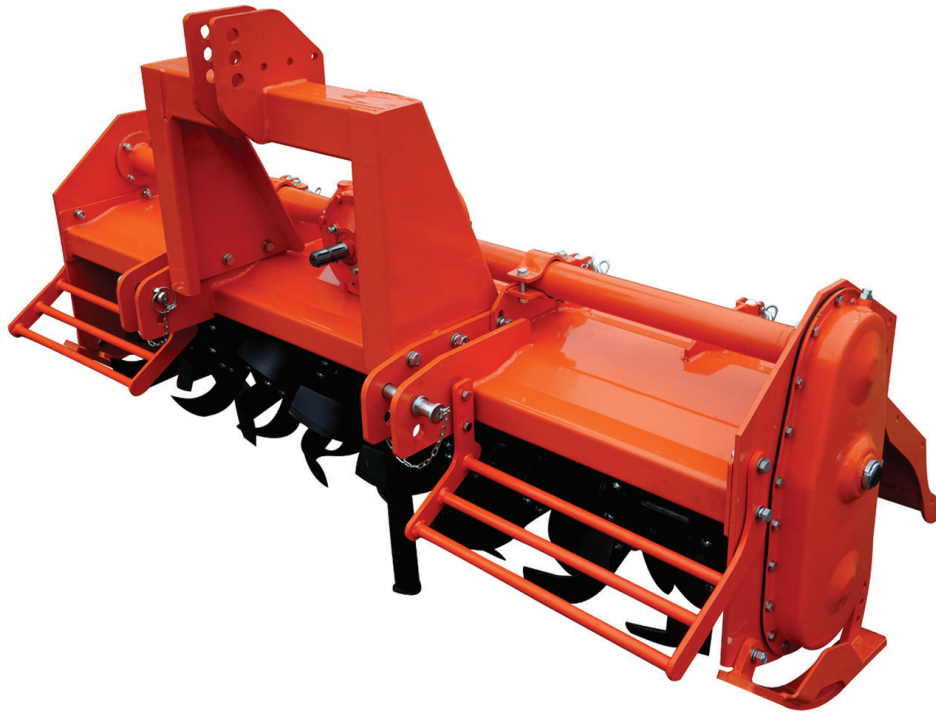




BE-IGN210 Rotary Tiller



Operations & Parts Manual

For Models:

- BE-IGN210

Purchase Date	Model No.	Serial No.
Dealer		

BE-IGN MODELS

Whether you are laying turf around a gold course or growing small crops, the Rotary Tiller is perfect for preparing your top soil for planting. It creates a seed bed finish and is ideal for crop and lawn preparation, improving productivity as well as presentation.

FEATURES:

- PTO driven, adjustable rear flap for safety as well as providing a smooth finish.
- 6 extra strong blades per flange for a more thorough tilling of top soil.
- Height adjustable skids for depth control.
- Extra strong design for long life and reliability.

MODEL	BE-IGN210
Tractor HP	55-70 HP
3-Point Linkage	Cat 2
Length	1030mm
Width	2270mm
Height	1145mm
Weight	498kg
Digging Width	2000mm
Digging Height	180mm



Before operating the Rotary Tiller read the following safety instructions. Failure to comply with these warnings may result in serious injury or death

CONGRATULATIONS! On the purchase of your new Rotary Tiller. This information is to assist you in preparing, operating and maintaining your Rotary Tiller. Please read and understand the information completely before operating your new Rotary Tiller, paying special attention to all the safety details. Keep this manual handy for a ready reference.

SAFETY FIRST

You are responsible for the safe operation and maintenance of your Rotary Tiller. You must ensure that you and anyone else who is going to operate, maintain or work round the Rotary Tiller is familiar with the operating and maintenance procedures and related safety information contained in this manual. This manual will take you step-by-step through your working day and alert you to all good safety practices that should be adhered to while operating the Rotary Tiller.

Remember, you are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that everyone operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

Rotary tiller owners must give operating instructions to operators or employees before allowing them to operate the machine.

The most important safety feature on this equipment is a safe operator. IT is the operator's responsibility to read and understand all safety and operating instructions in the manual and to follow these. All accidents can be avoided.

A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator jeopardizes himself and bystanders to possible serious injury or death.

Do not modify the equipment in any way. Unauthorized modification may weaken the function and/or safety and could affect the life of the equipment.

Think SAFETY, Work SAFELY!

