CX130C
Hydraulic Excavator

Service Manual

Part Number
48024945
1st Edition
English 11/2016

CASE CONSTRUCTION

Upper component

Swing unit

Swing motor assembly		
Swing motor		
	Manufacturer	Hyest Corporation Ltd.
	Motor type	Fixed displacement piston motor
		With parking brake
	Intake amount	**65 cm³/rev** (**3.97 in³/rev**)
	Operating pressure	**27.9 MPa** (**4047 psi**)
	Operating flow	**130 l/min** (**130.0000 US gpm**)
	Mechanical brake torque	**336.1 N·m** (**247.895 lb ft**) min.
	Brake off pressure	**2.9 MPa** (**421 psi**) or less
	Relief valve set pressure	**27.9 MPa** (**4047 psi**) at **108 L/min** (**28.5 US gpm**) **27.3 MPa** (**3960 psi**) at **40 L/min** (**10.6 US gpm**)
Swing reduction gear		
	Reduction gear type	Planetary gear 2-stage reduction gear
	Reduction ratio	17.03
Dry weight		**99 kg** (**218.258 lb**)
Turntable bearing		
	No. of teeth	98
	Weight	**177.7 kg** (**391.761 lb**)
Counterweight		
	Weight	**2200 kg** (**4850.170 lb**)

Engine-related

Engine

Engine model name	Isuzu GJ-4JJ1X diesel engine
Engine type	4-cycle, water-cooled, overhead camshaft type straight cylinder, direct fuel injection type (electronic control)
Number of cylinders-bore-stroke	4 -∅ **95.4 mm** (**3.76 in**) - **104.9 mm** (**4.13 in**)
Total displacement	**2.999 L** (**0.7923 US gal**)
Compression ratio	17.5
Rated output	**70.9 kW** (**96.40 Hp**) / **1800 RPM**
Maximum torque	**349 N·m** (**257.41 lb ft**) / about **1600 RPM**
Fuel consumption ratio	***** g/kWh** at **1800 RPM**
Engine dry weight	About **320 kg** (**705.479 lb**)
Engine dimension	L **928 mm** (**36.5354 in**) - W **760 mm** (**29.921 in**) - H **888 mm** (**34.9606 in**)
Cooling fan	∅ **550 mm** (**21.654 in**) - suction type - 8 vanes, plastic
	With bell mouth-type fan guide
Pulley ratio	0.95 (reduction)
Charging generator	**24 V 50 A** AC type
Starter motor	**24 V 4 kW** (**5.4 Hp**) reduction type
Coolant capacity	**6.0 L** (**1.6 US gal**)
Oil pan capacity	Max: **15.0 L** (**4.0 US gal**) Min: **11.0 L** (**2.9 US gal**) (not including oil filter)
Direction of rotation	Right (viewed from fan side)
	Compliant with JISD 0006-2010

Muffler

Manufacturer	Sankei Giken Kogyo Co., Ltd.
Type	D 240 x 650 L
Maximum displacement	**20500 L/min** (**5415.5 US gpm**)
Weight0	**13.2 kg** (**29.1010 lb**)

Abbreviation	Explanation
RAM	Random access memory
REF	Reference
RH	Right hand
ROM	Read-only memory
RP	Rail pressure
Rr	Rear
RWD	Rearward
+ Flush head S	+ Flush head Screw
+ Phillips pan head S	+ Phillips pan head Screw
+ Screw tapping S	+ Screw tapping Screw
S/A	Subassembly
SAE	Society of Automotive Engineers
SBF	Slow blow fuse
SCV	Suction control valve
SIG	Signal
SLD	Shield
SP pin	Special pin
ST	Starter/start
STD	Standard
SW	Switch
TDC	Top dead center
TEMP	Temperature
TP	Throttle position
UART	Universal asynchronous receiver-transmitter
VB	Battery voltage
VGS Turbo	Variable geometry system turbo
High-strength W	High-strength washer
Outer-tooth W	Outer-tooth washer
W/H	Wire, harness
W/L	Warning lamp
W/S	Welded splice
WOT	Wide open throttle

Engine - Service instruction

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Precautions on maintenance

To prevent the engine from being damaged and to ensure the reliability of engine performance, be careful of the following points when performing maintenance works.

When placing the engine on the ground, make sure that the bearing surface of the oil pan does not directly contact the ground.

Use an appropriate wood frame, etc. to support the engine at the engine foot portion and the flywheel housing portion. There is only a small gap between the oil pan and oil pump strainer, so be careful not to damage the oil pan and oil strainer.

- While the air duct or air cleaner is removed, cover the open section of the intake to prevent foreign matters from entering the cylinder.
  If a foreign matter enters the cylinder, it may seriously damage the cylinder when the engine starts.
- When maintaining the engine, be sure to disconnect the negative battery cable.
  Failure to do this may cause the harness or electrical components to be damaged.
  If energizing is required for inspection, be careful not to cause a short.
- Before assembly, apply the engine oil to the slide contact surface of the engine.
  This work ensures appropriate lubrication when first starting the engine.
- When the valve train component, piston, piston ring, connecting rod, connecting rod bearing, and/or crankshaft journal bearing are removed, line them up in the correct order so that their original positions are clear.
- When installing, install it in the same position as when it was removed.
- When assembling the engine, replace the gasket, oil seal, and O-ring with new ones.
- For a component with the liquid gasket applied, carefully remove the old liquid gasket and clean the component so that no oil, water, and/or dust remain.
  Thereafter, apply the specified liquid gasket to each component before assembly.
- Assemble components with the liquid gasket applied within 5 minutes of applying the liquid gasket.
  If **5 min** have passed, remove the old liquid gasket and apply liquid gasket again.
- When assembling or installing a component, make sure to tighten them at the specified torque to ensure secure installation.

Important precautions for handling this engine

Crankcase - Install

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Oil jet pipe installation

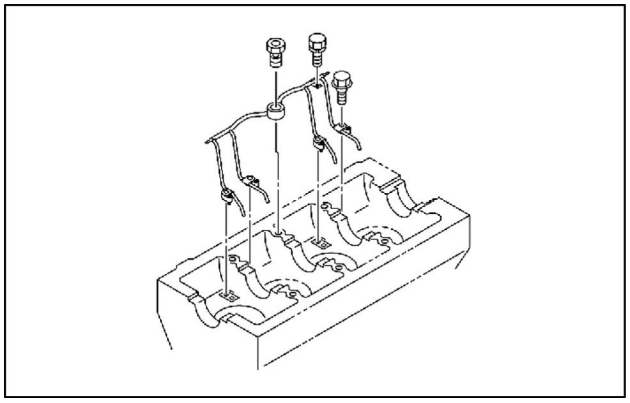
1. Install the oil jet pipe to the cylinder block.
   - Align the oil jet pipe knock pin with the cylinder block pin hole and tighten the **M8** bolt, **M6** bolt, and check valve.

     Tightening torque: **25 N·m** (**18 lb ft**) Bolt **M8**

     Tightening torque: **8 N·m** (**6 lb ft**) Bolt **M6**

     Tightening torque: **30 N·m** (**22 lb ft**) Check valve

     ⚠ CAUTION: Be careful not to deform or damage the oil jet nozzle.



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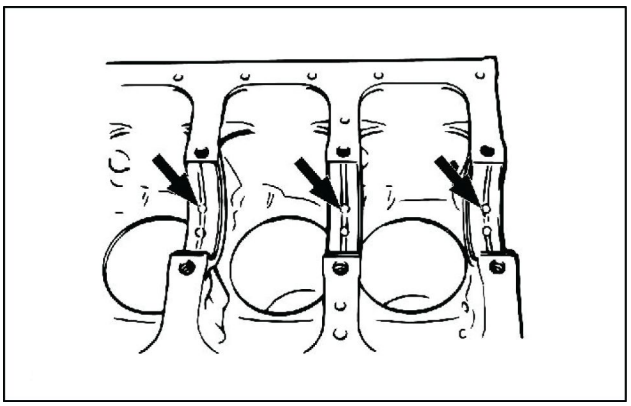
Crankshaft installation

1. Install the crankshaft bearing to the cylinder block.
   - Install the crank shaft upper bearing to the cylinder block.
2. Apply the engine oil to the crankshaft bearing.
   - Apply to the crankshaft upper bearing.

     ⚠ CAUTION:

     - Do not apply oil to the cylinder block bearing installation surface or the outer circumference of the bearing.
     - When replacing the crankshaft bearing, select the grade by referring to the following.



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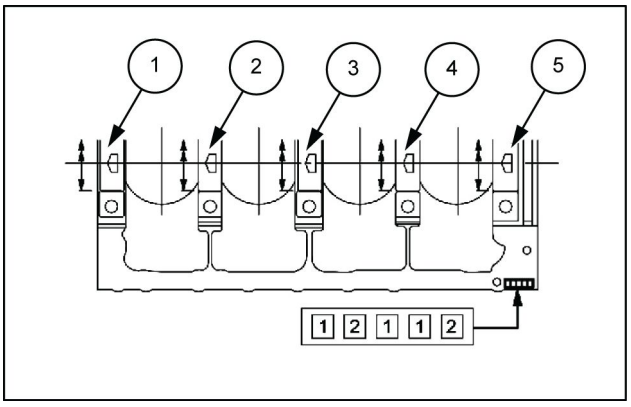
3. Select the crankshaft bearing.
   - Carefully consider the inner diameter grade of the cylinder block journal and the diameter grade of the crankshaft journal when selecting and installing a new bearing.
   - The grade of the crankshaft bearing housing **(1)**, **(2)**, or **(3)** is marked on the rear right of the cylinder block.

     1. No. 1
     2. No. 2
     3. No. 3
     4. No. 4
     5. No. 5



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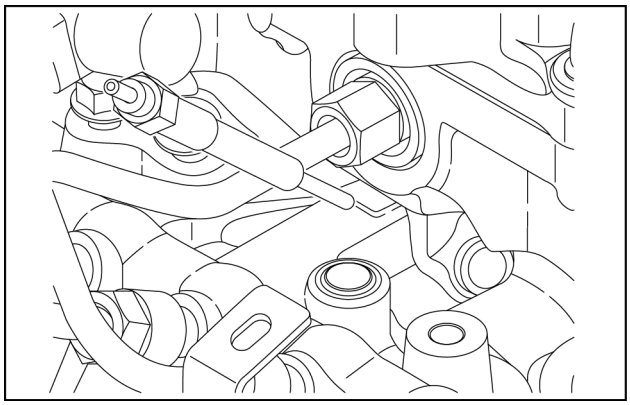
Glow plug installation

1. Install the glow plug on the cylinder head assembly.

   Tightening torque : **18 N·m** (**13 lb ft**)

   ⚠ CAUTION: Do not exceed specifications when tightening as over-tightening may result in breakage.



COIL16CEX0063AA 87

Glow plug connector installation

1. Install the glow plug connector to the glow plug.
   - Install the glow plug connector to the glow plugs of the No.1, No.3 and No.4 cylinders.

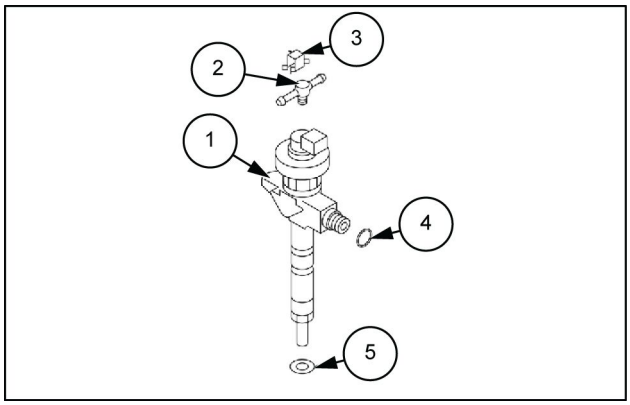
     ⚠ CAUTION: Install the glow plug connector so that there is no interference with the cylinder head.

     Tightening torque : **1.8 N·m** (**1.328 lb ft**)

Injector Installation

1. Install the injector gasket **(5)** to the injector **(1)**.
   - Push in until your hand stops.
   - Do not forcibly push the injector gasket **(5)** in as it will be pushed in to the end during clamp tightening.
2. Install the O-ring **(4)** to the injector **(1)**.
   - When installing the O-ring **(4)**, be careful not to cause damage by applying engine oil to it.

   2. Leak pipe
   3. Clap



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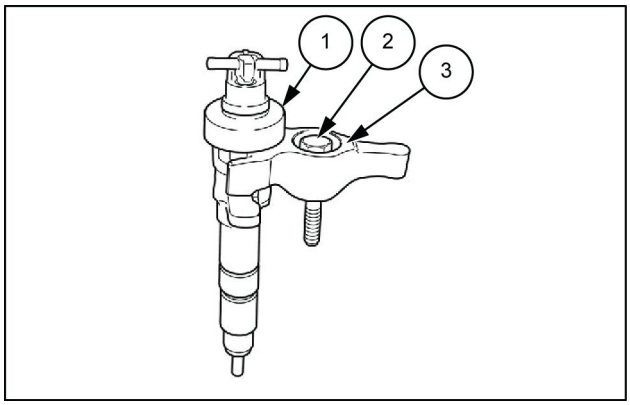
3. Install the clamp to the injector **(1)**.
   - Apply engine oil to the threaded portion and seat surface of the injector clamp bolt **(2)**.

   3. Injector clamp

   ⚠ CAUTION: Do not reuse the clip, injector gasket, or O-ring.



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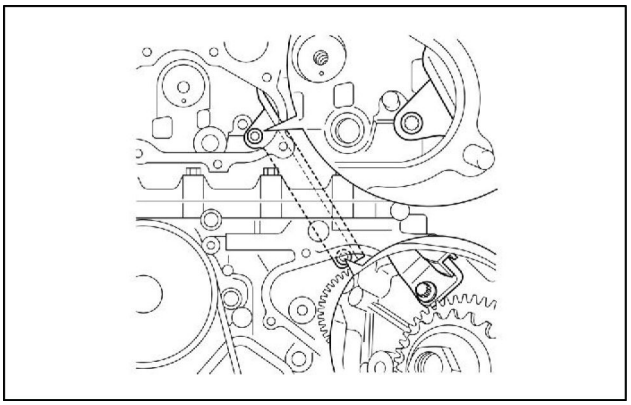
Timing chain guide removal

1. Remove the timing chain guide from the cylinder head.



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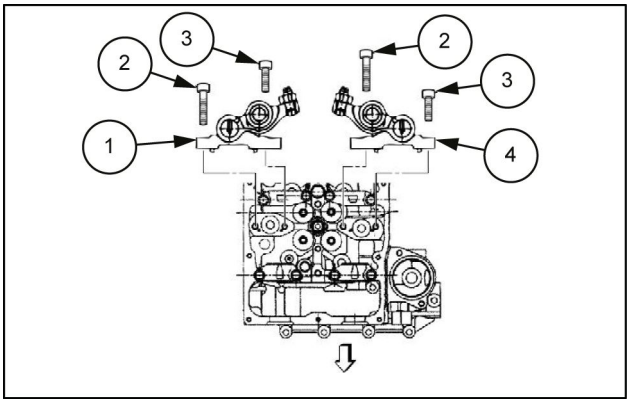
Rocker arm shaft assembly removal

1. Remove the rocker arm shaft assembly from the cylinder head.
   - If reusing the rocker arm shaft assembly, install it to its original position.

   1. Exhaust rocker arm shaft assembly
   2. Screw
   3. Screw
   4. Inlet rocker arm shaft assembly



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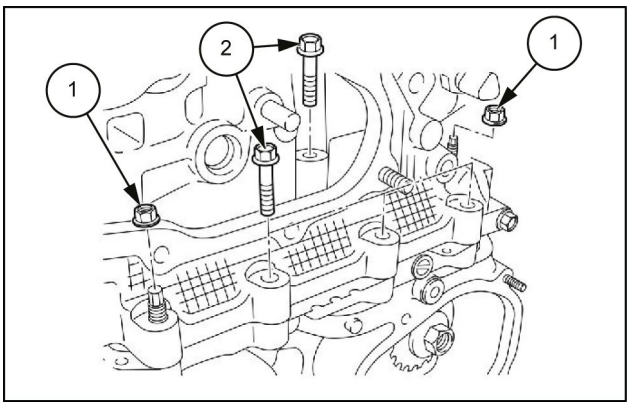
Cylinder head assembly removal

1. Remove the bolt **(2)** from the timing gear case.
2. Remove the nut **(1)** from the timing gear case.



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Cylinder head gasket installation

1. Install the dowel pin to the cylinder block.

NOTE: *Install only when the dowel pin has been removed from the cylinder block.*

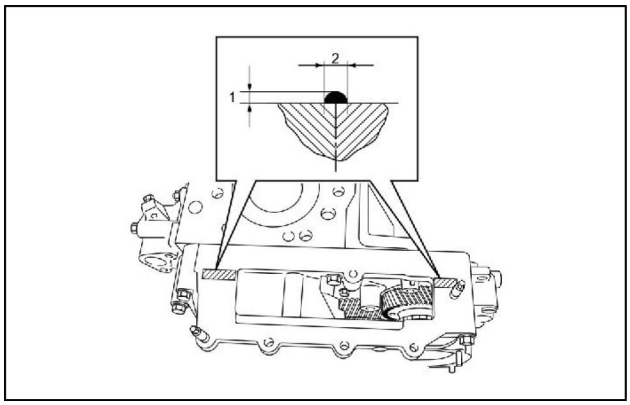
2. Apply the liquid gasket to the cylinder block.

NOTE: *As shown in the diagram, apply ThreeBond 1207B to the aligning surface of the gear case.*
Use the same grade for the gear case gasket as the cylinder head gasket.

3. Install the cylinder head gasket to the cylinder block.

> ⚠ CAUTION:
>
> - Install the cylinder head gasket and gear case gasket within **5 min** of applying liquid gasket.

1. **2 - 3 mm** (**0.0787 - 0.1181 in**)
2. **3 - 4 mm** (**0.1181 - 0.1575 in**)



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Cylinder head assembly installation

1. Install the cylinder head assembly to the cylinder block.

NOTE: *Gently place the cylinder head while aligning with the cylinder block dowel.*

> ⚠ CAUTION:
>
> - When installing, be careful not to damage the cylinder head gasket.

2. Apply engine oil to the head bolt.

NOTE: *Apply engine oil to the threaded portion of the head bolt and seat surface.*
Tighten the head bolts in the order shown in the diagram using a torque wrench and angle gauge.

> ⚠ CAUTION:
>
> - Use a new head bolt.

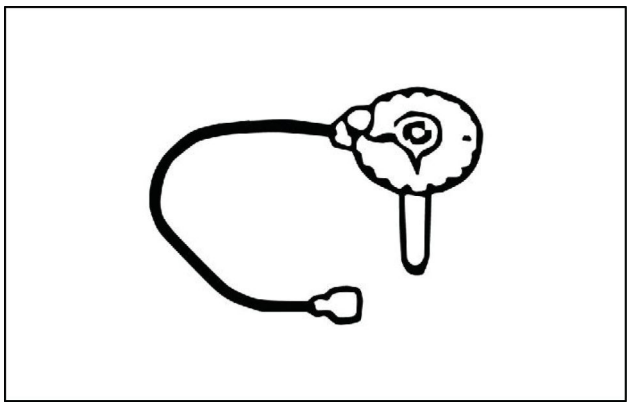
Special tool: Angle gauge (Refer to **Cylinder heads - Special tools (10.101)**)

Tightening torque: **70 N·m** (**52 lb ft**) 1st time

Tightening torque: **70 N·m** (**52 lb ft**) 2nd time

Specified angle: 60° - 75° 3rd time

Specified angle: 60° - 75° 4th time



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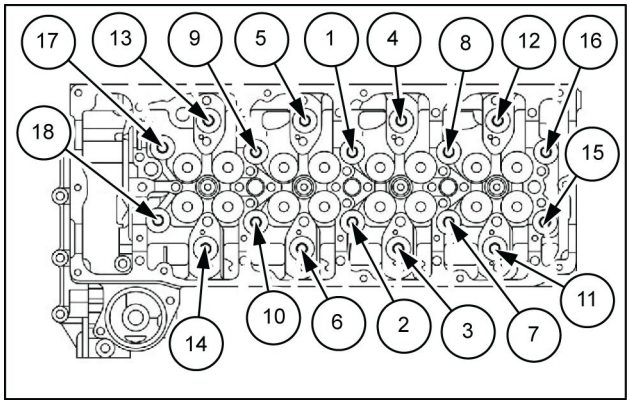

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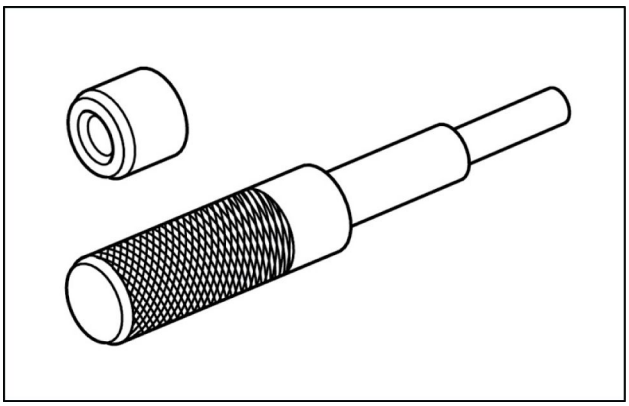
Valve guide - Special tools

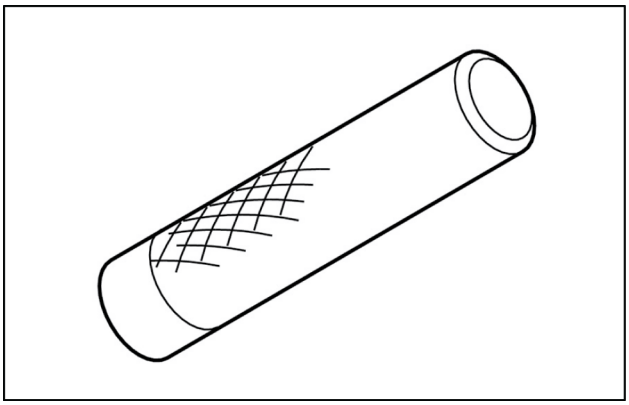
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Isuzu reference	CASE CONSTRUCTION tool number	Description
5-8840-2816-0	**380300016**	Valve guide remover and installer



SMIL14CEX4888AA 1

Isuzu reference	CASE CONSTRUCTION tool number	Description
5-8840-2817-0	**380300017**	Valve stem seal installer



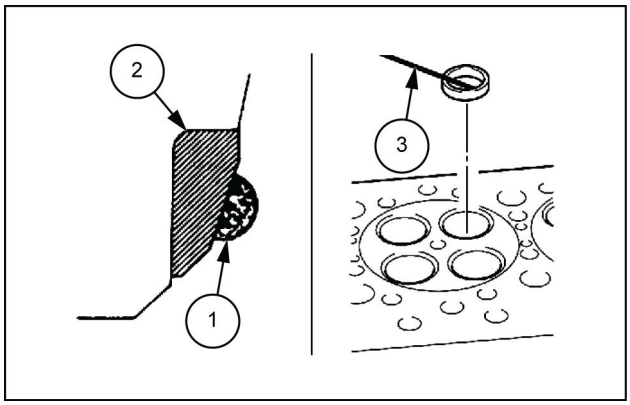
SMIL14CEX4889AA 2

Valve seat insert removal

NOTE: *Arc weld the entire inner circumference **(1)** of the valve seat insert.*
*Cool the valve seat insert **(2)** for **2 - 3 min**.*
*Contraction due to cooling makes it easier to remove the valve seat insert **(2)**.*

1. Remove the valve seat insert **(2)** from the cylinder head using a screwdriver **(3)**.

> ⚠ CAUTION: Be careful not to damage the cylinder head.



LPIL12CX00696AB 20

Valve seat insert Installation

1. Put a dolly block **(1)** on the valve seat insert **(2)**.

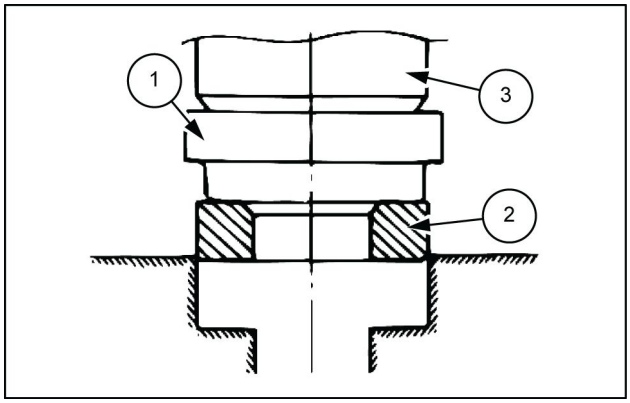
NOTE: *Carefully place the dolly block **(1)** with the outer diameter that is smaller than the valve seat insert **(2)** on the valve seat insert **(2)**.*

2. Install the valve seat insert **(2)** to the cylinder head using a press **(3)**.

NOTE: *Gradually apply pressure to the dolly block **(1)** and push in the valve seat insert **(2)**.*

> ⚠ CAUTION: Do not apply excessive pressure with a press **(3)**.

NOTE: *Add compound to the valve seat surface and gently tap the valve while turning it to fit.*
Confirm that it is touching evenly around the entire circumference.



LPIL12CX00697AB 21

Coolant Filling

1. Replenish the radiator assembly with coolant.

Fuel air bleed

- Before starting the engine

1. Prepare the pan.
   - Place an appropriate pan under the fuel filter.
2. Turn the plug.
   - Sufficiently loosen the air removal plug.
3. Operate the priming pump.
   - Operate the priming pump 20 times or more until fuel spills out around the plug.
4. Close the plug.
5. Operate the priming pump.
   - Operate the priming pump 10 times or more until it is completely filled with fuel.
   - Wait for approximately **1 min** after operating the priming pump.
6. Drain air from the fuel filter assembly.
   - Sufficiently loosen the air removal plug.
7. Close the plug.
   - Sufficiently tighten the air bleeding plug to the fuel filter.

   ⚠ CAUTION: Tighten the air removal plug and then completely wipe away any excess fuel in the vicinity.
8. Operate the priming pump.
   - Push the priming pump 10 times to 15 times to feed fuel into the supply pump.
   - Or less, after starting the engine.
9. Start the engine and put it into an idling state.
   - Idle for **5 s**.

   ⚠ CAUTION: Do not rev the engine.
10. Adjust the engine speed.
    - Slowly increase the engine speed and maintain for **3 s**.
    - After completion of the above operation, operate at maximum revolutions on the side of the machine and repeat the operation of revving to the maximum speed multiple times.

      ⚠ CAUTION: If air removal operations are insufficient, due to the possibility of engine trouble, make sure to follow all procedures.

