



Technical Manual

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SAFETY LABELS AND INSTRUCTIONS

This manual contains important information affecting the safety of personnel and the equipment being used.

The safety instructions and behavioural rules are intended to protect operators from potentially dangerous situations and assist in the safe operation of the trailer and associated equipment.

The following symbols are used with safety instructions and identify varying degrees of hazardous conditions.

The safety instructions associated with these symbols are to be considered the minimum requirements for effective hazard and operational control.



DANGER

Points in the text marked with this symbol draw attention to immediately impending danger. Possible consequences are very serious or fatal injury.



WARNING

These points contain information on potentially dangerous situations. Possible consequences are very serious or fatal injury.



CAUTION

This symbol draws attention to potentially dangerous situations. Possible consequences are light to moderately serious injury and machine damage.



NOTICE

Points in the text marked with this symbol draw attention to potentially harmful situations. Possible consequences are damage to machine or equipment in immediate vicinity



IMPORTANT

Text marked with this symbol contains useful information associated with the machine and its application.



ENGINE OIL

The proper SAE viscosity grade oil is determined by the minimum outside temperature at cold engine start up, and the maximum out engine temperature during the engine operation. Use the minimum temperature column on the table to determine the oil viscosity to start a *cold soaked* engine. Use the maximum temperature column on the table to determine the oil viscosity for operation at the highest temperature anticipated. In general, use the highest viscosity oil to meet the start up temperature requirement.

TORQUE CONVERTER/TRANSMISSION FLUID

Transmission Fluid Shell Donax TC30 is suitable for use in the torque converter and transmission. Refer to the Fluid Specification Table (page 16) for the oils which may be used under given conditions.



Do not use Dextron II in the torque converter/transmission.

CAUTION

HYDRAULIC OIL

Use high quality anti-wear hydraulic oil or engine oil for the hydraulic (steering, brakes and attachment actions) system. Referring to the Fluid Specification Table (page 16). ISO/VG 68 Oil and SAE 20W-20 Engine Oil both have a viscosity of 300 to 350 SUS at 38°C and therefore fit into these temperature ranges. For colder ambient temperatures, ISO/VG 32 Hydraulic Oil or SAE 10 W Engine Oil (150-200 SUS at 38°C) are better suited. The viscosities given are for use as guidelines only; however, do not use an oil which will exceed 4000 SUS at start up or be less than 80 SUS during operation. Also any oil used must have a viscosity index of no less than 90. Consult your oil dealer or manufacturer for oils that meet these requirements.



Engine oil being used as hydraulic oil must meet Mil-L-46152 or 2014C and API class CC or CD standards. No similar standards have been written for anti-wear hydraulic oil; it is therefore up to the machine owner to ensure that the oil is of a high quality.

CAUTION

GEAR OIL

Use Shell differential oil HP gear oil LS 90 or equivalent SAE90LS oil suitable for limited slip differentials.

MULTI-PURPOSE EP GREASE

Use multi-purpose EP grease, which contains both 1% to 5% molybdenum disulphide conforming to MIL-L-7866, and a suitable corrosion inhibitor. National Lubricating Grease Institute (NLGI) Grade No. 2 is suitable for most temperatures. NLGI No. 1 or No. 0 are suitable for extremely low temperatures.

EXHAUST CONDITIONER ISOLATION

To isolate the exhaust conditioner perform the following procedure:

1. Ensure the area is clear of any obstruction and area is fit for carrying out safe operation and maintenance.
2. Isolate the machine.
3. Isolation of the *wet bath* exhaust conditioner is carried out via a valve located between the water inlet hose to the conditioner shutdown float chamber. The main isolation valve has two positions *closed* and *open*, this regulates the water flow from the make up tanks.



If the exhaust conditioner remains isolated after testing or maintenance to the system and the machine is returned to service it will be purged of water causing the machine to shutdown via the safety system.

Main Supply/Isolation Valve





Tick Box ✓

Activity Required	1	2	3	Defects/Comment
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2.2 DRIVETRAIN - Wheels and Tyres

Inspect wheel studs / nuts for damage, looseness and any missing. Tighten / replace as required.				
Inspect the tyre assemblies for damage (tears/splits) and wear. Check tyre pressure.				

2.3 DRIVETRAIN - Axles and Planetaries

Check for any oil leaks.				
Check pinion oil seals				

3. HYDRAULICS

Check the main hydraulic oil level and fill as required. Indicate litres used.				Ref: Spec 3
Ensure the hydraulic filler cap is secure and sealing.				
Check and record the following gauge pressures: Steering Accumulator pressure (2500 psi / 17250 kPa) Brake Accumulator pressure (2500 psi / 17250 kPa) Brake Head Pressure (1750 psi / 12100 kPa)				
Note : Machine Not To Be Operated if Brake Head pressure is below 1750 PSI				
Check the steering circuit pressure filter indicator, replace filter if required.				CAT Part No. 501800
Check the hydraulic return filter indicator, replace if required				CAT Part No. 502126

4. PNEUMATICS - Air Receiver

Drain away all condensation from the air receiver vessel.				
Drain air circuit water trap.				
Inspect the circuit and relief valve for damage, leaks and correct operation.				

4.1 PNEUMATICS - Main Isolation Valve

Inspect the 2-way valve for correct operation, leaks and locking mechanism. Replace/repair as required.				
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4.2 PNEUMATICS - Horn

Inspect the air horn and its operating valve for correct operation, abnormal noise (bypass), security and any leaks. Ensure the valve is clearly labelled. Repair as required.				
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Tick Box ✓

Activity Required	1	2	3	Defects/Comment
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5.1 ELECTRICS, INSTRUMENTS and CONTROLS - Electrical System

Check lights for correct operation.				
Check cables, hoses and flameproof joints are secure.				
Check DCS installation for security.				
Check alignment, condition and mounting of alternator, drive coupling and motor.				

