# CX235C SR
# Tier 4
## Crawler Excavator

# SERVICE MANUAL

**Part number 84577150**
1st edition English
February 2012

CASE CONSTRUCTION

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## Large oil consumption

1. Large oil consumption Description of Symptom
   The oil consumption amount described in the manual of the actual unit is significantly exceeded.
2. Large oil consumption Diagnostics

   - Preliminary inspection
     Before using this section, perform the functional inspection and OBD system check to check all of the following.
     Since the oil consumption varies widely by handling of the actual unit, check the reference oil consumption (A) of the actual unit manufacturer.
     Reference oil consumption/hour
     Reference oil consumption per engine: 4 L ( 1.06 gal ) {4.2 qts}/100 hours Check the actual oil consumption (B).
     Actual oil consumption/hour
     Refer to the inspections and maintenance list in the operation manual and perform the inspection based on the operation time of the actual unit.
     Refer to the actual unit manual to inspect an actual unit whose operation time exceeds 3,000 hours.
     The ECM and monitor are operating correctly.
     DTC check.
     Check the condition of the actual unit, and locate the appropriate symptom.
     Check with the customers whether they are using the specified engine oil and fuel.
   - Visual inspection
     Careful visual inspection is required for several symptom procedures.
     This can lead to fixing a problem without further inspections, and can save valuable time.
     The inspection includes the following.
     Whether bluish white smoke continuously comes out.
     Whether blow-by gas comes out excessively.
     Whether oil is mixed into the coolant.
     Proper connections, cracks, and twists in the pipes and hoses related to oil.
     Extensively check for any leaks or blockage.
     Whether there is any fuel leak, pipe damage, or dents in the lubricant system.
     Abnormalities of the air intake system parts such as the turbocharger inspection
   - Diagnostic aids
     Air intake system abnormalities such as sucked down oil or raised oil and excessive blow-by gas
     Engine body abnormalities such as oil combustion and excessive blow-by gas
     Perform inspections for functional diagnosis, and confirm the operation, control of each part,etc.
     Repair if abnormalities are found.



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**⚠ WARNING**

- **When loosening the check valve, loosen it a little at a time and stop when any grease appears.**
  **The pressure inside the cylinder is very high, so there is the danger of grease being expelled and the plug flying off if the check valve is loosened too much.**

**⚠ CAUTION**

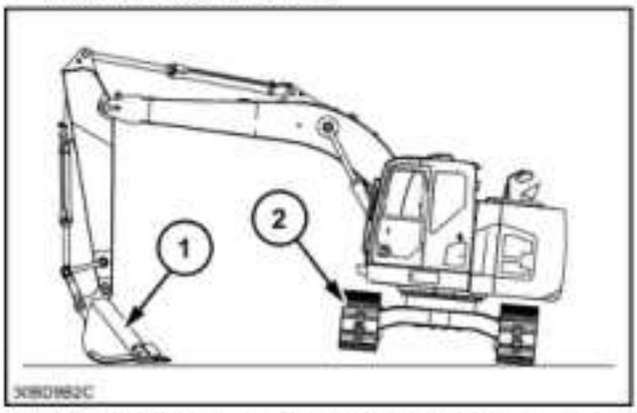
- **Before removing the shoes, be sure to bleed off any air in the hydraulic circuits.**
- **Be sure to inspect the wire rope and other lifting equipment before beginning work.**
- **Do not stand or pass under the suspended load.**

