

Document Title: Product plates	Function Group: 000	Information Type: Service Information	Date: 2014/4/12
Profile: CEX, EC60C [GB]			

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Product plates

When ordering spare parts, and in all telephone enquiries or correspondence the model designation and the Product Identification Number (PIN) must always be quoted.

Product plate

The product plate on the machine shows the manufacturer's name and address, model designation, PIN, machine weight, engine output, production year and year of delivery. There is also room for the CE mark. The plate is positioned under the boom on the superstructure frame.

Engine

The engine product plate contains type designation and part and serial numbers and is positioned on the engine inside the rear engine cover on the right side of the machine.

Attachment quick coupler

The attachment quick coupler nameplate is attached on the outside of the attachment quick coupler. (shows part number and weight)

Bucket

The bucket nameplate is attached on the top of the bucket. (shows the bucket model order No, Serial number, bucket part number, rated capacity, weight, cutting width, tooth part number and adapted part number)

Cab

The nameplate is attached on the inside of the cab and indicates the product number, serial number, model type, and weight.

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Product plates

The following illustrations and descriptions show the product plates on the machine. When ordering spare parts or for short enquiries by phone and in correspondence you should always specify model designations and product identification number.

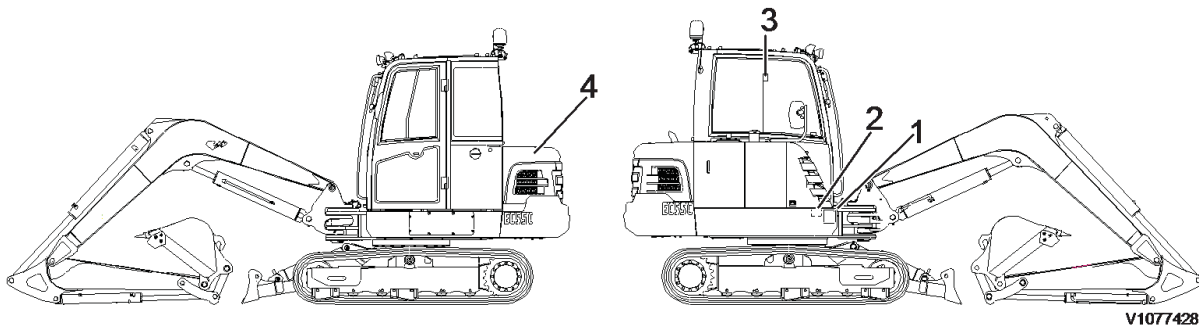


Figure 1

Product Identification plate (PIN)

The product plate contains name and address of manufacturer, model/type designation and 17 digit PIN number.

Supplementary PIN plate (EU countries only)

V	C	E	E	C	3	5	C	C	0	0	0	1	2	3	4	5
A		B			C		D									

V1076896

Figure 2

Example of 17 digit PIN number on PIN plate

- A. World Manufacturing Code
- B. Machine description
- C. Check letters
- D. Serial number

The supplementary plate contains information about machine mass in kg, engine net power in Kw, manufacturing year, machine serial number and a CE-mark.

Machine mass

The machine mass in kg on the supplementary PIN plate is based on:

- cab or canopy
- most used track type
- most usual bucket (without load)
- full fuel tank

For safety reasons, 103 % of the machine mass will be shown on the supplementary PIN plate.

Cab identification plate

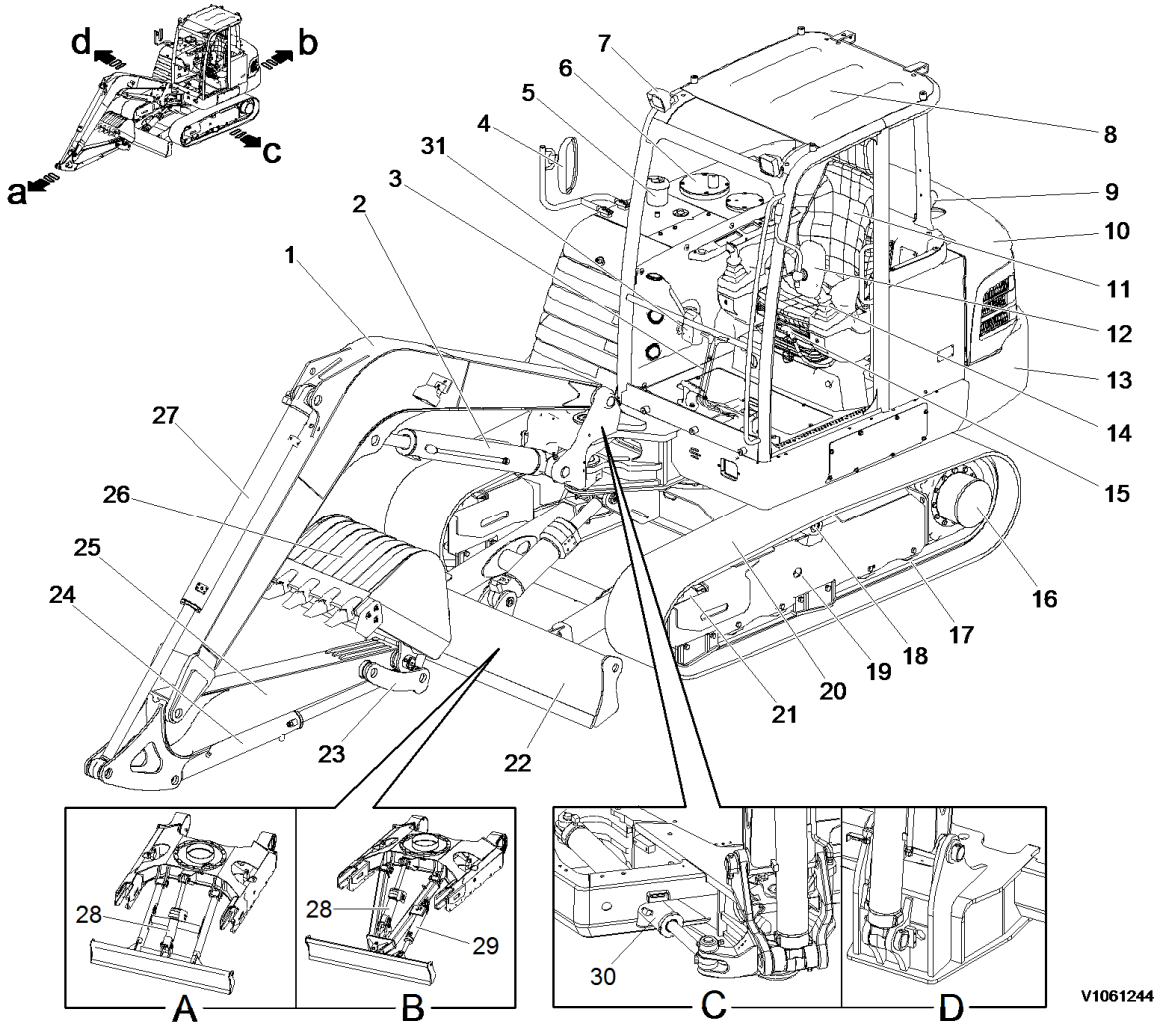
The plate contains information about product number, machine model, cab serial number, ROPS/TOPS certificate number, max. machine mass and international standard.