6. FRAME RELATED - Canopy

Check for damage, security of fasteners				
---	--	--	--	--

6.1 FRAME RELATED - Guards and Covers

Inspect all guards and covers for security, damage and any missing covers/retainers. Repair or replace as required.				
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6.2 FRAME RELATED - Fire Extinguisher

Inspect the fire extinguisher mounting/ holding bracket for security, damage and that the extinguisher is easy to remove and secure when clamped in.				
Check the charge pressure indicator, where fitted, is registering within the operable range and appears to be free and operating correctly.				

6.3 FRAME RELATED - Fire Suppression System – If Fitted

Inspect the security of all fittings and components of the fire suppression systems.				
Check the fire suppression bottle for the correct pre-charge. The indicator needle should be in the green zone.				

6.4 FRAME RELATED - Lubrication

Lubricate the following grease point. Lubricate until grease is purged from the bushes.				Ref: Spec 7
Articulation Pillow block Drive line Cylinder pins Zone manifolds 3 x Lift cylinder top pivot points 2 x Tilt cylinder pins 6 x Steer cylinder pins 2 x RAS Cradle – Lift arm pivot pins 2 x Pedal pivot points 2 x Radiator pivot points 4 x Diff pinion oil seals 4 x Rear axle bolster bushes 2 x				



Tick Box ✓

Activity Required	1	2	3	Defects/Comment
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5. ELECTRICS, INSTRUMENTS and CONTROLS - Operator's Compartment

Ensure compartment is clean of all loose materials, coal, dirt etc.				
Inspect the condition of the operators gauges. Check for correct operation : Brake Head Pressure Brake Accumulator Pressure Steering Accumulator Pressure Engine Water Temperature Engine Exhaust Temperature Transmission Temperature Air Pressure Engine Oil Pressure Exhaust Filter Back Pressure				
Inspect the operator's seat for physical damage, including cushions and pads.				
Inspect all control devices (pedals, levers, handles, switches etc) for signs of wear damage, and incorrect operation. Repair as required.				
Inspect tilt/lift and implement control valve boots for damage and replace if necessary.				
Check door hinges and latches for correct operation. Repair as required.				
Inspect and clean under dash.				
Drain safety system air circuit water trap.				

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Check and record DCS display controller and configuration software revision number.				
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4.2 PNEUMATICS - Horn

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4.3 PNEUMATICS - Brake valves

Replace the Park/Emergency Brake valve				CAT Part No. 500438
Replace the Park Brake Air Pilot valve				CAT Part No. 502103

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FUEL FILLER CAP

FUEL TANK INSPECTION COVER AND LEVEL
GAUGE, DRAIN PLUG UNDERNEATH

Ensure park brake is on and the wheels are chocked before draining fuel tank as access is from under the machine.

WARNING

FUEL LINES

Care and Maintenance

Daily: carry out a visual inspection for fuel leaks on all external fuel lines and connections. Check that hoses are not resting on or touching sharp edges, rotating elements or heat sources such as exhaust system components.

Servicing

As hoses and associated fittings have a finite service life, carry out a thorough inspection every 1000 service hours. Inspect all fuel lines for signs of deterioration, including hose clamps and anchor ties and replace as required. Replace all fuel system hoses at major overhaul or every five years.

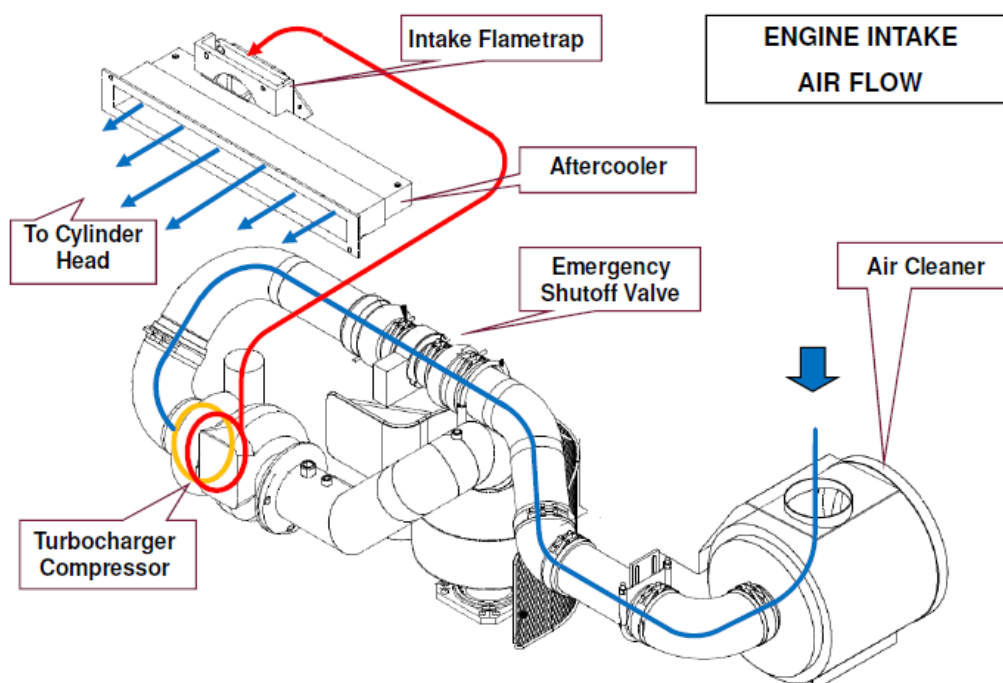


AIR INTAKE SYSTEM

GENERAL DESCRIPTION

The air, entering the turbocharger via the air cleaner is picked up by the turbo rotor blades and carried to the discharge side of the turbo. The continuous discharge of air from the turbo enters the air chamber of the cylinder block via the flame trap and sweeps through the intake ports of the cylinder liners.

