CX130 Crawler Excavators
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* *Consult the Engine Service Manual*

[redacted] *Sections to be distributed at a later date*

NOTE: CNH Company reserves the right to make changes in the specification and design of the machine without prior notice and without incurring any obligation to modify units previously sold.

The description of the models shown in this manual has been made in accordance with the technical specifications known as of the date of design of this document.

Section

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SAFETY, GENERAL INFORMATION AND TORQUE SPECIFICATIONS

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WARNING : *This symbol is used in this manual to indicate important safety messages. Whenever you see this symbol, carefully read the message that follows, as there is a risk of serious injury.*

GENERAL INFORMATION

Cleanning

Clean all metal parts except bearings, in a suitable cleaning solvent or by steam cleaning. Do not use caustic soda for steam cleaning. After cleaning, dry and put oil on all parts. Clean oil passages with compressed air. Clean bearings in a suitable cleaning solvent, dry the bearings completely and put oil on the bearings.

Inspection

Check all parts when the parts are disassembled. Replace all parts that have wear or damage. Small scoring or grooves can be removed with a hone or crocus cloth. Complete a visual inspection for indications of wear, pitting and the replacement of parts necessary to prevent early failures.

Bearings

Check bearings for easy action. If bearings have a loose fit or rough action replace the bearing. Wash bearings with a suitable cleaning solvent and permit to air dry. DO NOT DRY BEARINGS WITH COMPRESSED AIR.

Needle bearings

Before you press needle bearings in a bore always remove any metal protrusions in the bore or edge of the bore. Before you press bearings into position put petroleum jelly on the inside and outside diameter of the bearings.

Gears

Check all gears for wear and damage. Replace gears that have wear or damage.

Oil seals, O-rings and gaskets

Always install new oil seals, O-rings and gaskets. Put petroleum jelly on seals and O-rings.

Shafts

Check all shafts that have wear or damage. Check the bearing and oil seal surfaces of the shafts for damage.

Service parts

Always install genuine Case service parts. When ordering refer to the Parts Catalog for the correct part number of the genuine Case replacement items. Failures due to the use of other than genuine Case replacement parts are not covered by warranty.

Lubrication

Only use the oils and lubricants specified in the Operator’s or Service Manuals. Failures due to the use of non-specified oils and lubricants are not covered by warranty.

SAFETY

This symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED. The message that follows the symbol contains important information about safety. Carefully read the message. Make sure you fully understand the causes of possible injury or death.

To prevent injury always follow the Warning, Caution and Danger notes in this section and throughout the manual.

Put the warning tag shown below on the key for the keyswitch when servicing or repairing the machine. One warning tag is supplied with each machine. Additional tags Part Number 331-4614 are available from your service parts supplier

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WARNING: *Read the operator's manual to familiarize yourself with the correct control functions.*

WARNING: *Operate the machine and equipment controls from the seat position only. Any other method could result in serious injury.*

WARNING: *This is a one man machine, no riders allowed.*

WARNING: *Before starting engine, study Operator's Manual safety messages. Read all safety signs on machine. Clear the area of other persons. Learn and practice safe use of controls before operating.*
It is your responsibility to understand and follow manufacturers instructions on machine operation, service and to observe pertinent laws and regulations. Operator's and Service Manuals may be obtained from your Case dealer.

WARNING: *If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.*

WARNING: *When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution.*

WARNING: *When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure.*

WARNING: *When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way.*

WARNING: *Use insulated gloves or mittens when working with hot parts.*

WARNING: *Lower all attachments to the ground or use stands to safely support the attachments before you do any maintenance or service.*

WARNING: *Pin sized and smaller streams of hydraulic oil under pressure can penetrate the skin and result in serious infection. If hydraulic oil under pressure does penetrate the skin, seek medical treatment immediately. Maintain all hoses and tubes in good condition. Make sure all connections are tight. Make a replacement of any tube or hose that is damaged or thought to be damaged. DO NOT use your hand to check for leaks, use a piece of cardboard or wood.*

WARNING: *When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer.*

WARNING: *When using a hammer to remove and install pivot pins or separate parts using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors).*

WARNING: *Use suitable floor (service) jacks or chain hoist to raise wheels or tracks off the floor. Always block machine in place with suitable safety stands.*

WARNING: *When servicing or repairing the machine, keep the shop floor and operator's compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and/or shop cloths as required. Use safe practices at all times.*

