SERVICE MANUAL

LOADALL (ROUGH TERRAIN VARIABLE REACH TRUCK)
531-70, 535-95, 541-70

EN - 9813/9050 - ISSUE 1 - 01/2018

This manual contains original instructions, verified by the manufacturer (or their authorized representative).

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Foreword

The Operator's Manual

⚠

You and others can be killed or seriously injured if you operate or maintain the machine without first studying the Operator's Manual. You must understand and follow the instructions in the Operator's Manual. If you do not understand anything, ask your employer or JCB dealer to explain it.

Do not operate the machine without an Operator's Manual, or if there is anything on the machine you do not understand.

Treat the Operator's Manual as part of the machine. Keep it clean and in good condition. Replace the Operator's Manual immediately if it is lost, damaged or becomes unreadable.

Contents

Notes:

00 - General

Introduction

Forks can be installed on many different types of agricultural or construction machines. Forks can be directly mounted on to a lift arm or carriage or mounted to a lift arm via a quickhitch assembly. There are a vast amount and size of forks used for numerous applications.

Forks can be used to lift, raise and carry heavy things and stack them where required.

Health and Safety

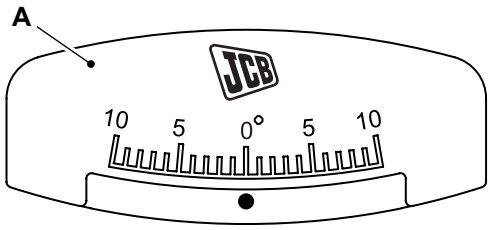
⚠ **CAUTION** This component is heavy. It must only be removed or handled using a suitable lifting method and device.

Calibrate

When the boom is assembled, do a check of the carriage alignment to make sure that the measurement is accurate.

1. Make the machine safe. Refer to (PIL 01-03).
2. Make sure that the tyre pressures are correct.
3. Make sure that the machine is parked on flat level ground.
4. Check the inclinometer to make sure that the chassis is level.

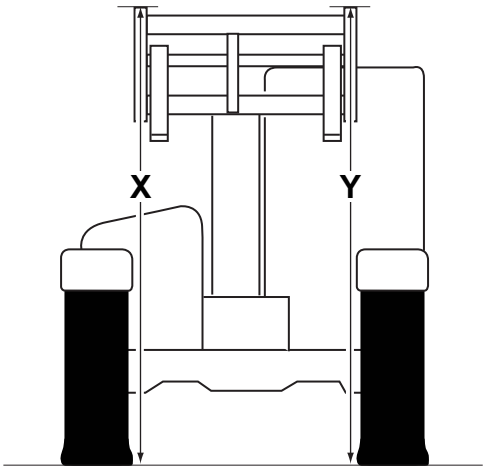
Figure 31.



A Inclinometer

5. Measure the left and right side carriage height from the ground to the top of the carriage and note the dimensions.

Figure 32.



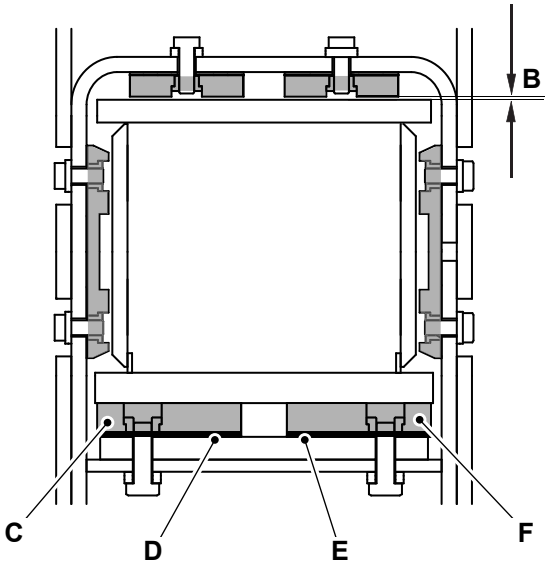
X Left side dimension
Y Right side dimension

6. If there is a difference between left and right side dimension, the front lower wear pads 1 and wear pads 2 can be shimmed.
7. Add or remove the shim 1 and shim 2 as necessary to align the carriage. Refer to adjust (PIL 06-12-30).
8. Make sure that the difference in shim thickness of shim 1 and shim 2 does not exceed the specified value.

   Length/Dimension/Distance: 3.2mm
9. Make sure that the maximum wear pad clearance does not exceed the specified value.

   Length/Dimension/Distance: 3mm

Figure 33.



B Maximum wear pad clearance
C Lower wear pad 1
D Lower wear pad 2
E Shim 1
F Shim 2

30 - Pivot Pins

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pesticides, fungicides, herbicides), refer to the instructions provided by the supplier of the chemical agent as well as instructions provided by the sprayer's manufacturer.

Personal protective equipment (PPE) must be used inside the cab when specified by those directions.

The air delivery system cannot offer a full protection, but a partial protection can be achieved by following some basic rules:

- Keep doors windows and hatches closed during the spraying operation.
- Keep the cab interior clean.
- Do not enter the cab with contaminated shoes and/or clothing.
- Keep all used personal protective equipment outside the cab.
- Bring the wire harness of the remote spray control box into the tractor cab.
- Remove the outside air delivery cab filter after the spraying operation and store it in a dry dust free room. Reserve it for the next spraying operation; replace with a service part filter.
- Active carbon filters must be properly stored in a sealed plastic bag to preserve their functionality.
- Use only genuine JCB filters and ensure that the filter is correctly installed.
- Check the condition of the sealing material and have it repaired when required.

O Manual steer mode lever
R Heater cover (if installed)
T Air conditioning hoses at TXV
V Brake pipe
X View- master cylinder
Z Single lever control
P Clip
S Heater hose clips
U Servo hose clip
W View- cab mounted servo
Y Brake pipe

12 - Handle

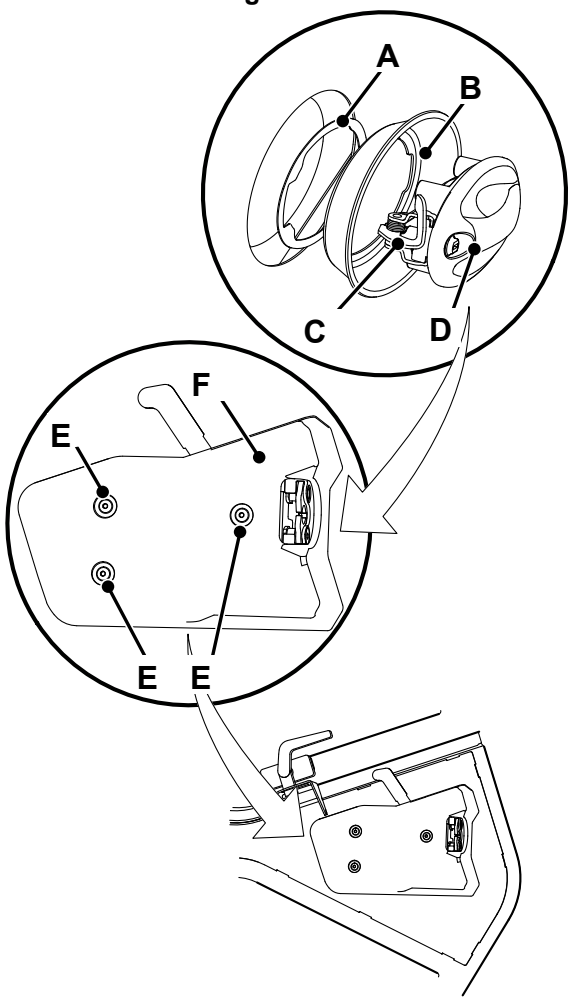
Remove and Install

Remove

The inner and outer handle are combined in one unit.

1. Make the machine safe.
   Refer to: PIL 01-03.
2. Support the outer handle.
3. Remove the screws from the inside of the door and lift away the cover plate.
4. Disconnect the latch assembly from the handle lever.
5. Slightly tilt the handle unit to unhook the unit from the door assembly. Retain the gasket and trim plate.

Figure 90.



A Gasket
B Trim plate
C Latch assembly
D Handle- exterior
E Retaining screws
F Cover plate

Install

1. The installation procedure is the opposite of the removal procedure.

Notes:

Check (Operation)

Binary Switch

The binary pressure switch is located in the HVAC (Heating Ventilation Air Conditioning) system pipework. Refer to: PIL 12-03.

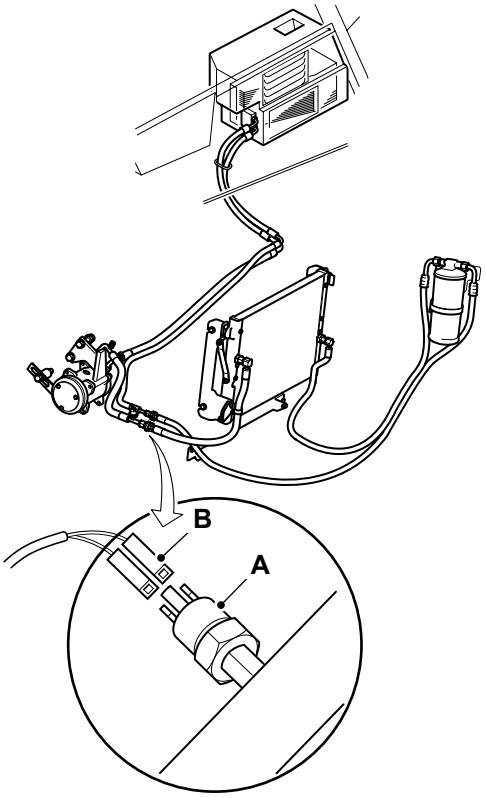
Before testing the binary pressure switch, check the refrigerant charge level. If the refrigerant charge level is satisfactory, test the switch as described below:

1. Make the machine safe.

   Refer to: PIL 01-03.

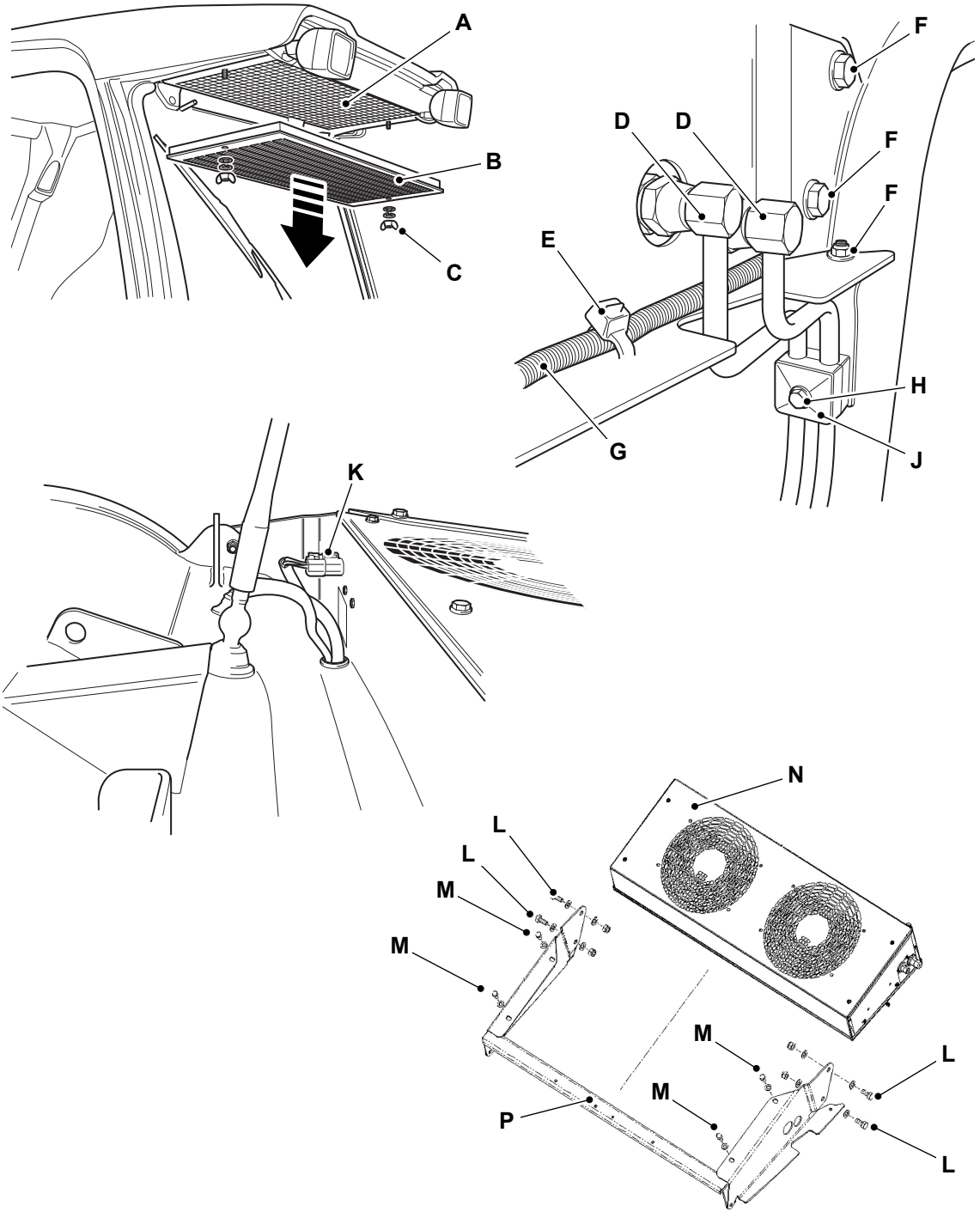
2. Switch off the engine and remove the harness connectors from the pressure switch.
3. Connect a link wire between the two harness connectors (effectively bypassing the pressure switch).
4. Switch on the engine and HVAC system. If the system operates, one of the switches inside the binary pressure switch assembly is faulty.
5. Install a new pressure switch assembly. If the clutch still fails to operate, check the harness electrical wiring for damage and open or short circuits.

Figure 112.



A Binary pressure switch
B Harness connectors

Figure 119.



A Condenser matrix
B Protective cover
C Cover fasteners
D Air conditioning pipes
E Cable ties
F Condenser support bolts
G Work light harness
H Pipe clamp bolt
J Pipe clamp
K Condenser electrical connector
L Condenser support nuts
M Bracket securing screws
N Condenser unit
P Support bracket

accordance with local regulations. Use authorised waste disposal sites.

9. When the pressure washing is complete move the machine away from the wash area, or alternatively, clean away the material washed from the machine.

10. Before working on specific areas of the engine use a compressed air jet to dry off any moisture. When the area is dry use a soft clean brush to remove any sand or grit particles that remain.

11. When removing components be aware of any dirt or debris that may be exposed. Cover any open ports and clean away the deposits before proceeding.

Additional cleaning must be carried out prior to working on the high pressure fuel system. Refer to: PIL 18-00-00.

Check (Condition)

Start the engine and check for:

- Excessive smoke
- Excessive vibration
- Excessive noise
- Overheating
- Performance
- Unusual smells.

09 - Bedplate

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09 - Rear Oil Seal

Remove and Install

Special Tools

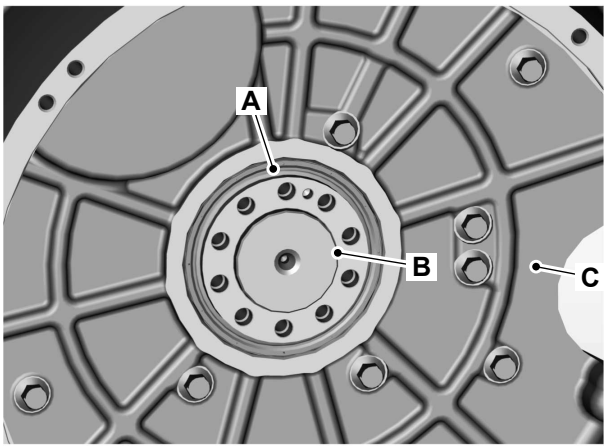
Description	Part No.	Qty.
Crankshaft Rear Oil Seal Installation Tool (430 Engine)	320/A3125	1

This procedure requires service parts. Make sure you have obtained the correct service parts before you start. Refer to Parts Catalogue.

Remove

1. Make the machine safe.
   Refer to: PIL 01-03.
2. Make sure that the engine is safe to work on. If the engine has been running, let it cool before you start the service work.
3. Get access to the engine. If necessary, remove the engine.
   Refer to: PIL 15-00-00.
4. Remove the flywheel.
   Refer to: PIL 15-54-00.
5. Use a suitable lever behind the lip of the seal, carefully prise out the oil seal from the counterbore in the flywheel housing. Take care not to scratch or damage the counterbore or the crankshaft hub. Damaged or dirty sealing faces will cause the oil seal to fail. The crankshaft oil seal must not be reused. Discard the crankshaft oil seal.

Figure 163.

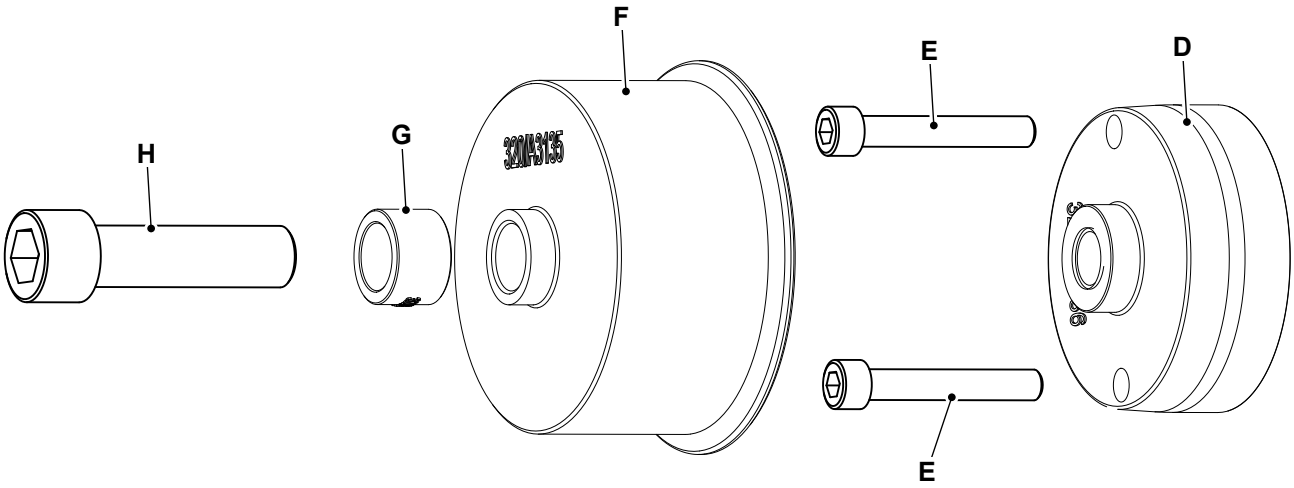


A Crankshaft oil seal
B Crankshaft
C Flywheel housing

Install

1. Make sure that the counterbore and the crankshaft hub are clean and free from damage and corrosion. Use a suitable degreasing agent to clean all traces of oil and grease from the counterbore. The oil seal has a special coating and MUST be installed dry without lubricant.
2. Install the crankshaft oil seal guide to the crankshaft hub, using the bolts 1 (x2).
   Special Tool: Crankshaft Rear Oil Seal Installation Tool (430 Engine) (Qty.: 1)

Figure 164.



00 - General

Introduction

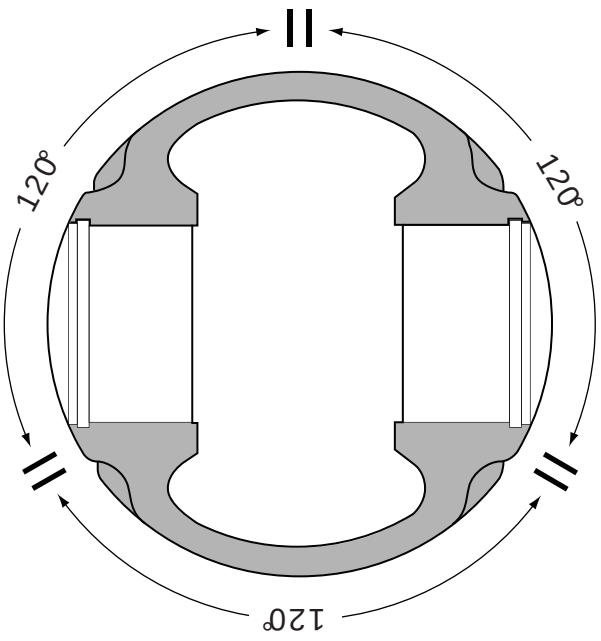
The oil filter is a spin on type which screws on and off the oil filter head.

12 - Valve Spring

Remove and Install

Refer to: PIL 15-30-00.

Figure 203.



Remove and Install

Special Tools

Description	Part No.	Qty.
Template for Sealant Oil Sump - Pressed (430 Engine)	320/B4120	1
Oil Sump Location Dowel	892/01150	1

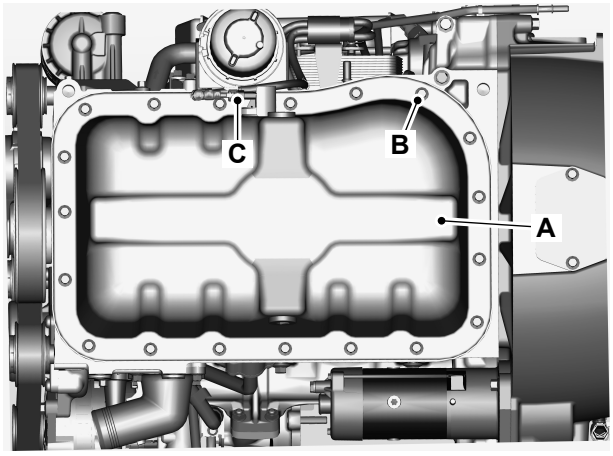
Consumables

Description	Part No.	Size
Clear Silicone Sealant	4102/0901	0.31L

Remove

1. Make the machine safe.
   Refer to: PIL 01-03.
2. Make sure that the engine is safe to work on. If the engine has been running, make sure the engine has cooled sufficiently before you start.
3. Drain the engine oil.
   Refer to: PIL 15-21-00.
4. If installed, disconnect the oil level sensor.