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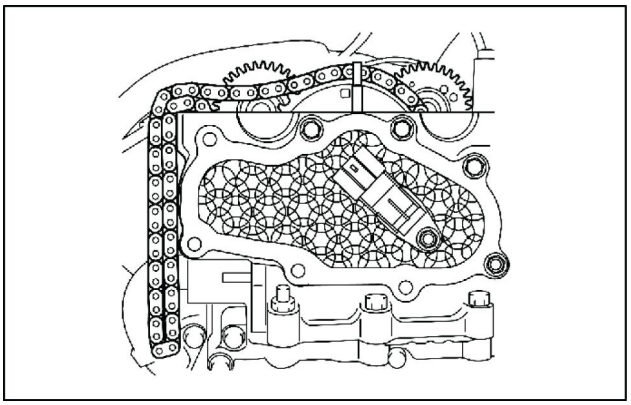
- After removing the sprocket, move the timing chain upward.



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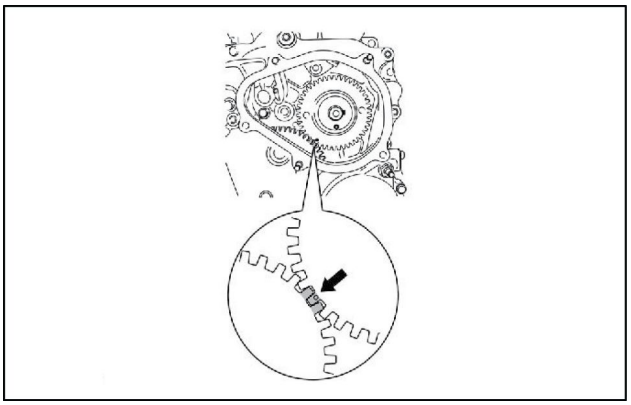
Timing chain removal

1. Remove the timing chain from the sprocket.
   - Remove from the supply pump sprocket.

Supply pump gear removal

1. Check alignment mark of the supply pump gear.



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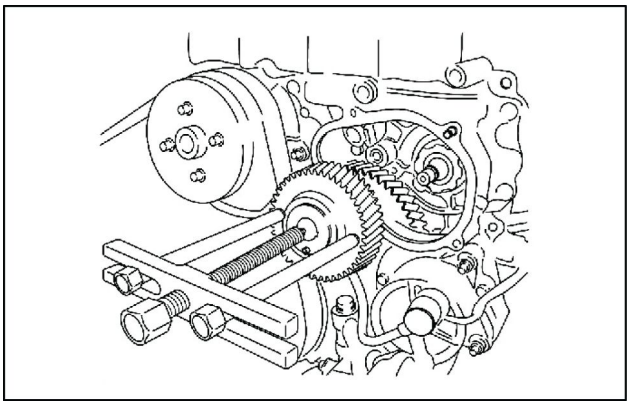
2. Remove the supply pump gear from the fuel supply pump.
   - Remove the supply pump gear using a gear puller.



LPIL12CX00320AA 20

Exhaust manifold - Remove

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CX130C LC version with tier 3 emission level	LA

Battery ground cable Disconnect

1. Disconnect the battery ground cable from the battery.

Coolant Drain

2. Drain coolant from the radiator.

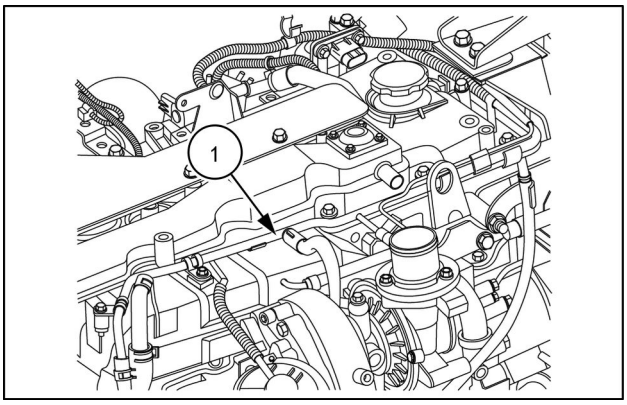
> ⚠ CAUTION:
>
> - Do not loosen or remove the radiator cap when the coolant is hot.
> - Steam and boiling water can burst out, possibly causing burns or heat related injuries.
> - When opening the radiator cap, place a thick cloth over the cap when the coolant is cooled, and turn it gradually to release the pressure before opening it.

NOTE: *Loosen the water drain plug on the rear right side of the engine, as well as the radiator drain plug.*
Completely drain the coolant.
After completely draining the coolant, securely tighten the drain plug.

Water pipe removal

1. Remove the water pipe **(1)** from the engine assembly.

NOTE: *Because the plastic pipe is easily damaged during hose removal, do not remove from the side of the plastic pipe if possible.*



COIL16CEX0057AA 1

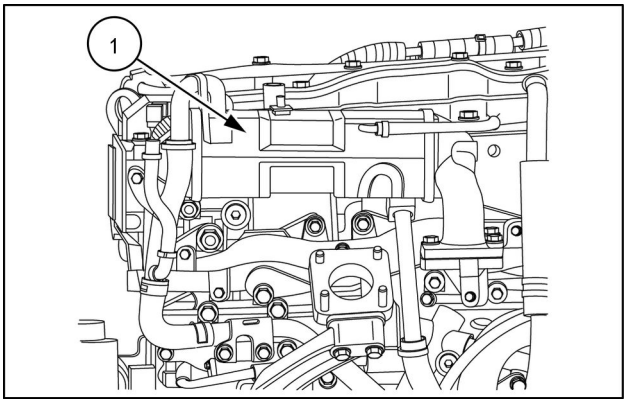
EGR cooler removal

1. Remove the EGR cooler **(1)** from the exhaust manifold and cylinder head assembly.

NOTE: *Remove the IN side and OUT side of the rubber hose for the water pipe and remove the EGR cooler **(1)** and gasket.*

> ⚠ CAUTION: Do not hold the water pipe section when removing the EGR cooler **(1)**.

NOTE: *Because the plastic pipe is easily damaged during hose removal, do not remove from the side of the plastic pipe if possible.*



COIL16CEX0075AA 2

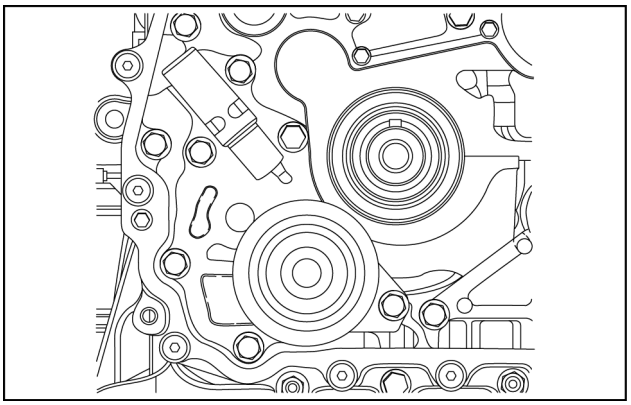
Engine oil pump - Install

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Oil pump assembly installation

1. Install the oil pump assembly to the timing gear case.
   - Apply engine oil to the pump gear and pump case and tighten to the specified torque.
   - Verify that the pump gear rotates smoothly.

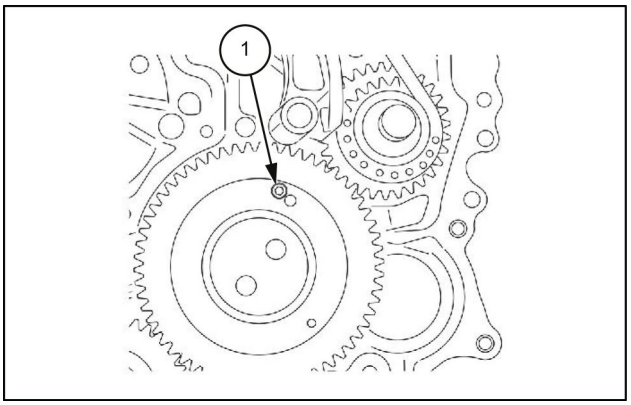
     Tightening torque : **25 N·m** (**18 lb ft**)



COIL16CEX0070AA 1

Crank gear installation

1. Install the crank gear to the crankshaft.
   - Install by aligning with the alignment mark for the idle gear.
2. Remove the bolt from idle gear A.
   - Remove the **M6** sub gear fixing **(1)** bolt from idle gear A.

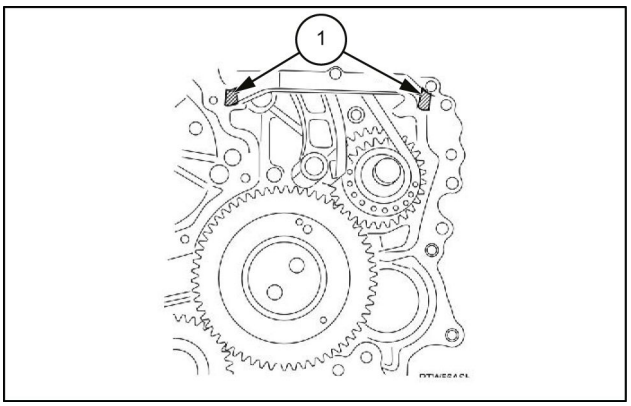


LPIL12CX00286AB 2

Gear case cover installation

1. Apply liquid gasket to the timing gear case.
   - Apply liquid gasket, ThreeBond 1207B to the area shown in the diagram.

   1. Liquid gasket application area



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Battery ground cable connect

1. Connect the battery ground cable to the battery.

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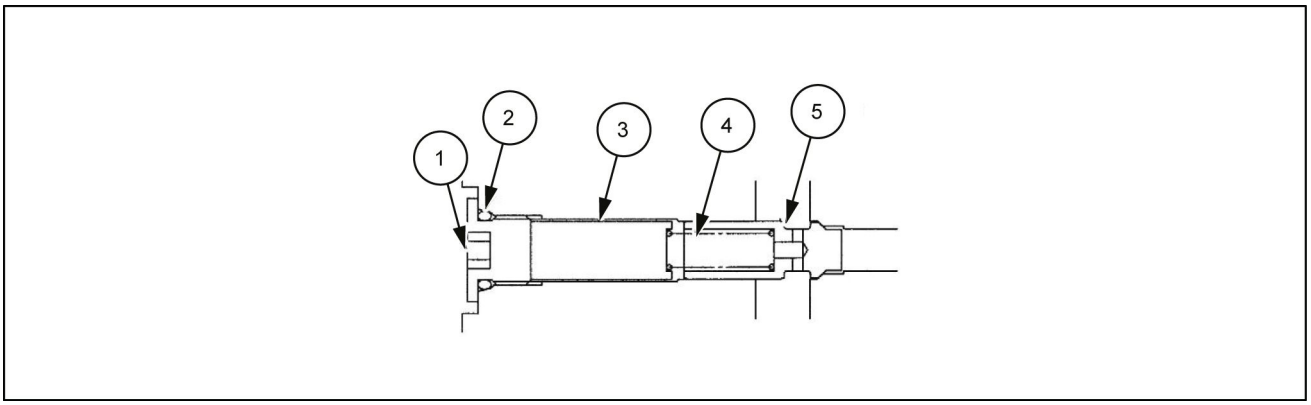
(*) See content for specific models

Boom regeneration check valve



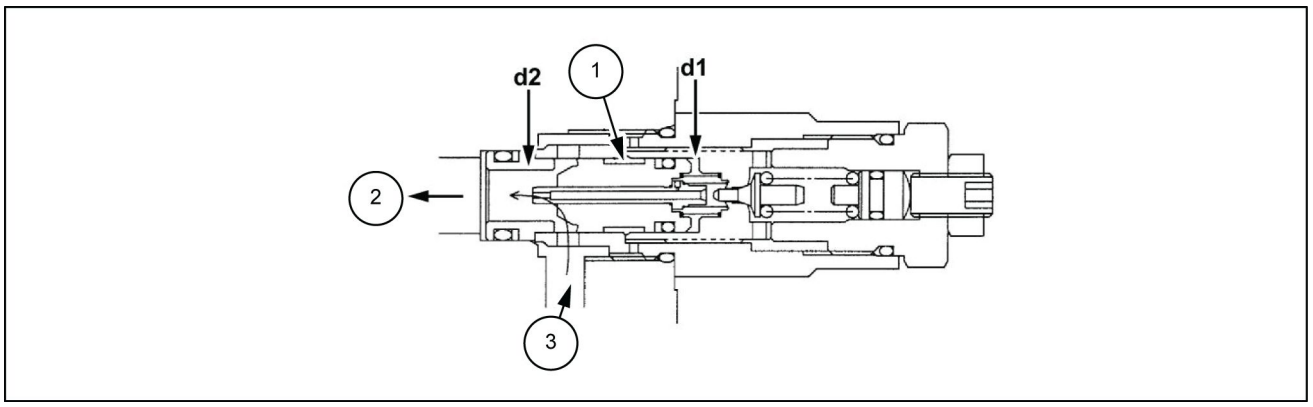
LPIL12CX01799EB 15

1. Cap (Quantity 1)
2. O-ring (Quantity 1)
3. Spacer (Quantity 1)
4. Spring (Quantity 1)
5. Check valve (Quantity 1)

Make-up operation

Because d1 becomes greater than d2, normally the cylinder port pressure is higher than the tank pressure, so main poppet B is securely seated.

When the cylinder port pressure drops (and approaches negative pressure) and the cylinder port pressure becomes less than the tank pressure, main poppet B opens after receiving tank pressure proportional to the difference in surface areas of d1 and d2, the oil flows from the tank path to the cylinder port, and this prevents cavitation.

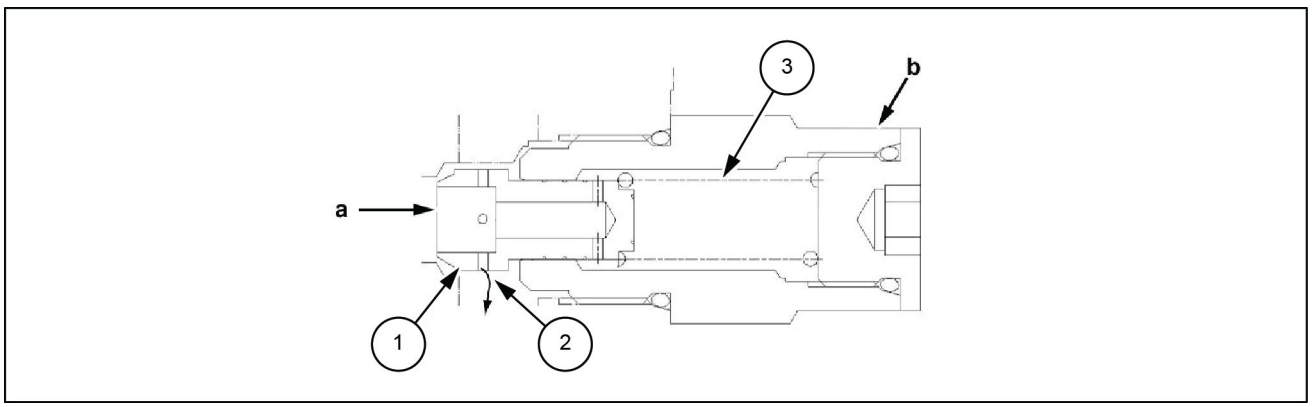


LPIL12CX01982EB 23

1. Main poppet B
2. Cylinder port
3. Tank path

Foot relief valve

Because the load on spring C is extremely small, the oil from the center bypass path opens the poppet and flows into the tank path. [Check valve operation]

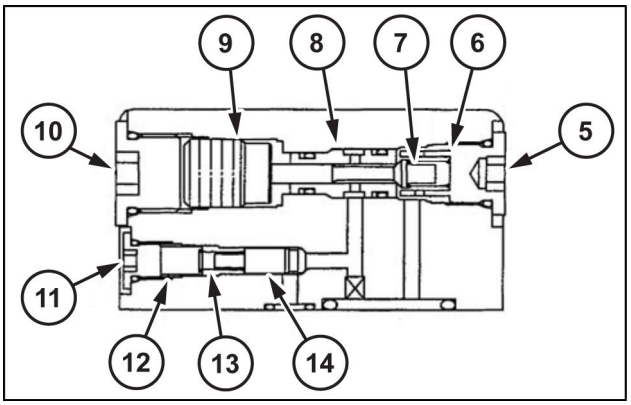


LPIL12CX01983EB 24

1. Poppet
2. Tank path
3. Spring C

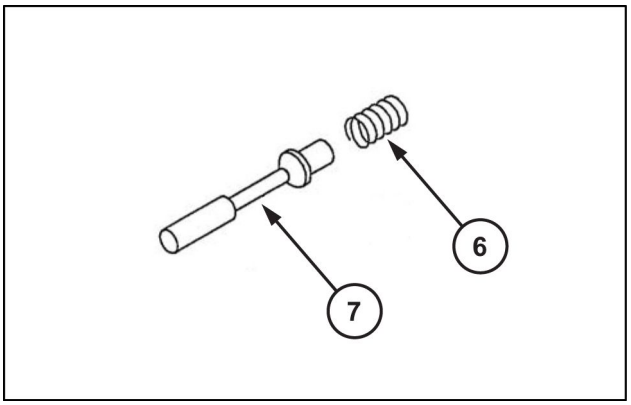
a. From center bypass path
b. Hexagonal opposite: **36 mm** (**1.42 in**)
Tightening torque: **80 N·m** (**59.00 lb ft**)

2. Cover section
   Remove the cap **(5)**, spring **(6)**, and poppet **(7)**.
   - Cap
     Hex socket diameter: **8 mm** (**0.315 in**)
     Tightening torque: **50 N·m** (**36.9 lb ft**)



SMIL15CEX6171AB 24

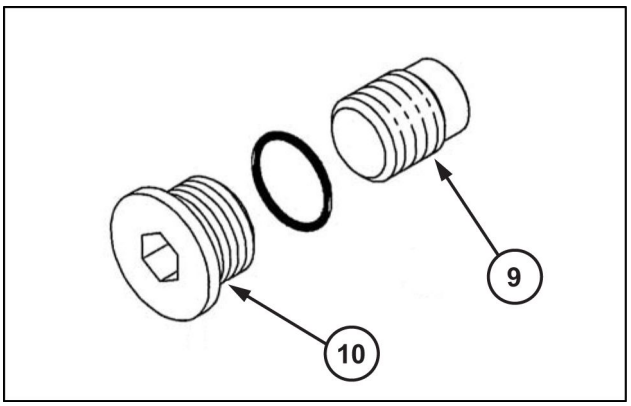
For parts that have been in operation for a long time, the poppet **(7)** can sometimes not be removed from the edge of the sleeve seat surface. Do not force disassembly of parts.



SMIL15CEX6172AB 25

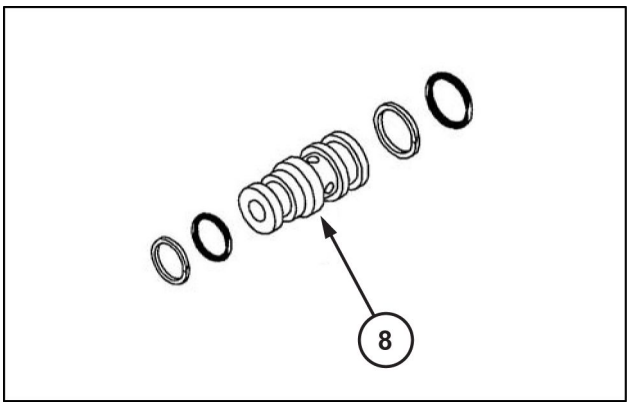
Remove the cap **(10)** and remove the piston **(9)**.

- Cap
  Hex socket diameter: **10 mm** (**0.394 in**)
  Tightening torque: **60 N·m** (**44.3 lb ft**)



SMIL15CEX6173AB 26

Use a pipe with an inner diameter of D6 and an outer diameter of D10 and lightly tap out the sleeve **(8)** from the left side.

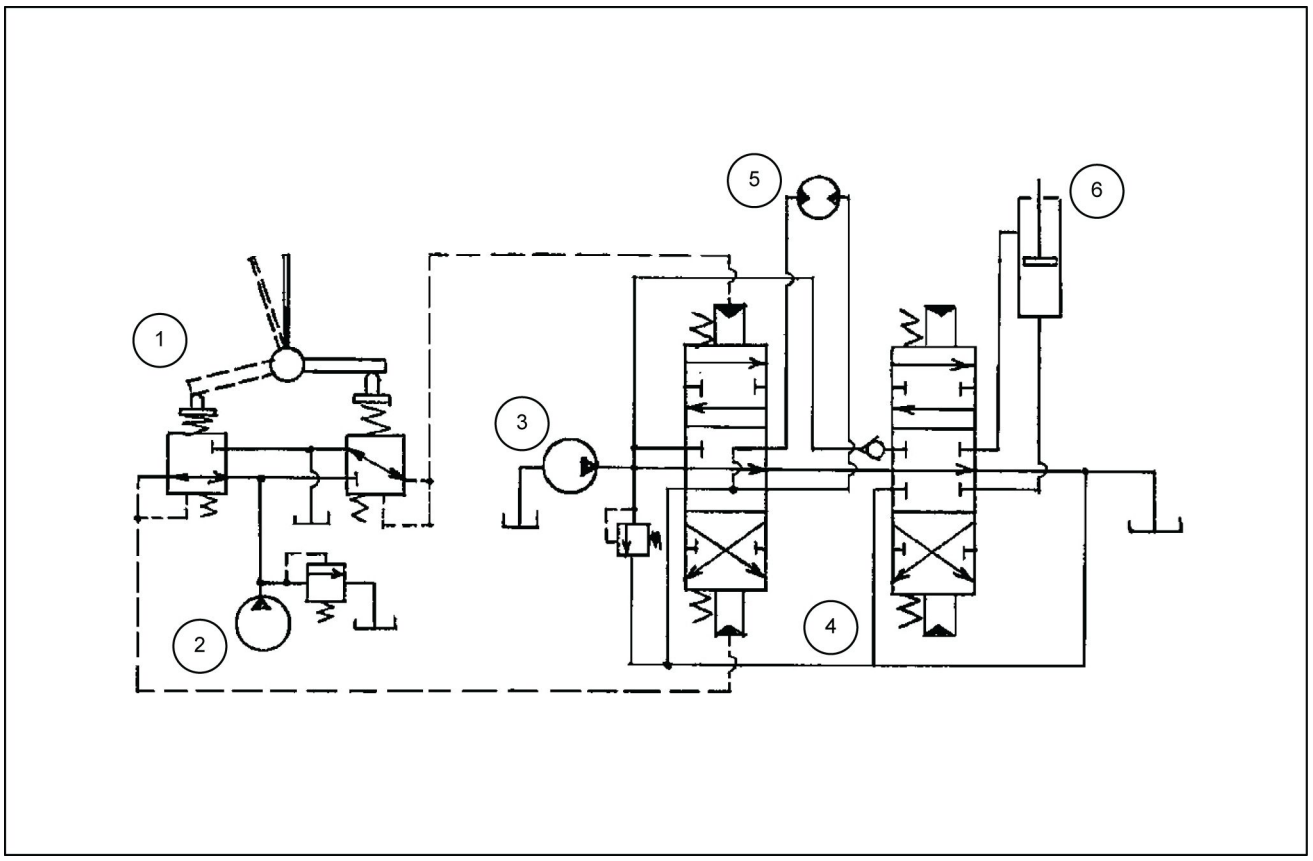


SMIL15CEX6174AB 27

Operation

Operation of the remote control valve is explained based on the hydraulic circuit diagram (Fig. **1**) and operation explanation diagrams (Fig. **2** - Fig. **4**).

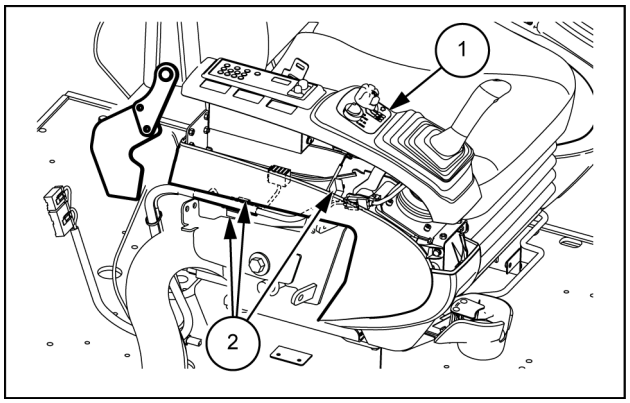
Fig. **1** is a typical usage example for the remote control valve.



LPIL12CX01993FB 1

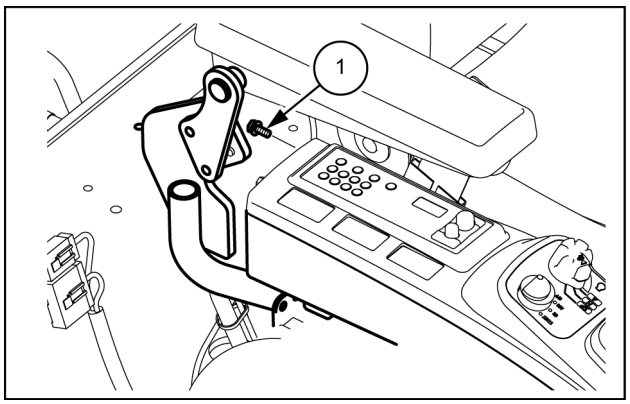
1. Pilot valve
2. Pilot pump
3. Main pump
4. Control valve
5. Hydraulic motor
6. Hydraulic cylinder

9. Connect the 3 connectors **(2)** and install the console top cover **(1)**.



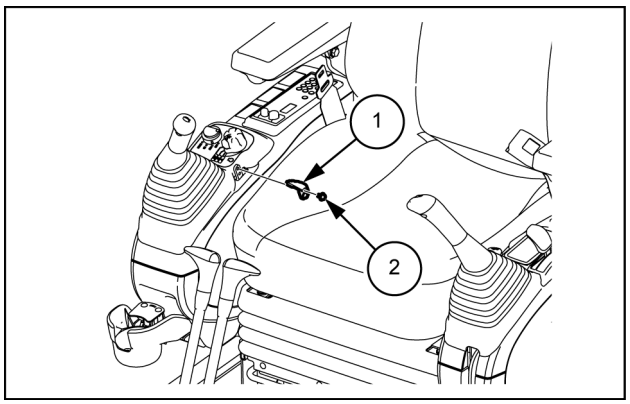
SMIL14CEX1429AB 9

10. Use a Phillips screwdriver to install the 2 screws **(1)** on the console top cover.



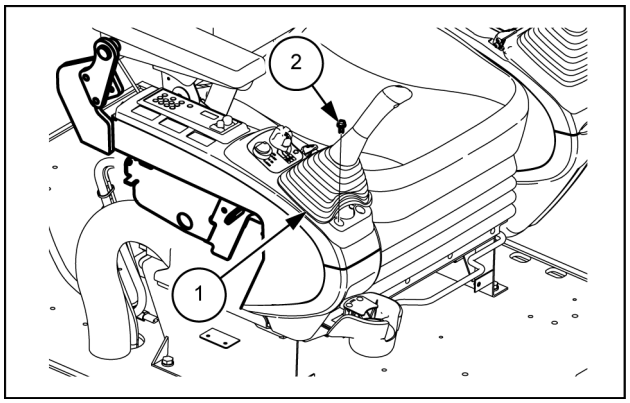
SMIL14CEX1430AB 10

11. Use a Phillips screwdriver to install the 2 screws **(2)**, and then install the handle of the tilt lever **(1)**.



SMIL14CEX1431AB 11

12. Use a Phillips screwdriver or box wrench [**10 mm**] to install the 2 bolts **(2)** on the console top cover and put the boot **(1)** on the control lever.



