CX330 and CX350 Crawler Excavators
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* *Consult the Engine Service Manual*

[redacted] *Sections to be distributed at a later date*

NOTE: CASE 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.

Section

1001

SAFETY, GENERAL INFORMATION AND STANDARD TORQUE DATA

Case

Cre 7-27690GB

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GENERAL INFORMATION

Cleaning

Clean all metal parts except bearings, in a suitable cleaning solvent or by steam cleaning. Do not use caustic soda for steam cleaning. After cleaning, dry and put oil on all parts. Clean oil passages with compressed air. Clean bearings in a suitable cleaning solvent. Dry the bearings completely and put oil on the bearings.

Inspection

Check all parts when the parts are disassembled. Replace all parts that have wear or damage. Small scoring or grooves can be removed with a hone or crocus cloth. Complete a visual inspection for indications of wear, pitting and the replacement of parts necessary to prevent early failures.

Bearings

Check bearings for easy action. If bearings have a loose fit or rough action, replace the bearing. Wash bearings with a suitable cleaning solvent and permit to air dry. DO NOT DRY BEARINGS WITH COMPRESSED AIR.

Needle Bearings

Before you press needle bearings in a bore always remove any metal protrusions in the bore or edge of the bore. Before you press bearings into position, put petroleum jelly on the inside and outside diameter of the bearings.

Gears

Check all gears for wear and damage. Replace gears that have wear or damage.

Oil Seals, O-rings and Gaskets

Always install new oil seals, O-rings and gaskets. Put petroleum jelly on seals and O-rings.

Shafts

Check all shafts that have wear or damage. Check the bearing and oil seal surfaces of the shafts for damage.

Service Parts

Always install genuine Case service parts. When ordering refer to the Parts 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.

Place a “Do not operate“ tag on the starter switch key before carrying out any service or repair work on the machine.

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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.*

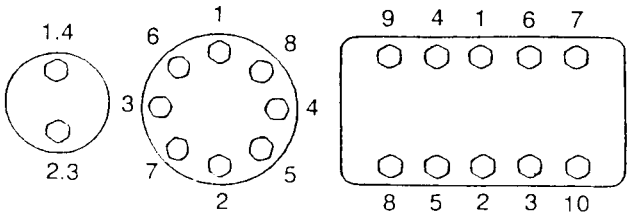
WARNING: *Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. Open the doors and get outside air into the area.*

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 and Nuts

Tighten alternately so that tightening torque can be applied evenly. The numbers in the figure below indicate the order of tightening.



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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	157.2	196.0	274.0
		[lb-ft]	5.1	14.5	29.0	43.4	72.5	116.0	144.6	202.4
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	78.4	117.6	176.4	245.0	343.0
		[lb-ft]	6.5	15.9	31.1	57.8	86.8	130.1	180.8	253.1

NOTES

Section

1002

1002

SPECIFICATIONS AND SPECIAL TORQUE SETTINGS

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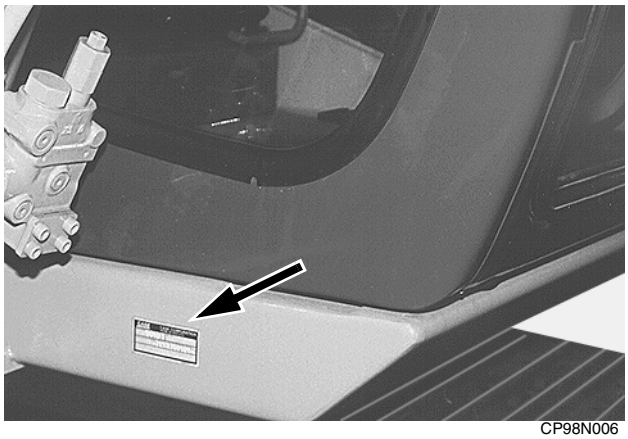
WARNING: *This symbol is used in this manual to indicate important safety messages. Whenever you see this symbol, carefully read the message which follows. Your safety depends on it.*

TYPE, SERIAL NUMBER AND YEAR OF MANUFACTURE OF THE MACHINE

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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(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 .....

Travel control valve .....

Attachment control valve .....

Swing control valve .....

INGREDIENTS

The ingredients must correspond to specific characteristics for every usage.

WARNING: *You must respect the operating conditions for the different ingredients.*

Hydraulic fluid

The CASE hydraulic fluid is specially adapted for high pressure and CASE's hydraulic circuit. The type of fluid to be used depends on the ambient temperature.

Temperate climates

-20°C to +40°C
Fluid type: ISO VG 46
CASE reference: POHYDR

Hot climates

0°C to +60°C
Fluid type: ISO VG 100
CASE reference: POHYPC

Cold climates

-40°C to +20°C
Fluid type: ISO VG 22
CASE reference: POHYPF

Temperate climate biodegradable fluid:
This yellow-coloured fluid is miscible with standard fluid. When introducing this fluid, it is recommended to drain the hydraulic system completely.
Fluid type: ISO VG 46
CASE reference: CASYNTH 46

These different grades of fluids must comply with the CASE specification.

Transmission assembly oil

Extreme pressure oil used for transmission assemblies in housing.
Extreme pressure oil TYPE API GL5 GRADE 80W90 and ISO VG 150

Greases

The type of grease to be used depends on the ambient temperature.

Hot and temperate climates

-20°C to +60°C
Extreme pressure EP NLGI grade 2 grease with molybdenum disulfide.

Cold climates

-40°C to +20°C
Extreme pressure EP NLGI grade 0 grease.

Engine oil

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

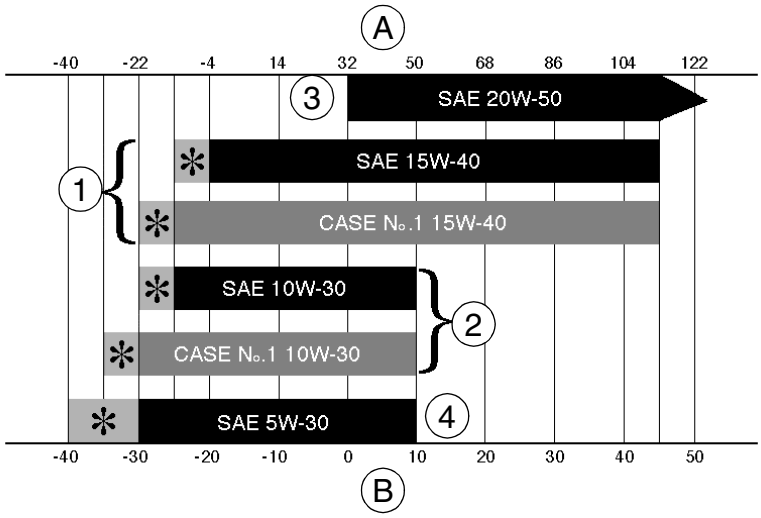
If you are unable to procure the CASE No. 1 Multiperformance or Performance engine oil, use the corresponding oil from the API/CG/CF category.

NOTE: *Do not put any performance additives or any other additives in the engine housing. The oil changing intervals are indicated in this manual based on tests carried out on CASE lubricants.*

RD97F136

RD97F100

Viscosity of oils/Operating range of oils



CS98M561

(A) FAHRENHEIT TEMPERATURE
(B) CELSIUS TEMPERATURE
(1) ALL SEASONS
(2) WINTER
(3) TROPICAL
(4) ARCTIC
(*) SHOWS THAT IT IS NECESSARY TO USE AN OIL HEATER OR THERMAL COOLER.

Fuel

The fuel to be used must comply with the D975 norm of the American Society for Testing and Materials (ASTM).

Use type No. 2 fuel, use of other fuels can cause a loss of engine power and excessive fuel consumption.

In cold weather, it is provisionally accepted that a mixture of No. 1 and No. 2 fuels be used. Contact your fuel supplier.

If the temperature drops below the freezing point of the fuel (point where paraffin appears), paraffin crystals in the fuel will cause loss of engine power or starting trouble.

IMPORTANT: *In cold weather, fill up the reservoir with fuel after each workday, in order to avoid the formation of condensation.*

Storing fuel

Prolonged storage of fuel promotes the accumulation of foreign bodies or condensed moisture in the storage tank. Many engine failures are caused by the presence of water in fuel.

The storage tank must be placed outside and the fuel should be maintained at as low a temperature as possible. Drain the condensed moisture at regular intervals.

Antifreeze/anticorrosive

Use the antifreeze in all seasons to protect the coolant system from corrosion and to avoid any risk of freezing.

In environments with a temperature greater than -36°C, use a 50% mixture of antifreeze in an ethylene glycol base.

In environments with a temperature less than -36°C, it is recommended that you use a 40% water and 60% antifreeze mixture.

Environment

Before carrying out any maintenance operation on this machine and before throwing away the liquids or lubricants used, always think of the environment. Never throw oil or liquids on the ground and never put them in leaking containers.

Consult your local centre for ecological recycling for information on the appropriate method for disposing off these substances.

Plastic and resin parts

When cleaning plastic parts, on the console, the instrument panel, the indicator and gauges etc., do not use petrol, paraffin, paint solvents, etc. Use only water, soap and a soft cloth.