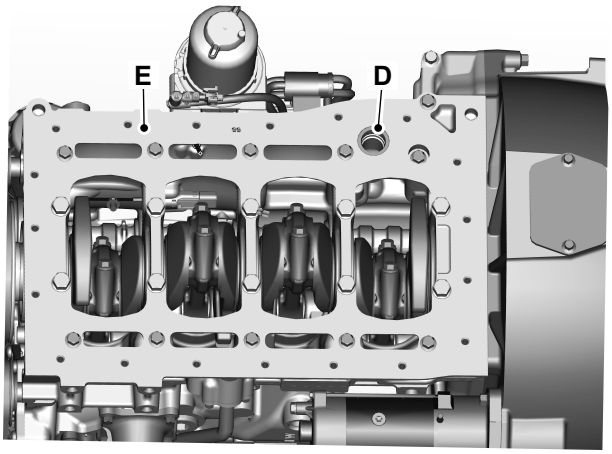
Figure 216.



A Oil sump
B Bolts (x19)
C Oil level sensor

5. Remove the bolts (x19) and remove the oil sump from the engine. The oil sump may be difficult to remove due to adhesion of sealing compound. If necessary, carefully lever the mating flanges apart. Do not use excessive force, the oil sump could be damaged. Make sure that you do not damage the sealing face on the bedplate or the oil sump.
6. Remove the oil pick up seal. The oil pick up seal MUST NOT be re-used. Discard the oil pickup seal.

Figure 217.



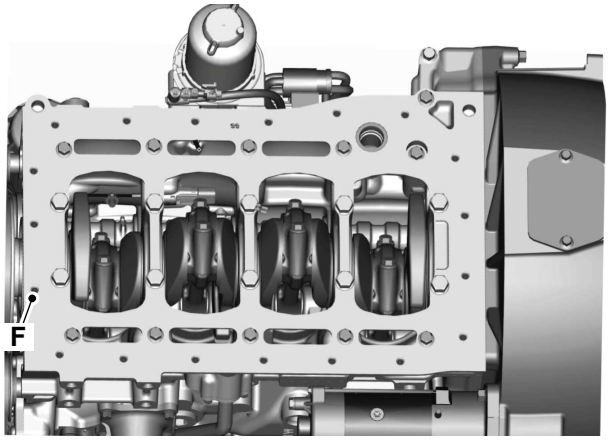
D Oil pick up seal
E Bedplate

7. Use a gasket removal compound, carefully remove all traces of sealing compound from the oil sump and engine mating faces. Do not allow the sealing compound to enter the engine.
8. Use a suitable degreasing agent to thoroughly clean the oil sump.

Install

1. Lightly smear the inside of the new oil pick up seal with clean engine oil and install into the bedplate. DO NOT install the seal on to the oil sump as this may damage the oil pick up seal. Damage to the seal could cause a drop in oil pressure and subsequently damage to the engine.
2. Install the oil sump location dowel into the position shown.
   Special Tool: Oil Sump Location Dowel (Qty.: 1)

Figure 218.



F Oil sump location dowel position

3. Use the fixing bolts to locate the template to the oil sump mating face. Make sure that the

57 - Oil Filler

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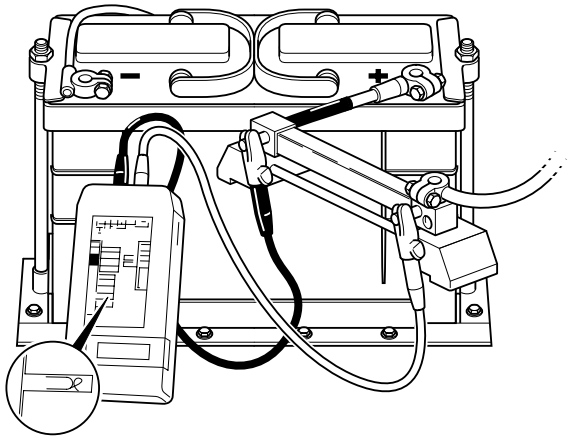
5.2. If the reading is zero, check the cables for continuity, particularly at the starter terminals.

6. If the voltage is correct, check the alternator.

Alternator Charging Test

Figure 242.



1. Make sure that all battery and alternator connections are in place, secure and making good metal to metal contact, especially the earth connections to chassis and engine.
2. If the battery is in a fully charged condition, before commencing the test switch on the working lights for

   Duration: 3min
3. Alternatively, operate the starter for a few moments with the ESOS (Engine Shut-Off Solenoid) fuse removed.
4. Install an open type shunt between the battery positive lead and the battery positive terminal.

   Current: 100A
5. Connect a Multimeter positive lead to machine side of the shunt and negative lead to battery side of the shunt.
6. Connect the leads to the multimeter and set the multimeter to the relevant range as follows.
7. AVO 2002

   7.1. Red lead to volts (middle) socket on multimeter.

   7.2. Black lead to negative on multimeter.

   7.3. Right side slider to DC (Direct Current) voltage.

   7.4. Left side slider,Refer to Figure 242.
8. AVO 2003

   8.1. Red lead to amps socket (A) on the multimeter.

   8.2. Black lead to negative on multimeter.

   8.3. Right side slider to DC voltage

   8.4. Left side slider to 200 Shunt
9. FLUKE 85

   9.1. Red lead to volts socket (V) on multimeter.

   9.2. Black lead to COM socket on multimeter.

   9.3. Set dial to mV.
10. Start the engine and run at maximum speed. Multimeter should show maximum alternator output in Amps (Refer to Technical Data). The multimeter reading should be taken as soon as possible after starting the engine, as the charging current will fall rapidly.
11. A zero reading indicates failure of the alternator and may be caused by one of the following conditions. These are listed in the order of probability.

    11.1. Defective suppression capacitor.

    11.2. Dirty slip rings or worn brushes.

    11.3. Defective regulator.

    11.4. Defective rectifier.

    11.5. Open or short circuited field (rotor) windings.

    11.6. Open or short circuited power (stator) windings.
12. If any fault is found, replace the complete alternator.

00 - General

Introduction

The engine sensors continually send signals to the ECM (Engine Control Module) to help the ECM to control the smooth running of the engine and related components.

The ECM processes signals from the sensors continually and its response will be based on an evaluation of the combination of sensor signals.

After removal from the engine, protect the sensors from knocks, dust and water ingress and any high temperature sources.

The sensors are not serviceable, therefore they must be replaced in the event of damage.

Remove and Install

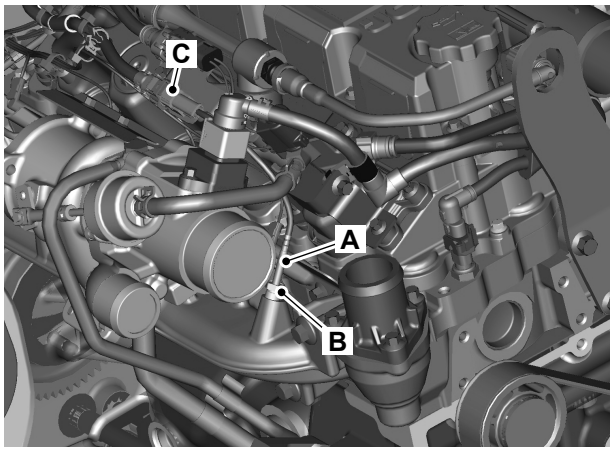
The exhaust manifold temperature sensor is a non-serviceable item. If the sensor is faulty or damaged it must be replaced.

Before Removal

1. Make sure that the engine is safe to work on. If the engine has been running, let it cool before you start the service work.
2. Get access to the exhaust manifold temperature sensor.

Remove

Figure 265.



A Exhaust manifold temperature sensor
B Retaining nut
C Electrical connector

1. Disconnect the electrical connector.
2. Undo the retaining nut.
3. Remove the sensor from the exhaust, take care not to damage the sensor probe.

Install

1. The installation procedure is the opposite of the removal procedure. Additionally do the following steps.
2. Tighten the retaining screw to the correct torque value.

Table 112. Torque Values

Item	Nm
B	45 ± 5

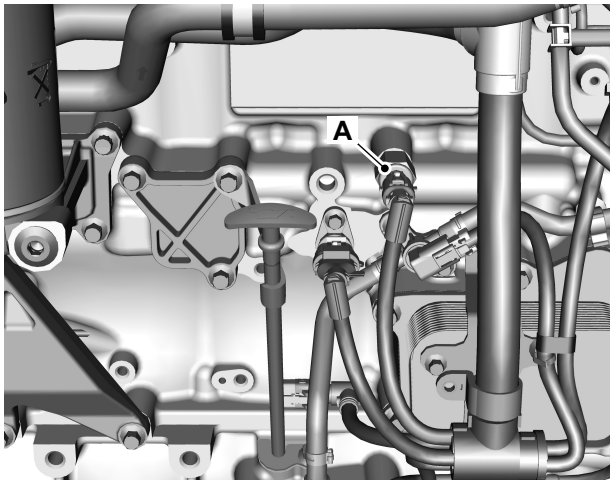
Remove and Install

The engine oil pressure switch is a non-serviceable item. If the switch is faulty or damaged it must be replaced.

Remove

1. Make sure that the engine is safe to work on. If the engine has been running, let it cool before you start the service work.
2. Get access to the engine.
3. Clean the area around the oil pressure sensor.
4. Disconnect the electrical connector at the engine oil pressure switch.
5. Remove the switch from the crankcase.
6. Discard the sealing washer. Plug all the open ports and hoses to prevent contamination.

Figure 277.



A Engine oil pressure switch

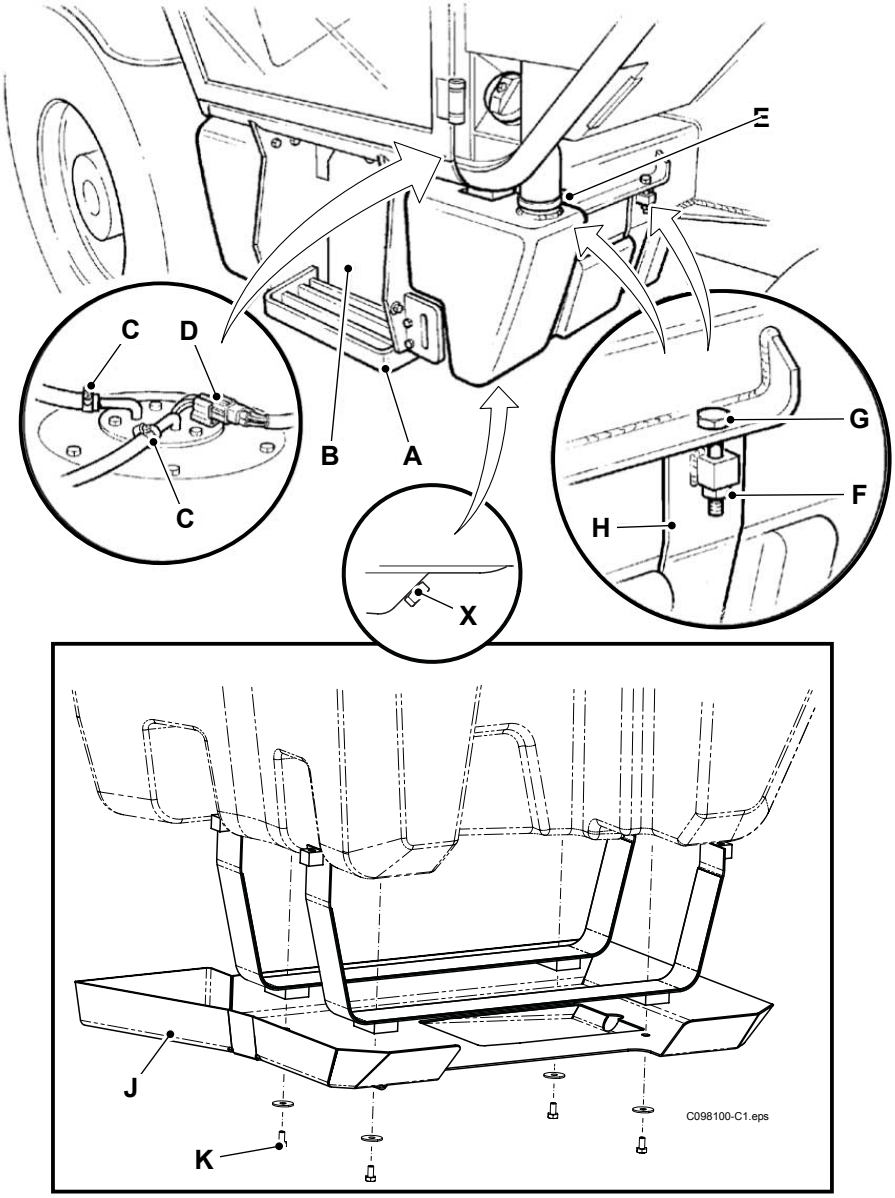
Install

1. The installation procedure is the opposite of the removal procedure. Additionally do the following steps.
2. Replace the sealing washer.
3. Tighten the engine oil pressure switch to the correct torque value.

Table 117. Torque Values

Item	Nm
A	14 ± 2

Figure 285. Fuel Tank



A Steps
B Battery cover
C Fuel hoses
D Electrical connections
E Clip
F Nuts 1
G Bolts 1
H Holding straps
J Tank belly guard
K Securing bolts and washers
X Drain plug

Install

1. The installation procedure is the opposite of the removal procedure. Additionally do the following steps.

   1.1. Make sure that all foam and rubber mats and seals on the tank are in good condition (if installed). Install new parts if they are defective.

   1.2. Tighten the fuel tank support bracket nuts to the correct torque value. Refer to (PIL 72).

   1.3. Reinstall all pipework, electrical connectors, brackets, cable ties and the filler neck. Make sure that no hoses are twisted or trapped.

   1.4. Make sure that all connections are tight and correctly connected and secured.

00 - General

Introduction

Fuel at rail pressure is continuously supplied to the injectors via high pressure fuel pipes.

The high pressure fuel injector fuel pipes consist of thick walled, seamless steel tubing. The ends of the tubes are formed with conical nipples for sealing in the sealing cones on the common rail and on the injector at port. It is essential that the tubes are maintained and installed correctly for safe and effective engine operation.

Important: If the high pressure fuel pipes are removed for any reason they must be renewed. Installing the original fuel pipes will cause fuel leaks at the pipe connections.

Fuel injection takes place when the solenoid coil is energised by the ECM (Engine Control Module).

Combustion

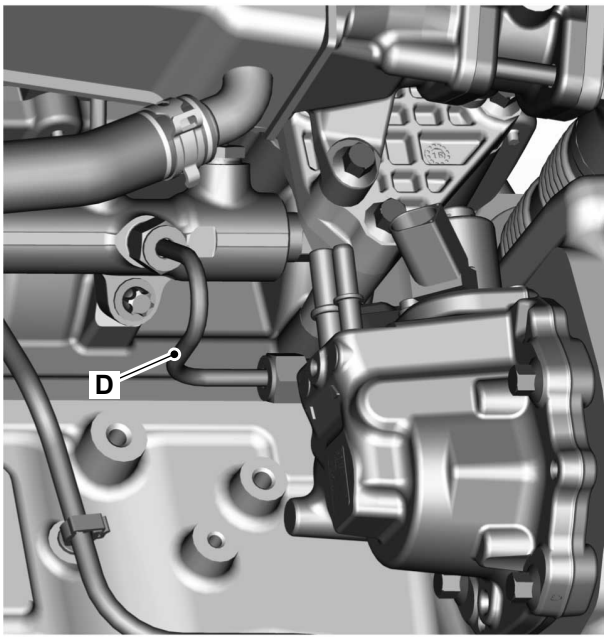
The engine employs a direct injection system. Fuel is injected directly into the cylinder, the mixing taking place in the combustion chamber which is recessed into the crown of the piston.

The process of mixing starts during the induction stroke and continues throughout the compression stroke. The inlet porting and combustion chamber are carefully designed to ensure that when the fuel is injected it is mixed thoroughly with the air.

The multi-point injector and high injection pressure ensure a good distribution of fuel throughout the air which aids mixing. The mixing process continues until combustion is complete.

To further enhance efficient combustion, the ECM initiates several separate injections of fuel during the compression stroke. The timing of the fuel injections is also varied by the ECM depending on engine operating parameters.

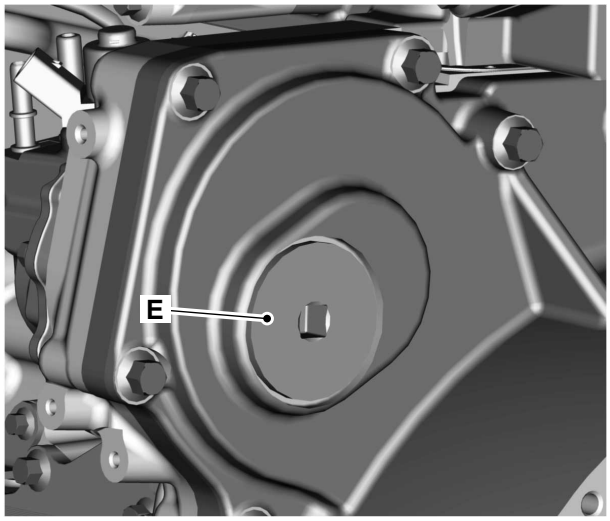
Figure 318.



D High pressure fuel pipe

7. Remove the fuel injection pump gear cover.

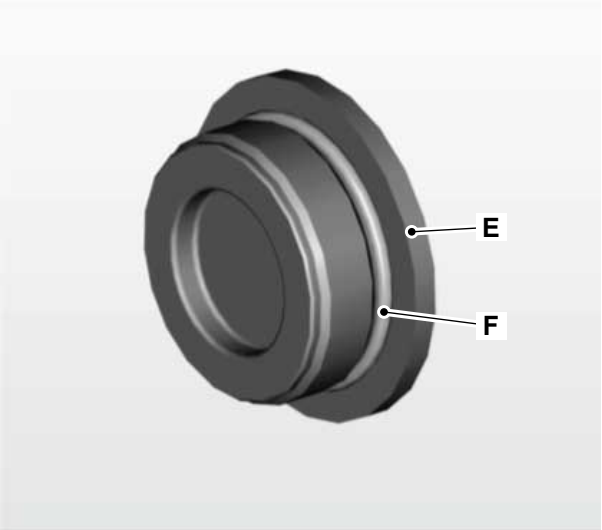
Figure 319.



E Fuel injection pump gear cover

8. Remove the O-ring from the fuel injection pump gear cover. The O-ring MUST NOT be reused. Discard the O-ring.

Figure 320.



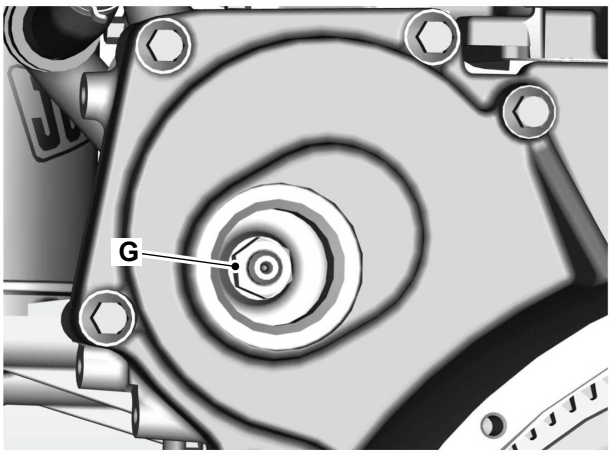
E Fuel injection pump gear cover
F O-ring

9. Insert the fuel injection pump nut catcher special tool.

   Special Tool: FIP Gear Nut Catcher (430 Engine) (Qty.: 1)

10. Remove the nut securing the fuel injection pump gear to the drive shaft. Remove the fuel injection pump nut catcher special tool.

Figure 321.



G Fuel injection pump drive gear retaining nut

11. Remove the bolts (x3) securing the fuel injection pump to the engine. When the bolts are removed the pump will be held in place only by the taper between the drive gear and the drive shaft.

    Special Tool: C-Shaped Ring Spanner (Qty.: 1)

Check (Condition)

1. Check that the EGR (Exhaust Gas Recirculation) for excessive carbon build up. Visually inspect for leaks at the EGR. Make sure all gaskets are in good condition, replace as required.

Remove and Install

Remove

This procedure requires service parts. Make sure you have obtained the correct service parts before you start. Refer to the Parts Catalogue.

1. Make the machine safe.

   Refer to: PIL 01-03.

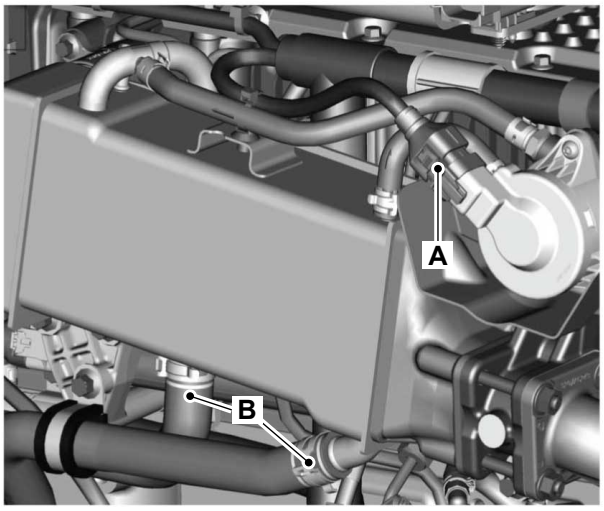
2. Make sure that the engine is safe to work on. If the engine has been running, let it cool before you start the service work.

3. Drain the coolant.

   Refer to: PIL 21-00-00.

4. Disconnect the electrical connector from the EGR (Exhaust Gas Recirculation) actuator.

Figure 332.



