DALBO

POWERROLL

(EU-type approval MMPRAR)

GB

1030 & 1230

MADE IN DENMARK

MMPRAR
DALBO POWERRROLL 1030 & 1230 cm

Congratulations on your new POWERRROLL. For **safety reasons** and to make the best possible use of the machine, you should read the following instructions **before putting it into operation**.

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Points, which are of importance with regard to safety are marked ∇.

∇ Using the roller with a non-original hydraulic circuit will invalidate the warranty.

∇ DALBO cannot be held liable for damage caused by a non-original hydraulic circuit.

∇ Tighten all screw connections after a few hours' use.

∇ The hydraulics must not be operated unless the roller is properly connected to a tractor.

∇ The machine must only be operated from the tractor. There must be no-one in the immediate vicinity of the roller.

∇ The roller must not be operated by children.

∇ The driver is responsible for ensuring that the roller is correctly marked in accordance with the current Road Traffic Act.

∇ The driver is responsible for the tractor used being large enough to handle the roller properly. A minimum of 130 HP (97 kW) is recommended.

∇ Please make sure at any time to have enough clearance to overhead power lines.

Your POWERRROLL has:

VIN number: _____. Designation: _____.
Month of manufacture: _____. Net weight kg: _____.

Please always quote the serial number when making inquiries about spare parts or service.
There is a list of spare parts at the back of the booklet which provides a summary of the roller's individual parts.

EU COMPLIANCE DECLARATION

DALBO A/S
DK-7183 Randbøl

Declares herewith that the above machine is manufactured in accordance with the provisions of directive 2006/42/EC, which replaced directive 98/37/EC and change directives 91/368/ECC, 93/44/ECC and 93/68/ECC on harmonization of member state legislation concerning health and safety requirements related to the construction and manufacture of machines.

CE

This machine corresponds to the safety requirements in the European Safety Guidelines.

DALBO A/S Date: _____

Alessio Riulini, CEO

Contents:

Application:

The POWERRROLL is used before and after sowing to break up clods and press down stones. It also creates good contact between seed and soil, ensuring uniform crop germination.

The roller can also be used to advantage after stubble tilling to promote conversion of plant residues and the germination of waste and weed seeds.

The POWERRROLL can also be used for rolling pasture. Rolling presses stones down and flattens out any molehills and irregularities so that they will not hamper any future working in the field.
Rolling also breaks up the surface crust and increases the air supply to the roots.

∇ The POWERRROLL must **not** be used as a transporter, pile driver, hydraulic press or the like. If in doubt, ask your dealer or DALBO.

∇ The POWERRROLL must **not** be used for rolling roads or similar hard surfaces.

∇ When operating the roller, the user must sit in the driver's seat of the tractor, and there must be **no-one** on the roller or in its immediate vicinity.

Noise:

The roller may make a little noise during rolling, particularly if the Cambridge rings are worn. It will be well below the danger level for the tractor driver, however.

Dust:

∇ Rolling in very dry conditions may generate a great deal of dust. It is advisable to close the tractor's windows/doors and use the tractor's air-conditioning system, or to use a dust mask.

Handling:

The 12.3 m POWERROLL generally comes disassembled for transport. It should be assembled by you DALBO dealer's qualified fitters at a professional workshop which has an approved crane/lifting tackle.
It consists of the following main parts:

QTY	PARTS	WEIGHT approx.	CROSSKILL	CAMBRIDGE
1	Drawbar	435	-	-
1	Central section without rings	625	720	875
2	Inner side section	330	720	875
2	Connecting link	60	-	-
2	Outer side section	100	615	745
2	Ram 110/50x700	41		
2	Ram 80/40x350	21		
2	Ram 63/30x400	20		
2	Brake hub	70		
2	Wheel 15.0/55-17	62		
2	Wheel 19.0/45-17 (optional extra)	68		

Assembly:

See fig. 1.
The machine should be assembled by your DALBO dealer's qualified fitters at an "approved" workshop:
A crane which can lift at least 1000 kg should be used.

1. Fit the central section pos. 1 with roller rings, and position it in the centre of a flat area of floor so that it is resting on the roller rings and wheel hubs. There must be approx. 7 m of space on either side of the centre.
2. Fit the drawbar pos. 2 with the two pins pos. 3. They must be inserted from the outside so that the square end plate prevents rotation.

∇ **Remember the split pin.**

3. Connect the two red hoses to a double-acting valve on a tractor or pump station and run the two large rams pos. 4 out to their maximum length.
4. Mount the two large rams on the drawbar and central section. So that the central section stands vertically.

