TUCKERBILT®

T-644

6-Yard Concrete Transport Vehicle

OPERATION AND MAINTENANCE MANUAL

Table of Contents

T-644 Operation and Maintenance Manual

Keep this manual in your T-644 as a ready reference.

Foreword

The SAFE and EFFICIENT operation of the T-644 depends on the skill and alertness of the operator. To safely use and maintain the T-644, the operator must:

- Be aware of the working capabilities of the T-644.
- Know the make-up of the T-644.
- Have an understanding of the T-644 Danfoss DP720 monitor operations.
- Comply with the maintenance, safe-driving, and load-handling procedures of the T-644 described in this manual.

It is critical that a qualified individual, experienced in T-644 operation, guide any new operator(s) through several driving and pouring operations before the new operator attempts to operate the T-644 on their own. It is the responsibility of the employer to make sure the operator they designate can see, hear, and has the physical and mental ability to operate the T-644 safely.

This manual contains information necessary for the operation and daily maintenance of the T-644.

> *NOTE: Optional equipment is sometimes installed which can change the operating characteristics described in this manual. Before operating any T-644, make sure the necessary instructions for any optional equipment installed on your T-644 are available, have been studied, and are completely understood.*

All information, specifications, and illustrations in this manual are based on the latest data available at the time of publication. The specifications, torques, pressures, measurements, adjustments, illustrations, and instructions can change at any time. These changes can affect operating procedures and the service required by the product. Obtain the most complete and current information from your Tuckerbilt® dealer before starting any job. Additional manuals are available from your Tuckerbilt® dealer. T-644 operator training is provided through your Tuckerbilt® dealer. They will be glad to answer any questions you have about operating or maintaining your new T-644.

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T-644 Authorized Use and Limitations

The T-644 Concrete Transporter is designed to collect concrete from a batch plant and discharge it into nearby forms efficiently and safely. That is the T-644's sole purpose and those are the only functions for which the T-644 is authorized to be used. Any use of the T-644 other than transporting concrete between batch plant and forms is an unsafe and unauthorized use of this equipment and may result in injury or death to operators, crewmembers or bystanders and damage to the T-644. The manufacturer assumes no liability whatsoever for improper or unauthorized use(s) or operation(s) of the T-644 Concrete Transport Vehicle.

- Modifications, changes, or additions to the T-644 must be factory approved.
- The T-644 is not intended for and should never be operated on public roads.
- When pouring concrete using the T-644 it is critical that the machine be on flat, stable ground.
- Moving in a straight path, parallel to the angle of the incline, a loaded T-644 can negotiate a + 6˚ grade with the hopper level to the frame.
- Do not turn or attempt to maneuver the T-644 unless it is on flat, stable ground.

T-644 Operator Safety Guidelines

The safety rules and regulations in this manual are representative of some, but not all rules and regulations that apply to the T-644. The most effective way of preventing serious injuries or death to yourself and others is for you to know how to maintain and operate the T-644 properly. Drive carefully and avoid maneuvers or conditions that can cause accidents. Do not operate the T-644 if it needs maintenance, repair or appears to be unsafe in any way. Report all unsafe conditions immediately to your supervisor and contact your authorized Tuckerbilt® dealer. Do not attempt any adjustments or repairs unless you are trained and authorized to do so. All maintenance and repair operations should be undertaken on flat, stable ground.

Continuing improvement and advancement of product design may have caused changes to your T-644, which may not be included in this publication. Whenever a question arises regarding your T-644, or this publication, please consult your Tuckerbilt® dealer for the latest available information.

All T-644 users should be familiar with their local, regional, and national regulations.

Proposition 65 Warning

WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

Important Warning Symbols

The following safety signs and notices are used in this manual to emphasize important and critical instructions.

- These are the safety alert symbols. They are used to call your attention to potentially serious personal injury hazards. Obey all safety messages that follow these symbols to avoid serious injury or death.

DANGER Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to your machine.

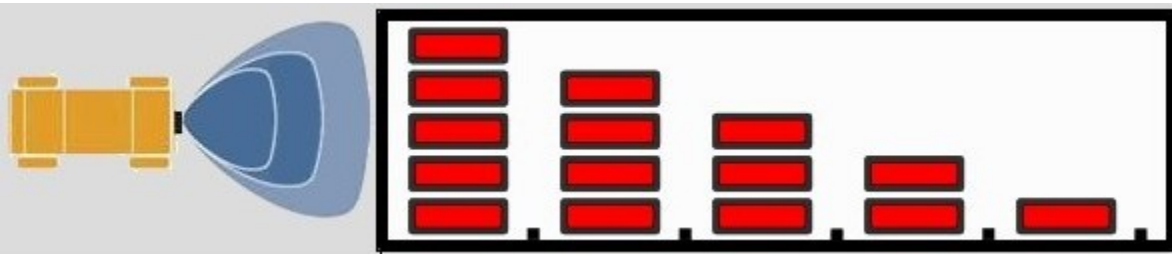
Protect yourself from injury. Use proper safety equipment, including safety glasses, hardhat, and hearing protection when required.

Directional Terms

The directions “left,” “right,” “front” and “rear” used in this manual are given from the viewpoint of the operator facing forward as he sits in the cab of the T-644.

Safety Features

Safety Features, Back Up Alert System



The Back Up Alert System helps avoid collisions in two ways.

- Notifies the operator of an object's proximity to the rear of the T-644.
- The Back Up Alarm alerts people or machinery of an approaching T-644.

The Back Up Alert System is automatically activated when reverse propel is initiated. When the Back Up Alert System is active, the following happens:

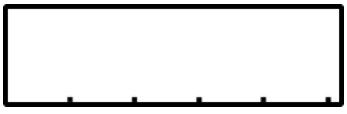
- The Radar Screen is shown on The Danfoss DP 720 Monitor.
- The Beeper in the dash starts to sound.
- The Back Alarm at the rear of the machine starts to sound.

If the area behind the T-644 is clear:

- The Radar Screen may show one or no bars.
- The Beeper in the dash will beep slowly.
- The Back Up Alarm at the rear will not be very loud.

When the T-644 backs toward an object or something approaches the rear of the machine:

- The Radar Screen bars will start from right to left, increasing as the distance decreases.
- The Beeper in the dash will beep rapidly.
- The Back Up Alarm gets louder and the beeps become more rapid.



No objects detected

Object detected

Object very close. Maximum Caution Required!

Safety Features, Seat Safety Circuit

The Seat Safety Circuit is activated when the operator leaves the seat for more than 2 seconds. When the Seat Safety Circuit is active, the following happens:

- The air supply to the operator cab is shut off.
- The parking brake is automatically engaged.
- Propel is immediately disabled, stopping forward or backward machine travel.
- The engine speed is reduced to idle (if in Auto Mode).
- All hydraulic functions are disabled, except A/C.

Because activation of the Seat Safety Circuit will automatically engage the parking brake, it must be manually released (pushed in) by the operator when he returns to the seat to resume operating the machine.

While operating the T-644 the operator must keep the seat belt securely fastened across their lap to prevent rising out of the driver's seat and inadvertently activating the seat safety circuit. The sudden stop caused by activation of the seat safety switch can cause injury, death or tip-over of the T-644 — especially but not limited to times when the T-644 is carrying a load of concrete.

Seat Safety Circuit Override

In the event of a defective seat switch or wiring issue, an override in the Danfoss DP 720 Monitor has been provided to enable temporary operation of the T-644. This is designed as an emergency procedure to allow for emptying the hopper and/or a return to maintenance to fix the issue. The override requires you to acknowledge the danger of enabling the override and a password must be entered to get to the override screen. Upon selecting, you still must confirm by pressing Yes. For the duration of the override, the following popup screen is displayed and counts down from 300 seconds. When 10 seconds are left, the machine will slow to a stop and the engine will return to an idle. At 0 Sec. the brakes will lock, and the hydraulic functions will no longer be active except for the A/C. Please plan accordingly!!!! If more time is required, the override can be restarted by going through the entire override procedure again. For more information on how to activate the override, please refer to the Safety Override in the Danfoss DP 720 Monitor Section.

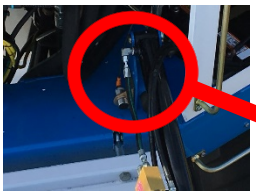
Safety Features, Chute Cover Door Sensors

The Chute Cover Door Sensors will stop Auger rotation if a door is opened. The Chute Cover Doors must remain closed for the Auger to turn. Keep the sensor surface clean and avoid impact for maximum sensor life. A 3/8" gap is standard between the door and sensor.

Chute Cover Door Sensor Override

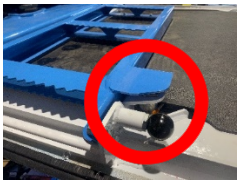
DANGER In the event of a defective proximity sensor or wiring issue, an override in the Danfoss DP 720 Monitor has been provided to enable temporary operation of the T-644. This is designed as an emergency procedure to allow for emptying the hopper. The override requires you to acknowledge the danger of enabling the override and a password must be entered to get to the override screen. Upon selecting, you still must confirm by pressing Yes. For the duration of the override, the following popup screen is displayed and counts down from 120 seconds. If more time is required, the override can be restarted by going through the entire override procedure again. For more information on how to activate the override, please refer to the Safety Override in the Danfoss DP 720 Monitor Section.

Safety Features, Engine Bay Back Door Sensor



The Engine Bay Back Door Sensor alerts the operator on the Danfoss DP720 Monitor that the door is open or not fully closed. This sensor does NOT stop any movement!! Be aware of the additional swing radius when the door is open. Severe damage may occur if it were to strike an object. Be alert if moving the T-644 when this door is open.

Safety Features, Engine Bay Service Platform Ladder Sensor



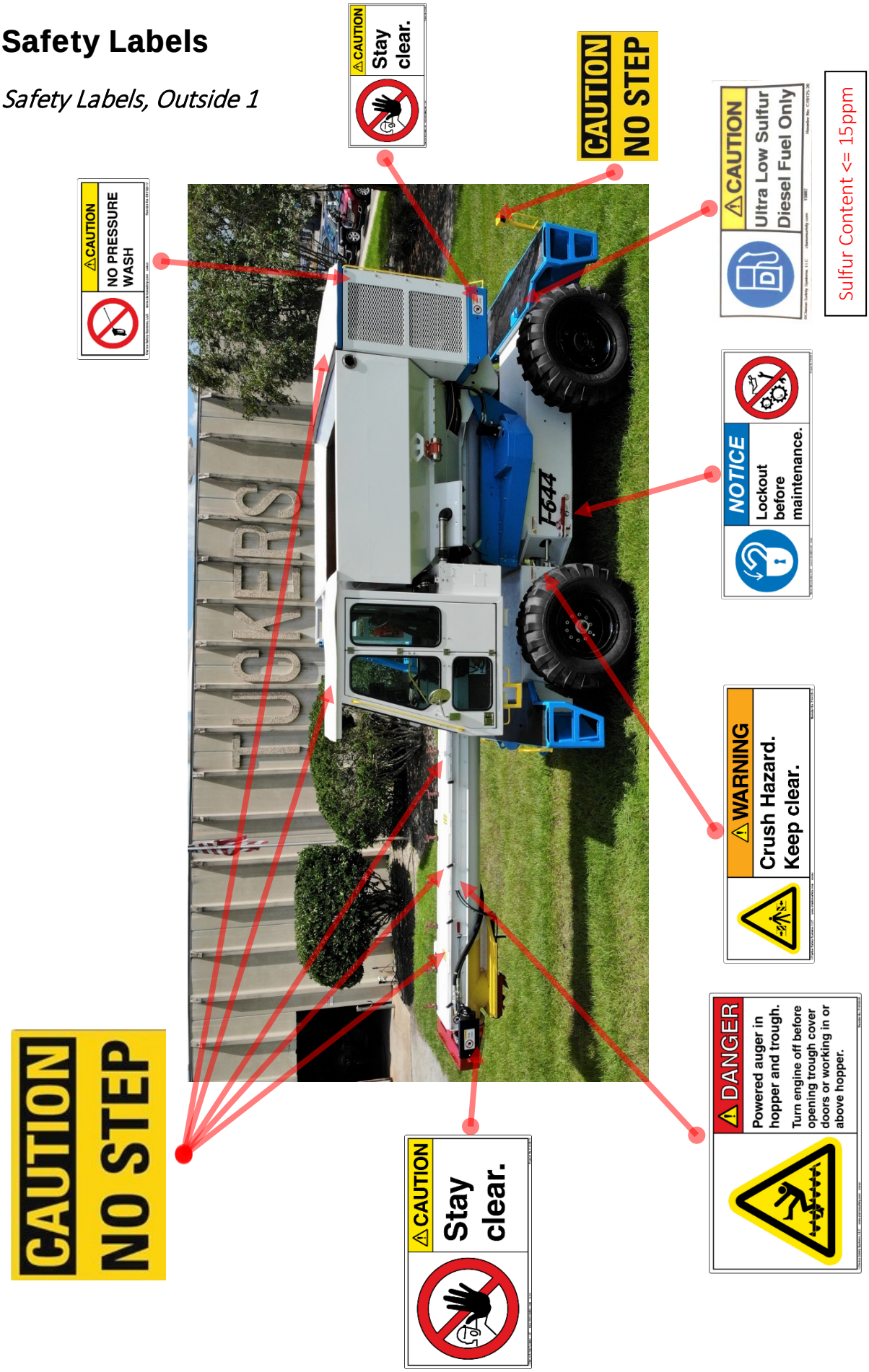
The Engine Bay Service Platform Ladder Sensor will not allow the Engine Bay Back Door to close IF the Ladder is unfolded. The Engine Bay Hydraulic Power Unit will run, but the cylinder will not move.

Safety Features, Propel Creep

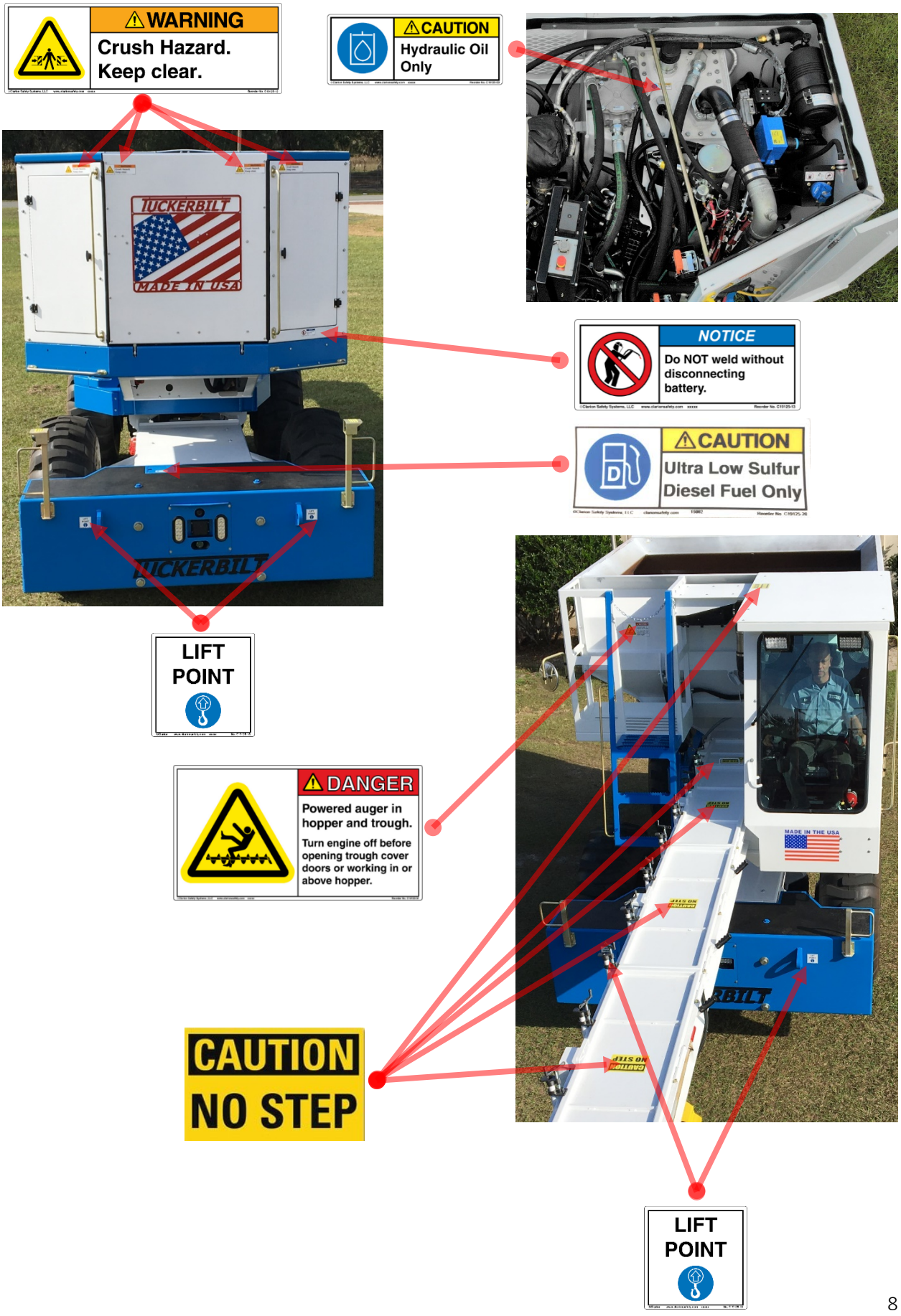
Propel Creep (Creep) is a speed limiting software feature that allows the operator to quickly set a maximum percentage (1-100%) of Forward and Reverse propel command. This is a toggle ON/OFF feature often used for operation in close quarters, or when learning to operate the T-644. For example, if an operator enabled Creep set to 10%, the T-644 would move slowly.

Safety Labels

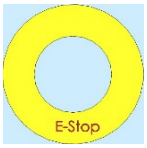
Safety Labels, Outside 1

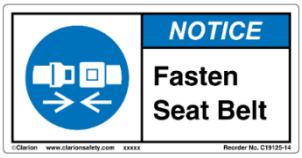


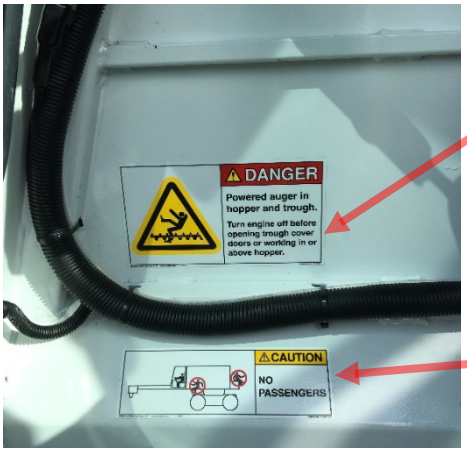
Safety Labels, Outside 2

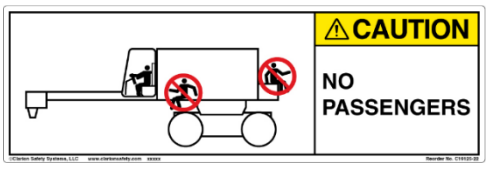


Safety Labels, Inside Cab









T-644 Components

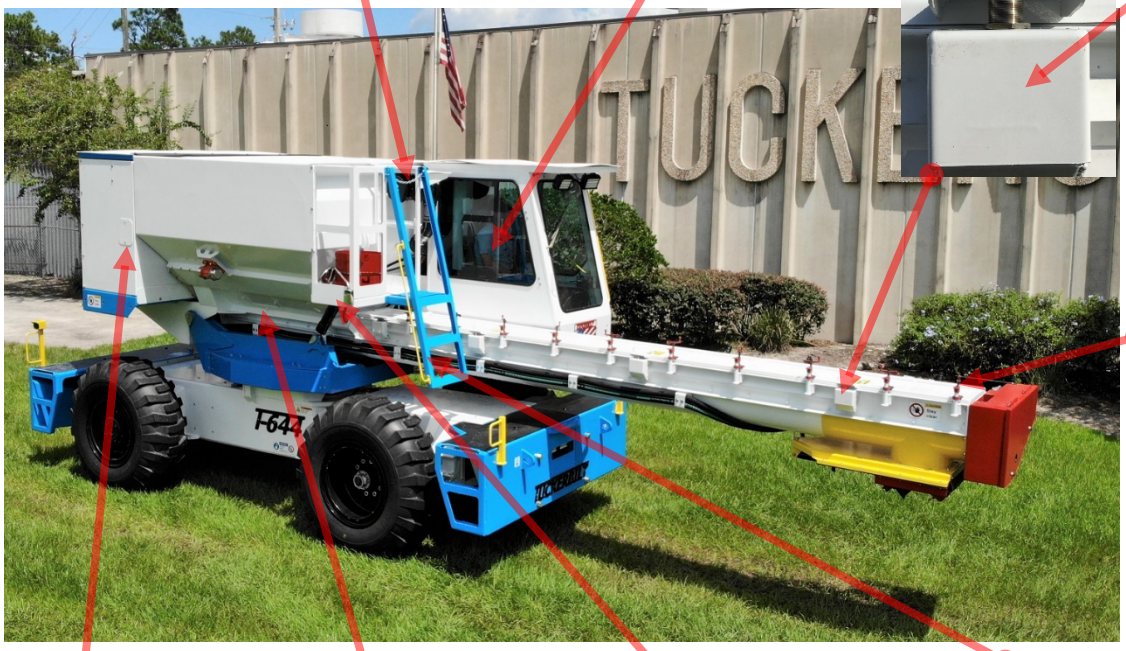
T-644 Components, Left Side

Work Lights
Hopper
Engine bay
Swing Motor
Rear Bumper
Chute Cover Doors
Left Turntable Cover
Left Rear Wheel
Auger Drive Box
Slide Gate
Chute Door Opener Tool
Chute
Headlights
Left Front Wheel

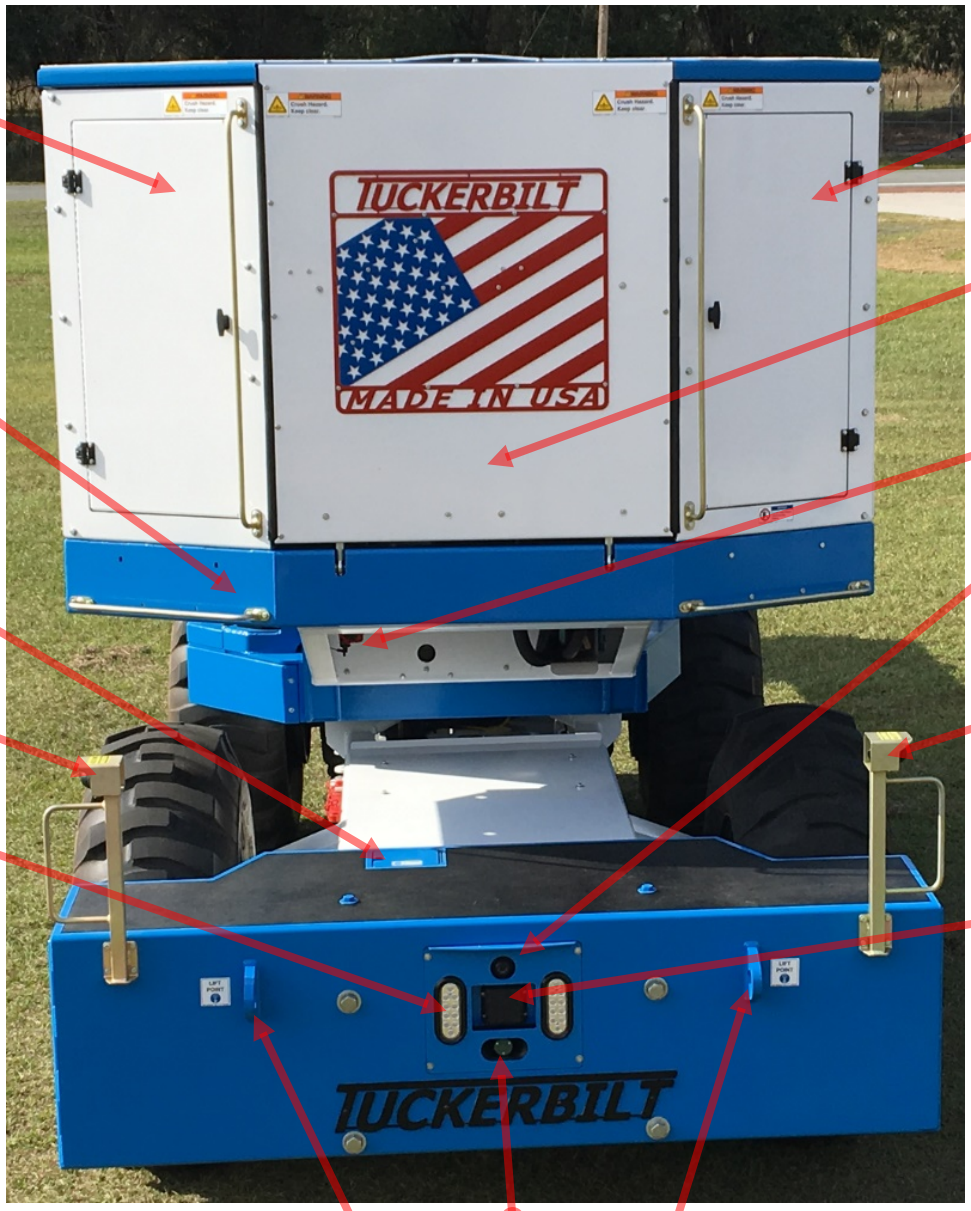
6 Cubic Yard Maximum Fill Line (Inside Hopper)

Operator Cab
Left Side Camera
Left Hopper Vibrator
Gear Hub
Fire Extinguisher (Inside Cab)
Front Axle
Front Lift Points

T-644 Components, Right Side



T-644 Components, Rear



Left Engine Bay Side Door

Right Engine Bay Side Door

Engine Bay Back Door

Engine Base

Fuel Lift Pump w/Water Separator

Fuel Fill

Rear Camera

Left Camera

Right Camera

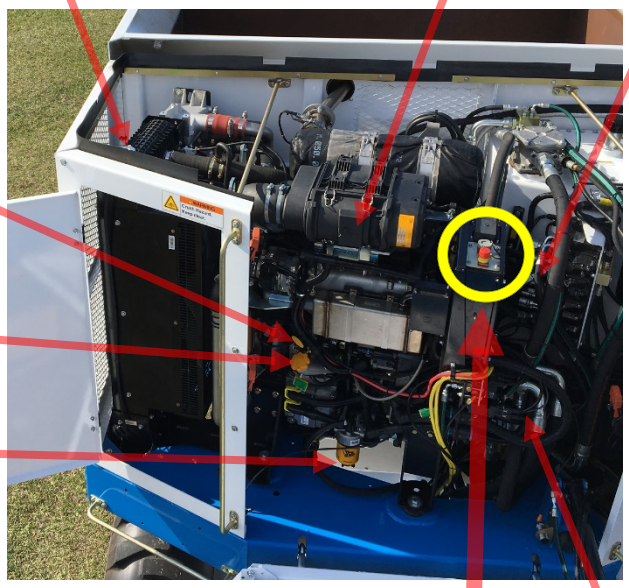
Back Up Lights

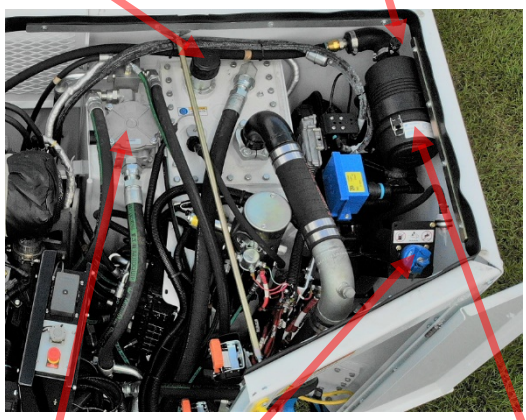
Backup Radar

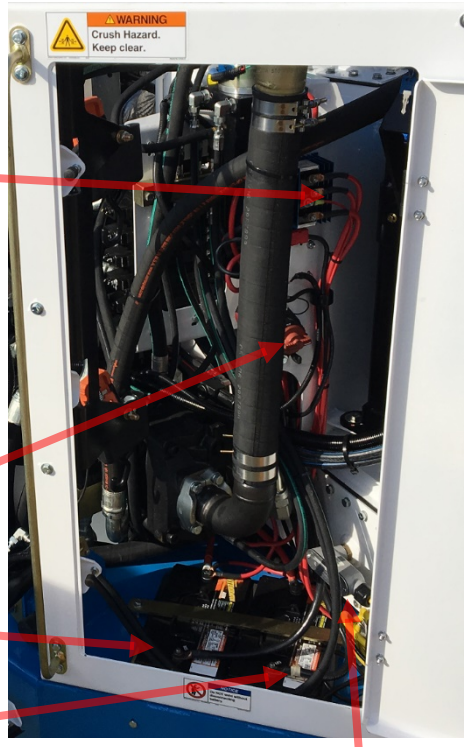
Back Up Alarm

Rear Lift Points

T-644 Components, Engine Bay







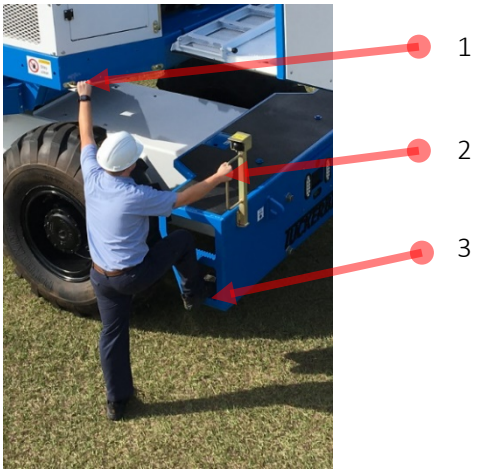
T-644 Access Procedures

Three-Point Rule

WARNING

Use the Three-point rule to reduce your chance of a slip or a fall while entering or exiting the T-644.

