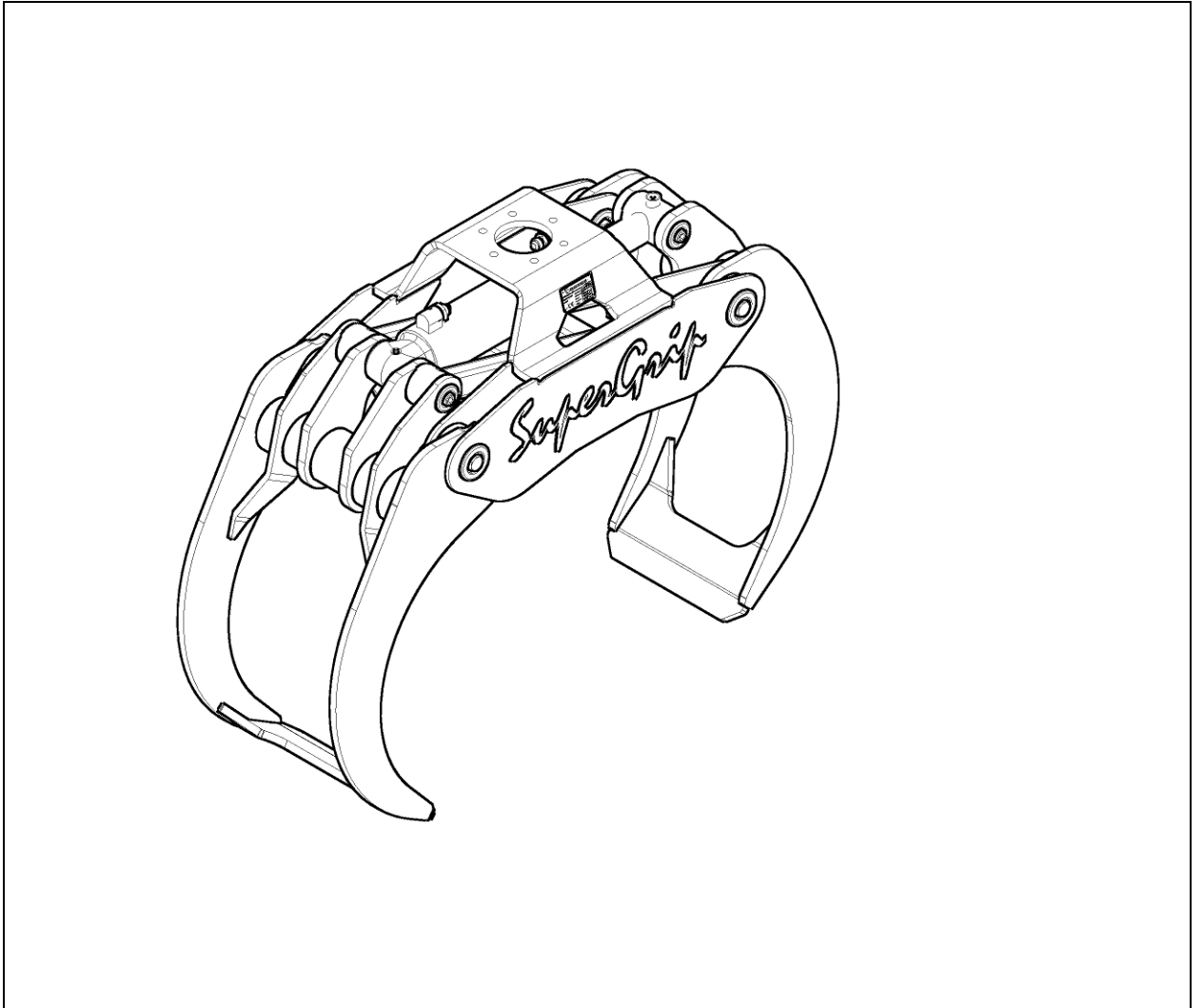


HULTDINS
*SuperGrip*TM



This publication contains instructions for the installation and handling of the *SuperGrip SG* grapples. The instructions cover both general information for all models, and procedures or specifications applicable to individual models. If doubt should arise concerning the validity of the instructions please consult the nearest dealer for more detailed information.

Illustrations, technical information and specifications were, as far as we have been able to judge, correct at the time of print. However, we reserve the right to, without prior notice, revise specifications, instructions, equipment, etc. as a result of ongoing product improvement activities.

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 **Important!**

The parts and components used in HULTDIN SYSTEM AB's products are specifically chosen. Therefore original spare parts are always the best alternative in a possible need of repairs or upgrading.

All service and repairs should be carried out by qualified service personnel or an authorized repair shop with suitable tools and lifting devices.

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SWEDEN

This publication applies to the following models:

SG 260/-R	S/N 026-5050 and up
SG 260S	S/N 044-0280 and up
SG 360/-R/-S	S/N 027-4460 and up
SG 420/-R	S/N 028-2530 and up
SG 520/-R/-S	S/N 029-1770 and up
SG 720S	S/N 072-0001 and up

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Safety instructions

General safety

- This page describes important safety instructions, which the operator should have a good knowledge of before the equipment is used.
- This product should only be used by operators with proper knowledge and training.
- The owner and the operator are responsible for following all safety regulations and that the machine is safely equipped.
- The owner and the operator are responsible for following National and local laws, regulations and other instructions when using the product.
- The owner and the operator are responsible for replacing damaged parts and/or unreadable warning signs.
- The manual should be available at all times so that the operator is able to follow safety regulations and the procedures of maintenance activities.



Meaning of safety messages



Danger!