WARNING: *Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in this Service Manual.*

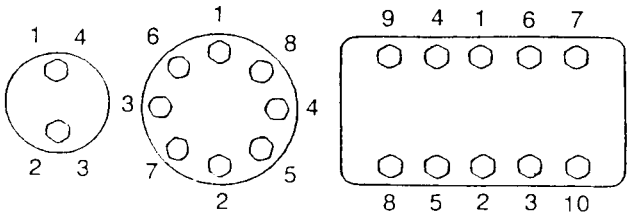
WARNING: *Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. Open the doors and get outside air into the area.*

WARNING: *When the battery electrolyte is frozen, the battery can explode if (1), you try to charge the battery, or (2), you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.*

STANDARD TORQUE DATA FOR CAP SCREWS AND NUTS

Tightening of cap screws, nuts

Tighten alternately so that tightening torque can be applied evenly. The numbers in the figure below indicate the order of tightening.



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Cap screws which have had Loctite used (white residue remains after removal) should be cleaned with loght oil or suitable cleaning solvent and dried. Apply 2-3 drops of Loctite to the thread portion of the cap screw and then tighten.

Torque table

Tighten cap screws and nuts according to the table below if there are no other special instructions.

Cap Screw Name Size (Size)			M6	M8	M10	M12	M14	M16	M18	M20
Cap Screw	Spanner	[mm]	10	13	17	19	22	24	27	30
		[in.]	0.39	0.51	0.67	0.75	0.87	0.95	1.06	1.18
	Tightening torque	[Nm]	6.9	15.7	32.3	58.8	98.0	137.2	196.0	274.0
		[lb-ft]	5.1	11.6	23.9	43.4	72.3	101.2	144.6	202.4
Socket Head Cap Screw	Spanner	[mm]	5	6	8	10	12	14	14	17
		[in.]	0.20	0.24	0.32	0.39	0.47	0.55	0.55	0.67
	Tightening torque	[Nm]	8.8	21.6	42.1	78.4	117.6	176.4	245.0	343.0
		[lb-ft]	6.5	15.9	31.1	57.8	86.8	130.1	180.8	253.1

Section

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GENERAL SPECIFICATIONS AND SPECIAL TORQUE SETTINGS

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WARNING: *This symbol is used in this manual to indicate important safety messages. Whenever you see this symbol, carefully read the message that follows, as there is a risk of serious injury.*

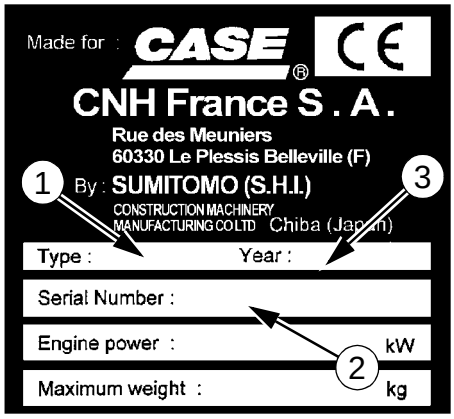
TYPE, SERIAL NUMBER AND YEAR OF MANUFACTURE OF THE MACHINE

When placing a parts order or making a request for information or assistance, always give you CASE Dealer the type and serial number of the machine concerned.

Enter the required information on the lines below: Type, serial number, year of manufacture of the machine and the serial numbers of hydraulic and mechanical components.

Machine

CT04D014



CT04A171

(1) Type.....

(2) Serial number.....

(3) Year of manufacture.....

Engine

Make and type.....

Serial number.....

Component serial numbers

Hydraulic pump.....

Swing reduction gear.....

Travel reduction gears.....

Travel control valve.....

Attachment control valve.....

Swing control valve.....

FLUIDS AND LUBRICANTS

Lubricants must have the correct properties for each application.

WARNING: *The conditions of use for individual fluids and lubricants must be respected.*

Hydraulic fluid

CASE hydraulic fluid is specially designed for high pressure applications and for the CASE hydraulic system. The type of fluid to be used depends on the ambient temperature.

Temperate climates

-20°C to +40°C
Fluid type ISO VG 46
CASE reference: POHYDR

Hot climates

0°C to +60°C
Fluid type ISO VG 100
CASE reference: POHYPC

Cold climates

-40°C to +20°C
Fluid type ISO VG 22
CASE reference: POHYPF

These various grades of fluid must be in conformity with the CASE specification.

