

CX210C
Tier 4
Crawler Excavator

SERVICE MANUAL

Part number 84551720B

English

October 2012

Replaces part number 84551720





Section

1001

Safety, general information and standard torque data

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Safety, general information and standard torque data

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.

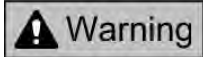
LUBRICATION

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, general information and standard torque data

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.

Safety, general information and standard torque data

⚠ 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.

Safety, general information and standard torque data

ROPS Judgment Method

1. Purpose

Check against the ROPS judgment criteria to judge whether the machine satisfies the ROPS criteria or not. The weight and boom of the machine greatly effects whether the ROPS judgment criteria is satisfied or not. The ROPS test assumes that the weight being used is the weight of the machine when the maximum number of selectable options are mounted (as of 2009).

However, depending on the derivative machinery or the order details, the weight and boom position may differ from the assumed weight or position.

2. Criteria for judging whether a machine satisfies the ROPS criteria

1) Weight

The weight must not be over the weight shown below for each class.

If the weight is exceeded, there is a danger that the cab could be damaged and the operator could die or sustain a serious injury when the machine falls over.

If the weight exceeds the stipulated weight, the machine will not satisfy the ROPS criteria.

• Weight (X3 model)

To satisfy the ROPS criteria, the weight must not be over the indicated weight. (The below weights are the weights indicated on the nameplate within the ROPS cab)

Machine body total weight	Class
16000 kg (35274.146 lb) or less	SH75X-6 SH125X-6
20500 kg (45195.000 lb) or less	SH120-6 SH150-6
28000 kg (61729.756 lb) or less	SH235X-6
31000 kg (68343.658 lb) or less	SH200-6 SH240-6 SH240-6 LR SH290-6
40000 kg (88185.365 lb) or less	SH330-6
50000 kg (110231.707 lb) or less	SH470-6

* The ROPS test assumes that the SH470-6 has a cage guard (alone).

Machine body total weight	Class
16000 kg (35274.146 lb) or less	CX75C CX145C
20500 kg (45195.000 lb) or less	CX130C CX160C CX180C
28000 kg (61729.756 lb) or less	CX235C
31000 kg (68343.658 lb) or less	CX210C CX250C CX250C LR CX300C
40000 kg (88185.365 lb) or less	CX370C
50000 kg (110231.707 lb) or less	CX470C

* The ROPS test assumes that the CX470C has a cage guard (alone).

Machine body total weight	Class
16000 kg (35274.146 lb) or less	CX75C CX145C
20500 kg (45195.000 lb) or less	CX130C CX160C
28000 kg (61729.756 lb) or less	CX235C
31000 kg (68343.658 lb) or less	CX210C CX250C CX250C LR CX300C
50000 kg (110231.707 lb) or less	CX470C

Safety, general information and standard torque data

* The ROPS test assumes that the CX470C has a cage guard (alone).

• Weight (X2 model)

To satisfy the ROPS criteria, the weight must not be over the indicated weight. (The below weights are the weights indicated on the nameplate within the ROPS cab)

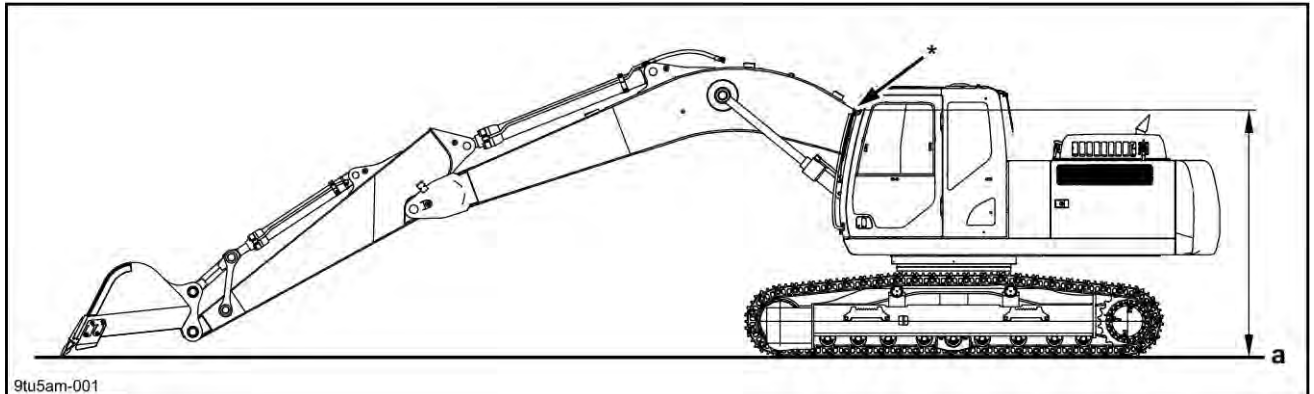
Machine body total weight	Class
26600 kg (58643.268 lb) or less	SH120-5
	SH150-5
	SH200-5
	SH240-5

