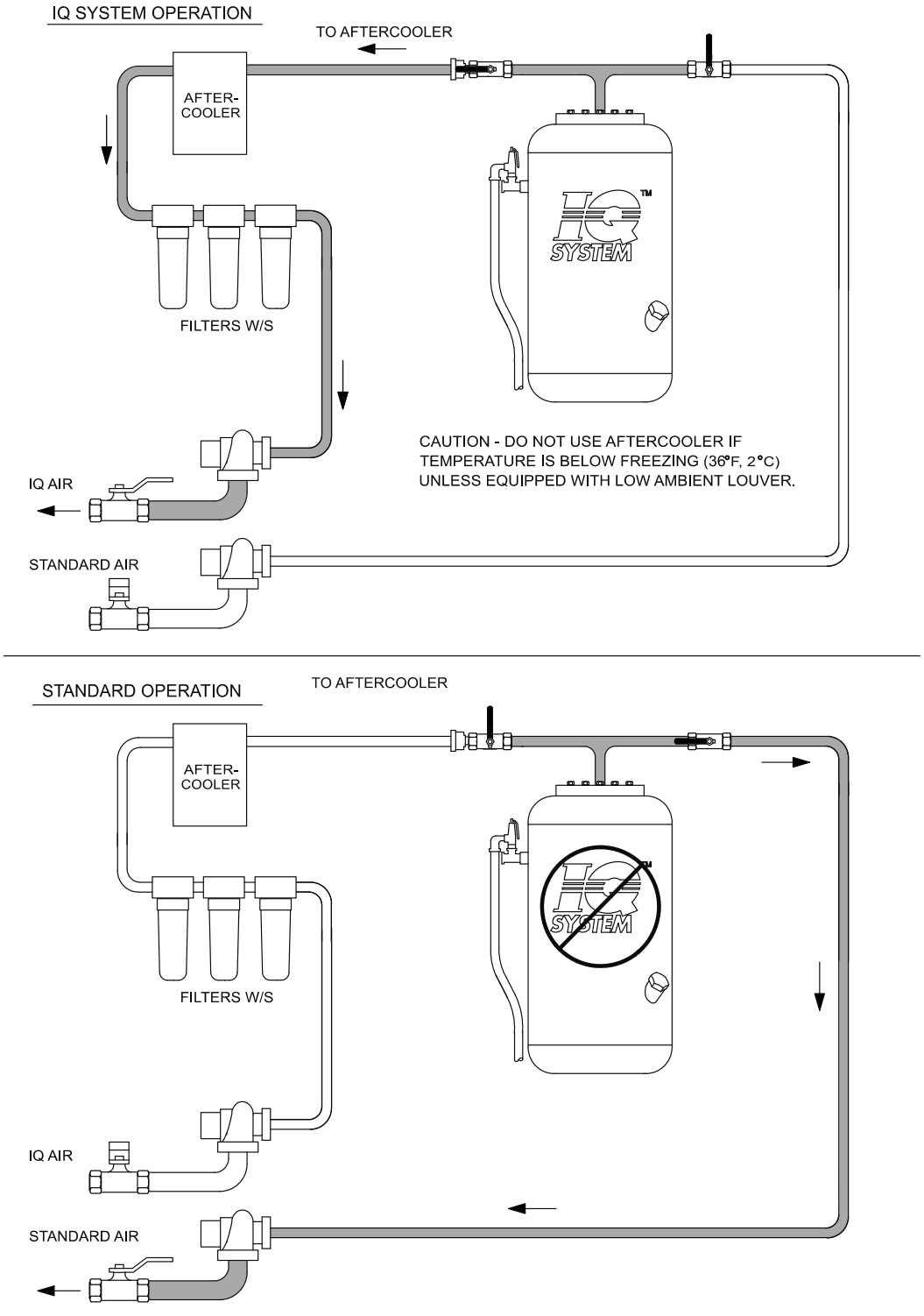
Keep all doors and panels closed during operation to direct proper flow of cooling air across the aftercooler and maintain aftercooling performance.

Low Ambient Option Operation

When the ambient temperature falls to the point that the aftercooler outlet temperature is approaching 45°F (7°C), the Temperature Control Unit (TCU), mounted behind the control panel, will automatically adjust the louvers to control the cooling airflow through the aftercooler.

There are no user selectable or serviceable components in the TCU. Contact factory service if any abnormal operation of the low ambient temperature system occurs.

IQ System Configuration



Maintenance

Daily Maintenance

Verify, during full load (maximum compressed air delivery) operation, the IQ System filter restriction is not excessive. Filter restriction can be checked at the control panel. The compressor will shutdown if restriction exceeds recommended values.

⚠ CAUTION

Excessively restricted filter elements may cause an increase in the amount of aerosol water and oil carryover, which could result in damage to downstream equipment. Normal service intervals should not be exceeded.

Weekly Maintenance

- Remove Y-strainer screens at the bottom of the moisture separator and both filters. Clean out any residue.
- Verify the orifices below the Y-strainers are not clogged.
- Verify the piping from the orifice purge points to the exhaust system is not clogged.

⚠ CAUTION

Blockage of the Y-strainers, orifices, or piping can result in flooding of the vessels with condensate. If flooding occurs, excessive condensate may enter the airstream and could result in damage to downstream equipment.

Yearly Maintenance

The normal maintenance interval on the Primary and Secondary IQ System Filter Elements is one year (earlier if pressure drop becomes excessive). High filter restriction will shut down the compressor if restriction exceeds recommended values.

Filter Replacement

- With engine shut down, ensure pressure is relieved from air system.
- Disconnect drains on the bottom of each filter housing. Inspect fittings and hoses for any blockage. Clean if necessary.
- Using a chain wrench or similar tool, loosen the housing. The housing should be removed by hand after initial loosening, taking care to prevent the housing from falling.

Note: Remove complete canister. Removing bottom only will not allow element replacement.

- Remove the filter element.
- Verify the part number and positions of new element vs. old element, as the two IQ filter stages are of different media. Replace filter element. Do not damage outer wrap.
- Put a small amount of petroleum jelly or other non-synthetic grease on the element O-ring to aid installation into the filter head.
- Replace housing. Do not overtighten.
- Repeat the above procedure on the remaining filter element.
- Reconnect drains on the bottom of each filter housing.

Revision History

Rev.	CN Number	Comments
A		Original release
B		Updated Content

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