Notes:

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00 - General

Introduction

When moved to their maintenance position, the access panels give you access to parts or areas of the machine that are not required during machine operation.

Before you operate the machine, make sure that all of the access panels are correctly in their closed or installed positions.

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03 - Evaporator

Introduction

The evaporator works in the opposite way as the condenser, here the liquid refrigerant is converted to gas, absorbing the heat from the air in the compartment.

The evaporator is located inside the HVAC (Heating Ventilation Air Conditioning) unit.

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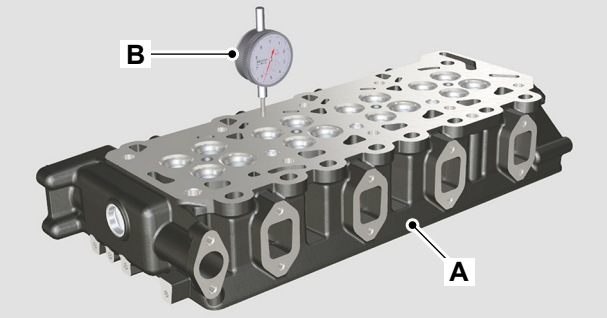
Calibrate

Flatness Check

Put the cylinder head on a surface plate and measure its flatness with a dial gauge.

If the level deviation is greater than 0.10mm (0.004in), the cylinder head must be machined. The cylinder head should not be machined more than 0.20mm (0.008in) in depth.

Figure 153.



A Cylinder head
B Dial gauge

Remove and Install

Consumables

Description	Part No.	Size
Cleaner/Degreaser - General purpose solvent based parts cleaner	4104/1557	0.4L

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

Before Removal

1. This procedure requires service parts. Make sure you have obtained the correct parts before you start, refer to Parts Catalogue.
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.
4. Remove the thermostat.
   Refer to: PIL 21-12-00.
5. Remove the exhaust manifold.
   Refer to: PIL 18-24-04.
6. Remove the inlet manifold.
   Refer to: PIL 18-24-03.
7. Remove the rocker cover.
   Refer to: PIL 15-42-06.
8. Remove the rocker assembly.
   Refer to: PIL 15-42-00.

Remove

Make sure that the engine is at ambient temperature before you remove the cylinder head, to prevent deformation.

1. Remove the bolts that attach the cylinder head to the crankcase. Note that the bolts must not be re-used. Discard the bolts.

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00 - General

Introduction 15-111
Technical Data 15-112
Component Identification 15-113
Operation 15-115
Adjust 15-117
Calibrate 15-117
Remove and Install 15-119

Introduction

The valve train system opens and closes the valves with correct timing in relation to the piston movements.

Each push rod has one end in a valve tappet and the other end under a rocker arm, or as applicable. Hydraulic tappets are used which automatically adjust the clearance between the valve and push rods.

The valves extend through the cylinder head. The valves are made from a special metal to provide a long service life. Damaged or worn valves cannot be lapped or reground and must be replaced with new ones. Each valve stem has an oil seal.

The Valve seat inserts are pressed into the cylinder head. The seat inserts are also made from a special metal to provide for a long service life. Damaged or worn seat inserts can be removed and replaced with new ones.

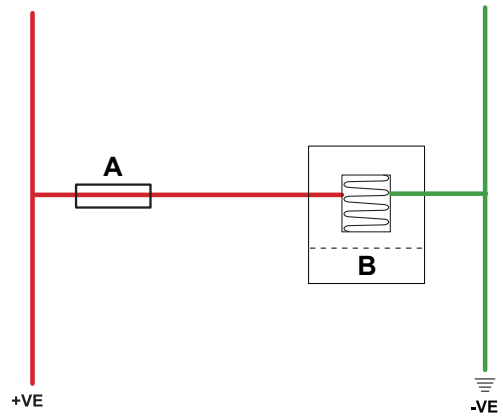
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Diagram

Grid heater link harnesses are used for the earth and power supply for the grid heater.

Figure 322.



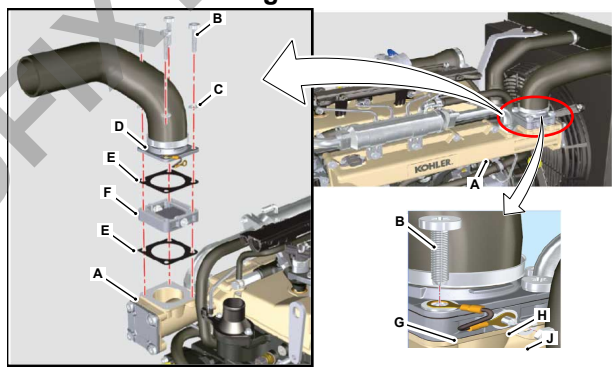
A Fuse
B Grid heater

Remove and Install

Remove

1. Make the machine safe.
   Refer to: PIL 01-03-27.
2. Let the engine cool.
3. Get access to the engine intake manifold.
4. Remove the bolts and washers to remove the earth cable and the intake hose. Refer to Figure 323.
5. Remove the intake hose with the flange that connect to the grid heater. Refer to Figure 323.
6. Remove the grid heater with the gaskets from the intake manifold. Refer to Figure 323.