- Read the operator's manual and all safety signs carefully before operating, maintaining, adjusting or removing the rotary tiller.
- Do not allow passengers to ride on the rotary tiller.
- Operate only at a safe distance from bystanders. Clear the area of people, especially small children, before starting.
- Stop PTO before dismounting tractor.
- Keep feet and hands from under rotary tiller at all times.
- Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.
- Do not stand between the tractor and rotary tiller.
- All rotary blades have the ability to discharge objects at high speeds, which could result in serious injury to bystanders or passers-by, use extreme caution.
- Place all controls in neutral, stop tractor engine, set park brake, removal ignition key and wait for all moving parts to stop before servicing, adjusting, attaching or removing.
- Review safety related items annually with all personnel who will operate or maintain the rotary tillers.
- Do not operate machine if you feel unwell or physically unfit, in which case you should stop working.
- This machine was designed with safety very much in mind. However, there is no real substitute for caution and attention in preventing accidents. Once an accident has happened, it is too late to think about what you should have done.
- Use a tractor equipped with a Roll Over Protective Structure (ROPS). Always wear your seatbelt. Serious injury or even death could result from falling off the tractor - particularly during a turnover when the operator could be pinned under the ROPS or the tractor.
- Never exceed the limits of a piece of machinery.
If it ability to do a job, or to do so safely, is in question - **DON'T TRY IT.**
- Clear working area of stones, branches or hidden obstacles that might be hooked or snagged, causing injury or damage.

OPERATING SAFETY

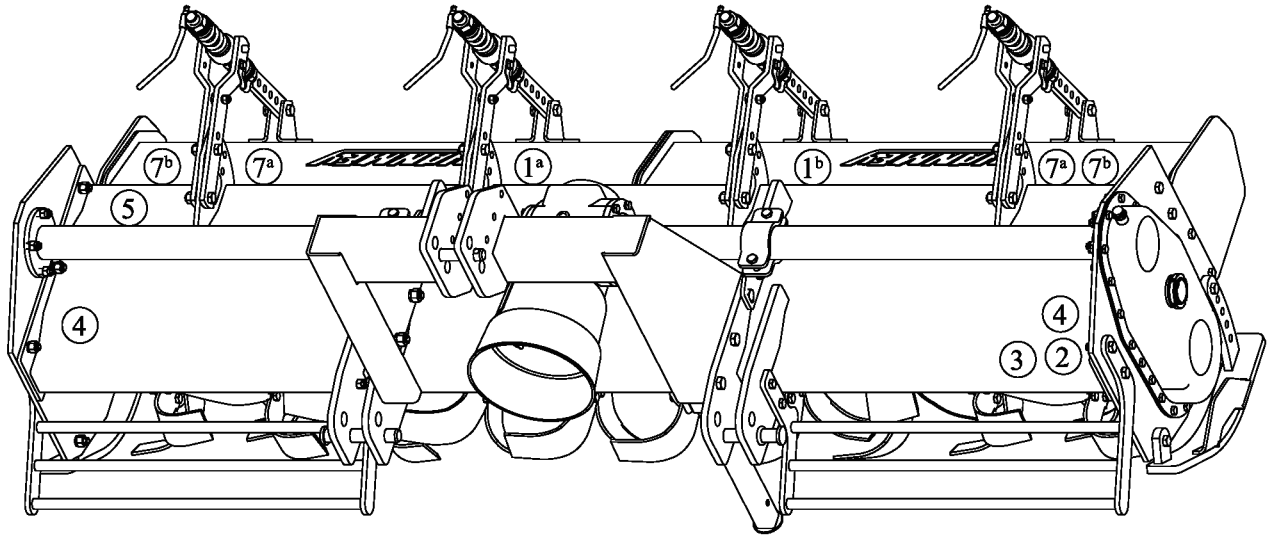
- Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting, repairing or removing.
- Do not allow riders.
- Install and secure all guards and shields before starting or operating.
- Keep hands, feet, hair and clothing away from moving parts.
- Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, attaching or removing.
- Place all tractor and machine controls in neutral before starting.
- Never start or operate machine unless sitting on tractor seat.
- Clear the area of bystanders, especially small children, before starting.
- Stay away from PTO shaft and machine when engaging PTO. Keep others away.
- Use warning lights on tractor when transporting.
- Do not put hands or feet under machine while tractor engine of machine is running.
- Do not operate rotary tiller in raised position.
- Objects can be thrown out from under machine with sufficient force to severely injure people.
- Stay away from machine when it is running. Keep others away.
- Always know what you are tilling. Never operate rotary tiller in an area that has hidden obstacles. Remove sticks, stones, wire or other objects from working area before starting.
- Review safety instructions with all operators annually.

