



AXR-E



GB
300 cm

AXR-E

Type 300 cm

Congratulations on your new AXR-E. To ensure **safe operation** and to obtain optimal use of the machine, read the rules and instructions of the following operator's manual carefully **before operating the machine**.

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Your AXR-E:

Type No.: _____ Serial No.: _____
Month of manufacture: _____ Net weight (kg): _____

For prompt service, always quote your machine serial number when making enquiries regarding spare parts or service. A comprehensive index of spare parts can be found in the back of this manual to give you an overview of AXR-E components and to facilitate ordering.

EU DECLARATION OF CONFORMITY

Maskinfabriken DAL-BO A/S
DK-7183 Randbøl

Hereby declare that the above-mentioned machine has been manufactured in compliance with the provision of the Council Directive on the approximation of the laws of the Member States relating to machinery 98/37/EC, which replaces Council Directive 89/392/EEC and amendments 91/368/EEC, 93/44/EEC and 93/68/ECC concerning the Essential Health and Safety Requirements for the design and manufacture of Machinery.

CE

This machine complies with the safety requirements stipulated by the European safety regulations.

Maskinfabriken DAL-BO A/S

Date: _____

Director Kaj Pedersen

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Safety



The safety alert symbol is used throughout this manual to identify important safety warning messages concerning your safety, the safety of other users or the functional safety of the implement. Observe all safety instructions and make them readily accessible to all users of the equipment.

General

- The operator must be thoroughly familiar with all safety precautions and operations of this equipment prior to using.
- The safety signs on the AXR-E contain important instructions concerning your safety, the safety of those around you, and the correct operation of the machinery.
- Never allow anyone to ride on the implement during operation or transport.
- Never allow bystanders within the operating radius of the AXR-E when the implement is in operation. Operate the AXR-E only while seated in the driver's seat of the tractor.
- Before performing any adjustments, maintenance or repairs on the machinery, always lower the AXR-E to the ground or secure in transport position, set the tractor brakes, turn off the engine and remove the ignition key to secure against unintentional operation.
- Remember to secure the drawbar stand and the lift arms with lynch pins.
- Operate the tractor and AXR-E only while seated in the driver's seat.
- Always drive according to conditions.
- Do not use the AXR-E unless all safety signs are installed. Replace defective safety signs immediately.

Hydraulic System

- Never allow bystanders within the operating radius of the AXR-E when the hydraulic system is activated to prevent individuals from the danger of being crushed.
- Before performing maintenance or repairs on the hydraulic system, lower the implement to the ground, relieve pressure in the system, turn off the engine and remove the ignition key.
- Clean the hydraulic fittings thoroughly before connection. Ensure that the pressure is relieved in the hydraulic system before connecting the hydraulic hoses to the tractor's hydraulic services.
- After making repairs to the hydraulic system, thoroughly bleed air out of the system.
- Regularly check hydraulic hoses for defects such as cracks, bends, chafing or leaks. Replace defective hoses immediately.
- Avoid spilling oil on the ground. In case of spills, collect the oil and dispose of it properly.
- In case skin should come in contact with hydraulic oil or grease or in case clothing should become stained with oil, remove the stained clothes immediately and wash the affected skin areas thoroughly. Oil and grease are harmful to the skin.
- Escaping hydraulic oil under high pressure can penetrate the skin and cause severe injury. If an accident occurs, see a doctor immediately.

Hitching

- An individual is in danger of being crushed during the hitching process. Never place yourself or anyone else between the tractor and the AXR-E, or between parts that must be attached or connected.

Maintenance and Repairs

- Before servicing or making adjustments to the machine, securely block the machine, engage the tractor and machine brakes, stop the engine and remove the keys.
- Tighten all nuts, bolts, hydraulic fittings or any other fastened assemblies after a few hours' use. Check often to make sure that they remain thoroughly tightened. Inspect all pins, screws and bolts for wear or damage and make sure that all are securely in place to avoid any possible damage or breakdown of the machine.

- Dispose of oil, grease and filters according to applicable environmental regulations.

Transport

- All safety and warning signs and devices required by law must be displayed, mounted and tested for public road use. The driver is responsible for the correct use of lights and markings in compliance with the present Traffic Act and Highway Code of the local traffic legislation.
- It is the responsibility of the driver to consult with local traffic authorities in order to ensure that the size, weight and load of the machinery may be transported on public roads.
- When towing the implement, the total weight of the tractor and the maximum allowed axle load must not be exceeded. The weight on the front axle must not be less than 20 percent of the total mass of the tractor. If it is less than 20 percent, extra weight must be added to the front of the tractor.

Correct Use

- Correct use of the AXR-E includes adherence to the instructions of the manufacturer concerning operation, maintenance and repair, as well as the use of genuine factory replacement parts.
- Do not allow anyone to operate, maintain or repair the AXR-E unless they are familiar with the implement and they are thoroughly aware of the possible hazards.
- The manufacturer does not accept any liability for injury or warranty if the equipment has been altered in any way without prior authorization from the manufacturer or if the injury is a result of incorrect use of the implement. The user accepts complete responsibility in these cases.
- Never load extra weight onto the AXR-E.

Technical Data

AXR-E

Size (cm)	300
HP (recommended)	70-120
Gross weight kg:	2800
Wheels	11.5/80x15.3
Options	
Angle Adjustment	Yes
Outer Harrows	Yes
Lights	Yes
Wheels	400/60x15.3

How to Use This Manual

If the order of points described under the main subject areas of the manual seems confusing or illogical, refer to the Table of Contents where all subject headings can be found.

The main points of the operator's manual are placed into five main categories:

- Safety
- Set-up and Operation
- Options
- Maintenance
- Repairs

The following safety alert symbols are used throughout this manual to indicate:



Points that are extremely important for the function and life of the machinery.



Points that involve safety.

Usage

The AXR-E is a rugged disc harrow that is designed to cut, mix and pulverise plant stubble and plant residue. The AXR-E performs particularly well when breaking down large quantities of straw and plant residue, since the implement will never drag or become plugged with plant material.

The AXR-E is constructed on a heavy-duty main frame onto which the disc gangs are mounted in an offset X formation. A roller consisting of 60 cm steel rings and scrapers is mounted in a three-point hitch on the back of the tool.

A special feature of the AXR-E is the dual depth control system. Penetration depth can be controlled both by the lift arms of the tractor and by the packer roller attachment. This special implement design provides smooth and steady field work. The working depth can be precisely controlled, which results in a field surface that is even and uniformly packed without any trace of wheel tracks.

The AXR-E is an effective tool for plough-free cultivation, and at the same time it conditions the soil for an ideal seedbed. A seed drill with a working width of 4 m can be mounted as an optional accessory.

The AXR-E can also be equipped with optional accessories such as a three-point hitch for mounting a seed drill. Other optional equipment includes hydraulic angle adjustment and depth adjustment.

