

Document Title: Tightening specifications	Function Group: torque, 715	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Tightening torque, specifications

Protecting plate

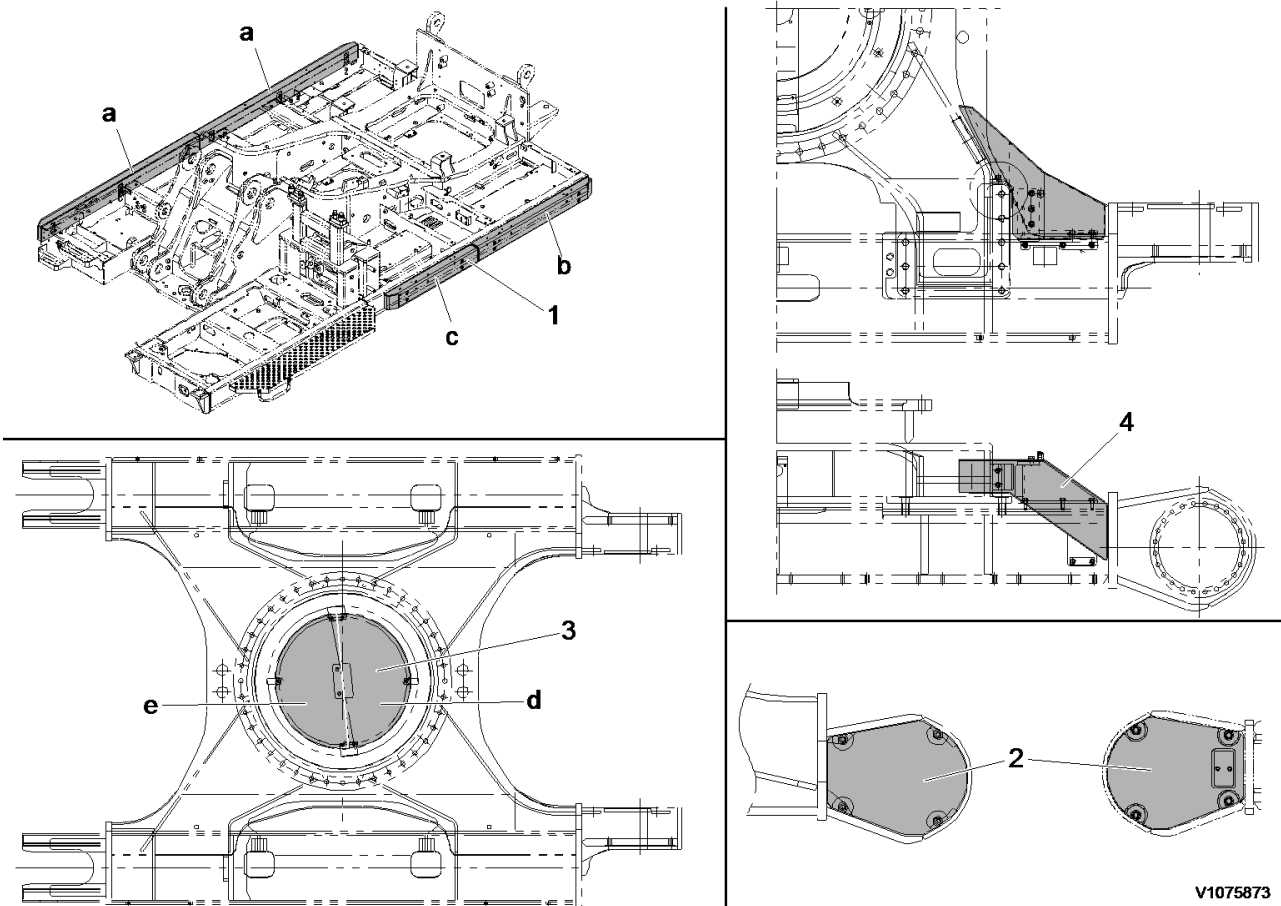


Figure 1
Machine view, protecting plate

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

No.	Items	Weight: kg (lbs)	Tightening torque
1	Side (LH, RH) impact protection	a: 73 (161) b: 53 (117) c: 42 (93)	262 ±26 (26.7 ±2.7) (193 ±19)
2	Track motor protection cover (LH, RH)	LH: 11 (24) RH: 11 (24)	
3	Undercover Coat loctite (#277 or 609) on screws.	d: 37 (82) e: 30 (66)	265 ±29 (27 ±3) (195 ±22)
4	Retractable protection plates (LH, RH)	LH: 40 (88) RH: 40 (88)	

Document Title: Protecting plate, description	Function Group: 715	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Protecting plate, description

Bucket cylinder protecting guard, Demolition

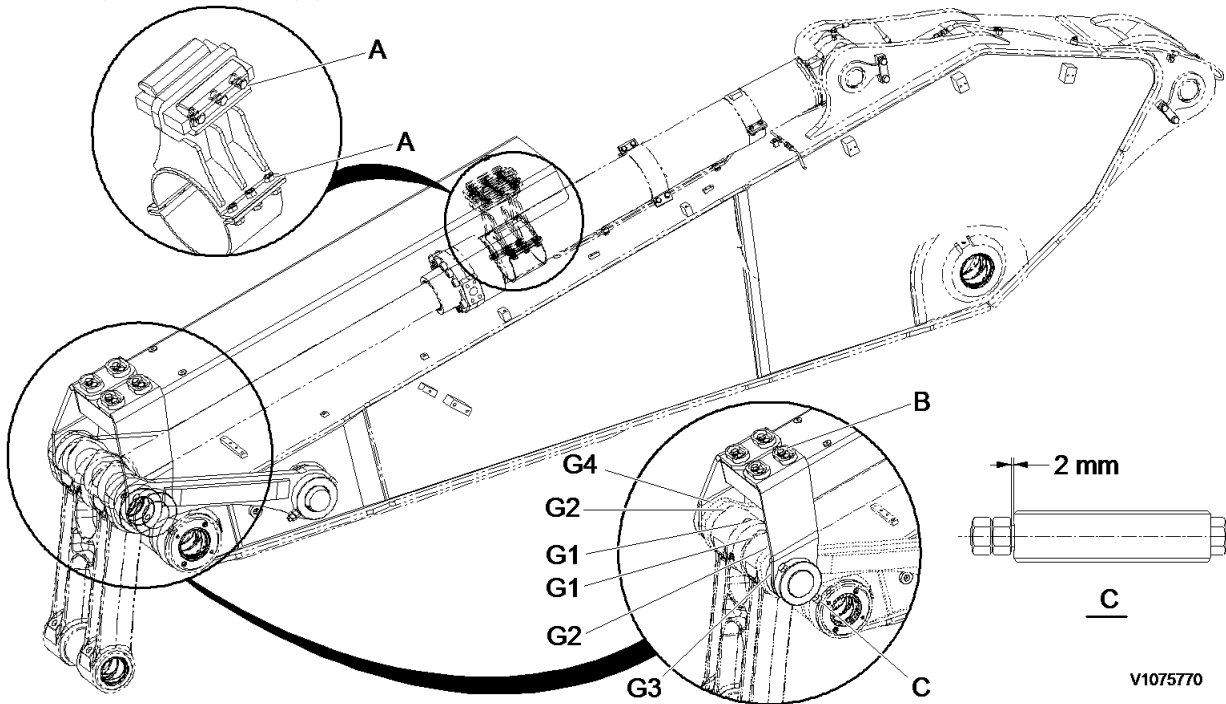


Figure 1
Protecting guard, bucket cylinder (standard)

Gap and shims

Items	Gap clearances: mm (inch)		Thick shims (1.0 t)	Thick shims (0.5 t)
	Minimum	Maximum	Quantity	Quantity
GAP 1	+0.5 (0.01969)	+2.5 (0.09843)	2	–
GAP 2	+2.0 (0.07874)	+3.0 (0.11811)	2	–
GAP 3	+0.5 (0.01969)	+1.5 (0.05906)	–	1
GAP 4	+0.5 (0.01969)	+1.5 (0.05906)	–	1
A	111 ±11 Nm (11.3 ±1.1 kgf m) (82 ±8 lbf ft)			
B	262 ±26 Nm (26.7 ±2.7 kgf m) (193 ±19 lbf ft)			
C	511.9 ±50.9 Nm (52.2 ±5.2 kgf m) (376.9 ±37.5 lbf ft)			

NOTE!

