

# THAWZALL

Tamarack Industries



## XHR

Flameless Air Heater

# Operators Manual



As a new customer of Tamarack Industries we would like to welcome you! We are looking forward to providing you with technical support for your Thawzall unit. Whatever you need we are here to help.

## **Ways to contact us for support**

### **By Phone : 1-888-757-3545**

The main Technical support phone line is staffed monday-friday 7:00 AM to 4:30 PM excluding holidays.

### **After hours support**

Calls received outside of regular hours are directed to the On-call technician. After hours support is reserved for issues that cannot wait until the next business day for resolution. If no answer please leave a message and we will get back to you as soon as possible.

### **By Email : [support@tamarack-ind.com](mailto:support@tamarack-ind.com)**

Feel free to email us at any time with technical questions or parts inquiries. Please include the year make and model of your unit if you have a specific question about your machine so we can better help you. If it is an emergency please call 1-888-757-3545

For more information please visit our website

**[www.thawzall.com](http://www.thawzall.com)**

For model:

**XHR**

Please record the following information from your new Thawzall for future reference. This information is required for all warranty claims.

Purchase date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Machine model: \_\_\_\_XHR\_\_\_\_

Machine serial number: \_\_\_\_\_

\*Vin number located on trailer tongue\*

**Manufactured by Thawzall, LLC**

A DIVISION OF TAMARACK INDUSTRIES

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Alexandria, MN 56308

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# WARNING



## CALIFORNIA - Proposition 65 Warning

Engine exhaust and some of its constituents and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

Some examples of these chemicals are:-

- Lead from lead-based paints
- Crystalline silica from bricks
- Cement and other masonry products
- Arsenic and chromium from chemically treated lumber

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals:

**ALWAYS** work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

# INTRODUCTION

Congratulations on your choice of a Tamarack Industries Thawzall XHR to complement your construction operation. This equipment has been designed and manufactured to meet the needs of the buyer for the efficient heating of construction sites.

Safe, efficient and trouble free operation of your XHR requires that you and anyone else who will be operating or maintaining the Heater, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained in the Operator's Manual.



This manual is applicable to the XHR built by Tamarack Industries. Use the Table of Contents as a guide when searching for specific information.

Keep this manual handy for frequent reference and to pass on to new operators or owners.

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# SAFETY

## SAFETY ALERT SYMBOL

This Safety Alert symbol means  
**ATTENTION! BECOME ALERT!**  
**YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on the Tamarack Heat King and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

### 3 Big Reasons

**Accidents Disable and Kill**  
**Accidents Cost**  
**Accidents Can Be Avoided**

### SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

**DANGER -** Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

**WARNING -** Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

**CAUTION -** Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

# Safety, Installation & Operation

## SAFETY

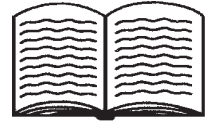
**YOU** are responsible for the **SAFE** operation and maintenance of your Tamarack Industries Heat King. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Heat King be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the Heater.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Heater owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.
- The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Most accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- The Installation must meet the requirements of the B138.2, Portable Oil Burning Equipment- installation requirements
- Think SAFETY! Work SAFELY!

## GENERAL SAFETY

1. Read and understand the Operator's manual and all safety signs before operating, maintaining, adjusting, servicing or cleaning the Heater.
2. Only trained competent persons shall operate the Heater. An untrained operator is not qualified to operate the machine.



3. Have a first-aid kit available for use, should the need arise and know how to use it.



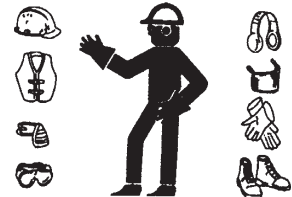
4. Do not allow riders.

5. Have a fire extinguisher available for use should the need arise and know how to use it.



6. Wear appropriate protective gear. This list includes, but is not limited to:

- A hard hat
- Protective boots with slip resistant soles
- Protective goggles
- Heavy gloves
- Hearing protection



7. Place all controls in their OFF position, disconnect power cords and wait for all moving parts to stop before servicing, adjusting or maintaining

8. Wear appropriate hearing protection when operating for long periods of time.



9. Wear protective gloves



10. Ventilation ~ Never operate in a poorly ventilated or enclosed area. Avoid prolonged breathing of exhaust gases.





11. Hot surface ~ Avoid contact with hot exhaust and glycol system. Allow to cool before performing repairs or service.



12. Electrocution Hazard ~ Always use proper size grounded extension cord. Inspect all extension cords for cuts, frayed wires and broken connectors. Do not use cords if not in good condition.



13. Fire Hazard ~ Do not operate machine in the vicinity of open flames, sparks or while smoking.



14. Explosion Hazard ~ Battery  
Take care when handling battery (if installed)



## ELECTRICAL SAFETY

1. Place all controls in their OFF position, disconnect power cords and wait for all moving parts to stop before servicing, adjusting or maintaining.
2. Place all controls in their OFF position before plugging in power cords.
3. Keep all electrical components in good repair before starting.
4. Do not lay power lines or connectors in water or on a wet surface. Dry connectors and raise power lines out of the water before and during operation.
5. Do not operate machine if there are electrical malfunctions. Correct problem before resuming work.

## TIRE SAFETY

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
3. Have a qualified tire dealer or repair service perform required tire maintenance.
4. Torque wheel nuts to 120 ft-lbs

## STORAGE SAFETY

1. Store unit in an area away from human activity.
2. Do not permit children to play on or around the stored Heater.



## FUEL SAFETY



**Danger: To avoid possible injury, fire, or explosion, please read and follow these instructions.**

1. Handle fuel with care. It is highly flammable.
2. Allow burners to cool for 5 minutes before refueling. Clean up spilled fuel before restarting engine.
3. Do not refuel the machine while smoking or when near open flame or sparks.
4. Always use an approved fuel container.
5. Fill fuel tank outdoors.
6. Prevent fires by keeping machine clean of accumulated trash, grease and debris.

## MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the Heater.
2. Place all controls in their OFF position, disconnect power cords and wait for all moving parts to stop before servicing, adjusting or maintaining.
3. Follow good shop practices:
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
4. Keep hands, feet, clothing and hair away from all moving and/or rotating parts.
5. Always wear heavy gloves to prevent burns when handling hot components. Wait until burners, coils and glycol system components have cooled before working on them.
6. Do not attempt any adjustment or maintenance to any system of the Heater unless the power wires are disconnected from the battery.
7. Make sure that all guards, shields and hoods are properly installed and secured before operating the Heater.
8. Securely support the machine using blocks or safety stands before working beneath it or changing tires.
9. Store and transfer diesel fuel, solvents, cleaners or any flammable liquids only in safety standard approved containers.



## OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, servicing, maintaining or adjusting the Heater.
2. Place all controls in their OFF position, disconnect power cords and wait for all moving parts to stop before servicing, adjusting or maintaining.
3. Do not allow riders in or on machine during transport.
4. Clear the area of bystanders, especially small children, before starting and operating.
5. Keep the working area clean and free of debris to prevent slipping or tripping. Clean up fuel spills immediately if they occur.
6. Slow down. Use care when working around unit - the steps, frame or floor may be wet and/or slippery.
7. Do not allow personnel that are taking drugs, alcohol or any medications that impair the senses or when excessively tired or stressed to operate the Heater.
8. Do not operate unit in a poorly ventilated or enclosed area to prevent asphyxiation when the heaters are operating.
9. Do not smoke when connecting fuel source or when working around machine.
10. Always wear heavy gloves when working on the machine to prevent burns when touching hot components.
11. Use the foot pedal switch to engage the hose reel take up or extend function and guide the hose by hand.
12. Keep all electrical lines and components in good working order. Do not operate in wet conditions or when standing in water. Damp or wet conditions can cause shocks or trip the breakers.
13. Keep all components in good condition.
14. Do Not plug or block access doors or vents. Keep 1 foot of clearance around unit.
15. Review safety instructions with operators annually.

## SAFE TRANSPORTATION AND STORAGE



### TRANSPORTING SAFETY

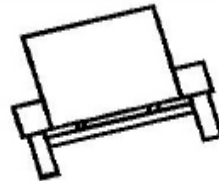
1. Attach to towing vehicle and secure with a mechanical retainer. Cross the safety chains under the hitch and anchor to truck frame.
2. Connect the brake anchor cable to the truck frame to activate the trailer brakes if the trailer unexpectedly unhooks. Provide sufficient slack for turning.
3. Check that all lights and reflectors required by the DOT are clean and functioning.
4. Do not exceed 55 mph under ideal conditions.
5. Do not allow riders on machine.
6. Do not drink and drive.

When transporting the machine, review and follow these instructions:

1. Be sure all bystanders are clear of the machine.
2. Back the truck up to the hitch and lower hitch over the ball.
3. Secure with a mechanical retainer.
4. Cross the safety chains under the hitch and attach to truck frame.
5. Attach the brake line to the truck frame. Be sure to leave sufficient slack for turning.
6. Connect electrical harness to truck plug-in.
7. Raise and secure the hitch jack.
8. Reverse the Heat King set-up procedure
9. Check and be sure that all lights are working.
10. Do not allow riders on machine.
11. Never exceed a safe travel speed.
12. Do not drink and drive.
13. Check with local highway authorities on the specific requirements for transporting fuel oil through their jurisdiction. Always comply with the requirements before transporting.



### WARNING



#### TRAILER TOWING CAN BE HAZARDOUS

- \* DO NOT exceed 55 mph under ideal conditions
- \* Reduce speed under adverse weather, road or terrain conditions
- \* Avoid sudden lane changes, U-turns etc.
- \* Sudden maneuvers may cause tipping, rollover, jackknifing or sliding of the trailer and without warning loss of control of the towing vehicle may result.
- \* Allow for increased braking distance due to weight of trailer
- \* Read the Operator's Manual before towing.

## SIGN-OFF FORM

Tamarack Industries follows the general Safety Standards specified by the Society of Automotive Engineers (SAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the Heat King must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

## SIGN-OFF FORM

[illegible]

**TAMARACK INDUSTRIES  
THAWZALL**

**WARRANTY REGISTRATION FORM & INSPECTION REPORT**

**WARRANTY REGISTRATION (please print)**

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer's Name \_\_\_\_\_

Distributor Name \_\_\_\_\_

Address \_\_\_\_\_

Address \_\_\_\_\_

City, State, Code \_\_\_\_\_

City, State, Code \_\_\_\_\_

Phone Number ( \_\_\_\_ ) \_\_\_\_\_

Check One:

Contact Name \_\_\_\_\_

Private ☐

THAWZALL Model \_\_\_\_\_

Contractor ☐

Serial Number \_\_\_\_\_

Other \_ \_ \_ \_

Delivery Date \_\_\_\_\_

**DISTRIBUTOR INSPECTION REPORT**

\_\_\_\_ Tire Pressure Checked  
\_\_\_\_ Wheel Bolts Torqued  
\_\_\_\_ Brakes Work  
\_\_\_\_ Check Fluid Levels (Fuel and Glycol)  
\_\_\_\_ Lubricate Machine  
\_\_\_\_ Check That All Controls Function  
\_\_\_\_

**SAFETY**

\_\_\_\_ Emergency Stop Switch Works  
\_\_\_\_ All Decals Installed and Legible  
\_\_\_\_ Lights and Reflectors Installed,  
Clean and Working  
\_\_\_\_ Review Operating And  
Safety Instructions

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date \_\_\_\_\_

Dealer's Rep. Signature \_\_\_\_\_

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date \_\_\_\_\_

Owner's Signature \_\_\_\_\_

# Tamarack Industries CONDITIONS OF SALES & LIMITED WARRANTY

All sales made by Tamarack Industries, here after referred to as Tamarack, a Division of ELJO Industries Inc. are subject to these conditions unless otherwise agreed in writing with a duly authorized officer of Tamarack. In all cases of conflict between these conditions and the requirements of the purchase order, these conditions shall prevail.

