
610

OWNER'S MANUAL

Forward

Thank you for purchasing our company's tiller.

This manual contains information on operation and maintenance of the WM610 tiller, which is based on the most recent product information available at the time of approval for printing. We reserve the right to make amendments without advance notice and without incurring any obligation for sequences. No part of this publication maybe reproduced without written permission.

This manual should be considered a permanent part of the tiller, and remain with it if it is resold.

Safety information

Safety is very important for you and others, We have written down important safety information in both manual and machine, Please read it carefully.

Safety information gives you warning that you may bring potential danger to yourself and others. The key words with “!” are put before every piece of information. These words are “danger, warning, attention”.

- ◆ Please pay attention to the meanings of the above-mentioned identifiers.

! Danger: if you don't operate follow those indicated in the manual, serious injures, even death will be caused.

! Warning: if you don't operate follow those indicated in the manual, device damage and injures will be caused.

! Attention: if you don't operate follow those indicated in the manual, device damage and injures may be caused.

You can see other important information marked with “ATTENTION”.

ATTENTION: If you don't operate as those indicated in the manual, device damage will be caused.



ATTENTION

◆ If mini tiller is operated follow those indicated in the manual, it will work safely and reliably. Before operating the mini tiller, please read this manual carefully. Otherwise, injures and device damage will be caused.

- When engine starting, the tension roller should be in the disengaged position with belt.
- When the machine is working, please pay attention to safety!
- Be careful about the rotary blades, because they may hurt you!
- Before changing gear, should release the tension roller with the belt.
- The machine clutch device is comprised of tension roller and belt.
- Fuel and lube oil must be clear.

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Chapter I. Safety information and Warning

◇1. Training

- a) Please read this manual carefully, and learn how to operate and use the tiller.
- b) Don't allow children and anyone without proper training to operate this tiller to avoid injury.
- c) Keep all persons (especial the kids) and pets away from the tilling area.

◇2. Preparation

- a) Move all the sundries away from the tiller area.
- b) Before engine starting, be sure the clutch is disengaged and the shift lever is in the neutral position.
- c) It is not allowed to operate the tiller without wearing proper coat. Wearing the antiskid shoes can improve the stability on the slide surface.
- d) Be careful the fuel, it is extremely flammable.
 - 1) Using the proper tank to store the fuel.
 - 2) It is not allowed to refuel when engine working or before engine cooled. Refueling the lube oil into the tank is not permitted.
 - 3) Refuel in a well-ventilated area with the engine stopped.
 - 4) Before starting, tightening the fuel cap, and cleaning the spilled fuel.
- e) When engine running, any adjustment is not allowed (except the special adjustment recommended by manufacture).
- f) For any operation, such as: preparation, operation and maintenance, should wear the safety glasses.

◇3. Operate

- a) Keep your hands and feet away from the rotating parts while engine is running .
- b) Be careful to operate on (or across) the cobble road, pavement or highroad.

Watching out for the potential risk, the traffic. Taking the passenger is not allowed.

c) Running into the sundries, should stop the engine, inspect the tiller. It is not allowed to start or operate before it is repaired.

d) Attention the operation floor, avoid to slip and fall.

e) Any unusual vibration is the sign of fault, should stop and inspect machine immediately.

f) Stop the engine, in case of leaving, cleaning the rotor, maintenance,

~~adjustment and inspection.~~

g) After using, should do the preventive measures, such as: disengage the power output, gear in neutral position, engine off.

h) Before cleaning, maintenance and inspection, the engine should be off, and ensure all the moving parts to be stop.

i) Exhaust contains poisonous gas, don't use the tiller in enclosure space.

j) No protective devices, no operation the tiller.

k) Keep away from the kids and pets.

l) To be avoid to deeper tilling depth, and faster, cause the machine overload.

m) The tiller should not run high speedr on the slippery road, be careful the back situation when using backward gear.

n) Keep people away from the machine.

o) Use only genuine parts or their equivalents(such as: wheel bob-weight, balancing weight, carbin etc).

p) In poor view or lighting environment, don't operate the tiller.

q) Be careful to operate on hard land, because the blade into land can push the tiller forward. In this case happened, release the handle bar, don't try to control it.

r) Do not use the tiller on slope.

s) When the tiller goes up or down the slope, should prevent tip-over.

