



Operator's Manual and Spare Parts



Disc Plough MODEL -DH HEXA SERIES

CONGRATULATION

Dear Customer,

With the decision to buy TIGER agriculture machinery, you have made a wise choice. You will immediately note the ruggedness and dependability of this machine. This manual contains information on operation and maintenance of the machine. Observing all advice will guarantee a regular working order a longer machine life and savings on machine maintenance. To avoid injuries and to get the best results from your machine, read it carefully and keep it around for future reference.

GANESH AGRO EQUIPMENTS is always at your disposal to give you quick and efficient assistance to maintain the correct operation and maximum output of this machine.

With best Wishes

**GANESH AGRO EQUIPMENTS
North Gujarat
India**

Disclaimer :

GANESH AGRO EQUIPMENTS reserves the right to alter the machine without prior notice and without immediately updating this manual. The Disc plough is designed exclusively for working the soil. Failure to use this machine other than as described in this manual could result in human injury and / or equipment damage and / or equipment damage. GANESH AGRO EQUIPMENTS declines any responsibility for damage or injury caused by, directly or indirectly, from breakage of the machine or parts thereof, as well as those caused by proper or improper use of the same.

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1. INTRODUCTION

This manual describes the regulations for usage and maintenance of the machine. This manual is integrating part of product and must be kept in safe place consultation during the whole life span of the machine. It is user's responsibility to check that the machine is operated only in optimum conditions of safety for people, animals and property. So the machine must be used by trained person who knows all usage rules mentioned in this book.

2. DESCRIPTION OF THE MACHINE

Hexa series disc plough mounted to tractor with three point linkage system (Universal) and trailed by drawbar. Machine can be easily transported to the field.

2.1 AREAS OF USAGE

These disc plough are used for deep ploughing/ land preparation of rough soil. Before use of chisel, cultivators and disc harrow on the field, you use this disc plough for deep ploughing and turn over of the soil as primary tillage. These disc ploughs are also used on all kinds of soils for making of seed bed, seedling bed, chopping of weeds, mixing of organic and inorganic fertilizers with soil and aeration as easily.



ATTENTION

- The customer should instruct personnel on accident risks, on the operator safety devices provided, on noise emission risks and on general accident prevention regulations provided for by the international directives and by the law in the country in which the machines are used.
- In any case, the machine should be used exclusively by skilled operators who will be held to follow scrupulously the technical and accident – prevention instructions in this manual.
- It is the user's responsibility to check whether the machine is operated only in optimum conditions of safety for people, animals and property.

3. WARRANTY

- On delivery, check that the equipment has not been damaged during transport and that the accessories are integral and complete.

- The purchaser will enforce his rights on the warranty only when he has respected conditions concerning the benefit of warranty.
- The warranty is valid for one year, against all defects of material from the date of delivery of the equipment.
- The warranty does not include working and shipping costs.
- Obviously, all damage to person or things are executed from warranty.
- The warranty is limited to the repair or replacement of the defective piece, according to the instructions of the manufacturer.
- Dealer or users may not claim any indemnity from the manufacturer for any damage they may suffer (because of costs for labour, transport, defective, workmanship, direct or indirect accidents, loss of earnings on the working positions, etc.)

3.1 EXPIRY OF WARRANTY

WARRANTY expires:

- If limits set out in technical data table are ignored during the usage.
- If instructions set out in this manual have not been carefully followed.
- If the equipment is used badly, defective maintenance or another errors by client.
- If original spare parts are not used.
- Any claims following the receipt of damaged goods shall be presented in writing within 8 days from the receipt of the goods.