The Three-Point rule means that three of your four limbs are to remain in contact with the machine at all times- either two hands and a foot, or two feet and one hand.



DO'S

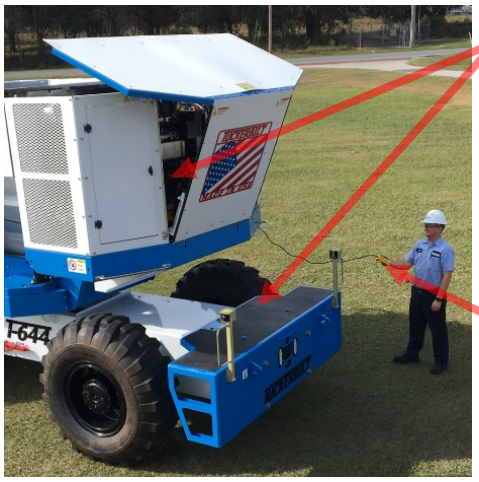
- Ensure that the bottoms of your shoes are clean before climbing.
- Enter and Exit facing the T-644.
- Slow down and use caution in bad weather.
- Get a firm grip on the handles with your hands.
- Look for obstacles on the ground before exiting.

DON'TS

- Don't climb with something in your "free" hand. Reach up for it after you get to the ground and vice versa.
- Don't ever jump out.
- Don't use tires as step surfaces.
- Don't use the door frame or door edge as a handhold.
- Don't become an injury statistic.

Only you can prevent a fall! A professional T-644 operator knows the Do's and Don'ts of getting in and out of the machine and practices the Three-Point Rule every day.

Engine Bay Platform Access



Engine Bay Back Door Pendant

Always Use provided grab handles and steps.

WARNING While opening the Engine Bay Back Door, stand to the side as loose items, concrete or otherwise, may fall from the roof.

WARNING While entering or exiting the T-644, use the Three-Point Rule.

1. Use the Engine Bay Back Door Pendant to open the door. Beware of Crush Hazard when opening and closing!
2. Climb to the Bumper deck using the grab handles and steps.
3. Fold out Platform Ladder and use to climb to Service Platform.
4. Engage Platform Safety Straps. (See: Engine Bay Platform Safety Strap Instructions)
5. To exit, perform Steps 4-1 in the reverse order.

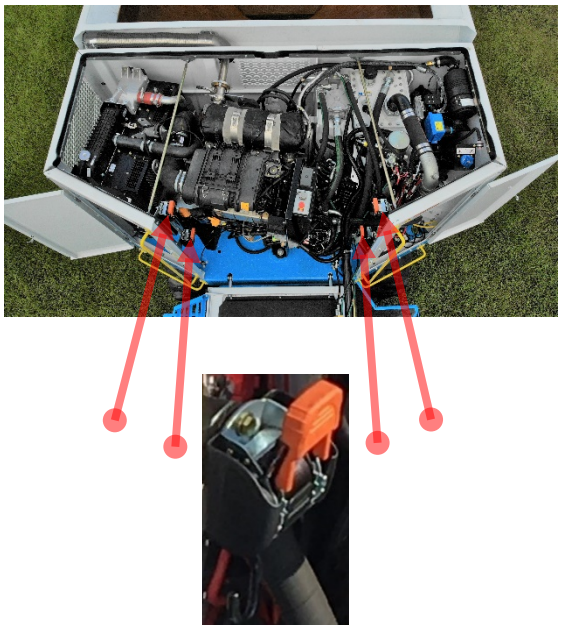
Engine Bay Service Platform Ladder

Engine Service Platform

Engine Bay Platform Safety Straps

DANGER

Install and lock 4 Service Platform Safety Straps when working on platform



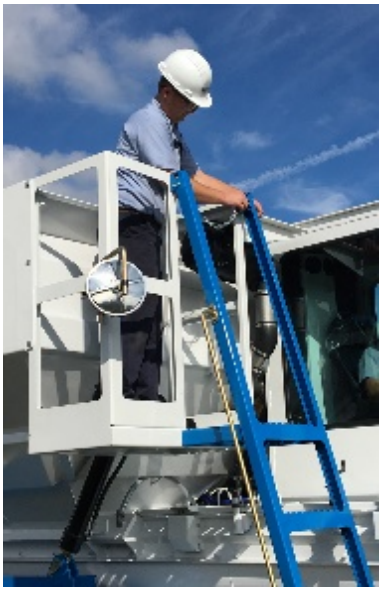
1. Hook Safety Strap to corresponding loop.
2. Ratchet snug.
3. Repeat for each strap. (X 4)
4. When finished working, loosen Strap ratchet and retract.
5. Ensure Straps are stored clear of moving parts.

Washout Platform Access

WARNING While entering or exiting the T-644, use the Three-Point Rule.

1. Climb to the Bumper deck using the grab handles and steps.
2. Climb to the Washout Platform using the Ladder.
3. Once in the Washout Platform, secure the safety chain across the entryway.
4. To exit, perform Steps 1-3 in reverse order.





WARNING Don’t climb with something in your “free” hand. Reach up for it after you get to the ground and vice versa.

Operator Cab Access

WARNING While entering or exiting the T-644, use the Three-Point Rule.

1. Open Operator Cab Door.
2. Climb to the Bumper deck using the grab handles and steps.
3. Enter the Operator Cab, and sit down.
4. Buckle seatbelt.
5. Fold Left Joystick Console down.
6. Fold Left Armrest Down.
7. Close Operator Cab Door.
8. To exit, follow Steps 1-7 in reverse order.

DANGER When in the Cab, and operating the T-644, wear your seat belt. Make sure it is in good working order.

CAUTION ***The T-644 is equipped with a pressure sensitive "seat safety circuit" under the driver's seat that senses if an operator is properly seated at the controls. When operating the T-644 it is critical that you remain seated and securely belted into place for your safety and to prevent accidental engagement of the seat safety switch. Leaving the seat while the T-644 is in operation will cause a sudden and dangerous automatic engagement of the brakes and the loss of power to all controls.***

Operator Cab

Operator Cab, Components

Park Brake

USB Charger

Hopper is straight when centered between Green Lines.

Air Gauge

Beeper

E-Stop

Key On/Off

Video Camera Monitor

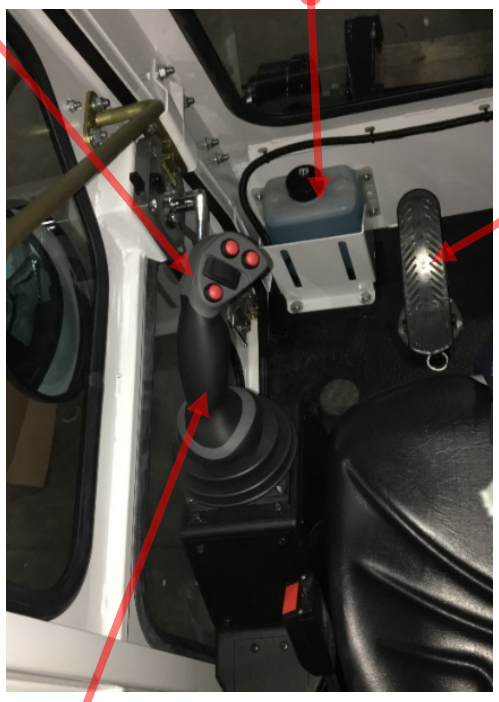
Tucker Model & Serial Plate

Fire Extinguisher

Danfoss DP720 Monitor

Door Handle

Windshield Washer Bottle



Brake Pedal

Cup Holder

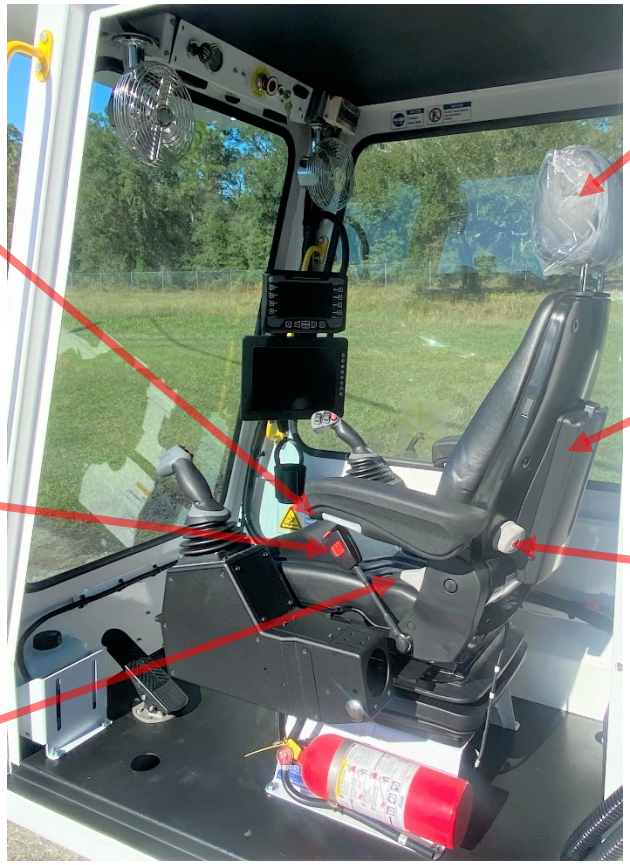
Right Joystick

Emergency Glass Break Hammer

Left Joystick

Operator Cab, Seat

Armrest
The height of the front of the armrest can be raised or lowered by turning the adjustment knob. Adjust so the hand rests comfortably on the joystick while the forearm is supported. The armrest can be folded up if required.



Headrest
The headrest can be adjusted for height by pulling up over the various increments up to the end stop. By pushing forward or backward the angle can be changed individually. To remove pull up over stop.

Manual Storage Box

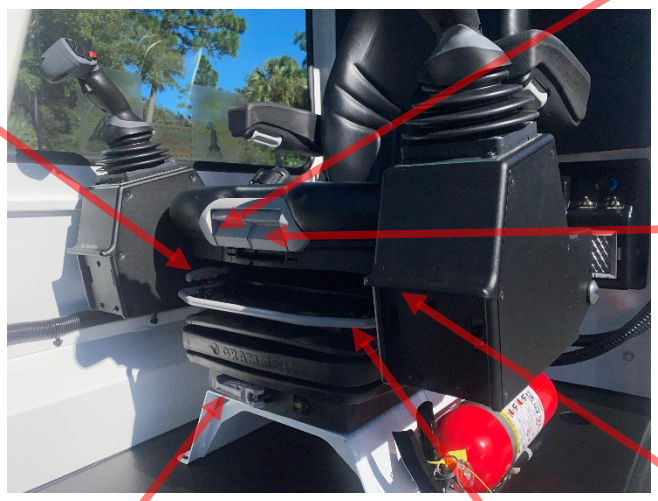
Seatbelt

Lumbar Adjustment
By turning the knob left or right, both the height and curvature of the backrest cushion can be adjusted.

Backrest Adjustment
Lift locking lever to release backrest catch. By pressing forward or backward the backrest can be moved to the desired position. Release lever to lock position.

Seat Pan Angle
Lift the handle. By applying pressure on or off of the front or rear of the seat pan, it can be moved to the desired angle.

Seat Slider
Raise lever to adjust seat forward or backward in relation to the joystick consoles. Adjust to avoid reaching for joysticks.



Seat Pan Depth
Lift handle to move seat pan forward or backward.

Lift Joystick Console Here

Weight Adjustment
Adjust the seat for the driver's weight by turning the handle clockwise (+) or counterclockwise (-) with the driver not sitting on the seat.

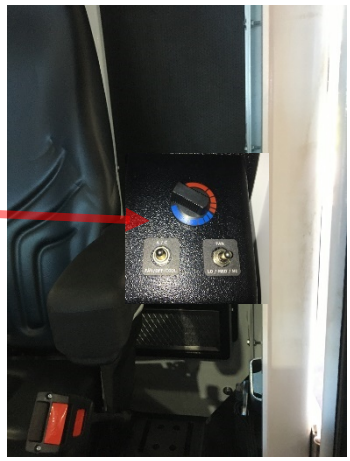
Console Slider
Lift the locking lever to adjust the entire seat and joystick console front to back. Ensure the locking lever latches into position with an audible click.

Operator Cab, Air Quality System

The T-644 Cab Air Quality System is made up of four main parts:

- Cab Fresh Air Pressurizing Filter
- A/C- Heater
- Recirculation Filter
- Pressure Monitor

The Cab Fresh Air Pressurizing Filter separates debris from the outside air and pumps it into the A/C. This creates positive pressure in the Cab, keeping outside unfiltered air from entering the Cab. This filter also keeps the A/C coils clean in the dusty environment. The A/C-Heater unit allows for temperature control. The Cab Recirculation Filter continually pulls air from the bottom of the Cab where dust typically gathers, filters it, and then sends it back to the A/C. Clean air continually flows over the operator's head even if the A/C or Heater is off. The Pressure Monitor will alert the operator if Cab pressure drops too low. Typically, this alarm will sound if the Cab door is open for an extended period of time. It can be momentarily silenced by pressing and holding the black button for a few seconds.



Danfoss DP720 Monitor

DP720 Overview

The Danfoss DP720 Monitor (DP720) is the communications interface between the operator and the CAN Bus system used to control the machine operation. From Key On until Key Off, the DP720 is a constant source of information.

The Rectangles are used to select the option just to the right or left of this symbol. Optionally the Screen is a Touch Screen and selections may be made on the screen itself.

The X is used to back up one Menu at a time. Press and hold the X to quickly return to the DP720 Main Menu.

The O is used to accept the option directly above it. Most often it is a Check Box: 
If not a check box, press and hold from most screens to return to Main Run.

Use a quarter or large screwdriver to remove the plug. A USB drive can be inserted to save current Maintenance Logs and Configurations in future versions.

DP720 General Information

 Throughout the manual, you may see overlapping indicators such as this. This is done for educational purposes and in actual operation only one will show at a time.

In the DP720 screenshots shown in the manual, most buttons appear green. During use, this will not always be the case.

During use of the DP720, most buttons will be gray until selected.
Typically, a grey button means that the function is OFF.

When a button is selected it turns green.
Typically, a green button means that the function is ON.

Buttons are either "latched" or "momentary". Latched means that the button stays selected until pushed again (e.g., Headlights). Momentary means that the button is only selected while the button is being held (e.g., Horn).

DP720 Pop-Up Messages

Engine Cover Open: Indicates the engine cover is open, but does not stop operation.

Release Park Brake: This message will flash and beep when travel or steering is initiated with the Parking Brake on. Touch the icon and hold for 5 seconds and it will not return until the next Key cycle.

Low Engine Coolant Level: A loose or blown radiator hose or heater hose can be the cause. Only override this alarm if you have checked for leaky equipment.

Open Slide Gate Before Engaging Auger: The Slide Gate must be open for the Auger to turn. If not, this pop-up will be displayed.

DP720 Start Sequence

Logo

The Logo screen is the first that you will see after the DP720 powers up.

The DP720 and Micro Controller (MC) communication status is shown by the indicators to the left.

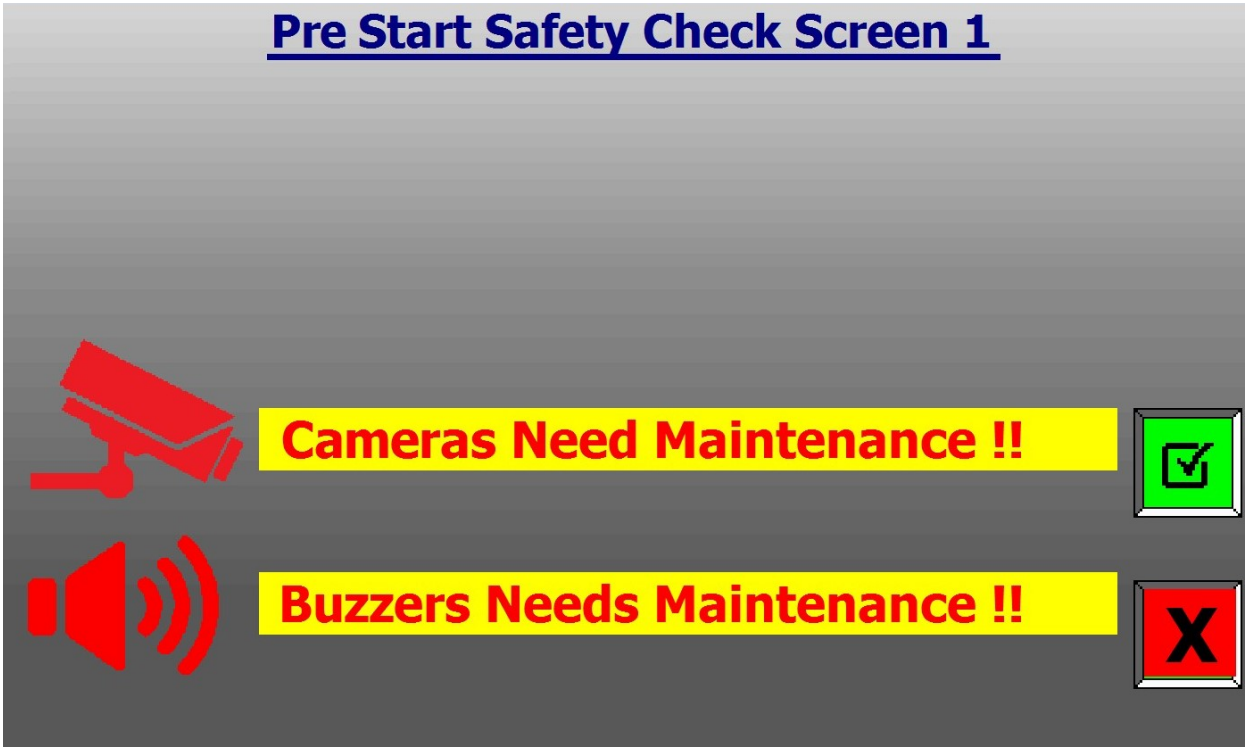
✓ Indicates all is well.

✗ Indicates there is an issue.

The DP and MC software versions are displayed to the right of their name.

If there are no issues, the program will advance to the next screen.

Pre Start Safety Check Screen 1



The Pre Start Safety Check Screen 1 prompts the operator to confirm two things.

1. **Are safety cameras working?**

 To confirm all are working.  To indicate camera maintenance is required.

Either answer will allow the program to proceed.

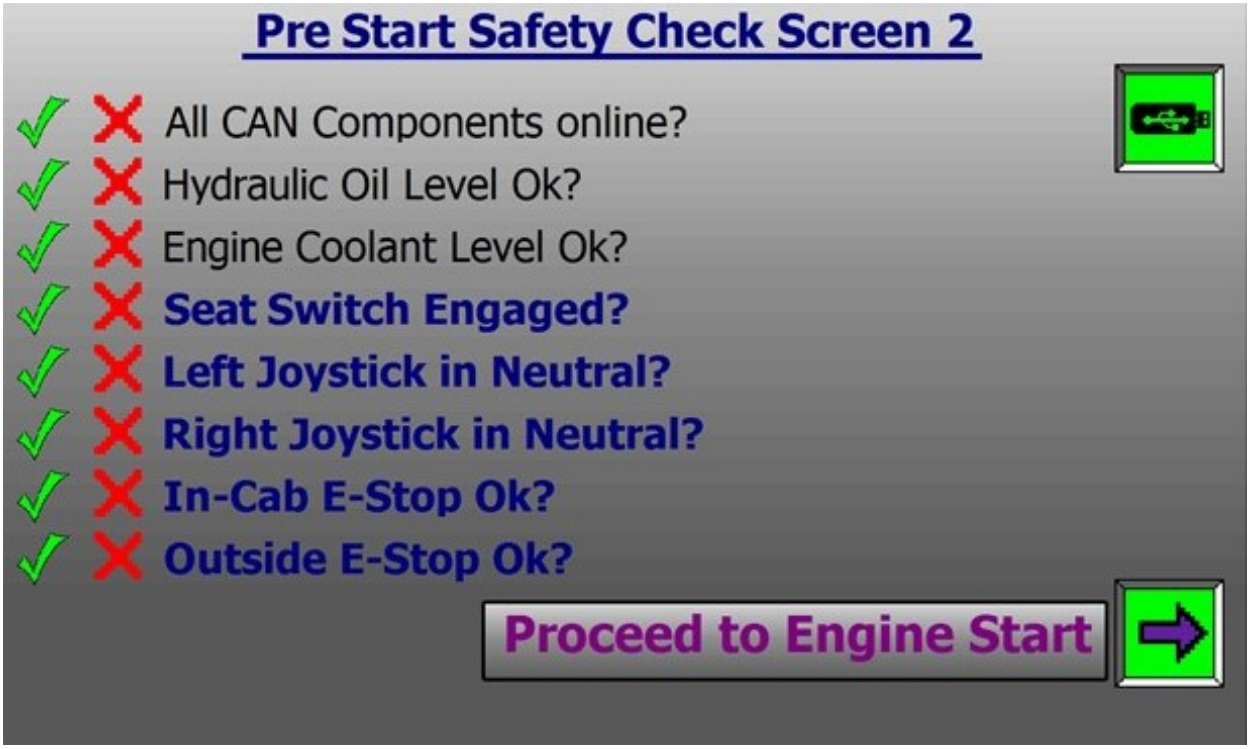
2. **Are back up and alarm buzzers working?**

 To confirm all are working.  To indicate buzzer maintenance is required.

Either answer will allow the program to proceed.

 When "X" is selected one of the following corresponding messages will be displayed:

Pre Start Safety Check Screen 2

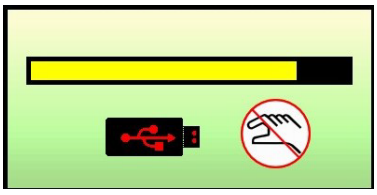


The Pre Start Safety Check Screen 2 displays the status of critical components prior to the machine start.

Indicates all is well. Indicates there is an issue.

If an appears, the situation should be corrected before proceeding.

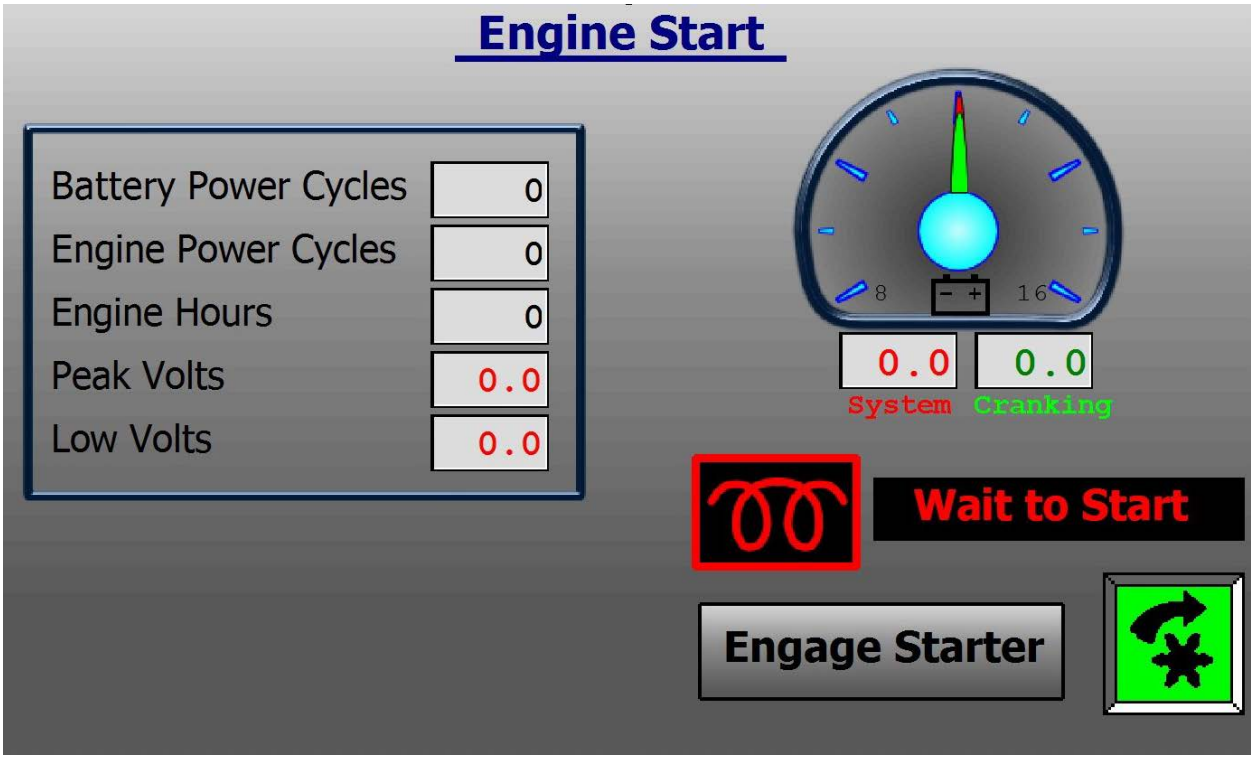
A USB drive may be inserted in the DP720 to export a log of the safety checks. Insert the drive, then press the icon.



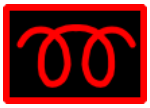
This pop-up will display during an export to USB. Do not remove until finished.

Proceed to Engine Start screen.

Engine Start



The Engine Start screen is where the Starter button is located.



If the Gird Heater symbol is red, and **Wait to Start** is displayed, Engine Pre-heating is required. Wait until it goes back to gray before starting.

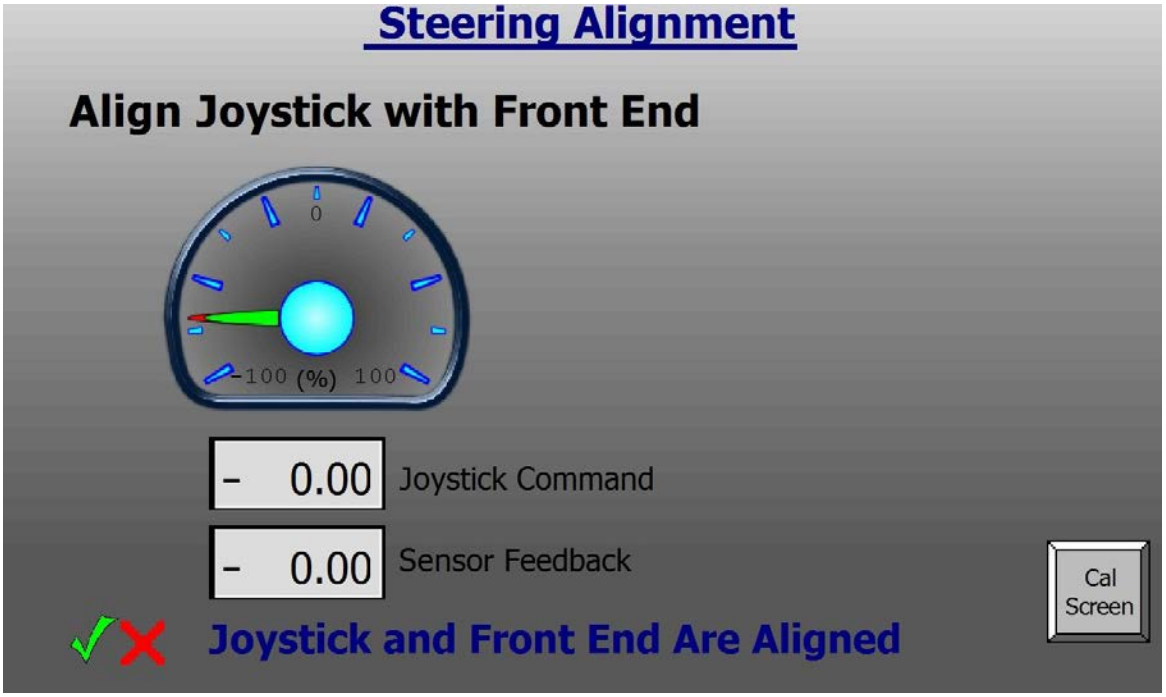
The T-644 has two batteries. Each is represented by a separate indicator on the dial.

