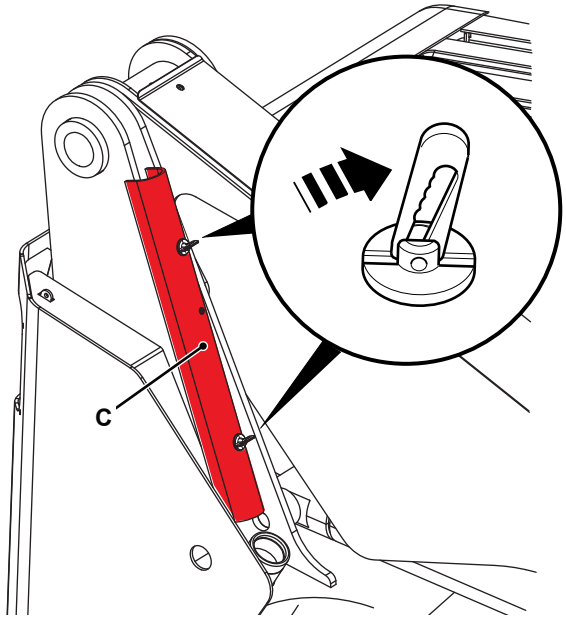
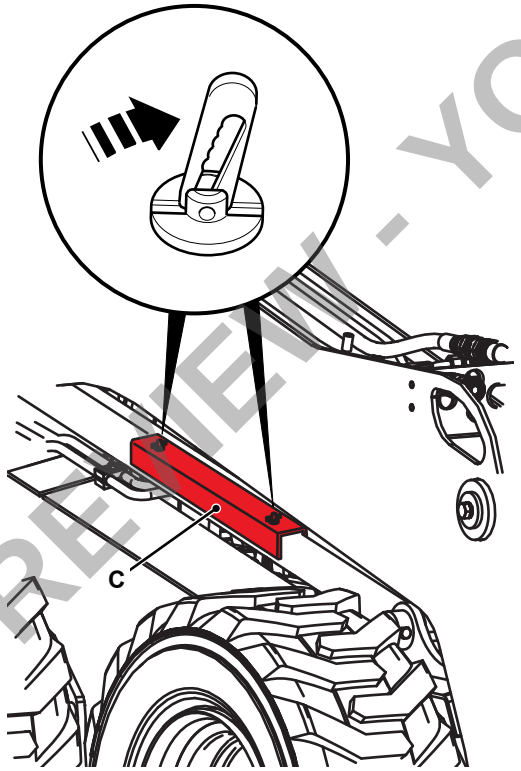
## Installing the Lift Arm Maintenance Strut

**Figure 3. Stowage Radial Lift**




**C** Stowage position

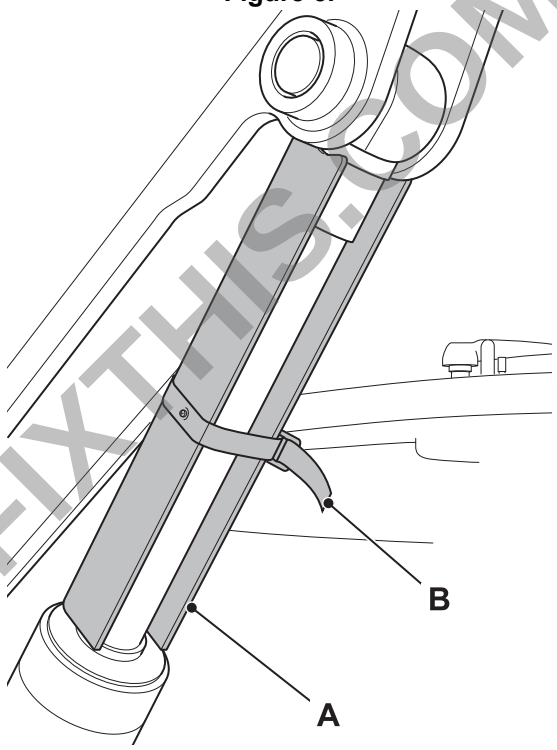
**Figure 4. Stowage Vertical Lift**




**C** Stowage position

1. Remove the shovel or attachment.
2. Park the machine on level, solid ground. Stop the engine.
3. Remove the strut from its stowage position.
4. Raise the lift arm just far enough to install the strut.
5. Stop the engine and remove the ignition key.
6. Place the strut around the lift ram piston rod. Secure it in position with the strap.

**Figure 5.**




**A** Strut
**B** Strap

7. To prevent any chance of the lift arm creeping down and trapping your fingers, the lift arm should be lowered onto the strut. Lower the arm carefully, to prevent possible damage to the strut. Stop as soon as the weight of the lift arm is on the strut.
8. Disconnect the battery to prevent accidental operation of the engine. Refer to (PIL 33-03).
9. If necessary, put blocks against the two sides of the wheels before you get below the machine.

## Removing the Lift Arm Maintenance Strut

1. Raise the lift arm to take the weight off the strut.
2. Stop the engine and remove the ignition key.
3. Remove the strut.
4. Secure the strut in its stowage position.
5. Lower the lift arm to the ground.

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not push on the front glass if installed. The glass could break.

4. Install the two rear mounting nuts and compression plates to secure the cab/canopy. Torque tighten to

   Torque: 205N·m

The compression plate is critical for ROPS (Roll-Over Protective Structure) integrity. Only replace with the correct JCB approved part.

Never operate the machine with the cab/canopy in the raised position. Always secure the cab/canopy using the rear mounting nuts and compression plates tightened to the correct torque. If they are not installed the cab/canopy could tip forward unexpectedly.

