Tigercat®

822D/L822D FELLER BUNCHER

SERVICE MANUAL

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Tigercat 822D/L822D Feller Buncher

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 5.0, APRIL 2017

CAB EXITS

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

Front door–This is the main point of entry and is the only door to 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 SWITCH–FRONT in THIS SECTION.

Side 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 not equipped with a safety interlock switch and therefore, when left open, will not deactivate the pilot controls in the cab. Always turn OFF the engine before using the side door exit.

Escape hatch–This is a third cab exit for use if the front exit or side door exit become blocked. This hatch is not equipped with a safety interlock switch and therefore, when left open, will not deactivate the pilot controls in the cab. Always 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.

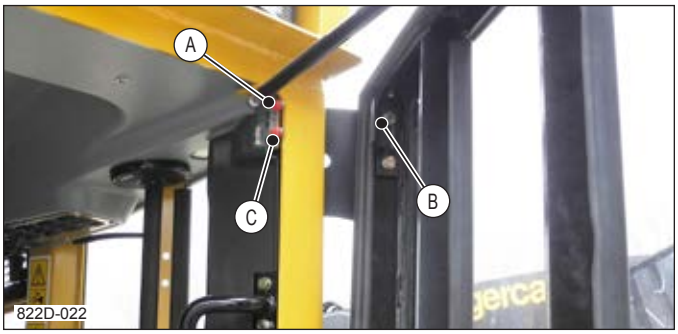
All operators should practice using all the cab exits to become familiar with escape procedures should they need to perform them in the dark, when the machine is in a rolled position, or other possible adverse conditions.

All three exits should be checked to make sure they are operational and will function in an emergency. The safety interlock mechanism on the front door and, the side door and 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 2.

INTERLOCK DOOR SWITCH–FRONT



A Interlock Door Switch
B Actuator (On Door)
C Interior Cab Light Switch

The front door is equipped with an interlock door switch to prevent the machine from being operated while the front door is open (pilot system is turned OFF).

Push the red PILOT OFF interlock switch and confirm the PILOT OFF Icon is activated (yellow) on the computer display before removing seat belt. DO NOT use the front door interlock switch to turn pilot OFF.

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

WARNING

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

TO OPERATE

Close the front door and press the green PILOT ON RESET interlock switch. The PILOT ON icon will be activated (green) on the computer display.

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

WARNING

- When the engine is running, do not allow anyone in areas of the machine where they may be crushed by moving components.

- Do not change any pressure or relief settings 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.
- When opening or closing the power operated engine door, watch for personnel in door areas.

- If the engine is running inside a building, make sure sufficient ventilation is available to prevent a build-up of toxic exhaust fumes. Run the engine only when it is necessary for testing or adjustments.
- Work in a ventilated area. If it is necessary to run an engine in an enclosed area, use an exhaust pipe extension to allow toxic exhaust fumes to be routed outdoors.
- If you don't have an exhaust pipe extension, either work outside, or open the shop doors.

- Dispose of fluids properly. Do not pour fluids into the ground, stream, pond or lake.
- Before draining any fluids, know the proper way to dispose of them.
- When performing required hydraulic checks and blade speed adjustments, install the saw blade guard. Refer to the ATTACHMENT MANUFACTURER'S DOCUMENTATION.

- 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.

⚠ WARNING

DO NOT operate this machine to lift or move any objects other than what it is designed to lift or move.

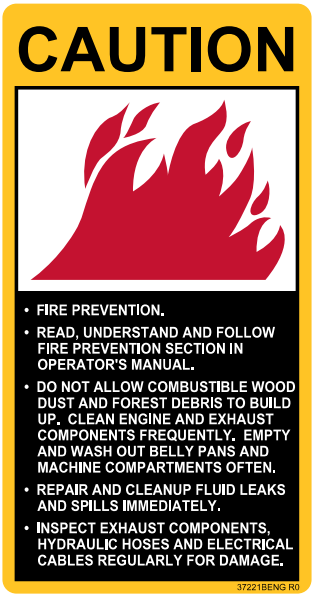
The boom system is intended for use in tree felling applications only.

- **Do not use the boom to service other equipment.**
- **Do not use the boom to lift items such as tires, engines, cylinders, boom components, etc.**
- **Do not modify the boom system.**
- **Do not add hooks or lugs to the boom for the purpose of attaching lifting rigging.**
- **Do not use the attachment for any purpose other than the intended felling function.**

Maintain a safe operating distance between the machine, the workers and all other personnel. It is the duty of the operator to ensure no person approaches the machine while in use.

Failure to follow the above instructions could result in serious injury or death.

- **Remain with the machine** for at least 45 minutes at the end of operations while the machine cools.
- **Remove all keys,** lock equipment and fuel fill cap at the end of operations to reduce the risk of vandalism.
- **Be cautious when smoking.** An open flame, a lighted cigarette, etc., should not be permitted around any vehicle, especially during fuelling operations or when the fuel system is open to the atmosphere or when servicing batteries.



- **AFTER transporting (trucking) a machine** from one job site to the next, open all doors and access panels and blow off any debris that may have repositioned itself onto the engine and exhaust parts due to wind turbulence caused by the journey.
- **Before starting repair work,** such as welding, the surrounding area should be cleaned and a fire extinguisher should be close by.
- **Store rags and other combustible materials** in a safe, fireproof location.
- **Do not use the machine** on top of or to push piles of burning timber. A machine fire will most probably result.

NOTICE

Equipment fires adversely effect your ability to log, may increase your insurance premiums dramatically or prevent you from obtaining insurance coverage at all.

WHAT TO DO TO PREPARE FOR A MACHINE FIRE

- Prevent the fire from happening in the first place by ensuring all machine systems are frequently inspected and always well maintained.
- All hand held fire extinguishers must be charged and in working order. Fire extinguishers require routine care. Follow the manufacturer's instructions for inspection and maintenance shown on the label of the fire extinguisher and in the FIRE EXTINGUISHER MANUFACTURER'S DOCUMENTATION.
- Any pressurized water systems on the machine (if applicable) must be charged and in working order. Refer to PRESSURIZED WATER SYSTEM MAINTENANCE in SECTION 3.
- You must have the proper fire extinguishers on site. Most fires involving mobile forestry equipment will be Class **A** or **B**.

  Dry chemical extinguishers should be rated **ABC** and pressurized water extinguishers should be rated **A**.

  Class **A** fires involve ordinary combustibles such as wood, cloth, paper, rubber and many plastics, Class **B** fires occur with flammable liquids such as diesel fuel, oil and grease and Class **C** fires apply to energized electrical equipment.
- Make sure the nozzle of any hand held extinguisher and pressurized water system available on the machine and at the work site fits within the fire extinguisher access holes in the doors of the machine.
- The fire detection system* must be in working order. Refer to FIRE DETECTION SYSTEM in SECTION 2.
- The fire suppression system** must be charged and in working order. Refer to FIRE SUPPRESSION SYSTEM (OPTIONAL) in SECTION 2.
- You must be familiar with the recommended procedures for fire contained in the emergency action plan of your company.

STORED ENERGY HAZARD

This label warns of a STORED ENERGY HAZARD.

The machine is equipped with an accumulator. The accumulator has **stored energy** in the form of hydraulic pressure. Servicing the accumulator, hydraulic tank or any hydraulic components before releasing pressure **COULD RESULT IN DEATH OR SERIOUS INJURY.**

DO NOT SERVICE ACCUMULATOR OR ANY HYDRAULIC COMPONENTS BEFORE RELEASING PRESSURE.

ELECTROCUTION HAZARD

This label warns of a potential ELECTROCUTION HAZARD. Contact with electric lines **WILL RESULT IN DEATH OR SERIOUS INJURY!**

Before beginning work in any area, study the area thoroughly and become familiar with any potential hazards, especially electrocution hazards from electric lines.

DO NOT MOVE ANY PART OF THE MACHINE OR LOAD WITHIN 3 M (10 FT) PLUS TWO TIMES LINE INSULATOR LENGTH OF ANY ELECTRIC LINES!

STORED ENERGY

The saw blade stores energy from the hydraulic motor between tree cuts so it can supply up to 1000 hp during a one second tree cut. However, this rotational energy, if misapplied, can result in wood materials or other objects being thrown strongly enough to cause damage and injure people.

BE AWARE OF THE HAZARDS

Users of machines with disc saw felling heads must be aware of all safety precautions. In this section, some previously unknown, unexpected safety hazards are illustrated and explained. These should be studied before use of the machine and then reviewed again after use has begun.

SAFE PRACTICES

It is understood and expected that logging organizations and operators must develop and practice additional rules to suit particular conditions of terrain, trees, soil and job requirements. The information provided in this section is intended to assist towards a quicker understanding of how and why things can happen when a high speed disc saw is in use and to assist in the development of safe operating practices.

It should not be assumed that all possible dangers have been discovered and described in this section.

OTHER INSTRUCTIONS

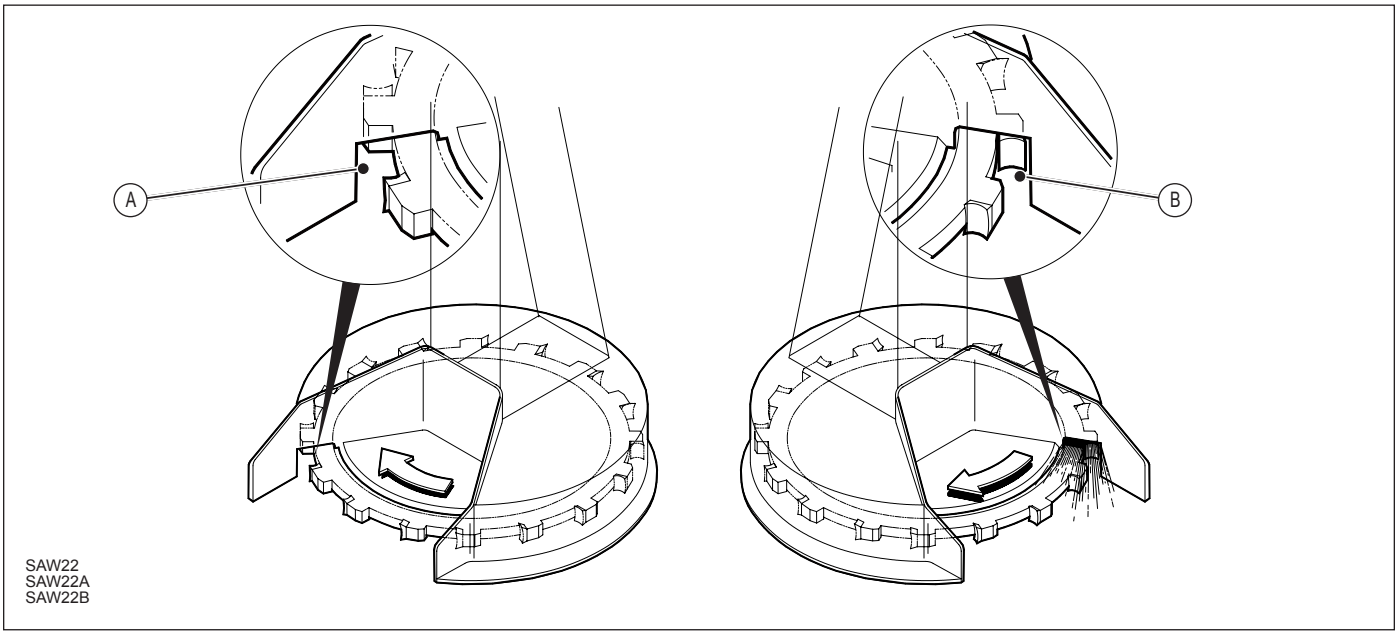
All instructions contained in the operator and service manuals for use and maintenance of Tigercat disc saw heads and other disc saw heads installed on Tigercat machines must be read, understood and followed.

DANGERS

Here are the most common means by which a rotating disc saw can cause harm by throwing:

- The normal throwing of chips from the cut.
- Soil particles are thrown from the ground.
- Loose chunks of wood encountered or produced are tossed by the exposed blade.
- Sticks and debris falling onto the blade or sliding across the blade are struck by the teeth and thrown.
- Metal pieces from the blade or from encountered objects are thrown.
- Wood pieces enter the saw housing and are expelled by the blade.
- In very peculiar cases the saw can throw long lengths of wood as spears.

SAW HOUSING ENTRANCE AND EXIT SPACE



Saw Bade Entrance and Exit Space	
A Ingoing Opening of the Saw Blade Housing	B Outgoing Opening of the Saw Blade Housing

To avoid the ingestion of materials into the housing space above the disc (and later ejection) the ingoing entrance for the saw rim of teeth is kept as small as practical. It is important that this high wear area be maintained at its original size and shape.

The outgoing opening is large enough to allow the housing to clean itself and allows most things inside to be thrown out. Its throw direction and angle must be respected. A long snout on the ingoing side reduces this danger.

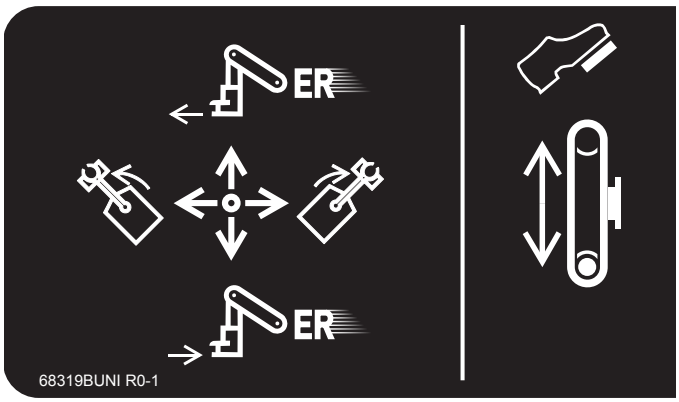
IMPORTANT!

This manual is applicable to factory installed machine functions and controls. It does not take into account any changes or modifications made after shipment. Verify all functions before operating this machine.

JOYSTICKS CONTROLS

Each joystick has four primary functions as outlined below:

LEFT JOYSTICK



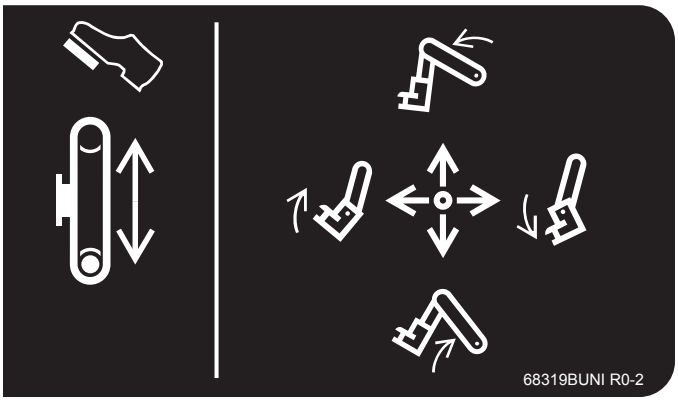
STICK BOOM, FORWARD/BACK

- Move the joystick back to move the boom IN toward the machine.
- Move the joystick forward to move the boom OUT away from the machine.

SWING, LEFT/RIGHT

- Move the joystick right to swing the upper structure to the CW (RIGHT).
- Move the joystick left to swing the upper structure to the CCW (LEFT).

RIGHT JOYSTICK



HOIST BOOM, UP/DOWN

- Move the joystick back to raise the boom UP.
- Move the joystick forward to lower the boom DOWN.

HEAD TILT, FORWARD/BACK

- Move the joystick right to tilt the felling head FORWARD.
- Move the joystick left to tilt the felling head BACK.

The programming of the heater unit in the cab determines when the heater is ON and OFF.

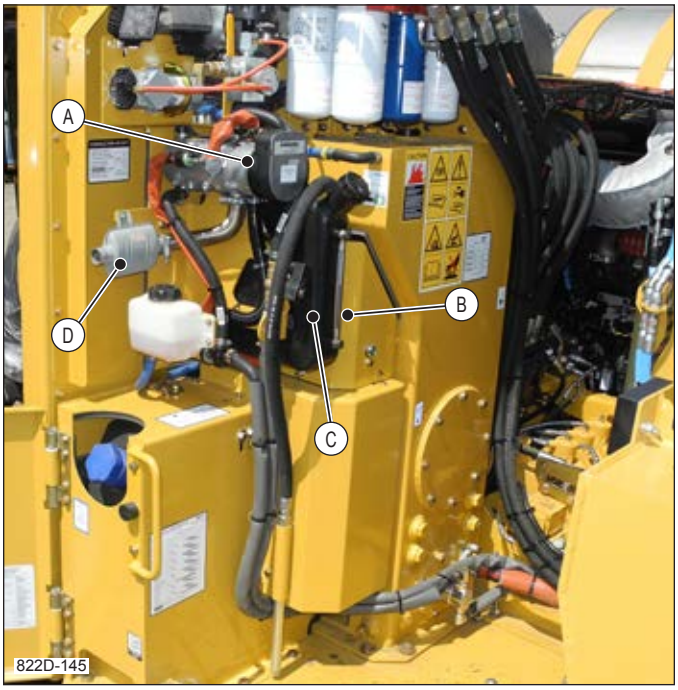
Consult the MANUFACTURER'S DOCUMENTATION for additional information.

IMPORTANT!
During warm weather when the engine coolant heater is not in use, operate the heater for a period of 20 minutes monthly. This circulates engine coolant to all components of the system.

NOTICE

Open the engine coolant shut-off valve before operating the coolant heater. Damage to the engine coolant heater pump may result if the valve is closed.

Refer to ENGINE COOLANT SHUT-OFF VALVES in THIS SECTION for more information.



822*3001–822*3042

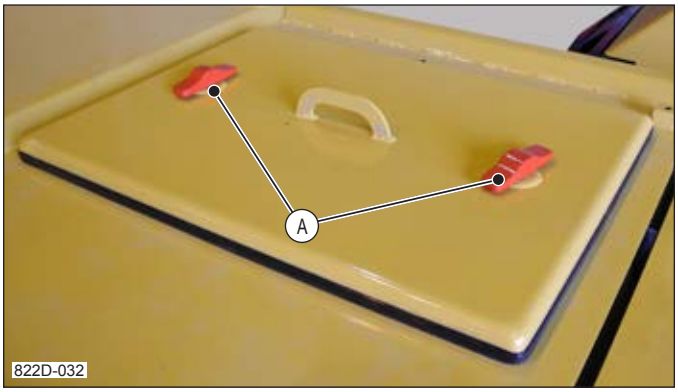
822*3043–822*4000	
Engine Coolant Heater Components	
A	Engine Coolant Heater
B	Heater Fuel Tank
C	Heater Fuel Level Gauge
D	Heater Exhaust

ROOF ESCAPE HATCH

A Escape Hatch
B Escape Hatch Internal Retaining Knobs

If you are unable to use either the front or side doors, due to blockage or lack of access, use the roof escape hatch (third emergency exit). Turn OFF the engine before using this exit.

There are two retaining knobs on the inside to allow removal of the hatch. These knobs should only be hand-tightened to allow them to be unscrewed in case of an emergency.



A Escape Hatch External Retaining Knobs

This escape hatch can also be opened from the outside of the cab. Turn both knobs counterclockwise. If they are too tight to turn by hand, you can kick the knob at either end to loosen it. Once the knobs are removed, lift the escape hatch from the cab roof.

⚠ WARNING

Removal of these knobs from the outside will cause internal knobs and brackets to fall freely, possibly striking the operator and causing additional injury.

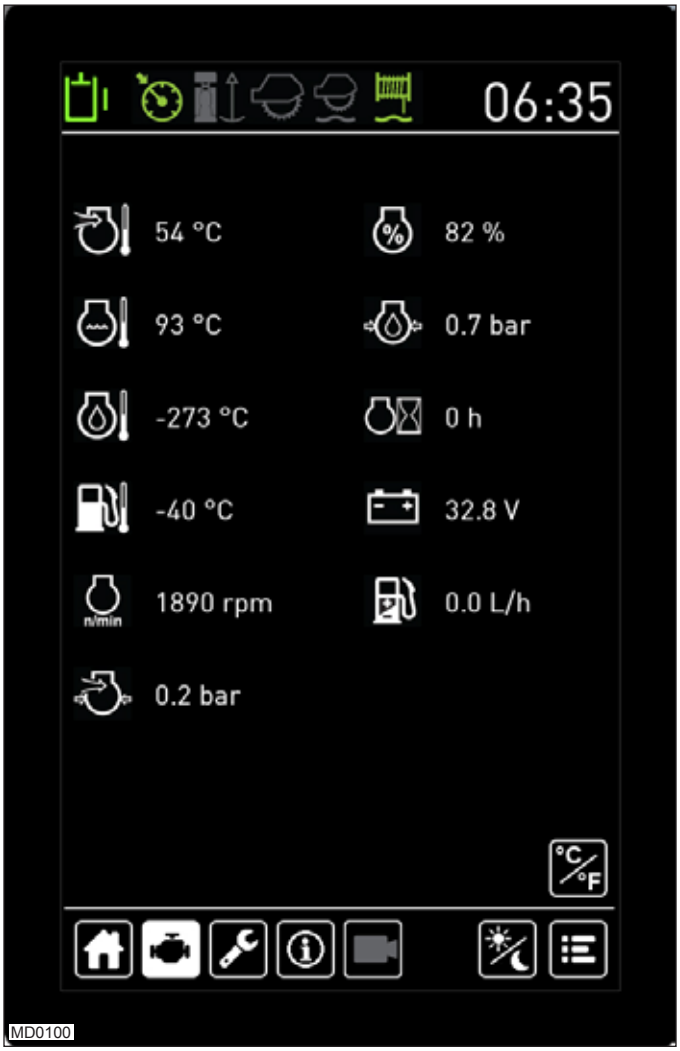
For more information refer to EMERGENCY EXITS–MAINTENANCE GUIDE in SECTION 3.

⚠ WARNING

Heat from sun exposure can cause the exit seals to bond to the cab's painted surfaces. Careless use of glues or sealants to repair leaks also bond the exit panel.

Failure to follow proper maintenance procedures can result in the exit being unusable in an emergency.

ENGINE MENU



From the home screen, tap the Engine icon.