∇ **Remember washers and split pins.**

5. Mount the rams pos. 5 on the central section.

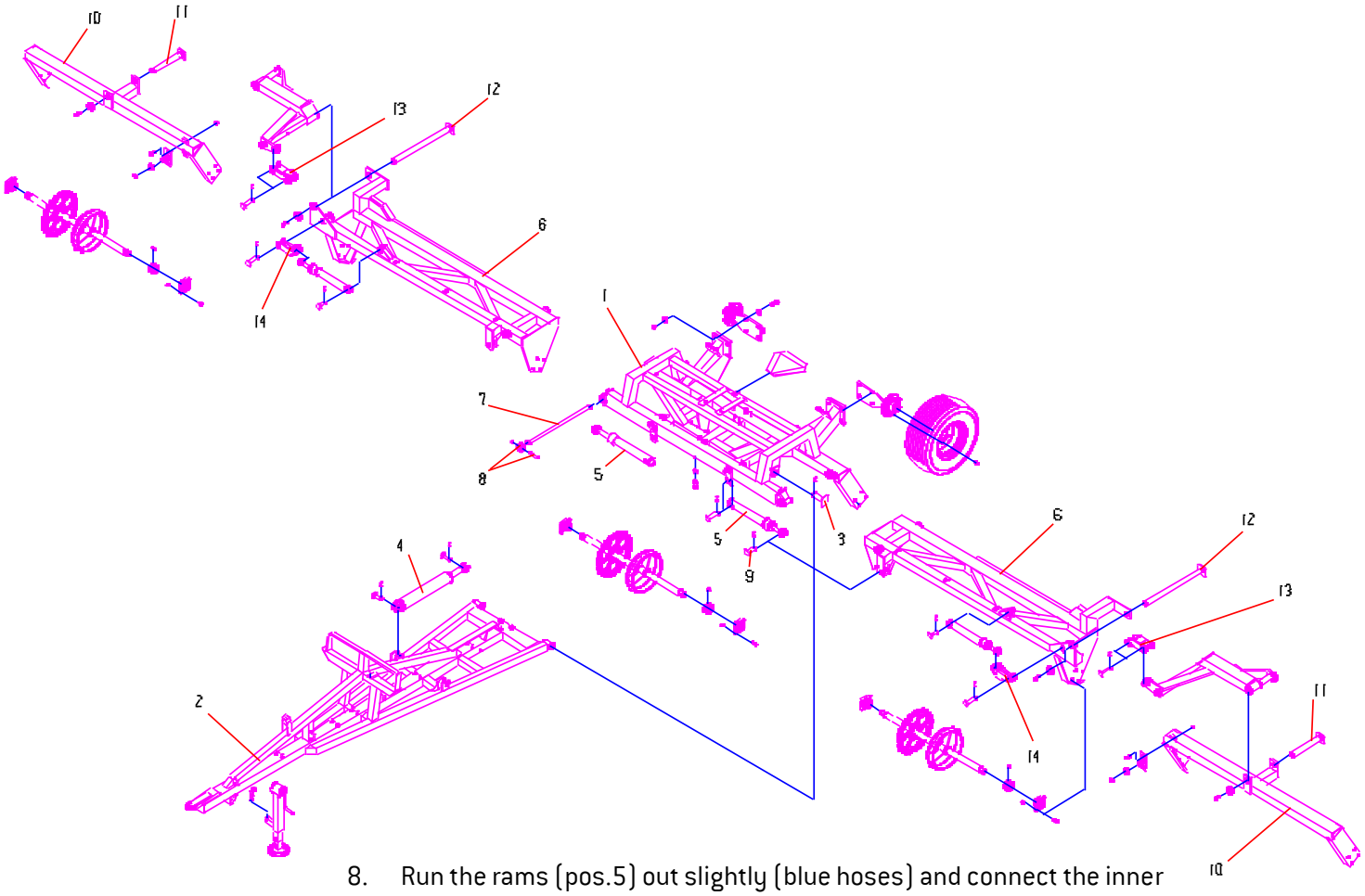
∇ **Remember the split pins.**

6. Secure the hydraulic hoses in the clamps.

7. Fit the inner side sections pos. 6 without the roller rings. This is done by hooking onto the middle of the roller section itself so that the frame can be turned to get the pin pos. 7 in.
This requires two people. It is important to guide the side sections so that hole in the bushing is aligned with the hole in the pin. Lubricate the pins before they are fitted, it is a tight fit. Do not strike the pin directly. Put a wooden block in between so as not to damage the pin.

∇ **Take care that the section does not swing round!**
Secure the pin with the loose bushing and M12 bolt pos. 8

Fig. 1:



8. Run the rams (pos.5) out slightly (blue hoses) and connect the inner sections with the pins pos. 9.

∇ **When both sections have been fitted**, swing them out **carefully** with the rams. The rams ensure that they do not swing back and tip over backwards.

∇ **Remember washers and split pins.**

9. Fit the outer sections pos. 10 with the pin pos. 11. Secure with the washer and screw the bolt, to which Loctite 270 has been applied, firmly into the end of the pin.
10. Mount the connecting links on the inner sections with the pin pos. 12. Secure with the washer and screw the bolt, to which Loctite 270 has been applied, firmly into the end of the pin.
11. Secure the rams for the outer sections to the inner sections.

12. Fit the rocker arms as shown in fig. 1 pos. 13 + 14 (pos. 13 being the wide top part) and join the outer section to the inner section with them. **Secure all pins with split pins.**
13. Mount all hydraulic hoses, components and fittings as shown in the hydraulic diagram at the back of the book.

∇ **It is very important that the hydraulic circuit is fitted according to the diagram, as the system contains several safety components. Operating the roller without these components can result in personal injury and mechanical damage.**

∇ **Using the roller with a non-original hydraulic circuit will invalidate the warranty.**

∇ **DALBO cannot be held liable for damage caused by a non-original hydraulic circuit.**

14. Operate the large rams so that the roller tips into working position. This allows the wheels to be fitted without using a jack.
15. Fit the wheels.

∇ **Remember to tighten them properly.**

16. Lift the drawbar and fit the jack. Unscrew it until the drawplate is approx. 45 cm above the ground.
17. Tip the roller up with the large rams.

∇ **Not too quickly or the roller will tip over backwards. If the hydraulics have been connected correctly, the restricted flow will ensure that these operations cannot be carried out too quickly.**

Figure 2:

18. Fit the roller rings on all side sections. Use an approved crane which can lift min. 1000 kg. roller rings with an approved strap/chain. As shown in fig. 2.

∇ **Guide the rings into place on the roller and tighten up properly.**

19. Using the rams (pos. 5), swing the side sections in until they hit the stop/ transport bearing. Keep an eye on the hydraulic hoses.

∇ **Take care not to get trapped.**

20. Using the large rams (red hoses), lower the side sections into the transport bearing.

Starting:

Connect the roller to the drawbar of the tractor . This should be approx. 45 cm above the ground so that the drawbar is horizontal in working position. If the tractor's drawbar is lower, the drawplate on the roller can be fitted underneath the drawbar.

∇ **Remember to secure the drawbar pin.**

Connect each of the two sets of hydraulic hoses to its own double-acting hydraulic tap. All the hoses have a ½" male connector. If your tractor is not equipped for this, your dealer will be able to help.
A maximum pump pressure of 160 bar is required.

∇ Defective hoses **must** be repaired or replaced immediately.
A broken hose can in bad cases cause personal injury or mechanical damage to the roller in adverse circumstances.

Operation:

The roller **must** always be operated from the driver's seat and there must be **no-one** else in the vicinity of the roller.
The changeover from transport position to working position should take place while stationary on approximately level ground with the tractor almost idling.

∇ It is **extremely dangerous** to modify the hydraulic system, as the circuit contains several safety components.

Unfolding:

Figure 3

First raise the side sections clear of their transport bearing with the large rams (red hoses). Swing the side sections out jointly, with the swing rams (blue hoses pos. 5), and then push the outer sections out into working position. Hydraulic valves on the central section ensure that this is done in the correct sequence through operation of the valve connected to the blue hoses.

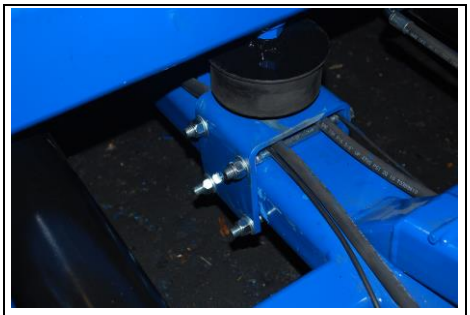


Figure 4

Tip the roller down with the large rams (red hoses) until the adjusting bolt on the central section is touching the leaf spring mounted on the drawbar. It may be necessary to adjust the bolt, depending on the height of the tractor's draw bar.
Put the operating valve, connected to the red hoses, into the neutral position.

If the adjustment is correct, the large rams should move in neutral position, the adjustment bolt should be touching the leaf spring, and all the roller sections should exert the same pressure across the full working width.