Machine body total weight	Class
26600 kg (58643.268 lb) or less	CX130B
	CX160B
	CX180B
	CX210B
	CX240B

2) Boom position

⚠ WARNING

- If the machine has been modified so that the boom position has been lowered, the machine will not satisfy the ROPS criteria.
- It is necessary to consult with our company if it is possible that the boom's position has been lowered by modification.
- The extent to which a boom position has moved cannot be determined in the same way for all machines.



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a	Ground point
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With the tip of the bucket in contact with the ground surface at maximum work radius, if the position (* in the diagram) that overlaps with the cab when viewed from the side is markedly lower than that of a standard machine (standard arm), the machine will not satisfy the ROPS criteria.

Also, with a machine body with a cab mounted that can withstand up to 31 tons, the effect of mounting a 24 ton machine, which is near the restriction weight, and a 21 ton machine to the same cab will not be the same.

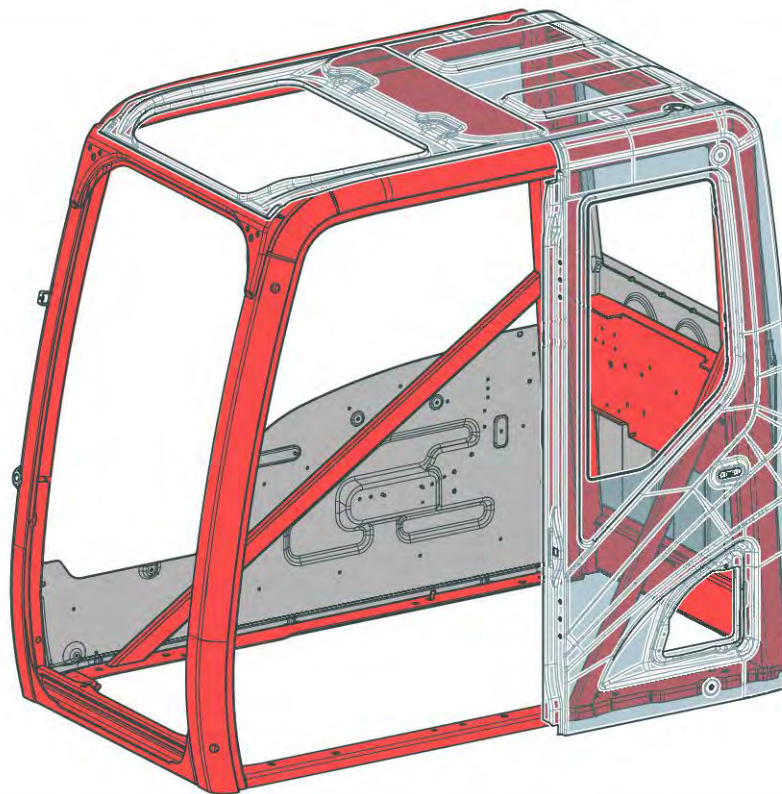
3. Prohibited items

- Modifications that reduce the strength of a platform that has a cab with a ROPS mounted to it. (Actions or modifications that reduce the functionality of the anchoring part at the left-rear of the cab)
- Modifications that effect the strength of the ROPS of a cab.

A forbidden all modifications (red part)	All modifications (grinding, welding, drilling holes, removing, etc.) are prohibited.
Allow under specified conditions (gray part)	Removal of parts is prohibited. Bar welding and making holes [up to diameter 20 mm (0.787 in.)] by drilling are possible.