**(1) SALES POLICY:** Nothing herein shall be construed as abridging the right of Tamarack to sell directly or indirectly to: (a) Federal, State or Provincial Governments or Agencies thereof, or to Agencies employing Federal, State or Provincial Government aid; (b) Purchasers who buy Tamarack's products for sale as integral or assembled parts of their products; (c) Firms operating on a national scale; (d) Any other class of purchaser to whom Tamarack may from time to time, elect to sell.

**(2) PRICES:** All prices are F.O.B. our warehouses, freight allowance as specified on Distributor Net Price Lists. The suggested list prices and discounts schedules are established by Tamarack and are intended to act as a guide for our distributors. Unless otherwise stated in writing, prices are subject to change without notice and will be applied as in effect at time of shipment.

**(3) TERMS:** Unless otherwise agreed upon in writing by an officer of Tamarack, all invoices become due and payable net 30 days following the date in invoice. Interest at the maximum legal rate will be charged on all overdue accounts. Minimum net charge per invoice is \$75.00

**(4) CANCELLATION AND CHANGES:** No orders or sales may be cancelled or changed without the consent of Tamarack. At Tamarack's option cancelled/changed orders are subject to payment of cancellation charges equal to all costs incurred by Tamarack up to the date of cancellation/change.

**(5) DELAYED DELIVERIES:** Tamarack shall not be liable for any delay of merchandise for any cause whatsoever.

**(6) CLAIMS:** All goods shall be deemed delivered to purchaser at the time they are placed in the hands of carrier and consigned to purchaser: loss, damage or destruction of any said merchandise is assumed by purchaser. No claims may be made for shortages unless made in writing within ten days from receipt of merchandise.

**(7) RETURN OF GOODS:** Written permission from Tamarack must be obtained before returning any merchandise. All transportation charges must be borne by the purchaser. Credit for returned goods will be based on the original price paid, less 20%. Special parts or custom-built items cannot be returned for credit.

**(8) LIMITATION OF LIABILITY:** Tamarack's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting

from contract, or the performance or breach thereof, or the design, manufacture, sale, delivery, resale, installation, technical direction of installation, inspection, repair, operation or use of any equipment covered by or furnished under contract shall in no case exceed the price paid by the purchaser for the equipment. Tamarack also disclaims all purchaser for the equipment. Tamarack also disclaims all liability, whether in contract, tort, warranty, or otherwise, to any party other than purchaser.

**(9)** All Price Lists, Catalogues and other material shall remain the property of Tamarack and are subject to return on demand. The Suggested List Prices are established by Tamarack and are intended to act as a guide. All shipping weights shown are approximate.

## LIMITED TAMARACK WARRANTY

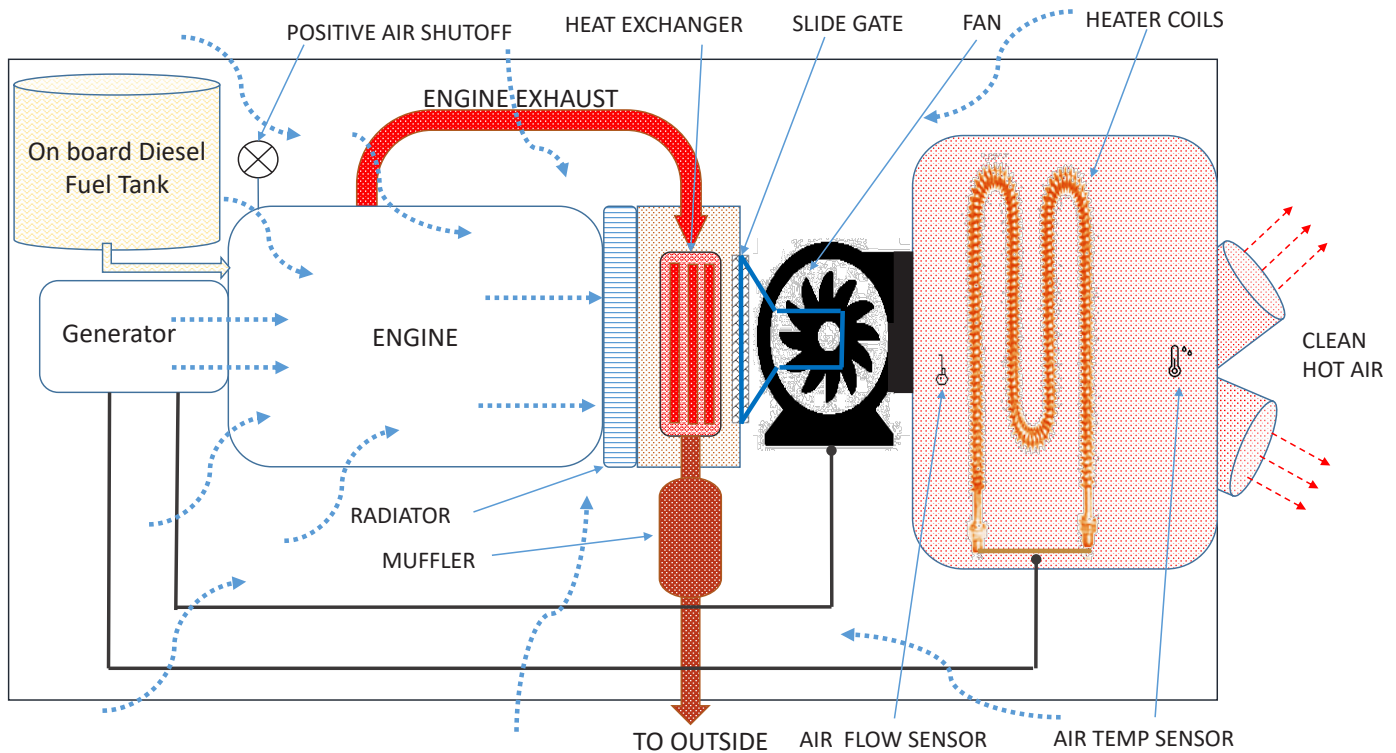
For two years from date of purchase, Tamarack will replace or repair for the original purchaser, free of charge, any part or parts, found upon examination by any Tamarack Authorized Service Depot or by the Tamarack factory, to be defective in material or workmanship or both. Equipment and accessories not manufactured by Tamarack are warranted only to the extent of the original manufacturer's warranty. All transportation charges on parts submitted for replacement or repair under this warranty must be borne by the purchaser. For warranty service contact your nearest Tamarack Authorized Service Depot.

THERE IS NO OTHER EXPRESS WARRANTY, IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO ONE YEAR FROM PURCHASE AND TO THE EXTENT PERMITTED BY LAW. LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES ARE EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW. (THIS WARRANTY IS AN ADDITION TO ANY STATUTORY WARRANTY.)

## WARRANTY VOID IF NOT REGISTERED

P.O. Box 234, Station "L"  
Winnipeg, Manitoba  
Canada R3H 0Z5

# How It Works



## Flameless Heater:


This equipment was designed for space heating of buildings under construction, as an outdoor application with engine exhaust gases discharged outdoors. This unit is a self-contained and does not require an external power supply.

The XHR has a diesel engine and AC alternator which is used to provide power to the on board heater bank and blower motor. External air is drawn into the enclosure, this air is then heated by the residual heat from the internal components. The air is further heated by being drawn through the coolant radiator and through a heat exchanger utilizing hot exhaust gases. This heated air is finally blown across a heater bank to increase the air to the desired temperature setting. This flameless application is well suited for use in hazardous areas where flamed heaters cannot be used. The unit is automated by an onboard computer system with user settable temperature and air speed.

# Controls







## 1. TACTILE KEY'S

- 1.1.  Used for screen navigation & button activation

## 2. TOUCHSCREEN

- 2.1. Displays machine graphics & parameters  
2.2. Touch activation as described in Screen Operation Section

## 3. HMI INDICATORS

- 3.1.  Power Indication & Mode Status  
3.2.  USB Connected  
3.3.  Network Connected  
3.4.  CPU Processing

## 4. DIAL ENCODER

- 4.1.  Parameter Adjustment

## 5. HOME KEY

- 5.1.  Returns To Previous Screen

## 6. ESCAPE KEY

- 6.1.  Returns To Previous Screen

## 7. USB PORT

- 7.1.  Software Update & Factory Use




# OPERATIONS

## STARTUP

### PRE-MACHINE STARTUP

(PRE-STARTUP INSPECTION PERFORMED)

### PRE-ALARM & ENGINE START SEQUENCE

1. At the Main Screen or Engine Screen press 
2. Provided ECU "Wait to Start" lamp is OFF, HMI buzzer will begin to beep for 5sec indicating the Engine is about to start
3. HMI will begin to crank the engine until Cutout RPM reached or 10sec elapses

### ENGINE WARM UP SEQUENCE


1. Engine Idles at Idle RPM until High Idle Engine Temp is reached
2. HMI will command engine to High Idle

### HEAT CONTROL OPERATION

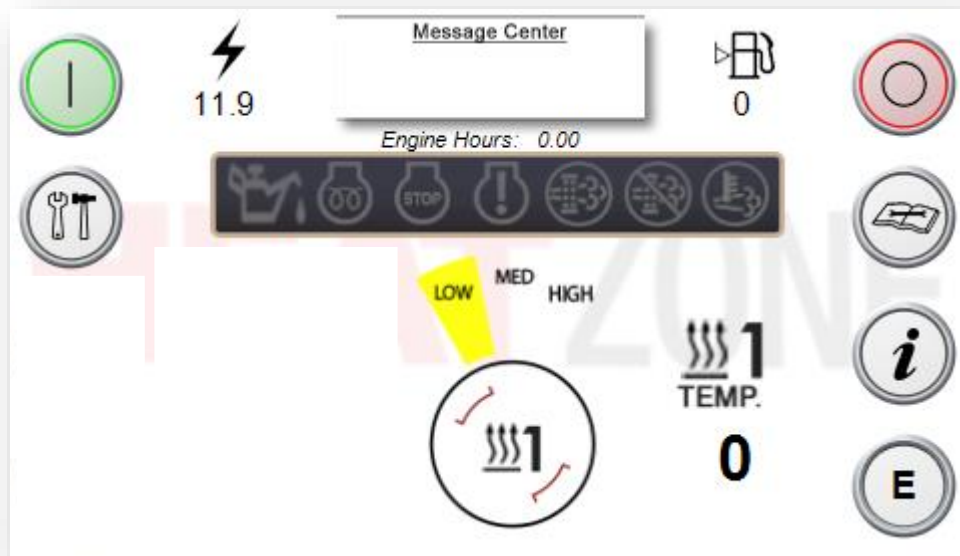
1. HMI turns on Blower after Blower 1 Delay setting
2. HMI Turns on Heater 1 after Heater 1 Delay setting
3. HMI begins Heat Control by cycling heaters 2 thru 4 to achieve desired Heat Setting selected on Main Screen.
  - 3.1. LOW Setpoint Factory Default: 100 DegF
  - 3.2. MED Setpoint Factory Default: 150 DegF
  - 3.3. HIGH Setpoint Factory Default: 200 DegF

**NOTE:** The Heat Control also monitors the Engine Load Percentage which may cause the controller to lower the Heater load for an interval of time. This is to optimize the performance of the equipment while protecting the wear of the engine.


### ENGINE SHUTDOWN SEQUENCE

1. At the Main Screen or Engine Screen press 
2. HMI will turn off Heat Control leaving on the Blower Motor ON. 'SHUTDOWN CYCLE' is displayed in message center.
3. HMI will continue run the Blower Motor until LOW IDLE ENGINE TEMP is reached OR 3min elapses
4. After 5sec HMI will command Engine Idle RPM
5. After 1min HMI will shut off Engine
6. HMI Message Center will display "Machine Ok"

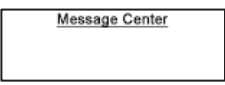
## MAIN SCREEN - OVERVIEW




### 1. DISPLAY

- 1.1.  Engine Battery Voltage is displayed here. Data is transmitted over J1939 network from Engine.

1.1.1. **NOTE:** No Engine data is transmitted when the Ignition is OFF.