**You must obey all mentioned rules in this book.
Otherwise, you can be injured and your machine
can be damaged.**

4. TECHNICAL SPECIFICATION

SPECIFICATION	DH02	DH03	DH04	DH05
Linkage	Three Point Linkage – CAT II			
Disc Number	2	3	4	5
Disc Diameter(inch)	26” to 30”			
Disc Spacing (mm)	540			
Working Width (mm)	600	900	1200	1500
Total Width (mm)	1115	1265	1420	1570
Weight (kg)	380	460	585	690
Tractor Power (HP)	55 – 60	65 – 70	75 – 80	85 - 90
Penetration Depth (mm)	150 - 300			

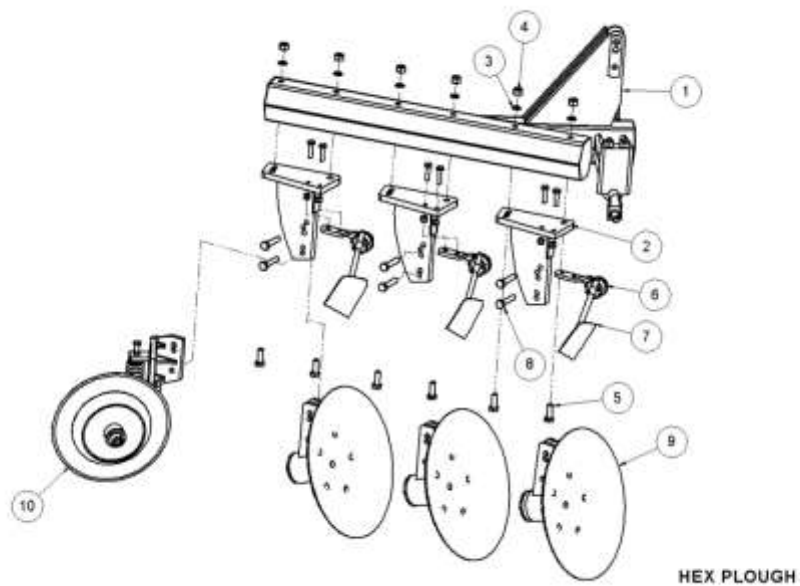
** Manufacturer reserves rights to change them without notice.

If the machine is handled by winch, it must be lifted hooking onto Appropriate holes with suitable winch or crane. Because of danger involved, this operations should be carried out by trained and responsible persons. The mass of machine is mentioned on the identification plate.

4.1 DIMENTIONS OF THE MACHINE

		Unit	DH02	DH03	DH04	DH05
L	Length	Mm	1560	2130	2520	2910
W	Width	MM	1115	1265	1420	1570
H	Height	MM	1300	1300	1300	1300




4.2 MAIN PARTS OF MACHINE (i.e.DH03)



PART REFE.NO.	DESCRIPTION	QTY
1	Top Mast Component	1
2	Dish Fitting Bracket	3
3	Plain Washer	6
4	Hex Nut	6
5	Hex Bolt	6
6	Dish Scrapper Bracket	3
7	Dish Scrapper	3
8	Hex Bolt	6
9	Dish Fitting Assembly	3
10	Furrow Dish Assembly	1

5. SAFETY MEASURES

Safety alert symbol is used in conjunction with following Signal words, according to the degree of possible injuries that may result operating the implement;

 DANGER	DANGER identifies the most serious hazards, if not avoided, will result in death or serious injury.
 WARNING	WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.
 CAUTION	CAUTION indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	IMPORTANT indicates instruction or procedure that, if not observed, can cause damage to equipment or environment.
	NOTE indicates helpful information.

READ – UNDERSTAND – FOLLOW, the safety messages following the Safety Alert symbol and Signal Words. Failure to comply with safety messages could result in serious bodily injury or death.

5.1 FOLLOW GENERAL SAFETY INSTRUCTIONS



The machine must be used only by authorised and well-trained operators. The operators must have read and understood the instructions of this manual. They must make adequate preparation for the proper use of the machine and in case of doubt about the use of the machine and/or the interpretation of this manual the operator must contact the Manufacturer or the Dealer.



The manual must always remain with the machine. In case of loss or damage, request a new copy to the manufacturer or your Dealer.



Follow strictly the rules prescribed by the safety pictograms applied to the machine.