Figure 323.



A Intake manifold
B Bolts
C Washers
D Intake hose with flange
E Gaskets
F Grid heater
G Earth cable
H Washer
J Bolt

6.1. The grid heater has two gaskets, attached above and below the heater. Refer to Figure 323.

Install

1. Installation is the opposite of the removal procedure.
2. If the grid heater is removed or replaced, always replace the gaskets with the new.
3. Install the grid heater and intake hose with the flange to the intake manifold.

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Health and Safety

⚠ **WARNING** Make the machine safe before working on it. Park the machine on level ground and lower the loader arm. Stop the engine and remove the ignition key. Make sure the park brake is engaged. Disconnect the battery to prevent the engine being started. Block all four wheels.

Notice: Before carrying out arc welding on the machine, disconnect the battery and alternator to protect the circuits and components. The battery must still be disconnected even if a battery isolator is installed.

Notice: Do not isolate the machine electrics when the engine is running, this may cause damage to the machine electrics.

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00 - General

Introduction 15-337
Operation 15-338
Diagram 15-340
Remove and Install 15-341

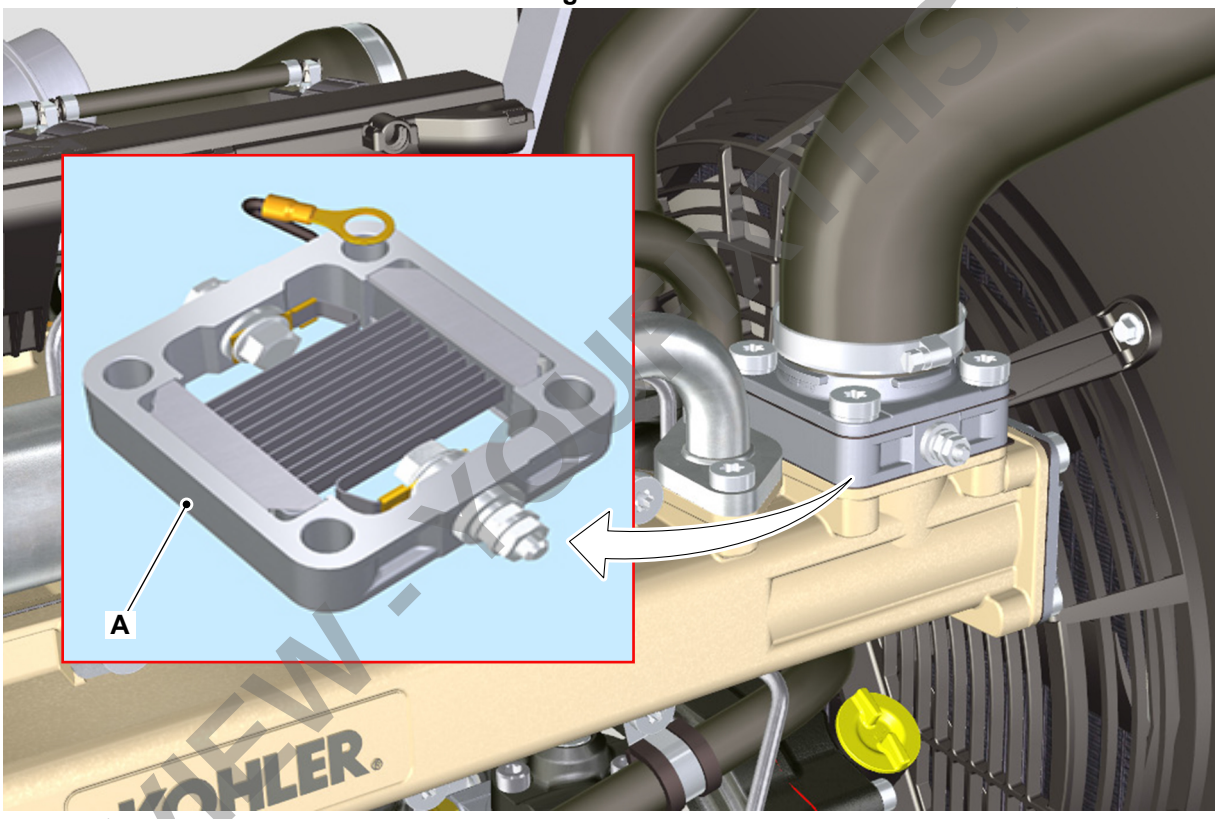
Introduction

Introduction

The cold starting device has a resistance, operated by the ECM (Engine Control Module).