- 1.2.  Machine status is displayed here including Faults, Warnings, and Engine Codes.

- 1.3.  Fuel Level is displayed here. Data is transmitted over J1939 from SKIM.

- 1.4.  Engine Hours is displayed here. Data is transmitted over J1939 network from Engine.

- 1.5. Engine Oil Level is displayed with the following icon. Data is transmitted over J1939 network from SKIM.



- Inactive



- Active

1.6.Engine Wait is displayed with the following icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*



- Inactive



- Active

1.7.Engine Stop is displayed with the following icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*



- Inactive



- Active

1.8.Engine Fault is displayed with the following icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*



- Inactive



- Active

1.9.DPF Active is displayed with the following icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*



- Inactive



- Active

1.10.High Exhaust Temp is displayed with the following icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*



- Inactive



- Active

1.11.DPF Disabled is displayed with the following icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*



- Inactive



- Active



1.13.**TEMP.** Duct Temperature is displayed here in Fahrenheit.

## 2. NAVIGATION



2.1. Press adjacent tactile button or touch screen icon to navigate to SETUP SCREEN.

2.1.1. **NOTE:** This feature disappears when equipment is running.



2.2. Press adjacent tactile button or touch screen icon to navigate to MAINTENANCE SCREEN.

2.2.1. **NOTE:** This feature disappears when equipment is running.



2.3. Press adjacent tactile button or touch screen icon to navigate to INFORMATION SCREEN.



2.4. Press adjacent tactile button or touch screen icon to navigate to ENGINE SCREEN.

## 3. FUNCTIONS




3.1. System Start is activated here. This initiates the start sequence of the machine.



3.2. System Stop is activated here. This commands the shutdown sequence of the machine.



3.3. Gate Open is activated here. Function illuminates  when active.

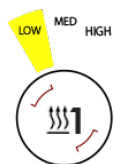
3.3.1. **NOTE:** Only displayed when Actuator is Active in OEM Settings



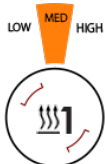
3.4. Gate Close is activated here. Function illuminates  when active.

3.4.1. **NOTE:** Only displayed when Actuator is Active in OEM Settings

3.5. Heat Setting is selected by touching the center of the circle in the Heat Setting.



- LOW Setting

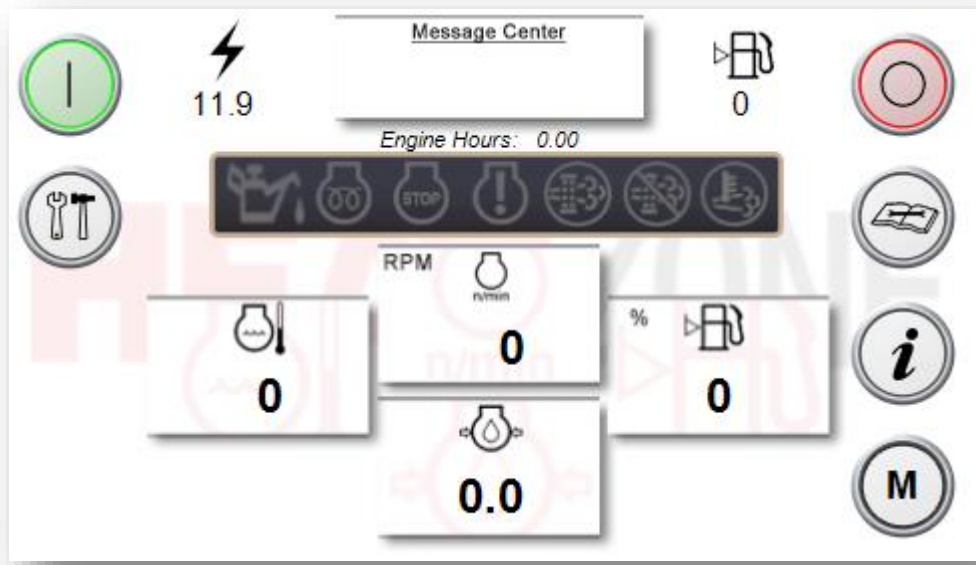


- MEDIUM Setting





- HIGH Setting


## ENGINE SCREEN - OVERVIEW




### 1. DISPLAY (Notice display features carry over from Main Screen)


1.1.  Engine Temp is displayed in the field below this icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*

1.2.  Engine RPM is displayed in the field below this icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*

1.3.  Engine Oil Pressure is displayed in the field below this icon. Data is transmitted over J1939 network from Engine. *Refer to engine manufacturer for further information.*

1.4.  Fuel Level is displayed in the field below this icon. Data is transmitter over J1939 from SKIM.

### 2. NAVIGATION (Notice navigation features carry over from Main Screen)

2.1.  Press adjacent tactile button or touch screen icon to navigate to MAIN SCREEN.

### 3. FUNCTIONS (Notice function features carry over from Main Screen)

## SETUP SCREEN - OVERVIEW

The screenshot displays a control interface for engine settings. On the left, there are three circular icons: a key, a clock, and a target with the letter 'A'. The main area contains a grid of settings. At the top, a box labeled 'ENGINE TYPE' shows a dash '-'. To the right, a green status indicator says 'SETTINGS UNLOCKED'. The settings are organized as follows:

LOW TEMP SETPOINT	MID TEMP SETPOINT	HIGH TEMP SETPOINT
100	150	200
HIGH IDLE ENGINE TEMP	DUCT OVER TEMP	LOW IDLE ENGINE TEMP
90	230	0
BLOWER 1 DELAY	HEATER 1 DELAY	ELECTRIC ACTUATOR
15	10	YES
IDLE RPM 1100		CUTOUT RPM 600

### 1. DISPLAY

1.1.ENGINE TYPE is the selected engine profile to be controlled

*All temperatures displayed in Fahrenheit*

1.2.LOW TEMP SETPOINT is the LOW temperature setting.

1.3.MID TEMP SETPOINT is the MEDIUM temperature setting.

1.4.HIGH TEMP SETPOINT is the HIGH temperature setting.

1.5.HIGH IDLE ENGINE TEMP is the minimum “warm up” temperature the Engine must reach before proceeding to High Idle startup.

1.5.1. **NOTE:** High Idle setting is 1800 RPM

1.6.DUCT OVER TEMP is the max allowable temperature within the Duct before the machine will perform a commanded shutdown sequence.

1.7.LOW IDLE ENGINE TEMP is the minimum “cool down” temperature the Engine should reach before proceeding to Low Idle shutdown.

1.7.1. **NOTE:** If this temperature is not reached within 3min the Engine will proceed to Low Idle and shutdown.

1.8.BLOWER 1 DELAY is the time delay after engine is started to engage the Blower Motor. Display is in seconds.

1.9.HEATER 1 DELAY is the time delay after the Blower Motor is engaged for the purpose of limiting inrush current. Display is in seconds.

1.10.ELECTRIC ACTUATOR is to enable the Actuator controls when installed.

1.11.IDLE RPM is to set the engines IDLE RPM. This is for qualified personnel ONLY.

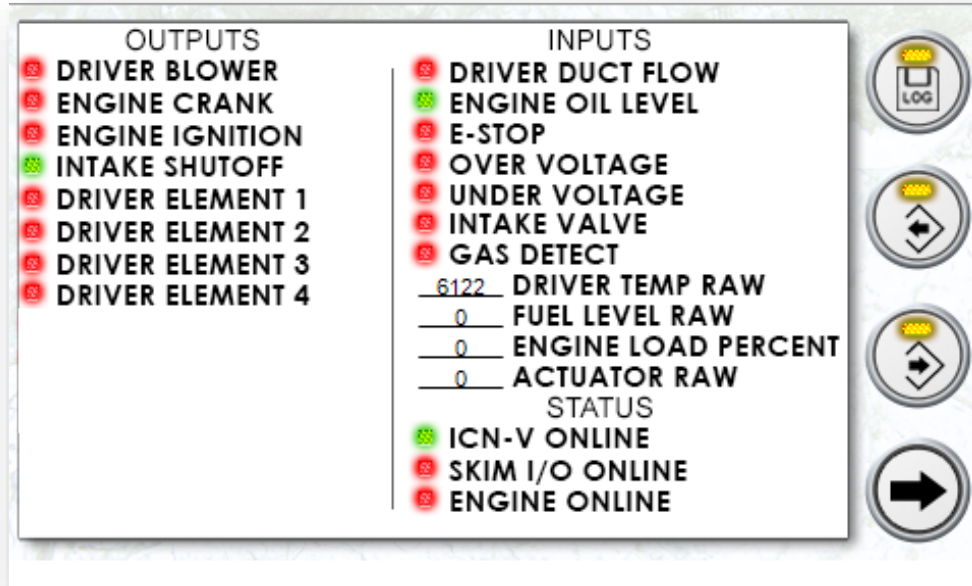
1.12.CUTOUT RPM is the RPM at which the start signal will disengage due to the engine running. This adjustment is for qualified personnel ONLY.

1.13.**SETTINGS UNLOCKED** indicates that access has been granted to modify factory settings.

# DIAGNOSTICS

## SOFTWARE

### DIAGNOSTIC SCREEN - OVERVIEW



#### 1. DISPLAY

- Function ON/ Device Online
- Function OFF/ Device Offline

1.1.OUTPUTS displays the status for a column of Digital functions being controlled

1.2.INPUTS displays the status for a column of Digital & Analog functions being monitored.

1.3.STATUS displays the online or offline status of networked devices.

#### 2. NAVIGATION

2.1. Press adjacent tactile button or touch screen icon to navigate to INFORMATION SCREEN.

2.2. Returns To Previous Screen

#### 3. FUNCTIONS

- Active
- Standby
- Disconnected





3.1. Log Export is activated here. Machine log will upload to compatible USB storage device.

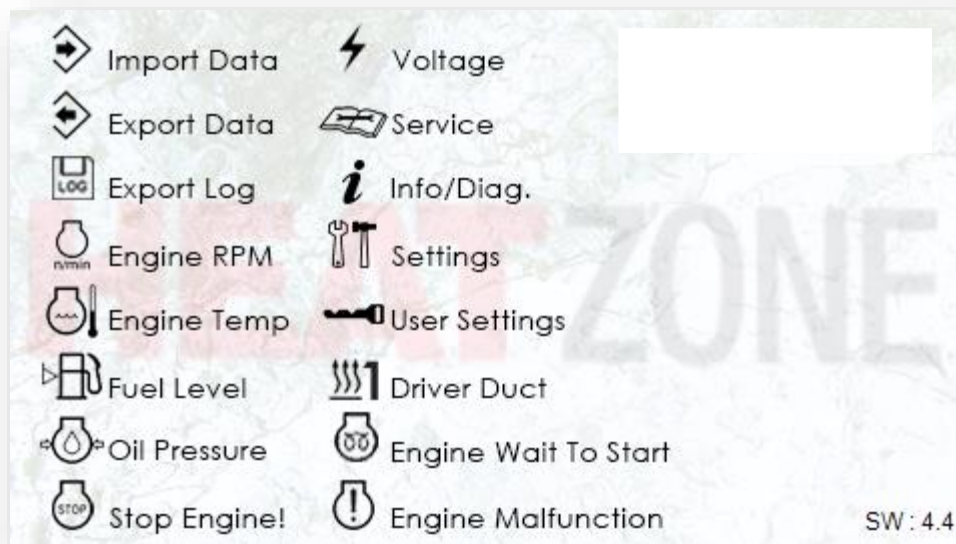


3.2. Parameters Export is activated here. Machine parameters can be downloaded to compatible USB storage device. (Factory Use)



3.3. Parameters Import is activated here. Machine parameters can be downloaded to compatible USB storage device. (Factory Use)

## INFORMATION SCREEN – OVERVIEW



### 1. DISPLAY

1.1. This screen displays the symbols used within the application with a description of each.

1.1.1. **NOTE:** The software version is located in the bottom right of screen.

