# SERVICE MANUAL

SKIDSTEER LOADER

**135, 155, 175, 190, 205**

EN - 9813/6750 - ISSUE 1 - 04/2016

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.

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# Fault-Finding


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**Table 20. Engine - Will Not Start or Difficult to Start (No Exhaust Smoke)**

| Cause | Remedy |
|---|---|
| No fuel in supply tank. | Check the level in the fuel tank, use sight gauge or dipstick. Replenish as required. |
| Starter switch or starter electrical system failure. | Check the operation of the starter switch. Check the correct electrical wires for open or short circuits. |
| Improper starting procedure. | Verify proper starting procedure. |
| Fuel Filter blocked with water or other contamination. | Drain fuel/water separator or replace fuel filter. |
| Defective fuel lift pump (fuel supply inadequate). | Check that the lift pump operates and delivers fuel to the high pressure fuel pump. Check the correct electrical wires for open or short circuits. Check fuses. |
| Fuel is aerated. | Check the fuel system for loose connections and possible air ingress points. Rectify and bleed the fuel system. |
| Fuel inlet restriction. | Maximum inlet restriction to fuel lift pump must not exceed 100mm Hg. |
| Air intake or exhaust system blocked. | Visually check the air intake and exhaust system for blockage or obstruction. Remove as required. Check the air filter elements for signs of blocking. Replace as required. |
| Fuel drain return line blocked, not connected properly. | Verify that the fuel return line is not obstructed and connected to the top of the fuel tank. |
| One or more fuel injectors worn or malfunctioning. | Check the electronic fault codes. Check the electrical connections at the injectors. |
| ECM (Engine Control Module) or electrical sensor fault. | Check the electronic fault codes. Check the electrical connections at the ECM and sensors. |
| Worn or malfunctioning high pressure fuel pump. | Check the electronic fault codes. Do all the necessary fault finding checks before removal of the high pressure fuel pump. |
| Injectors Contaminated. | Check the injectors. Use the Servicemaster test procedure in Servicemaster Tools Actuator Test. Test and replace as required. |



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**Table 205. Wires 200-399, 2000-3999 (These numbers are reserved for battery feeds)**

| Wire Number | Description |
|---|---|
| Wires 200-299 and 2000-2999 | Unfused battery feeds. Power supplies output by an ECU. |
| Wires 300-399 and 3000-3999 | Fused battery feeds. Power supplies output by an ECU. |

**Table 206. Wires 400-599, 4000-5999**

| Wire Number | Description |
|---|---|
| Wires 400-599 and 1000-5999 | These numbers are reserved for instruments, sensors and variable input/output signal wires used in electronic systems. CAN (Controller Area Network) wires also use numbers in this series. |

**Table 207. Wires 600-799, 6000-7999**

| Wire Number | Description |
|---|---|
| Wires 600-799 and 6000-7999 | These numbers are used for earth wires. When the number is printed on to a wire it is prefixed by the Earth symbol. This symbol is printed onto the wire, it may however be omitted from harness drawings. Where a load is switched negative, the wire number from the load to the switch shall be different to that of the wire from the switch to the earth. |

**Figure 491.**



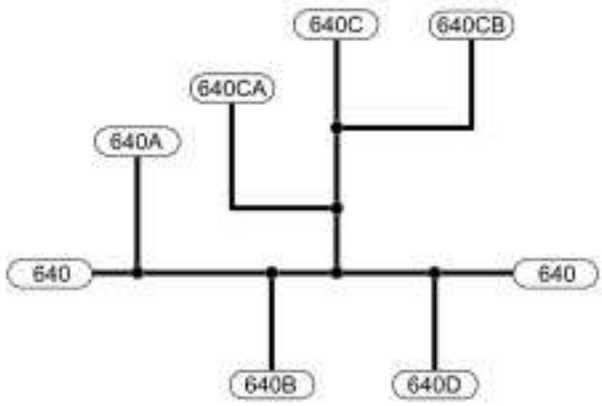

**Table 208. Wires 800-999, 8000-9999**

| Wire Number | Description |
|---|---|
| Wires 800-999 and 8000-9999 | These numbers are reserved for switched supplies to electrical loads, i.e. to lights, etc. Power supplies output by an ECU |