The cold starting device operates when the ambient temperature is ≤ 15°C (59.0°F). The intake air is heated through the resistance and helps in starting the machine.

Figure 462.



A Cold starting device

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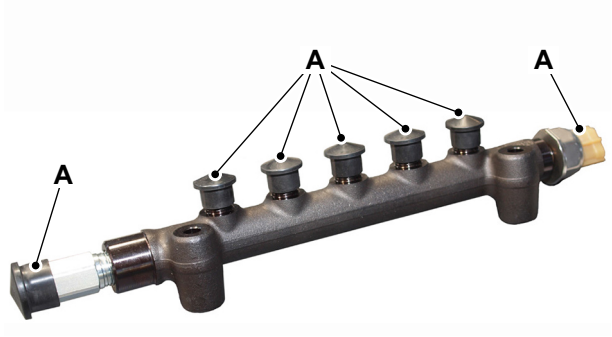
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Store and Recommission

Storage

All the openings of the rail must be protected by attaching protective caps and it must be positioned as shown in figure during the component storage.

Figure 519.

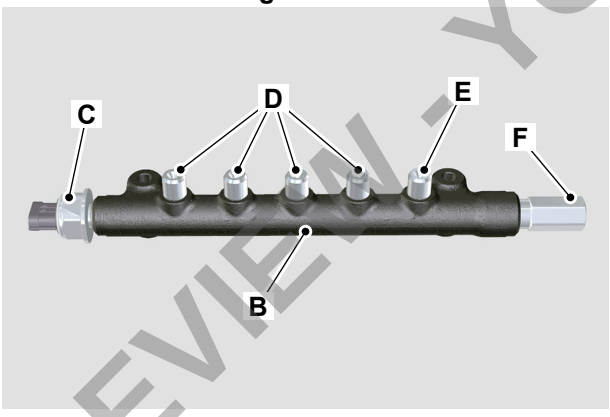


A Protective cap

Handling

1. Make sure you hold the fuel rail only from the body.
2. Do not hold the fuel rail from the safety valve side.

Figure 520.



B Body
C Pressure sensor
D Outlet pipe fitting
E Inlet pipe fitting
F Safety valve

3. Do not hold the rail from the pressure sensor side.
4. Do not hold the rail from the inlet and outlet pipe fitting.

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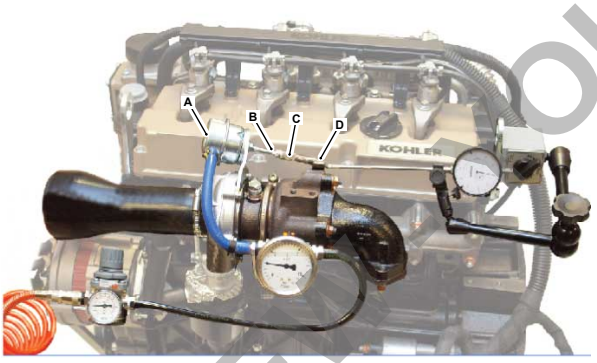
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Adjust

The adjustment must be done when the engine is switched off.

1. Check the pressure.
2. If the pressure is less or greater than the stated value, adjustment must be done, as follows.
3. Unscrew the nut.
4. Remove the split pin on the terminal and disconnect the rod.
5. Hold the rod, screw to increase / or unscrew to decrease the pressure, the ring until the pressure reaches the corrected calibration.
6. Tighten the nut.
7. Reconnect the rod and replace the cotter pin on the terminal. The rod should not turn during adjustment.

Figure 608.



A Wastegate control valve
B Nut
C Rod
D Terminal

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00 - General

Introduction 24-49
Technical Data 24-50
Component Identification 24-51
Operation 24-52
Check (Operation) 24-54
Bleed 24-55

Introduction

The park brake also called the hand brake is a latching brake usually used to keep the vehicle stationary. It is also used to prevent a vehicle from rolling when the operator needs both feet to operate the clutch and throttle pedals.

The park brake usually consists of a cable directly connected to the brake mechanism on one end, and to a hand-operated lever, on the floor at the side of the driver.

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00 - General

Introduction 27-3
Health and Safety 27-4
Check (Condition) 27-4

Introduction

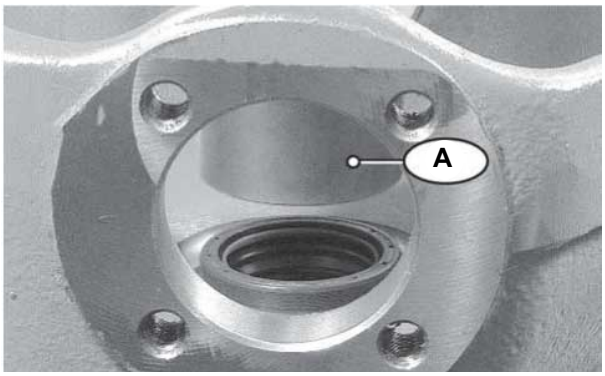
This section contains information on machine driveline system. The machine driveline system consists of the following parts.

