



SERVICE MANUAL

CRAWLER EXCAVATOR

CX700
TIER III

CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer.

REVISION HISTORY			
Issue	Issue Date	Applicable Machines	Remarks
First Edition	05-2006	CX700 TIER III Crawler Excavator	87551416 NA
Revision 1	07-2006	CX700 TIER III Crawler Excavator	87364111 NA

CX700 Crawler Excavator

Table of Contents

DIVISION/SECTION	SECTION N°	REFERENCE N°
1 GENERAL INFORMATION		
Safety, general information and standard torque data	1001	7-27691NA
General specifications and special torque setting	1002	9-94060NA
Numerical value conversion table	1003	9-35540
2 ENGINE		
Radiator and engine removal and installation	2001	9-94480NA
Engine specifications	*	
Disassembly and assembly of the engine	*	
3 FUEL SYSTEM		
Fuel tank, removal and installation	3001	9-94470NA
Fuel engine system	*	
4 ELECTRICAL SYSTEM		
Electrical system, electrical and electronic troubleshooting	4001	9-94700NA
Inspection and maintenance of batteries and connecting a booster battery	4002	9-36830NA
Computer and engine controller, removal and installation	4003	9-94510NA
5 UNDERCARRIAGE		
Removal and installation of tracks	5001	9-36860NA
Rollers	5003	9-94340NA
Sprocket	5004	9-36890NA
Idler wheel and tension shock absorber	5005	9-94350NA
6 DRIVE TRAIN		
Travel-motor reduction gear assembly, removal and installation	6001	9-94440NA
Travel hydraulic motor, disassembly and assembly	6002	9-94620NA
Swing reduction gear, removal and installation	6003	9-94450NA
Swing reduction gear, disassembly and assembly	6004	9-42630NA
Travel reduction gear, disassembly and assembly	6005	9-94610NA
7 UNDERCARRIAGE HYDRAULICS		
8 UPPERSTRUCTURE HYDRAULICS		
Depressurising and decontaminating the hydraulic system, use of the vacuum pump and bleeding the components	8000	9-94430NA
Specifications, troubleshooting, checks and hydraulic pressure settings	8001	9-94080NA
Hydraulic reservoir removal and installation	8002	9-94490NA
Main hydraulic pump and pilot pumps, removal and installation	8003	9-94540NA
Main hydraulic control valve, removal and installation	8004	9-94500NA
Attachment cylinders, removal and installation	8005	9-94810NA
Hydraulic swivel, removal and installation	8006	9-94600NA
Pilot blocs, removal and installation	8007	9-94520NA
Swing motor, removal and installation	8008	9-94420NA
Main hydraulic pump, disassembly and assembly	8010	9-94590NA
Main hydraulic control valve, disassembly and assembly	8011	9-94780NA
Attachment cylinders, disassembly and assembly	8012	9-94580NA
Hand control levers, disassembly and assembly	8013	9-94630NA
Foot control levers, disassembly and assembly	8014	9-40991NA
Eight-solenoid valves, disassembly and assembly	8015	9-42521NA
Caution valve, disassembly and assembly	8016	9-94530NA
Safety valve	8017	9-94690NA
Hydraulic swivel, disassembly and assembly	8018	9-94410NA
Swing motor, disassembly and assembly	8019	9-42530NA

DIVISION/SECTION	SECTION N°	REFERENCE N°
Hydraulic functions	8020	9-94090NA
Fan motor, removal and installation	8022	9-94660NA
Fan motor, disassembly and assembly	8023	9-94670NA
Fan pump, removal, disassembly, assembly and installation	8024	9-94680NA
Hydraulic component functions	8030	9-94130NA
9 UPPERSTRUCTURE		
Upperstructure, turntable and counterweight	9002	9-94560NA
Boom, dipper and bucket	9003	9-94570NA
Seat and seat belt	9004	9-40960NA
Cab and cab equipment	9005	9-94650NA
Air conditioning troubleshooting	9006	[REDACTED]
Air conditioning unit disassembly and assembly	9007	9-94640NA
Air conditioning servicing	9008	[REDACTED]
Air conditioning components	9009	[REDACTED]
Removal and installation attachment, counterweight and side frame	9010	9-94140NA
Large size hydraulic schematic	Pocket	87519799
Large size electrical schematic	Pocket	87519792

* Consult the Engine Service Manual 9-36410NA

[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.

