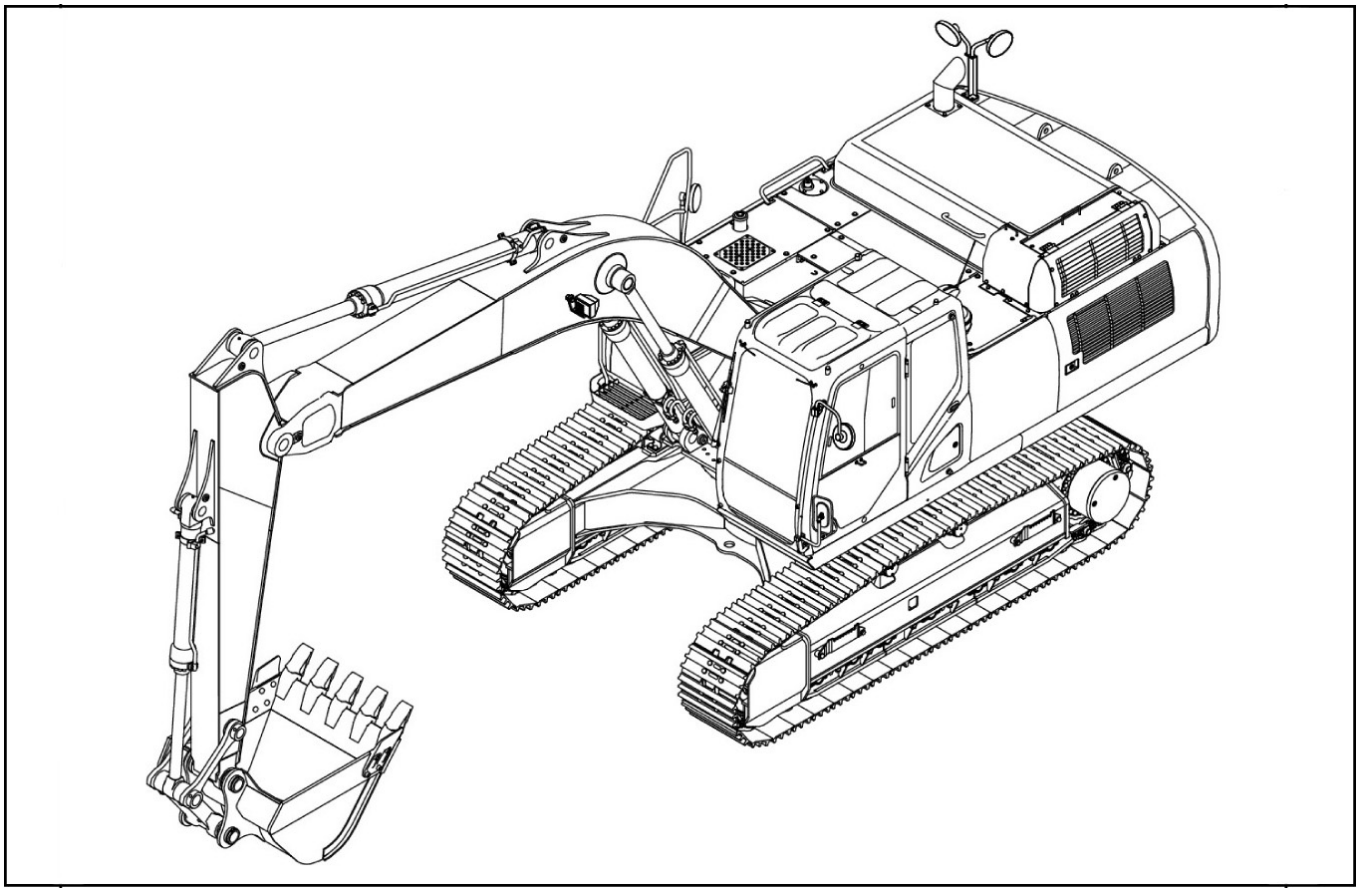
SERVICE MANUAL

Lep 84512399 EN



CX470C Tier 4
Crawler Excavator

Issue date September 2011

CRAWLER EXCAVATORS
CX470C TIER 4
SERVICE MANUAL

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DIVISION/SECTION SECTION N°

Section

1001

Safety, general information and standard torque data

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GENERAL INFORMATION

CLEANING
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 Catalogue 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

⚠ Warning	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 key switch when servicing or repairing the machine.
One warning tag is supplied with each machine.
Additional tags are available from your service parts supplier.

⚠ 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

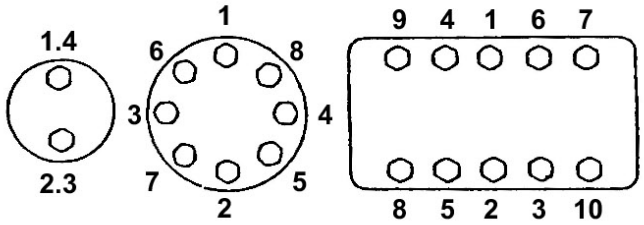
Engine exhaust fumes can cause death.
If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension.
Open the doors and get outside air into the area.