Transmission component oil

Extreme pressure oil used for transmission components inside sealed housings.
Extreme pressure oil TYPE API GL5 GRADE 80W90 or ISO VG 150.

Grease

The type of grease to use depends on ambient temperature.

Temperate and hot climates

-20°C to +60°C
Extreme pressure grease EP NLGI grade 2 with molybdenum disulphide.

Cold climates

-40°C to +20°C
Extreme pressure grease EP NLGI grade 0.

Engine oil

CASE engine oil No. 1 is recommended for your engine. This oil ensures correct lubrication of your engine in all working conditions.

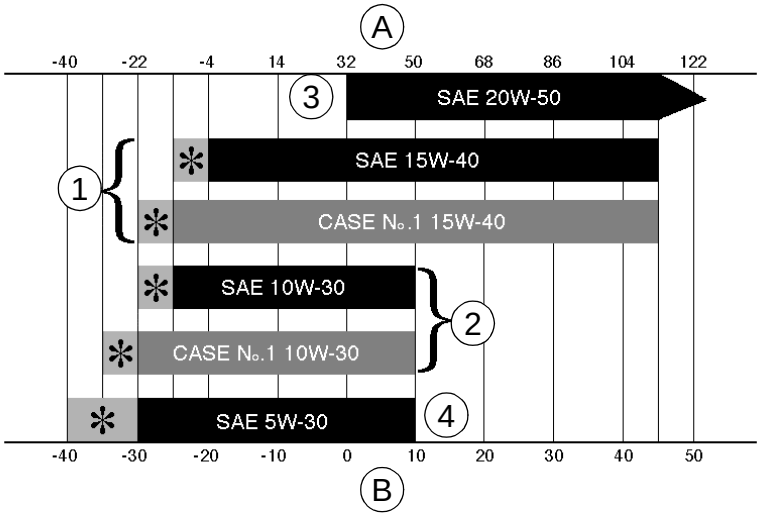
If CASE No. 1 Multiperformance or Performance engine oil is not available, use oil corresponding to category API/CG/CF.

NOTE: *Do not put any Performance Additive or other additive in the sump. Oil change intervals shown in this manual are based on tests carried out on CASE lubricants.*

RD97F136

RD97F100

Oil viscosity/Oil range



CS98M561

(A) FAHRENHEIT TEMPERATURE
(B) CELSIUS TEMPERATURE
(1) ALL SEASONS
(2) WINTER
(3) TROPICAL
(4) ARCTIC
(*) SHOWS THAT AN ENGINE OIL HEATER OR ENGINE COOLANT SOLUTION HEATER MUST BE USED

Fuel

Use fuel that is to ASTM (American Society for Testing and Materials) D975 standard.

Use Grade No. 2 fuel. The use of other types of fuel can result in a loss of power and may cause high fuel consumption.

In cold weather, the use of a mixture of fuels No. 1 and No. 2 is temporarily permitted. Consult your fuel supplier.

If the temperature falls below the fuel cloud point (point at which wax begins to form) the wax crystals will cause power loss or will prevent the engine from starting.

IMPORTANT: *In cold weather, fill the fuel tank at the end of the day's work, in order to prevent the formation of condensation.*

Fuel storage

Long storage can lead to the accumulation of impurities and condensation in the fuel. Engine trouble can often be traced to the presence of water in the fuel.

The storage tank must be placed outside and the temperature of the fuel should be kept as low as possible. Drain off water and impurities regularly.

Anti-freeze/Anti-corrosion

Use anti-freeze in all seasons to protect the cooling system from corrosion and all risk of freezing.

In environments with a temperature higher than -36°C, use a mixture of 50% ethylene-glycol based anti-freeze.

For areas where the temperature is below -36°C, it is advisable to use a blend of 40% water and 60% anti-freeze.

Environment

Before carrying out any servicing operation on this machine and before disposing of used fluids or lubricants, always think of the environment. Never throw fluid or oil on the ground and never keep them in leaking receptacles.

Consult your local ecological recycling centre to obtain information on the appropriate means of disposing of these substances.

Components made from plastic or resin

When cleaning plastic parts, the console, the instrument panel, the gauges, etc., do not use petrol (gasoline), paraffin (kerosene), paint solvents, etc. Use only water, soap and a soft cloth.

The use of petrol (gasoline), paraffin (kerosene), paint solvents, etc, will cause discoloration, cracking or deformation of these components.