Engine identification plate

The engine identification plate contains information about manufacturer, designation and engine serial number.

Document Title: Component locations	Function Group: 000	Information Type: Service Information	Date: 2014/4/12
Profile: CEX, EC60C [GB]			

Component locations



V1061244

Figure 1
Position of components

- | | |
|----------------------------|--------------------------------------|
| A Fixed type (dozer blade) | a Front |
| B Angle type (dozer blade) | b Rear |
| C Boom slewing type | c Left |
| D Boom fixed type | d Right |
| 1 Boom | 17 Bottom roller |
| 2 Boom cylinder | 18 Top roller |
| 3 Travel lever (pedal) | 19 Track tension adjustment position |
| 4 Rear mirror (right) | 20 Tracks |
| 5 Fuel tank | 21 Idler |
| 6 Hydraulic tank | 22 Dozer blade |

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- 7 Working lights
- 8 Cab
- 9 Muffler
- 10 Bonnet
- 11 Operator's seat
- 12 Rear mirror (left)
- 13 Counterweight
- 14 Control lever
- 15 Control lock-out lever (safety locking lever)
- 16 Track motor and gearbox
- 23 Link
- 24 Bucket cylinder
- 25 Dipper arm
- 26 Bucket
- 27 Dipper arm cylinder
- 28 Dozer blade cylinder
- 29 Angle cylinder (dozer blade)
- 30 Slewing cylinder (boom)
- 31 Instrument panel

Document Title: Measurement conversion tables	Function Group: 030	Information Type: Service Information	Date: 2014/4/12
Profile: CEX, EC60C [GB]			

Measurement conversion tables

Length

Unit	cm	m	km	in	ft	yd	mile
cm	1	0.01	0.00001	0.3937	0.03281	0.01094	0.000006
m	100	1	0.001	39.37	3.2808	1.0936	0.00062
km	100000	1000	1	39370.7	3280.8	1093.6	0.62137
in	2.54	0.0254	0.000025	1	0.08333	0.02777	0.000015
ft	30.48	0.3048	0.000304	12	1	0.3333	0.000189
yd	91.44	0.9144	0.000914	36	3	1	0.000568
mile	160930	1609.3	1.6093	63360	5280	1760	1

1 mm = 0.1 cm, 1 mm = 0.001 m

Area

Unit	cm2	m2	km2	a	ft2	yd2	in2
cm2	1	0.0001	-	0.000001	0.001076	0.000012	0.155000
m2	10000	1	0.000001	0.01	10.764	1.1958	1550.000
km2	-	1000000	1	10000	1076400	1195800	-
a	0.01	100	0.0001	1	1076.4	119.58	-
ft2	-	0.092903	-	0.000929	1	0.1111	144.000
yd2	-	0.83613	-	0.008361	9	1	1296.00
in2	6.4516	0.000645	-	-	0.006943	0.000771	1

1 ha = 100 a, 1 mile² = 259 ha = 2.59 km²

Volume

Unit	cm3 = cc	m3	Liter	in3	ft3	yd3
cm3 = m liter	1	0.000001	0.001	0.061024	0.000035	0.000001
m3	1000000	1	1000	61024	35.315	1.30796
Liter	1000	0.001	1	61.024	0.035315	0.001308
in3	16.387	0.000016	0.01638	1	0.000578	0.000021
ft3	28316.8	0.028317	28.317	1728	1	0.03704
yd3	764529.8	0.76453	764.53	46656	27	1

1 gal(US) = 3785.41 cm³ = 231 in³ = 0.83267 gal(US)

Weight

Unit	g	kg	t	oz	lb
g	1	0.001	0.000001	0.03527	0.0022
kg	1000	1	0.001	35.273	2.20459

t	1000000	1000	1	35273	2204.59
oz	28.3495	0.02835	0.000028	1	0.0625
lb	453.592	0.45359	0.000454	16	1
1 tonne(metric) = 1.1023 ton(US) = 0.9842 ton(UK)					

Pressure

Unit	kgf/cm ²	bar	Pa=N/m ²	kPa	lbf/in ²	lbf/ft ²
kgf/cm ²	1	0.98067	98066.5	98.0665	14.2233	2048.16
bar	1.01972	1	100000	100	14.5037	2088.6
Pa=N/m ²	0.00001	0.001	1	0.001	0.00015	0.02086
kPa	0.01020	0.01	1000	1	0.14504	20.886
lbf/in ²	0.07032	0.0689	6894.76	6.89476	1	144
lbf/ft ²	0.00047	0.00047	47.88028	0.04788	0.00694	1
1 kgf/cm ² = 735.56 Torr(mmHg) = 0.96784 atm						