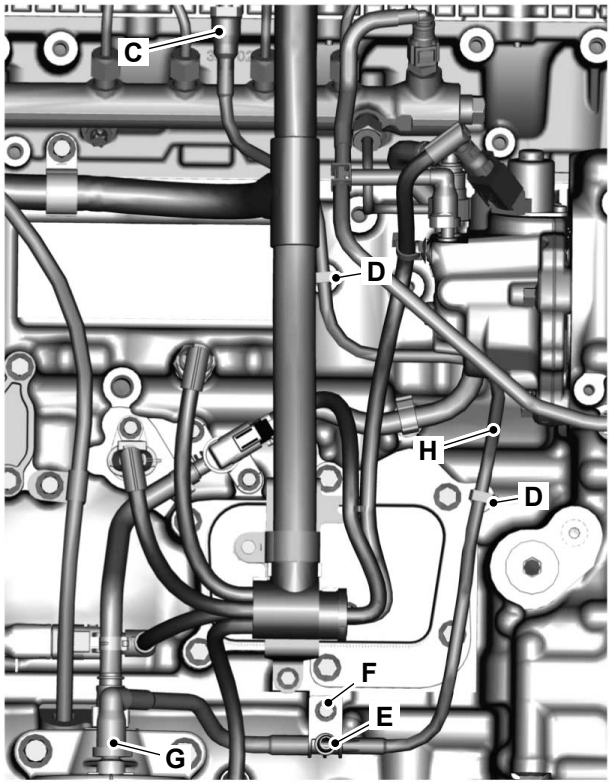
A Electrical connector
B Coolant hoses

5. Disconnect the coolant hoses.

6. Remove the bolts 1 (x2) that secure the exhaust gas intake pipe to the cylinder head.

2. Disconnect the fuel supply connector.
3. Remove the retaining clips securing the pipe to the engine.

Figure 352.



C Injector leak-off pipe connector
D Retaining clips (x2)
E 3 way connector
F Bolt 1
G Fuel filter connector
H Fuel pipe

4. Remove the bolt 1 securing the three way connector to the engine.
5. Disconnect injector leak off pipes.
6. Disconnect the fuel pipe from the fuel filter.
7. Remove the fuel pipe.

Install

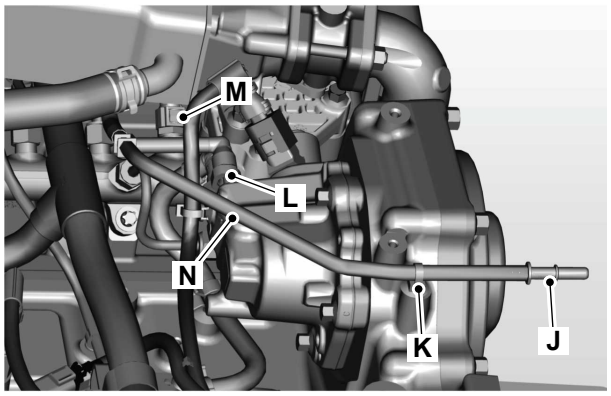
1. The installation procedure is the opposite of the removal procedure. Additionally do the following step.
2. Tighten the bolt 1 to the correct torque value.

Return To Tank Fuel Pipe

Remove

1. Disconnect the return to tank pipe from the machine.

Figure 353.



J Return to tank pipe machine connector
K Retaining clip
L Fuel injection pump connector
M Fuel rail connector
N Fuel pipe

2. Remove the retaining clip.
3. Disconnect the fuel injection pump connector.
4. Disconnect the fuel rail connector.
5. Remove the fuel pipe.

Install

1. The installation procedure is the opposite of the removal procedure.

Fuel Filter To Fuel Injection Pump Pipe

Remove

1. Make sure that the engine is fully clean. The fuel filter to fuel injection pump pipe is on the 'clean' side of the fuel filter. Any contamination will go directly into the high pressure fuel system.

   Refer to: PIL 18-00-00.

2. Disconnect the electrical connector from the fuel temperature sensor.

05 - Fan Motor

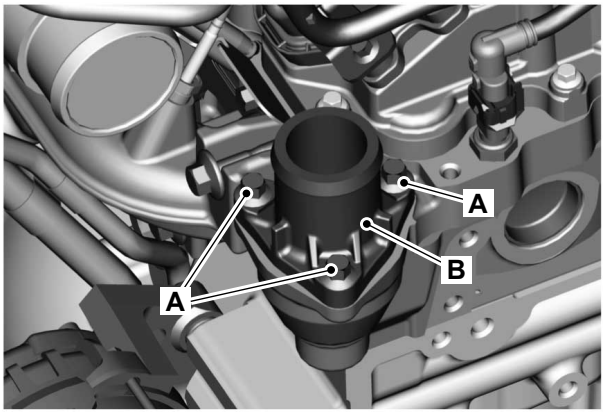
Contents **Page No.**

Remove and Install

Remove

1. Make the machine safe.
   Refer to: PIL 01-03.
2. Make sure that the engine is safe to work on. If the engine has been running, let it cool before you start the service work.
3. Drain the coolant.
   Refer to: PIL 21-00-00.
4. Disconnect the hose from the thermostat housing.
5. Remove the bolts (x3).

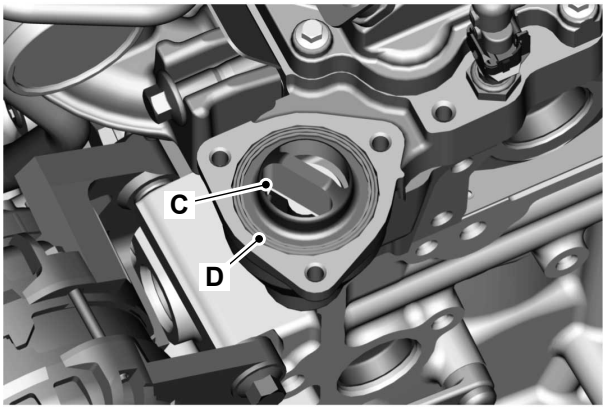
Figure 367.



A Bolts (x3)
B Thermostat housing

6. Remove the thermostat housing.
7. Remove the thermostat.

Figure 368.



C Thermostat
D Seal

8. Remove the seal. The seal must not be reused, discard the seal.

Install

1. The installation procedure is the opposite of the removal procedure. Additionally do the following step.
2. Replace the seal.
3. Tighten the bolts to the correct torque value.
4. When you fill the cooling system, make sure that you use the correct water/antifreeze mixture. A 50% mixture should be maintained even if frost protection is not required.
   Refer to: PIL 75-09-03.

Table 161. Torque Values

Item	Nm
A	24 ± 2

00 - General

Introduction

The service brake is used to stop the machine when it is in motion.

The service brake is a hydraulic system. The machine operator applies pressure to the brake pedal in the cab.

The pedal is connected to the master cylinder which supplies hydraulic pressure to the applicable brake units to apply the brakes.

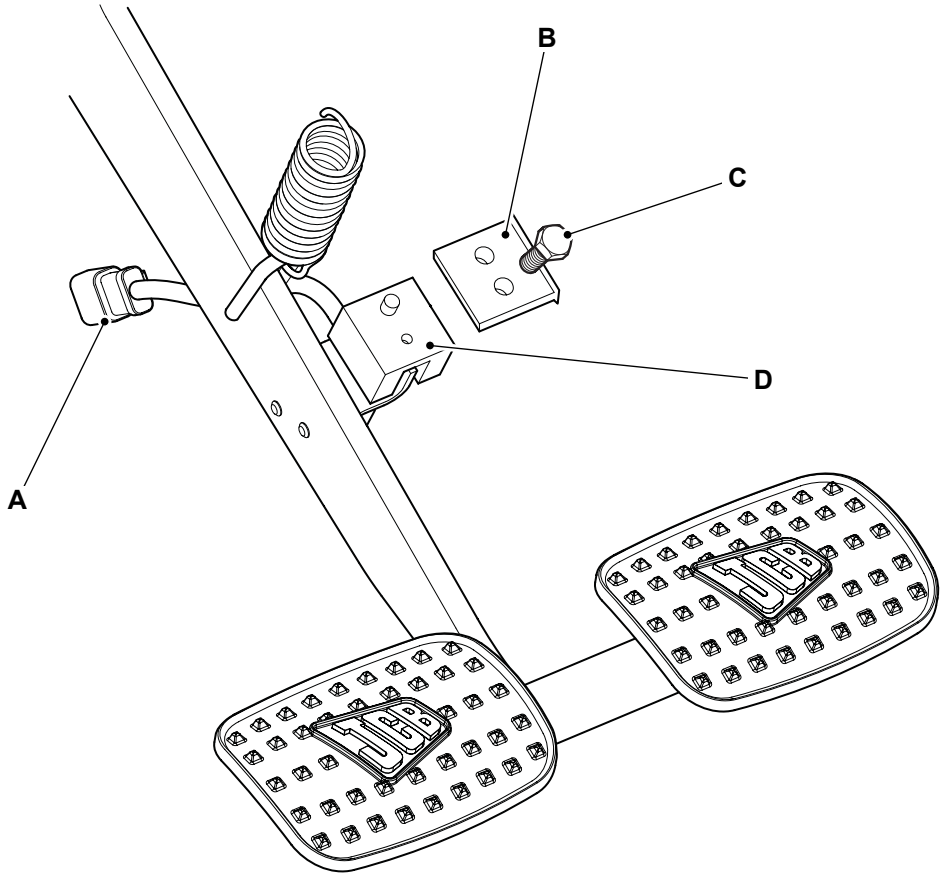
The brake packs are located in the axle- some machines have front and rear brakes whilst some machines only have front axle brakes.

Remove and Install

Remove

1. Make the machine safe. Refer to (PIL 01-03).
2. Follow the general health and safety procedures. Refer to (PIL 01-03).
3. Press the brake pedal.
4. Disconnect the electrical connector from the panel harness.
5. Hold the switch and remove the screw.
6. Remove the switch from the bracket.

Figure 395.



A Electrical connector
B Bracket
C Screw
D Switch

Install

Installation is the opposite of the removal procedure but additionally do the below steps.

1. Locate the caliper on the brake disc.
2. Install new mounting bolts with hardened washers.
3. Tighten the mounting bolts to the correct torque value.
4. Attach the cable to the mounting bracket and secure in place with the clip.
5. Install the clevis joint and the pin into the relevant hole in the operating lever.
6. Make sure there is enough space for the movement of the operating lever, to make sure that positive brake application, and that the lever returns to the rest position when the park brake is released.
7. Adjust the park brake cable. Do not remove the he clevis to adjust the cable.

Table 188. Torque Values

Item	Description	Nm
B	Mounting bolts	255

Check (Pressure)

Special Tools

Description	Part No.	Qty.
Pressure Gauge (0-400 Bar)	892/00279	1
Pressure Gauge (0-70 Bar)	892/00346	1

The steer circuit pressure is integrated with operation of the hydraulic pump and the main hydraulic system pressures. Refer to (PIL 30-00-00)

Gear pump machines

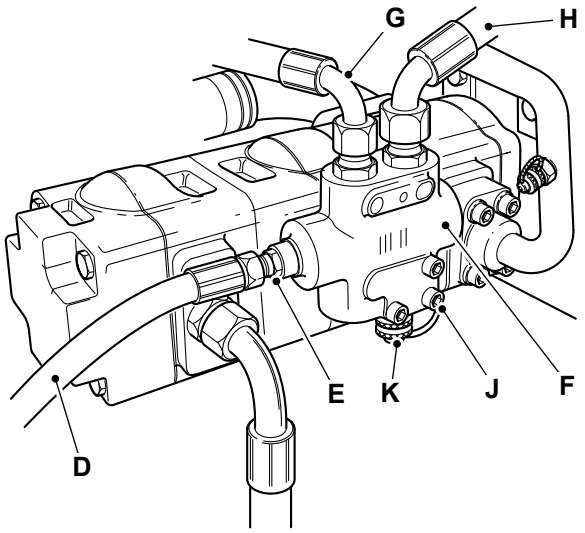
Hydraulic pressure tests

Standby pressure

1. Make the machine safe. Refer to (PIL 01-03).
2. Turn the steering wheel to the left and to the right several times to discharge the system pressure.
3. Disconnect hose 1 and install a pressure test gauge into the valve port.

   Special Tool: Pressure Gauge (0-70 Bar) (Qty.: 1)
4. Put the open end of hose 1 into a clean container in order to collect any oil drainage.

Figure 418.



D Hose 2
E LS (Load Sense) port adaptor
F Priority valve
G Hose 1
H Hose 3
J Socket head screws
K Test point

5. Disconnect hose 2 from load sensing port adaptor and put a plug on the hose opening. Do not cap the LS port adaptor.
6. Set the steering to neutral (do not turn the steering wheel), and start the engine. Gradually increase the engine speed to 1000 RPM (Revolutions Per Minute) and check the maximum pressure gauge reading, it should be within the specified limit.

   Pressure: 5.9–8.7bar (85.5–126.1psi)

   6.1. If the pressure is more than the specified limit then clean the priority valve. Refer to (PIL 25-03).

   6.2. If after cleaning the valve the pressure is more than the specified limit then check the steering pump section flow rate and pressure.

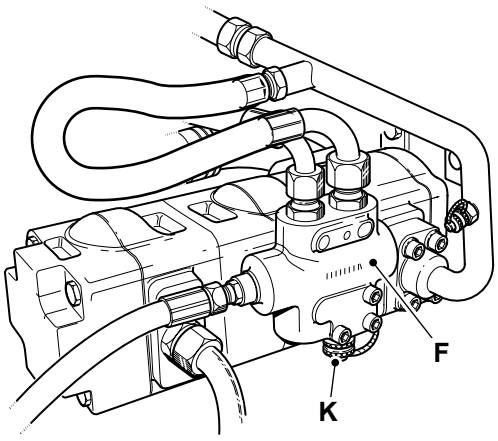
   6.3. If the hydraulic pump flow and pressure tests are satisfactory, then the priority valve must be replaced with a new one. Refer to (PIL 25-03).

Steering pressure

1. Make the machine safe. Refer to (PIL 01-03).
2. Turn the steering wheel to the left and to the right several times to discharge the system pressure.
3. Connect a pressure gauge to the test point located on the priority valve.

   Special Tool: Pressure Gauge (0-400 Bar) (Qty.: 1)

Figure 419.



F Priority valve
K Test point

4. Run the engine at 1500 RPM and turn the steering wheel to full lock.
5. Hold the wheel on full lock and check the gauge reading. This should be equal to the relief valve operating pressure. Refer to (PIL 25-00).
6. If necessary, remove the plug on the hydraulic steer unit and adjust the pressure setting.

00 - General

Introduction

Refer to gear pump, (PIL 30-11-00).

Notes:

C Point3

3.1. Unscrew the ball joint until you can fit an open ended spanner on the rod at point3. Turn the ball joint towards the spanner to secure it and to prevent damage to the rod.

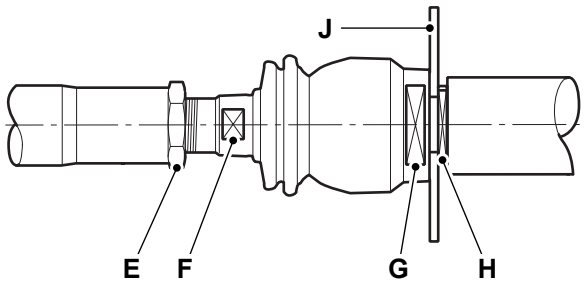
3.2. The piston rod operates at full length. Any damage to the surface will cause fluid leaks. Make sure you do not damage it or attempt to grip the rod diameter with pipe grips etc.

3.3. Hold the spanner at point3 and remove the ball joint at point4 by moving it against the spanner at point3.

4. Remove the target disc where applicable.

5. If you replace the inner or outer ball joints, make sure you install a replacement link arm assembly.

Figure 470.



E Lock nut
F Threaded adjuster
G Spanner flat on ball joint
H Spanner flat on the rod
J Target disc

D Point4

Install

If the you have to dismantle the power track rod ram, carry out the procedure before you remove and install the link arms. Refer to (PIL 30-15).

1. The installation procedure is the opposite of the removal procedure.

2. When you install, also do the following steps:

2.1. Install the target disc (where applicable).

2.2. Apply threadlocker and sealer on the first three threads of the inner ball joint where it screws into the end of the track rod.

Consumable: JCB Threadlocker and Sealer (Medium Strength)

2.3. If the link arms have been renewed, make sure you check the wheel alignment.

2.4. Bring the wheels to straight ahead position.

2.5. Measure the distance1 and distance2 between the outer edges of the wheel hub as shown.

2.6. Make sure that the difference between the distance1 and the distance2 is of the specified value for correct alignment.

Length/Dimension/Distance: 1mm

2.7. To adjust the wheel alignment, remove the lock nuts. Turn the threaded adjusters equally to get the correct alignment. Tighten the lock nuts.

2.8. Check the target disc and proximity switch setting (where applicable). Refer to steering system- track rod, refer to (PIL 25-18).

Operation

Operation Overview

The Powershift gearbox is an electro-hydraulic transmission unit. Input from the engine is by means of a torque converter. Gear shifting and direction selection are controlled by engaging and disengaging multi-disc clutch packs.

Electric solenoid valves divert pressurised oil (provided by the gearbox oil pump) to the selected clutch packs.

Drive direction and gear ratio are selected by means of electrical control switches (typically a steering column mounted lever and swivel switch). Inputs from control devices are connected to various ECU (Electronic Control Unit)s. The ECUs energise the applicable electrical devices depending on the machine status. The ECUs are connected to the machine CAN (Controller Area Network)bus which enables integrated control of all the main machine systems.

For ECU details refer to (PIL 33-45).

Start up

Electrical interlocks prevent the engine being started, unless the transmission is set to neutral.

Drive Direction Control

A column switch controls the drive direction, forward, neutral or reverse. Inputs from the switch are connected to the transmission ECU via the CANbus which in turn energise the applicable gearbox control solenoids.

Joystick Direction Controls

Drive direction can also be controlled with the joystick F / N / R (Forward / Neutral / Reverse) direction control switch. Inputs from the switch are connected to the transmission ECU via the joystick powerbase ECU and the CANbus. There is a logic control for drive direction selection. Selection of Forward or Reverse with the column switch disables the joystick direction control switch. Both the joystick and column switch must first be set to Neutral before the joystick direction control switch is enabled.

Manual Gear Controls

A rotating barrel switch controls selection of the gear ratios (1,2,3 or 4). Inputs from the switch are connected to the transmission ECU via the CANbus which in turn energise the applicable gearbox control solenoids.

Joystick Gear Controls

Gear ratio selection can be controlled with the joystick ratio up (plus) and down (minus) buttons. Inputs from the buttons are connected to the transmission ECU via the machine control ECU and the CANbus.

A gearbox mounted ground speed sensor detects the ground speed of the machine. Signals from the sensor are connected to the transmission ECU via the machine control ECU and the CANbus. The ECU responds by preventing ratio selection if the machine ground speed is not within pre-set values.

When the ratio up (plus) button is pressed the transmission ECU selects the next (higher) gear ratio. When the ratio down (minus) button is pressed the transmission ECU selects the next (lower) gear ratio

Park brake on

When the park brake is ON the park brake switch state changes. Inputs from the switch are connected to the transmission ECU via the machine control ECU and the CANbus. The ECU selects Neutral even if Forward or Reverse is selected. An audible warning sounds.

Transmission dump

The input from the transmission `dump' switch on the joystick is connected to the transmission ECU. When the switch is pressed the ECU selects Neutral even if Forward or Reverse is selected.

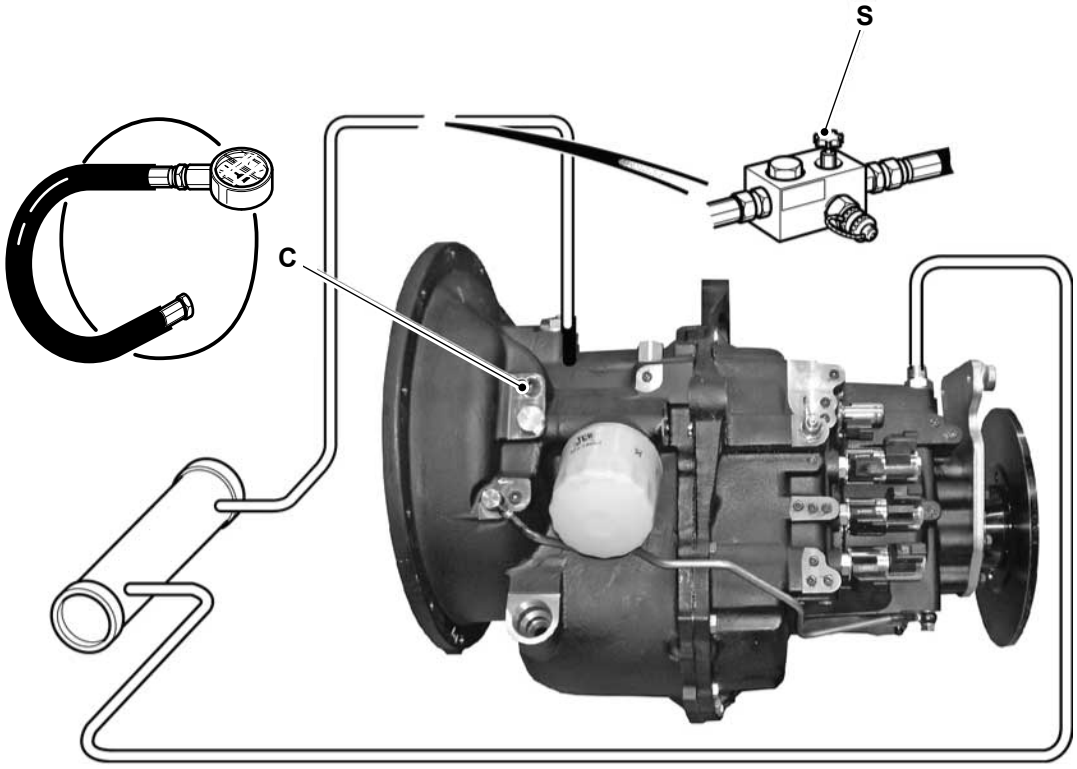
2/4 Wheel drive select

A cab mounted switch controls 2 or 4 wheel drive selection. Inputs from the switch are connected to the machine control ECU which in turn energises the applicable gearbox control solenoid. The transmission automatically selects 4 wheel drive when the service brakes are applied.