Items to prepare

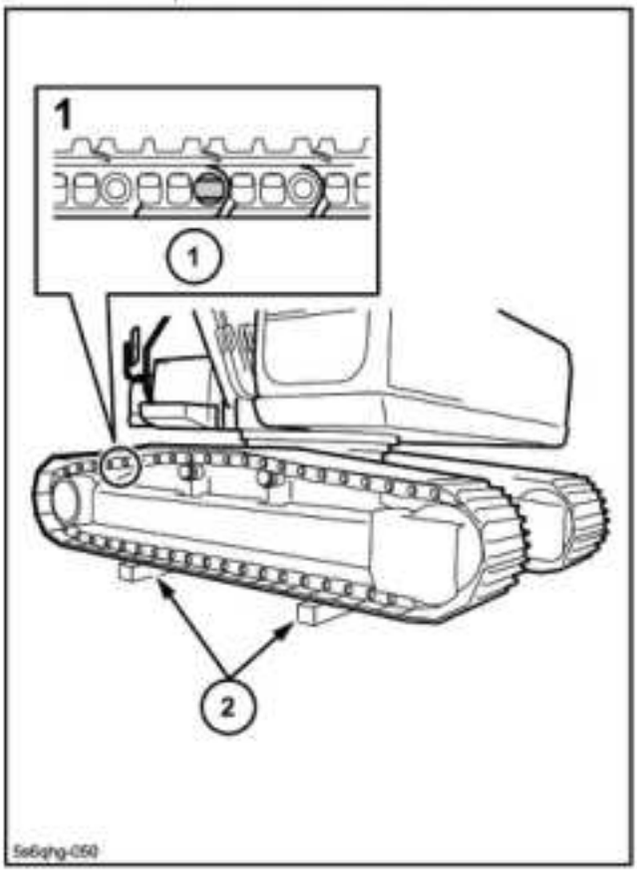
- Box wrenches [ 19 mm ( 0.748 in ) ]
- Wrenches [ 19 mm ( 0.748 in ), 24 mm ( 0.945 in ) ]
- Hammer (to remove the master pin)
- Striking jig (to remove the master pin)
- Liftcrane (with the required lifting capacity)
- Wire rope (with the required breaking load)
- Loctite #262
- Wood plank
- Rag
- Cleaning fluid

## Removal of Sprocket

1. Allow the bucket (1) to touch the ground so as to elevate the shoe (2) of the side to be removed as in the diagram on the right.