# HARDWARE

## CONTROL PANEL

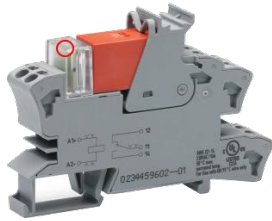
### 1. Back Panel Components

1.1.DC Fuse Holders provide Blown Fuse Status



1.1.1.

1.2.DC Control relays provide ON/OFF LED indication



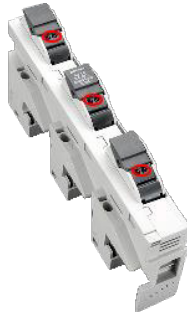
1.2.1.

1.3.DC Power Supply provides indication that output voltage is good (>90%)



1.3.1.

1.4.Class CC Fuse Holder provide Blown Fuse Status



1.4.1.

1.5.LM1 provides indication of status of the following:

1.5.1. Over-voltage Relay - Yellow

1.5.2. Power On – Green

1.5.3. Under-voltage Relay – Yellow



1.5.4.

## CHASSIS COMPONENTS

### 1. 600449R0 – Chassis Harness

#### 1.1.E-STOP Operator provides indication of status

1.1.1. E-STOP pressed – LED ON

1.1.2. E-STOP pulled out – LED OFF



1.1.3.

### 2. 600318 – Air Flow Sensor

#### 2.1.Sensor provides indication of status

2.1.1. Power/ Standby – Red

2.1.2. Relay Closed – Green

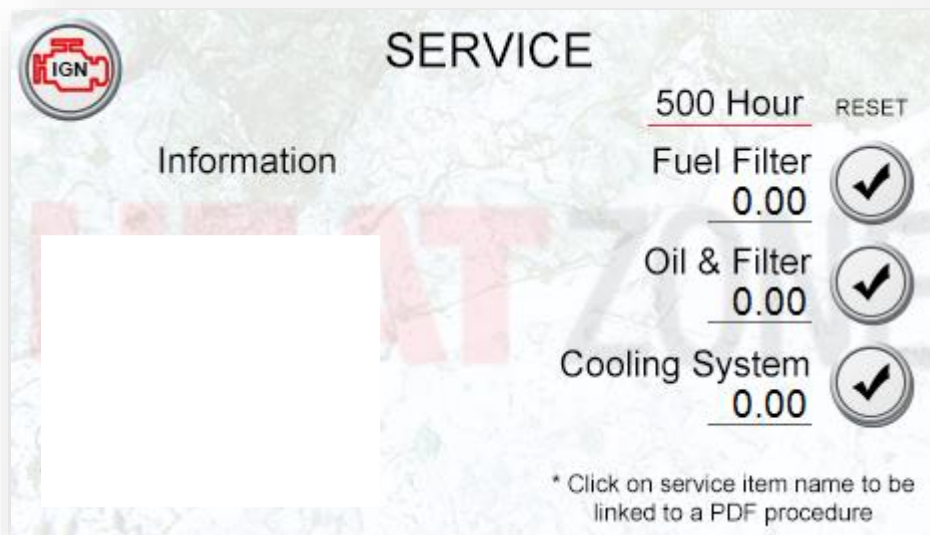
### 3. Duct Temperature Sensor

3.1.Sensor provides indication of power when Green.

# SERVICE

## SOFTWARE

### SERVICE SCREEN – OVERVIEW




#### 1. NAVIGATION


1.1. Selecting "Information, CAT engine, Deutz Engine, John Deere Engine, Fuel Filter, Oil & Filter, or Cooling System" will direct you to a PDF containing information pertaining to that subject.

1.2.  Returns To Previous Screen

#### 2. FUNCTIONS

2.1. Engine Ignition can be toggled via screen press or adjacent button. Icon also displays the status as follows:

 - Ignition ON

 - Ignition OFF

500 Hour is a column tracking the engine hours between services for maintenance required after 500 hours.

2.2.  will reset the corresponding service performed

# TROUBLESHOOTING

## SOFTWARE

### COMMANDED SHUTDOWN FAULTS

*Faults that activate shutdown sequence without activating Intake Valve Shutoff*

1. CODE: 'WARNING' 'Fuel Level Low'
  - 1.1.CAUSE: Fuel Level dropped below 2%.
  - 1.2.HOW TO CLEAR: Fuel Level must reach >10%.
2. CODE: 'FAULT' 'Fuel Level Sensor'
  - 2.1.CAUSE: Fuel Sensor Signal not detected.
  - 2.2.HOW TO CLEAR: Correct signal.
  - 2.3.POSSIBLE ISSUES: Check wiring or replace sensor.
3. CODE: 'CYCLE POWER' 'Duct Flow Shutdown'
  - 3.1.CAUSE: Flow Sensor input OFF while Blower Motor is ON.
  - 3.2.HOW TO CLEAR: Cycle Power.
  - 3.3.POSSIBLE ISSUES: MMP1 is tripped, inspect sensor indicators and wiring.
4. CODE: 'CYCLE POWER' 'Duct Overtemp Shutdown'
  - 4.1.CAUSE: Duct Overtemp setting reached.
  - 4.2.HOW TO CLEAR: Cycle Power.
  - 4.3.POSSIBLE ISSUES: Duct is blocked, Gate Actuator closed too far, ambient temperature too high.
5. CODE: 'FAULT' 'Duct Temp Sensor'
  - 5.1.CAUSE: Duct Temp Sensor signal not detected.
  - 5.2.HOW TO CLEAR: Correct signal.
  - 5.3.POSSIBLE ISSUES: Check wiring or replace sensor.
6. CODE: 'FAULT' 'Check Oil Level'
  - 6.1.CAUSE: Oil Level Sensor input OFF indicating oil has dropped below safe level.
  - 6.2.HOW TO CLEAR: Correct signal.
  - 6.3.POSSIBLE ISSUES: Check Oil Level Gauge and wiring. Refer to Factory for troubleshooting Engine.
7. CODE: 'FAULT' 'Skim IO Offline'
  - 7.1.CAUSE: SKIM IO is not detected on J1939 network.
  - 7.2.HOW TO CLEAR: Correct communication to device.
  - 7.3.POSSIBLE ISSUES: Check power indicators and wiring.
8. CODE: 'FAULT' 'ICN-V Node 5 Offline'
  - 8.1.CAUSE: ICN-V is not detected on CANopen network.
  - 8.2.HOW TO CLEAR: Correct communication to device.
  - 8.3.POSSIBLE ISSUES: Check power indicators and wiring.

## EMERGENCY SHUTDOWN FAULTS

*Faults that activate immediate shutdown and activate Intake Valve Shutoff*

1. CODE: 'CYCLE POWER' 'E-Stop Shutdown'
  - 1.1.CAUSE: E-Stop operator pressed.
  - 1.2.HOW TO CLEAR: Correct Cause & Cycle Power.
2. CODE: 'CYCLE POWER' 'Gas Detect Shutdown'
  - 2.1.CAUSE: Gas Detect Sensor signal ON indicating atmosphere is unsafe to operate.
  - 2.2.HOW TO CLEAR: Correct Cause & Cycle Power.
3. CODE: 'CYCLE POWER' 'Engine Overrev Shutdown'
  - 3.1.CAUSE: Engine RPM exceeded safe operating speed indicating malfunction.
  - 3.2.HOW TO CLEAR: Correct Cause & Cycle Power.
  - 3.3.POSSIBLE ISSUES: Gas is in atmosphere or engine failure. Refer to Factory.
4. CODE: 'CYCLE POWER' 'Undervoltage Shutdown'
  - 4.1.CAUSE: 3-Phase AC power dropped below tolerance.
  - 4.2.HOW TO CLEAR: Correct Cause & Cycle Power.
  - 4.3.POSSIBLE ISSUES: Genset or AVR malfunctioned. Refer to Factory.
5. CODE: 'CYCLE POWER' 'Overvoltage Shutdown'
  - 5.1.CAUSE: 3-Phase AC power exceed upper tolerance.
  - 5.2.HOW TO CLEAR: Correct Cause & Cycle Power.
  - 5.3.POSSIBLE ISSUES: Genset or AVR malfunctioned. Refer to Factory.

## MACHINE NOTIFICATIONS

*Codes that serve to notify operator. Some may prevent machine start.*

1. CODE: 'STARTUP CYCLE'
  - 1.1.CAUSE Machine Startup has been activated by operator
  - 1.2.HOW TO CLEAR: No action necessary
2. CODE: 'SHUTDOWN CYCLE'
  - 2.1.CAUSE: Machine Shutdown has been activated by operator
  - 2.2.HOW TO CLEAR: No action necessary
3. CODE: 'ACTIVE ENGINE CODE' 'SPN## FMI##'
  - 3.1.CAUSE: Engine Error Occurred
  - 3.2.HOW TO CLEAR: Refer to Factory to troubleshoot Engine.
4. CODE: 'WARNING' 'Low Voltage Detected'
  - 4.1.CAUSE: Voltage to HMI dropped below tolerance.
  - 4.2.HOW TO CLEAR: Correct Cause.
  - 4.3.POSSIBLE ISSUES: Check PS1 indicators, bad Voltage Booster, poor Battery health, inspect wiring.

5. CODE: 'WARNING' 'High Engine Temp'
  - 5.1.CAUSE: Engine Temp reached 210degF. This is to warn operator prior to engine ECM commanding shutdown.
  - 5.2.HOW TO CLEAR: Correct Cause.
6. CODE: 'WARNING' 'Intake Valve Closed'
  - 6.1.CAUSE: Intake Shutoff Valve has not reset by controller. Engine will not start.
  - 6.2.HOW TO CLEAR: Cycle Power or wait for Intake Controller to reset valve.
7. CODE: 'FAULT' 'Inspect Intake Valve'
  - 7.1.CAUSE: Intake Valve signal was not received during emergency shutdown
  - 7.2.HOW TO CLEAR: Correct Cause & Cycle Power.
  - 7.3.POSSIBLE ISSUES: Check wiring.

## HARDWARE

### SYSTEM TROUBLESHOOTING

1. ISSUE: No Power at HMI  
POSSIBLE CAUSES:
  - 1.1. Battery Disconnect OFF
    - 1.1.1. Turn ON
  - 1.2. 25A Fuse Blown (P09 – 600449R0)
    - 1.2.1. Needs to be replaced
  - 1.3. 5A Fuse Blown ("F8" – 600435)
    - 1.3.1. Needs to be replaced
  - 1.4. HMI Failure
    - 1.4.1. Needs to be replaced

2. ISSUE: No Power at PS1  
POSSIBLE CAUSES
  - 2.1. Engine not running at High Idle
    - 2.1.1. Initiate Start Cycle
  - 2.2. 15A Fuse Blown ("F5" – 600435)
    - 2.2.1. Needs to be replaced
3. ISSUE: No Power to LM1  
POSSIBLE CAUSES:
  - 3.1. Disconnect OFF
    - 3.1.1. Turn ON
  - 3.2. Fuse Blown at F0 in Genset
    - 3.2.1. Needs to be replaced
  - 3.3. AVR Failure
    - 3.3.1. Refer to Factory
  - 3.4. Genset Failure
    - 3.4.1. Refer to Factory
4. ISSUE: No Power to Blower when MC-1 turns ON  
POSSIBLE CAUSES:
  - 4.1. Disconnect OFF
    - 4.1.1. Turn On
  - 4.2. MMP1 Tripped
    - 4.2.1. Inspection by qualified personnel required.
  - 4.3. AVR Failure
    - 4.3.1. Refer to Factory
  - 4.4. Genset Failure
    - 4.4.1. Refer to Factory
5. ISSUE: No Heat while machine running  
POSSIBLE CAUSES:
  - 5.1. F1...F4 Fuses Blown
    - 5.1.1. Inspection by qualified personnel required
    - 5.1.2. Needs to be replaced
  - 5.2. MC1...4 Failure.
    - 5.2.1. Needs to be replaced
  - 5.3. Heater Failure.
    - 5.3.1. Refer to Factory
6. ISSUE: Running Lights not ON while machine running  
POSSIBLE CAUSES:
  - 6.1. 10A Fuse blown ("F9" – 600435).
    - 6.1.1. Needs to be replaced
  - 6.2. Light Failure.
    - 6.2.1. Needs to be replaced.
  - 6.3. Relay Failure ("R3" - 600435).
    - 6.3.1. Needs to be replaced.



