

including, but not limited to, loss of use, loss of profits, loss of production, expense of substitute equipment or other commercial loss or damage.

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## User Manual



### KisanKraft Limited

**Warehouse:** 818 3B1 to 818 3B18, Podalalur - Sangam Road, Prabagiripatnam, Podalalur, Nellore - 524345, Andhra Pradesh, INDIA

**Head Office:** #4, 1<sup>st</sup> Main, 7-A Cross, Maruthi Layout, Dasarahalli, HAF Post, Hebbal, Bangalore 560024, Karnataka, INDIA

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- ◆ Kolkata ◆ Lucknow ◆ Nellore ◆ Pune ◆ Raipur



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|  |   |  |  |
|--|---|--|--|
| Product                                    | <b>Agricultural Cultivator / Inter-Power Weeder</b> | KisanKraft Invoice Date  |  |
| Brand                                      | <b>KisanKraft</b>                                   | KisanKraft Invoice No.   |  |
| Model                                      | <input type="checkbox"/> <b>KK-IC-305D</b>          |  |  |
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## Before Getting Started

Thank you for purchasing our Inter-cultivator.

- This manual can guide you to solve the problems when you are 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 situations, your understanding and pardon is highly appreciated. If you find some problems or have some good suggestions, please do not hesitate to contact your dealer.
- No part of this publication may be reproduced without written permission.
- This manual should be considered a permanent part of the cultivator and remain with it if it is resold.

## Application

This machine is small, lightweight, multi-functional, and with a high efficiency for cultivation. It can climb hills, run in water, walk over the field ridges and ditches, move freely and change the directions easily, and it is especially applicable to various works in hilly area, dry land, paddy field, orchard, vegetable garden and greenhouse, etc. Cultivating, ditching & ridging, and transport are the machine's basic functions. Moreover, after being equipped with relative devices and tools, it may be used to pump water, spray water and pesticide, reap the crops, generate electricity, fertilizer, implant seeds, threshing, cut tendrils, grind something, etc. The machine has a simple structure, can be easily repaired and its fuel consumption is less. It is your ideal micro agricultural machine.

**NOTE: KK-IC-350D and KK-CRT-550D have similar function. Additionally, KK-IC-350D can work as a DITCHER.**

## Safety Instructions

- Read the instructions carefully. Be familiar with the controls and the proper use of the equipment.
- Never allow children or people unfamiliar with these instructions to use the machine.
- Never work while people, especially children, or pets are nearby.
- Operator or owner is responsible for accidents or hazards to other people or their property.

### Before starting the machine:

- Ensure sufficient engine oil.
- Press clutch during gear shifting.
- Load after idling the machine for 5 minutes.
- Close the choke for cold start
- Keep the choke half open for hot start.
- Before starting the machine, set shifting bar to the neutral position.
- When the machine is working, pay attention to the safety!
- Be careful not to be hurt by the rotary blades!
- While grasping the reverse handle, the shifting bar must be set to the neutral position.
- Fuel and lubricant must be clean.
- Clutch must be broken off when changing the shift.

- Please read the contents of nameplate on the handle bar carefully before using the machine.
- Must install the safety protecting board on the machine before using machine or after maintenance.

- Muffler is a high temperature spare part, do not touch the Inter-cultivator in work or out of work freshly.

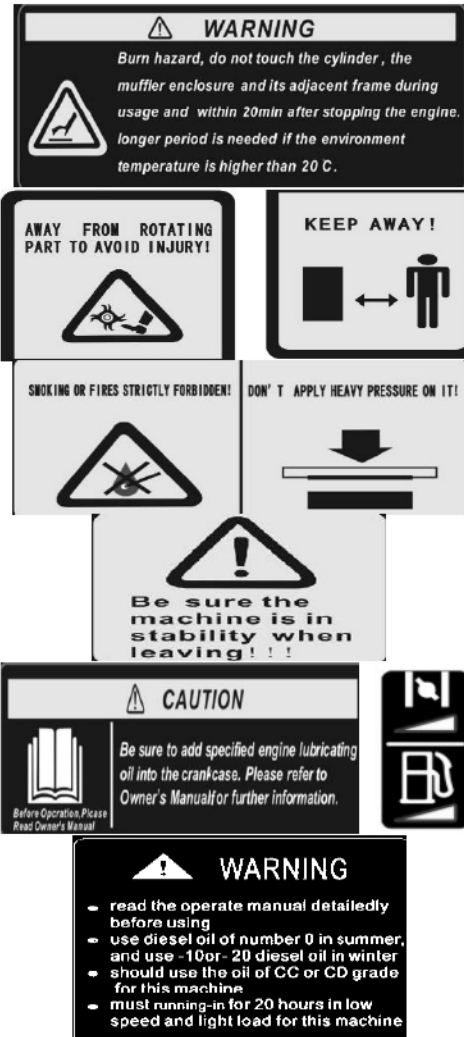
- When the Inter-cultivator is working, keep an eye on the rotary parts, do not be too close to the machine to avoid being hurt by the rotary blades.

- Keep the components of oil box away from fire and smoke.

- Keep this machine stable before use and read the instruction carefully

- Please refuel on time

- Please pay attention to warning signs



|  |  |  |  |
|--|--|--|--|
| Product                                    | Agricultural Cultivator / Inter-Power Weeder | KisanKraft Invoice Date  |  |
| Brand                                      | KisanKraft                                   | KisanKraft Invoice No.   |  |
| Model                                      | ☐ KK-IC-305D                                 |  |  |
| WARRANTY PERIOD                            | 6 MONTHS                                     | FOR THE SPECIFIED PERIOD FROM THE DATE OF SALE OR DELIVERY WHICHEVER IS EARLIER. |  |
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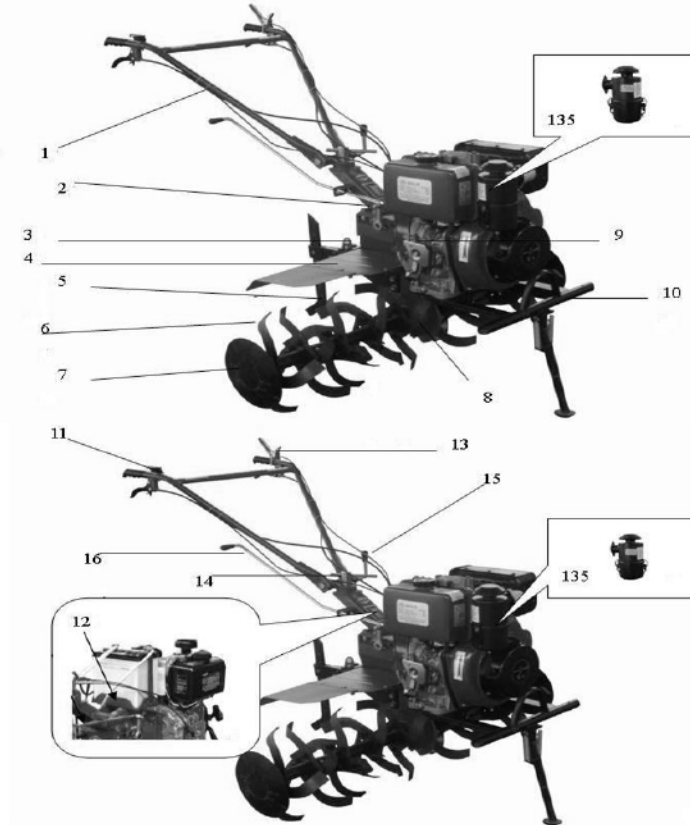
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### Overview-KK-IC-305D



- |                                    |                                     |
|------------------------------------|-------------------------------------|
| 1. Handle Bar                      | 9. Diesel Engine                    |
| 2. Gear-box Assy.                  | 10. Bumper                          |
| 3. Adjustment Screw                | 11. Throttle Switch                 |
| 4. Fender                          | 12. Battery base                    |
| 5. Deep Furrowing Resistance Stick | 13. Safety Device (Dead-man Handle) |
| 6. Rotary Blade                    | 14. Locked Handle (Up & Down)       |
| 7. Side Disc                       | 15. Locked handle (left & right)    |
| 8. Stepped Box Assy.               | 16. Shifting Bar                    |

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**Scope- KK-IC-305D**

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

Fix the tines onto the left and right side of the transmission shaft of the running part of the Inter-cultivator, then use two M8×55 screw bolts for axial positioning. After that, the machine can start cultivating. (See following table 2 and figures 2, 3)

| Form of Tines             | Four groups  |            | Five groups          |   |
|---------------------------|--|------------|----------------------|---|
|                           | 3 blades   | 4 blades   | 3 blades             | 4 blades  |
| No. of blades             | 3×8  | 4×8        | 3×10                 | 4×10  |
| Width of cultivation (mm) | 1050   | 1050       | 1350                 | 1350  |
| Applicable Soil           | Paddy field without too much water and with Earth of high moisture | Hard earth | Wet earth after rain | Dry land or with long stump from long-stem. Crop. |

Figure 2. Cultivating device



Figure 3. Ditching device



**Ditching & Ridging:** Knock down the adjustment screw before the ditcher is fixed. Subject to the adjustment of the width and height for ditcher, the ditching can be conducted. (See figure 3)

**Short Distance Transport:** When fixing the forearm of the wagon box on the trailer and wheels on the transmission shaft of the running part, the machine can be used for transportation. The rated load is 250kg, under normal rotation speed of the diesel engine, speed of the fast shift is about 10km/h and that of the slow shift is about 5 km/h.

**Multi-Functional Working:** Dismount protection cover of the gear-box (No.2 in Figure 1), unscrew the bolts away from the rear part of the main shaft, and take the cover for keys out of the shaft, fasten the self-contained belt pulley or coupling onto the gear-box's main shaft's rear part with screws. Type A of common V belt is adopted for belt pulley's cross section. Rated rpm of the belt pulley is 3000 rpm. When the corresponding devices are equipped, pumping water, spraying, threshing, reaping, generating electricity, etc. are realized. (Above additional implements are in exploration process.)

|  |   |  |  |
|--|---|--|--|
| Product                                    | <b>Agricultural Inter-Cultivator / Power Weeder</b> | KisanKraft Invoice Date  |  |
| Brand                                      | <b>KisanKraft</b>                                   | KisanKraft Invoice No.   |  |
| Model                                      | <b>☐ KK-IC-305D</b>                                 |  |  |
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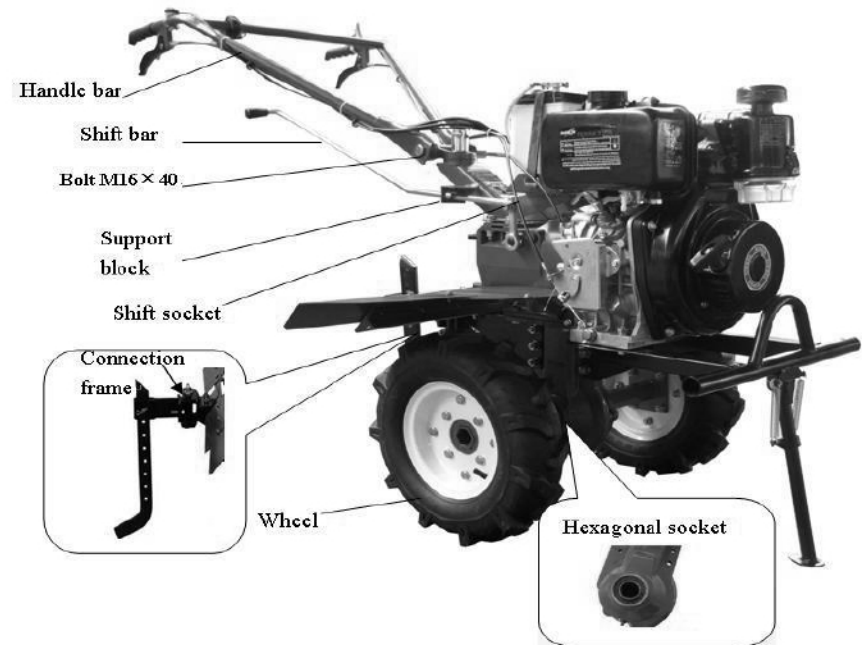
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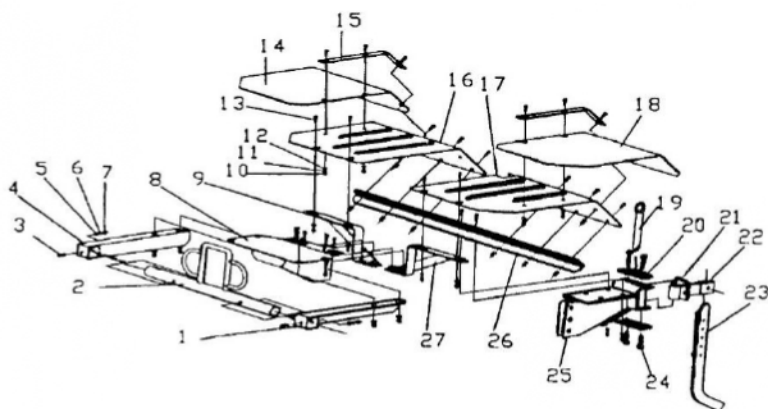


## Assembly –IC-305D



1. Fix the main machine; insert the hexagonal output shaft onto stepped box's output casing's hexagonal hole.
2. Fix the hexagonal stop casing onto the hexagonal output shaft with M6×6 socket head screws, and make sure the hexagonal shaft does not move axially.
3. **Wheel fixing:** fix the wheels at the two sides of the Hexagonal output shaft, and fix them with two M8×55 bolts and M8 nuts.
4. **Trailer fixing:** Fix the link group onto the trailer, use the link shaft assembly for connection, insert the split pin  $\phi 3 \times 26$  and insert the velocity adjustment screw into square groove of the link group, and fix it with M8×55 bolts and nuts.
5. **Handle bar fixing:** Two gear discs of the handle bar support aim at the discs of the handle bar support base, and adjust the positions. Fix them with M16×140 bolts, flat gasket 16 and spring gasket 16.
6. **Shifting bar assembly:** Get the shifting bar through the groove of shift support in the handle bar support base, and insert it into the hole of the shift casing, then fix it with split pin  $\phi 3.2 \times 16$ . Set the shifting bar in neutral position.