Before rolling is started, activate the swing rams (red and black hoses) for folding until the pressure gauge mounted above the accumulator reads 60-100 bar. 1030 outer section (black) only 15-30 bar. After this it is very important that the handle for the swing rams are put in floating position. The floating position is necessary to achieve hydraulic weight transfer, in which the sections are free to move individually. The accumulator will then work as an hydraulic "spring" that is preset. The presetting means that the roller transfers weight from the central section out to the side sections, ensuring uniform pressure across the full working width and giving the roller great freedom to follow uneven ground.

Check all the accumulators on the machine **at least once a year for leaks and to ensure that the precharge pressure is set correctly**. Contact an authorized DALBO dealer for more information.

Folding:

First release the pressure from the side sections (blue hoses) by unfolding them (pressure on the
Then tilt the roller up on to the wheels with the large rams (red hoses). Fold the side sections in using the swing rams (blue hoses), pulling the outer sections in first and then bringing the side sections in together until they hit the transport bearing. Finally lower the side sections into the transport bearing using the large rams (red hoses).

∇ It must not be possible for the valves to apply pressure to the roller by themselves during transport. It is advisable to put them in neutral position if possible.

The roller should only be folded for transport. It does not have to be folded for turning in the field.
It is also possible to reverse in working position.

Recommended driving speed: 6-8 kph. Slower on stony ground.

Maintenance:

Retighten all screw connections, including **hub nuts**, after the first day of work.

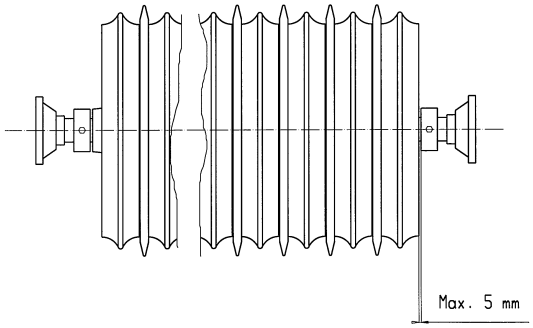
Chassis - 12 lubrication points - lubricate daily.
Roller bearings - 10 - lubricate every 50 working hours.

Lubricate the wheel bearings once a season by removing the hub caps and greasing. It is advisable to adjust the bearings before lubrication.
*For rollers fitted with air brakes:
Brake key - 2 lubrication points - lubricate once a season. Do not overlubricate, as this can damage the brakes.

Adjust the wheel bearings once a season. Follow the instructions for replacing wheel bearings, points 1, 2, 11, 12 and 13.

Stopring adjustment. After the first season the surface of the stoprings will be worn smooth, so they will take up slightly less space. Adjust the play which has been created, down to max. 5 mm by moving the stoprings, see fig. 6. Remember to do the stopring screws up tightly. It is advisable to undo and tighten the screws a few times so that they grip better.

Fig. 5



Tire pressure:

400/60-15,5 Alliance

Size	Rim	Unloaded Dimension		Loaded Static radius mm	Rolling Circumference mm	Load Index PR Symbols	Inflation Pressure bar	Recommended Load							
								Speed							
								Drive wheel				Free rolling			
		SW mm	OD mm					10 kmph	25 kmph	40 kmph	50 kmph	10 kmph	25 kmph	40 kmph	50 kmph
400/60-15.5	13.00DC	404	874	377	2510	148A8 136A8	1	1320	1120	940	846	1860	1580	1330	1200
							2	1970	1680	1410	1269	2790	2370	1990	1790
							2.5	2250	1920	1610	1449	3180	2700	2270	2040
							3.5	2740	2330	1960	1764	3860	3280	2760	2480
							4	2970	2520	2120	1908	4170	3550	2980	2680
							4.4	3140	2670	2240	2016	4410	3750	3150	2840

480/45-17 Alliance

Size	Rim	Unloaded Dimension		Loaded Static radius mm	Rolling Circumference mm	Load Index PR Symbols	Inflation Pressure bar	Recommended Load							
								Speed							
								Drive Wheel				Free Rolling			
		SW mm	OD mm					10 kmph	25 kmph	40 kmph	50 kmph	10 kmph	25 kmph	40 kmph	50 kmph
480/45-17	16.00x17	491	866	380.35	2562	14	0.8	1430	1290	1020	918	2020	1710	1440	1300
						146A8 134A8	1.5	2060	1850	1470	1323	2910	2480	2080	1870
							2.8	2970	2670	2120	1908	4200	3570	3000	2700
							3	3090	2780	2210	1989	4370	3710	3120	2810

520/50-17 STARCO

520/50-17 159B TL STARCO SG Flotation (FREE WHEEL)												
	1.0bar	1.3bar	1.6bar	1.9bar	2.2bar	2.5bar	2.8bar	3.1bar	3.3bar	3.5bar	3.8bar	**4.0bar**
10km/h	2895	3375	3810	4215	4595	4950	5290	5615	5825	6030	6325	6520
15km/h	2570	2995	3380	3735	4070	4385	4685	4975	5160	5340	5605	5775
20km/h	2430	2835	3200	3540	3855	4155	4440	4715	4890	5060	5310	5470
25km/h	2315	2700	3050	3370	3670	3955	4225	4485	4650	4815	5050	5205
30km/h	2175	2535	2860	3165	3450	3720	3975	4220	4375	4530	4755	4900
35km/h	2120	2470	2790	3085	3360	3620	3870	4105	4260	4410	4630	4770
40km/h	2065	2405	2715	3000	3270	3525	3765	3995	4145	4290	4500	4640
45km/h	2005	2335	2635	2915	3175	3420	3655	3880	4025	4165	4370	4505
50km/h	1945	2265	2555	2825	3080	3320	3550	3770	3910	4045	4245	**4375**

When parking for a fairly long time under damp conditions, projecting piston rods should be greased to prevent rust.

REPAIRS:

Removing/mounting wheels on the road

To remove a wheel on the road, hoist the drum with a strap and crane (A), or car jack (B) as shown in the pictures below. Make sure, that the car jack has a secure stand and the implement is connected with the tractor. The wheel will thus be free of the ground.
The wheel nuts are removed and the wheel can be replaced. After installing the new wheel, screw the nuts on and tighten with a "firm hand". Next, lower the wheels so that they are touching the ground and tighten the nuts to 300 Nm.

It is important that the wheel nuts and wheel surfaces are clean, otherwise the wheel nuts may loosen.

It is important that the lifting device is able to manage 75% of the machine's total weight. In addition, the machine must be properly braked and secured.

Fig. 30

Removing/mounting wheels on the ground

To remove wheels, unfold the drum with the rings resting on the base. The wheels will not therefore touch the ground.
The wheel nuts are removed and the wheel can be replaced. After installing the new wheel, screw the nuts on and tighten with a "firm hand". Next, lower the wheels so that they are touching the ground and tighten the nuts with 300 Nm.

It is important that the wheel nuts and wheel surfaces are clean, otherwise the wheel nuts may loosen.