- 7. ISSUE: Engine not Online  
POSSIBLE CAUSES:
  - 7.1. Ignition not ON or Start Cycle has not been initiated
  - 7.2. Emergency condition NOT cleared
    - 7.2.1. See Message Center on HMI and refer to Software Codes.
  - 7.3. 25A Fuse blown (P09 – 600449R0)
    - 7.3.1. Needs to be replaced.
  - 7.4. 5A Fuse Blown (“F8” – 600435)
    - 7.4.1. Needs to be replaced.
  
- 8. ISSUE: Engine Starter will not engage after Pre-Start alarm  
POSSIBLE CAUSES:
  - 8.1. Wait to Start required by Engine ECM.
    - 8.1.1. See indicators on HMI and refer to Screen Layout.
  - 8.2. 25A Fuse blown (P09 – 600449R0)
    - 8.2.1. Needs to be replaced.
  - 8.3. 5A Fuse Blown (“F8” – 600435)
    - 8.3.1. Needs to be replaced.
  - 8.4. Engine Starter Failure.
    - 8.4.1. Refer to Factor for troubleshooting Engine.

# Maintenance

**NOTE:** The Thawzall XHR can be equipped with a DEUTZ or FIAT engine.

Please refer to the appropriate service information for your engine.

Top level maintenance is provided in this section. For detailed engine maintenance procedures please refer to the engine manufacturers operation and maintenance manual supplied with your heater. There you will find a full range of maintenance procedures and maintenance scheduling.

## Maintenance Record

[illegible]

# XHR Engine Maintenance Chart

## Deutz Engine



Description	Operation	Every 350 Hours	Every 500 Hours	Monthly
Engine oil	Change	X		
Engine Oil filter	Change	X		
Engine Air Filter	Check			
Engine Fuel filter	Change			
Grease Axle Hubs	Service			X
Torque Wheel Nuts (120 ft/lbs)	Check			X

## Service Parts

Description	Part Number/ Type
Engine Oil	See Engine Manual
Engine Oil Filter	0117 4416
Engine Air Filter (inner)	0118 0871
Engine Air Filter (outer)	0131 9258
Engine Fuel Filter	0413 7456
Engine Fuel/Water Separator	0413 0241

Refer to engine manual for greater detail

# XHR Engine Maintenance Chart

## Fiat Engine



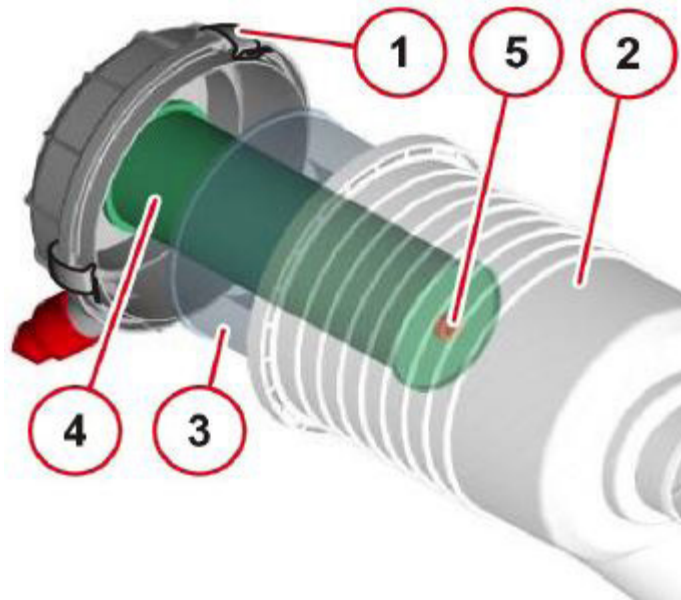
Description	Operation	Every 600 Hours	Every 1200 Hours	Monthly
Engine oil	Change	X		
Engine Oil filter	Change	X		
Engine Air Filter	Check		X	
Engine Fuel filter	Change	X		
Grease Axle Hubs	Service			X
Torque Wheel Nuts (120 ft/lbs)	Check			X

## Service Parts

Description	Part Number/ Type
Engine Oil	See Engine Manual
Engine Oil Filter	5802431041
Engine Air Filter (inner)	P822769
Engine Air Filter (outer)	8050800
Engine Fuel Filter	5801693493
Engine Fuel/Water Separator	504372615

Refer to engine manual for greater detail

# Air Filter



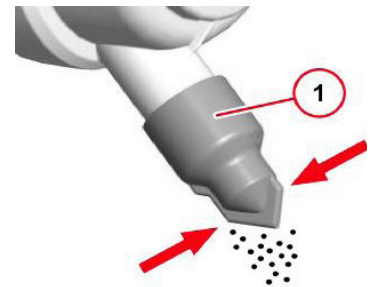
1. Clamp
2. Filter hood
3. Outer air filter
4. Inner air filter
5. Hexagon nut

## Maintaining the Air filter

### NOTICE

**Do not clean the air filter with chemicals or hot liquids!**

- Maintain the filter elements according to the interval in the maintenance schedule
- Lift the clamps to open the housing
- Pull out the filter element, blow out with compressed air from the inside to the outside if soiling is only slight.
- Replace if heavily soiled.
- Unscrew hexagonal nut
- Replace inner and outer filters

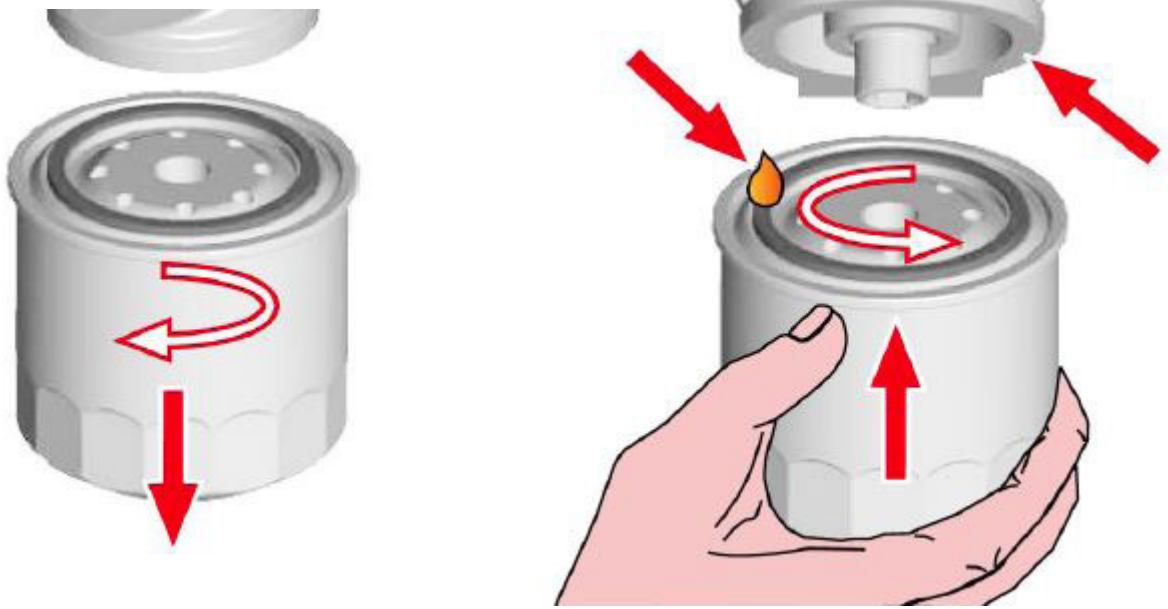


## Clean the air filter dust discharge valve

- Empty the dust discharge valve (1) by pressing together the discharge slit.
- Remove and stuck on dust residues by squeezing the upper area of the valve.
- Clean the discharge slit.

Refer to engine manual for greater detail

# Fuel Filter



## Change fuel filter

### Remove

Remove the spin-on fuel filter with a filter wrench, collect escaping fuel.

### Install

**Do not pre-fill an on-engine fuel filter with fuel.** Prefilling the fuel filter can result in debris entering the fuel system and damaging fuel system components. Lubricate the O-ring seal with clean lubrication oil.

Use the correct fuel filter. See the service parts page for the correct part number for your engine. Install the filter on the filter head. Tighten the filter until the gasket contacts the filter head surface. Tighten the fuel filter an additional  $\frac{3}{4}$  turn after contact, or consult the filter manufacturer instructions.

Prime fuel system after filter installation.

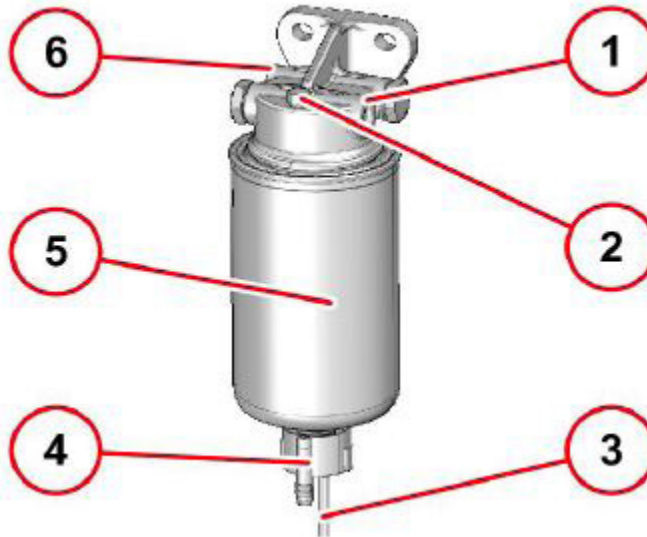
### WARNING

The fuel pump high-pressure fuel lines and fuel rail contain very high-pressure fuel. Never loosen any fittings while the engine is running. Personal injury and property damage can result. To prime the engine use the OEM installed priming device. Typically, a priming pump is installed at or near the prefilter. See the OEM's instructions for the number of strokes (hand primer) or cycles time (electric priming pump) needed to prime the low pressure system.

Operate the engine and check for leaks.

# Fuel/Water Separator

## DEUTZ ENGINE



1. Fuel supply flow to the pump
2. Venting Screw
3. Electrical connection for water level sensor.
4. Drain Plug
5. Filter Cartridge
6. Fuel supply from the tank

### Priming the Fuel System

#### NOTICE

Do not crank the engine continuously for more than 30 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

The fuel system is primed via the electric fuel supply pump.

In order to ensure that no error messages are generated, no attempt should be made to start the system whilst priming.

### Draining Water

- Shut down engine.
- Place suitable container underneath.
- Disconnect electrical connection.
- Loosen drain plug.
- Drain until pure fuel runs out.
- Tighten drain plug.
- Connect electrical connection

### Changing the Pre-filter insert

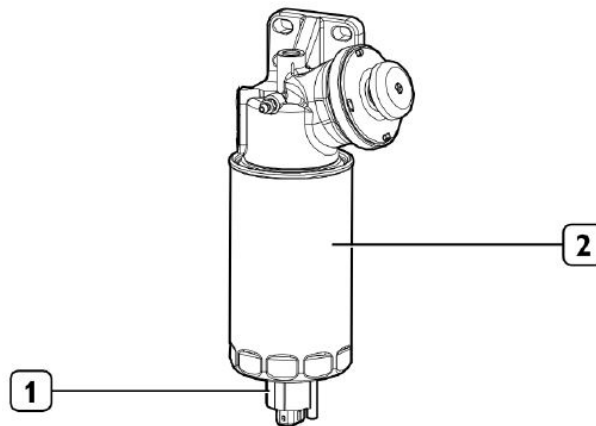
- Shut down engine
- Place suitable container underneath.
- Disconnect electrical connection.
- Loosen drain plug and drain liquid.
- Dissassemble filter insert.
- Clean any dirt off of the sealing surfaces
- Wet the sealing surfaces of the filter cartridge with fuel and screw back on to the filter head, clockwise.
- Tighten drain plug.
- Connect electrical connection
- Prime the fuel system.