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

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**Have any questions please write to me:
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Section

1001

SAFETY, GENERAL INFORMATION AND TORQUE SPECIFICATIONS

TABLE OF CONTENTS

GENERAL INFORMATION	3
SAFETY.....	4
STANDARD TORQUE DATA FOR CAP SCREWS AND NUTS.....	6

 **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



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.

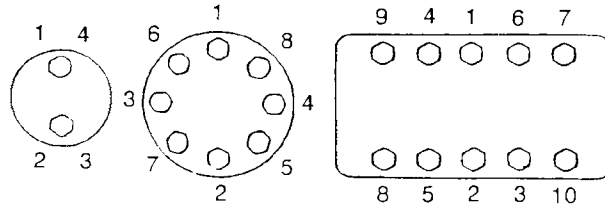


WARNING: When the battery electrolyte is frozen, the battery can explode if (1), you try to charge the battery, or (2), you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others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



JS00481A

Cap screws which have had Loctite used (white residue remains after removal) should be cleaned with light 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	
Hexagon 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	19.6	39.2	58.8	98.1	156.9	196.1	294.2
		[lb-ft]	5.1	14.5	28.9	43.4	72.3	115.7	144.6	217
Hexagon 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	78.5	117.7	176.5	245.2	343.2
		[lb-ft]	6.5	15.9	31.1	57.9	86.9	130.2	181	253.2

Section 1002

1002

SPECIFICATIONS AND SPECIAL TORQUE SETTINGS

TABLE OF CONTENTS



WARNING: *This symbol is used in this manual to indicate important safety messages. Whenever you see this symbol, carefully read the message which follows. Your safety depends on it.*

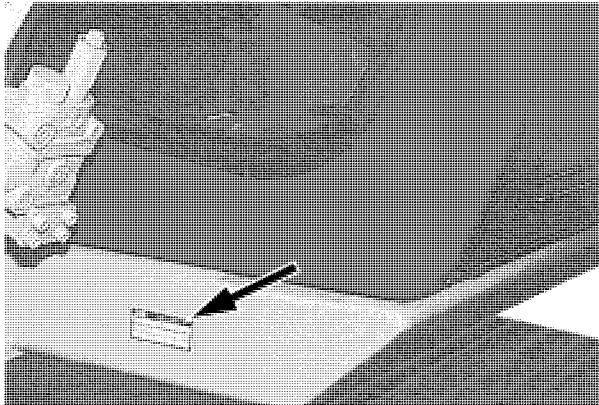
TYPE, SERIAL NUMBER AND YEAR OF MANUFACTURE OF THE MACHINE	3
FLUIDS AND LUBRICANTS	4
SPECIFICATIONS.....	8
COMPONENT WEIGHT	16
DIMENSIONS AND WEAR LIMIT OF THE TRACK ASSEMBLY	18
DIMENSIONS AND WEAR LIMITS OF ATTACHEMENT MOBILE JOINTS	23
SHIMS FOR ADJUSTING ATTACHMENT GAPS.....	28
SPECIAL TORQUE SETTINGS.....	30
MACHINE OVERALL DIMENSIONS.....	33

TYPE, SERIAL NUMBER AND YEAR OF MANUFACTURE OF THE MACHINE

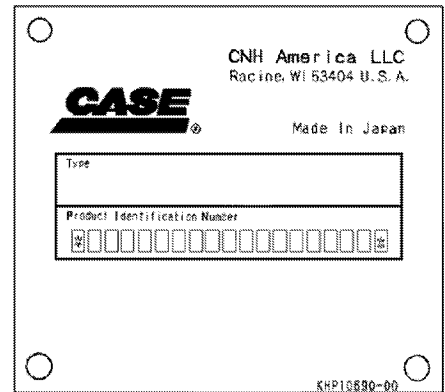
For all part orders, request for information or assistance, always specify the type and the serial number of the machine to your Case dealer.

Fill in the following lines with the required information: Type, serial number, year of manufacture of the machine and the serial numbers of the hydraulic and mechanical components.

