DR. BENDER *GmbH*
Innovative Power Tools

Operating Manual
Sawing accessories
HF III

SQUATINA
KOGIA
ESPADA

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Art. No. 102249 KOGIA
Art. No. 102248 SQUARTINA
Art. No. 102251 SQUARTINA B

Subject to change

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Contents

Attention

The safety instructions included in this operating manual must be followed! Custom models and design variants may deviate from the basic type in technical details. In the event of any discrepancies, we recommend that you contact DR.BENDER GmbH urgently. Always state the machine type and the machine number in any correspondence.

1.0 Symbol and pictogram description

Warning

Indicates instructions which may endanger your health or the functionality of the unit if they are not followed. The warranty shall become null and void if you cause defects to the unit by non-compliance with these instructions.

Recycling

Please direct waste to recycling.

Disposal

The customary and regional laws shall be observed for disposal.

Safety signs on the machine

Wear safety shoes

Wear gloves

Wear a safety helmet

Wear protective goggles

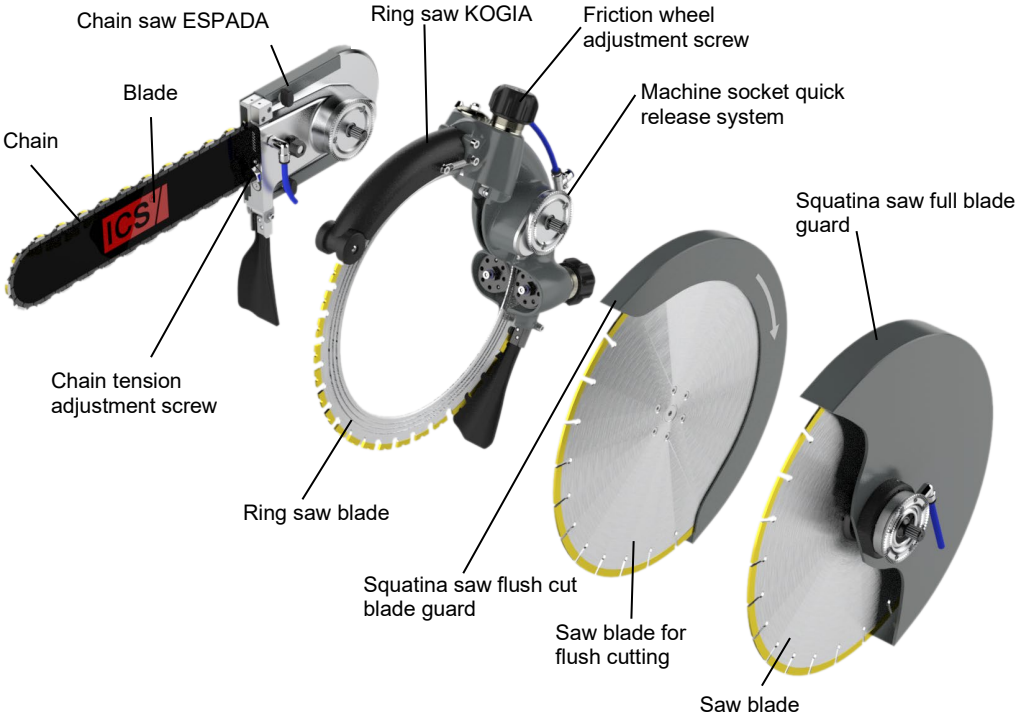
Wear ear protection

Wear a breathing mask

Pull the power plug before work on the device

Read the instructions

1.1 Function description



2.0 General instructions

2.1 Technical description

The BELUGA, SQUATINA, KOGIA and the ESPADA represent a whole new generation of drive units for stone cutting. The exceptionally comprehensive modular system offers the flexibility needed today when performing cutting work in concrete and stone. To achieve this, newly developed high-frequency motor parts are used in the motor. The frequency range is controlled by the frequency converter from 0 - 1000 Hz integrated into the Powerbox. The Powerbox can be operated on a single-phase 230 V mains supply as well as on a 400 V mains supply with up to 12 kW. Our motors automatically detect the correct voltage and then work at the allowed power rating for the voltage. At 1000 Hz, the rotor reaches a speed of 30.000 min^{-1}. A major benefit lies in the exceptional weight / power ratio (motor power output = 8 kW / weight = 12.5 kg -> 0.64). Using conventional technology e.g. type BBM33extra (motor power output = 2.4 kW / weight = 13.5 kg -> 0.17). This means that the weight of the machine has been reduced fourfold using the high-frequency technology. Further benefits lie in the stepless speed control. This enables the best speed to be assigned to each tool diameter in order to attain the best possible cutting speed on the tool. During work, the speed can be steplessly reduced if you come up against steel reinforcements and thus can be optimised according to the progress of the work. Here, you can run the unit at much higher cutting speeds (Attention! depends on the tool) and in doing so, the progress of the job can be speeded up by up to 200 %. With conventional machines, the torque drops very sharply at the higher speeds and therefore, this advantage does not apply here.

2.2 Applications

All attachments can be used with drive units, which are fitted with the DR. BENDER quick release system. If you are using custom-built machines, the details on the quotation and the order confirmation also apply.

When suitable saw blades and drill bits are used, a wide range of materials can be cut:

- Concrete (even with strong reinforcement)
- Sandstone and limestone
- All building materials for solid walls
- Asphalt road surfacing

3.0 Transport and storage

3.1 Transport

Warning

The attachments must be inspected for transport damage after receipt. Any damage present must be recorded in writing.