- Axle. Refer to: PIL 27-20-00.
- Wheel drive pump. Refer to: PIL 27-31-00.
- Wheel drive motor. Refer to: PIL 27-32-00.
- Wheels. Refer to: PIL 27-29-00.

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Figure 981.



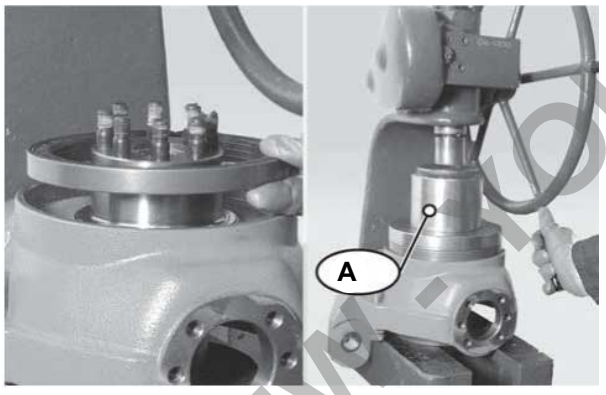
A Special tool

5. Apply multi gasket to the outer surface of the swivel case sealing ring.

   Consumable: JCB Multi-Gasket

6. Using special tool (910.06.4203) install the swivel case sealing ring into the seat. Refer to Special Tools (PIL 78-94).

Figure 982.

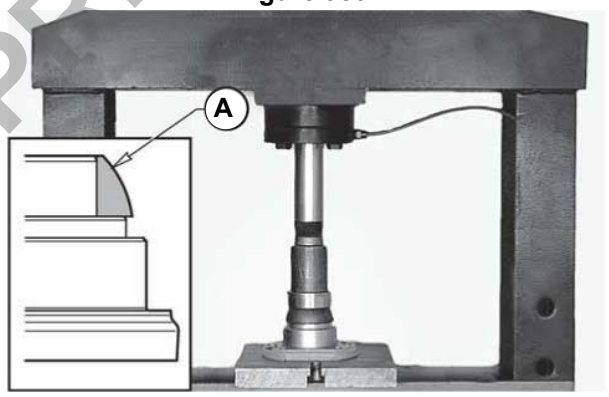


A Special tool

6.1. Make sure the sealing ring is correctly positioned.

7. If the trunnion cover was removed use a suitable press to install the cover to the trunnion.

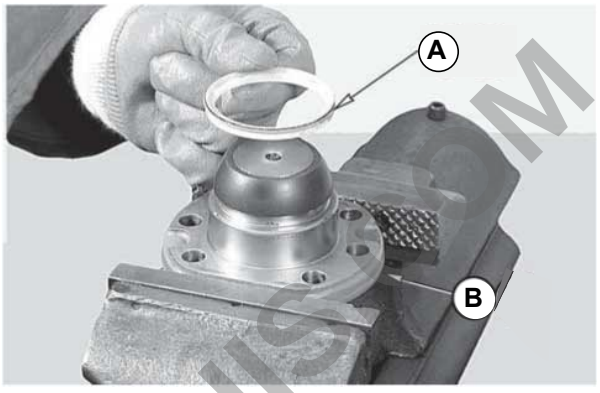
Figure 983.



A Cover

8. Install the sealing rings on to the trunnions, make sure to align the marks made during disassembly.

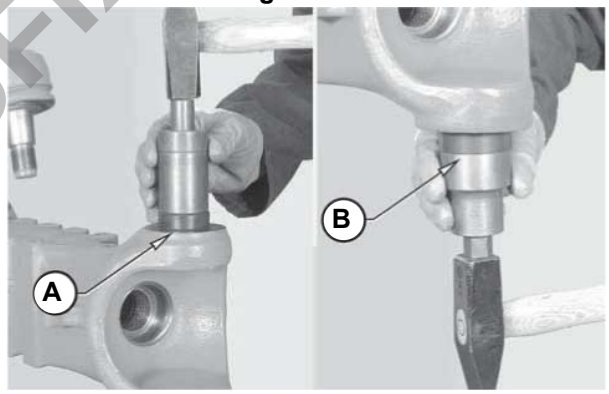
Figure 984.



A Sealing ring
B Trunnion

9. Lubricate the upper and lower bushings and install into the arm.

Figure 985.



