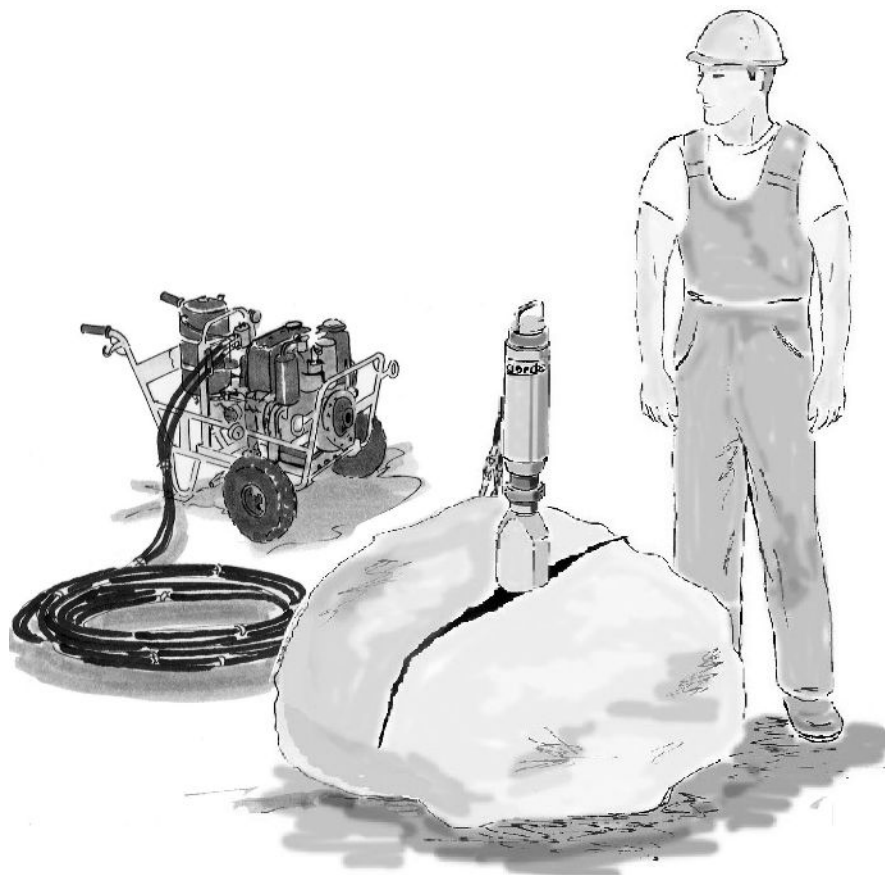




Product Manual

Hydraulic Stone and Concrete Splitter



© by **Darda GmbH**

Darda GmbH, Blumberg retains the copyright to this documentation.

This documentation is solely intended for the operator and his personnel.

The content of this documentation (text, figures, drawings, graphics, plans, etc.) may not be copied or distributed in part or in full without our consent in writing, nor can it be used without authorisation for competitive purposes or given or made accessible to third parties.

Darda GmbH

Im Tal 1

D – 78176 Blumberg

Phone: + 49 / 0 77 02 / 43 91-0

Fax: + 49 / 0 77 02 / 43 91-12

Email: info@darda.de

Internet: <http://www.darda.de>

Product manual: Hydraulic Stone and Concrete Splitter

Version: 1.0 English

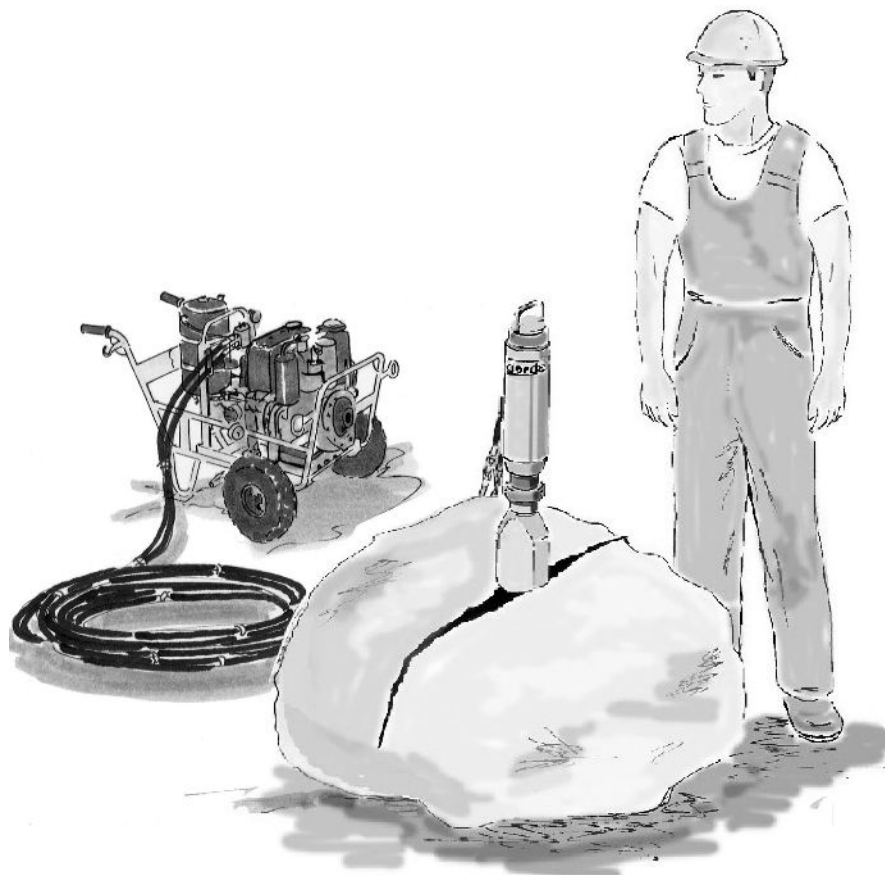
Release date: 04/2010

We reserve the right to change the design and device for the improvement of the product.



Information Manual

Hydraulic Stone and Concrete Splitter



© by **Darda GmbH**

Darda GmbH, Blumberg retains the copyright to this documentation.

This documentation is solely intended for the operator and his personnel.

The content of this documentation (text, figures, drawings, graphics, plans, etc.) may not be copied or distributed in part or in full without our consent in writing, nor can it be used without authorisation for competitive purposes or given or made accessible to third parties.

Darda GmbH

Im Tal 1

D – 78176 Blumberg

Phone: + 49 / 0 77 02 / 43 91-0

Fax: + 49 / 0 77 02 / 43 91-12

Email: info@darda.de

Internet: <http://www.darda.de>

Information manual: Hydraulic Stone and Concrete Splitter

Version: 1.0 English

Release date: 04/2010

We reserve the right to change the design and device for the improvement of the product.

Outline of Product Manual

The entire documentation of the hydraulic stone and concrete splitter includes:

Product Manual

- Information Manual (IM)**
 - for the operator of the device
- Operating Manual (OM)**
 - for the operator and
 - for the technical supervisor of the device

Overview of the Entire Documentation

Overview of the Information Manual (for the operator)

Information Manual (IM)

Chapter	Contents
1	Introduction
2	Device Data Sheet
3	Technical Data
4	Instructions for Servicing, Maintenance and Repair
5	Information for Disposal
A	Appendix A – List of Signatures

Overview of the Operating Manual (for the operator and technical supervisor)

Operating Manual (OM)

Chapter	Contents
1	Introduction
2	Safety Instructions
3	Device Description
4	Work Preparation
5	Commissioning / Operation / Shut-down Procedure
6	Replacing the Splitting Heads
7	Troubleshooting
8	Technical Data
9	Disposal

Table of Contents (IM)

Chapter	Subject	Page
1	Introduction	1
1.1	Preface	1
1.2	Product Identification / Product Information	1
1.3	Receiving Inspection	1
1.4	Definition of Terms	2
1.5	Responsibility of the Operator	2
1.6	Intended Use	3
1.7	Limited Service Life	3
1.8	Complaints	4
1.9	Guarantee and Liability	4
1.10	Declaration of Conformity	4
2	Device Data Sheet	5
3	Technical Data	6
3.1	Splitters	6
3.2	Hydraulic Oil	6
4	Instructions for Servicing, Maintenance and Repair	7
5	Information for Disposal	8
5.1	General Information	8
5.2	Disposal of Old Oil	8
A	Appendix A – List of Signatures	14

1 Introduction

1.1 Preface

Dear – Customer,
– Operator,

You are about to

- operate
- maintain or
- convert

type C stone and concrete splitter(s).

This manual is intended to provide you with the information required to carry out these important tasks.

- Please read this manual carefully!
- Act exactly in accordance with the descriptions provided!
- Be absolutely certain to heed the safety instructions!

We will be happy to answer any questions you may have. The telephone / fax numbers, as well as the email and internet addresses can be found in the credit notes on the first page of this manual.

Best wishes,
Darda GmbH

1.2 Product Identification / Product Information

The Darda type C splitters are used for splitting natural stone and concrete.



The descriptions in this product manual relate to splitter types C2S, C4S, C9, C10S and C12 from **Darda GmbH**.

The splitting devices are available in different designs that can be identified in the appendages to the names. The name appendages describe the used splitting heads (e.g. "N" for a standard splitting head).

1.3 Receiving Inspection

- Immediately after unpacking, inspect
 - the splitter for transport damage and defects,
 - the completeness of the delivery with reference to the delivery note,
 - any accessories included in the delivery.
- Make certain that no parts remain in the packaging and dispose of the packaging in accordance with the national or regional regulations if there is no reason for complaint.

1.4 Definition of Terms

In this product manual, the hydraulic stone and concrete splitter is described as a device in the following sections.

1.5 Responsibility of the Operator

The operator is required to allow work with the device only by experts who

- were sufficiently trained in accordance with the activities to be carried out.
- know the fundamental requirements for work safety and the prevention of accidents and have been familiarised with the handling of the device by qualified staff.
- have read and understood the safety and warning information in this documentation.