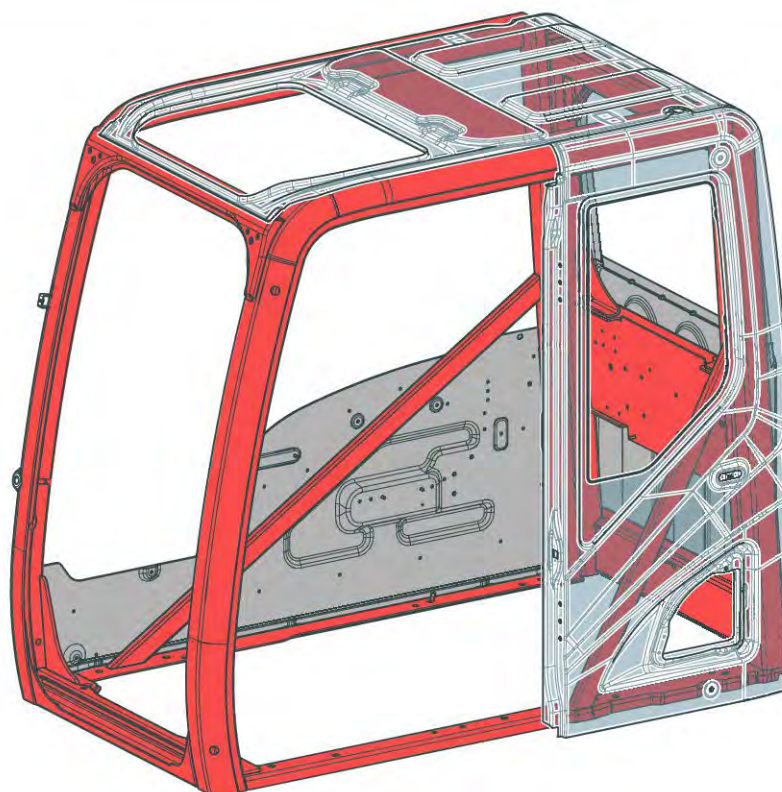
Safety, general information and standard torque data

[X3 Cab (SH120-6/SH150-6)]
[X3 Cab (CX130C/CX160C/CX180C)]
[X3 Cab (CX130C/CX160C)]



