Operating Manual
/
Spare Parts List
Michaelis
Gear Mowing Bucket

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1. General Description

The Michaelis mowing bucket is an attachment for hydraulic excavators for the upkeep of drains and for mowing embankments.

The Michaelis gear mowing bucket has due to its special gear drive a particular high cutting power. Only the pin for the adaptor has to be lubricated, otherwise the bucket is maintenance-free.

The knife moves parallel above the stationary finger bar. While running the knife is “floating” rather than lying on the fingers.

To operate the gear mowing bucket a separate oil circuit is needed, which means that an unpressurized return line according to the type is required. Depending on the excavator type in some cases a special hydraulic mower setup for flow dividing is necessary.

2. Operating Instruction

- Never permut pressure an return line when connecting. Check couplings for tight fit.
- We recommend to mark the pressure and return line to rule out a mix up.
- The diameter of the return line has to comply with the guidelines of the manufacturer.
- The back-up pressure of the return line may not exceed 5 bar.
- The maximum operating pressure of 180 bar has to be observed.
- To keep wear and tear low the clearance between knife and finger should be between 0,10 and 0,20 mm.
- Check the orifice plate if the mowing bucket starts hard and abrupt.
- The main pin has to be lubricated once a day.
- The bolts of the motor flange fastening may in case of a changing not rise through the gear cover inside the gear case. The bolts need to be screwed in with sealing strap.
- If a demounting of the gear is necessarry it is recommended to contact the manufacturer for proper handling.

3. Starting up

Check the mowing bucket for possible damage before starting up. Check the fastening of the knife holder for tight fit before starting with mowing.

- Attaching and proper gibbing of the mowing bucket onto the dipper.
- Starting the excavator and warming up to reach the operating temperature of the hydraulic oil.
- Turn off the excavator for installing the hydraulic lines.
- Before starting with mowing turn the bucket on and off in intervals to reach the operating temperature of the bucket.

If the knife starts to hard and abrupt check the orifice plate. The orifice plate is located in the pressure side of the motor fitting.
Please find the respective diameters of the drilled hole below

Type:	**Diameter:**
up to M 3000 G	∅2,2 mm
M 4000 G	∅2,6 mm
M 5000 G	∅2,8 mm

Technical data gear mowing bucket:

Type:	**Cutting width:**	**Oil flow Quantity:**	**Weight*:**
M 2200 G	2,2 m	22 l/min	420 kg
M 2500 G	2,5 m	22 l/min	490 kg
M 3000 G	3,00 m	22 l/min	610 kg
M 4000 G	4,00 m	32 l/min	740 kg
M 5000 G	5,00 m	48 l/min	950 kg

To operate the gear mowing bucket a separate oil circuit is necessary. An unpressurized recirculation line according to the type has to be provided (see table below)

Type:	**max.allowed pressure**	**max.allowed back-up pressure**	**Diameter of delivery line**	**Diameter of recirculation line**
M 2200 G	180 bar	5 bar	∅12x1,5	∅18x1,5
M 2500 G	180 bar	5 bar	∅12x1,5	∅18x1,5
M 3000 G	180 bar	5 bar	∅12x1,5	∅22x2,0
M 4000 G	180 bar	5 bar	∅12x1,5	∅22x2,0
M 5000 G	180 bar	5 bar	∅12x1,5	∅22x2,0

Attention!