A Upper bushing
B Lower bushing

10. Lubricate the bushing and the seat in the arm.

11. Using special tool (910.06.4209) install the bushing into the seat. Refer to Special Tools (PIL 78-94).

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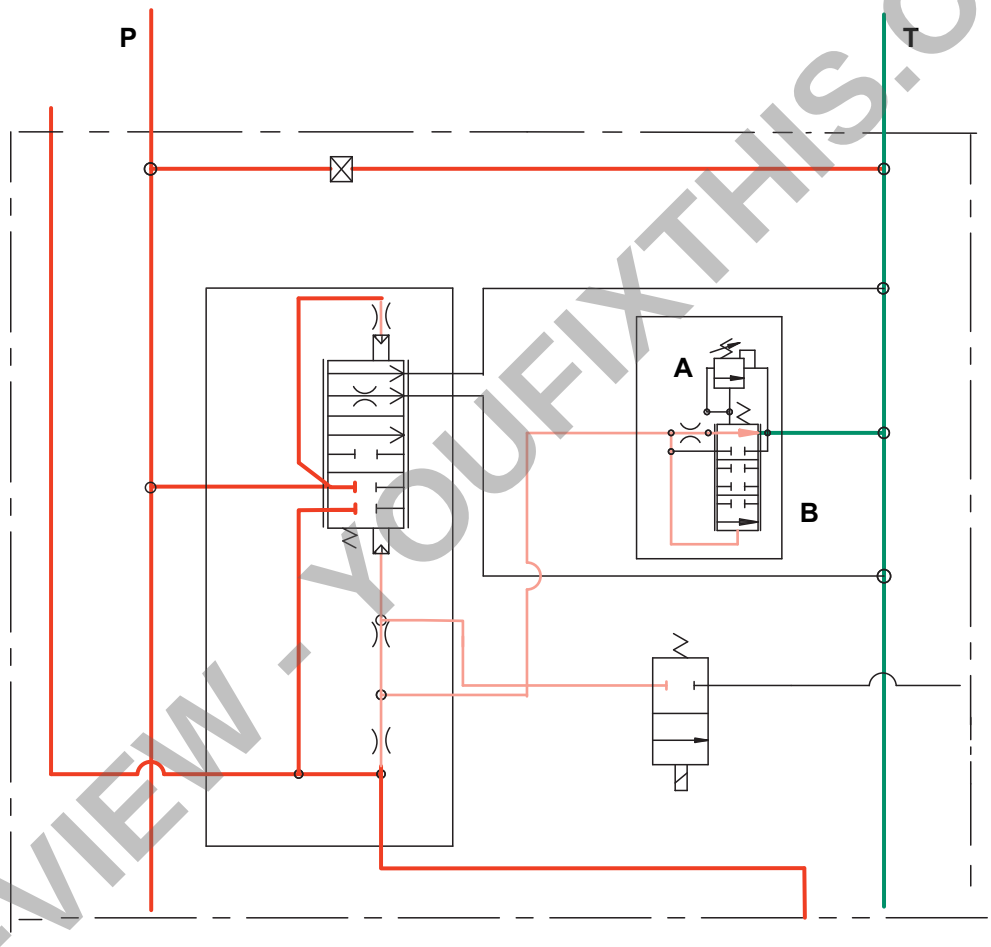
Main System Pressure Relief

When a service ram is at the end of its stroke or there is a resistance, the pressure in the load sense line increases. When this pressure is above 260bar (3,768.1psi), the LSRV (Load Sense Relief Valve) opens and the load sense oil is sent to tank to stop an increase in pressure.

The LSRV unit includes a drain regulator valve. The drain regulator valve allows the excess load sense pressure to drain to the tank when no spools are operated. The valve will close the drain line when the service spools are in operation.

The load sense pressure relief valve is factory set and sealed with a plastic tamper proof cap. No adjustment is normally necessary.

Figure 1047. Main System Pressure Relief



A LSRV
P Pressure port
B Drain regulator valve
T Tank port

(For: 525-60 [T4F], Agri, Agri-Plus)

The schematic diagrams show a typical system. For machine specific schematics refer to (PIL 30-00).

Pressures quoted are for illustration purposes only. For correct pressure, refer to (PIL 30-00).

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Install

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

    1.1. Tighten the valve block mounting bolts to the specified torque value. Only three of the four securing bolts are used.

    1.2. Make sure to phase the hose elbows correctly to prevent damage or chafing.

    1.3. Check the LSRV (Load Sense Relief Valve) pressure. Refer to (PIL 30-51).

    1.4. Check the ARV (Auxiliary Relief Valve) pressures. Refer to (PIL 30-51).

    1.5. Operate the machines hydraulic system. Check for correct operation and leaks.

    1.6. Check the hydraulic fluid level. Refer to (PIL 30-00).

Table 307. Torque Values

Item	Description	Nm
A	Valve block mounting bracket bolts	47

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00 - General

Introduction 30-165
Check (Operation) 30-166

Introduction

The HBCV (Hose Burst Check Valve) prevents the uncontrolled movement of the cylinder ram pistons. The HBCV will lock if the hydraulic pressure is unsatisfactory or if a hose bursts.