The turbocharger is mounted on the outlet flange of the exhaust manifold. After the engine has started exhaust gases flowing through the turbine housing cause the turbine wheel and shaft to rotate. The intake turbocharger impellor, mounted on the opposite end of the turbine shaft, draws in fresh air via the air cleaner. The turbocharger delivers high pressure fresh air to the intake side of the heat exchanger. The air delivered from the turbocharger is at elevated temperature due to the compression process. To increase the efficiency of the combustion process the heated air is cooled via a heat exchanger (aftercooler) mounted in the cylinder block opening between the cylinders. Engine coolant flows, through the aftercooler and air flow is cooled before entering the combustion chambers.



SAFETY PRECAUTIONS

The following safety precautions are not intended to be exhaustive. Safe work practices should be used when servicing or operating heavy machinery.

- ALWAYS** give the engine an opportunity to cool down before performing air intake system servicing.
- ALWAYS** wear personal protective equipment including safety glasses, gloves and suitable clothing, particularly when cleaning filters using compressed air.
- ALWAYS** be aware of, and isolate, other forms of energy and pinch points (fan, belts, pulleys) when accessing the engine compartment including pneumatic stored pressure, engine coolant pressure and other heat sources such as engine block and exhaust system components.

WATER PUMP BELT TENSION

To check and adjust the water pump belt tension:

1. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
2. Loosen the tension on the idler pulley adjusting bolts.
3. Adjust the idler pulley to obtain the correct belt tension.
4. Tighten the idler pulley in position.
5. Replace belt if cracked or worn.



WARNING

Replace all guards and machine covers before returning the machine to service.



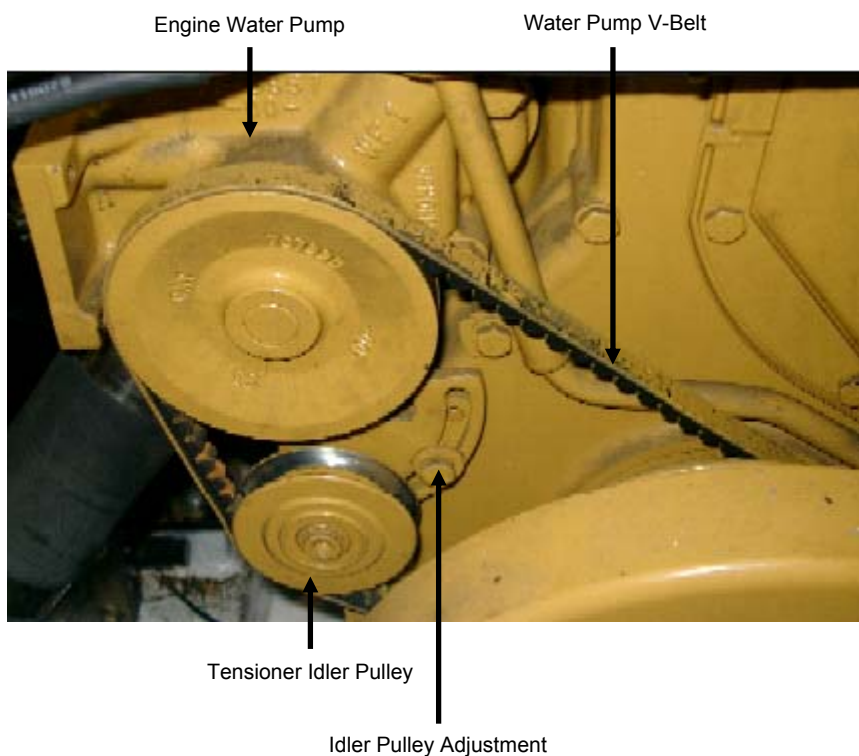
WARNING

Only replace with a FRAS belt.



NOTICE

Correct belt tension is achieved when a firm push with the thumb midway between the two pulleys creates a deflection of no more than the belt depth.



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Maintenance

Daily:

1. Flame path and connecting bolts inspection.
2. Exhaust conditioner low water shutdown testing.

Perform low water shutdown system:

1. Start DES and ensure all shutdown systems are operational, allow engine to warm up and run for several minutes.



2. Shut make up tank ball valve and open the low water shutdown test ball valve.



Main Supply/Isolation Valve



Low Water Shutdown Test Ball Valve

3. Observe machine taking note of water flow out of the low water shutdown test point when DES shuts down. Ensure the display on the DCS shutdown system indicates both proximity switches/magnetic reed switches are open.



WARNING

If the engine fails to stop or the water stops flowing out the test valve before the engine, DO NOT use the machine until the fault is rectified and tested.



FLAME PATH JOINTS OR FIXED CONNECTIONS

As with other maintenance and examination schedules the flameproof exhaust system should be inspected, by a suitably appointed and qualified person, at intervals consistent with mine site and statutory maintenance schemes. The following is the suggested intervals for maintenance and inspection of the flameproof components.

Daily:

1. Visually check joint fasteners (nuts, bolts and studs) securing flameproof joints i.e. exhaust manifold to engine block, exhaust manifold to turbo, turbo to exhaust downpipe, exhaust downpipe to exhaust conditioner, exhaust conditioner to particulate filter.

Every 50 service hours:

1. Check tightness of all joint fasteners (nuts, bolts and studs) securing flameproof joints i.e. flame exhaust manifold to engine block, exhaust manifold to turbo, turbo to exhaust downpipe, exhaust downpipe to exhaust conditioner, exhaust conditioner to particulate filter. Use soapy water around joints to check for any leaks.

Every 2000 service hours or 2 service years (Code D):

1. Disassemble all flameproof joint connections and inspect for finish, flatness, corrosion or damage. Repair as required.
2. Discard and replace all fixed joint gaskets.
3. Hydrostatically pressure test all exhaust system exhaust and water jacket chambers external to the engine block i.e. exhaust downpipe and purifier.

Water Jacket	Hydrostatic test	250 kPa (35 psi)
Gas Path	Hydrostatic test	1589.9 kPa (229 psi)
Exhaust Conditioner	Hydrostatic test	100 kPa (14.5 psi)

EXHAUST EMISSION TESTING PROCEDURE

Statutory requirements specify intervals for testing diesel engine exhaust emissions. For accurate testing the engine must be loaded as near as practical to maximum output power. The following procedure should be carried out for loading the engine to near maximum power.



