

FIELDKING

Robust Turbo Happy Seeder



➤ [Operator Manual](#) ➤ [Service Manual](#) ➤ [Part Catalogue](#)

CONGRATULATIONS!

You have invested in one of the best implements of its type in the market today.

The care you give your "FIELDKING" implement will greatly determine your satisfaction with its performance and its service life. A careful study of this manual will give you a thorough understanding of your new implement before operating.

If your manual is lost or destroyed, "FIELDKING" will be glad to provide you a new copy. Visit to nearest dealership & get a copy. Most of our manuals can also be downloaded from our website at www.fieldking.com.

As an authorized "FIELDKING" dealer, we stock genuine "FIELDKING" parts which are manufactured with the same precision and skill as our original equipment. Our trained service persons are well informed on methods required to service "FIELDKING" equipments and are ready to help you.

Should you require additional information or assistance, please contact us.

YOUR AUTHORIZED

FIELDKING DEALER

BECAUSE "FIELDKING" MAINTAINS AN ONGOING PROGRAMME OF PRODUCT IMPROVEMENT, WE RESERVE THE RIGHT TO MAKE IMPROVEMENTS IN DESIGN OR CHANGE IN SPECIFICATION WITHOUT INCURRING ANY OBLIGATION TO INSTALL THEM ON UNITS PREVIOUSLY SOLD. BECAUSE OF THE POSSIBILITY THAT SOME PHOTOGRAPHS IN THIS MANUAL WERE TAKEN OF PROTOTYPE MODELS, PRODUCTION MODELS MAY VARY IN SOME DETAIL. IN ADDITION, SOME PHOTOGRAPHS MAY SHOW SHIELDS REMOVED FOR THE PURPOSE OF CLARITY. NEVER OPERATE THIS IMPLEMENT WITHOUT ALL SHIELDS IN PLACE.

TO THE PURCHASER

This manual contains valuable information about your new "FIELDKING" Robust Turbo Happy Seeder. It has been carefully prepared to give you helpful suggestions for operating, adjusting, servicing and ordering spare parts.

Keep this manual in a convenient place for quick and easy reference. Study it carefully. You have purchased a dependable and sturdy Robust Turbo Happy Seeder but only by proper care and operation you can expect to receive the service and long life designed and built into it.

Sometime in the future your Robust Turbo Happy Seeder may need new parts to replace which are worn out or broken. If so, go to your dealer and provide him equipment's detail like model and part number.

CUSTOMER INFORMATION

Name _____

Purchased From _____

Date of Purchase _____

Model No. _____

Serial No. _____

PURCHASER / OPERATOR'S RESPONSIBILITY

1. Read and understand the information contained in this manual.
2. Operate, lubricate, assemble and maintain the equipment in accordance with all instructions and safety procedures in this manual.
3. Inspect the equipment and replace or repair any parts that are damaged or worn out which under continued operation would cause damage, wear to other parts, or cause a safety hazard.
4. Return the equipment or parts to the authorized "FIELDKING" dealer, from where it was purchased, for service or replacement of defective parts that are covered by warranty. (The "FIELDKING" Factory may inspect equipment or parts before warranty claims are honored.)
5. All costs incurred by the dealer for traveling to or transporting the equipment for warranty inspection and claims will be borne by the customer.

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Foreword

Conservation Agriculture - based crop management practices have proved to produce more at less costs, reduce environmental pollution, promote conjunctive use of organics (avoids residue burning), improve soil health and promote timeliness of planting and other farm operations to address issues of terminal heat stress. One of the key elements of CA (Conservation Agriculture) is rational soil cover with organics (crop residues, cover crops etc), which has great relevance not only in terms of managing the agricultural waste but also in eliminating residue burning, improving soil health, conserving water, help in adaptation to and mitigating of climate change effects. In India alone, more than 140 tonne of crop residues are disposed of by burning each year. In rice-wheat system of the Indo Gangetic Plain of South Asia, the disposal of rice residues is one of the key challenges and in most combines harvested rice fields of western IGP, the rice residues are burnt before planting wheat. Burning of crop residues is a major contributor to poor air quality (particulates, greenhouse gases), human respiratory ailments, and the death of beneficial soil fauna and micro-organisms.

Managing the residues of combine-harvested fields for direct drilling (no-till) as surface mulch provides multiple benefits such as of improved crop yields, conserved soil moisture, saving of irrigation, buffered soil temperature, improved Soil Organic Carbon, adaptation to terminal heat in addition to environmental benefits through eliminating burning. Robust Turbo Happy Seeder, an innovative planter, has been developed and distributed at farm level in India. However, capacity development of extension agents, operators, custom service providers and farmers on calibration, operation, field/situation-specific adjustments and maintenance is critical for its efficient use.

Operational Manual for Robust Turbo Happy Seeder

1. Introduction

Multiple challenges associated with plough based conventional production practices that include deteriorating natural resources, declining factor productivity, yield plateau, shortages of water & labour and escalating costs of production inputs coupled with emerging challenges of climate change both in irrigated intensive systems as well as low intensity rain-fed ecologic are the major threat to food security of South Asia. Water and labor scarcity and timeliness of farming operations specially crop establishment under the emerging climatic uncertainties are becoming major concerns of farming all across farmer typologies, production systems and ecologic in the region. In many parts of South Asia, over-exploitation and poor management of groundwater has led to declining water table and negative environmental impacts.

Conventional tillage based flooded rice receiving the largest amount of fresh water compared to any other crop is the major contributor to the problems of declining groundwater table ranging from 0.1– 1.0 m year⁻¹ specially in north-west India and increasing energy use and costs. The problem has further been intensified with the unavailability of labor in time, and multi-fold increase in labor costs. Fragmented land holdings and nucleus farm families further exacerbates the problem of availability of farm labor.

Direct drilling (seeding/ planting with zero tillage technology) is one such practice that potentially addresses the issues of labor, energy, water, soil health etc.

