

Document Title: <b>Description, general</b>	Function Group: <b>000</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Description, general

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			

The EC27C is a Compact excavator with caterpillar drive.

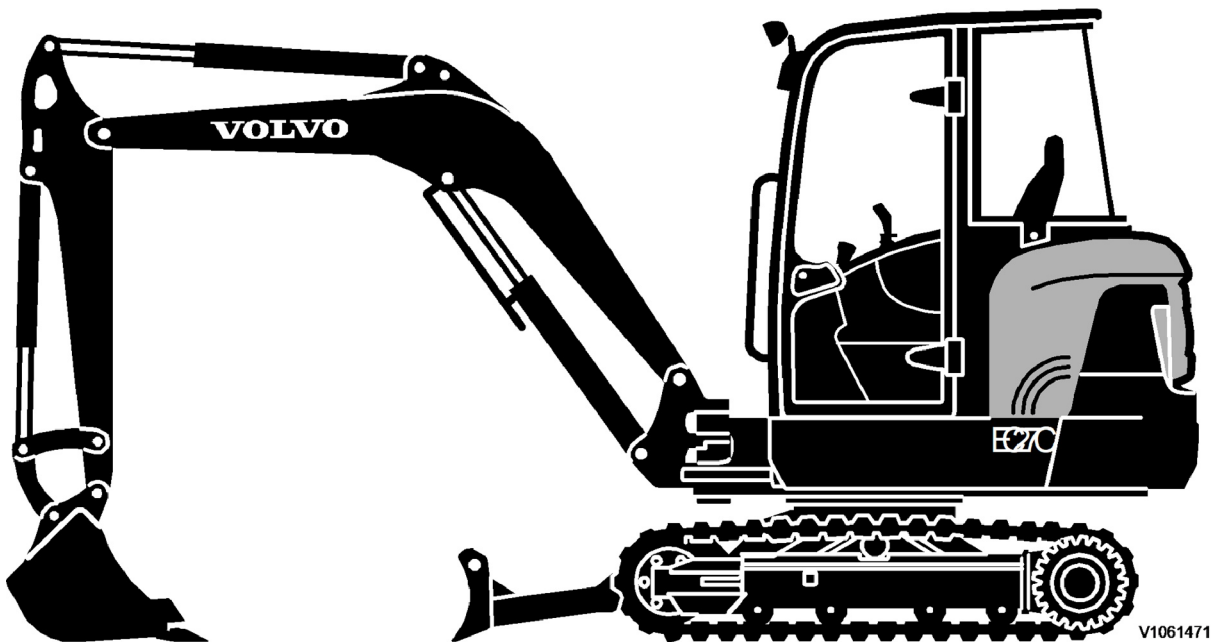
The engine is a vertical, water-cooled, in-line, three cylinder, four-stroke diesel engine with direct injection, type D1.6. It is a low emission engine with automatic idle control.

The drive movement takes place via two tracks. Each track is driven by an axial piston engine with two speeds and a planetary gear.

The hydraulic system is a hydraulic load-sensing system which guarantees complete independence of the individual movements.

The superstructure swivel movement is guaranteed by a hydraulic radial piston motor which directly (i.e. without reduction gear) drives a ball-mounted swing ring gear with internal toothing and remote lubrication.

The undercarriage consists of a centre section in X-form to increase the torsional rigidity and chamfered side members.



V1061471

**Figure 1**  
**Compact Excavator EC27C**

Document Title: <b>Product plate, description</b>	Function Group: <b>000</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

