

CX460 TIER 3 CRAWLER EXCAVATOR SERVICE MANUAL TABLE OF CONTENTS

DIVISION/SECTION	SECTION N°	REFERENCE N°
1 GENERAL INFORMATION		
Safety, general information and standard torque data	1001	7-27691EN
General specifications and special torque setting	1002	SC4601002-0EN
2 ENGINE		
Radiator and oil-cooler	2001	SM4602001-0EN
Engine specifications	*	
Disassembly and assembly of the engine	*	
3 FUEL SYSTEM		
Fuel tank	3001	SM4603001-0EN
Fuel engine system	*	
4 ELECTRICAL SYSTEM		
Electrical system, electrical and electronic troubleshooting	4001	SC4604001-0EN
Main and engine electronic control boxes	4003	SM4604003-0EN
5 UNDERCARRIAGE		
Removal and installation of tracks	5001	SM160B5001-0EN
Rollers	5003	SM4605003-0EN
Sprocket	5004	SM160B5004-0EN
Idler wheel and tension shock absorber	5005	SM4605005-0EN
6 DRIVE TRAIN		
Drive motor and final drive transmission removal and installation	6001	SM4606001-0EN
Swing reduction gear, removal and installation	6003	SM4606003-0EN
Swing reduction gear, disassembly and assembly	6004	SM4606004-0EN
Travel reduction gear disassembly and assembly	6005	SM4606005-0EN
7 UNDERCARRIAGE HYDRAULICS		
8 UPPERSTRUCTURE HYDRAULICS		
Depressurising and decontaminating the hydraulic system, use of the vacuum pump and bleeding the components	8000	SM4608000-0EN
Specifications, troubleshooting, checks and hydraulic pressure settings	8001	SC4608001-0EN
Hydraulic reservoir removal and installation	8002	SM4608002-0EN
Main and hydraulic pilot pumps, removal and installation	8003	SM4608003-0EN
Main hydraulic control valve, removal and installation	8004	SM4608004-0EN
Attachment cylinders, removal and installation	8005	SM4608005-0EN
Hydraulic swivel, removal and installation	8006	SM4608006-0EN
Pilot blocs, removal and installation	8007	SM4608007-0EN
Swing motor, removal and installation	8008	SM4608008-0EN
Main hydraulic pump, disassembly and assembly	8010	SM4608010-0EN
Main hydraulic control valve, disassembly and assembly	8011	SM4608011-0EN
Attachment cylinders, disassembly and assembly	8012	SM4608012-0EN
Hand control levers, disassembly and assembly	8013	SM4608013-0EN
Foot control levers, disassembly and assembly	8014	SM4608014-0EN
Six-solenoid valves, disassembly and assembly	8015	SM4608015-0EN
Caution valve, disassembly and assembly	8016	SM4608016-0EN
Safety valves	8017	SM4608017-0EN
Hydraulic swivel, disassembly and assembly	8018	SM4608018-0EN
Swing motor, disassembly and assembly	8019	SM4608019-0EN
Hydraulic functions	8020	SC4608020-0EN
Travel hydraulic motor, disassembly and assembly	8021	SM4608021-0EN
Fan motor, removal and installation	8022	SM4608022-0EN
Fan motor, disassembly and assembly	8023	SM4608023-0EN
Fan pump, removal, disassembly, assembly and installation	8024	SM4608024-0EN
Hydraulic component functions	8030	SC4608030-0EN

DIVISION/SECTION	SECTION N°	REFERENCE N°
9 UPPERSTRUCTURE		
Upperstructure, turntable and counterweight.....	9002	SM4609002-0EN
Boom, dipper and bucket	9003	SM4609003-0EN
Seat, removal and installation.....	9004	SM4609004-0EN
Cab and cab equipment.....	9005	SM4609005-0EN
Air conditioning unit disassembly and assembly.....	9007	SM4609007-0EN
Large size hydraulic schematics	Pocket	87574463A
Large size electrical schematics	Pocket	87574470A

* *Consult the Engine Service Manual*

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.



Lep SM460TOC-0EN

Issued 09-07



Section 1001

**SAFETY, GENERAL INFORMATION
AND TORQUE SPECIFICATIONS**



CNH

Lep 7-27691EN

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1001-2

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.



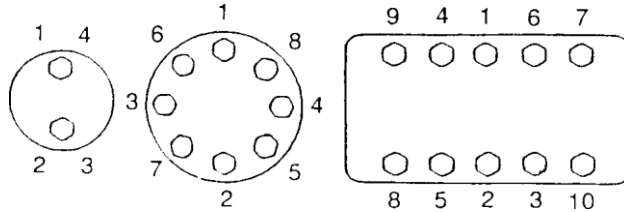
WARNING: When the battery electrolyte is frozen, the battery can explode if (1), you try to charge the battery, or (2), you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others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

1001-6

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	
Cap Screw	Spanner	[mm]	10	13	17	19	22	24	27	30
		[in.]	0.39	0.51	0.67	0.75	0.87	0.95	1.06	1.18
	Tightening torque	[Nm]	6.9	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
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	5
Machine.....	5
Engine	5
Serial numbers of the components.....	5
FLUIDS AND LUBRICANTS.....	6
Hydraulic fluid.....	6
Transmission component oil.....	6
Grease	6
Engine Oil.....	7
Engine fuel, maintenance of fuel filters and fuel storage.....	8
Anti-freeze/Anti-corrosion.....	10
Environment	10
Plastic and resin parts	10
SPECIFICATIONS.....	11
Main data.....	11
Performance.....	11
Complete machine dimensions	11
Main body dimensions.....	11
Engine	12
Cooling system	12
Capacity of coolant and lubricants	12
Hydraulic oil filter	12
Fuel filter.....	12
Operating devices	13
Hydraulic system	14
Swing unit.....	16
Travel lower body	16
Work Unit.....	17
Digging force (ISO 6015).....	18
COMPONENT WEIGHT	19
Major component weight	19
Bucket weight.....	20
Other component weight	21
DIMENSIONS AND WEAR LIMIT OF THE TRACK ASSEMBLY.....	22
Sprocket.....	22
Idler wheel	23

Upper roller	24
Lower roller	25
Track	26
DIMENSIONS AND WEAR LIMITS OF ATTACHEMENT MOBILE JOINTS.....	27
1. Boom foot/Frame	27
2. Boom cylinder foot/Frame	28
3. Boom cylinder head/Boom	28
4. Arm cylinder foot/Boom.....	29
5. Boom/Arm	29
6. Arm cylinder head/Arm	29
7. Bucket cylinder foot/Arm	30
8. Connecting rod/Arm	30
9. Compensator/Bucket	30
10. Connecting rod/Compensator/Bucket cylinder head	31
11. Arm/Bucket	31
SHIMS FOR ADJUSTING ATTACHMENT GAPS.....	32
For boom foot.....	32
SPECIAL TORQUE SETTINGS	33
MACHINE OVERALL DIMENSIONS	36

1002-4

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



CT04A171A

(1) Type

(2) Serial number

(3) 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

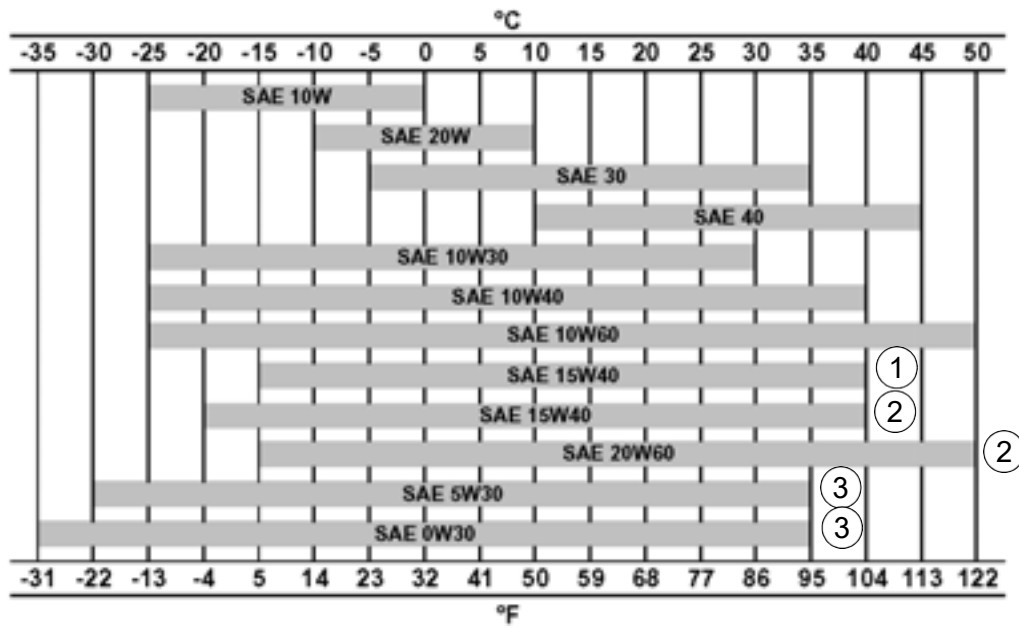
THE CASE/AKCELA No. 1 engine oil is recommended for your engine. This oil ensures proper lubrication of your engine for all operating conditions.

