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Construction Equipment

Service Information

Document Title: **Component locations**	Function Group: **000**	Information Type: **Service Information**	Date: **2014/4/11**
Profile: **CEX, EC55B [GB]**			

Component locations

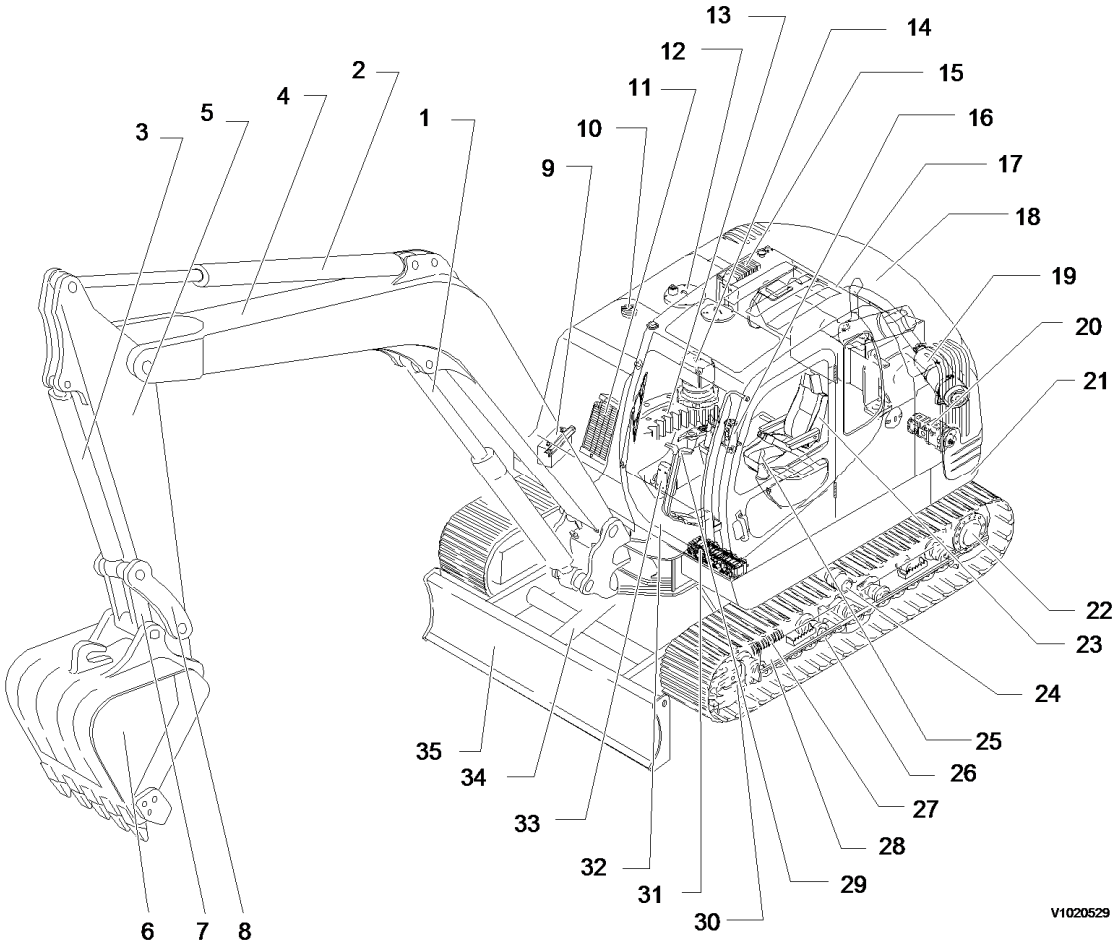

Figure 1
Location of components

1	Boom cylinder	13	Slew ring gear	25	Control lever
2	Arm cylinder	14	Slew motor and gearbox	26	Bottom roller
3	Bucket cylinder	15	Radiator and oil cooler	27	Spring package
4	Boom	16	Center passage	28	Undercarriage
5	Arm	17	Engine	29	Travel lever
6	Bucket	18	Bonnet	30	Idler
7	Link	19	Air cleaner	31	Main control valve
8	Yoke	20	Hydraulic pump	32	Cab
9	Battery	21	Counterweight	33	Instrument panel
10	Fuel tank	22	Track motor and gearbox	34	Dozer blade cylinder
11	Air condenser	23	Operator's seat	35	Dozer blade
12	Hydraulic tank	24	Top roller		