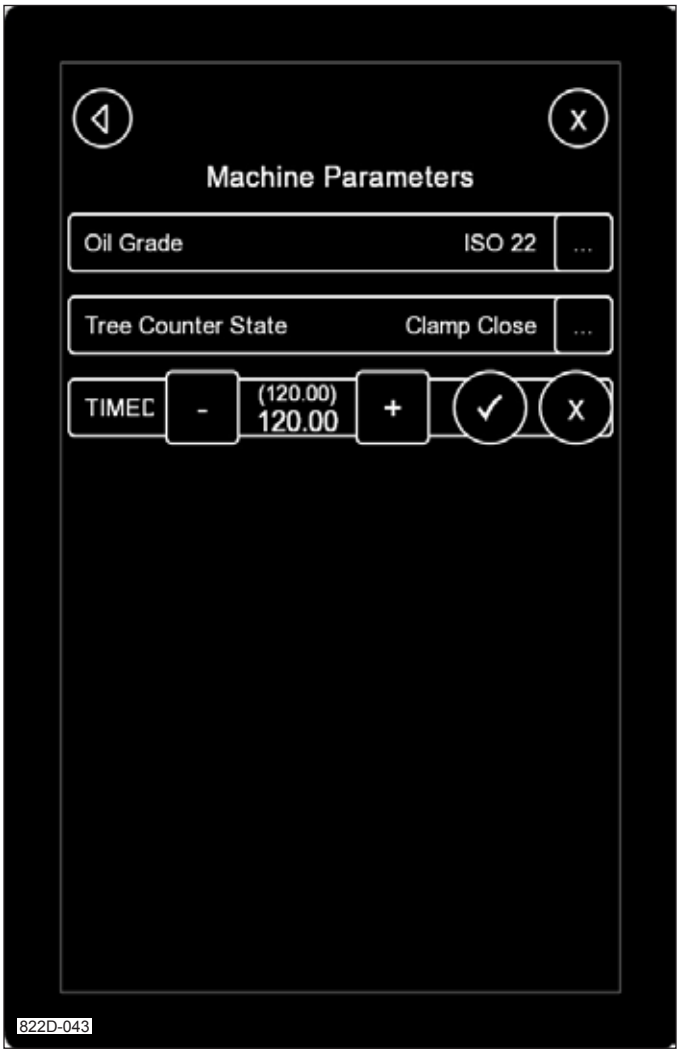
The Engine menu icon is now active and the related functions are displayed:

- Charge Air Temperature (°C or °F)
- Engine Coolant Temperature (°C or °F)
- Engine Oil temperature (°C or °F)
- Fuel Temperature (°C or °F)
- Engine Speed (rpm)
- Air Intake Boost Pressure (bar or psi)
- Engine Load %
- Engine Oil Pressure (bar or psi)
- Engine Hours
- Battery Voltage (Volts)
- Fuel Rate (L/h or gph instantaneous)

Tap to toggle between metric or imperial units of measure.

TIMED PURGE INTERVAL

From the Machine Parameters menu, tap the TIMED PURGE INTERVAL bar.



This is the fan purge interval (how often the fan runs a purge cycle).

The TIMED PURGE INTERVAL is set to a default value of 120.00 seconds. Tap the - / + buttons to adjust the setting value.

HYDRAULICS

From the Adjust menu, tap the Hydraulics bar.

The Hydraulics menu displays the following selections:

- ACCUM O/C
- CLAM O/C
- WRIST CW/CCW

Tap Min to enter the adjustment mode. Activate and hold the Accumulator Open function on the joystick and at the same time tap the - / + buttons to adjust the ACCUM O/C Min Minus setting so the accumulator just starts to creep.

NOTE: When in the ACCUM O/C Max Minus line, only the Max current is applied to the accumulator when the function is activated.

NOTE: The Max current range is 0–700 mA. The default setting is 600 mA.

Tap Max to enter the adjustment mode. Activate and hold the Accumulator Close function on the joystick and at the same time tap the - / + buttons to adjust the ACCUM O/C Max Minus setting. It may be necessary to switch between Accumulator close and Accumulator open on the joystick to set this adjustment.

Adjustment of this setting determines the speed of the accumulator when closing. Increasing this setting speeds up the accumulator; decreasing the setting slows it down.

NOTE: The Start current range is 0–1000 ms. The default setting is 0 ms.

Tap Start to enter the adjustment mode. Tap the - / + buttons to adjust the ACCUM O/C Start Minus setting. Adjustment of this setting (along with the ACCUM O/C Min Minus setting) determines how the accumulator will begin to open. Increasing this setting results in a less aggressive start; decreasing the setting results in a more aggressive start.

NOTE: The Stop current range is 0–1000 ms. The default setting is 0 ms.

Tap Stop to enter the adjustment mode. Tap the - / + buttons to adjust the ACCUM O/C Stop Minus setting. Adjustment of this setting (along with the ACCUM O/C Min Minus setting) determines how the accumulator stops when the function is deactivated. Increasing this setting results in a less aggressive stop; decreasing the setting results in a more aggressive stop.

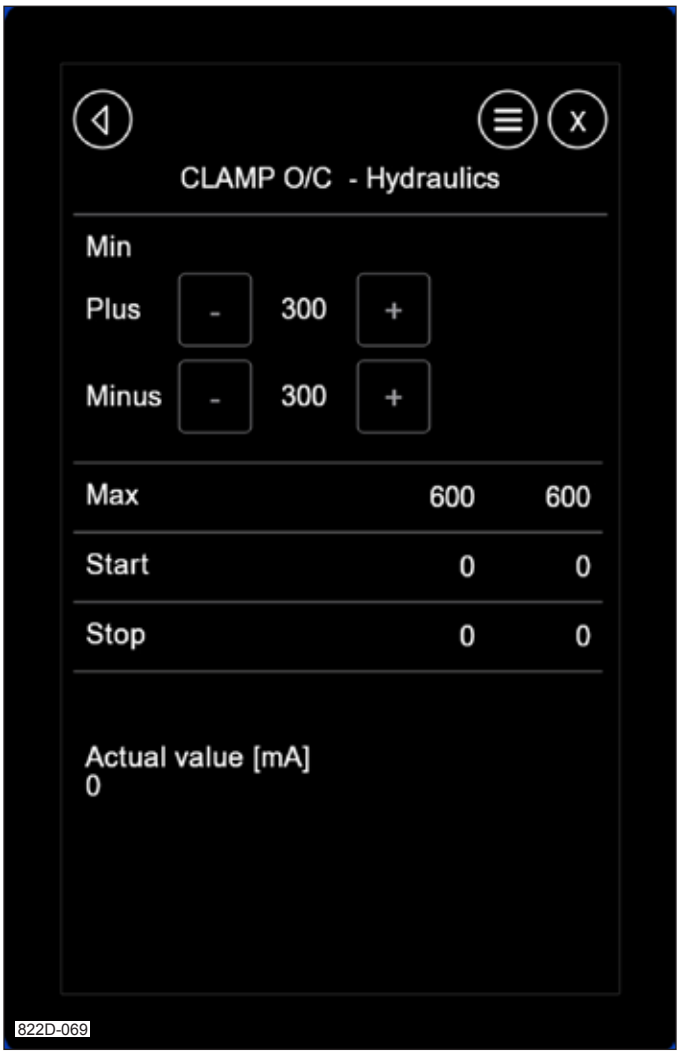
The ACCUM O/C Minus Open adjustment is now complete.

ACCUMULATOR DEFAULT SETTINGS

At any time during the adjustment procedures, you can reset to the factory default settings. Tap the Cancel/Reset button, tap 'Reset' and then tap the ✓ button.

NOTE: This action will reset all values within the current menu.

CLAMP ADJUSTMENT



From the Hydraulics menu, tap the CLAMP O/C button.

CLAMP CLOSE (PLUS) ADJUSTMENT

NOTE: When in the CLAMP O/C Min Plus line, only the Min current will be applied to the clamp when the function is activated.

IMPORTANT!
An inaccurate adjustment of the Min Current renders the start and stop ramps inaccurate.

Activate and hold the Clamp Close function on the joystick and at the same time tap the - / + buttons to adjust the CLAMP O/C Min Plus setting so the accumulator just starts to creep.

NOTE: When in the CLAMP O/C Max Plus line only the Max current will be applied to the clamp when the function is activated.

PREFERENCES

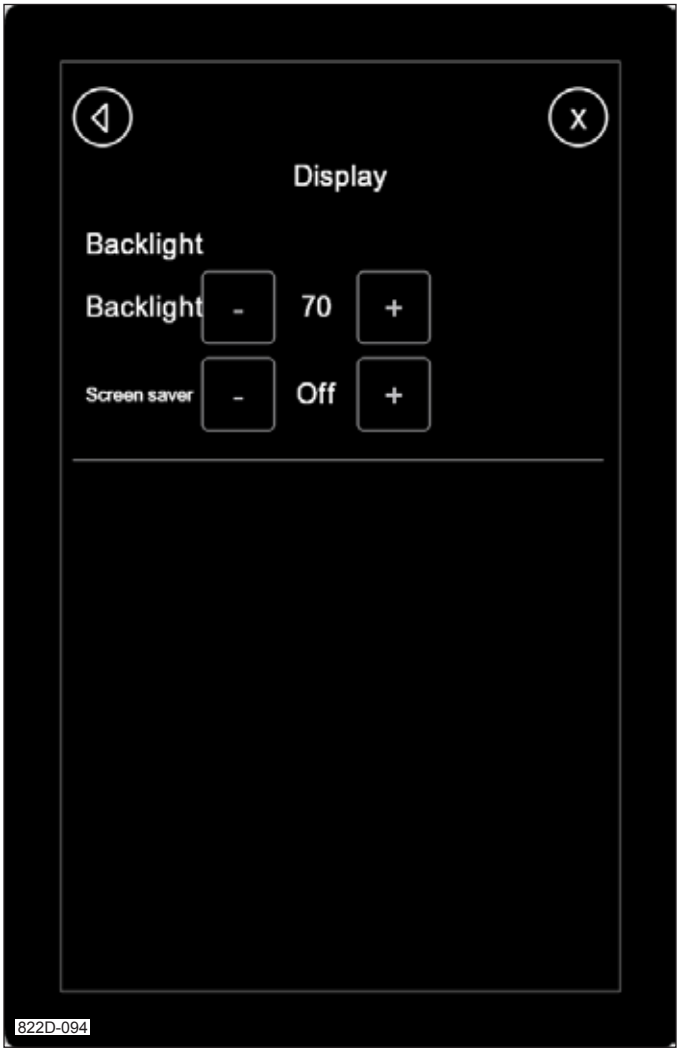
From the Adjust menu, tap the Preferences bar.

In the Preferences menu, the following functions can be adjusted as required:

- Display
- Date/Time
- Language

DISPLAY

From the Preferences, tap the Display bar.



Tap the - / + buttons to change value for the following information:

- Backlight (20–100% in increments of 10%)
- Screen saver (Screen: Off–Dimmed–Black)
- Timeout (5 second minimum default for Screen saver)
- Dimmed light (10–90%)

Tap the back button to return to the Adjust menu.

ENGINE FAULT CODE MESSAGES–ALERT

When an alert engine fault code message is received from the engine electronic control module, an alert engine fault message is displayed, an alarm light flashes and an audible alarm sounds.

These alerts provide the Suspect Parameter Number (SPN) code and the Fault Mode Identifier (FMI) code, as well as a message describing the fault (when available).

Alert engine fault codes are lower priority messages than critical level engine fault code messages. Alert messages can be hidden but action (service engine) is required to resolve the cause of the fault.

An example of an alert engine fault message is shown above.

NOTE: Some less common engine fault codes will appear without a message describing the fault. Make a note of the SPN and FMI codes and contact service for more information.

Refer to the ENGINE MANUFACTURER'S DOCUMENTATION for specific information regarding the engine.

NOTE: Contact your Tigercat dealer to obtain an Engine Fault Codes chart. An up to date copy should be kept in the Operator's Manual Box (in the cab on the wall behind the operator's seat). The chart is updated regularly by the engine manufacturer, so it is important to check periodically with the Tigercat dealer to ensure you have a current copy of the Engine Fault Codes chart.

DIESEL EXHAUST FLUID LEVEL MESSAGES

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

The engine ECU generates three levels of diesel exhaust fluid level messages:

- Diesel exhaust fluid level <10%
- Diesel exhaust fluid level <5%
- Diesel exhaust fluid level empty

In all instances, immediate action should be taken to avoid affecting engine performance and damage to the diesel oxidation catalyst/selective catalytic reduction (DOC/SCR) aftertreatment system components:

- Turn OFF the engine
- Fill the DEF tank
- Turn ON the engine to clear the message

Refer to DIESEL EXHAUST FLUID TANK in THIS SECTION.

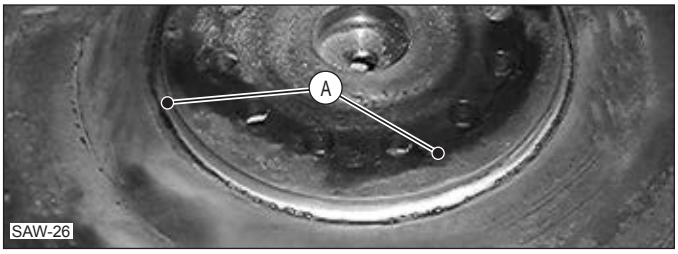
DIESEL EXHAUST FLUID LEVEL <10%

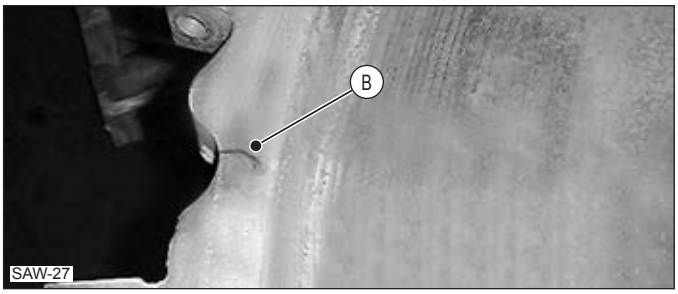
When the engine ECU detects the diesel exhaust fluid level is below 10%, a message is displayed along with a flashing alarm light and an audible alarm.

DIESEL EXHAUST FLUID LEVEL <5%

When the engine ECU detects the diesel exhaust fluid level is below 5%, a message is displayed along with a flashing alarm light and an audible alarm.

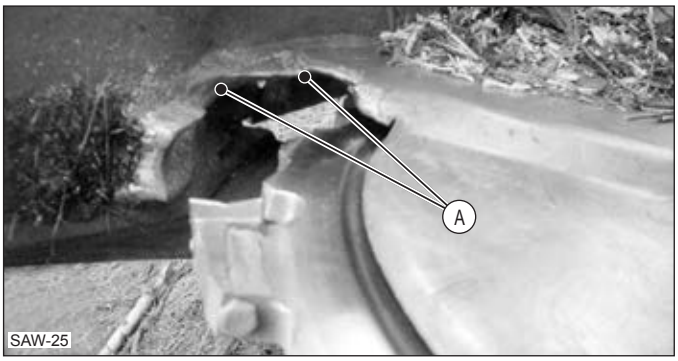
NOTE: Beginning immediately after a DEF level <5% message, there will be a ramp down of the engine speed (60%) and torque (65%) over 40 minutes.





A Stress Cracks around Saw Hub
B Stress Cracks

17. Inspect the disc for stress cracks and the disc does not wobble due to worn saw shaft bearings.



A Saw Housing Damage

18. Check the saw housing is clear and undamaged. Turn OFF the machine immediately if you feel a vibration when the cutting disc is running.
19. Check all exits.
20. Be sure all doors and access panels are securely fastened.
21. Inspect all windows daily and immediately after any impacts. Refer to WINDOWS – INSPECTION AND MAINTENANCE in SECTION 3.
22. Unlock all cab doors.

ANTI-STALL

On the Engine Information screen on the computer, there is an Anti-Stall icon. Tap the icon to turn the Anti-Stall ON/ OFF.

Tapping Anti-Stall ON turns on an electronic load control system which automatically prevents overloading of the engine when several high load functions are in use at the same time. It should be ON during normal machine operation and OFF only when performing service checks on the machine.

If engine stalling occurs, check:

- The Anti-Stall function is ON.
- The relevant 10 A fuse located in the cab fuse and relay panel (fuse is labelled A/C HEAT COMBO UNIT RELAY IGNITION AND FUNCTION PANELS).
- Malfunction of the Anti-Stall system.

Tigercat 822D/L822D Feller Buncher

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 5.3, APRIL 2017

Tigercat Model 822D FELLER BUNCHER
SERVICE AND LUBRICATION SCHEDULE

REFER TO **Tigercat** OPERATOR'S MANUAL FOR FURTHER INFORMATION

SERVICE POINT NO.	DESCRIPTION	SERVICE EVERY						CAPACITY			REMARKS/LUBRICANT
		8 ⧖	125 ⧖	250 ⧖	500 ⧖	1000 ⧖	2000 ⧖	LITRE	USG	QTY	
1	COOLING SYSTEM	CHK	CHANGE COOLANT EVERY 2 YEARS					50	13.2		SEE ENGINE MANUFACTURER'S OPERATIONS AND MAINTENANCE MANUAL FOR REQUIRED ANTIFREEZE SOLUTION AND MIXTURE.
2	ENGINE OIL/FILTER	CHK •		REP •				•	•		• SEE ENGINE MANUFACTURER'S OPRATION AND MAINTENANCE MANUAL FOR PROCEDURES AND CAPACITIES.
3	CRANKCASE VENTILATION FILTER - T4F ONLY				REP •					1	
4	FUEL FILTER (ENGINE)			REP •						1	
5	FUEL/WATER SEPARATOR	DRN		REP						1	REFER TO SECTION 3 OF THE OPERATOR'S OR SERVICE MANUAL FOR DETAILS.
6	DEF DOSING MODULE FILTER - T4F ONLY			REP						1	
7	IN-TANK FUEL STRAINER					CHK				1	DRAIN TANK, CLEAN OR REPLACE AS NECESSARY.
8	AIR INTAKE PRECLEANER	CHK								1	CLEAN INTAKE & DISCHARGE AREAS AS REQUIRED.
9	AIR INTAKE PRIMARY ELEMENT	CHK								1	CHECK FILTER RESTRICTION INDICATOR. REFER TO 8 HOUR SCHEDULED MAINT. FOR DETAILS.
10	AIR INTAKE SAFETY ELEMENT	CHK								1	
11	AIR INTAKE CONNECTIONS	CHK					REP				CHECK FOR LOOSE CLAMPS AND DAMAGED RUBBER COMPONENTS. REPLACE RUBBER COMPONENTS.
12	HYDRAULIC TANK BREATHER						REP			1	
13	HYDRAULIC TANK - DRY FILL CAPACITY (INCLUDES SUCTION ELBOW, MANIFOLD AND HOSES)	CHK					D/R	231	61	1	DRAIN AND REFILL AT SEASONAL OIL CHANGE SEE APPROVED HYDRAULIC OILS IN THE MANUAL* *Tigercat RECOMMENDS REGULAR USE OF AN OIL TESTING PROGRAM.
14	HYDRAULIC OIL RETURN FILTERS, 1 BLUE WATER ABSORBING ELEMENT 5 WHITE HIGH PERFORMANCE FILTERS		CHK		REP †					6	IF THE FILTER BYPASS ICON ON THE COMPUTER DISPLAY TURNS RED BETWEEN SCHEDULED MAINTENANCE INTERVALS, CHANGE THE ELEMENTS.
15	PILOT FILTER				REP					1	
16	CASE DRAIN FILTER				REP					1	
17	CASE RETURN FILTER, ATTACHMENT	CHK			REP					1	SERVICE EVERY 500 HOURS OR WHENEVER THE BACKPRESSURE INDICATOR IS IN THE RED.
18	SWING BEARING	LUB 24 ⧖						10 SHOTS		1	GREASE EVERY 24 HOURS WHILE SWINGING LITHIUM BASE EP2 GREASE ◆
19	SWING PINION	LUB						10 SHOTS		1	GREASE WHILE SWINGING LITHIUM BASE EP2 GREASE ◆
20	SWING GEARBOX LOWER BEARING			LUB				5 SHOTS EACH FITTING		2	REFER TO 250 HOURS SCHEDULED MAINTENANCE FOR DETAILS LITHIUM BASE EP2 GREASE ◆
21	SWING GEARBOX UPPER GEARING	CHK		D/R				17	4.5	2	FILL WITH 75W-90 OR 80W-140 SYNTHETIC GEAROIL TO BOTTLE FILL LINE.
22	ROTARY MANIFOLD TOP SEAL (ON BOTTOM ON UNIT)			LUB				2 SHOTS		1	REFER TO 250 HOURS SCHEDULED MAINTENANCE FOR DETAILS LITHIUM BASE EP2 GREASE ◆
23	TRACK DRIVE GEARBOX		CHK ‡	D/R				6	1.5		FILL WITH SAE 75W-90 (SPEC) RECOMMENDED SYNTHETIC GEAR OIL FOR SEVERE DUTY APPLICATION ‡ CHECK OIL WITH LEVEL PLUG AT 6 O'CLOCK AND OTHER PLUG 9 O'CLOCK POSITIONS.
24	TRACK ROLLERS AND IDLERS CHECK FOR OIL LEAKAGE				CHK						IF LEAKING, REFER TO TO 500 HOURS SCHEDULED MAINTENANCE IN THE MANUAL FOR DETAILS.
25	HOIST, STICK AND TILT JOINTS: - ER BOOM SYSTEM	LUB						PURGE		13	LITHIUM BASE EP2 GREASE ◆
26	HOIST, STICK AND TILT CYLINDERS: - ER BOOM SYSTEM	LUB						PURGE		8	LITHIUM BASE EP2 GREASE ◆
27	DOOR AND COVER HINGES				LUB			1 SHOT		10	LITHIUM BASE EP2 GREASE ◆
28	ENGINE ROOF CYLINDER PINS				LUB			LUB		4	APPLY OIL LIBERALLY
29	ATTACHMENT	SEE MANUFACTURER'S MAINTENANCE SCHEDULE.									

LEGEND

2 FTG/125 ⧖ — LUBRICATION POINT WITH A DESIGNATED NUMBER OF FITTINGS (2FTG) AND HOURS BETWEEN SERVICING (125⧖). JOINT TO BE PURGED.

♦ USE LITHIUM BASED GREASE CONTAINING MOLYBDENUM DISULFIDE.

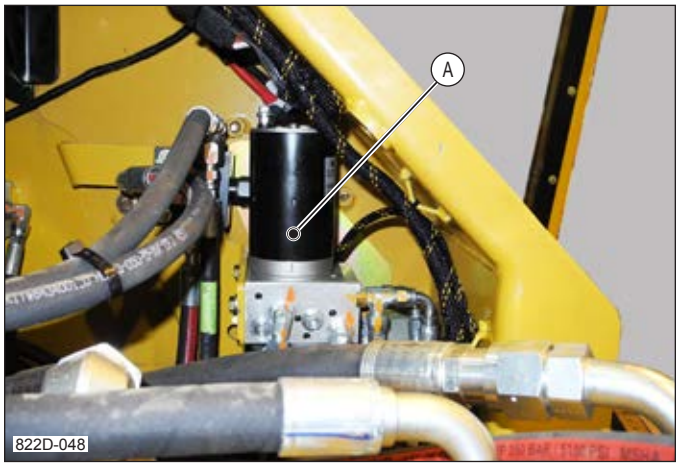
† USE OF FILTERS OTHER THAN GENUINE TIGERCAT REPLACEMENT FILTERS IS NOT RECOMMENDED.

⧖	HOURS
CHK	CHECK
REP	REPLACE
DRN	DRAIN
D/R	DRAIN AND REFILL
LUB	LUBRICATE

78676BENG R1

ENGINE COMPARTMENT ROOF AND SIDE DOOR

POWER ROOF AND SIDE DOOR OPERATION



A Electric Pump–Roof

The engine compartment roof and door are opened hydraulically using an electric pump and hydraulic cylinders.

A Roof Switch

⚠ CAUTION

Be sure all personnel are clear of the power engine-door before opening the door.

The roof switch, located on the upper-right control panel in the cab, is used to open and close the engine compartment roof and side door.