Be sure that all safety pictograms are legible. If pictograms are worn, they are replaced with others obtained from the Manufacturer and placed in the position indicated by this manual.



Before using the machine, make sure that all safety devices are installed and in good working conditions. In case of damages of shields of shields, replace them immediately.



Is forbidden to remove or alter safety devices.



Before starting and during operation of the implement make sure there are no people or animals in the area of operation: the machine can project material from the back, with risks of serious injury or death.



Pay maximum attention to avoid any accidental contact with rotating parts of the machine.



During operation, adjustment, maintenance, repairing or transportation of the machine, the operator must always use appropriate Personal Protective Equipment (PPE)



Do not operate the implement while wearing loose-fitting clothing that can give rise to entanglement in parts of the machine.



Do not operate the implement when tired, not in good condition or under the influence of alcohol or drugs.



If the use of the machine is required at night or in conditions of reduced visibility, use the lighting system of the tractor and possibly an auxiliary lighting system.

5.2 FOLLOW EQUIPMENT SAFETY INSTRUCTIONS



Use the implement for its intended purpose only. Improper use can damage the implement and cause serious injury to persons, animals, or death.



The machine should be used by a single operator driving the tractor.



Any unauthorised modification of the machine may cause problems in safety and relieves the manufacturer from any liability for damages or injuries that may result in operators, third parties, and objects.



Before using the machine, familiarise yourself with its controls and its working capacity.



Do not leave the implement unattended with tractor engine running.



Do not operate implement on unstable (muddy or sandy) or rocky ground.



Keep the machine clean from debris and foreign objects which may damage functioning or cause injury.



Do not use the machine if the category of the connecting pins of the Disc plough does not match that of the tractor hitch system.



Do not use the machine with missing bolts, screws, pins or safety pins.



Never use the machine to transport or lift people, animals or objects.



Make certain that at least 20 % of the total weight (tractor, implement and ballast) is on the front axle of the tractor to ensure stability. Add front ballast if required.



Do not operate the implement if the driveshaft is damaged. The driveshaft could break during operation, causing serious injury or death. Remove the driveshaft and repair or replace it before continuing operation.

5.3 FOLLOW OPERATING SAFETY INSTRUCTIONS



Before using the machine, be sure to have cleared the operating area from obstacles (stones, branches, debris, etc.). Mark all the obstacles that cannot be removed (e.g., by means flags).



Its forbidden to stand near an implement like this when parts are moving.



The operator must operate implement (lifting/lowering) only from the driving seat of the tractor. Do not perform lifting manoeuvres on the side or behind the tractor.



Before making changes in direction, turns or going in reverse, slightly lift the implement off the ground after disengaging the power take-off, to avoid damage to the machine.



In the presence of step or slopes (greater than 15 degree) the action of this machine may cause instability of the tractor with a risk of tipping off which a consequence may be serious injury or death hazard. Consult the manual for the tractor to determine the maximum slope that the tractor can handle.



Stop operating immediately if blades strike a foreign object. Repair all damage and make certain rotor and blades are in good condition before resuming operation.



Always turn off the engine before you start any operation.



Avoid clutch's overheating caused by too long or frequent slipping of the clutch, since it can damage the clutch components. Before checking slip clutch, make sure it has cooled. Clutch could be extremely hot and cause a severe burn.



Prolonged use of the implement can cause overheating of the gearbox. Do not touch the gearbox during use and immediately after, it could be extremely hot and cause a severe burn.

5.4 FOLLOW TRANSPORTING SAFETY INSTRUCTIONS



Before transporting, determine the stopping characteristics of the tractor and implement.



Transport only at speeds where you can maintain control of the equipment.



When driving on roads, the implement must be in transport position adequately raised from the road surface, with tractor lifting hydraulics locked so that the Disc plough cannot be lowered accidentally.



The implement may be wider than the tractor. Pay attention to transporting for people, animals, buildings/sheds and/or other obstacles.



When turning, use extreme care and reduce tractor speed.



