

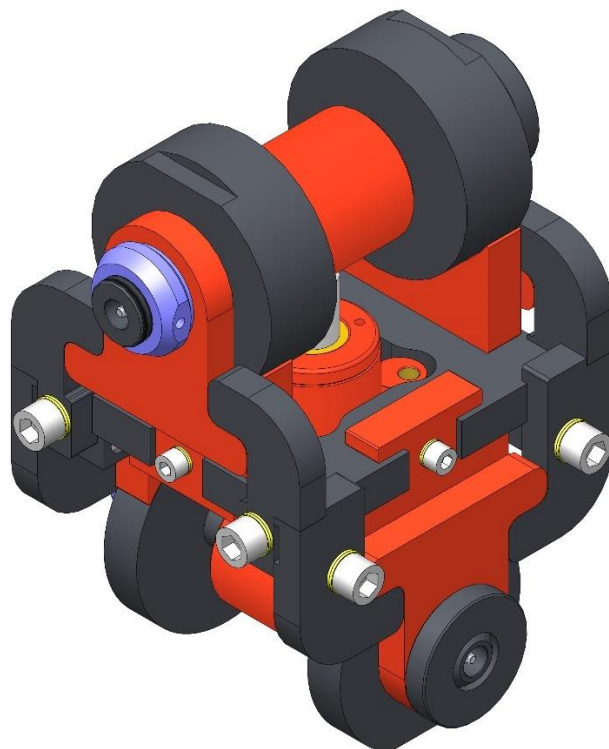
VALLIUS

Forestry Solutions

FLOWLINK

Hydraulic Swing Damper

Original Installation-, Operation- and maintenance manual





Vallius Forestry Oy Ltd

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9.5.2018

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1.0 Forewords

Congratulations for the successful Hydraulic Swing Damper selection.

By following the instructions shown in the manual, it contributes that the Hydraulic Swing Damper will work reliably, serving you a long time and many years ahead. In a case of any doubt, please contact your local Hydraulic Swing Damper -reseller or the machine manufacturer.

Store this manual for future needs.

Respectfully

Vallius Forestry Oy Ltd

Intended use for Hydraulic Swing Damper!

The Hydraulic Swing Damper is suitable for controlling unwanted pendulum movements of different types of work equipment in operating machines with folding cranes. Flowlink is attached to the end of the crane boom. Typically, Flowlink is attached to a rotator. Flowlinks can thus be used to cushion the pendulum movement of a timber crane and head of the harvester.

Operating machine = A harvester with a safety cab, a timber car, or an agricultural tractor.

It is forbidden to use the Flowlink Hydraulic Swing Damper for any other purpose!

This manual is intended as a guide. The publication information is reviewed at regular intervals and the necessary changes are made to new editions. Vallius Forestry Oy Ltd may make improvements or modifications to the machines described in this publication at any time

Vallius Forestry Oy Ltd is not responsible for any direct or indirect damages that may arise from the use of this manual.

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2.0 Flowlink Hydraulic Swing Damper dimensions

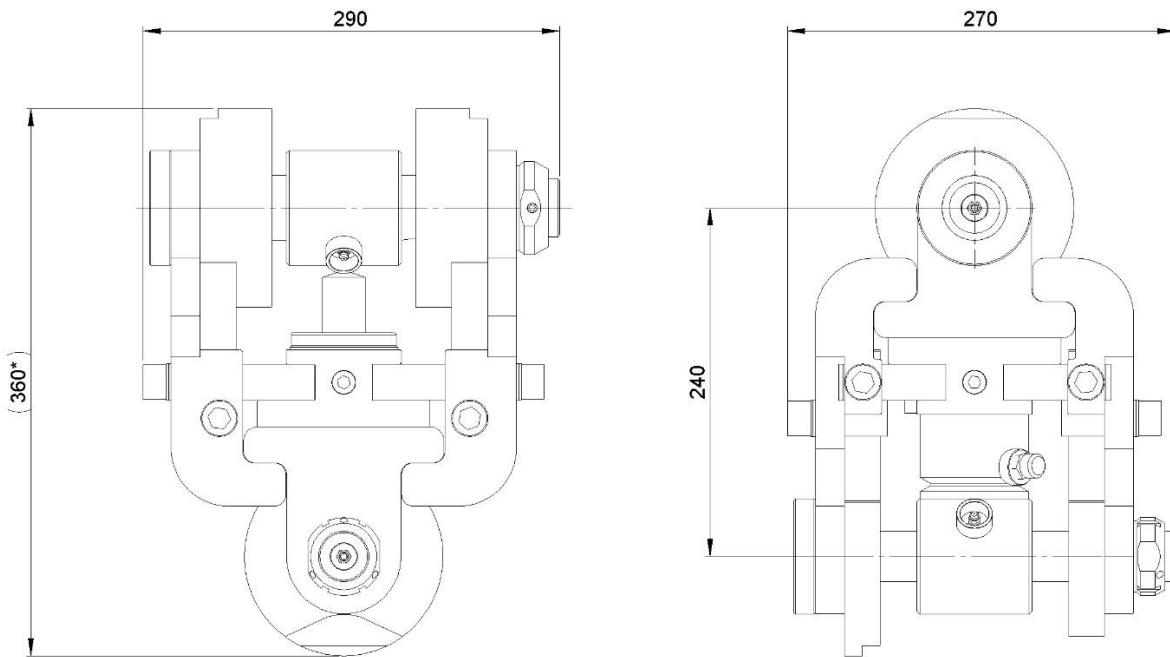


Figure 1. FLOWLINK - Hydraulic Swing Damper main dimensions.