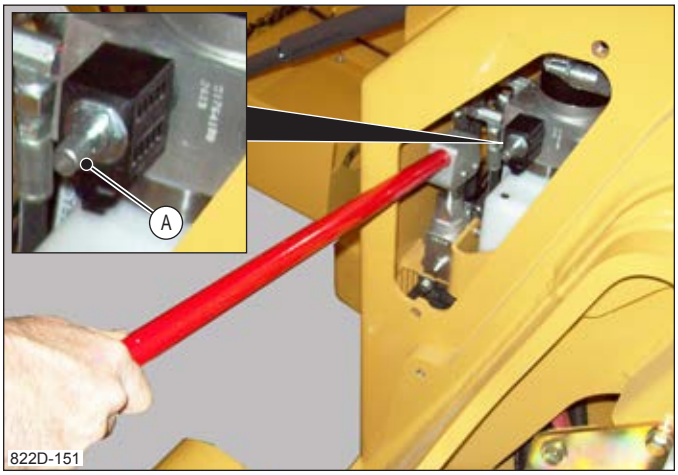
The engine compartment roof and side door circuit does not normally require scheduled maintenance other than lubrication of cylinder and pivot points.

Tigercat recommends the use of DEXRON III TYPE transmission fluid in this circuit. Total circuit capacity is approximately 2 L (0.53 US gal). The fill port is located on the top of the reservoir bottle attached to the bottom of the pump.

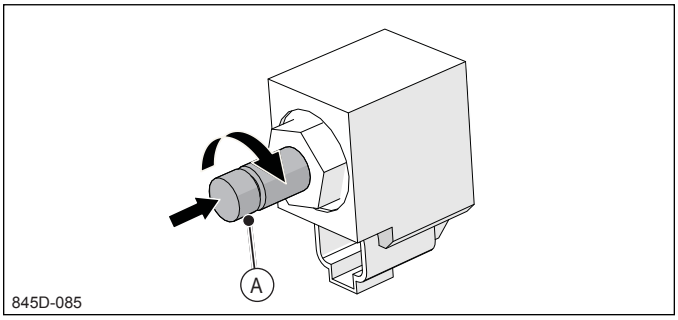
MANUAL HAND PUMP OPERATION

This machine is equipped with a manual back-up engine compartment roof and side door hand pump mounted behind a cover plate on the left side of the pump compartment front access door.

The hand pump can be used to hydraulically open and close the roof and side door (if required).



A Solenoid Valve Metal Pin



A Metal Pin

The default operating position of the upper enclosure power roof pump solenoid is when the metal pin is turned fully CW.

ER BOOM SYSTEM

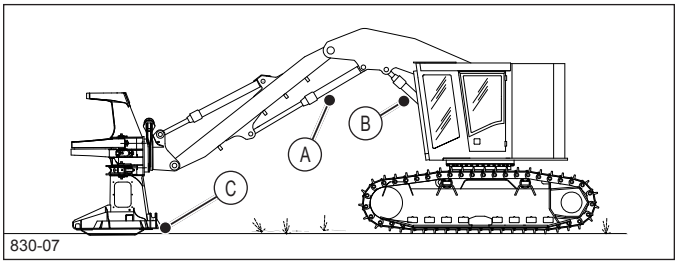
⚠ WARNING

This machine is equipped with a non-switchable ER boom system and may behave in an unexpected manner compared to a conventional boom system.

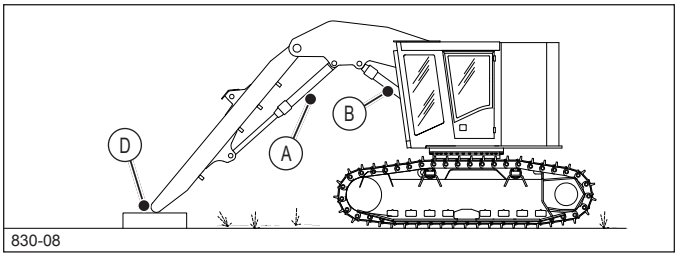
When performing maintenance procedures or setting up a machine equipped with an ER boom system, the following points must be noted:

- The hoist and stick cylinder circuits are connected hydraulically. Disconnecting a hydraulic line to a boom cylinder may cause either boom to move unexpectedly.
- The booms may also move unexpectedly if a port relief adjusting screw is unscrewed (counterclockwise) too far and the pressure drops below that which is required to hold the weight of the booms and attachment.

  The attachment must be properly parked for service (see 'Parking the Boom' illustration) and the engine must be turned OFF before disconnecting any hydraulic lines.
- Some machines are equipped with pressurized hydraulic tanks. Relieve the pressure in the hydraulic tank by opening the hydraulic tank vent valve and waiting until the sound of escaping air stops.
- Before attempting to disconnect any hydraulic hoses or perform work on the boom system, make sure:



830-07



830-08

Parking the Boom

A	Stick Cylinder Fully Extended
B	Hoist Cylinder Fully Retracted
C	Head Flat on Ground
D	Tip of Stick Boom Fully Supported

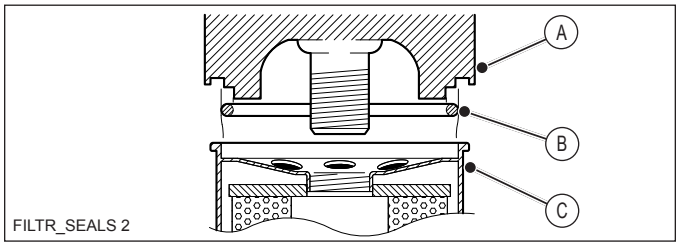
  - The machine is parked on level ground with the head sitting flat on the ground.
  - The stick cylinders are fully extended or the hoist cylinder is fully collapsed.
  - The tip of the stick boom is supported.

DO NOT rely on the attachment to support the boom system during servicing. Slow leakage in the hydraulic components can cause the attachment to move unexpectedly.

For additional safety precautions, refer to ER BOOM SYSTEM PRECAUTIONS in SECTION 1.

NOTE: Because of the hydraulic connection between the hoist and stick cylinders, the hoist cylinder can overpower the stick cylinders under certain conditions, causing the stick boom to move unexpectedly. This most often occurs when setting the HOIST BOOM UP relief valve, causing the stick cylinders to extend. It may also happen at other times if the relief settings are not correct. All personnel and equipment must be clear of the boom path and there is sufficient overhead clearance for the head to rise before making any adjustments.

● O-RING GASKET



A Filter Head
B Gasket
C Filter Element

a. Remove the used gasket and clean the gasket seat in the head.

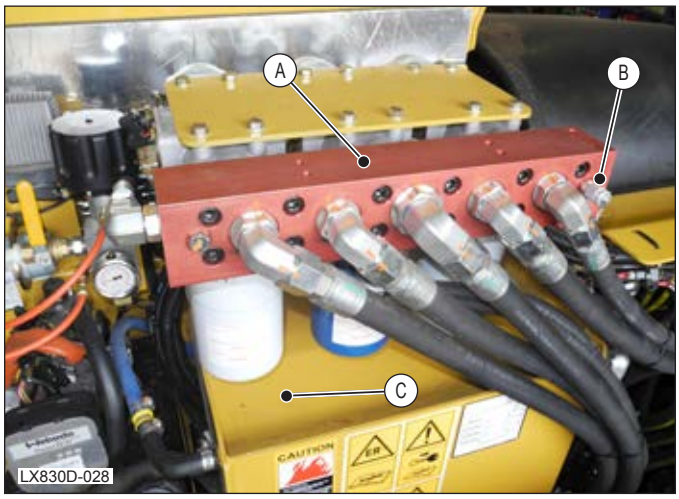
b. Apply clean oil to the new gasket surfaces.

c. Install the new gasket on the inside lip of the filter.

d. Screw on the new filter until the gasket makes contact.

e. Tighten the filter until the top edge makes metal to metal contact with the filter head (Approximately 1½ additional turns after gasket contact.).

11. Close the air vent valve.



A Return Manifold
B Bleed Coupler Connection
C Waste Oil Tray

12. Attach the bleed hose (supplied with the machine) to the bleed coupler connection.

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 return manifold.

17. Clean up any spilled oil.

18. If oil reaches FULL mark before air is completely bled, do the following:

    a. Close the air vent valve

    b. Place the ignition switch in the ON position. Do not start the engine.

       The hydraulic tank pressurization pump will pressurize the tank. Listen for the pump to stop.

    c. Place the ignition switch in the OFF position.

    d. Attach the bleed hose to the bleed coupler connection on the return manifold while the other end is in the waste container.

    e. Disconnect the bleed hose when a steady stream of oil is coming out of the bleed hose.

    f. Repeat as necessary.

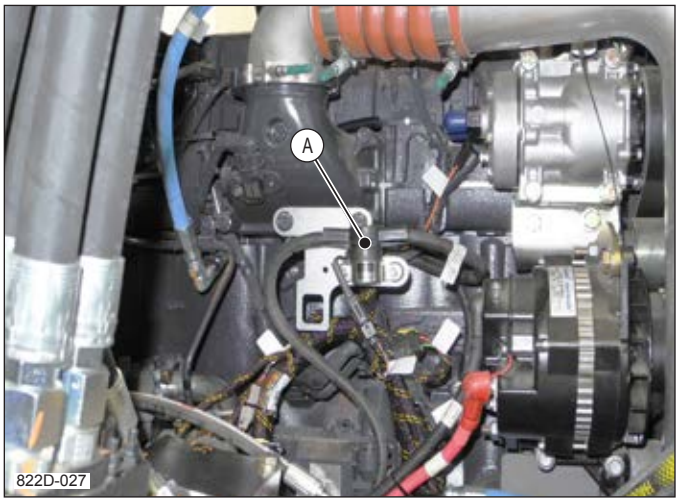
19. Start the engine and check for leaks.

20. Run engine at LOW IDLE speed for at least five minutes to purge any remaining air from the filter system. Then turn OFF the engine for 15 minutes to allow air bubbles in the hydraulic tank to rise.

A Hydraulic Oil Tank
B Right Side Sight Gauge (Second Gauge)
C Left Side Sight Gauge (First Gauge)

21. Re-check hydraulic oil level–top-up as needed.

RELAY – GRID HEATER



822*3001 – 822*3250

822*3251 – 822*4000

A Grid Heater Relay

This relay is energized by a voltage controlled by the ECU when the key is turned to the RUN position. This activates the heating elements (grid heater elements) located in the engine air intake manifold to heat the intake air when starting the engine. This activity works in conjunction with the WAIT TO START function. Refer to STARTING ENGINE and COLD WEATHER STARTING in SECTION 2.

BATTERY CARE

Tigercat uses two types of batteries dependant on the machine application, model and design.

- Absorbed Glass Mat (AGM)
- Flooded Lead Acid (FLA).

NOTICE

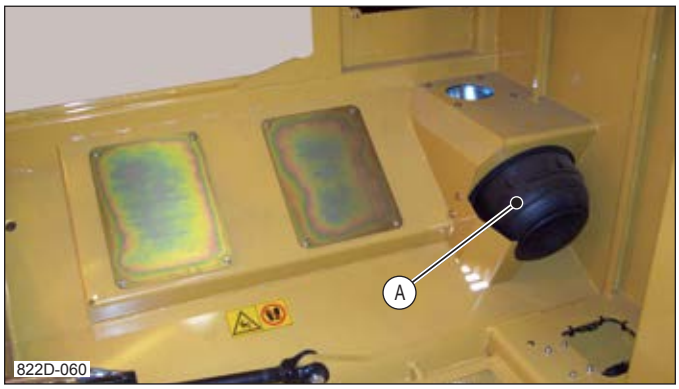
Before charging the battery, it is important to identify which type of battery you have. Always read and follow the battery and charger manufacturer's instructions prior to connecting or charging a battery.

All batteries are sensitive to overcharging. Charging or maintaining AGM batteries requires the use of a smart charger with an AGM setting. The peak charging voltage for AGM batteries varies slightly between battery manufacturer's. Exceeding this voltage can cause permanent battery damage. Refer to the BATTERY MANUFACTURER'S charging instructions for more information.

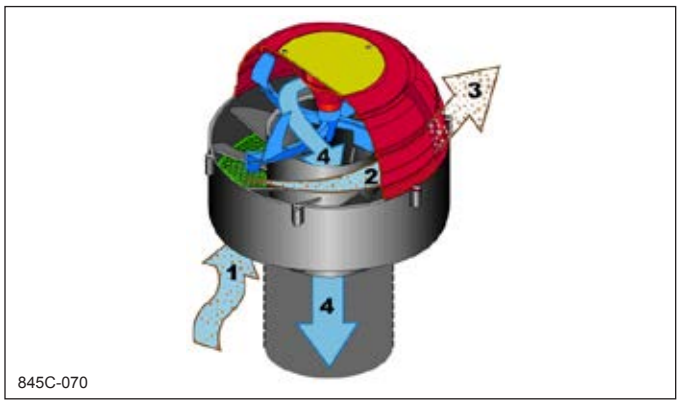
Refer to BATTERY MANUFACTURER'S instructions for charging or maintaining FLA batteries.

AIR INTAKE SYSTEM

ENGINE AIR PRECLEANER



A Air Precleaner



Precleaner Operation

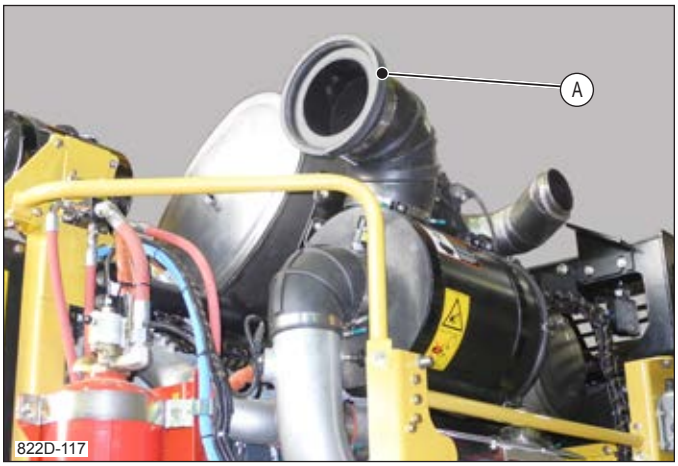
The precleaner receives air via two air intake grills on the right side of the engine roof, behind the clean-out covers and through a passageway fabricated into the roof. With the roof open, the clean-out covers can be removed to allow access behind the engine air intake grill to remove any debris. Refer to CLEAN-OUT COVERS in THIS SECTION.

HOW IT WORKS

1. Air enters the underside of the dome through screened louvres, which prevents clogging by blocking any particles larger than the ejection slot from entering the unit.
2. Curved particle accelerator blades slam air and dirt up against the sidewall.
3. Angled fins along the interior surface move heavier-than air debris towards the ejection slot.
4. Clean air continues to swirl down into the engine air inlet pipe.

The engine air precleaner should be checked daily to make sure that foreign materials have not plugged the intake area or the exhaust port area of the precleaner.

AIR INTAKE SEAL



A Air Intake Seal

Periodically check to ensure seal on top of precleaner is making proper contact with the sealing surface of the inside top of the power door. Hot air leakage at this seal will reduce engine power.

INTAKE TUBING AND JOINTS

A Rubber Elbows and Tubing

Check all air intake system components, rubber elbows, connector hoses, tubes and clamps for damage, hardening, wear, cracks, leaks, loose clamps or loose hanger bracket hardware and repair or replace immediately.

Replace all air intake rubber components such as elbows and connectors every 2000 hours. High temperatures in this area can cause the rubber to harden.

NOTE: High-temperature silicone connectors do not need to be replaced unless they are damaged.

DIESEL EXHAUST FLUID (DEF) TANK

The DEF tank is located in the service compartment in the rear of the machine immediately behind the cab.

A DEF Tank Fill Cap

The DEF fill cap can be accessed through the hinged side door. The fill point is equipped with a filter to prevent contaminants from entering the tank.

The DEF tank capacity is 80 L (21.1 US gal). DO NOT overfill the tank. The 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).

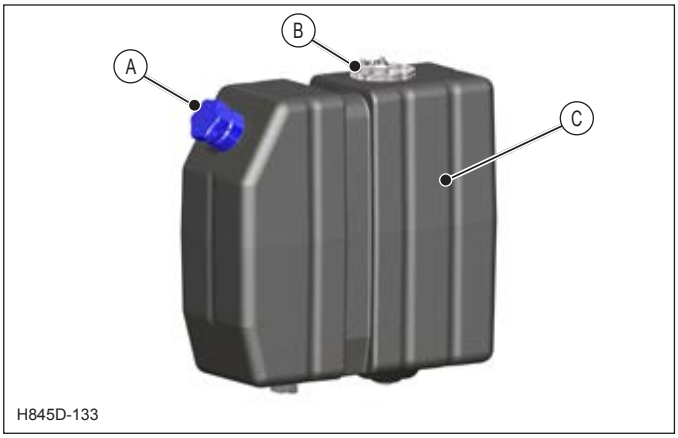
A DEF level indicator is shown on the Home screen of the computer display, below the fuel gauge.

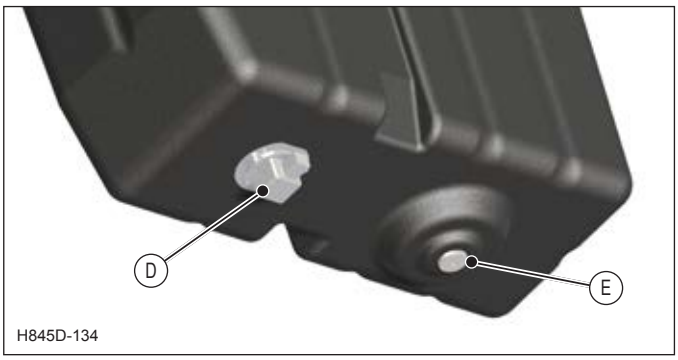
When a problem with DEF levels or quality is detected, information messages are shown on the computer display.

The strainer may be the cause and can be visually inspected for debris. Clean or replace, as required.

NOTE: Extremely low DEF levels or quality problems, may result in derating of engine performance to meet exhaust emission requirements. Action to correct DEF levels or quality problems should be taken immediately to avoid affecting engine performance and damage to the DOC/SCR aftertreatment system components.

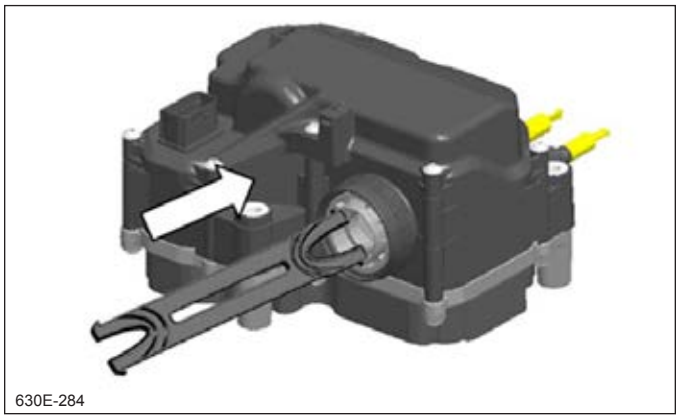
Refer to COMPUTER DISPLAY MESSAGES in SECTION 2.





A Fill Inlet with Cap
B Heater Unit
C DEF Tank
D DEF Quality Sensor
E Drain Plug

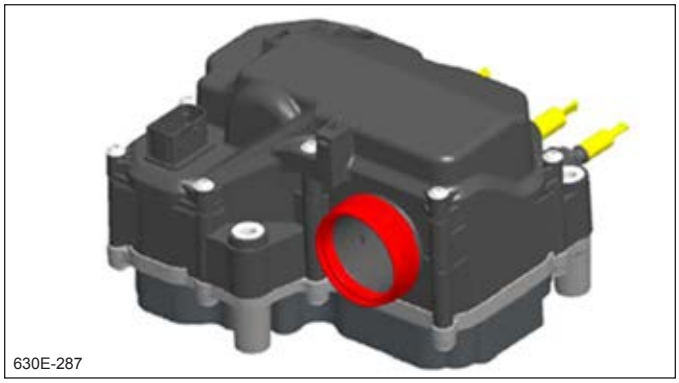
The DEF tank includes a fill inlet with cap, a heater unit, a DEF quality sensor and a drain plug.


630E-284

10. Insert the tool edge completely until a click is felt or heard.


630E-286

11. Pull out the filter, using a tool in the slot on the filter removal tool if required.

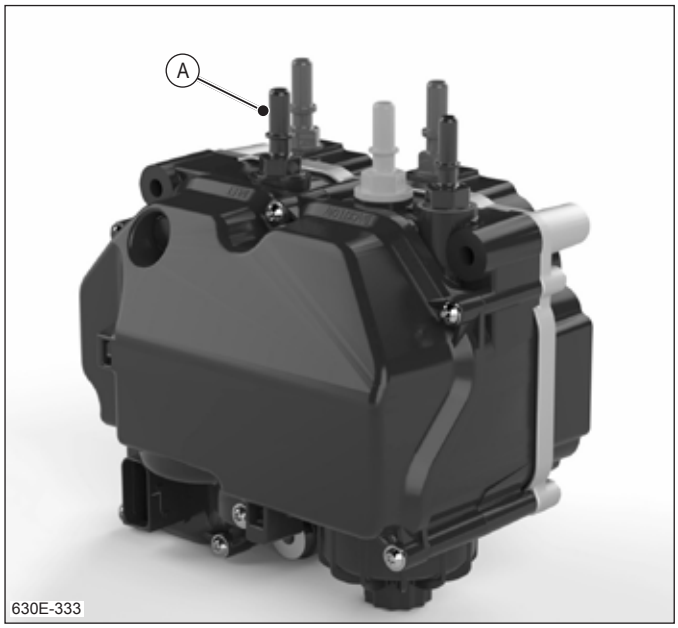

630E-287

12. Clean surfaces with distilled/demineralized water only to avoid DEF contamination.

    Check the area around the filter for cracks. If cracks are found the supply module must be replaced.

13. Thoroughly clean the filter cover to avoid introducing contamination.

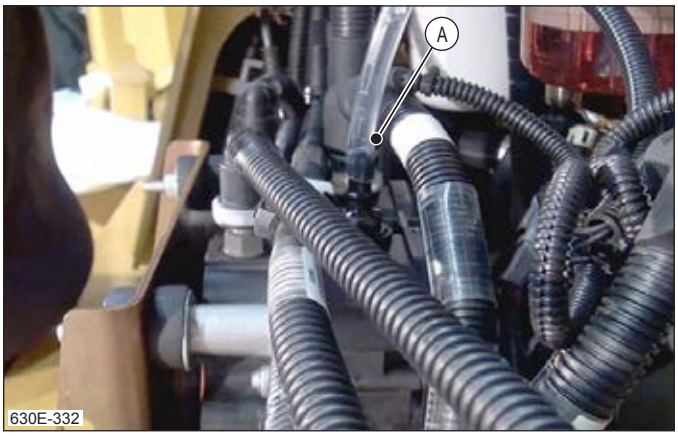
DEF FLUSHING TEST



630E-333

A	Inlet Port

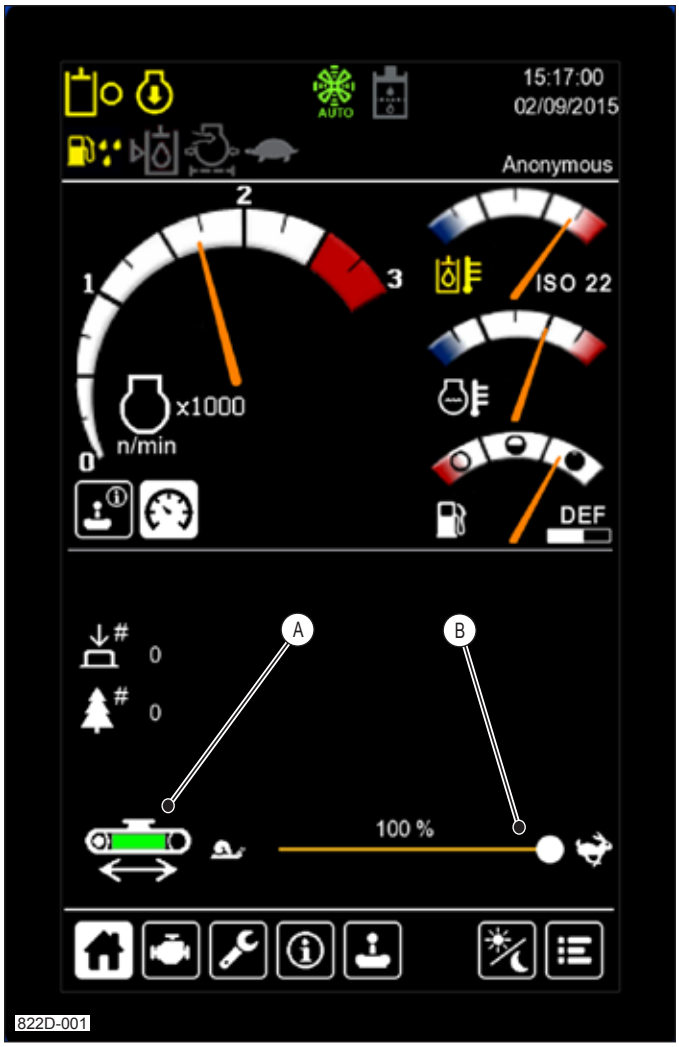
1. Disconnect the DEF hose from the inlet port of DEF supply module.
2. Fill the plastic bottle with distilled/demineralized water.

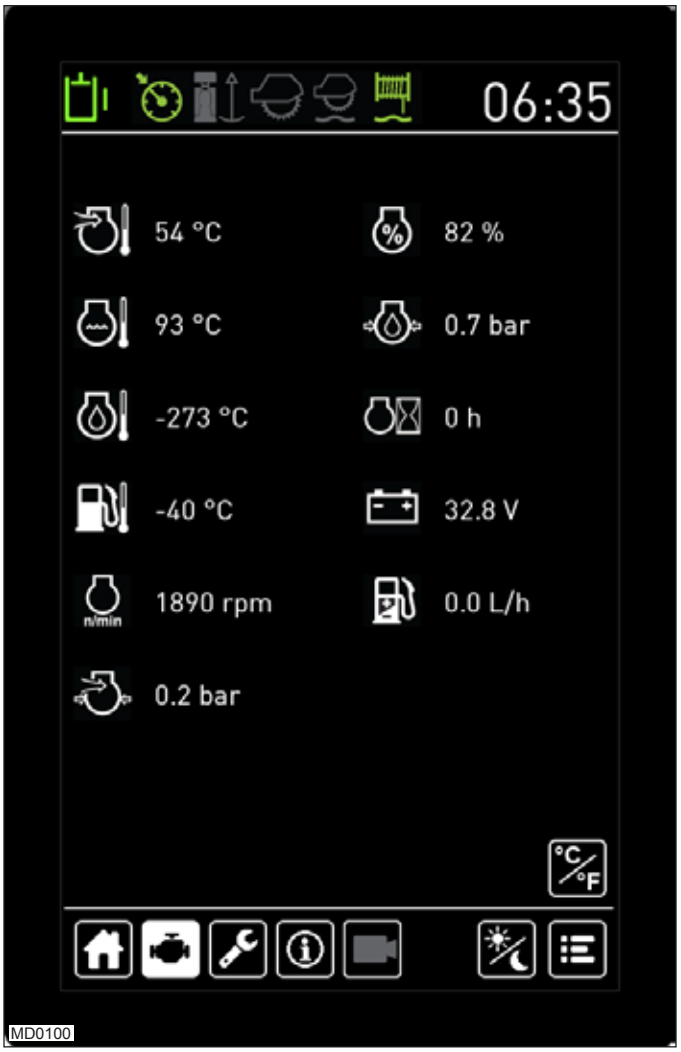


630E-332

A	Inlet Port

3. Connect the water bottle hose to the inlet port of the DEF supply module.





5. Reconnect ECU chassis multi-pin connector.
6. Turn key switch to RUN position and observe computer display. WAIT for the screen to display the gauges before starting the engine.
7. Start the engine. If the drive pressure reading does not rise within 20–30 seconds, turn OFF the engine. If the drive pressure reading is between 18–31 bar (260–450 psi), run the engine at LOW IDLE for 20 minutes. Check the engine oil pressure. DO NOT operate any functions.
8. Set engine speed to LOW IDLE and run each BOOM function for two minutes at LOW pressure to purge air from circuit.
9. Set engine speed to LOW IDLE and slowly operate the drive function forward and reverse a few times.
10. Set engine speed to HIGH IDLE and run each function again for two minutes to flush circuit.
11. Set engine speed to LOW IDLE and turn OFF the engine.
12. Top up the radiator/surge tank with clean coolant.

⚠ CAUTION

- **DO NOT use abusive cleaning procedures either by hand or pressure washing on polycarbonate windows.**
- **DO NOT use brushes, razor blades, scrapers, squeegees or other sharp tools on polycarbonate windows.**
- **DO NOT clean polycarbonate windows when the daytime temperature is high or in direct sunlight.**
- **DO NOT use abrasive or highly alkaline cleaners on polycarbonate windows.**
- **DO NOT use glass cleaners in either aerosol or non aerosol containers to clean polycarbonate windows.**

Failure to follow these cleaning instructions will shorten the service life of polycarbonate and may cause visual hazing, loss of light transmission and delamination of the polycarbonate hard surface coating.

CONCEALING HAIRLINE SCRATCHES

The appearance of scratches and minor abrasions on the surfaces of polycarbonate windows can be minimized by using a mild automotive polish such as:

- Johnson's Paste Wax
- Novus Plastic Polish #1 and #2
- Mirror Glaze Plastic Polish

Be certain to clean the polycarbonate window as outlined prior to application of an automotive polish. Refer to CLEANING INSTRUCTIONS in THIS SECTION.

Parker

Assembly Torque

JIC 37 Degree Flare

SAE Dash Size	Thread Size	Tube Connection FFWR	Swivel or Hose Connection FFWR
-2	5/16-24	NA	NA
-3	3/8-24	NA	NA
-4	7/16-20	2	2
-5	1/2-20	2	2
-6	9/16-18	1 1/2	1 1/4
-8	3/4-16	1 1/2	1
-10	7/8-14	1 1/2	1
-12	1 1/16-12	1 1/4	1
-14	1 3/16-12	1	1
-16	1 5/16-12	1	1
-20	1 5/8-12	1	1
-24	1 7/8-12	1	1
-32	2 1/2-12	1	1
-40	3-12	1	1

F.F.W.R : Flats From Wrench Resistance
All values are for Steel, Stainless Steel and Brass

NPTF

SAE Dash Size	Thread Size	Tube Connection TFFT	Swivel or Hose Connection TFFT
-2	1/8-27	2-3	2-3
-3	NA	NA	NA
-4	1/4-18	2-3	2-3
-5	NA	NA	NA
-6	3/8-18	2-3	2-3
-8	1/2-14	2-3	2-3
-10	7/8-14	NA	NA
-12	3/4-14	2-3	2-3
-14	NA	NA	NA
-16	1-11 1/2	1.5-2.5	1.5-2.5
-20	1 1/4-11 1/2	1.5-2.5	1.5-2.5
-24	1 1/2-11 1/2	1.5-2.5	1.5-2.5
-32	2-11 1/2	1.5-2.5	1.5-2.5
-40	NA	NA	NA

T.F.F.T. : Turns from finger tight
All pipe values are for Steel, Stainless Steel and Brass

O'ring Face Seal / Seal-Lok

SAE Dash Size	Thread Size	Tube Connection FFWR	Swivel or Hose Connection FFWR
-2	NA	NA	NA
-3	NA	NA	NA
-4	9/16-18	1/4 TO 1/2	1/2 TO 3/4
-5	NA	NA	NA
-6	11/16-16	1/4 TO 1/2	1/2 TO 3/4
-8	13/16-16	1/4 TO 1/2	1/2 TO 3/4
-10	1-14	1/4 TO 1/2	1/2 TO 3/4
-12	1 3/16-12	1/4 TO 1/2	1/3 TO 1/2
-14	NA	NA	NA
-16	1 7/16-12	1/4 TO 1/2	1/3 TO 1/2
-20	1 11/16-12	1/4 TO 1/2	1/3 TO 1/2
-24	2-12	1/4 TO 1/2	1/3 TO 1/2
-32	NA	NA	NA
-40	NA	NA	NA

F.F.W.R : Flats From Wrench Resistance
All values are for Steel, Stainless Steel and Brass

BSPT

SAE Dash Size	Thread Size	Tube Connection TFFT	Swivel or Hose Connection TFFT
-2	1/8-28	2-3	2-3
-3	NA	NA	NA
-4	1/4-19	2-3	2-3
-5	NA	NA	NA
-6	3/8-19	2-3	2-3
-8	1/2-14	2-3	2-3
-10	NA	NA	NA
-12	3/4-14	2-3	2-3
-14	NA	NA	NA
-16	1-11	1.5-2.5	1.5-2.5
-20	1 1/4-11	1.5-2.5	1.5-2.5
-24	1 1/2-11	1.5-2.5	1.5-2.5
-32	2-11	1.5-2.5	1.5-2.5
-40	NA	NA	NA

T.F.F.T. : Turns from finger tight
All pipe values are for Steel, Stainless Steel and Brass

SAE J1926 Straight Thread Port Assembly Torques

SAE DASH SIZE	THREAD SIZE	ASSEMBLY TORQUE = 10 % -0											
		NON-ADJUSTABLE				ADJUSTABLE				PLUGS			
		SEAL-LOK		TRIPLE-LOK FERULOK PIPE FITTINGS		SEAL-LOK		TRIPLE-LOK FERULOK PIPE FITTINGS		HOLLOW HEX HP5ON-S		HEX HEAD P5ON-S	
		lbf.ft (lbf.in)	Nm	lbf.ft (lbf.in)	Nm	lbf.ft (lbf.in)	Nm	lbf.ft (lbf.in)	Nm	lbf.ft (lbf.in)	Nm	lbf.ft (lbf.in)	Nm
2	5/16-24	(310)	20	(85)	10	(310)	20	(60)	7	(30)	3.5	(85)	10
3	3/8-24	(310)	20	(155)	18	(310)	20	(100)	11	(55)	6	(155)	18
4	7/16-20	(310)	20	(260)	29	(310)	20	(180)	20	(120)	13.5	(260)	29
5	1/2-20	(360)	40	(280)	32	(360)	40	(250)	28	(170)	19	(280)	32
6	9/16-18	(420)	46	(350)	40	(420)	46	(350)	40	(410)	46	(350)	40
8	3/4-16	60	80	(620)	70	60	80	(620)	70	60	80	(620)	70
10	7/8-14	100	135	85	115	100	135	85	115	100	135	85	115
12	1 1/16-12	135	185	135	183	135	185	135	183	135	185	135	183
14	1 3/16-12	175	235	175	237	175	235	175	237	175	235	175	237
16	1 5/16-12	200	270	200	271	200	270	200	271	200	270	200	271
20	1 5/8-12	250	340	250	339	250	340	250	339	250	340	250	339
24	1 7/8-12	305	415	305	414	305	415	305	414	305	415	305	414
32	2 1/2-12	375	510	375	509	375	510	375	509	375	510	375	509

Tigercat 822D/L822D Feller Buncher

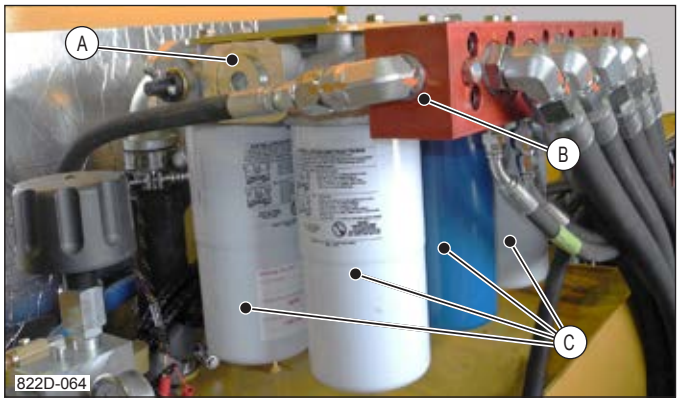
SECTION 4–HYDRAULIC SYSTEM

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 4

ISSUE 1.0, MARCH 2017

RETURN FILTERS, HYDRAULIC OIL



A Filter Head
B Return Manifold
C Return Filters (Two Not Shown)

The majority of return oil entering the tank passes through six spin-on hydraulic oil filters. One of the filters is a water absorbing filter (colour blue) which is in place to assist with removing unwanted moisture from the hydraulic oil. The filters are connected in parallel to three separate return filter heads.

There is a bypass valve, preset at 1.7 bar (25 psi), built into each filter head, which will open in the event the elements become restricted. Before this valve is activated, a 1.4 bar (20 psi) filter restriction pressure switch, located on one of the filter heads, will cause the hydraulic oil filter bypass icon on the computer to change to RED.

NOTE: The hydraulic oil filter bypass icon will be illuminated yellow when hydraulic oil temperature is low and the filter restriction pressure switch is activated.

NOTICE

Contaminated hydraulic fluid can lead to premature failure of hydraulic components and costly repairs. Filters must be replaced at the recommended time intervals, Refer to scheduled maintenance in this section.

Use of hydraulic oil filters other than the Tigercat brand could lead to severe wear and rapid failure of hydraulic system components.

FILTER RESTRICTION PRESSURE SWITCH

A Filter Restriction Pressure Switch

A 1.4 bar (20 psi) filter restriction pressure switch is installed in the return manifold. When an oil pressure differential in excess of 1.4 bar (20 psi) is encountered at the return filters in the hydraulic tank, this pressure switch closes and the hydraulic oil filter bypass icon changes to RED on the computer display. The alarm will sound and the alarm light flash continuously.

IMPORTANT!
Do not use these warnings as a substitute for changing the oil filters at regular intervals as per the SCHEDULED MAINTENANCE program in SECTION 3.

This information is assuming normal operating conditions and running temperatures.

FILTER/STRAINER SERVICE NOTE: The filters should be checked/changed when the oil filter bypass icon changes to yellow on the computer display. If the icon remains yellow after the filters have been changed, the return strainers attached to the base of the return tubes in the hydraulic tank should be examined for possible obstruction.

NOTICE

NEVER pre-fill hydraulic oil filters.

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 valves, pumps and motors. The cleanliness of hydraulic oil cannot be guaranteed unless it is always pre-filtered before use.

OPERATING TIPS

When using the controls on a load sensing system think of what the system is trying to do for you. If you move the lever 20% of its total angle, the system will provide whatever pressure it takes (up to its maximum capacity if needed) to meet this speed requirement. If you move the lever past the point needed in an attempt to speed up the boom movement, you will only overshoot the speed you wanted. Relax and try to use the least amount of lever action you can.

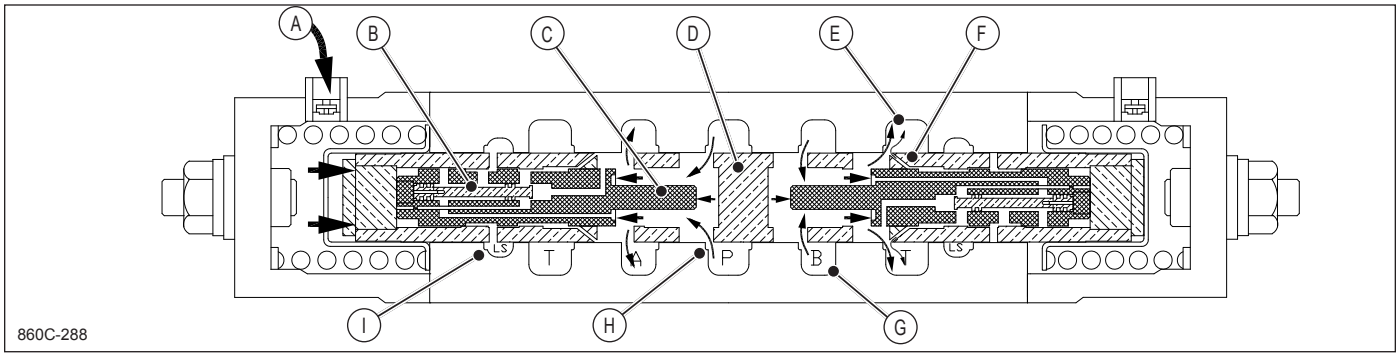
Load sensing systems respond to rough operation by amplifying these movements. If you find the boom is jerky or always giving 'feedback', you're probably too active on the controls. If slowing down doesn't eliminate the roughness, the margin pressure setting may be too high and can be reduced to calm down the machine's response.

Refer to SET MARGIN PRESSURE in THIS SECTION.

Another feature of this system is the maximum flow of each function, in each direction, can be tuned to your requirements. This is easily done by changing the flow adjusting screws on each control valve. Take the time to set up your machine, as this greatly reduces fatigue.

Refer to ADJUST OIL FLOW TO CYLINDERS in SECTION 12 and CHECKING PRESSURE AND SWING SPEED, SET SPEED FIRST in SECTION 15.

When operating the swing function move the lever slowly. Operating the swing harshly or quickly reversing direction wastes power and generates excessive heat, as oil is dumped over the crossline reliefs.



(D) Control Valve Section	
A Pilot Oil	F Angled 'V' Vent Port opens
B Shuttle Valve	G 'B' Port work Port opens
C Compensator Valve moves left	H 'P' Pressure Port opens slightly
D Control Spool	I Oil flows to LS Passage
E 'T' Tank Port Return	

Control valve section (D):

- Control spool continues to move to right
- 'P' Pressure Port opened slightly
- Highest working pressure

The next port to open is the angled 'VENT' port on the right side of the control spool which connects to the tank port 'T'. This connects all passages in the compensator spool to return pressure. There is no movement at this time but as soon as the work port 'B' opens and oil flows, the returning oil will push the compensator valve to the right and connect 'B' to 'T'.

The 'PRESSURE' port in the control spool is the last port to open. When it opens, pump discharge pressure flows through the passage in the compensator spool and through the shuttle cavity to the load sense passage.

The load sensing pressure increases causing the pump to increase its displacement and further increase the pressure. The compensator valve keeps the 'WORK' port passage closed until the pump discharge pressure is higher than the 'WORK' port pressure (load check feature).

Once the pump discharge pressure is higher, the shuttle valve moves to the right and connects load sensing pressure to the cavity behind the compensator valve. The compensator valve moves to the left allowing oil to flow to the work port. With the compensator valve open, the cavity to the right of the compensator valve assumes approximate work port pressure and this pressure flows through the passage to the shuttle cavity allowing work port pressure to control load sensing pressure. As the control spool moves further, in response to pilot pressure, the compensator valve and shuttle valve positions remain the same.

Tigercat 822D/L822D Feller Buncher

SECTION 5–PILOT SYSTEM

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 5

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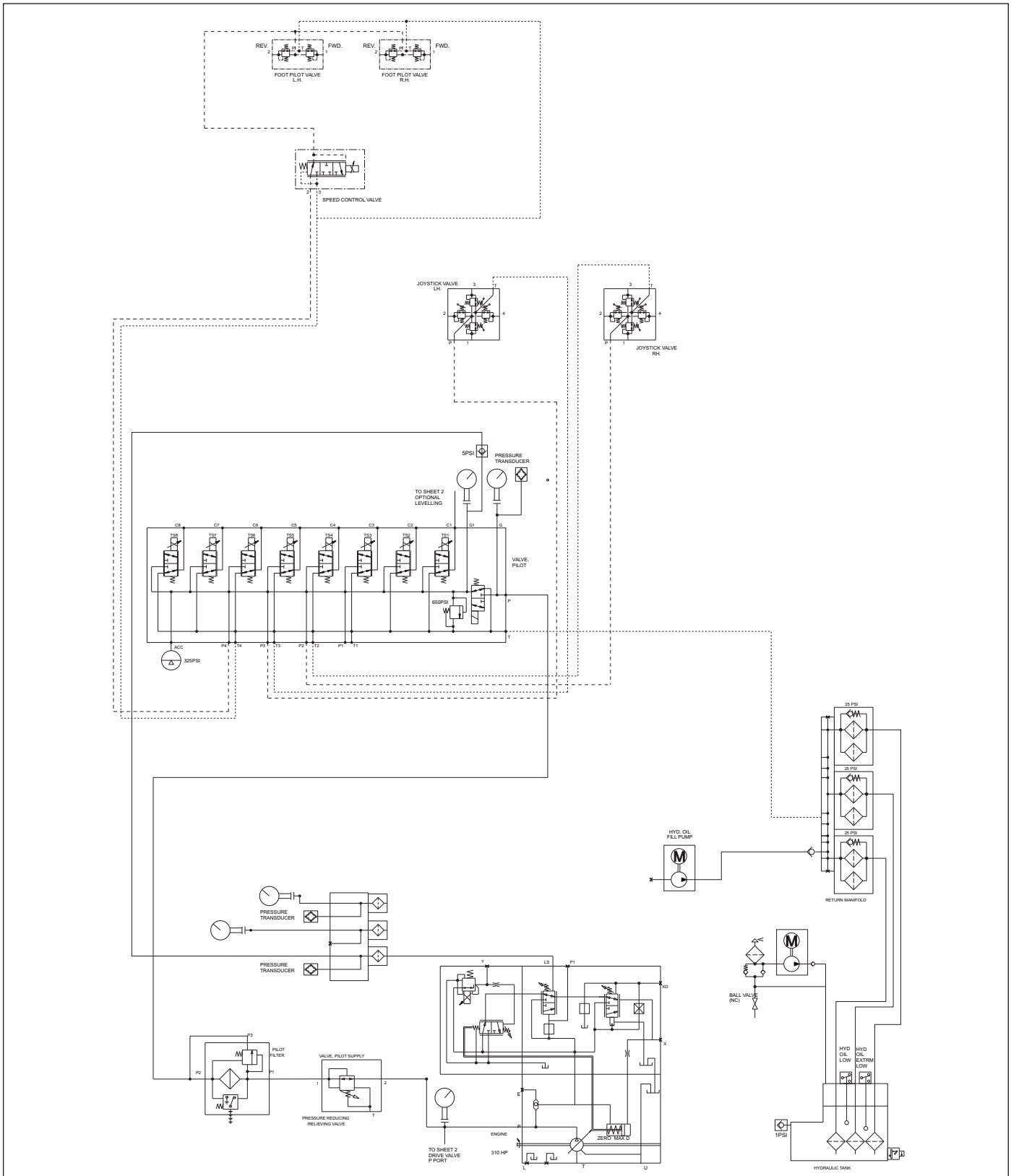
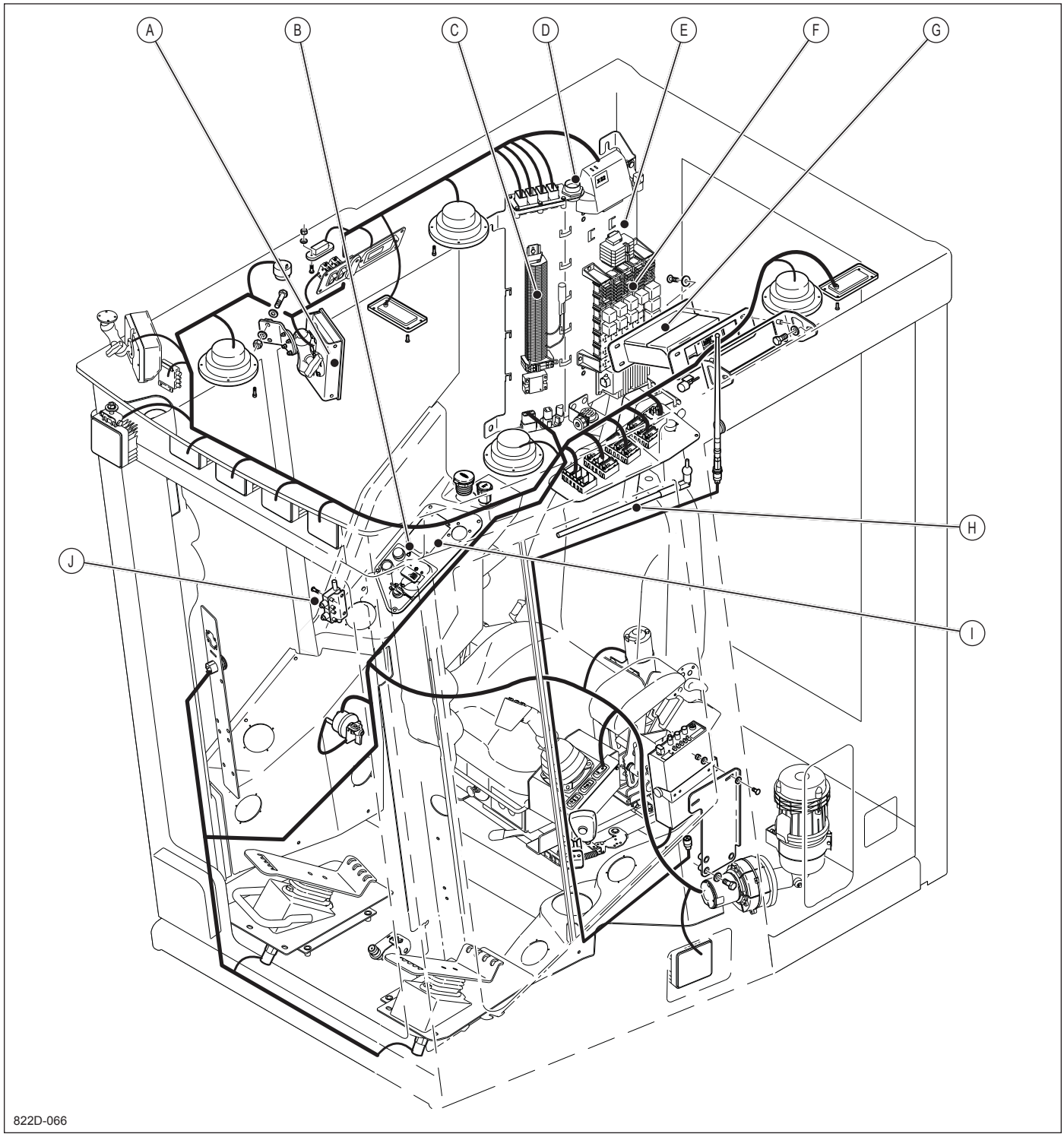