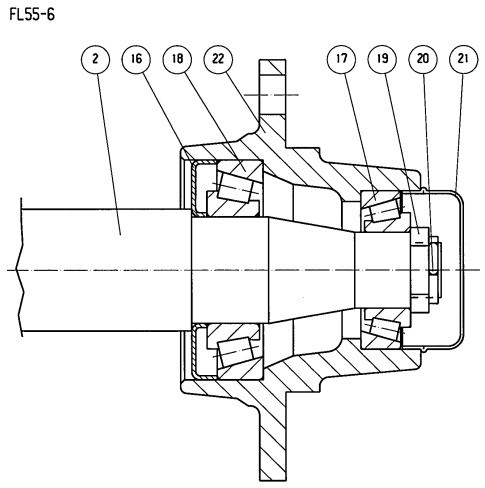
Re-tighten the wheels after 1-2 hours of use.

Replacing wheel bearings. See fig. 6.

1. Remove the hub cap (pos. 21).
2. Remove the split pin (pos. 20).
3. Undo the nut (pos. 19).

4. The shaft (pos. 2) can now be knocked out.
5. The bearings (pos. 17 + 18) can now be removed.
6. The sealing ring (pos. 16) can now be removed.
7. Fit the outer races from the bearings (pos. 17 + 18) in the hub casing (pos. 22).
8. Fit the sealing ring (pos. 16).
9. Fit the inner race from the bearing (pos. 18) on the axle (pos. 2) and fit the axle in the hub casing.
10. Fit the inner race from the bearing (pos. 17) on the axle (pos. 2).
11. Screw the nut (pos. 19) onto the axle (pos. 2) while turning the hub casing (22). Tighten the nut until it is difficult to turn the hub casing (pos. 22). Then loosen the nut until the hub casing can be turned without resistance again.
12. Fit the split pin (pos. 20).
13. Fit the hubcap (pos. 21).
14. Lubricate the hub with ball bearing grease.

Fig. 6:



Bearings, rings and shafts:

Removal of roller shaft with rings for replacement of bearings, rings or shaft. Should be done at a workshop.

Side section - REMOVAL:

∇ This requires an approved crane which can lift at least 1000 kg.
Park the roller with the section in question beneath the crane - preferably connected to a tractor. If there is no tractor, an hydraulic pump with two double-acting valves will be required. The pump must be able to supply a pressure of at least 160 bar.
Tie the opposite section in to the guide shackle above the transport bearing so that it can still be moved up and down. Lift the side sections free from the transport bearing with the large rams (red hoses). Swing the side section in question approx. 1 m out to the side with the swing ram (blue hoses).

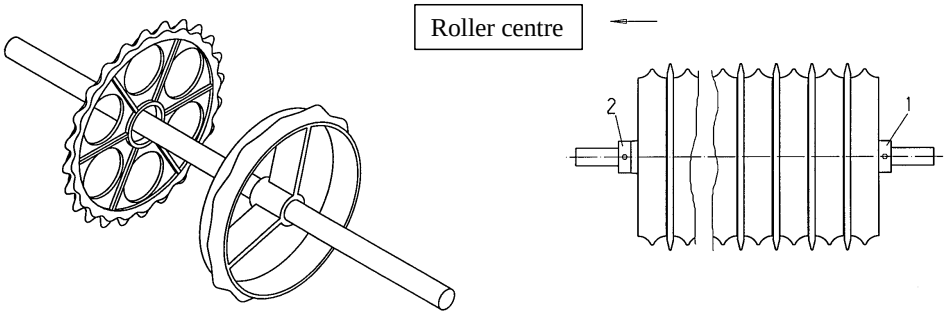
Attach carefully with two chains/straps around the rings approx. 1 m apart. Lift until the chains/straps are taut. Undo the nuts by the bearings. Lift with the crane until the screws are loose. Remove them, and the entire shaft can be manoeuvred off.

∇ Clean the grease off the bearing housing. Clean the projecting shaft end with a file to remove any burrs. Undo the stop screws in the bearings. The bearings can now be pulled out.

When the stopring with the two stop screws has been removed, the roller rings can be pulled off the shaft.

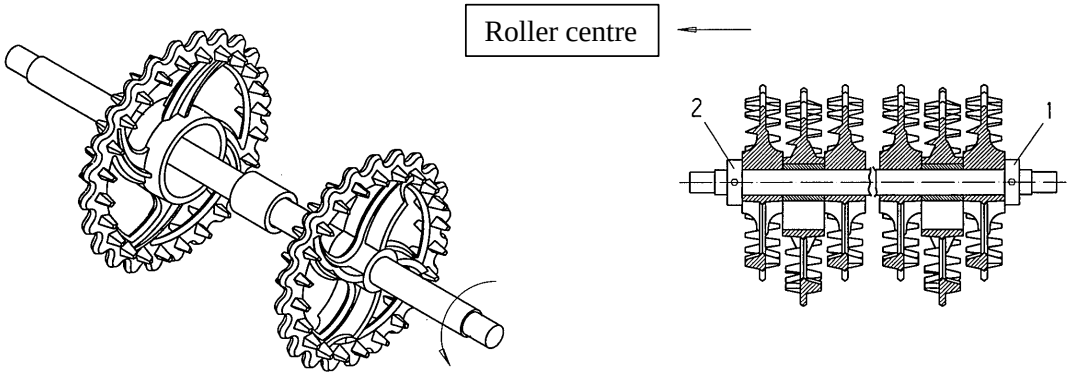
ASSEMBLY:
Cambridge rings. After the outside stopring, fig. 7 pos.1, start with a smooth ring with its "nose" pointing in, see fig. 7. Follow this with a serrated ring with the smooth side facing out. It should go right up over the hub ("nose") of the smooth ring.
Continue in the same way until approx. 12 cm is left. Omit the last serrated ring. Make sure that the rings are tight up against each other.

Fig. 7:



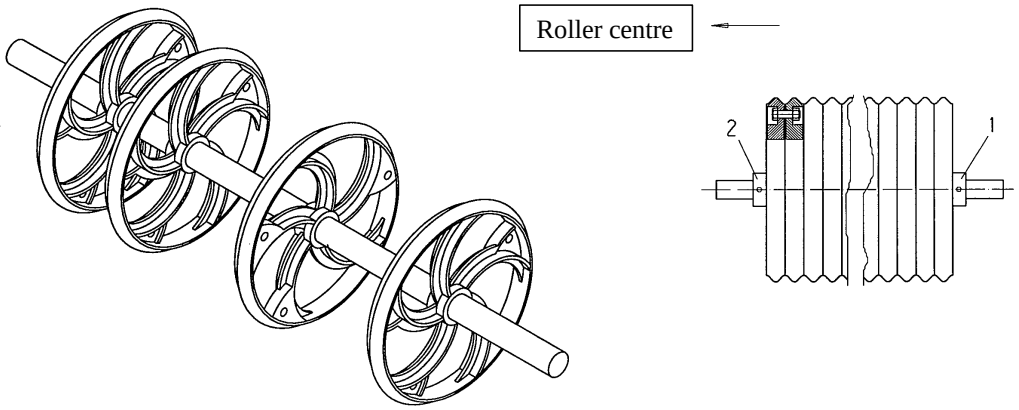
Crosskill rings. Note the direction of rotation of the shaft. After the outside stopring, fig. 8 pos.1, start with a small ring. It must face as shown in fig. 8. Then fit a bushing.
On top of this fit a large ring which faces as shown in fig. 8.
Finish with a small ring. Make sure that the rings are tight up against each other.

