

MULTIFOREST»

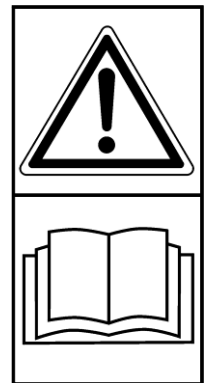
Instructions for Use and Maintenance

Tilt crane

V6700, V8300



Caution! Read instructions before use.



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USER MANUAL WARNING SYMBOLS

- DANGER!** Refers to a situation where there is imminent danger that could result in serious injury or death.
- WARNING!** Refers to a situation where there is danger that could result in injury.
- ATTENTION!** Refers to a situation where there is danger or misuse possibility that could damage property.
- NOTE!** Refers to a situation where you must remember to check or carry out maintenance or repair.

INTRODUCTION

The given user manual includes information and maintenance instructions needed to use the device in the best possible way.

Although the device user could have a lot of experience in the area, it is required to read the user and maintenance instructions carefully as they contain information that ensures efficient and safe work. Regular maintenance of the device is the best guarantee for its effective and economical functioning.

- ATTENTION!** Each user shall be aware of all safety and operations instructions and shall adhere to them.

The crane manufactured by Trejon is designed to lift timber and energy wood from the ground onto the trailer and vice versa.

1. GENERAL SAFETY INSTRUCTIONS

1.1. GENERAL

The given user manual is intended for the ONIAR device operator, maintainer, or repairer.

Guidelines help:

- . • To use the device safely.
- . • To use the device properly and profitably.
- . • To spot, avoid, and prevent any possible situations that might cause danger.

The given user manual must be kept in the truck cabin, also it must always be available when using the device.

Each user must read the given user manual before using the device and adhere to it.

The device is of proper technical level and complies with the appropriate current safety regulations.

Using the device, in addition to the user manual, both laws and regulations imposed by local workplace safety and the workplace safety inspectorate as well as by the state should be followed.

Using the device in any way other than its intended purpose or exceeding its performance indicators is not the efficient use of the device. The manufacturer/ supplier shall not be liable for any damages caused by such use.

In case any problems or issues arise that cannot or shall not be resolved by the user, please contact the dealer.

1.2. SAFETY

DANGER! Industrial accidents happen frequently in situations that are different from usual work patterns. Therefore, when operating the device, all the possible and probable situations that may arise from work patterns must be taken into account.

- . • The appliance must strictly comply with the requirements of workplace safety.
- . • The device risk zones must be known to the user; human presence in these zones is prohibited.
- . • The user is responsible for the whole risk zone of the working area while operating the device.
- . • The user must see the whole risk zone clearly. If necessary, use a signalman.
- . • Before each use, the device safety must be verified and the device must be repaired, if necessary.
- . • Before operating or using the device, it must be ensured that the device does not cause danger to other people or property.
- . • Exceeding the given performance characteristics is prohibited.
- . • The device cannot be used by ill individuals or by individuals under the influence of alcohol or drugs.
- . • All of the device safety and warning plates must be legible and intact. If necessary, they should be renewed.
- . • In case of any safety threats, the device must not be used unless the safety threats have been eliminated.
- . • If safety threats cannot be eliminated, the working process must be stopped.

1.3. MAINTENANCE

Without the manufacturer permission, it is prohibited to make changes in the design, configuration, and setup of the device. The electric and hydraulic system malfunctions shall be repaired and the supporting structures shall be welded only by certified professionals.

The manufacturer is not liable for damages caused by:

1. Unauthorized changes;
2. Use of any spare parts other than original;
3. Natural wear and tear;
4. Improper maintenance.

When maintaining the Device:

- . • When the base vehicle engine is on, moving parts cannot be touched.

- Must be ensured that the device cannot be operated during maintenance.
- Maintenance instructions must be followed and special attention to the annual safety check must be paid.
- Lubrication is subject to the instructions provided in the user manual.

Safety devices should be set up back into their place immediately after the completion of maintenance works.

The points 10-11 of the user manual provide further information on the maintenance and lubrication.

1.4. HYDRAULIC SYSTEM SAFETY INSTRUCTIONS

Using the device, it must verify that the device does not have any liquid leaks, and the appeared leaks should be removed before operating the device.

ATTENTION! Hydraulic system works shall be undertaken by trained and experienced professionals. When repairing the hydraulic system:

- The reparable area should be cleaned. Solvents cannot be used when cleaning details.
- The device must be under set during maintenance and repair works. Neither the cylinders nor the valve block can be taken off until the device is well-under set.
- The pressurized hydraulic system cannot be repaired.
- When changing the hydraulics components and the hoses, original spare parts or the ones authorized by the manufacturer must be used. In particular must be followed the compliance of the pressure classes with the work pressures.
- Oil should be stored in containers indoors. Oil should be poured from the container directly into the tank.
- Stoppers, funnels, strainers, and filling holes must be clean.

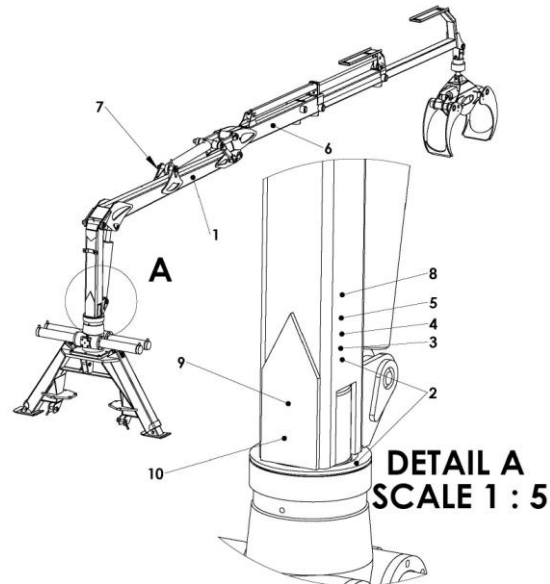
In case oil gets into the eye, rinse immediately with plenty of water and seek immediate medical attention. Oil can be removed from the skin by washing or wiping. When working with oils and lubricants, protective equipment must be used.

Bio-oil should be used in ecologically fragile areas. It is necessary to prevent the hydraulic fluid from getting into the surrounding environment. Waste oil must always be collected into containers, they must not be left in a natural environment!

2. STICKERS AND TAGS

The crane must have the following tags and stickers attached. Missing or faulty stickers should be renewed.

1. Crane name
2. Product label
3. User manual
4. Hydraulics
5. Lifting capacity
6. Risk zone
7. Lifting place
8. Prohibition
9. Power lines
10. Tensioning




1. Crane name –

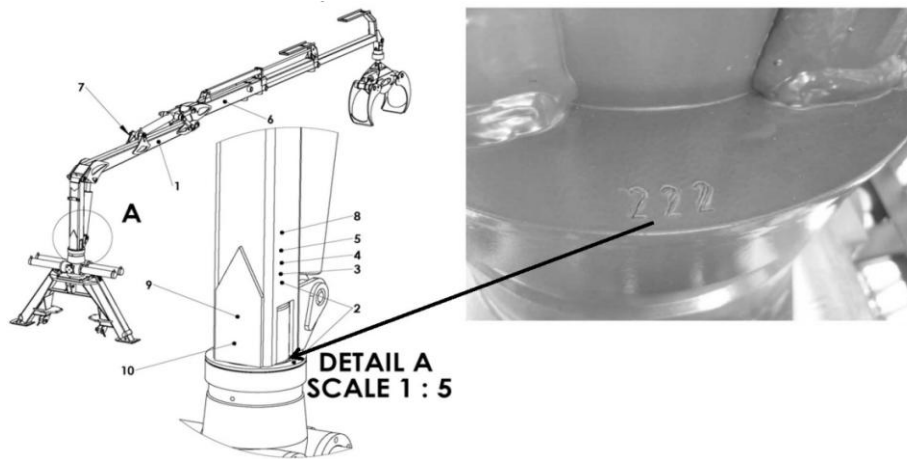
The device name given by the manufacturer or the dealer.

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2. Product label Contains information about the construction year and the serial number of the crane, which is important for future identification of the crane. It also includes data about the manufacturer and the dealer.

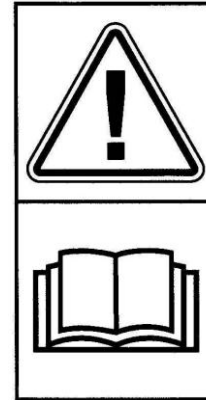
Hersteller/Producer Oniar OÜ Pargi 16, Märjamaa Estonia www.oniar.eu	Importeur/Importer:
Type:	
Serial nr: xxxxx	
Baujahr/year: 2010	

The crane's serial number is also engraved into the bottom part of the crane's king boom, in addition to the product label.



3. User manual

The sticker reminds of the requirement of reading the instructions before appliance.



4. Hydraulics

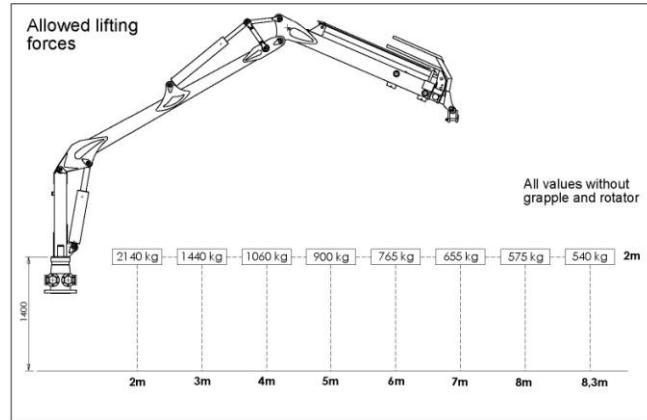
Minor damages in the hydraulic system must be eliminated immediately. The system may explode due to the damage. The pressurized hydraulic system is dangerous.



5. Lifting capacity

The crane cannot exceed the lifting capacity indicated on the sticker.

NB! In the current picture, the crane lifting capacity data are given for illustrative purposes only and may differ from the real lifting capacity of a specific crane. The real lifting capacity is reflected on the side frame



sticker and in the attachment of the user manual.

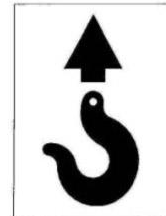
6. Risk zone

GEFAHRENBEREICH 20M

When operating the device, the crane driver must ensure that nobody is located in the distance less than 20 meters from the truck. The risk zone signs may be in different languages, depending on the dealer and the target market.