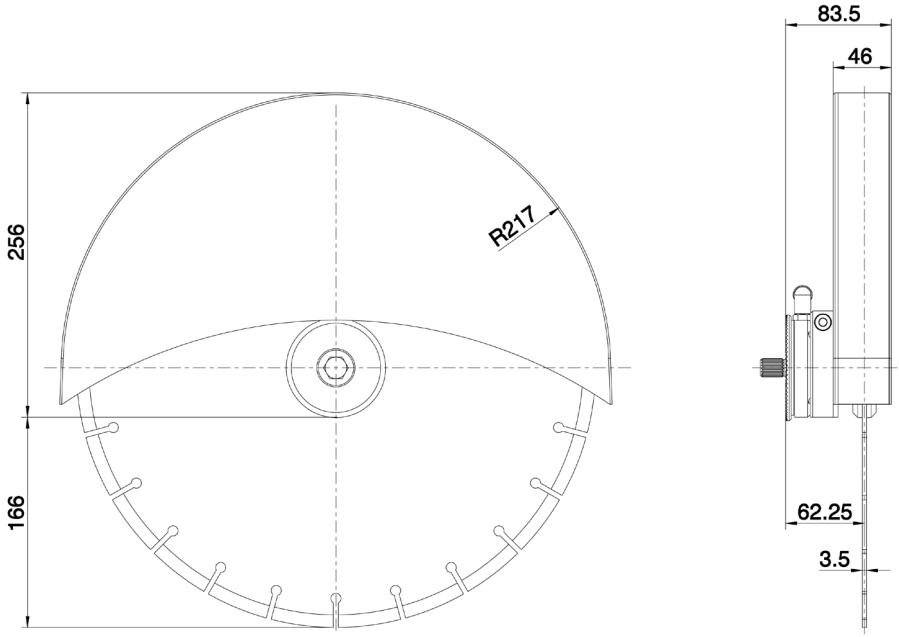
3.2 Storage

The storage location should be dry, clean, and at a constant temperature wherever possible. To keep the lubrication film in the bearings and the seal systems from separating, the drive shaft should be turned several times manually after a lengthy storage period, e.g. at monthly intervals. The roller bearings of the devices should be replaced (or re-lubricated) if the period between delivery and commissioning is more than 4 years. This period will be significantly reduced if the storage conditions are unsuitable.

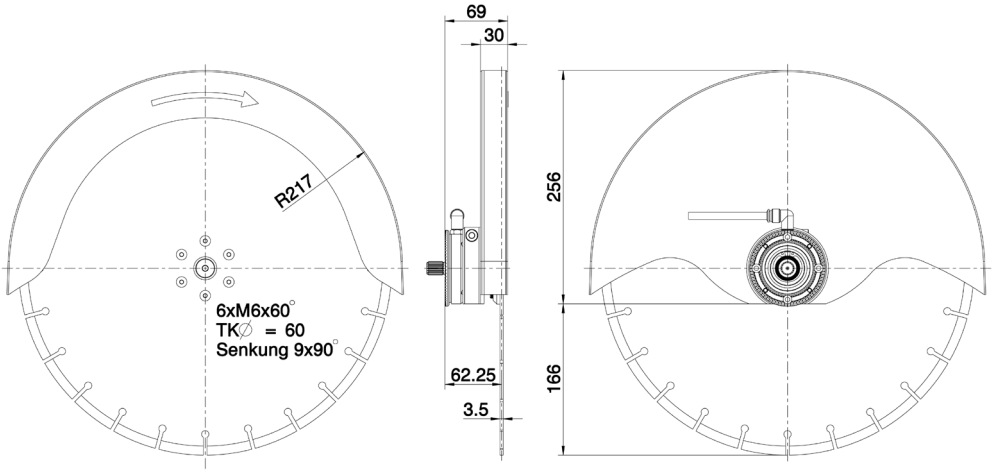
4.0 Main dimensions and technical data

4.1 Dimensions

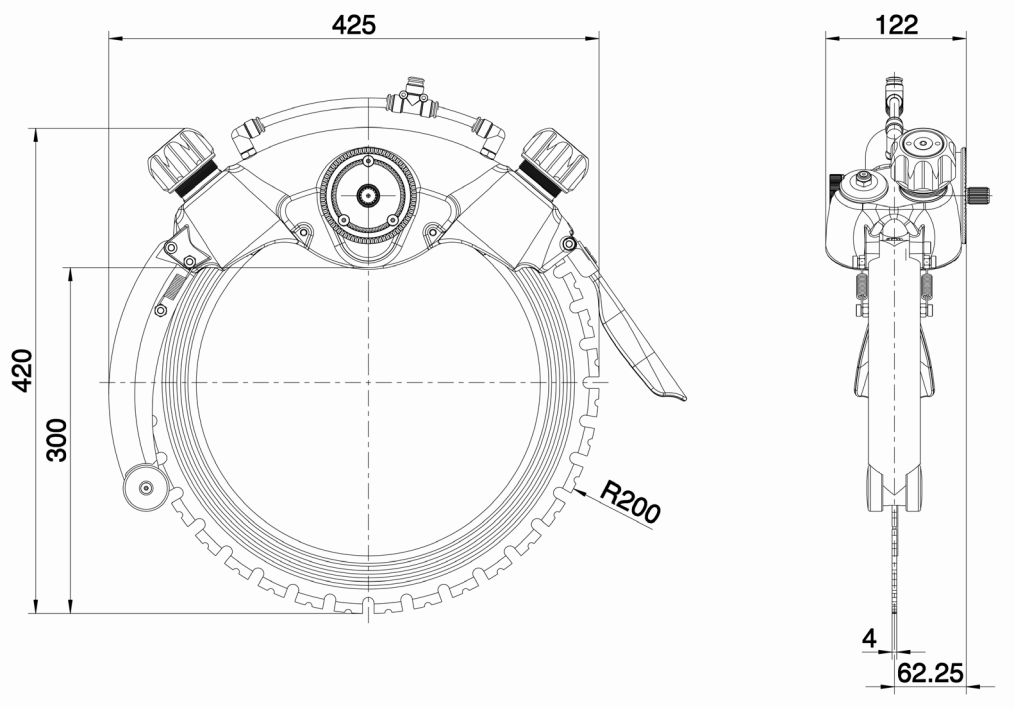
4.1.1 Squatina Full blade guard attachment



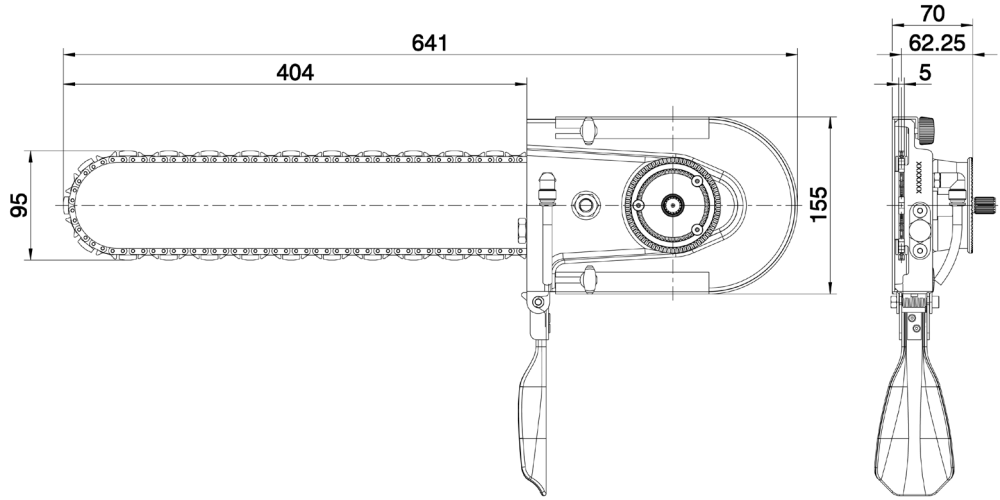
4.2.1 Squatina flush cut blade guard attachment



