

INSTRUCTION MANUAL

HYDRAULIC BOOSTER

HC2258



MINIMUM SIZE – MAXIMUM POWER

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1.1 - Safety Precautions - IMPORTANT -

Although the miniBOOSTER hydraulic booster has been designed with operator safety in mind, it still requires the operator to be vigilant upon use.

Therefore, it should be observed that the below mentioned safety instructions are followed. Contact miniBOOSTER or your local miniBOOSTER distributor in case of any doubt.



Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. miniBOOSTER cannot be held responsible for damage or injury resulting from unsafe use, lack of maintenance or incorrect product and/or system operation. Contact your miniBOOSTER distributor if in doubt as to the safety precautions and operations.



Eye protection must be worn while unpacking, installing, repairing and initial start-up of this miniBOOSTER product.



Gloves must be worn while unpacking, installing, repairing and initial start-up of this miniBOOSTER product.



The hydraulic system should always be de-pressurised before any couplings are disconnected. Check the integrity of connections before applying any hydraulic pressure.



Do not apply any hydraulic pressure to non-connected fittings.



Do not unscrew any nipples, couplings or fittings being under any hydraulic pressure.



Avoid sharp bends and kinks when routing hydraulic hoses.



Never exceed the maximum working pressure of the hydraulic system.



If the hydraulic system is under pressure **DO NOT STAND IN LINE** with any fittings, connections or other moving parts i.e. piston-rods and/or any other parts mechanically or hydraulically connected to the hydraulic



All hoses, couplings and fittings connected to the hydraulic system, including the miniBOOSTER, must be kept clean and free from debris and contamination at all times. Follow all instructions provided in this manual whenever installing, running and/or repairing the miniBOOSTER.

This instruction does not override any local safety regulations or relevant hazardous, regulations, which must always take precedence.

Never exceed the specified maximum pressure ranges, temperatures and flows.

Never put the component into operation until the machine, into which it is assembled, complies with all relevant directives and regulations in EU and EFTA.

miniBOOSTER® A/S cannot be held responsible for damage or injury resulting from unsafe use of the product, lack of maintenance, or incorrect product and system application.

If you have any doubts about precautions or applications, contact your local distributor, the manufacturer or visit www.minibooster.com

1.2 - Warranty

Never attempt to disassemble the booster or any other component from the system where it is not specifically described to do so. Any attempt will void the warranty if no consulting has taken place with miniBOOSTER.

DECLARATION OF CONFORMITY

We the manufacturer:

miniBOOSTER Hydraulics A/S
Fynsgade 3
DK 6400 Sønderborg
DENMARK

Declare that:

Hydraulic boosters all types, variants and accessories are designed and manufactured in accordance with the below directives.

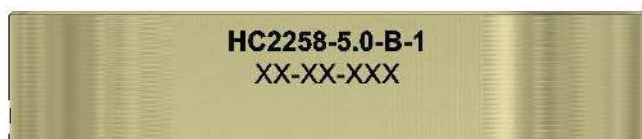
2006/42/EC Machinery Safety Directive
97/93/EC Pressure Equipment Directive where required (Max HPXVol >10,000)

The manufacturer miniBOOSTER® is ISO 9001 certified by Bureau Veritas (Certificate number DNKFRC10000046A). Each hydraulic booster has an identifiable serial number, stamped into its metal body. Year of manufacture and intensification factor are stamped into the metal body too. All technical documentation is drafted in accordance with the term "sound engineering practice" and in accordance with all of the processes and test procedures described in miniBOOSTER®'s process guides. All boosters are individually pressure tested prior to the EOL-approval.

1.3 - Serial Number and Identification plate location

Each individual hydraulic booster can be identified by a unique serial number and its type-code which is stamped on the manifold housing.

The type number and the serial number is required when ordering repairs of the miniBOOSTER hydraulic booster.