**Figure 13.**

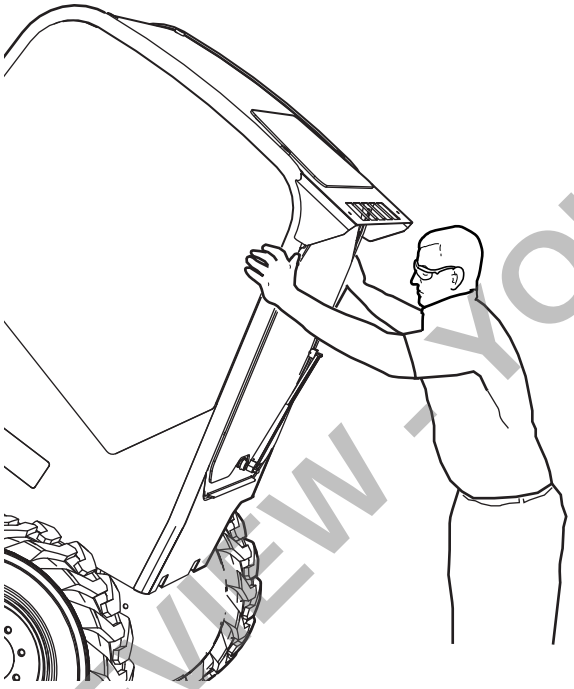
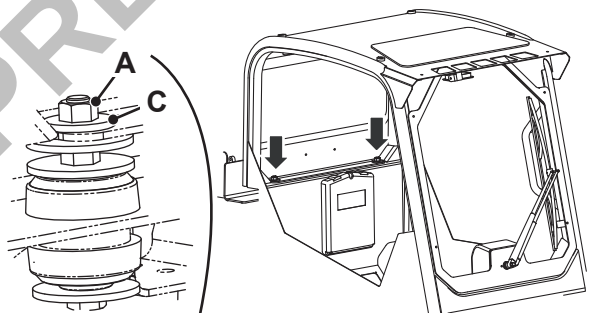


**Figure 14.**



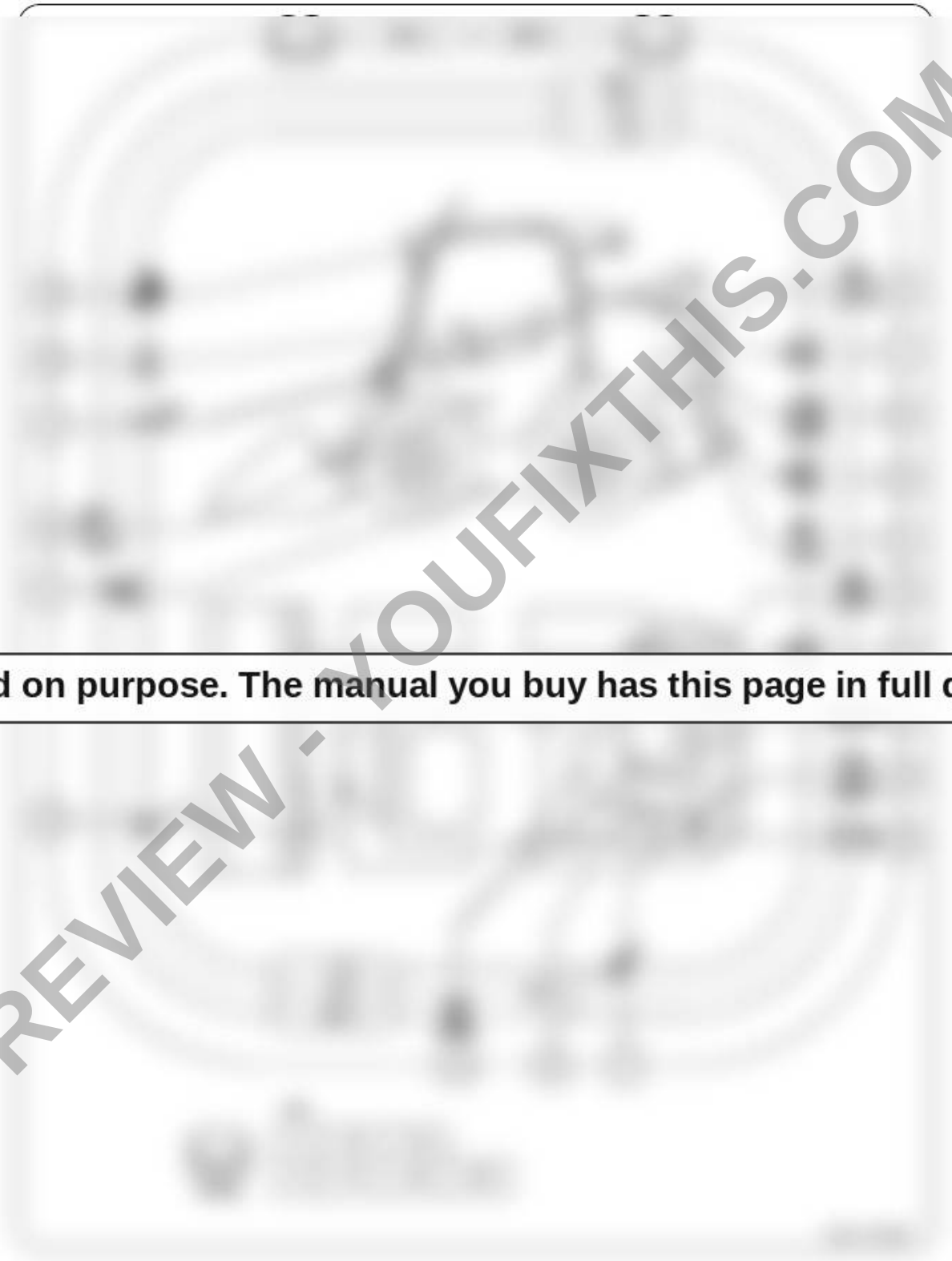

**A** Mounting nut
**C** Compression plate

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Figure 18. 135, 155



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**Notice:** The engine and other components could be damaged by high pressure washing systems. Special precautions must be taken if the machine is to be washed using a high pressure system.

