Tigercat®

875 LOGGER

SERVICE MANUAL

SERIAL NUMBER 8750101 TO 8750500

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SAFETY SYMBOLS

This safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

The safety alert symbol identifies important safety messages on machines, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Understanding Signal Words

DANGER

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

WARNING

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

CAUTION

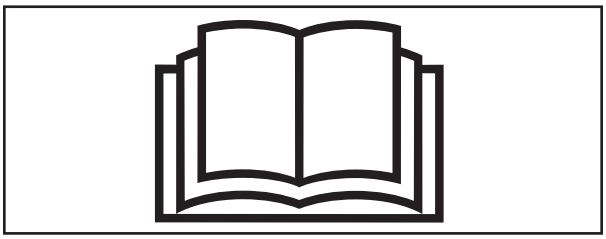
CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

GENERAL SAFETY PRECAUTIONS

Remember that safety is a prime responsibility of all.

To minimize the risks and promote safety at all times, this section of the operator's manual details a number of safety rules which should always be followed and obeyed.

Always read the operator's manual before operating the machine. Pay close attention to WARNINGS and HAZARD identifications



Follow all instructions from safety inspector and supervisors.

You must be fully trained to operate this piece of equipment. Know the capabilities and the limitations of the equipment. Learn the most efficient operating techniques.

Do not let untrained persons operate the machine.

Use recommended protective clothing and safety devices such as gloves, safety boots, safety hat, goggles, and ear protection when necessary. These safety rules highlight both general and specific measures that the operator should be familiar with and adhere to. More specific measures are illustrated with pictograms which may also be attached to the machine in locations pertinent to their respective message. Keep safety labels in good condition. Repair or replace damaged labels.

HARVESTING ATTACHMENT – GENERAL SAFETY

Improper operation, maintenance or repair of this product can be dangerous and could result in injury or death. Do not operate or perform any maintenance or repair of this product until you have read and understood the operation and repair information contained in the manuals provided by the attachment manufacturer.

The following are general safety guidelines for harvesting attachments. Note that the design, operation and maintenance of attachments varies among manufacturers. Always follow the specific safety, maintenance and operating procedures provided by the attachment manufacturer.

The operator of the carrier and harvesting head must be properly trained in the operation of the equipment and its safety requirements.

PRIOR TO STARTING OPERATION:

⚠ WARNING

The attachment may release held trees when the cab front door is opened, the pilot system is turned off or the fire suppression system is activated. Never exit the cab with a tree suspended in the attachment.

- Ensure no one is near the machine where the risk of personal injury is present.
- Ensure no one is in the line of the chain saw when starting or operating the harvesting head. The hydraulically driven saw chain reaches high speeds and is an extreme hazard if the chain breaks.
- Regularly inspect, check and maintain the saw guide (bar), the saw chain and sprocket, ensuring that all components are secure and not damaged as detailed in the harvesting attachment operator's manual.
- Ensure that all safety equipment upgrades available from the attachment manufacturer have been installed.
- Before starting each shift the operator must test ALL functions of the carrier and attachment to ensure that they are in proper working order.

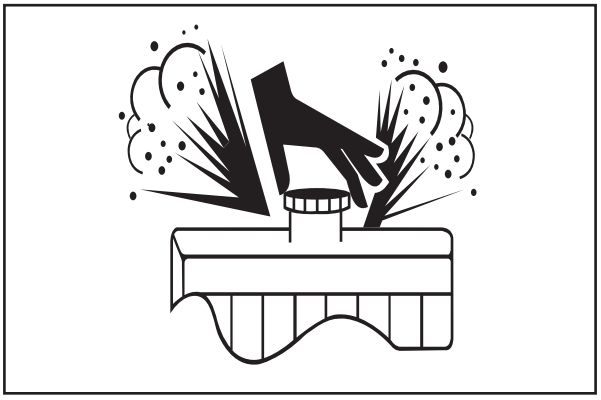
OPERATION:

Felling trees with the harvester is very dangerous and should be done only by properly trained and experienced operators.

⚠ WARNING

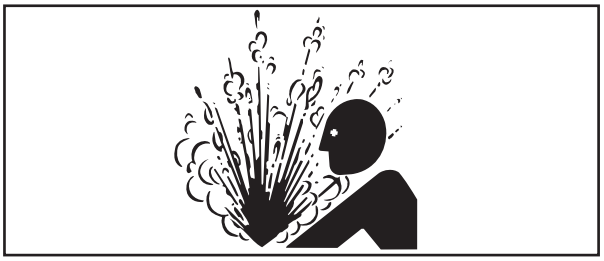
The operator must release trees from the attachment, place attachment on the ground, and shut pilot system off if someone enters into the hazard zone.

- Lower the attachment to the ground and turn pilot system off whenever machine is not in use.
- **Always** fell trees in the direction that they are leaning.
- **NEVER** fell trees close to overhead power lines, vehicles, houses, roads/pathways, etc.
- Do not allow anyone within the *Hazard Zone* of 150 m (500 ft) from the machine during operation.
- **Never** fell trees when there are personnel on the ground within the 150 m (500 ft) Hazard Zone.
- **NEVER** fell trees in the direction of the operator's cab.



Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut the engine off. Only remove radiator fill cap when cool enough to touch with bare hands. Slowly loosen radiator fill cap to first stop to relieve pressure before removing completely.



Do not change any pressure or relief setting unless Tigercat authorized instruction has been obtained.

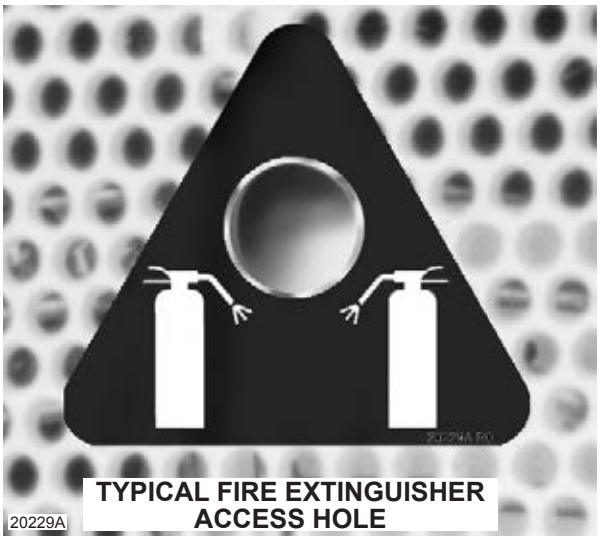
Use the proper tool for the job. Repair or replace worn or damaged tools including lifting equipment immediately.

Keep your hands, feet, head, and loose clothing away from power driven parts. Tie long hair behind your head. Remove rings and other jewellery to prevent electrical shorts and entanglement in moving parts.

Always be aware of machine pinch points that could cause injury. Never place body parts within the range of motion of the working parts of the machine.

Never stand under an object supported with hydraulics. Always use safety stands or a locking device.

- Use the **PASS** method. This is the most effective use of a fire extinguisher.
  - **P**ull the pin at the top of the extinguisher that keeps the handle from being pressed. Break the plastic seal as the pin is pulled.
  - **A**im the nozzle at the base of the fire. Do not aim the nozzle at the flames. In order to put out the fire, you must extinguish the fuel, not the flames. Hose nozzles are often clipped to the extinguisher body. Release the hose before taking aim.
  - **S**queeze the handle to release the pressurized extinguishing agent. The handle can be released at any time to stop the discharge.
  - **S**weep from side to side at the base of the fire until the fire is completely out or the fire extinguisher is empty



TYPICAL FIRE EXTINGUISHER ACCESS HOLE

- Place the nozzle of the fire extinguisher into the appropriate fire extinguisher access hole and discharge the extinguisher.
- Only if you can safely do so, open the access panels to the machine in the area of the fire.
- Failing all attempts to access the machine compartment, discharge the extinguisher through the mesh or any available openings on the machine.
- Ensure that the machine and all components have cooled down sufficiently after a fire so that re-ignition does not occur.
- Remain with the machine until help arrives.

WHAT TO DO AFTER A MACHINE FIRE HAS OCCURRED

- Before returning the machine to work.
  1. Ensure that the cause of the fire is determined and all appropriate repairs are completed.
  2. Ensure that the fire detection system* or the fire suppression system** is properly serviced and in working order (if applicable).
  3. Ensure that all extinguishers used in fighting the fire are replaced or recharged.
- 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.

THROWN OBJECTS HAZARD

This label informs you of the thrown objects hazard that exists when operating this harvesting head. Warn all personnel to stay 150 m (500 ft) away when operating the machine and head. During operation objects can be thrown or ejected at high speed and can travel long distances. Ejection of chain saw parts or other objects can cause serious injury or death.

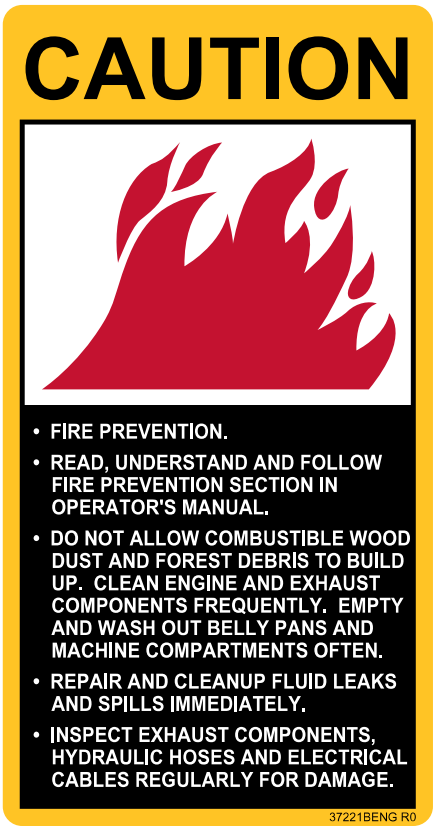
NEVER operate or position the head with the chain saw bars in line with any bystanders, other machines or facing towards the operator's cab.

Orient the bar and chain so high velocity parts are thrown away from any bystanders and equipment. **ALWAYS** follow chain manufacturer's guidelines for proper use and maintenance.

ALWAYS be aware of the location of other machines and personnel who are working in the harvesting area and be prepared to stop operations if they enter your working area without warning. Be prepared for this potential hazard and take appropriate action if required!

This label is located inside the cab in full view of the operator. Should this harvesting head be purchased "loose" without a machine, one of these labels will be sent along with the head to be affixed to the inside of the cab at a future date.

FIRE PREVENTION!



This label advises operators of the following:

READ UNDERSTAND AND FOLLOW THE FIRE PREVENTION GUIDELINES IN THIS MANUAL. These guidelines provide all the necessary action required to preventing fires on this machine. DO NOT OPERATE THIS MACHINE until you have read these instructions and have performed any necessary maintenance required that will prevent the potential of a fire from starting on this machine.

It is also important to note that fire prevention inspections and maintenance MUST BE PERFORMED FREQUENTLY (several times per day). A clean combustible free machine as well as frequent inspections of the exhaust components, hydraulic hoses and electrical cables and performing any necessary repairs immediately will help prevent fires.

Maintain a charged fire extinguisher on the machine at all times, know where it is and know how to use it!

GENERAL

FIRE PREVENTION

Maintaining your machine properly will greatly extend its life and reduce your operating costs.

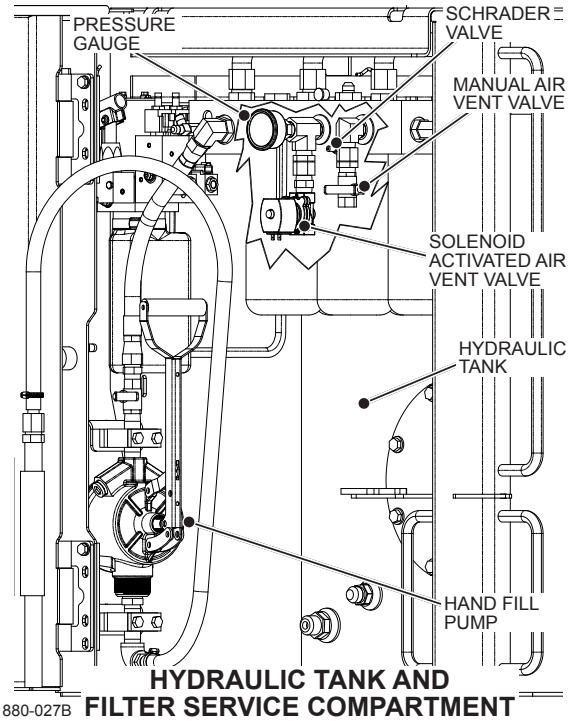
Fire can result in a machine loss which can be financially devastating.

⚠ CAUTION

After transporting (trucking) a machine from one job sight to the next, open all doors and access panels and blow off any debris that could have re-positioned itself onto the engine and exhaust parts due to wind turbulence caused by the journey.

1. Forest debris and fine organic material (twigs, pine needles, branches, bark, leaves, saw dust, small wood chips) and any other combustible materials when allowed to accumulate, form a fuel source that when ignited is extremely difficult to extinguish. A thorough program of regular cleaning and washing will reduce the possibility of a fire starting. In the event a fire does start, the regular cleaning program will improve the chances of successfully extinguishing a fire.
2. Pay close attention to wiring and plumbing routings during maintenance, ensure that ALL wiring harnesses or hydraulic hoses are properly restrained and clamped to prevent damage from chaffing.
3. If equipped, read the fire suppression system manual and have the system serviced regularly by qualified personnel.
4. In case of fire lower the boom system to the ground and turn OFF the engine before discharging the fire suppression system.

Refer to FIRE PREVENTION in SECTION 1 of THIS MANUAL for additional information.



880-027B **HYDRAULIC TANK AND FILTER SERVICE COMPARTMENT**

IMPORTANT!

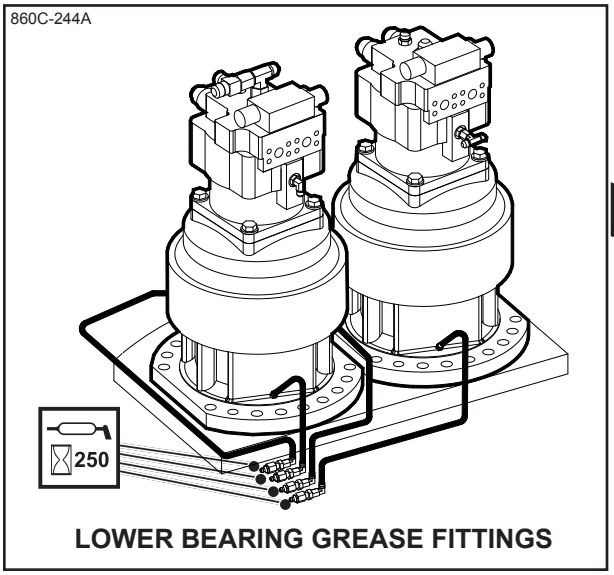
PRESSURIZED HYDRAULIC TANK.

34.5 kPa (5 psi) MAXIMUM.

Before servicing hydraulic system, wearing eye protection, release air pressure from tank using air vent valve.

After service is completed, close manual air vent valve and add air pressure from a clean air source to the hydraulic tank via the Schrader valve. **Do not exceed 34.5 kPa (5 psi)**. Refer to HYDRAULIC TANK PRESSURIZATION INSTRUCTIONS in THIS SECTION for details.

SWING DRIVE LUBRICATION



LOWER BEARING GREASE FITTINGS

LOWER BEARING GREASE FITTINGS

LUBRICATION OF SWING DRIVE GEARBOX LOWER BEARINGS

The cavity in the lower portion of the gearbox where the lower bearings are housed is completely filled with grease.