**Table 209. Wires In Splices**

| Wire Number | Description |
|---|---|
| Various | The main input wire is allocated with a wire number and a suitable description, i.e. Wire 640 earth splice to earth. The additional wires in the splice are allocated the same wire number and a postfix, i.e. 640A, 640B, etc. |

**Figure 492.**




**General Points**

1. Wires continue to have the same number even after passing through a connector block to another harness.
2. The descriptions are applicable to JCB specification wiring harnesses. The machine may be installed with some wiring that does not conform to the JCB specifications, typically when it is part of equipment supplied by other manufacturers.



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## Technical Data

**Table 249. Sealants Approved Product Information**

| Subsection | Commercial name | Product Number | Colour | Shelf life | Technical data | Comments |
|---|---|---|---|---|---|---|
| High strength | Loctite 275<br>Permabond A140 | 4102/0500 | Green | 730d | 250bar (3,623.2psi) torque strength (on M8) | Non drip formulation, used on larger fittings, coarse threads. |
| High strength | Forgeway 240FC | 4102/3100 | Yellow | 270d | 25bar (362.3psi) breaking strength | Can be painted over with some 2 pack paint. Maximum width of joint =35mm, minimum width =2mm, minimum depth =2mm. Recommended depth of joint = width of joint. |
| Medium to high strength | Loctite 620 | 4102/3500 | Green | - | 172bar (2,492.7psi) shear strength | Used for locating pins in radiator assemblies, sleeves into pump housings and bearings in auto transmissions. Not suitable for plastics. |
| Medium strength | Loctite 518 | 4102/2000 | Red, fluorescent | 365d | 90bar (1,304.3psi) tensile strength | Typically used as form-in-place gasket on rigid flanged connections. |
| Medium strength | Loctite 5182 | 4102/4100 | Red gel, fluorescent | - | 80bar (1,159.4psi) shear strength | It is manufactured to minimise air bubbles in the package. Used to seal gaskets, housings, cases and covers. It can also be used to repair and replace cut gaskets (up to 0.08mm in thickness). |
| Medium strength | Loctite 595 | 4102/2500 | Clear | 365d | 6mm gap filling | Formulated to withstand weathering and extreme temperature cycling. Used for potting, coating and sealing. Can be applied horizontal, vertical and overhead. |
| Medium strength | Loctite 577<br>Permabond A1044 | 4102/1900 | Yellow | 365d | 170bar (2,463.8psi) breakaway torque | A fast curing thread sealant used on coarse threads and pipe fittings up to 75mm thread size. Clearance for gap filling 0.8mm. |
| Medium strength | Loctite 2431 | 4102/2700 | Blue | 365d | 140–340bar (2,029.0–4,927.5psi) breakaway torque | Taper thread sealant, non-fluorescing to see oil leaks. Suitable for all taper fittings up to M36. |
| Low strength | Clayton Dewandre air brake sealant SC1252 | 4102/2200 | White opaque | 12h full cure | Maximum seal pressure 29bar (420.3psi) | Seals pipes and plugs against leakage of air, fuels, lubricants and coolants. Hardens to a tough seal resistant to shock and vibration. Easily dismantled. |
| Low strength | Red Hermetite | 4102/0800 | - | - | Resistant to oil | Non-hardening paste jointing for joints regularly opened for servicing. |