Make sure that the alternator, starter motor and any other electrical components are shielded and not directly cleaned by the high pressure cleaning system. Do not aim the water jet directly at bearings, oil seals or the engine air induction system.

Use a low pressure water jet and brush to remove dried mud or dirt.

Use a pressure washer to remove soft dirt and oil.

The product must always be greased (if appropriate) after pressure washing or steam cleaning.

## Preparation

1. Make the machine safe.
2. Stop the engine and let it cool for at least one hour. Do not try to clean any part of the engine while it is running.
3. Make sure that all of the electrical connectors are correctly coupled. If the connectors are open, attach the correct caps or seal with water proof tape.

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# 03 - Attachments and Options

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- 03-09-03 Mechanical Quickhitch ..... 03-9
- 03-09-09 Electronic Quickhitch ..... 03-11

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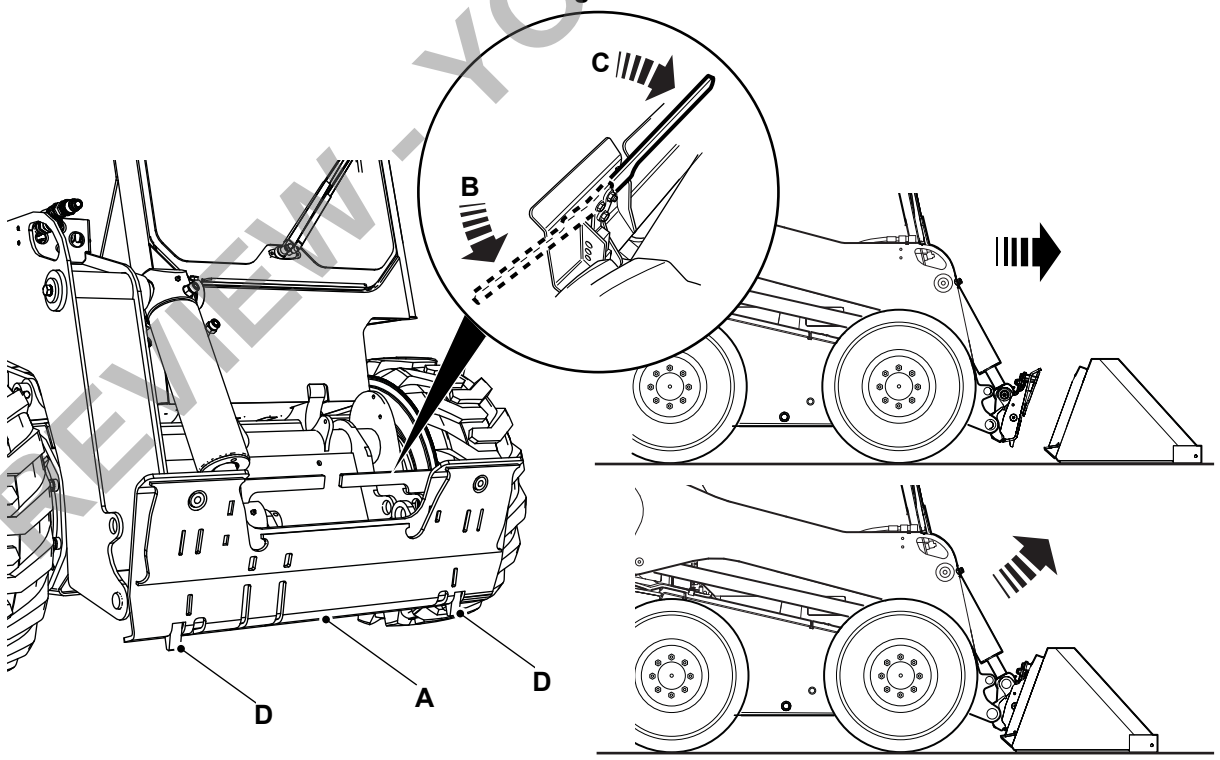
# 03 - Mechanical Quickhitch

## Disconnect and Connect

### Connect

1. Align the machine square to the shovel/attachment.
2. Lower the lift arm fully to bring the quickhitch plate below the level of the lips on the shovel/attachment. Move the levers (one each side of quickhitch plate) fully out.
3. Drive the machine slowly forward. Stop when the quickhitch plate just touches the shovel/attachment.
4. Raise the lift arm and engage the hitch plate in the lips on the shovel/attachment. Stop the movement as soon as the plate is engaged.
5. Move the lift arm control lever to roll back the shovel/attachment slightly.
6. Stop the engine and remove the ignition key.
   6.1. If the keyless ignition option is installed, stop the engine and wait.
   Duration: 15s
7. Raise the safety control locks and dismount the machine.
8. Push the levers fully in, to engage the quickhitch locking pins. Check that the levers are locked into the detents.
9. Check that the locking pins are engaged through the attachment.
10. The shovel/attachment is now locked onto the quickhitch.
11. If appropriate connect the attachment tail hoses lift arm pipework.
12. Return to the cab seat and lower the safety control locks. The shovel/attachment is now ready for use.

**Figure 19.**




**A** Quickhitch plate
**B** Levers out
**C** Levers in
**D** Quickhitch locking pins



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Notes:

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6. Install it in its locking position.

### Operation Position

1. Remove the locking pin from its locking position. Refer to Figure 25.
2. Install it in its stowage position. Refer to Figure 26.
3. Swing the door to the right and push it closed.
4. Lock the rear cover (if lock is installed).

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# 12 - Lift Arm

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# 00 - General

## Introduction

The machine has identification plates that contain important information relating to the specific machine details, for example VIN or PIN number and engine serial number. These serial numbers can help you identify exactly what equipment has been installed on the machine.

