

GASOLINE TILLER15HD

OWNER'S MANUAL



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 injuries, 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.

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!
- Fuel and lube oil must be clear.
- Before shifting the gear, you must disconnect the clutch. When holding the backshift bar, the gear lever must be put in the neutral position.
- Gasoline is flammable; you must pay attention to fire and exploding.

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

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1. Safety information and warning

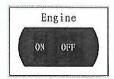
- ♦ 1. Training
- a). Carefully read this manual, fully know all the controlling functions and the proper operation, learn how to quickly stop and dispart the tiller.
- b). Children are not allowed to use tiller. And adults who don't learn this manual are also not allowed to use this manual.
 - c). Keep working area without other people, especially children and pets.
 - ♦ 2. Preparation
 - a). Check working area, and move away all the sundries.
- b). Disengage all the clutches and place gear to neutral position before starting engine.
 - c). Do not use tiller without suitable clothes and skid-proof shoes.
 - d). Carefully deal with fuel which is tinder.
 - 1). Use suitable container to store fuel.
 - 2). Do not add fuel when engine is working or hot.
 - 3). Carefully add oil outdoor. Don't allow to add oil indoor.
 - 4). Wrest on fuel tank cap, and clean out spilling fuel.
 - e). When engine is working, do not do any adjustment which are not allowed.
 - f). Wearing eye protect glasses when preparation, working and servicing.
 - ♦3. Operate
 - a). Never use hand or foot to touch rotary blades when it is working
- b). When go across cobbled road, crosswalk, and road, pay more attention to the latent danger. Do not let people ride on the tiller.
- c). If tiller bumps something, stop to check. If it is broken, repair it and then start it.
 - d). Be careful when working, do not fall or slip.
- e). If tiller has abnormal noise, it means that it may have problems. Stop the tiller to check reason.
- Stop engine before leaving, cleaning blades, servicing, adjusting and checking.

- g). When no people working on the tiller, shift gear to the neutral gear and stop the engine.
- h). Before check, clean and repair the tiller, stop engine and confirm if every part is in stop state.
 - i). Do not work tiller indoor, because exhaust is poisonous.
 - j). Do not work when there isn't proper equipment.
 - k). Keep away from children and pets.
 - 1). Do not let tiller over load because of deep tilling depth and fast speed.
 - m). Do not let tiller run on the slip road. Be careful when reverse.
 - n). Do not let looker-on come near the tiller.
 - o). Only this additional equipment allowed by manufacture can be used.
 - p). Do not use tiller when it is dark.
- q). When work on the hard land, blades may hitch the land and push tiller forward. In this condition, release the tiller and let it go itself, do not try to control it. Or else, there will be danger.
 - r). Do not work on the sharp slop.
 - s). When tiller go across slope, be careful and do not let tiller fall.
 - ♦ 4. Service and store
 - a). Keep tiller and its additional equipment in well working condition.
- b). Periodically check engine bolts and other bolts, make sure they are fixed well, to ensure tiller in good working condition.
- c). Tiller should be kept indoor and away from fire. Stop and cool the engine before storage.
- d). If tiller needs to be stored for a long time, this manual should be also kept as an important part.
- e). Do not try to repair the tiller unless you know the knowledge, and have proper tools.

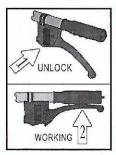


2. Warning labels

♦ These labels warn you of potential hazards that can cause serious injury. Read them carefully. If a label comes off or becomes hard to read, contact your tiller dealer for a replacement.