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

SPECIFICATIONS

	CX330	CX350

Engine

Make	Isuzu	Isuzu
Model	6HK1XQB	

Type: Four stroke, water cooled with overhead valves, direct injection in-line cylinder (electronic control) with turbo-charger.

Number of cylinders	6
Bore and stroke	115 x 125 mm
Displacement	7790 cc

Operating conditions

Idle	900 rpm
Max speed	2000 rpm
Power ECC 1289	185.45 kW (248.6 HP)
Max torque	962.3 Nm at 1600 rpm

Capacities

Engine oil capacity	33 litres
Engine cooling circuit	42 litres
Capacity of only the radiator	21 litres
Fuel reservoir	580 litres
Hydraulic fluid reservoir capacity	175 litres
Total hydraulic circuit capacity	350 litres
Capacity of only the oil-cooler	16.5 litres
Travel reduction gear housing capacity	11 litres
Swing drive housing capacity	6 litres
Idler pulley capacity	250 cc
Upper roller capacity	245 to 250 cc
Lower roller capacity	280 cc

NOTE: *These capacities are given only for information purposes. To check the fluid levels, always use the oil gauge, visual gauges or the filler cap.*

Electrical system

Type of system	24 volts earth negative
Alternator amperage	50 amperes
Battery	
Number of batteries required	2
Voltage of each battery	12 volts
Capacity	140 Ah
Reserve	160 min
Cold startability at -17°	800 A
Load for load control	400 A
Starter	
Voltage	24 volts
Power	5 kW
Voltage regulator	built-in, without adjustment

	CX330	CX350

Hydraulic system

Main hydraulic pump

Variable flow double pump, with axial pistons.

Maximum flow	2 x 284 l/min
Displacement	2 x 140 cc

Hydraulic pilot pump

Fixed flow pump

Max flow	26.4 l/min
Displacement	13 cc

Pressure setting

Pilot circuit relief	39 ± 1 bar
Main circuit relief (standard)	343 ± 3 bar
Main circuit relief (Power-up)	373 ± 5 bar
Secondary relief (Boom raising, dipper and bucket)	392 ± 5 bar
Secondary relief (boom lower)	274 ± 5 bar
Secondary relief (swing)	294 ± 4 bar
Secondary relief (travel)	380 ± 5 bar
Safety valve (boom and dipper)	392 ± 5 bar

Cylinder

Boom cylinder

Cylinder bore	145 mm
Rod diameter	100 mm
Stroke	1495 mm

Dipper cylinder

Cylinder bore	170 mm
Rod diameter	120 mm
Stroke	1748 mm

Bucket cylinder

Cylinder bore	150 mm
Rod diameter	105 mm
Stroke	1210 mm

Cylinder leakage - attachment lowering (without load)

Boom cylinders (rods retracted)	3 mm/5 min
Dipper cylinder (rod extended)	5 mm/5 min
Dipper cylinder (rod extended)	7 mm/5 min
Total (at the end of the attachment)	200 mm/5 min

Cylinder speed (in S mode)

Boom raised (bucket open and on the ground)	4.6 ± 0.5 sec.
Boom lowered (bucket open)	3.7 ± 0.5 sec.
Dipper extended	3.7 ± 0.5 sec.
Dipper retracted	4.8 ± 0.5 sec.
Bucket open	3.0 ± 0.5 sec.
Bucket closed	5.4 ± 0.5 sec.

Control valve

Five-element control valve for dipper, boom acceleration, swing, option and right travel.
Four-element control valve for dipper, bucket, boom acceleration and left travel.
Load holding relief valve for boom and dipper.

	CX330	CX350

Swing

Fixed flow engine with axial pistons.
Automatic disk brakes.

Upperstructure frame swing speed	9.6 rpm	
Displacement	180 cc	
Work flow	284 l/min	
Reduction ratio	27.143	
Brake torque	≥ 927.1 Nm	
Minimum brake release pressure	29 bar	
Permissible motor leak	16 l/min	

Travel

Two-speed motor with axial pistons.
Automatic disk brakes.

Low speed	3.2 kph	
High speed	5.5 kph	
Gradeability	70% (35°)	
Tractive effort	27 400 daN	
Displacement	290.7/170.1 cc	
Work flow	284.2 l/min	
Reduction ratio	40.4675	
Braking torque (reduction gear excluded)	≥ 902 Nm	
Number of sprocket turns (10 turns)		
Mode "S", high speed	16.6 ± 0.6 sec.	
Mode "S", low speed	27.8 ± 0.6 sec.	
Permissible deviation in travel over a distance of 20 m		
Mode "H", full speed	1 m	
Permissible motor leak	14 l/min	

Undercarriage

Monobloc frame with fabricated elements.
Lubricated rollers and idler wheels.
Grease track tension.

Weight load on track		
with 600 mm track pads	0.64 bar	0.67 bar
with 700 mm track pads	0.55 bar	0.58 bar
with 800 mm track pads	0.49 bar	0.52 bar
with 900 mm track pads	0.44 bar	
Track tension	340 to 360 mm	

	CX330	CX350

Attachment

Digging force	24 840 daN	
Break-out force		
2.20 m dipper	24 600 daN	
2.60 m dipper	21 100 daN	
2.65 m dipper	-	21 100 daN
3.20 m dipper	17 800 daN	
3.25 m dipper	-	17 800 daN
4.00 m dipper	15 260 daN	

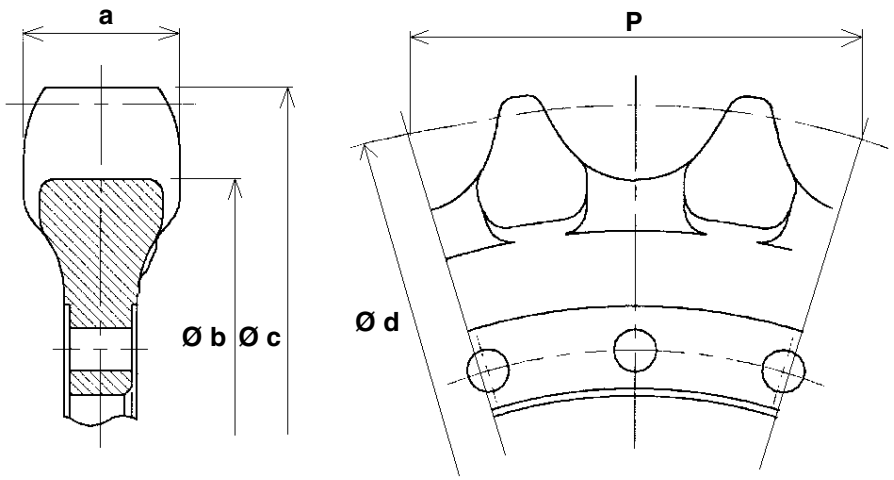
Weight of components

Engine	650 kg	
Hydraulic pump	130 kg	
Attachment control valve	192 kg	
Swing motor and reduction gear assembly	407 kg	
Travel motor and reduction gear assembly	380 kg	
Boom cylinder	287 kg	
Dipper cylinder	515 kg	
Bucket cylinder	280 kg	
Counterweight	6400 kg	7400 kg
Cab	254 kg	
Turntable	590 kg	
Complete upperstructure	13 860kg	14 850 kg
Hydraulic swivel	54 kg	
Complete chassis	12 200 kg	12 400 kg
Machine without attachment	26 640 kg	27 840 kg
Attachment	7050 kg	7860 kg
Complete boom	3370 kg	3660 kg
Complete dipper	2110 kg	2300 kg
Radiator and oil-cooler assembly	160 kg	
Fuel reservoir	235 kg	
Hydraulic reservoir	202 kg	
Idler wheel	154 kg	
Upper roller	44 kg	
Lower roller	60 kg	
Tension damper	497 kg	
600 mm track	2217 kg	
700 mm track	2417 kg	
800 mm track	2682 kg	
900 mm track	2817 kg	