- Store the machine in an area away from human activity.
- Do not permit children to play on or around the stored machine.
- Store the machine in a dry, level area.
- Clean grease and oil as required and protect it from the elements.

MAINTENANCE SAFETY

- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
- Follow good shop practices.
- Keep service area clean and dry.
- Be sure electrical outlets and tools are properly grounded.
- Use adequate light for the job at hand.
- Make sure there is plenty of ventilation. Never operate the engine of the tractor in a closed building. The exhaust fumes may cause asphyxiation.
- Before working on this machine, shut off the engine, set the brakes and remove the ignition key.
- Never work under equipment unless it is secured by a mechanical stand.
- Use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance work. Use heavy gloves when handling blades.
- Only use genuine parts for service and maintenance.
- A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
- Periodically tighten all bolts, nuts, screws and check that all pins are properly installed to ensure unit is in a safe condition.
- When completing a maintenance or service function, make sure all safety shields and devices are installed before placing machine in service.

The position of safety decals are shown in the illustration below. Good safety requires that you familiarize yourself with the various safety signs and increase your Safety Awareness.

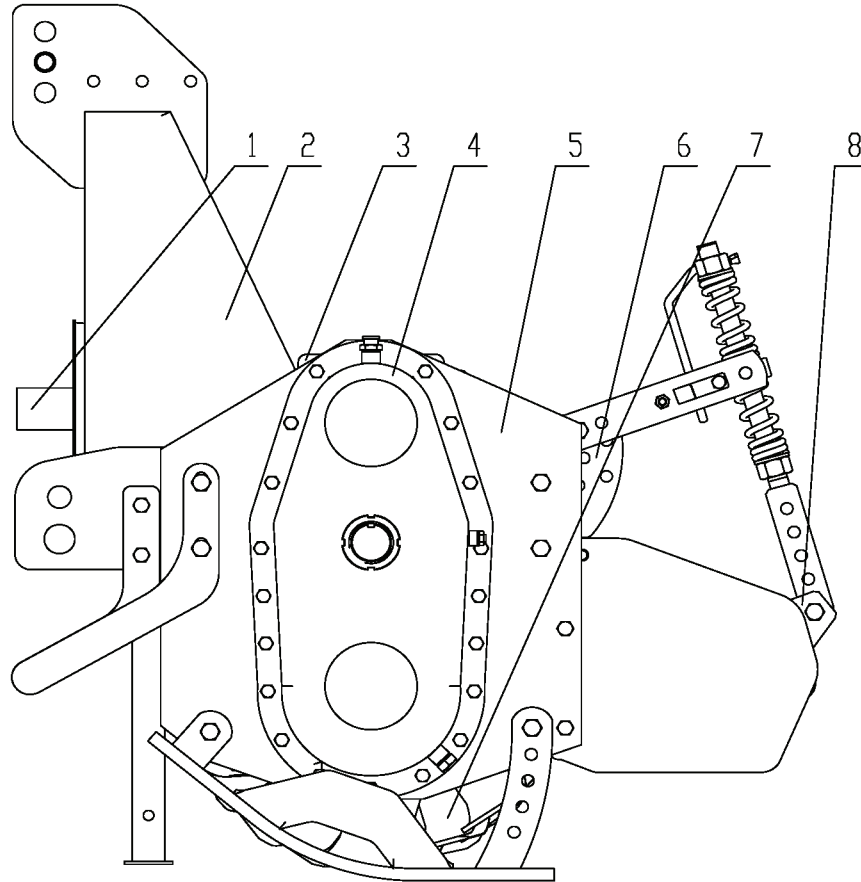


1^a 1GNA-230B

2 Model
Serial No

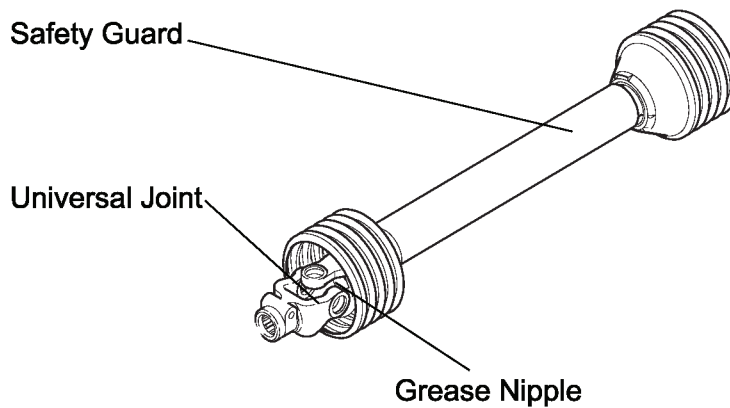
3 ST:





1. PTO Shaft	2. Head Stock	3. Gear box	4. Pulley Gear box
5. Right side plate	6. Cover	7. Blade Shaft	8. Trailing Bar

PTO Shaft



Each rotary tiller has the same number of left and right blades. The outer flanges have three blade end turned inwards. The inner flanges carry six blades and consists of three left and three right. Make sure the front or sharpened edge of the blades enter the soil first.

CONNECTING WITH THE THREE-POINT LINKAGE OF TRACTOR

The rotary tiller is connected to the tractor by the three-point linkage. Install as follows:

1. Align the center of headstock by reversing the tractor, raise the link arm to appropriate height, reverse the tractor to make the link arm of tractor joint with the left and right pin of rotary tiller.
2. First install the left lower linkage arm, then install right lower arm, (because the leveling lift rod has a screw that can be adjusted length). Finally insert the pins.
3. Install the upper linkage arm and then insert the pin.
4. Mount universal coupling and then insert the pins, poke the cotter pin.

ADJUSTMENT BEFORE WORKING

1. On a flat surface, lower the implement to the ground. If not sitting level side to side, adjust the vertical linkage arms on the three-point linkage until the implement is sitting level on the ground.
2. Adjust the toplink to reduce the angle at the PTO shaft universal to the minimum at working depth. The angle of the universal should not exceed 10° when it is working and 30° when it is lifted for transport. Do not engage and operate the PTO at angle of greater than 10° at the universal.
3. Adjust the working depth by setting the adjustable skids to the required height.

STARTING OF THE TILLER

First, check the level of the gear oil in the gearbox and the side chain box, grease the PTO shaft and the bearing seat of the blade shaft. Then check for looseness of all connecting bolts and nuts, if loose, tighten at once. If a crack or bent blades are found they must be replaced.

Starting tractor: Lift the hoe so the blades clear the ground, engage the PTO and run at low revs to ensure there is no jamming.

Soil penetration: Use PTO speed 1 (540RPM) and select low creeper gear. Increase rev and lower the tiller gradually until desired depth is met, then proceed forward.

1. Grease: Use multi-purpose lithium based grease.
2. Gearbox Oil: Use SAE 90 Gear Oil.
3. Storing Lubricants: Your machine can operate at top efficiency only if clean lubricants are used.
Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

GREASING

1. Use a hand-held grease gun for all greasing.
2. Wipe grease nipple with a clean cloth before greasing, to avoid injecting dirt and grit.
3. Replace and repair broken nipples immediately.
4. If nipples will not take grease, remove and clean thoroughly. Also clean lubricant passageway.
Replace nipple if necessary.

MAINTENANCE

The recommended period is based on normal operating conditions. Severe or unusual conditions may require more frequent maintenance.

DAILY MAINTENANCE

- Check all nuts and bolts in connection parts, replace if required.
- Check the oil in gearbox. Fill up to line if required.
- Pump grease into each grease nipple three to five times.
- Clean the implement; take away all debris and residue.

SEASONAL MAINTENANCE

- Check the machine as above for daily maintenance.
- Check the oil in gearbox; replace if contaminated.
- Check the bearings of blade spindles for wear and tear, if worn, disassemble, clean and replace them if it is necessary, grease as required.

ANNUAL MAINTENANCE

- Thoroughly clean the rotary tiller of debris and residue.
- Drain the gearbox and clean it thoroughly. Fill with new gear oil up to the dedicated oil level.
- Check and clean blade axles. Check oil seals and replace if necessary.
- Check all blades, replace them if they are worn out or damaged.
- Repair the side skirts; return them to original technical condition. Replace damaged or broken protective devices.
- Remove the drive shaft from the machine. Pull the PTO shaft apart. Check and replace any components that are damaged or worn. Install the PTO shaft on the machine. The PTO shaft should telescope easily and the guard turn freely on the shaft, grease if necessary.