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Service Information

Document Title: **Measurement conversion tables**	Function Group: **030**	Information Type: **Service Information**	Date: **2014/4/11**
Profile: **CEX, EC55B [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

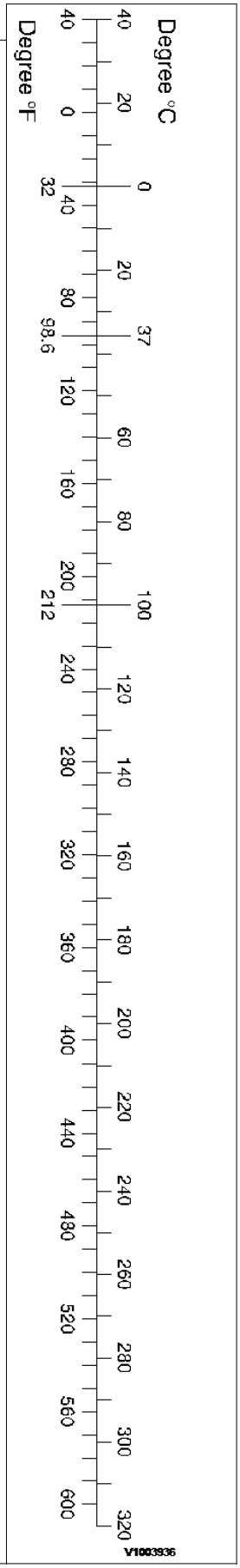
Unit	**kgf/cm2**	**bar**	**Pa=N/m2**	**kPa**	**lbf/in2**	**lbf/ft2**
kgf/cm2	1	0.98067	98066.5	98.0665	14.2233	2048.16
bar	1.01972	1	100000	100	14.5037	2088.6
Pa=N/m2	0.00001	0.001	1	0.001	0.00015	0.02086
kPa	0.01020	0.01	1000	1	0.14504	20.886
lbf/in2	0.07032	0.0689	6894.76	6.89476	1	144
lbf/ft2	0.00047	0.00047	47.88028	0.04788	0.00694	1
1 kgf/cm2 = 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. H2O	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/cm2)	x 14.22	= psi	x 0.070	= (kgf/cm2)
(newton/mm2)	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 sec2 (m/s2)	x 3.28	= ft/s2	x 0.305	= m/s2
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: **Start switch, specifications**	Function Group: **030**	Information Type: **Service Information**	Date: **2014/4/11**
Profile: **CEX, EC55B [GB]**			

Start switch, specifications

Specifications

Item	Specifications
Maximum current	B–BR, B–ACC : 30 A B–R1, B–R2 : 60 A B–C : Momentary 75 A, Continuous 22 A
Insulation resistance	1 MΩ or more (500 V megohmmeter)

Wire specifications

NO.	Specifications
2A	B+, AVS 5.0 Y
3	BR, AVS 3.0 R/W
5	ACC, AVS 3.0 R
23	R2, AVS 5.0 W
7	C, AVS 3.0 R/SB
26	R1, AVS 3.0 R/GN

Document Title:	Function Group:	Information Type:	Date:
Battery disconnector switch, specifications	**030**	**Service Information**	**2014/4/11**
Profile: **CEX, EC55B [GB]**			

Battery disconnector switch, specifications

- Operating voltage: DC 6 ~ 36 V

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Service Information

Document Title: **Tightening torque, specifications**	Function Group: **030**	Information Type: **Service Information**	Date: **2014/4/11**
Profile: **CEX, EC55B [GB]**			

