

OPERATION, MAINTENANCE AND SPARE PARTS MANUAL

HYDRAULIC CRANE FARMİ 4571 / FARMİ 4581



**READ THIS OPERATION AND MAINTENANCE MANUAL CAREFULLY
BEFORE USING THE MACHINE**

FARMİ®
FOREST

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FARMI 4571 / FARMI 4581

WARNING SYMBOLS IN THIS MANUAL



- imminent danger which could cause serious personal injury or death



- danger which could cause personal injury



- conditions or misuse that could damage equipment or machinery

NOTE!

- reminders, such as for performing checks or carrying out maintenance or repair procedures

INTRODUCTION

This manual includes the information and maintenance instructions required for operating the machine in the optimal manner.

Although you have experience in using this kind of machinery, read the operation and maintenance instructions carefully since they include information enabling efficient and safe operation. Regular maintenance is the best way to guarantee the efficient and economical performance of the machine.



Each and every operator must read, understand, and follow all safety instructions and procedures.

CUSTOMER FEEDBACK

We are happy to receive your opinions and suggestions for improvements by mail, fax or e-mail. All implemented suggestions for improvements will be rewarded.

PRODUCT WARRANTY

Farmi provides a 12-months warranty on all Farmi products.

Register on our home page (www.farmiforest.fi) under FeedBack ("Product Registration" form) within 30 days after the receipt of the product to get full product warranty and additional information on your product. If it is not possible for you to register via internet, please register as follows: Complete the registration form on the last pages of this manual and return it to us within 30 days after the receipt of the product.



EC DECLARATION OF CONFORMITY

Manufacturer:

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Person authorized to compile the technical documentation:

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Commercial name:

Farmi

Machine denomination:

Hydraulic crane

Machine type:

FARMI 4571 / FARMI 4581

Machine series number:

Herewith, we declare that the machine brought into circulation conforms with the pertinent requirements of the Machinery Directive 2006/42/EC and the EMC Directive (directive relating to electromagnetic compatibility) 2004/108/EC.

The following harmonized standards have been applied for the conceptional design of the machine:

SFS EN ISO 12100-1, SFS EN ISO 12100-2, EN 12999, EN 294, EN 982,
EN60204-1, SFS EN ISO 4254-1

Iisalmi

(Place)

15.1.2013

(date)

Juha Hallivuori

FARMI 4571 / FARMI 4581

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When ordering spare parts, please indicate machines type from the machine plate, spare parts order number, description and quantity required. Example. HK4581, 54561477, slide bearing 1 pc

GENERAL SAFETY INSTRUCTIONS

These safety instructions are meant for the owners of FARMI equipment, as well as those who operate, service or repair it.

The instructions help with:

- using the machine safely, appropriately and effectively.
- identifying, avoiding and preventing potentially dangerous situations.

The manufacturer supplies an instruction manual, which must always be available at the place of operation of the machine. Each user must read the safety, maintenance and operating instructions before operating the machine, and comply with these instructions at all times.



Ensure that every operator of the machine is familiar with the content of the instruction manual and situation-specific safety instructions, and has been suitably trained before operating the machine.

The machine complies with technical requirements and applicable safety regulations. However, incorrect use, maintenance or repair of the machine may cause risks.

In addition to the instruction manual, remember to comply with regulations of the local occupational health and safety authorities, and with your country's laws and decrees.

The manufacturer is not liable for damages caused by:

- incorrect, negligent or inappropriate use of the product.
- non-original spare parts.
- normal wear and tear.
- misuse caused by an untrained person's improper actions.
- alterations made without the manufacturer's permission.



Written authorization must be requested from the manufacturer for any alterations to the machine.

STARTING

- Familiarize yourself thoroughly with the use, operation and controls of the machine and its equipment before starting.
- Familiarize yourself with the capacities and limitations of the machine and its equipment.
- Do not use the machine unless you are completely familiar with its operation.
- Be aware of the machine's danger zones.
- During operation, prevent bystanders from entering the danger zone.
- Ensure that each operator has the necessary safety equipment, such as a helmet, safety goggles, work safety boots and suitable protective clothing.
- Never wear loose clothing around moving parts. Protect long hair!
- Ensure that work is carried out according to the stipulations of applicable occupational health and safety legislation.
- Before starting up or using the machine, ensure that it cannot cause a risk to other people or property.
- Perform a safety check on the machine before every use. If you observe any faults or deficiencies, repair the machine immediately.
- Before operating the machine, ensure that there are no foreign articles in it.
- Place the machine on a hard, level surface for operation. In the winter avoid working in slippery areas.
- Before mounting and using the machine, check the PTO drive shaft for correct condition and attachment.
- Never use a faulty or deficient machine.

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TRANSPORT

- Before driving with the machine, ensure the safe mounting of the machine. Make sure that the journals are seating correctly and that the pins are tight. Check the tension of the lower link stabilizers.
- Before driving with the machine, make sure that the required lamps and reflectors as well as the slow moving vehicle sign are attached correctly. Moreover, the lamps should be checked for correct functioning.
- Before driving with the attached machine, make sure that the hydraulic unit of the machine is depressurized (unless otherwise instructed in the operating instructions).
- When driving on public roads, always observe the valid traffic regulations. The travel speed must be adapted to the specific conditions.
- When driving, please take into consideration the additional mass resulting from the machine's weight. It may affect the reactions, the steerability and the braking function of the tractor.
- Please note that the machine rear sways when turning.
- Pay attention to the machine's height near bridges or other height restricting objects.
- When backing off, the machine may obstruct the rear view. Exercise extreme caution. If necessary, ask a flagman to help you; he can indicate the required distances.
- It is prohibited for other people to ride on the machine.

- Never insert any body part into the machine with the engine running.
- If any faults arise that may jeopardize occupational safety, turn off the machine.
- During operation, the machine's operator is responsible for safety in the whole work area. Work may not be carried out in the presence of any factors that jeopardize occupational safety.
- Exercise extreme caution when hitching / unhitching the machine from a tractor/trailer.



The machine's operator must have constant, unobstructed visibility of the work area. If this is not possible, the operator must work with an assistant.

- Look out for moving parts when the machine is in operation.
- Secure the machine against unauthorized and accidental operation (e.g. moving when parked) whenever it is left unattended.
- Never leave the machine running unattended.
- Avoid causing fast, stroke-like loading.
- Never exceed the given operating values.
- All safety and warning signs on and in the machine must be legible and intact.
- The machine may not be operated by persons who are unwell or under the influence of drugs or alcohol.

OPERATION



Many occupational accidents take place in abnormal circumstances. Therefore it is important to take into account all the possible circumstances that may arise during operation of the machine.

- Depending on the machine's type, it will have diverse safety devices and protectors. These are meant to protect the machine and its operator, and they must never be removed or altered. Never start up or use the machine without all the safety devices and protectors in place. Also check the universal joint's safety equipment and joints.
- The machine may only be serviced and repaired by professionals.
- Electrical and hydraulic faults may only be repaired by authorized professionals.
- In cases requiring welding, contact the manufacturer.
- Turn off the tractor engine and disconnect the universal joint before beginning service or maintenance actions.
- Before any maintenance work, turn the main power switch of the tractor to OFF.
- Ensure that there is no pressure in the hydraulic system.
- Take out the key from the tractor's ignition for the duration of the servicing or maintenance. Check that the power is off from the machine you are working on.

- When servicing the machine, place it on a level surface and ensure that it cannot be moved.
- Observe the service intervals and annual safety inspections.
- All spare parts and equipment must fulfill the manufacturer's requirements. This can be guaranteed by using original parts.
- Put all safety devices back into place immediately once servicing or maintenance is complete.



When lifting the machine, check that the lifting/hoisting equipment is in perfect working order. Check the weight of the machine before lifting it. Choose lifting trajectories so that they do not cause any danger.

Many countries have specific legislation on lifting, hoisting cables and hoists. Always comply with local safety regulations.

OILS AND LUBRICATION

- Always use the oil types recommended by the manufacturer. Other types of oil may cause faults or improper operation of the equipment, which could lead to serious damage to people or property.
- Never mix different liquids or oils.
- Always follow the manufacturer's lubrication instructions.
- Use control equipment carefully until the hydraulic oil has had time to reach its operating temperature.

SAFETY INSTRUCTIONS FOR HYDRAULIC CIRCUITS

1. Work on hydraulic equipment may only be carried out by professional hydraulic engineers.
2. Be cautious when using the equipment in cold conditions.
3. Check the machine for leaks. Do not use the machine if there is a leak from any system. Check all hydraulic hoses – particularly those which are bent during use – and replace any that are in poor condition or have leaks. Ensure that all joints are tight and that the lines are not damaged. Check that all protective caps and filler caps are closed properly. Check the hose sheathing for damage.
4. Check that all hose connectors, lengths and qualities comply with applicable requirements. When replacing or repairing hoses, use original parts or hoses and connectors recommended by the manufacturer. Check particularly that the pressure classes of the hoses and connectors are suitable to the operating pressure levels.
5. Check that all safety devices such as pressure relief valves, etc., are in place and work properly. Familiarize yourself with their use. Safety systems may never be bypassed.
6. Check the main hydraulic parts daily, and always after a fault. Replace any damaged parts immediately.
7. If a component is damaged, clean it before repairing it. Do not use solvents when cleaning parts.
8. Do not attempt to carry out repairs that you are not fully familiar with.
9. Never carry out repairs of the hydraulic circuit when the system is pressurized. When pressurized, the oil spray can penetrate the skin and cause mortal danger.
10. Never work below a device or component that is only being held up by hydraulics. Use separate supports when carrying out maintenance or repairs. Do not disconnect cylinders or their valves until the machine is well supported.
11. Most hydraulic oils do not evaporate easily. Risk factors include hot oil, spills and oil mist (pressurized).
12. If oil gets into your eyes, rinse with plenty of water and contact a doctor.
13. Avoid prolonged or repeated contact with your skin.
14. If sprays or contact with the skin cannot be avoided, use protective gloves, goggles and clothing as necessary. Do not use oily clothing.
15. Avoid discharging hydraulic oil into the environment, as it can pollute waterways and the groundwater. If biodegradable oil is to be used, please contact the manufacturer beforehand and have the suitability of your equipment for the operation with biodegradable oil confirmed by him before such oil is used.
16. Store the oil in sealed containers provided by the manufacturer. Try to transfer the oil directly from its container into the tank.
17. If the oil must be passed through other containers, ensure that they are completely clean. Caps, funnels, sieves and filling holes must also be clean.
18. Never store oil outdoors, as water could condense in it.
19. Always dispose of oil in a suitable container, never into the environment!

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SAFETY INSTRUCTIONS FOR LOADERS

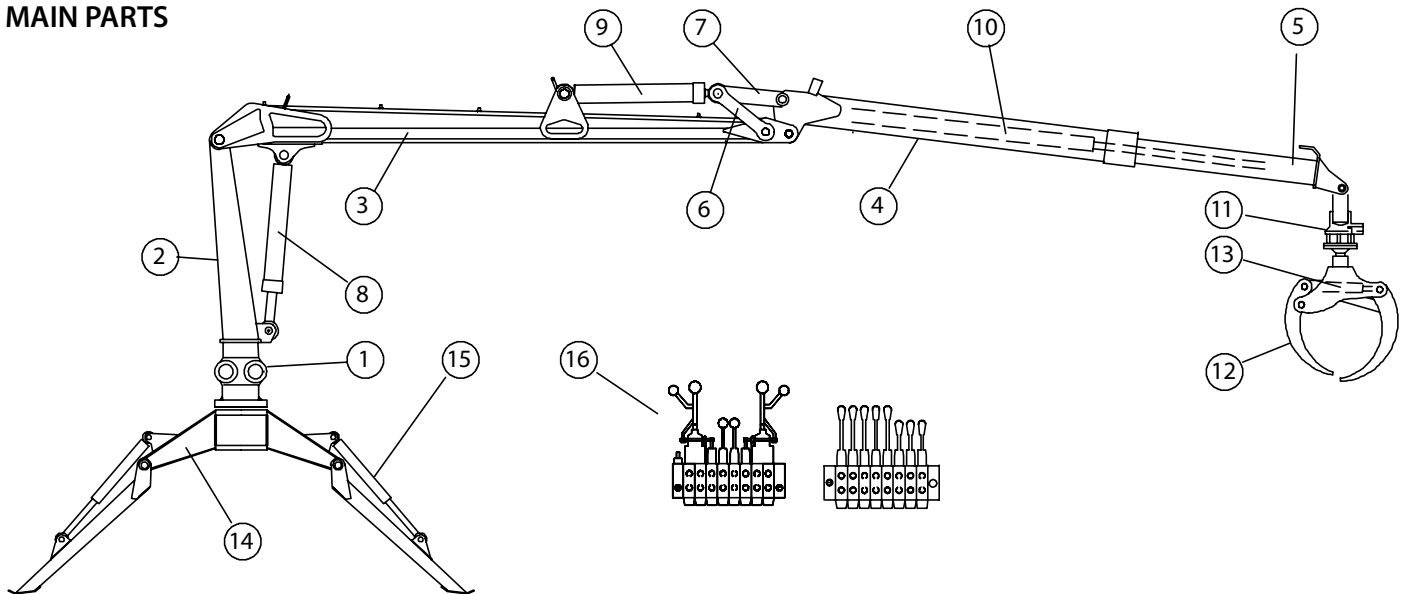
- Ensure the machine is properly supported during storage.
- Council of State Decision 856/1998 requires that loading crane operators be at least 18 years of age and have received sufficient instruction in its operation. This applies in Finland.
- Before starting the machine, ensure that there are no bystanders within a radius of 20 meters.
- During operation, the vehicle must be positioned on sufficiently solid ground, in a properly stable position. The support legs must be used in all circumstances.
- Always put on the parking brake during loading.
- Do not exceed the given load values.
- Never stand beneath a hanging load.
- Do not leave booms in raised position unattended!
- The loader must not be used for lifting people.
- When lifting, note that the booms sag slowly.
- When working in the proximity of live wires, always adhere to the given safety distances (cf. table).
- Take particular care when lifting heavy loads and turning the loader to the side.
- Never use the loader for towing.
- Do not run the machine's movements to their extremes at full speed.
- If the vehicle assembly falls over, do not jump out of the vehicle.
- If the booms sag down under excess loading, use the shifting boom to shift the load closer to the column. Do not open the grapple.
- If the machine comes into contact with a power line, do the following:
 - Call for assistance immediately and ensure that no one enters the danger zone.
- If you are outside the machine, do not touch any part of the machine.
- If you are inside the machine, leave it by JUMPING OUT. When you jump, make sure both feet touch the ground at the same time. Do not touch the vehicle or the ground with your hands after jumping out. Move at least 20 meters away from the vehicle by hopping on two feet.

| Voltage rating, kW | Minimum distance, m | | |
|--------------------|---------------------|---------|--------------|
| | Overhead line | | Pendant line |
| | below | on side | |
| <1 | 2 | 2 | 0,5 |
| 1-45 | 2 | 3 | 1,5 |
| 110 | 3 | 5 | - |
| 220 | 4 | 5 | - |
| 400 | 5 | 5 | - |

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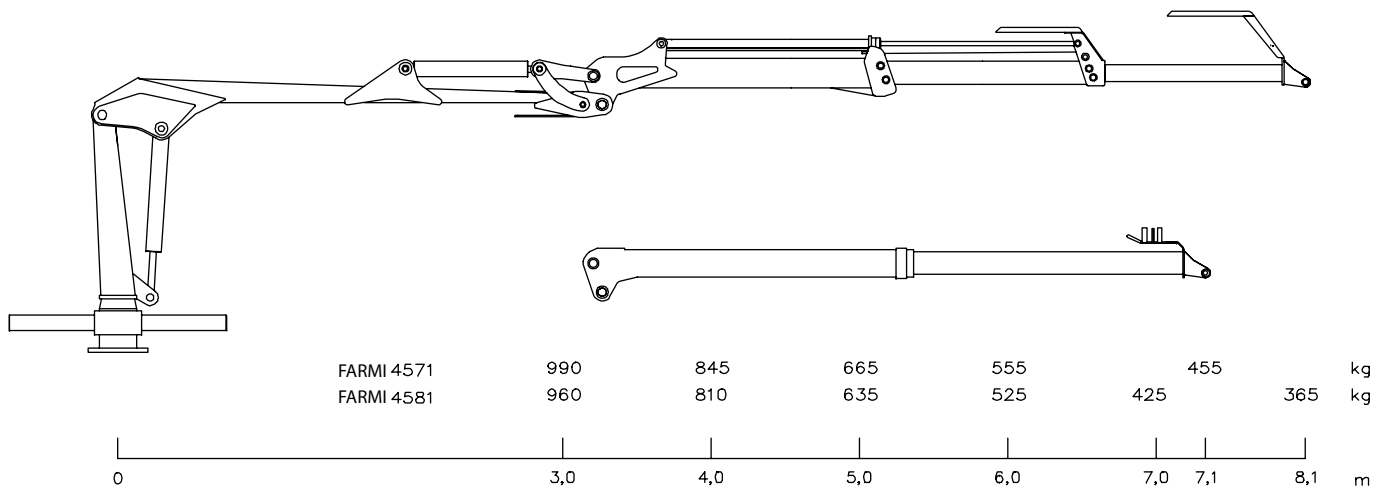
TECHNICAL DATA

MAIN PARTS



- | | |
|---------------------|--|
| 1. Slewing device | 9. Folding cylinder |
| 2. Column | 10. Extension cylinder |
| 3. Lifting arm | 11. Rotator |
| 4. Folding arm | 12. Grapple |
| 5. Extension boom | 13. Grapple cylinder |
| 6. Side bar | 14. Mounting rack + hydraulic support legs |
| 7. Draw bar | 15. Support leg cylinder |
| 8. Lifting cylinder | 16. Control valve |

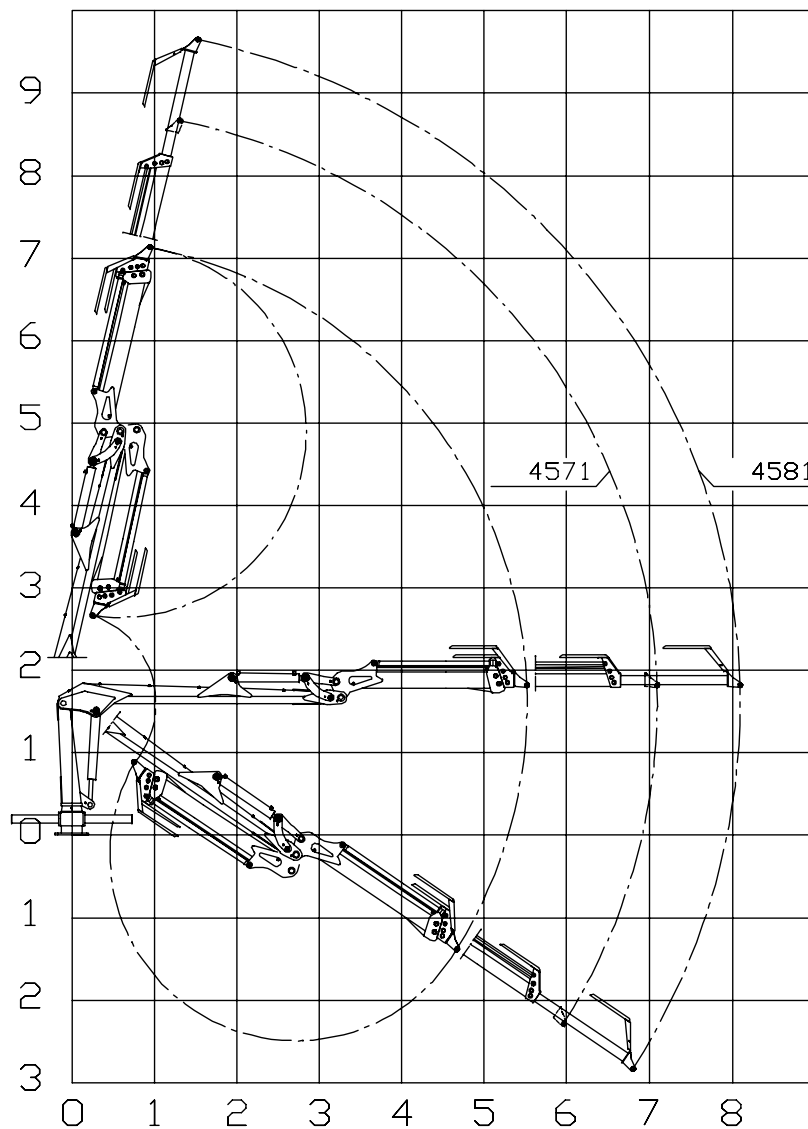
LIFTING CAPACITY



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| TECHNICAL DATA | FARMI 4571 | FARMI 4581 |
|---|------------|------------|
| Lifting torque, kNm gross | 45 | 45 |
| Max. reaches, m | 7,1 | 8,1 |
| Lifting capacity, kg, 4 m | 845 | 810 |
| Lifting capacity, kg / max. reach | 455 | 365 |
| Slewing angle, ° | 400 | 400 |
| Slewing torque, kNm | 17,4 | 17,4 |
| Max. working pressure, bar | 195 | 195 |
| Recommended pump capacity, l / min | 30-60 | 30-60 |
| Grapple area, m ² | 0,21 | 0,21 |
| Rotator (rotating angle continious) | FR10 | FR10 |
| Rotator torque, kNm | 0,93 | 0,93 |
| Grapple + rotator weight, kg | 105 | 105 |
| Total weight with grapple + rotator, kg | 1045 | 1100 |
| Mounting rack + hydraulic support legs weight, kg | 267 | 267 |

LIFTING REACH



ASSEMBLY AND MOUNTING



Read these instruction before starting any assembly or mounting work. Improper mounting work can cause hazards during use of the crane. Mounting carried out in a manner other than that specified in this manual can expose the user to danger and will void the manufacturer's guarantee.

Check the stability of the crane-vehicle assembly by performing the necessary calculations. See "Determining the stability".

The mounting must be performed by the manufacturer or a service center or person authorized by the manufacturer.

The strength class of the mounting bolts is 10.9. Use self-locking nuts, e.g., DIN985.

Put all screws into place. First tighten all screws in threaded holes to torque, and then all screws in unthreaded holes.



Retighten the bolts after the test run and the first day of use.

When mounting the crane on a foundation not delivered by FARMI Forest, use the mounting plate shown in figure 1. In mounting, allow enough space for servicing and repairs.

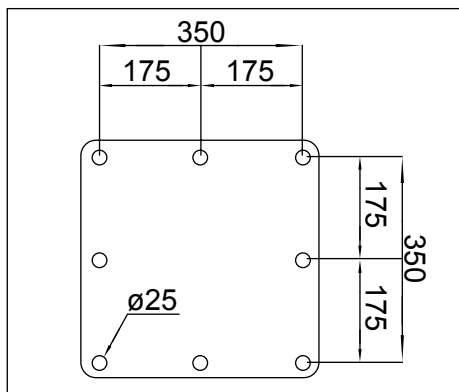


Fig. 1. Mounting plate for FARMI 4571/4581

INSTALLATION INSPECTION

Decisions 354/83 and 530/83 made by the Finnish Council of State stipulate that an installation inspection must be performed for each crane-vehicle assembly before use.

An inspection form can be found in this manual.

The person performing the inspection must be familiar with the crane's construction and operation.

MOUNTING THE MULTI- AND DOUBLE-ACTING VALVES



The valve must be positioned or covered so that the levers cannot be used inadvertently.

Install the valve using the included bracket at the desired location, paying attention to the direction of the hoses and movement during loading and transferring so that there is no risk of abrasion or clamping.

The label indicating the safe distance from live conductors must be clearly visible during operation.



Hoses in the operator's cabin must be protected so that the user is not endangered by oil jets in the event of breakage.

The levers in the multi-lever valve can be moved to different positions if necessary. Detach the levers from the valve before moving them.

CONNECTION TO THE HYDRAULIC SYSTEM

Before connecting the crane to the tractor's hydraulic system, make sure that the oils are compatible. The crane has been tested using 10W/30 oil that meets the API SE, CD, and API GL-4 requirements.

We recommend connecting the pressure hose to the single-acting hydraulic outlet and the return hose to the tank via the return filter. The filter's intended flow rate is 80 l/min and the filtering density 25 µm abs.

The crane can also be connected to the double-acting hydraulics outlet. If this is done, make sure that the lever of the double-acting valve controlling the flow is in the right position so that the pressure is directed to the pressure connection of the crane's control valve. Check the operation of the double-acting outlet in the vehicle's operating manual.

The person testing the crane must be qualified to use it.

1. Read the installation inspection report. If no installation inspection has been performed, do not use the crane.
2. Ensure that the control valve's pressure line (P) has been connected properly and that the return (T) is unobstructed.
3. Check the hydraulic oil level.
4. Familiarize yourself with the control valve's functions.
5. Ensure that the hoses can move freely. Remove any transport supports and ties.
6. Ensure that there are no people or obstacles in the operating area. The danger zone is 20 m.
7. The crane must be tested on a level, firm base.

COMMISSIONING



Before using the crane, familiarize yourself with the operating and safety instructions.

INSPECTIONS BEFORE TESTING

Do not pressurize the hydraulic system before connecting the control valve's 1/2" quick couplings to the vehicle's hydraulic system.

Connect the pressure hose (P) to the valve as indicated by the arrow and the return hose (T) to the vehicle as indicated by the arrow.



Do not pressurize the control valve's return line (T) – this could cause the valve to break. Ensure that the 1/2" quick coupling are locked.

TESTING

1. Ensure that the control valve's control levers are in the middle position.
2. Connect the oil flow to the crane. Let oil flow through the valve for a while.
3. Lower the support legs.
4. Carefully drive the crane movements one by one to their extreme positions and repeat this until the movements are smooth.
5. After testing the crane, inspect the joints and repair any leaks.
6. Check the mounting bolts of the crane and the fitting stand, and tighten them if necessary.
7. Check the hydraulic oil level, and top up the oil if necessary.



Be careful when bleeding air from the system. If you drive a cylinder to its extreme position at full force, the air pressure in the cylinder will damage the seals.



Be extremely careful when there is air in the cylinders.

PRACTICE RUNS

- Drive through every movement with an unloaded crane, paying attention to the positions in which the crane can hit obstacles.
- Move the control levers smoothly and steadily, avoiding quick and jerky movements.
- Learn to use several functions simultaneously. This enables smooth, precise operation.
- Start off at a low engine speed in order to avoid sudden movements.
- When you have become accustomed to the crane's movements, choose the appropriate engine speed so that operation is efficient but you still have the movements under control.

The lowest recommended operating temperature for the crane is -25°C .

Note that the hydraulic seals, hoses, and steel structures are prone to damage at low temperatures.

When starting work at cold temperatures, first let the oil flow freely through the valve for a couple of minutes.

The maximum operating temperature for hydraulic oil is $+75^{\circ}\text{C}$.



Use the support legs only to provide additional support for the vehicle.

When working on an inclined surface, do not load the crane with the full lifting torque, and be extremely careful.

When loading from uphill, note that the slewing movement may not be able to support the load but the pressure relief valves can be overloaded and the load can move down, causing a danger of the crane falling over.



Never move the boom to its extreme position at full speed!



Be careful when working near electric cables. Observe the safe distances.

When transferring the crane, support it against the trailer body or load.

DETACHING THE CRANE

Ensure that the ground under the crane is sufficiently hard and level.

Ensure that there are no extra people around and that no danger will be caused to others where the crane is to be stored. Pay special attention to the storage location of the control valve, ensuring that, e.g., it is out of the reach of children.



Always switch the pump off before removing the quick coupling between the crane and the vehicle.



When detaching the crane from the vehicle, make sure that there are no people in the immediate vicinity.

1. Lower the support legs to the desired height.
2. Lower the booms as shown in fig. 2.
3. Lower the crane using a hoist.
4. Make sure that the crane cannot lean over. Fig. 2.
5. Detach the crane from the vehicle.
6. Detach and cover the control valve's quick couplings.

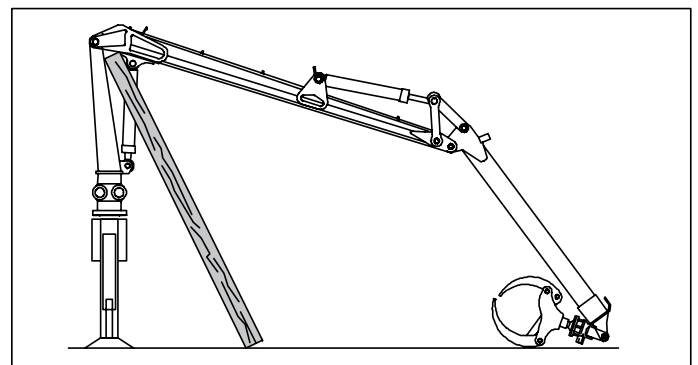


Fig. 2. Lowering the booms

STORAGE INSTRUCTIONS

1. Clean the crane and, if necessary, touch up any points where paint has peeled off.
2. Lubricate the crane thoroughly (see Lubricating Instructions).
3. Release the pressure from the cylinders.
4. Protect the cylinder piston rods and exposed parts of the control valve with grease.
5. Store the crane in a sheltered area, away from direct contact with the ground.
6. When you start using the crane again, remove the protective grease from the cylinder piston rods and the control valve.

MAINTENANCE

- Maintenance work must be carried out regularly to ensure safe and trouble-free operation.
- Always use the appropriate tools.
- Determine the location of the defect.
- Keep the disassembled sections, removed parts, and the repair area protected from dirt.
- Clean the parts using kerosene, never fuel oil.
- Valve adjustments and repairs are to be performed by dedicated service personnel.

SLEWING DEVICE

- See maintenance table.

BOOMS

- Keep the axial clearance in the joints as small as possible. Do not over-tighten.

REPLACING BEARINGS

- When installing bearing sleeves, use an appropriate drift.
- Make sure that the new bearing's grease hole meets the nipple.
- If the bearings have grease pockets, fill these with Vaseline.

REPLACING THE HYDRAULIC CYLINDER SEALS

Replace all hydraulic cylinder seals at the same time.

1. The piston rod guide is attached with a thread. Unscrew the guide using a large pipe wrench or create a special tool for the purpose, making use of the drill holes in the piston rod guide.
2. Pull out the piston rod and its guide.
3. Detach the piston from the rod.
4. Clean the seal grooves and install the new seals. Be careful not to break the seals when installing them!
5. Install the piston on the rod and tighten to 240 Nm.
6. Lubricate the new seals with hydraulic oil before pushing the piston into the cylinder sleeve.

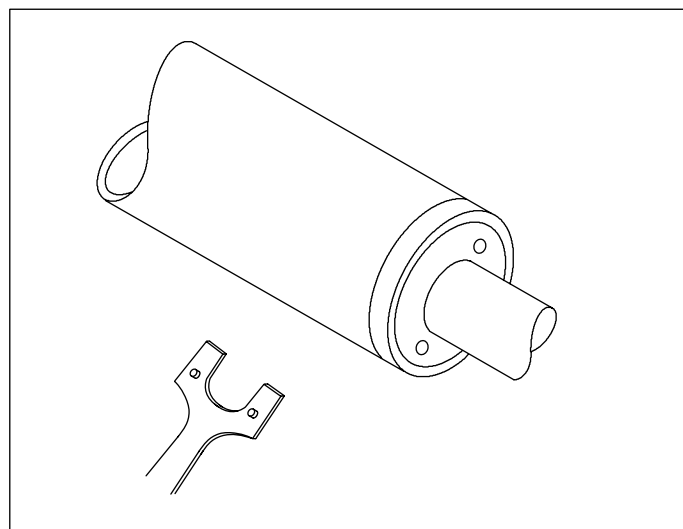


Fig. 3. Detaching the cylinder guide

PRESSURE MEASUREMENT

Always make the adjustments with the manometer in place.

- The main pressure is measured from the measuring point in the control valve's inlet section.
- Adjustments and inspections for each movement:
 - Set the main pressure relief valve to 5 bar above the value set for the protective valve.
 - Perform the movement, and check and adjust the pressure if necessary.
 - Finish by adjusting the main pressure to the set value.
- Pressure measurements are to be performed at the normal operating temperature and at the normal flow rate.
- The free flow pressure can be read from the manometer when the flow of oil is directed through the valve.

REPAIR WELDING

If welding is required for modifying or repairing the crane, note the following:

- The welder must be qualified: welding grade 3. There must be no root defects.
- Remove paint and any oil from the location to be welded.
- Connect the ground terminal directly to the piece to be welded – there must be no joints in between.
- Use OK 48.00 or equivalent electrodes. The electrodes must be dry.
- Improperly welded structures can get fractured.

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MAINTENANCE TABLE

| OBJECT | ACTION | | |
|------------------------------------|---|--|---|
| | Maintenance interval, working hours | | |
| | 10 h, or after working shift | 50 h, or after working week | 250 h |
| General | Check cylinders and leakages in hoses | Check pins and lockings Check the screws. | Check the condition of primary structures |
| Slewing device | Grease slide bearings | | Check the screws. |
| | Grease racks | | Adjust rack bearings |
| | Grease rack bearings | | |
| | Check the oil level in the sight glass | | Change the oil every year. |
| Booms | Grease slide bearings | | Check slide bearings and adjust sideways clearance necessary. |
| | Lubricate extensions upper and lower surfaces | | |
| Cylinders | Grease articulation bearings | | Check hydraulic cylinders bearings. |
| Grapple | Grease slide bearings | | Check grapples fixing to rotator |
| Support legs, mounting base | Grease slide bearings | | Check hydraulic cylinders bearings. |

| FARMi 4571 / 4581 Tightening torque | | |
|-------------------------------------|---------|--|
| Slewing device | 1100 Nm | hexagonal socket head screw M24x2-90 ZN 10.9 |
| Slide pieces | 22 Nm | screw M8x16 / M8x12 ZN88 |

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LUBRICATION

Using the appropriate hydraulic oils and lubricants is essential for the trouble-free operation of the machine.

CHANGING THE OIL

Change the oil according to the vehicle's maintenance recommendations.

The crane has been filled with 10W/30 oil at the factory. If the oil temperature does not exceed 70°C in the summer, winter oil can be used all year round.

When changing oil, make sure that the oil grade being used is compatible with the system and any oil remaining in it.

HYDRAULIC OIL REQUIREMENTS

The freezing point must be below -50°C.

The viscosity must not be lower than 1.5 E°, +50°C for piston pumps and 2.5 E°, + 50°C for gear pumps.

The hydraulic oil must contain the necessary additives for lubrication, rust protection, and defoaming.

Hydraulic oils intended for use in tractors are usually also suitable for use in hydraulic cranes.

OIL AND LUBRICANT GRADE TABLE

| OIL MAKE | HYDRAULIC SYSTEM | | GREASE NIPPLES |
|----------------|------------------|--|---|
| | -10°C ...+30°C | -25°C...-10°C | |
| BP | ENERGOL SHF 46 | ENERGOL SHF 32,22 | ENERGREASE LS-EP2, L21M |
| ESSO | UNIVIS N46 | UNIVIS N 32,22 | BEACON EP2, MULTIPURPOSE GR MOLY |
| MOBIL | DTE 16 | DTE 15,13 | MOBILUX EP 2 MOBIL GREASE MP, SPECIAL |
| SHELL | TELLUS OIL T46 | TELLUS OIL T32,22 | ALVANIA EP GREASE 2 |
| TEBOIL | HYDRAULIC OIL 46 | HYDRAULIC OIL 32, 33 | SOLID 2/ summer, SOLID 0/ winter |
| UNION / TEXACO | RANDO OIL HDZ 46 | RANDO OIL HDZ 32, HYDRAULIC OIL HD 5W | MARFAK MULTI PURPOSE 2, MOLYTEX GREASE 2 |

LUBRICATING POINTS TABLE

| Lubricating point | Qty | Action | Interval | Notes |
|---------------------|-------|-------------|----------|---------------------------|
| Slewing device | | | | |
| Bearings | 3 | Greasing | 50 h | |
| Racks | 1 | Greasing | 50 h | |
| Oil | 5,5 l | Checking | 50 h | |
| | | Changing | 1000 h | or once a year |
| Booms | | | | |
| Articulation | 5 | Greasing | 10 h | |
| Cylinder ends | 4 | Greasing | 10 h | |
| Extensions surfaces | 2 | Lubrication | 10 h | Apply grease to surfaces. |
| Grapple | | | | |
| Articulation | 6 | Greasing | 10 h | |
| Cylinder ends | 2 | Greasing | 10 h | |
| Support legs | | | | |
| Articulation | 2 | Greasing | 10 h | |
| Cylinder ends | 4 | Greasing | 10 h | |

FARMI 4571 / FARMI 4581

TROUBLE SHOOTING

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|------------------------------------|---|--|
| CRANES WORKING MOVEMENTS SLOW | PUMP IS TOO SLOW | CHECK PUMPS ROTATING SPEED |
| | FAULTY PUMP | CHANGE OR GET THE PUMP FIXED |
| | LEAKS OR OBSTRUCTIONS IN OIL LINES | INSPECT OIL LINES |
| | OIL TOO THICK | CHANGE TO A THINNER (CORRECT) OIL GRADE |
| CRANES DESCENDING MOVEMENTS SLOW | OBSTRUCTIONS IN THE OIL LINES | CHECK THE LINES AND THE CHOKES |
| | CLOGGED-UP (RETURN) FILTER | CLEAN OR RENEW FILTER |
| | OIL TOO THICK | CHANGE TO A THINNER (CORRECT) OIL GRADE |
| CRANES MOVEMENTS TOO FAST | ROTATION SPEED TOO HIGH OR PUMP TOO BIG | CHOOSE A CORRECT SPEED OF ROTATION AND CORRECT PUMP SIZE |
| | INCORRECT OPERATION | LEARN TO OPEN THE CONTROL VALVE TO A SUITABLE DEGREE |
| CRANES WORKING MOVEMENTS POWERLESS | NOT ENOUGH OIL | ADD OIL (AIR BLEEDING) |
| | FAULTY PUMP | CHANGE OR GET THE PUMP FIXED |
| | FAULTY RELIEF VALVE OR SHOCK VALVES | CHANGE THE RELIEF VALVE OR SHOCK VALVES |
| | FAULTY CONTROL VALVE | CHANGE OR GET THE VALVE FIXED |
| | FAULTY CYLINDERS OR SEALS | CHECK THE CYLINDERS AND CHANGE THE SEALS |
| CRANE MOVEMENTS ARE JERKY | AIR IN HYDRAULIC SYSTEM | CHECK OIL LEVEL, BLEED AIR FROM SYSTEM |
| | NOT ENOUGH OIL | CHECK THERE ARE NO OBSTRUCTIONS OR LEAKS ON THE INLET SIDE, ADD OIL |
| | FAULTY PUMP | CHECK THE PUMP AND GET IT FIXED |
| BOOMS DESCEND BY THEMSELVES | FAULTY CONTROL VALVE | INSPECT THE CONTROL VALVE AND GET IT FIXED |
| | FAULTY CYLINDERS OR HOSES FAULTY SHOCK VALVE | FIX THE LEAKAGE POINT. CHECK CYLINDERS AND SEALS, CHECK, CLEAN, ADJUST |
| CONTROL VALVE'S SPINDLES STICKING | VALVE'S FIXING SCREWS TOO TIGHT | CHECK SCREWS TIGHTENING TORQUE 50 Nm (5 kPm) |
| | VALVE NOT ON LEVEL MOUNTING BASE | MOUNT THE VALVE ON A LEVEL BASE |
| | VALVE'S TIE BOLTS TOO TIGHT, FAULTY SPINDLE | CHECK SCREWS TIGHTENING TORQUE 27,5 Nm (2,75 kPm), CHANGE A NEW BLOCK WITH SPINDLES |

FARMI 4571 / FARMI 4581

TESTING THE STABILITY

The formulas and examples included in these instructions are based on the SFS 4677 standard.

During the test, the vehicle is in normal working condition without load, tilted 5° to the side. The ground must withstand the maximum load applied by the wheels or the other points of support.

The test is performed at the maximum reach with 10% overload. All normal crane functions are performed, but cautiously. The vehicle's 5° inclination is achieved by putting a suitable riser under one of the rear wheels. Its height can be calculated as follows:

h = riser height needed

z = vehicle width from wheel center to wheel center

$h = 0.087 \times z$

Example:

$z = 180 \text{ cm}$

$h = 0.0887 \times 180 \text{ cm} = 16 \text{ cm}$

The vehicle is considered stable if no more than one point of support rises off the ground during the test. Increased stability when loading it from the side can be achieved by lengthening the track and/or adding rear axle load by using, for example, wheel weights.

DETERMINING THE STAND-STABILITY BY CALCULATION

The crane is considered stable when the stability ratio "n" calculated from formula below is equal or larger than 1.

EXAMPLES 1 AND 2

A1 = Normal distance from cranes turning center to overturning edge.

B1 = Normal distance from booms end (load) to overturning edge.

C1 = Distance from vehicles rear axles center and overturning edge.

E1 = Normal distance from booms point of support to overturning edge.

G = Maximum load at distance A + B

N = Cranes weight without booms

P = Booms weight (centroid)

M2 = Rear axle weight without load

n_1 = Stability factor

EXAMPLES 3 AND 4

A2 = Normal distance from cranes turning center to overturning edge.

B2 = Normal distance from booms end (load) to overturning edge.

C2 = Distance from vehicles rear axles center and overturning edge.

E2 = Normal distance from booms point of support to overturning edge.

G = Maximum load at distance A + B

N = Cranes weight without booms

P = Booms weight (centroid)

M3 = Rear axle weight without load

n_2 = Stability factor

You can use the example for calculating the stand stability for any tractor by measuring "K" and "H" from the tractor. With these measures you can calculate "C".

K = Distance between the tractors rear shaft and the cranes pivot point

H = Tractors wheelbase

See the tractors manual for rear axle weight M3, "n" value must be more than 1.

| | | |
|---------|-----|-------|
| Formula | C = | H x A |
| | | K + H |

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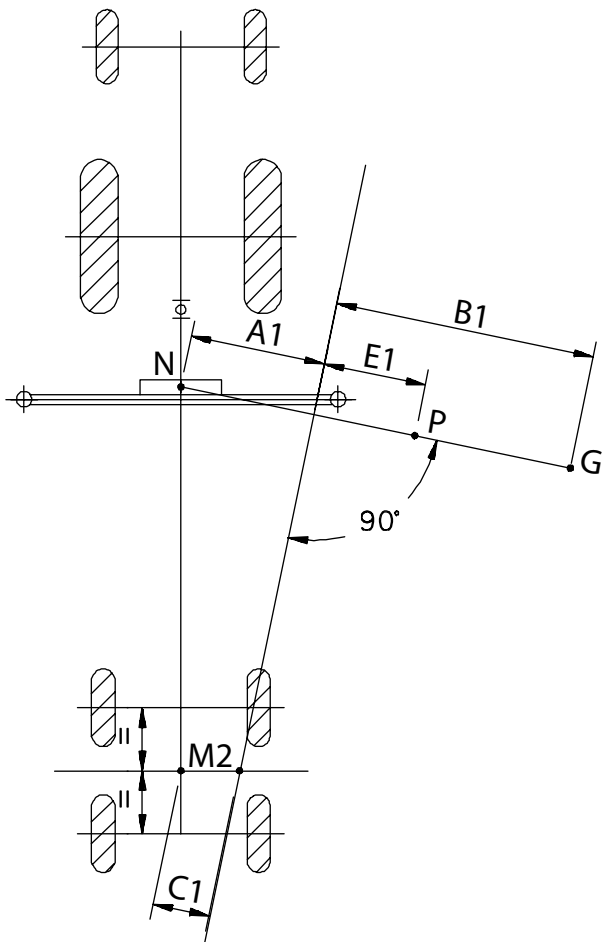
EXAMPLE 1

tractor + Vario 121 + FARMI 4571

| | |
|---------|--|
| Formula | $n = \frac{N \times A1 + M2 \times C1}{G \times B1 + P \times E1}$ |
|---------|--|

| | | |
|-------------|-------------|--------------|
| N = 730 kg | B1 = 530 cm | C1 = 120 cm |
| A1 = 180 cm | P = 620 kg | M2 = 1850 kg |
| G = 460 kg | E1 = 110 cm | |

| | | |
|------|--|--------|
| n1 = | $\frac{730 \times 180 + 1850 \times 120}{460 \times 530 + 620 \times 110}$ | =1,132 |
|------|--|--------|



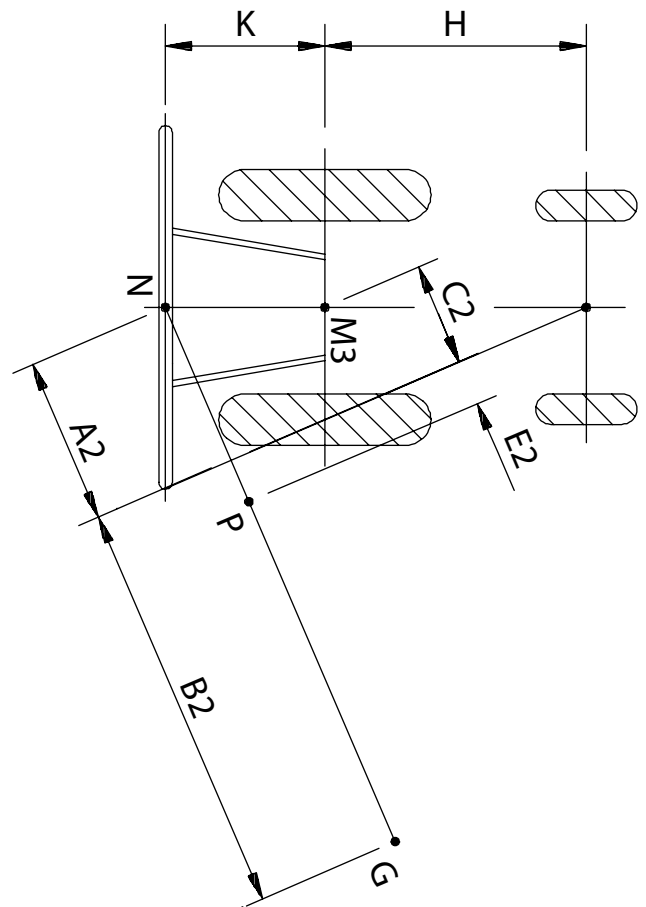
EXAMPLE 3

tractor Valtra T190 + FARMI 4571

| | |
|---------|--|
| Formula | $n = \frac{N \times A2 + M3 \times C2}{G \times B2 + P \times E2}$ |
|---------|--|

| | | |
|-------------|-------------|--------------|
| N = 730 kg | B2 = 585 cm | C2 = 103 cm |
| A2 = 140 cm | P = 660 kg | M3 = 2190 kg |
| G = 460 kg | E2 = 60 cm | |

| | | |
|------|---|--------|
| n2 = | $\frac{730 \times 140 + 2190 \times 103}{460 \times 585 + 660 \times 60}$ | =1,023 |
|------|---|--------|



EXAMPLE 2

tractor + Vario 121 + FARMI 4581

| | |
|---------|--|
| Formula | $n = \frac{N \times A1 + M2 \times C1}{G \times B1 + P \times E1}$ |
|---------|--|

| | | |
|-------------|-------------|--------------|
| N = 730 kg | B1 = 530 cm | C1 = 120 cm |
| A1 = 180 cm | P = 650 kg | M2 = 1850 kg |
| G = 460 kg | E1 = 110 cm | |

| | | |
|------|--|--------|
| n1 = | $\frac{730 \times 180 + 1850 \times 120}{460 \times 530 + 650 \times 110}$ | =1,120 |
|------|--|--------|

EXAMPLE 4

tractor Valtra T190 + FARMI 4581

| | |
|---------|--|
| Formula | $n = \frac{N \times A2 + M3 \times C2}{G \times B2 + P \times E2}$ |
|---------|--|

| | | |
|-------------|-------------|--------------|
| N = 730 kg | B2 = 564 cm | C2 = 98 cm |
| A2 = 133 cm | P = 620 kg | M3 = 2190 kg |
| G = 460 kg | E2 = 60 cm | |

| | | |
|------|--|--------|
| n2 = | $\frac{730 \times 133 + 2190 \times 98}{460 \times 564 + 620 \times 60}$ | =1,117 |
|------|--|--------|

FARMI 4571 / FARMI 4581

PRESSURE RELIEF VALVES

| FUNCTION | MULTI-LEVER VALVE | | |
|-----------------------|---------------------------------------|--------------------------------|-----|
| | MAIN PRESSURE RELIEF VALVE 195 bar | | |
| | BLOCK | PRESSURE RELIEF VALVE (bar) | |
| | | A | B |
| SLEWING | 1 | 185 | 185 |
| LIFTING | 2 | 210 | - |
| FOLDING | 3 | 210 | 150 |
| ROTATOR | 4 | - | - |
| GRAPPLE | 5 | - | - |
| EXTENSION | 6 | - | 90 |
| SUPPORT LEG, LEFT. | 7 | - | - |
| SUPPORT LEG, RIGHT | 8 | - | - |

| FUNCTION | 2-LEVER VALVE | | |
|-----------------------|---------------------------------------|--------------------------------|-----|
| | MAIN PRESSURE RELIEF VALVE 195 bar | | |
| | BLOCK | PRESSURE RELIEF VALVE (bar) | |
| | | A | B |
| SLEWING | 1 | 185 | 185 |
| LIFTING | 7 | 210 | - |
| FOLDING | 2 | 150 | 210 |
| ROTATOR | 8 | - | - |
| GRAPPLE | 6 | - | - |
| EXTENSION | 3 | - | 90 |
| SUPPORT LEG, LEFT. | 4 | - | - |
| SUPPORT LEG, RIGHT | 5 | - | - |

| FUNCTION | ON/OFF VALVE | | |
|-----------------------|---------------------------------------|--------------------------------|-------|
| | MAIN PRESSURE RELIEF VALVE 195 bar | | |
| | BLOCK | PRESSURE RELIEF VALVE (bar) | |
| | | pin locking | lever |
| SLEWING | 1 | 185 | 185 |
| LIFTING | 8 | 210 | - |
| FOLDING | 2 | 150 | 210 |
| ROTATOR | 7 | - | - |
| GRAPPLE | 5 | - | - |
| EXTENSION | 4 | - | 90 |
| SUPPORT LEG, LEFT. | 3 | - | - |
| SUPPORT LEG, RIGHT | 6 | - | - |

| FUNCTION | EHC VALVE | | |
|-----------------------|---------------------------------------|--------------------------------|-----|
| | MAIN PRESSURE RELIEF VALVE 195 bar | | |
| | BLOCK | PRESSURE RELIEF VALVE (bar) | |
| | | A | B |
| SLEWING | 1 | 185 | 185 |
| LIFTING | 2 | 210 | - |
| FOLDING | 3 | 210 | 150 |
| ROTATOR | 4 | - | - |
| GRAPPLE | 5 | - | - |
| EXTENSION | 6 | - | 90 |
| SUPPORT LEG, LEFT. | 7 | - | - |
| SUPPORT LEG, RIGHT | 8 | - | - |

FARMI 4571 / FARMI 4581

HYDRAULICS

CONNECTION TO THE CLOSED CENTER SYSTEM, ON / OFF, 60 l

1. Replace the R1/2" plug on the T fitting by a R1/2" double nipple. Connect the tank hose here.
2. Plug this hole for the tank hose with R1/4" and R1/2" plugs.
3. Tighten the main relief valve by $\frac{3}{4}$ turn so that its pressure is at least 5-10 bar higher than that of the tractor

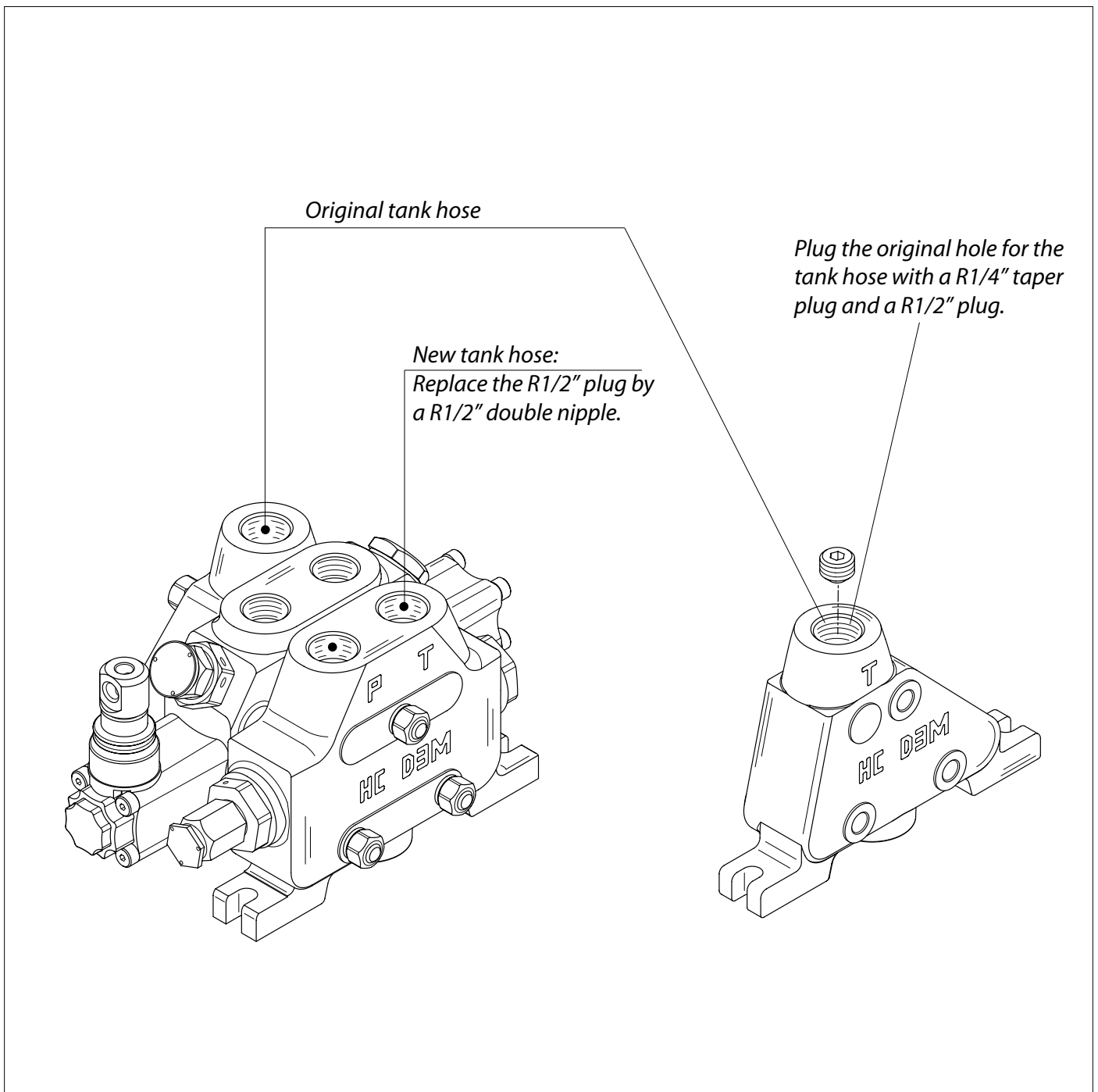
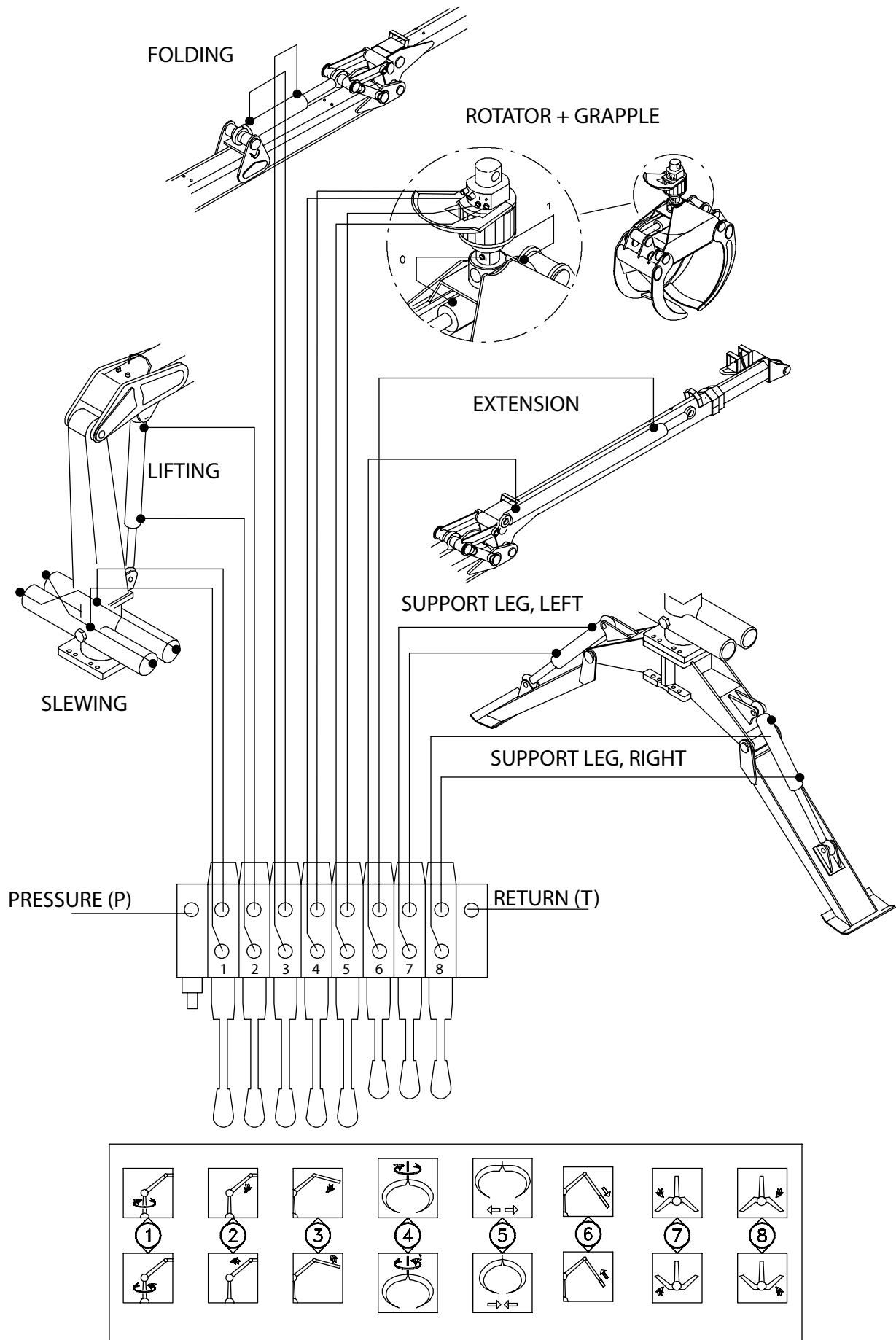


Fig 4. Modifying the valve for closed center system

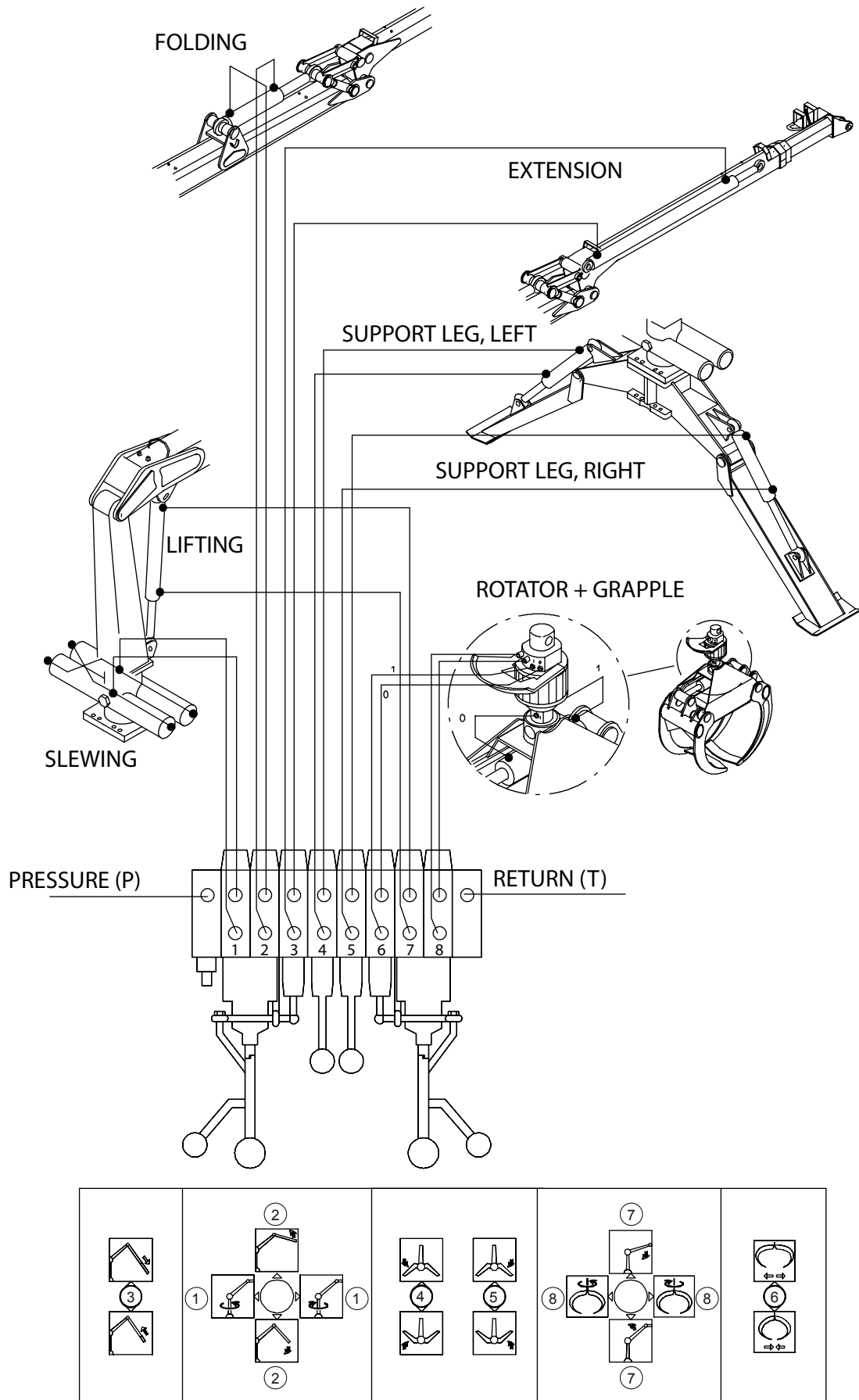
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CONNECTING THE MULTILEVER VALVE



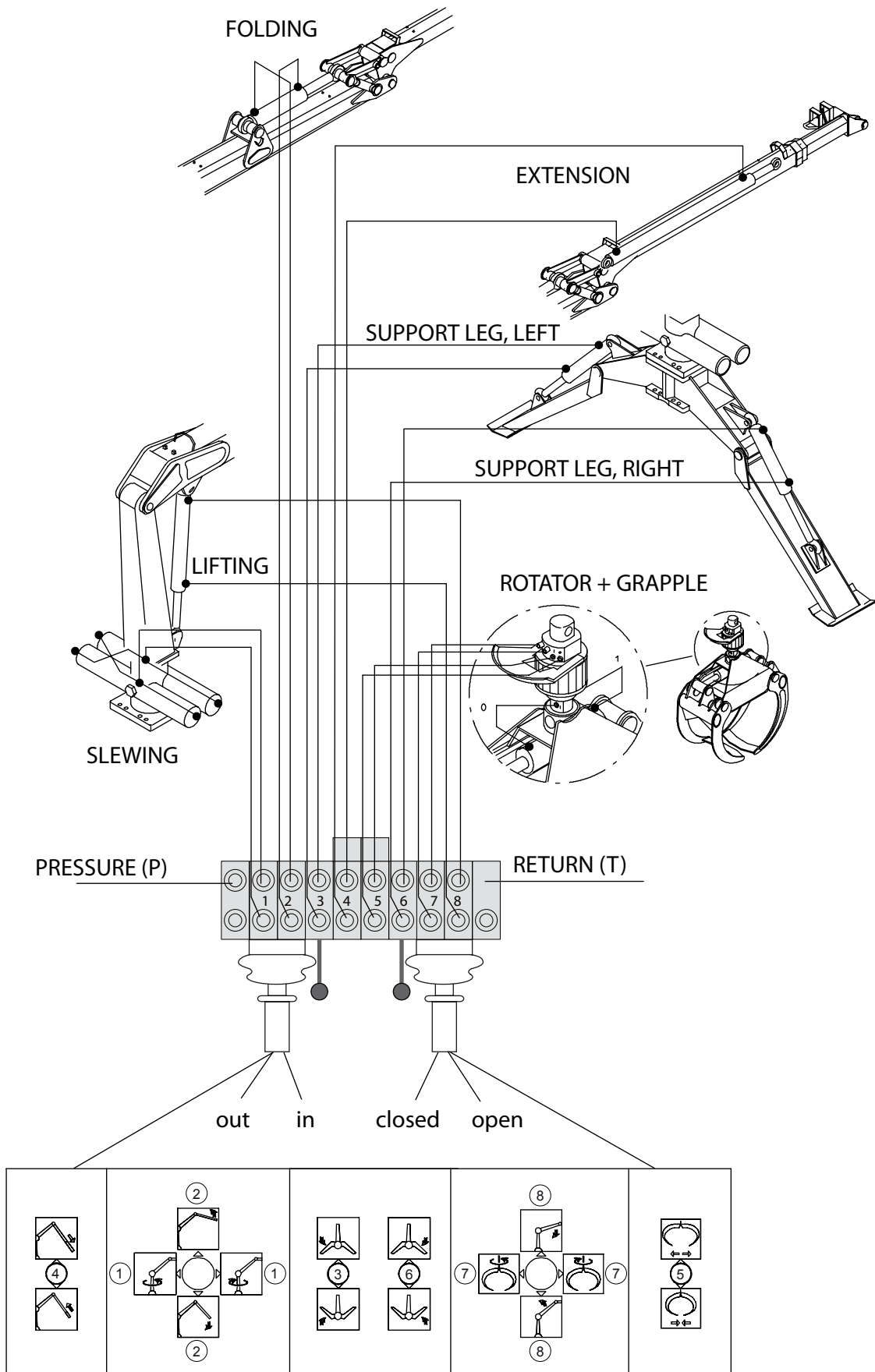
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CONNECTING THE 2-LEVER VALVE, (80 l)



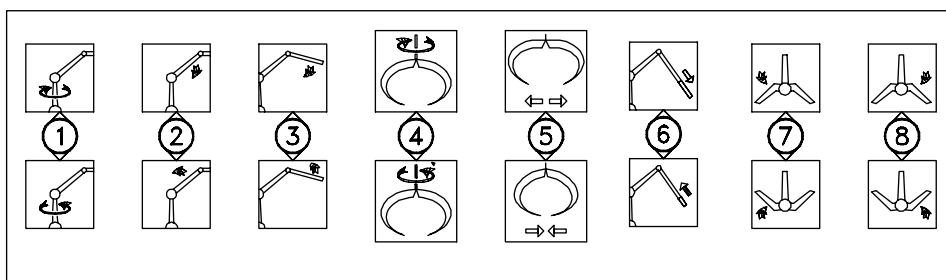
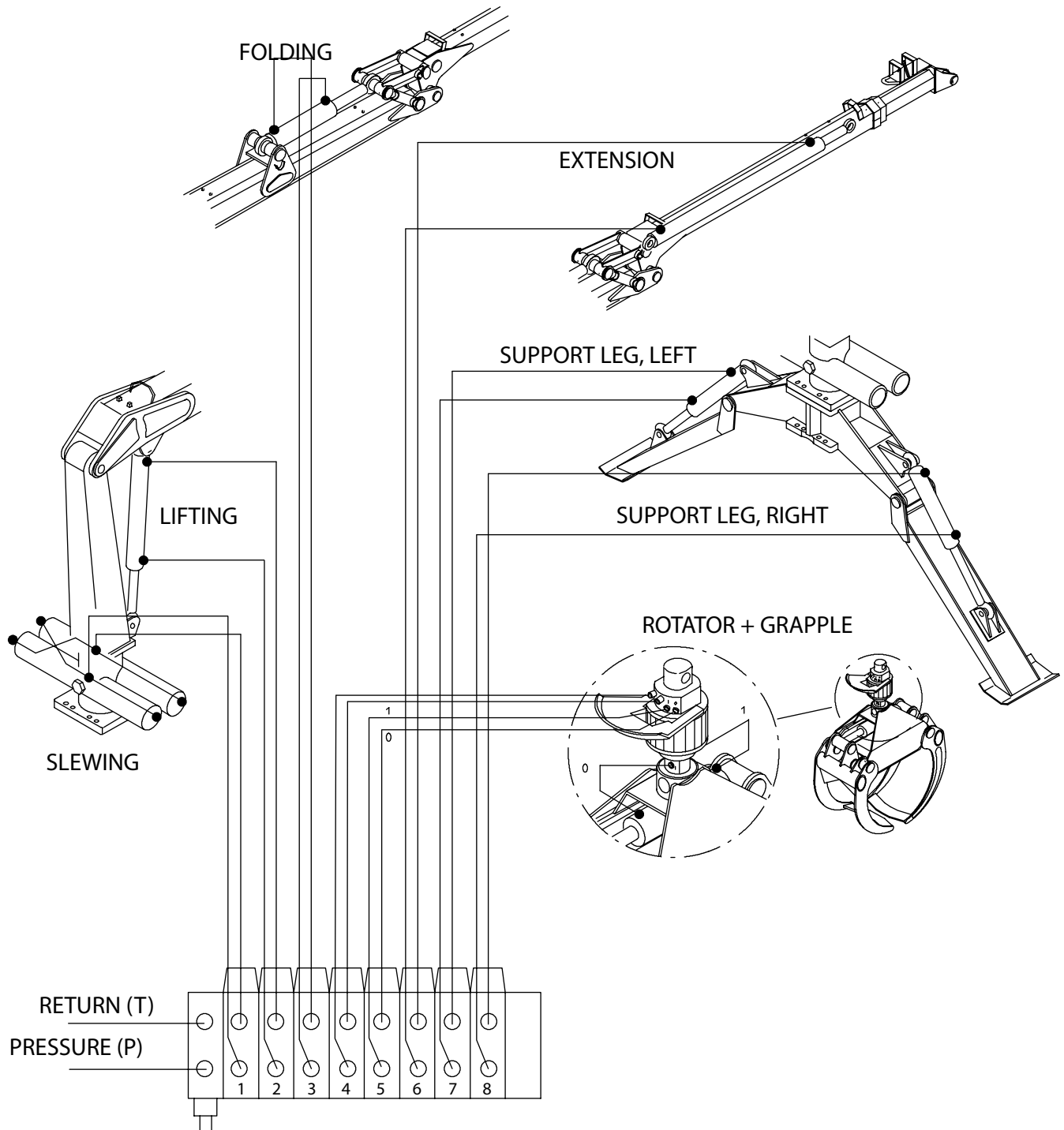
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CONNECTING THE ON/OFF VALVE (60 l)



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CONNECTING THE EHC VALVE



FARMI 4571 / FARMI 4581

INSTALLATION INSPECTION RECORD

| | | | |
|---------------------------------|-------|----------------|--|
| CRANE TYPE | FARMI | CHASSIS: model | |
| SERIAL NO. | | make, model | |
| YEAR OF MANUFACTURE | | | |
| | | | |
| Load test according to SFS 4261 | date: | performed by: | |

F = faultless R = needs repair

| ITEM UNDER INSPECTION | Notes | F | R |
|---|-------|---|---|
| 1. Before installation; 3-point lift | | | |
| state of lifting arm | | | |
| state of pusher arm | | | |
| locking of tractive resistance sensor | | | |
| gaskets and cleanness of hydraulic connections | | | |
| 2. Before test drive | | | |
| check state of machine, load and operating plates | | | |
| stick minimum distance warning label e.g. to valve connector or rear window | | | |
| check sizes and locking of loader's mounting pins | | | |
| check that the hydraulic hoses are connected correctly | | | |
| check that fast couplings are securely in place | | | |
| check that valve shafts move smoothly | | | |
| check the amount of hydraulic oil in the tractor | | | |
| check valve table attachment | | | |
| check shielding of hoses in the cabin and shielding of levers | | | |
| check tightness of loader fastening screws (cf. installation manual) | | | |
| 3. During test drive | | | |
| cylinder bleeding | | | |
| determining stand stability | | | |
| test use with allowable load (cf. loading table) | | | |
| loader/cabin at various hoist positions | | | |
| loader/cabin at various boom positions | | | |
| hose friction | | | |
| 4. After test drive | | | |
| sagging of booms, max. range 15 cm/min | | | |
| check amount of oil with cylinders broken in | | | |
| oil leaks; tighten joins if necessary | | | |

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ANNUAL INSPECTION RECORD

F = faultless R = needs repair

| ITEM UNDER INSPECTION | ANNUAL INSPECTION | | |
|--|-------------------|---|-------|
| | F | R | NOTES |
| CLEANLINESS OF LIFTING BOOM | | | |
| WELDED JOINTS OF LIFTING BOOM | | | |
| WELDED JOINTS OF FOLDING BOOMS | | | |
| WELDED JOINTS OF COLUMN | | | |
| FASTENING OF ROTATOR | | | |
| STATE OF BRACKETS | | | |
| BACKLASH OF ROTATING DEVICE | | | |
| STATE OF SWIVEL AXIS BEARINGS | | | |
| STATE OF LIFTING BOOM BEARINGS | | | |
| STATE OF FOLDING BOOM BEARINGS | | | |
| STATE OF JOINT PINS | | | |
| LOCKING OF JOINT PINS | | | |
| STATE OF CONTROLS | | | |
| STATE OF CYLINDERS | | | |
| STATE OF CYLINDER GASKETS | | | |
| STATE OF PISTON RODS | | | |
| STATE OF HYDRAULIC HOSES | | | |
| STATE OF HYDRAULIC HOSE | | | |
| STATE OF HYDRAULIC CONNECTORS | | | |
| PROTECTION OF REGULATING VALVE LEVERS | | | |
| TIGHTNESS OF LOADER'S FASTENING | | | |
| OPERATION, MAINTENANCE AND INSPECTION MANUAL | | | |
| STATE OF SAFETY DISTANCE TABLE | | | |
| STATE OF LOAD SIGN | | | |
| STATE OF MACHINE PLATE | | | |
| HAS INSTALLATION INSPECTION BEEN CARRIED OUT? | | | |
| PRESSURE RELIEF VALVE _____ bar | | | |
| PROTECTION VALVES _____ bar | | | |
| STATE OF STRUCTURES AFTER MAX. ALLOWABLE TEST LOAD | | | |
| SAGGING OF BOOMS, MAX. RANGE OF 60 cm | | | |
| STATE OF SLIDE PLATES, MAX. GAP OF 8 mm | | | |

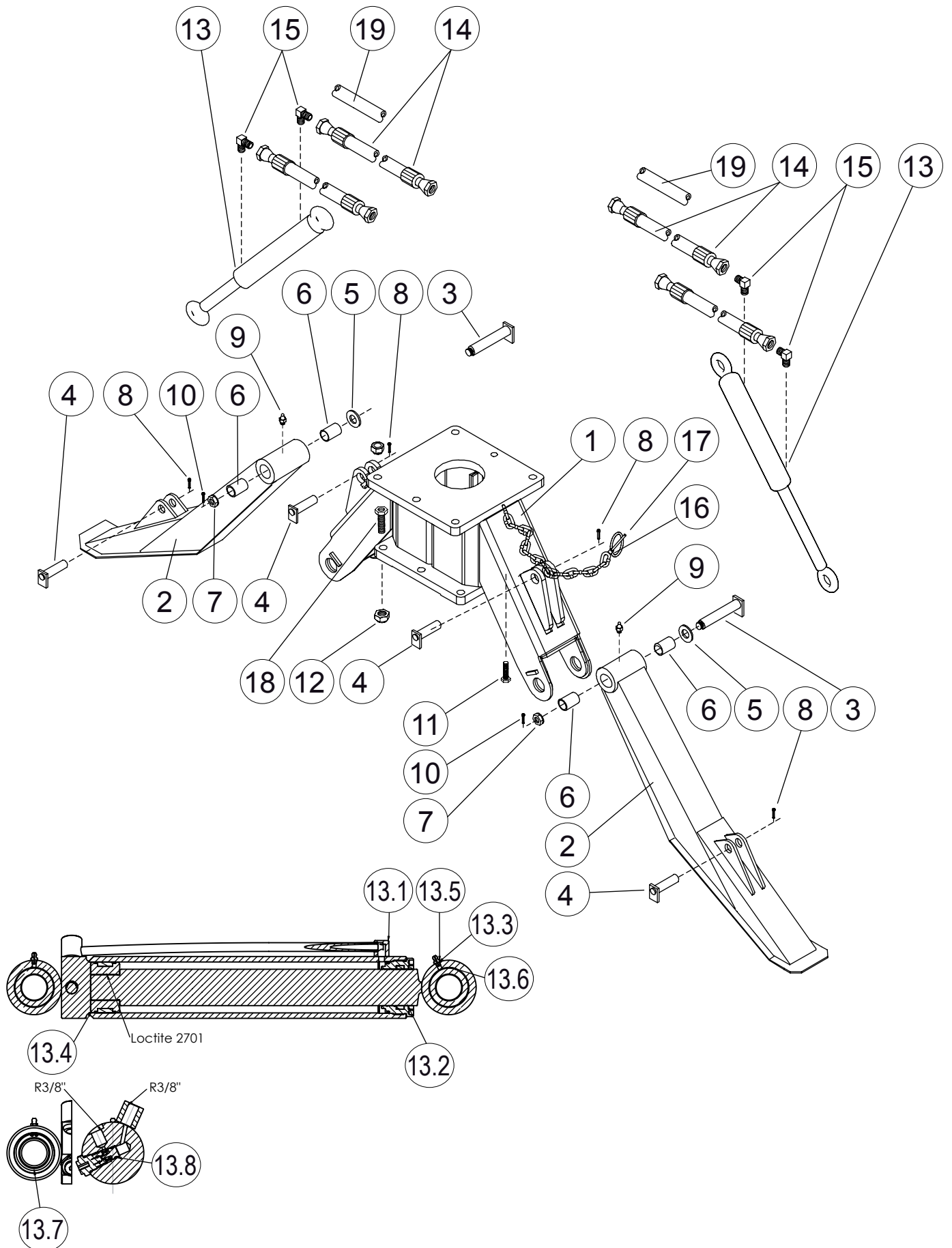
Inspector:

Date and place:

Notes:

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HYDRAULIC SUPPORT LEGS



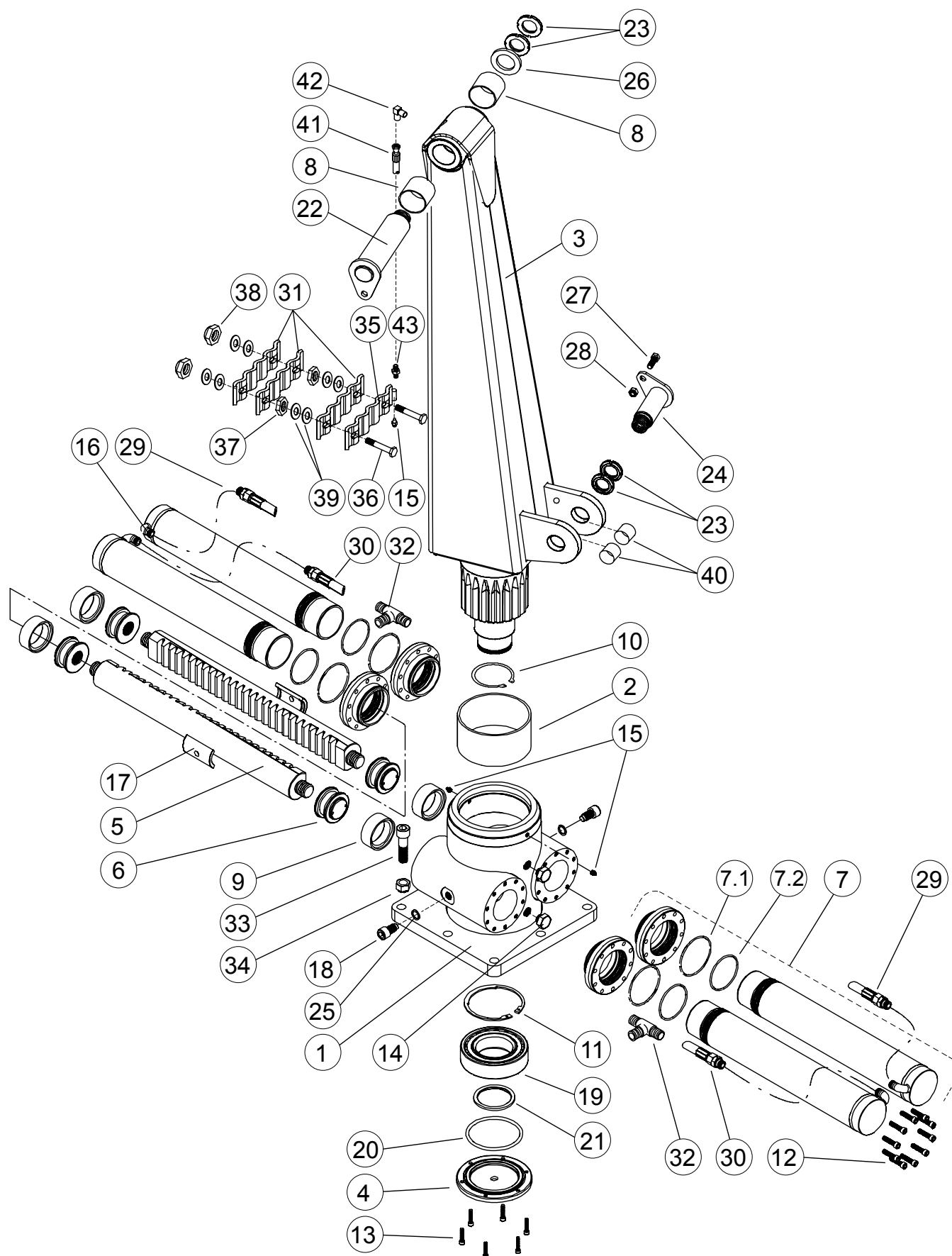
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HYDRAULIC SUPPORT LEGS

| Part | Order no | Description | Remarks | Qty |
|------|----------|----------------------|------------------------|-----|
| 1 | 43397360 | Mounting rack | | 1 |
| 2 | 43397440 | Support leg | | 2 |
| 3 | 33380148 | Pin for support leg | | 2 |
| 4 | 43492050 | Pin for cylinder | | 4 |
| 5 | 43380229 | Washer | | 2 |
| 6 | 54562483 | Slide bearing | | 4 |
| 7 | 52115243 | Castle nut | M30 DIN937 | 2 |
| 8 | 52840220 | Cotter pin | 8X50 DIN1481 | 4 |
| 9 | 52401015 | Grease nipple | AR1/8 | 2 |
| 10 | 52813151 | Split pin | 5X50 DIN94 ZN | 2 |
| 11 | 52064673 | Screw | M24X2X70 DIN931 10.9ZN | 6 |
| 12 | 52117231 | Lock nut | M24X2 DIN985 10.9 | 6 |
| | | | | |
| 13 | 56096070 | Hydraulic cylinder | 70/50-360 | 2 |
| 13.1 | 56097240 | Cylinder tube | | 1 |
| 13.2 | 56097250 | Guide | | 1 |
| 13.3 | 56097260 | Piston rod | | 1 |
| 13.4 | 56097270 | Piston | | 1 |
| 13.5 | 52401015 | Grease nipple | | 4 |
| 13.6 | 54591029 | Articulation bearing | | 2 |
| 13.7 | 52231586 | Circlip | | 2 |
| 13.8 | 56096080 | Valve | | 1 |
| 13.9 | 52355030 | Seal kit | | 1 |
| | | | | |
| 14 | 56520380 | Hose assy | S3/8"S L=3,6 m | 4 |
| 15 | 52444820 | Angle nipple | 90° | 4 |
| 16 | 43492670 | Chain | | 2 |
| 17 | 54815147 | Ring cotter | | 2 |
| 18 | 52070224 | Socked head screw | M24X2-90 10.9ZN | 6 |
| 19 | 03592380 | Water drainage pipe | 0,7 m | 4 |

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SLEWING DEVICE



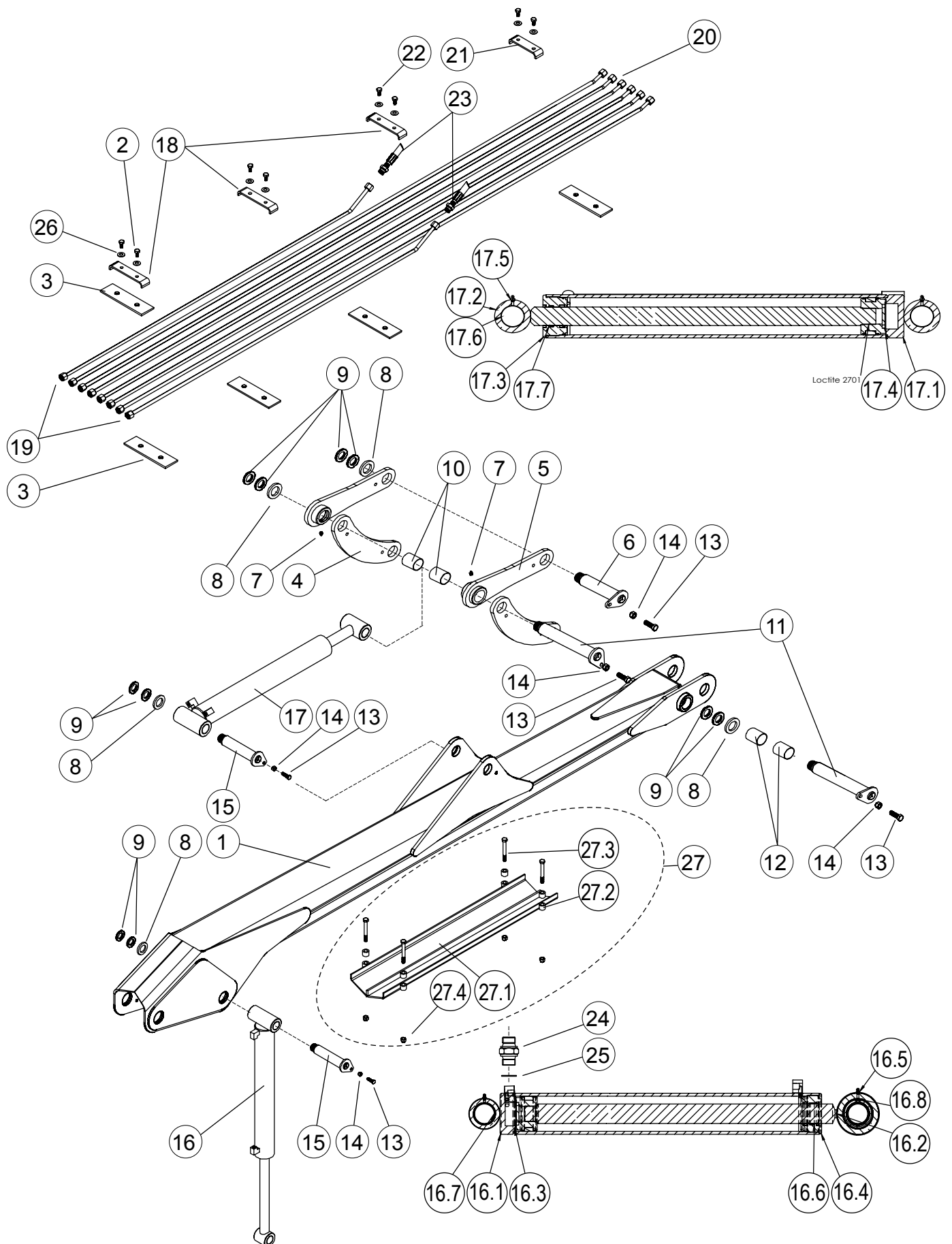
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SLEWING DEVICE

| Part | Order no | Description | Remarks | Qty |
|------|----------|-------------------|---------------------|-----|
| 1 | 43590130 | Frame | | 1 |
| 2 | 54561477 | Slide bearing | | 1 |
| 3 | 43590180 | Column | | 1 |
| 4 | 43590070 | Plate | | 1 |
| 5 | 43590050 | Rack | | 2 |
| 6 | 43590110 | Piston | | 4 |
| 7 | 43590120 | Cylinder | | 4 |
| 7.1 | 52304045 | O-ring | 108X3 | 1 |
| 7.2 | 52304050 | O-ring | 100X3 | 1 |
| 8 | 54563291 | Slide bearing | | 2 |
| 9 | 52333168 | Gasket | | 4 |
| 10 | 52230307 | Circlip | | 1 |
| 11 | 52231610 | Circlip | 160X4 DIN472 | 1 |
| 12 | 52001385 | Socked head screw | M10X45 DIN912 8.8ZN | 40 |
| 13 | 52001278 | Socked head screw | M8X20 DIN912 8.8ZN | 6 |
| 14 | 52460037 | Oil control glass | | 2 |
| 15 | 52401015 | Grease nipple | AR1/8 | 3 |
| 16 | 52451002 | Angle nipple | | 4 |
| 17 | 43590060 | Footstep bearing | | 2 |
| 18 | 43590960 | Screw | | 2 |
| 19 | 54522602 | Roller bearing | | 1 |
| 20 | 52302767 | O-ring | 160x3 | 1 |
| 21 | 43591610 | Spacer plate | | 1 |
| 22 | 43590650 | Pin | | 1 |
| 23 | 52118080 | Axle nut | M40X1,5 | 4 |
| 24 | 43592850 | Pin | | 1 |
| 25 | 52390200 | Usit-ring | | 2 |
| 26 | 43390889 | Washer | 70X70 | 1 |
| 27 | 52062031 | Screw | M12X40 DIN933 8.8ZN | 1 |
| 28 | 52117124 | Lock nut | M12 DIN985 8.8ZN | 1 |
| 29 | 56520075 | Hose assy | S3/8"S L=0,6 m | 2 |
| 30 | 56520125 | Hose assy | S3/8"S L=0,85 m | 2 |
| 31 | 33391335 | Hose fastener | | 3 |
| 32 | 52443678 | T-nipple | | 2 |
| 33 | 52070224 | Socked head screw | M24X2-90 10.9 ZN | 8 |
| 34 | 52117231 | Lock nut | M24X2 DIN985 10.9 | 6 |
| 35 | 43393270 | Hose fastener | | 1 |
| 36 | 43391937 | Screw | 95 | 2 |
| 37 | 52110046 | Nut | M10 DIN934 8ZN | 2 |
| 38 | 52117108 | Lock nut | M10 DIN985 8ZN | 2 |
| 39 | 52200045 | Washer | M10 DIN126 58ZN | 8 |
| 40 | 43391325 | Bushing | | 2 |
| 41 | 56571040 | Hose assy | 6SP 1/8 6SP L=0,5 | 1 |
| 42 | 52422011 | Angle nipple | CLL-06 R 1/8 | 1 |
| 43 | 52421013 | Connector | BL-06 R 1/8 | 1 |

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LIFTING ARM



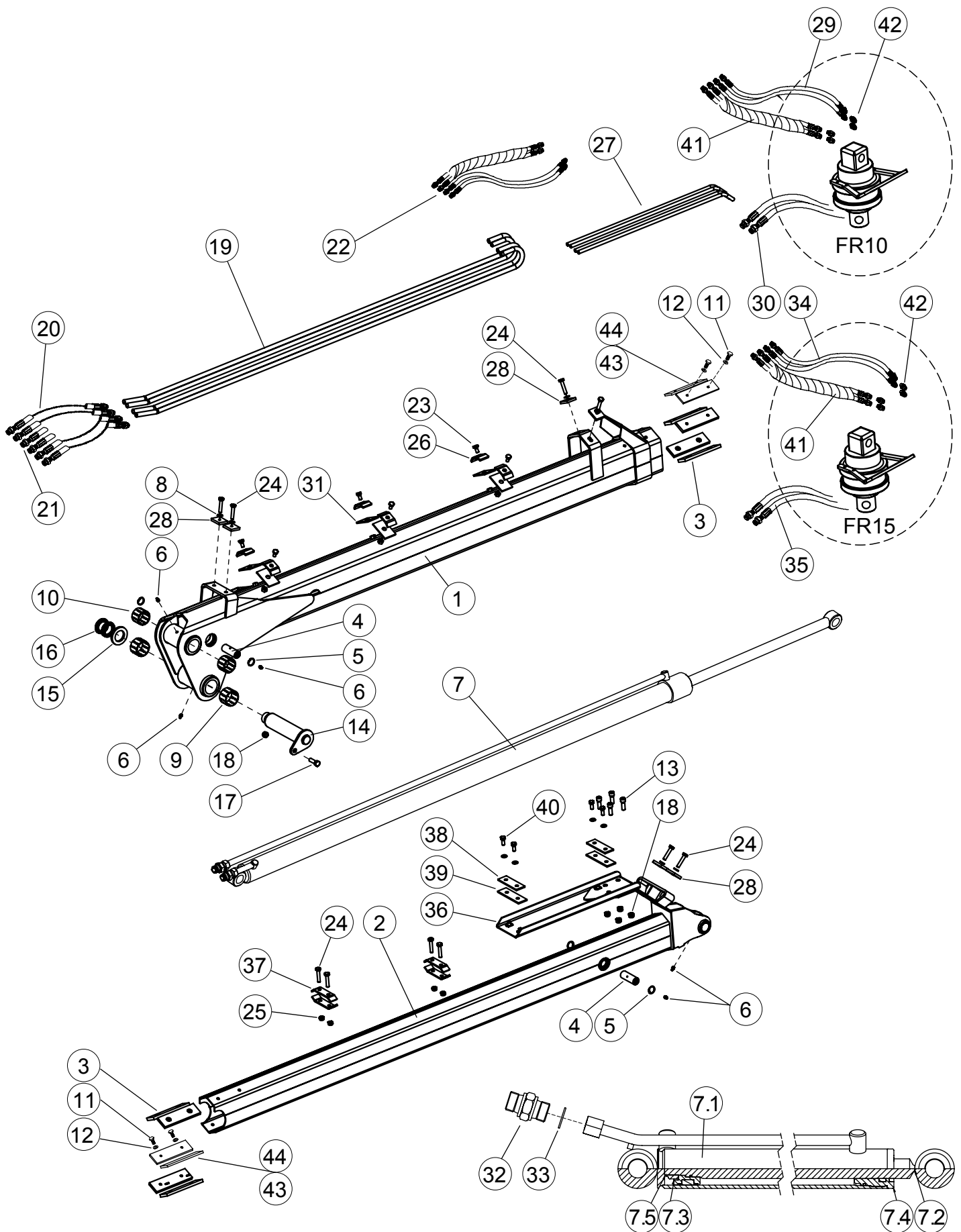
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LIFTING ARM

| Part | Order no | Description | Remarks | Qty |
|------|----------|----------------------|--------------------------|-----|
| 1 | 43590190 | Lifting arm | | 1 |
| 2 | 52060225 | Screw | M10X25 DIN933 88ZN | 2 |
| 3 | 43493170 | Rubber | 5X50X170 | 5 |
| 4 | 43590480 | Outer shaft | | 2 |
| 5 | 43590510 | Inner shaft | | 2 |
| 6 | 43590590 | Pin | D50 | 1 |
| 7 | 52401015 | Grease nipple | AR1/8 | 5 |
| 8 | 43390889 | Washer | 70X70 | 5 |
| 9 | 52118080 | Axle nut | M40X1,5 | 10 |
| 10 | 54562483 | Slide bearing | | 2 |
| 11 | 43590570 | Pin | | 2 |
| 12 | 54562509 | Slide bearing | | 2 |
| 13 | 52062031 | Screw | M12X40 DIN933 88ZN | 5 |
| 14 | 52117124 | Lock nut | M12 DIN985 8ZN | 5 |
| 15 | 43590610 | Pin | | 2 |
| 16 | 56097200 | Lifting cylinder | 90/50-675, double acting | 1 |
| 16.1 | 56097202 | Cylinder tube | | 1 |
| 16.2 | 56097206 | Piston rod | | 1 |
| 16.3 | | Piston | | 1 |
| 16.4 | 56097204 | Guide | | 1 |
| 16.5 | | Grease nipple | | 1 |
| 16.6 | | Ring | | 1 |
| 16.7 | | Slide bearing | | 1 |
| 16.8 | | Articulation bearing | | 1 |
| 16.9 | 56097208 | Seal kit | | 1 |
| 17 | 56097210 | Folding cylinder | 90/45-650, double acting | 1 |
| 17.1 | | Cylinder tube | | 1 |
| 17.2 | 56097740 | Piston rod | | 1 |
| 17.3 | 56097230 | Guide | | 1 |
| 17.4 | | Piston | | 1 |
| 17.5 | | Grease nipple | | 2 |
| 17.6 | | Slide bearing | | 1 |
| 17.7 | | Ring | | 1 |
| 17.8 | 52356100 | Seal kit | | 1 |
| 18 | 43493190 | Tube clamp | | 3 |
| 19 | 43591880 | Hydraulic pipe | 1630 | 2 |
| 20 | 43591890 | Hydraulic pipe | 2800 | 6 |
| 21 | 43493180 | Tube clamp | | 1 |
| 22 | 52060514 | Screw | M10X20 DIN933 88ZN | 8 |
| 23 | 56570443 | Hose assy | S 3/8 SPT12 L=0,30 m | 2 |
| 24 | 52432028 | Double fitting | R3/8 | 4 |
| 25 | 52390556 | Usit-ring | U17,28X23,8X2,03 | 4 |
| 26 | 52200474 | Washer | M10 DIN440 ZN | 8 |
| 27 | 43594330 | Shield | complete, accessory | 1 |
| 27.1 | 43594270 | Shield | | 1 |
| 27.2 | 43110162 | Bushing | | 4 |
| 27.3 | 52062494 | Screw | M12X100 DIN931 88ZN | 4 |
| 27.4 | 52117124 | Lock nut | M12 DIN985 8ZN | 4 |

FARMI 4571 / FARMI 4581

FOLDING ARM FARMI 4571



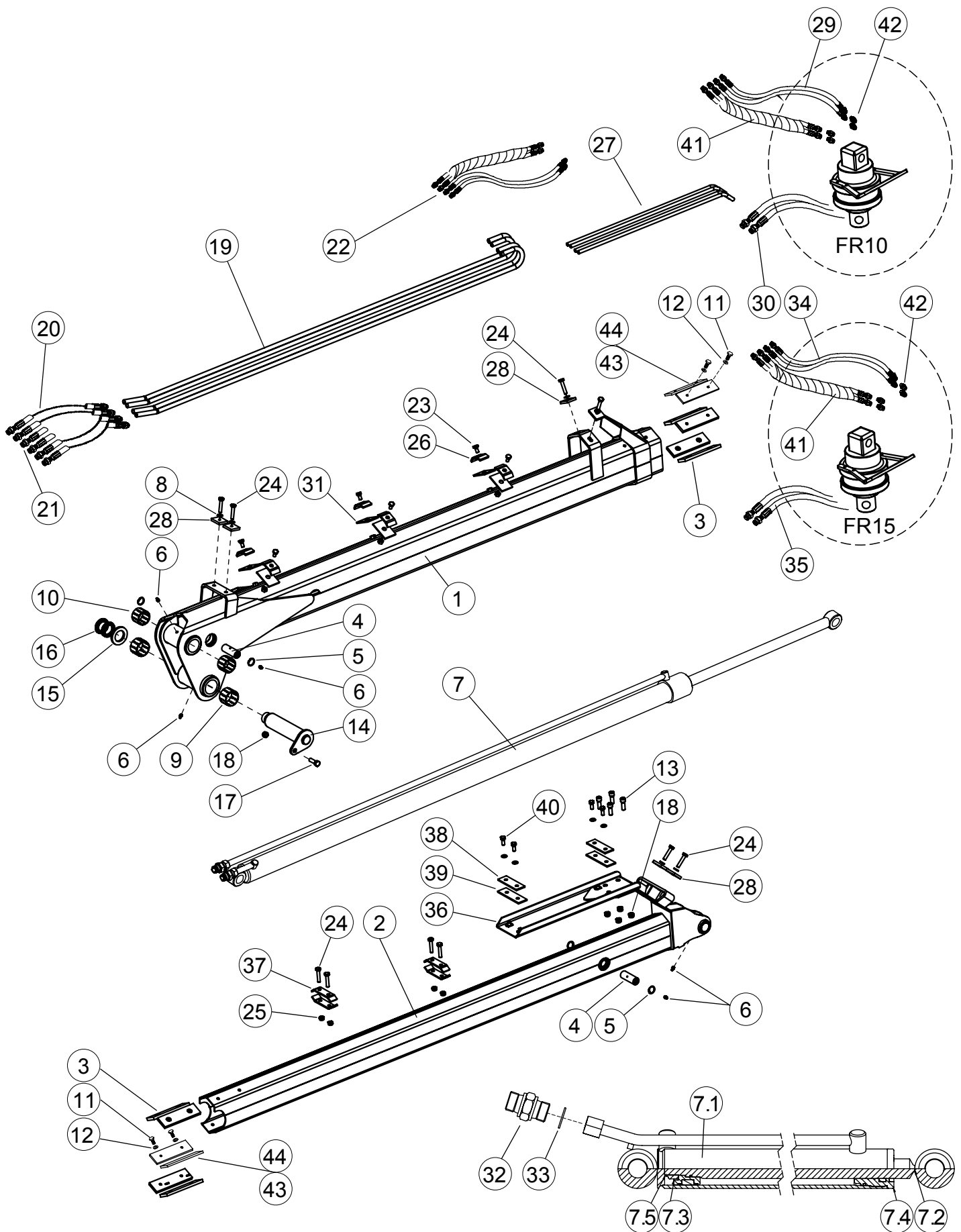
FARMI 4571 / FARMI 4581

FOLDING ARM FARMI 4571

| Part | Order no | Description | Remarks | Qty |
|------|----------|-----------------------------|--------------------|-----|
| 1 | 43590210 | Folding arm | | 1 |
| 2 | 43591050 | Extension boom | | 1 |
| 3 | 43286871 | Slide plate | | 8 |
| 4 | 43390814 | Pin | | 2 |
| 5 | 52231040 | Circlip | 28x1,2 DIN472 | 4 |
| 6 | 52401015 | Grease nipple | AR1/8 | 5 |
| 7 | 56098030 | Extension cylinder | 50/30-1600 | 1 |
| 7.1 | | Cylinder tube | | 1 |
| 7.2 | | Piston rod | | 1 |
| 7.3 | | Piston | | 1 |
| 7.4 | | Guide | | 1 |
| 7.5 | | Nut | | 1 |
| 7.6 | 56098040 | Seal kit | | 1 |
| 8 | 52200045 | Washer | M10 DIN125 58ZN | 10 |
| 9 | 54562582 | Slide bearing | | 2 |
| 10 | 54562509 | Slide bearing | | 2 |
| 11 | 52060120 | Screw | M8x14 DIN933 88ZN | 16 |
| 12 | 52114311 | Lock washer | M8 NORD-LOCK | 16 |
| 13 | 52070400 | Hexagonal socket head screw | M12X35 DIN912 88ZN | 4 |
| 14 | 43590630 | Pin | | 1 |
| 15 | 43390889 | Washer | | 1 |
| 16 | 52118080 | Axle nut | M40X1,5 | 2 |
| 17 | 52062031 | Screw | M12X40 DIN933 88ZN | 1 |
| 18 | 52117124 | Lock nut | M12 DIN985 8ZN | 5 |
| 19 | 43391549 | Hydraulic pipe | | 4 |
| 20 | 56570401 | Hose assy | | 4 |
| 21 | 56570435 | Hose assy | | 2 |
| 22 | 56570550 | Hose assy | | 4 |
| 23 | 52060514 | Screw | M10X20 DIN933 88ZN | 6 |
| 24 | 52060266 | Screw | M10X50 DIN931 88ZN | 10 |
| 25 | 52117108 | Lock nut | M10 DIN985 8ZN | 4 |
| 26 | 43391440 | Tube clamp | | 6 |
| 27 | 43595160 | Hydraulic pipe | | 4 |
| 28 | 43493730 | Fastener | | 6 |
| 29 | 56521149 | Hose assy | | 4 |
| 30 | 56520075 | Hose assy | | 2 |
| 31 | 43392059 | Rubber | | 6 |
| 32 | 52432028 | Double fitting | R3/8 | 2 |
| 33 | 52390556 | Usit-ring | | 2 |
| 34 | 43496670 | Hose assy | | 4 |
| 35 | 03598270 | Hose assy | | 2 |
| 36 | 43492450 | Pipe fastener | | 1 |

FARMI 4571 / FARMI 4581

FOLDING ARM FARMI 4571



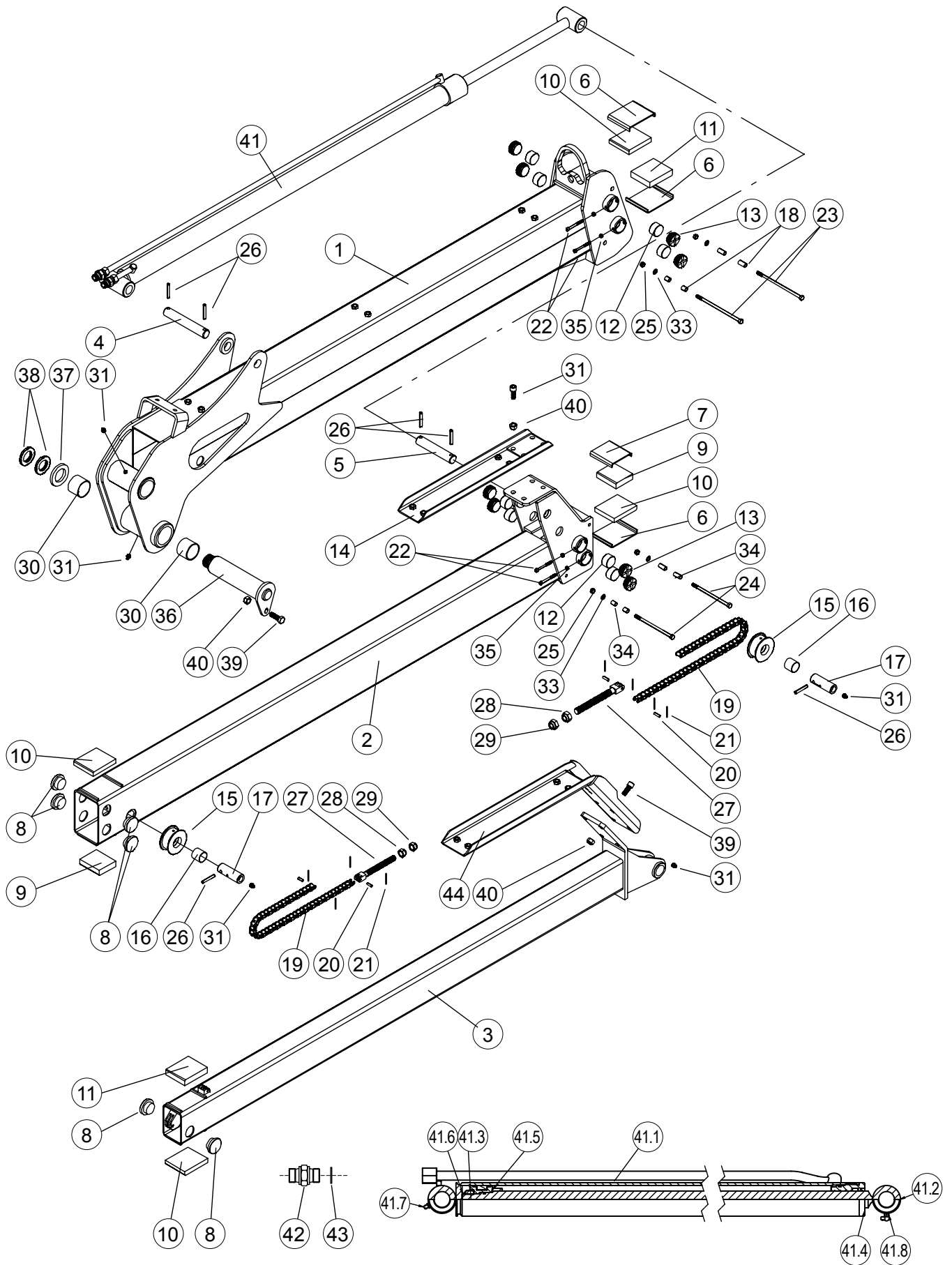
FARMI 4571 / FARMI 4581

FOLDING ARM FARMI 4571

| Part | Order no | Description | Remarks | Qty |
|------|----------|-------------------|--------------------|-----|
| 37 | 43493040 | Plate | | 4 |
| 38 | 43493200 | Plate | | 2 |
| 39 | 43493510 | Rubber | | 2 |
| 40 | 52060225 | Screw | M10X25 DIN933 88ZN | 4 |
| 41 | 03594190 | Protection spiral | | 2 |
| 42 | 52436210 | Nipple | | 4 |
| | | | | |
| 43 | 43497730 | Adjustment plate | if necessary | 0-4 |
| | or | | | |
| 44 | 43497720 | Adjustment plate | if necessary | 0-4 |

FARMI 4571 / FARMI 4581

DOUBLE EXTENSION FARMI 4581



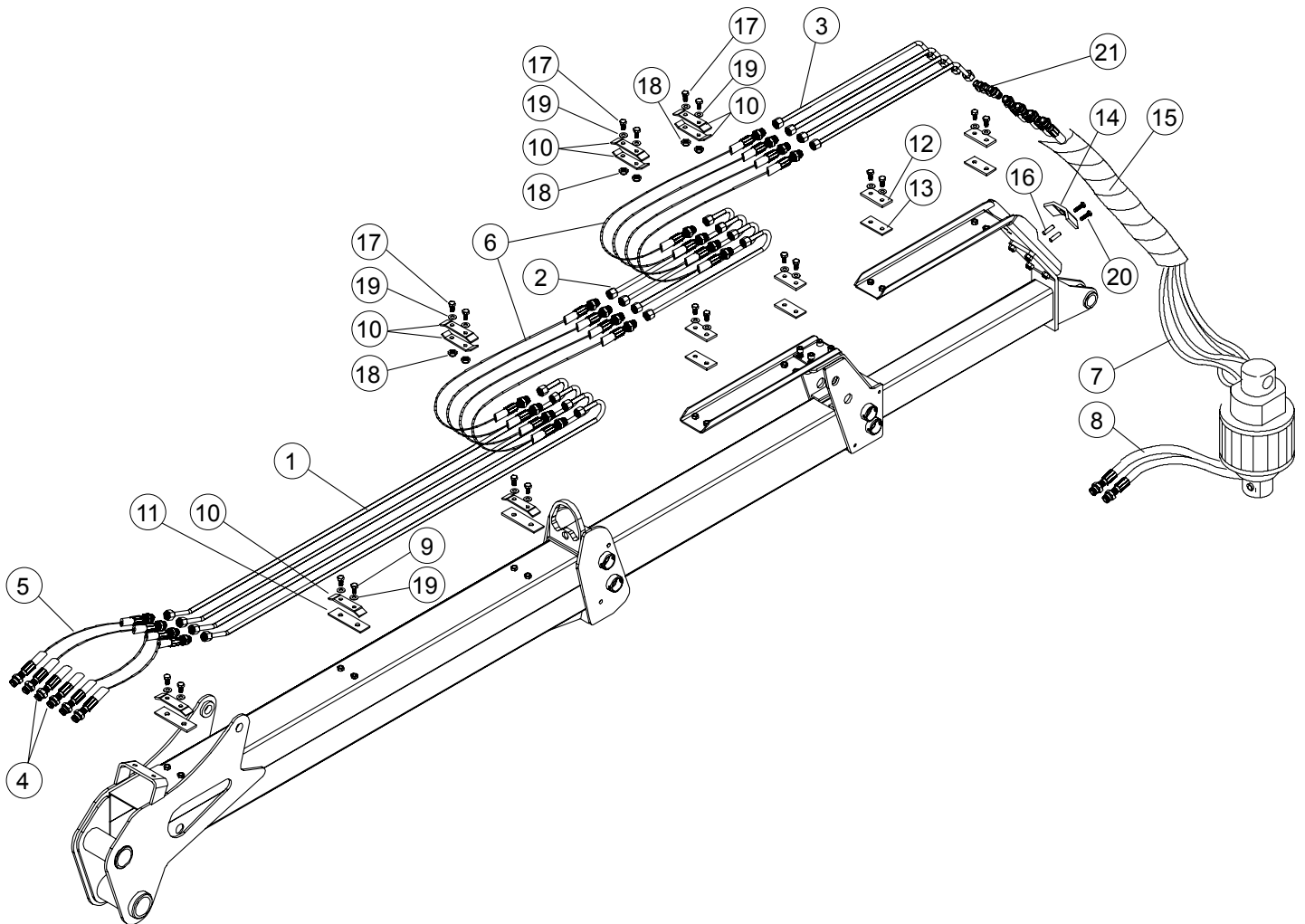
FARMI 4571 / FARMI 4581

DOUBLE EXTENSION FARMI 4581

| Part | Order no | Description | Remarks | Qty |
|------|----------|-----------------------------|----------------------|-----|
| 1 | 33592100 | Outer boom | | 1 |
| 2 | 33591980 | Middle boom | | 1 |
| 3 | 33591920 | Extension boom | | 1 |
| 4 | 43592510 | Pin | | 1 |
| 5 | 43592370 | Pin | | 1 |
| 6 | 43592480 | Slide plate fastener | | 3 |
| 7 | 43592490 | Slide plate fastener | | 1 |
| 8 | 43592470 | Slide plate | | 6 |
| 9 | 43592460 | Slide plate | | 2 |
| 10 | 43592450 | Slide plate | | 4 |
| 11 | 43592440 | Slide plate | | 2 |
| 12 | 43591530 | Slide plate | adjustable | 8 |
| 13 | 43591540 | Adjustment screw | | 8 |
| 14 | 43592240 | Pipe fastener | | 1 |
| 15 | 43492580 | Diverting pulley | | 2 |
| 16 | 54561311 | Slide bearing | | 2 |
| 17 | 43591590 | Pin | | 2 |
| 18 | 43592590 | Bushing | D12X25 | 4 |
| 19 | 54828447 | Chain | | 2 |
| 20 | 54826276 | Pin | | 4 |
| 21 | 52813037 | Split pin | 1,5X12 DIN94 ZN | 8 |
| 22 | 52001559 | Hexagonal socket head screw | M6X60 DIN912 88ZN | 8 |
| 23 | 52004298 | Screw | M8X160 DIN931 10.9ZN | 2 |
| 24 | 52060506 | Screw | M8X130 DIN931 88ZN | 2 |
| 25 | 52117082 | Lock nut | M8 DIN985 8ZN | 4 |
| 26 | 52840238 | Cotter pin | 8X60 DIN1481 | 6 |
| 27 | 54828454 | Clevis pin | | 2 |
| 28 | 52111077 | Nut | M16 DIN936 8ZN | 2 |
| 29 | 52110079 | Nut | M16 DIN934 8ZN | 2 |
| 30 | 54562582 | Slide bearing | | 2 |
| 31 | 52401015 | Grease nipple | AR1/8 | 4 |
| 32 | 52001245 | Hexagonal socket head screw | M12X30 DIN912 88ZN | 4 |
| 33 | 52200037 | Washer | M8 DIN126 58ZN | 4 |
| 34 | 43592920 | Bushing | D12X15 | 4 |
| 35 | 52117066 | Lock nut | M6 DIN985 8ZN | 8 |
| 36 | 43590630 | Pin | | 1 |
| 37 | 43390889 | Washer | 70X70 | 1 |
| 38 | 52118080 | Axle nut | M40X1,5 | 2 |
| 39 | 52062023 | Screw | M12X30 DIN933 88ZN | 5 |
| 40 | 52117124 | Lock nut | M12 DIN985 8ZN | 9 |
| 41 | 56098020 | Extension cylinder | 50/30-1295 | 1 |
| 41.1 | | Cylinder tube | | 1 |
| 41.2 | | Piston rod | | 1 |
| 41.3 | | Piston | | 1 |
| 41.4 | | Guide | | 1 |
| 41.5 | | Bushing | | 1 |
| 41.6 | 52117215 | Nut | M20X1.5 DIN985 | 1 |
| 41.7 | | Grease nipple | M6X1 DIN A | 1 |
| 41.8 | | Grease nipple | M6X1 90o | 1 |
| 41.9 | 56098040 | Seal kit | | 1 |
| 42 | 52432028 | Double fitting | R3/8 | 2 |
| 43 | 52390556 | Usit-ring | U17,28X23,8X2,03 | 2 |
| 44 | 43592270 | Pipe fastener | | 1 |

FARMI 4571 / FARMI 4581

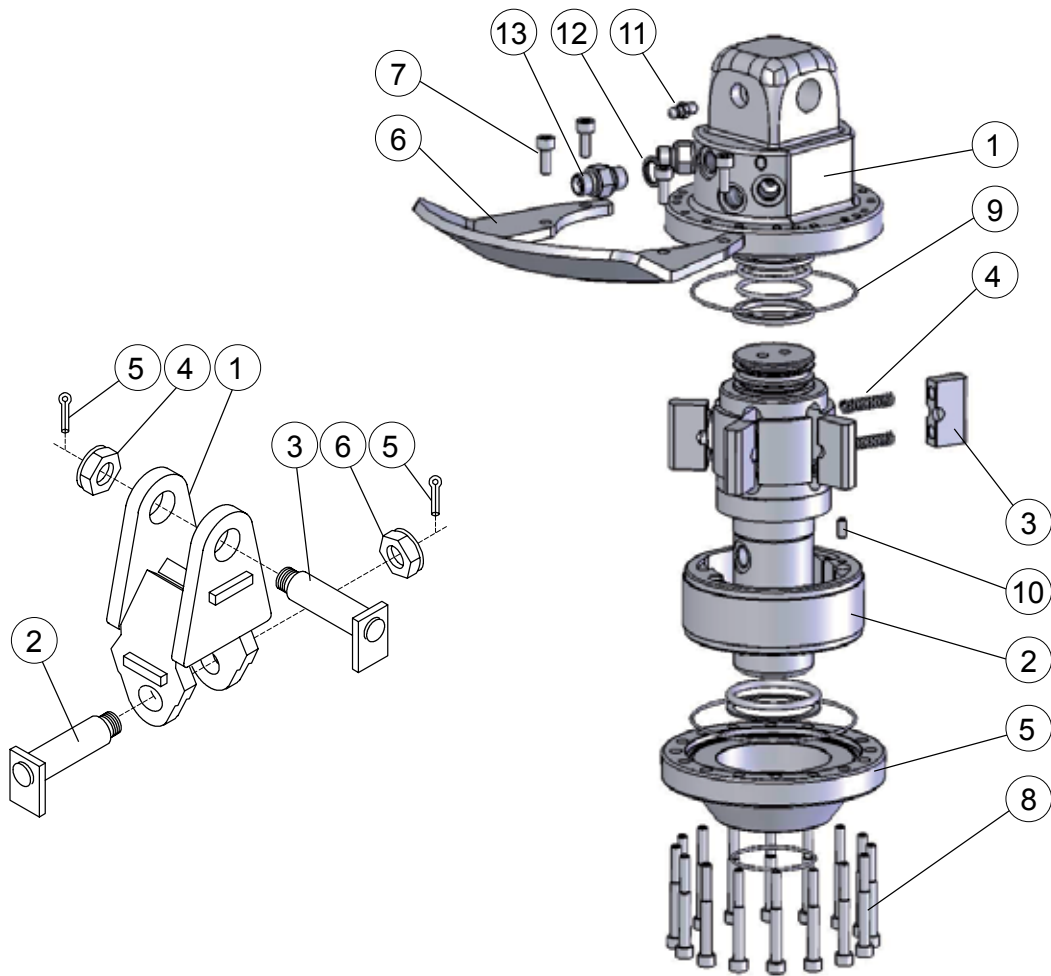
FARMI 4581 HYDRAULICS / DOUBLE EXTENSION



| Part | Order no | Description | Remarks | Qty |
|------|----------|-------------------|--------------------------|-----|
| 1 | 43592600 | Hydraulic pipe | 1750 | 4 |
| 2 | 43592620 | Hydraulic pipe | 630 | 4 |
| 3 | 43592630 | Hydraulic pipe | 630 | 4 |
| 4 | 56570229 | Hose assy | S 3/8 SPT12 L=1,4 m | 2 |
| 5 | 56570492 | Hose assy | SPT12 3/8 SPT12 L=1,1 m | 4 |
| 6 | 56570500 | Hose assy | SPT12 3/8 SPT12 L=1,35 m | 8 |
| 7 | 56521149 | Hose assy | V 3/8 SPT12 L=0,95 m | 4 |
| 8 | 56520075 | Hose assy | S3/8"S L=0,6 m | 2 |
| 9 | 52060514 | Screw | M10X20 DIN933 88ZN | 14 |
| 10 | 43493040 | Tube clamp | | 9 |
| 11 | 43592610 | Rubber | 5X40X130 | 3 |
| 12 | 43592320 | Tube clamp | | 4 |
| 13 | 43592330 | Rubber | 5X40X87 | 4 |
| 14 | 43592310 | Tube clamp | | 1 |
| 15 | 54922430 | Protection spiral | 2,0 m | 1 |
| 16 | 43592340 | Bushing | | 2 |
| 17 | 52060258 | Screw | M10X40 DIN933 88ZN | 6 |
| 18 | 52117108 | Lock nut | M10 DIN985 8ZN | 8 |
| 19 | 52200045 | Washer | M10 DIN126 58ZN | 20 |
| 20 | 52060944 | Screw | M10X60 DIN933 88ZN | 2 |
| 21 | 52436210 | Nipple | | 4 |

FARMI 4571 / FARMI 4581

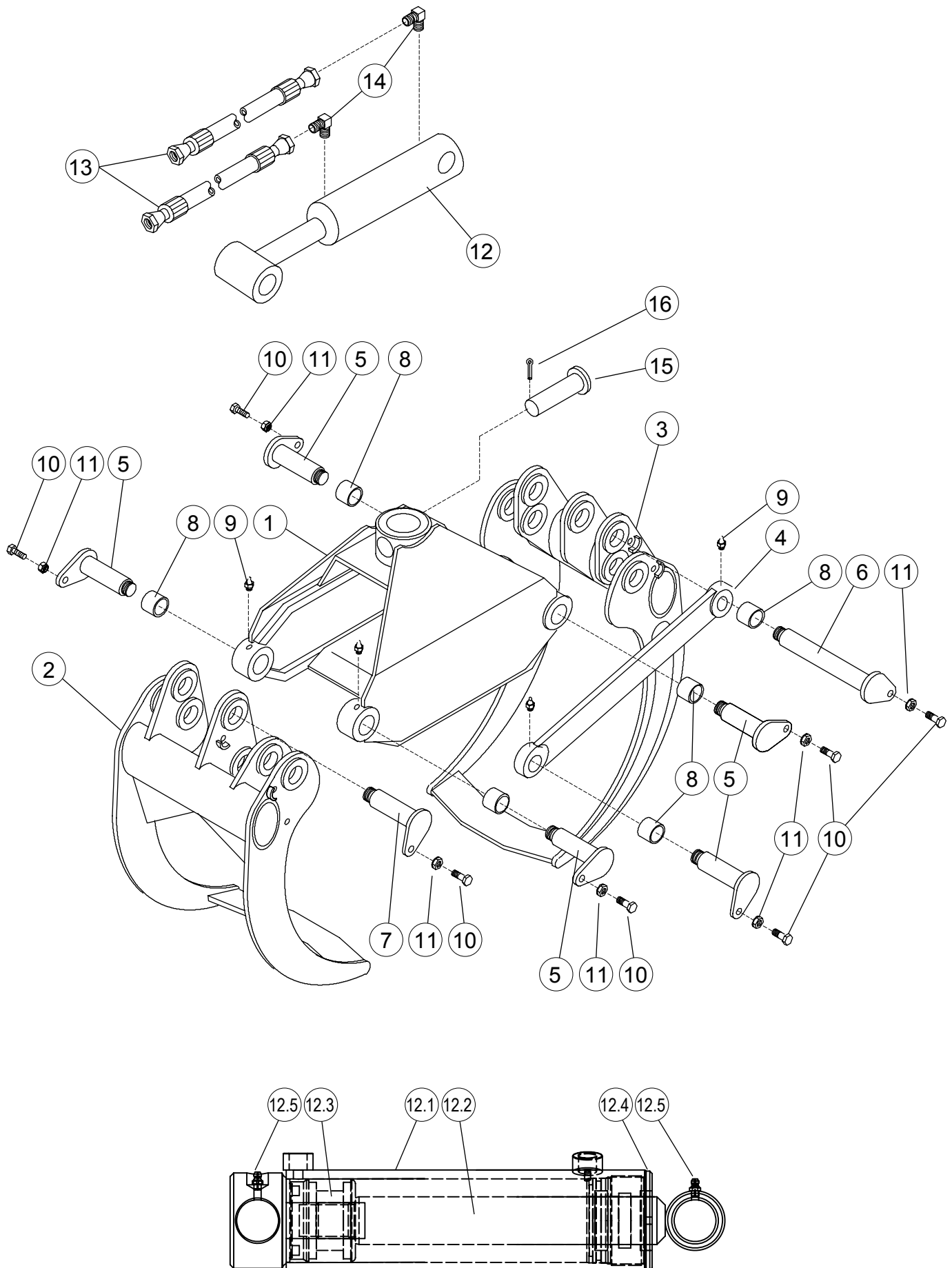
PENDANT + ROTATOR FR10



| Part | Order no | Description | Remarks | Qty |
|--------------|----------|-----------------------------|------------------|-----|
| PENDANT | | | | |
| 1 | 23391709 | Pendant | | 1 |
| 2 | 43280445 | Pin | | 1 |
| 3 | 43391713 | Pin | | 1 |
| 4 | 52115243 | Castle nut | M30 DIN937 | 1 |
| 5 | 52813151 | Split pin | 5X50 DIN94 ZN | 2 |
| 6 | 52115102 | Castle nut | M24 DIN937 8ZN | 1 |
| ROTATOR FR10 | | | | |
| 1 | | Upper cover | | 1 |
| 2 | 58112681 | Stator | | 1 |
| 3 | 58100512 | Wing | | 5 |
| 4 | 54601125 | Spring | | 10 |
| 5 | 58211624 | Lower cover | | 1 |
| 6 | 58000902 | Hose guard | | 1 |
| 7 | 58112767 | Hexagonal socket head screw | M8X20 | 4 |
| 8 | 58112715 | Hexagonal socket head screw | M8X70 | 16 |
| 9 | 52357910 | Seal kit | | 1 |
| 10 | | Cotter pin | 6X14 | 1 |
| 11 | 58112723 | Grease nipple | M8X1,25 | 1 |
| 12 | 52390556 | Usit-ring | U17,28X23,8X2,03 | 2 |
| 13 | 58112749 | Restrictor nipple | | 2 |

FARMI 4571 / FARMI 4581

23595050 GRAPPLE PTK21S



FARMI 4571 / FARMI 4581

23595050 GRAPPLE PTK21S

| Part | Order no | Description | Remarks | Qty |
|------|----------|---------------|--------------------|-----|
| 1 | 43595310 | Frame | | 1 |
| 2 | 13282058 | Inner jaw | | 1 |
| 3 | 13282090 | Outer jaw | | 1 |
| 4 | 23282023 | Lever | | 1 |
| 5 | 43281930 | Pin | | 5 |
| 6 | 43281955 | Pin | | 1 |
| 7 | 43281971 | Pin | | 1 |
| 8 | 54561287 | Slide bearing | | 6 |
| 9 | 52401015 | Grease nipple | AR1/8 | 6 |
| 10 | 52060233 | Screw | M10X30 DIN933 88ZN | 7 |
| 11 | 52117108 | Lock nut | M10 DIN985 8ZN | 7 |
| | | | | |
| 12 | 56097220 | Cylinder | 70/40-196 | 1 |
| 12.1 | 58222350 | Cylinder tube | | 1 |
| 12.2 | 58222360 | Piston rod | | 1 |
| 12.3 | 58222370 | Piston | | 1 |
| 12.4 | 58222380 | Guide | | 1 |
| 12.5 | 52401015 | Grease nipple | AR1/8 | 2 |
| 12.6 | 58222390 | Seal kit | | 1 |
| | | | | |
| 13 | 56520075 | Hose assy | S3/8"S L=0,6 m | 2 |
| 14 | 52442357 | Angle nipple | RK3/8-R3/8 UK 90o | 2 |
| 15 | 43091123 | Pin | | 1 |
| 16 | 52840311 | Cotter pin | 6X60 DIN1481 | 1 |

03462820 LEC2/6+2 ON/OFF, 60 l



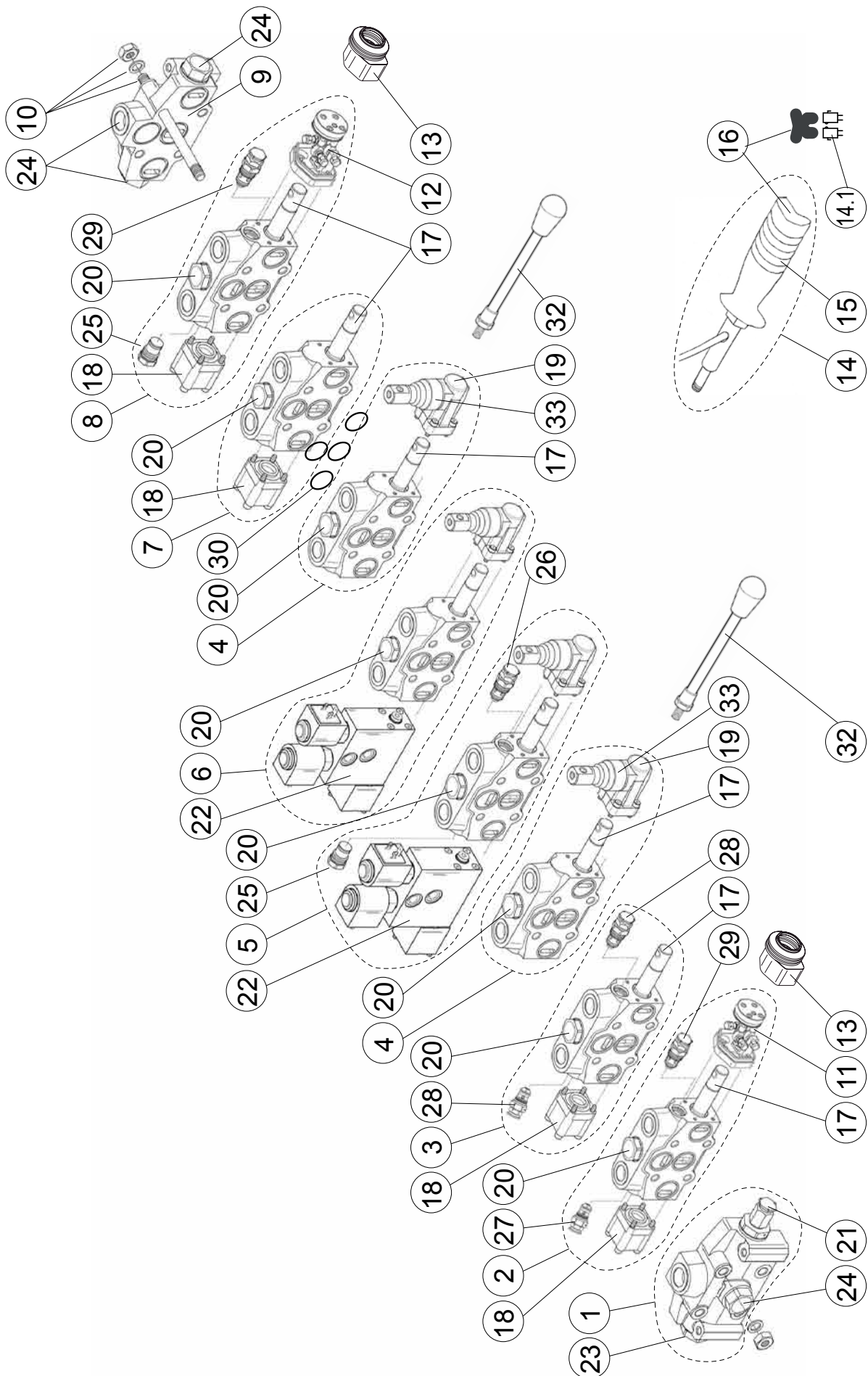
FARMI 4571 / FARMI 4581

03462820 LEC2/6+2 ON/OFF, 60 l

| Part | Order no | Description | Remarks | Qty |
|------|----------|----------------------------------|------------------------|-----|
| 1 | 58222680 | Working section | | 1 |
| 2 | 58222690 | Working section | | 1 |
| 3 | 58222700 | Working section | | 1 |
| 4 | 58222710 | Working section | | 1 |
| 5 | 58222720 | Working section | | 1 |
| 6 | 58222700 | Working section | | 1 |
| 7 | 58222730 | Working section | | 1 |
| 8 | 58222740 | Working section | | 1 |
| 9 | 58222530 | Outlet section | | 1 |
| 10 | 58222500 | Inlet section | | 1 |
| 11 | 58222490 | Tie rod kit | | 1 |
| 12 | 52301470 | Retaining ring | | 4 |
| 13 | 58222480 | Joystick control, right and left | | 1 |
| 14 | 55140910 | Protective rubber | for joystick control | 2 |
| 15 | 55150254 | Joystick | | 2 |
| 15.1 | 55131050 | Micro switch | | 2 |
| 16 | 58217795 | Protective rubber | for joystick | 2 |
| 17 | 55138500 | Tumbler switch | | 2 |
| 18 | 58222820 | Spindle | sections 4 + 5 | 2 |
| 19 | 58222830 | Spindle | sections 1+2+7+8 | 4 |
| 20 | 58222840 | Spindle | sections 3+6 | 2 |
| 21 | 58222290 | Spool return action | sections 2+3+6+7 | 4 |
| 22 | 58222450 | Spool return action, floating | sections 1+8 | 2 |
| 23 | 58222300 | Lever actuation | | 2 |
| 24 | 58222305 | Check valve kit | | 8 |
| 25 | 58222280 | Main pressure relief valve | adjustable | 1 |
| 26 | 58222600 | Electrical control | | 4 |
| 26.1 | 58222870 | Tube + nut | | 4 |
| 27 | 58222610 | Plug | | 1 |
| 28 | 58222615 | Plug | 1/2" | 1 |
| 29 | 58222620 | Plug | | 3 |
| 30 | | Antishock valve | see the separate table | 5 |
| 31 | 58222210 | Seal kit | between the sections | 9 |
| 32 | 58222230 | Seal kit for spindle | sections 1+2+3+6+7+8 | 6 |
| 33 | 58222220 | Seal kit for spindle | sections 4+5 | 2 |
| 34 | 58231670 | Protective rubber | sections 3+6 | 2 |
| 35 | 58223290 | Lever | 135 mm | 2 |
| | 55126020 | Electrics | | 1 |
| Part | Order no | Description | Remarks | Qty |
| | 58222250 | Antishock valve | 80 bar | |
| | 58222260 | Antishock valve | 160 bar | |
| | 58222240 | Antishock valve | 175 bar | |
| | 58222245 | Antishock valve | 190 bar | |
| | 58222255 | Antishock valve | 240 bar | |

FARMI 4571 / FARMI 4581

03595320 LEC 2/6+2 ON/OFF, 80 l



FARMI 4571 / FARMI 4581

03595320 LEC 2/6+2 ON/OFF, 80 l

| Part | Order no | Description | Remarks | Qty |
|------|----------|----------------------------|----------------------|-----|
| 1 | 58231400 | Inlet section | | 1 |
| 2 | 58231420 | Working section | section 1 | 1 |
| 3 | 58231410 | Working section | section 2 | 1 |
| 4 | 58231440 | Working section | sections 3+6 | 2 |
| 5 | 58231630 | Working section | section 4 | 1 |
| 6 | 58231640 | Working section | section 5 | 1 |
| 7 | 58231460 | Working section | section 7 | 1 |
| 8 | 58231450 | Working section | section 8 | 1 |
| 9 | 58231470 | Outlet section | | 1 |
| 10 | 58231480 | Tie rod kit | | 4 |
| 11 | 58231490 | Joystick control, left | | 1 |
| 12 | 58231500 | Joystick control, right | | 1 |
| 13 | 55140910 | Protective rubber | for joystick control | 2 |
| 14 | 55150254 | Joystick | | 2 |
| 14.1 | 55131050 | Micro switch | | 2 |
| 15 | 58217795 | Protective rubber | for joystick | 2 |
| 16 | 55138500 | Tumbler switch | | 2 |
| 17 | 58231590 | Spindle | sections 1-8 | 8 |
| 18 | 58231510 | Spool return action | sections 1-3, 6-8 | 6 |
| 19 | 58231520 | Lever actuation | sections 3-6 | 4 |
| 20 | 58231530 | Check valve kit | | 8 |
| 21 | 58222280 | Main pressure relief valve | 175 bar | 1 |
| 22 | 58231650 | On/off control | | 2 |
| 23 | 58222610 | Plug | | 1 |
| 24 | 58231580 | Plug | | 4 |
| 25 | 58231540 | Plug | | 2 |
| 26 | 58231550 | Antishock valve | 90 bar | 1 |
| 27 | 58222260 | Antishock valve | 160 bar | 1 |
| 28 | 58231560 | Antishock valve | 185 bar | 2 |
| 29 | 58231570 | Antishock valve | 200 bar | 2 |
| 30 | 58222790 | Seal kit | | 9 |
| 31 | 58222800 | Seal kit for spindle | | 8 |
| 32 | 58231660 | Lever | | 2 |
| 33 | 58231620 | Protective rubber | | 2 |
| | 55126020 | Electrics | | 1 |

[illegible]

WARRANTY

Farmi Forest Oy grants a 12-month warranty on all of its products, covering material and manufacturing faults. The warranty comes into effect on the product's delivery date.

The manufacturer is not liable for damages caused by:

- misuse of the product
- alterations or repairs made without the manufacturer's permission
- insufficient maintenance
- non-original parts

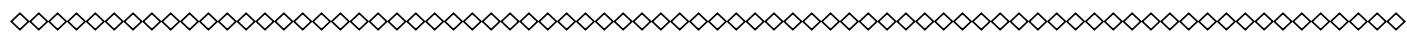
The warranty does not cover wearing parts.

Send faulty parts, carriage paid, to the manufacturer for inspection. Repairs will be conducted by Farmi Forest Oy or an authorized expert. The warranty is valid only if the bottom part of this page is filled in and returned to the manufacturer within 30 days of receipt of the product.

By returning the warranty certificate, you confirm that you have read and understood the instruction manual that came with the product.



Farmi Forest Corporation
Ahmolantie 6
FIN-74510 IISALMI
FINLAND



PRODUCT REGISTRATION FORM

Date of delivery: ____/____ 20____

Dealer:

Dealer's address:

Dealer's tel:

Product and type:

Serial number:



Return to the manufacturer

Date of delivery: ____/____ 20____

Dealer:

Dealer's address:

Dealer's tel:

Customer:

Customer's address:

Customer's tel:

E-mail:

Product and type:

Serial number:



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