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Table 342.

Connector Code	Device
B002	Starter Motor
B002	Boom Worklight
B003	Auxiliary
B004	Retract Proximity Switch
C002	LH Headlight
C005	RH Headlights
C006	Cooling Fan
C007	Ambient Sensor
C008	Hand Throttle/Creep
C010	Venting Valve
C013	Joystick
C014	Joystick
C017	RH Rear Lights
C018	LH Rear Lights
C019	Trailer Socket
C020	Number Plate Light
C021	Reverse Alarm
C022	Tilt Lock
C022A	Tilt Lock 10K
C022B	Tilt Lock 1K 300R
C022C	Tilt Lock 5K 360R
C023	Boom Angle Sensor
C024	Rear Steer Sensor
C025	LLMITransducer
C026	Front Steer Sensor
C027	Auxiliary Changeover Valve
C028	2WS (Two Wheel Steer)
C029	4WS (Four Wheel Steer)
C030	AWS (All Wheel Steer)
C031	Crab Steer
C033	Hydraulic Temperature Sensor
C035	Fuel Level Sensor
C037	Ground
C045A	Boom Retract 33K
C045B	Boom Retract 5K6R
C045C	Boom Retract 1K8R
C046	Hydraulics ECU
C047	Hydraulics ECU
C048	Hydraulics ECU
C049	Hydraulics ECU
C050	Hydraulics ECU
C051	Can Termination
C052	Chassis Angle Sensor
C052	Chassis Angle Sensor
C054	Auxiliary Socket
C055	Hydraulic ISO Switch
C056	Foot Throttle

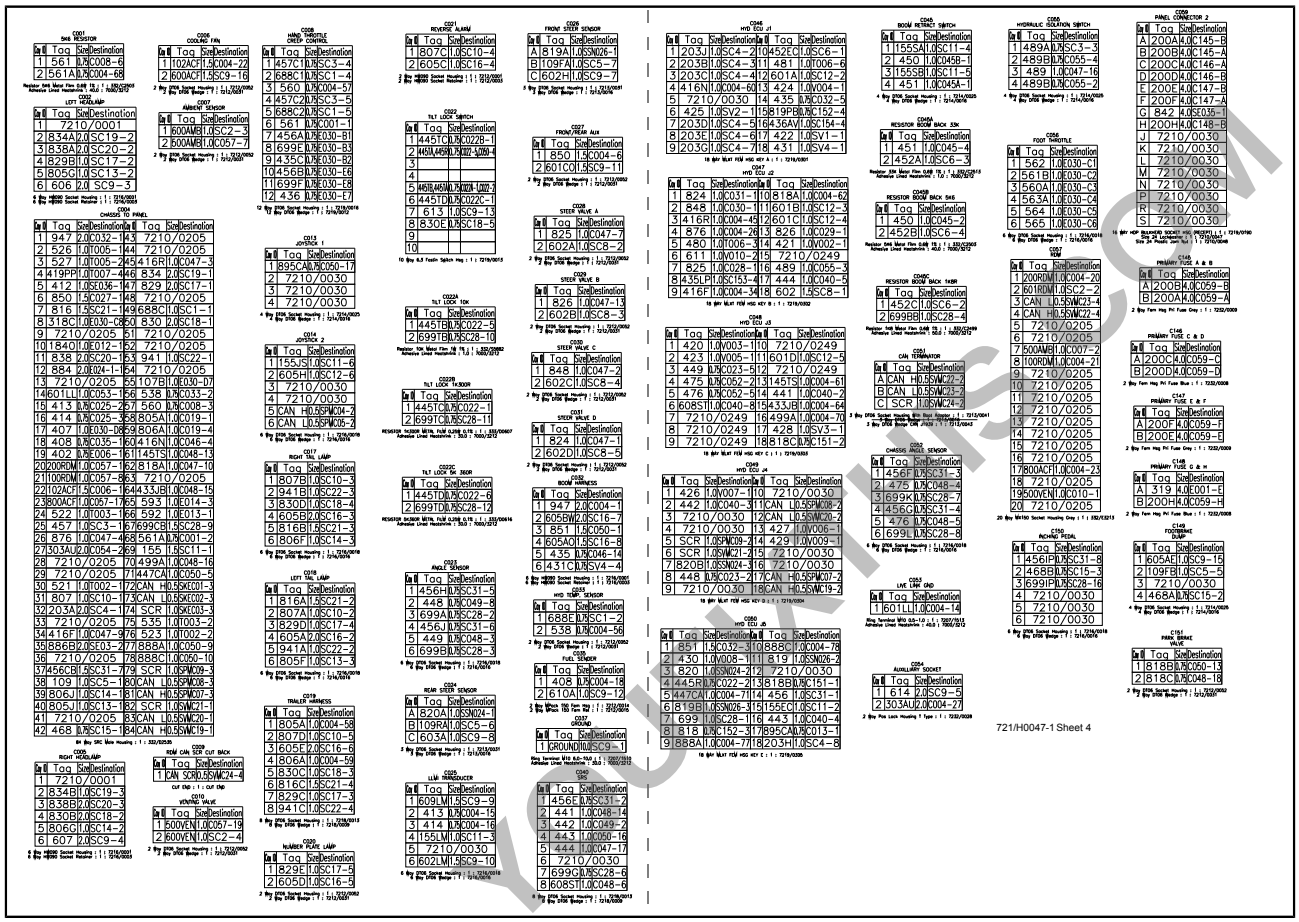
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Page 33-200

Figure 1249. Chassis Harness (721/H0047-1)

Page 33-201



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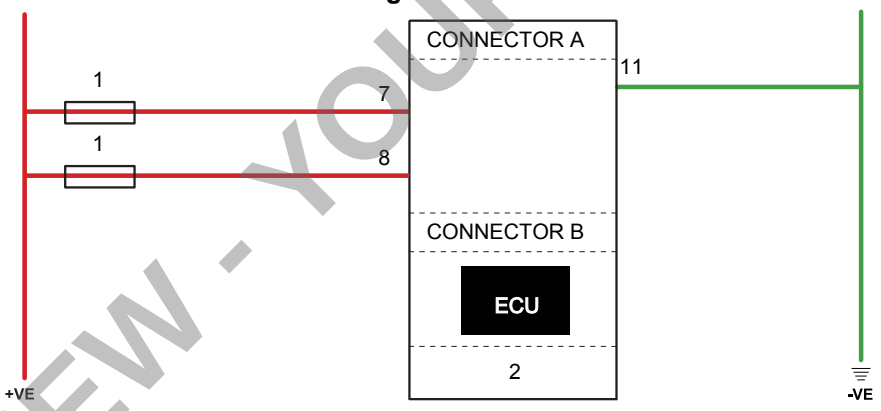
Immobiliser ECU Pin Outs

Table 362. Connector A

Pin Number	Connected to	Type
1	Not used	-
2	Not used	-
3	Not used	-
4	Not used	-
5	Not used	-
6	Not used	-
7	Power	12V battery
8	Power	12V battery
9	CAN (Controller Area Network)bus high	CAN bus
10	CANbus low	CAN bus
11	ECU earth	Earth
12	Not used	-

Immobiliser ECU Power and Earth Connections

Figure 1272.



A Fuse

B Immobiliser ECU

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Component Identification

Tool Suite

All tools available for the Loadall range of machines are included in this section. The applicability of the tool depends on the machine model/ variant.

Table 376.

Tool	Machine Application	Icon	Description
JCB Ecomax engine set-up	Machines with SH, SL and DH engines		Configure the engine ECU (Electronic Control Unit) to match the engine parameters.
IFM transmission diagnostics	Machines with PS760, 4 or 6 gearbox		View gearbox operating parameters in real time. Perform gearbox electrical actuator tests.
T4i cluster setup	All machines		Configure the LMS (Loadall Monitoring System) display ECU to match machine parameters.
Loadall datalogger	All machines		Reads/ prints/ displays and clears the machine fault code logs.
JCB loadall machine diagnostics T4i	All machines		Comprehensive diagnostic information about machine related sensors, actuators and ECUs.
Lift arm angle sensor calibration	Machines with LLMC (Longitudinal Load Moment Control)		Calibrates the lift arm angle sensors.
Loadall immobiliser setup	Machines with immobiliser		
Immobiliser diagnostics	Machines with immobiliser		View immobiliser operating parameters in real time. Applicable for key system and keypad system immobilisers.

Diagnostics Connector

For the Servicemaster System connection procedure, refer to electrical system- electronic diagnostic, refer to (PIL 33-57).

The main connection point is shown in the figure Refer to Figure 1357. .

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Check (Operation)

Make sure you carry out the procedures in LLMI (Longitudinal Load Moment Indicator) Fault Finding before the procedures in LLMC (Longitudinal Load Moment Control) Fault Finding.

For LLMI Fault Finding, refer to Electrical System, Load Motion Control System, Display Unit, Fault Finding, (PIL 33-66-03).

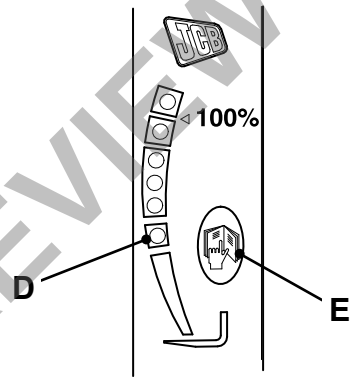
For LLMI Fault Finding, refer to Electrical System, Load Motion Control System, General, Fault Finding, (PIL 33-66-00).

LLMI Self Test Function

The LLMI unit has a self test function. Perform the test as follows:

1. Park the machine (unloaded) on level ground with the engine running. Apply the park brake and place the forward/reverse lever in the neutral position.
2. The green LED (Light Emitting Diode) at the bottom of the display illuminates to show that the indicator is receiving power.
3. Press the display button and release.
4. All LED's on the indicator flash and the audible alarm sounds if the unit is functioning correctly.
5. If the unit is defective, install a new unit.

Figure 1398.



D Green LED
E Display button

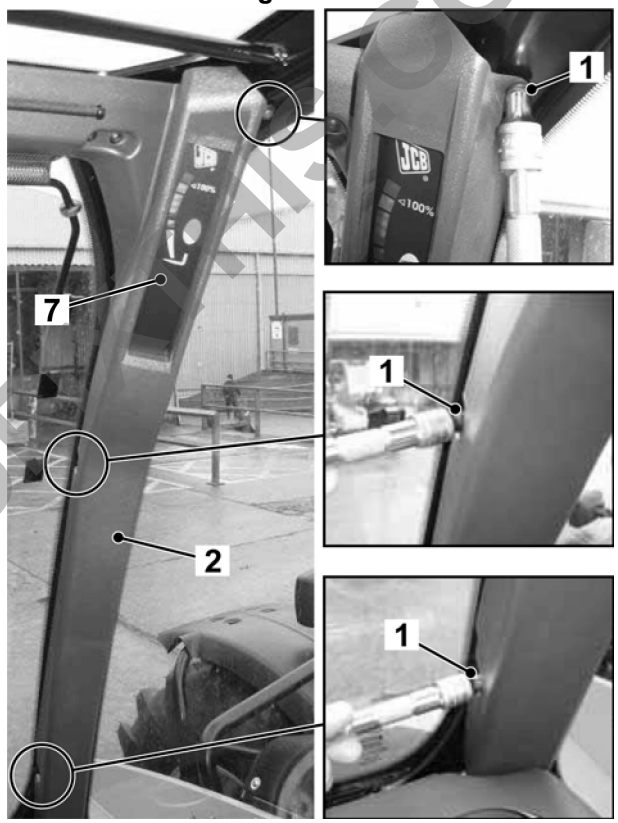
Refer to Electrical System, Load Motion Control System, General, Check (Operation), (PIL 33-66-03).

Remove and Install

Removal

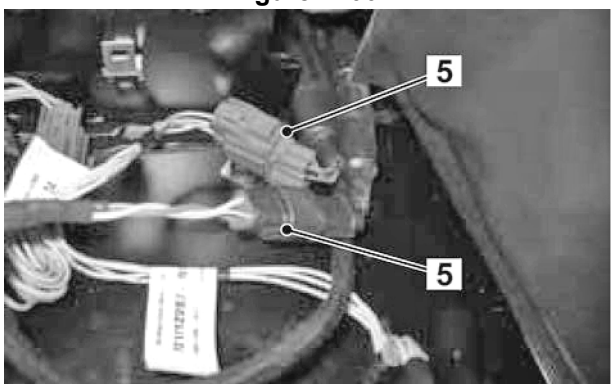
1. Park the machine and make it safe. Lower the boom. Obey the care and safety procedures.
2. Disconnect the battery. Obey the care and safety procedures. Ref (PIL 01-03).

Figure 1399.



1 Screws
2 Cover
6 Retainers
7 LLMI (Longitudinal Load Moment Indicator) Unit

Figure 1400.



5 Electrical connectors

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Subsection	Commercial name	Product Number	Colour	Shelf life	Technical data	Comments
Direct glazing	Terostat 8900 LV	4103/4200	Black	365d in cartridges. 180d in sausage pack. 180d in hobbocks and drums	80bar (1,159.4psi) tensile strength	One component, pumpable adhesive/sealant based on polyurethane, which cures by reaction with moisture to an elastic rubber. The skin formation and curing time are dependent on humidity, temperature and depth of joint. High temperature and high moisture reduces curing time. Sag resistant, temperature range of -40°C (103.9°F) to 90°C (193.9°F) short exposure (up to 1h) of 130°C (265.8°F).
Direct glazing	Sika 295 UV	4103/4300	Black, white	365d	-	Direct glazing adhesive for plastic glazing panels. One component polyurethane adhesive of paste like consistency. 60min tack free time, 1d cure time (4mm at 23°C (73.4°F)). Good UV, fresh water and seawater resistance. Do not apply below temperatures of 10°C (50.0°F) or above 35°C (95.0°F).

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