### Priming

Refer to engine manual for greater detail

# Fuel/Water Separator

## FIAT ENGINE



1. Drain Valve
2. Filter

### Draining Water

- Shut down engine.
- Place suitable container underneath.
- Disconnect electrical connection.
- Loosen drain plug.
- Drain until pure fuel runs out.
- Tighten drain plug.
- Connect electrical connection

### Changing The Filter Element

- Shut down engine
- Place suitable container underneath.
- Disconnect electrical connection.
- Loosen drain plug and drain liquid.
- Dissassemble filter insert.
- Clean any dirt off of the sealing surfaces
- Wet the sealing surfaces of the filter cartridge with fuel and screw back on to the filter head, clockwise.
- Tighten drain plug.
- Connect electrical connection
- Vent the fuel system.

### Priming the Fuel System

#### NOTICE

Do not crank the engine continuously for more than 30 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

- Ensure the fuel system is in working order and the supply valve is in the “on” position ( if equipped)
- Operate the hand priming pump. Count the number of operations of the pump. After approximately 80 depressions of the pump stop.
- The fuel system should now be primed and the engine should be able to start.
- Operate the engine starter and crank the engine. After the engine has started, operate the engine at low idle for a minimum of 5 minutes to ensure the system is free from leaks.

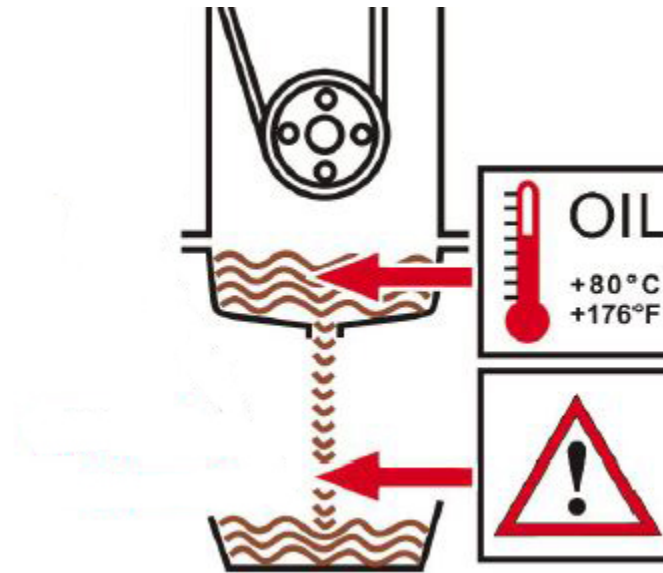
#### NOTE

Do not loosen the high pressure fuel lines in order to purge air from the system. This procedure is not required.

Refer to engine manual for greater detail



# Engine Oil and Filter



**Oil Drain**

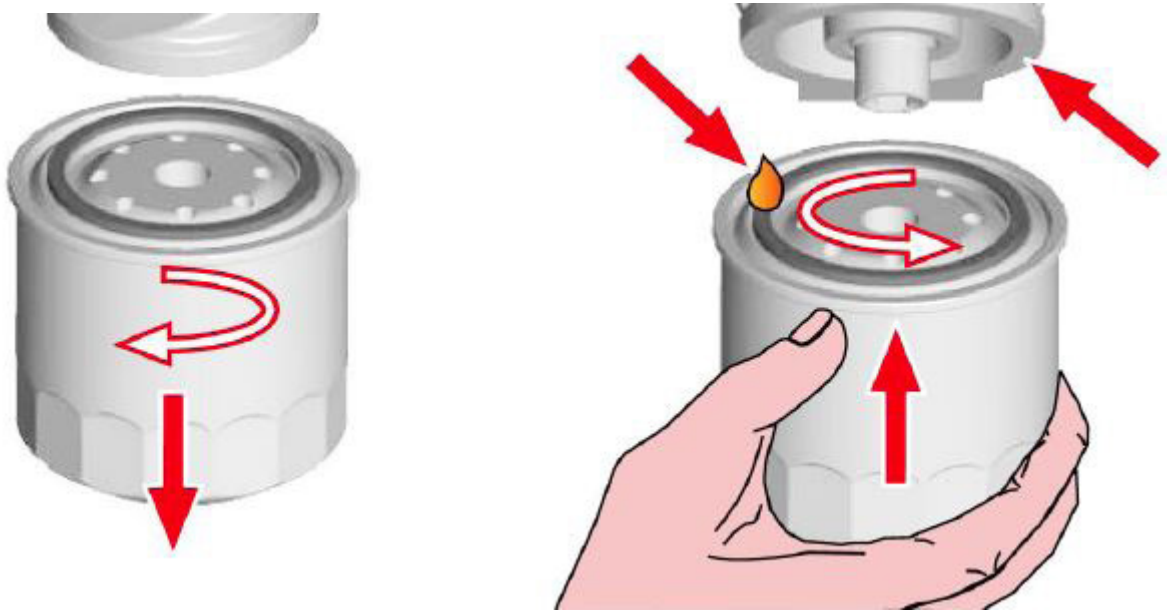


To reduce the possibility of personnel injury, avoid direct contact of hot oil with your skin. Danger of scalding! Do not pull out the dipstick with the engine running. Danger of injury!

**NOTE:** For most engines, use a container that can hold at least 20 liters (21qt) of lubricating oil.

Change the lubricating oil and filter at the specified oil change interval. See the maintenance schedule to find the correct change interval for your application.

1. Operate the engine until the temperature reaches 80°C (176°F).
2. Shut off the engine
3. Position drain pan under the oil drain plug.
4. Remove the oil drain plug. Drain the oil immediately to be sure all the oil and suspended contaminants are removed from the engine.
5. Turn in and tighten oil drain plug .



## Change oil filter

### REMOVE

Clean the area around the lubricating oil filter head.

Use an oil filter wrench to remove the filter.

Clean the gasket surface of the filter head.

**NOTE:** The O-ring can stick on the filter head. Be sure it is removed before installing the new filter.

### Install

Use the correct oil filter. See the service parts page for the correct oil filter part number.

Use clean oil to coat the gasket surface of the filter.

Apply a light film of lubricating oil to the gasket sealing surface before installing the filter.

**NOTE:** Be careful the no debris is poured into the filter. If using an oil supply with a metallic or plastic seal under the cap, be careful to peel the seal back. Punching the seal with a knife or sharp object can create debris in the oil container.

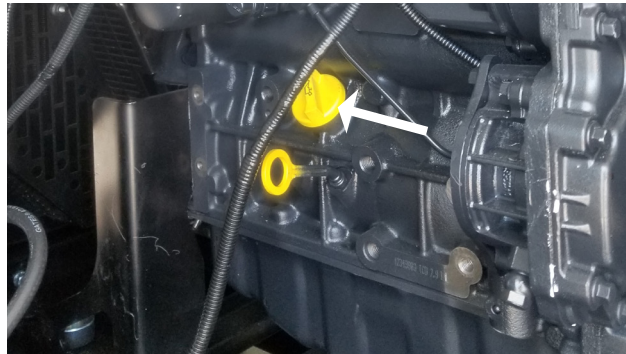
### CAUTION

Mechanical overtightening of the filter can distort the threads or damage the filter sealing element seal. Install the filter on the oil filter head. Tighten the filter until the gasket contacts the filter head surface. Tighten  $\frac{3}{4}$  turn after the gasket makes contact with the filter head.

## Fill

Clean and check the lubricating oil drain plug threads and sealing surface. Use a new sealing washer, if damaged.

Install the lubricating oil pan plug.



**DEUTZ ENGINE**



**FIAT ENGINE**

Fill the engine with clean lubricating oil to the proper level.

Idle the engine to inspect for leaks at the drain plug and , if replaced, the oil filter seal.

NOTE: Engine oil pressure must be indicated on the gauge within 15 seconds after starting. If oil pressure is not registered within 15 seconds, shut off the engine immediately to avoid engine damage. Confirm that the correct oil level is in the oil pan.

Shut off the engine. Wait approximately 5 minutes to let the oil drain from the upper parts of the engine. Check the level again. Add oil as necessary to bring the oil level to the H (high) mark on the dipstick.

## OIL LEVEL MAINTENANCE CHECK

### CAUTION

Never operate the engine with oil level below the MIN level or above the MAX level. Poor engine performance or engine damage can occur.

The engine must be level when checking the oil level to make sure the measurement is correct. Shut off the engine for an accurate reading.

Wait at least 15 minutes after shutting off the engine to check the oil level. This allows time for the oil to drain into the oil pan.



# XHR Specifications

## General Capacities and Component Specifications

Height (w/ heater vent)	94.5"
Width	77"
Length	160"
Weight ( Fuel Empty/Full)	5300/6400 LBS
Engine (2 options)	Deutz / Fiat F34
Air Ducts	2 x 12"
Heater Element	480V Electric

## Trailer and Fuel Tank







Axles	7000 Lb. With Electric Brakes
Tires	ST235/80R-16
Tire Inflation Pressure	80 PSI
Wheel Nut Torque	120 FT-LBS
Hitch	2-5/16" Ball or Pintle
Tie Downs	4 For Transporting
Fuel Tank Capacity	160 US Gallons
Ground Clearance	14"
Containment	173%

## Performance Specifications

Nominal Heat Output	572,000 BTU/H
Fuel Requirement	#1 or #2 Diesel Fuel
Fuel Consumption	4.5 GPH MAX
Run Time	Min 35 Hrs @ 100%
Air Flow	Variable Max 4500 CFM



# Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
 	B-3, D-2B	  	

## Section 1. Chemical Product and Company Identification

<b>Product Name</b>	<b>DIESEL FUEL</b>	<b>Code</b>	W104 SAP: 120, 121, 122, 287
<b>Synonym</b>	Diesel 50, Diesel 50 LS, #1 Diesel, #1 Diesel LS, Diesel LC, Seasonal Diesel, Seasonal Diesel LS, Diesel AA, Domestic Marine Diesel, International marine Diesel, Seasonal Diesel Locomotive, Domestic Marine diesel LS, diesel -20°C (LS), LSD, Low Sulphur Diesel, dyed diesel, marked diesel, coloured diesel, Naval Distillate.	<b>Validated on</b>	3/2/2001.
<b>Manufacturer</b>	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	<b>In case of Emergency</b>	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
<b>Material Uses</b>	Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type.		

## Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	CAS #	% (V/V)	TLV-TWA(8 h)	STEL	CEILING
1) Diesel oil.	68334-30-5	>99.9	Not established*	Not established	Not established
2) Proprietary additives.	Not available	<0.1	Not established	Not established	Not established
3) Aromatic content is 50% maximum (benzene: nil).					
4) * Notice of Intended Change (2000): 100 mg/m <sup>3</sup> , skin, A3.					
<b>Manufacturer Recommendation</b>	Not applicable				
<b>Other Exposure Limits</b>	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

## Section 3. Hazards Identification.

<b>Potential Health Effects</b>	Eye contact may cause mild eye irritation. Skin contact can cause moderate to severe irritation and produce drying, cracking, or defatting dermatitis. Inhalation of vapours can cause CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconsciousness and possibly death. Inhalation can also cause irritation of nose and throat. Aspiration of liquid drops into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure. For more information, refer to Section 11.
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## Section 4. First Aid Measures

<b>Eye Contact</b>	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
<b>Skin Contact</b>	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
<b>Inhalation</b>	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
<b>Ingestion</b>	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
<b>Note to Physician</b>	Not available

## Section 5. Fire-fighting Measures

<b>Flammability</b>	Class II - combustible liquid (NFPA).	<b>Flammable Limits</b>	LOWER: 0.7%, UPPER: 6%
<b>Flash Points</b>	Diesel Fuel: Closed Cup: >40°C (>104°F) Marine Diesel Fuel: Closed Cup: >60°C (>140°F)	<b>Auto-Ignition Temperature</b>	225°C (437°F)
<b>Fire Hazards in Presence of Various Substances</b>	Flammable in presence of open flames, sparks, or heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite. May accumulate in confined spaces.	<b>Explosion Hazards in Presence of Various Substances</b>	Containers may explode in heat of fire. Do not cut, weld, heat, drill or pressurize empty container. Vapour explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.
<b>Products of Combustion</b>	Carbon oxides (CO, CO <sub>2</sub> ), nitrogen oxides (NO <sub>x</sub> ), sulphur oxides (SO <sub>x</sub> ), sulphur compounds (H <sub>2</sub> S), water vapour (H <sub>2</sub> O), smoke and irritating vapours as products of incomplete combustion.		