Do not operate the tractor with weak or faulty brakes or worn tires.



Always use tractor lighting system and auxiliary lighting system for an adequate warning to operators of other vehicles, especially when transporting at night or in conditions of reduced visibility.



In the case of lifting this implement, make sure that any lifting device is suitable to operate safely, and use only the lifting points prescribed on Disc plough.

5.5 FOLLOW MAINTENANCE SAFETY INSTRUCTIONS



Perform repairs and replacements part should only be original spare parts provided by the manufacturer, importer or your dealer.



Perform maintenance operations using appropriate Personal Protective Equipment (protective eyeglasses, har hat, hearing protection, safety shoes, overall and work gloves, filter mask).



Before any maintenance operation, make sure that the parts which become hot during use (friction clutch, gearbox etc) have cooled.



Do not perform repairs that you do not know. Always follow the manual instructions and in case of doubt contact the Manufacturer or your dealer.



Do not swallow fuels or lubricants. In case of accidental contact with eyes, rinse well with water and consult a doctor.

5.6 FOLLOW STORAGE SAFETY INSTRUCTIONS



Never leave the tractor unattended with the implement in the lifted position. Accidental operation of lifting lever or a hydraulic failure may cause a sudden drop in the unit which result in injury or death.



Make sure all parked machines are on a hard, level surface and engage all safety devices.



Place support blocks under implement as needed to prevent the unit from tipping over onto a child and/or an adult. An implement that tips over can result in injury or death.











Store the unit in an area away from human activity.

5.7 SAFETY STICKERS ON THE MACHINE

The signs described are reproduced on the machine. Keep them clean and replace them if they should come off or become illegible. Carefully read each description and learn their meanings by heart.

1. Before operating, carefully read instruction manual.
2. Before carrying out maintenance, stop machine and consult instruction manual.
3. Danger getting squashed during opening. Keep at a safe distance from machine.
4. Danger getting trapped. Keep away from moving parts.
5. Do not turn right while disc harrow is working.
6. Do not operate without lubrication.
7. Lubricate bearing till grease overflow from lubricant nozzle
8. Identification Plate.

1		<p>Disengage the TRACTOR ENGINE, turn OFF the tractor engine, remove the key and ensure that all rotating parts have stopped before approaching the implement. Read the operator's manual before performing any maintenance operation. Thrown or flying objects hazard.</p>
2		<p>Safety Equipment</p>
3		<p>Crushing hazards & Thrown or Flying objects hazards.</p>
5		<p>Rotating Gears</p>
6		<p>Oil filling point</p>
7		<p>Lifting point</p>
8		<p>Grease filling point</p>
9		<p>Hand Hazard</p>

6. ATTACHING OF THE MACHINE TO THE TRACTOR

Before attaching machine to the tractor, the following cares should be taken.

1. The power of the tractor should be convenient to the machine which mentioned in technical specification.
2. Air pressure in the tractor's tires must be sufficient.
3. It is inconvenience within motion area of lifting levers.
4. It is absolutely forbidden to stand between the tractor and the equipment while adjusting the middle lever.
5. It is absolutely forbidden in space between the tractor and the equipment with engine running and without hand brake pulled.
6. If your machine has hydraulic system the both side of system should be under pressure while connecting the hydraulic hoses of machine to tractor's hydraulic system.
7. If your machine has an electric system, electric and sensor connections should be connected safely.

The following routine procedure must be followed for attaching the machine to the tractor.

1. Place the plough duly levelled on the flat piece of land.
2. Reverse the tractor to the plough (Do not drag the plough up the tractor)
3. Attach the left arm of the tractor to the plough first.
4. Attach the central arm to the plough. To attach, turn the screws on both sided to an equal length. If the arm is too short or too long, turn the screw to adjust both at the same time until aligned with the hole on the central arm.
5. To attach the lower right arm, turn the screw until the mounting pin is at the same level as the hole on the tractor arm. If the gap between hole and mounting pin is too close or too distant, turn the control arm in or pull it away to appropriate distance. You may have to adjust both height and distance at the same time. When the hole at tractor arm and mounting pin are eve, insert the pin in the hole and lock it with the lynch pin.
6. After attaching the plough lift it and adjust the control arm parallel to the ground. When you look from both rear or sideways, the disc should all be touching the ground uniformly.