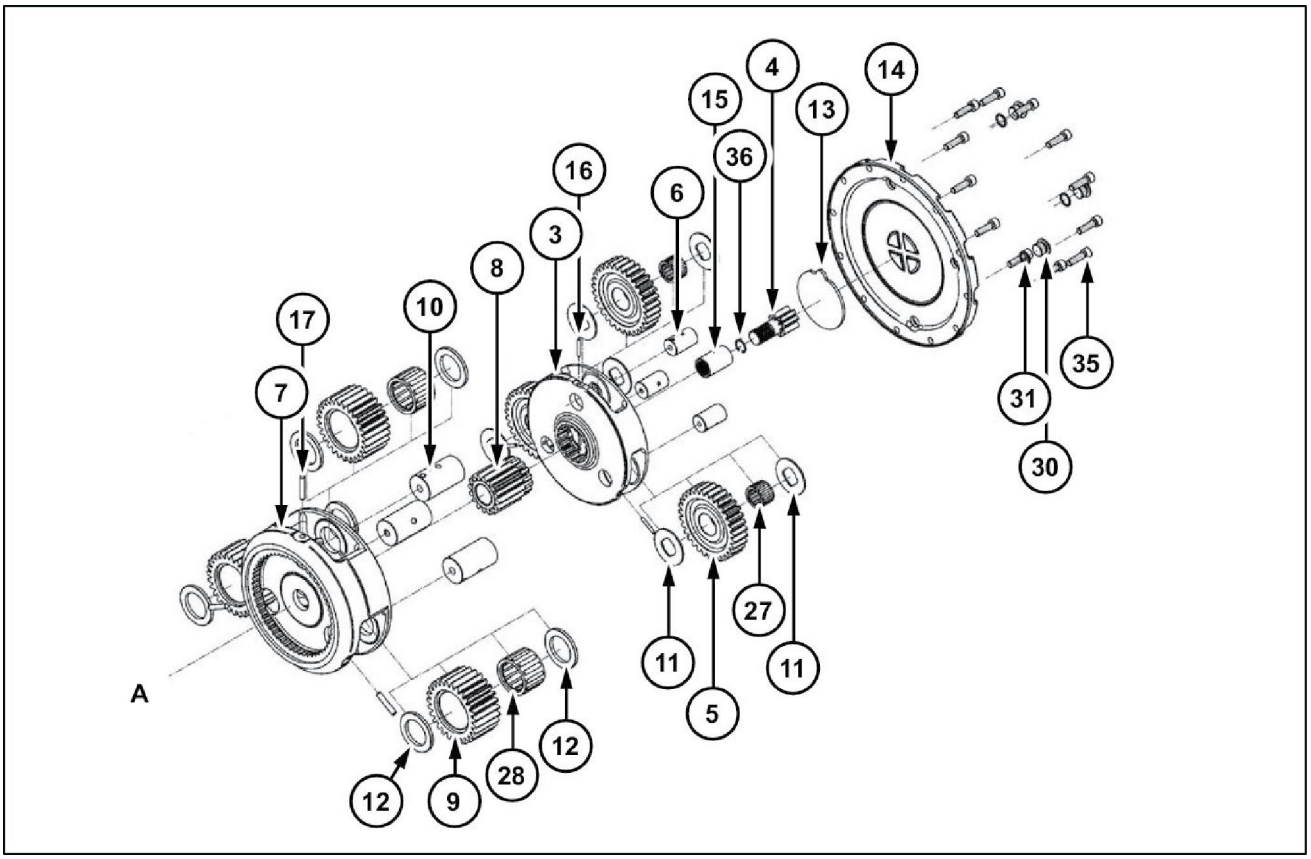
SMIL14CEX1432AB 12

Code	Jig name	Remarks
3	Bearing press-fit jig 2	
4	Floating seal mounting jig	
5	Rod 1	
6	Angular bearing press-fit jig	
7	Shim thickness adjustment jig	
8	Rod 2	

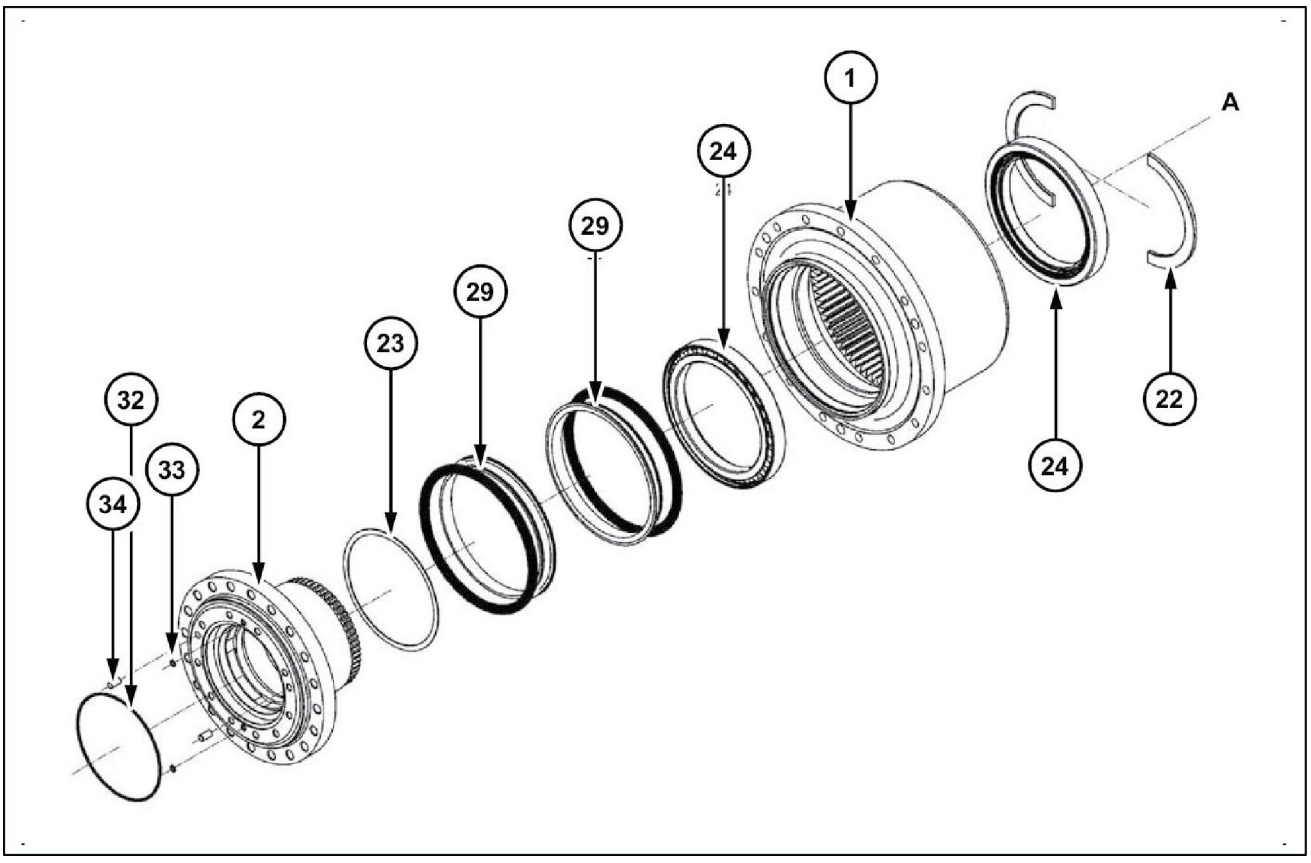
a	Puller	t	**80 mm** (**3.150 in**)	am	Ø **370 mm** (**14.567 in**)
b	Guide shaft	u	**250 mm** (**9.843 in**)	an	Ø **296 mm** (**11.654 in**)
c	Hammer	v	Ø **9 mm** (**0.354 in**)	ao	Ø **328.9 - 329.1 mm** (**12.9488 - 12.9567 in**)
d	Stopper nuts [**M8** x **1.25 mm** (**0.04921 in**)]	w	Ø **70 mm** (**2.756 in**)	ap	Ø **331.5 - 331.6 mm** (**13.0512 - 13.0551 in**)
e	Guide A (flange and housing: material DURACON)	x	Ø **80 mm** (**3.150 in**)	aq	Ø **331.3 - 331.4 mm** (**13.0433 - 13.0472 in**)
f	Guide B (flange)	y	**25 mm** (**0.984 in**)	ar	**C0.5 mm** (**0.0197 in**)
g	Guide C (housing)	z	Ø **8 mm** (**0.315 in**)	as	**R0.5 mm** (**0.0197 in**)
h	Press-fit auxiliary jig (flange)	aa	Ø **100 mm** (**3.937 in**)	at	Ø **345.2 - 345.3 mm** (**13.5906 - 13.5945 in**)
i	(**M8** thread depth)	ab	Ø **51 mm** (**2.008 in**)	au	Ø **332.3 - 332.4 mm** (**13.0827 - 13.0866 in**)
j	Surface knurling processing	ac	Ø **91 mm** (**3.583 in**)	av	Ø **345.5 - 345.7 mm** (**13.6024 - 13.6102 in**)
k	Including the assembly diagram	ad	**30 mm** (**1.181 in**)	aw	Ø **337.0 - 337.1 mm** (**13.2677 - 13.2717 in**)
l	**32 mm** (**1.260 in**)	ae	**34 mm** (**1.339 in**)	ax	Ø **332.2 - 332.4 mm** (**13.0787 - 13.0866 in**)
m	**2 mm** (**0.079 in**)	af	Ø **36 mm** (**1.417 in**)	ay	Ø **344.5 - 344.6 mm** (**13.5630 - 13.5669 in**)
n	**20 mm** (**0.787 in**)	ag	Ø **73 mm** (**2.874 in**)	az	**R0.1 - 0.2 mm** (**0.0039 - 0.0079 in**)
o	Ø **24 mm** (**0.945 in**)	ah	**4.9 - 5.1 mm** (**0.1929 - 0.2008 in**)	ba	**R1 mm** (**0.039 in**)
p	Ø **33 mm** (**1.299 in**)	ai	**24.9 - 25.1 mm** (**0.9803 - 0.9882 in**)	bb	Ø **280 mm** (**11.024 in**)
q	**C1 mm** (**0.039 in**)	aj	**11.2 - 11.5 mm** (**0.4409 - 0.4528 in**)	bc	Ø **294 mm** (**11.575 in**)
r	**60 mm** (**2.362 in**)	ak	**14 °** - **16 °**		
s	**10 mm** (**0.394 in**)	al	**11.5 mm** (**0.453 in**)		

Travel motor - Exploded view

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

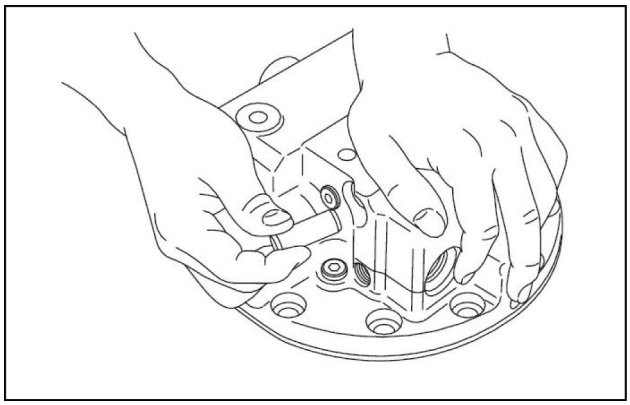


LPIL12CX02555FA 1



LPIL12CX02556FA 2

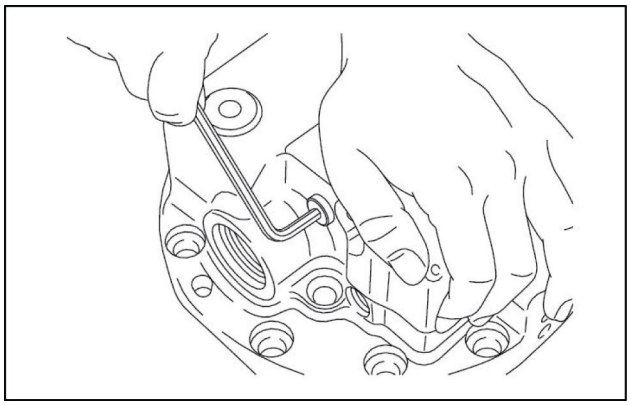
3. Remove the rear flange **(301)** from the piston **(381)**.



LPIL12CX02400AA 29

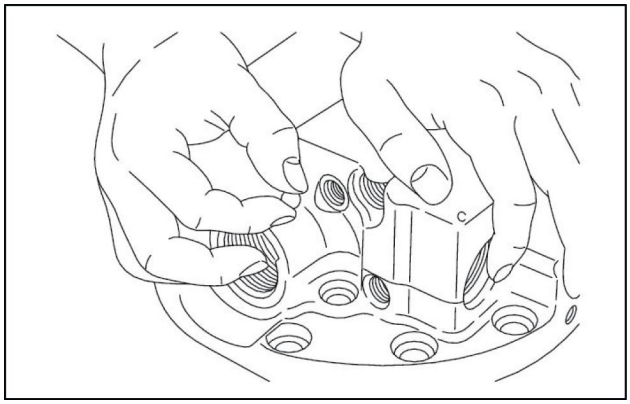
Disassembly of check ball section

1. Remove the 2 plugs **(352)** from the rear flange **(301)**.
2. Remove the O-rings **(358)** from the plugs **(352)**.
   - Do not reuse the removed O-rings **(358)**.



LPIL12CX02435AA 30

3. Remove the steel balls **(353)** from the rear flange **(301)**.
   - If the steel ball is difficult to remove, use a magnet to remove it.

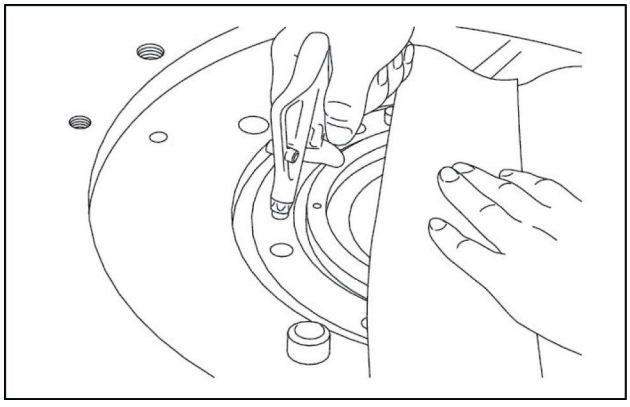


LPIL12CX02436AA 31

Disassembly of parking brake section

> ⚠ CAUTION: If compressed air is suddenly injected, the piston **(112)** can fly from the spindle **(2)** and cause injury, so place a protective cover over the piston **(112)**.

1. Inject compressed air into the path hole for the spindle **(2)** parking brake, and remove the piston **(112)** from the spindle **(2)**.

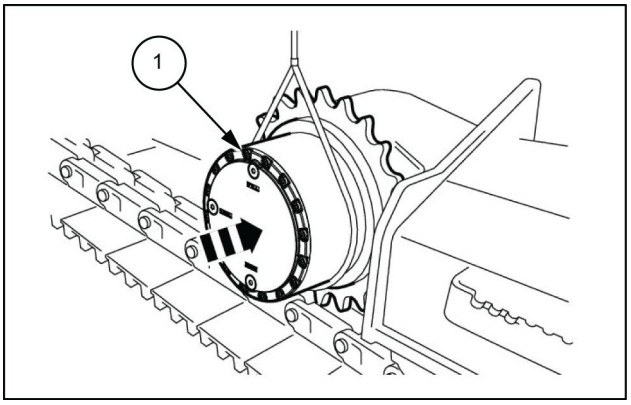


LPIL12CX02437AA 32

Travel motor - Install

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

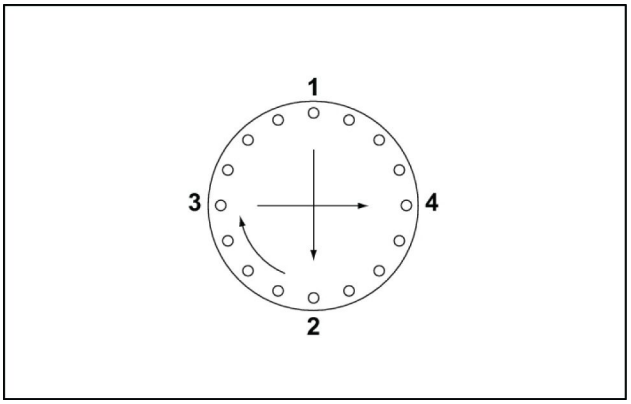
1. Attach the travel motor to the lower frame as shown in the diagram.
   - Be careful of the installation angles.



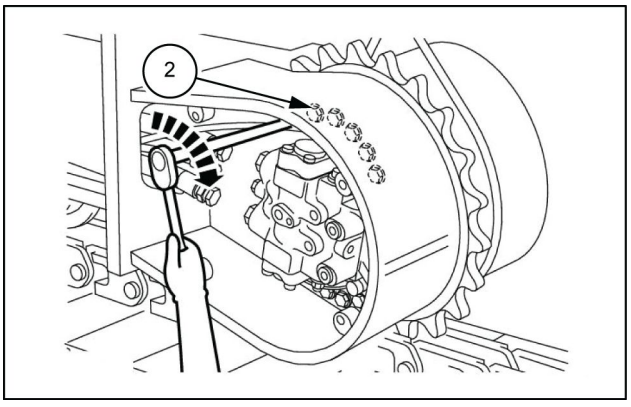
LPIL12CX01325AB 1

2. Apply **LOCTITE® 262™** to the installation bolt **(2)** threaded sections and temporarily tighten all 18 bolts. Use a wrench [**24 mm**] to tighten the top and bottom alternately to the specified torque so that an even tightening force acts on the opposing sides.

   Tightening torque **M16**: **267 - 312 N·m** (**196.93 - 230.12 lb ft**).



LPIL12CX01326AB 2



LPIL12CX01327AB 3

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(*) See content for specific models

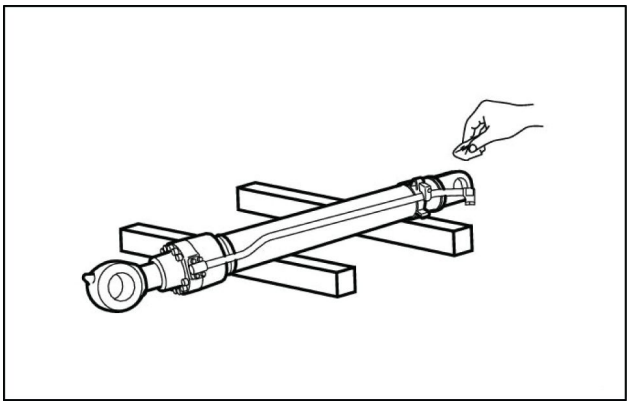
Bucket cylinder - Install

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Tighten lines and bolts being installed to the specified torque.

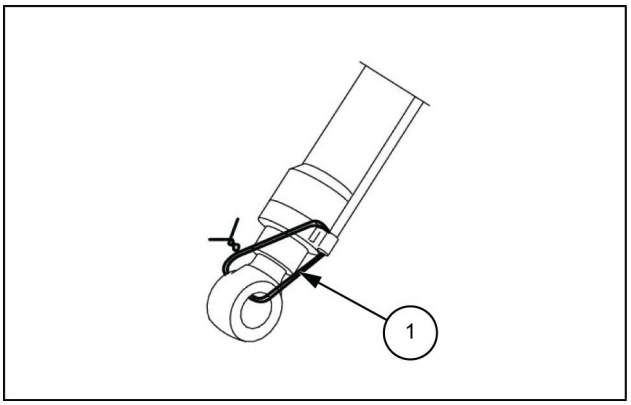
When the torque is not specified, check the **Torque - Special torque settings ()**.

1. Clean each pin and pin hole.



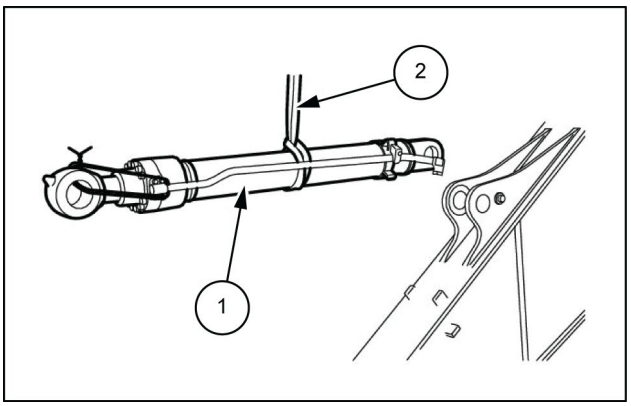
LPIL12CX01540AA 1

2. Tie the cylinder rod with wire **(1)** so that it cannot come out.



LPIL12CX01541AB 2

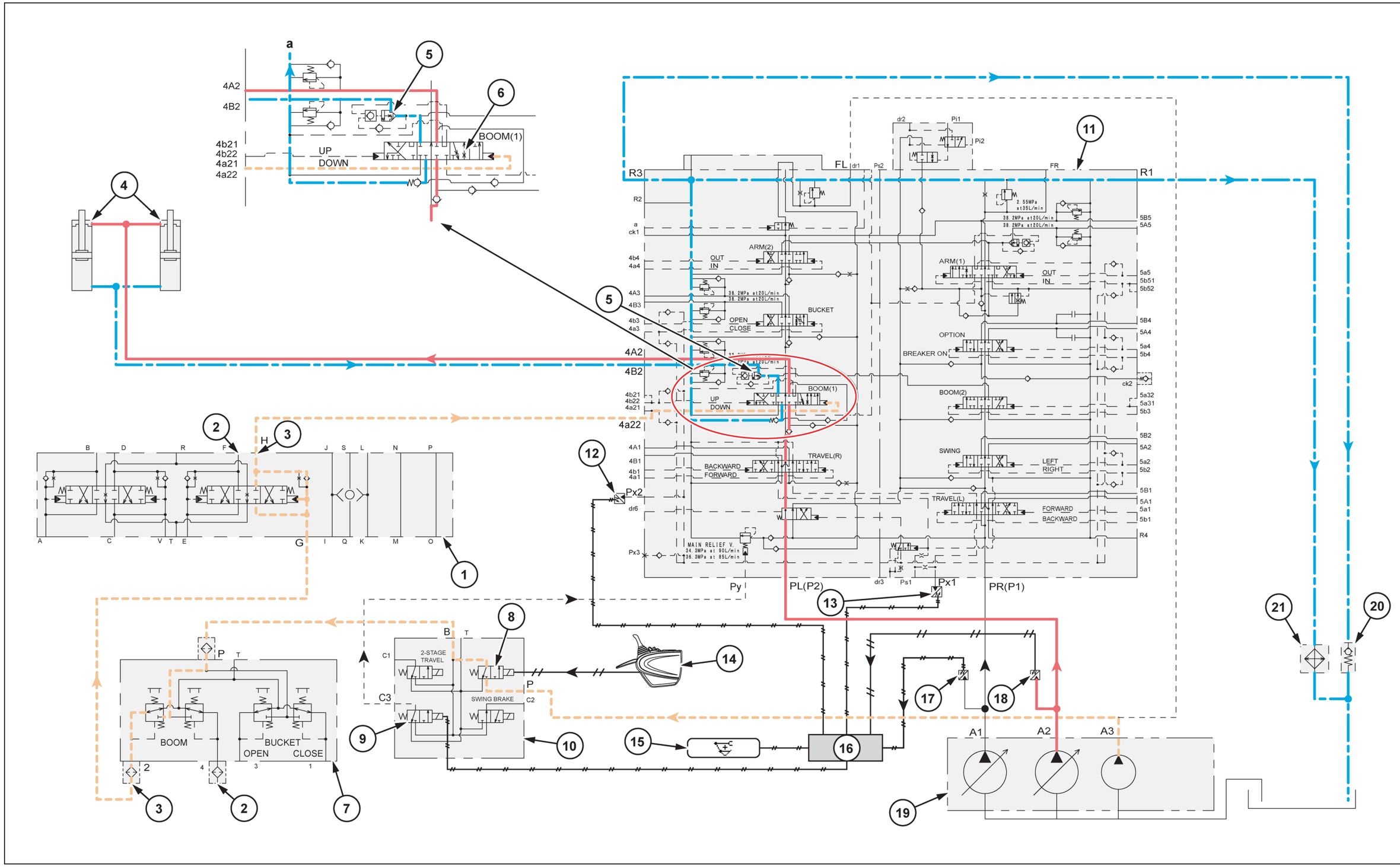
3. Use a liftcrane and nylon sling **(2)** to lift the bucket cylinder **(1)**.
   - Wrap the nylon sling to the inside of the line so that it is not crushed.