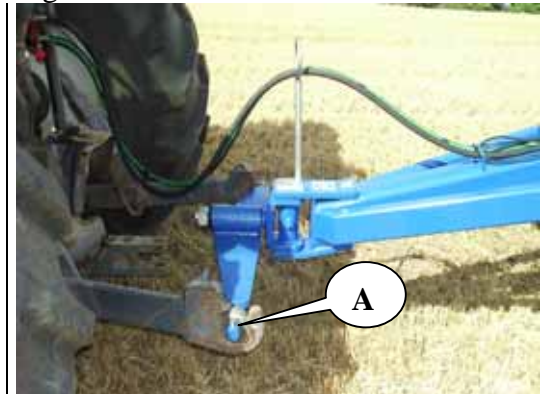
Hitching and Unhitching

Hitching

The linkage of the AXR-E is manufactured in compliance with DS/ISO 730-1 category II and III.

1. Mount the drawbar arm sockets (A) of the implement into hooks of the tractor. Elevate the lift and make sure that the pins are firmly engaged in the hooks.
2. Mount the hydraulic hoses.

Fig. 1



Remember to secure the lift arms with lynchpins and make sure that the locking mechanism in the tractor lift arms secures the linkage.

Hydraulics

There are varying requirements for hydraulic connections depending on the type of AXR-E model (see "Options"). The standard model requires one double-acting service for the wheel frame.

Unhitching

Lower the AXR-E to the ground before unhitching. Relieve the pressure from the hydraulic system and dismantle the implement drawbar from the tractor lift arms. Remove any lights.



Remember to relieve the pressure in the connecting hoses to the hydraulic system before disconnecting the hoses.

Adjustments and Settings

The AXR-E is preset in the factory, but some fine adjustments will always be necessary before use. Numerous adjustment possibilities make your AXR-E more versatile and allow you to obtain optimum performance from the implement.

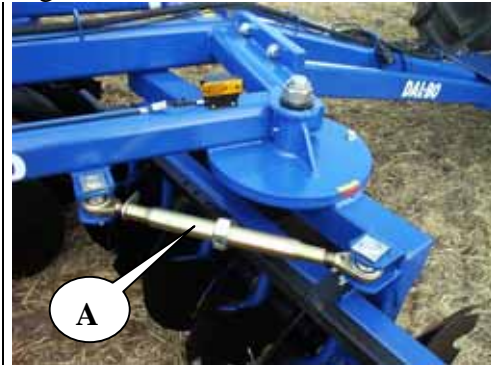
As a standard position, level the AXR-E horizontally for work in the field. **This standard levelling position is important to achieve an even and uniform field finish.**

Disc Angling

The angle of the discs can be adjusted according to need. As a standard position, set the front and rear gangs at the same angle.

Adjust the angle of the discs by lengthening or shortening the turnbuckles (A) located between the main frame and the disc gangs. Remember to tighten the tightening nut on the turnbuckle.

Fig. 2



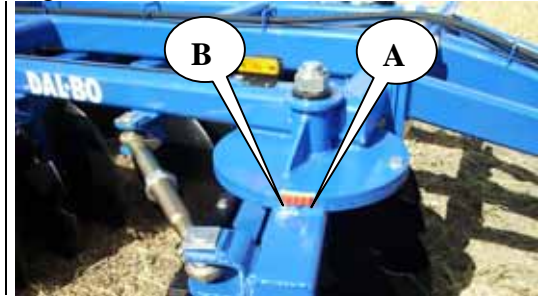
Four notches (A) on the pivot indicate the angle of the disc gangs. For the front disc gang, count the notches from the middle of the disc harrow towards the front, and for the rear disc gang, count the notches from the middle of the harrow towards the rear of the implement.

Fig. 3



Fig. 4

When working on hard, dry soil, it is recommended that the most aggressive setting be used (A), but when working on loose soil and under wet conditions, a more passive setting (B) is appropriate.



The discs should be set only as aggressively as needed to achieve a satisfactory cutting depth and field finish. This will save on the wearing of the parts and the amount of tractor force needed to pull the implement.

Fig. 5

A combination wrench (A) is supplied for the adjustment of the angle adjustment turnbuckles and the castle nuts.

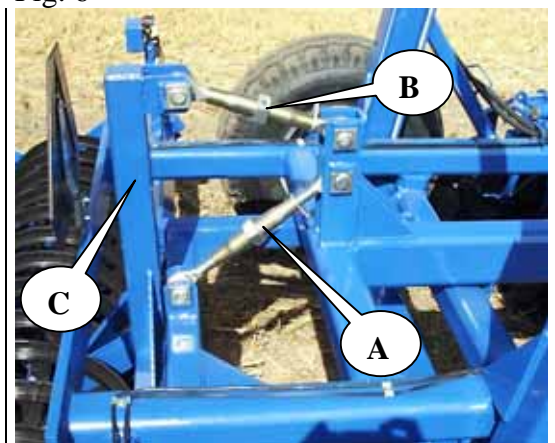


Depth Adjustment

The working depth can be adjusted on the lift and on the rear T-ring packer roller.

Fig. 6

1. To increase the working depth, shorten the turnbuckle (A). Adjust turnbuckle (B) so that the tower beam (C) is vertical.
2. To decrease the working depth, lengthen turnbuckle (A) and adjust the tower beam so that it is vertical.

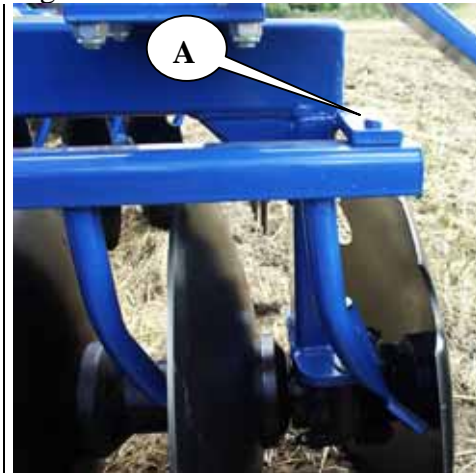


The lift of the AXR-E must also be adjusted. See section "Operating and Driving Instructions".

Scrapers

Adjust the scrapers by loosening the bolts (A), allowing the scrapers to move. Adjust the scrapers so that there is a minimum space of 5 mm between the scrapers and the discs, but make sure that the scrapers never touch the discs.

