

# **Operating Instructions**

**Power Harrows** 

# Zirkon 9 KA

(from serial No. 237 390 on)



# **CE** Safety is our concern !

Part No. 175 1365 GB-4/05.03

# LEMKEN GmbH & Co. KG

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#### Dear customer!

We would like to thank you for the confidence you brought to us when buying this implement.

The advantages of the implement will be shown, only, when the implement will be operated and used with due.

When handing over this implement your dealer has already introduced you with regard to operation, adjustment and maintenance. But this short introduction requires still an additional detailed studying of the instruction book.

Therefore read this instruction book carefully <u>before</u> the first use. Please pay attention to the safety instructions mentioned in this instruction book.

We hope you will understand that conversion work, not being mentioned expressly in this instruction book, may only be carried through with a written agreement of the manufacturer.

#### Ordering spare-parts

When ordering spare-parts please state type and serial No. of the implement. These information will be found on the identification plate.

Put down these data on the following table so that they are always available.

| Type of implement: |
|--------------------|
| No.:               |

Please think of using genuine Lemken spare-parts, only. Spirious parts influence the function of the implement negatively, show a shorter lifetime and increase in nearly all cases the effort in maintenance.

We hope you will understand that LEMKEN can not take on the guarantee for operational disadvantages and damage being caused by using spirious parts!

#### **DEFINED USE**



• Read and adhere to these "General Health- and Safety precautions" before putting the power harrow to work!

The ZIRKON 9 KA power harrows have been designed purely for the cultivation of agricultural soil!

Any use beyond the one stipulated above is no longer considered as defined use. The manufacturer does not accept any responsibility for damages resulting from this; the operator himself carries the full risk!

**EXEMPER** 

Under "defined use" the manufacturer's prescribed operation-, maintenanceand repair conditions are to be adhered to!

- The ZIRKON 9 KA power harrows may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers!
- The applicable accident prevention advice as well as the generally accepted safety technical, working, medical and road traffic rules should be adhered to!
- Any damages resulting from unauthorised changes to the machine rule out the responsibility of the manufacturer!

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# **1 SAFETY INSTRUCTIONS**



- Before using the machine, always check both it and the tractor for roadworthiness and operational safety.
- As well as the notes in these instructions the operator is advised to comply with the generally applicable safety at work regulations and those relating to use of the public highway.
- Do not wear loose clothing.
- Before starting work, familiarise yourself with all equipment and working parts as well as their functions. It is too late for this when you are working.

**EXEMISEN** 

- Keep the machine clean.
- Couple the power harrow as instructed only using the stipulated fixings.
- Special care is required when coupling and uncoupling implements to or from the tractor.
- Release cables for quick-action three point linkage couplings must hang loosely and must not release themselves at the lowest point.
- Before starting the engine and engaging the PTO check the area around the machine (e.g. children).
- Riding on the power harrow both during work and during transport is not allowed.
- Never leave the drivers seat whilst the tractor is in motion.
- Driving conditions, steerage and braking are affected by mounted or towed implements and ballast weighs. Therefore, ensure sufficient front end weight for steering and braking!
- When cornering, take into account the wide overhang and/or the centrifugal effect of the power harrow.
- Only engage the power harrow if all the protective fixtures are attached and are in the working position!
- Do no stand in the working area!
- Do not stand in the turning and swinging area of the power harrow.
- Hydraulic devices must be operated only if nobody is standing in the swinging area!
- Before leaving the tractor, lower the power harrow onto the ground, switch off the engine and remove the ignition key!
- Nobody must stand between the tractor and power harrow unless the tractor is secured to prevent it rolling away by the parking brake and/or by wheel chocks.
- Lock the wheel track eradicators in the transport position!

# Trailed implements

- Secure implement and tractor against unintended rolling!
- Never exceed the maximum permissible load of the drawbar or hitch!
- When fitting the implement to a drawbar or hitch, ensure sufficient movement at the hitch-point.

# Attached implements

• Before mounting or dismounting implements on/from the three-point linkage, move the raise / lower control to the position at which accidental raising or lowering cannot take place!

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- In the case of three-point linkage mounting, ensure that the tractor balls and the mounting pins of the implement are of the same category!
- There is the risk of injury from pinch and shear points in the three-point linkage area!
- When operating the external lift controls for the three-point linkage, do not stand between the tractor and implement!
- Always ensure sufficient lateral limitation for the three-point linkage of the tractor in the transport position of the implement!
- When driving on roads with the implement raised, the raise/lower control must be locked to prevent lowering!

#### **Mounted implements**

- Before mounting and dismounting implements on/from the three-point linkage, move the raise / lower control to the position at which unintentional raising or lowering cannot take place!
- In the case of three-point linkage, ensure that the tractor balls and power harrow pins are of the same category.
- There is the risk of injury from pinch and shear points in the three-point linkage area!
- When operating the external lift controls for the three-point linkage, do not stand between the tractor and power harrow.
- Always ensure sufficient lateral limitation for the three-point linkage of the tractor in the transport position of the power harrow.
- When driving on roads with the power harrow raised, the raise/lower control must be locked to prevent lowering.

#### Power take-off shaft operation

- Only drive shafts stipulated by the manufacturer may be used!
- Both halves of the protective tube of the PTO shaft must be anchored to prevent rotation and be in working order!
- Fit and remove the PTO shaft only when the power take-off drive is disconnected, the engine is switched off and the ignition key has been removed!
- Always ensure the correct assembly and safety of the PTO shaft!
- Before engaging the power take-off drive, ensure that the selected speed of the tractor's power take-off shaft matches the permissible speed of the power harrow!

• Before engaging the power take-off drive, ensure that nobody is standing in the hazard area of the power harrow!

**EXEMISEN** 

- Never connect the power take-off shaft when the engine is switched on!
- When working with the power take-off shaft, nobody must stand in the area of the rotating power take-off shaft.
- Always disconnect the power take-off shaft if excessive angular displacements occur.
- Caution: After disengaging the power take-off drive, the rotors take a few seconds to come to rest. Do not approach the power harrow too closely during this time. Work must not be carried out upon it until it comes to a complete standstill!
- Clean, lubricate or adjust the appliance driven by the power take-off shaft only when the power take-off shaft is disconnected, the engine is switched off and the ignition key has been removed!
- Retain the uncoupled PTO shaft on the mount provided!
- After removing the PTO shaft replace the screw-on guard over the tractor PTO.
- In the event of damage, rectify it prior to continuation of work.

#### Hydraulic equipment

- The hydraulic pipes are under pressure.
- When connecting hydraulic rams, the pipes must be connected as directed.
- When connecting hydraulic pipes to the tractor ensure that incorrect use is avoided. If the connections are reversed, the opposite function is carried out (e.g. raising/lowering) and there is a risk of accidents!
- Regularly check the hydraulic pipes and replace them in the event of damage or signs of ageing. The replacement pipes must comply with the technical specification as laid down by Lemken.
- Hydraulic oil escaping at high pressure can penetrate the skin and cause serious injury!
- Before working on any hydraulic equipment lower all implements/attachments, release hydraulic pressure where possible and switch off the tractor engine.