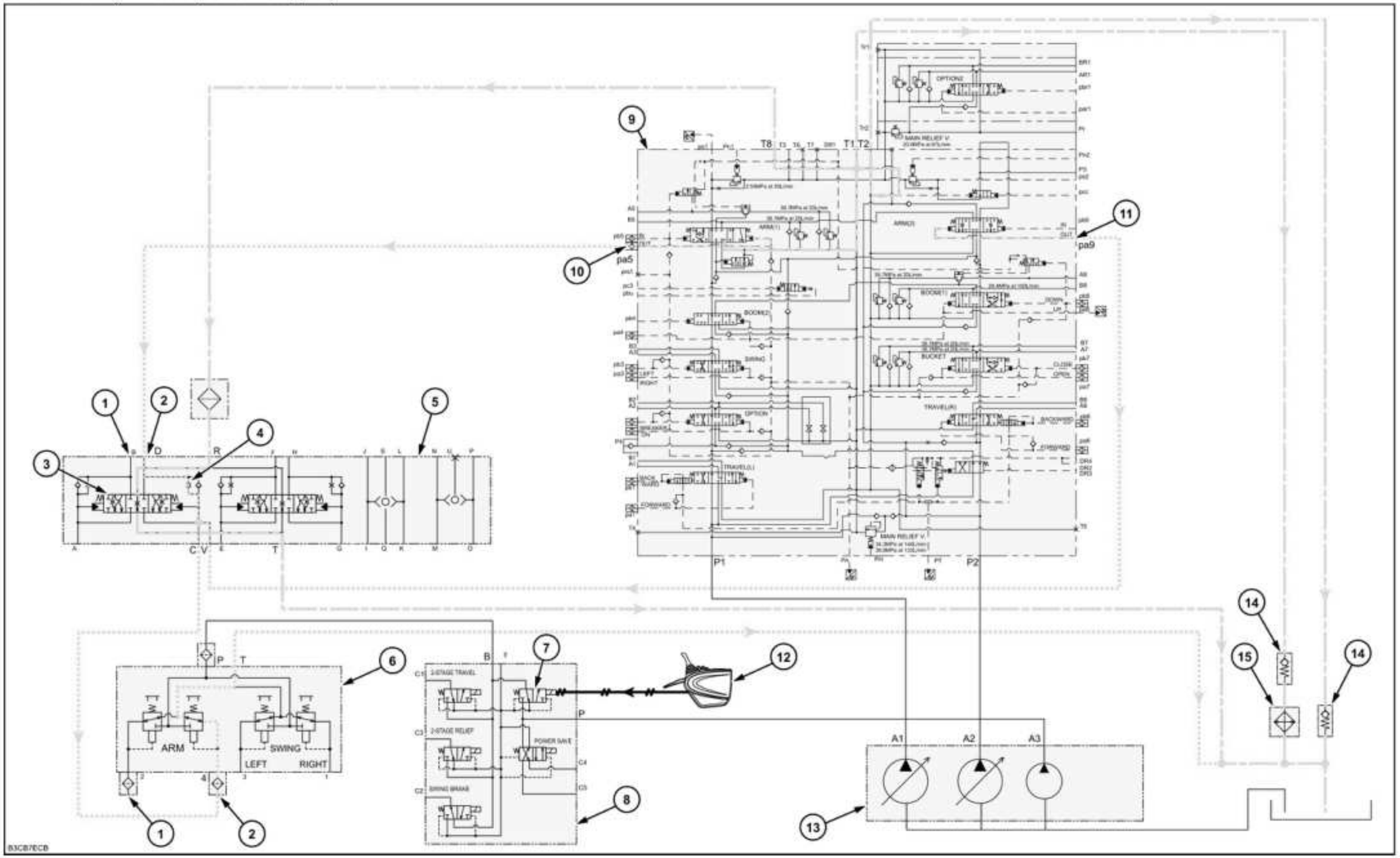

2. Slowly rotate the shoe so that the shoe joint section (1) is aligned as in the diagram on the right.
   Place wood plank (2) under the shoe and return the bucket to its original position.
   Perform air bleeding for the hydraulic line.
   For details, see Air Bleed Procedures.






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Cushion circuit (arm-out operation stopped)





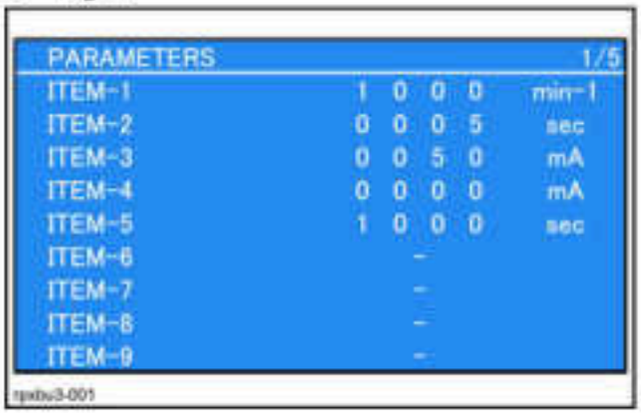

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## PARAMETERS

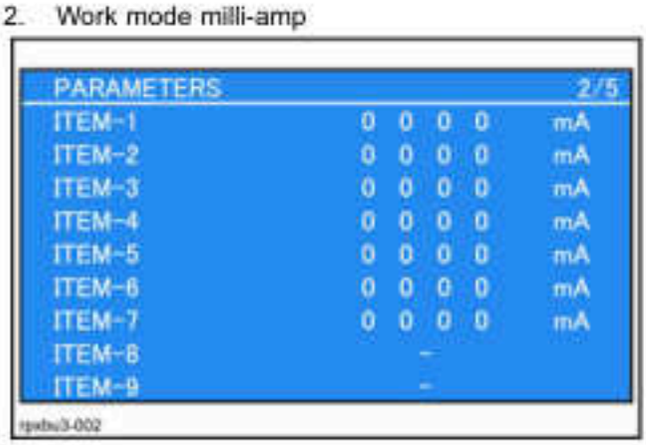
The work mode speed and pump milli-amps can be set.