7. Lifting place

The bench marks of the lifting eye intended for lifting the crane.



8. Prohibition

It is prohibited to use the crane for lifting piece-goods or using it for purposes other than lifting timber with timber lift grip.



9. Power lines

When working in the immediate vicinity to electricity power lines, be especially careful. The sign provides the permitted safe working distance from power lines.

WARNING		
Nominal tension	Minimum distance from uninsulated wire	Minimum distance from insulated wire
U kv	m	m
U<1	2	0,5
1<U<45	3	1,5
U<110	5	

10. Tensioning

A warning to check the slewing machine and to tighten nuts regularly.

ATTENTION!

Control of the bolting Slewing.
(first time after 10hrs. operating then each 100tim.

- Loosen the lock nuts
- Tighten the screws with 10kPm
- Loosen the screws 10-20 degrees
- Tighten and lock with lock nuts.

3. LIFTING THE CRANE

Before lifting the crane, ensure that you use the lifting equipment and slings of the appropriate type in accordance with the crane weight.

Upon lifting, ensure that the equipment used functions normally; the equipment must be checked regularly.

Choosing the lifting equipment, be aware of the lifting weight and do not exceed the lifting capacity permitted by the manufacturer.

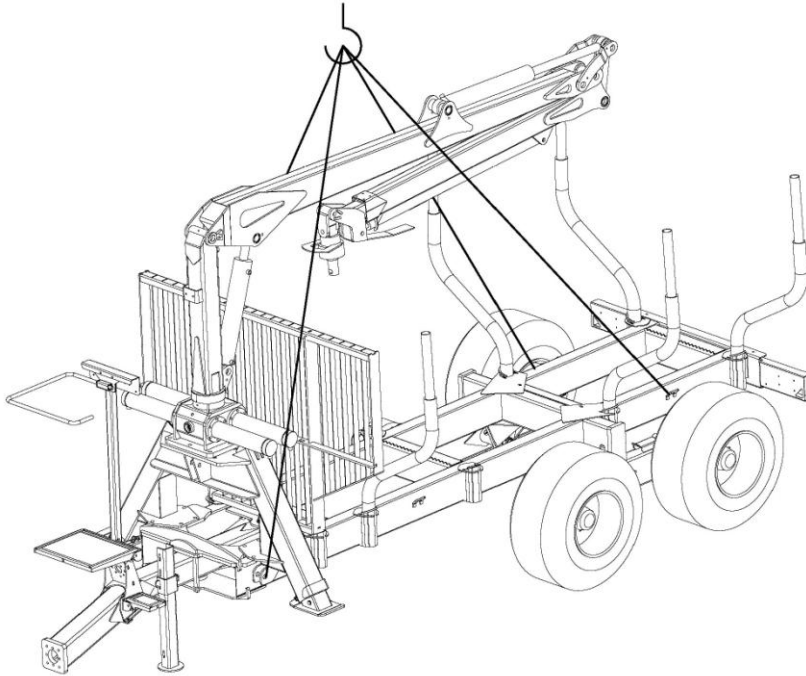
The crane should be lifted using the appropriate lifting eyes. The crane lifting eyes can only be used for lifting the crane. If the crane is attached to the trailer, the package must be lifted through the backside lifting eyes of the trailer and the three-point linkage of the support legs. See the user manual attachment for the crane and its additional equipment weights.

During the time of lifting, do not stand under the load. The tracking hoist must be chosen so that it does not cause danger.

Lifting the crane with the trailer

This section deals with lifting the crane only with the trailer produced by Trejon. The crane may be lifted only with an empty, unloaded, trailer.

The weight of the package produced by Trejon, including the trailer, is up to 3,600 kg. In order to lift the crane with the trailer, use appropriate lifting equipment and slings, which allows to lift a load of at least 4,000 kg.



When lifting the crane with the trailer, the following should be taken into account:

1. Attach slings onto the backside lifting eyes of the trailer and the three-point linkage of the support legs.
2. Ensure that the slings are securely attached.
3. Adjusting the sling length, find the point where the crane is well-balanced.

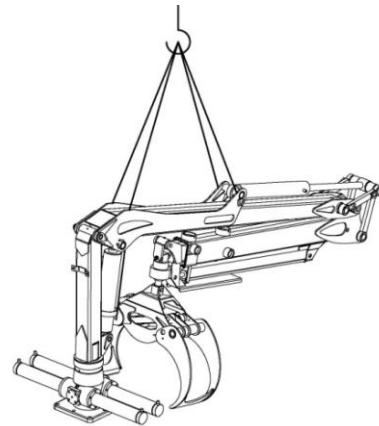
Lifting the crane

The crane weight with the package and the support legs can be up to 1,800 kg depending on the crane type and accessories. Suitable lifting equipment and slings must be able to lift at least 2,000 kg.

When lifting the crane, the following should be taken into account:

1. Attach slings to the side eyes of the crane.
2. Ensure that the slings are securely attached.
3. Adjusting the sling length, find the point where the crane is well-balanced.

Lifting the crane through the lifting eyes can proceed either with or without the support legs and the grapple. Lifting the crane through the lifting eyes with the trailer is prohibited.



4. CRANE INSTALLATION

4.1. GENERAL TERMS AND CONDITIONS

ATTENTION! Read the given user manual before installing the crane. Installation errors cause unsafe conditions when operating the crane. Neglecting the manufacturer guidelines results in dangerous situations and the warranty becomes void.

DANGER! Installing the crane involves moving heavy equipment, thus, there is increased risk of being wedged in between.

The factory produces cranes in the following possible combinations:

- Crane on support legs fitted to the trailer;
- Crane on support legs packed together;
- Individually packed crane.

Before installing the crane, ensure that the crane is compatible with the base vehicle and the trailer in terms of performance indicators. Learn about the trailer, base vehicle, and crane compatibility from the seller.

ATTENTION! Installation operations should be performed by a qualified and experienced crane professional only. Installing the crane, use the lifting equipment of the appropriate type in accordance with the crane weight.

Fitting the crane to any platform, the following must be followed:

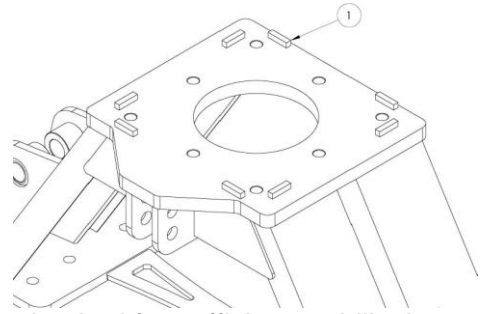
- When fitting, use bolts of class 12.9 (high strength).
- Use automatically locking nuts, such as DIN985 with nylon fixators.
- Select the bolt diameter according to the diameter of the holes in the slewing frame -D23 mm holes are compatible with the M22 bolts, and D21 mm holes, with the M20 bolts. Bolts must be long enough to ensure proper fixation of the slewing frame to the base plate. The crane slewing machine bolt diameter (either M20 or M22) is available in the spare parts list of the crane slewing machine.

Fitting the crane to any other base plate than produced by the manufacturer, the following conditions must be met:

- The base plate must be at least 30mm thick S355 steel plate.
- The base plate surface finish shall conform to Ra 12.5 finish.
- The base plate bolt holes that connect the plate to the crane must be D21 mm (for M20 bolts) or D23 mm (for M22 bolts) in diameter depending on the bolt holes of the crane slewing machine. The hole diameter

accuracy must be +/- 0.3 mm.

- The base plate external dimension must be at least 30 mm bigger than the base plate of the slewing machine fitted. Measures for appropriate plate are in attachment of current user manual.
- The base plate must have sidershifters welded to the slewing frame (12x12x30 mm steel S355, position 1 in the picture) in case re-tightening of retentions bolts has not been carried out properly and the bolts are loose.



Immediately after the installation, the base vehicle should be checked for sufficient stability in accordance with section 6.

ATTENTION! After the first working day and the test run, the retention bolts should be re-tightened.

4.2. FITTING THE CRANE TO THE THREE-POINT-LINKAGE OF TRACTOR

The crane is fitted to the tractor three-point linkage with a console. Fitting the crane to the support legs plate, follow the requirements set out in section 4.1.

ATTENTION! The three-point linkage can be used primarily for crane transportation.

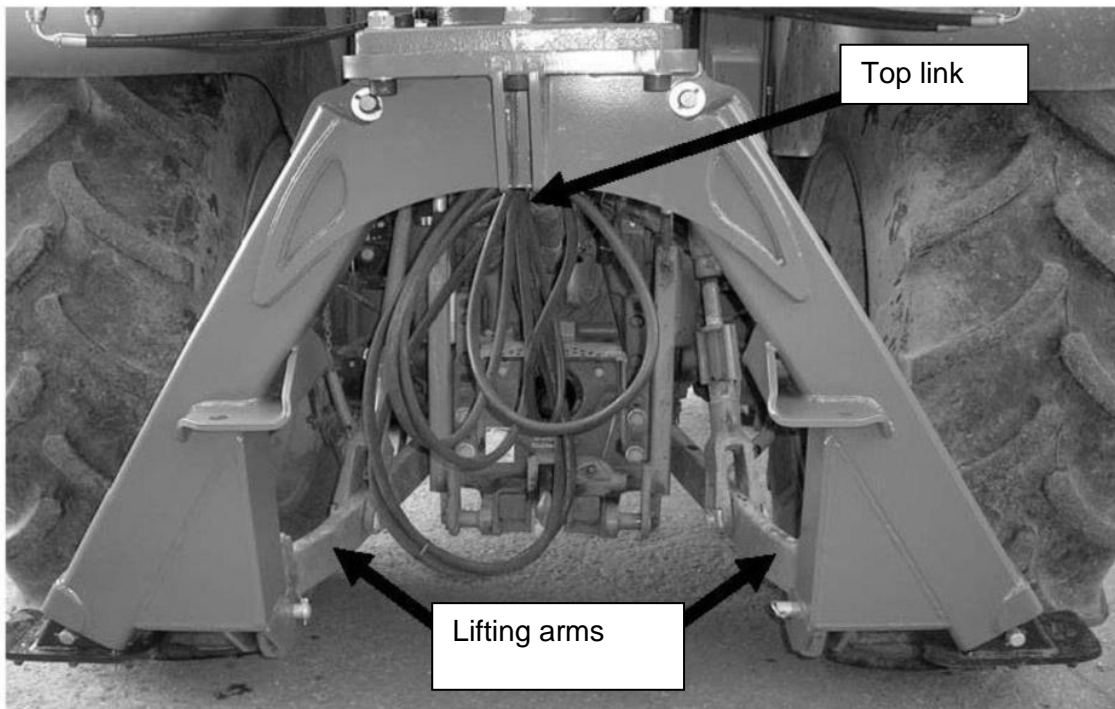
If the crane is connected to the tractor three-point linkage, it is not recommended to lift with the crane as it can cause breakage of the tractor linkage or the crane's support legs lifting ears. Prior to fitting to the tractor three-point linkage, the crane must be in a stable position on the ground supported by the legs and scantlings – on the one side, supported by the retracted supporting legs on the ground, on the other side, by the grapple against the ground.