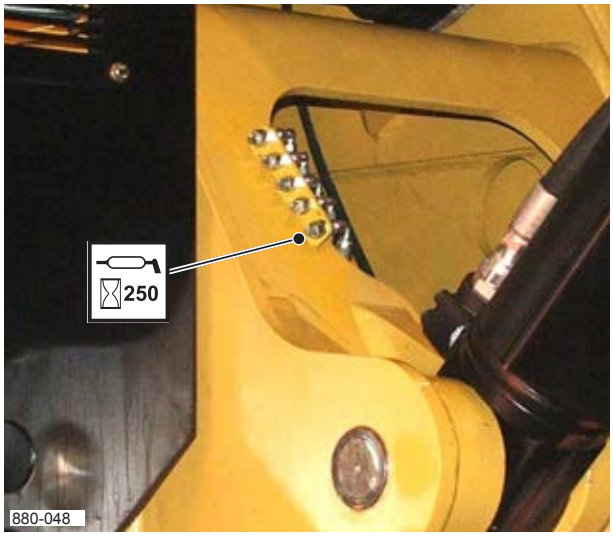
Locate the 4 lube fittings on the front of the machine turntable frame. With the gearbox at operating temperature and the lubricating grease warm, use a hand grease gun and slowly pump 5 shots of grease into each grease fitting. **Do not over grease!**

NOTE: During cold weather applications the swing function must operate for several hours to achieve operating temperature. Warm the lubricating grease to 22°C (72°F) before lubricating the gearboxes. **Do not** force grease, gearbox failure may result. **Do not** use winter grease. Refer to SCHEDULED MAINTENANCE – 250 HOURS in THIS SECTION.

For additional information refer to SECTION 15 in the SERVICE MANUAL.

IMPORTANT!

Do not use a power grease gun to lubricate this machine. Use a hand grease gun only.



ROTARY MANIFOLD SEAL

LUBRICATION OF ROTARY MANIFOLD SEAL

To lubricate the rotary manifold seal, apply 2 shots grease every 250 hours to the lower grease fitting.

NOTE: During cold weather applications the swing and machine functions must operate for several hours to achieve operating temperature. Warm the lubricating grease to 22°C (72°F) before lubricating the rotary manifold seal. **Do not over grease!**

IMPORTANT: PRESSURIZED HYDRAULIC TANK. 34.5 kPa (5 psi) MAXIMUM.

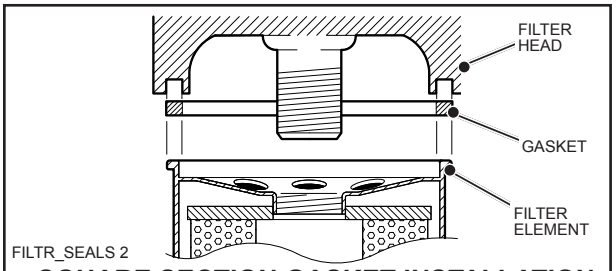
Before servicing hydraulic system, wearing eye protection, release air pressure from tank using air vent valve.

Filter change procedure:

1. Park the machine on level ground with the attachment resting on the ground.
2. Open the enclosure roof and left side enclosure door.
3. Turn OFF the engine.
4. Turn the BATTERY DISCONNECT SWITCH to the OFF position.
5. Wearing eye protection, release air from the hydraulic tank by opening the AIR VENT VALVE. Pull handle DOWN 90° to open valve.

NOTE: Air pressure expelling from the vent valve will blow accumulated loose debris in the compartment.

6. Wipe clean the area around the filter and head.
7. Wearing eye and face protection (in case of an oil spray), unscrew the old filter.
8. Dispose of old filter and any oil properly.
9. Drain away any accumulation of oil in the tray (if equipped) by using the drain hose routed through the floor to a waste oil container.
10. The new **Tigercat** filter is supplied with two gaskets enclosed, examine the filter head closely to determine which gasket should be used and follow the instructions to ensure proper installation.



SQUARE SECTION GASKET INSTALLATION

■ Square Section Gasket

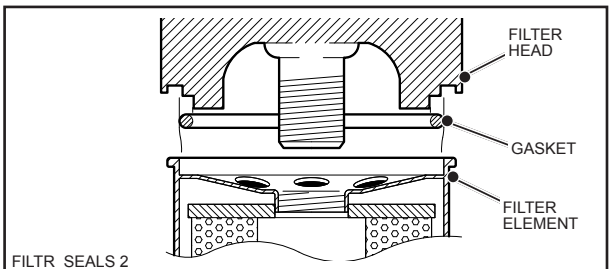
Remove used gasket and clean groove in head.

Apply clean oil to new gasket surfaces.

Install new gasket into groove in filter head.

Screw on new filter until gasket makes contact.

Tighten filter an additional 3/4 turn.



O-RING GASKET INSTALLATION

● O-RING GASKET

Remove used gasket and clean gasket seat in head.

Apply clean oil to new gasket surfaces.

Install new gasket on inside lip of filter.

Screw on new filter until gasket makes contact.

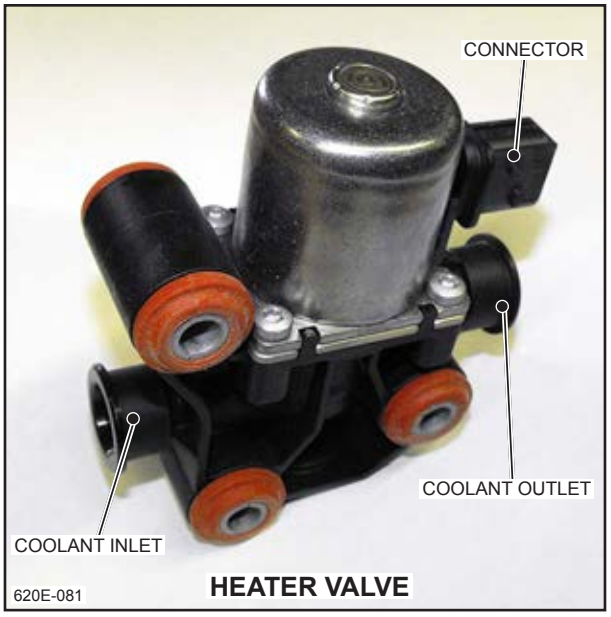
Tighten filter until top edge makes metal to metal contact with filter head.

(Approximately 1–1/2 additional turns after gasket contact.)

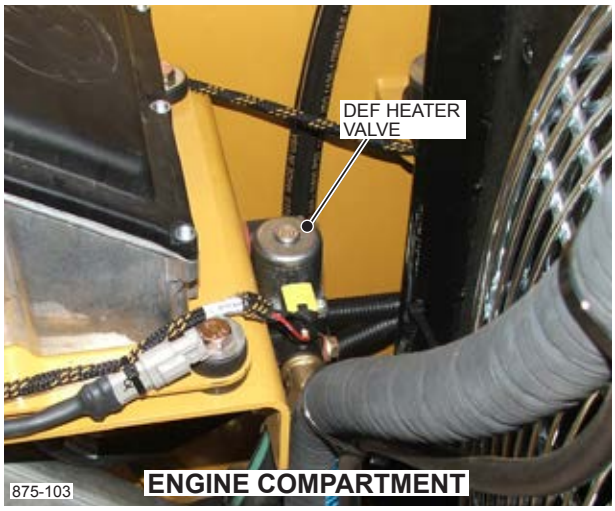
11. Close AIR VENT VALVE, push the **handle UP**.

12. Attach a bleed hose to the test fitting on the return manifold using a quick coupler with a drain hose.
13. Route hose to a waste oil container.
14. Use fill pump to raise hydraulic oil level up to the FULL line, replacing oil lost during filter change.
15. As oil is being pumped into the tank, purge air out the bleed hose from the return manifold until a steady stream of oil is coming from the bleed hose.
16. Disconnect bleed hose from the coupling at the manifold.
17. Clean up any spilled oil.

HEATER VALVE/HEATED DEF SUPPLY LINES



The heater valve is located inside the engine compartment in front of the supply module.



The heater valve controls the flow of engine coolant through the DEF tank heater coil. This machine is equipped with electrically heated DEF supply lines.

DEF freezes at -11°C (12°F).

Temperature sensors signals control the operation of both the electrically heated DEF supply lines and the heater valve which, depending on the temperature, opens or closes the flow of hot engine coolant in the heater coil.

Heating is switched OFF when:

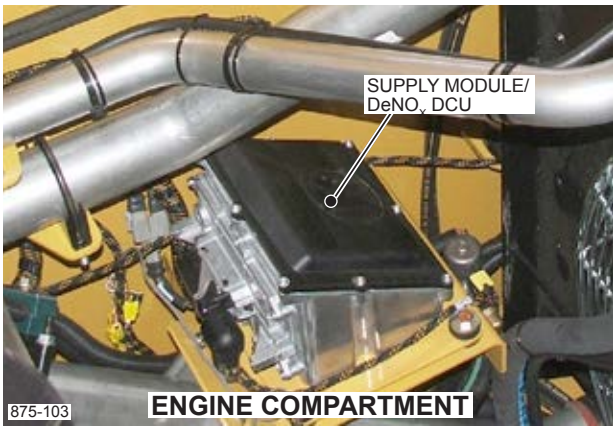
• DEF tank temperature >16°C (61°F)

Heating is switched ON when:

• DEF tank temperature <15°C (59°F)

When conditions require heating the system will thaw DEF within 30 minutes of engine start for proper operation of the SCR aftertreatment system. Note also that whenever the engine is stopped all DEF is pumped back to tank before the engine power system is turned off. This process takes approximately 90 seconds.

$DeNO_x$ DOSING CONTROL UNIT (DCU)



$DeNo_x$ DCU is incorporated into the supply module located in the engine compartment.

The SCR aftertreatment system is electronically managed by the DCU (Dosing Control Unit) incorporated in the supply module. The DCU calculates and adjusts the flow rate of the DEF solution into the system based on current engine speed, torque delivered, exhaust temperature, amount of nitrogen oxides present and humidity levels incoming air.

The DCU is connected to the Engine ECU (electronic control unit).

SUPPLY MODULE

The supply module pump picks up the DEF solution from the tank and sends it under pressure to the dosing module mounted on the mixer tube to be injected into the exhaust pipe upstream of the catalytic converter.

TORQUE CHART

LOCATION	THREAD DIAMETER	TORQUE (LUBRICATED)		
		lbf-ft	Nm	lbf-in
Cylinder, Hoist, 140 mm (48083B and 57874B)				
Piston nut	M75	5830	7900	
Cylinder end cap bolts	M17	270	367	
Set screw, piston	M14	44	57	
Cylinder, Stick, 150 mm (58686B)				
Piston nut	M80	9810	13300	
Cylinder end cap bolts	M19	384	520	
Set screw, piston	M14	44	57	
Cylinder, Cab Tilt, 4" (5475B)				
Machined piston	$1^{7}/_{16}$" UN	500	678	
Steel plug	Blue Loctite		4	30
Set screw, piston	$^{5}/_{16}$" UNF	18	25	
Cylinder, Roof, 2" (5475B)				
Piston nut	$^{3}/_{8}$" UNF	110	149	
Cylinder, Tilt, Power Clam/B-n-T, 110 mm (52959B)				
Piston nut	M58	2420	3280	
Cylinder end cap bolts	M13	126	171	
Set screw, piston	M10	23	31.5	
Cab, Mounting				
Bolts, Rear (6) 3 per side	1" UNC	682-750	925-1016	
Swing bearing				
Swing bearing bolts	$^{7}/_{8}$" UNC	500	678	
Swing gearbox mounting bolts	M20	400	530	
Engine mounting - Tigercat NEF 6.7 Engine				
Bolt, Front bracket/mount to chassis	M24	675	915	
Bolts, Rear bracket/mount to chassis	M24	675	915	
Bolts, bracket to engine, front	M12	80	109	
Bolts, bracket to engine, rear	M12	80	109	
Pump drive				
Drive plate to flywheel	M10 (Blue Loctite)	34	46	
Pump mounting plate to bell housing	M10	25	34	
Undercarriage				
Track shoe bolts (FH400)	M24	T/T*	T/T*	
Roller mounting bolts	1" UNC	680-750	925-1016	
Sprocket bolts	M20 (Blue Loctite)	380	515	
Gearbox mounting bolts	M20 (Blue Loctite)	380	515	
Drive motor mounting bolts	M14 (Blue Loctite)	55	75	
Torque arm bolts, rotary manifold	$^{5}/_{8}$" UNC (Blue Loctite)	170	230	
Rotary manifold mounting bolts	M12 (Blue Loctite)	80	108	
Rotary manifold mounting plate mounting bolts	M12 (Blue Loctite)	80	108	
Counterweight Mounting Bolts	$1^{1}/_{2}$" UNC	750	1017	

***T/T** represents **Torque-turn.** This is a method of torquing the track shoe bolts and is fully described in SECTION 11 of the Tigercat SERVICE MANUAL.

Torque values pertaining to the engine and attachment are provided in the service manuals applicable to those major components.

875 TORQUE CHART.XLS

Tigercat 875 Logger
SECTION 4 – HYDRAULIC SYSTEM

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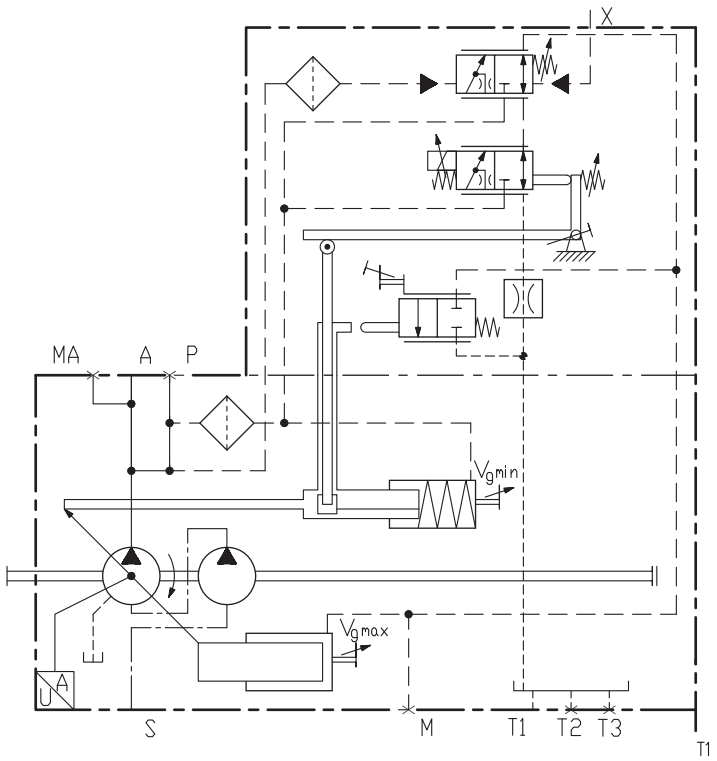
ISSUE 1.0, MAY, 2015