1. Engine



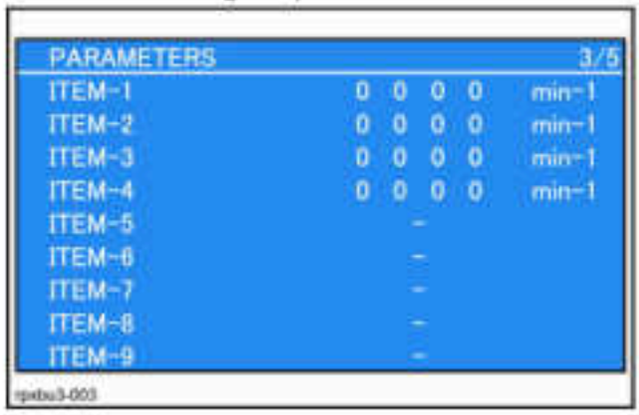

| | | |
|---|---|---|
| ITEM-1 | min$^{-1}$ ( rpm ) | Auto idling speed |
| ITEM-2 | ms*100 | Auto idle time |
| ITEM-3 | mA | Transient load minimum milli-amp (normally 50 mA) |
| ITEM-4 | mA | Semi-transient load minimum milli-amp |
| ITEM-5 | ms*100 | Eco gauge update period (normally 1000 ms) |

2. Work mode milli-amp



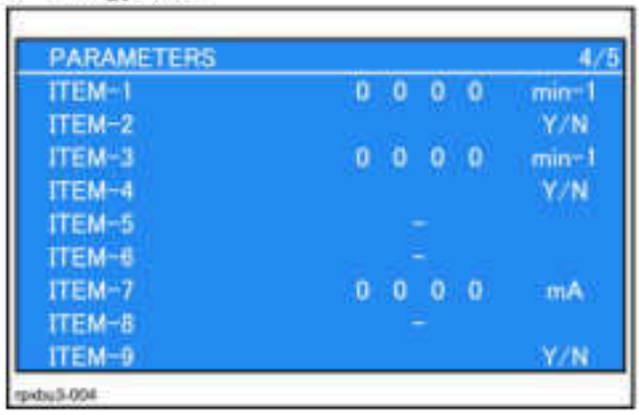

| | | |
|---|---|---|
| ITEM-1 | mA | SP mode milli-amp (Hi) |
| ITEM-2 | mA | SP mode milli-amp (Low) |
| ITEM-3 | mA | H mode milli-amp (Hi) |
| ITEM-4 | mA | H mode milli-amp (Low) |
| ITEM-5 | mA | A mode milli-amp (Hi) |
| ITEM-6 | mA | A mode milli-amp (Low) |
| ITEM-7 | mA | Minimum milli-amp |

3. Work mode engine speed




| | | |
|---|---|---|
| ITEM-1 | min$^{-1}$ ( rpm ) | SP mode speed |
| ITEM-2 | min$^{-1}$ ( rpm ) | H mode speed |
| ITEM-3 | min$^{-1}$ ( rpm ) | A mode speed |
| ITEM-4 | min$^{-1}$ ( rpm ) | Idling speed |

4. Energy save




| | | |
|---|---|---|
| ITEM-1 | min$^{-1}$ ( rpm ) | Speed change amount during boom-down swing operation |
| ITEM-2 | - | - |
| ITEM-3 | min$^{-1}$ ( rpm ) | Semi-auto idling speed change amount |
| ITEM-4 | - | - |
| ITEM-5 | - | - |
| ITEM-6 | - | - |
| ITEM-7 | mA | Speed limit milli-amp |