4.1.3 KOGIA attachment



4.1.4 ESPADA attachment



4.2 Technical data

4.2.1 SQUATINA full blade guard attachment

Maximum saw blade diameter	400	*mm*
Cooling medium	Air / Water	-
Saw blade holder diameter	1 (25.4 mm)	“
Max. depth of cut	170	*mm*
Weight	4.6	*kg*

4.2.2 SQUATINA flush cut blade guard attachment

Maximum saw blade diameter	400	
Cooling medium	Air / Water	-
Saw blade holder diameter	1 (25.4 mm)	“
Pitch diameter for fastener countersunk holes	60 (6x60° M6)	*mm*
Max. depth of cut	170	*mm*
Weight	4.5	*kg*

4.2.3 KOGIA attachment

Maximum ring saw blade diameter	400	*mm*
Cooling medium	Water	-
Max. depth of cut	300	*mm*
Weight	5.0	*kg*

4.2.4 ESPADA attachment

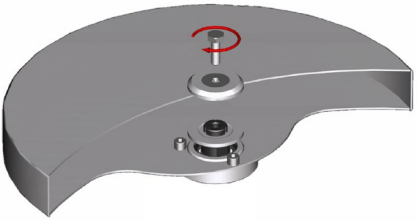
Blade length	380	*mm*
Cooling medium	Water	-
Max. depth of cut	380	*mm*
Weight	5.2	*kg*

5.0 Commissioning

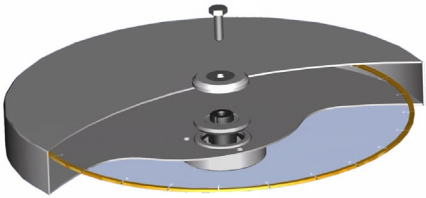
5.1 SQUATINA Full blade guard attachment

5.1.1 Saw blade change

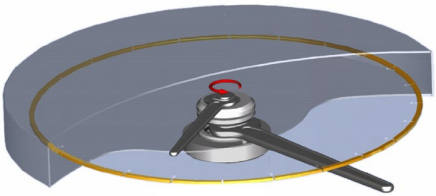
Remove the hex screw of the saw flange by turning it clockwise. Attention, the screw has a left-hand thread.
Remove the top half of the flange with the matching washer.



Insert the blade into the guard and plug it onto the output spindle fitting. Always thoroughly grease the saw blade hole and the output spindle as well as the hex screw.



Place the top half of the flange with the matching washer onto the saw blade and make sure that the flange half engages the output spindle. Attach the hex screw and tighten by turning anticlockwise. To tighten the hex screw with a SW17 spanner, you must hold the output spindle at the same time with an SW27 spanner.



5.2 SQUATINA Flush cut blade guard attachment

5.2.1 Saw blade change

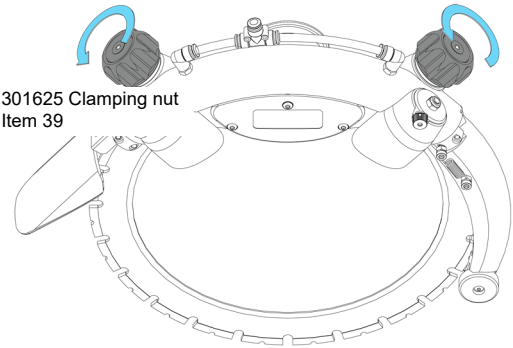
Proceed as described above in 5.1.1, but loosen or tighten the 6 hex socket countersunk head screws instead of the centred left hand thread screw.

5.3 KOGIA attachment

5.3.1 Ring saw blade change / adjustment

1. Remove the ring saw blade from the friction wheel / clamp.

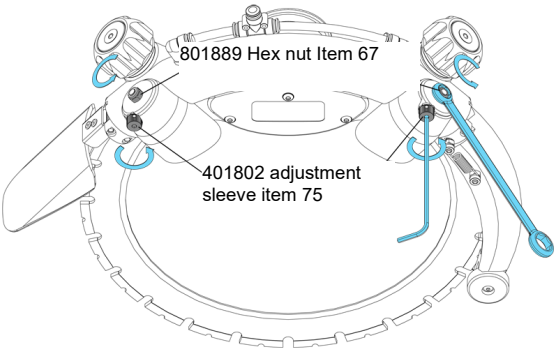
Fully release the clamping nut (item 39) by turning anticlockwise in order to remove the ring saw blade from the friction roller.



To clamp the ring saw blade, the two clamping nuts must be tightened equally by turning them clockwise as far as possible. The spring pressure must be set so that the rollers automatically reset up to the depth of wear of the ring saw blade.

2. Unhook / lift the support rollers.

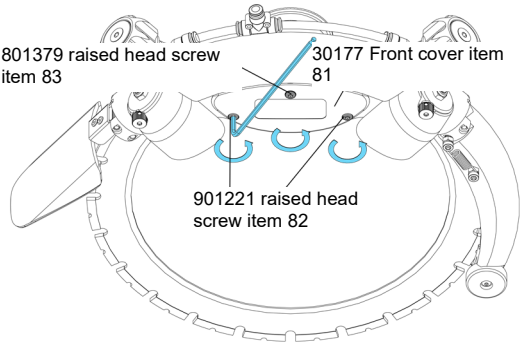
Loosen the hex nut (item 67) with the SW 13 box spanner and tighten it again slightly. Turn the adjustment sleeve (item 75) approx 8-9 turns to the left to unhook the support rollers from the ring saw blade by approx. 2 mm.



When fitting the support rollers, put the hex nut (item 67) back on slightly. Using the adjustment sleeve (item 75), put the roller onto the ring saw blade by turning it clockwise. The clamping roller may never be set onto the ring saw blade with too high a contact pressure. With the ring saw blade stationary, it must be possible to turn it by hand. Now tighten the hex nut (item 67).