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death, serious injury and/or serious property damage.



Warning!

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death, serious injury and/or serious property damage.



Caution!

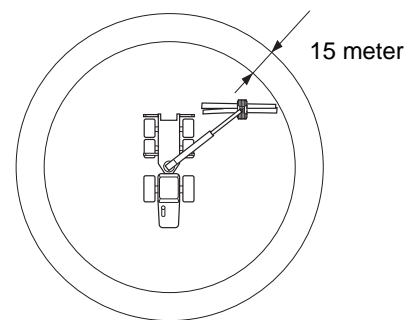
Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury and/or property damage

Operational Safety

- Check the grapple for damages at the beginning of each shift. Tighten all fasteners regularly.
- Make sure that the hydraulic pressure in the grapple cylinder is adjusted according to the specifications. If the pressure is too low the grapple will not be able to carry its load. If the pressure is too high, the grapple will be overloaded, which could cause a structural failure, resulting in injury and/or property damage.
- The grapple must not be used for lifting personnel.
- The grapple is not designed for handling rocks, heavy spare parts, etc.
- The grapple arms on the SuperGrip II-A must NOT be used to dig up stumps and rocks.

If used as described above the grapple arms or other parts of the grapple could fail, resulting in injury and/or property damage.

- The load of the grapple must not exceed the recommended maximum rating as structural failure could occur, resulting in injury and/or property damage.
- When operating this equipment ensure all unauthorized persons remain at least 15 meters clear of the machine.
- The operator must immediately evict unauthorized persons who are in the danger zone or are heading towards the danger zone
- Personnel inside the danger zone must be well protected against falling load.
- Personnel inside the danger zone must keep clear of hanging load.
- The operator should be aware that the load, or parts of the load, could fall from the grapple at any time.



Maintenance safety

- The machine's condition must be checked regularly, daily inspections shall be performed and any deficiencies must be corrected. The machine shall be maintained in such condition that the operator or other persons not exposed to danger or accidents.
- Never commit any service on the equipment without proper knowledge. All service and repairs in electrical and hydraulic systems should be carried out by qualified personnel only.
- Repair any damages immediate when discovered. Do not use the equipment until any damages are rectified.
- Before performing any maintenance or service work, lower the grapple to the ground and shut off the engine. Turn off any master shut-offs and do not allow personnel in the cab.
- Use safety glasses and protective gloves when servicing the equipment. Hydraulic oil or lubricants in contact with skin or eyes may cause irritations or allergies.
- Use hard hat and safety boots when servicing the equipment. Leakage of hydraulic oil or lubricants will increase the risk of slipping or falling.
- The grapple has sharp edges. Use proper wrenches and protective gloves when working on the grapple
- Hydraulic hoses and adapters may be pressurized even with the engine shut off. Loosen any parts with caution.
- Always make sure that the system is depressurized before committing any service on the equipment.
- Always secure movable parts mechanically before any hydraulic hose is loosened.
- Never try to stop a leakage in the hydraulic system with you hand. Pressurized hydraulic oil can be injected under the skin and cause death or severe damage.



Welding

In case of a structural repair of the equipment, when welding may be needed, consult the dealer for recommended instructions.

When welding on the grapple the following steps must be taken:

- Make sure that fire-extinguishing equipment is available.
- Clean the area around the welding area to eliminate any fire hazard.
- Connect the ground wire so the welding current does not pass over any bushings.
- Place the ground wire as close to the welding area as possible.
- When welding close to bushings, disassemble the bushings as they are made of a plastic compound-material which high temperatures may damage.

Modifying the equipment

It is not approved to:

- Modify the grapple without the consent of HULTDIN SYSTEM AB.
- Alter the function of the grapple without the consent of HULTDIN SYSTEM AB.
- Use spare parts other than original HULTDINS parts.

Main parts

The *SuperGrip SG* is made up of the following main parts.
All parts are replaceable.