Approximate conversions

SI	Conversion	Non-SI	Conversion	SI
Unit	Factor	Unit	Factor	Unit
Torque				
newton meter (N·m)	x 10.2	= kgf·cm	x 0.8664	= (lbf·in)
newton meter (N·m)	x 0.74	= lb·ft	x 1.36	= N·m
newton meter (N·m)	x 0.102	= kgf·m	x 7.22	= (lbf·ft)
Pressure (Pa = N/m²)				
kilopascal (kPa)	x 4.0	= in. H ₂ O	x 0.249	= kPa
kilopascal (kPa)	x 0.30	= in. Hg	x 3.38	= kPa
kilopascal (kPa)	x 0.145	= psi	x 6.89	= kPa
(bar)	x 14.5	= psi	x 0.069	= (bar)
(kgf/cm ²)	x 14.22	= psi	x 0.070	= (kgf/cm ²)
(newton/mm ²)	x 145.04	= psi	x 0.069	= (bar)
megapascal (MPa)	x 145	= psi	x 0.00689	= MPa
Power (W = J/s)				
kilowatt (kW)	x 1.36	= PS (cv)	x 0.736	= kW
kilowatt (kW)	x 1.34	= HP	x 0.746	= kW
kilowatt (kW)	x 0.948	= Btu/s	x 1.055	= kW
watt (W)	x 0.74	= ft·lb/s	x 1.36	= W
Energy (J = N·m)				
kilojoule (kJ)	x 0.948	= Btu	x 1.055	= kJ
joule (J)	x 0.239	= calorie	x 4.19	= J
Velocity and Acceleration				
meter per sec ² (m/s ²)	x 3.28	= ft/s ²	x 0.305	= m/s ²
meter per sec (m/s)	x 3.28	= ft/s	x 0.305	= m/s
kilometer per hour (km/h)	x 0.62	= mph	x 1.61	= km/h
Horse power/torque				
BHP x 5252 rpm = TQ (lb·ft)			TQ x rpm 5252 = B.H.P.	
Temperature				
°C = (°F - 32) / 1.8		°F = (°C x 1.8) + 32		
Flow Rate				

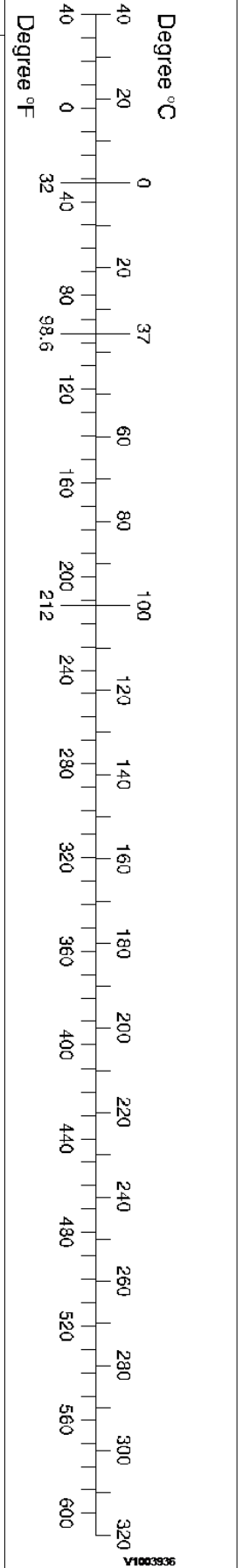
liter/min (dm³/min)

x 0.264

= US gal/min x 3.785

= liter/min

Note: () non-si unit



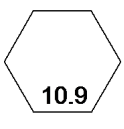
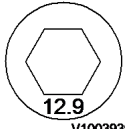


Document Title: Standard tightening torques	Function Group: 030	Information Type: Service Information	Date: 2014/4/12
Profile: CEX, EC60C [GB]			

Standard tightening torques

The following charts give the standard tightening torques of screws and nuts. Exceptions are given in each sections of "disassembly and assembly".

Tightening torque (meter)

