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1100A/B (E) -6

OWNER'S MANUAL



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## **Foreword**

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Thank you for choosing our mini tiller.

- This manual indicates about operation and maintenance of 1100A-6 and 1100B-6 mini tillers.

- All contents of this manual are based on the latest information when the manual is printed.

- The right to revise the manual without any prior notice is reserved and any legal responsibility of the manual will not be borne by the manufacturer.

- None parts in this manual can be copied without formal approval.

- This manual should be regarded as a part of the tillers, so it should be handed over when resold or rented.

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## Safety information

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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 injuries, even death will be caused.

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

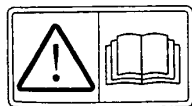
**! Attention:** if you don't operate follow those indicated in the manual, device damage and injuries may be caused.

### Damage prevention

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.

### Safety prevention



◆ 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.

### Attention

- When starting engine, please turn gear lever to neutral position.
- When the machine is working, please pay attention to safety!
- Be careful about the rotary blades, because they may hurt you!
- When holding the backshift bar, the gear lever must be put in the neutral position.
- Fuel and lube oil must be clear.
- When shifting the gear, you must disconnect the clutch.

As model is always improved, photos or illustrations may have difference comparing the actual machine.

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# Chapter1 Profile of mini tiller

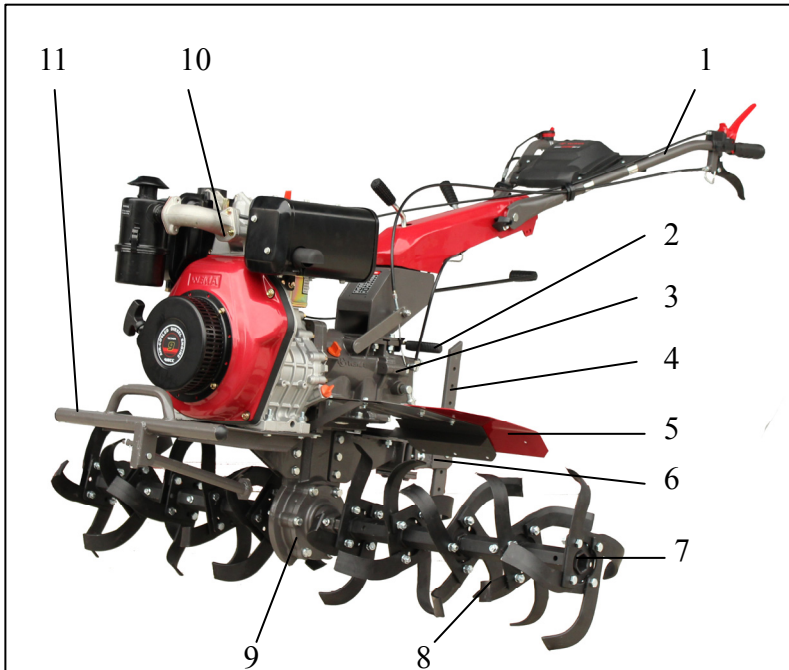
## I . Specification

Table 1

	Items and models		1100A-6			1100B-6		
Mini tillers	Dimension(L×W×H)mm		1800×1100×1000			1800×1350×1000		
	Max tilling scope(mm)		1100			1350		
	Tilling depth		150～300			150～300		
	Main running-in method		Machine grind-in			Machine grind-in		
	Rotating speed (r/min)	High auxiliary shift (H)	-1	0	1	0	2	
			83	-	83	-	145	
		Low auxiliary shift(L)	-1	0	1	0	2	
			24	-	24	-	42	
Productivity( $m^2 / h$ )		534-1000			534-1200			
Engine	Engine model		178F			186FB		
	Engine type		Single-cylinder, vertical, air-cooling, 4-stroke, direct injection					
	Bore×stroke		78×62			86×70		
	Displacement(L)		0.296			0.406		
	Rated power(max)kw(hp)/rpm		4.4(6)/3600			6.6(9)/3600		
	Starting system		Recoil start					
	Fuel tank capacity(L)		3.5			5.5		
	Fuel number		Num.0(summer)			Num.-10(winter)		
	Lube capacity(L)		1.1			1.65		
	Suitable lube		SAE10W, above CC grade					
	Lube mode		Pressure splash mode					
	Net weight		≤33			≤48		
	Dimension(L×W×H)mm		383×421×450			417×441×494		

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## II . General chart



Picture1

1: handle bar assy    2: Output clutch grip    3: gear box assy    4: resistance rod  
5: fender    6: drag bar    7: rotary device components    8: rotary blades  
9: running case assy    10: diesel engine    11: Bumper



# Chapter2 Applicable scope

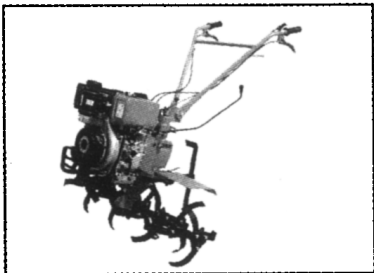
## I . Rotary tillage

Rotary tillage components are installed on both sides of the driving shaft of mini tiller running gear. Tighten the shaft with two bolts M8×55. Then the mini tiller can work. (Look at table2 and Picture2).

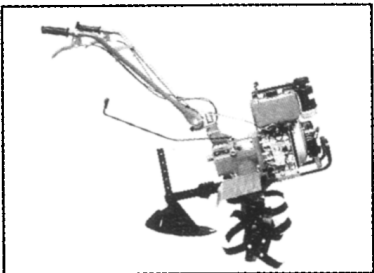
Table 2

Tilling device mode	4groups	5groups		
	4blades	4blades		
Tilling blades	2×4×4	2×5×4		
Tilling scope(mm)	1100	1350		
Suitable soil	Paddy field with insufficient water; clayed soil	solid soil	Wet soil	Dry soil

Picture2: tilling device



Picture3: ditching device



## II . Ditching and ridge forming

Take away resistance rod, install ditching device and adjust the width and height of ditching device. (Picture3)

## III. Short distance transportation

Install forearm of mini tiller case on the drag body and wheels on the driving shaft. The rated load is 250kg. At the rated speed of diesel engine, fast shift speed is about 10km/h and slow shift speed is 1.8km/h.

## IV. Multifunctional work

Take away the safety cover of gear box (num.2 in picture 1), n the back bolt of main shaft, the key sleeve of the shaft, then install the attaching belt pulley and coupling on the main shaft of gear box and fasten with bolts. Ordinary V-belt A-model is used for the cross section of belt pulley. The rated speed of belt pulley is 3000r/m. When it is attached with relative machine tools, auxiliary tools, you can carry out such multifunctional work: bailing, sprinkling, chemical spraying, threshing, reaping and generating power.

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## V. Instruction table of attaching tools

Number	Name	Unit	Usage
1	Rotary tilling wheels of paddy field	Set	Tilling in paddy field
2	Water pumping device(self-priming water pump 3-inch)	Set	Pumping water
3	Ditcher	Set	Ditching
4	Reaper	Set	Reaping rice, wheat
5	Grass cutter	Set	Cutting weeds
6	Rotary cultivator	Set	Smashing soil block

## Chapter3 Operation and use of mini tiller

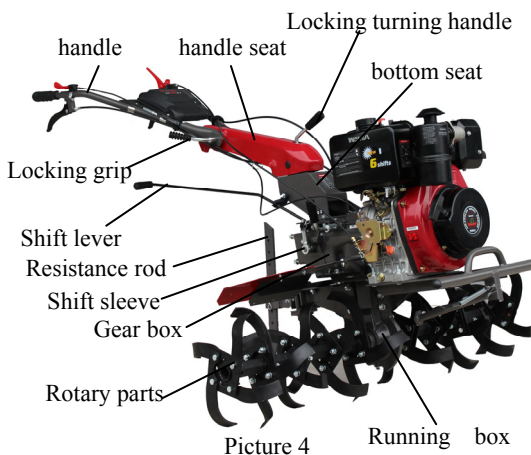
### I . Unpacking assembly(Picture4)

1. Wheels and tilling blades assembling: take the tiller chassis out of packing materials, fix the chassis, put the wheel tube or tilling blades tube on both ends of the hexagon PTO shaft, fix with pin 6\*40 and pin clip in bolts box.

2.Handle assembling: take out the handle and handle seat, align the handle seat with bottom seat fluted disc, fasten with spring washer 16 and locking turning handle. Align the fluted discs of the handle with the fluted discs of the handle seat, adjust the handle height to comfortable position, use bolt M12×140, spring washer 12 and locking grip to fix them.

3.Resistance rod installation: take away the pins between the resistance rod and connecting shelf to get the resistance rod and adjust its direction by 180°.

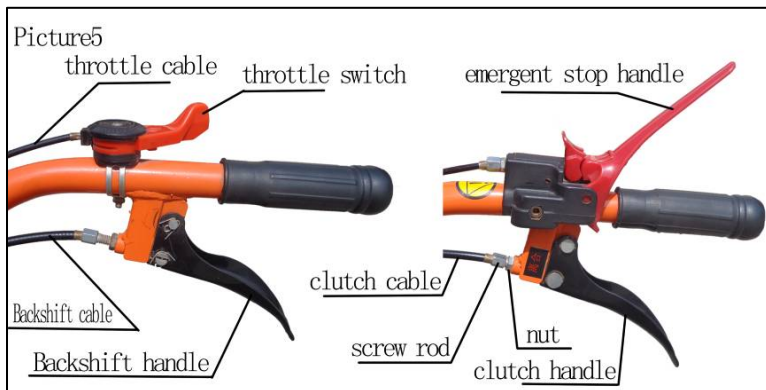
4.Mud fender installation: install frames of both sides and protection frame components on the mini tiller. Then install protection panel of both sides and paddy field protection panel of both sides.



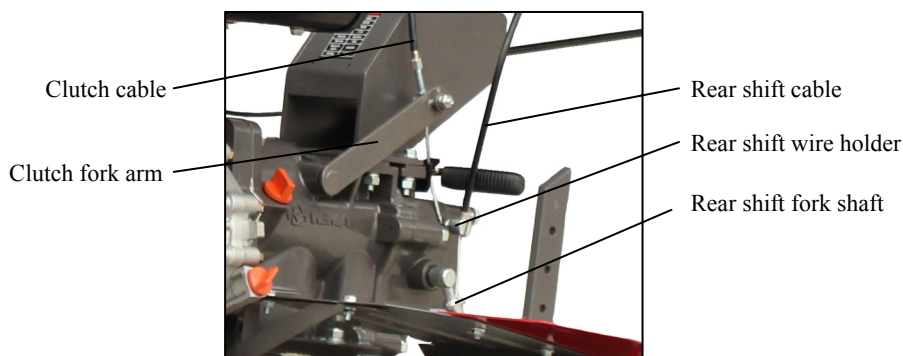
Picture 4

### II . Installation and adjustment of cables

1. clutch cable adjustment(look at picture5 and 6)



Picture5



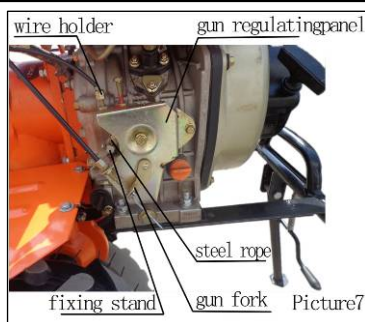
Picture 6

- ①. Unlock nuts on the screw rod.
  - ②. Instantaneously rotate the screw rod to show the shortest part of the handle bar.
  - ③. Thread the cable head into clutch plug behind the gear box assy and make sure the head is in the big hole of the plug.
  - ④. Thread the steel wire-rope into the M8 hole of arm plug, and then properly press down the clutch fork arm to insert the cable head into clutch plug.
  - ⑤. Rotate out the screw rod and clip it repeatedly, unlock the clutch handlebar until spring force of clutch can reposition the bar, and then fasten the nuts.
2. backshift cable adjustment(Picture5 and 6)
- ①. Unlock the fasten nuts on the screw rod.
  - ②. Instantaneously rotate the screw rod to show the shortest part of the handle bar.
  - ③. Thread the cable into the backshift shaft at the side of gear box and make sure the cable head is in the big hole of shaft.
  - ④. Properly counterclockwise rotate the backshift fork shaft, thread the cable into the narrow slit of backshift plug through the side of the gear box and make sure the cable head is in the big hole of the plug.
  - ⑤. Rotate out the screw rod and holdfast it repeatedly, unlock the backshift bar. When spring force can reposition the bar, you should fasten the nuts.
3. throttle cable adjustment(look at picture7)

Diagram

- ①. Turn throttle switch to the fastest position.

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



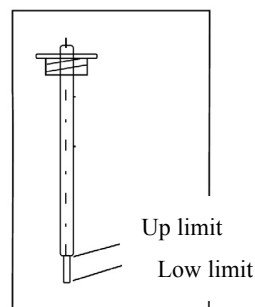
### III. Checking and refueling

1. Check whether the connection bolts are loose or not and fasten the loose bolts according to the bolt moment in the following table3 (diesel engine bolts and nuts moment is in diesel engine instruction).

Table 3

Name	Moment(N.M)
Flange and diesel engine	20~25
Flange and gear box	35~40
Bolts behind the main shaft of gear box	10~12
Bolts on the backshift shaft of gear box	26~40
Bolts between the engine frame and running case	35~40
Bolts on the end cover of running gear	10.6~15
Bolts on the drag bar of running gear	50~60
Bolts between the running gear and gear box	35~40
Drag bar	45~60
Bolts on the bottom plate of diesel engine	35~40
Bolts on the handlebar frame	35~40

2. Check if the handlebars of the operation system (gun, clutch, shift lever, backshift) are flexible. If they are not in their positions, please adjust them.
3. Turn lever to the neutral position.
4. Refueling:
  - ①. SAE10W-40 oil is recommended. Please refer to the picture9.
  - ②. Refuel the gear box with oil num20. Lay down the machine, and refuel through the hole upper the gear box. Checking oil level by dipstick (attention: not rotate the oil ruler). The oil level should be in the range of the dipstick showed in the picture.

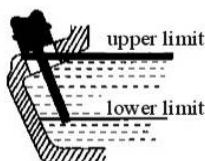


Picture 8

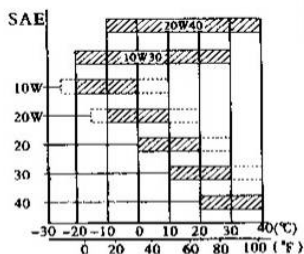
- ③. Refuel air cleaner with oil, take away the synthetic glass cover tent below the cleaner, and refuel 0.1L num.20 oil.
- ④. Choose diesel engine oil according to the working environment(Picture9)

#### lube entrance

put the diesel engine in the smooth place and check the oil level when filling; pay attention to insert the oil sticker lightly and not to rotate the sticker



Capacity	Model	178F
gallon		1, 1(0, 2.4)



recommended value  
 usable limit  
 A.P.I classification of diesel engine  
 maintenance  
 lube must contain CC or CD grade  
 Picture9

5. Refuel the oil tank with num.0, num.-10 or num.-20 light oil (please refer to the diesel engine instruction).

**Attention:** fuel level should not exceed above the mark.

6. Make fore starting preparations according to the diesel engine instruction.

#### IV. Starting(attention: the shift lever must be in the neutral position)

1. Start diesel engine according to the procedure of instruction.
2. The diesel engine should run 2 to 3 minutes at the idle speed (1500 to 2000r/m) with no-load.
3. Check if the diesel engine runs normally. If not, it should stop working and be inspected.

#### V. Operation(attention: mini tiller must go through running-in before operating. Please refer to chapter4)

##### 1. Slow gear

- ①. Hold the clutch bar with left hand to open the clutch.
- ②. pull back the shift lever with right hand, meanwhile, pay attention if it is in the slow position, then hold the right bar with right hand(attention: do not hold the backshift bar).
- ③. Slowly unlock the clutch bar to close the clutch. In this situation, mini tiller can

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run at slow gear.

- ④. Speed up properly with right hand, then mini tiller can run at a low speed of 5km/h.

## 2. Fast gear

- ①. Hold the clutch bar with left hand to open the clutch.
- ②. Push the shift lever to the front with right hand, meanwhile, pay attention if it is in the fast position, then hold the bar with right hand(attention: do not hold the backshift bar)
- ③. Slowly unlock the clutch bar to close the clutch. In this situation, mini tiller can run at fast gear.
- ④.Speed up properly with right hand, then mini tiller can run at a speed of 10km/h.

## 3. Back gear

- ①. Hold the clutch bar with left hand to open the clutch.
- ②. Adjust the shift lever to the neutral position with right hand.
- ③. Slowly unlock the clutch bar to close the clutch, then mini tiller will step back.( attention: do not unlock the backshift bar)
- ④. If it is unnecessary to step back, you should holdfast clutch bar slowly with left hand, then unlock the shift bar with right hand.

4. When shifting in the process of running, you should decelerate (the standard should be the continuous work of diesel engine), then close the clutch. You should change the shift until the machine stop working

5. When changing the direction, you should rotate the bar to left or right.(attention: do not mis-hold the bar, so as to avoid damaging the wheels when directing)

## 6. Stop working

- ①. Hold the clutch bar with left hand to open the clutch.
- ②. After adjusting the shift lever to the neutral position, you should unlock the clutch bar to make the machine stop working.
- ③. When it necessary to stop working, the procedure should be done according to the diesel engine instruction.(attention: this work is usually done on the smooth ground.)

## VI. Connection of attaching tools

1. When rotating, you should take away the wheels, fix hexagonal sleeve of rotary device on both sides of the hexagonal shaft with bolts M8×55. Attention: there are blade units on both sides; make sure the blade cutting edge works firstly when the mini tiller runs. After the rotary blades are installed, you must install the safety panel to prevent injuries by blades. Tilling depth can be adjusted through adjusting resistance rod.

2. When ditching, you should take down resistance rod, install the ditcher and adjust its depth and height. After finishing these, you can do ditching work.(look at picture3)

Range of ditching scope: 14cm-40cm

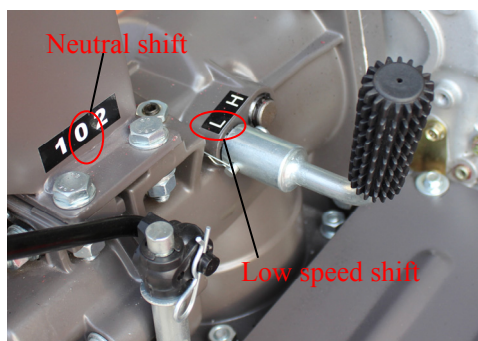
Range of ditching depth: 11cm-25cm

3. Short-distance transportation

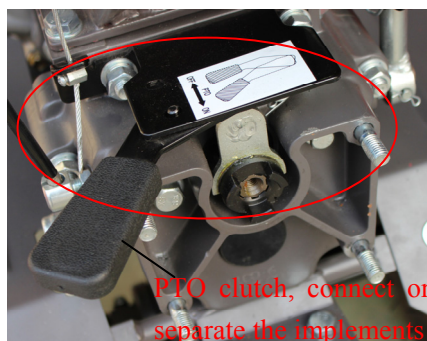
Install forearm of mini tiller case on the drag bar of running gear and install wheels on the driving shift of the running gear. After finishing these, you can transport. The rated load is 250kg. Under the rated rotary speed of diesel engine, the fast speed is around 10km/h and slow speed 1.8km/h.

4. Multifunctional work

Take off the resistance rod, rotate the handle for 180°, put the auxiliary shift on “L” position. Connect the implements (reaper, rotary cultivator, mower, grass cutter, sprayer pump and etc. ) to gearbox back cover, PTO side, screw nuts on the 4 bolts there. Put the shift lever on neutral position “0”, put the auxiliary shift lever on low speed position “L”, use the rear shift handle to start working with the multifunctional implements.



Shifting position



Connecting position



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## **VII. Attention items of using mini tiller**

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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.
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.
3. Pay attention to the oil level of diesel engine and gear box. When they are insufficient, please refuel them.
4. Never cool the diesel engine in the way of water-pouring.
5. Prevent mini tiller from falling down when tilling.
6. Never install mini tiller with rotary blades work on sand or stone to avoid damaging blades.
7. After tilling, pay attention to clear away dirtiness on the mini tiller: mud, grass and oil stain.
8. Frequently wash the sponge in the air filter, and change oil more often.

## **VIII. Attentions of Operating Engine**

1. BREAK-IN OF NEW ENGINE .  
If your engine has not breaking in yet, improper usage will shorten the life of engine. the initial 20 hrs is the break-in-period. The operator must obey the following items :
2. RUNNING IN FOR 5 MINS AFTER FIRST START.  
Running with low speed and low load before the engine gets hot. Avoid running with high speed and full load, or low speed and no load.
3. AVOID RUNNING WITH OVERLOAD.  
During break-in period, the engine can't run with full load, but can run with 3000rpm and 50% load.
4. CHANGE ENGINE OIL REGULARLY.  
After working for 20hrs, change the oil when engine is still warm, otherwise it will be difficult to drain the residual oil in the engine.

## **IX. Oil Bath Type Air Filter:**

1. Check the oil level before operating.
2. Fill oil up to upper limit. If oil is dirty, change it. Please use diesel to

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clean oil bath element frequently, then dip the element in the oil and squeeze out extra.

## **Running**

### **WARNING**

- Be sure to operate the engine in a good ventilated place in order to avoid exhaust poisoning.
- Avoid letting hands, body & clothes entangle in output shaft, belt pulley, V-type belt pulley and other moving parts, so as to prevent from getting injured.
- Stop the engine first and then maintain the movable parts and other parts around it. Make sure there are no tools and sundries in the body of the engine before operating.

## **Run engine for 5mins to warm up**

### **NOTICE**

- The muffler becomes very hot during and immediately after operation. Don't touch it.
- The air filter will inhale the air around itself when the engine works. Don't let the hands, body and clothes approach the air filter to avoid injury.

**After the engine becomes warm, put the speed lever on necessary position to run the engine.**

### **NOTICE**

- Be sure to use the speed lever to adjust the speed of engine.
- Do not loose the speed limit screw and fuel control screw; otherwise the speed and output of engine will be abnormal.

## **Running**

- a. If the engine gives out black smoke continuously, it is because the engine is overloaded. The belt pulley of the engine or that of the powered equipment must be adjusted.
- b. Pay attention to the following points when the engine is running:
  - i. Whether there is abnormal sound and vibration?

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ii. Whether the exhaust is normal?

iii. Whether the engine gives out white or black smoke continuously?

If any of the above phenomena is detected, stop the engine immediately and contact the nearby dealer.

## **X. Methods of Starting the Agricultural Mini-tiller**

a. Starting by Hand:

- Open fuel switch.
- Put engine speed lever in the start position
- Lock emergent stop handle..
- Hold recoil starter grip.
- Pull the starting handle slowly until you feel resistance, then release it slowly.
- Push the reducing valve down to pressureless position. It will get back automatically by itself after the engine gets started.
- Starting : hold the starting handle with two hands, pull the rope lightly until you feel the resistance, then pull the rope to the end with speed and strength.
- If it is not easy to start the engine when the weather gets cold.  
You could take down the refuel screw on the cylinder cover and fill in 2ml oil before starting.

### **Notice**

Tighten the refuel screw on the cylinder cover except filling oil in order to avoid rain and dust to get in the engine and wearing or damage of the engine.

## **XI. Safety Instructions**

Do's...

- Do visual check before starting, every time
- Keep Agricultural Mini-tiller Clean
- Do use recommended Fuel and Lubricants Only
- Do Check Fuel Level
- Do Check Air Intake Filter oil level

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- Do Check Engine Oil and Gear Oil levels
  - Do Check for any leakage
  - Do Check Decompress Knob before starting
  - Do Check Gear in Neutral position before starting
  - Do use recommended attachments Only
  - Do maintain distance (1ft) from buildings and other equipments when operating, to avoid any accidents
  - Keep away from flammable materials
  - Keep away from children and pets to avoid any injuries or accidents.
  - Only operator with knowledge of machine and its operations must be permitted to operate Agricultural Mini-tiller
  - Must stop engine before refueling, and refuel in good ventilation place
  - Must clean and spilled or over flown fuel of the Agricultural Mini-tiller
  - Let Agricultural Mini-tiller cool down before storing indoors.

### **Don'ts...**

- Don't overflow the fuel, but also never let fuel tank run out empty
- Don't use adulterated fuel
- Don't smoke or allow flame or spark where Agricultural Mini-tiller is refueled or where fuel is stored
- Don't inhale exhaust for it can contain poisonous carbon monoxide
- Don't run Agricultural Mini-tiller without adequate ventilation
- Don't lean/tilt Diesel Hal more than 20°, otherwise fuel may spill
- Don't cover Agricultural Mini-tiller top so as to avoid fire
- Don't touch muffler/exhaust, as it gets hot when operating and stays hot for sometime after stopping
- Don't delay on service schedules
- Don't Operate Diesel Hal continuously more than 2hrs.30mins for any given operation (Give break of 20mins)
- Don't make any alterations in Design, Operations and Functioning of Functioning of Agricultural Mini-tiller other than Company's recommendation.

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## Chapter4 Maintenance

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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.

### **I . Running-in of mini tiller**

1. As for running-in of mini tiller, please refer to its instruction.
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 oil, run the mini tiller at idle speed for 3 to 5 minutes to wash it , then drain oil completely. Please refuel oil and carry out running-in for 4 hours according to the forth procedure of chapter3. By doing so, the mini tiller can work in normal condition.

### **II . Technical maintenance of mini tiller**

A. Every-time maintenance (before and after work ):

1. Listen and check if there is malfunction of every part (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.

B. Primary maintenance (per 150 hours)

6. Carry out maintenance work based on all contents of every- time maintenance.
7. Wash gear box, running gearbox and change lube oil.
8. Check and adjust clutch, shift system and reverse gear system.

C. Secondary maintenance (per 800 hours)

9. Carry out maintenance work based on all contents of primary maintenance.

10. Check all gears and bearings. If they are fretted severely, please replace them.
11. Check other parts of mini tiller, such as: rotary blades or bolts and so on. If there is damage, please replace them.

D. Technical inspection (per 1500-2000 hours)

12. 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.
13. Invite special technician to check friction plate and clutch.

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

### III . Technical maintenance table of mini tiller(mark"0" indicates the maintenance contents)

Table 4

Working intervals and maintenance contents	Every day	Work with half load for 8 hours	Work for one month or 20 hours	Work for 3 months or 150 hours	Every year or 1000 hours	Per 2 years or 2000 hours
Check and tighten nuts, bolts	0					
Check and refuel lube	0					
Check and change lube		0(first time)	0(second time)	0(third time or more)		
Check if there is oil leakage	0					
Clean mud, grass and oil stain	0					
Debug malfunction	0					
Adjust operation parts	0					
Friction plate of clutch						0
Gears and bearings					0	

#### IV. Long-period storage of mini tiller

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

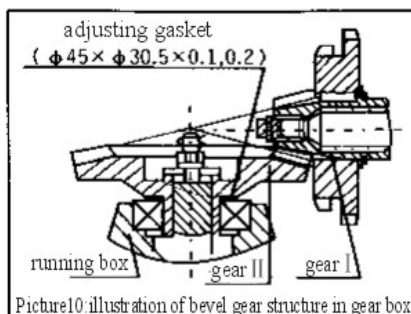
1. Keep diesel engine with seal according to its instruction.
2. Wash oil stain and clean dust on the machine.
3. Drain lube oil in the gear box and refuel new oil.
4. Paint pickling oil on non-aluminum parts where there is no paint.
5. Store mini tiller in the dry, safe place where there is enough aeration.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

#### V. Debugging method of bevel gear assy:

When bevel gear drives abnormally with loud noise, you should check and debug it immediately. The debugging methods are as follows:

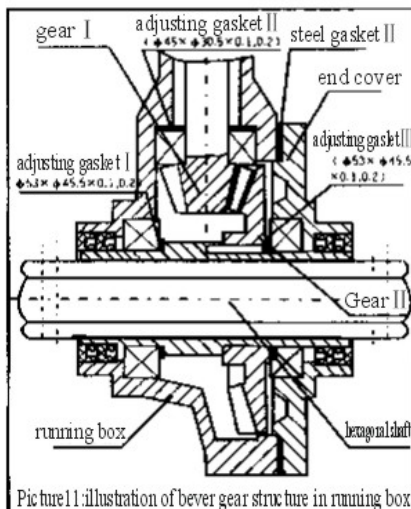
1. Bevel gear clearance debugging of gear box(look at picture10)

- ① when bevel gear assy clearance  $\Delta < 0.05$ , you should increase clearance between gear box and running gear box with steel gasket.
- ② When bevel gear assy clearance  $\Delta > 0.3$ , one should adjust the range  $0.05 \sim 0.10$  between the bearing and gear II shaft.



2. Bevel gear clearance assy debugging of running gear box(look at picture11)

- ① when bevel gear clearance  $\Delta < 0.05$ , you should adjust the gasket range  $0.2 \sim 0.3$  to increase clearance. Meanwhile, you should change steel gasket II and adjust gasket III to ensure clearance of gear II shaft is  $0.05 \sim 0.15$ .
- ② When bevel gear assy clearance  $\Delta > 0.3$ , you should decrease gasket I, meanwhile, ensure clearance of gear II shaft is  $0.05 \sim 0.15$ ; or increase gasket II, meanwhile, ensure clearance of gear I is  $0.05 \sim 0.15$ .



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## **VI. Debugging method of backshift gear and cable**

When reverse of mini tiller is abnormal, you should debug the backshift handlebar and cable. As for the method, please refer to chapter3.

**Attention:** 1. Hold, unlock backshift handlebar twice to three times, which is to put into gear. If the gear is not properly adjusted, please debug it until it is well done.

2. When driving the mini tiller, please unlock backshift handlebar. After finishing this, backshift gear should return to its original position immediately, and there should not be abnormal collision noise in the gear box, otherwise, gear will be destroyed.

## **VII. Debugging method of clutch cable**

Due to friction plate abrasion, clutch fork abrasion, function of the clutch become poor after a period of use. Therefore, you should debug the clutch cable. As for the debugging method, please refer to chapter3.

**Attention:** 1. Hold, unlock the clutch handlebar for twice to three times. This is to check working condition of clutch. If it is abnormal, you should debug the clutch.

2. If it is debugged for several times, and it is still in bad condition, it is certain that clutch fork or friction plate is fretted severely. Therefore, you should change the friction plate or clutch fork with new parts in the special maintenance station. Never move clutch randomly in case of destroying the clutch and other parts.

## **VIII. Debugging method of throttle cable**

When revolving the throttle switch and finding accelerating and decelerating function of the diesel engine is not good, you should debug the throttle cable. As for the method, please refer to chapter3.

**Attention:** 1. Revolve the throttle switches for twice or three times and check the accelerating and decelerating function of diesel engine.

2. The throttle cable and connection head should be fastened with screws.

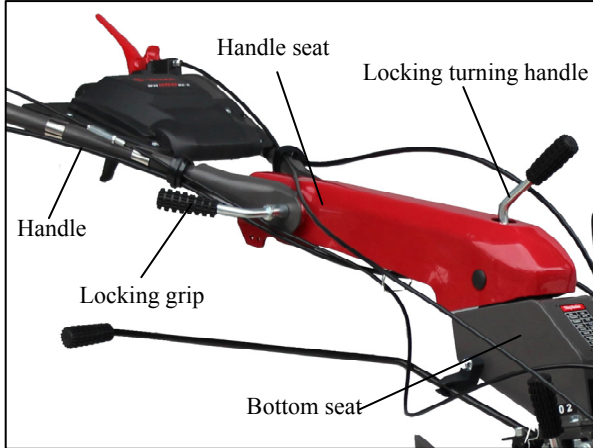


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## IX. Debugging method of handle bar

Four directions of handlebar can be properly set according to one's height and tilling requirement. The method is in the following (look at pictue12)

### 1. Up-and-down debugging of handle bar:



pictue12

- ① Unlock the handlebar elements, disengage the terminal fangs between the handlebar and handle frame
  - ② Set the position of handle bar according to one's height and habits.
  - ③ Revolve the handlebar to let terminal fangs meet between the handlebar and handle frame.
- ### 2. Left-and-right debugging:
- ① Unlock the nut on the handle frame. This is to unlock the terminal fangs.
  - ② Set handlebar to the proper position on the left or right.
  - ③ Tighten the nut to let terminal fangs meet.

# Chapter5 Troubleshooting

- I . Troubleshooting of diesel engine(refer to the diesel engine instruction)
- II . Troubleshooting of clutch(attention: never disassemble the clutch assy just by yourself.

Table 5

Phenomenon	Reason	Solution
The clutch can not be separated or closed.	Malfunction of clutch handlebar	Repair or change
	Damage of clutch cable	change
	Misadjustment of clutch fork	Readjust cable or change clutch fork
	Failure welding of clutch fork shaft, arm and frame	Repair or change
	Warping or breaking of fork pins	Change clutch fork pin
	Friction plate becomes useless	Change
	Spring becomes useless	Change
	Friction plate can not contact bearing cross section of clutch cover	Put gasket behind the bearing
	Burn-out of bearing in clutch	Change; refuel the gear box
Skidding(diesel engine runs normally after unlocking the handlebar, but the main shaft of gear box does not run or runs slowly )	Spring becomes useless	Change
	Clutch fork shaft becomes useless	Check the jointing section between the locating bearing and pusher to make it flexible
	Maladjustment of clutch cable	Readjust clutch cable

### III. Troubleshooting of gear-box

Table 6

Phenomenon	Reason	Solution
Fast, slow and neutral shift can not be positioned	Screws and round nuts behind the shaft become loose	Take away screws and key sleeve behind the main shaft; reinstall key sleeve and screws after tightening the round nuts
Gear can not be positioned	Auxiliary brick is severely fretted	change auxiliary brick
	Bevel gear becomes loose	Tighten the nuts
	Heavy abrasion on the hole of the arm	Change arm elements
	Spring in the main shaft becomes useless	change
	Main shaft moving: the cover screws behind the case becomes loose	Tighten the screws
	The distortion of the shift lever	Adjust the shift lever; change
Back shift can not be positioned	Abrasion of backshift fork	Readjust shift cable; change shifting fork
	Backshift cable becomes useless	Readjust cable; change cable
	Backshift shaft becomes loose	Tighten screws behind the shift shaft
	Backshift fork is seized	Check the section between backshift fork and pusher to make it flexible
Back shift gear can not be positioned	Backshift shaft becomes loose, making gear seized	Tighten the screws behind the backshift shaft
	The spring on the backshift shaft becomes useless	Change the spring
	The backshift shaft becomes curved	Change the backshift shaft
Backshift shaft becomes loose	Bolts behind the backshift shaft become loose	Tighten the bolts
	The backshift shaft and case are not well fitted	Change

Gear noise is too big	Bevel gear shaft and backshift shaft become curved	Change
	Gears are heavily fretted	Change gear
	Bevel gear shaft and backshift shaft are not well fitted	Change
There is oil leakage of back cover on the main shaft	Oil seal on the main shaft becomes useless	Change oil seal B17×40×8
There is oil leakage of backshift shaft	Bolts behind the backshift shaft become loose	Tighten bolts
	O-ring on the backshift shaft becomes ineffective	Change O-ring $\Phi$ 18×1.8
There is oil leakage of backshift fork shaft	O-ring becomes useless	Change O-ring $\Phi$ 11.2×2.65
There is oil leakage of clutch shift fork	O-ring becomes useless	Change O-ring $\Phi$ 10.2×2.65
There is oil leakage of shift shaft	O-ring becomes useless	Change O-ring $\Phi$ 11.8×1.8
There is oil leakage of flange	Bolts become loose	Tighten bolts
	Steel gasket is damaged	Change
There is oil leakage of case	There are hidden micro holes in the case	Weld or paint to stop leakage

#### IV. Troubleshooting of running gear

Table 7

Phenomenon	Reason	Solution
Gear noise is too big	Gear is heavily fretted or repaired improperly	Readjust or change the gear
Gear is seized	Gear installation is incorrect	Reinstall

Overheat	Lube in the case is insufficient	Refuel lube according to the requirement
	Gear side clearance is too narrow	Reinstall
	Shaft windage is too narrow	Readjust
There is oil leakage of gear box	Bolts become loose	Tighten
	Seal gasket is damaged	Change
There is oil leakage of outer-section of crankshaft	Oil seal is damaged	Change oil seal $B45 \times 62 \times 8$
There is oil leakage of hexagonal hole in the crankshaft	The shaft sleeve is broken	Change
There is oil leakage of oil drain hole	O-ring is damaged	Change O-ring $\Phi 10.2 \times 2.65$
	Bolts become loose	Tighten according to the requirement
There is oil leakage of the case	There are hidden micro holes in the case	Weld or paint to stop leakage

## V . Troubleshooting of other parts

Table 8

Phenomenon	Reason	Debugging method
Rotary blades are broken	Collide with stones in the course of using	Change, pay attention not to collide with the stones in the soil
The operating cable is broken	Long period abrasion	Change

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# Chapter6 Easily-damaged parts of mini tiller

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Table 9

Number	Name	Assy
1	Clutch cable	Handle frame assy
2	Back shift clutch	Handle frame assy
3	Gun clutch	Handle frame assy
4	Throttle switch	Handle frame assy
5	Rubber handlebar	Handle frame assy
6	Rubber sleeve	Shift lever, tighten handlebar
7	Oil seal 45×62×8	Gear box assy
8	Oil seal 17×40×8	Transmission box assy
9	Easily-damaged parts of engine	Refer to instruction and picture of engine

# Chapter7 Bearings of mini tiller

Table 10

Number	Model	Name	Specification	Quantity	Remark
1	GB276-82	Radial ball bearing	6005	2	Used for gear box, front
			6007	1	Used for Flange plate
			6202	1	Used for Clutch, diesel engine
			6203	2	Used for gear box, back cover
			6009	1	Used for crankshaft sleeve
2	GB297-84	Thrust bearing	30204	1	Used for driving bevel gear II
			32009	1	Used for crankshaft sleeve
			30206	1	Used for driven bevel gear
3	GB-5846-86	Needle roller bearing	KT14×18×13	1	Used for main shaft
			KT22×26×13	2	Used for counter-shaft

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# WARRANTY CARD

## IMPORTANT ADVICE TO CUSTOMER

<Please read and understand all the contents of owner's manual before using>

- **WARRANTY WILL BE IN-VALIDATED IF THE SAID EQUIPMENT IS DAMAGE THAT RESULT FROM MISUSE, NEGLECT, OR ACCIDENT OR INSTALLED, DISMANTLED, REPAIRED OR SERVICED BY ANY PERSON OTHER THEN THE AUTHORISED SERVICE DEALER OR DAMAGE THAT RESULT FROM OVER LOADING AND ANY MODIFICATION OR CONVERSATION NOT APPROVED BY THE MANUFACTURERS.**
- **TWO FREE SERVICE IN ONE YEAR ARE OFFERED FOR THE EQUIPMENT FROM THE DATE OF PURCHASE.**
- **FREE SERVICE IS OFFERED ONLY ON AUTHORISED SERVICE DEALER SHOP, ALL THE TRANSPORTATION & HANDLING CHARGES WILL BE BORNE BY THE CUSTOMERS.**
- **TO OBTAIN WARRANTY BENEFITS THE COMPLETE EQUIPMENT AND WARRANTY CARD MUST BE PRESENTED TO ANY AUTHORISED SERVICE DEALER SITE AT CUSTOMERS RISK AND EXPENSE. NO WARRANTY CAN BE CLAIMED OR VALID WITHOUT PRESENTATION OF THE WARRANTY CARD.**
- **ONE YEAR STANDARD QUALITY WARRANTY OFFERED TO THE ORIGINAL OWNER(S) OF THE PRODUCTS WHICH IS VALID FROM THE ORIGINAL DATE OF PURCHASE.**
- **WARRANTY COVERS THE REPAIRING OR REPLACEMENT OF MECHANICAL PARTS ONLY AGAINST MANUFACTURING DEFECTS OF THE SAID EQUIPMENT WITHIN ONE YEAR FROM THE DATE OF PURCHASE PROVIDING THAT THE EQUIPMENT HAS BEEN USED IN ACCORDANCE WITH**



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**THE MANUAL / INSTRUCTION BOOK .**

- **NOTE: BRING ORIGINAL WARRANTY CARD WITH THE EQUIPMENT.**
- **WARRANTY CARD WILL BE VALID WITHIN WARRANTY PERIOD.**

**IDENTIFICATION**

**CUSTOMER NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**PHONE NO:** \_\_\_\_\_ **CELL NO:** \_\_\_\_\_

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**MODEL NO:** \_\_\_\_\_ **ENGINE NO:** \_\_\_\_\_

**DATE OF PURCHASE:** \_\_\_\_\_

**WARRANTY EXPIREY DATE:** \_\_\_\_\_

**CUSTOMERS SIGNATURE :** \_\_\_\_\_

**AUTHORISED SALES DEALER NAME & STAMP:** \_\_\_\_\_