NOTE –

1. The plough will work best when the right wheel of the tractor is inside the previously ploughed furrow. Readjust the plough alignments again if necessary.
2. To get good results from the plough discs should be replaced when their diameter is reduced to 22”.

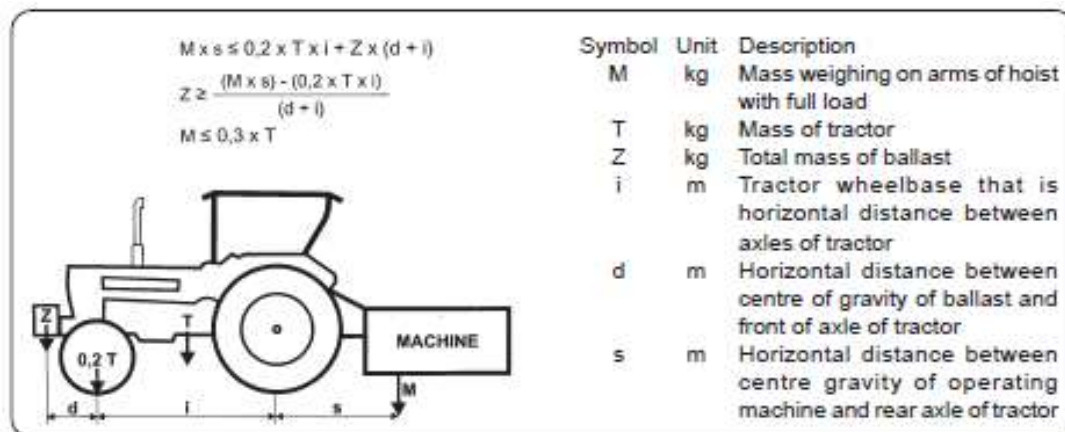
6.1 TRANSPORTING OF THE MACHINE AND THE STABILITY OF THE TRACTOR AND THE MACHINE DURING TRANSPORT

1. Comply with transport regulations and highway limits.
2. When driving on public roads, pay attentions traffic lights and indicators.

3. Any transport accessories must be provided with suitable signs and guards.
4. It is very important to remember that road holding capacity as well as direction and braking capacity can be influenced, sometimes considerably by equipment being either carried or towed.
5. When taking bend, calculate centrifugal force and centre of gravity will shift depending on whether equipment is being carried or not.
6. For transport adjust and fasten side lever chain. Lock hydraulic lifting control lever.
7. For displacements beyond working area, equipment must be placed in transportation position.
8. When dimensions of carried or partially carried equipment conceal tractor's signalling and lighting devices, these must also be installed on equipment itself, in conformity with regulations of highway of country involved. When in operation make sure that lighting system is in perfect working order. It is also important to remember that correct signalling sequence of headlights includes.

6.2 Tractor Stability and Lifting Capacity Check

When machine is jointed to tractor, It becomes an integral part of it. Attached equipment's weight is closely related with road position and stability of tractor. In normal conditions, it is assumed that 20% of tractor weight is carried by front axle. In this case, attached equipment's weight should not be greater than 30% of tractor weight. This factor can be summarized in following formulas:



When machine is attached to tractor, front weights should put through above mentioned formula. These weights should be calculated according to capacity of tractor's lifting weight and packing.

7 USAGE OF MACHINE

In order to get the better results, the following adjustments are necessary:

7.1 CUTTING ANGLE ADJUSTMENTS

Discs would not cut if they are rolled straight ahead. They must be set at an angle. Provision is made in the plough standard for the adjustment of the horizontal disc angel and vertical tilt angle to obtain optimum disc operation in

different soil conditions. Depending on soil type, vegetation or humidity, the disc has several adjustments:

A) Disc angle is the angle which the plain of cutting edge makes with the line of travel. It is normally 42 – 47. Reducing this angle increases the disc rotation with respect to ground speed and reduces the tendency of the plough to over cut. Increasing the disc angle improves the disc penetration.

B) Tilt Angle is the angle which the plain of the cutting edge makes with the vertical line. It ranges from 15 – 25. Increasing the tilt angle improves disc penetration in heavy, sticky soils. Decreasing the tilt angle improves disc penetration in loose and brittle soils.

7.2 WIDTH OF CUT ADJUSTMENT

Every disc plough has a particular width of cut ranging from 18-25 cm's depending on the diameter of the blade. However to suit various draft and penetration requirements the width of the cut for the front disc can be adjusted with the help of drawbar. Drawbar has an index line which can be lined up with different (1,2,3) markings on the drawbar carrier as shown.

7.3 LEVELING THE PLOUGH

The level of the plough is controlled by the tractor top link. If the rear end of the plough beam is on higher level than the front end of the beam, lengthen the top link. If rear end of the plough beam is on lower level than the front end, then shorten the top link. Lateral levelling is controlled by adjusting the length of the tractor right lower link. These adjustments must be made with the plough prior to operation.

7.4 SCRAPPER ADJUSTMENTS

Scrapers are set low enough to catch and turn the furrow slice before it falls away from the disc. For deeper ploughing, the scraper has to be set a little higher. For sticky soils, set them closer to the disc. The research study data reveals that mould board type scraper performs the best, but in sticky soils use of hoe type scraper is better.

7.5 DEPTH ADJUSTMENT

Plow depth adjustment can be done either by the hydraulic of the tractor, or by the discs angle and/or by the guide wheel spring bolt.

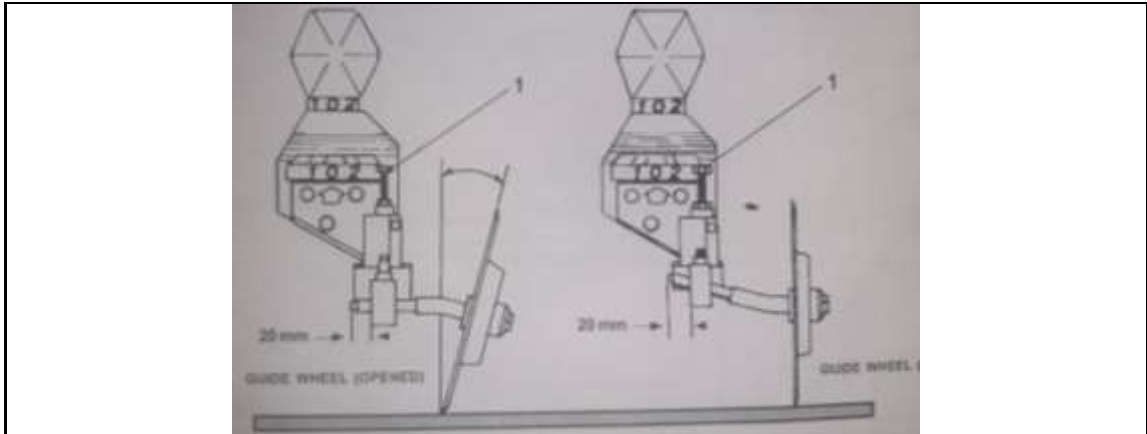
7.6` GUIDE WHEEL ADJUSTMENT

The guide wheel, besides permitting more and better penetration of the disc blades, is also responsible for the tractor and plough, acting as a rudder, avoiding lateral deviations.

Adjust the guide wheel, so that it stays in the same direction of the hitching tower of the tractor's 3rd point, and the axle should be at 20 mm in figure -

When making the first stroke (run), with the plough, try to line the guide wheel up, not taking in consideration if any disc blade of the plough doesn't penetrate what

is important is that the last disc blade performs the desired depth, adjusting it by the guide wheel spring bolt (1) in figure - .