DIMENSIONS AND WEAR LIMIT OF THE TRACK ASSEMBLY

Sprocket

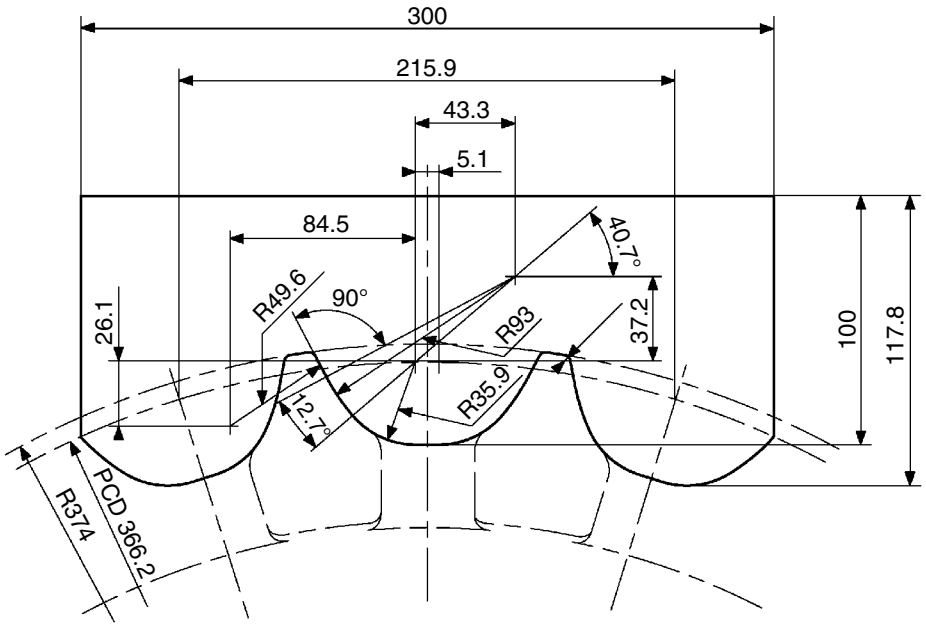
Dimensions



CS01B512

Mark		Dimension (mm)
a	Standard	83
	Limit	73
Ø b	Standard	660.7
	Limit	649.2
Ø c	Standard	748
	Limit	738
Ø d	Standard	732.5
	Limit	---
P	Standard	215.9
	Limit	---

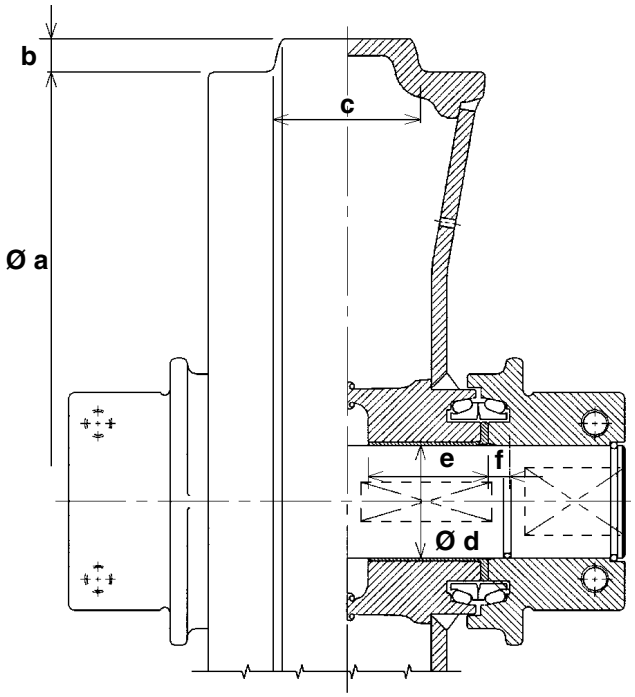
Gauge



CI01N501

Idler wheel

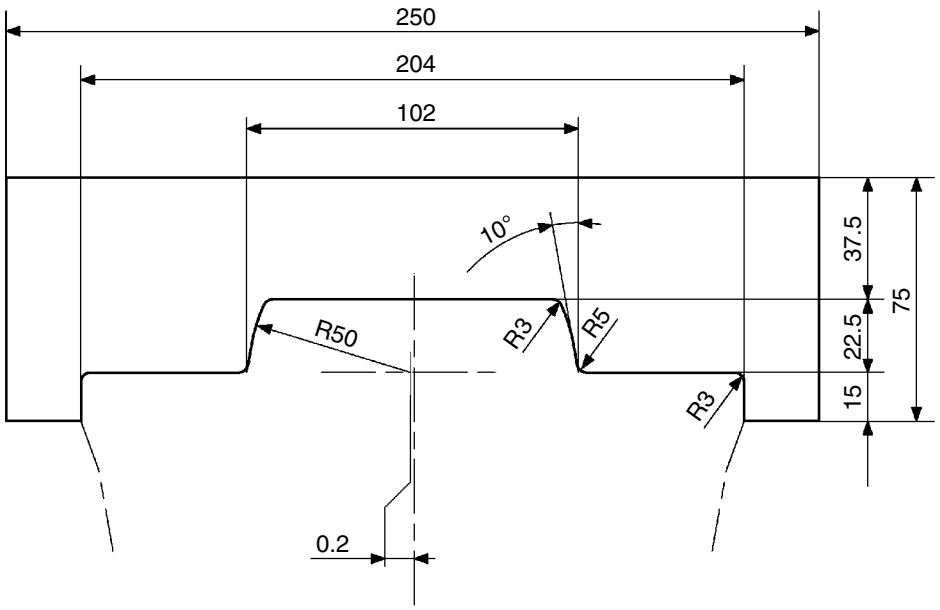
Dimensions



CS01B514

Mark		Dimension (mm)
Ø a	Standard	560
	Limit	550
b	Standard	22.5
	Limit	---
c	Standard	102
	Limit	92
Ø d (shaft)	Standard	85
	Limit	84
Ø d (bushing)	Standard	85
	Limit	86
e	Standard	82
	Limit	81
f	Standard	19
	Limit	18.6

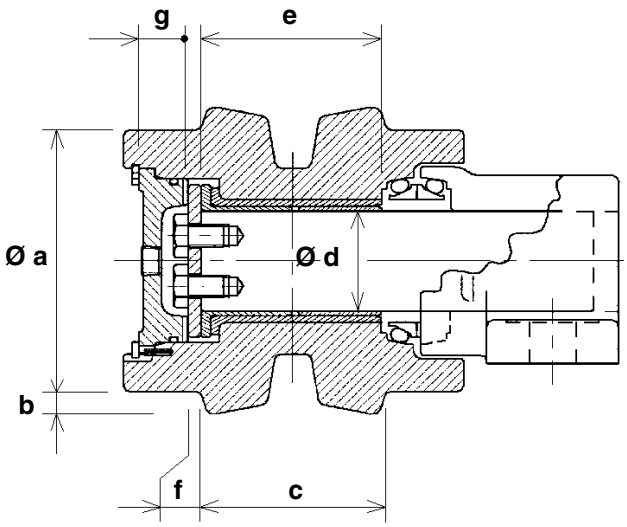
Gauge



CI01N502

Upper roller

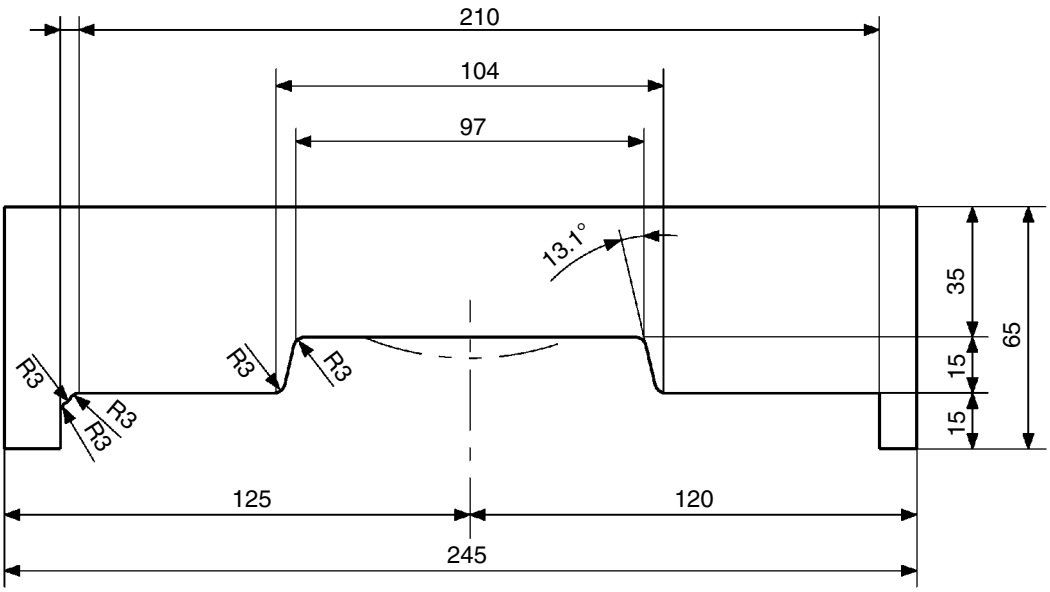
Dimensions



CS01B516

Mark		Dimension (mm)
Ø a	Standard	150
	Limit	140
b	Standard	15
	Limit	---
c	Standard	104
	Limit	---
Ø d (shaft)	Standard	65
	Limit	64
Ø d (bushing)	Standard	65
	Limit	66
e	Standard	69
	Limit	68
f	Standard	9
	Limit	8.5
g	Standard	30
	Limit	---