Please regard the following instructions in the interest of all staff:

- Add to this documentation the generally valid, legal and otherwise binding regulations for work safety, accident prevention and environmental protection, and inform the personnel working with the device about this!
- Supplement this documentation with instructions taking into account specific company features e.g. regarding the organisation of work, processes, personnel deployed (including duty of supervision and notification)!
- Clearly determine the responsibilities of the staff for the operating, cleaning, maintenance, etc.!
- Check at regular intervals whether the personnel bear the danger and safety instructions in mind during work!
- Take measures to ensure the device is only operating when in safe and perfect operating condition!
- Have the device cleaned and serviced at regular intervals!
- Do not let any structural changes be made (with the exception of those described in the documentation) without written approval from the manufacturer!
- Ensure that persons that were not familiarised with the residual risks of the device via the safety instructions do not enter the danger zone of the device!
- The operator or construction management team is solely responsible for securing the construction site / demolition site and its surroundings.
Before beginning work, the persons responsible for the construction site / demolition site must ensure that there are no dangers, particularly when cable lines for supplying energy or dangerous materials are present.
Measures are to be taken or a suction system is to be installed in cases where dust builds up. For short work, you can also use respiratory equipment suited for dust.

⇒ **OM, 2 Safety Instructions**

1.5.1 Definition of Specialists / Authorised Personnel

Physical or material damage can result from unqualified intervention in the device. Only qualified personnel may operate, clean and maintain the device for this reason.

Qualified personnel in this sense are persons who

- are familiar with the safety concepts of concrete demolition.
- are trained as operating personnel in handling concrete demolition crushers / steel shears and know the content of the product manual related to the company and operation.
- have received appropriate training from qualified personnel.
- were authorised due to their schooling, experience and training as well as their knowledge of the relevant norms, conditions, accident prevention requirements, structural calculations and company relations by the person in charge of the safety of the device. These qualified persons carry out the required activities and can recognise and avoid possible dangers.

1.6 Intended Use

The device from **Darda GmbH** is solely intended for the commercial splitting of concrete, rock and stone within fixed buildings and in freestanding structures.

The following restrictions are to be regarded!

All work must be carried out in accordance with the descriptions in this product manual and all relevant safety and environmental protection regulations must be heeded.

Please regard the technical data and the figures that explain the correct usage of the devices.



All options for using the device that are not expressly described under proper use and the conditions thereof are not permitted.

1.7 Limited Service Life

The service life of the devices is limited.

Regardless of the number of operating hours, have the hydraulic hoses replaced by the manufacturer or a person authorised by the manufacturer every 6 years.



Before using the device, check its overall condition, safety and ability to operate each time.

1.8 Complaints

Damage claims arising from transport damage will only be honoured if the manufacturer and the delivery company are notified immediately.

- Immediately fill out a damage report for a returned shipment (due to transport damage / repairs) and send the parts back to the manufacturing plant in their original packaging, if possible.
- Record possible transport damage on the shipping documents upon receipt of the goods!
- Enclose the following details in the returned shipment:
 - Name and address of the sender and recipient
 - Type and serial number of the device (⇨ **Chapter 2, Device Data Sheet**)
 - Description of the defect
 - In case of transport damage: delivery company name and, if possible, exact time of delivery, driver's name and registration number of the delivery vehicle

1.9 Guarantee and Liability

In principle, our **General Sales and Delivery Conditions** apply to the use of the devices. Agreements which deviate from these have to be agreed in writing and confirmed by us! The General Sales and Delivery Conditions are given to the operator together with the offer. Guarantee and liability claims in respect of personal injury or damage to property will not be honoured if they arise from one or more of the following causes:

- use of the device for purposes other than those for which it is intended.
- operation of the devices with defective safety equipment or incorrectly installed or non-functional protection and / or safety equipment.
- disregard of the instructions in this product manual in respect of safety, transportation, storage, installation, commissioning, operation, maintenance and repair of the devices.
- improper installation, commissioning, operation, maintenance and repair of the devices.
- deficient monitoring and maintenance of parts which are subject to wear (e.g. cutting heads, crushing tips, oil filter).
- unauthorised structural changes to the devices.
- natural disasters, foreign matter impacts and acts of God.

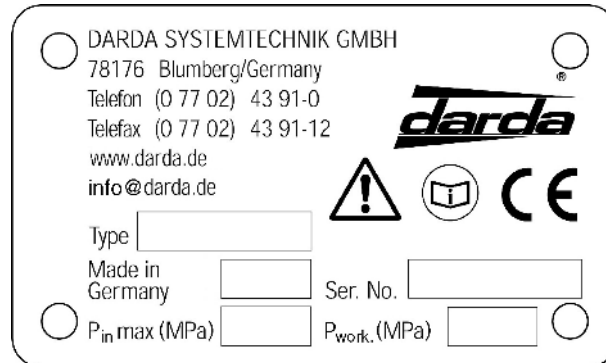
To ensure the functional safety, only original replacement parts from the manufacturer may be used.

1.10 Declaration of Conformity

You will find the Declaration of Conformity at our website under <http://www.darda.de>

2 Device Data Sheet

This product manual is based on the device types C2S, C4S, C9, C10S and C12, which are defined in the following.



DARDA SYSTEMTECHNIK GMBH
78176 Blumberg/Germany
Telefon (0 77 02) 43 91-0
Telefax (0 77 02) 43 91-12
www.darda.de
info@darda.de

Type

Made in Germany Ser. No.

$P_{in,max}$ (MPa) P_{work} (MPa)




  

Fig. 2-1 Name plate

Please enter the name plate data of your device in the above illustration, if the manufacturer has not already done this.

3 Technical Data

3.1 Splitters

Type	Splitting head	Required borehole diameter mm	Minimum borehole depth mm	Splitting distance mm	Theoretic splitting force kN/tonne
C2S	N	32-33	270	9	3490/355
C4S	N	35-36	430	10-40	4524/461
C4S	WL	35-38	540	14	3267/333
C4S	WLL	35-38	700	14	3267/333
C9	N	45-48	410	18-44	2995/305
C9	L	45-48	580	18-40	2995/305
C9	LL	48-50	1080	18-40	2995/305
C10S	N	41-43	630	18-45	4948/504
C12	W	45-48	550	24-56	4849/494
C12	N	45-48	610	20-50	6061/618
C12	L	45-48	680	15-35	8082/824

Type	Splitting head	Effective splitting force kN/tonne	Weight kg	Length of splitting cylinder mm	Length of splitting head mm
C2S	N	1913/195	18	745	140
C4S	N	2256/230	22	995	250
C4S	WL	1864/190	23	1145	400
C4S	WLL	1864/190	24	1255	510
C9	N	1962/200	22	1020	230
C9	L	1962/200	23	1190	400
C9	LL	1962/200	28	1690	900
C10S	N	2551/260	32	1400	380
C12	W	3150/321	31	1250	340
C12	N	3507/358	31	1290	380
C12	L	4048/413	32	1380	450

3.2 Hydraulic oil

Normal conditions	Cold regions
ISO VG 22	ISO VG 10

4 Instructions for Servicing, Maintenance and Repair

We call your attention expressly to the fact that servicing, maintenance and repair work may only be carried out by authorised and trained personnel!



This implies they have read and must have understood this product manual and in particular Chapter 2 Safety Instructions, and in addition, have completed occupational training which has provided them with the necessary technical background for their work!

The operator is responsible for the qualifications of his personnel.

For damage that results from insufficient knowledge and training of the personnel, the manufacturer does not assume liability.

5 Information for Disposal

5.1 General Information

The operator is responsible for the proper disposal of the device. The sector-specific and local conditions for the disposal of different materials must be followed.



Disassembly and disposal of the device may only be handled by qualified personnel.

5.2 Disposal of Old Oil

Old oil is to be disposed in an environmentally friendly way and under consideration of the regional and national requirements.

- Make sure that the old oil does not pollute the environment.
- Dispose of old oil in suitable containers that meet the requirements.

Appendix A – List of Signatures

Procedure / How to fill in the list of signatures

- Copy the list of signatures below.
- Enter the address of your company / authority and confirm using the company stamp.
- Make any member of the staff enter their name and signature (who have been instructed on the devices either on your own or the manufacturer's premises).
- File this list with the other documents.

List of Signatures

of the following company / authority / operator:

Address / Stamp

The persons listed below confirm by their signature that they have been instructed, by means of

- this product manual (IM and OM)
- through special training / instructions given by the manufacturer, on
 - the functions,
 - the operations,
 - the conversion, maintenance, servicing

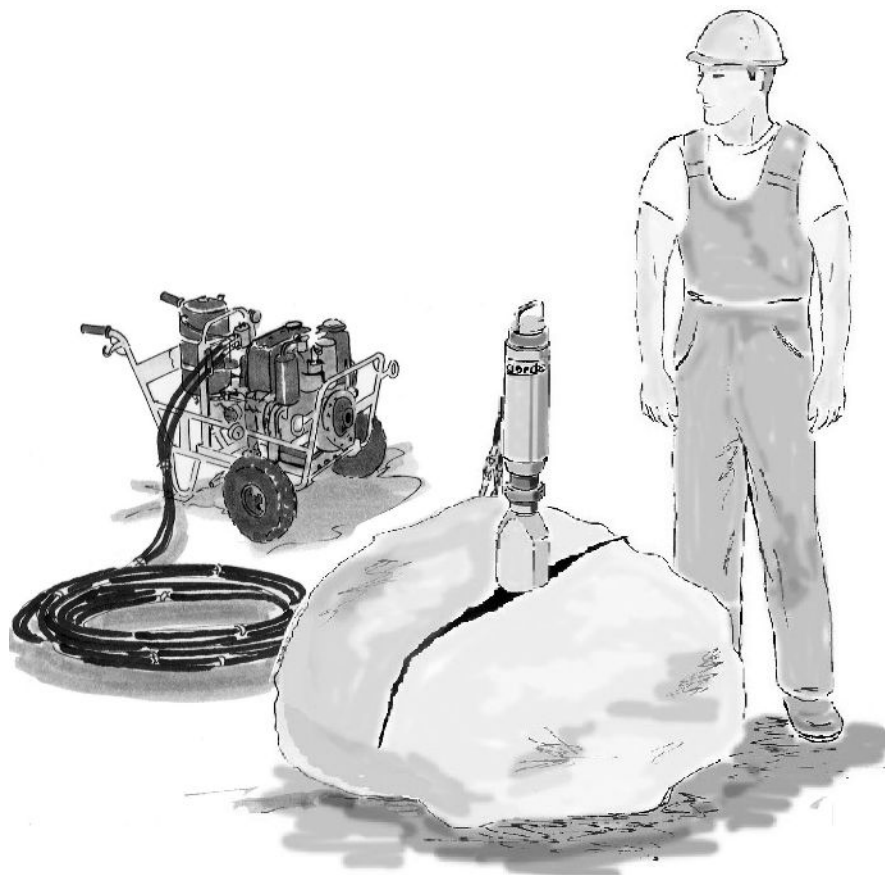
of the devices and that they have read and understood Chapter **2 Safety Instructions of the Operating Manual**.