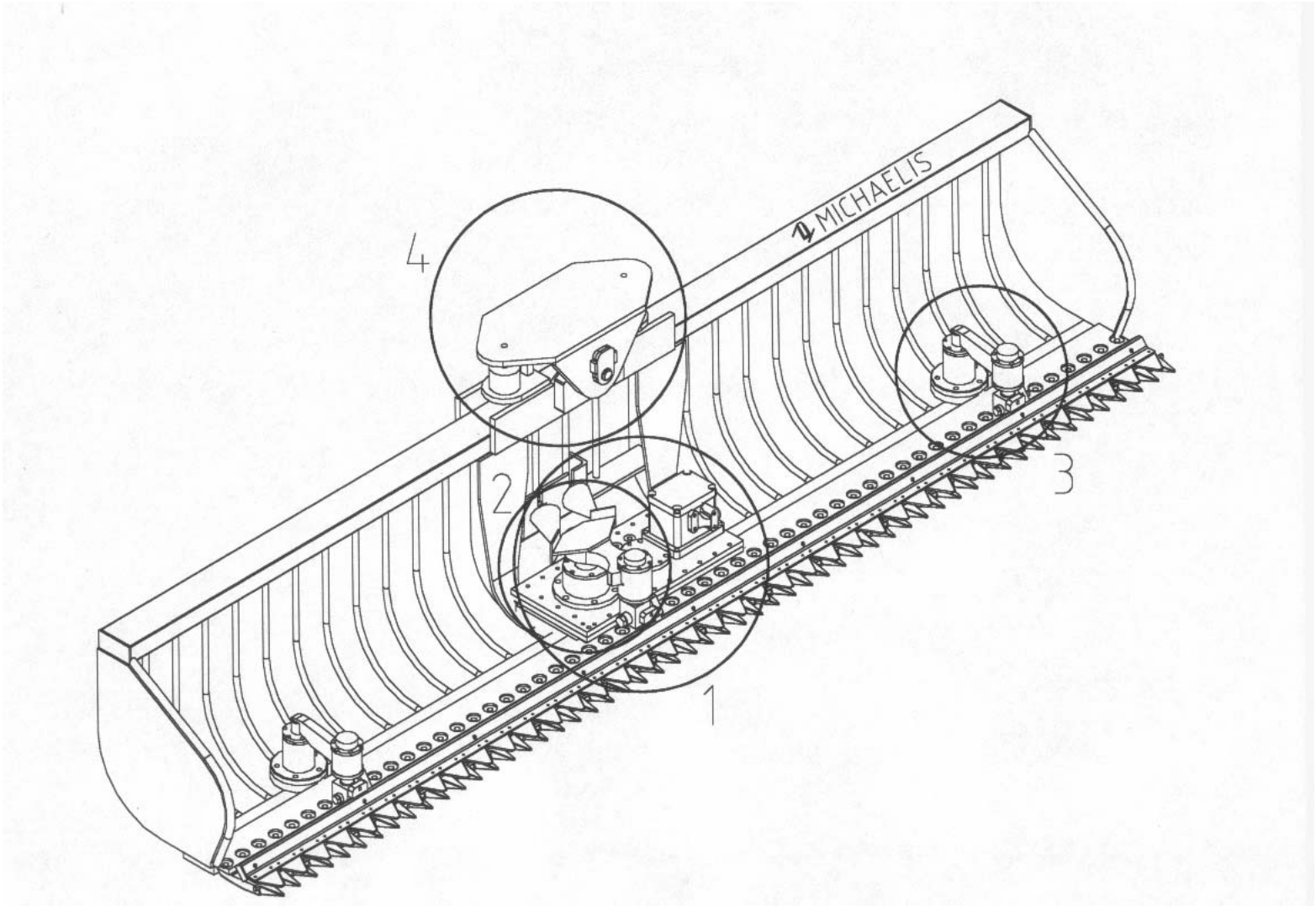
The return line of the mowing bucket to the return line of the excavator (**green marking**).

The pressure line of the mowing bucket to the pressure line of the excavator (**red marking**).

If the return line and the pressure line are mixed up an integrated safety valve will let the flow into the surroundings.

In this case mowing works have to be stopped immediately

Assembly Units



Assembly:

1 Gear
2 Drive pendular
3 Side pendular
4 Adaptor

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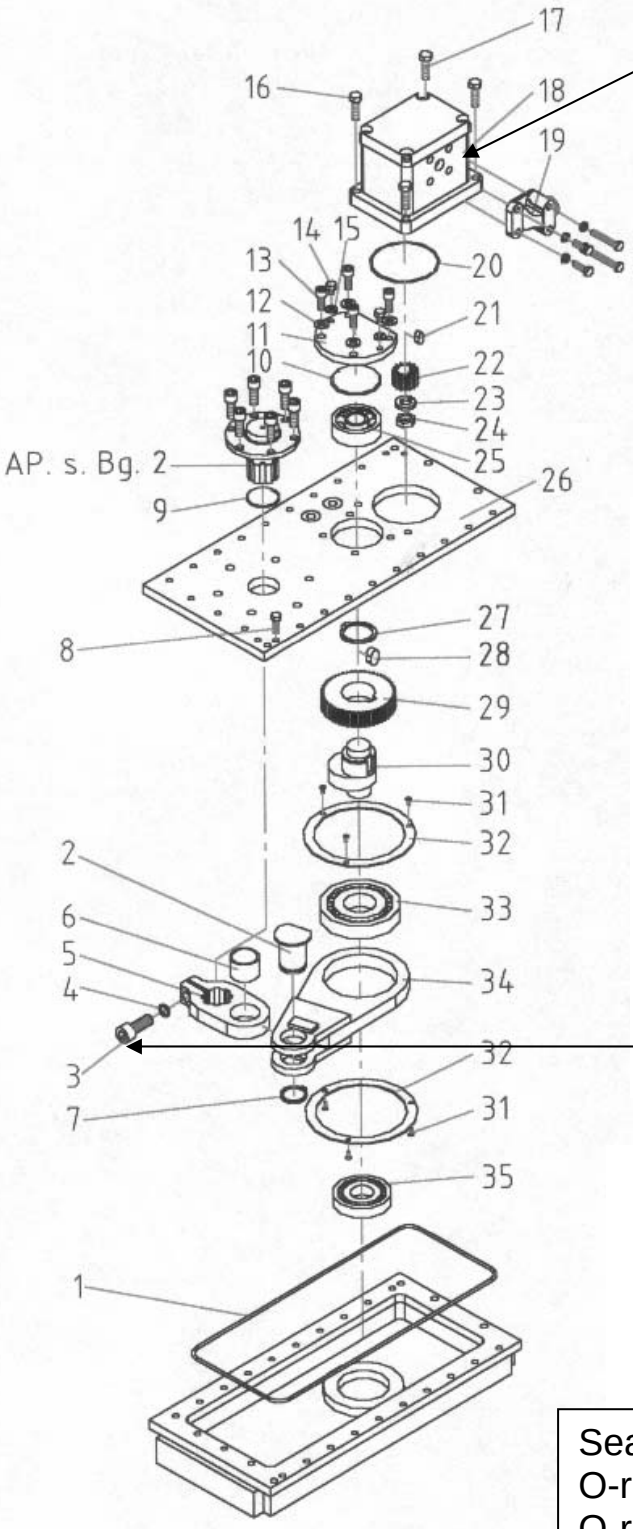
Assembly 1 Gear

Number	Quantity	Description	
1	1	O-ring 377 x 4,5	
2[1]	1	Clamping lever pin	
3	1	Socket head screw M16x35 10.9	DIN 912
4	1	Anti-vibration washer 16 mm	DIN 128
5[1]	1	Clamping lever	
6[1]	1	Clamping lever bush	
7	1	Circlip 38x1,75	DIN 471
8	23	Hexagon bolt M8x25	DIN EN 24017
9	1	O-ring 94x3	DIN 3771
10	1	O-ring 72x3	DIN 3771
11	1	Eccentric cover	
12	4	Anti-vibration washer 10mm	
13	4	Socket head screw M10x25	DIN 912
14	2	Hexagon bolt M8x10	DIN EN 24017
15	2	Anti-vibration washer 8mm	
16	2	Hexagon bolt M10x35	DIN EN 24017
17	2	Hexagon bolt M10x50	DIN EN 24017
18[1]	1	Hydraulic motor	Bosch
19	2	Attachment flange	
20	1	O-ring 100x2,5	DIN 3771
21	1	Woodruff key	
22	1	Gear wheel Z16	
23	1	Anti-vibration washer 16mm	DIN 128
24	1	Hexagon nut	
25[1]	1	Deep groove ball bearing	6007 (6008)*
26[1]	1	Gear cover	
27[1]	1	Circlip A50 (A55)	DIN 471
28	1	Feather key 14x30	
29	1	Gear wheel Z52	DIN EN 24014
30[1]	1	Eccentric	
31	6	Hexagon bolt M4x12	DIN 7991
32	2	Brass disc	
33	1	Cylindrical roller bearing NU212(NU312)	
34[1]	1	Push rod	
35[1]	1	Cylindrical roller bearing NU207(NU208)	

[1] Please state the cutting width of your mowing bucket when ordering.