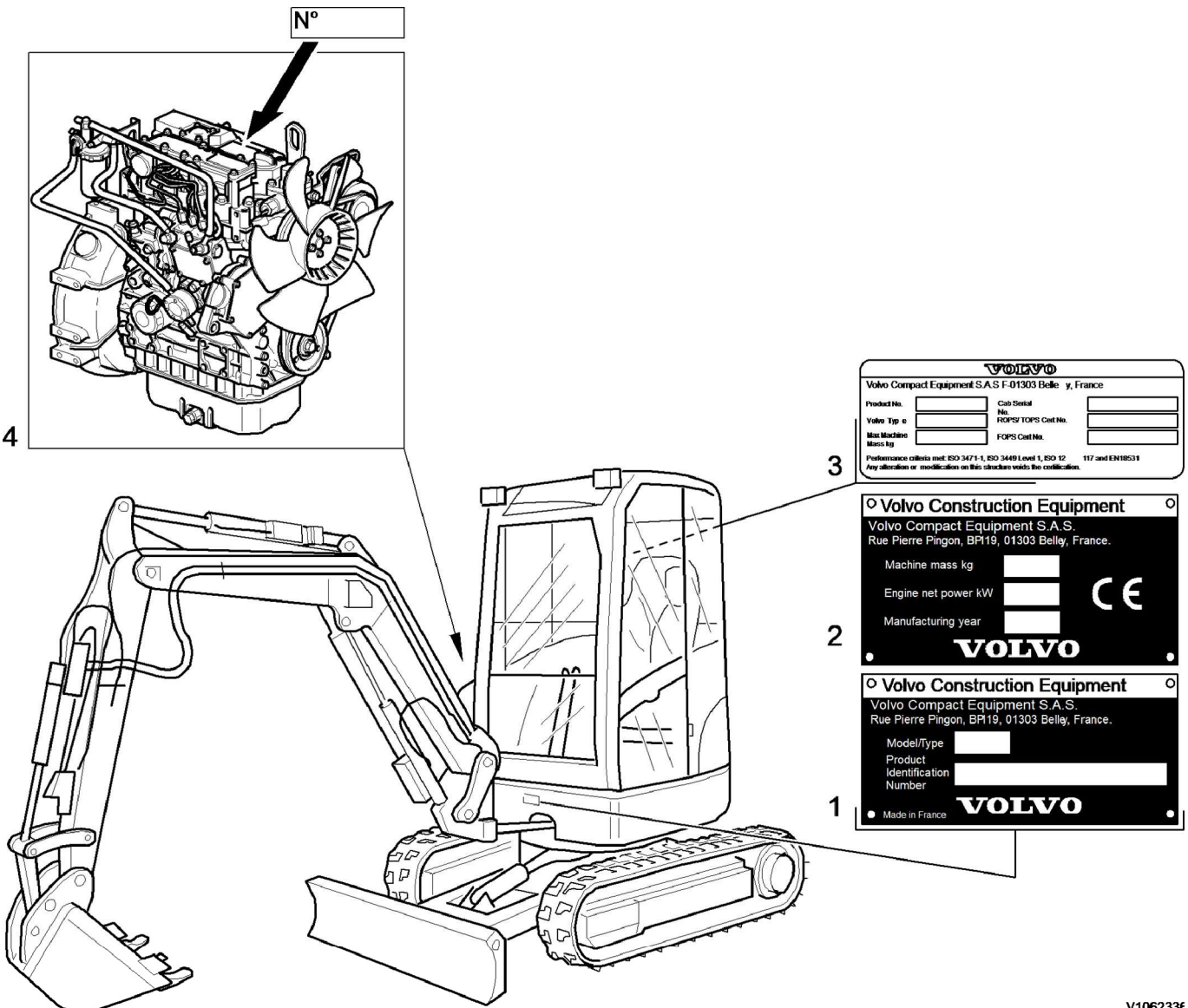
### Product plate, description

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			

The diagrams and descriptions below show the rating plates on the compact excavator.

When ordering spare parts and for telephone enquiries and in correspondence, always quote the model designation and product identification number.



## **Figure 1**

### **Data plates**

1. Data plate
2. Engine product plate
3. Colour code

#### **1. Name plate**

The data plate indicates the manufacturer's name and address, model/type designation and the 17-digit ID number.

#### **2. Auxiliary data plate (EU countries only)**

The auxiliary data plate indicates machine weight (in kg), nominal engine power (in kW), year of manufacture, machine serial number and a CE mark.

#### **Machine weight**

The machine weight (in kg) listed on the auxiliary data plate is based on:

- ✘ Basic machine with 50% of the weight of Volvo-approved extra equipment
- ✘ Conventional track chain type
- ✘ Conventional bucket (without load)
- ✘ Full fuel tank
- ✘ For reasons of safety, 103% of the machine weight is indicated on the auxiliary data plate.

#### **3. TOPS/ROPS and FOPS emblem**

The emblem is located in the cab on the right B-pillar. The Tip Over Protective Structure (TOPS) and Roll Over Protective Structure (ROPS) protect the operator in the event the machine tips over or rolls over. Protection is also provided by the Falling Object Protective Structure (FOPS).