### Assembly drawing of safety protection guard installation.



- |                                       |                                      |
|---------------------------------------|--------------------------------------|
| 1. Bracket of collision bumper(left)  | 15. Fixty of safety protection guard |
| 2. Bracket of collision bumper(front) | 16. Safety protection guard(right)   |
| 3. Bolt m8 (bg5781-86)                | 17. Safety protection guard(left)    |
| 4. Bracket of collision bumper(right) | 18. Fender for paddy field(left)     |
| 5. Nut m8(gb41-86)                    | 19. Dowel                            |
| 6. Spring washer φ8(gb93-87)          | 20. Connecting plate                 |
| 7. Washer φ8(gb95-85)                 | 21. Bolt m8×50(gb5781-86)            |
| 8. Stand (diesel)                     | 22. Connector jointing assembly      |
| 9. Bracket(right)                     | 23. Deep furrowing resistance stick  |
| 10. Nut m6(gb41-86)                   | 24. Bolt m8×25(gb5781-86)            |
| 11. Spring washer φ6(gb93-87)         | 25. Bulling set (trough comp 16mm)   |
| 12. Washer φ6(gb95-85)                | 26. Bracket of fender comp           |
| 13. Bolt m6×10(gb5781-86)             | 27. Bracket (left)                   |
| 14. Fender for paddy field (right)    |                                      |

**ATTENTION:** After maintenance the safety protection guard installment must be fixed on the Inter-cultivator wholly.

### Installation and Adjustment for cable: Please See Figure 5 and 6 below.

- Unscrew the locknut of the tie rod.
- Spin the tie rod clockwise until the exposed handle support is the shortest.
- Get the joint of cable into the clutch wire socket of rear part of the gear-box assembly, and ensure the joint of cable goes into the hole of the socket.
- Get the wire into the M8 hole on base of the clutch fork arm, properly press the fork arm of the clutch, and put the joint of cable into the wire socket.
- Unscrew the tie rod, grasp and loosen the clutch handle until the spring force in the clutch can reset the handle, then screw the locknut.

KisanKraft has a large range of products to serve the farmers. A list of our products is given below:

#### Brush Cutters and Accessories

- Brush Cutter/Power Weeder
- Backpack Brush Cutter
- Tea Pruner
- Pole pruner with Engine
- Reaper Attachment
- Blades-Circular
- Blades (2 & 3 points)
- Baffle
- Nylon Rope
- Tap & Go

#### Chainsaws

- Petrol Chainsaw
- Electric Chainsaw
- Chain Sharpening Machine

#### Engines and Water Pumps

- Engine –Diesel-(Horizontal)
- Engine –Diesel(Vertical)
- Engine-Kerosene
- Water Pump with Petrol Engine
- Water Pump with Kerosene Engine
- Water Pump with Diesel Engine

#### Hand Tools

- Secateurs
- Folding Saw
- Garden Rake
- Garden Shovel
- Hedge Shear
- Lopper
- Telescopic Hedge Shear
- Telescopic Lopping Shear
- Tree Pruner
- Telescopic Steel Pipe & Fruit Picker Bag
- Sheep Shear

#### Garden Tools

- Electric Pressure Washer
- Hedge Trimmer
- Lawn Mower (Electric, Petrol & Manual)
- Leaf Blower

#### Cultivators and Accessories

- Petrol and Diesel

#### Sprayers and Accessories

- Battery Sprayer
- Portable Power Sprayer
- Trolley Sprayer
- Manual Knapsack Sprayer
- Manual Pressure Sprayer
- Rose Cans
- Hose Crimping Machine
- HTP Sprayer
- HTP Delivery Hose
- HTP Hose Reel
- HTP Stand
- HTP Gun / Lance(Brass Rod)
- Knapsack Power Sprayer
- Mister / Duster / Granuel Spreader
- HTP Sprayer Set with Diesel Engine
- HTP Sprayer Set with Kerosene Engine
- Fogging Machine

#### Milking Machine

- Wood Shredder
- Fodder Ensiling Chaff Cutter
- Fodder Grinder Chaff Cutter
- Fodder Mini Chaff Cutter

#### Harvester

- Maize Sheller
- Maize Sheller + Dehusker
- Maize Combine Harvester
- Onion Digger Carlotti Italy
- Tea Leaf Harvester
- Sugarcane Combine Harvester
- Sugarcane Leaf Stripper

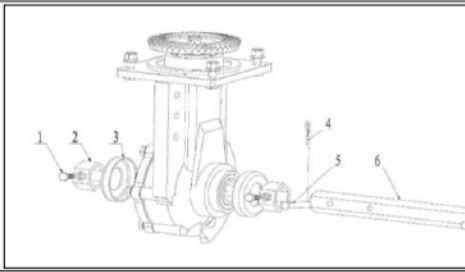
#### Transplanter and Post Hole Digger

- Paddy Transplanter (2 & 8 Rows)
- Transplanter-Vegetable & Tobacco
- Post Hole Digger(4" to 14"Augers)



## Output Shaft Parts

| Ref No | KK-Part No | KK-PART NAME              | Qty |
|--------|------------|---------------------------|-----|
| 1      | G/B 9-1    | Hexagon head bolts- M8*16 | 2   |
| 2      | G/B 9-2    | hexagon retainer sleeve   | 2   |
| 3      | G/B 9-3    | dust cover                | 2   |
| 4      | G/B 9-4    | clip B                    | 2   |
| 5      | G/B 9-5    | Pin 8*50                  | 2   |
| 6      | G/B 9-6    | Hexagon output shaft      | 1   |



## Fender part 2

| KK-Part No | KK-PART NAME   | Qty |
|------------|--|-----|
| G/B 10-1   | FENDER LEFT BIG PART                                   | 1   |
| G/B 10-2   | FENDER LEFT SMALL PART                                 | 1   |
| G/B 10-3   | FENDER LEFT ANGLE PLATE                                | 1   |
| G/B 10-4   | FENDER WELDMENT LEFT                                   | 1   |
| G/B 10-5   | M6 RUBBER WASHER                                       | 3   |
| G/B 10-6   | M8 x 1.25 mm, L = 20 mm, PARTIALLY THREADED, GRADE 8.8 | 4   |
| G/B 10-7   | M6 GENERAL PURPOSE WASHER                              | 3   |
| G/B 10-8   | M6 x 1 mm, L = 20 mm, PARTIALLY THREADED, GRADE 8.8    | 3   |
| G/B 10-9   | M6 x 1 mm, STEEL HEX NUT                               | 3   |
| G/B 10-10  | STIFFENER LEFT FENDER                                  | 1   |
| G/B 10-11  | STIFFENER LEFT FENDER                                  | 1   |
| G/B 10-12  | M8 x 1 SQUARE NUT                                      | 2   |

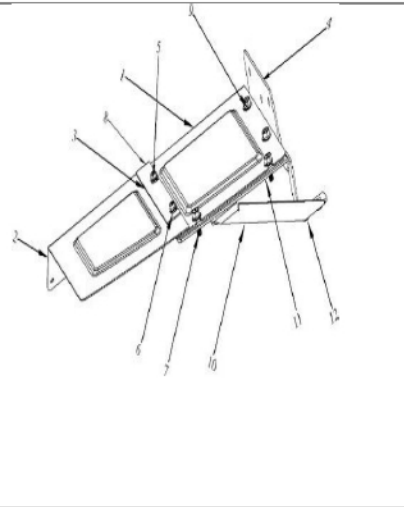


Figure 5

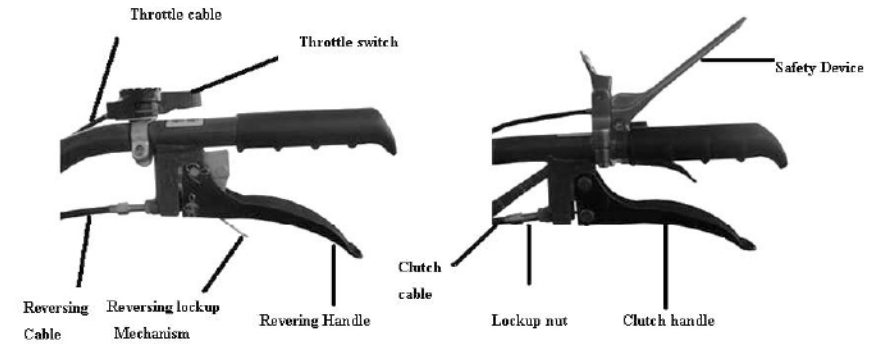
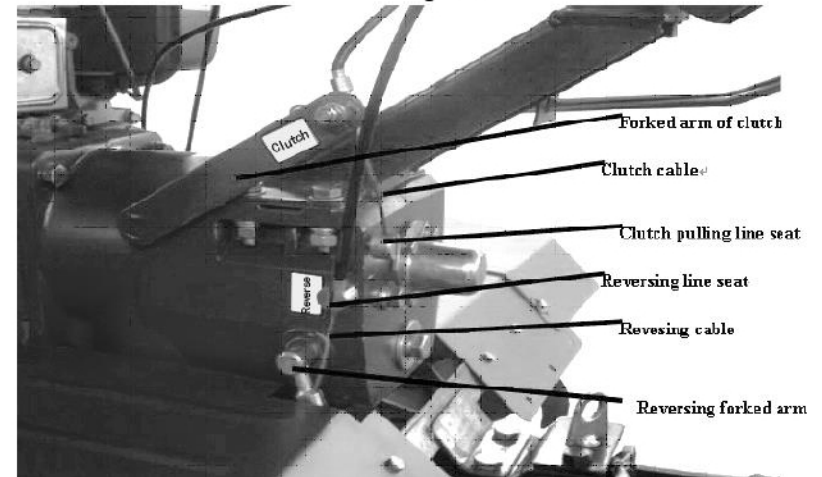


Figure 6



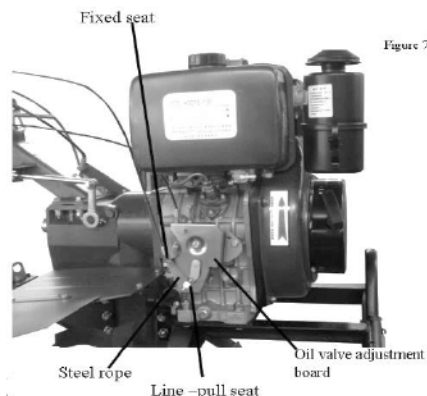
### Adjustment of the reversing gear cable: (See Figure 5 and 6)

1. Unscrew the locknut of the tie rod.
2. Spin the tie rod clockwise until the bare handle support is the shortest.
3. Get the cable into the reversing fork shaft besides the gear-box, and ensure the joint of cable goes into the hole of the fork shaft.
4. Properly pull the reversing fork shaft counterclockwise, get the cable into the narrow gap of the reversing wire socket besides the gear-box, and ensure the pipe head goes into the hole of the wire socket.
5. Unscrew the tie rod, grasp and loosen the clutch handle until the spring force in the clutch can reset the handle, then screw the locknut.

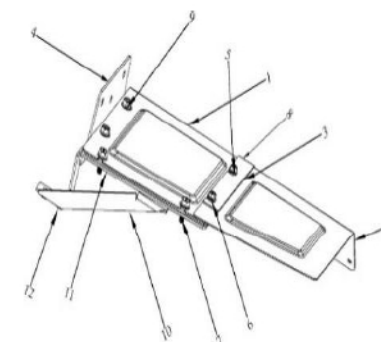
### Adjustment of the throttle cable:

(See Figure 7 )

- Shift the throttle switch clockwise to minimum positioning.
- Get wire of the throttle cable into the threading base and firm base on
- Top of the throttle adjustment board of the diesel engine.
- Tighten the wire, screw the binding bolts on the firm base.
- Adjust the throttle switch repeatedly until the throttle handle on the oil valve adjustment board can reach the maximum and minimum position.



|          |  |   |
|----------|--|---|
| G/B 7-2  | FENDER RIGHT SMALL PART                                | 1 |
| G/B 7-3  | FENDER RIGHT ANGLE PLATE                               | 1 |
| G/B 7-4  | FENDER WELDMENT RIGHT                                  | 1 |
| G/B 7-5  | M6 RUBBER WASHER                                       | 3 |
| G/B 7-6  | M8 x 1.25 mm, L = 20 mm, PARTIALLY THREADED, GRADE 8.8 | 4 |
| G/B 7-7  | M6 GENERAL PURPOSE WASHER                              | 3 |
| G/B 7-8  | M6 x 1 mm, L = 20 mm, PARTIALLY THREADED, GRADE 8.8    | 3 |
| G/B 7-9  | M6 x 1 mm, STEEL HEX NUT                               | 3 |
| G/B 7-10 | STIFFENER RIGHT FENDER                                 | 1 |
| G/B 7-11 | STIFFENER RIGHT FENDER                                 | 1 |
| G/B 7-12 | M8 x 1 SQUARE NUT                                      | 2 |



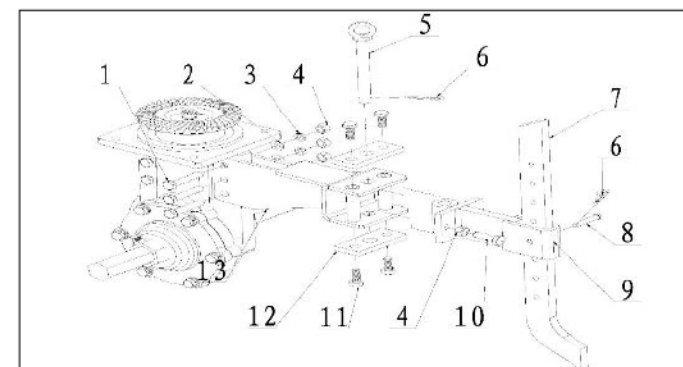
### Checks and Refueling:

1. Check whether all the connection bolts are tight or not, and fix the connection bolts according to the moment of force listed in table 3. (Refer to the instruction manual for diesel engine for the screwing moment of force bolt and nut respectively)

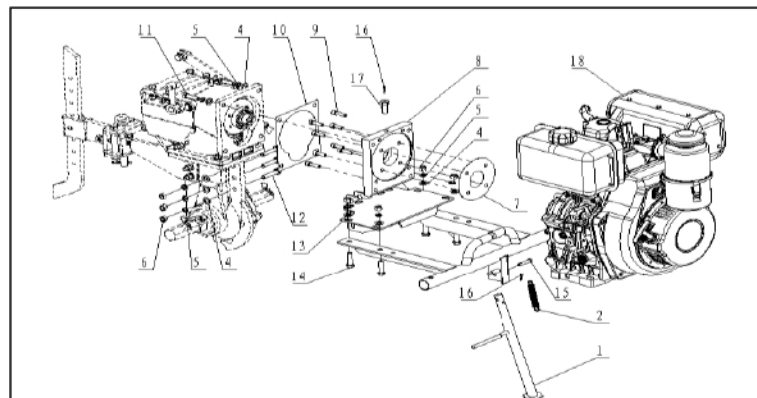
| Name of parts  | Moment of force (N.M) |
|--|-----------------------|
| Flange and the diesel engine                                 | 20-25                 |
| Flange and the gear-box                                      | 35-40                 |
| Binding bolts of end of driving shaft of gear-box            | 10-12                 |
| Binding bolts of reversing gear shaft of gear-box            | 26-40                 |
| Binding bolts between engine support and traveling mechanism | 35-40                 |
| Binding bolts of cover of the traveling mechanism            | 10.6-15               |
| Binding bolts of trailer of the traveling mechanism          | 50-60                 |
| Connection bolts between traveling mechanism and gear-box    | 35-40                 |
| Trailer unit   | 45-60                 |
| Set bolts of the diesel engine base                          | 35-40                 |
| Set bolts of the handle support base                         | 35-40                 |

2. Check each handle of the manipulation system (throttle switch, clutch, shifting bar and reversing bar) to see whether they can move freely or not. If they are out of the right positions, make them at the right positions.
3. Pull shift bar of the gear-box to the neutral position.

### Trailer Body, Connecting Frame and Resistance Rod Parts



| Ref No | KK- Part No | KK-PART NAME                          | Qty |
|--------|-------------|---------------------------------------|-----|
| 1      | G/B 8-1     | Hexagon head bolts-full thread M10*50 | 3   |
| 2      | G/B 8-2     | washer 10 Plain                       | 3   |
| 3      | G/B 8-3     | spring washer 10                      | 3   |
| 4      | G/B 8-4     | Nut M10                               | 5   |
| 5      | G/B 8-5     | Pin with hoop                         | 1   |
| 6      | G/B 8-6     | clip B                                | 2   |
| 7      | G/B 8-7     | resistance rod                        | 1   |
| 8      | G/B 8-8     | Pin 8*43                              | 1   |
| 9      | G/B 8-9     | connecting frame                      | 1   |
| 10     | G/B 8-10    | Bolt M10*35                           | 2   |
| 11     | G/B 8-11    | Hexagon head bolts-M10*20             | 4   |
| 12     | G/B 8-12    | strengthen plate, trailer body        | 2   |
| 13     | G/B 8-13    | Dragging bar                          | 1   |



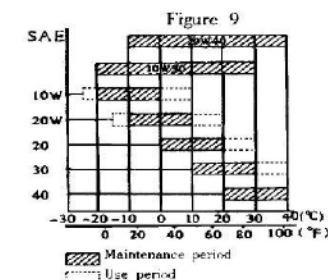
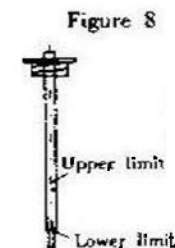
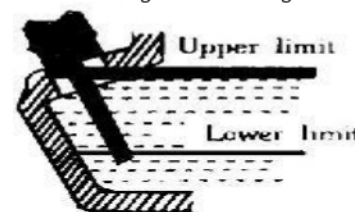
| Bumper, engine support frame and flange parts |             |                                       |     |
|---|-------------|---------------------------------------|-----|
| Ref No  | KK- Part No | KK-PART NAME                          | Qty |
| 1   | G/B 6-1     | support bar of bumper                 | 1   |
| 2   | G/B 6-2     | draw spring, support bar of bumper    | 1   |
| 3   | G/B 6-3     | bumper(WM1100A)                       | 1   |
|   | G/B 6-3     | bumper(WM1100B)                       | 1   |
| 4   | G/B 6-4     | washer 10 Plain                       | 11  |
| 5   | G/B 6-5     | Spring Washer 10                      | 11  |
| 6   | G/B 6-6     | Nut M10                               | 7   |
| 7   | G/B 6-7     | flange gasket                         | 1   |
| 8   | G/B 6-8     | flange(WM1100A/B)                     | 1   |
| 9   | G/B 6-9     | <b>Inner hexagon Screw M8*30</b>      | 4   |
| 10  | G/B 6-10    | Gear box gasket                       | 1   |
| 11  | G/B 6-11    | Hexagon head bolts-full thread M10*40 | 4   |
| 12  | G/B 6-12    | Hexagon head bolts-full thread M10*40 | 3   |
| 13  | G/B 6-13    | Engine support frame(WM1100A)         | 1   |
|   | G/B 6-13    | Engine support frame(WM1100B)         | 1   |
| 14  | G/B 6-14    | Hexagon head bolts-full thread M10*50 | 4   |
| 15  | G/B 6-15    | Pin 8*43                              | 1   |
| 16  | G/B 6-16    | <b>Cotter pin 2.5*30</b>              | 2   |
| 17  | G/B 6-17    | Hexagon bolt M12*1.25*25(Breather)    | 1   |
|   | G/B 6-18    | Bumper Block                          | 2   |
|   | G/B 6-19    | Rubber sleeve(Support Bar)            | 1   |
|   | G/B 6-20    | Spring washer 8                       | 8   |
|   | G/B 6-21    | Positioning pin 8 × 14                | 2   |
|   | G/B 6-22    | <b>Inner hexagon Screw M8*25</b>      | 4   |
|   | G/B 6-23    | Rubber washer                         | 2   |

### Fender Parts -1

| KK- Part No | KK-PART NAME          | Qty |
|-------------|-----------------------|-----|
| G/B 7-1     | FENDER RIGHT BIG PART | 1   |

- Refilling the engine oil:
  - Refill the SAE10W-40 lubricant into the crankcase of
  - The diesel engine. See Figure 9 for details Make the whole machine stable and horizontal, and refilling 20 # lubricant engine oil into the gear-box from oil hole at the top of the gear-box .when check the oil level, put the oil dipstick into the oil. (Note: not to turn the dipstick around), the oil level should be between the two limits of the oil dipstick. (refer to figure 8)

**Select the appropriate lubricant** for the diesel engine according to the environmental temperature. (See figure 9).  
Fill in machine oil when diesel engine is placed level, and checking the oil level only needs a poke by dipstick rather than a rotation of dipstick.  
Lubricant Oil grade shall be grade CC or CD.



- Knock down the lower cover of the air cleaner, refill about 0.1 liter 20# engine oil into the air cleaner.

**Important Note: Do not exceed the mark when refilling.**

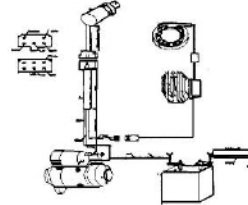
### Connection of Auxiliary Devices & Tools

- When cultivating is needed:** Knock down the wheels, fix the hexagonal union of the cultivating device onto two ends of the hexagonal shaft of the running part, and axially fix them with M8×55 bolt. Note: cultivating blades are divided into two groups, namely, the left and the right. Fixing the blades should guarantee that when the machine is running, the blade edge should work first. After fixing the blades, also fix the left and right protection board for safety purpose. Depth of the cultivating can be realized by adjusting height of the velocity adjustment screw and angles between the lever and the ground (refer to table 4).
- Cultivation of paddy field:** When the submerged depth of human's feet in the paddy field is less than 25cm, bent blades for wet land can be directly used for the cultivation of paddy field.
- When ditching is needed:** Unlade the Deep Furrowing Resistance Stick, fix the ditcher, adjust width & height of the ditcher, and then ditching can be conducted.
  - Width scope of ditching : 14cm-40cm
  - Depth scope of ditching: 11cm-25cm



4. **Short distance transport:** Fix forearm of the wagon box on the trailer and wheels on the transmission shaft of the running part, the machine can do a transportation job. The rated load is 250kg, under normal rotated speed of the diesel engine, speed of the fast shift is about 10 km/h and that of the slow shift is about 5km/h.
5. **Multi-functional working:** Knock down protection over of the gear-box (No.2 in Figure 1), unscrew the bolts away from the rear part of the main shaft, and take the cover for keys out of the shaft. Fasten the self-contained belt pulley or coupling onto the gear-box's main shaft's rear part with screws. Type A of common V belt is adopted for belt pulley's cross section. Rated rpm of the belt pulley is 3000 rpm. When the corresponding devices are equipped, pumping water, spraying, threshing, reaping, generating electricity, etc. are realized.

Hookup, Electric Starter:



### Preparation:

1. The safety protection guard must be attached to the machine before using.
2. Check that the blade and fender are correctly assembled and securely fastened.
3. While working, always wear substantial footwear and long trousers. Do not operate the equipment barefoot or wearing open sandals.
4. Thoroughly inspect the area where the equipment is to be used and remove all objects which can be thrown out by the machine.
5. **WARNING-Diesel is highly flammable:**
  - a. Store fuel in containers specifically designed for this purpose
  - b. Refuel outdoor only and do not smoke while refueling.
  - c. Add fuel before starting the engine. Never remove the cap of the fuel tank or add diesel while the engine is running or when the engine is hot.
  - d. If diesel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until diesel vapors have dissipated.
  - e. Replace all fuel tank and container caps securely
6. Replace faulty silencers

Before using, always visually inspect to see that tools are not worn or damaged. Replace worn or damaged elements and bolts in sets to preserve balance.

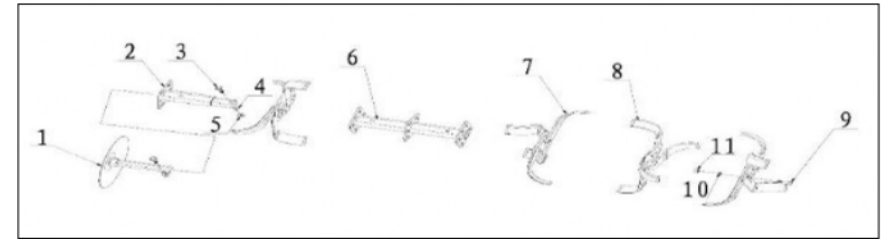
## Before Operating an Engine

### Break-in of new engine:

- Refer to the Engine's instruction manual for the breaking-in of the diesel engine
- As for a new or overhauled Inter-cultivator, it should be working for 1 hour under no load or 5 hours under light load, then drain all the lubricant from the gear-box and crankcase of the diesel engine, refill appropriate fix of clean diesel, and clean them at a slow speed for 3-5 minutes, then drain the diesel off. Refill engine oil into them according to instructions to enter four hours breaking-in, then the machine can work.
- If your engine is 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 rules:

**Running in for 5 minutes 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.

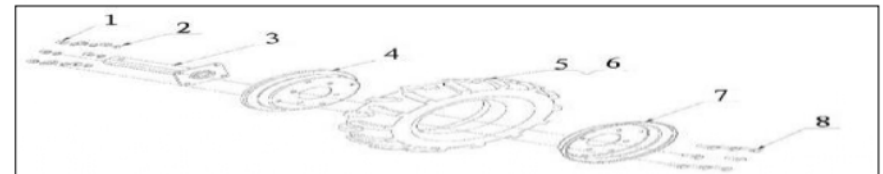
**Avoid running with overload:** During break-in period, the engine can't run with full load, but can run with 3000rpm and 50% load.