Classification		4.8T			8.8T			10.9T, 12.9T		
Screw type		 V1003937			 V1003938			  V1003939		
Screw size		Tightening torque			Tightening torque			Tightening torque		
mm	inch	N m	kgf m	lbf ft	N m	kgf m	lbf ft	N m	kgf m	lbf ft
M 4	0.15	1.96 ±0.19	0.2 ±0.02	1.4 ±0.1	-	-	-	3.92 ±0.39	0.4 ±0.04	2.9 ±0.3
M 5	0.19	2.94 ±0.29	0.3 ±0.03	2.2 ±0.2	5.88 ±0.59	0.6 ±0.06	4.3 ±0.4	7.84 ±0.78	0.8 ±0.08	5.8 ±0.6
M 6	0.23	4.90 ±0.49	0.5 ±0.05	3.6 ±0.4	9.8 ±0.98	1.0 ±0.10	7.2 ±0.7	13.72 ±1.37	1.4 ±0.14	10.1 ±1
M 8	0.31	11.76 ±1.17	1.2 ±0.12	8.7 ±0.9	23.541 ±2.35	2.4 ±0.24	17.3 ±1.7	32.36 ±2.94	3.3 ±0.3	23.8 ±2.2
M 10	0.39	22.55 ±2.25	2.3 ±0.23	16.6 ±1.7	48.05 ±4.9	4.9 ±0.5	35.4 ±3.6	63.74 ±6.86	6.5 ±0.7	46.9 ±5.1
M 12	0.46	39.22 ±3.92	4.0 ±0.4	29 ±3	85.32 ±8.83	8.7 ±0.9	62.8 ±6.5	110.81 ±10.78	11.3 ±1.1	81.6 ±7.9
M 14	0.55	62.7 ±5.88	6.4 ±0.6	46 ±4	140.24 ±13.73	14.3 ±1.4	103.2 ±10.1	175.53 ±17.65	17.9 ±1.8	129.2 ±13
M 16	0.62	93.16 ±8.82	9.5 ±0.9	69 ±6	219.67 ±21.57	22.4 ±2.2	161.7 ±15.9	261.83 ±26.47	26.7 ±2.7	192.8 ±19.5
M 18	0.71	132.3 ±13.72	13.5 ±1.4	97 ±10	290.28 ±29.42	29.6 ±3.0	213.7 ±21.7	372.65 ±37.26	38.0 ±3.8	274.4 ±27.4
M 20	0.78	182.40 ±18.63	18.6 ±1.9	134 ±14	430.51 ±43.14	43.9 ±4.4	317.0 ±31.8	511.90 ±50.99	52.2 ±5.2	376.9 ±37.5
M 22	0.87	242.22 ±24.51	24.7 ±2.5	178 ±18	579.57 ±57.85	59.1 ±5.9	426.7 ±42.6	680.58 ±67.66	69.4 ±6.9	501.1 ±49.8
M 24	0.94	314.79 ±31.38	32.1 ±3.2	232 ±23	740.40 ±73.54	75.5 ±7.5	545.1 ±54.2	884.56 ±88.25	90.2 ±9.0	651.2 ±65
M 30	1.17	613.80 ±61.78	62.6 ±6.3	452 ±45	-	-	-	1726.95 ±172.59	176.1 ±17.6	1271.4 ±127.1
M 36	1.40	1061.08 ±105.91	108.2 ±10.8	781 ±78	-	-	-	2984.16 ±298.12	304.3 ±30.4	2197 ±219.5
M 42	1.65	1684.78 ±168.67	171.8 ±17.2	1240 ±124	-	-	-	4738.57 ±473.66	483.2 ±48.3	3488.7 ±348.7
M 45	1.77	2072.15 ±206.92	211.3 ±21.1	1525 ±152	-	-	-	5828.09 ±582.51	594.3 ±59.4	4290.9 ±428.9

Tightening torque (inch)

Classification		4.8T			8.8T			10.9T, 12.9T		
Screw size		Tightening torque			Tightening torque			Tightening torque		
mm	inch	N m	kgf m	lbf ft	N m	kgf m	lbf ft	N m	kgf m	lbf ft
1/4	6.35	9.80 ±0.98	0.6 ±0.06	4.3 ±0.4	23.53 ±2.35	1.0 ±0.1	7.2 ±0.7	16.67 ±1.96	1.7 ±0.2	12.2 ±1.2
5/16	7.94	11.76 ±1.17	1.2 ±0.12	8.7 ±0.8	19.61 ±1.96	2.0 ±0.2	14.4 ±1.4	29.42 ±2.94	3.0 ±0.3	21.7 ±2.2
3/8	9.53	19.61 ±1.96	2.0 ±0.20	14.4 ±1.4	40.20 ±3.92	4.1 ±0.4	29.6 ±2.9	54.91 ±4.90	5.6 ±0.5	40 ±4
7/16	11.11	31.38 ±3.13	3.2 ±0.32	23 ±2	59.82 ±5.88	6.1 ±0.6	44.0 ±4.3	87.27 ±8.82	8.9 ±0.9	64 ±6
1/2	12.70	46.09 ±4.60	4.7 ±0.47	34 ±3	100.02 ±9.80	10.2 ±1.0	73.6 ±7.2	131.40 ±12.74	13.4 ±1.3	97 ±10
9/16	14.29	66.68 ±6.66	6.8 ±0.68	50 ±5	140.23 ±13.72	14.3 ±1.4	103.2 ±10.1	186.32 ±18.63	19.0 ±1.9	137 ±14
5/8	15.88	91.20 ±9.12	9.3 ±0.93	67 ±7	200.05 ±19.61	20.4 ±2.0	147.3 ±14.4	255.95 ±25.49	26.1 ±2.6	190 ±19
3/4	19.05	156.90 ±15.69	16.0 ±1.60	115 ±15	-	-	-	442.28 ±44.12	45.1 ±4.5	325 ±33
7/8	22.22	250.07 ±25.00	25.5 ±2.55	185 ±19	-	-	-	702.15 ±70.60	71.6 ±7.2	520 ±52
1	25.40	372.65 ±37.26	38.0 ±3.80	275 ±27	-	-	-	1048.33 ±104.93	106.9 ±10.7	770 ±77
1 1/8	28.58	530.54 ±53.05	54.1 ±5.41	390 ±39	-	-	-	1492.57 ±149.06	152.2 ±15.2	1100 ±110
1 1/4	31.75	727.65 ±72.76	74.2 ±7.42	535 ±54	-	-	-	2048.61 ±204.95	208.9 ±20.9	1510 ±151
1 3/4	34.93	968.89 ±96.88	98.8 ±9.88	710 ±71	-	-	-	2724.29 ±272.62	277.8 ±27.8	2000 ±200
1 1/2	38.1	1257.21 ±125.72	128.2 ±12.82	925 ± 93	-	-	-	3537.26 ±354.02	360.7 ±36.1	2600 ±260

NOTE!

This torque table does not apply to screws with nylon packings or where nonferrous metal washers are to be used, or which require tightening to a different specified torque, or tightening procedure.

NOTE!

N m (Newton meter): 1 N m ≅ 0.1 kgf m

Tightening torque of split flange screws

Use these torques for split flange screws.