If the CASE/AKCELA Multigrade "No. 1 ENGINE OIL" cannot be obtained, use the oil corresponding to one of the following categories: ACEA E7. API CI-4.



CP02N001

Oil viscosity / Oil range



CT02M001

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

1002-8

Engine fuel, maintenance of fuel filters and fuel storage

In order to meet the emission control regulation of 3rd-stage, the engine components have been made precisely and they are to be used under high-pressure conditions.

Therefore, the specified fuel must be used for the engine.

As a matter of course, not only the guarantee will not be given for the use of a fuel other than the specified but also it may invite a serious breakdown.

In addition, since suitable specifications for the fuel filter elements have been established for this engine, use of the genuine filter is essential.

The following describes the specifications and the requirements of the fuel to be applied, and maintenance of the fuel and the fuel elements.

Fuel to be applied

Selection of fuel

Following conditions must be met for the diesel engines, that is the one;

- 1 In which no dust even fine one is mixed,
- 2 With proper viscosity,
- 3 With high cetane rating,
- 4 With good flow properties in lower temperature,
- 5 With not much sulfur content, and
- 6 With less content of carbon residue

Applicable standards for diesel fuel

Applicable Standard	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/2869-197	Class A-1
EN590	

If a standard applied to the fuel for the diesel engine is stipulated in your country, check the standard for details.

Requirements for diesel fuel

Although conditions required for the diesel fuel are illustrated above, there are other requirements exerting a big influence on its service durability and service life.

Be sure to observe the following requirements for selecting fuel.

Sulfur content	2500 ppm or less
HFRR*	460 mm or less
Water content	0.05 wt% or less

* HFRR (High-Frequency Reciprocating Rig.): An index showing lubricating properties of the fuel.

Sulfur content reacts to moisture to change into sulfuric acid after combustion.

Use of a fuel containing much sulfur content allows it to accelerate internal corrosion and wear.

In addition, much sulfur content quickens deterioration of engine oil allowing its cleaning dispersive property to be worse which results in acceleration of wear of sliding portions.

HFRR is an index that indicates lubricating property of a fuel.

Large value of the index means poor lubrication so that seizure of the machine components may result if such a fuel is used.

Since a fuel with high HFRR value also has lower viscosity, it can easily be leaked out.

If the fuel is mixed with the engine oil, the oil is diluted to deteriorate its lubricating property resulting in acceleration of wear.

Water content allows inside of the fuel tank to rust which in turn blocking the fuel line and the fuel filter.

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

This may also cause wear and seizure of the machine components.

If atmospheric temperature goes below the freezing point, moisture content in the fuel forms fine particle of ice allowing the fuel line to be clogged.

IMPORTANT : *Obtain table of analysis for the fuel you are using from the fuel supplier to confirm that it meets the criteria described above.*

IMPORTANT : *If a fuel which does not meet the specifications and the requirements for the diesel engine, function and performance of the engine will not be delivered. In addition, never use such a fuel because a breakdown of the engine or an accident may be invited.*

Guarantee will not be given to a breakdown caused by the use of a improper fuel.

Some fuels are used with engine oil or additives mixed together with diesel engine fuel.

In this case, do not use these fuels because damage to the engine may result as the fuel has been contaminated.

It is natural that the emission control regulation of 3rd-stage will not be cleared in case where a fuel that does not meet the specifications and the requirements is used.

Use the specified fuel for compliance of the exhaust gas control.

IMPORTANT : *If you use diesel fuel which contains much sulfur content more than 2500 ppm, be sure to follow the items below for the engine oil selection and maintenance of engine parts. Guarantee will not be given to breakdowns caused by not to follow these items.*

1 Selection of engine oil

Use API grade CF-4 or JASO grade DH-1.

2 Exchange the engine oil and engine oil filter element by the periodical interval reported on the Operator's Manual.

3 Inspect and exchange the EGR (*)parts and fuel injector parts of engine every 3000 hour of use.

* EGR: Exhaust Gas Recirculation

Maintenance of fuel filters

Be sure to use the genuine fuel filters.

The fuel injection system is precisely constructed and the genuine filter employs finer mesh than conventional filters to improve protection of machine equipment.

If a filter with coarse mesh is used, foreign object passing through the filter enters into the engine so that machine equipment can wear out in a short period of time.

IMPORTANT : *If a fuel filter other than the genuine filter is used, guaranty will not be applied to a fault caused by the use of a wrong filter.*

Two kinds of fuel filter, the pre-filter and the main filter, are mounted on the machine.

Be sure to use the genuine fuel filters and replace them at the periodic intervals reported on the operator's Manual.

IMPORTANT : *Since the pre-filter also has a function of water separation, discharge water and sediment when the float reaches lower part of the filter elements. CHECK EVERY DAY before to start the engine.*

Time to replace filters may be advanced according to properties of the fuel being supplied.

- Therefore, take measures to prevent dust or water from being entered in the fuel tank when supplying fuel.
- When supplying fuel directly from a fuel drum can, leave the drum as it stands for a long period of time to supply clean fuel standing above a precipitate.
- If it is hard to leave the drum for a long period of time, install a fuel strainer and a water separator before the fuel tank of the machine to supply clean fuel.

Water drain cock is provided on the bottom side of the fuel tank.

- Drain water before starting the engine every morning.
- In addition, remove the cover under the tank once a year to clean up inside of the tank.

1002-10

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 (-36.4°F), 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 or your CASE Dealer 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 CX460 Hydraulic Excavator
 Operating weight 46600 kg (102735 lbs)
 Engine output 270 kW / 1950 rpm

Performance

Swing speed 9.0 Tr/min.
 Travel speed
 Low Speed 3.1 km/h (1.93 mph)
 High Speed 5.3 km/h (3.30 mph)
 Maximum drawbar pull 341 kN (76659.85)
 Grade ability 70% (35°)
 Ground pressure 80 kPa (600 mm (23.62 in) grouser shoe)

Complete machine dimensions

	Standard arm (3.40 m) (11 ft 1.85 in)	Short arm (2.55 m) (8 ft 4.39 in)
Length	11940 mm (470.07 in)	11990 mm (472.04 in)
Width	3350 mm (131.88 in)	3350 mm (131.88 in)
Height	3600 mm (141.73 in)	3670 mm (144.48 in)

Main body dimensions

Main body width See machine overall dimensions
 Main body length See machine overall dimensions
 Upper side swing body width 3040 mm (120 in)
 Cab width 1000 mm (39.37 in)
 Main body height 3270 mm (128.73 in)
 Tail swing radius 3620 mm (142.51 in)
 Distance of rear swing body 3600 mm (171.73 in)
 Ground clearance for upperstructure 1330 mm (52.36)
 Center-to-center of wheels 4400 mm (173.22)
 Overall track length 5450 mm (214.56)
 Maximum track width 3350 mm (131.88 in)
 Center-to-center for track 2750 mm (108.26)
 Width of track shoe 600 mm (23.62 in) (Optional: 750 mm (29.52 in))
 Minimum ground clearance (To bottom of lower frame) 540 mm (21.25)

1002-12

Engine

Name	SUZU, 6UZ1
Type.....	Water-cooled, 4-cycle diesel, 6-cylinder in line, direct injection (electronic control), turbocharger with air cooled intercooler, without cooling fan.
No. of cylinders - bore x stroke	6-dia. 120 mm x 145 mm
Displacement.....	9.839 L (2.599 gal)
Compression ratio	17.5
Rated output.....	270 kW / 1950 min ⁻¹
Maximum torque.....	1435 Nm / approx. 1500 min ⁻¹
Dry weight.....	Approximately 840 kg
Engine dimensions (LxWxH)	1235x953x1272 mm (48.62x37.51x50.07 in)
Oil pan	All direction 35°, inclinable
Cooling fan.....	Remote (diameter 1016 mm (39.99 in) suction type-6 blades resin & steel)
Oil pan capacity	Maximum: 36 L (9.51 gal) Minimum: 25 L (6.60 gal) (excluding oil filter)
Direction of rotation.....	Right (as seen from fan)
Starter, reduction type.....	24 V, 5.5 kW
Alternator, AC type.....	24 V, 50 A
Battery	2 x 12V, 128 Ah/5 Hr

Cooling system

Fan drive system.....	Hydraulic drive
Fan type	Ø 1016 mm (39.99 in), 6 blades, air intake
Radiator	
Fin type.....	wavy
Fin pitch.....	2.0 mm (0.078 in)
Oil cooler	
Fin type.....	wavy
Fin pitch.....	1.75 mm (0.069 in)
Inter-cooler	
Fin type.....	triangular straight
Fin pitch.....	2.0 mm (0.078 in)
Fuel cooler	
Fin type.....	wavy
Fin pitch.....	2.0 mm (0.078 in)

Capacity of coolant and lubricants

Coolant	38 L (10.03 gal)
Fuel.....	611 L (161.41 gal)
Lubricant for engine	36 L (9.51 gal)
Lubricant for travel reduction gear (per side)	15 L (3.96 gal)
Lubricant for swing reduction gear (per side).....	10.5 L (2.77 gal)
Hydraulic oil	460 L (121.51 gal)
Capacity of hydraulic oil tank	230 L (60.76 gal)

Hydraulic oil filter

Suction filter (inside tank).....	150 mesh
Return filter (inside tank).....	10 µm
Nephron filter (inside housing).....	1 µm
Pilot line filter (inside housing)	10 µm

Fuel filter

Main filter	4 µm
Pre-filter	10 µm

Operating devices

Operator's seat

Location: left side

Structure: KAB 555: 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 all window.