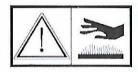
Engine flameout switch mark



Handle correctly unlock identification



Safety precautions when refueling



Overheating is a warning



Rotary tool and risk identification



Safety of operation and warning signs



The correct use of warning signs

3. Profile of rotary tiller

◆ 1. Specification (Table 1)

	ITEM	DESCRIPTION
	Model	15HD
ENGINE —	Engine model	Diesel engine
		178F(E)
	Rated Power(kw)	4
	Rated Speed(r/min)	3600
	Fuel Capacity	3.5L
	Staring system	Recoil start/electric start
TILLER -	Dimension (L×W×H)mm	1600×750×800
	Net Weight(kg)	92kg+40kg
		Automotive
	Drive System	Style Gear
		Transmission
	Ground Speed	0.3 , 1.4 , 6.8 mph fwd;0.6 , 1.4 mph rev
	РТО	990 rpm
	Drive Tires	4.0-8, 4.0-10
	Tilling width	16", 20". 26"
	Tilling Depth	0" to 7" in 1" increments
	X720 (2 forwa	rd+2 back+travel)
HIP OF THE STREET	Walking speed	(tire) (N=3600rpm)
gear	m/min	rpm(The tire diameter=430 mm)

Co	ontrol handles (Backward)
1	14.07
2	32.46
3	149.11
-1	14.81
-2	34.19
	Rotary speed (plow knife)
gear	rpm (Tillage cutter diameter=330 mm)
1	297
	• Tiller •
Attachments	• Sickle Bar •
	• Snow thrower •
	• Brush Mower •
	• Lawnmower •
	• Sweeper •

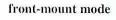
Table 1

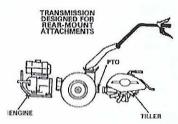
Specifications will change according to improvement of tiller. So this tablet is only for reference.

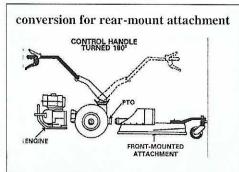
SCHEME CONFIGURATIONS

natural configuration

converse-mode configuration

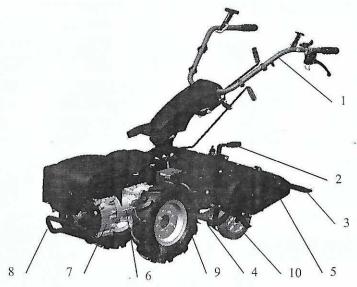






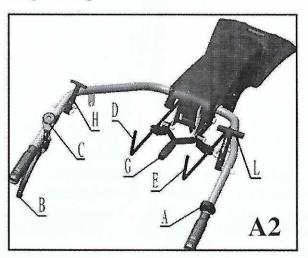
4. Component and control locations

♦ 1. General chart



1. Hand Control Assy 2. Drag Bar 3. Mud Guard 4. Rotary Tines 5. Protective Cover 6. Gear Box Assy 7. Engine 8. Stand 9. Front Tire 10. Rear Wheel

◆ 2. Control description (Fig-A2)





A —engine stop switch: It is red and cuts out power to the machine at the end of working or when a problem occurs.

B- clutch control lever.

C —throttle control lever.

D —speed control lever. The locations of the different speeds are shown on the selector (Fig-A3).

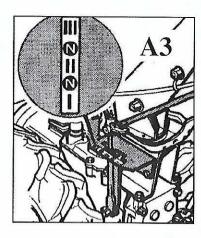
E -P.T O. lever. On the two- wheel tractors there is a safety device that prevents simultaneous.

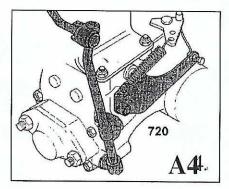
engagement of the rotary hoe with reverse speed (Fig-A4).

G- handlebar height adjustment lever.

H —rod or lever to adjust the handlebar steering column.

L —reverse unit control lever. Before engaging the reverse lever, always engage the clutch lever.





These models are similar to the model 720 in many respects, but the number of speeds is increased to three forward speeds and two reverse.

The drive gears are available through a rod on the left side of the handlebar.

Forward and reverse are controlled with the red lever on the right top of the handlebar.

On each of these models, a PTO/ reverse lockout device prevents shifting into reverse with the tiller engaged.