The Example Specifies:

HC2258	Booster Model
36-23-001	Serial number
	(week-year-number)
CERXXXXX	Materials certificate

Nomenclature:

5.0	$i = 5.0 : 1$
B	With dump valve
1	BSPP connections

1.4 - Material Certificate

All body parts of the hydraulic booster system are marked with a 3.1 material certificate specification number, which provides materials traceability.

A material certificate verifies the origin batch numbers, the compositions and the test results of the materials used for the individual body parts. It is possible to order the certificates on request.

1.5 - Technical Specification



Never exceed the below pressure, flow and temperature ranges, as this will damage the internal seals of the booster.

Model HC2258
Versions A & B
Weight 5,5 kg / 12.2 lbs

Pressure Ranges

Inlet P_{IN} and T 0 - 207 bar / 3,000 psi
 Outlet P_H 0 - 700 bar / 10,150 psi

Flow Ranges

Inlet P_{IN} and T 0 - 40 l/min / 10.5 US gpm
 Outlet P_H 0 - 4.2 l/min / 1.1 US gpm

Connections

IN, R, Z and H 1/4" BSPP female

Temperature Ranges

Media oil -40°C to +120°C / -40°F to +248°F

Materials of Construction

Booster Cast iron
 Check valves Alloy steel
 Static seals standard Nitrile NBR

Fluids

Recognized hydraulic fluids.

		0-140 BAR (0-2,030 psi)		141-207 BAR (2,031-3,000 psi)		> 207 BAR (> 3,000 psi)	
Media		ISO 4406 Scale number	Micron rating	ISO 4406 Scale number	Micron ratings	ISO 4406 Scale number	Micron ratings
Oil	>5cSt	19/17/14	10	18/16/13	5	17/15/12	3

Filtration Recommendations



Medias not filtered in accordance with the recommendations given in this chapter may be the reason to severe damage of the hydraulic booster system.