Transmission Oil Pressure and Temperature

Oil pressure and temperature sensors are connected to the machine instrumentation which displays the pressure and temperature status. Warning displays and fault codes are activated if the oil pressure or temperature is not within pre-set values.

Figure 493. Converter in, converter relief valve pressure tests



C Converter inlet and converter relief valve pressure test point

S Load valve

Disassemble and Assemble

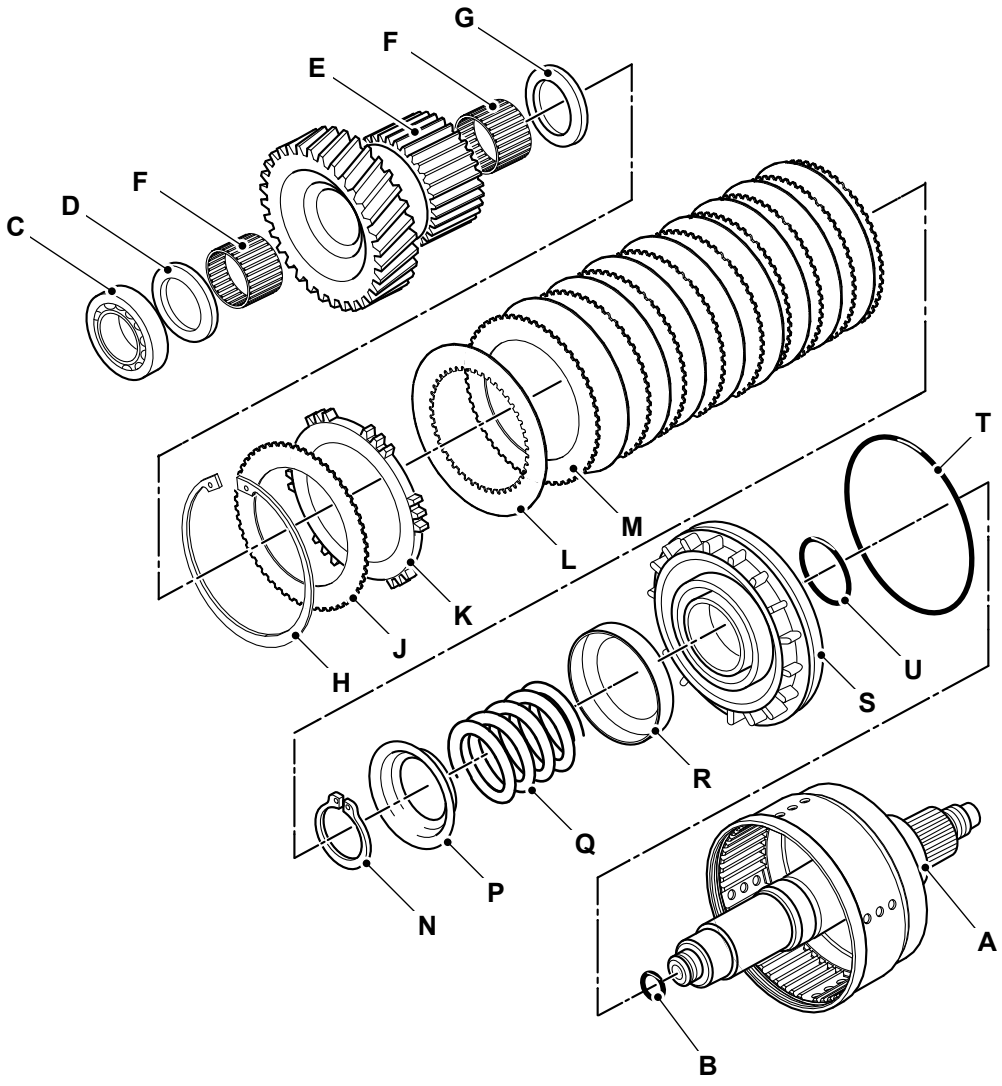
(For: PS750 MK4, Pressure ON)

Special Tools

Description	Part No.	Qty.
Hand Pump Pressure Test	892/00223	1

Disassemble

Figure 505.



Disassemble and Assemble

Special Tools

Description	Part No.	Qty.
Hand Pump Pressure Test	892/00223	1

27 - Speed Sensor

Introduction

The sensor sends a varying frequency signal to the Transmission ECU to determine the current rotational speed of the input shaft or torque converter. The ECU uses the input shaft speed to determine the slippage across the torque converter and potentially to determine the rate of slippage across the clutches. This information is vital to regulate the application of the torque converter lock-up clutch smoothly and effectively.

54 - Main Shaft

Introduction

The main shaft receives its power from the engine and transmits the power to other components in the gearbox.

Refer to Driveline, Semi-Automatic Gearbox, Output Shaft, Introduction (PIL 27-06-58).

Remove and Install

Special Tools

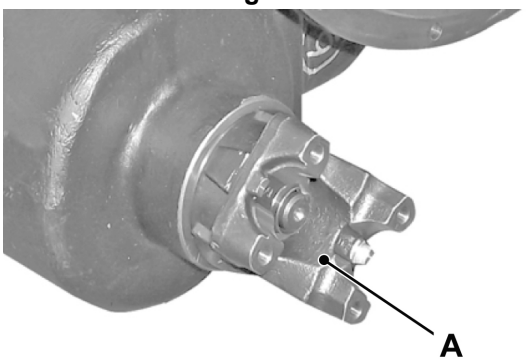
Description	Part No.	Qty.
Drive Coupling Spanner	892/00812	1

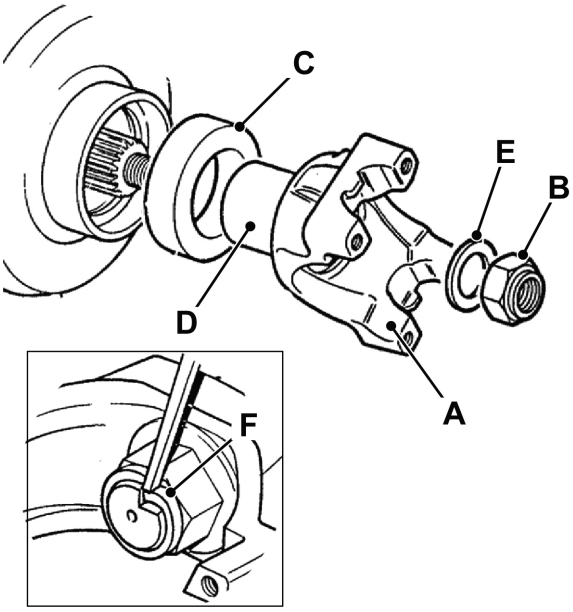
Remove

1. Bend back the stake nut locking ring.
2. Clean the area around the yoke. Do not allow particles of grit to fall into the gearbox.
3. Use service tool 892/00812 to hold the yoke and at the same time undo the nut. The nut is very tight, the help of an assistant will be required. Discard the nut.

   Special Tool: Drive Coupling Spanner (Qty.: 1)
4. Remove the yoke and the washer.
5. If necessary remove the oil seal. Do not damage the seal housing.

Figure 576.



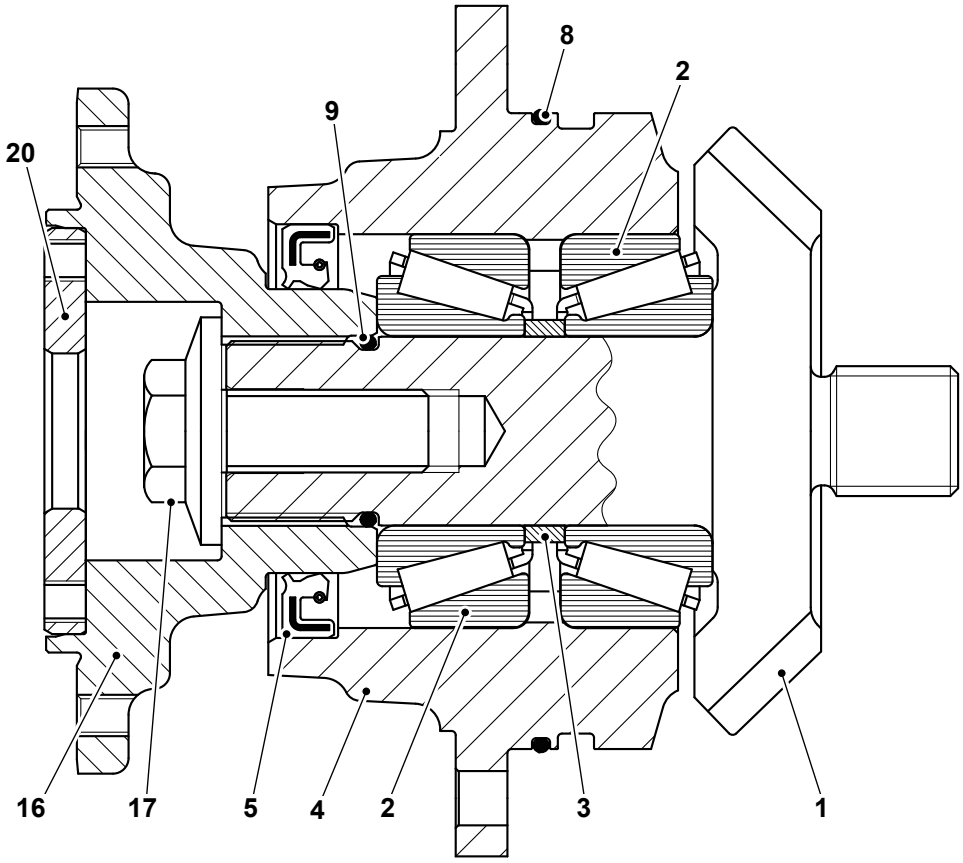


A Yoke
B Stake nut
C Oil seal
D Oil seal interface
E Washer
F Locking ring

Install

1. Make sure that the oil seal interface on the yoke is clean and free from wear or damage.
2. If necessary install a new oil seal. Locate the seal in the position shown, the seal does not locate to the back of the housing.
3. Lubricate the lips of the oil seal.
4. Install the yoke.
5. Install the stepped washer the correct way around with the plan face facing the stake nut as shown.

Figure 596. Bevel Gear Assembly (Bolt)



1 Bevel gear
2 Bearing
3 Spacer
4 Carrier- bearing
5 Triple lip seal
8 O-ring 1
9 O-ring 2
16 Drive flange
17 Setscrew
20 Adaptor

1. Remove the bevel gear assembly (nut). Refer to Figure 597.

   1.1. Use a reaction block to hold the gear assembly in a vice.

   Special Tool: Reaction Block Fixture (Qty.: 1)

   1.2. Remove the stake nut.

   1.3. Remove the pinion gear from the bearing carrier.

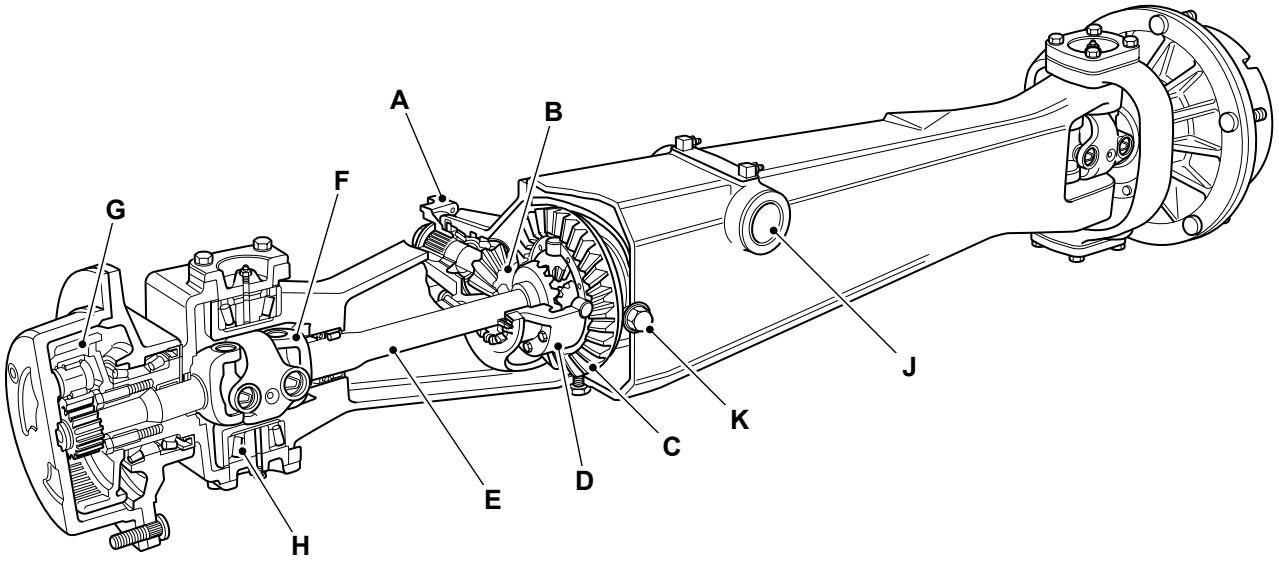
   1.4. Remove the triple lip seal 3 and the O-ring 5.

   1.5. Remove the O-ring 6.

   1.6. Remove the bearing 6 and spacer 5.

   1.7. Put a suitable drift through the two holes in the pinion gear and then remove the bearing 6 from the gear.

Figure 609.



A Yoke connection to propshaft (axle input)
B Pinion
C Crownwheel
D Differential unit
E Driveshaft
F Universal coupling
G Reduction gear hub
H Steer swivel trunnion bearings
J Axle pivot
K Oil filler / level plug

00 - General

Introduction

The axle drivehead transmits drive from the input coupling yoke to the driveshafts through the differential unit.

09 - Pinion Gear

Introduction

A pinion gear is a small gear that meshes with a larger crownwheel. They are mainly used in vehicles to maintain a forward movement.

29 - Wheel

Contents **Page No.**

Notes:

Clean

Special Tools

Description	Part No.	Qty.
Hydraulic Flushing Rig	892/01255	1

Cleaning Operation

The purpose of cleaning oil is to remove contaminants of all types and sludge by filtering hydraulic fluid through a cleaning unit. Follow the instructions in the Hydraulic flushing rig instruction manual.

Procedure

1. Connect the Hydraulic flushing rig in place of the hydraulic filter.

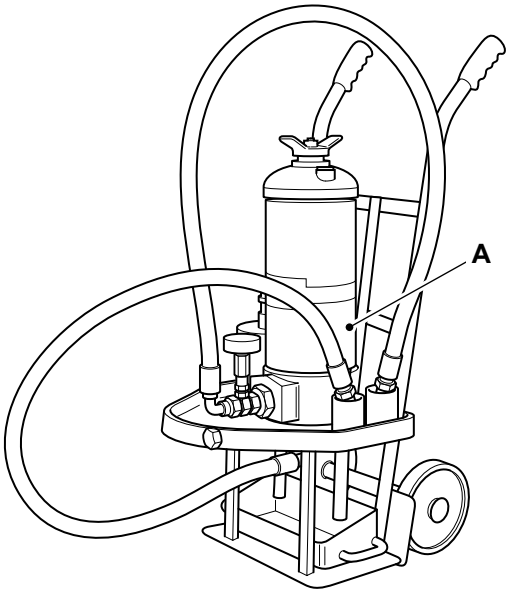
   Special Tool: Hydraulic Flushing Rig (Qty.: 1)

2. Run the system for sufficient time to pump all the hydraulic fluid through the unit.

3. Disconnect the cleaning unit and reconnect the filter.

4. Top up the system with clean hydraulic fluid as required.

Figure 693.



A Hydraulic flushing rig

Contaminant Standards

Dirt that damages your system is in many cases too small to be seen with the eye. The particle size is measured in microns (1 micron = 0.001 mm (0.0000394 in).

Listed below are a few typical comparisons:

- Red Blood Cell = 8 microns (0.008 mm, 0.000315 in)
- Human Hair = 70 microns (0.07 mm, 0.00275 in)
- Grain of Salt = 100 microns (0.1 mm, 0.00394 in)

The smallest particle visible to the naked eye is 40 microns (0.00157) approximately. Standards will often be quoted to ISO (International Standards Organisation) for which literature can be obtained.

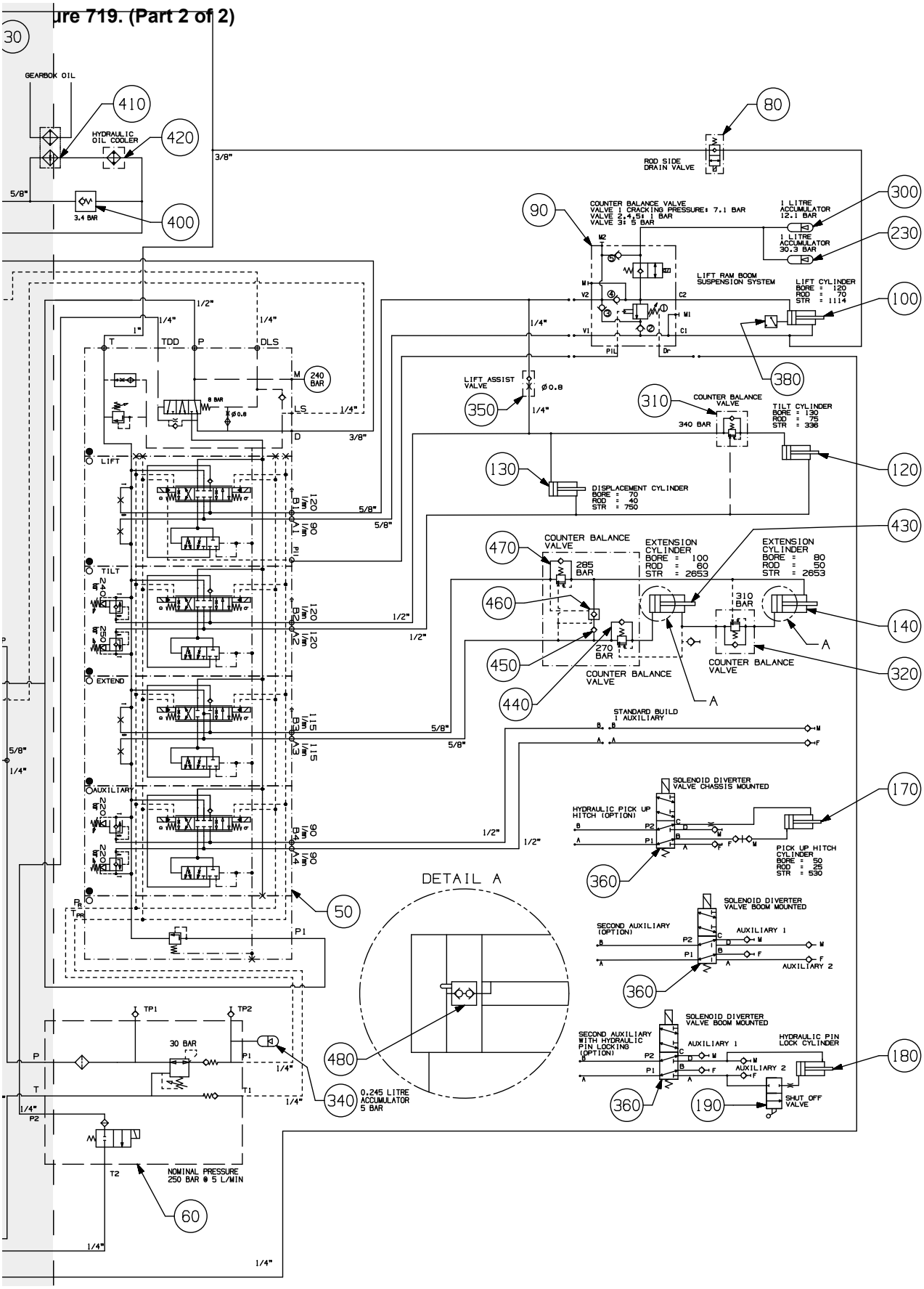
Notes:

Item	Description	Notes
51	Accumulator	SRS
52	Accumulator	SRS
53	Accumulator	Trailer brake
55	Steering control valve	Orbitrol
56	Steer mode valve	Manual
57	Steer mode valve	Auto / electrical
58	Bi-directional check valve	AG tyre option
65	Vented counterbalance valve	Extend outer
66	Cartridge	Extend outer
67	Make up valve	Extend
68	Check valve	

Table 360. LSP Electro Servo (S2) 333/G4105-11 (535-95)

Item	Description	Notes
A	Lift spool	
B	Tilt spool	
C	Extend spool	
D	Auxiliary spool	
E	Quick release couplings	
F	Make up valve detail view	
10	Variable displacement pump	
20	Variable displacement pump - power control	
30	Make-up valve	Inner extend
40	Cartridge	Outer extend
50	Hydraulic control valve	
60	Servo system control valve	Pilot feed
70	Trailer brake valve	Trailer brake
80	Poppet valve - 2 port	SRS rod side drain
90	Accumulator	Trailer brake
100	Lift cylinder SRS	SRS Lift
110	Lift cylinder	Non SRS Lift
120	Tilt cylinder	Tilt
130	Displacement cylinder	Displacement
140	Inner extend cylinder	
150	Outer extend cylinder	
160	Steering power track rod	
170	Hitch cylinder	Hydraulic hitch
180	Hydraulic pin locking cylinder	Carriage
190	Ball valve	Hydraulic pin lock
200	Check valve	
210	Suction filter element	In tank
220	Return filter	In tank
230	Accumulator	Pilot valve
240	Vented Counterbalance Valve	Outer extend
250	Hydraulic oil cooler	
260	Hydraulic oil cooler -t4	
270	Pilot piston	Sway
280	Check valve - low leak	Sway
290	Sway cylinder	Sway
300	Counterbalance valve - non SRS	Lift
310	Counterbalance cartridge	Tilt
320	Counterbalance cartridge	Inner extend
330	Counterbalance cartridge	Outer extend
340	Counterbalance valve - SRS	
350	Adaptor	Lift assist
360	6-way solenoid change over valve	Auxiliary
370	Pressurised hydraulic filler / breather	Tank
380	Pressure transducer	SRS
390	Cartridge	Outer extend
400	Variable fan motor 11cc	81–93kW

ure 719. (Part 2 of 2)



Flow- Main services pump[1]	71.3L/min
Flow- Steering pump	37.6L/min
Flow- Cooling fan pump	31.7L/min
Maximum pressure- port EF	265 (3,840.6)
Maximum pressure- port P	200 (2,898.5)
Maximum speed	2500 RPM
Minimum speed	500 RPM
Weight	34.1kg

(1) At 2200 RPM and system pressure (90% min displacement).