Assembly 1
Gear



ohne Abb.:
O-Ring 33x2,5

Attention
The tightening torque of the socket head screw is
140Nm

Seal kit gear		
O-ring 377 x 4,5		1x
O-ring 94 x 3	flange	1x
O-ring 72 x 3	eccentric cover	1x
O-ring 100 x 2,5	motor	1x

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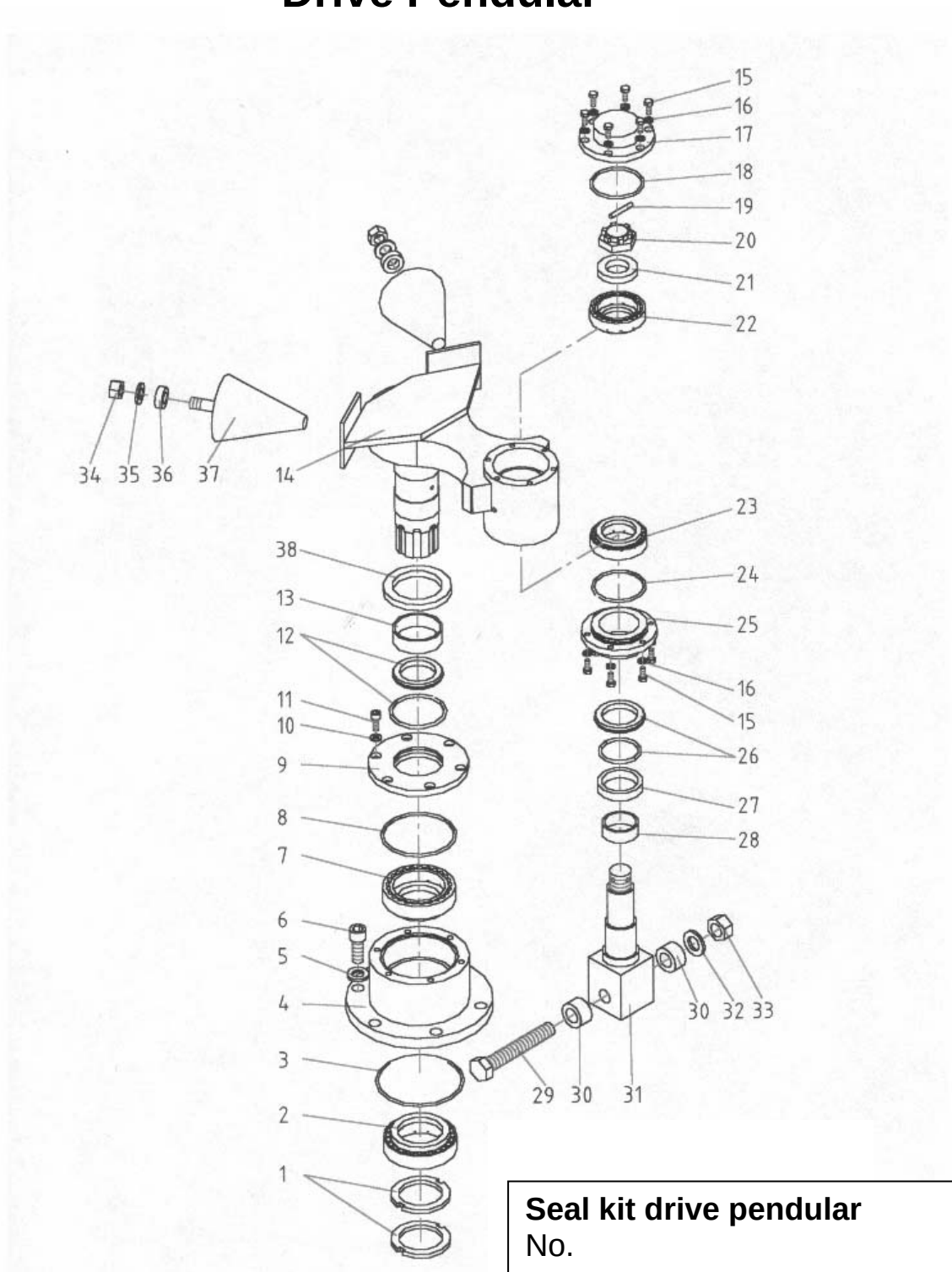
Assembly 2 Drive Pendular