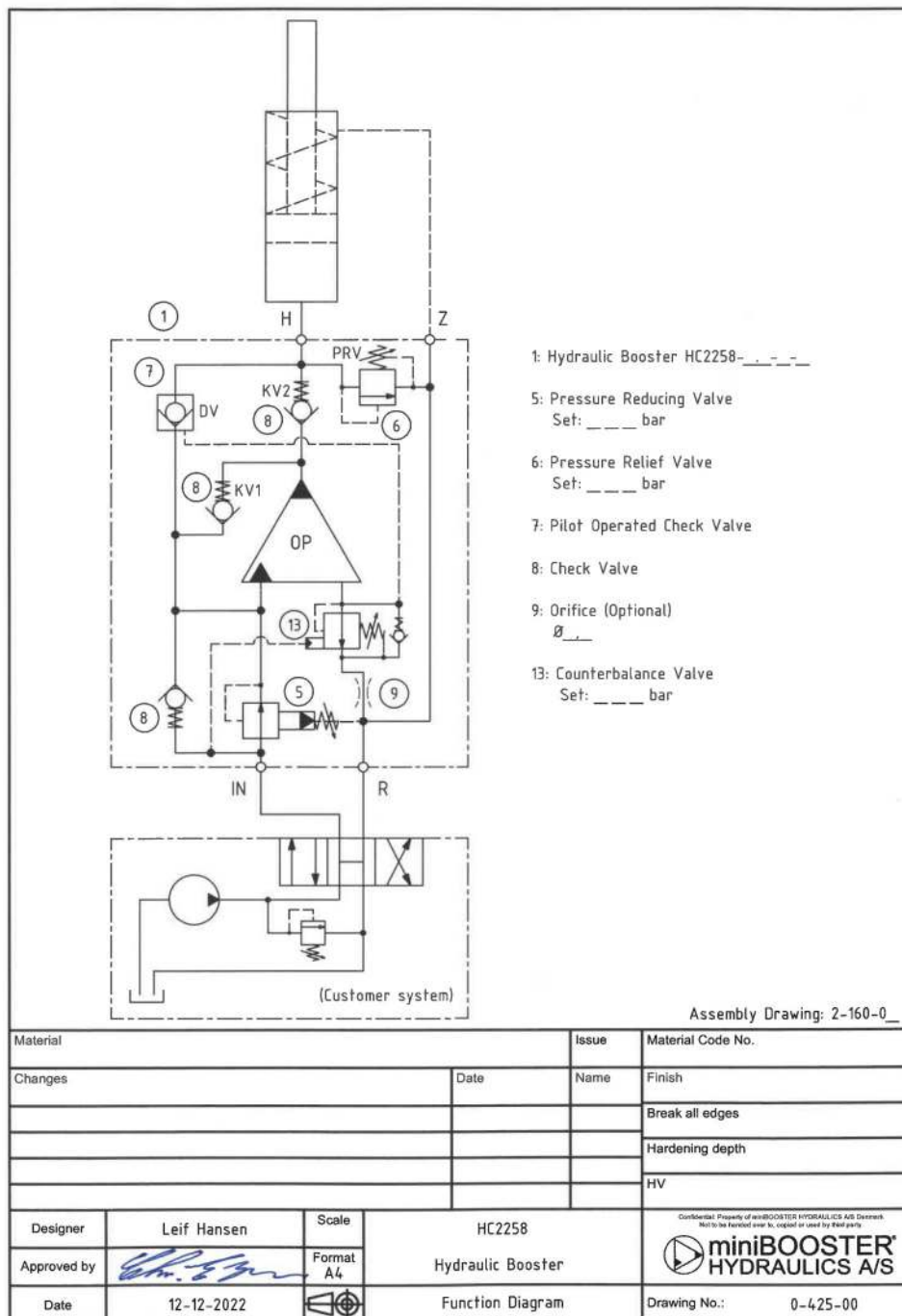
2.1 - Product Description

The HC2258 is a In-line mounted hydraulic booster and it is equipped with a pressure reducing valve, a counterbalance valve on the low pressure side and a relief valve on the high