



OPERATION AND MAINTENANCE MANUAL FINISHING MOWER



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AGPRO wants to thank you for having chosen one of its products.

The technological evolution and the new request of the agricultural world have pushed our firm to a continued improvement, focused on the product, on the quality of the materials and on the quality of work.

The present manual contains the description of the machine and the necessary instructions to correctly use it, along with the instructions for an ordinary and periodic maintenance of the shredder.

Such manual is subdivided in easily recognizable chapters for a practical consultation.

The indications in the present manual are addressed to a professional user, who must have specific knowledge about the driving modalities of the tractor with which the machine is connected. The user has to be authorized, instructed and opportunely trained.

We recommend you to use only original spare parts and accessories.

The use of non-original parts could be dangerous reducing the duration and the performances of the machine as well as the decay of the warranty.

In the case of doubt about the interpretation of the subjects illustrated in this handbook, we suggest you to contact the dealer who will be ready to assist you whenever you need it.

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CHAPTER I SAFETY INFORMATION

PLEASE NOTE

Make sure all potential operators of this equipment review this manual and all safety messages contained within.

1.1 Safety First

Read these safety rules attentively and strictly follow suggested precautions to avoid any potential danger and safeguard your health and personal safety.

The purpose of this manual is to familiarize the operator with the operation and regular servicing of the machine. Remember that the time spent on maintenance extends the life of your machine.

The safety information given in this manual does not replace any safety codes, insurance needs, federal, state and local laws. Make sure your machine has the correct equipment required by your local laws and regulations.



This safety alert symbol indicates important safety messages in this manual. When you see this symbol, carefully read this message that follows and be alert to the possibility of personal injury or death.

Operators are responsible for the **safe** operation and maintenance of their MOWER. **Each operator** must ensure that you and anyone else who is going to operate, maintain or work around the MOWER be familiar with the operating and maintenance procedures and related **safety** information contained in this manual.

This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the MOWER.

Remember, **operators** are the key to safety. Good safety practices not only protect operators but also the people around them. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented.

Do not risk injury or death by ignoring good safety practices.!

- MOWER owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually.
- The most important safety feature on this equipment is a **safe** operator. It is the

operator's responsibility to read and understand **all** Safety and Operating instructions in the manual and to follow these. Most accidents can be avoided.

- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.



Think SAFETY! Work SAFELY!

1.2 General Safety

1. Read the operator's Manual and all safety signs carefully before operating, maintaining, adjusting or unplugging the Finishing mower.
2. Allow no riders on Finishing mower.
3. Operate only at safe distance from bystanders. Clear the area of people, especially small children, before starting.
4. Stop PTO before dismounting tractor.
5. Keep feet and hands from under Finishing mower at all times.
6. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.
7. Do not stay between the tractor and the machine.
8. Do not approach Finishing mower until all motion has stopped.
9. All rotary blades have the ability to discharge objects at high speeds, which could result in serious injury to bystanders or passers-by, use with extreme caution.
10. Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
11. Review safety related items annually with all personnel who will operate or maintain the Finishing mowers.
12. Do not operate machine if you feel unwell or physically unfit, in which case you should stop working.
13. This machine was designed with safety very much in mind. However, there is no real substitute for caution and attention in preventing accidents. Once an accident has happened, it is too late to think about what you should have done.
14. Use a tractor equipped with a Roll Over Protective Structure (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off the tractor – particularly during a turnover when the operator could be pinned under the ROPS or the tractor.
15. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question – **DON'T TRY IT.**
16. Clear working area of stones, branches or hidden obstacles that might be hooked or snagged, causing injury or damage.

1.3 Operating Safety

1. Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting, repairing or unplugging.
2. Do not allow riders.
3. Install and secure all guards and shields before starting or operating.
4. Keep hands, feet, hair and clothing away from moving parts.
5. Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
6. Place all tractor and machine controls in neutral before starting.
7. Never start or operate machine unless sitting on tractor seat.
8. Clear the area of bystanders, especially small children, before starting.
9. Stay away from PTO shaft and machine when engaging PTO. Keep others away.
10. Clean reflectors, SMV and lights before transporting.
11. Use hazard flashers on tractor when transporting.
12. Do not put hands or feet under machine while tractor engine or machine is running.
13. Do not operate Finishing mower in the raised position.
14. Objects can be thrown out from under machine with sufficient force to severely injure people. Stay away from machine when it is running. Keep others away.
15. Always know what you are cutting. Never operate Finishing mower in an area that has hidden obstacles. Remove sticks, stones, wire or other objects from working area before starting.

16. Review safety instructions with all operators annually.

1.4 Storage Safety

1. Store the machine in an area away from human activity.
2. Do not permit children to play on or around the stored machine.
3. Store the machine in a dry, level area. Support the frame with planks if required.

1.5 Maintenance Safety

1. Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
2. Follow good shop practices.
 1. Keep service area clean and dry.
 2. Be sure electrical outlets and tools are properly grounded.
 3. Use adequate light for the job at hand.
3. Make sure there is plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.
4. Before working on this machine, shut off the engine, set the brakes, and remove the ignition key.
5. Never work under equipment unless it is blocked securely.
6. Use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance work. Use heavy gloves when handling blades.
7. When replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacture will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.
8. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
9. Periodically tighten all bolts, nuts and screws and check that all pins are properly installed to ensure unit is in a safe condition.
10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing machine in service.

1.6 Safety Signs

1.6.1 Care of Safety Signs

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. If a component with a safety sign(s) affixed is replaced with a new part, make sure new safety sign(s) are attached in the same locations as the replaced components.
4. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

1.6.2 Safety Signs locations

The types of safety signs and locations on the equipment are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various safety signs, the type of warning and the area, or particular function related to that area, that requires your **SAFETY AWARENESS**.

CHAPTER II SPECIFICATIONS

2.1 Brief Introduction

HANMEY series Finishing mower is designed to cut a variety of grasses and other ground covers. You take the responsibility if the machine is used in any other purposes.

The Finishing mower consists of three rotating shafts with three free-swinging steel blades attached to them. The blades cut the grass while traveling over the working area. Rotational power to the shaft is provided by the tractor PTO through the gearbox in the center of the machine.

The Finishing mower attaches to the 3 point hitch on the tractor.

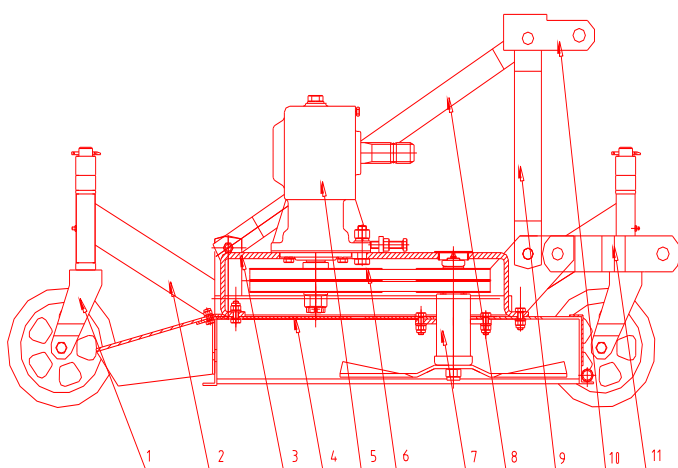


Fig. 2.1 Main components of the Finishing mower

1. Wheel assembly
2. Wheel bracket
3. Gearbox seat
4. Deck
5. Gearbox
6. Belt wheel
7. Blade axle
8. Rear link rod
9. Front link rod
10. Bracket for suspension (Upper)
11. Bracket for suspension (Lower)

2.2 Specifications and Parameters for Finishing Mower

Model	FMN120	FMN150	FMN180
Dimensions (L×W×H) (mm)	1300×750×500	1630×950×500	1950×1050×500
Structure weight (kg)	175	188	210
Cutting width (mm)	1200	1500	1800
Working efficiency (m ² /h)	4000-7000	4000-8000	4000-8000
Input rotating speed (RPM)	540		
PTO spline size	6-tooth Φ35 Rectangular spline		
Power required (HP)	20-30	25-35	30-50

CHAPTER III OPERATION



CAUTION: Be familiar with the machine before starting. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum field efficiency.

3.1 Checking Before Operating

Before operating the machine, the following areas should be checked off:

1. Before starting up the machine, check and Lubricate all grease points all lubricated parts inside the machine.
2. Use only an agricultural tractor of horsepower within limits of the machine specified.
3. Check that the machine is properly attached to the tractor. Be sure retainers are used on the mounting pins.
4. Be sure extra weights are mounted on the front of the tractor.
5. Check the oil level in the gearbox. Add as required.
6. Check that the tractor PTO shaft turns freely and that the machine driving shaft can telescope easily.
7. Check the blades. Be sure they are not damaged or broken and swing freely in their mount. Repair or replace as required.
8. Check and tighten the blade bolts.
9. Check for entangled material in all rotating parts. Remove this material.
10. Install and secure all guards, doors and covers before starting.

3.2 Machine Running-in

Although there are no operational restrictions on the Finishing mower when used for the first time, it is recommended that the following mechanical items be checked:

A. After operating for 1/2 hour or after completing 2 acres:

1. Check and tighten all nuts, bolts and other fasteners.
2. Check that the blades are in good condition and swing freely.
3. Check the oil level in the gearbox. Add as required.
4. Check that the machine driving shaft shield turns freely.
5. Lubricate all grease points.

B. After operating for 5 hours and 10 hours:

1. Repeat items 1 to 5 of Section A.
2. Then go to the regular service schedule as defined in CHAPTER IV, 4.2.1.

3.3 Equipment Matching

To insure the safe and reliable operation of the Finishing mower, it is necessary to use a tractor with the correct specifications. Use the following list as a guide in selecting a tractor to use on the machine.

1. Horsepower:
The power requirements range from 20hp for light cutting in level terrain up to 35 hp in heavy cutting in rough terrain. Use a tractor appropriate for your conditions.
2. Front End Weights:
It is recommended that tractor be equipped with front-end weights to provide extra stability. This is particularly important if using front-wheel assist tractor.
3. 3 Point Hitch:

The Finishing mower is equipped with a category 0 3 point hitch. Be sure the tractor 3 point hitch is in the proper configuration.

Install the lift arm stabilizer or shorten the stop chains to place the arms into the non-sway configuration. Refer to the tractor manual for details.

4. Load Sensing Hydraulics:

The operator should set the tractor hydraulic system to provide “float” on the 3 points hitch. Refer to the tractor manual for details.

The float feature will allow the machine to follow the ground contours during operation.

5. PTO Shaft:

The tractor must have a 1 3/8 inch 6 spline 540 RPM PTO shaft to fit the driving shaft supplied with the machine. Do not use shaft adapters or operate at any other speed.

It is not recommended that a tractor with variable speed PTO's be used on the Finishing mower. Operating at speeds faster than 540 RPM will overload the cutting components and lead to early failures.

3.4 Attaching / Unhooking

The Finishing mower should always be located on a level, dry area that is free of debris and other foreign objects.

The machine coupling is equipped with 3 pins so that the machine can be coupled with all tractors with universal coupling. Each telescopic pole on the machine can be adjusted properly according to the type of the tractor. Keep the Finishing mower away the tractor with a certain distance. The universal joint shall be tense and the largest distance of the machine driving shaft in the closed state shall be no shorter than 25 cm.



CAUTION: Before installing the universal joint, the tractor and the machine motor shall be stopped and the key be taken away.

When attaching the machine to a tractor, follow this procedure:

1. Put off the protective cover of tractor's PTO shaft, lower link and suspension mechanics of tractor.

Note:

It may be necessary to add weight to the 3 points hitch to lower the lift arms.

2. Backing up the tractor at low speed towards the Finishing mower and raise the lower links to proper level.
3. Stop tractor, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.
4. Connect two tractor's lower links with Finishing mower's left and right lower suspension bracket and put pins in. Connect the tractor's upper link with Finishing mower's upper suspension bracket well and put pin in.
5. Attach the machine driving shaft to the tractor's PTO shaft by retracting the locking pin, FMide the universal joint over the shaft and push on the universal joint until the lock pin clicks into position. Pull on the universal joint to be sure it is locked in position.



Note: While connecting 3 points hitch, pay attention to that the PTO shaft of the tractor shall be parallel with the ground. It is very important to keep the machine driving shaft and the PTO shaft of the tractor in parallel.

6. Make sure that the machine driving shaft telescopes easily and that the shield rotates

freely.



Important: Be sure that the machine driving shaft does not bottom out when going through its working angles.

7. Use the 3 points hitch to raise the machine from the ground before moving the machine.
8. Reverse the above procedure when unhooking the machine from the tractor.

3.5 Field Operation

Place the 3 points into its “float” operating mode to allow the machine and the hitch to move up and down.

1. Pull the machine into the field and align the machine with the working area.
2. Adjusting the height
There are 4 sets adjusting spacer on the wheel fork, which make the cutting height range of 40mm-90mm. By add or reduce adjusting spacer to get a desired cutting height.
3. Starting machine:
 - a. Run the engine at low idle.
 - b. Slowly engage the PTO control to start the machine.
 - c. Slowly bring the engine to the rated PTO speed. Never exceed rated speed.
 - d. Lower the machine to the ground and proceed down the field.



DANGER: Never operate Finishing mower in the raised position.

4. Stopping machine:
 - a. Slowly decrease engine speed to low idle.
 - b. Disengage PTO clutch slowly.



WARNING: Place all controls in neutral, lower machine, stop engine, set park, remove ignition key and wait for all moving parts to stop before dismounting.

5. Ground speed:
Travel speed can vary between 3 and 8 mph (5 and 13 kph) depending on the grass and terrain conditions. It is the responsibility of the operator to note the condition of the job being done and set the speed to obtain a quality cutting job and maintain control of the machine.

The speed can be increased if a good job is being done.

Decrease speed if you are producing a ragged cut or leaving patches uncut.



WARNING: The rotating blades can pick up objects and expel them at a high rate of speed. These projectiles can be a hazard to the people and property. Never operate Finishing mower when there are bystanders, especially children around. Use extra care when operating in populated or congested areas.

3.6 Transporting

When transporting the machine, review and follow these instructions:

1. Be sure that the machine is securely attached to the tractor and all retainer pins are installed.
2. Be sure you have installed extra weights on the front of the tractor.

3. Clean the SMW emblem, lights and reflectors and be sure they are working.
4. Be sure you are in compliance with all applicable lighting and marking regulations when transporting.
5. Be sure your machine can clearly be seen by overtaking and oncoming traffic.
6. Do not allow riders.
7. Always use hazard flashers on the tractor when transporting.
8. Use pilot vehicles front and rear when transporting during times of limited visibility.

3.7 Storage

After the season's use, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of next season. To insure a long, trouble free life, this procedure should be followed when preparing the unit for storage:

1. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris and residue.
2. Inspect the blades and rotor for damage or entangled material. Repair or replace damaged parts. Remove all entangled material.
3. Lubricate all grease nipples. Make sure that all grease cavities have been filled with grease to remove any water residue from the inside.
4. Touch up all paint nicks and scratches to prevent rusting.
5. Move to storage area.
6. Select an area that is dry, level and free of debris.
7. Unhook from tractor (see Section 3.4).
8. If the machine cannot be placed inside, cover with a waterproof tarpaulin and tie securely in place.
9. Store the machine in an area away from human activity. Do not allow children to play on or around the store machine.

CHAPTER IV SERVICE AND MAINTENANCE

4.1 Service

4.1.1 FLUIDS AND LUBRICANTS

1. Grease:
Use multi-purpose lithium based grease.
2. Gear Box Oil:
Use 80W90 Gear oil or equivalent for all operating conditions. Each Gearbox Capacity:
0.85 litre
3. Storing Lubricants:
Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

4.1.2 GREASING

1. Use a hand-held grease gun for all greasing.
2. Wipe grease nipple with a clean cloth before greasing, to avoid injecting dirt and grit.
3. Replace and repair broken nipple immediately.
4. If nipples will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace nipple if necessary.

4.2 Maintenance



ATTENTION: All maintenance, repairing, cleaning and lubricating shall be conducted when the tractor and motor are stopped and the key is taken away..

The period recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent maintenance.

4.2.1 8 Hours or Daily Maintenance

- 1 Check and screw all nuts and bolts in connection parts.
- 2 Check the oil in gearbox. Fill them up to line if it's necessary.
- 3 Press butter in each oil nipple three to five times.
- 4 Clean the implement; take away all grass and mud.



IMPORTANT: Check the oil level only when the unit is cold and the machine is on the level.

4.2.2 Season Maintenance

- 1 Check the machine as below beside the terms of daily maintenance.
- 2 Check the oil in gearbox; replace it if it is bad.
- 3 Check the bearings of blade spindles whether mud and water have been enter because oil seals are damaged, if it's so, disassemble and clean them and replace them if it is necessary. And then press butter into them.
- 4 Check the distance between bearings and gears. Adjust them if it's necessary.

4.2.3 Annually Maintenance

- 1 Cleaning mud and grass on the machine thoroughly.
- 2 Let the oil in gearbox drain out thoroughly. Check and clean it. Fill new gear oil up to the dedicated oil level.
- 3 Check all clearance between bearings and gears if you have replaced them. Please run it without load for 3-5 minutes.
- 4 Check and clean blade axles. Replace oil seals and press butter into them.
- 5 Check all blades, replace then if they are wear-out or damaged.

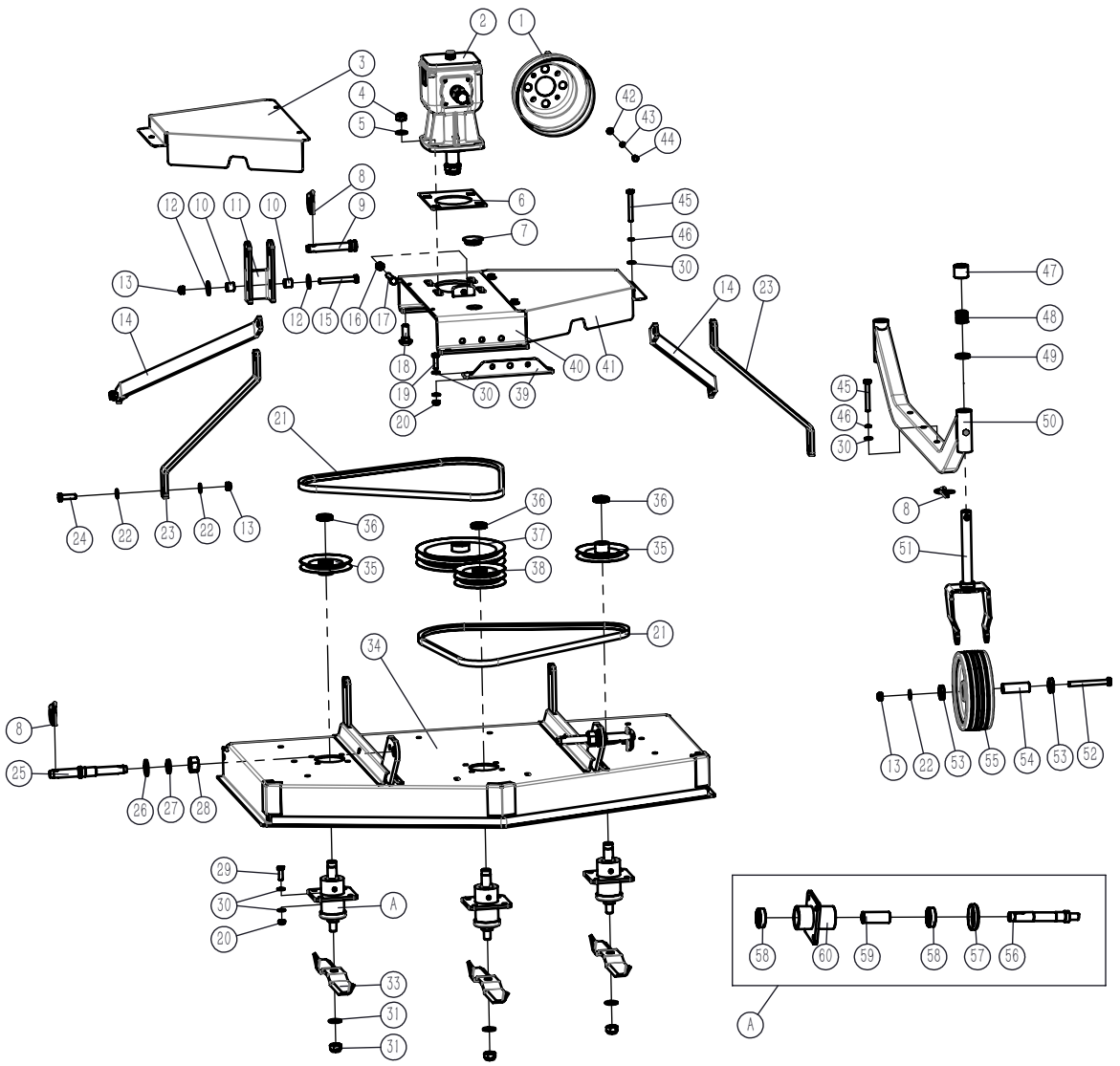
- 6 Repair the side skirts; let them to original technical condition. Replace damaged or broken protective devices.
- 7 Remove the driving shaft from the machine. Pull the machine driving shaft apart. Check and replace any components that are damaged or worn. Install the machine driving shaft on the machine. The machine driving shaft should telescope easily and the guard turn freely on the shaft

CHAPTER V TROUBLE SHOOTING

This Finishing mower is designed to cut grass or other plants. It is a simple and reliable system that requires minimal maintenance.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

Problem & Possible Cause	Solution
1. Finishing mower doesn't turn Tractor clutch FMips. PTO shaft FMips	Tighten or replace FMip clutch. Repair tractor PTO clutch
2. Poor cutting job Traveling too fast. Blades dull. Grooves in grass. Scalping. Grass being left.	FMow down. Sharpen blades. Bent blade. Straighten or replace blade. Machine too low. Raise machine. Traveling too fast. FMow down. Top link too short. Extend top link.
3. Gearbox seal leaking Grease overheating.	Drill 3/16" hole in level plug and insert cotter pin. Hole will act as a breather and prevent pressurizing.
4. Noisy gearbox Poor gear mesh.	Remove input shaft and gear. Replace worn parts. Reassemble and use shims to give a gear backlash of 0.006-0.018 inches measured at 2 13/16" from shaft centerline.
5. Clutch FMips Overloads. Clutch loose. Clutch worn out.	FMow travel speed. Tighten springs on clutch plates. Replace clutch components or assembly as required.
6. Vibration Out of balance.	Check for bent, damaged or broken blades. Repair or replace as required



No	Part Number	Description	Qty
1	FM120.00.401	PTO Protection cover	1
2	XH30.283Z.01L	Gearbox	1
3	FMN120-0119	Belt pulley cover(R)	1
4	DIN985-87	Nut M16	4
5	GB97.1-85	Washer 16	4
6	FMN120-0117	Gearbox gasket	1
7	FM120.00.110-2	Rubber cover	1
8	TY-SXZJ-12	Lock pin Φ 12	7
9	WC42-0101	Up linkage pinshaft	1
10	FMN120-0122	Spacer	2
11	FMN120-0121	Up linkage frame	1
12	GB96.2-2002	Washer 12	2
13	DIN985-87	Nut M12	9
14	FMN120-0124	Rear rod	2
15	GB5782-86	Bolt M12 \times 100	1
16	GB6170-86	Nut M12	1
17	GB5783-86	Bolt M12 \times 70	1
18	GB12-88	Bolt M16 \times 45	4
19	GB5783-86	Bolt M10 \times 35	2
20	DIN985-87	Nut M10	16
21	GB11544	V belt B1930	2
22	GB97.1-85	Washer 12	14
23	FMN120-0123	Front rod	2
24	GB5783-86	Bolt M12 \times 40	4
25	WC42-0102	Down rod pin shaft	2
26	GB97.1-85	Washer24	2
27	GB93-87	Spring washer 24	2
28	GB6170-86	Nut M24	2
29	GB5783-86	Bolt M10 \times 30	14
30	GB97.1-85	Washer 10	36
31	DIN985-87	Nut M18	3
32	GB97.1-85	Washer 18	3
33	FMN120-0115	blade	3
34	FMN120-0013	Hood	1
35	FMN120-0019	Single groove small pulley	2
36	GB812-88	Round nut M24 \times 1.5	3
37	FMN120-0017	Double groove large pulley	1
38	FMN120-0018	Double groove small pulley	1
39	FMN120-0116	Nipple fixing plate	1
40	FMN120-0014	Gearbox frame	1

41	FMN120-0118	Belt pulley cover(L)	1
42	GB97.1-85	Washer 8	4
43	GB93-87	Spring washer 8	8
44	GB5783-86	Bolt M8x16	8
45	GB5782-86	Bolt M10x80	6
46	GB93-87	Spring washer 10	6
47	FMN120-0108	Adjusting ring	4
48	FMN120-0109	Buffer pressure spring	4
49	FMN120-0106	Adjusting spacer	4
50	FMN120-0012	Wheel frame	2
51	FMN120-0011	Wheel fork	4
52	GB5782-86	Bolt M12x110	4
53	FMN120-0102	Spacer	8
54	FMN120-0101	Shaft sleeve	4
55	WG-0008	Wheel	4
56	FMN120-0111	blade shaft	3
57	FMN120-0014	Protection spacer	1
58	GB276-94	Bearing 6205	6
59	FMN120-0112	Spacer	3
60	FMN120-0016	Blade shaft seat	3