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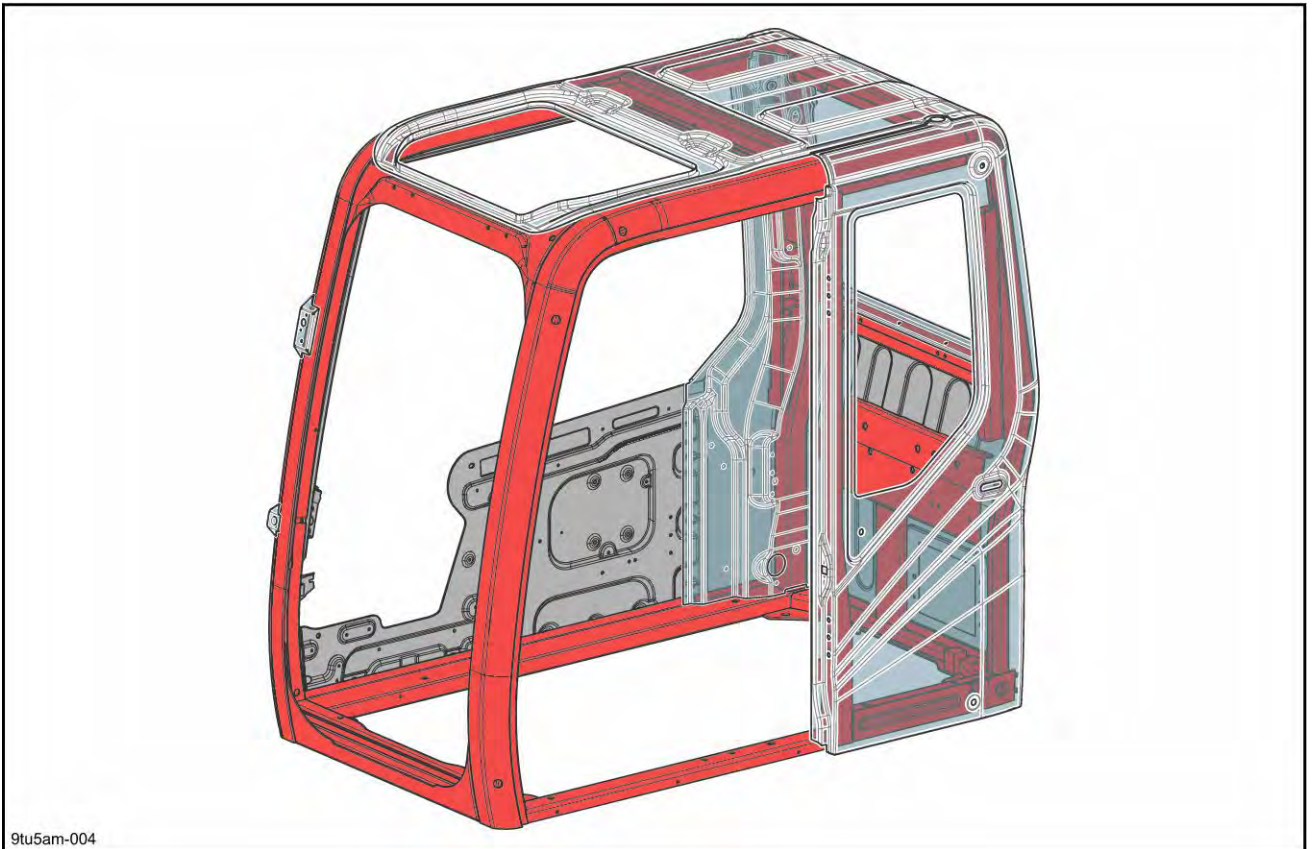
[X3 Cab (SH200-6/SH240-6/SH290-6)]
[X3 Cab (CX210C/CX240C/CX290C)]



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Safety, general information and standard torque data

[X2 Cab (SH200-5/SH240-5/SH290-5)]
[X2 Cab (CX210B/CX240B/CX290B)]

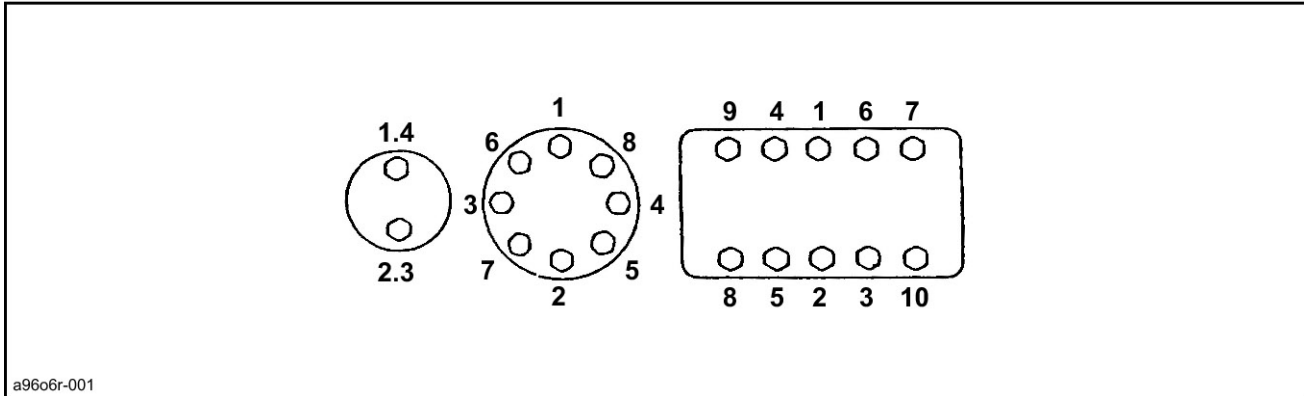


- In general, high cabs do not satisfy the ROPS criteria. (It is necessary to consult with our company to check if the high cab model satisfies the ROPS criteria.)