pressure side. The relief valve controls the maximum outlet pressure of the H port (To the A port of e.g. a cylinder). The pressure is adjustable up to 700 bar / 10,150 psi

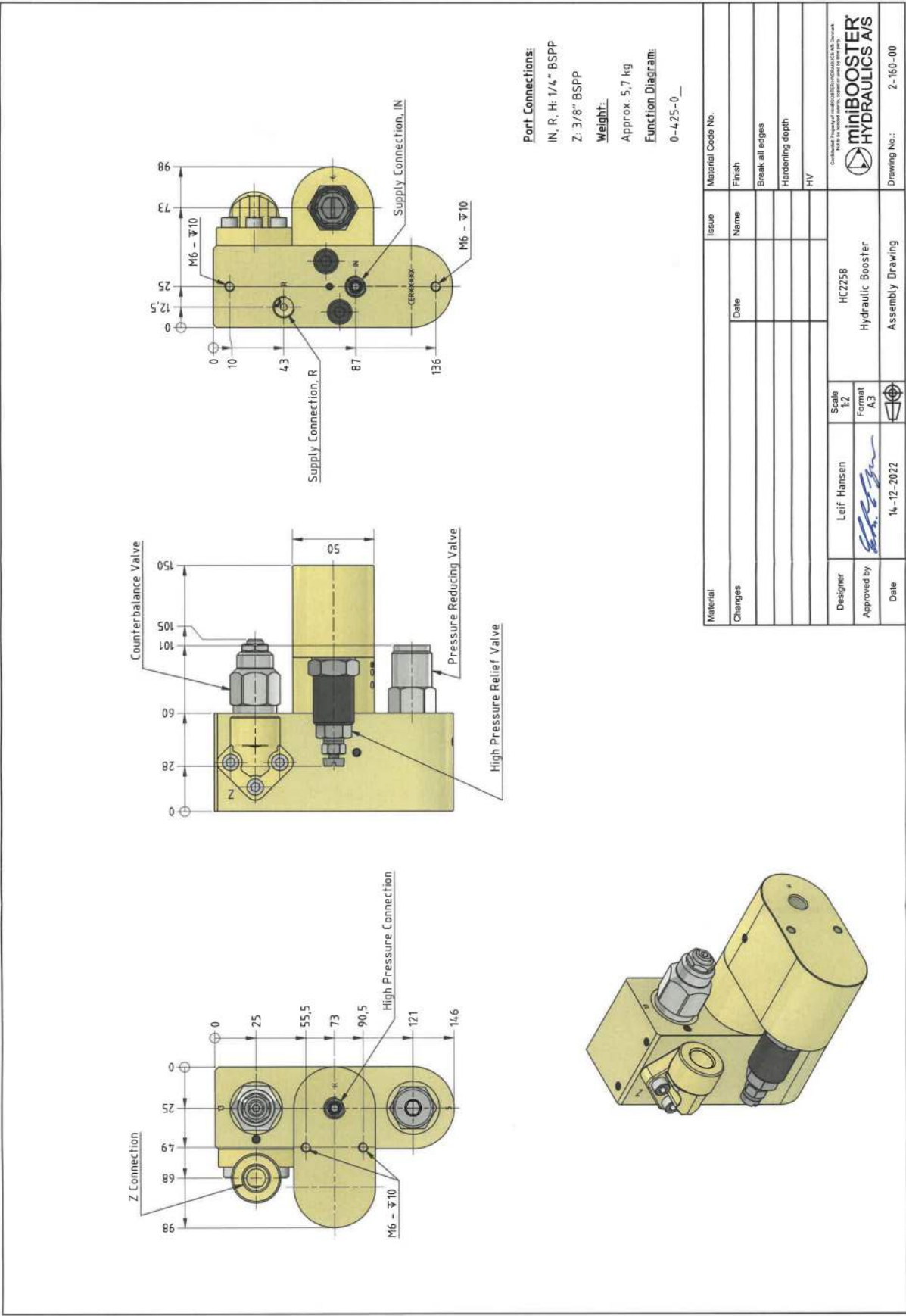
Key features of the hydraulic booster:

- ▶ Adjustable maximum outlet pressure
- ▶ Wide range of intensification factors available
1.2 / 1.5 / 2.0 / 2.2 / 2.5 / 2.8 / 3.2 / 4.0 / 5.0 / 6.6 / 9.0 / 13.0 / 16.0 / 20.0 / 25.0

2.2 - Function Diagram

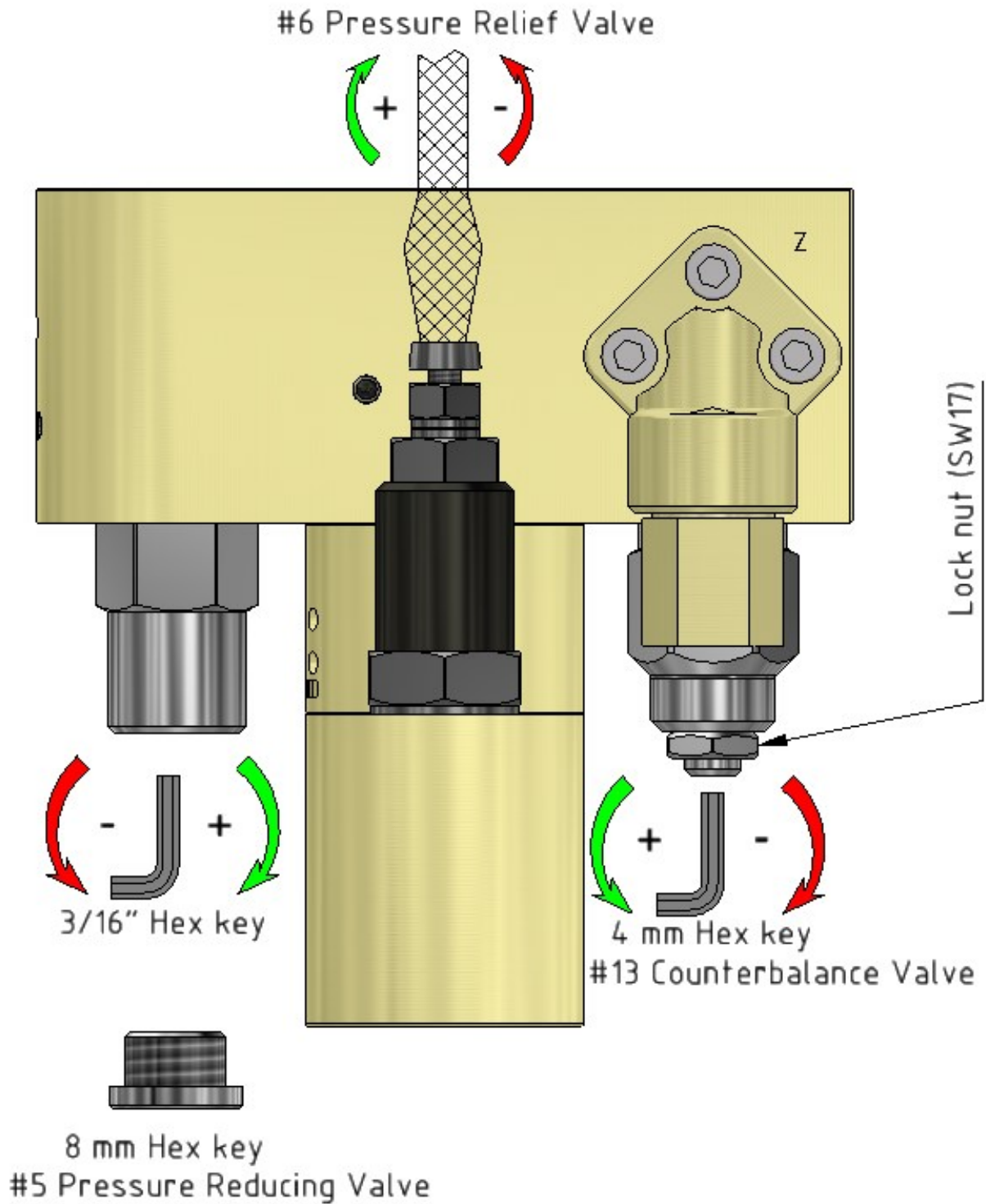


2.3 - Assembly Drawing



3.1 - Introduction

The three valves are pre-adjusted to customer specific settings. If needed, the following section provides guidance for any needed re-adjustment. A guide to adjust the hydraulic booster from scratch is also included.



3.2 - Booster Inlet Pressure Control (Pressure Reducing Valve #5)

Tools:

4 mm or 5/32" hex key.

9/16" wrench.

7/8" torque wrench (*only required for replacing the valve*).

CW = Clockwise direction

CCW = Counterclockwise direction

3.3.1

Loosen the nut from the stem of the valve using the 9/16" wrench (CCW).

3.3.2

Use the 4 mm - 5/32" hex key to rotate the stem and adjust the reducing pressure.

Note: it is recommended to read the pressure from the M1 connection of the manifold!

CW = Increase inlet pressure to the booster

CCW = Decrease inlet pressure to the booster

ΔP per one turn: 50 bar / 725 psi

3.3 - Oscillating Control (Counterbalance Valve #13)

Preliminary steps:

- Stop the pump.
- Decrease the counterbalance valve set pressure as much as possible (CW).

3.3.1

Turn on the pump and increase the pump pressure to the desired counterbalance setpoint.

3.3.2

Slowly increase the Counterbalance valve set pressure until the booster starts to oscillate (CCW). Use your hand and hearing to sense the oscillation.

The counterbalance setting is now ok

CW = Decrease counterbalance setting

CCW = Increase counterbalance setting

3.4 - High Pressure Outlet Control (Relief Valve #6)

Tools:

10 mm spanner or adjustable wrench.

Slotted screwdriver

17 mm torque wrench (*only required for replacing the valve*).

22 mm torque wrench (*only required for replacing the valve*).

CW = Clockwise direction

CCW = Counter Clockwise direction

3.2.1

Loosen the 10 mm lock nut from the stem of the valve (CCW).