When a front mount attachment is on the unit, the third gear (transport gear) is blocked out.



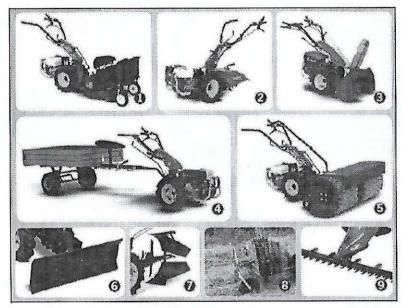
5. Applicable scope

♦1. Rotary tilling

Applicable to garden, tea plantation, orchard, sugarcane, corn land, vegetables land, greenhouse etc., for rotary assignments.

♦2. Multifunctional work

Take away rear wheels or resistance rod, match the relative tools and accessories and carry out multifunctional work, such as covering mulch, reaping, and chemical spraying.

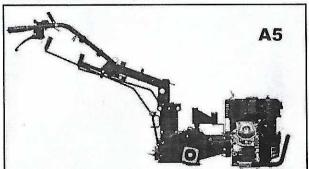


Note: (1) the lawn mower; (2) rotary cultivator; (3) Snow blower; (4) trailer; (5) sweeping machine; all landowners with (6) bulldozer flip plow; Today windrower; Pet-name ruby lawnmower

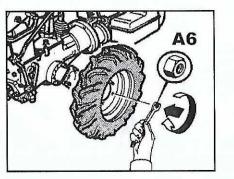
6. Operation and use of rotary tiller

♦Recover Mounting after open the packing carton:

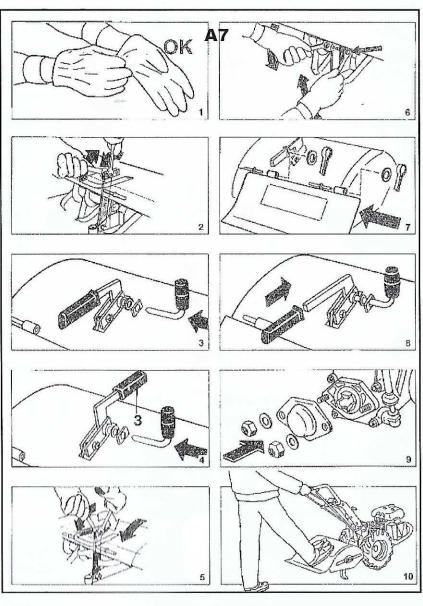
♦ 1. Put the machine on the even place. See A5.



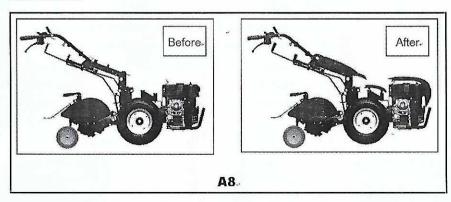
♦ 2. Mounting the rubber wheel on the wheel flange with 8 pcs of M10 nuts. See A6.



♦ 3. Rotary cultivator mounting: mounting the rotary cultivator to the gearbox of the tractor with 2 M12 bolts, to see A7.



◆ 4. Cover mounting: put the cover on the machine and insert in the mounting holes. See A8.



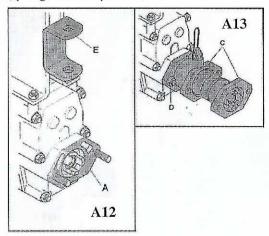
7. Use and care of attachments

◆Implement assembly

Implements are mounted directly to the flange A (Fig-A 12) or fitting between the attachment the quick hitch C (Fig-A13).

It is necessary that nuts D (Fig-A13) which fasten the implement to the machine are well tightened.

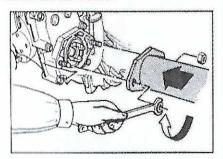
It is necessary to turn the handle bar of 180, in order to better match rotary cultivator, opener, plough and components.