Fig. 7

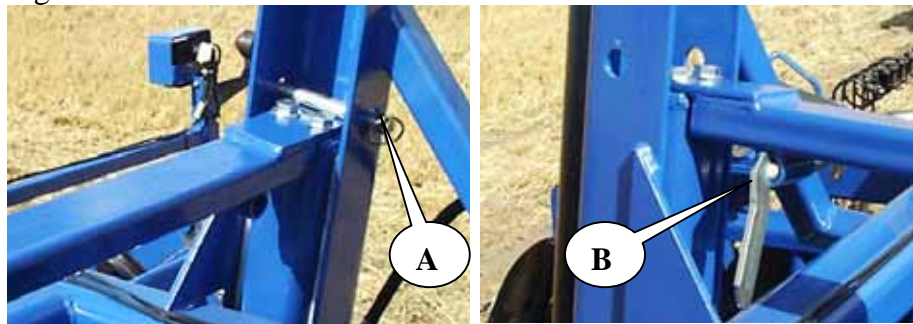


Operating and Driving Instructions

Proper operation is essential to attain the optimum performance from your AXR-E. Proper operation entails both carrying out tillage operations in the field correctly as well as following safety precautions carefully. Before operating the AXR-E, read this manual and make sure that you have a thorough understanding of all safety precautions.

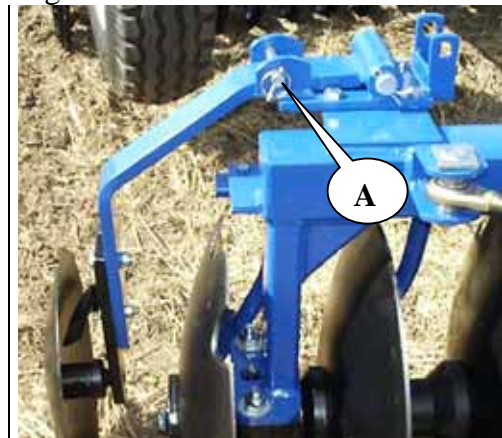
Upon arrival to the field, remove the transport pin (A) and place it in the holder (B).

Fig. 8



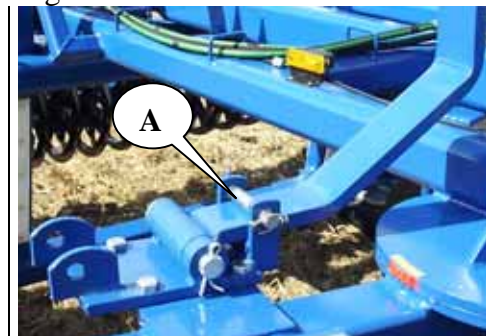
Unfold the outermost discs on the rear disc gangs. Insert the pins (A) to secure the outer discs.

Fig. 9



Before leaving the work area, fold up the small discs and insert the pin (A) to secure the discs in a folded position.

Fig. 10



The outermost disc in the front must run 5-10 cm from the preceding trail in order to obtain the optimum performance of the machine and to achieve a level field surface.

Penetration Depth

The AXR-E can be set for light tillage operations. Depth can be precisely controlled by means of the suspended packer roller sections as well as the position control of the tractor lift. The AXR-E can be set for very light soil cultivation at a depth of only 5 cm. If work is carried out at a depth of only 5 cm, best results will be achieved through a very aggressive angling of the discs, so that the full amount of the cut can be achieved.

While working in the field, it is important that the AXR-E works parallel to the ground. The position control on the lift should be set for a fixed bottom stop position, so that the disc harrow is lowered to the same depth every time.

Fig. 11



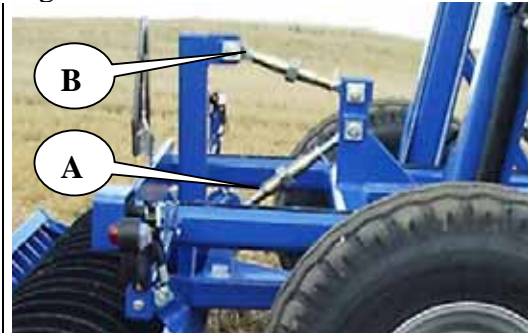
When starting up, first lower the tractor lift down to the chosen depth. Next, sink the rear of the AXR-E down using the wheel frame. This special control of the implement provides a uniform start and stop of tillage work at the headland.

Adjustment of Operating Depth

Adjusting the operating depth requires changing the depth in both the lift and the packer roller.

Adjust the turnbuckle (B) so that the beam tower of the packer roller is horizontal.

Fig. 12



Angling

The discs can be angled according to need. For heavy work on a hard field, set the front disc gangs more aggressively than the rear gangs to be able to break up the soil more easily.

Ridge forms along the middle

A ridge of soil may form in the middle under the AXR-E while driving. If this occurs, the angle of the rear disc gang is too large, or the lift might not be lowered enough, causing the AXR-E to tilt backwards.

For a better field finish, you can often achieve good results by angling the front gangs a little more aggressively than the rear gangs. The front discs break up the surface easier and enable the rear gangs to mix more effectively.

Ridges form on the sides

If the front gangs are set too aggressively, ridges may form on the outside of the outermost discs. These ridges could also appear if the driving speed is too high, or if the lift is lowered too far down, causing the AXR-E to tilt forwards.

The working angle (tilt) of the AXR-E must be set to suit conditions. Depending on the type of land surface and the amount of moisture in the soil, adjustments to the AXR-E will be necessary in order to adapt the tool to the specific field that needs to be worked.

Travel Speed

A working speed between 8 and 12 km/hour is recommended, but always drive according to conditions.

It should be noted that wear on the implement increases considerably when the travel speed is increased, especially under dry soil conditions. Damage to the T-rings and discs may also result from driving too fast under unfavourable conditions.

Power Requirements

Power requirements change according to soil type, terrain and travel speed.

Troubleshooting

Problem	Cause	Action
Ridge in the middle	<ul style="list-style-type: none"> • Angle too wide on the rear disc gang 	<ul style="list-style-type: none"> • Reduce the angle of the rear disc gang • Increase the angle of the front disc gang
	<ul style="list-style-type: none"> • AXR-E tilts backwards 	<ul style="list-style-type: none"> • Lower the packer roller (increase the length of the turnbuckle) • Lower the lift
	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
Ridge on the sides	<ul style="list-style-type: none"> • Angle too wide on the front disc gang 	<ul style="list-style-type: none"> • Reduce the angle of the front disc gang
	<ul style="list-style-type: none"> • Angle too small on the rear disc gang 	<ul style="list-style-type: none"> • Increase the angle of the rear disc gang
	<ul style="list-style-type: none"> • Travel speed too fast 	<ul style="list-style-type: none"> • Reduce travel speed • Mount outer harrows • Adjust outer harrows
	<ul style="list-style-type: none"> • Imprecise driving 	<ul style="list-style-type: none"> • The distance between the different passes must be more accurate.

Options

Your AXR-E can be equipped with various types of optional equipment, depending on individual needs.

- Hydraulic angle adjustment
- Hydraulic depth adjustment
- Outer harrows
- Bearing protectors
- F-iron cage roller

Table 1. Hose Markings

Cylinder	Colour	Service	Function
Angle adjustment	Blue	Double-acting	To adjust the angle of the discs
Depth adjustment	Green	Double-acting	To regulate the working depth of the discs

Hydraulic Angle Adjustment

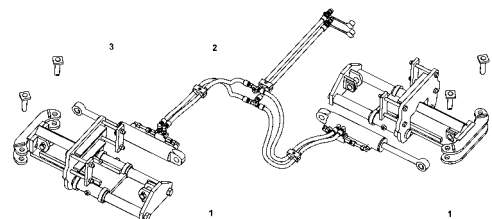
Hydraulic angle adjustment makes it possible to change the angle of the discs from inside the cab while you are driving on the field.

Operating Instructions

Hydraulic angle adjustment provides the user with greater flexibility since it allows the user to react immediately to the changes in the field structure.

The optimum setting can be more easily attained when the results of the angle changes can be seen immediately. It is not recommended that you drive with a larger angle than necessary, since this will increase wear on the machinery and more power will be required from the tractor to pull the unit.

Fig. 13



Mounting

1. Dismount the turnbuckles from the brackets (A).
2. Mount the hydraulic angle adjustment between the two brackets on which the turnbuckles had previously been mounted.
3. Mount the disc gang turnbuckles onto the hydraulic angle adjustment.
4. Fasten the hydraulic hoses to the main frame. (**Make sure that the hoses do not get caught or squeezed**).
5. Connect the hydraulic hoses to a double-acting service on the tractor.



After mounting, activate the angle adjustment in the fully extended position several times to bleed air out of the system.



Never allow bystanders within the operating radius of the AXR-E when the angle adjustment is activated.

Hydraulic Depth Adjustment

Hydraulic depth adjustment provides greater flexibility while working in the field. The installation size of the cylinders is the same as that of the turnbuckles, so switching them requires only a very simple procedure.

Outer Harrows

Outer harrows limit the amount of soil and plant residue that is cast out to the side by the outermost discs of the front disc gangs. Outer harrows are designed to prevent soil and plant residue from being cast out beyond the reach of the rear discs.

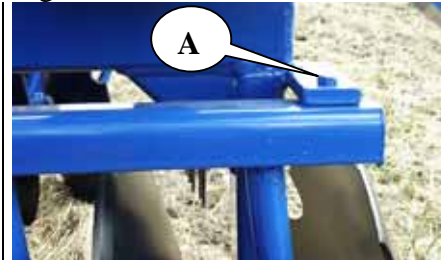
Outer harrows afford you greater freedom with respect to travel speed since soil and residue are always kept within the reach of the AXR-E regardless of speed and angle. A smooth, even field finish can be more easily achieved with mounted outer harrows.

Mounting

The outer harrows are mounted on top of the scraper fittings on the front gangs.

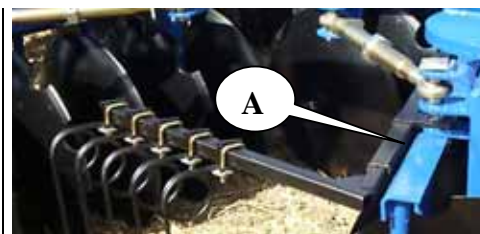
Remove the bolts (A).

Fig. 14



Fasten the innermost telescopic sliding beams onto the scraper fittings.

Fig. 15



Adjustment

The distance between the outermost disc and the fingers of the outer harrows can be adjusted to approx. 30 cm by removing the bolt/pin of the telescopic sliding piece and by pulling/pushing the outer piece of the outer harrow. This setting can vary according to soil type, terrain and travel speed.

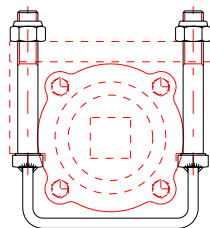
Bearing Protectors

Bearing protectors can be mounted on the disc bearings if you wish to have extra protection for the bearing housings. Bearing protectors are installed in the holes that hold the bearings and replace the original bolts.

Mounting

Mounting of the bearing protectors must be carried out while the AXR-E is resting on the ground. Remove the bolts from one bearing at a time and mount the bearing protector. Before starting to dismount the bearings, make sure that the bearings are clean.

Fig. 16



F-Iron Cage Roller

An F-iron cage roller can be mounted behind the T-ring roller to achieve an even finer field finish.

It is especially important that the tower (see Fig. 6) is vertical when mounting the cage roller.

Fig. 17



Maintenance

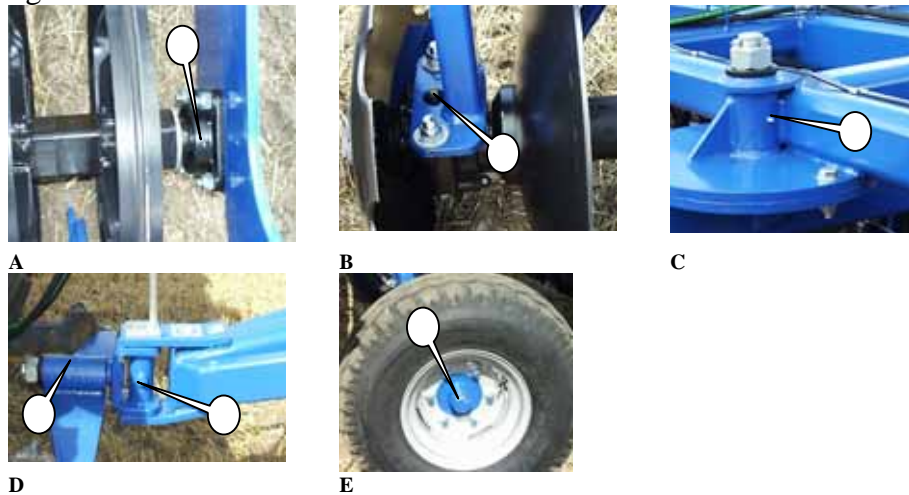
Proper maintenance ensures a long lifetime for the AXR-E and also optimum performance from the implement. To facilitate maintenance, grease fittings have been mounted on those locations where wear on the equipment is the greatest.



Tighten all nuts, bolts, hydraulic fittings or any other fastened assemblies after the first workday. Inspect all pins and bolts for wear or damage and make sure that all are securely in place to avoid any possible damage or breakdown of the machine. Check for leaks in the hydraulic system.

Lubrication

Fig. 18



Lubrication Points	Number of fittings	Lubrication interval (hours)	Photo
Packer roller bearings	3	50	A
Disc bearings	8	50	B
Centre pins of disc gangs	4	50	C
Drawbar	2	50	D
Wheel bearings	2	200	E
Hydraulic angle adjustment	4	25	



Lubricate all lubrication points at least once a year.

Hydraulic System



Inspect all hydraulic hoses for chafing or leaks. Check hoses for pinching.



Defective hydraulic hoses must be replaced immediately. A ruptured hose could cause personal injury to the user or mechanical damage to the equipment.



To avoid rust, any projecting piston rods should be coated with oil or grease if the AXR-E is to be parked for a long period of time. Remember to remove the oil or grease prior to operation.

Adjustments

Adjusting the castle nut on the pivots

The pivots are tightened to a torque of 100 Nm by the factory, but they must be tightened again if a gap develops between the plates.

Lower the AXR-E completely before tightening the pivots.

1. Knock the slotted split pin (A) out of the shaft.
2. Tighten the castle nut (A) to a torque of 100 Nm, or until there is no longer a gap between the plates when the AXR-E is raised. Tighten the castle nut so that the hole in the axle lines up with the notches of the castle nut. Remember to insert the slotted split pin.

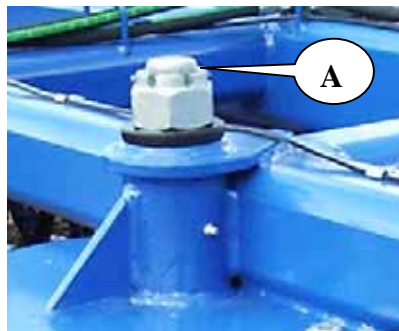


Fig. 19



To protect the shaft and the pivot plates, a bolt (B) has been mounted inside an oblong slit located on the pivot plates. This bolt absorbs the pulling force that originates from the discs when the tractor begins to drive forward. This bolt (B) must be just loose enough that it can slide along the oblong slit when the angle of the discs is changed.

Wheels

Lubricate and adjust the wheel bearings once a year. Make sure that the tyre pressure is equal to the recommended tyre pressure appearing on the wheel. If the AXR-E has been frequently in use both in the spring and in the autumn, the wheel bearings must be lubricated every six months.

Dismounting/mounting of wheels

To dismount the wheels, lower the AXR-E until the discs are resting on the ground but still supported by the wheels, so that the hub nut can be loosened without causing the wheels to rotate. Next, lift the wheels clear off the ground and remove the hub nut completely. The wheel can then be removed and replaced. After mounting a new wheel, screw the nut on and tighten by hand. Next, lower the wheels until they are touching the ground and tighten the nut to a torque of 300 Nm.

Adjustment and lubrication of wheel bearings

1. The AXR-E must be resting securely on the ground with the wheels raised from the ground.
2. Remove the hubcap.
3. Take out the split cotter pin.
4. Tighten the castle nut $1/6$ of a rotation until the hole is lined up with the axle. The wheel/hub must be turned just enough so that there is no drag on the bearing, yet there must not be so much slack in the hub that it jiggles from side to side. If there still is some slack in the hub, repeat the process.
5. Replace the split cotter pin.
6. Fill the hubcap $3/4$ full with lubricant and reinstall.

Angle Adjustment

The hydraulic angle adjustment can only be changed by adjusting the turn-buckles.

Wheel Frame

Do not lubricate the sliding rails, since this will only encourage impurities and debris such as dust, soil and residue to collect on the machinery and increase wear.

Replacements and Repairs



Safety is important in connection with **all** repair work on the AXR-E. The following safety precautions and the safety points listed in the beginning of this manual must be observed and followed.



Before performing any adjustments, maintenance or repairs on the machinery, always lower the AXR-E to the ground or secure in transport position, set the tractor brakes, turn off the engine and remove the ignition key to secure against unintentional operation.



Pay careful attention to safety when performing repair work on the hydraulic system. Remove hydraulic pressure prior to doing any maintenance, and block the part if needed.



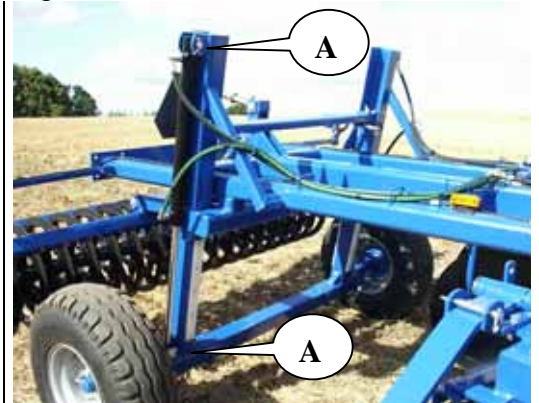
After making repairs to the hydraulic system, always bleed air out of the system before operating the AXR-E again to avoid any possible personal injury or mechanical breakdown or damage.

Hydraulics

Replacing wheel frame cylinder

1. The AXR-E must be resting securely on the ground. Relieve pressure in the hydraulic system.
2. Dismount the hydraulic hoses.
3. Remove the pins (A)
4. Mount a new cylinder (Remember the split cotter pin).
5. Mount the hydraulic hoses.

Fig. 20



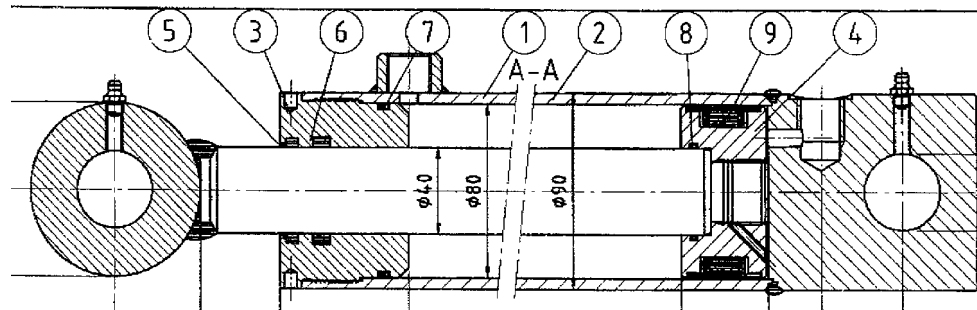
After mounting the cylinder, activate the wheel frame cylinders until the piston rods begin to move in the cylinders. Next, activate the cylinders in the opposite direction until the cylinder is back in the starting position. Move the cylinders several times in this way. Then activate the cylinders out into the fully extended position to bleed air out of the system.



Never allow bystanders within the operating radius of the implement.

Replacing the seals on the wheel frame cylinder

Fig. 21



Cylinder 50/30-600 Ø25 (91843)

1. Empty the oil from the cylinder by carefully moving the cylinder back and forth.
2. Move the piston to the middle position. Unscrew the gland (pos. 3) from the cylinder casing (pos. 1). (A special tool is needed to remove the gland). If the gland is stuck, it may help to warm up the very front of the socket. When the gland has been unscrewed, pull the piston towards the gland. Pull the piston rod completely out of the cylinder casing.
3. Remove the self-locking nut holding the sleeve (pos. 4).
4. Pull the sleeve (pos. 4) off the piston rod.
5. Pull the gland (pos. 3) off the piston rod.
6. Remove the seals from the gland and the sleeve (pos. 5+6+7+8+9).
7. Clean all parts thoroughly. Check for filings, shavings, burrs, and make sure that there is no rust around the scraper ring (pos. 5) in the gland. If rust is found, it must be removed.

Assembly

- 1 Assemble the new seals (pos. 5+6+7+8+9) into the gland and the sleeve.
- 2 Lubricate the screw threads on the gland (pos. 3) and the cylinder casing with oil.
- 3 Mount the gland (pos. 3) onto the piston rod.
- 4 Mount the sleeve (pos. 4) and screw on the self-locking nut **with Loctite**. Make sure that the screw threads are completely clean and free from oil or other impurities before using Loctite. **Do not refill the oil for the first 12 hours after the application of Loctite.**
- 5 Lubricate the outermost seal of the sleeve that has contact with the cylinder casing and the inside of the cylinder casing, then guide the piston rod into the middle position of the casing.
 1. Screw the gland onto the casing and tighten.
 2. Mount the cylinder. (See "Changing").

Replacing Angle Adjustment Cylinder

Retract the angle adjustment cylinder until it is almost completely retracted. The AXR-E must be resting securely on the ground. Relieve the pressure in the hydraulic system.

1. Dismount the hydraulic hoses.
2. Remove the pins. The cylinder is now free.
3. Mount the cylinder in reverse order.



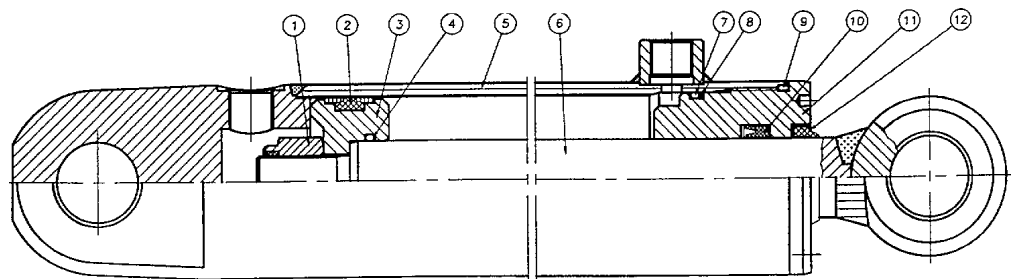
After assembling the hydraulic angle adjustment, bleed air out of the system by moving the cylinder back and forth to the fully extended and retracted positions.



Never allow bystanders within the operating radius of the implement when the hydraulic system is activated.

Replacing the seals on the angle adjustment cylinder

Fig. 22



Cylinder 70/30-205

1. Empty the oil from the cylinder by carefully moving the cylinder back and forth.
2. Move the piston into the middle position. Unscrew the gland (pos. 11) from the cylinder casing (pos. 5). A special tool is needed to remove the gland. If the gland is stuck, it may help to warm up the very front of the socket. When the gland has been unscrewed, pull the piston out towards the gland. Pull the piston rod (pos. 6) out of the cylinder casing (pos. 5).
3. Remove the locking nut (pos. 1) which holds the sleeve (pos. 3).
4. Pull the sleeve (pos. 3) off the piston rod (pos. 6).
5. Pull the gland (pos. 11) off the piston rod (pos. 7).
6. Remove the seals from the gland and the sleeve (pos. 2+4+7+8+9+10+12).
7. Clean all parts thoroughly. Check for filings, shavings and burrs, and make sure that there is no rust around the scraper ring (pos. 12) in the gland. If this is the case, it must be removed.

Assembly

1. Assemble the new seals into the gland and the sleeve (pos. 2+4+7+8+9+10+12).
2. Lubricate the screw threads on the gland (pos. 11) and the cylinder casing (pos. 5) with grease or oil.
3. Place the gland (pos. 11) onto the piston rod (pos. 6).
4. Mount the sleeve (pos. 3) and screw on the self-locking nut **with Loctite**. Make sure that the screw threads are completely clean and free from oil or other impurities before using Loctite. **Do not refill the oil for the first 12 hours after the application of Loctite.**
5. Lubricate the outermost seal on the sleeve which has contact with the cylinder casing and the inside of the cylinder casing with oil, then guide the piston into the middle position.
6. Fit the gland onto the cylinder casing and tighten.

Replacing Scrapers

Change the scrapers when they are so worn that they no longer can perform satisfactorily.

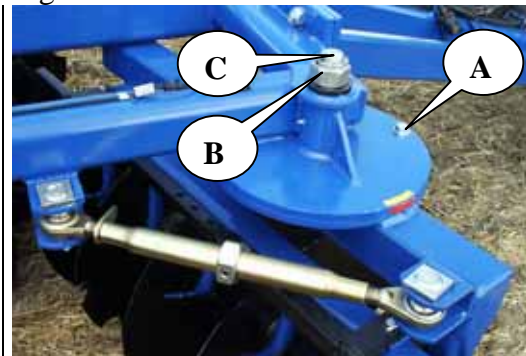
Disc scrapers

The scrapers are mounted onto the disc gang with two bolts. Remove the bolts and mount a new scraper. Notice that the scrapers on the right/left sides as well as the scrapers on the front and back gangs are different. For adjustment of the scrapers, see "Scrapers".

Dismounting Disc Gangs

It is recommended that a crane is available for the dismounting of the disc gangs.

Fig. 23



1. Suspend the disc bars with two straps so that the disc gangs are hanging in balance. The straps and the crane must be able to carry 500 kg.
2. Lift until the straps carry the weight of the disc gangs.
3. Remove the bolt (A).
4. Remove the split cotter pin and the castle nut (B).

5. Raise the AXR-E carefully with the tractor's lift and also by means of the wheel frame on the AXR-E, so that the main frame is pulled out of the pin. The crane should not lift the disc gangs, but rather just support the disc gangs so that they do not tip over when the pin is pulled out of the bushing.
6. It is necessary to dismount the disc shaft in order to change the pin (C).
7. Reassemble in reverse order.

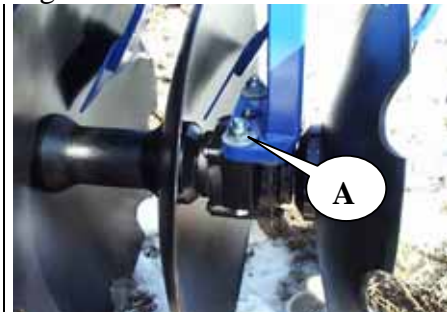


Take precautions to ensure that the disc shaft does not roll away unintentionally.

Replacing Discs and Disc Bearings

Before changing the bearings, the AXR-E must be hitched to a tractor. Lower the transport wheels on the AXR-E so that the wheels just barely carry the weight of the AXR-E, but the discs are still lightly resting on the ground.

Fig. 24



1. Remove the bolt (A) (if bearing protectors are mounted on the bearings, first remove the nuts, and then the bearing protectors can be removed).
2. After the bolts have been removed (remember there are 2 bearings on each shaft), raise the AXR-E. Discs and shaft can then be rolled away or the AXR-E can be moved away.
3. Remove the split cotter pin from the castle nut and unscrew the nut. The spacers, discs and bearings can then be pulled off the shaft. Be careful not to damage the screw thread on the shaft.



If work is performed under the AXR-E when it is raised on the wheel frame and/or has been raised by the lift, the AXR-E must be supported.

Mounting discs and bearings

1. Clean the shaft, discs and bearings.
2. Assemble the discs, spacers and bearings while they are still on the floor. Be careful not to damage the screw thread on the shaft. The end of the shaft can be gently tapped with a hammer to get the pieces to move to the bottom.
3. After the last disc has been placed onto the shaft, assemble (1) end washer, (2) clamp and (3) castle nut. It is recommended that the final tightening of the nut be carried out after the shaft has been mounted onto the AXR-E.

4. Roll the assembled shaft under the AXR-E. The holes of the bearings must be lined up with the flanges of the AXR-E.
5. Lower the AXR-E carefully to within a few mm of the bearings. Insert the bolts. Use extreme caution when performing this procedure. Before making final adjustments to the shaft and inserting the bolt, the AXR-E must be securely blocked and held in place.
6. After tightening the bolts in the bearings, tighten the castle nut to a torque of 1500 Nm (150 kgm) and insert the split cotter pin.



Performing repairs or maintenance work under the AXR-E when it is raised from the ground requires strong support from underneath. No one is allowed under the AXR-E unless it is firmly blocked and supported.

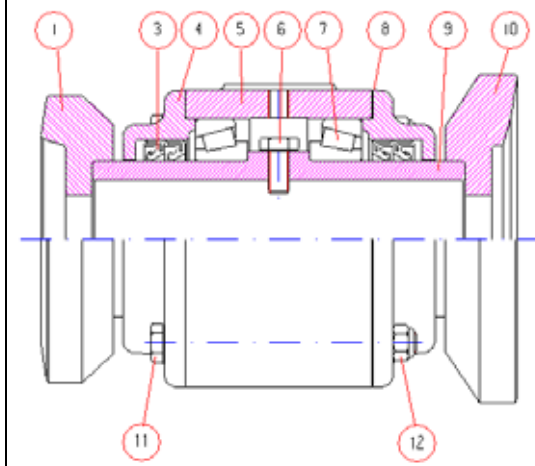
Make sure that the spacers and the bearings are facing in the right direction so that the ends are positioned up against the discs.

Replacing the bearings in the housings

Fig. 25

1. Flange Ø138 (inside disc)
- 3 Sealing 75/95/10
- 4 Cap
- 5 House
- 6 Bolt 10x20
- 7 Bearing
- 8 Cap sealing
- 9 Shaft
- 10 Flange Ø158 (outside disc)
- 11 Bolt 10x120
- 12 Nut M12

Fig. 26



1. Remove the flanges (pos. 1+10) from the bearing housing.
2. Remove the 4 bolts (4 pieces, pos. 11) and lift the covers (pos. 4) off both sides of the housing.
3. Press out the lip seals (pos. 3) in each cover (pos. 4). Since lip seals must be in extremely good condition in order to use them again, it is generally suggested that they be replaced.
4. Press the bearings (pos. 7) out of the housing by means of a hydraulic press. The bearings can also be knocked out of the housing by tapping on the hollow shaft (pos. 9), but the hollow shaft must be protected with a wooden block. (The hollow shaft is constructed with a collar in the middle which presses the bearing out when you knock on the shaft). If the bearings are very worn, the inner ring may remain inside the housing. Tap the inner ring out with a mandrel. Be careful not to damage the housing.

5. Press or knock the inner ring out of the hollow shaft (pos. 9).
6. Clean all parts that will be used again.

Assembly

1. Mount the outer ring into the housing (Since these bearings are conical roller bearings, it is important that the outer ring is facing in the right direction so that the outer ring matches the inner ring).
2. Mount the inner ring of the bearing onto the hollow shaft (Remember that the inner rings must be facing in the right direction so that they match the outer rings). Press the inner rings all the way out to collar of the hollow shaft.
3. Mount the hollow shaft together with the inner ring of the bearings into the bearing housing.
4. Mount the other outer ring into the bearing housing. Turn the hollow shaft so that the rollers in the bearing match with the outer and inner rings
5. Replace the lip seals. It is important that the lip seals be fitted in correctly so that soil or debris cannot penetrate the bearing and so that grease can be pressed out of the bearing in case of over-lubrication.
6. Replace the covers onto the inner part and bolt them firmly to the bearing housing.
7. Replace the flanges (pos. 1+10).

Mounting/Dismounting Wheels

To dismount the wheels, the AXR-E must be resting securely on the ground with the wheels clear off the ground. Remove the hub nut completely. The wheel can then be removed and replaced. After mounting a new wheel, screw the nut on and tighten by hand. Next, lower the wheels until they are touching the ground and tighten the nut to a torque of 300 Nm.

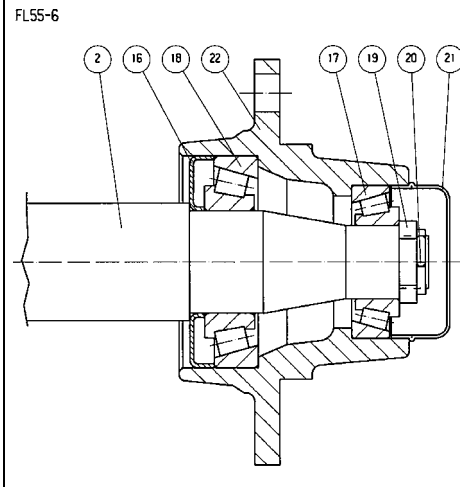


It is important that the wheel lug nuts and the mounting surface of the rim are clean; otherwise the nuts will become loose.

Replacing Wheel Bearings

1. Remove the hubcap (pos. 21).
2. Take out the split cotter pin (pos. 20).
3. Unscrew the castle nut (pos. 19).
4. Pull off the hub (pos. 22).
5. Remove the bearings (pos. 17+18).
6. Remove the seal (pos. 16).

Fig. 27



Assembly

1. Mount the outer rings (pos. 17+18) from the bearings into the hub (pos. 22).
2. Place the seal (pos. 16) onto the axle.
3. Place the inner ring from the bearing (pos. 18) onto the axle (pos. 2) and replace the hub.
4. Place the inner ring from the bearing (pos. 17) onto the axle (pos. 2).
5. Screw the castle nut onto the axle (pos. 2) and turn the hub (pos. 22) at the same time. Tighten the nut until there is a slight drag on the wheel as it is turning. Next, loosen the castle a quarter turn or until the hub rotates easily.
6. Replace the split cotter pin (pos. 20).

Fill the hubcap (pos. 21) $\frac{3}{4}$ full with grease and reinstall.

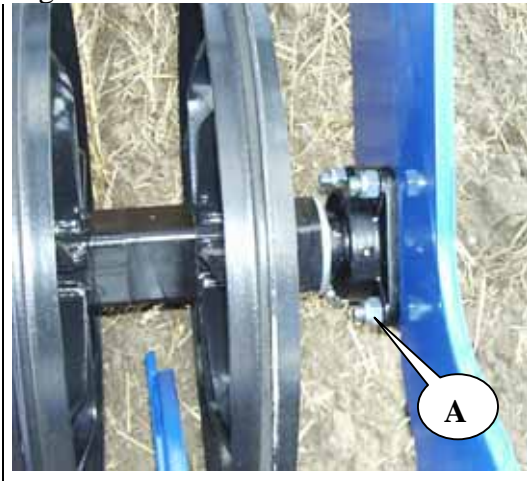
Dismounting T-Ring Shafts

All repair work must be carried out on an even surface. The AXR-E and the T-rings must be resting on the ground. Lower the packer roller until the discs are resting on the ground.

Replacing shafts/bearings

1. Remove the bolts (A) of both the flange bearings and the bearing in the middle.
2. Lift the AXR-E onto the wheel frame and drive forward, freeing the T-ring shaft.
3. Loosen the setscrews in the bearings and slide the bearings off the shaft.
4. Dismount the T-rings and the spacers.

Fig. 28



Mounting the T-ring shaft

Position the shaft with the T-rings so that you can roll it in between the bearing plates of the packer roller frame.



When mounting the axle with bearings, make sure to position the bearings with the grease fittings facing towards the back, enabling easier access for lubrication and protecting them from stones.

Scrapping



Remove pressure from the hydraulic system.



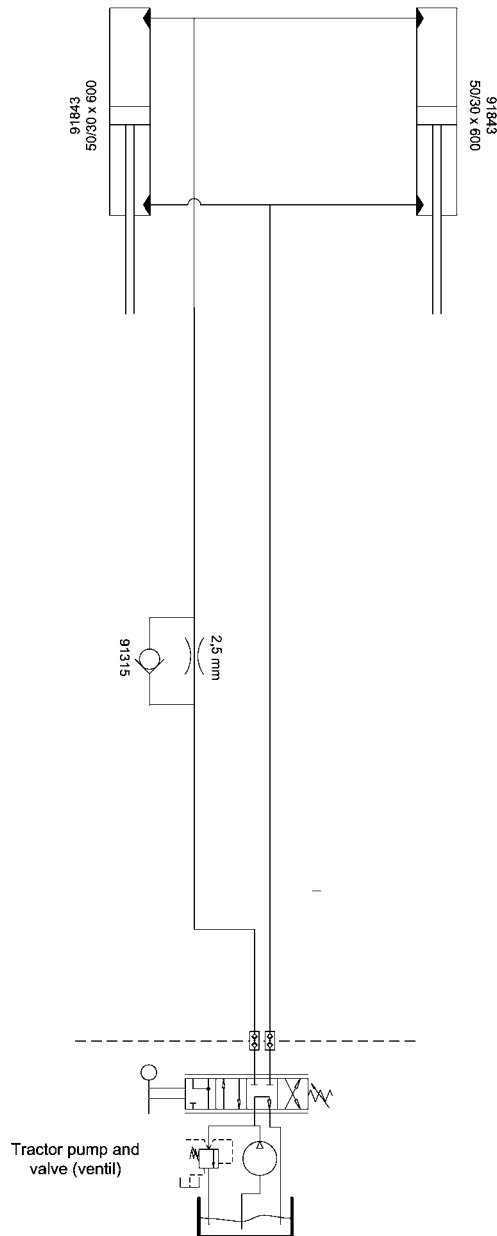
When dismantling/mounting components, always pay attention to the weight of the part that you are about to handle. It is **important** to support or secure the part so that it cannot fall.

Dismount all hydraulic hoses and cylinders and empty the oil. To avoid pollution of the ground and the surrounding area, collect as much oil as possible. Dispose of the oil and the hoses properly.

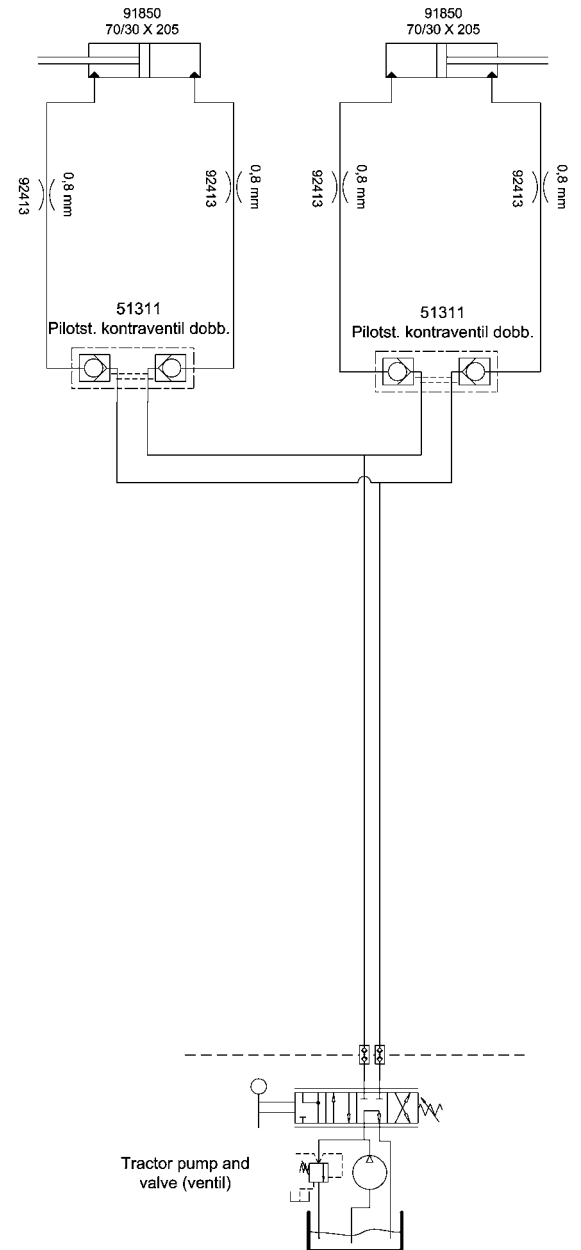
All iron used in the machine is recyclable.

Hydraulic System Diagram

Fig. 29



Hjulstel
 Rad Gestell
 Wheel frame
 Carde de roue.



Vinkeljustering
 Winkelregulierung
 Angle adjustment
 Ajustage d'angle.

Spare Parts