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## Remove and Install

**Special Tools**

| Description | Part No. | Qty. |
|---|---|---|
| Lifting Brackets | 892/01160 | 1 |

**Lifting Equipment**

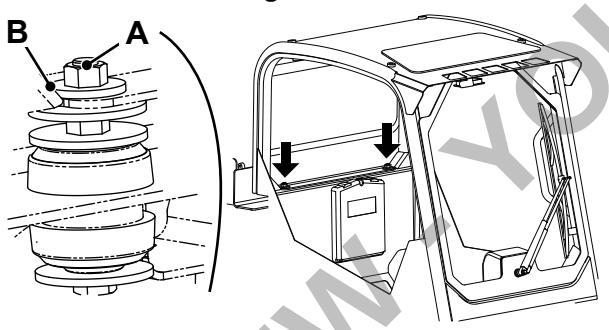
You can be injured if you use incorrect or faulty lifting equipment. You must identify the weight of the item to be lifted then choose lifting equipment that is strong enough and suitable for the job. Make sure that lifting equipment is in good condition and complies with all local regulations.

The procedure for cab and canopy models is the same.

## Remove

1. Make the machine safe with the lift arm raised. Refer to (PIL 01-03).
2. Remove the two rear mounting nuts and compression plates that secure the cab at the rear.

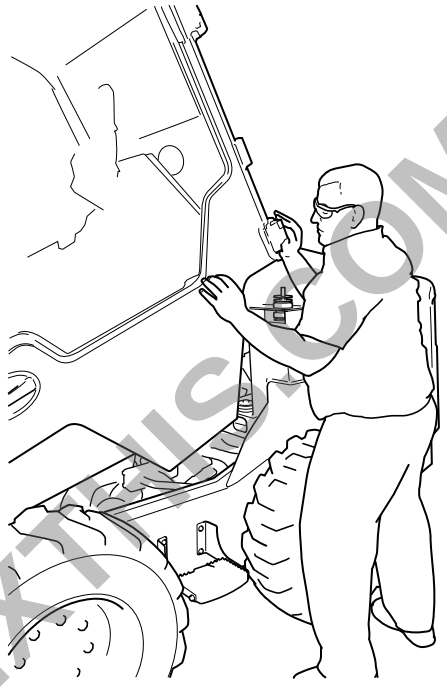
**Figure 49.**




**A** Mounting nuts
**B** Compression plates

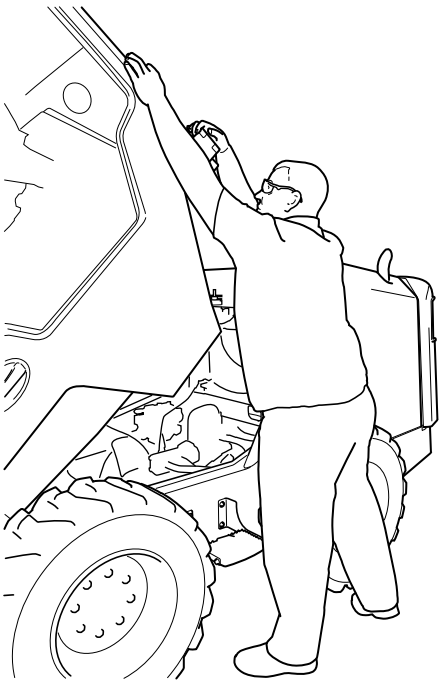
3. Raise the cab by lifting the corner of the cab behind the operator's door. Do not try to raise the cab by pulling on the front of the cab.

**Figure 50.**



4. Unfold the safety strut from the stowed position. Position the cab safety strut to support the cab.

**Figure 51.**



5. Disconnect the cab harness connection(s).

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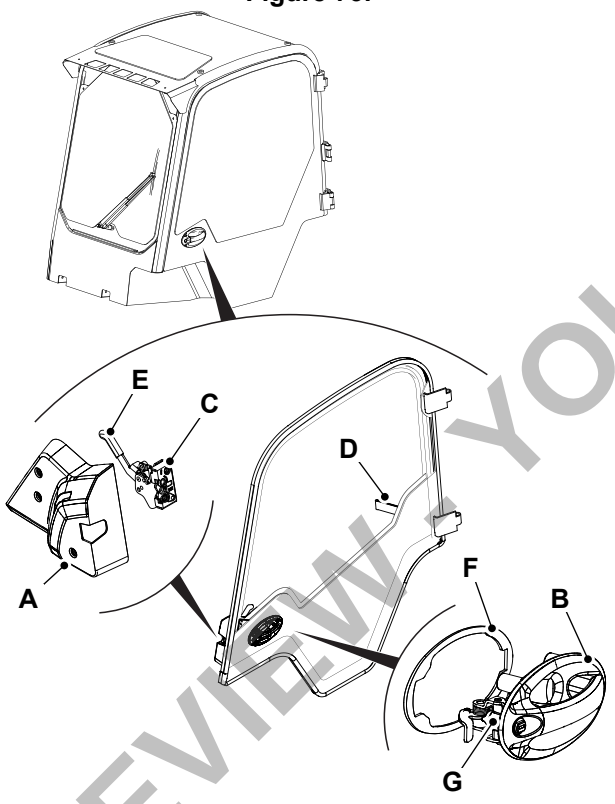
# 03 - Interior Door Handle

## Remove and Install

### Remove

1. Make the machine safe with the lift arm lowered. Refer to Maintenance, Prepare the Machine for Maintenance.
2. Remove the screws, remove the inside door latch cover.
3. Remove the screws, remove the door latch and interior door handle.

**Figure 73.**




**A** Door latch cover
**C** Door latch
**E** Interior door handle

### Install

1. Replacement is a reversal of the removal procedure.

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# 00 - General

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Fault-Finding ..... 12-13
Discharge and Pressurise ..... 12-15
Check (Leaks) ..... 12-18
Check (Level) ..... 12-18
Check (Operation) ..... 12-19

## Introduction

To maintain optimum operator comfort in warm climates or during seasons of high ambient temperature, the air conditioning system delivers cool, dehumidified air into the cab. Cooling is provided by passing the warm ambient air, together with recirculated air, over an evaporator matrix in the air conditioning unit.