Machine



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CR1LO05J002E00

Make and type

Serial number

Year of Manufacture

Engine

Make and type

Serial number

Serial numbers of the components

Hydraulic pump

Swing reduction gear

Travel reduction gears

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/AKCELA 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 (-4° to 104° F)

CASE/AKCELA: HYDRAULIC EXCAVATOR FLUID (MS 1230. ISO VG 46. DIN 51524 PART 2 HV)

Hot climates: 0°C to +50°C (32° to 122° F)

CASE/AKCELA: AW HYDRAULIC FLUID 68 HV (MS 1216. ISO VG 68. DIN 51524 PART 3 CATEGORY HVLP)

Cold climates: -25°C to +20°C (-13° to 68° F)

CASE/AKCELA: AW HYDRAULIC FLUID 32 (MS 1216. ISO VG 32. DIN 51524 PART 2)

Biodegradable fluid: -30°C to +40°C (-22° to 104° F)

This yellow-colored fluid is miscible with standard fluid. If used to change standard fluid, it is advised to drain the circuit completely before refilling with this fluid.

CASE/AKCELA: HYDRAULIC EXCAVATOR FLUID BIO (MS 1230. ISO VG 46. DIN 51524 PART 2 HV)

Transmission component oil

Extreme pressure oil used for enclosed transmission components.

CASE/AKCELA: GEAR 135H EP (SAE 80W-90. API GL 5. MIL-L-2105 D. MS 1316. ZF TE-ML 05A)

Grease

CASE/AKCELA: MOLY GREASE 251H EP-M (251H EP-M. NLGI 2)

"Extreme Pressure" multipurpose grease with lithium soap and molybdenum disulphide.

CASE/AKCELA: MULTIPURPOSE GREASE 251H EP (251H EP. NLGI 2)

"Extreme Pressure" multipurpose grease with lithium soap and calcium.

CASE/AKCELA: PREMIUM GREASE EP2 (NLGI 2)

"Extreme Pressure" multipurpose grease with lithium soap.

Hydraulic breakers

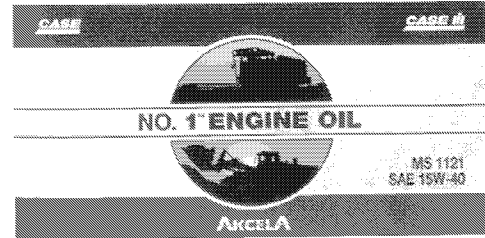
CASE/AKCELA: MULTIPURPOSE GREASE 251H EP (NLGI 2).

Engine Oil

THE CASE/AKCELA No. 1 engine oil is recommended for your engine. This oil ensures proper lubrication of your engine for all operating conditions.

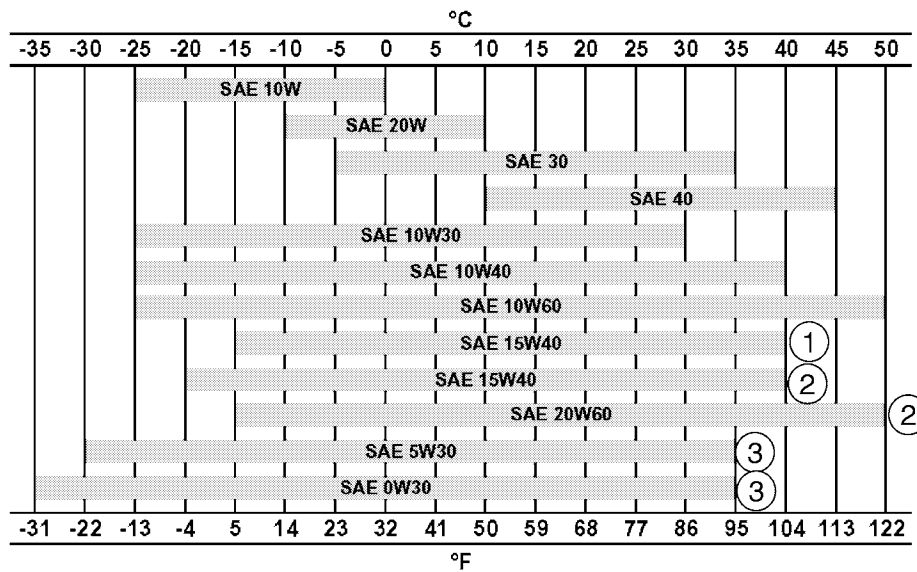
If you are unable to procure the CASE No. 1 Multiperformance or Performance engine oil, use the corresponding oil from the API/CG/CF category.