♦PTO Operating Instruction

Coupling Attachment to PTO

When the PTO flange of the attachment is coupled to the unit PTO flange and the PTO is engaged, the splined shaft slides out to engage the splined (grooved) shaft of the attachment. Then the shafts rotate as a single member until the PTO shift lever is used to retract the drive shaft.

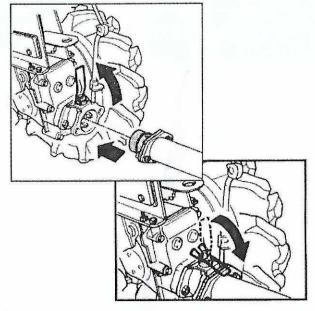


There are also PTO extensions in length of 3" and 6" which can be coupled between the PTO and attachment for better balance with certain attachment and engine combinations.

A. Direct Coupling

- 1. Remove the lock nuts and washers from the tractor PTO studs.
- 2. Align the tractor PTO with the connecting flange of the attachment.

 Always bring the tractor to the attachment. If necessary, use props to level the attachment.
- 3. Slide the PTO stud into the attachment flange and secure with the washers and lock nuts.



B. Quick Hitch

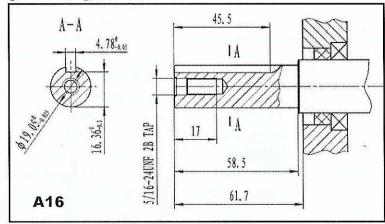
- 1. The hitch consists of two parts held together by a captive T-handled pin. Pull and turn pin sideways, to separate the parts.
- 2. Remove the two nuts from the tractor PTO studs and the two bolts and nuts from the quick hitch.



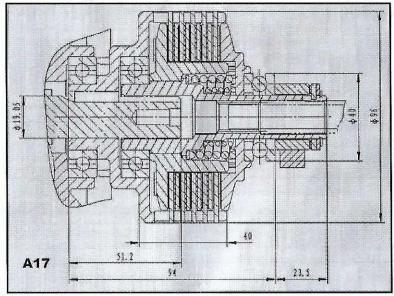
- 3. Attach the female part, pin-side-up, to the tractor PTO. Attach the male part, hole-side-up, to the attachment connecting flange. Install and tighten the four nuts.
- 4. Fit the attachment part into the PTO part. Twist the pin so it drops down into locking position, securing the two parts together.
- 5. To uncouple, pull the pin.

8. Installation dimensions

◆Engine mounting, See A16:



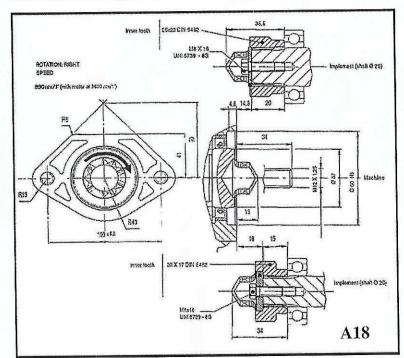
♦ Clutch mounting, See A17:



♦Power output combination

This combination is the locking three tooth components, independent of the gear rotate right, the output speed depends on the engine (Engine speed for 3600 revolutions per time sharing, PTO. Output speed for 990 revolutions per cent).

Combination and flange size please refer to graph Fig-A18.



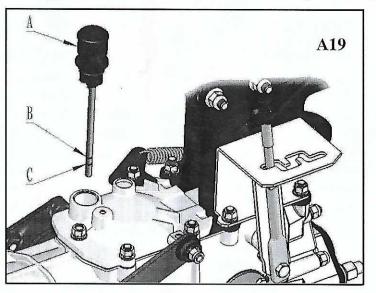
9. Checks before starting the machine

Check oil level following the instructions in the engine operating manual, to ensure correct lubrication, especially when working on slopes the oil level should be at maximum. At the same time preventing excess oil filling and Avoiding overflow, to use the quality and density of oils as prescribed in the same operating manual.