Tightening torque, specifications

Protecting plate

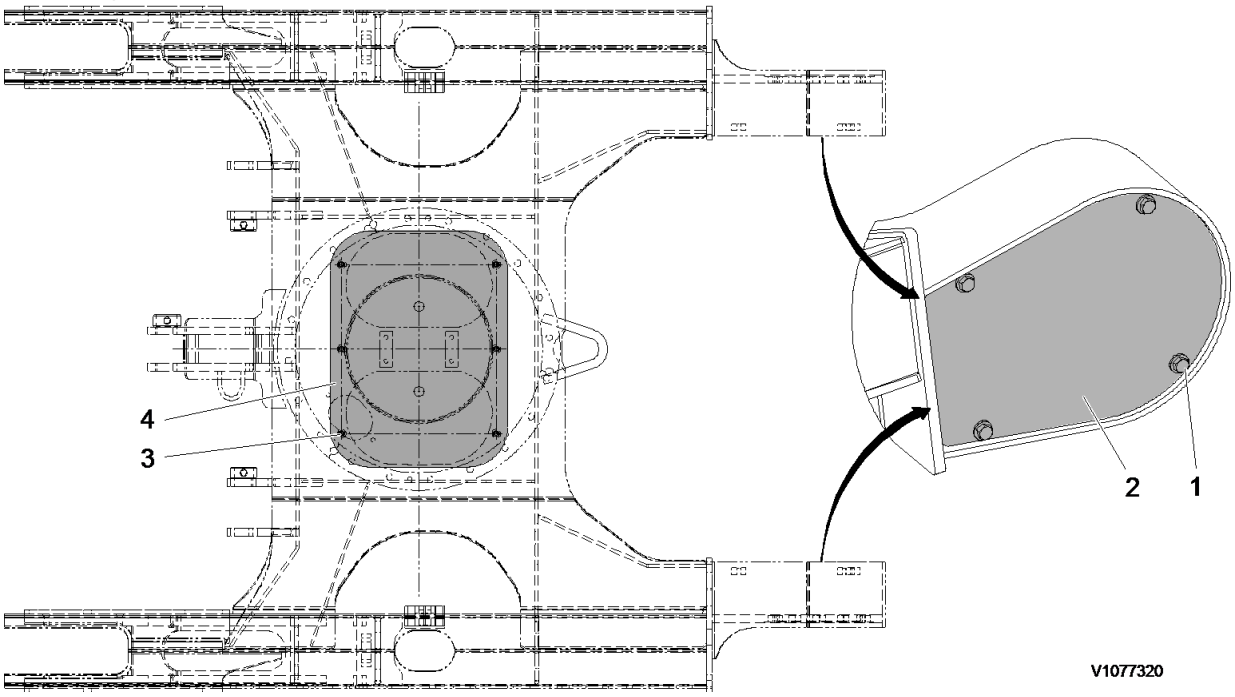

Figure 1
Machine view, protecting plate

Tightening torque: Nm (kgf m) (lbf ft)

No.	Items	Weight: kg (lbs)	Tightening torque
1	Mounting screws	–	111 ±11 (11.3 ±1.1) (82 ±8)
2	Track motor protection cover (LH, RH)	2.9 (6.4)	–
3	Mounting screws	–	111 ±11 (11.3 ±1.1) (82 ±8)
4	Undercover (Mud) thick: 2.3	4.6 (10.5)	–
	Undercover (Mud) thick: 6	12 (26.5)	–

NOTE!
Coat loctite (#277 or 609) on screws.