Number	Quantity	Description	
1	2	Slotted round nut M48x1,5	
2+7	2	Tapper roller bearing	33010
3	1	O-ring 94x3	
4	1	Drive pendular case	
5	6	Anti-vibration washer 12mm	
6	6	Socket head screw M12x30	DIN 912
8	1	O-ring 80x3	DIN 3771
9	1	Drive pendular flange case	
10	6	Anti-vibration washer 6mm	
11	6	Socket head screw M6x16	DIN 912
12	1	Rod seal ∅ 55	
13	1	Inner ring 55x50x17	
14[1]	1	Drive pendular arm	
15	12	Socket head screw M5x12	DIN 912
16	12	Anti-vibration washer 5mm	
17	1	Drive pendular cover	
18+24	2	O-ring 57x3	DIN 3771
19	1	Hollow dowel pin 5x32	DIN EN 28752
20	1	Castle nut M24x1,5	DIN 937
21	1	Washer A25	DIN 1441
22	1	Tapper roller bearing	32007
23	1	Tapper roller bearing	30206
25	1	Drive pendular flange axle	
26	1	Rod seal ∅40	
27	1	Foam rubber ring ∅40	
28	1	Inner ring 35x40x20,5	
29	1	Hexagon bolt M16x100-10.9	DIN EN 24014
30	2	Washer A16	DIN 1441
31	1	Square axle drive pendular	
32	1	Anti-vibration washer 16mm	DIN 128
33	1	Hexagon nut M16	DIN EN 24032
34	2	Hexagon nut M12	
35	2	Anti-vibration washer 12mm	
36	2	Washer A12	DIN 125
37	2	Parabolic buffer	
38	1	Foam rubber ring ∅55	

[1] Please state the cutting width of your mowing bucket when ordering.

Assembly 2
Drive Pendular



Seal kit drive pendular

No.		
27	Foam rubber ring ∅40	1x
38	Foam rubber ring ∅55	1x
26	Rod seal ∅40	1x
12	Rod seal ∅55	1x
24	O-ring 57x3	2x
8	O-ring 80x3	1x

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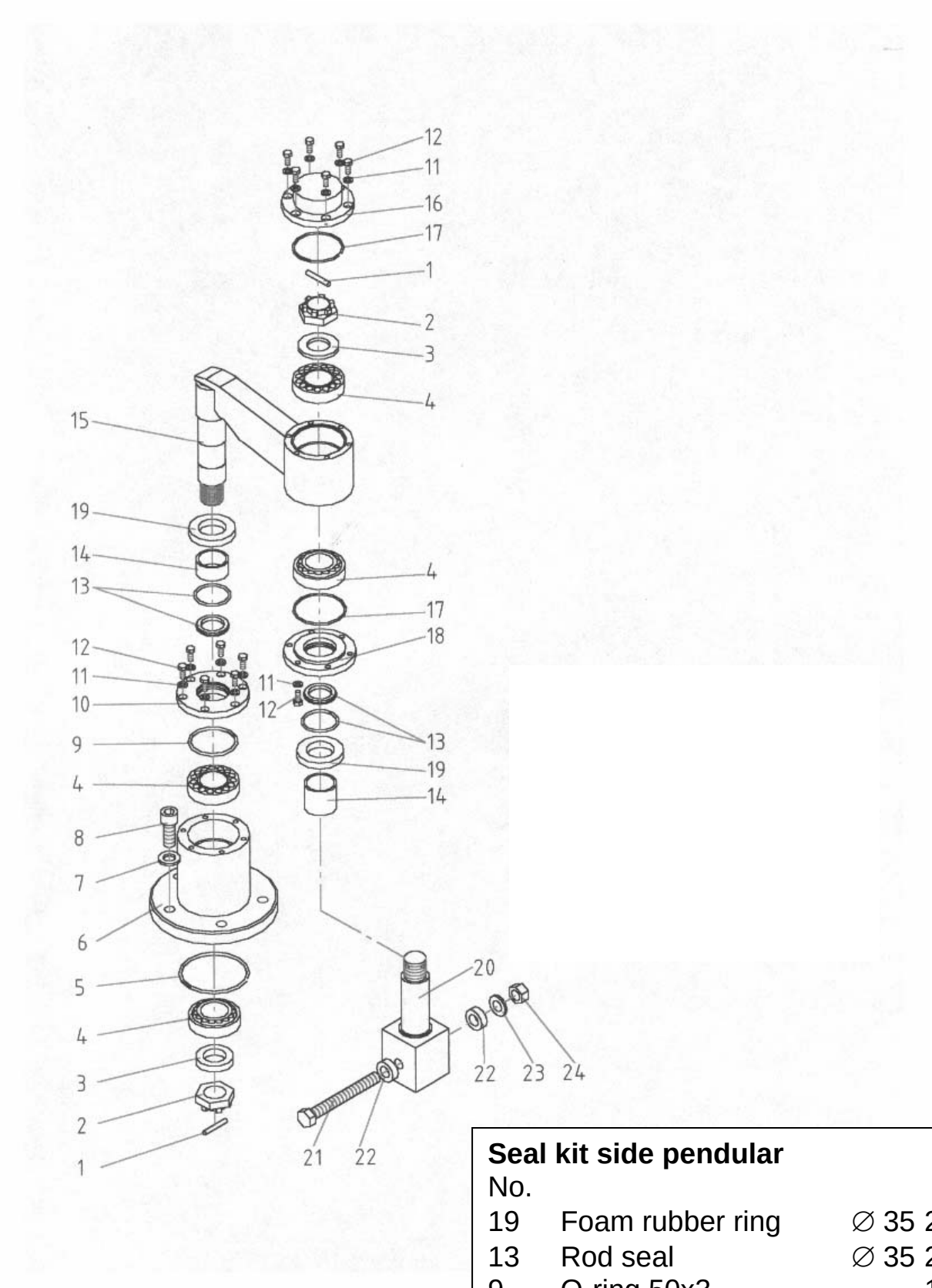
Assembly 3 Side Pendular