# **Maintenance**

- Whenever possible, only carry out work on the power harrow when it is lowered onto the ground with the PTO drive disengaged, and the tractor engine at rest with the ignition key removed.
- Always ensure safety when working on a raised machine by the use of suitable, secure supports.
- Regularly check all nuts and bolts, and tighten these if necessary.
- Dispose of oil and grease properly.
- In the event of welding being required on the power harrow ensure that, if a tractor has to be attached, its battery/alternator is disconnected.

• Only use genuine or approved replacement parts when repairing the power harrow.

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# <u>Tyres</u>

- When working on the tyres make sure that the implement has been placed on the ground safely and that it is secured by chocks against unintentional rolling!
- Fitting tyres requires knowledge and special tools!
- Repairwork on tyres may only be conducted by trained staff and with suitable tools!
- Check air pressure regularly and adhere to the advised air pressure!

#### <u>Brakes</u>

- Check function of brakes before each drive!
- The braking systems must be checked regularly!
- Repairwork on brakes may only be conducted by trained staff and with suitable tools!



#### 2 USE OF SPRING LOADED BRAKE RAM

In order to make unloading and manoeuvring possible without air pressure supply, the spring loaded brake rams (FS) and therewith the complete braking assembly have been locked out of use by means of a key bolt (KS).



Before the first use, the braking assembly must be set under pressure, the nut of the key bolt (KS) loosened, the key bolt turned by 90° and finally removed. (If it is not possible to set the braking system under pressure, the nut of the spring loaded key bolt must be loosened until it is free and can be removed.)

After that close the opening of the spring loaded brake ram by means of a protection cap (SC).

Finally fit the key bolt into the top bore (AB) of the braking ram and secure it by means of nut and peg.

Never loosen the outer tightening straps (SP) of the spring loaded brake rams (FS), as the ram is under pressure respectively spring tension.

# **3 WARNING STICKERS**

# 3.1 General Instructions

The LEMKEN Zirkon 9 KA is equipped with all features to ensure safe operation. Where potential danger areas of the implement can not be fully safeguarded, warning stickers are fitted which draw attention to these.

#### 3.2 Meaning of the stickers

Familiarise with the meaning of the stickers. The following descriptions inform about them in detail.



**WARNING:** Read and adhere to this Instruction book and these "General Health- and Safety precautions", before putting the implement to work!

390 0555



**WARNING**: Shut off engine and remove key before performing maintenance or repair work!



390 0509



**WARNING:** Keep well clear of the working and swinging area of the implement!





WARNING: Pinch Point!

390 0506



**WARNING:** Turning direction of the rear PTO = clockwise!

390 0511



WARNING: Do not climb on the machine!

390 0512



**WARNING:** Keep well clear of the folding area of the implement!

390 0540



WARNING: Danger due to revolving parts!





**WARNING:** Wait until all machine components have stopped completely before touching them!

.390 0513



WARNING: Stay clear of hot surfaces!

390 0590



**WARNING:** Hydraulic accumulator contains gas and oil under pressure. For removal and repair instructions in technical manual must be followed.



3.3 Positions of the warning stickers



**EXEMPER** 

# **4 COMPACT INFORMATION**

The following adjustments must be done to use the Zirkon effective and optimal.

#### Rotor RPM

The rotor RPM must be adjusted to the desired working effect. As standard it is possible to adjust 360 1/min or 444 1/min with a PTO shaft RPM of 1000 1/min.

#### • Working depth

The working depth should be adjusted as shallow as possible by means of the depth adjusting device.

#### • Side shields

The side shields must be set so deep, that they are covering the lateral rotating tools completely.

#### • Rear levelling bar

The rear levelling bar (PB1) must be adjusted so high that it is positioned approximately 2 cm above the ground. It must be positioned higher, if too much soil is built up.

#### • Wheelmark eradicators

The wheelmark eradicators (SP1) must be adjusted so deep that they work approximately 5 to 10 cm below the wheelmark surface. In any case they should be in a deeper position than the tines of the power harrow Zirkon.

#### • Scrapers

The scrapers of the packer roller, the trapeze packer roller or the trapeze disc roller must be adjusted equally. Certainly the hard-faced or hard metal scrapers must be adjusted as close as possible to the roller surface, but may not touch it.

| Zirkon 9/400 K - Zirkon 9/600 K |            |     |                    |                |  |
|---------------------------------|------------|-----|--------------------|----------------|--|
|                                 |            | 540 | )= <sup>(1/1</sup> | min)<br>  1000 |  |
| Wassier o                       | The second |     | <b>h</b> (1/i      | min)           |  |
| 18                              | 20         | 195 | 270                | 360            |  |
| 16                              | 22         |     | 218                | 291            |  |
| 15                              | 23         |     | 195                | 261            |  |
| 20                              | 18         | 240 | 333                | 444            |  |
|                                 |            | _   |                    | 290 4149       |  |







#### **5 REPARATION OF THE TRACTOR**

#### 5.1 Drawbar

The tractor must be equipped with a clevis drawbar (G2), which is designed for a vertical load of 1.750 kg.

The drawbar must be extended until the measurement A and B are equal.

Drawbars according to ISO 6489 can be adjusted to the measurement 400 mm (see drawing). The Zirkon 9 KA will be delivered with the suited 400 mm adjustment (measurement B) as standard.

Measurement A = horizontal distance between coupling point (G3) and PTO shaft (G5) of the tractor.

Measurement B = horizontal distance between the coupling point (G3) and transmission shaft (G6) of the PTO transmission of the power harrow.

When the coupling point (G3) is in the

centre between PTO shaft (G5) and transmission shaft (G6) and when the cross shaft runs horizontally, the diffrent angles are well-adjusted when changing the direction. The load on the cross shaft and the neighboured parts are at its minimum.

The maximum driven curve will be determined by the length of the cross shaft (G7) pushed together.

The PTO shaft must always have an overlap of at least 240 mm in straight position.









#### 5.2 Required spool valves at the tractor

The Zirkon 9 KA will be delivered with separate hydraulic hoses for each use as standard.

If required the Zirkon can be equipped with hydraulic control with 6/2 wav а connection, an electromagnetic or an electronic hydraulic control. The protection caps of the hydraulic hoses are marked in colours and the hydraulic hoses alphanumerically (from August '99 on).



For the operation of each control the following tractor spool valves must be available:

#### 5.2.1 Zirkon 9 KA

|                                | Single acting<br>spool valve | Double acting<br>spool valve | Implement sided colour coding | Coding |
|--------------------------------|------------------------------|------------------------------|-------------------------------|--------|
| Folding-in device              |                              | x                            | red                           | P1, T1 |
| Power harrow<br>lifting device |                              | Х                            | green                         | P2, T2 |
| Lift linkage                   | Х                            |                              | blue                          | P3, T3 |
| Track marker                   | Х                            |                              | black                         | P4     |
| Hydraulic angle<br>adjustment  |                              | х                            |                               |        |

#### 5.2.2 Zirkon 9 KA with hydraulic control with 6/2 way connection

|                                | Single acting spool valve | Double acting<br>spool valve | Implement sided<br>colour coding | Coding |
|--------------------------------|---------------------------|------------------------------|----------------------------------|--------|
| 6/2 valve                      |                           | x                            | red                              | P1, T1 |
| Power harrow<br>lifting device |                           | x                            | green                            | P2, T2 |
| Track marker                   | Х                         |                              | black                            | P4     |
| Hydr. angle<br>adjustment      |                           | x                            |                                  |        |

By means of the 6/2 valve it is possible to operate two uses with one spool valve.

# 5.2.3 Zirkon 9 KA with electromagnetic hydraulic control

|                           | Single acting<br>spool valve | Double acting<br>spool valve | Implement sided<br>coloured coding | Coding |
|---------------------------|------------------------------|------------------------------|------------------------------------|--------|
| Control valve             |                              | x                            | red                                | P1, T1 |
| Hydr. angle<br>adjustment |                              | x                            |                                    |        |

By means of the electronic hydraulic cal control valve all other uses can be operated by the control box from the tractor seat.

5.2.4 Zirkon 9 KA with electronic hydraulic control (Load Sensing)

|                             |  | Implement sided<br>coloured coding                     | Coding         |
|-----------------------------|--|--|----------------|
| Electrical<br>control valve | Pressure connection<br>Return pipe connection<br>Load Sense connection | Oil supply = red<br>Return pipe = red<br>LS-pipe = red | P1<br>T1<br>LS |
| Hydr. angle<br>adjustment   | Double acting<br>spool valve   |  |                |

By means of the electromagnetic or electronic hydraulic control all other uses can be operated by the control box or operation terminal from the tractor seat.

# 5.3 Sockets

For the electrical uses the following sockets must be available at the tractor:

|                                    | Volt | Socket                    |
|------------------------------------|------|---------------------------|
| Lighting equipment                 | 12   | according to DIN-ISO 1724 |
| Electro magnetic hydraulic control | 12   | according to DIN 9680     |
| Electrical hydraulic control valve | 12   | according to DIN 9680     |
| PTO shaft control                  | 12   | According to DIN 9680     |

The range of tolerance is between 10 V and 15 V. Excess voltage and undervoltage lead to operational malfunctions and can damage electric parts. Furthermore a fuse protection of the power supply of 40 A must be ensured.

# 5.4 Braking assembly

The tractor must be equipped with a two line air pressure braking device.



### 6 PREPARATION OF THE ZIRKON 9 KA POWER HARROW

#### 6.1 Drawbar eye

The troughs of the power harrow must be positioned horizontally to the ground during work. They stand horizontally, when the distance between lower edge of the frame (Z0) and the ground is 330 mm  $\pm$  25 mm.

The drawbar eye (Z1) can be fitted to the frame (Z0) at a distance of 400 mm, 450 mm, 500 mm or 550 mm to the ground whilst maintaining the distance of 330 mm.

#### 6.2 PTO transmission

If the drawbar (G2) cannot be extended according to section "Drawbar", the PTO transmission (G4) must be repositioned.

The PTO transmission can be fitted to the frame (Z0) in six different length positions and four different height positions, in order to ensure that the driving lane runs straight from the PTO shaft of the tractor to the middle gear box of the Zirkon 9 KA.

It must be ensured that the shaft (G6) of the PTO-transmission (G4) and the

middle gear box are positioned absolutely parallel in working position. Required adjustments can be carried through by means of the top link (OL).







#### 6.3 Brake pressure regulator

Depending on the existing axle load the brake power must be adjusted by means of the brake pressure regulator (BR1) according to the following table. For the adjustment the lever (BR2) must be turned. Four different brake pressure adjustments are possible: 1/1, ½, O and



The arrow (BR3) points to the chosen setting.

| Minimum air pressure<br>with |            | Adjustr    | nent of the air brake regulator |     |   |
|------------------------------|------------|------------|---------------------------------|-----|---|
| Axle load                    | 30<br>km/h | 40<br>km/h | 50<br>km/h                      |     |   |
| up to<br>3.000 kg            | 0,8 bar    | 0,8 bar    | 1,0 bar                         | X   | For manoeuvring with a tractor<br>without air pressure supply.<br>Before manoeuvring the system<br>must be pressurised with air<br>pressure, and that to a<br>pressure of at least 3,5 bar. |
| 3.000kg                      | 0,9 bar    | 1,0 bar    | 1,3 bar                         |     |   |
| -<br>4.000 kg                |            |            |                                 | 0   |   |
| 4.000 kg                     | 1,2 bar    | 1,4 bar    | 1,8 bar                         |     |   |
| 6.000 kg                     |            |            |                                 | 1/2 |   |
| 6.000 kg<br>-                | 1,9 bar    | 2,2 bar    | 2,9 bar                         |     |   |
| 8.000 kg                     |            |            |                                 | 1/1 |   |

# 6.4 Air pressure of the wheels (550/60-22.5)

Adjust tyre pressure according to speed of travel and axle load in accordance to the above table.

The maximum allowed air pressure is 2,9 bar.

This pressure must not be exceeded.



#### 6.5 PTO shaft

After the drawbar eye (Z1) and the tractor drawbar (G2) are positioned so that the troughs of the power harrow are horizontal to the ground and the coupling point (G3) is midway between the tractor PTO shaft (G5) and the machine PTO shaft (G6) of the PTO-transmission (G4), the length of the PTO shaft (G7) must be adapted.

The Zirkon 9 KA power harrows are equipped with four PTO shafts. It must be ensured that the PTO shaft guards of each PTO shaft are prevented from spinning by fixing the chain (G11) provided to a nearby static part. The PTO shaft (G7) between tractor and PTO transmission must never be pushed together completely.

There must always be a minimum overlap of the profile and protective tubes of at least 240 mm.

If the PTO shaft (G7) is too long, it must be shortened.

If the PTO shaft (G7) is too short, a longer PTO shaft of the same series must be fitted.

**WARNING:** If it is required to shorten the PTO shaft, it must only be done by a specialist.





# 7 ROTOR SPEEDS

The desired working effect depends, among other things, on the forward speed and the rotor speed. The lowest rotor speed possible should be used at which the required result is achieved. Excessively high rotor speeds mean high wear and commensurate fuel consumption.

The working speed recommended for the rotor speeds is shown in the following diagram.

The Zirkon 9 KA power harrows are delivered as standard with the pair of gears 18/20 (drive/output). Thus a rotor speed of 360 RPM is obtained at 1000 RPM PTO.



#### Recommended working speeding in dependence of the rotor ROM

If another pair of gears is fitted, then this is marked correspondingly on the sticker 390 4148. The diagram area I is valid for light to medium soils and diagram area II for heavy to heaviest soils.

During work the rotor RPM can be modified by means of changing the gears or by means of using another pair of gears.

**ATTENTION!** The PTO drive shaft RPM of 1000 should always be chosen. When working with 540 or 750 RPM, the drive shaft torque increases by 85 % respectively by 33 % and that with the same rotor speed.



#### 7.1 Changing the rotor speeds / Changing the gears





Other rotor speeds can be obtained by interchanging pairs of gears or by using another set of gears. See table. Only rotor speeds which are listed in the table may be selected.

- To change the gear, switch off the PTO drive shaft and also the tractor engine.
- Remove the ignition key. -
- Remove cover (GG0), paying particular attention to the seal.
- Exchange the pairs of gears according to the table.
- Replace the cover (GG0), ensuring that the seal is positioned correctly.
- Tighten the bolts carefully.



 Read and adhere to the General Safety Instructions as well as to the Instructions "PTO drive shaft"!

• Only clean, lubricate or adjust the power harrow or PTO shaft when the PTO shaft is disconnected, the tractor engine is switched

off and the ignition key removed.

- Change gears with completely lowered power harrow and seed drill (if fitted) only.
- Changing the gears requires sufficient knowledge and correct tools.
- Caution: After disengaging the power take-off drive, the rotors take a few seconds to come to rest. Do not approach the power harrow too closely during this time. Work must not be carried out upon it until it comes to a complete standstill!



# 8 ATTACHING AND DETACHING THE POWER HARROW

# 8.1 Attaching to the tractor

- Drive the tractor close to the power harrow.
- Connect hydraulic hoses to the tractor couplings according to section "Required spool valves at the tractor".
- By means of the hydraulic ram of the power harrow lifting device, adjust the drawbar eye (Z1) to the same height of the drawbar clevis.
- Attention: When it is not possible to adjust the drawbar to the same height, the wheel (F6) of the discharge valve (F5) must be turned a little clockwise!
- Connect drawbar of the tractor with the drawbar eye (Z1) of the power harrow and secure it.
- Remove the PTO shaft (G7) from its mount (G9) and connect to the tractor PTO! Secure PTO shaft guards (G10) from spinning by fixing the chain (G117).
- Swing mount (G9) of PTO-shaft upwards and secure.
- If available place the control box of the electro magnetic hydraulic control, operation terminal the of the electronic hydraulic control and the warning box of the PTO shaft control corresponding cable in with the tractor cab and connect each to the socket concerned! See section "Sockets"!







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- Connect electric cables of the lighting equipment!
- Place the rope (A5) of the lock valves (A6) in the tractor cab so that they hang free and cannot slip out of the tractor cab!
- Lift the power harrow completely by means of the hydraulic ram (F2) and lift link (F8) and fold it in. Therefore the hydraulic folding device must be operated and that at the same time, the valves (A6) opened by means of pulling the rope (A5).
- Close lock valve (F0) by means of the grip extension (F9). It must be pulled to the front then.
- Fit protection devices and lighting equipment, when driving on public roads.
- Connect braking hoses and put wheel chocks (Z14) into the holders (Z15) and secure.









 Release the parking brake by operating the red button (Z12) of the parking valve (Z13).

 When driving on public roads, the protection devices (SV1) must be fitted. When the power harrow is equipped with a packer roller, the roller must be protected by means of the protection device (SV2).

 The protection devices will be fitted to the power harrow or the packer roller by means of the tightening straps (SV3).



Z13





# 8.2 Detaching of the power harrow

The Zirkon 9 KA can be parked in folded-in as well as in folded-out position. If it is parked in folded-out position, stands (A11) must be fitted. When it is required to park the implement in folded-out position, the protection devices (SV1) and (SV2) must be detached first. The power harrow must always be parked on level and firm ground and be secured against unintended rolling.

- Unlock lock valve (F0) by means of moving rearwards the grip extension (F9).
- Lower the power harrow completely by means of the hydraulic ram (F2) of the power harrow lifting device so far that the drawbar eye (Z1) is relieved and does not touch the drawbar (G2).
- Close lock valve (F0).
- Switch off the tractor engine and make the hydraulic hoses free of pressure by means of switching the spool valves to and fro.
- Disconnect hydraulic hoses and fit protection caps.
- If existing, take out the operation units out of the tractor cab, disconnect the cable and place the operation units safe and dry. If the operation units are fixed in the tractor cab, only the cables must be dismounted and put on the power harrow. The screw connections must be protected against dirt and moisture.
- Swing down mount (G9) of the PTO shaft and detach PTO shaft (G7) from the tractor side and put it into the mount (G9)!
- Remove the wheel chocks (Z14) out of the holders (Z15) and secure.
- Disconnect the brake hoses.





- Activate the parking brake by means of pressing the red button (Z12) of the parking valve (Z13) behind the air container.
- Disconnect the drawbar eye (Z1) from the drawbar of the tractor.



#### 8.3 Stands

If it is required to park the Zirkon 9 KA in folded-in position, the stands (A11) must be pulled out first and secured by means of the pin.

In folded out and working position the stands must be in their raised position.

# 8.4 Transport

For transport the power harrow must be lifted by the lift link (F8) until the device (F10) with roller guide (F11) prevents a lateral swinging of the power harrow. Afterwards fold-in the power harrow and close the lock valve (F0) to prevent an unintended lowering. Therefore the grip extension (F9) must be moved forward.

If a seed drill is mounted or fitted to a lift linkage, the coulter bar or the seed drill must be lifted completely and folded-in afterwards. The corresponding spool valves must be locked, the folding-out





locking device of the folding device checked with regard to correct function **and the air pressure regulator must be adjusted to the current axle load**. After attaching the lighting equipment together with the warning boards transport on public roads can start.



• Read and adhere to these General Health- and Safety precautions!



# 9 FOLDING-IN AND -OUT OF THE POWER HARROW

#### 9.1 Folding-in of the wing sections

- For transport, the power harrow must be lifted completely and then folded-in. The power harrow may be folded-in and -out, only, when fitted to the tractor.
- Move the spool valve into the 'folding-in' position = 1<sup>st</sup> pressure position and draw the ropes (A5) of the lock valves (A6), in order to fold-in the wing sections fully. After that slacken the ropes, in order to close the lock valve.
- Check whether the ropes are slackened correctly.



Lock spool valve to prevent an unintentional folding-out of the wing sections!

#### 9.2 Folding-out of the wing sections

 The Zirkon 9 KA may only be parked in folded-out position.
Before folding-out, the power harrow

must be lifted completely.

- Draw the ropes (A5) to open the lock valves (A6) and set the tractor spool valve into the 2<sup>nd</sup> pressure position = folding-out position, in order to fold-out the lateral sections.
- When the lateral sections are folded-out completely, slacken the ropes (A5) to close the lock valves (A6) again.





- Read and adhere to the General Safety Instructions as well as to the Instructions 'Hydraulic equipment'!
- The ropes must <u>always</u> be relieved during lifting and lowering procedure of the power harrow!



# **10 ADJUSTMENTS**

#### 10.1 Top link

By means of the top link (OL) the power harrow will be adjusted so that the PTO shaft (G6) of the PTO transmission (G4) and the entrance shaft of the middle gear box are nearly parallel to each other.

ATTENTION! When the PTO drive shaft and the gearbox entrance shaft are not parallel to each other, the PTO shaft vibrates. This leads to wearing and damage of



the PTO shaft, the gearbox and the PTO drive shaft.

#### 10.2 Working depth

The working depth of the power harrow depends on the tilth required. In general the power harrow should work as shallow as possible.

The working depth of the power harrow will be adjusted after lifting the power harrow by means of the left and right central depth adjustment (TE1). After removing the spring pin (TE2) the working depth of one power harrow unit can be adjusted by means of shifting the adjusting bar (TE3) to or fro.

The working depth will be increased when the adjusting bar is moved to the



centre of the implement. The working depth will be reduced, when the adjusting bar (TE3) is moved to the outside. After the adjustment the adjusting bar must be secured by means of the spring pin (TE2). Each power harrow unit of the Zirkon 9 KA is equipped with a central depth adjustment (TE1).

Attention: In the lowest working depth adjustment the power harrow is wider than 3 m in transport position. Before driving on public roads the working depth must be altered; therefore the rod (TE3) must be moved to the centre of the implement and then secured by the spring pin (TE2).



#### 10.3 "Allround" tines

The "Allround" tines (AR) in special hardened version can either be fitted in drag or grade position to the rotor.

When the working position of the tines (AR) should be changed from "drag" to "grade" position and the other way round, the tines of a rotor must be fitted to the neighboured rotors.

After changing the tines, all bolts must be tightened by means of a tightening torque of 400 Nm. After that it must be checked, whether all tines are fitted correctly by means of turning the rotors manually. When this is possible without problems, all tines are fitted correctly.





Tines in "drag" position

Tines in "grade" position

Hard-faced "Allround" tines are available which are hard-faced on the drag- or grade side as desired. Each contrary cutting side of the tines (AR) is not hard-faced, but special hardened.

#### 10.4 Side shields

The side shields (RL1) must be adjusted in height so that the rotating tools are covered completely. When worn they must be set deeper correspondingly. After each deeper adjustment, they bolts (RL2) must be tightened again.





#### 10.5 Pressure load on the rollers

By means of the overflow valve (F2) weight can be transferred from the chassis (F4) to the rollers.

Turning the adjuster wheel (F6) clockwise

=> higher pressure load

Turning the adjuster wheel (F6) anticlockwise

=> lower pressure load

Each pressure load ajustment can be read at the marking lines of the adjuster.



The hydro accumulator (F3) ensures that the disc cultivator can be adapted to the ground independently from the chassis.

When the disc cultivator is lowered again after turning on headland, the spool valve concerned must be held in this pressure position for approximately 5 seconds, so that the pre-adjusted pressure inside the hydraulic system can be reached again.

When the Zirkon 9 KA is used solo (without overflow valve (F5)) the chassis can be lifted during work via the hydraulic ram (F2).





#### 10.6 Stop screws

By means of the stop screws (KM1) and (KM2), the basic frame and the folded-in power harrow will be adjusted, that the power harrow units in transport position are vertical and cannot hit a mounted seed drill and do not exceed the allowed transport width of 300 cm.

After an adjustment of the stop screws, each counter nut (KM3) must be tightened carefully.



The Zirkon 9/500 KA and Zirkon 9/600 KA power harrows show one stop screw (KM2) as pendulum limit and the Zirkon 9/400 KA and -9/450 KA power harrows two stop screws and that on the left and right side of the pendulum axle.

#### 10.7 Turning on headlands

Before reversing on headland the power harrow must be lifted completely. It is recommended to switch off the PTO. After reversing on headlands the PTO will be switched on again and the power harrow lowered. The spool valve must be operated (ca. 3 - 5 sec) until the pre-adjusted pressure for the pressure load on the roller will be reached again.

After that set tractor spool valve to floating position.

If working with a seed drill the coulter bar must be raised before reversing on headlands. After reversing the coulter bar must be lowered again.



• Read and adhere to the General Safety Instructions as well as the Instructions "Maintenance"!



# 10.8 Rollers

#### 10.8.1 General Instructions

The Zirkon 9 KA can be equipped with a number of rollers (W0): Tube bar roller RSW 540, Trapeze ring roller TRW 500, Trapeze packer roller TPW 500, Trapeze disc roller TSW 500 or Packer roller ZPW 500.

The tube bar roller and the trapeze ring roller are free of maintenance.

The trapeze disc roller, the trapeze packer roller and the packer roller are equipped with adjustable scrapers, which must be re-adjusted from time to time.





#### 10.8.2 Adjustment of the scrapers

The adjustable scrapers (W1) of the 500 mm rollers will be adjusted by means of the adjuster nut (W2) and the eccentric nut (W5).

The adjuster nuts (W2) of the packer rollers will be adjusted by means of a 19 mm spanner and the eccentric nuts (W6) with a 24 mm spanner.

Before adjusting, the screw (W7) belonging to it, must be loosened by means of a 19 mm spanner and after that tightened again.





10.8.3 Distance of the scraper to the roller surface sleeve

The distance between scraper (W1) and roller surface (W5) must be adjusted as follows. The setting instructions are valid for all packer rollers, trapeze packer rollers and trapeze disc rollers.





#### 10.9 Wheelmark eradicators

One pair or two pairs of wheelmark eradicators (SP1) can be fitted to the Zirkon.

The eradicators can be positioned laterally and are vertically adjustable by means of pins (SP2). Secure pins (SP2) by means of the circlip (SP3).

#### 10.10 Levelling bar

The Zirkon 9 KA can be equipped with a levelling bar (PB1) in the rear.

If fitted the lower edge of the levelling bar (PB1) should be set 2 cm above the surface by means of the pin (PB4).

If the levelling bar feeds too much soil into the rotor blades, it must be set into a higher position.

By means of the eccentric lever (PB2) the solid levelling bar can be adjusted without strong effort. The eccentric lever must be secured by means of the linch pin (PB3), so that the lever cannot slip off. The pin (PB4) must be unsecured before the adjustment and may first be re-fitted, when the levelling bar is hold safely by the eccentric lever (PB2).







- Read and adhere to the General Safety Instructions!
- If a fitted levelling bar is removed, provide alternative guards.
- The levelling bar is suspended in a floating position there is danger of being pinched or crushed.





Attention: Never use the power harrow without safety device and rollers!

**EXEMPERIE** 

#### 10.11 Side shield extension

In order to prevent dam formation caused by the following roller, side shield extensions (RL3) are available, which are fitted at the rear of the side shields (RL1). They show slotted holes, which are covered washers (RL4). by After loosening the bolts (RL5), each side shield extension can be moved to the front and rear to adjust the required distance to the roller. This distance should be as small as possible. After the adjustment the bolts (RL5) must be tightened again.

#### 10.12 Feed discs

For an especially level work feed discs (R1) are available. They are fitted to the outside of the carrier (R4) by means of the brackets (R3). The feed discs (R1) shall work so deep that no ridges are visible. The working depth will be adjusted by means of a pin adjustment with pin (R2). After a depth adjustment the pin (R2) must be secured. The side discs can also be adjusted laterally to reach the exact working width, for example 4 m.