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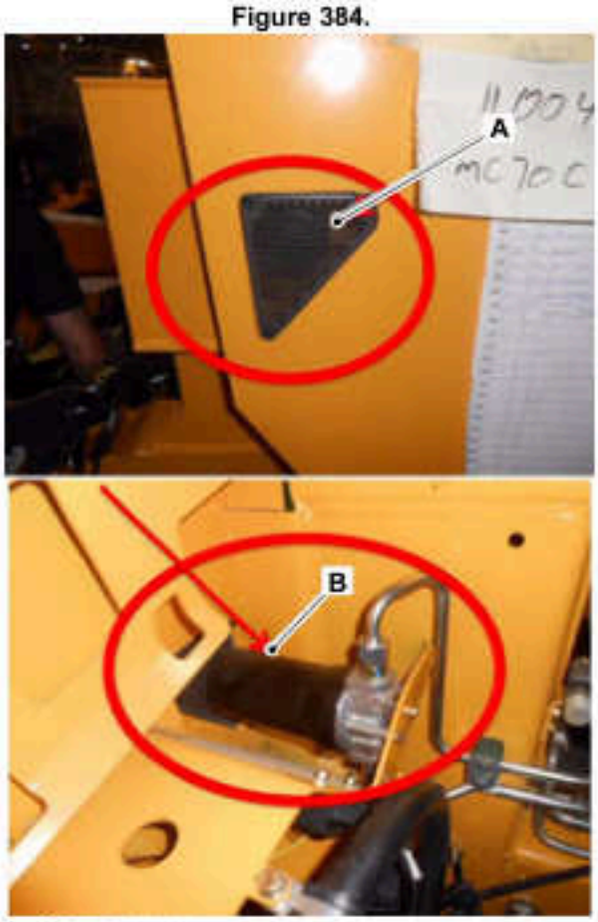
## Remove and Install

**Notice:** Ensure that dirt etc. does not enter the hydraulic system during this job.

### Remove

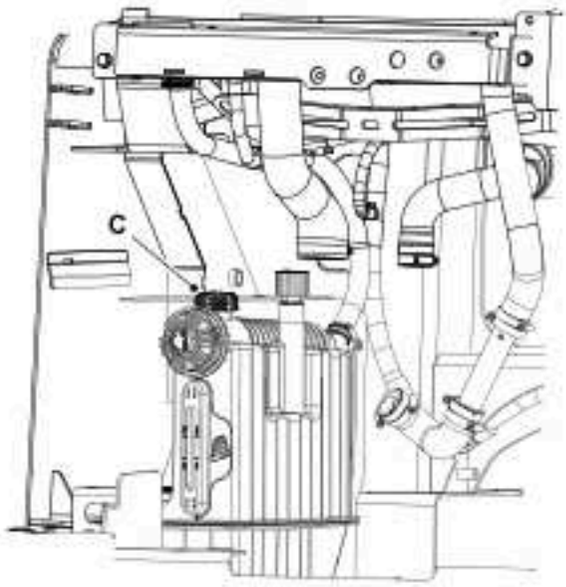
1. Make the machine safe with the lift arm lowered. Refer to (PIL 01-03).
2. Open the engine compartment. Refer to (PIL 06-06).
3. Loosen the hydraulic tank filler cap and allow all pressure to dissipate.
4. Remove the side access cover.
5. If necessary, drain and flush the hydraulic tank. Refer to (PIL 30-00).
6. Remove and discard the charge filter.
   6.1. You must dispose of the old filters in accordance with your local Health and Safety regulations.

**Figure 384.**




**A** Access cover
**B** Hydraulic charge filter

**Figure 385.**




**C** Tank filler cap

### Install

1. The installation procedure is the opposite of the removal procedure.
2. Lubricate the seal on the new filter with clean oil.
3. Slide the new filter into the filter base.
4. Make sure that the O-ring seats properly.
5. Check the oil level and fill as required. Refer to (PIL 30-00).
6. Install the tank filler cap.
7. Run the engine for a few minutes to check for leaks.
8. Add oil to the correct level. Refer to (PIL 30-00).
9. Tighten the tank filler cap to the correct torque value.