When making the second stroke, when the tractor tyre gets into the furrow, then the final plough adjusting should be done. If the tractor tends to the right side, adjust the guide wheel to the right direction, if the tractor tends to the left, adjust the guide wheel to the left direction, by opening or closing it.(Figure -)

8 DETACH OF THE MACHINE FROM THE TRACTOR

1. Park the tractor on a flat surface, pull the handbrake and put the wheel chock to tires.
2. Hydraulic arms of tractor should be alignment.
3. Lower the machine by means of the tractor hydraulic arms.
4. Wind up the machine support leg and insert the safety pin.
5. If your machine has shaft dismount the shaft from tractor.
6. If your machine has hydraulic hoses depressurize the pressure through tractor's hydraulic valve and disconnect the hydraulic hoses from the tractor.
7. If your machine has electric system disconnect the electric connections from the tractor when tractor is in stop position.
8. Pull out the connection pins.

9. MAINTENANCE

Here follows a list of various maintenance operations to be carrying out periodically. Lowered operating costs and a longer lasting machine depend, among others, on the methodical constant observation of these rules.

The maintenance periods listed in this manual are only indicative and are for on normal conditions on use therefore be varied depending the kind of service, the more or less dusty surroundings, seasonal factors, etc. For more serious conditions of service, maintenance will logically be done more often. Before injecting grease, the nipples must be cleaned to avoid must, dust and foreign bodies from mixing with the grease; otherwise they will reduce or even annul the effect of the lubrication.

- After use wash the equipment thoroughly.
- If disc plough is new then after first two hours of working tighten all nut bolts.

- Check the plough adjustments if the steering is hard.
- Check the scrapper adjustments frequently.
- If the soil has entered in grease nipple, then change the nipple.
- After every fifty hours grease all greasing points with grease gun and tighten all nuts and bolts.
- After three hundreds hours, open the hub of disc plough & cleanse it with diesel oil, pump in new grease & replace its seal.
- Constantly check for loose nuts and bolts.
- Sharpen the disc if the blades are dull. Blunt blades increase the draft considerably.
- When the diameter of disc is reduced to 24" it is desirable to change the degree of hub by loosening the mounting bolts.
- Discs cannot work beyond 22" diameter. They must be replaced for effective ploughing.

At the end of the season or if a long period of rest is for seen it is advisable:

- Carefully check worn or damaged parts and replace if necessary.
- Tighten all screws and bolts.
- Grease the all unpainted parts. Protect the equipment with a cover (such as nylon and etc.)
- Keep your machine in a dry place. Don't move it and keep away from unauthorized people.
- If these operations are done carefully, it will be total advantage for you because next season your machine will be perfectly ready to work.
- Finally, we remind you that the manufacturer is always available for any and all necessary assistance and spares.

10. Trouble Shooting

PROBLEM	CAUSE	SOLUTIONS
Low Penetration	- Blunt Disc - More Tilt Angle	-Sharpen the Edge - Set the Tilt Angle
Heavy Draft	- Blunt Disc - Furrow Too Wide	- Sharpen the edge - Reduce the tilt angle
Excessive side draft	- Improper hitching	- Hitch Properly
Less Scouring	- Defective Scrapper - Loose Bearing	- Adjust the scrapper - Set the Bearing
Uneven Furrow	- Disc Angle Not Uniform - Hitching Defective	- Set the Disc Angle - Set the Hitching

11. Torque Table

Check frequently Disc plough hardware to make sure that screws and bolts are tightened according to torque values listed in the following table:

BOLT SIZE (METRIC)	8.8 grade		10.9 grade	
	N m	Ft lb	N m	Ft lb
M6	11	8	15	11
M8	26	19	36	27
M10	52	39	72	53
M12	91	67	125	93
M14	145	105	200	150
M16	225	165	315	230
M18	310	230	405	300
M20	440	325	610	450