MAINTENANCE CHECKLIST											
	8HRS/Daily			50HRS/Weekly			Annually				
Lubricate PTO Shaft	✓			✓			✓				
Lubricate Caster Wheels	✓			✓			✓				
Lubricate Blade Spindle	✓			✓			✓				
Check Gear Box Oil Level				✓			✓				
Clean Machine							✓				
Lubricate & Clean PTO Shaft Cover							✓				

PTO SHAFT MAINTENANCE

The PTO shaft is designed to telescope to allow for dimensional changes as the machine goes through its operating range. A Tubular guard encloses the driving components and is designed to remain stationary on a turning shaft when required. The shaft should telescope easily and the guard turn freely on the shaft at all times. Annual disassembly, cleaning and lubrication is recommended to insure that all components function as intended. To maintain the shaft, follow this procedure:

1. Remove the shaft from the machine
2. Pull shaft apart.
3. Use a screwdriver to pry the tabs out of the sleeves on each end. There are 3 tabs per guard.
4. Pull the shaft out of the plastic tubular guard.
5. Use a solvent to clean the male and female portions of the telescoping ends.
6. Apply a light coat of grease to each end.
7. Clean grooves on each end where the tabs are located. Clean each tab also.
8. Apply a light coat of grease to each groove.
9. Insert the shaft into its respective guard and align the slots with the groove.
10. Insert the tabs through the slots and seat in the groove.
11. Check that each guard turns freely on the shaft.
12. Assemble the shaft.
13. Check that the shaft telescopes easily.
14. Replace any components that are damaged or worn.
15. Install the shaft on the machine.

GEARBOX MAINTENANCE

The gearbox used on the rotary tiller will give many years of trouble-free service with minimal maintenance requirements. Maintain the gearbox by following this procedure:

Oil Level:

- Remove the level plug from the rear or side of the gearbox.
- Add oil through the filler plug located on the top of the gearbox until oil comes out of level plug.
- If gearbox has a dipstick on filler plug, then fill to indicator mark.

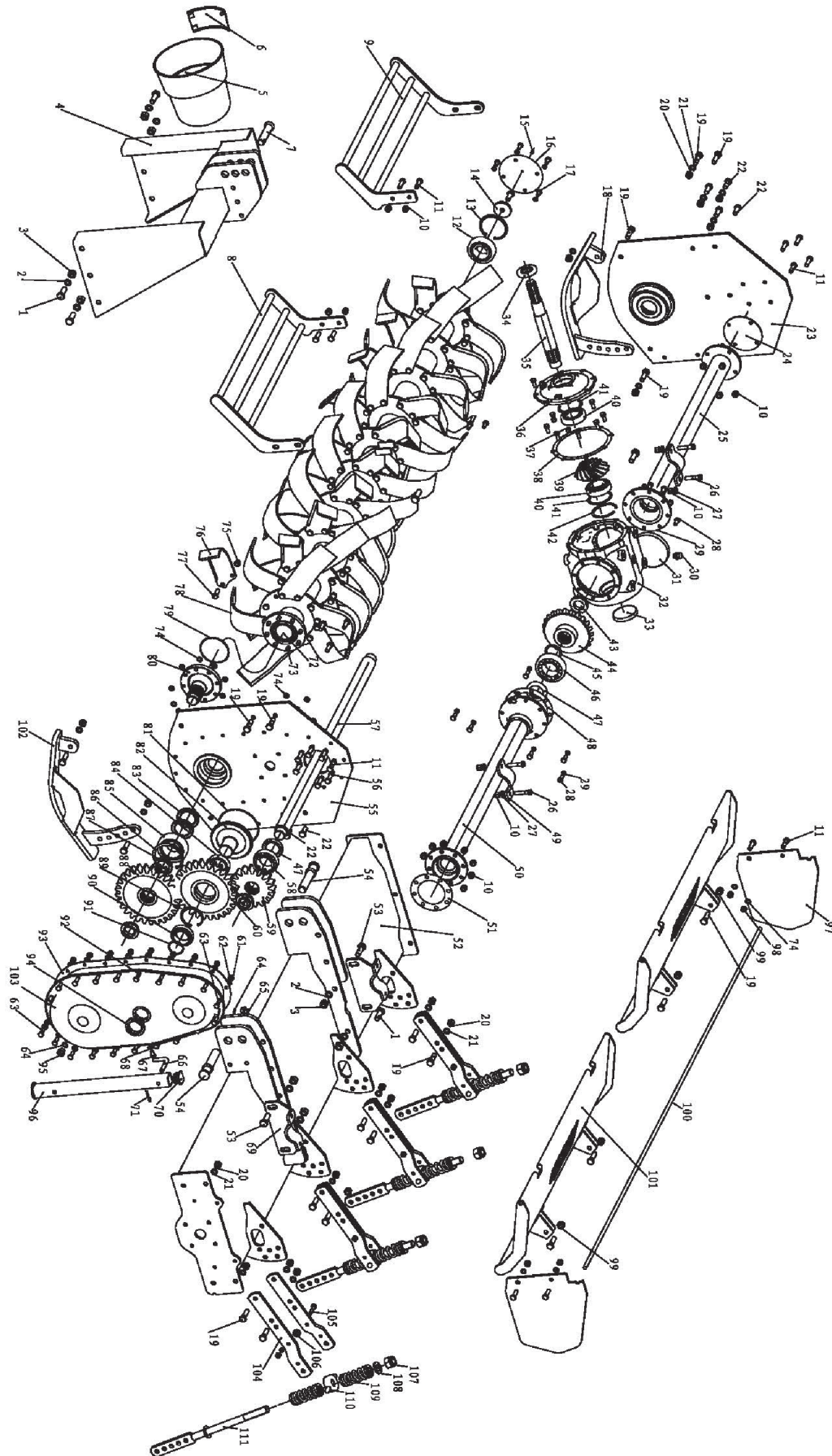
IMPORTANT: Check the oil level only when the unit is cold and the machine is on the level.