One of the key elements of CA is rational soil cover with organics (crop residues, cover crops etc) has greater relevance not only in terms of managing the agricultural waste but particularly for eliminating burning, improving soil health, conserve water, help in adaptation to and mitigating of climate change effects. Globally, annual production of crop residues is estimated at 3440 million tonnes of which large quantities are not managed properly. In India alone, more than 140 million tonnes of crop residues are disposed of by burning each year. In rice-wheat system of the IGP of South Asia, the disposal of rice residues is one of the major challenges due to poor quality for fodder, bio-conversion, and engineering applications. In most combine harvested rice fields of western IGP, the rice residues are burnt before planting of wheat. The field burning of crop residues is a major contributor to poor air quality (particulates, greenhouse gases), human respiratory ailments, and the death of beneficial soil fauna and micro-organisms. During burning of crop residues around 80% of carbon is lost as CO₂ and a small fraction is evolved as CO. Burning involving incomplete combustion can also be a source of net emissions of many greenhouse gases including CO, CH₄, SO₂ and N₂O. Crop residue burning accounts 6.6 million tonnes of CO₂ equivalent emission annually in India (INCCA, 2010). Apart from loss of carbon, up to 80% loss of N and S, 25% of P and 21% of K occurs during burning of crop residues

For managing residues of combine harvested crops and field (loose as well as anchored) as surface mulch and realize multiple benefits of improve crop yields, conserve soil moisture, saving of irrigation, buffer soil temperature, improve SOC, adapt to terminal heat effects in addition to environmental benefits through eliminating burning, 'Robust Turbo Happy Seeder', is now available, which is capable of direct drilling (ZT) into heavy surface residue loads in a single operation. Many of the farmers in India and elsewhere have started using Robust Turbo Happy Seeder for residue management. However, one of the major constraints in large scale adoption of this technology as well as sub-optimal use efficiency of planter is the lack of skills/knowledge on operation, calibration and maintenance of the machinery. There are different field situation specific adjustments needed before the use and the seed rate etc as per the crop and field conditions to realize the potential benefits of the technology.

2. Importance of Robust Turbo Happy Seeder vis-a-vis residue retention

Conservation Agriculture (CA) based management practices has been reported as potential strategy to address the labor, water, energy, soil health farm profitability and climate change issues generally encountered under the conventional tillage based crop production systems. Robust Turbo Happy Seeder is a planter capable of direct drilling in the fields with surface retention of residues and without any soil disturbance which in turn take care of 2 of the 3 basic elements of CA. The direct drilling (zero tillage) operation saved on labor, water, energy, reduce cost of production and improved maintain soil health while facilitating timely planting with similar or higher crop productivity. The residue retention on the soil surface reduce evaporative losses, buffers the soil moisture & temperature, as well as canopy temperature and help is adapting to terminal heat effects. Residue retention also leads to significant improvement in C sustainability index. With the

invention of Robust Turbo Happy Seeder, farmers need not burn the crop residues for sowing of next crop even with the heavy residue loads in high yielding crops harvested using combines. The THS has a provision of direct drilling of seed and fertilizers at desired seed and fertilizer rates, depth and spacing in one go.

With further improvement in the technology, having additional attachment of seed box having inclined plate seed metering systems, the THS become precise multi-crop planter. This type of arrangement allows the planter for direct drilling of different small and coarse grain crops with change in inclined plates and gear in accordance to the optimal geometry of different crops.

Under the scenario of small holder farm typologies across the South Asia, it is neither affordable not advisable to purchase planter for the planting of different crops by all the farmers. The multi-crop THS is capable of planting different crops and provides simple solution not only for planting but also improve working efficiency of the planter and extended employment to the service provider. In addition to provisions for adjustments in row spacing, depth, gears for power transition to seed and fertilizer metering systems, the multi-crop THS have precise seed metering system using inclined rotary plates with variable groove number and size for different seed size and spacing for various crops.

3. Major components and description of Robust Turbo Happy Seeder.

The Robust Turbo Happy Seeder has nearly 20 major components as described in figure 1 and the individual components are described in further sub-section.

3.1. Frame

The frame of this machine is made of mild steel. All the parts of machine are attached to it. It works as a body in the machine. It is welded on the needed parts which increase the strength of frame. Tynes are attached to the frame which is used to drill the soil. Tynes are attached by U-Clamping as shown in Figure

1. These U- shaped clamps can be unbolted to change the distance between furrow openers or number of furrow openers. Mainly tynes are used at equal spacing.

3.2. Slit and furrow openers

Furrow openers or slits are attached to the lower portion of tynes which are used to drill the soil and place the seed and fertilizer at desired place. As the furrow openers drill the soil, the seeds and fertilizers dropped in the delivery pipes and passed through the seed and fertilizer boots through the action of drive wheel and finally placed into the slits opened by the furrow opener. Various component of the furrow opener/slit are depicted in Figure 2.

There are various types of furrow openers/ slits. The inverted T-type slits/furrow openers are used in THS. The spacing between two furrow openers is generally kept about 20-22 cm. The cutting portion of furrow openers (point of share) is made of 8 mm thick high carbon bit welded to a mild steel plate. The working front edge of the slit/furrow openers has a piece of carbon steel (hardness 65 RHN) welded all round the nose, tip and sides to reduce wear and tear.

The furrow opener is welded to the mild flat steel shank (straight leg standard mounted with T-type slit openers).The blades can be of “welded on” or “bolted on” or even “knock down” type.