3. Loosen the front cover

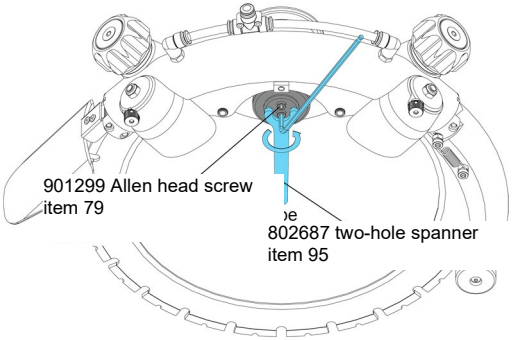
Loosen the 3 raised head screws (item 82 and item 83) with an SW 4 Allen key. Remove the front cover (item 81)



4. Replace the friction wheel

Loosen both Allen head screws with the SW 13 Allen key (item 79). To do so, lock the two-hole spanner (item 95) on the flange to hold it down.

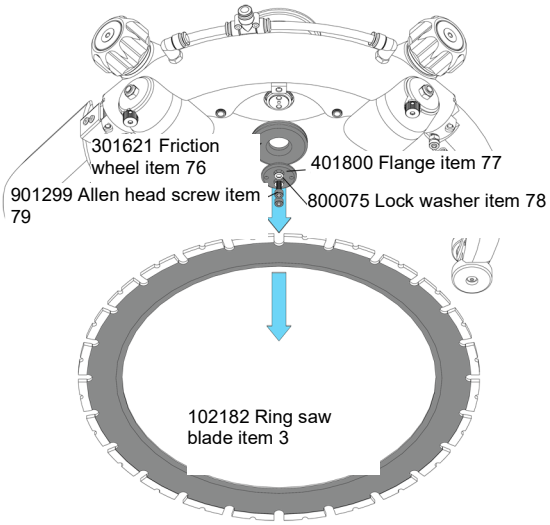
If the friction wheel is worn, it must be replaced. Only use original spare parts. Please ask your dealer.



5. Replace the ring saw blade.

The ring saw blade must not be replated with diamond segments. Only use original ring saw blades. Please ask your dealer.

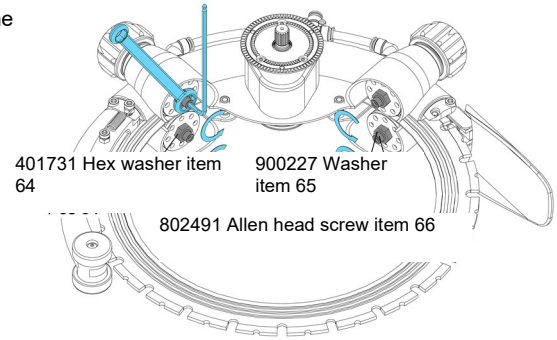
When inserting the ring saw blade, make sure that the three raised edges engage into the three grooves of the ring saw blade.



6. Loosen the support and the guide rollers

Using a swan neck SW 17 box spanner, tighten the hex washer (item 64 / 45) Loosen both Allen head screws with the SW 5 Allen key (item 66)

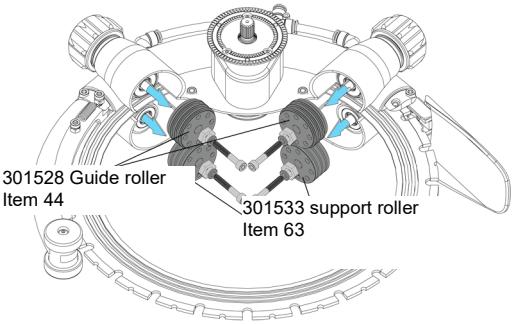
When reinserting the raised head flange screw, use medium strength Loctite.



7. Replace the support and the guide rollers

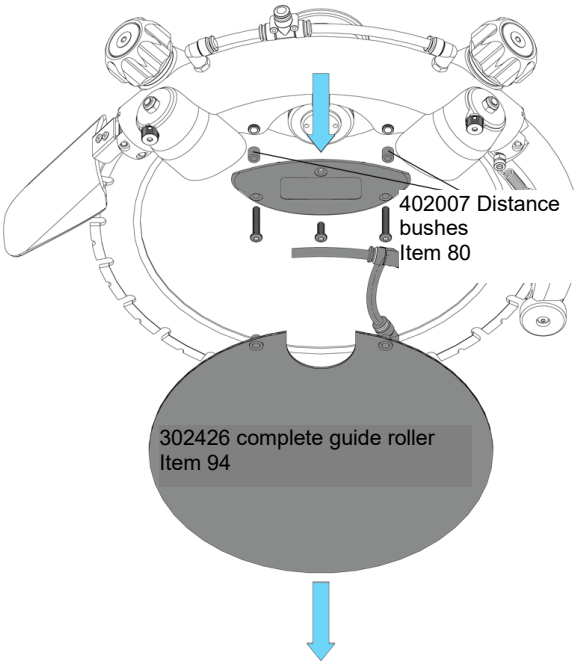
Loosen the support rollers (item 63) and the guide rollers (item 44).

The edges of the rollers that engage the ring saw blade must be sharp. If this is not the case, they must be replaced.



5.3.2 Fitting the optional guide plate

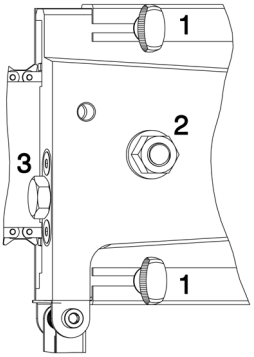
Remove the front cover (item 81), see 5.3.1 item 3.
Replace the two distance bushes (item 80) through the complete guide plate (item 94).



5.4 ESPADA attachment

5.4.1 Chain / blade change

Remove the side guard by loosening the two wing screws (1) on the console.
Loosen the hex nut (2) in the centre of the console until it can be turned by hand.



Turn the clamping screw (3) anticlockwise until the blade bears against the drive wheel.

The old chain can now be removed from the blade tip.

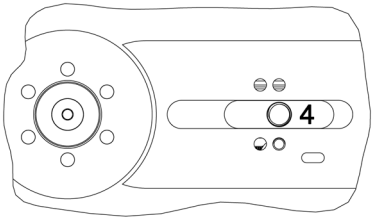
When pulling on the new chain, make sure that the chain is first placed around the drive wheel, then into the guide groove towards the blade tip.

The blade is now tensioned by turning the clamping screw (3) clockwise. The chain tension should be set so that the chain is taut but can still be moved by hand.