Number	Quantity[1]	Description	
1	2	Hollow dowel pin 5x32	DIN EN 28752
2	2	Castle nut M24x1,5	DIN 937
3	1	Washer ∅ 25	
4	4	Tapper roller bearing	32006
5	1	O-ring 72x3	DIN 3771
6	1	Bearing case	
7	5	Anti-vibration washer A10	
8	5	Socket head screw M10x30	DIN 912
9	1	O-ring 50x3	DIN 3771
10	1	Side pendular flange case	
11	18	Anti-vibration washer A5	
12	18	Socket head screw M5x12	DIN 912
13	2	Rod seal ∅ 35	
14	2	Inner ring 35x30x17	
15	1	Side pendular arm	
16	1	Side pendular cover	
17	2	O-ring 55x2	DIN 3771
18	1	Side pendular flange axle	
19	2	Foam rubber ring ∅ 35	
20	1	Square axle side pendular	
21	1	Hexagon bolt M12x100-10.9	DIN 933
22	2	Washer A12	DIN 1441
23	1	Anti-vibration washer A12	
24	1	Hexagon nut M12	DIN EN 24032

[1] The stated quantity refers to 1 side pendular.

Cutting width in m	Number of side pendulars
2,2	2
2,5	2
3	2
4	3
5	4

Assembly 3
Side Pendular



Seal kit side pendular		
No.		
19	Foam rubber ring	∅ 35 2x
13	Rod seal	∅ 35 2x
9	O-ring 50x3	1x
17	O-ring 55x2	2x
5	O-ring 72x3	1x

