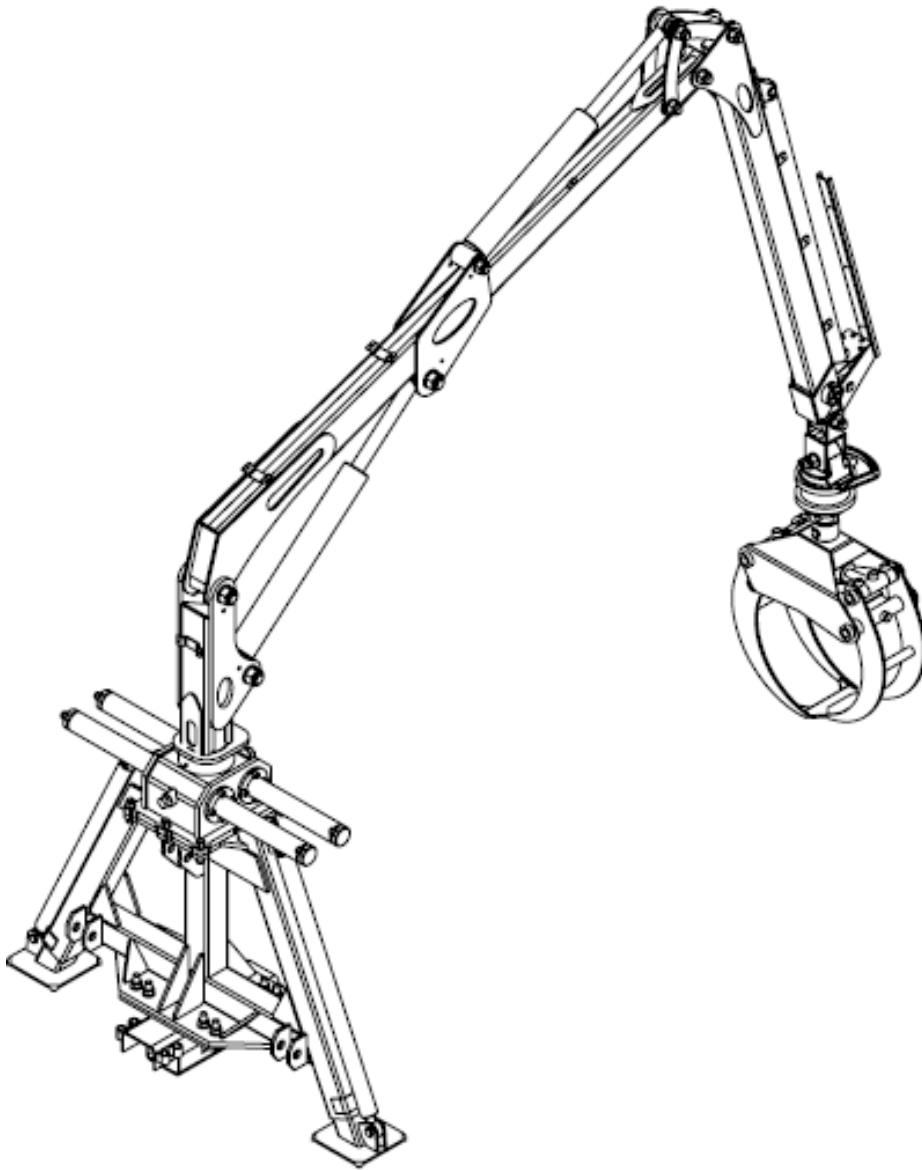


**COUNTRY**®



**MANUAL**

**FOREST CRANE COUNTRY 480**

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## 1. GENERAL

**Please turn special attention to this document before your start to use forest crane COUNTRY 480!**

This manual gives you a detailed overview about forest crane **COUNTRY 480**. Read the manual carefully before you start using this machine. The manual contains essential directions for efficient and safe use of this equipment.

**These instructions should always be followed!**

This forest crane is constructed for loading works in forestry and agriculture.

This machine meets all technical standards and safety regulations of EU Machinery Directive and its amendments. Forest crane is fitted out with CE marking.

Operator of forest crane is obliged to be aware of and strictly follow all safety precautions and instructions described in this manual. In addition to this, instructions of local occupational safety authorities, as well national laws and regulations, must be followed.

**Using the machine for other tasks than those for which it is intended or exceeding its performance is not allowed!**

The manufacturer/dealer is not responsible for damage caused by misuse of the forest crane. Pay attention to regular maintenance. In case there will occur problems with forest crane, which are not covered in this manual, contact authorized dealer or manufacturer.

## 2. SAFETY SYMBOLS



**DANGER**

High risk, which can cause serious injury or death



**WARNING**

Risk of equipment damage



Reminder for technical inspection, repair or maintenance

## 3. SAFETY

### 3.1 General

Read the manual carefully before you start operating with forest crane. Use forest crane only for right purposes. The operator must have a proper valid licence to work with the tractor and the forest crane and has sufficient training to use this machine. Notice, avoid and prevent all potentially hazardous situations.

### IT IS STRONGLY FORBIDDEN:



**DANGER**

- to use forest crane in state of intoxication by alcohol, drugs or other psychoactive substances
- to leave the load in UP position without supervision
- to use forest crane for lifting people
- to exceed maximum loading values
- to rebuild forest crane
- to use repairing materials without the producer's permission
- to localize a leakage from hydraulic hoses or connections by hand

### BEFORE YOU START OPERATING FOREST CRANE, MAKE SURE THAT:



**WARNING**

- crane is in working condition
- you have **FULL** visibility over all the working area
- crane is placed firmly on even ground
- the tractor parking brake is engaged
- support legs is in the operating position and spanning crane

## 3.2 Safety distances

**General safety distance for working with forest crane is 15 metres!**

Follow special safety distance when working close to live electrical conductors:

Rated voltage, kV	Safety area,m
kuni 0,5	2
kuni 20	10
35 - 110	25
220 - 330	40

**Table. 1** Minimum safety area from electrical conductors

**All live electrical conductors must be clearly visible while operating with forest crane!**

## 3.3 Hydraulic system



### **DANGER**

- Hydraulic system must be serviced by qualified and experienced hydraulics mechanic only
- Continually inspect the condition of hydraulic system. Repair all safety endangering defects immediately



### **WARNING**

- Before hydraulics maintenance work make sure that the system is not pressurized
- When replacing hydraulic components and hoses, use original spare parts or parts recommended by the manufacturer



- When performing maintenance work, use safety goggles and gloves
- Prevent oil dripping to the ground to avoid environment pollution
- When working in ecologically sensitive areas, use bio-oil

## 3.4 Operation with forest crane



### **DANGER**

- Ensure, that forest crane is in good working condition
- Operating with damaged or defective machine is prohibited!
- Ensure, that you have control over all the working area
- Prevent entering unauthorized persons to the working area
- Use tractor's parking brake during working with forest crane
- When leaving the machine, always secure it from unauthorized access and unintended operation
- Pull the support legs up before moving the tractor



### **WARNING**

- Support legs must be used while working with forest crane!
- Never lift heavier load, than stated by the manufacturer!
- Do not use an equipment, which is not recommended by the producer!



- Manufacturer is not responsible for damage or loss, that is caused by misuse or incorrect, careless and inappropriate use of the machine

**Follow the traffic regulations while driving  
on public roads!**

## 4. TECHNICAL DATA

### 4.1 Dimensions of the forest crane

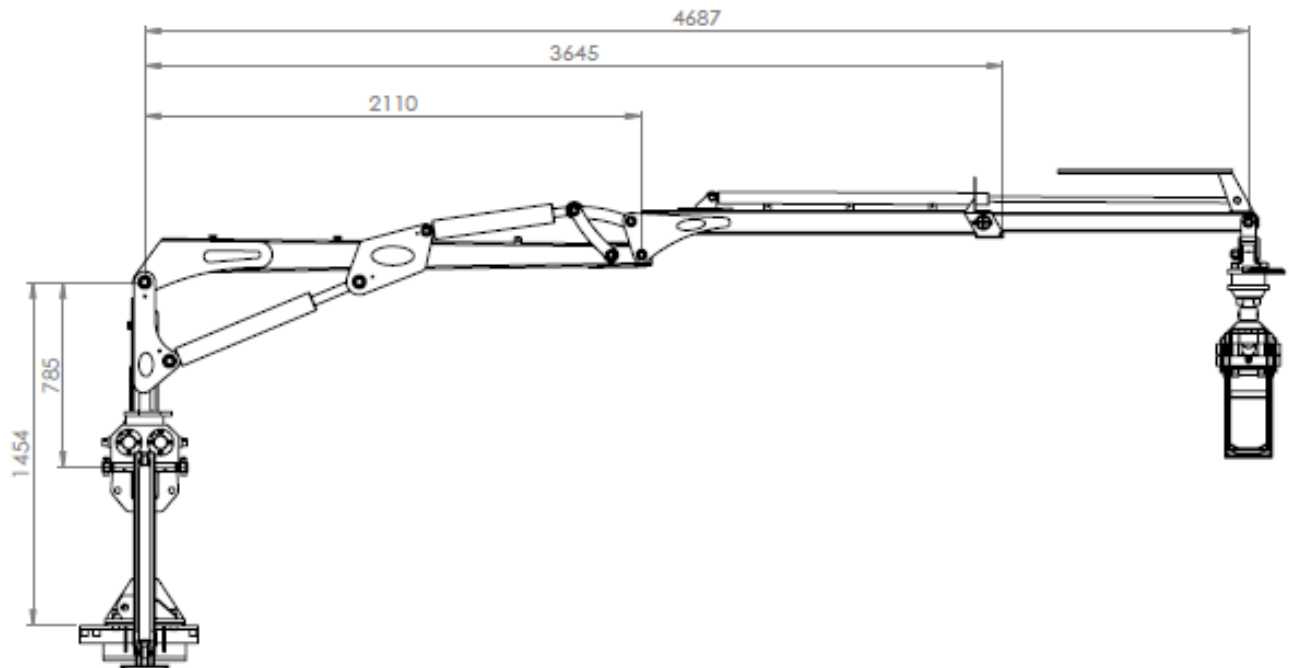


Figure. 1 Forest crane Country 480 dimension (mm)

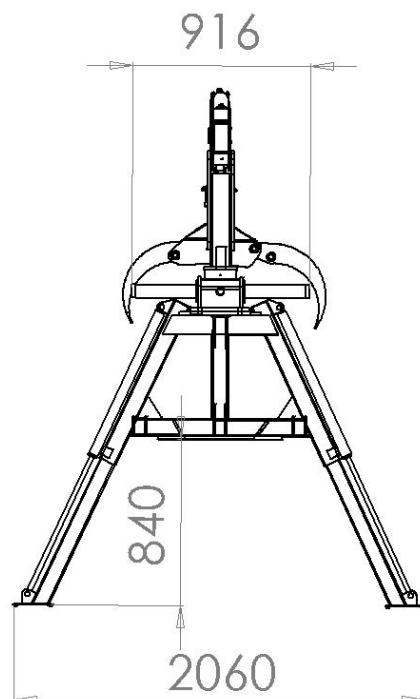


Figure.2 Forest crane Country 480 support legs (mm)