1. The "System" battery powers the electronics and sensors.

2. The "Cranking" battery powers the starter and the vibrators.

Press  to Start the Engine.

Steering Alignment



The Steering Alignment screen compares the Joystick steer command to the Front End position.

 Indicates Joystick and Front End are aligned. The program will automatically proceed to Main Run.

 Indicates Joystick and Front End are **NOT** aligned. Once aligned by the operator, the program will automatically move on to Main Run.

Press to jump to the Steering Calibration Page.

Alignment occurs when the Joystick and the Front End are pointed in the same direction.

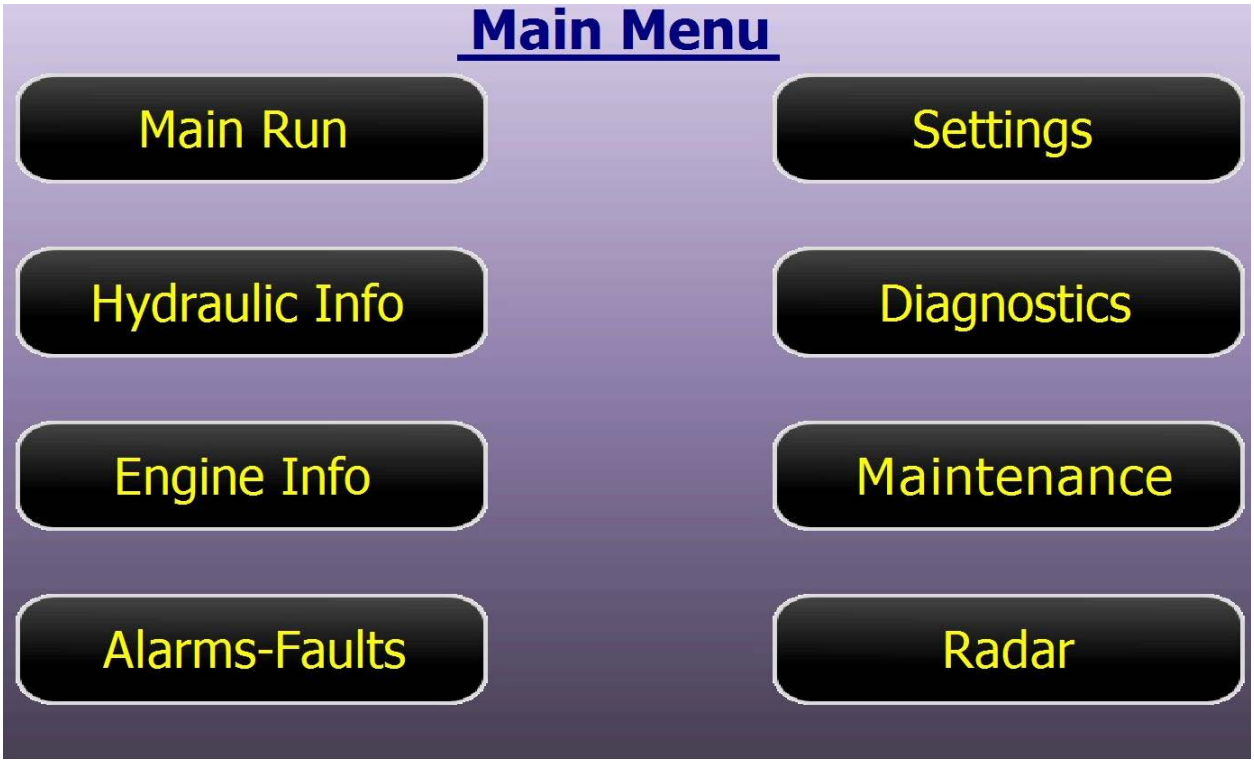
EXAMPLE**: NOT** aligned

- Indicators not pointed in the same direction
- Grey "Button" (Main Run)

EXAMPLE: aligned

- Indicators pointed in the same direction
- Green "Button" (Main Run)

DP720 Main Menu

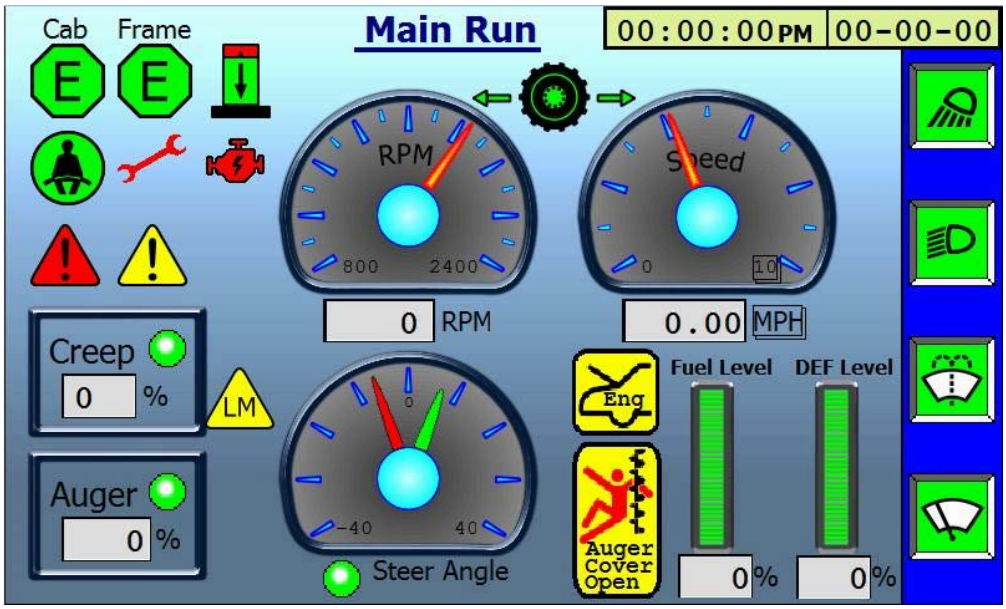


The Main Menu page lists the category headings.

- Main Run: The default screen containing the most commonly used icons and short cuts.
- Hydraulic Info: Hydraulic component pressures, temperatures, and levels
- Engine Info: Engine codes, temperatures, pressures, and conditions.
- Alarms-Faults: Alarm or Fault details and descriptions and overrides.
- Settings: Presets for Creep and Auger, DP720 Display preferences and Steering Encoder setup.
- Diagnostics: CAN Bus system troubleshooting tools.
- Maintenance: An hourly based record of when major service was performed.
- Radar: Test the Radar without causing machine movement.

Main Run

From Main Menu - Main Run



Main Run: The default screen containing the most commonly used icons and short cuts.

Icon Descriptions:

E-Stop status: Cab and Engine Compartment (Frame). Green is run, Red is stop.

Elevator status: If equipped with Elevator option, Green is down, Red is up.

Seat status: Green if an operator is in the seat, Red if not. Touch a Red icon for Override instructions.

Maintenance status: Green if maintenance tasks are up to date, Red if not. Touch the icon to view Service log.

Engine status: Green when all systems are normal, Red if not. Touch the icon to view Engine Info.

Alarm-Fault status: The triangle will flash when a Fault (Red), or an Alarm (Yellow) occurs. Touch a flashing icon to view the appropriate Fault or Alarm screen.

Creep status: The current Creep % setting is shown. Green circle when active, Gray when off. Touch the icon to quickly access the Presets screen.

Main Run, 2

Load Mode status: Load Mode is active when icon is shown.

Auger status: The current Auger % setting is shown. Positive is Forward, while Negative is Reverse. Green circle when active, Gray when off. Touch the icon to quickly access the Presets screen.

RPM: Engine speed.

Speed: T-644 ground speed.

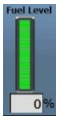
Propel Enabled: Displayed when Steering is aligned, and an Operator Present trigger is pulled. Icon must be visible for propel.

Steer Angle: Shows the relationship between Joystick and the Front End. Touch the icon to display the Steering Trim popup.

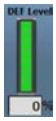
Steering Trim: The Left or Right Arrows are used to fine tune the Front End center point.

Engine Bay Back Door Status: Door is open when icon is displayed.

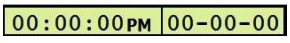
Auger Cover Door Status: A door is open when icon is shown. Touch the icon to quickly access the Alarms screen to determine which door is open or to Override.



Diesel Fuel Level



Diesel Exhaust Fluid Level (Tier 4 final)



Time and Date: Touch the icon to quickly access Settings screen to adjust.

Work Lights

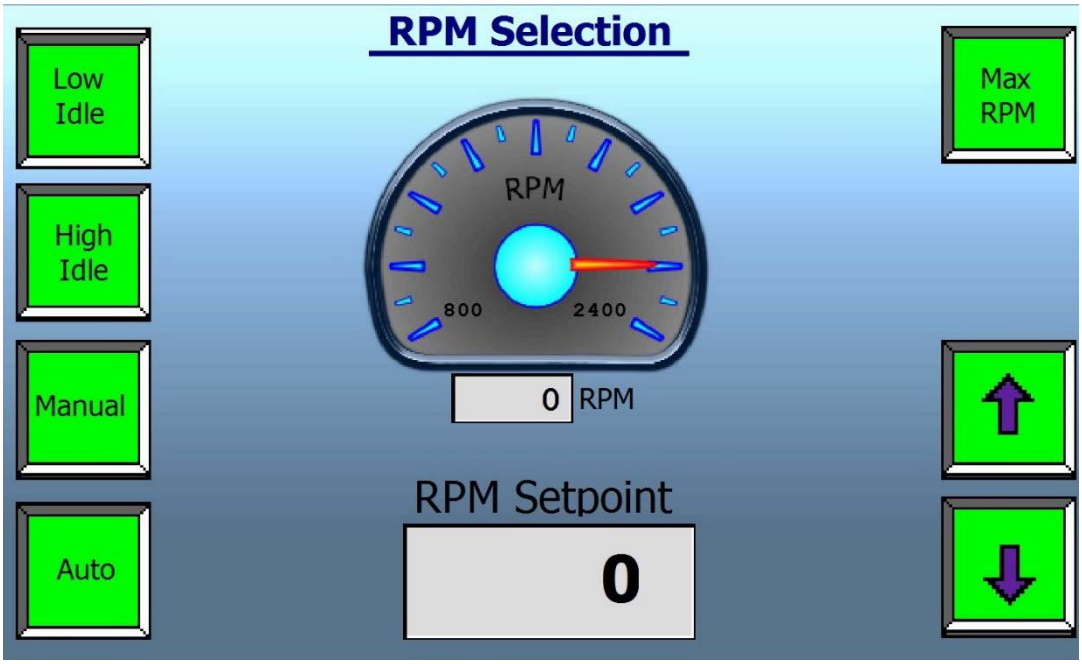
Head Lights

Windshield Washer

Windshield Wiper

RPM Selection

From Main Run - 

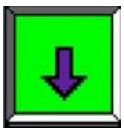


Low Idle: Sets Engine speed to 1200 RPM.

High Idle: Sets Engine speed to 1500 RPM.

Manual: Allows the operator to set Engine Speed between 1200 and 2200 RPM.

 Increase Engine RPM while in Manual

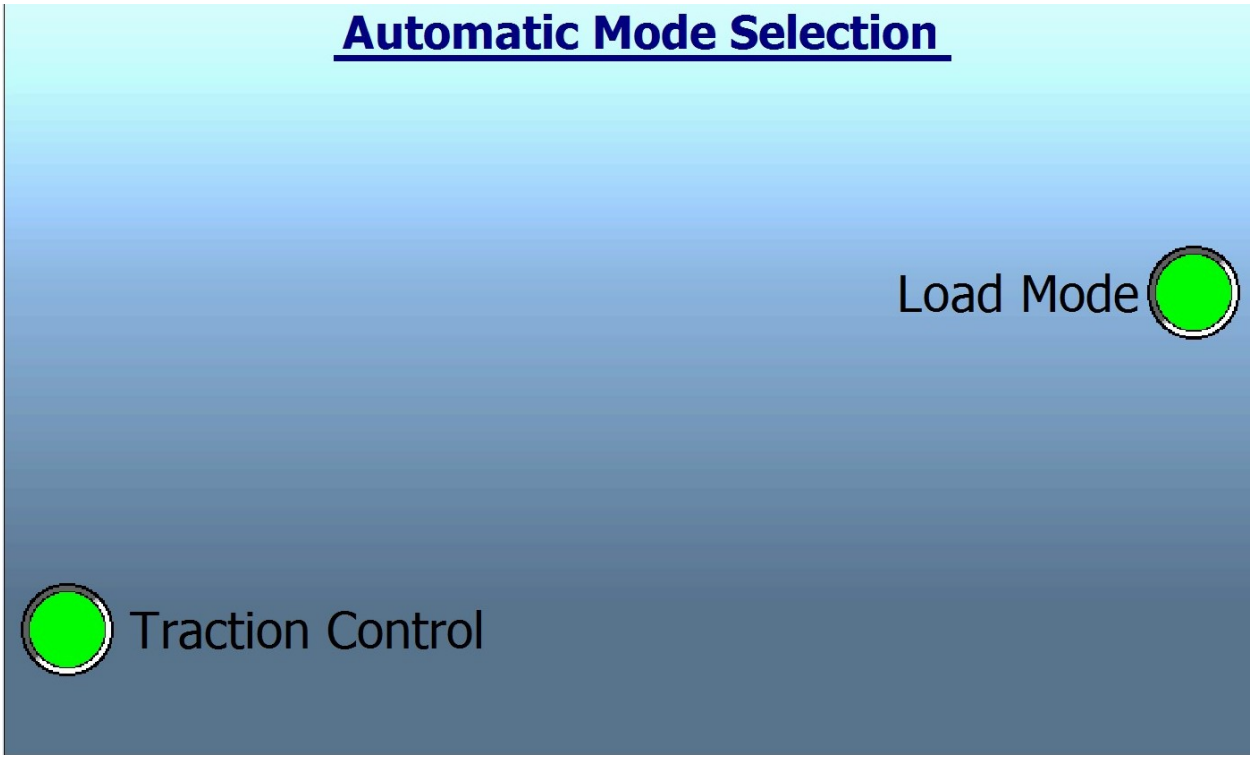
 Decrease Engine RPM while in Manual

Auto: Engine speed is automatically adjusted based on work requirements.

Max RPM: Sets Engine speed to 2200 RPM.

Automatic Mode Selection

From Main Run - 



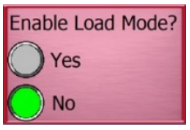
Traction Control: A software solution to help avoid tire slip. Green circle when enabled, Gray when off. It remains enabled, even after Key cycles, until turned off.

Load Mode: (LM) A software solution that does several things:

- Traction Control is enabled if not already.
- Creep is enabled if not already.
- Steering angle is LIMITED.

Green circle when enabled, Gray when off. LM is disabled after a key cycle. Load Mode is to be designed to make loading the T644 onto a trailer or truck ramp safer and easier. It can also be used to navigate narrow batch plant or form aisleways.

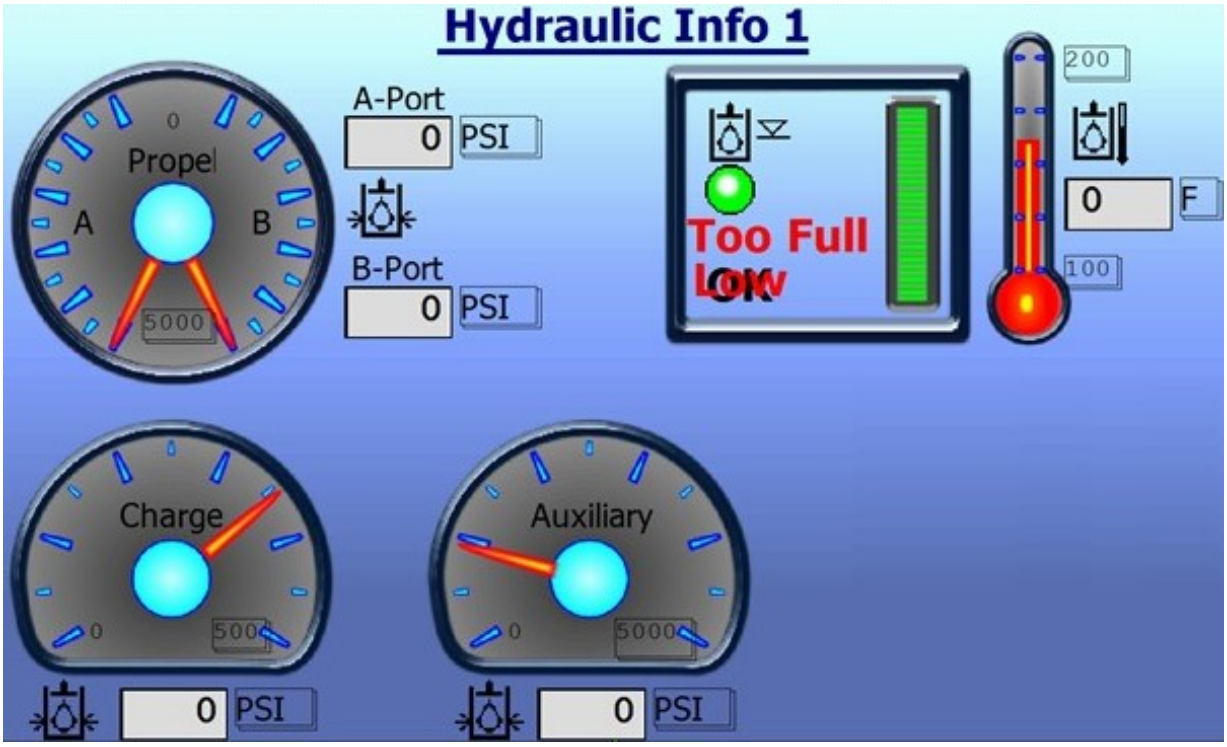
When LM is selected, a pop-up confirmation box will appear. A “Yes” selection is required to enable.



Icon is displayed on the Main Run screen when enabled.

Hydraulic Info 1

From Main Menu - Hydraulic Info



The T-644 has two main hydraulic pumps. Mounted directly to the engine is the Propel Pump, followed by the Auxiliary Pump. The Auxiliary Pump handles all other functions besides Propel.

Propel Gauge: A-Port – Forward Drive Pressure. B-Port – Reverse Drive Pressure.

Charge Gauge: Displays the Charge Pressure of the Propel Pump. Approximately 350 PSI is normal. The pressure should maintain during forward or reverse propel.

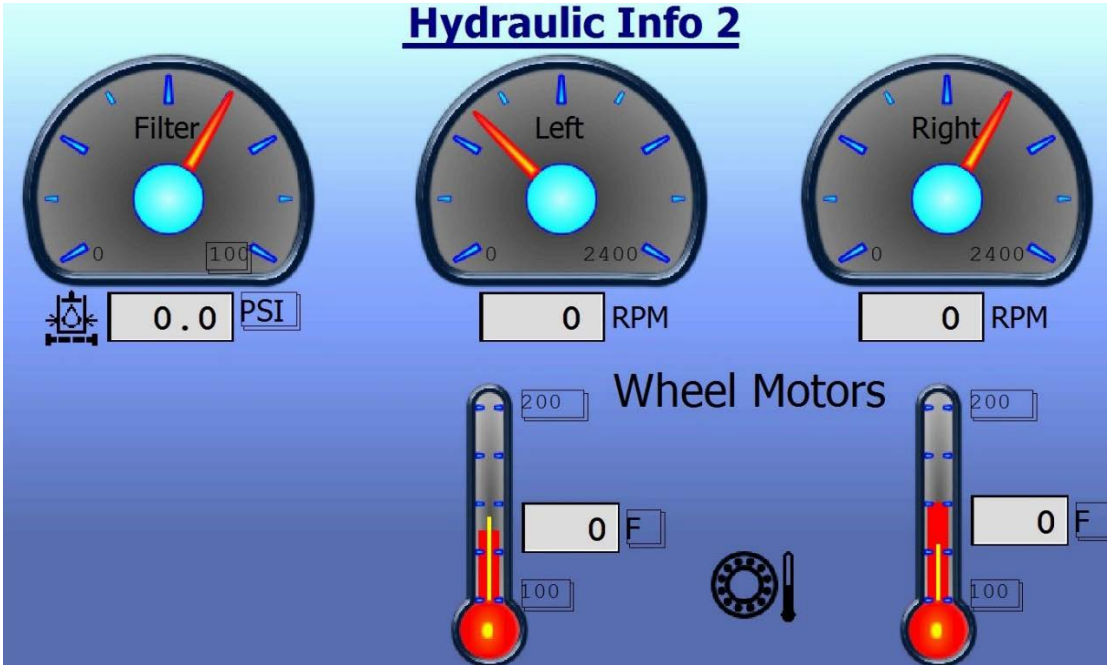
Auxiliary Gauge: The pressure required to Steer, Auger, Lift, Swing, AC, etc. All functions besides propel. 300-400 PSI on this gauge is normal when at idle.

Hydraulic Oil Temperature

Hydraulic Oil Level. Ideal is in the middle "like a dip-stick".

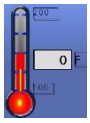
Hydraulic Info 2

From Main Menu - Hydraulic Info 



Filter Gauge: Displays the Hydraulic return filter pressure. Under 20 PSI is normal. Higher pressures indicate the filter needs to be replaced.

Left and Right Wheel Motor Tachometers.

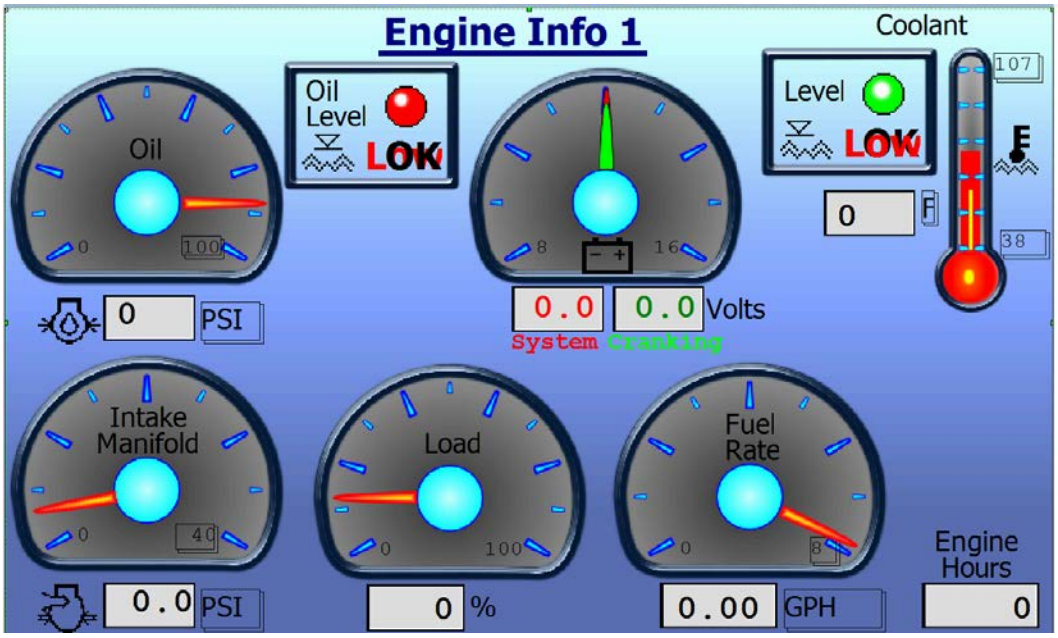


Left and Right Wheel Motor Temperatures

Engine Info 1

From Main Menu - Engine Info

From Main Run - 



 Engine Oil Pressure Gauge

 Engine Intake Manifold Pressure

 The T-644 has two batteries. Each is represented by a separate indicator on the dial.

1. The "System" battery powers the electronics and sensors.
2. The "Cranking" battery powers the starter and the vibrators.

 Engine Coolant Temperature.

 Engine Oil Level and Engine Coolant Level indicators.

 Engine Load Gauge

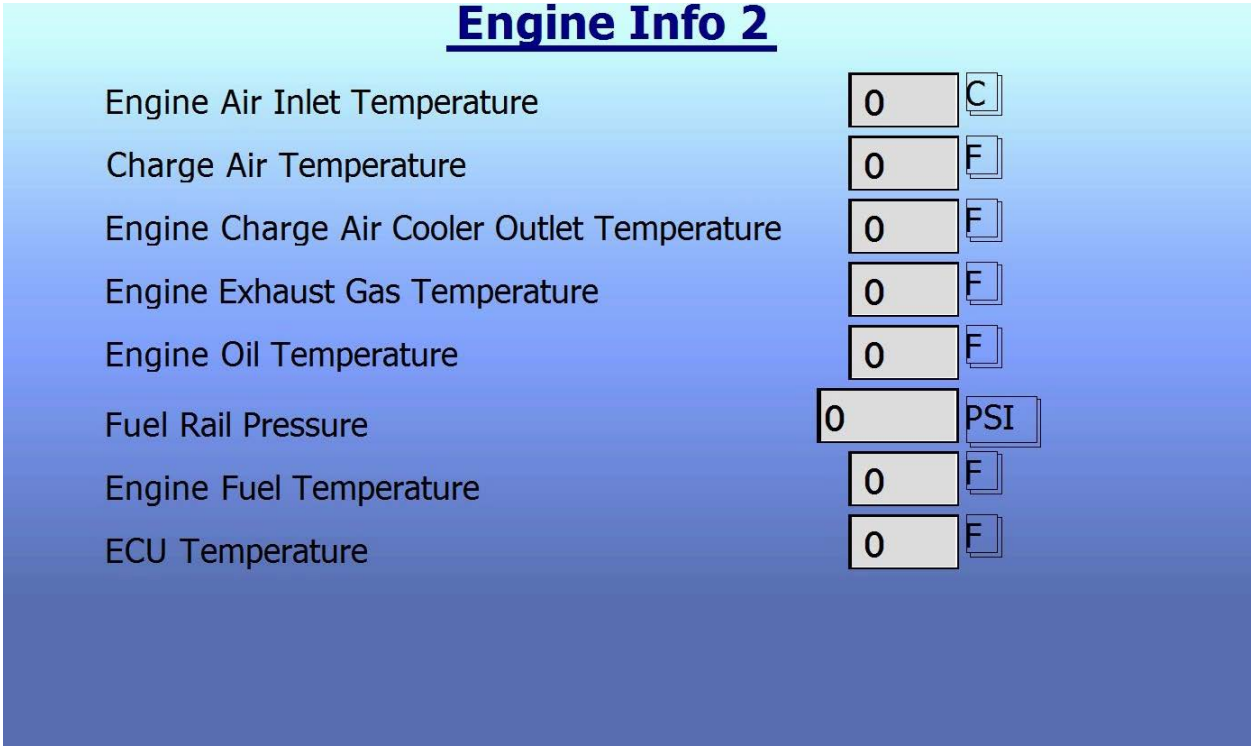
 Engine Fuel Burn Rate Gauge

Engine Hours

Engine Info 2

From Main Menu - Engine Info -

From Main Run - -

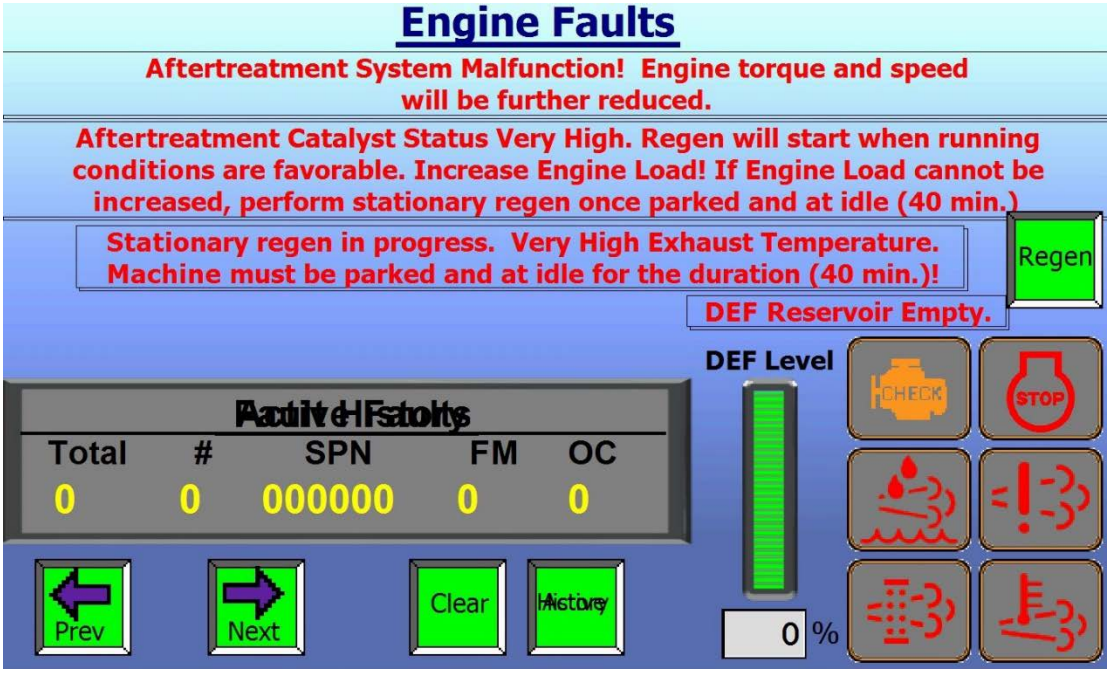


Engine diagnostic information.

