CX210C
Crawler Excavator

SERVICE MANUAL

Part number 48063128
English
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CASE
CONSTRUCTION

SERVICE MANUAL

CX210C Crawler excavator LC version - ISUZU engine GI-4HK1X (TIER 3)

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Foreword - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your CASE CONSTRUCTION Sales and Service Networks.

Safety rules

Personal safety

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

⚠ DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

⚠ WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

⚠ CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: *Notice indicates a situation that, if not avoided, could result in machine or property damage.*

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: *Note indicates additional information that clarifies steps, procedures, or other information in this manual.*

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules - General information

Cleaning

Clean the metal parts with cleaning solution that meets the standard and steam cleaning. (except for bearings)

After cleaning, dry well, and inject oil in all parts.

Also inject oil into the bearings after drying.

Inspection

When disassembling parts, check all the parts.

If there are any worn or damaged parts, replace them.

Inspect carefully to prevent initial breakdowns.

Bearing

Replace any loose bearings.

Air dry bearings before installing them.

Needle bearing

When inserting needle bearings, be very careful not to damage them.

Apply grease to the section where the needle bearing will be inserted.

Gear

Check that there is no wear and no damage.

Oil seal, O-ring, gasket

Always install new oil seals, O-rings, and gaskets.

Apply grease to sections where oil seals and O-rings will be inserted.

Shaft

Check that there is no wear and no damage.

Check the bearings and check for damaged oil seals on the shaft.

Service parts

Install CASE CONSTRUCTION genuine service parts.

When placing an order, check the parts catalog. It contains the CASE CONSTRUCTION genuine part numbers.

Any breakdowns arising from the installation of non-genuine parts are not covered by the warranty.

Lubricants (fuel, hydraulic oil)

Use the oil from the specified company or specified in the operator's manual or service Manual.

Any breakdowns arising from any fuel or hydraulic oil other than those specified are not covered by the warranty.

Safety rules - Personal safety

WARNING:

This symbol indicates a precaution.

It gives information concerning the safety of the operator and those in the surroundings.

Read and understand these precautions thoroughly before performing the work.

Always comply with warnings and precautions so as to avoid any accidents.

This section covers information related to overall safety.

Check whether all warning labels are in place.

Additional labels can be ordered from Service Parts.

WARNING:

Read the operator's manual to gain a thorough understanding of machine control operations.

WARNING:

Perform any machine operations from the seating position.

Any other method may cause severe injuries.

WARNING:

Only the one operator is to ride on the machine. No one else is to ride on it.

WARNING:

Check the safety messages in the operator's manual before starting the engine.

Check all the warning labels on the machine.

Check that no one is within the machine’s operating range.

Check the operating methods in a safe location before starting the actual work.

Understand the machine operations well, then operate in compliance with all service-related laws and regulations.

The operator's manual can be purchased at your CASE CONSTRUCTION dealer.

WARNING:

Working with sloppy clothes or clothes with which safety cannot be ensured leads to damage to the machine and injury to the operator.

Always wear clothes that ensures safety.

In order to work more safely, it is recommended to wear additional safety equipment.

Helmet, safety shoes, ear protection, goggles, work clothes, and gloves

WARNING:

Pay careful attention when working with the engine running.

WARNING:

Check hydraulic equipment.

Work according to the procedure.

Do not change the procedure.

WARNING:

Check that there is no one in the surroundings before draining the pressure from hydraulic circuits during machine hydraulic cylinder inspection.

WARNING:

Use gloves when handling high-temperature parts.

WARNING:

Bring the lower parts or attachments in contact with the ground before inspecting or repairing them.

WARNING:

Check that hoses and tubes are securely connected.

If there is any damage to a hose or tube, replace it.

Do not check for oil leaks by hand. Use cardboard or wood.

WARNING:

When removing an attachment pin or other hardened pin, use a hammer that has a soft head.

WARNING:

Wear eye protection when using a hammer to install a pin or when working with a grinder.

At this time, use goggles or eye protectors that meet standards.

WARNING:

Park the machine in a safe location when repairing or inspecting it.

WARNING:

Use work site protection when repairing the machine.

Check the oil, coolant, grease, and tools.

Recover materials and parts as necessary.

Pay enough attention to safety.

WARNING:

Some of the machine's parts are extremely heavy.

Use an appropriate lifting equipment for such parts.

For weights and procedures, see the Service Manual.

WARNING:

Exhaust gases are toxic.

Always provide good ventilation when working indoors or in any other enclosed space.

WARNING:

If the electrolytic battery solution freezes, it may explode.