Fitting the crane with the tractor three-point linkage, the following must be followed:

1. Using the tractor, get as close as possible to the support legs console of the crane.
2. Free the lateral stabilizers of the tractor lower link.
3. Adjust the tractor lower links, maneuvering the tractor and regulating the link height with the support legs ears.
4. Connect the tractor lower links to the lower lifting ears of the legs.
5. Shift the support legs upper eye with the help of the lifting equipment (see lifting requirements in section 3) perpendicular to the fixation point of the upper link. Attach the upper link onto the support legs console. Adjust the length of the upper link to as short as possible -this ensures the

minimum loading capacity of the upper link.

6. Fix the linkage to the support legs with fingers and lock with retaining rings. Lock the lower link lateral movement and fix the upper link.



For crane transportation, the crane boom support must be installed onto the front of the tractor.

The boom support installation user manual is given by the boom support manufacturer.

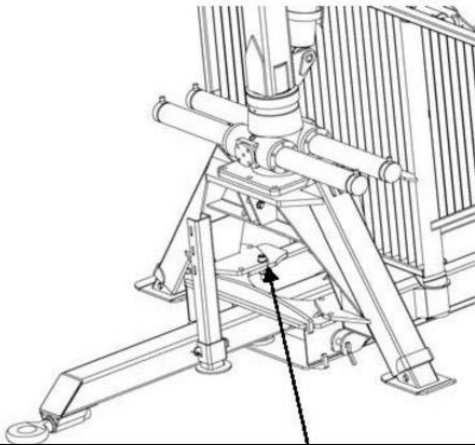


4.3. FITTING THE CRANE TO THE TRAILER

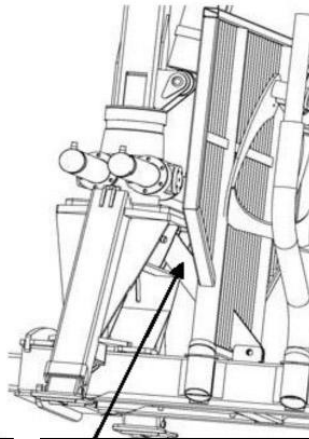
This section deals with the crane fitting to the Multiforest trailer only. Fitting the crane to any other trailer, ensure that the trailer and the crane are compatible.

The crane is fitted to the trailer with a support leg console. The crane must be attached to the support legs in accordance with the requirements listed in section 4.1. Installing the crane and the support legs, the following must be taken into account:

1. Lower the trailer drawbar onto a solid surface.
2. Lift the crane with the support legs onto the trailer (see lifting instructions in section 3).
3. Attach the legs to the trailer with 12.9 bolts (torque 350Nm). Bolt diameter is M22 or M20 according to the model of the trailer and the support legs (see the spare parts list for bolt specification).
4. Ensure legs console support with diagonal bar (only in case of telescope support legs). Without the diagonal bar, the crane use is prohibited.

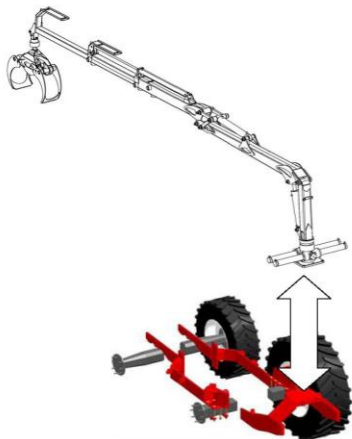


Attach the legs to the trailer with 8 bolts M22x100 DIN912 -12.9. Use washer DIN6919 M22 HOT HV300 and nut M22 Nyloc DIN985.



When mounting the telescopic outriggers use diagonal brace included in the kit.

4.4. FITTING THE CRANE TO THE TRACTOR FRAME



Fitting the crane to the base frame of the tractor, follow the conditions in section 4.1. It is advisable to use the support legs working with the crane. The front of the tractor must be provided with the boom support of the crane.

The valve block attached to the tractor frame must enable the floating position of the lifting, folding, and turning sections. Ask the crane dealer for appropriate additional equipment. Each tractor type has a different type of tractor frame fittings, boom supports, and support legs. Ask the tractor or crane dealer for appropriate tractor equipment. The installation guide of support legs, boom support, and frame fixation is normally provided by the frame manufacturer.

4.5. ATTACHING THE VALVE BLOCK TO THE CRANE

Multiforest delivers cranes along with valve blocks. The factory system tests the valve blocks and fills them with MG46 hydraulic oil. Cranes are tested and digitally weighed according to the lifting capacity indicators shown in the table.

ATTENTION! The crane valve block can be installed and adjusted by authorized persons only.

DANGER! The hoses reaching the cab-mounted valve block must be oil-resistant so that if the hose breaks, the user stays clean.

Connecting the valve block electrical components, monitor the permitted cable tension. Permitted distribution voltage is 12 V.

The valve block electricity flow should be taken as close to the base vehicle battery as possible.

The factory supplies the crane with the cable, the junctions of which are labeled. The cable length can be different for different tractors; therefore, all the cranes are provided with identical cables. If a standard cable length is not suitable, the cable should be replaced.

WARNING! Cable extension is prohibited.

After the valve block installation or its regulation by an authorized person, the crane must always be tested with a weight in accordance with the performance indicators provided in the table.

ATTENTION! Exceeding the crane lifting capacity is prohibited.

After the installation or regulation of the valve block, it must be sealed to prevent the valve block valve adjustment by unauthorized persons. To seal, rubber seal can be used, which is engraved with the identification mark after heating that cannot be forged.

In the case of seal breach by a third person, the warranty becomes void.

The valve block must be securely fixed to prevent any movement on rough terrain.

The valve block pressures can be found in the attachment of the given user manual.

4.6. INSTALLATION CHECK

Each crane installation package shall be checked before operating. The crane installation verification protocol is provided in attachment of user manual.

Checks must be carried out by a professional familiar with the crane design and functions

5. CONNECTING THE HYDRAULIC SYSTEM

Before connecting the hydraulic system, the crane must be installed and fixed in accordance with section 4.

Before connecting the crane and tractor hydraulics, check the compatibility of oils. The factory has filled the hydraulics with the MG46 oil, which meets the API SE, CD, and API GL-4 requirements.

The tractor user manual provides information about the hydraulics pressure and the reflux.

ATTENTION! Connecting the hydraulics, the following should be noted:

1. During the connection, the tractor engine should not be working.
2. The connectors' junctions must be clean so that dirt cannot be drawn into the system. Solvents should not be used to clean components.
3. Connect the drawbar turning cylinder hoses with the valve block section of the tractor.
4. The brake hose should be connected to the tractor brake system. If the tractor has no brake section extract, it may also be connected to the hydraulics. In this case, the brake section pressure must always be connected to the free stream before driving to prevent brake lock.
5. Connect the support legs' hoses with the crane or tractor valve block. Connect each support leg to the various sections.
6. All junctions must be properly locked
7. The pressure and return flow must be connected properly. The pressure in the valve block return flow channel causes breakage of the valve block.
8. The hydraulics pipeline emerging from the tractor must not exceed the permitted technical data values of the hydraulic oil pressure and oil flow nominal rate.
9. Ensure that the return flow pipeline has free return flow (maximum pressure of 2 bars).

It is advisable to connect the valve block's pressure hose (P) to the output of the hydraulics system and the return hose to the return filter through the tank. The filter nominal flow rate is 80 l/min and the filter density, 25 im abs.

6. STANDING STABILITY TEST

Information on your tractor performance indicators compatibility with trailer and crane is available from your device dealer.

Standing stability test is necessary to ensure that the trailer, crane and the base vehicle are compatible as well as that it is safe to work with the crane, taken into account its performance indicators. Standing stability test should be conducted by qualified and experienced professionals.

The base vehicle, crane and trailer complex is stable when lifting the maximum plus 10% of the maximum allowed lifting capacity, it does not result in more than one support point of the trailer raising above the ground. Lateral stability is improved by increasing ledge width and/ or adding rear axle weight, for example, wheel weight.

Example:

The base vehicle's normal condition during the test is without load, with the incline of 5° in the fall direction. The substrate must be capable of bearing the weight of wheels or other bigger loads coming from different support section.

The test is performed with the maximum operating range, with 10% overload. The test is performed under normal conditions, however, paying special attention. The 5° incline of the base vehicle can be reached by adding a lifting component to one of the rear wheels, which height is calculated as follows:

h = lifting component required height

z = width of the base vehicle from the tire centre to the middle.

$h = 0,087 \times z$

Example:

$z = 120 \text{ cm}$

$h = 0,087 \times 120 \text{ cm} = 15 \text{ cm}$

The given formulas and calculation examples in the given user manual are based on the SFS 4677 standard.

7. OPERATING THE CARE

7.1. GENERAL TERMS AND CONDITIONS

The user:

- The user must be at least 18 years old and have corresponding training to operate.
- Before operating the device, terms of use and the device functions must be thoroughly studied. The device should not be used until the user manual has been read, so that in emergency situations, proper action can be taken.
- One must become familiar with the device, its installations, the related constraints, and various effective working techniques.
- Before using the device, the user must study the functions of the features.

Risk zone:

- The crane risk zone is 20 meters. The user must always see the risk zone clearly and when working, ensure that there are no unauthorized persons or obstacles in the way. If necessary, prevent unauthorized access to the risk zone.
- It is prohibited to walk or stand in the immediate vicinity of the working device.

DANGER! Staying under suspended load is strictly prohibited.

Assigned use:

- The crane is intended for timber and energy wood lifting.

DANGER! The crane should not be used for carrying people or living creatures.

- It also prohibited to use the crane for carrying, winching or towing.