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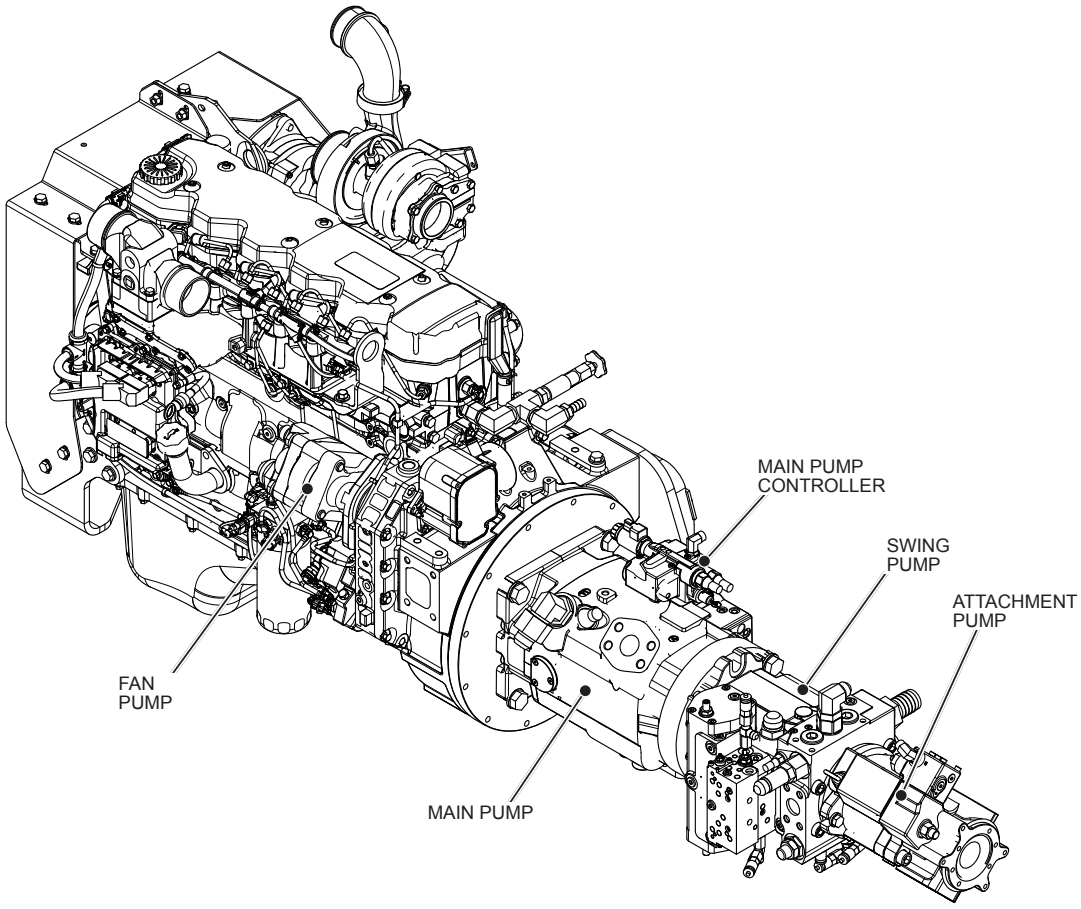
MAIN PUMP SCHEMATIC DIAGRAM



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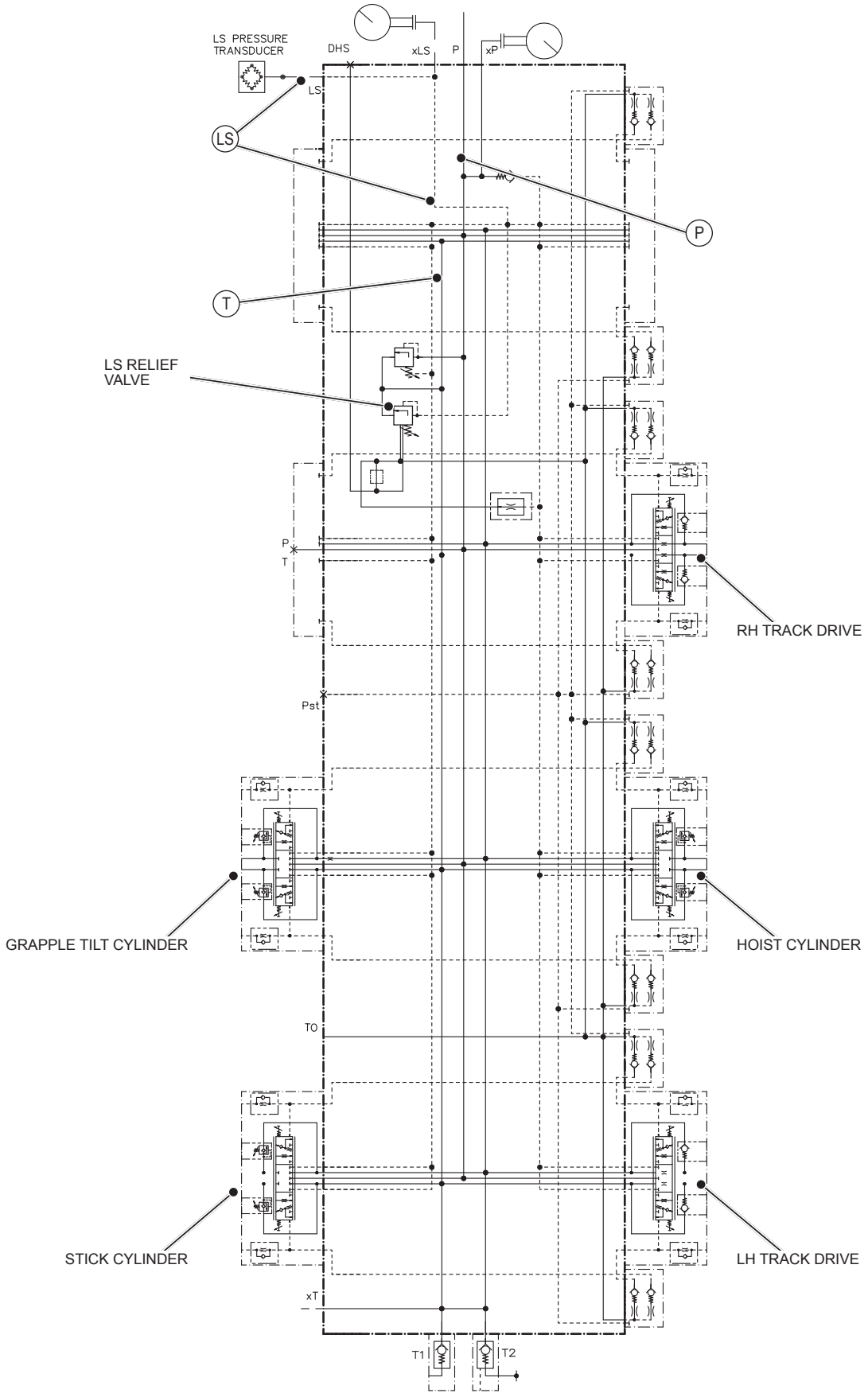
HYDRAULIC PUMP INSTALLATION



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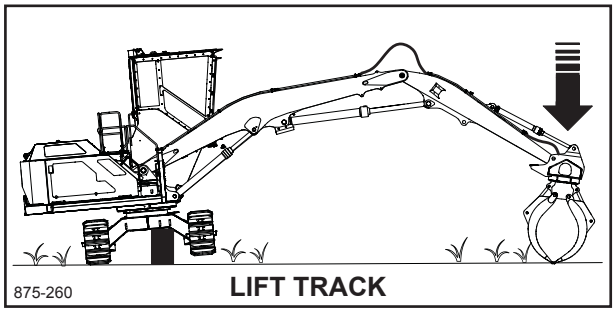
MAIN CONTROL VALVE ASSEMBLY

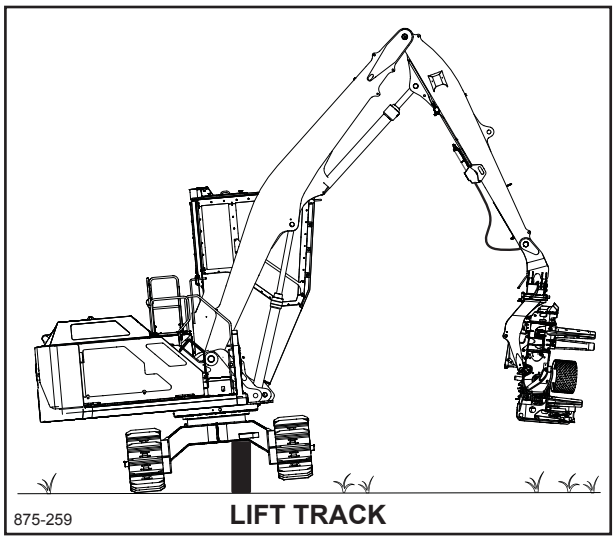
6. Use the IQAN MD3 to set fan service mode to ON. Refer to COMPUTER – ADJUSTMENT MENU – COOLING FAN SERVICE MODE SECTION 6 of THIS MANUAL.

7. Use the IQAN MD3 to set anti-stall mode to OFF. Refer to COMPUTER–ADJUSTMENT MENU–ANTI-STALL MODE in SECTION 6 of THIS MANUAL.
8. With the aid of an assistant swing boom so it is over left side track, perpendicular to the track frame.
9. Apply swing brake.
10. Position the attachment head in a vertical position and swing boom to left side of the machine.



11. Place the attachment on ground and by forcing down with boom controls, lift the track clear of ground.

    or, for Harvesters



    Use a jack of suitable design and capacity to safely lift the left track clear of the ground.

    Refer to serial number plate for machine weight (less attachment).

    Refer to ATTACHMENT MANUFACTURER'S MANUAL for correct attachment weight information.

12. Use blocks to firmly support the undercarriage frame in raised position.

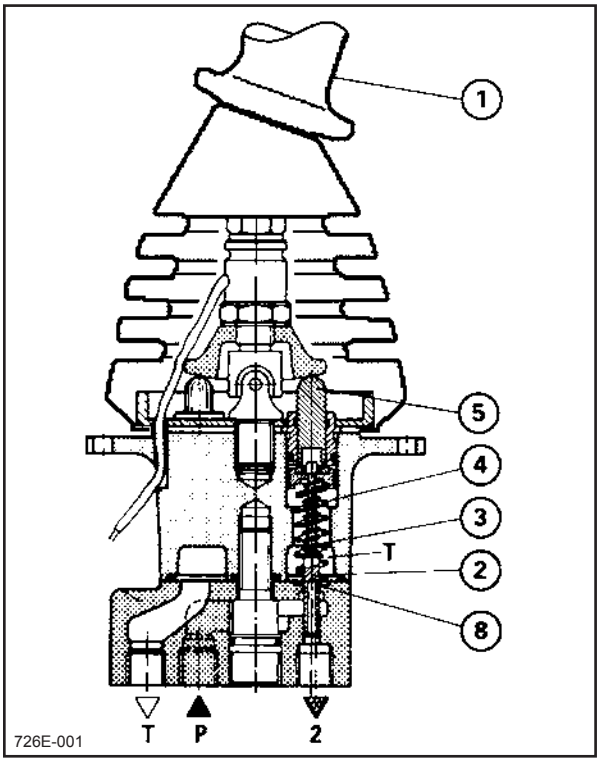
⚠ WARNING

The tracks will turn during this next step.

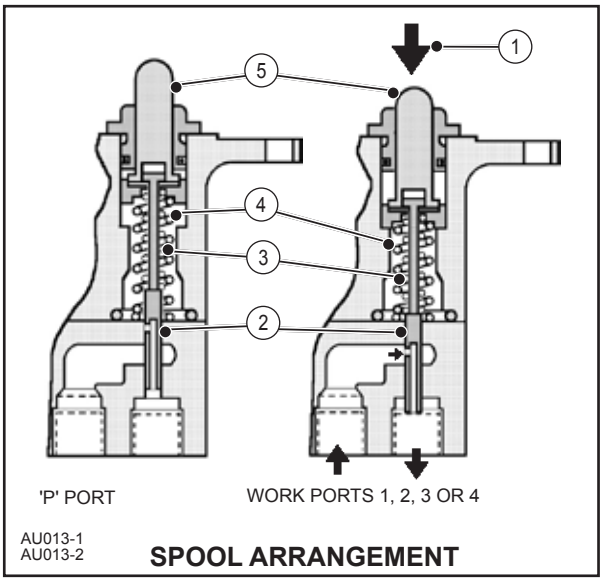
13. Put track switch in track low. Press the LH track forward pedal fully.

JOYSTICKS AND FOOT PEDALS

These pilot valves are manually operated, directional control valves and operate on the same principle as a direct operating pressure reducing valve. Both the joystick and foot control valves (pedals) use similar spool arrangements.



Operated by hand or foot these valves direct pilot oil to the main control valve pilot end caps. The corresponding spool valve then shifts from its center position and directs pump flow to operate a function.



SPOOL ARRANGEMENT

OPERATING DESCRIPTION

In the neutral position the joystick lever is held centered by return springs (4). When the lever (1) is operated, the plunger (5) is pushed against its return spring (4). At the same time the regulating spool (2) is moved through the regulating spring (3). When the regulating stroke begins, there is a connection from port (P) via hole (8) in the spool and work ports 1, 2, 3 or 4 in the base of the valve, to the boom valve pilot end caps.

Pilot pressure is directly proportional to the operator position of the joystick or foot pedal and the regulating spring characteristics.

PILOT SYSTEM ELECTRICAL CIRCUIT

With the engine running, the pilot shut off valve solenoid is not energized until the cab door is closed and latched and the pilot reset lever is placed in the down position. Two proximity switches, one on the cab door frame and one on the seat frame are used as part of the pilot system interlock electrical circuit.

When the cab door is closed and the pilot reset lever is down, the proximity switches are activated which will allow the MD3 computer to energize the coil on the pilot shut off valve to shift the valve spool and supply oil to the pilot circuit via the pilot manifold. The green pilot on icon on the MD3 computer display will also be turned ON.

Whenever the cab door is opened or if the pilot reset lever is pulled UP the door or reset lever proximity switch opens deactivating the signal to the MD3 computer which de-energizes the pilot shut off valve and shuts down the pilot system. This prevents pilot oil from reaching the controls. The pilot Icon on the MD3 display will turn amber indicating the pilot circuit is OFF.

NOTE: If the engine has been turned off and the pilot reset lever is down and the cab door is closed, the engine cannot be started until the pilot reset lever is up. This prevents unintended operation of any pilot operated functions during engine starting.

MAIN ELECTRICAL DESCRIPTION

Installed in the main fuse and relay electrical box are three 60 amp fuses, one 125 amp, and one 150 amp fuse. The electrical box is located in the radiator/heat exchanger service compartment on the left side of the machine. The fuses are ahead of the system circuit fuses and are there to prevent major damage to the electrical systems of the machine in the event of a short circuit in any of the main battery feed lines.

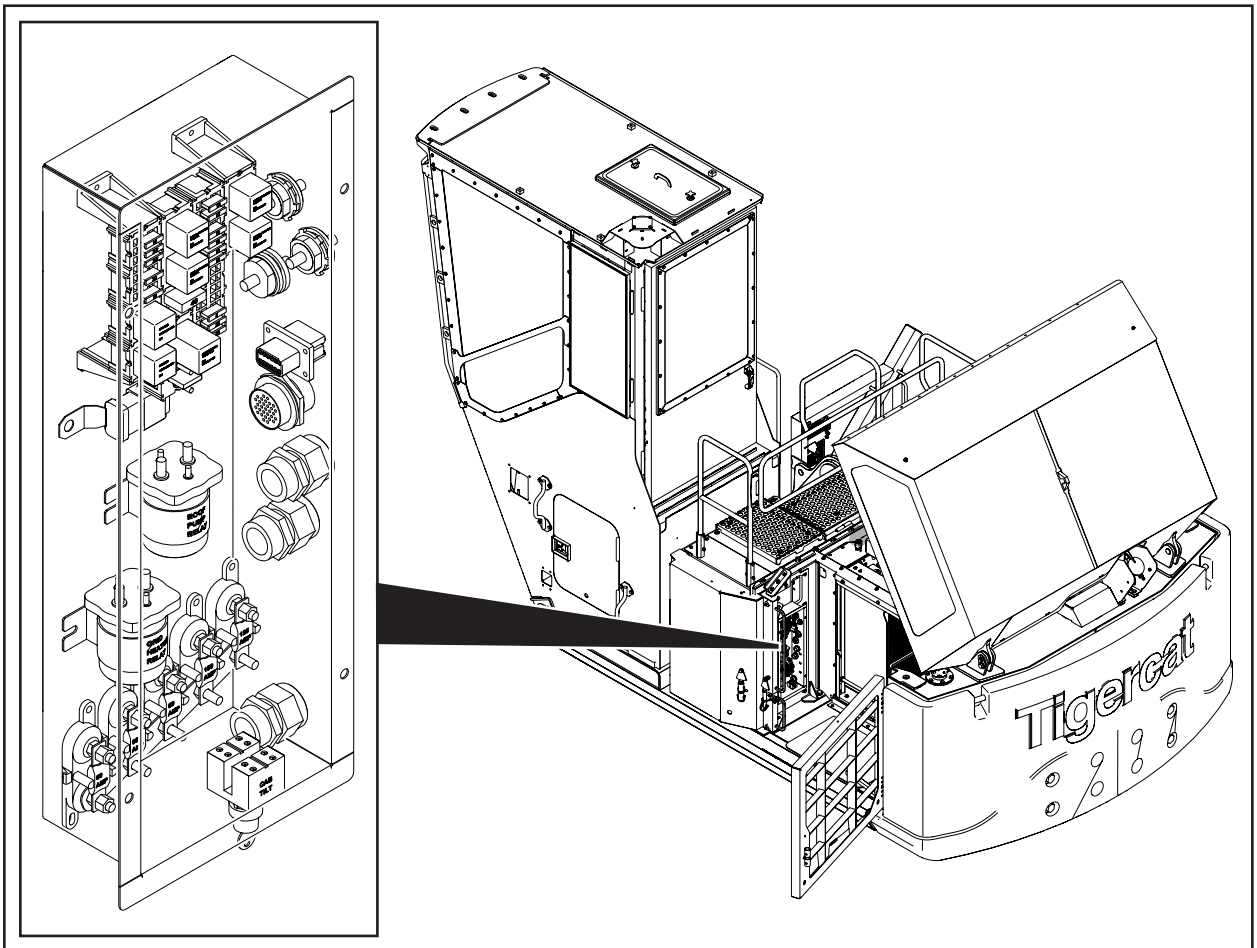
Each circuit on the machine is further protected against current overload by individual circuit fuses. The circuit fuses on the fuse, relay and electrical panel in cab protect the cab electrical components.