Safety, general information and standard torque data

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 (in.)	10 (0.394)	13 (0.512)	17 (0.669)	19 (0.748)	22 (0.866)	24 (0.945)	27 (1.063)	30 (1.181)
	Tightening torque	N·m (lbf·ft.)	6.9 (5.090)	19.6 (14.459)	39.2 (28.917)	58.8 (43.376)	98.1 (72.367)	156.9 (115.743)	196.1 (144.661)	294.2 (217.028)
Hexagon socket head bolt	Wrench	mm (in.)	5 (0.197)	6 (0.236)	8 (0.315)	10 (0.394)	12 (0.472)	14 (0.551)	14 (0.551)	17 (0.669)
	Tightening torque	N·m (lbf·ft.)	8.8 (6.492)	21.6 (15.934)	42.1 (217.028)	78.5 (57.909)	117.7 (86.826)	176.5 (130.202)	245.2 (180.881)	343.2 (253.175)



Section

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Specifications

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Specifications

CX210C

Main Data

Operating weight	21700 kg (47840.56 lb)
Engine output	119.3 kW/1800 min ⁻¹ (159.98 HP/1800 rpm)
Bucket capacity	Heaped 0.9 m ³
	Leveled 0.61 m ³

Performance

Standard weight	13.5 kN (3035.440 lbf)	
Swing speed	11.8 min ⁻¹ (11.8 rpm)	
Travel speed	Low speed 3.4 km/h (2.113 mile/h)	
	High speed 5.6 km/h (3.480 mile/h)	
Maximum pulling force	188 kN (42271.32 lbf)	
Grade ability	70 % (35°)	
Ground pressure	49 kPa (7.11 psi) [600 mm (23.622 in) grouser shoe]	43 kPa (6.24 psi) [700 mm (27.559 in) grouser shoe]
	38 kPa (5.51 psi) [800 mm (31.496 in) grouser shoe]	

Main Unit Dimensions

Main unit length	4960 mm (195.276 in)
Main unit width	3190 mm (125.591 in)
Upper swing body width	2770 mm (109.055 in)
Cab width	1000 mm (39.307 in)
Main unit height	2960 mm (116.535 in)
Swing radius (rear end)	2750 mm (108.268 in)
Swing body rear end distance	2750 mm (108.268 in)
Swing body rear section bottom height	1040 mm (40.945 in)
Distance between tumblers	3660 mm (144.094 in)
Overall track length	4470 mm (175.984 in)
Overall track width	3190 mm (125.590 in)
Distance between tracks	2390 mm (94.094 in)
Track shoe width	800 mm (31.496 in)[options 600 mm (23.622 in), 700 mm (27.559 in)]
Minimum ground clearance	440 mm (17.323 in)(to bottom of lower frame)

Engine

Name	Isuzu 4HK1X diesel engine
Model	4-cycle, water-cooled, overhead camshaft type, common rail system (electronic control), cooled EGR, with turbocharger (variable displacement type), DPD system
No. of cylinders - bore x stroke	4 - D115 mm (4.528 in) x 125 mm (4.921 in)
Total stroke volume	5.193 L (1.37188 gal)
Maximum torque	621 N·m/1500 min ⁻¹ (458.10 lbf·ft/1500 rpm)
Starter	24 V 5.0 kW reduction type
Charging generator	24 V 50 A AC type
Battery	12 V 92 Ah/5 HR x 2

Cooling System

Fan type	D650 mm (25.591 in), 7 blades, suction
Radiator	
Fin type	Wavy
Fin pitch	1.75 mm (0.06890 in)

Specifications

Oil cooler	
Fin type	Wavy
Fin pitch	1.75 mm (0.06890 in)
Intercooler	
Fin type	Triangular straight
Fin pitch	1.75 mm (0.06890 in)
Fuel cooler	
Fin type	Wavy
Fin pitch	2.0 mm (0.07874 in)

