

HIGHLINE Vertical Total Mix Ration (TMR) Manual

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Parts are subject to change at any time, without prior or direct notice to the consumer. The contents of this manual can as well be changed without prior notice. For information about adjustment, maintenance or repairing, which are not mentioned in this manual, you are advised to consult the technical support of your supplier.

This manual has been made with all possible effort, but Highline Manufacturing Inc. cannot be responsible for possible mistakes in this manual, nor for the consequences.

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1.0 PRESIDENT'S MESSAGE

The Vertical Total Mix Ration (TMR), a proven name in the cattle feeding field, is distributed by Highline Mfg. Inc. The TMR was designed to work in the most difficult of mix ration feeding situations. A little time and effort will ensure the performance and durability of your TMR.

This manual has been prepared to provide the information necessary for the safe and efficient operation of your TMR. In it, you will find safety procedures, maintenance routines and detailed parts diagrams.

In order to maintain our high standards, changes or improvements are made from time to time. Highline Mfg. Inc. reserves the right to make those changes and add improvements when practical to do so without incurring any obligation to make such changes on machines previously sold.

Should the need arise, this manual will assist you in acquiring replacement parts. If your dealer does not have the parts you need in stock, they will be happy to order them for you. Feel free to contact Highline Mfg. Inc. or your local dealer if you need information that is not included in this manual.

Highline Mfg. Inc. thanks and congratulates you for selecting the Vertical Mixer Feeder as the machine for your bale handling needs.

*Chuck Lepage, President
Highline Mfg. Inc.*

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2.0 SCALES WARRANTY

Highline New Agricultural Equipment Limited Warranty

Effective July 1, 2000

1 Year Parts and Labour

Highline Mfg. Inc (hereinafter "Highline") warrants this new Agricultural product of Highline's manufacturer to be free from defects in material and workmanship, under normal use and service for one (1) full year after initial purchase/retail sale.

Highline will warrant its product for one (1) year parts and labour, if performed by a qualified Dealer. This Limited Warranty shall apply only to complete machines of Highline's manufacture, parts are covered by a separate Limited Warranty.

EQUIPMENT AND ACCESSORIES NOT OF HIGHLINE'S MANUFACTURE ARE WARRANTED ONLY TO THE EXTENT OF THE ORIGINAL MANUFACTURER'S WARRANTY AND SUBJECT TO THEIR ALLOWANCE TO HIGHLINE ONLY IF FOUND DEFECTIVE BY SUCH MANUFACTURER .

During the Limited Warranty period specified above, any defect in material or workmanship in any warranted item of Highline Agricultural Equipment not excluded below shall be repaired or replaced at Highline's option without charge by any authorized independent Highline Dealer. An authorized Dealer must make the warranty repair or replacement. Labour in accordance with Highline's labour reimbursement policy. Highline reserves the right to supply remanufactured replacement parts as it deems appropriate.

RETAIL PURCHASER RESPONSIBILITY : This Limited Warranty requires proper maintenance and periodic inspections of the Agricultural Equipment as indicated in the Operator's Manual furnished with each new Agricultural Equipment. The cost of routine or required maintenance and services is the responsibility of the retail purchaser. The retail purchaser is required to keep documented evidence that these services were performed. This Highline New Agricultural Equipment Limited Warranty may be subject to cancellation if the above requirements are not performed