⚠ 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.

Bolt and Nut Tightening

- Tighten alternating between left and right and top and bottom so that uniform tightening force is applied.



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- If Loctite was used on a removed bolt (there is something white sticking to the bolt when it is removed), clean the old Loctite off with cleaning fluid, dry the bolt, then apply 2 - 3 drops of Loctite to the thread section of the bolt.

Torque table

Bolt nominal diameter (size)			**M6**	**M8**	**M10**	**M12**	**M14**	**M16**	**M18**	**M20**
Hexagon bolt	Wrench	[mm]	10	13	17	19	22	24	27	30
	Tightening torque	[N・m]	6.9	19.6	39.2	58.8	98.1	156.9	196.1	294.2
Hexagon socket head bolt	Wrench	[mm]	5	6	8	10	12	14	14	17
	Tightening torque	[N・m]	8.8	21.6	42.1	78.5	117.7	176.5	245.2	343.2

Bolt nominal diameter (size)			**M6**	**M8**	**M10**	**M12**	**M14**	**M16**	**M18**	**M20**
Hexagon bolt	Wrench	[in]	0.394	0.512	0.669	0.748	0.866	0.945	1.063	1.181
	Tightening torque	[lbf・ft]	5.090	14.459	28.917	43.376	72.367	115.743	144.661	217.028
Hexagon socket head bolt	Wrench	[in]	0.197	0.236	0.315	0.394	0.472	0.551	0.551	0.669
	Tightening torque	[lbf・ft]	6.492	15.934	217.028	57.909	86.826	130.202	180.881	253.175

Section

1002A

Specifications

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Overall (CX470C)

Main Data

Model name	CX470C Fixed Sideframe	CX470C Retractable Side-frame	CX470C MASS Excavator (Fixed Sideframe)	CX470C MASS Excavator (Retractable Side-frame)
Operating weight	47800 kg	49300 kg	48200 kg	49700 kg
Engine output	270 kW/2000 min^{-1}			

Performance

	CX470C Fixed Sideframe	CX470C Retractable Side-frame	CX470C MASS Excavator (Fixed Sideframe)	CX470C MASS Excavator (Retractable Side-frame)
Standard weight	26.5 kN		37.1 kN	38.8 kN
Swing speed	9.1 min^{-1}			
Travel speed	Low speed 3.2 km/h			
	High speed 5.3 km/h			
Maximum pulling force	340 kN			
Grade ability	70 % (35°)			
Ground pressure	82 kPa (600 mm grouser shoe)	84 kPa (600 mm grouser shoe)	83 kPa (600 mm grouser shoe)	85 kPa (600mm grouser shoe)
	67 kPa (750 mm grouser shoe)	69 kPa (750 mm grouser shoe)	67 kPa (750 mm grouser shoe)	69 kPa (750 mm grouser shoe)
	56 kPa (900 mm grouser shoe)	58 kPa (900 mm grouser shoe)	57 kPa (900 mm grouser shoe)	58 kPa (900 mm grouser shoe)

Main Unit Dimensions

	CX470C Fixed Sideframe	CX470C Retractable Sideframe	CX470C MASS Excavator (Fixed Side-frame)	CX470C MASS Excavator (Retractable Sideframe)
Main unit length	6445 mm			
Main unit width	3560 mm	3700 mm (maximum track retraction for transport = 3200 mm)	3560 mm	3700 mm (maximum track retraction for transport = 3200 mm)
Upper swing body width	3060 mm (3590 mm with catwalk)			
Cab width	1000 mm			
Main unit height	3440 mm	3590 mm	3440 mm	3590 mm
Swing radius (rear end)	3730 mm			
Swing body rear end distance	3720 mm			
Swing body rear section bottom height	1330 mm	1480 mm	1330 mm	1480 mm
Distance between tumblers	4400 mm			
Overall track length	5450 mm			
Overall track width	3350 mm	3490 mm (maximum track retraction for transpor = 2990 mm)	3350 mm	3490 mm (maximum track retraction for transport = 2990 mm)

	CX470C Fixed Sideframe	**CX470C Retractable Sideframe**	**CX470C MASS Excavator (Fixed Side-frame)**	**CX470C MASS Excavator (Retractable Sideframe)**
Distance between tracks	2750 mm	2890 mm (maximum track retraction for transport = 2390 mm)	2750 mm	2890 mm (maximum track retraction for transport = 2390 mm)
Track shoe width	600 mm (option 750 mm, 900 mm)			
Minimum ground clearance	540 mm (to bottom of lower frame)	740 mm (to bottom of lower frame)	540 mm (to bottom of lower frame)	740 mm (to bottom of lower frame)