Tightening torque (split flange screws)

Thread diameter of screw (mm)	Width across flats (mm)	Tightening torque		
		N m	kgf m	lbf ft
10	14	65.7 ±6.8	6.7 ±0.7	48.4 ±5
12	17	112 ±9.8	11.5 ±1	83 ±8
16	22	279 ±29	28.5 ±3	206 ±20

Tightening torque for hydraulic plugs with O-ring

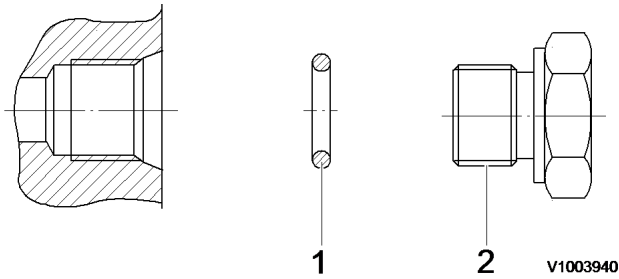


Figure 1
Hydraulic plugs with O-ring

1. O-ring
2. Plug

Pf thread

Tightening torque (hydraulic plugs)

Thread	Plug part No.	Tightening torque N m	Tightening torque kgf m	Tightening torque lbf ft
1/8	9415-11012	24.51 ±1.96	2.5 ±0.2	18 ±1.4
1/4	9415-11022	49.03 ±4.90	5.0 ±0.5	36 ±3.6
3/8	9415-11032	73.54 ±4.90	7.5 ±0.5	54 ±3.6
1/2	9415-11042	107.87 ±9.80	11.0 ±1.0	79 ±7
3/4	9415-11052	176.52 ±9.80	18.0 ±1.0	130 ±7
1	9415-11062	205.94 ±19.61	21.0 ±2.0	152 ±14

Tightening torque for swivel nut fitting with O-ring

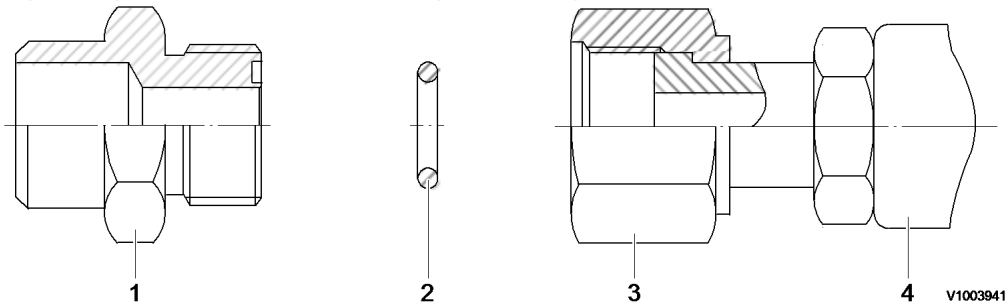


Figure 2
Swivel nut fitting with O-ring

1. Connector
2. O-ring
3. Swivel nut
4. Hose

Tightening torque for swivel nut fitting

Tube outer diameter (in)	Thread size (in)	Tightening torque, N m	Tightening torque, kgf m	Tightening torque, lbf ft
1/2	UN 13/16 – 16	93.16 ±9.31	9.5 ±0.95	69 ±7
3/4	UN 1 3/16 – 12	176.52 ±17.65	18 ±1.8	130 ±13
1	UN 1 7/16 – 12	205.94 ±20.59	21 ±2.1	152 ±15

Document Title: Service positions	Function Group: 091	Information Type: Service Information	Date: 2014/4/12
Profile: CEX, EC60C [GB]			

Service positions

Park the machine on a horizontal and firm surface.

The suitable position is indicated in the description for the various service jobs.