The item #4 and #5 before assembly coated grease on the hole inside.

Document Title: Boom cylinder protecting guard, removal	Function Group: 715	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Boom cylinder protecting guard, removal

Op nbr 715-019

1. Park the machine in the service position.
Raise boom cylinders (1), to Vertical position and stop engine.

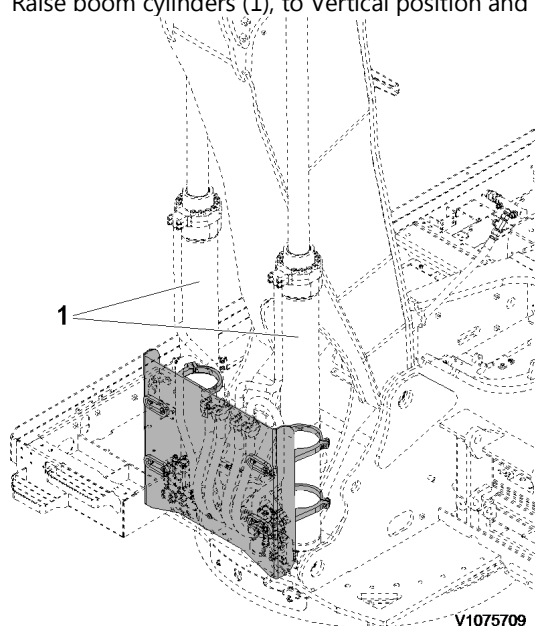


Figure 1
Position, boom cylinders

2. Install I-bolt and sling protector guard (2) securely with a hoist.

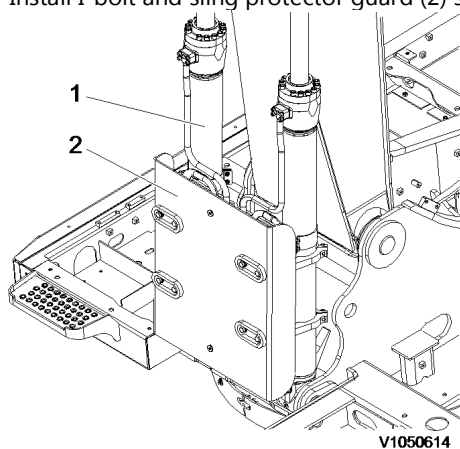


Figure 2
Installation, I-bolt and sling

NOTE!

Protector guard weight: 80 kg (176 lbs)

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! WARNING

The parts are heavy. Take appropriate safety cautions when handling them.

3. Remove screws (3) and protector guard (2).

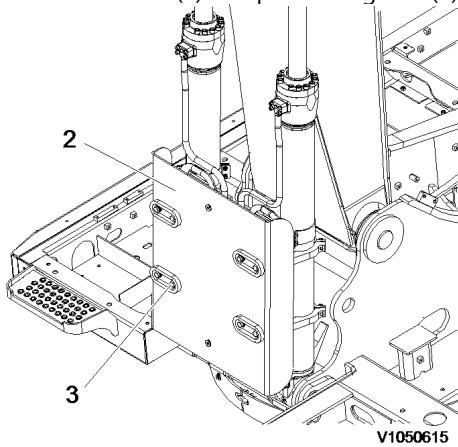


Figure 3
Remove, protector guard

4. Remove screws (4) and clamps (5).

NOTE!

When the last screw has been removed, the clamp falls down.

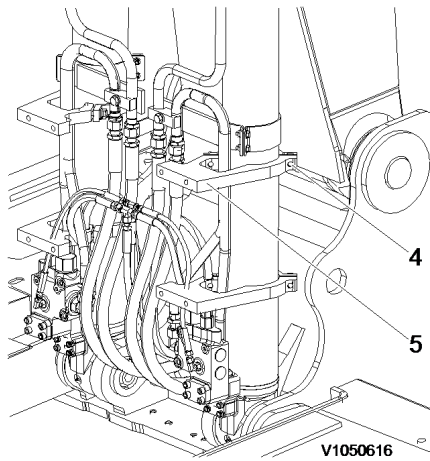


Figure 4
Remove, clamp

Document Title: Boom cylinder protecting guard, installation	Function Group: 715	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Boom cylinder protecting guard, installation

Op nbr 715-020

1. Park the machine in the service position.
Raise boom cylinders (1), to Vertical position and stop engine.

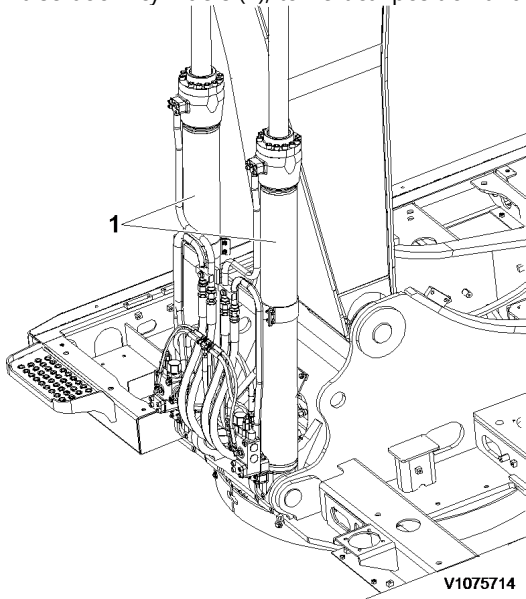


Figure 1
Service position, boom cylinder

2. Mark clamp location on each the boom cylinder (1).

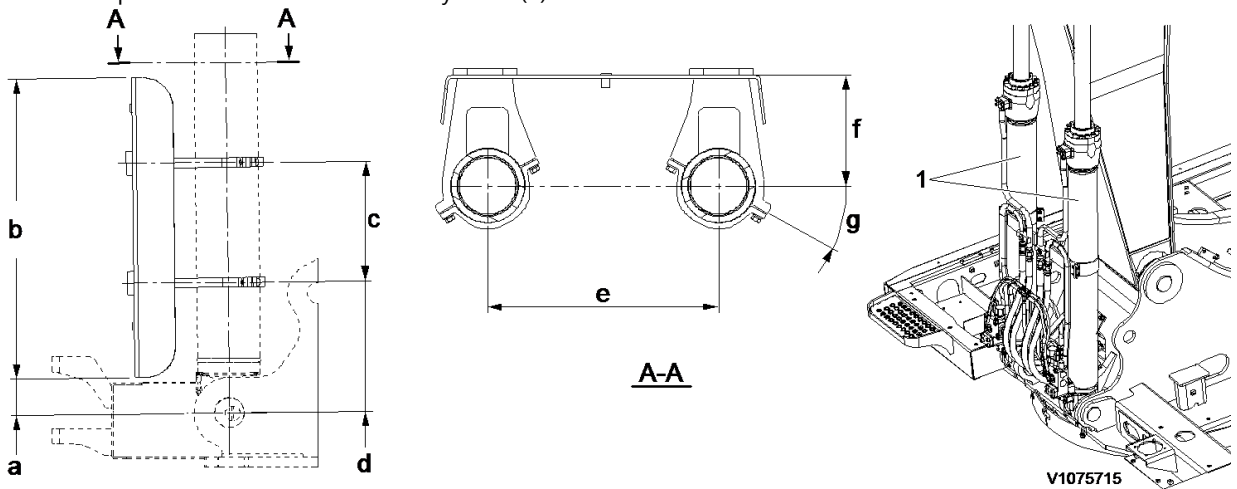


Figure 2
Marking, clamp position

- a. 120 mm (4.7 inch)

- b. 1000 mm (39.4 inch)
- c. 400 mm (15.7 inch)
- d. 435 mm (17.1 inch)
- e. 776 mm (30.6 inch)
- f. 316 mm (13.6 inch)
- g. 30°