Fuses in the main fuse and relay electrical box protect the circuits for the work lights, engine ECU, roof/cab tilt pump and many other machine operating circuits.

Two 60 amp fuses located in the battery compartment provide unswitched power for service lights, engine ECU relay, battery disconnect relay optional engine preheat system, cab tilt switch and MD3 real time clock (RTC).

A battery booster jumper plug is located in the battery compartment. This jumper connector is used in conjunction with jumper cables with matching ends. If standard jumper cables are used the negative connection can be made anywhere on the upper structure, as close to the batteries as possible on bare metal.

If a fuse “blows” it should be replaced with a fuse of the same amperage rating. If the fuse "blows" again, the circuit in question must be inspected for a possible short circuit.



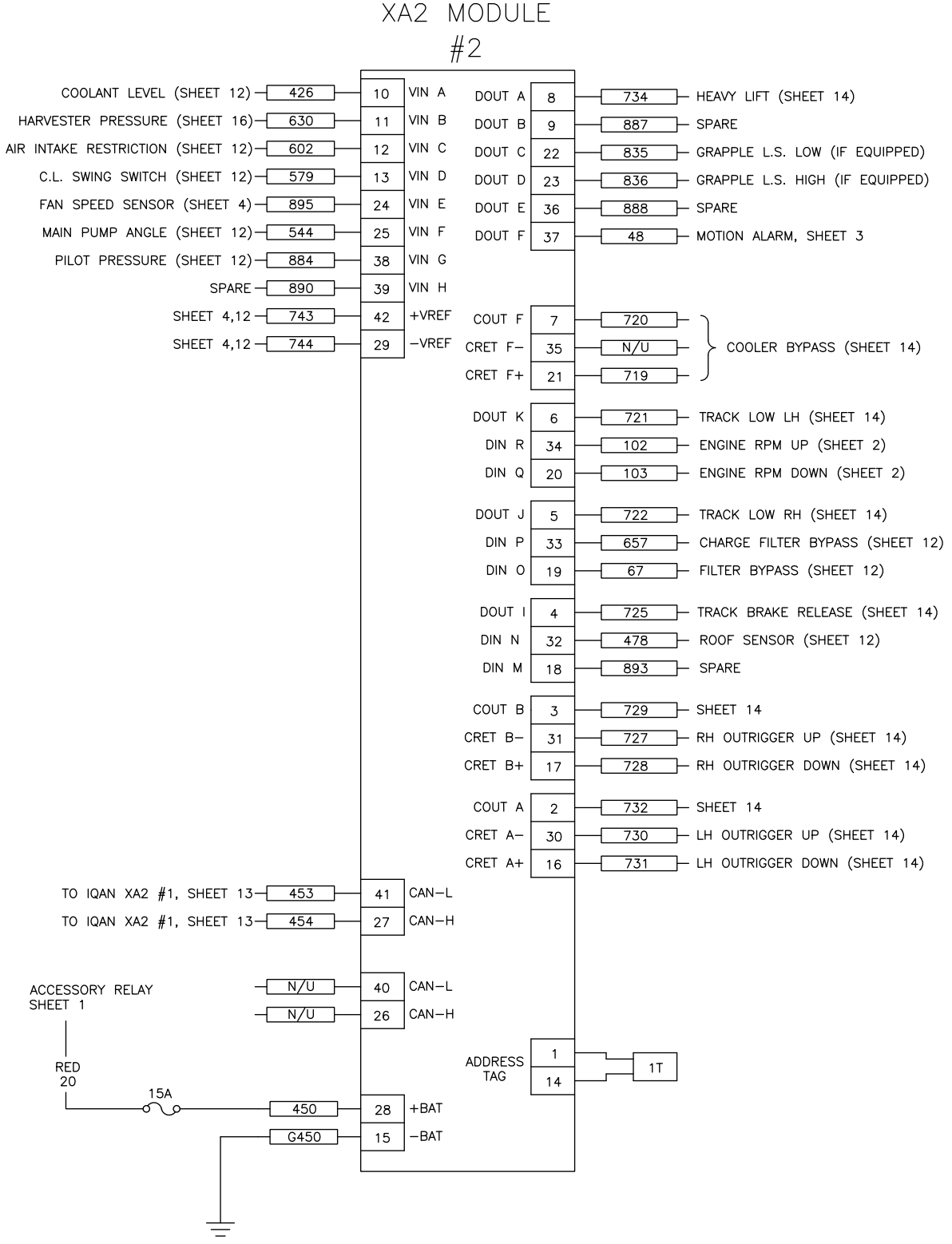
MAIN FUSE ELECTRICAL BOX LOCATION

ENGINE DIAGNOSTICS CONNECTION

Plug a remote electronic diagnostic device into this connection such as a lap-top computer with appropriate engine manufacturer's software to perform engine performance analysis and tuning.

NOTE: This operation can only be performed by a trained service technician.

COMPUTER, CONTROLS AND SWITCH PANEL - CAB LEFT HAND PILLAR



60927BR1S15

XA2-A1 ENGINE FRAME MODULE SCHEMATIC

SELF WARMUP MODE (HARVESTER ONLY)

The hydraulic oil Self Warmup Mode can be manually started from the Information Menu by pressing the F3 button – WARMUP INITIATE, only if the pilot is OFF and hydraulic oil temperature is low.

After the WAIT TO START icon shuts off, start the engine.

The MD3 displays an Information dialogue box requesting input from the operator as to whether or not to begin hydraulic oil Self Warmup.

Press the F2 (Yes) button to begin self warmup.

Press the F3 (No) button to skip self warmup.

The self warmup mode increases engine speed to 1100 rpm and shifts the Pump2 section of the main valve to the warmup position where hydraulic oil flows over a relief to warm it to operating temperature. Note also that when the hydraulic oil temperature is low the oil cooler bypass will be open reducing oil cooling.

After pressing the F2 (Yes) button the MD3 displays another Information dialogue box stating that self warmup is engaged.

Press F2 (Stop) to manually stop self warmup. Note also that if the pilot system is turned ON, self warmup will disengage.

When hydraulic oil reaches operating temperature self warmup mode will automatically disengage.

Note that to ensure self warmup mode functions correctly it is important that hydraulic oil grade be selected correctly to match the type of hydraulic oil in use. This information is used by the machine program to adapt hydraulic oil temperature warmup information for the operating range of each Hydraulic Oil Grade.

Hydraulic oil grade information is shown on the main menu below the hydraulic oil temperature gauge. Refer to COMPUTER – ADJUSTMENT MENU – OIL GRADE in THIS SECTION for hydraulic oil grade selection settings information.

MEASURE MENU

From the main menu page press the F2 button (Measure) to access the measure menu.

The following menu items can be selected.

- Engine Parameters
- IQAN Status
- I/O
- Outputs
- Inputs
- Sensors
- Fan
- Anti-stall
- Fuel Consumption
- J1939 Parameter Inputs
- Linde Tank

Use the Arrow Up or Arrow Down to select the menu item. Press OK to confirm the selection.

Press the back button (or F1) to return to the main menu page.

Refer to COMPUTER – MAIN MENU PAGE – MEASURE MENU – EXAMPLE – MEASURE MENU in THIS SECTION for an example of measure menu navigation.

This menu is used by Tigercat Service technicians to view measured values on the MD3 display. Refer to IQAN SOFTWARE – IQANRUN 2 QUICK SUMMARY – MEASURE (GRAPH) in THIS SECTION for more information about graphing and exporting measured values for service diagnostics.

INFO MENU

From the main menu page press the F4 button (Info) and the access the info menu.

The machine ID information will be displayed on the screen.

The following menu items can be selected:

- Modules – Press F1 to select
- Logs – Press F3 to select

Press the back button to return to the main menu page.

MODULES

From the Info menu press F1 to select the modules menu.

This menu provides information on the following machine modules:

- MD3 Computer Module
- Cab XS2
- Frame Module 0 XA2
- Frame Module 1 XA2
- Tigercat FPT NEF 6.7 L
- DeNo$_x$ Module

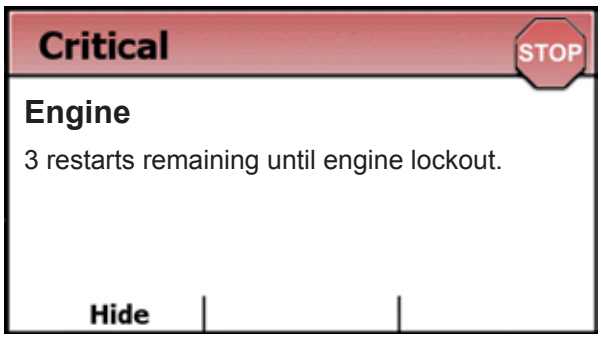
Shown above the MD3 module has been selected. Specific information for the MD3 is displayed on the screen.

Use the Arrow Up or Arrow Down to select the menu item. Press OK to confirm the selection.

This menu is used by Tigercat service technicians. Selected module diagnostics information is also accessible through the measure menu

Press the back button (or F1) to return to the main menu page.

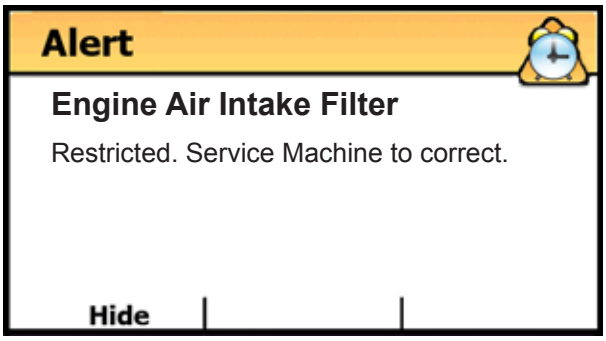
ENGINE RESTARTS REMAINING UNTIL ENGINE LOCKOUT



This message will be displayed, alarm light will flash and alarm will sound to inform the operator of the number of restarts available before the engine is locked out.

Note that an engine is locked out after several other critical aftertreatment system messages regarding the cause of the problem and this message regarding the number of restarts until engine lockout.

Refer to COMPUTER – MESSAGES – CRITICAL – ENGINE LOCKED OUT in THIS SECTION.



ENGINE AIR INTAKE FILTER RESTRICTED

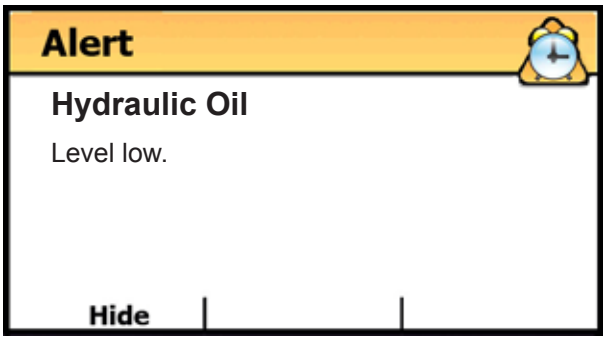
This message will be displayed when a signal is received from the engine air filter restriction sensor on the engine air cleaner.

The engine air intake pressure icon illuminates YELLOW when service to the filter is required.

The engine air intake pressure icon illuminates RED, along with an ALERT message, when service to the air filter has reached a critical state.

When this happens the engine air cleaner requires immediate service.

Refer to AIR INTAKE SYSTEM, ENGINE – FILTER RESTRICTION INDICATOR in SECTION 3 of THIS MANUAL.

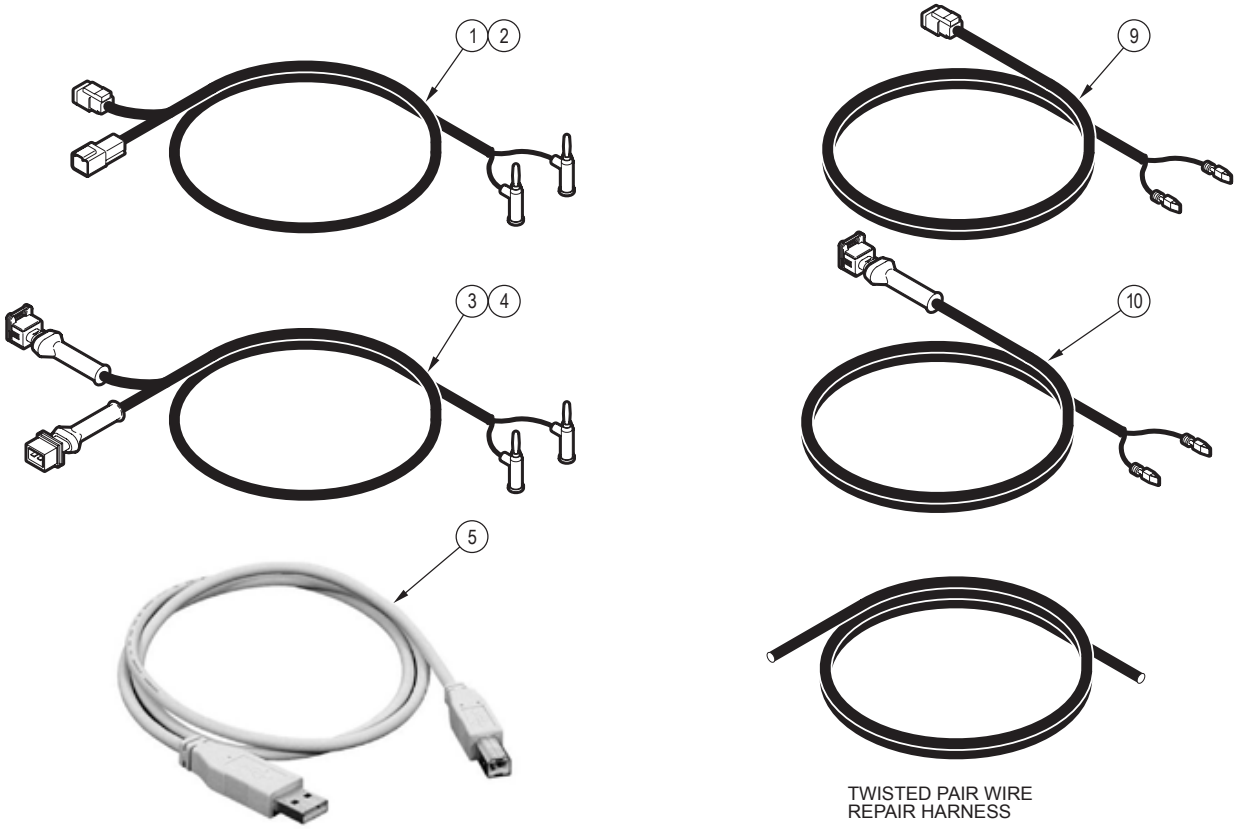


HYDRAULIC OIL LEVEL LOW

This message will be displayed when the main hydraulic tank oil level is low.