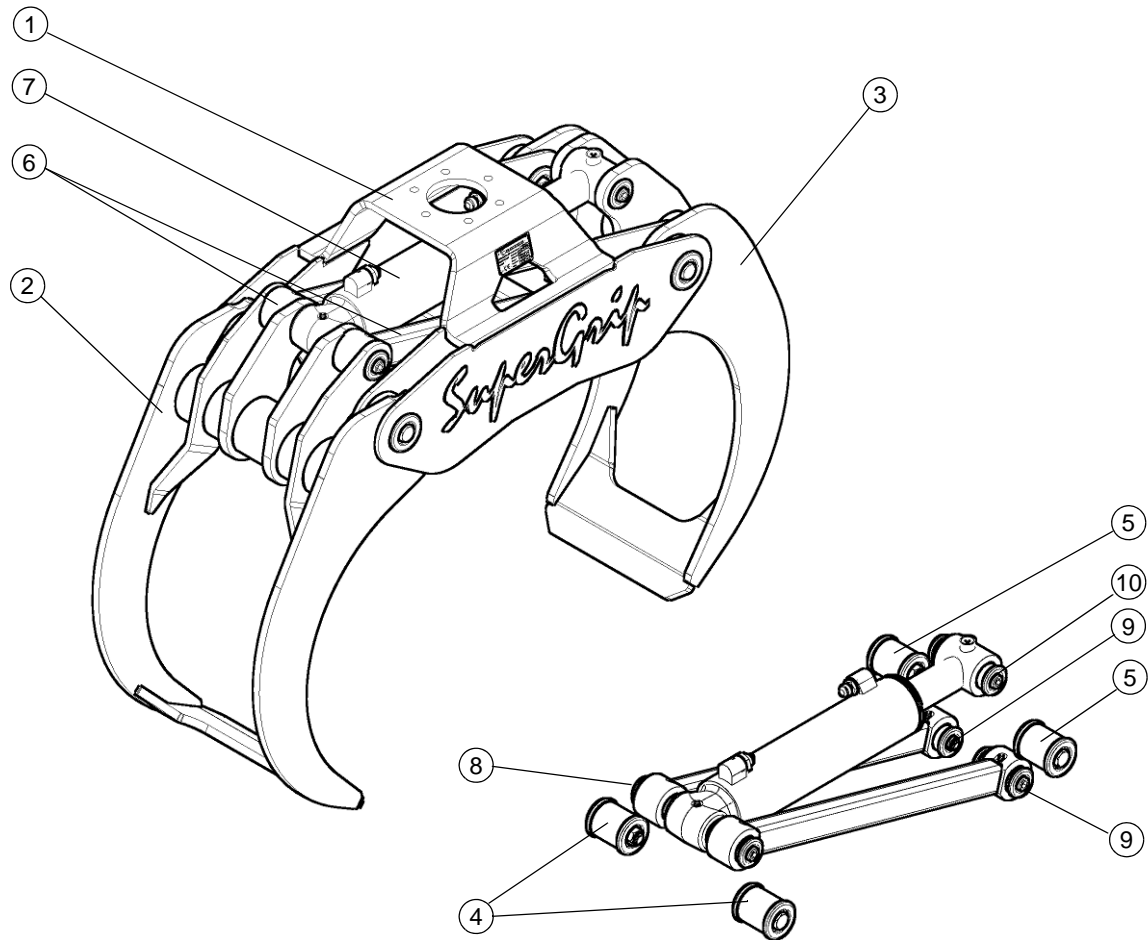


Fig. 1 Main parts

- | | |
|--|--|
| 1 Frame | 7 Hydraulic cylinder |
| 2 Female grapple arm | 8 Pin-joint system, grapple arm-rod-hydraulic cylinder |
| 3 Male grapple arm | 9 Drill holes for rotator bracket |
| 4 Pin-joint system, frame-female grapple arm | 10 Pin-joint system, rod-male grapple arm |
| 5 Pin-joint system, frame-male grapple arm | 11 Pin-joint system, piston rod-male grapple arm |
| 6 Rod | |

Product description

The *SuperGrip SG* is a short wood grapple that is generally mounted on cranes/booms intended for on road- and off road-vehicles. The *SuperGrip SG* is only intended to be used for timber, cut-to-length, whole-tree and waste wood systems.

The *SuperGrip SG* must not be used when lifting rocks or when performing equivalent lifts as there is a risk that the grapple arms or other parts of the grapple may fail, which could result in injury or damaged equipment.

Labeling

The *SuperGrip SG* is labeled with serial number, model number, max. load, max.pressure and a CE-label according to the following figure.

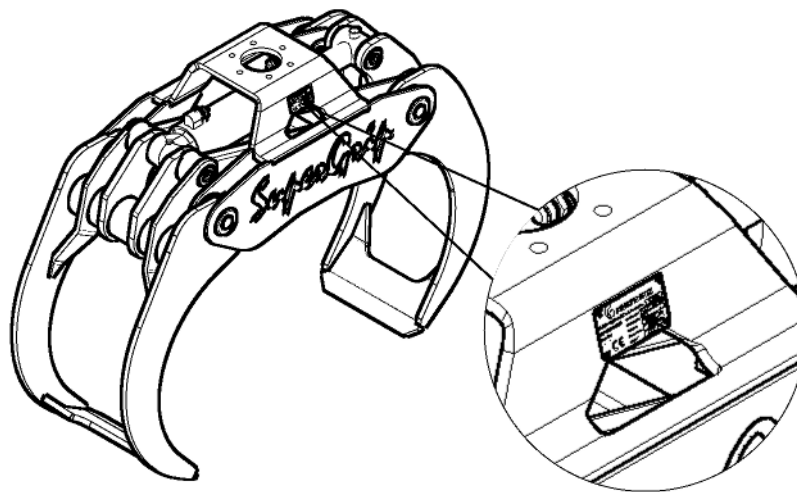


Fig. 2 Labeling

Technical data

SuperGrip SG

Special tools

Description	Diam.	Order No.
Mandrel, pin-joint system.....	50 mm	0660 207
	60 mm	0683 010
	70 mm	0660 208
	80 mm	0683 011
Mandrel, bushings.....	50 mm	0660 290
	60 mm	0683 150
	70 mm	0660 290
	80 mm	0683 150