3. Install screws (3) and clamps (2), don't over tighten the clamps (2).

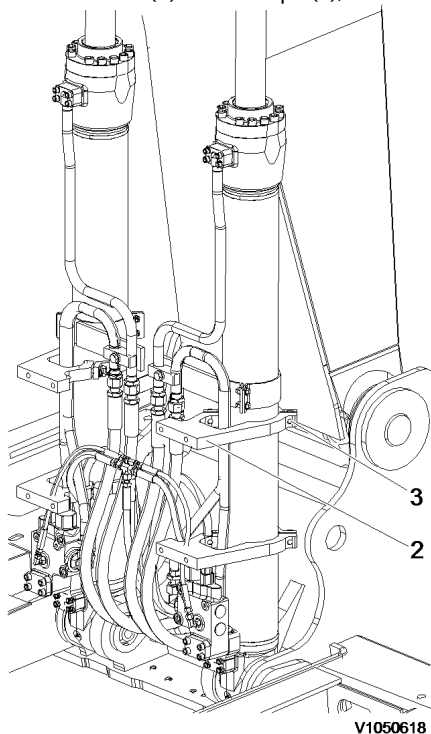


Figure 3
Installation, clamp

4. Sling protector guard (4) securely with a hoists and install screws (5).

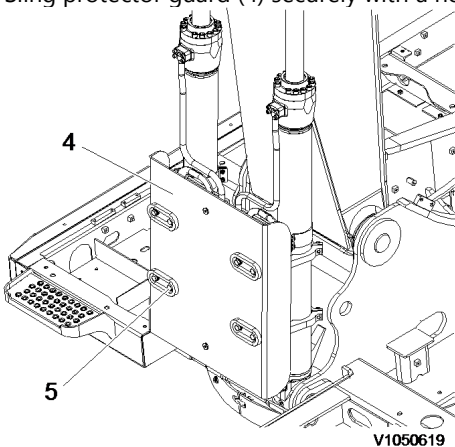


Figure 4
Installation, protector guard



WARNING
The parts are heavy. Take appropriate safety cautions when handling them.

NOTE!

Protector guard weight: 80 kg (176 lbs)

Tightening torque screws (5): 262 ±26 Nm (26.7 ±2.7 kg m) (193 ±19 lbf ft)

5. Before installing screws (6) apply loctite 277.

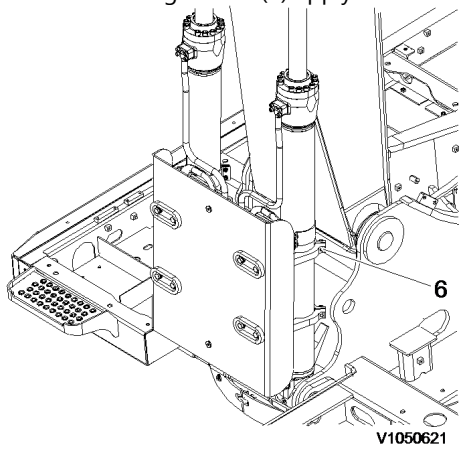


Figure 5
Installation, clamp screw

NOTE!

Tightening torque screws (6): 262 ± 26 Nm (26.7 ± 2.7 kg m) (193 ± 19 lbf ft)

6. Check for interference of protector guard by operating the boom cylinders.

Document Title: Additional counterweight, description	Function Group: 716	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

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Additional counterweight, description

A demolition equipped machine has an additional counterweight. The counterweight have one base part that is fixed on the machine and one removable part.

The removable part should only be fitted on the machine when the demolition boom is used.

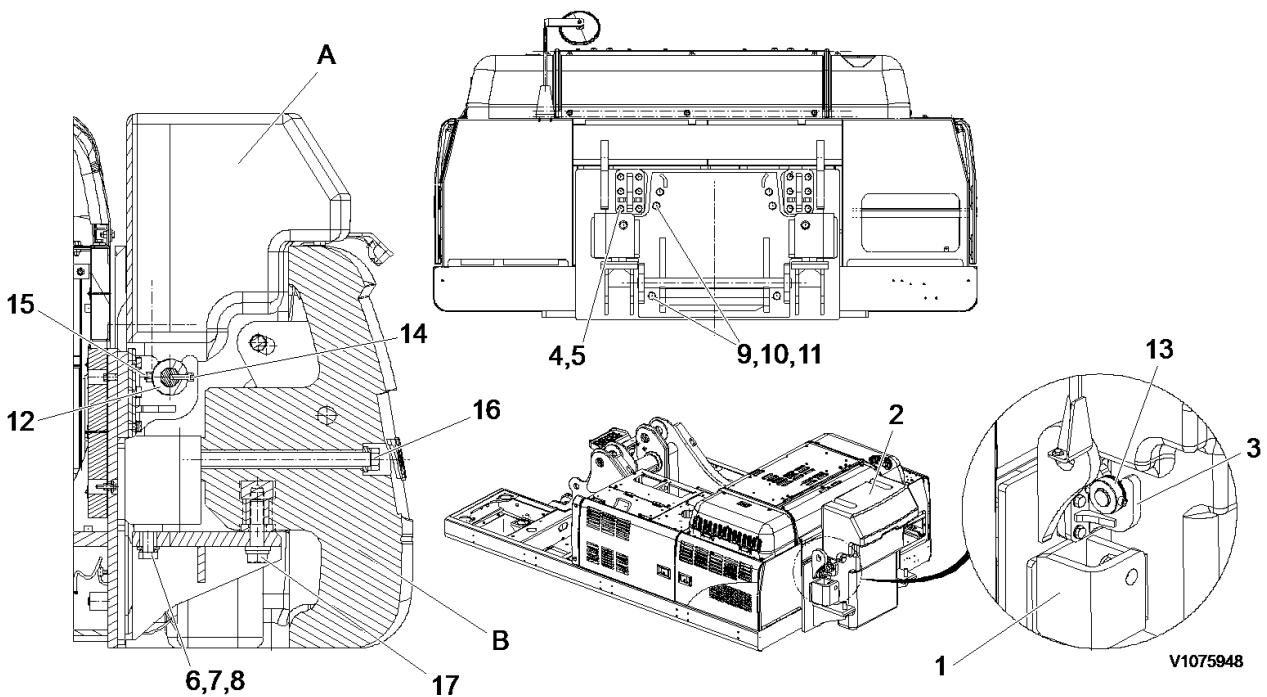


Figure 1
Additional (A) and Removal (B) counterweight

1	Additional counterweight support	5	Washers	9	Washers	13	Shim
2	Additional counterweight	6	Screws	10	Washers	14	Screws
3	Brackets	7	Spring washers	11	Screws	15	Lock nuts
4	Screws	8	Washers	12	Locking ring	16, 17	Screws

Tightening torque screws:

- (No. 4): 512 ±51 Nm (52.2 ±5.2 kg m) (377 ±38 lbf ft)
- (No. 6): 1373 ±137 Nm (140 ±14 kg m) (1011 ±101 lbf ft)
- (No. 11): 885 ±88 Nm (90.2 ±9 kg m) (651 ±65 lbf ft)
- (No. 16): 1900 ±190 Nm (193 ±19 kg m) (1400 ±140 lbf ft)
- (No. 17): 1900 ±190 Nm (193 ±19 kg m) (1400 ±140 lbf ft)

Document Title: Additional counterweight, description	Function Group: 716	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

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Additional counterweight, description

A demolition equipped machine has an additional counterweight. The counterweight have one base part that is fixed on the machine and one removable part.

The removable part should only be fitted on the machine when the demolition boom is used.

