



HE-VA

*Operating Instructions
Declaration of Conformity
Spare Parts List*

*Front-Roller
1.5m / 2.6m / 3.0m / 4.0m (rigid)
4.0m / 5.0m / 6.0m (hydraulic)*



Important: Before using the machine, please study the Operating Instructions thoroughly to ensure that you are familiar with the safety instructions.

Manual 8000451-03

050922



HE-VA

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EC DECLARATION OF CONFORMITY

in accordance with the EU Machinery Directive 2006/42/EC
applicable as from December 29th 2009:

HE-VA ApS
N. A. Christensensvej 34,
DK-7900 Nykøbing Mors

hereby confirms that the following machine has been manufactured in accordance with the Council
Directive 2006/42/EC.

The declaration comprises the following machine:

HE-VA Front-Roller 1.5 / 2.6 / 3.0 / 4.0 m (rigid)
and
4.0 / 5.0 / 6.0 m (hydr.)

Nykøbing the 29th December 2009


Villy Christiansen

The undersigned is furthermore authorised to compile technical documentation for the above
machine.

Delivery Check

Upon delivery to the dealer/supplier as well as to the customer, check the Front-Roller for possible damages.

Machine Description

Range of Application

The Front-Roller is a front-mounted roller for land packing in connection with preparation of the seedbed and seeding with combi-harrow, rotor-harrow, tine rotary cultivator etc. The Front-Roller may be applied on all types of soil, however, is suitable for light and medium-heavy soil types.

The Front-Roller is mounted in the front-lift of the tractor. If the Front-Lift is equipped with double-acting hydraulics, it is possible to transfer weight from the tractor onto the Front-Roller. In order to achieve optimum control in connection with the transfer of the weight from the tractor to the roller, the Front-Lift should be equipped with spring suspension in order to achieve a flexible connection between the tractor and the roller. Furthermore, the tractor should be with four-wheel drive.

As extra equipment, the Front-Roller may be equipped with Front-Harrow and/or Spring-Board as well as carriers for additional weights.

	1,5 m	2,6 m	3,0 m	4,0 m	4,0 m Hydr.	5,0 m Hydr.	6,0 m Hydr.
<u>Technical specifications</u>							
Working width	1,50m	2,60m	3,00m	4,00m	4,00m	5,00m	6,00m
Total width	1,73m	2,66m	3,08m	4,17m	4,3 m	5,21m	6,22m
Transport width	1,73m	2,66m	3,08m	4,17m	2,70m	2,80m	2,97m
Length	1,29m	1,29m	1,29m	1,61m	1,61m	2,00m	2,00m
Height folded					2,00m		2,83m
Weight without extra equipment:							
Cambridge rings, Ø45cm/18"	485kg	790kg	900kg	1280kg	1430kg	1675kg	2010kg
Cambridge rings, Ø51cm/21"	615kg	930kg	1060kg	1505kg	1655kg	1955kg	2348kg
Cambridge rings, Ø62cm/24"	760kg	1160kg	1330kg	1875kg	2025kg	2345kg	2820kg
Cross-kill rings, Ø48/53cm	550kg	730kg	830kg	1210kg	1360kg	1590kg	1905kg
V-profile ring 600mm	570kg	850kg	970kg	1385kg	1535kg	1805kg	2170kg
Additional weight – double frame	42kg	42kg	42kg	78kg			
Oil outlet	1 double-acting outlet on 4.0m – 5.0m - 6.0m hydr.						
Maximum weight transfer from the tractor	800kg						
Noise level	under 70 dB (A)						

Extra equipment	2,6 m	3,0 m	4,0 m	4,0 m Hydr.	5,0 m Hydr.	6,0 m Hydr.
Additional weight – Front-Harrow	158kg	177kg	254kg	275kg	330 kg	397kg
Additional weight – Spring-Board	185kg	205kg	260kg	460kg	515 kg	570kg
Oil outlet - Spring-Board	1 double-acting outlet at the front of the tractor					

The Front-Roller complies with DS/ISO 8759/2, Front – Three-Point suspension (cat. II).

Distance between the lift arms (balls) is 870 mm

Operating Instructions

Start-up

Front-Roller

During transport the Front-Roller frame is locked in relation to the top frame. Before starting the work, the locking bar must be moved from transport position to working position.



- When the locking bar is in working position, the roller will be self-steered and thus following the tractor.
- In working position, the roller must be horizontal in the direction of driving.
- In sharp turns, e.g. in connection with turning at the ends and reversing, the Front-Roller must be lifted.
- When the roller is mounted in a HE-VA Front-Lift with spring suspension, the following applies:

When transferring weight from the tractor onto the roller, you will get the best combination of packing and control when the Front-Lift manometer shows 35 – 60 bar (depending on the weight of the tractor).

Front-Harrow

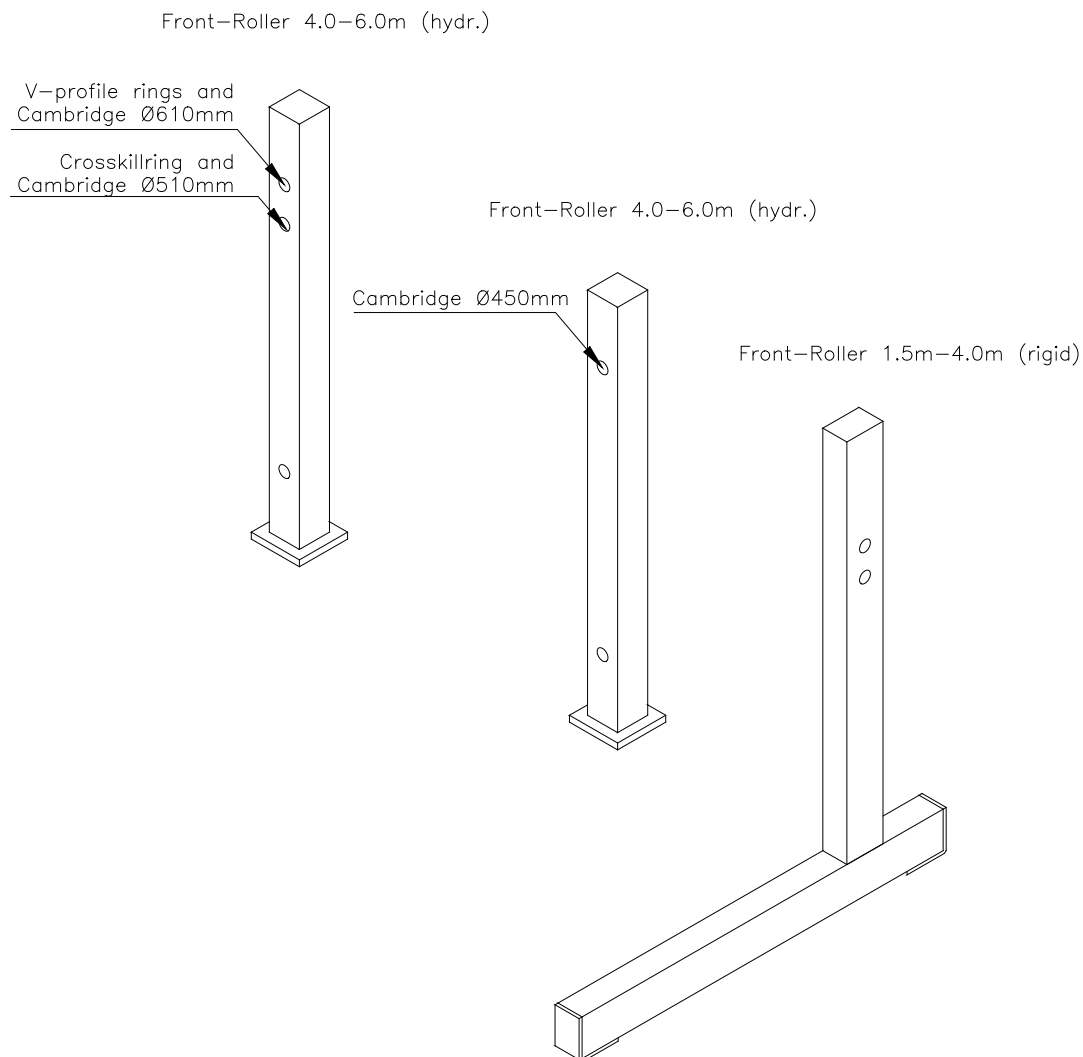
Before adjusting the working depth, make sure that the roller runs horizontally. The two spindles must be synchronised, i.e. one spindle may as a maximum be turned 5 turns before the other spindle is turned the corresponding number of turns in the same direction. For each turn of the handle, the front-harrow is lifted/lowered 5 mm.

Spring-Board:

The Spring-board requires a double-acting oil outlet at the tractor. The tine angle is hydraulically controlled from the driver's cab, and the depth control is made manually. The tines work independent of each other, however, they may be connected by means of a transverse locking system (extra equipment), if a greater levelling effect is required. The change-over is made easily and quickly without any tools.

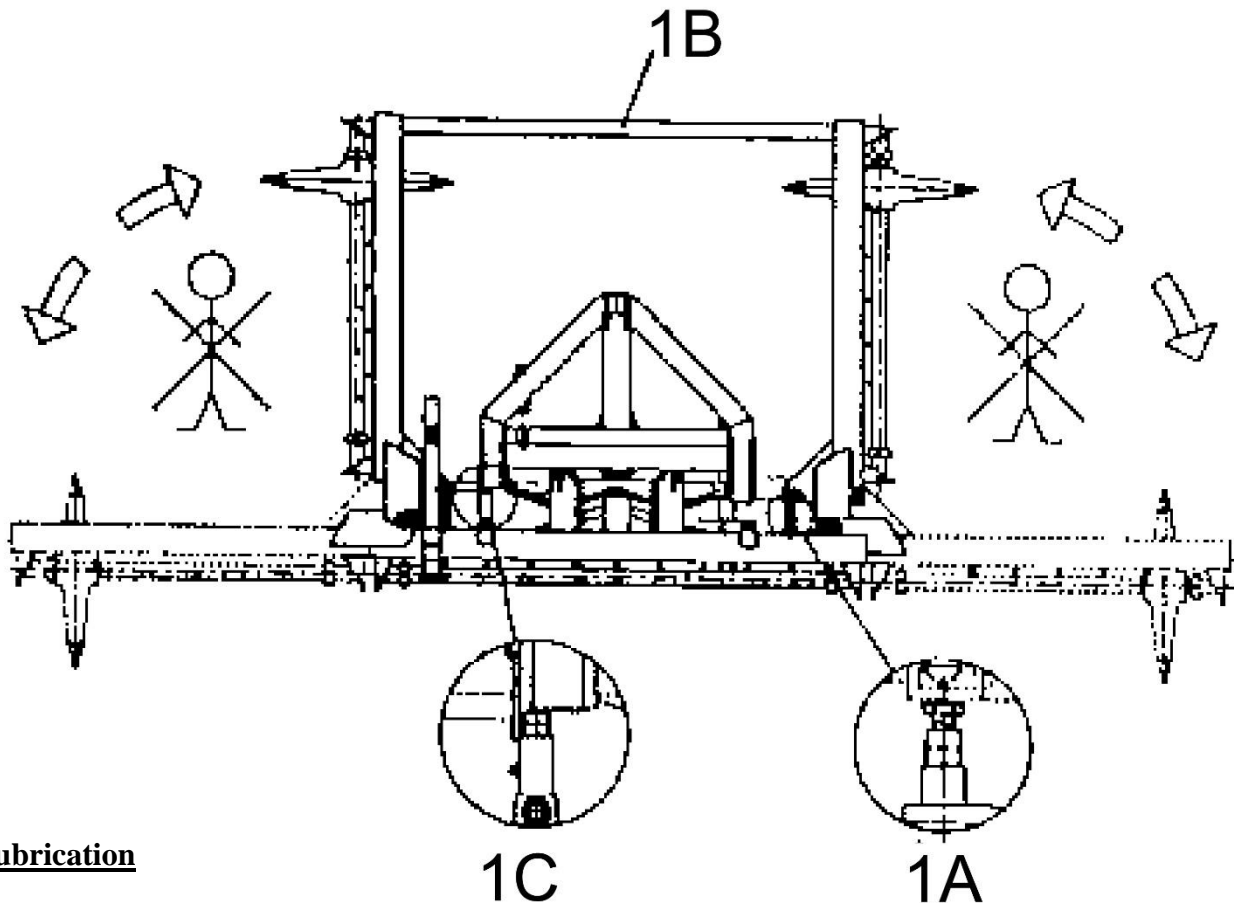
Uncoupling and coupling

The Front-Roller is equipped with supporting legs which must be lowered when the machine is uncoupled. Before uncoupling, a possible mounted Spring-Board must be lifted, and the hydraulic system is to be de-pressurized. Furthermore, the Front-Harrow must be lifted so that the weight of the Front-Roller does not rest on the tine of the harrow but on the supporting legs.



Transport (hydraulic machines)

For transport, the wing sections are to be lifted. The bolts at the cylinders are to be adjusted so that the wing sections are vertical (fig. 1A). Hereafter, the mechanical locking bar (fig. 1B) is to be mounted for reasons of failure in the hydraulic system. Moreover, the built-in transport lock must be locked, to prevent the roller from swaying around during transport (fig 1C).



Lubrication

Front-Roller

For lubrication, maintenance and repair, the tractor must be braked and the motor stopped. The Front-Roller is to be lowered or supported properly so that it cannot fall in event of failure in the front-lift's or the tractor's hydraulic system. For lubrication of the hydraulic Front-Rollers, the wing sections have to be lowered or the mechanical locking bar has to be mounted in lifted state (see fig. 1B).