Safety rules - Cab protective structure

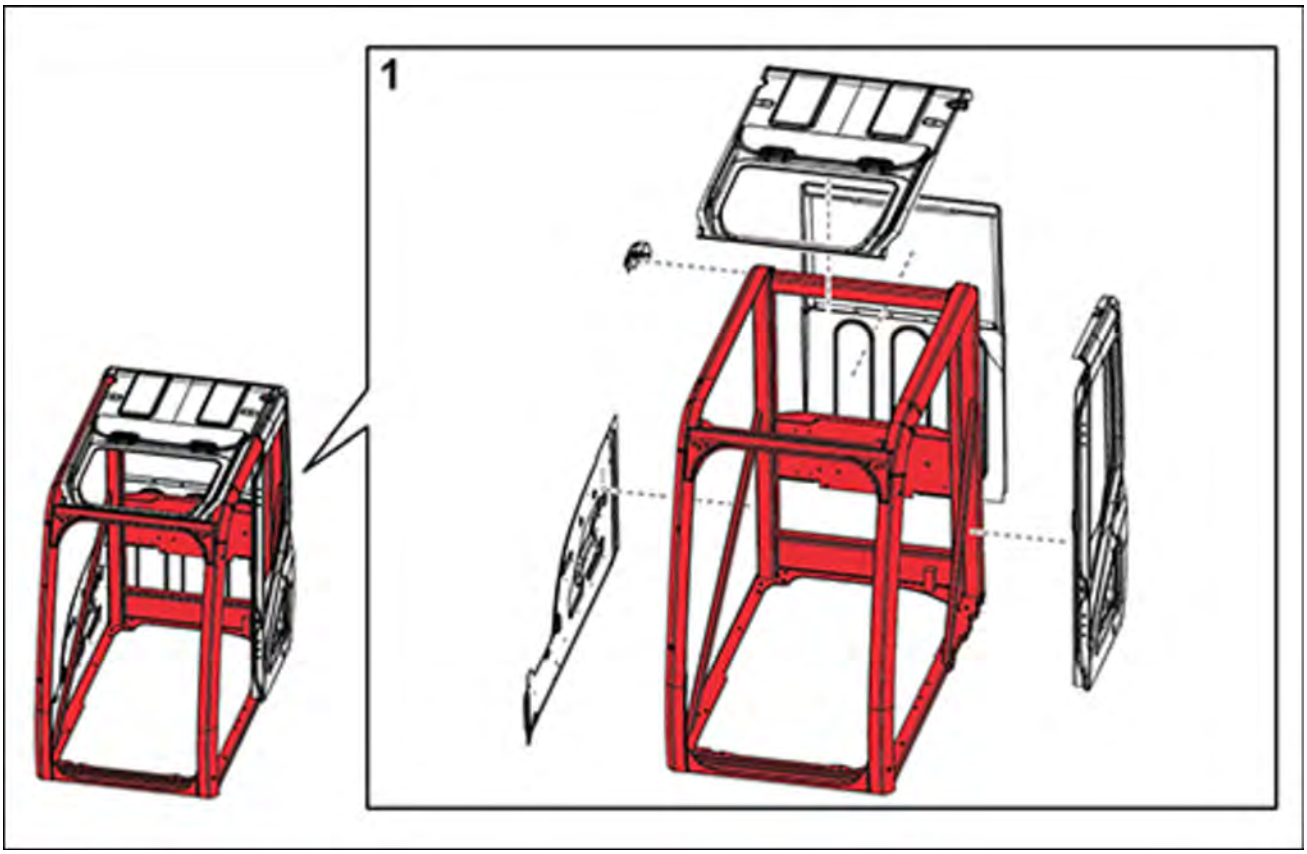
Cab protective structure

Modifying the cab main components is prohibited in order to protect the operator.

Prohibited items

- Modifications that reduce the strength of a platform that has a cab with a protective structure mounted on 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 cab with a protective structure.

Modifications prohibited (red part)	All modifications (grinding, welding, drilling holes, removing, etc.) are prohibited.
Modifications permitted under 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.



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Safety rules - Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE CONSTRUCTION strongly recommends that you return all used batteries to a CASE CONSTRUCTION dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.

Mandatory battery recycling

NOTE: *The following requirements are mandatory in Brazil.*

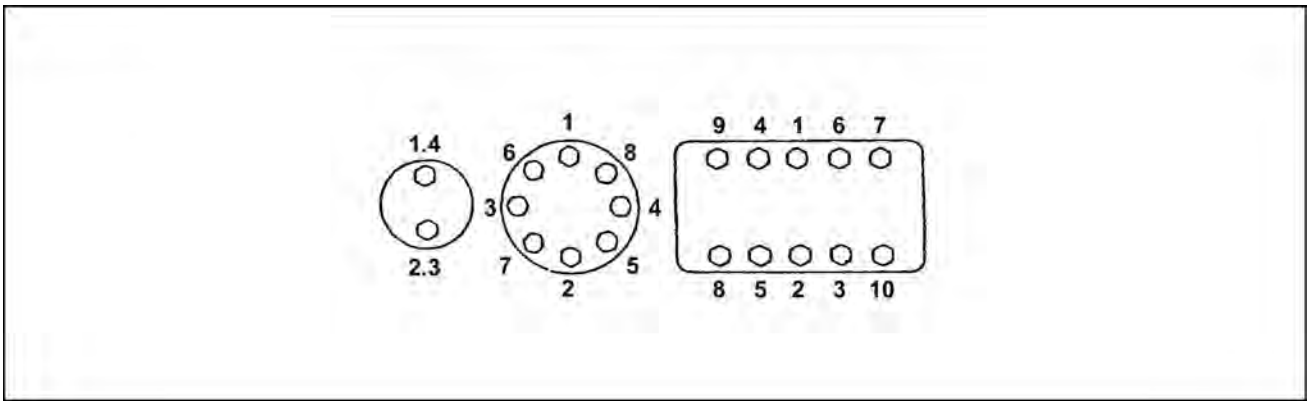
Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

Torque - Bolt and nut

- 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.