Tighten the hex nut (2) again.

The guard can then be pushed on again and fastened with wing screws (1). Make sure that the plastic washers of the wing screws are not clamped between guard and console.

First remove the chain as described in 5.4.1.



Remove the hex nut (2) completely and pull the holding plate from the blade.

The blade can now be easily removed from the console.

Place the new blade into the console. Make sure that the clamping pins (4) are guided into the holes provided on the blade.

Now insert the holding plate through the oval hole of the blade and insert the hex nut again (2), attach it by hand.

Move the chain to insert and tension it as described in 5.4.1.

5.5 Saw blades

You can use any saw blade with a connection bore of 1 “ (25.4 mm) . Only use saw blades which are suitable for the stone type. Using only concentric saw blades that are not deformed prolongs the service life of the drive unit. Ensure that the diamond segments have an adequate undercut in relation to the saw blade.

5.6 Cutting speed when sawing

The Squatina 400 may operate with a max. saw blade Ø of 400 mm

Saw blade Ø	Squatina 400 with SXM V			
	2830 min-1			
300 mm	45 m/s			
350 mm	52 m/s			
400 mm	60 m/s			

The Kogia 400 may operate with a max. ring saw blade Ø of 400 mm

Saw blade Ø	Kogia with SXM V			
	2025 min-1			
400 mm	43 m/s			

The Espada can be operated with various blade and chain lengths.

Blade chain length	Espada with SXM V			
	5120 min-1			
380 mm	22 m/s			
480 mm	22 m/s			
600 mm	22 m/s			

6.0 Warranty

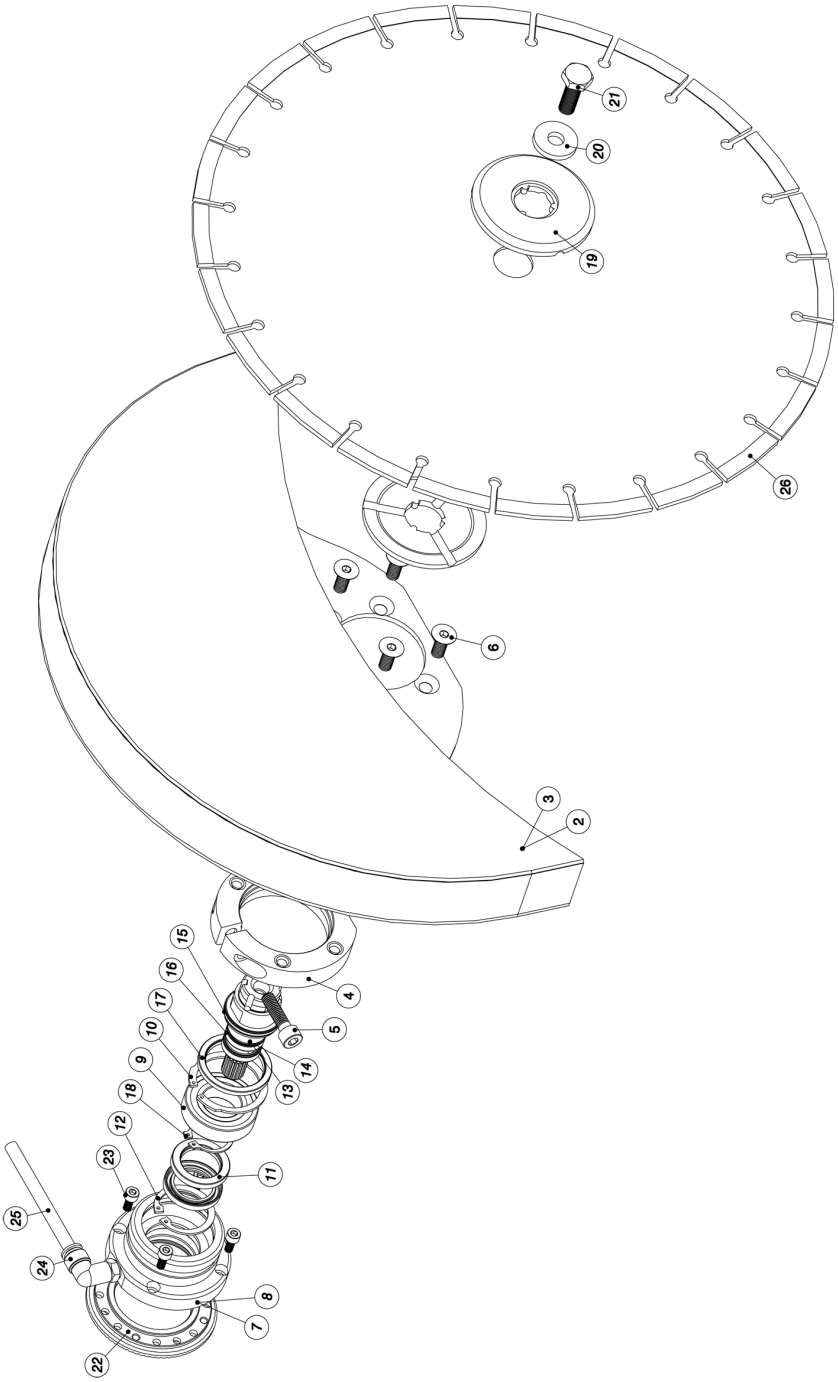
Pursuant to our Terms & Conditions of Sale, we offer a warranty of 12 months from the date of purchase. This covers the free repair of material and production defects shown to have been caused prior to sale.
An original sales receipt must always be produced when asserting a warranty claim. It must include the full address of the dealer, purchase date, and type code of the product. The user manual for the relevant product as well as the safety instructions must have been followed.
Damage caused by operating errors is not covered by the warranty.
The manufacturer's products are developed and built for specific applications. If the product is used for purposes other than the intended purpose based on the user manual, or in the event of misuse, or if unapproved accessories are used, the warranty shall become null and void.
The products must be regularly maintained and cleaned according to the instructions in the user manual. The warranty shall become null and void in the event of an intervention by third parties (opening the machine).
The warranty does not cover maintenance and cleaning work.
You must ensure that only original spare parts and accessories are used. The products must be purchased from an authorised dealer. If non-original parts are used, this may result in consequential damage and increased risk of accidents. The manufacturer is not liable for such damage. Disassembled, partially disassembled units and units repaired with third party parts are not covered by the warranty.
Certain parts are subject to normal wear and tear depending on use. These parts include e.g. carbon brushes, ball bearings, switches, mains cables, seals, etc. These consumable parts are not covered by the warranty. Consumable parts are highlighted in the spare parts lists.