#### **4. Engine product plate**

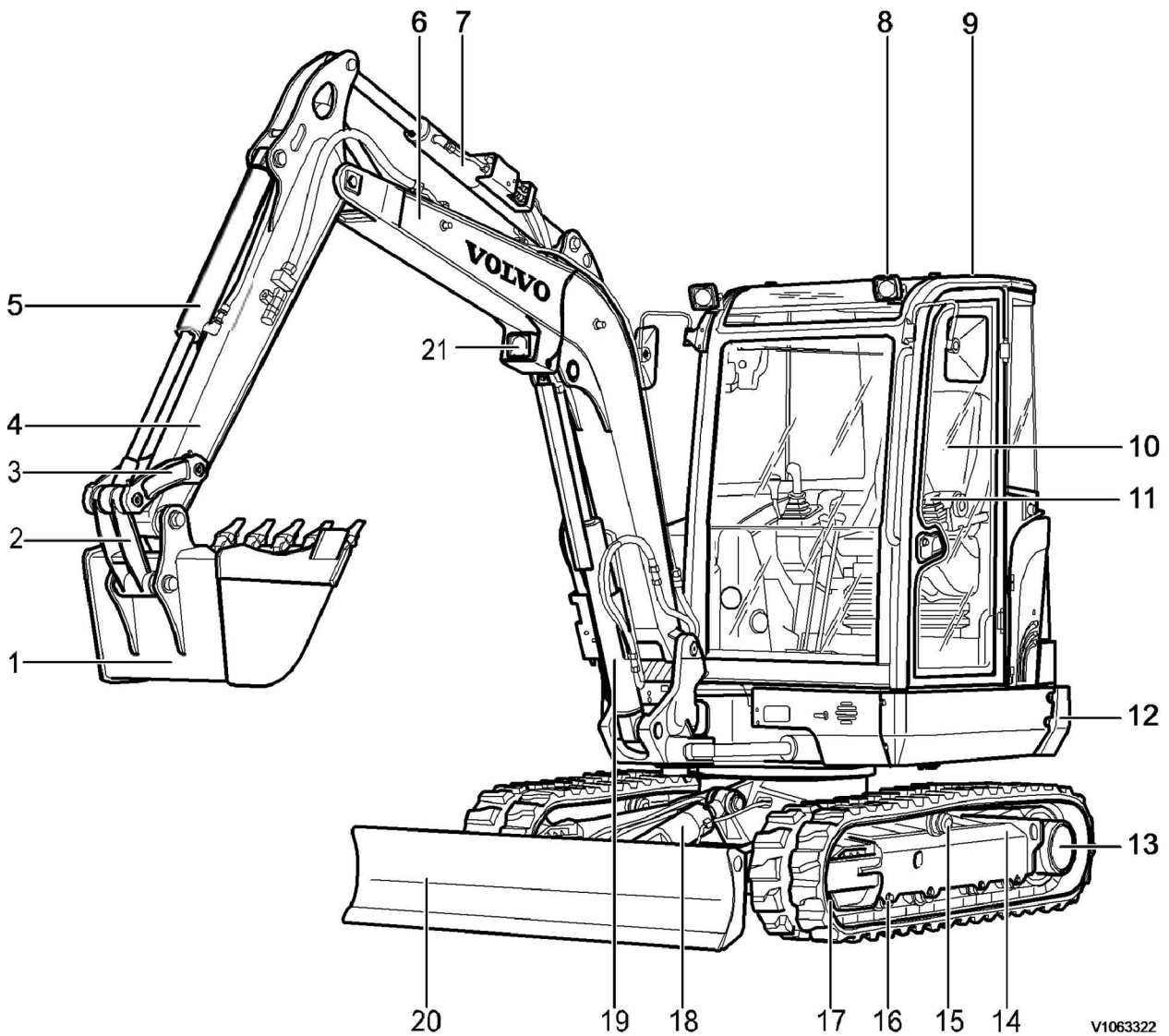
The engine data plate indicates manufacturer information, designation and engine serial number. It is located on the tilt lever trim.

Document Title: <b>Component locations</b>	Function Group: <b>000</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Component locations

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			



**Figure 1**  
**Component locations**

- |   |        |    |               |    |                             |
|---|--------|----|---------------|----|-----------------------------|
| 1 | Bucket | 9  | Cab           | 17 | Guide wheel, including fork |
| 2 | Link   | 10 | Driver's seat | 18 | Dozer blade cylinder        |

3	Yoke	11	Control lever	19	Boom cylinder
4	Arm	12	Counterweight	20	Dozer blade
5	Bucket cylinder	13	Travel motor	21	Boom lamp
6	Boom	14	Underframe		(Option)
7	Dipper arm cylinder	15	Supporting roller		
8	Working light	16	Track roller		

Document Title: <b>Volvo standard tightening torques</b>	Function Group: <b>030</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Volvo standard tightening torques

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			

Tightening torques in the following tables refer to bolted joints with tensile strength according to the below. The tables should be regarded as general guidelines for tightening bolted joints where nothing else is specified.

**NOTE!**

Increase the values by 10% for flange bolt type U6FS. Bolts and nuts should be clean and lubricated with oil.

Metric coarse and fine threads, tensile strength class 8.8	Nm	kpm	lbf ft
M6	10 ±2	1,0 ±0,2	7,4 ±1,5
M8	24 ±5	2,4 ±0,5	18 ±3,5
M10	48 ±10	4,8 ±1,0	35 ±7,4
M12	85 ±18	8,5 ±1,8	63 ±13
M14	140 ±25	14,0 ±2,5	103 ±18
M16	220 ±45	22,0 ±4,5	160 ±33
M20	430 ±85	43,0 ±8,5	320 ±63
M24	740 ±150	74,0 ±15,0	550 ±110

Metric coarse and fine threads, tensile strength class 10.9	Nm	kpm	lbf ft
M6	12 ±2	1,2 ±0,2	9 ±1,5
M8	30 ±5	3,0 ±0,5	22 ±3,5
M10	60 ±10	6,0 ±1,0	44 ±7,4
M12	105 ±20	10,5 ±2,0	78 ±14,5
M14	175 ±30	17,5 ±3,0	130 ±22
M16	275 ±45	27,5 ±4,5	204 ±33
M20	540 ±90	54,0 ±9,0	400 ±66
M24	805 ±160	80,5 ±16,0	594 ±118

UNC-threads, coarse pitch	Nm	kpm	lbf ft
1/4"	9 ±2	0,9 ±0,2	6,6 ±1,5
5/16"	18 ±4	1,8 ±0,4	13 ±3,0
3/8"	33 ±8	3,3 ±0,8	24 ±5,9
7/16"	54 ±14	5,4 ±1,4	40 ±10

1/2"	80 ±20	8,0 ±2,0	59 ±15
9/16"	120 ±30	12,0 ±3,0	89 ±22
5/8"	170 ±40	17,0 ±4,0	130 ±30
3/4"	300 ±70	30,0 ±7,0	220 ±52
7/8"	485 ±115	48,5 ±11,5	360 ±85
1"	725 ±175	72,5 ±17,5	530 ±130

Document Title: <b>Standard tightening torques</b>	Function Group: <b>030</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Standard tightening torques

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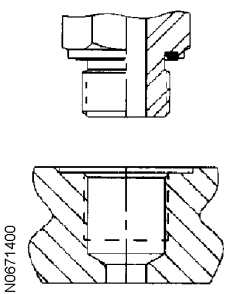
Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			

### Hydraulic connections, general

Before fitting pipe couplings, plugs and hoses:

- Make sure that the sealing surfaces are clean and free from pores or scratches.
- Check elastic seal rings for defects.
- Oil in threads, sealing surfaces and contact surfaces except for ORFS-connections (ORFS = O-Ring Face Seal).

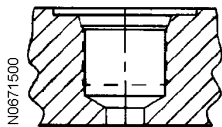
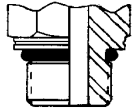
### Nipples

Valve connections, ORFS-connections with ED seals (DIN 3852 form E)		
		
Connection thread (mm)	Width across flats (mm)	Torque (Nm)
M10 x 1.0		19
M12 x 1.5	17	37
M14 x 1,5	22	58
M16 x 1,5	22	74
M18 x 1,5	24	94
M20 x 1.5		130
M22 x 1.5	27	140
M27 x 2.0	32	190
M33 x 2.0	41	330
M42 x 2.0	50	470
M48 x 2.0	55	570
Connection thread (inches)	Width across flats (mm)	Torque (Nm)
G 1/8	17 alt. 19	19
G 1/4	19 alt. 22	58
G 3/8	22 alt. 27	84
G 1/2	27 alt. 32	120



G 3/4	32 alt. 41	190
G 1	41 alt. 46	330
G 1 1/4	50	470
G 1 1/2	55	570

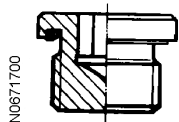
#### Valve connections, ORFS-connections with O-ring seals (ISO 6149)



Connection thread (mm)	Width across flats (mm)	Torque (Nm)
M8 x 1.0		11
M10 x 1.0		21
M12 x 1.5	17 alt. 19	37
M14 x 1,5	19 alt. 22	47
M16 x 1,5	22	58
M18 x 1,5	24 alt. 27	74
M22 x 1.5	27 alt. 32	110
M27 x 2.0	32	180
M33 x 2.0	32, 41 alt. 46	330
M42 x 2.0	50	350
M48 x 2.0	55	440
Connection thread (inches)	Width across flats (mm)	Torque (Nm)
7/16 - 20 UNF	16	21
1/2 - 20 UNF		26
9/16 - 18 UNF	19	37
3/4 - 16 UNF	22	74
7/8 - 14 UNF	27	110
1 1/16 - 12 UNF	41	180
1 5/16 - 12 UNF	41	284
1 5/8 - 12 UNF	50	300
1 7/8 - 12 UNF	55	390

#### Blanking plugs

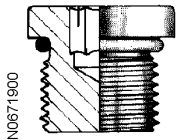
##### Blanking plugs with ED seal



Connection thread (mm)	Allen key dim. (mm)	Torque (Nm)
M10 x 1.0	5	12
M12 x 1.5	6	25
M14 x 1,5	6	35
M16 x 1,5	8	55
M18 x 1,5	8	65
M20 x 1.5	10	80

M22 x 1.5	10	90
M26 x 1.5	12	100
M27 x 2.0	12	140
M33 x 2.0	17	230
M42 x 2.0	22	360
M48 x 2.0	24	360
Connection thread (inches)	Allen key dim. (mm)	Torque (Nm)
G 1/8	5	13
G 1/4	6	30
G 3/8	8	60
G 1/2	10	80
G 3/4	12	140
G 1	17	200
G 1 1/4	22	400
G 1 1/2	24	450

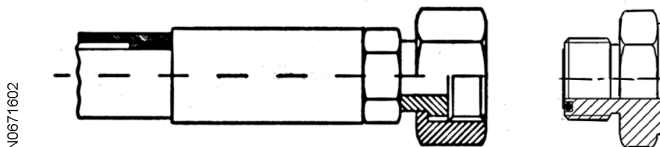
### Blanking plugs with O-ring seal (ISO 6149)



Connection thread (mm)	Allen key dim. (mm)	Torque (Nm)
M10 x 1.0	5	20
M12 x 1.5	6	35
M14 x 1,5	6	45
M16 x 1,5	8	55
M18 x 1,5	8	70
M20 x 1.5	10	80
M22 x 1.5	10	100
M26 x 1.5	12	130
M27 x 2.0	12	170
M33 x 2.0	14	310
M42 x 2;0	22	330

### ORFS-connections

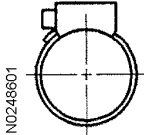
#### ORFS-connections (ISO 8434-3)



Thread size (in)	Width across flats (mm)	Tightening torque (Nm) *
9/16 - 18 UNF	17 alt. 19	25
11/16 - 16 UN	22	35
13/16 - 16 UN	24	55
1 - 14 UNS	30	85
1 3/16 - 12 UN	36	120
1 7/16 - 12 UN	41 alt. 46	160
1 11/16 - 12 UN	50	200

2 - 12 UN	60	260
* Threads and sealing surface must not be oiled in before tightening.		