The 1.5 – 3.0 m Front-Rollers (rigid) have 4 lubrication points, the 4.0 m rigid Front-Rollers have 6 lubrication points, the 4.0 m hydraulic Front-Rollers have 14 lubrication points and the 6.0 m hydraulic Front-Rollers have 16 lubrication points. All Front-Rollers must be lubricated after every 10 working hours as well as after the cleaning in order to press out any water and dirt. The lubrication points are located at ball bearings, supporting rollers and cylinders.

Note!

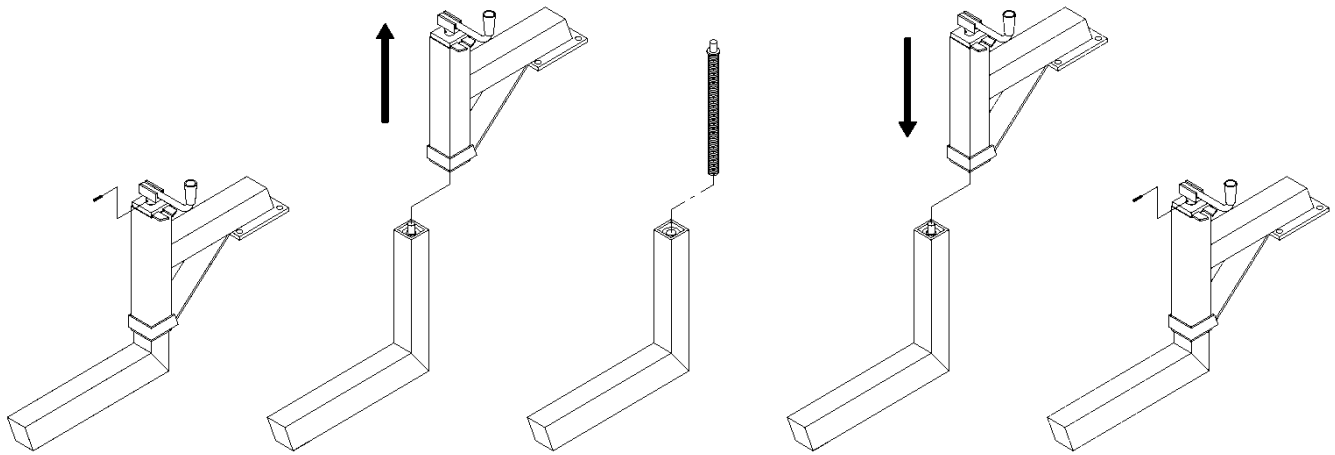
However, the double-sealed ball bearings should only be lubricated every 20 working hours and by 1-2 strokes so that the sealing rings are not pressed out.

Front-Harrow

The Front-Harrow's spindles are not equipped with lubricating nipples. Once a year, e.g. when the season is over and the machine is stored for the winter, the spindles should be dismantled and lubricated with ball bearing grease.

Note!

Before dismantling the Front-Harrow, the harrow points should rest on the support, otherwise the harrow will fall down when the roll pins are knocked out.



Roll pins are knocked out.

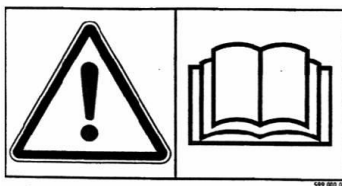
Consoles are lifted.

Spindles are screwed off, lubricated and screwed in again.

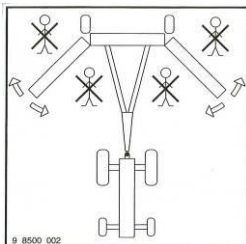
Consoles are lowered over inside part.

Roll pins are knocked down again.

Safety – and other markings on the machine



Study the Operating Instructions thoroughly before any operation of the machine and observe all safety instructions.



Take care that no persons are within the machine's hazardous area during the unfolding and folding procedure..



Plate with number and year of manufacture

**HUSK - PLEASE NOTE -
ACHTUNG - ATTENTION**
EFTERSPÆND BOLTE
TIGHTEN UP THE BOLTS
BOLZEN NACHZIEHEN
RESSERRER LES BOULONS

Tighten up the bolts regularly. If this is not performed, our warranty obligations will no longer apply.

Maximum torque according to ISO 898-1 in Nm. With lubricated thread			
Metric thread	Quality 8.8	Quality 10.9	Quality 12.9
M10x1,5	38	54	63
M12x1,75	66	95	110
M14x2,0	105	150	176
M16x2,0	164	235	274
M18x2,5	233	323	377
M20x2,5	331	458	535
M22x2,5	450	622	727
M24x3,0	572	791	925

Maintenance

The entire machine

- After the first 10 hours of operation, tighten up all bolts.
- Further check on a regular basis that all bolts are tightened.
- Before the winter storage, wash and lubricate the machine. If you use high-pressure cleaner, do not spray directly on the ball bearings. After the washing, you may spray the machine with oil.
- Check regularly that all rings are whole and that there are no stones jammed in the rings.

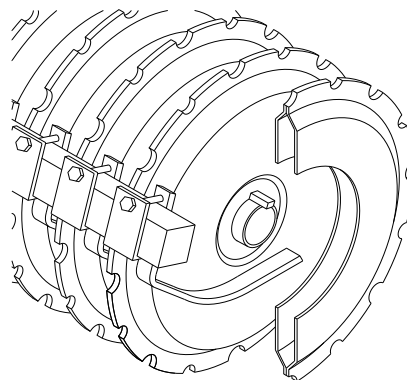
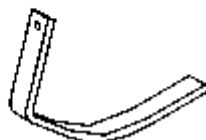
Front-Harrow/Spring-Board

Turn/replace the points before the harrow tines show signs of wear.

Scrapers

The Front-Roller with V-profile rings has special designed scrapers among the packer rings.

To avoid unnecessary wear and to obtain the best scraper effect it is important to check the centering of the scrapers every day.

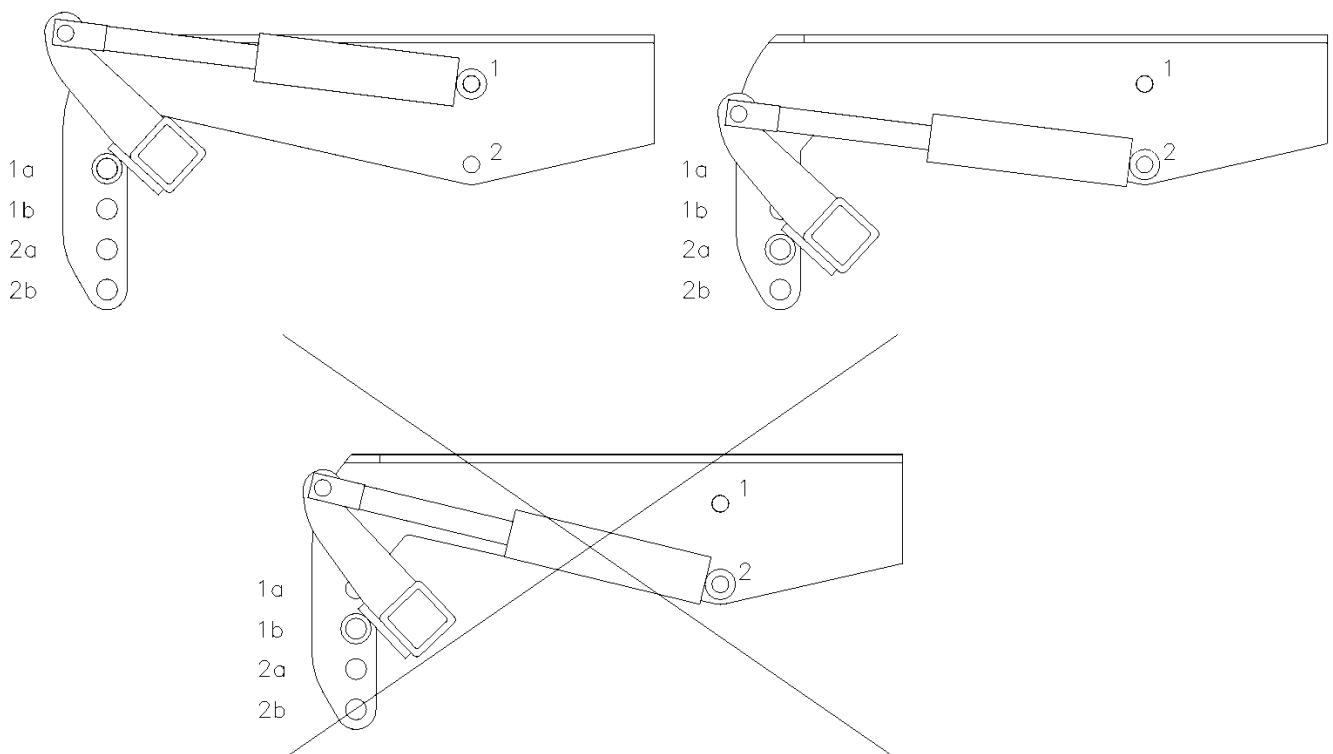


Spring-Board

Mounting of cylinder on Spring-Board

The hydraulic cylinders are mounted as shown in the below figure. It is important to have them correctly mounted in order to get the correct moment on the cylinders.

The ring type determines whether the cylinders must be mounted in hole 1 or hole 2. If the machine is equipped with 450 or 550 mm rings, the cylinders must be fitted in hole 1 and hole 1a or 1b. If the machine is equipped with 620 mm rings, the cylinders must be fitted in hole 2 and hole 2a or 2b.

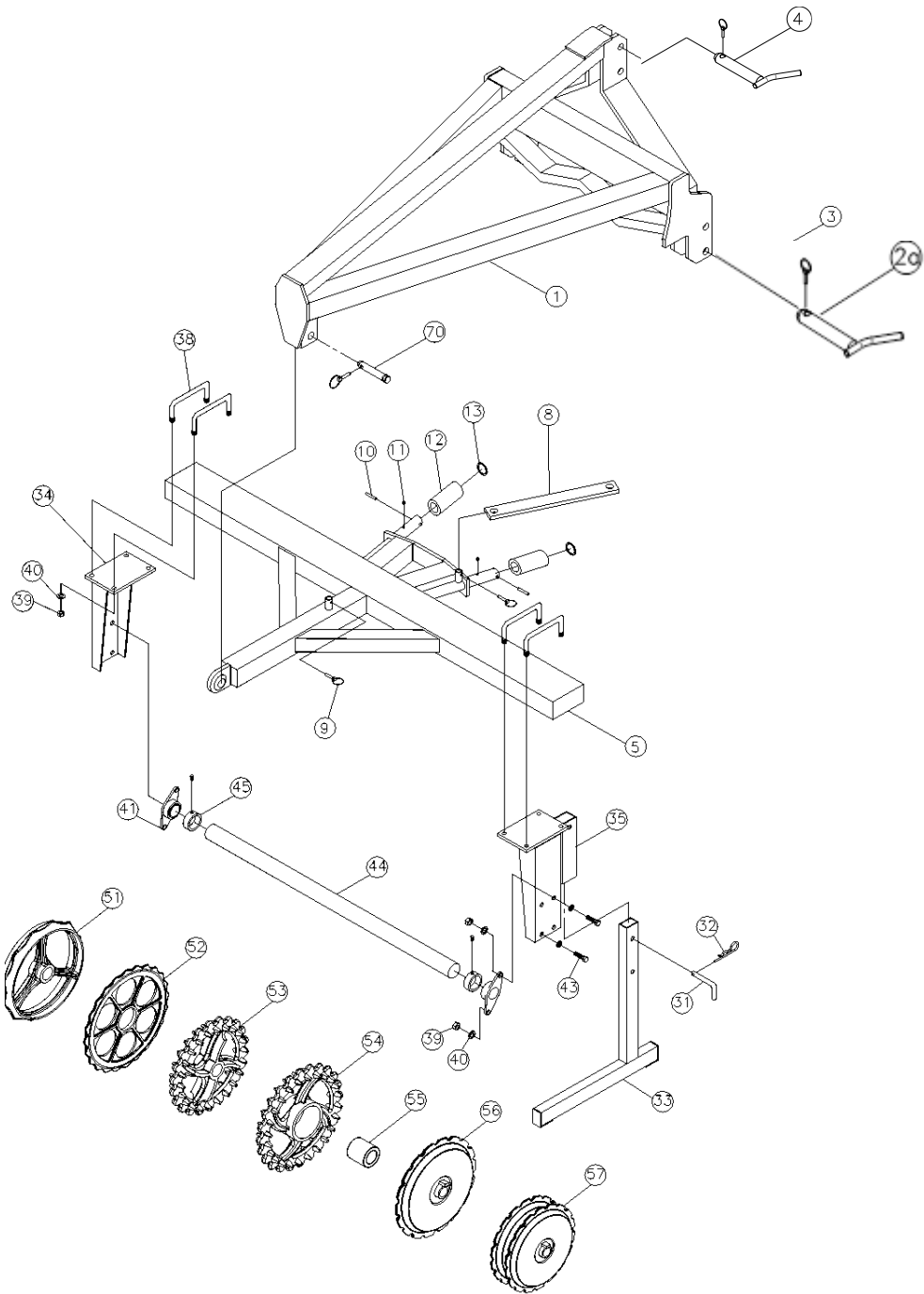


Retromounting of Front-Harrow and Spring-Board

Both the Front-Harrow and the Spring-Board can be mounted directly on the frame. If the Front-Roller is to be mounted with both a Front-Harrow and Spring-Board, a double frame is necessary. Spring-Board is to be mounted on the front bar and the Front-Harrow on the rear bar.