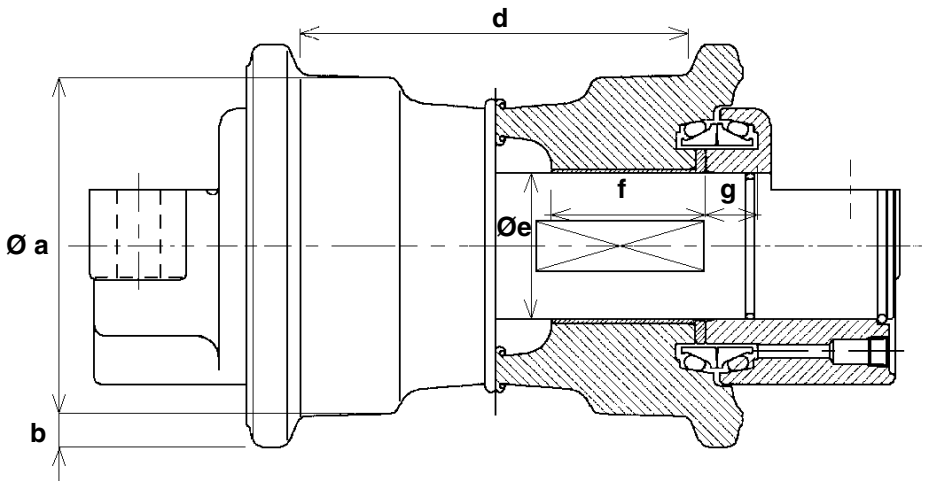
Gauge



CI01N503

Lower roller

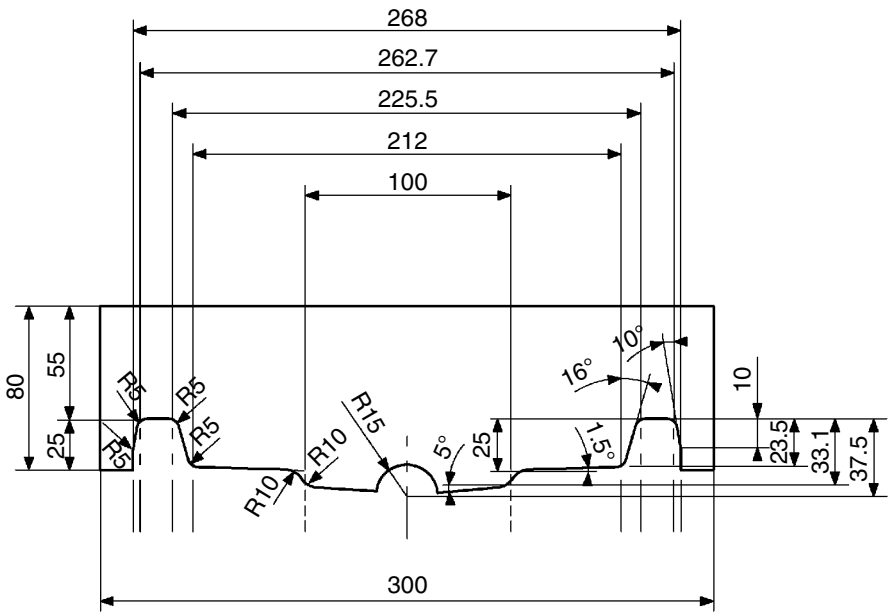
Dimensions



CS01B518

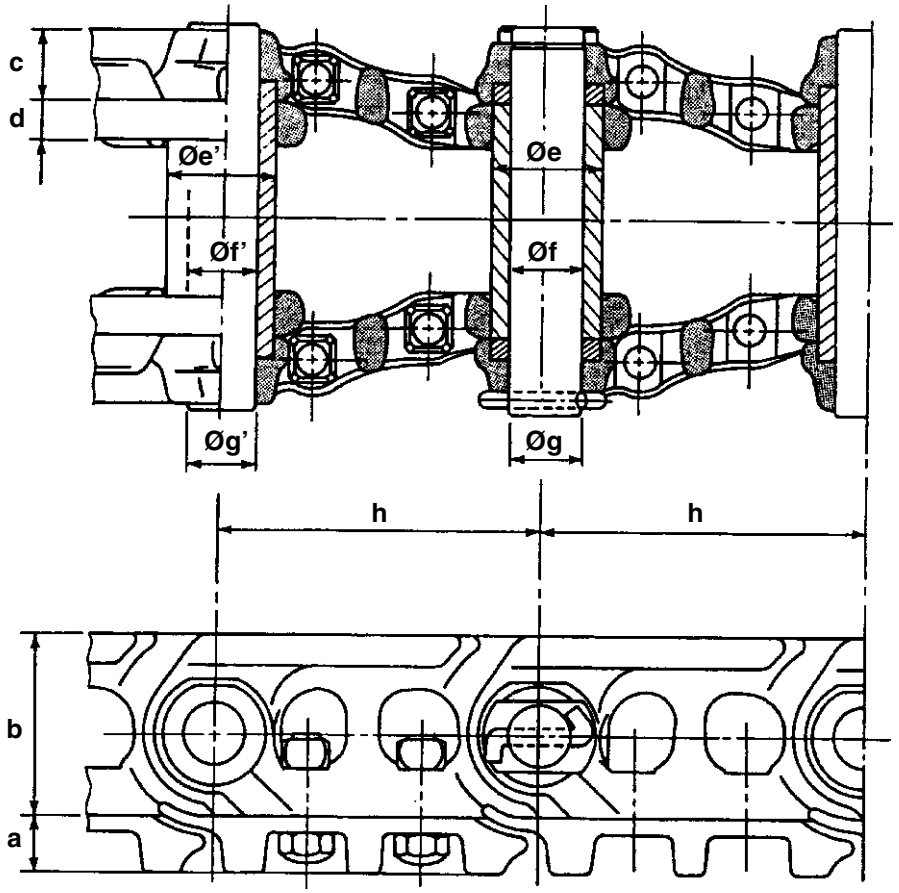
Mark		Dimension (mm)	Mark		Dimension (mm)
Ø a	Standard	180	Ø e (ring)	Standard	75
	Limit	170		Limit	76
b	Standard	25	f	Standard	82
	Limit	20		Limit	81
d	Standard	216	g	Standard	17.5
	Limit	224		Limit	17
Ø e (shaft)	Standard	75			
	Limit	74			

Gauge



CI01N504

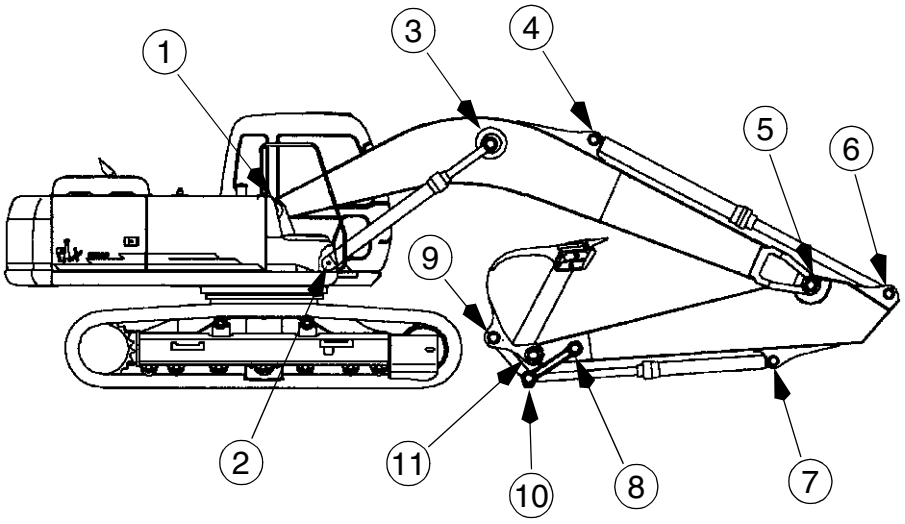
Track



CS01B520

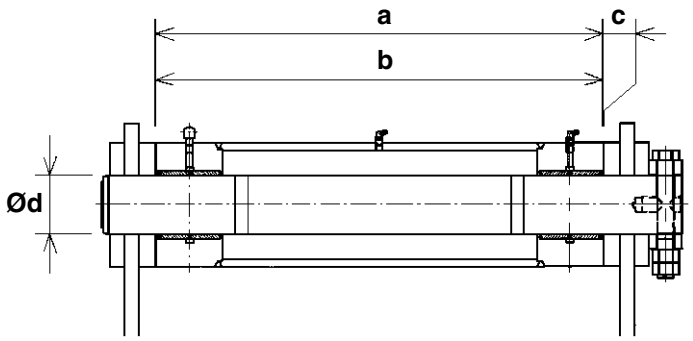
Mark		Dimension (mm)	Mark		Dimension (mm)
a	Standard	49	Ø e (ring)	Standard	71.35
	Limit	34		Limit	67
b	Standard	129	Ø f (ring)	Standard	47.9
	Limit	124		Limit	50.4
c	Standard	43	Ø g (shaft)	Standard	47
	Limit	41		Limit	45
d	Standard	28.4	h	Standard	215.9
	Limit	27		Limit	---
			Ø e' (bushing)	Standard	71.35
				Limit	67
			Ø f' (bushing)	Standard	48.4
				Limit	50.8
			Ø g' (shaft)	Standard	47.6
				Limit	45