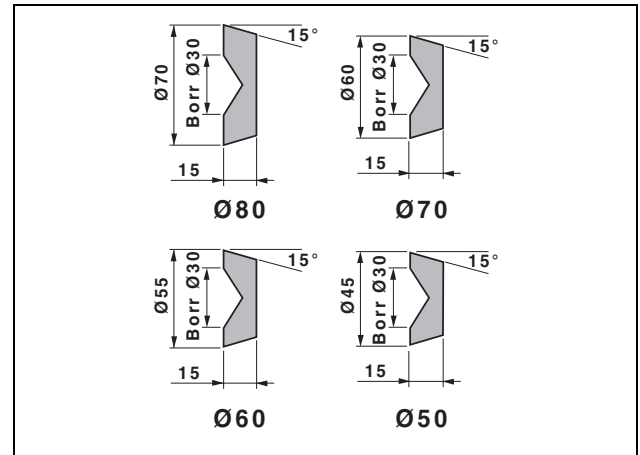


Fig. 3 Mandrel, Pin-joint system

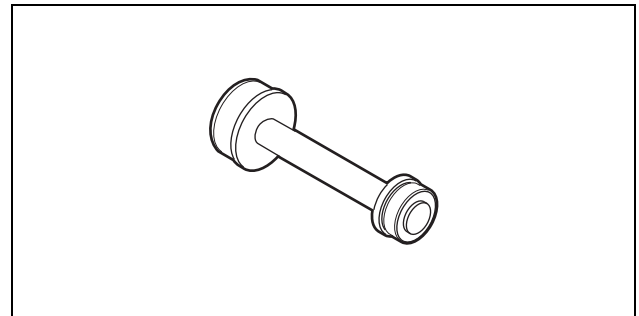


Fig. 4 Mandrel, bushings

Grease and Loc-Tite

Grease

Use a mineral oil based grease thickened with, or mixable with a lithium soap. The grease should be classified as L-XCCIB2 according to ISO 6743-9. Molybdenisulfid content max 3 %. Base fluid viscosity 170 to 220 cSt at 40°C. NLGI class 1-2.

Greasing intervals

Every 1000 hours of use.

Hydraulic hoses

The cylinder hoses should be 1/2" (13,0 mm) according to DIN 20022; SAE 100 R2AT rating. Hose assemblies should be sized for burst pressure with at least a triple safety factor (three times the working pressure).

Rotator fasteners

The rotator should be installed to the grapple with fasteners with the dimension M16 of grade min. 10.9, alternativ M20 of grade min. 8.8

Operating pressure

Max. operating pressure 25 MPa

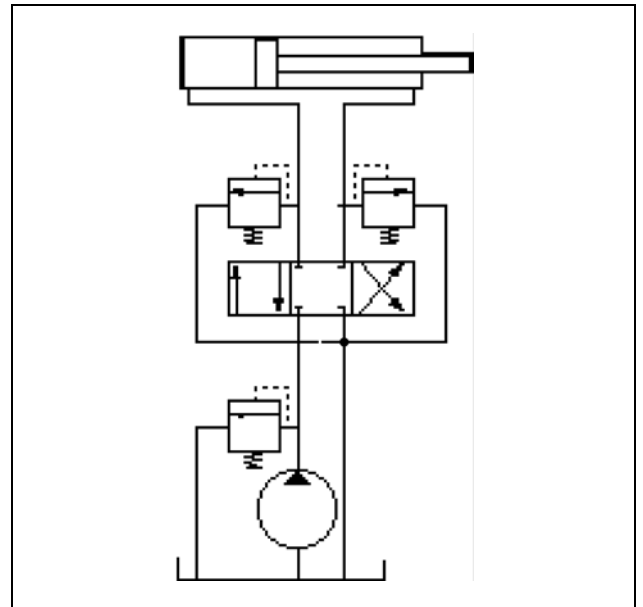


Fig. 5 Hydraulic diagram

Torque and socket/wrench sizes

				Torque	Socket/wrench size
MC6S	16	12.9		330 Nm	14 mm
M6S	20	10.9		500 Nm	30 mm
MC6S	20	12.9		500 Nm	17 mm
M6S	24	10.9		900 Nm	36 mm
Piston ø80.....				700 Nm	-
Piston ø90/ø100				850 Nm	-
Gland ø80.....				700 Nm	-
Gland ø90/ø100.....				850 Nm	-