When this alarm is activated stop the engine and look for signs of broken hoses or other leaks. Repair leaks and refill tank to the FULL mark on the sight gauge. Restart the engine and inspect for leaks. Operating machine with a low hydraulic oil level can cause hydraulic pumps to fail.

Note that the hydraulic oil level icon illuminates yellow when a hydraulic oil level low alert message has been activated.



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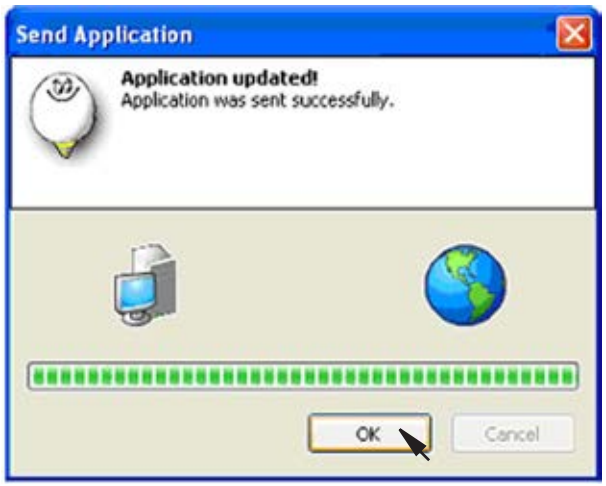
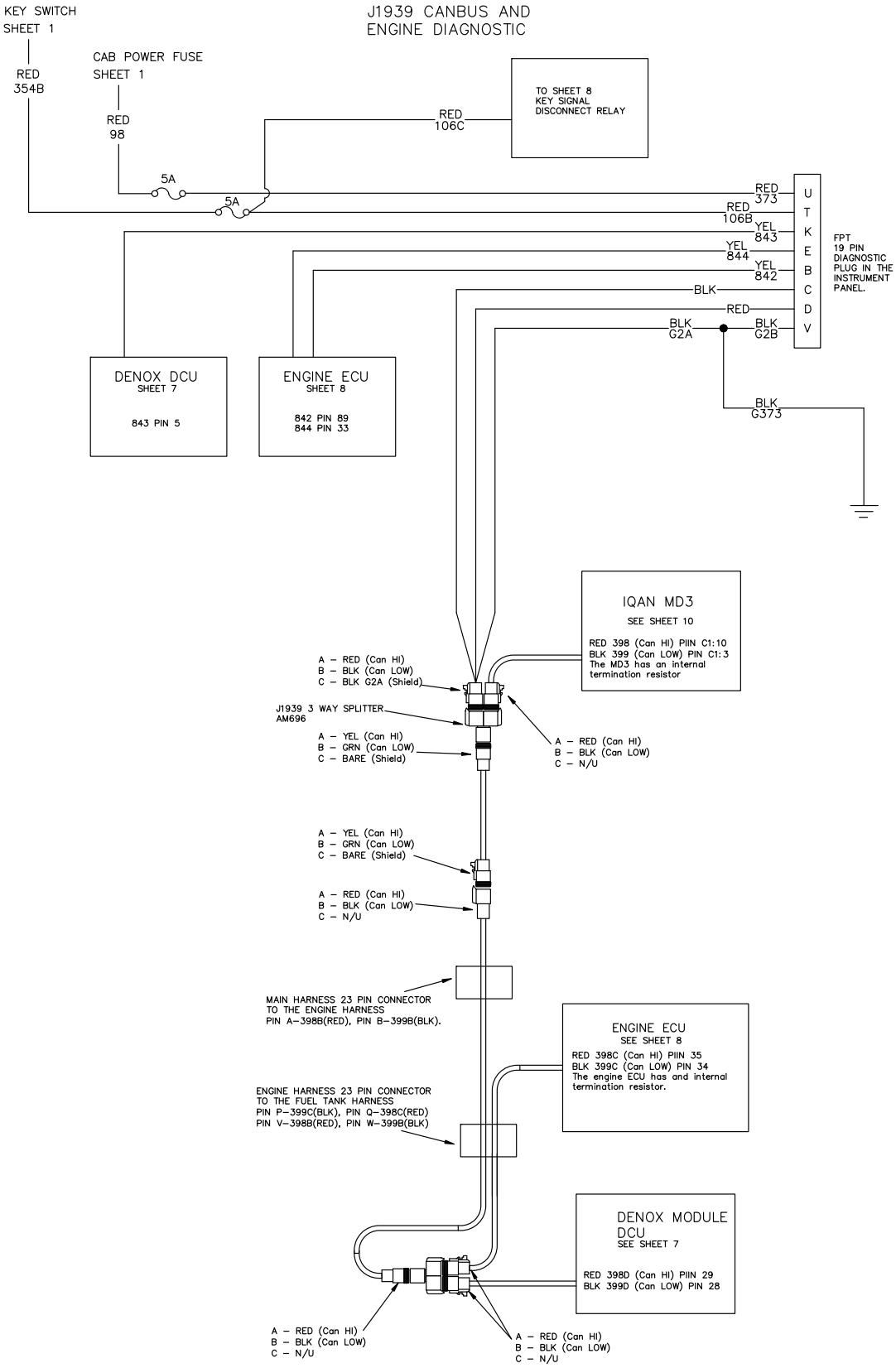
ELECTRICAL KIT – SERVICE AND DIAGNOSTICS – SELECTED ITEMS



12. Once the application is loaded successfully, the dialogue box will indicate the application was successfully sent.

The MD3 will restart and show the main screen of the application.

The Update is now complete.



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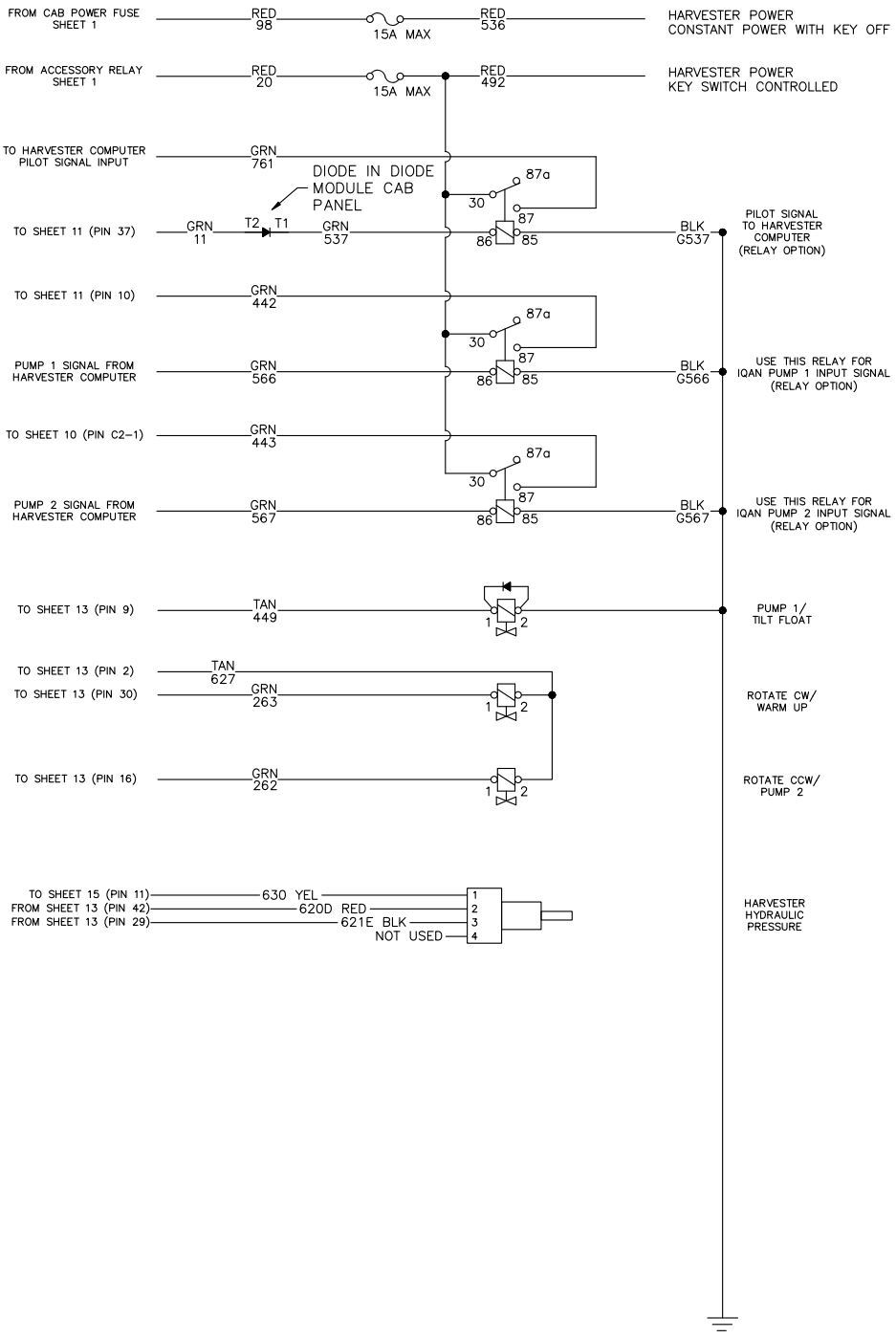
ELECTRICAL SCHEMATIC SHEET 6 OF 19

HARVESTER



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ELECTRICAL SCHEMATIC SHEET 16 OF 19

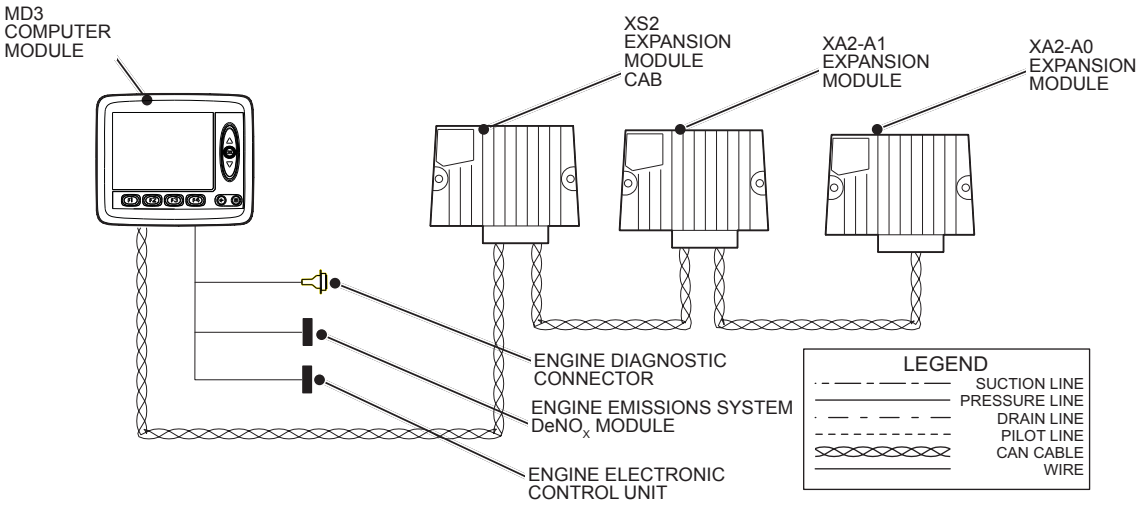
IQAN ANTI-STALL

HORSEPOWER LIMITING CONTROL – GENERAL DESCRIPTION

In the past it was common to overload an engine when several high load functions were used at the same time. Engine overload was typically avoided only by the operator. To prevent engine overload, the machine is equipped with an electronic system which detects any decrease in engine rpm and de-strokes the main pump to reduce the load on the engine and at the same time maintain engine rpm. This is done without any input from the operator.

An IQAN MD3 computer system is used to prevent engine overload and incorporates the following components:

- IQAN MD3 Computer and Display Module
- XS2–A0 Module (Cab)
- XA2–A0 Expansion Module
- XA2–A1 Expansion Module
- Engine Electronic Control unit (ECU)
- Engine Emissions System $DeNo_x$ Module
- Various controls, switches, sensors and valves not shown



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COMPUTER CONTROL SYSTEM COMPONENTS

Tigercat 875 Logger
SECTION 10 – COOLING SYSTEM

CONTENTS - SECTION 10

ISSUE 1.0, MAY, 2015

COMPUTER CONTROL SYSTEM

The computer control system is part of a network of components. Temperature sensors, switches and adjustments on the MD3 send inputs to the MD3 computer which controls fan speed and direction.

FAN CIRCUIT DESCRIPTION

Fan Rotation

Fan rotation is controlled by the reversing valve on the fan motor. Fan rotation will reverse when:

- Cooling fan switch is placed in the clean position
- Fan service mode has been selected on the MD3 computer
- A timed purge interval has been activated.

724G-011 **COOLING FAN SWITCH**

CLEAN POSITION – Momentarily pressing the switch in the clean position sends an input signal to the MD3 computer. The MD3 computer then sends an output signal to the reversing valve on the motor. The reversing valve shifts, re-directing airflow through the cooling assembly components to remove dust and debris. Refer to CAB CONTROLS – COOLING FAN - SWITCH in SECTION 2 of the OPERATOR'S MANUAL.

The fan clean icon will illuminate in green on the computer display when the clean cycle operates.

NOTE: The pilot system must be on to operate the clean cycle. Also, the MD3 computer will turn A/C and defrost systems off when in the clean mode.

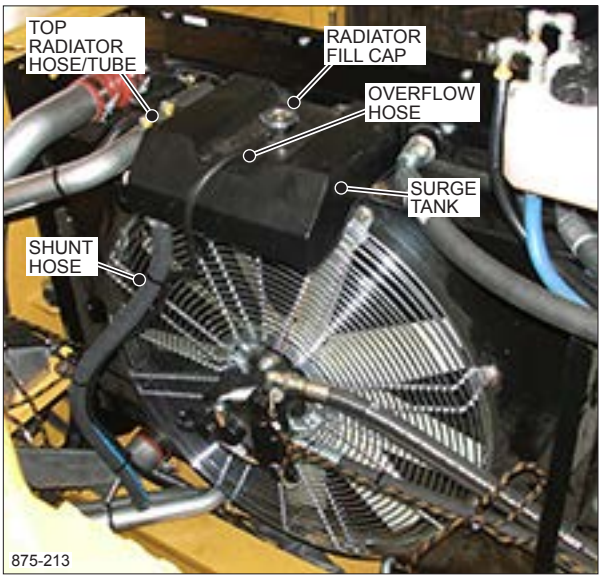
When service mode is selected on the MD3, the MD3 computer sends an output signal to the reversing valve on the motor. The reversing valve shifts changing the flow of oil through the motor, changing direction of rotation. Refer to COMPUTER – ADJUSTMENT MENU – COOLING FAN SERVICE MODE in SECTION 2 of the OPERATORS MANUAL.

NOTE: The MD3 computer will turn service mode off if the roof is closed. Also, the MD3 computer will turn A/C and defrost functions off when fan service mode is on.

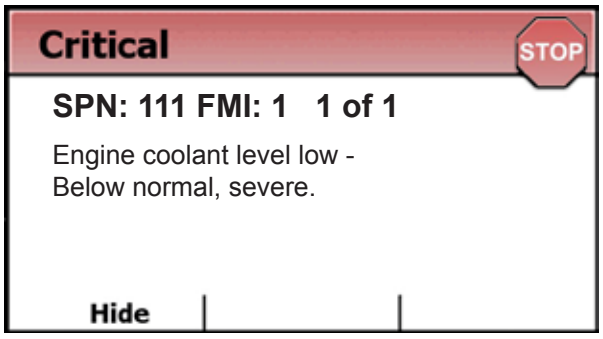
The timed purge interval will reverse the fan at automatic intervals. The MD3 computer sends an output signal to the reversing valve on the motor. The reversing valve shifts changing the flow of oil through the motor, changing direction of rotation. Refer to COMPUTER – MAIN MENU PAGE - ADJUST MENU – MACHINE PARAMETERS – TIMED PURGE INTERVAL of the OPERATORS MANUAL.

RADIATOR

The radiator is the centre core section of the side by side heat exchangers in the cooling assembly.



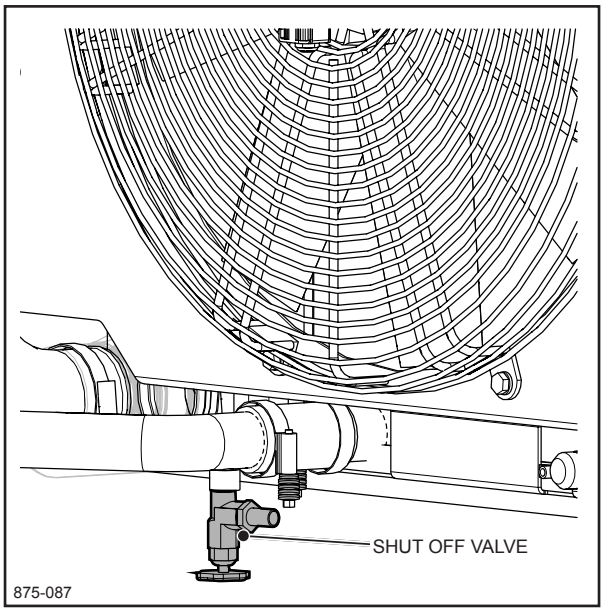
A surge tank is mounted at the top and in front of the radiator to provide for overflow protection during high temperature and make up coolant when the cooling system is cold. The surge tank has 5 L (1.3 US gal) drawdown capacity, 3 L (0.8 US gal) expansion, total capacity is 8 L (2.1 US gal).



A low coolant sensor is installed on the side of the surge tank. The sensor will activate the engine coolant level low message on the computer display. Refer to COMPUTER – MESSAGES - CRITICAL – ENGINE COOLANT LEVEL LOW in SECTION 6 of THIS MANUAL.

A radiator fill cap mounted on top of the surge tank maintains a 1.25 bar (18 psi) pressure on the coolant in the radiator. This pressure provides for over boil protection of the cooling system.

Only remove radiator fill cap when the cooling system, including the radiator fill cap and upper radiator tube, is no longer hot. Turn the radiator fill cap slowly counterclockwise until it first stops. Do not press down while turning the radiator fill cap. If you hear a hiss, wait for that to stop. A hiss means there is still some pressure left. Keep turning the radiator fill cap, but now push down as you turn it. Remove the radiator fill cap.

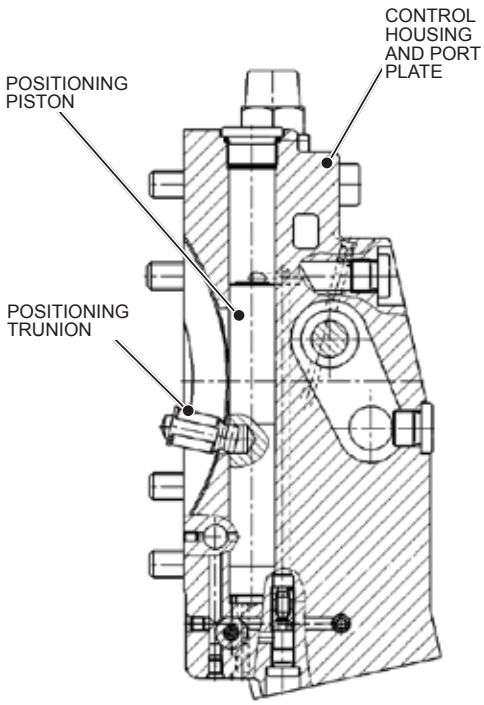


A shut off valve located on the bottom of the radiator tube provides a drain for the engine coolant. It is recommended that the engine coolant (60% antifreeze – 40% distilled water) be changed every two years.

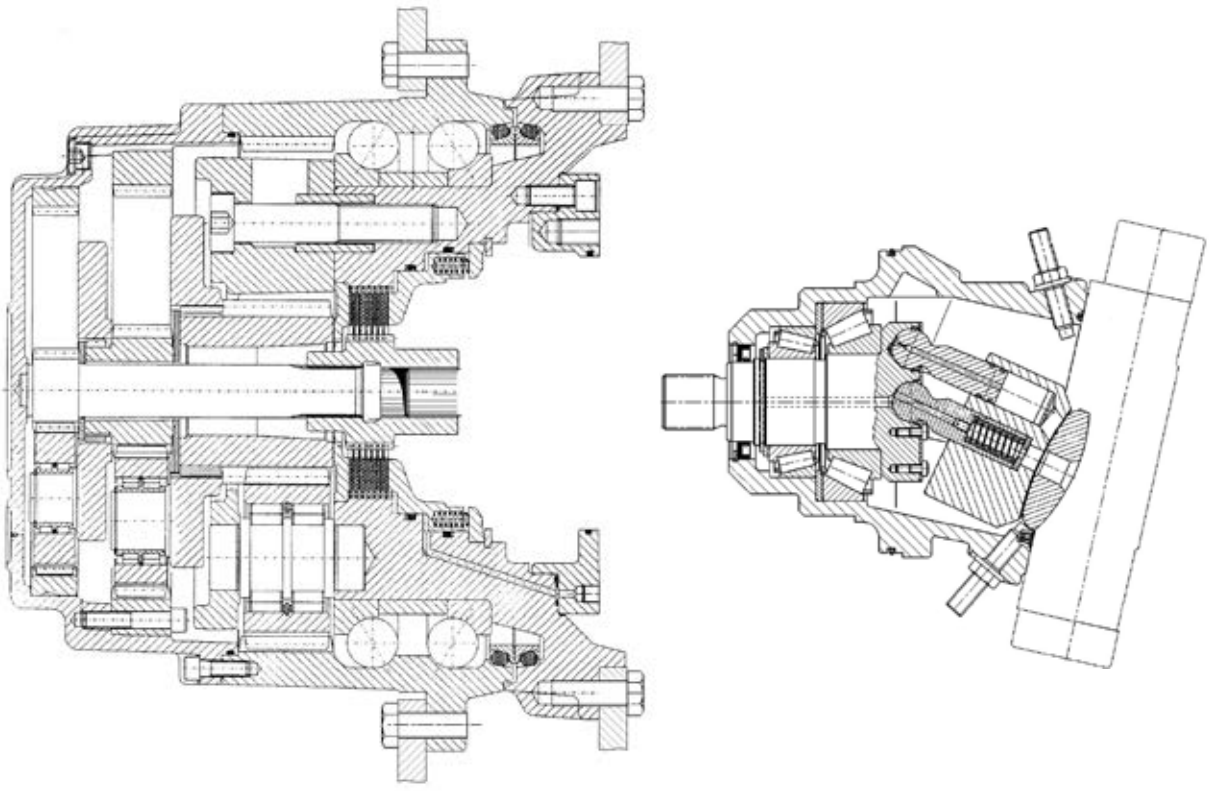
Supply oil from the drive pump enters the motor through the port plate to the pistons. During operation, high pressure supply oil enters the piston bores in the cylinder block. The position of the rotating group forces the cylinder block against the concave surface of the port plate and the pistons against the output shaft. Piston sliding action causes the rotating group to turn.

The cylinder block is attached to the output shaft which causes the output shaft to turn. During the second half of the motor rotation, low pressure is discharged as the pistons ride up to a higher position on the concave surface of the port plate. To reverse rotation, oil flow is reversed. During operation a small amount of supply oil flows through the center of each piston. This oil lubricates the piston to output shaft joint.

The rotating group angle is changed by the positioning piston in the motor port plate from minimum displacement to maximum displacement. When the electric control solenoid does not demand maximum displacement the motor runs at its fastest speed, subject to load. When the electric control solenoid demands maximum displacement, the motor runs at its slowest speed.



860C-297 **MOTOR PORT PLATE**



860C-290A **TRACK DRIVE MOTOR AND GEARBOX** 860C-286

TRACK SPEED SET-UP PROCEDURE

Refer to PRESSURE AND SPEED SETTING and HYDRAULIC OIL OPERATING RANGE chart in SECTION 3 of THIS MANUAL for specific values and TRACK TIMING CHART in THIS SECTION for specific track rpm values.

NOTE: Changes in margin pressure affect track speeds. Also the maximum displacement adjustment screw on the motor is not adjusted during this procedure.

Both left and right track drives have four speed settings which are dealt with in the following procedures, they are:

1. Forward – High
2. Forward – Low
3. Reverse – High
4. Reverse – Low.

There are only three adjustments required to set track speeds.

- Forward flow stop adjusting screw (located at the main control valve)
- Reverse flow stop adjusting screw (located at the main control valve)
- Motor minimum displacement adjustment stop (located at the drive motors)

TRACK SPEED ADJUSTMENT

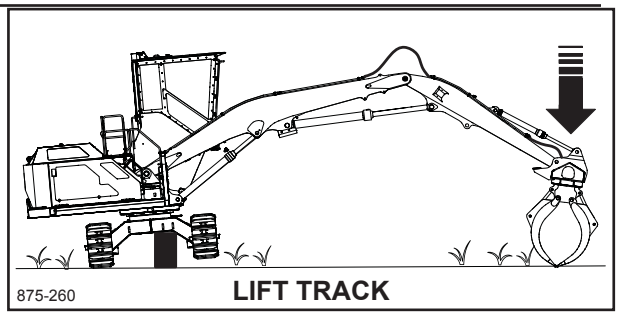
⚠ CAUTION

Use caution when in the cab as a slight touch of the controls can cause sudden rotation of the upper structure and boom assembly

⚠ CAUTION

Be aware of other personnel in the area. Operator is responsible for the safe operation of the machine.

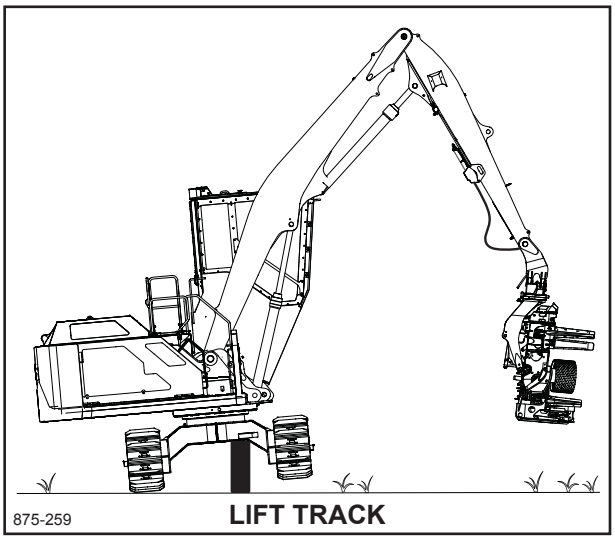
5. Make sure hydraulic oil is at operating temperature.
6. Remove both left and right side drive motor inspection covers.



875-260 **LIFT TRACK**

7. Swing boom to the side of machine.
8. Place the grapple on the ground. Force down with the boom controls to lift the track off the ground.

   or, for Harvesters



875-259 **LIFT TRACK**

   Use a jack of suitable design and capacity to safely lift the left track clear of the ground.

   Refer to serial number plate for machine weight (less attachment).

   Refer to ATTACHMENT MANUFACTURER'S MANUAL for correct attachment weight information.

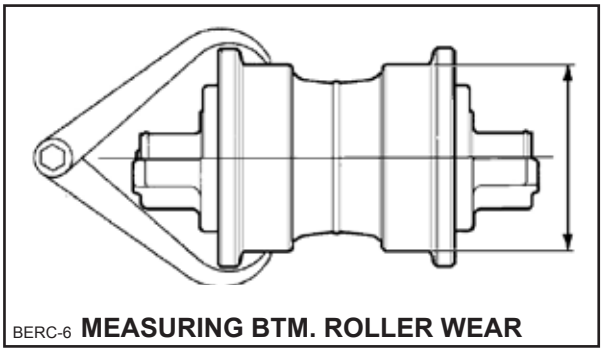
⚠ WARNING

Do not place arms, legs or body under track while in the raised position.

9. Use blocks to firmly support the undercarriage frame in a raised position.

BOTTOM ROLLER WEAR

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



BERC-6 **MEASURING BTM. ROLLER WEAR**

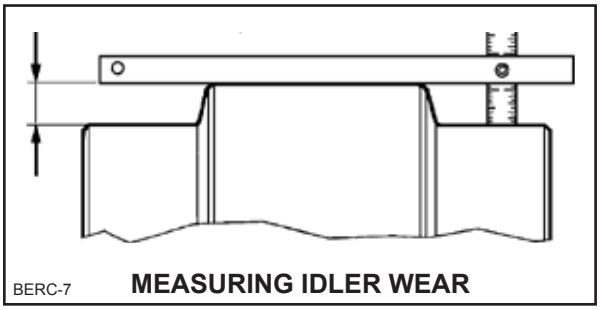
If accessibility to the rollers is impaired by guards, then concentrate on the front and rear rollers, these will be the most worn.

WEAR LIMITS FOR FH400 TRACK TYPE

Wear	Height
New roller	200.0 mm (7.87 in)
75% worn	188.5 mm (7.42 in)
100% worn	177.0 mm (6.97 in)

IDLER WEAR

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



BERC-7 **MEASURING IDLER WEAR**

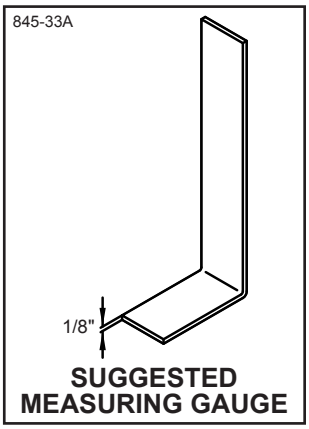
flange and parallel to the idler shaft.

WEAR LIMITS FOR FH400 TRACK TYPE

Wear	Height
New idler dimension	22.0 mm (0.866 in)
100% wear	28.0 mm (1.102 in)

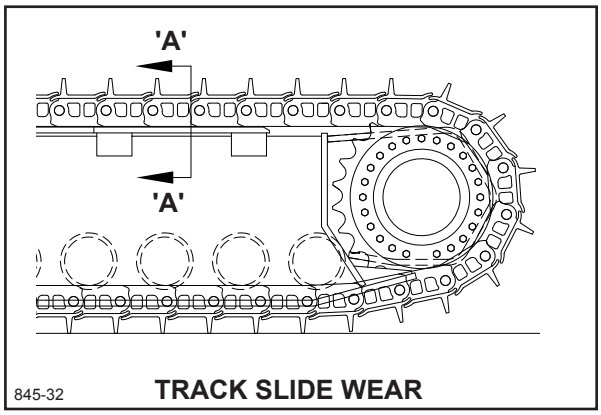
TRACK SLIDE WEAR

Track slide wear should be checked periodically to make sure that it does not go over the limit and cause damage to the chain link bushings.

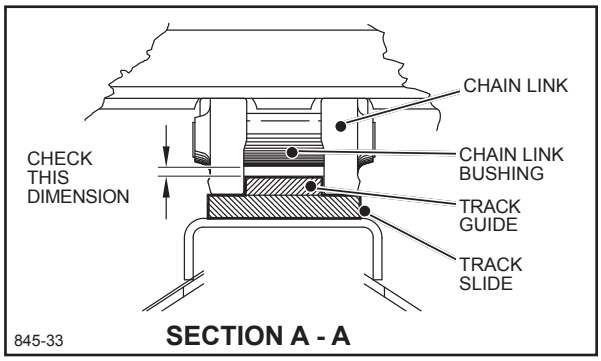


SUGGESTED MEASURING GAUGE

Since the checking area is not immediately visible, the measuring may be done using a gauge made from a piece of $^{1}/_{8}$ in. flat bar. The gauge is inserted down through the holes in the track and placed between the track guide and the track bushing. Make sure that dirt build-up does not interfere with the reading. Check at several locations. The ends of the track slides tend to wear first. The slides should be replaced if excessive wear is found.

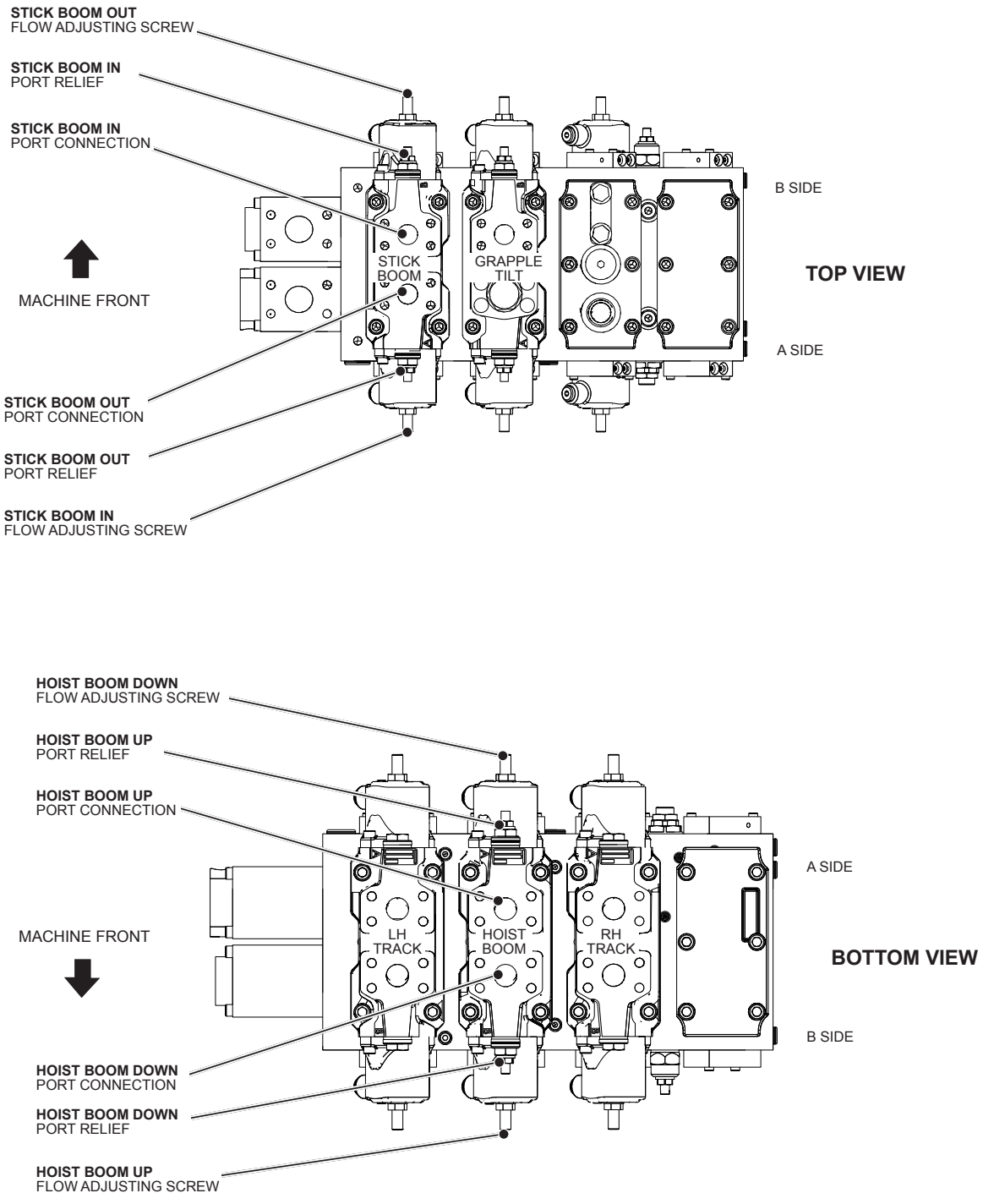


845-32 **TRACK SLIDE WEAR**



845-33 **SECTION A - A**

The wear occurs on the top of the track slide as the chain links slide along and this wear will reduce the clearance between the track guide and the chain link bushings. When this clearance disappears the chain link bushings will start to wear.



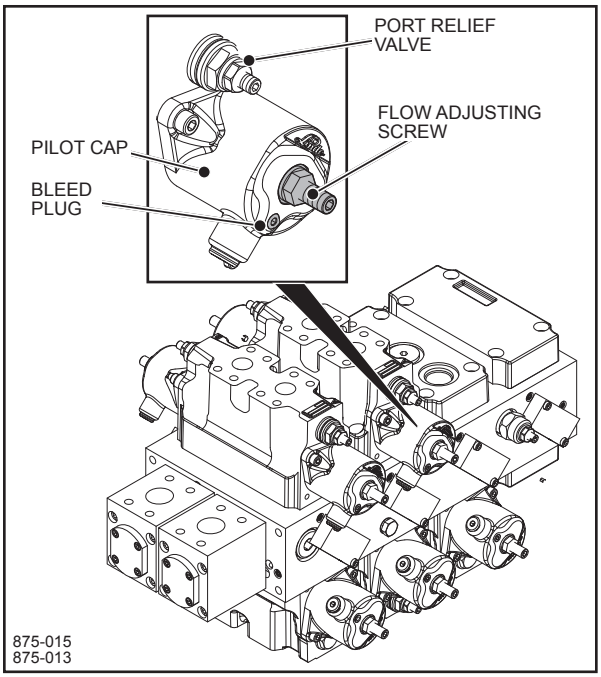
875-210
875-211

MAIN CONTROL VALVE, BUTT 'N' TOP/POWER CLAM

SETTING PORT RELIEF VALVES

HOIST BOOM, STICK BOOM, AND GRAPPLE TILT

Refer to PRESSURE AND SPEED SETTING and HYDRAULIC OIL TEMPERATURE OPERATING RANGE chart in SECTION 3 of THIS MANUAL for specific pressure and speed values.



NOTE: Constant adjustment of the locknut on the port relief valve adjusting screws will eventually cause the seal in the nut to break down and leak. Because of this it is best to keep the adjusting procedure brief.

1. Make sure the hydraulic oil is at operating temperature.
2. Connect a 0 – 700 bar (0 – 10,000 psi) gauge to the (P) test port on the main control valve.
3. Start engine and set throttle speed to LOW IDLE or slightly above (to prevent stalling).

4. To activate the pilot system, close the cab door and place the pilot reset lever in the down (ON) position.

5. Use the IQAN MD3 to set fan service mode to ON. Refer to COMPUTER – ADJUSTMENT MENU – COOLING FAN SERVICE MODE SECTION 6 of THIS MANUAL.

Tigercat 875 Logger
SECTION 15 – SWING

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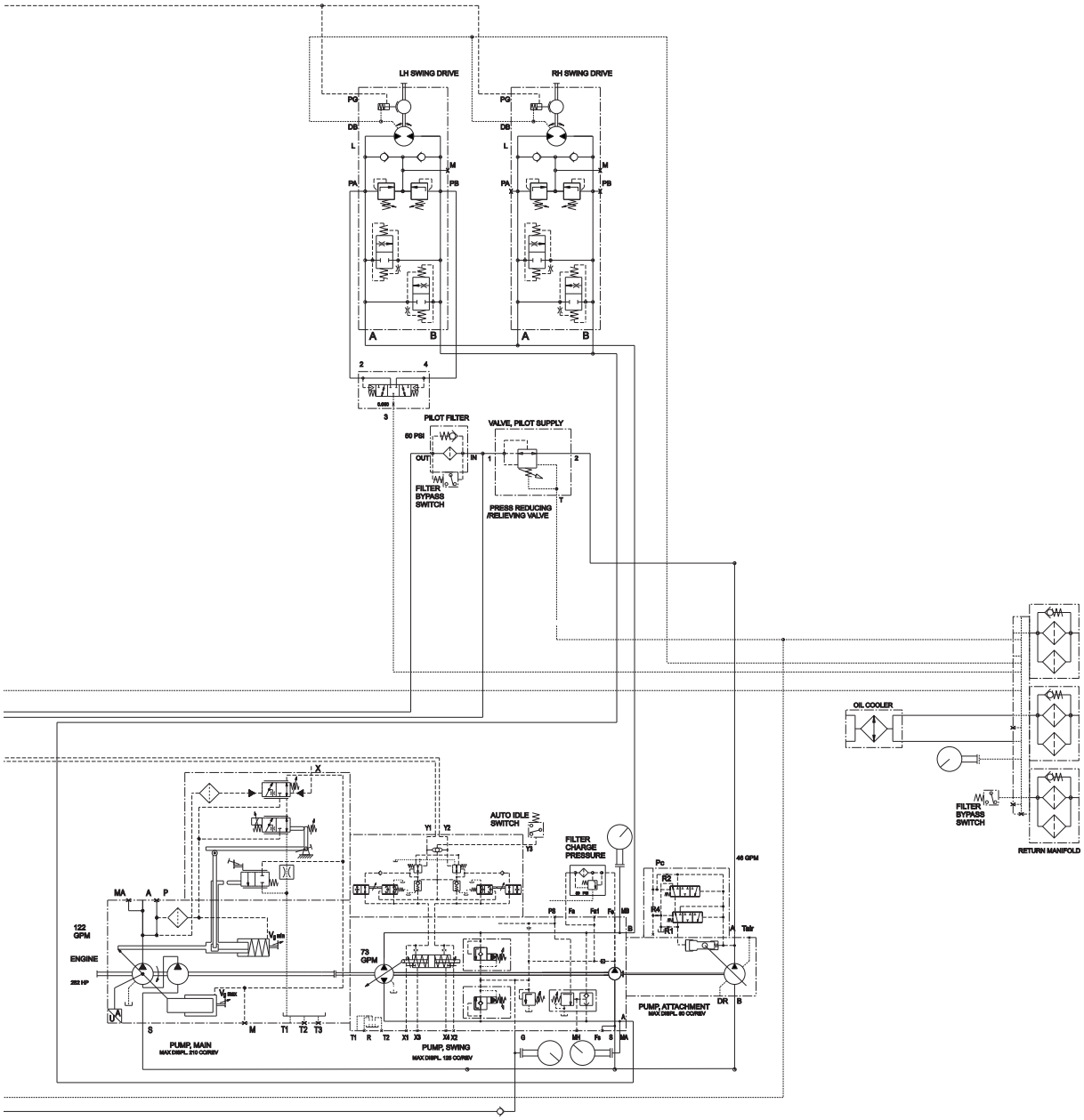

SWING DRIVE HYDRAULIC SCHEMATIC

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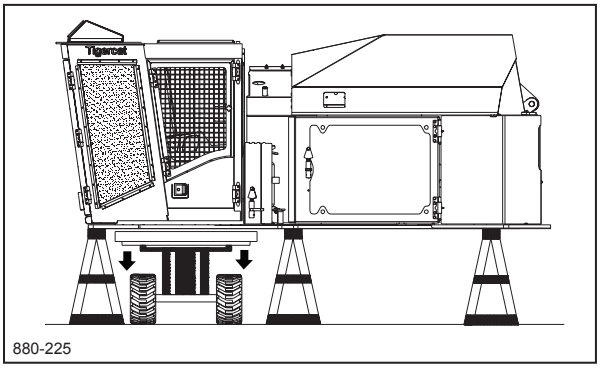
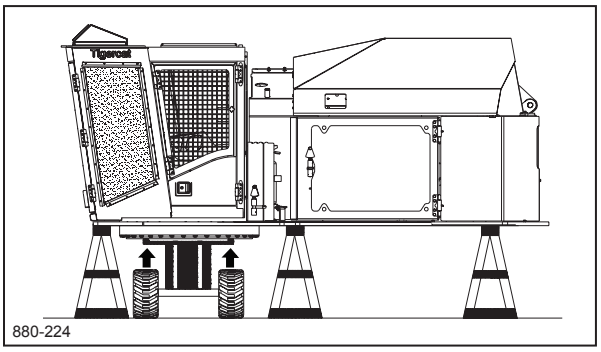
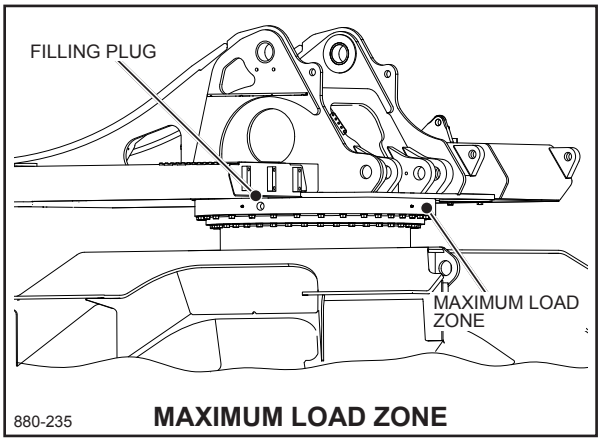


17. Lower and remove the swing bearing.
18. Remove from all machined surfaces (swing bearing and upper structure) nicks, burrs, paint, welding beads and all foreign material.



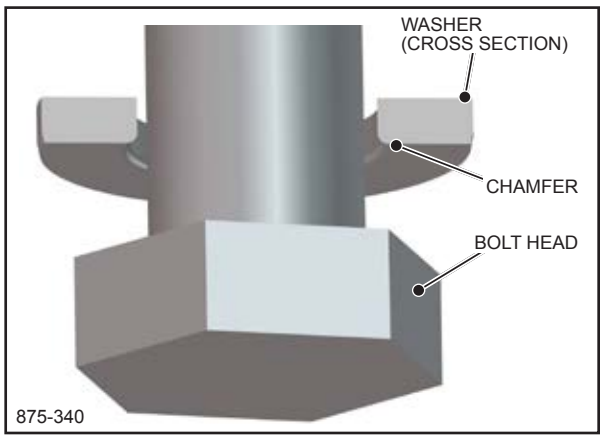
19. Position inner race so that 'G' marking or heat treatment hardness gap is 180° from filling plug.
20. Using a lift truck, position the new swing bearing under the upper structure. Position the swing bearing grease fittings and filling plug with the undercarriage as previously noted.



MAXIMUM LOAD ZONE

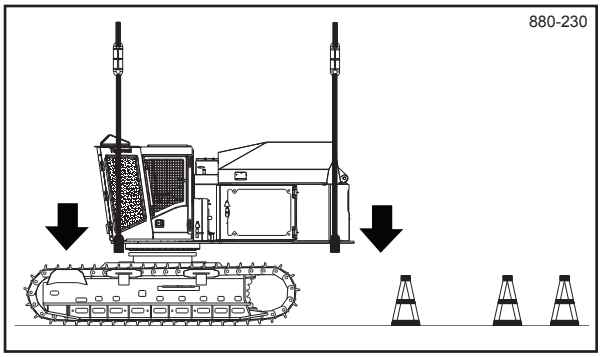
NOTE: Mount the swing bearing outer race with the filling plug 90° to the maximum load zone.

21. Lubricate the threads of new bolts with lithium based EP2 grease containing molybdenum disulfide.
22. Install the bolts and washers in the outer swing bearing race. Finger tighten the bolts until there is no gap between the washer and outer bearing race.

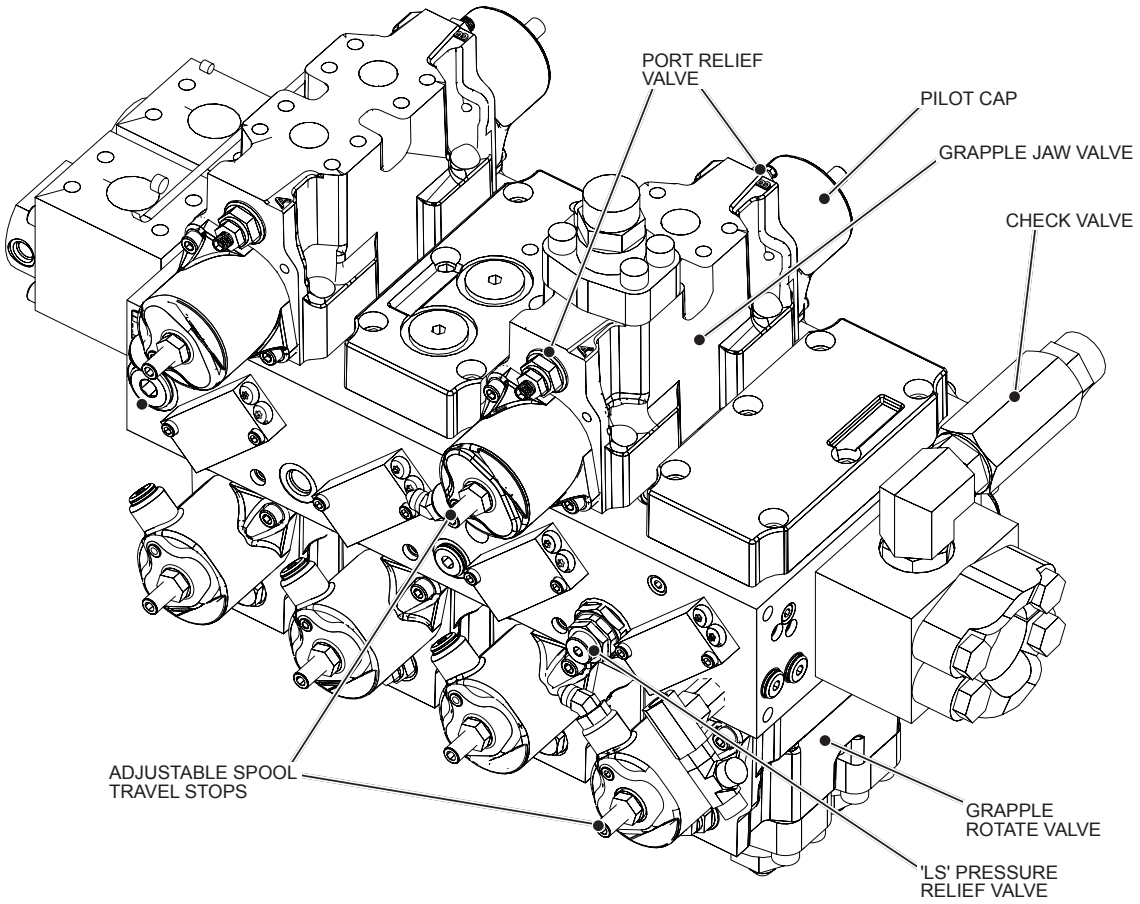


IMPORTANT!
The washers must be positioned on the bolt so the inner diameter chamfer on the washers face towards the bolt heads.

23. Adjust the swing bearing backlash. Refer to ADJUST SWING BEARING BACKLASH in THIS SECTION.
24. Make sure that all nicks, burrs, paint, welding beads and foreign material have been removed from the undercarriage flange and swing bearing outer race



25. Position the upper structure on the undercarriage.
26. Lubricate the threads of new bolts with lithium based EP2 grease containing molybdenum disulfide.



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MAIN CONTROL VALVE, PULPWOOD GRAPPLE SYSTEM

The grapple jaws open/close and grapple rotate motor are controlled by two of six valve sections on the main control valve. Each pulpwood grapple valve section has port relief valves with anti-cavitation features that protect the circuits from abnormally high pressures induced by the working load.

Adjustable spool travel-stops on each pilot cap can be adjusted to limit spool travel and control the flow of oil to the function(s). Controlling the flow of oil to the cylinders and motor also controls the operating speed.

The flow of oil from the grapple rotate valve section can also be adjusted electronically by controlling the pressure of pilot oil to the valve. Refer to ELECTRONIC ADJUSTMENT PROCEDURE – PULPWOOD GRAPPLE ROTATE in this section.

To adjust the relief valves refer to SETTING PORT RELIEF VALVES in THIS SECTION.

To adjust the spool travel stops refer to ADJUST OIL FLOW – CYCLE TIMES in THIS SECTION.

Refer to MAIN CONTROL VALVE DESCRIPTION in SECTION 4 of THIS MANUAL for additional information about the main control valve.

MD3 ELECTRONIC ADJUSTMENT PROCEDURE

PULPWOOD GRAPPLE ROTATE

Adjustments to grapple rotate with the IQAN MD3 computer control system electronically adjusts the performance of this function to suit operating conditions. Refer to COMPUTER – MAIN MENU PAGE-ADJUST MENU – EXAMPLE: GRAPPLE OPEN/CLOSE in SECTION 6 of THIS MANUAL for an example of adjustment menu navigation.

NOTE: Update of the IQAN program may be required as a result of PSB updates, program improvement updates or other component updates.

1. Using the IQAN MD3 from any screen MENU BUTTON – ADJUST – HYDRAULICS. Refer to MAIN MENU PAGE – ADJUST MENU in SECTION 6 of THIS MANUAL for more information.

2. Scroll UP/DOWN to select ROTATE/PUMP2. Press OK once then press OK again.
3. To choose the plus (rotate CCW) or minus (rotate CW) direction for adjusting, use the appropriate function button F3 or F4.

Refer to COMPUTER – MAIN MENU PAGE-ADJUST MENU – HYDRAULICS – CONTROL ADJUSTMENT SETTINGS in SECTION 6 of THIS MANUAL for a description of min/max current, Start/Stop slope.

4. Min Current is the first choice that can be adjusted. The range is 0 – 500 mA. Scroll UP/DOWN to reset value, then press OK. The selection will move to the next adjustment, Max Current.

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SECTION 17 – LOADER GRAPPLE, BUTT 'N' TOP/POWER CLAM

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ROTATE FLOAT

Adjustments to rotate float with the IQAN MD3 computer control system electronically adjust the performance of this function to suit operating conditions. Refer to COMPUTER – MAIN MENU PAGE-ADJUST MENU – EXAMPLE: GRAPPLE OPEN/CLOSE in SECTION 6 of THIS MANUAL for an example of adjustment menu navigation.

NOTE: Update of the IQAN program may be required as a result of PSB updates, program improvement updates or other component updates.

1. Using the IQAN MD3 from any screen MENU BUTTON – ADJUST – HYDRAULICS. Refer to COMPUTER – MAIN MENU PAGE-ADJUST MENU in SECTION 6 of THIS MANUAL for more information.

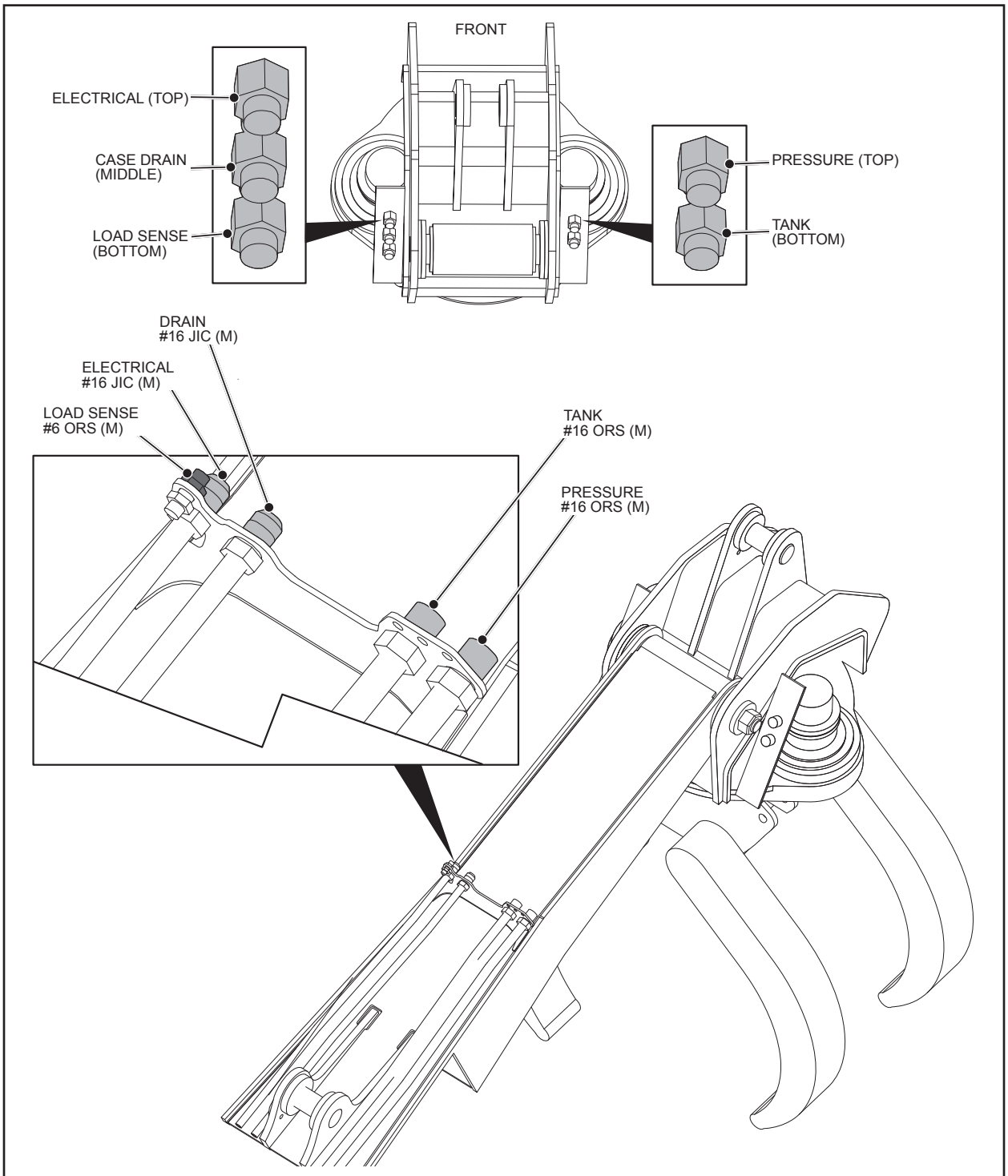
2. Scroll UP/DOWN to select ROTATE FLOAT COUT. Press OK once then press OK again.

   Refer to COMPUTER – MAIN MENU PAGE-ADJUST MENU – HYDRAULICS – CONTROL ADJUSTMENT SETTINGS in SECTION 6 of THIS MANUAL for a description of min/max current, Start/Stop slope.

3. Min Current is the first choice that can be adjusted. The range is 0 – 500 mA. Scroll UP/DOWN to reset value, then press OK. The selection will move to the next adjustment, Max Current.

ATTACHMENT INSTALLATION

To prevent excessive loss of hydraulic oil from the system while servicing or installing the attachment, it may be necessary to install a vacuum on the hydraulic tank. Refer to HYDRAULIC SYSTEM OPERATION – HYDRAULIC TANK VACUUM INSTALLATION in section 4 of THIS MANUAL.



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HOSE CONNECTIONS FOR LOADER BUTT 'N' TOP/POWER CLAM

CAB TILT CYLINDER REPLACEMENT, BLEEDING AND FILLING PROCEDURE

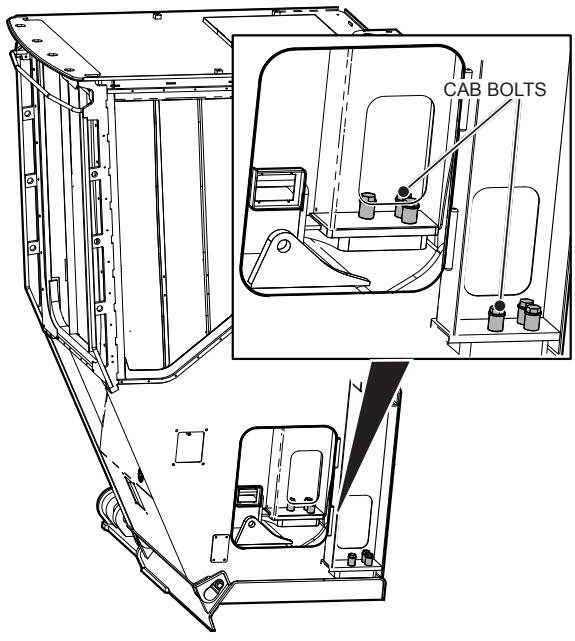
⚠ DANGER

It is essential to purge all air from cab tilt cylinder prior to using cylinder to tilt cab. Failure to purge all air out of the cylinder can result in uncontrolled cab dropping while tilting. This can result in tilt cylinder failure, restraint cable failure, cab and frame damage and serious injury or death.

⚠ DANGER

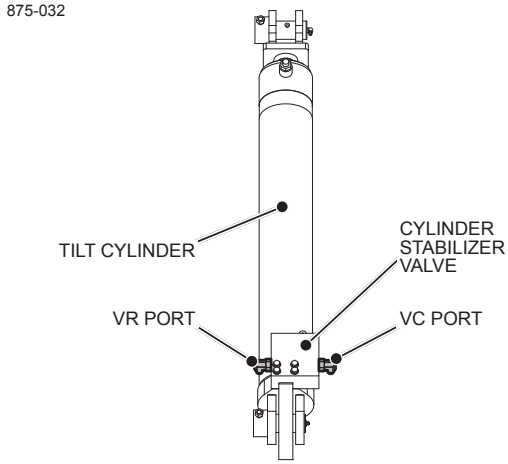
All personnel to be clear of cab while tilting. Serious injury or death could result from crushing. Always tilt cab fully forward or backward.

1. Park the machine on level ground and engage the swing brake.
2. Position attachment securely on the ground.
3. Make sure there is enough clearance available around and above the machine to avoid contact with power or telephone lines.
4. Do not park on a hillside or incline.



CAB TILT BOLTS

5. Cab to be in operating position (up) with all six cab retaining bolts secured.



CAB TILT CYLINDER - BOTTOM VIEW

6. Locate ports VR and VC on the cylinder stabilizer valve on cab tilt cylinder. Label the hoses to the ports for reassembly.

⚠ DANGER

When working with high pressure hydraulic systems, the pressure must be relieved before any disassembly can occur. Failure to do so can result in product damage and/or severe personal injury.

7. Slowly loosen and remove hoses from the power pack to the tilt cylinder stabilizer valve. Plug the ends to avoid losing excess oil. Repeat the process for the hose leading from the cylinder stabilizer valve to the rod end of the cylinder.
8. Unscrew the cylinder stabilizer valve mounting bolts and remove. Install the cylinder stabilizer valve on the new tilt cylinder.
9. Remove the rod end hydraulic adapter from original cylinder and install on new cylinder,
10. Remove pin keeper bolts and pins (save these components for reassembly) and remove cylinder.

    NOTE: Do not install and pin the new cylinder until all air has been bled from the cab tilt hydraulic system.