7.0 General Safety Instructions

The general safety instructions can be found in the supplied safety instruction booklet.

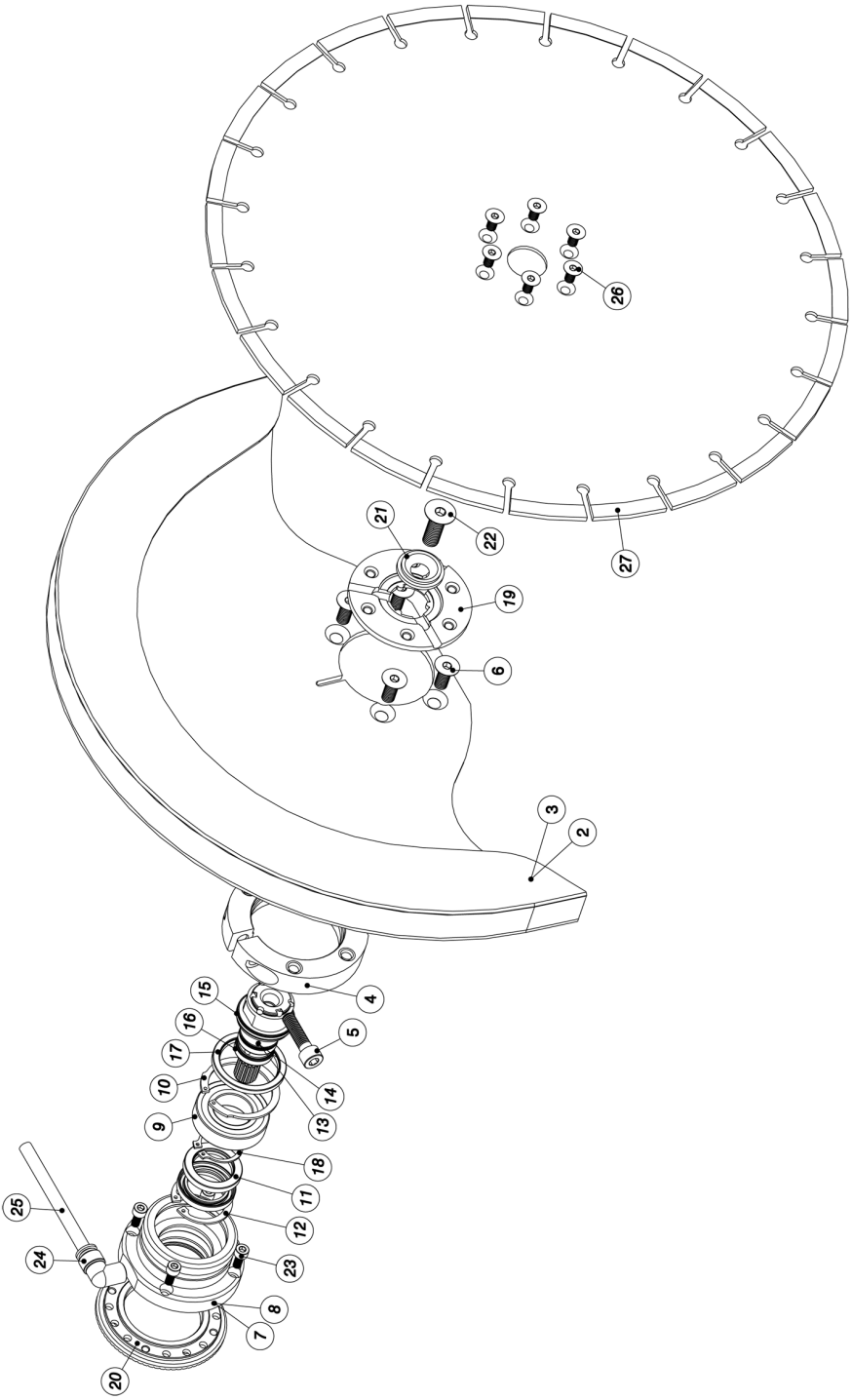
8.0 Spare parts lists

8.1 SQUATINA Full blade guard attachment



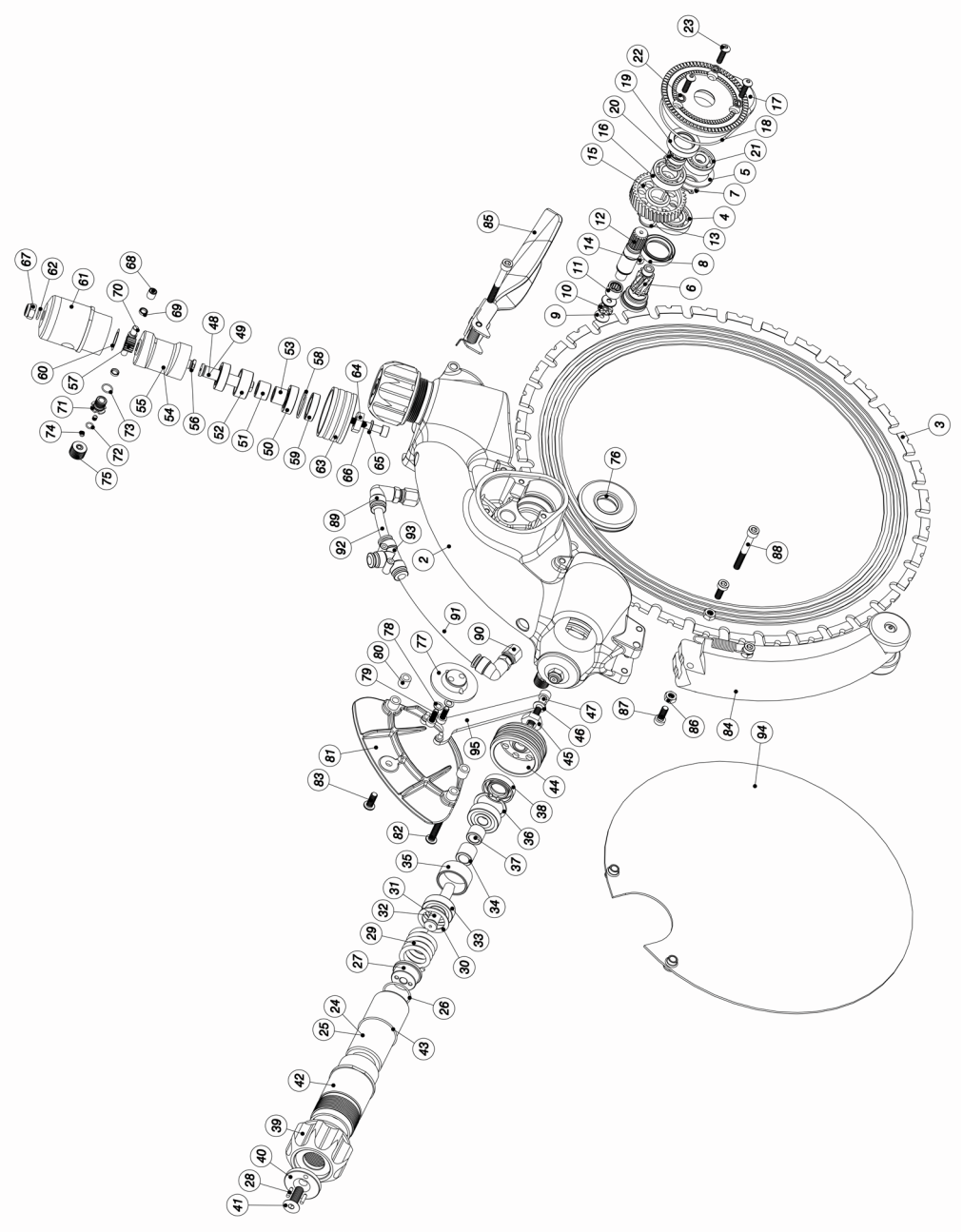
Item	Part no.	Description	No.
1	102248	Attachment SQUATINA 400 complete	1
2	101353	Guard complete	1
3	100276	Guard	1
4	401452	Hub	1
5	900302	Allen head screw	1
6	901126	Hex socket countersunk head screw	4
7	301705	Rotor WSS	1
8	102194	Rotor housing	1
9	900000	Groove ball bearing	1 **
10	801368	Snap ring	1
11	802418	Rotary shaft seal	2 **
12	900795	Snap ring	1
13	301761	Spindle complete	1
14	301704	Spindle	1
15	401668	Bushing	1
16	401853	Shaft sleeve	1
17	901116	Rotary shaft seal	1 **
18	900202	Snap ring	1
19	301244	Flange	2
20	902076	Washer	1
21	901041	Hex screw	1
22	301522	Flange	1
23	900688	Allen head screw	4
24	802402	Threaded nipple	1
25	802403	Water hose	1 **