Engine Faults, 1

From Main Menu - Engine Info - ▶ - ▶

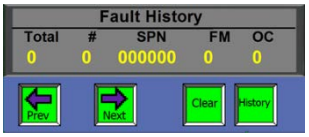
From Main Run - ⚡ - ▶ - ▶ Portions of this page are Tier 4 Final Only



Messages shown in Red will not be displayed unless needed.

Manual Regen Icon: Green when enabled, Gray when off.

Engine Code Reader: Displays Active Faults or Fault History



Diesel Exhaust Fluid "DEF" Tank Level

If any fault occurs that involves the icons here, this page will automatically display.

MIL (Amber) Lamp

Stop Lamp

DEF Level Lamp

Aftertreatment Lamp

SCR Refresh Lamp

Refresh Active Lamp

Engine Faults, 2

Combinations of icons will be displayed at times to show engine exhaust treatment status.

DEF Level Status:

DEF Level <= 15% - Aftertreatment Lamp flashes Amber, DEF Lamp appears and disappears.

DEF Level <= 5% - Aftertreatment Lamp solid Amber, DEF Level Lamp appears.
Max. available engine torque across all RPM is reduced at 1% per minute.

DEF Level <= 5% (+25 mins) - Aftertreatment Lamp Flashes Red. DEF Level Lamp appears.
Max. available engine torque across all RPM is reduced to 75%.

DEF Level <= 0% - Aftertreatment Lamp Solid Red, MIL Lamp Solid Amber, Stop Lamp Flashing Red, DEF Level Lamp appears.
Engine continues reduction to forced Idle.

DEF Level <= 0% (+30 mins) - Aftertreatment Lamp Solid Red, MIL Lamp Solid Amber, Stop Lamp Solid Red, DEF Level Lamp appears.
Engine at forced Idle.

Detection of poor-quality DEF, interruption of dosing, tampering or emissions system Fault:

Detection starts - Aftertreatment Lamp Flashes Yellow.

After 2 hours - Aftertreatment Lamp Solid Yellow.
Max. available engine torque across all RPM is reduced at 1% per minute.

2 hours, 25 minutes - Aftertreatment Lamp Flashes Red.
Max. available engine torque across all RPM is reduced to 75%.

3.5 hours - Aftertreatment Lamp Solid Red, MIL Lamp Solid Amber, Stop Lamp Flashes Red.
Engine at forced Idle.

4 hours - Aftertreatment Lamp Solid Red, MIL Lamp Solid Amber, Stop Lamp Solid Red,
Engine at forced Idle.

Engine Faults, 3

SCR Refresh Status:

Stationary Refresh is Active

SCR Refresh light Green, Engine Reports SCR Catalyst Status High. Engine makes available refresh calibration and refresh calibration only triggers when running conditions are favorable.

SCR Refresh light Yellow, Engine Reports SCR Catalyst Status Very High. Refresh calibration still available.

SCR Refresh light Red, Engine Reports SCR Catalyst Status Critical. Engine signals Inducement Strategy. Refresh Calibration still available. Inducement Commences (Warning). Aftertreatment Lamp Amber flashing.

SCR Refresh light Red, Aftertreatment Lamp Amber solid. 2 hours of engine operation after detection of SCR Catalyst Status Critical. Max. available engine torque across all RPM is reduced at 1% per minute.

SCR Refresh light Red, Aftertreatment Lamp Red flashing. 2 hours, 25 minutes of engine operation after detection of SCR Catalyst Status Critical. Max. available engine torque across all RPM is reduced to 75%.

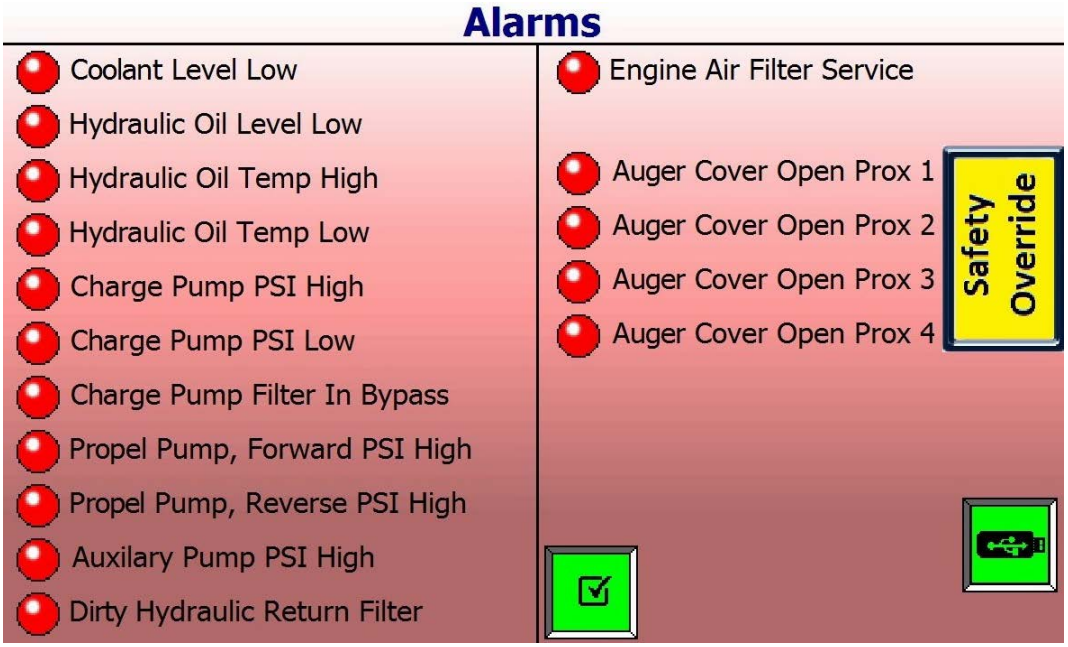
SCR Refresh light Red, Aftertreatment Lamp Red solid. MIL (Amber) lamp solid. Red Stop Lamp flashing. 3.5 hours of engine operation after detection of SCR Catalyst Status Critical. Max. available engine torque across all RPM is reduced to 75%. Maximum available engine torque and engine speed range commences its reduction to forced idle condition.

SCR Refresh light Red, Aftertreatment Lamp Red solid. MIL (Amber) lamp solid. Red Stop Lamp solid. 4 hours of engine operation after detection of SCR Catalyst Status Critical. Engine at forced idle.

Alarms-Faults

Alarms

From Main Menu - Alarms-Faults



 Alarm Condition

 Normal Condition

When an Alarm occurs, the Buzzer in the cab sounds, and attention is required. A pop-up message will prompt the operator to silence the Buzzer, or view the Alarm screen. While viewing the Alarm screen the Buzzer is automatically silenced.

Press  to reset the Alarm condition. If it no longer exists, the icon will turn Gray.

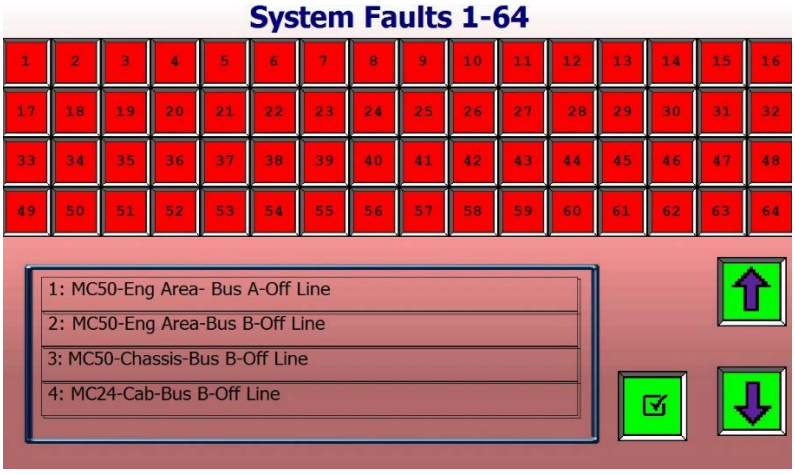
If the condition still exists, after several minutes, the alarm Buzzer and warning will occur again. This will repeat until the condition is resolved.

If an Auger Cover Door Sensor is creating the Alarm, this page will tell you which one.

Press this icon to follow instructions for Safety Override if required.

Faults 1-64

From Main Menu - Alarms-Faults - 



 Fault Condition

 Normal Condition

When a Fault occurs, the Buzzer in the cab sounds, and attention is required. A pop-up message will prompt the operator to silence the Buzzer, or view the Fault screen. While viewing the Fault screen the Buzzer is automatically silenced.

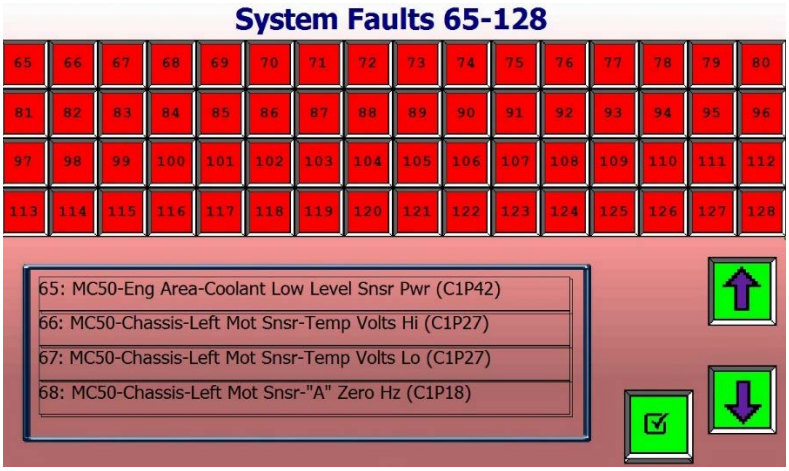
Press  to reset the Fault condition. If it no longer exists, the icon will turn Gray.

Touch a Red icon to scroll the list to the corresponding Fault for more Info.

 Scroll Fault list.

Faults 65-128

From Main Menu - Alarms-Faults -  - 

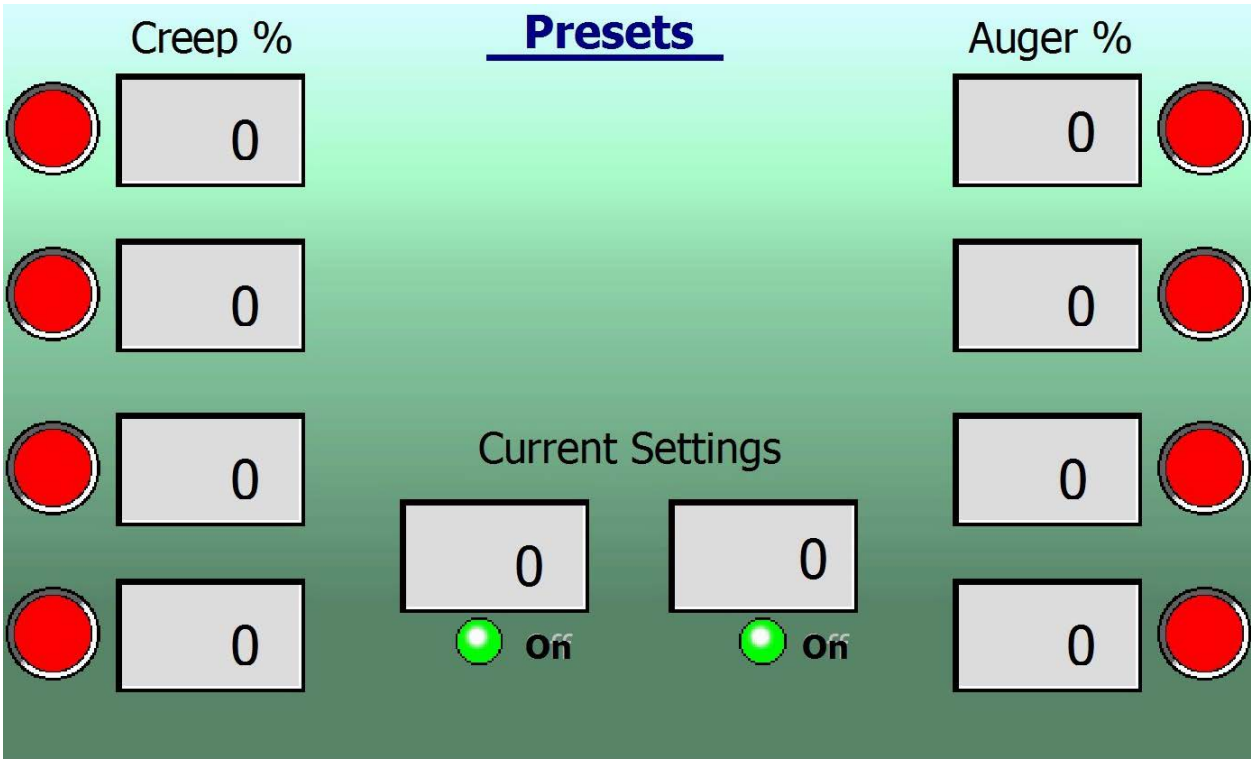


See Appendix for Fault list.

Settings

Presets

From Main Menu - Settings



The Presets screen functions like the radio memory buttons in your vehicle. Save up to 4 Creep and 4 Auger settings for fast adjustment.

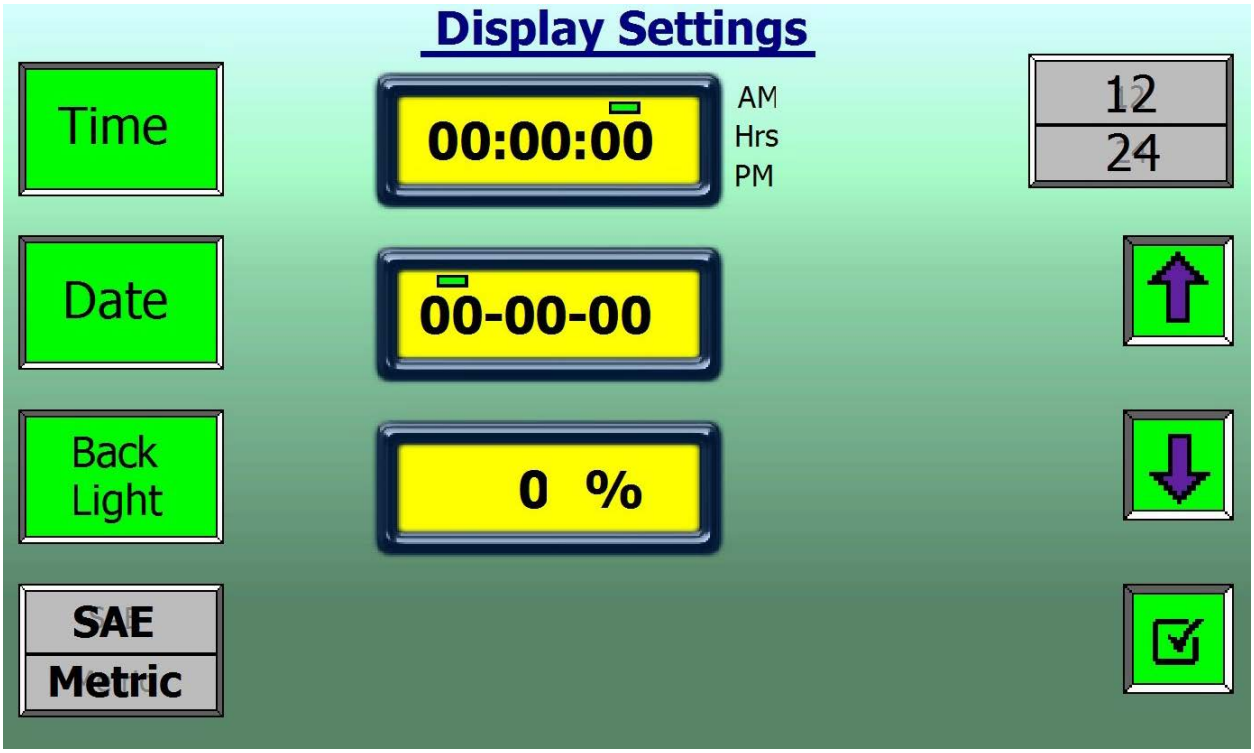
- Creep and Auger % can be adjusted from the JS at any time.
- Touch 

or 

on Main Run to directly access Presets.
- To Set a Preset: Adjust to the % required with the JS. Press and hold a corresponding Gray button until it turns to Red.
- To Select a Preset: Press desired button quickly. The value will be selected and the screen returns to Main Run.

Display Settings

From Main Menu - Settings - 



To Set:

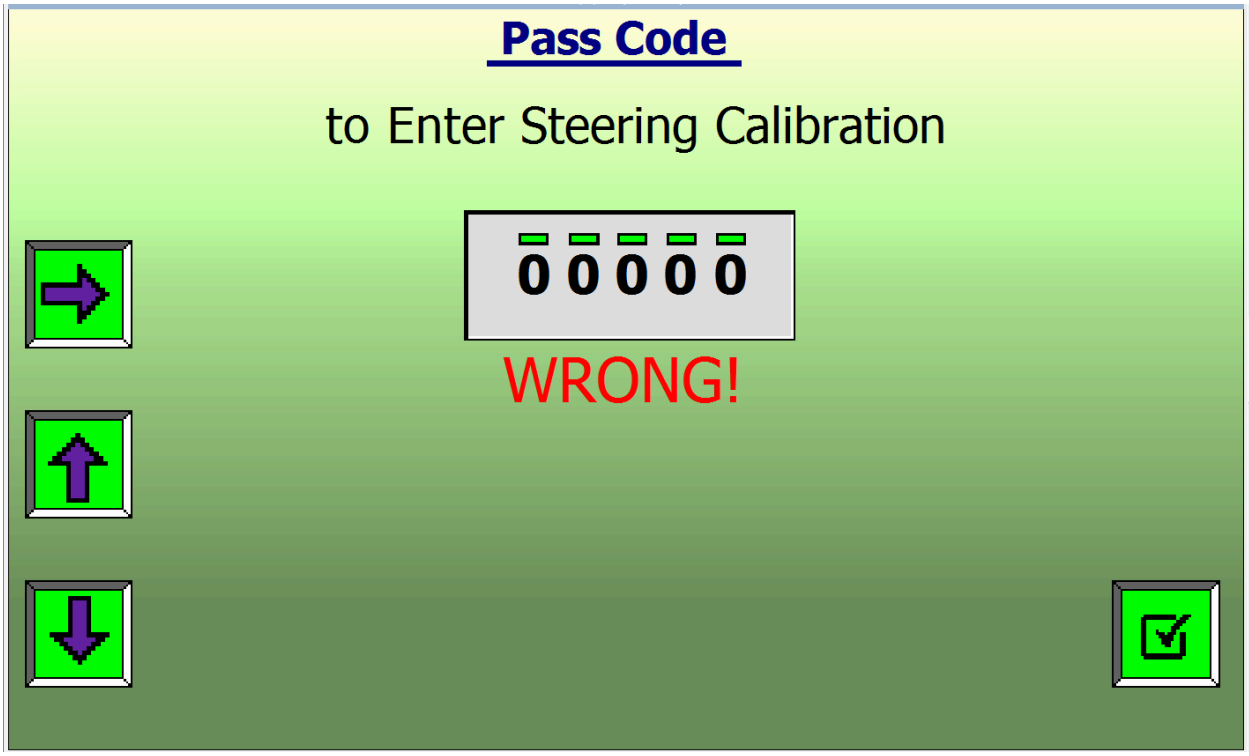
- Press Time, Date, or Back Light. Only choose one to set at a time.
- Use Arrows to adjust field under green indicator.
- Press Time or Date again to move green indicator to desired field.
- Press Time or Date until all fields are completed. Button will turn Gray.

SAE/Metric: Selects US or Metric units of measure.

12/24: Selects time format preference.

Pass Code, Steering Calibration

From Main Menu - Settings - ▶ - ▶



Steering Pass Code: 12345

Use the Up/Down arrows to increase/decrease the digit under the green bar.

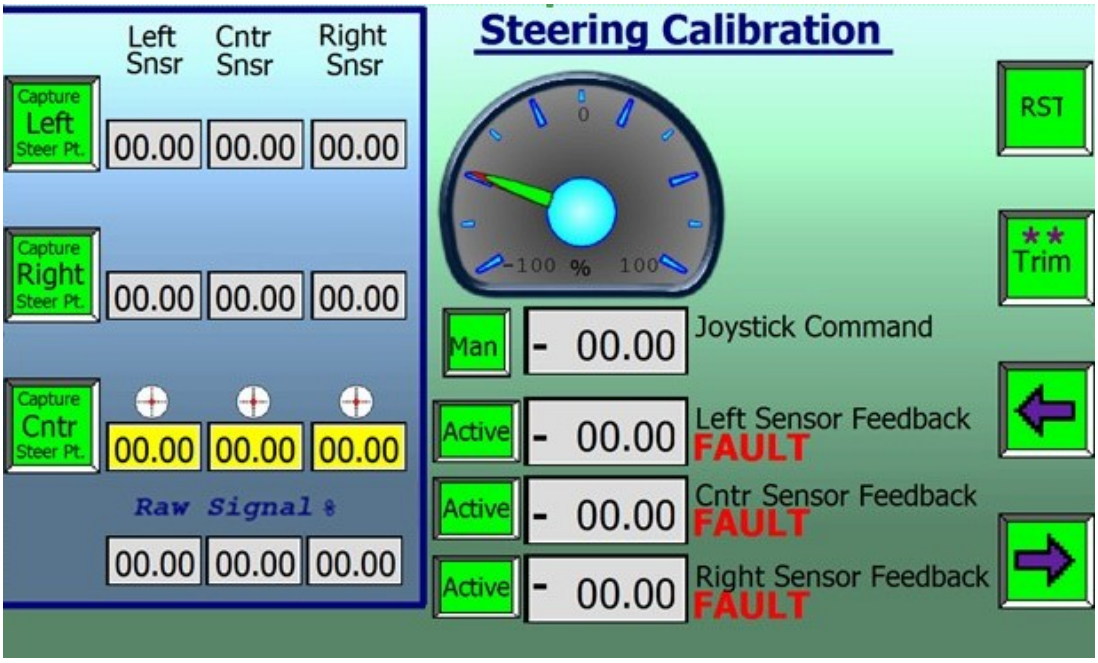
When the desired number shows, use the Right Arrow to move to the next digit.

When all 5 digits read the correct passcode, press the Check box to enter.

If you enter an incorrect passcode: WRONG! will be displayed.

Steering Calibration, 1

From Main Menu - Settings - ▶ - ▶ - Steering passcode



The T-644 uses the following 3 encoders to monitoring the steering position.

- Left steering cylinder linear encoder (Left Snsr).
- Center articulate pin encoder (Cntr Snsr).
- Right steering cylinder linear encoder (Right Snsr).

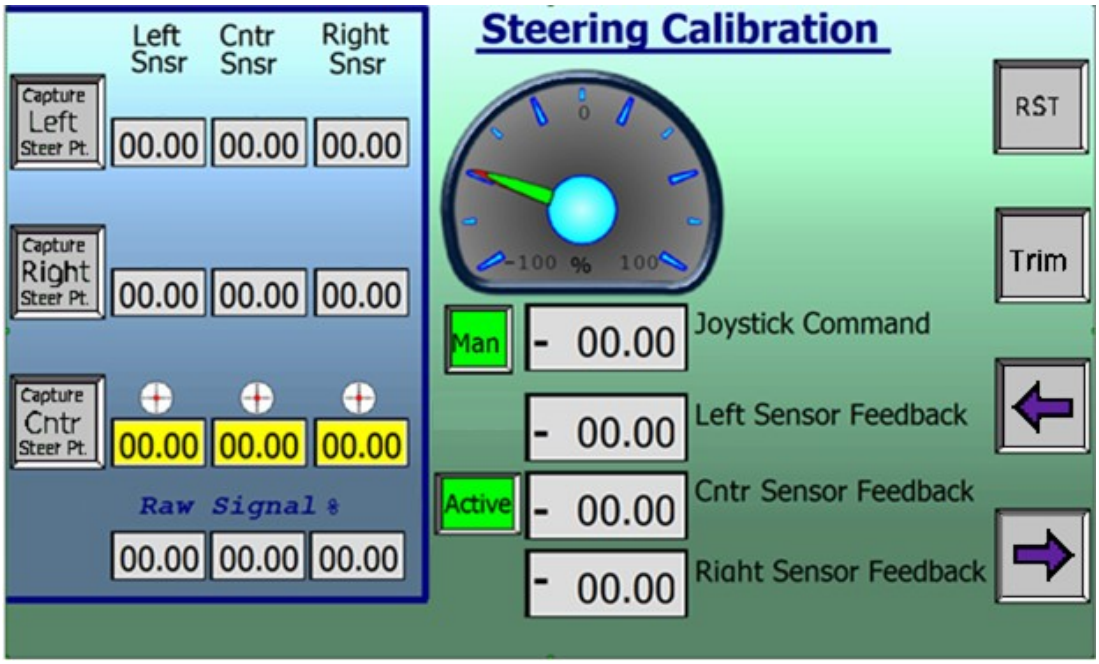
The Cntr Snsr is Active by default with the Left and Right Snsr acting as back-up. Anytime one encoder has a value that is out of range from the other two, it will FAULT. Any time one of the encoders is installed, or to reset a FAULT, calibration is required.

The center articulate pin encoder is mounted above the lower articulate pin. The encoder magnet is on top of the lower articulate pin. Left, and right steering cylinder linear encoders are mounted beneath the steering cylinders.

- Left row: The "Captured" value for each sensor when steered full lock to the left.
- Right row: The "Captured" value for each sensor when steered full lock to the right.
- Cntr row: The "Captured" value the computer returns to for straight line driving.
- Bottom row: Raw Signal %: The current voltage % of signal from each sensor.
- Sensor Feedback: The % of -100% to +100% of steering. (0% is straight ahead). This value is on the gauge above for the Joystick command and the "Active" sensor.

Steering Calibration, 2

From Main Menu - Settings - ▶ - ▶ - Steering passcode



Steering Calibration Instructions:

1. Install Articulate Lock Bar.
2. Press RST until it flashes green. Factory margin points restored.
3. Press Man until it turns green. Screen should look like above.
4. Press Capture Cntr Steer Pt. and hold (until flash) to lock the center setting of all three encoders.