LPIL12CX01542AB 3

STRAIGHT TRAVEL CIRCUIT (WITH HBCV)

As an example, this section explains the case in which forward travel and boom-up operations are carried out simultaneously.
By operating the travel remote control valve to the forward side, the pilot pressure oil is fed to the control valve 5a1 port and switches the left travel spool to the forward side.
In the same way, the oil is also fed to the 4a1 port and switches the right travel spool to the forward side.
The discharge oil from hydraulic pump A1 enters the control valve PR (P1) port and the discharge oil from hydraulic pump A2 enters the control valve PL (P2) port. Switching the left and right travel spools lets each oil flow to the respective travel motor and causes forward travel.
If a boom-up operation is carried out during travel, the pilot pressure oil is fed via the cushion valve to the control valve 4b21 port and switches the boom 1 spool to the up side.
The pilot pressure oil from the control valve 4b21 port separated internally is fed from the 4b22 port to the 5a31 port and switches the boom **(2)** spool to the up side.
Because the spool is switched, the pilot pressure oil from Ps1 that was connected to the tank side through the travel spool is cut off. In this way, the pressure oil from Ps1 switches the straight travel signal.
The pilot pressure oil separated internally from 4b21 operates on the straight travel valve pilot chamber via the straight travel signal and the straight travel valve is switched.
The amount of switching of the straight travel spool varies with the upper pilot pressure. (The pilot pressure is low for slight upper operation, so the amount of switching of the straight travel spool is slight to prevent sharp reduction in the travel speed.)
The straight travel being switched makes it possible for the PR (P1) port pressure oil to drive travel and for the PL (P2) port pressure oil to drive the upper. Since the left and right motors are driven by 1 pump for travel, the left and right motors have the same pressure and straight travel is possible.
Furthermore, the PL (P2) port excess oil is fed to the travel side via the check with travel merge orifice to minimize the drop in speed.
The same operations are carried out when travel and an upper actuator other than for the boom are operated simultaneously.


a
4A2
4B2
4b21
4b22
4a21
4a22
UP
DOWN
BOOM(1)
R3
R2
R1
FL
FR
dr2
Pi1
Pi2
dr1
Ps2
a
ck1
ARM(2)
OUT
IN
4b4
4a4
4A3
4B3
38.2MPa at20L/min
BUCKET
OPEN
CLOSE
4b3
4a3
4A1
4B1
4b1
4a1
TRAVEL(R)
BACKWARD
FORWARD
Px2
dr6
Px3
MAIN RELIEF V.
34.3MPa at 90L/min
36.3MPa at 85L/min
Py
PL(P2)
PR(P1)
dr3
Ps1
Px1
2.55MPa at35L/min
ARM(1)
OPTION
BREAKER ON
BOOM(2)
SWING
LEFT
RIGHT
TRAVEL(L)
FORWARD
BACKWARD
5B5
5A5
5a5
5b51
5b52
5B4
5A4
5a4
5b4
ck2
5a32
5a31
5b3
5B2
5A2
5a2
5b2
5B1
5A1
5a1
5b1
R4
A B D R F H J S L N P
A C V T E G I Q K M O
P T
BOOM
BUCKET
OPEN CLOSE
2 4 3 1
B T
C1
2-STAGE TRAVEL
C3
SWING BRAKE
C2
A1 A2 A3
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

Pressure line
Tank line
Pilot pressure line
Pilot tank line
Electric line

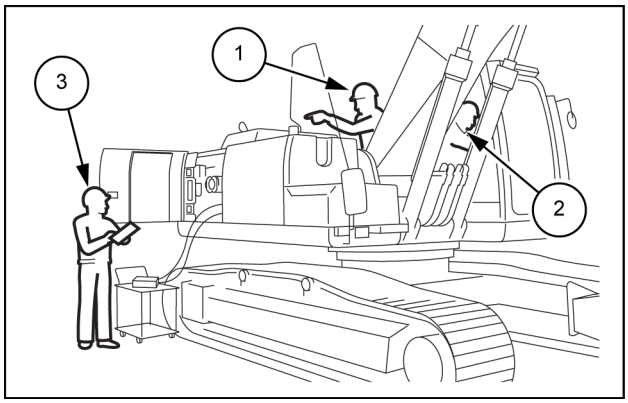
1. Cushion valve
2. Bucket (close)
3. Bucket (open)
4. Remote control valve (boom, bucket)
5. Lever lock
6. Pressure boost relief
7. 4 stack solenoid valve
8. Control valve
9. Bucket cylinder
10. Upper pilot pressure sensor
11. Console lever lock switch
12. Monitor display
13. Computer A
14. P1 pressure sensor
15. P2 pressure sensor
16. Hydraulic pump
17. Check valve
18. Oil cooler

CUSHION CIRCUIT (WHEN ARM-OUT OPERATION STOPPED)

When the remote control valve arm-out operation lever is returned to neutral, the oil pushed out from the control valve 5a5 and 4b4 ports flows to the cushion valve D port through the cushion orifice and returns from the remote control valve to the hydraulic tank.
Through this orifice, the arm spool moves to the neutral position without returning sharply, so the cushioning is improved.

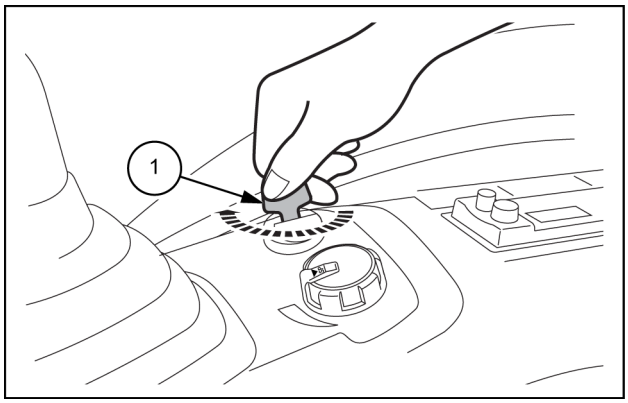
Flow Measurement

1. Perform a flow measurement. When performing a flow measurement, position workers as shown in the figure.
   (Worker 1 **(1)** : Work instructor, in charge of pressure adjustment)
   (Worker 2 **(2)**: Operator)
   (Worker 3 **(3)**: In charge of measurement and recording of flow and pressure)



SMIL14CEX2119AB 11

2. The operator starts the engine following the work instructor's signal.
3. Check the hydraulic fluid temperature (**50 °C** (**122 °F**)) on the monitor.
   Check whether the engine speed and the pump current are normal values.
4. The operator instructs the worker 1 to perform relief operation with the arm out.



SMIL14CEX2120AB 12

   1. Ignition key

5. The worker 2 reduces the arm-out port relief. (Min: **24 MPa** (**3481 psi**) P1 + P2)
6. Start a flow measurement.
7. Perform relief operation with the arm out.
8. Measure data in increments of **2 MPa** (**290 psi**) (P1 + P2).
   * Perform the measurement up to **24 - 76 MPa** (**3481 - 11024 psi**), and finish it when the highest pressure is reached.
9. Remove the flow meter.

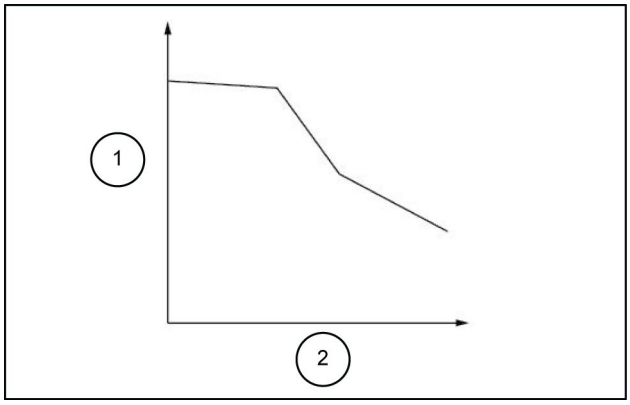
   * This is because the maximum pressure gauge of the flow meter exceeds the tolerance from **40 MPa** (**5802 psi**).

10. Set the arm-in port relief valve to normal pressure again.
    (For details of the adjustment, refer to **Hydraulic systems - Pressure setting (35.000)**).

The movement of the servo piston is transmitted to the spool by the feedback mechanism, and this operation continues until the open section between the spool and the sleeve closes.

Low tilting (low flow) command priority mechanism

1. Discharge volume Q
2. Discharge pressure (1.33P1 + 0.67P2)



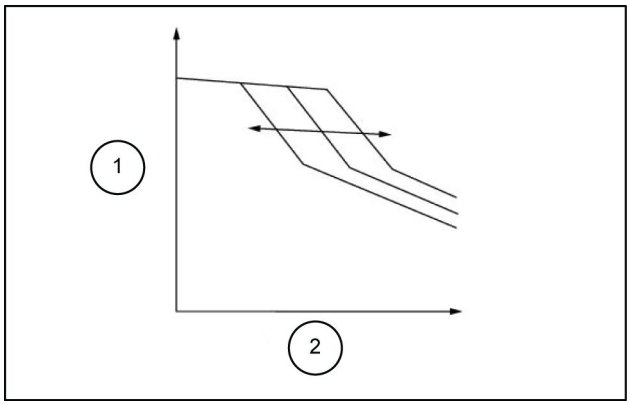
SMIL13CEX0977AA 3

The flow control and the horsepower control tilting command is transmitted to the feedback lever and spool via the large openings [C and F sections] of lever 1 and lever 2, but since the C and F sections have a structure in which a pin D4 projects into a large hole D8, the pin **(897)** only contacts the lever that makes the tilting smaller and the D8 hole for the lever on the side that has the larger tilting command state is free rather than being in contact with the pin **(897)**.

This type of mechanical selection method gives priority to flow control and horsepower control commands with low tilting.

Power shift control (decreased horsepower control)

1. Discharge volume Q
2. Discharge pressure (P1 + P2)



LPIL12CX02774AB 4

Use the power shift pressure Pf to arbitrarily control the pump set horsepower. (See the Discharge pressure (P1 + P2))

When the power shift pressure Pf increases, the compensation rod **(623)** is moved to the right via the pin **(898)** and the compensation piston **(621)**, so the pump tilting angle and the horsepower setting are reduced in the same way as was explained with the overload prevention operation of horsepower control.

By contrast, as the power shift pressure Pf decreases, the horsepower setting increases.

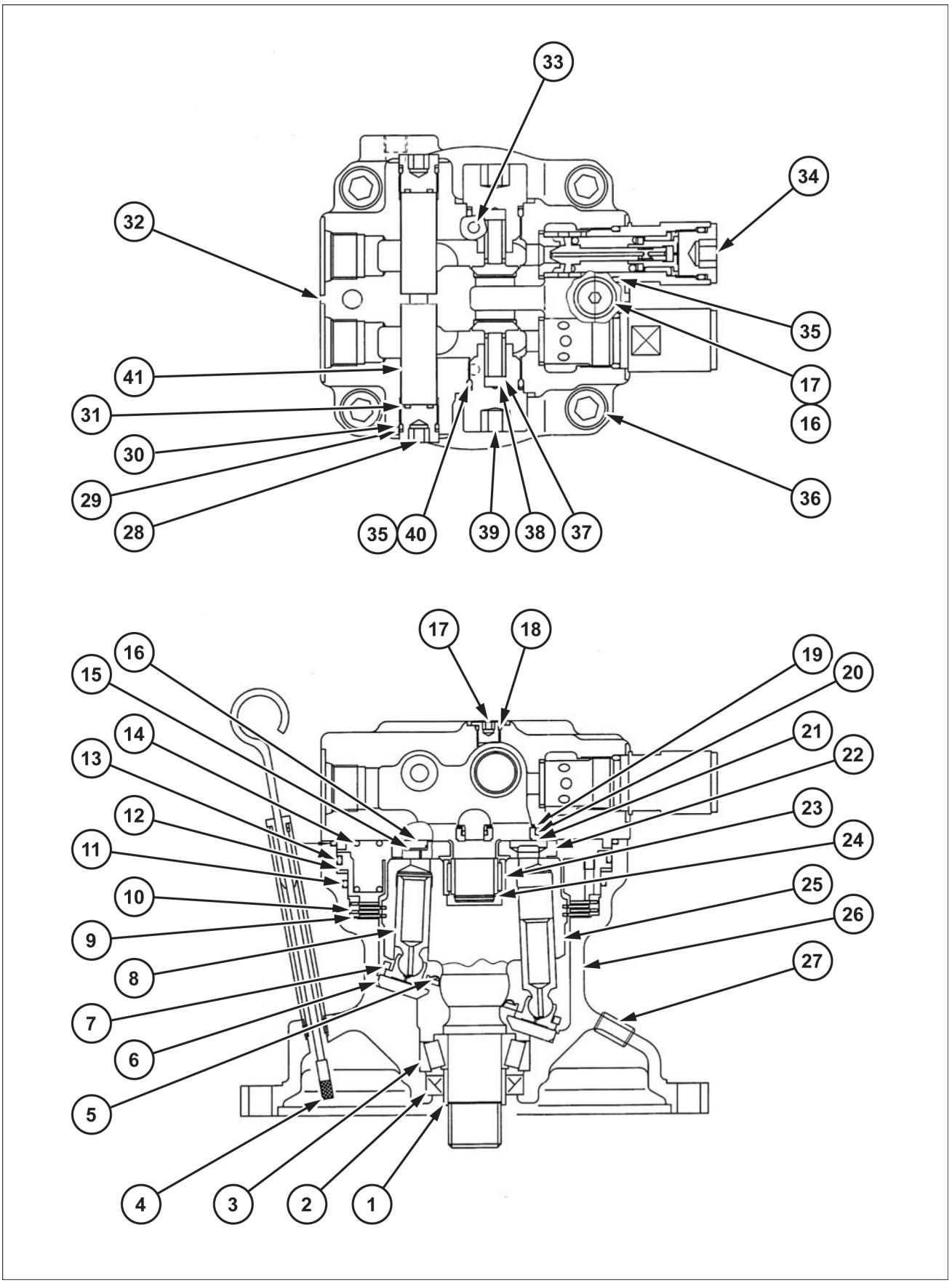
Hydraulic systems - 35

Reservoir, cooler, and filters - 300

CX130C LC version with tier 3 emission level
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3

Hydraulic swing system - Sectional view

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

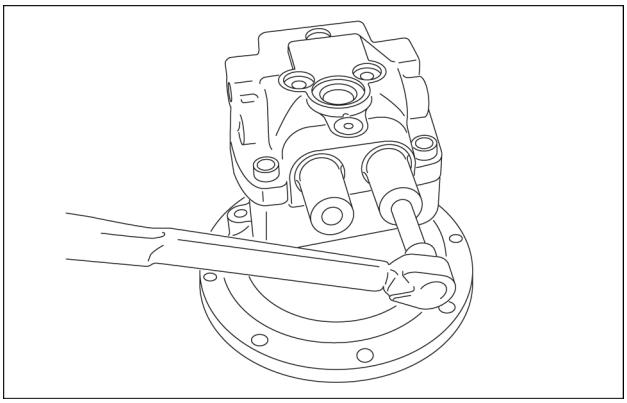


SMIL15CEX4543HB 1

Swing reduction motor - Disassemble

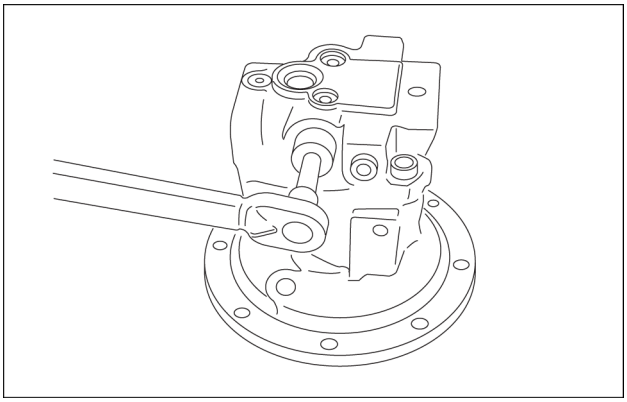
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

1. Removal of relief assembly
   Use a hexagon wrench on the caps [**14 mm** hexagon diameter] to remove the relief assemblies **(34)** installed on the motor main unit.
   - When reassembling the disassembled relief assemblies **(34)**, make sure to install them in their original locations.



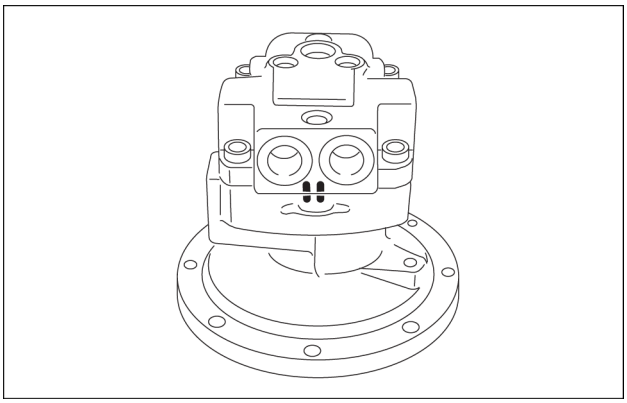
SMIL15CEX4552AA 1

2. Removal of make-up and bypass valve assembly
   Loosen and remove the caps **(39)** [**14 mm** hexagon diameter] and remove the springs **(38)** and checks **(37)**.
   - When reassembling disassembled parts, make sure to install parts in their original locations.



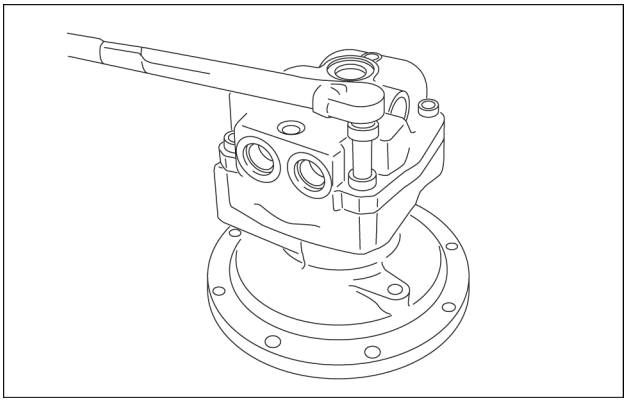
SMIL15CEX4553AA 2

3. Making a reference mark on the motor matching surface
   - It is useful for reassembly to make reference marks with white paint on the matching surface of the cover **(32)** and housing **(26)** .



SMIL15CEX4554AA 3

4. Loosening the tightening bolts
   - Loosen and remove the cover **(32)** and housing **(26)** [**12 mm** hexagon diameter].



SMIL15CEX4555AA 4

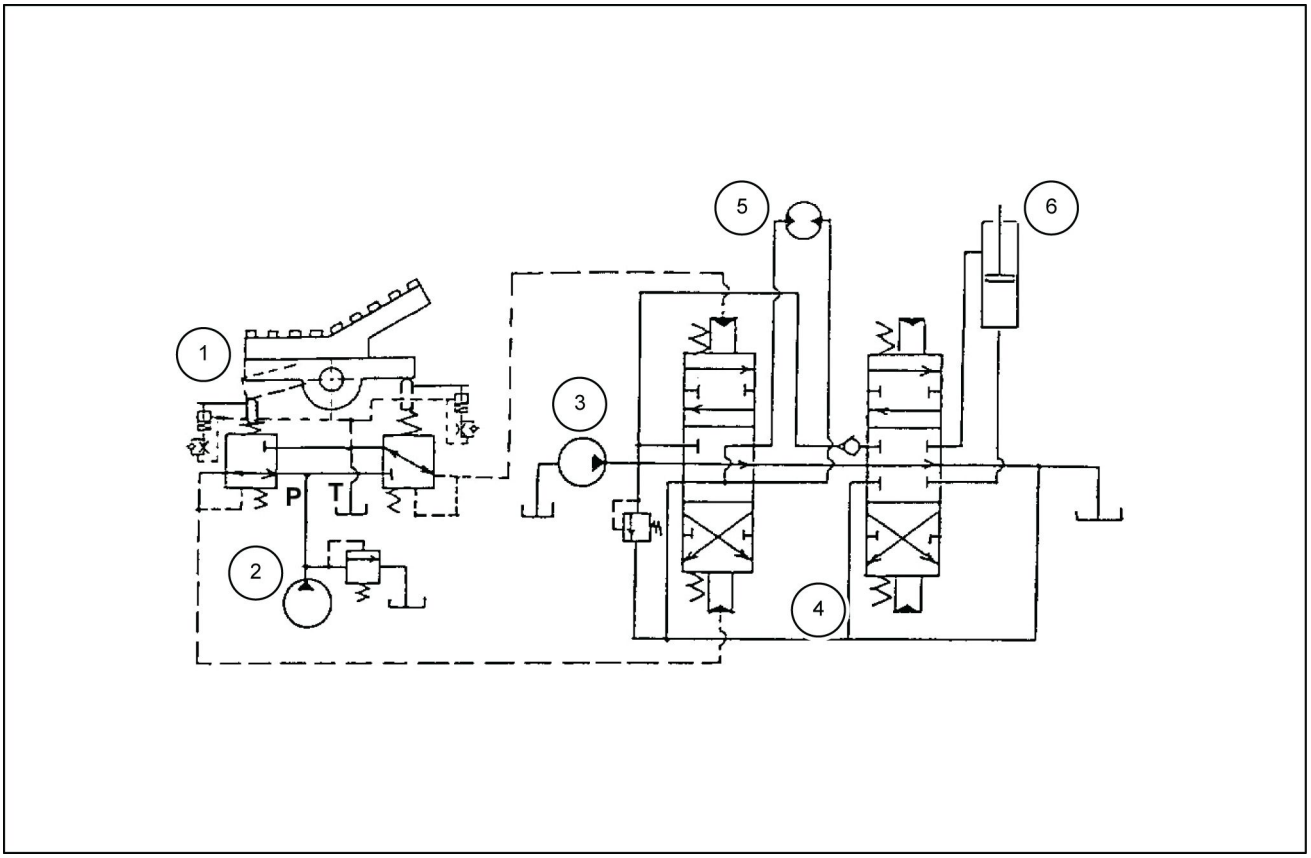
Pedal control - Dynamic description

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Operation

The remote control valve with built-in damper (hereinafter, remote control valve with damper) is a remote control valve that incorporates into the remote control valve main unit a damping function for preventing the man-machine system hunting (lever hunting) phenomenon.

Operation of the remote control valve with damper is divided into the Pressure Reduction Valve Section and the Operation Section Damping Mechanism Section. The explanations in these 2 sections are based on the hydraulic circuit diagram, assembly cross-section diagram, and damping operation explanation diagram below. The diagram below is a typical usage example for the remote control valve.



LPIL12CX01998FB 1

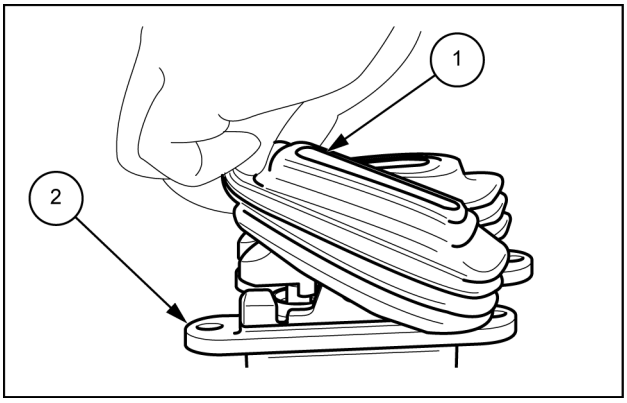
Hydraulic circuit diagram

1. Remote control valve
2. Pilot pump
3. Main pump
4. Control valve
5. Hydraulic motor
6. Hydraulic cylinder

Pedal control - Disassemble

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

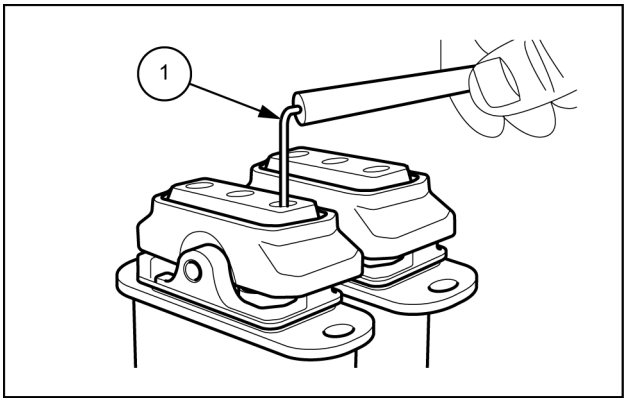
1. Use a shock plate to secure the remote control valve in a vise, and then remove the bellows **(1)** from the cover **(2)**.
   - Be careful not to tear the bellows.



SMIL14CEX1449AB 1

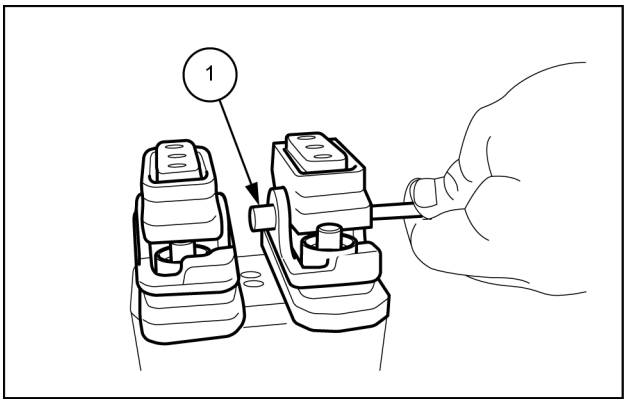
2. Use a hexagon wrench **(1)** on the hexagon socket head locking screws to loosen them.

   Be careful, as application of **LOCTITE® 241** makes the loosening torque high.



SMIL14CEX1450AB 2

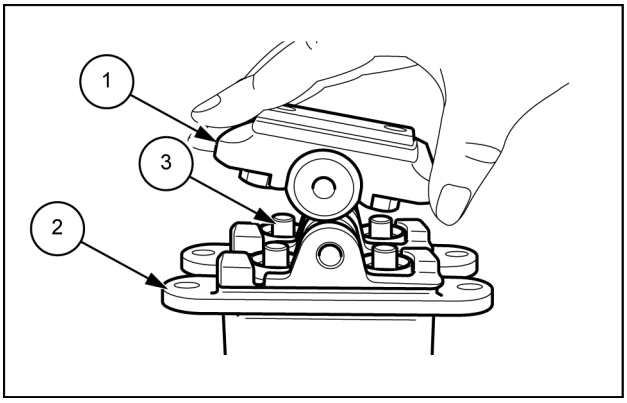
3. Place a round rod [D **8 mm** (**0.315 in**) or less] against one end of the cam shaft **(1)** and lightly strike it with a hammer to remove the shaft.



SMIL14CEX1451AB 3

4. Remove the cams **(1)** as an assembly with the locking screws and lock nuts attached.

   Record the positions of the cams in relation to the covers **(2)**.
   - Be careful when removing, as the push rods **(3)** may fly off.