NOTE: Do not put any Performance Additives or any other additives in the engine housing. The oil changing intervals are indicated in the Operator's manual based on tests carried out on CASE lubricants.



CP02N001

Oil viscosity / Oil range



CT02M001

- 1) With mineral base
- 2) With semi-synthetic base
- 3) With synthetic base

Fuel

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

Use grade No. 2-D fuel. The use of other types of fuel can result in a loss of power of the engine and may cause high fuel consumption.

In cold weather (below -7°C), it is provisionally approved to use a mixture of fuels No. 1-D and No. 2-D.

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.

Required conditions for diesel fuel

The following specific conditions are required for diesel fuel:

- Must be free from minute dust particles.
- Must have adequate viscosity.
- Must have high cetane value.
- Must have high fluidity at low temperature.
- Must have low sulphur content.
- Must have little residual carbon.

Diesel fuel recommendation

- JIS (Japanese Industrial Standard) : No. 2
- DIN (Deutsche Industrie Normen) : DIN 51601
- SAE (Society of Automotive Engineers) Based on SAE-J-313C: No. 2-D
- BS (British Standard) Based on BS/2869-1970: Class A-1

IMPORTANT : *If fuel other than the specified one is used, engine operation will be impaired.*

Using fuels other than those recommended can damage the fuel injection pump, the injector and other parts of the fuel supply system and the engine. **CASE disowns any responsibility concerning this kind of damage, which is not covered by the guarantee.** To avoid any damage to the engine fuel supply system, you are recommended to take the following safety messages into account:

Some fuel suppliers mix used engine oil with diesel fuel. Certain manufacturers of large engines allow them to do this. However, for your engine, do not use diesel fuel contaminated by engine oil. In addition to damaging the engine, this fuel can actually adversely affect the correct purification of exhaust gases. Before using any diesel fuel, ask the supplier if this fuel has been mixed with engine oil.

IMPORTANT : *For use of the correct fuel additives, consult your oil or lubrication supplier. Do not inject fuel oil or gasoline, both fuels can damage the engine.*

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.

CASE/AKCELA: PREMIUM ANTI-FREEZE (MS 1710)

For areas where the temperature goes down to -38°C, mix 50/50 with water.

IMPORTANT : *Do not mix products of a different origin or brand. The same product must be used when topping up the system.*

Environment

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

Contact your local ecological recycling centre to obtain information on the correct method of disposing of these lubricants.

Plastic and resin parts

When cleaning plastic parts, the console, the instrument panel, the indicators etc... avoid using petrol, kerosene, paint solvents etc... Use only water, soap and a soft cloth.

The use of petrol, kerosene, paint solvents etc... causes discoloration, cracks or deformation of these parts.

SPECIFICATIONS

Main data

Model name CX700 Hydraulic Excavator
 Operating weight 69 500 kg (153220 lbs)
 Engine output 345 kW / 1800 rpm

Performance

Standard weight..... 38.8 kN (8723 lbf)
 Swing speed..... 6.5 Tr/min.
 Travel speed..... Low Speed 3.0 km/h (1.86 mph)
 High Speed 4.1 km/h (2.54 mph)
 Maximum drawbar pull 469kN (105435 lbf)
 Grade ability 70% (35°)
 Ground pressure..... 74 kPa (900 mm (235.43 in) grouser shoe)