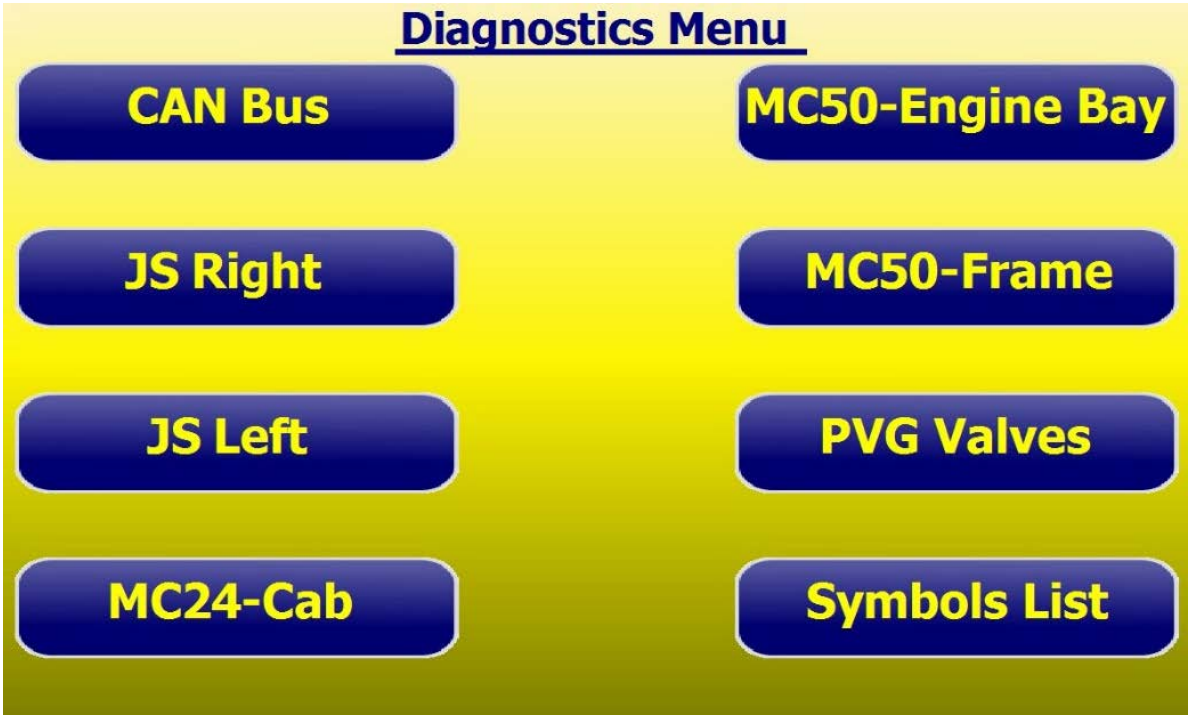
At any time during the Left or Right Capture, you may see FAULT *under "Cntr Sensor Feedback". This is normal during the Calibration.*

5. Remove Articulate Lock Bar.
6. Steer full Left with JS and hold. Press Capture Left Steer Pt. and hold (until flash) to lock full left for all encoders.
7. Steer full Right with JS and hold. Press Capture Right Steer Pt. and hold (until flash) to lock full right for all encoders.
8. After all Calibration is complete, turn the Key Off. Wait for at least 2 minutes if Tier 4 Final engine.
9. Turn Key On, and return to the Steering Calibration Screen. There should be No Faults. It should look like the screen above. If not, start at step 1 and try the procedure again.

Diagnostics

Diagnostics Menu

From Main Menu - Diagnostics



CAN Bus: Graphically displayed CAN A and CAN B routing to confirm component connection status.

JS Right: Explanation of Right JS functions and test page to verify operation.

JS Left: Explanation of Left JS functions and test page to verify operation.

MC24-Cab: Danfoss MC24 Controller mounted in the cab. Definition of inputs and outputs for controller.

MC50-Engine Bay: Danfoss MC50 Controller mounted in the engine bay. Definition of inputs and outputs for controller.

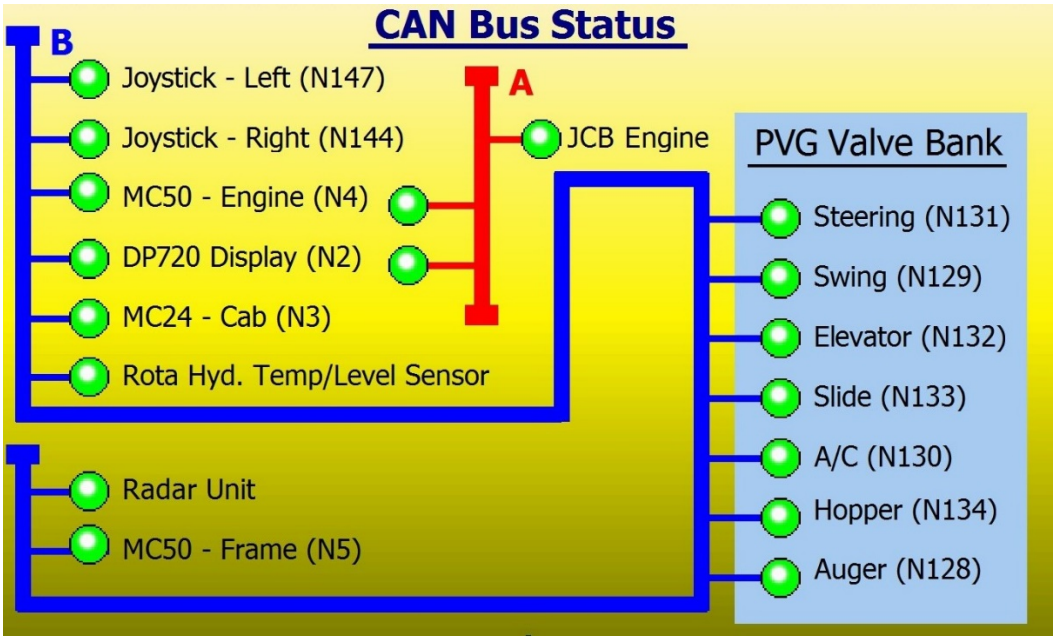
MC50-Frame: Danfoss MC50 Controller mounted in the Lower Frame. Definition of inputs and outputs for controller.

PVG Valves: Verify individual hydraulic valve spool function and status.

Symbols List: Icon Definitions

CAN Bus Status

From Main Menu - Diagnostics - CAN Bus



The Can Bus Status screen offers a quick visual way to confirm all CAN Bus items are online.

Green circle when online and Gray when offline.

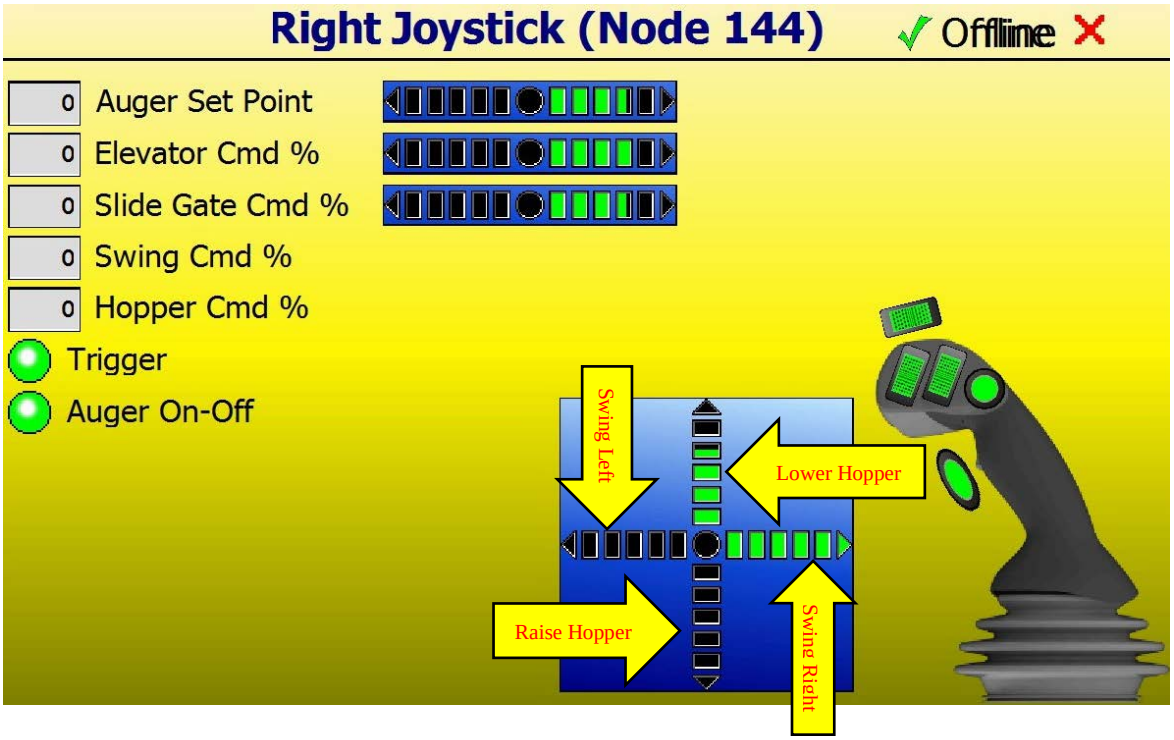
Item Node number, or "Address" on the CAN Bus, is shown in parentheses.

The T-644 uses two separate CAN Bus networks "A" and "B". The A is shown in Red while the B is shown in Blue.

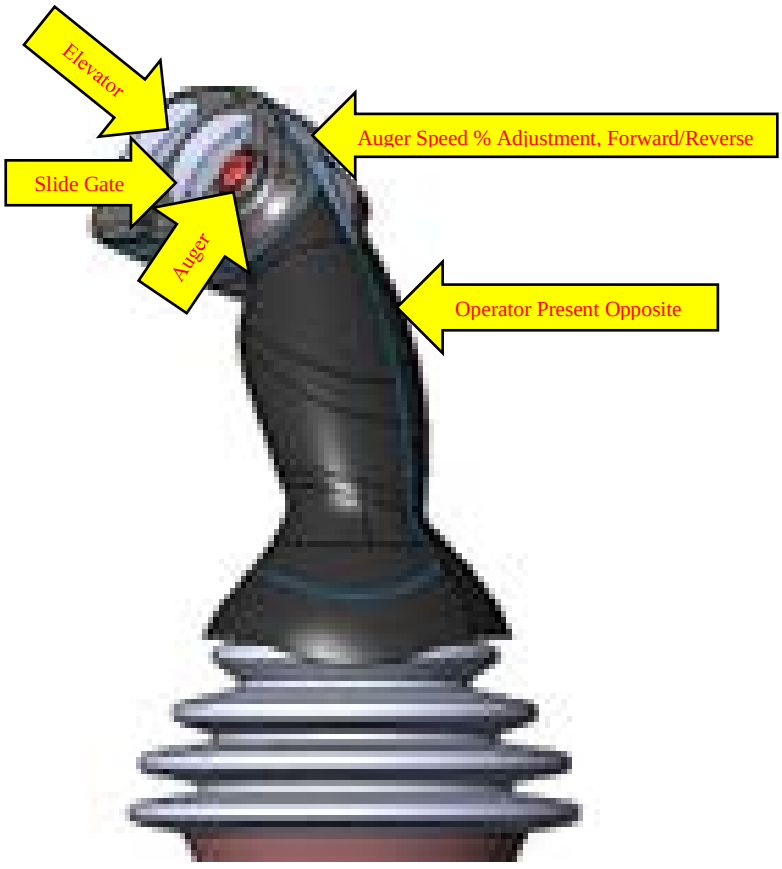
CAN Bus A is used by the engine and CAN Bus B is the network used by the rest of the truck.

JS Right

From Main Menu - Diagnostics - JS Right

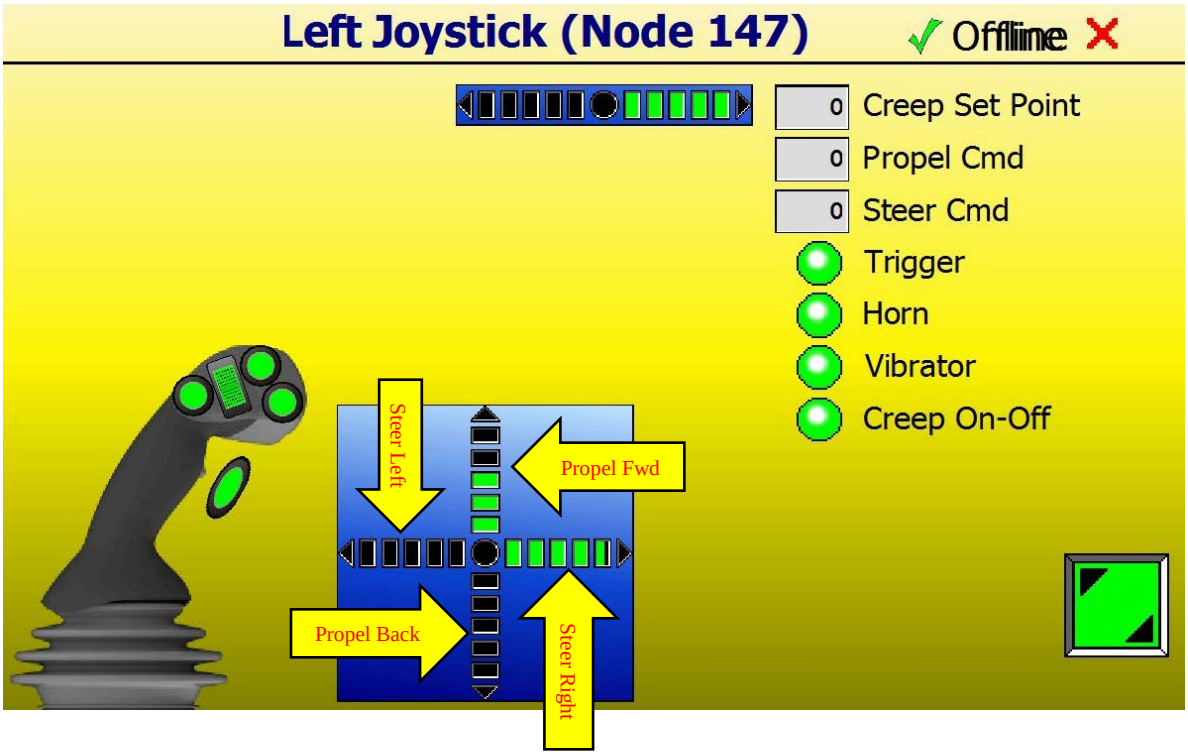


The Right Joystick screen is where (JS) commands can be tested and confirmed without machine movement.

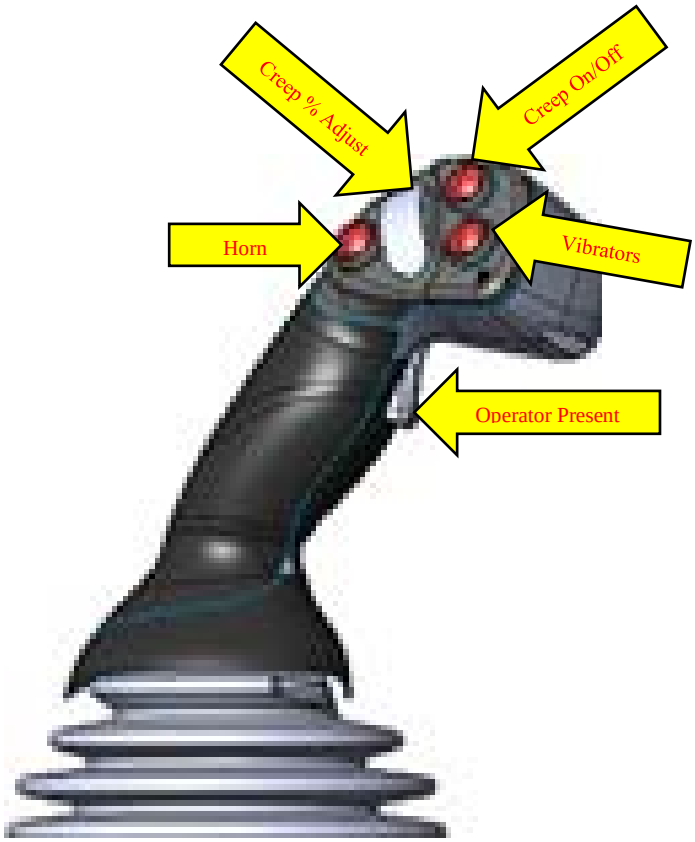


JS Left

From Main Menu - Diagnostics - **JS Left**

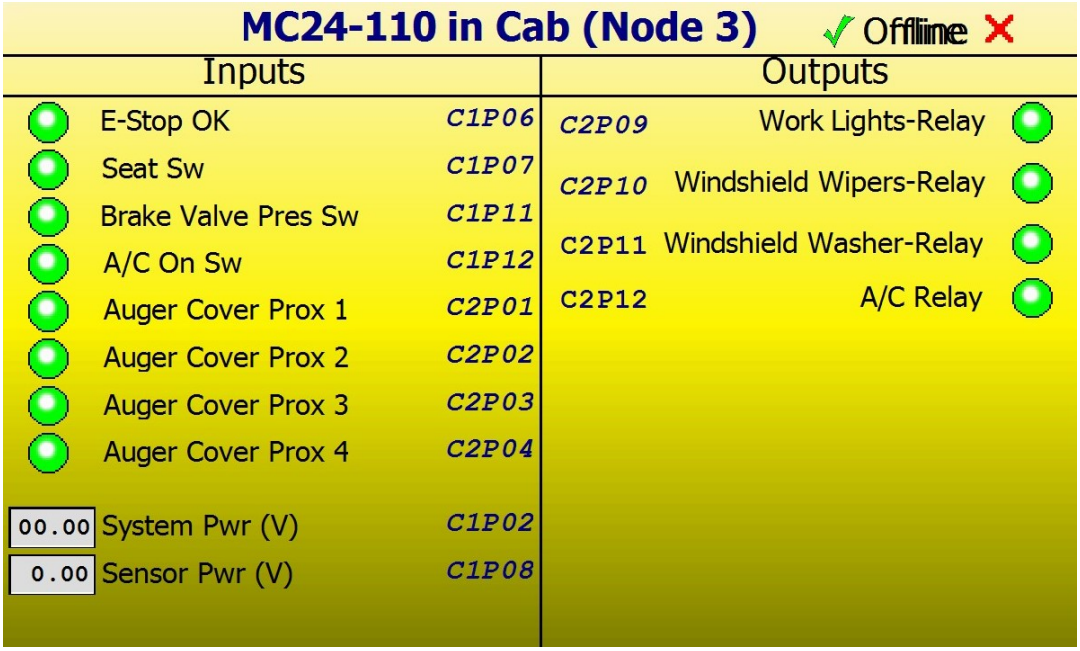


The Left Joystick screen is where (JS) commands can be tested and confirmed without machine movement.



MC24 - Cab

From Main Menu - Diagnostics - MC24-Cab



The MC24 in Cab screen displays the controller's status of each Input and Output in real time.

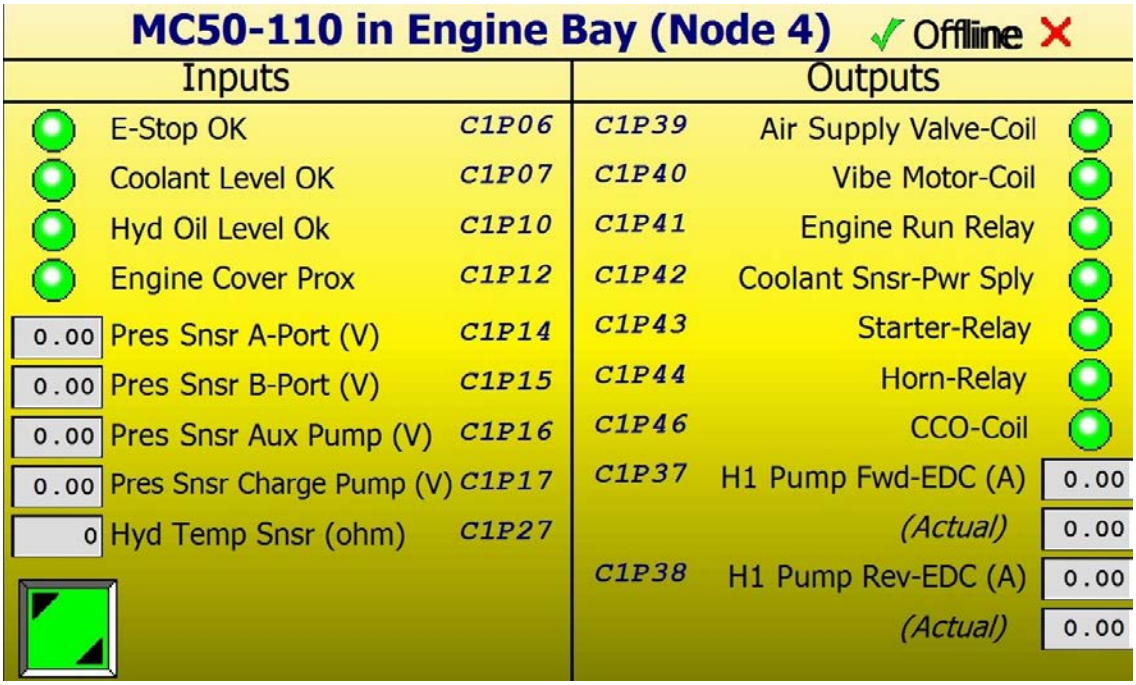
Green circle when on and Gray when off.

The associated "C" number is the Pin location of the particular wire on the controller plug.

Touch circle or button to toggle Outputs On/Off.

MC50 - Engine Bay

From Main Menu - Diagnostics - MC50-Engine Bay



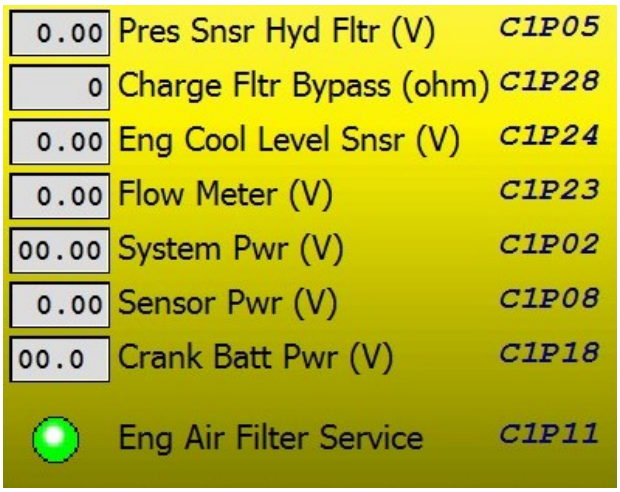
The MC50 Engine Bay screen displays the controller's status of each Input and Output in real time.

Green circle when on and Gray when off.

The associated "C" number is the Pin location of the particular wire on the controller plug.

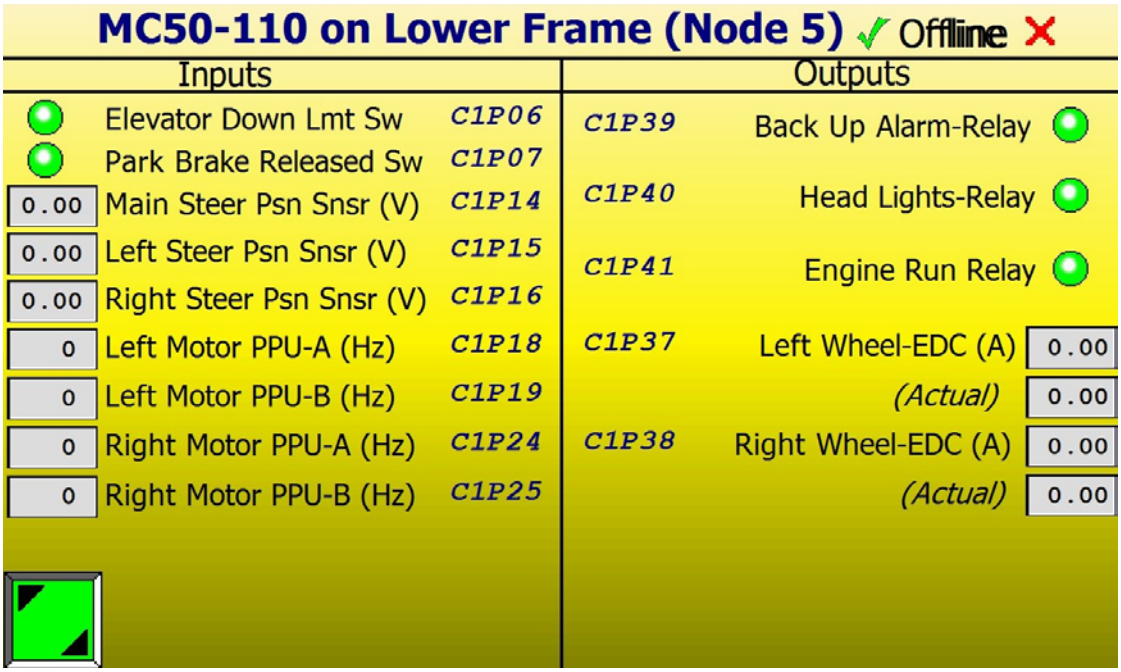
Touch circle or button to toggle Outputs On/Off.

 Touch to toggle between page 1 and 2 of MC50 Engine Bay Inputs.



MC50 Lower Frame

From Main Menu - Diagnostics - MC50-Frame



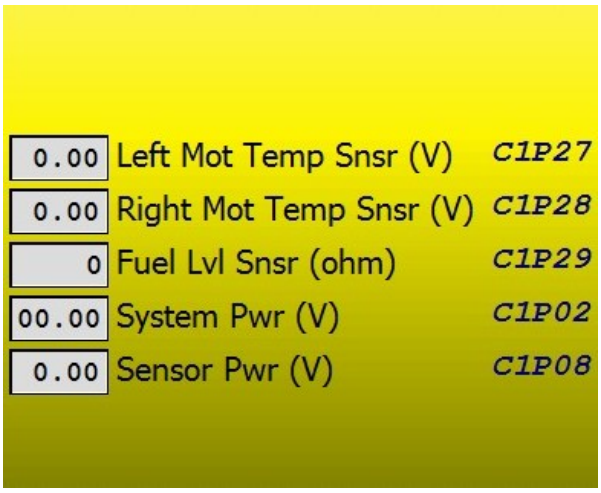
The MC50 Lower Frame screen displays the controller's status of each Input and Output in real time.

Green circle when on and Gray when off.

The associated "C" number is the Pin location of the particular wire on the controller plug.

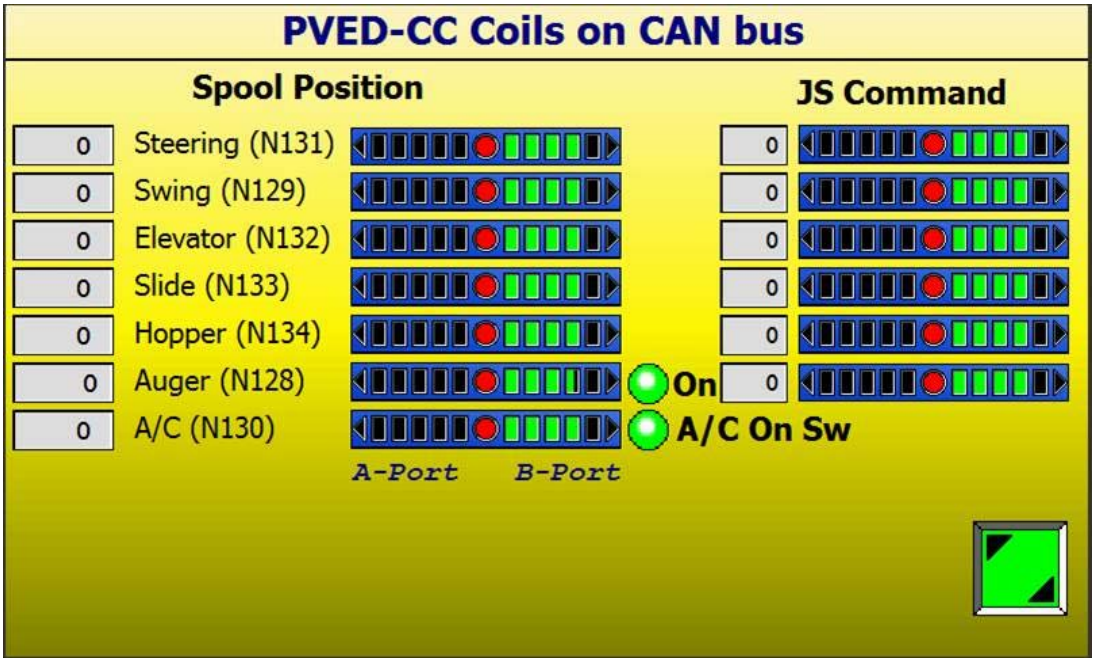
Touch circle or button to toggle Outputs On/Off.

 Touch to toggle between page 1 and 2 of MC50 Lower Frame Inputs.