WARNING

Wear personal protection equipment when working in proximity to a running engine as long term hearing loss may result.



WARNING

Position wheel chocks at both front wheels to eliminate sudden machine movement.



CHECKING AND GREASING OF DRIVE COUPLING

Care and Maintenance

To check the drive coupling:

1. Park the machine on flat, level ground.
2. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
3. Check for excessive free play in bearings.
4. Locate the remote grease point to the side of the air cleaner assembly.
5. Greasing of the coupling bearings should be carried out at 250 hour service intervals.



CAUTION

ONLY Shell Stamina RL2 grease should be used for drive coupling bearing lubrication.



NOTICE

DO NOT over grease drive coupling assembly. The greasing of the assembly is to replenish the lubricant not to replace it.

Greasing Port and Relief Port



ENGINE DRIVE COUPLING



ROUND HEAD GREASE NIPPLE

SERVICE DATA

Converter Outlet Pressure

To test the converter outlet pressure perform the following steps:

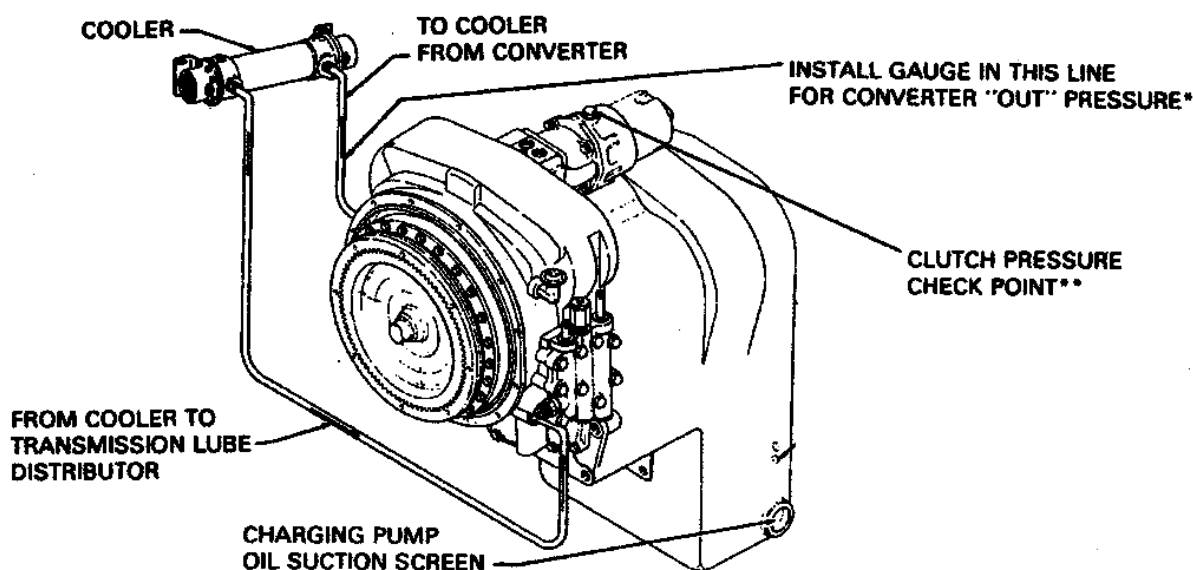
1. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
2. Remove the cover over the top of the transmission. This panel is located in front of the operator's compartment.
3. Attach a 0-500 kPa pressure gauge to the port adjacent to the converter outlet temperature pick up.
4. Start the machine and bring the transmission oil temperature to between 82.2 °C and 93.3 °C. This can be read from the transmission temperature gauge in the operator's compartment. To bring the temperature to this level it is necessary to work the machine or to *stall* out the converter. To stall out the machine apply the brakes and engage the transmission control levers in the forward and high gear positions. Accelerate the engine to ½ to ¾ throttle. Hold the engine at stall until the desired outlet temperature is reached.



Excessive transmission stall will overheat and damage the torque converter.

CAUTION

5. Once the correct transmission oil temperature has been reached park the machine on flat, level ground and leave it running.
6. Place the transmission in neutral and apply the park brake.
7. The minimum converter outlet pressure is 172.4 kPa (25 psi) when the engine speed is 2000 RPM.
8. The maximum converter outlet pressure is 482.6 kPa (70 psi) when the engine is at no load governed speed (2250 RPM).
9. Shutdown the machine, allow sufficient time for the transmission to cool, remove the pressure gauge and replace the test port plug.





GREASING AND INSPECTING DRIVE LINES

Care and Maintenance

The drive lines are to be lubricated at every weekly service. Failure to maintain proper lubrication is one of the most frequent causes of drive line failure. Lubrication of the drive line points is important due to the large loads that the needle bearings in the universal joints transmit.

Lubricant should be applied with either a hand operated grease gun or a pressure gun. The specification of the lubricant can be found in Section 1.

To lubricate and inspect the drive lines perform the following:

1. Park the machine on flat, level ground. Ensure the machine is in a straight line.
2. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
3. Lubricate each universal joint until grease is visible at the journal cross bearing caps. This will ensure the grease will fully lubricate the universal joint and purge the old lubricant.
4. Using a small pinch or wrecking bar check the flanges on the transmission and differential flanges for tightness. If either is loose drop that end of the drive shaft. Twist the flange to check any backlash between the splines and the flange. Replace any flange that is not a snug fit. If there is play in any of the universal joints replace it. Inspect the splines at the slip joints and replace that drive shaft if there is excessive wear. If the front drive line is removed, take off the carrier bearing and inspect it for wear.
5. Inspect the tightness of the bolts in the universal joints and if necessary re-tighten to the correct torque (see Section 1).
6. Check the condition of the rubber boots over the slip joints and ensure they are properly secured.
7. Grease the slip joints.
8. Grease the carrier bearing on the front drive shaft.