Participant Name	Date, Signature	Instructor (Date, Signature)



Operating Manual

Hydraulic Stone and Concrete Splitter



© by **Darda GmbH**

Darda GmbH, Blumberg retains the copyright to this documentation.

This documentation is solely intended for the operator and his personnel.

The content of this documentation (text, figures, drawings, graphics, plans, etc.) may not be copied or distributed in part or in full without our consent in writing, nor can it be used without authorisation for competitive purposes or given or made accessible to third parties.

Darda GmbH

Im Tal 1

D – 78176 Blumberg

Phone: + 49 / 0 77 02 / 43 91-0

Fax: + 49 / 0 77 02 / 43 91-12

Email: info@darda.de

Internet: <http://www.darda.de>

Operating manual : Hydraulic Stone and Concrete Splitting Device

Version: 1.0 English

Release date: 04/2010

We reserve the right to change the design and device for the improvement of the product.

Outline of Product Manual

The entire documentation of the hydraulic stone and concrete splitter includes:

Product Manual

- **Information Manual (IM)**
 - for the operator of the device
- **Operating Manual (OM)**
 - for the operator and
 - for the technical supervisor of the device

Overview of the Entire Documentation

Overview of the Information Manual (for the operator)

Information Manual (IM)

Chapter	Contents
1	Introduction
2	Device Data Sheet
3	Technical Data
4	Instructions for Servicing, Maintenance and Repair
5	Information for Disposal
A	Appendix A – List of Signatures

Overview of the Operating Manual (for the operator and technical supervisor)

Operating Manual (OM)

Chapter	Contents
1	Introduction
2	Safety Instructions
3	Device Description
4	Work Preparation
5	Commissioning / Operation / Shut-down Procedure
6	Replacing the Splitting Heads
7	Troubleshooting
8	Technical Data
9	Disposal

Table of Contents (OM)

Chapter	Subject	Page
1	Introduction	1
1.1	Preface	1
1.2	Validity	1
1.3	Storage	1
1.4	Definition of Terms	1
1.5	Symbols in this Manual	2
1.6	Responsibilities of the Personnel	6
1.7	Limited Service Life	7
1.8	Protection against Unauthorised Operation, Servicing and Repair	7
1.9	Personal Protective Gear	7
2	Safety Instructions	8
2.1	Intended Use	8
2.2	Safety Information for Certain Types of Use	9
2.3	Safety Instructions for the Different Tasks	11
2.4	Safety Information for Maintenance	11
2.5	Danger from Operating Material / Splitting Material	13
2.6	Safety Instructions for Conversion	14
2.7	Safety Instructions for Transport	15
2.8	Safety Instructions for Commissioning	15
2.9	Protective Gear	16
2.10	Information about Off-limits Area	17
2.11	Device Protection	18
3	Device Description	19
4	Work Preparation	20
4.1	Drilling boreholes	20
4.2	Connection to Hydraulic Hoses	21
4.3	Lubrication	22
5	Commissioning / Operation / Shut-down Procedure	23
5.1	Commissioning / Operation	23
5.2	Operation	24
5.3	Safety-conscious Work	25
5.4	Expanding	26
5.5	Shut-down Procedure	28
6	Replacing the Splitting Heads	29
6.1	Splitter Type C4S	29
6.2	Splitter Types C9, C10S, C12	31
6.3	Maintenance Every 6 Years	32
6.4	Cleaning	33
6.5	Repair	33
7	Troubleshooting	34
8	Technical Data	35
8.1	Splitters	35
8.2	Hydraulic Oil	35
9	Disposal	36
9.1	Disposal of Old Oil	36

1 Introduction

1.1 Preface

Dear Operator,
Dear Technical Supervisor,

You are about to operate, convert, maintain or repair (a) type C hydraulic stone and concrete splitter(s).

This operating manual is intended to support you with information for carrying out this important work.

Please read this operating manual carefully and pay special attention to the safety instructions!

If you have questions about the hydraulic stone and concrete splitter or its components, our staff will be happy to assist you.

Best wishes,
Darda GmbH

1.2 Validity

The descriptions in this **operating manual** refer solely to the

Hydraulic Stone and Concrete Splitter

as defined on the Device Data Sheet as a whole or they refer to modules, components and individual parts that were developed and built by Darda GmbH.

⇒ **IM, 2 Device Data Sheet**



1.3 Storage

This **operating manual** is a component of the entire documentation for the devices and must always be stored in the vicinity of the devices so it is immediately available if need be.

1.4 Definition of Terms

In this product manual, the hydraulic stone and concrete splitter is described as a device in the following sections.

1.5 Symbols in this Manual

1.5.1 Danger Warning Levels

DANGER!



Text that is marked with **DANGER!** provides a warning about exceptionally great, immediate dangers. If you do not take accident prevention measures, these hazards will lead with certainty to serious (irreversible) injuries or even death!
Please heed this text and take the accident prevention measures!

WARNING!



Text that is marked with **WARNING!** provides a warning about exceptionally great, possible danger. If you do not take accident prevention measures, these hazards will lead with certainty to serious (irreversible) injuries or even death!
Please heed this text and take the accident prevention measures!

CAUTION!



Text that is marked with **CAUTION!** provides a warning about possible dangerous situations. If you do not take accident prevention measures, these hazards will lead with certainty to slight or medium (irreversible) injuries!
Please heed this text and take the accident prevention measures!

ATTENTION!

Text that is marked with **ATTENTION** contains very important instructions for situations that, if the accident prevention measures are not taken, may result in damage to the product and / or its functions or an object in its vicinity.
Please heed this text and take the accident prevention measures!



Text that is marked with this symbol contains very important instructions!
Please heed this text!



This symbol indicates text that contains important instructions / comments or tips.

1.5.2 Danger Symbols**1.5.2.1 General Danger Symbols**

Warning about dangers that lead to serious (irreversible) injuries or even death!

1.5.2.2 Specific Danger Symbols

Warning about dangerous voltage and/or dangerous electricity!



Warning about dangerous hot surfaces!



Warning about mechanical movements or hand injuries!



Warning about explosions!



Provide lubrication every 2 hours!

1.5.3 Instruction Symbols

- Regard the provided documentation and/or instructions!



- Switch off the device (disconnect)!



- Remove the plug from the electrical power supply!



- Wear an industrial hard hat in accordance with EN 397!



- Use ear protectors!



- Use a face mask for protection class 2 with a mechanical strength A!



- Use safety gloves with pulse protection and
 - an abrasion resistance of power level 4
 - a cut resistance of power level 4
 - an average resistance of power level 4



- Use safety shoes for protective class S1!



- Use the appropriate dust respirator!



- Safety clearance for the operator at least 10 m.
The additional danger zone is to be determined by the operator.

1.5.4 General Symbols

● This dot marks the descriptions of activities which you should carry out.

– This dash marks specifications.

⇒ This arrow marks a cross reference.

If a cross reference to another chapter is necessary in the text, this is shortened for clarity.

Example: ⇒ **OM, 2 Safety Instructions**

This means: See Chapter 2 Safety Instructions,
in the Operating Manual.

If the cross reference refers to a page, figure or position number, this information is added at the end of the cross reference.

Example: ⇒ **Fig. 4 - 4, Pos. 1**

This means: See figure 4 position number 1
(in chapter 4 of this operating manual).

(3) Numbers in brackets refer to the positions in figures.

1.6 Responsibilities of the Personnel



Before beginning work, all persons entrusted with jobs using the devices are required

- to heed the fundamental regulations on industrial safety and accident prevention.
- to read the safety instructions and the warning information contained in this product manual and to confirm with their signature that they have understood them.

(⇒ IM, Annex A – List of Signatures)

Please regard the following instructions in the interest of all staff:

- Refrain from any method of working which might present a safety risk!
 - Follow all danger and warning instructions in this product manual!
 - Please also regard the general, statutory and otherwise binding regulations on industrial safety, accident prevention and environmental protection!
 - Regard the fire-alarm and fire-fighting possibilities and inform yourself about the location and operation of fire extinguishers!
 - Wear the protective clothing that is appropriate for the work to be performed!
 - Do not have open long hair, loose clothing or jewellery (including rings)!
 - Perform only work for which you have been sufficiently trained and instructed!
 - Do not perform any service work without prior consultation with the manufacturer and the operator!
 - Do not make any structural changes without approval in writing from the manufacturer (except what is described in this product manual)!
 - Ensure that other persons who do not work with the devices (and consequently do not know the risks of the devices) cannot enter into the danger zones.
 - Shut down the devices in case any danger occurs! Protect the device against accidental start-up and notify the operator / supervisor immediately!
-

1.7 Limited Service Life

The service life of the devices is limited.

Regardless of the number of operating hours, have the hydraulic hoses replaced by the manufacturer or a person authorised by the manufacturer every 6 years.



Before using the device, check its overall condition, safety and ability to operate each time.