◇4. Maintenance and Storage

a) Keep the tiller, attached device and components in good operation condition.

b) At set intervals, check if the bolts fasten to ensure the tiller in safe operation condition.

c) Indoor storage, away from the fire, cool the engine before indoor storage.

d) For long-period storage, should keep the this manual well, too.

e) Don't try to repair the machine, otherwise you have the proper tools and disassemble, assemble and maintenance manual.

Chapter II. Profile of mini tiller

◆1. Specification

Item		Data				
		WM610				
Tiller	Dimension (L*W*H)mm	1600×1100×1000				
	Net/Gross Weight(kg)	90/100				
	Driving Model	Belt\Gear				
	Tilling Width(mm)	1100				
	Tilling Depth(mm)	100-250				
	Gear	Neutral(roller belt type)				
		Gear	1	2	3	R
Auxiliary gear		L/H 13/ 20	L/H 37/58	L/H 83/129	L/H 16/24	
Engine	Model	178FS				
	Bore×Stroke(mm)	78×62				
	Displacement(cc)	296				
	Rated Power(kw)	4				
	Rated Rotation Speed (r/min)	1800				

Chart I

◆2. General chart

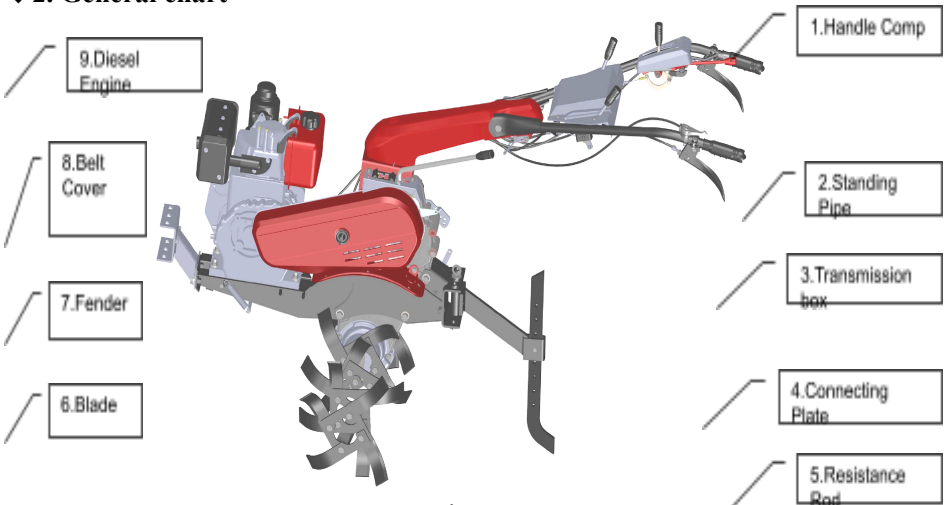


Photo I

Chapter III. Applicable Scope

◆1. Rotary Tillage

The Mini-tiller is suitable for cultivating, earth backing, ditching, ridging, weeding, film mulching for garden, orchard canopied vegetables.

The rotary device (photo II) is connected to the tiller's transmission box power output shaft, cutting edge forward, fixed by pin and jump ring, after assembling the resistance rod, then can do the rotary tillage. The rotary blade refers to the Chart II.