The air conditioning system is a closed circuit through which the refrigerant is circulated, its state changing from gas to liquid and back to gas again, as it is forced through the system. The major components of the system are the:

- Compressor
- Condenser matrix
- Receiver drier
- Expansion valve
- Evaporator matrix

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# 01 - Machine

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- 01-09-15 Service Point Locations ..... 01-22

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- 01-33-00 General ..... 01-27


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## Health and Safety

**Attachments**

Use only the JCB approved attachments that are specified for your machine. Operating with non-specified attachments can overload the machine, causing possible damage and machine instability which could result in injury to yourself or others.

The use of non-approved attachments could invalidate your warranty.

**Attachments**

If you have an attachment which is not covered in the Operator's Manual do not install it, use it or remove it until you have obtained, read and understood the pertinent information. Install attachments only on the machines for which they were designed.

***WARNING!*** *Load and unload on firm, level ground. Always be alert for possible hazards. Take special care when turning or reversing.*

***DANGER!*** *Before lowering the attachments to the ground, make sure that the machine and the area around it are clear of other people. Anyone on or close to the machine could fall and be crushed by the attachments, or get caught in the linkages.*

***DANGER!*** *Using the forks alone as a working platform is hazardous; you can fall off and be killed or injured. Never use the forks as a working platform.*

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Notes:

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## Remove and Install

**Consumables**

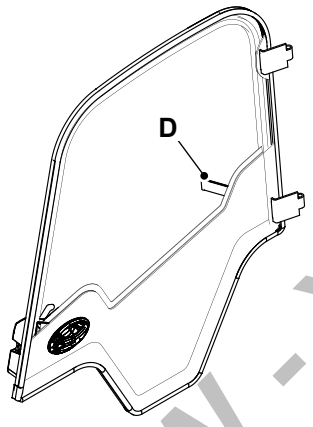
| Description | Part No. | Size |
|---|---|---|
| Extreme Performance Moly Grease | 4003/1327 | 0.4kg |
| | 4003/1326 | 12.5kg |

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

### Remove

1. Make the machine safe with the lift arm lowered. Refer to (PIL 01-03).
2. Remove one end of the gas strut from the door. If necessary, remove the gas strut completely.
3. Unhook the check strap.

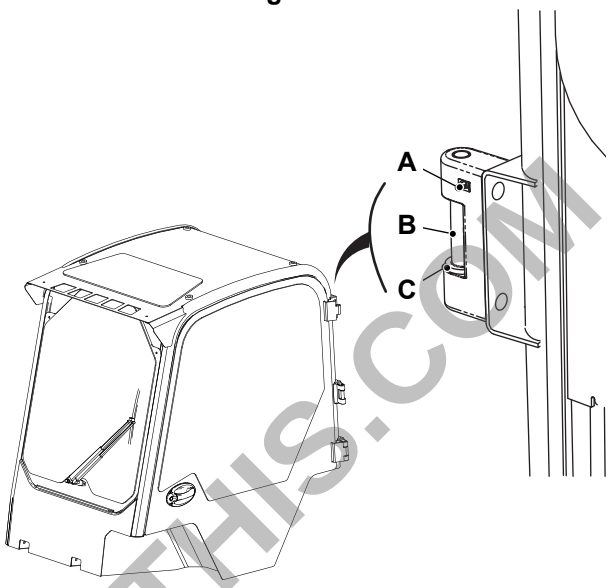
**Figure 67.**




**D** Check strap

4. Remove the setscrew from the upper and lower hinges.
5. Remove the hinge pin from the upper and lower hinges.

**Figure 68.**




**A** Setscrew
**B** Hinge pin
**C** Bush

6. Lift the door off its hinges and move to a safe place.
7. If worn, the bushes can be removed from the hinge brackets on the door and replaced.
8. If the hinge pins are worn they must be replaced.
9. If necessary, unscrew the nut and remove the washer and lock pin. Renew any worn or damaged components.

### Install

1. Replacement is a reversal of the removal procedure. Apply a smear of grease to the hinge pins.

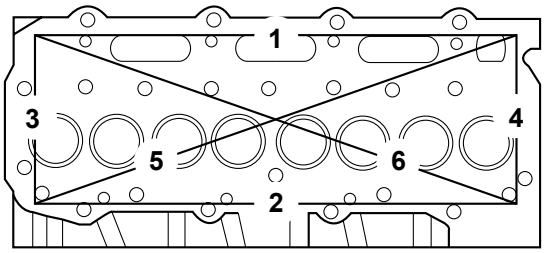
   Consumable: Extreme Performance Moly Grease

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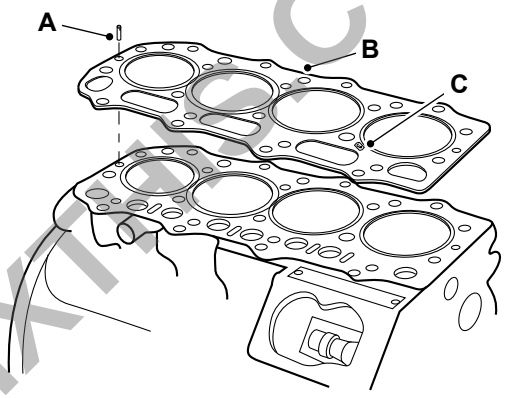
Figure 102.




## Calibrate

- The dowel pins in the crankcase hold the cylinder head gasket in the correct position when the cylinder head is installed. Refer to Figure 103.
- The stamped marking on the cylinder head gasket must face upward. This makes sure that the cylinder head gasket is installed correctly. Refer to Figure 103.

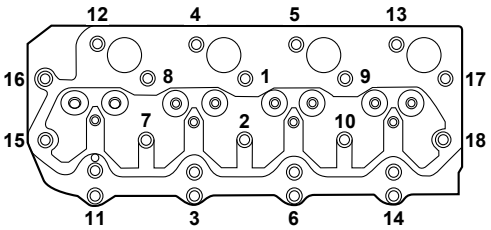
Figure 103.