(For: 531-70 [5AA], 535-95 [5AB], 541-70 [5AD])

Depending on the specification of your machine, the following pumps may be installed:

Two section double pump (1)

Table 373.

Type	Double gear pump
Mounting	Gearbox
Direction of rotation	Anti-clockwise
Maximum speed	3000 RPM
Minimum speed	500 RPM
Weight	22.7kg

Table 374.

Theoretical displacement	Value
Main services pump (mounting flange end)	36 cc/rev
Cooling fan pump	16 cc/rev

Table 375.

Flow at 2200RPM and system pressure (90% min. displacement)	Value
Main services pump (mounting flange end)	71.3L/min
Cooling fan pump	31.7L/min

Table 376.

Minimum pressure	Value
Port EF	265bar (3,840.6psi)
Port P	200bar (2,898.5psi)

Two section double pump (2)

Table 377.

Type	Gear pump
Mounting	Gearbox
Direction of rotation	Anti-clockwise
Maximum speed	2200RPM
Minimum speed	500RPM
Weight	TBA

Table 378.

Theoretical displacement	Value
Main services pump (mounting flange end)	45 cc/rev
Cooling fan pump	16 cc/rev

Table 379.

Flow at 2200RPM and system pressure (90% min. displacement)	Value
Main services pump (mounting flange end)	TBA
Cooling fan pump	TBA

Table 380.

Minimum pressure	Value
Port EF	260bar (3,768.1psi)
Port P	180bar (2,608.7psi)

Three section triple pump (3)

Table 381.

Type	Triple gear pump
Mounting	Gearbox
Direction of rotation	Anti-clockwise
Maximum speed	2500RPM
Minimum speed	500RPM
Weight	34.1kg

Table 382.

Theoretical displacement	Value
Main services pump (mounting flange end)	36 cc/rev
Steering pump	19 cc/rev
Cooling fan pump	16 cc/rev

Table 383.

Flow at 2200RPM and system pressure (90% min. displacement)	Value
Main services pump (mounting flange end)	71.3L/min
Steering pump	37.6L/min
Cooling fan pump	31.7L/min

Table 384.

Minimum pressure	Value
Port EF	265bar (3,840.6psi)
Port P	200bar (2,898.5psi)

should be kept to a minimum. If leaving for more than one week, apply a light coating of suitable grease or petroleum jelly to the exposed part of the ram piston rod.

2. Use genuine JCB parts when replacing parts.

   2.1. If parts other than genuine JCB parts are used, the desired results may not be obtained. Use only genuine JCB parts.

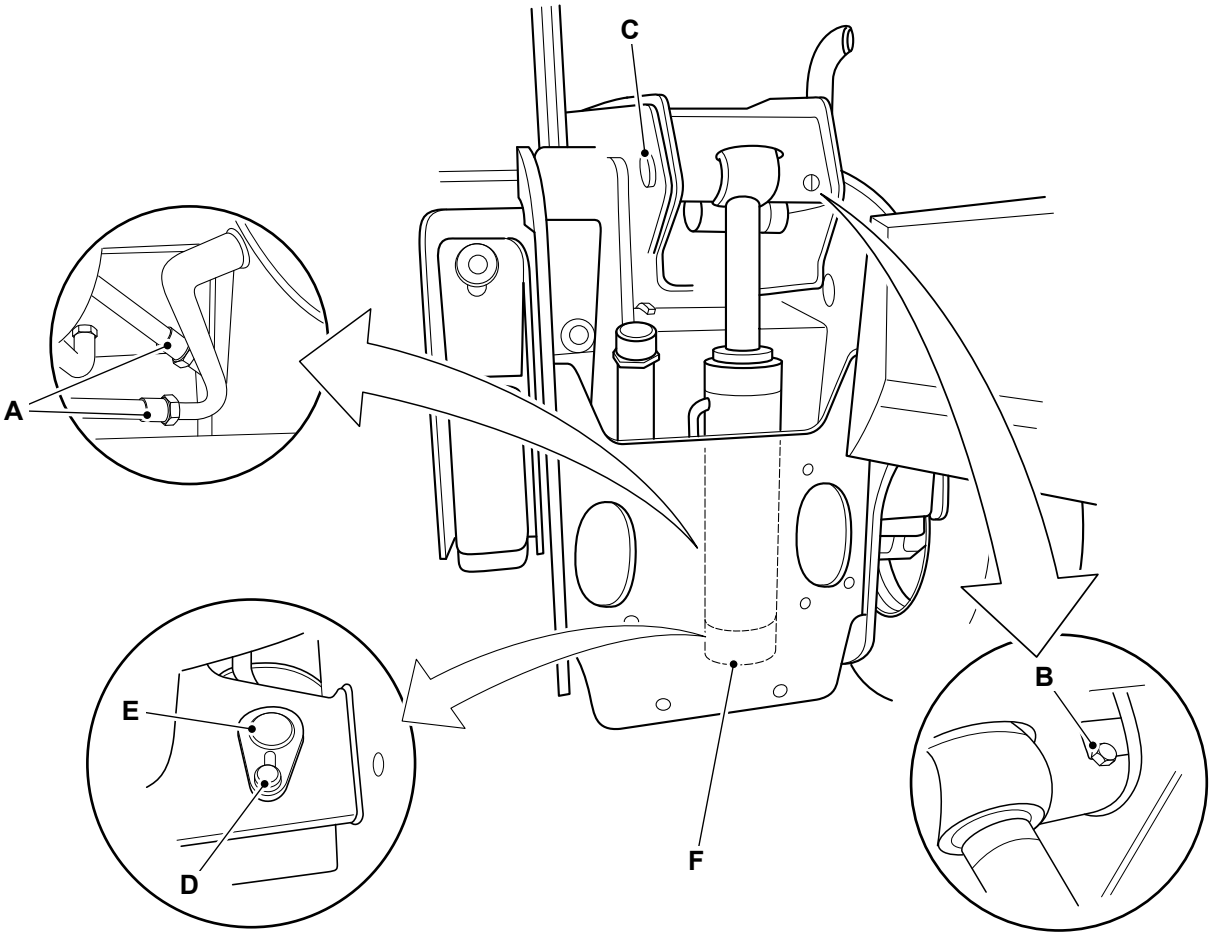
3. Caution during dismantling and reassembly.

   3.1. Dismantling the ram while it is still installed on the machine can be dangerous as unexpected movements of the machine can occur. Remove the ram from the machine and then dismantle.

   3.2. If reassembled with dirty hands, foreign matter can enter the ram causing a shorter life span and also the other hydraulic equipment may be damaged. Reassemble in a clean state.

   3.3. Follow the instructions in the diagrams regarding torque tightening for screwed parts. If the torque is too high or too low, it can cause damage.

Figure 769.



A Hydraulic hoses
B Lock bolt/nut
C Pivot pin 1
D Lock bolt
E Pivot pin 2
F Displacement ram

06 - Smooth Ride System (SRS)

Technical Data

(For: 531-70 [5AA], 541-70 [5AD])

Table 402.

Charging gas	Air free dry nitrogen
Accumulator capacity	1L
Accumulator weight	4.4kg

Table 403. Accumulator charge pressure

Accumulator	**Value**
Accumulator1	10.3bar (149.3psi)
Accumulator2	20bar (289.9psi)

(For: 535-95 [5AB])

Table 404.

Charging gas	Air free dry nitrogen
Accumulator capacity	1L
Accumulator weight	4.4kg

Table 405. Accumulator charge pressure

Accumulator	**Value**
Accumulator1	12.1bar (175.4psi)
Accumulator2	30.3bar (439.1psi)

Spool 3	Boom extend & retract Service	Integral proportional electro servo pilot operated
Spool 4	Auxiliary service	Integral proportional electro servo pilot operated

The maximum auxiliary service flow available is up to 95L/min with 'manual' thumb wheel operation, and up to 65L/min with 'constant' operation selected.

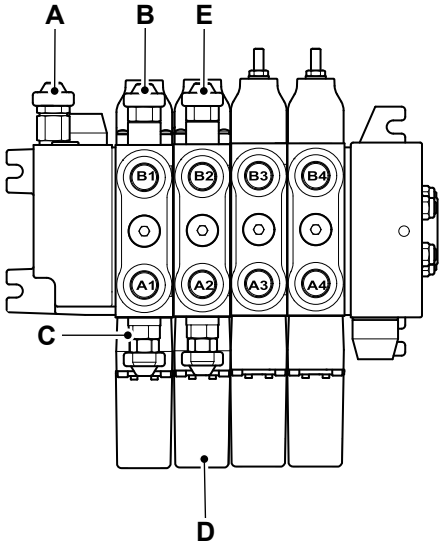
Table 410. Relief valve pressures

Item	Value
LSRV(1)	260bar (3,768.1psi)
ARV (Auxiliary Relief Valve)	-
Auxiliary ram rod side	220bar (3,188.4psi)
Auxiliary ram head side	220bar (3,188.4psi)
Carriage tilt ram rod side	275bar (3,985.5psi)
Carriage tilt ram head side	140bar (2,029.0psi)

(1) Before you check the Load Sense relief valve pressure, allow the hydraulic system to warm up to 50°C (121.9°F) to make sure an accurate reading. Be sure to identify the machine variant correctly.

Load Sense Pressure System (Agri-Extra Machines)

Figure 804. 4 Spool control valve block



A LSRV
B Auxiliary ram rod side
C Auxiliary ram head side
D Carriage tilt ram rod side
E Carriage tilt ram head side

Table 411.

Type	Spool, load sense- pressure compensated, double acting spools	
Spool 1	Auxiliary service	Integral proportional electro servo pilot operated
Spool 2	Carriage tilt service	Integral proportional electro servo pilot operated
Spool 3	Boom extend & retract Service	Integral proportional electro servo pilot operated
Spool 4	Boom lift & lower service	Integral proportional electro servo pilot operated

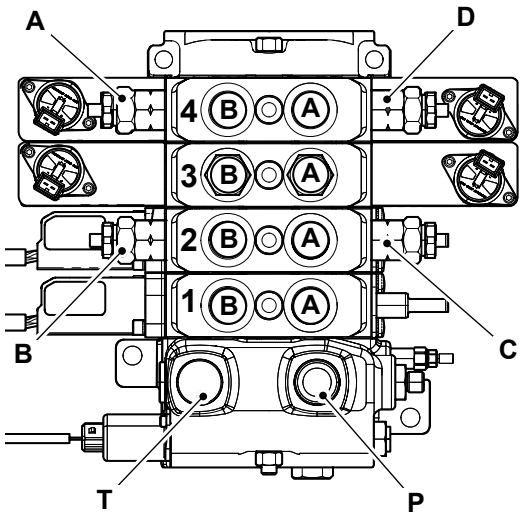
The maximum auxiliary service flow available is up to 95L/min with 'manual' thumb wheel operation, and up to 65L/min with 'constant' operation selected.

Table 412. Relief valve pressures

Item	Value
LSRV(1)	240bar (3,478.2psi)
ARV	-
Auxiliary ram rod side	220bar (3,188.4psi)
Auxiliary ram head side	220bar (3,188.4psi)
Carriage tilt ram rod side	275bar (3,985.5psi)
Carriage tilt ram head side	200bar (2,898.5psi)

(1) Before you check the Load Sense relief valve pressure, allow the hydraulic system to warm up to 50°C (121.9°F) to make sure the reading is accurate. Make sure you identify the machine variant correctly.

Figure 818.



A Auxiliary ram rod side
B Carriage tilt ram rod side
C Carriage tilt ram head side
D Auxiliary ram head side
T Test port
P Pressure port

Table 440.

Pilot pressure range: (machines with single lever controls)	Value
All machines	10–30bar (144.9–434.8psi)

Dual lever control

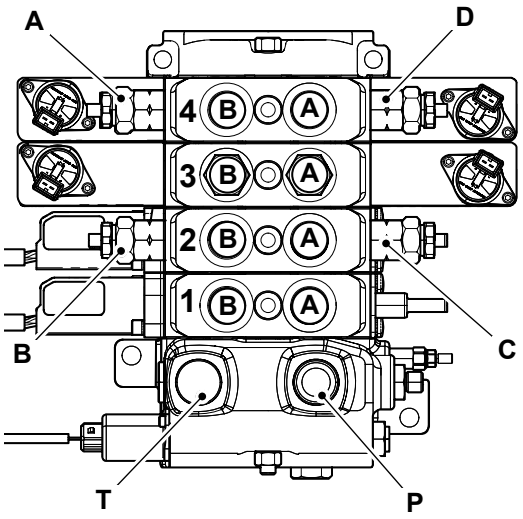
Table 441. 4 Spool, parallel service, double acting spools

Spool 1	Lift arm raise & lower service	Manually operated
Spool 2	Lift arm extend & retract service	Manually operated
Spool 3	Carriage tilt service	Manually operated
Spool 4	Auxiliary service	Manually operated

Table 442. Relief valve pressures

Relief valve	Pressure value
MRV	240bar (3,478.2psi)
ARV	-
Auxiliary ram rod side	220bar (3,188.4psi)
Auxiliary ram head side	220bar (3,188.4psi)
Carriage tilt ram rod side	250bar (3,623.2psi)
Carriage tilt ram head side	240bar (3,478.2psi)

Figure 819.



A Auxiliary ram rod side
B Carriage tilt ram rod side
C Carriage tilt ram head side
D Auxiliary ram head side
T Test port
P Pressure port

(For: 541-70 [5AD])

Single lever control

Depending on the specification of your machine, alternative valves may be installed. Refer to (PIL 30-53-00).

Table 443. 4 Spool, parallel service, double acting spools

Spool 1	Lift arm raise & lower service	Manually operated
Spool 2	Carriage tilt service	Manually operated
Spool 3	Lift arm extend & retract service	Solenoid, servo pilot operated
Spool 4	Auxiliary service	Solenoid, servo pilot operated

Table 444. Relief valve pressures

Relief valve	Pressure value
MRV	260bar (3,768.1psi)
ARV	-
Auxiliary ram rod side	220bar (3,188.4psi)
Auxiliary ram head side	220bar (3,188.4psi)
Carriage tilt ram rod side	276bar (4,000.0psi)
Carriage tilt ram head side	138bar (2,000.0psi)

60 - Directional Control Valve

Contents **Page No.**

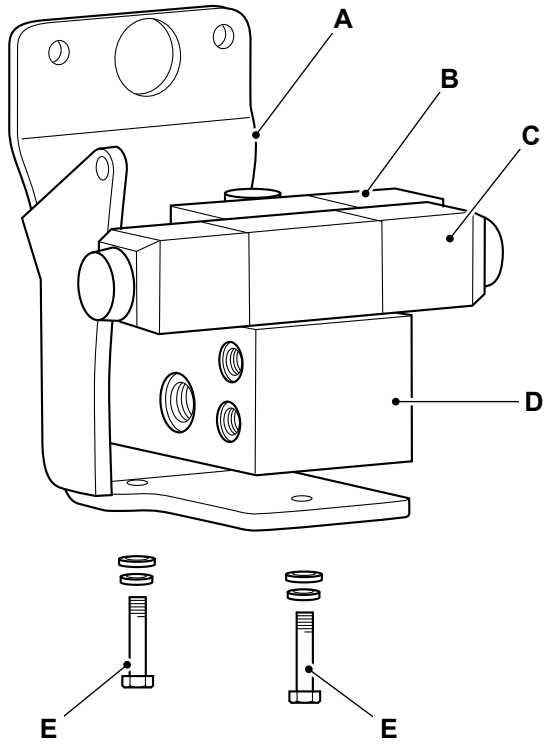
Remove and Install

⚠ **WARNING** A raised and badly supported machine can fall on you. Position the machine on a firm, level surface before raising one end. Ensure the other end is securely chocked. Do not rely solely on the machine hydraulics or jacks to support the machine when working under it. Disconnect the battery, to prevent the machine being started while you are beneath it.

Remove

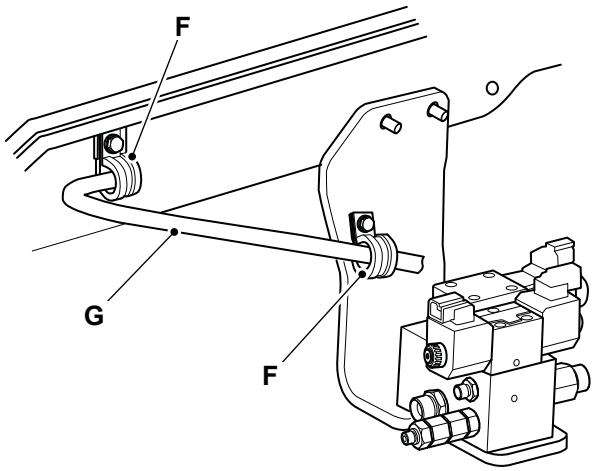
1. Make the machine safe with the lift arm raised. Refer to (PIL 01-03).
2. Install the safety strut. Refer to (PIL 06-69).
3. Follow the general health and safety procedures. Refer to (PIL 01-03).
4. Put labels on the hydraulic hoses to help installation.
5. Disconnect the hydraulic hoses.
6. Plug all the open ports and hoses to prevent contamination.
7. Disconnect the electrical connector from the stabiliser sway/fan selector solenoid.
8. Disconnect the electrical connectors from the sway direction control solenoids.
9. Make a note of the route of the harness.
10. Remove the harness retaining clips.
11. Support the sway/fan valve.
12. Release the bolts and remove the sway/fan valve from the bracket.

Figure 857.



A Bracket
B Sway/fan selector solenoid
C Sway direction control solenoids
D Sway/fan valve
E Bolts

Figure 858. Typical Sway Valve Harness



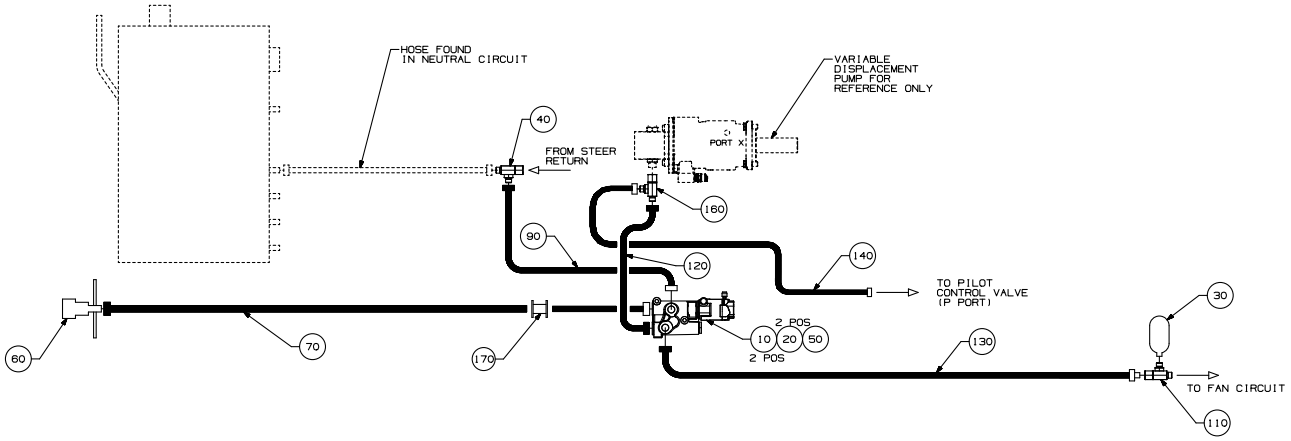
F Harness retaining clips
G Harness

Component Identification

For: 531-70 [5AA], 535-95 [5AB], 541-70 [5AD] ..... Page 30-322
For: 531-70 [5AA], 541-70 [5AD] ..... Page 30-324

(For: 531-70 [5AA], 535-95 [5AB], 541-70 [5AD])

Figure 868. Neutral Circuit Layout

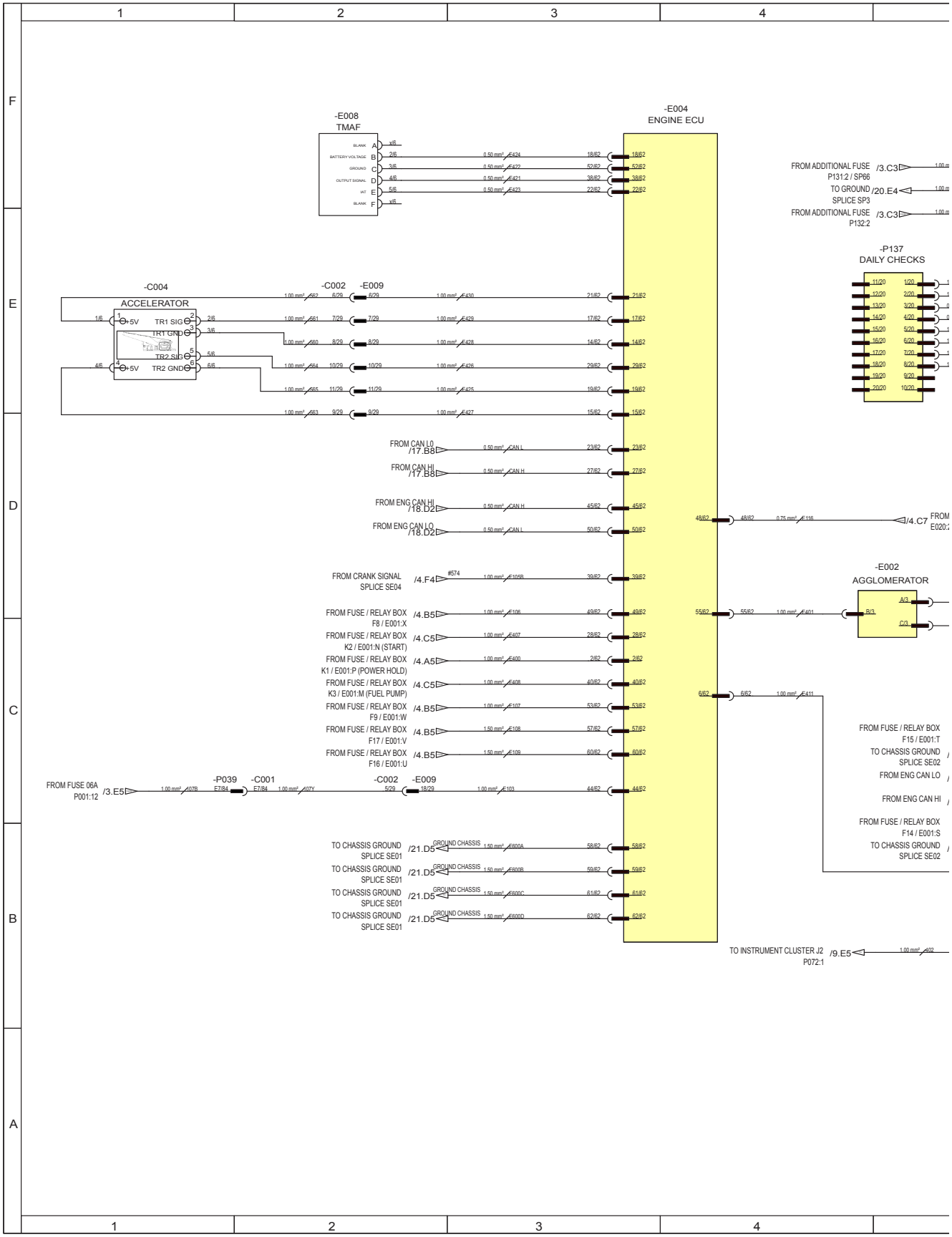


00 - General

Introduction

It is important that the electrical system on the machine is in a sound state of repair.