26	302042	Saw blade	1 **
			Wearing parts **

8.2 SQUATINA Flush cut blade guard attachment



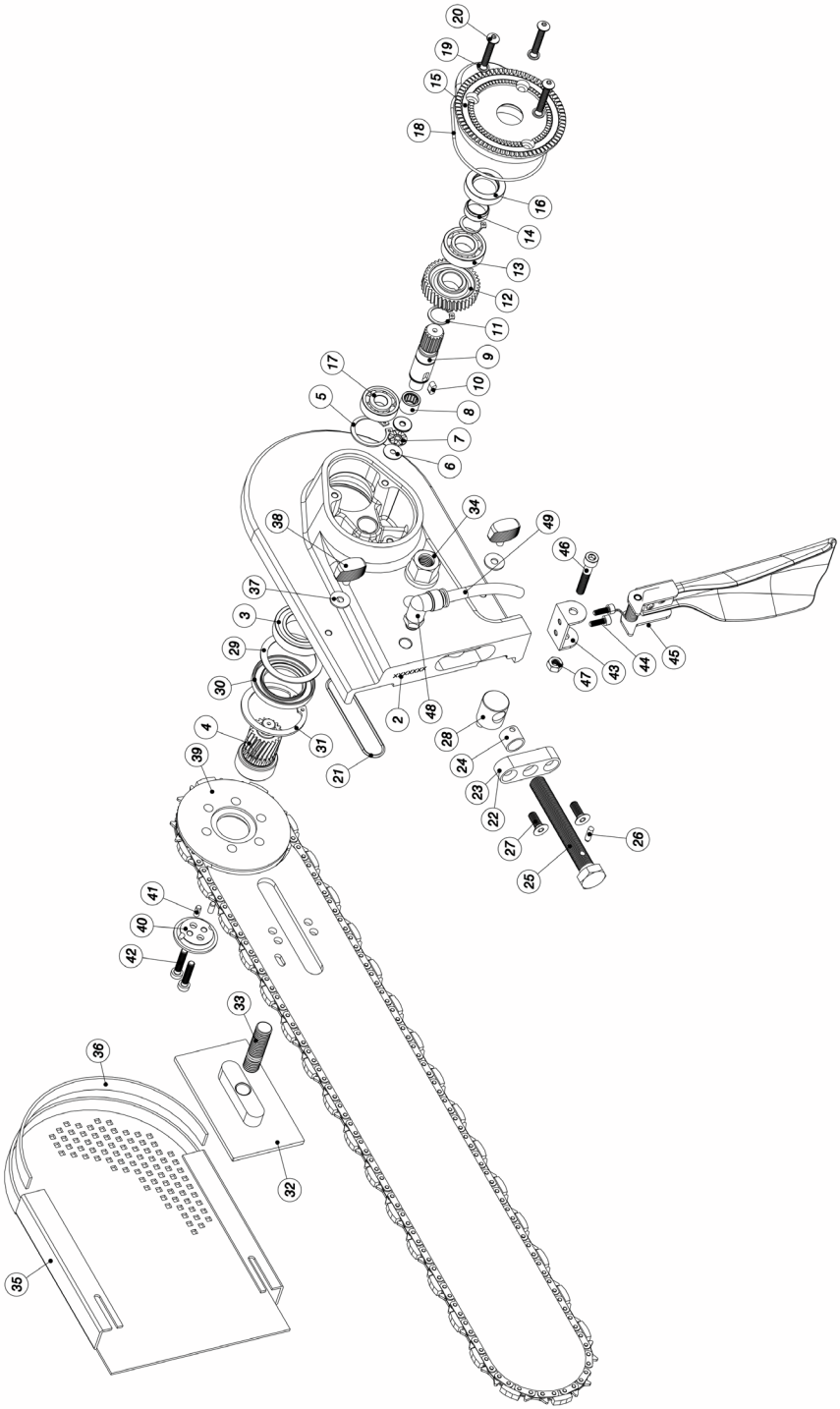
Item	Part no.	Description	No.
1	102251	Attachment Squatina 400 flush cut complete	1
2	101757	Guard complete	1
3	102372	Guard	1
4	401452	Hub	1
5	900302	Allen head screw	1
6	901126	Hex socket countersunk head screw	4
7	301703	Rotor WS BS	1
8	102194	Rotor housing	1
9	900000	Groove ball bearing	1 **
10	800559	Snap ring	1
11	802418	Rotary shaft seal	2 **
12	900795	Snap ring	1
13	301762	Spindle complete	1
14	301702	Spindle	1
15	401668	Bushing	1
16	401853	Shaft sleeve	1
17	901116	Rotary shaft seal	1 **
18	900202	Snap ring	1
19	301307	Flange	1
20	301522	Flange	1
21	401605	Washer	1
22	901065	Hex socket countersunk head screw	1
23	900688	Allen head screw	4
24	802402	Threaded nipple	1
25	802513	Water hose	1 **
26	901019	Allen head screw	6 **
27	302041	Saw blade	1 **
			Wearing parts **