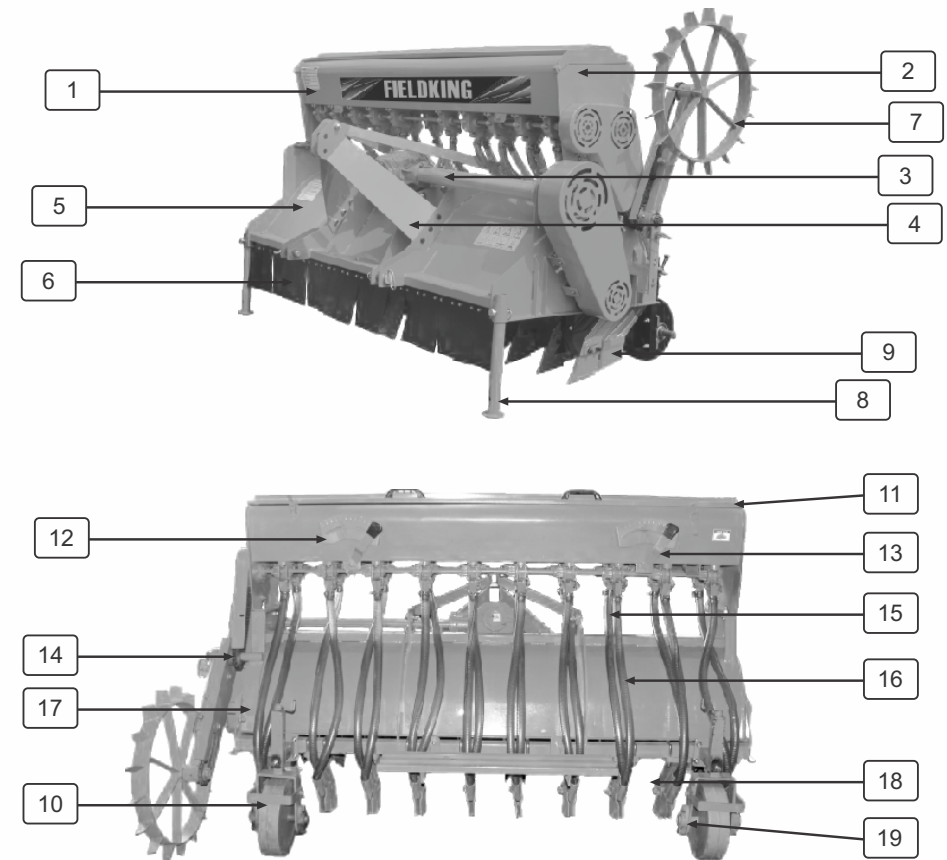


Figure 1. Major Components of Robust Turbo Happy Seeder

1. Seed box
2. Fertilizer box
3. PTO drive mechanism
4. Three point linkage
5. Machine cover
6. Rubber Guard
7. Drive wheel
8. Stand
9. Furrow openers
10. Press wheel
11. Seed and fertilizer box cover
12. Fertilizer rate adjustment lever
13. Seed rate adjustment lever
14. Drive mechanism
15. Fertilizer delivery pipe
16. Seed delivery pipe
17. Frame
18. Flails
19. Seed boot.

Disadvantage of “welded on” blades is that they require machine shop for replacement, whereas, a farmers himself can replace the other two types of blades. Double boot is provided behind each furrow opener to receive a tube (steel ribbon or polyethylene tube with a minimum diameter of 25 mm) each from seed and fertilizer metering devices. The furrow openers are adjusted to make 3–5 cm wide slits.

3.3 Flails

The flails are wings attached to a shaft, called flail shaft (Figure 3). Flail blades are placed on the rotor and arranged in such a way that flails blades are in exactly ahead of machine furrow openers. When the flail

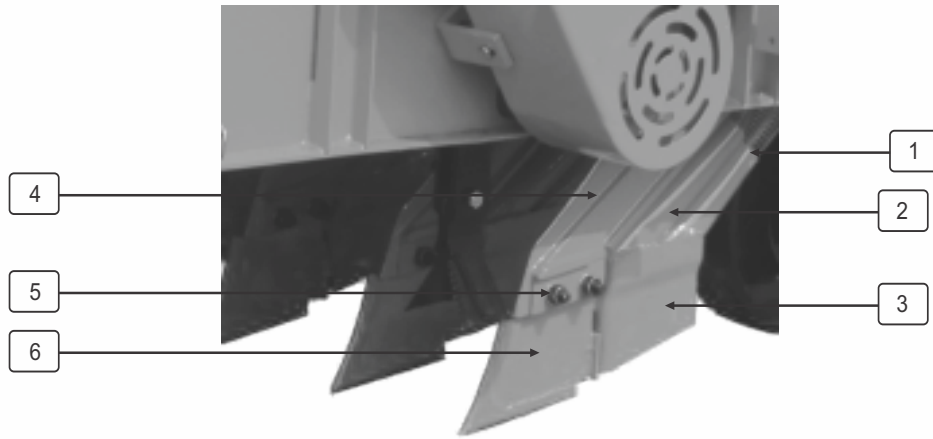


Figure 2. Major parts of furrow opener/slit
1. Seed boot 2. Fertilizer boot 3. Slit 4. Tynes
5. Furrow opener changing nuts 6. Point of share