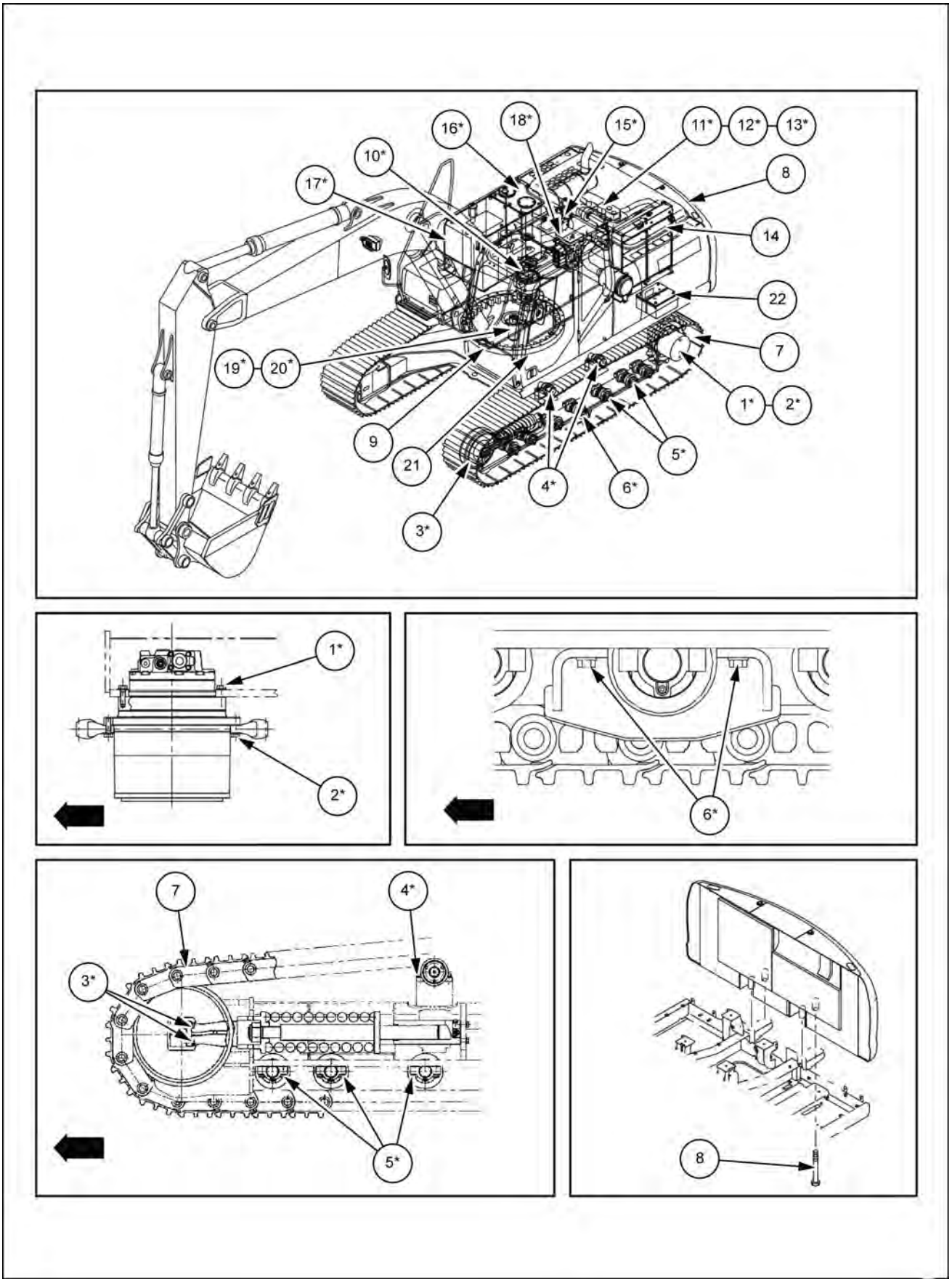
Torque table

Bolt nominal diameter (size)		M6	M8	M10	M12	M14	M16	M18	M20
Hexagon bolt	Wrench	10 mm	13 mm	17 mm	19 mm	22 mm	24 mm	27 mm	30 mm
	Tightening torque	6.9 N·m (5.089 lb ft)	19.6 N·m (14.456 lb ft)	39.2 N·m (28.912 lb ft)	58.8 N·m (43.369 lb ft)	98.1 N·m (72.355 lb ft)	156.9 N·m (115.723 lb ft)	196.1 N·m (144.636 lb ft)	294.2 N·m (216.991 lb ft)
Hexagon socket head bolt	Wrench	5 mm	6 mm	8 mm	10 mm	12 mm	14 mm	14 mm	17 mm
	Tightening torque	8.8 N·m (6.491 lb ft)	21.6 N·m (15.931 lb ft)	42.1 N·m (31.051 lb ft)	78.5 N·m (57.899 lb ft)	117.7 N·m (86.811 lb ft)	176.5 N·m (130.180 lb ft)	245.2 N·m (180.850 lb ft)	343.2 N·m (253.131 lb ft)