**Fire Fighting Media and Instructions**

NAERG96, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible).

CAUTION: This product has a moderate flash point above 40°C: Use of water spray when fighting fire may be inefficient.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions.

SMALL FIRES: Dry chemical, CO<sub>2</sub>, water spray or regular foam.

LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk.

Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

**Section 6. Accidental Release Measures****Material Release or Spill**

NAERG96, GUIDE 128, Flammable Liquids (Non-polar/ Water-immiscible).

ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if without risk. Contain spill. Absorb with inert absorbents, dry clay, or diatomaceous earth. Avoid inhaling dust of diatomaceous earth for it may contain silica in very fine particle size, making this a potential respiratory hazard. Place used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

**Section 7. Handling and Storage****Handling**

Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk. DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. DO NOT ingest. Do not breathe gas/vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately. Avoid contact with skin and eyes. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.

**Storage**

Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles. Ground all equipment containing material.

**Section 8. Exposure Controls/Personal Protection****Engineering Controls**

For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.

**Personal Protection -**

**The selection of personal protective equipment varies, depending upon conditions of use.**

**Eyes**

Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.

**Body**

Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.

**Respiratory**

Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.

**Hands**

Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.

**Feet**

Wear appropriate footwear to prevent product from coming in contact with feet and skin.

**Section 9. Physical and Chemical Properties**

<b>Physical State and Appearance</b>	Bright oily liquid.	<b>Viscosity</b>	1.3-4.1 cSt @ 40°C (104°F)
<b>Colour</b>	Clear to yellow / brown. Low sulphur diesel fuels (<0.05 wt % sulphur) are colourless to light yellow (and may be dyed red for taxation purposes). Regular sulphur diesel fuels (0.05-0.50 % sulphur) may be colourless to yellow / brown and are usually dyed red for taxation purposes.	<b>Pour Point</b>	Variable, 0°C to -50°C (32°F to -58°F)
<b>Odour</b>	Petroleum oil like.	<b>Softening Point</b>	Not applicable.
<b>Odour Threshold</b>	Not available	<b>Dropping Point</b>	Not applicable.
<b>Boiling Point</b>	150-371°C (302-700°F)	<b>Penetration</b>	Not applicable.
<b>Density</b>	0.85 kg/L @ 15°C (Water = 1).	<b>Oil / Water Dist. Coefficient</b>	Not available
<b>Vapour Density</b>	4.5 (Air = 1)	<b>Ionicity (in water)</b>	Not applicable.

DIESEL FUEL		Page Number: 3	
<b>Vapour Pressure</b>	1.0 kPa @ 20°C (7.5 mmHg @ 68°F).	<b>Dispersion Properties</b>	Not available
<b>Volatility</b>	<0.1 (Butyl acetate = 1), less than gasoline.	<b>Solubility</b>	Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

<b>Section 10. Stability and Reactivity</b>			
<b>Corrosivity</b>	Not available		
<b>Stability</b>	The product is stable under normal handling and storage conditions.	<b>Hazardous Polymerization</b>	Will not occur under normal working conditions.
<b>Incompatible Substances / Conditions to Avoid</b>	Reactive with oxidizing agents and acids.	<b>Decomposition Products</b>	May release COx, NOx, SOx, H2S, H2O, smoke and irritating vapours when heated to decomposition.

<b>Section 11. Toxicological Information</b>	
<b>Routes of Entry</b>	Skin contact, eye contact, inhalation, and ingestion.
<b>Acute Lethality</b>	Acute oral toxicity (LD50): 7500 mg/kg (rat).
<b>Chronic or Other Toxic Effects</b>	
Dermal Route:	Skin contact may cause moderate to severe irritation. Repeated exposure would produce drying and cracking or defatting dermatitis.
Inhalation Route:	Inhalation of vapours can cause CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconsciousness and possibly death. Inhalation can also cause irritation of nose and throat.
Oral Route:	Aspiration of liquid drops into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure.
Eye Irritation/Inflammation:	Eye contact may cause mild irritation, but no permanent damage.
Immunotoxicity:	Not available
Skin Sensitization:	This product is not expected to be a skin sensitizer, based on the available data and the known hazards of the components.
Respiratory Tract Sensitization:	This product is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.
Mutagenic:	This product is not expected to be a mutagen, based on the available data and the known hazards of the components.
Reproductive Toxicity:	This product is not expected to be a reproductive hazard, based on the available data and the known hazards of the components.
Teratogenicity/Embryotoxicity:	This product is not expected to be a teratogen or an embryotoxin, based on the available data and the known hazards of the components.
Carcinogenicity (ACGIH):	ACGIH Notice of Intended Change (2000): proposed A3: animal carcinogen. [Diesel oil]
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as group 1, 2A or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	Not available
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
<b>Other Considerations</b>	No additional remark.

Section 12. Ecological Information			
Environmental Fate	Not available	Persistence/ Bioaccumulation Potential	Not available
BOD5 and COD	Not available	Products of Biodegradation	Not available
Additional Remarks	No additional remark.		







**Section 13. Disposal Considerations**

<b>Waste Disposal</b>	Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations. Consult your local or regional authorities.
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**Section 14. Transport Information**

<b>TDG Classification</b>	Diesel Fuel UN1202 3 III	<b>Special Provisions for Transport</b>	Not applicable.
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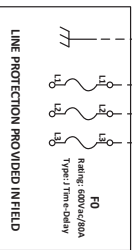
**Section 15. Regulatory Information**

<b>Other Regulations</b>		This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).																					
		All components of this formulation are listed on the US EPA-TSCA Inventory.																					
		All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).																					
		This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.																					
		Please contact Product Safety for more information.																					
<b>DSD/DPD (Europe)</b>		Not evaluated.		<b>HCS (U.S.A.)</b>  CLASS: Irritating substance. CLASS: Target organ effects. CLASS: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).																			
<b>ADR (Europe) (Pictograms)</b>		NOT EVALUATED FOR EUROPEAN TRANSPORT  NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.		<b>DOT (U.S.A) (Pictograms)</b>  																			
<b>HMIS (U.S.A.)</b>		<table border="1"><tr><td>Health Hazard</td><td>2*</td></tr><tr><td>Fire Hazard</td><td>2</td></tr><tr><td>Reactivity</td><td>0</td></tr><tr><td>Personal Protection</td><td>H</td></tr></table>		Health Hazard	2*	Fire Hazard	2	Reactivity	0	Personal Protection	H	<b>NFPA (U.S.A.)</b>  <table><tr><td rowspan="2">Health</td><td rowspan="2"></td><td>Fire Hazard</td><td>2</td></tr><tr><td>Reactivity</td><td>0</td></tr><tr><td colspan="2"></td><td>Specific hazard</td><td></td></tr></table>		Health		Fire Hazard	2	Reactivity	0			Specific hazard	
Health Hazard	2*																						
Fire Hazard	2																						
Reactivity	0																						
Personal Protection	H																						
Health		Fire Hazard	2																				
		Reactivity	0																				
		Specific hazard																					
				Rating	0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme																		

**Section 16. Other Information**

<b>References</b>	<p>Available upon request.</p> <p>* Marque de commerce de Petro-Canada - Trademark</p>		
<b>Glossary</b>	<p>ACGIH - American Conference of Governmental Industrial Hygienists</p> <p>ADR - Agreement on Dangerous goods by Road (Europe)</p> <p>ASTM - American Society for Testing and Materials (</p> <p>BOD5 - Biological Oxygen Demand in 5 days</p> <p>CAN/CGA B149.2 Propane Installation Code</p> <p>CAS - Chemical Abstract Services</p> <p>CEPA - Canadian Environmental Protection Act</p> <p>CERCLA - Comprehensive Environmental Response, Compensation and Liability Act</p> <p>CFR - Code of Federal Regulations</p> <p>CHIP - Chemicals Hazard Information and Packaging Approved Supply List</p> <p>COD5 - Chemical Oxygen Demand in 5 days</p> <p>CPR - Controlled Products Regulations</p> <p>DOT - Department of Transport</p> <p>DSCL - Dangerous Substances Classification and Labeling (Europe)</p> <p>DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)</p> <p>DSL - Domestic Substance List</p> <p>EEC/EU - European Economic Community/European Union</p> <p>EINECS - European Inventory of Existing Commercial Chemical Substances</p> <p>EPCRA - Emergency Planning and Community Right to Know Act</p> <p>FDA - Food and Drug Administration</p> <p>FIFRA - Federal Insecticide, Fungicide and Rodenticide Act</p> <p>HCS - Hazardous Communication System</p> <p>HMIS - Hazardous Material Information System</p> <p>IARC - International Agency for Research on Cancer</p> <p>IRIS - Integrated Risk Information System</p> <p>LD50/LC50 - Lethal Dose/Concentration kill 50%</p> <p>LDLo/LCLo - Lowest Published Lethal Dose/Concentration</p> <p>NAERG'96 - North American Emergency Response Guide Book (1996)</p> <p>NFPA - National Fire Prevention Association</p> <p>NIOSH - National Institute for Occupational Safety &amp; Health</p> <p>NPRI - National Pollutant Release Inventory</p> <p>NSNR - New Substances Notification Regulations (Canada)</p> <p>NTP - National Toxicology Program</p> <p>OSHA - Occupational Safety &amp; Health Administration</p> <p>PEL - Permissible Exposure Limit</p> <p>RCRA - Resource Conservation and Recovery Act</p> <p>SARA - Superfund Amendments and Reorganization Act</p> <p>SD - Single Dose</p> <p>STEL - Short Term Exposure Limit (15 minutes)</p> <p>TDG - Transportation Dangerous Goods (Canada)</p> <p>TDLo/TCLo - Lowest Published Toxic Dose/Concentration</p> <p>Tlm - Median Tolerance Limit</p> <p>TLV-TWA - Threshold Limit Value-Time Weighted Average</p> <p>TSCA - Toxic Substances Control Act</p> <p>USEPA - United States Environmental Protection Agency</p> <p>USP - United States Pharmacopoeia</p> <p>WHMIS - Workplace Hazardous Material Information System</p>		
<b>For Copy of MSDS</b>	<b>Prepared by Product Safety - TAR on 3/2/2001.</b>		
<b>Fuels &amp; Solvents:</b>	<b>Data entry by Product Safety - JDW.</b>		
<b>Western Canada, telephone: 403-296-4158; fax: 403-296-6551</b>			
<b>Ontario &amp; Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228</b>			
<b>Quebec &amp; Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385</b>			
<b>For Product Safety Information: (905) 804-4752</b>			



600VAC/ 150A  
3POLE BUSBAR

HEATER-1  
480 VAC  
12.0 FLA

ENCLOSURE TYPE	
1	EQUIVALENT CONDUIT HUBS AND/OR FITTINGS MUST BE USED TO MAINTAIN ENVIRONMENTAL RATING

WIRE & CABLE SPECIFICATIONS

FUSE CHART			
DESCRIPTION	VOLTAGE	SIZE	TYPE
F0	600VAC	80	117
F01-A1	600VAC	25A	250-120

**⚠ WARNING ⚠**

TO AVOID OVER CURRENT, SHORT-CIRCUIT AND OVERHEAT PROTECTION, THE MANUFACTURERS OF THE POWER SUPPLY MUST BE ADVISED OF ANY SHORT-CIRCUIT PROTECTION MUST BE FOLLOWED TO REDUCE RISK OF FIRE OR ELECTRICAL SHOCK.