Tilling device mode	4 group
	4pieces
Tilling blade	4×8
Tilling width	1100mm

Chart II

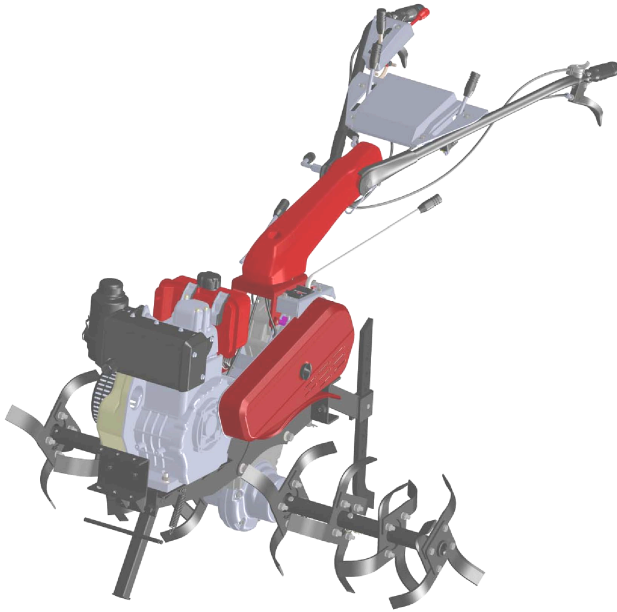


Photo II

◆2. Ditching & Ridging

Disassembling the connecting plate, installing the rotary cultivator, then adjusting the ditching width, then can do ditching.

◆3. Multi-function Usage

Disassembling the connecting plate, installing the relative tools, it can do the jobs such as: ridging, film mulching, weeding, spraying etc.

Chapter IV. Operation and use of mini tiller

◆1. Installation Method

Up packing assembly:

1. take out the tiller and components from the packing.
2. Fix the body of tiller, install wheels axle bush on both sides of hexagonal shaft and fix the bushes with 2 10x55 pins and type B jump ring, then install the R&L wheels(4.00-8) on wheel axle bush, adjust the width, and fix the wheels with 2 10x65 pins and Type B jump ring.
3. Connecting plate and resistance rod installation: Fix the connecting plate on the connecting set with the pin spindle, and fix with jump ring C, then fix the resistance rod and connecting plate with 8x43 pin and jump ring B, adjusting the height.
4. Standing pipe and handle comp installation: Connecting the standing pipe on the tiller, and adjusting the position, then fasten the fixing handle bar. Installing the handle comp, adjusting the height to a comfortable position, then fasten handle comp through the fixed handle bar.
5. Checking the tiller, attached components if it exists lack, then go for next step following this manual.

Operation Introduction:

Before the tiller leaves the factory, adjusting and debugging is done, for comfortable and easier using, the user should inspect and adjust it again.

◆2. Daily Checking

- ◇2.1 Checking the engine lube oil.

Warning!

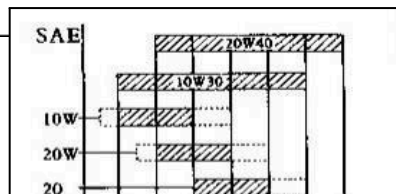
The normal engine lube oil capacity is 1.1L. Using the engine with low oil level will cause serious engine damage.

- ⊙ Insert the dipstick into the filler neck without screwing it in.
- ⊙ Get the dipstick out, check the oil level. The oil level should be the mentioned position in the dipstick. (look at Photo III)
- ⊙ SAE10W-40 oil is recommended for general environment temperature. (look at Chart III)
- ⊙ Refuel air cleaner with oil, disassembling the synthetic glass cover tent below

the cleaner, and refuel 0.1L No.20 oil.

! WARNING

Don't run the engine without the air filter, it could shorten the engine's service life..



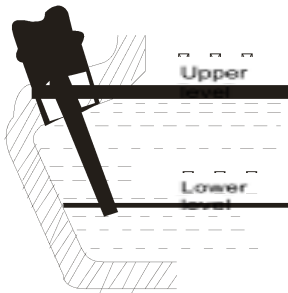


Photo III

Chart III

- ◇2.2 Check the gear box lube oil
- ◎Put the tiller on horizontal position, and remove the oil rubber plug.
- ◎The normal oil capacity: 2.5L.
- ◎#20 lube oil is recommended.

! WARNING

Oil refueled should not exceed the upper level.

! WARNING

Don't run the machine without oil in the gear box, it could shorten the service life of the parts in the gear box.

◆3

! ATTENTION

Before adjusting the handlebar, place the tiller on firm level ground to prevent the handle from collapsing accidentally.

- ◎To adjust the tiller height, loosen the adjuster, select the appropriate height

and tighten the adjuster.

◎The tillers have revolving adjustable handle bar. It allows the operator to drive the tiller from the right or left when tilling.

◇3.2 Tilling depth adjustment

◎Through adjusting the height of the resistance rod, to control the tilling depth. Rod going down, for reducing the depth; Rod going up, for increasing the tilling depth.

◇3.3 The clutch operation

◎To tension and loose the belt roller, can control the engine power output.

◎Pushing the main clutch bar forward, can tension the belt roller, and the engine power will drive the gear box, then the rotary blade will revolve. Pushing the main clutch bar back, can loose the belt roller, the rotary blade will stop.(look at Photo IV)

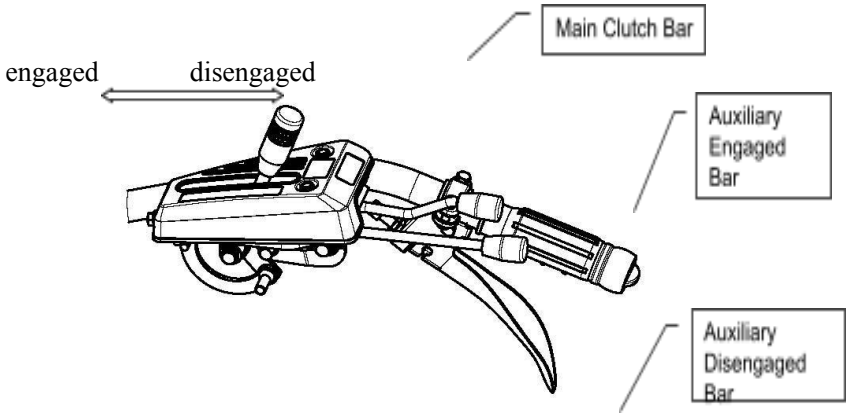


Photo IV

! WARNING
Main clutch cable unseemly adjustment, could cause the in
proper using.

normally. run

©Auxiliary gear bar: when changing from low gear to high gear, first should
 disengage the main clutch. (look at Photo V)

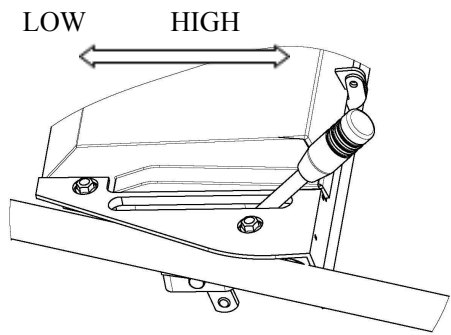


Photo V

©Turning clutch lever: There is left and right, two independed turning clutch
 levers. Sqweezing the lever (refer the arrow directon as Photo VI), the sqweezed
 lever side wheel will stop, the tiller will turn to the stopped wheel side.

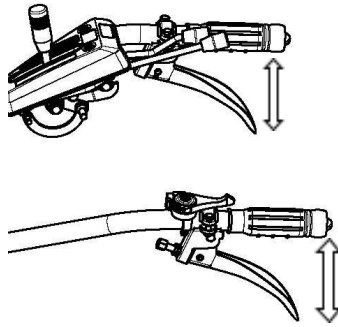


Photo VI

◆4. Operation Attention

! CAUTION

◇4.1 When using mini tiller, you should pay attention to the working situation and sound of every part, check if the connection is good. There mustn't be loosed connection. If there is abnormal situation, you should stop the mini tiller and check.

◇4.2 Never carry out work with heavy load if mini tiller has not been used for a long time, especially the new ones or the repaired ones.

◇4.3 Pay attention to the oil level of diesel engine and gear box. When they are insufficient, please refuel them.

◇4.4 Never cool the diesel engine in the way of water-pouring.

◇4.5 Prevent mini tiller from falling down when tilling.

◇4.6 Never install mini tiller with rotary blades work on sand or stone to avoid damaging blades.

◇4.7 After tilling, pay attention to clear away dirtiness on the mini tiller, mud, grass and oil stain.

◇4.8 Frequently wash the sponge in the air filter, and change oil more often.

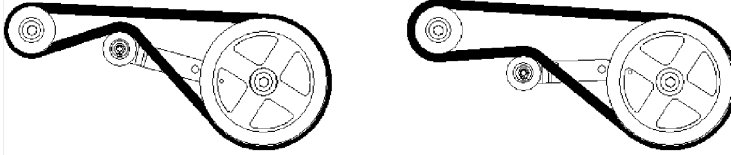
◆5

◎1.

engaged. Pushing the main clutch bar forward(look at Photo IV), can tension the belt roller, and the engine power will drive the gear box, then the rotary blade will

revolve. Pushing the main clutch bar back, can loose the belt roller, the rotary blade will stop.

⊙If the belt tension is not in this range, it needs adjustment. To adjust, loosen the four engine mounting bolts and the engine stay tightening bolt, and move the engine forward or reverse to get proper tension of the belt, the fasten the bolts.



Belt tension condition

Belt loosing condistion

Photo VII

◇5.2Cable installation and adjustment

⊙Main clutch cable adjustment (Photo VIII)

①Thread the screw rod into the supporter in the handle bar,make the bolt in middle position.

②Connect the cable head on the main clutch bar, assemble the flat washer 6 and clip 1.6×20.

③The spring of the main clutch cable hooks the arm of belt roller, adjusting the screw rod until the roller can tension the belt, then fix the nut.

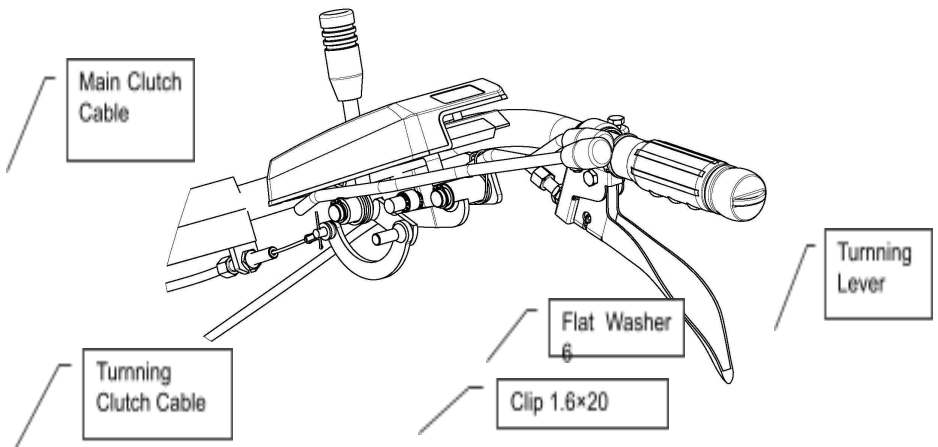


Photo VIII

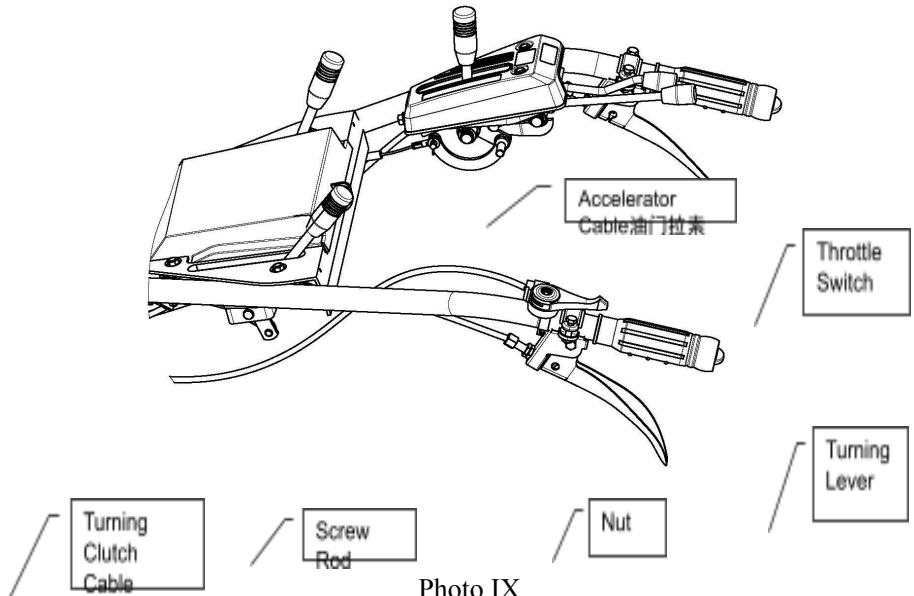


Photo IX

◎Throttle switch adjustment(look at Photo IX)

- ①Turn the throttle switch switch to the slowest position.
- ②Thread the steel wire-rope of the throttle switch into the pole and plug of regulation panel of the diesel engine throttle switch.
- ③Fasten the steel wire-rope and fix the screw.
- ④Adjust the throttle switch switch repeatedly until the throttle switch bar of the regulation panel can be in the fastest or slowest position.

◆6. Engine Start and Stop

◇6.1. Start

Before starting the engine, be sure the clutch is disengaged and the shift lever is in the neutral position.

Move the throttle switch switch to the middle position, then pull the starter grip to start the engine.

◇6.2. Stop the engine

Turn the throttle switch switch to slowest position, and the engine will stop.

Chapter V. Maintenance

Due to rotary situation, abrasion and load change of mini tiller, bolts will become loose and parts will be worn during the work. These changes will destroy the proper working state of mini tiller, create abnormal fitting clearance, degrade output of diesel engine, increase oil consumption, lead to the maladjustment of spare parts, increase malfunction of mini tiller. All these will seriously affect the working efficiency of mini tiller. To decrease the frequency of the above-mentioned accidents, prevention of maintenance work must be done strictly and regularly to keep the mini tiller in a good technical state and prolong its life.

◆1. Running-in of mini tiller

◇1.1 As for running-in of diesel engine, please refer to its instruction.

◇1.2 If mini tiller is new or is just heavy repair, it should work without load for one hour. After the mini tiller works with light load for five hours, all oil in gear box and crankcase of diesel engine should be drained immediately. Afterwards, you should refuel adequate clean diesel oil, pull the starting grip 5~10 times, then drain it. Refuel the lube oil for 4 hours running-in, then can use the tiller normally.

◆2. Technical maintenance of the tiller

◇2.1 Every-time maintenance (before and after work)

① Listen and check if there is malfunction of every parts (such as abnormal noise, overheat, loose screw and so on).

② Check if there is oil leakage from diesel engine, gear box and running gear.

③ Check if the oil level of diesel engine and gear box is between the upper and lower limit of dipstick.

④ Clean the whole machine and spare parts which are with mud, grass and oil stain regularly.

⑤ Do daily record.

◇2.2 Primary maintenance (per 150 hours)

① Carry out maintenance work based on all contents of every-time maintenance.

② Wash gear box, running gearbox and change lube oil.

③ Check and adjust clutch, shift system and reverse gear system.

◇2.3 Secondary maintenance (per 800 hours)

① Carry out maintenance work based on all contents of primary

maintenance.

② Check all gears and bearings. If they are fretted severely, please replace them.

③ Check other parts of mini tiller, such as: rotary blades or bolts and so on. If there is damage, please replace them.

◇2.4 Technical inspection (per 1500-2000 hours)

① Take the whole machine to the specific maintenance station, to have a check. If the spare parts are severely fretted, they must be changed or repaired according to the situation.

◇2.5 As for the maintenance of diesel engine, please refer to its instruction.

◆3. Technical maintenance table of mini tiller (mark "√" indicates the maintenance contents)

Working intervals Maintenance contents	everyday	Work with half load for 8 hours	Work for 1 month or 20 hours	Work for 3 months or 150 hours	Every year or 1000 hours	Per 2 years or 2000 hours
Check & tighten nuts, bolts	√					
Check and refuel lube	√					
Check and change lube		√(1 st time)	√(2 nd time)	√(3 rd time or more)		
Check if there is oil leakage	√					
Clean mud, grass and oil stain	√					
Debug malfunction	√					

Adjust operation parts	√					
Tighten the belt	√					
Gear and bearing					√	

◆4. Long-period storage of mini tiller

When mini tiller needs storing for a long period, the following measures should be taken to prevent tarnishing.

- ◇4.1 Keep diesel engine with seal according to its instruction.
 - ◇4.2 Wash oil stain and clean dust on the machine.
 - ◇4.3 Drain lube oil in the gear box and refuel new oil.
 - ◇4.4 Paint pickling oil on non-aluminum parts where there is no paint.
 - ◇4.5 Store mini tiller in the dry, safe place where there is enough aeration.
 - ◇4.6 Properly keep the attaching tools, certificates of conformity and instruction of mini tiller.
-

Chapter VI. Troubleshooting

◆1. Troubleshooting of diesel engine (refer to the diesel engine instruction)

◆2. Troubleshooting of tiller as the following table:

Phenomenon	Reason	Solution
The clutch can not disengage or doesn't disengage completely	Belt is too tight	Adjusting the engine position, to make the belt proper position according with the manual requirement.
	The roller in loosened condition, tighten the belt	Adjusting the clutch cable, moves the roller down to proper position
After belt tension, tilling is not powerful	Belt is loose	Adjusting the engine position, to make the belt proper position according with the manual requirement.
	The roller in loose condition, far away to the belt	Adjusting the engine position, to make the belt proper position according with the manual requirement.
Gear can not be positioned	No installation the steel ball, spring, or improper steel ball position	replace
	Gear shaft quality problem	replace
Gear jumping	Improper steel ball position, weak spring	Replace the spring

Gear box oil leakage	oil seal Failure	Replace
	Loose bolt or nut.	Fasten or replace
	The connection surface between the aluminum washer and gear box body is not flat.	Polish the connection surface, or use glue.
	Too much lube oil filling	Drain the oil to proper level
Abnormal gear-box noise	Gear is not in proper position	Move gear to proper position
	Gear wheel and gear-box become curved	Replace the gear wheel or gear-box
	No lube oil	Fill the lube oil
Engine supporter broken	Welding problem	Reweld or replace
Rotary blade rubs the gear-box	No installation the dowel pin and clip pin	Install the pin
	Blade quality problem	replace
Rotary blade doesn't work	Wrong installation directly	All the blades edge face tiller running direction
	Same installation of L&R rotary blade	Replace one of them
Engine exhausts black smoke	Spilling oil in cylinder head	Running the tiller sometime, burn the mixer oil, reduce the operation angle.

Chapter VII. Wearing parts list

no	Item	Assy
1	Clutch cable	Handle frame assy
2	Throttle switch cable	Handle frame assy
3	Throttle switch switch	Handle frame assy
4	Rubber handle bar	Handle frame assy
5	Rubber sleeve	Shift lever, tighten handle bar

6	Oil seal, fork shaft	Gear-box
7	Oil plug	Gear-box
8	Wearing parts of engine	Refer to the user's manual of engine