Levers and pedals

For travel use: Levers and pedals (hydraulic pilot type) (x2)

For operating machine use: Levers (hydraulic pilot type) (x2)

Instruments and switches

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

Travel speed switchover: Low-speed / high-speed 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	House:	24V, 70W (x1)
	Boom:	24V, 70W (x1)
	Cab:	24V, 70W (x2)
Interior light		24V, 10W (x1)

Horn: electric horn (x2)

Other:

Wiper with intermittent function.

Window washer fluid.

Air conditioner.

Rear view mirror (left and right side).

DC-DC converter.

1002-14

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 volume	182 cm ³ (11.11 cu in) x 2 /rev
Rated operating pressure	31.4 MPa (4554 psi)
Maximum operating pressure	34.3 MPa (4975 psi)
Input revolution speed	1980 min ⁻¹ (at 1980 rpm ⁻¹)
Maximum discharge flow	360 L/min (95.10 gpm) x 2 at 1980 min ⁻¹ (at 1980 rpm ⁻¹)
Input horsepower	221.6 kW
Shaft input horsepower	224.7 kW at 1980 min ⁻¹ (at 1980 rpm ⁻¹)
Shaft input torque	1072.8 Nm (791 lb-ft) at 1980 min ⁻¹

Pilot pump

Pump type	Gear pump
Displacement volume	cm ³ (0.91 cu in)/rev
Operating pressure	3.9 MPa (566 psi)
Maximum flow	29.7 L/min (7.84 gpm) (at 1980 min ⁻¹) (at 1980 rpm ⁻¹)
Input horsepower	3.1 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	360 L / min (95.10 gpm)
Main relief set pressure	standard; 31.4 MPa (4554 psi) (at 340 L/min (89.81 gpm))
.....	power boost; 34.3 MPa (4975 psi) (at 315 L/min (83.21 gpm))
Overload set pressure	when boom down; 24.5 MPa (3553 psi) (at 20 L/min (5.28 gpm))
.....	other: 36.3 MPa (5265 psi) (at 20 L/min (5.28 gpm))
Foot relief set pressure	3.38 MPa (490.22 psi) (at 61 L/min (16.11 gpm))

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 override variable throttle valve
- Swing priority variable throttle valve
- Backup 2-speed confluence

Hydraulic Cylinders

Boom cylinder (x2)

Cylinder bore	Ø170 mm (Ø6.69 in)
Rod diameter	Ø115 mm (Ø4.52 in)
Maximum retracted length	2230 mm (87.79 in)
Stroke	1550 mm (61.02 in)

Arm (dipper) cylinder

Cylinder bore	Ø200 mm (Ø7.87 in)
Rod diameter	Ø140 mm (Ø5.51 in)
Maximum retracted length	2588 mm (101.88 in)
Stroke	1820 mm (71.65 in)

Bucket cylinder

Cylinder bore	Ø165 mm (Ø6.49 in)
Rod diameter	Ø115 mm (Ø4.52 in)
Maximum retracted length	1972 mm (77.63 in)
Stroke	1285 mm (50.59 in)

Rotating Joint

Operating pressure	
High pressure passage (ABCD)	34.3 MPa (4975 psi)
Drain port (T)	1.0 MPa (145 psi)
Pilot port (P)	3.9 MPa (566 psi)
Hydrostatic test pressure	
High pressure passage (ABCD)	51.5 MPa (7469 psi)
Drain port (T)	2.0 MPa (290 psi)
Pilot port (P)	5.9 MPa (856 psi)
Flow	
High pressure passage (ABCD)	360 L / min (95.10 gpm)
Drain port (T)	40 L / min (10.56 gpm)
Pilot port (P)	31 L / min (8.18 gpm)
Number of revolutions	15 min ⁻¹ (15 rpm ⁻¹)
Torque; when pressurizing 2 ports	196 Nm (144.5 lb-ft)
Port A; forward right	G1
Port B; forward left	G1
Port C; backward right	G1
Port D; backward left	G1
Port E; drain port	G1/2
Port F; pilot port	G1/4

Solenoid Valve

Valve specifications	
Maximum flow	P -> B: 20 L/min (5.28 gpm) Other: 5 L/min (1.32 gpm)
Rated pressure	4.5 MPa (652.67 psi)
Solenoid specifications	
Operating voltage	DC 20 to 32 V
Power consumption	17 W max.

Hand

control

valve

Manufacturer	Kawasaki
Operating pressure	3.92 MPa (569 psi)
Secondary pressure, primary short type	0.49 to 2.89 MPa (71.06 to 419.15 psi)
Operating angle	
Ports 1, 3	19°
Ports 2, 4	25°
Operating torque	
Port 1	0.58 to 2.03 Nm (0.42 to 1.49 lb-ft)
Port 3	0.47 to 1.92 Nm (0.34 to 1.41 lb-ft)
Ports 2, 4	0.71 to 2.30 Nm (0.52 to 1.69 lb-ft)

Foot

control

valve

Manufacturer	Kawasaki
Operating pressure	3.92 MPa (569 psi)
Secondary pressure, primary short type	0.49 to 2.89 MPa (71.06 to 419.15 psi)
Operating angle	12.4°
Operating torque	
Valve	4.16 to 9.03 Nm (3.068 to 6.660 psi)
Damper	4.90 Nm (at 0.0275 m/s) (3.614 psi (at 0.090 f/s))

1002-16

Swing unit

Swing circle	Swing bearing type (with internal gears)
Swing parking brake	Mechanical lock (operational lever linkage type)
Swing lock.....	Mechanical lock (swing lock switch linkage type)
Swing hydraulic motor.....	Fixed displacement piston motor
Displacement	250 cm ³ (15.26 cu in)/rev
Operating pressure.....	29.4 MPa (4264 psi)
Operating flow	360 L/min(95.10 gpm)
Mechanical brake torque	1288 Nm (949.97 lb-ft) min.
Brake off pressure	2.9 MPa (420.60 psi) max.
Relief valve set pressure	29.3 MPa (4249 psi) max.
Reduction gear	Planetary gear 2-stage reduction System
Reduction ratio.....	27.143

Travel lower body

Travel hydraulic motor (x2).....	Variable displacement piston motor, automatic 2-speed switch-over with parking brake
Displacement	/170.1 cm ³ (17.74/10.38 cu in)/rev
Operating pressure	34.3 MPa (5192 psi)
Operating flow	360.4 L/min (95.20 gpm)
Brake torque	71 KNm (52366 lb-ft) min. (including reduction gear)
Relief valve set pressure	35.8 to 38.8 MPa (at 50L/min) (5192 to 5627 psi (at 13.20 gpm)
Automatic 2-speed switch-over pressure	26.5 MPa (3843 psi)
Reduction gear	Planetary gear 3-stage reduction system
Reduction ratio	60.652
Travel brake	Hydraulic lock
Parking brake.....	Mechanical lock (travel lever linkage type)
Track shoe	
Model	Assembly-type triple grouser shoe
Number of shoes (per side)	50
Shoe width	
Standard	600 mm (23.62 in)
Optional.....	750 mm (29.52 in)
Grouser height	36 mm (1.41 in)
Link pitch	228.6 mm (8.99 in)
Roller	
Number of upper rollers (per side).....	2
Number of lower rollers (per side)	9
Track belt tension adjuster	Grease cylinder type (with cushion spring)

Work Unit

Model Backhoe attachment

Capacity / dimensions / working dimensions

Bucket width..... 1400 mm (55.11 in) (without side cutter)

Width of bucket with side cutter 1510 mm (59.44 in)

Weight of bucket with side cutter..... 1830 kg (4034 lbs)

	Boom 6980 mm (274.80 in)	
	Standard arm	Short arm
Arm (dipper) length	3380 mm (133.07 in)	2530 mm (99.60 in)
Bucket radius	1840 mm 72.44 in	
Bucket wrist angle	176°	
Maximum digging radius	12000 mm 472.43 in	11230 mm 442.12 in
Maximum digging radius at ground line	11770 mm 463.38 in	10990 mm 432.67 in
Maximum digging depth	7720 mm 303.93 in	6870 mm 270.47 in
Maximum vertical straight wall digging depth	6570 mm 258.66 in	5670 mm 223.22 in
Maximum reach height	11140 mm 438.58 in	10820 mm 425.98 in
Maximum dump height	7740 mm 304.72 in	7420 mm 292.12 in
Minimum swing radius at front	4990 mm 196.45 in	5140 mm 202.36 in
Overall height with minimum swing radius at front	9250 mm 364.17 in	9320 mm 366.92 in