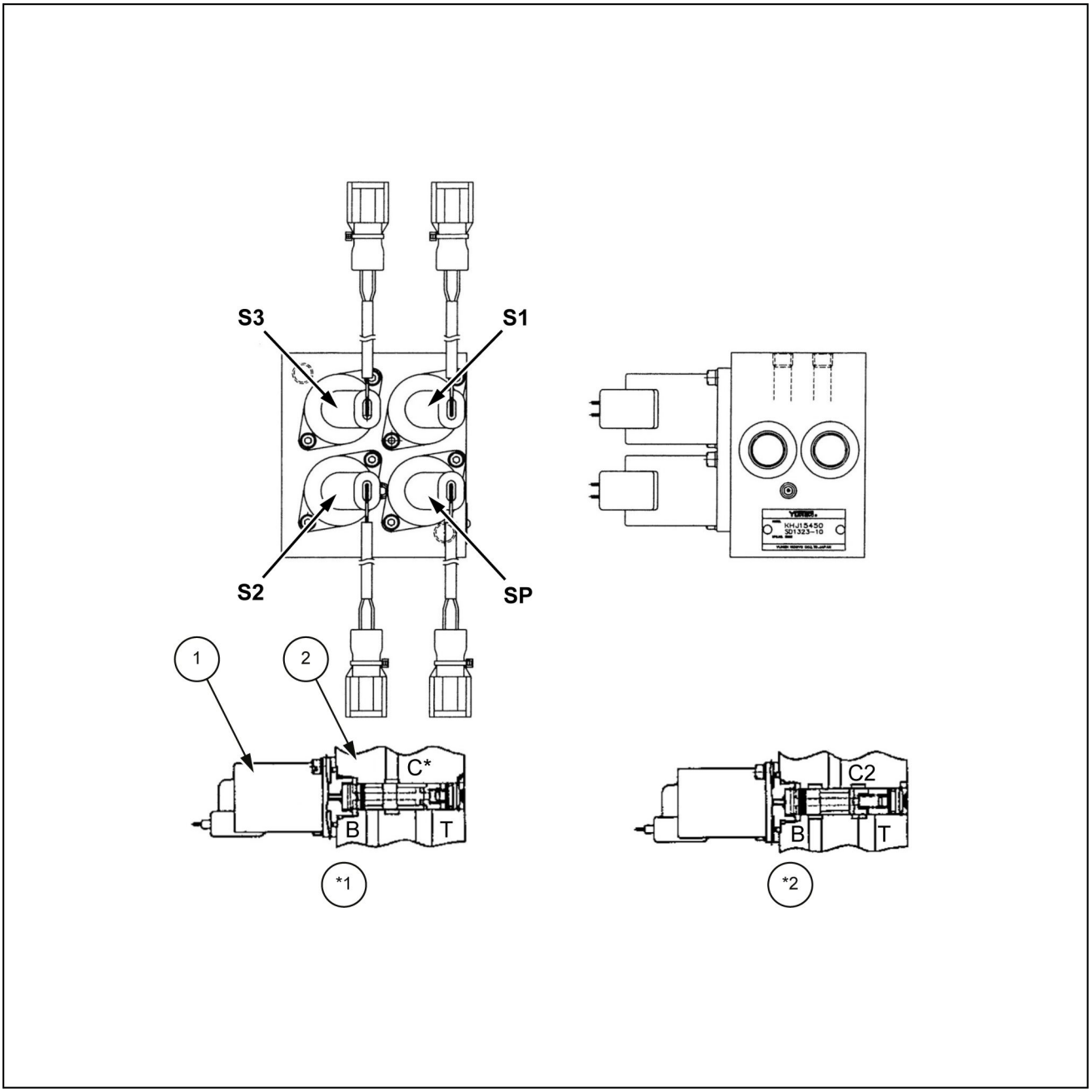
SMIL14CEX1452AB 4

Pilot solenoid valve block - Sectional view

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

External shape diagram and component parts

This valve is made up of the body and the electromagnetic switchover valve.



SMIL15CEX3607GB 1

*1. Normal closed type solenoid: SP, S1, S3
*2. Normal open type solenoid: S2

1. Electromagnetic switchover valve
2. Body

Boom cylinder - Static description

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Troubling diagnostics

Hydraulic cylinder trouble, countermeasure and solution

It is not easy to discover trouble locations.

The table below shows general symptoms, suggested causes and also solutions.

For repairs, see the suggested causes and solutions in **Boom cylinder - Troubleshooting (35.736)**.

The cause of machine problems are often not rooted in just a single part. Problems are often due to the relationship of one part with another.

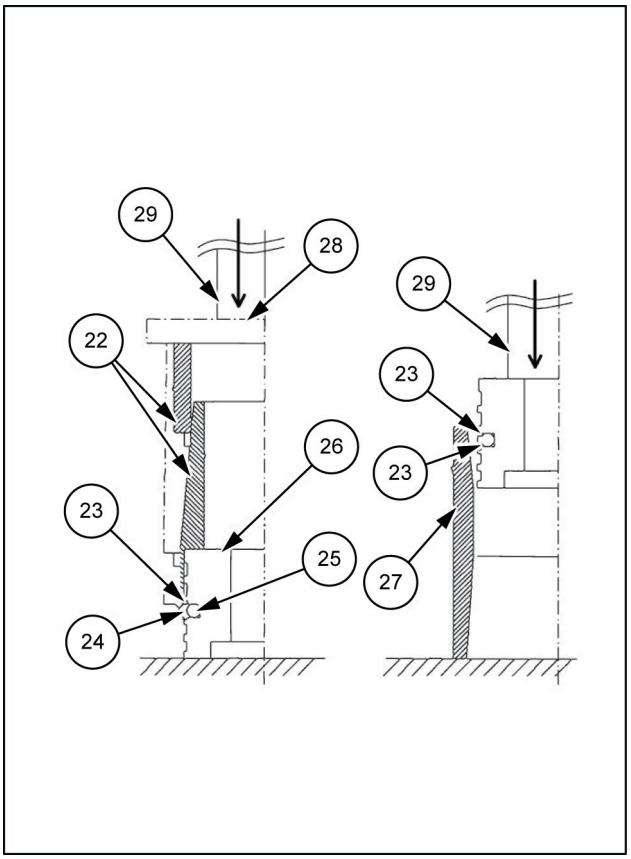
In some cases, solutions are required other than those given in **Boom cylinder - Troubleshooting (35.736)**.

In such a case, contact with our company to investigate the problem and its cause further and take appropriate measures.

Item	Symptom
1	Piston rod sliding section oil leak (For the judgment values, refer to " **Boom cylinder - Inspect (35.736)**")
2	Cylinder head matching section oil leak
3	Pipe and cylinder tube welding section oil leak
4	Operation defect

Assembly of piston assembly

1. Attach the seal ring **(24)**.
   - Attach the back-up ring **(23)** for one side and the O-ring **(25)** on the piston **(26)** in advance, place on the press platform, and use the seal ring insertion jig **(22)** as in the diagram to assemble the seal ring.
2. Calibrate the seal ring.
   - Mount the seal ring **(24)** and the other backup ring **(23)**, and then immediately calibrate with the seal ring calibration jig **(27)** so that the seal ring does not remain expanded. (Strictly observe this instruction.) Since the seal ring is stretched when it is mounted, if it is not calibrated, “Insertion of piston rod into the tube” is not possible.
3. Assemble the slide ring.
   - Spread the cut section of the slide ring the minimum with both hands and install from the axial direction. If it is spread too wide, it cannot be mounted.
     * Consult with our company about jigs.

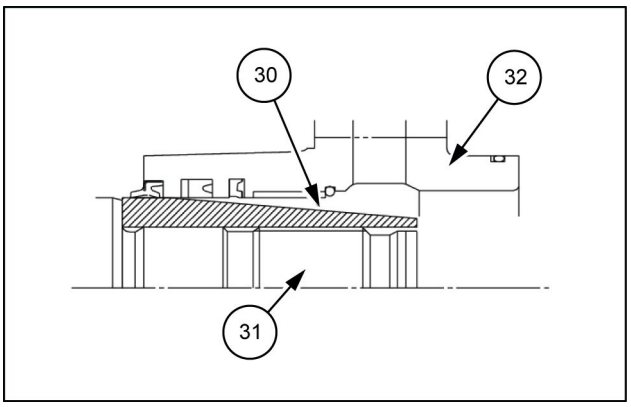


LPIL12CX02943BB 6

Assembly of piston rod assembly

1. Secure the piston rod **(31)**.
2. Assemble the cylinder head **(32)** on the piston rod **(31)**. Be careful that the wiper ring and U-ring lips do not catch on the stepped section. Use the cylinder head insertion jig **(30)** as in the diagram on the right to assemble the cylinder head on the piston rod.
   - Apply grease or oil and assemble being careful not to scratch the packing.

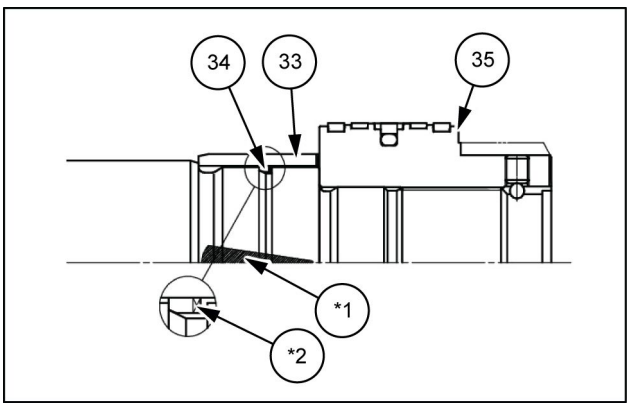
   28. Metal block
   29. Press



LPIL12CX02944AB 7

3. If there is a cushion on the extension side, assemble the cushion ring **(33)** and cushion seal **(34)** with the following procedure.
   1. Insert into the groove with the side of the cushion seal with the slit **(*2)** facing the piston side.
   2. Assemble with the part of the cushion ring processed to be flat facing as in the diagram.

   (*1) Flat surface processing
   (*2) Face the slit to the screw side



LPIL12CX02945AB 8

Counterweight - Prepare

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

⚠ WARNING

Avoid injury!
Shut off the engine, remove the key, and make sure all motion is stopped before servicing the machine. Failure to comply could result in death or serious injury.

W1128A

⚠ WARNING

Crushing hazard!
The lifting systems must be operated by qualified personnel who are aware of the correct procedures to follow. Make sure all lifting equipment is in good condition, and all hooks are equipped with safety latches.
Failure to comply could result in death or serious injury.

W0256A

⚠ WARNING

Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.
Failure to comply could result in death or serious injury.

W0398A

NOTICE: *Thoroughly secure the removed counterweight with the wire ropes and lifting equipment so that it does not fall over.*

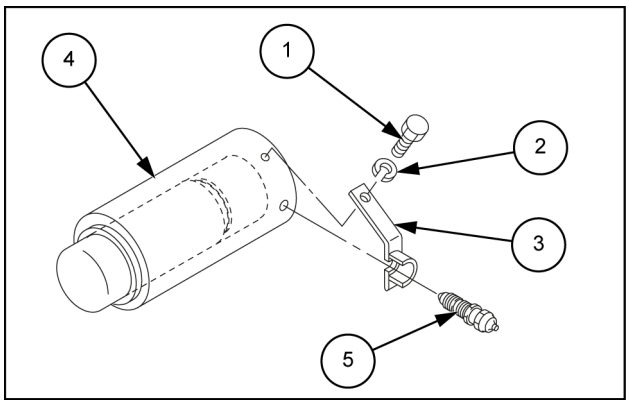
Items to prepare:

- Box wrench [**41 mm**]
- Eyebolt (M35)
- Balance lifting device
- Shackle (with the required lifting capacity) x 4
- Wire rope (with the required breaking load) x 4
- Lifting equipment (with the required lifting capacity)
- Wood planks, etc.
- Rag
- Cleaning fluid

Track tensioner - Disassemble

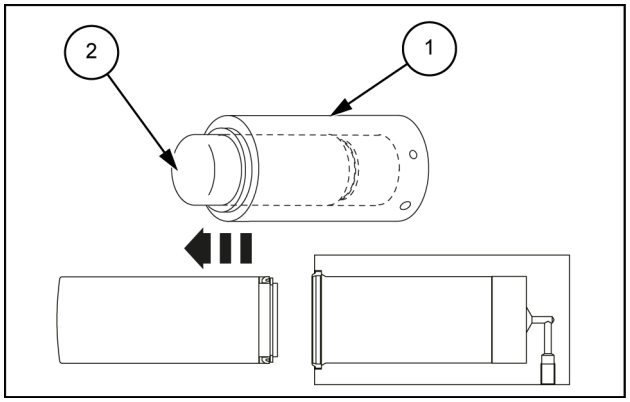
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

1. Clean the grease cylinder with kerosene, remove the bolt **(1)** and washer **(2)**, and remove the bracket **(3)**. Remove the check valve **(5)** from the grease cylinder **(4)**.



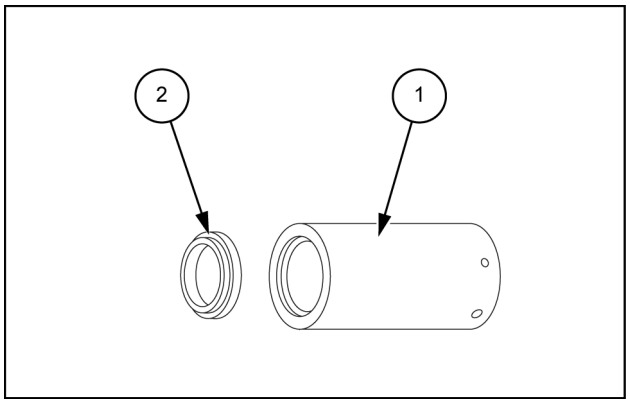
SMIL14CEX1161AB 1

2. Pull out the piston rod **(2)** from the grease cylinder **(1)**.



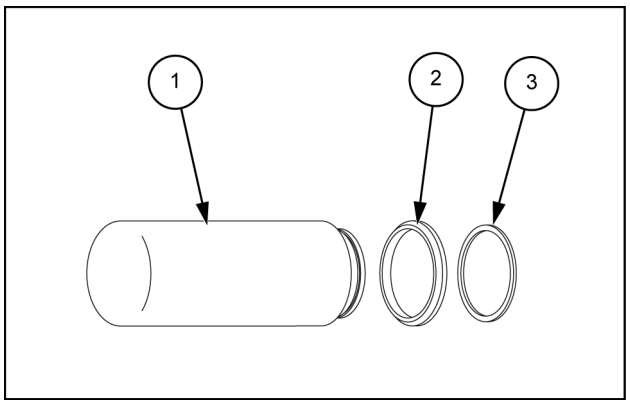
SMIL14CEX1162AB 2

3. Use the removal jig **(B)** to remove the dust seal **(2)** from the grease cylinder **(1)**.



SMIL14CEX1163AB 3

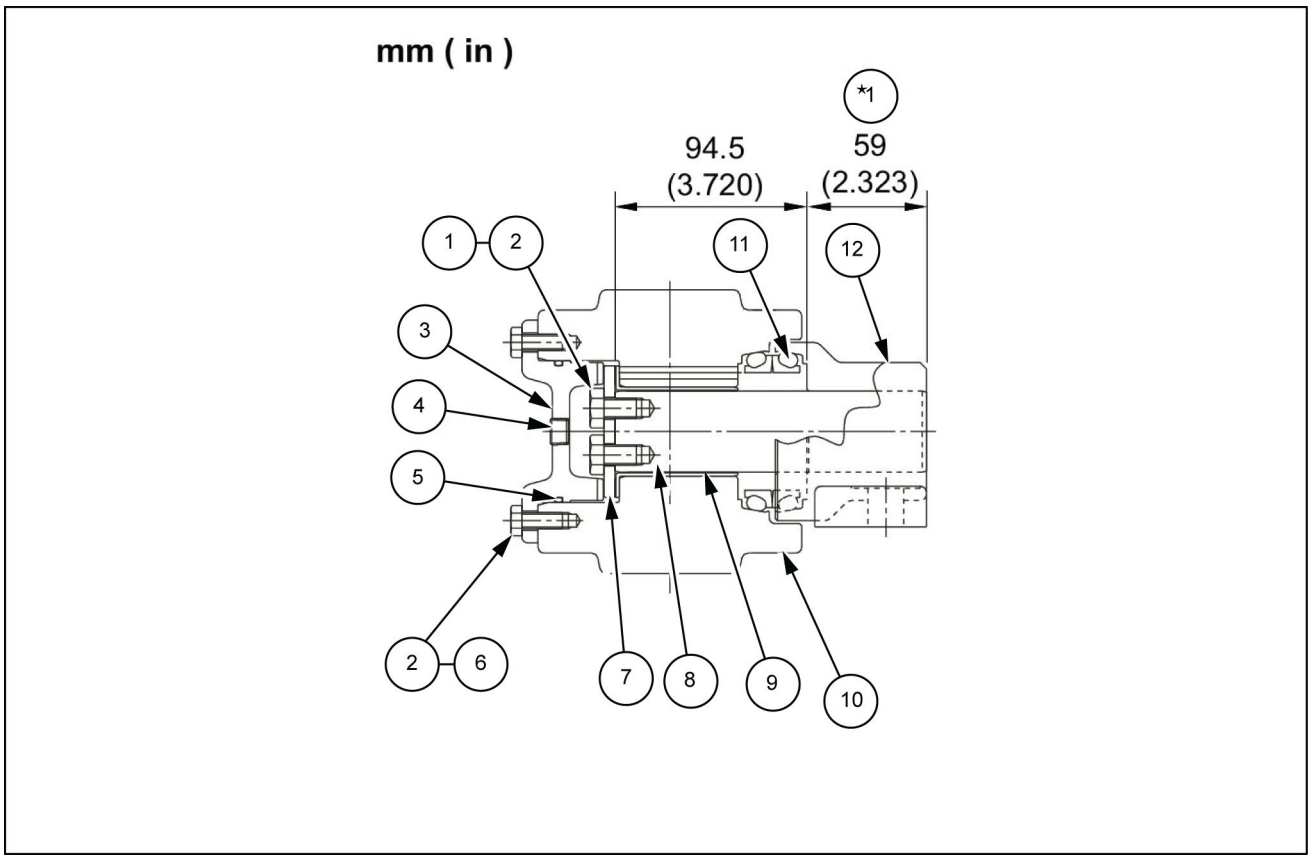
4. Remove the snap ring **(2)** from the piston rod **(1)**, and then use the removal jig **(B)** to remove the U-packing **(3)**.



SMIL14CEX1164AB 4

Track support roller - Component identification

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA



LPIL12CX02602FB 1

- *1 Press fit length
- 1. High-strength bolt
- 2. **LOCTITE® 262™**
- 3. Cover
- 4. Plug with seal nylon
- 5. O-ring
- 6. High-strength bolt M8 x 25
- 7. Thrust plate
- 8. Shaft
- 9. Bushing
- 10. Roller
- 11. Floating seal
- 12. Bracket

NOTE: *All the dimensions in figure are in mm (in).*

Contents

Tracks and track suspension - 48

Track frame and driving wheels - 130

(*) See content for specific models

Electrical systems - 55

Warning indicators, alarms, and instruments - 408

CX130C LC version with tier 3 emission level
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3

(*) See content for specific models

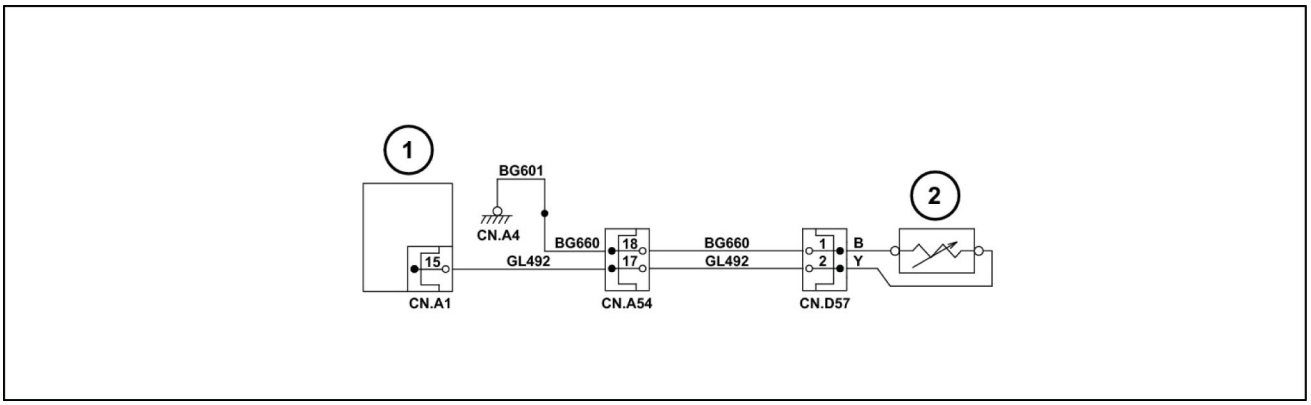
7040-Fuel level sensor signal abnormality

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Control Module : MCM

Solution:

1. Use the below image for the fault code resolution process:



LPIL12CX00892EB 1

1. Computer A
2. Fuel level sensor

Float position and resistance

Float position	Full	Half	Empty
Resistance	**10 Ω** **0 - 4 Ω**	**38 Ω**	**80 Ω** **0 - 10 Ω**

* Temperature conditions: **5 - 35 °C** (**41 - 95 °F**)

Turn the key switch ON.

Inspect the connection status of each connector and ground. Make sure that all the connectors are secured.

A. If diagnostic trouble code 7040 is displayed, proceed to Step **2**.

2. Check the fuel level sensor **(2)** resistance on the service support screen.

A. If the resistance is more than or equal to **100 Ω**, proceed to Step **3**

B. If the resistance is less than or equal to **2 Ω**, proceed to Step **6**.

3. Turn the key switch OFF and disconnect the fuel level sensor connector **CN.D57**.

Measure the resistance between the terminal 1 and terminal 2 of the fuel level sensor connector **CN.D57** sensor side (see the float position and resistance table).

A. If the resistance is not a standard value, replace the fuel level sensor **(2)**.

B. If the resistance is within standard value, proceed to Step **4**.

4. Inspect for continuity between the ground and terminal 1 of the fuel level sensor connector **CN.D57** harness side.

A. If there is no continuity, find and repair the open circuit on the wire ID BG660 or BG601.

B. If there is continuity, proceed to Step **5**.

5. Turn the key switch ON.

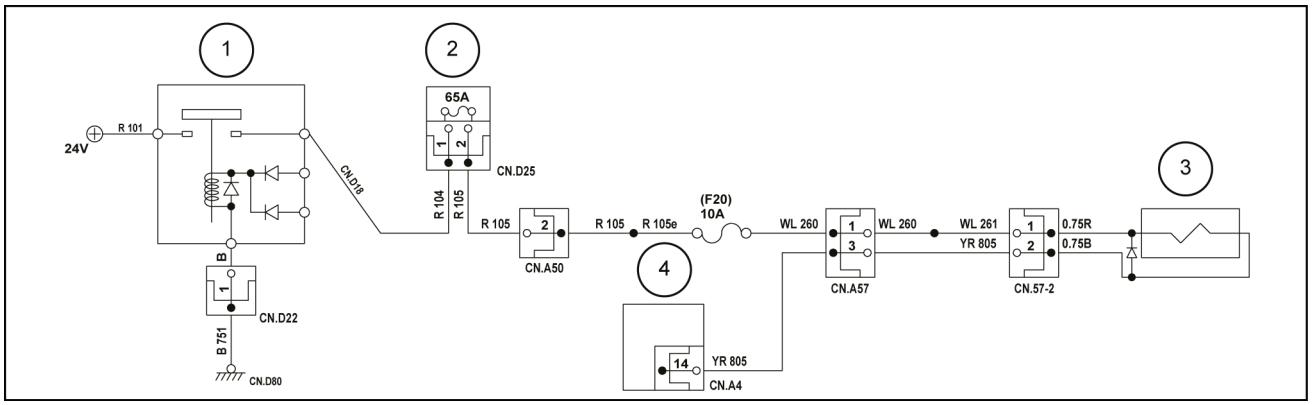
7246-2 pumps flow solenoid signal abnormality

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Control Module : MCM

Solution:

1. Use the below image for the fault code resolution process:



SMIL15CEX3285EB 1

1. Relay battery
2. Fusible link; fuse box
3. Option 2 speed
4. Computer A

Turn the key switch ON.

2. Inspect the connection status of each connector. Make sure that all the connectors are secured.

   Inspect the fusible link **65 A** fuse and fuse box F20 **10 A** fuse.

   A. If diagnostic trouble code 7246 is displayed, proceed to Step **3**.

3. Turn the key switch OFF and disconnect the connector **CN.57-2**.

   Measure the resistance between the terminals 1 and 2 of the connector **CN.57-2** 2 pumps flow solenoid side.

   A. If the resistance is not within **34 - 47 Ω**, replace 2 pumps flow solenoid **(3)**.

   B. If the resistance is within **34 - 47 Ω**, proceed to Step **4**.

4. Turn the key switch ON.

   Measure the voltage between the ground and terminal 2 of the **CN.57-2** harness side.

   A. If the voltage is not **0 V**, replace the short circuit on the wire ID YR805.

   B. If the voltage is **0 V**, proceed to Step **5**.

5. Turn the key switch OFF.

   Inspect for continuity between the ground and terminal 1 of the connector **CN.57-2** harness side.

   A. If there is no continuity, proceed to Step **6**.

   B. If there is continuity, replace the short circuit on the wire ID WL260, WL261, R105e, R105, or R104.

6. Inspect for continuity between the ground and terminal 2 of the connector **CN.57-2** harness side.

   A. If there is no continuity, repair and replace the open circuit on the wire ID YR805.

   B. If there is continuity, proceed to Step **7**.

7. Turn the key switch ON.

7614-Air-conditioner panel mismatch

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Control Module : MCM

Solution:

1. Turn the key switch ON.

   Check for an error on the service support model selection screen.

   A. If the model selection screen is not correct, correctly set the model selection.

   B. If the model selection screen correct, proceed to Step **2**.
2. Check that the numbers of the installed air conditioner panels match the model number.

   A. If the air conditioner panel number does not match the model, replace with an air conditioner panel that matches the model.

   B. If the air conditioner panel number matches the model, replace the air conditioner panel.

P0122-Throttle position sensor, low input

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Control Module : ECM

Solution:

1. Check and diagnose the below fault codes before you proceed with the diagnostics code 0122.

   Diagnostic trouble code 1655

2. Turn OFF the starter switch.

   Disconnect the harness connector from the intake throttle valve.

   Turn ON the starter switch.

   Measure the voltage between the intake throttle position sensor **5 V** power supply circuit and a normal GND.

   If the voltage is less than or equal to **4.9 V**, inspect to see if there is an open circuit or high resistance with the **5 V** power supply circuit between the ECM and the intake throttle position sensor.

   NOTE:
   *• The intake throttle position sensor shares the **5 V** power supply circuit with other sensors.*
   • The diagnostic trouble code set on a sensor which shares this circuit may be detected.

   A. If a problem is found, repair the **5 V** power supply circuit.

   B. If there are no problems, proceed to Step **3**.

3. Connect the test cable with fuse between the intake throttle position sensor **5 V** power supply circuit and the signal circuit.

   Check the intake throttle position sensor display with the trouble diagnosis scan tool.