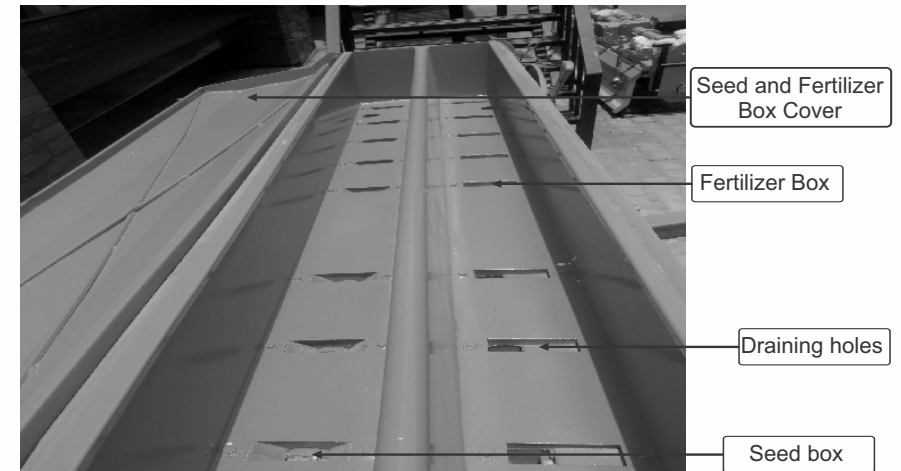


Figure 5. Seed box and fertilizer box

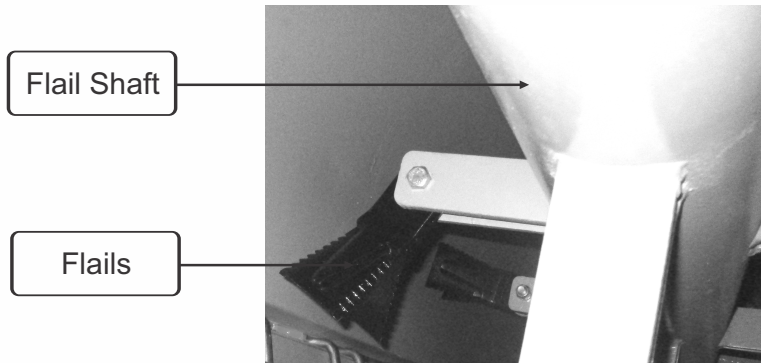


Figure 3. Flails and flail shaft

shaft rotates, the flails also rotate and clean the residue left in front of tynes to facilitate drilling of seed and fertilizers in the seed rows. Each furrow opener has two set of flail blades which clean the furrow opener twice in one rotation of machine rotor. The accumulation of residues over machine tynes is dependent on clearance between rotating flail blades and machine tynes i.e. if clearance is more than the optimum level, then accumulation of residue will start to occur on the other side if clearance is on less, then machine load on tractor increases.

3.4 Seed and Fertilizer Box

The seed and fertilizer box set is depicted in figure 5. Trapezoidal shaped seed and fertilizer boxes are mounted side by side on the frame, fertilizer box in front and seed box in the rear.

3.5 Seed metering mechanism

The key elements of the seed metering system are depicted in Figure 7, 8 and 9 and described as under

- **Seed box:** It is used to store the seed in the machine
- **Fluted rollers:** Fluted rollers are attached to the shaft. As the shaft rotates, the fluted roller also rotates and seed delivered to the seed delivery pipe through the flow control tongue.
- **Seed rate adjusting lever:** Seed rate adjustment lever is attached to the seed box for increasing or decreasing the rate of seed into the fluted rollers. There is a scale on the adjusting lever which helps us in increasing or decreasing the seed rate.
- **Flow tongue adjustment lever:** There is a flow tongue adjustment lever also. It controls the flow of seed into the seed delivery pipe dropping from fluted roller.



Figure 7. Seed metering mechanism

- **Seed pipe:** It is used to take the seed from flow control tongue to the seed boot
- **Seed boot:** Seed boot finally drops the seed into the slit in the soil opened by the furrow opener.

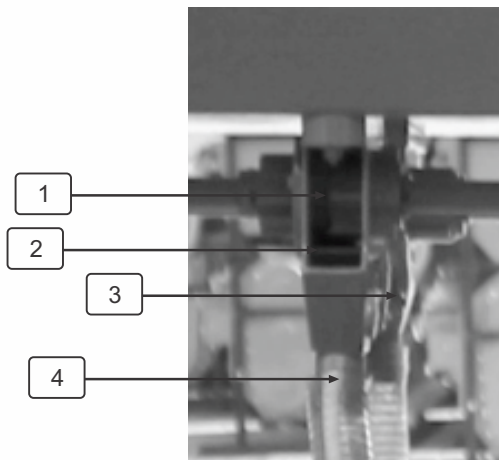


Figure 8. Fluted roller and components
 1. Fluted roller 2. Flow tongue
 3. Flow tongue adjusting lever 4. Seed pipe

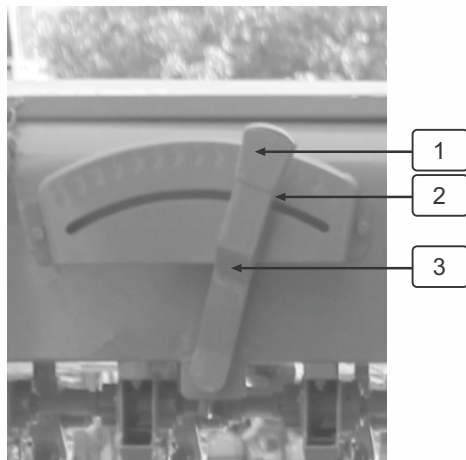


Figure 9. Seed adjustment lever
 1. Lever 2. Scale 3. Adjusting nut

2. Seed delivery pipe: It is used to take the seed from cups to the seed boot.
3. Seed boot: Seed boot finally drops the seed into the slit in the soil opened by the furrow opener.

3.6 Fertilizer metering system

The fertilizer metering system controls the rate of fertilizer application in the field for a specific crop. The fertilizer metering system is depicted in Figure 12. Generally there are two type of fertilizer metering systems which are depicted in Figure 13 and 14.

The fertilizer metering system as shown in figures 12, 13 and 14 generally consists of following components.

1. Fertilizer box
2. Lever
3. Drive shaft
4. Fluted roller
5. Fertilizer delivery pipe
6. Fertilizer boot

The fertilizer rate is adjusted with the help of the lever as shown in Figure 14. The lever is set to the recommended fertilizer level. Before setting the fertilizer rate by the lever, the nut as shown in Figure 14 is loosened and after the setting it is tightened again. After setting to a particular fertilizer rate, the fluted rollers pick the fertilizer from the fertilizer box and then drop it in to the fertilizer cup. The cup then drops the fertilizer in to the fertilizer delivery pipe which is finally reaches in to the soil through the fertilizer boot (shown in Figure 2) attached to the furrow opener.



Figure 12. Fertilizer metering system

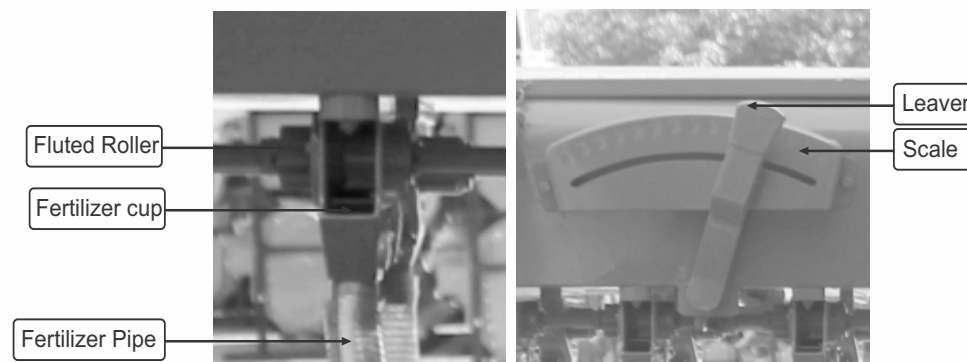


Figure 13. Fluted rollers

Figure 14. Fertilizer adjustment lever

3.7. Drive wheel

Drive wheel is mounted on the side of the frame and placed on back (Figure 16). The function of drive wheel is to provide drive to the seed and fertilizer metering systems. The diameter of the drive wheel is 70 to 75 cm. Chains are attached to the drive wheel and the driving shaft. There are lugs on the circumference of drive wheel to avoid or minimize slippage. The trapezoidal lugs are of generally 6 cm height.

3.8. Depth control wheel

Two Depth control wheels are attached back side bar of the frame. The diameter of wheels is about 30-35 cm. it is made of mild steel. The function of these wheels is to regulate insertion of the furrow openers into the soil to place the

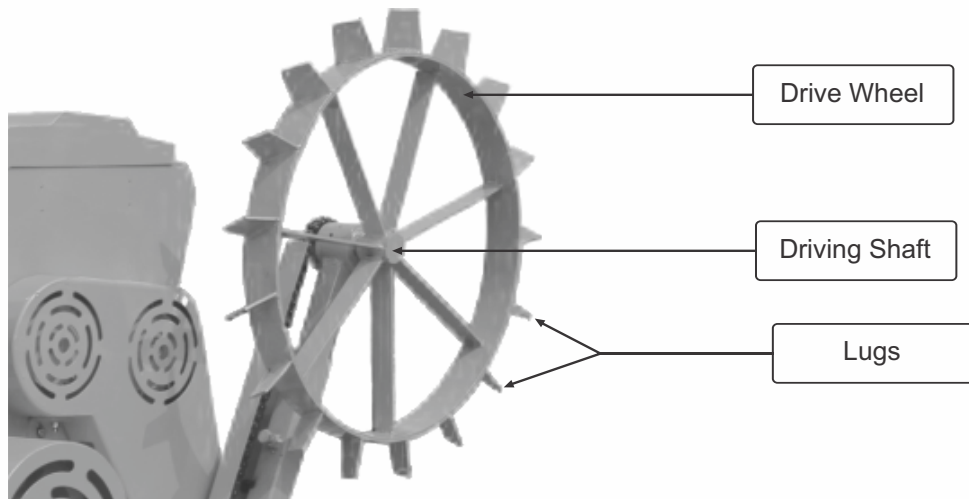


Figure 16. Drive wheel and components

seed at desired depth in all the rows and across the field. The depth of the seed placement can be increased or decreased with the help of depth adjusting screw pointed in Figure. The depth control wheels should be adjusted for the desired seed placement depth under the real field condition specific to a particular plot or field and should be done for each field. Care should be taken to adjust the press wheels at equal depths to ensure uniformity in the depth of seed and fertilizer placement.

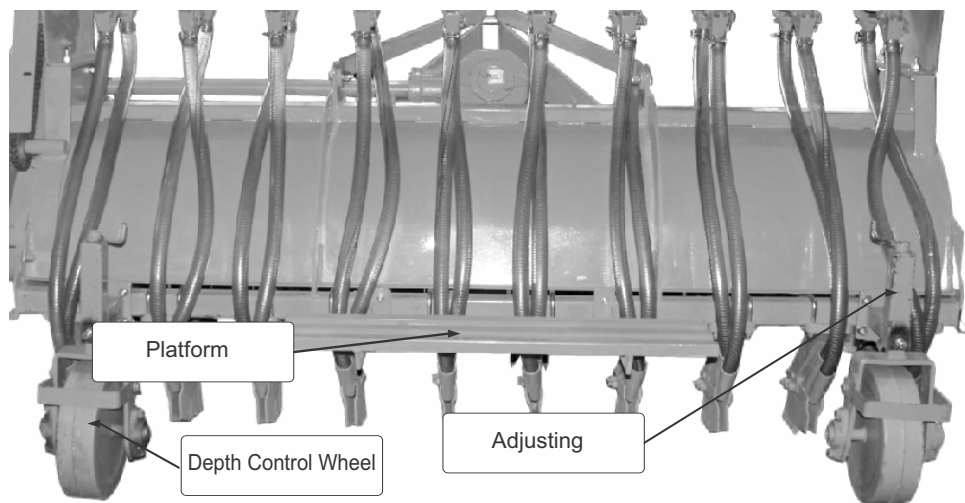


Figure 17. Press wheel and adjustment

3.9. Power transmission unit

There are two power transmission systems in Robust Turbo Happy Seeder-

3.9.1 PTO Shaft

The power transmission system by the PTO shaft is depicted in Figure 18. PTO shaft provides drive to the flails. The PTO shaft of tractor is first attached to the PTO gear box with the help of PTO attachment shaft. There is a PTO drive shaft in the machine which provides the drive to the PTO drive pulley. A belt joins the PTO drive pulley to the flail drive pulley which rotates the flail shaft and hence, the flails get drive from PTO shaft and start to rotate.

3.9.2 Drive wheel

Drive wheel provides necessary power to meter the seed and fertilizer delivery from machine to the soil. As the drive wheel rotates, the chain mechanism starts to move through driving and driven shafts as shown in Figure 19 a and 19 b. The chain rolls over the fertilizer and seed sprockets/gear. These sprockets/ gears rotate the seed and fertilizer shafts. As the seed and fertilizer shaft rotates, the fluted rollers (seed and fertilizer metering mechanism) start to work and the seed and fertilizer delivers to the seed and fertilizer delivery pipes. There is flip gate which can be opened to apply oil/grease to the chain whenever necessary (Figure 19 b).

3.10. Seed and Fertilizer delivery pipes

Seed and fertilizers delivery pipes are attached to the seed and fertilizer box through the seed and fertilizer cups (Figure 20). These pipes carry the seed/fertilizer from the seed and fertilizer metering systems through aluminium flow control tongue/ cups to the seed/ fertilizer boot. Tubes should be connected firmly so that these may not come out during field operation. The precautions as outlined below must be taken for fixing/ use of delivery pipes:

- The pipes should be protected from bending and breakage.
- Old/bent pipes should be replaced.
- Excessive bend in the pipes should be avoided otherwise the bend will cause obstruction in free flow of seed/fertilizer and results in non-uniform seed placement and crop establishment.
- The pipes must be inserted about one inch into the seed/ fertilizer boot.

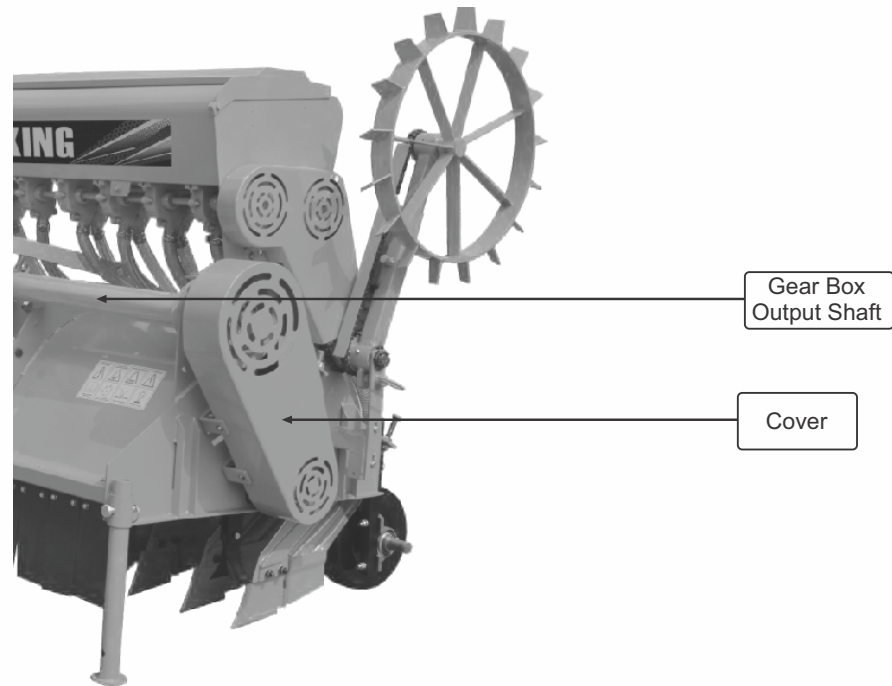
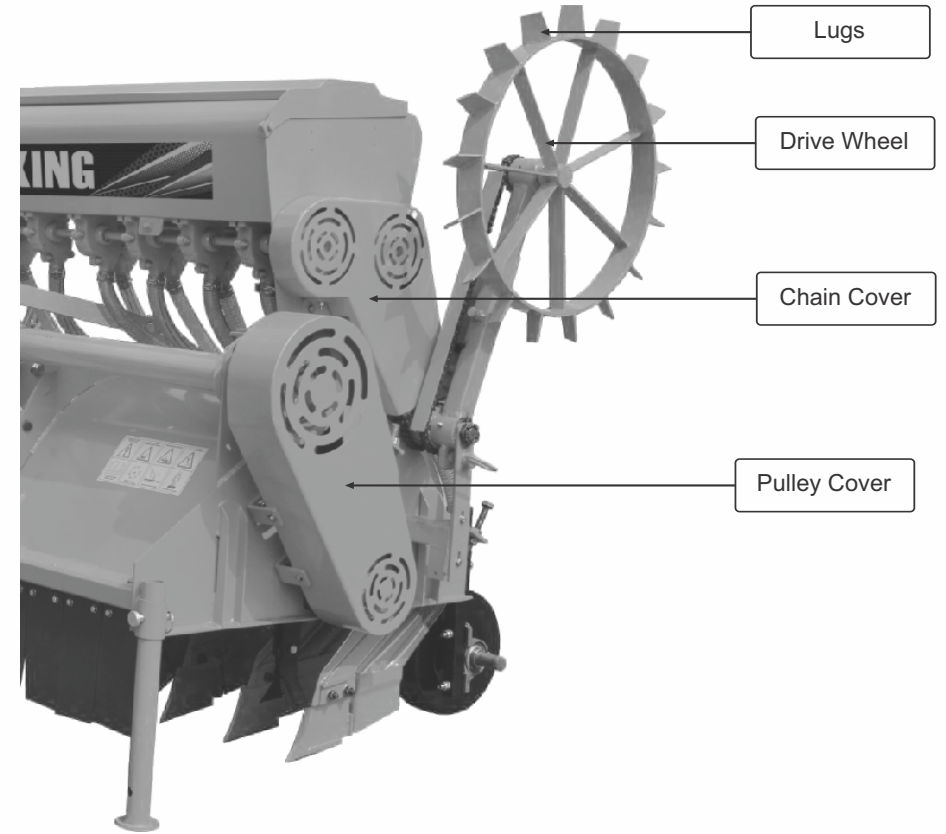
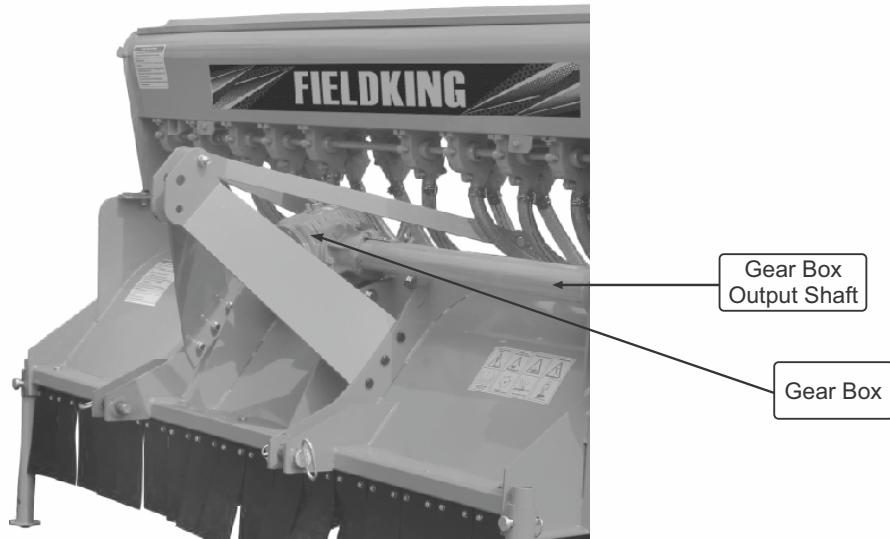


Figure 19a. Transmission through drive wheel

Figure 18. Power transmission system by PTO shaft

4. Calibration of machine for seed and fertilizer rates

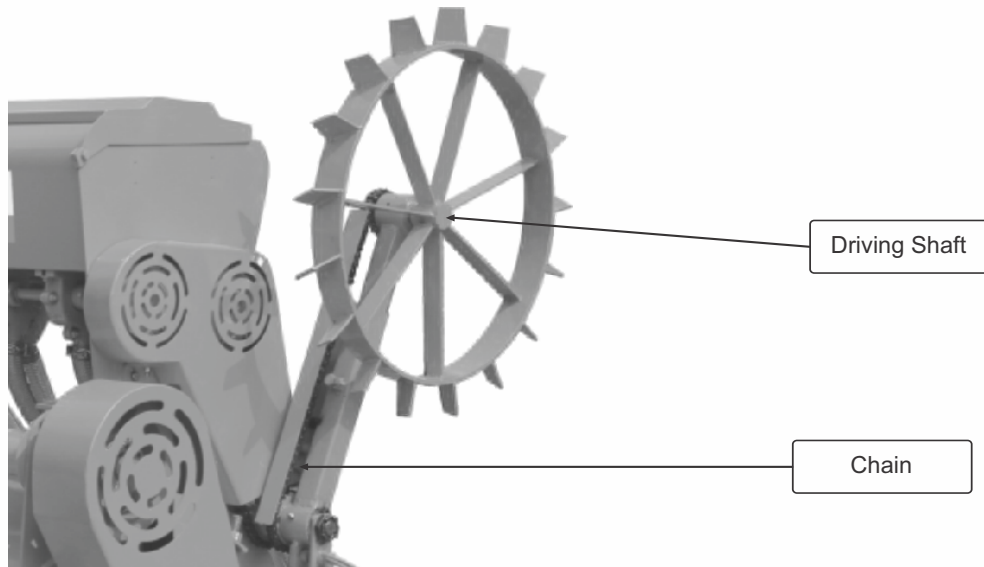


Figure 19b. Power transmission through drive wheel

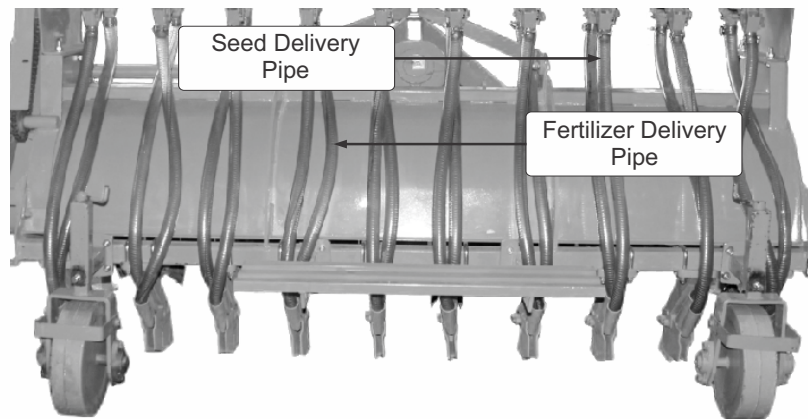


Figure 20. Seed and fertilizer delivery pipes.

4.1 Calibration in field

First of all, fill the seed and fertilizer in the respective boxes. Set the indicator at desired seed and fertilizer rates (as shown in Figure 10). Mark a distance of 50 meters in the field.



Figure 22. Radius of drive Wheel



Figure 23. Distance between two furrow openers

Take the seed and fertilizer delivery pipes out from the boots and put delivery outlets of the pipes in the polythene bags and tight them using rubber rings (Figure 21). Run the machine and collect the seeds/fertilizers from each delivery pipes after 50 meter run of the machine. The amount of seed and fertilizer collected from each delivery pipes in 50 meter run is then weighed in grams. Then we calculate the seed rate and fertilizer rate by the given formula

One acre = 4000 m²

Width of planter = x (m)

Distance = 50 m

Weight of seed or fertilizer in pipes = y (kg) Seed or fertilizer rate (kg/ acre) =

$$\left(\frac{\text{Weight of seed or fertilizer (Kg.)} \times \text{Area / acre (400 m}^2\text{)}}{\text{Width of planter (m)} \times \text{distance covered (m)}} \right)$$

If the seed or fertilizer rates are not as per the desired rates, then re-set the indicators or the inclined plates, gears etc in accordance to the desired rates and repeat the whole process of field calibration as described above.

5. Hitching of machine

The machine has three standard hitch points; two lower and one upper. The machine is attached to tractor through these three hitch points with the help of link pins (Figure 24). The top link hitch point also helps in leveling the machines. The three point hitch adjustments where the machine fixes to the tractor should be adjusted. The machine should be level from side to side and have just enough forward and backward adjustment to enter the soil at the proper angle.

6. Operating the Robust Turbo Happy Seeder

With the help of three point linkage, the machine is attached to the tractor of optimal capacity (hp) as per the size of planter. After hitching the planter, the PTO shaft of tractor is attached to the PTO shaft linkage of machine which gives drive to the flail with the help of belts. The planter is to be calibrated and adjusted as per the requirements i.e. seed rate and fertilizer rate, depth of sowing, plant



Figure 24. Hitching of machine through three-point linkage.

to plant spacing as per the crop and field conditions. As the tractor moves, the drive wheel starts to rotate which gives drive to the seed and fertilizer shaft. As the shafts start to move, the seed and fertilizer metering (fluted rollers, inclined plates) also start to move and the fertilizer and seed drops fertilizer and seed delivery pipes and further to the seed and fertilizer boots. The seed and fertilizer boots are attached to the slits. Now the fertilizer and seed placed into the soil as the furrow openers are penetrating in soil. As the machine gets power from PTO shaft, the flails start rotating and they clean and shift the residue in front of the furrow openers so as the residues doesn't drag and accumulate in seed rows.