Fig. 8:



Welled rings. Start with two rings which are bolted together as shown in fig. 9.
Fill the shaft until approx. 22 cm is left. Then finish with two rings bolted together.
Make sure that the rings are tight up against each other.

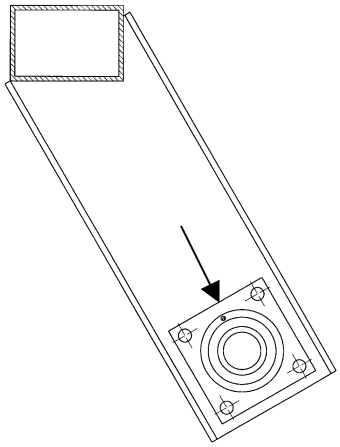
Fig. 9:



Insert the stopring, fig. 8-10 pos. 2, and tighten well. It is advisable to undo and tighten it several times so that the screws can grip properly. Then push the bearings onto the shaft.

∇ Unfold the roller frame as described above. Attach two chains/straps. Lift the complete shaft with rings up and into the roller frame using an approved crane (min. 1000 kg).
Note that the last stopring to be fitted, fig. 7 -9 pos. 2, must face the middle of the roller.
Fit the bearings and tighten. Remember to position the lubrication nipples so that they can be lubricated, see fig. 10. Apply Loctite no. 270 to the stop screws and tighten well. Fold the roller as described under operation.

Fig. 10:



Central section - REMOVAL:
Hitch the roller to a tractor if possible. If a tractor is not available, a hydraulic pump with two double-acting valves will be required. It must be able to supply a pressure of at least 160 bar.
Lift the side sections free of the transport bearings with one of the valves (red hoses). Swing them right out with the other valve (blue hoses).

∇ If the roller is not hitched up to a tractor, **it must be unfolded carefully to prevent it from tipping over backwards**.
Tip the roller down until the roller rings are standing on the ground.

∇ The swing rams (blue hoses) **MUST NOT BE OPERATED** in this situation.

∇ Now the bolts holding the ball bearings can be removed. **Watch your fingers.** Then tip the roller up carefully. Make sure that the roller shaft remains on the ground.

Cambridge rings. Start with a smooth ring with its "nose" pointing in, see fig. 8.
Follow this with a serrated ring with the smooth side facing out. It should go right up over the hub ("nose") of the smooth ring.
Continue in the same way until approx. 12 cm is left. Omit the last serrated ring.
Make sure that the rings are tight up against each other.

Crosskill rings. Note the direction of rotation of the shaft. Start with a small ring. It must face as shown in fig. 8. Then fit a bushing.
On top of this fit a large ring which faces as shown in fig. 8.
Finish with a small ring. Make sure that the rings are tight up against each other.

Welled rings. Start with two rings which are bolted together as shown in fig. 9.

Fill the shaft until approx. 22 cm is left. Then finish with two rings bolted together. Make sure that the rings are tight up against each other.

Insert the stoprings, fig. 22 pos. 53. The protruding shaft ends must be the same length. This is achieved by striking the shaft. Tighten the stoprings well. It is advisable to undo and tighten them several times so that the screws can grip properly.
Then push the bearings onto the shaft ends.
Unfold the roller frame as described above under removal. Push the complete shaft up against the frame. In the case of a crosskill roller, make sure that the direction of rotation is correct as shown in fig. 8.
Fit the bearings and do up well. Remember to position the lubrication nipples so that they can be lubricated, see fig. 10.

Tip the roller to the vertical.

∇ **THE SWING RAMS MUST NOT** be operated before THE ROLLER IS ALL THE WAY UP.

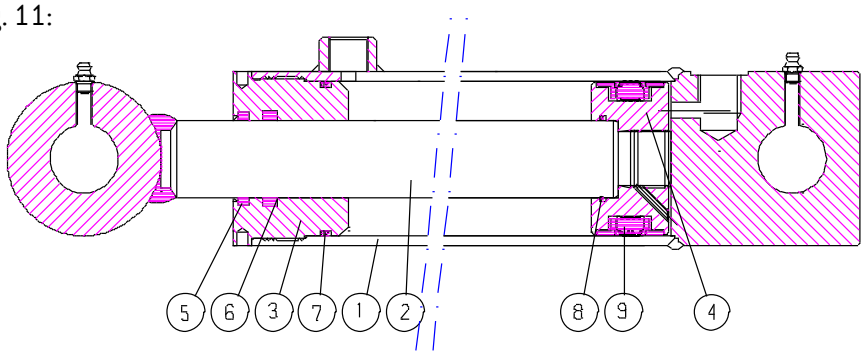
Rams:

Swing rams (inner fig. 22 pos.46 outer fig. 23,24 pos. 67**):**
This can be done with the roller in transport or working position. The rams must be unpressurised in both cases.
Disconnect the hoses. It is advisable to place a bucket underneath to collect oil.
Take off the split pins and washers, then the ram can be removed. It weights 21 kg.

Assemble in reverse order. After assembly swing the side wings out and in carefully a few times (see under operation) to get the air out of the system.
Check that the hoses can follow without getting caught, and that the connections are not leaking.

Ram – inside:
Replacing the hydraulic sealings:
REMOVAL:
1. Empty the oil from the ram, compressed air can be used to move the piston rod back and forth, to press the oil out.
2. Place the piston rod in the middle position. Unscrew the gland (pos. 3) 30 mm out. If the gland can't be unscrewed, it may be necessary to warm it up to 300°c. Let it cool off slowly. With the gland screwed out, pull the piston rod out towards the gland. Screw the gland all the way off, and the piston rod can now be removed.
3. Remove the sleeve (pos. 4).
4. Pull the gland off the piston rod (pos. 2).
5. The sealings above the sleeve are now removed, (pos. 5,6,7,8,9), use either a awl or a screwdriver.
6. Clean all the parts. Check for filings and shavings, make sure that their is no rust in the gland. If this is the case, it must be romoved.