Check oil level in the gearbox through oil plug A (Fig-A19) verify that the level is between the two grooves B and C .It is necessary to add oil AGIP rotra MP SAE 80W/90(RIT.US-A-MIL-l-2105C), (The lubricating oil is suitable for high pressure environment use).

Never fill the tank with oil when engine is running.

After having performed these operations, the machine is ready to be started.



10. Start the machine

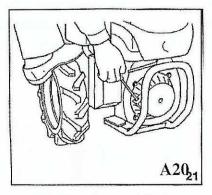
♦Ensure that gear lever and PT O lever are disengaged

1)Press down ON the engine stop switch ON the "ON" type of button, let the engine flameout line break, pull throttle switch handle and let the engine throttle in ajar state.

2)In accordance with the engine specification, make the engine start state in preparation.

3) Slowly pull the starting handle unit the hooking system is engaged then strong pull back with the foot (Fig-A20).

The rope handle must always be grasped with one hand only to prevent the engine "kicking back".



When the engine has started, allow it to run idle for some minutes, to allow oil to lubricate all moving parts grip the clutch lever on the handlebars to allow the locking stop spring to release. Make sure not to fully release the stop-lever A (Fig. -A20) which will stop the engine running.

Engage and locate the speed control rod to the desired speed position. If the gear not engage immediately release the clutch lever slightly and fully until and feel-in when the gear is engaged release the clutch lever slowly and fully until the machine starts.

To engage drive to the implement engage the clutch lever and locate the control rod its forward position if engagement is not immediate release the clutch lever slightly and feel-in.

Note: the machine adopts normally open type clutch for power transmission, it conforms to the EN 709-1992 the relevant safety standards.

Note: when rotary cultivator work, machine cannot be automatically cut to in reverse state, this design ensures the safety of operator foot.

If the operator would be prepared to machine by forward gears state switch to reverse state, it must first will power output control rod (PTO) in the vacancy state, and then open reverse control rod.



11. Operation Instruction:

♦ Notice:

- 1. The tiller need to running-in when first time using,
- 2. The tiller use the normally open clutch for the power transmission, adapt to the safety standard of EN 709-1992.
- 3. When the rear rotary cultivator is working, the machine cannot shift to the reverse gear freely, to protect the operator's feet. The operator must disconnect the PTO lever firstly, then shift the lever to the reverse gear.
- 4. Operator must shift the lever slowly to the proper gear when operating. If the variable gear didn't act immediately, he/she need to clench the clutch handle slowly, feeling the gear's working condition, and try again. Start the engine, when the operator clench the clutch handle, the tiller start to work; when loose the clutch handle, the tiller stop.

♦1.Slow Speed

- 1) Loose the clutch handle by left hand, make the clutch detach.
- 2) Pull back the shift lever to the slow gear, make sure it is in place, then hold the right handle by right hand (Attention: Do not hold the reverse handle).
- 3) Press down the clutch lock, clench the clutch handle slowly, the clutch connected, and the tiller working at the low speed.
- 4) Turn the throttle to proper place, the tiller works at the low speed about 0.3km/h.

♦2. High Speed

- 1) Loose the clutch handle by left hand, make the clutch detach.
- 2) Push forward the shift lever to the fast gear, make sure it in place, then hold the right handle by right hand (Attention: Do not hold the reverse handle).
- 3) Press down the clutch lock, clench the clutch handle slowly, the clutch connected, and the tiller working at the high speed.
- 4) Turn the throttle to proper place, the filler working at the high speed about 3.3km/h.

♦3. Reverse Gear

- 1) Loose the clutch handle by left hand, make the clutch detach.
- 2)Put the shift lever to neutral gear "N", pull back reverse lever slowly.