SPECIFICATIONS

	CX130LC/CX130LR	CX160	CX180

Engine

Make	Isuzu	←	←
Model	BB-4BG1TRA-01DD-4BG1TRA-02	←	

Type: Four stroke, water-cooled, overhead valve, direct injection (electronically controlled), in-line engine with turbo-charger.

Number of cylinders	4	←	←
Bore and stroke	105x125mm	←	←
Displacement	4329cm^3	←	←

Operating conditions

Idling	1000 tr/mn	←	←
Max speed	2100 tr/mn	2200 tr/mn	←
ECC 1289 power rating	66,2 KW (89cv)	75KW (101cv)	←
Max torque at 1600 rpm	324 Nm	389 Nm	←

Capacities

Engine oil capacity	15L	←	←
Engine cooling system	17.7 L	←	←
Capacity of the radiator only	6 L	←	←
Fuel tank	250 L	←	←
Hydraulic fluid reservoir capacity	73 L	←	←
Total hydraulic system capacity	123 L	148 L	←
Capacity of the cooler only	7 L	←	←
Travel reduction gear housing capacity	3 L	←	←
Swing drive housing capacity	2.2 L	5 L	←
Idler wheel capacity	160cm^3	180cm^3	←
Upper roller capacity	35 to 40 cm^3	50 to 55 cm^3	←
Lower roller capacity	190 cm^3	210 cm^3	←

NOTE: *These capacities are only provided in an indicative manner. To check fluid levels, always use the oil dipstick, sight glasses or the filler cap.*

Electrical system

Type of system	24 volts negative earth
Alternator amperage	50 A
Battery	
Number of batteries required	2
Voltage of each battery	12 volts
Capacity	120 Ah
Reserve	160 min
Cold starting capacity at -17°C	800 A
Load for load checking	400 A
Starter motor	
Voltage	24 volts
Power	4.5 kW
Voltage regulator	integrated, not adjustable

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Hydraulic system

Main hydraulic pump

Double, axial piston, variable flow pump.

Max flow	2x123 l/min	2x137 l/min	←
Displacement	2x57.6 cm^3	2x64 cm^3	←

Hydraulic pilot pump

Fixed flow pump.

Max flow	22,8 l/min	22 l/min	←
Displacement	10.7 cm^3	←	←

Pressure settings

Pilot circuit secondary relief valve	39 ±1 bar	←	←
Main relief valve (standard)	343±3 bar	←	←
Main relief valve (higher pressure - 2-stage relief)	363±5 bar	←	←
Secondary relief valves (boom, dipper and bucket)	383±5 bar	←	←
Secondary relief valves (swing)	279±4 bar	←	←
Secondary relief valves (travel)	430±5 bar	353±5 bar	←
Secondary relief valve (boom and dipper)	383±5 bar	←	←

Cylinder

Boom cylinder

Barrel diameter	105 mm	115 mm	←
Rod diameter	70 mm	80 mm	←
Stroke	990 mm	1179 mm	←

Dipper cylinder

Barrel diameter	115 mm	125 mm	←
Rod diameter	80 mm	90 mm	←
Stroke	1108 mm	1253 mm	←

Bucket cylinder

Barrel diameter	95 mm	105 mm	←
Rod diameter	65 mm	75 mm	←
Stroke	881 mm	985 mm	←

Leaks on the cylinder - attachment lowering (without load)

Boom cylinders (rod retracting)	≤ 3 mm/5 min	≤ 5 mm/5 min	←
Dipper cylinder (rod extension)	≤ 5 mm/5 min	≤ 5 mm/5 min	←
Bucket cylinder (rod extension)	≤ 7 mm/5 min	≤ 7 mm/5 min	←
Full (at the end of the attachment)	≤ 200 mm/10 min	≤ 200 mm/10 min	←

Cylinder speeds (in mode S)

Boom raising (open bucket on the floor)	3.6±0.6 sec.	3.8±0.6 sec.	←
Boom lowering (open bucket)	3.0±0.6 sec.	3.6±0.6 sec.	←
Dipper extension	2.6±0.6 sec.	3.0±0.6 sec.	←
Dipper retraction	3.2±0.6 sec.	3.6±0.6 sec.	←
Bucket opening	2.3±0.6 sec.	2.4±0.6 sec.	←
Bucket closing	3.6±0.6 sec.	4.2±0.6 sec.	←

Control valve

Five section control valve for dipper, boom acceleration, swing, option and RH travel.
Four section control valve for dipper acceleration, bucket, boom and LH travel.
Load holding valve for boom and dipper.