Make sure that all the health and safety warnings in this section are followed. The machine must be safe with the battery isolated before you attempt to disconnect any electrical connections or work in the engine compartment.


-E008
TMAF
-E004
ENGINE ECU
-C004
ACCELERATOR
-C002
-E009
-P137
DAILY CHECKS
-E002
AGGLOMERATOR
-P039
-C001
FROM ADDITIONAL FUSE P131:2 / SP66
TO GROUND SPLICE SP3
FROM ADDITIONAL FUSE P132:2
FROM CAN LO /17.B8
FROM CAN HI /17.B8
FROM ENG CAN HI /18.D2
FROM ENG CAN LO /18.D2
FROM CRANK SIGNAL SPLICE SE04
FROM FUSE / RELAY BOX F8 / E001:X
FROM FUSE / RELAY BOX K2 / E001:N (START)
FROM FUSE / RELAY BOX K1 / E001:P (POWER HOLD)
FROM FUSE / RELAY BOX K3 / E001:M (FUEL PUMP)
FROM FUSE / RELAY BOX F9 / E001:W
FROM FUSE / RELAY BOX F17 / E001:V
FROM FUSE / RELAY BOX F16 / E001:U
FROM FUSE 06A P001:12
TO CHASSIS GROUND SPLICE SE01
FROM FUSE / RELAY BOX F15 / E001:T
TO CHASSIS GROUND SPLICE SE02
FROM ENG CAN LO
FROM ENG CAN HI
FROM FUSE / RELAY BOX F14 / E001:S
TO CHASSIS GROUND SPLICE SE02
TO INSTRUMENT CLUSTER J2 P072:1
Page 33-27

Page 33-50

Figure 893. Directional Indicators
160/B4268 Issue 2- Sheet 11

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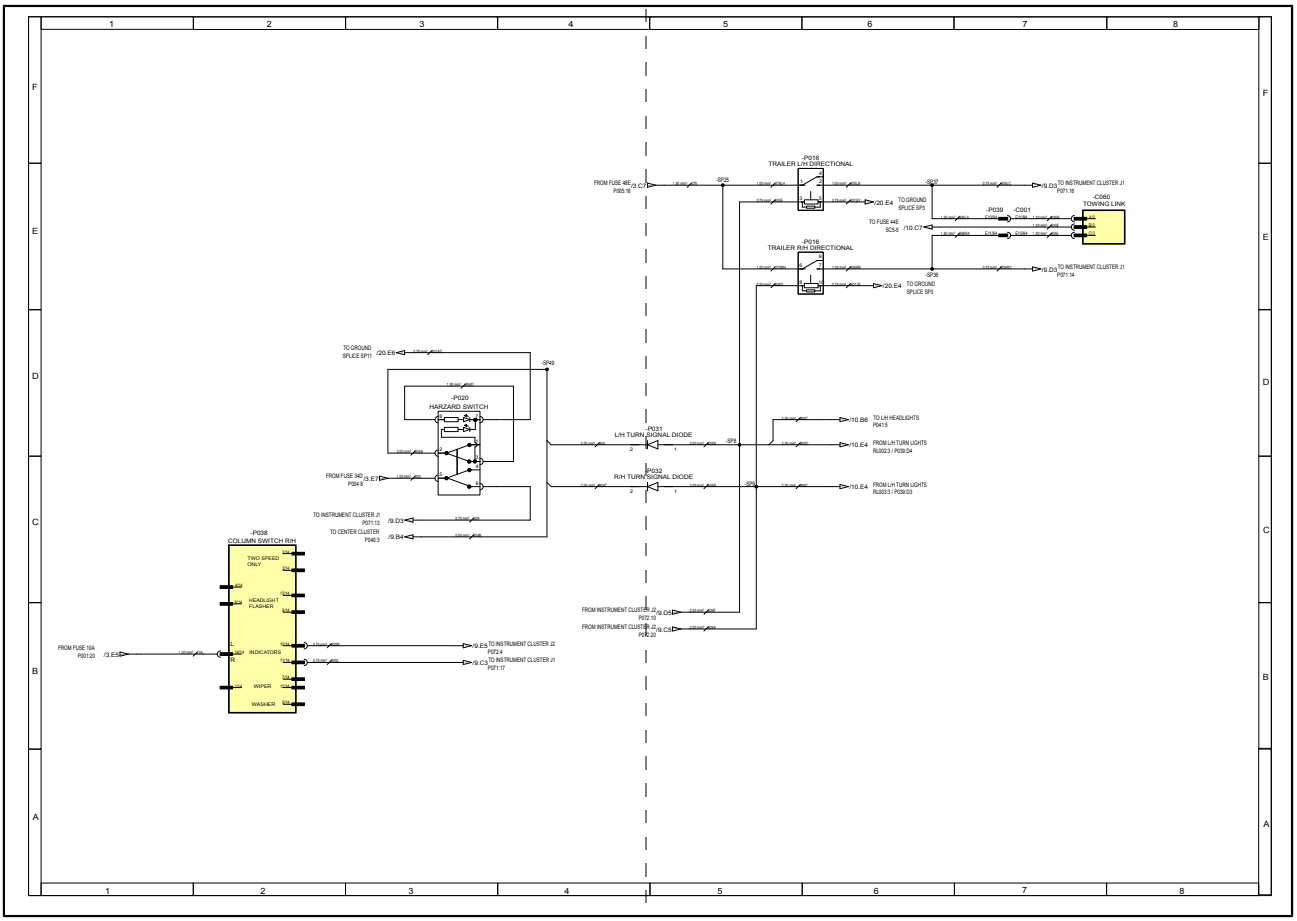
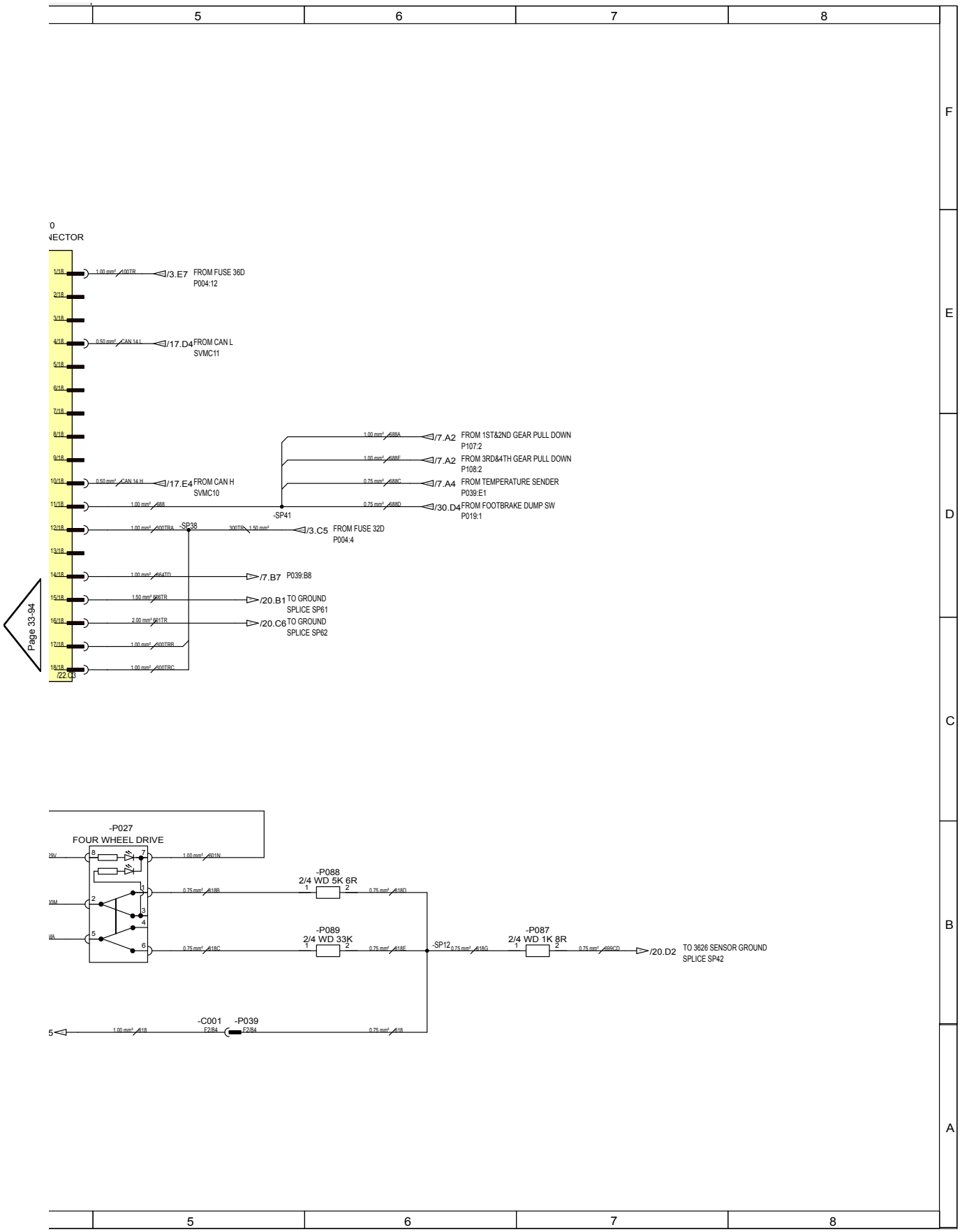
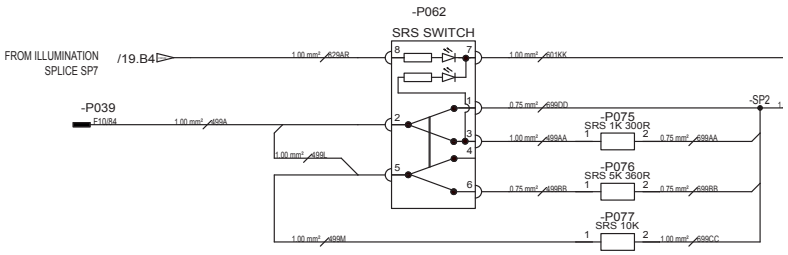



5
6
7
8
F
E
D
C
B
A
0
NECTOR
1/18
2/18
3/18
4/18
5/18
6/18
7/18
8/18
9/18
10/18
11/18
12/18
13/18
14/18
15/18
16/18
17/18
18/18
/22.C3
1.00 mm² 300TR
/3.E7 FROM FUSE 36D
P004:12
0.50 mm² CAN 14 L
/17.D4 FROM CAN L
SVMC11
0.50 mm² CAN 14 H
/17.E4 FROM CAN H
SVMC10
1.00 mm² 688
-SP41
1.00 mm² 688A
/7.A2 FROM 1ST&2ND GEAR PULL DOWN
P107:2
1.00 mm² 688E
/7.A2 FROM 3RD&4TH GEAR PULL DOWN
P108:2
0.75 mm² 688C
/7.A4 FROM TEMPERATURE SENDER
P039:E1
0.75 mm² 688D
/30.D4 FROM FOOTBRAKE DUMP SW
P019:1
1.00 mm² 300TRA
-SP38
300TR 1.50 mm²
/3.C5 FROM FUSE 32D
P004:4
1.00 mm² 664TD
/7.B7 P039:B8
1.50 mm² 666TR
/20.B1 TO GROUND
SPLICE SP61
2.00 mm² 661TR
/20.C6 TO GROUND
SPLICE SP62
1.00 mm² 300TRB
1.00 mm² 300TRC
Page 33-94
-P027
FOUR WHEEL DRIVE
1.00 mm² 601N
-P088
2/4 WD 5K 6R
0.75 mm² 618B
0.75 mm² 618D
-P089
2/4 WD 33K
0.75 mm² 618C
0.75 mm² 618E
-SP12
0.75 mm² 618G
-P087
2/4 WD 1K 8R
0.75 mm² 699CD
/20.D2 TO 3626 SENSOR GROUND
SPLICE SP42
-C001
F2/84
-P039
F2/84
1.00 mm² 618
0.75 mm² 618


-P062
SRS SWITCH
FROM ILLUMINATION SPLICE SP7
/19.B4
1.00 mm² /629AR
1.00 mm² /601KK
-P039
F10/B4
1.00 mm² /699A
0.75 mm² /699DD
-SP2
-P075
SRS 1K 300R
1.00 mm² /699AA
0.75 mm² /699AA
1.00 mm² /699L
-P076
SRS 5K 360R
0.75 mm² /699BB
0.75 mm² /699BB
-P077
SRS 10K
1.00 mm² /699M
1.00 mm² /699CC

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(For: 531-70 [5AA], 535-95 [5AB], 541-70 [5AD])

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Figure 921. (Part 1 of 2)

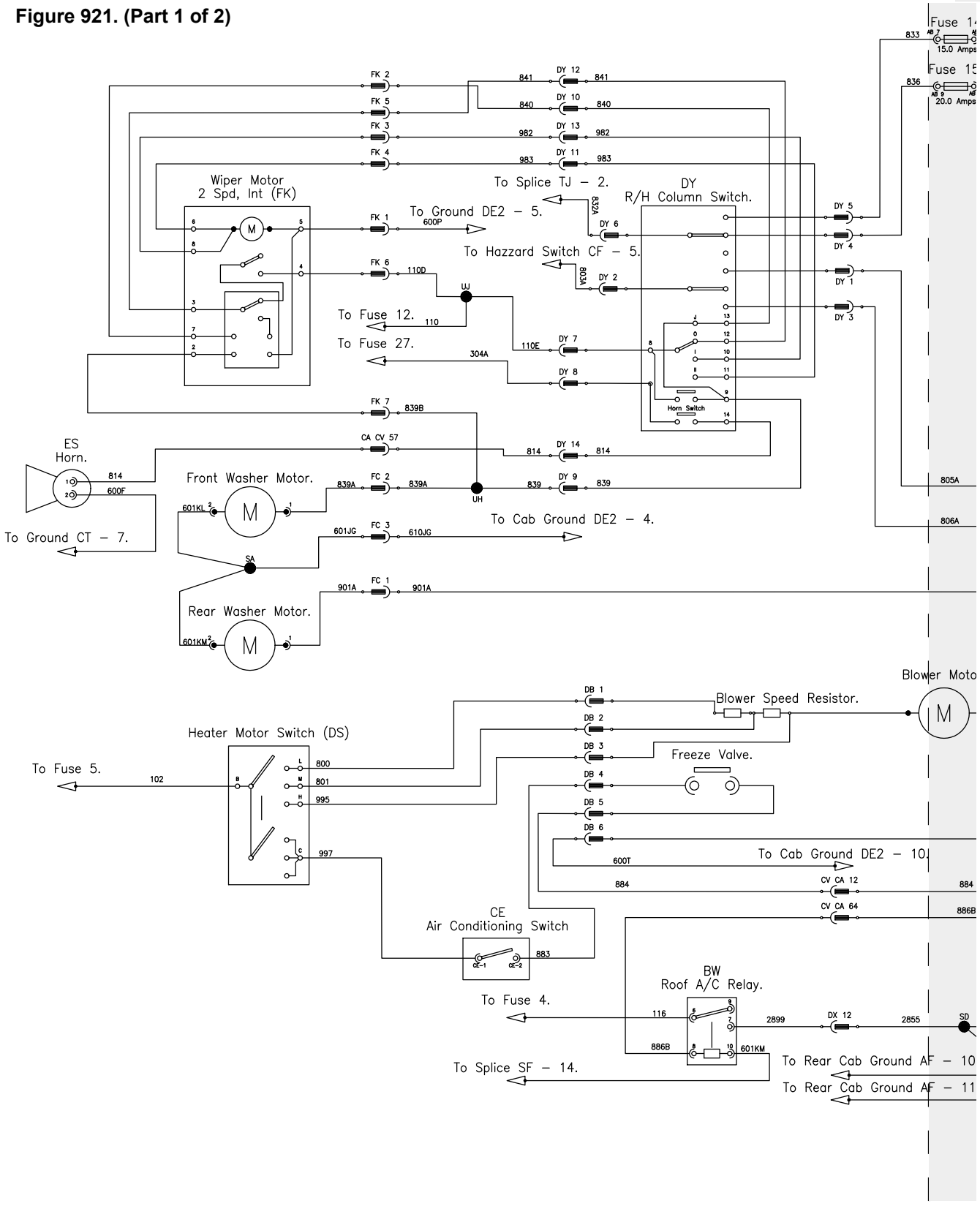

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Figure 927. Inloader Control, Reverse Fan, Hitch Control, LLMI, Sway Control 160/16000 Issue 1 (sheet 12 of 20)

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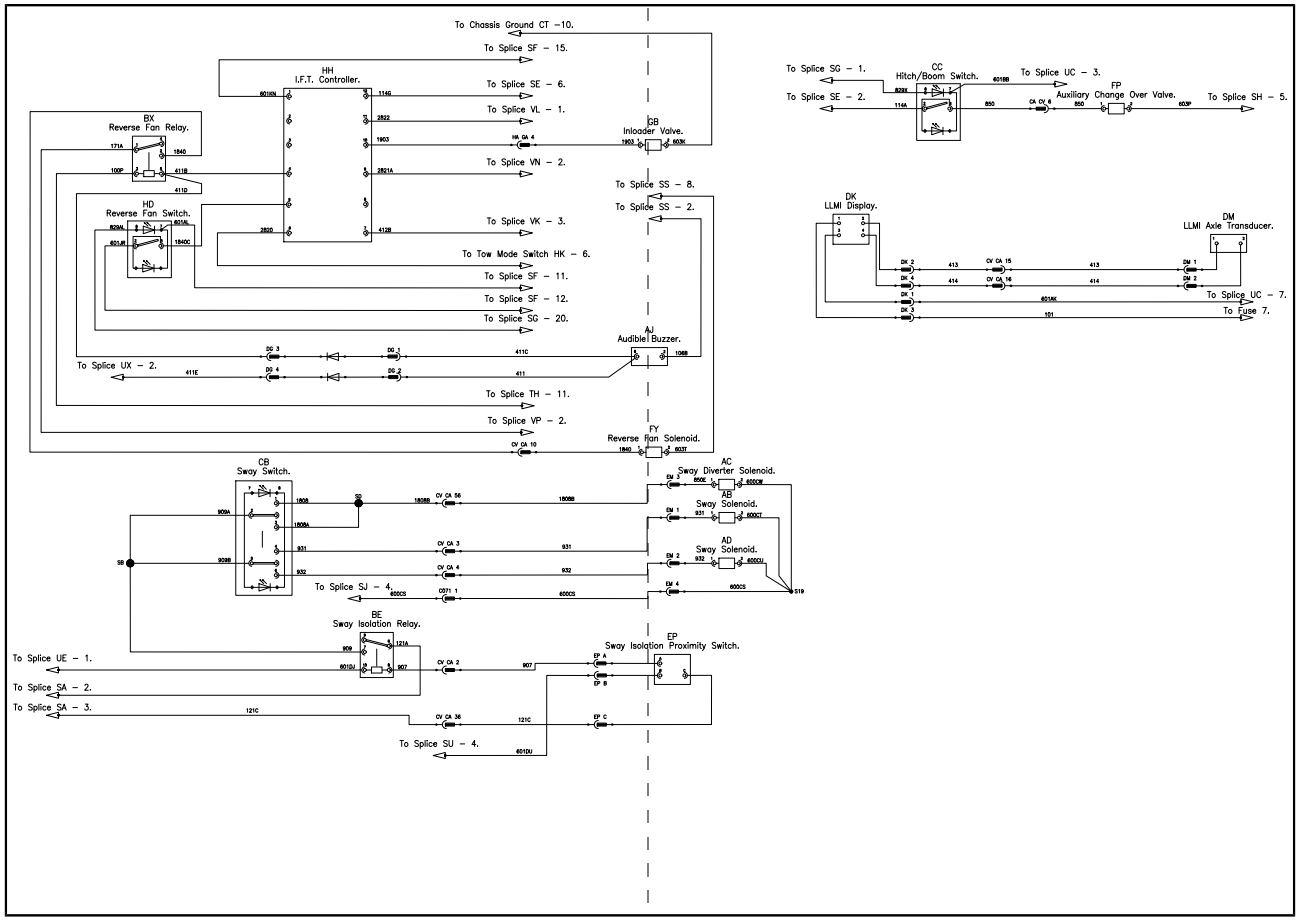