Torque - Special torque settings

Code	Retightening location		Bolt nominal diameter	Wrench	Tightening torque
1*	Travel motor		**M16**	**24 mm**	**267 - 312 N·m** (**196.93 - 230.12 lb ft**)
2*	Drive sprocket		**M16**	**24 mm**	**267 - 312 N·m** (**196.93 - 230.12 lb ft**)
3*	Take-up roller		**M16**	**24 mm**	**267 - 312 N·m** (**196.93 - 230.12 lb ft**)
4*	Upper roller		**M20**	**30 mm**	**521 - 608 N·m** (**384.27 - 448.44 lb ft**)
5*	Lower roller		**M18**	**27 mm**	**371 - 432 N·m** (**273.64 - 318.63 lb ft**)
6*	Track guard		**M18**	**27 mm**	**400 - 462 N·m** (**295.02 - 340.75 lb ft**)
7	Shoe		**M20**	**30 mm**	**250 - 350 N·m** (**184.39 - 258.15 lb ft**) Tightening angle: **115 - 125 °**
8	Counterweight		**M33**	**50 mm**	**1862 - 2058 N·m** (**1373.34 - 1517.90 lb ft**)
9	Turntable bearing	Outside **(29)**	**M20**	**30 mm**	**468 - 545 N·m** (**345.18 - 401.97 lb ft**)
		Inside **(36)**	**M20**	**30 mm**	**518 - 590 N·m** (**382.06 - 435.16 lb ft**)
10*	Swing unit		**M20**	**30 mm**	**539.4 - 629.6 N·m** (**397.84 - 464.37 lb ft**)
11*	Engine	Mount	**M16**	**24 mm**	**264.9 - 313.9 N·m** (**195.38 - 231.52 lb ft**)
12*		Front bracket	**M10**	**17 mm**	**63.8 - 73.6 N·m** (**47.06 - 54.28 lb ft**)
13*		Rear bracket	**M16**	**24 mm**	**205.9 - 247.1 N·m** (**151.86 - 182.25 lb ft**)
14	Radiator		**M16**	**24 mm**	**147.2 - 176.6 N·m** (**108.57 - 130.25 lb ft**)
15*	Hydraulic pump	Pump	**M20**	**17 mm** hexagon socket head	**367 - 496 N·m** (**270.69 - 365.83 lb ft**)
16*	Hydraulic tank		**M16**	**24 mm**	**232.4 - 276 N·m** (**171.41 - 203.57 lb ft**)
17*	Fuel tank		**M16**	**24 mm**	**232.4 - 276 N·m** (**171.41 - 203.57 lb ft**)
18*	Control valve		**M16**	**24 mm**	**267 - 312 N·m** (**196.93 - 230.12 lb ft**)
19*	Center Joint	Lock bar	**M12**	**19 mm**	**88.3 - 107 N·m** (**65.13 - 78.92 lb ft**)
20*		Joint	**M12**	**19 mm**	**109 - 127 N·m** (**80.39 - 93.67 lb ft**)
21	Cab		**M16**	**24 mm**	**149 - 173 N·m** (**109.90 - 127.60 lb ft**)
22	Battery		**M10**	**17 mm**	**19.6 - 29.4 N·m** (**14.46 - 21.68 lb ft**)

NOTICE: *For items marked with *, always apply* ***LOCTITE® 262™*** *or the equivalent and tighten to the specified torque. The tightening torque in kgf•m is determined with N · m ÷ 9.8 (lbf · ft ÷ 7.2).*



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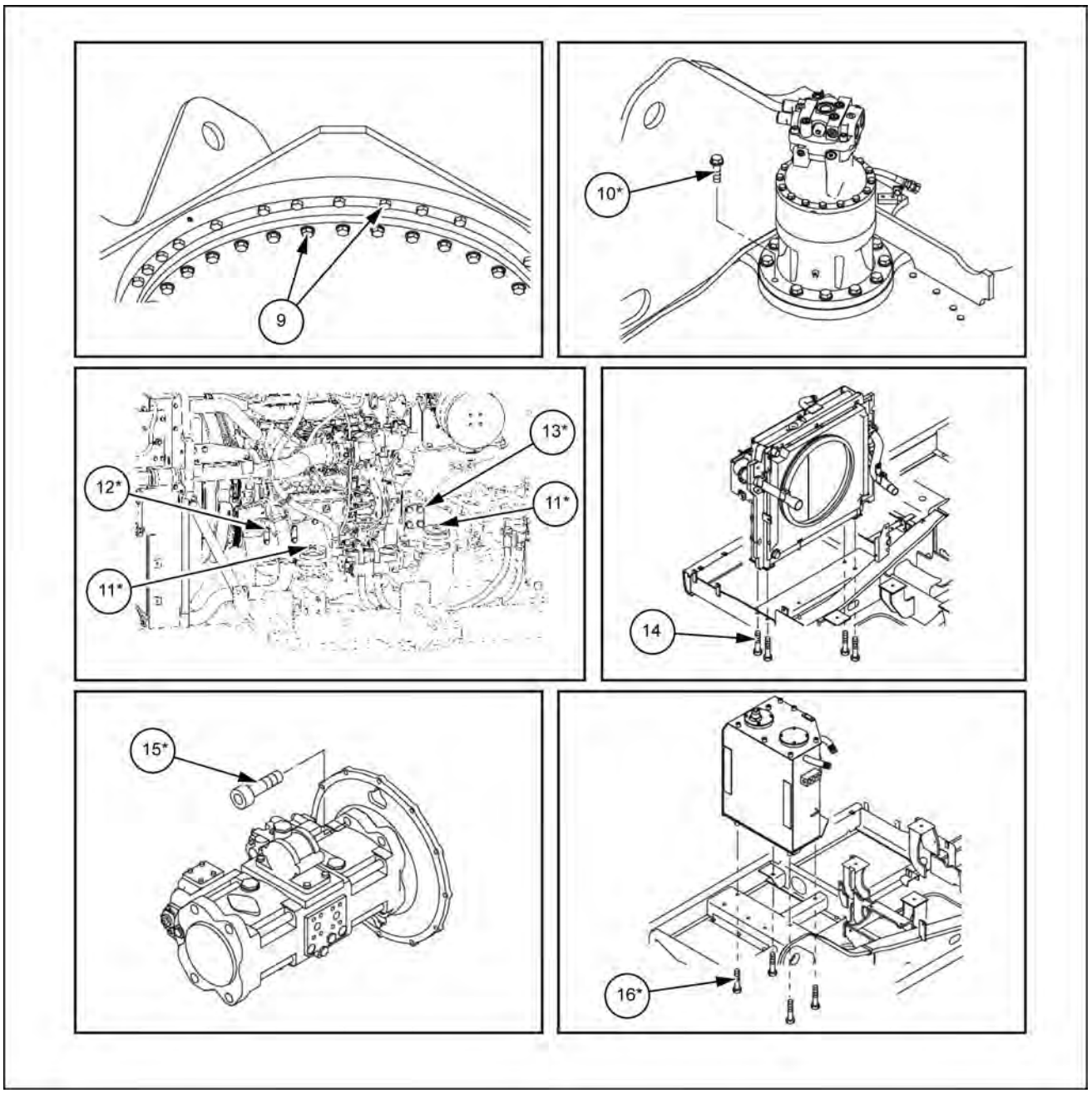

