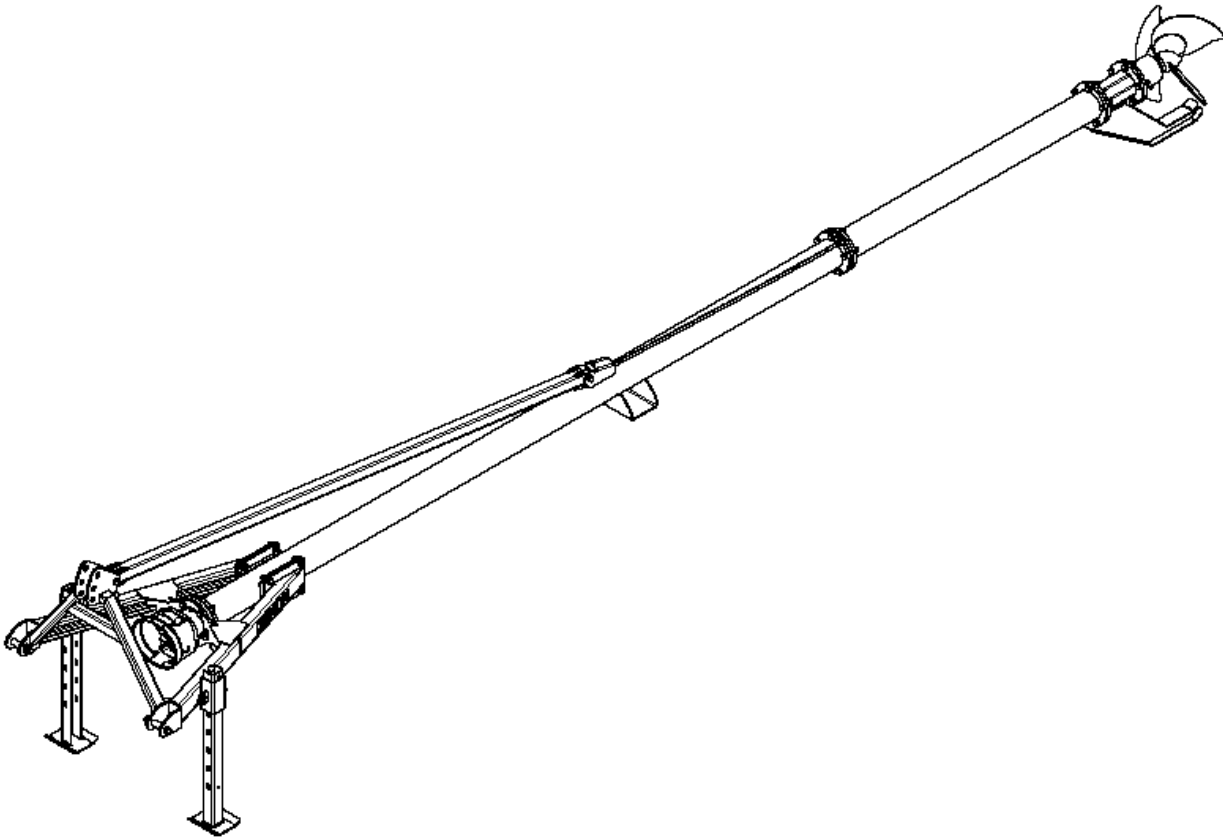
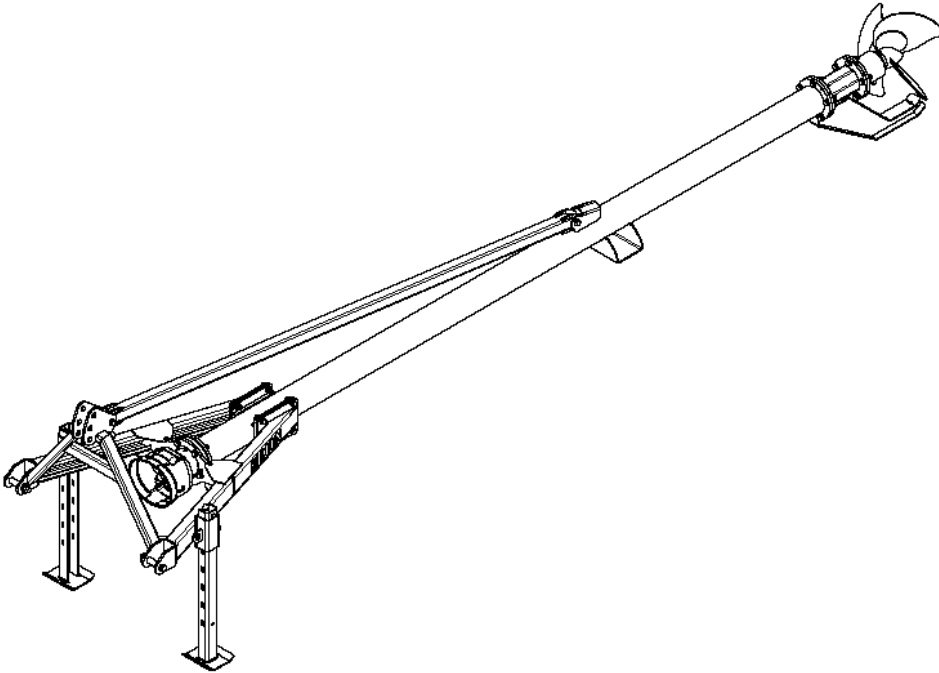




PO50/PO70

Duun Industrier as
7630 Åsen, Norway
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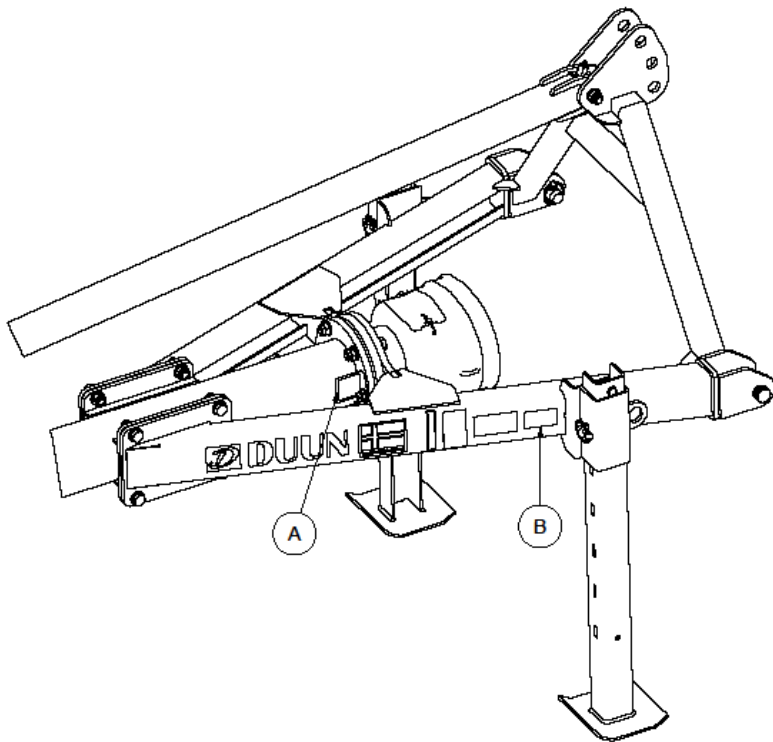


Congratulations on your Duun PO50/70.

All Duun tractor operated machines have been engineered and tested in close cooperation with representative users to produce functionally safe and user-friendly machines.

Please read this instruction manual before using the machine.

Good luck!



Machine identification

Serial number and manufacturer are specified on the metal plate (A)

Register the serial number and delivery time on the list below.

Always state the serial number in all inquiries regarding service.

The machine is CE marked (B). This confirms that the machine is designed in accordance with the EU machinery directive.

Serial number

Time of delivery (month/year)

CONTENT

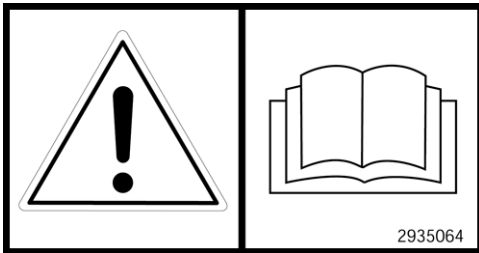
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Safety

All operators, mechanics and the owner must always work carefully with agricultural machinery. Read and observe safety instructions in this instruction manual.

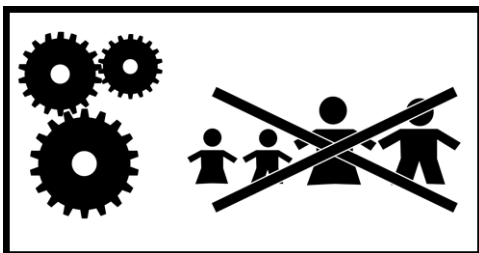


Be particularly aware of warning signs with this symbol, it marks measures that must be carried out in order to avoid accidents. The symbol appears in the instruction manual and on warning signs on the machine.



Instruction manual

All operators, mechanics and the owner must be well acquainted with the instruction in this instruction manual before the machine is taken into use.



Safety of the surroundings

Be very careful when other people or animals are near the machine or tractor. Never start the machine when there are people or animals close to it, also never stand between the tractor wheels and the machine!



Be very careful during maneuvering and installing

Ensure that no one is in the pump's operating radius or "impact area" during installing and maneuvering.



Safe connection and use

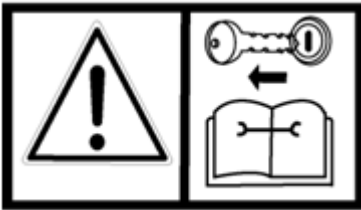
Do not allow anyone to stand between the machine and the tractor when the machine is connected to the tractor. The same applies when using the machine. Ensure that the connection is made in a secure manner.



Power transmission shaft

The tractor is disengaged and the handbrake is applied before the shaft is connected to the tractor's PTO. Max. PTO speed is 540 r.p.m. Make sure that there is the same angle in both joints (ie the pin on the tractor is parallel to the pin on the gearbox). Different angles cause imbalance, vibrations and increased wear. The power transmission shafts must always have protective covers that were originally supplied. **Damaged and worn covers must be replaced immediately!**

During raising and lowering of the rod pump, the power transmission shaft is dismantled.



Safety in case of interruptions and maintenance

Always remember to stop the tractor engine and remove the ignition key before greasing, adjusting, cleaning or carrying out repairs. This is to ensure that the tractor does not start before you have finished.



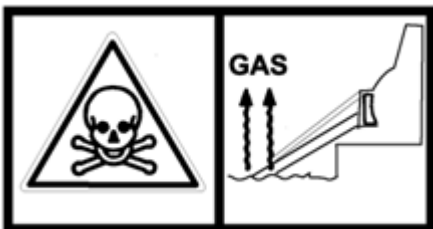
Crushing hazard for hands and fingers with rotating parts

Protective covers must always be fitted except for necessary maintenance and always with the engine stopped. Pay particular attention to the risk of crushing at points marked for this.



Work noise

The noise level during use of the propeller depends on the tractor's general noise level and the acoustics at the workplace itself. In certain cases this can exceed 85db. In such cases, the operator must use hearing protection.



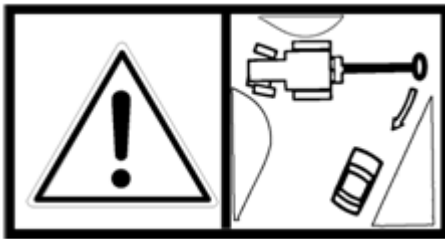
Gas hazard!

During the stirring of slurry, gas evolution occurs which in strong concentrations can be fatal for humans and animals. Follow the following safety regulations to avoid injury! - Avoid air flushing during stirring as far as possible!- Never go down into a slurry container without being absolutely sure that all gas has been removed (can be checked with a gas meter that is submerged with a string) - Never work alone in a slurry container - be at least two people and use a safety harness - lifeline. - Use a fresh air mask! -open doors that the gas has low outlets in the farm building itself during slurry processing. Check the state of health in the farm building continuously during slurry handling! Avoid any unnecessary stay near the slurry chute and propeller during stirring.



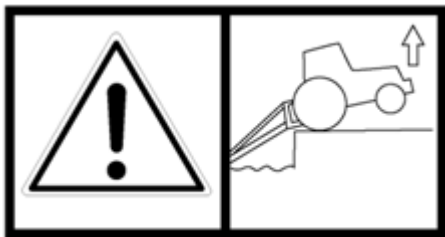
Contact with live wires etc. during transport

Be aware that the propeller can stick out over the tractor during transport and there is a risk of contact with live wires - railway underpasses during movement!



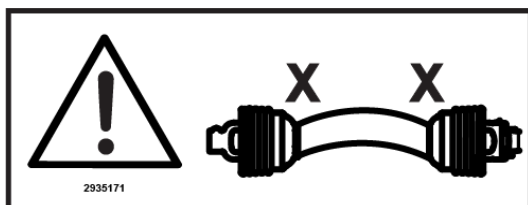
Safe transport

The propeller has a very long turning radius behind the tractor. This can cause dangerous traffic situations when exiting and turning on a busy road. Please be aware of this and avoid situations such as outlined. During transportation over long and busy distances, the propeller should be transported on a tractor trailer or similar.



Steep hazard during manoeuvring

The propeller forms a long weight arm behind the tractor. This means that during removal from storage it can lift up the tractor at the front. The problem can be remedied with front weights or other load at the front of the tractor (loader). Pay particular attention to this and avoid quick maneuvers during removal from the slurry storage.



Risk of spraining the power transmission shaft

It is important to adapt the length of the power transmission shaft to each individual tractor. If it is too long, the shaft can be pressed completely together and there is a risk that either the pin on the propeller shaft or the pin on the tractor will be destroyed.

Warranty terms

Duun Slurry mixer has 12 months guarantee against defects in materials and workmanship.

Parts that are not originally manufactured by Duun Industrier as, for example, wheels, hydraulic parts, etc. are subject to these suppliers' guarantees and terms.

In cases where a repair is considered to be covered by the guarantee, the representative must inform the supplier's representatives that the repair is intended executed based on the guarantee.

In this context, the following information must be recorded:

- Product name
- The product's serial no. (see the machine identification)
- Date of sale
- The product owner's address, telephone no.
- The seller with address, tel. no.

In case of such a repair, the supplier is presented with a claim within 3 weeks after the repair date.

Replaced parts are to be kept until a decision has been made with reference to the claim and the replaced parts are to be forwarded to Duun Industrier as for assessment if so required.

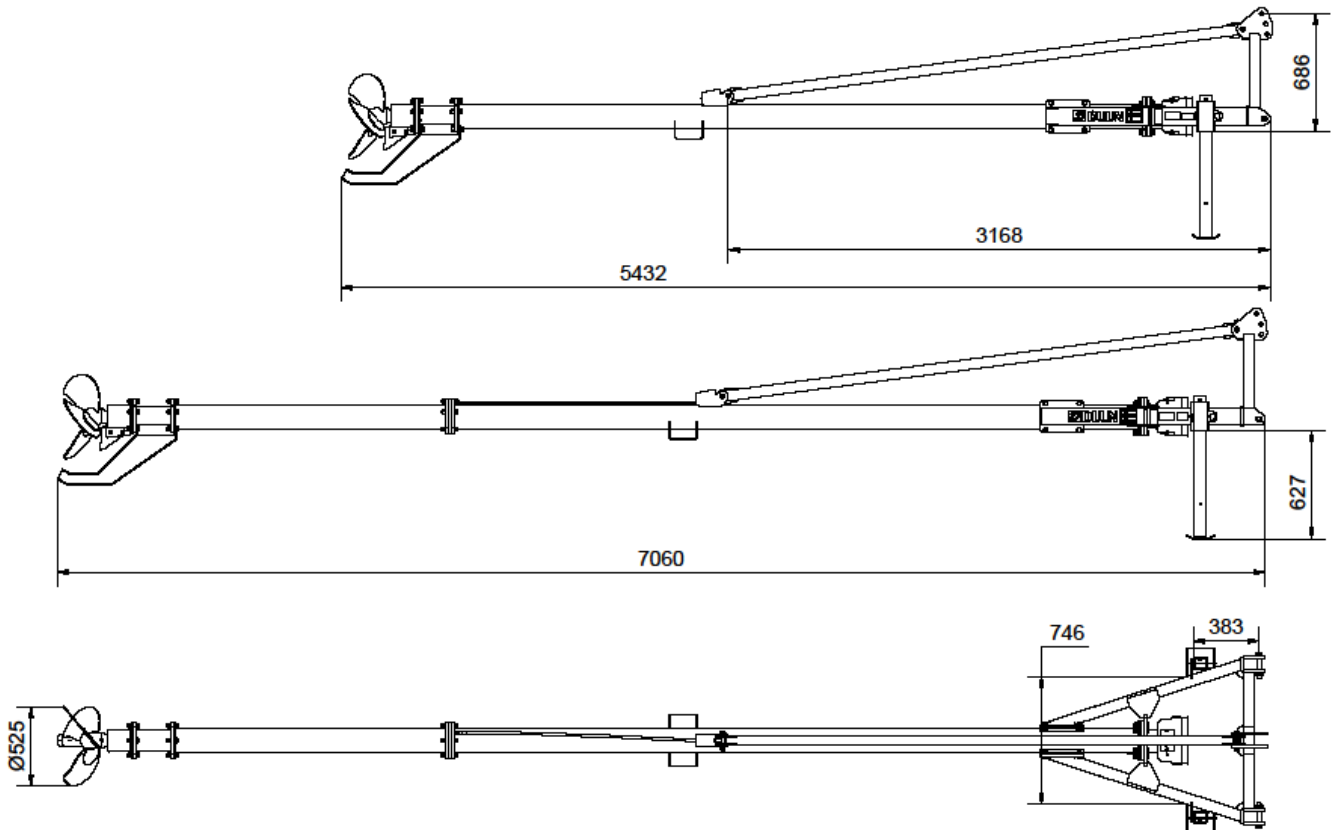
As the employment of the product is beyond our control, we may only guarantee the quality and do not accept liability for the product's general performance.

Duun Industrier as reserves the right to modify the design and specifications and/or make alterations and improvements without notification.

What is not included in the guarantee:

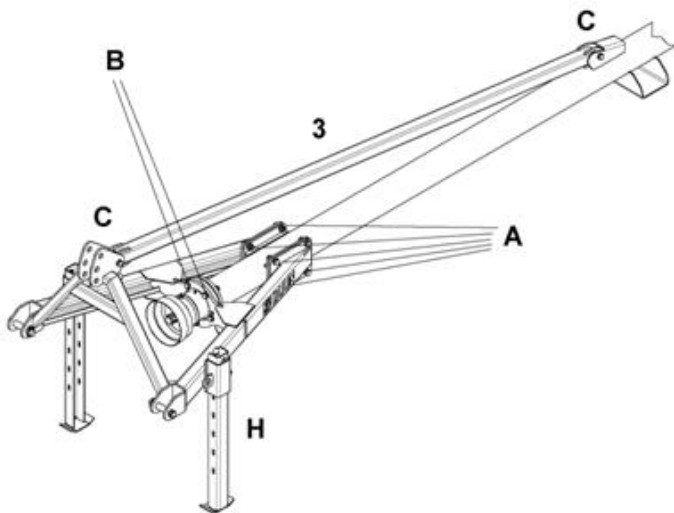
- The guarantee does not cover economic loss as a consequence of interruptions.
- The guarantee does not cover consequential loss due to defects.
- The warranty does not cover damage to galvanization as a result of mixing in acidic liquids.
- The guarantee does not cover defects or damage caused by misuse and uses that are not in accordance with the instruction manual's specifications and guidelines.

Technical data of propeller agitators



Features	Propeller PO50 5m	Propeller PO70 7m
Net weight	260 kg	320 kg
Total length	5432 mm	7060 mm
Total height for insertion	620 total 642mm	620 total 642mm
Power transmission shaft speed and power requirement	750 rpm approx. 100 hk 1000 rpm approx. 150 hk	750 rpm approx. 100 hk 1000 rpm approx. 150 hk
Number of blades on propeller	3 pcs.	3 pcs.
Diameter of propeller	555 mm	555 mm
Minimum insertion opening on the wall	500 mm	500 mm
Power transmission shaft	Wide angle 8th shaft	Wide angle 8th shaft
Standard connection pin	1 3/4" 6z	1 3/4" 6z

Mounting instructions



Assembly before use

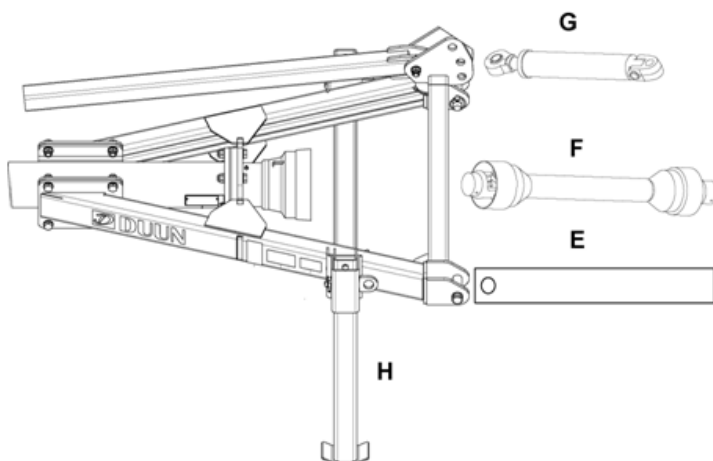
The main part three-point linkage 1 and the propeller stem itself 2 are assembled with screws at points **A** and **B**.

First, fasten the connection at point **A** with 8 hexagon screws M16x45 with spring washers and lock nuts.

The connection in point **B** is made with 5 hexagon screws M16x60 + spring washers and lock nuts. These screws must be tightened step by step, i.e. all are added soluble and the shaft is rotated, then the screws are further tightened and the main shaft is rotated 5-10 times before the screws are added with a torque of 200 nm (i.e. approx. 40kg on a 0.5m arm.)

The bracing rod 3 is fixed at points **C** with 2 hexagonal screws M16x110 + spring washers and lock nuts.

The support legs for the three-point linkage are adjusted to a suitable height before proceeding with connection to the tractor.



Connection

Check that no one is standing between the tractor and the machine during connection. Back the tractor up to the propeller agitator, and stop the engine before mounting the lifting arms in the three-point linkage.

Stabilizing rods/support rods on tractors must be used, i.e. locked to ensure that the agitator does not have uncontrolled lateral movements while driving.

It is very important to connect the stirrer that the tie rods (**E**) are as parallel as possible to the power transmission shaft (**F**), as illustrated. The hydraulic top strut (**G**) makes it possible to angle the stirrer. The support leg (**H**) for the three-point linkage are raised to the top position when the stirrer is in use.

ATTENTION

Under no circumstances should the stirrer rotate when it is not immersed in liquid - This is due to the bearings in the bottom zone being lubricated by the manure mass!

Rotating shaft

Before connecting the power transmission shaft, ensure the following points.

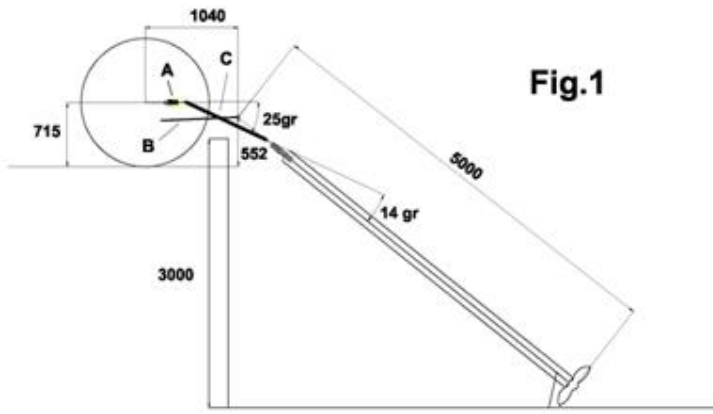
Make sure that the shaft's protective tubes are intact and that the two halves of the shaft fit freely into each other. The length of the power transmission shafts must be adjusted carefully, if it is too long it can damage the bearing in the tractor's PTO or the propeller's bearings. Also ensure good lubrication of the profile tubes. Read the instruction manual for the power transmission shaft.

Check that the PTO shaft can be rotated by hand to ensure it is not buckling anywhere.

Make sure, all covers for the shaft are in good condition and correctly fitted. Never start the machine without this being in order! Pay particular attention to the plastic covers on the power transmission shaft. If these are damaged, they must be replaced immediately! The locking chains for the plastic covers must always be attached to suitable fasteners on the propeller to prevent the covers from rotating. The covers are lubricated according to the specified interval.

Mount the PTO shaft on the tractor's PTO with the shear bolt coupling against the propeller agitator. Safety chain is attached to the propeller to prevent rotation of protective covers. The power transmission shaft must always have a shear bolt coupling max. 4180 Nm. Check that the power transmission shaft will not sit in tension when the machine is lifted to a maximum or min. height. Also note that the angle of the shaft can be too large when using very short shafts - contact the supplier - importer.

PTO shaft examples of working angles

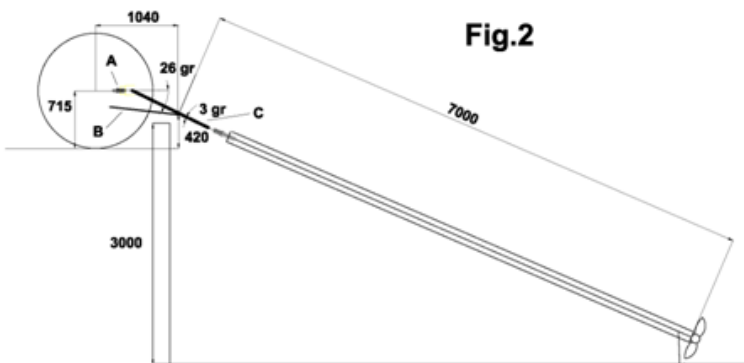


5 meters of propeller tubes in 3m width reservoir

- A – The tractor's PTO
- B – The tractor's drawbar
- C – Power transmission shaft

Example, with base in wheel diameter 715mm and drawbar length 1040mm and drawbar height above the ground 552mm.

It is an advantage the largest working angle, in this case 25 degrees, occurs at the wide-angle intersection that is closest to the tractor - in this case 25 degrees. Which is the max. The angles can be distributed between the tractor coupling and the propeller coupling (14 degrees in this case) by raising and lowering the drawbars (B).



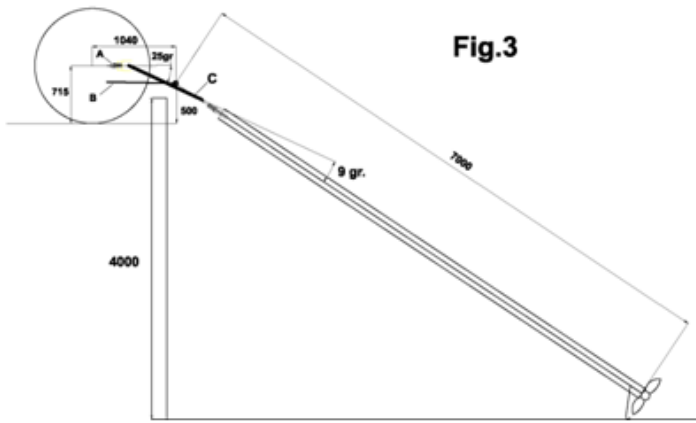
7 meters of propeller tubes in 3m width reservoir

- A – The tractor's PTO
- B – The tractor's drawbar
- C – Power transmission shaft

Example, with base wheel diameter 715mm and drawbar length 1040mm and drawbar height above the ground 420mm.

It is an advantage the largest working angle, in this case 26 degrees, occurs at the wide-angle junction closest to the tractor - in this case 26 degrees. which is more than the maximum. The angles can be distributed between the tractor coupling and the propeller coupling (3 degrees in this case) by raising and lowering the drawbars (B).

In this case, the drawbars should be raised to reduce the angle at the tractor and increase the angle at the propeller connection.



7 meters of propeller tubes in 4m width reservoir

- A – The tractor's PTO
- B – The tractor's drawbar
- C – Power transmission shaft

Example with base in wheel diameter 715mm and drawbar length 1040mm and drawbar height above the ground 500mm.

It is an advantage the largest working angle, in this case 25 degrees, occurs at the wide-angle intersection that is closest to the tractor - in this case 25 degrees. which is max.

The angles can be distributed between the tractor coupling and the propeller coupling (9 degrees in this case) by raising and lowering the drawbars (B).

In this case, the drawbars should be raised to reduce the angle at the tractor and increase the angle at the propeller connection.

Work over edges

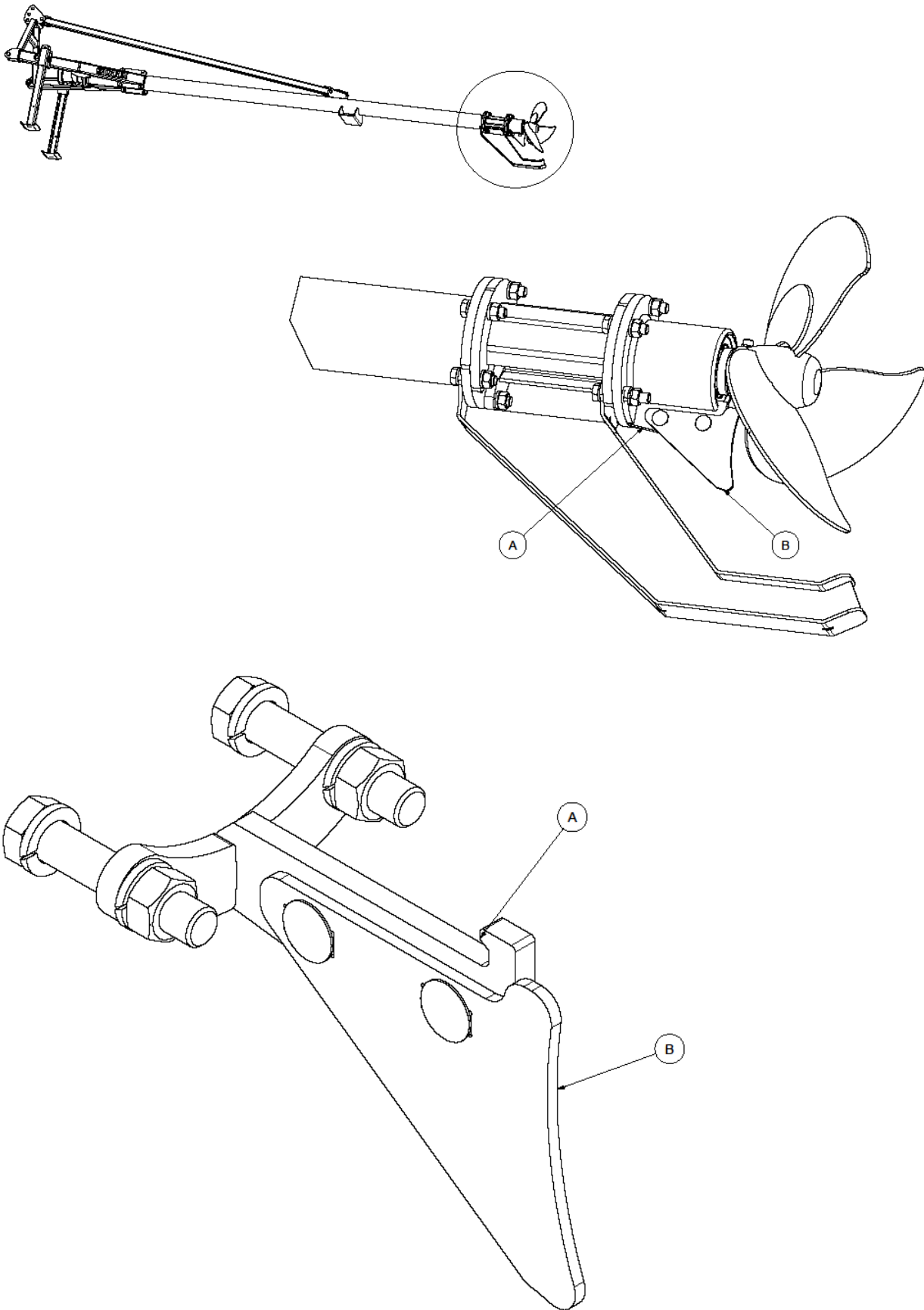
In such situations where the drawbars cannot be lowered, the largest angle occurs at the connection between the tool and the power transmission shaft. In such cases, a wide-angle shaft with the wind angle closest to the implement is recommended (art.number 2961163).

Lubrication under large working angles and heavy loads

Wide-angle shafts are basically not designed for constant operating angles. During large angular deflections and large forces, the shaft must therefore be lubricated often to ensure proper lubrication.

Interval: every 2 operating hours.

Cutting knife for extra cutting of the mass

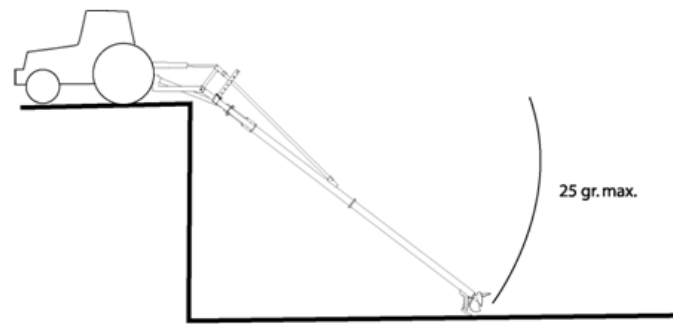


To achieve better cutting of "long-haired" manure, you can mount the accessory 132129015 Cleaning knife set. P.O. Mk2.
The set contains the mounting bracket (A) and the cleaning knife itself (B).

Agitation practical use

Limitation of working angles

The agitator should never have a working angle that exceeds 25 degrees as illustrated. It is recommended that the maximum angle at the connection between the power transmission shaft and agitator is a maximum of 25 degrees and the same angle between the tractor and the power transmission shaft is a maximum of 6 degrees. Please note that it is disadvantageous for wide-angle shafts to go in the same track all the time, i.e. work at a constant same angle. This can be remedied by varying the height and angle while driving - this applies especially when driving at the "extremities".



Tractor protection

The tractor should stand on a level surface during agitation for reasons of cooling system and lubrication of the PTO. Protect the tractor from moving forwards or backwards while stirring, ref. points A, B. The agitator exerts large pushing forces and the tractor should therefore be locked against involuntary forward movement while driving. Also be aware of large side forces from the propeller when it breaks the fluid layer - crust and similar.

Gas hazard!!

During the stirring and loading of slurry, gas is produced, which in strong concentrations can be fatal to humans and animals. Implement safety regulations.

Acidic liquids - corrosion

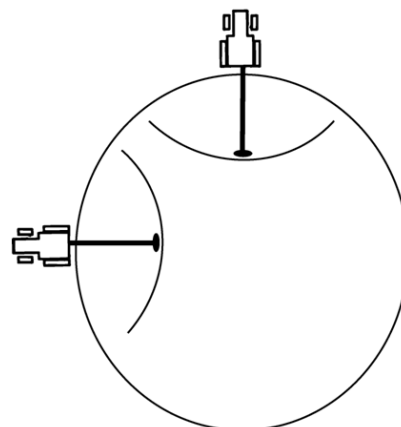
The stirrer is not intended for use in liquids with a low PH value - typical such are reservoirs with a large amount of silo juice, process water, etc.. Such liquids can damage the hot galvanizing and we accept no responsibility for such a damage. During the use in acidic liquids, it is strongly recommended to rinse the stirrer after use.

Avoid contact with the wall during stirring

Despite the fact that the support leg protrudes beyond the diameter of the propeller, it is recommended to keep a good distance from walls.

Step-by-step stirring – processing

In large tanks it is advantageous to start processing by making sections as outlined (semi-circles) just below the surface. After the sections have been established, the stirrer is placed in the reservoir at an angle to rotate the mass. To avoid unnecessary sedimentation of the mass, it is an advantage to change the direction of rotation at regular intervals.



Correct speed

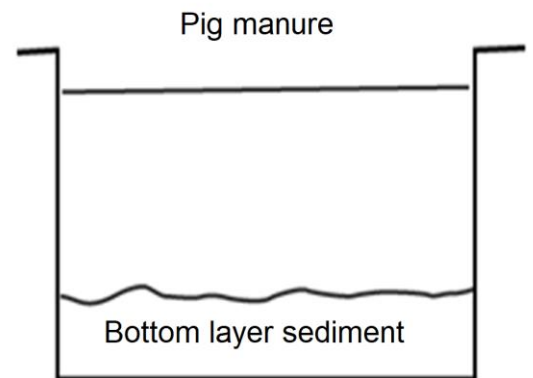
The mixer is designed for up to 1000 rpm. speed. Therefore, it is important to enter a speed that is favorable to the tractor and does not cause vibration. During an increase in speed, one will experience vibrations below so-called critical revs caused by self-oscillations. The effect of the propeller increases in line with speed and power consumption.

Avoid dry running

We draw particular attention to the fact that the bearing below the propeller is lubricated by the slurry mass in the same way as thousands of slurry pumps! This is a proven and reliable price cut with its origins in ship equipment. For this reason, the propeller must not be operated without a liquid supply.

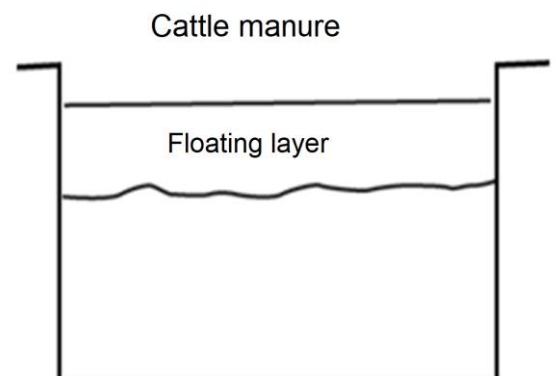
Stirring in cattle manure

Manure from cattle will form a thick fluid bed as illustrated. Most of the solids in this manure are concentrated here. This layer must be mixed with liquid before loading into a tanker and driving out. This is the best done by the propeller starting work submerged in the transition between wet and dry. After making cuts in circles as outlined on the previous page, the propeller is tilted in a submerged position to cause the mass to rotate in the reservoir. If the mass does not rotate, this indicates the dry matter content is too high and water must be added. It is very important you do not start unloading - loading before the reservoir is well mixed and of the same consistency - otherwise you will often experience problems with thick mass at the end. The propeller also has a lower efficiency when it has to work at an angle (basin with a small amount) - it is therefore an advantage to drive out the main amount of slurry at the same stirring, since the mass very quickly separates into a floating layer and liquid.



Stirring in pig manure

Pig manure stands out with large amounts of sediment and often a thin floating layer. Therefore, you should first break up the fluid layer in the same way as for cattle manure. Stirring is then carried out as close to the bottom as possible. Since pig manure sediments very quickly, it is important to keep stirring near the bottom going continuously during discharge. Here it is even more important to run out the main amount of slurry at the same stirring, since the mass settles very quickly and is difficult to stir with low filling in the reservoir.



Service and maintenance

First of all

Before cleaning, lubricating, repairing or adjusting the machine, stop the engine, activate the handbrake and remove the key during the work. Pay special attention to safety during maintenance work, park the machine in accordance with specified safety rules.

Subsequent inspection of screw connections

Screws, nuts, nipples and bolts on the machine must be retightened after two hours of operation.

Cleaning after use

The propeller is cleaned with a high-pressure washer after use. To carry out rough washing of the tube, you can wash via the drain holes in the stem. It is also recommended to drain the inside of the upper cover tube by filling in water and letting this flow out through the same hole after filling the tube inside. This requires the propeller is tilted forward with the three-point linkage as the lowest shaft point.

Lubrication of the central bearing

This is lubricated every hour during operation and at the end of driving via the lubrication nipple at point A (7m propeller only). This is to ensure the bearing supports the shaft as best as possible. It is very important the bearing has a fresh supply of lubricating grease when the mixer is parked after stirring. **NB! It is important to fill the hose with lubrication during assembly that lubrication reaches the bearing immediately.**

Lubrication of the front main bearing

It is necessary to lubricate this bearing frequently under the heavy loads. The bearing is lubricated via the grease nipple at point B.

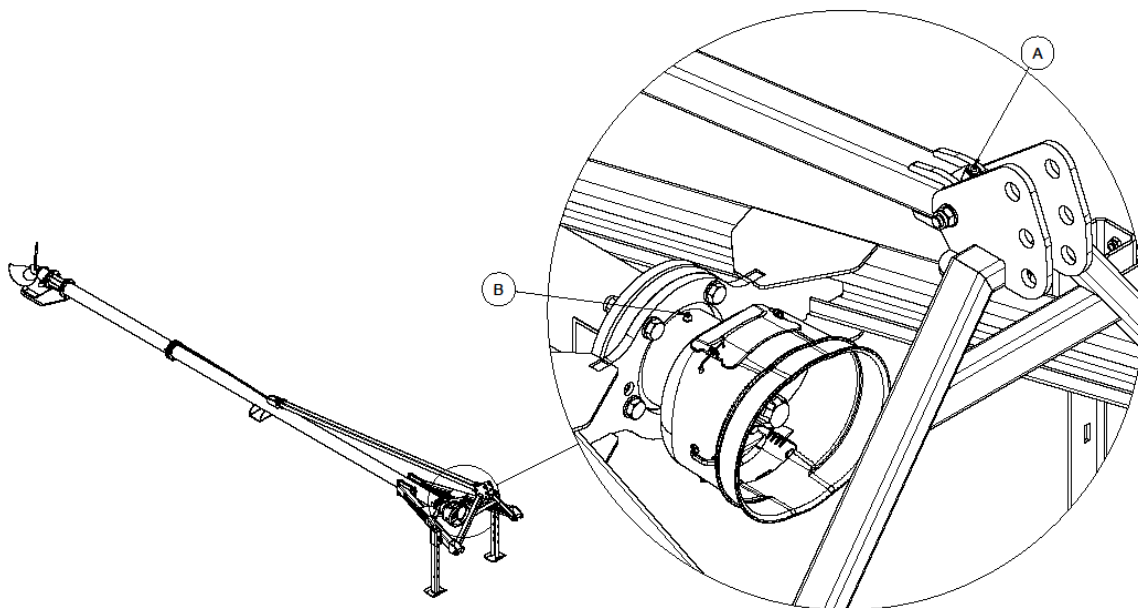
Interval: Every 4th operating hour and at the end of driving. Recommended amount 7-8 grams per times minimum. It is very important the warehouse has a fresh supply of lubricating grease when the mixer is "set aside" after stirring to prevent slurry damage to the warehouse.

Power transmission shaft

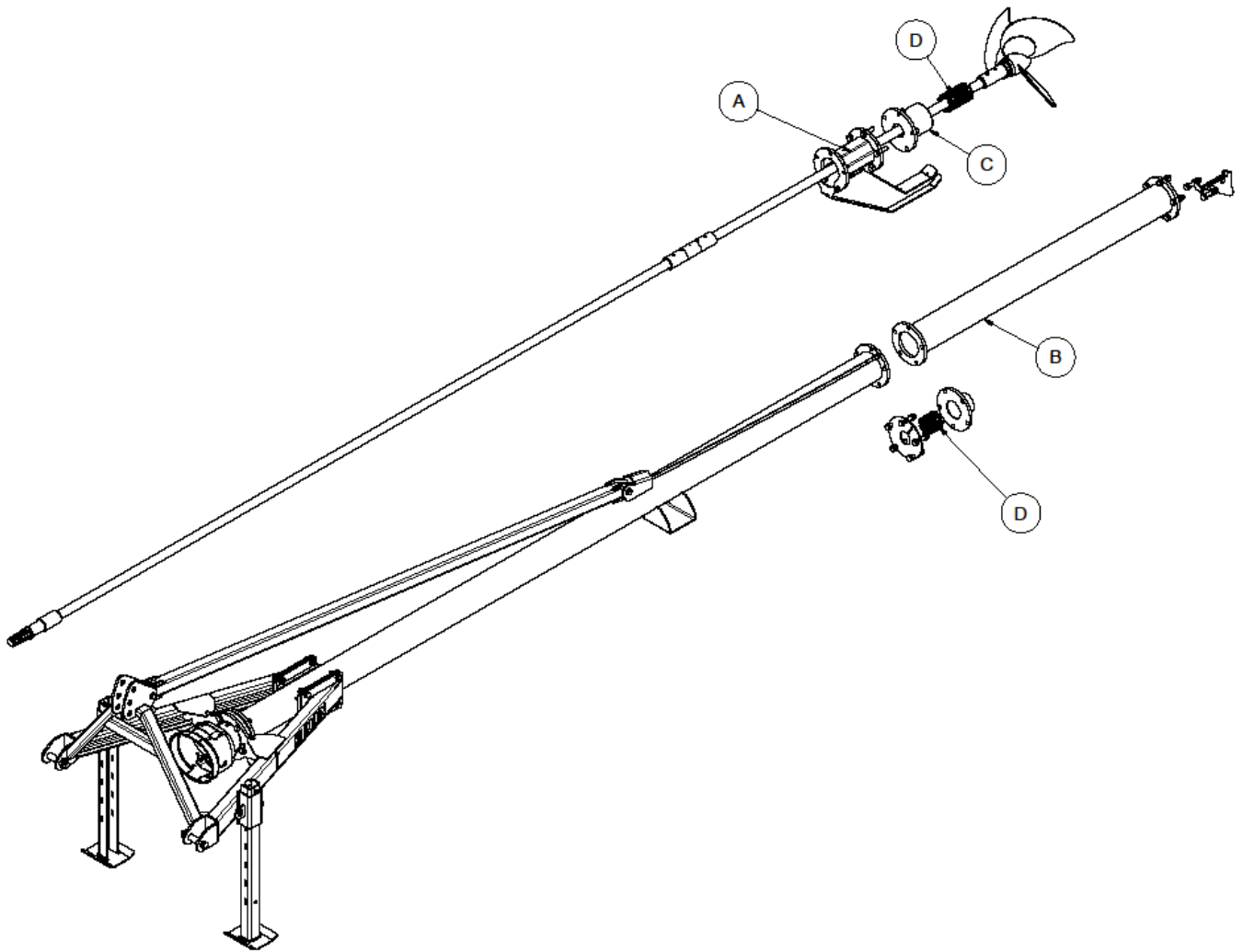
When the wide-angle shaft works at a fixed angle, the lubrication interval should be 2-4 hours to ensure that the shaft has a sufficient supply of lubricating grease.

Interval: Every 2-4. operating hours. Maintained in accordance with the enclosed instruction manual. Please contact the supplier if this is missing.

Grease quality: Good quality universal grease.



Replacement of bearings



During change of the lower bearings (D) and middle bearings (D PO70), unscrew part (A) from the propeller shaft so that you can push part (C) up to change the lower bearings and part (B) up to change the middle layers. Lower storage 4 pcs. 2245028. Central storage 2 pcs. 2245028.

Roller bearings and sealing rings replacement instructions

It is recommended this operation be carried out at a workshop

During installation of a new bearing in the propeller hub, it is important, it is done correctly for the life of the bearing. The bearing to be installed consists of five parts, the parts must be oriented to each other as they are in the packaging, do not change any parts.

First, press in a new outer ring with a suitable tool, be careful not to damage the hub or bearing ring, it is the best if you use a tube or shaft with a slightly smaller diameter than the stock one. Further on, insert rolls with spacer sleeve, here it is important the bearing is inserted in the same order as it was taken out of the packaging. Lastly, the last bearing ring is pressed into place.

The sealing ring behind the hub (facing the propeller tube) must be mounted with the spring side facing the propeller tube. Cavities around springs are filled with grease before assembly.

The propeller shaft is rotated approx. 20 revolutions while tightening the five screws on the hub, for the bearing to sit better. Rotate between each tightened bolt.

Lubricate the bearing well after assembly, there is no danger of the shim ring bursting since the rear shim ring will evacuate excess grease.

Shear bolt coupling

Remember to lower the machine, stop the tractor's engine and disconnect the PTO before fitting a new cutting bolt. Bolts in the form of hexagons are used here. screw M12x65 qual.8.8.

Disconnection

This is done in the opposite order of connection.

Working on the machine and the PTO shaft, the power supply to the tractor must be disconnected.

The machine must be placed on a level surface.

The power transmission shaft must be disconnected and hung on a hook attachment.

Locking bolts for drawbars released.

The machine disconnected and can be left.

Illustration for changing the Plastic bearing below the propeller (32) + PVDF - bearing (3).

Gas hazard

1. Measures and points in connection with slurry gas.
2. Extraction fan in the basement contributes to negative pressure and extracts the gas.
3. If there is an open connection between the cellar and the animals housing, the grates can be covered with plastic to contribute to negative pressure when an extraction fan is used. A gas-tight connection between the animals housing and the basement provides better security, especially when combined with an extraction fan in the basement.
4. Stir downwind - if possible with open windows, doors and closed gate.
5. If the discharge from stirring flows into the surface of the slurry storage, strong gas development occurs - especially in the starting phase. This is due to mixing of air and slurry mass.
6. Open doors in the barn and the gas will have a low outlet in the farm building itself.
7. Use a gas meter at all times in the animal rooms during slurry pumping. We believe this is absolutely necessary regardless of the type of pump and whether or not you have a tight connection.
8. Avoid unnecessary stay near the shaft and propeller during slurry release/stirring.

We therefore recommend the IBT article (Department of Technical Sciences ÅS/NLH) no. 33/87 "measures against slurry gas poisoning" for more details.

9. Never stir in calm and windless weather!
10. Ensure proper ventilation in animals housing. Let all fans run at full blast, remember, all doors and windows must also be opened.
11. Make sure that ventilation fans do not draw air from the pump inside. If there are openings in the gate or pump sump and the wind direction blows against these, slurry gas can be forced from the basement up into the barn.
12. Do not stand near the filling opening of the transport tank during filling, or in the pump pit during stirring.
13. Never enter animals housing where there may be suspicion of slurry gas without a gas mask with gray filter B. Remember that there must be enough air present even when you use a mask!
14. Never go down into a slurry cellar or tanker without fresh air equipment.
15. If possible, agitation should be carried out when there are no animals inside.
16. Stir gently. Remember, new equipment can increase the effect and make the stirring more powerful and increase the risk of a gas accident.

*Points 9-16 ref. Agriculture's HSE service.
www.lhms.no*

Declaration of conformity

Responsible person

Name: Karl Martin Eggen
Position: CEO
Company name: Duun Industrier as
Address: N-7630 Åsen
Norway
Telephone: +47 74 01 59 00

Person responsible for the technical documentation: Rolf Even Duun

Declares that the following machine: PO50 Mk2 Slurry mixer
Manufacturer: Duun Industrier as
Type: Duun Slurry mixer PO50 Mk2
is in accordance with:

Directive 2006/42/EC Machinery

Signed by:



Karl Martin Eggen

Åsen, 15.09.2020

Declaration of conformity

Responsible person

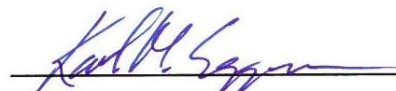
Name: Karl Martin Eggen
Position: CEO
Company name: Duun Industrier as
Address: N-7630 Åsen
Norway
Telephone: +47 74 01 59 00

Person responsible for the technical documentation: Rolf Even Duun

Declares that the following machine: PO70 Mk2 Slurry mixer
Manufacturer: Duun Industrier as
Type: Duun Slurry mixer PO70 Mk2
is in accordance with:

Directive 2006/42/EC Machinery

Signed by:



Karl Martin Eggen

Åsen, 15.09.2020