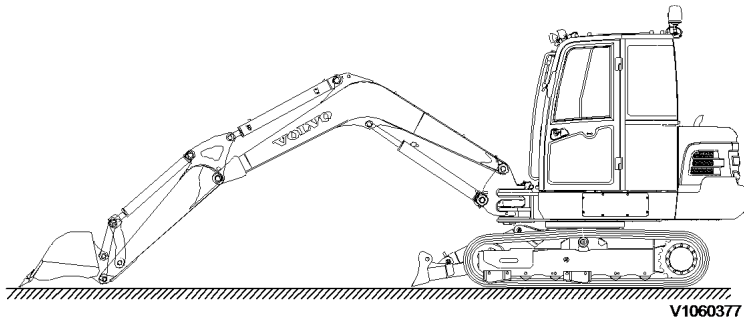


Figure 1
Service position A

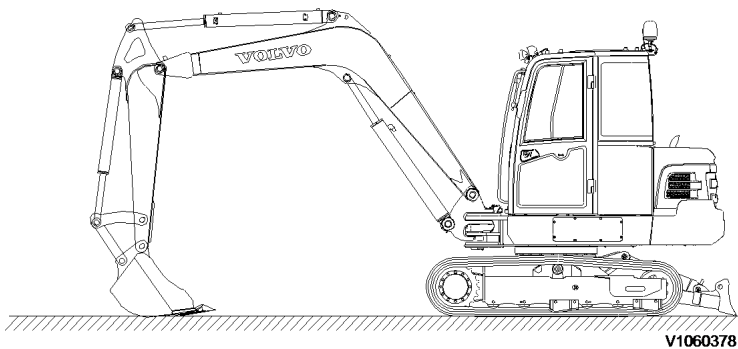


Figure 2
Service position B

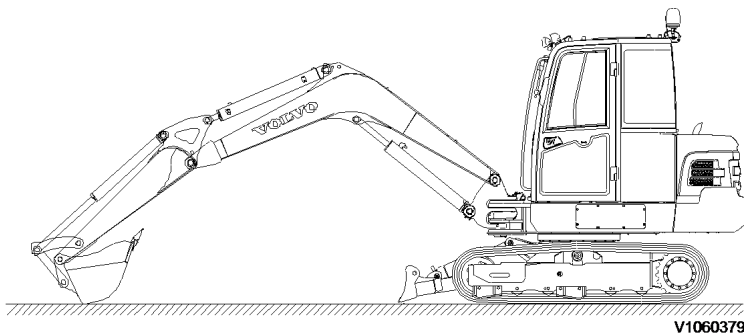


Figure 3
Service position C

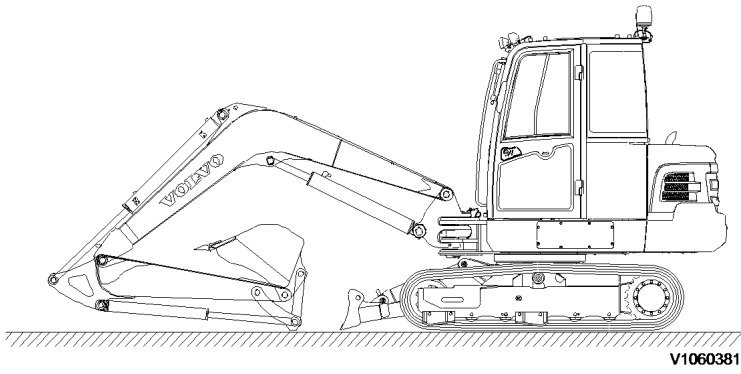


Figure 4
Service position D

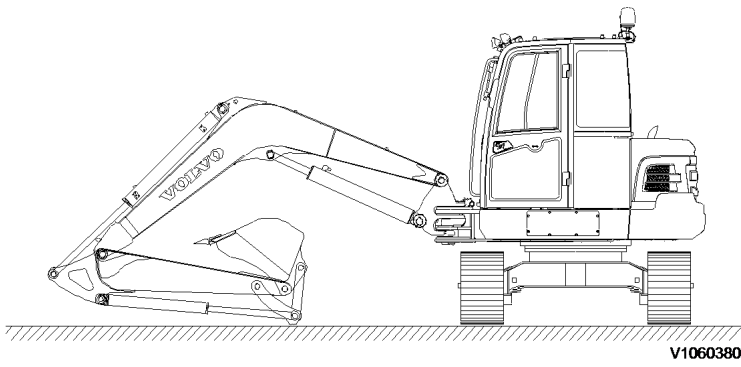


Figure 5
Service position E

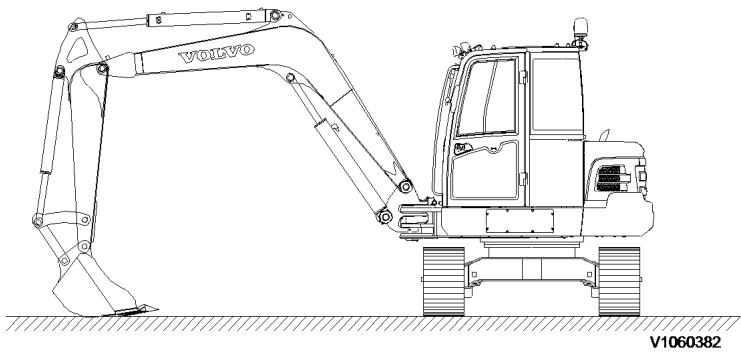


Figure 6
Service position F

Document Title: General precautions	Function Group: 191	Information Type: Service Information	Date: 2014/4/11
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General precautions

WARNING

For safety, observe the following rules.

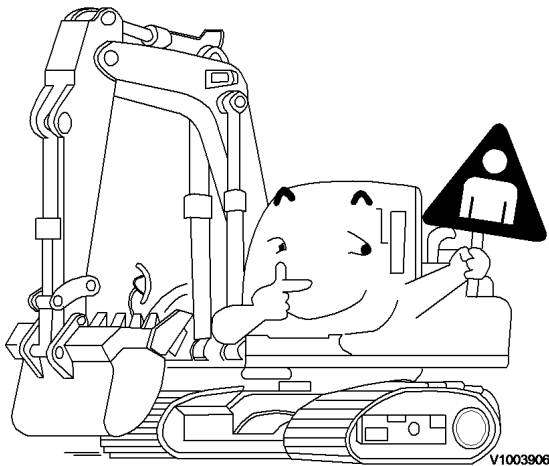


Figure 1
Keep the safety rules

Safety precautions

- When carrying out any operation or maintenance, have trained and experienced personnel carry out the work.
- When carrying out any operation or maintenance, carefully read the Operator's manual.
Read all the precautions given on the decals which are fixed to the machine.

Safety device

- Make sure that all guards and covers are mounted in their proper position. Repair or replace if damaged.
- Pay attention to the method of using any safety locking device or safety belt.

Safety clothes and hard hat

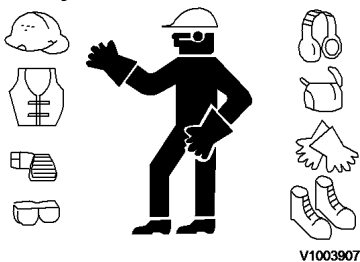


Figure 2
Wear clothes suitable for welding work

- Wear the specified work clothes in the correct manner.

- Use the specified protective gear (hard hat, safety glasses, safety shoes, mask, gloves). Guard against injury from flying pieces of metal or debris, wear goggles, gloves and helmet. Always have a trained and experienced welder carry out any welding work. When carrying out welding work, always wear welding gloves, apron, glasses, cap and other clothes suitable for welding work.