1.8 Protection against Unauthorised Operation, Servicing and Repair

The operation, servicing and repair work on the devices may solely be performed by qualified personnel (↔ IM 1.5.1 Definition of Specialists / Authorised Personnel).

The operator is to ensure that only he/she can operate the device and that it is secured against use by third parties.

1.9 Personal Protective Gear

The personal protective gear in this product manual is solely recommended in connection with the device.

The requirements for personal protective gear due to the conditions at the site of use or other products or use of the device in combination with other products are not described in this product manual and must be handled by the operator and construction management team in accordance with the actual risks.

You will find specifications for the protective gear in **chapter 1.5.3 Instruction Symbols**.



2 Safety Instructions

The device is a quality product manufactured according to recognised technology rules and was released from the manufacturing plant in perfect condition in respect of safety technology!

In spite of this, there are residual risks

- during assembly / disassembly,
- during commissioning / shut down procedure,
- during operation and
- during maintenance / cleaning.

When there is

- lack of knowledge of these residual risks,
- failure to heed the warning information in this product manual,
- work which is incorrectly implemented or
- use of the device for purposes for which it is not intended,

this could result in death or serious bodily injuries or damage to property!

As a result of these existing potential residual risks it is the manufacturer's duty to inform the operators and users about these risks!

As the manufacturer we fulfil our duty to inform with the descriptions in this product manual in general and, in particular, in this chapter.

2.1 Intended Use

The Darda type C splitters are suited for splitting concrete, rocks and stones within fixed buildings and in freestanding structures. All other materials such as metal cannot be handled with this method.

The splitters are also suited for use under water if the relevant environmental protection guidelines are observed.

You may not apply any external mechanical force, e.g. by using crowbars, on the splitter, and in particular on the pressure pieces and the wedge (possibility of deformation).

Only the hydraulic oils listed in the chapter Technical Data may be used.

To ensure the functional safety and guarantee, only Darda hydraulic aggregates may be used.



**Any further usage exceeding the specified ones is considered improper!
The manufacturer is not liable for any personal or material damage resulting therefrom!**

2.2 Safety Information for Certain Types of Use**2.2.1 Hazards caused by hot surfaces**

Even after a short operation time or after longer idle times, the hydraulic hose assemblies or other device parts can already or still be hot!

In case of skin contact, serious burns may be incurred!

- Note that during normal operation the hydraulic oil may reach a temperature of up to 80 °C!
- Never open the screw connections of the hydraulic device parts that are hot (or highly pressurised)!
- Before starting work at hydraulic device parts, check whether you can work safely at the given temperature! Before starting work at hydraulic device parts, let them cool down sufficiently if need be!
- Wear protective gear that is appropriate for all the work with or on the devices!

2.2.2 Hazards from the surroundings

DANGER!

There are dangers from the surroundings.

Surrounding dangers are dangers that can emerge at the site where the devices are used, but are not caused by them.

- Observe the surroundings when working with the devices and stop your work immediately if you notice dangers and inform the operator / construction management team in charge.
 - Evacuate the danger zone, if need be.
-

2.2.3 Hazards from insufficient lighting

WARNING!

In the event of insufficient light when working with the device, there is a danger of bodily injury and / or material damage.

The person in charge of the splitting site is to ensure that minimum lighting power of 200 Lux is present in the work area of the device.

2.2.4 Hazards caused by pressurised device parts



DANGER!

Hydraulic oil escaping at high pressure can permeate the skin and may cause poisoning, infections and other serious injuries to the eyes or other organs!

- For all work at hydraulic hose assemblies or device parts, wear appropriate personal protective gear (e.g. hard hat, face screen, protective gloves, protective clothing)!

2.2.5 Hazards from meteorological impacts



DANGER!

Meteorological impacts can affect the device as well as the splitting material.

- Stop working with the device immediately in the event of a thunderstorm since there is a danger of being hit directly by lightning!
- Do not work with the device during thunderstorms.

2.2.6 Hazards from operator with limited sensory perception



DANGER!

Operating the device with limited sensory perception can result in dangers for the operator, third persons and the surroundings.

- Operating the device with limited sensory perception is strictly forbidden.

2.3 Safety Instructions for the Different Tasks**2.3.1 Failure or malfunctioning****DANGER!**

If the device fails or malfunctions, it is to be taken out of operation immediately.

- Block off the work area of the device.
- Secure the device against commissioning.
- Inform the operator immediately.

2.4 Safety Information for Maintenance**DANGER!**

We call your attention expressly to the fact that maintenance of the devices may only be carried out by trained personnel with a profound mechanical and hydraulic knowledge!

- Before you carry out maintenance work on the devices, switch off all hydraulic and electric aggregates connected to the device!
- Before carrying out work on the device, separate all the hydraulic and electric aggregates!
- Relieve the hydraulic accumulators / hose assemblies / devices, etc. from pressure!
- Take measures to avoid an unintentional commissioning of the device!
- Carry out the maintenance work in accordance with the descriptions in this operating manual!

2.4.1 Safety risk from defective maintenance / servicing**DANGER!**

Regard the information about the maintenance intervals.

The defective maintenance of the devices can lead to damage due to the high mechanical demands.

Defective maintenance / servicing can represent dangers for persons.

2.4.2 Safety risk from contaminated hydraulic oil



ATTENTION!

- Before starting up the devices, check the hydraulic oil for contamination. Contaminated hydraulic oil can lead to malfunctioning.

2.4.3 Hazards from a loss of power



DANGER!

With a loss of power, dangers for people and the environment can result from the device.

- Protect the hydraulic aggregate against accidental start-up and block off the danger zone.

2.4.4 Hazards from (absent) separator



DANGER!

If the hydraulic hoses of the stone and concrete splitter are not equipped with a separator (e.g. couplings), there is a danger of unexpected start-up / delayed shut-off with work on the device.

- Before you separate the device from the hydraulic aggregate,
 - lay the device on a firm surface.
 - switch off the hydraulic aggregate and secure it against accidental start.

2.4.5 Hazards from concealed dangers / residual risks

DANGER!

When concrete, rocks and stone are split, there are fundamentally unforeseeable residual risks that can only be prevented by systematic work planning, working methods taking into account possible risks, experience, etc.!

The following list is intended to draw your attention to some possible risks:

- When supply lines / pipe systems that are not deactivated are damaged, the device may be live, water or other media may escape or the supplies to other sections of the building areas that are not affected by the splitting may be cut off!
 - Before starting work, discuss the procedure with the person in charge of the splitting site!
 - Wear appropriate personal safety gear for all work!
 - Do not linger in the danger zone of the device during splitting work and take appropriate measures to prevent other personnel from entering this zone!
 - Carry out the work with utmost care!
-

**2.5 Danger from Operating Material / Splitting Material****2.5.1 Hazard from dust**

CAUTION!

To protect yourself from dust that accumulates when splitting concrete, rock and stone, the operator is to take measures to minimise this (e.g. by using suction system).

For short work you can also use respiratory equipment suited for dust.



2.5.2 Hazards from operating material

2.5.2.1 Hazards from hydraulic oil



DANGER!

When working in the area of hydraulic supply lines, danger can result from

- - suddenly escaping hydraulic oil,
- - contact with hydraulic oil that damages your health.
- Only perform work on the hydraulics
 - when the hydraulic hoses are not pressurised.
 - Note that even if the hydraulic supply is deactivated, there still may be danger arising from hydraulic oil which possibly remains in the hoses and which may be pressurised!
- Regularly check that the hydraulic hoses and their connections are in the proper state!
- Use personal protective gear suited for all activities!
- If you have swallowed or breathed in hydraulic oil,
 - seek out medical treatment immediately. Inform the doctor of emergency measures recommended by the hydraulic oil manufacturer!
 - If you have got hydraulic oil in your eyes, on your skin or clothing,
 - take the recommended emergency measures,
 - contact a doctor immediately.

2.6 Safety Instructions for Conversion



DANGER!

We call your attention expressly to the fact that the conversion and the hydraulic installation of the device may only be carried out by trained and authorised personnel with a profound mechanical and hydraulic knowledge!

- Carry out the conversion in accordance with the professional association's safety instructions and the regulations for the prevention of accidents!
- Only use correct and functional parts / tools for converting the device!
- Only carry out the conversion of the device while heeding the descriptions in this product manual!
- Before converting the device, be sure to take it out of operation as described in chapter 5.5 and secure it against accidental start-up.

2.7 Safety Instructions for Transport**DANGER!**

When transporting the device, the applicable work protection measures are to be considered!

- Secure the device in accordance with the requirements for transport (e.g. with lashing straps) to prevent slippage.
-

2.8 Safety Instructions for Commissioning**DANGER!**

We call your attention expressly to the fact that the conversion and the hydraulic installation of the device may only be carried out by trained and authorised personnel with a profound mechanical and hydraulic knowledge!

- Make sure there are no potential hazards for persons or the environment when commissioning the device!
 - Make sure that no persons linger or enter the danger zone of the device or this area in general during commissioning!
 - Take measures that provide warnings before commission the device!
 - Before any commissioning, check
 - proper functioning of the device!
 - whether the device and all its components are free from contamination, wear, deformation, damage and corrosion!
 - whether all parts and fixtures fit tightly!
 - hydraulic hoses and connections for leakage!
 - whether the device has been lubricated sufficiently!
 - the correct assembly of the splitting heads
 - the condition of all wear parts.
 - Before beginning work, plan your procedure and execute the work methodically!
 - If necessary, consult experts and ask them for information or advice!
 - Never direct the device against persons if it is fully operational!
 - Do not put into operation a device whose functional / operational safety is not ensured / present!
-

2.9 Protective Gear



When working on / with the device, wear the personal protective gear that the relevant safety instructions require!

Work with the device is not allowed without personal protective gear!

2.9.1 Class S1 safety shoes



When performing tasks such as

- transport
- commissioning
- operation
- maintenance, cleaning, servicing,

wear safety shoes in class S1 according to IEC 61310.