PVG Valves

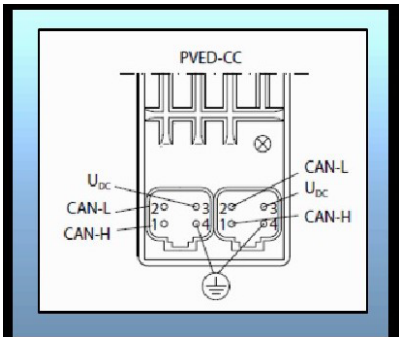
From Main Menu - **Diagnostics** - **PVG Valves**



The PVG Valves Screen allows the operator to verify individual valve spool positions vs. J/S command in real time.

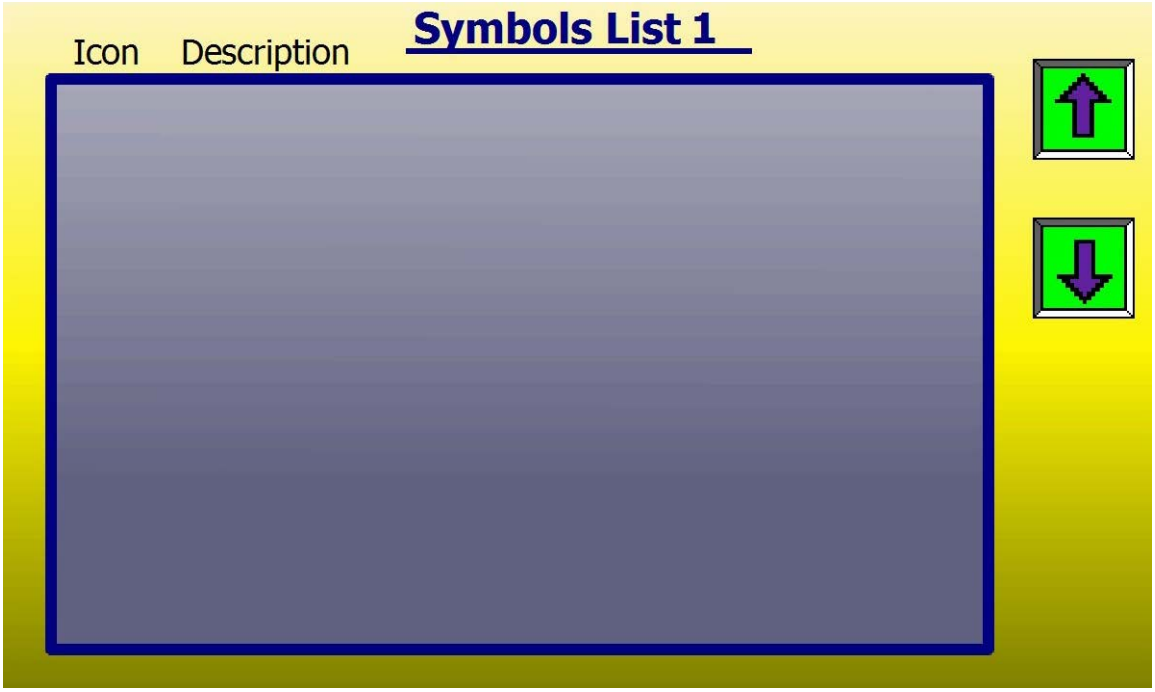
Item Node number, or "Address" on the CAN Bus, is shown in parentheses.

Touch  to display the wiring diagram for the electrical connectors to the valves.



Symbols List

From Main Menu - **Diagnostics** - **Symbols List**



The Symbols list defines all Icons used in the DP720.

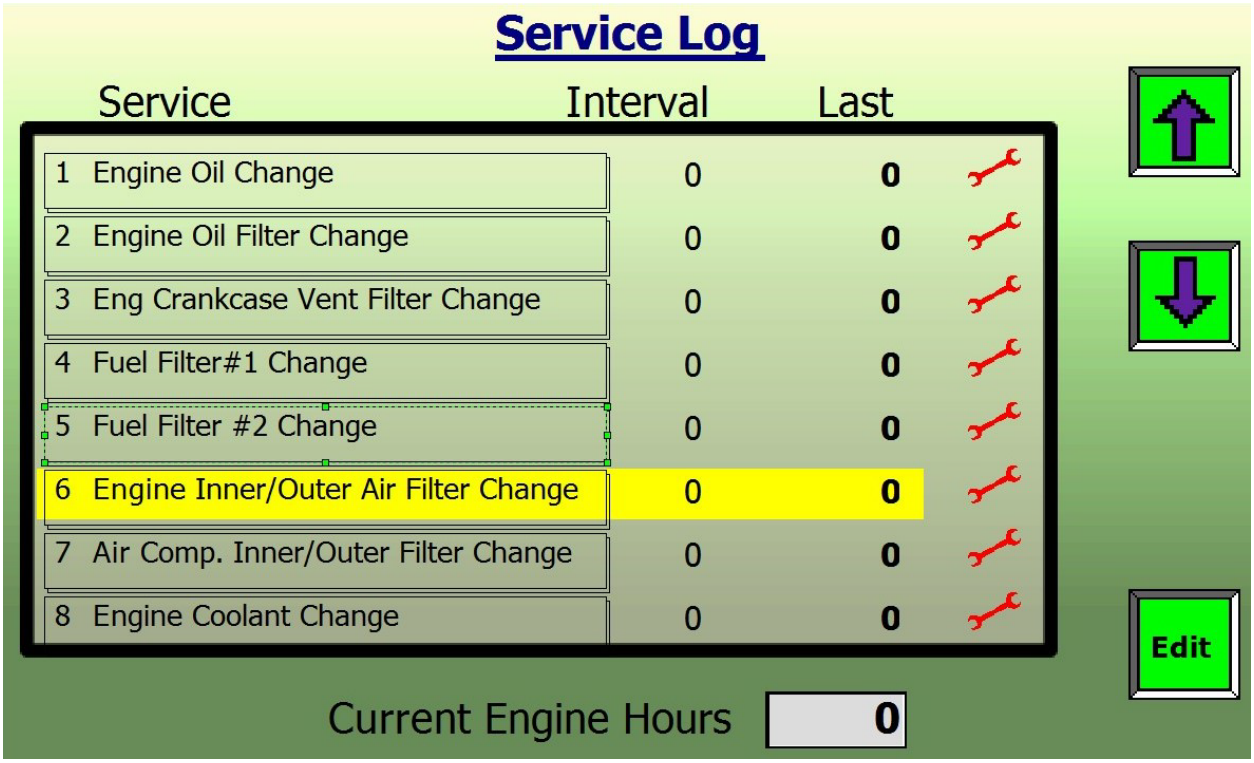
Use  to scroll the Symbols.

Maintenance

Service Log

From Main Menu - Maintenance

From Main Run - 



The Service Log screen allows the operator to view maintenance records at a glance.

 Use Up/Down arrows to scroll through the maintenance items.

Press to edit the Service Log. Follow on screen instructions.

Pass Code

From Main Menu - Maintenance - Edit

From Main Run -  - Edit

A Pass Code must be entered to edit the Log.

Pass Code: 54321

 Use the Up/Down arrows to increase/decrease the digit under the green bar.

 When the desired number shows, use the Right Arrow to move to the next digit.

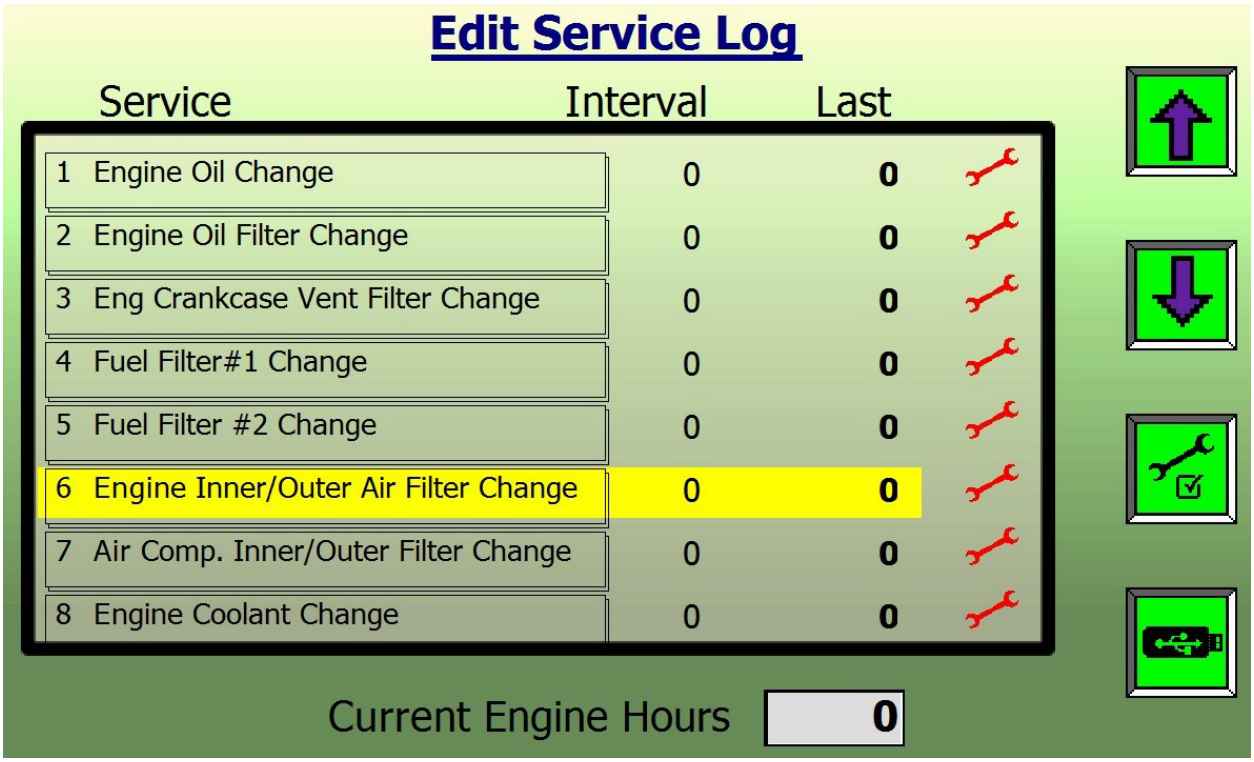
 When all 5 digits read the correct passcode, press the Check box to enter.

If you enter an incorrect passcode: WRONG! will be displayed.

Edit Service Log

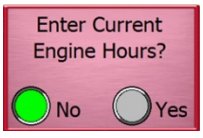
From Main Menu - Maintenance - Edit - successful passcode

From Main Run -  - Edit -successful passcode



 Use Up/Down arrows to scroll to the maintenance item to edit.

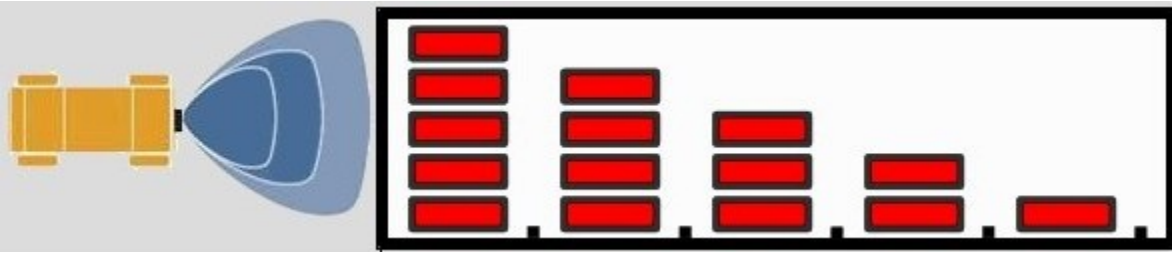
 Press to edit item.



A confirmation pop-up box will appear. A Yes answer will save the Current Engine Hours to the Log.

Radar

From Main Menu - Radar



The Radar screen allows an operator to test the function of the Radar while stationary.

In this manner, a technician could approach the rear of the vehicle to "test" the Radar without the danger of an approaching machine.

DP720 Override

Safety Warning

From Main Run -  or 

The operator must confirm their understanding of overriding Safety features. The override is designed to be used in emergency situations only.

Press to follow on screen instructions for override.

Safety Override Pass Code

From Main Run -  or  - 

Safety Override Pass Code: 00911

 Use the Up/Down arrows to increase/decrease the digit under the green bar.

 When the desired number shows, use the Right Arrow to move to the next digit.

 When all 5 digits read the correct passcode, press the Check box to enter.

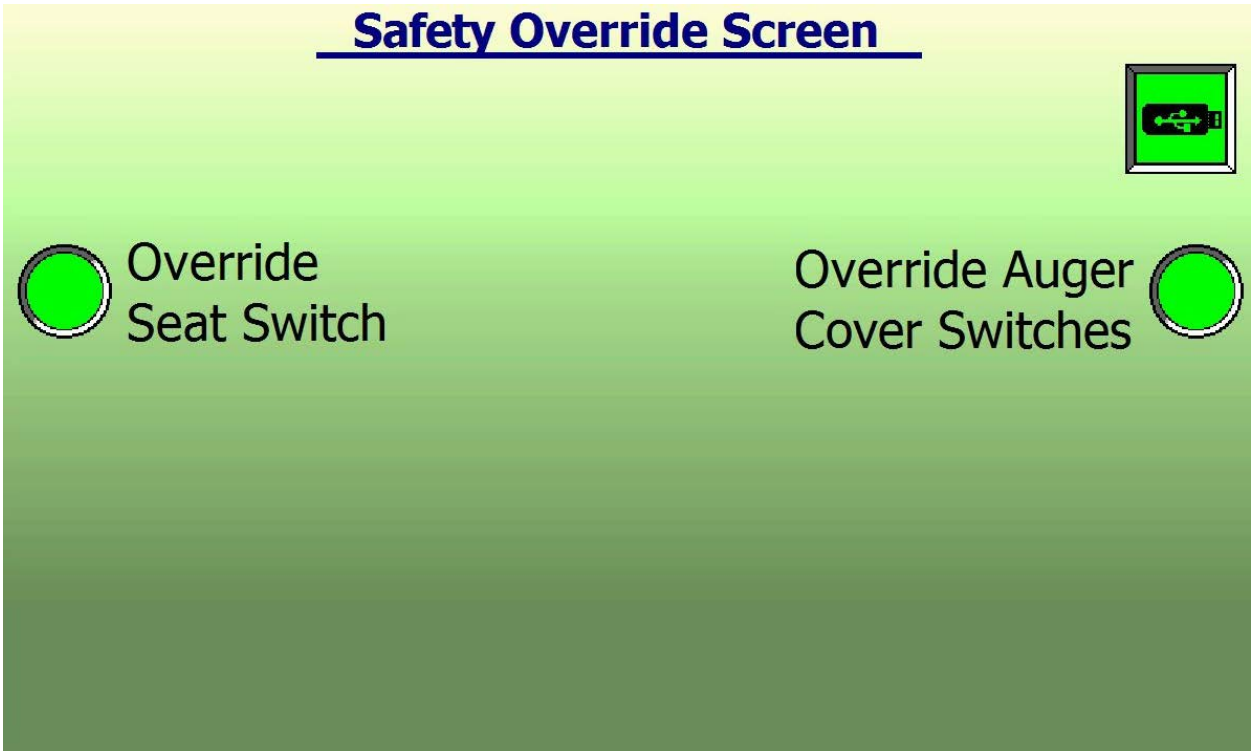
If you enter an incorrect passcode: WRONG! will be displayed.

Safety Override Screen

From Main Run - 

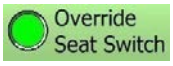
or  - 

- successful password



Select the required override.

Safety Override Screen, Seat Switch

From Main Run -  or  -  - successful password - seat - 

 Press to override Seat Switch.

The following pop-up message will be displayed. The timer for the override counts down from 300 Seconds (5 Minutes).

When 10 seconds are left, the machine will slow to a stop and the engine will return to an idle.

When 0 seconds are left, the brakes will lock, and the hydraulic functions will no longer be active except for the A/C.

If more time is required, the override can be restarted by going through the entire override procedure again.

Safety Override Screen, Auger

From Main Run -  or  -  - successful password - seat - 

 Press to override Seat Switch.

The following pop-up message will be displayed. The timer for the override counts down from 120 Seconds (2 Minutes).

If more time is required, the override can be restarted by going through the entire override procedure again.

Preventative Maintenance

A well-maintained machine is a safer machine. The key to maintaining your T-644 properly is to follow the instructions in this manual faithfully, completely, and at the proper intervals. Do not operate the T-644 until you know it is safe to do so and all inspections and maintenance requirements have been fulfilled. Do not permit unauthorized or unqualified personnel to operate, service or maintain this machine. Always operate and perform any maintenance of the machine on a level surface.

Prior to any Maintenance

Shut engine off, remove ignition keys and take the keys with you before dismounting.
Place Keys in Pocket

Keep keys with you so that no one else can start machine while you are servicing or inspecting it. Never leave keys in an unoccupied cab.

Lock the Articulate Safety Lock Bar (Figure 1.)

Figure 1

WARNING

- **Unintended movement of the machine** or any component system of the T-644 may cause injury to the technician or bystanders. To protect against unintended movement, secure the machine and disable the specific component while you are servicing it.
- **Some cleaning solvents are flammable.** To avoid possible fire, do not use cleaning solvents in an area where a source of ignition may be present.
- **Fluid under pressure**. Relieve pressure in the hydraulic system before removing hoses, fittings, gauges, or components

Escaping hydraulic fluid under pressure can have sufficient force to penetrate your skin causing serious injury and/or infection. This fluid may also be hot enough to cause burns. Use caution when dealing with hydraulic fluid under pressure. Never use your hand or any other body part to check for leaks in a pressurized line. Seek medical attention immediately if you are cut by hydraulic fluid.

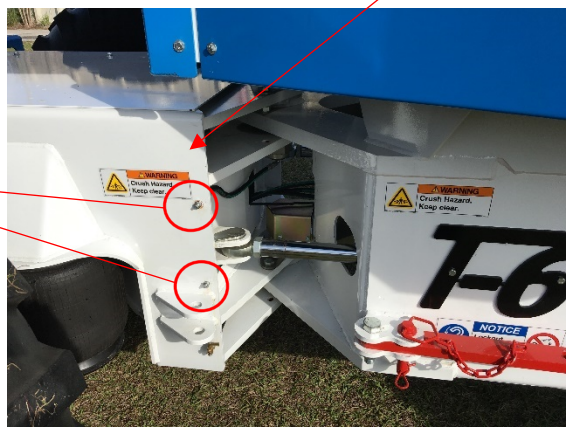
Grease Fitting Locations

Grease Fitting Locations, Left Side

1 fitting –
Auger Bearing

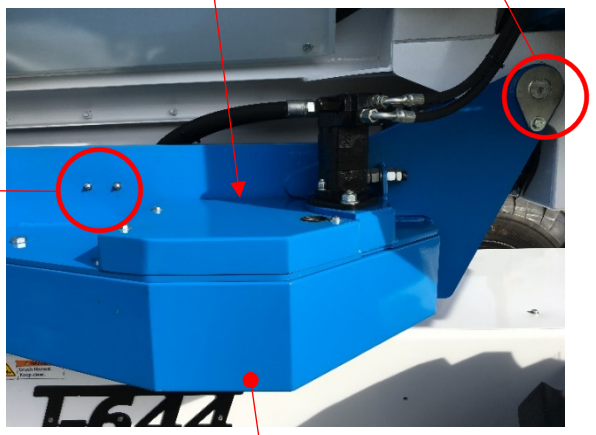
2 fittings –
Slide Gate Cylinder.

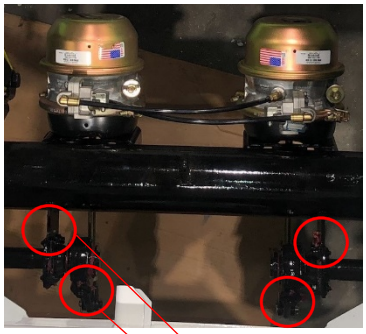
1 fitting -
Hopper Pivot



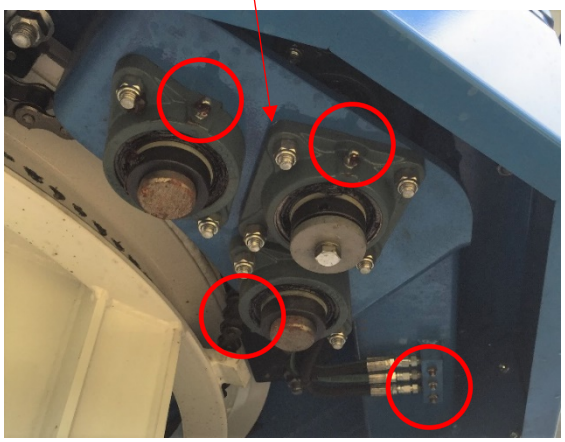
2 fittings -
Articulate
Joint

2 fittings -
Upper Turntable





6 fittings - Front Axle
2 – Outer Brake Cam
2 – Inner Brake Cam
2 – Slack Adjusters



6 fittings -
1 (Ea.) Turntable Swing Bearing

Grease Fitting Locations, Right Side

1 fitting -
Hopper Pivot

Grease Fitting Locations, Engine Bay

2 Fittings -
Engine Bay
Door Cylinder

Chain Inspection and Adjustment

The chains on the T-644 must be regularly inspected, lubricated, and adjusted to maintain proper tension to avoid unnecessary repairs and downtime. The chains are as follows:

1. Auger Drive Chain
2. Turntable Swing Motor Chain
3. Turntable Main Chain

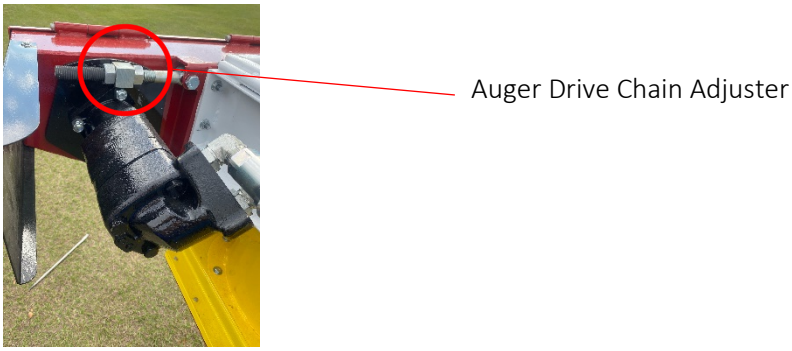
Chain Inspection and Adjustment, Auger Drive Chain

Auger Drive Chain Inspection:

1. Remove plastic inspection plug from Auger Drive Box Cover.
2. Insert a suitable tool through the inspection hole to check chain tension. Up to ½" of play is acceptable. Adjust chain if necessary.
3. Replace inspection plug when finished.

Auger Drive Chain Adjustment:

1. Open Auger Drive Box Cover by removing the two bolts.
2. Loosen the two Auger Motor Plate fasteners.
3. Adjust Auger Drive Chain tension with the Adjuster Nuts.
4. Tighten Auger Motor Plate fasteners.
5. Verify correct chain tension.
6. Close Auger Drive Box Cover, and replace the two bolts.



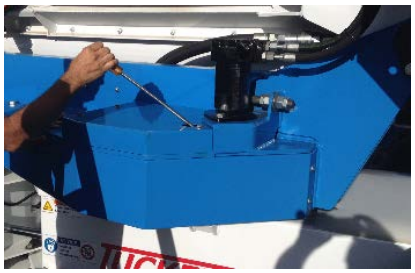
Auger Drive Chain Lubrication:

1. Open Auger Drive Box Cover by removing the two bolts.
2. Lubricate the chain as necessary with an aerosol chain lube.
3. Close Auger Drive Box Cover, and replace the two bolts.

Chain Inspection and Adjustment, Turntable Swing Motor Chain

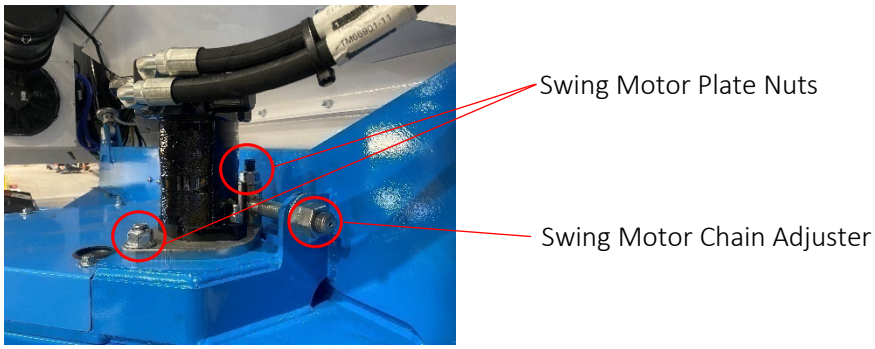
Turntable Swing Motor Chain Inspection:

1. Remove plastic inspection plug from Turntable Swing Motor Chain Cover.
2. Insert a suitable tool through the inspection hole to check chain tension. ¼" to ½" of play is acceptable. Adjust chain if necessary.
3. Replace inspection plug when finished.



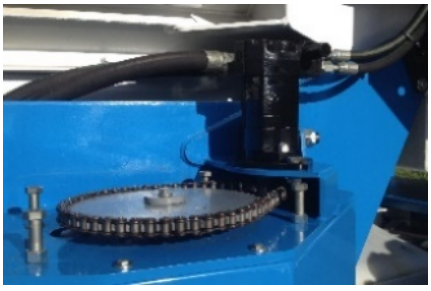
Turntable Swing Motor Chain Adjustment:

1. Loosen Swing Motor Plate nuts.
2. Remove plastic inspection plug from Turntable Swing Motor Chain Cover.
3. Adjust Swing Motor Chain tension with the Adjuster Nuts.
4. Tighten Swing Motor Plate nuts.
5. Verify correct chain tension.
6. Replace inspection plug when finished.



Turntable Swing Motor Chain Lubrication:

1. Remove Turntable Swing Motor Chain Cover by removing the four bolts.
2. Lubricate the chain as necessary with an aerosol chain lube.
3. Replace Turntable Swing Motor Chain Cover and the four bolts.



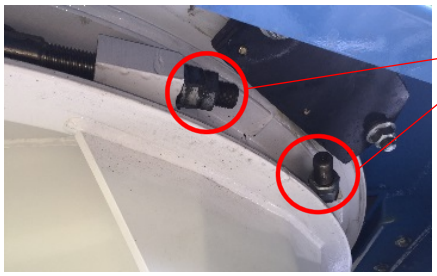
Chain Inspection and Adjustment, Turntable Main Chain

Turntable Main Chain Inspection:

1. Inspect the Turntable Main Chain from underneath the Turntable Covers.
2. Insert a suitable tool between the Main Chain and the Turntable Channel to check chain tension. No play is acceptable. Adjust chain if necessary.

Turntable Main Chain Adjustment:

1. Locate the Turntable Main Chain Adjusters under the Front, Right Turntable Cover Door.
2. Loosen jam nut.
3. Adjust Turntable Main Chain for NO play.
4. Tighten jam nut.



Turntable Main Chain Lubrication:

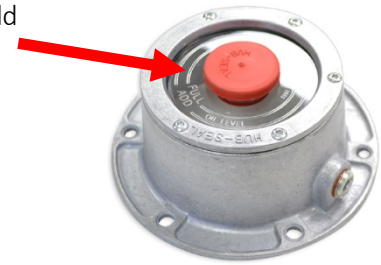
1. Lubricate the chain as necessary with an aerosol chain lube.

Fluid Level Inspection

Front Axle Hub

1. Check level in front axle on both left and right sides. Gear Lube should be visible between the "Add" and "Full" lines.
2. Add 85-140W Gear Lube if necessary.

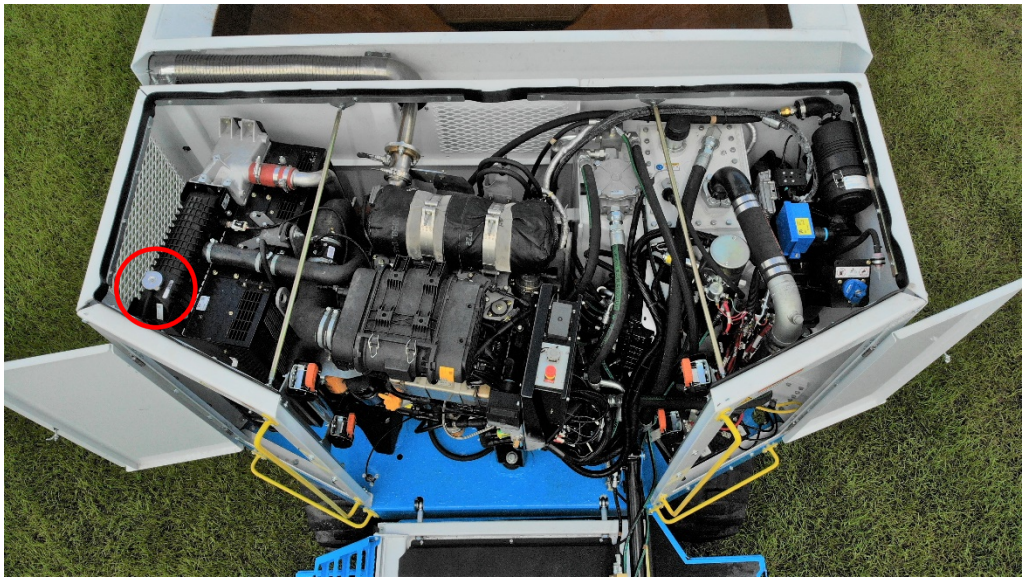
Gear Lube level should be between lines.