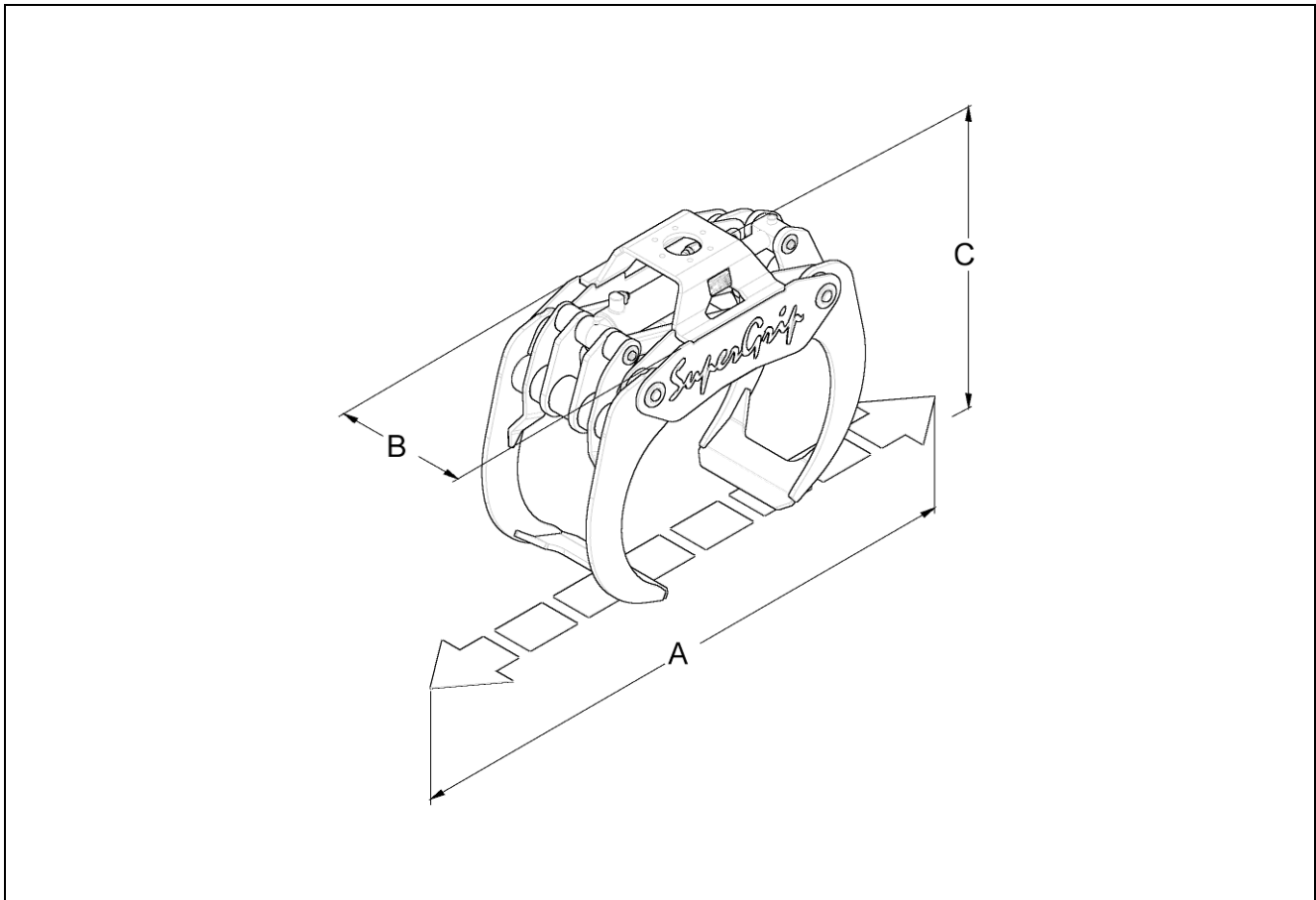
SG


Fig. 6 Dimensions

		SG 260	SG 300	SG 360	SG 420	SG 520
Gripping area, tip-tip	m ²	0,26	0,30	0,36	0,42	0,52
Max. gripping width (A)....	mm	1 525	1 480	1870	2 075	2279
Min. gripping diameter	mm	90	91	110	120	170
Max. load.....	kg	3 500	3 500	5 000	5 000	5 500
Weight.....	kg	180	187	288	320	350
Height, arms closed	mm	550	560	627	668	753
Height, arms tip-tip (C)	mm	867	910	962	1 040	1 152
Overall grapple width (B)...	mm	430	430	510	510	514
Cylinder size		80/56	80/56	90/56	90/56	100/63