### Hose clamps

Hose clamps with worms		
		
Intended for hose outside diameter (mm)	Width across flats (mm)	Torque (Nm)
10 - 19	7	2,5
20 - 30	7	3,5
31 - 49	7	4.5
50 - 231	7	5.5

### Bolts and nuts

The pretension achieved at a particular tightening torque depends greatly on the coefficient of friction of the screw connection.

The coefficient of friction in turn depends on the surface finish and lubrication state. The values have been calculated on the assumption of a coefficient of friction of 0.2 for dry chromated flange screws and 0.15 for oiled chromated flange screws. The lower torque for socket head and traditional hex bolts is due to the shorter lever moment below the screw head (smaller head diameter) compared with flange bolts.

The following abbreviations for surface treatment are used in the tables:

- Fe/Zn-Fe = Black chromated zinc - iron
- FZB = Blank chromated

#### NOTE!

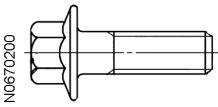
In some body parts, there are weld bolts with much lower strength than normal bolts of the same dimension.

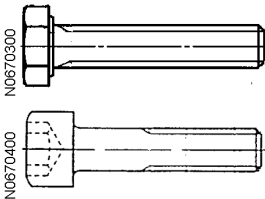

#### NOTE!

When Nordloc washer is used, increase the torque by 20%.

#### NOTE!

Bolts provided with liquid alt. micro-capsuled thread locker or thread sealant shall be tightened with the same torque as a lubricated bolt of the same type.

Flange bolts						
						Blind rivet nut
Threads. (mm)	Width across flats (mm)	Torque (Nm)				Torque (Nm)
		8.8 Fe/Zn-Fe dry	8.8 Fe/Zn-Fe Oiled	10.9 Phosphated	10.9 Phosphated Oiled	
						Dry
M5	8	7	6			6
M6	10	12	10			10
M8	12	28	24			24
M10	14	56	48	70	60	48
M12	17	100	85	125	105	82
M14	18	160	140	200	175	
M16	21	250	220	320	275	

Hex bolts and Allen head bolts							
							Blind rivet nut
	Wrench size (width across flats)		Torque (Nm)				Torque (Nm)
Threads. (mm/inch)	Hexagon (mm/inch)	Wrench socket (mm/inch)	8.8 FZB & Fe/Zn-Fe Dry	8.8 FZB & Fe/Zn-Fe Oiled	10.9 Phosphated Oiled	12.9 Untreated Oiled	Dry
M5	8	4	6	5			6
M6	10	5	10	9		20	10
M8	13	6	25	22		40	24
M10	16	8	50	44	60	80	48
M12	18	10	90	75	105	140	82
M14	21	12	140	125	175	220	
M16	24	14	220	190	275	340	
M20	30	17	450	380	540	650	
M24	36	19	770	660	900	1 120	
M27	41	-	1 100	940	1 350	1 620	
M30	46	22	1 500	1 280	1 840	2 210	
M36	55		2 500	2 300	3 210	3 850	
1/4 UNC	7/16	3/16	12	10	15	20	
5/16 UNC	1/2	1/4	25	21	30	40	
3/8 UNC	9/16	5/16	45	38	55	70	
7/16 UNC	5/8		65	55	90		
1/2 UNC	3/4	3/8	100	85	130	170	
9/16 UNC	13/16		145	123	190		
Nuts on weld bolts (material S235JRG2-EN 10025)							
							
Threads.				Tightening torque (Nm)			
M6				5			
M8				12			

### Tolerances

Modern high-quality torque wrenches normally give a variation of  $\pm 5\%$  of the indicated value. This, together with variations in friction coefficient, gives a range in the pretensioning force of approximately  $\pm 16\%$  for lubricated bolted joints and  $\pm 29\%$  for dry bolted joints.

Document Title: <b>Conversion tables</b>	Function Group: <b>030</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Conversion tables

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			

### 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	cm <sup>2</sup>	m <sup>2</sup>	km <sup>2</sup>	a	ft <sup>2</sup>	yd <sup>2</sup>	in <sup>2</sup>
cm <sup>2</sup>	1	0.0001	-	0.000001	0.001076	0.000012	0.155000
m <sup>2</sup>	10000	1	0.000001	0.01	10.764	1.1958	1550.000
km <sup>2</sup>	-	1000000	1	10000	1076400	1195800	-
a	0.01	100	0.0001	1	1076.4	119.58	-
ft <sup>2</sup>	-	0.092903	-	0.000929	1	0.1111	144.000
yd <sup>2</sup>	-	0.83613	-	0.008361	9	1	1296.00
in <sup>2</sup>	6.4516	0.000645	-	-	0.006943	0.000771	1