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Construction Equipment

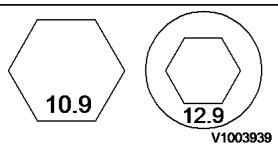
Service Information

Document Title: **Standard tightening torques**	Function Group: **030**	Information Type: **Service Information**	Date: **2014/4/11**
Profile: **CEX, EC55B [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

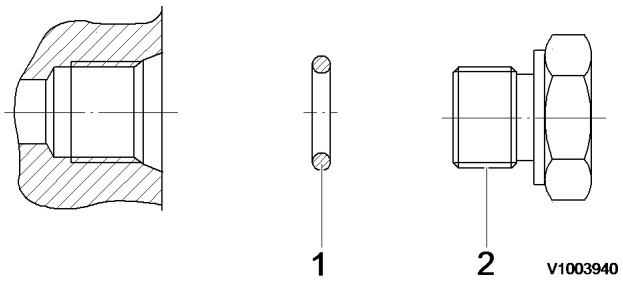


Figure 1
Hydraulic plugs with O-ring

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

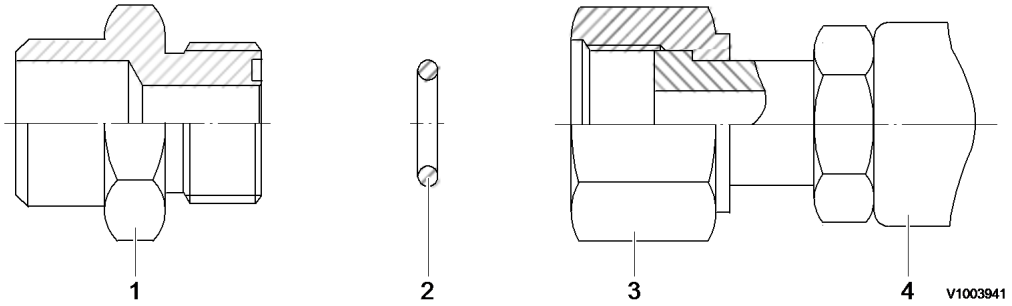


Figure 2
Swivel nut fitting with O-ring

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

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Service Information

Document Title:	Function Group:	Information Type:	Date:
NET 8940-00200 Replace tool for the remote control valve joint	**080**	**Service Information**	**2014/4/11**
Profile: **CEX, EC55B [GB]**			

NET 8940-00200 Replace tool for the remote control valve joint

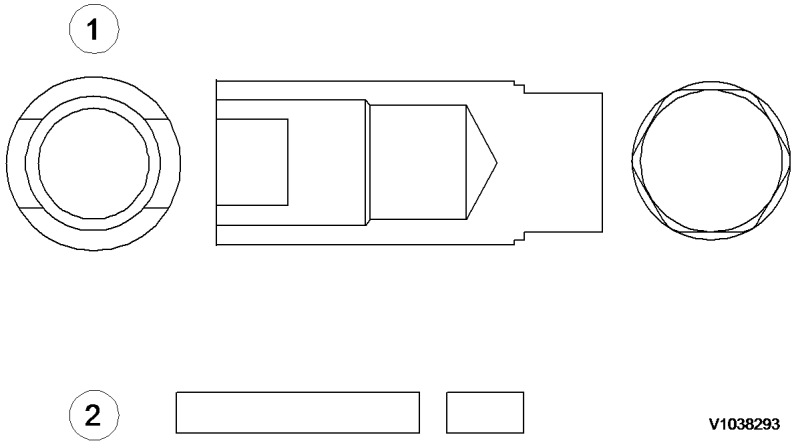

Figure 1
Replace tool for the remote control valve joint

Item	Quantity	Name	Remark
1	1	Socket	SAE 4130 (QT)
2	1	Stop plate	SAE 4130 (QT)

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Service Information

Document Title: **E-tools, NET 8940-00350 Replace tool for the swing motor assembly**	Function Group: **080**	Information Type: **Service Information**	Date: **2014/4/11**
Profile: **CEX, EC55B [GB]**			