After the season's use, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of next season. To insure a long, trouble free life, follow the procedure outlined below:

1. Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris and residue.
2. Inspect the blades and rotor for damage or entangled material. Repair or replace damaged parts. Remove all entangled material.
3. Lubricate all grease nipples. Make sure that all grease cavities have been filled with grease to remove any water residue from the inside.
4. Touch up all paint nicks and scratches to prevent rusting.
5. Move to storage area.
6. Select an area that is dry, level and free of debris.
7. Unhook from tractor.
8. If the machine cannot be placed inside, cover with a waterproof tarpaulin and tie securely in place.

Store the machine in an area away from human activity. DO not allow children to play on or around the stored machine.

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
PTO Shaft inclined too much.	Rotary tiller failed horizontal level. One side sway chain of tractor is too short.	Adjust the horizontal level of the tiller. Adjust the chain.
PTO Shaft injured.	Direction mistaken. Grease deficient. Angle of PTO shaft is too big or is gripped. Rotary tiller fallen down the soil sharply.	Re-assemble correctly. Rinse needle and pump grease sufficiently. Limit the rising position and re-lock the position. Fall the tiller down the soil smoothly.
Noise in gearbox.	The clearance between the two helical bevel gears is too large. Bearing injured. Tooth of gear broken.	Adjust this clearance. Replace bearing. Replace gear.
Noise inside of gearbox.	Foreign matter dropped in gear box. Bearing on the third shaft injured. Bearing on the middle shaft injured.	Take foreign matter out of the gearbox. Replace bearing. Replace bearing.
Trouble rotation of cultivator shaft.	Gear or bearing injured or gripped. There was no clearance between the two helical bevel gears. Out of shape of left side plane. Cultivator shaft crooked or out of shape. Cultivator shaft twined with grass or hold soil seriously.	Replace gear or bearing. Adjust the clearance of the helical bevel gear pair. Correct side plane. Correct or replace cultivator shaft. Clear away grass or soil.
Blade slot injured.	Blade run foul of stone so that it suffers too much force. Blade assembled on opposite direction so that it suffers too much force. Rotary tiller fallen down the soil sharply so that it suffers too much force.	Clear away the stone form the field. Assemble the blades correctly. Fall the tiller down the soil smoothly.
Blades crooked or broken.	Blade run foul of stone. Doing plow when tractor turns a corner in the field. Rotary tiller fallen the hard ground.	Replace blades and clear away the stones from the field. Rise the tiller and do not plow when the tractor turns a corner in the field. Fall the tiller down smoothly.



PARTS LIST

BE-IGN210

REF NO.	PART NO.	DESCRIPTION	QTY
1	GB5783 - M15x45	Bolt M16x45	4
2	GB93 - 16	Spring Washer M16	8
3	GB6710 - M16	Nut M16	8
4	1ZD-230-00-25	3-Point Link Weldment	1
5	WX-L 601	Side Cover for PTO	1
6	WX-L 601A	PTO Cover	1
7	1G-180-00-019	Pin for Top Link	1
8	1ZD-230-00-018	Left Protector	1
9	1ZD-230-00-019	Right Protector	1
10	GB889 1 - M12	Lock Nut M12	20
11	GB5783 - M12x40	Bolt M12x40	20
12	GB276 - 6309	Ball Bearing 6309	1
13	GB893 1 - 100	Cir Clip 100	1
14	1ZD-230-00-138	Right Spacer	1
15	GB1152 - M8x1	Grease Nipple M8x1	1
16	1GN-150-00-104	Right Bearing Cover	1
17	GB5783 - M10x20	Bolt M10x20	4
18	1GNA-230B-00-029	Right Slide Weldment	1
19	GB5783 - M14x50	Bolt M14x50	20
20	GB6170 - M14	Nut M14	18
21	GB93 - 14	Spring Washer M14	18
22	GB5783 - M14x35	M14x35	7
23	1GNA-230B-00-014	Right Side Plate Weldment	1
24	1ZD-230-00-137A	Gap Connector	1
25	1GNA-180B-00-016	Right Support Tube	1
	1GNA-200B-00-016	Right Support Tube	1
	1GNA-220B-00-016	Right Support Tube	1
	1GNA-230B-00-016	Right Support Tube	1
26	GB5783 - M12x55	Bolt M12x55	124
27	GB97 1 - 12	Plain Washer M12	24
28	GB5783 - M10x25	Bolt M10x25	28
29	GB93 - 10	Spring Washer M10	1
30	FM120-00-199	3/8 Breather	1
31	NFG RCA - 140x15	Plug 140x15	1
32	1GNA-230B-00-101	Gearbox	1

REF NO.	PART NO.	DESCRIPTION	QTY
33	NFG RCA 90x12	Plug 90x12	1
34	CFW - 40x72x10	Oil Seal 40x72x10	1
35	1GNA-230B-00-117	Output Shaft	1
36	1GNA-230B-00-104	Front Cover of Gearbox	1
37	DUSAI-3-8-19	Plug ZG3/8-19	2
38	1GNA-230B-00-106	Paper Washer for Gearbox	1
39	1GNA-230B-00-141	Small Bevel Gear	1
40	GB297 - 30308	Bevel Bearing 30308	2
41	TZDP - 90x76x1	Adjust Washer 90x76x1	2
42	GB893 1 - 90	Cir Clip 90	1
43	1GNA-230B-00-195	Nut (inside gearbox)	3
44	1GNA-230B-00-146	Big Bevel Gear	1
45	TZDP - 62x50x1	Adjustable Washer 62x50x1	1
46	GB297 - 30310	Bevel Bearing 30310	1
47	CFW - 50x75x12	Oil Seal 50x75x12	2
48	1GNA-230B-00-191	Right Paper Washer of Shaft Tube	1
49	1ZD-230-00-185	Upper Clamp	2
50	1GNA-180B-00-013	Shaft Tube Weldment	1
	1GNA-200B-00-013	Shaft Tube Weldment	1
	1GNA-220B-00-013	Shaft Tube Weldment	1
	1GNA-230B-00-013	Shaft Tube Weldment	1
51	1G-150-01-108	Left Paper Washer of Shaft Tube	1
52	1GNA-180B-00-015	Deck Weldment	1
	1GNA-200B-00-015	Deck Weldment	1
	1GNA-220B-00-015	Deck Weldment	1
	1GNA-230B-00-015	Deck Weldment	4
53	GB5783 - M16x50	Bolt M16x50	2
54	1G-180-00-020	Pin for Bottom Link	1
55	1GNA-230B-00-011	Left Side Plate Weldment	8
56	TONG DIAN - 12	Copper Washer M12	1
57	1GNA-180B-00-109	Transmission Shaft	1
	1GNA-200B-00-109	Transmission Shaft	1
	1GNA-220B-00-109	Transmission Shaft	1
	1GNA-230B-00-109	Transmission Shaft	1
58	GB297 - 32210	Bevel Bearing 32210	1

PARTS LIST (CONT.)

