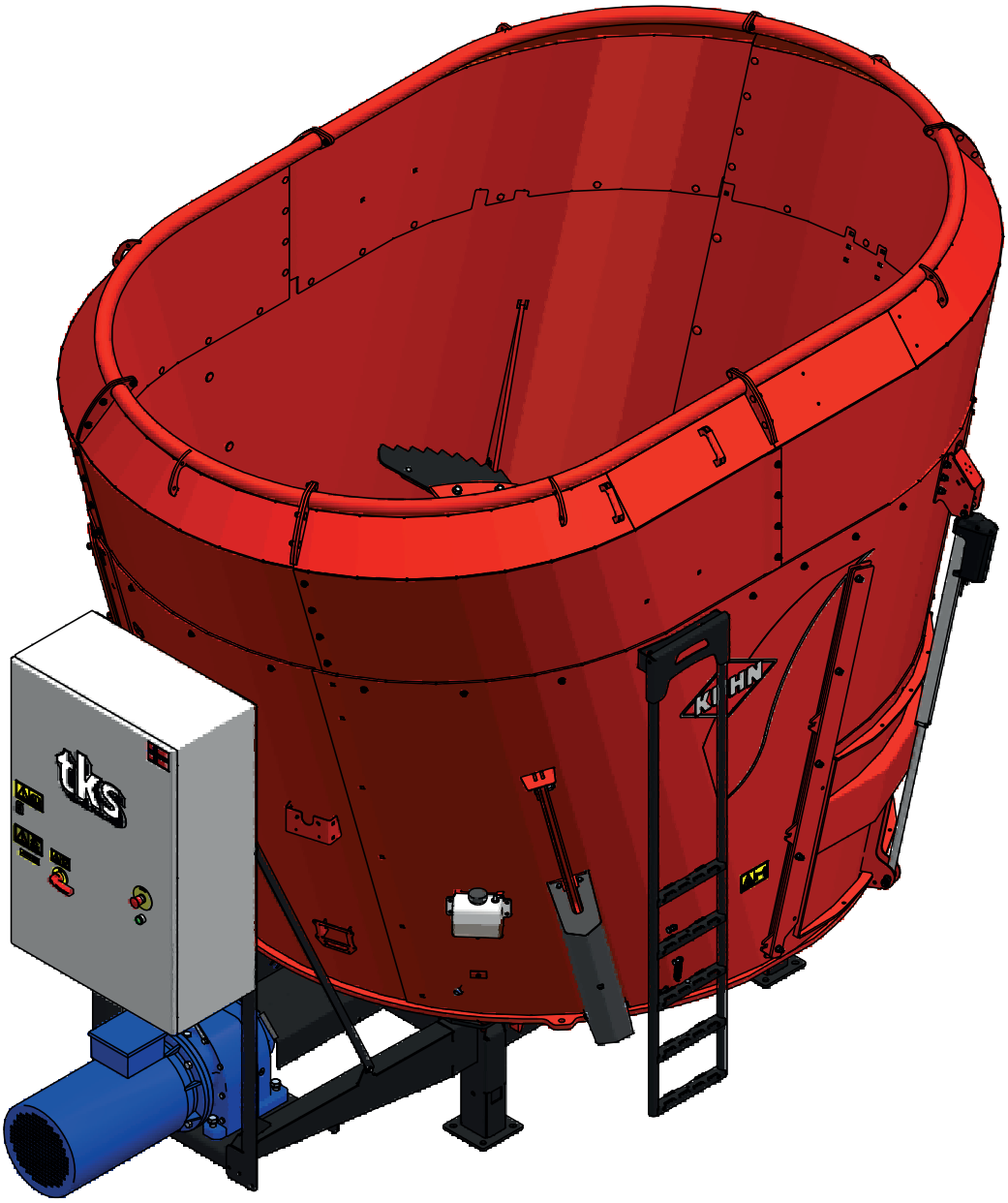
Operator's manual
TKS
Kuhn FeedMixer



1 General safety instructions

1.1 CE - Declaration of conformity

We,
TKS Agri AS,
Kvernelandsvegen 100
N-4355 Kverneland
Norway
declare that the product:

TKS Kuhn - FeedMixer

has been built in conformity with the Machine Regulations, and meets the relevant fundamental health and safety requirements.

Kverneland, 9 September 2016

Atle Sjølyst - Kverneland
General Manager

Enter the serial number of the machine here :

_____

TKS Agri AS, manufacturer of agricultural products, reserves the right to change the design and/or specification of its products without prior warning.
This does not imply any obligation to modify previously supplied machines.

1.2 Guarantee

This TKS product is guaranteed against manufacturing and material defects for one year.

If the owner wishes a defect to be covered by the product guarantee, he or his representative must inform the dealer of this when ordering parts and/ or repairs. Claims must be reported within the guarantee period.
The dealer must complete a claims form for each case covered by a guarantee and send it to TKS or TKS's distributor/ importer within the 10th of the month following the one in which the defect was reported.
The defective parts shall be marked with the claim number and be kept for up to 6 months so that TKS or TKS's distributor/ importer can inspect them.
Since TKS products are used outside the manufacturer's control, we can only guarantee the product quality, and not that it will perform its function, nor are we liable for any consequential damage.

The guarantee is not valid if:

a) third party spare parts are used, or the product is repaired or altered without the approval of TKS
b) the operating and servicing instructions have not been followed.
c) the machine has been used for other purposes than those for which it is designed.

The guarantee does not cover damage due to normal wear and tear.
Official safety regulations specify requirements that apply to the users/ owners and manufacturers of this machine, relating to the careful review of safety hazards that may arise when this type of machine is used correctly. Therefore, TKS and our importer/ distributor are not responsible for the functioning of components that are not shown in the spare parts catalogue for this product.
TKS reserves the right to change the design of the product without this implying any obligations in relation to previously supplied machines.

NB! It must be possible to identify all enquiries relating to this product by the product's serial number; see page 9 on Machine identification.

Content

1.3 Introduction

Congratulations on buying your new TKS product. You have chosen a functional, high quality product. A network of helpful dealers will be able to advise you on its use, as well as provide servicing and spare parts.
All TKS products are designed, tested and built in close cooperation with farmers and machine workshops to ensure optimal effi ciency and reliability.
Please read this instruction manual carefully and familiarise yourself with the machine‘s manner of operation before starting to use it. There are many conditions and variables that can affect the machine's functionality and manner of operation. It is therefore vital that you consider all known conditions and adapt usage according to these. A good understanding of the machine‘s manner of operation and performance, together with a high degree of knowledge with regard to feeding and feed types/consistencies will ensure the best possible result. The machine is a highly advanced feed robot that operates without the need for supervision and must be used in accordance with the applicable instructions from the manufacturer and other regulations in force at any given time.
By being thorough and making the necessary adaptations to local conditions, you will ensure the best possible results.

Yours faithfully
TKS Agri AS

TKS Agri AS,
Kvernelandsvegen 100
N-4355 Kverneland
Norway

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1.4 FeedMixer
1.4.1 Model description and area of use

FeedMixer is designed for cutting silage, round bales, square bales and most types of forage.
It cuts most types of round bales and silage. The cut depends on the consistency and type of feed.
FeedMixer is particularly useful for creating a good mix in a short time.
It is therefore suitable for mixing full feed, which often involves mixing feed types of very different consistency and character.
It is important that finer ingredients and smaller quantities are mixed quickly before the structure of the feed is damaged. With its powerful motor and augerdesign, you will quickly obtain a loose and homogeneous material that can be easily dispensed from all types of feed carts or belts.
FeedMixer has vertical augers that produce a fine material in which the structure of the feed is retained. It is particularly important with pre-dried material that the feed is not compressed into wet lumps. This will reduce the feed intake to the animals.

To achieve the best possible result, more time and involvement is required than "traditional" feedout methods. The quantities of individual feed types and the duration of the mixing process must remain the same each time mixing is performed if composition and consistency are to remain uniform – otherwise feed intake and production will be affected.
All functions are electrically operated. The counter knives are moved in position during mixing and retracted during the discharging process.
Where FeedMixer has to discharging several times a day, the door is closed between each operation.
FeedMixer can be equipped with a sensor that reset mixing time, when a new bale is loaded into the machine while mixing process initiated
When weight system record loads under 200 kg in the mixer while discharging, the rotational speed increases in order to clean the augers and threw off the rest of the feed.
FeedMixer can be supplied in sizes from 8 - 27m^3. Sizes of 8 - 12m^3 are supplied with one auger, while sizes of 18 - 27m^3 are supplied with two augers. The electrical control system controls all functions, and it has been configured for operating a conveyor belt. The mixing motor is controlled by frequency inverter, enabling a soft start-up and stop.

The controller also includes measurement of power consumption, so you can keep an eye on what it costs to use FeedMixer for a day, a week or a month, for instance. An electrical stationary mixer is significantly cheaper to run than tractor-powered models.

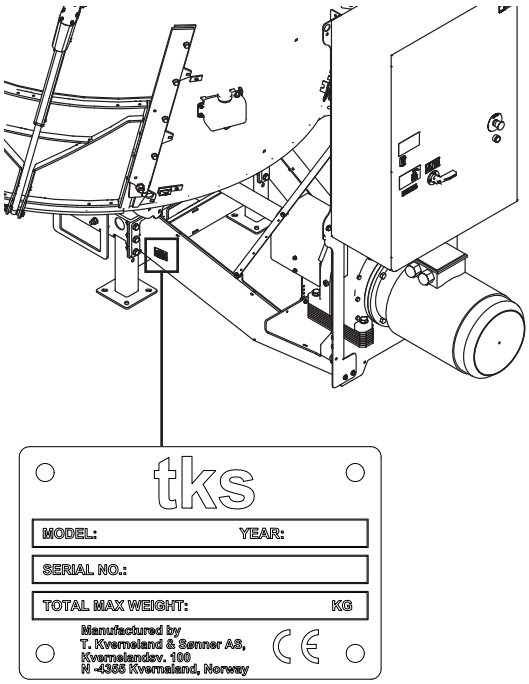
NB: The instructions given in this operator's manual apply to standard operating conditions. Individual circumstances may arise at the premises of the user that deviate from the instructions provided here.
The need to make changes to the machines and equipment as a result of such circumstances shall not constitute grounds for making a claim against the manufacturer or supplier.

Climate, temperature, grass types, time of cutting, cutting/pressing equipment and conservation methods are some factors that may affect the functionality and performance of the machine. It is important to adapt and adjust the machine to suit local conditions in order to achieve the best possible result.

Chapter 1 describes the design of the machine and the functions of its individual components. FeedMixer is occasionally pictured with optional equipment fitted. Any optional equipment is labelled as such in this instruction manual and can be supplied at an additional cost.

1.4.2 Machine identification

The machine's serial number and the address of the manufacturer are written on the machine. See the illustration on this page.
Please use the information on the name plate when making any enquiries about spare parts or servicing.
This product is CE marked. This mark, along with the associated written EU confirmation, means that the product fulfi ls current health and safety requirements, and complies with the following directives: Machine Directive



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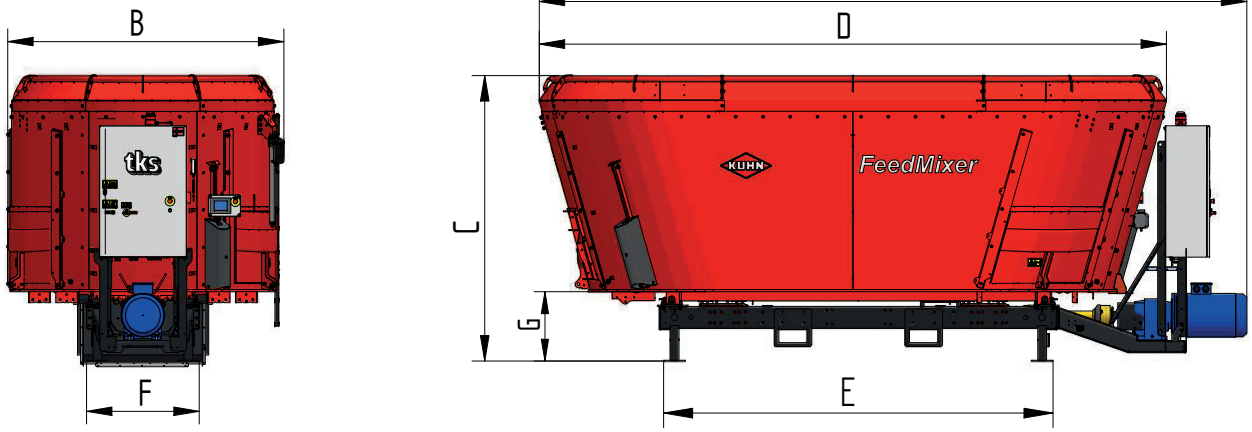
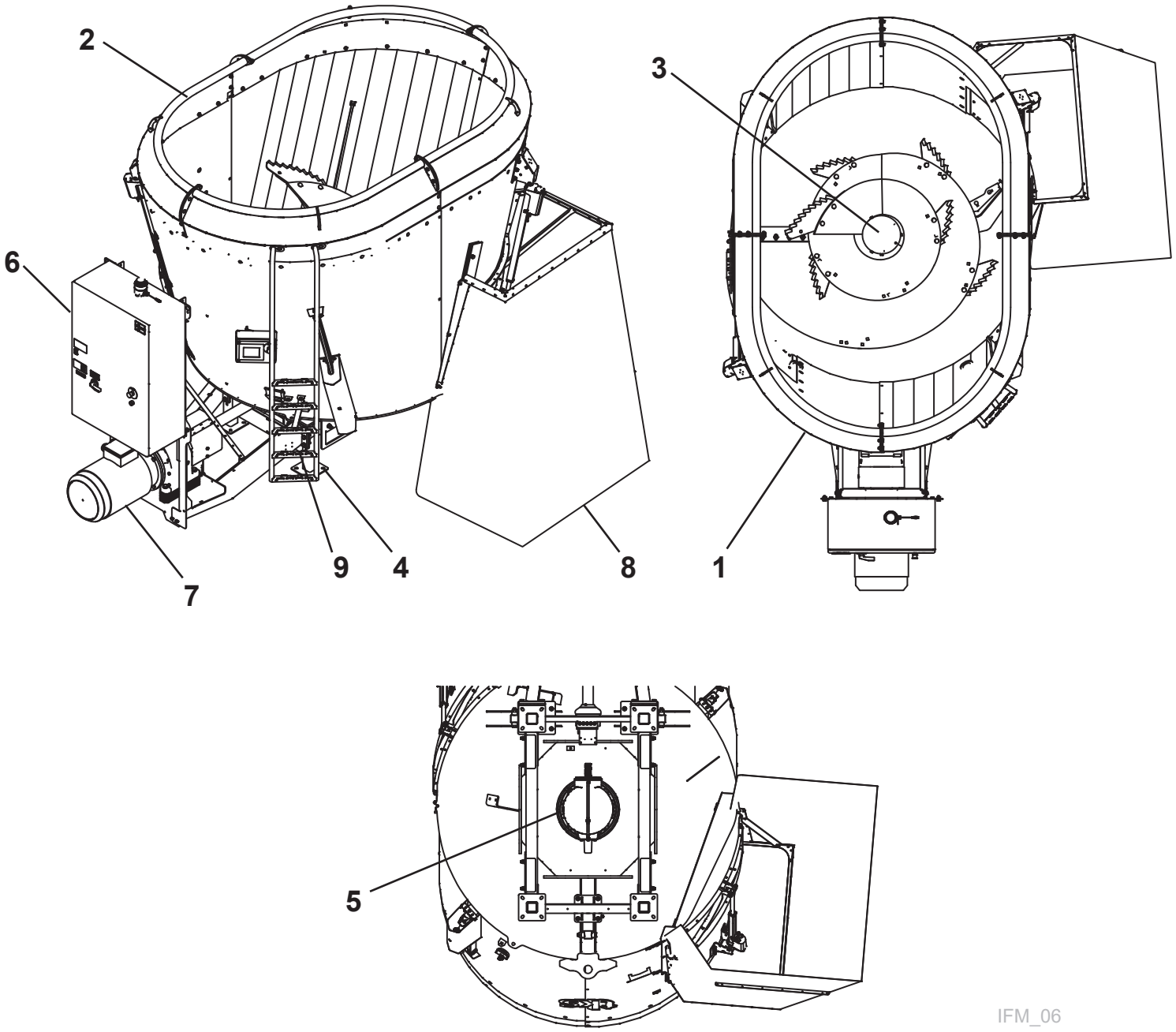
1.4.3 Technical data - measurement



Model	Size in m^3	Length mm A	Width mm B	Height mm C	Length Mixing hopper D	Length w/legs E	Width w/legs F	Height under Mixing hopper G	Weight Kg	Motor kW
8.1 DS	8	4350	2350	2410	3240	1600	1035	687	3000	22
10.1 DS	10	4350	2350	2760	3240	1600	1035	687	3100	30
12.1 DS	12	4350	2350	3010	3240	1600	1035	687	3300	30
18.2 DL	18	6620	2550	2330	5710	3575	1035	634	6200	37
22.2 DL	22	6620	2550	2620	5760	3575	1035	634	6400	37
25.2 DL	25	6620	2550	2890	5920	3575	1035	634	6600	37
27.2 DL	27	6620	2550	3020	5990	3575	1035	634	6800	45

1.4.4 Technical description

1 Mixing hopper
2 Extension kit
3 Auger
4 Weighting cell
5 Gear unit
6 El. cabinet
7 Gear motor
8 Feedout chute
9 Counter knives with activator



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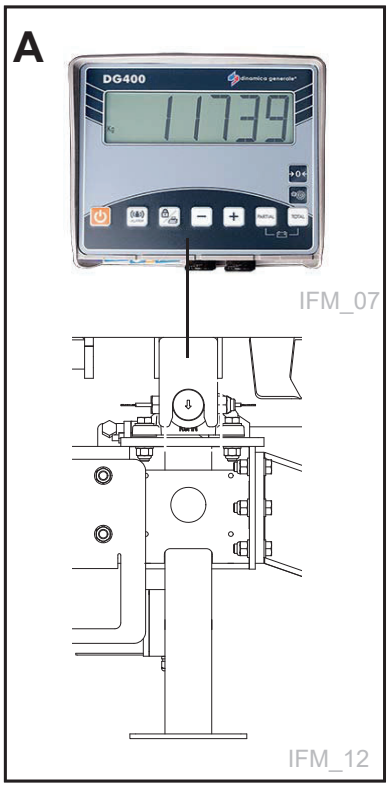
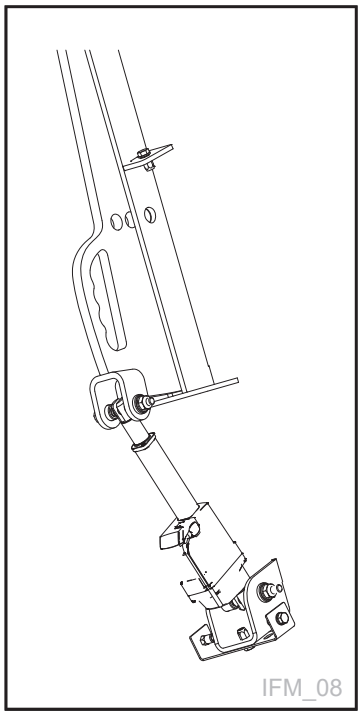
1.4.5 Equipement

Equipment:
A Loading cell
B Counter knife with activator





1.4.6 Optional equipment

Optional equipment:
Auger k-nox stainless wear steel

1.5 Safety

Please pay particular attention to this symbol. It designates a safety risk, and describes precautions that must be taken to avoid accidents. The control cabinet must be powered off and locked with padlock when maintenance is performed.
Before operating, adjusting or repairing the machine, the user, technician or owner should familiarise himself with the safety instructions contained in this installation manual.

Safety at work is your responsibility!
Please read and understand these general safety instructions.

1.5.1 General safety instructions

In order to be able to load the bale into the hopper, the machine must be open.This means that people may come into contact with moving parts if they are standing in the immediate vicinity of the machine while it is in use.

Warning! Once the auger is running, never lean over the top edge of FeedMixer or enter the hopper when the machine is operating.
If the machine is placed in a sunken floor, the distance from the floor to the top of FeedMixer must not be less than 1.5 m.
It is a conditional requirement of using the machine that no one must be in the immediate vicinity of the machine during use.
In addition, in terms of machine type, FeedMixer is of conventional agricultural design and, from a safety perspective, the solutions choosen are considered to be on a par with or superior to existing products on the market.

Use of the machine
The machine must only be used for the purpose for which it is designed.

Operating
The machine operator must remain at the end of the machine where the control box and the associated operating panel are mounted.

Supervision
The owner/operator must ensure that the area is sufficiently signposted and that there is no unauthorised access.

The machine's method of operation
The operator must familiarise himself with the machine's method of operation and function so that the machine can be used in a safe and appropriate manner.

Keep a safe distance
Humans and animals must be kept away from the machine when it is in operation.
Keep your distance from working, rotating and moving parts.

Think safety at work
Never climb on the machine while it is operating.
When performing maintenance, the power supply must be disconnected

Warning – audio and illuminated indicator
The control system (software) has been updated for safe start-up. A built-in buzzer sounds for 30 seconds before start-up of the machine. This audio signal is accompanied by a light signal that flashes during the entire period of operation.

Protective guards
Check that all guards are in place and installed correctly. Do not start the machine until this has been done. Damaged guards must be repaired or replaced immediately.

Spare parts
For safety reasons we recommend that you only use original spare parts. The use of third-party spares invalidates the product guarantee.

Maintenance
Ensure that the machine is properly maintained and is kept in good condition. Never attempt to change the mechanical workings of the machine.

The area in which the machine is operating
Must be physically sealed off or locked to prevent danger to humans or animals.

Control panel
The power supply must be cut off before opening the panel.

1.5.2 Additional safety instructions

The machine is marked with a ⚠ warning signs. If these signs are damaged, they must be replaced.

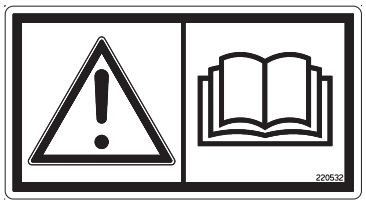


Fig. 1

Warning sign UH220532 (Fig. 1)
Be careful! Ensure that you read and understand the instruction manual before using the machine, and before making any adjustments or performing any maintenance.

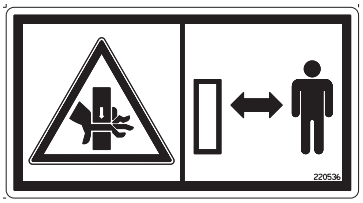


Fig. 2

Warning sign UH220536 (Fig. 2)
Risk of crushing hand.
Keep away from the counter knives.

Fig. 3

Warning sign 988346 (Fig. 3)
The main power switch must be secured by a padlock.
Work should only be performed by authorised personnel.

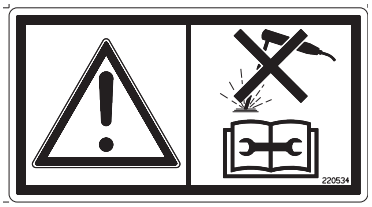
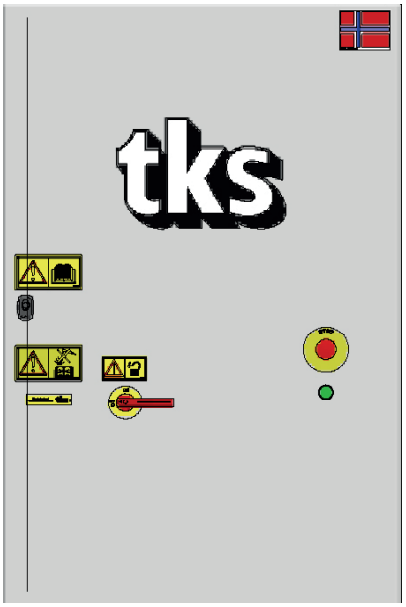
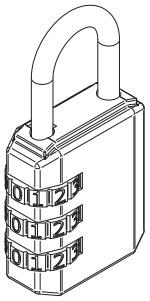


Fig. 4

Warning sign UH220534 (Fig. 4)
Disconnect all electrical connections before carrying out welding work or maintenance.

1.5.3 The control cabinet must be secured with padlock



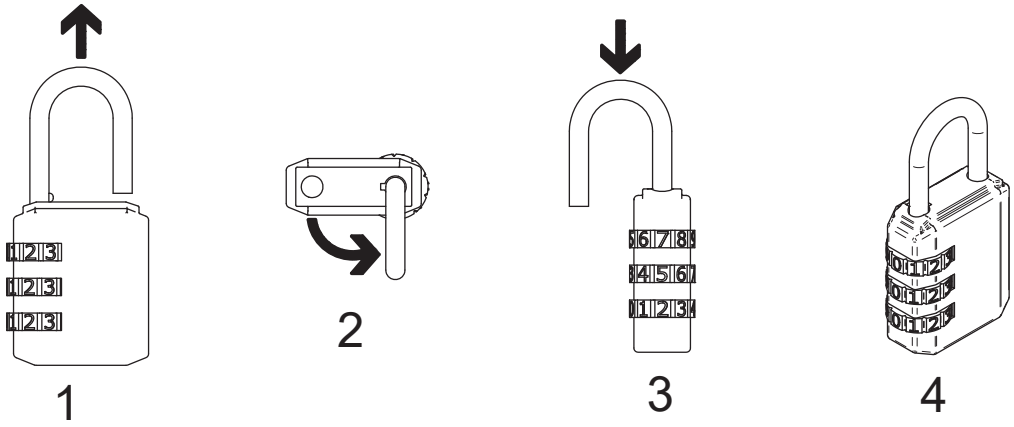


Important!

The control cabinet must be powered off and locked with padlock when maintenance is performed, especially when knives are sharpened or beeing replaced.
The padlock can be found inside the control cabinet.

Enter your personal code:

1. Set the three code pads so that 0-0-0 is set in the middle of the arrow marker on the short edge of the padlock and raise the handlebar.
2. Turn the hoop 90^{O} counterclockwise and push it down as far as it goes.
3. While holding the hoop down, enter your personal code using the three code discs.
4. Release the hoop and turn it back to its original position.



NB! The padlock are now ready for use with your personal code.

1.5.4 Lifting the machine

The lifting straps are attached to the points screwed into the bottom of FeedMixer.
See Fig. 5
Use an extra strap to help keep the machine in position.

Caution!
Never stand underneath a suspended load. Any persons carrying out lifting operations must of course have the appropriate qualifications/ skills.

Be careful!
Keep your distance when moving the machine. Ensure that there are no persons underneath or near the machine during lifting.

1.5.5 New machine - caution

Read the operator's manual
Be particularly careful when starting a new machine for the first time. Installation faults, incorrect operation, etc. may lead to expensive repairs and loss of earnings. The TKS product guarantee does not cover damage resulting from failure to follow the recommendations contained in the instruction manual.

Please pay particular attention to this symbol. It is used to highlight important information, to help prevent incorrect installation and operation.

Pay particular attention to the following when commissioning a new machine:

- Check that the machine is correctly installed and that it is not damaged. Check to make sure that electrical cables are long enough, and positioned in such a way that they can track the movements of the machine without being damaged.

1.5.6 Lifting point

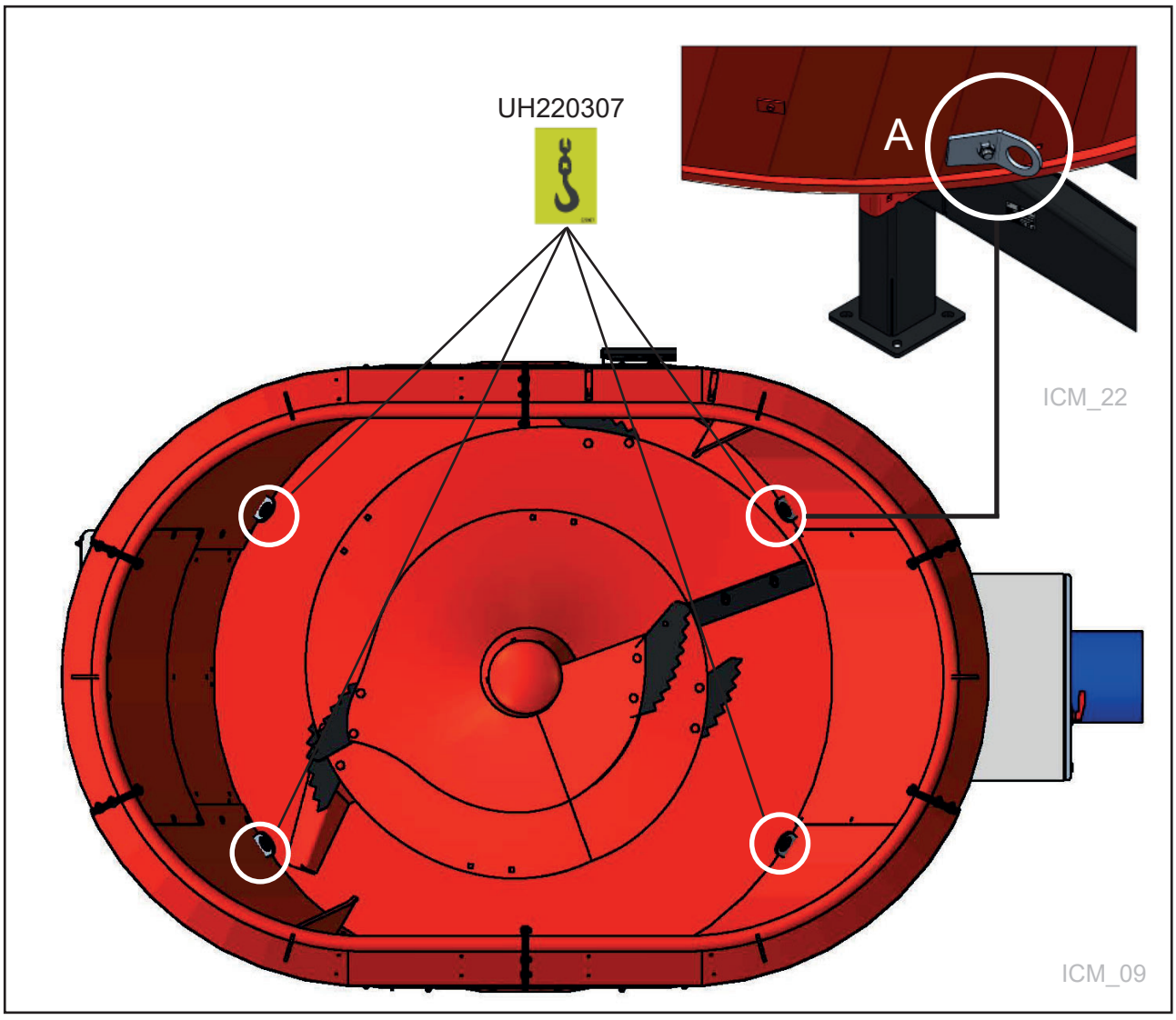


Fig. 5

Lifting point
Detach the four lifting points **(A)** after the machine is hoisted into place, and fit them to the outside of FeedMixer for subsequent use as and when needed. **See Fig. 5**

2 Function

2.1 Auger

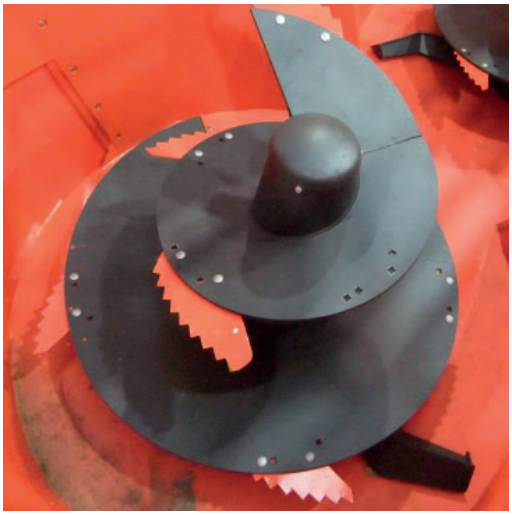


Fig. 6

During the mixing process, the auger transports the feed upwards to the middle of the mixing hopper.
The feed then falls off the mixing auger and a mixing cycle is created.

2.2 Knives

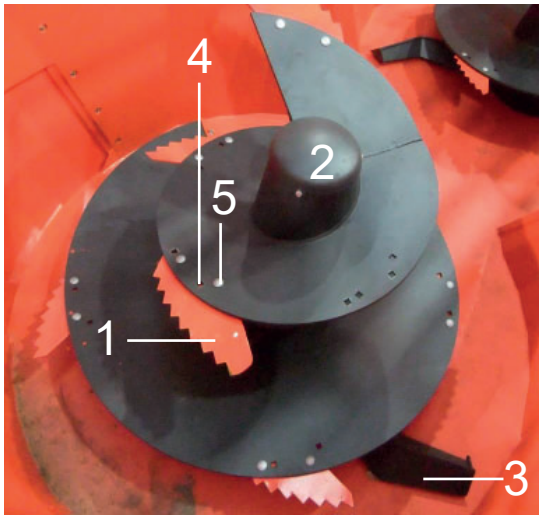


Fig. 7

The auger **(2)**, which is equipped with knives **(1),** finely chops up the feed constituents that have been loaded into the mixing hopper.
A discharging arm **(3)** together with the blades of the auger ensure a more stable and even discharging process.
See Fig. 7

The knives on the auger can be set to an aggressive position (4) or a normal position (5). The adjustable knives allow the mixing system to be adjusted to suit individual operating conditions at the company and the structure of the feed constituents.

Aggressive = short mixing time, higher power consumption.

Normal = longer mixing time, lower power consumption.
(E.g. if the fuses are smaller)

2.3 Overflow extension

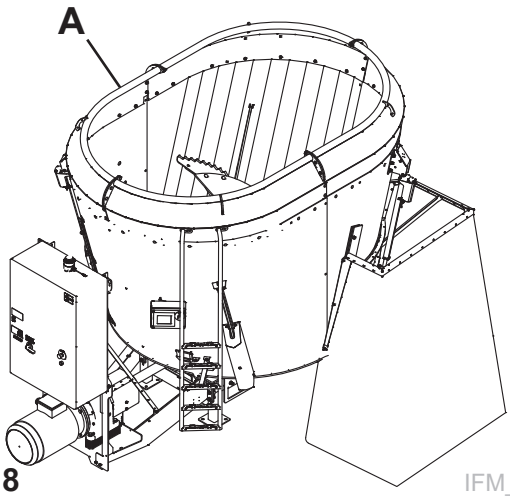
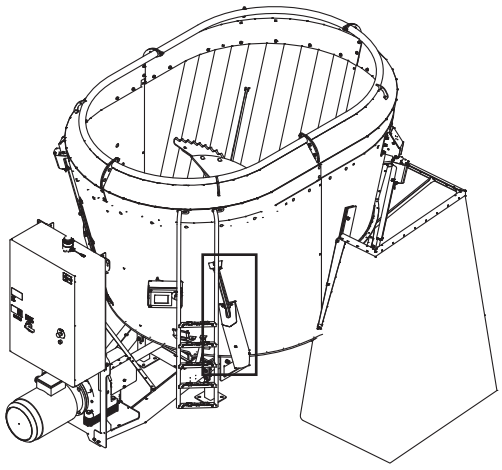


Fig. 8 IFM_13

- The anti overflow extension **(A)** prevents feed from being thrown over the edge of the hopper during the mixing process.

See Fig. 8

2.4 Counter knives



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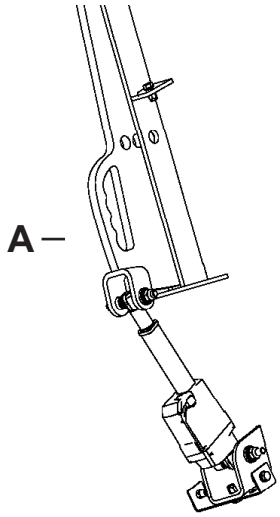

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Fig. 9

A better cut is achieved by using counter knives **(A).**

Counter knives are used to prevent rotating of round and square bales for a better cut.
The counter knives move in and out automatically, depending on whether the FeedMixer is in mixing mode or discharging mode.

- The counter knives are moved at mixing mode.
- The counter knives are retracted in discharge mode.

Automatic movement of the counter knifes can be disabled. The counter knifes can be placed in the desired position – deployed, retracted, or in the midway position.
See Fig. 9

Enabling the counter knives.

2.5 Door location

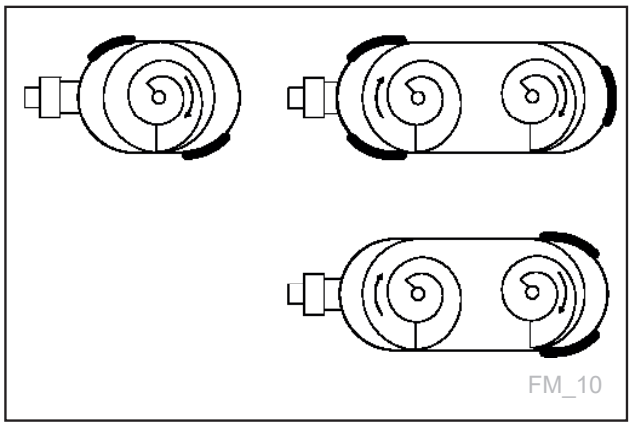


Fig. 10

FeedMixer has as standard option 3 doors. Possible optional discharge door location can be provided on request.
See Fig. 10

2.6 Ladder

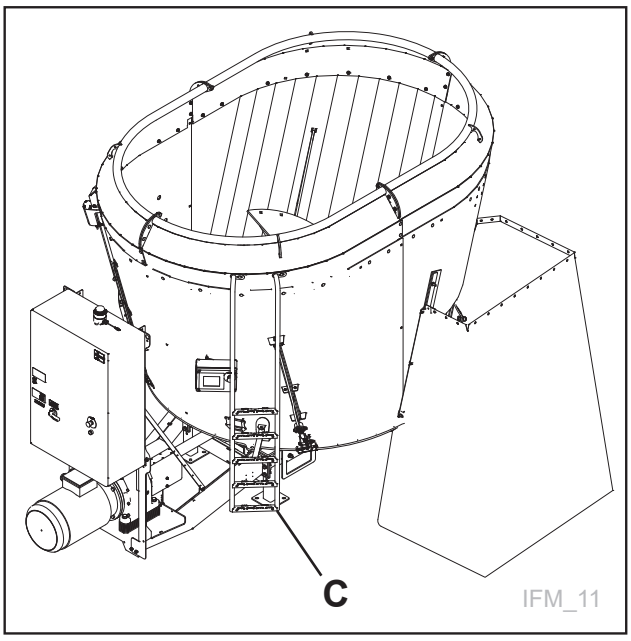


Fig. 11

Using a ladder **(C)** the operator can stand in a safe manner and keep an eye on the mixing process. If the ladder is used when discharging, an error may occur on the weight system.
See Fig. 11

3 Positioning and installation

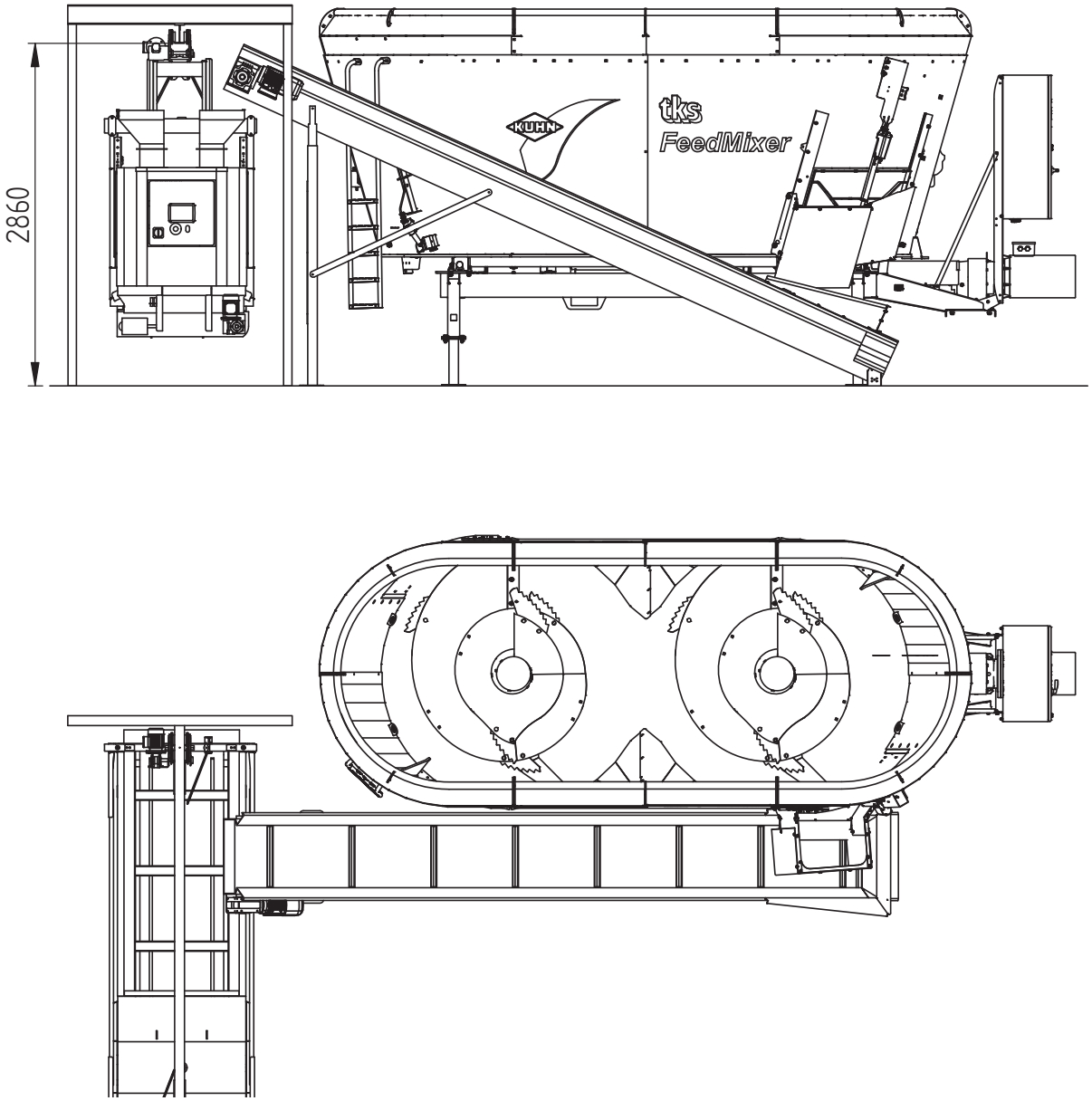


Fig. 12

NB!

Read before positioning FeedMixer:

- The surface must be designed to withstand the load of FeedMixer.
  See technical data chapter 1.4.3
- It is important that the surface is smooth and flat leveled to ensure that the weight system can work properly.
- If the machine is placed in a sunken floor, the distance from the floor to the top of FeedMixer must not be less than 1.5 m

3.1 Installation

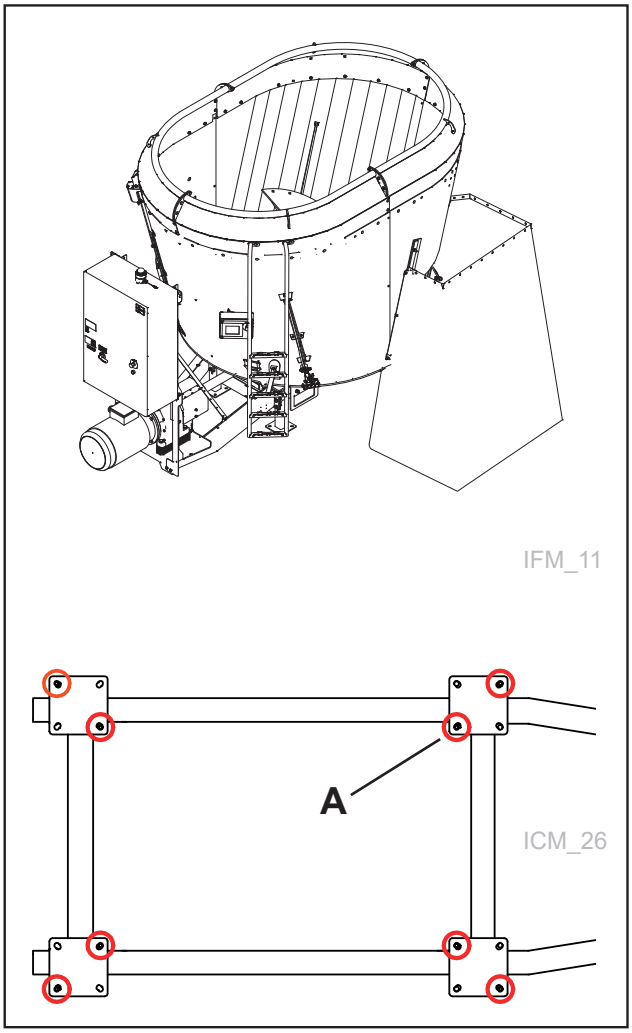


Fig. 13

- The machine is delivered assembled from TKS.
- Follow the installation instructions for FeedMixer precisely in order to avoid subsequent breakdowns.
- Remove all packaging.
- Remove equipment stored inside the machine.
- FeedMixer is secured using two expansion bolts placed diagonally opposite one another in each base plate **(A)**. These are included with the machine.
- The feeding shute for the door is flat-packed with associated bolts, and must be fitted in front of the door.

Important!

- All wiring for FeedMixer is performed at the factory by TKS.
- The power supply cable must be fitted by an authorised electrician.
- To achieve optimal operation, the power supply must have uniform and correct voltage in all phases. Fuses and cables must be adequately dimensioned.

See Fig. 13

3.2 Check gear oil level

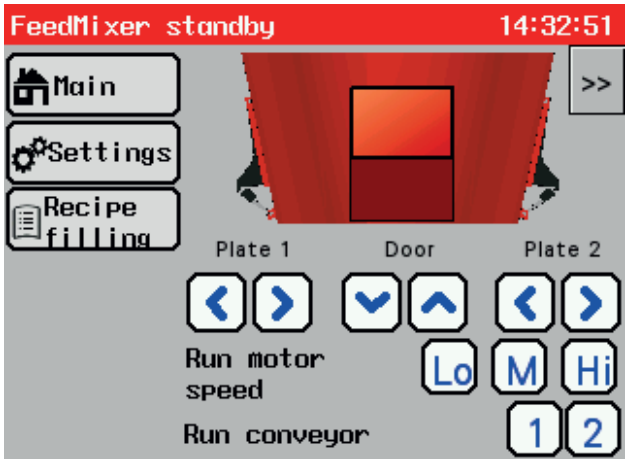
Fig. 14

- After installation and before FeedMixer has been commissioned, all the lubrication points on the driveshafts must be lubricated.
- Check the gear oil level in the oil tank. The level must not be below the mark **(A)** on the oil tank.

Se Fig. 14

See Chap. 6 on Maintenance and inspection

Function check



Important!

- Be careful when starting FeedMixer for the first time.
- Check all the functions on FeedMixer
- The functions are tested from the display
- Open manual control in the menu
- Press and hold the keys for the various functions

See User's manual TKS Controller

3.3 Remote control of the feedout process

When using FeedMixer together with an automatic feeding machine, separate pieces of electrical equipment must be connected. This equipment can either be a photocell a limit switch, or a radio transmitter and receiver

Connection must always be carried out by an authorised electrician.

Fig. 15

Photocell

The photocell is mounted on an I-beam.
Se Fig. 15

Function:

he limit switch measures the fi ll level in the feed cart or wagon.

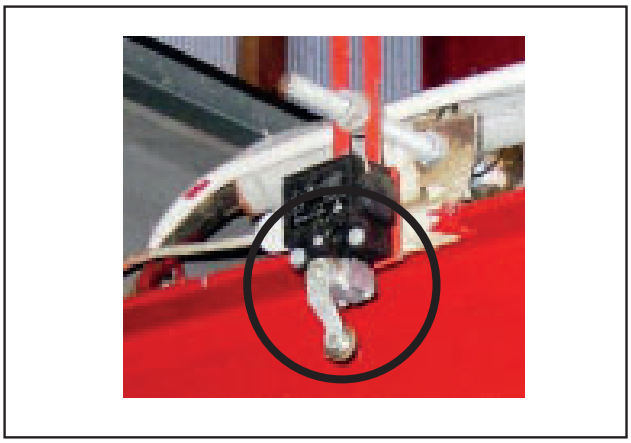


Fig. 16

Limit switch

The limit switch is fitted to the rail
Activated by the feed cart or wagon
See Fig. 16

Function:

The limit switch gives a signal when the feed cart or wagon is in position ready for filling.

4 Using FeedMixer

Dangerous situations may occur if components fail as a result of overloading FeedMixer!
The maximum payload of FeedMixer and the loading sequence for individual feed constituents must be observed

There is a risk of crushing and entrapment with subsequent risk of injury if you come into contact with any of the machine's moving parts.

Warning!

- **Once the auger is running, never lean over the top edge of FeedMixer or enter the hopper.**

Overloads may occur and blockages may be created if feed constituents get stuck on the counter knives.
Overloads reduce the performance and life time of FeedMixer.
The TKS warranty does not cover damage caused by overloading.

4.1 Loading

FeedMixer may only be loaded using suitable tools such as:

- Tractor with front loader/wheel loader
- Conveyor belt
- TKS Magazine R2
- TKS FeedHopper
- Crane

Important!

- When loading FeedMixer, carefully drop the feed from the lowest possible height inside the hopper.
- Dropping heavy loads from high heights may damage the equipment and is not covered by the warranty.
- Make sure that the feed does not stick to the edges of the hopper during loading.
- The hopper should ideally be loaded in front of or behind the auger, i.e. not in the middle just above the auger.
- With ideal loading it speeds up the mixing process, and it use less power.

4.2 Loading sequence

Light, dry feed is loaded first, before loading heavier, wetter feed.

Loading the bales

- Load the driest, lightest bale first.
- Wait for the bale to be ground up and cut into an even mixture before loading the next bale.
- Heavier, wetter bales (and any frozen bales) are loaded at the end.

We recommend consulting
a feed consultant to achieve the best possible mixture and optimal use of raw materials.

- Highly structured feed constituents (hay, straw etc.) should be loaded with the auger rotating.
- The mixing process can be left to run for a few minutes before adding the next constituent.
- Concentrated feed, and minerals should be loaded with the auger stationary.
  A stationary augerincreases the accuracy of the scales.
- Forage, maize and heavier feed constituents are added later during the mixing process with the augers rotating.
- Feed constituents with a higher water content, e.g. scraps, potato peel or turnip, are added toward the end of mixing process.
- Liquid feed constituents such as molasses and water are added at the very end.

4.3 Feed quantities

The loading quantity for a FeedMixer may vary due to the different feed constituents being loaded. The loading quantity depends on the following factors:

- The volume of the mixing hopper
- The dry matter content of all the feed con stituents
- Structure and straw length
- Order of loading

4.4 Mixing

The type and structure of the feed constituents being used, along with the desired cutting length of the feed mixture, determine the duration of the final mixing process.

- The mixing process will use longer time when using structured feed constituents.
- The counter knives slow the circulation of the feed in the mixing hopper. The further the counter knives are inserted into the mixing hopper, the braking effect gives better charging and mixing effect.
- The counter knives should be used to ensure good cutting of round and square bales.
- Blunt knives increases power consumtion power, for which reason the knives should be sharpened regularly.

See Chap. 6 on maintenance.

4.5 Warning sounds

FeedMixer gives audio alerts for functions during loading.

- If too much feed is loaded into the hopper, FeedMixer will give an audio signal indicating that the motor is operating at maximum load. No more feed must be loaded. The audio signal persists for as long as the motor remains under such strain. **Two short "beeps" – 5 seconds pause between sounds.**
- If more than 200 kg of feed are loaded after the mixing process is started, a new mixing time is activated. This requires that automatic reset of the mixing time has been enabled. **Two long "sounds"**

5 Troubleshooting

Fault	Causes	Procedure – error correction
Auger does not rotate	• *The shear bolt in the bolt-connection in front of the planet gear has sheared.*	• *Replace the shear bolt.*
Weight system, door or conveyor belt not working	• *Voltage too high.* • *Power cut.*	• *Check the fuses.* • *Turn off the mains supply for 30 seconds. Motor, door and counter knives will be reset automatically.*
Scales are showing incorrect values **Scales are not working**	• *The settings on the load cell amplifier are incorrect.*	• *The load cell amplifier must be configured correctly.*
	• *Auger connections on the scales' components have come loose.*	• *Retighten the augerconnections.*
	• *The switch is moist.* • *Insufficient contact in cables.*	• *Clean and dry the switch* • *(do not use contact spray).*
Alarm! **Door fault**	• *El. actuator does not reach top or bottom endpoints-within 30 seconds.* • *Silage in channel to door.*	• *Clean the outlet.* • *Check clearance in the slot of the door.*
Alarm! **Fault on limit switch for the counter knifes**	• *Both of the limit switches in the el. actuator give a signal.*	• *Check the cables for faults.*
Alarm! **Frequency inverter fault**	• *Power supply to the motor.* • *Overload/overheating on motor.*	• *Check the power supply.* • *Wait until the engine has cooled.* • *Press Reset alarms to reset the frequency inverter*
Alarm! **Conveyor fault**	• *Power supply to the motor. Overload on motor.*	• *Check the conveyor.* • *Enable motor protection.*
Alarm! **Feed feeding fault**	• *When there is no reduction in weight during the discharging process.*	• *Check the door outlet.*
Alarm! **External alarm input**	• *Fault in connected machine.*	• *Check connected machine.*

6 Maintenance and care

6.1 General safety instructions

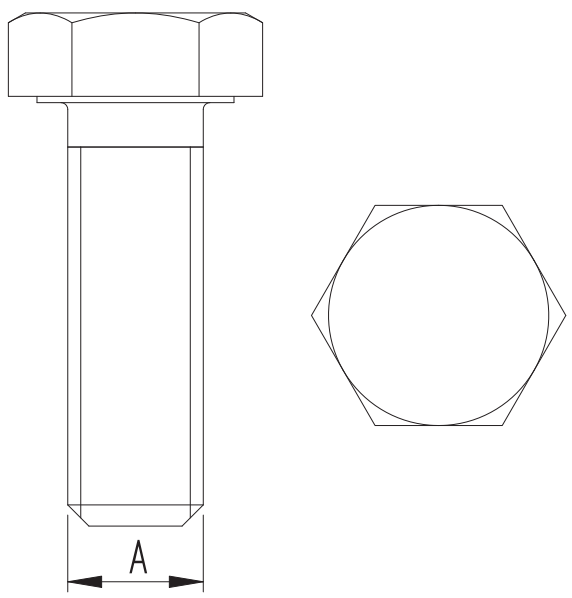
NB:

- Every time the machine is used, it is important to check the condition of the machine, and to ensure that safety equipment is in place if required.
- Make sure that all warning labels are in place and are legible.
- Cleaning, lubrication and adjustments of FeedMixer or the driveshaft must only be performed with the motor and power supply turned off.

- **Recommended procedure:**
- Disconnect the main switch from the machine. Only autorized personnel may perform such work.
- Avoid direct skin contact with oil and grease. In the event of personal injury caused by an oil leak, seek medical help immediately!
- Once maintenance and servicing has been completed, take care to refit all guards correctly.
- Check the torque of nuts and bolts initially after five hours of operation and then regularly (approx. every 50 hours of operation).

Retighten if necessary.

6.2 Recommended bolt torque



ICM_23

A	8.8	10.9
	Torque (Nm)	
M 6	10.3	14.71
M 8	25.5	35.3
M10	50.01	70.61
M12	87.28	122.58
M14	135.27	194.17
M16	210.84	299.1
M18	289.3	411.88
M20	411.88	576.5
M22	558.98	748.45
M24	710.99	1000.28

Fig. 17

6.3 Cleaning

Clean the machine regularly – and thoroughly when necessary. Dirt attracts moisture and causes rust to form.
After cleaning with a high pressure washer or steam, lubricate all rotating parts thoroughly.

Warning:
Electrical components such as the loading computer, junction box, loading cells and control panel must not be exposed to high pressure from a high pressure washer or steam cleaner.

6.4 FeedMixer – operation

- If FeedMixer is to be left inoperative over a longer period (more than one day), it must be emptied out completely.
- Disconnect the machine from the power supply.
- Clean the inside, outside and bottom of the machine.
- Remove accumulated plant debris.
- Repair paint damage in order to prevent rust. We recommend cleaning the machine as described in the section on maintenance.

NB:
Always disconnect the power supply before inspecting, servicing or repairing the machine.
.

The chapter on cleaning, servicing and maintenance is there for your own safety.

6.5 Shear bolt protection

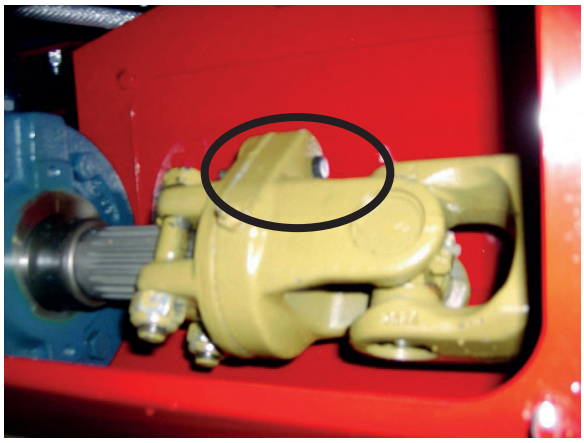


Fig. 18

The gearbox is protected by a shear bolt connection. If the shear bolt shears, the following action should be taken:

- Turn off the motor.
- Turn the main switch to the **"OFF"**.
- Secure with padlock.
- Remove the source of the overload, e.g. a foreign object, from FeedMixer
- Remove the protective cover.
- Remove the remains of the shear bolt.
- Rotate the driveshaft to the connection shaft so that the holes align.
- Replace the shear bolt M10X60:

Shear bolt 8.8 - used on a 11-37 kW motor
Shear bolt 10.9 - used on a 45 kW motor or larger
See Fig. 18

6.6 The auger knives

Fig. 19

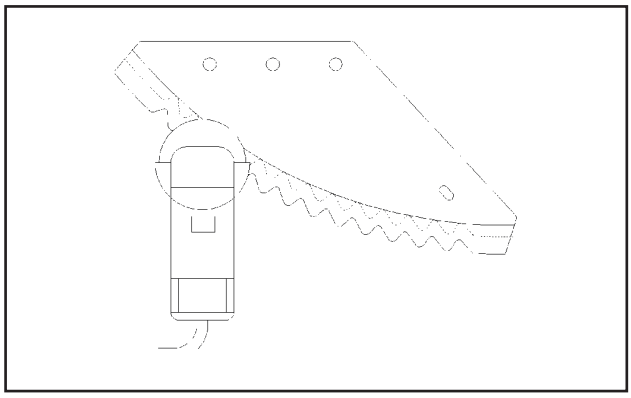


Fig. 20

Important!

Turn off the main switch and secure it before entering the feed mixer.

- The auger knives should be sharpened regularly.
- Blunt knives increase power consumption and mixing times while reducing cutting performance.
- The knives should be checked daily for visual faults.
- Replace damaged and blunt knives immediately.

To sharpen the knives, use an angle grinder with an undulating grinding disc.
Se Fig. 20
The knives must only be sharpened on the smooth side, never on the undulating side. Carefully resharpen the knives so that the blades are not exposed to excessive heat.

Precautions when sharpening knives:

- **Warning!**
- There may be a risk of the knives expelling grinding particles! This can cause serious injury, particularly to the eyes.

- When sharpening the knives, enter the empty feed mixer by stepping over the edge of the hopper.

- Use protective goggles and gloves.

- Carefully sharpen the knives on the smooth side.

- Clean the dust when sharpening is performed.

- Remove all foreign objects (tools, etc.) from FeedMixer.

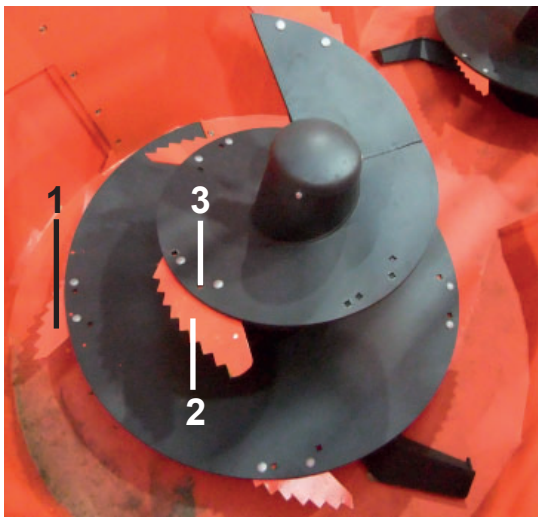


Fig. 21

If the blades become discoloured during sharpening:

- Excessive temperatures reduce the lifespan of the knives.

• The blades can be switched from "aggressive" mode **(1)** to "normal" mode **(2)** by reposition knife **(3)**

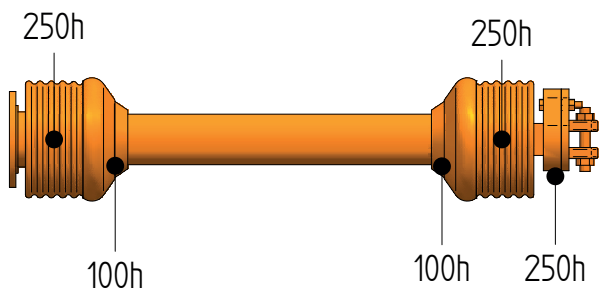
Aggressive = short mixing time, uses more power.
Normal = longer mixing time, uses less power.

WARNING!

- Exercise caution when fitting sharp knives!
- They can cause serious cuts to fingers and hands.
- Always use protective gloves when working with knives

- **Use the following tools when replacing knives:**
- Two spanners (size 19),
- protective gloves, edge guards for shielding the blades when fitting the knives.

6.7 Lubrication



Lubricating intervals for the main driveshaft are shown in the diagram on the left.
Further information can be found in the user manual published by the driveshaft manufacturer.
See Fig. 22

Oil level

- Always check the oil level when oil is cold.
- During operation the oil grows hot and the level rises.
- See oil level at expansion tank.
  Level shall be at mark.

Fig. 22

6.8 Oil change

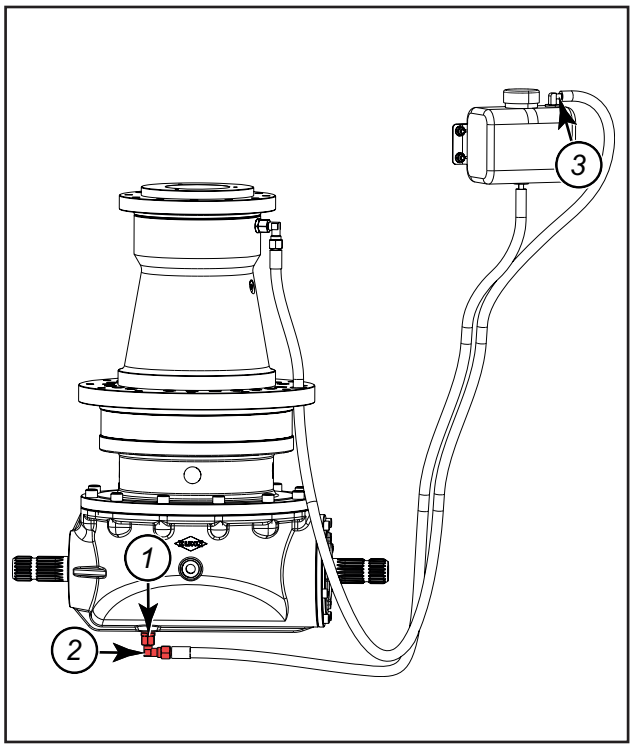


Fig. 23

NB:

Make sure that you do not slip on lubrication oil when draining and refilling the gearbox. Remove all traces of oil from the ground using a suitable product.

The drain plug for the right-angle gearbox is accessible underneath the machine.

- Place a hopper under the gearbox.
- Unscrew all fittings (1) and (2) under the right-angle gearbox.
- Wait until the oil has drained out.
- Disconnect the hose from the expansion tank (3).
- Blow air with a maximum pressure of 0.5 bar (7.3 psi) into the gearbox in order to empty it entirely.
- Fit all fittings (1) and (2) under the right-angle gearbox.

See Fig. 23

Before changing the oil in the right-angle gearbox, run the machine briefly to heat the oil slightly.

It is sound practice – and is also required by law in some countries – to treat wastewater using sedimentation and oil separation, and to practise controlled handover.

6.9 Filling with a pump

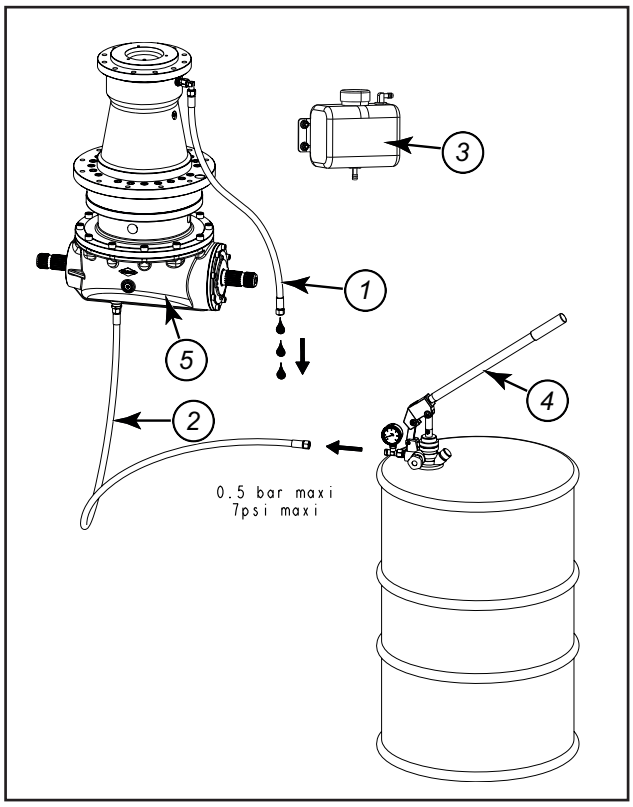


Fig. 24

- Disconnect the two hoses **(1) (2)** that connect the gearbox to the expansion tank **(3).**
- When the right-angle gearbox is empty, empty the hose **(1)** with a maximum pressure of 1 bar (14.5 psi).

NB:
This operation is necessary in order to check that the oil flowing out of the hose **(1)** during filling really is new oil.

Use an oil pump **(4)** to pump oil into the hose **(2)** connected to the bottom of the right-angle gearbox **(5)** until the oil flows out of the second hose **(1).**
See Fig. 24

Pump pressure
The pump pressure must be less than 0.5 bar (7.3 psi) in order to avoid damaging the seals in the right-angle gearbox.

When the oil begins flowing out of the other hose **(1)**, wait a few seconds to be sure that there is no air left in the oil circuit.

Fit the hoses:
The hose under the right-angle gearbox plugs into the bottom of the expansion tank.
The hose at the top of the right-angle gearbox is fitted to the top of the tank.

For machines with two augers, fill the two units separately at the top of the tank.
Fill the tank up to the level marker.

Capacity 21 l (5.5 gal) of oil per gearbox.
Capacity 49 l (12.9 gal) **oil SHELL OMALA 150** for two gearboxes plus the oil in the expansion tank.

6.10 Lubrication table

Description	Recommended lubricant	Corresponding standard
Right-angle gearbox 1 auger 21L + 2,5L =23,5L 2 augers 49L	SHELL OMALA 150	ISO VG 320/ SAE 80 W 90
Grease	SHELL RETINAX EP2	NLG1

6.11 Oil change gear motor

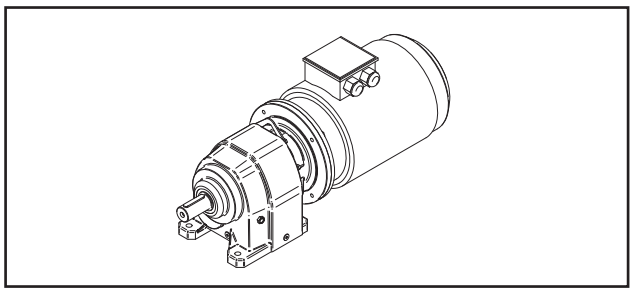


Fig. 25

Gearmotor
Amount 8,0 liter

AGIP	KLUBER	SHELL	MOBIL
Telium VSF 320	Syntheso D220 EP	Tivela Oil WB	Glygoil 30 SHC 630

Lubrication

First time after 100 hours. Then every 1500 hours

6.12 Lubricating the power transmission shaft

Fig. 26

- Remove the protective cone **(1)**.
- Pull the protective cone **(2)** backwards.
- Lubricate the shaft and break pin, cross 250h
- Refit the protection 100 h **(3)**.
- Turn the protective cone until it snaps into place **(4).**
- Press firmly to connect **(5).**
- Make sure the protective pipe is properly fitted **(6).**

See Fig. 26

Read and follow the instructions in the user manual included with the power transmission shaft.

7 Recycling - waste to resource -

TKS's products rely on electrical and electronic components in order to work.
These fall under the generic term of EE products. TKS's products use typical components such as cables, switches, motors, control units, etc.

When TKS products are thrown away those components containing contaminants should be treated and sorted in such a way that they do not pollute the environment. Contaminants should be taken care of safely.

Distributors are obliged to accept EE waste from products in the range of goods they sell.
This waste should be kept safe and sent on to an approved waste recipient or treatment plant.
EE waste must be sorted and transported in such a way that it is not damaged or destroyed.

If you need further information on the treatment of EE waste, please contact your distributor.

TKS is a member of Renas.
(National program for the collection/treatment of electrical/electronic waste)

Regards
TKS AS

Notes

TKS is a family owned company with a strong brand name. We are providing our customers with a unique and complete range of high quality products.

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