**A** Dowel pins
**B** Gasket
**C** Stamped marking

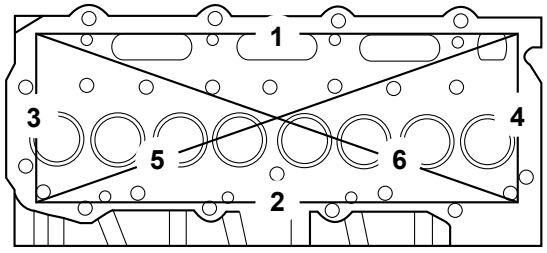
- Before you tighten the bolts, apply clean engine oil on the threads of the bolts. The bolts must be tightened to the torque of 101N·m in the specified numerical sequence only. Refer to Figure 104.

Figure 104.




- Use a straight edge and a feeler gauge to check the six positions for distortion. Refer to Figure 105.

Figure 105.




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## Technical Data

**Table 75. Injection timing**

| Engine | Maximum rated engine speed | Injection timing (BTDC)(1) |
|---|---|---|
| 404D-22 Industrial engine | 2200 RPM (Revolutions Per Minute) | 19 ± 1° |
| | 2400 RPM | 19 ± 1° |
| | 2600 RPM | 20 ± 1° |
| | 2800 RPM | 20 ± 1° |
| | 3000 RPM | 20 ± 1° |
| | 2800 RPM DE-RATE | 20 ± 1° |
| | 3000 RPM DE-RATE | 20 ± 1° |
| 404D-22 with balancer | 2800 RPM | 20 ± 1° |

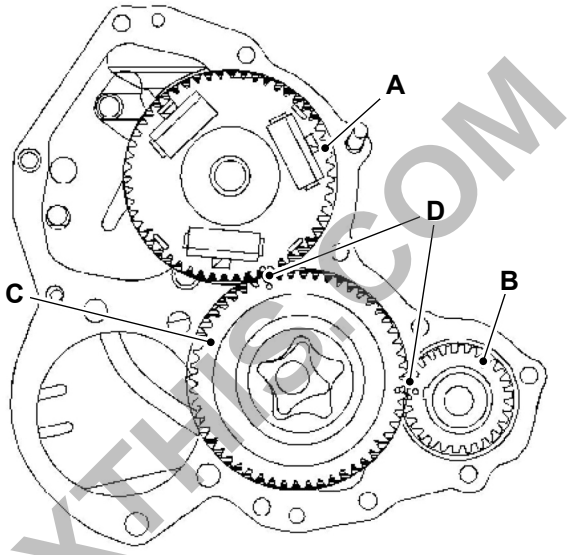
*(1) Before Top Dead Center*

**Table 76. Backlash for all gears**

| | |
|---|---|
| Minimum | 0.08mm |
| Maximum | 0.25mm |

## Component Identification

**Figure 195.**




**A** Camshaft gear
**B** Crankshaft gear
**C** Idler gear
**D** Timing mark

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# 21 - Governor

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Component Identification ..... 18-34
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Adjust ..... 18-36
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## Introduction

The governor is installed on the fuel injection pump on a diesel engine.

The governor reduces the fuel input to the injectors by altering the effective stroke of the fuel pump under no load. As the load increases, the governor adjusts the fuel pump to send more fuel to the injectors as required.

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# Fault-Finding

**Fault**

Hydrostatic Transmission Faults Table 115. Page 27-18

**Table 115. Hydrostatic Transmission Faults**

| Cause | Remedy |
|---|---|
| No oil in hydrostatic system | Check supply of oil to pump. |
| Isolator bar or arm rest not in correct position | Ensure isolator bar and arm rest are in operating position, check electrical wiring and switch as required. |
| Tyres worn or pressure incorrect | Check tyre pressures and condition. |
| Charge pressure incorrect | Charge pressure is controlled by the Charge Pressure Relief Valve, Carry out flow check. |
| No or low pump output | Check pump - Carry out wheel speed check. If one pump suspect, swap the motor feed hoses and notice if problem changes sides - if 'yes', pump related fault; if 'no', motor related fault. |
| A high pressure 'loop' relief valve/tow valve open/set incorrectly | Replace relief valve and re-check. |
| Pump neutral position set incorrectly | Adjust servo neutral position. |
| Pump servos incorrectly set | Adjust servos. |
| Feed hose failure | Check motor feed hoses. |
| Brake hose failure | Inspect brake hoses. |
| Brake release pressure incorrect | Check charge/brake pressure. |
| Electrical failure (brake valve circuit) | Check brake valve electrical circuit. |
| Brake valve inoperative | Check valve (sticking spool, etc.). |
| Brakes not released | Inspect motor brakes for seal damage. Repair as required. |
| Mechanical brake failure | Check brake components (worn plates, spring damage, etc.). |
| Motor leakage | Check motor case drain for confirmation of internal leakage (compare one motor with the other). Pulsing leakage indicates piston ring damage; continuous leakage, possibly more in one direction than the other, indicates distributor seal damage. On wheeled machines, check for shaft seal leakage by checking chain case oil level - increase in oil level indicates possible leakage. |
| Joystick inoperative | Check joystick (plunger movement, leaking seals, etc.) |
| Chain tension | Check chain tension. |
| Motor failure | Inspect motor for damage. Check the screen for sign of damage. Repair as required. |
| Chain/sprocket damage | Inspect chain and sprocket. Repair as required. |
| Pump/engine drive coupling failure | Check coupling. |
| Internal damage | Noise once per revolution indicates piston damage. Noise eight times per revolution indicates cam damage. Repair as required. |
| Timing incorrect or stop pin damaged | Inspect motor for damage or incorrect timing. Check charge pressure. Repair as required. |

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## 12 - Suction Strainer

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## Introduction

The suction strainer is a component used for trapping large and coarse particles, preventing them entering the hydraulic system. The strainer is usually located inside the hydraulic tank, at the hydraulic pump suction port.