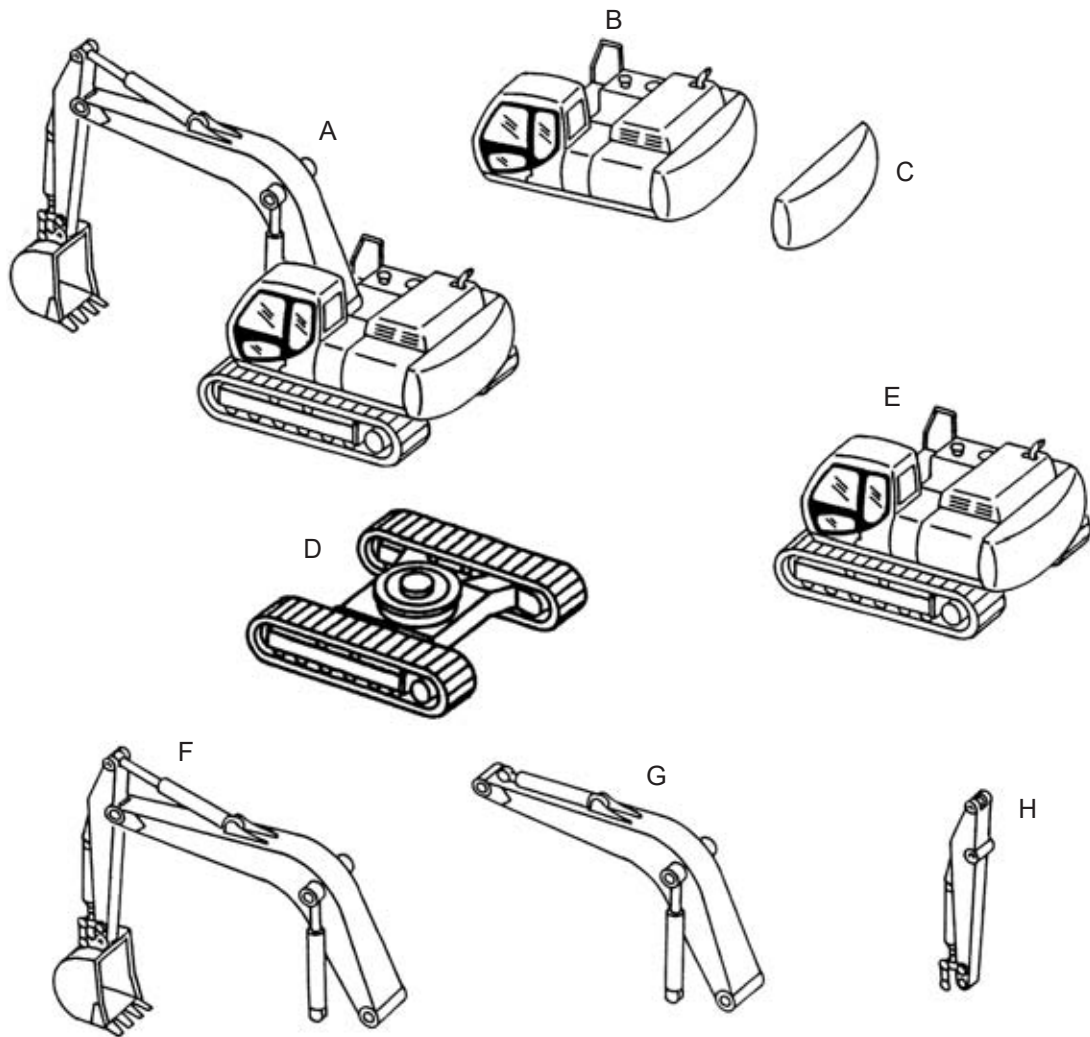
1002-18

Digging force (ISO 6015)

	Arm (dipper)	
	3380 mm (133.07 in)	2530 mm (99.60 in)
Bucket digging force (standard)	247 kN (55527.8 lbf)	247 kN (55527.8 lbf)
Bucket digging force (power boost)	270 kN (60698.4 lbf)	270 kN (60698.4 lbf)
Arm (dipper) digging force (standard)	209 kN (46985 lbf)	257 kN (57775.9 lbf)
Arm (dipper) digging force (power boost)	229 kN (51481.2 lbf)	281 kN (63171.3 lbf)

COMPONENT WEIGHT

Major component weight



330.3.01.00.51A

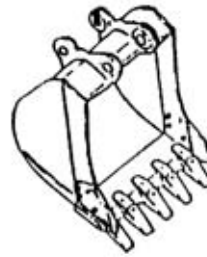
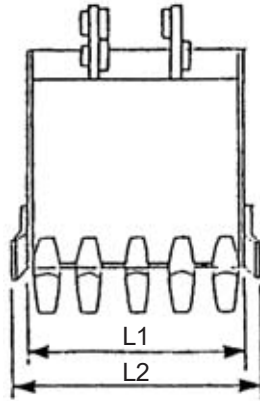
Weight information is approximate

A) Operating weight	46600 kg (102735 lbs)
B) Upper mechanism (including counterweight and turntable bearing).....	19700 kg (43431 lbs)
C) Counterweight.....	9200 kg (20282 lbs)
D) Lower mechanism (with standard grouser shoe).....	16700 kg (36817 lbs)
E) Main Unit Weighty	36400 kg (80248 lbs)
F) Attachments.....	10000 kg (22046 lbs)
G) Boom (including cylinders).....	5540 kg (12213 lbs)
H) Arm (dipper) (including cylinders and linkage)	2670 kg (5886 lbs)

1002-20

Bucket weight

	Bucket capacity (m ³)	Weight kg (lbs)	L1 mm (in)	L2 mm (in)
1	1.8	1430 (3153)	1384 (54.48)	1515 (59.64)
2	1.8 HD	1810 (3990)	1400 (55.11)	1508 (59.36)
3	2.0	1500 (3307)	1514 (59.60)	1645 (64.76)
4	2.0 HD	1910 (4211)	1530 (60.23)	1638 (64.48)
5	2.2	1510 (3329)	1825 (71.85)	1956 (77.00)



330.3.01.00.51BA

Other component weight

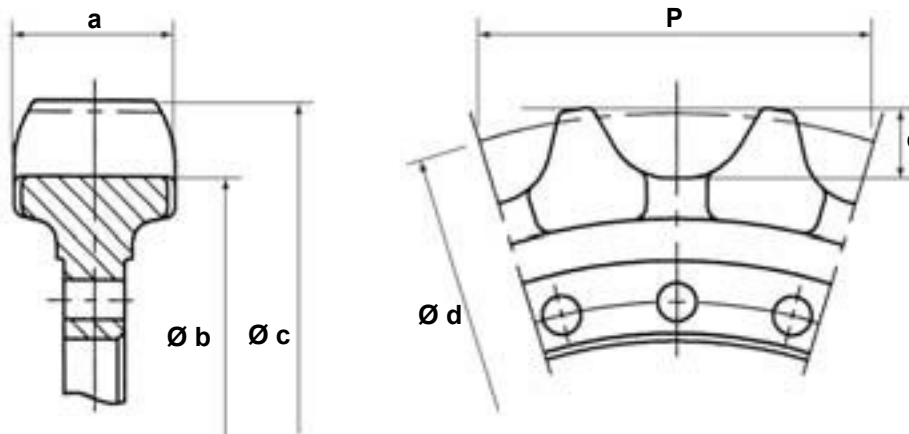
Engine	840 kg (1852 lbs)
Air cleaner	17.6 kg (38.8 lbs)
Hydraulic pump	245 kg (540 lbs)
Attachment control valve	424 kg (935 lbs)
Swing motor (excluding pinion)	565 kg (1245 lbs)
Travel motor and reduction gear assembly	613 kg (1351 lbs)
Rotary joint	56 kg (123 lbs)
Solenoid valve bank	7.0 kg (15.4 lbs)
Hand control valve	1.9 kg (4.2 lbs)
Foot control valve	7.8 kg (17.2 lbs)
Standard boom	3540 kg (7804 lbs)
Standard arm (dipper)	1690 kg (3726 lbs)
Short arm (dipper)	1490 kg (3285 lbs)
Boom cylinder (one)	400 kg (882 lbs)
Arm (dipper) cylinder	695 kg (1532 lbs)
Bucket cylinder	390 kg (860 lbs)
Fuel tank	243 kg (536 lbs)
Hydraulic oil tank	229 kg (505 lbs)
Turntable bearing	656 kg (1446 lbs)
Muffler	20 kg (44 lbs)
Radiator total weight	208 kg (458 lbs)
Oil cooler	34 kg (75 lbs)
Radiator	23.3 kg (51.3 lbs)
Air cooler	28.8 kg (63 lbs)
Fuel cooler	1.2 kg (2.64 lbs)
Idler wheel	251 kg (553 lbs)
Upper roller	44 kg (97 lbs)
Lower roller	82 kg (181 lbs)
Recoil spring	343 kg (756 lbs)
Recoil spring	141 kg (310.8 lbs)
Grease cylinder assembly	62.3 kg (137.3 lbs)
Threaded	68.8 kg (151.6 lbs)
Yoke	66.8 kg (147.2 lbs)
Track chains (per side)	
600 mm (23.62 in)	2580 kg (5688 lbs)
750 mm (29.52 in)	2930 kg (6459 lbs)