E-tools, NET 8940-00350 Replace tool for the swing motor assembly

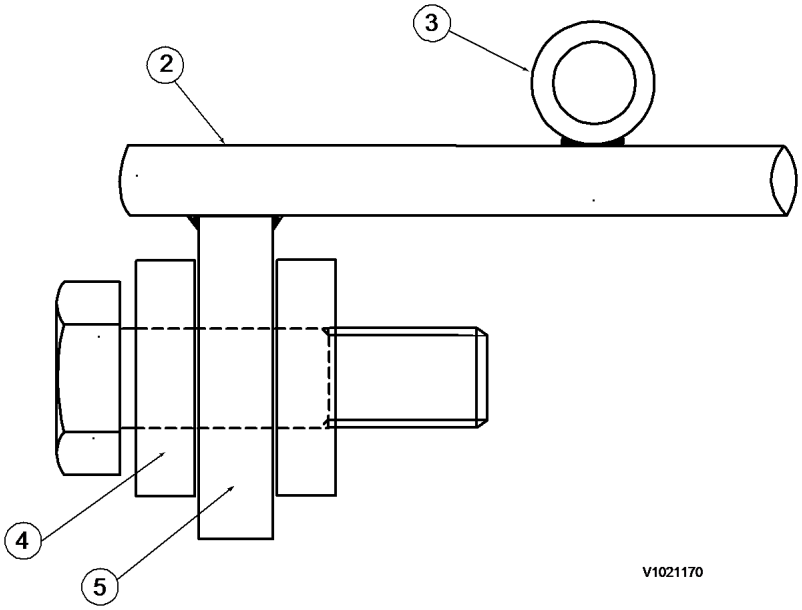

Figure 1
Replace tool, slew motor assembly

Item	Quantity	Name	Remark
1	1	Screw	SAE 1045 (QT)
2	1	Round bar	SAE 1045
3	1	Ring	SAE 1045
4	2	Washer	SAE 1045
5	1	Washer	SAE 1045

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
E-tools, NET 8940-00370 Guide pin for track motor and swing ring gear	**080**	**Service Information**	**2014/4/11**
Profile: **CEX, EC55B [GB]**			

E-tools, NET 8940-00370 Guide pin for track motor and swing ring gear

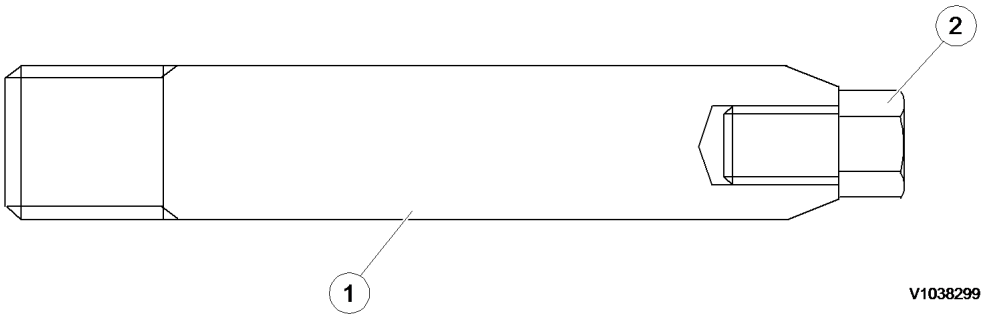

Figure 1
Track motor guide pin

Item	Quantity	Name	Remark
1	2	Guide bar	SAE 4130 (25 ~ 35 HRC)
2	2	Screw	

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Construction Equipment

Service Information

Document Title: **E-tools, NET 8940-00380 Replacement tool for swing ring gear**	Function Group: **080**	Information Type: **Service Information**	Date: **2014/4/11**
Profile: **CEX, EC55B [GB]**			

E-tools, NET 8940-00380 Replacement tool for swing ring gear

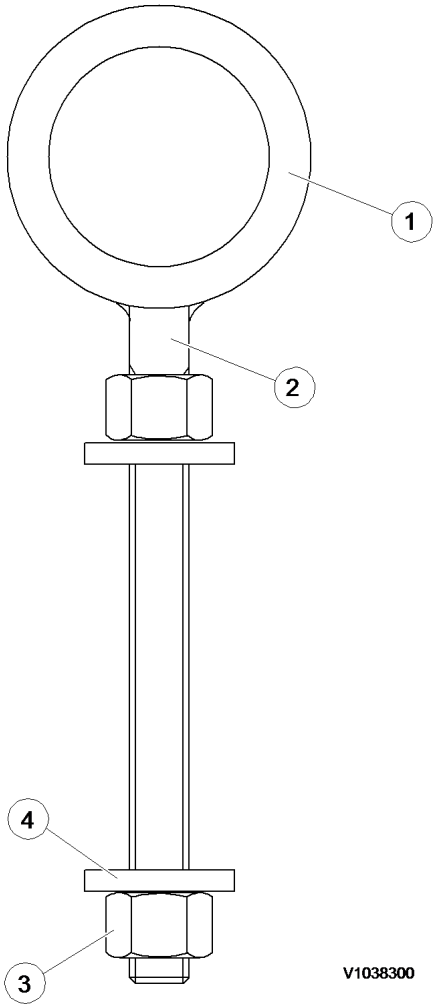

Figure 1
Replace tool for slew ring gear

Item	Quantity	Name	Remark
1	2	Ring	SAE 1045 (QT)
2	2	Round bar	SAE 1045 (QT)
3	4	Nut	
4	4	Washer	

Document Title: **General precautions**	Function Group: **191**	Information Type: **Service Information**	Date: **2014/4/10**
Profile: **CEX, EC55B [GB]**			

General precautions

WARNING

For safety, observe the following rules.

Safety precautions

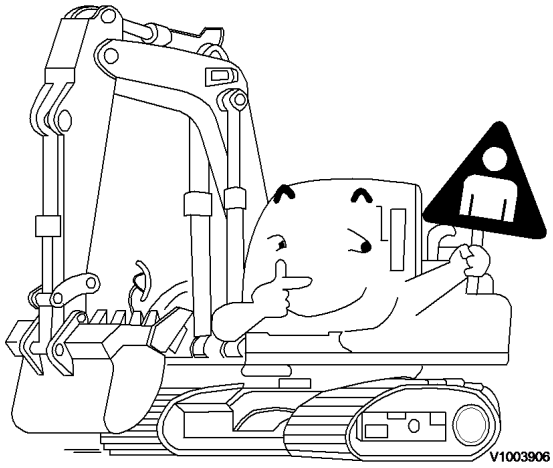

Figure 1
Keep the safety rules

- Do not operate the machine if you are under the influence of alcohol, medicine or other drugs.
- 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.
- Fasten the safety belt for all operations.

Safety clothes and hard hat

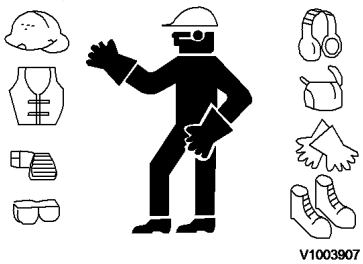

Figure 2
Wear clothes suitable for welding work

- 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

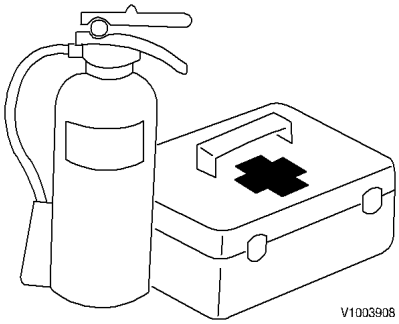

Figure 3
Prepare for emergencies

- 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

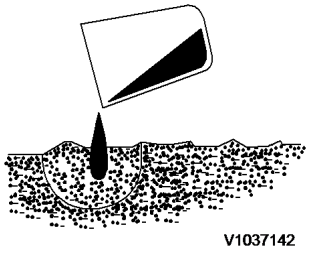

Figure 5

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

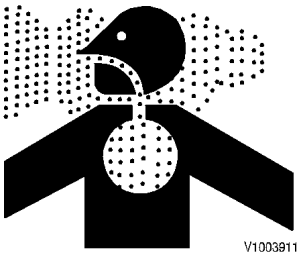

Figure 6
Avoid breathing dust

- 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.