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Swing

Fixed flow, axial piston motor.
Automatic disc brake.

Upperstructure swing speed	13.9 rpm	11.4 rpm	←
Displacement	65 cm^3	151 cm^3	←
Work output	100 l/min	155 l/min	←
Reduction ratio	17.03	13.34	←
Braking torque	≥ 294 Nm	≥ 739 Nm	←
Minimum brake release pressure	29 bar	←	←
Acceptable hydraulic motor leakage	xx l/min	←	←

Travel

Two-speed, axial piston motor.
Automatic disc brake.

Slow speed	3.8 km/h	3.2 km/h	2,4 km/h
Fast speed	5.5 km/h	5,5 km/h	4 km/h
Incline that can be overcome	70% (35°)	←	←
Tractive force	10 000 daN	11 300 daN	18340 daN
Displacement	52.7/34 cm^3	87/49 cm^3	162/95 cm^3
Work output	121 l/min	140 l/min	137 l/mn
Reduction ratio	72	57,5	43,2
Braking torque (excluding reducer)	145 Nm	135 Nm	483Nm
Number of turns at the sprockets (10 turns)			
Mode "S", fast speed	13.4±0.6 sec.	12.8±0.6 sec.	19.6±0.6 sec.
Mode "S", slow speed	20.6±0.7 sec.	21.9±0.7 sec.	33.4±0.7 sec.
Permitted deviation in travel over a distance of 20 m			
Mode "H", full speed	1 m	←	←
Acceptable hydraulic motor leakage	xx l/min	←	←

Undercarriage

One-piece undercarriage with welded components.
Lubricated rollers and idler wheels.
Grease type track tension.

Ground pressure			
with 500 mm track pads	0.39 bar	0.47 bar	
with 600 mm track pads	0.33 bar	0.40 bar	0,41 bar
with 700 mm track pads	0.29 bar	0.33 bar	0,36 bar
with 700 mm track pads (**CX130LR**)	0.31 bar		
With 800 mm track pads	X	X	0,33 bar
with rubber track pads	0.40 bar	X	X
Tracks tension	240 to 260mm	260 to 280mm	280 to 300mm

	CX130LC/CX130LR	CX160	CX180

Attachment

Break-out force	9740 daN	11 790 daN	←
Break-out force (**CX130LR**) 3490 daN			
Penetration force (**CX130LR**) 2300 daN			
2.10 m dipper	8020 daN		
2.50 m dipper	6740 daN		
3.00 m dipper	5610 daN		
2.20 m dipper	X	9300 daN	←
2.70 m dipper	X	8010 daN	←
3.10 m dipper	X	7400 daN	←

Weight of components

Engine	361 kg	←	←
Hydraulic pump	90 kg	←	←
Attachment control valve	140 kg	←	←
Swing motor/reduction gear assembly	99 kg	221 kg	←
Travel motor/reduction gear assembly	204 kg	247 kg	308 kg
Boom cylinder	108 kg	157 kg	←
Dipper cylinder	157 kg	210 kg	←
Bucket cylinder	93 kg	117 kg	←
Counterweight	2300 kg	3330 kg	←
Counterweight (**CX130LR**) 3560 kg			
Cab	254 kg	←	←
Turnable bearing	188 kg	244 kg	263 kg
Upperstructure	5820 kg	6780 kg	7670kg
Hydraulic swivel	27 kg	←	31 kg
Undercarriage	3880 kg	5760 kg	6570 kg
Machine without attachment	9830 kg	12 540kg	14240 kg
Attachment	2140 kg	3030 kg	3070 kg
Boom	1200 kg	1470 kg	1780 kg
Boom (**CX130LR**) 1080 kg			
Dipper	542 kg	729 kg	805 kg
Dipper (**CX130LR**) 610 kg			
Radiator and cooler set	48 kg	←	←
Fuel tank	72 kg	←	←
Hydraulic tank	106 kg	←	←
Idler wheel	65 kg	82 kg	←
Upper roller	13 kg	17 kg	←
Lower roller	20 kg	36 kg	←
Shock absorber	63 kg	85 kg	126 kg
Track 500 mm	728 kg	1016 kg	
Track 600 mm	816 kg	1164 kg	1257 kg
Track 700 mm	970 kg	1374 kg	1460 kg
Track 800 mm	X	X	1593 kg