#### 10.13 PTO shaft control

The PTO shaft control controls the safety clutches of the lateral PTO shafts, which are used as overload safety device.

When one of both safety clutchs operates, an alarm occurs. But only then when the power harrow is in lowered working position and the implement sensor (GW3) has no contact with the rod (TE3).



The control occurs via RPM sensors

(GW1) and a warning box (GW2), which will be supplied with power via a collecting box. The warning box is accommodated in the tractor cabin.



GW2 = warning box

- GW4 = ON / OFF switch
- GW5 = horn
- GW6 = cap with fuse
- GW7 = tractor connection cable
- GW8 = connection cable warning box/collecting box



#### 10.14 Power take off

The tractor PTO may only be engaged when the power harrow has been lowered to within a few centimetres of the ground and the side plates are in their working position. It must be disengaged when the power harrow is more than a few centimetres above the ground.



- <u>.</u>.
- Read and adhere to the General Safety Instructions as well as to the Instructions "Maintenance"!
  - Switch PTO drive shaft on, when the gearbox is lowered and no side shields are in protection position!

#### 10.15 Hydraulic angle adjustment

If desired instead of a top link (OL) a hydraulic ram can be fitted. With the hydraulic ram it its possible to change the angle to the power harrow and therewith the working depth (e.g. on headlands) from the tractor seat.

This adjustment may not be overdone, as therewith the parallel position of the PTO shaft of the PTO transmission in relation to the entrance shaft of the middle gear box will be changed.



# 11 HYDRAULIC CONTROLS

# - in combination with pneumatic seed drill -

# 11.1 6/2 way connection

By means of the lever (W3) the way connection (W1) can be switched over so that either the Zirkon and the coulter bar will be folded-in and -out or for work the hydraulic three point linkage or the coulter bar lifted or lowered.

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For to the 6/2 way connection (W1) one double acting spool value is less required with the tractor.



Coulter bar lifting device or operation of the hydraulic three point linage



Folding- in or -out

#### 11.2 Electromagnetic hydraulic control

Using a control box with four operating levers all functions with the exception of the fan are activated via a valve block (L8S).

In this way, 2-3 double-acting spool valves and one single acting spool valve on the tractor can be spared.

The spool valve must be permanently supplied with oil (constant pressure, constant flow or load-sensing system with load response).

- A = Lifting device
- B = Coulter bar lifting device
- C = Folding device
- D = Track marker operation
- E = ON, OFF
- F = Control light



Via an adjuster screw (F10) the control block can be adapted to the hydraulic system of the tractor.





# a) Operation with constant oil supply

The adjuster screw (F10) must be screwed out to the stop, in order to get into the constant oil supply mode.

In this position the oil is flowing back freely from the pump via the control valve from P to T into the tank. The simultaneous operation of the other uses at the tractor like fan, rear hydraulic and front hydraulic is not possible.

#### b) Operation with constant pressure

The adjuster screw (F10) must be screwed in to the stop, in order to get into the constant pressure mode.

The control valve is steadily under pressure. Now each use of the Zirkon 9 KA and the Solitair can be operated.

The simultaneous fan drive via an additional spool valve is possible.

If the LS-connection of the control valve is used, a load sensing operation with load response is possible.

# 11.3 Electronic hydraulic control

Via an operator terminal all functions of the Zirkon 9 KA are operated with pressure balance over a valve block (LU8S).

The weight transfer onto the rollers and the coulter pressure are monitored and constantly regulated.

At the touch of a button on the headlands the track markers, the coulter bar and the soil cultivation implement are automatically lifted at the



correct time and lowered accordingly. The valve block requires a connection to a load sensing system with load repose and not to a tractor spool valve.

Further information can be learned from the corresponding operators manual of the electronic control.

- <u>.</u>
  - Read and adhere to the General Safety Instructions as well as to the instructions "Hydraulic assembly"!



# **12 TRACK MARKERS**

# 12.1 Adjustments

Each track marker is equipped with a hydraulic ram (SP5). When operating the tractor spool valve concerned, the markers will be folded-in and –out in turn. This will be controlled by a switch valve.

For transport the track markers (SP7) must be folded-in by means of the hydraulic rams (SP5) and secured.



Track marker (SP1) secured. The pin (SP3) is located in hole (SP4).



Track marker (SP1) unlocked. The pin is located in hole (SP2).

After loosening the clamp screws (SP6) the length of the track marker arm (SP7) and the angle of the track marker discs (SP8) can be adjusted.

After the adjustment the corresponding clamp screws (SP6) will be tightened again carefully.

For transport, the track marker arms (SP7) must be folded-in by means of the hydraulic rams (SP5) and secured.





The track markers must be adjusted to the middle of the tractor track and that according to the following table.

| Zirkon   | Distance from the centre of the seed drill to the track groove | Distance from the outer<br>seeding coulter |  |
|----------|--|--|--|
| 9/400 KA | 400 cm   | 200 cm + 1/2 row distance                  |  |
| 9/450 KA | 450 cm   | 225 cm + 1/2 row distance                  |  |
| 9/500 KA | 500 cm   | 250 cm + ½ row distance                    |  |
| 9/600 KA | 600 cm   | 300 cm + 1/2 row distance                  |  |

#### 12.2 Shearbolt device

The track markers are protected against overload by means of a shearbolt (SP0).

After break of a shearbolt the shearbolt remains must be removed and after that a new shearbolt fitted.

Use only the shearbolts M10x45 / 8.8 with the part No.: 301 3240 for Zirkon 9/400 KA and -9/450 KA and the shearbolts M12x45 with the part No.: 301 3366 for Zirkon 9/500 KA and -9/600 KA.



Read and adhere to the General Safety Instructions as well as to the Instructions "Hydraulic Assembly"!





# **13 ATTACHING OR DETACHING THE SOLITAIR**

#### 13.1 General Instructions

The Zirkon 9 KA is available with coupling parts for mounting the Lemken Solitair seed drill.

The coupling parts include an upper catch hook (N0) and two supporting plates (N1) fitted to the chassis as shown. With these parts it is simple to mount the Lemken Solitair to the chassis (F4).

#### 13.2 Attaching the seed drill

- Unsecure and remove the front pin (N2).
- Drive carefully with the power harrow to the parked Solitair seed drill until the catch hook (N0) is positioned below the top link pin and the supporting plates (N1) are below the rear pins (N3).
- Connect hydraulic hoses of the Solitair 9 KA to the connection bracket (N4) of the Zirkon 9 KA.
- Unlock coulter bar of the Solitair and open lock valve (U3).
- Lower the Solitair a little by means of the hydraulic rams of the coulter bar lifting device until the top link pin hooks into the catch hook (N0) and the pins (N3) support on the supporting plates (N1).
- Fit front pin (N2) and secure by means of the spring pin.
- Connect electric cables.
- Lift coulter bar, remove outer stands (U1) and unsecure, lift and secure again the middle stand.