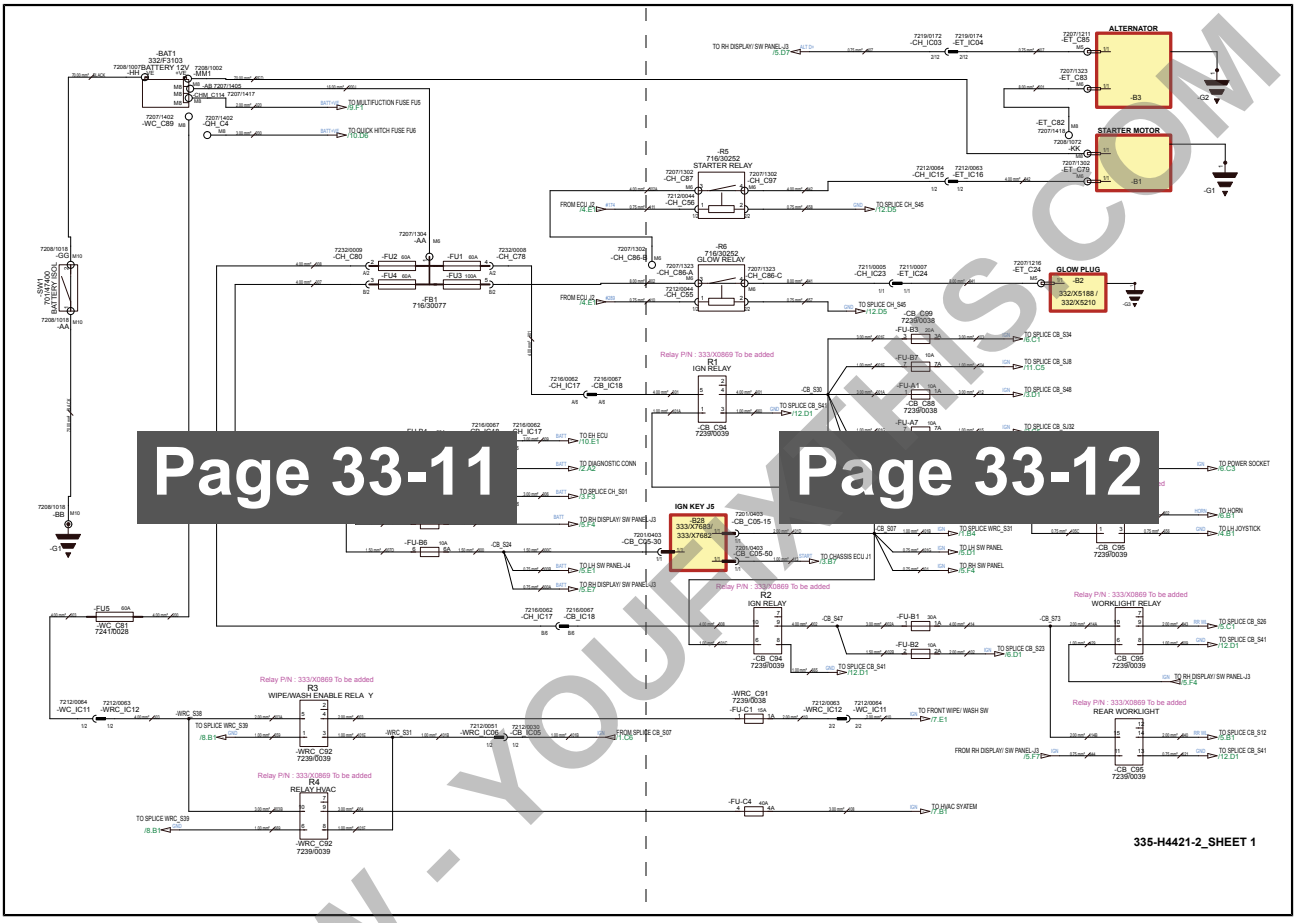
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## Diagram