SG -R

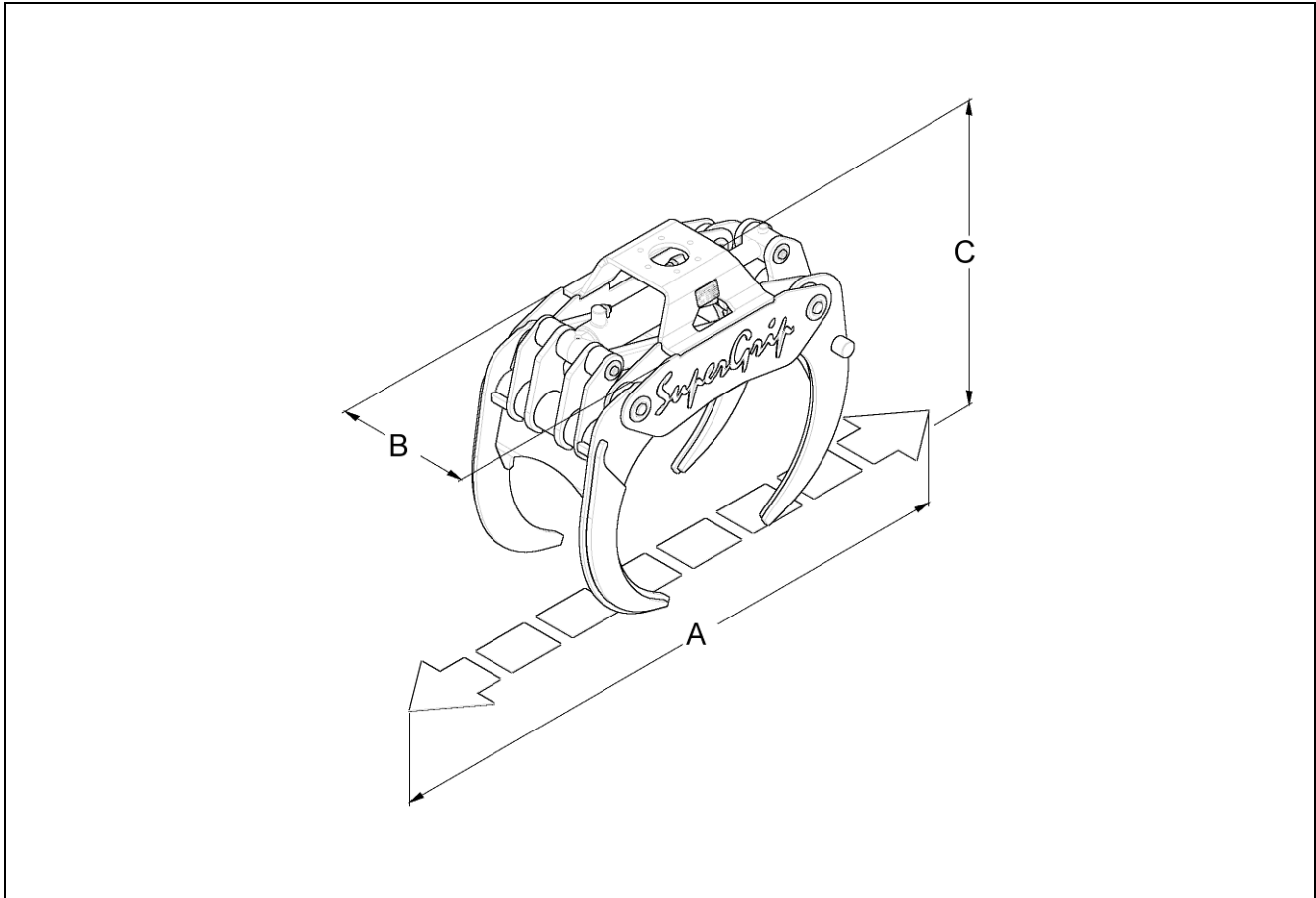


Fig. 7 Dimensions

		SG 260 R	SG 300 R	SG 360 R	SG 420 R	SG 520 R
Gripping area, tip-tip	m ²	0,26	0,30	0,36	0,42	0,52
Max. gripping width (A)....	mm	1 525	1 480	1870	2 075	2279
Min. gripping diameter	mm	90	101	110	120	170
Max. load.....	kg	3 000	3 000	4 000	4 000	4 500
Weight.....	kg	208	215	319	368	405
Height, arms closed	mm	565	565	638	671	757
Height, arms tip-tip (C)	mm	851	888	953	1 023	1 120
Overall grapple width (B)...	mm	430	430	510	510	514
Cylinder size		80/56	80/56	90/56	90/56	100/63

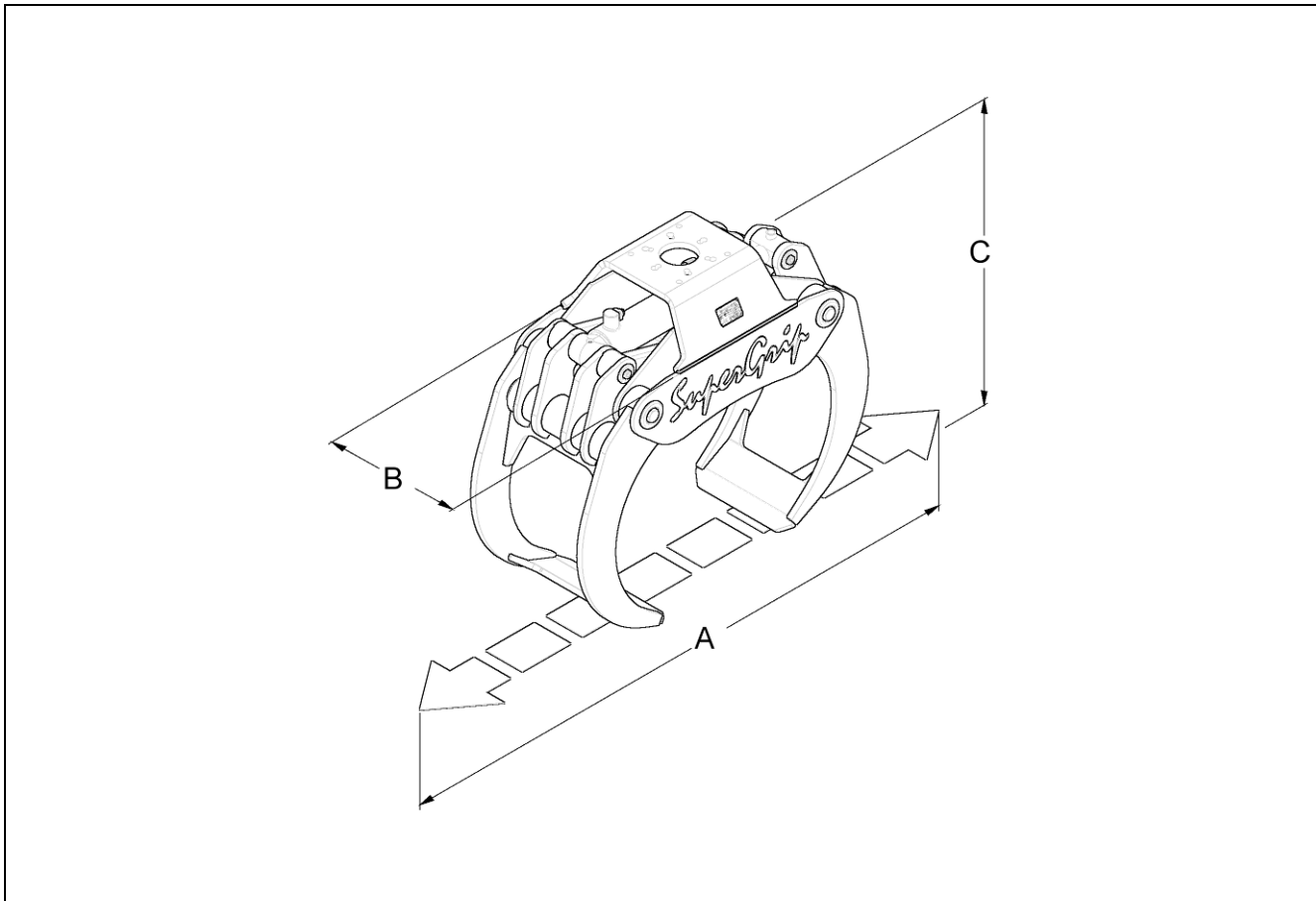
SG -S


Fig. 8 Dimensions

		SG 260 S	SG 300 S	SG 360 S	SG 520 S	SG 720 S
Gripping area, tip-tip	m ²	0,26	0,30	0,36	0,52	0,72
Max. gripping width (A).....	mm	1 525	1 480	1870	2279	2290
Min. gripping diameter	mm	90	91	110	170	189
Max. load.....	kg	4 500	4 500	8 000	8 000	8 000
Weight.....	kg	230	234	370	420	534
Height, arms closed	mm	550	560	656	753	759
Height, arms tip-tip (C)	mm	867	836	998	1 152	1 283
Overall grapple width (B)...	mm	430	430	522	514	514
Cylinder size		80/56	80/56	90/56	100/63	100/63

Functional description

The *SuperGrip SG* is made up of one frame (1) and two grapple arms, female grapple arm (2) and male grapple arm (3). The frame and the grapple arms are fixed together in four pin-joint systems (4).