Rotary blades parts

| Ref No | KK- Part No | KK-PART NAME       | 300-Qty | KK-PART NAME       | 400-Qty |
|--------|-------------|--------------------|---------|--------------------|---------|
| 1      | G/B 4-1     | Side Disk          | 2       | Side Disk          | 2       |
| 2      | G/B 4-2     | Counter tube       | 4       | Counter tube       | 4       |
| 3      | G/B 4-3     | Bolt M8*55         | 8       | Bolt M8*55         | 12      |
| 4      | G/B 4-4     | Spring washer 8    | 8       | Spring washer 8    | 12      |
| 5      | G/B 4-5     | Nut M8 Flanged     | 8       | Nut M8 Flanged     | 12      |
| 6      | G/B 4-6     | Main tube(WM1100A) | 4       | Main tube(WM1100B) | 4       |
| 7      | G/B 4-7     | Dry land Blade(L)  | 16      | Dry land Blade(L)  | 20      |
| 8      | G/B 4-8     | Dry land Blade(R)  | 16      | Dry land Blade(R)  | 20      |
| 9      | G/B 4-9     | Bolt M10*35        | 64      | Bolt M10*35        | 80      |
| 10     | G/B 4-10    | Nut M10            | 64      | Nut M10            | 80      |
| 11     | G/B 4-11    | Spring washer 10   | 64      | Spring washer 10   | 80      |
|        | G/B 4-7-1   | Wet Land Blade(L)  | 16      | Wet Land Blade(L)  | 20      |
|        | G/B 4-8-1   | Wet Land Blade(R)  | 16      | Wet Land Blade(R)  | 20      |

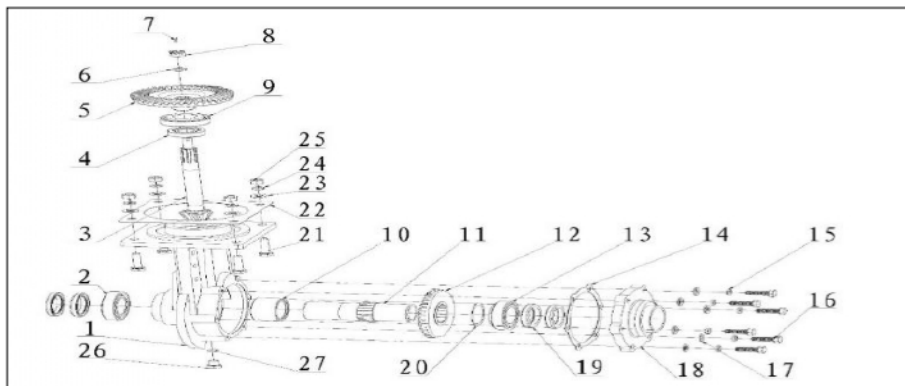
### Wheels Parts



| Ref No | KK- Part No | KK-PART NAME               | Qty |                         |
|--------|-------------|----------------------------|-----|-------------------------|
| 1      | G/B 5-1     | Nut M10                    | 8   |                         |
| 2      | G/B 5-2     | Spring washer 10           | 8   |                         |
| 3      | G/B 5-3     | Wheel axle/black           | 2   |                         |
| 4      | G/B 5-4     | Hub (inner side)           | 2   |                         |
| 7      | G/B 5-7     | Hub (outer side with hole) | 2   |                         |
| 6      | G/B 5-6     | Outer rubber tyre 4.00-8   | 2   | Tyre without inner tube |
| 5      | G/B 5-5     | Inner tube                 | N/A |                         |
| 8      | G/B 5-8     | Bolt M10*25                | 8   |                         |

### Bumper, Engine Support Frame and Flange Parts

## Walking Case Assy



| Ref No | KK Part No | KK Part Name                  | Qty | Ref No | KK Part No | KK Part Name                           | Qty |
|--------|------------|-------------------------------|-----|--------|------------|--|-----|
| 1      | G/B 3-1    | Walking case                  | 1   | 15     | G/B 3-15   | Spring washer 10*2.6                   | 6   |
| 2      | G/B 3-2    | Deep groove ball bearing 6009 | 1   | 16     | G/B 3-16   | Hexagon bolt M10*30                    | 6   |
| 3      | G/B 3-3    | Umbrella gear axes            | 1   | 17     | G/B 3-17   | gasket 10*2                            | 6   |
| 4      | G/B 3-4    | Taper roller bearing 30204    | 1   | 18     | G/B 3-18   | walking case cover                     | 1   |
| 5      | G/B 3-5    | Driven umbrella gear          | 1   | 19     | G/B 3-19   | lip seal 45*62*8                       | 4   |
| 6      | G/B 3-6    | Spring washer 12*3.1          | 1   | 20     | G/B 3-20   | adjusting gasket 0.1 for umbrella gear | 1   |
| 7      | G/B 3-7    | Cotter pin 2*30               | 1   |        |            | adjusting gasket 0.5 for umbrella gear | 1   |
| 8      | G/B 3-8    | Thin slotted nut M12          | 1   | 21     | G/B 3-21   | gasket of walking case                 | 1   |
| 9      | G/B 3-9    | Taper roller bearing 30206    | 1   | 22     | G/B 3-22   | Hexagon head bolts M10*40              | 4   |
| 10     | G/B 3-10   | Output shaft bush             | 1   | 23     | G/B 3-23   | washer 10*2                            | 4   |
| 11     | G/B 3-11   | hexagonal output shaft sleeve | 1   | 24     | G/B 3-24   | standard spring washer 10*2.6          | 4   |
| 12     | G/B 3-12   | Walking umbrella gear         | 1   | 25     | G/B 3-25   | hexagon nut M10                        | 4   |
| 13     | G/B 3-13   | Taper roller bearing 32009    | 1   | 26     | G/B 3-26   | hexagon bolt M12*1.25*12               | 1   |
| 14     | G/B 3-14   | gasket of walking case cover  | 1   | 27     | G/B 3-27   | O-ring 10.2*2.65                       | 1   |

## Rotary Blades Parts

**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.

### Oil Bath Type Air Filter:

- Check the oil level before operating.
- Fill oil up to upper limit. If oil is dirty, change it. Please use diesel to clean oil bath element frequently, then dip the element in the oil and squeeze out extra.

## Starting the Engine

**Note:** The shift bar must be in the neutral position

1. Start the diesel engine according to the procedures stipulated in the instruction manual for the diesel engine.
2. The diesel engine should run at a low speed (1500-2000 rpm) under no load for 2-3 minutes.
3. Check whether the diesel engine runs normally or not. If it is abnormal, stop the engine and have a check.

### 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 injury.
- 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

#### Note:

- 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.**

#### Note:

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

### While the engine is running

- 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.
- Pay attention to the following points when the engine is running:
  - i. Whether there is abnormal sound and vibration?
  - 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.

## Methods of Starting the Agricultural Inter-cultivator

### Starting by Hand:

1. Open fuel switch.
2. Put engine speed lever in the start position

3. Lock Auto-cut off switch.
  4. Hold recoil starter handle.
  5. Pull the starting handle slowly until you feel the resistance, then release it slowly.
  6. Push the decompression lever down by hand to no compression position. It will get back automatically by itself after the engine gets started.
  7. Starting: hold the starting handle with two hands, pull the rope lightly until you feel the resistance, then pull the rope fast with strength.
  8. 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.

**Note:** Tighten the refuel screw on the cylinder cover except filling oil in order to avoid rain and dust from getting in to the engine and wearing causing damage to the engine.

## Operation

(Note: breaking-in must be performed before the using the Inter-cultivator)

1. Using a slow shift:
  - The left hand should grasp the clutch handle tightly making the clutch separated.
  - The right hand should pull the shift bar backwards, make sure the shift casing is in the slow shift position, and observe whether it reaches the right position or not. Then the right hand should grasp the right handle.

(Note: Do not grasp the reversing bar)

  - i. Loosen the clutch handle gradually, the clutch will combine, and the Inter-cultivator can run at a slow speed.
  - ii. The right hand should increase the throttle properly so that the motor can run at a speed of 5 km/h
2. Using a fast shift:
  - The left hand should grasp the clutch handle tightly making the clutch separated.
  - The right hand pushes the shift bar forwards, make sure the shift casing is located in the fast shift position, and observe whether it reaches the right position or not. Then the right hand should grasp the right handle.

(Note: Do not grasp the reversing bar)

  - Loosen the clutch handle gradually, the clutch will combine, and the Inter-cultivator can run at a fast speed.
  - The right hand should increase the throttle properly so that the motor can run at a speed of 10 km/h.
3. Using a reversing shift:
  - The left hand should grasps the clutch handle tightly making the clutch separated.
  - The right hand should pull or push the shift bar to the neutral shift and observe whether it reaches the right position or not. The fore finger of right hand should grasp the trigger of the reversing shift first, then the right hand should grasp the reversing handle.
  - Loosen the clutch handle gradually, the clutch will combine, and the Inter-cultivator can run backwards.

(Note: Do not loosen the reversing handle)

  - When the backward running of the machine is not needed, the left hand should hold the clutch handle gradually, and the right hand should loosen the reversing handle.

| Ref No | KK- Part NO | KK-PART NAME  | Qty |
|--------|-------------|---|-----|
| 51     | G/B 2-51    | adjusting Gasket, countershaft                      | N/A |
| 52     | G/B 2-52    | Sheath, countershaft                                | 1   |
| 53     | G/B 2-53    | Thrust ball bearing 51104                           | 1   |
| 54     | G/B 2-54    | O-ring 25*1.8                                       | 1   |
| 56     | G/B 2-55    | Worm Colomn Pin 5*10                                | 2   |
|        | G/B 2-56    | Washer 41*12.5*4 Plain                              | 1   |
| 57     | G/B 2-57    | Spring washer 12                                    | 1   |
| 58     | G/B 2-58    | hexagon Bolt M12*1.25*25                            | 1   |
| 59     | G/B 2-59    | reverse gear/clutch fork shaft sheath<br>20*16*31.5 | 3   |
| 60     | G/B 2-60    | Bolt M5x30 Flanged                                  | 1   |
| 61     | G/B 2-61    | Reverse gear fork                                   | 1   |
| 62     | G/B 2-62    | Axes, reverse gear fork                             | 1   |
| 63     | G/B 2-63    | Nut M8  | 2   |
| 64     | G/B 2-64    | Seat, reverse gear cable                            | 1   |
| 65     | G/B 2-65    | Seat, clutch cable Inner                            | 1   |
| 65-1   | G/B 2-65-1  | Nut M8 Thin   | 1   |
| 66     | G/B 2-66    | Seat, clutch cable Outer                            | 1   |
| 67     | G/B 2-67    | Spring washer 8                                     | 1   |
| 68     | G/B 2-68    | Clutch fork pin 6 × 30                              | 1   |
| 69     | G/B 2-69    | Axes, clutch fork                                   | 1   |
| 70     | G/B 2-70    | Clutch fork   | 1   |
| 71     | G/B 2-71    | Ring 16   | 1   |
| 72     | G/B 2-72    | Clutch washer 26*15.3*2.7                           | 1   |
| 73     | G/B 2-73    | deep groove ball bearing 6202                       | 1   |
| 74     | G/B 2-74    | Washer 24*8*2 Plain                                 | 1   |
| 75     | G/B 2-75    | External teeth serrated lock washer                 | 1   |
| 76     | G/B 2-76    | Bolt M8*20  | 1   |
| 77     | G/B 2-77    | deep groove ball bearing 6007                       | 1   |
| 78     | G/B 2-78    | clutch cover assy                                   | 1   |
| 79     | G/B 2-79    | Countersunk rivet 6                                 | N/A |
| 80     | G/B 2-80    | Cover, cushion                                      | N/A |
| 81     | G/B 2-81    | Spline plate, clutch                                | N/A |
| 82     | G/B 2-82    | Cushion   | N/A |
| 83     | G/B 2-83    | Cover, clutch                                       | N/A |
| 84     | G/B 2-84    | Core comp, clutch                                   | 1   |
| 85     | G/B 2-85    | Platen(Clutch core)                                 | N/A |
| 86     | G/B 2-86    | Friction piece                                      | N/A |
| 87     | G/B 2-87    | steel piece   | N/A |
| 88     | G/B 2-88    | Driven plate assy(Clutch core)                      | N/A |
| 89     | G/B 2-89    | Spring(Clutch core)                                 | N/A |
| 90     | G/B 2-90    | Lift slab assy(Clutch core)                         | N/A |
| 91     | G/B 2-91    | Inner hexagon screw M5*20                           | N/A |
| 92     | G/B 2-92    | steel wire retainer ring for axe                    | N/A |
| 93     | G/B 2-93    | N/A   | N/A |
| 94     | G/B 2-94    | Ball bearing Sφ3.5                                  | N/A |
| 95     | G/B 2-95    | Active Pushing cover                                | N/A |
|        | G/B 2-96    | O ring 18x1.8                                       | 1   |
|        | G/B 2-97    | Split clip/Cotter pin 1.6x16                        | 1   |
|        | G/B 2-98    | Spring washer 6                                     | 4   |
|        | G/B 2-99    | Washer 8 plain                                      | 1   |

| Ref No | KK- Part NO | KK-PART NAME                     | Qty |
|--------|-------------|----------------------------------|-----|
| 1      | G/B 2-1     | Sheath, Shift rod                | 1   |
| 2      | G/B 2-2     | Pin 6×40, Shift rod              | 1   |
| 3      | G/B 2-3     | Clip A                           | 1   |
| 4      | G/B 2-4     | shift shaft sleeve 20*16*35.5    | 1   |
| 5      | G/B 2-5     | O-ring $\varnothing$ 11.2×2.65   | 4   |
| 5-1    | G/B 2-5-1   | O-ring 10.2*2.65                 | 4   |
| 6      | G/B 2-6     | shift shaft/shift fork shaft     | 1   |
| 7      | G/B 2-7     | Shift block                      | 1   |
| 8      | G/B 2-8     | gear box                         | 1   |
| 910    | G/B 2-9     | dipstick                         | 1   |
|        | G/B 2-10    | O-ring(dipstick)                 | 1   |
| 11     | G/B 2-11    | Principal axes                   | 1   |
| 12     | G/B 2-12    | steel wire retainer ring for axe | 2   |
| 13     | G/B 2-13    | Steel ball S $\Phi$ 6            | 4   |
| 14     | G/B 2-14    | Spring , Principal axes          | 2   |
| 15     | G/B 2-15    | Imitative gear                   | 1   |
| 16     | G/B 2-16    | Bearing 6204                     | 1   |
| 17     | G/B 2-17    | O-ring 45×1.8                    | 1   |
| 18     | G/B 2-18    | Pushing panel                    | 1   |
| 19     | G/B 2-19    | lip Oil seal B25×40×7            | 1   |
| 20     | G/B 2-20    | O-ring 17×2                      | 2   |
| 21     | G/B 2-21    | Sheath, principal axes           | 1   |
| 22     | G/B 2-22    | thrust-washer 20                 | 1   |
| 23     | G/B 2-23    | Round Nut M20×1.5                | 1   |
| 24     | G/B 2-24    | Key A6*6*20                      | 1   |
| 25     | G/B 2-25    | Sheath, Key                      | 1   |
| 26     | G/B 2-26    | Washer 8×28×3 Plain              | 1   |
| 27     | G/B 2-27    | Spring washer 8                  | 1   |
| 28     | G/B 2-28    | Bolt M8*20                       | 1   |
| 29     | G/B 2-29    | Protect cover, principal axes    | 1   |
| 30     | G/B 2-30    | Inner hexagon Screw M6×20        | 4   |
| 31     | G/B 2-31    | Cotter pin 2.5*30                | 1   |
| 32     | G/B 2-32    | Hexagon slotted nut M12(Long)    | 1   |
| 33     | G/B 2-33    | Washer 12 Plain                  | 1   |
| 34     | G/B 2-34    | Restrict cover, reverse gear     | 1   |
| 35     | G/B 2-35    | Reverse gear Spring              | 1   |
| 36     | G/B 2-36    | Spring seat, reverse gear        | 1   |
| 37     | G/B 2-37    | Double gear, reverse gear        | 1   |
| 38     | G/B 2-38    | Pushing plate, reverse gear      | 1   |
| 39     | G/B 2-39    | Axes, reverse gear               | 1   |
| 40     | G/B 2-40    | Gasket Reverse Gear              | 1   |
| 41     | G/B 2-41    | Spring washer 10                 | 1   |
| 42     | G/B 2-42    | Bolt M10*25                      | 1   |
| 43     | G/B 2-43    | cotter pin 2.5*30                | 1   |
| 44     | G/B 2-44    | Hexagon slotted nut M10          | 1   |
| 45     | G/B 2-45    | Washer M10 Plain                 | 1   |
| 46     | G/B 2-46    | Initiative umbrella gear         | 1   |
| 47     | G/B 2-47    | Countershaft                     | 1   |
| 48     | G/B 2-48    | Key A6*6*20                      | 1   |
| 49     | G/B 2-49    | needle bearing K182420           | 2   |
| 50     | G/B 2-50    | Double gear, countershaft        | 1   |