   If the voltage is more than or equal to **4.9 V**, inspect to see if there is a contact failure with the intake throttle valve harness connector.

   A. If a problem is found, repair the harness connector.

   B. If the harness connector is normal, replace the intake throttle valve.

   C. If there are no problems, proceed to Step **4**.

4. Inspect the signal circuit between the ECM and intake throttle position sensor.

   Make sure that there should be no open circuit or high resistance.

   Make sure that there should be no short to GND.

   A. If a problem is found, repair the signal circuit.

   B. If there are no problems, proceed to Step **5**.

5. Inspect the ECM harness connector for poor connection.

   A. If a problem is found, repair the harness connector.

   B. If the harness connector is normal, replace the ECM.

6. Set the injector ID code on the ECM.

   Perform the unit difference learning of the fuel supply pump to the ECM.

7. Confirm resolution:

Make sure there should be no open circuit or high resistance.

A. If a problem is found, repair the control circuit.

B. if there are no problems, proceed to Step **7**.

7. Disconnect the harness connector **CN.D1-02** from the ECM.

   Inspect the ECM harness connector **CN.D1-02** for a poor connection.

   A. If a problem is found, repair the harness connector **CN.D1-02**.

   B. If the harness connector **CN.D1-02** is normal, replace the ECM.

8. Set the injector ID code on the ECM.

   Perform the unit difference learning of the fuel supply pump to the ECM.

9. Confirm resolution:

   1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

   2. Turn the starter switch OFF for **30 s** or longer.

   3. Start the engine.

   4. Perform a test-run.

   5. Use the trouble diagnosis scan tool to confirm that a diagnostic trouble code has not been detected.

Wiring harnesses - Electrical schematic sheet 09 (55.100) Wiring harnesses - Electrical schematic sheet 08 (55.100)

P0238-Turbocharger boost sensor circuit high

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Control Module : ECM

Solution:

1. Check and diagnose the below fault code before you proceed with the diagnostics of 0238.

   Diagnostic trouble code 1655

2. Turn OFF the starter switch.

   Disconnect the harness connector **CN.E6** from the boost sensor.

   Check the boost pressure sensor display with the trouble diagnosis scan tool.

   If the reading is more than or equal to **0.1 V**, inspect the signal circuit between the ECM and the boost sensor.

   Make sure that there is no short circuit to the battery or ignition power is present.

   Make sure that there is no short to the **5 V** power supply.

   A. If a problem is found, repair the signal circuit.

   B. If there are no problems, proceed to Step **3**.

3. Inspect to see if there is an open circuit or high resistance in the GND circuit between the ECM and the boost sensor.

   NOTE:
   • The boost sensor shares the GND circuit with other sensors.
   • The diagnostic trouble code set on a sensor which shares this circuit may be detected.

   A. If a problem is found, repair the GND circuit.

   B. If there are no problems, proceed to Step **4**.

4. Inspect the boost sensor harness connector **CN.E6** for poor connection.

   A. If a problem is found, repair the harness connector **CN.E6**.

   B. If the harness connector **CN.E6** is normal, replace the boost sensor.

   C. If there are no problems, proceed to Step **5**.

5. Inspect the ECM harness connector **CN.D1-02** for a poor connections.

   A. If a problem is found, repair the harness connector **CN.D1-02**.

   B. If the harness connector **CN.D1-02** is normal, replace the ECM.

6. Set the injector ID code on the ECM.

   Perform the unit difference learning of the fuel supply pump to the ECM.

7. Confirm resolution:

   1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

   2. Turn the starter switch OFF for **30 s** or longer.

   3. Start the engine.

   4. Perform a test-run.

If there is a data display which does not display ON, inspect the EGR position sensor circuit which does not display ON.

Make sure there is no open circuit or high resistance between ECM and EGR position sensor.

Make sure there is no short to GND between ECM and EGR position sensor.

A. If a problem is found, repair the EGR position sensor circuit.

B. If there are no problems, proceed to Step **6**.

6. Inspect the EGR valve harness connector **CN.E3** for poor connection.

   A. If a problem is found, repair the harness connector **CN.E3**.

   B. If there are no problems, proceed to Step **7**.

7. In the EGR solenoid circuit between the ECM and EGR valve, inspect to see if there is a short circuit with the EGR position sensor.

   A. If a problem is found, repair the EGR solenoid circuit.

   B. If the EGR solenoid circuit is normal, replace the EGR valve. (Refer to " **Exhaust Gas Recirculation (EGR) valve - Remove (10.501)** " and " **Exhaust Gas Recirculation (EGR) valve - Install (10.501)**")

   C. If there are no problems, proceed to Step **8**.

8. Inspect the ECM harness connector **CN.D1-02** for poor connection.

   A. If a problem is found, repair the harness connector **CN.D1-02**.

   B. If the harness connector **CN.D1-02** is normal, replace the ECM.

9. Set the injector ID code on the ECM.

   Perform the unit difference learning of the fuel supply pump to the ECM.

10. Confirm resolution:

    1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

    2. Turn the starter switch OFF for **30 s** or longer.

    3. Start the engine.

    4. Perform a test-run.

    5. Use the trouble diagnosis scan tool to confirm that a diagnostic trouble code has not been detected.

Wiring harnesses - Electrical schematic sheet 10 (55.100) Wiring harnesses - Electrical schematic sheet 07 (55.100)

P0606-ECM/PCM processor

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Control Module : ECU

Solution:

1. Replace the ECM.

   Set the injector ID code on the ECM.

   Perform the unit difference learning of the fuel supply pump to the ECM.
2. Confirm resolution:

   1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.
   2. Turn the starter switch OFF for **30 s** or longer.
   3. Start the engine.
   4. Perform a test-run.
   5. Use the trouble diagnosis scan tool to confirm that a diagnostic trouble code has not been detected.

A. If a problem is found, replace the fuel hose.

B. If there are no problems, proceed to Step **7**.

NOTE:
• The fuel hose between the fuel tank and the fuel supply pump becomes negative pressure state when the engine is running.
• When the fuel hose is not connected securely, the air can enter.
• When the engine RPM or the engine load increases while the air has intruded in the fuel system, fluctuation in the common rail pressure is caused, and diagnostic trouble code 1093 may be detected.

7. Check that an appropriate clamp is used between the fuel tank and the fuel supply pump.

   A. If a problem is found, replace the clamp.

   B. If there are no problems, proceed to Step **8**.

8. Operate the priming pump until the handle becomes heavy.

   NOTE: *When a leak exists in the fuel system between the priming pump and the fuel supply pump, the pressing weight of the priming pump does not become heavy.*

   Start the engine.

   Inspect the high-pressure side of the fuel system and check for fuel leak between the fuel supply pump and common rail.

   NOTE:
   • The fuel may leak to the bottom section of the cylinder head cover from the high pressure hose inlet.
   • The engine oil level increases when the fuel leaks to the bottom portion of the cylinder head cover.
   • Inspect for fuel leaks into the engine oil.

   A. If fuel leak if found, fix the problem.

   B. If there are no problems, proceed to Step **9**.

9. Turn OFF the starter switch.

   Remove the fuel hose on the fuel supply pump side from the fuel filter.

   NOTE:
   • Use a pan to catch the fuel from the removed fuel hose.
   • Clean the pressure gauge and connection hose before connecting to the fuel pipe.
   • The fuel supply pump may be damaged due to foreign matter that has entered in the connection hose.

   Connect the pressure gauge between the fuel filter and the removed fuel hose.

   NOTE: *Confirm that the fuel system is connected securely.*

   Remove the air using the priming pump, and crank the engine for **5 s** or shorter.

   NOTE: *Repeat this until the engine starts.*

   Leave the engine idling for **1 min** or longer.

   While keeping the engine rotating at **1500 RPM** check the pressure gauge.

   Check if the pressure gauge shows a negative pressure value is equal or greater than **-17.0 kPa** (**-2.5 psi**) during inspection.

   NOTE: *Fuel clogging is checked with the negative pressure amount in the fuel system.*

   If the negative pressure is equal or greater than **-17.0 kPa** (**-2.5 psi**), inspect to see if there is damage or twisting with the fuel system between the fuel supply pump and the fuel tank.

P2149-Fuel injector group 2 supply voltage circuit

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Control Module : ECM

Solution:

1. Turn the starter switch OFF.

   Disconnect the harness connector from the cylinder head injector harness intermediate connector **CN.D8**.

   Turn the starter switch ON.

   Measure the voltage between the solenoid control circuit and GND.

   NOTE:
   • Solenoid control circuit and GND of the second cylinder injector.
   • Solenoid control circuit and GND of the third cylinder injector.

   If it is less than or equal to **12 V**, inspect to see if there is a short circuit to the GND with the control circuit between the ECM and injector harness intermediate connector **CN.D8**.

   A. If a problem is found, repair the control circuit.

   B. If there are no problems, proceed to Step **2**.
2. Inspect the charge voltage circuit between the ECM and the injector harness intermediate connector **CN.D8**.

   Make sure no short circuit to the battery or ignition power is present.

   Make sure no short circuit to GND is present.

   A. If a problem is found, repair the charge voltage circuit.

   B. If the charge voltage circuit between the ECM and the injector harness intermediate connector **CN.D8** is normal, replace the ECM. (Refer to **Engine Control Unit (ECU) - Remove (55.015)** and **Engine Control Unit (ECU) - Install (55.015)**)
3. Set the injector ID code on the ECM.

   Perform the unit difference learning of the fuel supply pump to the ECM.

   Inspect the injector harness intermediate connector **CN.D8** for a poor connection.

   A. If a problem is found, repair the injector harness intermediate connector **CN.D8**.

   B. If there are no problems, proceed to Step **4**.
4. Disconnect the harness connector **CN.D1-02** from the ECM.

   Inspect the ECM harness connector **CN.D1-02** for a poor connection.

   A. If a problem is found, repair the harness connector **CN.D1-02**.

   B. If there are no problems, proceed to Step **5**.
5. Inspect to see if there is an open circuit or high resistance with the charge voltage circuit between the ECM and the injector harness intermediate connector **CN.D8**.

   A. If a problem is found, repair the charge voltage circuit.

   B. If there are no problems, proceed to Step **6**.
6. Remove the cylinder head cover. (Refer to " **Valve cover - Remove (10.101)**)"

SERVICE MANUAL

Electrical systems

CX130C LC version with tier 3 emission level
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3

Hydraulic system control - Dynamic description - End attachment

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Breaker Mode

Purpose

It is possible to set the maximum flow and the maximum pressure for each of the five breakers.

Operation explanation

1. Each time the attachment select switch is pressed, it switches between Normal Mode → Breaker Mode → Crusher Mode → Normal Mode.
   The maximum flow for the switched mode is displayed on the monitor for **3 s**.
   * The breaker mode only has breaker mode 1 in the initial state, but a mode can be added on the flow setting screen.
2. Breaker can be used by selecting breaker mode.
   * Set the maximum flow and maximum pressure first on the flow setting screen.
   * If the set flow rate requires 2 pumps flow, 2 pumps flow is performed.
3. Judges if the flow rate is appropriate for the breaker.
   If it exceeds the correct flow rate, the "CHECK FLOW RATE" message is displayed and the buzzer sounds for **3 s**.
   * The message is displayed only when the breaker is being operated. Once the operation is stopped, the display disappears and the buzzer stops.
4. When the key is turned “OFF” once, then “ON” again, the attachment mode selected previously is retained.

Crusher mode

Purpose

It is possible to set the maximum flow and the maximum pressure for each of the five crushers.

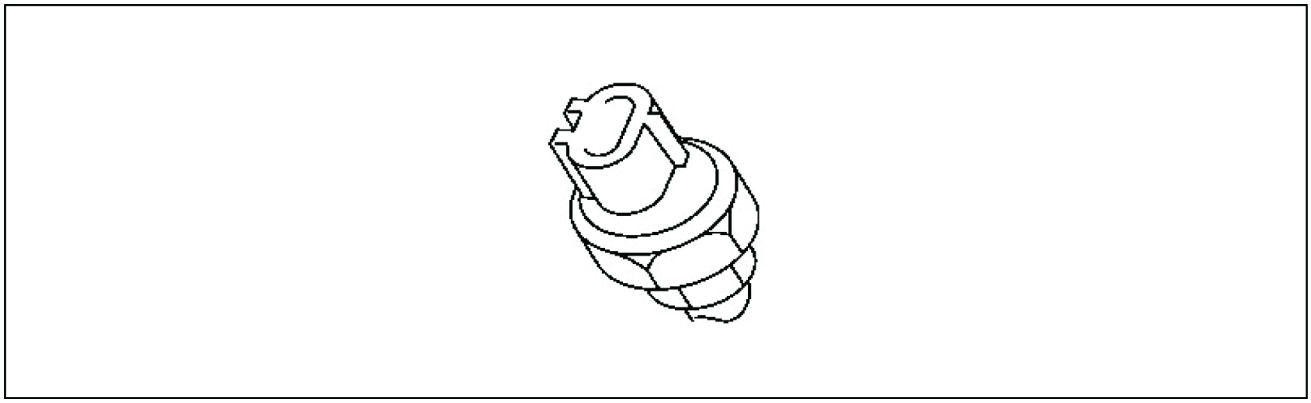
Operation explanation

1. Each time the attachment select switch is pressed, it switches between Normal Mode → Breaker Mode → Crusher Mode → Normal Mode.
   The maximum flow for the switched mode is displayed on the monitor for **3 s**.
   * The crusher mode only has Crusher Mode 1 in the initial state, but a mode can be added on the flow setting screen.
2. Crusher can be used by selecting crusher mode.
   * Set the maximum flow and maximum pressure first on the flow setting screen.
   * If the set flow rate requires 2 pumps flow, 2 pumps flow is performed.
3. When the key is turned “OFF” once, then “ON” again, the attachment mode selected previously is retained.

Air-conditioning system pressure switch - Static description

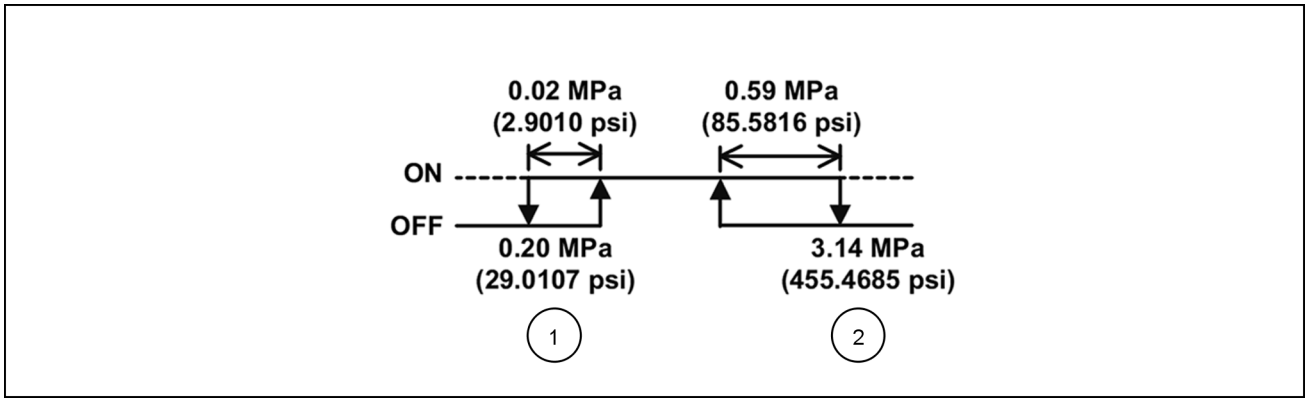
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Dual pressure switch



LPIL12CX02362EA 1

The dual pressure switch is installed on the receiver dryer. When there is pressure trouble in the coolant high-pressure side line (abnormally high pressure or abnormally low pressure), the dual pressure switch contacts open up to cut off the compressor power and protect the cooling cycle.



SMPH14CEX6783EB 2

Dual pressure switch specifications

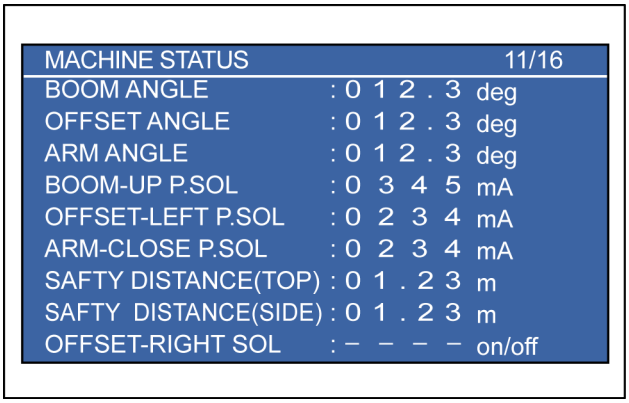
1	Lower-pressure side
2	High-pressure side

Simple inspection method for dual pressure switch.

1. With the cooling cycle stopped, remove the connector from the switch and check for continuity between the switch side connector terminals using the tester. If there is continuity, the switch is normal. (When the outside air temperature is **0 °C** (**32 °F**) or higher)
2. Connect the gauge manifold high-pressure side hose to the high-pressure side charge port. With the cooling cycle operating, the condenser front surface is covered with a plate shaped object and the high pressure rises. If the compressor stops around **3.14 MPa** (**455.457 psi**) , the switch is normal.
3. With the refrigerant removed, check for continuity between the switch side connector terminals using the tester. If there is no continuity, the switch is normal.

11. Safety distances

BOOM ANGLE	deg	Boom angle
OFFSET ANGLE	deg	Offset angle
ARM ANGLE	deg	Arm angle
BOOM-UP P.SOL.	%	Actual milli-amp for boomup proportional valve
OFFSET-LEFT P.SOL.	%	Actual milli-amp for offsetleft proportional valve
ARM-CLOSE P.SOL.	mA	Actual milli-amp for arm-in proportional valve
SAFETY DISTANCE (TOP)	m (ft.)	Safety distance (TOP VIEW)
SAFETY DISTANCE (SIDE)	m (ft.)	Safety distance (SIDE VIEW)
OFFSET-RIGHT SOL.	on/off	Offset-right solenoid



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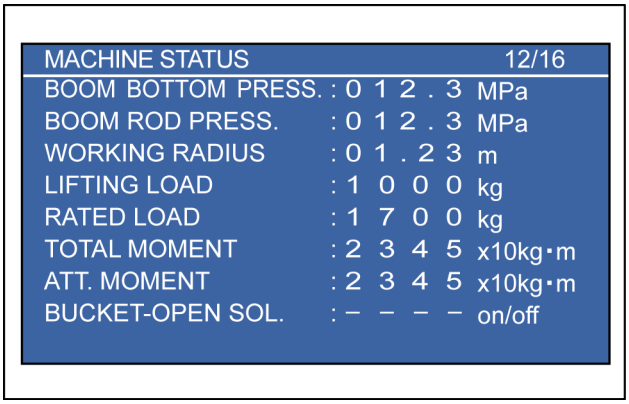
12. Hanging load

BOOM BOTTOM PRESS.	MPa (psi)	Boom cylinder bottom side pressure
BOOM ROD PRESS.	MPa (psi)	Boom cylinder rod side pressure
WORKING RADIUS	m (ft.)	Work radius
LIFTING LOAD	kg (lb)	Actual load
RATED LOAD	kg (lb)	Rated load
TOTAL MOMENT	kg.m	Total momentum
ATT. MOMENT	kg.m	ATT momentum
BUCKET-OPEN SOL.	on/off	Bucket-open solenoid



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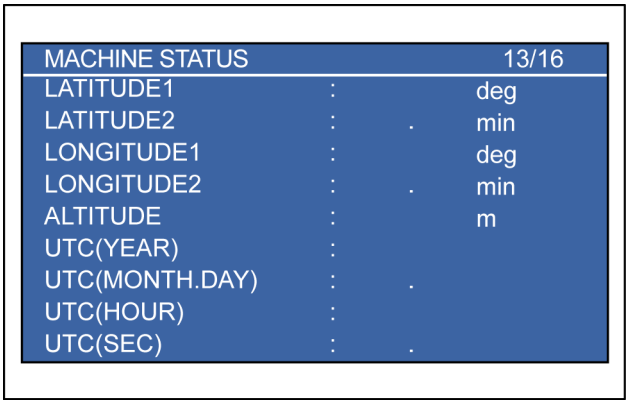
13. GPS information

LATITUDE1	deg	GPS latitude 1 (°)
LATITUDE2	min	GPS latitude 2 (minute)
LONGITUDE1	deg	GPS longitude 1 (°)
LONGITUDE2	min	GPS longitude 2 (minute)
ALTITUDE	m (ft.)	Altitude
UTC(YEAR)	-	Universal Time (year)
UTC(MONTH.DAY)	-	Universal Time (month, day)
UTC(HOUR)	-	Universal Time (hour)
UTC(SEC)	-	Universal Time (second)



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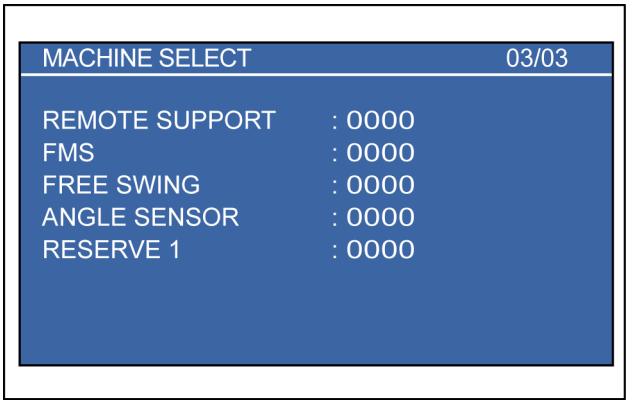
3. Model select

REMOTE SUPPORT	Remote support
FMS	Fuel abnormality warning (FMS)
FREE SWING	Free swing
ANGLE SENSOR	Angle sensor
RESERVE 1	(Option)



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Remote support

Value	Contents	Remarks
0	No number	
1	No number	

FMS

Value	Contents	Remarks
0	No number	
1	No number	

Free swing

Value	Contents	Remarks
0	Not used	
1	Used	

Angle sensor

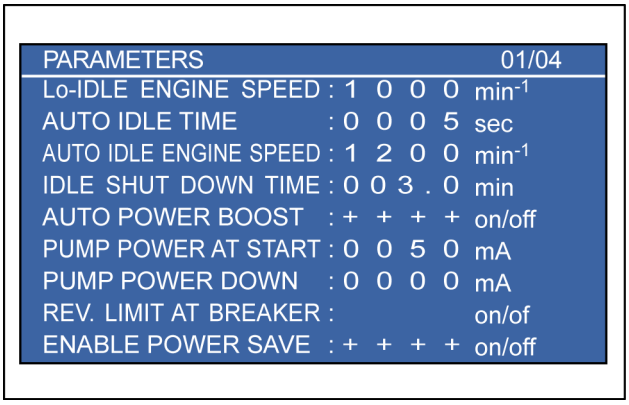
Value	Contents	Remarks
0	MONO or none	Supported from Ver. 2.00
1	OFFSET	Supported from Ver. 2.00
2	No number	

Parameters

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

1. Engine

Lo-IDLE ENGINE SPEED	min-1 (rpm)	Low idle engine speed
AUTO IDLE TIME	sec	Auto idle time
AUTO IDLE ENGINE SPEED	min-1 (rpm)	Auto idle speed
IDLE SHUT DOWN TIME	min	Idle shutdown time
AUTO POWER BOOST	on/off	Auto pressure boost control
PUMP POWER AT START	mA	Milli-amp for pump horsepower control proportional valve: at start of ATT operation
PUMP POWER DOWN	mA	Milli-amp for pump horsepower control proportional valve: negative offset amount
REV. LIMIT AT BREAKER	on/off	Flow control by engine speed (in breaker mode)
ENABLE POWER SAVE	on/off	Power save function



SMIL14CEX0662AA 5

Instrument cluster - Dynamic description - Clock

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Purpose

Displays the time on the monitor.

Operation explanation

- The time is always displayed on the monitor.
- The clock continues to operate, without display, when the key is turned “OFF”. (Because it uses power from the battery)

- 2-stage travel SOL
- 2-stage relief SOL
- Free swing SOL
- Battery relay
- Option hydraulic SOL (2nd speed)
- Option hydraulic SOL (switchover)
- Travel alarm
- Washer signal

- Proportional solenoid circuit controlled by computer A
  - Pump horsepower
  - Boom down
  - P1 flow

5 V circuit items

- Hydraulic oil temperature sensor
- Fuel level sensor
- P1 pressure sensor
- P2 pressure sensor
- N1 pressure sensor
- N2 pressure sensor
- Swing pressure sensor
- Upper pressure sensor
- Travel pressure sensor
- Return filter clog sensor
- Throttle angle sensor

Contents

Electrical systems - 55

Engine intake and exhaust system - 014

(*) See content for specific models

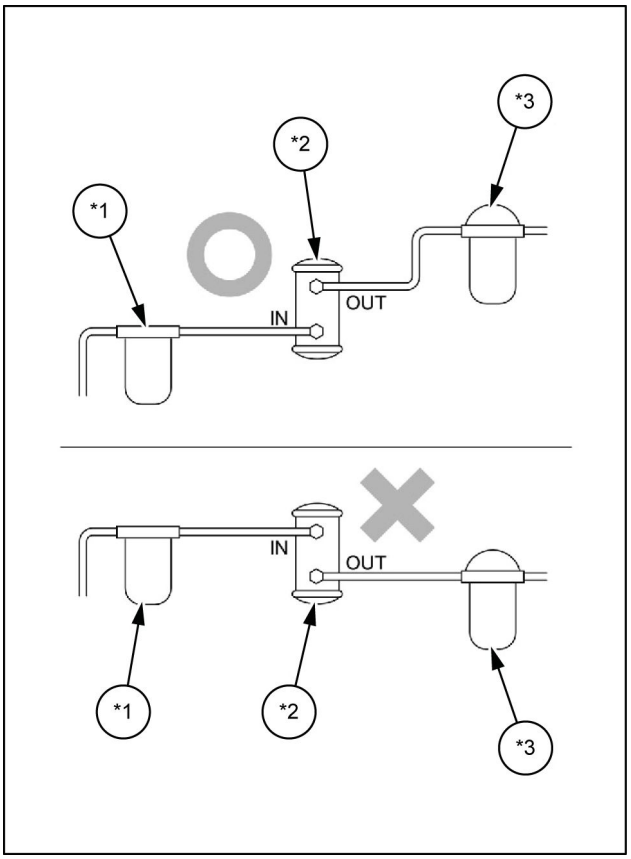
Electrical systems - 55

Engine starting system - 201

CX130C LC version with tier 3 emission level
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3

Visual inspection

Careful visual inspection is required for several symptom procedures. This can lead to correcting a problem without further inspections, and can save valuable time. The inspection includes the following:
Whether the fuel filter **(*3)** is clean and free from clogging.
Whether there is improper connection of the connector. Especially for CKP sensor and CMP sensor.
Whether the battery terminal voltage has dropped.
Correct wiring connections, tightening, and disconnection.
Whether the power of any commercial accessories is being taken from the ECM power.
Whether the ECM ground is clean and securely installed in the correct location.
Correct connections, cracks, and twists in the pipes and hoses related to fuel, air or oil. Extensively check for any leaks or blockage.
Whether the structure allows for air deposit due to layout of the fuel filter **(*3)**, pre-filter **(*1)** and electromagnetic pump **(*2)**.
Check whether they are arranged to prevent air accumulation as Isuzu genuine pre-filters **(*1)** do not have any plugs for air removal. Also check whether the inlet and outlet of the electromagnetic pump **(*2)** have an appropriate layout. Fix layouts which have the electromagnetic pump **(*2)** inlet on the upper side or have an outlet toward the motion direction of the machine.
Whether there are any fuel leaks, pipe damage, or dents in the fuel system.
Abnormalities of the air intake system parts.
Abnormalities of the exhaust system parts.