The design is equipped with two rods (5) that are mounted in two pin-joint systems (6) and (10). The rods transfer a controlled movement between the male and female grapple arm.

A cylinder (7), connected with hydraulic pressure and flow, transfers power to the grapple arms. The hydraulic cylinder is equipped with hydraulic dampening for "Soft Stop" to eliminate shock loads. The hydraulic cylinder is

mounted in pin-joint systems on the barrel side (6) and the piston rod side (9).

The cylinder works as a mechanical stop for max. opening of the grapple arms. The grapple arms work as a mechanical stop for min. opening of the grapple arms.

The grapple is suited for flange mounting of most rotators on the market (8).

All bushings in the grapple are made from a plastic compound-material with self-lubricating abilities. The bushings are designed with a built in lip seal for an effective protection against dust and dirt.

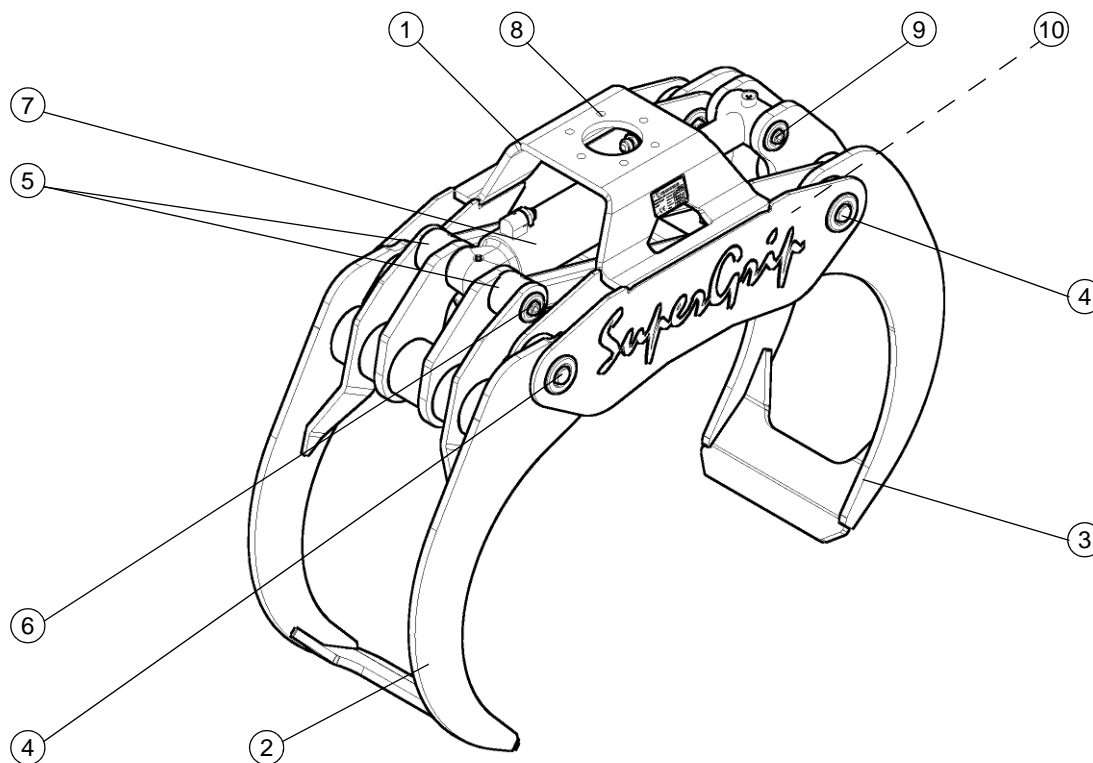


Fig. 9 Design

- | | | |
|----------------------------------|--|-------------------------------------|
| 1 Frame | 5 Rods | 8 Drill holes for rotator fastening |
| 2 Female grapple arm | 6 Pin-joint system, grapple arm-rod-cylinder | 9 Pin-joint system, piston rod |
| 3 Male grapple arm | 7 Hydraulic cylinder | 10 Pin-joint system, rod |
| 4 Pin-joint system, grapple arms | | |

Installation

Important!

All service and repairs should be carried out by qualified personnel or an authorized repair shop with suitable tools and lifting devices.

Installing the rotator

Note! Nail blocks to the pallet base to prevent the grapple from falling during transportation or service. Tie a strap around the stand for safe lifting. *See Fig. 10.*

Warning!

The grapple has sharp steel edges. Use protective gloves, and proper wrench sizes when working on the grapple.

1. Place the grapple on a firm base. *See Fig. 10.*
2. Make sure that the pressure of the grapple function is in accordance with specifications. *See Technical data.*

If needed, correct the hydraulic pressure of the grapple function.

3. Place the rotator on the grapple.

Turn the rotator's hose connections in the direction as shown in adjoining figure. *See Fig. 11.*

Note! Also review the corresponding rotator supplier's installation instructions if supplied.

