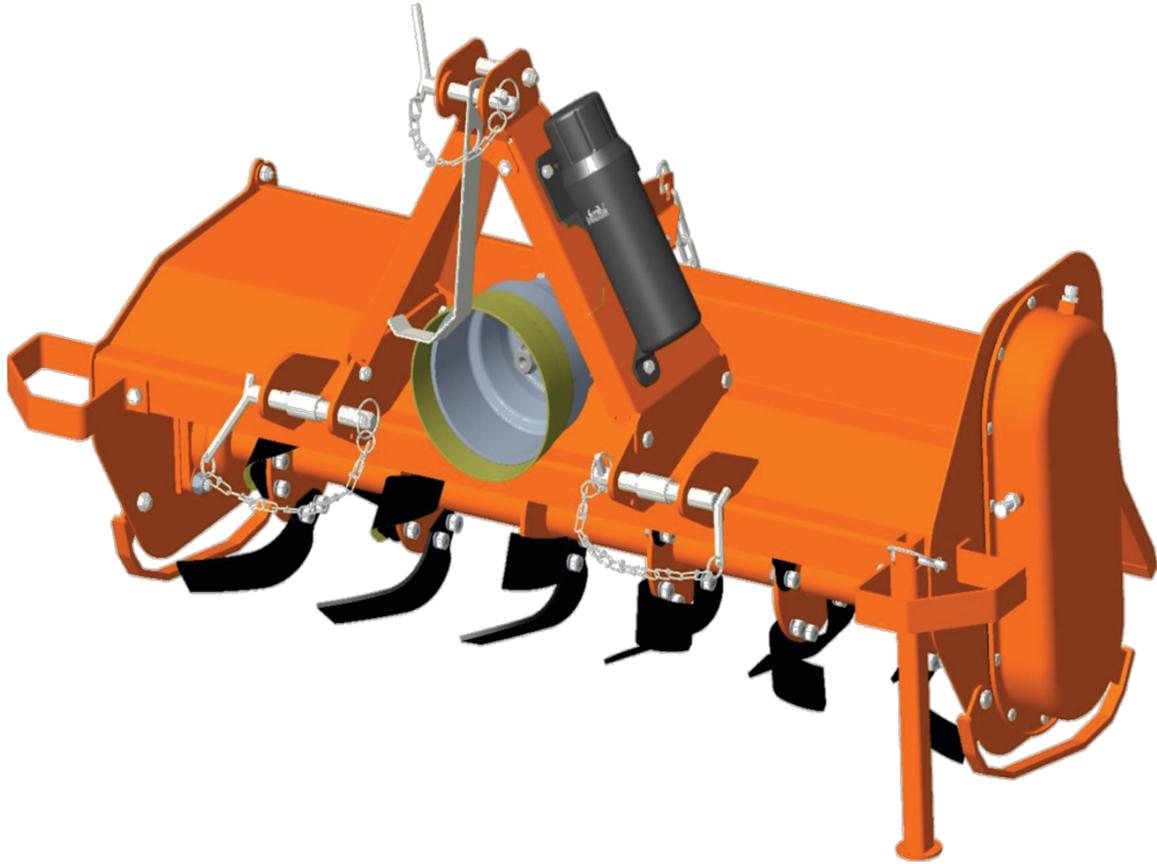
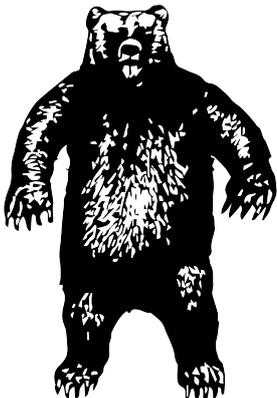


Grizzly® Rotary FMA Series



Operator's & Parts Manual



Grizzly®

Distributed by Direct Distributors Inc.

Congratulation for purchasing your new Grizzly® rotary tiller!

This tiller has been designed and manufactured following all safety and quality requirements needed for a safe and satisfactory use over time.

A careful reading of this manual will permit you to familiarize with your new equipment, and will provide you all the tools needed to use it safely.

A proper maintenance and knowledge of the safety rules of use will allow to obtain the best performance and a long service life of the machine.



The Safety Alert Symbol used throughout this manual and on safety decals of the machine indicates the presence of potential hazard to the operator. When you see this symbol, be alert and carefully read the message that follows it.

The Safety Alert Symbol is used in conjunction with following Signal Words, according to the degree of possible injuries that may result operating the implement:



DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.



CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT

Indicates instructions or procedures that, if not observed, can cause damage to equipment or environment.

NOTE

Indicates helpful information.

READ, UNDERSTAND, and FOLLOW the safety messages following the Safety Alert Symbol and Signal Words. Failure to comply with safety messages could result in serious bodily injury or death.

TO THE PURCHASER

This manual contains valuable information about GRIZZLY® ROTARY TILLER. It has been carefully prepared to give you helpful suggestions for operating, adjusting, servicing repair parts.

Keep this manual in a convenient place for quick and easy reference. Study it carefully. You have purchased a dependable and sturdy tiller, but only by proper care and operation can you expect to get the service and long life designed and built into it.

RIGHT-HAND AND LEFT-HAND sides are determined by watching from the tractor side.

Sometime in the future your tiller may need new parts to replace those are worn or broken. If so, go to nearest GRIZZLY® dealer and provide him the model and part number.

Customer information

Name _____

Purchased from _____

Purchased date _____

Model No. _____

Serial No. _____

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1. ABOUT THIS MANUAL

The manual is part of the machine, it must be kept in good condition and remain with the machine even in case of resale, until its demolition. In case of loss or damage, request a new copy to the Manufacturer or your Dealer.

The information, descriptions and illustrations in this manual describes the state of the product at the time of its publication, and may not reflect the product in the future.

The Manufacturer reserve the right to make design improvements or changes in specifications without incurring in any obligation to install them on units previously sold.

Text, illustrations and drawings of this manual cannot be disclosed or transmitted, in whole or in part, to third parties without the written permission of the Manufacturer. All rights are reserved.

2. INTRODUCTION

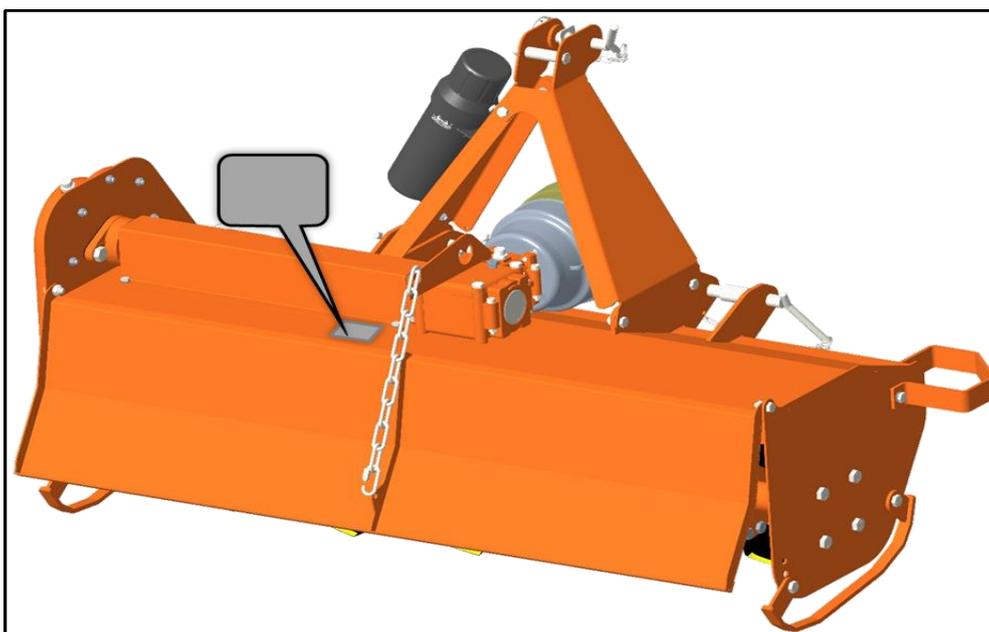
2.1. TILLER IDENTIFICATION

Each tiller is provided with a plate for unique identification (see position in picture below), showing with following information:

- Manufacturer name and address
- Product
- Model
- Chassis Serial Number
- Month & Year of manufacture
- Type
- Size/Working Width
- Weight
- Required Size of Prime mower

It's recommended to note down all data shown on the plate:

Any request for assistance or information regarding the machine must be directed to the Manufacturer or Dealer always referring to the model and serial number as shown on the plate affixed to the machine.



2.2. INTENDED USE

The FMA-series tillers are designed to be used uniquely for horticultural, agricultural, or commercial applications, to till soil for seedbed and planting preparation.

They are designed to be mounted on tractors equipped with hydraulic lift and universal three-point hitch that can support the implement weight, and driven by the power of the tractor through the PTO driveshaft.

The tractors used to operate the FMA-Series tillers must have the following requirements:

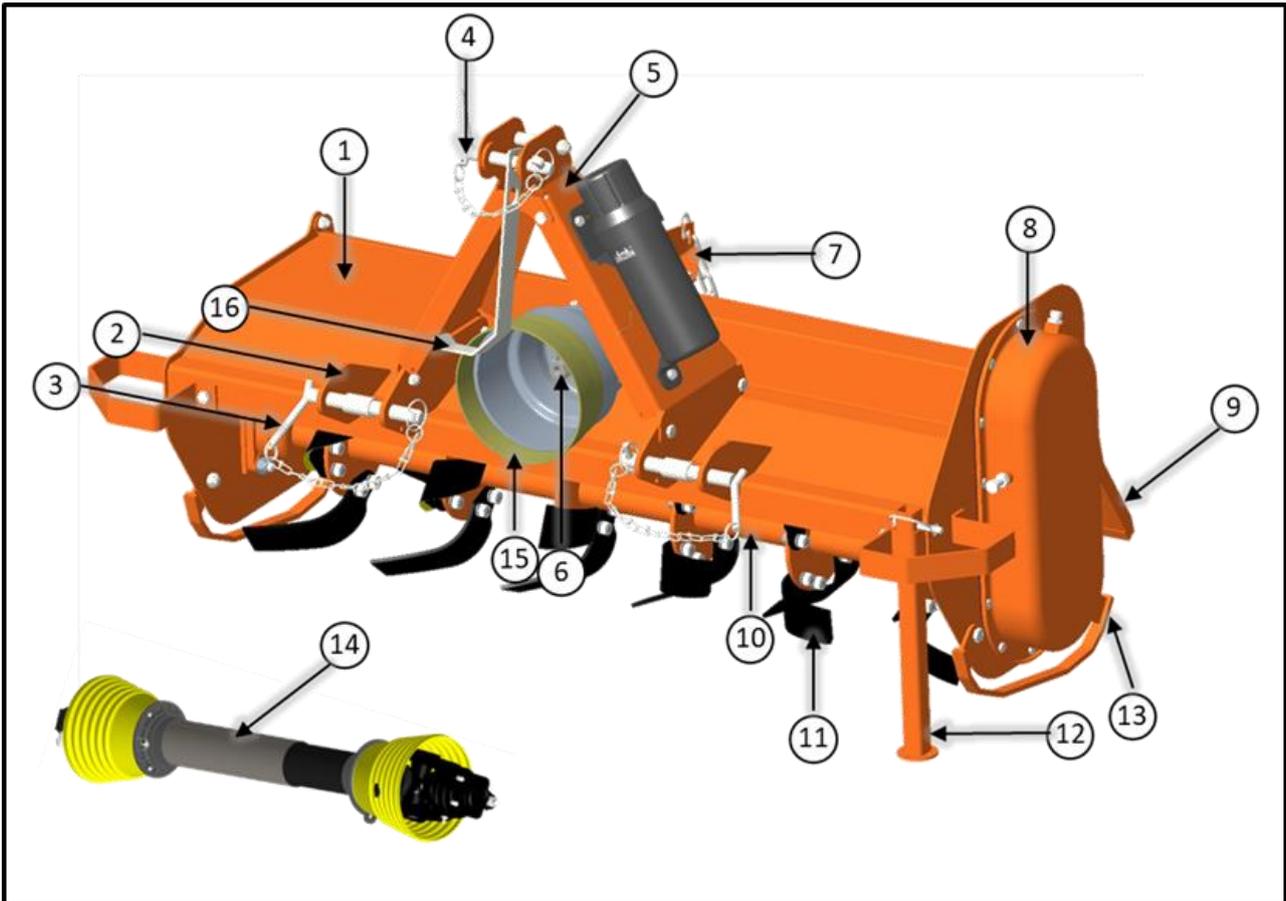
Hitch Category:	3-point Cat. I standard.
PTO:	540 RPM, 6-spline, 1 ³ / ₈ Z6
Horsepower:	As per given Technical Specification



DANGER

Any use of the machine other than the intended use is non-intended use, and is to be considered as unauthorized and dangerous. The manufacturer assumes no liability for damage resulting from non-intended use.

2.3. MAIN PARTSDESCRIPTION



1. Tiller deck	2. Clevis (lower hitch)
3. Lower hitch pin	4. Upper hitch
5. Topmast	6. Implement input connection (tiller PTO)
7. Gearbox	8. Side transmission case
9. Rear board	10. Rotor shaft
11. Tine	12. Parking stand
13. Skid	14. Cardan driveshaft
15. PTO Guard	16. Driveshaft Support

NOTE

Unless otherwise indicated, images shown in this manual refer to the tiller model wise.

2.4. TECHNICAL SPECIFICATIONS

DESCRIPTION	UNIT	MODEL		
		FMA 85	FMA 105	FMA 125
OVERALL DIMENSIONS	mm	1150	1345	1545
OVERALL WIDTH	mm	882		
OVERALL HEIGHT	mm	687		
TILLING WIDTH	mm	850	1050	1250
TRACTOR HP RANGE	HP	13-17 & 11-14	15-20 & 13-17	20-25 & 17-21
3-POINT HITCH TYPE	-	CAT-I		
NUMBER OF FLANGES ON ROTOR	No.	4	5	6
NUMBER OF TINES PER FLANGE	No.	4		
PTO INPUT SPEED	rpm	540		
ROTOR SHAFT SPEED	rpm 540	230		
STANDARD TINE CONSTRUCTION	-	Curved		
TRANSMISSION TYPE	-	Chain		
MAX WORKING DEPTH	mm	120		
ROTOR TUBE DIAMETER	mm	52		
ROTOR SWING DIAMETER	mm	386		
DRIVELINE SAFETY DEVICE	-	Shear Bolt		
WEIGHT (DRIVELINE EXCLUDED)	Kg.	115	125	135
	lbs	253	275	297

3. SAFETY

Proper use of equipment, a strict observance of the safety messages listed below and application of all reasonable practices to avoid any risks, prevents accidents or injury, allows the machine working better and longer, and minimize the failures. The manufacturer assumes no liability for any damage resulting from not applying the behavioral rules indicated into the manual.

3.1. GENERAL SAFETY INSTRUCTION



DANGER

The machine must be used only by authorized and well trained operators. The operator must have read and understood the instructions of this manual, it must make adequate preparation for the proper use of the machine and must hold a driving license. In case of doubt about the use of the machine and/or the interpretation of this manual, the operator must contact the Manufacturer or the Dealer.



WARNING

The manual must always remain with the machine. In case of loss or damage, request a new copy to the Manufacturer or your Dealer.



WARNING

Follow strictly the rules prescribed by the safety pictograms applied to the machine.



WARNING

Be sure that all safety pictograms are legible. If pictograms are worn, they must be replaced with others obtained from the Manufacturer, and placed in the position indicated by this manual.



DANGER

Before using the machine, make sure that all safety devices are installed and in good working conditions. In case of damages of shields, replace them immediately.



DANGER

Is absolutely forbidden to remove or alter safety devices.



DANGER

Before starting, and during operation of the tiller, make sure there are no people or animals in the operation area: the machine can project material from the back, with risks of serious injury or death.



DANGER

Pay maximum attention to avoid any accidental contact with rotating parts of the machine.



DANGER

During operation, adjustment, maintenance, repairing or transportation of the machine, the operator must always use appropriate Personal Protective Equipment (PPE).



DANGER

Do not operate the implement while wearing loose fitting clothing that can give rise to entanglement in parts of the machine.



DANGER

Do not operate the implement when tired, not in good condition or under the influence of alcohol or drugs.



CAUTION

If the use of the machine is required at night or in conditions of reduced visibility, use the lighting system of the tractor and possibly an auxiliary lighting system.

3.2. EQUIPMENT SAFETY INSTRUCTIONS



WARNING

Use the tiller for its intended purpose only. Improper use can damage the tiller and cause serious injury to persons, animals, or death.



DANGER

The machine should be used by a single operator driving the tractor.



WARNING

Any unauthorized modification of the machine may cause problems in safety and relieves the Manufacturer from any liability for damages or injuries that may result to operators, third parties and objects.



WARNING

Before using the machine, familiarize yourself with its controls and its working capacity.



WARNING

Do not leave the tiller unattended with tractor engine running.



WARNING

Do not operate tiller on too muddy, sandy or rocky soils.



WARNING

Keep the machine clean from debris and foreign objects which may damage functioning or cause injury.



WARNING

Do not use the machine if the category of the connecting pins of the tiller does not match that of the tractor hitch system.



WARNING

Do not use the machine with missing bolts, screws, pins or safety pins.



WARNING

Never use the machine to transport or lift people, animals or objects.



WARNING

Make certain, by adding front ballast, that at least 20% of the total weight (tractor, implement and ballast) is on the front axle of the tractor, to ensure stability.



WARNING

Before engaging the tractor PTO, make sure the tractor PTO speed is set as required for the tiller (540 rpm). Do not over speed PTO or machine breakage may result.



DANGER

Do not operate the tiller if the driveshaft is damaged. The driveshaft could be subject to breakage during operation, causing serious injury or death. Remove the driveshaft and replace it with an undamaged.

3.3. OPERATING SAFETY INSTRUCTIONS



WARNING

Before using the machine, be sure to have cleared the operating area from obstacles (stones, branches, debris, etc...). Mark all the obstacles that cannot be eliminated (e.g. by means flags).



DANGER

Never engage the tractor PTO in the presence of people close to the driveshaft. The body, hair or clothing of a person can get caught in rotating parts, causing serious injury or death.



DANGER

Before engaging the PTO and during all operations, make sure that no person or animal is in immediate area of action of the machine. Never use the tiller if people are in his working area.



DANGER

It's absolutely forbidden to stand near the tiller with moving parts.



WARNING

The operator must operate tiller lifting/lowering only from the driving seat of the tractor. Do not perform lifting maneuvers on side or behind the tractor.



WARNING

Before making changes in direction, turns or going in reverse, slightly lift the tiller from the ground after disengaging the power take-off, to avoid damage to the machine.



DANGER

In presence of steep slopes (greater than 15 degrees) the tilling action may cause instability of the tractor, with risk of tipping and consequent serious injury or death hazard. Consult the manual for the tractor to determine the maximum slope that the tractor is able to deal with.



DANGER

Always disengage the PTO before raising the tiller, and never engage the PTO with the tiller in the raised position. The machine might throw objects at high speed, causing serious injury or death.



WARNING

Never leave the driver's seat when the tractor is turned on. Before leaving the tractor, lower the tiller to the ground, disengage the PTO, insert the parking brake, stop engine and remove the key from the control panel



DANGER

The PTO shields of tractor and implement side, the driveshaft shielding and the driveshaft retaining chains must be properly installed and in good condition, to avoid risk of entanglement with serious injury or death.



DANGER

Before engaging the PTO of the tractor, always make sure that the drive shaft is mounted in the correct direction, and that its clamping elements are properly connected both to tractor side and to tiller side.

 **WARNING**

Stop operating immediately if blades strike a foreign object. Repair all damage and make certain rotor and blades are in good condition before resuming operation.

 **WARNING**

Always disengage the tractor PTO when the driveshaft exceeds an angle of 10 degrees up or down while operating. An excessive angle with driveshaft rotating can break the driveshaft and cause flying projectiles.

 **CAUTION**

Avoid shear bolt Loosen by too long or frequent Loosen, wear out or broken bolt, before shear running shear bolt tighten & safe.

 **CAUTION**

Prolonged use of the tiller can cause overheating of the gearbox. Do not touch the gearbox during use and immediately after, it could be extremely hot and cause severe burn.

 **WARNING**

All adjustment operations on the tiller must be performed by qualified and trained operators, with the tractor engine off, the PTO disengaged, the tiller lowered to the ground or on security stands, the ignition key off and the parking brake set.

3.4. TRANSPORTING SAFETY INSTRUCTIONS

 **WARNING**

Before transporting, determine the stopping characteristics of the tractor and implement.

 **WARNING**

Transport only at speeds where you can maintain control of the equipment.

 **WARNING**

When driving on roads, the implement must be in transport position adequately raised from the road surface, with tractor lifting hydraulics locked so that the tiller cannot be lowered accidentally.

 **DANGER**

The implement may be wider than the tractor. Pay attention during transporting to persons, animals or obstacles exposed.

 **WARNING**

When turning, use extreme care and reduce tractor speed.

 **WARNING**

Do not operate the tractor with weak or faulty brakes or worn tires.

 **CAUTION**

Always use tractor lighting system and auxiliary lighting system for an adequate warning to operators of other vehicles, especially when transporting at night or in conditions of reduced visibility.

 **DANGER**

In case of tiller lifting, make sure that the lifting device chosen is suitable to perform the operation safely, and use only the lifting points prescribed on tiller.

3.5. MAINTENANCE SAFETY INSTRUCTIONS

 **WARNING**

All maintenance and repairing operations must be performed by qualified and trained operators, with the tractor engine off, the PTO disengaged, the tiller lowered to the ground or on security stands, the ignition key off and the parking brake set.

 **WARNING**

Perform repairs and replacements necessary to the machine using only original spare parts provided by the manufacturer or your dealer.

 **DANGER**

Perform maintenance operations always using appropriate Personal Protective Equipment (protective eye glasses, hard hat, hearing protection, safety shoes, overall and work gloves, filter mask).

 **CAUTION**

Before any maintenance operation, make sure that the parts which may become hot during use (gear box...) have cooled.

 **WARNING**

Do not perform repairs that you do not know. Always follow the manual instructions and in case of doubt contact the Manufacturer or your dealer.

 **DANGER**

Do not swallow fuels or lubricants. In case of accidental contact with eyes, rinse well with water and consult a doctor.

3.6. STORAGE SAFETY INSTRUCTIONS

 **WARNING**

Never leave the tractor unattended with the tiller in lifted position. Accidental operation of lifting lever or a hydraulic failure may cause sudden drop of unit with injury or death by crushing.

 **DANGER**

Following operation, or before unhooking the tiller, stop the tractor, set the brakes, disengage the PTO, lower the attached tiller to the ground, shut off the engine, remove the ignition key and wait for all moving parts to stop.

 **WARNING**

Make sure all parked machines are on a hard, level surface and engage all safety devices.



CAUTION

Place support blocks under tiller as needed to prevent unit from tipping over onto a child and/or an adult. A tiller that tips over can result in injury or death.



CAUTION

Store the unit in an area away from human activity.

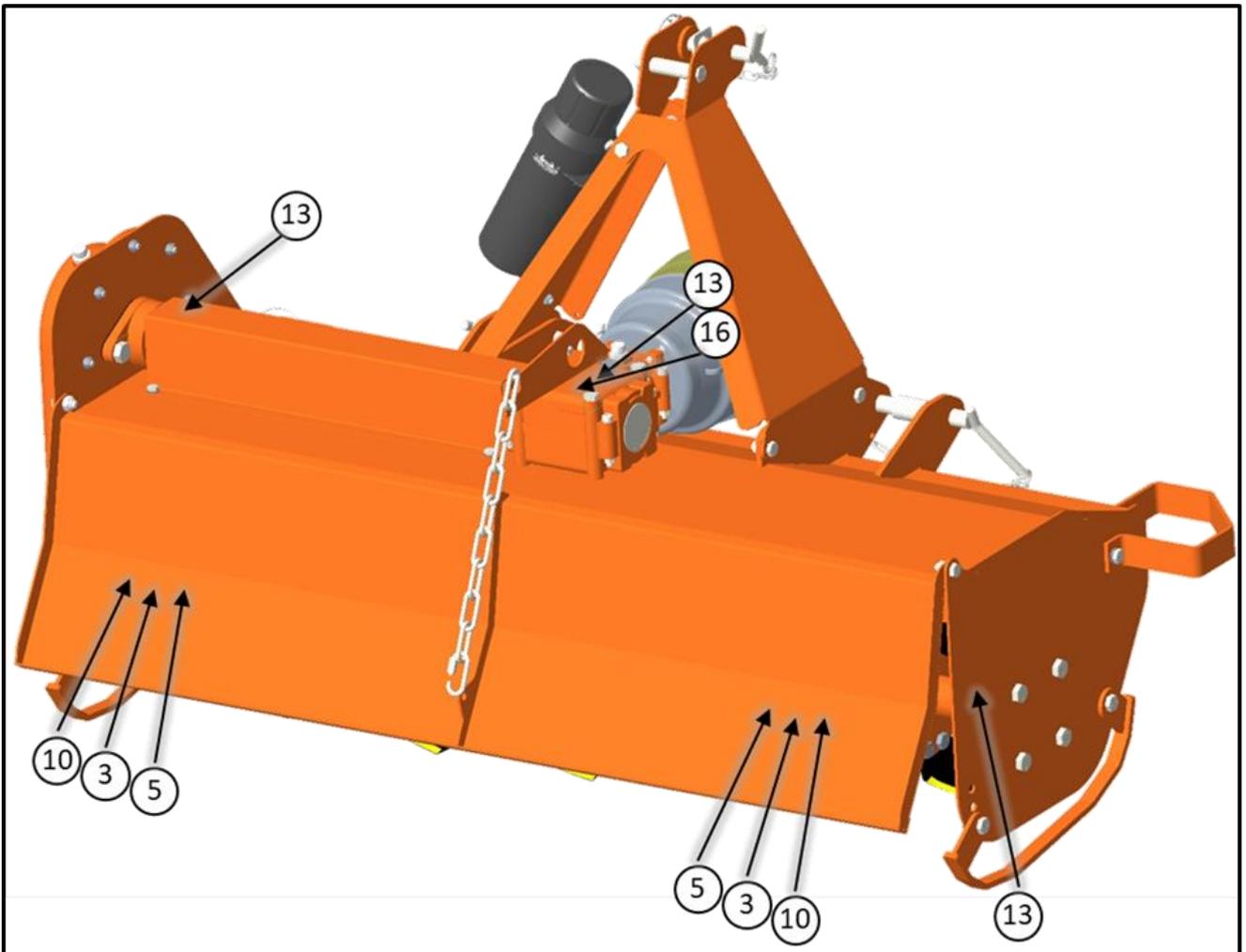
3.7. SAFETY LABELS

The safety labels applied on the machine give fundamental information for using the machine safely.

Make sure safety labels are in good conditions. If pictograms are worn, they must be replaced with others obtained from the manufacturer and placed in the position indicated by this manual.

Make sure the safety labels are legible. If necessary, wipe them by a cloth, with soap and water.

Safety Labels position and description



SR. NO.	SPARE CODE	DESCRIPTION	DECALS
1	D0090	WARNING: ALWAYS READ THE OPERATOR MANUAL	
2	D0038	MAINTENANCE:TURN OFF TRACTOR& REMOVE KEY	
3	D0095	THROWN OR FLYING OBJECTS HAZARD	
4	D0096	ROTATING KNIVES, LOWER LIMBS HAZARD	
5	D0078	HAND HAZARD	
6	D0079	ROTATING GEARS	
7	D0097	CRUSHING HAZARD BY LINK LIFTING	

8	D0098	IMPLEMENT INPUT DRIVELINE	
9	D0099	TRACTOR PTO RPM & ROTATION DIRECTION	
10	D0122	FINGERS/HANDS CRUSHING HAZARD	
11	D0082	SAFETY EQUIPMENT	
12	D0007	OIL FILLING PLUG – NEW	
13	D0008	GREASE – NEW	
14	D0009	OIL DRAIN PLUG	
15	D0006	MAINTAIN OIL LEVEL	

16	D0083	LIFTING HOOK JOINT	
17	D0108	CE LOGO	
18	D0092	DO NOT RIDE ON PLATFORM, KEEP DISTANCE	

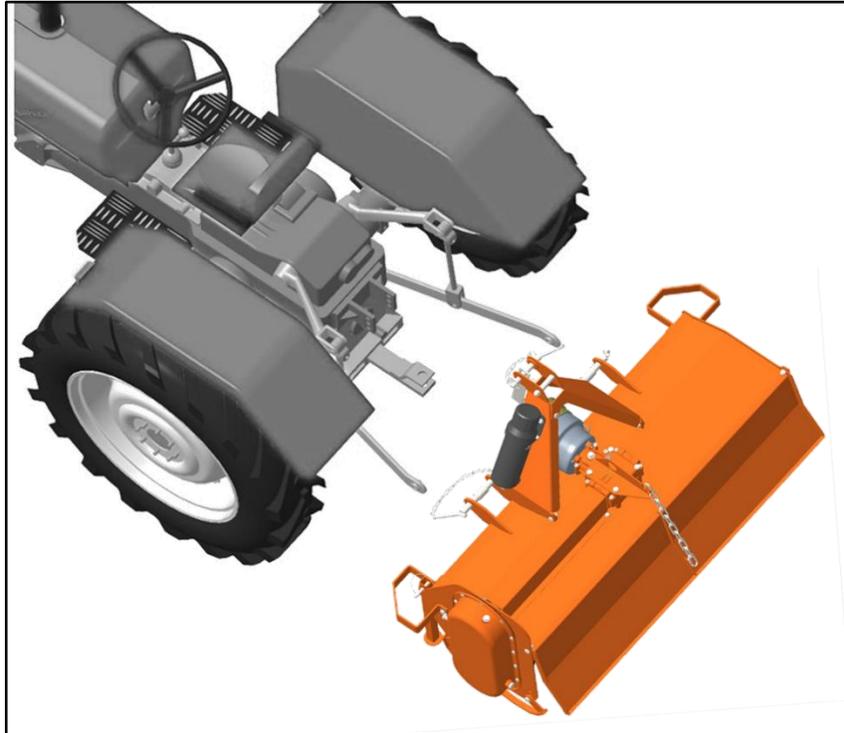
4. SET UP

The tiller is delivered fully assembled and equipped with a driveshaft with torque limiter (Shear Bolt) and related operating manual.

When the machine is delivered, check that there is no damage to the tiller or driveshaft. In case of damage or missing parts immediately notify the manufacturer or your dealer.

4.1. Connecting to the tractor

To connect the tiller to the tractor the operator must do the following:



- Drive the tractor in reverse, up to align the rear lifting arms to lower hitches of the tiller in parking;
- Set the tractor's parking brake, stop engine, remove the ignition key and get off the tractor;
- Connect the lifting arms of the tractor to the lower hitches of the tiller, through the use of the pins and the relative safety split pins;
- Raise the tiller until PTOs of tractor and machine are at the same height, then adjust the 3-point top link so that the front of the machine is leveled to the back (the axis of the tiller PTO must be parallel to the ground), in order to limit stress transmitted to the tiller through the cardan shaft;
- Make sure that left side of the tiller is leveled with the right, by adjusting the tractor lifting arms, then lock the arms to prevent swinging that could compromise the stability of tractor and machine; Finally adjust the parking stand, placing it at the highest point by means of the related elastic pin.

4.2. Driveline Installation

Before installing the driveshaft, the operator must read the manuals of driveshaft and tractor, checking in particular that rpm and direction of rotation of the tractor PTO match those of the tiller.

If the direction of rotation of the PTO tractor does not match that of the tiller, contact the manufacturer or your dealer.

To connect the driveshaft to the tractor and implement, the operator must:

- Park tractor and tiller on a flat surface, with parking brake set, engine off, and ignition key removed;
- Check that safety devices of driveshaft, tiller and tractor are in good condition, otherwise provide for their replacement;

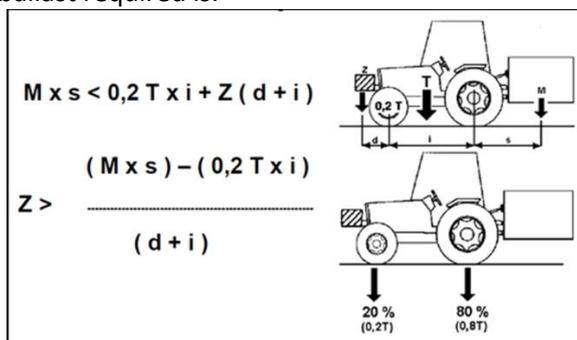
- Remove the PTO shield of the tiller through the fixing screws;
- Position the driveshaft with shear turned towards the implement side;
- Insert the Shear bolt on the tiller PTO, then ensure its tightening onto shaft through its fastener;
- Replace the PTO shield of the tiller through the fixing screws;
- Insert the driveshaft yoke on the tractor PTO, then ensure its tightening onto shaft through its fastener;
- Hook to the tractor and tiller the two retaining chains of the the driveline shielding, to prevent shielding rotation during functioning of the machine.

4.3. Tractor-tiller stability

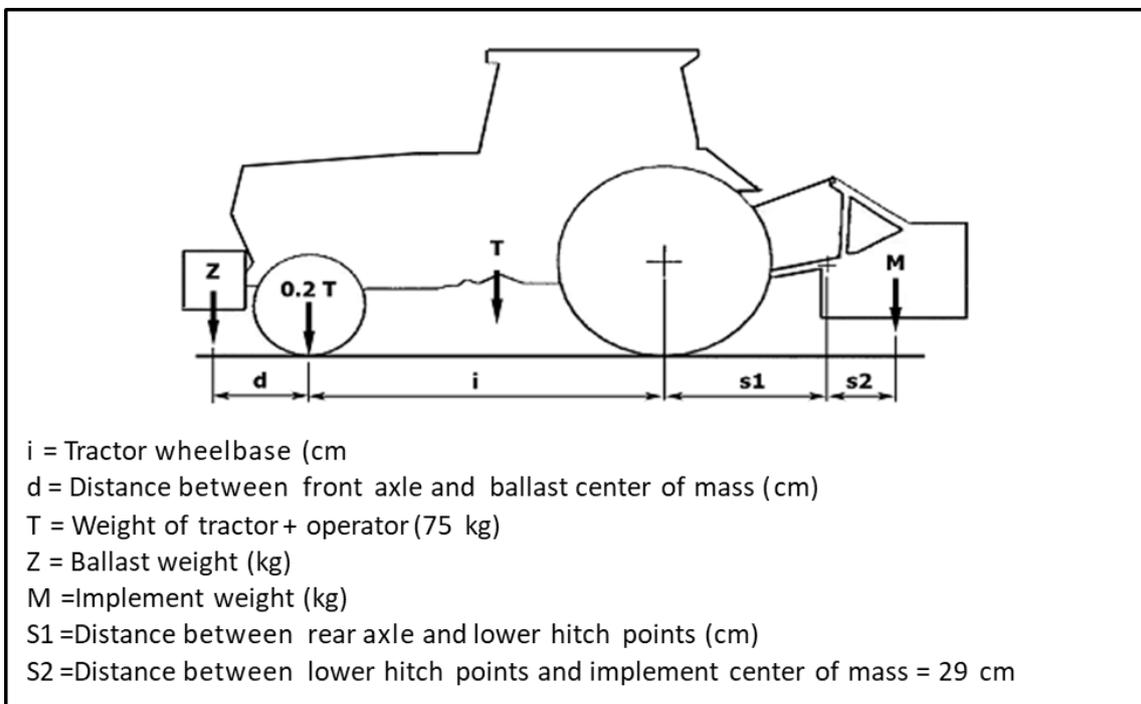
The weight of the machine modifies the stability of the system tractor-tiller, resulting in loss of steering control and braking.

The front axle of the tractor should always load with at least 20% of the overall weight of the system tractor-tiller.

Consequently, the minimum ballast required is:



To determine the appropriate characteristics of the ballast, refer to the manual of the tractor.



If the tiller is combined with other machines (fertilizers spreaders or seeders), the ballast check must be done considering:

M = total weight of the implements (tiller+roller+spreader/seedler)

S2 = Distance between lower hitch points and center of mass of implements (tiller+roller+spreader/seedler)

**CAUTION**

Check the lifting capacity and stability of the tractor and, if necessary, applying the front ballast. To determine the appropriate characteristics of the ballast, refer to the manual of the tractor.

5. OPERATING

Before operate the tiller, make sure you have read and understood the operating manuals of the tiller, tractor and PTO shaft, and followed what is described in the section "Set Up".

**DANGER**

During operation, adjustment, maintenance, repairing or transportation of the machine, the operator must always use appropriate Personal Protective Equipment (PPE).

Before starting work, ensure that all machine guards are in good conditions and fully functional.

During operation, the machine can throw material from the back: prevent people and animals to approach the operational area.

5.1. START UP

Before the start up and before each use, perform the following pre-operation inspections and service of the implement:

- Check that the tiller has not damaged functional parts and has all mechanical parts in good condition. Repair and / or replace the damaged parts;
- Check that the tiller has no missing parts (pins, safety pins, plugs oil ...). Restore the missing parts;
- Check that all guards and safety devices have no damages and are properly positioned. Repair and / or replace the damaged shielding, restore the correct position;
- Verify that the PTO driveshaft is properly installed (see section: Connection of the drive shaft);
- Check that the driveshaft is in good condition, and that its components are not subject to "sticking" (see section: Maintenance / Driveline);
- Check the presence of lubricant in all greasing points of the tiller (driveshaft, supports...) (see sect. Maintenance / Driveline and Maintenance / Support rotor);
- Check for oil leaks from the gearbox or the transmission side cover. Identify the reason of loss, then repair and / or replace the damaged components;
- Check the correct oil level in the gearbox and in transmission side box (see section maintenance);
- Check that blades are not excessively worn and the relating hardware is correctly tightened (see sect. Maintenance);
- Check that all the tiller hardware is properly tightened. Refer to the tightening table in the manual for proper torque values;
- Check that all safety decals are correctly positioned, in good condition and legible. Replace any damaged decals;
- Check that there is no constraints that may prevent the movement of equipment. Remove any constraint.
- Before the start up and before each use, make the following checks on the operating area identified for tillage:
 - Check that area is clear of foreign objects (rocks, branches or debris). Remove any obstacle and visibly highlight obstacles that cannot be eliminated (e.g. by means flags);
 - Make sure in the working area exposed there are no people or animals;
 - Make sure the soil to be worked is not too grassy, muddy, sandy or rocky.

**WARNING**

Before conducting the above inspections and service, make sure the tractor engine is off, all rotation parts are completely stopped and the tractor is in park with the parking brake engaged. Make sure the tiller is resting on the ground or securely blocked up and the tractor lifting hydraulics locked.

Once all the checks above have been done, start tractor and the tiller as follows:

- Start the tractor and engage the tractor PTO at low rpm, making sure that the tiller is NOT in the raised position but close to the ground, then increase speed engine until to 540 rpm;
- Lower the tiller on the ground and simultaneously start driving the tractor at low speed. Subsequently increase the ground speed depending on ground conditions;
- If the environmental temperature is very cold, it's recommended to wait a few minutes with the PTO of the tractor at low rate before lowering the tiller completely on the ground;
- Drive for a while operating the tiller, then stop the tractor to check the quality of the work performed. If you need to get off the tractor, lift the tiller just out of the ground, reduce engine speed and disengage PTO, set the parking brake, stop engine and remove the ignition key; If the working depth and/or soil texture are not as desired, correct them by adjusting the skids and/or the rear cover (see section Adjustments).

5.2. OPERATING INSTRUCTIONS

During operations:/ OPERATE ACCORDING TO FOLLOWING INTRUCTION

- Always keep the tractor engine at rpm rate ensuring to the tiller the right power required for the use;
- Always keep a tractor speed adequate to conditions of the soil to be worked (from 2 to 10 km/h approx.). Reduce speed in the case of hard or stony soils;
- Choose a driving pattern that provides the maximum pass length and minimizes turning;
- When working in the hills, if you can do "climbing" in the sense of the slope, in any case do not work along the hillsides, making the steps from top to bottom to reduce the terrace. Where possible always try to «work up» the slope. If this is not possible avoid hoeing along the contours of the hill and hoe up and down the slope to avoid a terracing effect;
- Always perform changes and reverse of direction with PTO disengaged and the tiller slightly lifted from the ground to avoid damage to the machine;
- Periodically check for foreign objects wrapped around the rotor shaft and remove them, after disengaging PTO, turning off tractor engine, and removing ignition key;
- If the blades strike a foreign object, or in case of prolonged intervention of the shear bolt broken due to an object wedged into the rotor, stop operating immediately, idle the engine speed and disengage the PTO. Wait for stopping of all rotating parts, then raise the implement and proceed to removing the object, after stopped the tractor, set the parking brake, stopped engine and removed the ignition key. Repair any damages immediately, and make sure rotor and blades are in good condition before restarting operation;

Typical problems that may occur operating the tiller are described into Troubleshooting section, together with their solutions.

5.3. ADJUSTMENTS**WARNING**

All adjustment operations must be performed with the tractor engine off, the PTO disengaged, the tiller lowered to the ground or on security stands, the parking brake set and the ignition key off.

UNIVERSAL PROPELLER SHAFT LENGTH ADJUSTMENT

IMPORTANT:

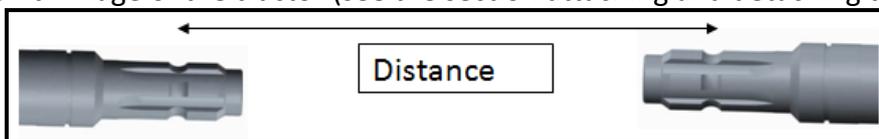
- The propeller shaft which will be used to operate the machine must definitely have protective covers.
- Propeller shaft without protective covers should never be used.
- The tractor may not be running during the mounting and dismounting of the shaft.
- No other persons should be around the propeller shaft during processes with the shaft.

Attention: The universal propeller shaft supplied, with the machine, is of standard length. Therefore, it might be necessary to adapt the universal drive shaft.

Make sure the PTO shaft length is compatible with the different working positions of the implement. If the PTO shaft is too long it might bend and damage may occur to the tractor or implement.

Place the tractor and the implement on a flat surface

Attach the 3-point linkage of the tractor (see the section attaching and detaching the implement)

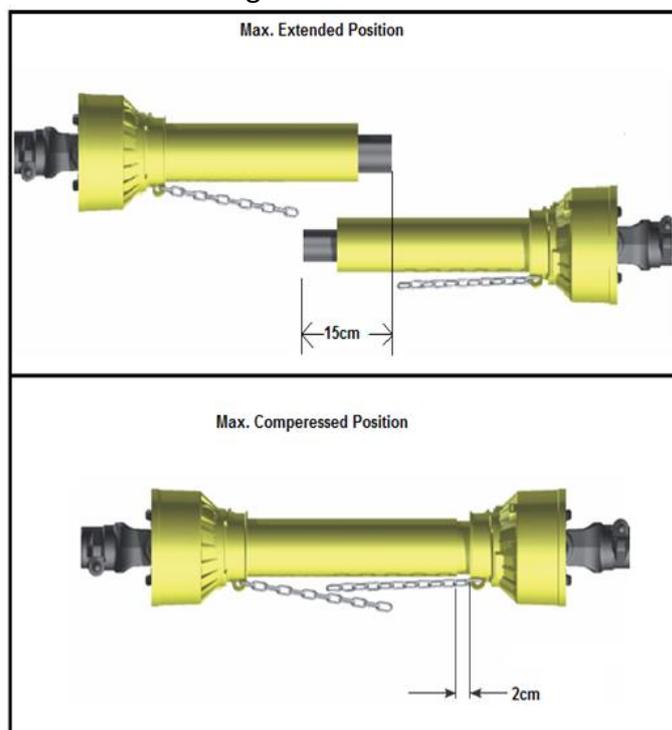


Find the length between the groove of PTO output on the tractor, and the PTO input on the implement when the implement and tractor is in horizontal position.

Raise the implement fully and measure from end-to-end between the two grooves. It is used to determine the shortest distance.

Lower the lift to about half and re-measure the distance, then drop the lift to the bottom and re-measure again.

Let the shortest distance be A and the longest distance be B.



- Put the both halves of the propeller shaft on a flat surface parallel to each other in such a way that the distance between the two push pin of the yoke should be equal to the shortest distance A.

- Measure the minimum clearance, this distance should be minimum 2 cm (Fig.), if this distance is more than 2 cm then no need to cut the shaft. If the clearance is less than 2 cm, then cut the pipe of propeller shaft along with cover both side such that the minimum clearance of 4 cm is maintained.
- Again, put both halves of the propeller shaft on a flat surface parallel to each other (Fig.) in such a way that the distance between the push pin of the yoke should be equal to the maximum distance B. If the minimum overlap is 15 cm, then no need to resize the propeller shaft and it is ready to be fit the tractor with the implement.



DANGER: failure to make these adjustments will damage the unit and causes personal injury.



Note: Clean the filings from the metal and dress the edges of the cuts with a file when done.

PROPELLER SHAFT WITH SAFETY LIMITER

The shear bolt torque limiter, inserted in the joint is equipped with a safety bolt that is set for an average force. Whenever unduly resistant obstacles cause the bolt to shear, it must be replaced by a new bolt of the same size and material.

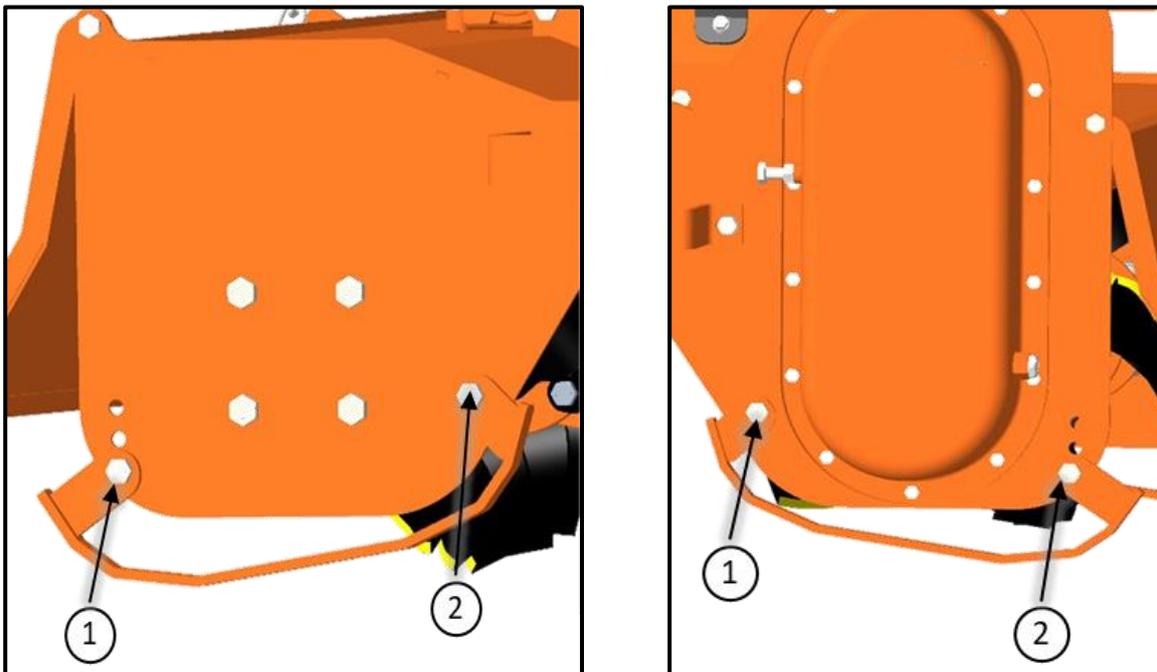


SKIDS ADJUSTMENT

The working depth of the tiller is determined by the position of the side skids: it may be increased by raising the skids, and decreased by lowered them. It's important that both skids are adjusted at the same height.

To adjust the working depth, perform the following steps:

- Lift the machine, put it safely on security stands, then switch the tractor engine off, disengage PTO, set parking brake and off the ignition key;
- Loosen the in the front of the skid (bolt 1 - see picture);
- Unscrew and remove the bolt on the rear of the skid (bolt 2 - see picture);
- Adjust the height of the skid through the holes, as desired;
- Reinstall the bolt 2 (refer to the tightening table of this manual for proper torque values);
- Tighten the bolt 1 (refer to the tightening table of this manual for proper torque value).

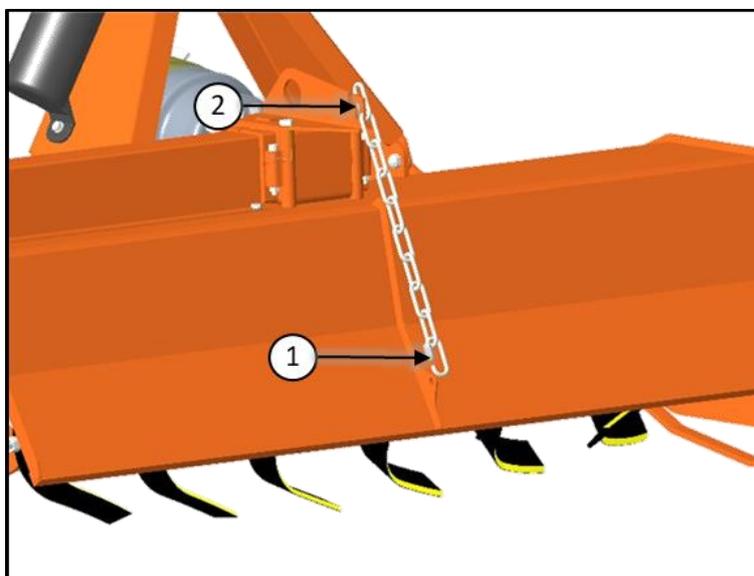


When finished, verify that both skids are at same level, and check if the front of the tiller is leveled to the back, when lowered to the ground. Adjust with the 3-point top link if necessary

REAR BOARD ADJUSTMENT

The FMA-Series tillers are equipped with a rear board with chain.

The position of the rear board is adjustable by varying the number of chain links included between distance XY, which remain tensioned under the weight of the board (i.e. links between the rear board hole 1 and the slot of the frame 2).



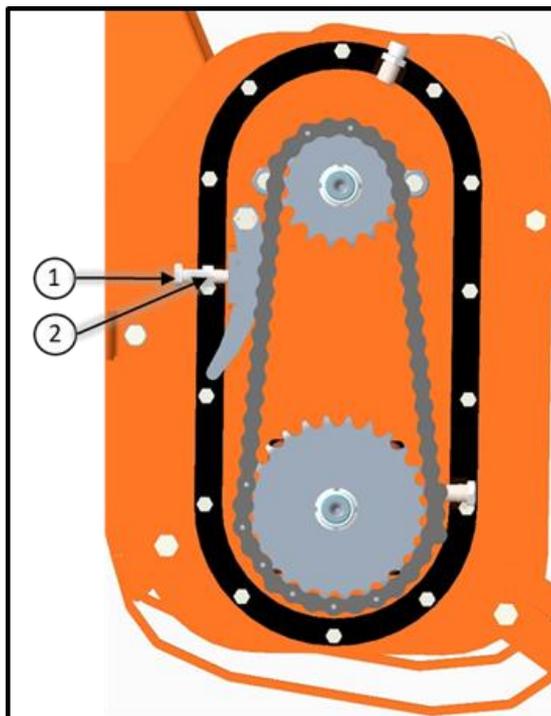
- To raise the rear board, reduce the number of chain links in tension. This operation, together with the increase of the tractor ground speed, allows to have a coarser soil texture;
- To lower the rear board, increase the number of chain links in tension. This operation, together with the reduction of the ground speed, allows to have a finer soil texture.

! WARNING

To avoid the risk of crushing or cutting of fingers, raise or lower the rear board only from the lower edge, not from the sides.

CHAIN TENSIONER ADJUSTMENT

The FMA-Series tillers are equipped with chain tensioner adjustment.



To adjust the chain tensioner, perform the following steps:

- Loosen the chain tensioner nut (nut 2 - see picture);
- Tighten the chain tensioner bolt as per requirement (bolt 1 - see picture);
- After adjustment, tighten the chain tensioner nut (nut 2 - see picture);

5.4. STOPPING AND DISCONNECTION

To stop the tiller at the end of a working session:

- Bring the tractor to a complete stop;
- Place the transmission in park or neutral;
- Reduce the engine speed, then disengage the PTO;
- Wait for stopping of all rotating parts;
- Lower the implement to the ground;
- Set the parking brake;
- Shut down the engine and remove the key before exiting the tractor;
- Do the cleaning and maintenance required to make the machine ready for later use (see Section Maintenance).



WARNING

Never leave the tractor unattended with the implement in the lifted position.

To disconnect the tiller from the tractor (e.g. to make a change of implement):

- Adjust the skids to their lowest position (see Section Adjustments);
- Adjust the parking stand to the lowest position, through the use of relative retaining pin;
- Park the tractor on a dry and level surface;
- Reduce the engine speed, then disengage PTO;
- Wait for stopping of all rotating parts;
- Lower the implement to the ground;

- Set the parking brake;
- Shut down the engine and remove the key before exiting the tractor;
- Place safety blocks under tiller to prevent unit from tipping over onto a child and/or an adult. A tiller that tips over can result in injury or death;
- Disconnect the driveline from the tractor PTO and rest it on the provided support of the tiller;
- Disconnect the top link and rear lifting arms of the tractor from the tiller hitches;
- Check the tiller stability. If needed, place additional safety blocks;
- Get on the tractor, start the engine and move away from the tiller slowly;
- Make sure the tiller remains stored in a protected area, to prevent that unauthorized personnel can approach it.

Before a long term storage (e.g. at seasonal end), do cleaning and maintenance operations as specified in Sections MAINTENANCE and STORAGE.

5.5. TRANSPORTING

To set the tiller for transportation, perform the following steps:

- Idle tractor engine, disengage tractor PTO, and wait for stopping of all rotating parts;
- Lift the tiller until the transport position, making sure the driveline transmission tubes does not contact tractor or tiller. A minimum gap of 2 cm should be leaved between the tubes and tractor and tiller (see also Section Driveline installation);
- Lock the tractor lifting hydraulics, turn off the engine, set the parking brake, remove ignition key and get off the tractor;
- Adjust the parking stand to the highest position, through the use of relative retaining pin, to prevent its possible damage during transport.

When driving on public roads, follow strictly all local laws and traffic regulations.



WARNING

When driving on public roads, reduce your speed, be aware of traffic around you and proceed in such a way that faster moving vehicles may pass you safely.

6. MAINTENANCE

Proper and regular maintenance ensures a long life of the equipment, avoids failures and saves time and repair costs.

Periodic inspections and maintenance operations described in this section must be performed by operator in the times and terms prescribed. Failure to comply with maintenance prescriptions can compromise the functioning and duration of the machine, and consequently invalidate the warranty.

The frequency of maintenance indicated refers to normal conditions of use: it must be intensified in severe operating conditions (frequent stops and starts, prolonged winter season etc.).

Repairs, maintenance and modifications other than those mentioned in this paragraph should NOT be performed without consulting the manufacturer or your dealer. Manufacturer, as the case, may give the authorization to proceed with the repair together with all necessary instructions.

Wrong or inappropriate repairs or maintenance may generate abnormal operating conditions, equipment damage and generate risks for the operator.



WARNING

For safety reasons, all maintenance operations must be performed with tractor PTO disengaged, tiller stopped and completely lowered to the ground or onto support blocks, parking brake set, tractor engine shut off, and ignition key removed.

IMPORTANT

Respect the environment. Store or dispose of unused chemicals as specified by the chemical manufacturer.

6.1. BLADES REPLACEMENT

Frequently check the wear condition of blades through visual inspection. The wear of blades is very variable depending on the type of soil.

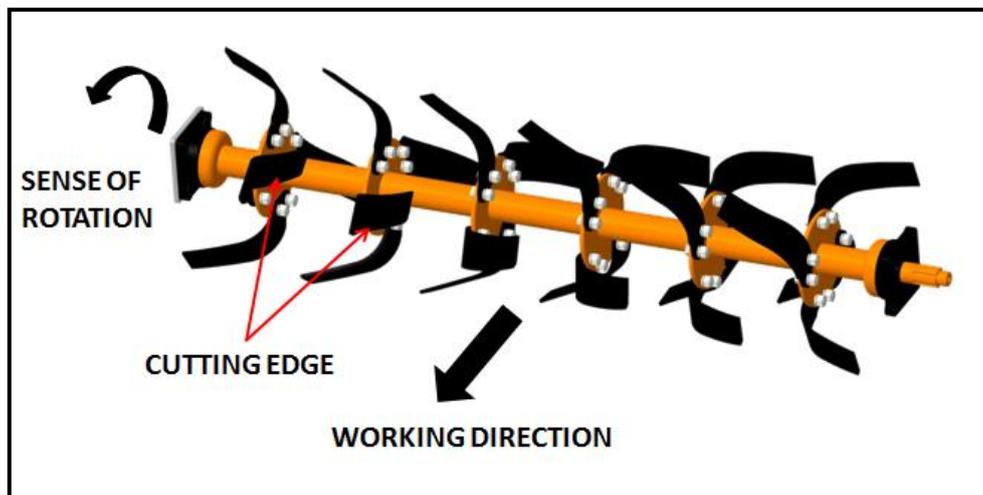
Replacement of the blades is necessary when the operator notices increase of power absorption during tilling, or when the blade dimension is significantly reduced compared to the original.

The use of the machine with blades in bad condition compromises the quality of work.

Before perform replacement of the blades:

- Idle tractor engine, set the parking brake, disengage tractor PTO, and wait for all moving parts to come to a complete stop;
- Place the tiller slightly lifted from the ground on safety blocks or mechanical stands;
- Lock the control lever of the hydraulic lift of the tractor;
- Turn off the tractor and remove the key.
- To perform the replacement of blades:
- Remove the two bolts and washers clamping the blade to the rotor flange, then remove the blade;
- Position the new blade exactly instead of the worn blade, then tighten the bolts, referring to the tightening table of this manual for proper torque values. Be sure to install the blade with cutting edge in front of the direction of rotation;
- Repeat the same procedure for all the other blades.

At the end of the replacement, make sure the blades have the right helical arrangement, as shown in the figure:



Periodically check the tightness of screws and nuts, and tighten if necessary.

IMPORTANT

Remove and install one blade at a time to ensure blades are correctly oriented when installed.

Replace worn blades only with original parts.

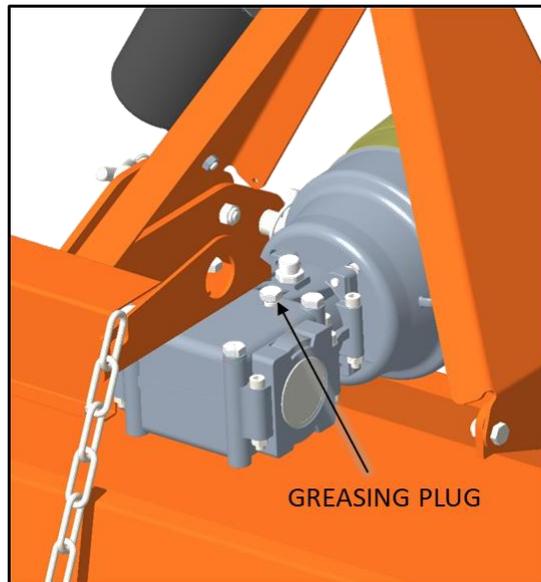
**CAUTION**

Worn tines may be very sharp!

6.2. GEARBOX LUBRICATION

Lubricant: GREASE EP00 HP (or equivalent 85 W - 140)

Frequency: each 100 working hours



IMPORTANT

Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

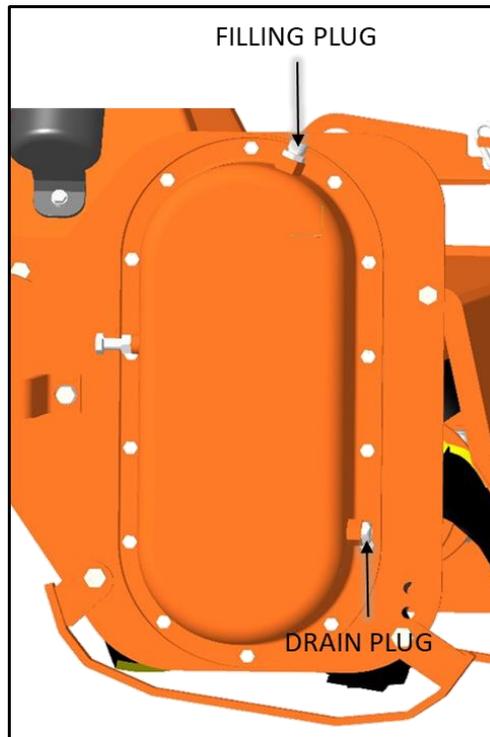


CAUTION

Before touching the gearbox wait until it has cooled sufficiently.

6.3. SIDE CASE LUBRICATION

Lubricant: SAE EP 140gear oil



Check the oil level every 50 hours, making sure it reaches the level plug on the transmission cover.

If the oil is below this level, fill up oil till restore the level.

The oil change must be performed every 200 working hours.

To make the oil change:

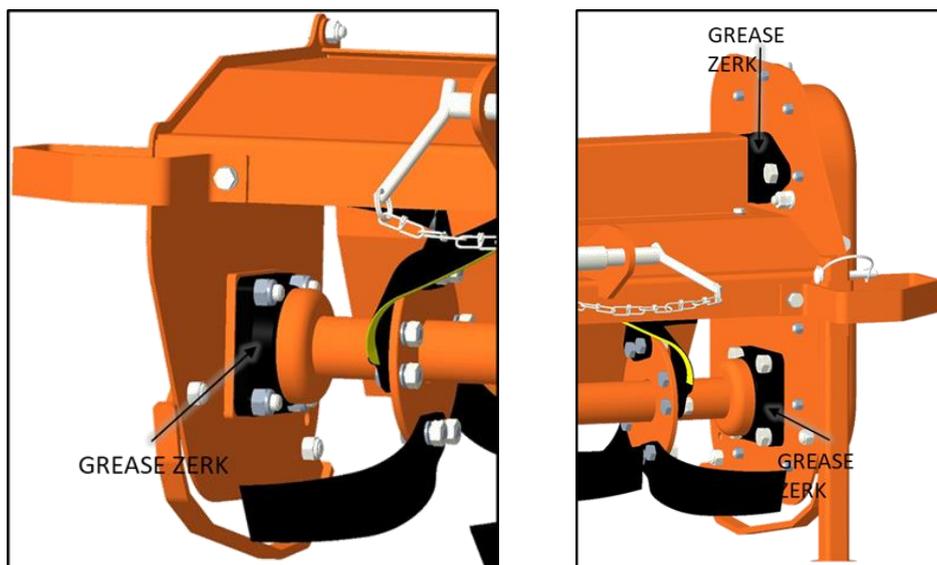
- Remove the skid from the transmission side;

- Place a tank under the oil level plug;
- Unscrew the oil level plug and drain completely the oil into the tank;
- Retighten the level plug;
- Unscrew the oil filling plug (top of transmission cover);
- Fill up oil till restoring the correct level (until level plug);
- Retighten the filling plug;
- Replace the side skid;
- Dispose the discharged oil into containers for used oil.

6.4. BEARING HOUSING LUBRICATION

Lubricant: SAE multi-purpose lithium-type grease

Grease the rotor hub supports every 8 working, through a suitable grease gun.



IMPORTANT

Make sure to clean the fitting zero before using grease gun.

Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

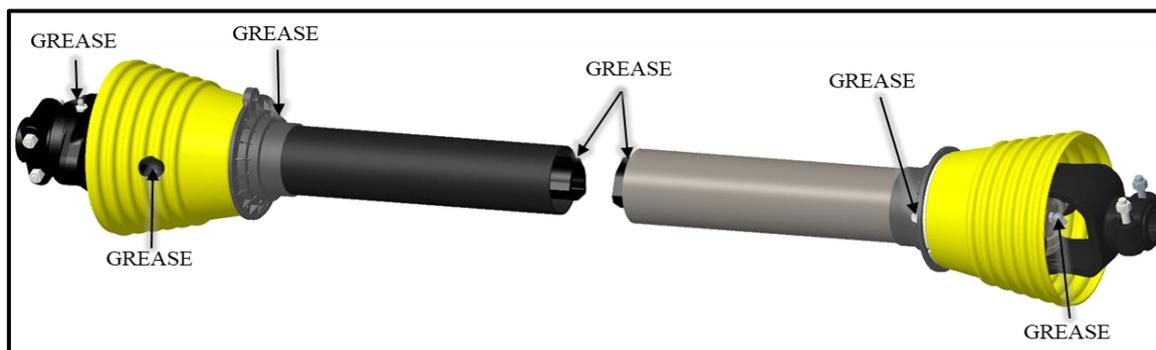
6.5. DRIVESHAFT MAINTENANCE

Disconnect the propeller shaft from the tractor and slide apart.

Clean and coat the inner tube of the propeller shaft with a light film of grease on daily basis or every 8 hours of work and then reassemble.

Grease crosses, sliding parts of protective shielding and driveshaft transmission tubes.

Lubricant: SAE multi-purpose lithium-type grease



IMPORTANT

For details about maintenance and lubrication of the driveshaft, refer to the user manual of the driveshaft manufacturer.

7. STORAGE

Before leaving the tiller unused for a long time, it's necessary to perform following tasks to preserve the appearance and functionality of the machine, and to make easier the restart at later use:

- Park the tiller on a flat surface, in a place dry and protected from exposition to the elements, possibly with storage temperature between 0 and 50 °C(see Section Stopping and disconnection);
- Thoroughly clean the machine, removing from the rotor all residues due to tillage, in order to avoid damage from grass and stagnant water;
- Inspect carefully the machine, checking for worn and/or damaged parts. Perform immediately all repairs and/or replacements needed, in order to make the machine ready for restarting;
- In case of abrasion of painted surfaces, provide restoring the surface protection through touch-up paint to prevent rust;
- Make sure the safety decals are in their original positions, intact and legible. When required, replace the decals immediately;
- Lubricate properly all grease points, and restore the oil levels as indicated in the maintenance Section. Use protective oil to coat the exposed mechanical components and to protect them against rust.

8. SCRAPPING

In case of scrapping, the machine must be disposed in appropriate and authorized sites, according to local legislation.

Before scrapping, separate plastic parts from rubber parts, aluminum, steel, etc.

Recover and dispose any exhausted oils to authorized centers for oil collecting.

9. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Gearbox/transmission case noise noticeable and constant	<ul style="list-style-type: none"> • Low oil level. • Worn gears. 	<ul style="list-style-type: none"> • Add oil to the gearbox/transmission case. • Replace gears
Intermittent noise from tiller	<ul style="list-style-type: none"> • Loose blades. • Gear tooth damaged. 	<ul style="list-style-type: none"> • Tighten blades hardware • Replace damaged gear
Noise and/or vibration from tiller	<ul style="list-style-type: none"> • Blades worn or damaged. • Bearings damaged. • the front of the tiller is not leveled to the back. • Rotor damaged. • Hard soil. 	<ul style="list-style-type: none"> • Replace blades. • Replace bearings. • Adjust 3-point top link of tractor making tiller PTO parallel to the ground. • Repair/replace rotor • Reduce ground speed
Driveline vibration	<ul style="list-style-type: none"> • Worn universal joint. • Machine lifted too high. • Debris wrapped on rotor. 	<ul style="list-style-type: none"> • Replace universal joint. • Lower machine and readjust tractor lift stop. • Remove debris.
Rotor stops turning	<ul style="list-style-type: none"> • Driveline shear bolt broken. • Broken chain in chain box. 	<ul style="list-style-type: none"> • Use of genuine Shear bolt in case Damage or reduce load • Repair broken link.
Machine skip or leaves crop residue	<ul style="list-style-type: none"> • Badly worn blades. • Driveline shear bolt broken. • Ground speed too fast for conditions. 	<ul style="list-style-type: none"> • Replace worn blades. • Use of genuine Shear bolt in case Damage or reduce load. • Reduce ground speed .
Smoke and/or hot smell from tiller	<ul style="list-style-type: none"> • Debris wrapped around in blades and/or rotor. • Low oil level in gearbox. 	<ul style="list-style-type: none"> • Remove debris. • Add oil.
Gearbox overheating	<ul style="list-style-type: none"> • Low oil level. • Hard soil. 	<ul style="list-style-type: none"> • Add oil. • Reduce ground speed.
Blades wear frequently	<ul style="list-style-type: none"> • Muddy or sandy soil. 	<ul style="list-style-type: none"> • Reduce ground speed.
Blades break frequently	<ul style="list-style-type: none"> • Stony soil. 	<ul style="list-style-type: none"> • Reduce ground speed.
Oil leaking from gearbox/transmission case	<ul style="list-style-type: none"> • Gearbox/transmission case overfilled. • Loose filling/drain plug. • Damaged breather plug. • Damaged seals. 	<ul style="list-style-type: none"> • Drain to proper level. • Tighten filling/drain plug. • Replace breather plug. • Replace seals.
Tillage depth insufficient	<ul style="list-style-type: none"> • Tiller is carried by tractor. • Tractor has insufficient power. • Skids need adjusting. • Blades worn or bent. • Blades incorrectly installed. • Debris entangled in blades and/or rotor. 	<ul style="list-style-type: none"> • Lower tractor 3-point arms. • Increase PTO speed • Adjust skids. • Replace blades. • Install tines correctly. • Clear rotor and/or blades
Soil texture too coarse	<ul style="list-style-type: none"> • Rear board too high. 	<ul style="list-style-type: none"> • Lower rear board.

	<ul style="list-style-type: none"> • PTO speed too slow. • Ground speed too fast. 	<ul style="list-style-type: none"> • Increase PTO speed. • Reduce ground speed.
Soil texture too fine	<ul style="list-style-type: none"> • Rear board too low. • Ground speed too slow. 	<ul style="list-style-type: none"> • Raise rear board • Increase ground speed.
Tiller choking up with soil	<ul style="list-style-type: none"> • Blades worn or bent. • Blades incorrectly installed. • Rear board too low. • Soil too wet. 	<ul style="list-style-type: none"> • Replace blades. • Install tines correctly. • Raise rear board. • Wait until soil dries.
Tiller skipping on ground or leaving crop residue	<ul style="list-style-type: none"> • Blades incorrectly installed (wrong helical arrangement, cutting edge in wrong direction...) • Debris entangled in blades and/or rotor. • Ground speed too fast. • Soil too hard. 	<ul style="list-style-type: none"> • Install blades correctly (replace right helical arrangement, position cutting edge in front of rotation direction...) • Clear rotor and/or blades. • Reduce ground speed. • Reduce ground speed and make tilling in more steps.
Tillage not uniform	<ul style="list-style-type: none"> • Blades worn or damaged. • Skids not aligned. • Tiller left side not leveled with right side. 	<ul style="list-style-type: none"> • Replace blades. • Align skids. • Adjust tractor 3-point arms.
Too load required to tractor	<ul style="list-style-type: none"> • Excessive working depth. • Excessive PTO speed. 	<ul style="list-style-type: none"> • Lower skids. • Reduce PTO speed.

10. TORQUE VALUES TABLE

Check frequently tiller hardware to make sure that screws and bolts are tightened according to torque values listed in following table:

	8.8 GRADE	10.9 GRADE	12.9 GRADE
BOLT SIZE (METRIC)	Nm	Nm	Nm
M6	11	15	15
M8	26	36	40
M10	52	72	81
M12	91	125	143
M14	145	200	218
M16	225	315	357
M18	310	405	478
M20	440	610	701

11. WARRANTY

Direct Distributors Inc. offer the following warranty to the purchaser of Grizzly® equipment mentioned herein above subject to the conditions set out herein after provided the Grizzly® equipment shall be in the possession of and used by such purchaser from the date of delivery.

Direct Distributors Inc. Warrants its products for a period of twelve (12) months from date of delivery, for manufacturing or material defects only. Failed part will be replaced at its authorized dealers only and any part component there of that shall be examined by them, shall disclose if to be defective. This warranty shall not apply to equipment or parts that have been subject to negligence, or accident, or not maintained as per company instructions specified in operator manual or that have been altered or repaired or used with non-genuine parts or abused or due to contaminated oil or used in not recommended application.

Warranty Terms & Conditions:

- 1) The purchaser of Grizzly® equipment should strictly follow the instruction given in the instruction manual provided by the company along with the Grizzly® equipment at the time of delivery. Changes if any, resulting in improper usage will not be covered by the warranty. This warranty will automatically terminate on the expiry of warranty period of 12 months. Even the Grizzly® equipment may not be in use for any time during the warranty period for any reason whatsoever including any technical reasons and time taken for such repairs/replacement of parts, and in transit, whether under this warranty or otherwise shall not be excluded from the warranty period.
- 2) All wear and tear items like bearings, chains, sprockets, oil seals, tines, blades, rubber parts and gaskets are not covered under warranty.
- 3) All items with normal wear or failure due to normal wear will not be covered under warranty.
- 4) While the company or authorized dealers will make every effort to carry out repairs/replacement of parts under this warranty as soon as possible. It is expressly made clear that the company shall not be liable to do within any specific period of time. In the event of repairs/replacement of any parts, this warranty will thereafter continue to remain in force only for the unexpired period of warranty.
- 5) It is entirely left to company discretion to repair/replacement of parts at the site of delivery or at the authorized service points of its dealers. The defective parts which has/have been agreed to be replaced, should be returned to the company without any further claim.
- 6) The warranty shall not cover any consequential or resulting liability, damage or loss arising directly or indirectly out of any defect in the Grizzly® equipment. This warranty shall be strictly limited to repairs and replacement of the defective parts specified in the warranty, and does not cover any reimbursement of labor charges for any repairs so earned out at dealer/client end.
- 7) This warranty shall not be extended in any case of replacement or return of the Grizzly® equipment as a whole. Only failed parts will be covered under warranty.
- 8) The purchasers of Grizzly® equipment will itself fully responsible for model/variant selection.
- 9) This warranty does not cover for statutory duties and taxes like excise, service tax or CST or VAT or State sales tax and octroi and any other local taxes payable on any of the parts which the company may supply or repairs free of cost during the warranty period.
- 10) This warranty also does not cover the cost of packaging, to and fro freight and transportation charges etc., on the defective Grizzly® equipment or other parts of the Grizzly® equipment sent to company's works in Rajkot or to the authorized service station.
- 11) **Warranty becomes avoid if:**
 - a) The Grizzly® equipment has not been delivered, assembled, started and put into operation by the company or its authorized representative.

- b) The dully filled delivery certificate is not in our possession within 15 days from the date of delivery.
 - c) The Grizzly® equipment or any parts thereof is subjected to neglect, fire, floods or other acts of God or if in the company's opinion any damage has caused to the Grizzly® equipment during transportation.
 - d) The original serial number is removed, obliterated or altered from the unit.
 - e) Any attempt is made to have the repairs executed by a person or persons, other than the company or its authorized representative.
 - f) Any defect is not informed immediately to the company or its authorized representative, any alteration in warranty card is made.
 - g) Whenever the user or anyone else on his behalf applies equipment to the tractor or to prime mover that has not been expressly approved by the manufacturer or not suitable to the equipment.
- 12) a) Any changes in the location of the Grizzly® equipment or in the/its ownership thereof during the warranty period must be intimated in writing to the company or its authorized dealer within ten days before the change. Failure to do so will absolve the company from the obligation under this warranty.
- b) Further, in the case of shifting for the continuation of the Warranty, the Grizzly® equipment has to be inspected by the company or its authorized representative before shifting from the original location and before using it at the new location. The inspection free levied by the company or its authorized representative as well as the cost of rectification of any damage in transit, detected in the above inspection, shall be borne by the purchaser/owner, if at the time of restarting, the Grizzly® equipment is found to be in working order, this warranty shall continue to be in force for the remaining period of the warranty.
 - c) Damage to the Grizzly® equipment or any part thereof caused during shifting or transportation is not covered by this warranty.
- 13) None of the company representative or authorized dealer is authorized to alter/amend any terms and conditions of this warranty policy. Only the management of the company is authorized to do so. The decision of the company will be final and binding to the purchaser.
- 14) This warranty policy shall be governed by and construed in accordance with the laws of India and the courts in Rajkot shall have exclusive jurisdiction.
- 15) This warranty is given in lieu of all other guarantees and condition expressed or implied by law or by the any person purporting to act on behalf of the company and excludes every condition, warranty or guarantee not herein expressly set out.

Note: The parts/material that are not covered by this warranty are as follows:

1. Blades
2. Universal joint cross
3. Paint
4. Bearings
5. Rubber parts
6. Gaskets
7. Fasteners
8. Fabrication
9. Chains & sprockets
10. Tines

12. SPARE PARTS

All repairs and replacements on the machine must be performed only by using original spare parts, which must be obtained / provided from the manufacturer or your dealer.

This section contains the information needed to identify the parts of FMA-Series tillers that may be ordered to manufacturer.

When request spare parts to manufacturer, always give following indications:

- Type of machine;
- Tiller serial number;
- Description and p/number of the spare parts;
- Quantities.

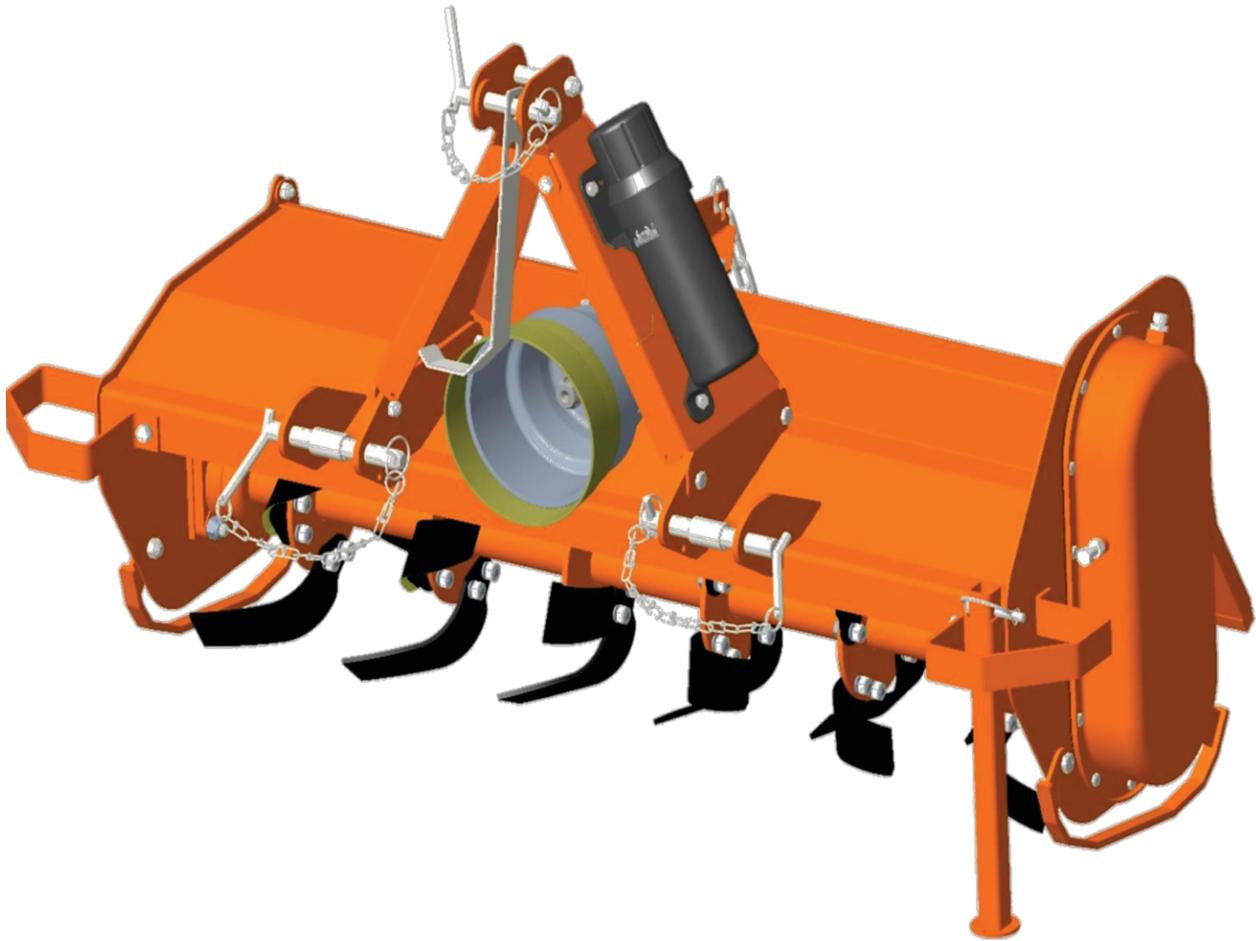
NOTE

For identification of p/numbers and description of safety decals refer to the Section Safety labels.

For identification of p/numbers and description of PTO driveline parts, refer to the manual of the driveshaft manufacturer.

The Manufacturer reserves the right to substitute a required part with an equivalent part, if applicable.

PART'S MANUAL

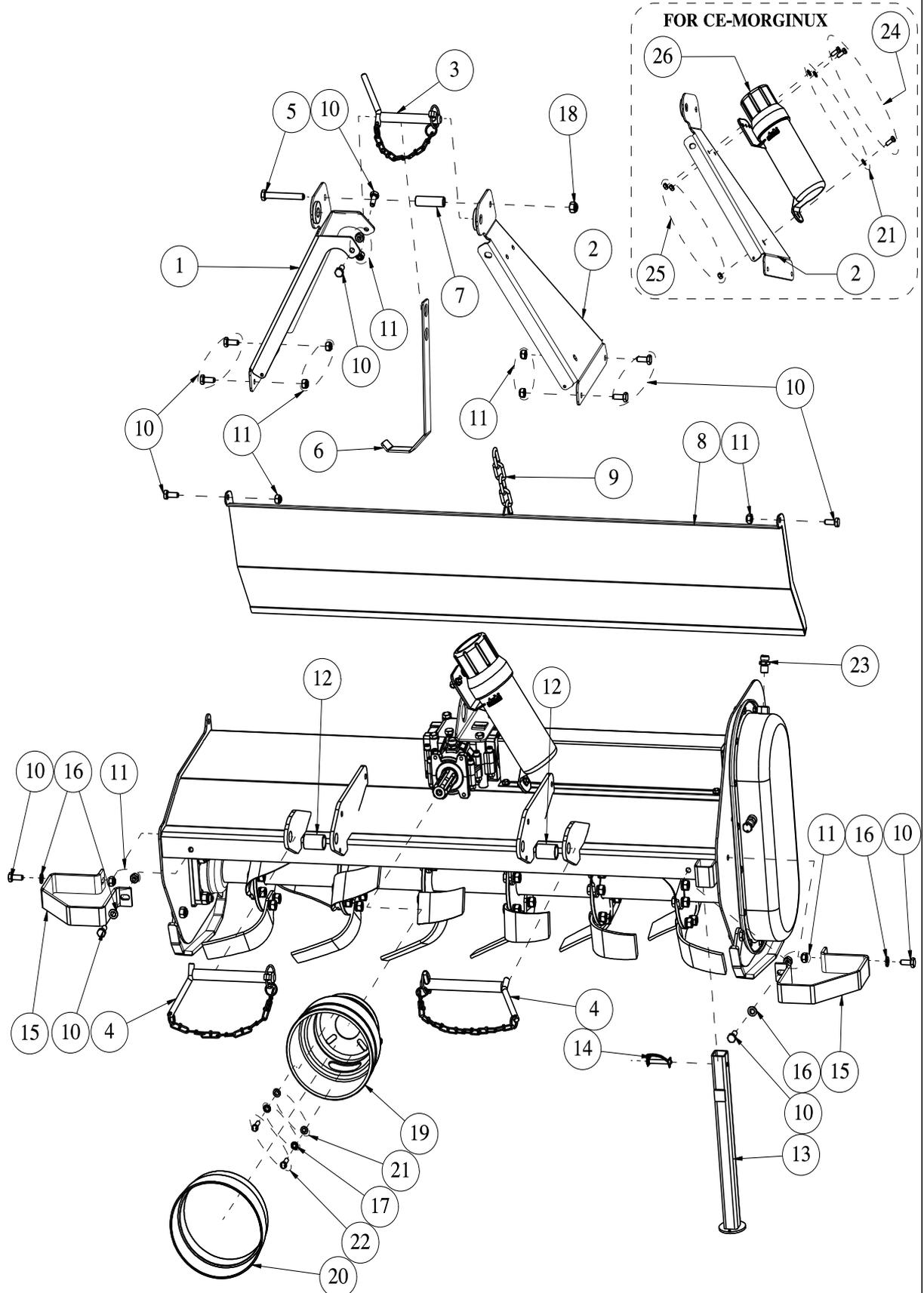


ROTARY TILLER ULTRA SERIES

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ACCESSORIES PARTS



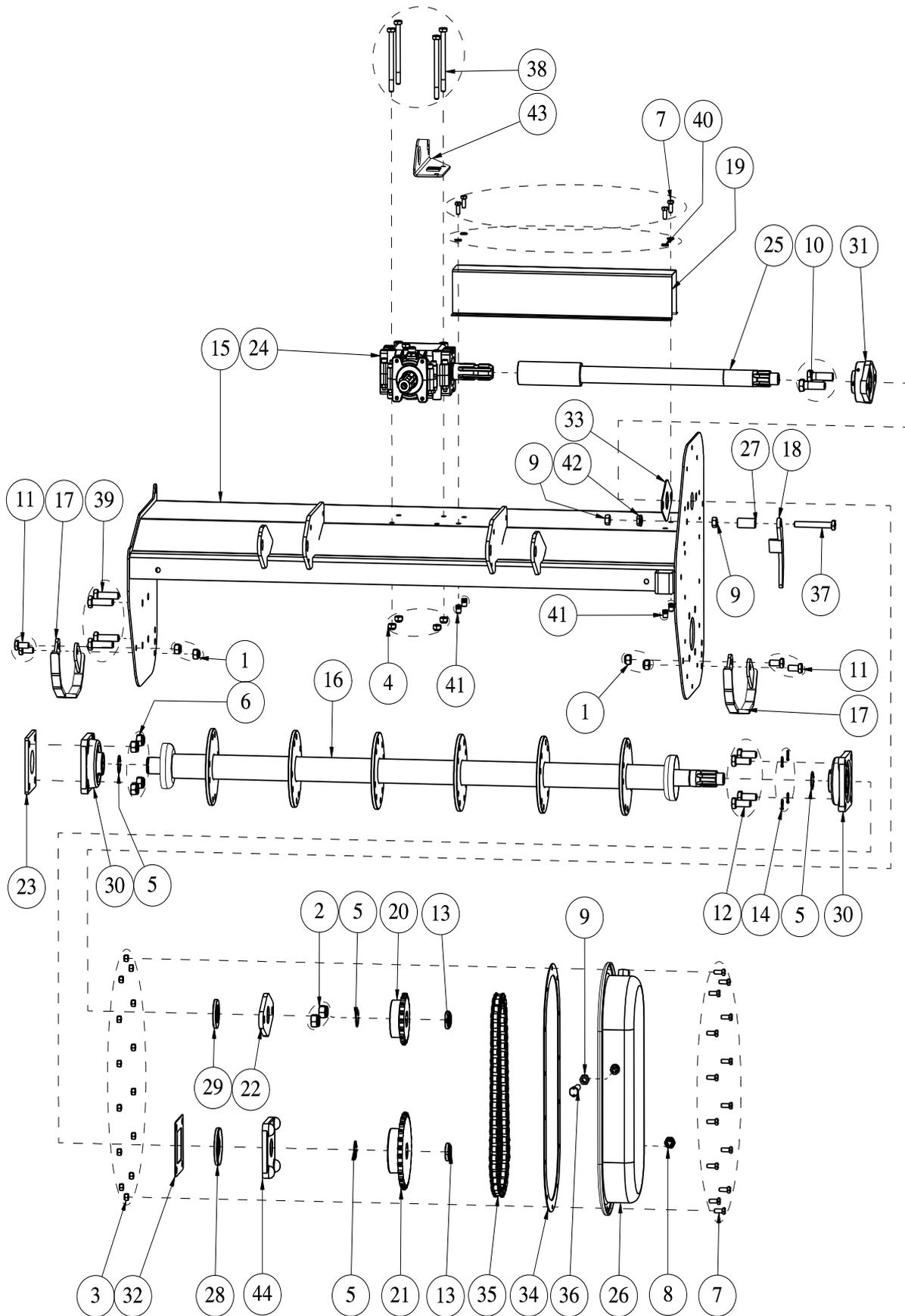
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1.1

ACCESSORIES PARTS

Sr. No.	Part No.	Description	Qty.
1	36007	LEFT PART OF 3 POINTS HITCH	1
2	36006	RIGHT PART OF 3 POINTS HITCH	1
	36073	RH PART OF 3 POINTS HITCH(3 HOLE)	
3	36029	HITCH PIN Ø19 WITH HANDLE	1
4	36030	HITCH PIN Ø22 WITH HANDLE	2
5	36044	HEX BOLT M12X1.75X90(DIN933)(8.8)(ZP)	1
6	36020	PTO SHAFT BRACKET	1
7	36033	BUSH (DIA. 20 X 13 X 65 L)	1
8	36008	BACK FLAP 125	1
	36056	BACK FLAP 105	
	36060	BACK FLAP 85	
9	36042	LIFTING CHAIN WITH QUICK LINK	1
10	17270	HEX BOLT M10X1.50X25(DIN933)(8.8)(ZP)	12
11	1298	NYLOCK NUT M10X1.50 (DIN-982)	12
12	36032	BUSH (DIA. 30 X 24 X 45 L)	2
13	36052	CRUTCH WELDMENT	1
14	36053	ROUND SNAPPER PIN D8xL51	1
15	36012	FENDER	2
16	8078	PLAIN WASHER 10MM (BS-4320)	4
17	36047	WASHER SCHNNOR M8	2
18	1209	NYLOCK NUT M12X1.75 (DIN-982)	1
19	17788	PTO SHAFT GUARD PLASTIC	1
20	36067	PTO GUARD CONE	1
21	8064	PLAIN WASHER 8MM (BS-4320)	5
22	8171	HEX BOLT M8X1.25X25(IS1364-2)(8.8)(ZP)	2
23	14311	AIR BREATHER 3/8" BSP (1GTSSR210)	1
24	8040	HEX BOLT M8X1.25X20(IS1364-2)(8.8)(ZP)	3
25	8181	HEX NUT M8X1.25(IS 1363)(8)(ZP)	3
26	26030	MANUAL BOX COVER 1/2	1

MACHINE PARTS (CHAIN DRIVE)



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2.1

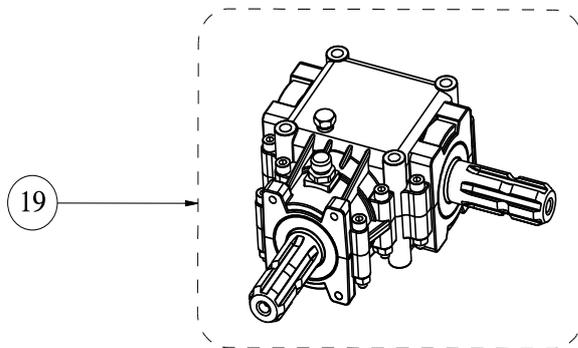
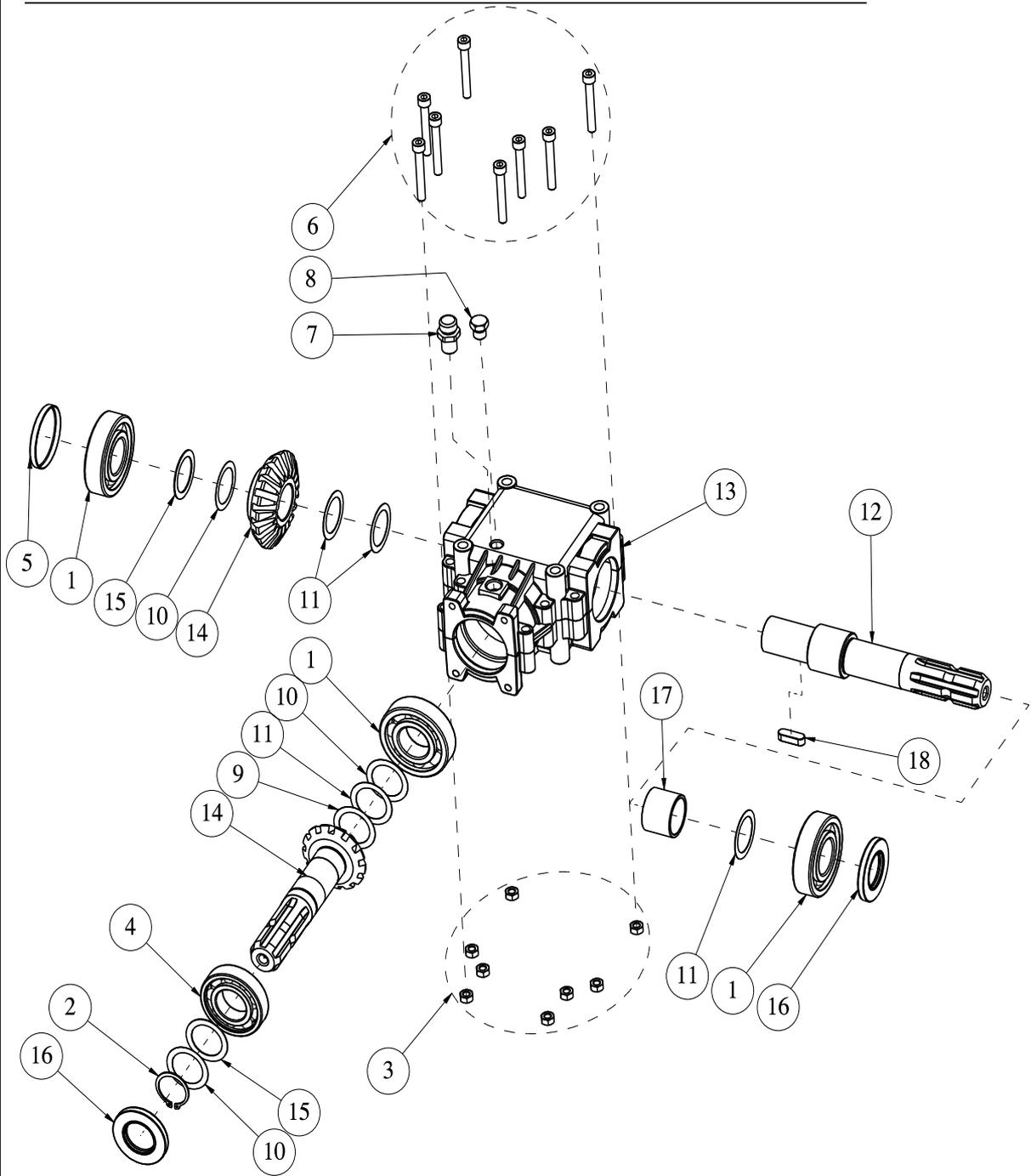
MACHINE PARTS (CHAIN DRIVE)

Sr. No.	Part No.	Description	Qty.
1	1209	NYLOCK NUT M12X1.75 (DIN-982)	4
2	1231	NYLOCK NUT M16X2.0 (DIN-982)	2
3	1297	NYLOCK NUT M8X1.25 (DIN-982)	14
4	1298	NYLOCK NUT M10X1.50 (DIN-982)	4
5	6024	CIRCLIP EXTERNAL 35MM	6
6	1574	NYLOCK NUT M14X2.00 (DIN-982)	4
7	24117	HEX BOLT M8X1.25X20(IS1364-2)(8.8)(ZP)	14
8	14314	OIL LEVEL GAUGE-3/8" BSP (1GTLA210)	1
9	17273	HEX NUT M12X1.75(DIN 934)(8)(ZP)	3
10	17278	HEX BOLT M16X2.00X50(IS1364-1)(8.8)(ZP)	2
11	17474	HEX BOLT M12X1.75X25(DIN933)(8.8)(ZP)	4
12	17810	HEX BOLT M14X2.00X35(DIN933)(8.8)(ZP)	4
13	33006	GUK SELF LOCKING NUT M25X1.5	2
14	14363	SPRING WASHER M14.00(IS 3063)(ZP)	4
15	36059	FRAME WELDMENT 85	1
	36055	FRAME WELDMENT 105	
	36005	FRAME WELDMENT 125	
16	-	SEE THE ROTOR PARTS PAGE	-
17	36010	DEPTH SKID COMP	2
18	36011	TENSIONER STOP	1
19	36063	DRIVING SHAFT COVER 85	1
	36054	DRIVING SHAFT COVER 105	
	36013	DRIVING SHAFT COVER 125	
20	36014	SPROCKET Z=17	1
21	36015	SPROCKET Z=26	1
22	36016	UCFL SUPPORT PLATE	1
23	36018	UCF SUPPORT PLATE SD SIDE	1
24	-	SEE THE GEAR BOX PARTS PAGE	-
25	36062	DRIVING SHAFT 85	1
	36058	DRIVING SHAFT 105	
	36028	DRIVING SHAFT 125	
26	36001	CHAIN COVER COMP	1
27	36031	TENSIONER RING	1
28	36034	OIL SEAL 35 X 80 X 8	1
29	36035	OIL SEAL 35 X 62 X 7	1
30	36036	SQ FLANGE BEARING UCFL 207	2
31	36037	FLANGE BEARING UCFL 207	1
32	36038	GASKET,UCF 207 BEARING	1
33	36039	GASKET,UCFL 207 BEARING	1
34	36040	GASKET,CHAIN COVER	1
35	36041	CHAIN 0.75" PITCH - 52 LINK	1
36	36043	HEX BOLT M12X1.75X60(DIN933)(8.8)(ZP)	1
37	36044	HEX BOLT M12X1.75X90(DIN933)(8.8)(ZP)	1
38	36045	HEX BOLT M10X1.50X130(DIN931)(8.8)(ZP)	4
39	36046	HEX BOLT M14X2.00X50(DIN933)(8.8)(ZP)	4
40	36047	WASHER SCHNNOR M8	4
41	36048	RIVSERT RIVET NUT M8X1.25	4
42	36049	LOCK NUT WITH O RING M12X1.75	1
43	36077	BRACKET	1
44	36081	UCF SUPPORT COVER RD SIDE	1

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GEAR BOX PARTS



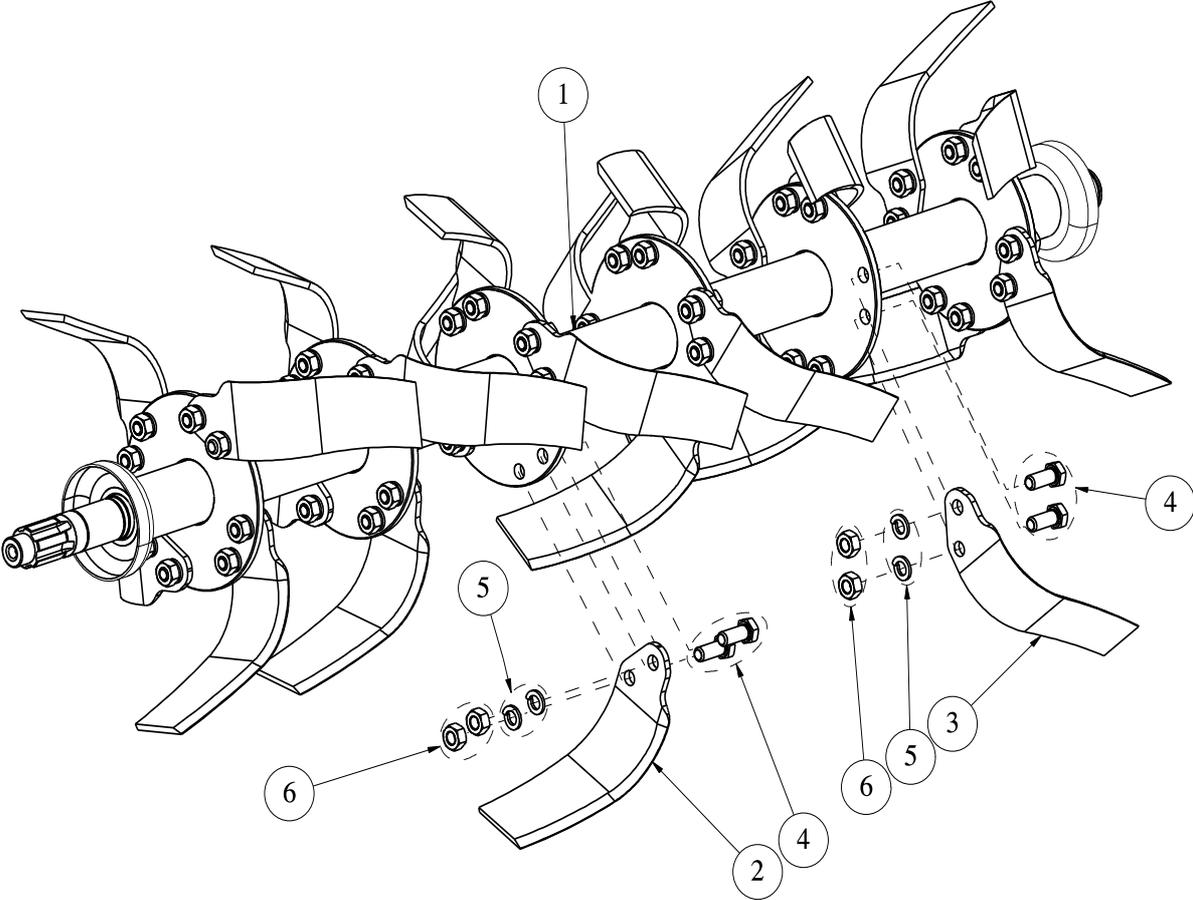
GEAR BOX PARTS

Sr. No.	Part No.	Description	Qty.
1	1131	BEARING 6307	3
2	6024	CIRCLIP EXTERNAL 35MM	1
3	8181	HEX NUT M8X1.25(IS 1363)(8)(ZP)	8
4	10143	BEARING 6207	1
5	14075	OIL SEAL 62 X 7	1
6	18048	ALLEN BOLT M8 X 1.25 X 60	8
7	14311	AIR BREATHER 3/8" BSP (1GTSSR210)	1
8	3323	1/4 BSP BOLT WITH O-RING	1
9	36002	SHIM (DIA 48 X 35.5)(0.10MM)	AS REQ.
10	36003	SHIM (DIA 48 X 35.5)(0.20MM)	AS REQ.
11	36004	SHIM (DIA 48 X 35.5)(0.50MM)	AS REQ.
12	36023	OUTPUT SHAFT	1
13	36075	GEAR BOX HOUSING	1
14	36082	CROWN T19 PINION T13 PAIR	1
15	36026	SHIM (DIA 48 X 35.5)(1.00MM)	AS REQ.
16	36035	OIL SEAL 35 X 62 X 7	2
17	36064	SPACER DIA 42 X 35.5 X 32.5 MM	1
18	36066	PARALLEL KEY 10 X 8 X 30	1
19	36027	GEAR BOX COMP	1

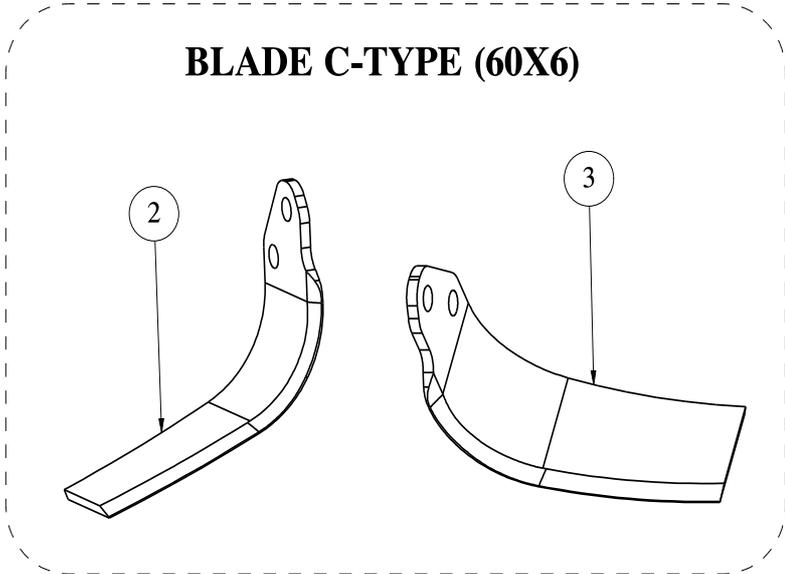
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ROTOR PARTS



BLADE C-TYPE (60X6)

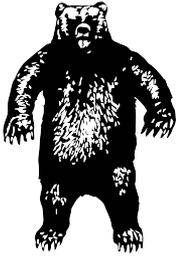


ROTOR PARTS

Sr. No.	Part No.	Description	Qty.
1	36009	ROTOR WELDMENT 125	1
	36057	ROTOR WELDMENT 105	
	36061	ROTOR WELDMENT 85	
2	36050	BLADE C-TYPE LH (60X6) W/O L	AS REQ.
3	36051	BLADE C-TYPE RH (60X6) W/O L	AS REQ.
4	17275	HEX BOLT M12X1.75X30(DIN933)(8.8)(ZP)	AS REQ.
5	14362	SPRING WASHER M12.00(IS 3063)(ZP)	AS REQ.
6	17273	HEX NUT M12X1.75(DIN 934)(8)(ZP)	AS REQ.

4.2

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