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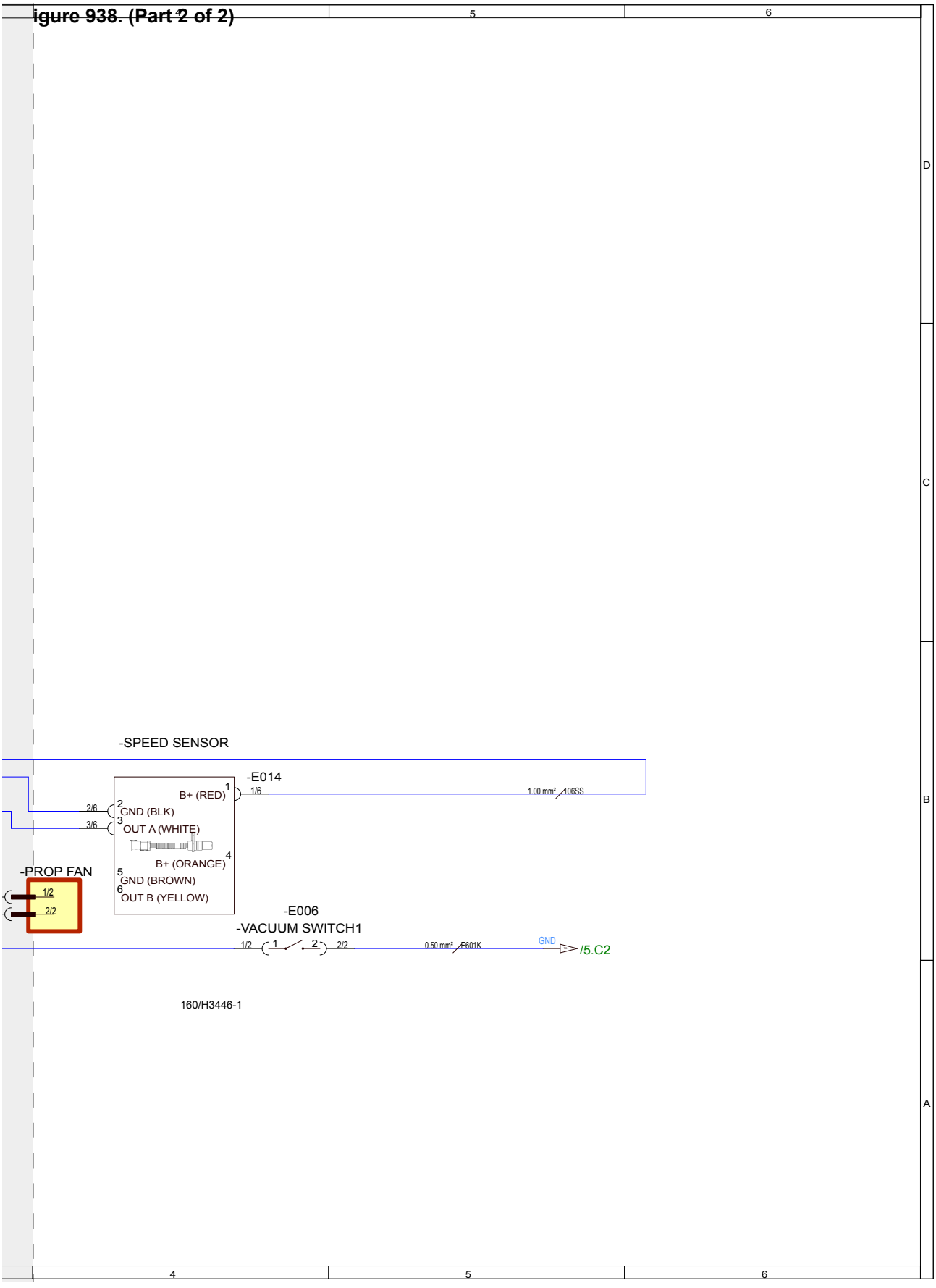
igure 938. (Part 2 of 2)



Remove and Install

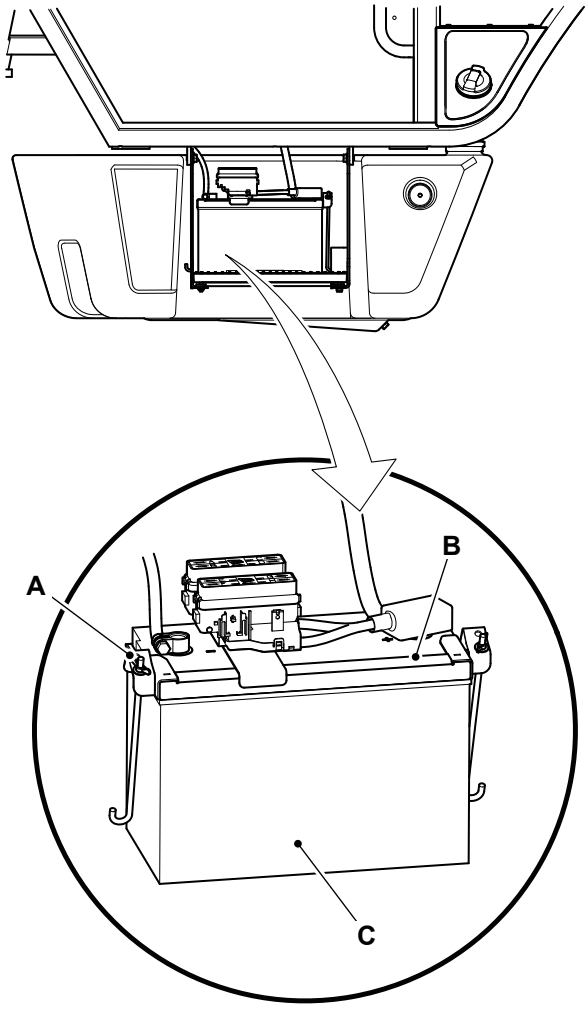
⚠ **CAUTION** This component is heavy. It must only be removed or handled using a suitable lifting method and device.

Your machine will differ from that shown below. The illustration is for information only.

Remove

1. Make the machine safe. Refer to (PIL 01-03).
2. Follow the hydraulic care and safety procedures. Refer to (PIL 33-00).
3. Get access to the battery (or batteries). Refer to (PIL 06-06-03).
4. Disconnect the batteries. Refer to (PIL 33-03).
5. Make sure that all battery connection wires are clear of the top of the batteries.
6. Remove the wing nuts and disconnect the battery clamps.
7. Lift the clamp clear of the batteries. Make sure you do not touch the battery terminals with the clamps.
8. Remove the batteries from the compartment and make sure that you do not use the access cover to support the weight of the battery.

Figure 949.



A Wing nuts
B Clamp
C Battery

Device	Description	Location	Harness connector
8000	Harness interconnections	Refer to electrical system- harness, refer to (PIL 33-12).	
9000	Fuseboxes	Refer to electrical system-fuse and relay, refer to (PIL 33-09).	
-000	Earth Points	Refer to electrical system- harness, refer to (PIL 33-12).	

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Figure 977. Lift Ram Harness 721/C5996- Issue 1 (sheet 1 of 1)

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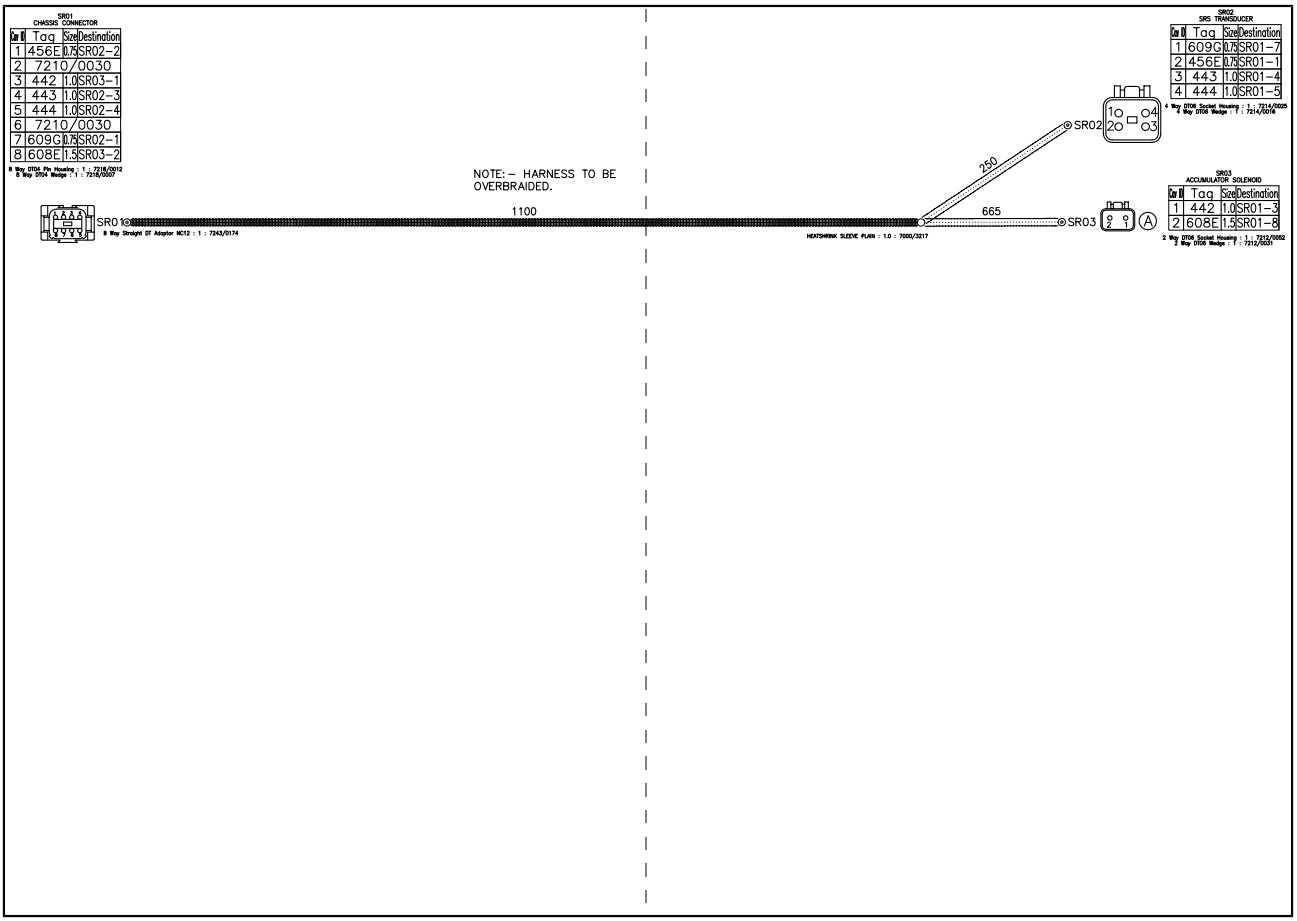

Figure 982. (Part 1 of 2)

-E001

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
A	5512	0.50 mm²	YE	-E005:1	-WIRES	
B						7210/0030
C						7210/0030
D						7210/0030
E	E300	4.00 mm²	YE	-E009:1	-WIRES	
F	5021	0.50 mm²	YE	-E005:2	-WIRES	
G						7210/0030
H	E117	1.50 mm²	YE	-E020:1	-WIRES	
J						7210/0030
K						7210/0030
L	E801	1.50 mm²	YE	-E003:1	-WIRES	
M	E408	0.75 mm²	YE	-E004:D1	-WIRES	
N	E407	1.50 mm²	YE	-E004:Q3	-WIRES	
P	E400	1.50 mm²	YE	-E004:Q4	-WIRES	
R						7210/0030
S						7210/0030
T						7210/0030
U	E109	1.50 mm²	YE	-E004:Q2	-WIRES	
V	E108	1.50 mm²	YE	-E004:Q1	-WIRES	
W						7210/0030
X	E106	0.75 mm²	YE	-E004:D4	-WIRES	

7220/0045 21 Way HDP Free Socket Housing (Plug)
Additional Components

-E002 WIF SENSOR

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
1	E401	0.75 mm²	YE	-E004:H3	-WIRES	
2	E601B	0.50 mm²	YE	-E004:N4	-WIRES	

7212/0179 2W AMPSEAL16 SLD FEM CONN KEY A RED
Additional Components

-E003 FUEL PUMP

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
1	E801	1.50 mm²	YE	-E001:L	-WIRES	
2	E601F	1.50 mm²	YE	-S2:S	-WIRES	

7212/0052 2 Way DT06 Socket Housing
Additional Components
7212/0031;1 # 2 Way DT06 Wedge

-E005 ENGINE INTERFACE

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
1	5512	0.50 mm²	YE	-E001:A	-WIRES	
2	5021	0.50 mm²	YE	-E001:F	-WIRES	
3	CAN 2 H	0.50 mm²	YE	-SDMC01:S	-MC3	
4	CAN 2 L	0.50 mm²	GN	-SDMC02:S	-MC3	
5	200GP1	2.00 mm²	YE	-S5:S	-WIRES	
6	200GP2	2.00 mm²	YE	-S5:S	-WIRES	
7	200GP3	2.00 mm²	YE	-S5:S	-WIRES	
8	200GP4	2.00 mm²	YE	-S5:S	-WIRES	

7218/0050 8 WAY DT06 SOC HSG KEY A BLACK NO END CAP
Additional Components
7218/0009;1 # 8 Way DT06 Wedge

-E006 VACUUM SWITCH

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
1	E441	0.50 mm²	YE	-E009:27	-WIRES	
2	E601K	0.50 mm²	YE	-S2:S	-WIRES	

7212/0010 2 Way Junior Power Timer Housing Short Body
Additional Components

-E007 DIESELMAX BUS

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
A	CAN 2 HI	0.50 mm²	YE	-SDMC01:S	-MC1	
B	CAN 2 LO	0.50 mm²	GN	-SDMC02:S	-MC1	
C						7210/0030

7213/0015 3 WAY DT06 SOC HSG NO END CAP
Additional Components
7213/0016;1 # 3 Way DT06 Wedge

-E010 VEHICLE CAN

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
A	CAN H	0.50 mm²	YE	-SPMC01:S	-PMC01	
B	CAN L	0.50 mm²	GN	-SPMC02:S	-PMC01	
C	SCR	0.75 mm²	YE	-SCREEN 2:S	-WIRES	

7213/0015 3 WAY DT06 SOC HSG NO END CAP
Additional Components
7213/0016;1 # 3 Way DT06 Wedge

-E004 ECU CONNECTOR

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
A1						7210/0208
B1						7210/0208
C1						7210/0208
D1	E408	0.75 mm²	YE	-E001:M	-WIRES	
E1						7210/0208
F1						7210/0208
G1						7210/0208
H1						7210/0208
J1	E616	0.75 mm²	YE	-E020:2	-WIRES	
K1						7210/0208
L1						7210/0208
M1						7210/0208
N1						7210/0208
O1						7210/0208
P1	E600B	1.50 mm²	YE	-S1:S	-WIRES	
Q1	E108	1.50 mm²	YE	-E001:V	-WIRES	
A2	CAN H	0.75 mm²	YE	-SPMC04:S	-WIRES	
B2	CAN L	0.75 mm²	YE	-SDMC04:S	-WIRES	
C2						7210/0208
D2	E425	0.75 mm²	YE	-E009:11	-WIRES	
E2	E426	0.75 mm²	YE	-E009:10	-WIRES	
F2	E427	0.75 mm²	YE	-E009:9	-WIRES	
G2						7210/0208
H2						7210/0208
J2						7210/0208
K2						7210/0208
L2						7210/0208
M2						7210/0208
N2						7210/0208
O2						7210/0208
P2	E600A	1.50 mm²	YE	-S1:S	-WIRES	
Q2	E109	1.50 mm²	YE	-E001:U	-WIRES	
A3	CAN L	0.75 mm²	YE	-SPMC05:S	-WIRES	
B3	CAN H	0.75 mm²	YE	-SDMC05:S	-WIRES	
C3						7210/0208
D3						7210/0208
E3						7210/0208
F3						7210/0208
G3						7210/0208
H3	E401	0.75 mm²	YE	-E002:1	-WIRES	
J3						7210/0208
K3						7210/0208
L3						7210/0208
M3						7210/0208
N3						7210/0208
O3	E842B	0.75 mm²	YE	-S4:S	-WIRES	
P3	E600C	1.50 mm²	YE	-S1:S	-WIRES	
Q3	E407	1.50 mm²	YE	-E001:N	-WIRES	
A4						7210/0208
B4						7210/0208
C4						7210/0208
D4	E106	0.75 mm²	YE	-E001:X	-WIRES	
E4						7210/0208
F4						7210/0208
G4						7210/0208
H4						7210/0208
J4						7210/0208
K4	E428	0.50 mm²	YE	-E009:8	-WIRES	
L4	E429	0.50 mm²	YE	-E009:7	-WIRES	
M4	E430	0.50 mm²	YE	-E009:6	-WIRES	
N4	E601B	0.50 mm²	YE	-E002:2	-WIRES	
O4						7210/0208
P4	E103	1.50 mm²	YE	-E009:5	-WIRES	
Q4	E400	1.50 mm²	YE	-E001:P	-WIRES	

7219/0298 64 way CMC fem conn assy blk code 1
Additional Components

-E011 OIL TEMP SENSOR

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
1	100TT	1.00 mm²	YE	-E009:28	-WIRES	
2	600TT	1.00 mm²	YE	-E009:29	-WIRES	

7212/0052 2 Way DT06 Socket Housing
Additional Components
7212/0031;1 # 2 Way DT06 Wedge

-E012 REVERSE FAN

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
1	1840	1.00 mm²	YE	-E009:19	-WIRES	
2	603T	1.00 mm²	YE	-E009:20	-WIRES	

7212/0052 2 Way DT06 Socket Housing
Additional Components
7212/0031;1 # 2 Way DT06 Wedge
332/E0988;1 # Deutsch DT04 2 Way Blanking Cap

-E013 PROPORTIONAL FAN

ID	Tag	Size	Colour	Destination	Cable	Cavity Seal
1	592	1.00 mm²	YE	-E009:21	-WIRES	
2	615	1.00 mm²	YE	-E009:22	-WIRES	

7212/0052 2 Way DT06 Socket Housing
Additional Components
7212/0031;1 # 2 Way DT06 Wedge
332/E0988;1 # Deutsch DT04 2 Way Blanking Cap

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V1.1 30/06/2016

Item	Description
AG	Beacon
AH	Right hand work light
AJ	Roof wiper
AK-1	Interior light +ve
AK-2	Interior light -ve
AL	Park brake
AM	Seat pressure
RC18	Basket E-stop

SLC harness

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Figure 993. (Part 1 of 2)

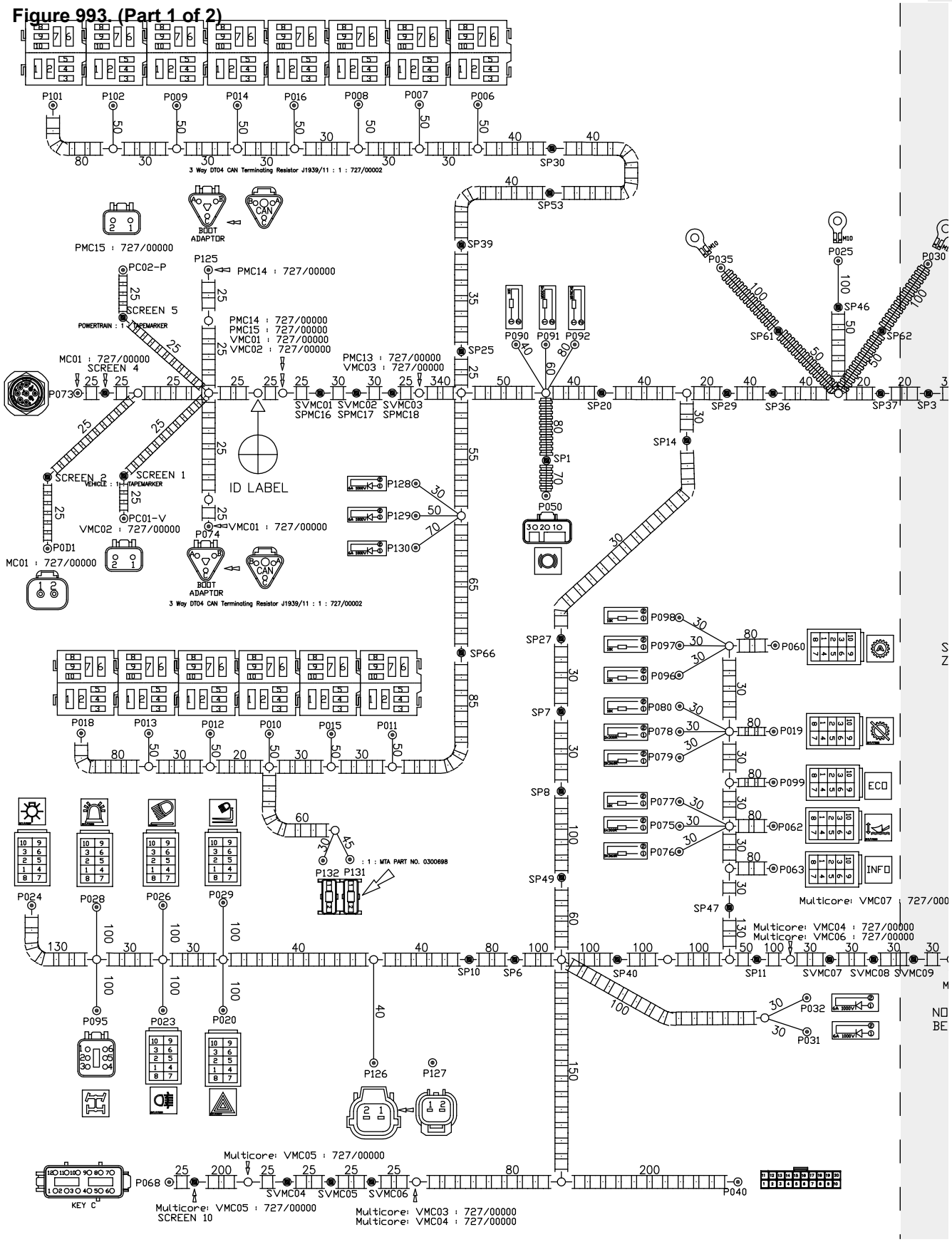

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Table 501.