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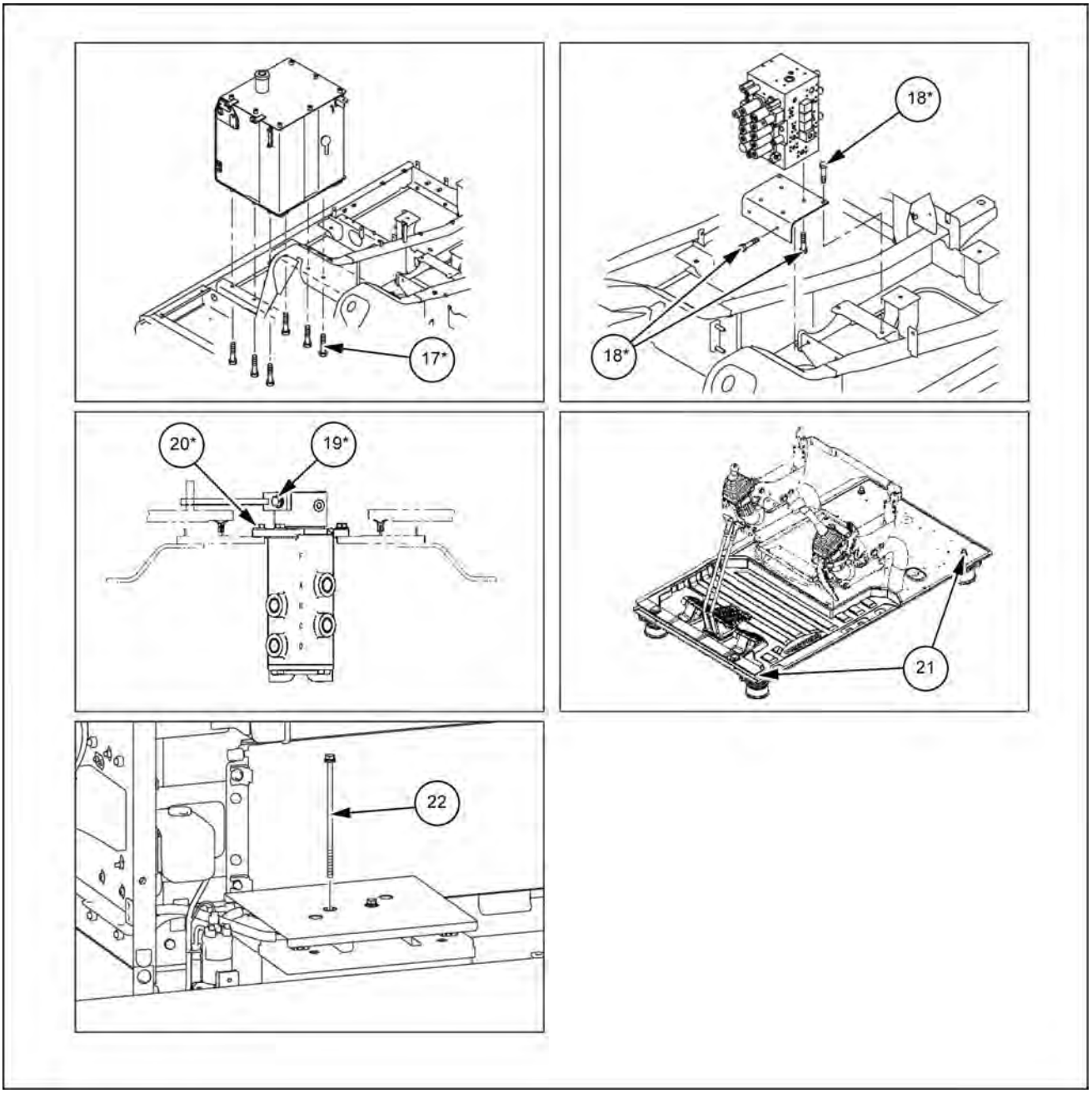

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Basic instructions - Shop and assembly

Shimming

For each adjustment operation, select adjusting shims and measure the adjusting shims individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value shown on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

1. Before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
2. Thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
3. Position the sealing lip facing the fluid.

   NOTE: *With hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will move the fluid towards the inner side of the seal.*
4. Coat the sealing lip with a thin layer of lubricant (use oil rather than grease). Fill the gap between the sealing lip and the dust lip on double lip seals with grease.
5. Insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
6. While you insert the seal, check that the seal is perpendicular to the seat. When the seal settles, make sure that the seal makes contact with the thrust element, if required.
7. To prevent damage to the seal lip on the shaft, position a protective guard during installation operations.

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts or CASE CONSTRUCTION Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts or CASE CONSTRUCTION Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

Protecting the electronic and/or electrical systems during charging and welding

To avoid damage to the electronic and/or electrical systems, always observe the following practices:

1. Never make or break any of the charging circuit connections when the engine is running, including the battery connections.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any machine attachment.
   - Position the welder ground clamp as close to the welding area as possible.
   - If you weld in close proximity to a computer module, then you should remove the module from the machine.
   - Never allow welding cables to lie on, near, or across any electrical wiring or electronic component while you weld.
4. Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

   NOTICE: *If you must weld on the unit, you must disconnect the battery ground cable from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*
5. Remove the battery ground cable. Reconnect the cable when you complete welding.

⚠ WARNING

Battery acid causes burns. Batteries contain sulfuric acid.
Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.
Failure to comply could result in death or serious injury.