- 3)Press down the clutch lock, clench the handle slowly, clutch connected, the till back up.(attention: do not loose reverse control lever)
- 4)Loose the clutch handle, and return reverse lever when stop reversing.
- ♦ 4. If need to shift gear when the tiller is moving, should reduce the throttle firstly, (engine should not stop), then detach the clutch, finish the gear shift when the tiller stop moving.
- ♦5. Change direction, pull the handle to left or right. Attention: do not hold the wrong handle.

♦6. Shut down

- 1) Turn the throttle switch anti-clockwise, the tiller slow down.
- 2) Loose the clutch handle, the clutch detached.
- 3) Put the shift lever on neutral gear, loose clutch handle, turn the throttle switch to min, tiller stop walking.
- 4) Let the power take-off (PTO) lever free.
- 5) Press the "connect" button on the engine stop switch, the engine shut down.
- ♦ Attention: Always shut down the tiller while it is traveling on the flat ground.

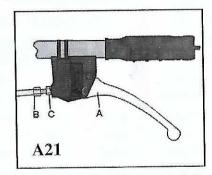


12. Maintenance

A proper maintenance and lubrication will help keep the machine in perfect working condition. The machine is delivered full of lubricants, however check oil levers before starting work.

Check that all screws and nuts tightened, particularly nuts D (Fig-A19) that fix the attachments to the machine, the nuts that fix wheels and the ones fixing the engine, lubricate the sliding bushes of the steering column stop rod.

♦ CLUTCH originally, the position of A lever (Fig-A21) is normal. As clutch wears out the same lever could have a wider opening. Being so uneasy to use. This means that it is necessary to adjust the cable setting lever, setting lever A its original position acting on adjustment device B and on counte: nut C.



♦ ENGINE for the intervals between maintenance follow the instructions given in the operating manual of engine.

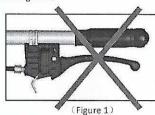
You should check the oil level every 4 hours of work and replace it every 50 hours of work always use good quality oil as indicated on the motor instruction book.

For the oil bath air filter, if you work in dusty conditions, wash the filtering hank and add oil every 8 hours. Use the same oil as for engine. For the engines having the air filter with the paper filter, clean this element with air or replace it if it is very obstructed GEARBOX: check oil level every so hours of work removing plug A and checking that, with horizontal machine, oil reaches the two notches B/C (Fig-A19).

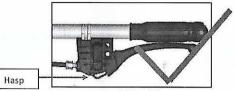
If necessary, add gearbox oil AGIP ROTRA MP SAE 80W/90 (RIF. US.A. MIL-L-2105C).

13. Important note

- 1. Gear box oil type: SAE80W/90.
- 2. When 15HD connects with trailer, loading capacity ≤0.5t.
- 3. When using tiller, operator should avoid making clutch to be half engaged. (Note: half engage means the handle bar was not held tightly. See figure 1)



4. After operator is familiarized with the machine, when tilling and walking, we suggest locking the clutch handle bar by hasp (See figure 2) to avoid half engage and reduce damage to friction disc, so as to prolong the usage life of clutch.



For new machine, must check:

(Figure2)

- 1) Cable lock nut on clutch arm must be tightened. (See figure 3);
- Cable lock nut on clutch handle bar must be tightened. (See figure 4);
- ③ Check if the compensation sleeve in the middle of clutch cable can compress normally or not. (See figure 5);
 - 4 Check if the compensation sleeve is tightened (See figure 6);
 - (See figure 7)

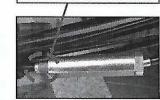
Adjustable distance: 1.5~3mm



(Figure 3)



(Figure 4)



(Figure 5)



(Figure 6)



(Figure7)

Clutch cable adjustment method:

1) Put gear shifting rod to neutral position (See figure 8);



Letter "N" indicates neutral position

(Figure 8)