Complete machine dimensions

	Standard arm (3.55 m) (11 ft 7.7 in)	Short arm (3.00 m) (9 ft 10 in)	Long arm (4.11 m) (13 ft 1.4 in)	Super Long arm (5.00 m) (16 ft 4.8 in)	Mass Digging arm (3.00 m) (9 ft 10 in)
Length	13290 mm (523.22 in)	13250 mm (521.65 in)	13300 mm (523.62 in)	13170 mm (518.50 in)	12110 mm (476.77 in)
Width	4150 mm (163.38 in)	4150 mm (163.38 in)	4150 mm (163.38 in)	4150 mm (163.38 in)	4150 mm (163.38 in)
Height	4300 mm (169.29 in)	4370 mm (172.04 in)	4470 mm (175.98 in)	5160 mm (203.14 in)	4760 mm (187.40 in)

Main body dimensions

Main body length 6910 mm (272.04 in)
 Main body width..... 4140 mm (162.99 in) (Grouser shoe retracted width: 3990 mm (157.08 in))
 Upper swing body width 3990 mm (157.08 in)
 Cab width..... 1000 mm (39.36 in)
 Main body height 3460 mm (136.22 in)
 Tail swing radius 4000 mm (157.47 in)
 Distance of rear swing body 3970 mm (156.29 in)
 Ground clearance for upperstructure..... 1510 mm (59.44 in)
 Center-to-center of wheels 4700 mm (185.03 in)
 Overall track length..... 5880 mm (231.49 in)
 Maximum track width 4150 mm (163.4 in) (Retracted width in transporting style: 3640 mm (143.3 in))
 Center-to-center for track..... 3250 mm (127.95 in) (Retracted width in transporting style: 2740 mm) (107.87 in)
 Width of track shoe 900 mm (35.43 in) (Optional: 650 mm (25.59 in), 750 mm (29.52 in))
 Minimum ground clearance 825 mm (32.48 in) (To bottom of lower frame)

Engine

Name	ISUZU, 6WG1X
Type: 4-cycle, water-cooled, overhead camshaft, common rail injection (electric control), with air-cooling type inter-cooler turbo with air-cooling.	
No. of cylinders - bore x stroke	6-dia. 147 mm x 154 mm (5.78 x 6.06 in)
Displacement	15.7 L (4.15 gal)
Compression ratio	16
Rated output	345 ± 7.0 kW / 1850 min ⁻¹
Maximum torque	1980N•m (1460.37 lb-ft) / 1500 min ⁻¹
Engine dimensions (LxWxH)	1462x1017x1422 mm (57.55 x40.03x55.98 in)
Oil pan	All direction 35°, inclinable
Oil pan capacity	Maximum: 52 L (13.73 gal) Minimum: 37 L (9.77 gal) (excluding oil filter)
Direction of rotation	Right (viewed from fan side); compliant with
Starter, reduction type	24 V, 7 kW
Alternator, AC type	24 V, 50 A
Battery	2x 12V/24V,140 Ah/5 Hr

Cooling system

Fan drive system	hydraulic drive
Fan type	diameter 1016 mm (40 in), suction type - 6 blades resin & steel
Radiator capacity	187.7kW
Fin type	wavy
Fin space	2.0 mm (0.07 in)
Oil cooler capacity	145.9 kW
Fin type	plate
Fin space	3.0 mm (0.11 in)
Inter-cooler capacity	61.1 kW
Fin type	triangular straight
Fin space	2.0 mm (0.07 in)
Fuel cooler capacity	3.58 kW
Fin type	wavy
Fin space	2.0 mm (0.07 in)
Coolant capacity	36 L (9.51 gal) (engine only)

Capacity of coolant and lubricants

Coolant	112 L (29.58 gal)
Fuel	900 L (237.75 gal)
Lubricant for engine	52 L (13.73 gal)
Lubricant for travel reduction gear (per side)	15 L (3.96 gal)
Lubricant for swing reduction gear (per side)	13.5 L (3.56 gal)
Hydraulic oil	650 L (171.71 gal)
Capacity of hydraulic oil tank	310 L (81.89 gal)

Hydraulic oil filter

Suction filter (inside tank)	150 mesh
Return filter (inside tank)	10 μ m
Nephron filter (inside housing)	1 μ m
Pilot line filter (inside housing)	10 μ m

Operating devices

Operator's seat

Location; left side

Structure; low frequency air suspension with helical springs and double acting hydraulic damper.

Cab

Smooth and round shape design cab, fabricated by press work Safety glass for front window, high impact plastics for other all windows.