4. Shift:  
When the machine is running, reduce the oil valve of the diesel engine (but subject to the diesel engine's not quenching), then the clutch is made separated. When the machine stops running, then shift.
5. Change directions:  
Pull the handle to left or right to make the machine turn left or right.  
(Note: pulling the wrong handle may damage the gears)
6. The operation method of recoil/electric starter and safety device:
  - Left hand close upon the red emergency stop lever in the handle bar, draw back the clutch handle with your middle finger and ring finger at a time. The above mutual locking will make the engine ready to start. And now, the operator can recoil –start the engine with hand according to the instructions given in the manual.
  - If the engine is of electric-starting model, carry out the following two steps. (step2, 3 are not suitable for recoil start engine) connecting well the power supply and control switch as the electric start hookup (or connect it beforehand). If the Inter-cultivator is without power supply, you should prepare a lead-acid battery accord with direct current 12V, 36AH.
  - Turn the starting-key Clockwise to the start position after inspecting clearly, and then release the key after the engine has started, it will return to the primary position automatically.
  - Adjust the throttling cock to the right position after the engine has started.
  - Press the red emergency lever in the handle bar (Grasp the emergency stop handle and the handle bar with your left hand), and buckle the trigger of emergency stop lock come out from the clutch handle gently by your middle finger. Restore the clutch handle down, then the clutch switch on, and the machine start to work. You should grasp the emergency stop handle and handle bar all the while in whole working course.
  - In case of any emergency, release the emergency stop handle and handle bar, the engine will flameout and the machine will stop working immediately.
7. **Stopping the machine:**
  - Grasp the clutch handle, and separate the clutch.
  - Pull the shift bar to the neutral position, loosen the clutch handle, and turn the oil switch clockwise to the minimum position, now the machine will stop.
  - When stopping of the diesel engine is needed, it should be conducted according to relative contents in the instruction manual.  
(Note: Stopping the machine is generally conducted on the flat ground)

### Safety Instructions during operation:

#### DO'S

- Do visual check every time before starting,
- Keep Agricultural Inter-Cultivator Clean.
- Do use recommended Fuel and Lubricants only.
- Do check the fuel level.
- Do check air intake filter oil level.
- Do check engine oil and gear oil levels.
- Do check for any leakage.
- Do check decompress knob before starting.
- Do check if the gear is in neutral position before starting.
- Do use recommended attachments only.

- Do maintain distance (1ft) from buildings and other equipment's when operating, to avoid any accidents.
- Keep the machine away from flammable materials.
- Keep the machine 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 Inter-Cultivator
- Must stop the engine before refueling and refuel in a place with good ventilation.
- Must clean and spilled or over flown fuel of the Agricultural Inter-cultivator.
- Let Agricultural Inter-Cultivator cool down before storing indoors.
- Work only in daylight or in good artificial light.
- Always be sure of your footing on slopes.
- Walk, never run with the machine.
- Exercise extreme caution when changing direction on slopes.
- Use extreme caution when reversing or pulling the machine towards you.
- Start the engine carefully according to instructions and with feet well away from the tool(s).
- Never pick up or carry a machine while the engine is running.
- Stop the engine:
  - Whenever you leave the machine
  - Before refueling.
- Reduce the throttle setting during engine shut down and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of working.

#### DON'TS...

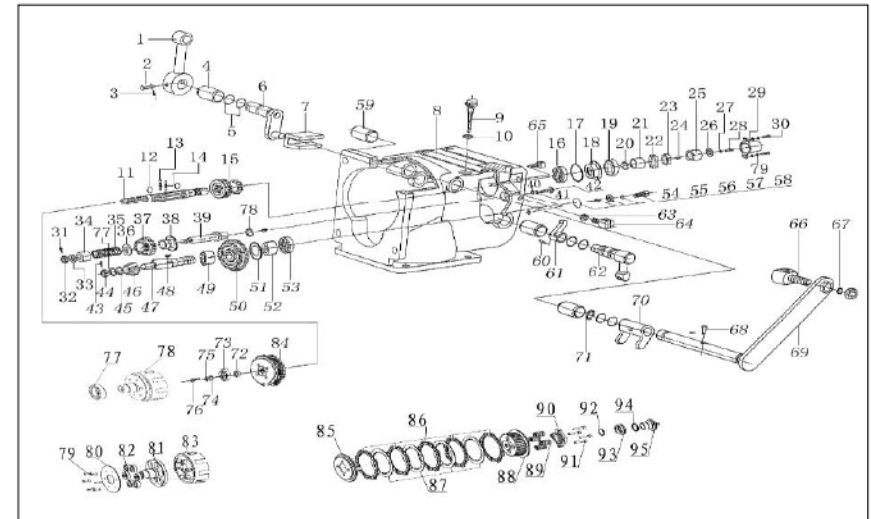
- Don't overfill the tank with fuel, but also never let fuel tank run out empty.
- Don't use adulterated fuel.
- Do not work on excessively steep slopes.
- Do not change the engine governor setting or over speed the engine.
- Do not put hands or feet near or under rotating parts.
- Don't smoke or allow flame or spark where Agricultural Inter-cultivator is refueled or where fuel is stored.
- Don't inhale exhaust for it can contain poisonous carbon monoxide.
- Don't run Agricultural Inter-cultivator in a place without adequate ventilation.
- Don't lean/tilt Diesel tank more than 20°, otherwise fuel may spill.
- Don't cover Agricultural Inter-cultivator top so as to avoid fire.
- Don't touch muffler/exhaust, as it gets hot during operating and stays hot for some time even after stopping.
- Don't delay on service schedules.
- Don't Operate Diesel Hal continuously more than 2hrs.30mins for any given operation (Give a break of 20mins)
- Don't make any alterations in Design, Operations and Functioning of Agricultural Inter-cultivator other than Company's recommendation.
- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.

#### Important Cautions during Operation

1. Pay attention to working situations and sound of each part during the work, check whether the connection between different parts is ok or not, loose connections

| Ref No | KK Part No | KK Part Name                     | Qty | Ref No | KK Part No | KK Part Name                   | Qty |
|--------|------------|----------------------------------|-----|--------|------------|--------------------------------|-----|
| 1      | G/B 1-01   | Handrail seat                    | 1   | 14     | G/B 1-14   | Pin 8*24                       | 2   |
| 2      | G/B 1-02   | Shift lever                      | 1   | 15     | G/B 1-15   | Lacing cord connector          | 2   |
| 3      | G/B 1-03   | Scuff sleeve, handrail seat      | 1   | 16     | G/B 1-16   | Hexagon head bolts- M16*150    | 1   |
| 4      | G/B 1-04   | Spring washer20*5(standard type) | 1   | 17     | G/B 1-17   | Tray, gear                     | 1   |
| 5      | G/B 1-05   | Locked lever                     | 1   | 18     | G/B 1-18   | Clutch cable                   | 1   |
| 6      | G/B 1-06   | Handrail                         | 1   | 19     | G/B 1-19   | Flameout switch cable          | 1   |
| 7      | G/B 1-07   | T figure locked lever            | 1   | 20     | G/B 1-20   | Reverse cable                  | 1   |
| 8      | G/B 1-08   | Cable clip                       | 4   | 21     | G/B 1-21   | Throttle cable                 | 1   |
| 9      | G/B 1-09   | Throttle switch Φ25(MF type)     | 1   | 22     | G/B 1-22   | Hexagon head bolts- M10*40     | 4   |
| 10     | G/B 1-10   | Reverse/clutch handlebar         | 2   | 23     | G/B 1-23   | Hex nut M10(C grade 1 type)    | 4   |
| 11     | G/B 1-11   | Handlebar rubber sleeve Φ25      | 2   | 24     | G/B 1-24   | Spring washer 10*2.6(standard) | 4   |
| 12     | G/B 1-12   | Flameout switch                  | 1   | 25     | G/B 1-25   | Washer 10*2(C grade)           | 8   |
| 13     | G/B 1-13   | Cotter pin 1.6*20(B type)        | 4   |        |            |                                |     |

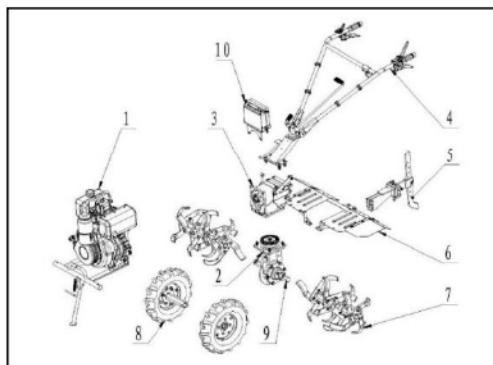
#### Shifting Gearbox Assy





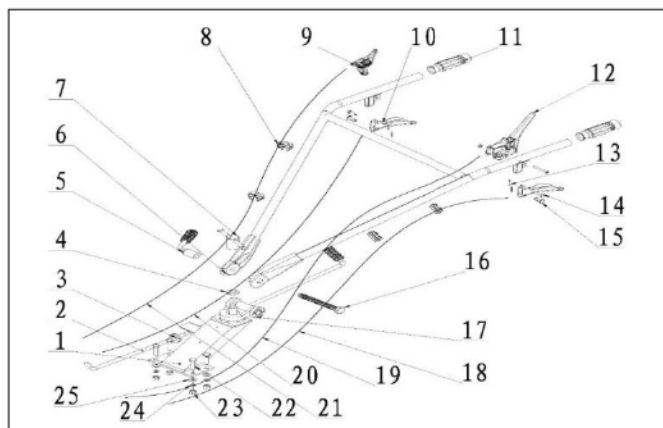
## Parts Diagram - Body IC-305D

### Intercultivator Exploded View



| Ref No | Description           | Ref No | Description   |
|--------|-----------------------|--------|---|
| 1      | Handrail parts        | 6      | Bumper, engine support frame and flange parts           |
| 2      | Shifting Gearbox Assy | 7      | Fender parts  |
| 3      | Walking case Assy     | 8      | Dragging bar, connecting frame and resistance rod parts |
| 4      | Rotary blades parts   | 9      | Output shaft parts                                      |
| 5      | Wheels parts          |        |   |

### Handrail Parts



- are not allowed. If abnormalities are found, stop the machine, and solve the problem immediately.
2. A cold machine should not be used to do heavy load work immediately after the machine is started, especially for the new machines or the ones after overhaul.
  3. Pay attention to checking the oil levels of the diesel engine and gearbox. Refill the engine oil when it is not enough.
  4. Do not cool the diesel engine by pouring water.
  5. Be cautious about the machine's tilting while farming.
  6. Machine fixed with cultivating blades should not be used on sandy or stony place.
  7. After using the machine for farming, pay attention to cleaning dirt, weeds, and smear on the surface of the machine and keep the machine clean.
  8. Clean the air cleaner with sponge or the wire mesh frequently and change the engine oil. (Keep an eye on the marking on the empty air cleaner oil level)

## Maintenance & Service

During the working period of the Inter-cultivator, due to the changing running speeds, abrasion and varying loads, phenomena of bolts loosening and parts wearing are inevitable which in turn may lead to the malfunction of the system, abnormalities of clearances, declination of engine power, more oil consumption, malfunction of each part, more failures of the machine, and the problems affect the normal use of the Inter-cultivator. To reduce chances of troubles, it is better to do a strict and regular maintenance job which emphasizes precautionary measures to keep a good performance and extend the machine's working life.

1. Keep all nuts, bolts and screw tight to ensure the equipment is in safe working condition.
2. Never store the equipment with diesel in the tank inside a building where fumes can reach an open flame or spark.
3. Allow the engine to cool before storing in any enclosed place.
4. To reduce the fire hazard, keep the engine, muffler, battery compartment and diesel storage area free of inflammable material and excessive grease.
5. Replace worn or damaged parts for safety.
6. If the fuel tank has to be drained, this shall be done outdoors
7. After adjustment or maintenance, the safety protection guard must be attached to the machine.

### Technical Service of Intercultivator

1. MAINTENANCE AFTER EACH WORK SHIFT (conducted before and after each shift)
  - Listen and observe if there are any abnormalities of each part (such as abnormal sound, overheating and bolt loosening)
  - Check if there is oil leakage in diesel engine, gearbox and Traveling box.
  - Check if the oil levels of the diesel engine and gearbox are between the two extremes of the oil dipstick.
  - Timely clean the mud, weeds and smear on the machine and its parts.
  - Keep a good record.
2. FIRST LEVEL SERVICE (EVERY 150 WORKING HOURS)
  - Do all the things listed for each work shift maintenance.
  - Clean the gearbox and Traveling box, and change the engine oil.
  - Check and adjust the clutch, shift system and reversing gear system.
3. SECOND LEVEL SERVICE (EVERY 600 WORKING HOURS)
  - Do all the things listed every 150 hours for service.
  - Check all the gears and bearings, replace with new ones if serious abrasion is found.
  - Other parts of the Inter-cultivator, like cultivating blade or connection bolts, if damaged, replace with new ones.
4. TECHNICAL OVERHAUL (EVERY 1800-2000 WORKING HOURS)
  - Take the machine apart in the local special service center, clean and check the machine, then replace or repair the seriously- worn out parts.
  - Specialized service men are invited to check the friction piece and clutch.
5. MAINTENANCE OF DIESEL ENGINE:
  - Refer to the instruction manual of the diesel engine.

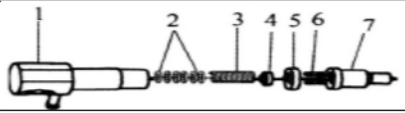
### Technical Service List of Intercultivator

| Interval →→                    | Daily | 8-Hrs | 20-Hrs<br>Or<br>1-Month | 150-Hrs<br>Or 3-<br>Months | 1000 Hrs<br>Or<br>1-Year | 2000 Hrs<br>Or<br>2-Years |
|--------------------------------|-------|-------|-------------------------|----------------------------|--------------------------|---------------------------|
| Check and screw bolts and nuts | ✓     |       |                         |                            |                          |                           |
| Check and refill engine oil    | ✓     |       |                         |                            |                          |                           |
| Clean and change the diesel    |       | ✓     | ✓                       | ✓                          |                          |                           |
| Check oil leakage              | ✓     |       |                         |                            |                          |                           |
| Clean dirt, weeds and smear    | ✓     |       |                         |                            |                          |                           |
| Troubleshooting                | ✓     |       |                         |                            |                          |                           |
| Adjust the control parts       | ✓     |       |                         |                            |                          |                           |
| Friction piece of the clutch   |       |       |                         |                            |                          | ✓                         |
| Gears and bearings             |       |       |                         |                            | ✓                        |                           |

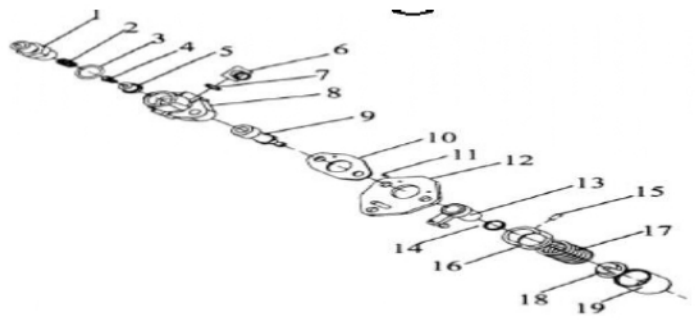
Note: The mark ✓ means service required.

### FUEL NOZZLE ASSEMBLY

| Part No | Part Name             | Qty |
|---------|-----------------------|-----|
| E15-00  | Fuel Injector         | 1   |
| E15-07  | Nozzle(Fuel Injector) | N/A |



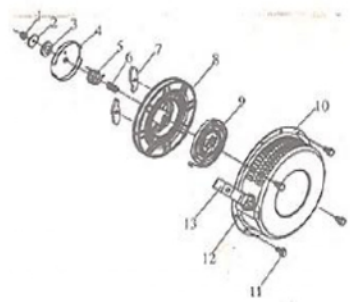
### FUEL INJECTION PUMP ASSEMBLY

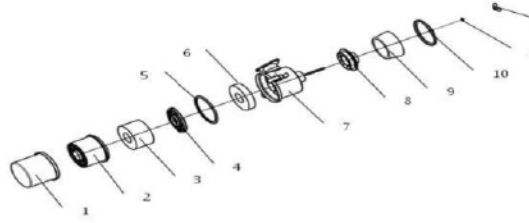


| Part No  | Part Name               | Qty | Part No | Part Name           | Qty |
|----------|-------------------------|-----|---------|---------------------|-----|
| E16-00   | Fuel Injector Pump Assy | 1   | E16-10  | Gasket (Flip Block) | N/A |
| E16-08/9 | Plunger Set             | N/A | E16-19  | Tappet              | N/A |

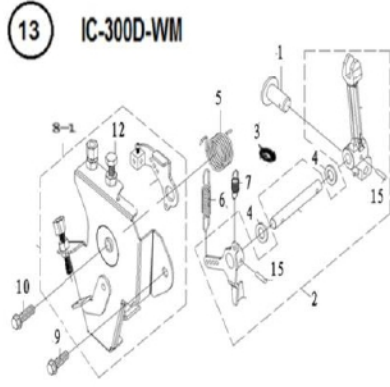
### RECOIL STARTER ASSEMBLY

| Part No | Part Name            | Qty |
|---------|----------------------|-----|
| E17-00  | Recoil Starter Assy  | N/A |
| E17-01  | Nut M8               | N/A |
| E17-02  | Washer(Starter)      | N/A |
| E17-03  | Friction Plate       | N/A |
| E17-04  | Starter Ratchet Reel | N/A |
| E17-05  | Return Spring        | N/A |
| E17-06  | Compression Spring   | N/A |
| E17-07  | Ratchet              | N/A |
| E17-08  | Starter Reel         | N/A |
| E17-09  | Spiral Spring        | N/A |
| E17-10  | Outer Case Assy      | N/A |
| E17-11  | Bolt M6*8 flanged    | 4   |
| E17-12  | Starter Rope         | N/A |
| E17-13  | Starter Handle       | N/A |

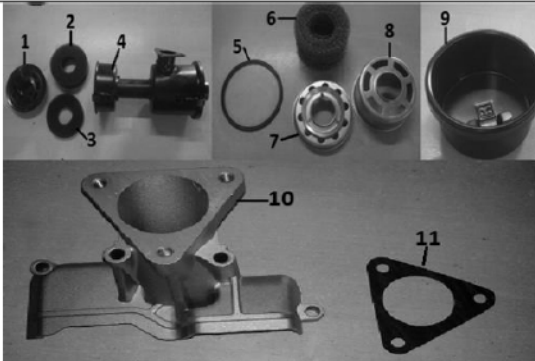


| Ref No. | Part No | Part Name                       | QTY |   |
|---------|---------|---------------------------------|-----|---|
| 12-00   | E12-00  | Air Cleaner Assy (Cyclone Type) | 1   | <p>12. Air Cleaner (11.001.027.0001)</p>  |

### GOVERNOR&CONTROL SYSTEM

| Ref. No. | Part No  | Part Name                 | QTY |  |
|----------|----------|---------------------------|-----|--|
| 1        | E13-01   | Tappet 25.5               | 1   | <p>13 IC-300D-WM</p>  |
| 2        | E13-02   | Lever Fork Assy           | 1   |  |
| 3        | E13-03   | Oil Seal 8*14*4           | 1   |  |
| 4        | E13-04   | Lever Washer              | 2   |  |
| 5        | E13-05   | Return Spring(Lever Fork) | 1   |  |
| 6        | E13-06   | Governor Spring           | 1   |  |
| 7        | E13-07   | Fine Spring               | 1   |  |
| 8-1      | E13-08-1 | Control Lever Assy.       | 1   |  |
| 8-2      | E13-08-2 | Spring Throttle           | 1   |  |
| 9        | E13-09   | Bolt M6*12 Flanged        | 1   |  |
| 10       | E13-10   | Bolt M6*30 Flanged        | 1   |  |
| 11       | E13-12   | Bolt M6*45                | 1   |  |
| 12       | E13-15   | Pin Roll                  | 2   |  |

### AIR CLEANER ASSEMBLY

| Part No | Part Name                 | Qty |  |
|---------|---------------------------|-----|--|
| E14-00  | Air Filter Assy(Oil Bath) | N/A |  |
| E14-01  | Air Filter Top Cover      | N/A |  |
| E14-02  | Air Filter sponge(Big)    | N/A |  |
| E14-03  | Air Filter sponge(Small)  | N/A |  |
| E14-04  | Air Filter Body           | N/A |  |
| E14-05  | O-Ring(Air Filter)        | N/A |  |
| E14-06  | Metal Filter(Air Filter)  | N/A |  |
| E14-07  | Metal Filter Body (Small) | N/A |  |
| E14-08  | Metal Filter Body (Big)   | N/A |  |
| E14-09  | Air Filter Sump           | N/A |  |
| E14-10  | Intake Pipe               | 1   |  |
| E14-11  | Air Cleaner Gasket        | 1   |  |
| E14-12  | Bolt M6*16 flanged        | 3   |  |

### Long-Term Storage of Inter-cultivator

When the Inter-cultivator needs long-term storage, the following measures should be adopted to avoid rust.

1. The instruction manual of diesel engine requires sealing the diesel engine up for keeping purpose.
2. Clean dust and dirt away from the surface of the machine.
3. Drain the lubricant from the gearbox and add new lubricant into it.
4. Paint anti-rust oil on the non-painted area of the non-aluminum surface
5. The machine should be kept in a well-ventilated, dry and soft place.
6. Keep well the self-contained tools, conformity certificate of product and instruction manual.

### Troubleshooting

#### Troubleshooting of Reversing Gears and Cables:

When the Inter-cultivator's running backwards is not normal, it is necessary to adjust the reversing gears and Cables, see the instructions below.

1. Grasp and loosen the reversing handle for 2-3 minutes to confirm the putting into gear. If it is abnormal, adjust it until it is qualified.
2. When the Inter-cultivator is running, loosen the reversing handle, the reversing gears should return to its original position and ensure that there is no abnormal sound made by gears colliding in the gear-box, otherwise, it may cause damage to the gear.

#### Troubleshooting of Clutch Cables:

After some time, use, the clutch does not perform well any more due to the weariness of friction piece and fork of clutch. As for how to adjust cable of the clutch, refer to instructions below.

1. Grasp and loosen the clutch handle 2-3 times to confirm the clutch status. If abnormal, readjust it.
2. If repeated adjustment cannot solve the problem, excess abrasion of fork or friction piece of the clutch can be confirmed. The machine should be sent to special service center to replace it with a new fork of friction piece of the clutch.
3. Dismounting the clutch by unspecialized person, which may cause damage to the clutch and the machine is forbidden.

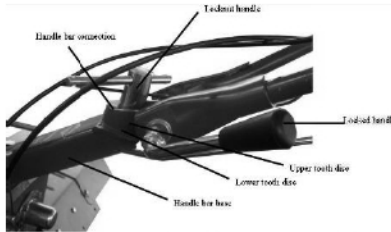
#### Troubleshooting of Accelerator Cables:

When spinning the throttle switch, check if the acceleration or deceleration performance of the diesel engine is good or not, adjust the throttle switch if necessary. Refer to instructions for measures.

1. Repeatedly spin the throttle switch 2-3 times and confirm whether the acceleration or deceleration performance of the diesel engine is ok.
2. Joint of the cable must be firmly connected to the throttle cable.

#### Use & troubleshooting of Handle Bar Frame:

According to your height, farming and other special requirements, the handlebar connection can be adjusted up and down, left and right appropriately as following: (see figure below)



1. The up and down debugging for the handle bar connection
  - a) Unscrew the Locked handle of the handle bar connection, and make the terminal tooth between the handle bar connection and the handle bar base separated.
  - b) Select the best position for the handle bar connection according to your height and comfort.
  - c) Then spin the handle to make the terminal teeth between the handle bar connection and handle bar base engage well with each other.
2. The left and right debugging for the handle bar connection.
  - a) Unscrew the locknut handle of the handle bar base and the upper and lower terminal teeth.
  - b) Spin the handle bar left or right to the desired position.
  - c) Then screw the locknut handle to make the higher and lower terminal teeth of the handle bar base engage well with each other.

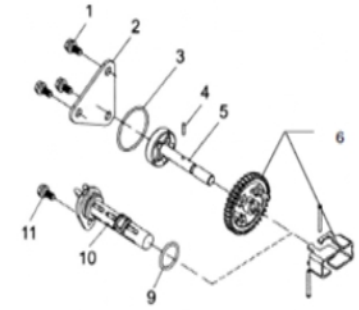
### Troubleshooting of Clutch:

NOTE: Please do not dismantle the clutch assembly yourself. You should contact our dealers for such repairs

| Symptom  | Cause  | Remedy  |
|--|--|---|
| Clutch fails   | Failure of the clutch handle   | Repair or replace the clutch handle   |
|  | Damage of the clutch Cables  | Replace the clutch cables   |
|  | Fork not in the right position   | Re-adjust the cable or replace the fork   |
|  | Welding points between fork shaft and arm base break off                           | Repair or replace the clutch cables   |
|  | Fork pin is bent or broken   | Replace the fork pin  |
|  | Malfunction of the friction piece  | Replace the friction piece  |
|  | Malfunction of spring  | Replace the spring  |
|  | The friction piece fails to touch the bearing face of the clutch cover             | Add some adjustment pads to the back of the bearing   |
| Skidding/Slipping (after loosening the clutch, the diesel engine runs normally, but the main shaft of the transmission shaft stops running or runs slowly) | Bearing is burnt in the clutch   | Replace the bearing Pay attention to refilling engine oil into the gear-box                       |
|  | The spring does not function due to tiredness                                      | Replace the spring  |
|  | 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. |
|  | Cable adjustment is not right  | Re-adjust the clutch Cables.  |

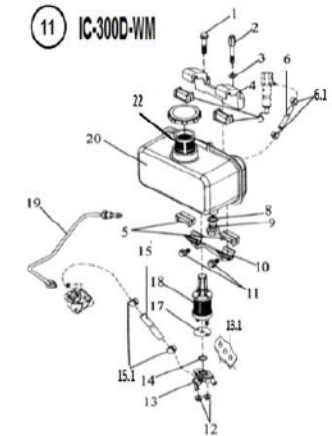
### Troubleshooting Bevel Gears Mesh:

| Part No | Part Name       | QTY |
|---------|-----------------|-----|
| E10-01  | Bolt M6x12      | 3   |
| E10-02  | Oil Pump Cover  | 1   |
| E10-03  | O-Ring 34.8x1.8 | 1   |
| E10-04  | Pin 3x16        | 1   |
| E10-05  | Oil Pump Assy   | 1   |
| E10-06  | Oil Pump Gear   | 1   |
| E10-09  | O-Ring 242.4    | 1   |
| E10-10  | Oil Filter Assy | 1   |
| E10-11  | Bolt M6x14      | 1   |



### FUEL TANK & FUEL PIPE ASSEMBLY

| Part No  | Part Name                | QTY |
|----------|--------------------------|-----|
| E11-01   | Bolt M8*45 flanged       | 1   |
| E11-02   | Upper Stay Bolt          | 1   |
| E11-03   | Washer 8 plain           | 1   |
| E11-04   | Upper Stay               | 1   |
| E11-05   | Fuel Tank Damper         | 4   |
| E11-06   | Fuel Return Pipe Assy    | 1   |
| E11-06.1 | Clip Fuel Return Pipe    | 2   |
| E11-08   | Fuel Tank Plug Seat      | 1   |
| E11-09   | Fuel Tank Plug           | 1   |
| E11-10   | Lower Stay Assy          | 1   |
| E11-11   | Bolt M6*14 flanged       | 2   |
| E11-12   | Nut M6 flanged           | 2   |
| E11-13   | Fuel Tank Cock Assy      | 1   |
| E11-13.1 | Gasket Fuel Tank Cock    | 1   |
| E11-14   | O-Ring 13.2x1.8          | 1   |
| E11-15   | Fuel Pipe Assy           | 1   |
| E11-15.1 | Clip Fuel Pipe           | 2   |
| E11-17   | Fuel Filter Gasket       | 1   |
| E11-18   | Fuel Filter Assy         | 1   |
| E11-19   | Fuel Injection Pipe Assy | 1   |
| E11-20   | Fuel Tank Assy           | 1   |
| E11-21   | Fuel Tank Cap Assy       | 1   |
| E11-22   | Fuel Filter Upper        | 1   |



### CAMSHAFT ASSEMBLY

| Part No | Part Name            | QTY |
|---------|----------------------|-----|
| E6-01   | Valve Rod Assy       | 2   |
| E6-02   | Valve Tappet         | 2   |
| E6-03   | Camshaft Timing Gear | 1   |
| E6-04   | Key 5x14             | 1   |
| E6-05   | Camshaft             | 1   |

### AIR CLEANER ASSEMBLY

| Part No | Part Name            | QTY |
|---------|----------------------|-----|
| E7-01   | Shock Absorber Seat  | 1   |
| E7-02   | Fan Case Welded Assy | 1   |
| E7-03   | Shock Absorber       | 5   |
| E7-04   | Collar 10x10         | 5   |
| E7-05   | Washer 6             | 5   |
| E7-06   | Bolt M6x25           | 5   |

### SILENCER /MUFFLER ASSEMBLY

| Part No | Part Name       | QTY |
|---------|-----------------|-----|
| E8-01   | Silencer Assy   | 1   |
| E8-02   | Nut 8           | 2   |
| E8-03   | Spring Washer 6 | 2   |
| E8-04   | Washer 8        | 2   |
| E8-05   | Bolt M6x14      | 2   |

### LUBE OIL SYSTEM /Oil Pump Assy

When the abnormal transmission of mesh of bevel gear of sound is confirmed, stop the machine and check as follows:

1. Clearance adjustment of mesh of angel gear in gear-box ( See Figure 10)

- When lateral clearance of mesh of the gear  $\Delta < 0.05\text{mm}$ , we should put some vulcanized paper to enlarge the clearance between the gear-box and the traveling box.
- When lateral clearance of mesh of the gear  $\Delta > 0.3\text{mm}$ , we should reduce the clearance to 0.05-0.10 mm between the bearings and gear II shaft

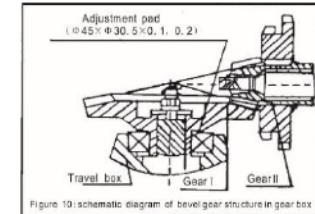


Figure 10: schematic diagram of bevel gear structure in gear box

2. Clearance adjustment of mesh of the gear in the running case.(See Figure 11)

- When lateral clearance of mesh of the gear  $\Delta < 0.05\text{mm}$ , we should increase adjustment pad I by 0.2-0.3mm to enlarge the clearance, and change vulcanized paper board II and adjustment pad. To ensure the axial clearance of the gear is 0.05-0.15mm.
- When lateral clearance of mesh of the gear  $\Delta > 0.3\text{mm}$ , we should reduce adjustment pad I, meanwhile the axial clearance of gear II is 0.05-0.15mm, or increase the adjustment pad II, meanwhile ensure the axial clearance of gear I is 0.05-0.15mm.

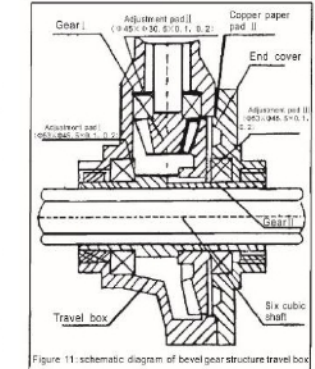


Figure 11: schematic diagram of bevel gear structure travel box

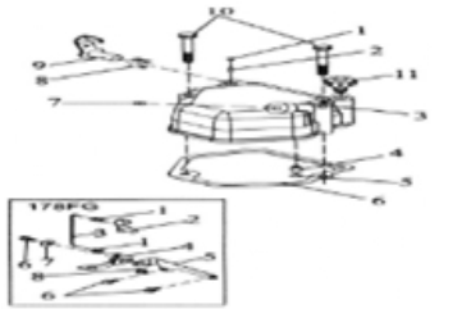
### Troubleshooting of Gear-box:

| Symptom                                 | Cause   | Remedy   |
|---|---|--|
| Failure of fast, slow and neutral shift | Bolts and nuts for the main shaft are loose   | Dismount the bolts, keys cover at the back of the main shaft, screw the round nuts tight, then fix back the bolts and keys cover and screw them tight. |
| Failure to shift to the right position  | Excess abrasion of puller   | Replace the puller   |
|   | Driving angle gear is loose   | Tighten the round nuts   |
|   | Excess abrasion of the upper hole in the connection piece of support arm                              | Replace the support arm assembly   |
|   | Positioning spring inside the main shaft does not function  | Replace the shaft  |
|   | Main shaft is moving, the bolts for tightening the cover for the rear of the gear-box body are loose. | Screw the bolts tight  |
|   | Deformation of shift bar brings about interference when you shift                                     | Adjust the shift bar or replace it   |
|   | Abrasion of reversing fork  | Re-adjust the cable of reversing shift.  |

| Symptom  | Cause  | Remedy  |
|--|--|---|
| Failure to shift the reversing shift to the right position |  | Replace the reversing fork  |
|  | Malfunction of reversing cable   | Re-adjust the cable.<br>Replace the cable   |
|  | The reversing shaft is loose   | Screw the bolts tight at the back of the reversing shaft  |
|  | The reversing fork is blocked to a standstill                                      | Clean the combined face between reversing fork and reversing pushing plate to make the fork move freely |
| The reversing gears do not reset                           | The loosening of reversing shaft makes the gear be blocked to a standstill         | Screw the bolts tight at the back of the reversing shaft.   |
|  | Malfunction of spring of the reversing shaft                                       | Replace the spring  |
|  | The reversing shaft is bent and deformed   | Replace the reversing shaft   |
| The reversing shaft is loose                               | Rear bolts of reversing shaft are loose  | Screw the reversing shaft   |
|  | The matching between reversing shaft and gear-box body is too loose                | Replace the shaft   |
| Too much noise from the gears                              | Deformation and bend of the angle gear and reversing shaft                         | Replace the shaft   |
|  | Too much lateral clearance due to excess abrasion of gears                         | Replace the gears   |
|  | The matching between bevel gear and reversing shaft and gear-box body is too loose | Replace the shaft   |
| Oil leakage of the main shaft's rear cover                 | Malfunction of O-shaped ring for the main shaft                                    | Replace with O-shaped ring $\phi 17 \times 1.8$   |
|  | Malfunction of lip-shaped oil seal in the main shaft                               | Replace with lip-shaped oil seal B25407   |
|  | Malfunction of O-shaped ring for the cover   | Replace with O-shaped ring $\phi 46 \times 1.8$   |
| Oil leakage of the reversing shaft                         | Loosening of bolts at the back of reversing shaft                                  | Screw the bolts tight   |
|  | Malfunction of O-shaped ring of the reversing shaft                                | Replace with O-shaped ring $\phi 18 \times 1.8$   |
| Oil leakage of the fork shaft of the reversing shaft       | Malfunction of O-shaped ring   | Replace with O-shaped ring $\phi 1.2 \times 1.8$  |
| Oil leakage of the fork shaft of the clutch                | Malfunction of O-shaped ring   | Replace with O-shaped ring $\phi 1.2 \times 1.8$  |
| Oil leakage of the shift shaft                             | Malfunction of O-shaped ring   | Replace with O-shaped ring $\phi 1.2 \times 1.8$  |
| Oil leakage of the flange connection                       | The bolts are loose there  | Screw the bolts tight   |
|  | The vulcanized paper board is damaged there  | Replace the paper board   |

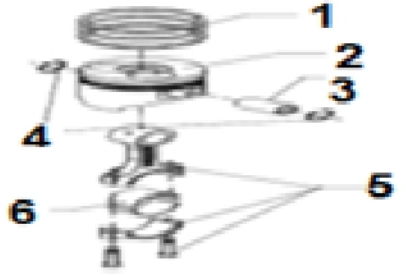
**CYLINDER HEAD BONNET ASSEMBLY**

| Part No | Part Name          | Qty |
|---------|--------------------|-----|
| E3-03   | Bonnet Assy        | 1   |
| E3-06   | Bonnet Gasket      | 1   |
| E3-10   | Bolt M6*55 flanged | 2   |



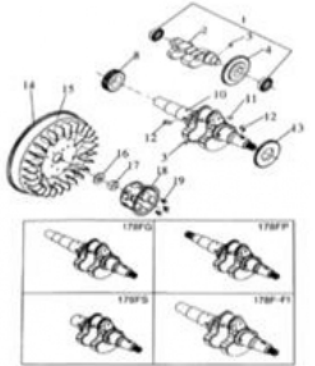
**PISTON & CONNECTING ROD ASSEMBLY**

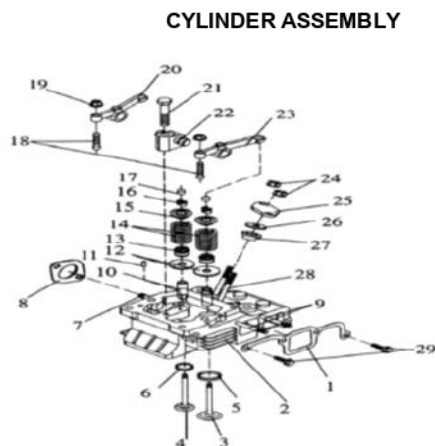
| Part No | Part Name           | QTY |
|---------|---------------------|-----|
| E4-01   | Piston Ring Set     | 1   |
| E4-02   | Piston              | 1   |
| E4-03   | Piston Pin          | 1   |
| E4-04   | Circlip Piston Pin  | 2   |
| E4-05   | Connecting Rod Assy | 1   |
| E4-06   | Crank Pin Bearing   | 1   |



**CRANK SHAFT & FLYWHEEL ASSEMBLY**

| Part No | Part Name                    | QTY |
|---------|------------------------------|-----|
| E5-01   | Ball Bearing 6202/P5         | 2   |
| E5-02   | Balancer Shaft               | 1   |
| E5-03   | Key 5x7                      | 2   |
| E5-04   | Timing Gear Of Balance Shaft | 1   |
| E5-08   | Crankshaft Timing Gear       | 1   |
| E5-10   | Crank Shaft                  | 1   |
| E5-11   | Steel Ball                   | 1   |
| E5-12   | Key 5x12                     | 2   |
| E5-13   | Drive Gear Of Balance Shaft  | 1   |
| E5-15   | Fly Wheel                    | 1   |
| E5-16   | Fly Wheel Nut Washer         | 1   |
| E5-17   | Fly Wheel Nut                | 1   |
| E5-18   | Starter Pulley               | 1   |
| E5-19   | Bolt M6x12                   | 3   |





| Ref. No. | KK-PART NO        | KK-PART NAME                  | Qty |
|----------|-------------------|-------------------------------|-----|
| 1        | E2-01             | Air Intake Gasket             | 1   |
| 2/5/6/10 | E2-02/5/6/10      | Cylinder Head                 | 1   |
| 3        | E2-03             | Intake Valve                  | 1   |
| 4        | E2-04             | Exhaust Valve                 | 1   |
| 7        | E2-07             | Stud AM 8*32                  | 2   |
| 8        | E2-08             | Silencer Gasket               | 1   |
| 9        | E2-09             | Bolt 6*72 flanged             | 2   |
| 11       | E2-11             | Pin 4*8                       | 1   |
| 12       | E2-12             | Valve Spring Washer           | 2   |
| 13       | E2-13             | Valve Conduit Oil Seal        | 2   |
| 14       | E2-14             | Valve Spring                  | 2   |
| 15       | E2-15             | Valve Spring Retainer         | 2   |
| 16       | E2-16             | Cotter                        | 4   |
| 17       | E2-17             | Valve Adjusting Plate         | 2   |
| 18       | E2-18/19/20/22/23 | Rock Arm Assy                 | 1   |
| 21       | E2-21             | Bolt M8*45 flanged            | 1   |
| 24       | E2-24             | Nut M6 flanged                | 2   |
| 25       | E2-25             | Nozzle Retainer               | 1   |
| 26       | E2-26             | Spacer Washer(Injector) (Set) | 1   |
| 27       | E2-27             | Insulation Sleeve             | 1   |
| 28       | E2-28             | Stud AM6*60                   | 2   |
| 29       | E2-29             | Bolt M6*25 flanged            | 2   |

| Symptom                                     | Cause                                   | Remedy   |
|---|---|--|
| Leakage of the gear-box body                | The gear-box body has tiny hidden holes | Re-welding or brush base paint to stop the leaking |
| Oil leakage of the fork shaft of the clutch | Malfunction of O-shaped ring            | Replace with O-shaped ring $\phi 1.2 \times 1.8$   |
| Oil leakage of the shift shaft              | Malfunction of O-shaped ring            | Replace with O-shaped ring $\phi 1.2 \times 1.8$   |
| Oil leakage of the flange connection        | The bolts are loose there               | Screw the bolts tight                              |
|   | The vulcanized paper is damaged         | Replace the paper board                            |
| Leakage of the gear-box body                | The gear-box body has tiny hidden holes | Re-welding or brush base paint to stop the leaking |

### Troubleshooting of Traveling Mechanism

| Symptom  | Cause  | Remedy   |
|--|--|--|
| Too much noise from the gear   | Excess abrasion or error repairing of the gear | Re-fix and re-adjust or replace the gear           |
| Gears are blocked to standstill when running                         | Error in fixing                                | Re-fix the gears.                                  |
| Overheating  | Not enough lubricant in the box                | Re-fill oil according to the request               |
|  | The lateral clearance of gear is too small     | Re-fix   |
|  | The axial clearance is too small               | Re-adjust the clearance value                      |
| Oil leakage of the gear-box connection                               | The connection bolt is loose                   | Screw the bolt tight                               |
|  | The seal gasket is damaged                     | Replace with lip-shaped oil seal B45628            |
| The oil leakage of the output shaft casing                           | The lip-shaped oil seal there is damaged       | Replace with lip-shaped oil seal B45628            |
| Serious oil leakage of the hexagonal hole in the output shaft casing | The shaft casing there is broken               | Replace the shaft                                  |
| Oil leakage of oil hole  | The O-shaped ring there is damaged             | Replace with O-shaped ring $\phi 10 \times 1.8$    |
|  | The bolts are loose                            | Screw the bolts tight                              |
| Leakage of the Traveling box body                                    | The Traveling box body has tiny hidden holes   | Re-welding or brush base paint to stop the leaking |

### Engine Troubleshooting:

### Difficulty in starting or failure to start:

| Cause   | Remedy   |
|---|--|
| A. Extremely cold weather   | Pour in 3-5g engine oil in air intake pipe or spray hot water at the top of the cylinder head. |
| B. Failure of fuel system   |  |
| 1. Fuel is frozen   | Replace the fuel, apply proper fuel type.  |
| 2. Water in fuel  | Clean oil tank and replace fuel  |
| 3. Failure of injector  | Adjust pressure or clean up carbon deposit, grind or replace parts                             |
| 4. Injector doesn't work or bad fuel supply of oil pump                                 | Fasten type T bolt of oil supply pipe, evacuate air in the pipe.                               |
| C. Insufficient compression force   |  |
| 1. Nuts of cylinder head is loosened or cylinder gasket is damaged                      | Fasten nuts or replace gasket  |
| 2. Piston ring, piston, or cylinder liner is worn out.                                  | Repair or replace the part whichever is necessary.   |
| 3. Piston ring is banded or broken  | Clean or replace the piston ring   |
| 4. Bad sealing of throttle and throttle seat causes gas leakage.                        | Grind throttle.  |
| 5. Improper clearance of air intake and exhaust valve.                                  | Adjust as per relevant requirements  |
| 6. Throttle stem is seized in duct  | Remove throttle and clean it   |
| 7. Too much drop of compression ratio even after adjusting throttle seat several times. | Replace throttle seat.   |
| D. Improper oil supply advance angle  | Adjust as per relevant requirements  |
| E. Viscosity of engine oil is too large   | Fill engine oil of right type and right grade.   |

### Insufficient Engine Power:

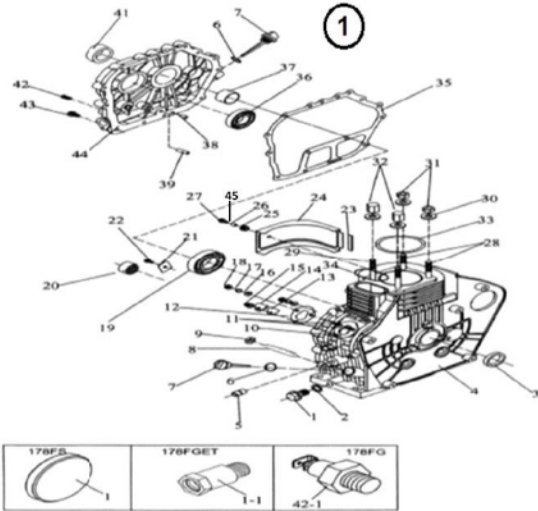
| Cause  | Remedy                                |
|--|---------------------------------------|
| A. Failure of oil passage system               |                                       |
| 1. Oil passage is blocked, unsmooth oil supply | Check the oil passage                 |
| 2. Bad oil supply of injection pump            | Repair or replace the necessary parts |
| 3. Failure of injector                         | Refer to "difficulty in starting"     |
| B. Insufficient compression force              | Refer to "difficulty in starting"     |
| C. Air filter is blocked                       | Clean or replace filter element       |
| D. Rotary speed is too low                     | Throttle up                           |
| E. Improper oil supply advance angle           | Adjust as per the requirements        |

| Ref. No. | KK-PART NO | KK-PART NAME   | Qty |
|----------|------------|--|-----|
| 1        | E1-01      | Drain Plug   | 1   |
| 2        | E1-02      | Washer (Drain Plug)  | 1   |
| 3        | E1-03      | Oil Seal Sg30*45*8   | 1   |
| 4        | E1-04      | Cylinder Block.  | 1   |
| 5        | E1-05      | Needle Bearing/Hk081410                                    | 2   |
| 6        | E1-06      | O-Ring 24*2.4  | 2   |
| 7        | E1-07      | Oil Filler cap   | 2   |
| 08/09    | E1-08/9    | Fuel Controller  | 1   |
| 10       | E1-10      | Stud AM6*30  | 1   |
| 11       | E1-11      | Stud AM6*40  | 2   |
| 12       | E1-12      | Fuel Injection Pump Gasket (Set)                           | 1   |
| 13       | E1-13      | Seal Gasket(Fuel Pump)                                     | 1   |
| 14       | E1-14      | Seal Plate(Fuel Pump)                                      | 1   |
| 15       | E1-15      | Nut M6 flanged   | 3   |
| 16       | E1-16      | Washer 6 plain   | 2   |
| 17       | E1-17      | Spring Washer 6  | 2   |
| 19       | E1-19      | Ball Bearing 6307/P5                                       | 1   |
| 20       | E1-20      | Needle Bearing HM1512                                      | 1   |
| 21       | E1-21      | Retainer(Bearing)  | 1   |
| 22       | E1-22      | Bolt M8*16 flanged   | 1   |
| 23       | E1-23      | Cushion Blocking   | 1   |
| 24       | E1-24      | Governor   | 1   |
| 25       | E1-25      | Vibration Isolation Cushion Block/Shock Absorber(Governor) | 1   |
| 26       | E1-26      | Sheath   | 1   |
| 27       | E1-27      | Bolt M6*20 flanged   | 1   |
| 28       | E1-28      | Cylinder Head Stud/M9*87                                   | 2   |
| 29       | E1-29      | Cylinder Head Stud/M9*104.5                                | 2   |
| 30       | E1-30      | Washer (Head Nut)  | 4   |
| 31       | E1-31      | Cylinder Head Nut short                                    | 2   |
| 32       | E1-32      | Cylinder Head Nut ( Long)                                  | 2   |
| 33       | E1-33      | Cylinder Head Shim (Set)                                   | 1   |
| 34       | E1-34      | Cylinder Rubber Ring                                       | 1   |
| 35       | E1-35      | Crank Case Gasket  | 1   |
| 36       | E1-36      | Ball Bearing 6206/P5                                       | 1   |
| 37       | E1-37      | Main Bearing   | 1   |
| 38       | E1-38      | Pin 8*12   | 2   |
| 39       | E1-39      | Oil Pipe   | 1   |
| 41       | E1-40      | Oil Seal SG30*45*10  | 1   |
| 42-1     | E1-41      | N/A  | N/A |
| 42       | E1-42      | Hexagonal internal screw plug                              | 1   |
| 43       | E1-43      | Bolt M8 * 33.5 flanged                                     | 15  |
| 44       | E1-44      | Crank Case Cover   | 1   |
| 45       | E1-45      | Washer 6*18*2  | 1   |



Parts Diagram & List- Engine of KK-IC-305D

CYLINDER BLOCK ASSEMBLY



|  |  |
|--|--|
| F. Improper clearance of air intake and exhaust valve.                                   | Adjust as per the requirements               |
| G. Parts of injection pump or injector is worn out or injection pressure is insufficient | Replace parts and adjust injection pressure. |

Unstable working or discontinuous eruption noise

| Cause   | Remedy   |
|---|--|
| A. Failure of fuel system   |  |
| 1. Air mixing in fuel system  | Evacuate the air                               |
| 2. Bad fuel quality or water mixing in fuel   | Check the fuel and replace it if necessary     |
| 3. Injector parts are jammed or excessive injection pressure                        | Check injector and adjust injection pressure   |
| 4. Needle valve parts of injector is worn out or parts are blocked by injector stem | Check the parts and replace if necessary.      |
| B. Speed regulating system is seized  | Check, repair or replace the regulating valve. |

Self-Shutdown of Diesel Engine:

| Cause   | Remedy   |
|---|--|
| A. Failure of fuel system   |  |
| 1. Insufficient fuel in oil tank  | Refill the fuel  |
| 2. Diesel oil filter and oil supply duct are blocked or gas leakage         | Clean or evacuate the air                                      |
| 3. Injector parts are seized  | Clean or grind parts and replace if necessary                  |
| B. Failure of lubrication system  |  |
| 1. Insufficient engine oil in crank case causes damages of mechanical parts | Fill engine oil, repair damaged parts and replace if necessary |
| 2. Bad lubrication of crank journal damages the bushing                     | Clean oil passage, repair damaged parts                        |

Other Failures:

| Cause                          | Remedy                     |
|--------------------------------|----------------------------|
| A. Injector is seized often    |                            |
| 1. High temperature crash stop | Crash stop is not allowed. |

|  |   |
|--|---|
| 2. Unclean fuel or damaged fuel filter.  | Clean oil tank, replace fuel filter   |
| <b>B. Engine oil overflows from exhaust</b>  |   |
| 1. Piston or cylinder head is worn out   | Check, repair and replace the piston or cylinder if necessary                   |
| 2. Throttle duct is worn out   | Check, repair and replace the throttle duct if necessary.                       |
| 3. Piston ring is bonded or damaged  | Clean or replace the piston ring  |
| 4. Excessive engine oil  | Discharge engine oil until normal level is reached                              |
| <b>C. Fluctuating rotary speed</b>   |   |
| 1. Gas leakage at the joint of oil supply pipe                                       | Fasten the joint or replace gasket  |
| 2. Adjusting bolt on speed regulating spring is loosened.                            | Adjust and fasten   |
| <b>D. Black smoke in exhaust</b>   |   |
| 1. Overload  | Reduce load   |
| 2. Improper power  | Select proper power   |
| 3. Improper oil supply advance angle   | Adjust as per relevant requirements   |
| 4. Incomplete combustion   | Check injector quality and if compression force is sufficient                   |
| <b>E. Stop the engine immediately in case of any of the following circumstances:</b> |   |
| 1. Fluctuating rotary speed  | Check speed regulating system, air mixing in fuel passage and evacuate the air. |
| 2. Abnormal noise suddenly   | Check each moving part for any damage   |
| 3. Black smoke in exhaust  | Check the fuel system for normal oil supply, particularly the injector.         |

**Other Troubleshooting:**

| Symptom                          | Cause   | Remedy  |
|----------------------------------|---|---|
| The cultivating blade is broken  | Collision with the hard things like stones when working | Replace the blade. Avoid colliding with hard things like stones in the earth when working |
| The manipulation cable is broken | Long-time abrasion in work                              | Replace the cable   |

**Technical Specifications**

| Parameter          | KK-IC-305D                               |
|--------------------|--|
| Rated Power        | 4.47 kW (6 hp)/3600                      |
| Rated speed        | 3600 RPM                                 |
| Displacement       | 296 cc                                   |
| Type               | diesel engine, 4 stroke, single cylinder |
| Type of cooling    | forced air cooling                       |
| SFC (Max)          | ≤310g/kWh                                |
| Bore * Stroke      | 78 * 62 mm                               |
| Fuel tank capacity | 3.5 Ltr                                  |
| Number of Gears    | 2 Fwd, 1 Rev                             |
| Cultivation Width  | 130 - 131 cm                             |
| Cultivation Depth  | 4.8 - 5.7 cm                             |