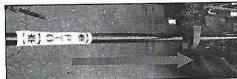


Reverse gear control rod



(Figure 9)

- ③ Release clutch handle bar to be free state;
- 4 Start engine;
- ⑤ Push forward PTO engine output control rod (See figure 10);



(Figure 10)

⑥ Now clutch handle bar is in loose state, and requiring PTO output head can't rotate (See figure 11);



(Figure 11)

- (7) Hold tight clutch handle bar, and see if PTO output head rotates or not;
- (8) If PTO output head cannot rotate, adjust lock nut on cable (See figure 3 and 4) to tighten it gradually until it starts to rotate and stables at 990 RPM, then further tighten the nut with another extra three to five circles:
- After the adjustment is done, when PTO output head can rotate normally, hold tightly and then loose
 the clutch handle bar for 10 times, and see if the compensation sleeve on clutch cable can compress
 normally. (Normal compress distance: 1.5∼3mm)

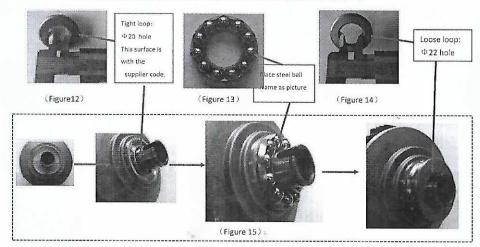
Check requirement before usage every time

Before usage every time, it is required to hold tightly and then loose the clutch handle bar for 5-10 times, and see if the compensation sleeve on clutch cable can compress normally. (See figure 5). If there is no compress, then adjust clutch cable right away.

Maintenance of clutch:

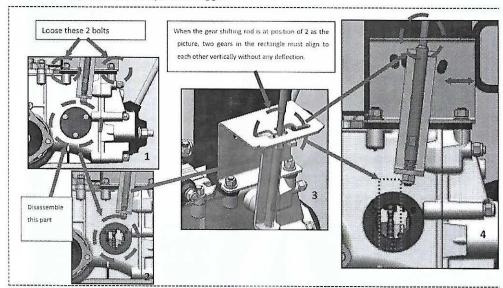
When operator uses too much half engagement of the clutch, it is very easy to damage the friction disc. The maintenance method is only to change clutch assembly, shifting fork, and clutch cable.

Clutch plane bearing, the correct assembly order is as below (Figure 12, 13, 14, 15):

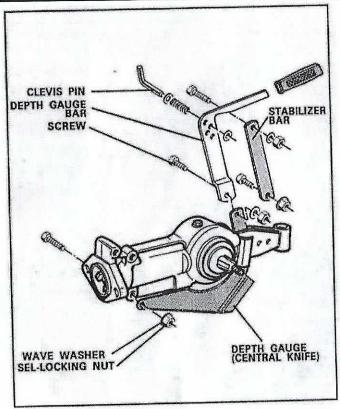


Maintenance when difficulty to change the gears

When it is difficult to change the gears and with abnormal noise, the maintenance method is to loose gear indication frame, and adjust the shifting gears:



14. Rotary Cultivator Operating Instruction



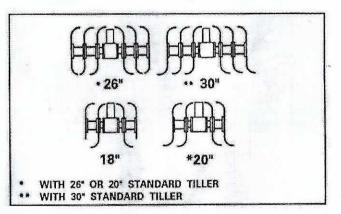
- 1.Stand the tiller on end so you can see the underside. Fasteners required for assembly are included. The bolts in the assembly drawing are labeled (M8 or M10) for the metric diameters, and length is given in millimeters.
- 2. Use the self-locking nut to fasten the depth gauge to the gear housing. Install the flange nut at the stabilizer bar bottom connection.
- 3. The depth gauge and stabilizer bar protrude through the top of the tiller housing. The bar is bolted to the brackets.

The gauge is pinned with the clevis pin and "hairpin". Tighten all nuts.