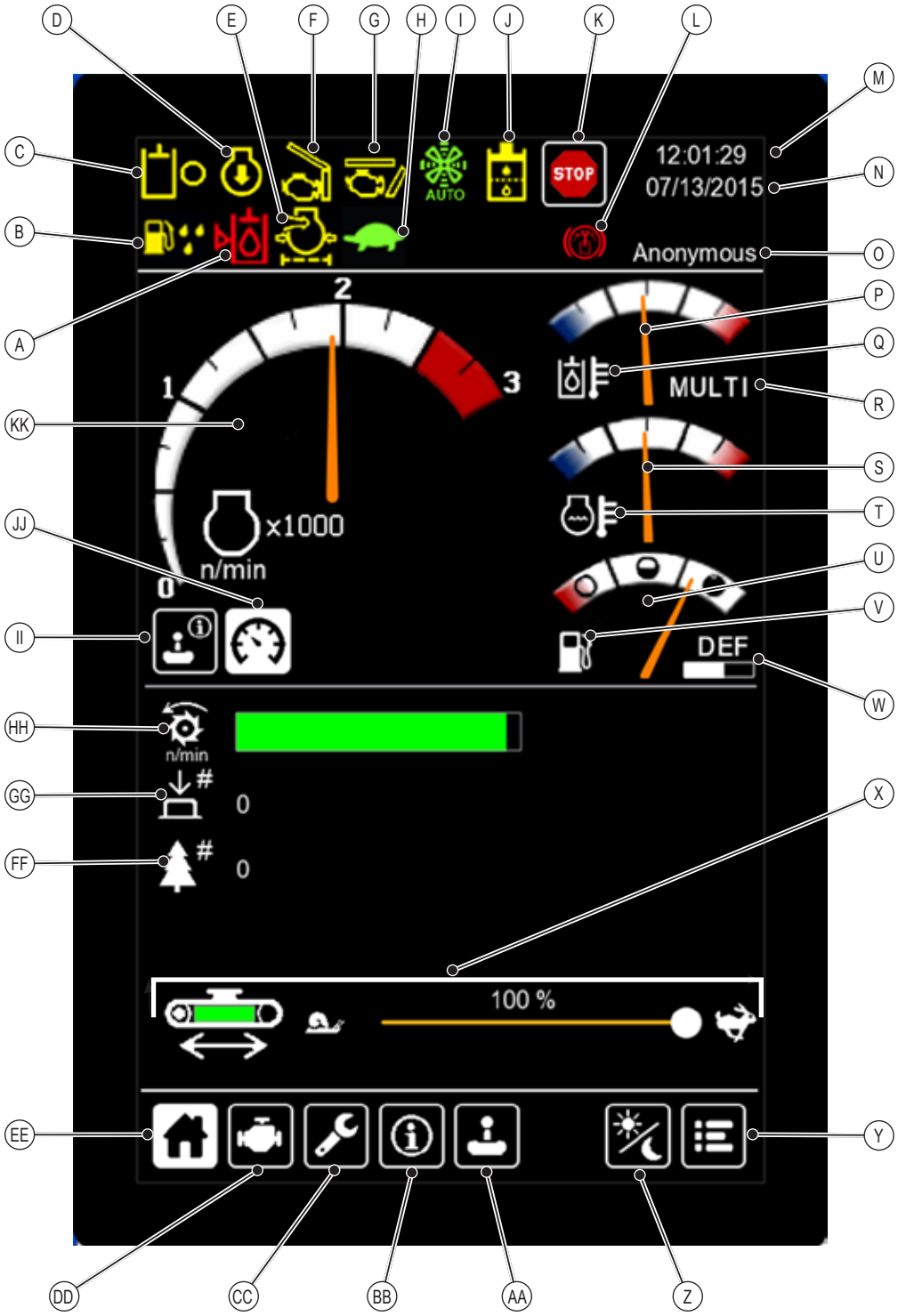
822D-029

Pilot System Hydraulic Schematic



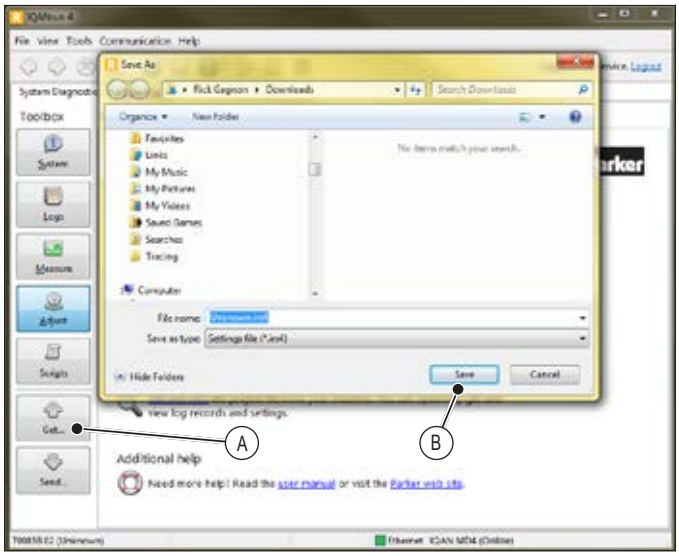
Electrical Installation–Cab	
A Computer and Display	F System Fuse and Relay Panel
B Control Panels	G Audio System
C Terminal Rail	H Antenna
D Cab Module	I Fire Suppression Control Panel
E Rear Panel	J Pilot Shut-Off Limit Switch on Front Door

Refer to ELECTRICAL SCHEMATICS in THIS SECTION for cab control panels pin connections and wiring designations.


D
E
F
G
H
I
J
K
L
M
C
N
B
O
A
P
Q
MULTI
R
KK
S
T
JJ
U
V
II
DEF
W
HH
GG
X
FF
EE
Y
DD
CC
BB
AA
Z
STOP
AUTO
12:01:29
07/13/2015
Anonymous
1
2
3
0
x1000
n/min
100 %

MD4-003

GET SETTINGS FILE



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.

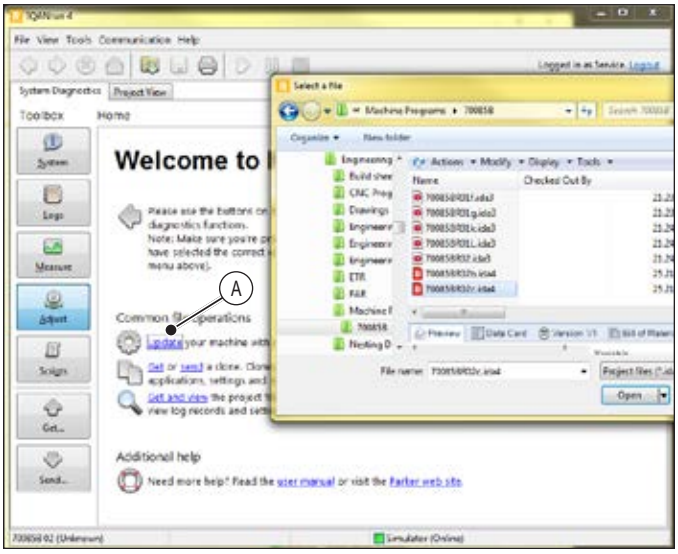
2. Click 'Save' to continue.

   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.

UPDATE APPLICATION TO COMPUTER

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



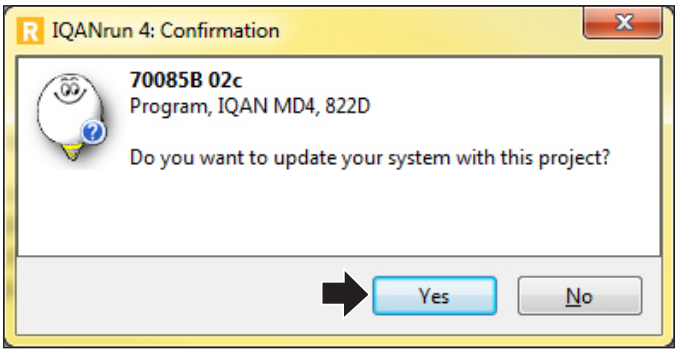
A 'Update' Link

1. Click on the Update link.

   A dialogue box will appear, prompting the selection of an application file (.ida4).

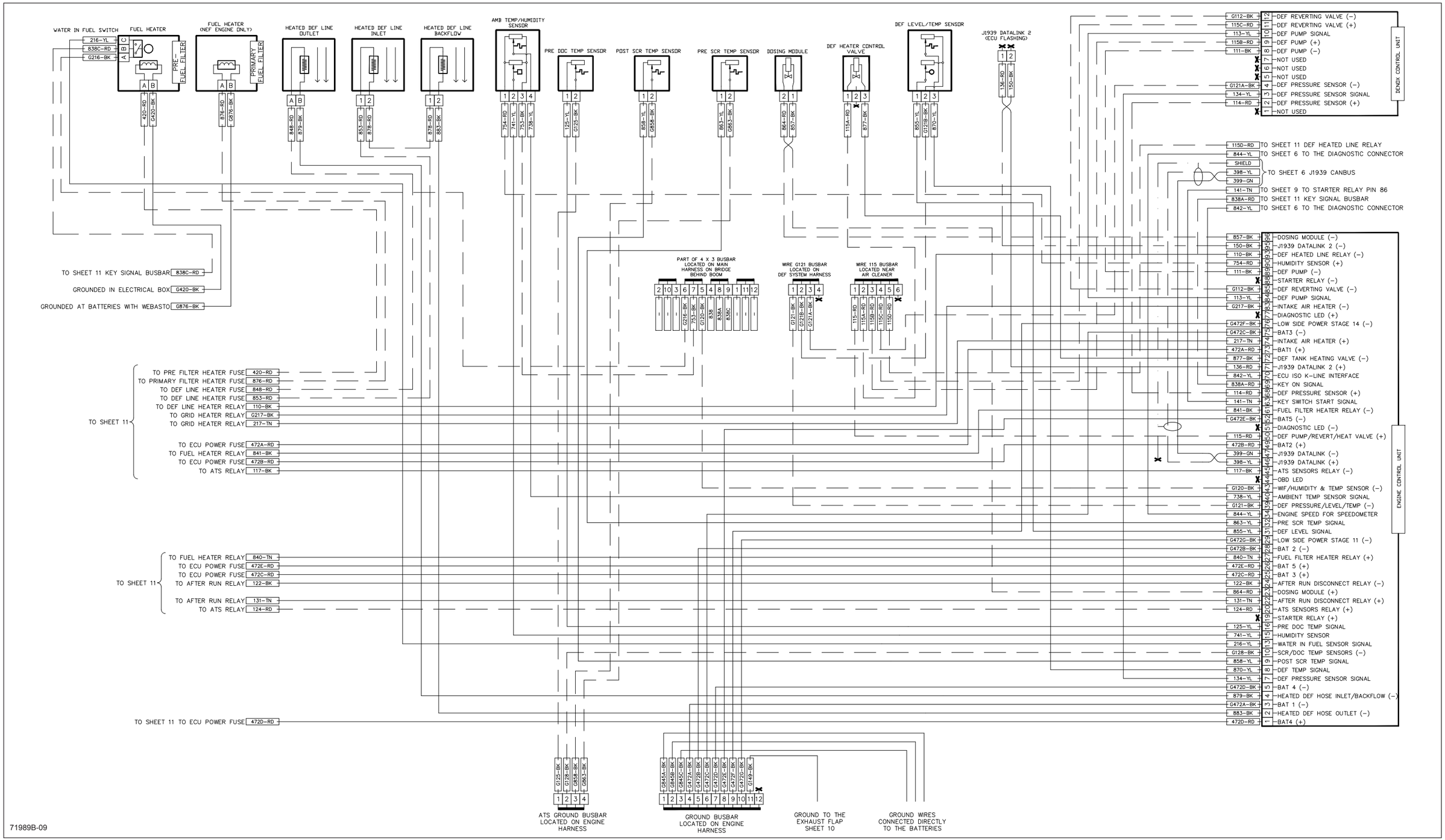
2. Select the appropriate application file (project file) for the machine and click 'Open' to continue.

   IQANrun 4 will request confirmation the application being loaded is correct.



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

   IQANrun 4 will provide a warning to ensure the machine is not moving and the engine is shut down (the key switch in the RUN position to power the computer; the engine not running).



Electrical Schematic–Sheet 9

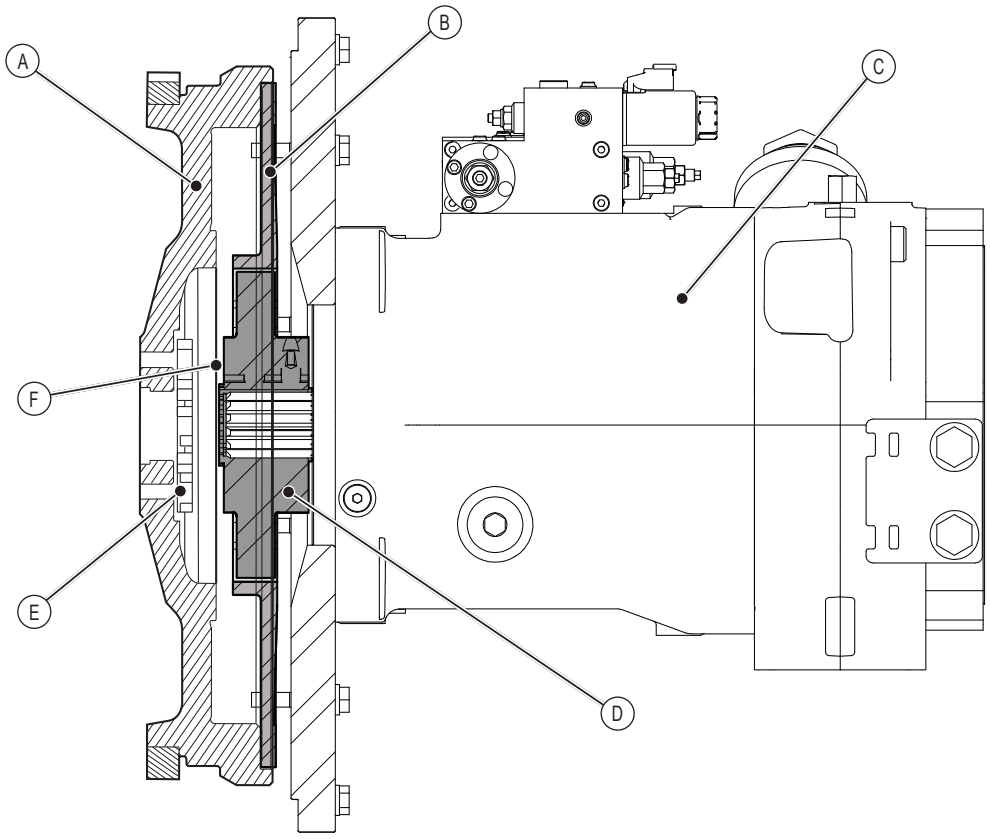
Tigercat 822D/L822D Feller Buncher

SECTION 7–ENGINE AND ANTI-STALL

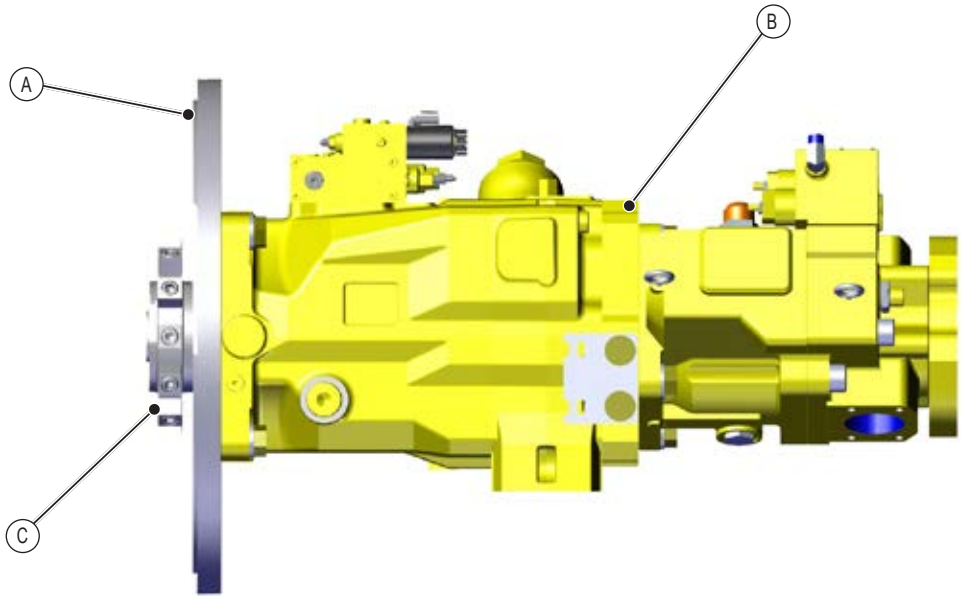
Read and understand the entire contents of this manual, and all manuals for any attachments or accessories associated with this machine, prior to operating or servicing this equipment.

CONTENTS–SECTION 7

ISSUE 1.0, MARCH 2017

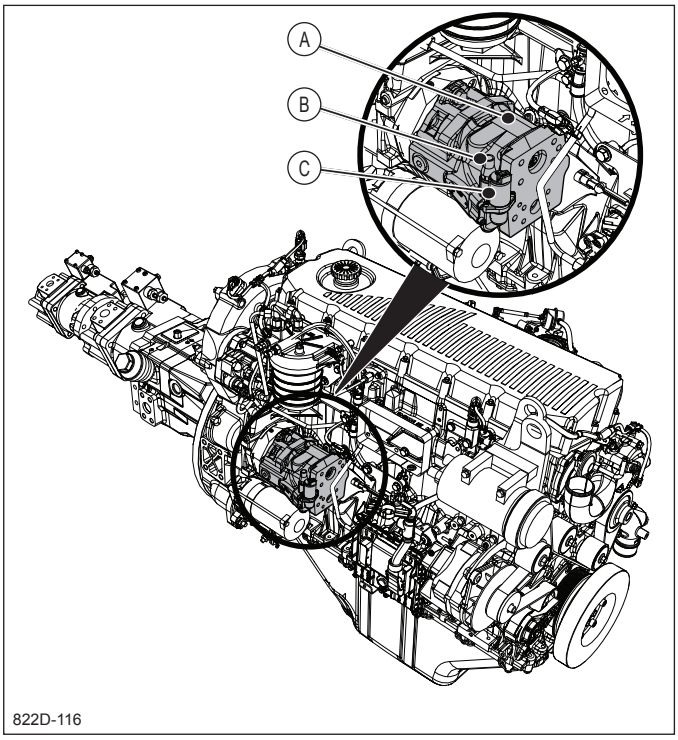


Cross Section View of Flex Drive Coupling	
A Cross Section Engine Flywheel	D Cross Section of Pump Coupler
B Cross Section of Flex Drive Coupler on Engine	E Possible Interference Points
C Main Pump	F Engine Flywheel Bolt Heads



Pump Coupler, Side View	
A Pump Mounting Plate Face	C Back of Coupler Teeth
B Pump Stack	

FAN PUMP



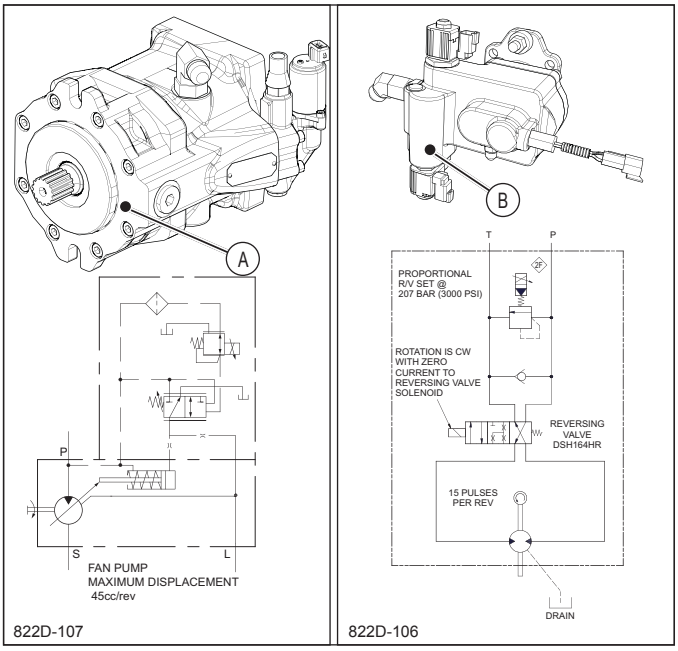
822D-116

A	Fan Pump
B	Maximum Pressure Adjusting Screw
C	Solenoid Control

The fan pump (mounted on the front engine auxiliary drive) is an axial-piston, variable-displacement pump with electronic controlled solenoid activated flow and pressure control. The pump operates in an open-loop hydraulic circuit, meaning hydraulic oil is always returned to tank. The following components make up the hydraulic fan drive system:

- Fan Drive Pump
- Fan Manifold
- Fan Drive Motor with Integral Control Valve
- Computer

When the cooling fan switch on the rear control panel is in the auto position, the computer activates/deactivates the solenoid control on the fan pump. The computer will send a signal (0–600 mA) to the solenoid. 0 mA will deactivate the solenoid allowing the pump swashplate to stroke, placing the pump at full pressure up to a maximum pressure of 186 bar (2700 psi) which supplies oil to the fan control valve which controls the oil flow direction to the fan hydraulic motor which drives the cooling fan (forward or reverse).



Fan Pump Schematic/Fan Motor Schematic	
A	Fan Pump
B	Fan Motor with Integral Control Valve

The amount of pump pressure is determined by the computer which receives signals from temperature sensors in the engine cooling system, hydraulic oil tank, charge air cooler and the status of the A/C (ON).

Signals from the temperature sensors, signifying cool temperature, prompt the computer to reduce the cooling system requirements. This results in a higher signal output from the computer to the pump control solenoid. Maximum output is 600 mA which places the pump at minimum pressure at 19 bar (280 psi) standby pressure.

Signals from the temperature sensors, signifying hot temperatures, prompt the computer to increase the cooling system requirements. This results in a lower signal output from the computer to the pump control solenoid. Minimum output is 0 mA which places the pump in maximum flow up to maximum pressure.

NOTE: If the cooling fan switch is placed in the full on position or momentarily pressed in the clean position the computer control is disabled and the fan will either reverse or go into the full on mode depending on switch position. Refer to SECTION 2, for details.

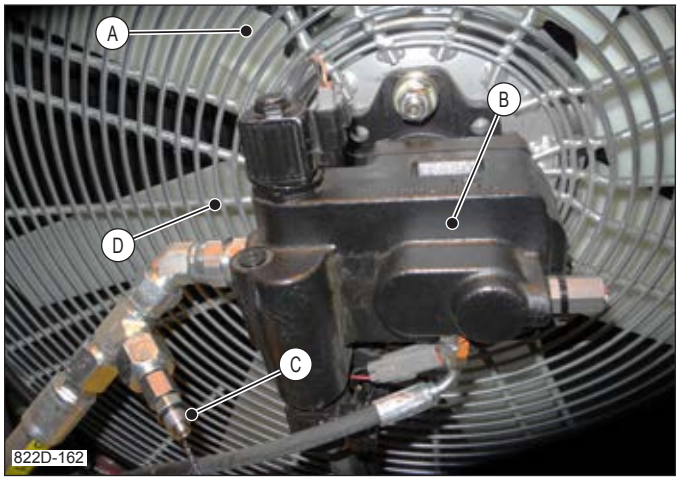
NOTE: If the wires at the solenoid control on the fan pump are disconnected the pump will automatically stroke to maximum flow up to maximum pressure.

FAN PUMP/MAXIMUM PRESSURE

SET MAXIMUM PRESSURE

Maximum pressure is the pressure at which the fan pump will begin to automatically de-stroke to limit the maximum pressure from the pump to the fan control valve circuit.

1. The hydraulic oil must be at operating temperature (refer to MACHINE PREPARATION–SYSTEM TEST AND WARM-UP in SECTION 2 for the hydraulic oil heat up procedure).

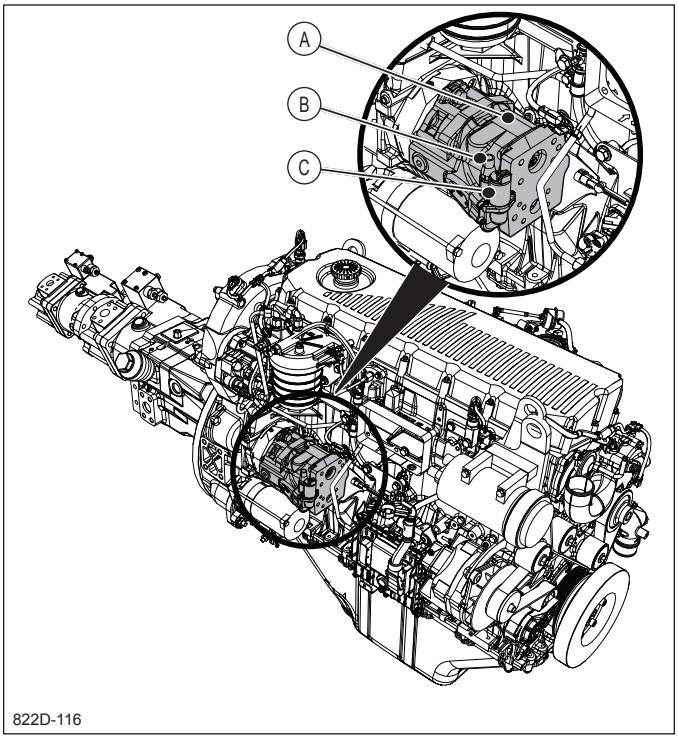


Fan Motor and Integral Control Valve Installation
A Fan
B Fan Motor with Integral Control Valve
C Test Port (Tee off the Fan Motor Hydraulic Oil Inlet)
D Finger Guard

2. Disconnect the wires at the pump control proportional solenoid valve on the fan pump. This will default the fan to FULL ON and cause the pump to go to max pressure.

   NOTE: When the engine is started, the computer will turn the alarm ON and a warning message will be appear on the computer display (because the wires have been disconnected at the solenoid). Ignore the alarm; it will turn OFF when the wires are reconnected after this test.

3. Start the engine, and set the engine speed to HIGH IDLE.



A Fan Pump
B Maximum Pressure Adjusting Screw
C Solenoid Control

If the maximum pressure requires adjustment:

1. Loosen the locknut on the POR pressure adjusting screw (2) (located on the fan pump controller).

2. Turn the adjusting screw (2) until the reading on the gauge meets specifications*.

   ***NOTE:** Refer to PRESSURE AND SPEED SETTINGS in SECTION 3, for pressure and speed specifications.

   Turning the adjusting screw IN (CW) will increase the pressure, turning the screw OUT (CCW) will decrease the pressure.

3. When the pressure is set, tighten the locknut on the adjusting screw. Repeat above procedure to verify the pressure setting is still correct.

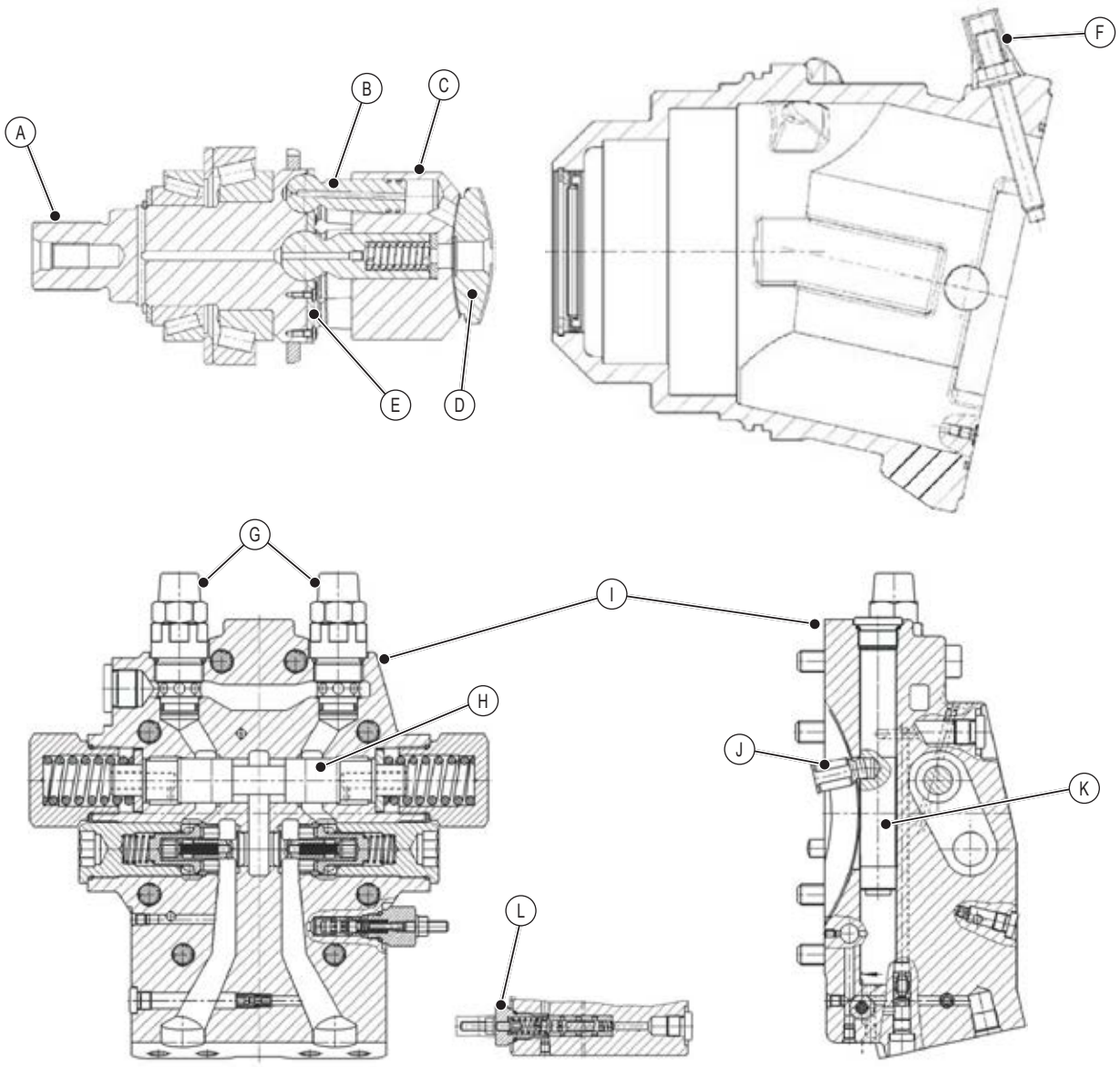
4. When test is complete, turn off the engine and reconnect the wires at the remote solenoid valve.

5. Adjust the pressure until the maximum fan speed is 2000 rpm.

DRIVE MOTOR DESCRIPTION

The drive motor is a variable displacement swashplate design. The motor is interchangeable from side to side.

The motor rotating group consists of a cylinder block with pistons and an output shaft attached to the rotating group by a retainer plate.



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A	Output Shaft	G	Crossover Relief Valve
B	Piston	H	Counter Balance Valve
C	Rotating Group	I	Control Housing and Port Plate
D	Control Lens	J	Positioning Trunnion
E	Retainer	K	Positioning Piston
F	Minimum Displacement Adjusting Screw	L	Begin of Regulation Valve

TRACK COMPONENTS

IMPORTANT!
Track sag must be set correctly before driving a new machine. Track sag may be set less than specified for shipping purposes.

The correct track sag must be adjusted once a machine has been delivered to the job sight and operating in the accumulated soil build-up in the undercarriage.

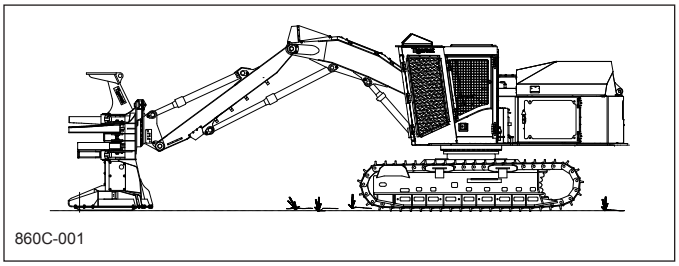
NOTE: The track sag dimension is very important and should be checked regularly, 50% increase in the life of the track assembly can be realized, particularly bushing O/D wear and track pitch by maintaining the correct amount of track sag. A track that is too tight will wear out significantly faster due to increased tension in the chain.

Track components operate under varying terrain conditions, most of which cause excessive wear. Wear to one component can quickly spread to the rest of the track assembly.

A periodic inspection must be completed to ensure components have not come loose, bolts are at the correct torque, components are within the specified wear limits (discussed further in this section) and where applicable, check lubrication points.

For a guide on inspection, refer to the MAINTENANCE SCHEDULE in SECTION 3.

OPERATING THE MACHINE



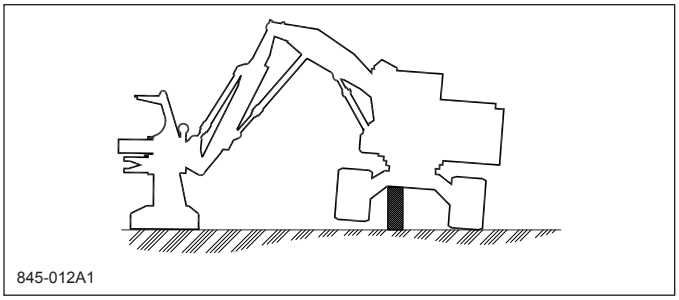
Operate Machine With Attachment Over Idlers

Whenever possible the machine should always be operated with the attachment head over the idlers and not over the sprockets.

Operating over the sprockets will result in overloading of the contact surfaces between the sprocket and the track bushings. Bushings could crack during sprocket impact.

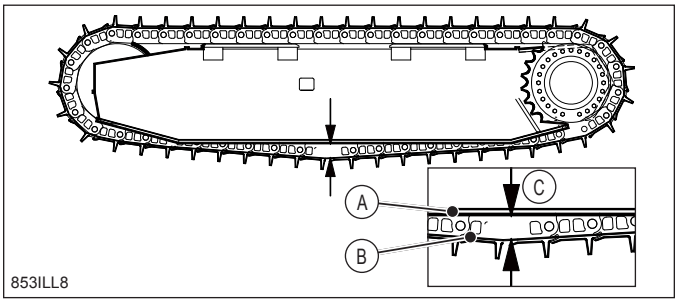
MEASURING TRACK SAG

1. Position the attachment head in the vertical position and swing the boom to the side of the machine.



Left Track – Raised

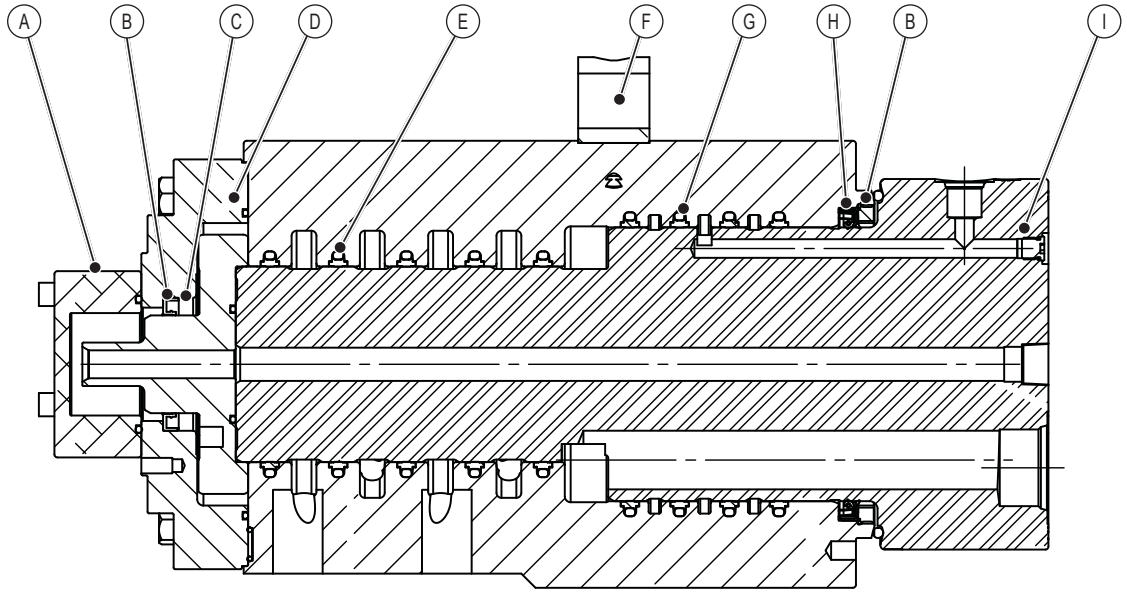
2. Place the attachment on the ground and force down with boom controls to lift the track clear of the ground.
3. Rotate the track in forward and reverse several times. Stop the track while in reverse. Do not clean the track.



A Underside of Track Guard
B Upper Surface of Track Guard
C SAG Dimension

4. Turn OFF the engine.
5. Measure the distance between the top surface of the track shoe at the centre of the lower surface of the track frame.
6. This dimension should be between 102 – 152 mm (4 – 6 in) for normal operations.

NOTE: If track sag is less than specified, track chain wear will be accelerated. If track sag is excessive, it is possible for the track to jump off the sprocket.



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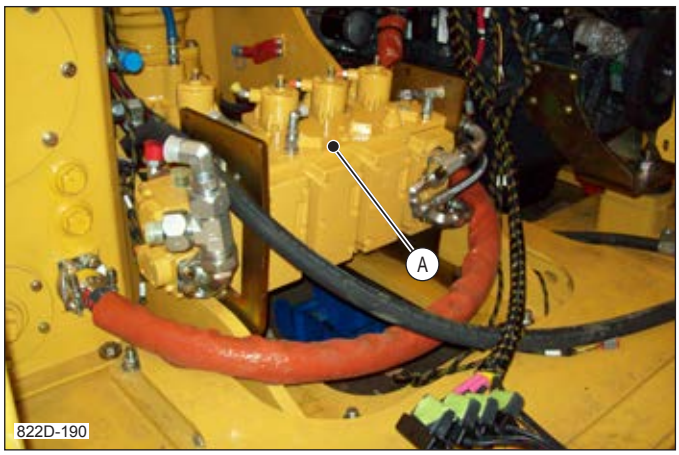
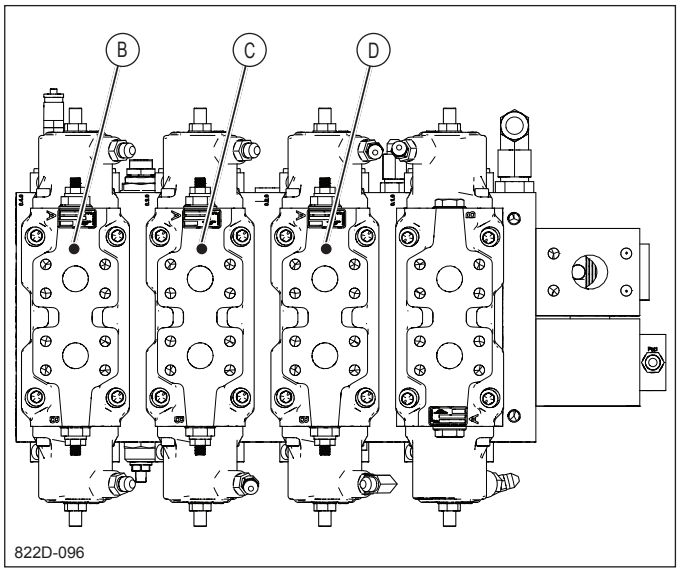
8 Passage Rotary Manifold Cross Section

A Cap	F Mounting Plate
B Seal	G Seal and O-Ring (×4)
C Snap Ring	H O-Ring
D Retainer Plate	I Spool
E Seal and O-Ring (×5)	

MAIN CONTROL VALVE





A Main Control Valve (View from Rear)
B Main Boom Valve (Hoist Cylinder)
C Tilt Valve Section
D Stick (ER) Boom Valve Section

The hoist boom, tilt and stick boom spool sections each have port relief valves with anti-cavitation features to protect the circuit from abnormally high pressures induced by the working load.

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

To adjust the relief valves, Refer to SET MAIN BOOM AND STICK PORT RELIEF VALVES in THIS SECTION.

To adjust oil flow, refer to ADJUST OIL FLOW TO CYLINDERS in THIS SECTION.

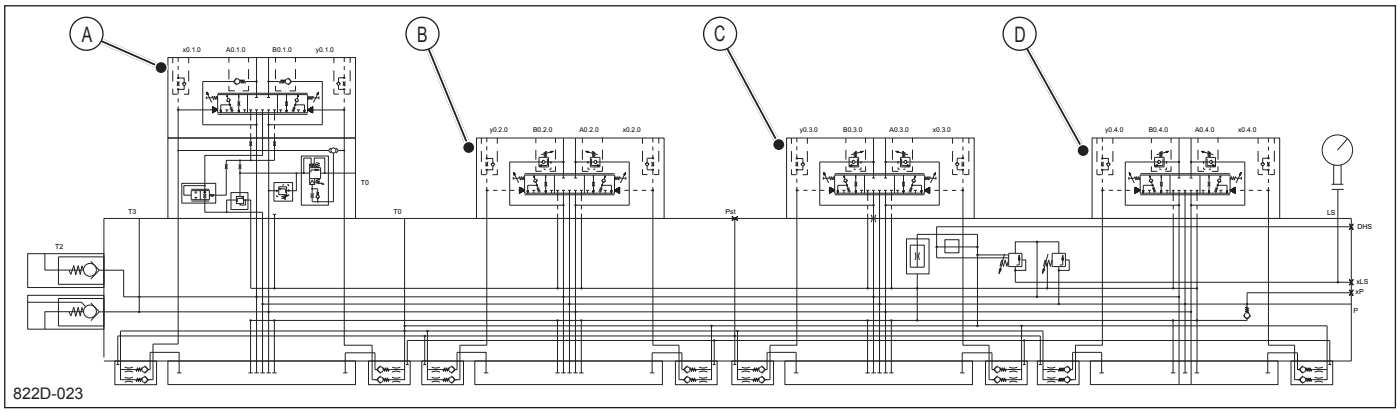
LOAD SENSING\ENGINE ANTI-STALL

The boom hydraulics (hoist, stick and tilt) along with the swing and track drive circuits are all under the control of the load sensing system incorporated into the main hydraulic circuit.

For a full description of the main hydraulic system, including load sensing, main pump and the main control valve, refer to SECTION 4.