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Assembly 4 Adaptor

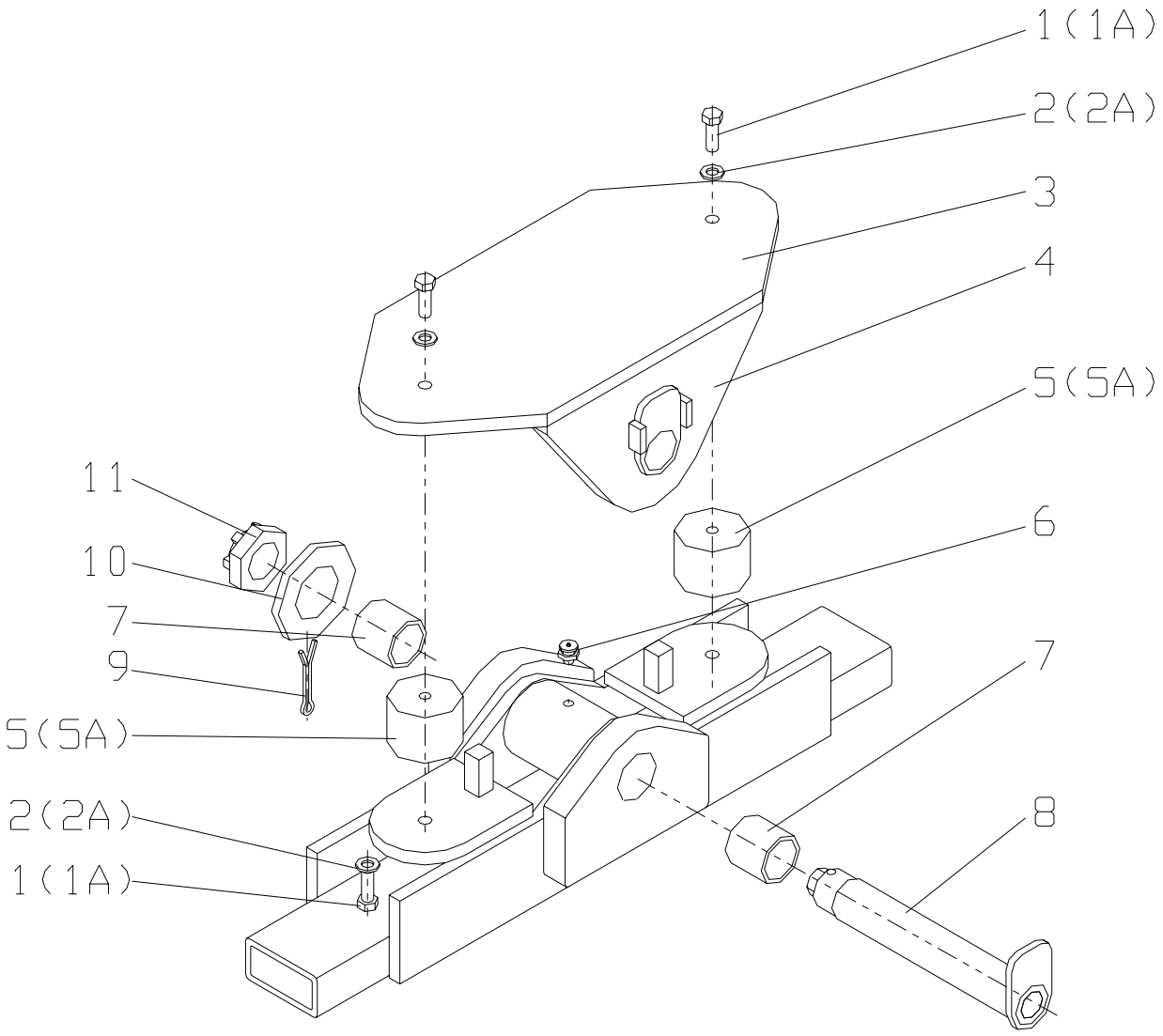
Number	Quantity	Description	
1	4	Hexagon bolt M12x25	DIN 933
1A	4	Hexagon bolt M16x30	DIN 933
2	4	Anti-vibration washer A12	
2A	4	Anti-vibration washer A16	
3	1	Adaptor	
4	2	Welding plate	
5	2	Rubber buffer ∅75x55	
5A	2	Rubber buffer ∅100x55	
6	1	Lubrication nipple C8	M8x1
7	2	Bearing bushing[1]	M128
8	1	Pin[1]	M104
9	1	Cotter pin 6x80 (8x80)	DIN 94
10	1	Washer	DIN 125
11	1	Castle nut[1]	DIN 937

[1] Please find the dimensions in the table below.

Type:	Pin [1]	Thread	Bushings
M 2200 G	256x∅45	M36x3	∅45x∅54x50
M 2500 G	256x∅45	M36x3	∅45x∅54x50
M 3000 G	283x∅60	M48	∅60x∅72x60
M 4000 G	283x∅60	M48	∅60x∅72x60
M 5000 G	283x∅60	M48	∅60x∅72x60

[1]Effective length

Assembly 4
Adaptor



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Assembly

Knife, Knife Holder, Knife Section

Number	Quantity	Description	
1[1]	-	Knife section	
2[2]	1	Knife back	
3[2]	1	Knife holder	
4	-	Hexagon nut M10	DIN EN 24032
5	-	Hexagon bolt M10x45	DIN EN 24017
6	-	Washer A8	DIN 125
7	-	Anti-vibration washer A8	DIN 128
8	-	Hexagon bolt M8x25	DIN EN 24017