REMOVING AND INSTALLING THE REAR DRIVE LINE

Removing the Rear Drive Line

To remove the rear drive shaft:

1. Park the machine on flat, level ground. Ensure the machine is in a straight line.
2. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
3. Support the drive shaft.
4. Remove the bolts from the universal joints at the transmission and rear differential.
5. Compress the drive shaft at the slip joint using a small pinch or wrecking bar.
6. Lower the drive shaft out of position.

PUMPS AND MOUNTINGS

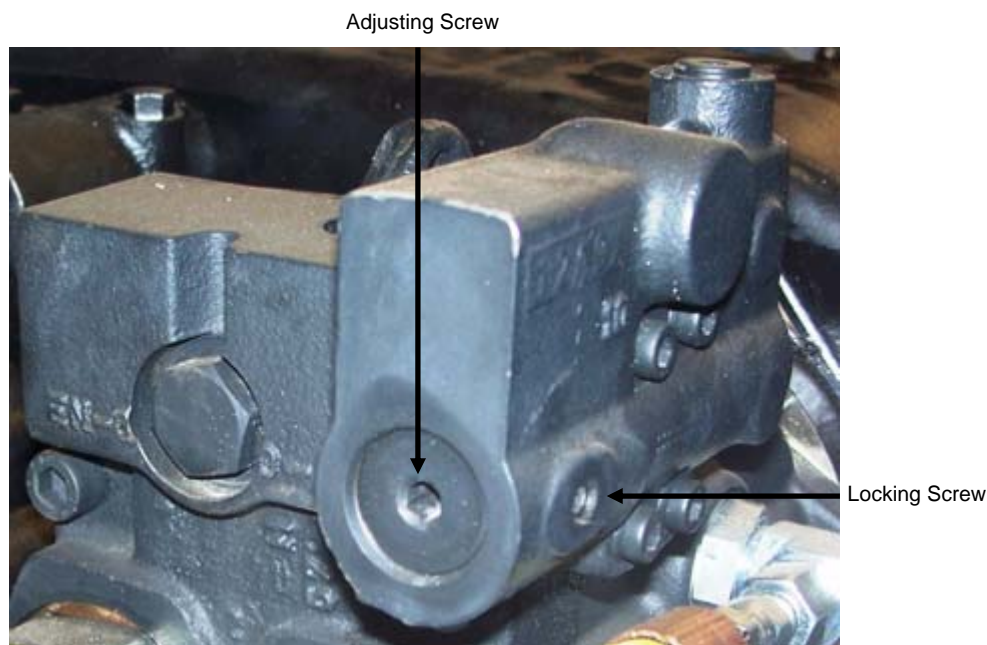
STEERING/BRAKE PUMP

The steering/brake pump is an axial piston type that utilises a pressure control that provides a flat cut off in flow at a preset screw adjustable pressure level. While system pressure is below the pressure setting, full flow is available from the pump. When system pressure reaches the preset value the pump is de-stroked to maintain the pressure level. The compensated steering/brake pump is mounted on the rear of the main hydraulic pump and is driven via the main pump drive shaft which in turn is driven from the transmission.

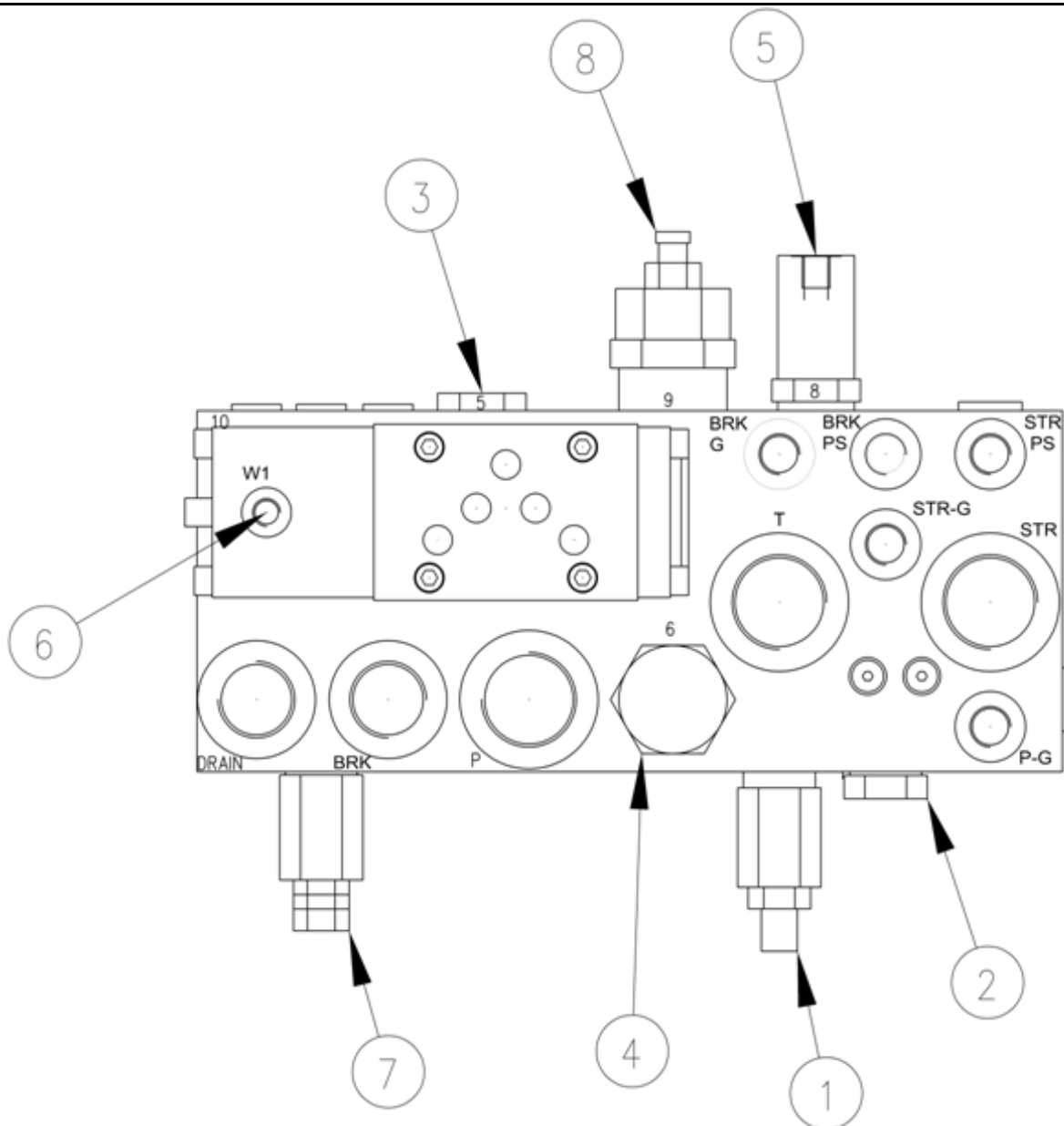
The compensated pressure setting should be checked by the operator daily, by checking the pressure on the steering and brake accumulator gauges.

To adjust the steering/brake pump compensated pressure setting:

1. Park the machine in a clear area, apply the park brake and install the articulation lock and chock the four wheels.
2. With the engine running at idle, release the park brake, access the steering/brake pump by removing the transmission cover and locate the pressure compensator adjustment on the underside of the pump housing.
3. Loosen the adjusting locking grubscrew and rotate the adjusting screw clockwise to increase the compensating pressure or counter-clockwise to decrease the compensating pressure.
4. Pressure can be observed at either the steering or brake accumulator pressure gauges located in the operator's compartment, alternatively a gauge may be fitted into the test port on the steering/brake manifold.
5. When the correct pressure is set tighten the adjusting locking grubscrew.



PRESSURE COMPENSATED STEERING AND BRAKE PUMP



Key

- (1) Relief Cartridge
- (2) Pilot Operated Check Valve
- (3) Check Valve
- (4) Check Valve
- (5) Pilot Operated 4/2 Valve
- (6) Pilot Operated C-Top 4/2 Valve
- (7) Pressure Reducing Valve
- (8) Pilot Operated Direction Control



Assembly:

Clean and inspect all parts for wear. Lubricate all rubber components from repair kit with clean system fluid.

1. Install new o-ring (2) on plug. Install new ball (2) and plug in housing. Torque plug 88.1-101.7 N-m (65-75 lb-in).
2. Install new o-ring (2) on valve assembly (3) and insert into housing bore. Note the direction of valve assembly.
NOTE: Be sure valve assembly seat is fully seated into housing.
3. Install new cage (2) into housing bore.
4. Install new o-ring (2) on plug.
5. Insert new backup ring (2) and new cup (2) inside end of plug. Note order of back up ring and cup.
NOTE: Some models use an o-ring in place of cup (2).
6. Install guide (4), spring and washer in end plug. Install plug in housing and torque 54.3-67.8 N-m (40-50 lb-ft).
7. Install new cup (2) and new backup ring (2) on piston (5) and insert into sleeve. Note direction of piston and sleeve.
NOTE: Some models use an o-ring in place of cup (2) and backup ring (2).
8. Install new backup ring (2) and new o-ring (2) on sleeve.
9. Install spring on piston (5).
10. Install piston and sleeve assembly (5) in housing bore. Note direction of assembly.
11. Install new retaining ring (2) in housing bore.
12. Install retainer and retaining ring in housing bore.
NOTE: Be careful not to scratch or mark housing bore
13. Install new o-ring (2) in housing bore.
14. Install spring (7), shim(s) (6) and piston in housing bore. Be sure to install the same number of shim(s) as were removed during disassembly.
15. Lightly coat inside bore of housing with graphite based grease and install new boot (2) on housing.
16. Apply graphite based grease sparingly to piston in chamfered area where rod makes contact.
17. Insert rod, piston, spring, spring and washer into housing (34). *NOTE:* Not all models use spring or washer.
18. Attach housings using cap screws and lock washers. Torque 29.8-36.6 N-m (22-27 lb-ft).
19. Install jam nut and clevis on end of rod. Adjust the clevis to the distance recorded during disassembly. Lubricate all bushings and pins with graphite based grease before assembling the pedal and base.
20. Fully depress pedal and torque jam nut 27.1-32.5 N-m (20-24 lb-ft) against clevis.
21. Install pedal stop screw and jam nut.
NOTE: With pedal in the release position, adjust pedal stop screw and jam nut so there is .38 mm-.76 mm (.015"-.030") of clearance between the pedal and top of pedal stop screw. Torque jam nut 27.1-32.5 N-m (20-24 lb-ft).



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ALTERNATOR DRIVE ASSEMBLY

Every 250 service hours check the condition of drive coupling from the hydraulic drive motor to the alternator.