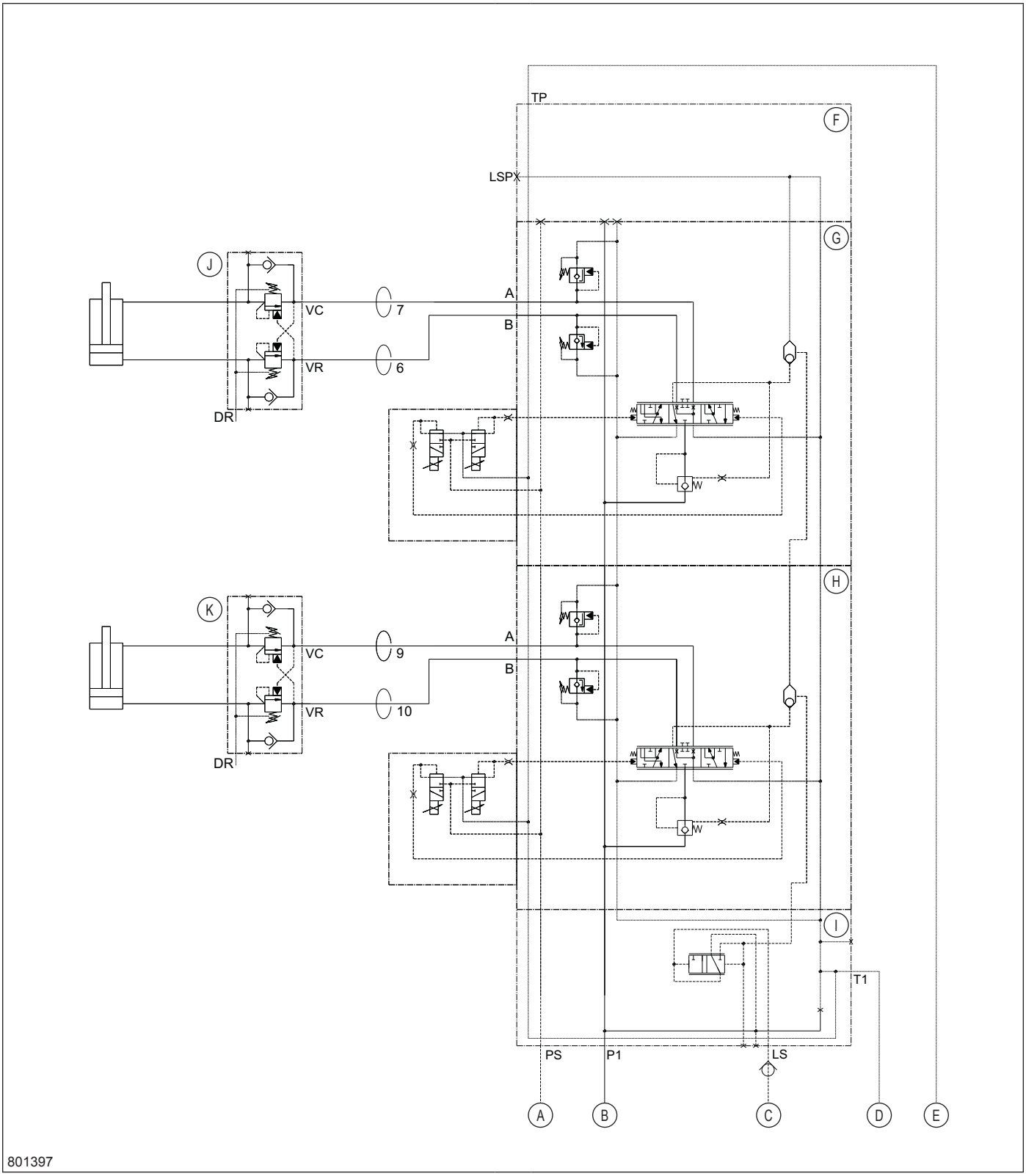
For a full description of the engine anti-stall, refer to SECTION 7.

For a full description of the pilot system, including the joystick handles, refer to SECTION 5.



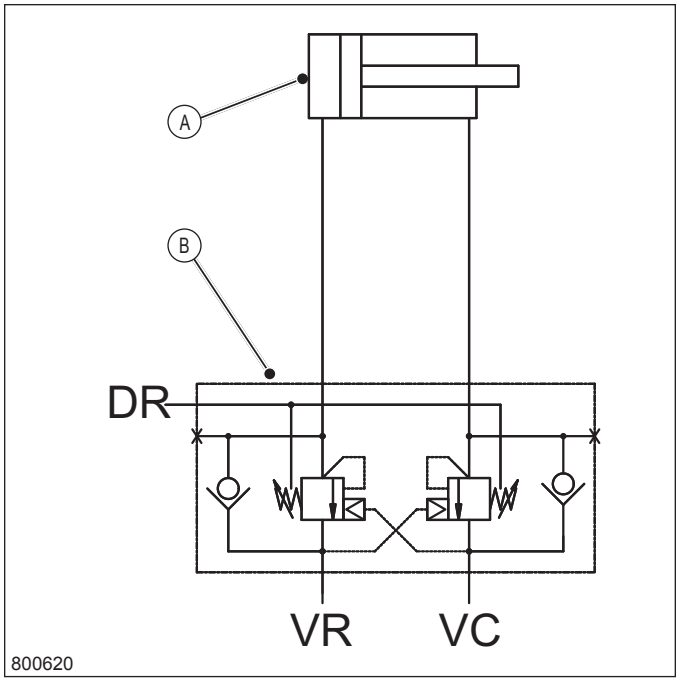
Main Control Valve Parts Schematic Diagram

A Swing Cylinder Valve Section
B Stick Boom Cylinder Valve Section
C Tilt Cylinder Valve Section
D Main Boom Hoist Cylinder Valve Section



Leveling Control Valve, Counterbalance Valves, and Leveling Cylinders Hydraulic Schematic

A Pilot Pressure Inlet	G Leveling Control Valve Section, Left Side
B Pressure Inlet	H Leveling Control Valve Section, Right Side
C Load Sense Outlet	I Leveling Control Valve Inlet Section
D Tank Return Outlet	J Left Leveling Cylinder Counterbalance Valve
E Pilot Drain Outlet	K Right Leveling Cylinder Counterbalance Valve
F Leveling Control Valve End Section	

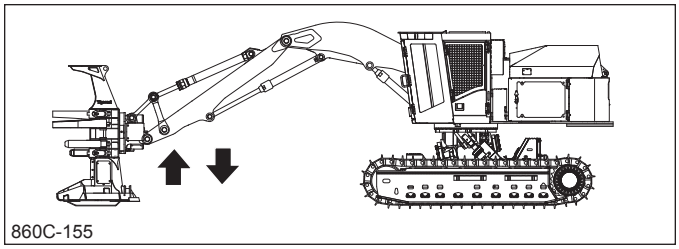


Counterbalance Valve Hydraulic Schematic
A Leveling Cylinder
B Counterbalance Valve

Pilot-operated relief valves inside the counterbalance valve assemblies facilitate load control and smooth operation.

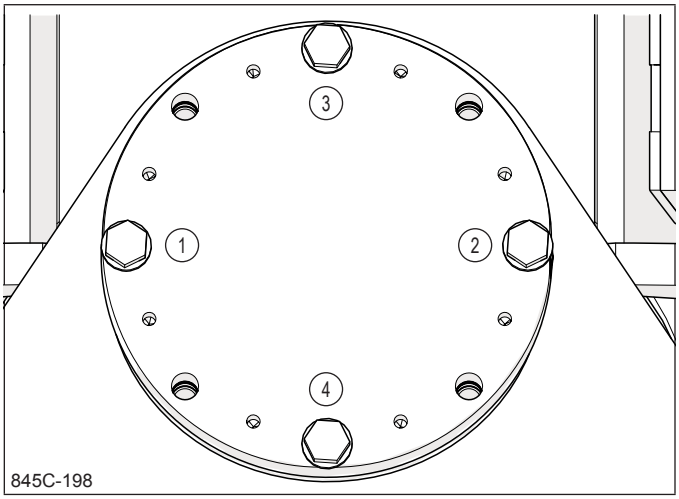
Oil entering work port 'VR' sends a pilot signal to the relief valve at port 'VC'. The relief valve opens, permitting return oil from the cylinder rod end to return to the leveling control valve.

Conversely, oil entering work port 'VC' sends a pilot signal to the relief valve at port 'VR'. The relief valve opens, permitting return oil from the cylinder base end to return to the leveling control valve.



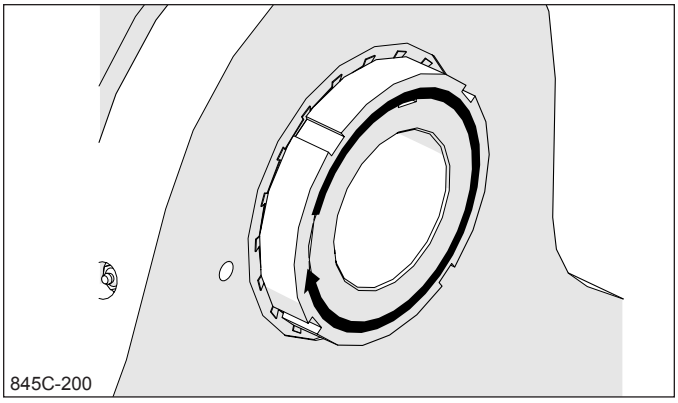
Remove Load at Rear Pin

31. Remove external load from the rear pin by lightly pushing the attachment into the ground (using boom down) and releasing the downward pressure (using boom up).
32. Park the machine on level ground with the attachment resting in front of the machine.
33. Apply the swing brake.
34. Turn OFF the engine.
35. Remove the ignition key.
36. Turn OFF the battery disconnect switch.
37. Install the leveling cylinder locks in the leveling mechanism.



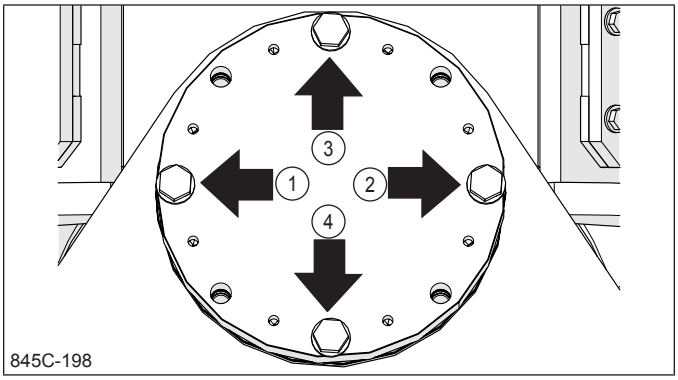
Torque Sequence

38. Torque the rear retaining cap bolts to 136 Nm (100 lbf-ft) in sequence as illustrated.

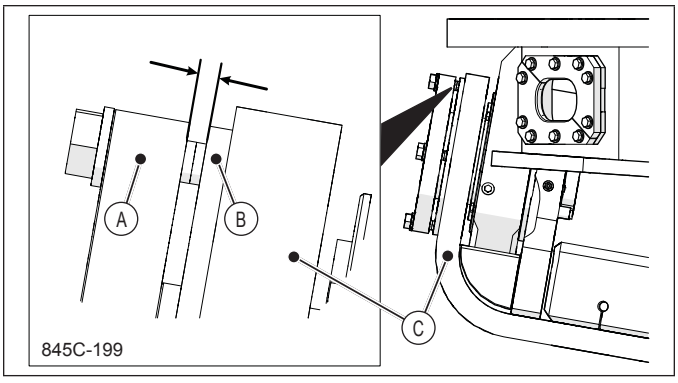


Rear Pivot Axis Bearing Locknut

39. Turn the rear bearing locknut clockwise until it is snug.
40. Repeat steps 21–39 until the rear retaining cap bolts remain torqued to 136 Nm (100 lbf-ft) and the rear bearing locknut can not be turned clockwise by hand.



Gap Measurement Locations



Gap Measuring Surfaces

A Rear Retaining Cap
B Rear Lug
C Pivot Base Plate

41. Measure the gap between the rear retaining cap and the surface of the rear lug in four places as illustrated.

    NOTE: The measurements may vary up to 0.25 mm (0.010 in).

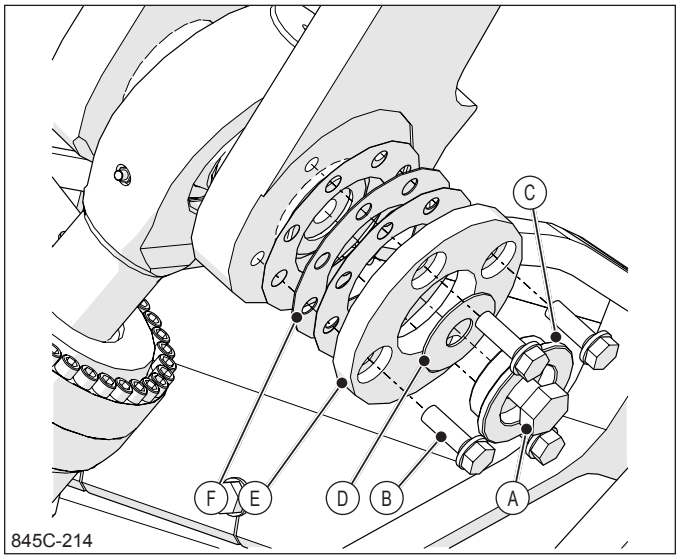
ADJUSTING AXIAL MOVEMENT OF THE BALL BUSHING ALONG THE PIN

LEVELING CYLINDER ADJUSTMENT

NOTE: Both leveling cylinders require this adjustment.

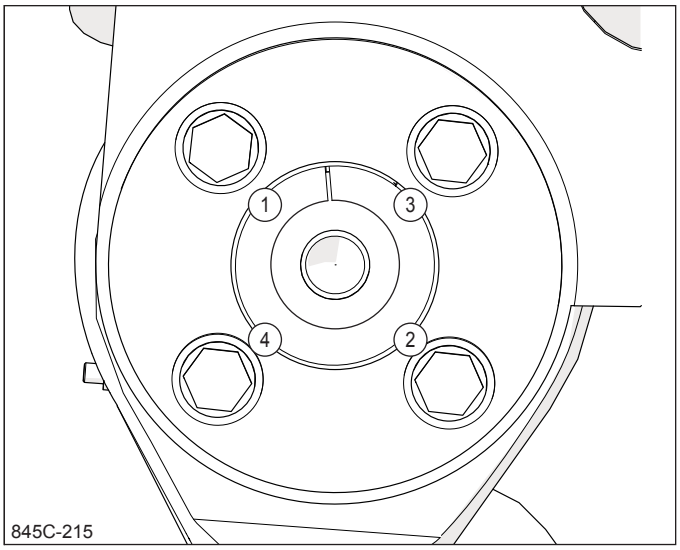
1. Park the machine on level ground with the attachment resting in front of the machine.
2. Support the upper structure to prevent movement. Refer to SUPPORTING THE UPPER STRUCTURE in THIS SECTION.

   NOTE: Do not apply external forces or load to the boom or attachment.
3. Apply the swing brake.
4. Turn OFF the engine.
5. Remove the ignition key.
6. Turn OFF the battery disconnect switch.



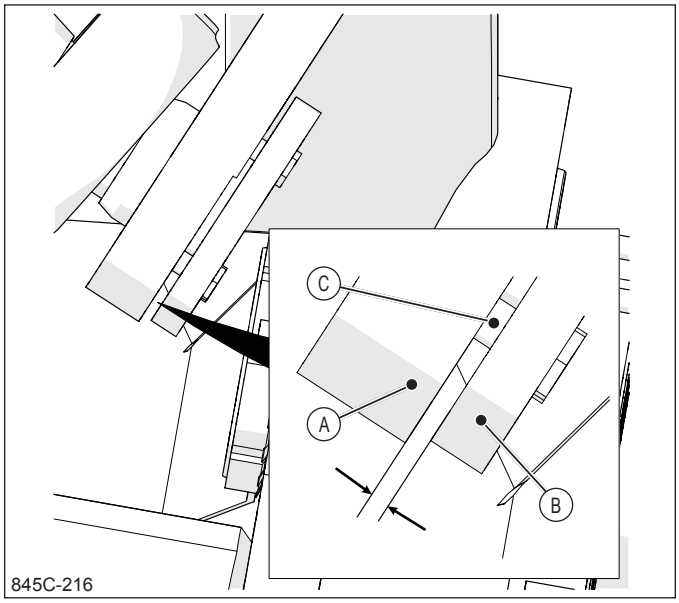
Sleeve Retaining Cap Removal	
A	End Bolt
B	Sleeve Retaining Cap Bolts and Washers
C	Washer
D	Spacer
E	Sleeve Retaining Cap
F	Shims

7. At the rod end of the leveling cylinder, remove the end bolt that passes through the sleeve retaining cap.
8. Remove the washer.
9. Remove the spacer.
10. Remove the sleeve retaining cap bolts and washers.
11. Remove the sleeve retaining cap.
12. Remove the shims.



Torque Sequence

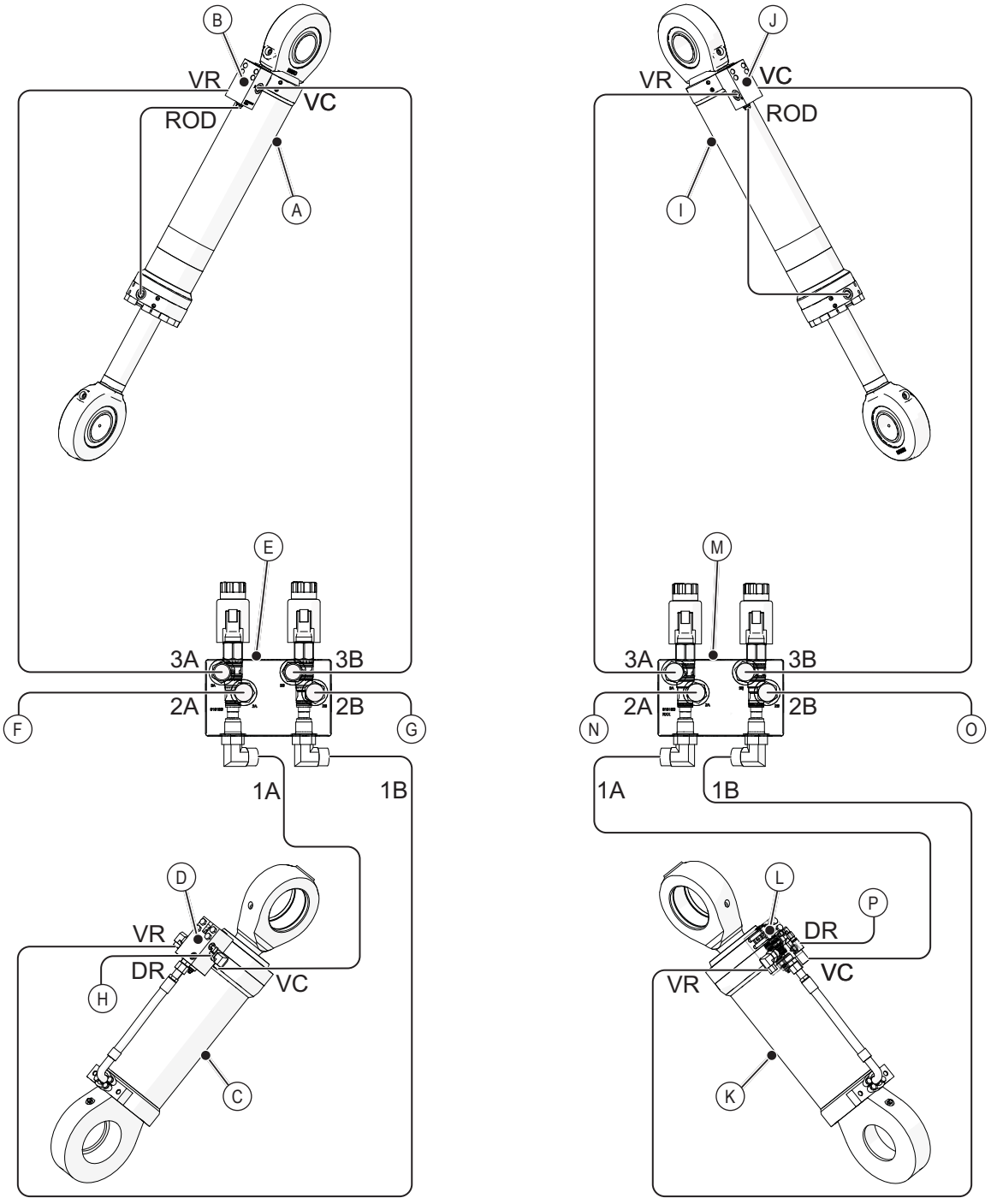
13. Install the sleeve retaining cap with four retaining cap bolts and washers. Snug the bolts, but do not tighten fully.
14. Torque the sleeve retaining cap bolts to ⅓ of the recommended torque of 520 Nm (400 lbf-ft) in sequence as illustrated.
15. Repeat in sequence until the recommended final torque of 520 Nm (400 lbf-ft) is reached.



Gap Measurement	
A	Pivot Lug
B	Sleeve Retaining Cap
C	Bolt

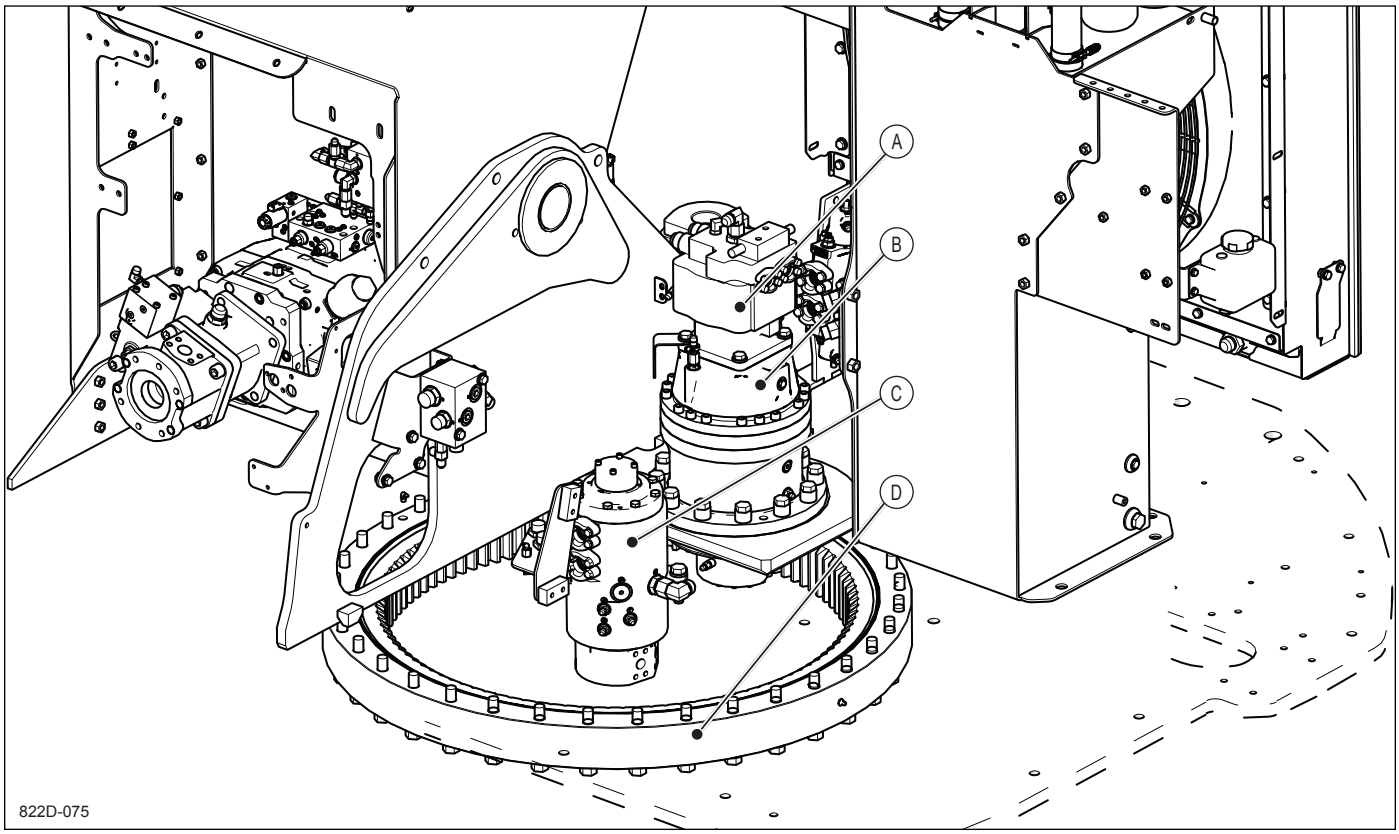
16. Measure the gap between the sleeve retaining cap and the surface of the pivot lug at each of four bolting locations around the cap.