Prepare for emergencies

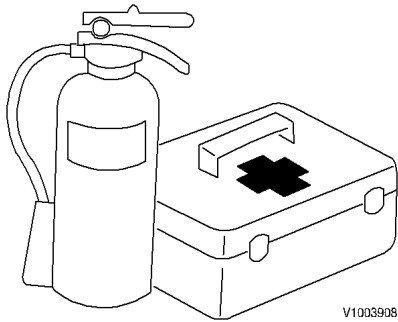


Figure 3
Prepare for emergencies

- Know where fire extinguishers are located and how to use them.
- Keep a first aid kit and an eye wash kit near the work area.
- Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

Handle fluids safely-avoid fires



Figure 4
Avoid fires

- Handle fuel with care. It is highly flammable.
- Do not refuel the machine while smoking or when near open flame or sparks. Always stop the engine before refuelling machine. Fill the fuel tank outdoors.
- Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Dispose of fluids properly

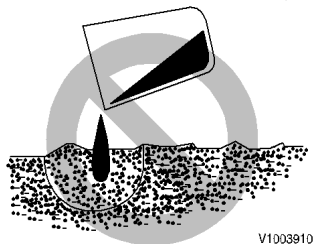


Figure 5

Do not pour oil into the ground

- Improperly disposing of fluids can harm the environment and ecology. Before draining any fluids, find out the proper way to dispose of waste from your local environmental agency.
- Catch draining fuel, oil, or other fluids in suitable containers.
Do not use food or beverage containers that may mislead someone into drinking from them. Wipe up spills at once.
- Do not pour oil into the ground, down a drain, or into a stream, pond, or lake.
Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, filters, batteries, and other harmful waste.

Working in contaminated environment



Figure 6

Avoid breathing dust

- Used cab and engine air filters from machines which operate in environments containing asbestos or other dangerous dust must be placed in the tight-fitting bag, before they are deposited in a designated place.
- The machine must be equipped for work within an environment which is contaminated or constitutes a health hazard before the work is initiated. Besides, special local regulations apply for such operations and for servicing a machine which has been used in such environment.

Document Title: Safety concerns everybody!	Function Group: 191	Information Type: Service Information	Date: 2014/4/11
Profile: CEX, EC60C [GB]			

Safety concerns everybody!

Always follow the instructions in the machine's Operator's Manual.

The Operator's Manual shall **always** be easily accessible in the cab.

Volvo designs and manufactures machines with a high level of safety as well as effectiveness. All this work may be wasted if anyone who is about to perform service on any of our machines does not read the safety instructions, or does not follow them, e.g., does not replace guards, climbs on slippery machine parts instead of using a ladder, grabs a hold of hoses instead of handles or uses the wrong tools for the job.

Always use the intended and adapted genuine Volvo spare parts for the machine in question to maintain safe and efficient function.

Machines seldom cause accidents, instead people often do.

A safety-conscious person and a well-maintained machine make for a safe, effective and profitable combination.

Those who do not follow the safety instructions and observe the warnings in this manual must make sure that their work method is safe. Otherwise, there is a great risk of accidents, perhaps even accidents that result in fatalities.



WARNING SYMBOL

This symbol appears at various points throughout the manual together with a warning text. It means "Warning, stay alert! Your safety is involved!".

Get to know the capacity and limits of your machine!

Document Title: CE-marking, EMC-directive	Function Group: 191	Information Type: Service Information	Date: 2014/4/11
Profile: CEX, EC60C [GB]			

CE-marking, EMC-directive

CE-marking



Figure 1

(Declaration of conformity, only applies to machines marketed within the EU/EEA).

This machine is CE-marked. This means that, when delivered, the machine meets the applicable "Essential Health and Safety Requirements" specified in EU's so-called Machine Safety Directive, 98/37/EC.

The person making any changes that affect machine safety is also responsible for the same.

As proof that the requirements are fulfilled the machine is supplied with an EU Declaration of Conformity, issued by Volvo CE for every individual machine. This EU declaration also covers attachments manufactured by Volvo CE. The documentation is a valuable document that should be stored in a safe place and retained for at least ten years. **The documentation shall always accompany the machine when it is sold.**

If the machine is used for other purposes or with other attachments than described in this manual, safety must be maintained at all times and in each individual case. The person carrying out such action is also responsible for the action which, in some cases, may require a new CE-marking and the issue of a new EU Declaration of Conformity.

EU EMC Directive

The electronic equipment of the machine may in some cases cause interference with other electronic equipment, or the equipment may be adversely affected by external electromagnetic interference, which may constitute safety risks.

The EU EMC directive on "Electromagnetic conformity" provides a general description of what demands can be made on the machine from a safety perspective, where permitted limits have been determined and given according to international standards.

A machine or device which meets the requirements should be CE-marked. Our machines have been specifically tested for electromagnetic interference. The CE marking of the machine and the declaration of conformity also cover the EMC directive.

If other electronic equipment is fitted to this machine, the equipment must be CE-marked and tested on the machine with regard to electromagnetic interference.

EU's noise directive

Within the EU there is a noise directive stating that a machine may not have noise values that exceed a certain level. The values are indicated on a plate on the outside of the machine. Each machine is also delivered with a noise certificate where Volvo CE assures that the machine fulfills the governing legal requirements. It is important that this certificate accompanies the machine when it is sold.

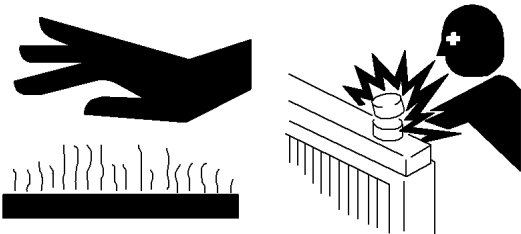
It is also important that no modifications are made to the machine's noise-damping components in order to fulfill the limit values.

Document Title: Cautions during operation	Function Group: 191	Information Type: Service Information	Date: 2014/4/11
Profile: CEX, EC60C [GB]			

Cautions during operation

Service cooling system safely

- At operating temperature, the engine coolant is hot and under pressure. The radiator and all lines to the heaters and engine contain hot coolant. Any contact can cause severe burns.
- Hot coolant can cause personal injury.
- Check the coolant level only after the engine has been stopped and the radiator pressure cap is cool enough to remove with your bare hand.
- Remove the radiator pressure cap slowly to release pressure.
- Cooling system additive contains alkali that can cause personal injury. Avoid contact with the skin, eyes and mouth.
- Allow cooling system components to cool before draining.