1002-22

DIMENSIONS AND WEAR LIMIT OF THE TRACK ASSEMBLY

Sprocket

Dimensions

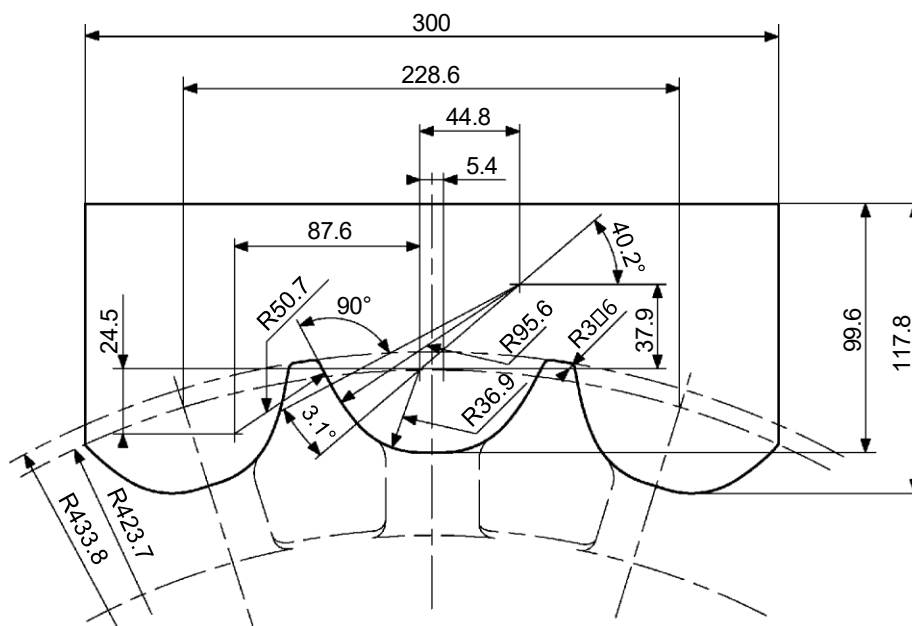


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Mark	Dimension		
		mm	in
a	Standard	90	3.54
	Limit	78	3.07
Ø b	Standard	773.6	30.45
	Limit	761.6	29.98
Ø c	Standard	867.5	34.15
	Limit	854.5	33.64
Ø d	Standard	847.3	33.35
	Limit	-	-
e	Standard	43.5	1.71
	Limit	48.5	1.90
P	Standard	229	9.01
	Limit	-	-

Gauge

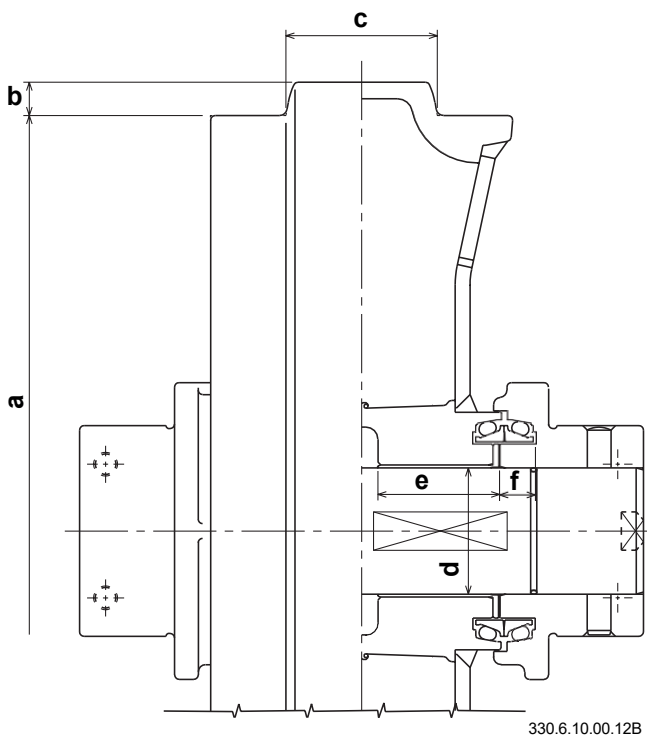
Unit in mm



CI01N501

Idler wheel

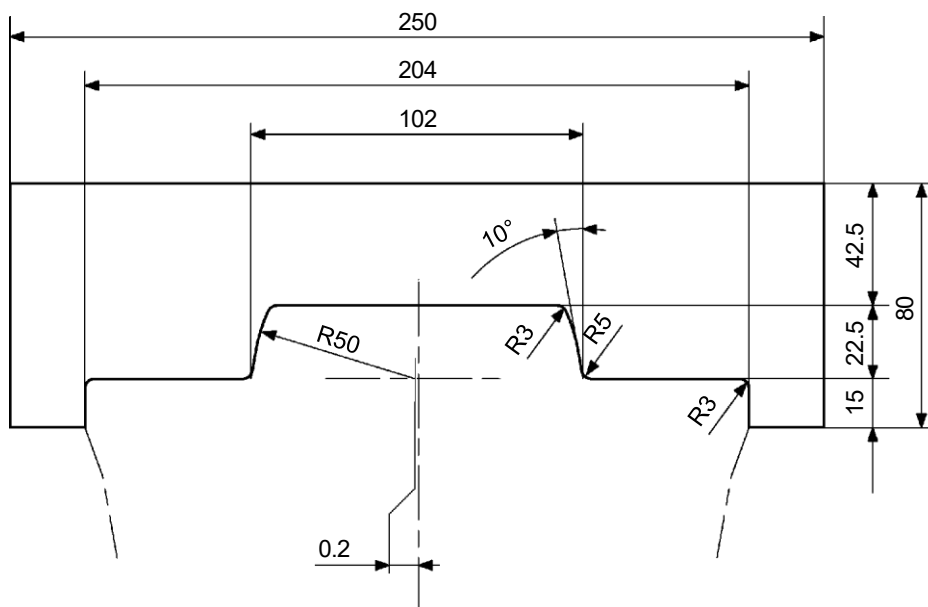
Dimensions



Mark	Dimension		
	mm	in	
Ø a	Standard	676	26.61
	Limit	665	26.18
b	Standard	22.5	0.88
	Limit	-	1.00
c	Standard	102	4.01
	Limit	92	3.62
Ø d (shaft)	Standard	95	3.74
	Limit	94	3.70
Ø d (bushing)	Standard	95	3.74
	Limit	96	3.77
e (bushing)	Standard	100	3.93
	Limit	99	3.89
f	Standard	15	0.59
	Limit	-	-

Gauge

Unit in mm

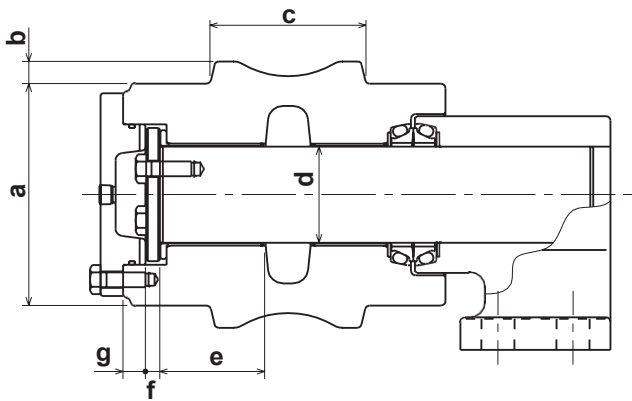


CI01N502

1002-24

Upper roller

Dimensions

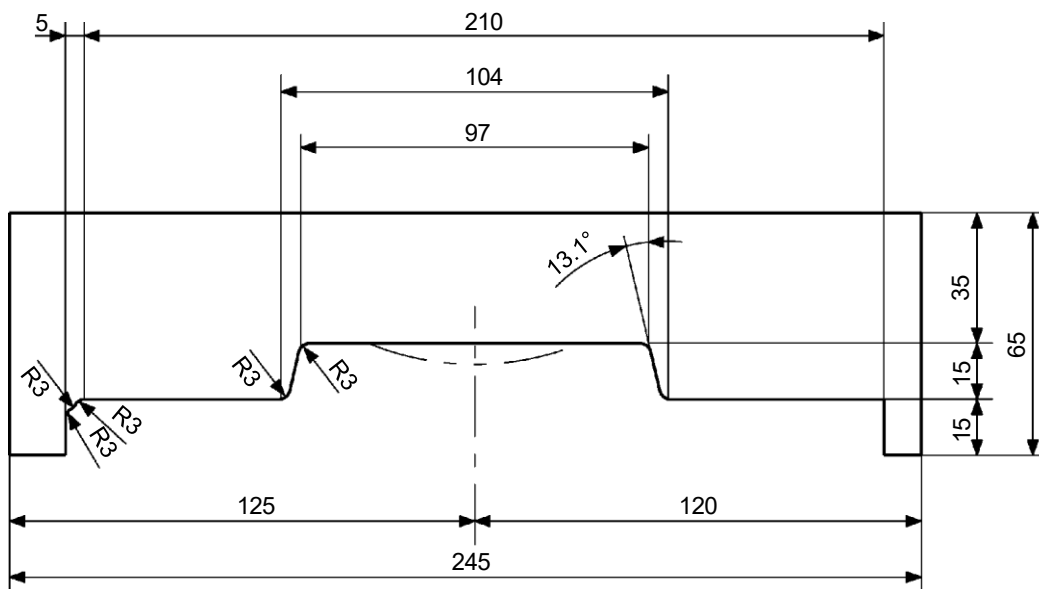


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Mark		Dimension	
		mm	in
Ø a	Standard	150	5.90
	Limit	140	5.51
b	Standard	15	0.59
	Limit	-	-
c	Standard	104	4.09
	Limit	-	-
Ø d shaft	Standard	65	2.55
	Limit	64	2.51
Ø d bushing	Standard	65	2.55
	Limit	66	2.59
e bushing	Standard	150	5.90
	Limit	149	5.86
f	Standard	9	0.35
	Limit	8.5	0.33
g	Standard	30	1.18
	Limit	-	-