Crane use:

ATTENTION! The device controls must be handled with care, especially in cold conditions.

Movements to utmost positions should not proceed at full speed.

ATTENTION! Operating the device, avoid shock loads.

- When lifting, take slow lifting jib pressing into account.
- Be especially careful lifting heavy loads and turning the crane.
- It is prohibited to use a defective device or the device unprepared for operation.
- Operating the device, ensure that:
 - The fitted warning and safety devices shall not be removed or altered, they shall be used properly.
 - Regular safety checks and related tests shall be run on the device.

Operating temperature:

- The crane minimum recommended operating temperature is -25 °C.
- In case of low temperatures, the higher user risk of the hydraulic system seals, hoses, and steel construction must be taken into account.

ATTENTION! If work is started in colder conditions, oil must circulate freely through the valve block for a few minutes.

- The hydraulic oil maximum temperature is +75 °C.

It must be noted that the manufacturer is not liable for damages caused by:

- Faulty use, negligence, or misuse.
- User errors proceed from faulty use caused by untrained professionals.

DANGER Never leave the lifting jib in the upright position unsupervised!

When departing, ensure that accidental or unauthorized use of the device is impossible. When parking, ensure support.

7.2. TEST RUN CHECK

Operating the crane for the first time, learn about the device and complete a test run. Before the crane test run, familiarize yourself with the functions and general use of the device.

Before the test run, ensure to do the following:

- Read section 4 regarding the installation check. The crane should not be used unless the installation check has been done.
- Check the trailer and the base vehicle hydraulics for quantity of hydraulic oil.
- Learn the functions to move the cylinders.
- Check that the hoses can move freely. Remove possible transportation struts and connections.
- Check that the pins, fingers, cotter pins, bolts, and nuts are fixed and in place.
- Ensure that no unauthorized persons and obstacles are in the crane risk zone.

- Check that the crane test run area is flat and firm.
- Check that the valve block joysticks move freely back into the middle position.
- The pressure hose must be connected (P) to the tractor pressurized side and the return flow hose (T), to the tractor return flow channel.

The crane hydraulics should not be turned on unless the crane hydraulic hoses are connected and fixed to the hydraulics of the base vehicle in accordance with section 5.

ATTENTION! The pressure must not circulate in the valve block return flow pipe (T)! The valve block breaks when the pressure circulates in the flow pipe.

7.3. TEST RUN

Prior to the crane test run, its hydraulic system should be connected and fixed with the hydraulic system of the base vehicle. The trailer support legs must be in the upmost position, and the valve block joysticks, in the middle position.

Before the test run, ensure that the following has been accomplished:

1. Apply the tractor parking brake.
2. Adjust the tractor engine speed to as low as possible so that the speed of the crane would be small.
3. Open the flow to the crane. Let oil circulate through the valve block for a shorter period of time.
4. Lower the support legs.

ATTENTION! If there is air in the cylinders, be very attentive! Remove the entrapped air from the cylinders with caution! If the cylinder goes into the upmost position with full force, the air pressure crashes the cylinder seals.

5. Move the cylinders separately with caution from one utmost position into another until the movements become smooth. Moving the cylinders for the first time, there might be specific hubbub in the cylinders -this is caused by the air in the cylinder, which comes out after a couple of movements into the upmost position.
6. Test different crane cylinder movements by moving them one at a time from one upmost position to another -get used to the movement of the crane and find risk zones where the crane may bump into the base vehicle and trailer.
7. After the test run, check and repair the leak connection points, if necessary.
8. Check and tighten the retention bolts, if necessary (in particular, monitor the crane turning cylinder bolts and the bolts that connect the slewing frame to the crane base).
9. Check the hydraulic oil and add more, if necessary.

7.4. CRANE TRANSPORT POSITION

Moving further with the crane, in the case of an empty trailer, the grapple must be attached to the trailer. If there is load in the trailer, booms should support the load. Underway, current traffic legislation must be followed.



position so that the cylinder can move freely. The floating position function is the valve block's feature, and the dealer provides further information about it.

ATTENTION! Without the floating position function, it is prohibited to transport the crane supported on the front of the tractor.

7.5. OPERATING THE CRANE

ATTENTION! If an accident happens and the device turns out defective, the working process must be stopped immediately. Work can be resumed only after repair works.

- Ensure that when operating the crane, there are no people in the risk zone and that the risk zone is clearly visible -the risk zone is 20 meters.
- Operating the trailer, the base vehicle as well as the trailer must be located on solid ground and have a stable position.

ATTENTION! While operating the crane, it is obligatory to use the support legs. The legs are intended to support the trailer and crane additionally during loading and not raising the trailer and load above the ground.

ATTENTION! While loading, the base vehicles parking brakes must always be used. The trailer hub brakes or the hydro brakes are designed as driving brakes and are not intended to be used as parking brakes.

- Operating the device, ensure low engine turns to avoid sudden movements.
- Move the empty crane through all crane routes and pay attention to the positions, in which the lifting jib may bump into barriers.
- Operating the device, check all the movements at low engine turns. Gaining experience, it is possible to increase the tractor engine speed, speeding up the crane velocity.

- Also, it is important that when operating the device for the first time, lighter loads are chosen – gaining experience, it is possible to lift heavier loads.
- The joystick base cannot be moved quickly or not in a smooth way.
- Operating the crane, ensure that the use of multiple functions allows the crane to move softly, with exact movements.

ATTENTION! Timber cannot be lifted if the boom extension is straightened. Using the boom extension, draw timber closer and lift as close as possible.

- If the lifting jib goes down in case of overload, the load should be shifted by the fold arm closer to the king boom, without opening the grapple.
- Working in extreme conditions, avoid extreme loads.
- Working on slopes, avoid overload and be especially careful. Loading on slopes, keep in mind that rotating, the load may not stay on top, but the valve block valves may be overloaded and the load may fall down and cause a rollover risk.
- Even in the case of leg support, there is always a risk of rollover – monitor stability. If the crane is attached to the trailer, the device has a higher risk of rollover than compared to the empty trailer.

WARNING! The lifting jib must never be turned to extreme positions! WARNING! Different materials may weigh differently, having similar appearance.

DANGER! When working near electrical wires, be careful. Keep the safety distance.

WARNING		
Nominal tension	Minimum distance from uninsulated wire	Minimum distance from insulated wire
U kv	m	m
U<1	2	0,5
1<U<45	3	1,5
U<110	5	

7.6. EMERGENCY

If case of rollover risk upon lifting, lower the load with lifting and the fold arm cylinder respectively onto the ground. Do not allow the grapple and material to fall.

If the device is about to roll over, keep your hands firmly fixed on the wheel and stay in the cabin – the cab operator is best protected in the cabin. Do not try to exit the cabin.

Should the device be in connection with a power line, act as follows:

- In case of being outside the device, it is forbidden to touch its parts.
- Being in the base vehicle, you should jump out. Jump keeping your feet together, leaping at least 20 meters away.
- You should immediately call for help and ensure that no one enters the risk zone (20 m).

8. CRANE REMOVAL

Upon removal of the crane, the surface hardness and evenness under the trailer and the base vehicle must be checked.

ATTENTION! Before disconnecting the junctions of the crane from the base vehicle, the base truck pump should always be shut down.

WARNING! Removing the crane from the base vehicle, there should be no unauthorized persons in the storage area or its immediate vicinity, equally important, there should be no threat to others.

Special attention should be paid to the hydraulic valve block storage area, so that it would be inaccessible to any third party, such as children.

Removing the crane from the base vehicle:

1. Adjust the legs to the desired height.
2. Support the crane with the grapple against the ground, the grapple must be supported with additional side support.
3. The crane should be lowered with a lifting device.
4. Prevent the crane from moving sideways.
5. Relieve the crane from the base truck and the trailer.
6. Disconnect and protect the junctions of the operating valve.

9. CRANE STORAGE

For the long-term sustainable use of the crane, the following must be followed when storing it:

- Damaged paint surfaces should be cleaned and, if necessary, re-painted.
- The crane should be lubricated carefully (see the user manual sections 1415)
- Pressure should be removed from the cylinders.
- The visible parts of the cylinder and control valve spindles must be protected with lubricants.
- The crane must be stored indoors or under shelter.

When operating the crane again after storage period, the protection grease from cylinder plunger rods and the spindles of valve block must be removed.

10. MAINTENANCE

The crane must be maintained regularly in order to ensure its safe and smooth functioning.

- Appropriate tools must be used for maintenance and repair works.
- Dismantled parts and repaired parts must be well-protected.
- Kerosene should be used for washing parts, but not fuel oil under any circumstances.
- The valve block regulation and repair must be done at the service shop.

The crane maintenance scheme is shown in the table below; the crane lubrication points, in attachment of user manual.

Regular crane maintenance checks must be carried out at least once a year. The protocol is annexed to the user manual. The inspection must be completed in accordance with the instructions and the protocol archived.

REPAIRED PLACE	OPERATION		
	Maintenance in working hours		
	10h or after the shift	50h after the working week	100h
1. General	Cylinder and hose leak check.	Finger and lock check. Bolt tightening check.	Visual check of bearing constructions. Bolt tightening check.
2. Slewing machine	Slider bearing lubrication. Rack bar lubrication.	First oil change. Oil level check.	Bolt tightening. Rack bar bolt adjustment.
3. Booms	Slider bearing lubrication. Telescope side, upper, and lower surface lubrication.		Slider bearing check and side backlash check, if necessary.
4. Cylinders	Slider bearing lubrication.		Hydro cylinder bearing check.
5. Grapple	Slider bearing lubrication.		Rack bar fitting to the rotator check,
6. Support legs, base	Slider bearing lubrication.		Hydro cylinder bearing check.

Slewing machine:

- The slewing machine is lubricated in accordance with the greasing instructions.
- In addition to the above mentioned, a complete oil change in the slewing frame must be carried out once in two years.

Replacement of bearings:

- When installing sleeve bearings, a proper installation tower must be used.
- Grease lubrication should feed the greasing nipple.
- The greasing pockets in the bearings must be filled with grease.

Different bolt torques are as follows:

- M8 23Nm
- M10 48 Nm
- M12 83 Nm
- M16 200 Nm
- M18 250Nm
- M20 320 Nm

In case of any failure, the faulty location should be identified before repair works. Electric and hydraulic system malfunctions may be eliminated and the bearing structures welded by authorized professionals only.

In case of hydraulic system leakage, follow section 1.4 of the user manual.

Welding is permitted only in agreement with the manufacturer. If it is necessary to make a change or repair welding, the following must be taken into account:

- The welder must be qualified, the welding quality class 3, with no welding flaws allowed.
- The place to be welded should be free from paint and oil.
- The grounding wire must be securely attached to part of the welding, joints should not be in between.
- OK 48.00 or equivalent is the suitable welding electrode. The electrodes must be dry.

DANGER! Amateur repair welding can cause construction breakage.

11. OILS AND LUBRICANTS

ATTENTION! The smooth functioning of the device is a result of the proper use of lubricants and hydraulic oils.

- The crane should be lubricated in accordance with section 10 of the maintenance scheme.
- Always use the oil and lubricants recommended by the manufacturer.
- In cold weather conditions, use appropriate oils and lubricants.
- Different liquids or oils should not be mixed.

11.1. OIL CHANGE

Oil should be changed in accordance with basic vehicle maintenance recommendations.

Crane cylinders are factory-filled using the MG46 oil.

If the oil temperature does not rise above 70 °C in summer, winter oil can be used all year round. During oil change, the compatibility of various oils as well as the remaining quantity of oil must be taken into account.

11.2. OIL REQUIREMENTS

Pour point must be below -50 °C. Viscosity should not drop below 1.5 E°, +50 °C in displacement piston pumps and below 2.5 E°, +50 °C in gear pumps.

Hydraulic oil must include the necessary ingredients to improve the lubricity as well as to prevent corrosion and foaming.

11.3 TABLE OF APPROVED OILS AND LUBRICANTS

The table below shows recommended oils and lubricants produced by different companies.

OIL BRAND	HYDRAULIC SYSTEM		GREASE
	SUMMER	WINTER	
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	DTE16	DTE 15,13	MOBILUX EP 2. MOBILUX EP 2 MOBIL GREASE MP, SPECIAL
SHELL	TELLUS OIL 746	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

Use the 80W/90 reducer oil (volume 3 liters) for the slewing machine.

WARRANTY TERMS AND CONDITIONS

Warranty- /assignment cartificate

- Warranty terms** - Valid between retailer (Trejon AB dealer) and machine purchaser.
- General about warranty - In order to obtain valid warranty terms set forth below, and the specific warranty terms set by each provider. These are attached to the user manual for each machine, as appropriate.
- Validity of warranty - The warranty is 12 months from date of purchase when used for personal use.
In some cases, the guarantee can be limited by running time.
- The warranty covers - Damaged parts, which have broken down because of defective production operations of materials in course of normal use of the machine.
- Only the labor cost for replacement of defective warranted part.
- The warranty does not cover - Transport costs applicable to the machine or the parts.
- Travel costs.
- Any resulting costs incurred as a result of damage to the machine.
- If the machine has been modified by the owner.
- Damage due to normal wear and tear of the machine – Not related to manufacturing defects, poor service, user inexperience or use of spare parts that are not original.
- Excessive or inappropriate use of the machine.
- The warranty is not applicable to parts which are subject to wear, for example hoses, sealing, oil, belts, batteries, chains, knives etc.
- The warranty period for replaced parts during the warranty period expires with the machine's warranty.
- Normal adjustments, maintenance or supervision
- Warranty procedures - Contact place of purchase as soon as any damage or malfunction is detected.
Do not use the machine if the damage can be worse.
- Warranty repairs must be performed by Trejon AB approved workshop.

ATTENTION!

The guarantee shall enter into force provided that the machine WARRANTY/ ASSIGNMENT CERTIFICATE has been fully completed and signed by both parties (seller, buyer), and a copy sent in to Trejon AB no later than 14 days from date of sale (the seller is responsible for this happening).

Assignment certificate:

Machine Buyer shall confirm with his signature that he had received manual containing operating instructions, and received information about the operating, security and maintenance requirements described in this and made the final inspection of the machine.

PLEASE FILL IN!



Product: _____ Serialno. _____

Salesman: _____ Company: _____

Signature of salesman: _____ Date of purchase: _____

Name of buyer: _____ Telephone: _____

Address: _____ Zipcode: _____

City: _____ Country: _____

Date: _____ Signature of buyer: _____

CE-Certificate of Conformity

Oniar LLC -Pargi 16, Märjamaa, Estonia

declares that the marketed device,

timber crane (mark) (serial number)

complies with the following directives: EU Machinery Directive 98/37/EU, EMC Directive 89/366/EU, and related amendments.

The device design complies with the following standards: EN292-2, EN294, EN982, EN60204 – 1.

Rebuilding the device, the person in charge must ensure that the conversion is carried out in accordance with the above mentioned directives. After rebuilding, the person in charge must provide the product CE marking.

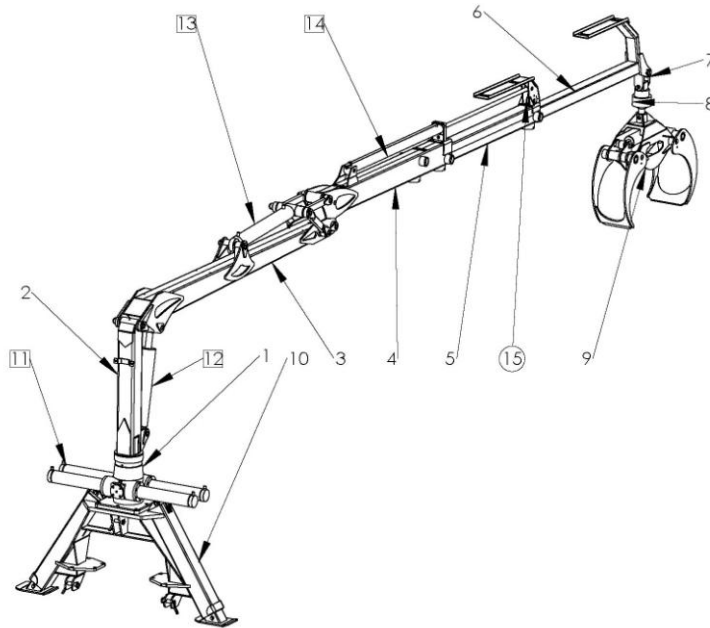
Märjamaa, June 29th, 2010



Mr Rein Loel Chairman of the Board of Oniar LLC

Attachment 1. Crane structure

1. Slewing machine
2. King boom
3. Main boom
4. Fold boom
5. Telescope 1
6. Telescope 2 (only 8,3 m)
7. Link
8. Rotator
9. Grapple
10. Support legs
11. Slewing cylinder
12. Lifting cylinder
13. Folding cylinder
14. Telescope cylinder
15. Chain (only 8,3 m)



The king boom (2) is attached to the crane slewing machine (1) with a bearing, being moved by the rack bars. The rack bars are moved by the slewing cylinders (11).

The main boom (3) attached to the king boom with the bearing is moved by the double acting hydro cylinder (12).

The double acting hydro cylinder (13) is attached to the main boom with the help of the folding boom (4) wide angle.

Telescope 1 (5) and telescope 2 (6) move in a synchronized way. They are moved by the cylinder (14). The crane chain (15) synchronizes movements. Telescope 2 is present only for 8,3 meter crane.

Telescope 1 and telescope 2 are supported by slider tiles on four sides.

The rotator (8) moves the grapple (9), which has one double acting hydro cylinder.

Support leg structure (10) has 2 support legs that can be lowered with the help of the double acting cylinder.

All the crane cylinders are controlled by the 8 section valve block. The valve blocks can be controlled mechanically, hydraulically, or electronically.

Attachment 2. Installation and test run check

CRANE TYPE				
SERIAL NUMBER				
PRODUCTION YEAR				
INSTALLATION TYPE				
CHECKED PLACE	NOTES	K	R	D
1. Before test run				
check the base vehicle settings, loading and control settings as well as protection				
follow table of minimum distances to power lines				
check sizes and locks of crane fingers				
hydraulic hoses properly connected to the tractor				
junctions securely locked				
valve block spindles move freely				
oil level of tractor hydraulics enough				
valve block and valve block base is fixed				
hoses are protected in the cab				
crane bolts tightened, see installation instructions				
2. Test run				
test run with permitted lifting capacity, see lifting capacity table				
letting air out of cylinders				
crane behaviour in case of different lifting jib positions				
standing stability adjustment				
Hoses and junction attrition				
3. After test run				
oil level check, cylinders forced inwards				
oil leaks, tightening connection points, if necessary				
fastening bolts retensioning				

K = in order R = needs repair D = defective

Attachment 3. Annual maintenance

Ensure that there are copies of annual checks and that the filled blanks are available during the check.

CHECKED PLACE	ANNUAL CHECK			
	K	R	D	NOTES
MAIN BOOM CLEANINESS				
MAIN BOOM WELDS				
FOLD BOOM WELDS				
KING BOOM WELDS				
ROTATOR FIXATION				
LIFTING EYE CONDITION				
SLEWING MACHINE RACK BAR BACKLASH				
KING BOOM BEARING CONDITION				
MAIN BOOM BEARING CONDITION				
FOLD BOOM BEARING CONDITION				
WIDE ANGLE FINGER CONDITION				
WIDE ANGLE FINGER LOCKS				
VALVE BLOCK JOYSTICK CONDITION				
CYLINDER CONDITION				
CYLINDER SEAL CONDITION				
CYLINDER PLUNGER RODS CONDITION				
HYDRAULIC HOSE CONDITION				
HYDRAULIC JUNCTION CONDITION				
CRANE FASTENING BOLT TIGHTENING				
CONDITION OF USER MANUAL				
CONDITION OF SAFE DISTANCES TABLE				
CAPACITY SIGN CONDITION				
DEVICE DATA SIGN CONDITION				
CRANE INSTALLATION CHECK DONE				
VALVE BLOCK CONDITION				
FRAME CONDITION AFTER LIFTING OF MAXIMUM ALLOWED WEIGHT				
HYDRAULIC EXTENSION BOOM				
EXTENSION BOOM WELDS				
SLIDER TILE CONDITION, BACKLASH MAX. 8 mm				

K = in order R = needs repair D = defective

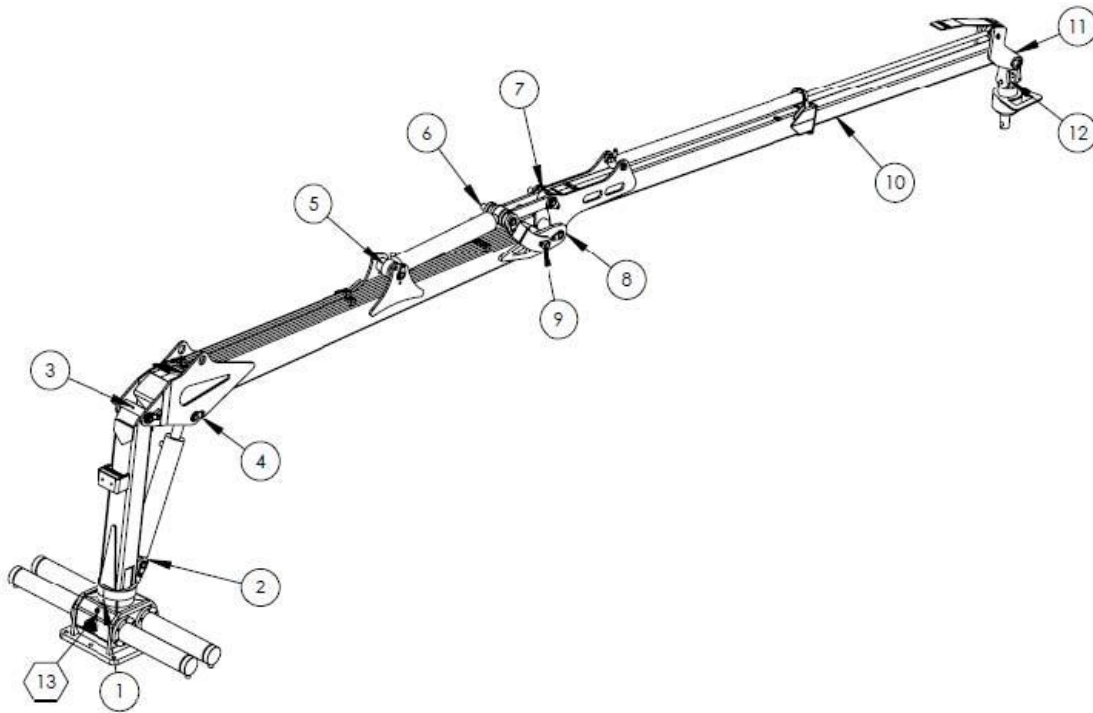
Examiner: _____

Time, location and signature: _____

Attachment 4. Failure scheme

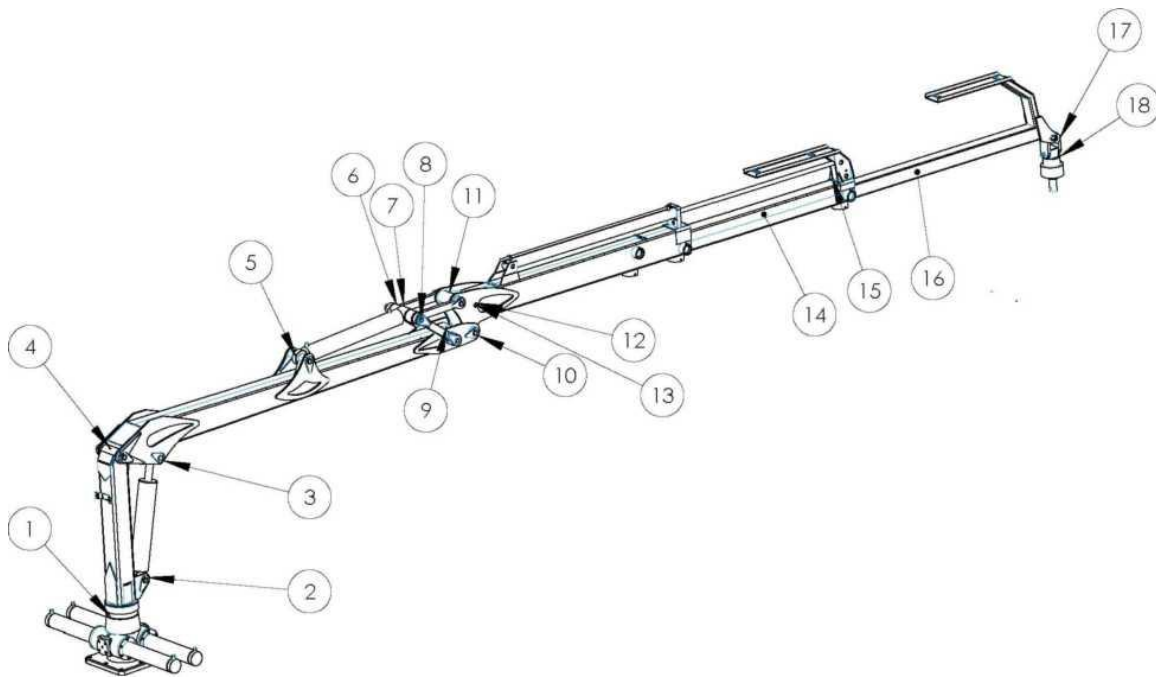
FAILURE	FAILURE CAUSE	DIRECTIONS FOR ELIMINATION
CRANE MOVEMENTS ARE SLOW	PUMP RUNS TOO SLOWLY	CHECK PUMP TURNS
	PUMP IS DEFECTIVE	ADD OIL (REMOVE AIR)
		REPAIR OR REPLACE PUMP
	OIL PIPE LEAKS OR CONTRACTIONS	CHECK OIL PIPE
	OIL TOO THICK	USE MORE LIQUID (APPROPRIATE) OIL TYPE
CRANE LOWERING MOVEMENTS ARE SLOW	OIL PIPE CONTRACTIONS	CHECK PIPE IN TERMS OF CONTRACTIONS
	PLUGGED (RETURN FLOW) FILTER	CLEAN OR REPLACE FILTER
	OIL TOO THICK	USE MORE LIQUID (APPROPRIATE) OIL TYPE
CRANE MOVEMENTS ARE TOO FAST	TOO MANY TURNS OR PUMP TOO BIG	CHOOSE APPROPRIATE TURNS OR PUMP
	WRONG WORK PATTERN	LEARN TO OPEN VALVES CORRECTLY
CRANE MOVEMENTS ARE WEAK	TOO LITTLE OIL	ADD OIL (REMOVE AIR)
	PUMP IS DEFECTIVE	REPAIR OR REPLACE PUMP
	MAIN VALVE OR PROTECTION VALVES ARE DEFECTIVE	REPLACE MAIN VALVE OR PROTECTION VALVES
	VALVE BLOCK IS DEFECTIVE	REPAIR OR REPLACE VALVE BLOCK
	CYLINDERS OR SEALS DEFECTIVE	CHECK CYLINDERS AND REPLACE SEALS
CRANE MOVEMENTS ARE NOT SMOOTH	AIR IN THE HYDRAULICS	CHECK WHETHER THERE IS ENOUGH OIL (REMOVE AIR)
	TOO LITTLE OIL	CHECK WHETHER THERE ARE CONTRACTIONS OR LEAKS. ADD OIL
	PUMP IS DEFECTIVE	CHECK OT REPAIR PUMP
JIBS TURN INWARDS BY THEMSELVES	PUMP IS DEFECTIVE	REPAIR OR REPLACE VALVE BLOCK
	CYLINDERS OR HOSES ARE DEFECTIVE. MAIN VALVE IS DEFECTIVE	REPAIR LEAKS, CHECK CYLINDERS, AND REPLACE SEALS. CHECK, CLEAN, AND ADJUST
VALVE BLOCK SPINDLES ARE LOCKED	VALVE BLOCK BOLTS OVERTIGHTENED	CHECK BOLT TORQUE: 50 Nm (5 kPm)
	VALVE BLOCK IS NOT ON EVEN FITTING BASE	ENSURE THAT FITTING BASE IS EVEN
	VALVE BLOCK BOLTS OVERTIGHTENED. SPINDLE IS DEFECTIVE	CHEK TORQUE: 27,5 Nm (2,75 kPm). REPLACE NEW SECTOR WITH SPINDLE

Attachment 5A. Crane lubrication points scheme V6700



1. Slewing machine upper bushing
2. Lifting cylinder lower eye bearing
3. King boom upper bushing
4. Lifting cylinder upper eye bearing
5. Folding cylinder eye bearing
6. 3 nipples – wide angle bushings and folding cylinder eye bearing
7. Fold boom upper bushing
8. Wide angle main boom bushing
9. Fold boom lower bushing
10. Sides of telescope – 4 sides
11. Link bushing
12. Rotator upper bushing
13. Slewing machine oil filling hole

Attachment 5B. Crane lubrication points scheme V8300



1. Slewing machine upper bushing
2. Lifting cylinder lower eye bearing
3. Lifting cylinder upper eye bearing
4. King boom upper bushing
5. Folding cylinder eye bearing
- 6 – 8. 3 nipples – wide angle bushings and folding cylinder eye bearing
9. Main boom top bushing
10. Fold boom lower bushing
11. Fold boom upper bushing
12. Chain roll
13. Inner chain
14. Sides of telescope
15. Chain roll and outside chain
16. Sides of telescope 2
17. Link bushing
18. Rotator upper bushing

Attachment 6. Crane technical data

Crane V6700 technical data:

- Maximum reach 6,7 meters
- Telescopic reach 1,34 meters
- Lifting moment bruto 46 kNm
- Lifting moment neto 30 kNm
- Slewing torque bruto 14 kNm
- Slewing angle 390°
- Reccomended pump capacity 40-60 l/min
- Weight without rotator and grapple 880 kg

Valve block:

- Main valve pressure 175 bar
- Turning left/right 160 bar
- Lifting cylinder section pressure, boom up/down 175/80 bar
- Folding cylinder section pressure. boom up/down 175 bar
- Telescope section pressure, telescope in/out 175/80 bar
- Grapple open/close 175 bar
- Support legs up/down 175 bar
- Allowed voltage 12V

Crane V8300 technical data:

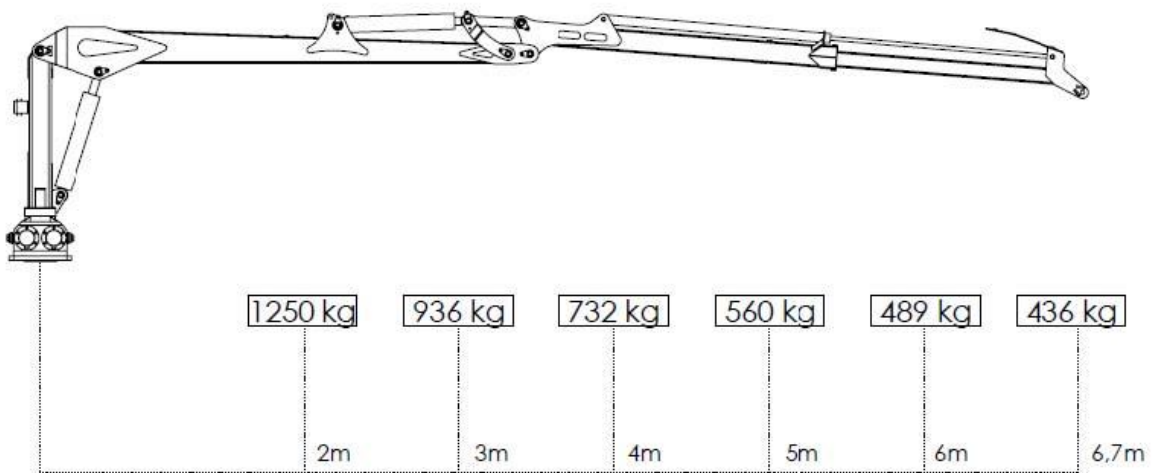
- Maximum reach 8,3 meters
- Telescopic reach 2,8 meters
- Lifting moment bruto 72 kNm
- Lifting moment neto 45 kNm
- Slewing torque bruto 15 kNm
- Slewing torque neto 10 kNm
- Slewing angle 390°
- Reccomended pump capacity 40-60 l/min
- Weight without rotator and grapple 1230 kg

Valve block:

- Main valve pressure 175 bar
- Lifting cylinder section pressure 150 bar
- Telescope section pressure 80 bar
- Allowed voltage 12V

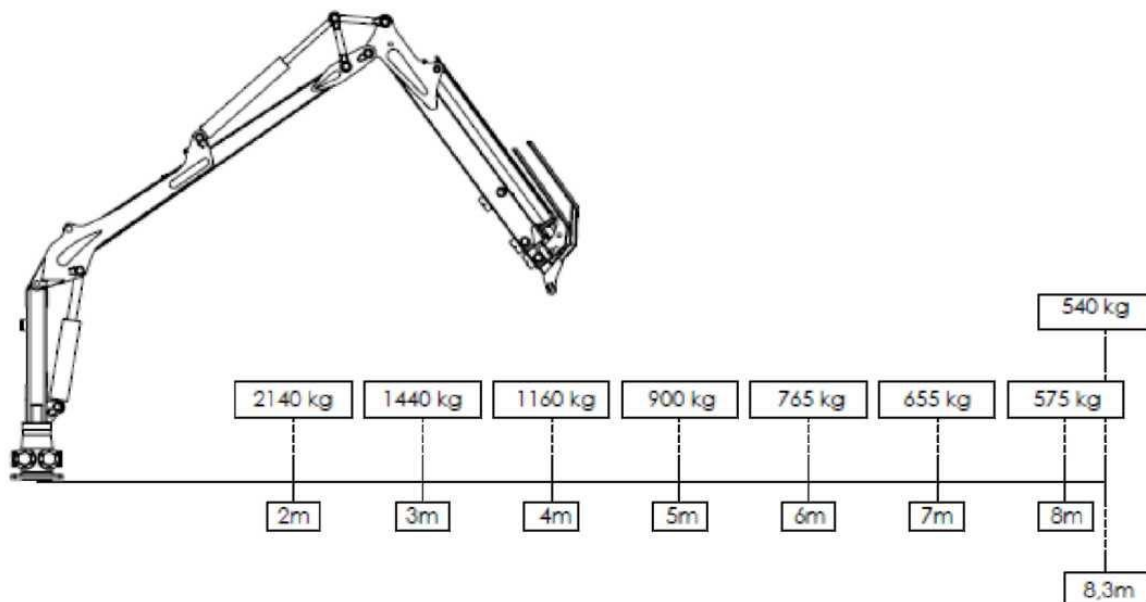
Crane V6700 maximum allowed lifting capacity without rotator and grapple

REAL LIFTING WEIGHTS
Link, rotator and grapple not included
working pressure 175bar

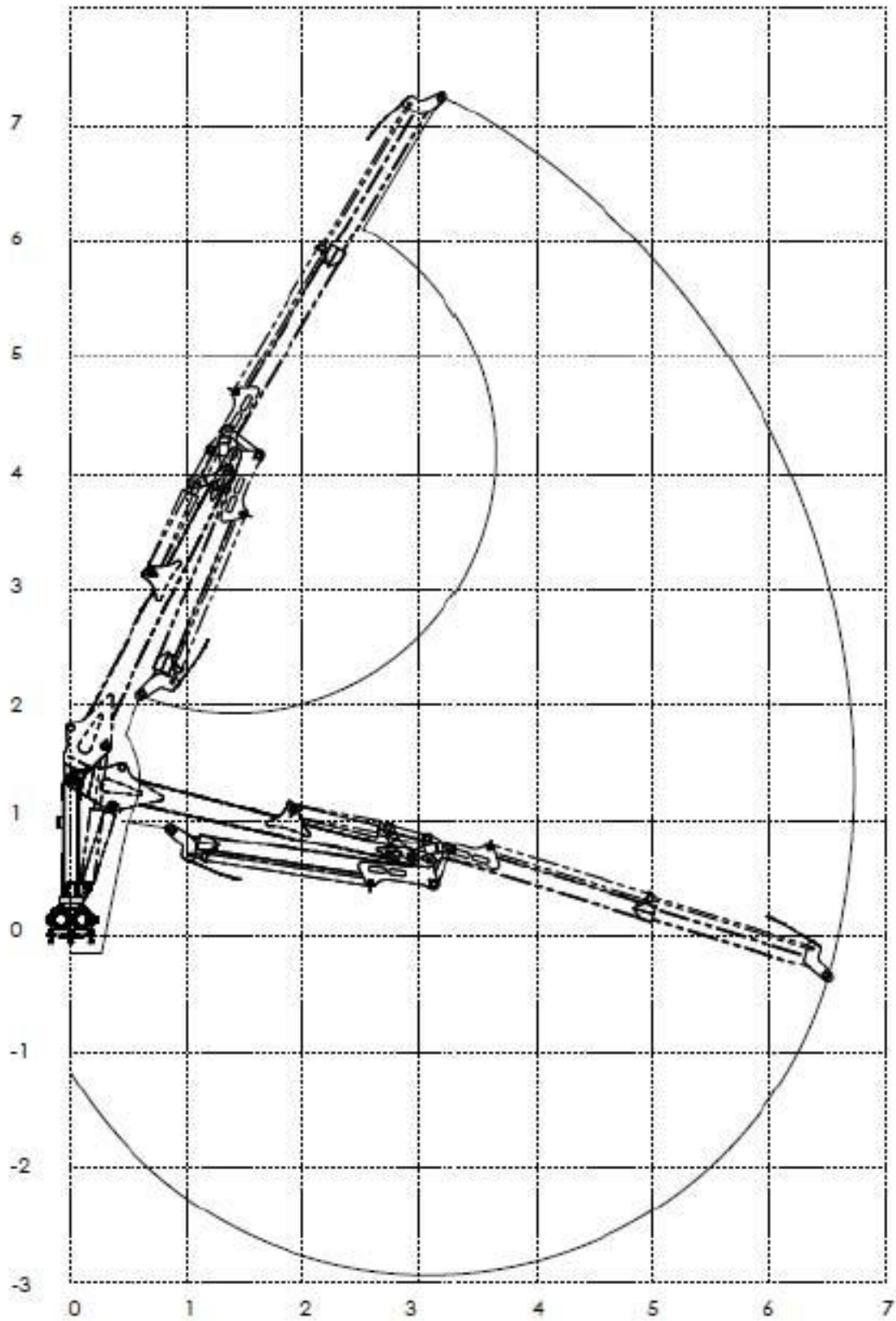


Crane V8300 maximum allowed lifting capacity without rotator and grapple

REAL LIFTING WEIGHTS
link, rotator and grapple not included
working pressure 175bar

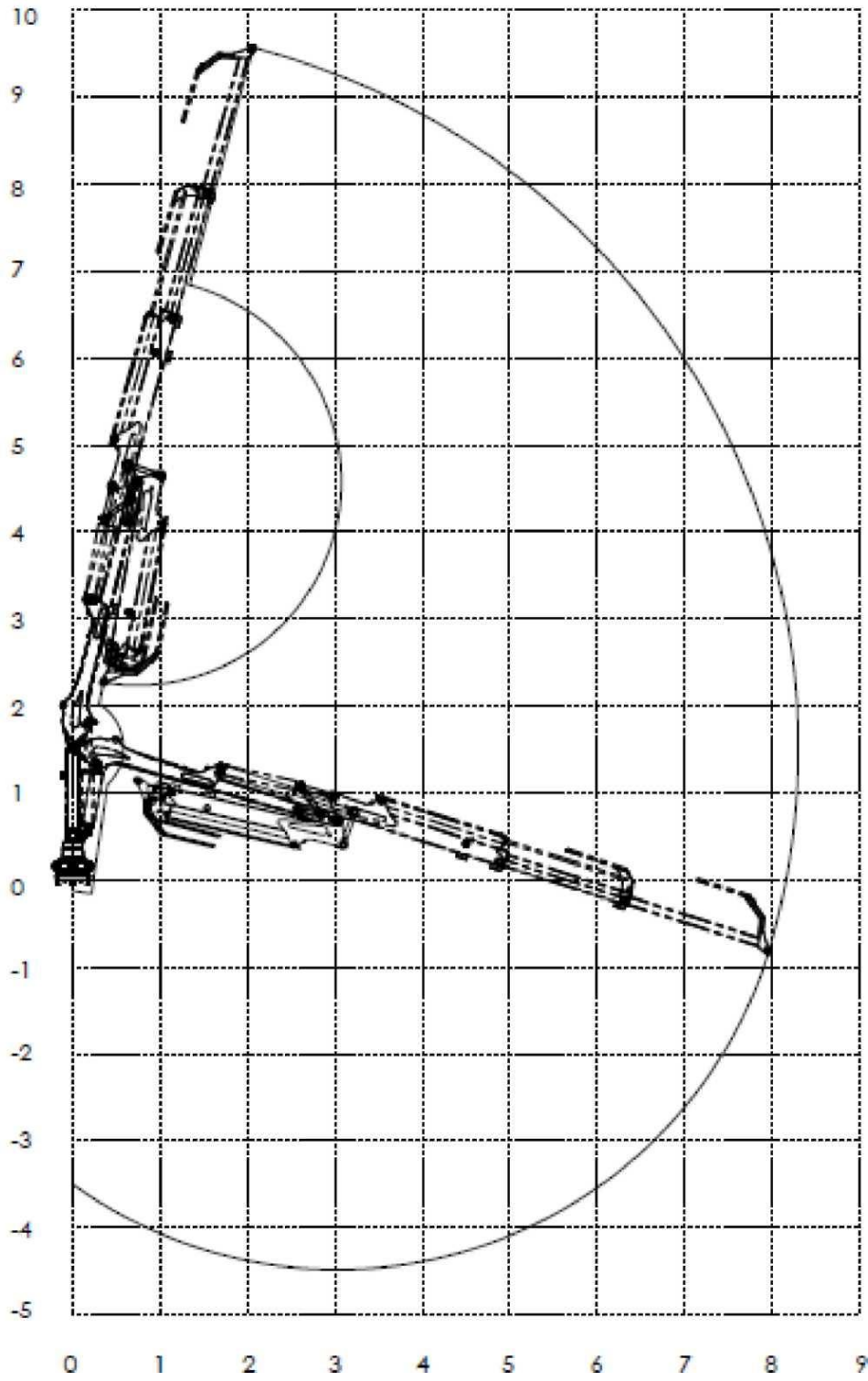


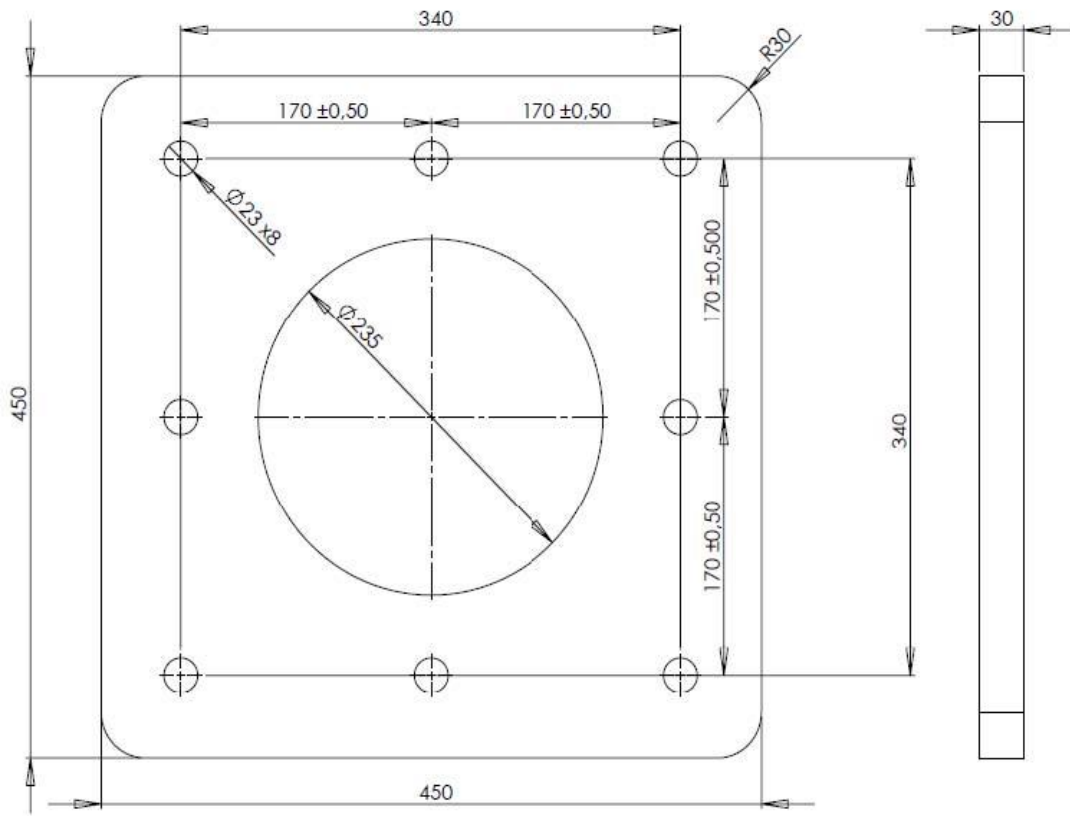
Crane V6700 kinematics scheme:



Crane V8300 kinematics scheme:

Crane 83 kinematics scheme:



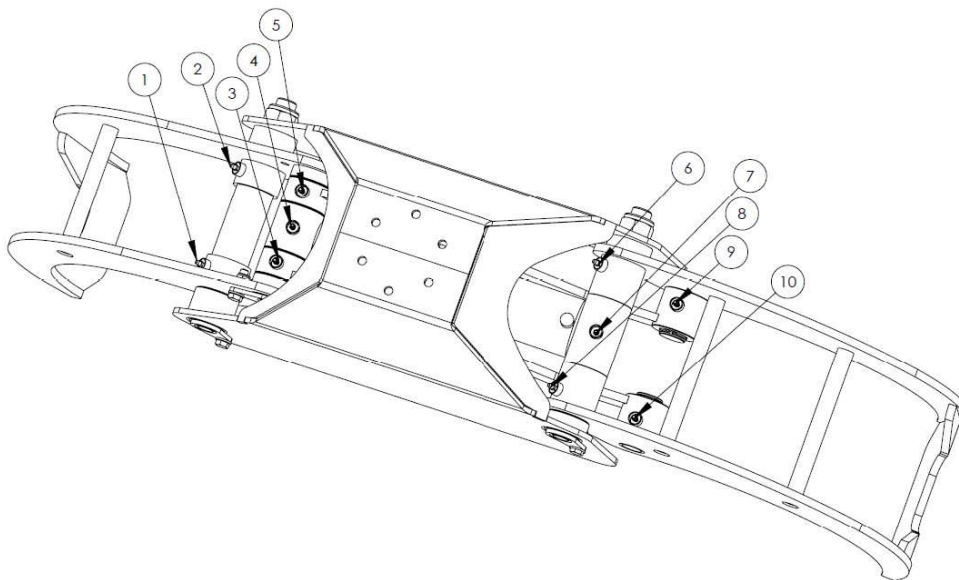
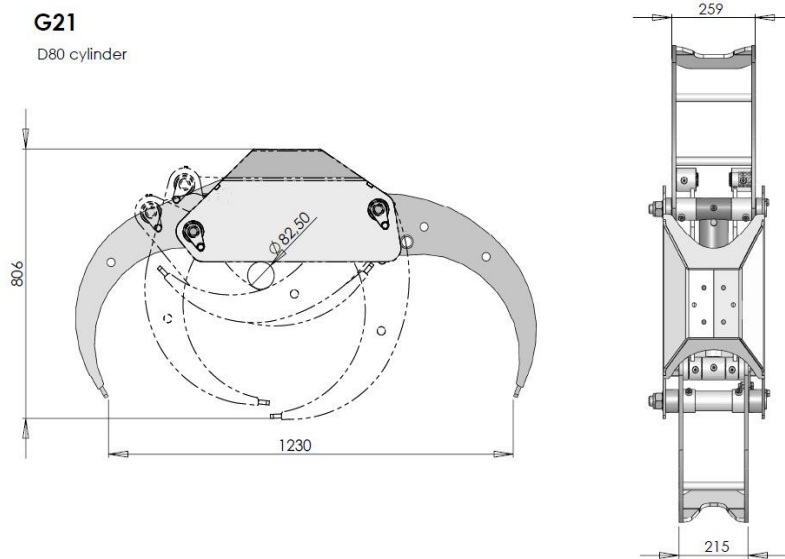


The base plate of crane has to meet the minimum requirements for measures stated on following drawing. The plate has to be at least 30 mm thick. When

Attachment 7. Crane attachments

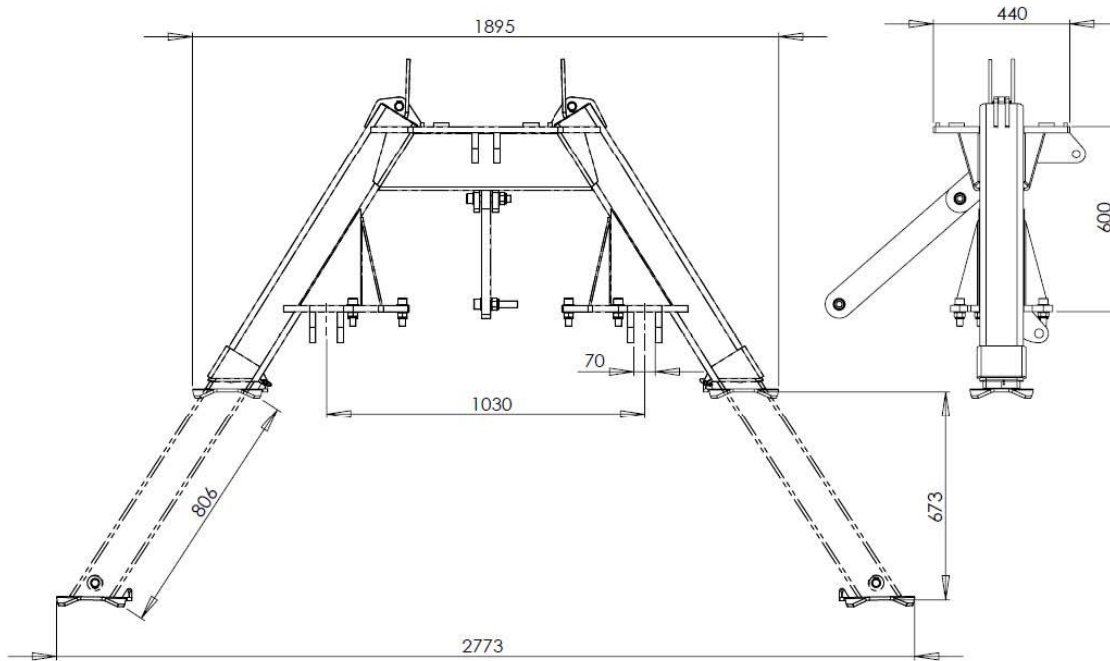
Grapple G21

Grapple weight 120 kg. Grapple area tip to tip 0,21 m².



Grapple lubrication points (10 lubrication nipples):

Crane support legs "A" for crane V6700
Support legs weight 290 kg.
Support legs "A" don't have lubrication nipples.



MULTIFOREST»

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