3.2.2

Use the screwdriver to rotate the stem and adjust the outlet pressure. (explanation in section 3.1)

CW = Increase outlet pressure of H port

ΔP per one turn: 94 bar / 1,363 psi

CCW = Decrease outlet pressure of H port

3.2.3

Retighten the nut. Use the screwdriver to prevent the stem from rotating.

Replacement

3.2.R.1

Use the 22 mm wrench to release the sealing nut (no more than 1 turn CCW). Afterwards, use the 17 mm wrench to unscrew the valve (CCW).

3.2.R.2

(new valve) Release the sealing nut on the new valve just until a slight resistance is felt (CCW).

3.2.R.3

Before installing the new valve, check that the cavity is free from any particles. Install the new valve by using the 17 mm wrench and apply a torque of 40 Nm / 30 lbf-ft. Finally, use the 22 mm wrench and apply a torque of 35 Nm / 26 lbf-ft to the sealing nut.

3.5 - Adjustment from Scratch

3.5.1

Stop the pump

3.5.2

Decrease the counterbalance valve #13 setting as much as possible using the 4 mm hex key (CW)

3.5.3

Decrease the pressure reducing valve #5 setting as much as possible using the 4 mm hex key (CCW)

3.5.4

Increase the high-pressure relief valve #6 setting as much as possible using the screwdriver (CW)

3.5.5

Turn on the pump again. Slowly increase the pump pressure to the IN port while increasing the pressure reducing valve until desired high pressure + 10% is reached.

3.5.6

Decrease the high-pressure relief valve #6 setting (CCW) until the desired end high pressure is reached.

3.5.7

Decrease the pressure reducing valve #5 setting (CW) until the point where the intensifier system stop oscillating again

3.5.8

Use the locknut to lock the high-pressure relief valve #6 setting

3.5.9

Use the locknut to lock the pressure deducing valve #5 setting

3.5.10

Alternately relief and pressure on while decreasing the counterbalance valve (#13) until desired oscillating start point of the intensifier system is reached.

3.5.11

The adjustments are now done, and the system is ready for use

4.1 - General Use

All new or repaired boosters from miniBOOSTER have been hydraulically tested under full load conditions after assembly and are guaranteed full functionality and efficiency.

The hydraulic booster systems has been designed and manufactured to provide reliable service over a range of demanding applications. The booster does not require special maintenance, but should be kept free from dust, dirt and debris.

A visual inspection for oil escaping on any exterior part of the hydraulic booster system should be conducted on a regular basis.

4.2 - Installation

The hydraulic booster system could be installed in any position (vertical, horizontal, angled etc.) Use the four provided screws to firmly secure the system.



Either way the hydraulic booster system is installed, it is important that the system is initially started-up in accordance to the below mentioned instructions. Incorrect initial start-up of the booster may cause severe damages to the internal components of the booster.

4.3 - Bleeding and Initial Start-Up

At the initial start-up the booster should be operated gently at a max LP-IN pressure of approximately 10 bar above setpoint for 30 to 60 seconds, as to ensure it is properly bled from trapped air. Hereafter the hydraulic booster system could be operated at its full capacity.



IMPORTANT! At no time should the booster be operated beyond the specifications listed in Section 1.5