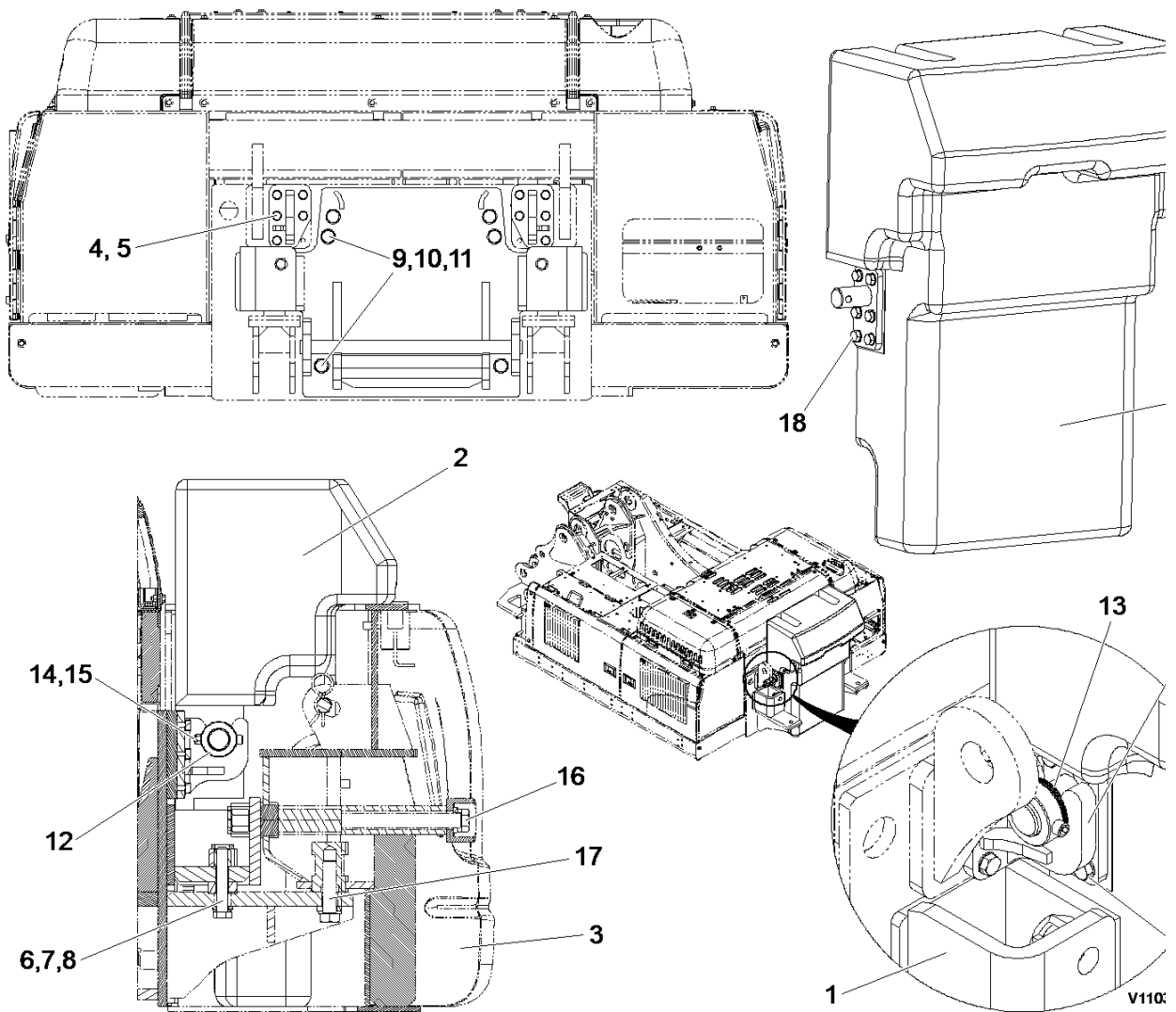


Figure 1
Additional (2) and Removal (3) counterweight

1	Support	7	Spring washers	13	Shim
2	Additional counterweight	8	Washers	14	Screws
3	Removal counterweight	9	Washers	15	Lock nuts
4	Screws	10	Washers	16	Screws

5	Washers	11	Screws	17	Screws
6	Screws	12	Locking ring	18	Screws
				19	Brackets

Additional counterweight 3800 kg (12787 lbs)

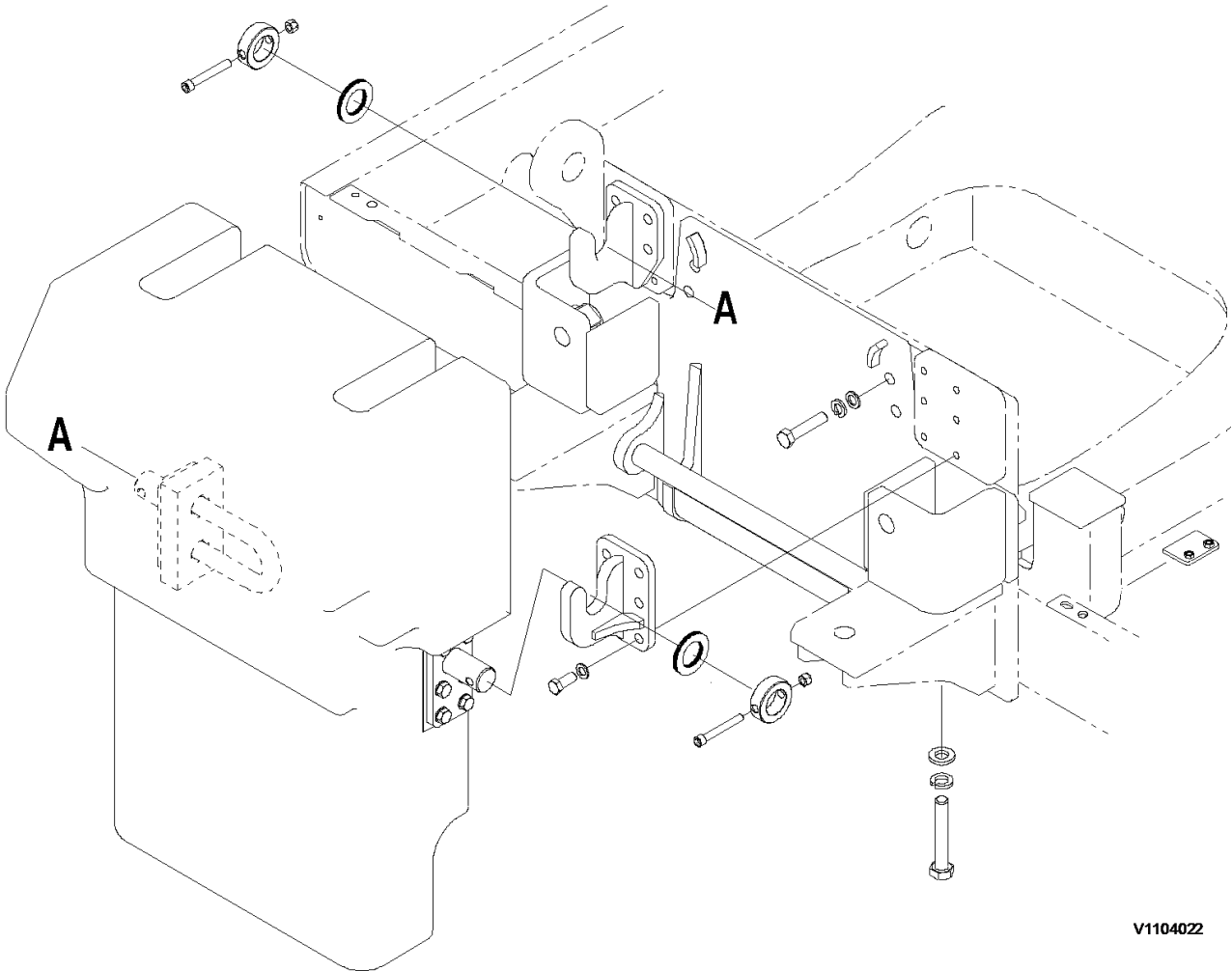
(No. 4, 18): 512 ±51 Nm (52.2 ±5.2 kg m) (377 ±38 lbf ft)

(No. 6): 1373 ±137 Nm (140 ±14 kg m) (1011 ±101 lbf ft)

(No. 11): 885 ±88 Nm (90.2 ±9 kg m) (651 ±65 lbf ft)

(No. 16): 1900 ±190 Nm (193 ±19 kg m) (1400 ±140 lbf ft)

(No. 17): 1900 ±190 Nm (193 ±19 kg m) (1400 ±140 lbf ft)



