VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Description	**000**	**Service Information**	**2014/3/8 0**
Profile: **CWL, L25F [GB]**			

Description

The wheel loader has a central articulating oscillating joint and four-wheel drive. The lifting frame is equipped with a hydraulic quick-change attachment bracket. Parallel kinematics provide high breakout force and exact parallel guidance when lifting.

The engine is a four-cylinder, four-stroke, in-line diesel engine with direct injection and oil/air cooling.

The hydrostatic transmission provides full power shift under load, both when changing direction (forward and reverse) and between ranges. Maximum drawbar force can be achieved in all ranges. The "inch/brake pedal" provides variable machine speed control and power transfer.

The front and rear axles are planetary rigid axles with 100% hydraulically engagable/disengagable differential locks on both axles.

The service brake is a drum brake acting on the wheels of the front axle and is operated via the "inch/brake pedal".

The parking brake is a drum brake acting on the wheels of the front axle upon mechanical engagement.

The hydraulic system is a thermostatically regulated oil circuit with integrated cooling system. Three-spool control valve with primary and secondary fuse protection.

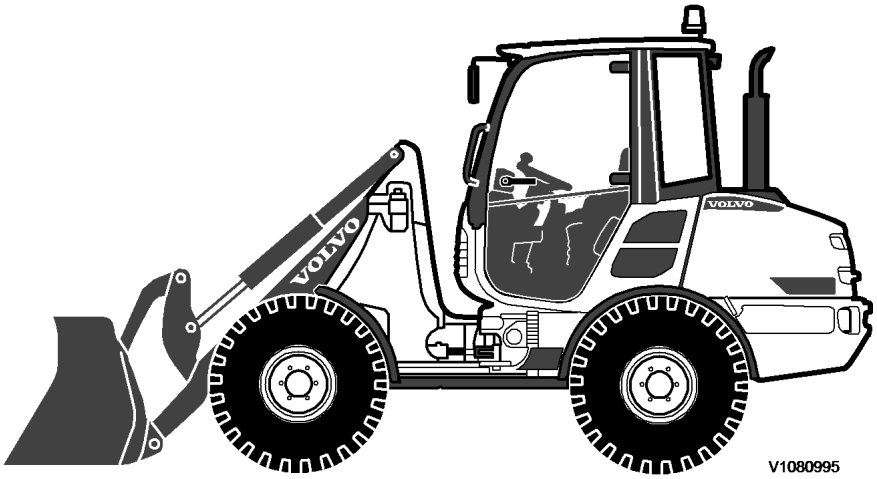


Figure 1

VOLVO
Construction Equipment

Service Information

Document Title: **Tightening torques**	Function Group: **030**	Information Type: **Service Information**	Date: **2014/3/8 0**
Profile: **CWL, L20F, L25F [GB]**			

Tightening torques

Wheel nuts

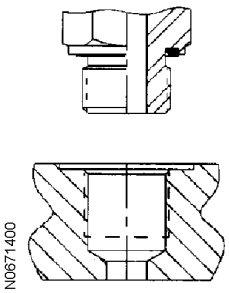
Wheel nuts		
 N0672000		
Thread M	**Wrench size (width across flats)**	**Tightening torque (Nm)**
M22 x 1.5	30	560 – 600

Hydraulic connections, general

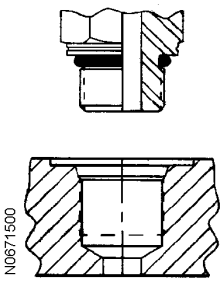
Before fitting pipe couplings, plugs and hoses:

- 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).

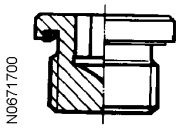
Valve connections

Valve connections, ORFS-connections with ED seals (DIN 3852 form E)		
 N0671400		
Connection thread (mm)	**Wrench size, width across flats (mm)**	**Tightening 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)	**Wrench size, width across flats (mm)**	**Tightening 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

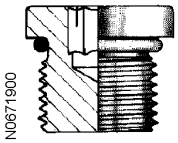
Valve connections, ORFS-connections with O-ring seals (ISO 6149)		
		
Connection thread (mm)	**Wrench size, width across flats (mm)**	**Tightening torque (Nm)**
M8 x 1.0		11
M10 x 1.0		21
M12 x 1.5	17 alt. 19	37
M14 x 1.5	19 alt. 22	47
M16 x 1.5	22	58
M18 x 1.5	24 alt. 27	74
M22 x 1.5	27 alt. 32	110
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)	**Wrench size, width across flats (mm)**	**Tightening 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)**	**Tightening 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)**	**Tightening 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

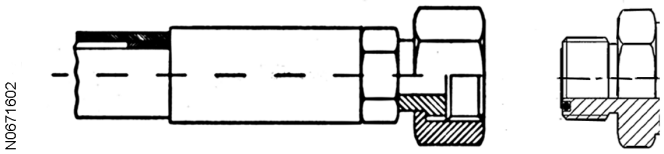
Blanking plugs with O-ring seal (ISO 6149)



Connection thread (mm)	Allen key dim. (mm)	Tightening 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

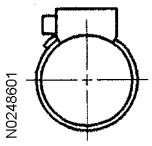
ORFS-connections (ISO 8434-3)



Thread (inches)	Wrench size, 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)	**Wrench size, width across flats (mm)**	**Tightening 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 pretensioning force achieved at a given tightening torque depends on the coefficient of friction of the bolted joint.
The coefficient of friction in turn depends on the surface texture, surface treatment and lubricated condition. The values are calculated assuming a coefficient of friction of 0.2 for a dry chromated flange bolt and 0.15 for a lubricated chromated flange bolt. The lower torque for Allen bolts and traditional hex bolts, in relation to flange bolts, is due to the shorter torque arm for the frictional force under the bolt head (smaller diameter of bolt head).

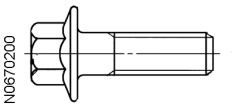
The following abbreviations for surface treatment are used in the tables:

- 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.

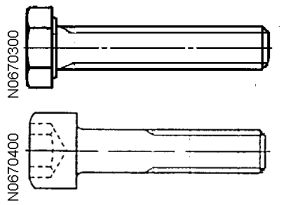
NOTE!
When Nordloc washer is used, increase the torque by 20%.

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**
Thread (mm)	**Wrench size, width across flats (mm)**	**Torque (Nm)**				**Torque (Nm)**
		8.8 Fe/Zn-Fe Dry	**8.8 Fe/Zn-Fe Lubricated**	**10.9 Phosphated**	**10.9 Phosphated Lubricated**	**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	

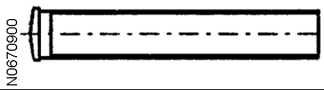
M16	21	250	220	320	275	

Hex bolts and Allen head bolts



	Wrench size (width across flats)		Torque (Nm)				Blind rivet nut Torque (Nm)
Thread (mm/inch)	**Hex bolt (mm/inch)**	**Allen head bolt (mm/ inch)**	**8.8 FZB & Fe/Zn-Fe Dry**	**8.8 FZB & Fe/Zn-Fe Lubricated**	**10.9 Phosphated Lubricated**	**12.9 Untreated Lubricated**	**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)



Thread	Torque (Nm)
M6	5
M8	12

Tolerances

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

Document Title: **Conversion tables**	Function Group: **030**	Information Type: **Service Information**	Date: **2014/3/8 0**
Profile: **CWL, L20F, L25F [GB]**			

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**	**l**	**in3**	**ft3**	**yd3**
cm3 = ml	1	0.000001	0.001	0.061024	0.000035	0.000001
m3	1000000	1	1000	61024	35.315	1.30796
dm3(l)	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 (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/cm2**	**bar**	**Pa=N/m2**	**kPa**	**lbf/in2**	**lbf/ft2**
kp/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
kg/cm2 = 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
Torque				
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
Pressure (Pa = N/m2)				
kPa	x4.0	=in.H2O	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/cm2	x14.22	=psi	x0.070	=kp/cm2
N/mm2	x145.04	=psi	x0.069	=bar
MPa	x145	=psi	x0.00689	=MPa
Power (W = J/s)				
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/s2	x3.28	=ft/s2	x0.305	=m/s2
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				
ºC =(ºF-32)/1.8			ºF =(ºC x1.8) +32	
Flow factor				
l/min (dm3/min)	x0.264	= US gal/min x3.785		=liter/min

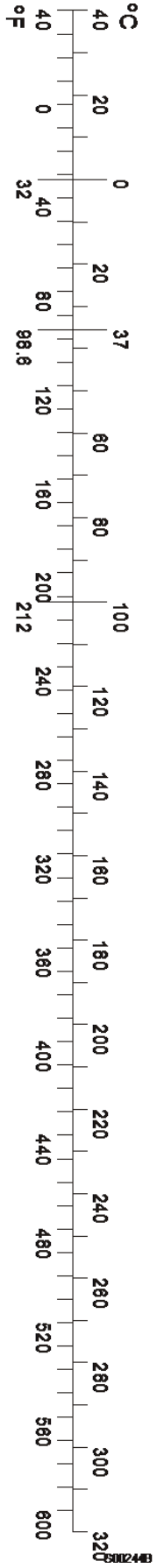


Figure 1

Document Title:	Function Group:	Information Type:	Date:
Machine, transporting	**050**	**Service Information**	**2014/3/8 0**
Profile: **CWL, L25F [GB]**			

Machine, transporting

Steering joint lock

When transporting the machine on a trailer or by rail, the articulated steering joint must be locked with the steering lock.

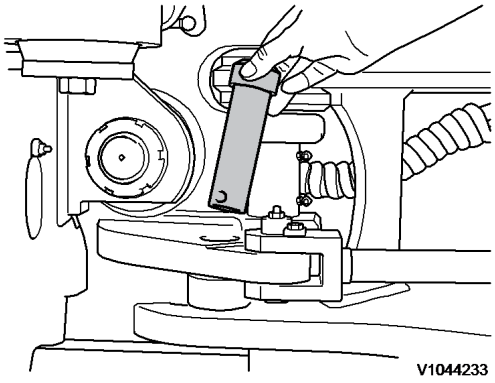


Figure 1
Steering joint lock

Also, the machine must be lashed down to the loading surface of the transport vehicle so that it cannot tip over or roll away. Block the wheels with chocks.

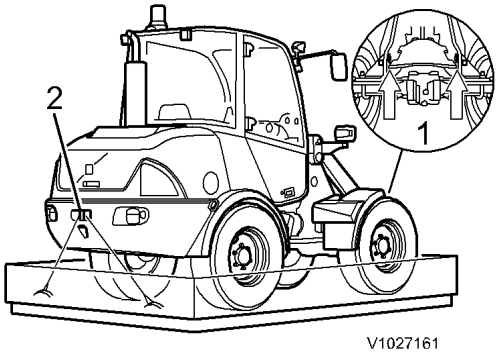


Figure 2
Lashing the machine

Marker plate for lashing

1. Fixing eyes on front frame
2. Fixing eyes on rear frame (towing device)

Lifting of machine

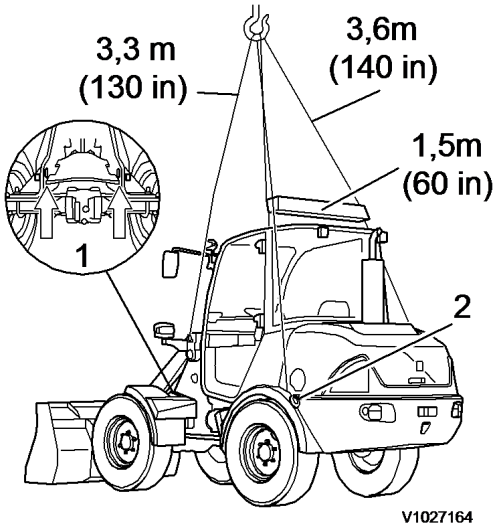


Figure 3
Lifting the machine

To lift the machine, use the indicated lashing points and lock the steering joint. The location of the lashing points is shown on the diagram.

Marking plate - Load/lift

1. Lifting/fixing eyes on front frame
2. Lifting eyes on rear frame

VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
E-tool Cab support	**080**	**Service Information**	**2014/3/8 0**
Profile: **CWL, L25F [GB]**			

E-tool Cab support

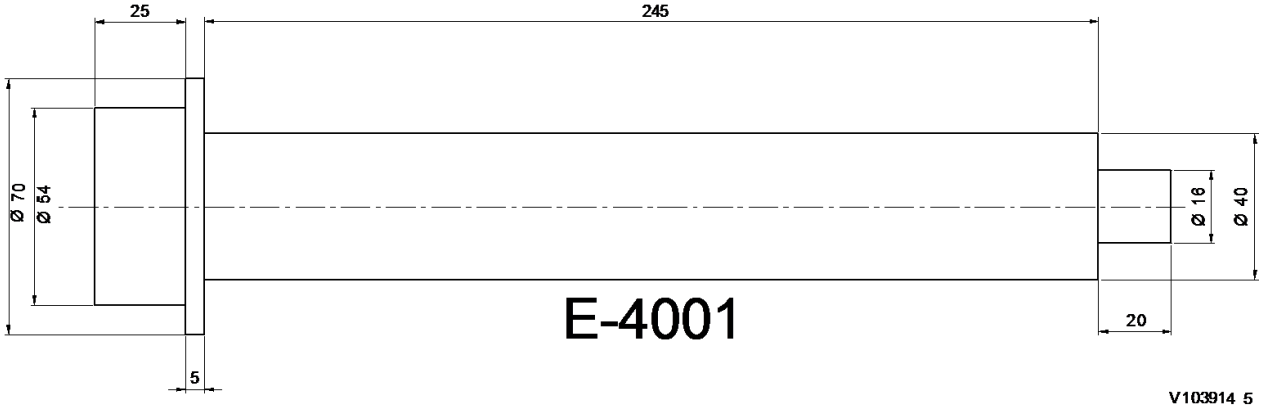


Figure 1

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Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
E-tool Guide bolts	**080**	**Service Information**	**2014/3/8 0**
Profile: **CWL, L25F [GB]**			

E-tool Guide bolts

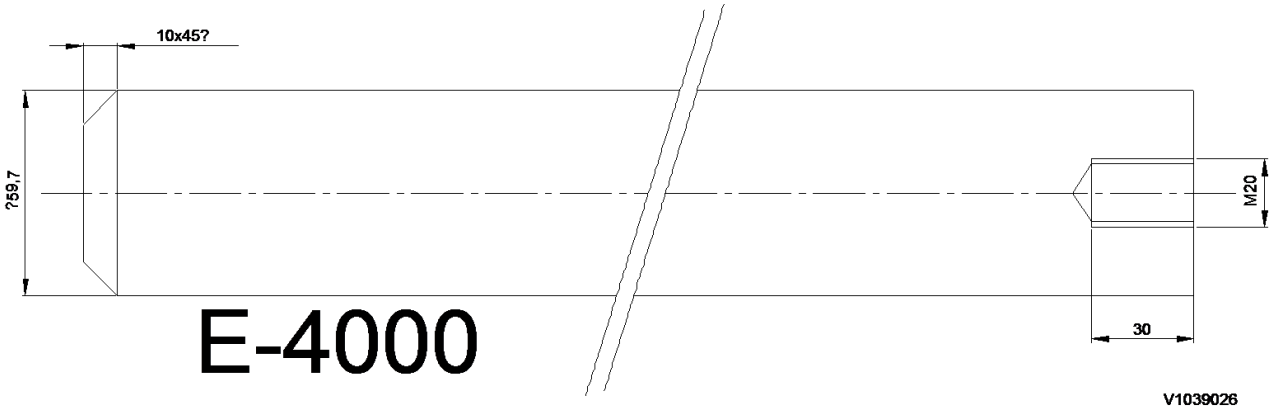

Figure 1
E-Tool for bend-swivel joint

VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
E-tool Sleeve	**080**	**Service Information**	**2014/3/8 0**
Profile: **CWL, L25F [GB]**			

E-tool Sleeve

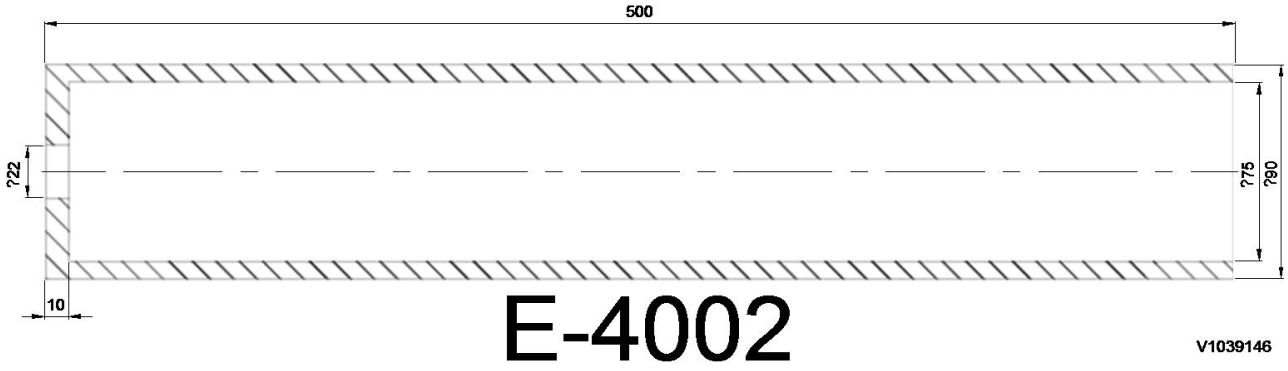

Figure 1

Document Title:	Function Group:	Information Type:	Date:
Service positions	**091**	**Service Information**	**2014/3/8 0**
Profile: **CWL, L25F [GB]**			

Service positions

NOTE!

Before starting maintenance work, place the machine on flat ground and place in the service position shown. Release pressure in the hydraulic system, i.e. turn off the engine, move the lever for the working hydraulics several times from neutral into the position "Raise - Lower", "Tilt In - Tilt Out".

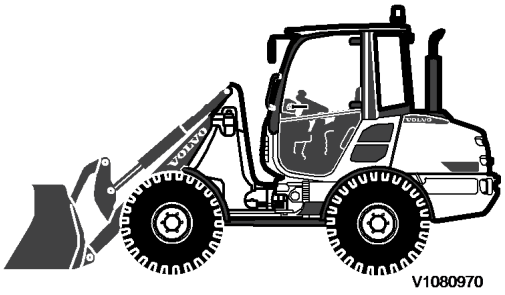

Figure 1
Service position, attachment flat on level ground

1. Place the machine on level ground, with the attachment flat on the ground.
2. Activate the parking brakes, insert wedges.
3. Remove ignition key.
4. For work in the hazardous area of the steering joint, the link must be blocked.
5. For work under the raised boom, the boom must be secured against accidental lowering.
6. A stable position must be ensured for installation, maintenance and repair work.
7. When raising the machine, use the lifting eyes provided. Secure the raised machine by supporting with corresponding supports.
8. Apply warning plate with the text "Do not start" to the steering wheel.

Many thanks for your purchase.
Happy every day.