Item	Description
C033	Joystick 2 connector
C034	Joystick 1 connector
C038	Joystick isolation switch
C038-A	Joystick isolation resistor 10K
C038-B	Joystick isolation resistor 1K330R
C038-C	Joystick isolation resistor 5K360R
C045	Tilt lock switch
C045-A	Tilt lock resistor 10K
C045-B	Tilt lock resistor 1K300R
C045-C	Tilt lock resistor 5K360R
C046	Constant auxiliary switch
C046-A	Constant auxiliary resistor 10K
C046-B	Constant auxiliary resistor 1K300R
C046-C	Constant auxiliary resistor 5K360R
C047	Stop switch
C052	Auxiliary venting switch
JS01	Chassis harness connector

Agri and Xtra machines with cab mounted joystick

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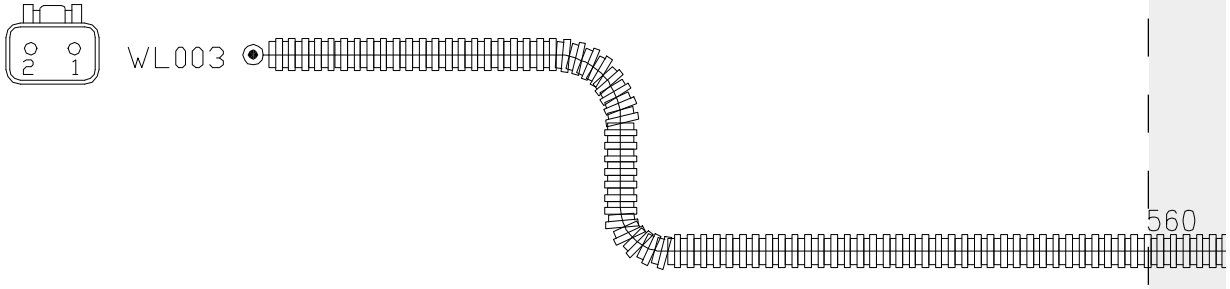
Figure 1005, (Part 1 of 2)

WL003
L/H WORKLIGH

Cav ID	Tag	Size	Destination
1	947B	2.0	ST1–3
2	601B	2.0	ST2–3

2 Way DT06 Socket Housing : 1 : 7212/0052
2 Way DT06 Wedge : 1 : 7212/0031



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15 - Alarm

Contents **Page No.**

3 LMS (Loadall Monitoring System)/Right side instrument panel ECU (Electronic Control Unit)
4 Trailer lights direction relay
5 Diode
6 Centre warning cluster
LHF Left side front light connector
LHR Left side rear light connector
RHF Right side front light connector
RHR Right side rear light connector

06 - Engine

Introduction

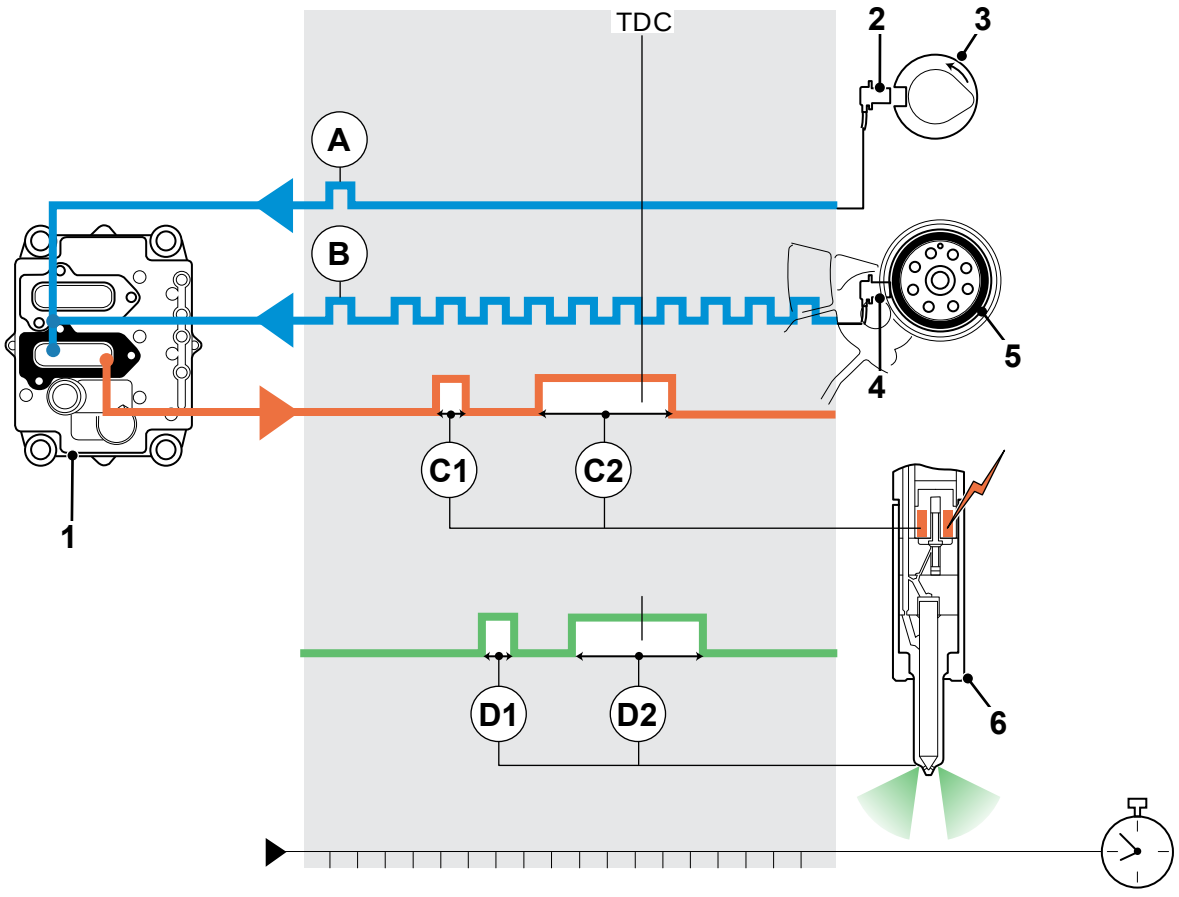
Central to the engine control system is the ECM (Engine Control Module). The prime function of the ECM is to initiate fuel injection. The engine cannot run without the ECM.

Signals from electrical sensors are continually monitored and processed by the ECM to determine when, how much and to which cylinder fuel must be injected.

The ECM controls fuel injection by energising electrical actuators in the fuel injectors, high pressure fuel pump and the common fuel rail.

Note: Other devices are connected to the ECM to control other engine related systems, refer to (PIL 15-84).

Figure 1043.



1 ECM
2 Camshaft position sensor
3 Camshaft target disc
4 Crankshaft position sensor
5 Crankshaft mounted target disc
6 Fuel injector

Pin Number	Connected to	Type	Refer to device
9	Left side column switch pin 4	Input	Operator left side column switch
10	2WD (Two Wheel Drive) / 4WD (Four Wheel Drive) switch	Input	2WD / 4WD operator switch
11	ECU Earth	Earth	Refer to diagram, (PIL 33-45-36)
12	ECU Earth	Earth	Refer to diagram, (PIL 33-45-36)
13	4WS (Four Wheel Steer) solenoid B	Output	Mode valve solenoids
14	Valve block lower solenoid	Output	Main hydraulic control devices
15	Not used	-	-
16	Emergency stop switch	-	Main hydraulic control devices
17	SRS (Smooth Ride System) pressure switch	Input	SRS pressure transducer
18	Steer mode solenoid returns	Output	Mode valve solenoids

Table 544. Connector J3

Pin Number	Connected to	Type	Refer to device
1	Valve block lift solenoid	Output	Main hydraulic control devices
2	Valve block extend solenoid	Output	Main hydraulic control devices
3	Lift arm angle sensor signal output 2	Input	Lift arm angle sensor
4	Chassis angle sensor signal output 1	Input	Chassis angle sensor
5	Chassis angle sensor signal output 2	Input	Chassis angle sensor
6	SRS drain / accumulator solenoid returns	Output	SRS control devices
7	Not used	-	-
8	Not used	-	-
9	Not used	-	-
10	Not used	-	-
11	ECU earth	Earth	Refer to diagram, (PIL 33-45-36)
12	Not used	-	-
13	Not used	-	-
14	SRS drain solenoid returns	Output	-
15	Hydraulic isolation switch	Input	Hydraulic isolation solenoid
16	SRS operator switch power	Input	SRS control devices
17	Crowd / dump solenoid returns	Output	Main hydraulic control devices
18	4WD solenoid earth	Output	Transmission devices

03 - Servicemaster

Introduction

JCB Servicemaster is an application to allow engineers to diagnose and setup the various electronic control units within the JCB product range. The tools comprise of a front end generic user interface that allows the user to select the machine which they wish to work on as well as a number of various tools which allow:

- Programming electronic control units
- Diagnosing electronic issues
- Setup of various options
- Checking the service history of the machine

JCB Servicemaster is updated on a monthly basis by incorporating Web Update. This is a program which works alongside Servicemaster to let the user know and allow them to download an update as and when it becomes available.

JCB Servicemaster software is for use with Microsoft Windows and a laptop personal computer. The laptop computer is connected to the machine diagnostic socket using special cables and an adaptor.

Use Servicemaster software to:

- Display data from a machine ECU (Electronic Control Unit)
- Change data stored in a ECU

Servicemaster software communicates with the machine ECM (Engine Control Module) using the CAN (Controller Area Network) bus, refer to Control Modules (PIL 33-45).

Structure

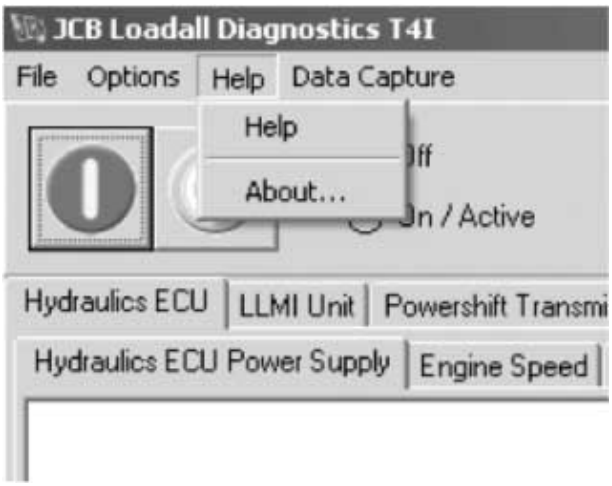
Servicemaster software is supplied via DVD and updated via the internet. A selector window is used to choose the correct software tool set for each machine range. Each tool is specific to the chosen machine range. The tool icons are shortcuts to the tool software files. Detailed information about how to use the tools is given in the applicable machine documentation.

Servicemaster Front Screen

The start-up page of Servicemaster is known as the front screen. This interface allows the user to easily and quickly navigate to the machine they are working on to ensure that they have the applicable tools for that machine.

Menu bar- 'Help' menu

Figure 1134.

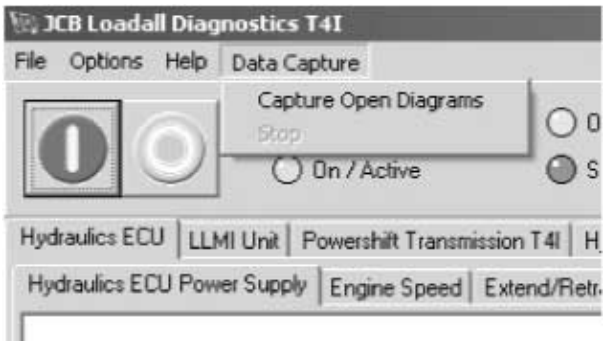


- Help: opens the help program.
- About: Opens a window showing the version number of the installed copy of the software.

Figure 1135.

Menu bar- 'Data Capture'

Figure 1136.



- Capture Open Diagrams: allows the current display to be saved.
- Stop: Stop the capture operation.

LED Status Key

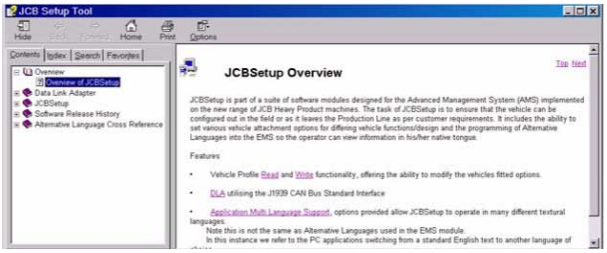
Displays a key for the colour status of the LED (Light Emitting Diode)s shown on the diagnostics pages. The LEDs change colour dependant on the electrical signal.

Figure 1137.

Table 558.

LED Colour	Electrical Signal Status
Dark green	Input/Output off
Light green	Input/Output on
Blue	Open circuit
Red	Short to ground

Figure 1176.



- About- opens a window showing the version number of the installed copy of the software. Refer to Figure 1177.

Figure 1177.

Build Options

This screen is used to configure the instrument cluster ECU machine build options. The options available will vary depending on machine model selected.

Figure 1178.

Configure electronic instrument cluster build options

1. Click “Connect” to begin communication with the ECU.
2. Enter the machine VIN (Vehicle Identification Number) number into the VIN box.
3. The available build options will be represented with white check boxes next to the text.
4. Click on the relevant check boxes to inform the ECU that the machine has that option installed.
5. Click "Next" button to be taken to the powertrain screen.

Powertrain Options

This screen is used to configure the instrument cluster ECU powertrain options. The options available will vary depending on machine model selected.

Technical Data

Table 561.

Fault Code	Fault Description	Fault Severity
P046D-2F	Trivial	
7F0E6-3	Extend Boost Solenoid STB	Operator
7F0E6-4	Extend Boost Solenoid STG	Operator
7F0E6-5	Extend Boost Solenoid Open	Operator
7F0E8-3	Extend Boost Solenoid Return STB	Operator
7F0E8-4	Extend Boost Solenoid Return STG	Operator
7F0E8-5	Extend Boost Solenoid Return Open	Operator
7F296-2	Left Stabiliser Lever Disagreement	Operator
7F296-3	Left Stabiliser Lever 1 OORH	Operator
7F296-4	Left Stabiliser Lever 1 OORL	Operator
7F297-2	Right Stabiliser Lever Disagreement	Operator
7F297-3	Right Stabiliser Lever 1 OORH	Operator
7F297-4	Right Stabiliser Lever 1 OORL	Operator
7F2B3-3	Left Stabiliser Lower Solenoid STB	Operator
7F2B3-4	Left Stabiliser Lower Solenoid STG	Operator
7F2B3-5	Left Stabiliser Lower Solenoid Open	Operator
7F2B4-3	Left Stabiliser Raise Solenoid STB	Operator
7F2B4-4	Left Stabiliser Raise Solenoid STG	Operator
7F2B4-5	Left Stabiliser Raise Solenoid Open	Operator
7F2B5-3	Right Stabiliser Lower Solenoid STB	Operator
7F2B5-4	Right Stabiliser Lower Solenoid STG	Operator
7F2B5-5	Right Stabiliser Lower Solenoid Open	Operator
7F2B6-3	Right Stabiliser Raise Solenoid STB	Operator
7F2B6-4	Right Stabiliser Raise Solenoid STG	Operator
7F2B6-5	Right Stabiliser Raise Solenoid Open	Operator
7F2BE-3	Left Stabiliser Solenoid Return STB	Operator
7F2BE-4	Left Stabiliser Solenoid Return STG	Operator
7F2BE-5	Left Stabiliser Solenoid Return Open	Operator
7F2BF-3	Right Stabiliser Solenoid Return STB	Operator
7F2BF-4	Right Stabiliser Solenoid Return STG	Operator
7F2BF-5	Right Stabiliser Solenoid Return Open	Operator

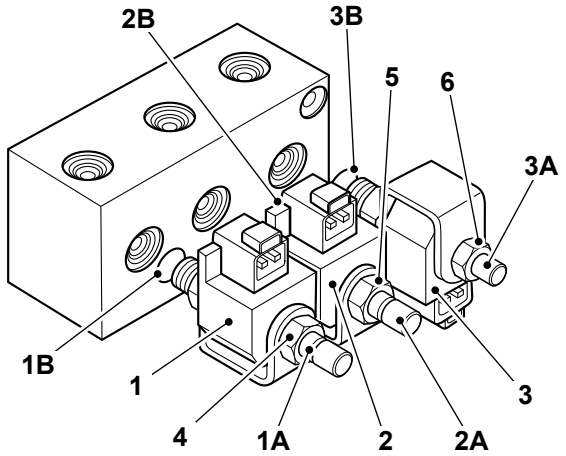
Fault Code	Fault Description	Fault Severity
P203B-22	Tank Head Unit Level Physical Signal Above Maximum Limit	Operator
P203B-81	CAN Bus Message Error From Headunit	Operator
P203B-86	CAN Bus Message Error For Tank Level From Head Unit	Operator
P203B-87	CAN bus Off Error From Headunit	Operator
P203F-21	Tank Head Unit Level Physical Signal Below Minimum Limit	Operator
P203F-68	Reagent Tank Level Low And Below Warning Threshold	Operator
P203F-7B	Reagent Tank Level Low And Empty	Operator
P2043-81	CAN Bus Message Error From Headunit	Operator
P2043-86	Adblue Temperature Message Error From Headunit	Operator
P2043-87	CAN bus Off Error From Headunit	Operator
P204B-00	Error While Monitoring The Stabilisation Of Pressure	Operator
P204B-02	Error On Pressure Line & Dosing Valve While Monitoring For BLockage	Operator
P204B-16	Measured Value Of Pressure Sensor Below The Tolerable Limit	Operator
P204B-17	Measured Value Of Pressure Sensor Above The Tolerable Limit	Operator
P204B-26	Error On Rate Of Pressure Reduction	Operator
P204B-29	Error On Pressure Line While Monitoring For BLockage	Operator
P204B-61	Error While Monitoring Of Pressure Buildup	Operator
P204C-16	Pump Pressure Signal Below The Minimum Voltage Limit	Operator
P204C-21	Error For Pump Pressure Physical Signal Below Lower Limit	Operator
P204D-17	Pump Pressure Signal Above The Maximum Voltage Limit	Operator
P204F-06	Error To Detect The Clogged Filter	Operator
P204F-7A	Error To Detect Leakage During No Dose	Operator
P204F-9A	Inducement Repeat Offence Active	Critical
P205B-00	Error To Indicate Overheating Of Adblue Tank	Operator
P205B-06	Error In Increase Of Urea Tank Temperature	Operator
P205B-16	Tank Head Unit Temperature Physical Signal Below Minimum Limit	Operator
P205B-17	Tank Head Unit Temperature Physical Signal Above Maximum Limit	Operator

Disassemble and Assemble

Disassemble

1. Remove the LLMC (Longitudinal Load Moment Control) valve block. Refer to electrical system-load motion control system, refer to (PIL 33-66).
2. Before you remove the solenoid assemblies or coils, put a label on them for correct installation.
3. Loosen and remove the securing nut on the coil on the valve you wish to remove.
4. Remove the solenoid.
5. Loosen and remove the cartridge.
6. Remove and discard the seal.
7. Repeat steps for the removal of the other valves. 3 to 6

Figure 1227.



1 Solenoid valve assembly 1
2 Solenoid valve assembly 2
3 Solenoid valve assembly 3
1A Cartridge 1
2A Cartridge 2
3A Cartridge 3
1B Seal 1
2B Seal 2
3B Seal 3
4 Securing nut
5 Securing nut
6 Securing nut

Assemble

Although the solenoid assemblies look very similar, they have different flow characteristics.

1. The installation procedure is the opposite of the removal procedure.
2. When you install, do the following step also:
   2.1. During assembly renew the seal 1, seal 2 and the seal 3.
3. Make sure that all components are tightened to the correct torque.

Table 566. Torque Values

Item	Nm
1A	27
1B	27
1C	27
4	4.1
5	4.1
6	4.1

00 - General

Introduction

Use the torque setting tables (Technical Data) only where no torque setting is specified in the text. Note: Dacromet fasteners are lubricated as part of the plating process, do not lubricate. Torque settings are given for the following conditions:

Table 571. Up to September 2017

Type	Condition 1	Condition 2
no coating	Unlubricated fasteners	Zinc flake silver (Dacromet) fasteners.
2 (obsolete from September 2017).	Zinc fasteners	Lubricated zinc and yellow plated fasteners.
3, 4 (obsolete from September 2017).	Yellow plated fasteners	Where there is a natural lubrication. For example, cast iron components.

Table 572. From September 2017

Type	Condition 1	Condition 2
no coating	Unlubricated fasteners	Dacromet) fasteners.
1	Zinc flake - silver	Zinc flake silver (Dacromet) fasteners.
5	Zinc and heavy trivalent with seal	
7	Zinc nickel - silver	
8	Zinc nickel - black	
9	Zinc flake - black	

Notes:

00 - General

Introduction

This section contains information on primers, solvents, cleaning solutions etc. that are in use at JCB.

All primers and solvents should be used at all times in line with the manufacturer's recommendations.

Approved primers and solvents

The table shown in Technical Data shows the approved primers and solvents available to use on JCB machines. The table also provides basic details to help with the selection of primers and solvents. More up to date information can be found on the manufacturer's website.

Operation

The schedules show the service tasks which must be done and their intervals.

The services must be done at either the hourly interval or the calendar equivalent, whichever occurs first.

The intervals given in the schedules must not be exceeded. If the machine is operated under severe conditions (high temperature, dust, water, etc.) shorten the intervals.

Table 602.

○	Service task can be completed by a competent operator. Details of how to complete the service task are given in the Operator's Manual.
□	We recommend that a Service Engineer completes the service task. Details of how to complete the service task are given in the Service Manual.