Tigercat®

H822C/LH822C/H830C/LH830C HARVESTER

SERVICE MANUAL

SERIAL NUMBER 82232001 TO 82233000
SERIAL NUMBER 82282001 TO 82283000
SERIAL NUMBER 83032001 TO 83033000
SERIAL NUMBER 83082001 TO 83083000

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Noise Level Inside Cab dB(A) As per Tigercat test ETR00047				
	Microphone direction:			
	Forward	Rear	Left	Right
Driving max speed (High)	77	76	77	76
Driving max speed (Low)	73	72	72	73
Boom opertation	72	73	72	73

NOISELEVELS.XLS

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against noise. Prolonged exposure to loud noise can cause impairment or loss of hearing. This machine exceeds 70 dB(A) in the cab and exceeds 85 dB(A) when servicing the machine engine.

Check with your local Safety Commission to determine if hearing protection is required at these levels.

Vibration Level - Whole-body As per Tigercat test ETR007 & ISO 2631-1 Weighted rms acceleration (m/s^2)				
	Seat		Seat-back	Feet
	Health	Comfort		
Driving max speed (High)				
x-axis (back-to-chest)	0.2370		0.5630	0.4020
y-axis (right-to-left)	0.2310		0.3200	0.4200
z-axis (buttocks-to-head)	0.4660		0.2110	0.6140
S	0.6571	0.5700	0.4850	0.2850
Driving max speed (Low)				
x-axis (back-to-chest)	0.1140		0.2150	0.1200
y-axis (right-to-left)	0.0764		0.0977	0.1440
z-axis (buttocks-to-head)	0.2170		0.0669	0.2230
S	0.2890	0.2568	0.1800	0.1000
Boom opertation				
x-axis (back-to-chest)	0.4510		0.6140	0.1830
y-axis (right-to-left)	0.3710		0.2470	0.3300
z-axis (buttocks-to-head)	0.4440		0.0838	0.3670
S	0.9304	0.7310	0.5070	0.1740

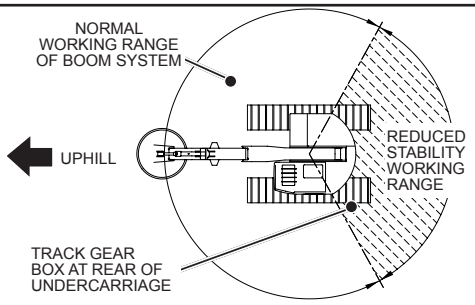
Vibration Level - Hand/Arm As per Tigercat test ETR007 Weighted rms acceleration (m/s^2)	
Driving max speed (High)	
S	1.770
Driving max speed (Low)	
S	1.170
Boom opertation	
S	0.770

**Note for hand/arm, all weighted RMS acceleration values are below 2.5 m/s^2 as per clause 3.6.3 Machinery Directive 98/37/EC Annex 1.*

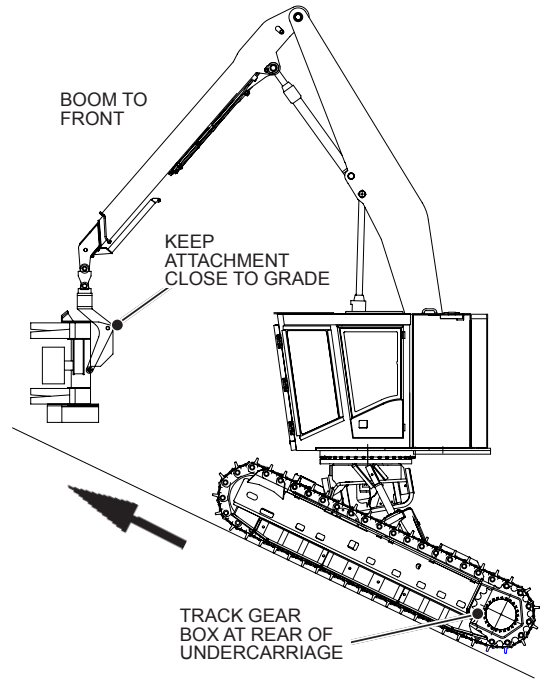
VIBRATION LEVELS.XLS

OPERATING SAFETY PRECAUTIONS continued

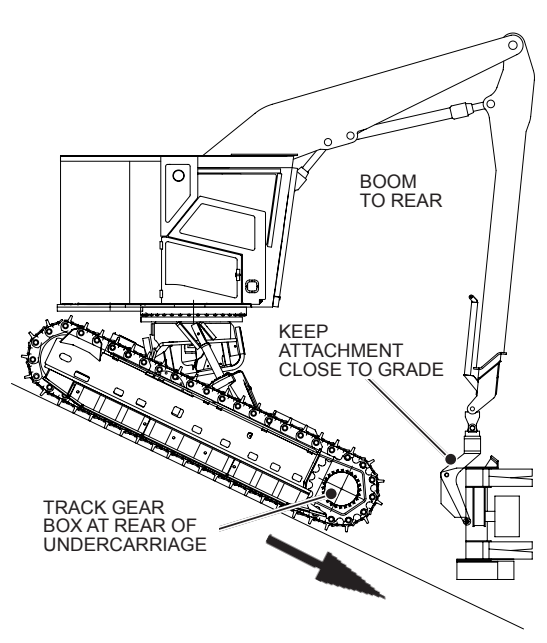
- NEVER travel across a STEEP slope or side hill.
- Always carry any load on the uphill side of the machine.
- Do not lift or move objects that exceed machine stability.
- Always be prepared to release the load in case it causes the machine to tip.
- Always position the cab so that you have a clear view in the direction of travel. Be aware of ground conditions and obstacles, in the path of the machine, before moving the machine.
- When crossing obstacles (boulders, stumps, ditches, etc.) the machine can shift rapidly, greatly affecting the stability of the machine. Move slowly over obstacles, and position the boom against the ground to reduce the risk of the machine shifting rapidly.
- Backing over obstacles unexpectedly while traveling down a slope poses a tipping risk. Know the path of the tracks whenever the machine is moved.
- When climbing a slope the boom should face uphill and the attachment should be kept close to the ground (FIG.3). When descending a slope the boom should face down hill and the attachment should be kept close to the ground (FIG.4). Be aware that the machine is in its least stable postion on a slope with the boom to the rear (see also FIG.1). Be particularly aware of machine stability when changing directions on, or travelling back down a slope.
- As you gain experience, recognize that the maximum slope on which the machine can operate cannot be defined simply by an angle value. Variables in surface terrain, soil types, rocks, boulders, stumps, and fallen trees, changing weather conditions, and first and foremost the experience and skill level of the operator, greatly affect the maximum slope limitations. Be aware that these factors can result in a shallow slope posing greater risk than a relatively steeper slope. **DO NOT attempt to work on slopes beyond your personal capability level**.



LH830-07 **FIG. 1 WORKING RANGES**



LH830-04 **FIG.3 CLIMBING SLOPE**



LH830-05 **FIG.4 DESCENDING SLOPE**

SERVICING SAFETY PRECAUTIONS continued

GREASE INJECTION INJURY WHEN USING PNEUMATIC GREASE GUNS

Pneumatic grease guns can deliver grease at pressures from 17 - 400 Bar (246 - 5801 psi). It takes less than 7 Bar (100 psi) to inject a substance through human skin.

ALWAYS ***get professional medical treatment immediately*** after any type of injection injury.

Provide the physician with information on the type of grease, the pressure setting of the gun, and similar details.

The amount of fluid injected, type of fluid (or material), pressure at which it was injected, and the elapsed time between injection and surgery all influence the chances of successful treatment for this type of serious injury.

Prior to using a high pressure pneumatic grease gun, perform the following:

- DO NOT OPERATE a high pressure pneumatic grease gun unless you have been trained in the proper operation and are aware of all safety precautions of such a tool.
- All operators of high pressure pneumatic grease guns MUST be trained in the hazards of its operations and the treatment for such injuries.
- Wear proper protective equipment such as gloves, safety hat and safety glasses.
- Inspect all parts of the grease gun for wear and tear and replace all worn or damaged parts.
- Make sure that protective shrouds are installed on all grease gun nozzles as safety devices.
- Remove dirt and grease from grease fittings prior to greasing.
- Replace any defective grease fittings on equipment with new fittings immediately.
- When badly positioned fittings are identified, replace them with angled or swivel fittings for easier access.

REMOVE IGNITION KEY BEFORE SERVICING THE MACHINE!

Prior to performing any service work or maintenance on the machine, stop the engine, **REMOVE THE IGNITION KEY** and store it in a safe place.

CRUSH HAZARD

This label warns of a downward force crush zone caused by swinging or falling logs. It is located on either side of the attachment end of the stick boom.

Approaching personnel are subject to crush injurys by falling or swinging logs which **could result in death or serious injury**.

DO NOT start the machine until other personnel are a safe distance away from the machine.

When the engine is running, **DO NOT** allow anyone in areas of the machine where they may be crushed by moving components.

Maintain a safe operating distance between the machine and workers and all other personnel. It is the duty of the operator to ensure that no person approach the machine while in use, the risk zone is 150 m (500 ft).

DO NOT attempt to service or work on the machine **UNTIL THE LOAD IS REMOVED** from the attachment, the **VEHICLE IS IN THE PARKED POSITION** and the **ENGINE IS TURN OFF**.

Tigercat H822C/LH822C/H830C/LH830C Harvester
SECTION 3 - LUBRICATION AND MAINTENANCE

Always 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 1.1, JANUARY 2015

SCHEDULED MAINTENANCE

EVERY 24 HOURS :

- **Perform FREQUENTLY maintenance**
- **Perform 8 HOUR maintenance**

Additionally:

- Lubricate swing bearing:
  1-fitting - 10 shots while swinging

EVERY 125 HOURS:

- **Perform FREQUENTLY maintenance**
- **Perform 8 HOUR maintenance**
- **Perform 24 HOUR maintenance**

Additionally:

- Open both (Left side door and cab roof escape hatch) emergency exits to ensure they are fully operational.
- Check **return filter bypass warning** is NOT displayed on the MD3 Computer with engine running at high idle with oil flow and oil at operating temperature.
- Check track gearboxes oil level with the fill plug at the 9 O'clock position and the drain plug at the 6 O'clock position.
- Check the battery fluid level unless it is maintenance free.
- Check the hydraulic pump and motor securing bolts.
- Check torque tightening points as per new machine maintenance.
- Carry out the A/C system inspection; Refer to CHECKING THE AIR CONDITIONING SYSTEM in this section.

Visually check for damage to:

- Hoist and stick booms
- Tracks and undercarriage
- Swing bearing area
- Attachment
- Make repairs immediately.

Visually inspect for:

- Frayed electrical wiring and hydraulic hoses.

  NOTE: Neglecting the proper maintenance of these items can result in fire.
- Wear in any other components.

Clean/replace:

- Inspect for debris buildup between the radiator, oil cooler and A/C condenser.

  Refer to the diesel engine service manual and attachment manual for additional required maintenance at this scheduled time period.

EVERY 250 HOURS:

- **Perform FREQUENTLY maintenance**
- **Perform 8 HOUR maintenance**
- **Perform 24 HOUR maintenance**
- **Perform 125 HOUR maintenance**

Additionally:

- Check all hydraulic pressures.
- Check oil in pump drive gearbox.
- Replace oil in track drive gearboxes with the drain plug at the 6 O'clock position and the fill plug at the 9 O'clock position.
- Lubricate rotary manifold seal; 1 fitting - 5 shots. **Do not use power grease gun.**
- Lubricate each swing drive gearbox lower bearing; 4 fitting - 5 shots each gearbox.****Do not use power grease gun.**

  With each swing gearbox at operating temperature slowly add **5 shots of lithium based ep2 to each side of the gearbox.

  NOTE: During cold weather, the swing function must be operated for several hours to achieve operating temperature.

  IMPORTANT!
  Do not force grease as gearbox failure may result. **Do not use winter grease.** Grease should purge from gearbox pinion seal.
- Clean and thoroughly inspect all surfaces of the main and stick booms for cracks. All cracks must be properly repaired in their early stages.

  NOTE: In most cases cracks will continue to grow in size and often lead to major structural damage. **Failure to regularly inspect for cracks and immediately repair the boom system will void the structural warranty.** Contact your Tigercat dealer for specific procedures required to correctly repair any cracks found.
- Drain and replace the swing drive gear box upper bearing gear oil. Refer to recommended oils in FILTER AND LUBRICATION SCHEDULE in this section.
- Lubricate leveler, intermediate pivot points; 2-fittings total - purge. Remove/replace protection plugs to access.
  (If equipped with leveler)
- Lubricate leveler, upper pivot points; 4-fittings total - purge. Remove/replace protection plugs to access (if equipped with a leveler).

CHECKING THE AIR CONDITIONING SYSTEM

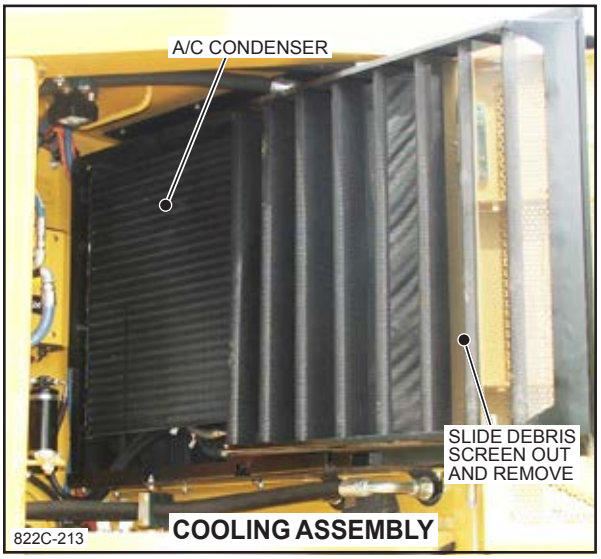
Any service work must be performed by a certified A/C technician. The system should be charged with R134a refrigerant only. PAG (polyalkylene glycol) oil should be present in the system and must be used on O-Rings and fittings during assembly.

A/C SYSTEM TOTAL CAPACITIES	
R134a REFRIGERANT	PAG OIL (polyalkylene glycol)
1.36 kg (3 lb)	207 ml (7 oz)

The *compressor* and *charge valves* are accessed on the top left side of the engine. The *receiver dryer* is mounted to the back of the engine compartment.

Perform following inspection along with 125 HOURS inspection outlined in SCHEDULED MAINTENANCE in this section.

1. Check *re-circulating* and *fresh air filters* in operator's cab. Refer to SECTION 2 of the OPERATOR'S MANUAL.



2. Check the *condenser core* for dirt and debris. Clean as required. Refer to CLEANING A/C CONDENSER AND COOLING ASSEMBLY in SECTION 2 of the OPERATOR'S MANUAL.

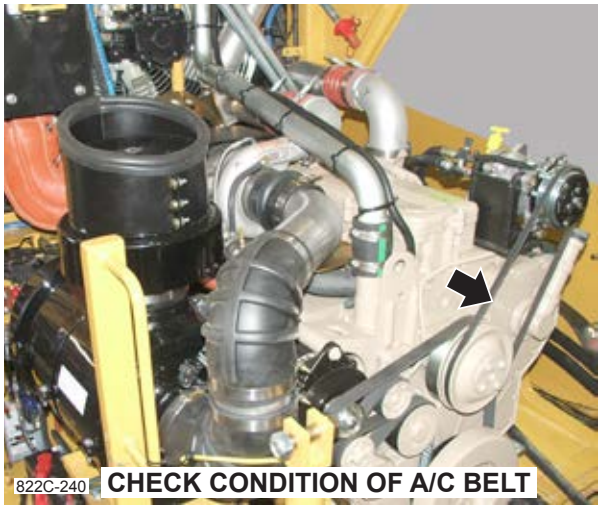
⚠ CAUTION

If using pressurized water or compressed air for cleaning, use at 2 bar (30 psi) or less. Always use personal protective equipment (safety glasses) to guard against flying debris.

⚠ CAUTION

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

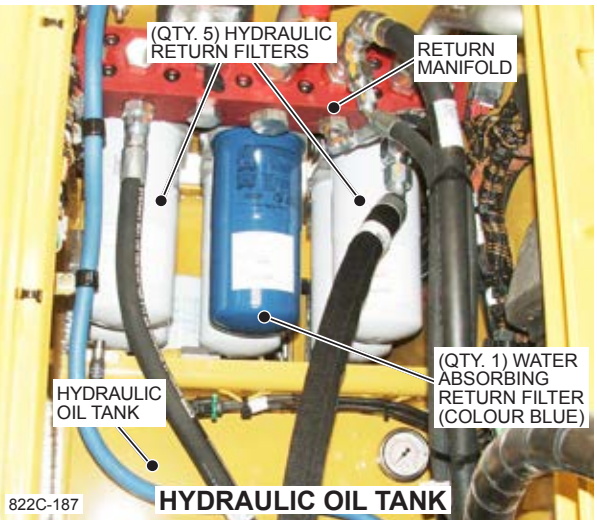
3. Check for dirt and debris; on the *evaporator coil* located inside the *A/C-heater unit* and also the inside of the *A/C-heater unit*. Clean as required.



4. With engine stopped, check and adjust *compressor drive belt* tension.
5. Check all A/C hoses for kinks.*
6. Run *air conditioning* system for **three to five minutes**.

   IMPORTANT!
   It is recommended that during cold weather, when the A/C system is not in use, the system be run for a period of 5 minutes every two weeks. This will circulate oil to all components of the A/C system.
7. Check *air temperature* exiting *vents* in cab.
8. Listen to *compressor* and *blower motor* for abnormal noises.*
9. Check to see that *compressor clutch* will engage.*

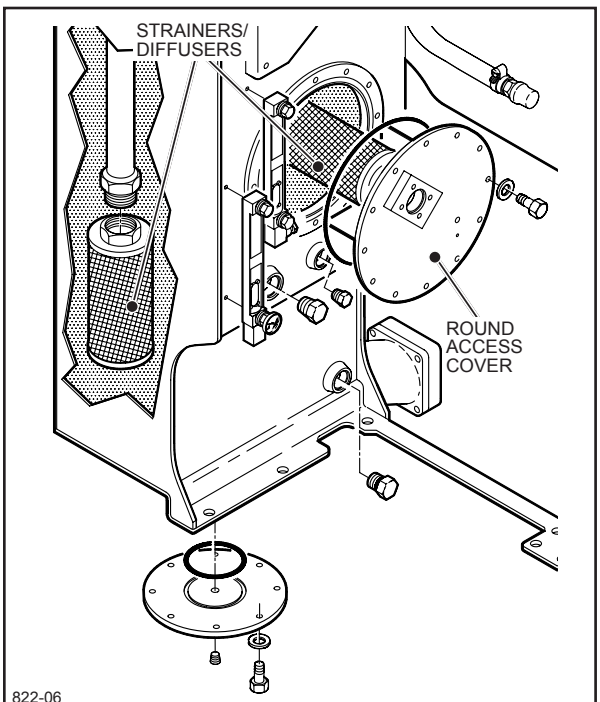
HYDRAULIC OIL RETURN FILTERS



HYDRAULIC OIL TANK

There are six replaceable filters mounted on three filter heads beside the tank.

The filters should be checked/changed at the intervals specified in the LUBRICATION AND MAINTENANCE SCHEDULE in this section.



RETURN TUBE STRAINERS/DIFFUSERS

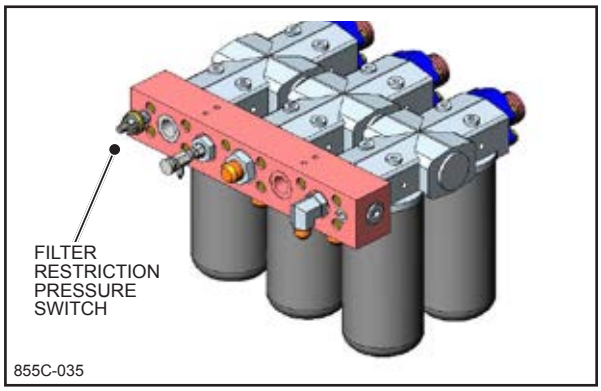
There are four reusable strainers/diffusers housed in the hydraulic tank, one (horizontal) on the case drain return port and three (vertical) on the return tubes. Inspecting, changing or cleaning the strainers should only be performed in the event of a pump or motor catastrophic failure or hydraulic oil contamination.

The filters should also be checked/changed when the oil filter bypass icon displays RED on the MD3 computer. If the icon continues to display RED after the filters have been changed, the return strainers/diffusers attached to the base of the return tubes in the hydraulic tank should be examined for possible obstruction.
Refer to CHANGING OR CLEANING THE STRAINERS/DIFFUSERS in this section.

If the FILTER BYPASS icon displays RED between scheduled maintenance intervals, STOP THE MACHINE and **change these filter elements**.

NOTE: The FILTER BYPASS icon will display YELLOW when hydraulic oil temperature is low and the filter restriction switch is activated. Allow oil to warm to operating temperature and the icon should change in colour to GREY. Refer to MACHINE PREPARATION in SECTION 2 of the OPERATOR'S MANUAL.

FILTER RESTRICTION PRESSURE SWITCH



There is a bypass valve built into each filter head, preset at 1.7 bar (25 psi) 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 installed in the return manifold, will send a signal to the computer control system when an oil flow in excess of 1.4 bar (20 psi) is encountered at the return filters. This pressure switch closes and the hydraulic oil filter bypass icon displays RED on the MD3 computer. The master alarm and alarm light will sound and flash. This assumes that operating conditions and running temperatures are NORMAL.

IMPORTANT!
DO NOT use these warnings as a substitute for checking the oil level at regular intervals as per the SCHEDULED MAINTENANCE program in this section.

Watch transition areas.

Try to minimize travel over transition obstacles as this accelerates undercarriage wear. If you must go across a transition, position the machine 90° to the transition. Without ground support, the undercarriage is subjected to side stresses that can result in rapid, excessive wear.

Other factors:

Application refers to the type of work you do. Bunching, loading, grading, digging and trenching are a few examples. This factor is largely beyond your control, but generally speaking, the more you work in high horsepower, high-torque applications, the faster your undercarriage will wear.

Material type is another key contributor to undercarriage wear that is outside your control, the more abrasive the material, the more rapid the wear rate.

Terrain, a third uncontrollable factor, describes the contours and slopes at your job site. The more time you spend in rugged, sloped areas, the faster your undercarriage will wear out.

Configuration refers to the way your machine is equipped and is therefore something you can control. To minimize undercarriage wear on steel-track machines, always use the narrowest track shoe possible that meets your flotation requirements. If you work in very sticky materials, consider using center-punched track shoes to reduce material packing in the undercarriage area.

Maintenance discipline plays a big role in undercarriage component life. One of the most critical maintenance practices is track adjustment. Tight track is the number-one "track killer." But whether your track is too loose or too tight, improper adjustment accelerates wear which can increase downtime and repair costs. Follow the manufacturer's recommendations for track adjustment, and always perform the adjustment in the machine's working environment. A second important maintenance process is cleaning the undercarriage. To maximize wear life, remove mud and debris at the end of every shift, or more frequently if necessary.

Talk to the experts:

Undercarriage components are expensive! To get long life and maximum value from your investment, consult with a dealer or factory rep that really knows the undercarriage business. Ask for advice on operating techniques. Explore relevant application, material and terrain issues. Fine-tune your maintenance processes. Working together with an undercarriage expert, you can manage your equipment investment over the long term.

FINAL DRIVE

Left Final Drive

Crossline relief	(Rexroth Only)		**345 bar (5000 PSI)**		Low
Motor Start of regulation	☐	H822C - 3600 PSI @ P	**See Manual**		Low
	OR				
	☐	LH822C /LH830C - 3800 PSI @ P	**Y1 69 bar (1000 PSI)**		Low
Brake release (pilot pressure)			**Non-Adjustable 28-35 bar (400 - 500 PSI)**		Low
Speed	H822C	☐	Low - F8	**10 RPM MAX.**	High
			Drive - F8	**28 RPM MAX.**	High
	H830C	☐	Low - FH400	**10 RPM MAX.**	High
			Drive - FH400	**28 RPM MAX.**	High
(Linde Motor only)	LH822C	☐	Low - F8	**10 RPM MAX.**	High
(Motor set to 115cc as per drawing 47912B)			Drive - F8	**28 RPM MAX.**	High
	LH830C	☐	Low - FH400	**9 RPM MAX.**	High
			Drive - FH400	**25 RPM MAX.**	High

Max. disp. Setting: Turn screw out until off the stroking piston, turn it back in to contact, then set max disp. by turning screw 1/4 turn in. (track raised off ground running in low)

Right Final Drive

Crossline relief	(Rexroth Only)		**345 bar (5000 PSI)**		Low
Motor Start of regulation	☐	H822C - 3600 PSI @ P	**See Manual**		Low
	OR				
	☐	LH822C /LH830C - 3800 PSI @ P	**Y1 69 bar (1000 PSI)**		Low
Brake release (pilot pressure)			**Non-Adjustable 28-35 bar (400 - 500 PSI)**		Low
Speed	H822C	☐	Low - F8	**10 RPM MAX.**	High
			Drive - F8	**28 RPM MAX.**	High
	H830C	☐	Low - FH400	**10 RPM MAX.**	High
			Drive - FH400	**28 RPM MAX.**	High
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(Motor set to 115cc as per drawing 47912B)			Drive - F8	**28 RPM MAX.**	High
	LH830C	☐	Low - FH400	**9 RPM MAX.**	High
			Drive - FH400	**25 RPM MAX.**	High

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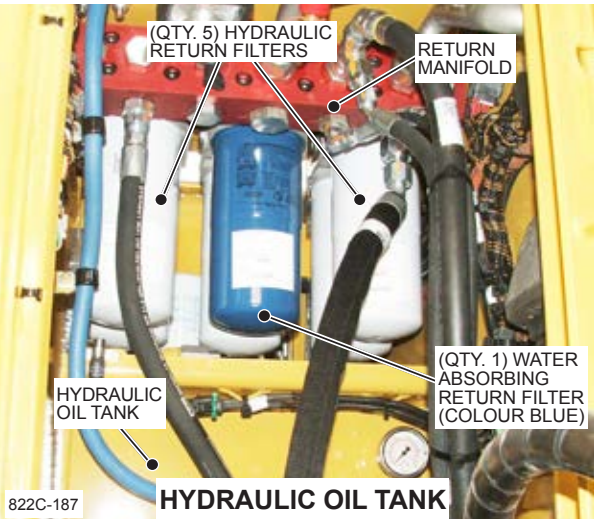

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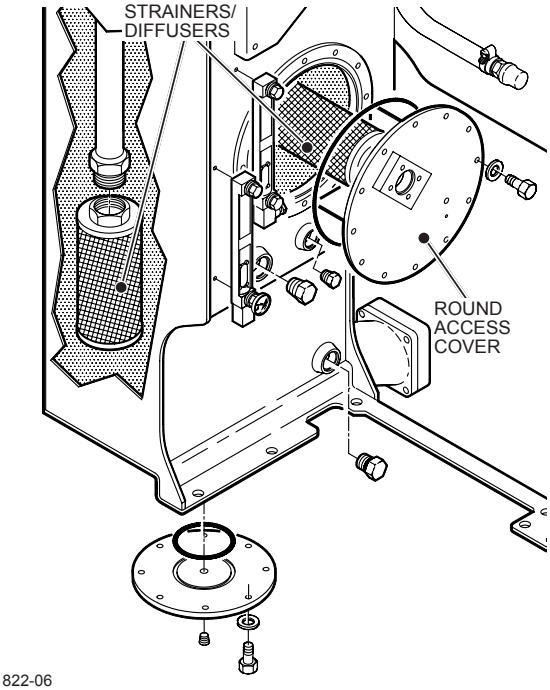

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Refer to CHANGING OR CLEANING THE STRAINERS/DIFFUSERS in SECTOIN 3.

If the FILTER BYPASS icon displays RED between scheduled maintenance intervals, STOP THE MACHINE and **change these filter elements**.

NOTE: The FILTER BYPASS icon will display YELLOW when hydraulic oil temperature is low and the filter restriction switch is activated. Allow oil to warm to operating temperature and the icon should change in colour to GREY. Refer to MACHINE PREPARATION in SECTION 2 of the OPERATOR'S MANUAL.

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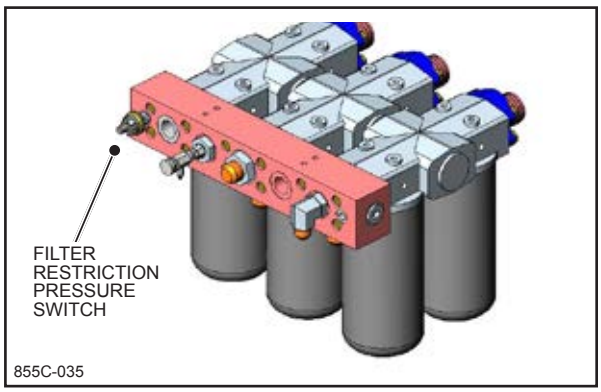


There is a bypass valve built into each filter head, preset at 1.7 bar (25 psi) which will open in the event the elements become restricted. Before this valve is activated, a 1.4 bar (20 psi) filter restriction pressure switch installed in the return manifold, will send a signal to the computer control system when an oil flow in excess of 1.4 bar (20 psi) is encountered at the return filters. This pressure switch closes and the hydraulic oil filter bypass icon displays RED on the MD3 computer. The master alarm and alarm light will sound and flash. This assumes that operating conditions and running temperatures are NORMAL.

IMPORTANT!
DO NOT use these warnings as a substitute for checking the oil level at regular intervals as per the SCHEDULED MAINTENANCE program in SECTION 3.

MAIN HYDRAULIC (LOAD SENSING) CIRCUIT

CIRCUIT DESCRIPTION

The main hydraulic circuit includes the components for the boom, pump2 valve section, swing, head rotate and travel operations as well as the leveling functions (if equipped).

An axial piston, swashplate controlled pump supplies oil for the main hydraulic system. A load sensing signal is sent back from the control valve manifold (LS port) to the main pump regulator (LS port) to control the pump output pressure.

Oil flow for each function is supplied by its own control valve section on the manifold. When the control valves are in neutral, there is no flow through the valves, therefore the system is closed-centre. When all control valves are in neutral, the pump will only supply enough oil to make-up for leakage in the system and the pressure remains at a low level, approximately 34.5 bar (500 psi). The control valve sections trap oil in their circuits when the spools are in neutral.

Oil returning to the tank from the control valve sections must open back pressure check valves in the control valve manifold before flowing to the reservoir via the oil cooler. This creates a small positive pressure in the manifold to prevent cavitation in the cylinders. All oil returning to the reservoir is filtered.

The Leveling control valve (if equipped) is also supplied by the main pump. A load sensing signal is sent back from Leveling control valve (LS port) to the main pump regulator (LS port) to control the pump output pressure. Refer to SECTION 13 for more complete information about the Leveling circuit.

FLOW ON DEMAND AND LOAD COMPENSATION

The combination of control valves and pump used in this system provides flow on demand and load compensation. Flow on demand means that only the required quantity of oil will be delivered to a function by the pump. This will save energy and reduce heat generation in the hydraulic system. Load compensation means that all functions will continue to receive oil regardless of their pressure and without further movement of the control levers.

Without this system, an operator moving control levers halfway on the boom UP and stick OUT controls would find that the lowest pressure function would move and the other would not move. To make both functions move the operator would have to move the high load lever much more than the low load lever. In other words, the operator would have to restrict oil flow to one function while opening up the valve fully to the other. This is what the load compensation system does automatically as will be explained further below.

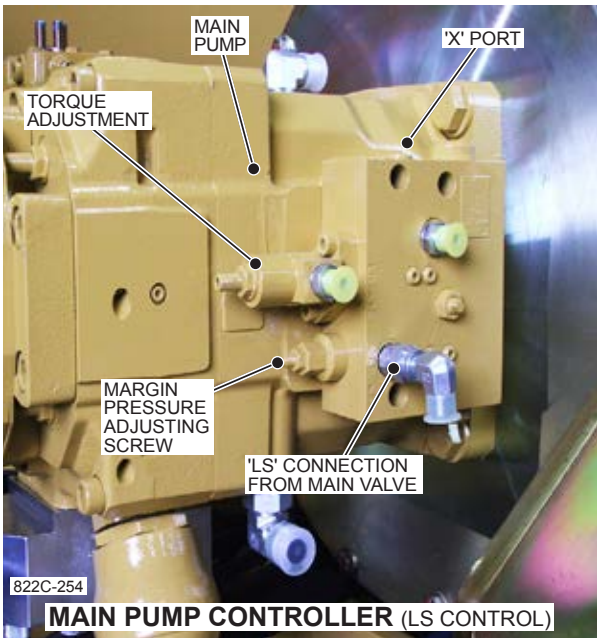
With the load compensation on this unit, the operator does not need to continually adjust the control lever to move two or more functions because of pressure differences.

Valves inside of the main control valve spools will automatically adjust flow according to the pilot pressure applied to the spool to move functions independent of load pressure.

SET MARGIN PRESSURE

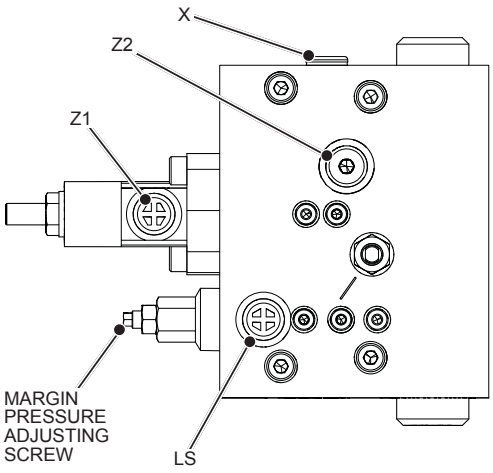
MARGIN PRESSURE is the difference between the LOAD SENSE pressure and the PUMP OUTPUT pressure while a function (boom, swing or travel) is being operated. For the load sensing system to operate correctly the differential pressure between LS and 'P' should be 20.7 Bar (300 psi). 'P' being higher than LS.

NOTE: If the margin pressure is not set correctly, the machine controls may not respond as they should, i.e., boom is jerky or sluggish.



MAIN PUMP CONTROLLER (LS CONTROL)

The margin pressure adjustment is made at the main pump controller attached to the main pump.

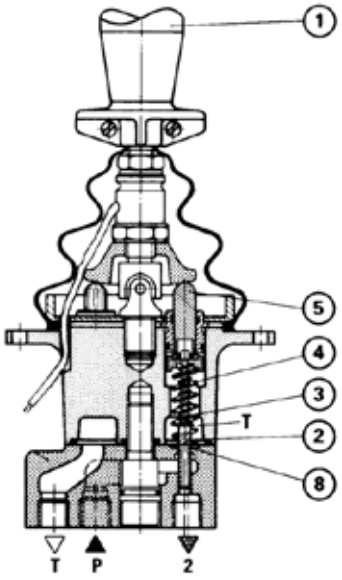


MAIN PUMP CONTROLLER VALVE

Continued on page 28

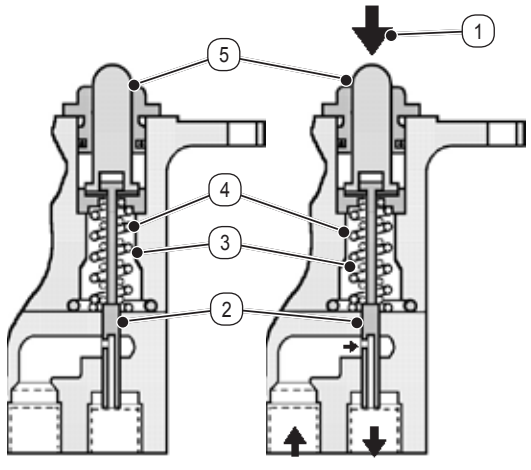
JOYSTICKS AND FOOT PEDALS

These pilot valves are manually operated, directional control valves and operate on the same principle as a direct operating pressure reducing valve.



JOYSTICK PILOT 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 centre position and directs pump flow to operate a function.



AU013-2

SPOOL ARRANGEMENT

OPERATING DESCRIPTION

In the neutral position, the joystick lever is held centred 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.

SYSTEM FUSES AND RELAYS

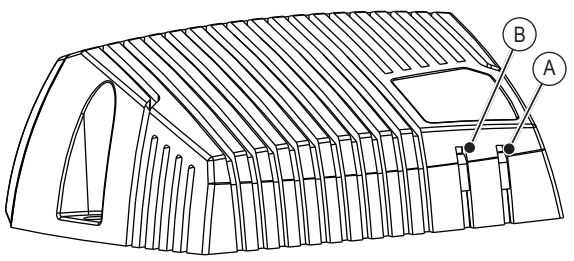
IMPORTANT
24 VOLT ELECTRICAL SYSTEM

The engine diagnostics plug is on the left side of the instrument panel about half way down the pillar. Refer to ENGINE DIAGNOSTICS CONNECTION in SECTION 2 of THE OPERATOR'S MANUAL.

The cab electrical controls fuse and relay panel is located in the cab on the right-rear side panel. The IQAN fuses are located here.

XS2 MODULE

X-MODULE LED



XS2 MODULE LED INDICATORS

XS2 MODULE LED INDICATORS

If there is an error detected, the master (MD3) will present a message on the display. The XS2 module also indicates an error status through the red blinking LED. This gives an immediate diagnosis as to the nature of the error that has occurred.

A. Supply Voltage LED (green).

LED ON (lit green) indicates supply voltage is ON.

LED OFF indicates supply voltage is OFF.

B. Status indicator LED (yellow/red).

Flashing yellow LED indicates correct status.

Flashing red LED indicates error status:

- One red primary flash and one, two or three secondary yellow flashes indicates an error controlled by the master (MD3).
- Two red primary flashes in a row and one or two yellow secondary flashes indicates an error controlled by the master (MD3).
- Three red primary flashes in a row and one yellow secondary flash indicates that the fault is related to the CAN-BUS.

LED indicator showing different XS2 and XA2 modes

Status		Flash	
Normal operation (yellow)			
Error code	**Error**	**Primary Flash (red) Error category**	**Secondary Flash (yellow) Error description**
1:1	Output error[a]		
1:2	Input error[a]		
1:3	Vref error[a]		
2:1	Voltage High/Low error[a]		
2:2	Low/High temperature[a]		
3:1	CAN error		
3:2	Address error		
4:1	Memory error[b]		
FE	Fatal error		

a. Error groups 1:n and 2:n are controlled by the master, see also on screen warnings.
b. FRAM memory error.

XA2 ERROR CODE

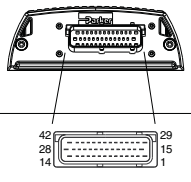
- Three red primary flashes in a row and two yellow secondary flashes in a row indicates that the fault is related to the address.
- Four red primary flashes in a row and one yellow secondary flash indicates a memory error.
- Continuous red primary flashing indicates a fatal error.

Internal diagnostics in the master (MD3), can be used to get more information about the XS2 module. The following values are supervised:

- Internal temperature (°C/°F)
- Power supply (V)
- Reference voltage (V)
- CAN address voltage (V)

XS2 MODULE WIRING PIN ASSIGNMENT

XS2-WIREASSIGN



1	ADDR-H	15	-BAT	29	-VREF
2	DOUT-G	16	DIN-I	30	DIN-J
3	DOUT-H	17	DIN-K	31	DIN-L
4	DOUT-I	18	DIN-M	32	DIN-N
5	DOUT-J	19	DIN-O	33	DIN-P
6	DOUT-K	20	DIN-Q	34	DIN-R
7	DOUT-L	21	DIN-S	35	DIN-T
8	DOUT-A	22	DOUT-C	36	DOUT-E
9	DOUT-B	23	DOUT-D	37	DOUT-F
10	VIN-A/DIN-A	24	VIN-E/DIN-E	38	VIN-G/DIN-G
11	VIN-B/DIN-B	25	VIN-F/DIN-F	39	VIN-H/DIN-H
12	VIN-C/DIN-C	26	CAN2-H	40	CAN2-L
13	VIN-D/DIN-D	27	CAN-H	41	CAN-L
14	ADDR-L	28	+BAT(+12V, +24V)	42	+VREF

Note that the XS2 module is equipped with eight voltage inputs (VIN-A to VIN-H) which may be configured as digital inputs (DIN-A to DIN-H). The function of these inputs is determined by the machine program.

NOTE: See to the XS2 MODULE SCHEMATIC in this section or MACHINE ELECTRICAL SCHEMATIC for detailed pin and wiring assignment.

MAIN MENU SCREEN

Press the menu button to go to the Main Menu screen.

The Main Menu screen displays the following selections:

- Adjust - Select F1
- Measure - Select F2
- Preferences - Select F3
- Info - Select F4

To return to the Main display press the Back button.

ADJUST MENU

From the Main Menu screen press the F1 button (Adjust) to access the Adjust menu.

This menu is an alternate method of accessing the Adjustment menu to make machine adjustments. See ADJUSTMENT MENU earlier in THIS SECTION for details.

The following menu items can be selected:

- Machine Parameters
- Machine Type
- Hydraulics
- Leveling
- AUTO ACCUMULATE (*N/A to the Harvester*)

Use the up arrow or down arrow button to select the MACHINE PARAMETERS menu item. Press OK to confirm the selection.

MODULES

Press F1 on the Info menu 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
- Cummins QSL9.0

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

NOTE: The information displayed is for representational purposes only and may differ from the information displayed by your machine.

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

Press the back button twice to return to the Info menu.

MODEM

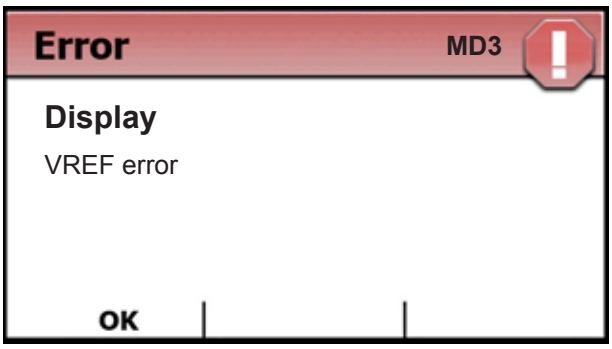
Press F2 on the Info menu to select the Modem menu. This menu provides information on the internal GSM modem as displayed below:

NOTE: The information displayed is for representational purposes only and may differ from the information displayed by your machine.

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

Press the back button to return to the Info menu.

ERROR MESSAGES



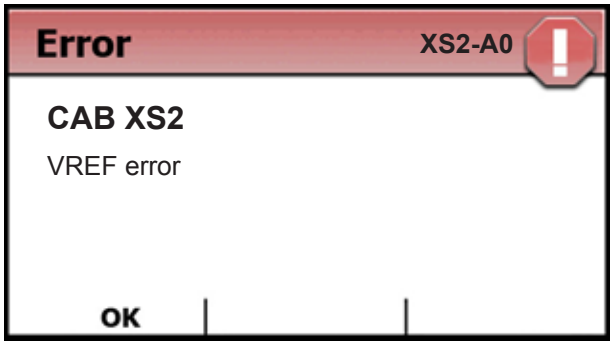
MODULE VREF ERROR

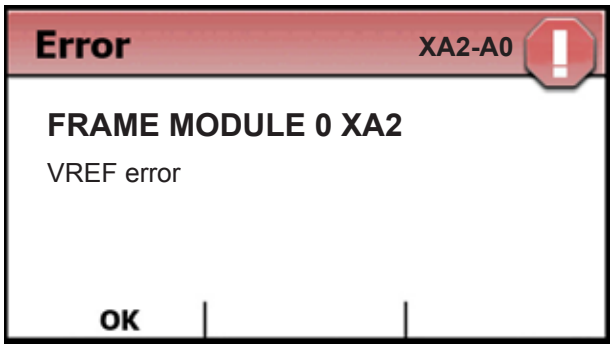
The module VREF message is displayed to indicate a problem related to the 5 V reference signal coming from the module.

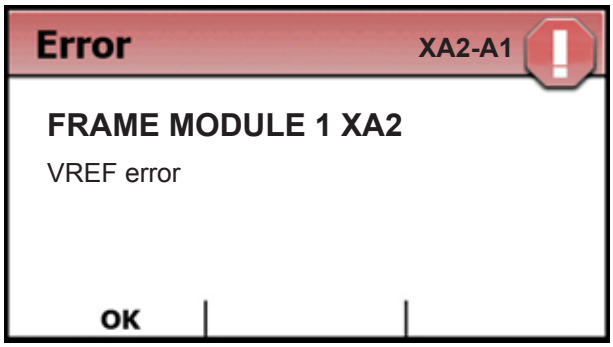
The module is identified on the display screen.

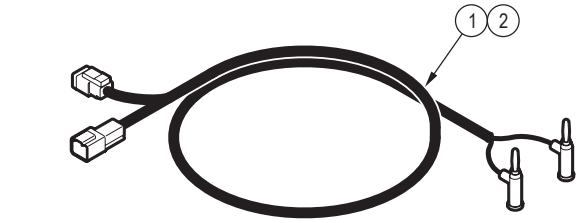
This message indicates a problem with a sensor, connecting wires or the 5V reference signal itself.

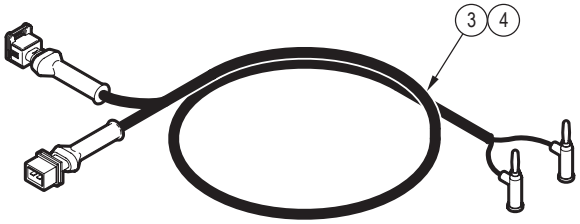
Once acknowledged, this message is replaced with a hardware fault message for the corresponding module when active faults are recalled to the screen. Refer to COMPUTER - MESSAGES AND WARNINGS - CRITICAL - HARDWARE FAULT in this section.

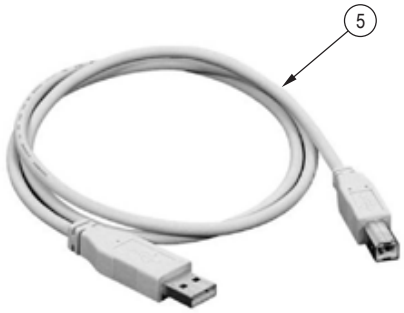


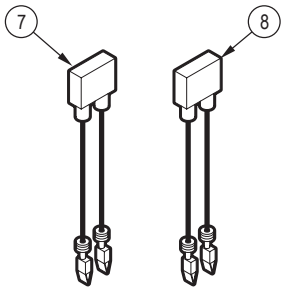


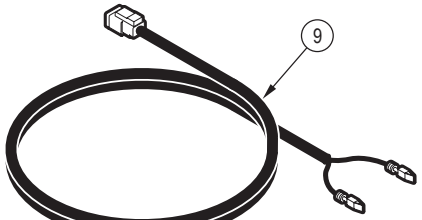


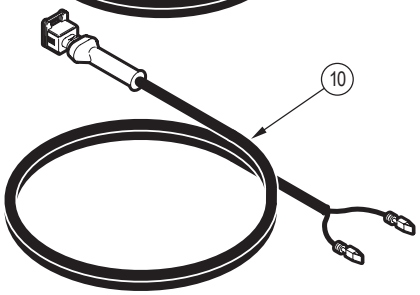


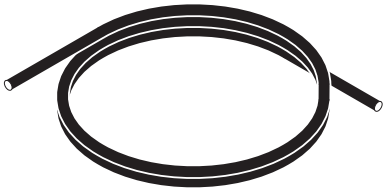






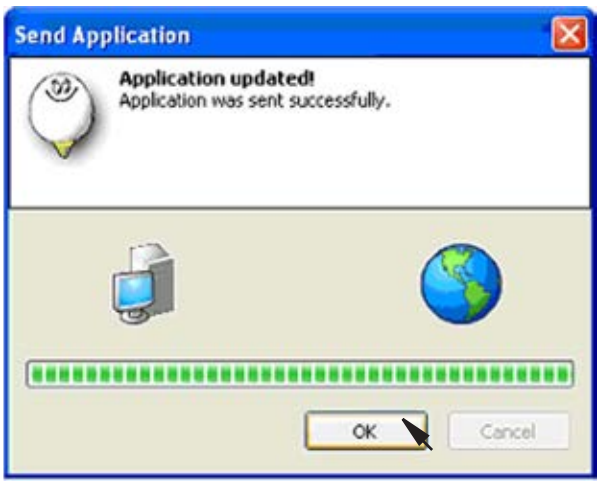






TWISTED PAIR WIRE
REPAIR HARNESS

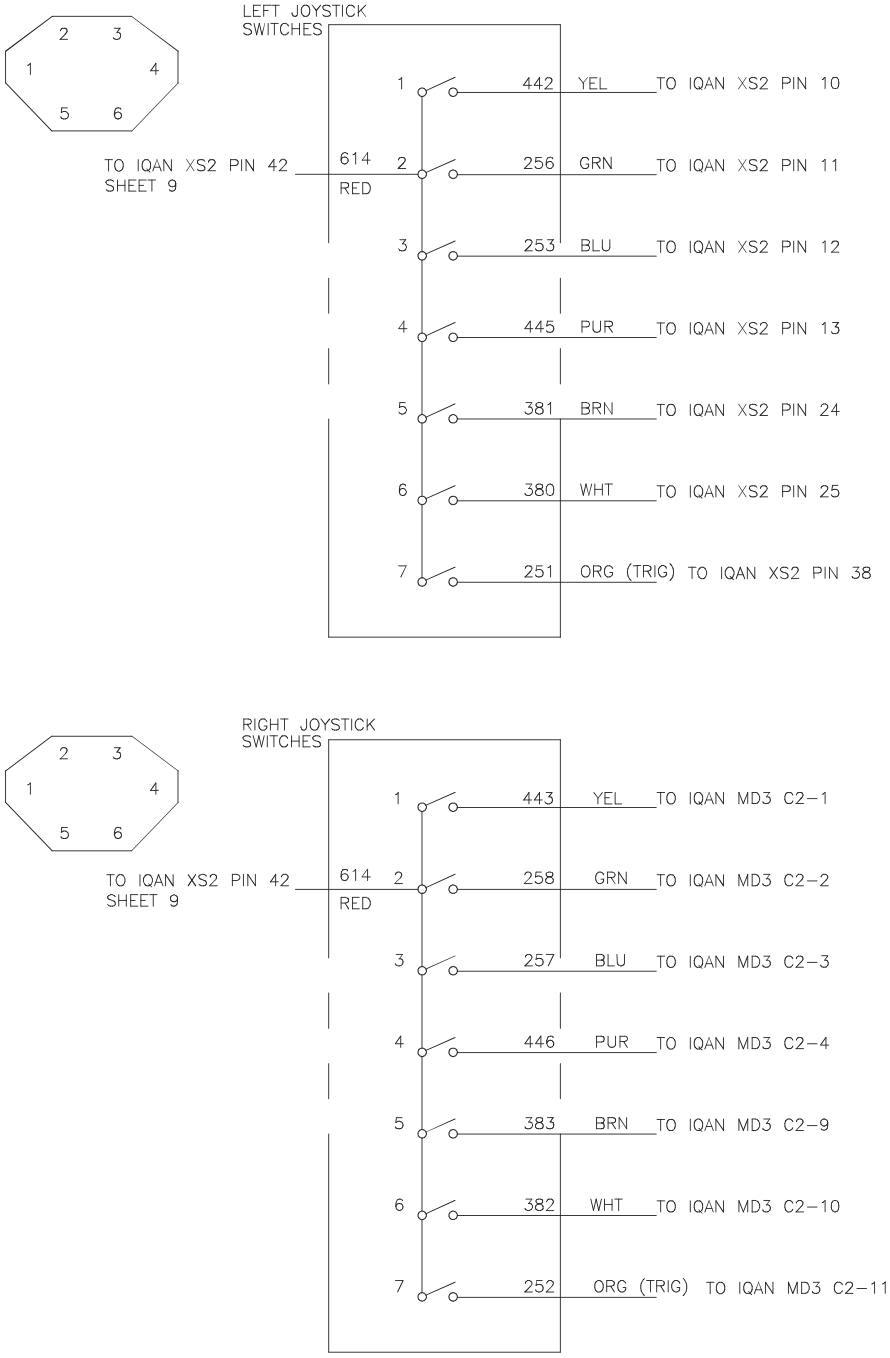
855C-002 **ELECTRICAL KIT - SERVICE AND DIAGNOSTICS - SELECTED ITEMS**



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

The MD3 will restart and show the Main Display screen of the application.

The Update is now complete.



SHEET 7 OF 14
56600B00-P07

MACHINE ELECTRICAL SCHEMATIC DIAGRAM

STARTING ENGINE

1. Ensure that pre-start checks have been performed and that the area is clear of personnel prior to starting the engine. Refer to OPERATING MACHINE - PRE-START CHECKS in this section.
2. Sound the horn to warn personnel of machine start-up.
3. Turn the ignition key switch to the run position. The WAIT TO START icon below will appear on the display during the *key on* engine preheat time. Heating elements (grid heater elements) located in the engine air intake manifold are turned on to heat the intake air when starting the engine. The engine must not be started until this icon turns off automatically.

4. Turn the ignition key switch to the start position to crank the engine.(If a vacuum pump is installed, the vacuum switch must be in the OFF position to allow the engine to crank.
5. When the engine starts, release the ignition key switch to the ON position.

   NOTE: If the engine does not start after three attempts, check the fuel supply system.
6. Set the throttle to LOW IDLE speed and wait three to five minutes before operating with a load.
7. Increase the engine speed (rpm) slowly to provide adequate lubrication to the bearings and allow oil pressure to stabilize.
8. If the engine stalls while operating the machine, turn the ignition key switch to the OFF position and repeat steps (1) to (5).

IMPORTANT!
Allow a cold engine to warm up at low idle for at least five minutes before applying any load. Check all measured values on the MD3 display terminal often during the warm-up period. See also, COLD IDLE ENGINE SPEED setting in this section.

IMPORTANT!
Do not attempt to start engine by shorting across starter terminals as personal injury could occur. Start engine only from the operator's seat.

IMPORTANT!
After engine has started, keep engine speed low until engine oil pressure registers on gauge. If it does not register within 10 seconds, stop engine and investigate cause.

IMPORTANT!
Do not keep the engine running at LOW IDLE for longer than 10 minutes. Fuel will not completely burn at low combustion temperatures.

IMPORTANT!
To avoid damage to the QSL9 engine parts, DO NOT connect jumper starting or battery charging cables to any QSL9 parts.

IMPORTANT!
The instructions written in this manual pertaining to starting, operating and stopping of the engine include excerpts from the original engine manufacturers operating manuals. For additional important operating and maintenance instructions, please refer to the ORIGINAL ENGINE MANUFACTURERS OPERATING AND SERVICE MANUAL applicable to the engine in use.

VACUUM SWITCH (IF EQUIPPED)

NOTE: If the machine is running (key in the RUN position), the vacuum system will not be energized if the vacuum switch is engaged. Conversely, the machine cannot be started if the vacuum switch is already engaged.

IQAN ANTI-STALL HORSEPOWER LIMITING CONTROL

GENERAL DESCRIPTION

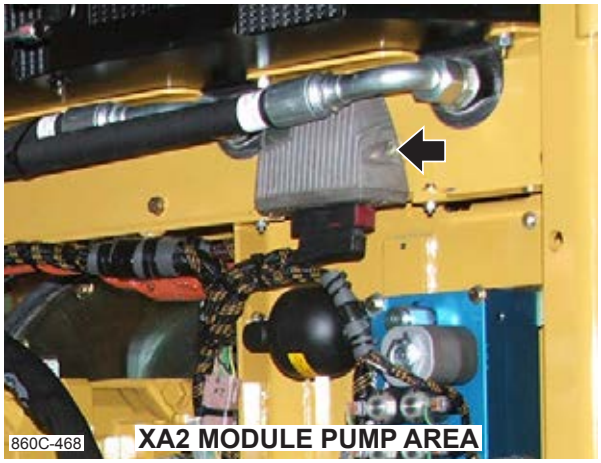
In order to prevent engine overloading, the machine is equipped with an electronic system which detects any drop in engine speed and de-strokes the main pump to reduce the load on the engine and at the same time maintain engine speed. This is done without any input from the operator and in most cases they will be unaware of the operation of this system.

An IQAN MD3 computer system incorporates the following components:

- MD3 Computer and Display Module

- XS2-A0 Module (Cab)

- XA2-A0 Expansion Module (LH - Tank/Valve Area)
  (Also refered to as IQAN XA2 #1 module)



- XA2-A1 Expansion Module (RH - Pump Area)
  (Also refered to as IQAN XA2 #2 module)

- Engine Electronic Control Unit

  The engine ECU provides engine rpm, boost pressure and other engine signals to the computer control system. These engine signals are used by the computer to determine anti-stall requirements.

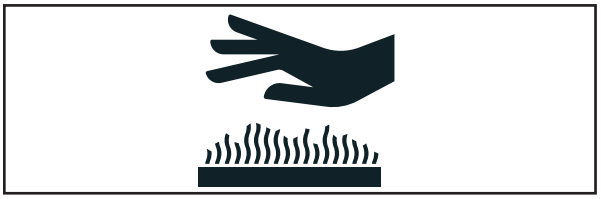
COOLING ASSEMBLY

The charge air cooler (CAC)/radiator/ hydraulic oil cooler assembly is mounted to the rear of the fan. The A/C condenser core is mounted to the rear of the CAC/radiator/ hydraulic oil cooler assembly. A debris screen is used to protect the CAC/radiator/ hydraulic oil cooler assembly. The hydraulically driven fan draws air through the screen, through the A/C condenser, through the CAC/radiator/ hydraulic oil cooler assembly and finally blows the air across the engine. The air is expelled to atmosphere through the perforated panels that make up the engine enclosure.

The complete cooling assembly is rubber isolation mounted to reduce the transmission of noise and to isolate the components from vibration.

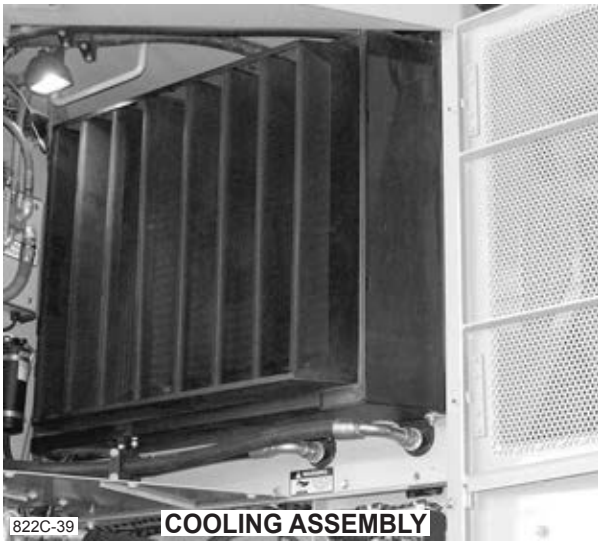
The fan drive system has a CLEAN (PURGE) function which reverses the direction of the fan to clean the cooling assembly by blowing air in the opposite direction through the cooling assembly to remove dust and debris.

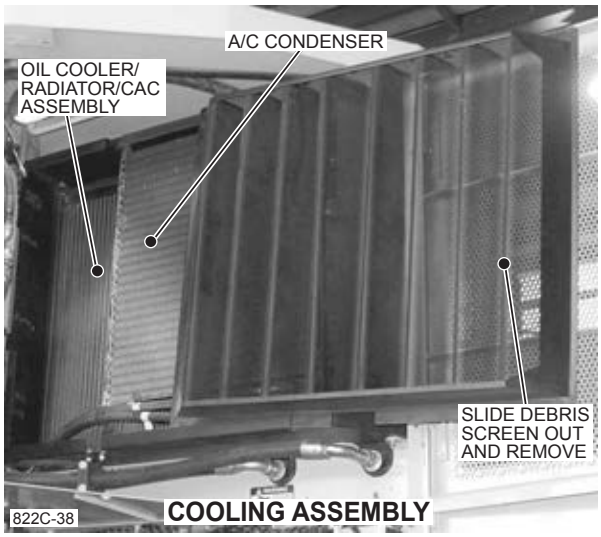
In addition, the entire cooling assembly should be checked every 8 hours (every shift) for accumulation of twigs, leaves, pine needles and dust. All of the engine enclosure doors should also be kept clean.



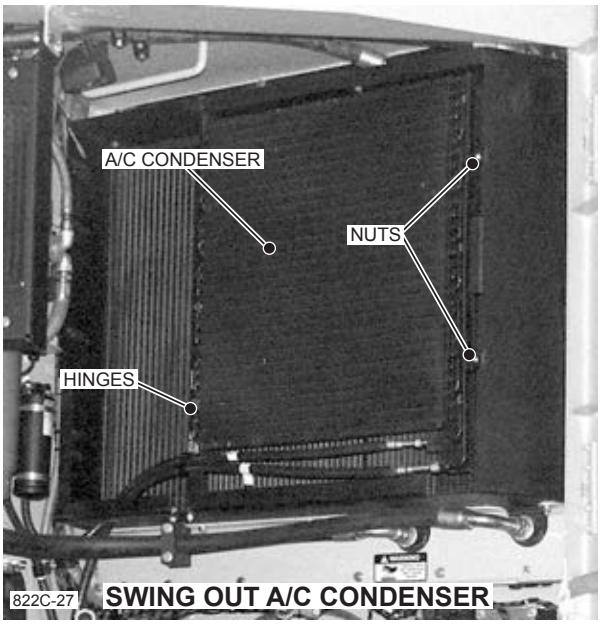
Use personal protective equipment to guard against flying debris. Compressed air or water may be used to clean this assembly, but care must be taken not to set the pressure too high otherwise damage to the components could result.

For detailed cleaning procedures, refer to CLEANING A/C CONDENSER AND COOLING ASSEMBLY in SECTION 2 of the OPERATOR'S MANUAL.


822C-39 COOLING ASSEMBLY



822C-38 COOLING ASSEMBLY



822C-27 SWING OUT A/C CONDENSER

COOLING FAN CIRCUIT DESCRIPTION

The fan cooling circuit is an open-loop hydraulic system consisting of a fixed displacement pump, a fan control valve and a fixed displacement motor.

Oil from the fan pump passes through the 'P' port into the fan control valve and is directed to the fan motor.

The direction of fan rotation is controlled by the flow of oil through the directional solenoid valve (SV1), which is operated by the fan control switch (DIGITAL IN - Fan Purge Switch) via the computer control system (DIGITAL OUT - Fan Reverse).

The speed of fan rotation is controlled by the flow of oil through the proportional solenoid (SV2) valve, which is operated by an electrical signal (CURRENT OUT - OC Fan Prop.) generated by the computer control system.

The computer control system generates a fan speed electrical signal based on:

- The position of the fan control switch (CLEAN) / AUTO / (FULL ON)
- The air conditioning controls (ON/OFF)
- The service mode switch (ON/OFF)
- The hydraulic oil temperature sensor readings
- The engine coolant temperature sensor readings
- The charge air cooler temperature sensor readings.

The cooling fan is designed to run only as fast as required to achieve the optimum operating temperatures for the engine coolant, engine intake air and hydraulic oil. These optimum temperatures are dictated by the engine and hydraulic component manufacturers for maximum life and efficiency of their respective components. Significant power savings and reduced warmup times can be realized by avoiding the operation of the fan at full speed when it is not required.

The operating temperature of the engine and the hydraulic system varies greatly depending on the operating conditions, and cannot be specifically stated. Factors such as ambient temperature, hydraulic oil viscosity, type of wood harvested, undergrowth and operator technique all have a major impact on the effectiveness of the cooling system.

If the temperature goes above the target temperature, the fan speed increases. If the temperature goes below the target temperature, the fan speed decreases.

The fan target temperatures are:

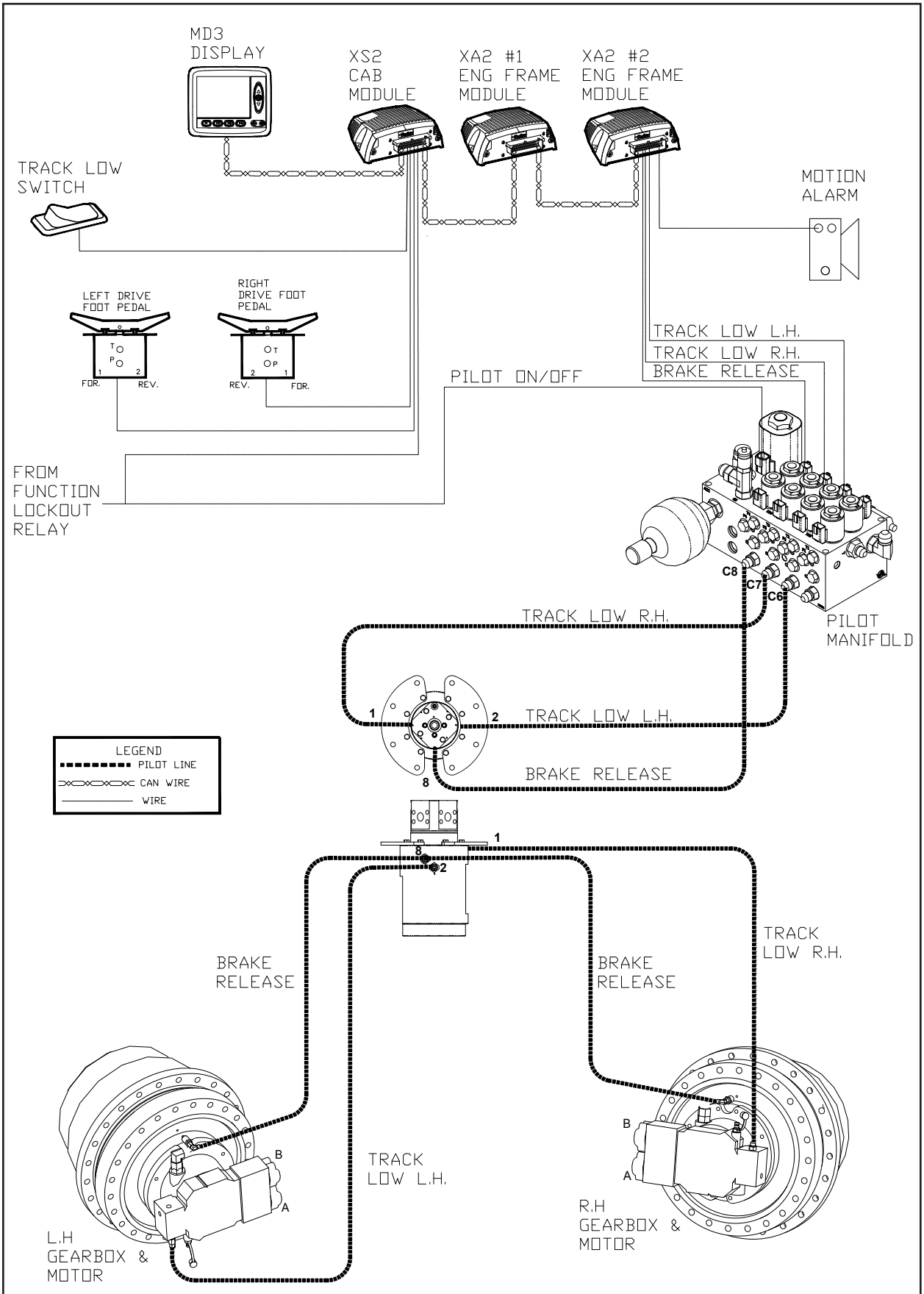
- Coolant 91°C (195°F)
- Charge Air Cooler 60°C (140°F)
- Hydraulic Oil 43-66°C (110-150°F) (Dependent upon oil type selected)

When any one of these three readings are reached, the fan will be at maximum speed.

With the cooling fan switch in the:

AUTO POSITION AUTO - AUTO is the normal operating position for the fan control switch. The fan operates completely in an automatic mode. It starts, speeds up, or slows down, all based on the temperature of the charge air, engine coolant and/or the temperature of the hydraulic oil. The electronic control module automatically adjusts the fan speed to the minimum required level to maintain optimal operating conditions. The fan defaults to full speed if an error in the controller exists.

When the switch is in the AUTO position and the fan runs at minimum speed due to low charge air, engine coolant or hydraulic oil temperatures, turning ON the A/C will cause the fan control to increase the cooling fan speed when the engine is at high idle. This ensures that sufficient air flow is available for the cab A/C even while the machine is still warming up.



860C-534 **TRACK LOW AND BRAKE RELEASE CIRCUIT DIAGRAM NON LEVELER**

This forces the pistons against an angled swashplate (5). Piston sliding action causes the rotating group to turn. The cylinder block is splined to the output shaft (3) 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 swashplate. To reverse rotation, oil flow is reversed. During operation, a small amount of supply oil flows through the centre of each piston to lubricate the piston to slipper (6) joint and the slipper to swashplate area.

High pressure supply oil also flows through a tube to lubricate the swashplate to bearing shell area. Normal leakage and lubrication oil aid in flushing and cooling the motor during drive operation.

The swashplate (5) angle is changed by the minimum displacement piston (7) and maximum displacement piston (8). When supply oil acts on the minimum displacement piston (7), the motor runs at its highest speed. When supply oil acts on the maximum displacement piston (8), the motor runs at its slowest speed. The maximum displacement piston is larger than the minimum piston and will hold the motor in maximum displacement when equal pressure acts on both pistons.

NOTE: Swashplate angle (motor displacement) is limited by the minimum and maximum displacement pistons contacting the minimum (9) and maximum (10) displacement adjustment stops. For minimum displacement, the maximum displacement piston contacts the minimum displacement adjustment stop. For maximum displacement, the minimum displacement piston contacts the maximum displacement adjustment stop.

Refer to DRIVE MOTOR FRONT COVER illustration.

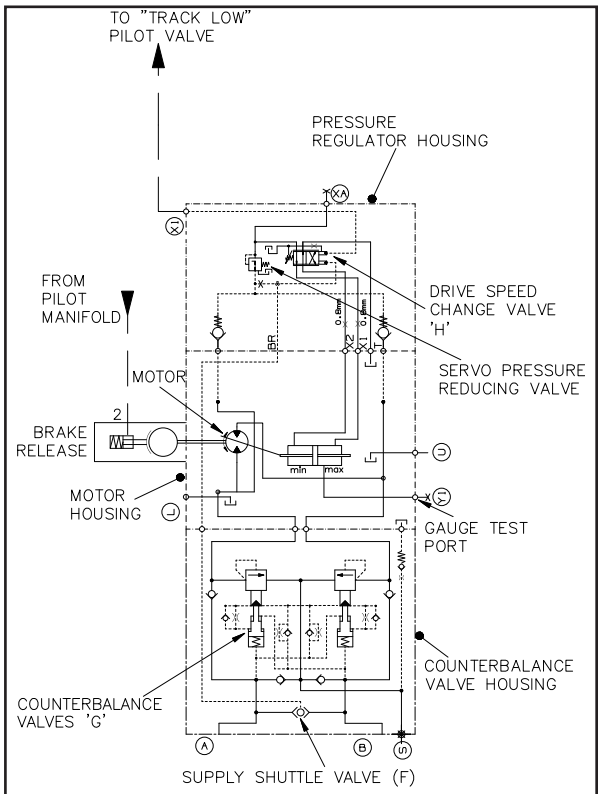
The drive motor cover (4) consists of several components to operate the drive functions.

The minimum displacement adjustment stop (9) limits the minimum angle the swashplate can move. The maximum displacement adjustment stop (10) limits the maximum angle the swashplate can move. The counterbalance valve(s) (11) protects the motor circuit from pressure spikes.

BRAKE CIRCUIT DESCRIPTION

Refer to motor schematic diagram

When the travel pedals are activated, pedal pressure switches signal the IQAN XA2 (A1) module of the computer control system to control the planetary gearbox brakes. Through internal logic, the computer control system uses the signal from the pedal pressure switches to control a single brake release solenoid valve on the pilot manifold. When the solenoid valve is energized, pilot oil is delivered to both planetary gearbox brake pistons causing them to release. If either travel pedal is activated, both planetary gearbox brakes are released and a motion alarm is activated.



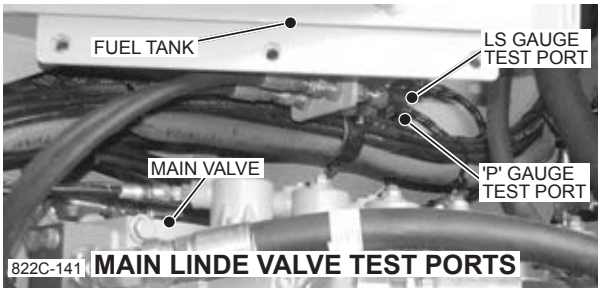
TYPE 'B' DRIVE MOTOR SCHEMATIC DIAGRAM

When either travel pedal returns to the neutral position, pedal pressure switches signal to the IQAN XA2 (A1) module of the computer control system to control drive motor displacement. Through internal logic, the computer control system uses the signal from the pedal pressure switches to control the left and right track low solenoid valves on the pilot manifold. If either solenoid valve is energized, pilot oil is delivered to the respective drive motor, shifting it to maximum displacement. Shifting the motors to maximum displacement allows for improved hydrostatic braking and steering by increasing drive motor torque.

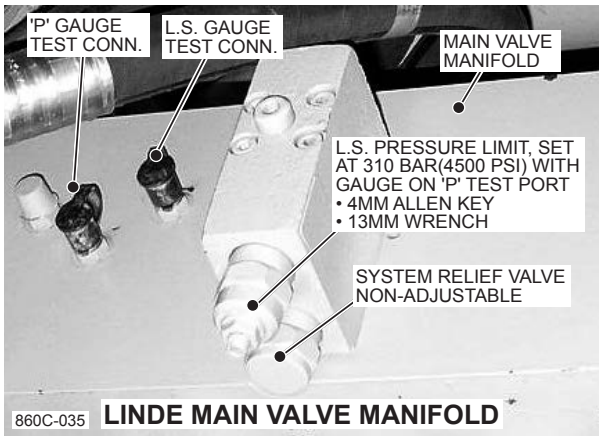
SET BEGIN OF REGULATION (TYPE 'B' MOTOR) (DRIVE SPEED CHANGE VALVE)

Place the attachment head securely on the ground before performing any service work.

1. Ensure the hydraulic oil is at operating temperature.
2. Remove both left and right drive motor inspection covers.

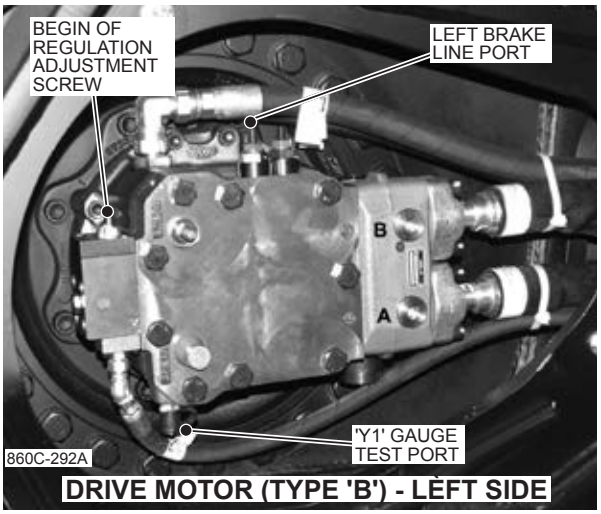


MAIN LINDE VALVE TEST PORTS



LINDE MAIN VALVE MANIFOLD

3. Install a 0-700 bar (0-10,000 psi) gauge on the 'P' test port on the main valve manifold.
4. Disconnect the left brake line at port on the final drive gearbox. Plug the hose and cap the port adapter on the gearbox.



DRIVE MOTOR (TYPE 'B') - LEFT SIDE

5. Install a 0-350 bar (0-5,000 psi) gauge on the drive motor gauge test port 'Y1', size 04JIC quick connect.
6. Turn ON the engine and set throttle to FULL .
7. From inside the cab, close and latch the front door and press the pilot reset switch to activate the pilot system.
8. Place the anti-stall switch to the OFF position.
9. Place the drive/low switch to DRIVE.
10. Activate the left track drive foot pedal in both forward and reverse directions to ensure that the track does not move.
11. With the aid of an assistant, activate left drive foot pedal in forward or reverse and temporarily set LS relief valve to 262 bar (3800 psi) on gauge at 'P' test port on main valve manifold.

    NOTE: This pressure setting can be adjusted between 214 and 262 bar (3100 psi and 3800 psi) depending on the operator's requirements. The lower the 'begin of regulation' setting, the sooner the drive motors will automatically shift to low when encountering difficult terrain conditions.

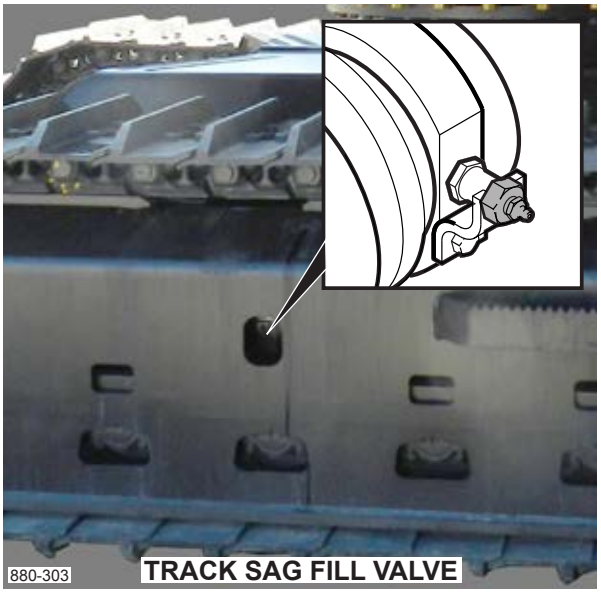
12. With the aid of an assistant, activate left track drive foot pedal in the forward direction and check pressure reading on gauge at motor gauge test port 'Y1' it should show between 55 and 70 bar (800 and 1,000 psi).

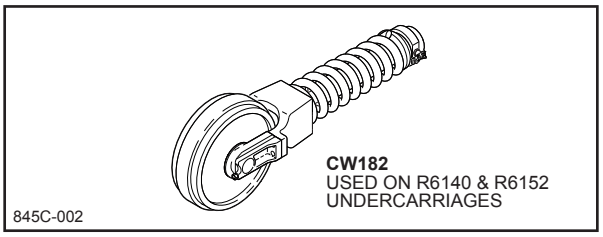
    If adjustment is required, loosen locknut on begin of regulation adjusting screw and turn screw in to increase pressure or out to decrease pressure. Tighten locknut.

13. Repeat steps (4) through (12) for the right drive motor.
14. Reset the LS relief valve to Main system LS relief pressure, (refer to specifications in section 3 of this manual). Refer also to SET LOAD SENSE RELIEF VALVE in SECTION 4 of this manual.
15. Set fan to RUN mode using the computer, then turn OFF the engine.
16. Re-connect the brake line(s) to both gearboxes.
17. Remove the pressure gauge and wipe up any spills.
18. Replace both left and right drive motor inspection covers.

TRACK SAG ADJUSTMENT

Filling procedures for track sag adjustment will depend on which undercarriage your vehicle is equipped with.

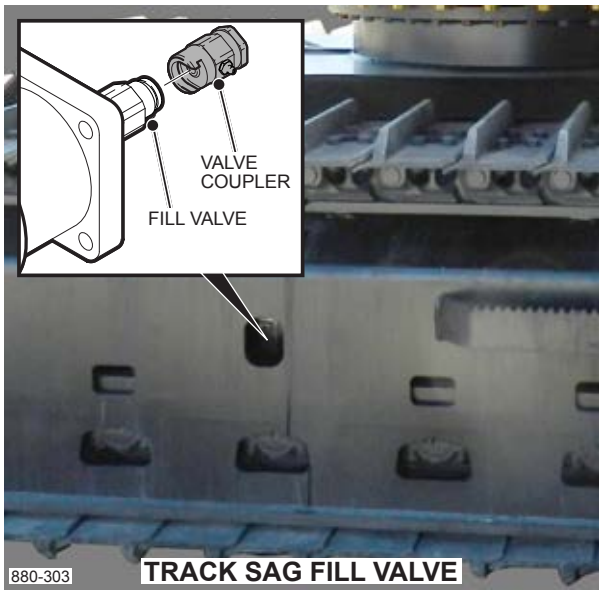


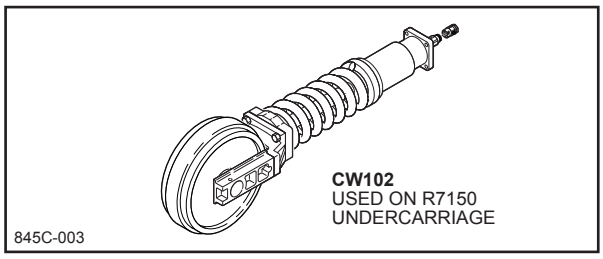


To tighten the track, use a grease gun and add grease at the fill valve until the track sag dimension is within recommended limits. Refer to MEASURING TRACK SAG in this section for recommended limits.

To loosen the track, slowly loosen the fill valve until grease begins to escape through the vent passage in the valve body housing. Grease will vent around the valve body threads. Remove grease until the track sag dimension is within recommended limits. Refer to MEASURING TRACK SAG in this section for recommended limits.

NOTE: The track sag fill valve is mechanically restricted from being removed completely.





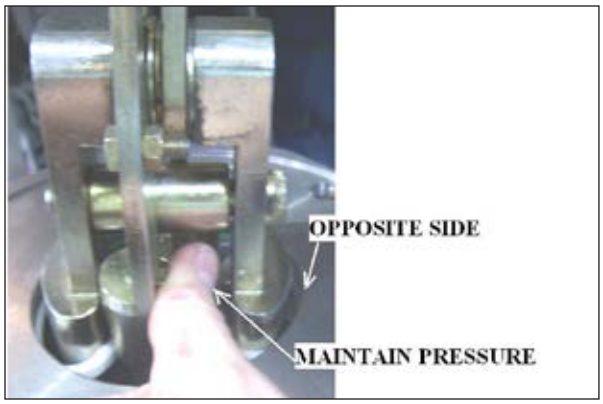
To tighten the track, attach the coupler onto the fill valve. Connect a grease gun to the grease fitting on the coupler. Add grease until the track sag dimension is within recommended limits. Refer to MEASURING TRACK SAG in this section for recommended limits. Remove the coupler and store in a safe place.

⚠ WARNING

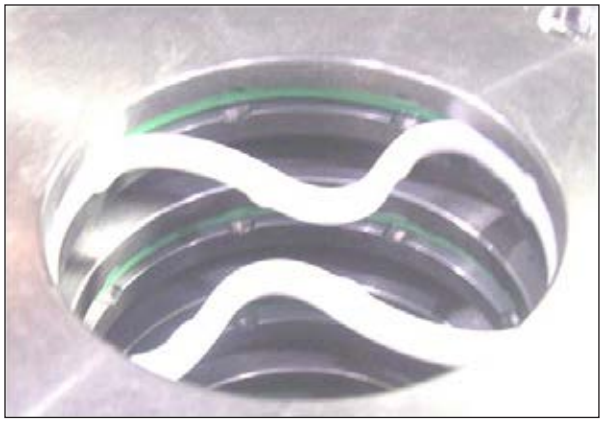
The grease is under very high pressure. Removing the fill valve completely may cause the valve to blow out and cause bodily harm.

To loosen the track, slowly loosen the fill valve until grease begins to escape through the vent passage in the valve body housing. Grease will vent around the valve body threads. Remove grease until the track sag dimension is within recommended limits. Refer to MEASURING TRACK SAG in this section for recommended limits.

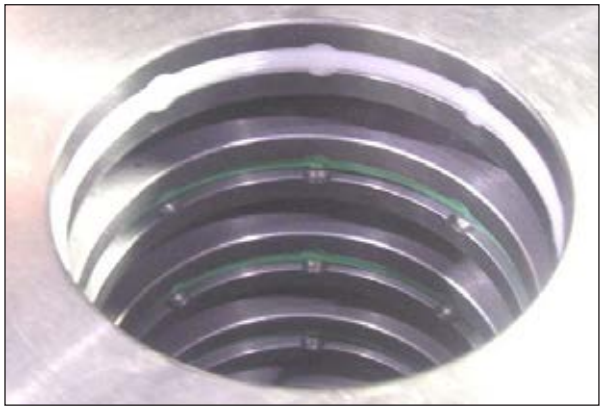
NOTE: The track sag fill valve is not mechanically restricted from being removed completely.



6. Apply pressure to hold first side in groove and slowly release clamp. Insert seal into groove on opposite side aligning tabs in groove.



7. Remove installation tool.



8. Smooth out seal and inspect.

ER BOOM SYSTEM

⚠ WARNING

This machine may be equipped with an ER boom system. Because of this, it may behave in an unexpected manner compared to a conventional boom system.

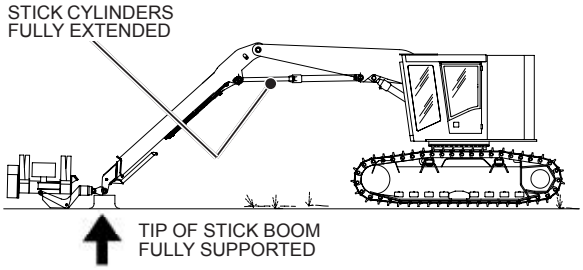
When performing maintenance procedures or setting up a machine equipped with an ER boom system, the following points must be noted:

- The hoist and stick boom cylinder circuits are connected hydraulically. Thus, disconnecting a hydraulic line to a boom cylinder may cause either boom to move unexpectedly.
- The boom 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 boom and head.
- Ensure that the boom is properly parked for service (as described on this page, see also FIG. 5 & 6) and that the engine is turned OFF before disconnecting any hydraulic lines.
- For machines equipped with pressurized hydraulic tanks, relieve pressure in the hydraulic reservoir by opening the hydraulic tank vent valve and waiting until the sound of escaping air stops.

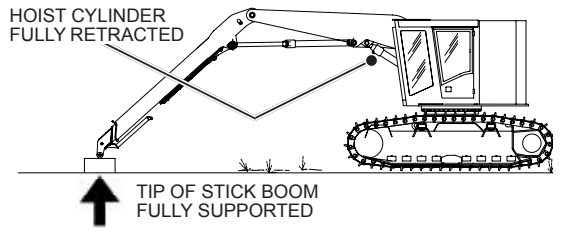
Before attempting to disconnect hydraulic hoses or perform work on the boom system, ensure that:

- The machine is parked on level ground with the head sitting flat on the ground.
- The stick cylinders are fully extended (FIG. 5) or the hoist cylinder fully collapsed (FIG. 6).
- 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.



H822C-001 **PARKING BOOM. FIG.5**



830-08 **PARKING BOOM. FIG.6**

For additional safety precautions refer to ER BOOM SYSTEM PRECAUTIONS in SECTION 1 of this manual.

NOTE: Because of the hydraulic connection between the hoist boom and ER cylinders, the ER 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 to extend, but it may also happen at other times if the relief settings are not correct. Ensure that all personnel and equipment are clear of the boom path and that there is sufficient overhead clearance for the head to rise before making any adjustments.

LEVELING CONTROL VALVE

The leveling control valve is located in the hydraulic pump compartment. Hydraulic oil for the leveling function is supplied by the main pump.

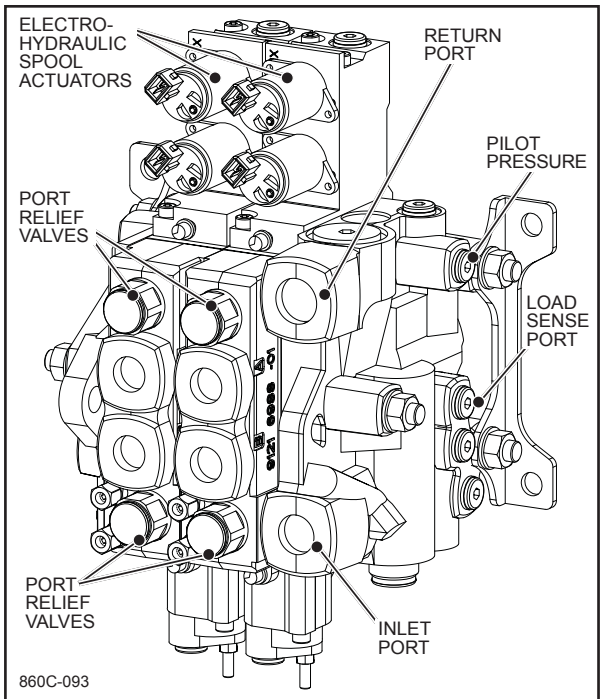
The spool sections of the leveling control valve are equipped with proportional, electro-hydraulic spool actuators. The actuators are spring centred to the neutral position, and are shifted by sending a variable volt signal (from the IQAN XA2-A1 module) to the appropriate solenoid.

The leveling control valve is equipped with port reliefs, on each side of all spool sections, 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. The 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.

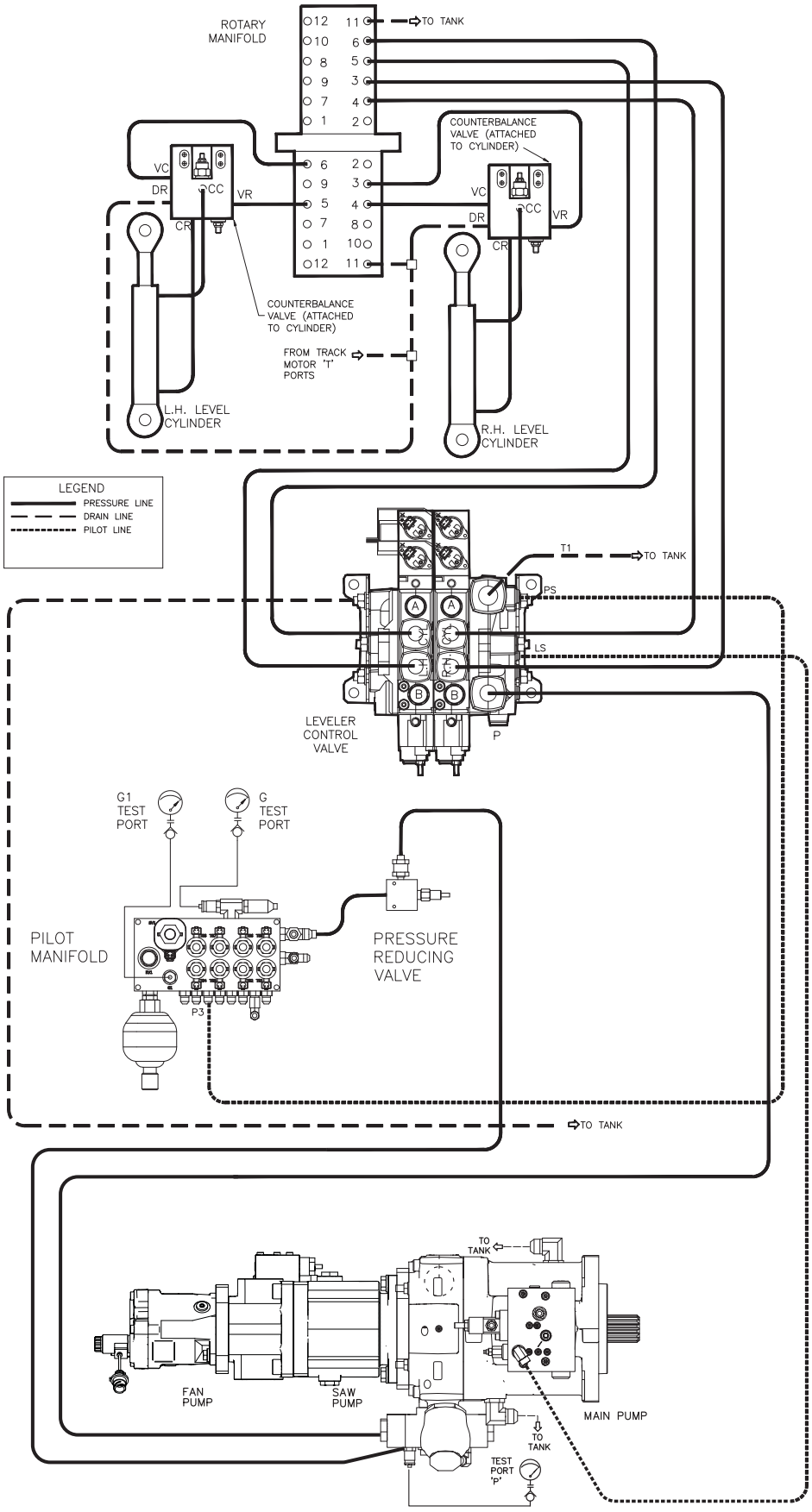
PORT CONNECTIONS:

The **'B'** ports (bottom ports) are connected to the **base end** of the cylinders and the **'A'** ports (top ports) are connected to the **rod end** of the cylinders.



LEVELING CONTROL VALVE (AT339)

LEVELING CONTROL VALVE



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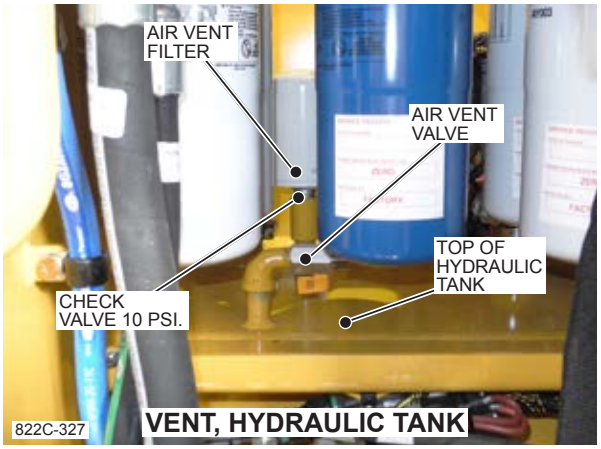
LEVELING HYDRAULIC CIRCUIT DIAGRAM

HYDRAULIC TANK PRESSURIZATION INSTRUCTIONS

IMPORTANT! PRESSURIZED HYDRAULIC TANK. 34.5 kPa (5 psi) MAXIMUM.
Before servicing hydraulic system, release air pressure from tank using air vent valve.

To release pressure from the hydraulic tank:



Wearing eye protection, release air from the hydraulic tank by opening the AIR VENT VALVE. Pull valve handle down 90° to open. Push valve handle up to close.

NOTE: Expelled air from vent valve will blow accumulated loose debris in the enclosure.

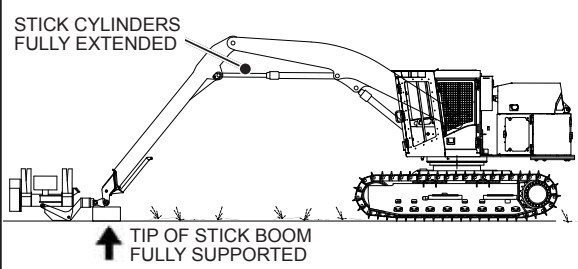
Releasing hydraulic tank pressure in the event of a hose breakage may reduce oil loss.

IMPORTANT!
Air vent valve must be opened before changing hydraulic filters and strainers or performing any other service on hydraulic circuits. Do not operate machine with the air vent valve in the open position.

During a filter change or return hose replacement, air is able to enter the return hydraulic circuit. It is important to bleed as much of this air as possible out prior to restarting the machine. See HYDRAULIC OIL RETURN FILTERS filter change procedure for instructions on bleeding air from return circuit. Air bubbles in the hydraulic system will damage the pumps.

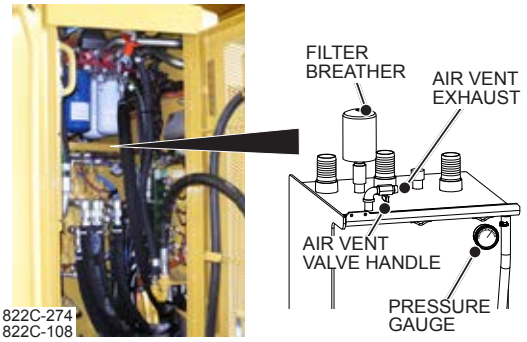
After service is completed, close air vent valve and add air pressure from a clean air source to the hydraulic tank via the Schrader valve. Do not exceed 34.5 kPa (5 psi).

INSTALLING A VACUUM PUMP ON THE HYDRAULIC TANK



Ensure that the attachment is resting squarely on a solid footing and engine is shut off before disconnecting any hydraulic lines.

IMPORTANT!
PRESSURIZED HYDRAULIC TANK
34.5 kPa (5 psi) MAXIMUM
Before servicing the hydraulic system, wearing eye protection, release air pressure from the tank using the air vent valve.



After service is completed, close the air vent valve. This system is self-venting and requires no external air source.

Install Vacuum Pump

1. Vent the tank has mentioned above. Remove the hydraulic tank breather filter hose clamp at the tank and lift the hose off the tank spout. Install a vacuum pump hose on tank breather port spout. Turn vacuum pump on to apply a vacuum in hydraulic tank.
2. When service is complete, turn off vacuum pump, remove hose and reinstall hydraulic tank breather filter hose and clamp on the tank spout.
3. Close 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)**.

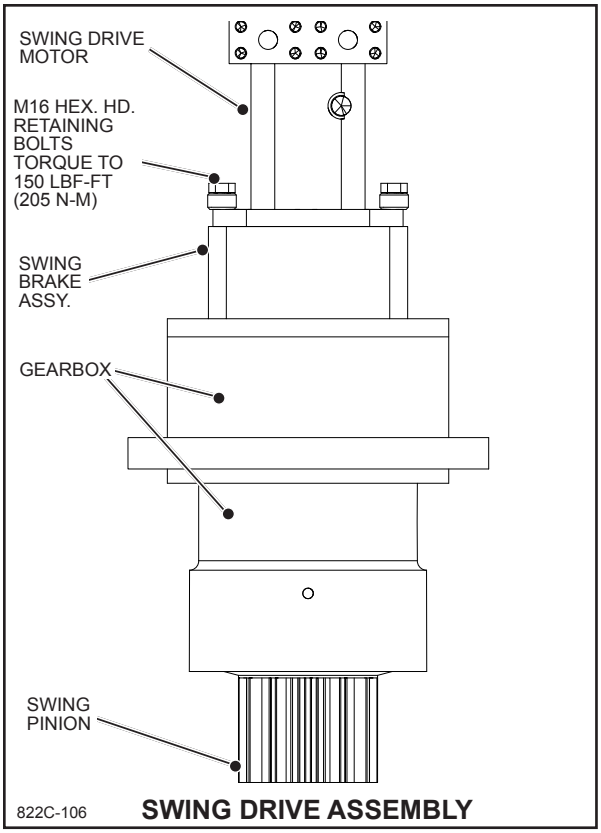
LEVELER DEFAULT SETTINGS

If,during the above adjustment procedure, the factory default settings are required, press the F2 button (Reset) and then select Yes in the pop up window by pushing the F2 button again. This will reset the setting to the factory default.

Below is a table showing all the leveler default settings.

860C/870C/L870C ADJUSTMENT TABLE					
Adjustments	Range (or Choice)			Units	Default Settings
WRIST -CW +CCW					
CW- Min Current	0	to	400	mA	200
CW- Max Current	200	to	750	mA	400
CW -Start Slope	250	to	1000	ms	400
CW -Stop Slope	250	to	1000	ms	750
CCW +Min Current	0	to	400	mA	200
CCW +Max Current	200	to	750	mA	400
CCW+ Start Slope	250	to	1000	ms	400
CCW+ Stop Slope	250	to	1000	ms	750
ACCUMULATOR -OPEN +CLOSE					
Open - Min Current	0	to	700	mA	300
Open - Max Current	300	to	750	mA	700
Open - Start Slope	0	to	1000	ms	0
Open - Stop Slope	0	to	1000	ms	0
Close + Min Current	0	to	700	mA	300
Close + Max Current	300	to	750	mA	700
Close + Start Slope	0	to	1000	ms	0
Close + Stop Slope	0	to	1000	ms	0
CLAMP -OPEN +CLOSE					
Open - Min Current	0	to	750	mA	300
Open - Max Current	300	to	750	mA	750
Open - Start Slope	0	to	1000	ms	0
Open - Stop Slope	0	to	1000	ms	0
Close + Min Current	0	to	750	mA	300
Close + Max Current	300	to	750	mA	750
Close + Start Slope	0	to	1000	ms	0
Close + Stop Slope	0	to	1000	ms	0
LEVELER ADJUSTMENT					
Leveler Stop Ramp	0	to	2000	mS	350
Leveler Start Ramp	0	to	2000	mS	350
Forward Leveler Speed	0	to	100	%	100
Rear Leveleing Speed	0	to	100	%	100
Right Cylinder - Retract Min	0	to	448	mA	300
Right Cylinder - Retract Max	300	to	750	mA	448
Right Cylinder + Extend Min	0	to	469	mA	300
Right Cylinder + Extend Max	300	to	750	mA	469
Left Cylinder - Retract Min	0	to	442	mA	300
Left Cylinder - Retract Max	300	to	750	mA	442
Left Cylinder + Extend Min	0	to	475	mA	300
Left Cylinder + Extend Max	300	to	750	mA	475

DISASSEMBLY AND ASSEMBLY OF THE SWING MOTOR FROM THE GEARBOX

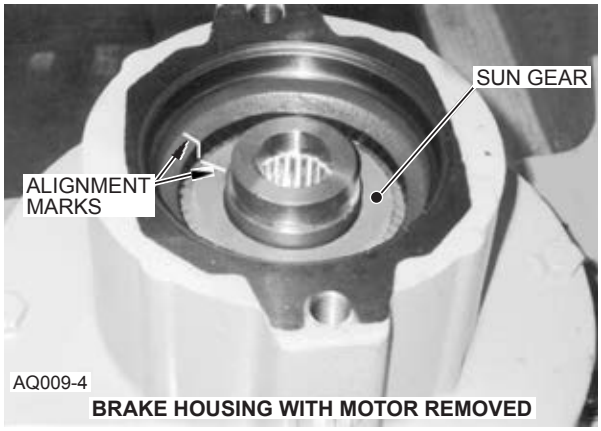


SWING DRIVE ASSEMBLY

When the swing drive motor is removed from the swing drive gearbox for inspection or repair, there is a possibility that the sun gear may not mesh properly with the first stage planetary gears when it is reinstalled. This will cause premature failure of the swing drive gearbox.

Installing the sun gear involves lining up all of the brake discs so that the outer splines on the sun gear can slide through the brake discs allowing the bottom gear teeth to mesh properly with the first stage planet gears.

1. Remove the swing drive motor from the swing drive gearbox.



BRAKE HOUSING WITH MOTOR REMOVED

2. Make alignment marks on the sun gear and brake housing to facilitate reassembly of the sun gear back into the swing drive gearbox.

   These alignment marks will ensure that both the brake disc and the first stage planetary gear teeth will be in alignment with the sun gear splines and bottom gear teeth, provided nothing has moved.

3. Remove the sun gear from the swing drive gearbox and inspect the gear teeth at the bottom of the sun gear for abnormal damage or wear.

   If there is no visible damage to the gear teeth, proceed to step (6). If there is visible damage to the sun gear, it must be replaced, proceed to step (4).

4. If the sun gear in step (3) has visible signs of damage, then the first stage planetary gears must also be inspected. Remove the brake assembly and inspect the first stage planetary gears for visible damage. If there is no visible damage, proceed to step (5). If there is visible damage to the first stage planetary gears, then the entire swing drive gearbox should be replaced.

5. Assuming there is no visible damage to the first stage planetary gears, reassemble the brake assembly back onto the swing drive gearbox and secure it by reusing the six M12x30mm hex head bolts. Torque each hex head bolt to 62 lbf-ft (84 N-m).

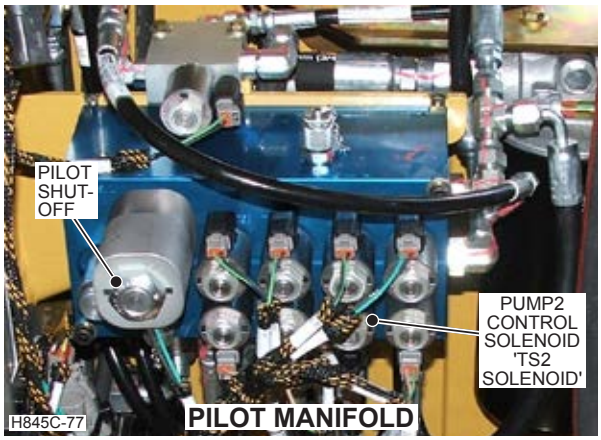
PILOT MANIFOLD

The pilot manifold is located in the valve service compartment beside the hydraulic oil tank, directly behind the cab. Pilot oil enters the manifold at the inlet port 'IN' and is then distributed to the various pilot functions of the machine.

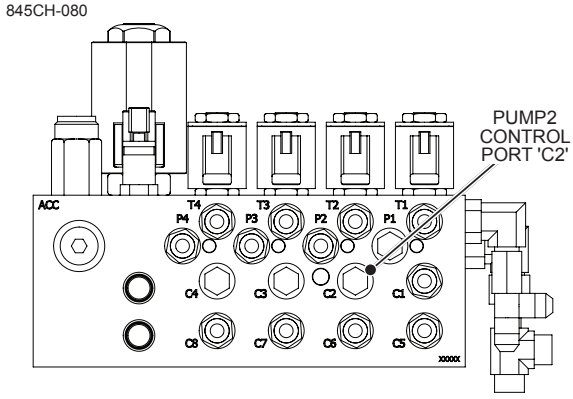
A PUMP2 electrical signal from the harvesting head control module is sent to the MD3 computer. The IQAN computer control system sends an electrical signal out from the XA2 #2 module to the PUMP2 solenoid in the pilot manifold. When energized the PUMP2 solenoid shifts the spool and directs pilot oil to one end of the PUMP2 valve section on the main control valve. The PUMP2 solenoid is proportional and the PUMP2 oil flow can be controlled through the MD3 screen.

The PUMP3 (optional) setting is a percentage of the PUMP2 setting to provide a lower flow when the demand is less than maximum. This setting is also controlled through the MD3 screen. See ELECTRONIC ADJUSTMENT PROCEDURE in THIS SECTION.

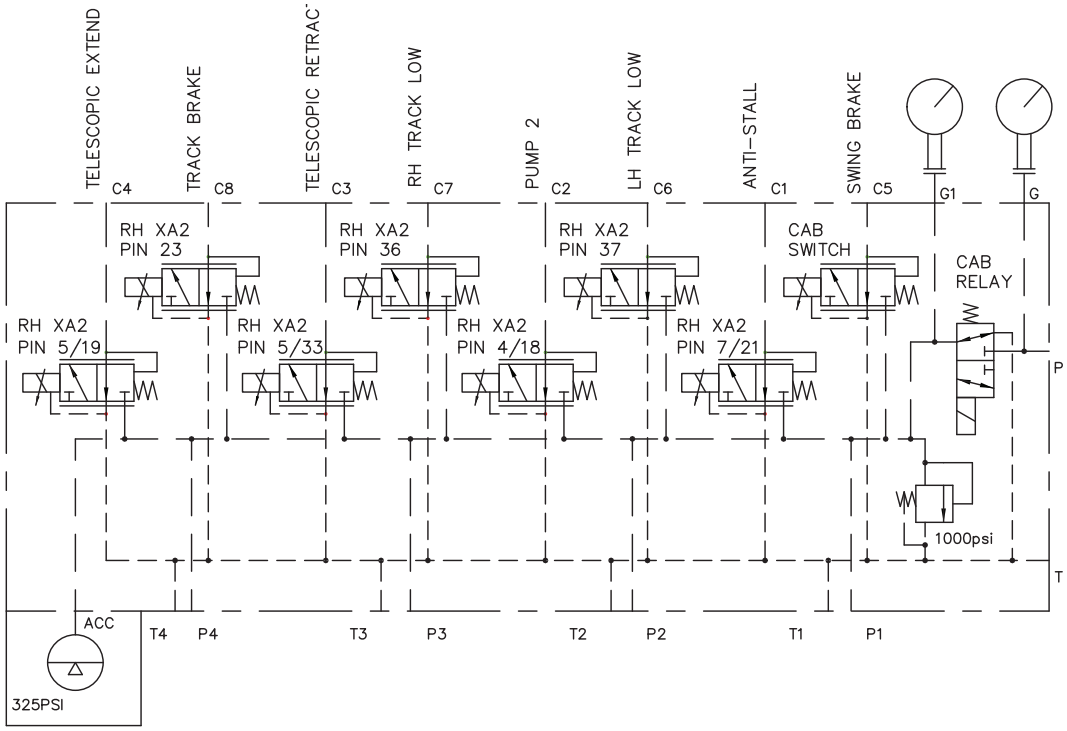
Refer to SECTION 5 of THIS MANUAL for a more complete description of the pilot manifold and its operation.



PILOT MANIFOLD



PILOT MANIFOLD – BOTTOM VIEW



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PILOT MANIFOLD SCHEMATIC

PUMP3 SETTINGS (OPTIONAL)

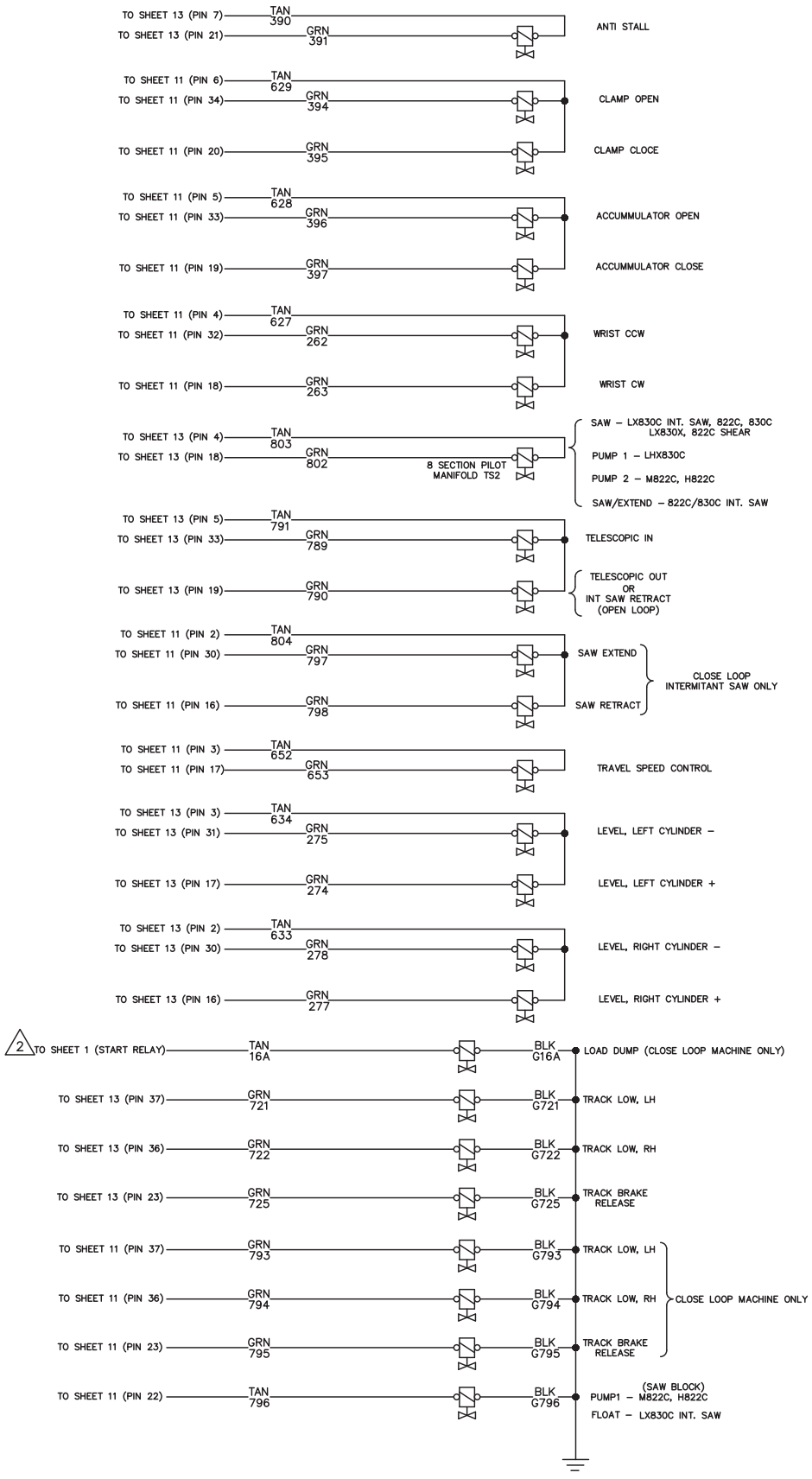
Press the menu button to go to the MAIN MENU.

Press F1 to access the Adjust menu.

Using the up or down arrow buttons scroll to the Machine Parameters menu and press OK.

Use the up or down arrow buttons to scroll to PUMP3 Active Flow and press OK.

The PUMP3 Active Flow setting allows for a second setting to the PUMP2 valve to allow for a lower flow if required. Use the up or down arrow buttons to adjust the % of the PUMP2 setting and press OK. The default setting is 25%.

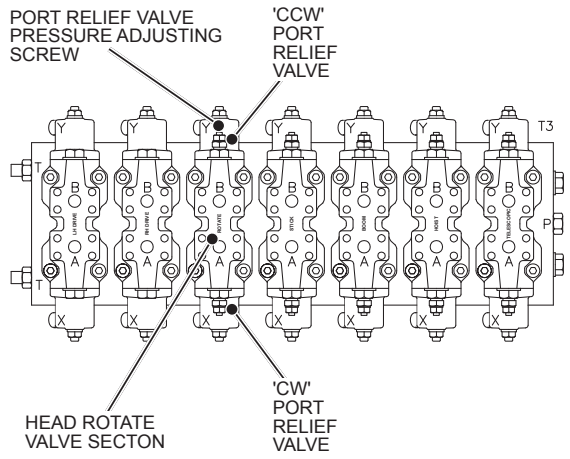


H822C-035

PUMP1 AND PUMP2 SOLENOID ELECTRICAL SCHEMATIC

⚠ WARNING

The attachment will rotate during this procedure. Operator must ensure that no one is near the attachment during this procedure.
The swing brake should be applied at all times during this procedure.



H822C-040 **MAIN CONTROL VALVE**

6. With the aid of an assistant hold the right joystick in HEAD ROTATE 'CW' position until the attachment rotates fully 'CW', loosen locknut on the head rotate 'CW' port relief valve cartridge and adjust. Refer to PRESSURE AND SPEED SETTINGS in SECTION 3 of THIS MANUAL for specifications.
7. Tighten locknut on adjusting screw taking care **NOT** to turn the adjusting screw at the same time.
8. Check the setting again.
9. With the aid of an assistant hold the right joystick in HEAD ROTATE 'CCW' position until the attachment rotates fully 'CCW', loosen locknut on the head rotate 'CCW' port relief valve cartridge and adjust. Refer to PRESSURE AND SPEED SETTINGS in SECTION 3 of THIS MANUAL for specifications.
10. Tighten locknut on adjusting screw taking care **NOT** to turn the adjusting screw at the same time.
11. Check the setting again.
12. Stop engine, remove all gauges and reinstall plugs and caps.

Pressure settings for a harvesting head will vary depending on the manufacturer and model of harvesting head in use. Refer to harvesting head manufacturer's service and installation information for recommended pressure settings and safe procedures for adjusting pressures.