DIMENSIONS AND WEAR LIMITS OF ATTACHMENT LINKAGES



CS01B521

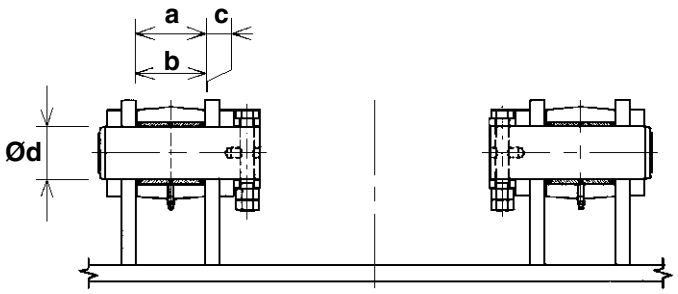
1. Boom foot/Frame



CS01B522

Mark		Dimension (mm)
a	Standard	860
	Limit	868
b	Standard	859
	Limit	857
c (a - b)	Standard	1.5 to 4
	Limit	Shims
Ø d (shaft)	Standard	110
	Limit	109
Ø d (bushing)	Standard	110
	Limit	111.5

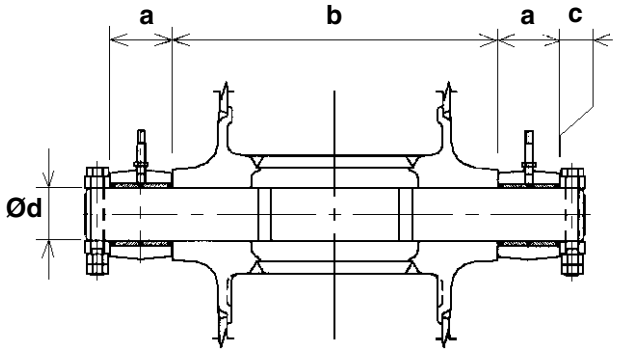
2. Boom cylinder foot/Frame



CS01B523

Mark		Dimension (mm)
a	Standard	131
	Limit	137
b	Standard	130
	Limit	127
c (play)	Standard	1 to 3.5
	Limit	Shims
Ø d (shaft)	Standard	90
	Limit	89
Ø d (bushing)	Standard	90
	Limit	91.5

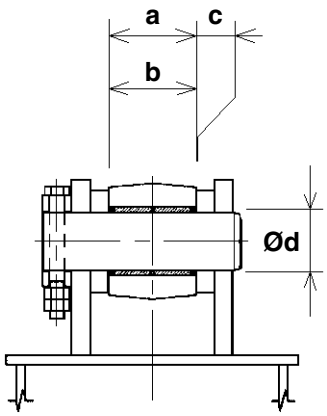
3. Boom cylinder head/Boom



CS01B524

Mark		Dimension (mm)
a	Standard	123
	Limit	120
b	Standard	669
	Limit	665
c (play)	Standard	1.5 to 3
	Limit	Shims
Ø d (shaft)	Standard	110
	Limit	109
Ø d (bushing)	Standard	110
	Limit	111.5

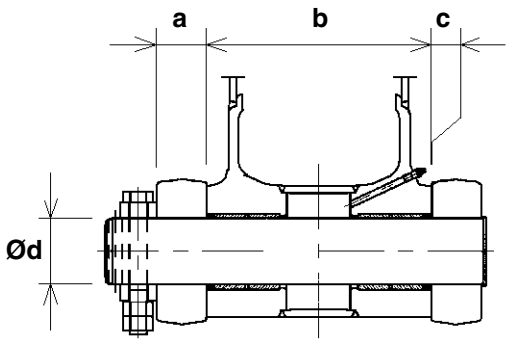
4. Dipper cylinder foot/Boom



CS01B525

Mark		Dimension (mm)
a	Standard	146
	Limit	152
b	Standard	145
	Limit	143
c (a - b)	Standard	1 to 3.5
	Limit	Shims
Ø d (shaft)	Standard	100
	Limit	99
Ø d (bushing)	Standard	100
	Limit	101.5

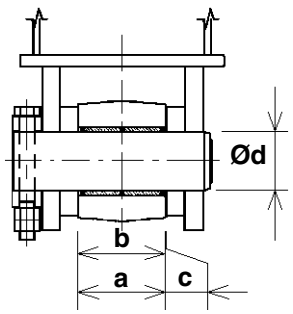
5. Boom/Dipper



CS01B526

Mark		Dimension (mm)
a	Standard	89
	Limit	87
b (boom)	Standard	392
	Limit	395
b (dipper)	Standard	391.5
	Limit	389
c (play)	Standard	0.5 to 2
	Limit	Shims
Ø d (shaft)	Standard	115
	Limit	114
Ø d (dipper)	Standard	115
	Limit	116.5
Ø d (boom)	Standard	115
	Limit	116.5

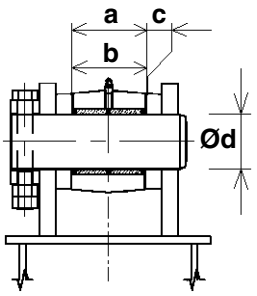
6. Dipper cylinder head/Dipper



CS01B527

Mark		Dimension (mm)
a	Standard	146
	Limit	151
b	Standard	145
	Limit	143
c (a - b)	Standard	0.5 to 3
	Limit	Shims
Ø d (shaft)	Standard	100
	Limit	99
Ø d (bushing)	Standard	100
	Limit	101.5

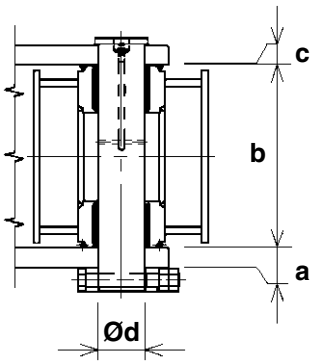
7. Bucket cylinder foot/Dipper



CS01B528

Mark		Dimension (mm)
a	Standard	146
	Limit	152
b	Standard	145
	Limit	143
c (a - b)	Standard	1 to 3.5
	Limit	Shims
Ø d (shaft)	Standard	95
	Limit	94
Ø d (bushing)	Standard	95
	Limit	96.5

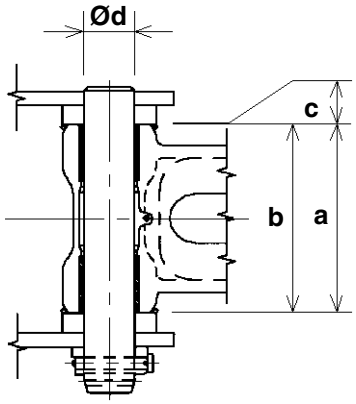
8. Connecting rod/Dipper



CS01B529

Mark		Dimension (mm)
a	Standard	50
	Limit	47
b	Standard	375
	Limit	371
c (play)	Standard	1 to 2
	Limit	Shims
Ø d (shaft)	Standard	85
	Limit	84
Ø d (bushing)	Standard	85
	Limit	86.5

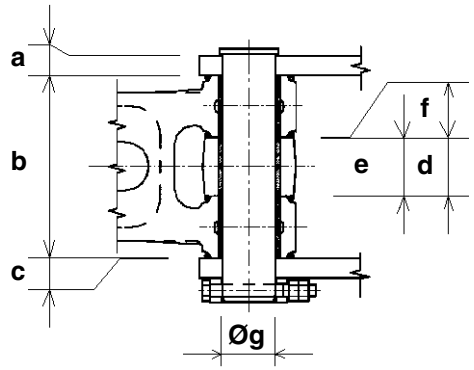
9. Compensator/Bucket



CS01B530

Mark		Dimension (mm)
a	Standard	50
	Limit	47
b	Standard	375
	Limit	371
c (play)	Standard	1 to 2
	Limit	Shims
Ø d (shaft)	Standard	85
	Limit	84
Ø d (bushing)	Standard	85
	Limit	86.5

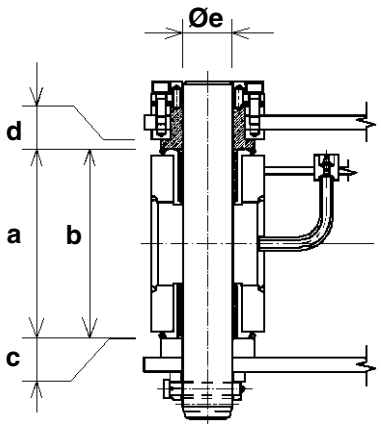
10. Connecting rod/Compensator/Bucket cylinder head



CS01B531

Mark		Dimension (mm)
a	Standard	50
	Limit	48
b	Standard	376
	Limit	371
c (play)	Standard	1.5 to 2.5
	Limit	Shims
d	Standard	106
	Limit	109
e	Standard	105
	Limit	102
f (d - e)	Standard	1.5 to 2.5
	Limit	Shims
Ø g (shaft)	Standard	105
	Limit	104
Ø g (compensator)	Standard	105
	Limit	106.5
Ø g (cylinder)	Standard	105
	Limit	106.5