Upper Side Work System

Model	Backhoe attachment		
Components, dimensions, working dimensions			
Standard bucket capacity	Heaped 0.9 m ³ (Leveled 0.61 m ³)		
Bucket width	1130 mm (44.488 in)		
Bucket width with side cutter	1230 mm (48.425 in)		
Bucket weight with side cutter	685 kg (1510.174 lb)		
Boom length	5700 mm (224.409 in)		
Arm type	Standard (STD/HD) [2.94 m (9.6457 ft)]	Short (STD/HD) [2.40 m (7.8740 ft)]	Ultra Short (STD) [1.91 m (6.2664 ft)]
Arm length	2940 mm (115.748 in)	2400 mm (94.488 in)	1910 mm (75.197 in)
Bucket radius	1450 mm (57.087 in)		
Bucket wrist angle	177°		
Maximum digging radius	9900 mm (389.764 in)	9420 mm (370.866 in)	8960 mm (352.756 in)
Maximum digging radius at ground line	9730 mm (383.071 in)	9240 mm (363.780 in)	8770 mm (345.276 in)
Maximum digging depth	6650 mm (261.811 in)	6100 mm (240.157 in)	5610 mm (220.866 in)
Maximum vertical straight wall digging depth	5960 mm (234.646 in)	5480 mm (215.748 in)	5000 mm (196.850 in)
Maximum digging height	9610 mm (378.346 in)	9390 mm (369.685 in)	9140 mm (359.843 in)
Maximum dump height	6810 mm (268.110 in)	6590 mm (259.449 in)	6330 mm (249.213 in)
Minimum swing radius at front	3660 mm (144.094 in)	3600 mm (141.732 in)	3580 mm (140.945 in)
Height for minimum swing radius at front	7640 mm (300.787 in)	7700 mm (303.150 in)	7700 mm (303.150 in)

Operating Device

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	
Levers and pedals	
For travel use	Lever and pedal type (hydraulic pilot type) x 2
For operating machine use	Lever type (hydraulic pilot type) x 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 (full color liquid crystal)	

Specifications

Work mode select status	SP/H/A	
Instruments (full color liquid crystal)		
Fuel gauge	Bar graph and indicator	
Engine coolant temperature gauge	Bar graph and indicator	
Hydraulic oil temperature gauge	Bar graph and indicator	
Hour meter	Digital type	
Machine status and warnings (full color liquid crystal and warning alarm) * has warning alarm		
Overheat (*) Battery charge (*) Electrical system abnormality (*) Refill fuel (*) Engine oil pressure (*) Refill coolant (*) Engine pre-heat Auto warm up Air cleaner (*) Anti-theft device triggered Engine system abnormality (*) Engine emergency stop (*)		
Illumination equipment		
Working light	Tank front surface	24 V 70 W x 1
	Cab top	24 V 70 W x 2
	Boom up	24 V 70 W x 1
Interior light	24 V 10 W x 1	
Horn	Electric horn x 2	
Other	Wiper with intermittent function, window washer, air conditioner, clock, rear view mirrors (left and right, total of 5)	

Swing Units

Swing circle	Swing bearing type (with inner gear)
Swing hydraulic motor	Fixed displacement piston motor x 1
Reduction gear	Planetary gear 2-stage reduction gear
Swing parking brake	Mechanical lock (operational lever linkage type)

Travel Lower Body

Travel hydraulic motor	Variable displacement piston motor x 2
Reduction gear	Planetary gear 2-stage reduction gear
Travel brake	Hydraulic lock
Parking brake	Mechanical lock (travel lever linkage type)
Track shoe	
Model	Assembly-type triple grouser shoe
No. of shoes (per side)	49
Shoe width	800 mm (31.496 in) [options 600 mm (23.622 in), 700 mm (27.559 in)]
Grouser height	26 mm (1.027 in)
Link pitch	190 mm (7.480 in)
Roller	
No. of upper rollers (per side)	2
No. of lower rollers (per side)	8
Track belt tension adjuster	Grease cylinder type (with cushion spring)

Hydraulic Equipment

Hydraulic Device

Hydraulic pump drive type	Direct engine link (no transmission)
Hydraulic pump	
Model	Double variable displacement piston pump x 1
	Gear pump x 1
Discharge volume	Piston pump 2 x 211 L/min (55.742 gpm)
	Gear pump 18 L/min (4.755 gpm)
Pump control method	Simultaneous output full-horsepower control
Set pressure of main relief valve	34.3 MPa (4975.126 psi) [36.8 MPa (5337.975 psi) for pressure boost]
Set pressure of overload relief valve	29.4 MPa (4264.578 psi) (boom down)
	38.7 MPa (5613.577 psi) (other)

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