

Tigercat[®]

470 MULCHER

SERVICE MANUAL

SERIAL NUMBER 4701001–4702000



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Tigercat 470 Mulcher

SECTION 1–SAFETY

Read and understand the entire contents of this manual, and all manuals for any attachments or accessories associated with this machine, prior to operating or servicing this equipment.

CONTENTS–SECTION 1

ISSUE 2.2, JUNE 2018

AVOID INJURY FROM BACKOVER ACCIDENTS	1.9
BATTERY DISCONNECT SWITCH	1.15
BATTERY SAFETY	1.8
BOOM CYLINDER LOCK.....	1.19
CAB EXITS.....	1.11
INTERLOCK DOOR SWITCH	1.11
CAB TILT SUPPORT LINK.....	1.20
COOLING SYSTEM	1.17
DIESEL EXHAUST FLUID (DEF).....	1.10
EXHAUST FUMES	1.17
FIRE PREVENTION	1.28
DRY CHEMICAL CLEANUP PROCEDURES	1.31
FIRE PREVENTION GUIDELINES	1.28
WHAT TO DO AFTER A MACHINE FIRE HAS OCCURRED.....	1.31
WHAT TO DO TO PREPARE FOR A MACHINE FIRE.....	1.29
WHAT TO DO WHEN A MACHINE FIRE OCCURS.....	1.30
FLUID INJECTION INJURY	1.23
GENERAL SAFETY PRECAUTIONS	1.4
GREASE INJECTION INJURY	1.24
HAZARD ZONE	1.4
INTERLOCK DOOR AND ARMREST SWITCHES	1.11
LIGHTNING SAFETY AWARENESS	1.25
LIGHTNING SAFETY	1.25
WHAT IS A LIGHTNING STRIKE?	1.25
MACHINE STABILITY AND TRACTION	1.12
MULCHING OPERATION SAFETY.....	1.13
NOTICE LABELS.....	1.42
OPERATING SAFETY PRECAUTIONS	1.10
PARKING THE MACHINE.....	1.15
PILOT SYSTEM PRESSURE, RELEASE.....	1.22
PREPARING THE MACHINE FOR MAINTENANCE	1.15
PROTECTIVE CLOTHING.....	1.4

CAB EXITS

There are three ways to exit the cab in case of an emergency.

Left door—This is also the main point of entry and is the only door that should be used under normal operating conditions to enter or leave the cab. This door is also equipped with a safety interlock switch. Refer to INTERLOCK DOOR AND ARMREST SWITCHES in THIS SECTION.

Right door—This door should be used for emergency exits only. Do not use this door to routinely enter or leave the cab. This door is also equipped with a safety interlock switch. Turn OFF the engine before using the right door exit.

Escape hatch—This is a third cab exit for use if the cab door exits become blocked. The hatch is not equipped with an interlock switch and therefore, when left open, will not deactivate the interlock system. Turn OFF the engine before using the escape hatch exit.

IMPORTANT!

The operator of the machine must be familiar with these emergency exits and how to use them.

All operators should practice using all the cab exits to become familiar with escape procedures should they need to perform them in the dark, when the machine is in a rolled position, or other possible adverse conditions.

All three exits must be checked to ensure they are operational and will function in an emergency. The interlock door switch on the cab doors and the escape hatch retaining mechanisms must not be tampered with or defeated.

IMPORTANT!

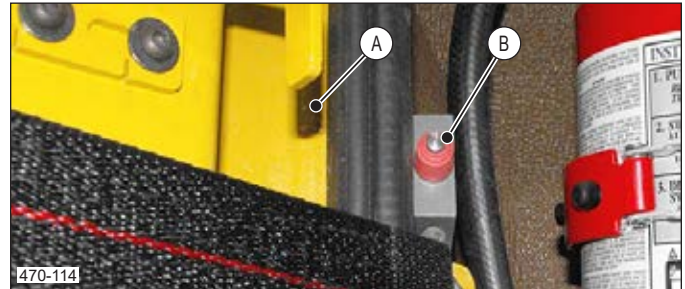
Unlock both doors before operating the machine to allow opening from the outside in case of an emergency. Make sure the doors are operational. Open the doors twice; once using the exterior latch handle and once using the interior handle.

For additional information, refer to EMERGENCY EXITS in SECTION 3.



Do not use the steering joystick to assist entering or leaving the cab.

INTERLOCK DOOR AND ARMREST SWITCHES



470-114

- A Actuator Plate
- B Interlock Door Switch (Left Door Shown)

Both doors and the left armrest are equipped with an interlock switch to prevent the machine from being operated with the doors open and the left armrest in the raised position (interlock system is deactivated).



470-414



MD0155

MD0154

- A Interlock Reset Switch
- B Interlock System OFF (Yellow)
- C Interlock System ON (Green)

To operate the machine, close both doors, lower the left armrest and press and release the interlock reset switch. The interlock system icon on the computer display will change from yellow to green.

Once the interlock system has been activated, the safety of both the operator and all persons outside the cab becomes the responsibility of the operator.

NOTE: The engine can be started but the machine functions cannot be operated with the doors open.



The interlock door and armrest switches and the interlock reset switch are safety features and their function must not be defeated in any way.

PRIOR TO WELDING

Prior to welding on any part of the machine, the repair area should be cleaned and a fire extinguisher placed nearby. Remove all paint from the area to be welded. Heated paint gives off toxic fumes.

1. Place the welding machine ground clamp as close to the work area as possible.

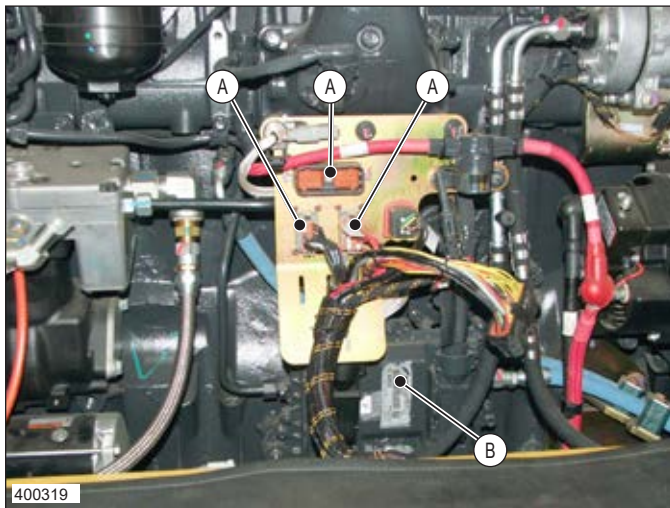
Stray current can pass through bearings.



A Battery Disconnect Switch (Right Rear Storage Compartment)

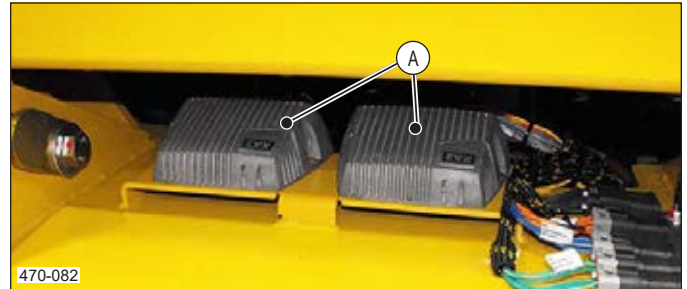
2. Turn OFF the battery disconnect switch.
3. Disconnect the negative (-) battery cable (connected to the starter motor) from the battery.

Due to the sensitive electronics on this machine, the following additional precautions must be taken:



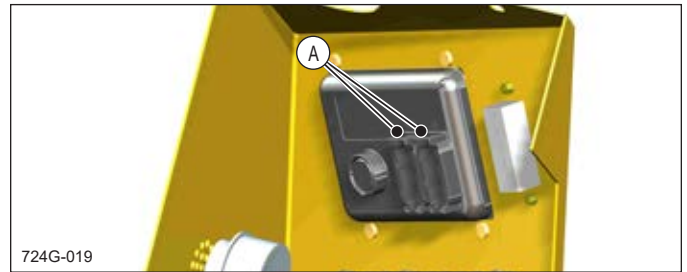
A Multi-Pin Connectors
B Engine Electronic Control Unit (ECU)

4. Disconnect the engine electronic control unit (ECU) by unplugging the three multi-pin connectors on the left side of the engine.



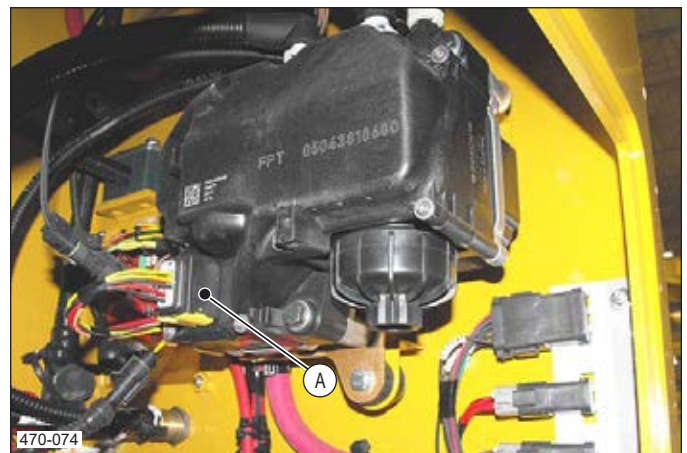
A Expansion Modules (Under Left Cab Door)

5. Disconnect the multi-pin connectors from the expansion modules.



A Computer Display Connectors

6. Disconnect the two multi-pin connectors from the back of the computer in the cab.



A DEF Supply Module Multi-pin Connector

7. Disconnect the DEF supply module (rear pump compartment) by unplugging the multi-pin connector.
8. When welding is complete, reconnect the multi-pin connectors and connect the negative (-) battery terminal cable.
9. Turn ON the battery disconnect switch.

- Ensure the machine and all components have cooled down sufficiently after a fire to prevent re-ignition from occurring.
- Remain with the machine until help arrives.

WHAT TO DO AFTER A MACHINE FIRE HAS OCCURRED

Before returning the machine to work:

1. Ensure the cause of the fire is determined and all appropriate repairs are completed.
 2. Ensure the fire detection system* or the fire suppression system** is properly serviced and in working order (if applicable).
 3. Replace or recharge all extinguishers used in fighting the fire.
- Notify your equipment dealer and/or Tigercat Industries Inc. by completing an incident report, Tigercat form number 5101.

***NOTE:** Fire detection systems are offered by Tigercat as an optional installation on some Tigercat product lines. Please disregard any references made to fire detection systems if not installed on your machine.

****NOTE:** Dry chemical fire suppression systems are offered by Tigercat as an optional installation on some Tigercat product lines. Please disregard any references made to fire suppression systems if not installed on your machine.

DRY CHEMICAL CLEANUP PROCEDURES

Both ABC dry chemical fire extinguishers and fire suppression systems discharge a chemical powder to extinguish the fire. The chemical makeup and the small particle size of the powder as well as the force of the discharge all contribute to the fire fighting capability. These same characteristics also permit the powder to penetrate into and fully cover all components in the vicinity of the discharge.

The following are recommendations for the cleanup and neutralizing of areas exposed to dry chemical powder:

NOTE: Workers performing this work must wear protective clothing, safety goggles and a fine particle dust mask to minimize their personal exposure to the dry chemical powder.

- All electrical systems must be completely de-energized prior to any cleanup.

- In areas of the machine that remained cool and dry during the fire, the dry chemical will stay in powder form. Be certain to clean these areas immediately to prevent any settled residual powder from coming into contact with moisture whether through direct contact or humidity in the air. Remove the powder residue by blowing off with air, sweeping, dusting or vacuuming using a HEPA filter capable of trapping the small dry chemical particles. Then wipe all surfaces with a damp cloth.

- In areas exposed to moisture, the dry chemical powder will combine with water to form a mildly acidic paste.

NOTE: All surfaces covered by this dry chemical paste including electrical contacts are vulnerable to corrosive attack.

To neutralize the acidic paste on large surfaces, spray or wash these areas with a mixture of three parts hot water to one part baking soda. Allow this mixture to stand for several minutes before rinsing with warm water. Wash the area with a mild soap and water solution. Rinse thoroughly with water. Blow-dry to remove all residual water. Cleaning electrical contacts with an electrical contact cleaner that has no flash or fire point and is non-corrosive and non-conductive such as CRC Contact Cleaner 2000.

- In areas exposed to heat during the fire, the dry chemical powder will melt forming a coating that cakes or crusts on all surfaces. To break down the caked dry chemical, spray or wash these areas with a 50/50 mixture of hot water and Isopropyl alcohol. Allow this mixture to stand in place for several minutes. The caked dry chemical when exposed to moisture is also mildly acidic. Therefore when the break down procedure has been completed, follow this immediately with the neutralizing procedure as described in step 2.

CHECK DAILY



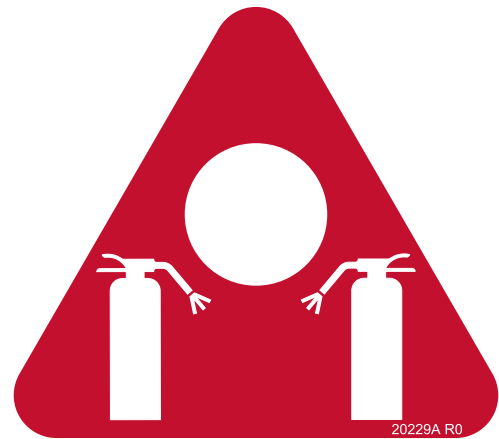
This label underscores daily fire prevention checks for combustible debris, fluid leaks, damaged wiring or hoses, and properly functioning fire-fighting equipment.

PORTABLE FIRE EXTINGUISHER

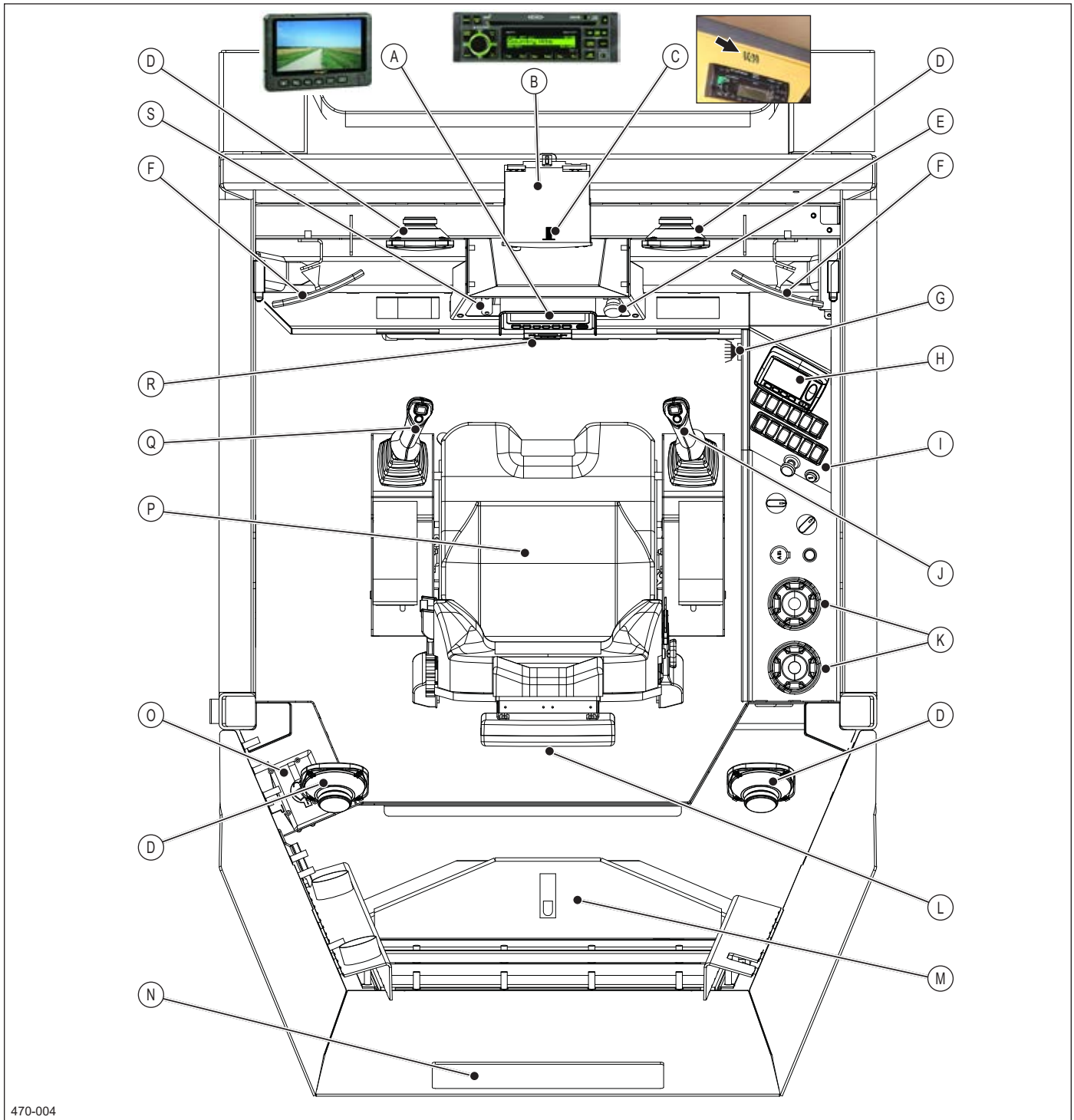


This label indicates portable fire extinguisher storage locations.

FIRE EXTINGUISHER ACCESS PORT



This label appears at each fire extinguisher access port.



Top View of Cab Controls, Accessories and Instrument Panel

- | | |
|-----------------------------|------------------------------------|
| A Camera Monitor | K Cup Holder |
| B AM/FM Radio/CD Player | L Operator's Manual Storage |
| C Hands-free Microphone | M Storage Compartment |
| D Speaker | N Cab Fresh Air Filter Compartment |
| E Emergency Shut-off switch | O Windshield Washer Fluid Bottle |
| F Convex Rear View Mirror | P Air Ride Seat |
| G Alarm | Q Steer/Track Drive Joystick |
| H Computer and Display | R 45° Level |
| I Instrument Panel | S Alarm Light |
| J Right Joystick | |

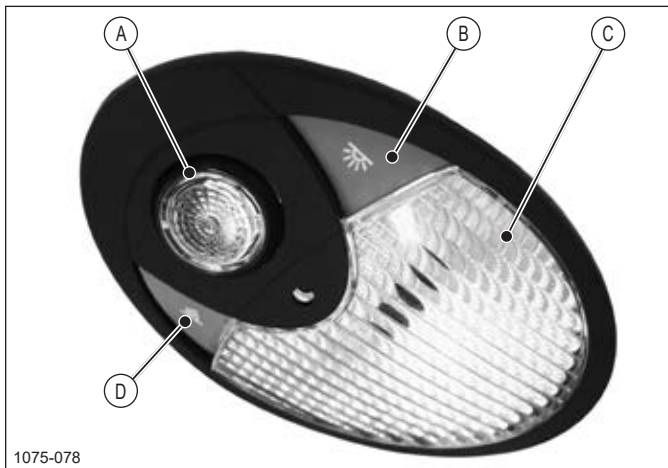
FEATURES, CAB



470-118

- | | |
|--------------------------------|--|
| A Interior Lighting | D Slope Indicator |
| B Hands-free Bluetooth | E Engine Coolant Heater Control Panel (Optional) |
| C AM/FM Stereo Radio CD Player | F Rear View Mirrors |

INTERIOR LIGHTING



1075-078

- | |
|--------------------------|
| A Pivoting Reading Light |
| B Light Switch |
| C Light |
| D Reading Light Switch |

Two light assemblies mounted in the roof inside the cab are used for cab interior lighting and reading lights.

Press on the corresponding light switch to turn on the desired light. To aim the reading light press on the reading light lens and pivot the light in the socket to the desired location.

AM/FM STEREO RADIO CD PLAYER

The AM/FM stereo radio CD player is located in the front of the cab roof above the front windshield. The system has four 2 way 5.25 inch speakers (2 front-mounted and 2 rear-mounted).

Refer to the MANUFACTURER'S DOCUMENTATION for complete operation instructions.

BLUETOOTH FUNCTIONS

The radio includes built in Bluetooth technology that allows you to connect it to Bluetooth devices for streaming audio playback and hands free calling. The hands free microphone is located in the radio enclosure and is connected to the radio.

Refer to the MANUFACTURER'S DOCUMENTATION for complete operation instructions.

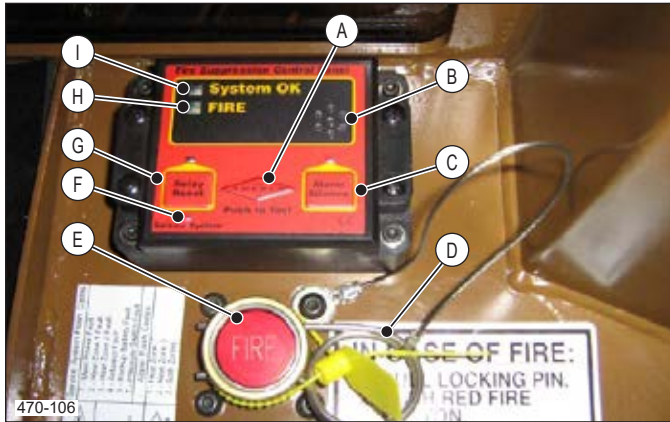
SLOPE INDICATORS

Two level indicators are provided, one on the side of the cab interior roof frame (shown above) for indicating fore/ aft level and one on the front console (not shown) for indicating side to side level.

REAR VIEW MIRRORS

Four, 4x8 inch convex rear view mirrors are located in the front of the roof to assist in the view out the rear windows. Use the mirrors along with the camera monitor when driving the machine in reverse.

AMEREX FIRE SUPPRESSION SYSTEM (OPTIONAL)



Control Panel

- A 'Push to Test' Button
- B Audible Alarm
- C 'Alarm Silence' Button and LED
- D Locking Pin
- E Manual Actuator Button
- F Service System LED
- G 'Relay Reset' button and LED
- H Fire Alarm LED
- I 'System OK' LED

The machine leaves the factory with the AMEREX fire suppression system fully deactivated to prevent accidental discharge. The in-line fuse for the power lead wire to the battery (in the battery compartment) is removed and the nitrogen bottle is not installed.

The system is not certified for use. Certification must be performed by a local AMEREX approved dealer.

NOTE: A pre-delivery inspection of the fire suppression system must be carried out to ensure the system is fully operational. This involves performing all daily and weekly inspection steps. Refer to FIRE SUPPRESSION SYSTEM–INSPECTION in THIS SECTION and FIRE EXTINGUISHER in THIS SECTION.

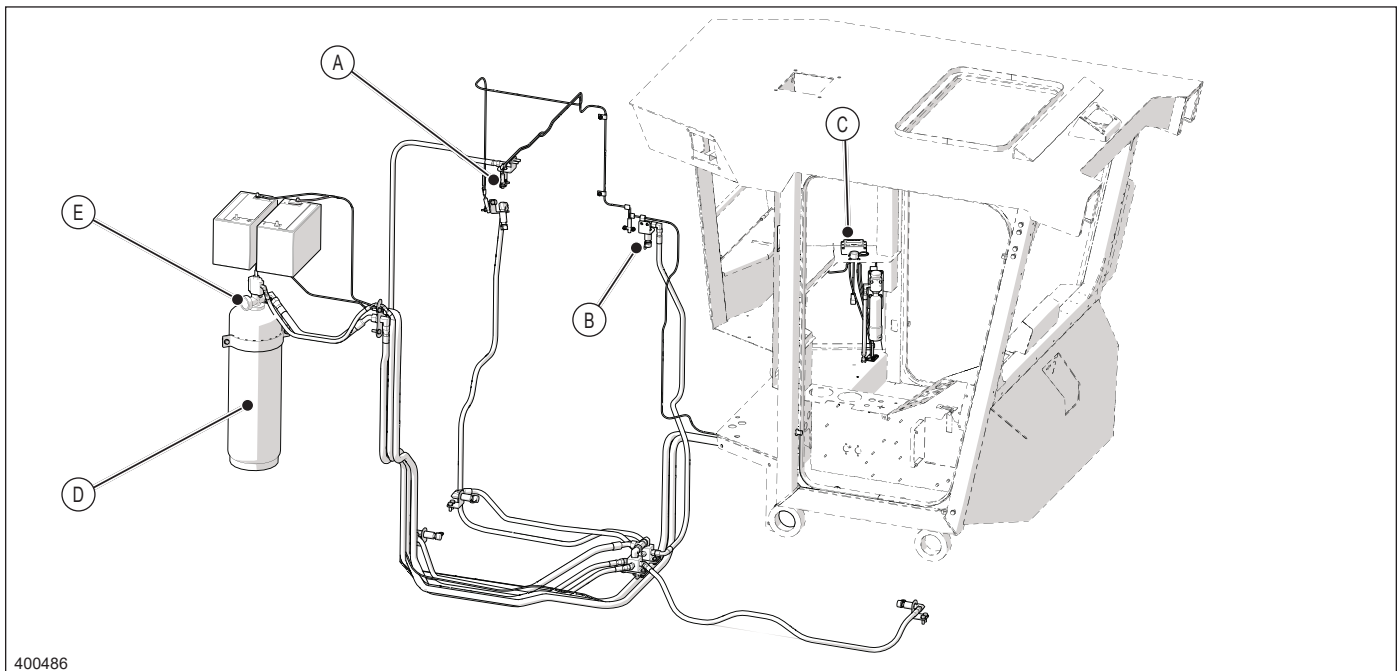
Read the owners manual applicable to the system installed on this machine for additional information on operation, service and AMEREX warranty requirements.

All machines are equipped with a fire detection system. For information about the fire detection system refer to FIRE DETECTION SYSTEM (OPTIONAL) in THIS SECTION.

The fire suppression system uses a dry chemical powder which is stored in a 23 kg (50 lb) pressurized cylinder. It is discharged through 6 nozzles strategically placed in the engine compartment and hydraulic areas. The discharge is activated either automatically by the fire detection thermostats or manually by the operator.

The control panel mounted in the cab provides continuous monitoring of the system. It also, automatically actuates the suppression system when signalled by the thermostats.

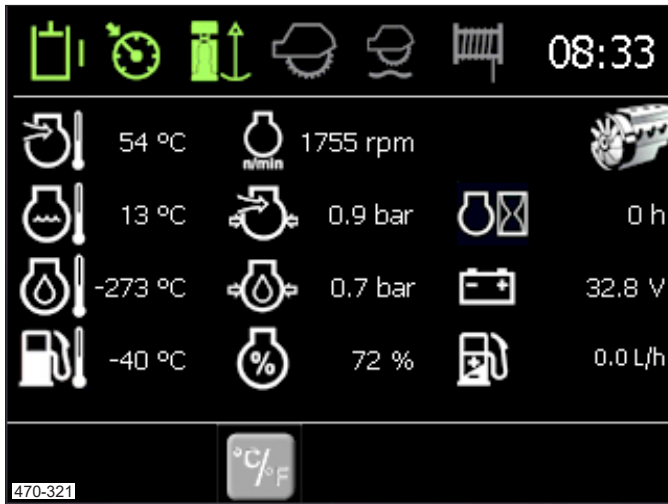
When the panel is plugged into an operational configuration the system will illuminate the green 'System OK' LED.



400486

- A Thermostat
- B Nozzle
- C Control Panel
- D Pressure Gauge
- E Cylinder (Contains Dry Chemical Powder)

ENGINE FUNCTIONS



Press the F2 button to toggle between metric and Imperial units of measure.

Press the back button to return to the main screen.

 CHARGE AIR TEMPERATURE

This display indicates the charge air cooler temperature reading.

If temperature rises above the recommended temperature, alarm will sound, check the following:

- Plugged cooler package air intake screens in doors access panel.
- Plugged charge air cooler.

Do not continue to operate the machine.

Refer to CLEANING COOLER PACKAGE in SECTION 3 and COMPUTER–MESSAGES in THIS SECTION.

 ENGINE COOLANT TEMPERATURE

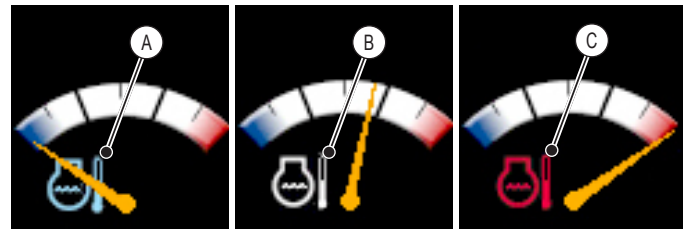
This display indicates the current engine coolant temperature.

If temperature rises above the recommended temperature, alarm will sound, check the following:

- Plugged cooler package air intake screens in doors and access panels.
- Plugged radiator.

Do not continue to operate machine.

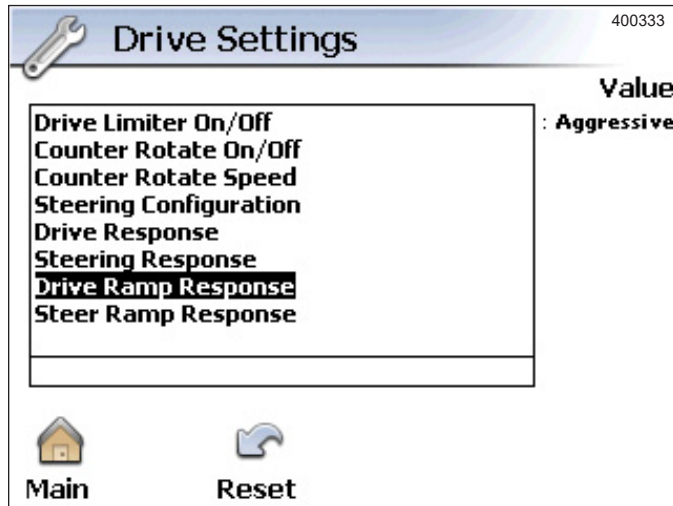
Refer to CLEANING COOLER PACKAGE in SECTION 3 and COMPUTER–MESSAGES in THIS SECTION.



- | | |
|---|---------------------------|
| A | Engine Temperature Low |
| B | Engine Temperature Normal |
| C | Engine Temperature High |

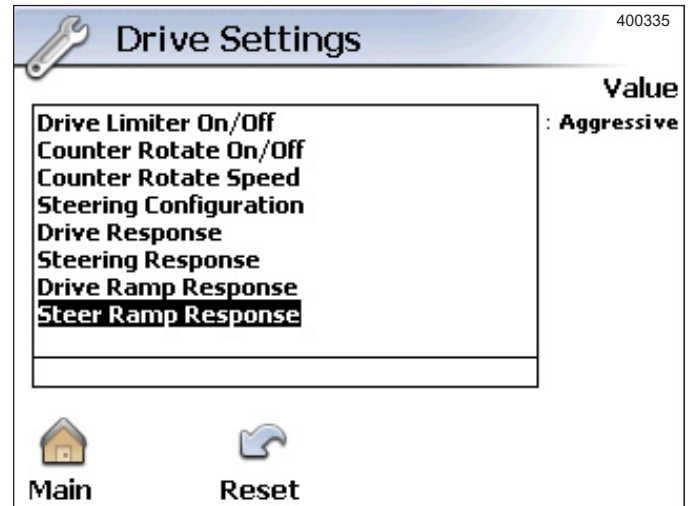
NOTE: Coolant temperature can also be monitored using the engine coolant temperature gauge on the main screen. The changes in gauge symbol colour indicate temperature range (BLUE=low, WHITE=normal, RED=high).

DRIVE RAMP RESPONSE

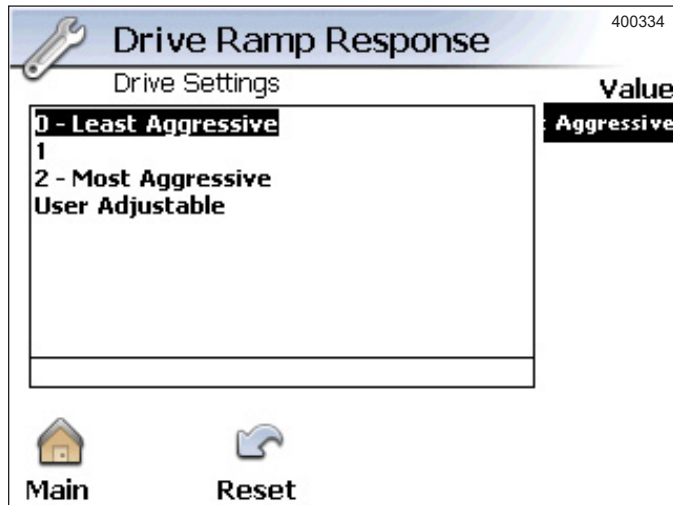


Press the UP or DOWN arrow buttons to select Drive Ramp Response, then press the OK button to make adjustments.

STEER RAMP RESPONSE



Press the UP or DOWN arrow buttons to select Steer Ramp Response, then press the OK button to make adjustments.

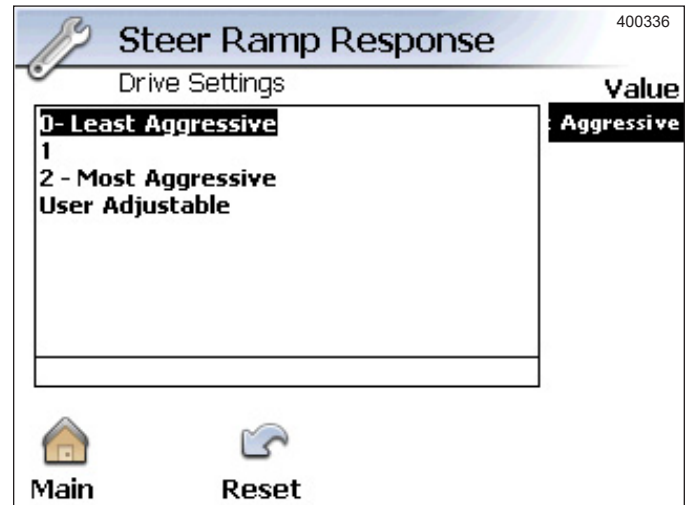


Four choices are given: 0 Least Aggressive through to 2 Most Aggressive and User Adjustable.

Press the UP or DOWN arrow buttons to select the desired selection, then press the OK button to confirm the selection.

Press the BACK button to return to the Drive Settings menu or press the BACK button twice to return to the adjustment menu.

Press the BACK button again to return to the Main screen.



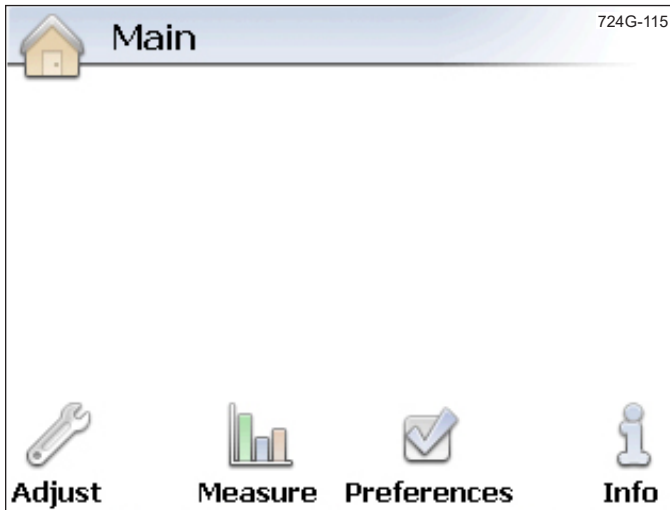
Four choices are given: 0 Least Aggressive through to 2 Most Aggressive and User Adjustable.

Press the UP or DOWN arrow buttons to select the desired selection, then press the OK button to confirm the selection.

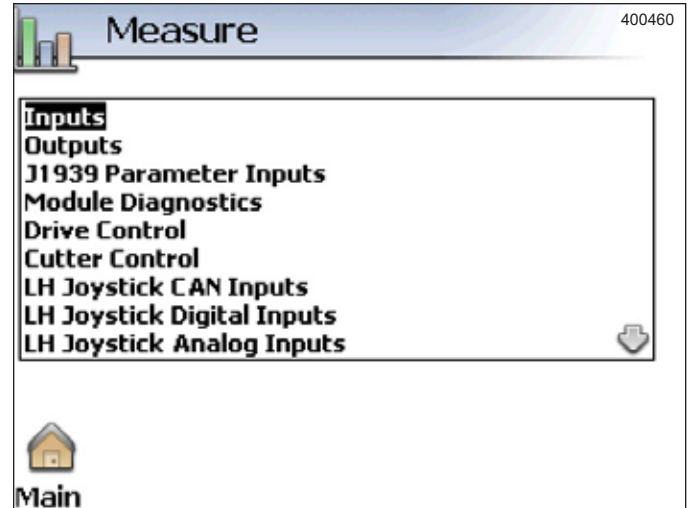
Press the BACK button to return to the Drive Settings menu or press the BACK button twice to return to the adjustment menu.

Press the BACK button again to return to the Main screen.

MEASURE MENU



Press the F2 button to access the Measure menu.



The following menu items can be selected.

- Inputs
- Outputs
- J1939 Parameter Inputs
- Module Diagnostics
- Digital Outputs
- Drive Control
- Cutter Control
- LH Joystick CAN Inputs
- LH Joystick Digital Inputs
- LH Joystick Analog Inputs
- RH Joystick CAN Inputs
- RH Joystick Digital Inputs
- RH Joystick Analog Inputs
- Boom Float
- Fan Control
- Fault Management
- Options

This menu is used by Tigercat service technicians. Refer to SECTION 6 of the SERVICE MANUAL for more information.


Press the UP or DOWN arrow buttons to select the menu item.

Press the OK button to view the information from the menu item.

Press the back button to return to the Measure menu or press the F1 button to return to the Main menu.

Press the back button again to return to the main screen.

HYDRAULIC OIL RETURN FILTERS BYPASSED

Critical		
Return Oil Filters		
Bypassed. Slowly warm up machine or service if already warm.		
Hide		


This message will be displayed, alarm light will flash and alarm will sound to inform the operator the hydraulic oil is bypassing the return filters.

This message may appear if the machine is cold. If the machine has already been warmed up, then the machine should be service immediately.

NOTE: When hydraulic oil is at operating temperature, the hydraulic oil filter bypass icon will be illuminated RED. When the hydraulic oil temperature is low the icon will be illuminated YELLOW.

Refer to HYDRAULIC OIL RETURN FILTERS in SECTION 3 for more information.

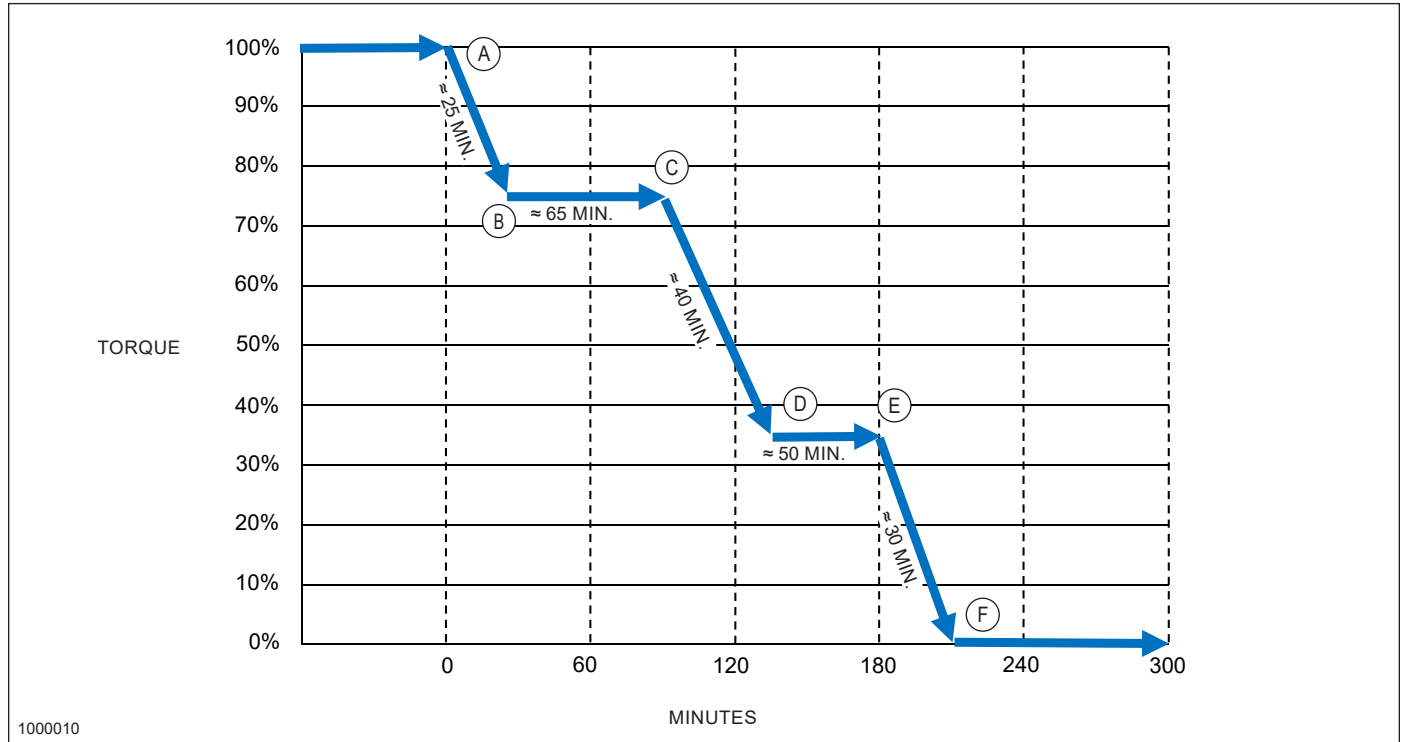
PUMP GEARBOX TEMPERATURE HIGH

Critical		
Pump Gearbox Temperature		
Temperature High.		
Hide		

This message will be displayed, alarm light will flash and alarm will sound to inform the operator the pump gearbox temperature is high.

Stop the machine immediately when this alarm is activated and check the gearbox for proper operation.

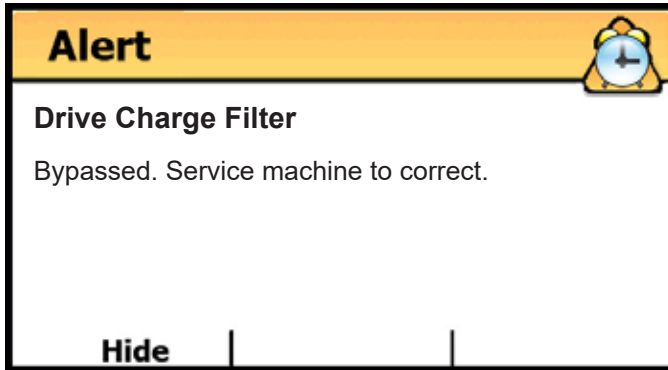
AFTERTREATMENT SYSTEM TECHNICAL FAILURE–ENGINE DERATE SEQUENCE



1000010

- | | |
|---|--|
| A Critical Message: Aftertreatment System–Technical Failure Severe. Engine torque begins to reduce. | D Engine torque reduced to 35% after 40 minutes. |
| B Engine torque reduced to 75% after 25 minutes. | E Engine torque begins to reduce further after 50 minutes. |
| C Engine torque begins to reduce further after 65 minutes. | F Engine speed reduced to LOW after 30 minutes. |

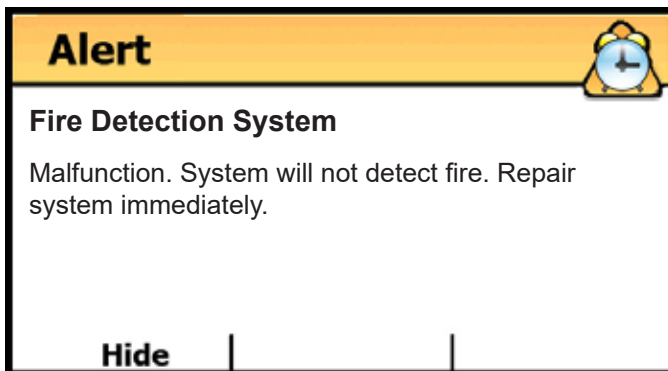
DRIVE CHARGE FILTER BYPASS



This message will be displayed when an alert level active fault related to the DRIVE CHARGE FILTER BYPASS has been activated.

Service machine alert message is an example of the type of fault that triggers this message. The charge pressure filter is restricted and requires service, or the oil temperature is cold allowing the oil to bypass the filter.

FIRE DETECTION SYSTEM MALFUNCTION

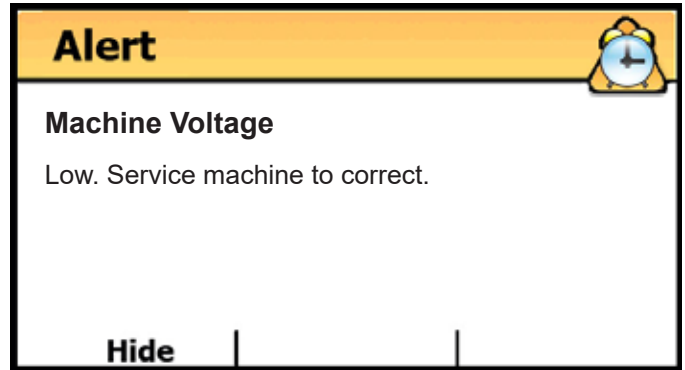


This message will be displayed when an alert level malfunction is detected in the fire detection system

Refer to FIRE DETECTION SYSTEM in THIS SECTION for more information.

Refer to WHAT TO DO IN CASE OF A MACHINE FIRE and WHAT TO DO AFTER A FIRE in SECTION 1.

MACHINE VOLTAGE LOW

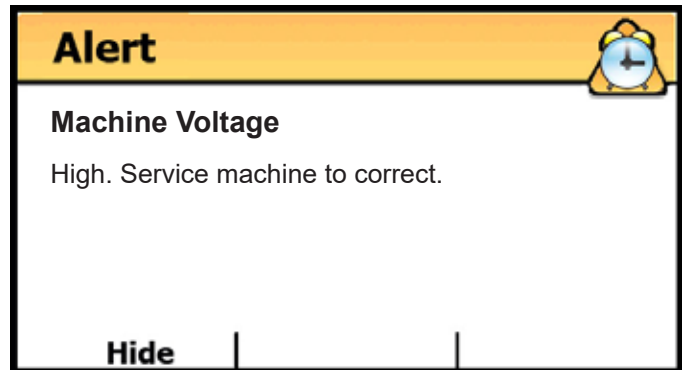


This message will be displayed when machine voltage readings of less than 20 volts are detected.

Machine voltage readings indicate voltage levels in the electrical system.

When this alarm is activated investigate the cause immediately.

MACHINE VOLTAGE HIGH



This message will be displayed when machine voltage readings of greater than 30 volts are detected.

Machine voltage readings indicate voltage levels in the electrical system.


When this alarm is activated investigate the cause immediately.


MODULE HIGH TEMPERATURE-ALERT


Module high temperature alert message is displayed to indicate the computer control system has detected high temperature readings in a system module.

The module is identified on the display screen. The temperature reading value is also displayed.

Once acknowledged this message will be replaced with a hardware fault message for the corresponding module when active faults are recalled to the screen. Refer to **COMPUTER-MESSAGES-ALERT-HARDWARE FAULT** in THIS SECTION.

Alert		MD3	
Display			
High temperature			
Value: 75° C			
OK			

Alert		XA2-A0	
XA2-A0-Module 1			
High temperature			
Value: 75° C			
OK			

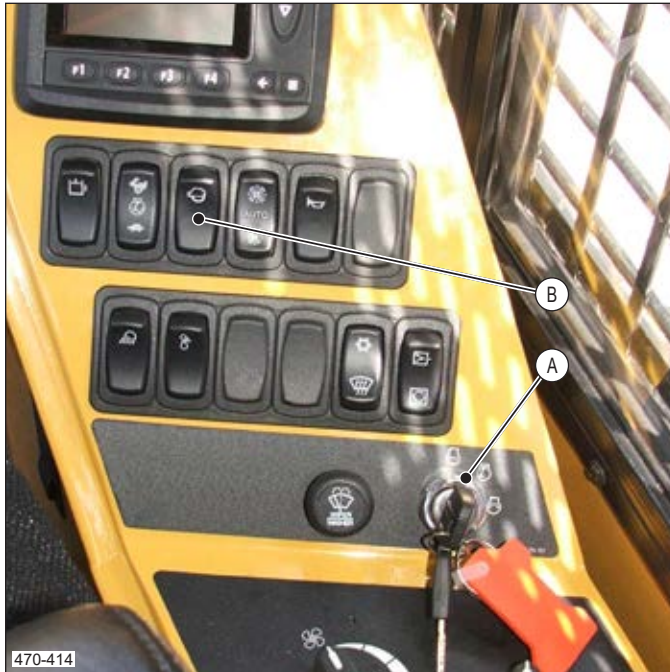
Alert		XA2-A2	
XA2-A2-Module 2			
High temperature			
Value: 75° C			
OK			

OPERATING THE MACHINE

Before operating the machine, follow the PERIODIC MAINTENANCE instructions in SECTION 3. Refer to the ENGINE OPERATION AND MAINTENANCE MANUAL supplied with this machine.

PRESTART CHECKS

1. Unlock cab doors, engine enclosure doors and hydraulic compartment doors.



A Ignition Key Switch
B Attachment Switch

2. Set the ignition key switch and the attachment switch to the OFF position.



A Portable Fire Extinguisher

3. Check portable fire extinguisher for sufficient charge.



A System OK LED

4. Check the fire suppression cylinder for sufficient charge. Refer to FIRE SUPPRESSION SYSTEM (OPTIONAL) in THIS SECTION.



A Fuel Level Gauge
B DEF Level Gauge (Tier 4f Machines Only)

5. Turn the ignition key switch to the RUN position to check fuel and DEF levels on the computer display main screen. Fill fuel and DEF to the required levels. Refer to REFUELLING PROCEDURE in SECTION 3 and DIESEL EXHAUST FLUID TANK—FILLING in SECTION 3.

NOTE: The DEF level indicator is applicable to Tier 4f machines only.

Tigercat 470 Mulcher

SECTION 3—LUBRICATION AND MAINTENANCE

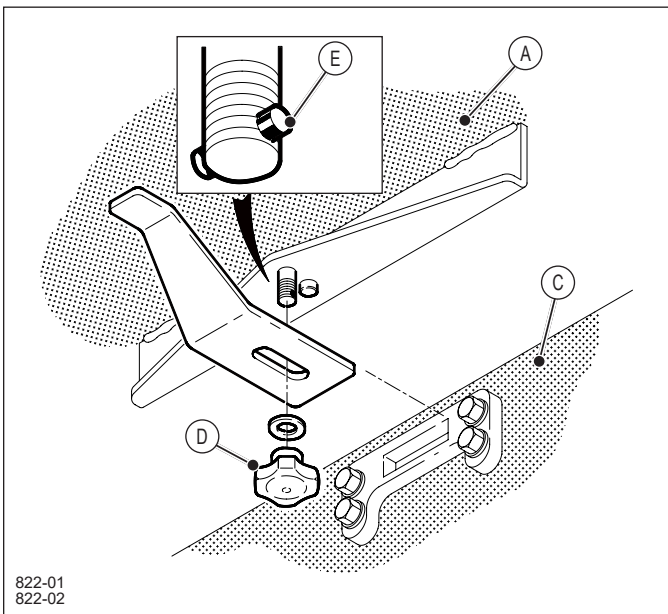
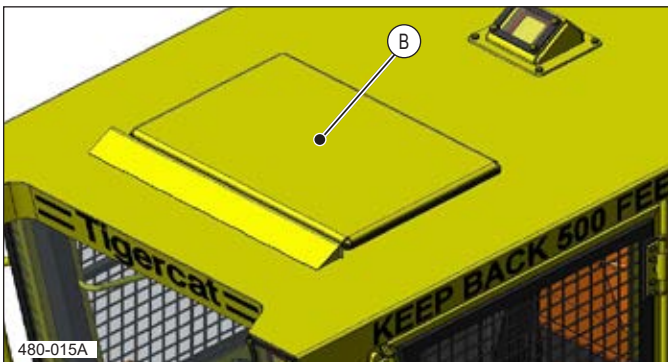
Read and understand the entire contents of this manual, and all manuals for any attachments or accessories associated with this machine, prior to operating or servicing this equipment.

CONTENTS—SECTION 3

ISSUE 2.2, JUNE 2018

ACCESS DOORS AND COVERS	3.21
AFTERTREATMENT SYSTEM.....	3.67
APPROVED ANTI-SEIZE PASTES FOR SENSORS	3.92
CATALYTIC CONVERTER	3.88
DEF (DIESEL EXHAUST FLUID).....	3.77
DEF QUALITY SENSOR.....	3.71
DEF SUPPLY LINES, HEATED	3.79
DEF SUPPLY MODULE.....	3.81
DENOX 2.2 DOSING SYSTEM	3.80
DIESEL EXHAUST FLUID (DEF).....	3.77
DIESEL OXIDATION CATALYST (DOC).....	3.81
DOSING MODULE (DEF INJECTOR)	3.87
EXHAUST FLAP	3.80
HEATER VALVE.....	3.79
HUMIDITY AND TEMPERATURE SENSOR.....	3.88
MIXER TUBE	3.87
NH3 SENSOR.....	3.90
NOX SENSOR	3.91
SYSTEM COMPONENTS.....	3.68
TANK, DIESEL EXHAUST FLUID	3.71
TEMPERATURE SENSORS	3.89
AIR CONDITIONING SYSTEM	
CAB AIR FILTERS	3.49
COMPRESSOR	3.47
CONDENSER	3.47
EVAPORATOR CORE, HEATER CORE AND BLOWERS	3.48
INSPECTION	3.50
RECEIVER-DRIER.....	3.47
AIR INTAKE SYSTEM	
AIR CLEANER	3.65
AIR CLEANER UNLOADER VALVE	3.66
AIR INTAKE TUBING AND JOINTS	3.64
CHANGING FILTER ELEMENTS.....	3.65
ENGINE AIR PRECLEANER.....	3.64
ENGINE AIR PRECLEANER GUARD	3.64
IMPROPER SERVICING	3.65
OVER SERVICING	3.65
AIR INTAKE SYSTEM, ENGINE	
AIR FILTER RESTRICTION INDICATOR.....	3.66
UNLOADER VALVE.....	3.66
ANTI-CORROSION SPRAY, REMOVAL	3.105
APPROVED HYDRAULIC OILS	3.20
BATTERY CARE	3.55
CAB TILT	3.25
LOWERING THE CAB	3.27
CARE OF POLYCARBONATE WINDOWS.....	3.102

ESCAPE HATCH REPLACEMENT



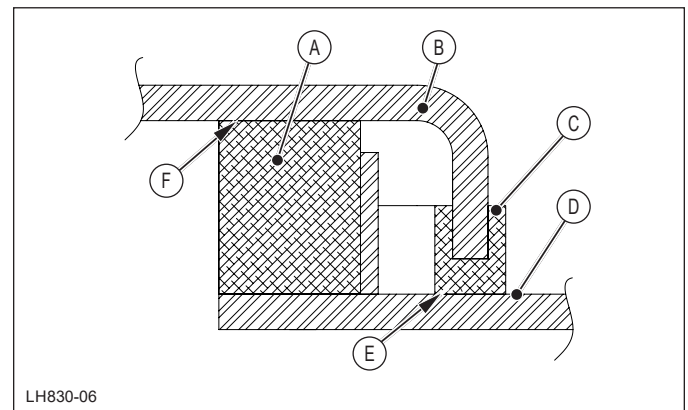
- A Escape Hatch (Interior View)
- B Escape Hatch (Exterior View)
- C Cab
- D Retaining Knob
- E Nylon Insert

NOTE: Centre mirrors have been removed for clarity.

NOTE: Do not apply silicone sealant between the Escape Hatch and the Cab Roof

Silicone sealant in these areas can bond the escape hatch to the cab, preventing removal of the escape hatch.

1. Clean all mating surfaces on both the escape hatch and cab roof, remove any silicone residue that may have been used to seal the joint.
2. The escape hatch gasket must be in good condition; replace if damaged.
3. Replace the nylon inserts in each stud, leaving approximately 3 mm (0.125 in) protruding at each end. These are to prevent the hand knobs from becoming loose under vibration.
4. Apply an anti-seize compound to the stud threads on the escape hatch and engage the hand knob threads three revolutions with washer and clamp bracket in place as illustrated.



Cross-Section of Escape Hatch Seal

- A Foam Seal
- B Escape Hatch
- C 'C' Channel Rubber
- D Cab Roof
- E Apply Lubricant to 'C' Channel Rubber
- F Apply Lubricant to Top Surface of the Foam Seal

5. To prevent foam seal or rubber 'C' channel from sticking to escape hatch or roof over time, apply a thin film of Tigercat part number AM926 dielectric non-curing silicone lubricant to the contact surfaces of foam seal and rubber 'C' channel. Remove excess spray with a dry rag so no build up remains.

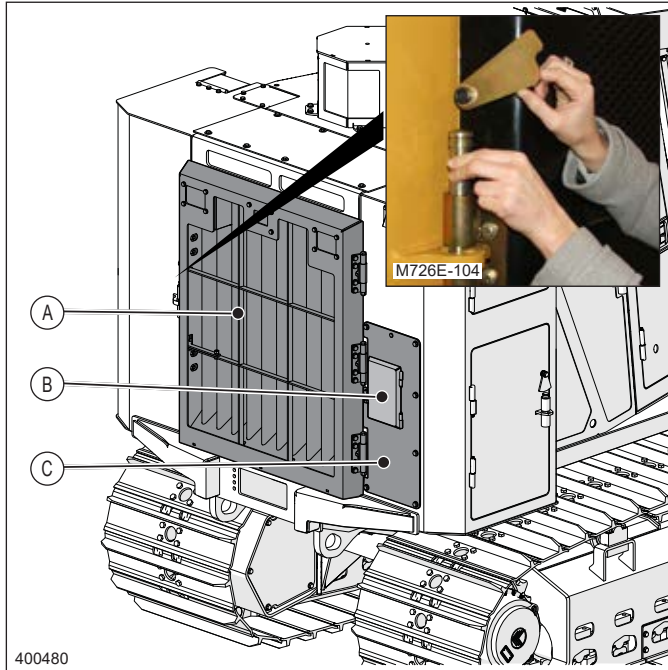
IMPORTANT!

Too much lubricant will cause the roof escape hatch to stick to the cab roof.

6. Install the escape hatch on the roof and engage the clamp bracket in the slot of the cab roof bracket.
7. Hand-tighten the knobs.

SERVICE COMPARTMENTS, ACCESS DOORS AND COVERS

REAR DOOR AND ACCESS COVERS



400480

- A Rear Door—Cooler Package
- B DEF Tank Fill Cap Door—Hinged
- C DEF Tank Access Cover—Removable (Bolted)

The rear door provides access to the debris screen and the cooler package heat exchangers. The door is perforated and acts as the first stage of debris screening for the air entering the cooler package.

To open the door, swing the latch pin stop to the side, lift up the latch pin and swing open the door. Lift the door lock from the storage location and place the door lock bolt in the hole provided in the door ledge to brace the door open. Reverse this procedure to close doors.

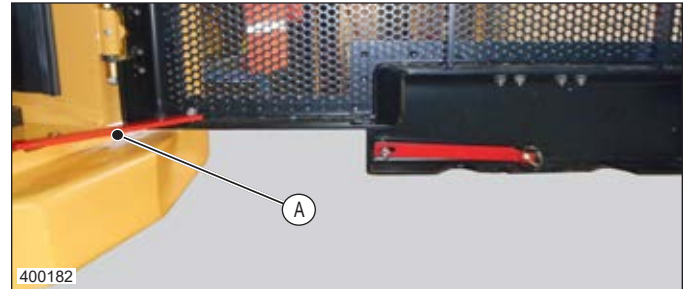
DEF TANK FILL CAP DOOR

NOTE: The aftertreatment systems and its related components are applicable to Tier 4f machines only)

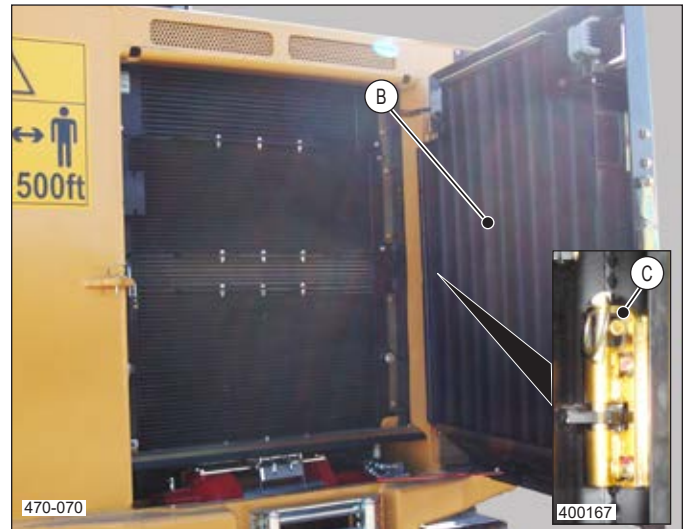
The DEF tank fill cap door provides access to fill the DEF tank. Remove the lynch pin and open the door to access the fill cap.

DEF TANK ACCESS COVER

The DEF tank access cover provides access to the DEF tank compartment. Remove the fasteners securing the access cover in place to access the DEF tank.



400182



470-070

400167

- A Door Lock
- B Debris Screen
- C Debris Screen Latch

DEBRIS SCREEN

The debris screen is located inside the rear door. Open the rear door as previously instructed. Remove the lynch pin and swing open the debris screen for cleaning.

HYDRAULIC SYSTEM**NOTICE**

Tigercat does not recommend the pre-filling of spin-on filters due to the risk of damage to the hydraulic system caused by unfiltered oil. Unfiltered oil used to pre-fill filters enters directly into the hydraulic circuit. Contaminants in unfiltered oil can cause significant and costly damage to hydraulic system components. The cleanliness of hydraulic oil cannot be guaranteed unless it is pre-filtered before use.

Use of filters other than genuine Tigercat replacement filters is not recommended. Replace filters at the recommended time intervals. Refer to **SCHEDULED MAINTENANCE** in THIS SECTION.

WARNING

WARNING: HOT HYDRAULIC OIL AND HOT MACHINE SURFACES CAN CAUSE SERIOUS BURNS!

- Before servicing the machine, allow the engine cooling system, fuel system, exhaust system, hydraulic system and machine surfaces to cool down.
- Use a thermometer to check surface and system temperatures to ensure it is safe to begin service work.
- Do not begin service work until the surface or system temperature has cooled down to below 38°C (100°F).

IMPORTANT!

Before servicing the hydraulic system, park the machine on level ground. Refer to **PARKING THE MACHINE** in SECTION 1.

ENGINE COOLANT HEATER UNIT PREVENTIVE MAINTENANCE

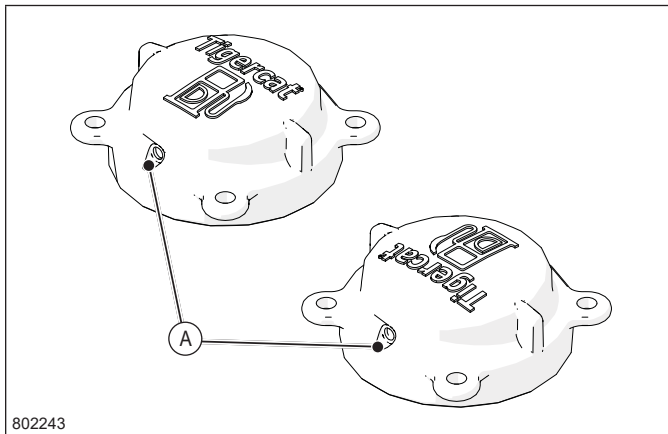
The following preventive maintenance schedule keeps the engine coolant heater unit in proper working order. Refer to the manufacturer's operation manual for further information.

DAILY MAINTENANCE

Complete the following preventive maintenance items once per day:

MACHINE FUEL TANK

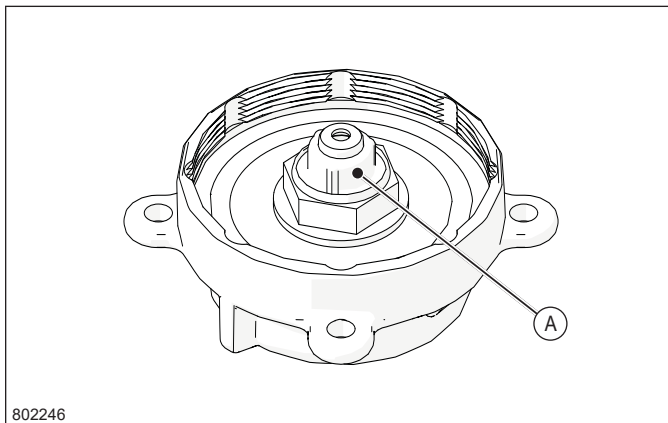
If the engine coolant heater unit draws fuel directly from the machine fuel tank:



Fuel Tank Fill Cap

A Vent Ports

Remove any debris, snow, or ice around the fuel tank fill cap. Keep the vent ports clear to prevent a vacuum inside the fuel tank.



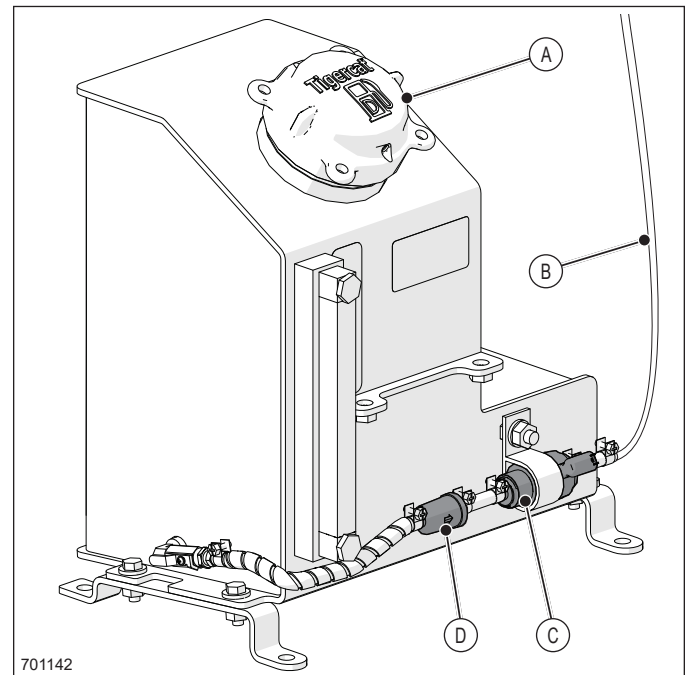
Fuel Tank Fill Cap

A Venting Valve

Inspect the fuel tank fill cap venting valve for proper operation in freezing temperatures. If the valve may freeze while the machine is parked overnight, leave the cap loose to prevent a vacuum inside the fuel tank.

REMOTE FUEL TANK

If the engine coolant heater unit draws fuel from a remote fuel tank:



Typical Remote Fuel Tank

- A Fill Cap
- B Fuel Line
- C Fuel Pump
- D Fuel Filter

Remove any debris, snow, or ice around the fill cap.

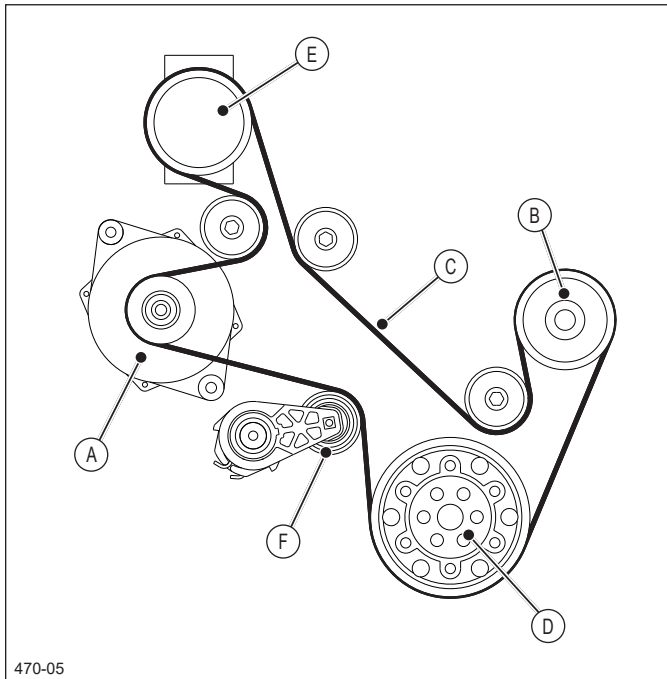
Inspect the tank vent line for free flow of air.

Inspect the fuel line and fittings for damage or leaks.

Refer also to REMOTE FUEL TANK FILLING in THIS SECTION.

SERPENTINE BELT

The serpentine belt is accessible through either of the engine compartment side doors.



- A Alternator
- B Water Pump Pulley
- C Serpentine Belt
- D Crankshaft Pulley
- E A/C Compressor
- F Belt Tensioner

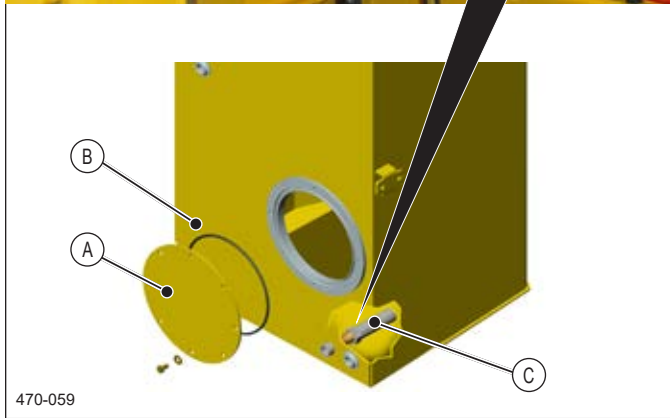
The serpentine belt is automatically tightened by a spring loaded tensioner. Check the condition and tension of the serpentine belt every 1000 hours.

Refer to ENGINE OPERATION AND MAINTENANCE MANUAL for inspection and replacement information for the serpentine belt.

IN-TANK FUEL STRAINER



400032



470-059

- A Fuel Tank Cover Plate
- B O-ring
- C Fuel Tank Strainer

The fuel tank strainer is threaded onto the inlet pipe of the engine fuel feed line, located inside the bottom of the fuel tank.

CHANGING OR CLEANING THE STRAINER

1. Park the machine on level ground. Refer to PARKING THE MACHINE in SECTION 1.
2. Remove the fuel tank drain plug in the bottom of the tank and drain the fuel into a suitable container.
3. Remove the round fuel tank cover plate and O-ring from the access hole. Discard the O-ring.
4. Remove the fuel strainer using the hex collar on the end of strainer.
5. Clean any debris from the fuel tank and wipe all accessible surfaces clean.
6. Clean the strainer carefully (it can easily be damaged by rough handling).
7. Check for a buildup of foreign materials where the strainer threads on to the pipe and elbow.
8. Reinstall the strainer.
9. Reinstall the fuel tank cover plate with a new O-ring.
10. Refuel and check for leaks.
11. Turn ON the battery disconnect switch.
12. Check that all personnel are clear of the machine before starting engine.
13. Sound horn to warn personnel of machine start-up
14. Start the engine.
15. Check for leaks again.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

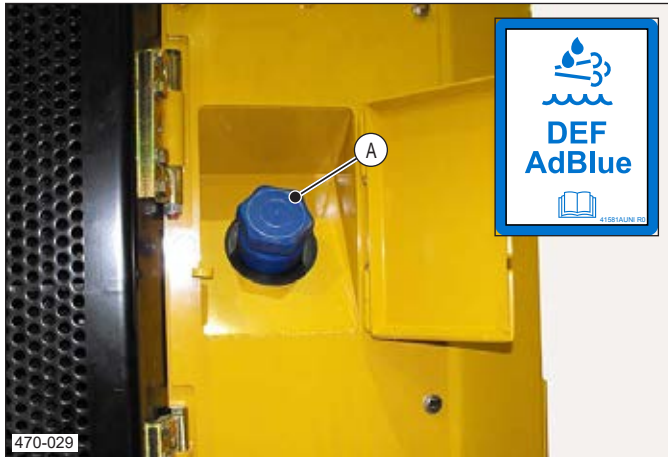
- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

DIESEL EXHAUST FLUID (DEF) TANK

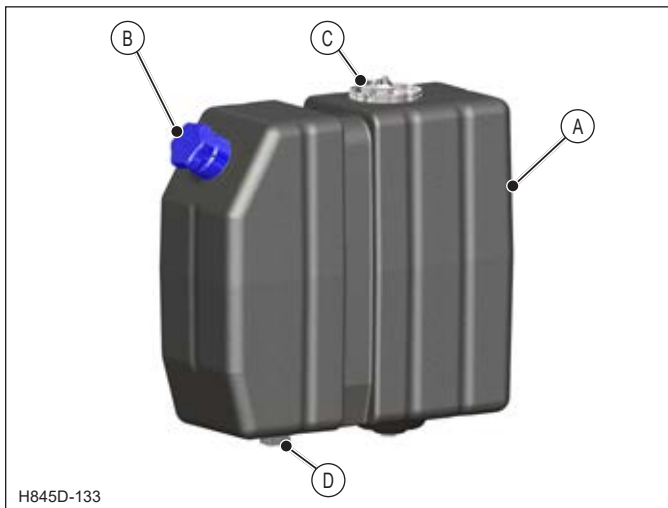


A DEF Tank Fill Cap

The DEF tank is located behind an access door in the compartment below the battery/storage compartment in the right rear corner of the machine. The DEF tank fill point is equipped with a strainer to prevent contaminants from entering the tank. Do not remove this strainer when filling the DEF tank.

DEF tank capacity is 80 L (21 US gals). Do not overfill tank. This tank is equipped with an expansion capacity of 7% required to allow for the expansion of DEF in cold temperature conditions. DEF freezes at -11°C (12°F).

A DEF level indicator is shown on the computer display main screen, below the fuel gauge.



H845D-133

- A DEF Tank
- B DEF Tank Fill Cap/Strainer
- C Sending Unit
- D DEF Quality Sensor

The DEF tank includes a fill cap/strainer, a sending unit and DEF quality sensor.

SENDING UNIT

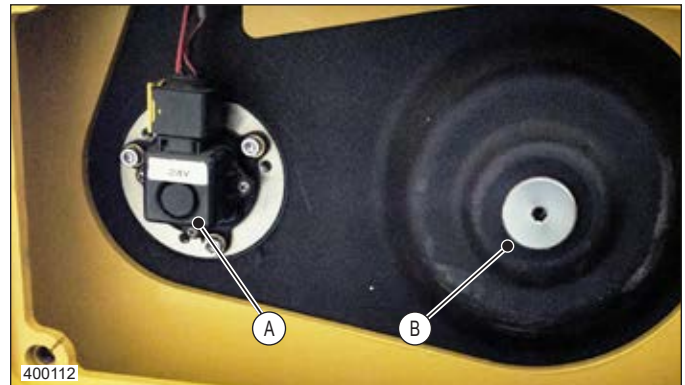


620E-082

- A Coolant Heater Coil
- B Level Sensor
- C Strainer
- D Temperature Sensor

The sending unit incorporates a heater coil, vent port, level sensor, strainer, temperature sensor, heating system inlet/outlet connections, DEF inlet/outlet connections and an electrical connector.

DEF QUALITY SENSOR



400112

- A DEF Quality Sensor
- B DEF Tank Drain Plug

The DEF quality sensor is located on the bottom of the DEF tank. It does not have to be removed when draining the tank.

DIESEL OXIDATION CATALYST (DOC)

A Diesel Oxidation Catalyst

The diesel oxidation catalyst (DOC) is located in the engine compartment upstream of the catalytic converter (SCR/CUC) and at its outlet incorporates the mixer tube and the mounting for the dosing module.

The DOC uses oxidation at high temperatures to convert carbon monoxide (CO), hydrocarbons (HC) and the soluble organic fraction (SOF) of diesel particulates into inert compounds, carbon dioxide (CO₂) and water vapour (H₂O).

In addition the DOC converts nitrogen oxide (NO) into nitrogen dioxide (NO₂). Increased NO₂ levels enhance the performance of the SCR catalyst at low temperatures and increase the effectiveness of the DOC/SCR aftertreatment system as a whole.

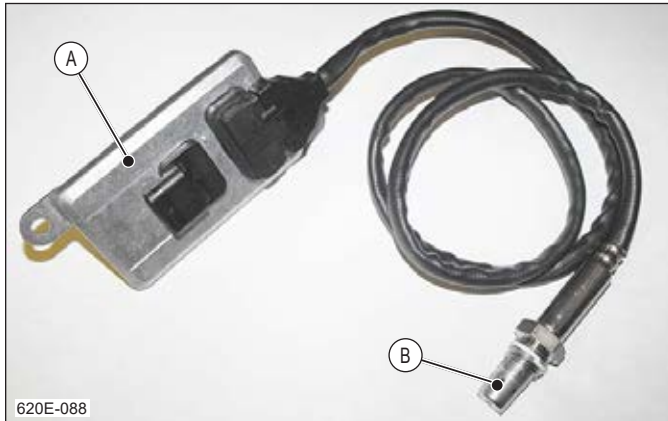
DEF SUPPLY MODULE

A DEF Supply Module

The supply module is located in the battery/storage compartment at the right rear of the machine.

The supply module pump picks up the DEF solution from the tank and sends it under pressure to the dosing module, mounted on the DOC. DEF is injected into the exhaust at the outlet of the diesel oxidation catalyst and upstream of the catalytic converter.

NOx SENSORS



A Electronic Control Unit
B NOx Sensor

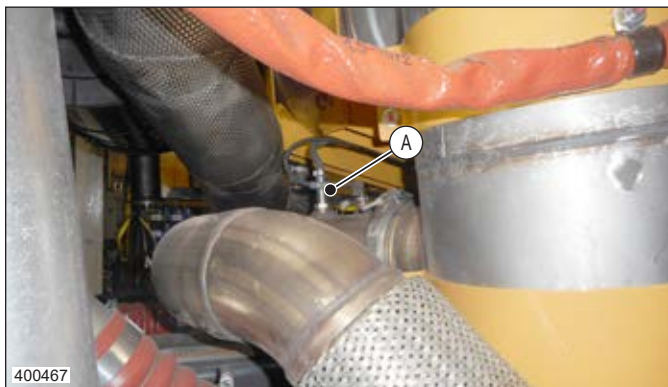
There are two NOx sensors and two NOx sensor ECU's in the aftertreatment system.

The NOx sensors detect and send information about the dosing of DEF solution and the efficiency of the catalytic converter to the DENOX 2.2 control system. This information is used to calculate the amount of DEF to be injected into the system and to monitor DOC/SCR aftertreatment system operation.

Each NOx sensor consists of a ceramic sensor and an electronic control unit linked by a cable. The sensor detects the concentration of nitrogen oxides in the exhaust.

The sensor, cable and control unit are considered to be one part for service/replacement purposes.

NOTE: Cable length cannot be changed as this will affect the proper operation of the sensor.



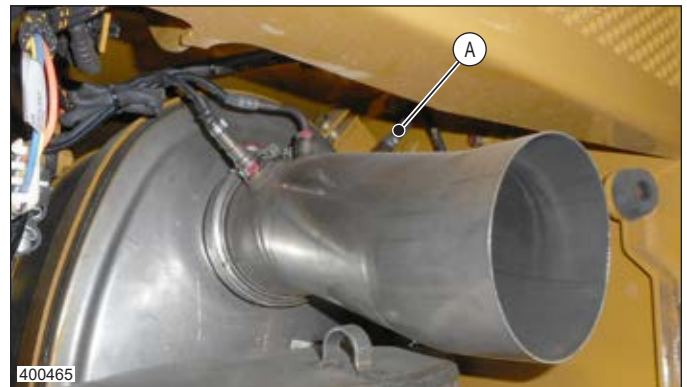
A Inlet NOx Sensor

The inlet NOx sensor is mounted on the tube between the turbo charger and the DOC inlet.



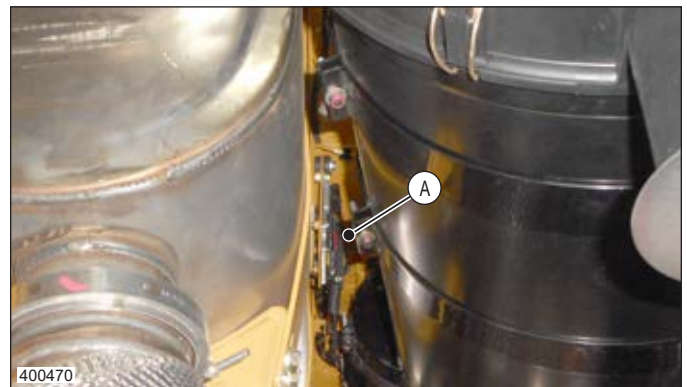
A Inlet NOx Sensor ECU

The inlet NOx sensor ECU is mounted on the wall at the front of the engine compartment next to the A/C receiver-drier.



A Outlet NOx Sensor

The outlet NOx sensor is mounted at the outlet of the catalytic converter.



A Outlet NOx Sensor ECU

The outlet NOx sensor ECU is mounted on a bracket between the air cleaner and the catalytic converter.

If an oil leak occurs in this area it should be thoroughly power-washed with a mild soap to ensure that all of the oil is removed. The presence of oil causes dust and dirt to cling to surfaces which impairs the ability of the reversible fan to remove dust and dirt particles.

Take care when cleaning, as the components can be damaged by careless handling and cleaning.



Avoid the risk of fire caused by debris accumulating on surfaces that may become hot during machine operation. Use care when cleaning to ensure debris removed from one area of the machine does not accumulate on other areas of the machine.

USING THE FAN CLEAN FUNCTION TO REMOVE DEBRIS DURING OPERATION

The hydraulic fan circuit has a CLEAN function for use in cleaning debris from the charge air cooler, radiator, oil cooler, A/C condenser, pump drive gearbox cooler, and air intake door screens during operation. By reversing the direction of the fan, air flows in the opposite direction, thereby forcing dust and debris off the charge air cooler, radiator, oil cooler, A/C condenser, pump drive gearbox cooler, and air intake door screens. Be sure no personnel are standing directly to the left of the machine when performing this operation. Dust and debris will fly out. Refer to FAN SWITCH (ENGINE COOLING) in SECTION 2 for more information.

GENERAL TORQUE SPECIFICATIONS

The torque values listed below are for general use only. Do not use these values if a different torque value or tightening procedure is shown for a specific application.

IMPERIAL



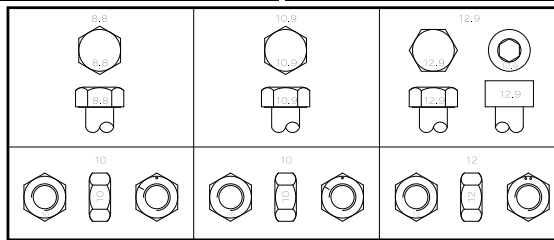
GRADE 5 BOLTS



GRADE 8 BOLTS

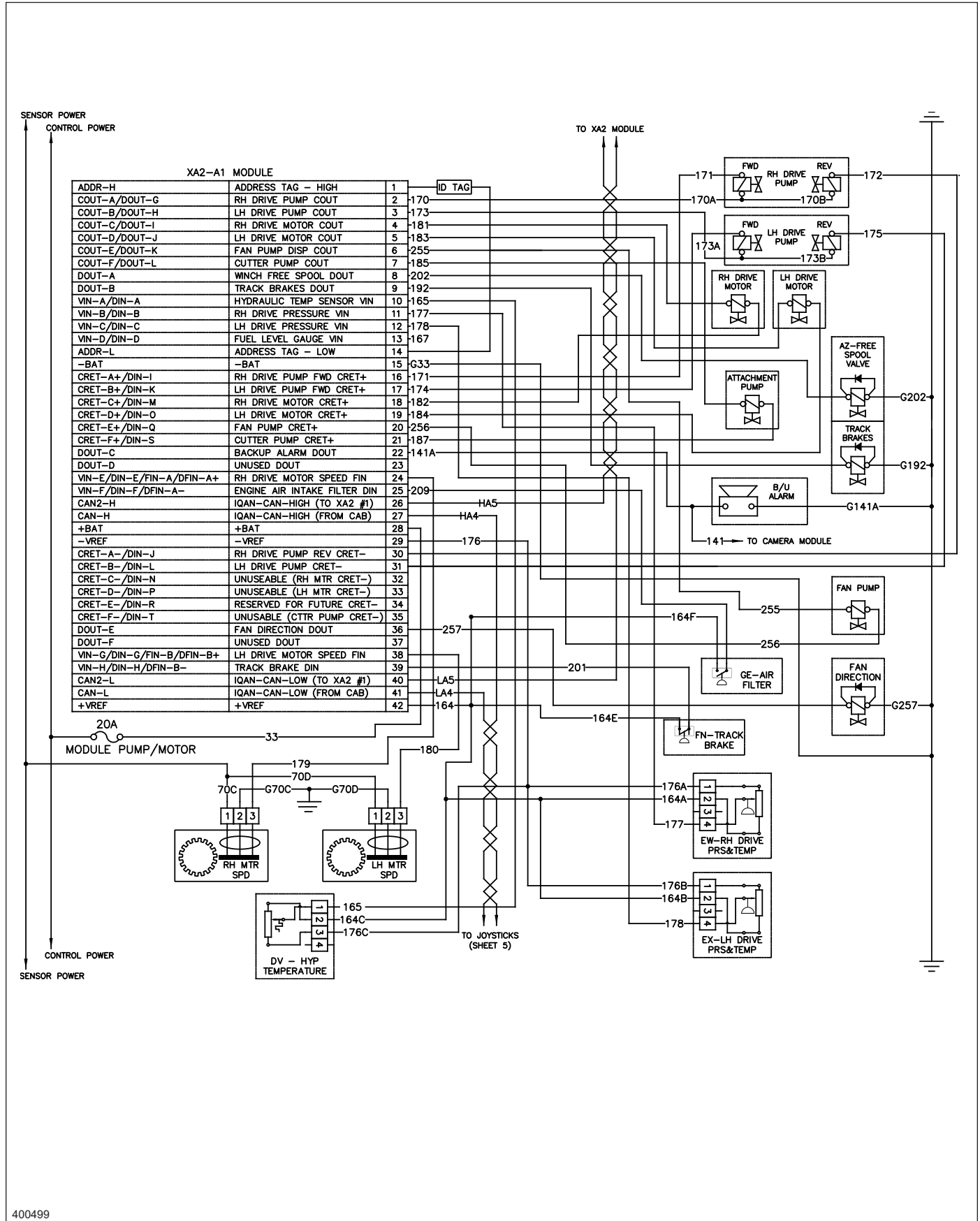
IMPERIAL BOLT TORQUE SPECIFICATIONS									
GRADE 5 BOLTS					GRADE 8 BOLTS				
COARSE THREAD	LUBRICATED		DRY		COARSE THREAD	LUBRICATED		DRY	
	Nm	lbf-ft	Nm	lbf-ft		Nm	lbf-ft	Nm	lbf-ft
1/4" - 20	9 - 9	6 - 7	11 - 13	8 - 9	1/4" - 20	12 - 13	9 - 10	16 - 18	12 - 13
5/16" - 18	18 - 19	13 - 14	24 - 26	17 - 19	5/16" - 18	25 - 27	18 - 20	33 - 37	25 - 27
3/8" - 16	31 - 35	23 - 25	42 - 46	31 - 34	3/8" - 16	44 - 49	33 - 36	59 - 65	44 - 48
7/16" - 14	50 - 55	37 - 41	67 - 74	49 - 54	7/16" - 14	71 - 78	52 - 58	95 - 104	70 - 77
1/2" - 13	77 - 84	57 - 62	102 - 112	75 - 83	1/2" - 13	108 - 119	80 - 88	144 - 159	106 - 117
9/16" - 12	111 - 122	82 - 90	147 - 162	109 - 120	9/16" - 12	156 - 172	115 - 127	208 - 229	154 - 169
5/8" - 11	153 - 168	113 - 124	203 - 224	150 - 165	5/8" - 11	215 - 237	159 - 175	287 - 316	212 - 233
3/4" - 10	271 - 298	200 - 220	361 - 397	267 - 293	3/4" - 10	383 - 421	282 - 310	510 - 561	376 - 414
7/8" - 9	437 - 480	322 - 354	582 - 640	429 - 472	7/8" - 9	616 - 678	455 - 500	822 - 904	606 - 667
1" - 8	654 - 720	483 - 531	873 - 960	644 - 708	1" - 8	924 - 1016	681 - 750	1232 - 1355	909 - 999
1 1/8" - 7	808 - 888	596 - 655	1077 - 1185	794 - 874	1 1/8" - 7	1310 - 1441	966 - 1063	1746 - 1921	1288 - 1417
1 1/4" - 7	1139 - 1253	840 - 924	1519 - 1671	1121 - 1233	1 1/4" - 7	1848 - 2033	1363 - 1499	2464 - 2710	1817 - 1999
FINE THREAD	LUBRICATED		DRY		FINE THREAD	LUBRICATED		DRY	
	Nm	lbf-ft	Nm	lbf-ft		Nm	lbf-ft	Nm	lbf-ft
1/4" - 28	10 - 11	7 - 8	13 - 14	10 - 11	1/4" - 28	14 - 15	10 - 11	18 - 20	14 - 15
5/16" - 24	20 - 22	14 - 16	26 - 29	19 - 21	5/16" - 24	28 - 30	20 - 22	37 - 41	27 - 30
3/8" - 24	36 - 39	26 - 29	47 - 52	35 - 38	3/8" - 24	50 - 55	37 - 41	67 - 74	49 - 54
7/16" - 20	56 - 62	41 - 46	75 - 82	55 - 61	7/16" - 20	79 - 87	58 - 64	106 - 116	78 - 86
1/2" - 20	86 - 95	64 - 70	115 - 127	85 - 93	1/2" - 20	122 - 134	90 - 99	163 - 179	120 - 132
9/16" - 18	123 - 136	91 - 100	164 - 181	121 - 133	9/16" - 18	174 - 192	128 - 141	232 - 255	171 - 188
5/8" - 18	173 - 190	127 - 140	230 - 253	170 - 187	5/8" - 18	244 - 268	180 - 198	325 - 358	240 - 264
3/4" - 16	302 - 332	223 - 245	403 - 443	297 - 327	3/4" - 16	427 - 469	315 - 346	569 - 626	420 - 462
7/8" - 14	482 - 530	355 - 391	642 - 706	474 - 521	7/8" - 14	680 - 748	502 - 552	907 - 997	669 - 736
1" - 14	735 - 808	542 - 596	979 - 1077	722 - 795	1" - 12	1037 - 1141	765 - 841	1383 - 1521	1020 - 1122
1 1/8" - 12	906 - 996	668 - 735	1207 - 1328	890 - 980	1 1/8" - 12	1468 - 1615	1083 - 1191	1958 - 2154	1444 - 1588
1 1/4" - 12	1262 - 1388	930 - 1023	1682 - 1850	1241 - 1365	1 1/4" - 12	2046 - 2250	1509 - 1660	2728 - 3000	2012 - 2213

METRIC



METRIC BOLT TORQUE SPECIFICATIONS													
SIZE	PITCH	CLASS 8.8				CLASS 10.9				CLASS 12.9			
		LUBRICATED		DRY		LUBRICATED		DRY		LUBRICATED		DRY	
		Nm	lbf-ft	Nm	lbf-ft	Nm	lbf-ft	Nm	lbf-ft	Nm	lbf-ft	Nm	lbf-ft
M6	1	8 - 9	6 - 7	11 - 12	8 - 9	11 - 12	8 - 9	15 - 17	11 - 12	13 - 14	10 - 11	18 - 19	13 - 14
M8	1.25	20 - 22	15 - 16	26 - 29	19 - 21	27 - 30	20 - 22	36 - 40	27 - 30	32 - 35	24 - 26	43 - 47	31 - 35
M10	1.5	39 - 43	29 - 32	52 - 57	38 - 42	54 - 60	40 - 44	72 - 79	53 - 59	63 - 70	47 - 51	84 - 93	62 - 68
M12	1.75	68 - 75	50 - 55	91 - 100	67 - 74	94 - 104	70 - 77	126 - 138	93 - 102	110 - 121	81 - 90	147 - 162	109 - 119
M14	2	109 - 120	80 - 89	145 - 160	107 - 118	151 - 166	111 - 122	201 - 221	148 - 163	176 - 194	130 - 143	235 - 259	173 - 191
M16	2	169 - 186	125 - 137	226 - 248	166 - 183	234 - 257	173 - 190	312 - 343	230 - 253	274 - 301	202 - 222	365 - 401	269 - 296
M18	2.5	234 - 257	172 - 190	312 - 343	230 - 253	323 - 356	239 - 262	431 - 474	318 - 350	378 - 416	279 - 307	504 - 554	372 - 409
M20	2.5	330 - 364	244 - 268	441 - 485	325 - 357	457 - 503	337 - 371	610 - 670	450 - 495	534 - 588	394 - 433	712 - 784	525 - 578
M22	2.5	451 - 496	332 - 366	601 - 661	443 - 487	623 - 686	460 - 506	831 - 914	613 - 674	728 - 801	537 - 591	971 - 1068	716 - 788
M24	3	571 - 628	421 - 463	761 - 838	562 - 618	790 - 869	583 - 641	1053 - 1159	777 - 855	923 - 1016	681 - 749	1231 - 1354	908 - 999
M27	3	837 - 921	618 - 679	1116 - 1228	823 - 906	1158 - 1274	854 - 940	1544 - 1699	1139 - 1253	1354 - 1489	998 - 1098	1805 - 1985	1331 - 1464
M30	3.5	1135 - 1249	837 - 921	1514 - 1665	1116 - 1228	1570 - 1727	1158 - 1274	2094 - 2303	1544 - 1699	1835 - 2019	1354 - 1489	2447 - 2692	1805 - 1985
M33	3.5	1545 - 1699	1139 - 1253	2060 - 2266	1519 - 1671	2137 - 2351	1576 - 1734	2849 - 3134	2102 - 2312	2498 - 2747	1842 - 2026	3330 - 3663	2456 - 2702
M36	4	1985 - 2183	1464 - 1610	2646 - 2911	1952 - 2147	2745 - 3020	2025 - 2227	3661 - 4027	2700 - 2970	3208 - 3529	2366 - 2603	4278 - 4706	3155 - 3471

HYDRAULIC SYSTEM ELECTRICAL SCHEMATIC-XA2-A1 MODULE



INTERLOCK SYSTEM

INTERLOCK RESET SWITCH



- A Interlock Reset Switch
- B Interlock System OFF (Yellow)
- C Interlock System ON (Green)

This switch is used to reactivate the interlock system after it has been deactivated by opening either of the cab doors, lifting the left armrest, or by turning the ignition switch to the OFF position. This system prevents accidental or improper use of the controls from anywhere but the operator's seat.

With the engine running, both doors closed and the left armrest in the lowered position, press and release the switch to reset the interlock system.

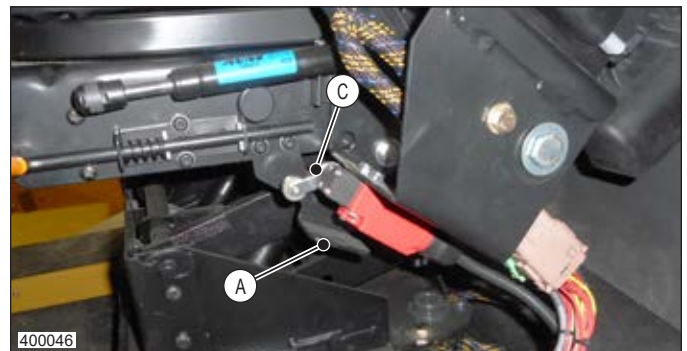
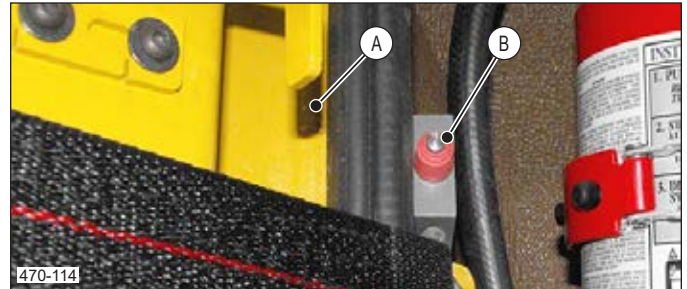
INTERLOCK DOOR AND ARMREST SWITCHES

Both doors and the left armrest are equipped with an interlock switch to prevent the machine from being operated with the doors open or the left armrest in the raised position (interlock system is deactivated).

To operate the machine, close both doors, lower the left armrest and press and release the interlock reset switch. The interlock system icon on the computer display will change from yellow to green.

CAUTION

All functions on the machine can now be operated, as intended or by accident.



- A Actuator Plate
- B Interlock Door Switch (Left Door Shown)
- C Interlock Armrest Switch (Left Armrest)

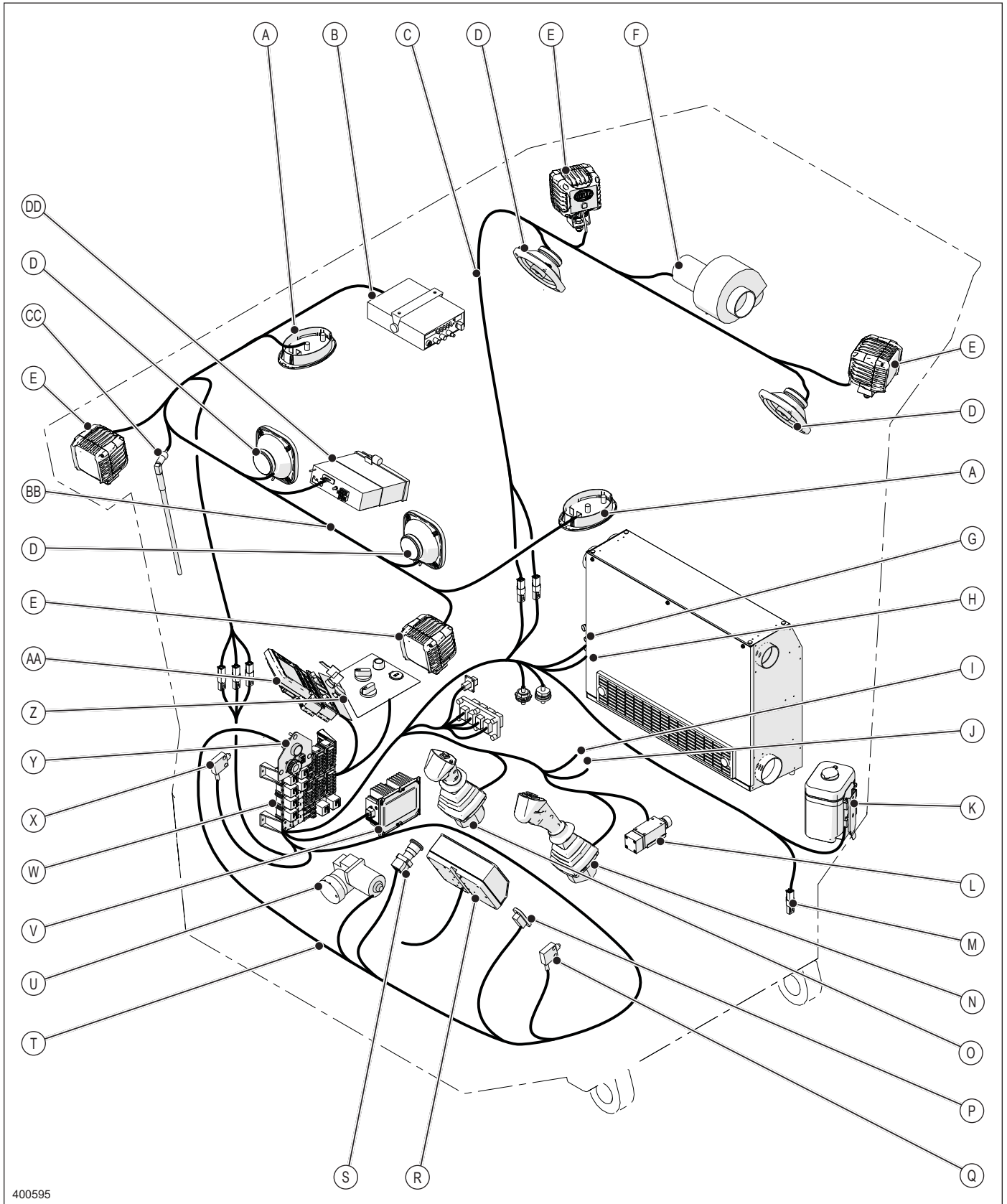
Once the interlock system has been activated, the safety of both the operator and all persons outside the cab becomes the responsibility of the operator.

NOTE: The engine can be started but the machine functions cannot be operated with the doors open and the left armrest in the raised position.

WARNING

The interlock door switches and the interlock reset switch are safety features and their function must not be defeated in any way.

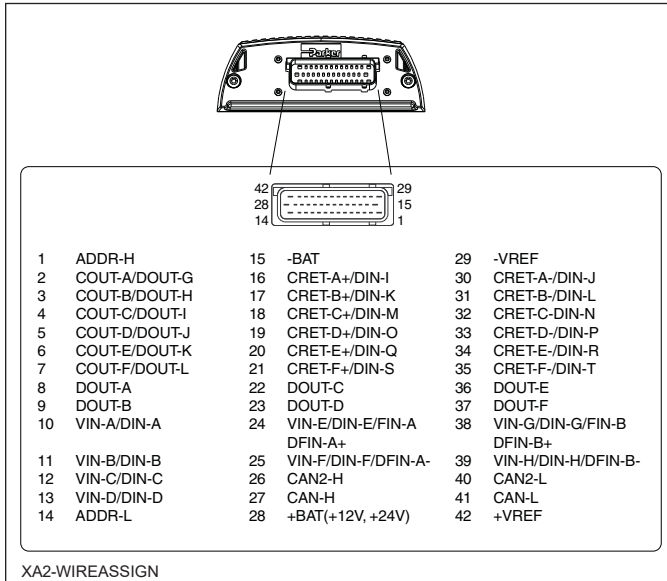
CAB ELECTRICAL COMPONENTS



400595

Refer to ELECTRICAL SCHEMATIC in THIS SECTION for pin connections and wiring designations.

WIRING PIN ASSIGNMENT



NOTE: The XA2 expansion module is equipped with eight voltage inputs (VIN-A to VIN-H) which may be configured as digital inputs (DIN), frequency inputs (FIN) or directional frequency inputs (DFIN). The XA2 expansion module is also equipped with six double proportional outputs (COUT-A to COUT-F) which may be configured as digital outputs (DOUT) and digital inputs (DIN).

Refer to ELECTRICAL SCHEMATIC in THIS SECTION for detailed pin and wiring assignments.

ID-TAG

ADDRESSING

Each module has a specific address, enabling the computer to communicate with it through the CAN bus. Practically, the system distinguishes between different modules through firstly verifying the module type and then, secondly, through the modules having unique addresses.

EXAMPLE

If a system has an XA2 module with address 0, the system will denote this one as XA2-A0. The letter 'A' refers to CAN bus A.

In order to assign any XA2 module a unique CAN address, an ID-Tag will have to be connected to the positions ADDR-H and ADDR-L.

TERMINATING

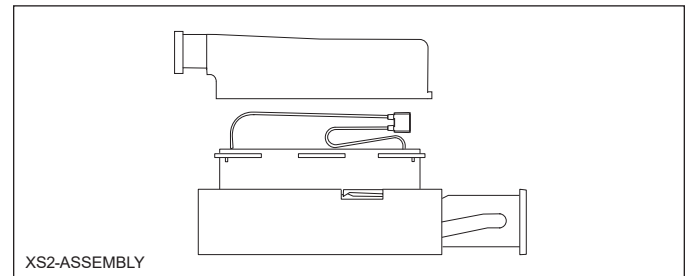
Module	ID-Tag	Resistance
Computer	No Tag	—
XA2-A0	0T	432 Ω
XA2-A2	2	976 Ω

To eliminate interference in communication through the CAN bus, the CAN bus must be terminated. Because the master module is located at the beginning of the bus, the master is provided with an internal termination. If an XA2 expansion module is located at the end of the CAN bus, use an ID-Tag having a combined address and terminating function. This is denoted with a 'T' for terminating, after the appropriate address such as, 0T, 1T or 2T.

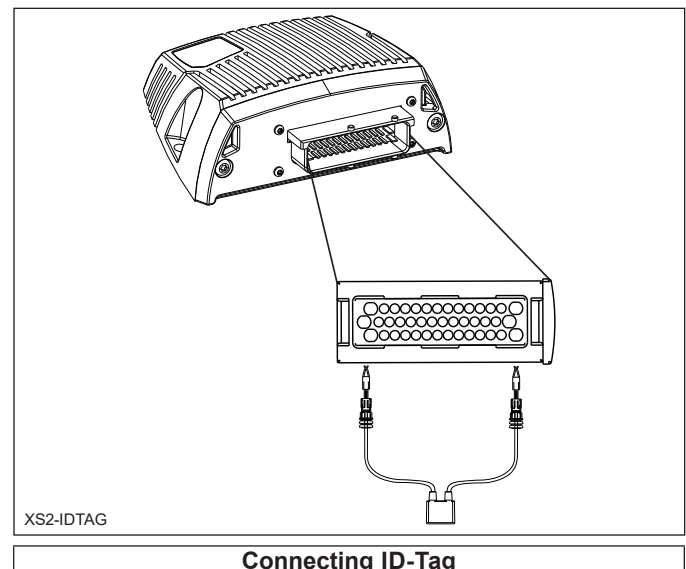
SELECTING APPROPRIATE ID-TAG

- Check the address number of the module.
- If the module is located at the end of the CAN bus then select the appropriate ID-Tag denoted with a 'T'.

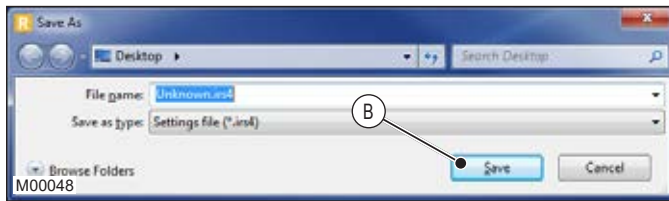
ASSEMBLING OF THE ID-TAG



The ID-Tag is placed in the connector in order to address/terminate the module. The ID-Tag is mounted under the connector casing. Bend the ID-Tag cables towards the opposite side, where the other cables enter the connector.



GET SETTINGS



- A 'Get' Button
- B Click 'Save'

1. Click the 'Get...' button on the left and select Get Settings.
 A dialogue box will appear prompting selection of a suitable folder and file name to save the 'Settings' file (.irs4).

The file name by default is the machine ID. It is recommended to use the serial number followed by the date for the file name.

2. Click 'Save' to continue.

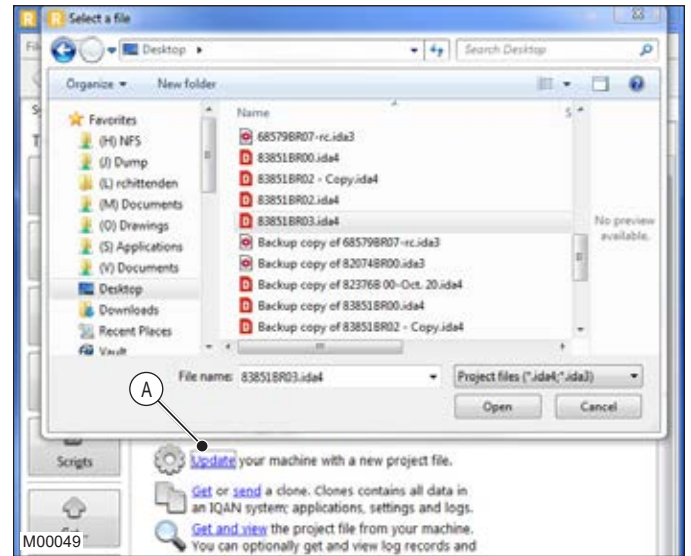
IMPORTANT!

A 'Settings' file should rarely be used. It should only be used if manually adjusting machine settings is not successful in returning a machine's performance to a previously acceptable state. Settings files may be date sensitive and should only be used on the day they were taken.

If a Settings file is used on a machine different than that which it was taken from, all adjustments must be reviewed in IQANrun 4 to ensure machine specific parameters (such as options, pump/motor currents, hour counters) are correct. If this is not done the machine may function improperly.

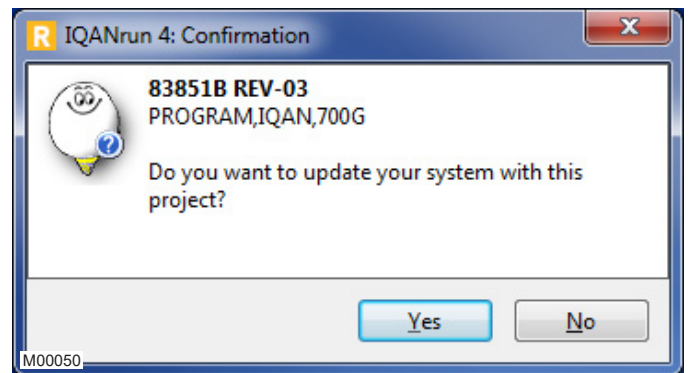
UPLOAD PROGRAM TO COMPUTER

A Clone file and Settings file must be saved as a backup prior to the update. Refer to MACHINE PROGRAM UPDATES–UPDATE PROGRAM–GET CLONE FILE and MACHINE PROGRAM UPDATES–UPDATE PROGRAM–GET SETTINGS FILE in THIS SECTION.

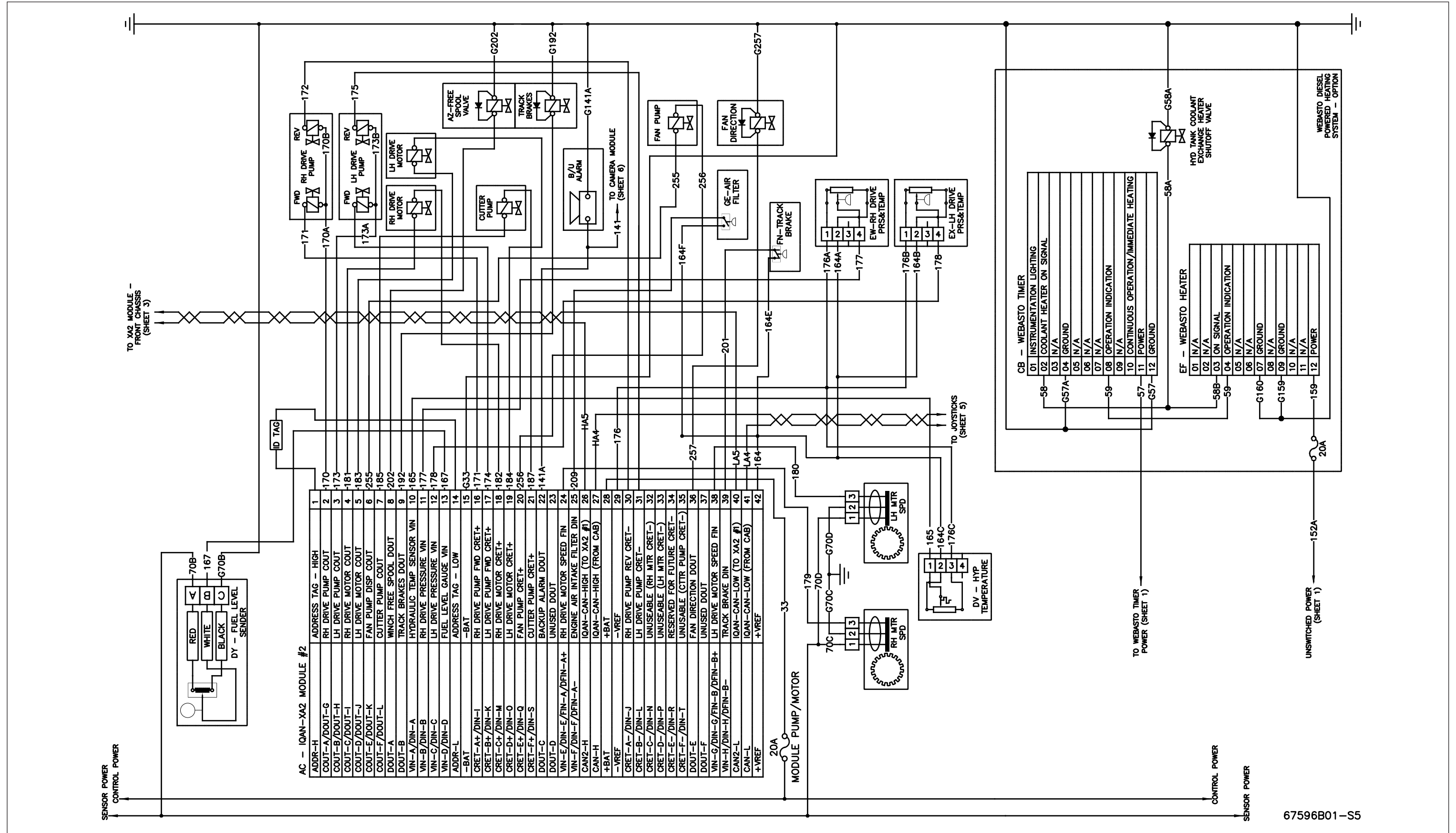


A 'Update' Link

1. Click on the Update link.
 A dialogue box will appear, prompting the selection of an program file (.ida4).
2. Select the appropriate program file (project file) for the machine and click 'Open' to continue.
 IQANrun 4 will request confirmation the program being loaded is correct.



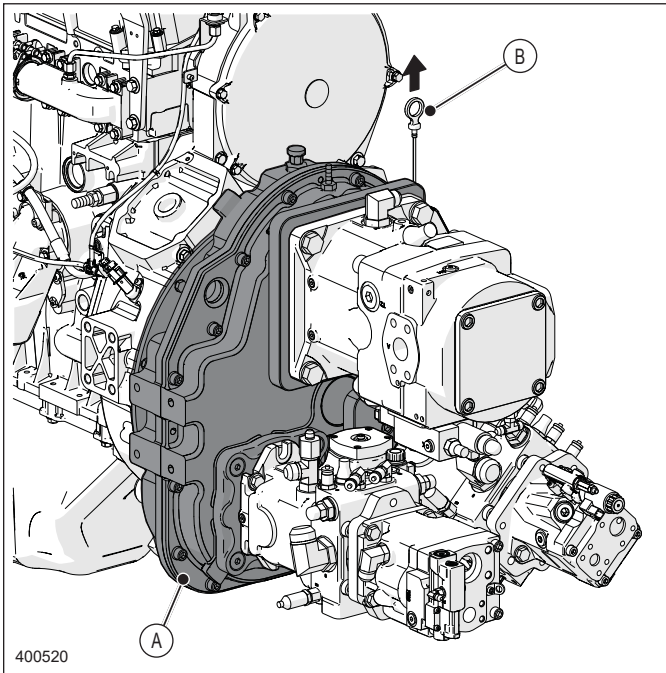
3. Click on 'Yes' to confirm, if the program is correct.



PUMP DRIVE GEARBOX

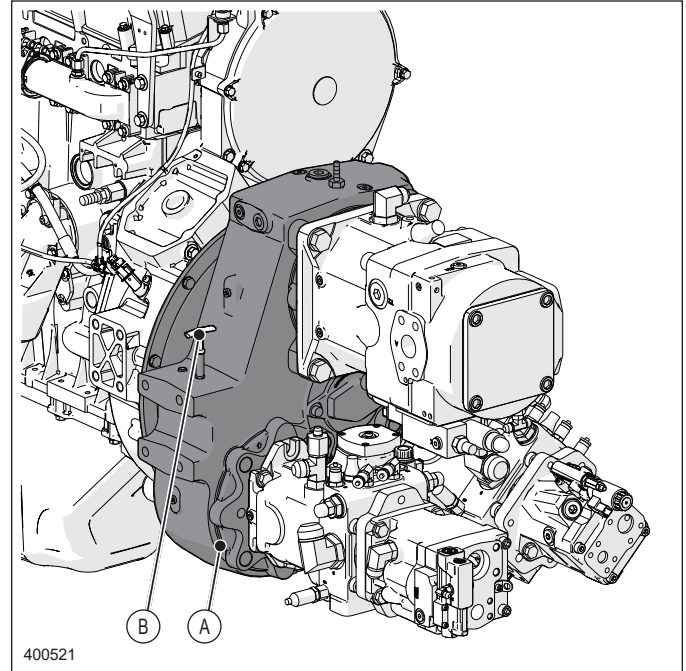
The pump drive gearbox, mounted on the back of the engine, drives three hydraulic pumps. The internal components of the pump drive gearbox are 'splash' lubricated by the action of the gears when turning.

The gearbox input shaft is splined to the pump drive coupling.



4701001

A Pump Drive Gearbox
B Gearbox Dipstick



4701002-4702000

A Pump Drive Gearbox
B Gearbox Dipstick

PUMP DRIVE GEARBOX SERVICE

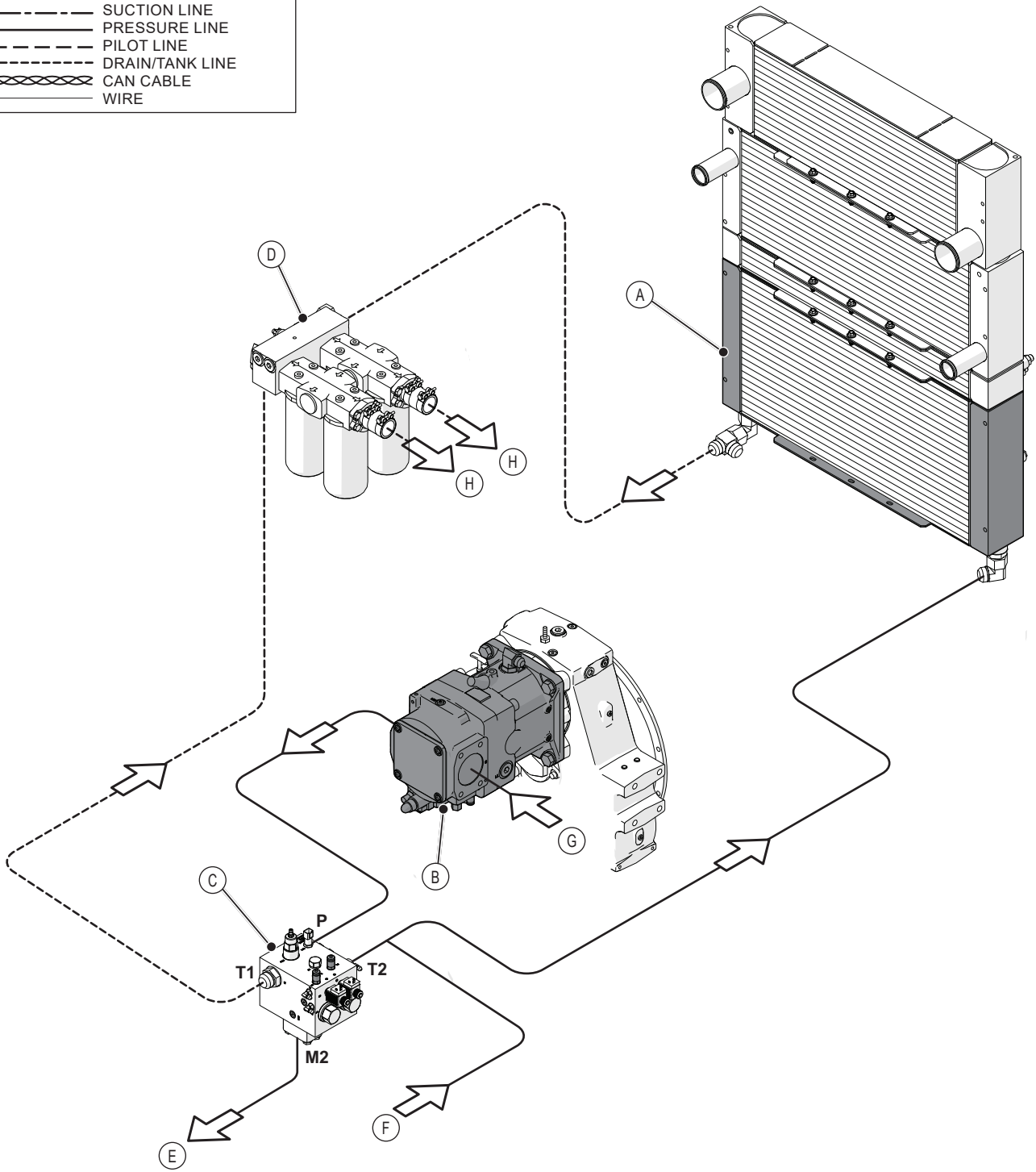
Refer to Tigercat PUMP DRIVE GEARBOXES SERVICE AND REPAIR MANUAL for disassembly, repair and reassembly instructions for the pump drive gearbox.

PUMP DRIVE GEARBOX SERVICE

Refer to MANUFACTURER'S SERVICE MANUAL for disassembly, repair and reassembly instructions for the pump drive gearbox.

HYDRAULIC OIL COOLER CIRCUIT COMPONENTS

LEGEND	
-----	SUCTION LINE
—————	PRESSURE LINE
- - - - -	PILOT LINE
-----	DRAIN/TANK LINE
▨▨▨▨▨	CAN CABLE
—————	WIRE



400530

- | | |
|--------------------------------|--|
| A Hydraulic Oil Cooler | E To Attachment |
| B Attachment Pump | F From Attachment |
| C Attachment Control Valve | G Suction Line—From Hydraulic Oil Tank |
| D Hydraulic Oil Return Filters | H Return to Hydraulic Oil Tank |

MINIMUM FAN SPEED WITH A/C ON

1. Park the machine on level ground. Refer to PARKING THE MACHINE in SECTION 1.

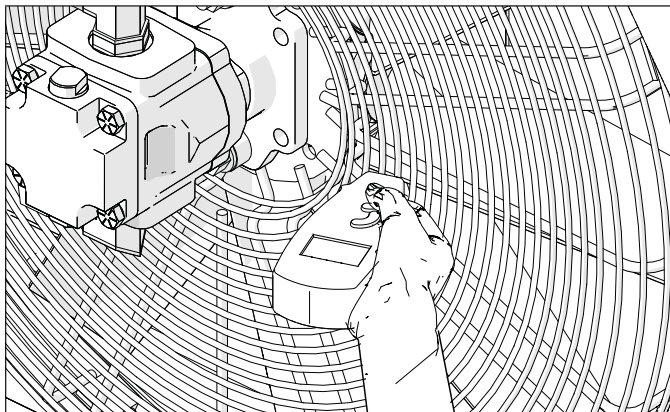
Ensure that engine coolant and hydraulic oil temperatures are well below the normal operating temperatures of coolant (91°C/195°F), hydraulic oil (varies with oil grade selected) and charge air cooler (44°C/111°F) throughout entire test or fan will rotate and test will be invalid.

2. Place a piece of reflecting tape on the fan hub.
3. Start the engine.
4. Set engine speed at HIGH.
5. Place FAN switch in AUTOMATIC position.



A A/C Switch

6. Place A/C switch in ON position.



Measuring Fan Speed

7. Measure the speed of fan blade rotation using a photo tachometer. Specification is 1200 rpm.

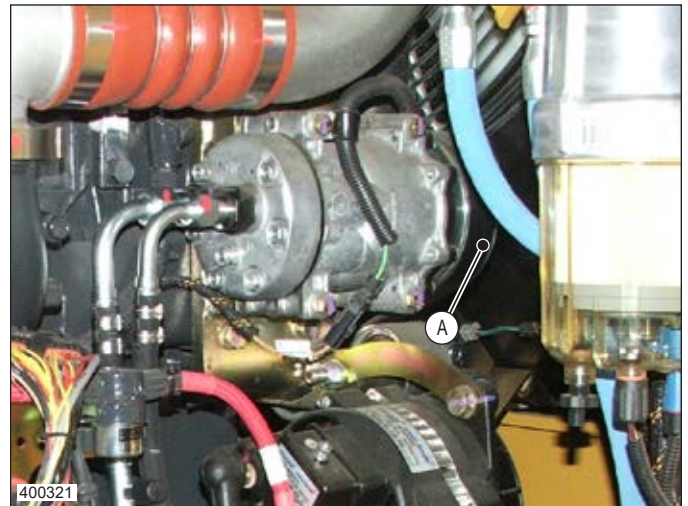
FAN 'CLEAN' SPEED AND CHECK FOR NO A/C DURING CLEAN MODE

1. Park the machine on level ground. Refer to PARKING THE MACHINE in SECTION 1.
2. Place a piece of reflecting tape on the fan hub.
3. Start the engine.
4. Set engine speed at HIGH.

CAUTION

Before placing the fan switch in the CLEAN position make sure that there are no personnel at the rear of the machine in the area where the fan will expel debris!

5. With the aid of an assistant momentarily press the fan switch in the CLEAN position.
6. Measure the speed of rotation of the fan blade using a photo tachometer. Specification is 1800-2000 rpm.



A A/C Compressor Clutch

7. With the aid of an assistant, momentarily press the fan switch in the CLEAN position and visually check clutch on A/C compressor. It should be disengaged and compressor not running.
8. When the CLEAN cycle is complete, the fan automatically returns to normal rotation direction and the clutch on the A/C compressor should engage and the compressor should be running.

ENGINE COOLANT HEATER (OPTIONAL)

Machines that work in cold climates are equipped with an optional engine coolant heater.

The coolant heater unit works in conjunction with a coolant pump, hydraulic oil heater, and electronic timer. The kit is connected to the cooling and electrical systems but operates independently of the engine.

CIRCUIT DESCRIPTION

When the coolant heater is operating, the coolant pump draws coolant from the engine through the coolant outlet manifold and supplies it to the coolant heater, where it is warmed by a heat exchanger. The warmed coolant flows out to the hydraulic oil heater and to the A/C heater unit in the cab. This flow cycle continues while the coolant heater is turned ON.

When the coolant heater unit is turned OFF and the engine is running the coolant pump also turns OFF and the hydraulic oil heater solenoid valve closes. Coolant then bypasses the hydraulic oil heater and continues to flow through the coolant pump, coolant heater and the A/C heater unit in the cab.

DANGER

Turn OFF the coolant heater during machine fuelling to prevent the risk of explosion.

Do not operate the coolant heater in garages, workshops, or enclosed spaces due to the risk of carbon monoxide poisoning.

Turn OFF the coolant heater in the presence of flammable vapours or dust to prevent risk of explosion.

WARNING

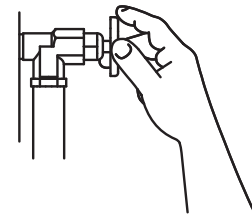
In the event of heavy smoke development, unusual combustion noises, fuel odour, or continuous fault cut-outs with error messages, turn OFF the coolant heater and remove the appropriate fuse(s) until inspected by qualified personnel.

Do not step on the coolant heater or place any objects in the vicinity of the coolant heater or its air inlet/exhaust ports.

NOTICE

Do not clean the coolant heater equipment with high pressure air or water.

NOTICE

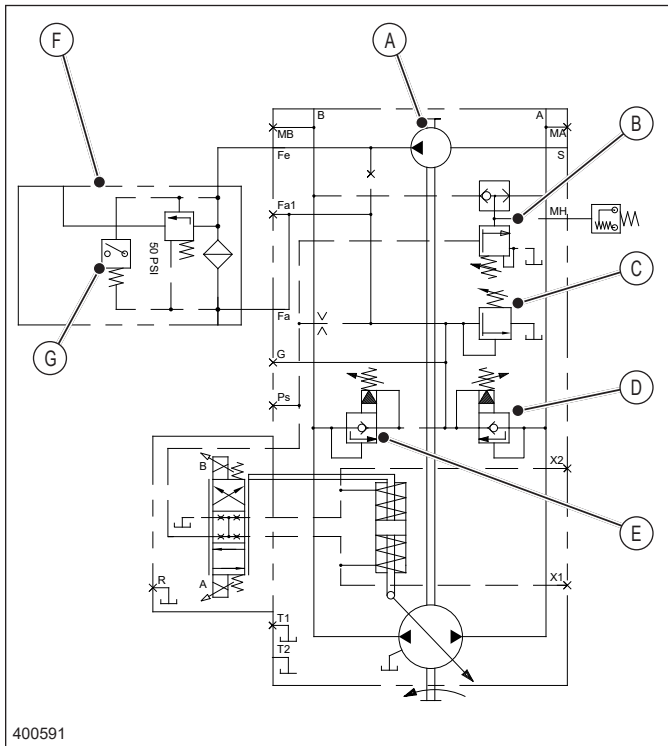


- OPEN THE ENGINE COOLANT HEATER SHUTOFF VALVE BEFORE OPERATING THE COOLANT HEATER.
- DAMAGE TO THE ENGINE COOLANT HEATER PUMP MAY RESULT IF THE VALVE IS CLOSED.

45046AENG R0

Refer to the following page for shut-off valve location

DRIVE PUMP HYDRAULIC SCHEMATIC



400591

- A Charge Pump
- B POR
- C Charge Pressure Relief
- D High Pressure Relief 'A'
- E High Pressure Relief 'B'
- F Charge Pressure Filter
- G Pressure Switch

Excess charge pump oil is relieved by the charge pump relief valve back into the case of the drive pump. The charge pressure filter ensures that only clean charge pump oil is introduced into the closed-loop hydrostatic circuit and the swashplate control system. Should the charge pressure filter become clogged with debris, charge pump flow is diverted to the tank preventing the entry of unfiltered charge pump oil.

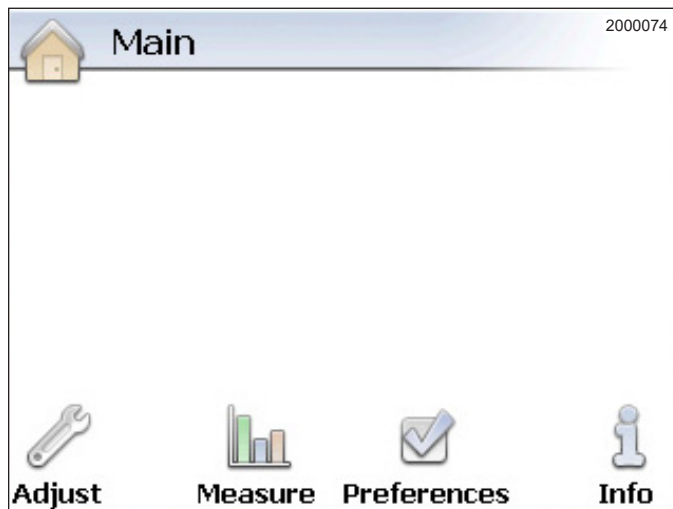
TEST DRIVE

NOTE: The following is to be completed using a laptop loaded with IQANRun with the user logged in as Service.

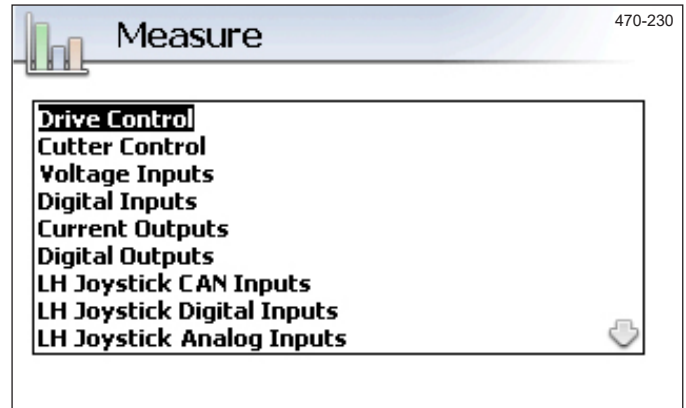
1. Position the machine on level, flat, hard ground with ample space to drive in both directions.
2. Confirm that track tension is correct for both tracks.
3. Set the engine speed to HIGH.
4. Set the speed control adjustment to minimum speed.



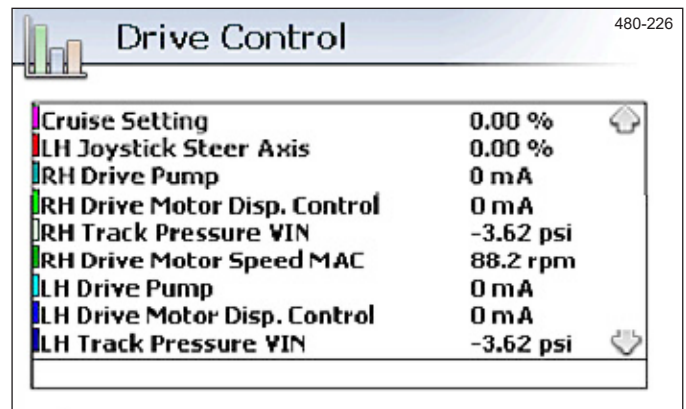
5. Press the Main Menu button



6. Press the F2 button to display the Measure menu.



7. Select Drive Control and press the OK button.

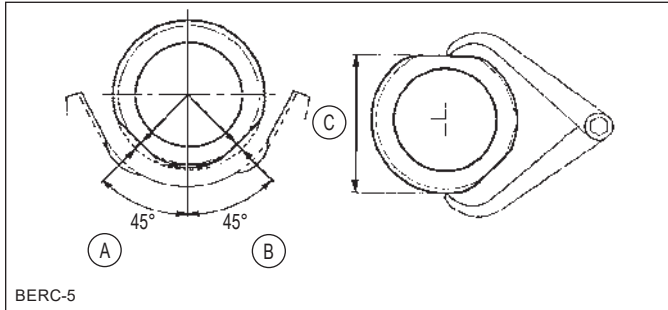


8. Monitor the Right Drive Pump and Left Drive Pump output values (in mA).
9. Push the drive joystick forward and enable cruise control when both values are between 205–210 mA.



10. At the Main screen, press the F3 button to access the Information menu.

BUSHING WEAR, OUTSIDE DIAMETER



Measuring Bushing Wear	
A	Forward Side Wear
B	Reverse Side Wear
C	Vertical Wear

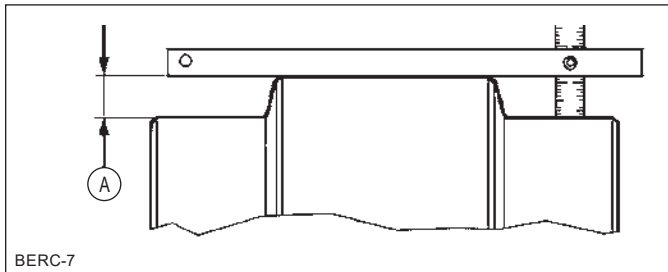
Use a calliper to measure the wear of the bushing outside diameter in three places.

NOTE: Bushing outside diameter is measured at three places because of the forward and reverse travel of the machine and a vertical wear that takes place.

Wear Limits for D4 Track Type	
New Bushing Outside Diameter	54.0 mm (2.13 in)
70% Worn	49.7 mm (1.96 in)
100% Worn	46.3 mm (1.82 in)

NOTE: Allowable wear in rocky ground is 75%.

IDLER WEAR



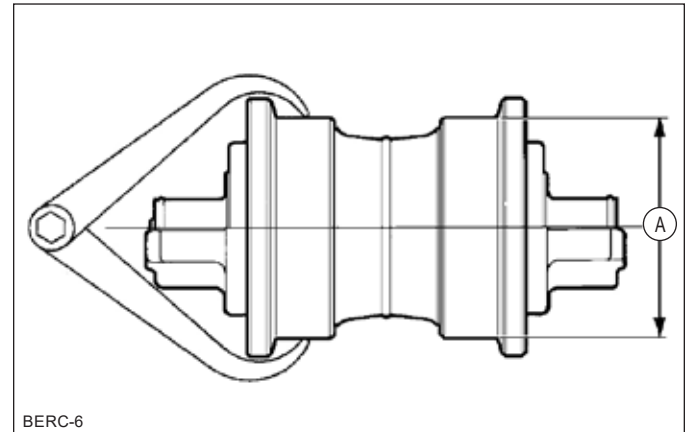
A	Idler Diameter
---	----------------

Measure the idler wheel side diameters (tread contact surface) at several points to obtain the worst wear condition. Position a depth gauge or measuring tape as close as possible toward the centre of the idler with the gauge flat on the centre flange and parallel to the idler shaft.

Wear Limits for D4 Track Type	
New Idler Dimension	17.00 mm (0.669 in)
70% Wear	22.10 mm (0.870 in)

BOTTOM ROLLER WEAR

Measure the roller diameter on the tread contact surface with a large calliper to obtain the worst wear condition.



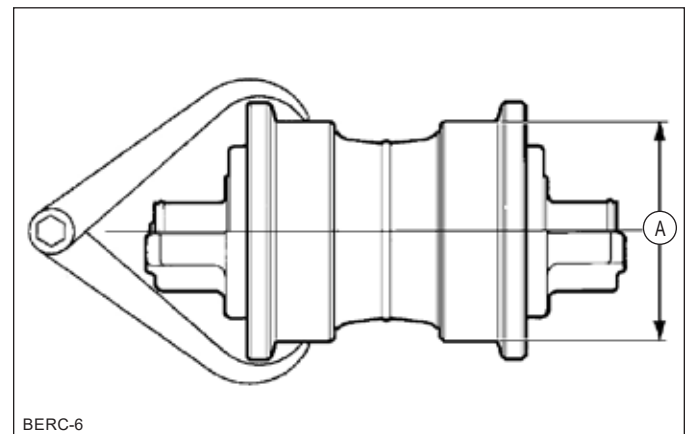
A	Measuring Bottom Roller Wear
---	------------------------------

If accessibility to the rollers is impaired by guards, then concentrate on the front and rear rollers, these will be the most worn.

Wear Limits for D4 Track Type	
New Roller	155.0 mm (6.10 in)
70% Worn	147.6 mm (5.81 in)
100% Worn	142.3 mm (5.60 in)

TOP ROLLER WEAR

Measure the roller diameter on the tread contact surface with a large calliper to obtain the worst wear condition.

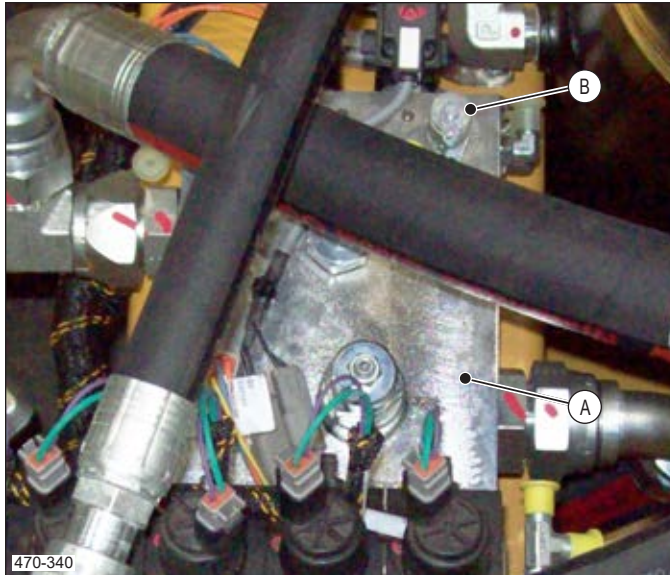


A	Measuring Top Roller Wear
---	---------------------------

Wear Limits for D4 Track Type	
New Roller	155.0 mm (6.10 in)
70% Worn	147.6 mm (5.81 in)
100% Worn	142.3 mm (5.60 in)

BOOM LIFT PORT RELIEF PRESSURE

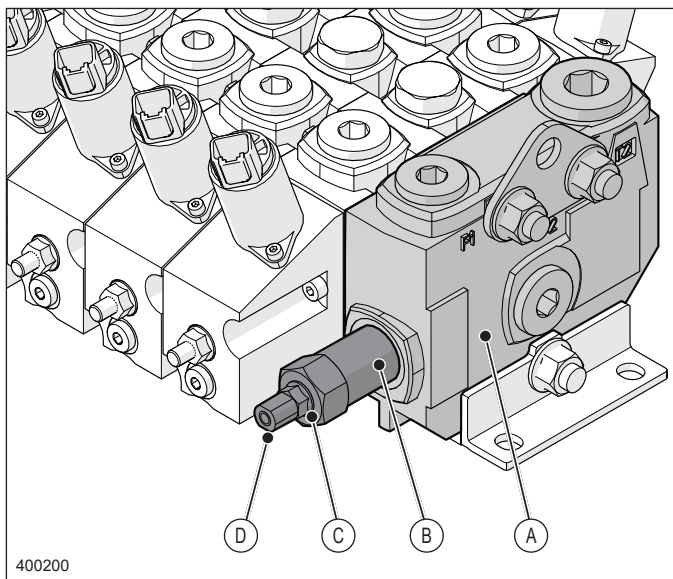
Refer to PRESSURE AND SPEED SETTINGS and HYDRAULIC OIL OPERATING RANGE CHART in SECTION 3 for specific pressure and speed values.



470-340

- A Attachment Control Valve
- B 'B1' Test Port

1. Connect a 0–350 bar (0–5000 psi) pressure gauge to the 'B1' test port on the attachment control valve.



400200

- A Main Valve Inlet Section
- B Main Pressure Relief Valve
- C Relief Valve Jam Nut–13 mm Wrench
- D Relief Valve Adjusting Nut–11 mm Wrench

2. On the main valve, turn the main pressure relief valve adjusting nut all the way IN.

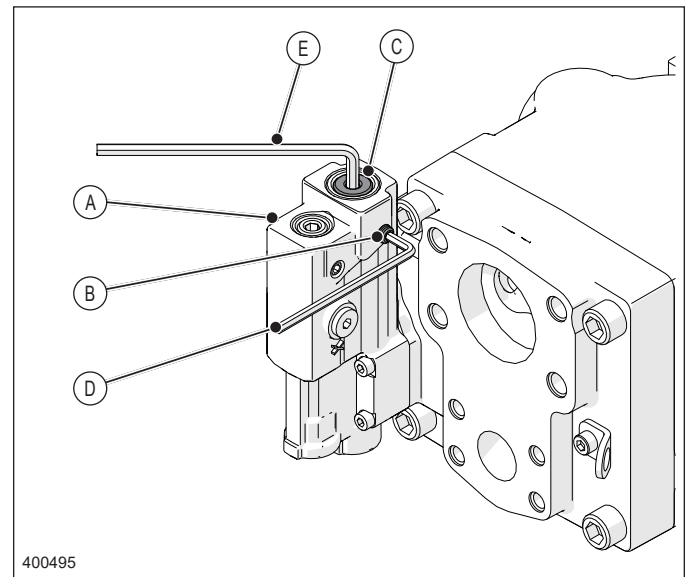
WARNING

Do not stand below the mulching head and lift boom or between the boom and front of the machine during this procedure.

3. Start the engine and set engine speed at LOW.
4. The hydraulic oil temperature must be 49°C–60°C (120°–140°F) before proceeding to the next steps.

IMPORTANT!

During the following procedures do not hold any function control over relief for longer than five seconds.



400495

- A Main Pump Controller
- B Main Pump–Pump POR Pressure Locking Screw
- C Main Pump–Pump POR Pressure Adjusting Screw
- D Allen Key–5/32" for Locking Screw
- E Allen Key–6 mm for Adjusting Screw

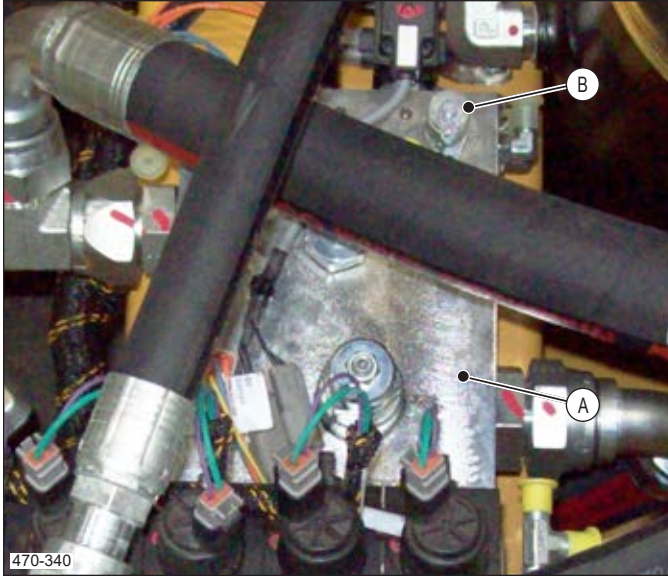
5. While holding the right joystick in the Boom LIFT position (fully retracted back), loosen the locking screw and adjust the Main Pump–Pump POR value to 242 bar (3500 psi) then turn the adjusting screw in ½ turn (approximately 276 bar (4000 psi)).

The pressure gauge reading will not exceed Main Valve–Boom Lift Port Relief specifications.

Refer to PRESSURE SETTINGS in SECTION 4 for more information.

TILT IN PORT RELIEF PRESSURE

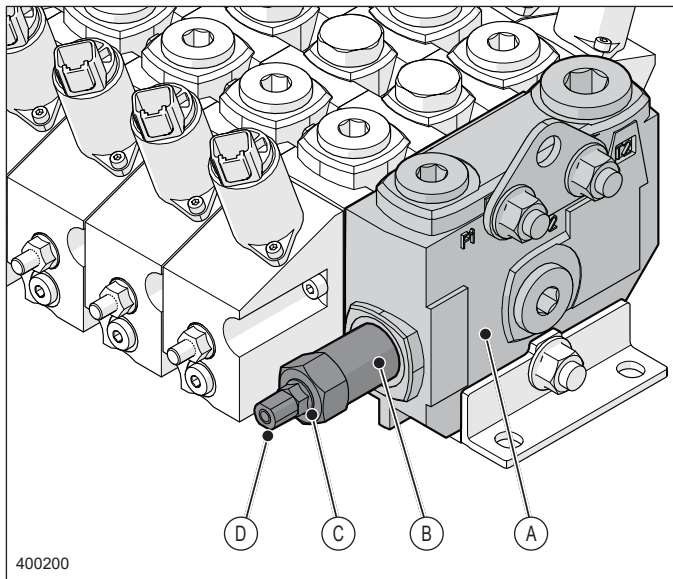
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470-340

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400200

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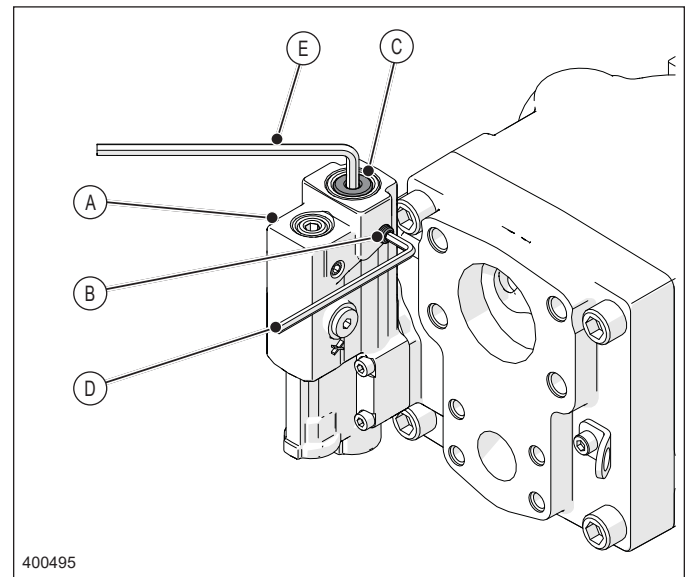
WARNING

Do not stand below the mulching head and lift boom or between the boom and front of the machine during this procedure.

3. Start the engine and set engine speed at LOW.
4. The hydraulic oil temperature must be 49°C–60°C (120°–140°F) before proceeding to the next steps.

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400495

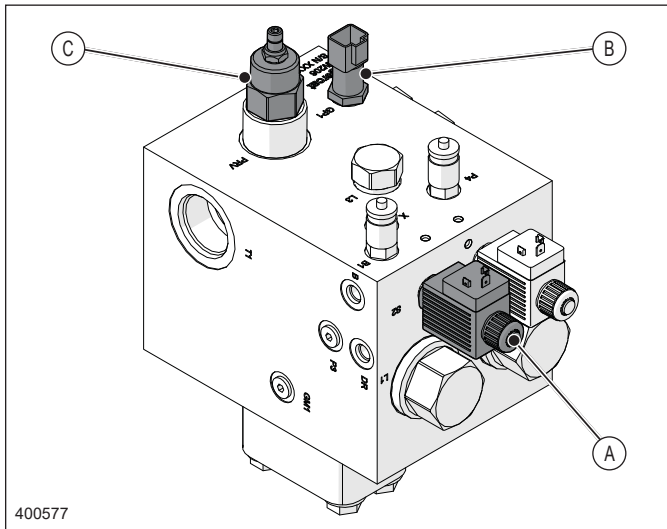
- A Main Pump Controller
- B Main Pump–Pump POR Pressure Locking Screw
- C Main Pump–Pump POR Pressure Adjusting Screw
- D Allen Key–5/32" for Locking Screw
- E Allen Key–6 mm for Adjusting Screw

5. While holding the right joystick in the Tilt IN position (fully left), loosen the locking screw and adjust the Main Pump–Pump POR value to 241 bar (3500 psi) then turn the adjusting screw in ½ turn (approximately 276 bar (4000 psi)).

The pressure gauge reading will not exceed Main Valve–Tilt In Port Relief specifications.

Refer to PRESSURE SETTINGS in SECTION 4 for more information.

ATTACHMENT PUMP AND ATTACHMENT CONTROL VALVE OPERATION



- A Attachment Solenoid Control Valve 'S1'
- B Pressure Transducer
- C Attachment Control Valve Main Relief Valve

When the attachment switch is in the OFF position and the engine is running, the attachment pump operates at minimum flow. Hydraulic oil is diverted through the 'T2' port to provide flow through the hydraulic oil cooler, the hydraulic oil return filters and back to the hydraulic oil tank. The attachment solenoid control valve 'S1' blocks pilot oil to the three operated cartridge valves. The pilot oil is vented through the 'DR' port, through the case drain strainer and back to the tank.

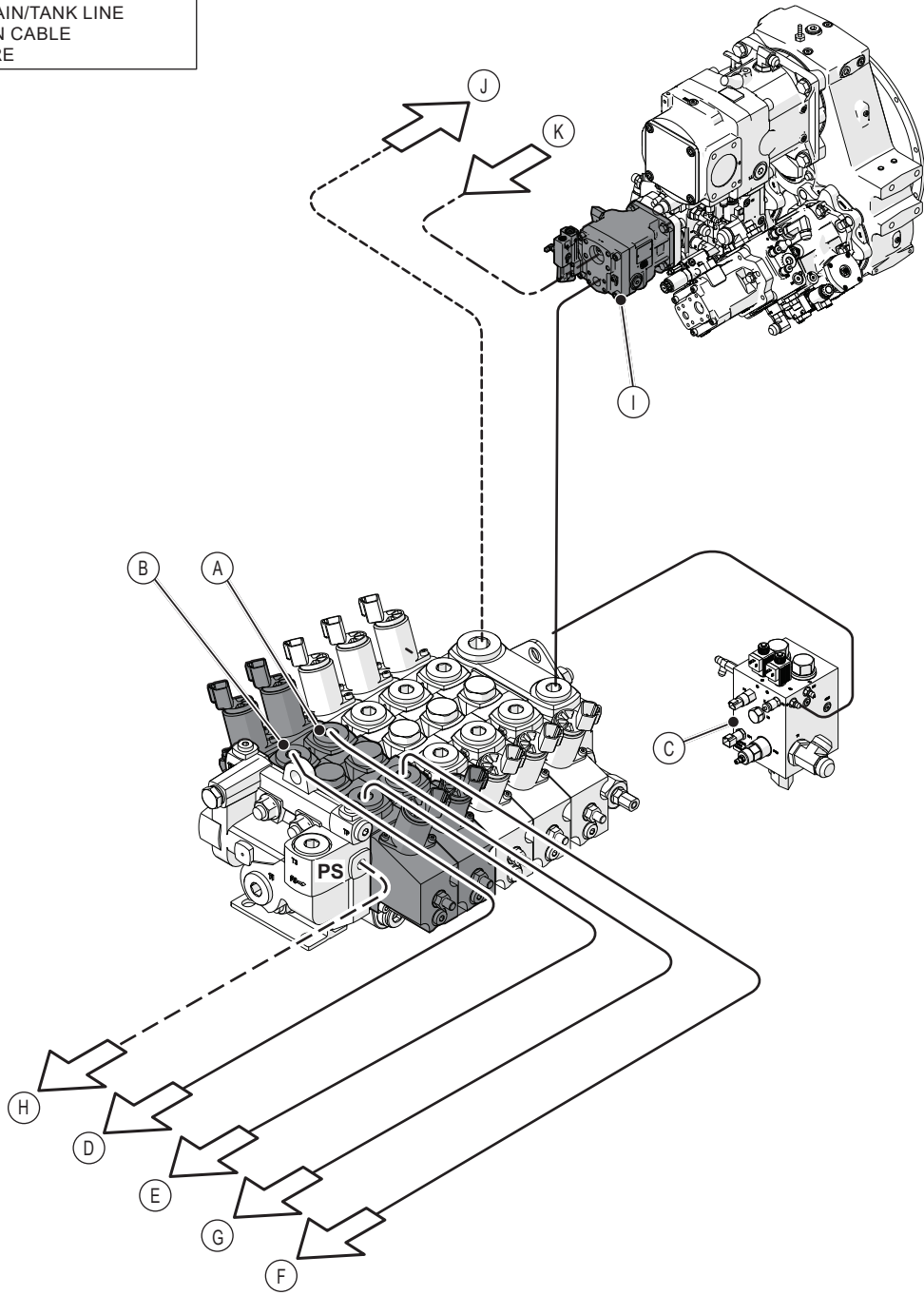
When the attachment switch is turned ON, the attachment pump momentarily destrokes to zero displacement. The attachment solenoid control valve 'S1' is actuated and directs pilot oil to all three pilot operated cartridge valves. The cartridge valve supplying the 'M2' port opens and the attachment pump strokes to provide oil flow to the attachment. The cartridge valve that diverts oil through the 'T2' port is blocked. Flow to the hydraulic oil cooler is now provided from the attachment.

A pressure transducer mounted on the attachment control valve provides a pressure signal for the computer to display the attachment and attachment circuit pressure.

The main relief valve mounted in the attachment control valve protects the attachment pump. In the event of failure of the POR valve on the attachment pump, oil is diverted to the hydraulic oil tank through the 'T1' port. Refer to **PRESSURE SETTINGS—SET ATTACHMENT CONTROL VALVE—MAIN RELIEF** in THIS SECTION.

PUSH BAR AND DEBRIS DOOR CIRCUIT COMPONENTS

LEGEND	
-----	SUCTION LINE
—————	PRESSURE LINE
- - - - -	PILOT LINE
-----	DRAIN/TANK LINE
⊘ ⊘ ⊘ ⊘	CAN CABLE
—————	WIRE



400507

- | | |
|--|---|
| A Main Valve—Mulching Head Push Bar Section | G Push Bar IN |
| B Main Valve—Mulching Head Debris Door Section | H Pilot System Supply |
| C Attachment Control Valve | I Main Pump |
| D Debris Door CLOSE | J Drain Line—Return To Hydraulic Oil Tank |
| E Debris Door OPEN | K Suction Line—From Hydraulic Oil Tank |
| F Push Bar OUT | |

Tigercat 470 Mulcher

SECTION 20–WINCH

Read and understand the entire contents of this manual, and all manuals for any attachments or accessories associated with this machine, prior to operating or servicing this equipment.

CONTENTS–SECTION 20

ISSUE 1.0, JUNE 2020

CIRCUIT COMPONENTS	20.3
CIRCUIT DESCRIPTION	20.2
CIRCUIT SCHEMATIC	20.4
ELECTRICAL SCHEMATIC	20.11
FREE SPOOL CIRCUIT	20.10
MAIN VALVE	
WINCH SPOOL SECTION	20.6
SOLENOID ELECTRICAL CONNECTORS	20.6
PRESSURE SETTINGS	20.8
WINCH IN PORT RELIEF PRESSURE	20.9
SAFETY PRECAUTIONS	
LOCKOUT DRIVES	20.8
WINCH	
CABLE	20.2
COMPONENTS	20.2
CROSS SECTION	20.7

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