WIDTH OF TILTH IMPORTANT

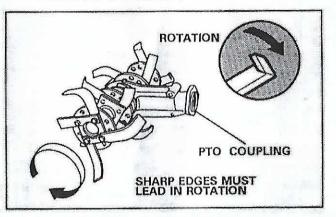
When changing sets of tines, it is important to keep the tines in place on one side for use as a model while changing tins on the other.

Do not mount the tines backwards on the flange.



Single row attachment for 15HD.

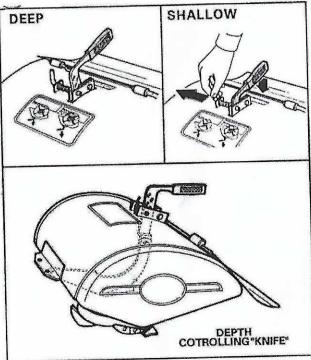
Available sizes are 18", 20", 26" and 30".



TILLING DEPTH ADJUSTMENT

The procedure is the opposite of what many people first would believe.

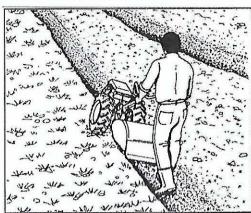
For the deepest soil penetration, you raise the depth controlling "knife" by pinning the bar in the bottom hole. (See drawing.)



- 1. Remove the hairpin and the clevis pin from the bracket and bar.
- 2. Raise or lower the bar handle to align the holes in the bar and brackets. Pin the bar at desired setting, or as recommended in step 3.
- 3. In hard ground, as when tilling a patch of ground for the first time, pin the depth adjustment rod through the top hole for a shallow cut.

After a pass or two to break up the hard top crust, stop the engine and pin the depth adjustment bar through the lower position hole. Pinning the bar through the bottom holes raises the depth-gauging "knife" for maximum tilling depth.





GARDENING SUGGESTIONS

- 1. When breaking new ground, or preparing hard, rocky soil. Till at a minimum depth, at the lowest gear setting, and at a fast throttle setting. In soft soils, you can probably start right off tilling at maximum depth and finest tilth is achieved in the lowest gear speeds.
- 2. You can avoid trampling over and tamping the fresh-tilled rows by walking to one side of the tiller.

Swing the handlebar to the side and adjust it to a comfortable height. After a bit of practice with the tiller, you can work out a pattern where your footprints will be erased with each new pass.

15. TROUBLE SHOOTING

Do not perform any maintenance with engine on

Below are listed a few small difficulties which may occur and which can be solved by the user

1) Gasoline engine does not start

Make the following checks in the order given

The fuel tank is at least half refueled

The fuel tap is open

A cold motor must be

chocked Fuel enters into

the carburetor

The breather hole in fuel tank cap is not clogged

The carburetor filter is clean

Carburetor jets are clean. Screw them out to inspect them

If there is dirty, clean them with blast air.

The sparking plug not works. Take out the plug and reconnect it for wire.

Touch the plug metal part to the metal part of the machine and turn the pulley as to start the motor, if a spark is found not to be between the plug electrodes. See if the plug wire connecties are tight if current still does not reach the electrodes. Change the plug.

In case the motor still does not start with a new sparking plug. The trouble is in the electrical system, points, conden-ser, coil or other part, and it is advisable to send to the nearest service or a specialized shop.

16.Store

Storage if the machine is not to be used for a long period of time, it is advisable to take the following precautions:

Empty the carburetor. Empty the oil motor.

Lubricate the cylinder introducing few drops of the same kind of oil used for the motor through the plug hole and turning the motor over several times without starting it, if it is a Diesel motor remove the injector by unscrewing the two bolt which fasten it to the head pour some oil into the hole.

Clean the motor and the machine thoroughly.

When restarting the operations, check that all security devices (motor-stop, reverse motion/PTO and clutch lever stopper) are working



HYUNDAI

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