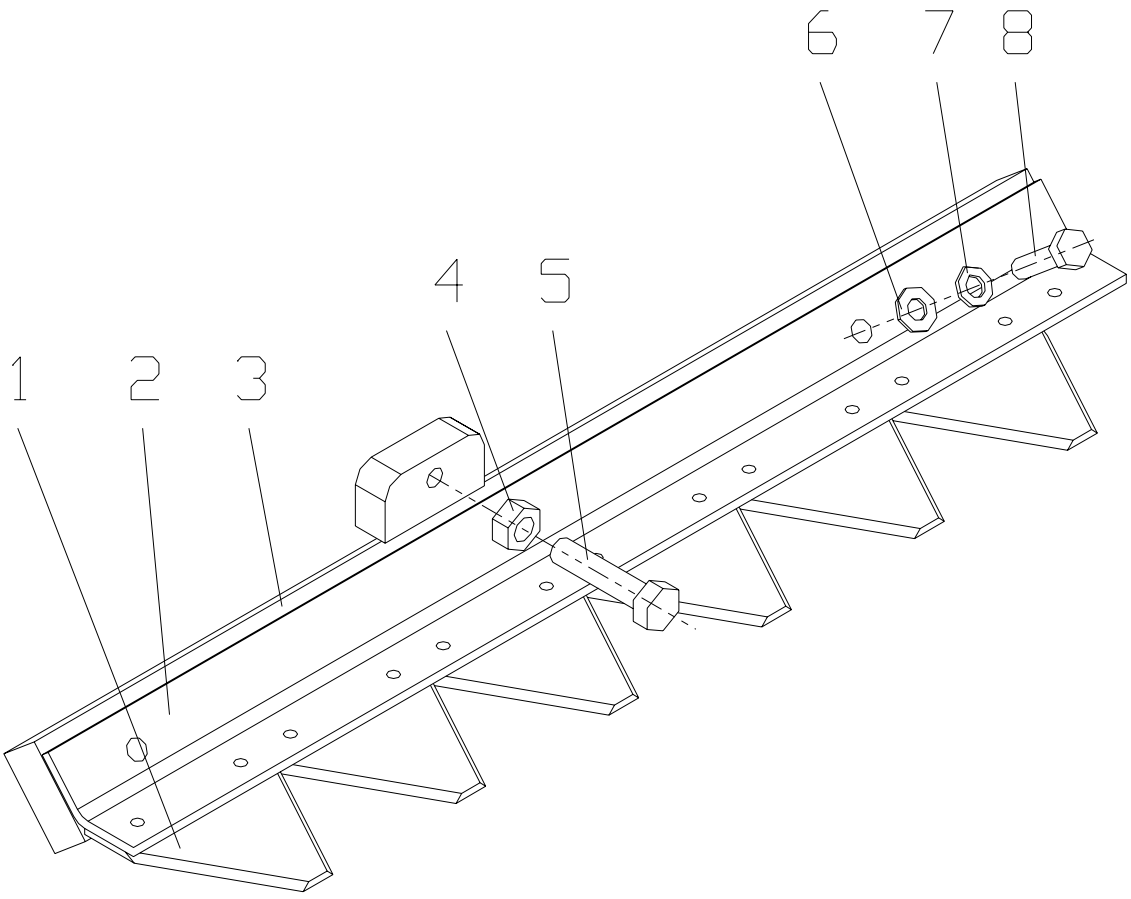
[1] Please state which knife sections you require when ordering. We have 3mm knife section to rivet and 4mm knife section to be bolted on.

[2] Please state the cutting width of your mowing bucket when ordering.

Cutting width in m	Number of knife sections
2,2	29
2,5	32
3	39
4	52
5	64

Assembly

Knife, Knife Holder, Knife Section



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Assembly Finger Bar

Number	Quantity	Description	
1	-	Doppelfinger	
2	-	Pipe frame	
3	-	Anti-vibration washer A12	
4		Hexagon bolt M12x40	DIN EN 24017

Cutting width in m	Numbers of fingers
2,2	20 ½
2,5	23
3	27 ½
4	36 ½
5	45

Assembly
Finger Bar