3.0 Connecting Hydraulic Swing Damper to operating machine

Flowlink-Hydraulic Swing Damper is attached to operating machines folding crane. Flowlink is mounted on the boom of the operating machine with separate boom specific adapters. The working device (e.g. rotator) is attached to the pendulum in turn with working device-specific adapters. You can get help with the Flowlink connection from your nearest reseller.

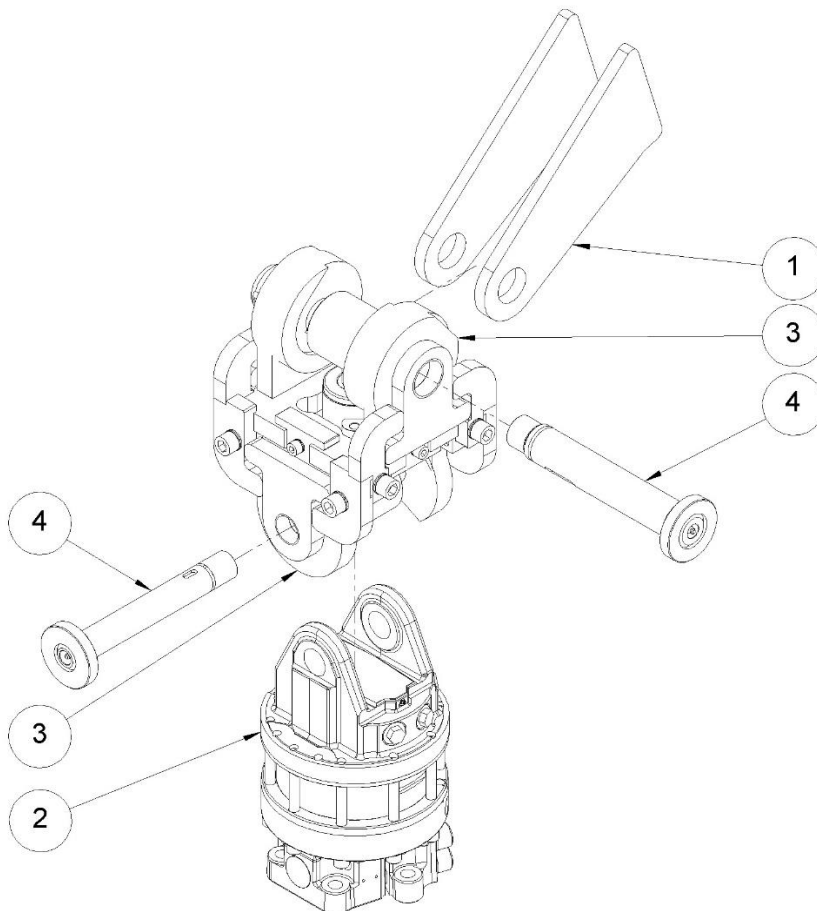


Figure 2. Flowlink parts and mechanical connection

The Flowlink Hydraulic Swing Damper adapters (Part No. 3) are made in accordance with the boom and rotator of the base machine (ordered separately). Install the Flowlink between the operating machines boom head (1) and the rotator (2) using the adapter (3). The shafts (4) are made to fit the boom and rotator. The hydraulic hose is connected between the operating machine and the Flowlink only after mechanical connection. The removal of Flowlink is done in reverse order.

NOTE !

The engine of the operating machine must be turned off before any cleaning or maintaining operations for the Flowlink. Before disassembling the pendulum, the machine must be on a firm ground. Ensure that the pressure of the hydraulic system is released before any work with the hoses or hose connections.



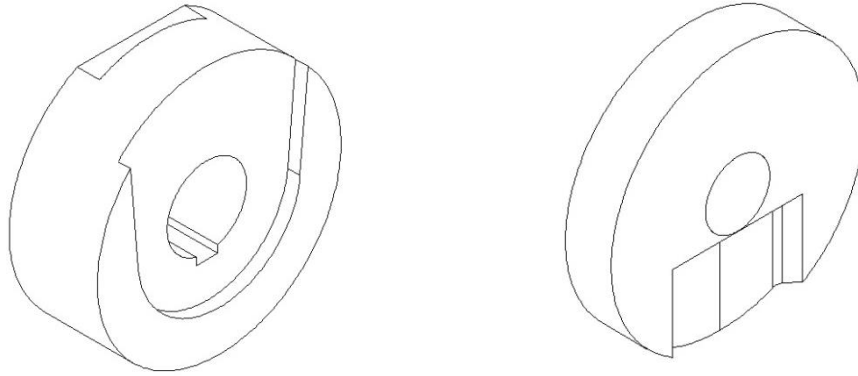


Figure 3. Adapters.