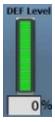
Engine Coolant

1. **With engine cold**, check Engine Coolant level.
2. Add Coolant if necessary.

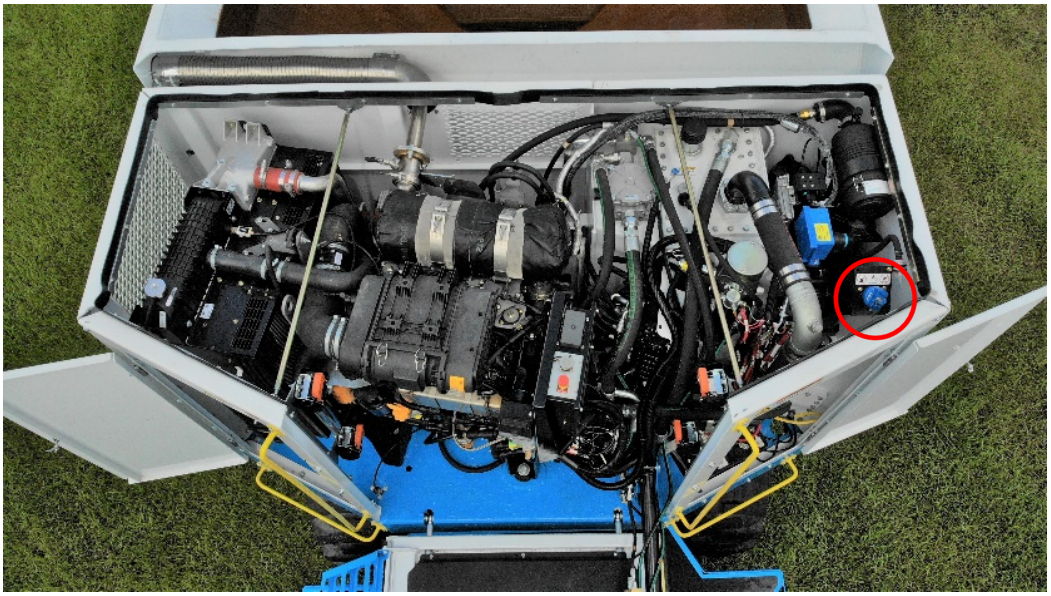
WARNING Do not open radiator cap when engine is hot or warm. Severe injury may occur!



Engine Diesel Exhaust Fluid



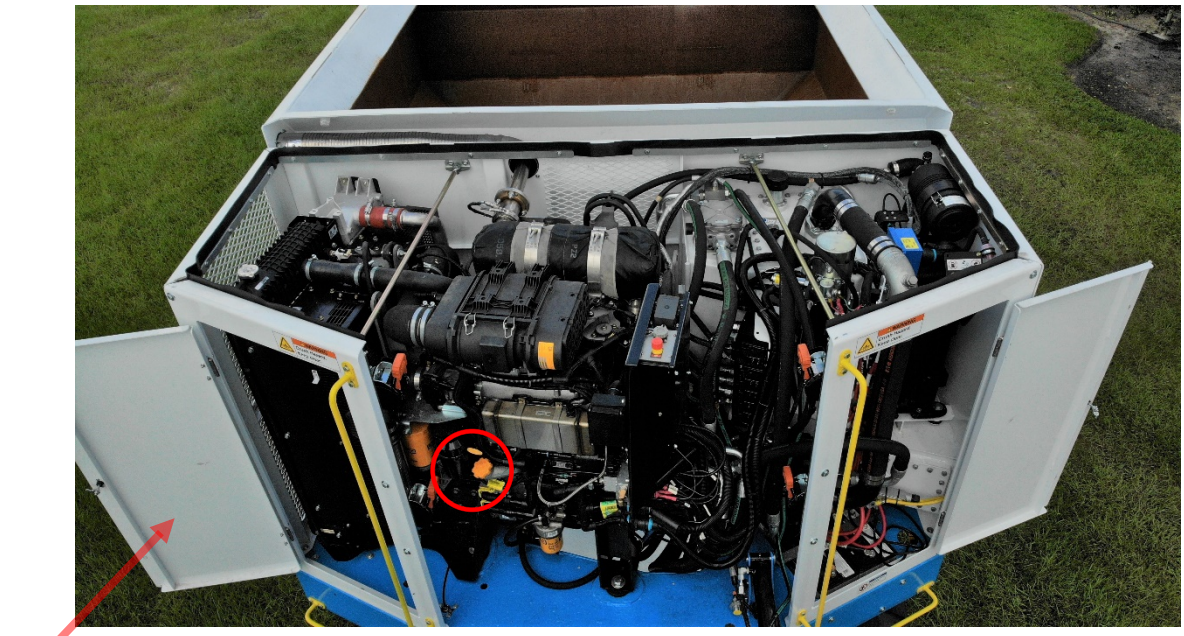
1. From Main Run Screen, check DEF level gauge.
2. Add DEF if necessary.



Engine Oil

1. **With engine cold**, check Engine Oil level on the Dipstick.
2. Add Engine Oil if necessary. Refer to engine owner's manual for required oil specifications.

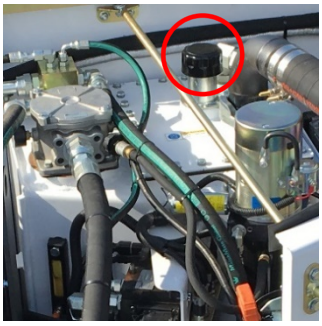
WARNING Do not check oil when engine is hot or warm. Severe injury may occur!



NOTE: The Engine Oil Dipstick can be accessed through the Left Engine Bay Side Door.

Hydraulic Oil

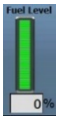
1. From the Main Menu Screen, then Hydraulic Info 1 Screen, check Hydraulic Oil Level gauge. The level should be in the middle of the lines like a “Dipstick”.
2. Add Hydraulic Fluid if necessary.



See Appendix for Hydraulic Oil Specifications.

Diesel Fuel

1. From the Main Run Screen, Check Fuel Level gauge.
2. Fill the T-644 with Ultra-Low Sulfur Diesel Fuel only.



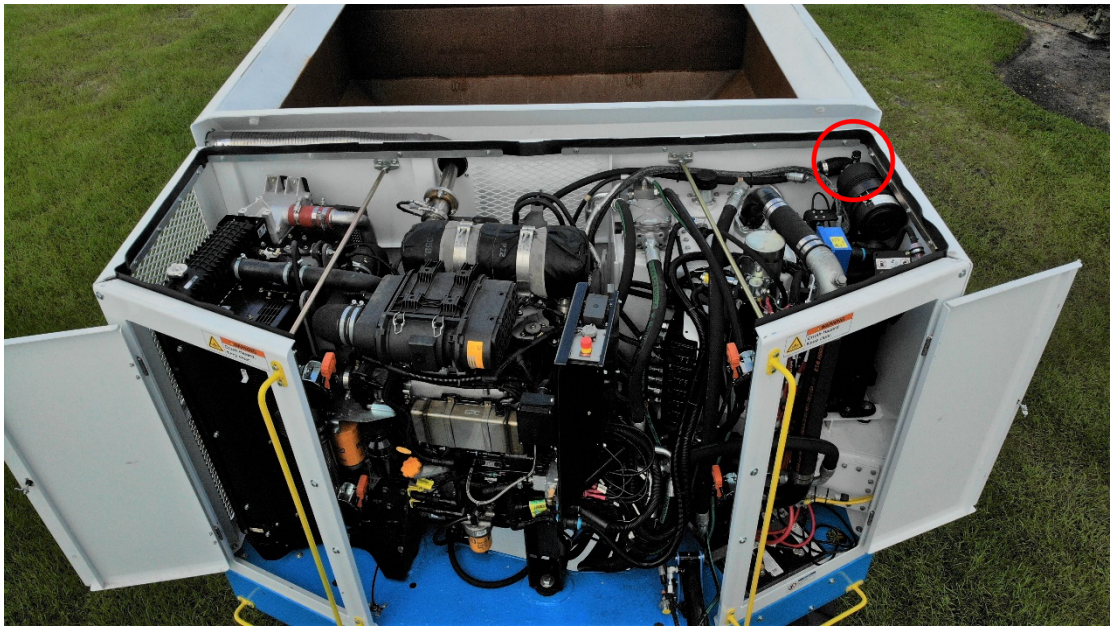
Windshield Washer Fluid

1. Check Windshield Washer Fluid in the Cab.
2. Add Fluid if necessary.

Compressed Air System Inspection

Compressor Intake Filter

1. Check Compressor intake breather indicator.
2. Replace filter if required.



Compressed Air Tank

1. Drain Compressed Air Tank daily.

Inspect Daily

- ☐ Underneath machine and engine compartment for leaks or damage.
- ☐ Oil, fuel, or coolant leaks. *(See fluid under pressure warning on page 66)*
- ☐ Battery and cables.
- ☐ All Wheels to ensure hardware is in place and appears tight.
- ☐ Steps and handholds for condition and cleanliness.
- ☐ Fire extinguisher
- ☐ Windows – Clean, not broken
- ☐ Mirrors
- ☐ Head Lights and Work Lights
- ☐ Back Up Alarm operation
- ☐ Back Up Lights
- ☐ Brake Pedal and Service Brakes
- ☐ Parking Brake
- ☐ Seat Belt
- ☐ Seat Adjustment
- ☐ Horn
- ☐ Camera Monitor - all 3 views
- ☐ Danfoss DP720 Monitor
- ☐ Both Joysticks movement forward, backward, left, and right and return to center.
- ☐ All Joystick rollers, buttons and triggers operate freely.

Service Daily

- ☐ Grease all fittings except front axle.
- ☐ Check auger drive chain tension.
- ☐ Check turntable main chain tension.
- ☐ Check turntable swing motor chain tension.
- ☐ Check engine oil level and top off if necessary.
- ☐ With engine cold, check engine water level and top off if necessary.
- ☐ Check oil level in front axle on left and right sides and add gear lube if necessary.
- ☐ Fuel the T-644
- ☐ Drain Air Tank

Service Weekly

- ☐ Check Tire Pressure for 65 PSI (4.48 Bars). Skip if equipped with Urethane-filled tires.
- ☐ Grease front axle.
- ☐ Check hydraulic oil level (DP720)
- ☐ Add DEF if necessary. (Diesel Exhaust Fluid, Tier 4 Final Engines Only)

Service Monthly

- ☐ Check Auburn gearbox gear lube levels. (85W-140 API GL-5 Gear Lube)

Operating Procedures

Ground Crew Responsibilities

Everyone on the crew should contribute to a safe work environment:

- by paying attention to the designated safety man.
- by being aware of the machine's activity at all times.
- by trying to observe and anticipate what the T-644 operator will do next, so they are not in the machines or the trough's path.

Hand Signals

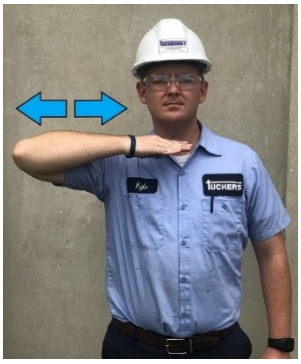
Forward

Reverse

Stop All

Discharge

Stop Discharge



Steer Left

Steer Right

Swing Left

Swing Right

Raise Chute

Lower Chute

T-644 Operation Precautions

Tip Over Caution

DANGER

Tip overs can occur if the T-644 is improperly operated. Injury or death may result. High-speed turns, combined with sudden braking, can cause a load shift that results in a tip over.

In Case of Tip Over

The operator should hold on firmly to the joysticks or armrests, brace feet, lean forward and lean away from the point of impact.

Loaded Machine Considerations

DANGER

Some concrete mixes are very fluid. Use caution when hauling these “wet” loads.

- Quick stops and sharp turns can cause a load shift in the Hopper that results in slosh over the sides.
- In extreme cases, a shifting load may cause the machine to tip over.
- A loaded T-644 weighs about double that of an empty machine.
- Keep this in mind as handling, acceleration, and braking will all be affected accordingly.

Workplace Navigation

- When driving the T-644, keep a constant lookout for personnel and equipment.
- Watch to the front and sides.
- Glance at the Camera Monitor.
- People and equipment can move into your path unexpectedly.
- Be ready to avoid a collision!
- Keep your eyes where you are traveling.
- Keep your hands on the Joysticks.
- The momentary distraction of waving to a fellow worker is all it takes to miss an approaching hazard.
- As you make turns, especially around buildings or stacks of materials, slow down and be sure you can see the path with time to react to unexpected obstructions.
- Just because this route was clear the last time you traveled it, does not mean it is unobstructed this time.
- If you feel that you may have run over an unseen obstacle stop the T-644 safely, turn off the machine, safely dismount and check your path.
- DO NOT BACK UP OR YOU MAY RUN OVER THE OBSTACLE A SECOND TIME!

Towing the T-644

In the event of an engine problem or other malfunction that prevents the T-644 from moving under its own power, the T-644 may be towed to a suitable nearby location for appropriate service.

(Figure 2.) Prior to towing, both rear wheel gearboxes must be disengaged to prevent possible damage to the hydraulic motors and pump. To disengage the gear box, remove the (2) quarter inch bolts that affix the disengage cap to the center of the gearbox. Once removed, flip the disengage cap over and put it back in place so that the protrusion on the cap pushes into the center of the gearbox and depresses the tip of disengage rod. Replace the (2) quarter inch bolts and tighten them to hold the disengage cap in place. Remember to disengage both gear boxes!

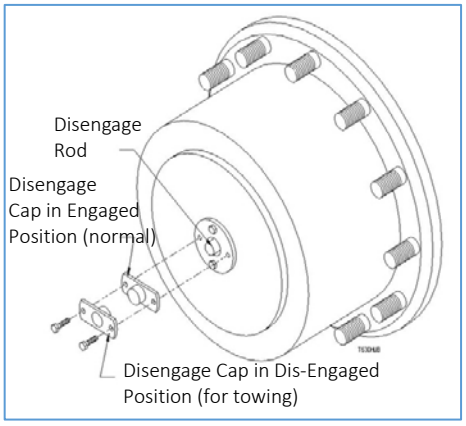


Figure 2

Reverse this procedure on both gearboxes to reconnect the gearbox for driving. It is critical to be sure the disengage rod has returned to the "out" position before reinstalling the disengage cap. You may have to rock the wheel.

The T-644 may be towed from either the front or rear, using appropriate gauge chains and/or hooks attached to the lift points (forward or rear). With a full load of concrete, the towing weight of a T-644 will be approximately 52,000 lbs. (23.6 metric tons.)

If the T-644 is immobilized, the chute can be pushed or pulled back to the travel position with a forklift, loader, or similar equipment. If the chute must be repositioned in this manner, use wood blocking to protect from equipment-to-equipment damage.

WARNING

Do not attempt to use a loader bucket or any other lifting equipment under the frame of the T-644 to either push or tow the T-644.
Never use any kind of equipment to push against the rear frame of the T-644.

Starting the T-644

Before starting the engine, make sure of the following:

1. The seat is properly adjusted.
2. The seat belt is properly fastened.
3. E-Stops are pulled to the OUT position.
4. Confirm the T-644 and immediate area is clear of personnel and obstructions.

Engine Start Sequence

- Turn the key to the ON position. The DP720 startup sequence will begin.

  Refer to DP720 Start Sequence in the Danfoss DP720 Monitor section for detailed information.
- Follow DP720 on screen instructions.
- Press Engine Starter button when prompted.
- The steering must be aligned to proceed to the Main Run screen.

• DO NOT leave the key in the ON position when the engine is OFF as this will drain the battery.

• DO NOT crank the engine for more than 10 seconds at a time as this can cause damage to the starter.

Moving the T-644

This section is divided into two parts:

1. Frame Movement - Left JS (green box)
2. Hopper Movement – Right JS (red box)

Overview: Operator training is done with the Frame Movement, Left JS first, and then the Hopper Movement, Right JS. New operators are instructed through a series of drills to become familiar with the Left JS and the T-644's unique driving characteristics. Once comfortable with the Left JS and driving, the operator will be instructed to perform a series of drills to become familiar with the Right JS and the T-644's Hopper movement. During these drills it is important that the operator only use one hand at a time to avoid confusion. Coordinated two hand control is possible after some practice.

Frame Movement

NOTE: Either the Left or Right JS operator present trigger must be held in any time movement is desired.

WARNING Before moving the T-644, Ensure the immediate area is clear of personnel and obstructions

DANGER Constantly monitor your surroundings. Maintain safety awareness!

DANGER Always be aware of the end of the Trough movement while steering!

- The T-644's maneuverability is due to its articulated steering.
- When the T-644 is steered to the left, the hopper and trough move right and vice versa.
- Note that while turning the T-644 gets "wider". This is important to remember when operating in tight quarters under the batch plant or near formwork.
- Start slowly and give yourself adequate clearances for safe operation!

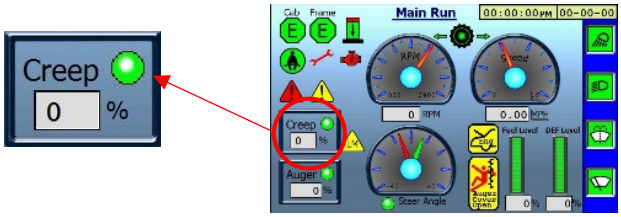
Propel Creep

- When Creep is enabled, it limits the maximum propel command from the JS to the propel pump.
- Additionally, Creep resets the entire range of the propel JS accordingly.
- The operator can adjust the Creep percentage on the fly with the roller on the Left JS.
- Creep gives the operator much finer control of the T-644.

Example: With Creep off, the entire throw of the JS would be 100%, half way would be 50% etc.
If Creep was enabled and set at 10%, the entire throw of the JS would be 10%, half way would be 5% etc.

Creep Operation:

- Press Creep button on Left JS to toggle Creep ON/OFF.
- Creep is Enabled when circle is Green, and OFF when circle is Gray.
- Use Roller on Left JS to adjust Creep %.
- By default, each time the machine is started Creep is always OFF.



Propel, Initial Instruction

- With the engine running, enable Creep.
- Verify Creep is enabled on Main Run screen (Green circle).
- Ensure Creep setting is between 20-30%.
- Push and hold the Park Brake valve to unlock parking brakes.
- Pull and hold the Operator Present Trigger on the Left JS.
- Slowly push the Left JS forward until the T-644 starts to move. More forward JS movement increases speed.
- The Engine RPM's will increase automatically as you start to move. This is normal as Auto RPM mode is the default setting.
- Steer the front wheels by moving the JS in the direction of intended travel.

- To Reverse, slowly pull the Left JS backward until the T-644 starts to move. More backward JS movement increases speed.
- Inexperienced operators initially tend to “over steer” the unit until confidence is gained.
- Practice at a very low speed in a safe, open area.
- Move the T-644 through both left and right 180º turns. “Figure 8’s” are a great drill for this.
- If possible, layout a slalom course with cones or blocks of wood. The operator should learn to weave between the markers and not hit any of them with a tire.
- Boards or dunnage work well to layout out a “tight” spot for learning to back the T-644 into.

Hopper Movement

Hopper Initial Instruction

NOTE: Either the Left or Right JS operator present trigger must be held in any time movement is desired.

WARNING Before moving the T-644, Ensure the immediate area is clear of personnel and obstructions

DANGER Constantly monitor your surroundings. Maintain safety awareness!

DANGER Get comfortable controlling the machine’s motion and operation before moving into close quarters and working near a crew, forms, or a batch plant.

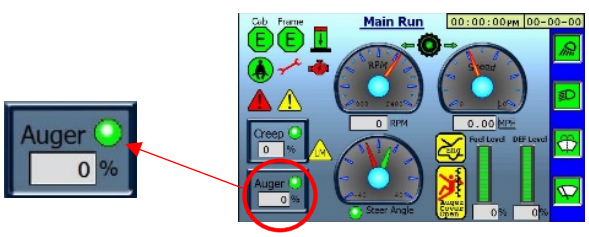
- Stop any travel before attempting to move the hopper for the first few times.
- Pull and hold the Operator Present Trigger on the Right JS.
- Gently move the Right JS in the direction the hopper is to swing. The farther the JS is pushed, the faster the swing.
- Practice swinging both directions.
- To re-align the hopper for proper straight forward travel. Swing the hopper until the Engine Bay is centered between the Green Lines of the Left and Right camera views.
- Raise the hopper up by moving the Right JS backward then lower the hopper by pressing the Right JS forward.
- Swing to the right and left with the hopper raised.
- Once comfortable, swing the hopper left, raise, and then add SLOW forward and backward travel.
- Swing the hopper to the right, raise, and then add SLOW forward and backward travel.

Auger Operation

- Pull and hold the Operator Present Trigger on the Right JS.
- Open the Slide Gate by holding the Roller down until the gate is completely open.
- Confirm desired Auger speed AND direction. Positive % is Forward, Negative is Reverse.
- The Auger Speed % F/R Roller is on the Right J/S, parallel with the Chute.
- Move the Roller towards the end of the Chute to increase Auger Speed %.
- Move the Roller towards the Hopper to decrease Auger Speed %.

- The Roller is proportional. Hold it all the way and it will automatically jump to 100% + or -.
- This can be done while the auger button is held down to quickly change from forward to reverse.
- Press and hold Auger button. Auger is Enabled when circle is Green, and OFF when Gray.
- Release Auger button to stop the auger rotation.

When the Auger button is depressed, the Engine automatically revs to Max RPM's. However, the T-644 will maintain the current travel speed.



If this pop-up message appears when attempting to run the Auger, and the Slide Gate is open:
Roll the Slide Gate Roller to the bottom and hold for at least 3 seconds.
The DP720 needs an "Open Slide Gate" command of at least 3 seconds to register that the Gate is open.

Pouring Practice Instruction

Once an operator becomes comfortable with the coordinated movement of both JSs in the T-644, the next step is to practice pouring drills. If there is an empty flatbed trailer, double tee, beam or similar in an unoccupied area of the yard use it to practice on.

- Approach the "form" and align the T-644 parallel.
- Pull to the end of the form and enable Creep.
- Lift the Hopper if necessary and Swing the Hopper into position.
- Open the Slide Gate, and press and hold the Auger button.
- Practice starting the Auger at a slow speed and increasing speed as required.
- Begin to move the T-644 in Reverse. This is done to move away from finishing crew.
- Move the Hopper left to right to "Place" concrete as necessary.
- Ensure that the T-644 is kept parallel to the form as it travels backward.
- Let off of the Auger button and close the Slide Gate.
- Swing the Hopper straight and lower.
- Drive safely away.

When approaching the form to fill it with concrete, it is critical that you align the front and rear wheel parallel to the form. This cannot be overstated. If you have the wheels of the T-644 parallel before you start pouring any concrete, the machine will travel straight along the form as you move. Failure to start with the wheels parallel to the form will cause the T-644 to either move away from the form or into the form as you progress. Either of these is potentially very dangerous.

Pouring Procedures

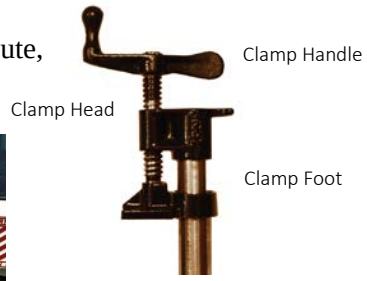
A typical shift of operation with the T-644 involves several tasks. They are as follows:

- Perform Preventative Maintenance. (See Preventative Maintenance section)
- Apply form oil.
- Fill the Hopper with concrete.
- Pour concrete.
- Wash out.

Applying Form Oil

Form oil must be applied to the Hopper and Chute before filling with concrete. This helps to prevent the concrete from sticking (this also makes clean up much easier.)

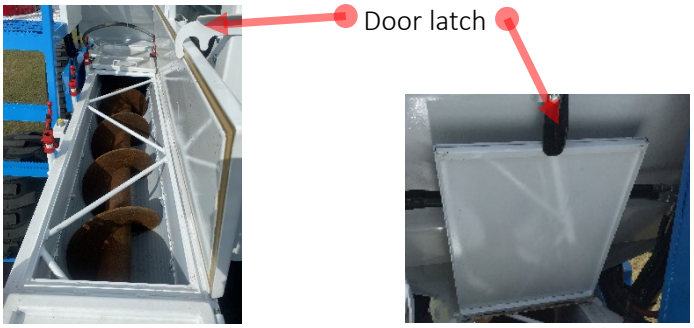
- Park the T-644 with the hopper straight and in the down position.
- Turn engine off.
- Remove key from ignition and place it in your pocket.
- Make sure the parking brake is engaged before leaving the cab.
- Exit the cab and proceed to the right side of the T-644. (See Access Section)
- Loosen each Chute Cover Door Clamp (clamp) handle. Turn each clamp head 1/4 turn counter-clockwise so that the clamp foot can pivot clear of the door.
- Use the Chute Cover Door Tool, mounted on the left front side of the chute, to open the front two chute doors



Chute Cover Door Tool

- Set the form oil spray can on the Front Bumper.
- Climb to the Bumper deck using the grab handles and steps. (See Access Section)

- Open the Chute Cover Door next to the Cab and secure it with the latch.
- Open the cover door closest to hopper and secure it with the latch.



- Set the form oil spray can on the Washout Platform.
- Climb to the Washout Platform using the Ladder. (See Access Section)
- Once in the Washout Platform, secure the safety chain across the entryway.
- Spray the inside of the Hopper with form oil.

DANGER

Any form oil spilled or sprayed onto surfaces where you walk, stand or step will create a potential slipping hazard.

- Climb down to the Bumper deck using the Ladder.
- Set the form oil spray can on the Bumper deck.
- Spray the underside of the open Cover Doors, the Auger and Trough with form oil as far as can be reached safely.
- Close the Chute Cover Door closest to the hopper.
- Close the Chute Cover Door located beside the Cab. (In sequence given)
- Turn Clamp heads so that the foot of the clamp is squarely over the Chute Cover Door.
- Tighten the Clamp down onto the surface of the door by turning the handle clockwise until snug. **Do not position or tighten the 4th safety clamp out from the hopper at this time!**
- Climb to the ground using the grab handles and steps.
- Spray the remaining underside of the open Cover Doors, the Auger and Trough with form oil.
- Spray Slide Gate and any funnel or attachment you may be using.
- Use the Chute Cover Door Tool to close the two forward-most Chute Cover Doors.
- Turn remaining Clamp heads so that the foot of the clamp is squarely over the Chute Cover Door.
- Tighten the Clamp down onto the surface of the door by turning the handle clockwise until snug.

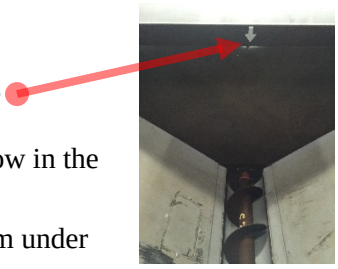
WARNING

To avoid machine damage, the Chute Cover Doors must be tightly sealed with the clamps properly positioned prior to moving or filling the T-644.

Filling the Hopper

- While observing all previously described safety procedures and practices, move the T-644 under the batch plant by backing under or pulling through. (As your plant and conditions allow.)
- Center the hopper of the T-644 under the discharge chute. Use a spotter's help the first time.
- Once in place, make a mental note of your surroundings. Pick a pole, column, or brace to reference your position.

Close the Slide Gate before the T-644 is filled from the batch plant.



- Level Hopper.
- Fill the T-644 with concrete no higher than to the bottom of the arrow in the Hopper. Maximum Hopper Capacity is 6 cubic yards (5.48 m).
- When filling is complete, check surroundings, and slowly drive from under the batch plant.

Pouring Concrete

Because of the maneuverability of the T-644, an operator will be able to put concrete precisely where it is needed in the form. This increases the speed and efficiency of form filling by saving the bed crew work. Slightly under-filling the form initially is recommended because it is quicker and easier to add a bit more concrete with the T-644 than it is to shovel out excess concrete using manpower.