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Special tools

The special tools that CASE CONSTRUCTION suggests and illustrate in this manual have been specifically researched and designed for use with CASE CONSTRUCTION machines. The special tools are essential for reliable repair operations. The special tools are accurately built and rigorously tested to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- Operating in optimal technical conditions
- Obtaining the best results
- Saving time and effort
- Working in safe conditions

Hydraulic contamination

Contamination in the hydraulic system is a major cause of the malfunction of hydraulic components. Contamination is any foreign material in the hydraulic oil.

Contamination can enter the hydraulic system in several ways:

- When you drain the oil or disconnect any line
- When you disassemble a component
- From normal wear of the hydraulic components
- From damaged seals or worn seals
- From a damaged component in the hydraulic system

All hydraulic systems operate with some contamination. The design of the components in this hydraulic system permits efficient operation with a small amount of contamination. An increase in this amount of contamination can cause problems in the hydraulic system.

The following list includes some of these problems:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- Movement of control valve spools is difficult
- Hydraulic oil that becomes too hot
- Pump gears, housing, and other parts that wear rapidly
- Relief valves or check valves held open by dirt
- Quick failure of components that have been repaired
- Slow cycle times are slow. The machine does not have enough power.

If your machine has any of these problems, check the hydraulic oil for contamination.

There are two types of contamination: microscopic and visible.

Microscopic contamination occurs when very fine particles of foreign material are suspended in the hydraulic oil. These particles are too small to see or feel. Microscopic contamination can be found by identification of the following problems or by testing in a laboratory.

Examples of problems caused by microscopic contamination:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- The hydraulic system has a high operating temperature

Visible contamination is foreign material that can be found by sight, touch, or odor. Visible contamination can cause a sudden failure of components.

Examples of problems caused by visible contamination:

- Particles of metal or dirt in the oil
- Air in the oil
- Dark or thick oil
- Oil with an odor of burned oil
- Water in the oil

If you find contamination, use a portable filter to clean the hydraulic system.

General specification

Engine

Type		Water-cooled, 4-cycle diesel, 4-cylinder in line, High pressure common rail system (electric control), Turbocharger with air cooled intercooler
Model		ISUZU GI-4HK1X
Rated flywheel horse power	(SAE J1349, ISO 9249)	**117.3 kW** (**159.484 Hp**) (**1800 RPM**)
	(ISO 14396)	**120.0 kW** (**163.155 Hp**) (**1800 RPM**)
Piston displacement		**5.193 L** (**1.37185 US gal**)
Maximum torque	(SAE J1349, ISO 9249)	**608 N·m** (**448.44 lb ft**) (**1600 RPM**)
	(ISO 14396)	**624 N·m** (**460.24 lb ft**) (**1600 RPM**)
Bore and stroke		**115 mm** (**4.528 in**) x **125 mm** (**4.921 in**)
Voltage		**24 V**
Alternator		**50 A**
Starter		**24 V 5.0 kW**

Hydraulic system

Main pumps		2 variable displacement axial piston pumps with regulating system	
	Max. oil flow		2 x **211 L/min** (**55.740 US gpm**) (**1800 RPM**)
	Working circuit pressure	Boom/Arm/Bucket	**34.3 MPa** (**4975.2 psi**)
			36.8 MPa (**5337.840 psi**) with auto power up
		Swing circuit	**29.4 MPa** (**4264.470 psi**)
		Travel circuit	**34.3 MPa** (**4975.2 psi**)
	Pilot pump	1 gear pump	
	Max. oil flow		**18 L/min** (**4.755 US gpm**)
	Working circuit pressure		**3.9 MPa** (**565.7 psi**)
Control valves		With Boom/Arm holding valve	
		One 4-spool valve for Right track travel, Bucket, Boom and Arm acceleration	
		One 5-spool valve for Left track travel, Auxiliary, Swing, Boom acceleration and Arm	
Swing device			
	Motor	Fixed displacement axial piston motor	
	Brake	Mechanical disc brake	
	Final drive	Planetary gear reduction	
	Turn table bearing	Ball bearing type with internal gear	
	Maximum swing speed	**11.5 RPM**	
	Swing torque	**64000 N·m** (**47203.98 lb ft**)	
Cylinders		NO. of cylinders – bore X Rod diameter X Stroke	
	Boom	2 x Ø **120 mm** (**4.724 in**) - Ø **85 mm** (**3.346 in**) - **1255 mm** (**49.409 in**)	
	Arm	1 x Ø **140 mm** (**5.512 in**) - Ø **100 mm** (**3.937 in**) - **1460 mm** (**57.480 in**)	
	Bucket	1 x Ø **120 mm** (**4.724 in**) - Ø **85 mm** (**3.346 in**) - **1010 mm** (**39.764 in**)	
Cooling system			
	Fan		Ø **650 mm** (**25.591 in**) with 7-blades
	Radiator capacity		**88.9 kW**
		Fin type	Corrugated fin (wavy type)
		Fin space	**1.75 mm** (**0.06890 in**)
	Long life coolant		Coolant **55 %**, Water **45 %**
	Oil cooler capacity		**47.2 kW**
		Fin type	Corrugated fin (wavy type)
		Fin space	**1.75 mm** (**0.06890 in**)
	Intercooler capacity		**7.9 kW**
		Fin type	Straight fin
		Fin space	**1.75 mm** (**0.06890 in**)
	Fuel cooler capacity		**1.3 kW**

	Fin type	Corrugated fin (wavy type)
	Fin space	**2.0 mm** (**0.0787 in**)
Filters		
Suction filter		105 µm
Return filter		6 µm
Pilot line filter		8 µm