Adapters required to mount Flowlink. On the left side is the operating machines' boom-made adapter. On the right is an adapter made in accordance with the rotor model. Adapter plates work as brake pads at the same time.

4.0 Instructions for handling and safety

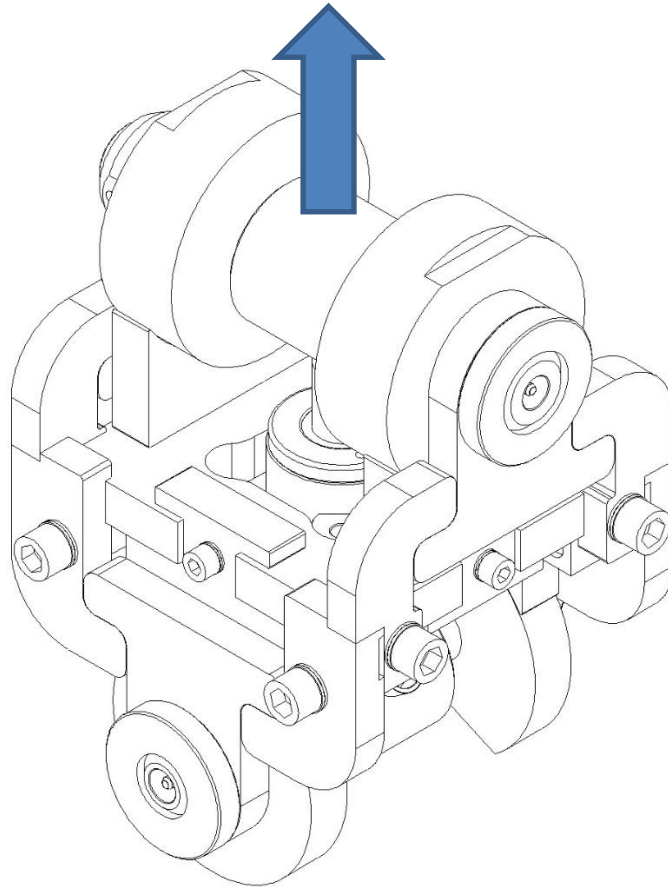


Figure 4. Lifting of Hydraulic Swing Damper.

The device can be lifted from the shaft with a lifting sling, Flowlink weights about 50 kg (ca. 110 lbs).

When Flowlink is transported connected to operating machine, follow the transportation instructions of the operating machine.

The loose device must be transported horizontally and properly tied.

The Hydraulic Swing Damper is controlled from the chassis of operating machine with control device.

It is intended only for the braking of the pendulum movement of the work equipment attached to the machine, other uses are prohibited.

The operating machine to which the Flowlink is connected must be CE marked.

► Check that there are no bystanders in the radius of 25m (82 feet) before you start the operating machine and start using the Hydraulic Swing Damper.

NOTE!



Follow the instructions regarding the hazard area of each machine. (operating machine, folding boom crane, the device which is connected to Hydraulic Swing Damper) If the hazard area is defined by different equipment suppliers to different sizes, the largest hazard area must be followed.

Take into account the existing legislation when working, e.g. road traffic law.

The machine operator must have appropriate capability and rights to operate the operating machine, i.e. the user must control the operating machine.



DANGER!

Failure to follow the safety instructions may result in material damage, serious injury, or even death.

Take note of the power lines, under is Tukes' instructions on how to operate in **Finland**: Tukes is a Finnish Safety and Chemicals Agency.

Check the applicable laws in your country.

Table 1: Warning distances for power lines.

Power line voltage	Safety distance (meter)		
	Open wire		Suspended wire
	Below	By the side	
0,4 kV*	2*	2*	0,5**
20 kV	2	3	1,5
110 kV	3	5	-
220 kV	4	5	-
400 kV	5	5	-

* Low voltage 0.4 kV overhead lines are currently very rare.

** The distance also applies to 1kV suspension lines

1kV = 1000 V

The hazard area for outsiders is the boom outreach + 25 m (82 feet). Outsiders are not allowed to reside closer than that. The user of the operating machine must ensure that there are no outsiders in the hazard area while working. The safety cab protects the user during the work. Follow the operating machine manufacturer's safety instructions.


NOTE!

The engine of the operating machine must be turned off before any cleaning or maintaining operations for Hydraulic Swing Damper. Ensure that the hydraulic system is not pressurized.


DANGER!

It is strictly prohibited to stay under the lifted operating machine boom.

HAZARD AREA


Figure 5. Hazard area warning label.

The boom of the operation machine must be marked with HAZARD AREA 25 m (82 feet)-label. The marking must be installed both sides of the boom.

Operation of the Hydraulic Swing Damper is allowed only when the user is in the cabin. All kind of remote or wireless control is strictly prohibited, if it allows the machine operator stay inside the danger area without protection of the safety cabin.

It is prohibited to use Hydraulic Swing Damper to carry or transport persons.