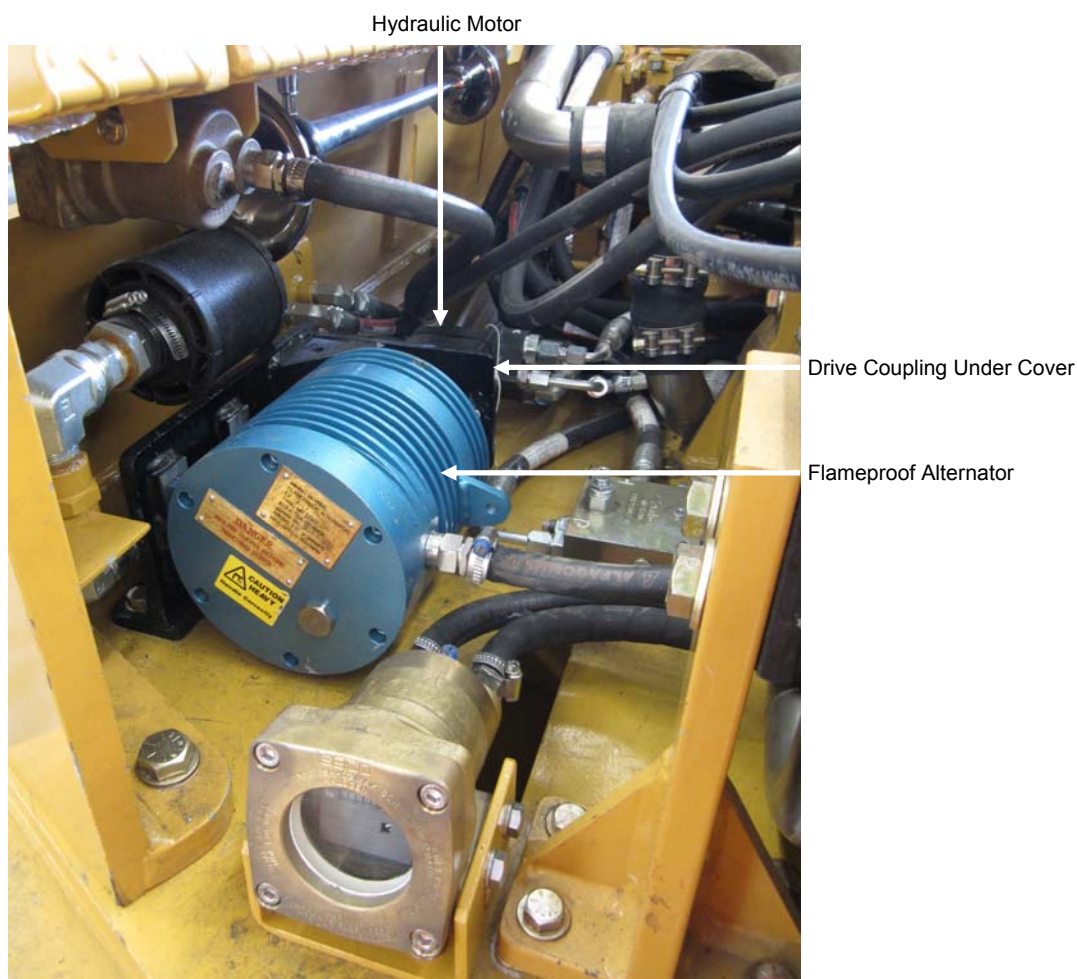
To check drive coupling:

1. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
2. Remove coupling guard.
3. Check wear on plastic drive coupling and check alternator and pump sprockets are tight.



NOTICE

No lubrication of the alternator coupling is required.



HYDRAULICALLY DRIVEN ALTERNATOR AND MOTOR ARRANGEMENT



DISPLAY ILLUSTRATIONS

System Off

The DCS wakes occasionally from a power saving sleep mode to check the state of the Power Up Pressure Switch.

If the PUPS has an open to close transition (edge triggered), the DCS will latch on the DCS battery supply to power the controller CPU.

It will then transition to the *System Startup Check*.

Note: Nothing is displayed in the *System Off state*.



System Startup Check

When the DCS is activated by the Power Up Pressure Switch, the DCS powers up and performs a self-check.

This self check includes verifying that a valid configuration is stored in memory.

This display screen also appears if the DCS is supplied trickle charge from the alternator while in the *System Off* state.

The three colour indicators will flash orange to indicate this.



System Startup Check Fail

Screen is displayed if the configuration file ;

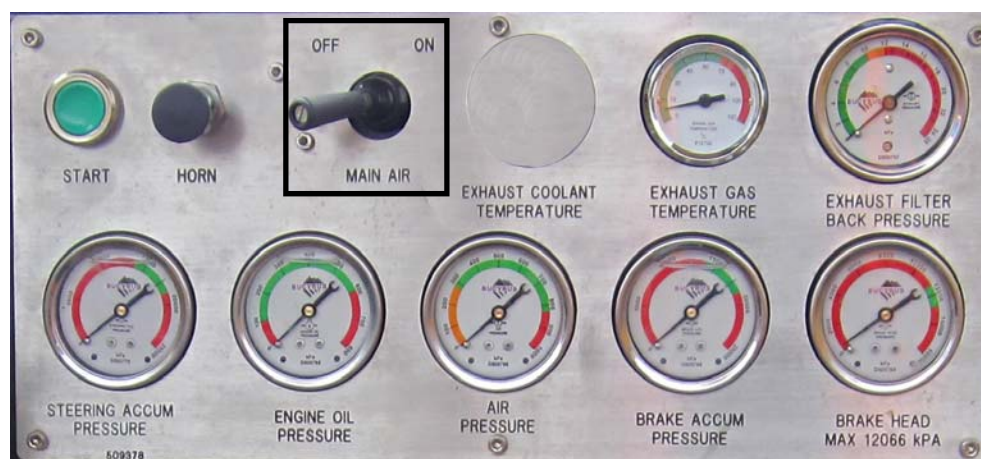
1. Is invalid,
2. Fails to load,
3. Or if the control unit is corrupt.

The three colour indicators will flash red to indicate this. Sometimes powering off the DCS by opening the PUPS, and then closing the PUPS to start over will fix the problem, if the configuration was not loaded successfully. Otherwise, the control unit may require reprogramming, repair, or replacement



SYSTEM OPERATION

1. **Position the on/off toggle switch to the *on* position:** This will activate the DCS electronics. The system will display “Waiting for methane sensor warm up” and the methane LED will be illuminated. After approximately 15 seconds the screen display will read “Pre run checks” while the DCS checks that the system is ready to start. Once this is completed the screen will display “Waiting for start”. The engine can now be started. If the engine is not started within 30 seconds the DCS will shut itself down. To restart the system toggle the on/off toggle switch to *off* then back to *on*.



ON/OFF TOGGLE SWITCH ON THE OPERATOR'S DISPLAY PANEL

2. **Start engine:** Activate the engine start button. After the engine has started, the display will read “Engine running”.
3. **After starting the engine** if the alternator is not charging the engine will run for a predetermined period of time before shutting down.
4. **Drive machine normally.**
5. **Shutdown:** When finished with the machine, toggle the on/off toggle switch to the *off* position. This will deactivate the DCS electronics, thus cutting power to the solenoid and shutting off pilot air pressure to the fuel shut off cylinder and the engine will stop.
6. **After a shutdown** whether by the operator or an engine trip, if the up or down arrows are pressed the system will return to “Waiting for start”.

FRONT FRAME

CHASSIS

The front frame is a welded chassis which facilitates fitment to the rear frame via the articulation joint and houses the lift arm, lift cylinder and tilt cylinder assemblies. The front frame also houses the forward facing headlights, the machine fire extinguisher (driver's side), articulation lock (off driver's side) and lift arm locks in the centre of the machine. Grease manifolds are located each side of the front frame for lubrication of the frame components.

Care and Maintenance

Daily:

1. Visually inspect the front frame and associated components for damage.
2. Check the security of the fire extinguisher, fire suppression bottles and articulation lock mountings.
3. Verify that the fire extinguisher is functional.

Servicing

Daily:

1. Grease the pin joints via the remote grease manifolds positioned both sides of the front frame in the articulation joint. These manifolds allow individual greasing to the top and bottom lift cylinder pins, inside and outside lift arm pins. Raise and lock the lift arm to observe purging of grease at the relevant pins to ensure adequate lubrication.



WARNING

Always ensure the articulation lock is correctly fitted when working in this area of the machine to isolate inadvertent movement of the articulation.

2. Grease the tilt cylinder pins and lift cylinder pins on the driver's and off driver's side. Grease nipples are located on the cover plates on the inside and outside of each pin. Observe purging of grease at the pins to ensure adequate lubrication.



Articulation Lock in Storage Position



OPERATOR'S SEATING

Seating is provided for the operator. The operator's seat is an in board facing adjustable position seat with suspension fitted. The suspension system consists of mechanical or pneumatic suspension with hydraulic shock dampening. An optional swivel seat base is available. A lap sash seat belt is fitted to the seat assembly for operator security.

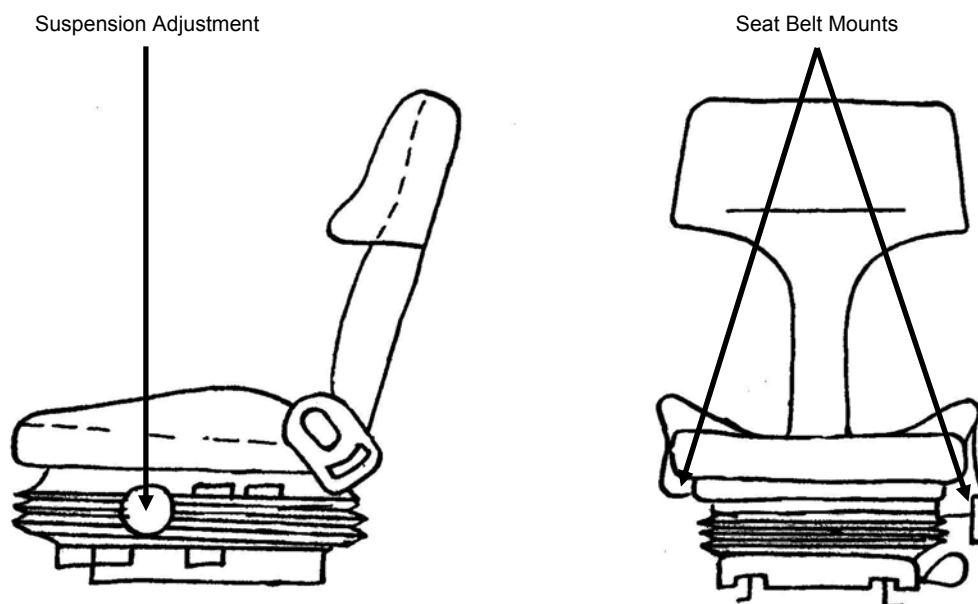
Care and Maintenance

Daily:

Visually inspect seating and seat belts for damage.

Servicing

No routine servicing is required on the seating other than visual inspection for functionality.



OPERATOR'S SEATING



AIR COMPRESSOR

The air compressor is driven from engine timing drive gears. Lubrication is via an oil line from the engine oil gallery in the engine block to the front of the compressor. Cooling is achieved from the cooling lines from the engine cooling system.

COMPRESSOR AND MOUNTINGS

Servicing

Replace the air compressor inlet filter every month or 250 service hours.

To remove and replace the air compressor inlet filter:

1. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
2. Isolate the pneumatic system using the main air isolation valve located at the air receiver.
3. Locate the filter housing above the air compressor assembly.
4. Remove the filter by unscrewing the retaining clamp at the base of the filter.
5. Remove the filter and discard in a responsible manner.
6. Fit the new filter and tighten clamp.

COMPRESSOR

If the pneumatic system fails to maintain sufficient charge pressure the compressor may be faulty and will need to be removed for inspection and overhaul.

To remove and replace the air compressor:

1. Ensure that the engine has had sufficient time to cool and is isolated and tagged as described in Section 1.
2. Drain all air pressure from the air receiver to ensure full isolation to the compressor. As the air compressor is water-cooled the cooling system will need to be drained. See Section 2 for the correct procedure for draining the cooling system.



WARNING

The engine cooling system runs at a nominal 100 kPa pressure and can reach temperatures of more than 100 °C. Release stored pressure and wear personal protective equipment when accessing.

3. Remove the air compressor intake filter, the governor air line and the stainless steel braided delivery hose from the compressor. Plug the hose ends to avoid contamination.
4. Remove the two cooling hoses from the air compressor. Plug the hose ends to avoid contamination.
5. Remove the oil delivery line from the engine to the compressor.
6. Remove the two mounting bolts from the front of the timing cover and three mounting bolts from the rear of the compressor and remove the bracket.
7. Remove compressor assembly clear of the engine.
8. Fit a new gasket to the compressor.
9. Fit the new compressor and secure with the mounting bolts.
10. Refit the two cooling hoses, two air hoses, lubricating oil lines and air filter.



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