8.3 KOGIA attachment



Item	Part no.	Description	No.
1	102249	Kogia attachment 400 complete	1
2	102260	Chassis complete	1
3	102182	Ring saw blade	1 **
4	901158	Groove ball bearing	1 **
5	900218	Snap ring	1
6	301900	Output gear	1
7	900208	Snap ring	1
8	802406	Rotary shaft seal	1 **
9	801573	Axial bearing washer	2 **
10	900800	Axial needle rim	1 **
11	900038	Needle bushing	1 **
12	301712	Drive shaft	1
13	900210	Snap ring	2
14	900127	Shaft key	1
15	301901	Drive wheel	1
16	900481	Groove ball bearing	1 **
17	301614	Flange	1
18	802506	O-ring	1 **
19	802451	Rotary shaft seal	1 **
20	401832	Shaft sleeve	1
21	901189	Groove ball bearing	1 **
22	802485	Sealing ring	3 **
23	901183	Raised head screw	3
24	301622	Tension rollers lever complete	2
25	301623	Tube	1
26	802426	O-ring	1 **
27	401786	Pin	1
28	900642	Dowel pin	2
29	802305	Compression spring	1
30	901337	Shim	1
31	301624	Tension shaft complete	1
32	401734	Tension shaft	1
33	900060	Groove ball bearing	2 **
34	401787	Bushing	1
35	401788	Bushing	1
36	901060	Snap ring	1
37	401728	Shaft sleeve	1
38	901181	Rotary shaft seal	1 **
39	301625	Clamping nut	1
40	401789	Washer	1
41	901336	Hex socket counters. head screw	1
42	301626	Bushing	1
43	802845	O-ring	1 **
44	301528	Guide roller	1 **
45	401731	Hex washer	1
46	900227	Washer	1
47	802491	Raised head flange screw	1
48	301627	Roller lever complete	2
49	301628	Roller shaft	1
50	901058	Groove ball bearing	2 **
51	401791	Bushing	1
52	401792	Bushing	1
53	401728	Shaft sleeve	1
54	301753	Worm gear complete	1
55	301629	Eccentric shaft	1
56	301737	Pin	1
57	301752	Worm gear	1
58	900801	Snap ring	1
59	901334	Rotary shaft seal	1 **
60	900153	Shim	1
61	301630	Bushing	1
62	900787	O-ring	1 **
63	301533	Support roller	1
64	401731	Hex washer	1
65	900227	Washer	1
66	802491	Raised head flange screw	1
67	801889	Hex nut	1
68	401831	Bushing	1
69	401877	Bushing	2
70	301738	Worm shaft	1
71	401801	Friction bearing	1 **
72	802396	O-ring	1 **
73	802484	O-ring	1 **
74	901161	Threaded pin	2
75	401802	Adjustment sleeve	1
76	301621	Friction wheel	1 **
77	401800	Flange	1
78	800075	Lock washer	2
79	901142	Allen head screw	2
80	402007	Distance sleeve	2
81	301773	Front cover	1
82	901221	Raised head screw	2
83	801379	Raised head screw	1
84	301634	Guard complete	1
85	301632	Splash guard complete	1
86	900655	Hex nut	2
87	900351	Allen head screw	2
88	900315	Allen head screw	2
89	802402	Threaded nipple	2
90	402000	Water nozzle	2
91	802757	Water hose	1
92	802786	Water hose	1
93	802726	T-plug connector	1
94	302426	Guide plate complete	1
95	802687	Two-hole spanner	1
96	803225	Gear lubricant oil	1 **
			Wearing parts **

8.4 ESPADA attachment



Item	Part no.	Description	No.
1	102255	Espada console	1
2	102254	Console	1
3	902085	Groove ball bearing	1 **
4	301881	Spindle	1
5	900202	Snap ring	1
6	801573	Axial bearing washer	2 **
7	900800	Axial needle roller and cage assembly	1 **
8	900038	Needle bushing	1 **
9	301712	Drive shaft	1
10	900127	Shaft key	1
11	900210	Snap ring	2
12	301745	Drive wheel	1
13	900481	Groove ball bearing	1 **
14	401832	Shaft sleeve	1
15	301614	Flange	1
16	802451	Rotary shaft seal	1 **
17	901189	Groove ball bearing	1 **
18	802506	O-ring	1 **
19	802485	Sealing ring	3 **
20	901183	Raised head screw	3
21	802345	O-ring	1 **
22	401760	Set screw complete	1
23	401660	Shaft key	1
24	401662	Bushing	1
25	401661	Set screw	1
26	900582	Dowel pin	1
27	900684	Hex socket countersunk head screw	2
28	401659	Eccentric pin	1
29	901350	Snap ring	1
30	803217	Rotary shaft seal	1 **
31	801368	Retainer ring	1
32	401884	Plate	1
33	902021	Stud bolt	1
34	901115	Hex nut	1
35	101963	Guard complete	1
36	401673	Seal	1 **
37	901117	Washer	2
38	802191	Wing screw	2
39	102341	Drive wheel complete	1
40	401940	Washer	1
41	900568	Dowel pin	2
42	901448	Allen head screw	2
43	301740	Bracket	1
44	900339	Allen head screw	2
45	301632	Splash guard complete	1
46	900312	Allen head screw	1
47	900655	Hex nut	1
48	802402	Threaded nipple	1
49	802785	Water hose	1 **
50	803225	Gear lubricant oil	1 **
			Wearing parts **