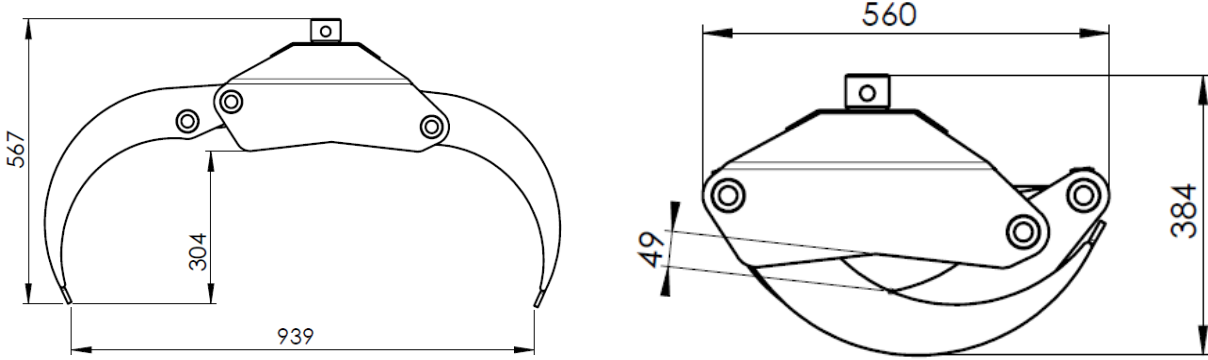


Figure. 3 Country grapple 0,12 dimension (mm)

## 4.2 Crane Country 480 lifting reach

*Lifting reach*

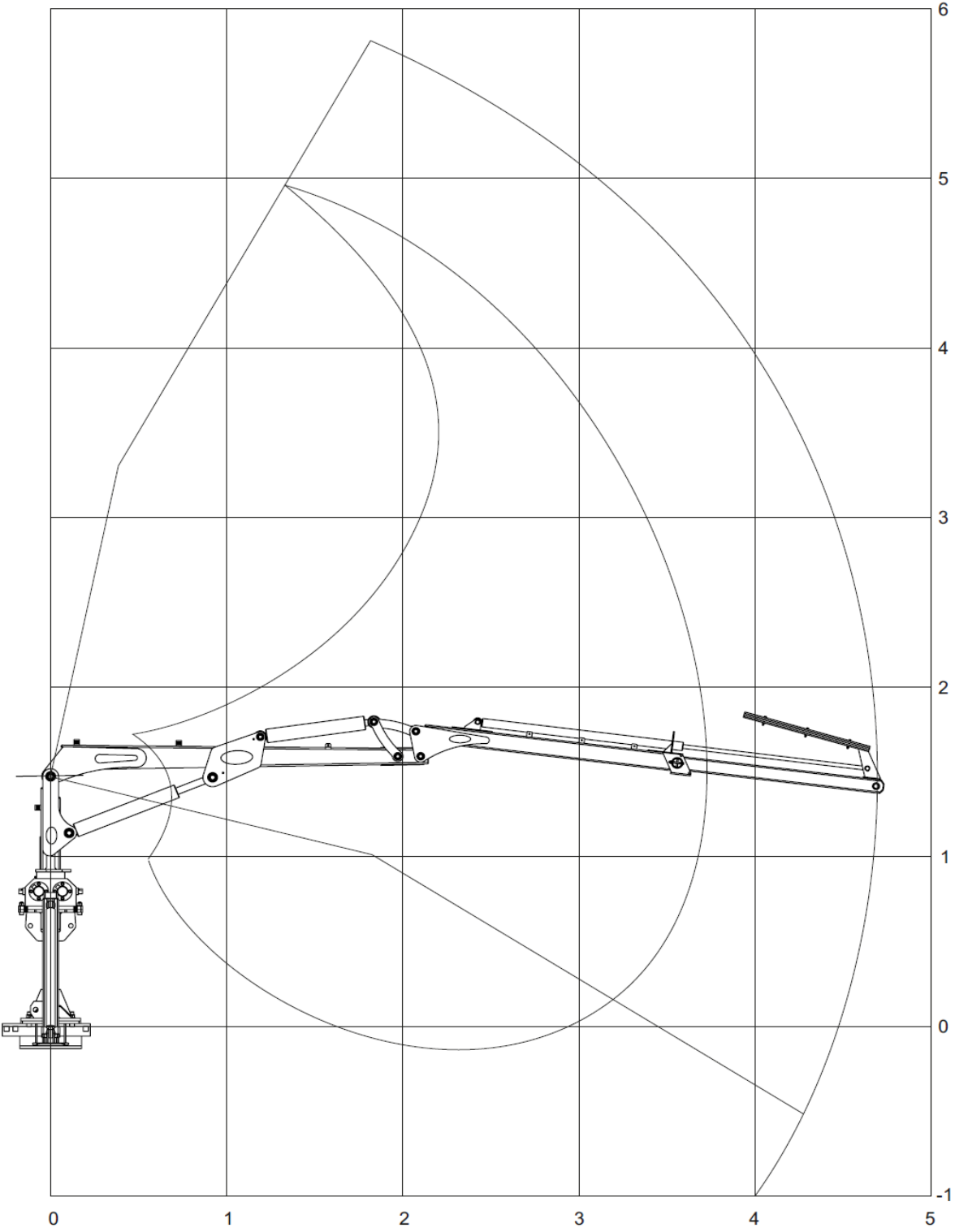
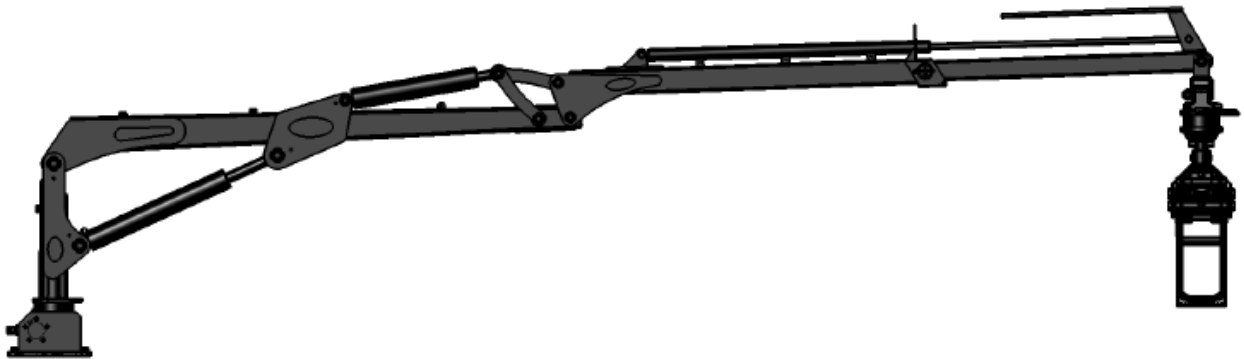


Figure 4. Lifting reach of crane Country 480



3,5m

4,7m

Country 480

550kg

370kg

## 4.2 Technical data

Parameters	COUNTRY 480
Max reach, m	4,7
Telescope, m	1
Lifting torque kNm, bruto	24
Lifting power, kg (4,7m)	370
Lifting power, kg (3,5m)	550
Slewing cylinders	4
Boom rotation	360°
Grapple, m2	0,12
Rotator	GR 30
Hydraulic valve, standard	6/8 XY
Working pressure, bar	175
Total weight, kg	373

Table. 2 Technical data table of COUNTRY 480

**Manufacturer reserves the right to change specifications without prior notice!**

## 5. ASSEMBLY AND MOUNTING



### WARNING

Read these instructions before starting any assembly or mounting work. Improper mounting can cause hazards during use of the forest crane. Mounting, carried out in a manner other than specified in this manual, can expose the user to danger and will void the manufacturer's warranty. Mounting of forest crane should be performed at the dealer service center or by person authorized by the manufacturer or dealer. Strength class for mounting bolts has to be DIN 985. Use self-locking nuts M16. The tightening torque for the mounting bolts of the crane and supporting legs not less than 300 Nm.



**Retighten bolts after the test run and after first 8 hours of use!**  
**Check after 40 working hours, tighten if needed!**

Use the mounting plate (fig. 4) when mounting the loader to the tractor frame or trailer of other producer. Use mounting plate with thickness no less than 16 mm. Make shure there will be enough space at mounting point for later service.

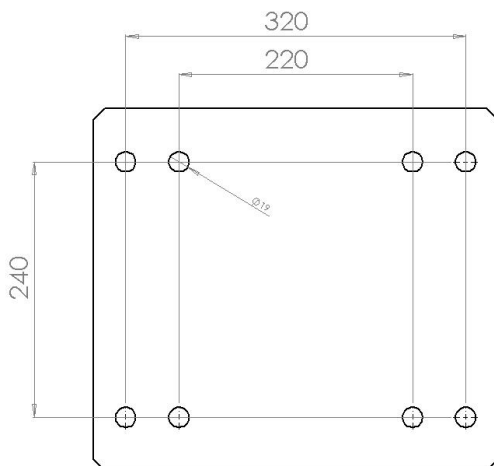


Figure. 5 Forest Crane COUNTRY 480 mounting plate measures (mm)



## WARNING

**Do not use hydraulic puller for forest crane connecting!**

### 5.1 Mounting forest crane with tractor

Use methods which is premitted by the tractor and forest crane manufacture!

Before mounting crane with tractor make sure that:

- tractor is placed firmly on even ground
- hydraulic hoses and couplings are not damaged
- there is enough oil in tractor hydraulic system

### 5.2 Mounting forest crane to the tractor 3-point linkage

Before mounting to the 3-point linkage make sure that:

- tractor is heavy enough and will not keel over
- tractor is placed firmly on even ground
- tractor 3-point linkage equipment is in working condition
- hydraulic hoses and couplings are not damaged
- there is enough oil in the tractor hydraulic system

### 5.3 Mounting control valve



**WARNING** The valve must be installed in the way that levers cannot be used inadvertently!

Install the valve at desired location using the included bracket. Leave enough space for hoses to avoid risk of abrasion or clamping while working with forest crane.



**DANGER**

Hoses in the operator's cabin must be covered in the way that the user is protected from the direct oil jets in case of hose breakage!

## 6. HYDRAULIC SYSTEM

### 6.1 Connection

Before connecting forest crane to the tractor's hydraulic system, make sure, that hydraulic oils are compatible. Check level of hydraulic oil. Forest crane has been tested using TEBOIL HYDRAULIC 46S hydraulic oil that meets standards API, SE, CD and API GL-4 conditions. We recommend connecting the pressure hose to the single-acting hydraulic outlet and the return hose to the tank via the return filter.

Make sure you connect the return hose always first and disconnect it last. Make sure the connection has made properly.

Forest crane can also be connected to the double-acting hydraulics outlet. If this option will be used make sure, that the lever of the double-acting valve is in the right position and the pressure is directed to the pressure connection of the crane's control valve. Check also vehicle's operating manual for hydraulic system connecting instructions.



**DANGER**

**STRICTLY FORBIDDEN CHECK POSSIBLE HYDRAULIC CONNECTIONS  
LEAKS WITH HAND!**



**WARNING**

**Ensure, that the control valve's pressure line (P) has been connected properly and that the return line (T) is unobstructed. In case there is obstruction in return line (quick couplings are not connected or are not locked properly) the pressure might rise over 10 bar and cause malfunction of control valve**

## 6.2 Shock valves

FUNCTION	HC 6/8 XY (80 L)		
	SECTION	Pressure (bar)	
		A	B
SLEWING	1	160	160
EXT. BOOM	2	175	120
TELESCOPE	3	80	-
SUPPORT LEG V	4	-	-
SUPPORT LEG P	5	-	-
GRAPPLE	6	-	-
GRAPPLE SLEWING	7	-	-
LIFTING	8	175	
MAIN SAFETY VALVE		180	

**Table. 3 Shock valve pressures for HC 6/8 XY control valve**



## 5.3 Hydraulic diagram and control functions

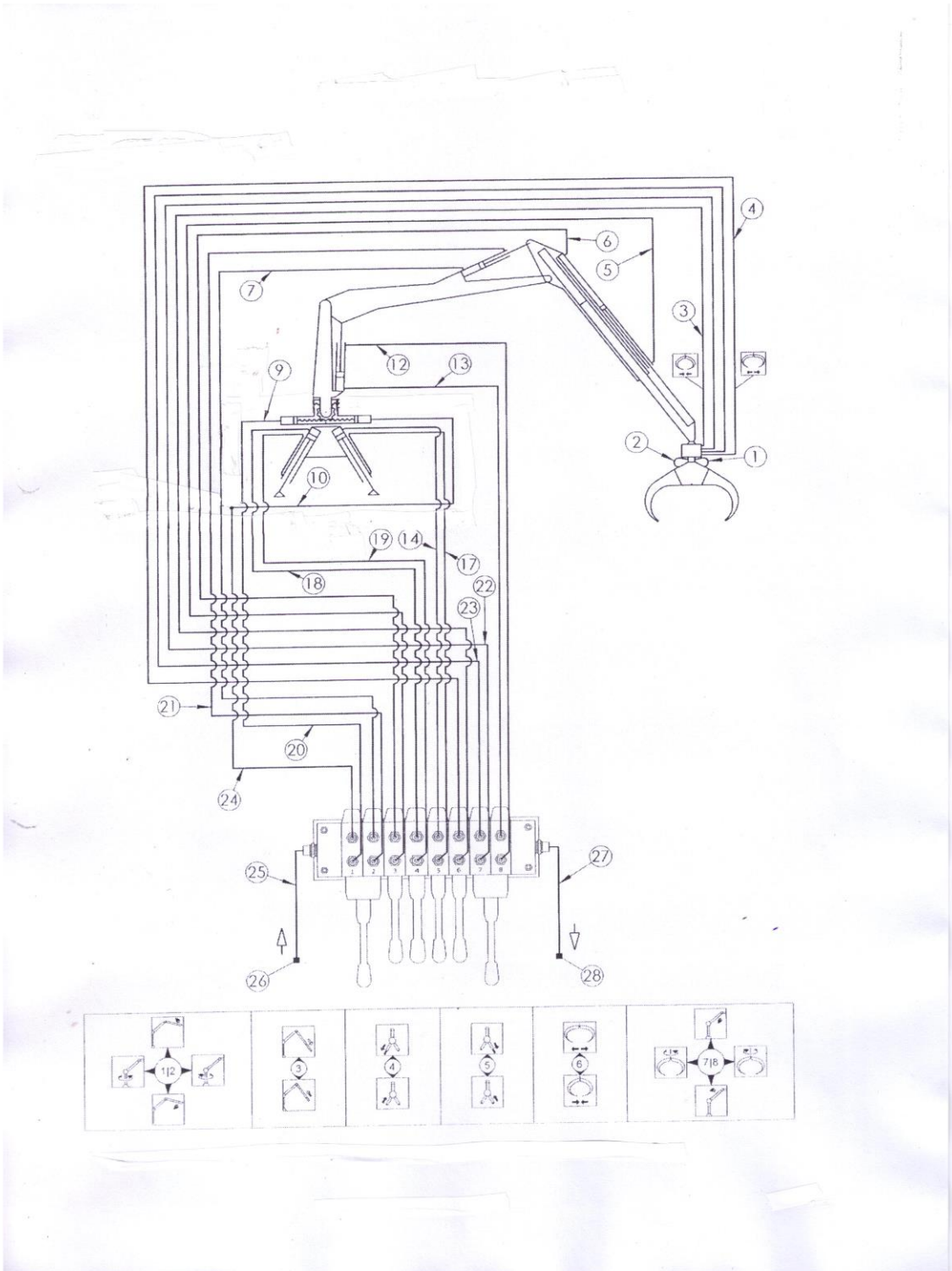


Figure 6. Country 480 hydraulic diagram and control lever operations with 6/8XY control valve

## 7. INSPECTION AND TESTING

Person who will test a forest crane must have proper training. In testing time tractor must be placed firmly on even ground. Refer to the manufacturer's instructions. Uncontrolled forest crane use is prohibited. Person who tests forest crane, must have very good knowledge and skills about working with control valve.

Don't pressurize hydraulic system before connecting control valve to tractor hydraulic system.



**WARNING**

**Don't pressurize hydraulic valve return line (T) – it may brake hydraulic valve!**



Product warranty is **NOT VALID** in case of user's incompetence handling of the equipment.

- Be sure that quick couplings are connected properly
- Be sure that the control valve's pressure line (P) and that the return line (T) has been connected properly
- Be sure that hydraulic hoses can move freely



**DANGER**

**Ensure that there are no people or obstacles in the operating area.**

**The danger zone is 15 m!**

## 8. OPERATING INSTRUCTIONS

### 8.1 Testing

Ensure that the control valve's levers are in the middle position. Switch on the pump and let oil flow through the valve for a while. Lower the support legs. Carefully drive crane movements one by one in the way, that all cylinders reach their extreme positions and repeat this until all movements are smooth. After testing forest crane, inspect connections and repair leaks if any appeared. Check the mounting bolts of the crane and support leg, tighten them if necessary. Check the hydraulic oil level, and fill up if necessary.



#### **DANGER**

**Be extremely careful, when there is air in the cylinders!**



#### **WARNING**

**Be careful when getting air out of system. If you drive cylinder to its extreme position at full force, the air pressure in the cylinder will damage the seals!**

### 8.2 Practice run

Drive through every movement with an unloaded crane, paying attention to the positions in which the crane might hit surrounding obstacles. Move the control levers smoothly and stoutly, avoiding quick and jerky movements. Learn to use several functions simultaneously. Start at low engine speed to avoid sudden movements. After you have become accustomed to the crane's movements, choose appropriate engine speed so, that operation is smooth and efficient, but you still have the movements under control. Loading big and heavy logs from distance, keep load close to the ground.

### 8.3 Working with load

Working on inclined surface, do not operate with the full lifting torque and be extremely careful. Loading uphill note, that turning crane with too much load might cause the oil pressure in slewing device cylinders to reach critical point, where shock valve has to intervene. This could make slewing device uncontrollable and crane might turn back to downhill direction in a way, that it might fall over. In such case lower the load as close to

ground as possible, but not too rapidly .

Forest crane should not be operated if temperature is below  $-25^{\circ}\text{C}$ . Note that the hydraulic seals, hoses and steel structures are prone to damage at low temperature. When starting work at cold temperature, first let the oil flow freely through the valve for a couple of minutes. The maximum operating temperature for hydraulic oil is  $+75^{\circ}\text{C}$ .



## **WARNING**

- **Don't forget to lift the support legs UP before moving to another place!**
- **Do not exceed the speed limit when driving! Be especially careful on turns!**
- **Use the support legs only for purpose to provide additional support for the vehicle!**
- **Never move the boom to its extreme position at full speed!**
- **Do not use support legs in DOWN position while parking!**

## **9. DETACHING FOREST CRANE**

Choose sufficiently hard and level ground for detaching forest crane. Ensure, that no unauthorized persons are around during detaching and storing process. When storing control valve, make sure it is out of the reach of children.



## **WARNING**

**Always switch the pump off before disconnecting quick couplings!**

- lower the support legs to support crane properly
- fix crane firmly by proper hoist
- Make sure that crane cannot lean over
- Detach quick couplings and put covers on them
- Detach crane from the vehicle

## 10. STORAGE INSTRUCTIONS

Clean forest crane and if necessary, touch up any points, where paint has peeled off. Lubricate forest crane thoroughly. Release pressure from the cylinders. Protect the cylinder piston rods and exposed parts of the control valve with grease. Store forest crane in a sheltered area (under the roof), avoid direct contact with the ground.

## 11. MAINTENANCE

### 11.1 Maintenance table

OBJECT	ACTION		
	Maintenance interval, working hours		
	8 hours	40 hours	250 hours
1. Crane	Check cylinder and hoses of leakages	Check pins and lockings, tighten mounting bolts	Check the condition of primary structures
2. Slewing device	Grease bearings		Check mounting bolts, tighten if needed. Adjusting the racks
3. Boom and ext	Grease slide bearings, cylinder eyelets and joints		Check slide bearings and joints, change if necessary
4. Cylinders	Grease eyelets		Check hydraulic cylinders
5. Grapple	Grease joints		Check grapple-rotator junction
6. Support legs		Grease joints and cylinder eyelets	

**Table. 4 Forest crane Country 480 maintenance table**

### 11.2 Adjusting the racks

Check the racks after 320 working hours, but not less, than once a year

- Release the locking nut
- Remove the bolt
- Tighten the bolt against the rack and tighten more 15-30°
- Tighten the locking nut

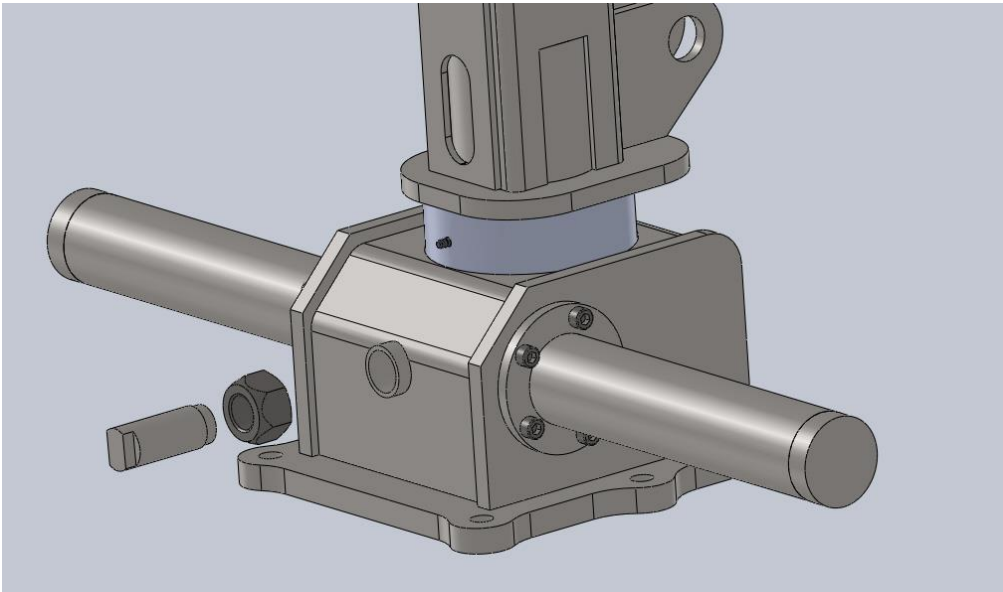


Figure. 7 Forest crane Country 480 adjusting racks of slewing device

**There is TEBOIL HYDRAULIC 46S oil in slewing device by manufacturer!**

### 11.3 Changing oil in slewing device

- Ensure that the slewing device is in horizontal position
- Release the lock nut
- Remove the bolt
- Pump the oil out with appropriate pump
- Fill up the slewing device with appropriate oil



**Oil level has to be up to the bolt hole lower edge!**

- Tighten the bolt against the rack and tighten more 15-30°
- Tighten the lock nut

**Change oil in slewing device is recommended to do once in 2 years!**



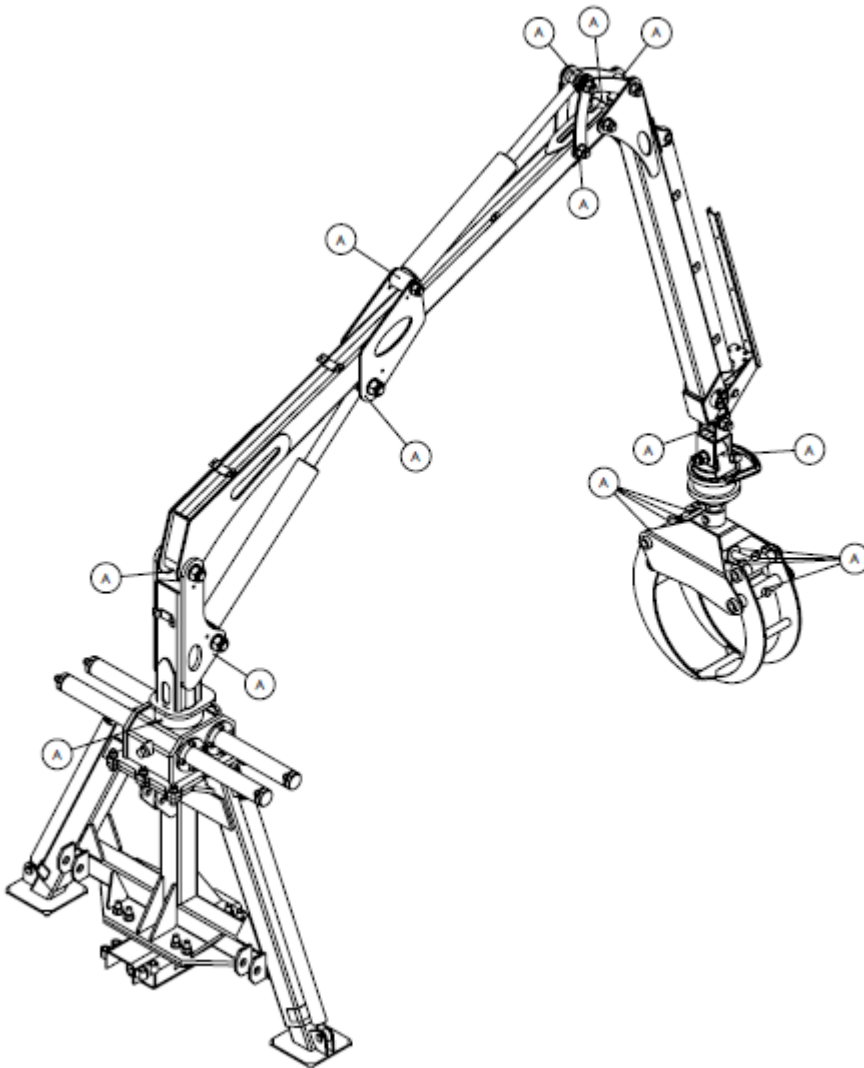
**Follow environmental conditions. Collect wasted oil in a container**

## 11.4 Lubrication

Using the appropriate lubricants like Beacon EP2, Multipurpose GR Moly, Mobilux EP2, Mobil Grease MP Special, Energrease LS-EP2 or similar. Right lubricants guarantee troublefree operation of the machine.

Lubrication point	Qty	Action	Interval, hours	Notes
<b>Slewing device</b>				
1. Bearings	1	Greasing	8	2% molybdensulfide
Slewing device	1	Oil	2000	Teboil Hydraulic lift 46
<b>Nooled</b>				2% molybdensulfide
3. Joint	7	Greasing	8	
4. Cylinder eyelet	4	Greasing	8	
<b>Grapple</b>				
5. Joint	9	Greasing	8	
<b>Rotator</b>				
7. Joint	1	Greasing	8	
<b>Support legs</b>				
8. Joint	2	Greasing	40	
9. Cylinder eyelet	4	Greasing	40	

**Table. 5 Forest crane Country 480 Oil and lubricant grade table**



**Figure 8. Country crane 480 maintenance points**

## **11.5 Changing the hydraulic oil**

Change the oil according to the vehicle's maintenance recommendations. Forest crane hydraulic system has been filled with TEBOIL HYDRAULIC 46S hydraulic oil at the factory. If the oil temperature does not exceed 75°C in summer, winter oil can be used all year round.



## 11.6 Hydraulic oil requirements



- Freezing point must be below  $-50^{\circ}\text{C}$
- Viscosity must not be lower than 1.5 E°,  $+50^{\circ}\text{C}$  for piston pumps and 2.5 E°,  $+ 50^{\circ}\text{C}$  for gear pumps
- Hydraulic oil must contain the necessary additives for lubrication, rust protection and defoaming

## 12. TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	REMEDY
<b>CRANES WORKING MOVEMENTS ARE SLOW</b>	Pump running too slowly	Check pump rotating speed
	Not enough oil	Add oil (air-bleeding)
	Faulty pump	Change or get the pump fixed
	Leaks or obstructions in oil lines	Inspect and clean oil lines
	Oil too thick	Change to a thinner (proper) oil grade
<b>CRANES DESCENDING MOVEMENTS ARE SLOW</b>	Obstructions in the oil lines	Check the lines and the chokes
	Clogged-up (return) filter	Clean and renew filter
	Oil too thick	Change to a thinner oil grade
<b>CRANE'S MOVEMENTS ARE TOO FAST</b>	Rotation speed too high or pump is too powerful	Choose a correct pump/speed of rotation
	Incorrect operation	Learn to open the control valve
<b>CRANE'S WORKING MOVEMENTS ARE POWERLESS</b>	Oil not enough	Add oil (also air bleeding)
	Faulty pump	Change or get the pump fixed
	Faulty or relief or shock valves or wrong adjustment	Change the relief or shock valves or adjust in right way
	Faulty control valve	Change or get the valve fixed
	Faulty cylinders or seals	Check the cylinders and change the seals
<b>CRANE'S MOVEMENTS ARE JERKY</b>	Air in hydraulic system	Check oil level, bleed air from system
		Check for obstructions or leaks on the inlet side
	Faulty pump	Inspect the pump and get it fixed
<b>BOOMS DESCEND BY THEMSELVES</b>	Faulty control valve	Replace or fix the valve
	Faulty cylinders or hoses	Fix the leaking point, check cylinder seals
<b>CONTROL VALVE STEMS STICKING</b>	Valve's fixing screws too tight	Check screws tightening torque 50Nm; (5kPm, 37 ftXlb)
	Valve not on level mounting base	Mount the valve on level base
	Valves'tie bolts too tight	Check screws tightening torque 27,5 Nm; (2,75 kPm; 20ftXlb)
<b>GRAPPLE'S OPENING BY ITSELF</b>	Faulty valve	Fix the valve
	Faulty cylinder of the grapple	Fix or change the cylinder
	Faulty rotator	Fix or change the rotator

**Table. 6 Forest crane Country 480 troubleshooting table**

## 13. SPARE PARTS

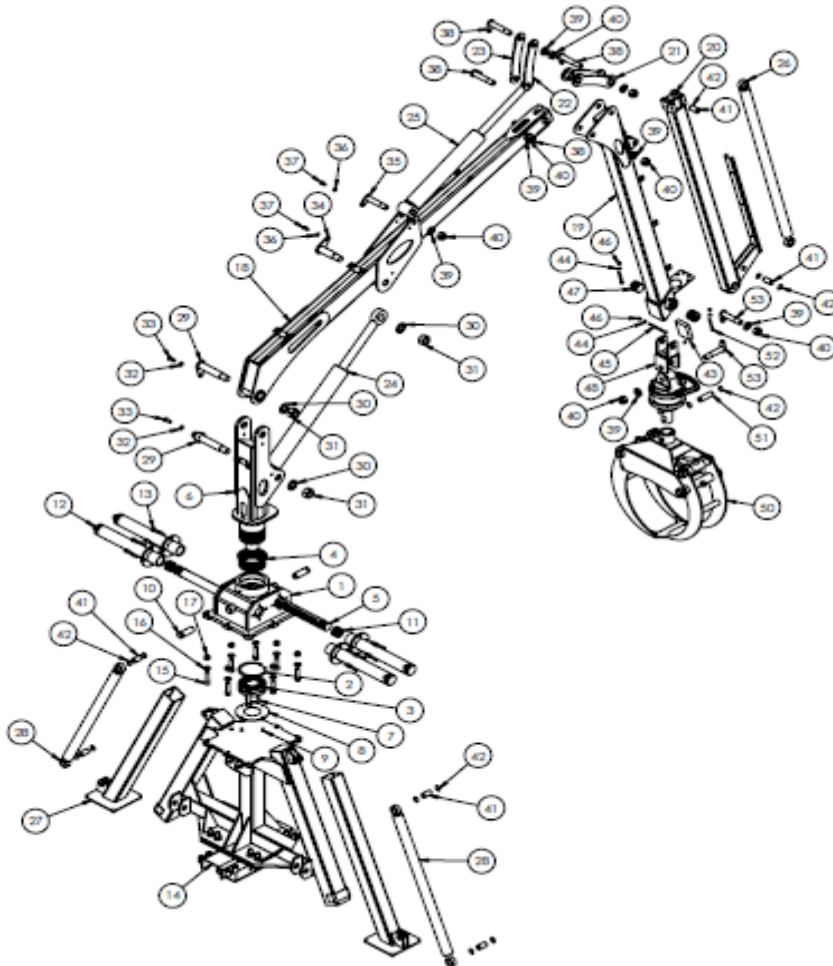


Figure 9. Country Crane 480 spare parts

Pos	Part name	Qty
1	Housing of turning device	1
2	Locking hoop	1
3	Double-row spherical roller bearing	1
4	Bronze slide bearing	1
5	Gear rack	1
6	Column	1
7	Locking hoop	1
8	Cover of slewing device housing	1
9	Flat socket cap bolts M6x16 DIN 7991	4
10	Gear rack regulating bolt	1
11	Seal 60/44/18.4	2

12	Hollows	4
13	Flat socket cap bolts M12x25 DIN 912	10
14	Housing of telescope support leg	1
15	Flat socket cap bolts M16x60 DIN 912	6
16	Washer M16 DIN 125	6
17	Nylon lock nut M16 DIN 958	6
18	Main boom	1
19	Ext. Boom	1
20	Telescope	1
21	Shaft	1
22	Left shaft	1
23	Right shaft	1
24	Cylinder of main boom	1
25	Cylinder of ext. boom	1
26	Cylinder of telescope	1
27	Support leg telescope	2
28	Cylinder of support legs	2
29	Shaft of column -boom junction	2
30	Washer M30 DIN 125	3
31	Nylon lock nut M30 DIN 985	3
32	Washer M12 DIN 125	2
33	Bolt M12x30 DIN 933	2
34	Main boom cylinder shaft on main boom	1
35	Shaft of main boom-ext. Boom	1
36	Washer M10 DIN125	2
37	Bolt M10x20 DIN 933	2
38	Ext. Boom cylinder shaft on ext. Boom	4
39	Washer M24 DIN 125	7
40	Nylon lock nut M24 DIN 985	7
41	Shaft with groove	6
42	Locking hoop	14
43	Plastic slider	1
44	Washer M8 DIN125	4
45	Bolt M8x110 DIN 931	1
46	Nylon lock nut M8 DIN 985	3
47	Plastic slider	2
48	Hanger	1
49	Rotator M30	1
50	Grapple 0,12	1
51	Shaft with groove	1
52	Bolt M8x80 DIN 931	2
53	Shaft of hanger	2

## 14. WARRANTY

Product warranty is valid for one year starting from the date of delivery or issuing an invoice. Product warranty is valid only in case if:

- rules and recommendations mentioned in the manual were followed
- during the maintenance original spare parts were used
- maintenance work was performed by qualified specialists
- forest crane was not overloaded
- proper pressure was used in the hydraulic system.

Product warranty is **NOT VALID** in case of user's incompetence and/or irrespective handling of the equipment. Warranty does not cover transportation cost or loss of profit due to normal abrasion or product failure.

**Producer:**

Coma Investing LLC

Tallinn

Harjumaa

Rävala pst. 19-101

10143 Estonia

Tel/fax: +372 32 77738

## 15. CERTIFICATE OF CONFORMITY

Manufacture,

### COMA INVESTING LLC

Tallinn

Harjumaa

Rävala pst. 19-101

10143 Estonia

confirm that forest crane COUNTRY 480 is produced and delivered

Date \_\_\_\_\_

Series nr. \_\_\_\_\_

complies with the standards of the Directive 98/37 EC; 2006/42/EC

West-Viru County

\_\_\_\_\_

\_\_\_\_\_

(date)

Marek Kokerov

manager