Hydraulic controls

Boom/Arm/Bucket/Swing	Pilot pressure control system (ISO control pattern)
Travel	Pilot pressure control system
Work mode select	SP - mode
	H - mode
	Auto - mode
Travel mode select	2 - speed travel
Attachment cushion control	
Hydraulic lock (gate lock, left side tilt console)	

Electrical system

Engine control			
			Dial type throttle control
			One touch idle / Auto deceleration / Auto idle shutdown system
			Emergency stop
Monitor system			
			Message display (Caution, condition, etc…)
			Work mode display (SP, H, Auto)
			Machine condition (Power boost, etc…)
			Alarm display and buzzer
			Water temperature
			Hydraulic oil temperature
			Fuel level
			Diagnosis system
			Rear & Right side view camera image
Wire harness			
			Waterproof type connector
Safety			
			Double horn
Battery			2 x **12 V 92 A·h** /5HR
Lights			
	Working light	Upper	**24 V 70 W** x 1
		Boom	**24 V 70 W** x 2
		Cab	**24 V 70 W** x 2
	Operator's cab room		**24 V 10 W** x 1

Operator environment

Operator's cab
Smooth and round shape design cab, fabricated by press work
Safety glass for all windows
Shock-less cab suspension by 4-point fluid mounting
Sliding front window with auto lock
Built-in type full-color LCD monitor display
Membrane switch on monitor display
Windshield wiper & washer
Floor mat
Polycarbonate roof hatch & Sun shade

	Auto air-conditioner	
	Rain deflector	
	Sun visor	
	Top guard OPG level 1 (in CAB structure)	
	Roll - over protective structure (ROPS)	
Operator's seat		
	KAB 865: Low frequency air suspension with air springs and double acting hydraulic damper.	
	With following features	
	Manual weight adjustment	Backrest angle adjustment
	Seat height adjustment	Adjustable pivoting armrests linked to consoles
	Adjustable headrest	Retractable seat belt
Others		
	Rear view mirror (Cab side & Right side)	
	Rear & Right side view camera	

Undercarriage

Travel motor		Variable displacement axial piston motor
Brake		Mechanical disc brake
Hydraulic service brake		Brake valve
Final drive		Planetary gear reduction
Travel speeds	High	**5.6 km/h** (**3.480 mph**) (Automatic travel speed shifting)
	Low	**3.4 km/h** (**2.113 mph**)
Drawbar pull		**188 kN** (**42264.081 lb**)
Number of carrier rollers (each side)		2
Number of carrier rollers (each side)		8
Number of shoes (each side)		49
Type of shoe		Triple grouser shoe
Link pitch		**190 mm** (**7.480 in**)
Width of shoe		**600 mm** (**23.622 in**) (S.T.D)
Grade-ability		**70 %** (**35 °**)

Mass

Operating mass	**21400 kg** (**47178.924 lb**)
with **2.94 m** (**9.6457 ft**) Arm, **0.9 m³** Bucket, **600 mm** (**23.622 in**) grouser shoe, operator, lubricant, coolant and full fuel tank	
Shipping mass	**20200 kg** (**44533.377 lb**)
Operating mass - (operator mass [**75 kg** (**165.35 lb**)]) + **90 %** of fuel mass + bucket mass [**760 kg** (**1675.513 lb**)])	
Counter weight mass	**4100 kg** (**9038.953 lb**)
Ground pressure	**0.044 MPa** (**6.38220 psi**)
with **2.94 m** (**9.6457 ft**) Arm, **0.9 m³** Bucket, **600 mm** (**23.622 in**) grouser shoe	

Digging force (with 1.0 m³ Bucket) (ISO 6015)

	[**2.94 m** (**9.6457 ft**)] Arm	[**2.4 m** (**7.8740 ft**)] Arm
Arm digging force	**103 kN** (**23155.32 lb**)	**123 kN** (**27651.50 lb**)
With auto power up	**110 kN** (**24728.98 lb**)	**132 kN** (**29674.78 lb**)
Bucket digging force	**142 kN** (**31922.87 lb**)	**142 kN** (**31922.87 lb**)
With auto power up	**152 kN** (**34170.96 lb**)	**152 kN** (**34170.96 lb**)

Dimensions

	[**2.94 m** (**9.6457 ft**)] Arm	[**2.4 m** (**7.8740 ft**)] Arm
Overall length (without attachment)	**4950 mm** (**194.882 in**)	**4950 mm** (**194.882 in**)
Overall length (with attachment)	**9400 mm** (**370.079 in**)	**9480 mm** (**373.228 in**)

Overall height (to top of boom)	**2970 mm** (**116.929 in**)	**3190 mm** (**125.591 in**)
Overall height (to top of cab)	**2950 mm** (**116.142 in**)	**2950 mm** (**116.142 in**)
Overall height (to top of guardrail)	**3120 mm** (**122.835 in**)	**3120 mm** (**122.835 in**)
Upper structure overall width	**2770 mm** (**109.055 in**)	**2770 mm** (**109.055 in**)
Swing (rear end) radius	**2750 mm** (**108.268 in**)	**2750 mm** (**108.268 in**)
Clearance height under upper structure	**1040 mm** (**40.945 in**)	**1040 mm** (**40.945 in**)
Minimum ground clearance	**440 mm** (**17.323 in**)	**440 mm** (**17.323 in**)
Wheel base (Center to center of wheels)	**3660 mm** (**144.094 in**)	**3660 mm** (**144.094 in**)
Crawler overall length	**4470 mm** (**175.984 in**)	**4470 mm** (**175.984 in**)
Track gauge	**2390 mm** (**94.094 in**)	**2390 mm** (**94.094 in**)
Undercarriage overall width [with **600 mm** (**23.622 in**) shoes]	**2990 mm** (**117.717 in**)	**2990 mm** (**117.717 in**)
Crawler tracks height	**920 mm** (**36.220 in**)	**920 mm** (**36.220 in**)