BE-IGN210

REF NO.	PART NO.	DESCRIPTION	QTY
59	1GNA-230B-00-147	Small Gear	1
60	1GNA-230B-00-148	Mid Gear	1
61	GB889 1 - M10	Lock Nut M10	20
62	GB97 1 - 10	Plain Washer M10	20
63	GB5783 - M10x30	Bolt M10x30	16
64	ZHU HE DIAN - 16	Combined Washer M16	2
65	CBW-00-011	Breather	1
66	ZL-25-103	Right-Angle Pin	1
67	GB5783 - M10x16	Bolt M10x16	1
68	ZHU HE DIAN - 10	Combined Washer M10	1
69	1GNA-230B-00-027	Support Plate for Shaft Tube	2
70	MFP120-00-101	Rubber End Cover	1
71	1G-150-01-142	Medium Size R-Clip	1
72	1ZD-180-00-011	Blade Axel Weldment	1
	1ZD-200-00-011	Blade Axel Weldment	1
	1ZD-220-00-011	Blade Axel Weldment	1
	1ZD-230-00-011	Blade Axel Weldment	1
73	GB5783 - M12x30	Bolt M12x30	8
74	GB93 - 12	Spring Washer M12	16
75	GB889 2 - M12x1.5	Lock Nut M12x1.5	120
76	1GNA-1800B-00-103	Blade (Left)	24
	1GNA-200B-00-103	Blade (Left)	27
	1GNA-220B-00-103	Blade (Left)	30
	1GNA-230B-00-103	Blade (Left)	30
77	GB5786 - M12x1.5x35	Bolt M12x1.5x35	124
78	1GNA-180B-00-102	Blade (Right)	24
	1GNA-200B-00-102	Blade (Right)	27
	1GNA-220B-00-102	Blade (Right)	30
	1GNA-230B-00-102	Blade (Right)	30
79	GB3452 1 - 103x3 55	O-Ring 103x3.55	1
80	1ZD-230-01-104	III Shaft	1
81	GB3452 1 - 145x3 55	O-Ring 145x3.55	1
82	1ZD-230-01-106A	Mid Shaft	1
83	CFW - 55x80x8	Oil Seal 55x80x8	3

REF NO.	PART NO.	DESCRIPTION	QTY
84	GB297 - 32911	Bevel Bearing 32911	1
85	GB276 - 6310	Ball Bearing	1
86	GB893 1 - 110	Cir Clip 110	1
87	1ZD-230-00-139	Spacer for III Shaft Gear	1
88	1GNA-230B-00-149	Bottom Gear	1
89	GB893 1 - 80	Cir Clip 80	1
90	GB297 - 32010	Bevel Bearing 32010	1
91	GB3452 1 - 48 7x3 55	O-Ring 48.7x3.55	1
92	GB5783 - M10x40	Bolt Mx40	4
93	1GNA-230B-00-105	Rubber Seal Washer for Side Transmission Gearbox	1
94	GB812 - M50X1 5	Round Nut M50x1.5	1
95	CBW-00-112	Bolt Plug	1
96	1GNA-230B-00-017	Support Leg Weldment	1
97	1ZD-230-00-162	Rear Side Guard	2
98	GB6170 - M12	Bolt M12	4
99	GB889 1 - M14	Lock Nut M14	4
100	1ZD-180-00-190	Link Rod	1
	1ZD-200-00-190	Link Rod	1
	1ZD-220-00-190	Link Rod	1
	1ZD-230-00-190	Link Rod	1
101	1ZD-180-00-013	Rear Guard Deck Weldment	2
	1ZD-200-00-013	Rear Guard Deck Weldment	2
	1ZD-220-00-013	Rear Guard Deck Weldment	2
	1ZD-230-00-013	Rear Guard Deck Weldment	2
102	1GNA-230B-00-028	Left Side Weldment	1
103	1GNA-230B-00-012	Cover Weldment for Side Transmission Gearbox	1
104	1ZD-230-0-166	Adjustable Hanging Support	8
105	GB5783 - M10x45	Bolt M10x45	4
106	1ZD-230-00-030	Handle	4
107	GB889.1 - 24	Nut M24	4
108	GB97.1 - 24	Washer 24	8
109	LXG2400017	Spring	8
110	1ZD-230-00-169	Seat	4
111	1ZD-230-00-026	Bar	4