Gauge

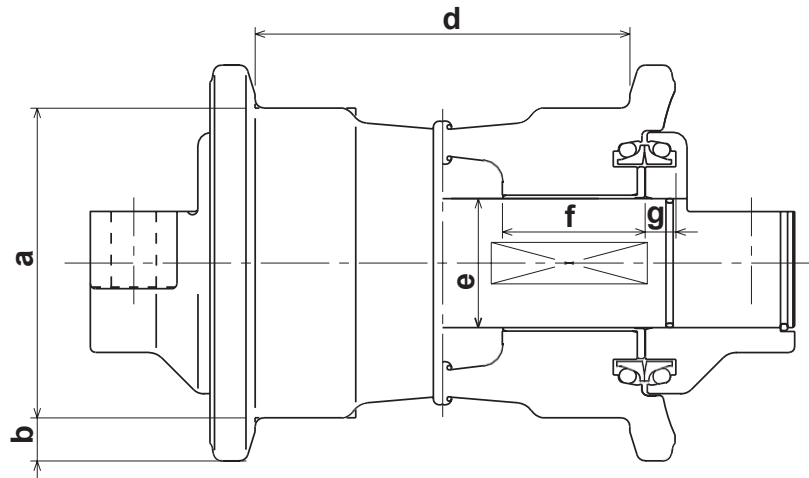
Unit in mm



CI01N503

Lower roller

Dimensions

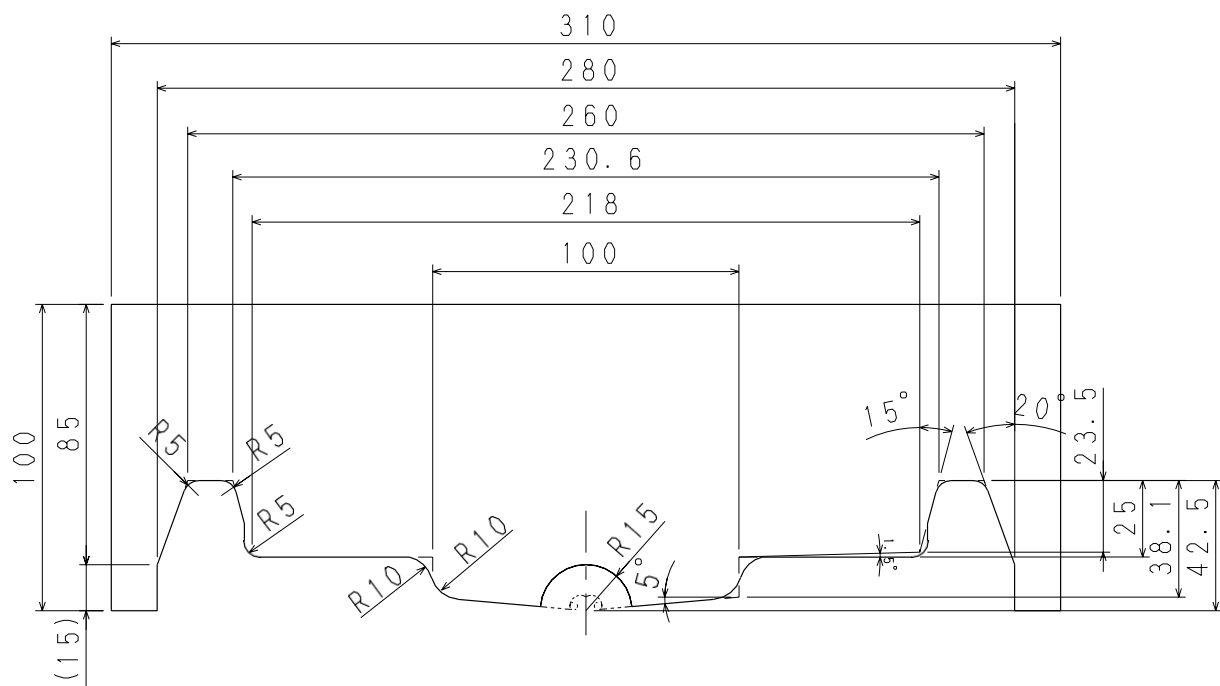


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Mark		Dimension		Mark		Dimension	
		mm	in			mm	in
Ø a	Standard	200	7.87	Ø e (bushing)	Standard	85	3.34
	Limit	188	7.40		Limit	86	3.38
b	Standard	25	0.98	Ø f	Standard	93	3.66
	Limit	20	0.78		Limit	92	3.62
d	Standard	223	8.77	g	Standard	24.5	0.96
	Limit	233	9.17		Limit	23.9	0.94
Ø e (Shaft)	Standard	85	3.34				
	Limit	84	3.30				

Gauge

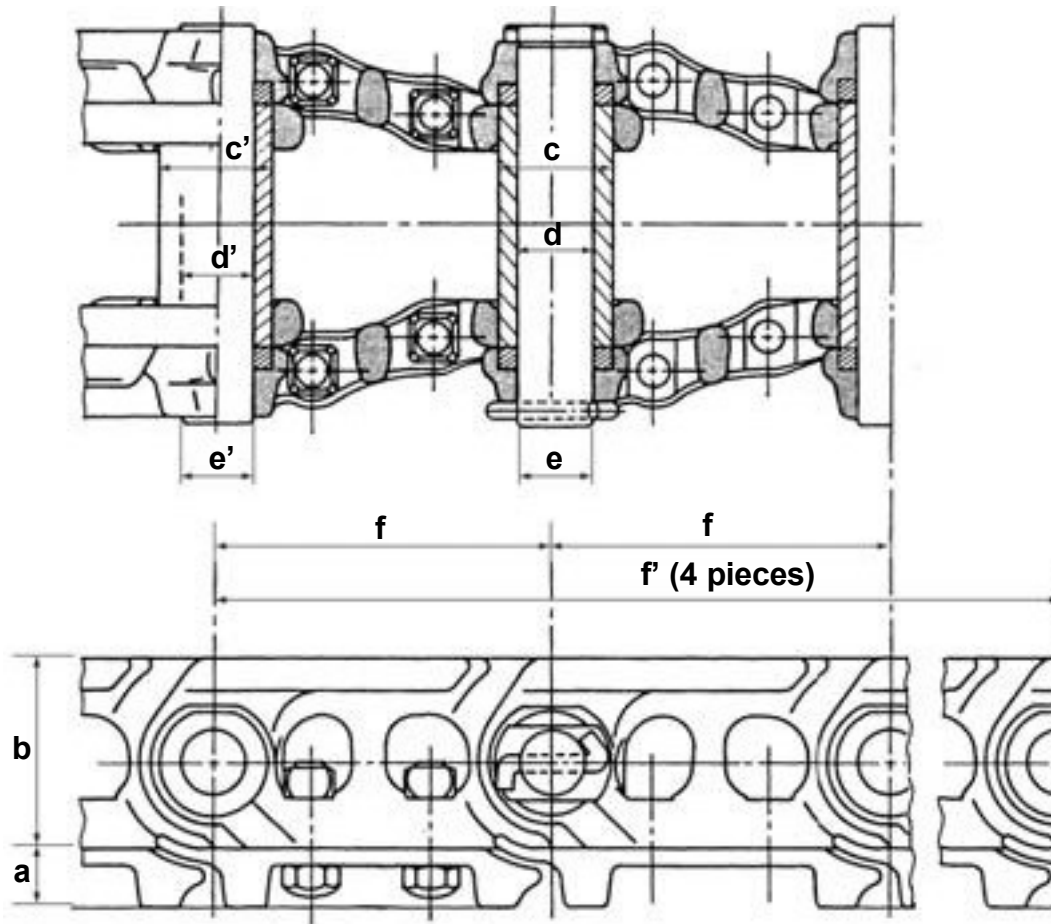
Unit in mm



KTA1107X-C02

1002-26

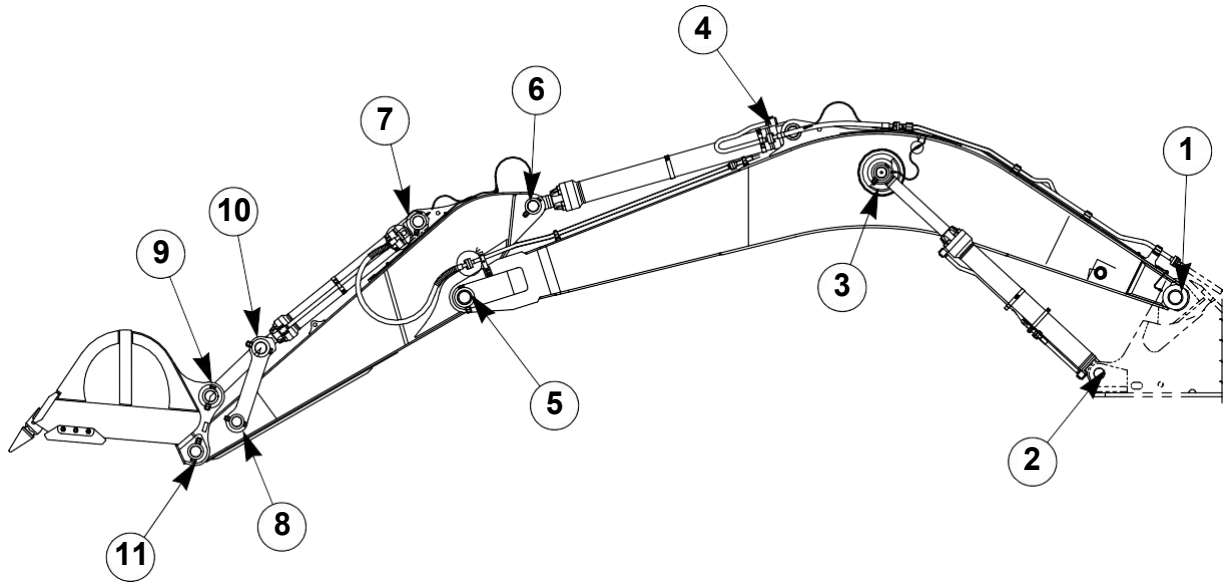
Track



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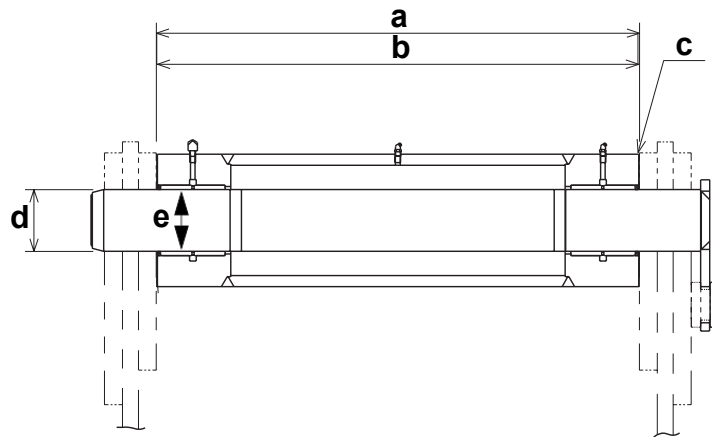
Mark		Dimension		Mark		Dimension	
		mm	in			mm	in
a	Standard	52	2.04	Ø c' (bushing)	Standard	73.33	2.88
	Limit	32	1.25		Limit	68.23	2.68
b	Standard	129	5.07	Ø d' (bushing)	Standard	49.2	1.93
	Limit	121	4.76		Limit	51.7	2.03
Ø c (bushing)	Standard	73.33	2.88	Ø e' (Pin)	Standard	48.8	1.92
	Limit	68.23	2.68		Limit	44.9	1.76
Ø d (bushing)	Standard	49.2	1.93	f' (4 pieces)	Standard	914.4	35.99
	Limit	51.7	2.03		Limit	-	-
Ø e (Pin)	Standard	48.6	1.91				
	Limit	45.1	1.77				
f	Standard	228.6	8.99				
	Limit	-	-				

DIMENSIONS AND WEAR LIMITS OF ATTACHEMENT MOBILE JOINTS



CRIL06C002F

1. Boom foot/Frame

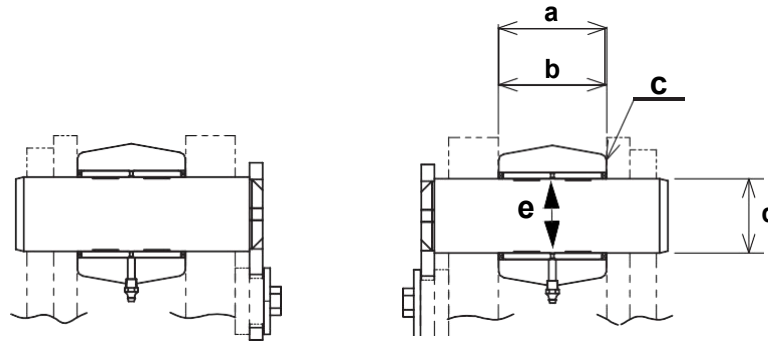


330.6.10.00.12C1

Mark		Dimension	
		mm	in
a (frame)	Standard	874	34.40
	Limit	882	34.72
b (boom)	Standard	871	34.29
	Limit	868	34.17
c (clearance)	Standard	3.5 to 5.5	0.13 to 0.21
	Limit	Shim adjustment	
Ø d (shaft)	Standard	120	4.72
	Limit	119	4.68
Ø e (bushing)	Standard	120	4.72
	Limit	121.5	4.78

1002-28

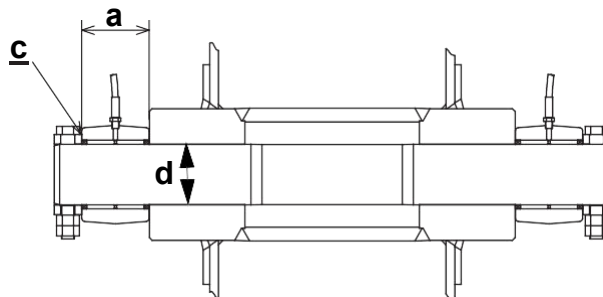
2. Boom cylinder foot/Frame



330.6.10.00.1.12C2

Mark		Dimension	
		mm	in
a (boom)	Standard	126	4.96
	Limit	132	5.19
b (cylinder)	Standard	125	4.92
	Limit	122	4.80
c (clearance)	Standard	1.5 to 3.5	0.05 to 0.13
	Limit	Shim adjustment	
Ø d (shaft)	Standard	120	4.72
	Limit	119	4.68
Ø e (bushing)	Standard	120	4.72
	Limit	121.5	4.78

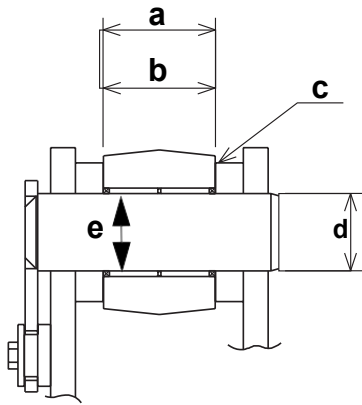
3. Boom cylinder head/Boom



330.6.10.00.12D1

Mark		Dimension	
		mm	in
a (boom)	Standard	140	5.51
	Limit	137	5.39
a (cylinder)	Standard	679	26.73
	Limit	675	26.57
c (clearance)	Standard	1.5 to 3.0	0.05 to 0.11
	Limit	Shim adjustment	
Ø d (shaft)	Standard	120	4.72
	Limit	119	4.68
Ø d (bushing)	Standard	120	4.72
	Limit	121.5	4.78

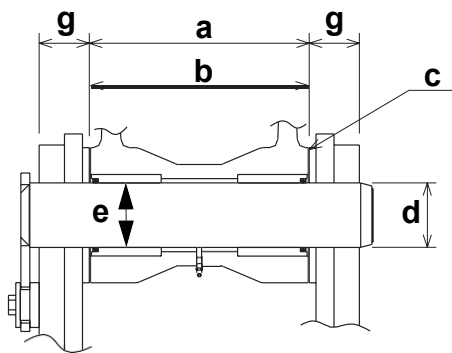
4. Arm cylinder foot/Boom



330.6.10.00.12D2

Mark		Dimension	
		mm	in
a (boom)	Standard	156	6.14
	Limit	162	6.37
b (cylinder)	Standard	155	6.10
	Limit	153	6.02
c (clearance)	Standard	1.0 to 3.0	0.03 to 0.11
	Limit	Shim adjustment	
Ø d (shaft)	Standard	120	4.72
	Limit	119	4.68
Ø e (bushing)	Standard	120	4.72
	Limit	121.5	4.78

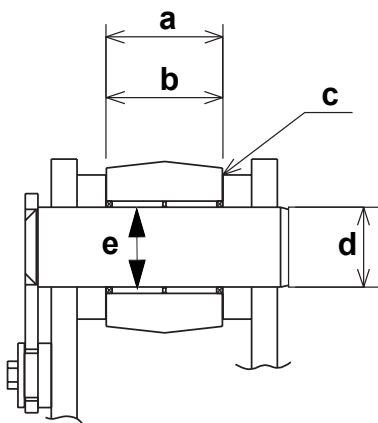
5. Boom/Arm



330.6.10.00.12E1

Mark		Dimension	
		mm	in
a (boom)	Standard	437	17.20
	Limit	440	17.32
b (arm)	Standard	432.7	17.03
	Limit	429.7	16.91
c (clearance)	Standard	4.5 to 5.5	0.17 to 0.21
	Limit	Shim adjustment	
Ø d (shaft)	Standard	120	4.72
	Limit	119	4.68
Ø e (bushing)	Standard	120	4.72
	Limit	121.5	4.78
g	Standard	98	3.85
	Limit	96	3.77