It is prohibited to use Hydraulic Swing Damper as a support, when moving or turning the operating machine.

It is prohibited to use Hydraulic Swing Damper as a lifting device or as a shovel. Do not transport or carry any objects with the Hydraulic Swing Damper.

Do not push the Hydraulic Swing Damper down with the boom as it may damage it.


DANGER !

It is prohibited to drive the operation machine or control the Hydraulic Swing Damper under the influence of the alcohol or drugs.

5.0 Construction overview and ordering the spare parts

When maintaining or repairing the Hydraulic Swing Damper, use only the original spare parts provided by the Vallius Forestry Oy Ltd.

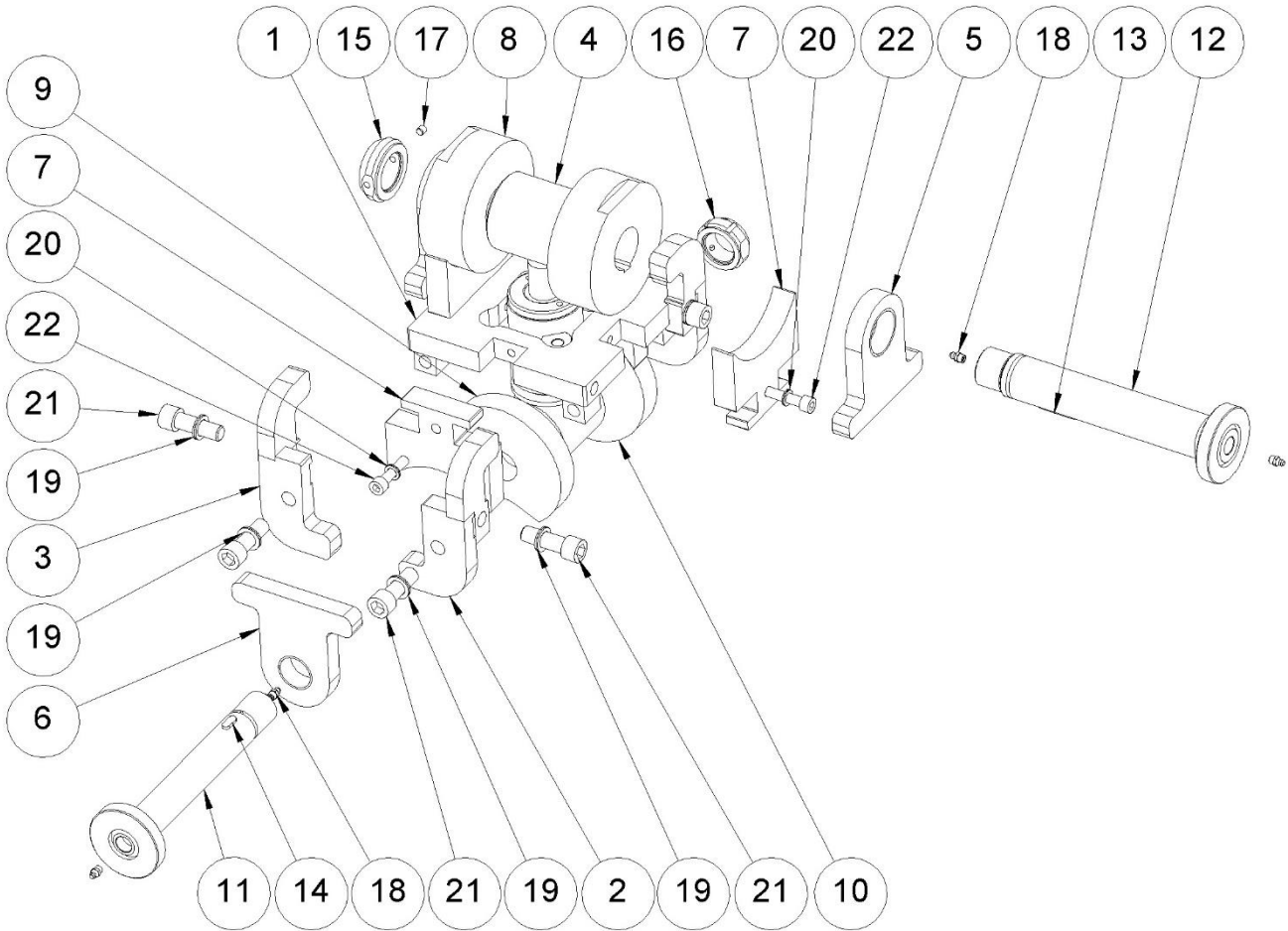


Figure 6. Exploded view of the device.

Table 2: Flowlink spare part list

Part	Appoinment	Draw.Nu	Standard	Material	Dimensions	Pcs
1	Frame	VF15-10579-A				1
2	Support	VF15-10581-A				2
3	Support	VF15-10582-A				2
4	Hydraulic Cylinder	VF15_0381_C			60/30-30 A218 WB45/35	1
5	Axis bracket	VF15-10572-A				2
6	Axis bracket	VF15-10573-A				2
7	Brake disc	VF15-10125-A	EN 10025-2	S355K2 + N	PL25 x 105,99 x 120	4
8	Adapter flange	VF15-10121-A		Hardox400	ø138 x 50	2
9	Adapter flange	VF15-10130-A		Hardox400	ø138 x 25	1
10	Adapter flange	VF15-10229-A		Hardox400	ø138 x 25	1
11	Axel D35	VF15-0436				1
12	Axel D45	VF15-10115-A				1
13	Wedge	VF15-10146-A			PL8 x 12 x 48	1
14	Wedge	VF15-10623-A			PL8 x 7 x 20	1
15	KMT-8				KMT 8	1
16	KMT-7				KMT 7	1
17	Set screw		DIN 913		M8 x 8	2
18	Grease nipple		DIN 71412		M8x1,25	4
19	Locking Washer		Nord-Lock		NL16	8
20	Locking Washer		Nord-Lock		NL10	4
21	Head socket screw		DIN 912		M16x50	8
22	Head socket screw		DIN 912		M10x45	4

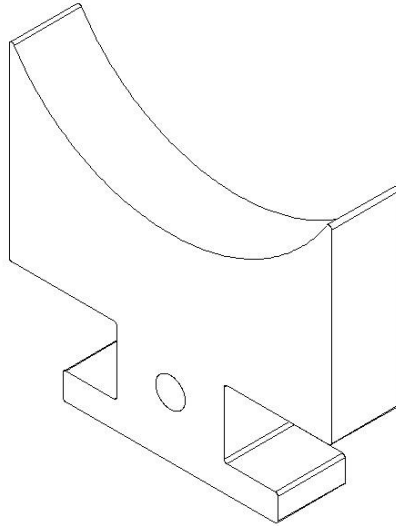


Figure 7. Brake pad available as spare part.

Brake pad set includes 4 brake discs (Figure 7). Order number VF15-10125-A

Read the instructions on how to change the brake pads on the page 17.

Ordering spare parts

Please take a contact to your local reseller or directly to:

Vallius Forestry Oy Ltd
Länsikatu 15
80110 Joensuu, Suomi Finland
Company's business ID:
26606158
www.valliusforestry.com

When ordering the spare parts, please give us the following information:

- Machine name (Type)
- Serial No
- Spare part order code (Drawing number)
- Spare part name
- Spare part quantity
- Name and address
- E-mail address
- Phone number
- Delivery / freight policy

All machine information is shown in the type label. Please place the order of the needed spare parts in advance to avoid any breaks in the operation.

6.0 Technical specifications and hydraulic connections

Hydraulic oil temperature range – 20 - +85 C°. (29-185 Farenheit).
Operating pressure for Flowlink -Hydraulic Swing Damper max. 30 MPa. The weight of the Flowlink is about 50 kg (100 lbs) (depending on the adapters).

Table 3: Requirements for the oil cleanliness, viscosity and temperature

Hydraulic fluid ³⁾			
Fluid cleanliness			ISO 4406, Class 20/18/15
Fluid viscosity range	$\nu_{\min/\max}$	mm ² /s	10 to 2000
Fluid temperature range ⁴⁾	$\theta_{\min/\max}$	°C	-20 to +85

range

Viscosity: ISO VG46



NOTE !

Do not use HEES, HEPG tai HETG oils without permission of the manufacturer.

Hydraulic connection

Diameters of the hydraulic hoses/pipelines of operating machine must be at least the same size as the hydraulic block connections. If smaller sizes are used, it will reduce the performance of the Flowlink.

A hose can be connected to the Flowlink hydraulic cylinder to go up or down, the other direction must be blocked.

The Flowlink is connected to operate on the operating machine's hydraulics with one connector.

Flowlink hydraulic cylinder threads:

- In, thread G 1/4

Specified operating pressure for the hydraulic hoses is max. 30 MPa (4350 PSI).

Use approved parts and components only.

Flowlink hydraulic connection

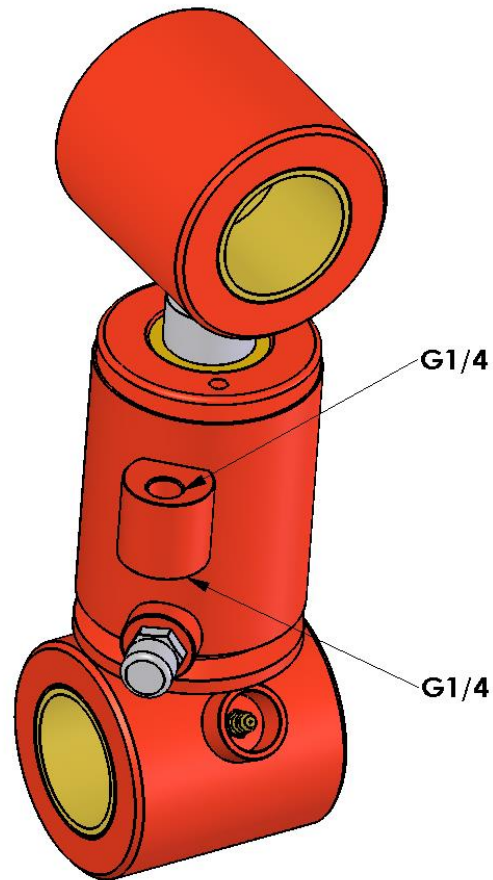


Figure 9. Flowlink's hydraulic hose connection to operating

The hydraulic hose in the Flowlink can be connected to go up or down. The vacant one must be blocked. Only use approved hydraulic components. Hydraulic connection must only be carried out by a person with a sufficient level of knowledge.



NOTE!

When handling hydraulic oil and oily hoses, protect your skin, wear protective gloves and protective goggles. Pressurized hoses must not be handled.

The magnitude of brake force is controlled with the magnitude of hydraulic pressure. Brake force affects the ability to suppress pendulum motion. The table below shows the cylinder pulling force at different pressure values.

Pressure [MPa]	Pull [N]
10	21210
11	23330
12	25450
13	27570
14	29690
15	31820
16	33940
17	36060
18	38180
19	40300
20	42420
21	44540
22	46660
23	48780
24	50900
25	53030
26	55150
27	57270
28	59390
29	61510
30	63630
31	65750
32	67870
33	69990
34	72110
35	74240

Pressure [PSI]	Pull [lbs]
1450	4768
1595	5245
1740	5721
1885	6198
2030	6675
2175	7153
2320	7630
2465	8106,
2610	8583
2755	9060
2900	9536
3045	10013
3190	10490
3335	10966
3480	11443
3625	11922
3770	12398
3916	12875
4061	13351
4206	13828
4351	14305
4496	14781
4641	15258
4786	15734
4931	16211
5076	16690

Braking force is adjusted to the used load. As the load increases, so does the need for braking force. In the table, recommendations for the pressure volume with different loads.

Load [kg]	Pressure [MPa]
500	10-13
1000	15-17
1500	17-22

Load [lbs]	Pressure [PSI]
1100	1450-1885
2200	2175-2465
3300	2465-3190

Flowlink Hydraulic-diagram

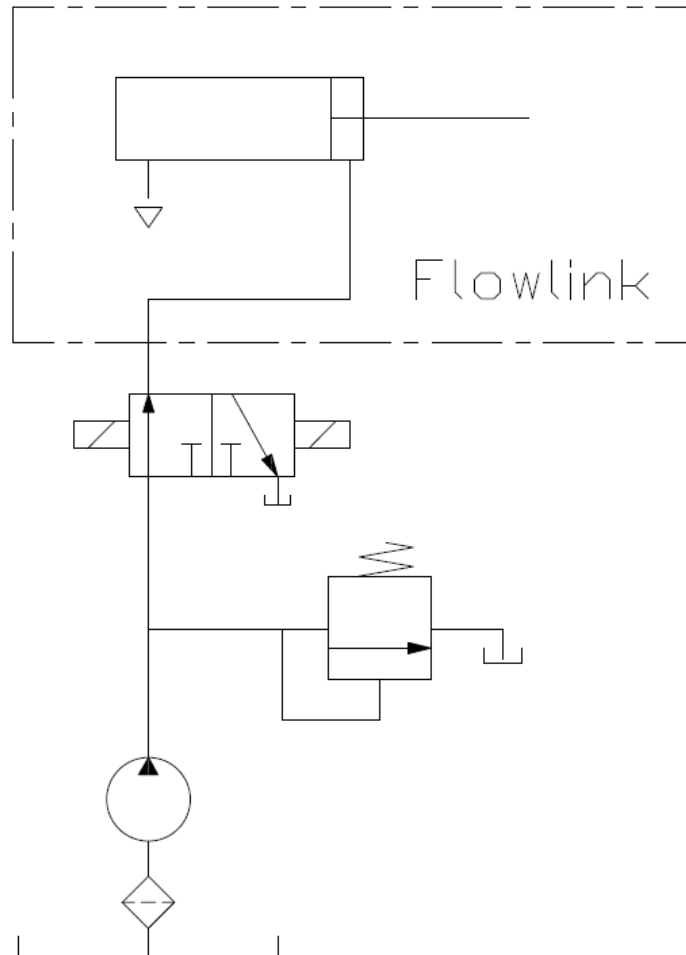


Figure 10. Flowlink Hydraulic-diagram.

7.0 Operation, maintenance, and storage

Check the machine daily, before and after the work. Check the screw connections of the unit, they must not be loose. Tighten the screws if needed. Check that all hoses and hose connections are unbroken and there are no leakages. If needed, change the broken hose, and tighten the connections.

Check the condition of brake pads. If necessary, change the brake pads. Replacing them is timely if they are damaged or the brake performance is significantly reduced.

Flowlink braking will turn on when the hydraulic pressure is applied to the pendulum. Braking is needed when, for example, the timber groove needs to be moved when empty (grab open). The brakes are switched off when the timber groove is opened.

On the first run with Flowlink, lock the brakes and release them. This will ensure that the braking goes on and off. If the operation is not normal, stop using the pendulum and contact your seller.

Use of Flowlink in the harvester: The harvester head requires a brake when the harvester head is driven to the tree trunk. The brake is switched off when the harvester head is closed.

When the work is stopped, the boom is lowered to the ground. Make a similar check on the device as before starting work.

For long-term storage, lubricate Flowlink with protection against corrosion, protect the ends of the hydraulic hoses from dirt. Purity in hydraulics allows trouble-free operation and is a prerequisite for longevity.

Make an external Hydraulic Swing Damper check, also check the bearing clearance and their condition.



NOTE!

Stop the engine before cleaning or servicing the Hydraulic Swing Damper. Make sure that the hoses are not pressurized.



DANGER!

It is always strictly prohibited to stay under the lifted boom or working machine.

Replacement of brake pads

Check the condition of the pads regularly. Only use original brake pads. This is how we can ensure the performance of the pads.

Guide to change brake pads:

Lower the boom of the operating machine onto a stable ground.

1. Check that the Flowlink hydraulics are non-pressurized and the brake pads are not in contact with the counter surfaces.
2. Unmount the Flowlink from the operating machine.
3. Remove the axle (No. 1, Fig. 11) and remove the bearing lugs (4).
5. Open the screws (2) and remove the supports (5).
6. The brake pad (No. 6) is released when removing the screw (3). Pull the old Brake Pad from the frame hinge and replace it with a new one.
7. Remove the supports also from the other side of the Hydraulic Swing Damper and replace the Brake Pad.
8. The assembly is performed in the reverse order.
9. Tighten the M16 screws to 210 Nm (8.8 property class).
10. Replace the Hydraulic Swing Damper other axle's brake pads the same way.

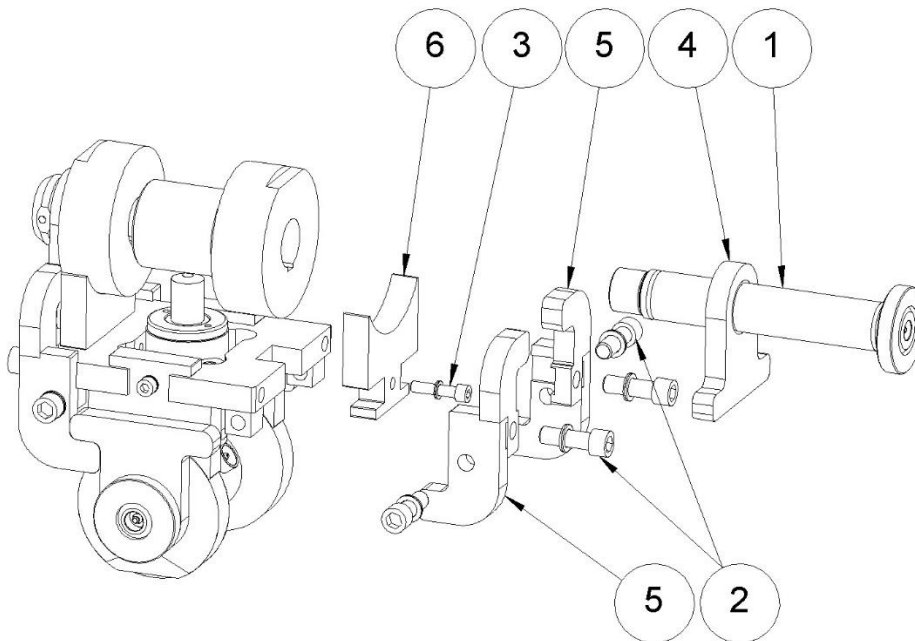


Figure 11. Replacement of brake pads



NOTE!

When handling the hydraulic oil and hydraulic hoses, use protective gloves and eye protection equipment. Pressurized hoses must not be handled.

Greasing of bearings

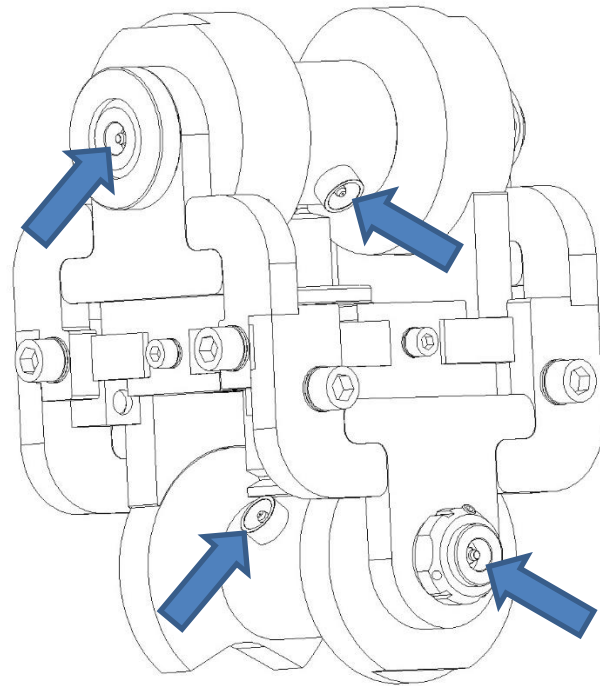


Figure 12. Greasing points.

Grease the bearings from six nipples (axles and cylinder bearings) after every 16 operating hours.

Use grease Arcanol LOAD1000 (FAG). Press the grease until the new, clean grease is squeezing out. Clean the squeezed, additional grease away from the machine surfaces.

Storage

The loose Flowlink is kept horizontally so it cannot topple.

If the Hydraulic Swing Damper is not used, the functionality and resale value will be improved with proper storage.

Clean and spot paint the brake shoe carefully before storing. Grease all grease nipples (6 pcs) and apply thin lubricant to places that cannot be spot painted or greased. The storage location should be dry and cool.

8.0 Disposal of the machine

When the machine has reached its lifetime, the disposal of the Flowlink and any of its parts must be performed using appropriate means in accordance with local laws and regulations. Follow the instruction in this manual to avoid any damage to the environment.

Remove the oil from the Flowlink hydraulic system and deliver all metal parts of the Flowlink to the local scrap metal-recycling company or authority, where the metal scrapping process is done under control and with good environmental manner. By this, you ensure that the scrapped Flowlink metals will be reused as a raw material in the future.

9.0 Warranty Terms and Certificates

Vallius Forestry Oy Ltd

Manufacturer offers warranty against defects for its products for a period of twelve (12) months from delivery to the customer.

The warranty covers all manufacturing, raw-material and component failures. Warranty covers the components under the warranty, but not the consequential loss which is caused by the component failure e.g. interruption of the work, transportation fees, rental costs of the replacement machine etc.

The warranty will not cover the defects caused by normal wearing, negligence, deliberate, improper installation or use, overload or the neglect maintenance.

The warranty will not cover wearing components as bearings, hoses, connectors/plugs, gaskets etc.

The warranty will not cover any machine failures cause by the fire, traffic accident or other accidental phenomenon.

The warranty is valid only if delivery and warranty certificates are signed when the machine is delivered to the customer. Customer is obligated to inform all defects immediately to the manufacturer or the reseller to avoid any further damages. Information must be delivered in written and within the warranty time.

The warranty is valid, only if the machine is repaired or maintained using original components or components, which are approved by the manufacturer in written beforehand.

Warranty request must cover following information: machine type, serial number, place of purchase (seller/reseller), date of delivery, customer name (buyer) and address.

The warranty is not valid if original machine or the intended use of the machine has been changed or the machine is equipped with additional component which are not approved in written by the manufacturer.

The warranty will be voided, if the owner of the machine has been changed during the warranty time.

WARRANTY CERTIFICATE

Flowlink -Hydraulic Swing Damper

Warranty certificate, 3 equal copies. One for the seller/reseller, one for the buyer, and one is delivered to **Vallius Forestry Oy Ltd** Länsikatu 15, 80110 Joensuu, Suomi Finland Company's business ID: 26606158
www.valliusforestry.com

Serial number _____

Seller/reseller _____

____ / ____ 20 ____

Place _____

Stamp

Vallius Forestry Oy Ltd
Länsikatu 15
80110 Joensuu, Suomi Finland
Company's business ID: 26606158
www.valliusforestry.com

DELIVERY CERTIFICATE

Delivery certificate, 3 equal copies. One for the seller/reseller, one for the buyer, and one is delivered to **Vallius Forestry Oy Ltd** Länsikatu 15, 80110 Joensuu, Suomi Finland Company's business ID: 26606158
www.valliusforestry.com

Product name _____

Serial number _____

Accessories, Changes _____

Owner/ Buyer/ Holder _____

Address _____

Postal code and place _____

Phone / e-mail _____

Seller/Reseller _____

____/____20 ____

Vallius Forestry Oy Ltd

Länsikatu 15

80110 Joensuu, Suomi Finland

Company's business ID:

26606158

www.valliusforestry.com

CERTIFICATE TO OWNER/ HOLDER FOR MANUAL INTRODUCTION AND PRODUCT TRAINING

Manual introduction and product training certificate, 3 equal copies. One for the seller/reseller, one for the buyer, and one is delivered to **Vallius Forestry Oy Ltd** Länsikatu 15, 80110 Joensuu, Suomi Finland Company's business ID: 26606158 www.valliusforestry.com

Product name _____

Serial number _____

Accessories, changes (if any) _____

Owner/ Buyer/ Holder / Product trainee _____

Company _____

Address _____

Postal code and place _____

Phone / e-mail _____

Seller/
Trainer _____

_____/____20_____ Place _____

Declaration

I am familiar with the User manual and the operating and safety instructions. I have participated in the product operation training.

Signature _____

Clarification _____

Company / title _____

Declaration of conformity

Original

EY-Declaration of Conformity

Vallius Forestry Oy Ltd

Länsikatu 15

80110 Joensuu, Finland

I hereby declare, that Flowlink hydraulic swing damper, released to the markets, is in accordance with EY- machine directive 2006/42/EY and its regulations.

Risk assessment has been done according to standard SFS-EN ISO 14121-1.

Joensuu 7.5.2018



Keijo Mutanen
Chairman of the Board