# 13.3 Detaching the seed drill

The Solitair seed drill must always be parked on level and firm ground.

- Before detaching, the hopper must be emptied completely and the lock valve (U3) of the coulter bar lifting device opened.
- Fold-out and secure coulter bar.
- Lift coulter bar by means of the hydraulic rams and move the stands (U1) laterally into the frame of the coulter bar up to the stop and lower and secure the middle stand.
- Unlock front pin (N2) and dismount.
- After that lower coulter bar and lift the Solitair 9 KA until the top link pin is a few centimeters above the catch hooks (N0).
- Close lock valve.
- Disconnect hydraulic hoses.
- Disconnect electric cables.
- Check, whether all hydraulic hoses and electric cables are disconnected. After that drive away carefully from the parked Solitair.

See instruction book of the Solitair 9 KA



- Read and adhere to the General Safety Instructions as well as to the Instructions "Mounted Implements"!
- The discharge valve (U4) is similar to an adjustable overflow valve.

• Before mounting or detaching the seed drill, the adjuster (U5) of the Solitair must be turned clockwise, as with a too low adjusted central coulter bar pressure, the Solitair cannot be lifted and sinks down without control.





#### 14 HYDRAULIC THREE POINT LINKAGE

#### 14.1 Attaching a seed drill

The Zirkon 9 KA power harrows are available with an hydraulic lift linkage (N6) (category II) for attaching a seed drill with own wheels.

The seed drill will be connected to the lower link unit (N7) of the lift linkage by means of the drawbar and secured by means of the locking bars (N8). The locking bars will be secured by the linch pins provided. After that attach and secure the top link (N9).

The spool valve for the hydraulic lift linkage must be set to floating position during work. Lifting the seed drill will be carried out by means of closing the hydraulic ram (N10).

The hydraulic hoses of the Solitair must be connected to the hydraulic couplings of the connection bracket (N4).

Before driving on public roads the seed drill must be lifted completely and the lock valve of the hydraulic ram (N10) closed.





#### 14.2 Lowering the mounted seed drill

The seed drill will be lowered as follows:

- Open lock valve of the hydraulic ram (N10) with closed tractor spool valve.
- After that set tractor spool valve to 'lowering' and lower the seed drill.

WARNING: Tighten counter nuts of the rear top link (N9) after each adjustment.



# 14.3 Detaching a seed drill

Prepare seed drill so that the drill can be parked safely.

- Lower the seed drill and disconnect all supply hoses and cables!
- Disconnect top link (N9) from the tractor and put it into the holder.
- Unlock and detach securing lever (N8).
- Lower three point linkage and drive away carefully with the Zirkon 9 KA from the seed drill.
  - Read and adhere to the General Safety Instructions!
  - Read and adhere also the instructions book of the seed drill manufacturer!

# **15 CHASSIS**

# 15.1 Wheels

The trailer of the Zirkon 9 KA is available with the tyres 550/60-22.5 or 12.5/ 80-18. Ply rate and profile description are printed in the tyre. Damaged or worn tyres must be re-placed immediately. The following minimum and maximum air pressures must be adhered:

| Tyres       | Part No.            | Profil | Ply-rating | min. allowed | max. allowed |
|-------------|---------------------|--------|------------|--------------|--------------|
|             |                     |        | (PR)       | air pressure | air pressure |
|             |                     |        |            | (bar)        | (bar)        |
| 550/60-22.5 | 550 8872<br>(right) | T 404  | 12         | 2,0          | 2,9          |
| 550/60-22.5 | 550 8873<br>(left)  | T 404  | 12         | 2,0          | 2,9          |
| 12.5/80-18  | 550 8874            | AW     | 10         | 2,5          | 3,1          |



- Read and adhere to the General Safety Instructions as well as to the Instructions "Tyres"!
- In connection with the tyres 12.5/80-18 it is not possible to fit a seed drill at the Zirkon 9 KÜA!

# 15.2 Brake assembly

If it is required to transport a Zirkon 9 KA on public roads with fitted or mounted seed drill, the disc cultivator must be equipped with a two line air braking device.

Generally the Zirkon 9 KA must be equipped with a braking device, if the pulling tractor does not reach the prescribed braking deceleration.



• Read and adhere to the General Safety Instructions as well as to the Instructions "Brakes"!



## **16 MAINTENANCE**

## 16.1 Changing the oil

Before changing the oil or checking the oil level the power harrow must be parked on level and firm ground. Check the oil level of the gear box (GG1) with change gears daily. The level must always stand between the marks of the scale (GG3). The oil of the lateral angle gear box must reach the control screw (GG5) when the power harrow is parked horizontally.



The oil of the angle gear box can only be drained when the power harrow is folded-in.

GG6 = filler plug GG7 = vent screw GG8 = drain plug

Intervals of oil changing

- first change after 50 working hours
- all further changes after 500 working hours, but at least once a year!

Until September 2002 the centre gearboxes (GG1) had been used with mineral oil and from September 2002 they are used with synthetic oil, only.

| Centre gearboxes   |  |  |  |  |  |
|--|--|--|--|--|--|
| up to No. 0042 F   | from No. 0043 F and for gearboxes,<br>which are already filled with<br>synthetic oil   |  |  |  |  |
| 4,8 l mineral oil  | 4,8 I synthetic oil  |  |  |  |  |
| Mobilube HD 85W-140 (Mobil)<br>or<br>BP Energear FE SAE 80W-140 (BP)<br>Deagear EP-C SAE 85W-140 (DEA)<br>Shell Spirax HD 85W-140 (SHELLI) | Mobil SHC 632<br>or<br>Mobil SHC 634   |  |  |  |  |
| Lateral gearboxes  |  |  |  |  |  |
| 2 I mineral oil  | 2 I mineral oil  |  |  |  |  |
| Mobilube HD 85W-140 (Mobil)<br>or<br>BP Energear FE SAE 80W-140 (BP)<br>Deagear EP-C SAE 85W-140 (DEA)<br>Shell Spirax HD 85W-140 (SHELLI) | Mobilube HD 85W-140 (Mobil)<br>or<br>BP Energear FE SAE 80W-140 (BP)<br>Deagear EP-C SAE 85W-140 (DEA)<br>Shell Spirax HD 85W-140 (SHELLI) |  |  |  |  |

Attention: Dispose of oil and grease as prescribed by law. Use only clean oil of the above stated specifications. Stop tractor engine before checking the oil level!



#### 16.2 Trough

The trough contains special long-life lowviscosity grease which must not be mixed with a different type of grease and which must be changed after 4,000 hours, or in the event of it becoming heavily contaminated with condensation. This will be recognised by a white discoloration. The condition of the grease must be checked annually and can be done having first unscrewed the cap (GG9).



Check level of grease only with a 'run up'

machine. The level must reach the centre of the teeth on the gears. Do not mix low-viscosity grease with other greases or oils.

#### Grease

Only the following stated quantity of grease must be filled: Zirkon 9/400 KA = 24 I Olit 00 (Optimol) per power harrow unit (total 48 I) Zirkon 9/450 KA = 27 I Olit 00 (Optimol) per power harrow unit (total 54 I) Zirkon 9/500 KA = 30 I Olit 00 (Optimol) per power harrow unit (total 60 I) Zirkon 9/600 KA = 35 I Olit 00 (Optimol) per power harrow unit (total 70 I)

Attention: Dispose of oil and grease as prescribed by law. Use only clean grease of the above stated specifications. Stop tractor engine before checking the grease level.



# 16.3 Lubrication

Lubricate the grease points with an universal grease according to the lubrication diagram.











# Lubrication diagram

|  | every        | every | every | every | every | before<br>winter brook | after winter |
|--|--------------|-------|-------|-------|-------|------------------------|--------------|
|  | hours of use |       |       |       |       | Dieak                  |              |
| Side shield (2x)   |              | x     |       |       |       | х                      | х            |
| Track markers (4x)                                       |              |       | х     |       |       | х                      | х            |
| Braking linkage (6x)                                     |              |       |       |       | х     | х                      | х            |
| Hydr. three point<br>linkage (1x)                        |              |       | х     |       |       | х                      | х            |
| Lift linkage (3x)  |              | х     |       |       |       | х                      | х            |
| Lower link (2x)  |              | х     |       |       |       | х                      | х            |
| Feed discs (2x)  |              | х     |       |       |       | х                      | х            |
| Bearing of the track marker discs (2x)                   |              |       | х     |       |       | х                      | х            |
| Folding and pendulum bearings (8x)                       |              | х     |       |       |       | х                      | х            |
| PTO shaft, bearings of<br>the protections tubes<br>(8x)  | x            |       |       |       |       | x                      | х            |
| PTO shaft, universal<br>joints (8x)                      |              |       |       |       | х     | х                      | х            |
| Grease adjuster pins                                     |              |       |       |       |       | х                      | х            |
| Grease the piston rods with non-acid grease              |              |       |       |       |       | x                      |              |
| Grease faces of the guiding discs and track marker discs |              |       |       |       |       | x                      |              |

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### 16.4 Bolts

All the nuts and bolts must be tightened after the first few hours of use, certainly within the first 8 hours and checked, and tightened if necessary, regularly after that. At least every 100 hours all bolts must be checked and tightened if necessary. The wheel nuts (M20x1.5) of the running axle and the brake axle must be tightened with 420 Nm. The wheel nuts (M18x1.5) of the running axles with 140x140 square tube must be tightened with 320 Nm.

#### 16.5 Rotor bearings

The bearings of the rotors must be checked with regard to the play. They must be checked after the first 100 hours of use and then every 20 hours of use. With too much play the corresponding bearings must be replaced, in order to prevent damage to the gear wheels and trough.

#### 16.6 "Allround" tines

Worn tines must be changed in good time.

#### 16.7 Scrapers

The scrapers must be adjusted regularly. Worn scrapers must be changed in time.

#### 16.8 PTO shaft

Regularly check the PTO shafts to ensure that it slides in and out smoothly. Regularly grease the shafts and universal joints. Always secure guards from spinning by fitting the chains to a nearby static part. PTO-shafts may only be repaired by experts, only.

#### 16.9 Hydraulic pipes

Regularly check the hydraulic pipes for damage and leaks. Replace any that are defective. All hydraulic hoses must be renewed after 6 years. Use genuine replacement parts, only.

#### 16.10 Axle bearings

They must be re-adjusted every 200 hours of use or when play is recognised.

# 16.11 Brake assembly

#### **Drain valve**

Operate drain valve (B1) regularly, in order to drain the air tank (B2).

#### **Brake lining**

Worn brake linings must be replaced.

#### **Cleaning filter**

The cleaning filters (B3) must be cleaned every 50 working hours. Therefore the securing bars (B4) must be removed and pulled out.

After cleaning (by air pressure) the

filter, the filter can be fitted again and secured by the securing bars.

#### Disconnecting the brake hoses

After disconnection of the red connection coupling the braking procedure starts = automatic braking.

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#### **Re-adjusting the brake**

When the brake lever (B9) opens with a braking more than 60 mm, the brake must be re-adjusted, so that the lever opens approx. 40 mm. The adjustment will be done by means of the adjuster device (B10).

#### Important:

Do not clean this implement with a Pressure Washer during the first 6 weeks. After this time a minimum nozzle distance of 60 cm must be observed with a maximum 100 bar pressure and 50° C temperature.



• Read and adhere to the General Safety Instructions as well as to the Instructions "Maintenance"!





# **17 DRIVING ON PUBLIC ROADS**

#### 17.1 General Instructions

The prescribed lighting equipment and warning boards are standard with the Zirkon 9 KA.

When driving on public roads, the protection devices (SV1) must be fitted by means of the straps (SV3). When the power harrow is equipped with a packer roller, the roller must be protected by means of the protection device (SV2).



#### 17.2 Allowed transport speed

- a)With the tyres 550/60-22.5 and in connection with a two line air braking device the Zirkon 9 KA is allowed to be driven up to 50 km/h, also with mounted Solitair seed drill.
- b)With the tyres 550/60-22.5 and in connection with a two line air braking device the Zirkon 9 KA is allowed to be driven up to 30 km/ h, when a seed drill is fitted to the three point linkage.
- c) With the tyres 12.5/80-18 the maximum allowed transport speed amounts 30 km/h.

#### **18 TECHNICAL DATA**

|   | Zirkon    |           |           |           |  |
|---|-----------|-----------|-----------|-----------|--|
|   | 9/400 KA  | 9/450 KA  | 9/500 KA  | 9/600 KA  |  |
| Working width (cm)  | 400       | 450       | 500       | 600       |  |
| Weight (kg) with tooth bar roller and track markers                     | ca. 4.200 | ca. 4.400 | ca. 4.700 | ca. 5.000 |  |
| Weight (kg) with seed drill Solitair                                    | ca. 5.400 | ca. 5.700 | ca. 6.100 | ca. 6.550 |  |
| Allowed axle load (kg) with braking assembly and tyres 550/60-22.5      | 8.000     | 8.000     | 8.000     | 8.000     |  |
| Allowed axle load (kg) without braking assembly, with tyres 550/60-22.5 | 3.000     | 3.000     | 3.000     | 3.000     |  |
| Allowed axle load (kg) without braking assembly, with tyres 12.5/80-18  | 3.000     | 3.000     | 3.000     | 3.000     |  |
| Allowed total weight (kg)<br>with braking assembly                      | 8.500     | 8.500     | 8.500     | 8.500     |  |
| Allowed total weight (kg)<br>without braking assembly                   | 5.000     | 5.000     | 5.000     | 5.000     |  |

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#### **19 NOISE, AIRBORNE SOUND**

The noise level of the Power Harrows ZIRKON 9 KA does not exceed 70 dB (A) during work.

#### 20 NOTES

It must be stated that these instructions apply only to the current design.

#### 21 NOISE, AIRBORNE SOUND

The noise level of the ZIRKON 9 KA Power Harrows does not exceed 70 dB (A) during work.