Crystalline silica (quartz) dust

Because crystalline silica is a basis component of sand and granite, many activities at construction sites produce dust containing crystalline silica. Trenching, sawing and boring of material containing crystalline silica can produce dust containing crystalline silica.
If dust which contains crystalline silica is present there are guidelines which should be followed.

1. Be aware of the health effects of crystalline silica and that smoking adds to the damage.
2. Be aware of and follows OSHA (or other) guidelines for exposure to airborne crystalline silica.
3. Know the work operations where exposure to crystalline silica may occur.
4. Participate in air monitoring or training programs offered by the employer.
5. Be aware of and use optional equipment controls such as water sprays, local exhaust ventilation, and enclosed cabs with positive pressure air conditioning.
6. Where respirators are required, wear a respirator approved for protection against crystalline silica -containing dust. Do not alter the respirator in any way. Workers who use tight-fitting respirators cannot have beards/mustaches which interfere with the respirator seal to the face.
7. If possible, change into disposable or washable work clothes at the work site ; shower and change into clean clothing before leaving the work site.
8. Do not eat, drink use tobacco products, or apply cosmetics in areas where there is dust containing crystalline silica.
9. Store food, drink and personal belongings away from the work area.
10. Wash hands and face before eating, drinking, smoking, or applying cosmetics after leaving the exposure area.

VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Cautions during operation	**191**	**Service Information**	**2014/4/10**
Profile: **CEX, EC55B [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.

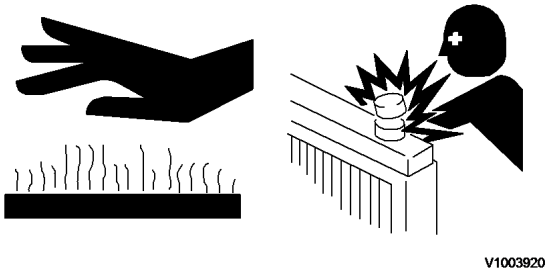

Figure 1
Hot coolant can burn you

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.

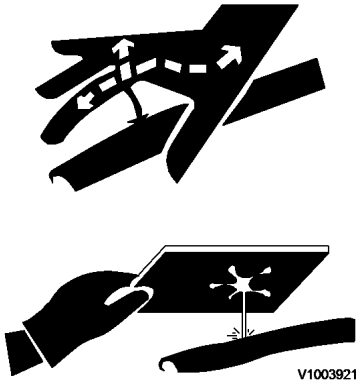

Figure 2

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.

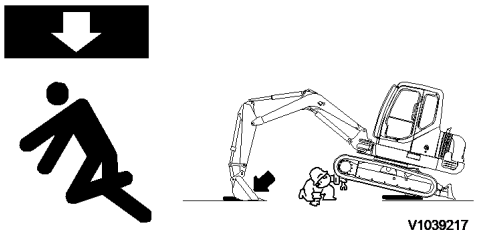

Figure 3
Support the equipment safely

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.

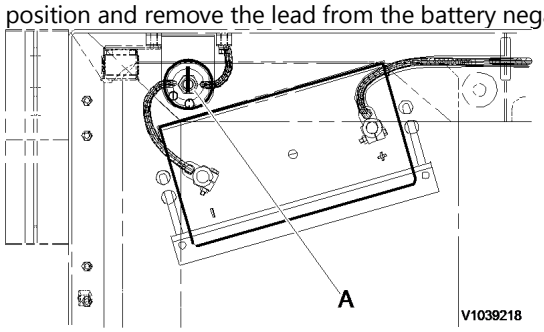

Figure 4
ALWAYS turn the master switch OFF when welding on the machine.

- 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.