V1104022

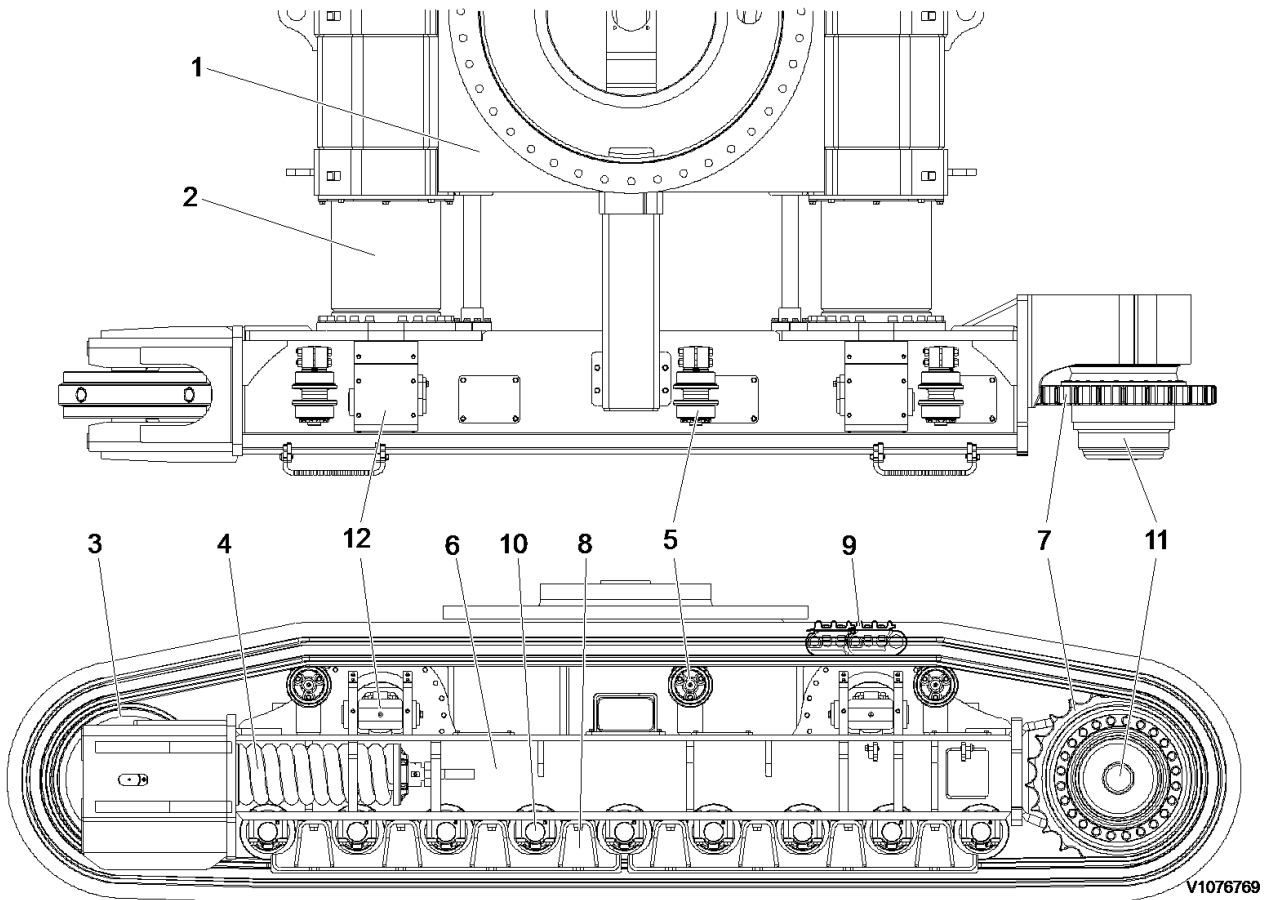
Figure 2
Additional counterweight

Document Title: Undercarriage, description	Function Group:	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Undercarriage, description

Hydraulic variable track

Undercarriage consists of idlers, springs, top and bottom rollers, sprockets, track links, variable cylinder, track motor, track frame and track guards.



V1076769

Figure 1
Hydraulic variable track lower frame

1	Lower center frame	5	Top roller	9	Shoe
2	Variable cylinder sliding tube	6	Track frame	10	Bottom roller
3	Idler	7	Sprocket	11	Track motor
4	Recoil spring	8	Track guard	12	Hydraulic variable track cylinder

Hydraulic variable track lower frame (Foot steps: Center type)

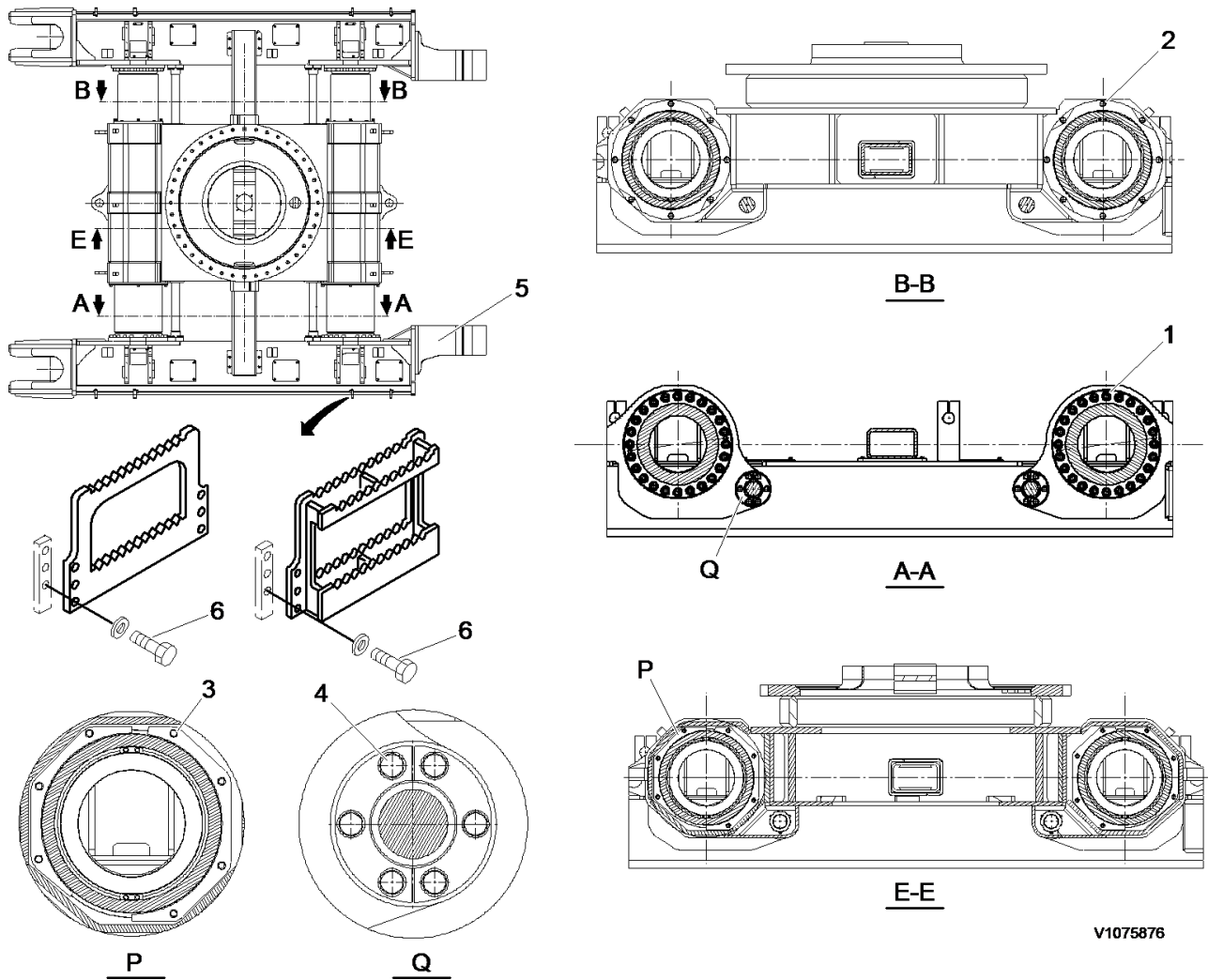


Figure 2
Variable lower frame

No.	Tightening torque: Nm (kgf m) (lbf ft)
1	885 ±88.3 (90.2 ±9.0) (651.2 ±65)
2	261.8 ±26.5 (26.7 ±2.7) (192.8 ±19.5)
3	63.7 ±6.9 (6.5 ±0.7) (46.9 ±5.1)
4	261.8 ±26.5 (26.7 ±2.7) (192.8 ±19.5)
5	Weight: 11250 kg (24802 lbs)
6	Foot step mounting screw: 265 ±29 Nm (27 ±3 kgf m) (195 ±22 lbf ft)

Document Title: Selection of track shoes	Function Group: 775	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Selection of track shoes

Choose suitable track shoes to match the ground conditions.

Method of selecting shoes

Confirm the category from the list of uses in the "Category" table then use the "Selection" table to select the shoe.

Categories "B" and "C" are wide shoe, so there are restrictions on their use. Therefore, before using, check the restrictions and consider carefully the conditions of use before selecting a suitable shoe width. If necessary, give the customer guidance in their use.

When selecting the shoe width, select the narrowest possible within the range that will give no problem with flotation and ground pressure. If a wider shoe than necessary is used, there will be a large load on the shoe, and this may lead to bending of the shoe, cracking of the links, breakage of the pins, loosening of the shoe screws, or other problems.