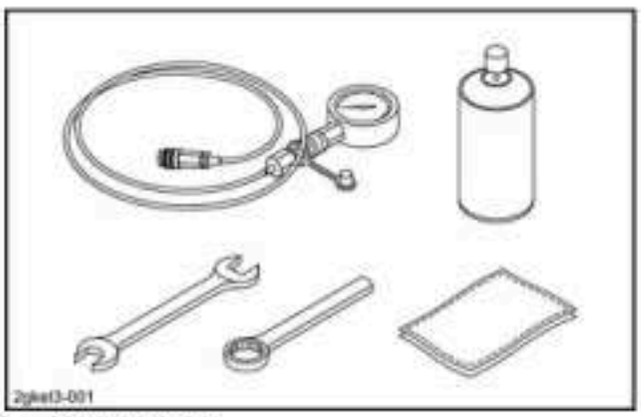


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## Pressure Measurement Preparations

1. Items to prepare

| | |
|---|---|
| 1 ) Pressure gauge | For 10 MPa (1450.54 psi) (for pilot and negative control pressure measurement)<br>For 60 MPa (8703.22 psi) (for main pressure measurement) |
| 2 ) Tool | Wrench (closed wrench)<br>17 mm (0.669 in)<br>Hexagon wrench 6 mm (0.236 in) |
| 3 ) Others | Rag<br>Cleaning fluid |

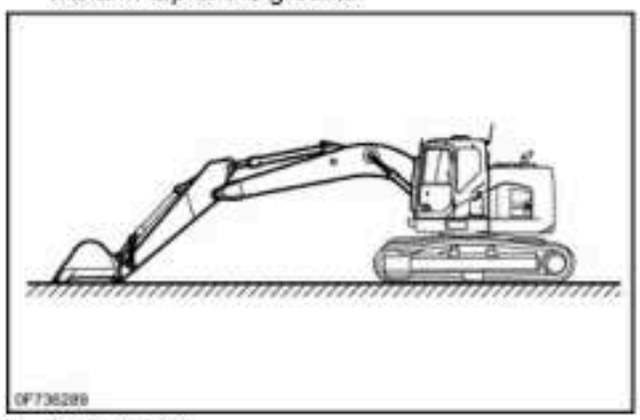



2. Monitor check
Use the service check to check the no-load engine maximum speed and the SP mode pump input milli-amp.

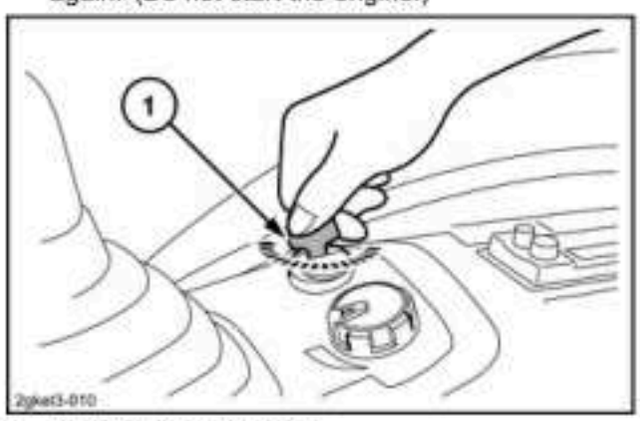
| Engine max. | SP mode milli-amp |
|---|---|
| 2000 $min^{-1}$ (2000 rpm) | 600 mA (during operation) |




3. Main unit installation
Put the main unit on solid, level ground, put the bucket cylinder at its open stroke end, the arm cylinder at its out stroke end, lower the boom, and touch the arm top to the ground.




4. Ignition key
Switch OFF the ignition key (1), check that the engine has stopped, then switch the ignition key ON again. (Do not start the engine.)




5. Oil temperature check
Use the service check to check the hydraulic oil temperature.

| | |
|---|---|
| Oil temperature | 45 - 55 °C<br>(113.0 - 131.0 °F) |

If the oil temperature is low, raise the oil temperature according to the warm-up operation procedure in the operator's manual.




6. Bleeding pressure from inside circuits



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# CX235C SR EXCAVATOR ELECTRICAL SCHEMATIC

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