    NOTE: The measurements may vary up to 0.25 mm (0.010 in).



Dozer Blade Hydraulic Circuit Diagram	
A Left Dozer Blade Cylinder	I Right Dozer Blade Cylinder
B Left Dozer Blade Cylinder Counterbalance Valve	J Right Dozer Blade Cylinder Counterbalance Valve
C Left Leveling Cylinder	K Right Leveling Cylinder
D Left Leveling Cylinder Counterbalance Valve	L Right Leveling Cylinder Counterbalance Valve
E Left Diverter Valve	M Right Diverter Valve
F Port '2A' to Rotary Manifold Port '7'	N Port '2A' to Rotary Manifold Port '9'
G Port '2B' to Rotary Manifold Port '6'	O Port '2B' to Rotary Manifold Port '10'
H Port 'DR' to Drain	P Port 'DR' to Drain

SWING DRIVE HYDRAULIC CIRCUIT



A Hydraulic Motor, Fixed Piston	C Rotary Manifold (8 Passage)
B Swing Drive Gearbox	D Spherical Bearing

The main pump supplies oil to the swing motor via the swing valve section on the main control valve manifold.

The swing function is controlled by the left joystick valve which sends proportional pilot signals to the main control valve manifold which supplies oil to the swing motor.

The swing motor is a piston motor with crossline relief valves mounted on the input end. The crossline relief valves provide a cushion to the high forces occurring during start and stop of the upper structure swing function.

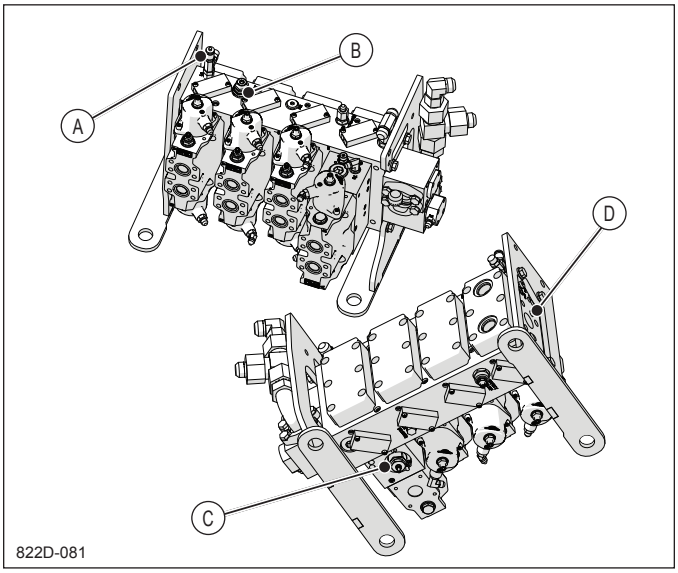
Power is transmitted from the motor to a double reduction planetary gearbox. The motor has a spring-applied, hydraulic-release, multi-disc brake in the motor housing. This brake is normally ON. Placing the swing brake switch in the OFF position energizes the swing brake solenoid pilot valve on the pilot manifold and allows pilot oil pressure to flow to the swing brake via port 'C5', to release the swing brake.

In the event electrical power is lost to the solenoid valve or hydraulic pressure to the pilot valve is lost, the swing brake will engage ON automatically.

PRESSURE, CROSSLINE RELIEF VALVES

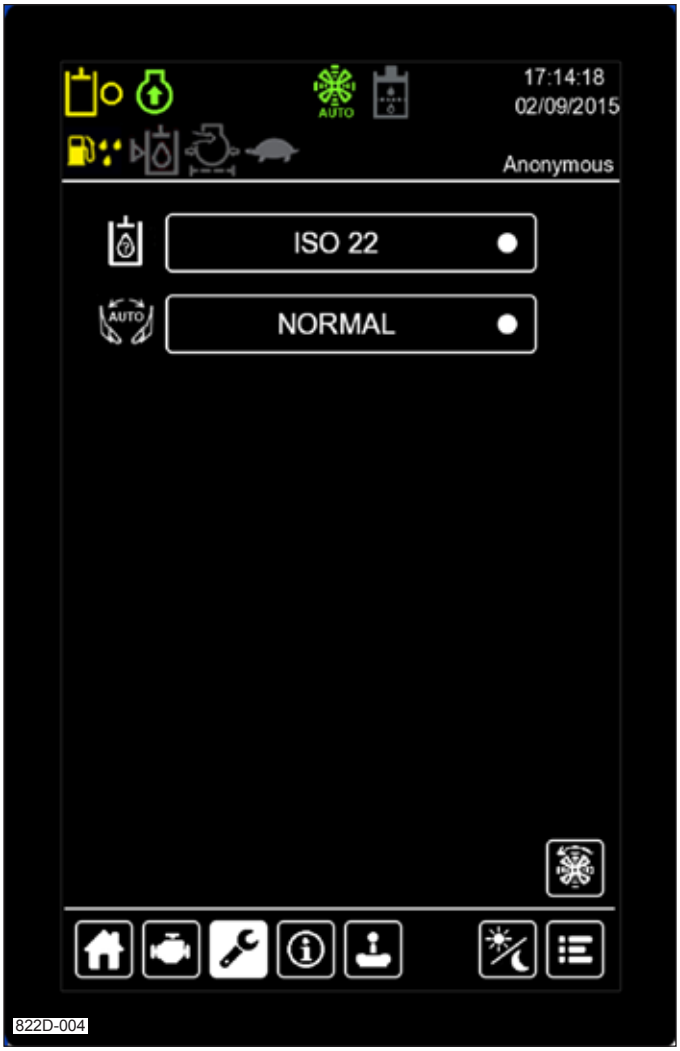
WARNING

The swing brake must be applied at all times during this procedure



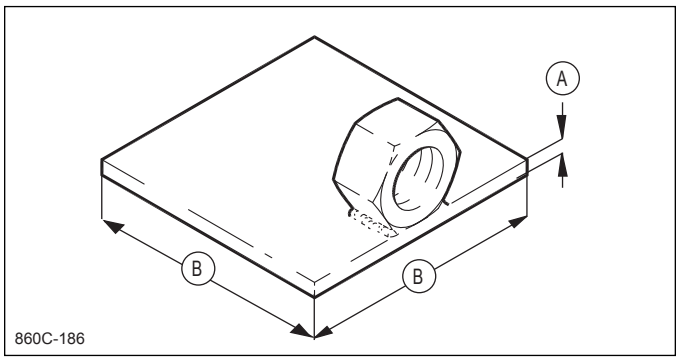
A 'LS' Pressure Test Port
B LS Pressure Relief Valve (Turn in Fully)
C Swing Torque Adjust
D 'P' Port

1. The hydraulic oil must be at operating temperature.
2. Install a 0–350 bar (0–5000 psi) pressure gauge in the 'P' port on the side of the main control valve manifold.
3. Turn ON the engine and set the speed control switch to HIGH IDLE.
4. Close cab door and press interlock reset button to activate the pilot system.
5. Turn the anti-stall switch OFF and the swing brake ON.
6. Place the fan in the SERVICE mode via the computer.



ADJUST SWING BEARING BACKLASH

1. Make up adjustment tool from a 101.6×101.6mm (4×4 in) piece of 6.35 mm (0.25 in) thick steel plate. Weld a 25 mm (1 in) nut on the plate as shown.



860C-186

Adjustment Tool	
A	6.35 mm (0.25 in)
B	101.6 mm (4.0 in)

2. Position the adjustment tool up against the underside of the turntable 12.7 mm (0.5 in) away from the bearing. Weld the tool to the turntable as shown using 6.35 mm (0.25 in) fillet weld.

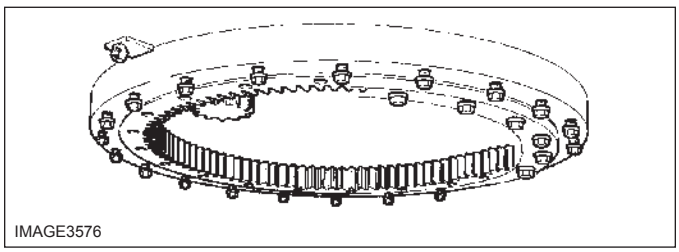


IMAGE3576

3. Install a 1×6 inch hex head bolt in the nut. Check the backlash between the pinion gear and swing bearing gear teeth. Should be 0.406–0.762 mm (0.016–0.030 in).

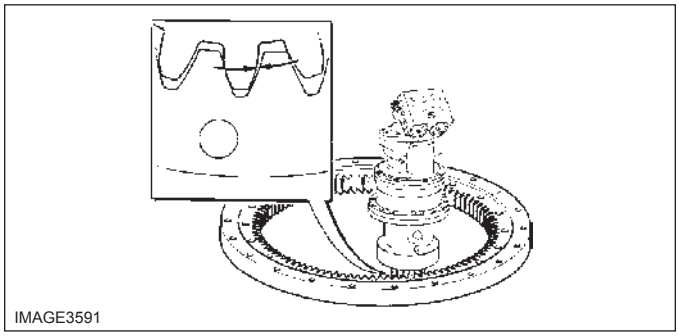


IMAGE3591

4. Loosen swing bearing outer race bolts, and adjust the hex head bolt to decrease the backlash or swing the upper 180° and adjust the hex head bolt to reposition swing bearing to obtain acceptable backlash of 0.406–0.762 mm (0.016–0.030 in).

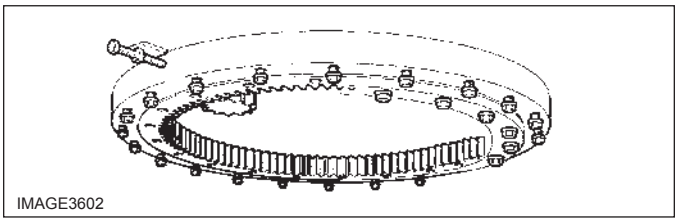
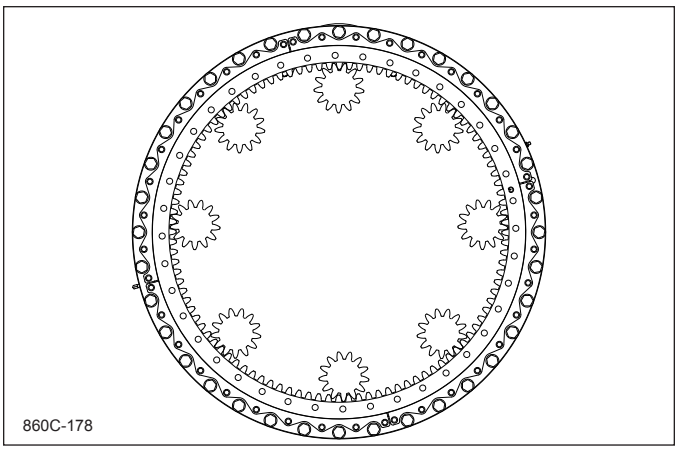
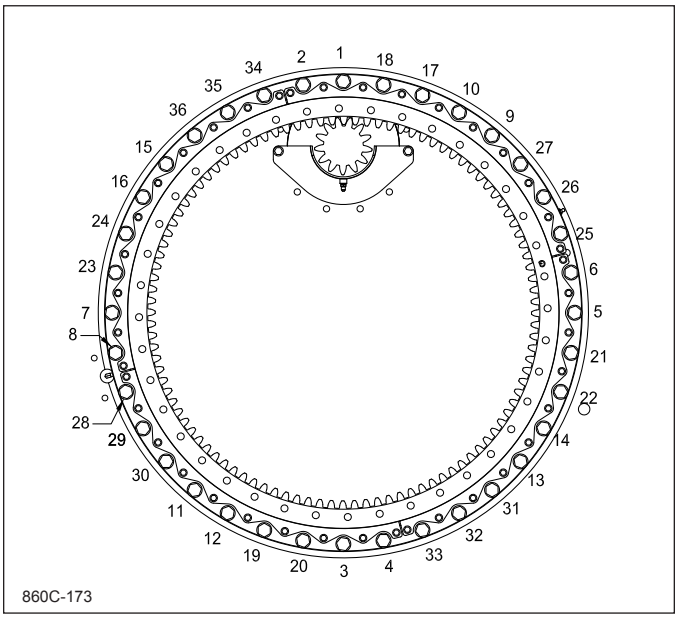


IMAGE3602

5. Torque four pairs of swing bearing outer race bolts located at 90° to each other to 610 N-m (450 lbs-ft.)

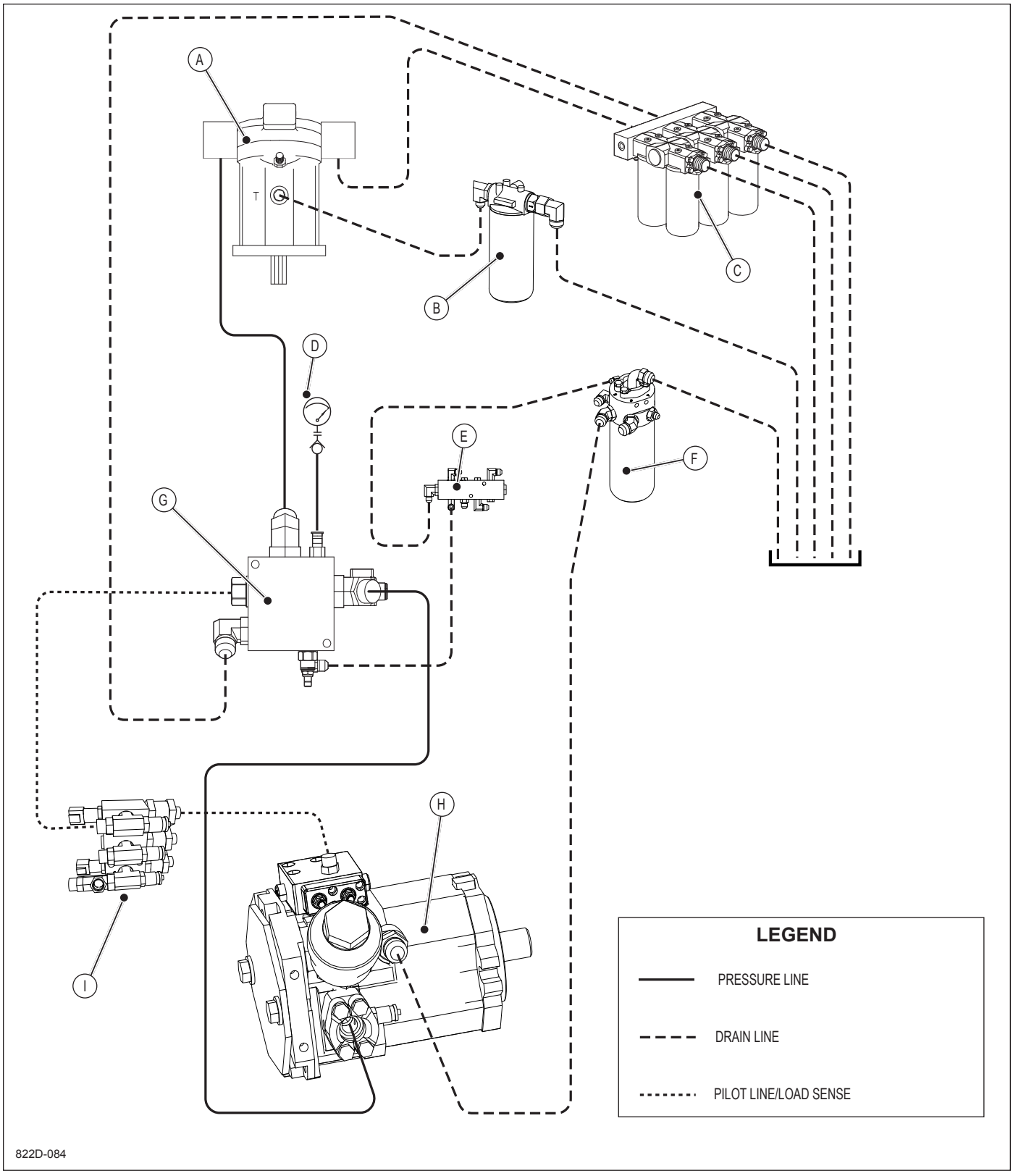

860C-178

6. Recheck and adjust backlash every 45° of gear rotation to obtain acceptable backlash of 0.406–0.762 mm (0.016–0.030 in).



860C-173

7. Apply Loctite-Blue (removable) to all bolts and torque swing bearing mounting bolts to 542–610 N-m (400–450 lbs-ft) with sequence shown above.



Saw Drive Component Circuit Diagram

A Saw Drive Motor	F Case Drain Strainer
B Return Strainer	G Saw Drive Control Valve
C Return Filters	H Saw Pump
D 'G2' Test Gauge Port	I Pump Load Sense Manifold
E Case Drain	

SPOOL SECTIONS

All of the attachment control valve spool sections are equipped with proportional, electro-hydraulic spool actuators. The actuators are spring centered to the neutral position, and are shifted by sending a variable current signal (from the XA2-A0 expansion module) to the appropriate solenoid. Each section has a pilot restrictor installed in the 'A' and 'B' side to create a 'ramping' effect and result in smooth, gentle function operation. Each spool section is equipped with a pressure compensator.

PRESSURE COMPENSATION

The primary purpose of pressure compensation is to maintain a constant flow rate to functions (maintain the same speed of movement), regardless of pressure variations in the system. The pressure compensator also contains a load-hold check valve. An orifice is installed in the LS portion to smoothly regulate the response of the compensator.

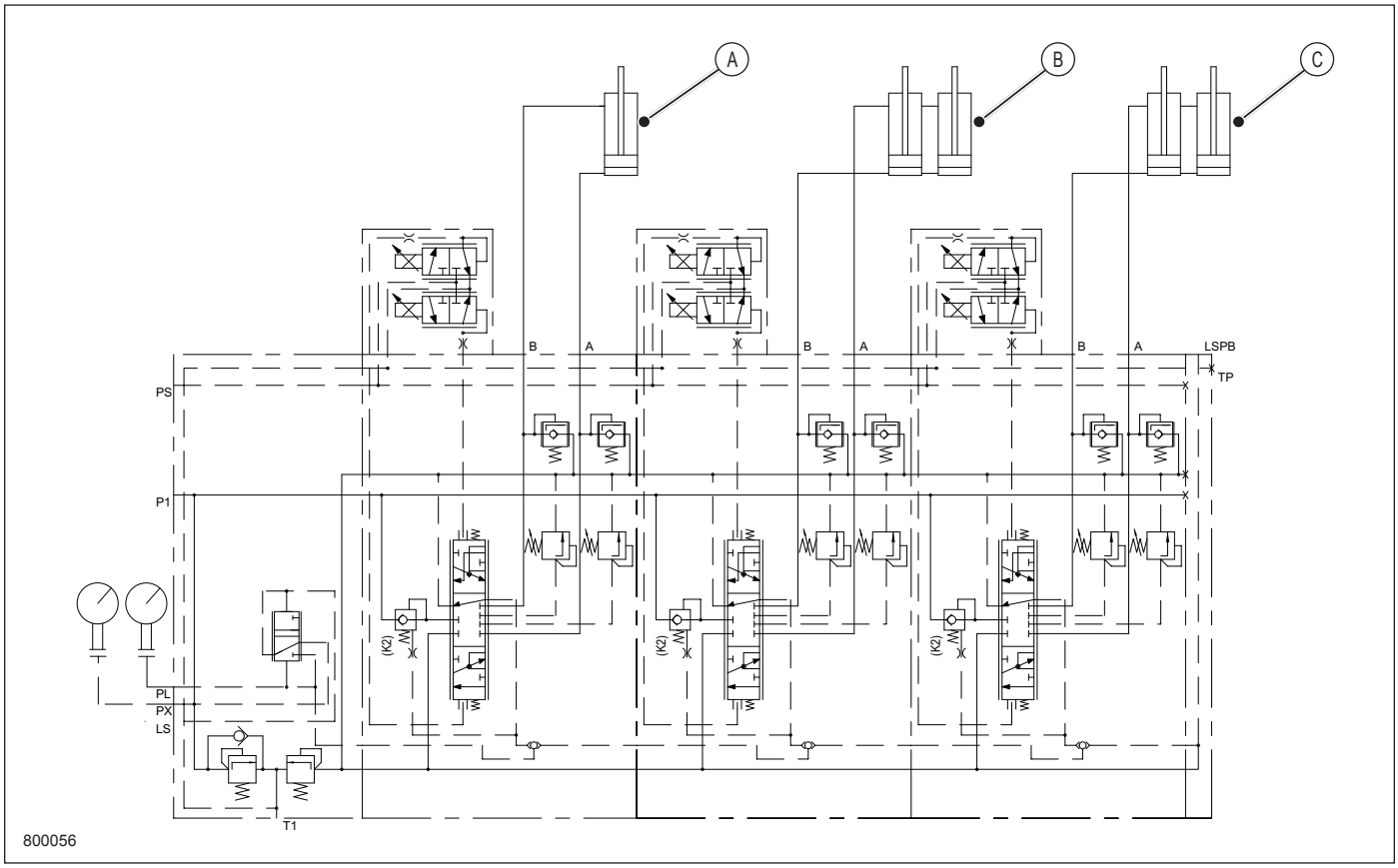
PORT RELIEFS

The attachment control valve is equipped with port reliefs on each side of all spool sections. The function of the port relief is to protect the valve and the function from pressure peaks in the system.

The port reliefs also act as anti-cavitation valves, which means they allow oil to flow from the tank gallery in the valve to the service ports in the event of under-pressure. Port reliefs cannot be adjusted. Port reliefs installed in each section are specifically designed for use in that section and should not be interchanged with port reliefs from other valve sections . Refer to REPLACING PORT RELIEF in THIS SECTION.

FEED REDUCTION VALVES

Adjustable feed reduction valves are provided for each attachment function. The purpose of the feed reducers is to limit the maximum pressure for each function flowing over relief.



Attachment Control Valve Hydraulic Schematic

A Wrist Cylinder
B Clamp Cylinders
C Accumulator Cylinders