4.4 - Repair

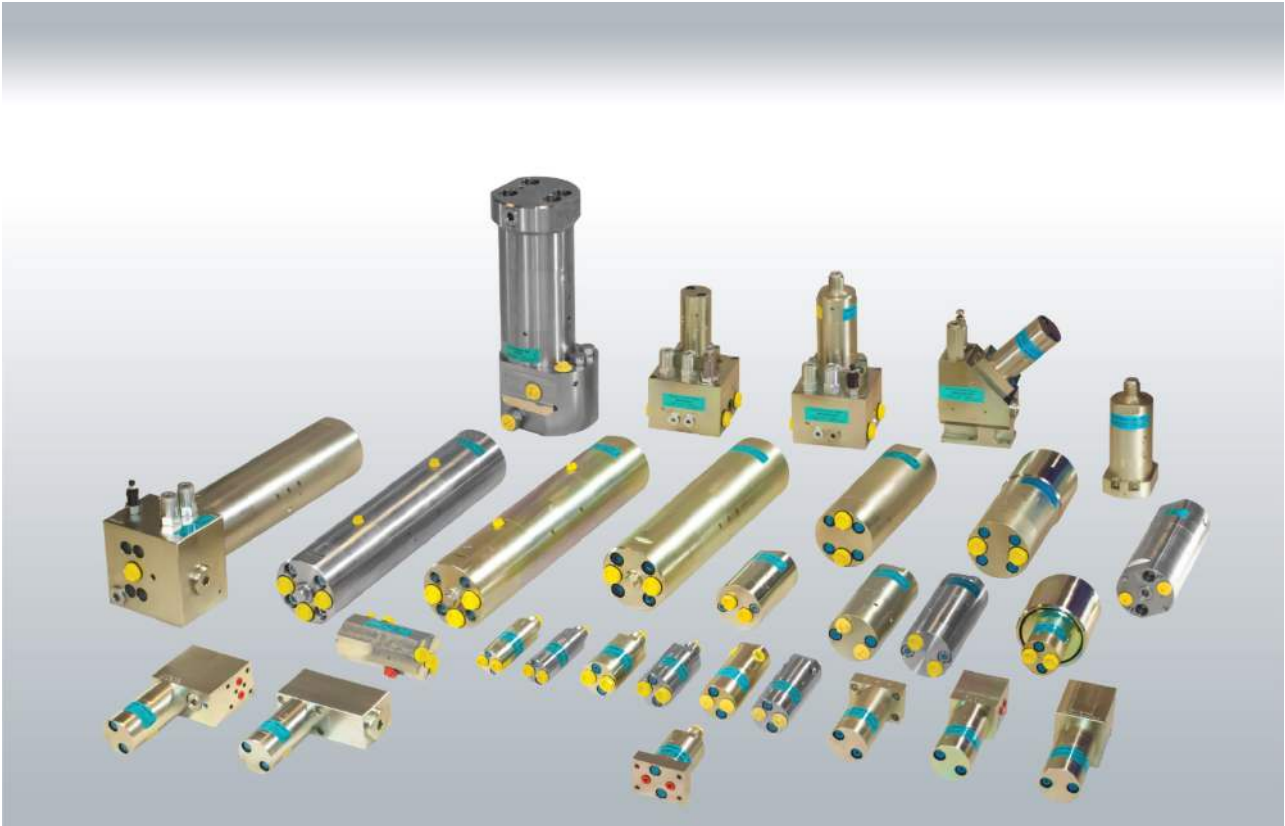
In case the booster should malfunction, all repairs of the product should be conducted by miniBOOSTER only i.e. since any intervention on the booster requires special tools and special testing equipment.

Before the hydraulic booster system is disconnected and sent for repair, it should be thoroughly cleaned at the exterior. Once the hydraulic booster system has been disconnected all connection bores should immediately be plugged efficiently with plugs or tape, before the booster is sent to miniBOOSTER or to the miniBOOSTER distributor, i.e. since an internal contamination of the booster may obstruct the fault-finding process at the miniBOOSTER service department.

5.1 - Troubleshooting

Symptom	Possible Causes	Remedy
Booster does not reach end pressure when the cylinder has been filled	High pressure relief valve setting is too low.	Adjust the pressure relief valve setting (See section 3.4)
High pressure is not building up	Pressure reducing valve setting is too low.	Adjust the inlet pressure control valve setting (section 3.2).
	Counterbalance Valve	Adjust the Counterbalance Valve setting (See section 3.3)
Booster does not oscillate when the cylinder has been filled.	Counterbalance Valve	Adjust the Counterbalance Valve setting (See section 3.3)
Other symptoms		Consult miniBOOSTER

The only full range of hydraulic intensifying solutions



Authorised distributor: