KEENAN MechFiber+

General operator's manual

All models

Revision A01 April 2022 EN

KEENAN
an Alltech company

CONTENTS

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Contents: General service and maintenance manual

This KEENAN service and maintenance operator's manual presents contact details and information on identification, warranty, safety and operation, as well as relevant information for operating, maintaining and troubleshooting your trailed KEENAN MechFiber+ diet feeder.

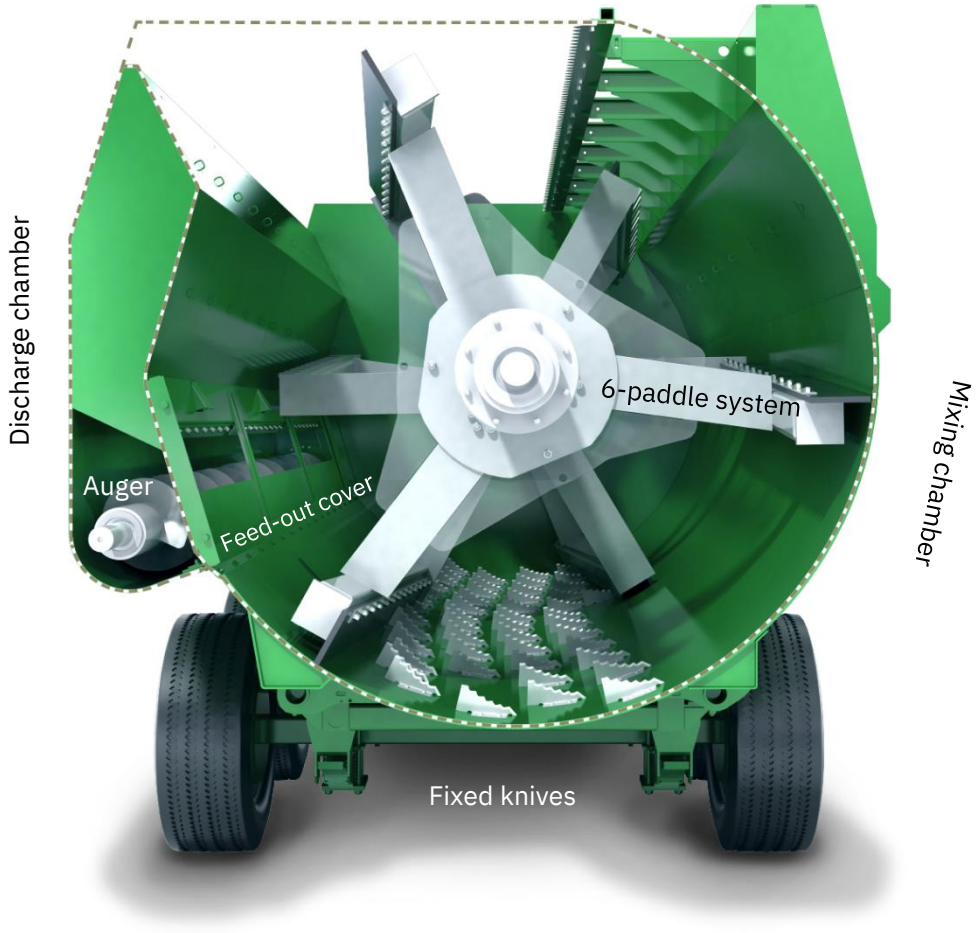
KEENAN MechFiber+ diet feeder

Thank you for purchasing a KEENAN product — we appreciate your business. Your decision to choose a KEENAN means that you are joining thousands of farmers worldwide who are benefitting from the KEENAN system. The KEENAN MechFiber+ diet feeder is a total mixed ration (TMR) feeder with a difference. It is a market leader due to its reliability, durability, efficiency in mixing and low horsepower requirements.

Our machines chop and mix feed in a consistent manner so that the herd is receiving the same homogenous mix every day. This ability is the cornerstone of the KEENAN MechFiber system, delivering improved efficiency and profitability on the farm. Bale handler models have the increased advantage of being able to handle bales of all sizes and types.

The minimum moving parts ensure a robust machine with high mechanical efficiency. Simple routine maintenance and correct operation will deliver many years of service. However, in the event of unforeseen problems, KEENAN's world-class service means you can be assured of a prompt solution.

The KEENAN MechFiber diet feeder is the cornerstone of the KEENAN MechFiber system, delivering improved efficiency and profitability on the farm.



Part I: General service and maintenance

1 Introduction

1.1 Purpose of this manual

This manual has been designed to present the general information you need to operate and maintain your machine. Further information on model- and equipment-specific operations and maintenance is available in separate manual supplements.

1.2 Intended use of the machine

The KEENAN MechFiber diet feeder range is exclusively designed for professional use, in accordance with the rules of agricultural practices. The operating functions are weighing, chopping/mixing and feeding out.

KEENAN also manufactures customised solutions for industrial applications.

The KEENAN MechFiber diet feeder should only be used, maintained and repaired by people who have technical knowledge of the machine and are aware of the possible risks. Proper use requires strict adherence to the instructions in the operator's manual. It is up to the user and the owner to comply with the instructions for accident prevention as well as the general rules on safety, occupational health and road legislation.

1.3 Ordering this manual

You can order this operator's manual by sending a request to:

Alltech Farming Solutions Ltd
Borris
Co. Carlow
R95 K223
Ireland
Telephone: +353 (0)59 977120
Email: keenaninfo@alltech.com

1.4 Reference and version of this manual

The version of this manual is displayed in the footnotes of each page and is composed as follows:

- Operator's manual containing general information or type(s) of machine(s)/model(s) concerned
- Manual version
- Language version

The cover page also shows the date of publication of this document.

1.5 Description and warning terms

Please read this manual carefully before operating your new KEENAN MechFiber diet feeder, paying particular attention to the warning notes, as explained here.

There are three different types of notes, as follows:

> **WARNING:**
> Texts with this symbol contain safety information.
> They warn you of serious dangers, possibly involving accident or injury.

> **CAUTION:**
> Texts with this symbol draw your attention to a possible risk of damage to your KEENAN MechFiber diet feeder. Failure to observe the information contained in a caution note may invalidate your warranty.

> **Note:**
> Texts with this heading give general information that improves the operational efficiency of your KEENAN MechFiber diet feeder.

2 Identification

2.1 General view of the machine

Figure 1

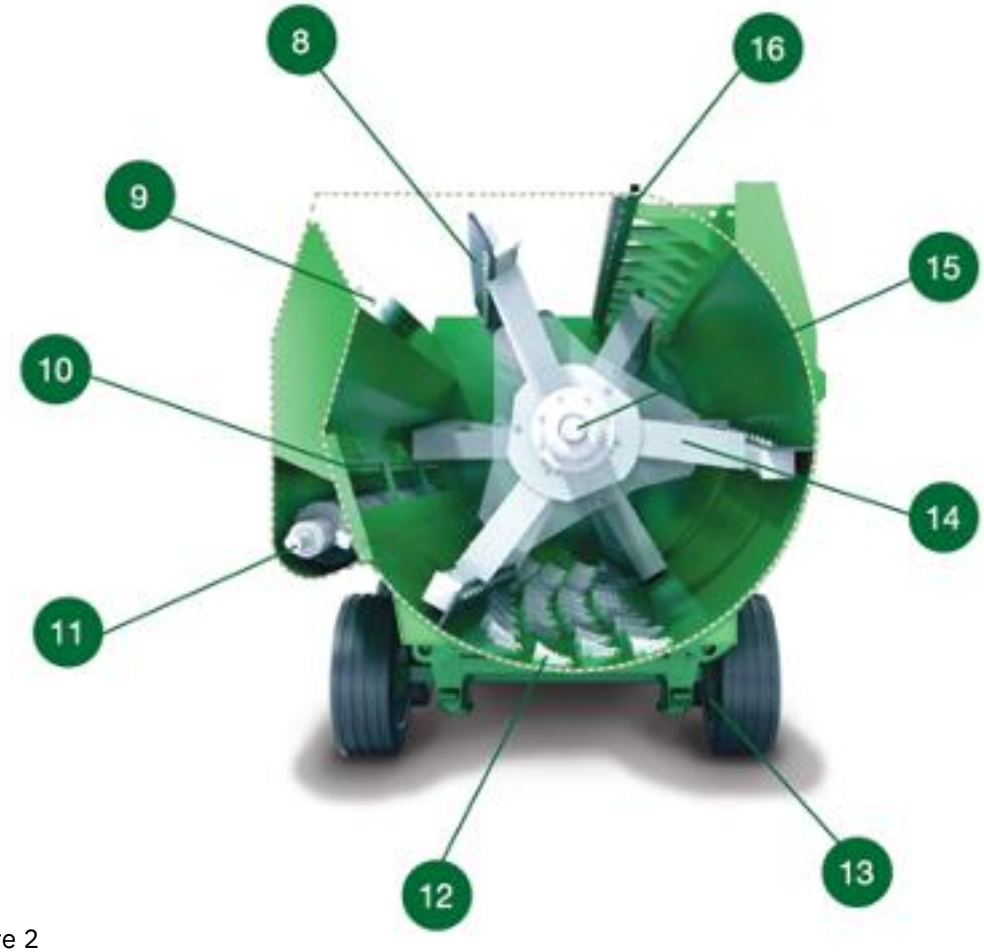


Figure 2

Reference	Description
1	Weigh box
2	Drive system covers
3	Drawbar
4	Stand
5	Feed-out tray
6	Lighting
7	Bale handler (optional)*
8	Paddle rubber
9	Bale handler cradle arm/tine location (optional)*
10	VFC-door
11	Auger
12	Body blades
13	Chassis and wheels
14	Paddle
15	Rotor
16	Top knife

Table 1

*Optional; see bale handler operator's manual supplement for information.

2.2 Identification plates

Figure 3

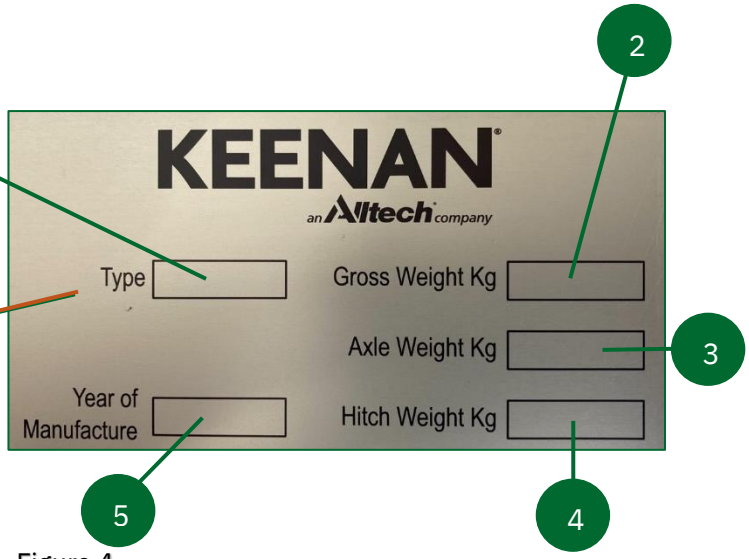


Figure 4

Figure 5

Figure 6

The serial number plate is located on the front left-hand drive system cover

Reference	Description
1	Machine type/version
2	Gross vehicle weight in kilograms
3	Axle weight in kilograms
4	Hitch weight in kilograms
5	Year of manufacture
6	Machine serial number

Table 2

Axle identification plate type 1

Figure 7

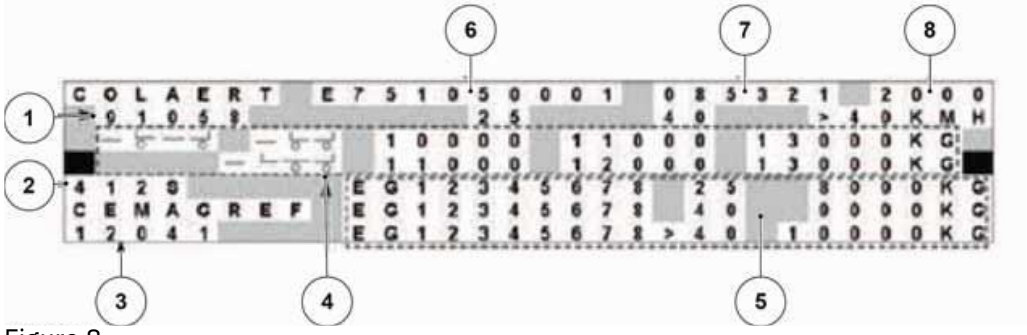


Figure 8

Reference	Description
1	Axle type
2	Brake type
3	Homologation number CEMAGREF
4	Loads
5	Homologation number TUV-speed-load
6	Axle code
7	Order number
8	Identification plate number

Table 3

Axle identification plate type 2

Figure 9

2.3 Machine identification

When receiving the machine, please enter the corresponding data below.

This document must remain within this user manual.

Information	Complete this column with the requested information
Machine type	
Serial number	
Year of manufacture	
Options	
Date of first use	
Dealer name	
Dealer address	
Dealer telephone number	

Table 4

3 Warranty

3.1 KEENAN Warranty policy

Alltech Farming Solutions Limited, trading as "KEENAN" (the "Company"), shall undertake to correct by repair or replacement, only at the Company's option, any defect of material or workmanship that occurs in any of its products as listed herein within the following warranty period. This Warranty is for the benefit of the initial owner as notified to the Company. This Warranty shall also apply to new and unused goods being resold by authorised dealers and/or distributors of the supplier. The Warranty period from the date of commissioning is twelve (12) months for new equipment and such shorter periods as may be agreed upon from time to time in writing for other products. This Warranty shall cease to apply on any resale or alteration or incorrect usage of the equipment by the initial owner.

The Warranty shall not apply to:

A) Any machine used by a third party who has not had instruction in the correct use of the machine by an official representative of KEENAN.
B) Any machine that has sustained damage through general wear and tear or neglect or use for which the machines were not intended to be used by the Company.
C) Bearings, sprockets, chains and other wearing parts, unless clear evidence of immediate working failure that is directly attributable to such parts can be furnished. Wearing parts include paddle rubbers, chains, jockeys, wheels and tyres.
D) Any consumable or perishable parts, such as knives, blades, rubber seals, hydraulic components, shear-bolts, brake liners, electric components and running gear, unless clear evidence of immediate working failure that is directly attributable to such parts can be furnished.
E) Any machine from which the identification marks have been removed or altered.
F) Any machine that has not received effective routine maintenance using recommended KEENAN products as outlined in the operator's manual.
G) Any machine that has received repairs or modifications by a person unauthorised by KEENAN.
H) Any machine fitted with spurious or non-genuine spare parts and attachments or spare parts or attachments not approved by the Company.
I) Any machine damaged in transit whilst being loaded or unloaded on premises other than those owned by the Company.
J) Parts that may be defective or that may have failed and are not retained on-site pending further investigation by the Company. Such parts may need to be inspected in situ by a Company representative.
K) Any machine damaged or any damage incurred prior to the machine being commissioned by an authorised representative of the Company.
L) Any machine not used in accordance with the instructions for use of the machine.
M) Any machine that has been altered or tampered with in a manner not approved by the Company.

The sole and exclusive claim against the Company made by the person specified above shall be for the repair or replacement of defective parts without prejudice to any rights pursuant to the Liability for Defective Products Act (1991). No other claim — including, but not limited to, for incidental, direct or indirect or consequential damages or for lost profits, lost sales, lost business, lost savings, loss of goodwill or loss of reputation or any other loss of whatever nature, however sustained — shall be available.

This Warranty constitutes the only warranty made by the Company and supersedes and overrides all oral and written statements or representations made by any Company representative or dealer or any other agreement, arrangement, practice, custom or understanding between the parties. Any claim under the Warranty must be promptly notified to the Company in writing at the address on the invoice.

This Warranty shall be construed in accordance with Irish law and shall be subject to the exclusive jurisdiction of the Irish Courts.

3.2 Product changes and improvements

Due to our policy of continuous improvement, Alltech Farming Solutions Ltd reserves the right to make changes in design, to add improvements or to otherwise modify any of its products without incurring any obligation on products previously supplied.

3.3 International patents

The KEENAN MechFiber diet feeder and the KEENAN MechFiber bale handler machines are subject to international patents, including the following:

Europe:	E0, 833,558	USA:	5,967,433
Japan:	Pending	Canada:	Pending
Australia:	691418	New Zealand:	305943
South Africa:	96/3148		

4 Safety

4.1 Safety instructions

The KEENAN MechFiber diet feeder has many safety features built into its design, but ultimately, safe operation requires the vigilance of the operator and an understanding of the potential safety hazards. The machine is designed to be used as a mixer/chopper wagon for mixing animal feeds. It should not be used for any other purpose that could affect its performance or safety.

For industrial applications, machines will be designed to suit individual requirements.

The following safety points are general guidelines. Given the wide variety of possible operating conditions, other safety risks may exist that are not captured in the list included here.

a) Always park the diet feeder on level ground and apply the handbrake when not in use.

b) Do not exceed 15 km/hour (10 mph) when in use/transit. Local road traffic laws will apply when the diet feeder is in transit on public roads, on which the maximum permissible speed is 25 km/hour. Exceeding this speed will compromise the life and safety of major components, such as the hitch, axle, wheels and chassis.

c) Ensure that the VFC-door is closed and that all feed-out trays/elevators are in the closed and transport position prior to using on a public road.

d) Exercise extreme caution for possibly overtaking traffic on either side when turning.

e) Do not stand on the ladder whilst the feeder is in transit. The diet feeder should never be used for the transport of people, animals or objects.

f) Do not stand between the tractor and the diet feeder while it is in use.

g) Use only a PTO shaft with a properly fitted safety guard and correct shear bolt.

h) Always connect the PTO shaft with the shear bolt end to the machine. The operating speed of the PTO is 540 RPM, and the direction of rotation is marked on the front cover. Always use a well-maintained PTO shaft and keep the safety covers in good condition.

i) Ensure that all trailing leads, hoses, etc., are well clear of the PTO.

j) Never operate the PTO in "ground speed mode" or drive the PTO in reverse.

k) Make sure all covers/guards are fitted and closed correctly. Never remove guards when the diet feeder is connected to the tractor.

l) Ensure that the diet feeder and the immediate area surrounding it are clear of people, especially children, before commencing operation. Ensure that there is sufficient visibility for the operator to observe all danger zones and that the tractor is equipped with mirrors to enable the operator to see both sides of the machine while it is in operation.

m) When connecting the tractor to the diet feeder, only connect it using the ring hitch/hitch on the diet feeder to ensure safe coupling. Ensure that the hitch is connected properly to the

tractor and that all pins and clips are properly installed. Then connect the PTO shaft in the correct fashion. Connect the hydraulic hoses, ensuring that the functions match the indicated valve on the tractor.

n) When disconnecting, always ensure that a stand or jack is used to secure the diet feeder in the park position, and ensure that the handbrake is properly applied. Before driving the tractor away from the diet feeder, ensure that all hoses and cables are disconnected.

o) Load only from the side indicated (see Figure 22; auger chamber side), using suitable equipment.

p) Standing level with or above the machine in order to load manually is not permitted. Loading should only be carried out with suitable equipment.

q) Regularly inspect all chains (at least weekly), sprockets and moving parts for wear and check all nuts and bolts for tightness.

r) The ladder on the rear of the diet feeder is to be used as a viewing point for the mixing chamber. It should not be used as a means of access to the mixing chamber nor onto the body of the machine. It is strictly forbidden to climb on the upper brim of the machine body. The height of the machine presents a potential fall hazard during entry and exit.

s) The noise emission level of the range of KEENAN MechFiber diet feeders has been recorded at 89.4 dB. Noise emission levels above 90 dB would require the wearing of suitable ear protection.

t) The breakaway safety brake device should be attached to the tractor at all times. The wire rope is connected to the hose holder (see Figure 11). Connect one end of the wire rope to the ring on the handbrake handle and fix the other end of the wire rope to a solid location on the back of the tractor (e.g., using the top link pin). In the event that the breakaway safety brake device is activated or damaged, it is recommended that KEENAN service is contacted for directions to reset.

u) Routine cleaning may be carried out using a power washer. Isolate any power sources before beginning. If washing the inside of the mixing chamber, open the drain bung underneath the body to allow water to escape. Always disconnect the PTO shaft from the tractor and stand on a suitably safe ladder or platform. Do not to climb on top of the machine or into the mixing chamber.

v) It is recommended that only KEENAN-trained and qualified maintenance personnel enter the mixing chamber.

In the case of an untrained person entering the mixing chamber, at the very minimum, the following precautionary safety guidelines should be strictly adhered to at all times:

1. Ensure that the PTO and hydraulic hoses are disconnected.
2. Apply the diet feeder handbrake and disconnect the tractor from the machine on level ground.
3. Use suitable PPE, such as protective footwear, eyewear and gloves.
4. Personnel should make themselves familiar with the location of all potential hazards before entering the machine, particularly the location of the top knife and body blades.

5. Be aware that sharp components may be hidden in or under material within the mixing chamber.
6. The top knife should always be fitted with the supplied guard (see Figure 12) before entering the machine. Begin by fitting the first 500 mm of guard from the rear of the machine. Then, as you enter, continue to fit the guard along the full length of the top knife.

   Note: The machine is supplied with a top knife guard, which can be found inside the driveline covers of the diet feeder.
7. Use a suitable and secure ladder for access to and from the diet feeder.

   Note: The ladder at the rear of the machine is provided as a means of viewing the ration only and should not be used as a means of access to the mixing chamber.
8. Always maintain three (3) points of contact while entering, exiting and moving within the mixing chamber of the machine.
9. When entering the base of the body, it is recommended to cover the body blades in the vicinity of where work is to be carried out.
10. When removing trapped objects, be aware that some machine components may move unexpectedly when cleared.
11. Take extreme care when moving around inside the body, as surfaces may be slippery.

Figure 10: Body blades

Figure 11: Breakaway safety brake

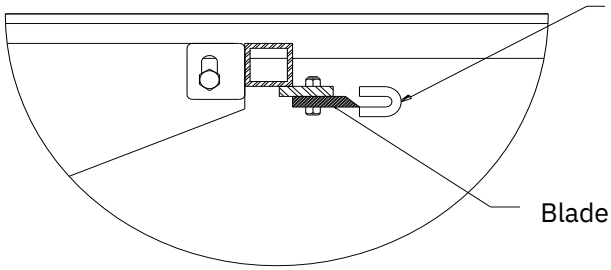


Figure 12: Top knife protection

KEENAN diet feeders have been designed to reduce risk to a minimum. However, as with any machine, the careful observation of safety procedures is necessary to prevent accidents.

See further details in each section. If you have any further questions, please contact your local KEENAN service partner for advice.

WARNING:
Failure to follow the safety guidelines above may lead to accident or injury.

WARNING:
Read the safety section before attempting to operate the machine.

WARNING:
The operator is responsible for the safe operation of the machine at all times. The KEENAN MechFiber diet feeder should only be operated by one person at all times. The diet feeder should never be left unattended during operation.

WARNING:
The breakaway safety brake device should be attached to the tractor at all times.

4.2 Safety signs and locations

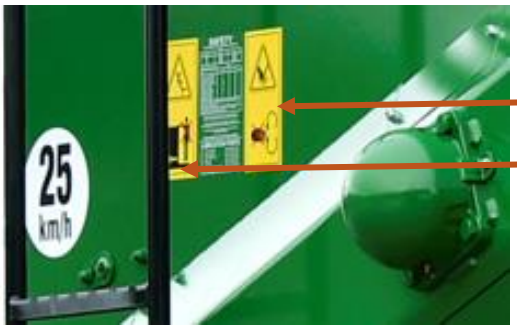


Figure 13

Figure 14

Figure 15

Figure 16

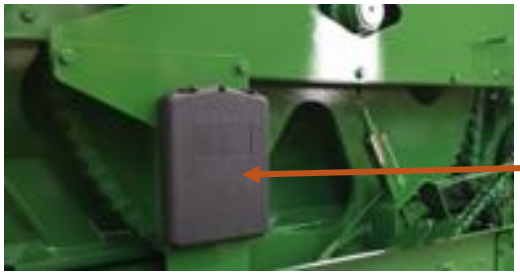


Figure 17

1

Read the operator's manual before using the machine.

2

Danger of flying objects. Keep a safe distance from the machine.

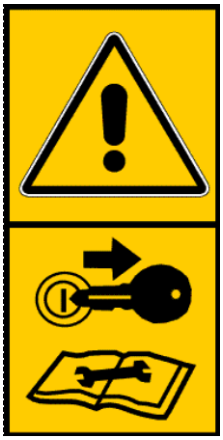
3

Stay clear of sharp blades.

4

Do not open or remove safety guards while the machine is connected to the tractor.

5



Shut off the engine and remove the key before performing maintenance or repair work on the machine.

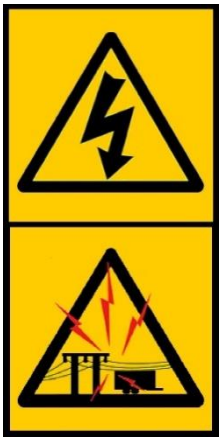
6

Never reach into the rotating auger. Danger of entrapment.

7

Do not ride on the platform or ladder.

8



Look out for overhead power lines.

9

Apply the handbrake when parked.

10

Do not stand between the tractor and diet feeder while it is in operation.

5 Operation

5.1 Set-up

The simplicity of the KEENAN MechFiber diet feeder design is reflected in its low power requirements. The power required varies depending on the mix used, the dry matter and the amount of chopping required.

If a tractor is at its limit during mixing, this will put extra strain on the moving parts, as there will be surges in power as the engine recovers during certain periods of the mix.

A tractor that has sufficient power will provide a much smoother drive to the diet feeder during all stages of operation.

- Ensure that the machine is level when hitched up. If the machine is not level, this can be corrected by adjusting the hitch height. The hitch height on the KEENAN MechFiber diet feeder provides a certain level of adjustment from the manufactured height. For further information, refer to the section on hitch height adjustment in the model-specific manual.

- The PTO shaft should be attached with the shear bolt end coupled to the machine. Make sure that the PTO guard is in good condition and is well-secured.

> **CAUTION:**
> Do not operate the PTO in “ground speed” mode. Reversing the drive on your machine will cause serious damage.

- Connect the hydraulic hoses (see Table 5) from the machine to double- and single-acting spool valves on the tractor, as appropriate.

- Examine the mixing chamber to ensure that:
  - All blade covers have been removed, where fitted.
  - All spare parts and foreign objects have been removed.
  - No damage has occurred during transport.

- Check the weigh box and ensure that the power lead from the weighing system is either connected to the tractor battery via a direct fused line, a 7-pin plug or to a 12-V battery located in the side box of the feeder. To zero the weigh box, press and hold the “zero” and “minus” keys together and hold until “end” appears on the screen, then release the buttons. If the power is supplied through a 7-pin lights connection, the tractor lights will need to be switched on to provide power to the weigh box. If you stand on the ladder, at the rear of the machine, you can check the reading on the weigh box against your known weight; this may require assistance.

- With the tractor running, check that the VFC-door opens fully and closes completely. Similarly, check the movement of the feed-out tray. Engage the PTO and check the turning of the paddles. The initial turning of the paddle rubbers against the side of the

KEENAN MechFiber diet feeder will generate noise, but this will decrease as the paddle rubbers become more pliable. If the machine is fitted with a bale handler, please refer to the bale handler-specific manual supplied.

- If the machine is fitted with a fold-down tray (OE-31 or OE-100), it will be necessary to remove the transport bracket from the tray, as per Figure 18 below.

Figure 18: Fold-down tray transport bracket

- If the machine is fitted with a steering axle, ensure that the steering stay bar is removed from the steering axle where fitted. The image below (Figure 19) indicates where the stay bar is located.

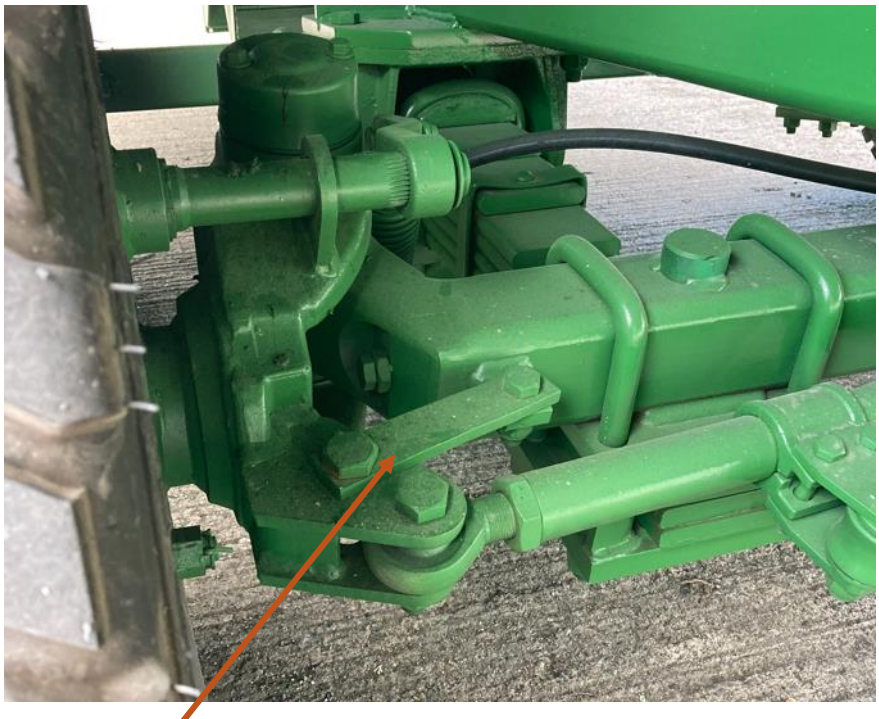


Figure 19: Steering axle transport bracket

Hydraulic and brake hoses	
Operation	**Colour**
VFC-door	Red and yellow
Feed-out tray	Blue
Bale handler creel (optional)	Green
Brakes	White
Beet-grid	Black

Table 5: Hydraulic and brake hoses

Note:
A: The design life of hydraulic hoses is subject to the level of wear and tear/usage, as well as factors like harsh climate. It is recommended that they be reviewed periodically (e.g., yearly) and should typically be replaced after ten years of operation, if necessary.

B: The maximum oil pressure of the hydraulic system is 3000 psi.

C: If there is a manual or electro-hydraulic spool valve fitted to the KEENAN MechFiber machine, it is very important to connect the hydraulic feed and return pipes correctly. The return pipe is not designed to take the hydraulic pressure normally seen in the hydraulic valve feed pipe, so the seals and/or the valve block itself may be damaged if oil flows in the wrong direction through the chest. Typically, the hydraulic return pipe on the valve block is fitted with a one-way flow valve to prevent oil from being fed to the valve block in the wrong direction. This is identifiable as a steel connection on the end of the pipe with an arrow stamped on its side to indicate the direction of oil flow through it. Oil flows into the valve chest through holes marked P (for pressure) and out through holes marked T (for tank). See Figure 20 below.

(The valve chest is set up for open-centre hydraulics. If the tractor has an alternative hydraulic system [other than open-centre], then contact should be made with the tractor agent. To alter to closed-centre hydraulics, there is a plug that can be fitted to the spool valve block that is available from KEENAN service partners on request.)

Figure 20: Manual hydraulic block

5.2 Weighing system

The KEENAN MechFiber diet feeder's electronic weighing system allows the exact quantity of individual materials to be loaded into the mixing chamber for accurate rationing. Individual loads can be weighed or successive loads can be accumulated to give the total weight of the feed. There are several different options available depending on the level of functionality required. For more detailed information, please refer to the specific manual supplied for your weighing system.

The weighing system is designed to be simple to operate, accurate and robust. It consists of four load cells connected to a weigh box unit (a readout box) at the front of the machine. The system uses 12-volt DC power from the tractor, or a battery, if fitted. The weigh box unit can be rotated for visibility during loading and from the tractor cab, but it should be folded out of the line of the tractor wheel for roadwork. Loads are displayed in kilograms or pounds, with scale increments of 5 kg/10 lbs. The unit is capable of measuring up to 18,140 kg (39,999 lbs.) with the appropriate weight bars. The system is maintenance-free, as it is fully electronic, with no moving parts. All components are sealed against moisture and dust and are resistant to frost and corrosion. The unit should not, however, be directly exposed to a high-pressure water jet. The weigh box unit may vary from model to model and region to region. A separate manual is supplied for your weigh box unit, which you should refer to for specific operating instructions.

INSTRUCTIONS FOR ELECTRONIC WEIGH BOX ARE CONTAINED IN A SEPARATE MANUAL

5.3 Machine telematics

The KEENAN fourth-generation controller, where fitted on the machine, has further options, including sensors that monitor the functionality of key components of the machine. The following is the list of options currently available:

1. Ambient temperature sensor
2. Oil level sensor
3. Chain tension sensor
4. Electronic VFC-door indicator
5. Rear feed-out position indicator

1. Ambient temperature sensor

The ambient temperature sensor provides a live temperature reading in the top bar of the KEENAN controller. This temperature is logged by the KEENAN controller and is fed back to the InTouch nutritional support team to provide background information when formulating diets.

2. Oil level sensor

The oil level sensor will trigger a warning symbol in the top bar of the KEENAN controller once the oil level drops below the minimum threshold required for correct operation.

3. Chain tension sensors

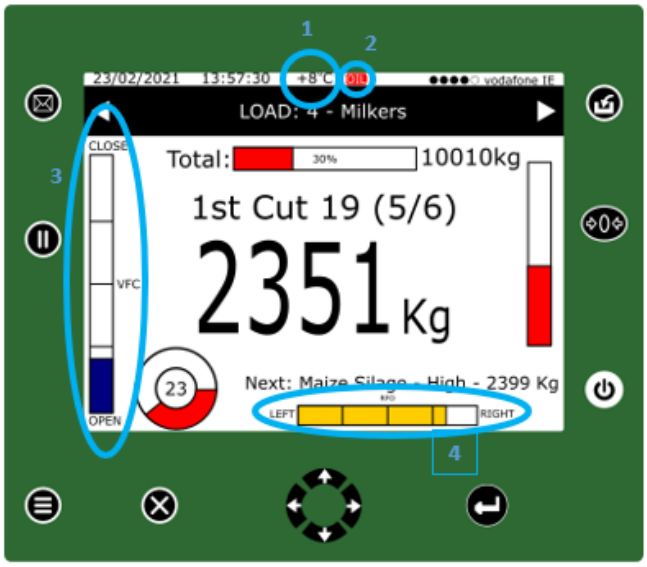
The chain tension sensors will trigger a warning message on the KEENAN controller once the chain pre-load tension has reduced to a level that requires intervention.

4. Electronic VFC-door indicator

The electronic VFC-door indicator displays a bar gauge on the left-hand side of the KEENAN controller screen. This gauge fills and empties to indicate the vertical position of the VFC-door.

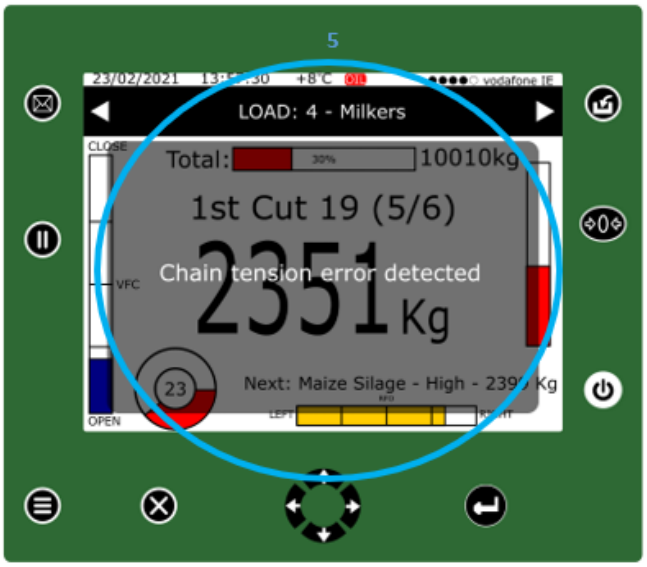
5. Rear feed-out position indicator

The rear feed-out position indicator displays a bar gauge on the bottom edge of the KEENAN controller screen. This gauge fills and empties to indicate the horizontal position of the rear feed-out elevator.



KEENAN controller graphic interface

1. Ambient temperature sensor
2. Oil level sensor
3. Electric VFC-door indicator
4. Rear feed-out position indicator



Chain tension error warning message

5. Chain tension sensor

5.4 Machine storage

At the end of the feeding season, follow the steps below for machine storage. Wash the machine down thoroughly, preferably using a power washer. Grease or oil all lubrication points, and open the drain bung on the bottom of the machine to evacuate any water inside the mixer.

1. Position the machine on flat, solid and stable ground.
2. Wash the machine down thoroughly, preferably using a power washer.
3. Retract the cylinder rods to protect them from moisture.
4. Repaint the areas where paint is no longer present.
5. Lubricate according to the maintenance plan given in this manual.
6. Place the machine onto axle stands to relieve the tires. Use standard support stand systems, and secure them to prevent any risk of accident due to unstable rigging.

> **CAUTION:**
> Lifting and support equipment accessories must be compliant and controlled in accordance with the regulations in force.

5.5 Diet feeder capacity

Due to the diversity of the materials available for feeding, as well as to the KEENAN MechFiber diet feeder's ability to incorporate a wide range of feed types into the ration, the capacity of the machine will vary. Ensure that overloading is avoided at all times, as mix quality could be seriously affected as a result and the machine could potentially be damaged.

Overloading must be avoided because:

- The mix will not be homogenous (or evenly mixed), preventing the machine from providing the maximum benefits.
- Mechanical failure will result. Due to the nature of the loading, this may occur at load levels below those that would break the shear bolt.

> **CAUTION:**
> The machine can be overloaded before the shear bolt breaks. Therefore, not breaking a shear bolt is not an indication that the machine is not being overloaded.

The overall amount of material that can be chopped/mixed in one load depends on the following:

- Machine size.
- Overall dry matter of the TMR.
- The chop length and quality of the material added.
- The loading procedure and loading order of the materials used (this has a major effect on machine capacity — e.g., the addition of straw first or last).
- Tractor H.P. rating.

Figure 21: Photograph illustrates a well-mixed ration showing consistent fibre length and the integration of forages and grains.

5.6 Loading and mixing

Load ingredients in the sequence recommended by your InTouch physical nutritionist, or as suggested in Section 6.2.

For non-bale handler models, ensure that bales are broken up prior to loading. As a general rule, material should be tumbling freely when mixing. If not, then the machine is overloaded and will not achieve the desired mix quality. Mixing is carried out by a centrally mounted rotor fitted with six angled paddles revolving at 5–6 RPM. Each paddle imparts a shearing action, sweeping the feed ingredients onto the strategically placed knives to produce a consistent and thorough mix with all types of materials, including baled silage, hay or straw, roots and liquids.

The angled paddles help mixing by sweeping the material from end to end. The placement of the blades ensures that the materials reach the optimum size/length, without grinding it down and destroying the all-important “scratch factor” of the forages producing a MechFiber mix.

Mixing time will be determined by the required chop length. Follow the procedures contained in this manual or consult your InTouch physical nutritionist for further information.

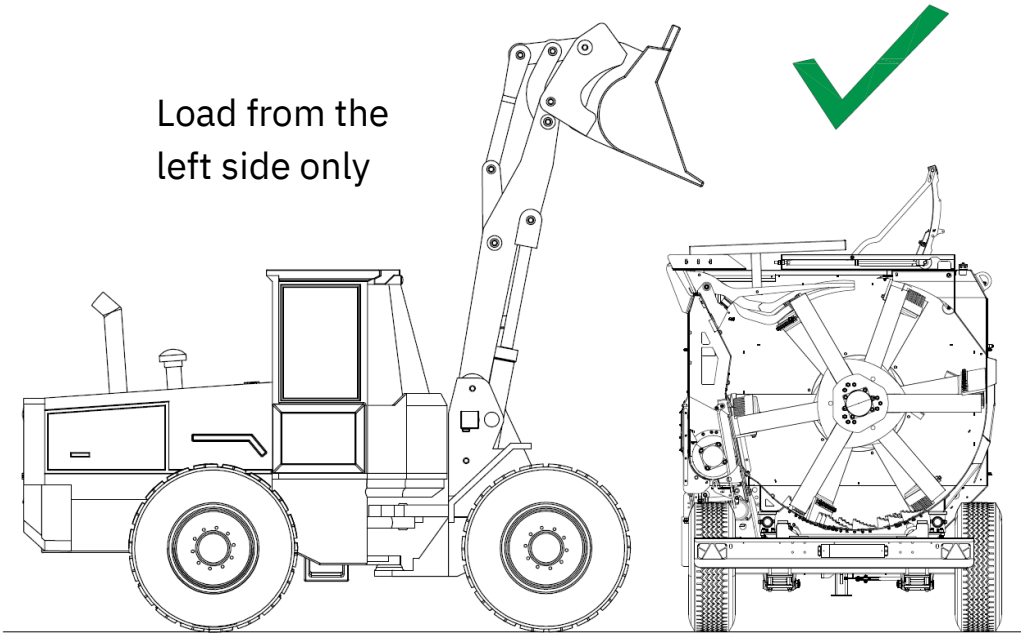
Note: The unique tumbling action of the machine is what carries out the mixing. If the machine is overloaded or loaded in an incorrect order, or if insufficient time is allowed for proper chopping, this tumbling action will not take place correctly. In addition to reducing mix quality, it will increase the horsepower requirements and reduce the life of the machine.

CAUTION:

Overloading will seriously affect machine performance and life and will invalidate your warranty.

The effectiveness and speed of chop are determined by:

- The number of effective (sharp and intact) blades.
- The dry matter of the material to be added.
- The amount of pre-chopping of the material.
- The loading sequence.
- The total amount of material to be chopped.
- The density of the bale.



Load long fibres slowly onto paddles

Figure 22: Loading the KEENAN MechFiber diet feeder

5.7 Feeding-out

During mixing, the mixing chamber is separated from the feed-out chamber by a variable feed control door (VFC-door), a guillotine door, thereby ensuring complete mixing. The feed-out chamber contains an auger that runs the entire length of the machine.

When chopping/mixing is complete, the feed-out tray should be set to the required position and the VFC-door dropped, allowing the material to be swept up by the paddles and pushed onto the auger (see Figure 2). The VFC-door should be partially opened at first, a quarter of the way, and when feed is seen discharging, then 15–20 seconds should be allowed before opening the VFC-door fully. Door position and ground speed should be set/used to allow an even feed-out rate.

> **CAUTION:**
> The VFC-door should only be opened or closed when the PTO is engaged (paddles turning) when material is in the machine.

1. Ensure that the VFC-door is still closed.
2. Re-engage the tractor PTO at idle, increasing the engine revs to between 1,400 and 1,600 RPM to achieve a paddle running speed of 6–8 RPM. Allow the TMR to loosen and tumble for 15–20 seconds.

3. Slowly open the VFC-door to a maximum of halfway open, then allow at least 1 minute before opening the door fully.
4. Select a ground speed to feed out at an even rate along the feed area.
5. When feed-out is complete, close the VFC-door, run the machine for 10–20 seconds to empty the auger chamber, then disengage the PTO before turning out of shed.

CAUTION:
Never open VFC-door before engaging PTO; serious damage may be caused as a result of a sudden load being put on the auger. Disengage the PTO before turning corners.

5.8 Operating the KEENAN MechFiber diet feeder

LOADING THE KEENAN MECHFIBER MIXER WAGON

GENERAL

- Park on level ground.
- Ensure that the variable feed control (VFC) door is closed.
- **Do not start PTO when VFC-door is open.**

LOADING AND MIXING SEQUENCE

- Load feed as close as possible to the loading side of the unit.
- Load concentrate feeds along the length of the machine.
- Load forages to the front, back and centre of the unit in alternate grabs during mixing.
- Remove all twine, wrap or polythene from bales.
- Round or square bales should be split or broken into four pieces at a **minimum.** Use front grab or forks as required.
- Stop PTO before moving to feed-out area.
- Mixing time will depend on the chop length required.

Below is a guide to the correct loading order. Consult with your local InTouch office/nutritionist for the best loading order for your ingredients.

Order	Feed ingredients	Paddle RPM	Tractor engine speed
1st	Straw, hay	All at 6–8 RPM	1,400–1,600 RPM
2nd	Water, liquid feeds		
3rd	Minerals, concentrates, protein meals, pulps, cereal grains		
4th	Grass silage		
5th	Maize silage		

Table 6: Loading the KEENAN MechFiber diet feeder

5.9 Washing and chopping root crops

With the machine stopped, add the root material to be washed and chopped. Ensure that there are no stones or foreign objects hidden in the roots.

1. Add water at approximately 300 kg (660 pounds) per ton of material to be chopped. Rotate the machine for 1–2 minutes at 6 RPM.

2. Park the machine on an incline. Open the wash gate and allow the water to drain off.

3. Repeating this process may be necessary if the materials being chopped are particularly dirty.

4. Chop the materials by running the machine at 8+ revs.

5.10 Lifting hooks and anchoring points

Front anchor points for lifting

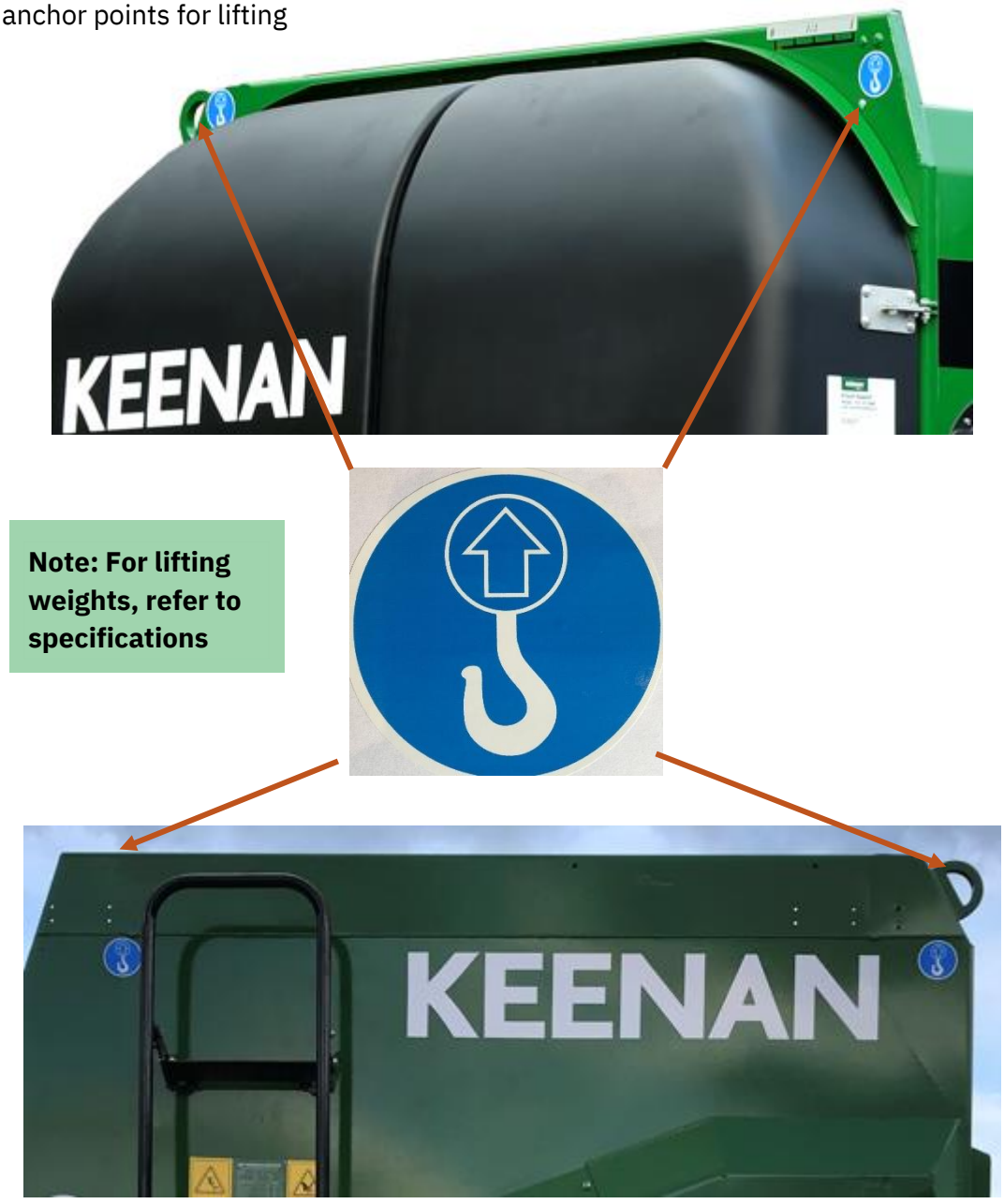


Figure 23: Lifting point locations

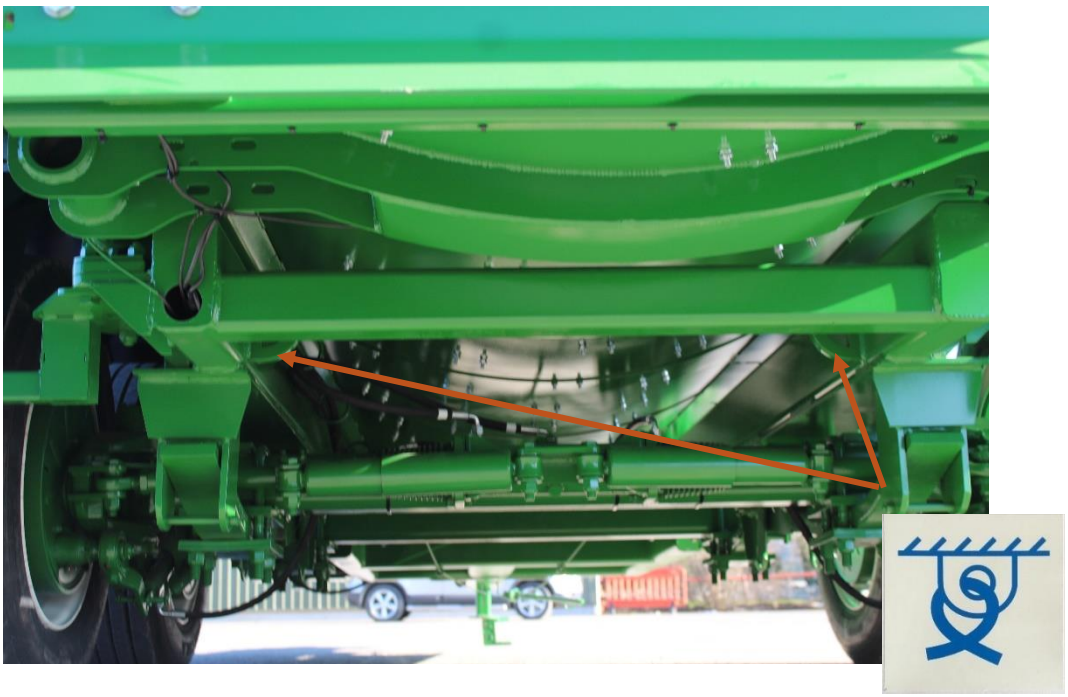


Figure 24: Rear tie-down points

Figure 25: Front tie-down point for transport

CAUTION:

Lifting and support equipment accessories must be compliant and controlled in accordance with the regulations in force.

6 Troubleshooting

6.1 General troubleshooting

ITEM	PROBLEM:	SOLUTION:
1	Weighing display won't work properly	Check Section 6.2 on weighing.
2	VFC-door does not move	Check hydraulic hoses and that valves are open. Check tractor hydraulic oil level. Check ram condition and ensure that pins are secure.
3	VFC-door drops during mixing	Insufficient hydraulic pressure — check spool valve on tractor or fit non-return valve in line. Check ram for signs of leakage.
4	VFC-door closes unevenly/sticks	Rams operating out of sequence — operate door to fully open position and hold level to allow oil to bypass the ram when door is fully open and level. Repeat on fully closed until door is even.
5	Excessive shear bolt breakage	Machine overloaded. Driving chains too loose — check condition and adjust chain tensioners as per model-specific manual. Feed-out too fast — open feed-out door slowly at first, then open fully. Turn paddle a few turns before opening the feed-out door to avoid huge load on machine, especially after feed has settled in body of machine. Run machine slower. For non-bale handler models, never load bales directly down on paddle in one go — always chop up into at least four pieces.
6	Noisy operation	Check drive system oil level. Check and adjust chain tension. Grease all tensioner pivot points. Check chain alignment.
7	Feed is not mixed properly	Insufficient mixing time. Loading materials in wrong order. Not enough time given for chopping. Overloading of machine.
8	Feed-out is too slow	Check condition of paddle rubbers. Slow down tractor ground speed. Reduce engine revolutions to give paddle more time to push material into auger. Ensure that material is fully chopped before unloading.
9	Horsepower requirement is too high	Check body blades and top knife sharpness. Machine overloaded. Bale handler tines may be set too low.
10	Machine is not chopping	Blades blunt. Not enough material in body — not heavy enough. Try adding more material, or in the case of hay/straw, add water or a fork of silage to weigh it down. Machine overloaded.

ITEM	PROBLEM	SOLUTION
11	Machine breaks drive chain link	Check chain alignment of large sprocket, tolerance +/-2 mm. Check chamfer on edge. Check roll pins used in joiner link. Check chain tension.
12	Bale goes in too quickly	If the bale goes into the machine too quickly, it may place an unnecessary load on the tractor and drive line and slow the overall mixing time, as the body blades aren't as efficient at chopping long, fibrous material as the top knife. Check tine buffers and tine-to-top-knife gap on bale handler models.
13	Excessive hitch wear	If excess hitch wear is noted, check: -Speed of use (hitch rated for 25 km/hour maximum). -That the hitch is level on the tractor. -Fit of hitch and lubrication. -Wear on tractor hitch. -That the brake operation matches the tractor brakes. -Excessive movement — not tight on pin/hitch.
14	Leaking valve chest (where fitted)	Check that oil is only flowing from pressure "P" side to tank "T" side. Reverse pressuring the valve check will damage the seals. The addition of a one-way valve on the return pipe will prevent this.
15	Leaking oiler (where fitted)	If oiler for drive chain (non-oil bath models only) leaks or loses oil, check the one-way valves in the oiler housing. Fit restrictor fitting to pressure line, which will smoothen out any power surges in the line and protect servo.
16	Excess oil on chains (where oiler is fitted)	Adjust oiler (where fitted on non-oil bath machines). The volume of oil sent to the chains when the VFC-door is operated may be adjusted by turning the set screw on the base of the oiler. The oiler operates on the closing stroke of the VFC-door. Therefore, the drive line should be left running for a period after the VFC-door is closed to allow the oil to fully cover the chain.
17	Blockage at top knife	On non-bale handler models, load smaller sections of material into machine. On bale handler models, check tine height settings as described in the bale handler manual supplement. Ensure that all feed materials are free from foreign objects before loading into machine. In the unlikely event of a large blockage occurring, which prevents the machine from restarting using the tractor, it may be necessary to enter the mixing chamber to manually clear the blockage. Please refer to Section 4: Safety — in particular, point "v".
18	Blockage at auger	Use VFC-door to meter material intake into auger. Refer to Section 5.7: Feeding out for correct operation of VFC-door. In the unlikely event of a large blockage occurring, which prevents the machine from restarting using the tractor, it may be necessary to enter the mixing chamber to manually clear the blockage. Please refer to Section 4: Safety — in particular, point "v".

ITEM	PROBLEM	SOLUTION
19	Blockage at rear feed-out conveyor	Use VFC-door to meter material intake into auger. Refer to Section 5.7: Feeding out for correct operation of VFC-door. Ensure that the conveyor belt rotates as VFC is opened. Check setting of priority flow valve (if fitted). In the unlikely event of a large blockage occurring, which prevents the machine from restarting using the tractor, it may be necessary to enter the mixing chamber or gain access to the discharge auger chamber to manually clear the blockage. Please refer to Section 4: Safety — in particular, point “v”.

Table 7: General troubleshooting

6.2 Weighing troubleshooting

KEENAN troubleshooting tips on weighing

If you experience problems in the operation of the weighing system, read through this troubleshooting section first before contacting KEENAN service.

Reading drifting

If the reading on the weigh box is drifting or does not stay steady, the most likely cause of the problem is dampness/moisture in or around the weigh box or cables. Please follow these steps to locate and correct the problem.

- Disconnect the cables on the weigh box. Ensure that they are labelled correctly for reconnection. Check both the plug on the cable and the connector on the weigh box for dampness and/or corrosion of the terminals. If any dampness is found, dry it off thoroughly with a hair drier. If corrosion is found on the terminals, clean thoroughly with electrical cleaner and dry. Reconnect cable and test.
- Check for loose wiring or dampness. Some machines are fitted with a junction box. The same procedure detailed above applies.
- Check weigh cell plugs for dampness, and also check weigh cell cables for any breaks and/or dampness.

If the above measures do not rectify the problem, then contact KEENAN service for further assistance.

System weighing inaccurately

If the machine is new or the weigh box has been replaced, it is possible that the weigh box may have the incorrect calibration code for the model. Contact KEENAN service, who can go through the procedure to check (or alter) the code.

If you suspect that the system is weighing inaccurately, check all four weigh cells to make sure that they are mounted correctly. If the bolt through the weigh cell has come loose or is broken, the weigh cell can rotate, resulting in that weigh cell giving an inaccurate reading. To check that the system is weighing correctly, get something with a known weight (e.g., a bag of fertilizer) and place it on each corner of the machine in turn. You should get the same reading for each corner. If one corner returns a significantly different reading from the other three, then this points to a faulty weigh cell on that corner. Also, if receiving a negative reading, that would indicate that the weigh cell is upside down — rotate it 180° and repeat the test.

Weigh box will not switch ON

Check the power cable thoroughly and make certain that you are getting power from the tractor to the display. Unscrew the power cable from the weigh box and ensure there is a good 10- to 13-volt supply across the internal pins of the cable. If the negative (-) and positive (+) are wired the wrong way around, the weigh box will not switch on [Dinamica Generale weigh boxes power cable — white (+) and black (-)].

7 General maintenance

7.1 Maintenance advice

A properly operated and maintained KEENAN diet feeder promises to operate trouble-free for years. **Regular maintenance of the machine is essential both for a long machine life and also to meet the warranty requirements**. Refer to the instructions in the maintenance section of this manual. Weekly cleaning of the machine is recommended to prevent corrosion to the mixer body from old feed. **The level of cleaning required will depend on the material being mixed, but any material that sits or lodges on the machine may adversely affect both the operation of the machine and the quality of the mix, if it subsequently falls into the feeder during mixing. It is, therefore, essential to routinely clean and wash down the feeder.**

The KEENAN MechFiber diet feeder has been designed for optimal performance, with a minimum of maintenance. Chains, bearings and grease points have been kept to a minimum without compromising function. All components are of high quality and provide excellent durability. Regular routine maintenance will ensure that your KEENAN MechFiber diet feeder gives you the best results with a minimum of problems.

> ⚠ **WARNING:**
> **Prior to carrying out any maintenance on the machine, always ensure that the tractor engine is stopped and disconnect the P.T.O. and hydraulic hoses from the tractor. Observe safety precautions at all times when working on the machine. Read Section 4 on safety before attempting to work on the machine.**

The recommended operating pressure in the hydraulic circuit is 170 bars and a flow rate of 40 litres per minute. Replacement hoses should comply with DIN EN 853. When replacing hydraulic hoses, always wear suitable protective equipment.

7.2 Wheels

1. Each year, lever off the hub cap, remove the split pin and castle nut and remove the hub.
2. Check seals, bearings, brake shoes, springs, studs and all other internal parts.
3. Replace worn parts, re-grease and refit.

Note: When re-fitting the wheels, tighten the castle nut until resistance is felt (do not over-tighten). Release the castle nut 1/6 of a revolution, check for movement in the hub, and if there is none, re-fit the split pin.

Changing a wheel

- Park the diet feeder on level ground and apply the handbrake.
- Fit chocks to opposite wheels to prevent machine movement during the operation. Loosen the wheel nuts with a wrench, but do not remove the nuts at this stage.
- Jack up the diet feeder underneath the axle until the bottom of the wheel is off the ground. Remove the nuts completely and slide off the wheel.
- Refit the wheel, ensuring that the centre of the wheel is properly located on the hub, and hand-tighten the wheel nuts.
- Lower the machine and tighten the nuts to the recommended torque using suitable equipment.
- Check the wheel nuts for tightness after 1 hour of use, and repeat on a weekly basis.

7.3 Rear feed-out (where fitted)

An elevator system requires regular maintenance in order to achieve optimal performance. Every week, the elevator needs to be checked to make sure that the belt is running straight and not wearing unevenly on one side. If the belt is not running straight, then adjust the tension by adjusting the tensioner nut on the side, and run it again to check.

The elevator surface needs to be kept clean at all times in order to avoid feed building up and falling into the rollers during operation. Do not allow old feed to build up on the sides of the belt.

Each week, ensure that the bearings are greased, as per Figure 26 below. Ensure that the elevator is free-moving in each direction and there is no feed caught in the slide-ways. Replace belts and side rubbers when they become worn; otherwise, the elevator will not function properly. Refer to the Rear Feed-Out Operator's Manual Supplement for spare parts, maintenance and operation.

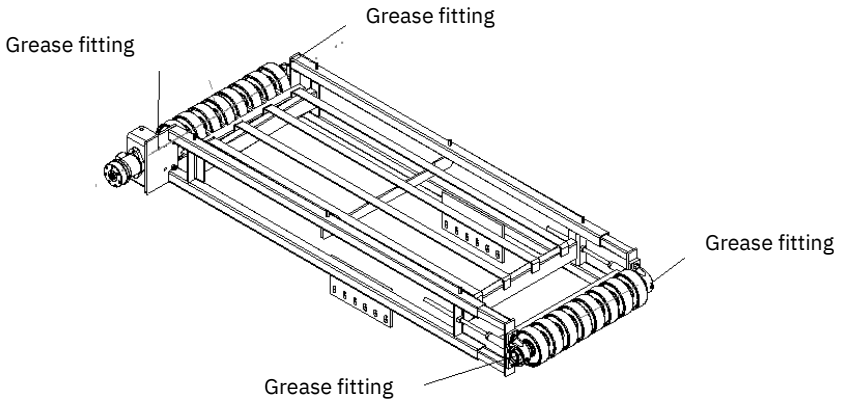


Figure 26: Rear feed-out elevator grease points

7.4 Side and stub elevator (where fitted)

An elevator system requires regular maintenance in order to achieve optimal performance. Every week, the elevator needs to be checked to make sure that the belt is running straight and not wearing unevenly on one side. If the belt is not running straight, then adjust the tension by adjusting the tensioner nut on the side, and run it again to check.

The elevator surface needs to be kept clean at all times in order to avoid feed building up and falling into the rollers during operation. Do not allow old feed to build up on the sides of the belt.

Each week, ensure that the bearings are greased, as per Figures 27 and 28 below. Ensure that the elevator is free-moving in each direction and that there is no feed caught in the slide ways.

Replace belts and side rubbers when they become worn; otherwise, the elevator will not function properly.

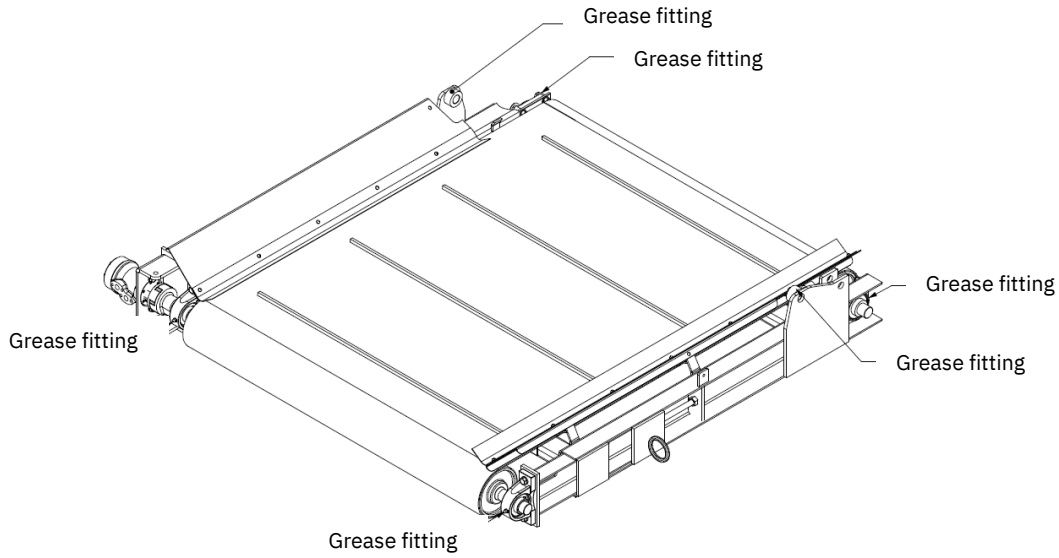


Figure 27: Side elevator greasing points

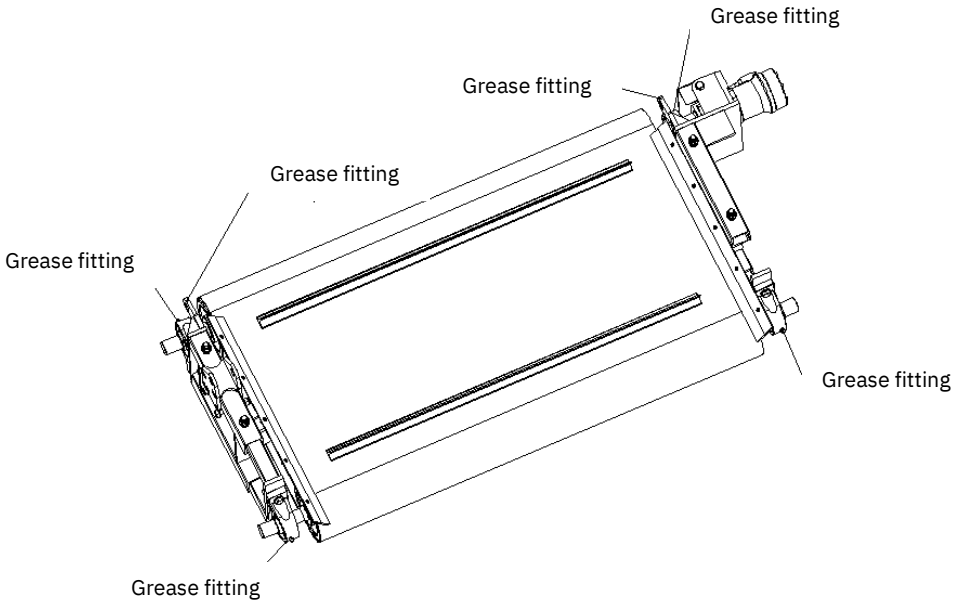


Figure 28: Stub elevator greasing points

7.5 Axle maintenance

Tightening and retightening wheel nuts

The following steps should be taken to tighten and retighten wheel nuts:

1. Impact wrenches should not be used, as the impact torque may be excessive.
2. Wheel nuts should be tightened diagonally every time in conjunction with a torque wrench.
3. In the case that power tools are the only tools available, they must be set to the correct torque (check Section 1.9 in the model-specific manual), as over-tightening may lead to damage or breakage.

Ensure that the nuts are correctly tightened after:

1. First use.
2. The first laden journey.
3. The first 1,000 km.
4. Every six months thereafter, or every 25,000 km (whichever happens first).
5. Every time a wheel is changed or removed (check how to safely remove a wheel in Section 1.10 in the model-specific manual).

7.5.1 Hubcap maintenance

Hubcaps that go missing or are damaged must be replaced immediately to keep dirt from penetrating the hub, which can damage the bearings.

Check that hubcaps are always in place and in good condition.

If the hubcaps are a press fit, visually check to ensure that they are fully home.
If the hubcaps are attached using screws, fit a new gasket, if needed, once the hubcap is removed. Retighten the screws regularly every 6 months.

7.5.2 Bearing play

The bearing play should be checked:

1. After the first month of use.
2. Before intensive use and every 6 months thereafter.

Wheel bearings are subject to varying levels of wear based on the:

1. Operating conditions.
2. Load.
3. Speed.
4. Adjustment and lubrication.

To check the wheel bearings:

1. Lift the wheel off the ground and turn it slowly, checking for any rough points or friction.
2. Turn it at a high speed to check for unusual noises, such as grating or knocking.

If there are signs of damage, or if the bearings are worn, the bearings and the seals should all be replaced.

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