Category, track shoes

Category	Use	Precautions when using
A	Rocky ground, normal soil	Travel in low speed when traveling on rough ground with obstacles such as large boulders and fallen trees.
B	Soft ground	Travel in high speed only on flat ground. When it is impossible to avoid traveling over obstacles, lower the travel speed to approximate half of low speed. NOTE! Cannot be used on rough ground where there are large obstacles such as boulders and fallen trees.
C	Extremely soft ground (swamp ground)	Use only for ground where "A" and "B" are impossible to use. Travel in high speed only on flat ground. When it is impossible to avoid traveling over obstacles, lower the travel speed to approximate half of low speed. NOTE! Cannot be used on rough ground where there are large obstacles such as boulders and fallen trees.

Selection, track shoes

Specifications	Specifications
600 mm triple grouser	A
700, 800 mm triple grouser	B
900 mm triple grouser	C
600 mm double grouser	A

Document Title: Idler, description	Function Group:	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Idler, description

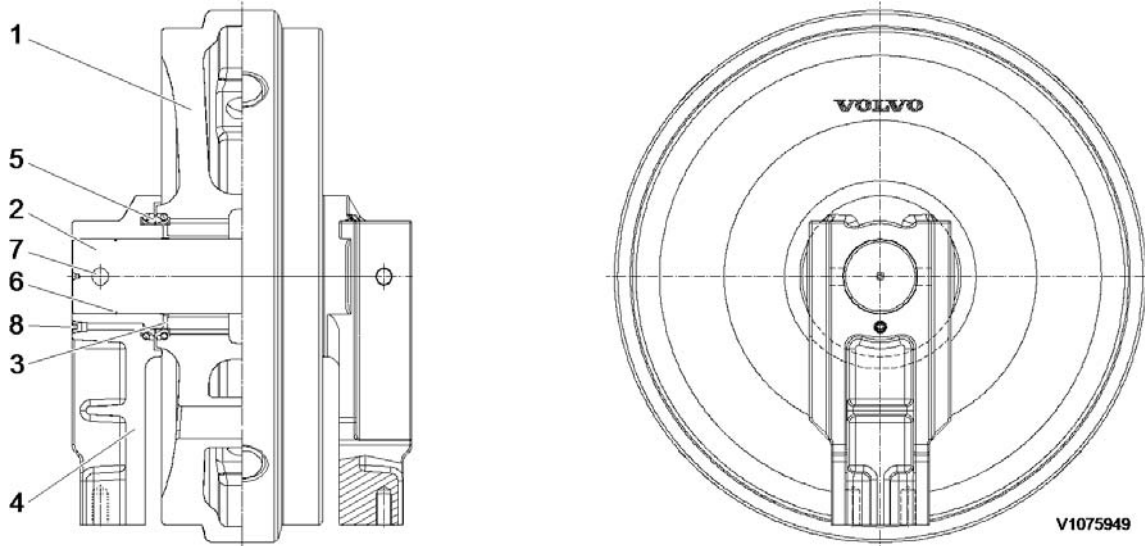


Figure 1
Structure, idler

1	Idler wheel	4	Support	7	Pin
2	Shaft	5	Seal	8	Plug
3	Bushing	6	O-ring (shaft)		

NOTE!

To carry about idling more than 10 times after filling oil. (Filling oil and oil speciation, see Operator's manual)

Document Title: Idler, measurement of wear	Function Group:	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Idler, measurement of wear

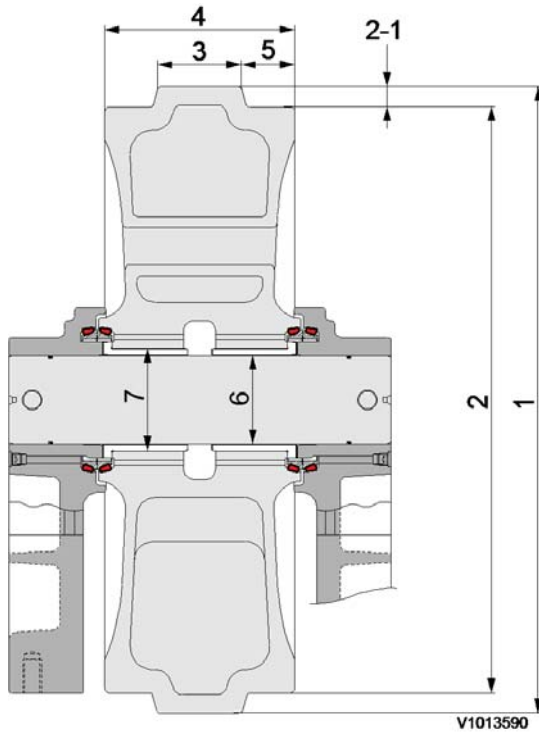


Figure 1
Idler

Wear limit, unit : mm (in)

No.	Check item	Standard size	Allowable limits		Remedy		
1	Outside diameter of flange	674 (26.5)	-		Rewelding or replacing		
2	Outside diameter tread	630 (24.8)	618 (24.3)				
2-1	Depth of tread	22 (0.87)	28 (1.10)				
3	Width of flange	101 (3.98)	91 (3.6)				
4	Total width of tread	204 (8.0)	-				
5	Width of tread	51.5 (2.03)	46.5 (1.83)				
6	Clearance between shaft and bushing	Standard size	Tolerance limits		Clearance		
		95 (3.7)	Shaft	Hole	Standard	Limits	
			0 -0.035 (0 -0.0013)	+0.515 +0.415 (+0.020 +0.016)	0.415 ~ 0.550 (0.0164 ~ 0.0216)	1.5 (0.059)	
7	Clearance between idler and bushing	110 (4.3)	+0.159 +0.124 (+0.0062 +0.0049)	+0.054 0 (+0.0021 0)	-0.07 ~ -0.159 (-0.0028 ~ 0.0062)	-	-

Tread and flange, measurement of wear

Tread, measurement of wear

1. Clean the surface of tread (a) and flange (b) of the idler.

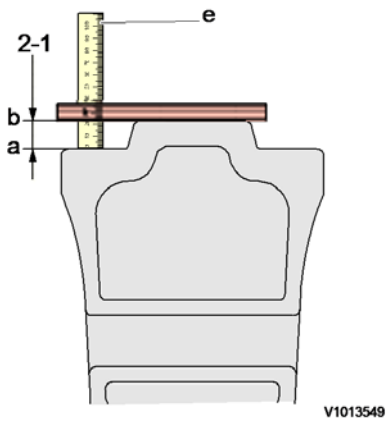


Figure 2

Measurement, tread wear

2. Set a scale on the surface of flange (b) horizontally. Measure the depth (2-1) between surface of flange (b) and surface of tread (a) using depth gauge (e).
- Tools: Depth gauge (150 mm, 5.9 in)
3. Measure 3 places to take average value.
4. Measure right and left alternately. Repair or replace if necessary.

Flange, measurement of wear

1. Clean the surface of measurement of the idler.

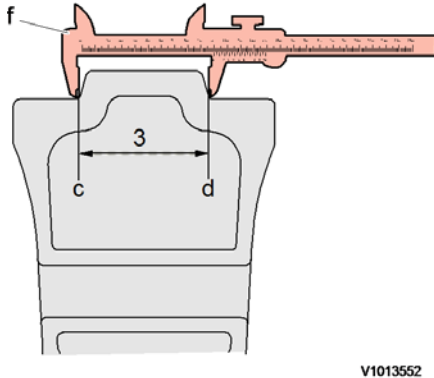


Figure 3

Measurement, flange wear

2. Measure the width of the flange between (c) and (d) using vernier calipers (1).
- Tools: Vernier calipers (200 mm, 7.8 in)
3. Measure 3 places to take average value.
4. Measure right and left alternately. Repair or replace if necessary.

Document Title: Idler, removal and installation	Function Group:	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Idler, removal and installation

Op nbr 775011

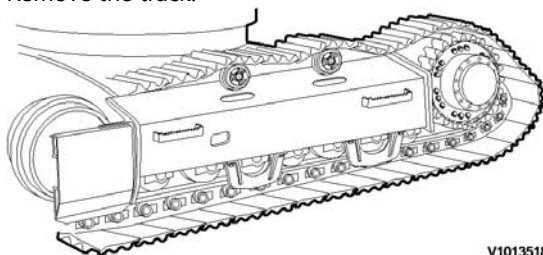
[14560748 Track pin press](#)

[14548448 Pump](#)

[14566479 Pin kit](#)

Removal of the idler and the spring package

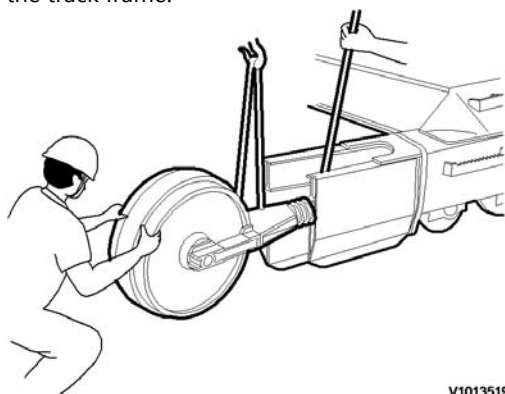
1. Remove the track.