**Figure 465. Ignition Switch, Ignition Relay, Fuses**



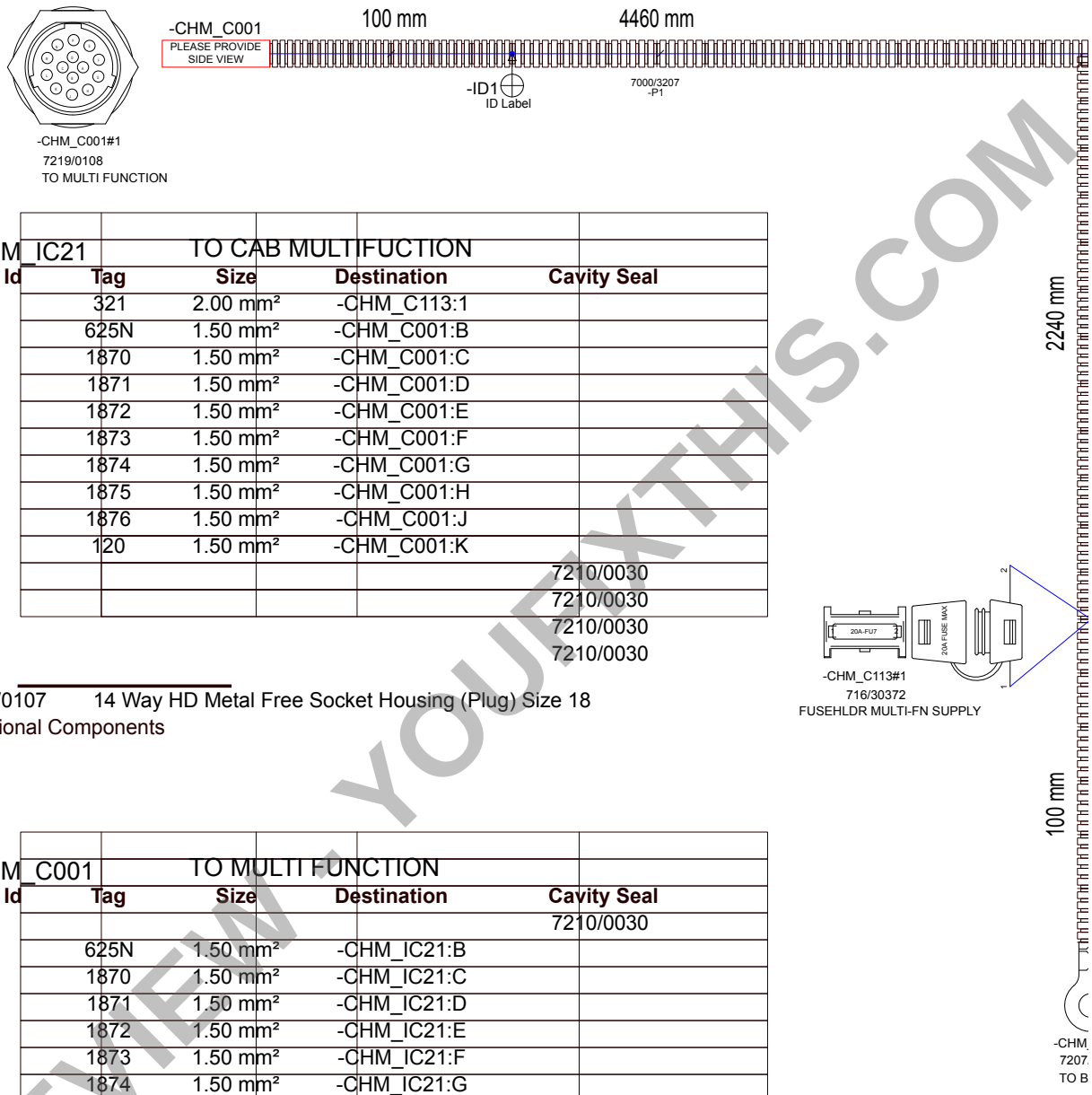

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**Figure 518. (Part 1 of 2)**

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-CHM_IC21 TO CAB MULTIFUCTION

| Cav Id | Tag | Size | Destination | Cavity Seal |
|---|---|---|---|---|
| A | 321 | 2.00 mm² | -CHM_C113:1 | |
| B | 625N | 1.50 mm² | -CHM_C001:B | |
| C | 1870 | 1.50 mm² | -CHM_C001:C | |
| D | 1871 | 1.50 mm² | -CHM_C001:D | |
| E | 1872 | 1.50 mm² | -CHM_C001:E | |
| F | 1873 | 1.50 mm² | -CHM_C001:F | |
| G | 1874 | 1.50 mm² | -CHM_C001:G | |
| H | 1875 | 1.50 mm² | -CHM_C001:H | |
| J | 1876 | 1.50 mm² | -CHM_C001:J | |
| K | 120 | 1.50 mm² | -CHM_C001:K | |
| L | | | | 7210/0030 |
| M | | | | 7210/0030 |
| N | | | | 7210/0030 |
| P | | | | 7210/0030 |

7219/0107 14 Way HD Metal Free Socket Housing (Plug) Size 18

Additional Components

-CHM_C001 TO MULTI FUNCTION

| Cav Id | Tag | Size | Destination | Cavity Seal |
|---|---|---|---|---|
| A | | | | 7210/0030 |
| B | 625N | 1.50 mm² | -CHM_IC21:B | |
| C | 1870 | 1.50 mm² | -CHM_IC21:C | |
| D | 1871 | 1.50 mm² | -CHM_IC21:D | |
| E | 1872 | 1.50 mm² | -CHM_IC21:E | |
| F | 1873 | 1.50 mm² | -CHM_IC21:F | |
| G | 1874 | 1.50 mm² | -CHM_IC21:G | |
| H | 1875 | 1.50 mm² | -CHM_IC21:H | |
| J | 1876 | 1.50 mm² | -CHM_IC21:J | |
| K | 120 | 1.50 mm² | -CHM_IC21:K | |
| L | | | | 7210/0030 |
| M | | | | 7210/0030 |
| N | | | | 7210/0030 |
| P | | | | 7210/0030 |

7219/0108 14 Way HD Bulkhead Metal Pin Hsg Size 18

Additional Components

7210/0120;1 # Size 18 Lockwasher
7210/0126;1 # Size 18 Metal Locknut
7210/0127;1 # HD30 Dust Cap Size 18 Metal Chain & eyelet
7243/0314;1 # NYLON ( PA6) BACKSHELL

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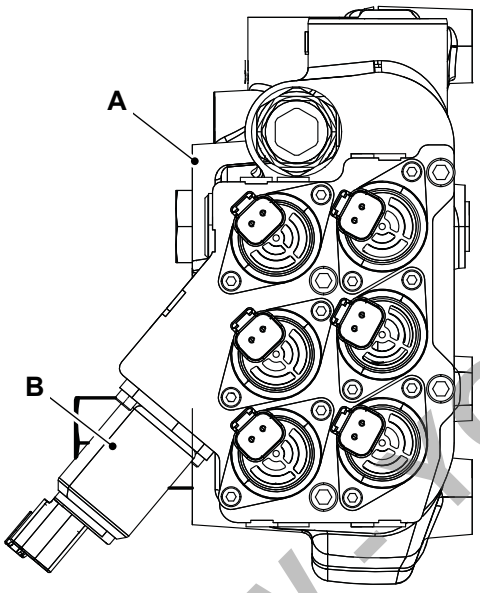
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# Remove and Install

## Remove

1. Make the machine safe with the lift arm lowered. Refer to (PIL 01-03).
2. Disconnect the battery. Refer to (PIL 33-03).
3. Raise the operator station. Refer to (PIL 09-00).
4. Disconnect the electrical connection.
5. Remove the implement pilot solenoid.

**Figure 563.**




**A** Lift arm valve block
**B** Implement pilot solenoid

## Install

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

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