2.9.2 Personal face mask for protection class 2 with a mechanical strength A!



When performing tasks such as

- commissioning
- operation
- maintenance, cleaning, servicing,

wear a face mask in protection class 2 according to EN 166.

2.9.3 Protective gloves with pulse protection and

- an abrasion resistance of power level 4
- a cut resistance of power level 4
- an average resistance of power level 4



When performing tasks such as

- transport
- commissioning
- maintenance, cleaning, servicing,

wear protective gloves with a pulse protection according to IEC 61310.

**2.9.4 Industrial protective hard hat**

When performing tasks such as

- transport
 - commissioning
 - operation
 - maintenance, cleaning, servicing,
- wear a hard hat according to EN 397.

**2.10 Information about Off-limits Area**

The operator or the construction management team is solely responsible for securing the direct and indirect danger zones.

Before beginning work, the person responsible for the construction site must ensure that there are no dangers, particularly when cable lines for supplying energy or dangerous materials are present.

2.11 Device Protection

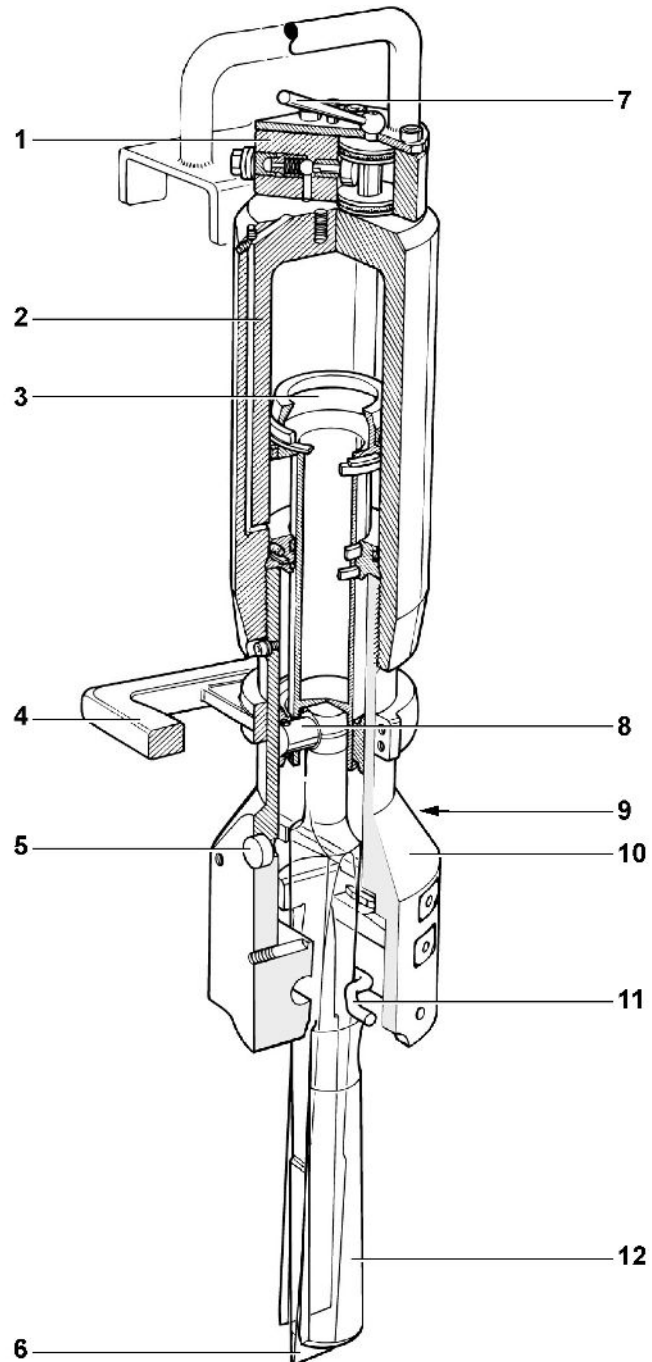
WARNING!



Please be sure to heed the following information or instructions to prevent the splitter from being damaged!

- Before all splitting work, check whether the pressure surfaces of the splitting wedge and the pressure pieces are sufficiently lubricated! Lubricate the pressure surfaces at the latest after 3 to 5 splittings! Solely use the Darda special lubricant paste!
- Avoid frequent full capacity utilization of the splitter by using multiple splitters with the smallest possible borehole intervals! Constantly reaching the maximum pressure and retraction of the splitting wedge in unsuccessful splitting leads - particularly with insufficient lubrication - to premature wear in the splitting heads and in some cases to the breaking of the wedge head!
- During and after each splitting process, check whether the splitting wedge correctly executes the desired movement after pressing the operating lever!
If the splitter is still operated after the wedge head breaks, this usually leads to the destruction of the splitter due to the uncontrolled meeting of the piston rod and wedge!
- Check the splitter for operational safety before any start-up!
- Do not increase the pressure in the hydraulic circuit under any circumstances! The pressure limitation valve on the hydraulic aggregate must limit the hydraulic pressure to a maximum of 50 MPa!
- Exclusively use hydraulic oils approved by the manufacturer!
- Never mix oils with different viscosities or from different manufacturers! If in doubt, completely change the hydraulic oil!
- Make sure that no foreign bodies (such as stones, sand, water) enter the hydraulic circuit when the hydraulic hoses and couplings are dismantled!
- Immediately cut off the hydraulic supply in case of a malfunction of the splitter, secure it against accidental start-up and inform the superior in charge about the malfunction!
- Make sure (due to the danger of the hydraulic oil overheating) that the operating lever is in the zero position on at least one splitter in the case of long interruptions with a running hydraulic aggregate!
- For the protection of the device, however, we recommend that you switch off the hydraulic aggregate.
- Remove the salt deposits after use under water by dipping and brushing off the splitter in / with freshwater!

3 Device Description



- | | |
|-------------------|---|
| 1 Control valve | 7 Operating lever |
| 2 Cylinder | 8 Bolt* |
| 3 Piston | 9 Screw (on the opposite side of the plastic cap) * |
| 4 Handle | 10 Built-in pot |
| 5 Plastic cap * | 11 Hooks (2 x, right and left) * |
| 6 Splitting wedge | 12 Pressure piece (2 x) |

* (only with C9, C10S and C12)

Fig. 3 - 1 Section of a splitter

4 Work Preparation

4.1 Drilling Boreholes

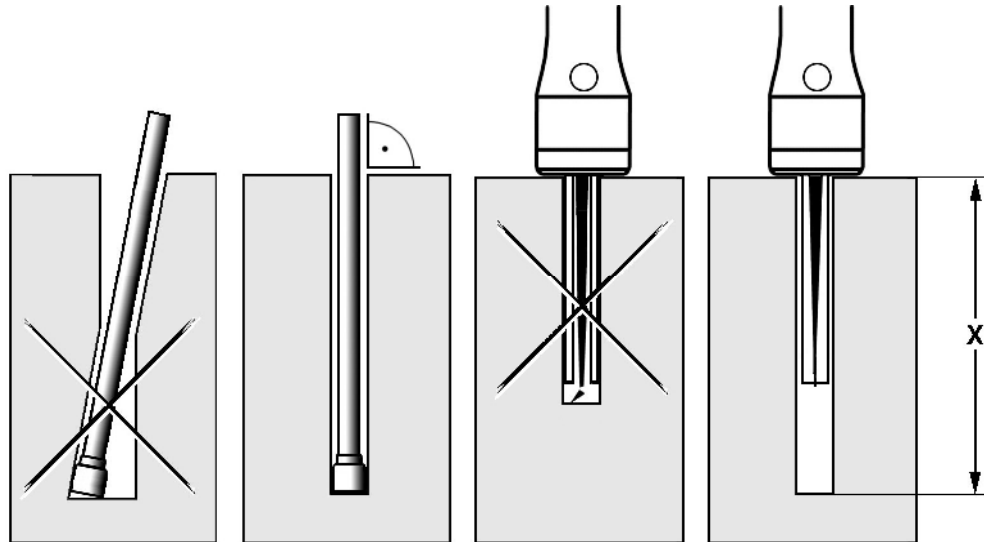


Fig. 4-1 - 1 Drilling boreholes



To avoid damage to the splitter, the boreholes must be the correct size and cautiously drilled!

Please heed the following instructions:

- To protect the splitting head, the borehole should be drilled as straight as possible.
- The diameter of the borehole should not exceed / fall below the values stated in the chapter Technical Data. Too much play between the perforated wall and the splitting head reduces the effective splitting distance.
- The borehole must be deeper than the length of the splitting head in the case of a completely extended wedge.

⇒ 8 Technical Data

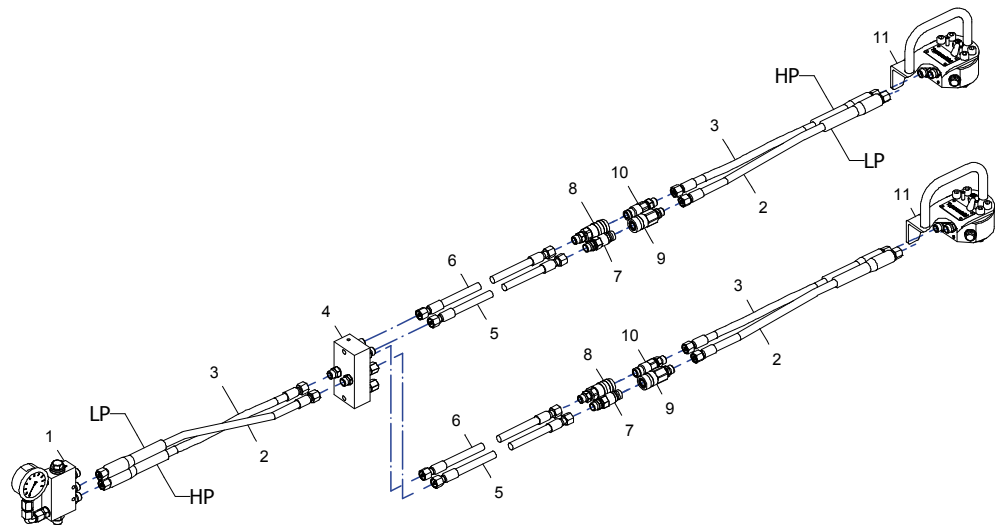
- The borehole is to be drilled vertically to the surface as a rule.
- To produce a long, straight split with multiple splitting cylinders, the borehole distance should amount to approx. 40 to 60 cm.

The outer borehole is to be drilled roughly 60 cm from the edge.

For particularly exact splits, e.g. in obtaining natural stone, test splits should be carried out at different drilling distances.

To control the splitting behaviour, intermediary boreholes in which the splitter will not be used can also be drilled.

4.2 Connection to Hydraulic Hoses



- 1 Pressure limitation valve, complete
- 2 Hydraulic hose
- 3 Hydraulic hose
- 4 Distribution pieces, 1 to 3-point, complete
- 5 Hydraulic hose
- 6 Hydraulic hose
- 7 Quick-release coupling, low pressure, complete
- 8 Quick-release coupling, high pressure, complete
- 9 Quick-release coupling, low pressure, complete
- 10 Quick-release coupling, high pressure, complete
- 11 Control valve, complete

HP = High Pressure LP = Low Pressure

Fig. 4-2 - 1 Connection of hydraulic hoses



This diagram is an example. Please find all diagrams in the current replacement parts list.

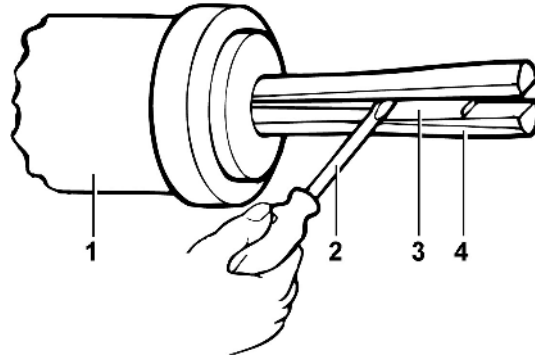
WARNING!



Do not bend hoses and test them for damage before use! Damaged hose sets may not be used!

- **Before connecting the hydraulic hoses and before commissioning, please heed the safety instructions in chapter 2 of this product manual!**
 ⇨ **2.2.4 Danger Caused by Pressured Device Parts**
- Connect the splitter(s) to the hydraulic aggregate. Heed the figure above.

4.3 Lubrication



- 1 Splitting cylinder
- 2 Screwdriver
- 3 Splitting wedge
- 4 Pressure piece

Fig. 4-3 - 1 Lubricating the pressure pieces and the wedge



Operation without or with insufficient lubrication usually leads to the cold welding of the splitting head and possibly to the destruction of the splitter!

- **Before all splitting work, check whether the pressure surfaces of the splitting wedge and the pressure pieces are sufficiently lubricated! Lubricate the pressure surfaces at the latest after 3 to 5 splittings! Solely use the Darda special lubricant paste!**

Procedure for lubrication:

- Spread the splitting head with a screw driver or similar instrument and use a spatula to apply a thin layer of Darda special lubricant paste on the pressure surfaces and pressure pieces and the splitting wedge.

Advantages of the Darda special lubricant paste:

- The special lubricant paste is the result of many years of experience.
 - Significant reduction of the high frictional forces. Maximum achievable splitting force (splitting force with conventional lubricants 20 - 50 % lower).
 - Lower wear and replacement part needs and thus cost savings.
-

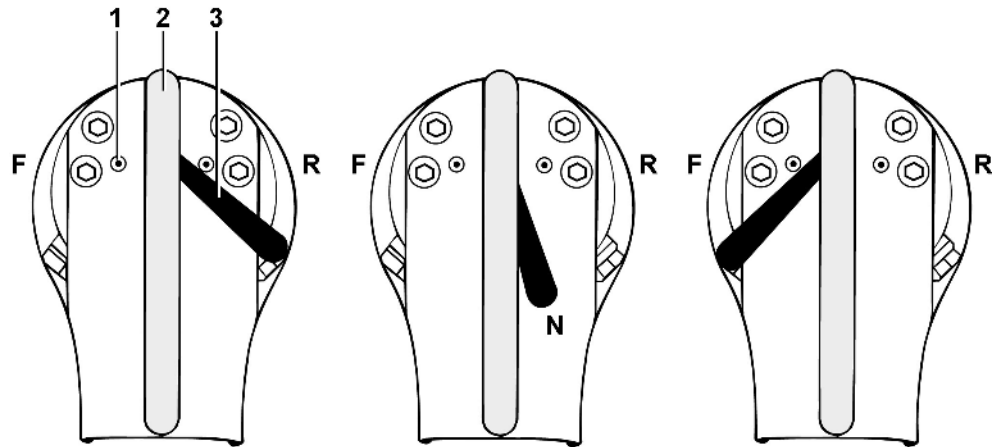


5 Commissioning / Operation / Shut-down Procedure**5.1 Commissioning / Operation**

We call your attention expressly to the fact that the conversion and the hydraulic installation of the device may only be carried out by trained and authorised personnel with a profound mechanical and hydraulic knowledge!

⇒ 2.8 Safety Instructions for Commissioning

5.2 Operation



- 1 Stop pins
- 2 Handle
- 3 Operating lever

Fig. 5-2 - 1 Operation of the splitting device



WARNING!

- Before commissioning the splitting device, please heed the safety instructions in chapter 2 of this product manual!

The splitter is operated with the operating lever at the upper end (head side) of the device. Depending on the position of the lever, you can differentiate between three different operating states:

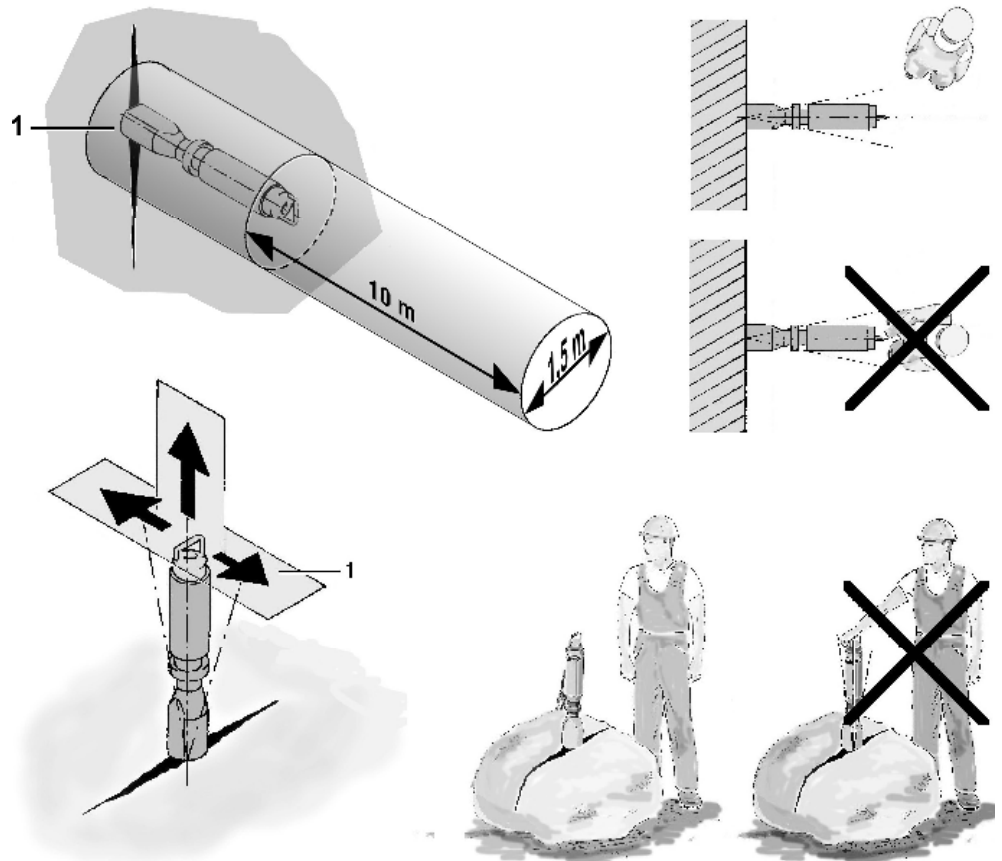
- R** Wedge back:
The wedge is retracted. As soon as the wedge has been completely retracted, the pressure limitation valve built into the Darda aggregate relieves the pressure cylinder (noticeable in the clearly audible bang from the aggregate).
- N** Zero position:
The wedge does not move. The hydraulic system is not under pressure (relieved).
- F** Wedge forward:
The wedge is extended and presses the two pressure pieces apart. As soon as the wedge has been completely extended, the pressure limitation valve built into the Darda aggregate relieves the pressure cylinder (noticeable in the clearly audible bang from the aggregate).

CAUTION!

Make sure (due to the danger of the hydraulic oil overheating) that the operating lever is in the zero position on at least one splitter in the case of long interruptions with a running hydraulic aggregate!



5.3 Safety-conscious Work



1 Danger zone!



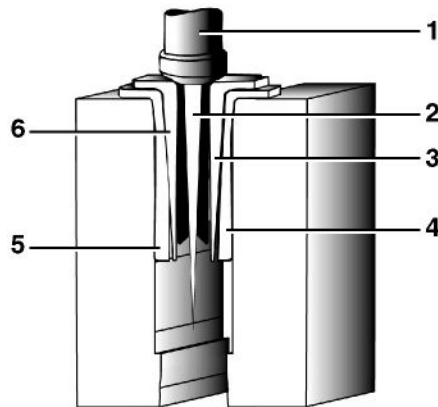
If the pressure pieces break during the splitting process, this can lead to sudden lateral or axial deflections of the splitter.

Fig. 5-3 - 1 Danger zones and correct handling

- Guide the splitter into the borehole by hand until it stops (operating lever position: **N / R** ⇨ 5.2 Operation)
- Turn the operating lever to position **F**.
- **Let go of the splitter and move at least 75 cm away from the device during the splitting process for your safety (⇨ figure 5.3-1).**
- **Do not linger in the danger zone of the splitter during the splitting process under any circumstance!**
- After the splitting process, turn the operating lever to position **R**. Wait until the wedge has been completely retracted and you have heard the bang. The bang comes from the pressure limitation valve of the hydraulic aggregate. The build-up of pressure can also be observed by the rearing of the hydraulic hoses.
- Now turn the operating lever to position **N** and pull the splitter out of the crack.

5.4 Expanding

5.4.1 Splitter types C2S, C4S



- 1 Built-in pot of splitter
- 2 Splitting wedge
- 3 Inner expander insert, 1st side
- 4 Outer expander insert, 1st side
- 5 Outer expander insert, 2nd side
- 6 Inner expander insert, 2nd side

Fig. 5-4-1 - 1 Expanding with expander inserts

After securing the split, e.g. with an iron wedge, the expander insert (4) is laid completely in the split.

Afterwards, you lay the second expander insert (3), which is thin at the bottom, flush against the built-in pot (1) and push the splitting heads together with the expander insert (3) in the retracted state of the splitting wedge (2) as far as possible into the split.

After extending the splitting wedge, secure the expanded split again and repeat the process until the expander insert (3) is also completely sunk in the split.

To achieve the maximum splitting distance, repeat the process with the second pair of expander inserts (5, 6).



5.4.2 Splitter types C9, C10S, C12

Expanding with expander pressure pieces

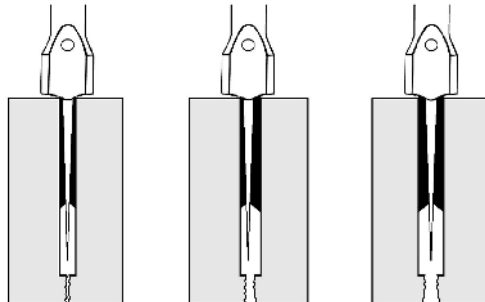


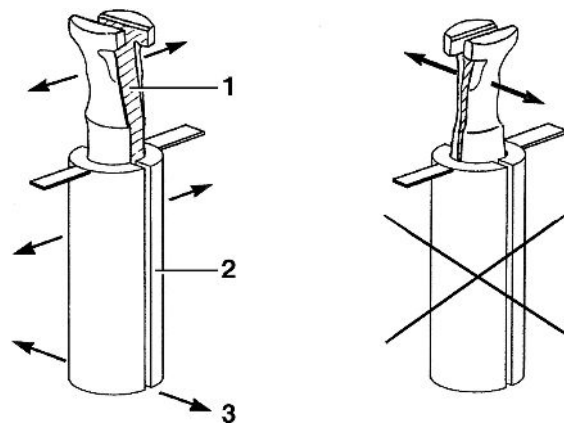
Fig. 5-4-2 - 1 Expanding with expander pressure pieces



To expand a split with these splitter types, the normal pressure pieces are successively replaced by thicker expansion pressure pieces. After each splitting or expansion process, the split must be secured e.g. with an iron wedge. To achieve an especially large splitting distance, the special expansion pressure pieces are available for the types C9 and C12. Exchanging the pressure pieces:

⇒ 6.2.1 Exchanging the Pressure Pieces

Splitting with pressure shells



- 1 Pressure piece
- 2 Pressure shell
- 3 Splitting direction

Fig. 5-4-2 - 2 Splitting with pressure shells



With heavily reinforced or qualitatively poor concrete, it can happen that only compression will take place around the borehole during the splitting of the concrete.

This problem can be resolved by using two large-surface pressure shells that are available for the types C9 and C12. A borehole with a 100 mm diameter must be drilled for use of the pressure shells. With regard to the depth of the boreholes, please heed the information in the chapter Technical Data!

Expanding with pressure shells and expansion pressure pieces is also possible.

5.5 Shut-down Procedure

- Switch off the hydraulic aggregate and protect it against accidental start-up.
- Avoid the pressure in the hydraulic circuit by moving the operating lever one or two times to its end position.

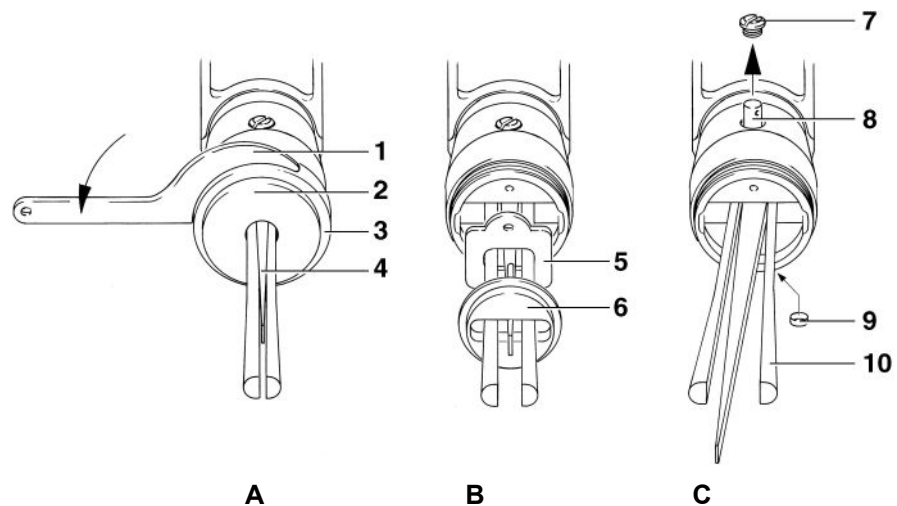
6 Replacing Splitting Heads



We call your attention expressly to the fact that the conversion and the hydraulic installation of the device may only be carried out by trained and authorised personnel with a profound mechanical and hydraulic knowledge!

6.1 Splitter Type C4S

6.1.1 Expansion of the splitting wedge and / or pressure pieces



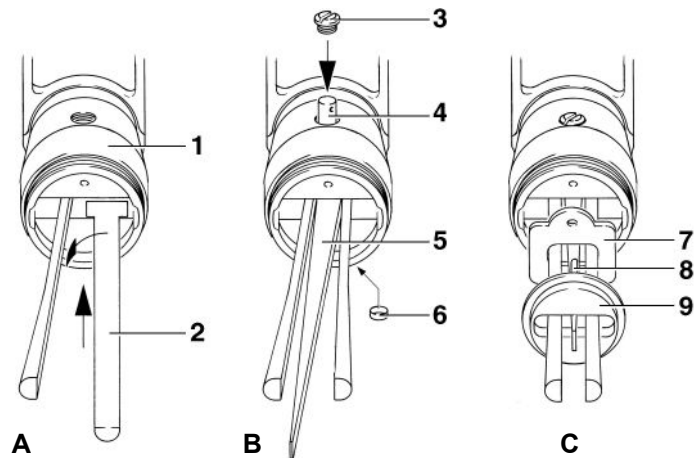
- | | |
|-------------------|-------------------|
| 1 Sickle spanner | 6 Guide disc |
| 2 Rubber disc | 7 Screw |
| 3 Grommet nut | 8 Bolt |
| 4 Splitting wedge | 9 Plastic cap |
| 5 Rubber disc | 10 Pressure piece |

Fig. 6-1-1 - 1 Expansion of the splitting wedge / pressure pieces



- Retract the splitting wedge (4) completely (**operating lever in position R**).
- Pull the rubber disc (2) forward.
- Remove the grommet nuts (3) with the sickle spanner (1) (fig. A).
- Remove the guide disc (6) and the inner rubber disc (5) with a screwdriver (fig. B).
- Extend the splitting wedge completely (**operating lever in position F**).
- **Switch off the hydraulic aggregate and protect it against accidental start-up!**
- Remove the screw (7) and the plastic cap (9) on the opposite side.
- Hit the bolt (8) with a mandrel and a hammer out of the wedge head (fig. C).
- Pull the splitting wedge out of the splitting cylinder.
- Remove the pressure pieces (10), if need be, by turning them 90° and pulling them out.

6.1.2 Assembly of the splitting wedge and / or pressure pieces



- | | |
|-------------------|---------------|
| 1 Built-in pot | 6 Plastic cap |
| 2 Pressure piece | 7 Rubber disc |
| 3 Screw | 8 Guide pin |
| 4 Bolt | 9 Guide disc |
| 5 Splitting wedge | |

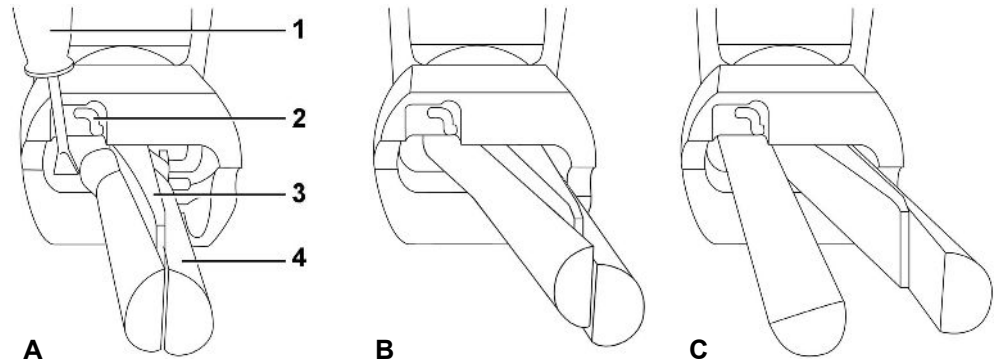
Fig. 6-1-2 - 1 Assembly of the splitting wedge / pressure pieces

- If need be, insert the pressure pieces (2) by guiding them into the built-in pot (1) and turning them 90 ° (fig. A).
- Spread the pressure pieces and insert the splitting wedge (5) into the built-in pot.
- Stick the bolt (4) through the screw opening into the hole of the splitting wedge and bang it carefully through the wedge head with a mandrel and hammer.



Using the splitting wedge with a not completely inserted bolt leads to damage or destruction of the splitting cylinder!

- **Before start-up**, close the screw opening by **completely** tightening the screw (3)!
- Insert the plastic cap (6) into the hole on the opposite side (fig. B).
- Activate the hydraulic aggregate and retract the splitting wedge completely (**operating lever in position R**).
- Press the rubber disc (7) into the recess of the built-in pot.
- Insert the guide disc (9) with its guide pins (8) in the recess of the built-in pot so that their surface is flush with the front of the built-in pot (fig. C)
- Screw the grommet nut (fig. 6-1 - 1, pos. 3) onto the built-in pot with the sickle spanner.
- Push the rubber disc (fig. 6-1 - 1, pos. 2) over the splitting head to the front surface of the grommet nut.

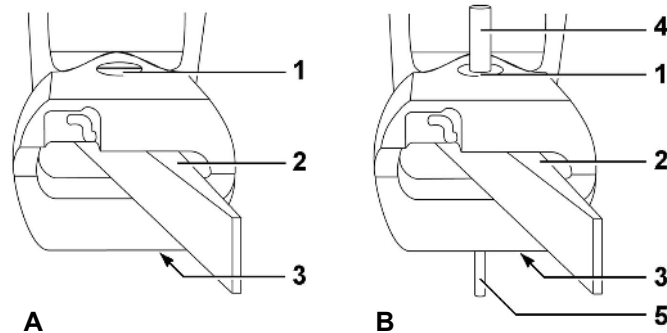
6.2 Splitter Type C9, C10S, C12**6.2.1 Exchanging the pressure pieces**

- 1 Screwdriver
- 2 Hooks (2 x, right and left)
- 3 Splitting wedge
- 4 Pressure piece

Fig. 6-2-1 - 1 Exchanging the pressure pieces

- Retract the splitting wedge (3) completely (**operating lever in position R**).
- Press both hooks (2), e.g. with a screwdriver, down or up (fig. A).
- Slide both pressure pieces together with the splitting wedge to the right (fig. B).
- Turn the left pressure piece 90° and pull it out (fig. C).
- Insert another pressure piece on the left side or slide the right pressure piece together with the splitting wedge to the left.
- Turn the right pressure piece 90° and pull it out.
- Now change the splitting wedge as described on the next page or assemble other pressure pieces in the reverse order.

6.2.2 Replacing the splitting wedge



- 1 Screw
- 2 Splitting wedge
- 3 Plastic cap (not visible)
- 4 Bolt
- 5 Mandrel for pounding out the bolt

Fig. 6-2-2 - 1 Replacing the splitting wedge

- Remove both pressure pieces as described on the previous page.
- Extend the splitting wedge (2) completely (**operating lever in position F**).
- **Switch off the hydraulic aggregate and protect it against accidental start-up!**
- Remove the screw (1) and the plastic cap (3) on the opposite side (fig. A).
- Bang the bolt (4) with a mandrel (5) and a hammer out of the wedge head (fig. B).
- Pull the splitting wedge out of the splitting cylinder.
- Assemble another splitting wedge in the reverse order.



Using the splitting wedge with a not completely inserted bolt leads to damage or destruction of the splitting cylinder!



- **Before start-up**, close the screw opening by **completely** tightening the screw (1).
- Assemble the pressure pieces as described in the previous chapter.

6.3 Maintenance Every 6 Years

- Regardless of the number of operating hours, have the hydraulic connections replaced by the manufacturer or a person authorised by the manufacturer every 6 years.

6.4 Cleaning

Only clean the device after shutting it down beforehand!

Before starting to clean, read the chapter about the shut-down procedure.

⇒ 5.5 Shut-down Procedure

- Remove
 - coarse splitting material which has settled on the device during work manually at regular intervals.
Wear personal protective gear for this work (such as respiratory equipment, face mask)!
 - To remove moisture from the bearings, the device must be lubricated after cleaning.

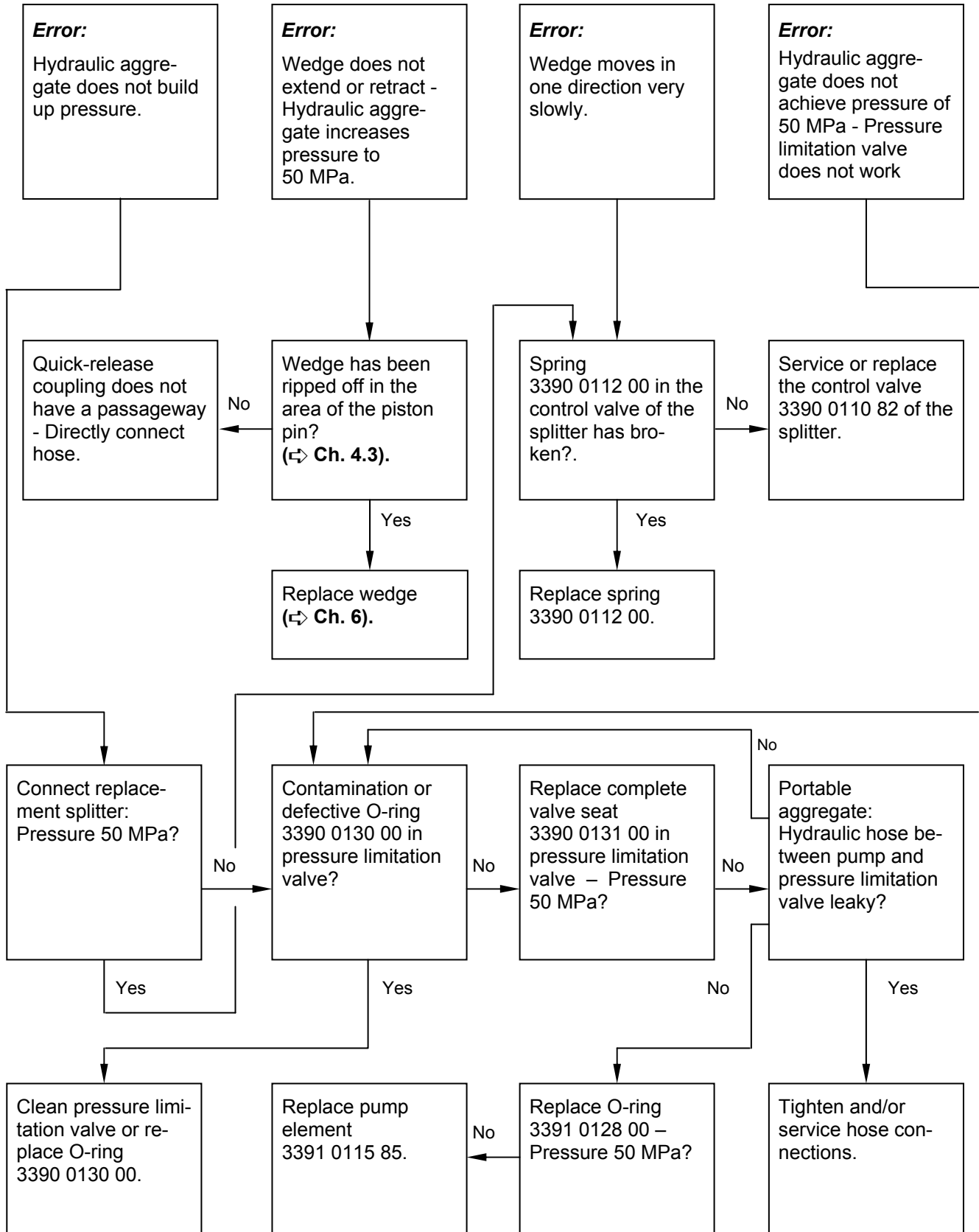
6.5 Repair

We call your attention expressly to the fact that repair work on the devices that are not described in the documentation is principally not allowed for reasons of safety!



Guarantee claims will not be honoured if the security lacquer or the lead seal is damaged!

7 Troubleshooting



8 Technical Data
8.1 Splitters

Type	Splitting head	Required borehole diameter mm	Minimum borehole depth mm	Splitting distance mm	Theoretic splitting force kN/tonne
C2S	N	32-33	270	9	3490/355
C4S	N	35-36	430	10-40	4524/461
C4S	WL	35-38	540	14	3267/333
C4S	WLL	35-38	700	14	3267/333
C9	N	45-48	410	18-44	2995/305
C9	L	45-48	580	18-40	2995/305
C9	LL	48-50	1080	18-40	2995/305
C10S	N	41-43	630	18-45	4948/504
C12	W	45-48	550	24-56	4849/494
C12	N	45-48	610	20-50	6061/618
C12	L	45-48	680	15-35	8082/824

Type	Splitting head	Effective splitting force kN/tonne	Weight kg	Length of splitting cylinder mm	Length of splitting head mm
C2S	N	1913/195	18	745	140
C4S	N	2256/230	22	995	250
C4S	WL	1864/190	23	1145	400
C4S	WLL	1864/190	24	1255	510
C9	N	1962/200	22	1020	230
C9	L	1962/200	23	1190	400
C9	LL	1962/200	28	1690	900
C10S	N	2551/260	32	1400	380
C12	W	3150/321	31	1250	340
C12	N	3507/358	31	1290	380
C12	L	4048/413	32	1380	450

8.2 Hydraulic oil

Normal conditions	Cold regions
ISO VG 22	ISO VG 10

9 Disposal

After shutting down the devices correctly (⇒ **5.5 Shut-down Procedure**) , removing the hydraulic oil and removing possible lubricating grease residues, the devices can be disassembled and recycled according to materials.



If contaminated with radioactive, poisonous or other substances hazardous to persons or the environment, the devices must be disposed of in accordance with the regulations applicable!

9.1 Disposal of Old Oil

Old oil is to be disposed in an environmentally friendly way and under consideration of the regional and national requirements.

- Make sure that the old oil does not pollute the environment.
- Dispose of old oil in suitable containers that meet the requirements.