11. Dipper/Bucket



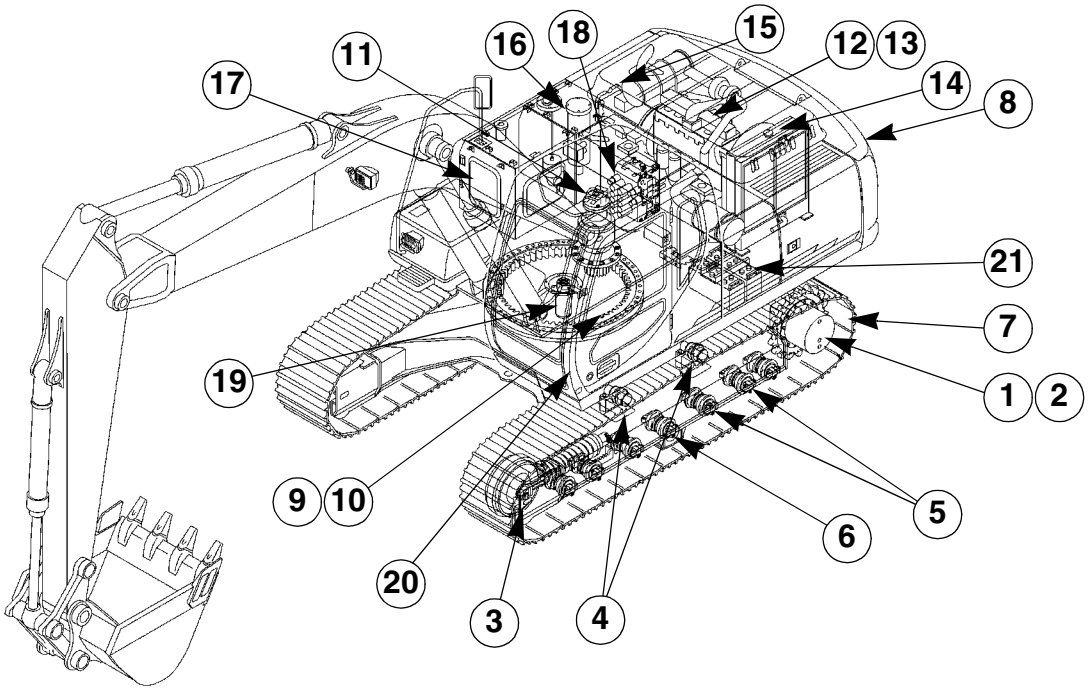
CS01B532

Mark		Dimension (mm)
a	Standard	401
	Limit	406
b	Standard	400
	Limit	397
c (a - b)	Standard	1 to 4
	Limit	Shims
d	Standard	16
	Limit	10
Ø e (shaft)	Standard	90
	Limit	89
Ø e (dipper)	Standard	90
	Limit	91.5
Ø e (bucket)	Standard	90
	Limit	91.5

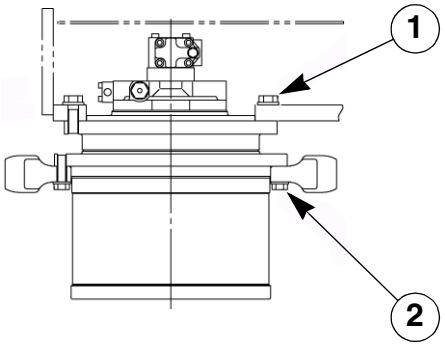
SPECIAL TORQUE SETTINGS

No.	Component	Screw (Ø)	Wrench (mm)	Torque setting (Nm)
1 *	Travel motor and reduction gear assembly	M24	36	900-1050
2 *	Sprocket	M20	30	521-608
3 *	Idler wheel	M16	24	267-312
4 *	Upper roller	M20	30	521-608
5 *	Lower roller	M24	36	900-1050
6	Chain guide	M24	36	900-1050
7	Track pad	M24	36	1236-1510
8	Counterweight	M33	50	1685-1960
9	Turntable (frame)	M24	36	900-1050
10	Turntable (upperstructure)	M24	36	900-1050
11 *	Swing motor and reduction gear assembly	M24	36	900-1050
12 *	Engine	M20	30	289-337
13 *	Engine bracket	M10	17	64-74
14	Radiator	M16	24	147-176
15 *	Hydraulic pump	M10	17	64-74
16 *	Hydraulic reservoir	M16	24	232-276
17 *	Fuel reservoir	M16	24	232-276
18 *	Control valve	M16	24	267-312
19 *	Hydraulic swivel	M16	24	267-312
20	Cab	M16	24	78-80
21	Battery	M10	17	20-29

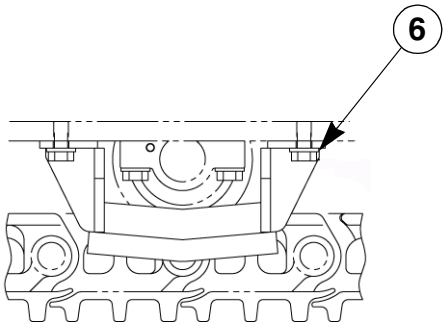
NOTE: *Use Loctite 262 or an equivalent on retaining screws of those components marked with an asterisk (*).*



CS00E507



CS01N968



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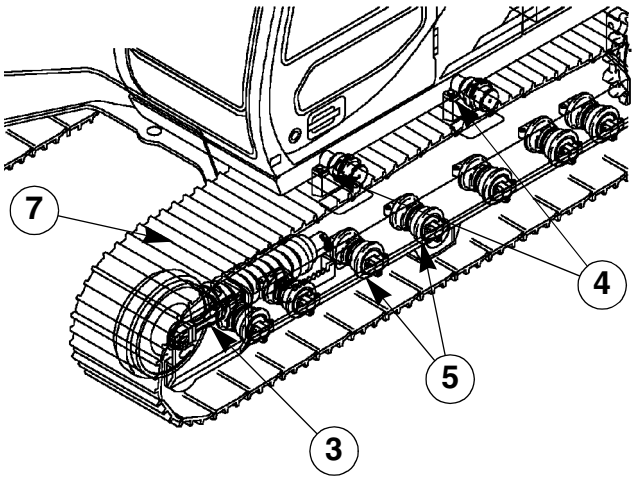
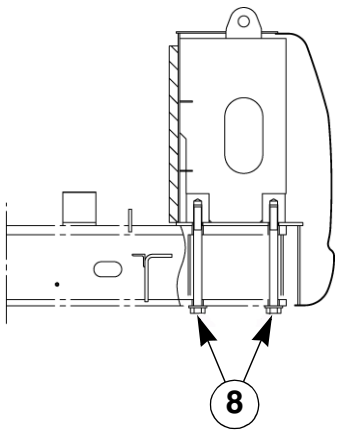
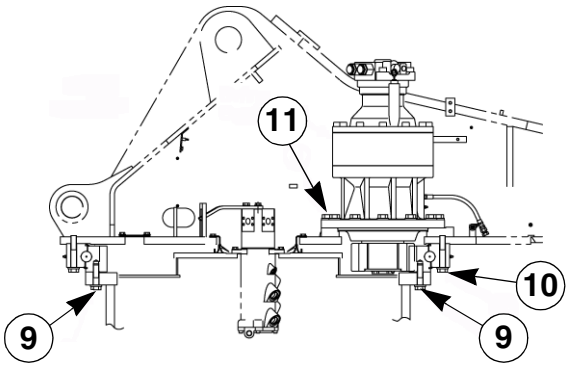


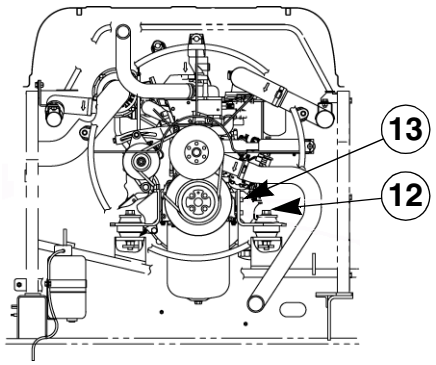
CS01N970



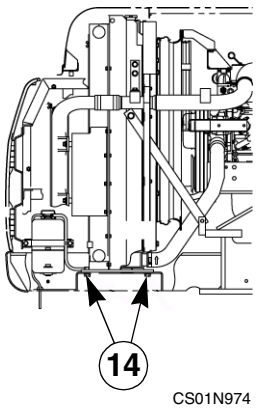
CS01N971



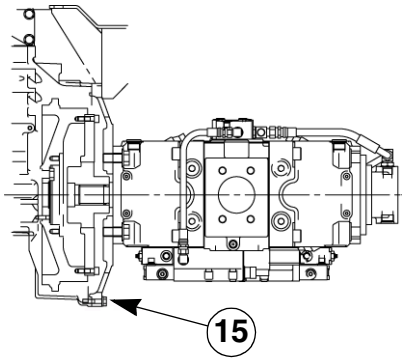
CS01N972



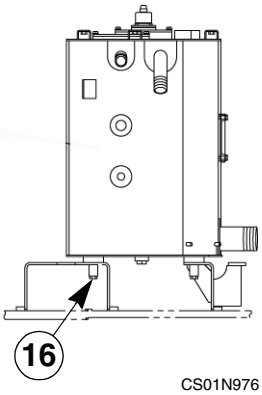
CS01N973



CS01N974



CS01N975



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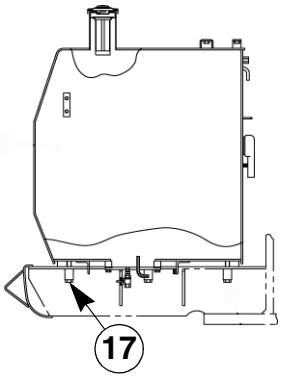

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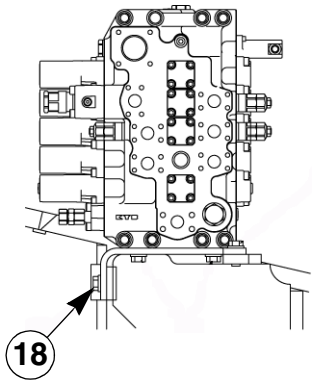
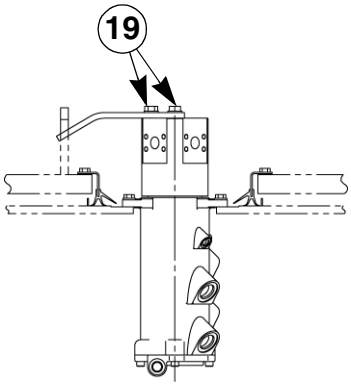


CS01N978



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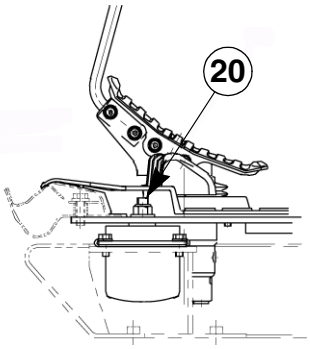
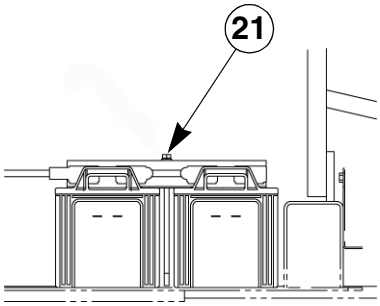
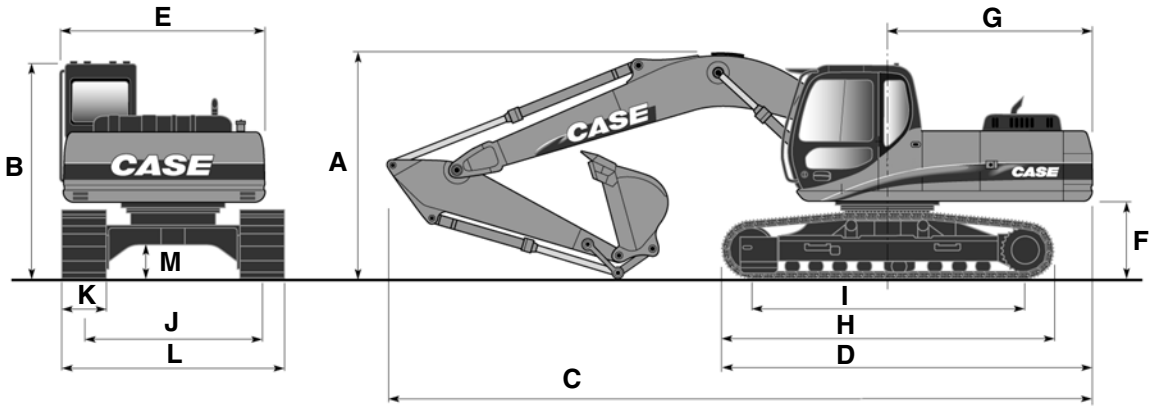


CS01N980



CS01N981

MACHINE OVERALL DIMENSIONS



CS01B533

	CX330				CX350		
	Dippers				Dippers		
	2.20 m	**2.60 m**	**3.20 m**	**4.00 m**	**2.20 m**	**2.65 m**	**3.25 m**
A	3.60 m	3.53 m	3.29 m	3.,51 m	3.57 m	3.53 m	3.29 m
B	3.13 m	3.13 m	3.13 m	3.13 m	3.13 m	3.13 m	3.13 m
C	11.25 m	11.13 m	11.05 m	11.09 m	11.25 m	11.13 m	11.05 m
D	5.91 m	5.91 m	5.91 m	5.91 m	5.91 m	5.91 m	5.91 m
E	3.04 m	3.04 m	3.04 m	3.04 m	3.04 m	3.04 m	3.04 m
F	1.21 m	1.21 m	1.21 m	1.21 m	1.21 m	1.21 m	1.21 m
G	3.45 m	3.45 m	3.45 m	3.45 m	3.42 m	3.42 m	3.42 m
H	4.98 m	4.98 m	4.98 m	4.98 m	4.98 m	4.98 m	4.98 m
I	4.04 m	4.04 m	4.04 m	4.04 m	4.04 m	4.04 m	4.04 m
J	2.60 m	2.60 m	2.60 m	2.60 m	2.60 m	2.60 m	2.60 m
K	0.60 m	0.60 m	0.60 m	0.60 m	0.60 m	0.60 m	0.60 m
L (with 600 mm track pads)	3.20 m	3.20 m	3.20 m	3.20 m	3.20 m	3.20 m	3.20 m
L (with 700 mm track pads)	3.30 m	3.30 m	3.30 m	3.30 m	3.30 m	3.30 m	3.30 m
L (with 800 mm track pads)	3.40 m	3.40 m	3.40 m	3.40 m	3.40 m	3.40 m	3.40 m
L (with 900 mm track pads)	3.50 m	3.50 m	3.50 m	3.50 m	-----	-----	-----
M	0.48 m	0.48 m	0.48 m	0.48 m	0.48 m	0.48 m	0.48 m

Section

2000

REMOVAL AND INSTALLATION OF THE ENGINE

March 2002

TABLE OF CONTENTS

SPECIFICATION

Weight of engine..... See Section 1002

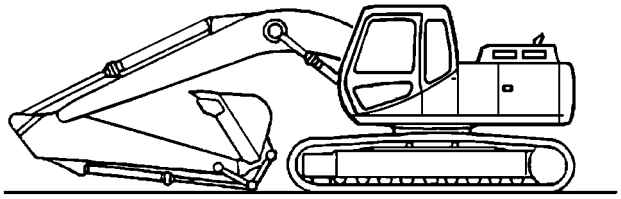
TORQUE SETTING

Retaining screw of the engine ..... 313 ± 25 Nm

ENGINE

Removal and installation

STEP 1



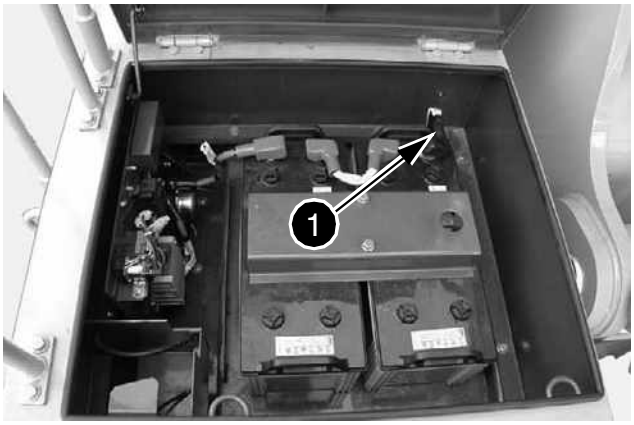
JS00163A

Park the machine on hard, flat ground. Lower the attachment to the ground.

STEP 2

Release pressure in the hydraulic system and in the hydraulic reservoir (see Section 8000).

STEP 3



CD01C162

Disconnect the battery ground (-) cable (1) from the battery.

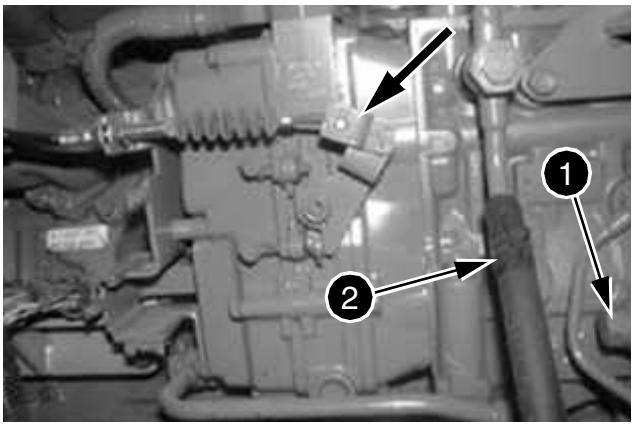
STEP 4

Refer to Section 8003 and remove the hydraulic pump.

STEP 5

Refer to Section 2001 and remove the radiator and oil-cooler assembly.

STEP 6

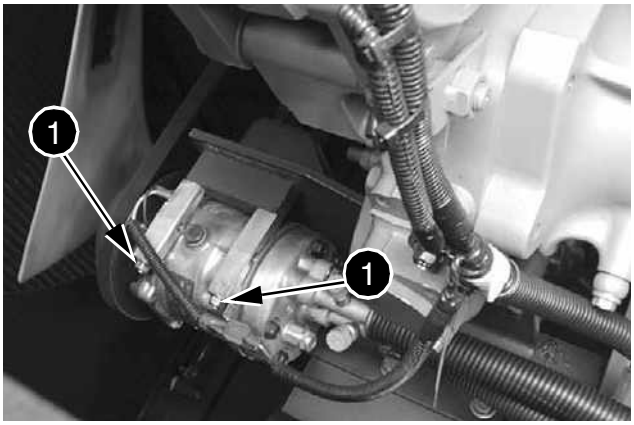


CD02C151

Remove the engine shutdown control (arrow).

Disconnect the fuel supply pipe (1) and the fuel return pipe (2) and plug them.

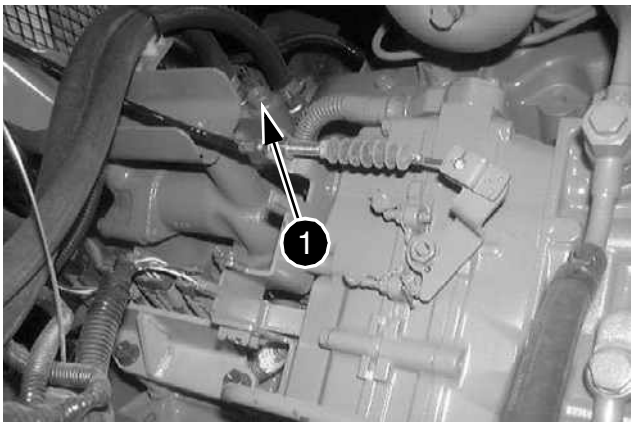
STEP 7



CD01D131

Remove the screws (1) from the compressor and put it away from the engine.

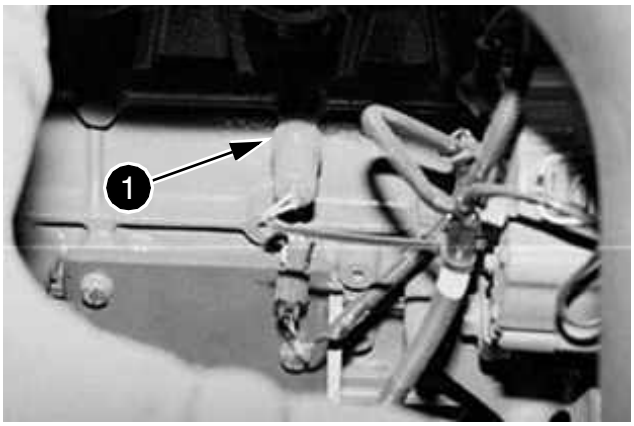
STEP 8



CD02C152

Label and disconnect the electrical connections from the water temperature sensor (1).

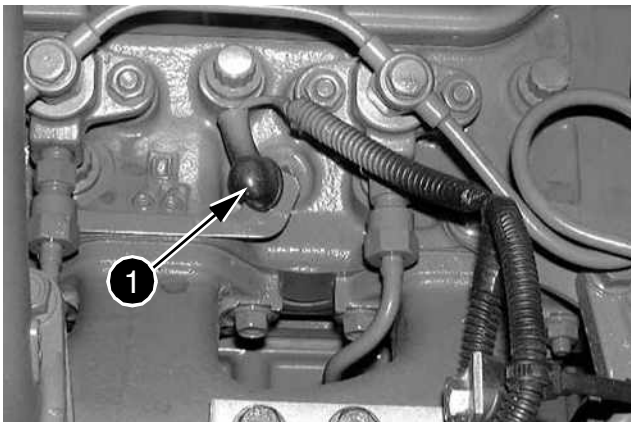
STEP 9



CD02C153

Label and disconnect the electrical connections from the oil pressure sensor (1).

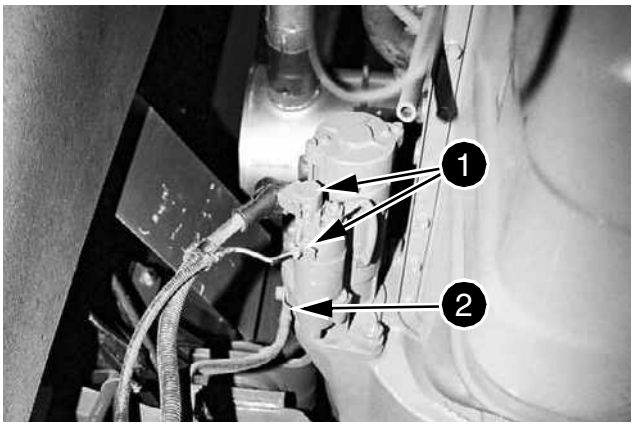
STEP 10



CD00J030

Label and disconnect the electrical supply (1) to the pre-heating plugs.

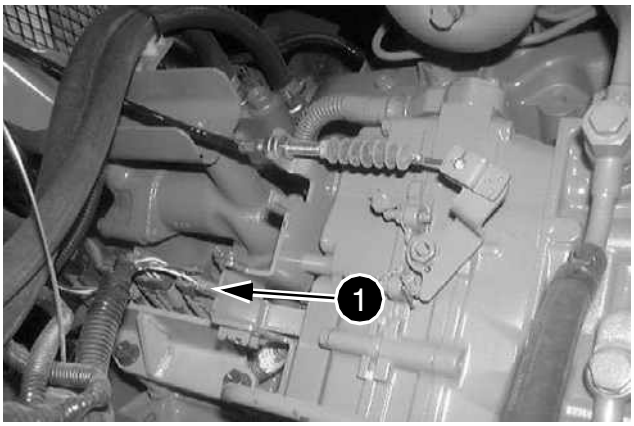
STEP 11



CD02C154

Label and disconnect the electrical connections to the starter motor (1). Remove the earth cable (2) at the engine end.

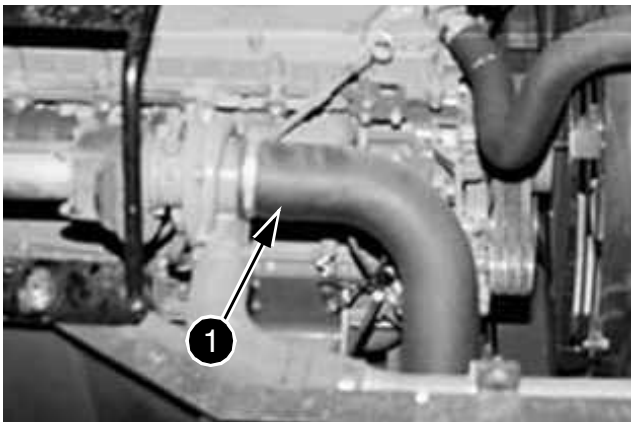
STEP 12



CD02C152

Label and disconnect the electrical connections of the electronic regulation (1) from the engine.

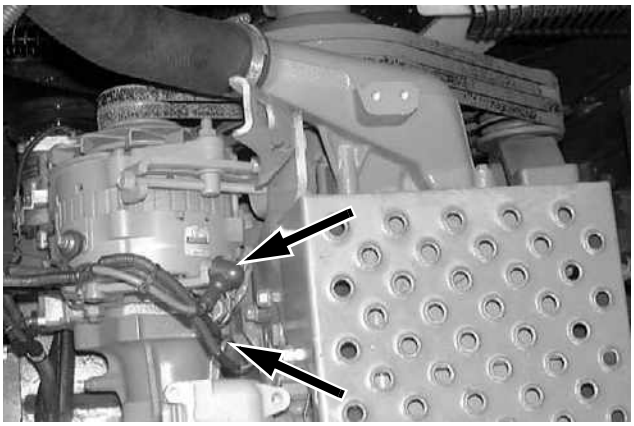
STEP 13



CD02C155

Remove the hose connecting the turbo-charger to the air filter (1).

STEP 14



CD01M004

Label and disconnect the electrical connections to the alternator (arrows).

STEP 15

Remove all the clips, etc, which fasten the electrical harnesses to the engine and move the harnesses out of the way.

STEP 16

Install a suitable lifting device on the engine lifting rings (for the weight of the engine, see Section 1002).

STEP 17

Remove the engine retaining hardware.

NOTE: *When installing, make a visual inspection of the condition of the rubber flexible mountings and change them if necessary. Respect the colours, light blue on the fan side, light green on the hand-wheel side. Tighten the engine retaining screws to a torque of 313 ± 25 Nm.*

STEP 18

When there is nothing interfering with the removal of the engine, raise the engine carefully and install it on a suitable repair bench.

NOTE: *When installing the engine in the machine, proceed in the reverse order from removal.*

Before operating the machine, carry out the following operations:

- Bleed and prime the fuel system (see Operator's Manual).
- Fill and bleed the engine cooling system (see Operator's Manual).
- Check the hydraulic, fuel and cooling systems for leaks.
- Check the oil level in the hydraulic reservoir. Top up if necessary.

NOTES