Specifications

Engine

	CX470C Fixed Sideframe / CX470C Retractable (Sideframe) / CX470C MASS Excavator (Fixed Sideframe) / CX470C MASS Excavator (Retractable Sideframe)
Name	ISUZU 6UZ1X diesel engine
Model	4-cycle, water cooled, overhead camshaft type Common rail system (electronic control), cooled EGR, with turbocharger, DPD system
Number of cylinders - bore x stroke	6 - D120 mm x 145 mm
Total stroke volume	9.839 L
Maximum torque	1435 N•m/1500 min^{-1}
Starter	24 V 5.5 kW Reduction type
Charging generator	24 V 50 A AC type
Battery	12 V 128 Ah/5 HR x 2

Cooling System

		CX470C Fixed Sideframe / CX470C Retractable (Sideframe) / CX470C MASS Excavator (Fixed Sideframe) / CX470C MASS Excavator (Retractable Sideframe)
Fan type		D1016 mm, 6 blades, suction
Radiator		
	Fin type	Wavy
	Fin pitch	1.75 mm
Oil cooler		
	Fin type	Wavy
	Fin pitch	1.75 mm
Inter cooler		
	Fin type	Triangular straight
	Fin pitch	2.0 mm
Fuel cooler		
	Fin type	Wavy
	Fin pitch	2.25 mm

Upper Side Work System

		CX470C Fixed Sideframe		**CX470C Retractable Sideframe**		**CX470C MASS Excavator (Fixed Sideframe)**	**CX470C MASS Excavator (Retractable Sideframe)**
Model		Backhoe attachment					
Components, dimensions, working dimensions							
	Standard bucket capacity	Heaped 2.00 m^3 (leveled 1.47 m^3)				Heaped 3.0 m^3 (leveled 2.2 m^3)	
	Bucket width	1530 mm				2020 mm	
	Bucket width with side cutter	1640 mm				-	
	Bucket weight with side cutter	1920 kg				2910 kg (no side cutter)	
	Boom length	6980 mm				6550 mm	
	Arm type	Standard (HD) (3.38 m)	Short (2.53 m)	Standard (HD) (3.38 m)	Short (2.53 m)	Short (2.53 m)	
	Arm length	3380 mm	2530 mm	3380 mm	2530 mm	2530 mm	

		CX470C Fixed Sideframe		CX470C Retractable Sideframe		CX470C MASS Excavator (Fixed Sideframe)	CX470C MASS Excavator (Retractable Sideframe)
	Bucket radius	1840 mm				1850 mm	
	Bucket wrist angle	176°				161°	
	Maximum digging radius	12000 mm	11230 mm	12000 mm	11230 mm	10810 mm	
	Maximum digging radius at ground line	11770 mm	10990 mm	11740 mm	10950 mm	10560 mm	10520 mm
	Maximum digging depth	7720 mm	6870 mm	7570 mm	6720 mm	6490 mm	6340 mm
	Maximum vertical straight wall digging depth	6570 mm	5670 mm	6420 mm	5520 mm	4920 mm	4770 mm
	Maximum digging height	11140 mm	10820 mm	11290 mm	10970 mm	10520 mm	10670 mm
	Maximum dump height	7740 mm	7420 mm	7890 mm	7570 mm	7180 mm	7340 mm
	Minimum swing radius at front	4990 mm	5140 mm	4990 mm	5130 mm	4800 mm	4800 mm
	Height for minimum swing radius at front	9250 mm	9320 mm	9400 mm	9470 mm	9050 mm	9200 mm

Operating Device

			CX470C Fixed Sideframe / CX470C Retractable Sideframe / CX470C MASS Excavator (Fixed Sideframe) / CX470C MASS Excavator (Retractable Sideframe)
Operator's seat			
	Position		Left side
	Structure		Adjustable forward and back and up and down, reclining mechanism, with seat suspension
Cab			Sealed steel type, all reinforced glass, ROPS, with sunroof
Levers and pedals			
	For travel use		Lever and pedal type (hydraulic pilot type) × 2
	For operating machine use		Lever type (hydraulic pilot type) × 2
Instruments and switches			
Work mode switchover			3 modes (SP/H/A)
	Travel mode switchover		Low-speed/high-speed switch type
	One-touch idle		Knob switch type
	Engine emergency stop		Switch type
Monitor device			
	Machine status display (TFT color liquid crystal)		
	Message display		
	Work mode select status		SP/H/A
Instruments			
	Fuel gauge		
	Engine coolant temperature gauge		
	Hydraulic oil temperature gauge		
	Hour meter		
	Rear view camera monitor		
	Warning display and warning alarm * has warning alarm		
	Overheat (*) Battery charge (*) Electrical system abnormality (*) Refill fuel (*) Engine oil pressure (*) Refill coolant (*) Engine pre-heat Warm up Air cleaner (*) Anti-theft device triggered Engine system abnormality (*) Engine emergency stop (*)		
Illumination equipment			
	Working light	Right front tool box front surface:	24 V 70 W × 1
		Cab top:	24 V 70 W × 2
		Boom side:	24 V 70 W × 2