When it comes time to pour concrete, recall the practice drill. This time there will be other people and equipment involved in a coordinated effort. This requires the T-644 operator to be aware of the crew and take them into account before making any movements. This list has a few added considerations.

- Approach the form, check the surroundings and align the T-644 parallel to the form.
- Pull to the end of the form and enable Creep.
- Ensure every one of the crew is ready and is aware of the machines intended movements.
- Check the Camera Monitor often.
- Lift the Hopper if necessary and Swing the Hopper into position.
- Verify Auger % is at the desired positive number. Adjust if necessary.
- Open the Slide Gate, and press and hold the Auger button.
- Starting the Auger at a slow speed and increasing speed as required is recommended.
- Begin to move the T-644 in Reverse. This is done so movements are always away from crew.
- Constantly monitor the position of the trough relative to the form and crew.

- Move the Hopper left to right to “Place” concrete as necessary.
- Watch for signals from the bed crew on where to pour concrete.
- Ensure that the T-644 is kept parallel to the form as it travels backward.
- When the hopper starts to run empty, press the Vibrator Button to shake remaining concrete into the auger while continuing to run the auger.
- Do not run the vibrators more than 30 seconds at a time.

Never run the vibrators with a full load of concrete in the hopper. This can cause the aggregate to settle, or compact so tightly that it will not auger out. Improper use of the vibrators may cause the concrete to “bridge” over the Auger and fail to leave the hopper.

- When the form is full, or the Hopper is empty, let off of the Auger button and close the Slide Gate.
- Swing the Hopper straight and lower.
- Drive safely away after making sure the crew is clear of the machine and your route is clear of equipment and debris.
- Cautiously proceed to the batch plant for another cycle.

Clean Up/Wash Out Procedures:

DANGER

Follow all safety procedures carefully during clean up and wash out to avoid injury or death to you, fellow workers or damage to the machine.

DANGER

Water on any surface where you may stand or step, especially if combined with form oil, will create a slip hazard. Do not attempt to walk while spraying with a high-pressure hose.

- Empty any excess concrete from the hopper and trough in an approved area and proceed to the wash out area.
- Park the T-644 with the hopper straight and in the down position.
- Close The Slide Gate.
- Turn engine off.
- Remove key from ignition and place it in your pocket.
- Make sure the parking brake is engaged before leaving the cab.
- Exit the cab and proceed to the right side of the T-644.
- Place wash down hose on Washout Platform.
- Climb to the Washout Platform using the Ladder. (See Access Section)
- Once in the Washout Platform, secure the safety chain across the entryway.
- Wash concrete from the Hopper walls with the water hose.
- Allow the water to pool inside the Hopper.

- When the Hopper is clean and there is sufficient water in Hopper, return to the operator cab. (See Access Section)
- Start engine.
- Open the Slide Gate.
- Run the Auger at -100% for 10 seconds. This will churn the water in the Chute, helping to clean the backside of the Auger and the inner surfaces of the Chute Cover Doors.
- Run the Auger at +100% for 2 seconds by moving the Auger Speed % F/R Roller forward to set the speed to 100%. Keep running the Auger during this time.
- Perform this reverse and forward process 5-6 times, then Auger the rest of the water and rocks from the Hopper.
- Turn engine off.
- Remove key from ignition and place it in your pocket.
- Make sure the parking brake is engaged before leaving the cab.
- Exit the cab and proceed to the right side of the T-644.
- Loosen each Chute Cover Door Clamp (clamp) handle. Turn each clamp head 1/4 turn counter-clockwise so that the clamp foot can pivot clear of the door.
- Use the Chute Cover Door Tool, mounted on the left front side of the chute, to open the front two chute doors

Chute Cover Door Tool

- Set the wash hose on the Front Bumper.
- Climb to the Bumper deck using the grab handles and steps. (See Access Section)
- Open the Chute Cover Door next to the Cab and secure it with the latch.
- Open the cover door closest to hopper and secure it with the latch.

Door latch

Sealing Area

- Wash the underside of the open Cover Doors, the Auger and Trough with the hose as far as can be reached safely.
- Ensure that the Sealing Area for the Cover Doors is clean of any concrete.
- Close the Chute Cover Door closest to the hopper.

- Close the Chute Cover Door located beside the Cab. (In sequence given)
- Wash Cab and Hopper of any remaining mud.
- Turn Clamp heads so that the foot of the clamp is squarely over the Chute Cover Door.
- Tighten the Clamp down onto the surface of the door by turning the handle clockwise until snug. **Do not position or tighten the 4th safety clamp out from the hopper at this time!**
- Climb to the ground using the grab handles and steps.
- Wash the end of the auger and under sides of the cover doors that you could not reach with the hose from the Bumper deck.
- Wash Slide Gate and any funnel or attachment you may be using.
- Use the Chute Cover Door Tool to close the two forward-most Chute Cover Doors.
- Turn remaining Clamp heads so that the foot of the clamp is squarely over the Chute Cover Door.
- Tighten the Clamp down onto the surface of the door by turning the handle clockwise until snug.

WARNING

To avoid machine damage, the Chute Cover Doors must be tightly sealed with the clamps properly positioned prior to moving or filling the T-644.

Appendix:

Fault List- 1-65

#	Component	System	Fault
1	MC50-Engine Area	CAN A (Port 1)	No Rx by DP720
2	"	CAN B (Port 0)	No Rx by DP720
3	MC50-Lower Frame	CAN B (Port 0)	No Rx by DP720
4	MC24-Cab	CAN B (Port 0)	No Rx by DP720
5	Engine	CAN A (Port 1)	No Rx by DP720
6	Joystick, Left	CAN B (Port 0)	No Rx by DP720
7	Joystick, Right	CAN B (Port 0)	No Rx by DP720
8	Preco Radar	CAN B (Port 0)	No Rx by DP720
9	PVED-CC Coil, Elevator	CAN B (Port 0)	No Rx by DP720
10	PVED-CC Coil, Auger	CAN B (Port 0)	No Rx by DP720
11	PVED-CC Coil, Swing	CAN B (Port 0)	No Rx by DP720
12	PVED-CC Coil, Steering	CAN B (Port 0)	No Rx by DP720
13	PVED-CC Coil, Slide Gate	CAN B (Port 0)	No Rx by DP720
14	PVED-CC Coil, Hopper	CAN B (Port 0)	No Rx by DP720
15	PVED-CC Coil, AC	CAN B (Port 0)	No Rx by DP720
16	MC50-Engine Area	CAN A (Port 1)	Bus Off
17	"	CAN B (Port 0)	Bus Off
18	MC50-Lower Frame	CAN B (Port 0)	Bus Off
19	MC24-Cab	CAN B (Port 0)	Bus Off
20	DP720	CAN A (Port 1)	Bus Off
21	"	CAN B (Port 0)	Bus Off
22	MC24-Cab	Sensor Power, C1P08	Volts > 5.15
23	"	"	Volts < 4.85
24	"	System Power, C1P02	Volts < 9.00
25	MC50-Engine Area	"	Volts > 5.15
26	"	"	Volts < 4.85
27	"	System Power, C1P02	Volts < 9.00
28	MC50-Lower Frame	"	Volts > 5.15
29	"	"	Volts < 4.85
30	"	System Power, C1P02	Volts < 9.00
31	MC24-Cab	Work Lights Relay, C2P09	Open Circuit
32	"	"	Over Current
33	"	Windshield Wiper Relay, C2P10	Open Circuit
34	"	"	Over Current
35	MC50-Engine Area	PSI Snsr, "Forward", C1P16	Volts too Hi
36	"	"	Volts too Lo
37	"	PSI Snsr, "Reverse", C1P14	Volts too Hi
38	"	"	Volts too Lo
39	"	PSI Snsr, "Charge", C1P17	Volts too Hi
40	"	"	Volts too Lo
41	"	PSI Snsr, "Aux", C1P15	Volts too Hi
42	"	"	Volts too Lo
43	"	Hyd Temp Snsr, C1P27	Snsr Not Detected (65535 err)
44	Reserved		
45	Reserved		
46	"	Flow Meter, C1P23	Volts too Hi
47	"	"	Volts too Lo
48	"	EDC Coil, "Forward", C1P37	Open Circuit
49	"	"	Short Circuit
50	"	"	Current Mismatch
51	"	EDC Coil, "Reverse", C1P38	Open Circuit
52	"	"	Short Circuit
53	"	"	Current Mismatch
54	"	Engine Start Signal, C1P43	Open Circuit
55	"	"	Over Current
56	"	Vibrator Relay, C1P40	Open Circuit
57	"	"	Over Current
58	MC24-Cab	Windshield Washer, C2P11	Open Circuit
59	"	"	Over Current
60	MC50-Engine Area	Air Supply Valve Coil, C1P39	Open Circuit
61	"	"	Over Current
62	"	Horn Relay, C1P44	Open Circuit
63	"	"	Over Current
64	"	Coolant Level Snsr, C1P24	< 100mV
65	"	Coolant Level Snsr Power Supply, C1P42	Over Current (Old Sensor)

Fault List – 66-128

#	Component	System	Fault
66	MC50-Lower Frame	Speed Snsr, Left Motor,	Temp Volts too Hi
67	"	(C1P18, C1P19, C1P27)	Temp Volts too Lo
68	"	"	Zero Hz on CH. A
69	"	"	Zero Hz on CH. B
70	"	"	Ch. A Hz ≠ Ch. B Hz
71	"	"	A-B Phase Out of Spec
72	"	"	Ch. A % Duty Out of Spec
73	"	"	Ch. B % Duty Out of Spec
74	"	"	Ch. A Signal Short to Pwr
75	"	"	Ch. A Signal Short to Ground
76	"	"	Ch. A Signal Open
77	"	"	Snsr Open Ground
78	"	"	Snsr Open Pwr
79	"	"	Ch. B Signal Short to Pwr
80	"	"	Ch. B Signal Short to Ground
81	"	"	Ch. B Signal Open
82	"	Speed Snsr, Right Motor,	Temp Volts too Hi
83	"	(C1P23, C1P24, C1P28)	Temp Volts too Lo
84	"	"	Zero Hz on CH. A
85	"	"	Zero Hz on CH. B
86	"	"	Ch. A Hz ≠ Ch. B Hz
87	"	"	A-B Phase Out of Spec
88	"	"	Ch. A % Duty Out of Spec
89	"	"	Ch. B % Duty Out of Spec
90	"	"	Ch. A Signal Short to Pwr
91	"	"	Ch. A Signal Short to Ground
92	"	"	Ch. A Signal Open
93	"	"	Snsr Open Ground
94	"	"	Snsr Open Pwr
95	"	"	Ch. B Signal Short to Pwr
96	"	"	Ch. B Signal Short to Ground
97	"	"	Ch. B Signal Open
98	"	Fuel Level Snsr, C1P29	ohms too Hi
99	"	"	ohms too Lo
100	"	"	Snsr Not Detected (65535 err)
101	"	EDC Coil, "Left Wheel", C1P37	Open Circuit
102	"	"	Short Circuit
103	"	"	Current Mismatch
104	"	EDC Coil, "Right Wheel", C1P38	Open Circuit
105	"	"	Short Circuit
106	"	"	Current Mismatch
107	"	Back-Up Alarm Relay, C1P39	Open Circuit
108	"	"	Over Current
109	"	Head Lights, Relay, C1P40	Open Circuit
110	"	"	Over Current
111	Joystick, Left	CAN Device	Component, Sys, Setup, Cal Flt
112	Joystick, Right	"	"
113	Preco Radar	"	"
114	PVED-CC Coil, Elevator	"	"
115	PVED-CC Coil, Auger	"	"
116	PVED-CC Coil, Swing	"	"
117	PVED-CC Coil, Steering	"	"
118	PVED-CC Coil, Slide Gate	"	"
119	PVED-CC Coil, Hopper	"	"
120	PVED-CC Coil, AC	"	"
125	Steer sensor position fault		
126	Pressure filter fault	Engine Area	C1P05
127	Charge pump filter fault	Engine Area	C1P28
128			

Kendall Hyken•052 Farm Tractor Lubricant

Kendall® Hyken 052 is a multifunctional fluid specially formulated for use in farm tractors and other off-highway equipment requiring one lubricant for the transmission, final drive, wet brakes and hydraulic systems. It meets the performance requirements of all major brands of farm tractors and other farm equipment that utilize a common fluid reservoir.

Hyken 052 is formulated to provide excellent oxidation resistance, excellent wear protection, protection against rust and corrosion, and resistance to foaming. It has carefully balanced frictional properties to ensure proper operation of wet brakes and transmission clutches.

Applications

Hyken 052 is recommended for use where the equipment manufacturer specifies:

- AGCO (Deutz-Allis) Power Fluid 821XL
- AGCO (White Farm) Q-1826, Q-1802 (Type 55 Fluid), Q-1766B
- Case IH MS1210, MS1209, MS1207, MS1206
- Case New Holland (CNH) MAT3525 (134-D Fluid), MAT3509, MAT3506, MAT3505
- Caterpillar TO-2 (obsolete)
- Denison Hydraulics HF-0, HF-1, HF-2
- Ford ESN-M2C134-D, ESN-M2C86-C, ESN-M2C86-B, ESN-M2C41-B
- Ford-New Holland FNHA-2-C-201.00
- John Deere JDM J20C, J14C (Type 303 Fluid)
- Kubota UDT Fluid
- Landini Tractor II Hydraulic Fluid
- Massey Ferguson CMS M1145, M1143, M1141, M1135, M1129A
- Sundstrand Hydrostatic Transmission Fluid
- Vickers (Eaton) M-2950-S, I-286-S
- Volvo VME WB 101 (VCE 1273.03)
- ZF TE-ML 03E, 05F, 06E, 06K, 17E

Hyken 052 also meets API GL-4 performance requirements.

Features/Benefits

- Excellent oxidation resistance and thermal stability
- Excellent wear protection for clutches, gears and hydraulic pumps
- Prevents brake chatter and grabbing
- Protects against rust and corrosion
- Excellent seal compatibility
- Good foam resistance
- Suitable for year-round use in most climates

Kendall Hyken® 052 Farm Tractor Lubricant Properties

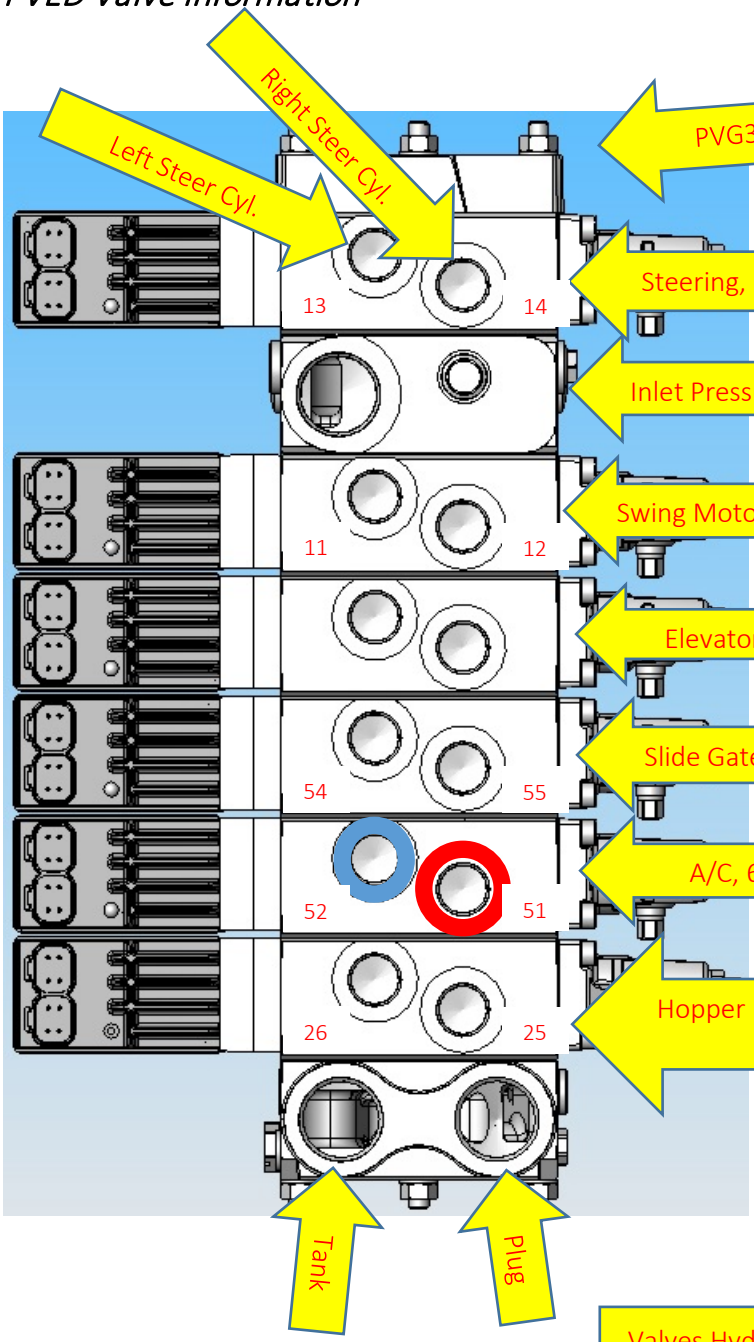
Typical Properties

Specific Gravity @ 60°F	0.872
Density, lbs/gal @ 60°F	7.26
Color, ASTM D1500	305
Flash Point (COC), °C (°F)	210 (410)
Pour Point, °C (°F)	-43 (-45)
Viscosity, Brookfield cP @ -20°C (Brookfield) cP @ -35°C (Brookfield)	 2,800 26,700
Viscosity, Kinematic cSt @ 40°C cSt @ 100°C	 61.0 9.3
Viscosity Index	146
Ash, Sulfated, ASTM D874, wt %	1.41
Total Base Number (TBN), ASTM D2896	9.6
Zinc, wt %	0.149

Health and Safety Information

For recommendations on safe handling and use of this product, please refer to the Material Safety Data Sheet via *http://w3.conocophillips.com/NetMSDS.*

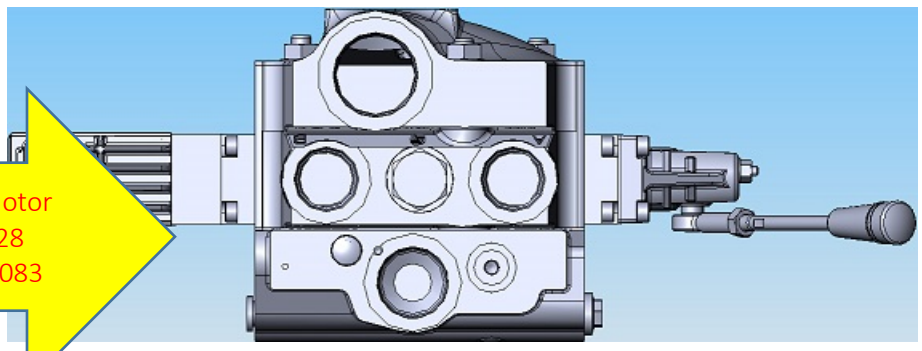
PVED Valve Information



Valves Hydraulic oil supplied by, Danfoss Ser. 45, 130cc Pump 2200 RPM Max. Berendsen Pump # 83022117

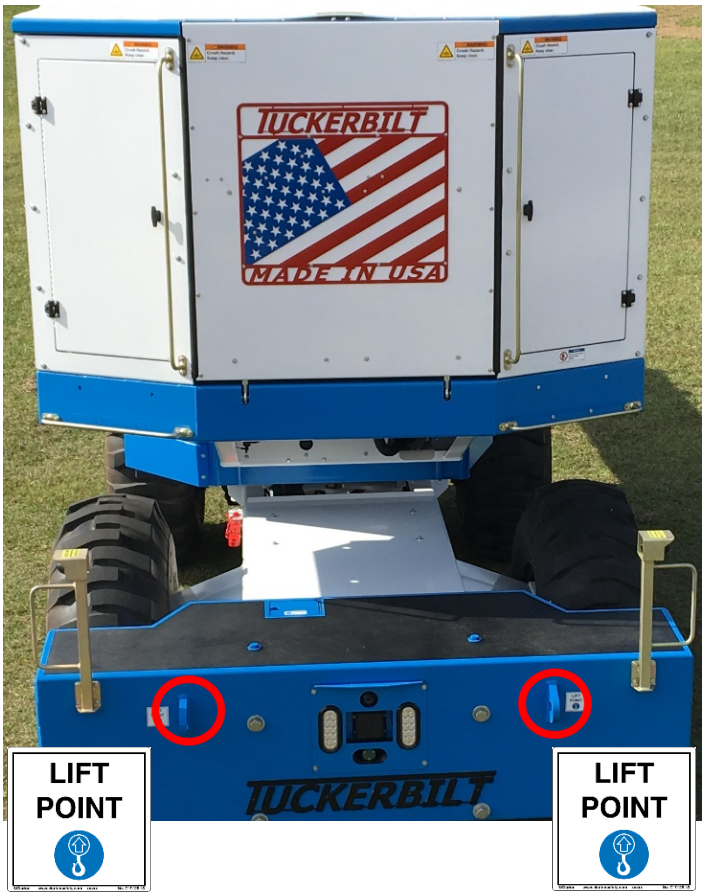
Pressure

Return



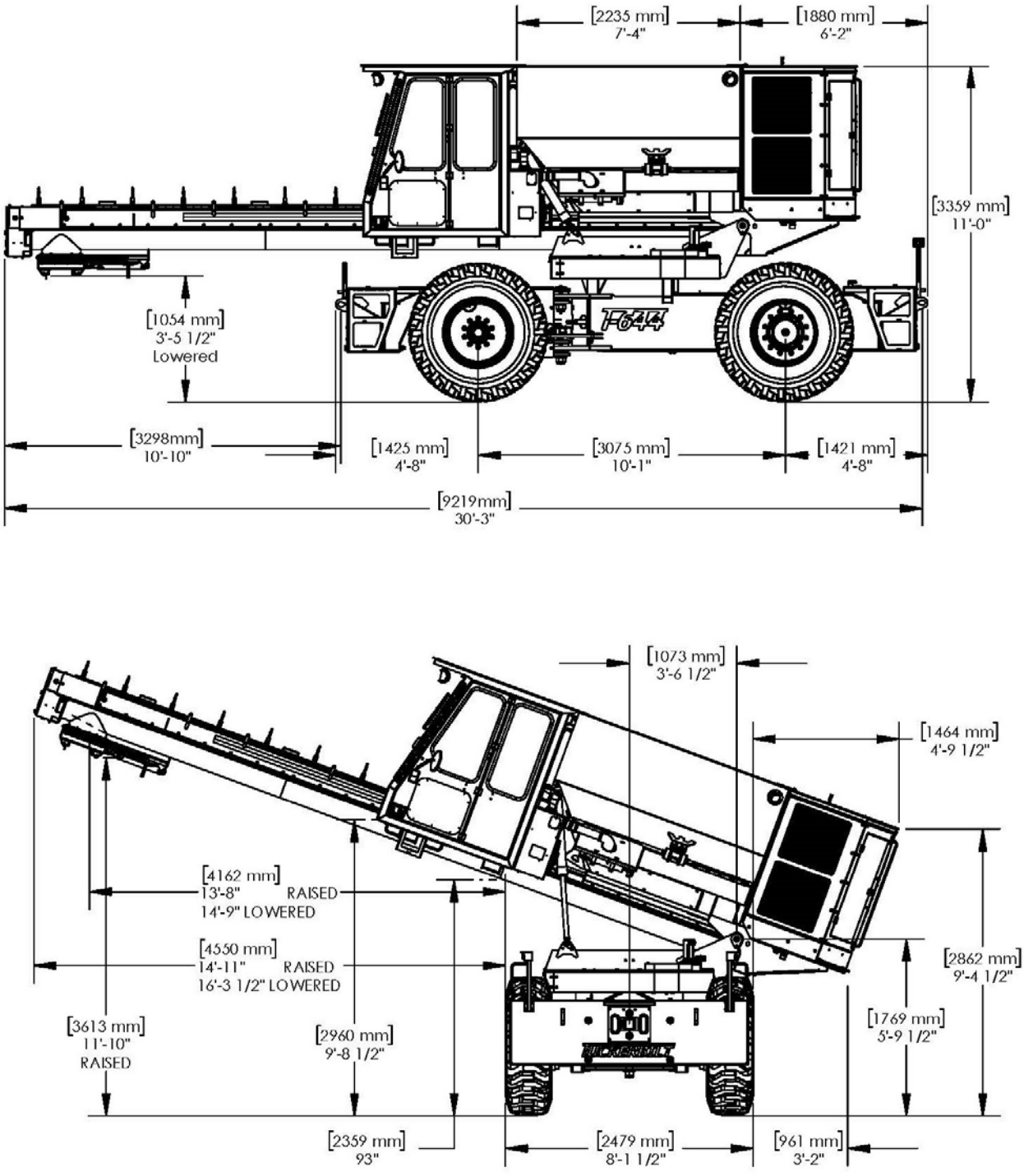
PVG100 Auger, 65 GPM Motor
Spool 11102193 – 80/128
Berendsen Valve # 161F5083

Lift Points

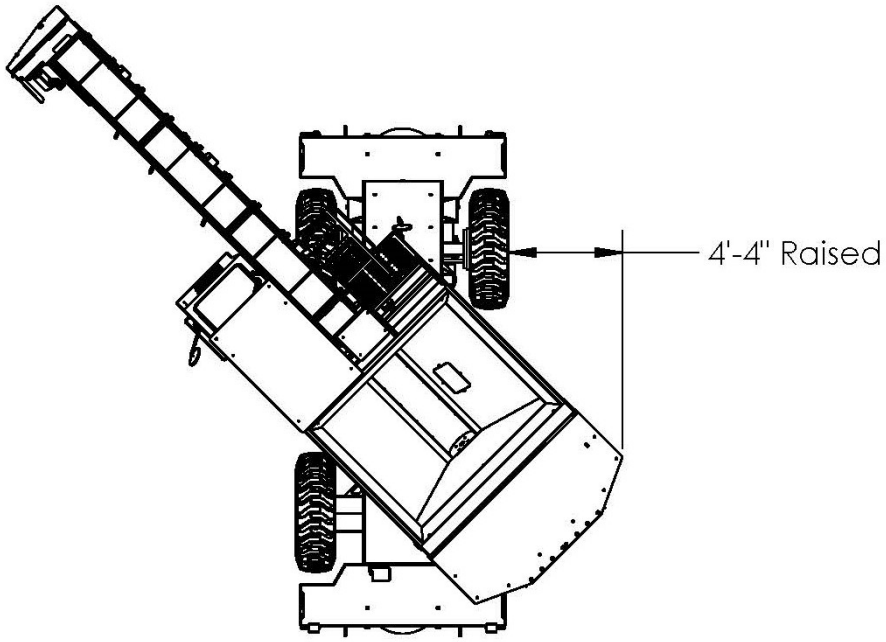


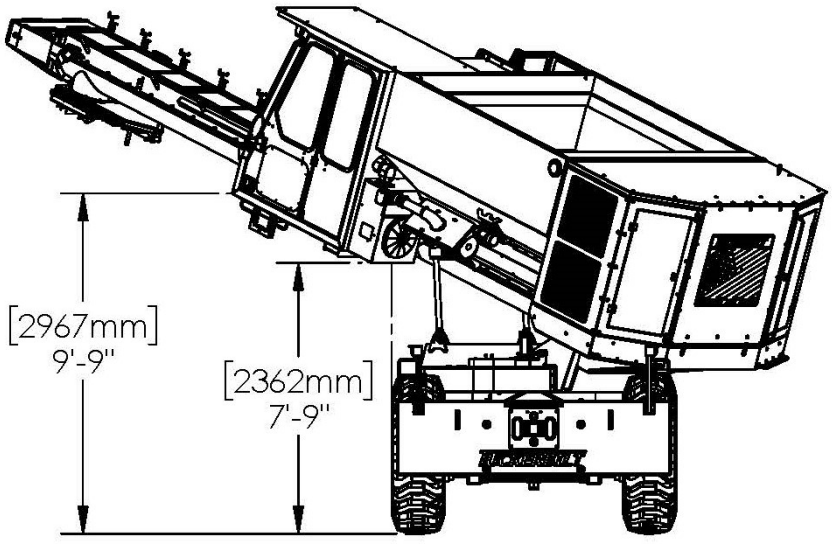
2 Lift Points Front, 2 Lift Points Rear. Approximately 26,000 Lbs.

Overall Dimensions



T-644 Overall Dimensions	DR. BY M.C.T.
	DATE 9/11/20
Specifications, descriptions and illustrative material in this literature are as accurate as known at the time of publication, but are subject to change without notice.	TUCKER'S





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