4. Connect the hydraulic hoses. *See Fig. 11.*
 - 1 Connect the rotator function 'grapple close' to the base end of the cylinder.
 - 2 Connect the rotator function 'grapple open' to the rod side of the cylinder.

The connection of the rotator for 'grapple open' is labeled '0' or 'G0'.

5. Make sure that the grapple functions correspond with the order of the joysticks at the operator seat.
6. Cautiously operate all functions to make sure that everything performs normally.

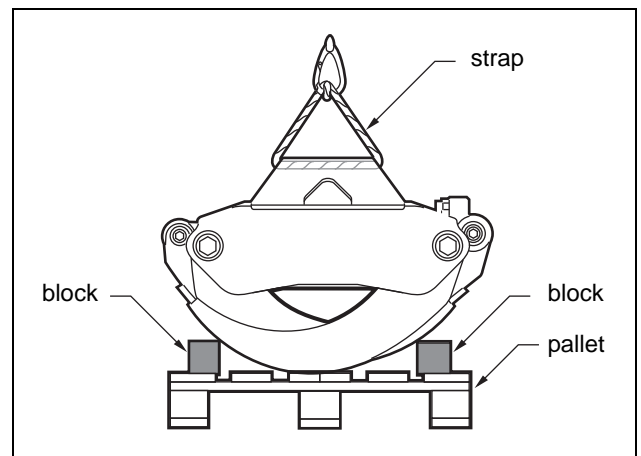


Fig. 10 Arrangement of the grapple at transportation or service

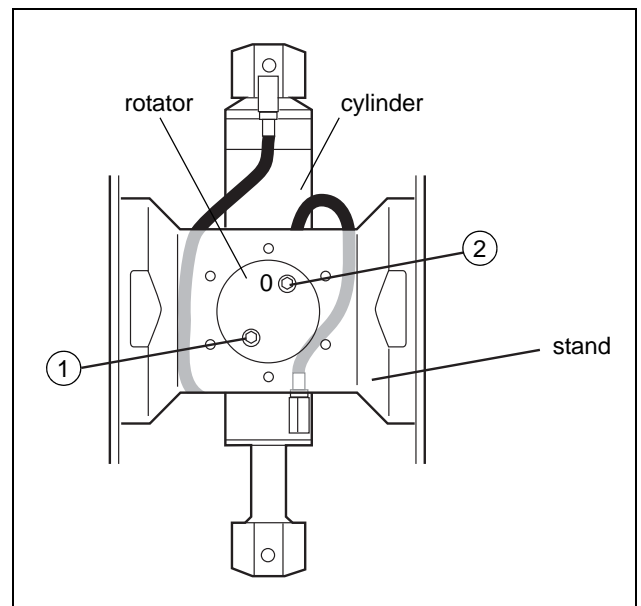


Fig. 11 Connecting the hydraulic hoses

Maintenance instructions



Warning!

Close the grapple and place it solid on the ground and shut down the machine or power source that normally operates the grapple before commencing service.



Warning!

The grapple has sharp steel edges. Use protective gloves, and proper wrench sizes when working on the grapple.



Warning!

Never touch or stand close to the pressurized cylinder and its hydraulic hoses.

Regular maintenance

Daily maintenance

Make sure that:

- Nothing abnormal has happened to the grapple regarding fastener joints and hydraulic hoses.
- No damages or cracking have occurred on the grapple.
- There is no leakage on the grapple.

Tighten any loose items and repair any damages.

Every 250 hours of operation

Make sure that:

- No fasteners are loose.
- The hydraulic hoses are not damaged.
- No damages or cracking have occurred on the grapple.
- There is no leakage on the grapple.

Tighten any loose items and repair any damages.

Lubrication

The grapple should be lubricated every 1000 hours of operation as the figure here shows.

Note! Use a mineral oil based grease thickened with, or mixable with a lithium soap. The grease should be classified as L-XCCIB2 according to ISO 6743-9. Molybdenisulfid content max 3 %. Base fluid viscosity 170 to 220 cSt at 40°C. NLGI class 1-2.

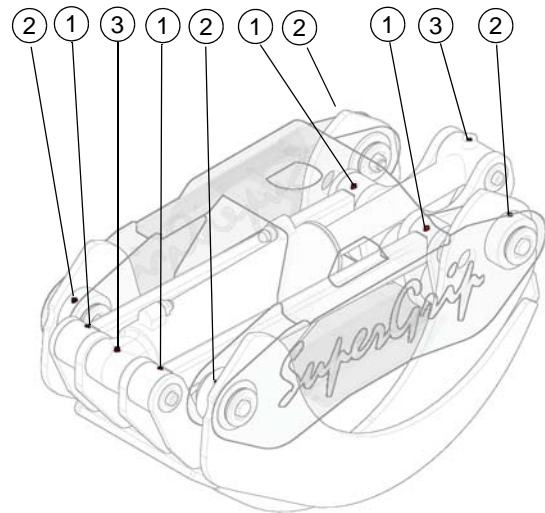


Fig. 12 Lubrication points

- 1 Rods 4 pcs
- 2 Grapple arm 4 pcs
- 3 Cylinder 2 pcs

Fastener joints and hydraulic hoses

Make sure at daily maintenance of the crane/boom that nothing abnormal has occurred with the grapple regarding fastener joints and hydraulic hoses.

The first month of operation

Fasteners

Tightening of the rotator fasteners should be made once a week during the first month of operation.

See *Technical data* regarding wrench size and torque.

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