LPIL12CX00518BB 1

Diagnostic aids

Fuel out, fuel freezing, mixture of air into the fuel piping, filter defect, pipe defect, fuel quality and failure of fuel system such as fuel tank.

Air intake system abnormalities such as clogged filter and air intake piping failure.

Use of low-viscosity fuel such as kerosene will promote worn on the supply pump and plunger and cause discharge failure, leading to engine start failure. In this case, the supply pump must be replaced.

In the event of engine start failure, check the fuel used with the customer. If low-viscosity fuel such as kerosene is used, this recurs even after replacement of the supply pump. Therefore, it is necessary to instruct the customer not to use any low-viscosity fuel.

Mixture of long-storage fuel and biofuel containing organic matters are prone to be oxidized. Oxidized fuel will promote worn on camshaft related parts in the supply pump, causing engine start failure due to discharge failure. In this case, the supply pump must be replaced.

Engine starter - Install

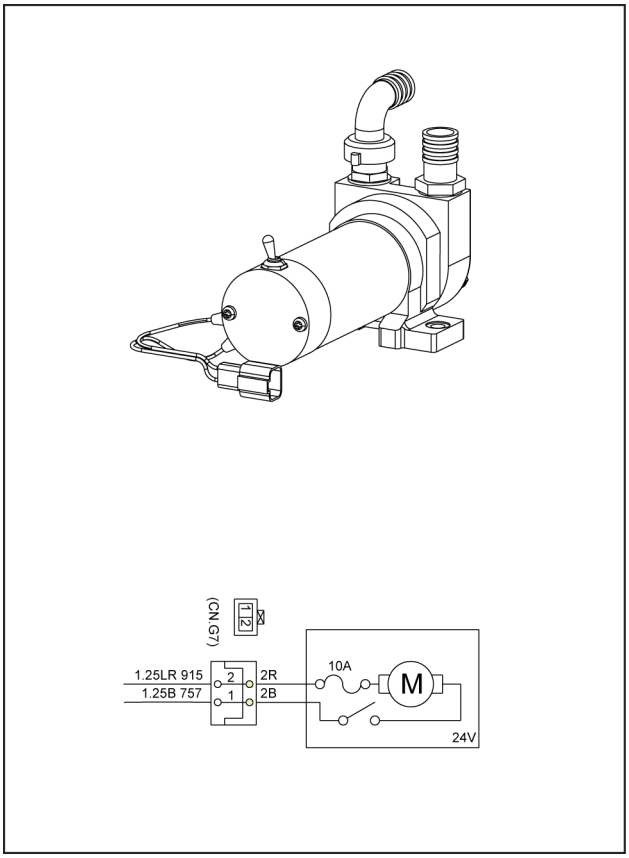
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Tighten bolts and nuts to the specified torque.

If the torque is not specified for a bolt or other part, see “Standard torque data for cap screws and nuts” on **Torque - Bolt and nut ()**.

Feed pump

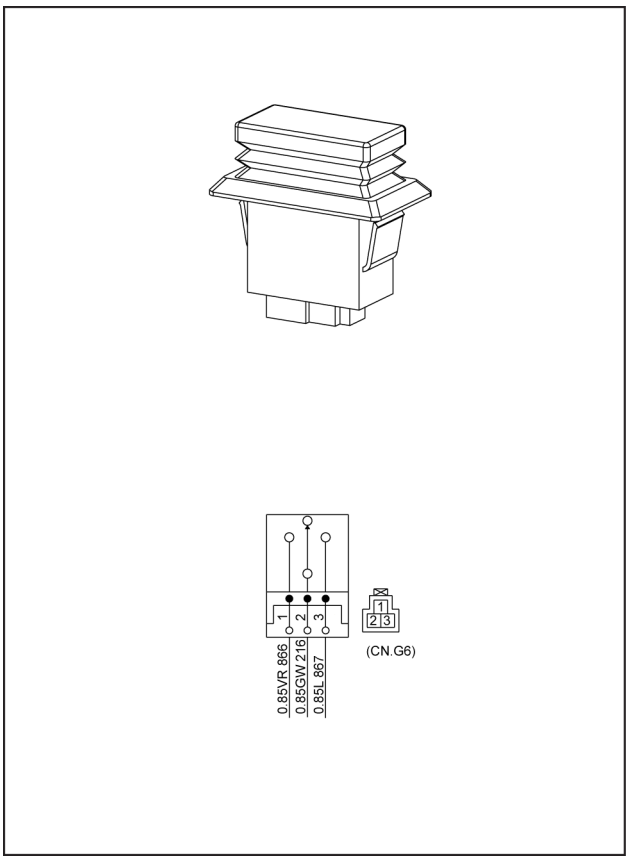
Part No.: KHR30380



SMIL15CEX7570BA 37

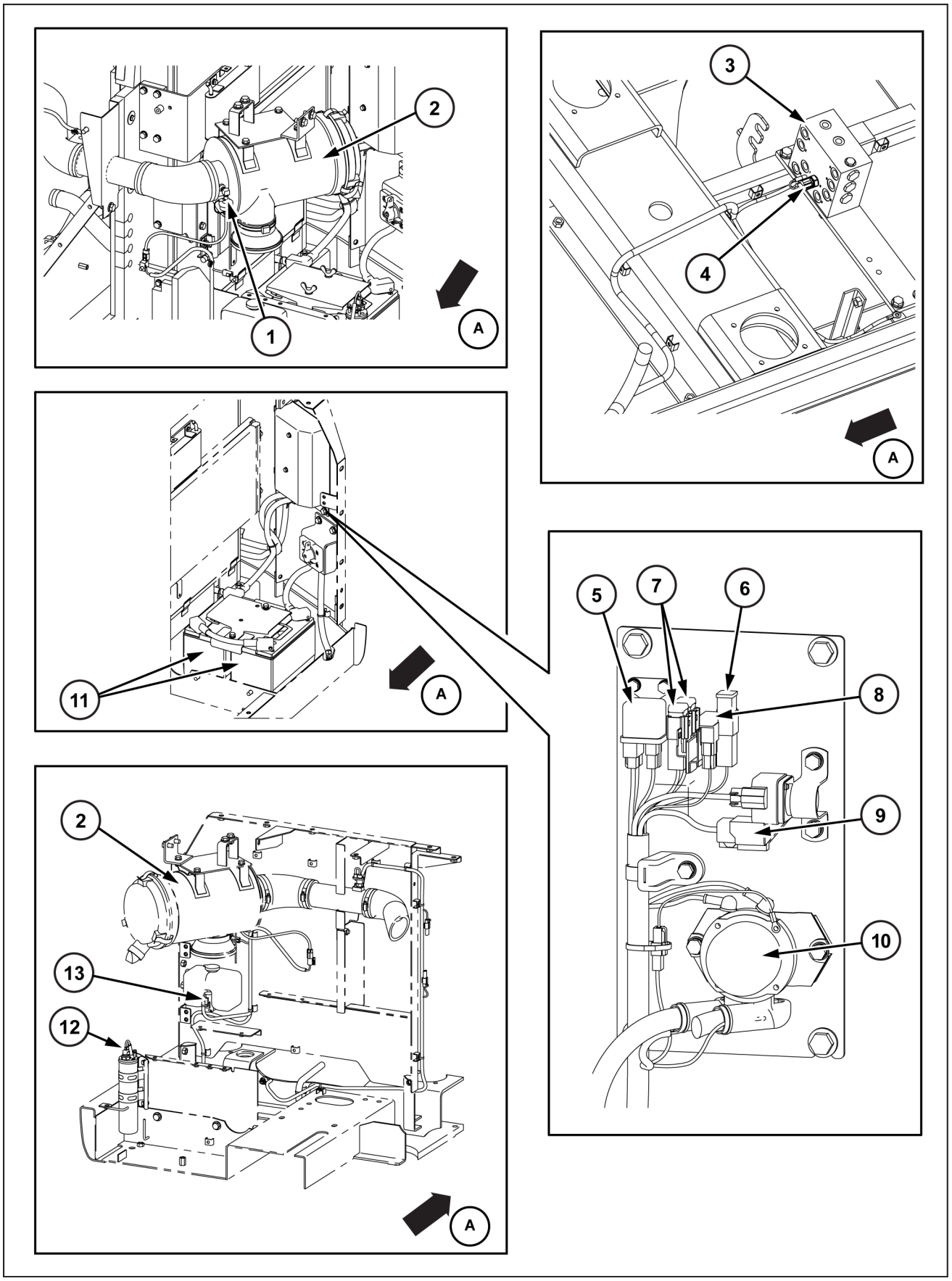
Feed pump switch

Part No.: KHR12900



SMIL15CEX7571BA 38

Main unit left-side layout diagram (radiator chamber)



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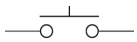
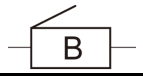
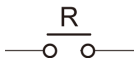
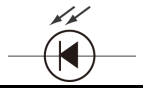
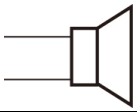
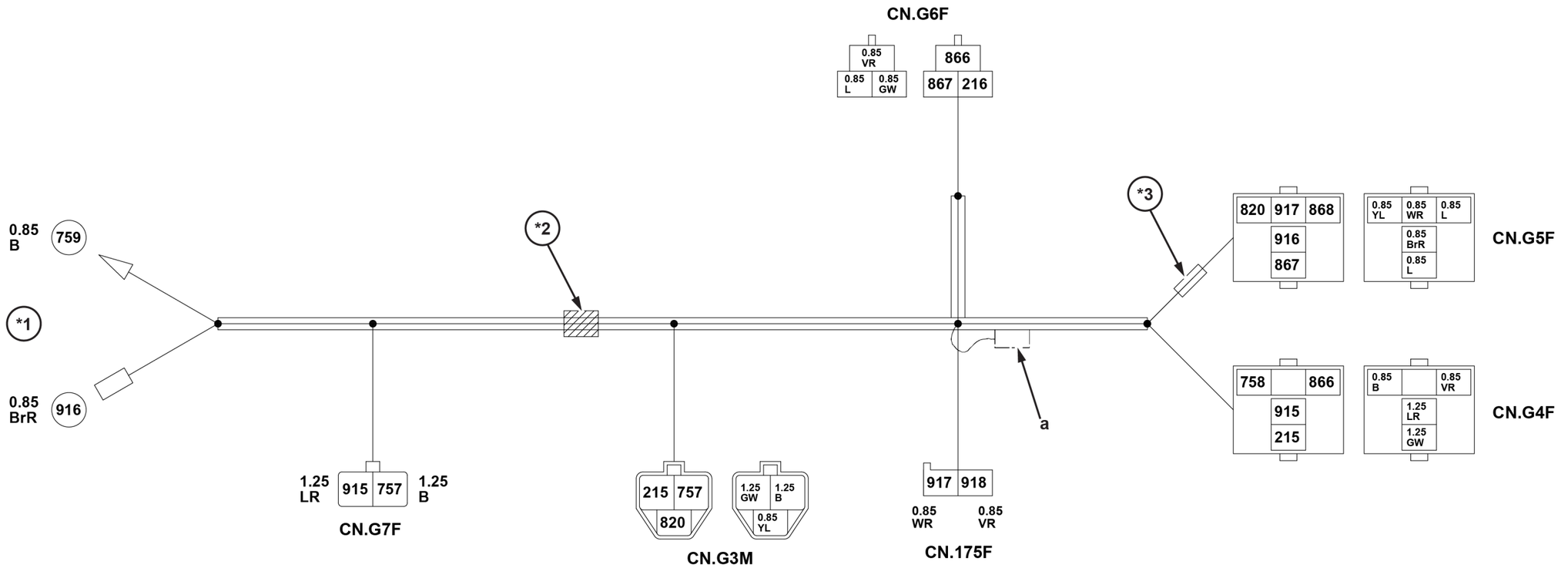
Electrical system - Overview - Electrical symbol list

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Symbol	Name	Symbol	Name
	Fuse		Variable solenoid valve
	Diode		Resistor
	LED		Variable resistor
	Toggle switch "a" contact		Variable resistor
	Push switch "a" contact		Alarm
	Limit switch "a" contact		Buzzer
	Limit switch "b" contact		Horn
	Relay coil		Motor
	Relay contact "a" contact		Solar radiation sensor
	Relay contact "b" contact		Speaker
	Solenoid valve		Lamp


CN.G6F
0.85 VR
0.85 L
0.85 GW
866
867 216
0.85 B
759
*1
0.85 BrR
916
*2
*3
820 917 868
916
867
CN.G5F
0.85 YL
0.85 WR
0.85 L
0.85 BrR
0.85 L
a
758 866
915
215
CN.G4F
0.85 B
0.85 VR
1.25 LR
1.25 GW
1.25 LR
915 757
1.25 B
CN.G7F
215 757
820
1.25 GW
1.25 B
0.85 YL
CN.G3M
917 918
0.85 WR
0.85 VR
CN.175F
KHR15101-C00

CN.A28	DC converter; 7-pin	CN.B12	Lifting equipment switch; 10-pin (ID: None)
CN.A29	Option power supply; 4-pin	CN.B14, B15, B16	Knob terminal (12 V power supply)
CN.A32	Option power supply	CN.B17	Seat suspension; 2-pin (fastened with red tape)
CN.A33	Immobilizer; Knob terminal (fastened with red tape)	CN.B19	Air conditioner unit A; 6-pin (Connect with supplied air conditioner harness)
CN.A34	CAN H knob terminal	CN.B20	Air conditioner unit B; 22-pin (Connect with supplied air conditioner harness)
CN.A35	CAN L knob terminal	CN.B21	Air conditioner panel; A (20-pin)
CN.A36	Diagnostic switch; Knob terminal	CN.B22–1	Air conditioner ground: M8 round terminal
CN.A37	Memory clear switch; Knob terminal	CN.B22–2	Air conditioner panel; B (16-pin)
CN.A38	Joint connector; 6-pin (fastened with red tape)	CN.B26	Right knob option switch; 6-pin (fastened with red tape)
CN.A39	Joint computer; 6-pin	CN.B27	Left knob option switch; 6-pin (fastened with red tape)
CN.A40	Joint; ground (6-pin)	CN.B28	Right knob option switch; 4-pin (fastened with red tape)
CN.A41	Joint; A (20-pin)	CN.B29	Left knob option switch; 4-pin (fastened with red tape)
CN.A42	Joint; B (20-pin)	CN.F7F	Fuse connector; 2-pin (fastened with red tape)
CN.A43	Ground CAB: M8 round terminal		

Many OBD system checks go into the backup operation mode based on the instruction from the ECM which is given when the ECM detects a failure in the related systems or components.

When the backup operation mode is activated, the output is reduced to protect the actual unit.

Trouble diagnosis

Basic knowledge of tools required

NOTE: *When performing the diagnostic procedure, lack of basic knowledge regarding this powertrain could result in an incorrect diagnosis or damage to the powertrain components.*
Do not attempt to diagnose a problem related to the powertrain without having the basic knowledge.
A basic understanding of hand tools, such as the trouble diagnosis scan tools, is required to utilize the service manual effectively.

About the diagnostic test performed on the actual unit

Past failures

- The diagnostic tests of the previous ignition cycle have been completed.
- The diagnostic tests of the current ignition cycle have passed.
- Problems identified in the diagnostic tests currently do not exist.

Current failures

- The diagnostic tests of the previous ignition cycle have been completed.
- Problems identified in the diagnostic tests currently exist.
- Problems exist in the current ignition cycle.

Glossary

DTC

Every time the starter switch is turned “ON”, the ECM performs the self-test on most of the wiring and components, records any detected system failure in the memory of the ECM, and performs the backup control, depending on the DTC.

Also, abnormalities that affect travel will cause the monitor to show an abnormality display to inform the operator.

Ignition cycle

Because the actual unit activates with a method to satisfy a predetermined diagnosis standard, an ignition cycle is defined as turning the starter switch “ON”, running, then turning the starter switch “OFF”.

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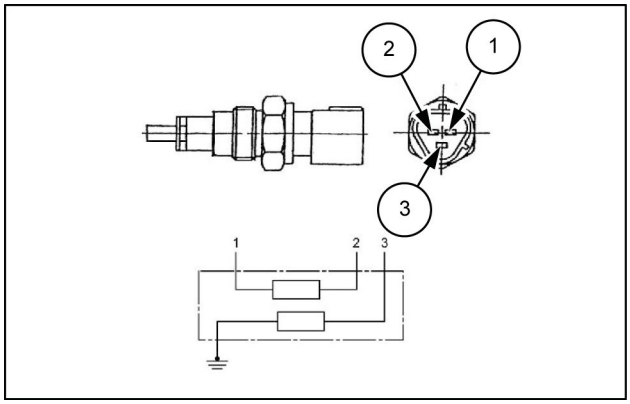
(*) See content for specific models

Engine coolant temperature sensor - Inspect

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

1. Inspect the engine coolant temperature sensor using the circuit tester.
   - Confirm that the resistance value according to water temperature matches the thermistor characteristics.

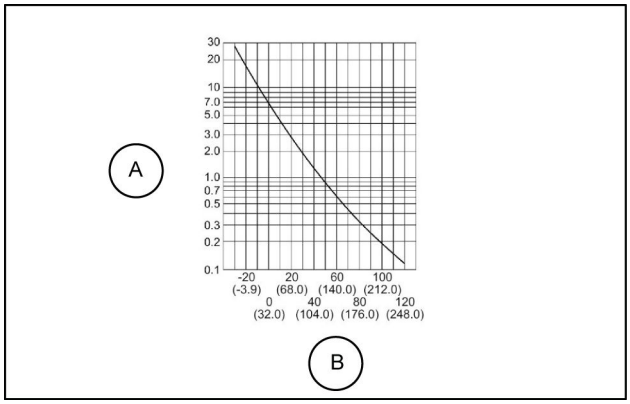
   1. GND terminal for engine control
   2. Signal terminal for engine control
   3. Signal terminal for meters



LPIL12CX00870AB 1

A. Resistance value (KΩ)

B. Engine coolant temperature °C(°F)

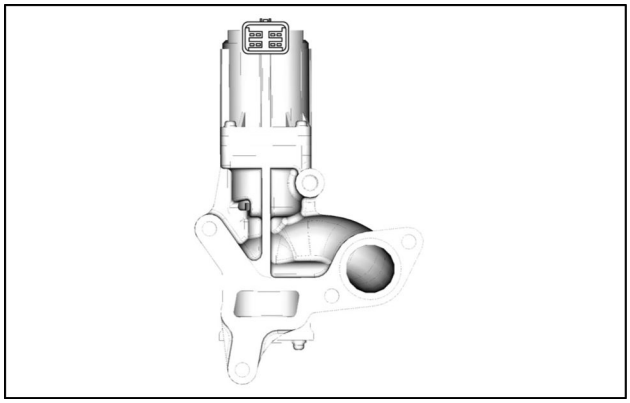


LPIL12CX00871AB 2

EGR position sensor

This sensor is installed inside the EGR valve to detect the EGR valve lift amount.

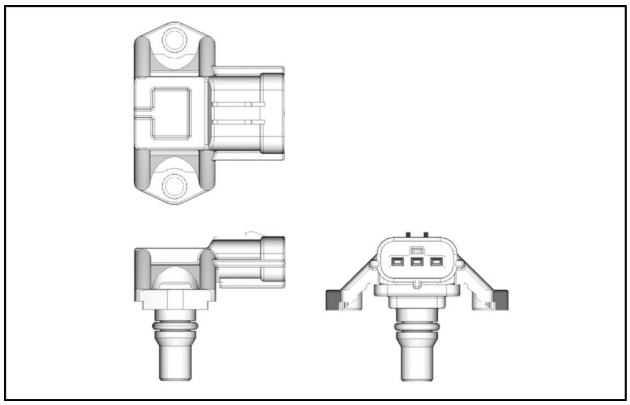
NOTE: *Do not disassemble the EGR position sensor. When an abnormality is found, replace the EGR valve assembly.*



SMIL15CEX7800AA 15

Boost sensor

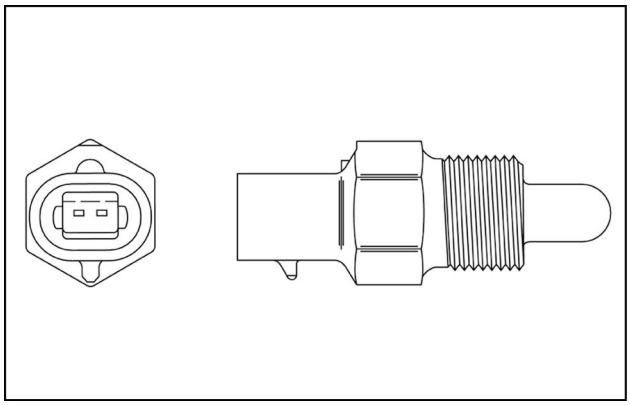
The boost sensor detects the boost pressure of the inlet pipe and converts the pressure into a voltage signal to send to the ECM. The voltage becomes higher when the pressure is higher, and it becomes lower when the pressure is lower. The ECM calculates the boost pressure from the voltage signal sent from the sensor and uses it to control the fuel injection, etc.



SMIL15CEX7801AA 16

Boost temperature sensor

The boost temperature sensor is installed to the EGR valve upstream side of the intake manifold. The sensor is the thermistor type, and the resistance value inside the sensor changes in accordance with the change in the temperature.

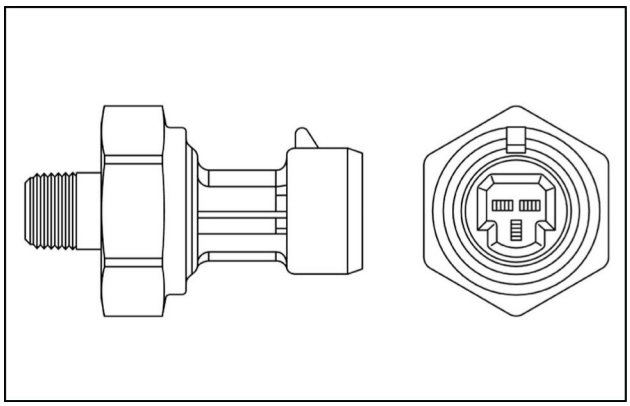


SMIL15CEX3528AA 17

Fuel filter pressure sensor

The fuel filter pressure sensor is installed on the fuel filter and converts the negative pressure in the fuel filter into a voltage signal.

The ECM calculates the negative pressure in the fuel filter from this voltage signal and judges whether or not the fuel filter is clogged.



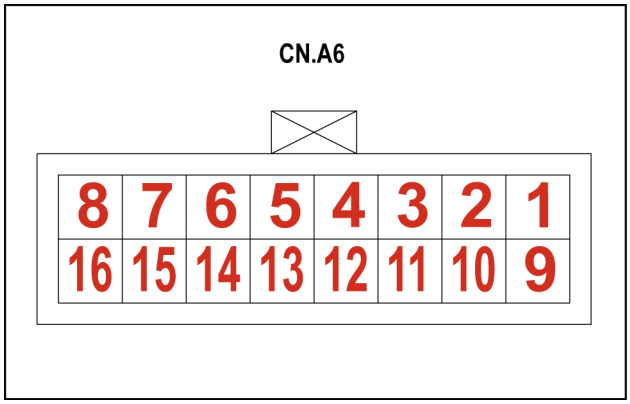
SMIL14CEX4007AA 18

Engine timing sensors Camshaft sensor - Inspect

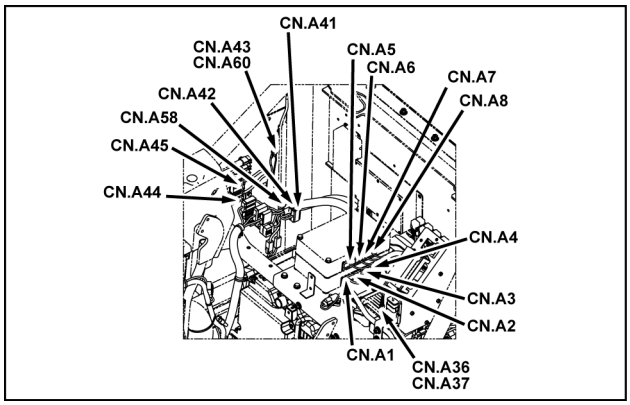
CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

1. Inspect the CMP sensor.
   - Inspect whether the CMP sensor is securely installed.
   - Inspect the sensor and connector sections for damage or debris.