1 ha = 100 a - 1 mile<sup>2</sup> = 259 ha = 2.59 km<sup>2</sup>

### Volume

Unit	cm <sup>3</sup> = cc	m <sup>3</sup>	l	in <sup>3</sup>	ft <sup>3</sup>	yd <sup>3</sup>
cm <sup>3</sup> = ml	1	0.000001	0.001	0.061024	0.000035	0.000001
m <sup>3</sup>	1000000	1	1000	61024	35.315	1.30796
dm <sup>3</sup> (l)	1000	0.001	1	61.024	0.035315	0.001308
in <sup>3</sup>	16.387	0.000016	0.01638	1	0.000578	0.000021
ft <sup>3</sup>	28316.8	0.028317	28.317	1728	1	0.03704
yd <sup>3</sup>	764529.8	0.76453	764.53	46656	27	1

1 gal (US) = 3785.41 cm<sup>3</sup> = 231 in<sup>3</sup> = 0.83267 gal (UK)

## 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 ton (metric) = 1.1023 ton (US) = 0.9842 ton (UK)

## Pressure

Unit	kp/cm <sup>2</sup>	bar	Pa=N/m <sup>2</sup>	kPa	lbf/in <sup>2</sup>	lbf/ft <sup>2</sup>
kp/cm <sup>2</sup>	1	0.98067	98066.5	98.0665	14.2233	2048.16
bar	1.01972	1	100000	100	14.5037	2088.6
Pa=N/m <sup>2</sup>	0.00001	0.001	1	0.001	0.00015	0.02086
kPa	0.01020	0.01	1000	1	0.14504	20.886
lbf/in <sup>2</sup>	0.07032	0.0689	6894.76	6.89476	1	144
lbf/ft <sup>2</sup>	0.00047	0.00047	47.88028	0.04788	0.00694	1

kg/cm<sup>2</sup> = 735.56 Dry (mmHg) = 0.96784 atm

## Unit explanations

Unit	abbreviation
Newton meter	Nm
Kilopoundmeter	kpm
Kilopascal	kPa
Megapascal	MPa
Kilowatt	kW
kilojoule	kJ
British thermal unit	Btu
Calorie	ca

## Approx. conversion

SI unit	Conversion factor	Non SI	Conversion factor	SI
<b>Torque</b>				
Nm	x10.2	=kg/cm	x0.8664	=lb in
Nm	x0.74	=lbf-ft	x1.36	=Nm
Nm	x0.102	=kg/m	x7.22	=lbft
<b>Pressure (Pa = N/m<sup>2</sup>)</b>				
kPa	x4.0	=in.H <sub>2</sub> O	x0.249	=kPa
kPa	x0.30	=in.Hg	x3.38	=kPa
kPa	x0.145	=psi	x6.89	=kPa
bar	x14.5	=psi	x0.069	=bar
kp/cm <sup>2</sup>	x14.22	=psi	x0.070	=kp/cm <sup>2</sup>
N/mm <sup>2</sup>	x145.04	=psi	x0.069	=bar
MPa	x145	=psi	x0.00689	=MPa
<b>Power (W = J/s)</b>				

kW	x1.36	=hp(cv)	x0.736	=kW
kW	x1.34	=bhp	x0.746	=kW
kW	x0.948	=Btu/s	x1.055	=kW
W	x0.74	=ft.lb/s	x1.36	=W
Energy (J = Nm)				
kJ	x0.948	=Btu	x1.055	=kJ
J	x0.239	=calorie	x4.19	=J
Speed and acceleration				
m/s <sup>2</sup>	x3.28	=ft/s <sup>2</sup>	x0.305	=m/s <sup>2</sup>
m/s	x3.28	=ft/s	x0.305	=m/s
km/h	x0.62	=mph	x1.61	=km/h
Horsepower/torque				
Bhp x5252 rpm = TQ (lb-ft)			TQ x rpm 5252 = bhp	
Temperature				
°C = (°F - 32) / 1.8			°F = (°C x 1.8) + 32	
Flow factor				
l/min (dm <sup>3</sup> /min)	x0.264	= US gal/min	x3.785	= liter/min

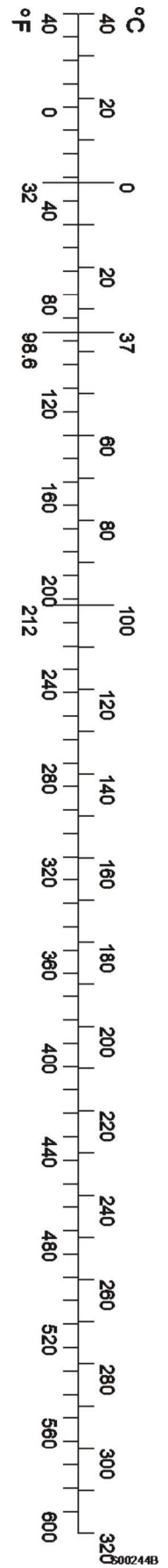


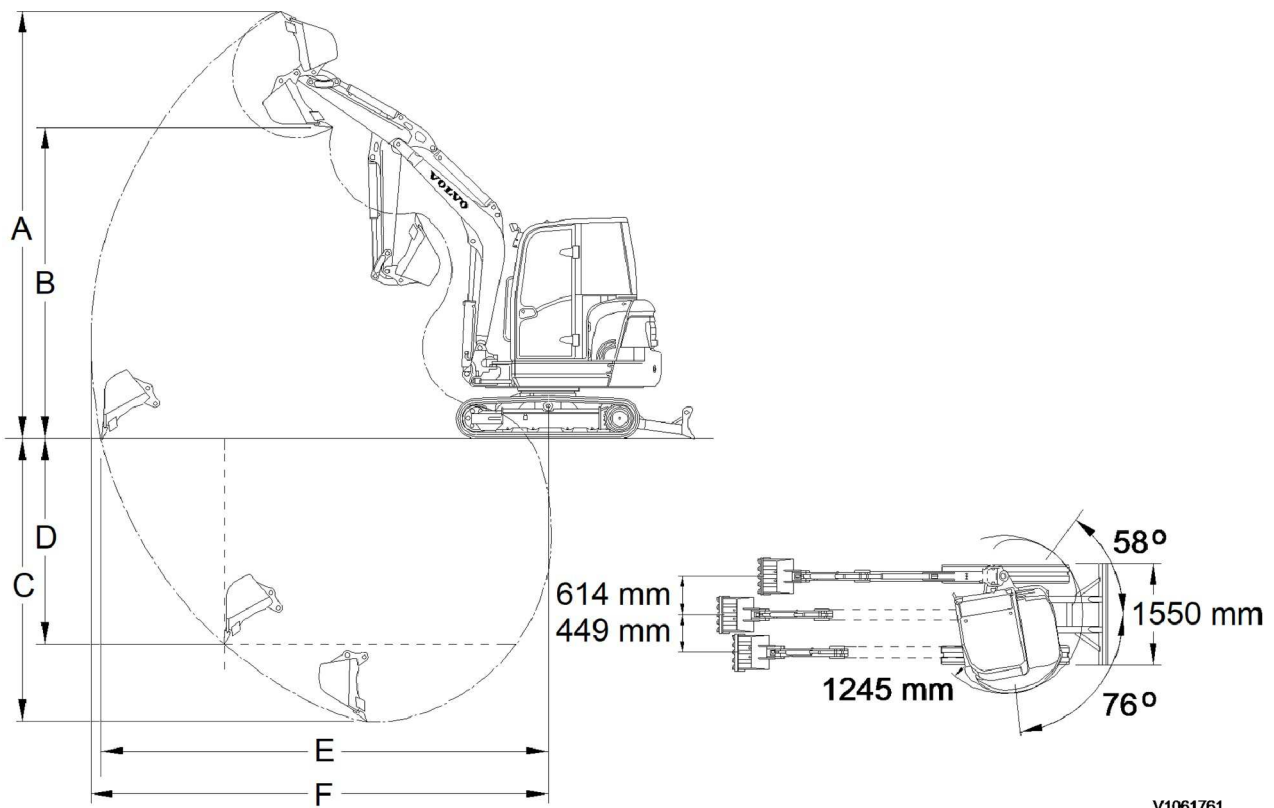
Figure 1

Document Title: <b>Dimensions</b>	Function Group: <b>030</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Dimensions

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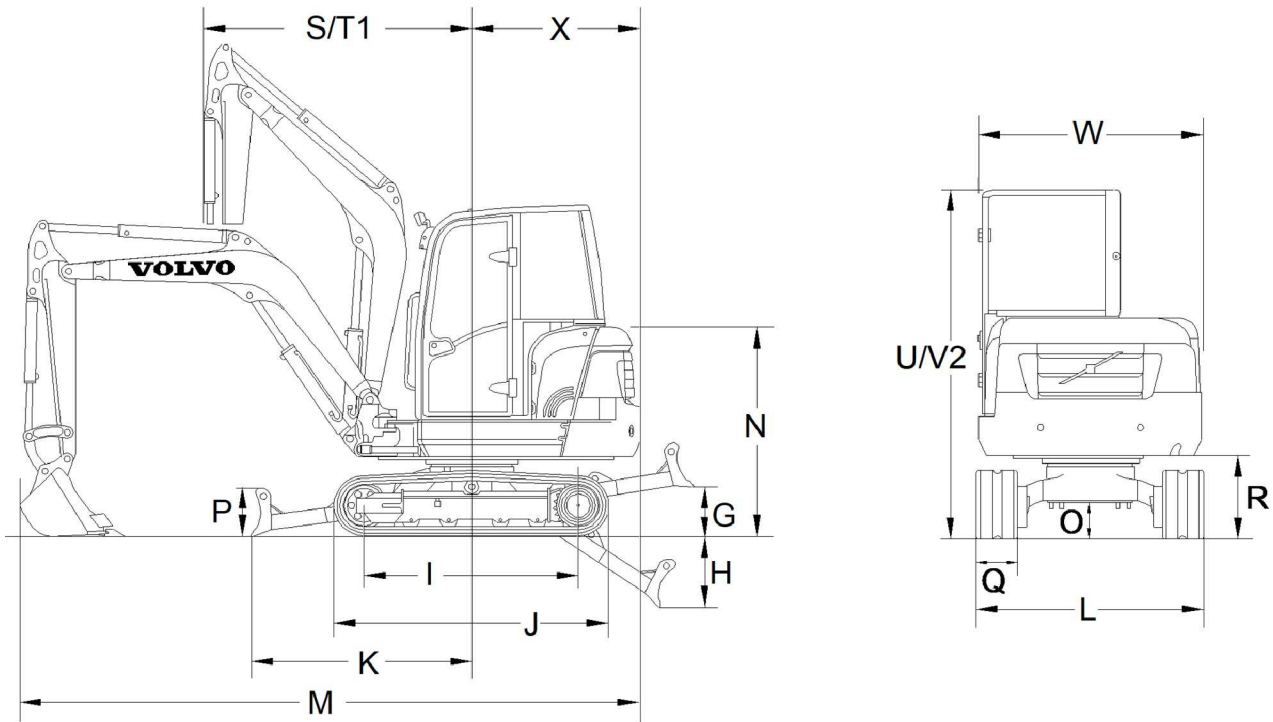
Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			



V1061761

**Figure 1**  
**Dimensions**





V1050070

**Figure 2**  
**Dimensions**

The letters in the figures refer to the table below.

Version	EC27C	
<b>Arm</b>	<b>1200 mm (47.24 in)</b>	<b>1500 mm (59.05 in.)</b>
A	4362 mm (171.73 in)	4550 mm (179.13 in)
B	3155 mm (124.21 in)	3343 mm (131.61 in)
C*	2509 mm (98.78 in)	2810 mm (110.63 in)
D	2072 mm (81.58 in)	2366 mm (93.15 in)
E	4422 mm (174.09 in)	4717 mm (185.71 in)
F	4553 mm (179.25 in)	4838 mm (190.51 in)
G	430 mm (16.93 in.)	
H	498 mm (19.61 in)	
I	1440 mm (56.69 in)	
J	1912 mm (75.28 in)	
K	1509 mm (59.41 in.)	
L	1550 mm (61.02 in)	
M	4406 mm (173.46 in)	4406 mm (173.46 in)
N	1549 mm (60.98 in)	
O	296 mm (11.65 in)	
P	335 mm (13.19 in)	
Q	Rubber 300 mm (11.81 in); Steel 250 mm (9.84)	
R	563 mm (22.17 in)	
S	1805 mm (71.06 in)	1856 mm (73.07 in)
T1	1422 mm (55.98 in)	1465 mm (57.68 in)
U	2457 mm (96.73 in)	
V2	2425 mm (95.47 in)	
W	1482 mm (58.35 in)	

X	1245 mm (49.02 in)
Total swivel angle	360°

\*: Excavation depth with blade lowered to floor

1: Front turning radius with maximum offset

2: Overhead guards

**NOTE!**

The machine specifications are given for information only and may be amended by the manufacturer at any time without prior notice.

Document Title: <b>Weight</b>	Function Group: <b>030</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Weight

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			

Version	Unit	Specifications
Cab or canopy	—	Cab
Rubber or steel chain	—	Rubber
Full fuel tank	—	Yes
Total MUC[T1] ⓘ	kg (lb)	2790 (6150)
Canopy	kg (lb)	- 125 (276)
Steel chain	kg (lb)	+ 60 (132)

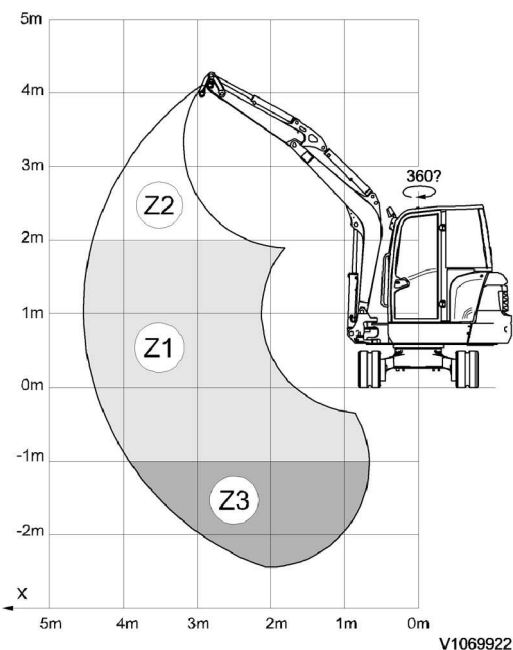
**[T1]**The total machine weight (as listed on the data plate) is obtained from the prevalent machine configuration (MUC). MUC comprises cab, rubber chain, standard pin bucket and a full fuel tank.

Document Title: <b>Lifting capacities</b>	Function Group: <b>030</b>	Information Type: <b>Service Information</b>	Date: <b>2017/7/7 0</b>
Profile: <b>EC27C Volvo</b>			

## Lifting capacities

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
EC27C Volvo			



**Figure 1**  
**Lifting capacities**

### **WARNING**

Transporting lifted objects is prohibited if the machine is not equipped with a safety valve on the boom, a load safety device and overload warning function. Follow the table inside the cab stating the nominal loads for lifting.

The permitted lifting loads correspond to 75% of the tilt load or 87% of the hydraulic limit value. The loads apply to the complete height (Z) and the specified range.

**The specified values apply to a machine:**

- without attachment and without attachment brackets.

**NOTE!**

If loads are transported using the lifting gear, the weight of the attachments must be deducted from the value given in the table.

- on level solid ground
- with rubber tracks
- Equipment during complete rotation
- Equipment parallel to the axis of the superstructure.
- With a 75 kg driver in the cab.

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