Working ranges

	[**2.94 m** (**9.646 ft**)] Arm	[**2.4 m** (**7.8740 ft**)] Arm
Boom length	**5700 mm** (**224.409 in**)	**5700 mm** (**224.409 in**)
Bucket radius	**1450 mm** (**57.087 in**)	**1450 mm** (**57.087 in**)
Bucket wrist action	**177 °**	**175 °**
Maximum reach at GRP	**9730 mm** (**383.071 in**)	**9240 mm** (**363.780 in**)
Maximum reach	**9900 mm** (**389.764 in**)	**9420 mm** (**370.866 in**)
Max. digging depth	**6650 mm** (**261.811 in**)	**6110 mm** (**240.551 in**)
Max. digging height	**9610 mm** (**378.346 in**)	**9410 mm** (**370.472 in**)
Max. dumping height	**6810 mm** (**268.110 in**)	**6590 mm** (**259.449 in**)

General specification - Main equipment

Lower component

Travel unit

Manufacturer	KYB Corporation
Motor type	Variable displacement piston motor
	Automatic 2-speed switchover with parking brake
Intake amount	**168.9 cm³/rev** (**10.31 in³/rev**)
Operating pressure	**34.3 MPa** (**4975 psi**)
Operating flow	**210.6 l/min** (**55.6346 US gpm**)
Brake torque	**32700 N·m** (**24118 lb ft**) min. (including reduction gear)
Relief valve set pressure	**35.3 MPa** (**5120 psi**) at **40 l/min** (**10.57 US gpm**)
Automatic 2-speed switch over pressure	**25.8 MPa** (**3742 psi**)
Reduction gear	
Reduction gear type	Planetary gear 2-stage reduction gear
Reduction ratio	43.246
Dry weight	**263 kg** (**579.816 lb**)

Take-up roller

Weight	**96.4 kg** (**212.5256 lb**)

Upper roller

Weight	**17.8 kg** (**39.2423 lb**)

Lower roller

Weight	**35.5 kg** (**78.2641 lb**)

Recoil spring

Item	Weight	Quantity
Yoke	**23.9 kg** (**52.6905 lb**)	1
Sems B **M16 x 50**	**0.5 kg** (**1.1023 lb**)	4
Threaded rod	**24.8 kg** (**54.6746 lb**)	1
Groove height N **M48**	**1.0 kg** (**2.2046 lb**)	1
SP pin 8 x 80	**0.1 kg** (**0.2205 lb**)	1
Recoil spring	**67.1 kg** (**147.9302 lb**)	1
Grease cylinder assembly	**28.4 kg** (**62.6113 lb**)	1
Sems B **M16 x 60**	**0.3 kg** (**0.6614 lb**)	2
Assembly (total)	**147.9 mm** (**5.8228 in**)	
Mounting length of spring	**576 mm** (**22.68 in**)	

Shoe

	Weight or Quantity
600 grouser	**1339 kg** (**2951.990 lb**)
Link	1 set
Shoe	49
Bolt	196
Nut	196
700 grouser	**1550 kg** (**3417.165 lb**)
Link	1 set
Shoe	49
Bolt	196
Nut	196
800 grouser	**1692 kg** (**3730.221 lb**)
Link	1 set
Shoe	49

	Weight or Quantity
Bolt	196
Nut	196

Upper component

Swing unit

Swing motor assembly		
Swing motor		
	Manufacturer	Toshiba Machine Co., Ltd.
	Motor type	Fixed displacement piston motor
		With parking brake
	Intake amount	**151 cm³/rev** (**9.21 in³/rev**)
	Operating pressure	**29.4 MPa** (**4264 psi**)
	Operating flow	**210.6 l/min** (**55.6346 US gpm**)
	Mechanical brake torque	**821.5 N·m** (**605.907 lb ft**) min.
	Brake off pressure	**3.2 MPa** (**464 psi**) or less
	Relief valve set pressure	**29.4 MPa** (**4264 psi**)
Swing reduction gear		
	Reduction gear type	Planetary gear 2-stage reduction gear
	Reduction ratio	16.757
Dry weight		**235 kg** (**518.086 lb**)
Turntable bearing		
	No. of teeth	92
	Weight	**244 kg** (**537.928 lb**)
Counterweight		
	Weight	**4100 kg** (**9038.953 lb**)

Engine-related

Engine

Engine model name	Isuzu 4HK1X 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 - ∅**115 mm** (**4.53 in**) - **125 mm** (**4.92 in**)
Total displacement	**5.193 l** (**1.3718 US gal**)
Compression ratio	17.5
Rated output	**117.3 kW** (**159.48 Hp**) / **1800 RPM**
Maximum torque	**608 N·m** (**448.44 lb ft**) / about **1600 RPM**
Fuel consumption ratio	**236.6 g/kWh** or lower
Engine dry weight	About **480 kg** (**1058.219 lb**)
Engine dimension	L **1020.4 mm** (**40.1732 in**) - W **829.0 mm** (**32.638 in**) - H **1011.8 mm** (**39.8346 in**)
Cooling fan	∅**650 mm** (**25.591 in**) - suction type - 7 vanes, plastic
	With bell mouth-type fan guide
Pulley ratio	0.85 (reduction)
Charging generator	**24 V 50 A** AC type
Starter motor	**24 V 5 kW** (**6.8 Hp**) reduction type
Coolant capacity	**14.0 L** (**3.698 US gal**)
Oil pan capacity	Max: **20.5 l** (**5.416 US gal**) Min: **13.0 l** (**3.434 US gal**) (not including oil filter)
Direction of rotation	Right (viewed from fan side)
	Compliant with JISD 0006-2010