Levers and pedals

For travel use; levers and pedals (hydraulic pilot type) (2)

For operating machine use; levers (hydraulic pilot type) (2)

Instruments and switches

Work mode switchover; 4 modes (heavy digging, standard, finishing and auto)

Travel speed switchover; Low Speed / High Speed panel switch

One-touch idle; Knob switch type

Monitor device

Machine status display (full-dot liquid crystal)

Travel speed selection status; Low Speed / High Speed

Work mode selection status; H/S/L/A

Auto idle selection status; ON/OFF

Instruments (full-dot liquid crystal, except for hour meter)

Fuel gauge; bar graph indicator

Engine coolant temperature gauge; bar graph indicator

Hydraulic oil temperature gauge; bar graph indicator

Hour meter; digital type

Machine Status and Warning Alarms (full-dot liquid crystal and warning tone) *Items have a warning alarm

Over heat*

Battery charge*

Faulty electrical system*

Refill fuel*

Engine oil pressure*

Refill coolant*

Engine preheat

Auto warm-up

Air cleaner*

Idling

Service interval

Digging power up

Lighting

Working light Tank: 24V, 70W (1)

 Boom: 24V, 70W (1)

 Cab: 24V, 70W (2)

Interior light 24V, 10W (1)

Horn; electric horn (2)

Other

Wiper with intermittent function (1)

Window washer fluid (1)

Air conditioner (1)

Rear view mirror (right-hand side) (1)

High dump

Hydraulic system

Hydraulic pump drive system, directly coupled to the engine (no transmission)

Main pump

Manufacturer	Kawasaki
Pump type	double variable displacement piston pump
Displacement	242 cm ³ (14.76 cu in) X 2 /rev
Rated operating pressure	31.4 MPa (4555 psi)
Maximum operating pressure	34.3 MPa (4975 psi)
Input revolution speed	1850 min ⁻¹
Maximum flow	448 L/min (118.34 gpm) X 2 at 1850 min ⁻¹
Input horsepower	282.2 kW
Shaft input horsepower	285 kW at 1850 min ⁻¹
Shaft input torque.....	1471 N•m (1085 lb-ft) at 1850 min ⁻¹

Pilot pump

Pump type	Gear pump
Displacement	15 cm ³ (0.91 cu in)/rev
Operating pressure	4.4 MPa (638.16 psi) to 4.6 MPa (667.17 psi)
Maximum flow	27.8 L/min (7.34 gpm) (at 1850 min ⁻¹) (1850 rpm ⁻¹)
Input horsepower	2.8 kW

Control characteristics; simultaneous output control of overall, negative control, electric horse power control

Control Valve

Model; 4-spool section: integrated (1) or 5-spool section: integrated (1)

Operation method; hydraulic pilot method: travel, swing and operating machine

Maximum flow	448 L / min (118.34 gpm)
Set pressure of main relief valve	standard; 31.4 MPa (4554 psi), power boost 34.3 MPa (4975 psi)
Set pressure of overload relief valve	when boom down; 27.5 MPa (3988 psi) at 20 L / min
.....	other: 36.3 MPa (5265 psi) at 20 L / min

Functions

- Straight travel circuit
- Boom UP / 2-speed internal confluence for Arm
- Boom/arm load holding circuit
- Boom down regenerative circuit
- Arm IN forced regenerative circuit
- Boom up priority (speed restriction of bucket)
- Boom up priority (Speed restriction of swing)
- Bucket 2-speed internal confluence
- Resevbe 2-speed internal confluence

Hydraulic Cylinders

Boom cylinder (2)

Inner diameter of tube x rod diameter x stroke 190x130x1805 mm (7.48x5.12x72.83 in)

Arm (dipper) cylinder

Inner diameter of tube x rod diameter x stroke 200x140x2025 mm (7.87x5.51x79.72 in)

Bucket cylinder (Standard boom specifications)

Inner diameter of tube x rod diameter x stroke 180x125x1465 mm (7.09x4.92x57.68 in)

Bucket cylinder (Mass boom specifications)

Inner diameter of tube x rod diameter x stroke 200x145x1450 mm (7.87x5.71x57.09 in)