Fig. 11:



ASSEMBLING:

1. Assembel the new sealings in the gland and sleeve. The scraper ring pos. 5 is mounted with the help of a pipe, that fits around the outside of the lip. The sleeve (pos. 9) is mounted with a round iron bar or screwdriver
2. The threads on the gland and ram housing should be greesed before assembling, (rust protection).
3. The gland pos. 3 is now mounted over the piston rod.
4. The sleeve pos. 4 is mounted and locked in place with "loctite". Make sure that the threads are clean, no oil or greese. **With use of loctitte, you must not fill the ram with oil the first 12 hours.**
5. Oil the sleeve and the top end of the ram housing, and press the pistion rod into the middel position.
6. Screw the gland down tight.

Ram – outside:

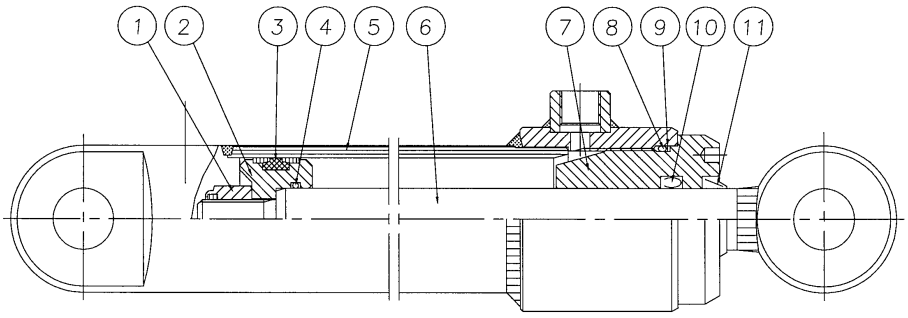
Replacing the packing set:

REMOVAL:

1. Drain the oil out of the ram (if necessary use compressed air to move the piston forward and back to force the oil out.
2. Run the piston into middle position. Unscrew the top (pos. 7) 30 mm. If the top is sitting very tight, this can be remedied by heating the front of the sleeve to approx. 300°C and then cooling it gently. Once the top has been screwed out, pull the piston out towards the top, then screw the top right off and remove the piston.

3. Remove the lock nut (pos. 1).
4. Remove the sleeve shoe (pos. 2).
5. Pull the top off the piston rod (pos.7).
6. Remove the packings from the top and sleeve shoe (pos. 3 + 4 + 8 + 9 + 10 + 11) - use an awl or screwdriver if necessary).
7. Clean all the parts and check for shavings, burrs, etc. Check whether there is any rust around the oil ring (pos. 11) in the top. If there is, it must be removed.

Fig. 12:



ASSEMBLY:

1. Fit new packings in the top and sleeve shoe. Fit the oil ring (pos. 11) using a piece of pipe which fits round the outside of the lip (or a special mandrel. Fit the sleeve (pos. 3) on the sleeve shoe using a round bar/screwdriver.
2. Lubricate the thread on the top and the ram sleeve with grease (corrosion-preventing anti-seizing agent.
3. Fit the top (pos. 7) on the piston rod.
4. Fit the sleeve shoe (pos. 2) and lock the lock nut with Loctite. Make sure that the thread is completely clean and free from oil and other impurities before using Loctite.
   Oil must not be put in for 12 hours after using Loctite.
5. Lubricate the sleeve (pos. 3) on the sleeve shoe and the inside of the far end of the ram sleeve with lubricating oil, then push the piston into middle position.
6. Screw the top on and tighten.

Tilting rams:
This is done with the roller in transport position. Disconnect the hoses. It is advisable to place a bucket underneath to collect oil
Take off the split pins and washers, then the ram can be removed. It weighs 41 kg.

Assemble in reverse order.

∇ There **must** be an air vent/plug in the top connection on one of the rams.
After assembly lift the side wings free from the transport bearings a few times (see under operation). Check that the oil connections are not leaking.

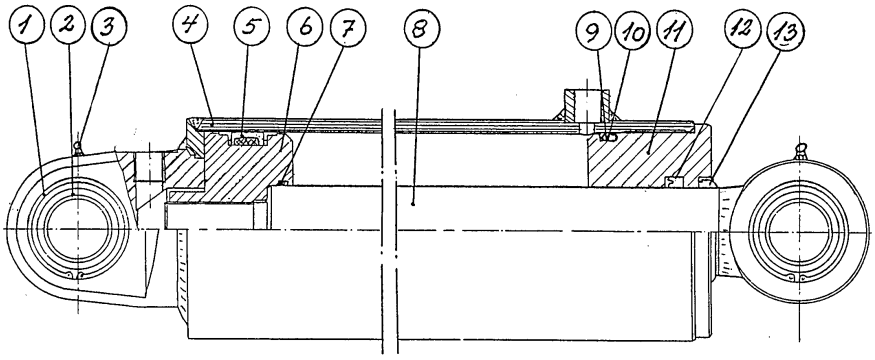
Replacing the hydraulic sealings:
REMOVAL:

1. Drain the oil out of the ram (if necessary use compressed air to move the piston forward and back to force the oil out.
2. Run the piston into middle position. Unscrew the top (pos. 11) 30 mm. If the top is sitting very tight, this can be remedied by heating the front of the sleeve to approx. 300°C and then cooling it gently. Once the top has been screwed out,

pull the piston out towards the top, then screw the top right off and remove the piston.

3. Remove the sleeve shoe (pos. 6).
4. Pull the top off the piston rod (pos.1).
5. Remove the packings from the top and sleeve shoe (pos. 5 + 7 + 9 + 10 + 12 + 13) - use an awl or screwdriver if necessary).
6. Clean all the parts and check for shavings, burrs, etc. Check whether there is any rust around the oil ring (pos. 13) in the top. If there is, it must be removed.

Fig. 13:



ASSEMBLY:

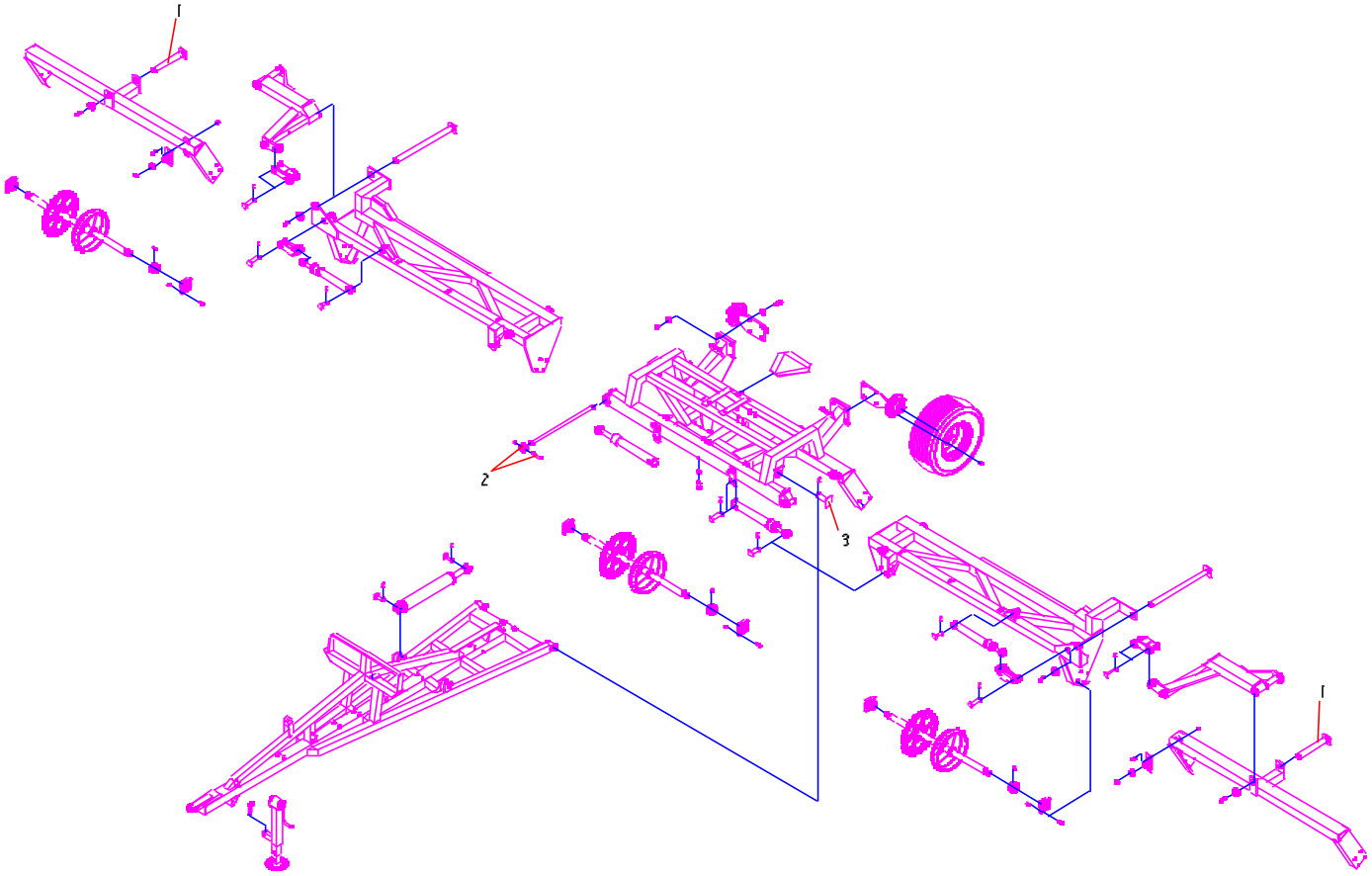
1. Fit new packings in the top and sleeve shoe. Fit the oil ring (pos. 13) using a piece of pipe which fits round the outside of the lip (or a special mandrel. Fit the sleeve (pos. 3) on the sleeve shoe using a round bar/screwdriver.
2. Lubricate the thread on the top and the ram sleeve with grease (corrosion-preventing anti-seizing agent.
3. Fit the top (pos. 11) on the piston rod.
4. Fit the sleeve shoe (pos. 6) and lock with Loctite. Make sure that the thread is completely clean and free from oil and other impurities before using Loctite. **Oil must not be put in for 12 hours after using Loctite.**
5. Lubricate the sleeve (pos. 6) on the sleeve shoe and the inside of the far end of the ram sleeve with lubricating oil, then push the piston into middle position.
6. Screw the top (pos. 11) on and tighten.

Outer sections:

Outer sections should be replaced at a workshop. See fig. 14.
This job is best done with the roller in transport position.
Remove the shaft with roller rings as described above.
Hook onto roughly the middle of the frame and lift until the pin (pos. 1) can be taken out.

∇ **Take care. As the pin is taken out, the roller frame can swing round.**
Assemble in reverse order.

Fig. 14:



Intermediate sections:

Intermediate sections should be replaced at a workshop. See fig. 14.
This job is best done with the roller in transport position.
First remove the outer section as described above.
Secure the opposite section with a piece of rope to prevent it from swinging out.
It must be able to tip up from the transport bearing.
Lift the roller sections free from the transport bearing using the large rams (red hoses).
Swing the section in question out using the inner swing ram (blue hoses).

Remove the ram. The hoses can remain attached.
Remove the locking screws (pos. 2).
Hook onto the centre of the roller frame and lift so that the large pin can be removed.

∇ **Take care. The frame can swing round.**
Assemble in reverse order.

Drawbar:

The drawbar should be replaced at a workshop which has a crane. Max. weight 700 kg.
Put the roller on a level surface in working position without a tractor. Lift the front end and remove the jack.
Lift just in front of the roller's main frame until the main pin is loose.
Remove the rams. This can be done without disconnecting the oil hoses.

∇ Knock/pull the main pin ´s out. Take care that the drawbar does not turn round.
Assemble in reverse order.

Scrapping:

Dismantle the roller in the following order:
1. Side shafts with rings, see page 11.
2. Central shaft with rings, see page 13.
3. Side sections, see page 18.
4. Wheels, see page 10.
5. Drawbar, see page 19.

Send the oil hoses, oil, tyres and hoses for incineration. The rest can be melted down and reused.

OPTIONAL EXTRAS:

Air brakes:

The 12.30 m POWERRROLL can be fitted with a WABCO dual-circuit air brake system for the German market, for example, to comply with StVO (Road Licensing Regulations).
The system is dimensioned and supplied by:

TRANSPORT-TEKNIK A/S
Sydholmen 10
DK-2600 Hvidovre
☎ +45 31 49 15 33
Fax +45 31 49 78 79

Spare parts for the system can be obtained through DALBO or from TRANSPORT-TEKNIK direct.
WABCO is an international company with service centres in Germany, Belgium, Brazil, France, the UK, Holland, India, Italy, Japan, Austria, Sweden, Switzerland, Spain and the USA.
The following service centres are to be found in Germany:

GESCHÄFTSSTELLE BERLIN
Gustav-Adolf-Str. 129 B (DGZ)
13086 Berlin
☎ (0 30) 47 80 05-0
Fax (0 30) 47 80 05-40

GESCHÄFTSSTELLE FRANKFURT
Werrastrasse 25-29
Postfach 90 03 10
60486 Frankfurt
☎ (0 69) 79 30 08-0
Fax (0 69) 79 30 08-39

GESCHÄFTSSTELLE HANNOVER
Lagerstrasse 2
30453 Hannover
Postfach 91 12 80
30432 Hannover
☎ (05 11) 9 22-0
Fax (05 11) 2 12 38 36

GESCHÄFTSSTELLE KÖLN
Vogelsanger Strasse 275
50825 Köln
☎ (02 21) 5 46 90-0
Fax (02 21) 5 46 90-33