EXCLUSIONS AND LIMITATIONS

The warranties contained herein shall **NOT APPLY TO:**

- (1) Any defect which was caused (in Highline's sole judgement) by other than normal use and service of the Agricultural Equipment, or by any of the following: (i) accident (ii) misuse or negligence (iii) overloading (iv) lack of reasonable and proper maintenance (v) improper repair or installation (vi) unsuitable storage (vii) non-Highline approved alteration or modification (viii) natural calamities (ix) vandalism (x) parts or accessories installed on Agricultural Equipment which were not manufactured or installed by Highline authorized Dealers (xi) the elements (xii) collision or other accident.
- (2) Any Agricultural Equipment whose identification numbers or marks have been altered or removed.
- (3) Any Agricultural Equipment which any of the required or recommended periodic inspection or services have been performed using parts not manufactured or supplied by Highline or meeting Highline Specifications including, but without limitation, lubricants (oil, grease), belt lacings, and hydraulic fluids.
- (4) Equipment used for rental, custom work, industrial and construction or if equipment is used for any other purpose than the intended agricultural application.
- (5) Any Agricultural Equipment used in demonstrations not performed by a Highline Dealer. Warranty will be at the discretion of Highline for all other demonstration warranty.
- (6) **New Agricultural Equipment delivered to the retail purchaser in which the warranty registration has not been completed and returned to Highline within ten (10) days from the date of purchase.**
- (7) Any defect that was caused (in Highline's sole judgement) by operation of the Agricultural Equipment not abiding by standard operating procedures outlined in the Operator's Manual.
- (8) Tire Limited Warranties and support are the responsibility of the respective product's manufacturer.
- (9) Transportation costs, if any, of transporting to the Highline Dealer.
- (10) In no event shall Highline's liability exceed the purchase price of the product.
- (11) Highline shall not be liable to any person under any circumstances for any incidental or consequential damages (including but not limited to, loss of profits, out of service time and damage to equipment which this equipment may be attached) occurring for any reason at any time.
- (12) Diagnostic and overtime labour premiums are not covered under this Limited Warranty Policy.
- (13) Depreciation damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow operating instructions, misuse, and/or lack of proper protection during storage.
- (14) Accessory systems and electronics not of Highline's manufacture are warranted only to the extent of such manufacturer's respective Limited Warranty if any.
- (15) Wear items which are listed by product group below:

COMMON WEAR ITEMS: roller chain, sprockets, clutches, shear bolts, clutch components, chains, gearbox housings bolts/torqued parts, flails, feed roller belting, coupler chain, DRV couplers, bogie wheels, apron tines and hoses.

PARTS WARRANTY

Parts replaced in the warranty period will receive the balance of the one year New Agricultural Equipment Limited Warranty. Replacement parts after the original machine warranty are warranted to be free from defects of material for ninety (90) days or the part will be repaired or replaced, without labour coverage for removal and reinstallation.

EXCLUSION OF WARRANTIES. UNLESS OTHERWISE REQUIRED BY LAW, AND EXCEPT FOR THE WARRANTIES EXPRESSLY AND SPECIFICALLY MADE HEREIN, HIGHLINE MAKES NO OTHER WARRANTIES, AND ANY POSSIBLE LIABILITY OF HIGHLINE HEREIN UNDER IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGHLINE RESERVES THE RIGHT TO MODIFY, ALTER AND IMPROVE ANY PRODUCT WITHOUT INCURRING ANY OBLIGATION TO REPLACE ANY PRODUCT PREVIOUSLY SOLD WITH SUCH MODIFICATION. NO PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY, OR TO ASSUME ANY ADDITIONAL OBLIGATION ON HIGHLINE'S BEHALF.

3.0 OPERATOR QUALIFICATIONS

Operation of this mixer / feeder shall be limited to competent and experienced persons. In addition, anyone who will operate or work around a mixer / feeder must use good common sense. In order to be qualified, he or she must also know and meet all other qualifications, such as:

1. Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your area or situation.
2. Current OSHA regulations state in part:
At the time of initial assignment and at least annually thereafter, the employer shall instruct EVERY employee in the safe operation and servicing of all equipment with which the employee is, or will be involved.
3. Unqualified persons are to STAY OUT OF THE WORK AREA.
4. A person who has not read and understood all operating and safety instructions is not qualified to operate the machinery.

FAILURE TO READ THIS MIXER / FEEDER MANUAL AND ITS SAFETY INSTRUCTIONS IS A MISUSE OF THE EQUIPMENT.

4.0 SAFETY FIRST

REMEMBER: The careful operator is the best operator. Most accidents are caused by human error. Certain precautions must be observed to prevent the possibility of injury or damage.



DO NOT ALLOW PERSONNEL OTHER THAN THE QUALIFIED OPERATOR NEAR THE MACHINE.



NEVER START THE MACHINE UNTIL ALL GUARDS AND SAFETY SHIELDS ARE IN PLACE.



DO NOT CLEAN, ADJUST OR LUBRICATE THE MACHINE WHEN IN MOTION.



BEFORE STARTING TRACTOR ENGINE, BE SURE PTO SHIELDS TURN FREELY.



LOOSE OR FLOPPY CLOTHING SHOULD NOT BE WORN BY THE OPERATOR.

4.1 Operating Precautions & Instructions

- A. Check to see that no obstructions are present in the mixer prior to start up.
- B. Before loading, run the mixer empty and check all operations.
- C. Do not overload the mixer, as the mixing efficiency maybe reduced and unit damage may occur.
- D. Be sure all shields are in place before operation.
- E. Use common sense when operating.

4.2 Important Safety Guidelines

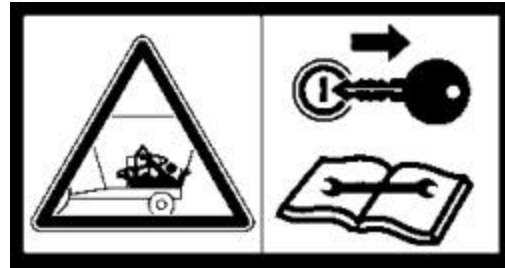
The warning stickers shown below are on the machine. They show an image that shows the danger (with triangle) and an image that explains how to prevent this danger.



BEWARE

It is dangerous to stand on the machine when it is in motion.

Never stand on the mixer when it is in motion



BEWARE

Working on the mixer auger can cause severe injuries on hands and feet and other physical damages

Before maintenance or repair activities stop tractor engine, extract ignition key and follow instructions in the operators manual



BEWARE

Falling into a mixer during operation can cause severe physical injuries

Never stand above the machine when the auger is in motion



BEWARE

After 1 hour in operation and then after every 10 hours tighten wheel nuts and check tire pressure



BEWARE

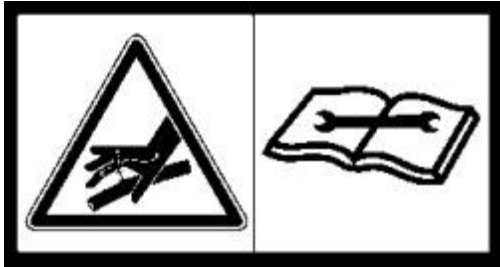
Tamping the feed can cause severe damage to the machine

Load the feed constituents slowly into the mixing tub and wait until these are cut before you continue the loading process



Beware

Before taking the mixer in operation carefully read this instruction manual

**BEWARE**

Broken hydraulic lines can cause physical injuries and environmental damage

Uncouple the mixer and repair or change the line(s)

**BEWARE**

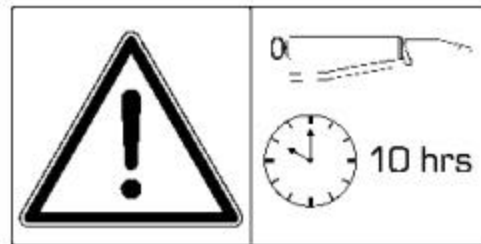
MAX 1000 RPM

The maximum RPM for this machine is 1000 RPM
The reduction gearbox automatically reduces to 540

**BEWARE**

Coming into contact with the PTO shaft when in operation can cause severe injuries and physical damage

Do not come near the turning PTO shaft
Only wear narrow clothing

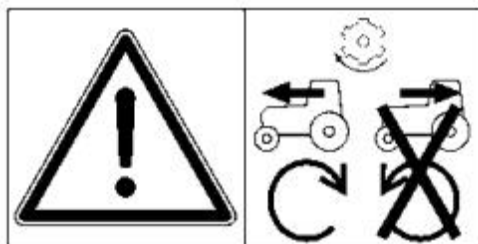
**BEWARE**

All greasing nipples have to be checked and greased every 10 operating hours

**BEWARE**

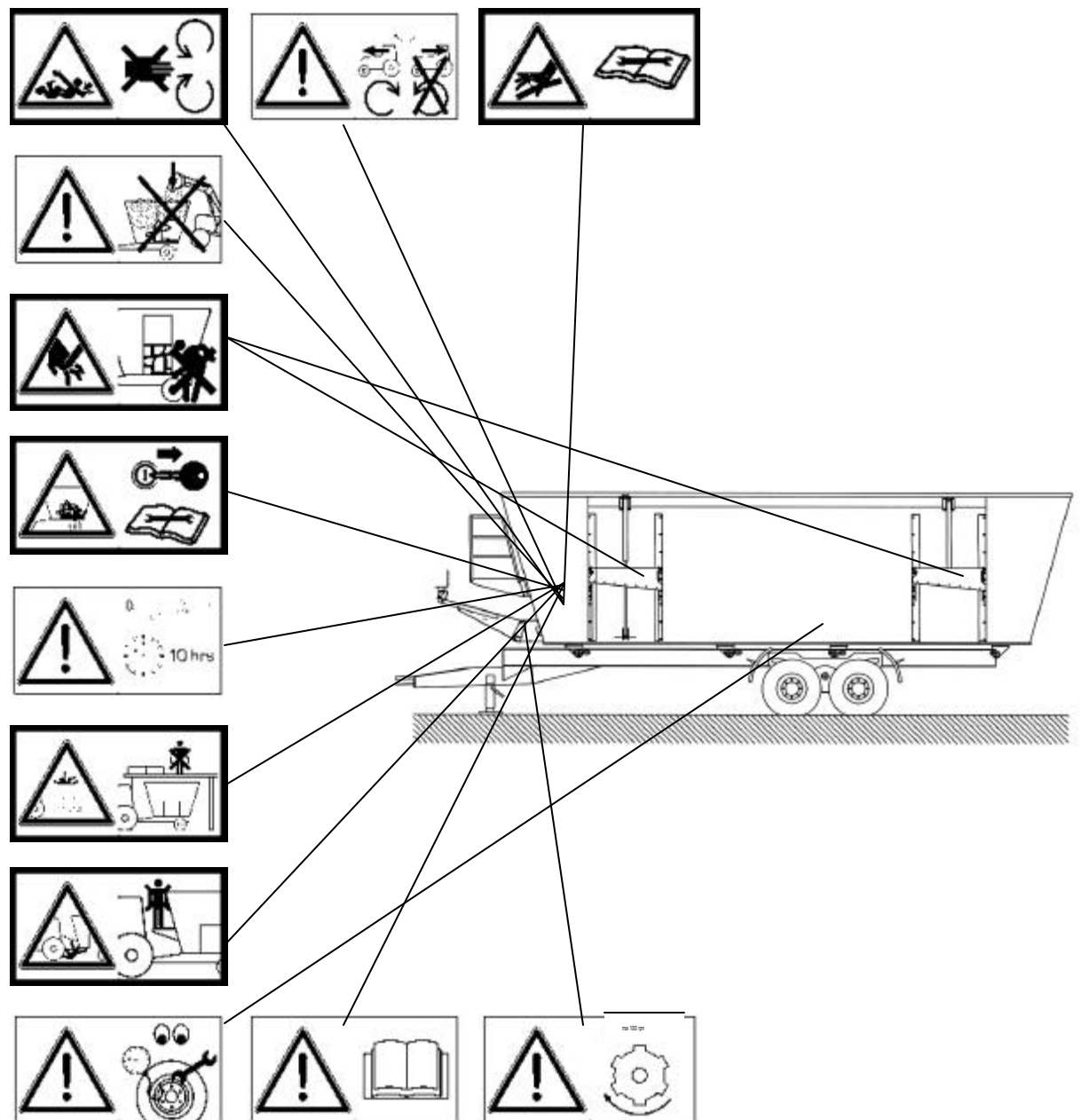
Direct contact with the auger and the knives can cause accidents

Do not come into the range of the turning auger when the unloading door is opened

**BEWARE**

Never drive backwards if the PTO of your tractor automatically reverses when the tractor is put in reverse gear

4.3 Warning Stickers



5.0 INTRODUCTION

5.1 General

Congratulations with your new **Highline TMR vertical mixer feeder**.

Before you put your mixer feeder into use, we ask you to read this manual very carefully. You will get the most benefit from your investment when you follow the instructions in this manual for use and maintenance.

Directional indications such as 'left', 'right', 'front' and 'rear' are to be interpreted when facing in direction of travel, with the mixer feeder attached to the rear of the tractor.

Destination and intended use

- Mixing and cutting of different kinds of livestock feed
- Transporting the feed to the livestock
- Rationing the feed to the livestock

Every other use than described above excludes your supplier from every responsibility.

Customers

The customers this manual refers to, are supposed to be competent and technically skilled persons.

Competent persons are persons who:

- have obtained a certain knowledge by means of course/training and who
- are proficient in using the machine.

Technically skilled persons are persons who:

- are competent and who
- have obtained a certain technical knowledge by means of course/training and who
- are acquainted with the technique of the machine and who are aware of the possible dangers and risks (i.e. a dealer of Highline Manufacturing Inc.)





With operating we mean:

adjusting the machine, working with the machine, cleaning and doing simple maintenance.

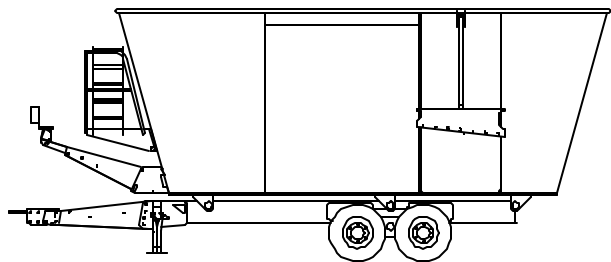
The goal / function of this manual is to create a safe and efficient interaction between human and machine.

Used symbols

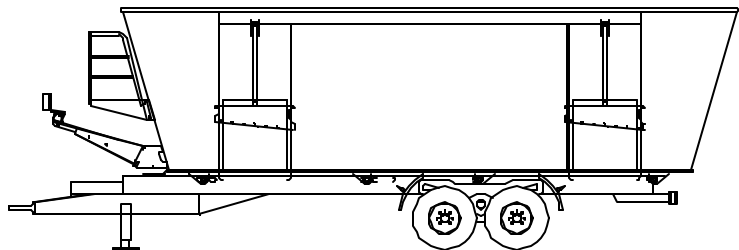
To focus on certain subjects or actions, the following symbols are used.

	WARNING / DANGER OF LIFE You can injure yourself if you don't execute the procedures carefully.
	CAREFUL The machine can be damaged if you don't execute the procedures carefully.
	ATTENTION A remark with additional information; warns you for possible problems.
	TIP Gives you suggestions and advice to make certain tasks easier.

6.0 TECHNICAL SPECIFICATIONS



1) TMR Twin Screw



2) TMR Triple Screw

Standard design TMR Twin/Triple Screw	Chassis prepared for weighing facility with weighing bars. The mixing tub has 2 or 3 augers with 'long-life' knurled knives. 2 adjustable contra knives. Planetary drive. Central lubrication of the augers by a pump. Left and right a hydraulically controllable unloading door (twin: choice front or rear). Electromagnetic valve-block with 3 functions and pressure gauge. PTO with shear bolt protection.
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Specifications	TMR 15 m ³ twin	TMR 17 m ³ twin	TMR 20 m ³ twin	TMR 20 m ³ maxi twin	TMR 24 m ³ maxi twin	TMR 30 m ³ maxi twin	TMR 36 m ³ Triple Screw	TMR 45 m ³ Triple Screw
Length	647 cm	647 cm	656 cm	712 cm	712 cm	744 cm	961 cm	1019 cm
Width	235 cm	236 cm	236 cm	266 cm	266 cm	281 cm	266 cm	281 cm
Height	264 cm	277 cm	294 cm	265 cm	295 cm	339 cm	323 cm	348 cm
Weight	5250 kg	5450 kg	5650 kg	7400 kg	8000 kg	9020 kg	13000 kg	15600 kg
Capacity	15 m ³	17 m ³	20 m ³	20 m ³	24 m ³	30 m ³	36 m ³	45 m ³
Tires	7.00x12 (4)	7.00x12 (4)	7.00x12 (8)	8.15x15 (8)	8.15x15 (8)	245/70R 19.5 (8)	245/70R 19.5 (8)	245/70R 19.5 (8)
Max axle load	12000 kg	13000 kg	14000 kg	19000 kg	19000 kg	19000 kg	24000 kg	31000 kg
Max. kg at towing eye	1500 kg	1500 kg	1500 kg	2000 kg	2000 kg	2000 kg	2500 kg	3000 kg
Max. total weight	11250 kg	12250 kg	13250 kg	16400 kg	17600 kg	19600 kg	27400 kg	33600 kg
Max. loading weight	6000 kg	6800 kg	8000 kg	8600 kg	9600 kg	12000 kg	14400 kg	18000 kg
Min. HP required	80 ⁽¹⁾	85 ⁽¹⁾	90 ⁽¹⁾	90 ⁽²⁾	95 ⁽²⁾	120 ⁽²⁾	150 ⁽²⁾	180 ⁽²⁾

⁽¹⁾ When equipped with gear reducer

⁽²⁾ Machine is standard equipped with gear reducer


Specifications	TMR 40 m ³ Triple Screw	TMR 45 m ³ Triple Screw
Length	961 cm	1019 cm
Width	266 cm	281 cm
Height	348 cm	348 cm
Weight	13800 kg	15600 kg
Capacity	40 m ³	45 m ³
Tires	245/70R 19.5 (8)	245/70R 19.5 (8)
Max axle load	26500 kg	31000 kg
Max. kg at towing eye	3000 kg	3000 kg
Max. total weight	29800 kg	33600 kg
Max. loading weight	16000 kg	18000 kg
Min. HP required	165	180 ⁽²⁾


7.0 ATTACHING THE MACHINE TO THE TRACTOR


- Step 1**
- The towing eye of the mixer feeder has to be approached up to ± 20 cm by the tow bar of the tractor.
 - The mixer feeder and the tractor have to be secured from driving away with the handbrake or wheel blocks.
- Step 2**
- When equipped with a manually adjusted jack: shove the jack manually in or out, so that the towing eye comes a little higher than the tow bar of the tractor.
 - When equipped with a hydraulically adjusted jack (optional): connect the hydraulic connector with the hydraulic system of the tractor. Open the spherical plug and shove the jack in or out so that the towing eye comes a little higher than the tow bar of the tractor.
- Step 3**
- Move the tractor backwards and put the pivot in (cotter with the split pin).
- Step 4**
- Screw in the jack.
(When equipped with a hydraulically adjustable jack, this can be done by first opening the spherical plug and then opening the concerning tractor valve, so that the oil is carried off.)
 - Retract the jack completely.
 - Remove the lock pin.
 - Fold in the jack.
 - Apply the lock pin again.
- Step 5** - Also connect the lighting (optional) if necessary.

Explanation of the connection pins and wires		
L	Yellow	Direction sign left
54 G	Blue	Consistent current
31	White	Mass
R	Green	Direction sign right
58 R	Brown	Lights right
54	Red	Brake light
58 L	Black	Lights left

- Step 6**
- Shut down the motor of the tractor, and remove the ignition key.
- Step 7**
- Connect the PTO between the mixer feeder and the tractor.

	<p style="text-align: center;">ATTENTION</p> <p>The tractor side of the PTO is indicated with a decal on the protection shield. Verify if the max. rpm is the same as the rpm of the PTO of the tractor.</p>
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	<p style="text-align: center;">CAREFUL</p> <p>The PTO needs at least 10-15 cm of space to shove in; so the drive won't be damaged in sharp turns.</p>
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	<p style="text-align: center;">ATTENTION</p> <p style="text-align: center;">Ensure that the hydraulic system of the tractor and the machine is pressureless when you connect or disconnect the hydraulic hoses.</p>
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	<p style="text-align: center;">ATTENTION</p> <p style="text-align: center;">Ensure that the free-return hose is attached carefully to prevent pressure increasing in the return pipe</p>
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Step 8 Connect the hydraulic system of the mixer feeder to the hydraulic system of the tractor. The hoses that should be connected, are one free return (hose with yellow cap) and one with single-acting function (hose with red cap).

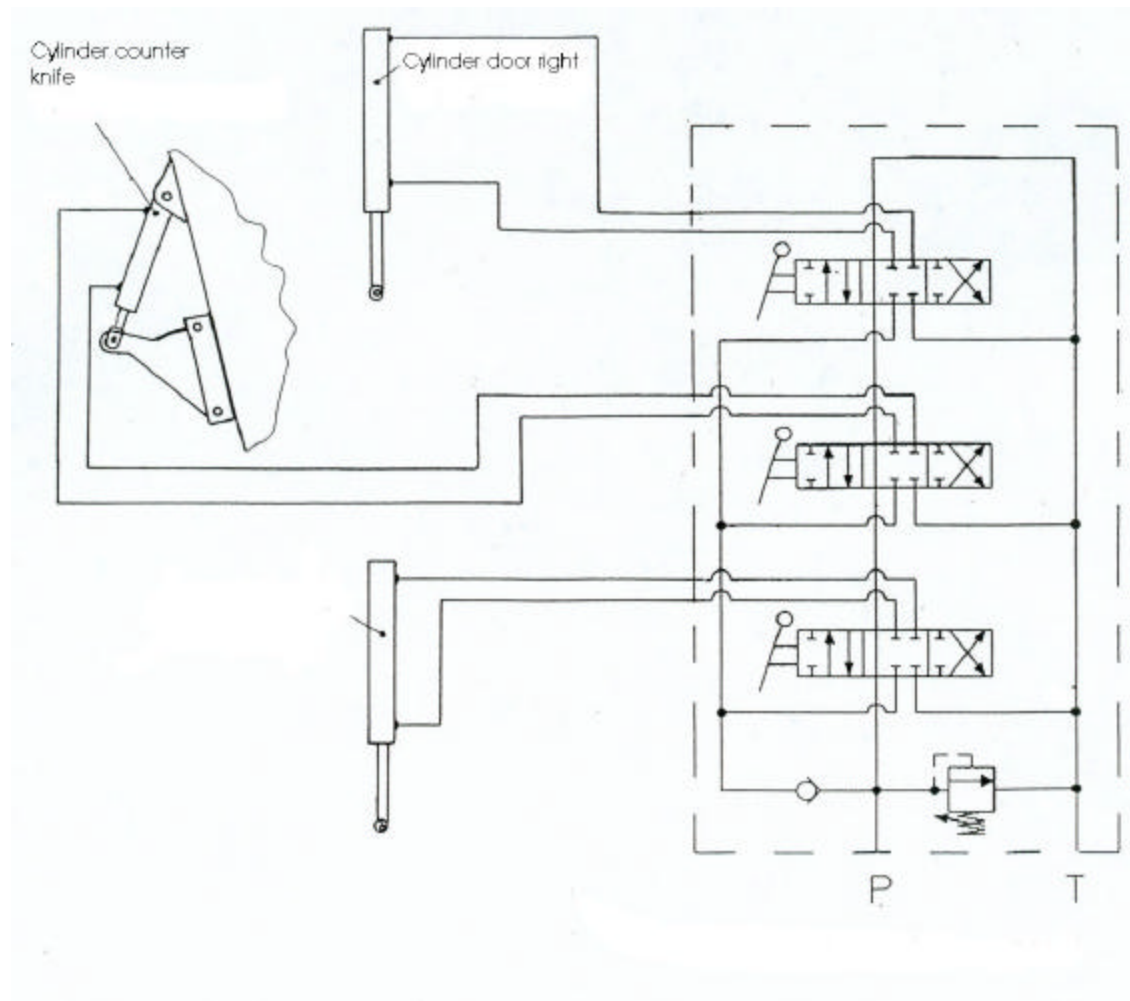
(The hydraulic scheme of the mixer feeder is in the parts list).

Step 9 If you have a mixer feeder with optional weighing installation, plug the feeding cable of the weighing installation in the socket of the tractor. For explanation about the weighing installation, consult the manual about the weighing installation specifically.

Step 10 First execute the daily maintenance before using the machine.

For any doubt, consult your dealer.

8.0 DISCHARGE DOOR + COUNTER KNIFES HYDRAULIC SCHEMATIC



9.0 LOADING INSTRUCTIONS & PRECAUTIONS

- A. Visually inspect mixer before each load.
- B. Do not overload the mixer. Mixer capacity can be reached by weight, but is usually reached by volume. An overloaded mixer will not mix correctly, and will pull harder, which could damage your tractor.
- C. Load hay first with machine running in:
 - 1. Low gear with very rough, course hay that needs to be cut shorter to increase palatability.
 - 2. High gear with normal to very tender hay.

NOTE: Gear selection can be determined by varying tractor throttle.

Adjust restrictor plates (counter knives) to fine tune length of cut. Always start with one knife, preferably the left hand rear, engaged one hole and increase until length if cut is correct.

NOTE: Engaging knives an excessive amount will cause mix quality to deteriorate.
- D. Add balance of grain and/or commodities, keeping more fragile ingredients towards the end of the loading sequence. For best results, add concentrates or other dry ingredients of small quantity as close to the middle of the loading sequence as possible.
- E. Load silage, green chop and/or other high moisture products.
- F. Load molasses, animal fat, and/or other liquid supplements last.
- G. Allow mixer three to four minutes to complete mixing after last ingredient is added.

NOTE: This time will vary, and could be longer depending on size of machine and under certain conditions.
- H. View mixing operation only from observation platform of mixer. Never allow more than two (2) people on platform at one time.
- I. For best results, off load mixed feed at as high RPM as possible, and with the door as open as possible. The load must be fed off in high gear at high RPM, to ensure even feed flow & clean out.

10.0 MAINTENANCE AND LUBRICATION

- Check the hydraulic hoses and hydraulic cylinder for wear, leakage and damage. Replace if necessary.
- Check tire pressure.

Tire pressures	
Tire type	Pressure (psi)
15 / 55 - 17	42
400 / 60 x 15.5	51
11.5 x 15	51
26 x 8 -14	73
245 / 70R 19.5	110
7.00 - 12	116
8.15 x 15	116
27 x 10 -12	116

- For safety, replace the hydraulic hoses 7 years after date of building

10.1 Lubrication Chart

DISENGAGE PTO & SHUT OFF POWER BEFORE LUBRICATING THE MACHINE.

LOOSE OR FLOPPY CLOTHING SHOULD NOT BE WORN BY THE OPERATOR.

AUGER BEARING: Grease every 10 hours.

PTO SHAFTS & U-JOINTS: Grease every 10-20 hours.

RIGHT ANGLE GEARBOX:

After the first 100 hours of operation, drain initial oil, preferably warm. Flush out the gear case with an approved non-flammable, non toxic solvent and refill with oil. Thereafter oil should be changed every 2000 hours or 12 months, whichever comes first. If machine usage is severe or more than 10 loads per day it is advisable to change the oil every 1000 hours or 6 months. Inspect and wash oil reservoir breather cap as needed. Air dry before reinstalling. Fill the gearbox with approximately 3½ gallon of EP 220 Synthetic Gearbox Oil.

PROCEDEDURE FOR FILLING GEAR BOX:

Remove bottom oil line from reservoir and attach to oil supply pump. Continue to pressure oil in gearbox until oil starts to run out of bottom reservoir fitting. Fill reservoir to centre of sight gauge. Check daily, oil level must always be visible in sight gauge. Reconnect oil line to bottom of reservoir. **Note: Do not fill gearbox through oil reservoir.**

RECOMMENDATION:

It is advisable to check the oil level of gear boxes at least once a month. If more than 10% of the total oil capacity has to be added, check for oil leaks.

11.0 PARTS

Instructions for ordering parts.

Parts are to be ordered from Highline Mfg Inc Dealers.

Have the following information ready

- Model Number (obtain from the serial number plate)
- Serial Number (obtain from the serial number plate)
- If possible, the part number (obtain from the owner's manual)

If unable to locate a dealer near you, you can find a listing on our website page, www.highlinemfg.com or contact the Customer Service Department at Highline.

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