CONNECTOR CN.A6 - CONTROLLER B (Male)



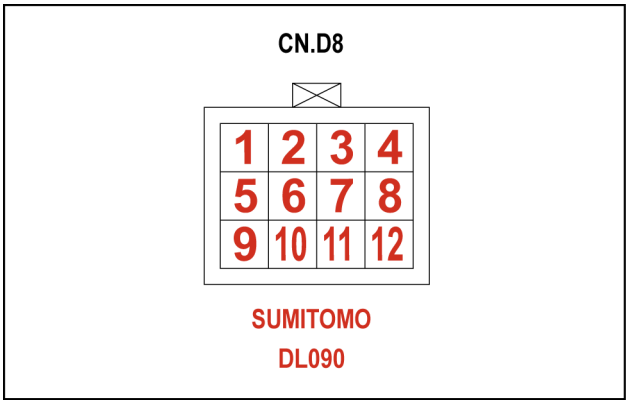
SMIL15CEX9246AA 11



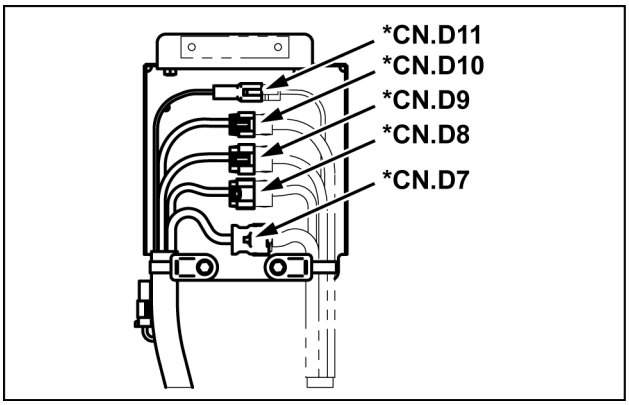
SMIL15CEX9239AA 12

Pin	From	Wire	Description	Color-Size	Frame
2	CN.A25-M-P-8	69A		BY	**SHEET 21**
3	CN.A25-M-P-1	065A		Y	
4	CN.A2-P-12	56		PL	**SHEET 20**
6	CN.A41-M-P-4	040D		P	**SHEET 23**
10	CN.A25-M-P-3	066A		YL	**SHEET 21**
12	CN.A2-P-4	55		PW	**SHEET 20**
14	CN.A42-M-P-4	041D		PG	**SHEET 23**

CONNECTOR CN.D8 - INJECTORS (Female)



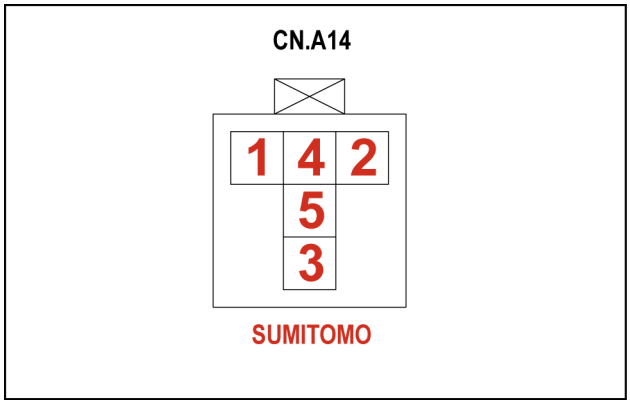
SMIL15CEX9418AA 50



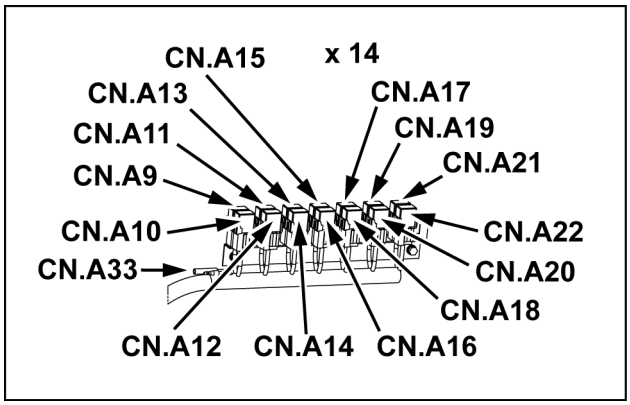
SMIL15CEX9403AA 51

Pin	From	Wire	Description	Color-Size	Frame
1	CN.E14-P-1	374A		W -1.25	**SHEET 09**
2	CN.E15-P-1	378A		WL -1.25	
3	CN.E16-P-1	376A		R- 1.25	
4	CN.E17-P-1	380A		RW -1.25	
5	CN.E14-P-2	375A		BL -1.25	
6	CN.E15-P-2	379A		BrW -1.25	
7	CN.E16-P-2	377A		VW -1.25	
8	CN.E17-P-2	381A		GW -1.25	

CONNECTOR CN.A14 - RELAY NEUTRAL START (Male)



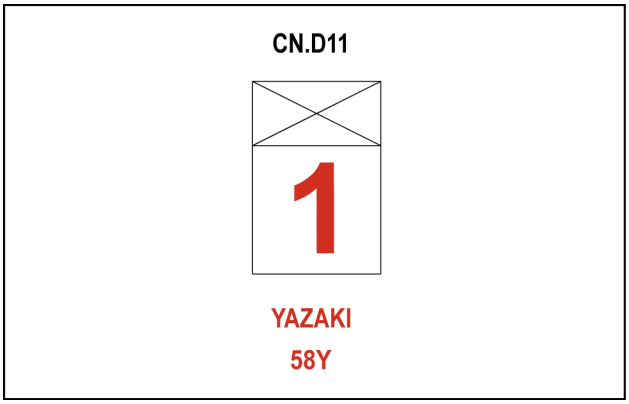
SMIL15CEX9299AA 9



SMIL15CEX9294AA 10

Pin	From	Wire	Description	Color-Size	Frame
1	SP-845-P-X	845		GR-0.85	**SHEET 29**
2	SP-706-P-X	706A		B-0.85	
3	CN.A46-F-P-5	10		BrR-0.85	**SHEET 31**
4	SP-011-P-X	11		Y-0.85	**SHEET 29**

CONNECTOR CN.D11 - GLOW PLUG (Male)



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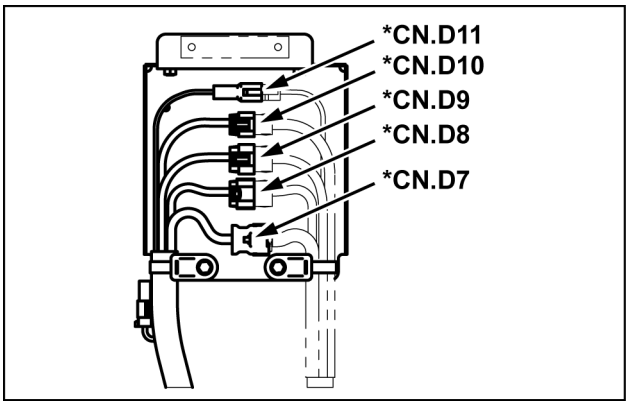
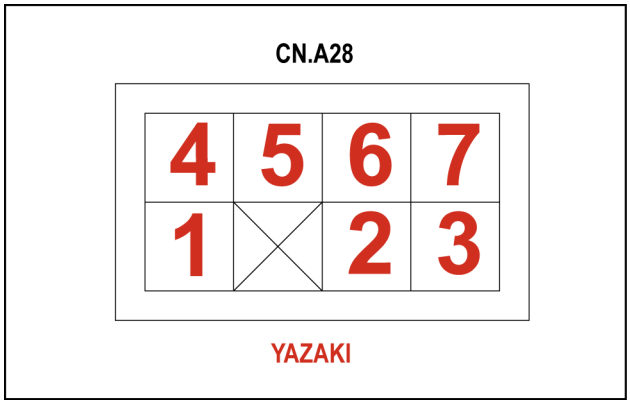


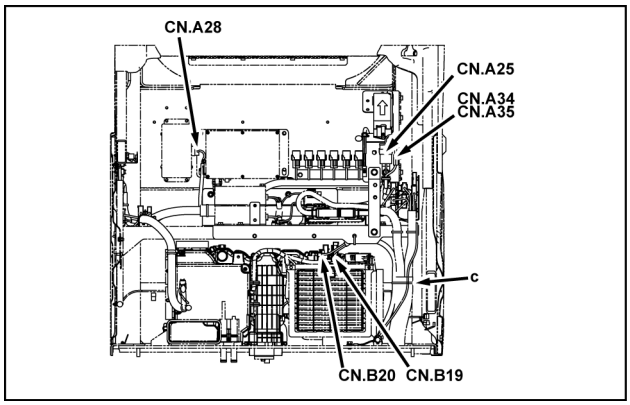
SMIL15CEX9403AA 45

Pin	From	Wire	Description	Color-Size	Frame
1	CN.D31-P-1	21		L-5.0	**SHEET 02**

CONNECTOR CN.A28 - DC/DC (24V/12V) CONVERTER (Male)



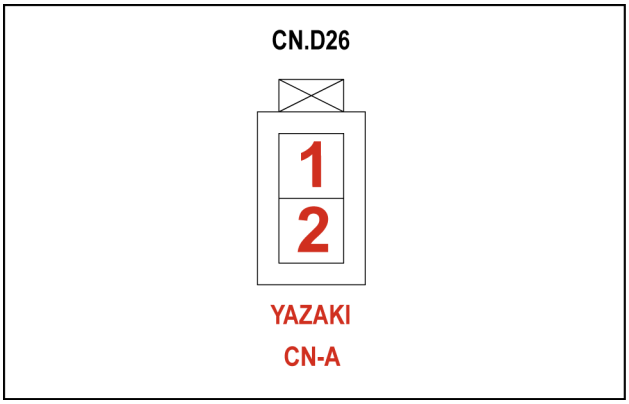
SMIL15CEX9279AA 17



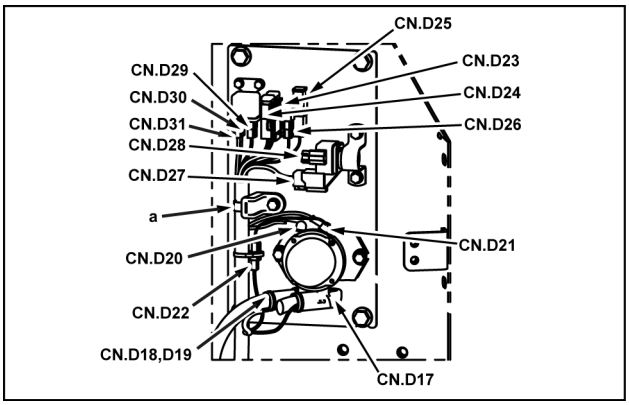
SMIL15CEX9270AA 18

PIN	From	Wire	Description	Color-Size	Frame
1	CN.A49-F-P-15	281		WR- 0.85	**SHEET 33**
2	CN.A41-M-P-14	163		RL	**SHEET 23**
3	SP-281-P-X	280		RY- 0.85	**SHEET 33**
4	CN.A49-F-P-16	709		BW- 0.85	
5	SP-703-P-X	708		B - 0.85	**SHEET 28**
6	F14-P-1	225		OR - 0.85	**SHEET 04**

CONNECTOR CN.D26 - FUSE CONT (Male)



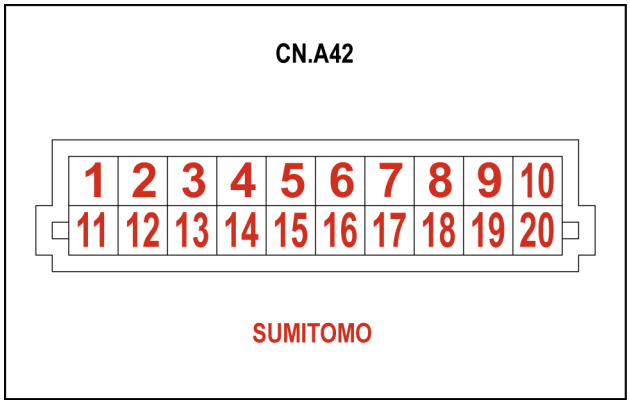
SMIL15CEX9338AA 49



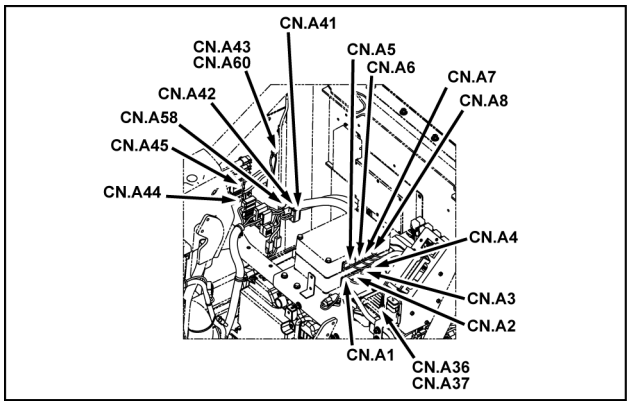
SMIL15CEX9336AA 50

Pin	From	Wire	Description	Color-Size	Frame
1	CN.D19-P-M8	106		W-1.25	**SHEET 02**
2	SP-118-P-X	107		W-1.25	**SHEET 03**

CONNECTOR CN.A42 (Male)



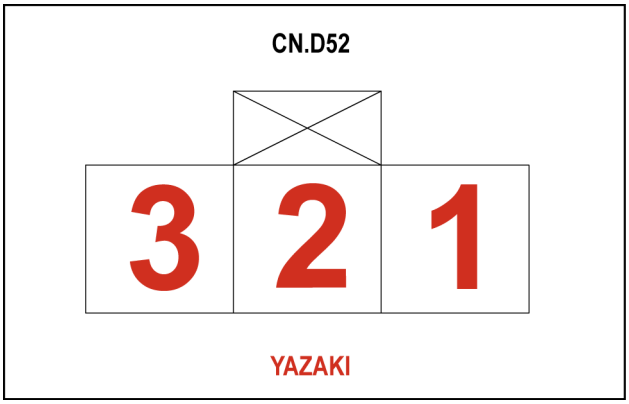
SMIL15CEX9278AA 5



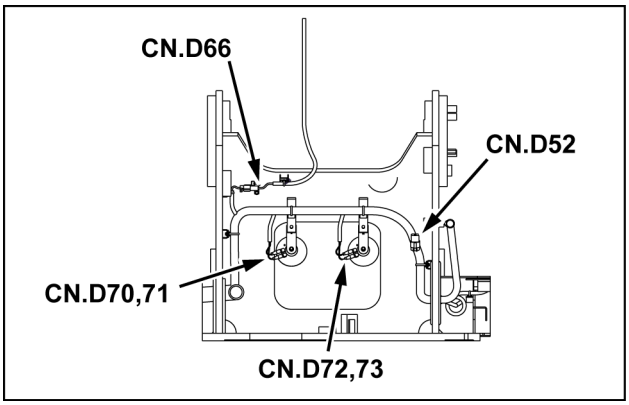
SMIL15CEX9239AA 6

Pin	From	Wire	Description	Color-Size	Frame
1	CN.A53-F-P-8	041A		PG	**SHEET 22**
2	CN.A44-M-P-8	041P		PG	**SHEET 23**
3	CN.A2-P-14	041C		PG	**SHEET 19**
4	CN.A6-P-14	041D		PG	**SHEET 20**
5	CN.A23-P-8	041E		PG	**SHEET 18**
6	CN.A24-M-P-8	041F		PG	**SHEET 26**
7	CN.A48-F-P-11	041G		PG	**SHEET 33**
8	CN.A26-M-P-4	041H		PG	**SHEET 26**
9	CN.A27-M-P-11	041T		PG	
10	CN.A35F-P-1	041J		PG	
11	CN.A51-F-P-8	600		BG-1.25	**SHEET 22**
12	SP-601B-P-X	601C		BG-1.25	**SHEET 18**
13	SP-602-P-X	602B		BG-1.25	**SHEET 20**
14	CN.A23-P-14	603		BG-1.25	**SHEET 22**
15	SP-610E-P-X	609		BG-1.25	
16	SP-610E-P-X	610F		BG-1.25	
17	CN.A46-F-P-10	620		BG-0.85	**SHEET 30**
18	SP-630-P-X	630		BG-0.85	**SHEET 22**
19	CN.A33M-P-1	637		BG	
20	CN.A57-F-P-16	640		BG	**SHEET 16**

CONNECTOR CN.D52 (Male)



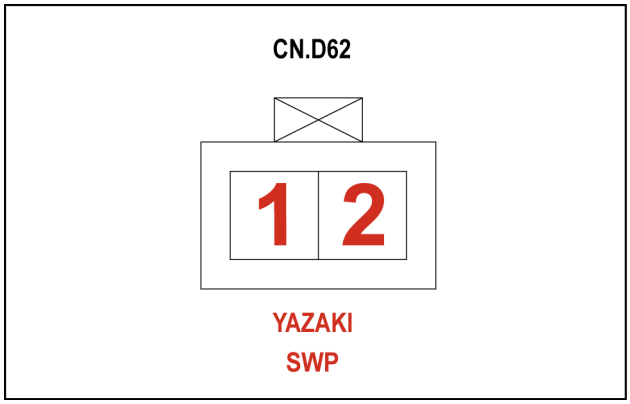
SMIL15CEX9371AA 24



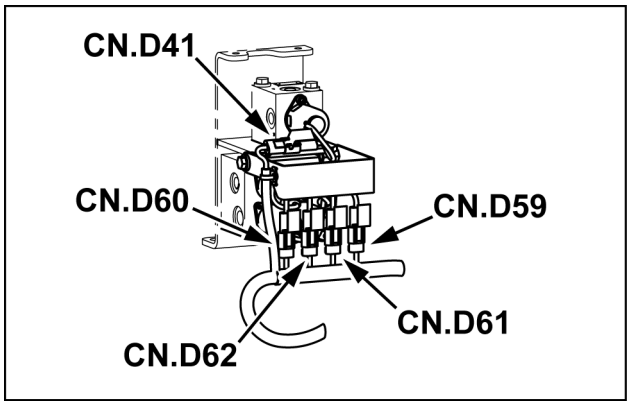
SMIL15CEX9370AA 25

Pin	From	Wire	Description	Color-Size	Frame
1	SP-409E-P-X	409F		W-0.85	**SHEET 14**
2	CN.A54-M-P-10	419A		Gr- 0.85	**SHEET 20**
3	SP-429E-P-X	429F		BW -0.85	**SHEET 14**

CONNECTOR CN.D62 (Male)



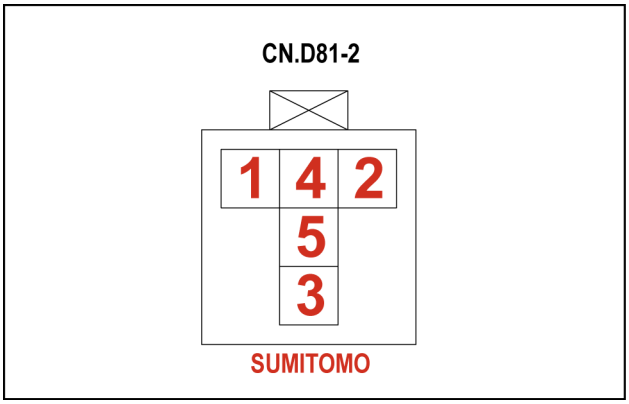
SMIL15CEX9351AA 12



SMIL15CEX9347AA 13

Pin	From	Wire	Description	Color-Size	Frame
1	CN.D58-F-P-4	183		R-0.75	**SHEET 12**
2	CN.A55-M-P-4	802A		Y-0.75	**SHEET 19**

CONNECTOR CN.D81-2 - RELAY STOP (Male)



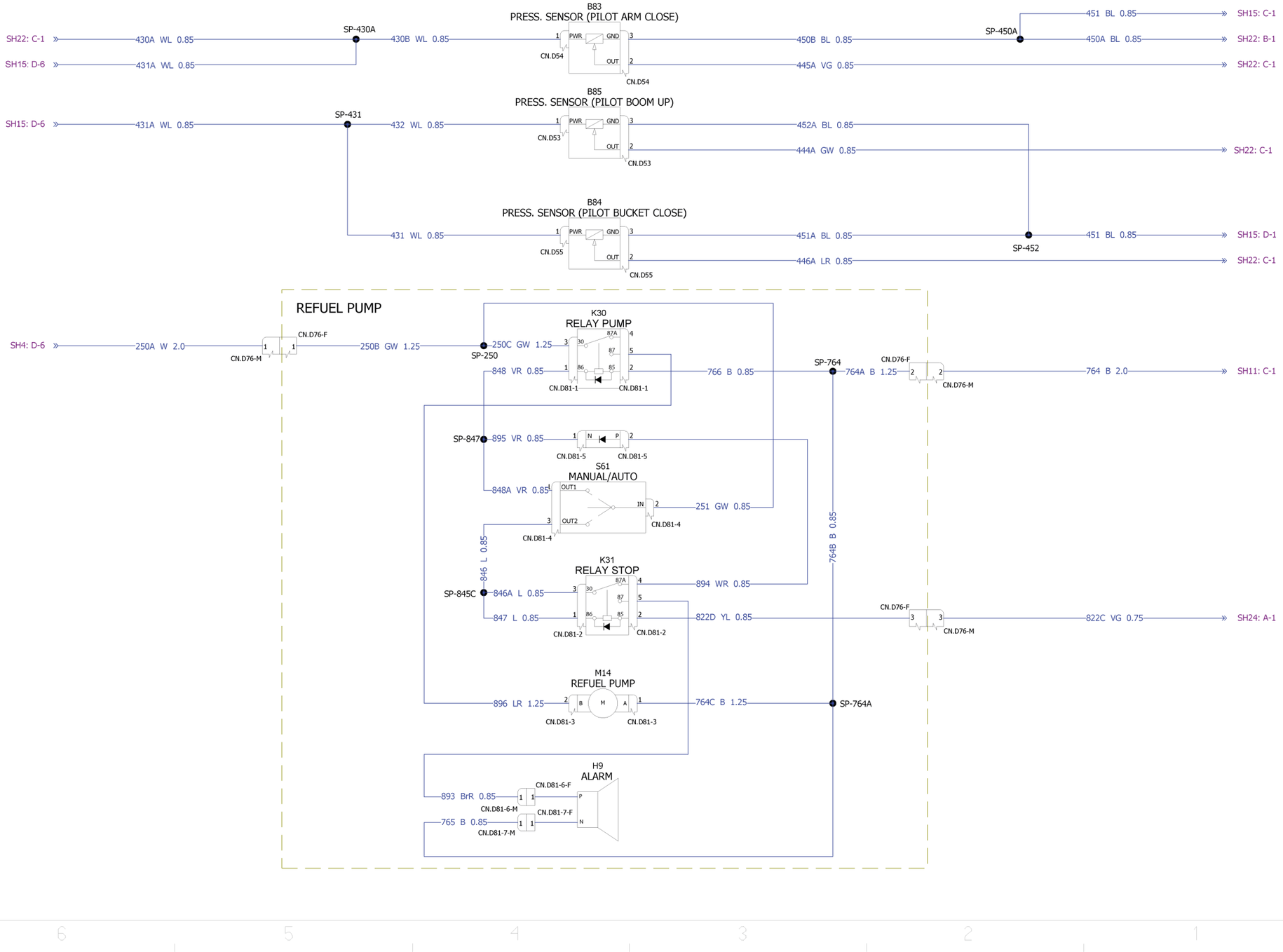
SMIL15CEX9458AA 6

Pin	From	Wire	Description	Color-Size	Frame
1	SP-845C-P-X	847		L-0.85	**SHEET 15**
2	CN.D76-F-P-3	822D		YL-0.85	
3	SP-845C-P-X	846A		L-0.85	
4	CN.D81-5-P-2	894		WR-0.85	
5	CN.D81-6-M-P-1	893		BrR-0.85	

Wiring harnesses - Electrical schematic sheet 02 - Starting circuit

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Type	Components	Connectors/link	Description
Battery	G1		Battery
Battery	G1A		Battery
Alternator	G2		Alternator
Relay	K2		Glow plug relay
Relay	K7		Battery relay
Relay	K69		Starter relay
Motor	M1		Starter motor
Motor	M6		Air vent direction control motor
Motor	M8		Blower motor
Battery	M10		Battery switch
Plug	R1		Glow plug
Battery	S94		Battery switch
Connector	CN.D11	**CN.D11**	Glow plug
Connector	CN.D12	**CN.D12**	Starter motor
Connector	CN.D13	**CN.D13**	Alternator
Connector	CN.D14	**CN.D14**	Alternator
Connector	CN.D15	**CN.D15**	Alternator
Connector	CN.D16	**CN.D16**	Ground
Connector	CN.D17	**CN.D17**	
Connector	CN.D18	**CN.D18**	
Connector	CN.D19	**CN.D19**	
Connector	CN.D20	**CN.D20**	
Connector	CN.D21	**CN.D21**	
Connector	CN.D22	**CN.D22**	
Connector	CN.D27	**CN.D27**	Relay starter
Connector	CN.D28	**CN.D28**	Relay starter
Connector	CN.D29	**CN.D29**	Relay glow
Connector	CN.D30	**CN.D30**	Relay glow
Connector	CN.D31	**CN.D31**	Relay glow
Connector	CN.D90	**CN.D90**	Starter motor
Connector	CN.D91	**CN.D91**	Battery switch
Connector	CN.D92	**CN.D92**	Battery switch
Connector	CN.D93	**CN.D93**	Battery
Connector	CN.D94	**CN.D94**	Battery
Connector	CN.D95	**CN.D95**	Battery
Connector	CN.D96	**CN.D96**	Battery
Connector	CN.D97	**CN.D97**	
Connector	CN.D98	**CN.D98**	
Connector	CN.D99	**CN.D99**	Ground



SMIL15CEX9212JA 1

Wiring harnesses - Electrical schematic sheet 29 - Main cab-relays

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Type	Components	Connectors/link	Description
Relay	K34		Relay starter cut
Relay	K63		Relay ECM
Relay	K64		Relay key ON
Relay	K65		Relay battery RL
Relay	K66		Relay idle stop
Relay	K67		Relay DPF
Relay	K68		Relay neutral start
Connector	CN.A9	**CN.A9**	Relay ECM
Connector	CN.A10	**CN.A10**	Relay DPF
Connector	CN.A11	**CN.A11**	Relay battery RL
Connector	CN.A12	**CN.A12**	Relay idle stop
Connector	CN.A13	**CN.A13**	Relay key ON
Connector	CN.A14	**CN.A14**	Relay neutral start
Connector	CN.A15	**CN.A15**	Relay starter cut
Connector	CN.A30	**CN.A30**	Front window limit switch
Connector	CN.A52	**CN.A52**	
Connector	CN.A53	**CN.A53**	
Connector	CN.A59	**CN.A59**	

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(*) See content for specific models

Boom - Prepare

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Raised equipment or machine movement without an operator can cause serious injury. Always do the following before performing any maintenance:
Park the machine on flat, level ground.
Lower the attachment to the ground.
Shut down the engine and remove the ignition key.
Lock the tracks.
Failure to comply could result in death or serious injury.

W0944D

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Assign a supervisor to direct worksite operations. Agree on all safety measures, procedures, and suitable hand signals.
Failure to comply could result in death or serious injury.

W0287A

⚠ WARNING

Avoid injury!
Use Personal Protective Equipment (PPE), including protective goggles, gloves, and safety footwear.
Failure to comply could result in death or serious injury.

W1036A

⚠ WARNING

Crushing hazard!
The lifting systems must be operated by qualified personnel who are aware of the correct procedures to follow. Make sure all lifting equipment is in good condition, and all hooks are equipped with safety latches.
Failure to comply could result in death or serious injury.

W0256A

⚠ WARNING

Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.
Failure to comply could result in death or serious injury.

W0398A

Contents

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SERVICE

(*) See content for specific models

Operator seat - Prepare

CX130C CRAWLER EXCAVATOR - W/BLADE- BRAZIL MARKET - TIER3	LA
CX130C LC version with tier 3 emission level	LA

Items to prepare:

- Wrench [**13 mm**]