V1013518

Figure 1
Removal, track

2. Pass a wire rope around the track spring bracket, lift the idler assembly and using a pry bar, push the bracket out of the track frame.

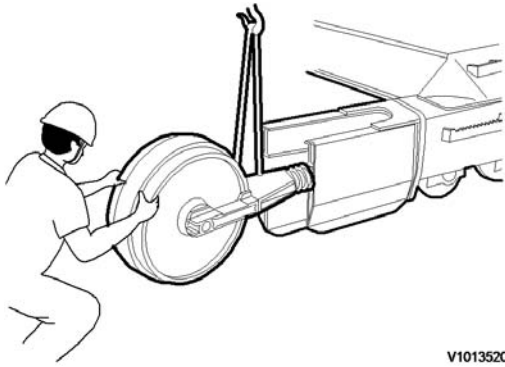


V1013519

Figure 2
Removal, idler assembly

Installing the idler and the track spring

3. Pass a wire rope around the track spring bracket, lift the idler assembly, then fit and push the slide block into the slide groove in the track frame.



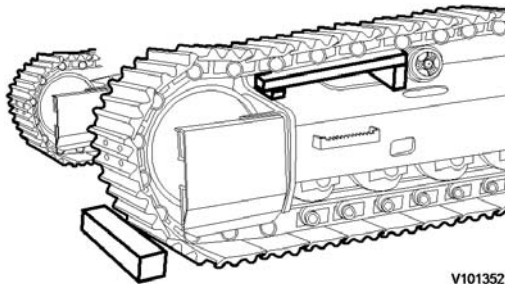
V1013520

Figure 3
Installation, idler assembly

NOTE!

Confirm that the boss at the piston end of the track spring is in the track frame hole.

4. Install the track.



V1013521

Figure 4
Installation, track

Document Title: Idler, disassembly	Function Group:	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Idler, disassembly

Prepare the following tools for disassembly and assembly.

The numbers in parentheses following each part name in the text correspond to those in figure.

1. Remove the screws, and remove the track spring.

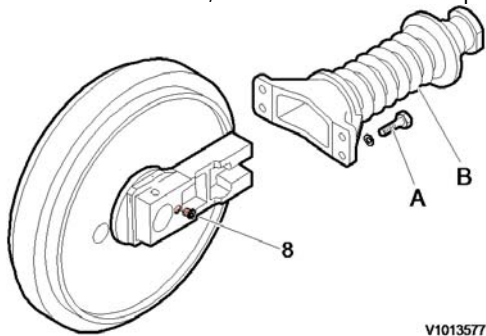


Figure 1
Removal, spring package

- A. Screw
- B. Spring package

2. Remove plug (8) to drain oil.

- Tool : Allen wrench (6 mm)

3. Put pin jig (d) on pin (7), and force out the pin by lightly tapping the jig with a hammer.

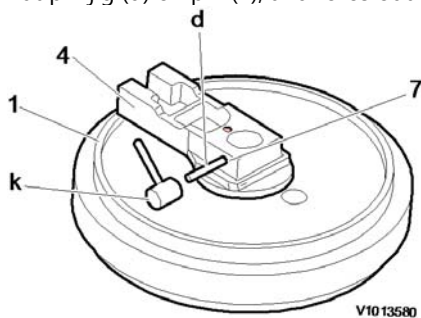


Figure 2
Removal, pin

4. Place idler (1) on idler support block (f), put shaft removal jig (g) on shaft (2) and force out the shaft using press (a).

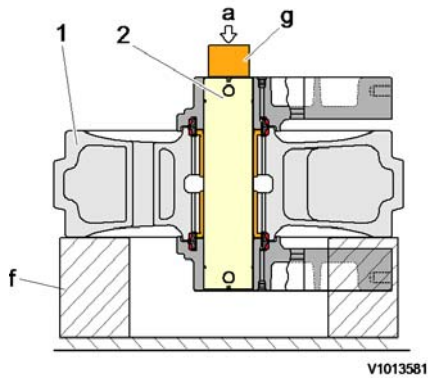


Figure 3
Push with a press

a. Press

5. Remove seal ring (5) and O-ring (9) from idler wheel (1) and support (4), respectively.
6. Remove O-ring (6) from shaft (2).

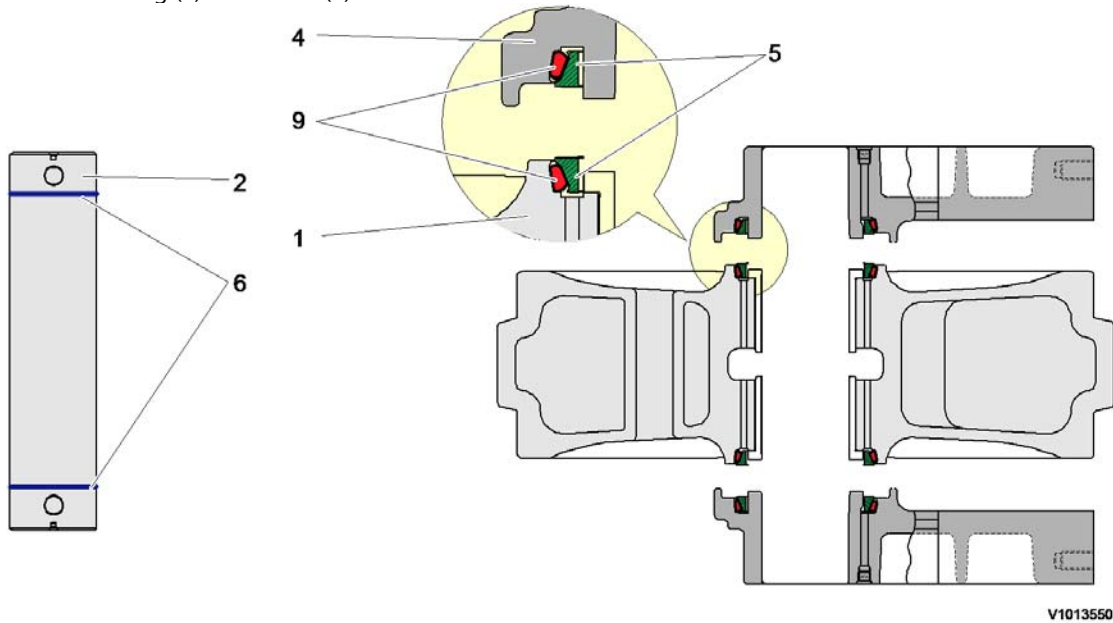


Figure 4
Removal, seal and sealing

7. Place idler (1) on idler support jig (f), put bushing pressure jig (h) on bushing (3) and bushing removal jig (e), and drive out the bushing by lightly tapping the jig.

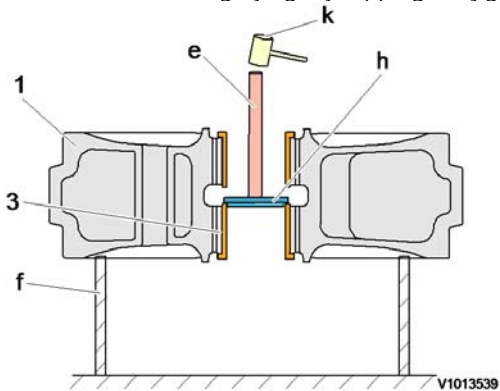


Figure 5
Removal, bushing

a. Press

Inspection after disassembly

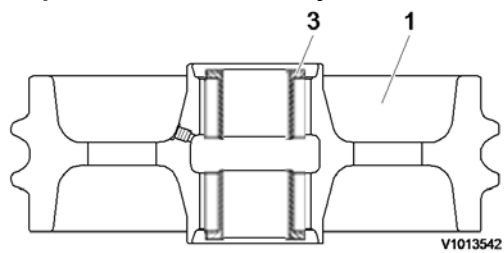


Figure 6

Inspection, parts

1. Confirm that there is no damage or rust on the sealing face of seal (5).
2. Confirm that any wear of idler (1) is within the allowable range.
3. Confirm that any wear of shaft (2) or bushing (3) is within the allowable range.

Document Title: Idler, assembly	Function Group:	Information Type: Service Information	Date: 2015/8/24
Profile: EXC, EC460C HR [GB]			

Idler, assembly

The numbers in parentheses following each part name in the text correspond to those in figure.

Assemble in the reverse order of disassembly.

1. Place bushing (3) on idler wheel (1), and using jig (h), force fit with press (a).

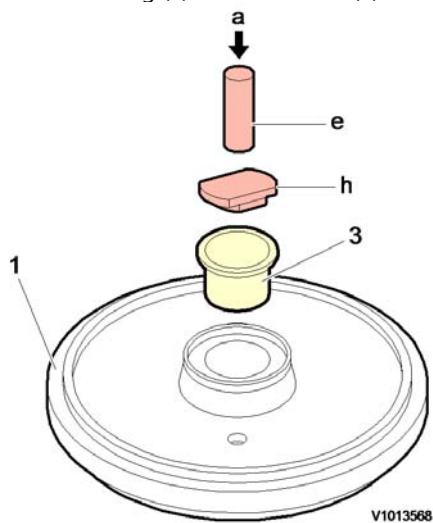


Figure 1
Assembly, bushing

2. Install O-ring (6) on shaft (2).

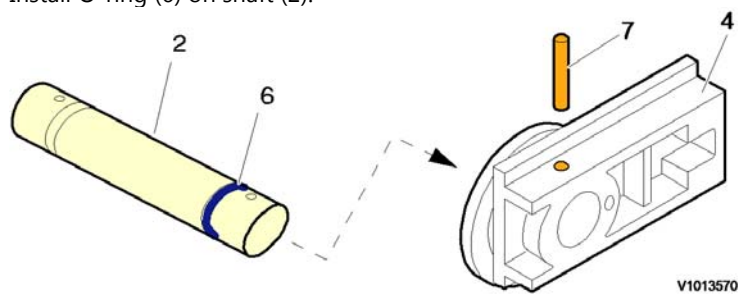


Figure 2
Assembly, O-ring and etc.

3. Apply a thin coat of grease to inner side of support (4), install shaft (2), and insert pin (7). In this case, take care not to damage O-ring (6).
4. Insert seal ring (5) and O-ring (9) to the support and idler wheel (1), respectively.



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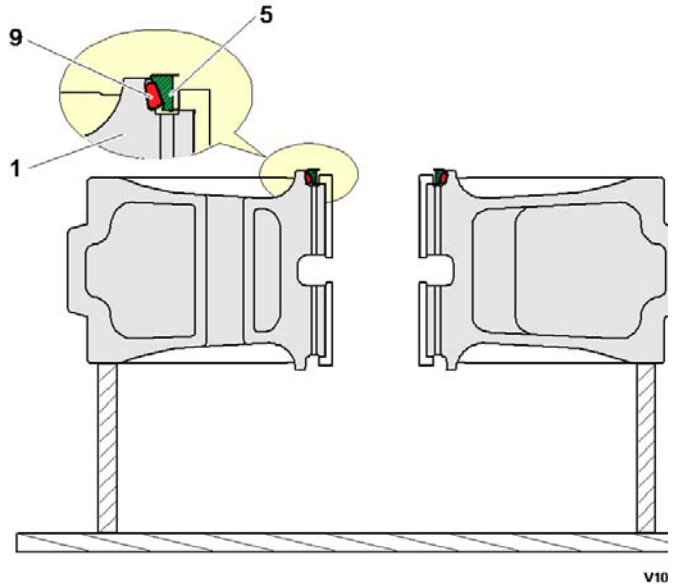
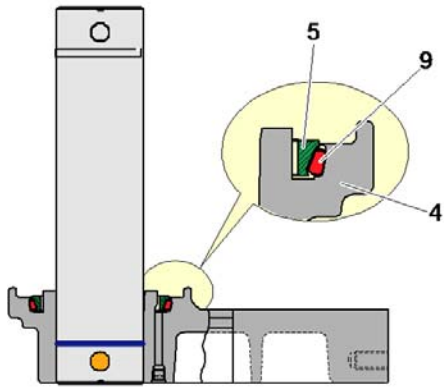


Figure 3
Assembly, shaft

5. Install shaft (2), and support (4) assembly to idler (1). Lightly coat engine oil on seal ring (5) contact face.

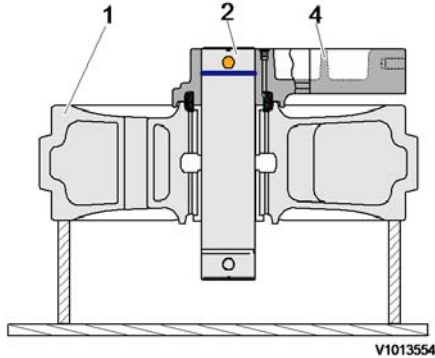


Figure 4
Assembly, shaft and support

6. Install support (4) with seal ring (5), O-ring (9) and shaft O-ring (6). Install support (4) assembly to idler (1). Lightly coat engine oil on seal ring (5) contact face.

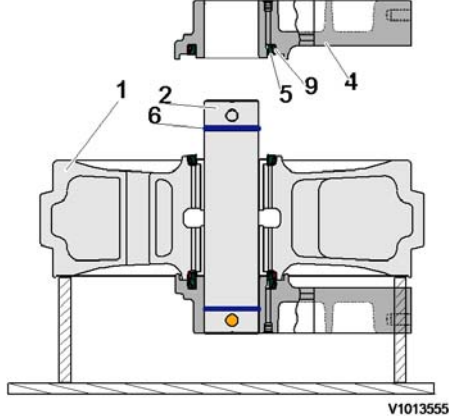


Figure 5
Assembly, support

7. Insert spring pin (7) with hammer (k).

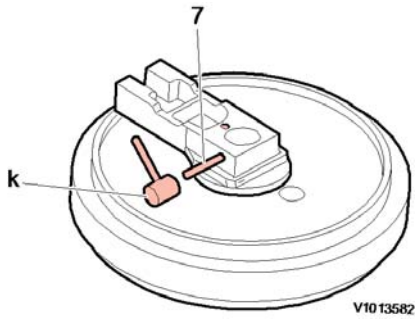


Figure 6
Assembly, spring pin

8. Prior to filling with oil perform a pressure leak test.
 - Attach a pressure regulated air line to the oil fill port, then completely immerse the assembly in water.
 - Under a pressure of 2 ~ 3 kgf/cm² (28 ~ 43 psi), air bubbles must not form for 15 seconds.
9. Fill with engine oil (j):

Oil amount	S/N 110001~115000	420 cc (25.6 cu in)
	S/N 115001~	460 cc (28.1 cu in)

10. Install plug (8) with teflon tape (L), and tighten securely.
 - Tool : Allen wrench (6 mm)
11. Confirm that there are no oil leaks around seals (5, 6) and plug (8).

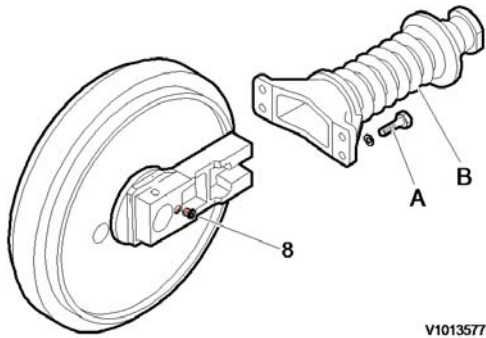


Figure 7
Assembly, idler and track spring

- A. Screw
- B. Spring package

12. End play must be within specifications

End play	S/N 110001~115000	0.3 ~ 1.18 mm (0.012 ~ 0.046 inch)
	S/N 115001~	0.23 ~ 1.33 mm (0.01 ~ 0.052 inch)

13. Assemble the idler assembly and track spring. After assembling, manually confirm that idler (1) rotates to the extent you can rotate it despite the resistance. (More than 10 times).
Tightening torque : 47 ~ 57 kgf·m (340 ~ 412 lbf·ft)
Apply loctite 277 to the screws.

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