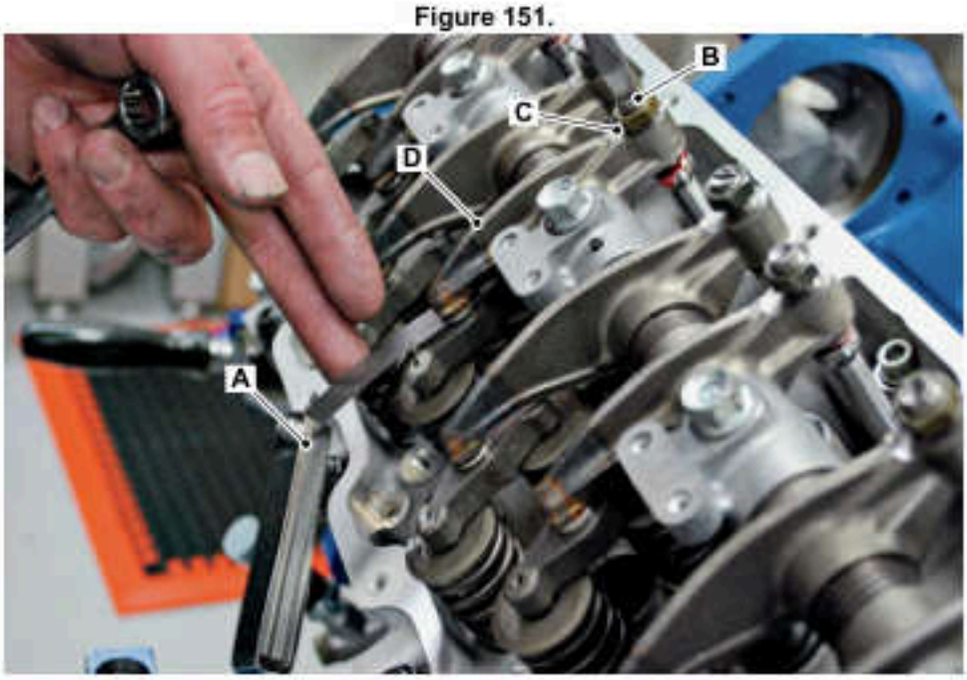
**Table 166. Torque Values**

| Item | Description | Nm |
|---|---|---|
| C | Tank filler cap | 50 |



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Figure 151.




**A** Feeler gauge
**B** Adjusting screw
**C** Locknut
**D** Rocker arm

6.3. Hold the locknut and turn the adjustment screw.

6.4. Adjust the valve lash until the correct specification is achieved.

6.5. After each adjustment, hold the adjusting screw and tighten the locknut.

7. Rotate the crankshaft in a clockwise direction to the specified angle.

   Angle: 180°

8. When the inlet valve of the No. 2 cylinder has started to open and the exhaust valve of the No. 2 cylinder has not completely closed, make sure that the "Top" mark on the timing case aligns with "Middle dot" on the crankshaft pulley.

9. Check the valve lash of the inlet valve and the exhaust valve of the No. 3 cylinder. If necessary, do the step 6

10. Rotate the crankshaft in a clockwise direction to the specified angle.

    Angle: 180°

11. When the inlet valve of the No. 1 cylinder has started to open and the exhaust valve of the No. 1 cylinder has not completely closed, make sure that the "Top" mark on the timing case aligns with "Single dot" on the crankshaft pulley.

12. Check the valve lash of the inlet valve and the exhaust valve of the No. 4 cylinder. If necessary, do the step 6

13. Rotate the crankshaft in a clockwise direction to the specified angle.

    Angle: 180°

14. When the inlet valve of the No. 3 cylinder has started to open and the exhaust valve of the No. 3 cylinder has not completely closed, make sure that the "Top" mark on the timing case aligns with "Middle dot" on the crankshaft pulley.

15. Check the valve lash of the inlet valve and the exhaust valve of the No. 2 cylinder. If necessary, do the step 6

16. Install the timing gear front case. Refer to (PIL 15-51).



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