**⚠ WARNING ⚠**

IN CASE OF A FAULT CURRENT INTERVENTION, OCCASION, CIRCUITS MUST BE CHECKED TO DETERMINE THE CAUSE OF THE INTERVENTION. IF A FAULT CONDITION IS IDENTIFIED, THE CIRCUIT MUST BE REPAIRED. THE ELECTRICAL ENGINEER'S MUST BE REPLACED TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK.

5



**CEMI**

DESIGN SYSTEMS INTEGRATION

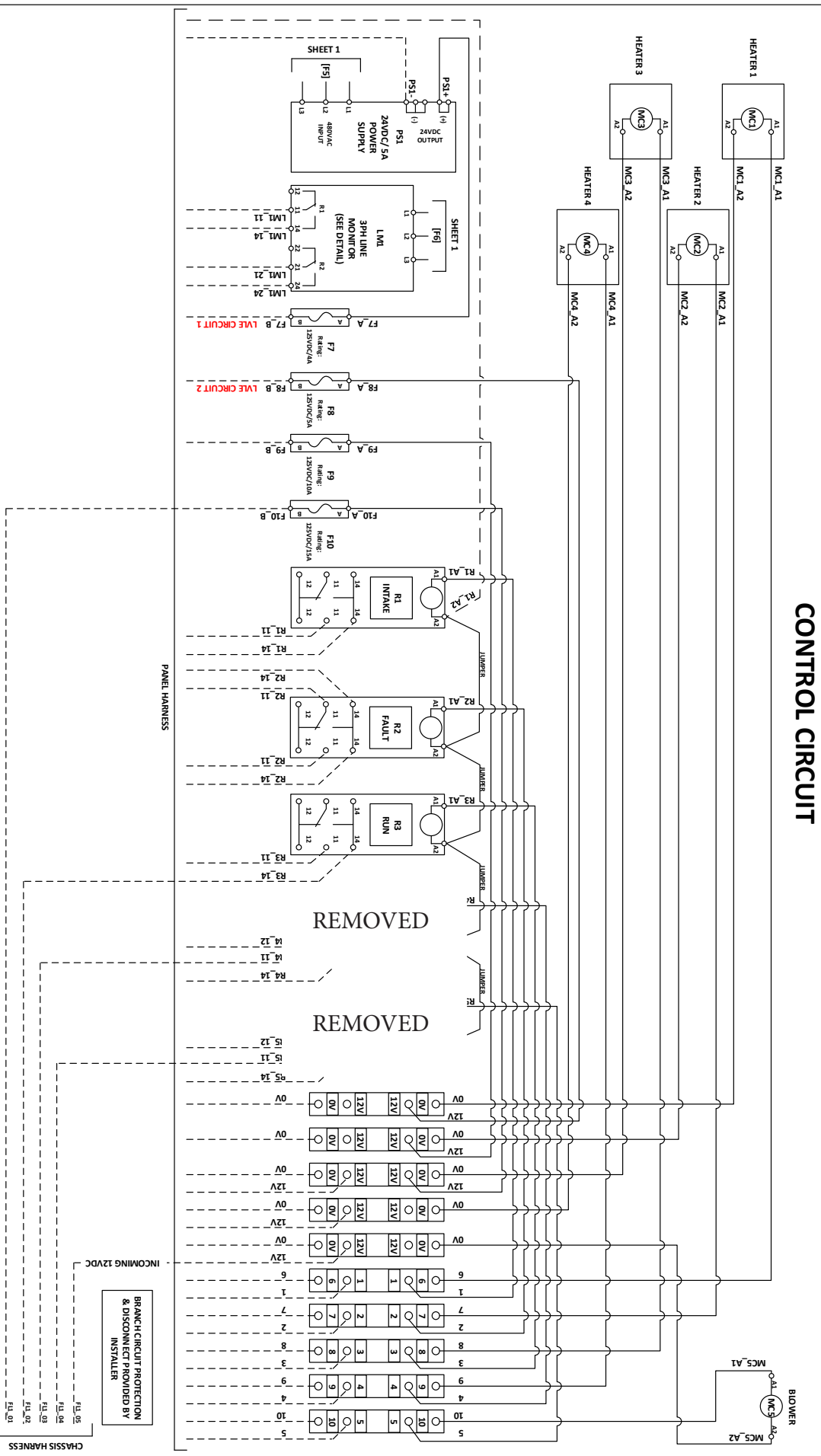
3500 N. 38th Ave., Suite F-10, SD57104  
PH: 605-388-0982

TOLERANCE	
LOCATION	
120	
DRAWN	JMA
ISSUED	11-Jun-2019

-0.00"	
PANEL, C	
DRAW	
600	

1 OF 3

# CONTROL CIRCUIT

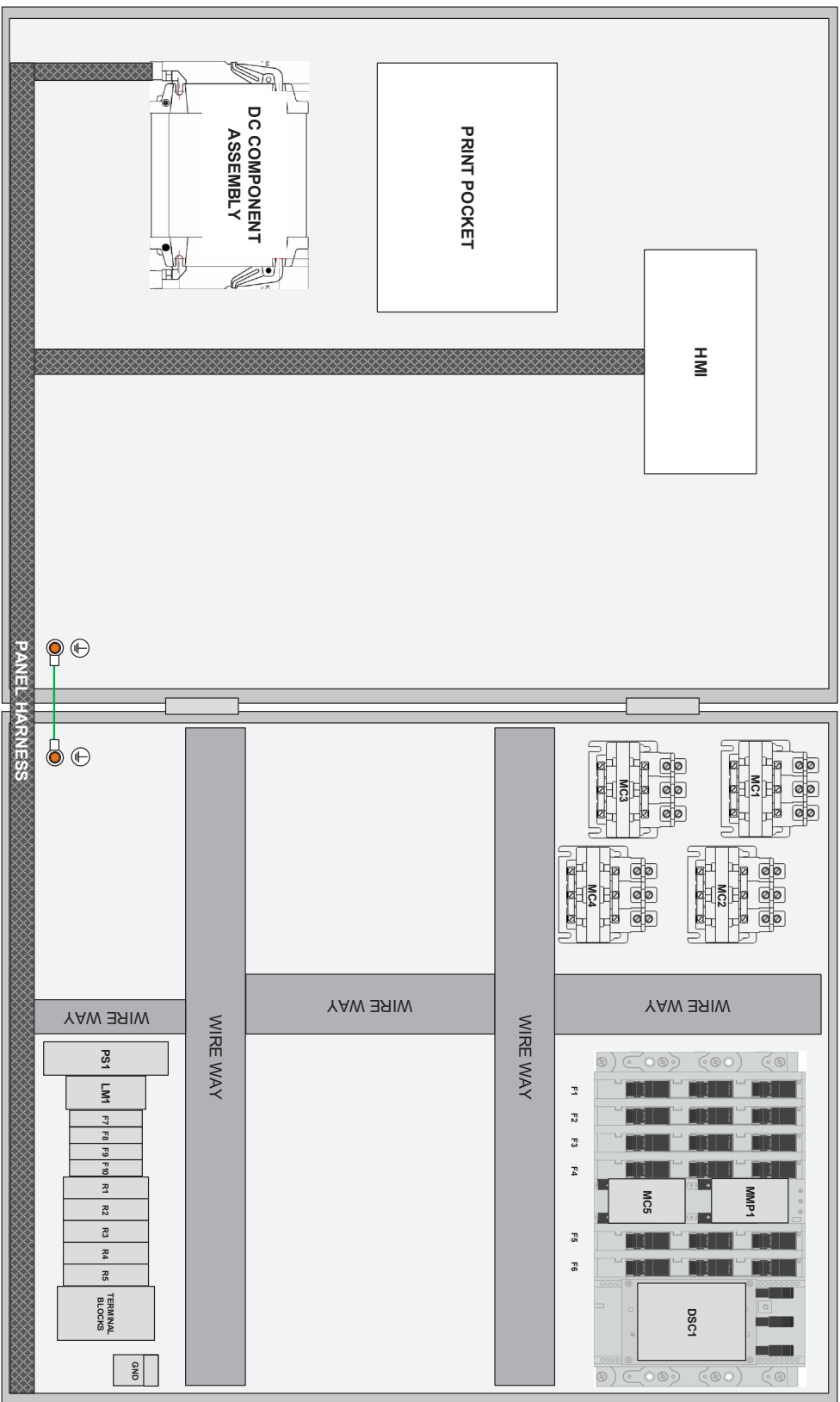


<b>DETAIL</b> LMI - DIAL SETTINGS VOLTAGE: 480 <1: 20% T1: 2.8 T2: 2.8			
<b>DESIGN SYSTEMS INTEGRATION</b> 3500 N. 34th Ave. Ste 404, S07704 PH: 605.388.9962		<b>PROPRIETARY AND CONFIDENTIAL</b> THIS DRAWING IS THE SOLE PROPERTY OF DAKOTA FLUID POWER AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF DAKOTA FLUID POWER.	
<b>TOLERANCE</b> +1.00" / -0.00"		<b>WIRE TYPE</b> GXL or SXL	
<b>LOCATION</b> 320		<b>TITLE</b> PANEL, CONTROL MAIN POWER X600	
<b>DRAWN</b> JMA		<b>DRAWING NO</b> 6004.35	
<b>ISSUED</b> 11 Jun 2019		<b>SHEET</b> 2 OF 3	


# LAYOUT

**DOOR**

## SUB-PANEL




ENCLOSURE: 36x30x12" TYPE 4  
SUB-PANEL: GALVANIZED STEEL

 <b>CEMI</b> DESIGN SYSTEMS INTEGRATION 3520 N. 7th Ave., Suite Fk5, 55257104 PH: 650.338.9842	PROPERTY AND CONTENT IN THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF DAQTA FLUID POWER AS A WHOLE. THE WRITTEN PERMISSION OF DAQTA FLUID POWER IS NOT REQUIRED.	<b>TOLERANCE</b> +1.00"/-0.00"	<b>WIRE TYPE</b> TITLE	GXL or SXL
	<b>LOCATION</b> 120	<b>PANEL, CONTROL MAIN POWER</b> X600	<b>DRAWING NO</b> 600435	<b>SHEET</b> 3 OF 3

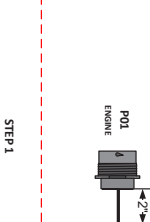
## 54

FRONT VIEW



**STEP 1**

P01 A		RESISTOR
P02 G	SPL 05	



IDENTITY	PLUG	DESCRIPTION
P01	DT06-ZS-P012	INTAKE VALVE
ITEM	PART NUMBER	DESCRIPTION
SOCKET	1	LA2702000
WEIGHT OZ	2	W25-P012
WEIGHT OZ	1	W25-P012
COLOR	SIZE	DESCRIPTION
1	BLK	INTK VALVE GND
2	WHT	INTK VALVE SIGNAL
		PO3 08
		PO3 07



**DESIGN SYSTEMS INTEGRATION**

**Deivi**

3500 N. St Paul Ave. Sioux Falls, SD 57104  
 PH: 605.338.9982

PROPERTY AND CONTENT	TOLERANCE	+1.00"/-0.00"	WIRE TYPE	GXL OR SXL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF DAIKIN FLUID POWER AND IS TO BE KEPT CONFIDENTIAL AS LONG AS IT RELATES TO THE DESIGN, INVENTION OR THE WRITING, PERMISSION OF DAIKIN FLUID POWER IS REQUIRED.	LOCATION	120	TITLE	
	DRAWN	JMA	HARNES, DEUTZ ADAPTER X60	
	ISSUED	15-Apr-2019	DRAWING NO	6004 38
			SHEET	1 OF 1

# THAWZALL

Tamarack Industries



2736 Latoka Lane SW, Unit B  
Alexandria, MN 56308  
USA



[WWW.THAWZALL.COM](http://WWW.THAWZALL.COM)



[support@tamarack-ind.com](mailto:support@tamarack-ind.com)



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