Spare Parts List

Frame 1.5 m (rigid)

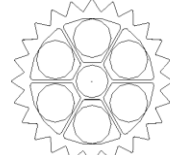
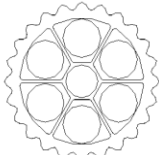


Plain ring
(lenient)

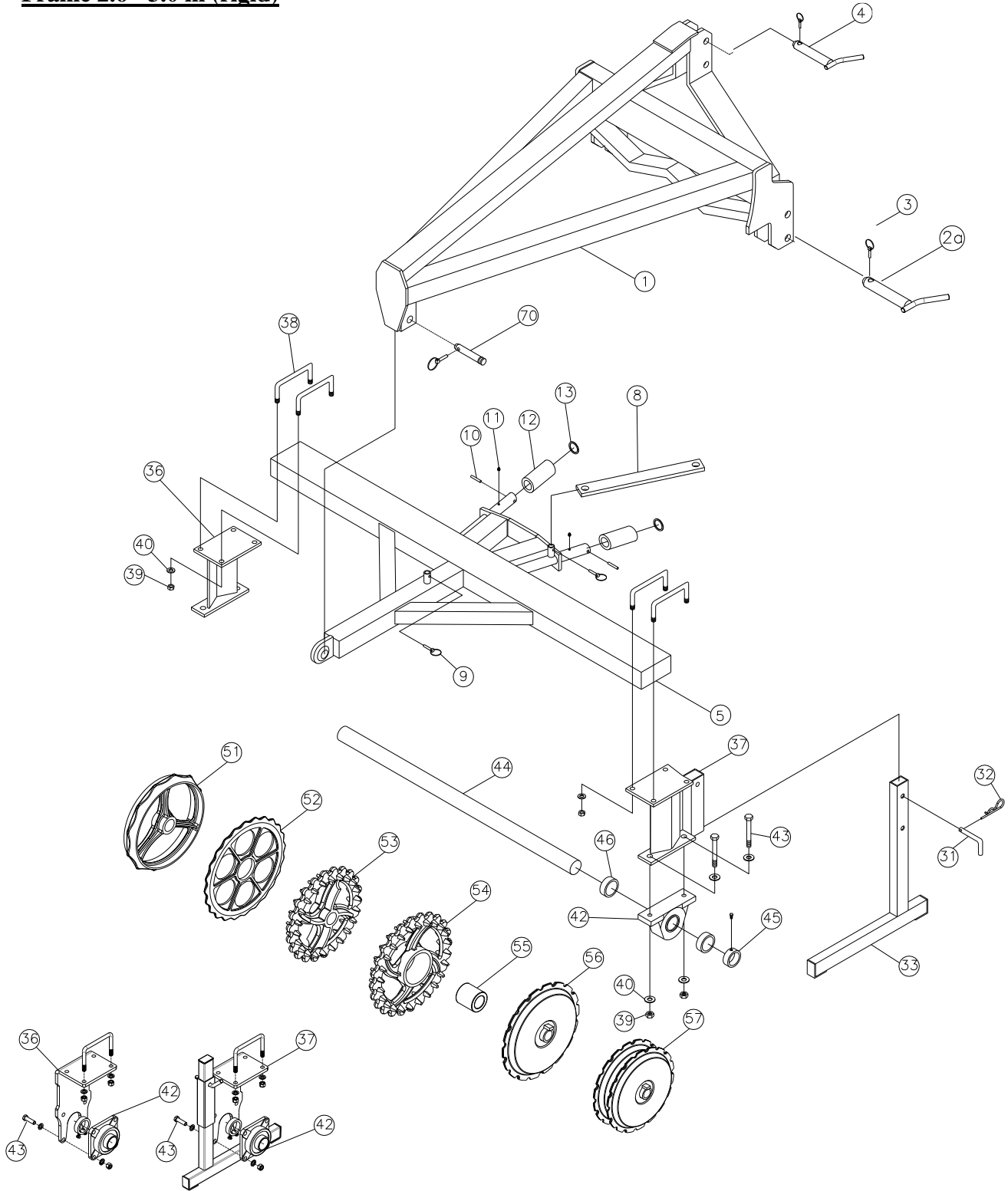
Serrated ring
(lenient)

Serrated ring
(aggressive)

Plain ring
(aggressive)



Frame 2.6 - 3.0 m (rigid)

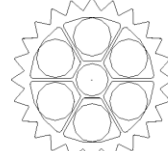
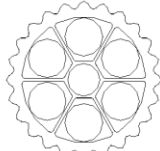


Plain ring
(lenient)

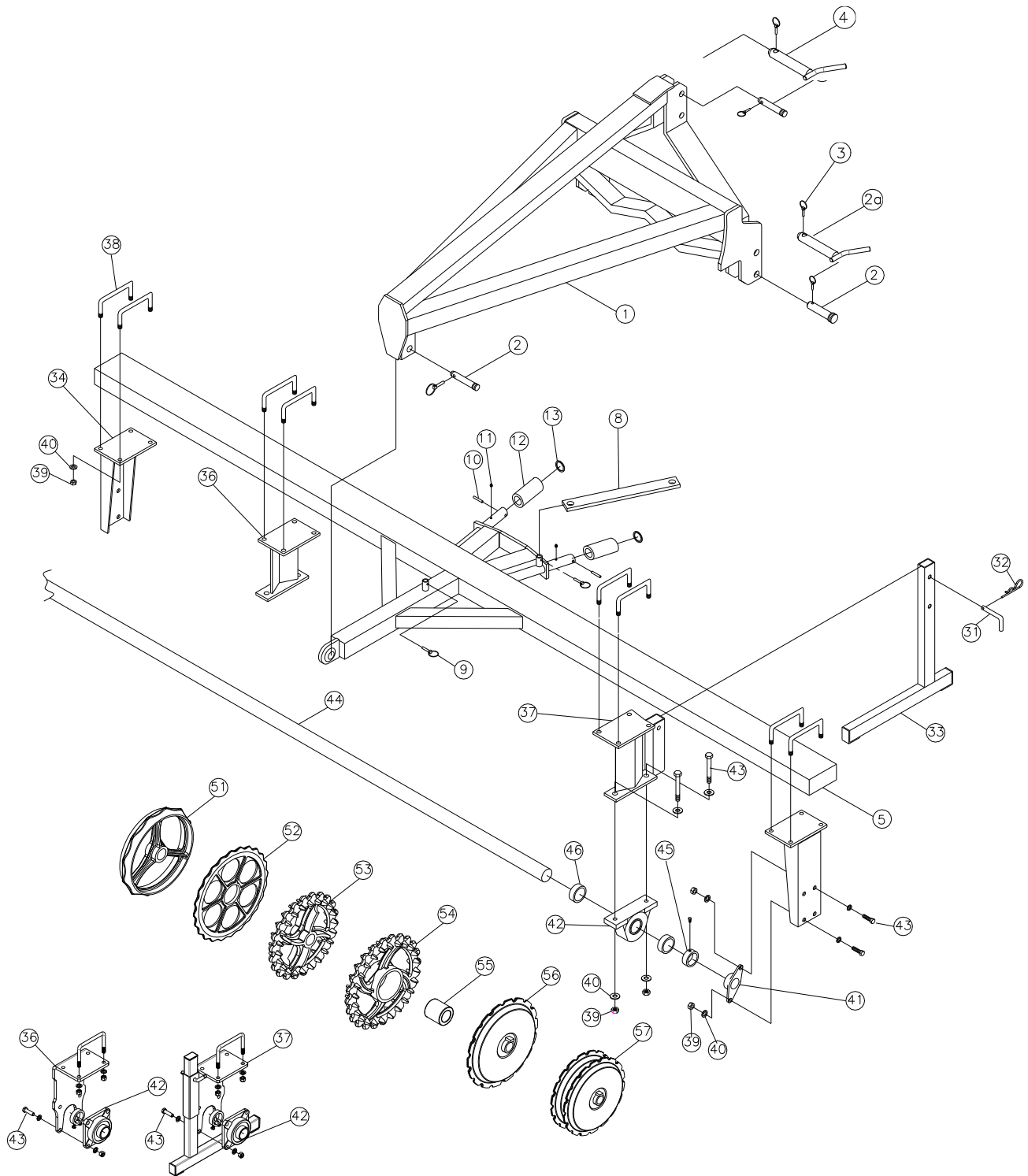
Serrated ring
(lenient)

Serrated ring
(aggressive)

Plain ring
(aggressive)

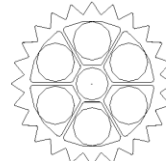
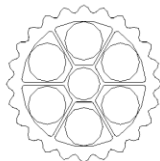


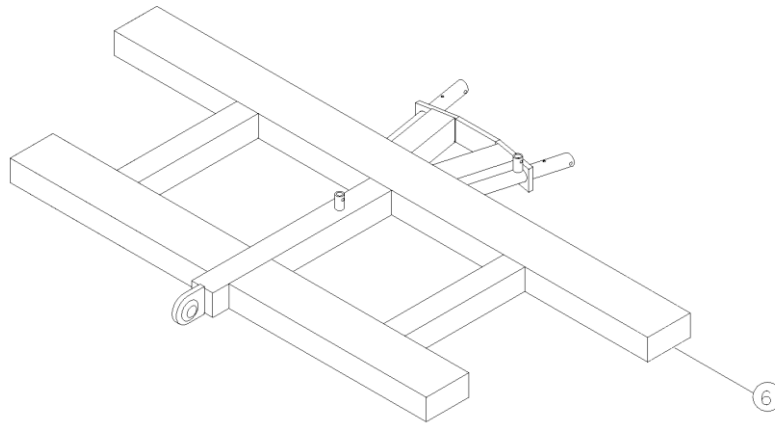
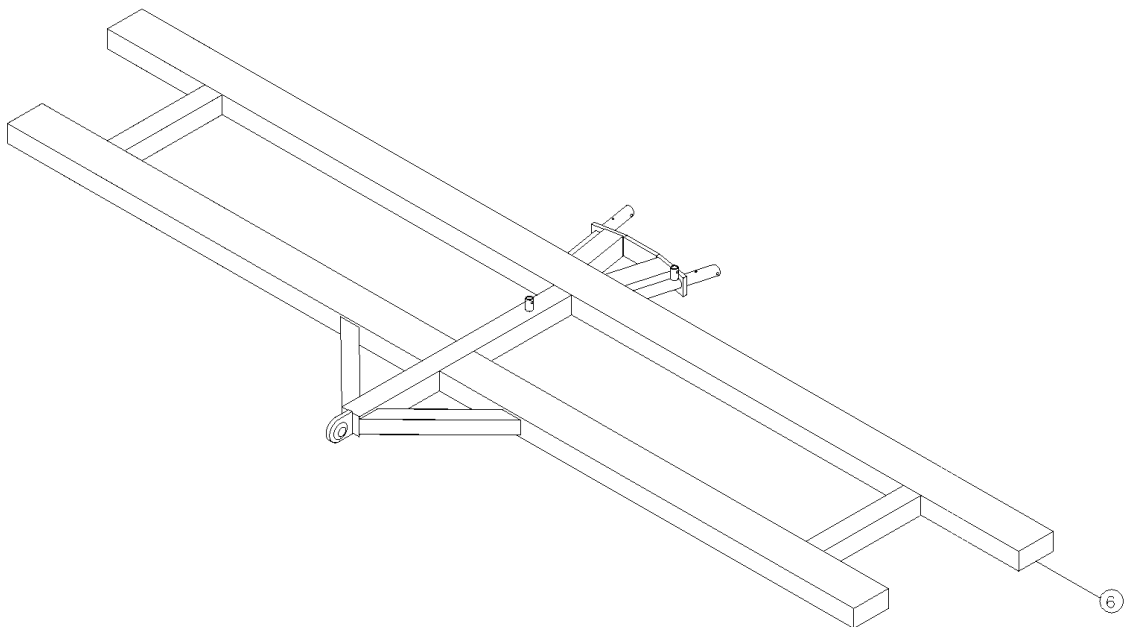
Frame 4.0 m (rigid)



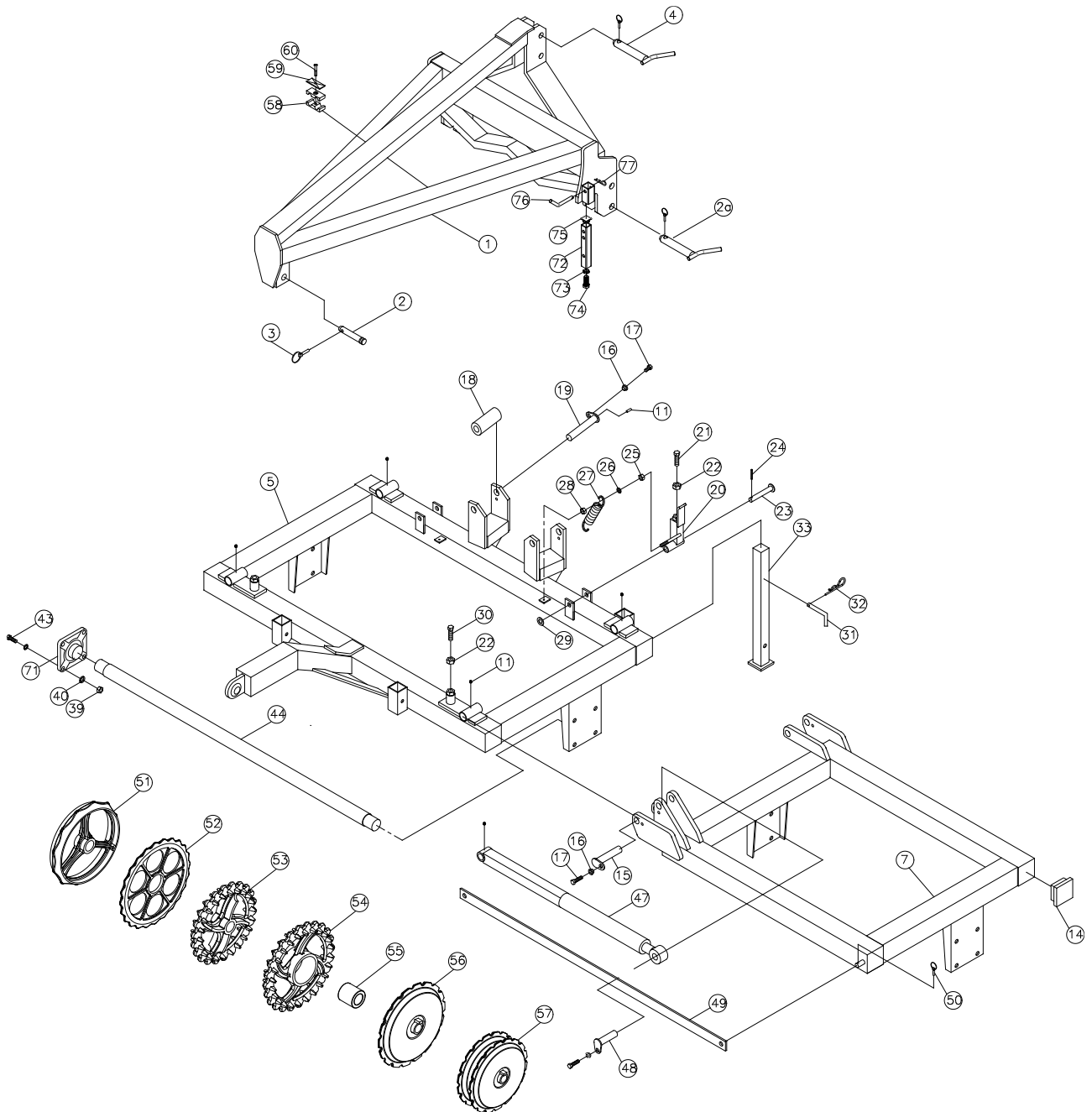
Plain ring (lenient) Serrated ring (lenient)

Serrated ring (aggressive) Plain ring (aggressive)



Double frame**1.5 – 3.0 m (rigid)****4.0 m (rigid)**

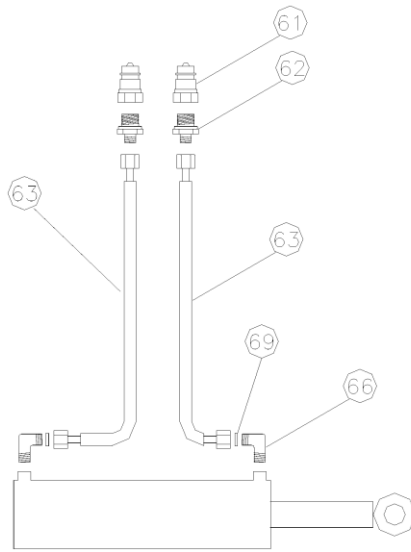
Frame 4.0 –5.0 - 6.0 m (hydr.)



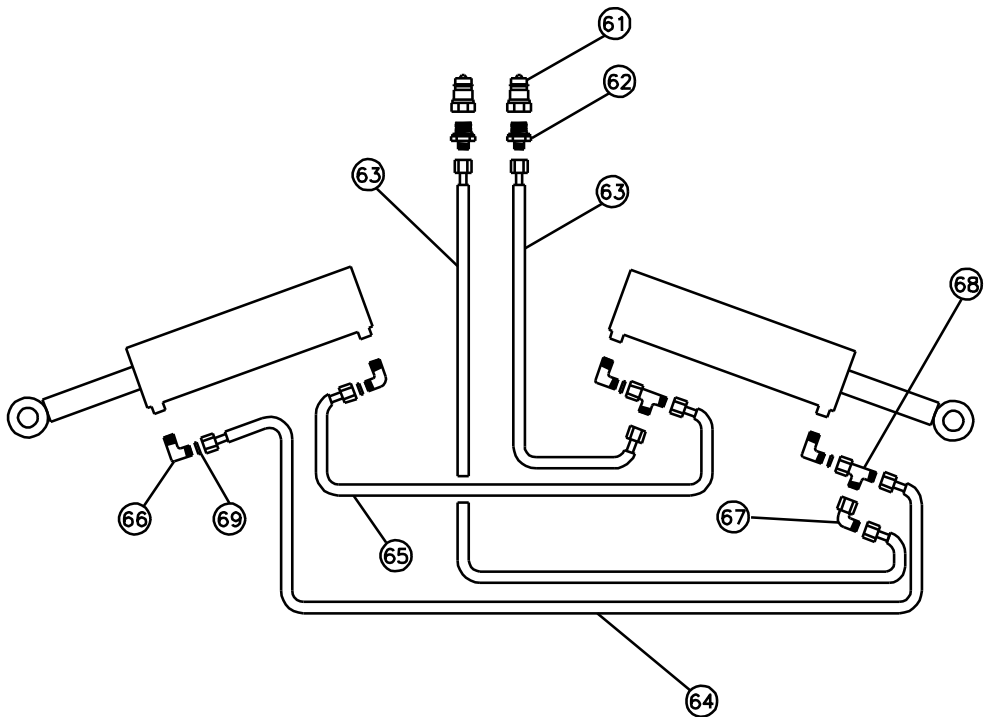
Plain ring (lenient)	Serrated ring (lenient)	Serrated ring (aggressive)	Plain ring (aggressive)

Hydraulics

4.0 m (hydraulic)



5.0/6.0 m (hydraulic)



Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr.	5.0m hydr	6.0m hydr.
1	671100400	Top frame	1	1	1				
1	671100200	Top frame				1			
1	671151410	Top frame					1		
1	670483000	Top frame						1	
1	670473000	Top frame							1
2	69528096J	Pin Ø28 L=96				1	1	1	1
3	690134004	Ring pin Ø10	4	4	4	4	4	4	4
2a	69528105B	Pin Ø28 w/handle	2	2	2	2	2	2	2
4	69525100B	Pin for top link Ø25 w/handle	1	1	1	1	1	1	1
5	630440200	Frame	1	1	1				
5	630460200	Frame				1			
5	630451000	Middle section					1		
5	630481000	Middle section						1	
5	630471000	Middle section							1
6	630580100	Double frame	1	1	1				
6	630590100	Double frame				1			
7	630452000	Wing section (R)					1		
7	630452010	Wing section (L)					1		
7	630482000	Wing section (R)						1	
7	630482010	Wing section (L)						1	
7	630472000	Wing section (R)							1
7	630472010	Wing section (L)							1
8	630440201	Locking bar	1	1	1	1			
9	690134003	Ring pin Ø8	2	2	2	2			
10	690130163	Roll pin Ø8x50	2	2	2	2			
11	690136029	Lubricating nipple M8	2	2	2	2	6	6	6
12	630440300	Supporting roller Ø63/Ø40 L=131 mm	2	2	2	2			
13	690137911	Shim Ø50/Ø40x2,5mm DIN 988	2	2	2	2			
14	690109204	Plastic plug 100x100					4	4	4
15	69530145G	Pin Ø30 L=145					4	4	4
16	630532600	Lock bush f/pin head					8	10	10
17	690101101	Bolt M12x25					8	10	10
18	671000100	Supporting roller					2	2	2

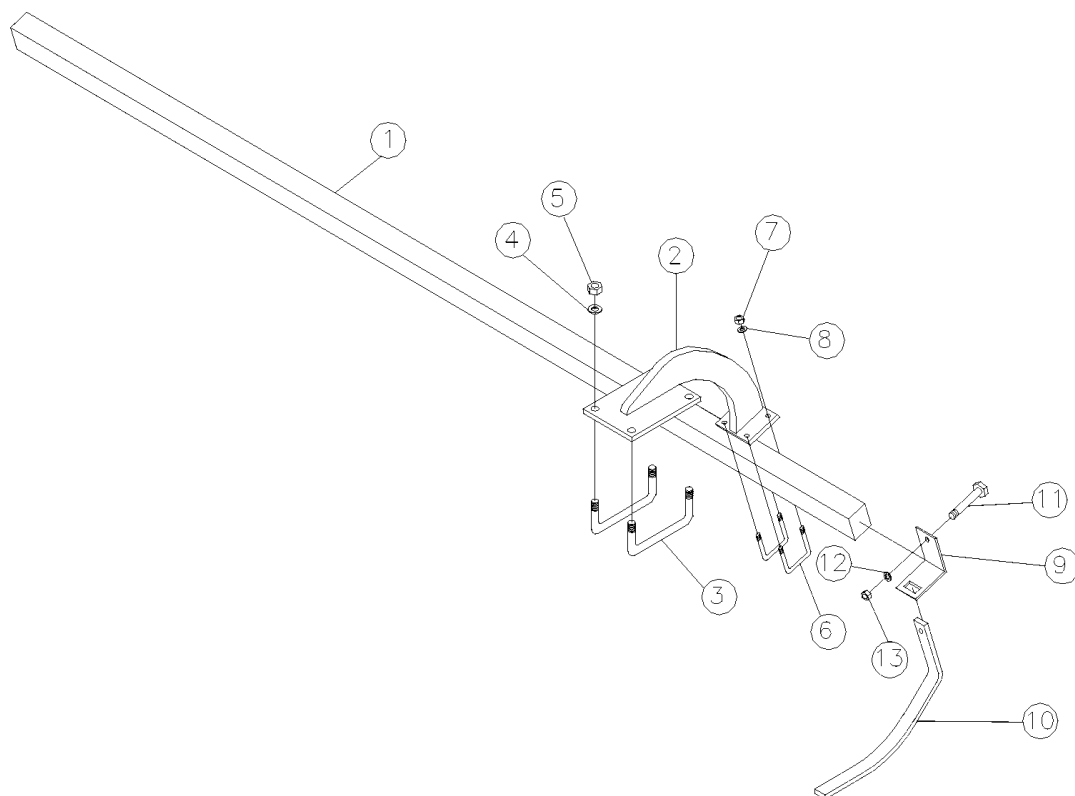
Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr.	5.0m hydr	6.0m hydr.
19	69530175I	Pin Ø30 L=175					2	2	2
20	671151300	Transport lock (R) (END)					1	1	1
20	671151301	Transport lock (L) (END)					1	1	1
21	690101164	Bolt M20x60 (END)					2	2	2
22	690112009	Nut M20 (lock nut)					4	4	4
23	69520118F	Pin Ø20 L=118 (END)					2	2	2
24	690132037	Split-pin Ø5x40 (END)					2	2	2
25	690112006	Nut M12 (END)					2	2	2
26	690117014	Facet plate Ø12 (END)					2	2	2
27	690139002	Tension spring 3.5x30x160 (END)					2	2	2
28	690113006	Self-locking nut M12(END)					2	2	2
29	690117005	Facet plate Ø20 (END)					2	2	2
30	690103146	Bolt M20x55 (set screw)					2	2	2
31	69516094A	Pin Ø16 L=94	1	1	1	1	3	3	3
32	690133005	Hairpin Ø4	1	1	1	1	3	3	3
33	634400610	Supporting leg (18" Cambridge)	1	1	1	1			
33	634400620	Supporting leg (21" Cambridge)	1	1	1	1			
33	634400630	Supporting leg (24" Cambridge & V-profile rings)	1	1	1	1			
33	634400650	Supporting leg (Crosskill ring)	1	1	1	1			
33	630471100	Supporting leg (18" Cambri.)					3	3	3
33	671000300	Supporting leg (Crosskill ring, V-profile ring and 21" and 24" Cambridge)					3	3	3
34	630401000	Endplate (R)	1			2			
35	630401100	Endplate w/supporting bracket (L)	1						
36	630401020	Bearing block (R)		1	1	1			
36	630401201	Bearing block from machine number 706305		1	1	1			
37	630401010	Bearing block w/supporting bracket (L)		1	1	1			
37	630401202	Bearing block w/supporting bracket from machine no 706305		1	1	1			
38	690110102	U-bolt M16x80x160x80	4	4	4	8			
39	690113008	Self-locking nut M16	12	12	12	24	12	12	12
40	690117013	Facet plate Ø16	16	16	16	32	24	24	24

Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr.	5.0m hydr	6.0m hydr.
41	690140080	Bearing UCFL 209 (Ø45)	2			2			
42	690140803	Bearing UCP 212 (Ø60)		2	2	2			
42	690140821	Bearing UCF 212 (Ø60) from machine no 706305		2	2	2			
	690136001	Lubricating nipple M6 (for Pos. 41)	2			2			
	690136029	Lubricating nipple M8 (for Pos. 42)		2	2	2			
43	690103131	Bolt M16x60 8.8	4	4	4	8	12	12	12
44	678621730	Axle 1730mm (Ø60)	1						
44	678612640	Axle 2640mm (Ø60) (Crosskill ring)		1					
44	678612660	Axle 2660mm (Ø60) (Cambridge ring)		1					
44	678613050	Axle 3050mm (Ø60) (Crosskill ring)			1				
44	678613080	Axle 3080mm (Ø60) (Cambridge ring)			1				
44	678624170	Axle 4170mm (Ø60)				1			
44	678631725	Axle 1725mm (Ø60) (middle section)					1		
44	678631200	Axle 1200mm (Ø60) (wing section)					2		
44	678632000	Aksel 2000mm (Ø60) (midterled)						1	
44	678631548	Aksel 1548mm (Ø60) (sideled)						2	
44	678631996	Axle 1996mm (Ø60) (middle section)							1
44	678632037	Axle 2037mm (Ø60) (wing section)							2
45	671040400	Stop ring w/bolt 20 mm	2	2	2	2	2	2	2
46	690600005	Distance bush 5 mm Cambridge ring 18"/21"/24"		4	4	4			
46	690600015	Distance bush 15 mm V-profile ring		4	4	4			
46	690600025	Distance bush 25 mm Crosskill ring		2	2	2			
46	690600035	Distance bush 35 mm Crosskill ring		2		2			
46	690600040	Distance bush 40 mm Crosskill ring			2				
47	630450400	Cylinder 70/40x500 (extended)					1		
47	690200301	Cylinder 80/40x400 (R)						1	1

Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr.	5.0m hydr	6.0m hydr.
47	690200300	Cylinder 80/40x400 (L)						1	1
47a	690136001	Lubricating nipple M6					1	4	4
47a	690136029	Lubricating nipple M8					1		
47b	690200062	Piston rod 70/40x500					1		
47b	690200047	Piston rod 80/40x400						2	2
47c	690200061	Cylinder tube 70/40x500					1		
47c	690200049	Cylinder tube 80/40x400						2	2
47d	690200063	Piston 70/40					1		
47d	690200133	Piston 80/40						2	2
47e	690200067	Guide bush 70/40					1		
47e	690200136	Guide bush 80/40						2	2
47f	690200068	Gasket set 70/40					1		
47f	690200138	Gasket set 80/40						2	2
48	69430107G	Pin Ø30 L=107					2		
48	69430145G	Pin Ø30 L=145						4	4
49	671150002	Locking bar					1		
49	670472001	Locking bar						1	1
50	690134001	Ring pin Ø4.5					2	2	2
51	690150039	Cambridge plain ring 18" (Ø60) (lenient)			29				
52	690150040	Cambridge serrated ring 18" (Ø60) (lenient)			26				
51	690150030	Cambridge plain ring 21" (Ø60) (lenient)	15	25	29	39	38	49	59
52	690150032	Cambridge serrated ring 21" (Ø60) (lenient)	14	22	26	36	35	46	56
51	690150024	Cambridge plain ring 21" (Ø60) (aggressive)	15	25	29	39	38	49	59
52	690150025	Cambridge serrated ring 21" (Ø60) (aggressive)	14	22	26	36	35	46	56
51	690150045	Cambridge plain ring 24" (Ø60) (lenient)	15	25	29	39	38	49	59
52	690150046	Cambridge serrated ring 24" (Ø60) (lenient)	14	22	26	36	35	46	56
51	690150027	Cambridge plain ring 24" (Ø60) (aggressive)	15	25	29	39	38	49	59
52	690150026	Cambridge serrated ring 24" (Ø60) (aggressive)	14	22	26	36	35	46	56
53	690150034	Crosskill ring 485 mm (Ø60)	8	14	15	20	18	23	27
53	690150074	Crosskill ring 550 mm	8	14	15	20	18	23	27

Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr.	5.0m hydr	6.0m hydr.
54	690150011	Crosskill ring (loose) 530 mm (Ø60)	7	11	12	17	17	20	26
54	690150075	Crosskill ring (loose) 600 mm (Ø60)	7	11	12	17	17	20	26
55	690150035	Hub f/loose Crosskill ring (Ø60)	7	11	12	17	17	20	26
55	690150076	Hub f/loose Crosskill ring ø104/ø60	7	11	12	17	17	20	26
56	690150036	V-profile ring, single (Ø60)	9	11	15	21	28	38	45
57	690150044	V-profile ring, twin (Ø60)	2	4	4	4			
58	690210210	Tube-support double Ø14/Ø14					4	4	4
59	690210211	Top plate f/double tupe-support					2	2	2
60	690103054	Bolt M8x40					2	2	2
61	690203001	Quick coupling ½" E402, male					2	2	2
62	690203003	Fitting, straight 10-1/2" BSP					2	2	2
63	690201033	Hydr. hose 2500 mm ¼" st/st					2	2	2
64	690201055	Hydr. hose 1010 mm ¼" st/st						1	1
65	690201051	Hydr. hose 250 mm ¼" st/st						1	1
66	690203006	Fitting, 90angle 10-3/8" BSP					2	4	4
67	690203016	Fitting, 90angle 10mm, premounted w/O-ring						1	1
68	690203120	Fitting T10L, premounted w/O-ring						2	2
69	690207901	Restrictor 1 mm					2	4	4
70	69525077J	Pin Ø25 L=77	1	1	1				
71	690140813	Bearing UCF 211					6	6	6
71a	690136029	Lubricating nipple M8 (for Pos. 71)					6	6	6
72	671100212	Security bracket					2	2	2
73	690112016	Lucknut M20					2	2	2
74	690103160	Bolt M20x60 8.8 sætbolt					2	2	2
75	690109209	Plastic plug 40x40x2, black					2	2	2
76	69516094A	Pin Ø16 L=94					2	2	2
77	690133005	Hairpin Ø4					2	2	2

Scraper (V-profile rings)

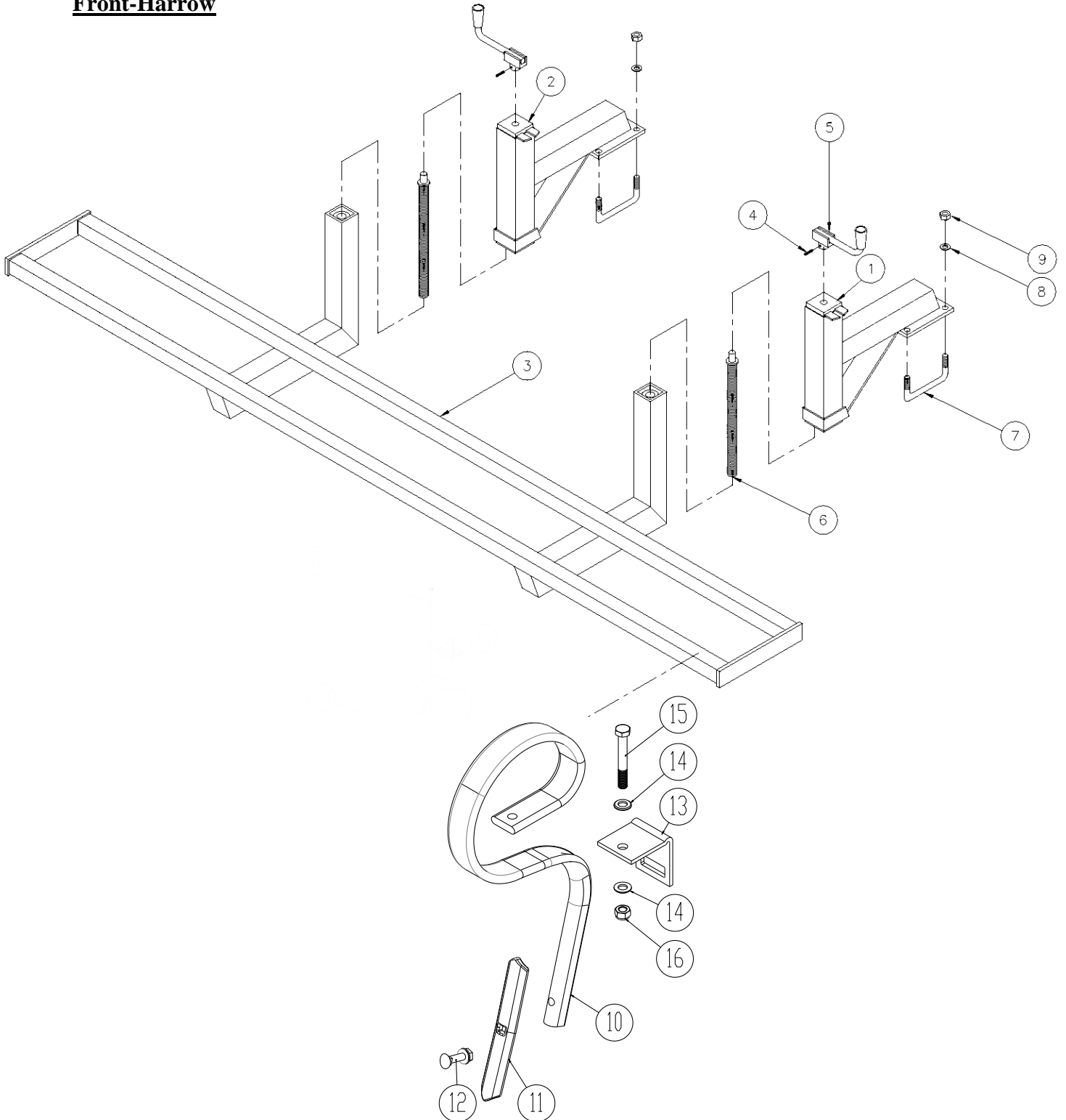


Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr	5.0m hydr	6.0m hydr
1	634400870	Scraper bar 1.5 m	1						
1	634400871	Scraper bar 2.6 m		1					
1	634400872	Scraper bar 3.0 m			1				
1	634400873	Scraper bar 4.0 m				1			
1	630458040	Scraper bar 4.0 m (middle section)					1		
1	630458030	Scraper bar 4.0 m (wing section)					2		
1	630478040	Scraper bar 5.0 m (middle section)						1	
1	630488040	Scraper bar 5.0 m (wing section)						2	
1	630478040	Scraper bar 6.0 m (middle section)							1
1	630478030	Scraper bar 6.0 m (wing section)							2
2	634400865	Bracket f/scraper bar Until machin no. 706737	2	2	2	2			
2	634400866	Bracket f/scraper bar After machin no. 706744	2	2	2	2			

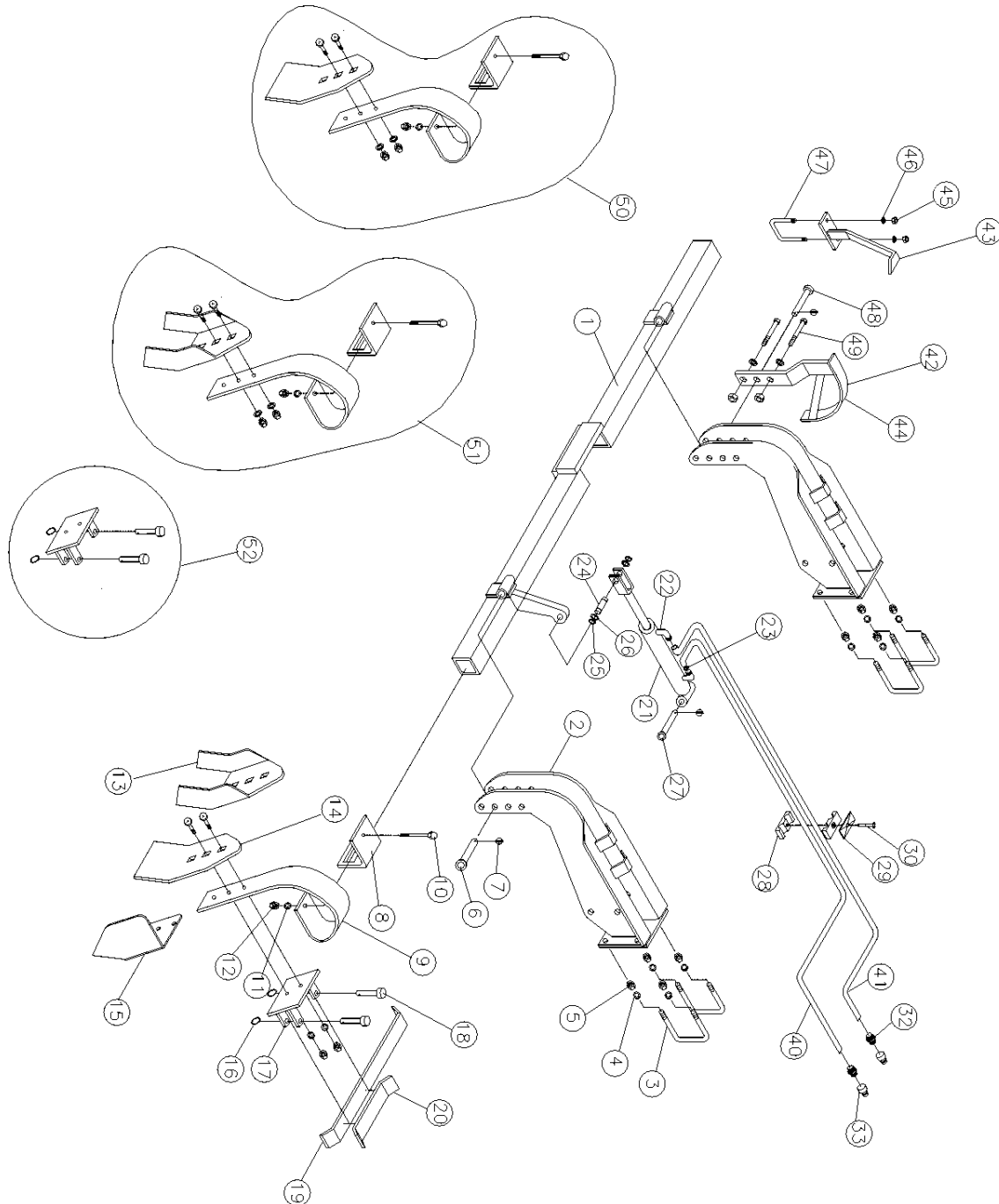
Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr	5.0m hydr	6.0m hydr
Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0m hydr	5.0m hydr	6.0m hydr
2	630458070	Bracket f/scraper bar					6	6	6
3	690110102	U-bolt M16x80x160x80	4	4	4	4			
3	690110101	U-bolt M16x100x100x100					12	12	12
4	690117013	Facet plate Ø16	8	8	8	8	24	24	24
5	690113008	Self-locking nut M16	8	8	8	8	24	24	24
6	690110020	U-bolt M10x70x70x70	4	4	4	4	12	12	12
7	690113005	Self-locking nut M10	8	8	8	8	24	24	24
8	690117012	Facet plate Ø10	8	8	8	8	24	24	24
9	690152030	Clamp	12	16	20	26	27	36	44
10	630938525	Scraper f/V-profile ring (long)	12	16	20	26	27	36	44
11	690103098	Bolt M12x110	12	16	20	26	27	36	44
12	690117014	Facet plate Ø12	12	16	20	26	27	36	44
13	690113006	Self-locking nut M12	12	16	20	26	27	36	44

Spare Parts List – Extra equipment

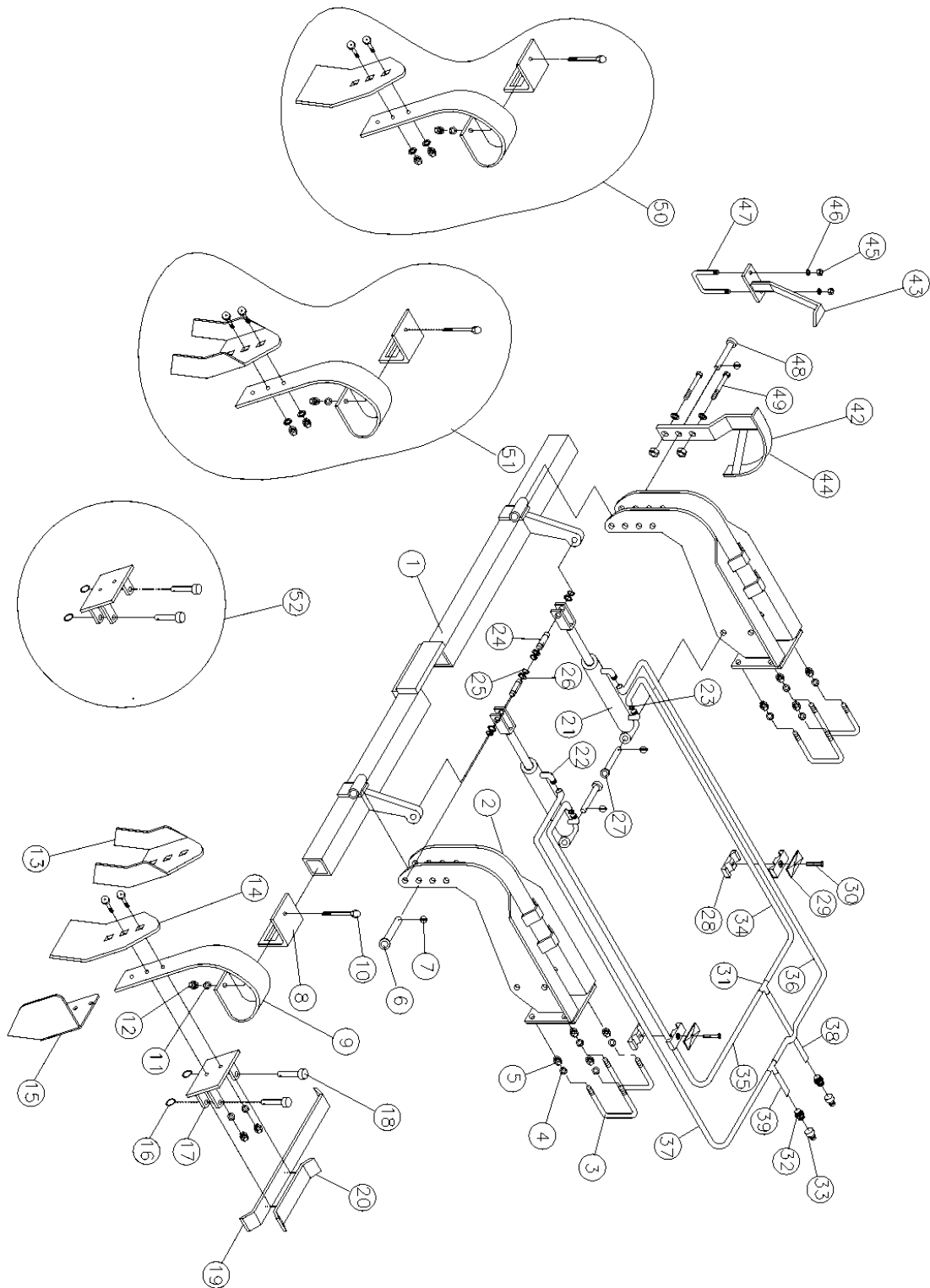
Front-Harrow



Pos.	Item no.	Designation	2.6 m	3.0 m	4.0 m	4.0m hydr.	5.0m hydr.	6.0m hydr.
1	631300100	Spindle console, left	1	1	1	3	3	3
2	631300200	Spindle console, right	1	1	1	3	3	3
3	631305100	Frame 2.6 m	1					
3	631315100	Frame 3.0 m		1				
3	631325100	Frame 4.0 m			1			
3	631345100	Middle section 4.0 m hydr.				1		
3	631355100	Middle section 5.0 m hydr.					1	
3	631335100	Middle section 6.0 m hydr.						1
3	631345101	Wing section 4.0 m hydr. (right)				1		
3	631345102	Wing section 4.0 m hydr. (left)				1		
3	631355101	Wing section 5.0 m hydr. (right)					1	
3	631355102	Wing section 5.0 m hydr. (left)					1	
3	631335101	Wing section 6.0 m hydr. (right)						1
3	631335102	Wing section 6.0 m hydr. (left)						1
4	690130158	Roll pin Ø8x30	2	2	2	6	6	6
5	690304102	Crank	2	2	2	6	6	6
6	690304101	Spindle, TR28x5 L = 410 mm	2	2	2	6	6	6
7	690110102	U-bolt M16x80x160x80	4	4	4	12	12	12
8	690117013	Facet plate Ø16	23	25	31	47	53	59
9	690113008	Self-locking nut M16	8	8	8	24	24	24
10	0422170	Tine w/point 45x12 mm Jack Pot	15	17	23	23	29	35
11	0422050	Point f/tine 45x12 mm	15	17	23	23	29	35
12	0386220	Hoe bolt M10x45 With nut and washer	15	17	23	23	29	35
13	0422371	Clamp f/tine 45x12 mm	15	17	23	23	29	35
14	0272270	Facet washer Ø12	30	34	46	46	58	70
15	0235450	Bolt M12x90 8.8	15	17	23	23	29	35
16	0264070	Self-locking nut M12	15	17	23	23	29	35

Spring-Board 2.6 m and 3.0 m (rigid)**Note:**

Check number and measurements of all hoses before ordering the spare parts.

Spring-Board 4.0 m (rigid)

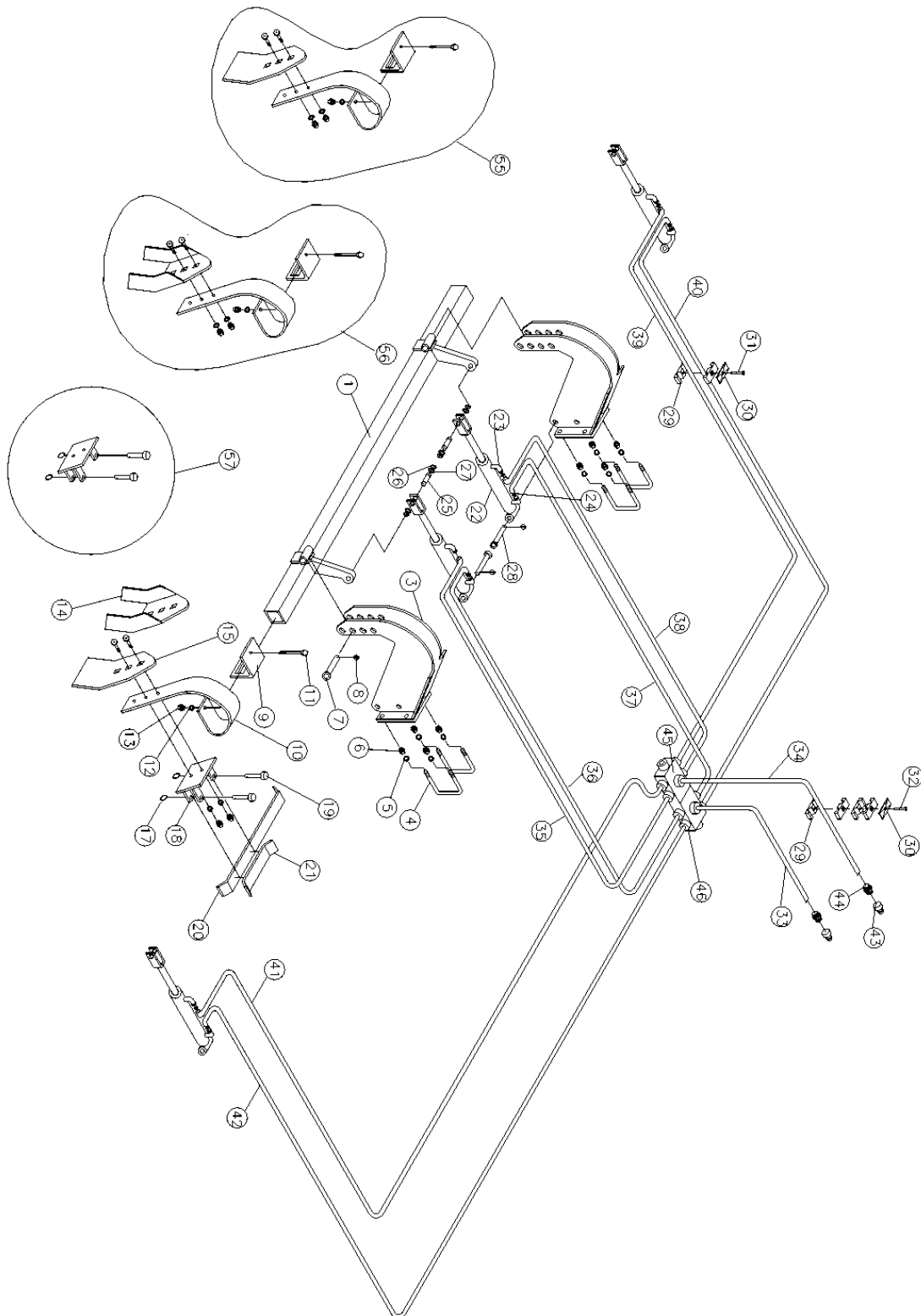
Note:

Check number and measurements of all hoses before ordering the spare parts.

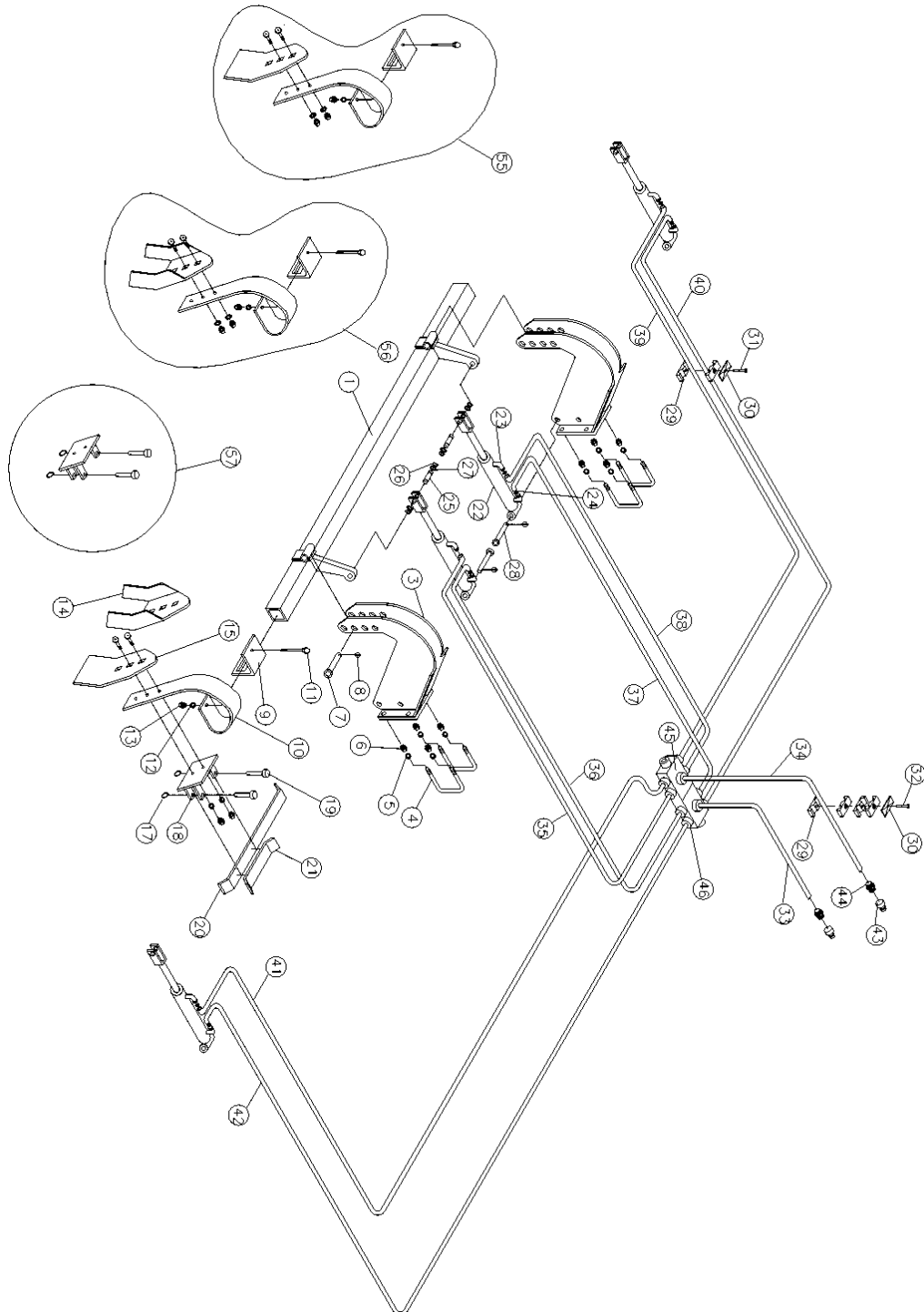
Pos.	Item no.	Designation	2.6 m	3.0 m	4.0 m
1	633230260	Bar	1	0	0
1	633240300	Bar	0	1	0
1	633260400	Bar	0	0	1
2	633244500	Horn	2	2	2
2	633244510	Horn from aug 2010	2	2	2
3	690110402	U-bolt M16x160x80x160	4	4	4
3	690110405	U-bolt M18x160x80x160 from aug 2010	4	4	4
4	690117013	Facet plate Ø16	8	8	8
4	690117015	Facet plate Ø18 from aug 2010	8	8	8
5	690113008	Self-locking nut M16	8	8	8
5	690113016	Self-locking nut M18 from aug 2010	8	8	8
6	69525087F	Pin Ø25 L = 87	1	1	1
7	690134001	Ring pin Ø4,5	3	3	4
8	633052200	Clamp f/tine	10	12	16
9	633052050	Tine (10x80)	10	12	16
9a	633052000	Tine complete	10	12	16
10	690103098	Bolt M12x110 10.9	10	12	16
11	690117014	Facet plate Ø12	10	12	16
12	690113006	Self-locking nut M12	10	12	16
13	633052150	Slicing plates point incl. bolts	10	12	16
14	633052100	Tine point (8x150) incl. bolts	10	12	16
15	633052250	Edge equipment (L)	1	1	1
15	633052255	Edge equipment (R)	1	1	1
16	690134000	Locking ring Ø30x3	20	24	32
17	633055500	Tine bracket f/transverse locking system	10	12	16
18	69512040K	Pin Ø12,5x40	20	24	32
19	633055710	Locking bar f/transverse locking system (long)	9	11	15
20	633055700	Locking bar f/transverse locking system (short)	2	2	2
21	690200160	Cylinder 50/30x155	1	1	2
22	690203006	Fitting, 90angle 10-3/8" BSP	2	2	4
23	690207901	Restrictor 1 mm	1	1	2
24	69520046D	Pin Ø20 L = 46	1	1	2
25	691372020	Seeger circlip ring Ø20	2	2	4
26	690115010	Washer Ø20/Ø28x1mm	2	2	4

Pos.	Item no.	Designation	2.6 m	3.0 m	4.0 m
27	69520087F	Pin Ø20 L = 87	1	1	2
28	690210210	Tube-support double Ø14/Ø14	2	2	6
29	690210211	Top plate f/double tube-support	1	1	3
30	690103054	Bolt M8x40	1	1	3
31	690203015	Fitting T10			2
32	690203003	Fitting, straight 10-1/2" BSP	2	2	2
33	690203001	Quick coupling 1/2" E402, male	2	2	2
34	690201053	Hydr. hose 1260 mm 1/4" st/st (for single and double frame)			1
35	690201036	Hydr. hose 1590 mm 1/4" st/st (for single and double frame)			1
36	690201053	Hydr. hose 1260 mm 1/4" st/st (for single and double frame)			1
37	690201036	Hydr. hose 1590 mm 1/4" st/st (for single and double frame)			1
38	690201020	Hydr. hose 1625mm 1/4" st/st (single frame)			1
38	690201033	Hydr. hose 2500 mm 1/4" st/st (double frame)			1
39	690201020	Hydr. hose 1625 mm 1/4" st/st (single frame)			1
39	690201033	Hydr. hose 2500 mm 1/4" st/st (double frame)			1
40	690201033	Hydr. hose 2500 mm 1/4" st/st (single frame)	1	1	
40	690201060	Hydr. hose 3000 mm 1/4" st/st (double frame)	1	1	
41	690201033	Hydr. hose 2500 mm 1/4" st/st (single frame)	1	1	
41	690201060	Hydr. hose 3000 mm 1/4" st/st (double frame)	1	1	
42	633151000	Scale f/depth control	1	1	1
43	633152000	Pointer f/depth control	1	1	1
44	698500018	Label for scale f/depth control	1	1	1
45	690113005	Self-locking nut M10	4	4	4
46	690117012	Facet plate Ø10	4	4	4
47	690110020	U-bolt M10x70x70x70 mm	1	1	1
48	69525095F	Pin Ø25 L=95	1	1	1
49	690101083	Bolt M10x35	2	2	2
50	633052000	Tine w/flat tine point (complete)			
51	633052025	Tine w/slicing plates point (complete)			
52	633055510	Tine bracket f/transverse locking system (complete)			

Spring-Board middle section 4.0 m (hydraulic)



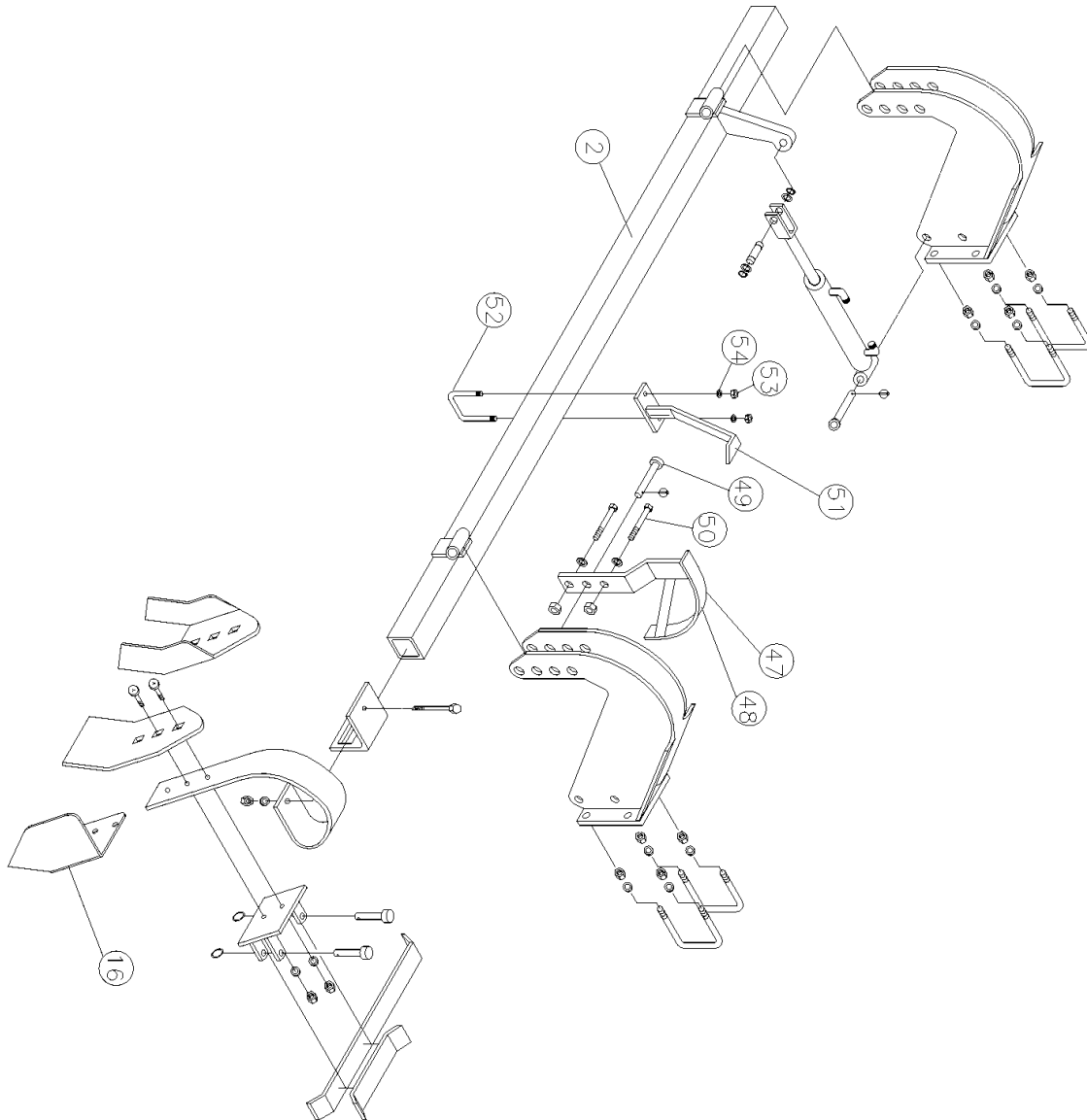
Note:
Check number and measurements of all hoses before ordering the spare parts.

Spring-Board middle section 5,0 - 6,0 m (hydraulic)

Note:

Check number and measurements of all hoses before ordering the spare parts.

Spring-Board wing section 4.0 - 5.0 and 6.0 m (hydraulic)



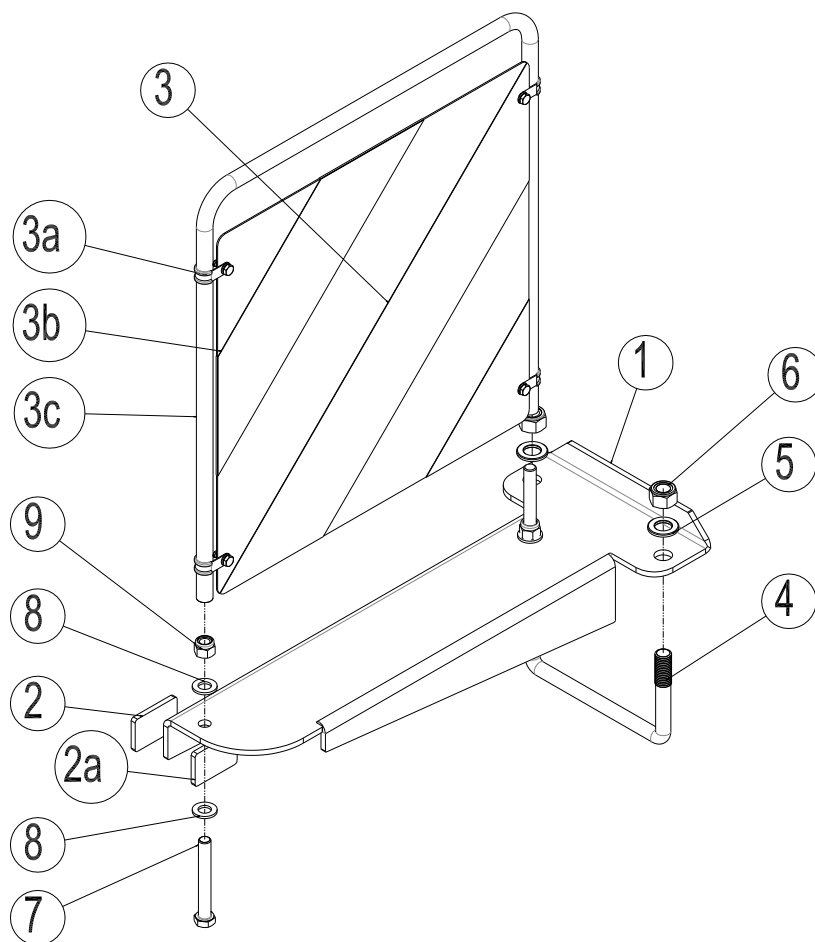
Pos.	Item no.	Designation	4.0 m	5.0 m	6.0 m
1	671880400	Bar (centre)	1		
1	671920500	Bar (centre)		1	
1	671900600	Bar (centre + left side)			2
2	671880410	Bar (right side)	1		
2	671880420	Bar (left side)	1		
2	671920510	Bar (left side)		1	
2	671920520	Bar (right side)		1	

Pos.	Item no.	Designation	4.0 m	5.0 m	6.0 m
2	671900610	Bar (right side)			1
3	671844500	Horn	6		6
3	671844510	Horn from aug 2010	6		6
4	690110101	U-bolt M16x100x100x100	12		12
4	690110404	U-bolt M18x100x100x100 from aug 2010	12		12
5	690117013	Facet plate Ø16	24		24
5	690117015	Facet plate Ø18 from aug 2010	24		24
6	690113008	Self-locking nut M16	24		24
6	690113016	Self-locking nut M18 from aug 2010	24		24
7	69525087F	Pin Ø25 L=87	5		5
8	690134001	Ring pin Ø4.5	10		9
9	633052200	Clamp f/tine	16		24
10	633052050	Tine (10x80)	16		24
10a	633052000	Tine complete	16		24
11	690103098	Bolt M12x110 10.9	16		24
12	690117014	Facet plate Ø12	16		24
13	690113006	Self-locking nut M12	16		24
14	633052150	Slicing plates point incl. bolts	16		24
15	633052100	Tine point (8x150) incl. bolts	16		24
16	633052250	Edge equipment (L)	1		1
16	633052255	Edge equipment (R)	1		1
17	690134000	Locking ring Ø30x3	32		48
18	633055500	Tine bracket f/transverse locking system	16		24
19	69512040K	Pin Ø12,5x40	32		48
20	633055710	Locking bar f/transverse locking system (long)	13		21
21	633055700	Locking bar f/transverse locking system (short)	6		6
22	690200160	Cylinder 50/30x155	4		3
23	690203006	Fitting, 90angle 10-3/8" BSP	8		6
24	690207901	Restrictor 1 mm	4		3
25	69520046D	Pin Ø20 L=46	4		3
26	691372020	Seeger circlip ring Ø20	8		6
27	690115010	Washer Ø20/Ø28x1 mm	8		6
28	69520087F	Pin Ø20 L=87	4		3
29	690210210	Tube-support double Ø14/Ø14	8		8
30	690210211	Top plate f/double tupe-support	3		3
31	690103054	Bolt M8x40	2		2
32	690103045	Bolt M8x65	1		1

Pos.	Item no.	Designation	4.0 m	5.0 m	6.0 m
33	690201033	Hydr. hose 2500 mm ¼" st/st	1		1
34	690201033	Hydr. hose 2500 mm ¼" st/st	1		1
35	690201015	Hydr. hose 710 mm ¼" st/st	1		1
36	690201015	Hydr. hose 710 mm ¼" st/st	1		1
37	690201015	Hydr. hose 710 mm ¼" st/st	1		
38	690201015	Hydr. hose 710 mm ¼" st/st	1		
39	690201018	Hydr. hose 1460 mm ¼" st/st	1		
39	690201020	Hydr. hose 1625 mm ¼" st/st			1
40	690201018	Hydr. hose 1460 mm ¼" st/st	1		
40	690201020	Hydr. hose 1625 mm ¼" st/st			1
41	690201018	Hydr. hose 1460 mm ¼" st/st	1		
41	690201020	Hydr. hose 1625 mm ¼" st/st			1
42	690201018	Hydr. hose 1460 mm ¼" st/st	1		
42	690201020	Hydr. hose 1625 mm ¼" st/st			1
43	690203001	Quick coupling ½" E402, male	2		2
44	690203003	Fitting, straight 10-½" BSP	2		2
45	660501440	Assembly block 12x3/8 BSP	1		1
46	690203002	Fitting, straight 10-3/8" BSP	10		8
47	633151000	Scale f/depth control	1		1
48	698500018	Label t/scale f/depth control	1		1
49	69525095F	Pin Ø25 L=95	1		1
50	690101083	Bolt M10x35	2		2
51	633152000	Pointer f/depth control	1		1
52	690110020	U-bolt M10x70x70x70mm	1		1
53	690113005	Self-locking nut M10	4		4
54	690117012	Facet plate Ø10	4		4
55	633052000	Tine w/flat tine point (complete)			
56	633052025	Tine w/slicing plates point (complete)			
57	633055510	Tine bracket f/transverse locking system (complete)			

Note:

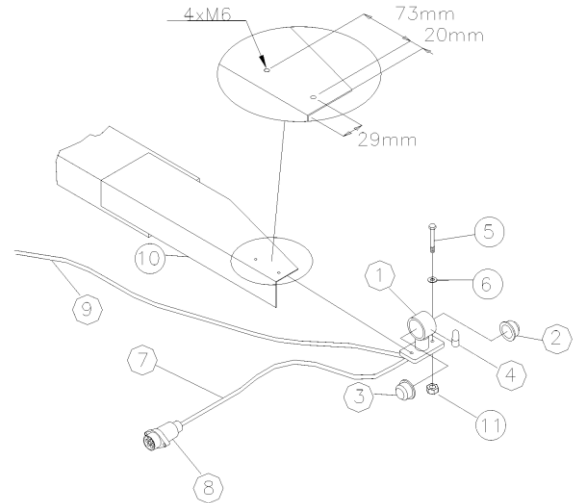
Check number and measurements of all hoses before ordering the spare parts.

Reflektor


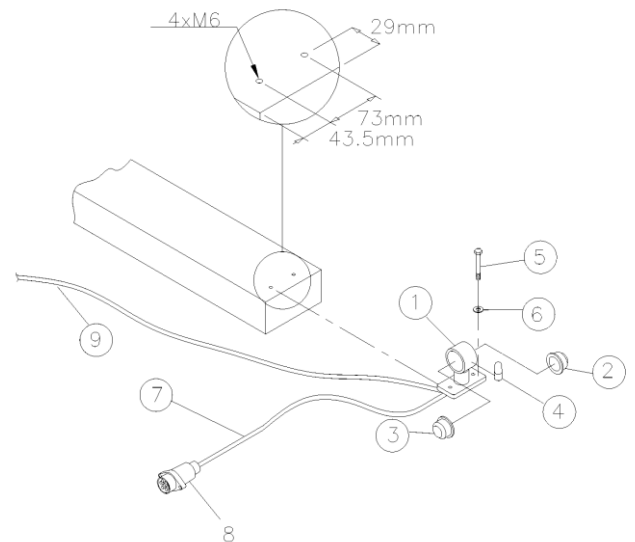
Pos.	Item no.	Designation	Qty.
1	690160069	Reflector holder, left	1
1	690160068	Reflector holder, right	1
2	690160048	Reflector, adhesive white 57x38	1
2a	690160046	Reflector, adhesive red 57x38	1
3	690160074	Full-mounted warning sign	1
3a	690160072	ABA Rubber clamps 15,9	4
3b	690160071	Warning sign 423x423 double	1
3c	690160073	Tube for warning sign Ø16	1
4	690110102	U-bolt M16x80x160x80	1
5	690117013	Facet plate Ø16	2
6	690113008	Self-locking nut M16	2
7	690103086	Bolt M12x90 8.8	2
8	690117014	Facet plate Ø12	4
9	690113006	Self-locking nut M12	2

Marking lights

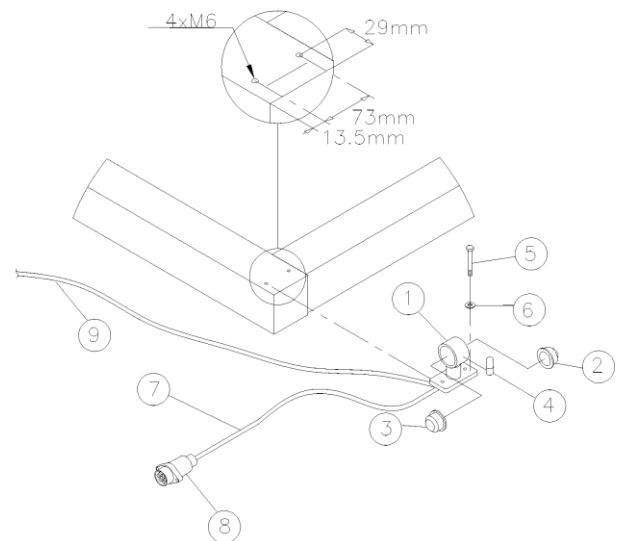
Placing of marking lights on
1.5 m – 3.0 m (rigid)



Placing of marking lights on
4.0 m (rigid)



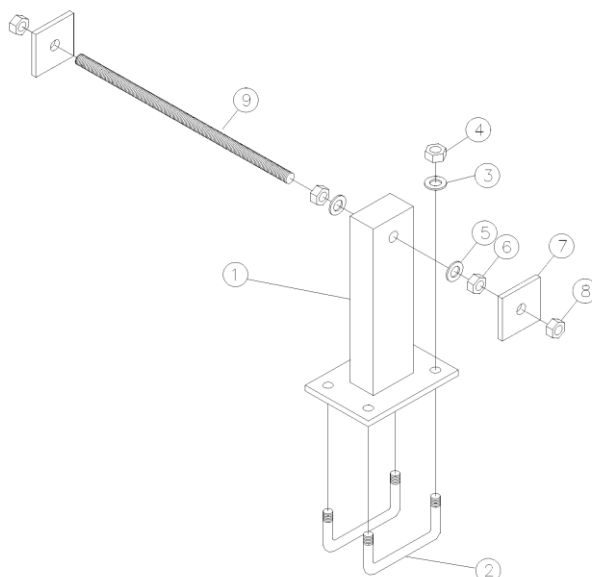
Placing of marking lights on
4.0 m – 5.0 - 6.0 m (hydr.)



Pos.	Item no.	Designation	1.5 m	2.6 m	3.0 m	4.0 m	4.0 m hydr.	5.0 m hydr	6.0 m hydr.
1	690160058	Marking lights	2	2	2	2	2	2	2
2	690160065	Glass f/marketing lights (white)	2	2	2	2	2	2	2
3	690160066	Glass f/marketing lights (red)	2	2	2	2	2	2	2
4	690160067	Bulb f/marketing lights 12V 10W – BA15s	2	2	2	2	2	2	2
5	690103025	Bolt M6x20	4	4	4	4	4	4	4
6	690117003	Facet plate Ø6	4	4	4	4	4	4	4
7	690160080	Cable 5 x 1 mm ² L = 3200 mm	1	1	1				
7	690160080	Cable 5 x 1 mm ² L = 3500 mm				1			
7	690160080	Cable 5 x 1 mm ² L = 4500 mm					1		
7	690160080	Cable 5 x 1 mm ² L = 6500 mm						1	1
8	690160070	Plug 7 poles DIN 72 577 – ISO 1724	1	1	1	1	1	1	1
9	690160080	Cable 5 x 1 mm ² L = 3200 mm	1	1	1				
9	690160080	Cable 5 x 1 mm ² L = 4200 mm				1			
9	690160080	Cable 5 x 1 mm ² L = 4500 mm					1		
9	690160080	Cable 5 x 1 mm ² L = 6500 mm						1	1
10	634400855	Plate f/reflector (L)	1	1					
10	634400856	Plate f/reflector (R)	1	1					
10	634400850	Plate f/reflector (L)			1				
10	634400851	Plate f/reflector (R)			1				
11	690113003	Self-locking nut M6	4	4	4				

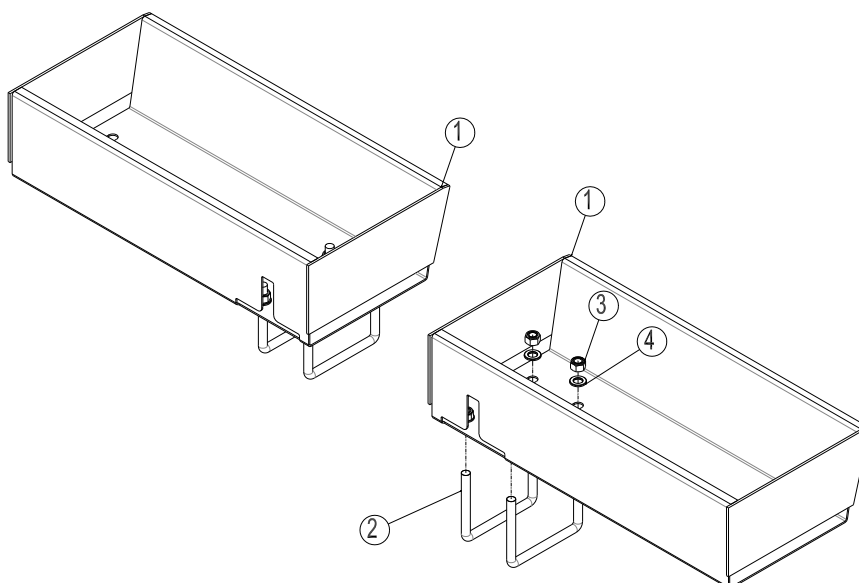
Note: Check number and measurements of all cables before ordering the spare parts

Weight carriers



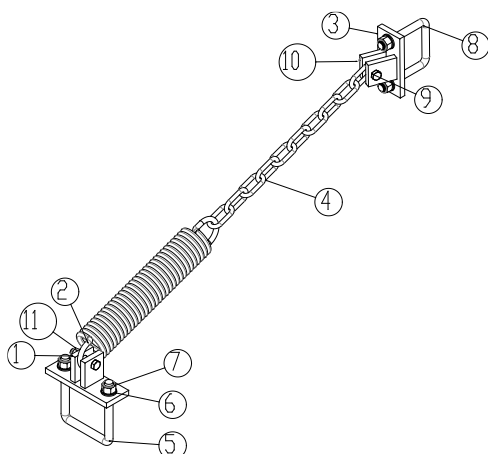
Pos.	Item no.	Designation	Qty.
1	634400400	Stand	2
2	690110102	U-bolt M16x80x160x80	4
3	690117013	Facet plate Ø16	8
4	690113008	Self-locking nut M16	8
5	690117005	Facet plate Ø20	4
6	690112009	Nut M20 (lock nut)	4
7	634400401	Clamping plate	4
8	690113009	Self-locking nut M20	4
9	630400601	Threaded rod M20 L = 500 mm	2

Stone boxes

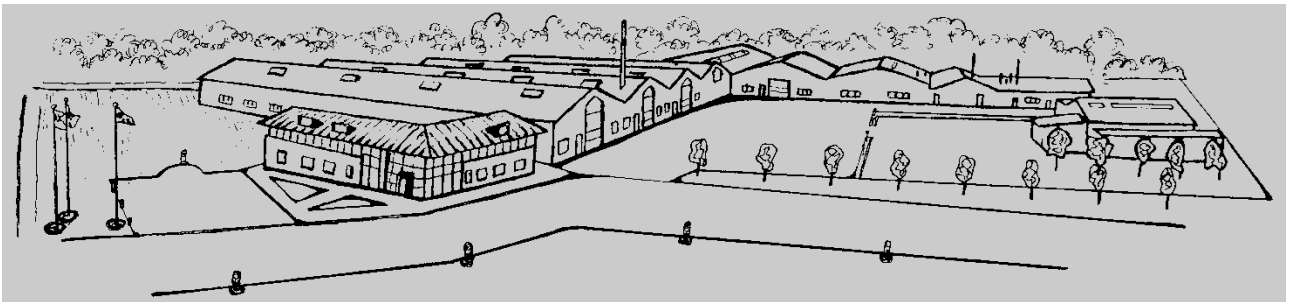


Pos.	Item no.	Designation	Qty.
1	630555004	Stonebox, left	1
1	630555006	Stonebox, right	1
1	630555005	Set of stonebox, incl 4 pcs. U-bolts M16x100x150x100	
2	690110103	U-bolt	4
3	690113008	Self-locking nut M16	8
4	690117013	Facet plate Ø16	8

Stabilization device



Pos.	Item no.	Designation	Pr. machine
1	670860010	Bracket for wing-section	2
2	690139001	Spring	2
3	670860005	Bracket upper	2
4	670860006	Chain	2
5	690110101	U-bolt M16x100x100x100	2
6	690117013	Facet plate Ø16	8
7	690113008	Self-locking nut M16	8
8	690110107	U-bolt M16x80x80x80	2
9	690103095	Bolt M12x60 8.8	4
10	690117014	Facet plate Ø12	4
11	690113006	Self-locking nut M12	4



The design is subject to modification without notice.