6. Arm cylinder head/Arm

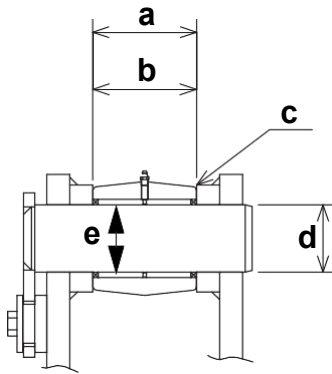


330.6.10.00.12F1

Mark		Dimension	
		mm	in
a (arm)	Standard	156	6.14
	Limit	161	6.33
b (cylinder)	Standard	155	6.10
	Limit	153	6.02
c (clearance)	Standard	1.0 to 3.0	0.039 to 0.11
	Limit	Shim adjustment	
Ø d (shaft)	Standard	120	4.72
	Limit	119	4.68
Ø e (bushing)	Standard	120	4.72
	Limit	121.5	4.78

1002-30

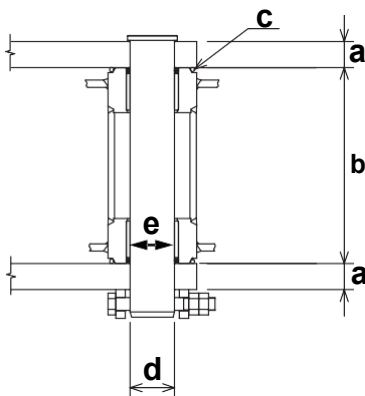
7. Bucket cylinder foot/Arm



330.6.10.00.12F2

Mark		Dimension	
		mm	in
a (arm)	Standard	141	5.55
	Limit	146	5.74
b (cylinder)	Standard	140	5.51
	Limit	138	5.43
c (clearance)	Standard	1.0 to 3.0	0.039 to 0.11
	Limit	Shim adjustment	
Ø d (shaft)	Standard	110	4.33
	Limit	109	4.29
Ø e (bushing)	Standard	110	4.33
	Limit	111.5	4.38

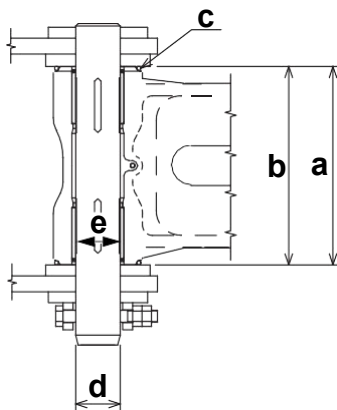
8. Connecting rod/Arm



330.6.10.00.12G1

Mark		Dimension	
		mm	in
a	Standard	50	1.96
	Limit	47	1.85
b	Standard	441	17.36
	Limit	437	17.20
c (clearance)	Standard	1.5 to 2.0	0.059 to 0.078
	Limit	Shim adjustment	
Ø d (shaft)	Standard	95	3.74
	Limit	94	3.70
Ø e (bushing)	Standard	95	3.74
	Limit	96.5	3.79

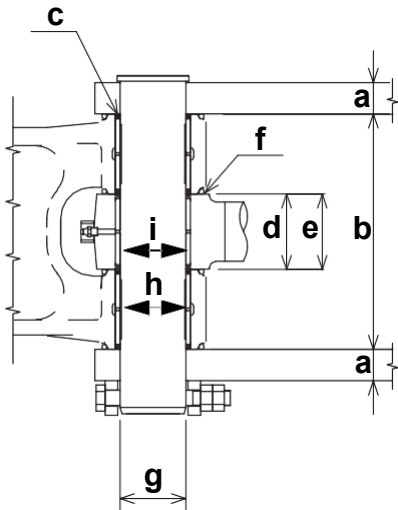
9. Compensator/Bucket



330.6.10.00.12G2

Mark		Dimension	
		mm	in
a (bucket)	Standard	480	18.89
	Limit	485	19.09
b (link)	Standard	479	18.85
	Limit	476	18.74
c (clearance)	Standard	1.5 to 3.5	0.059 to 0.13
	Limit	Shim adjustment	
Ø d (shaft)	Standard	100	3.93
	Limit	99	3.89
Ø e (bushing)	Standard	100	3.93
	Limit	101.5	3.99

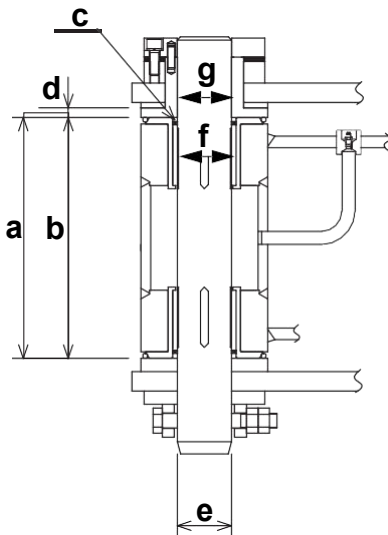
10. Connecting rod/Compensator/Bucket cylinder head



330.6.10.00.12H1

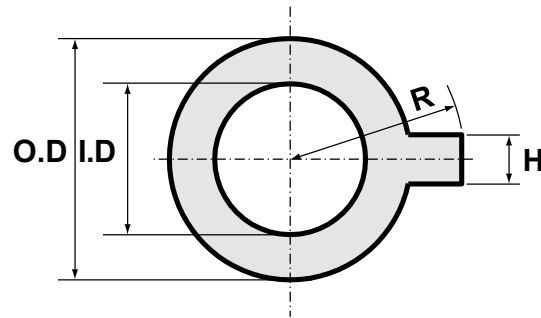
Mark		Dimension	
		mm	in
a	Standard	50	1.96
	Limit	48	1.88
b	Standard	441	17.36
	Limit	436	17.16
c (clearance)	Standard	1.5 to 2.5	0.059 to 0.098
	Limit	Shim adjustment	
d (link)	Standard	141	5.55
	Limit	143	5.62
e (cylinder)	Standard	140	5.51
	Limit	138	5.43
f (clearance)	Standard	1.5 to 2.0	0.059 to 0.078
	Limit	Shim adjustment	
Ø g (shaft)	Standard	110	4.33
	Limit	109	4.29
Ø h (bushing)	Standard	110	4.33
	Limit	111.5	4.38
Ø i (bushing)	Standard	110	4.33
	Limit	111.5	4.38

11. Arm/Bucket



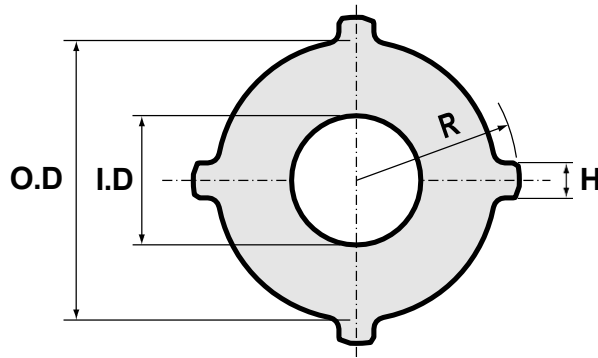
330.6.10.00.12I1

Mark		Dimension	
		mm	in
a (bucket)	Standard	480	18.89
	Limit	-	-
b (arm)	Standard	479	18.85
	Limit	476	18.74
c (clearance)	Standard	1.5 to 4.0	0.059 to 0.15
	Limit	Shim adjustment	
d	Standard	16	0.62
	Limit	10	0.39
Ø e (shaft)	Standard	100	3.93
	Limit	99	3.89
Ø f (bushing)	Standard	100	3.93
	Limit	101.5	3.99
Ø g (bushing)	Standard	100	3.93
	Limit	101.5	3.99

SHIMS FOR ADJUSTING ATTACHMENT GAPS**For boom foot**

000-6-10-02-02A

Part No.	I.D.	O.D.	R	H	Shim Thickness	Material
KNV1132	76	160	100	30	1.2	SPHC
KRV2390	91	190	115	30	1.2	SPHC
KBV1441	101	220	130	30	1.2	SPHC
KBV1748	101	230	135	30	1.2	SPHC
KSV1805	111	240	140	30	1.2	SPHC



000-6-10-02-02B

Part No.	I.D.	O.D.	R	H	Shim Thickness	Material
KSV1930	111	240	140	30	1.0	Urethane
KSV11380	111	240	140	30	2.0	Urethane
KSV1931	116	240	140	30	1.0	Urethane
KSV11390	116	240	140	30	2.0	Urethane
KTV10730	121	245	150	50	2.0	Urethane
KTV10740	121	245	150	50	1.0	Urethane
KTV10750	121	260	150	50	2.0	Urethane
KTV10760	121	260	150	50	1.0	Urethane
KWV0097	141	280	160	50	1.0	Urethane
KWV10510	141	280	160	50	2.0	Urethane
KWV0096	141	300	180	50	1.0	Urethane
KWV10500	141	300	180	50	2.0	Urethane
KUV10150	141	300	170	30	1.0	Urethane
KUV10160	141	300	170	30	2.0	Urethane
KUV10130	151	300	170	30	1.0	Urethane
KUV10140	151	300	170	30	2.0	Urethane