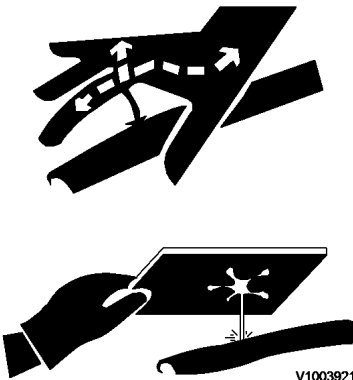
V1003920

Figure 1

Hot coolant can burn you

Avoid high-pressure fluids

- Escaping fluid under pressure can penetrate the skin causing serious injury.
- Avoid the hazard by releasing pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.
- Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks but do not use your bare hand. Protect hands and body from high pressure fluids.
- Be careful not to break, twist or damage the high pressure pipes. A jet spray of high pressure oil can cause electrical fires.



V1003921

Figure 2



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Avoid high pressure fluids

Handling of heavy objects

- When raising heavy components, use a hoist or crane.
- Ensure that wire ropes, chains and hooks are free from damage.
- Always use lifting equipment which has ample capacity.
Install the lifting equipment at the correct places.
- Use a hoist or crane and operate slowly to prevent the component hitting any other part.
- When disassembling or assembling, support the machine with blocks, jacks or stands before starting work.
Never use concrete blocks for supports. They can collapse under even light loads.
- Before starting work, lower the blade, ripper, bucket or any other work equipment to the ground.
- Do not work under the equipment when the equipment is not sufficiently supported.

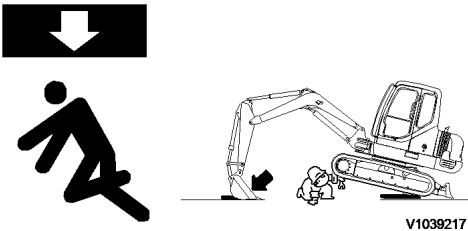


Figure 3
Support the equipment safely

Electrical system

- When welding on the machine or working on the electrical system, ALWAYS turn the master switch (A) STOP position and remove the lead from the battery negative (-) terminal.

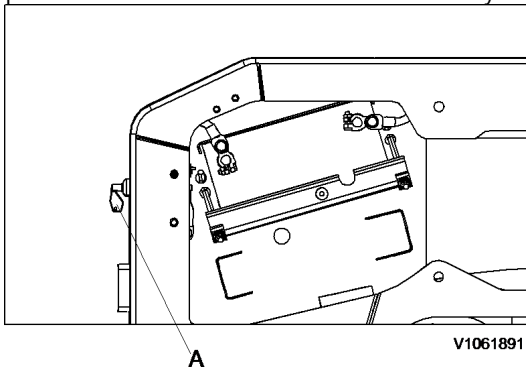


Figure 4

ALWAYS turn the master switch OFF when welding on the machine.

- The battery master switch (A) is installed inside the tool box located on the right side of machine.
— ON position : Turn the key clockwise to supply power to the electrical system.
— OFF position : Turn the key counter-clockwise to cut off electric power to the machine.
- When removing components, be careful not to break or damage the wiring.
Damaged wiring can cause electrical fires.
- When working on the battery, wear goggles or safety glasses.
- Sulphuric acid in battery electrolyte is poisonous.
It is strong enough to burn skin and eat holes in clothing and cause blindness if splashed into the eyes.
If you spill acid on your clothes or skin, immediately flush with large quantities of clean water, then get medical attention.
- If splashed into the eyes, flush with water and get medical attention immediately.
- Keep sparks, lighted matches, and open flame away from the top of battery. Battery (hydrogen) gas can explode.

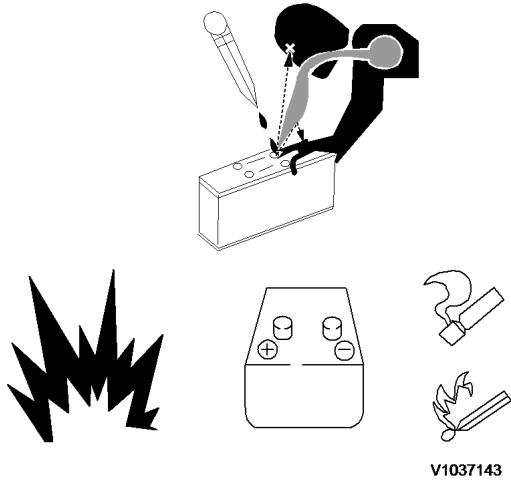


Figure 5
When working on the battery, pay attention

- Battery posts and cables touched by metal objects can short circuit and burn you.
- Keep tools away from posts, wires and terminals.
- Tighten the battery terminals to ensure good contact.
- When disassembling and assembling the battery, make sure that the battery terminals are correctly connected.

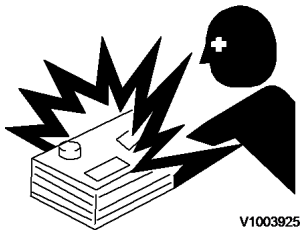


Figure 6
Battery posts and cables can burn you

- If water gets to the electrical system, abnormal operation or failure can result. Do not use water or steam on sensors, connectors and instruments in the cab.

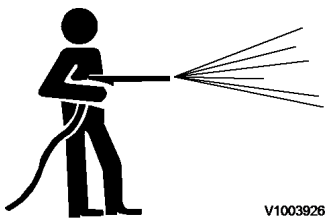


Figure 7
Do not use water or steam in the cab

Cautions during operation

- When removing covers which are under internal pressure or under pressure from a spring, always leave two screws in position on opposite sides. Slowly release the pressure, then slowly loosen the screws.

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