GESCHÄFTSSTELLE MÜNCHEN
Ratoldstrasse 71
80995 München
☎ (0 89) 31 21 33-0
Fax (0 89) 31 21 33-99

GESCHÄFTSSTELLE STUTTGART
Steinbeistrasse 16
70736 Fellbach
Postfach 21 60
70711 Fellbach
☎ (07 11) 5 75 45-0
Fax (07 11) 5 75 45-55

The following firms in Germany carry a full range of equipment, comprising:

- Original WABCO brake equipment
- All screw connections, hoses, hose clips, brackets, etc.
- Fitting instructions
- Brake diagram

Fendt:
X. Fendt & Co.
Joh Georg Fendt Strasse 4
87616 Marktoberdorf
☎ (0 83 42) 77-1
Fax (0 83 42) 77 220

Case/IH:
J.I Case GmbH
Postfach 10 07 54
41407 Neuss
☎ (0 21 01) 15 1-0
Fax (0 21 01) 15 15 98

Gebrüder Pfeiffer GmbH & Co. KG
Postfach 200146
41497 Grevenbroich
☎ (0 21 81) 78 66 to 87 68
Fax (0 21 81) 7 38 89

K.H.D.:
Ersatzteilvertrieb, Werk Köln-Deutz
Klöckner-Humbold-Deutz AG
51005 Köln
☎ (02 21) 8 22-70 78
Fax (02 21) 8 22-69 29

Schlüter
Anton Schlüter München GmbH
Werk Freising
Münchener Str. 32
85345 Freising
☎ (0 81 61) 1 30 51 to 1 30 55
Fax (0 81 61) 49 01

Landini, MF, Renault, Torpedo, Valmet, Zetor, ZT
Dipl.-Ing. Tietjen GmbH
Haus der Landtechnik
Calle Nr. 40
27333 Brücken
☎ (0 42 51) 37 72
Fax (0 42 51) 34 20

Belarus
Minsker Traktorenwerk
BELIMPEX Handels-GmbH
Aussenstelle Wiederoda/Oschatz
-Siedlung-
04779 Wiederoda
☎ (03 43 64) 2 26
Fax (03 43 64) 2 27

In Austria
(all tractor types):
Josef Atzlinger
A-4491 Niederneukirchen
☎ (00 43) 72 24 86 08

Case, John Deere, Ebro, Eicher, Fendt,
Fiatagri, Ford, Hürlimann, KHD, Lamborghini,

Air brake diagram:

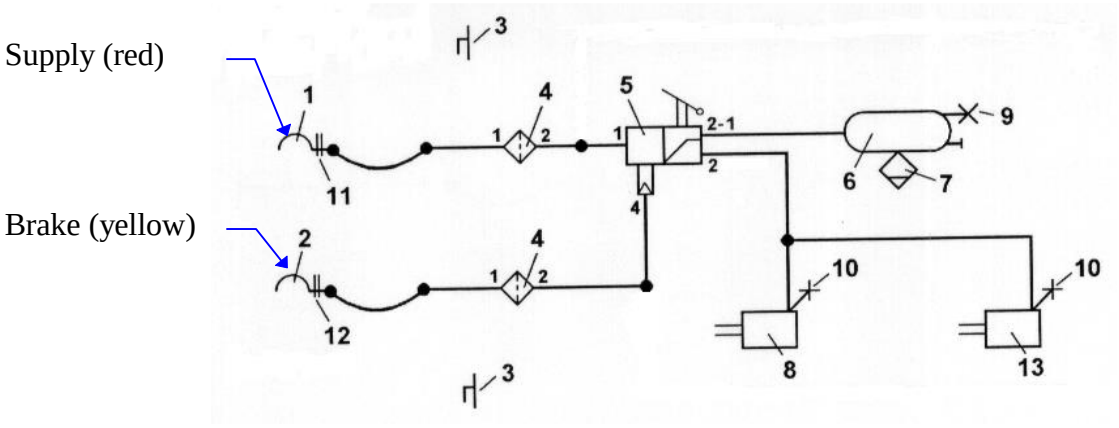
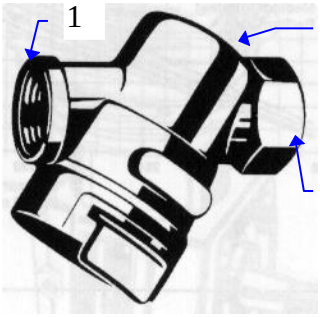


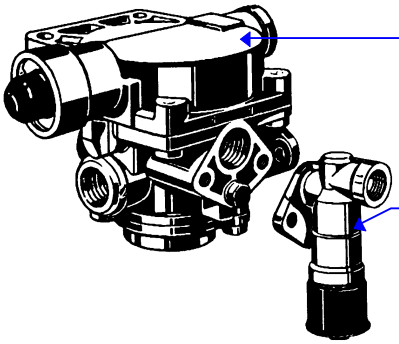
Figure 16

ITEM	QTY	DESIGNATION	WABCO Order No.
1	1	Hose coupling (red)	952.200.021.0
2	1	Hose coupling (yellow)	952.200.022.0
4	2	Line filter	432.500.020.0
5	1	Trailer brake valve	971.002.150.0
	1	Release valve	963.001.012.0
6	1	Tank 40 l Std. 640	040.276.0745.10
	2	Air tank mounting for 40 l-276 mm	541018
7		Drain valve	934.300.001.0
8/13	2	Membrane ram 20"	423.105.900.0
	2	Mounting kit, long fork	423.000.535.2
	2	Brake hub/cone, key length = 225 PBA-ST 6006/B318 75x75x400	10.10.215949



POS 4: Line filter
432.500.020.0

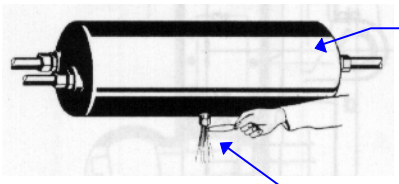
Figur 17



Pos 5: Breakvalve
971.002.150.0

Release valve
963.001.012.0

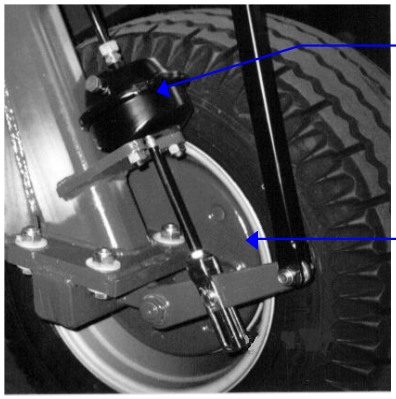
Figure 18



Pos 6: Airtank 40 ltr. Std. 640
040.276.0745.10

Pos 7: Drainvalve
934.300.001.0

Figure 19



Pos 8/13: Membrane ram 20”
423.105.900.0

Break hub, key lenth=225
PBA-ST 6006/B318 ■75x400
10.10.215233

Figure 20

SPARE PARTS: