

Multi-Functional Power tiller

# OWNER'S MANUAL



Applicable Machine Models:

TM950A

## PREFACE

Congratulations on your buying power tiller !

This power tiller will lead your family to a better life!

This machine is small, light, multi-functional, and with a high efficiency for revolving farming: it can climb hills, run in water, walk over the field ridges and ditches, move freely and change the directions easily. It is especially applicable to variously working in mountain areas, hilly areas, dry lands, paddy fields, orchards, vegetable gardens and greenhouses, etc. Revolving farming, ditching & ridging, and transportation are the machines' basic functions. Moreover, after being equipped with relative devices and tools, it can be used to pump water, spray water and pesticide, reap the crops, generate electricity, fertilize, implant seeds, thresh , cut tendrils, grind something, etc. The machine has a simple structure, can be easily repaired and its fuel consumption is low. It is your ideal micro agricultural machine.

The machine is a good helper for your family to be rich.

Before use the machine, please read the instruction manual carefully, it can guide you to solve the problems you have in terms of installing, manipulating and repairing the machine.

With the continuous innovation and improvement of the products, the contents in the instruction manual may differ slightly from the actual situation, your understanding and pardon is highly appreciated. If you find some problems or have some good suggestions, please do not hesitate to contact us.

Let's seek a bright future hand in hand.

Thanks!

**WARNING:** Without permission, no one can copy the content of this manual for other use; Please transfer this manual with the machine when selling.

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# **Chapter One Safety Warning**

## **Safety Warning**

### **I .Training**

A. Read the user manual carefully before using. Be command of how to operate the machine correctly.

B. Keep children away from the machine and do not operate the power tiller without reading the manual carefully.

C. Keep potential hazards especially small kids and pets away from the working area.

### **II Preparation**

A. Check the working area carefully, and remove all the unrelated matters

B. When starting the machine, set shift bar to be in the neutral position

C. Do not operate the machine with unsuitable clothes. When on slippery field, anti-slip shoes can keep you safe and stable.

D. Be careful when dealing with fuel, it is inflammable! Do as follows:

E. Storing the fuel in proper container.

F. Do not add fuel when the machine is under operating

G. Remember to add fuel outdoors.

H. Tightening the fuel cap before starting the machine.

I. Do not adjust the machine when the engine is under operating.

J. Please wear safety glasses when operating

### **III Operating**

A. When starting the machine, please set shift bar to the neutral position. And keep your hands and feet away from the rotary blades

B. Pay attention when operating the machine on stony road、 pavement or high way in order to avoiding accidents.

C. When running into obstacles, please shut down the engine immediately, and check whether there is any damages. Do not use the machine before it is fully repaired.

D. Pay attention to your feet to avoid slipping.

E. If there is abnormal shaking for the machine, please turn off the engine. Abnormal shaking can be a forewarning of machine failure.

F. Turn off the engine when repairing, adjusting or checking the machine.

G. When the power tiller is not under user's control, please take the following precautionary measures: separate the output shaft, take off the additional devices, put the shift bar in neutral position and turn off the engine.

H. Make sure all the parts are without operation when cleaning, repairing or checking the power tiller.

I. The engine exhausts harmful gas, do not operate the machine indoors.

J. Do not operate the machine without appropriate protection device.

K. Keep children and pet away from the power tiller when it is under operating

L. Do not overload the machine

M. The machine should not be operated with high speed on slippery land. Be careful when reversing

N. Do not allow bystanders be close to a operating machine.

O. You can only apply additional devices to the machine according to manufacturer guidance.

P. Do not operate the power tiller in bad visual or without enough light

Q. When the power tiller is working on hard soil, the blades may push the tiller forward. Please release your hands and do not operate the machine any more.

R. The power tiller should not be operated on steep hill.

#### IV Maintenance and Storage

a) Keep the machine, additional devices including battery in safe operation. Try to remove the battery after operating to avoid freezing and remember to charge the battery when necessary.

b) Remember to check all the bolts every once in a while to make sure the power tiller can work under safe operation.

c) The power tiller should be stored indoors, and be kept away from combustion source. Remember to cool down the engine before storage.

d) If the power tiller needs to be stored for a long time, please also keep the users' manual carefully

e) Do not repair the machine without proper tools and devices.

## Safety Mark

Please pay attention to the safety marks, or injury can be easily happened.



### WARNING

Don't use in a room without good ventilation, due to toxic CO emission.

2-1



### WARNING



Check the fuel and confirm no fuel spilling. Don't refuel before the engine stops working.

2-2

AWAY FROM ROTATING  
PART TO AVOID INJURY!



KEEP AWAY!



2-3

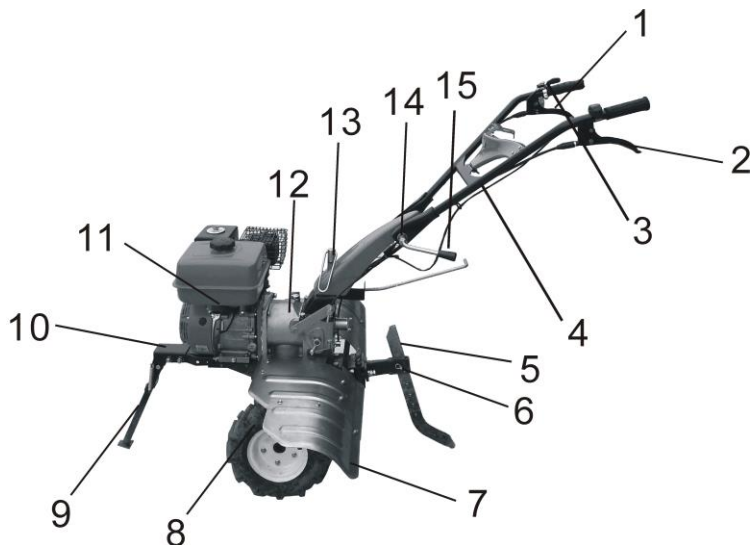


## Chapter Two General View

### I Specification

Items			Specification
Engine	Engine model		170F
	Rated output (kW)		4.0
	Rate speed (r/min)		3600
Tiller	Dimensions (mm)		1500×950×850
	Gross weight (kg)		110
	Transmission type		Full gear
	Connection type		Straight
	Tilling blades	Rotary speed (r/min)	Slow:88 .fast:124.reverse:67
		Max Radius of gyration (mm)	165
		Blades amount	24
	Rotary blade model		NO.2
	Tilling depth (cm)		≥10
	Tilling scope (cm)		100
	Working speed (m/s)		0.1~0.3
	Working performance (hm <sup>2</sup> /h.m)		≥0.04
	Fuel consumption (kg/hm <sup>2</sup> )		≤30

## II Main Spare Parts Name



- 1、 Reversing handle    2、 Clutch handle    3、 Turn-off switch    4、 Armrest    5、 Speed regulation bar  
6、 Speed regulation bar connector    7、 Fender    8、 Wheels    9、 Supporting bar    10、 Bumper  
11、 Engine    12、 Gear box    13、 Armrest fix handle    14、 Armrest adjusting bar    15、 Shift bar

## Chapter Three Main Application of Power Tiller

### I Revolving Farming

Install the revolving farming device onto the output shaft on the step box by using two M8\*50 screw bolts for axial positioning purpose, then the machine can start revolving farming (refer to following table )

Revolving Farming Device	4 groups	
	3 Blades	4 Blades
No. of Revolving Blades	3×8	4×8
Revolving Farming Width	1000	
Applicable Soil & Condition	Paddy Field After Raining	Hard Earth

### II Ditching & Ridging

Take off the speed adjusting bar before installing the ditcher. Adjust the ditcher to a proper width and height, then the ditching can be conducted

### III Short distance transport

After mounting wagon box forearm on the trailer and wheels on the transmission shaft, the machine can do the transportation job. The rated load is 250 kg, and the speed is about 8km/h with

fast shift and about 4.5 km/h with slow shift under normal rotate speed of the engine.

Picture 2: Revolving Farming Device

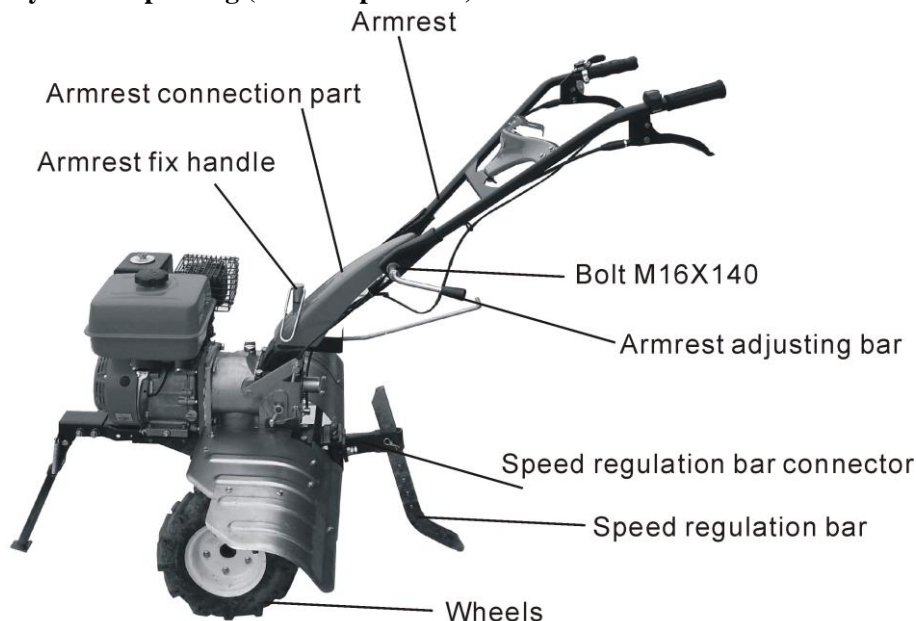


#### **IV Multi Functional Working**

Dismount the gear-box protection cover (picture1, item 2), and unscrew the bolts away from the rear part of the main shaft. Then take the keys cover off the shaft, and fasten the belt pulley or coupling onto the gear-box's main shaft with screw. The common A type V belt should be used. Under 3000 rpm rated rotating speed, the power tiller can function in water pumping, irrigating, medicine spaying, harvesting, electricity generating, etc.

# Chapter Four Operation & Use Method of Power Tiller

## I Assembly after unpacking ( refer to picture 4)



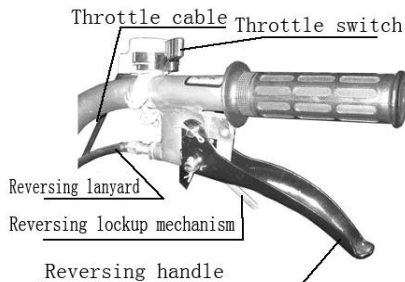
A. Wheels mounting: Mount the wheels at the two ends of the hexagonal output shaft with two M8×55 bolts and M8 nuts

B. Trailer mounting: Mount the connecting frame onto the trailer by connecting shaft, and insert pin  $\phi 3 \times 26$ . Put the speed regulation bar into the square groove of on the connecting frame, and fasten it by using 8×55 bolts and M8 nuts

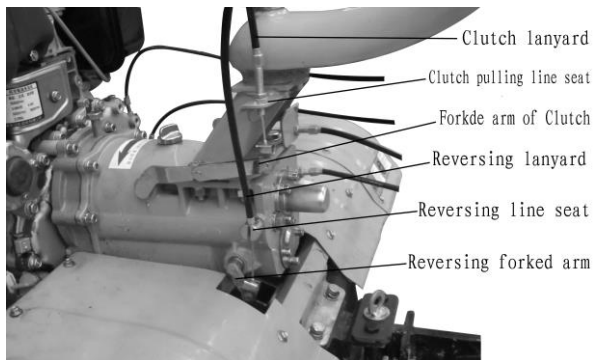
C. Armrest mounting: Assemble the armrest onto the armrest connection piece. Pulling up the armrest adjusting bar can make the armrest turn around.

## II Installation and Adjustment for Cable

A. Clutch cable adjustment ( refer to picture 5, 6).



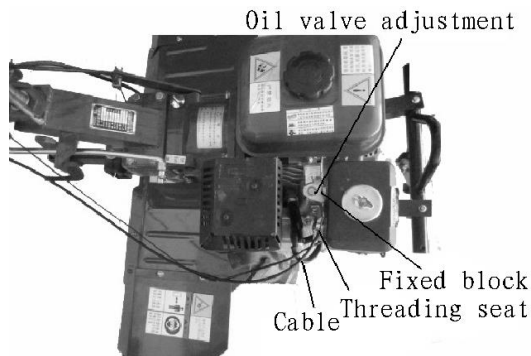
Picture 5



Picture 6

- a. Loosen the locking bolts on the screw
- b. Whirl the screw clockwise until it exposes a shortest length from the armrest.
- c. Get the cable head into the clutch cable seat at the back of the gear-box assembly. Ensure the cable head goes into the big hole on the cable seat.
- d. Get the steel wire in the clutch cable into the M8 hole on the clutch fork arm seat, press the clutch fork arm properly, and put the cable head into the cable seat.
- e. Whirl the screw, loosen the clutch handle until the spring force in the clutch can reset the handle, and then tighten the locknut.
- f. Reverting Cable Adjustment

- g. Loosen the locking bolts on the screw
- h. Whirl the screw clockwise until it exposes a shortest length from the armrest
- i. Get the cable head into the reversing cable fork shaft at the side of the gear-box assembly. Ensure the cable head goes into the big hole on the fork shaft
- j. Properly pull the reversing fork shaft counterclockwise, get the cable into the gap the reversing cable seat at the side of the gear box, and ensure the cable head goes into the big hole on the cable seat.
- k. Whirl the screw, loosen the reversing handle until the spring force in the clutch can reset the handle, and then tighten the locknut



Picture 7



### **Adjustment of the Accelerator Cable**

- a. Turn down the accelerator switch clockwise.
- b. Get the steel wire in the accelerator cable into the threading base and firm base on top of the accelerator adjustment board of the engine.
- c. Tighten the accelerator cable steel wire, and fasten the bolts on the retaining seat.
- d. Adjust the accelerator switch repeatedly until the accelerator can be adjusted to the maximum and minimum position.

### **III Checking and Refueling**

A. Checking whether all the connection bolts are tightly fastened or not, and fasten the connection bolts according to the torque listed in table 3(refer to the instruction manual for engine for the screwing torque of bolt and nut respectively)

Name of Parts	Torque ( N.m)
Flange and Engine	20~25
Flange and Gear Box	35~40
Binding Bolts on Gear Box Driving Shaft	10~12
Binding Bolts On Reversing Gear Shaft	26~40
Binding Bolts between Engine Supporter and Step Box	35~40

Binding Bolts on Step Box Cover	10.6~15
Binding Bolts on Trailer Unit	50~60
Binding Bolts between Step Box and Gear Box	35~40
Binding Bolts on The Engine base	35~40
Binding Bolts on The Armrest	35~40

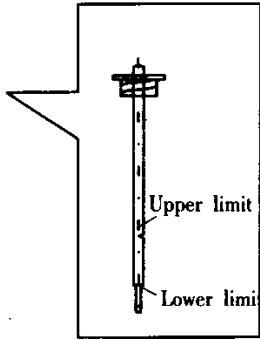
B. Check all the manipulation handles (accelerator, clutch, shift and reverse) to confirm whether they can move freely or not. If they are at wrong positions, please adjust them to the right positions.

C. Pull the shift bar of the gear box to the neutral position

D. Fill in engine oil

a) Fill in SAE15W-40 lubricant oil into the engine crankcase. Refer to picture 9 for details.

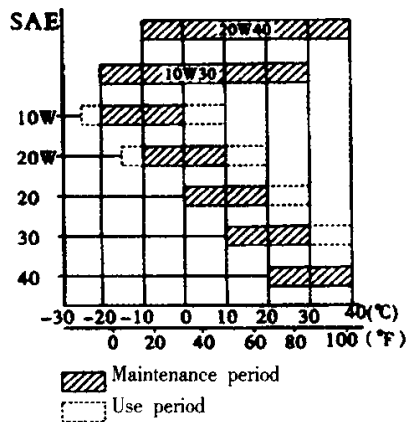
b) Put the machine stably and horizontally, and fill in SAE15W-40 lubricant engine oil into the gear box from the oil hole. When checking the oil level, please put in the oil dipstick (Note: do not turn the dip stick around). The oil level should be between the top and bottom limitation of the oil dipstick (Refer to picture 8)



Picture 8

c) When filling oil into the air cleaner, remove the air cleaner lower cover and fill in 0.1L SAE15W-40 engine oil

d) Select the appropriate lubricant for the engine according to the environment temperature (Refer to picture 9)



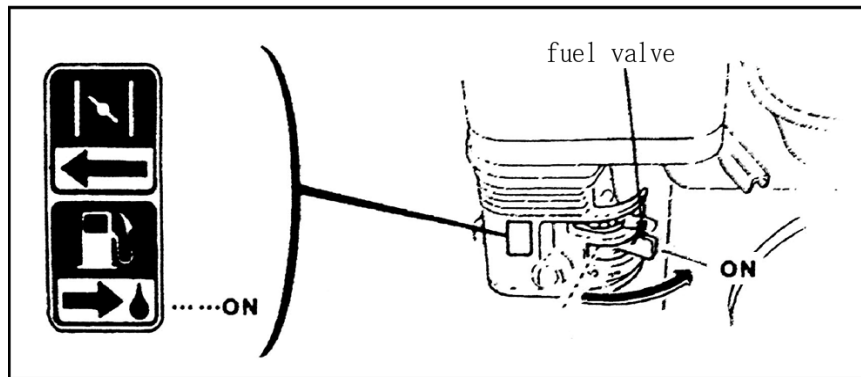
Picture 9

**Warning:** Do not exceed the upper limit when fueling.

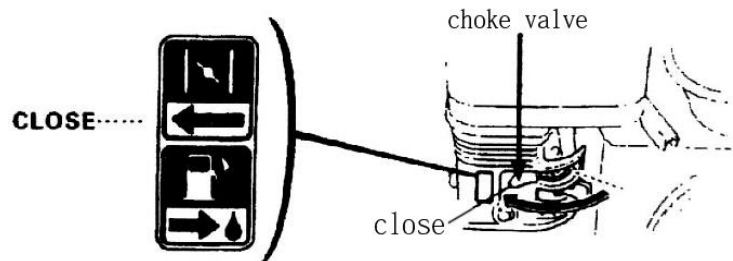
#### IV Starting

Note: the shift bar must be in the neutral position.

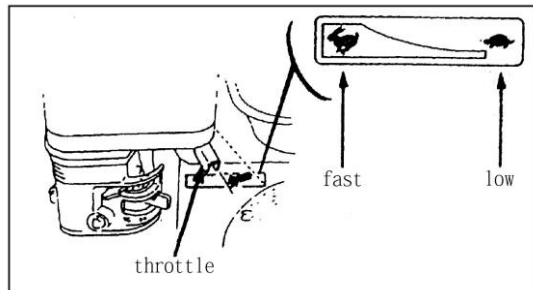
1. Pull the fuel valve to “ON”



2.Pull the choke valve to“CLOSE”



3. Turn the throttle left

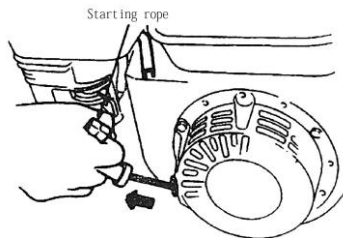


4. Pull the engine switch to "ON"

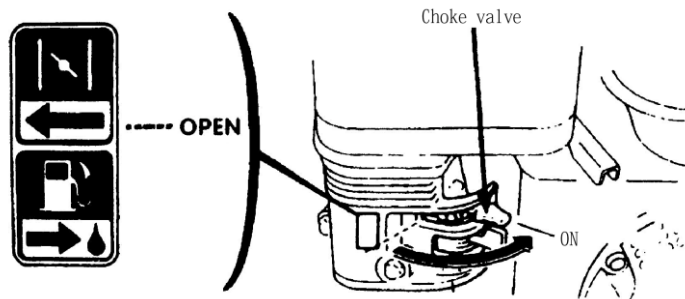


Pull the starting rope slightly and then pull with power after there is resistance.

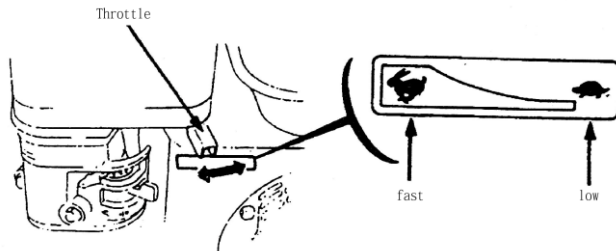
**Warning!** : do not let the starting rope go suddenly, or it will destroy the machine



5. After the engine pre-warming ,pull the choke valve to“OPEN”



## 6. Regulating the engine speed by the accelerator switch

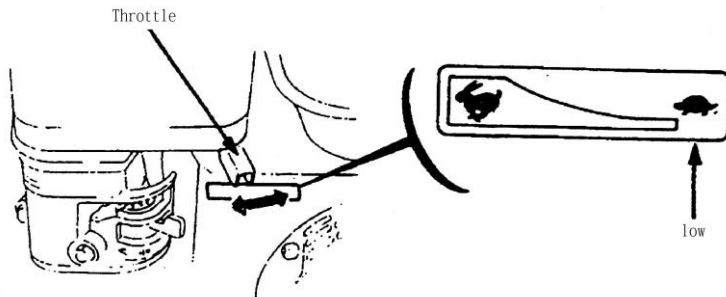


## V Turning off the engine

### (1) When do not use the emergency stop

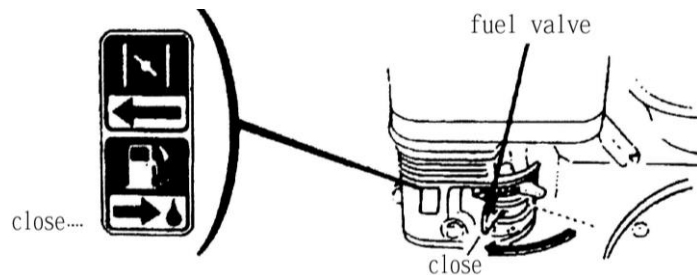
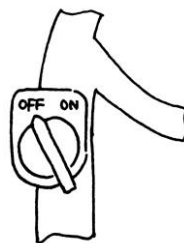
- When meet emergency stop, you can pull the engine switch to 'OFF'
- Under normal condition, please do as follows:
  1. Turn down the accelerator switch





2. Turn off the engine switch

3. Turn off the fuel valve.



## **(2)When using the emergency stop**

Loose the emergency stop handle and turn off the engine

## **VI Use of emergency stop**

Then hold the emergency stop handle and turn off the accelerator switch.

## **VIIUse of shifts**

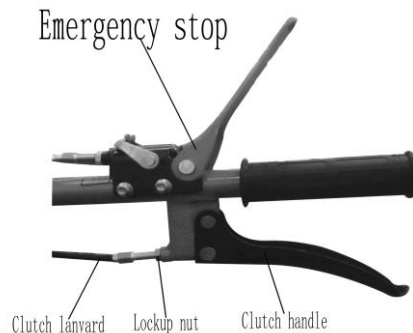
- Four shifts are available.

- Changing shift:

- 1) Turn off the accelerator switch
- 2) Grasp the clutch handle tightly to separate the clutch.
- 3) Pull the shift bar to your required position.
- 4) Loose the clutch handle

Use of reverse shift

- 1) Turn off the accelerator switch.
- 2) Grasp the clutch handle tightly to separate the clutch.。
- 3) Pull or push the shift bar to the neutral position. Then hold the reversing buckle with your



right hand forefinger and grasp the reversing handle tightly gradually。

4) Loosen the clutch handle gradually, then the clutch will be combined. The power tiller can reverse (Note: do not loosen the reversing handle)

### **VIII Attentions**

A. Pay attention to the power tiller working situation, make sure all the parts are well connected.

B. A cold machine is forbidden to do heavy load work immediately after it is started, especially for new machines or overhauled machines.

C. Pay attention to the oil levels of engine and gear box. Refill the engine oil when it is not enough

D. It is not allowed to cool the engine by watering

E. Be cautious about the machine's tilting when farming.

F. The machine mounted with revolving farming blades is forbidden to run on beach or pebbles.

G. After using the power tiller for farming, please clean dirt, weeds and smear on the machine to keep it clean.

H. Clean the sponge or the wire mesh in the air cleaner and change the engine oil frequently

## **Chapter Five Maintenance**

When the power tiller is under operating, due to the changes of running, abrasion and loading, bolts loosening and parts wearing are inevitable, which will lead to the system malfunction, high oil consumption and other failures of the machine. To reduce the trouble possibility, it is better to maintain the power tiller regularly and strictly to keep the machine in a good condition and to extend its working life.

### **I Running-in**

A. For engine running-in, please refer to the engine instruction manual

B. For a new or overhauled power tiller, please drain all the lubricant from the gear box and engine crankcase immediately after working for 1 hour under no load or 5 hours under light load. Then refill in engine oil according to 4 clause chapter 3 for a four- hour running- in before the machine can be operated.

### **II Maintenance**

A. Normal maintenance (before and after every operation)

a) Listen and observe if there are any abnormalities (such as abnormal sound, overheating and

bolt loosening, etc)

- b) Check if there is oil leakage in engine, gear box and stepping box
- c) Check if the oil level in engine and gear box is between the dipsticker limitations.
- d) Clean the mud, weeds and smear on the machine in time after operating.
- e) Keep a good farming record

B. The first rate maintenance (every 150 working hours)

- a) Do all the things listed for normal maintenance.
- b) Clean the gear box and step box, and change the engine oil
- c) Check and adjust the clutch, shift system and reversing system.

C. Second rate maintenance (every 800 working hours)

- a) Do all the things listed in first rate maintenance.
- b) Check all the gears and bearing, replace with new ones if serious abrasion is found.
- c) Replace with new ones if damages are found with revolving farming blades, connection bolts or other parts.,.

D. Technical overhaul (every 1500-2000 working hours)

- a) Take the power tiller to your local special service center for overhaul.
- b) Please ask professional serviceman to check the friction piece and clutch.

E. Refer to the engine instruction manual for engine maintenance

### III Technical maintenance reference sheet (items with “●” is required)

Items	Every time After using	8 hours under half load	The 1 <sup>st</sup> month or after 20 working hours	The 3 <sup>rd</sup> month or after 150 working hours	Every year or after 1000 working hours	Every two years or after 2000 working hours
Bolts checking	●					
Engine oil checking	●					
Fuel checking and filling		●	●	●		
Oil leakage checking	●					
Machine cleaning	●					
Trouble eliminating	●					
Control parts checking	●					
Clutch friction checking						●
gears and bearing checking					●	
Air Filter Oil Cleaning	●					

#### **IV Long time storage of power tiller**

When the power tiller needs a long time storage, the following measures should be adopted to avoid rust

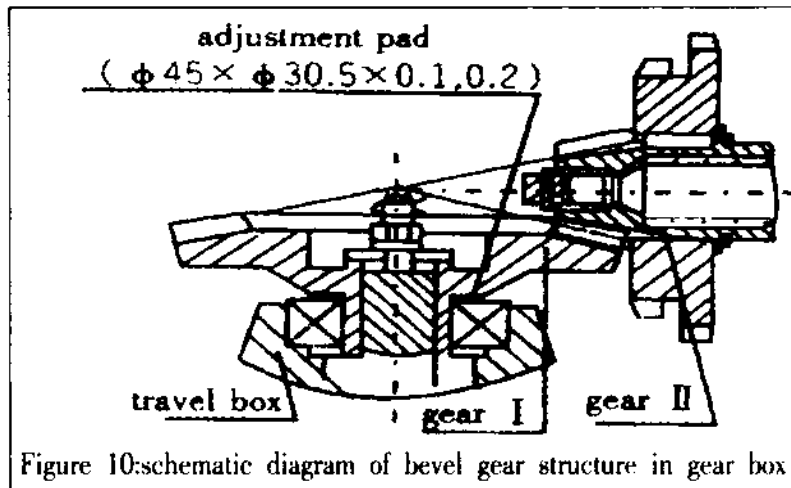
- A. Save the engine according the engine manual
- B. Clean dust and dirt away from the machine
- C. Drain the used lubricant from the gear box and add new lubricant
- D. Paint the anti rust oil on the non- aluminum surface
- E. The machine should be kept in a ventilated, dry and safe place
- F. Keep the tools and instruction manual.

# Chapter Six Adjustment For Power Tiller

## I. Bevel Gear Adjustment

When there is abnormal sound for bevel gear, please stop the machine immediately and check as following:

A. Clearance adjustment of bevel gear in gear box (Refer to picture 10)

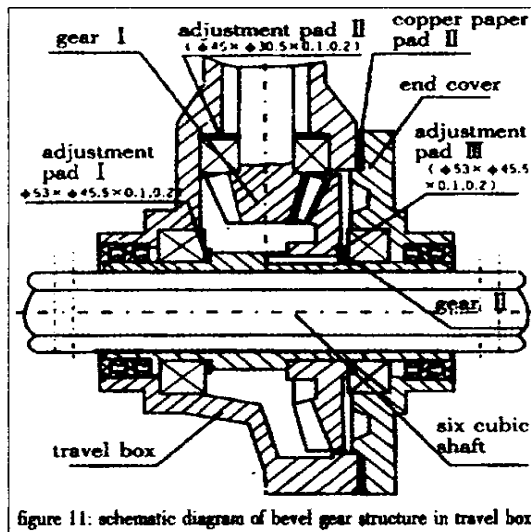




a. When lateral clearance of the gear  $< 0.05\text{mm}$ , please put some vulcanized gasket between the gear box and the step box to enlarge the lateral clearance.

b. When lateral clearance of the gear  $> 0.30\text{mm}$ , please put some vulcanized gasket between the bearing and gear II to enlarge clearance to  $0.05 \sim 0.1\text{mm}$ .

B. Clearance adjustment of the step box gear (Refer to picture 11)



a. When lateral clearance the gear  $<0.05\text{mm}$  , please increase adjustment pad I to  $0.2\text{-}0.3\text{ mm}$  to enlarge the clearance and change vulcanized gasket II and adjustment pad II to ensure the axial clearance of the gear is  $0.05\sim0.15\text{mm}$

b. When lateral clearance of the gear  $>0.3\text{mm}$  , please reduce adjustment pad I ,and ensure the axial clearance of gear II is  $0.05\sim0.15\text{mm}$ ; or increase the adjustment pad II, and ensure the axial clearance of gear I is  $0.05\sim0.15\text{mm}$

## **II Reversing gears and cable adjustment**

When the power tiller can not reverse normally, please adjust the reversing handle and cable. Refer to chapter three for details.

A. Grasp and loosen the reversing handle for 2-3 times to make sure there is nothing wrong with the gear engagement.

B. When the power tiller is under operation, please loosen the reversing handle, and the reversing gears should return to its original position. Make sure no gear colliding sound in the gear box or the gear can be damaged.

## **III Clutch cable adjustment**

After being used for some time, the clutch may not perform as well as before due to the friction piece and clutch fork wearing. Adjust the clutch cable by referring to chapter three detail.

A. Grasp and loosen the clutch handle for 2-3 times to make sure there is nothing wrong with

the clutch.

B. If repeated adjustment can not solve the problem, then it can be confirmed that excess abrasion of clutch fork or friction piece happened. Please send the power tiller to special service centre for repairing.

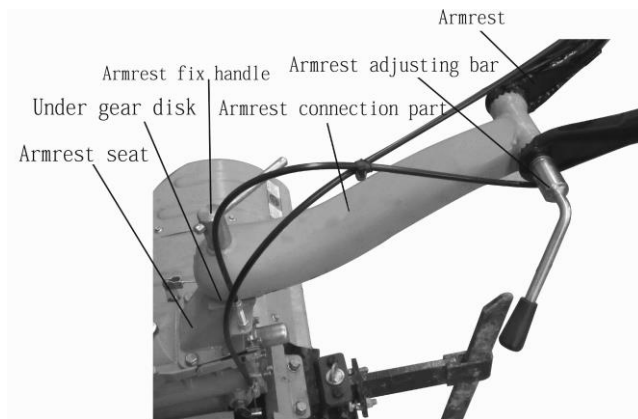
C. Do not dismount the clutch by a layman, which may cause damage to the clutch and other parts.

#### **IV Accelerator cable adjustment**

If the engine is not in a good performance when turning up or down the accelerator switch, please adjust the accelerator cable by referring to chapter three for details..

A. Repeatedly turn the accelerator switch for 2-3 times to confirm the engine performance.

B. The accelerator cable must be firmly connected to the cable joint.



## **V Armrest adjustment**

The armrest can be adjusted up and down, left and right appropriately according to the user's personal condition and the farming condition.

Do as following:

### **A. Up and down adjustment**

a. Loosen the armrest handle assembly to separate the gear ring between the armrest and armrest base.

b. Adjust the armrest to the best position according to your personal conditions.

c. Turn the handle to make the gear ring between the armrest and armrest base be engaged well with each other.

### **B. Left and right adjustment**

a. Loosen the locknut handle on the armrest base to separate the upper and lower gear ring.

b. Turn the armrest left or right as required.

c. The screw the locknut handle to make the upper and lower gear ring be well engaged with each other

# Chapter Seven Regular Failure And failure elimination

## I Clutch trouble eliminating (Note: do not dismount the clutch assembly by yourself)

Symptom	Cause	Settlement
the clutch fails to work	Clutch handle failure	Repair or replace
	Clutch cable damage	Replace
	Clutch fork can not be in the right position	Readjust the cable or replace the fork
	Welding points breaking off	Repair or replace
	Fork pin is bent or broken	Replace
	Friction piece failure	Replace
	Spring failure	Replace
	Bearing burnt	Replace or refill engine oil into gear box
After loosening the clutch, the engine runs normally, but the gear box main shaft stops running or runs slowly	Spring failure	Replace
	Fork shaft's failure to turn around freely makes the fork fail to reset completely	Clean the combined face between positioning shaft and pushing plate to make the fork move freely
	Clutch cable is not well adjusted	Readjust the clutch cable

## II Gear box trouble eliminating

Symptom	Cause	Settlement
Shift failure	Main shaft screws are loosen	Dismount the bolts, key cover and re-fasten
Failure to shift to the right position	Excess abrasion of shift block	Replace
	Driving bevel gear is loosen	Tighten the round nuts
	Excess abrasion of the hole in the support arm connection block	Replace the support arm block
	Main shaft positioning spring failure	Replace
	Main shaft is not stable and the gear box cover bolts are loosen	Tighten the bolts
	Deformation of shift bar leading to shift interference	Adjust the shift bar or replace it
Reversing shift failure	Reversing fork abrasion	Readjust the reversing cable or replace the reversing fork
	Reversing cable failure	Readjust the cable or replace it
	The reversing shaft is loosen	Tighten reversing shaft back bolts
	Reversing fork is blocked	Clean the combined face between reversing fork and reversing pushing plate to make the fork move freely
Reversing gears can not be	The loosening of reversing shaft	Tighten the reversing shaft

resetted	makes the gear be blocked to a standstill	back bolts
	Reversing shaft spring failure	Replace the spring
	Reversing shaft is bent and deformed	Replace the reversing shaft
The reversing shaft is loosen	Reversing shaft back bolts of are loose	Tighten the back bolts
	The matching between reversing shaft and gear box body is too loose	Replace
Too loud noise from the gears	Deformation and bent of the bevel gear and reversing shaft	Replace
	Too much lateral clearance due to excess abrasion of gears	Replace the gear
	The matching between bevel gear , reversing shaft and gear box body is too loose	Replace
Oil leakage of the main shaft rear cover	Main shaft O-ring failure	Replace $\phi 17 \times 1.8$ O-ring
	Main shaft oil seal failure	Replace oil seal B25 $\times$ 40 $\times$ 7
	Failure of O-ring on the cover	Replace O- ring $\phi 45 \times 1.8$
Oil leakage of the reversing shaft	Reversing shaft back bolts loosening	Tighten the bolts
	Reversing shaft O- ring failure	Replace O-ring $\phi 18 \times 1.8$
Oil leakage of the reversing fork shaft	O- ring failure	Replace O-ring $\phi 11.2 \times 2.65$

Oil leakage of the clutch fork shaft	O- ring failure	Replace O-ring $\phi 11.2 \times 2.65$
Oil leakage of the shift shaft	O- ring failure	Replace O-ring $\phi 11.2 \times 2.65$
Oil leakage of the flange connection	Bolts are loosen	Tighten the bolts
	vulcanized paper gasket is damaged	Replace
Gear box oil leakage	Tiny hidden holes exit on the gear box	Re-welding or padding to stop the leakage

### III Step box trouble eliminating

Symptom	Cause	Settlement
Too loud noise from the gear	Excess gear abrasion or error repairing of the gear	Remount, readjust or replace the gear
Gears are blocked to standstill when running	Error mounting	Remount
Overheating	No enough lubricant in the box	Refill oil according to the requirement
	The lateral clearance of gear is too small	Remount
	The axial clearance is too small	Readjust
Oil leakage of the gear box connection	Connection bolt is loosen	Tighten the bolts
	Seal gasket is damaged	Replace
Oil leakage of the output	Oil seal damage	Replace oil seal B45 $\times$ 62 $\times$ 8



shaft casing		
Serious oil leakage of the hexagonal hole in the output shaft casing	Shaft casing breaking	Replace
Oil leakage of the drain hole	O- ring damage	Replace O- ring $\phi 10 \times 1.8$
	Bolts are loose	Tighten the bolts
Leakage of the step box	Tiny hidden holes exit on the step box	Re-welding or padding to stop the leakage

#### IV Others

Symptom	Cause	Settlement
The revolving farming blade is broken	It is collided with the hard things like stones when working	Replace the blade, and to avoid colliding with hard things like stones in the earth when working
The manipulation cable is broken	Long term in working leading to wearing	Replace