6.1 Tips for proper working of the machine

The soil moisture must be optimum for the operation of the machine. For proper operation of Robust Turbo Happy Seeder, the soil moisture must be slightly lower than the field capacity. The ruts will be formed if the moisture content of the soil is more than optimum which will lead to the uneven placement of the seeds. To obtain the proper efficiency of the machine (uniform and good plant stand) it is advisable to uniformly distribute the crop residue in the field before operating THS either by straw spreader or manually. There are chances of the more

moisture content in the residue in the morning time due to dew which may cause wrapping of the loose straw on the flails which hinders the rotary movement of the flails. Therefore, it is advised to operate the THS after the dew dries. Adjust the depth of sowing through depth control wheels instead of using the hydraulic lift. Using the hydraulic lift to control the sowing depth may cause the touching of flails to the ground which may damage flails and also cause uprooting of the anchored residue. The ground clearance of the flails must be about 2.5 to 3 cm. The broken flail must be replaced before the further operation of the machine. Otherwise the excessive vibrations in the machine will lead to further breakage of other parts of the machine.

6.2 Maintenance

The machine should be properly serviced and maintained. It should be checked before use to ensure that all the nuts and bolts are tightened and that all the parts are in good condition. For example, if the furrow openers are worn out, they should be replaced. If the flails are broken they must also be replaced. The fertilizer and seed boxes should also be in good condition to allow free flow of seed and fertilizer. Chains should be adjusted and oiled. The tension of the belt should be proper. After use at the end of each day, the machine should be checked, the seed and fertilizer boxes cleaned, and the moving parts oiled.

6.3 Operating notes for the machine

6.3.1 Before operation

1. Before operating the THS planter for the first time, carefully read this manual and understand all the steps. Become familiar with the mechanism, adjustments and operating methods. Before each use in the field, review this list to make sure all necessary items are checked and adjusted.
2. Preferably the fields should be laser leveled for direct drilling of crops so as to ensure uniformity in soil moisture across the field.

Laser land leveling helps in achieving uniform depth of seeding and thus helps to achieve good crop establishment in residue conditions.
3. The cutter bar height of combine harvester during harvesting of crops (rice for example) should be such that after harvesting 50% of total straw remain anchored and rest 50% as loose residues (Figure 25).
4. Uniformly distribute the loose residues over the anchored residues across the field so that the residue load becomes uniform across the field (Figure 26).
5. During the early morning hours, the moist residues (due to dew and high surface soil moisture etc) tend to clog the planter during the early morning. Therefore, the Robust Turbo Happy Seeder may be operated after sufficient evaporation of moisture from residues. The efficiency will be different for other crops and situations, for example during summer and with wheat residues, it can plant >10 acres in a day with more operating window.

6. Ensure that the soil moisture content at the time of planting is optimal and uniform so as to have uniform crop establishment.
7. Soil moisture content is critical for machine operation as excess soil moisture can cause uprooting of anchored residues, followed by machine choking and on the other side low soil moisture affects the wheat germination (Figure 27).
8. Check the condition of the seeder and make any adjustments or repairs necessary. In particular, the fasteners, blade bolts and welds before operating. Replace any broken or worn out parts.
9. Select the proper row spacing, seed quantity, and depth according to the field and crop. (Re-adjust seed rate and planting depth after trial.)
10. Make sure that the seeds to be planted are clean, and free of soil and pebbles. Do not mix fertilizer with the seeds when seeding, as this will damage the seed metering device.
11. Add the seed to the seed box. Do not fill the seed box more than three quarters full, in order to prevent the buckling of the seed box.
12. Make sure that the fertilizer is clod free.
13. Calibrate the machine as given in heading 4.1 and 4.2.

6.3.2 During operation

1. Seeding with the help of Robust Turbo Happy Seeder, first insure rice crop must be either harvested in field by combine with super SMS system or straw equally spreaded in field.
2. Use double clutch tractor to operate the machine in field. 45-55 hp tractors are sufficient to operate 9 to 12 tyne Robust Turbo Happy Seeder.
3. Use double clutch lever to reduce forward speed of tractor to clear occasional residues build up during machine operation.
4. Engage the PTO gear of tractor, set the tractor engine to 1800-2000 RPM and operate the tractor in 1st low or 2nd low gear depending on the residue load in the field.



Figure 25. Rice field after combine harvesting (50% anchored residues and 50% loose residues).



Figure 26. Combine harvested rice field with uniformly distributed rice residues.

5. Ensure optimal depth of planting through adjustment of depth control wheels.
6. Raise Robust Turbo Happy Seeder while turning on headland without disengaging PTO gear.
7. Adjust top link of the machine to keep machine straight while operating in field.
8. Use recommended seed and fertilizer rate through calibrating the planter.
9. Oil level of Gear box should be checked as specified gear oil SAE140 & quantity required 1.2 Ltr .

6.3.3 After operation

1. Proper cleaning of the machine parts should be done after use, i.e., seed box, fertilizer box, metering mechanism, seed tubes, furrow openers, window drum, ground wheel etc should be cleaned and washed at the end of the season after completion of planting operations After drying the planter, grease all bearing, points, chain and sprockets.
2. Store the planter in a cool and dry place.



Figure 27. Uprooting of anchored rice residues due to high soil moisture content.

7. Troubleshooting

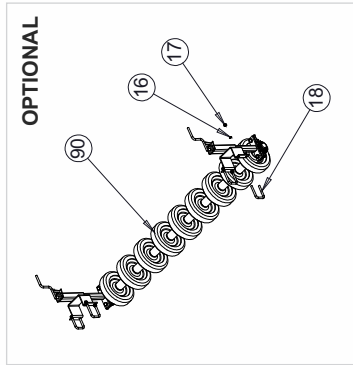
Problem	Cause	Remedy
Straw clogging/ dragging while operation of machine for planting	1. Residues are too wet due to overnight due and high surface soil moisture	1. Residues are too wet due to overnight due and high surface soil moisture
	2. Tractor engine RPM less than 1800-2000	2. Increase the engine RPM by adjusting throttle accordingly
	3. Robust Turbo Happy Seeder flails are hitting the soil	3. Increase the length of top link accordingly and ensure that flails don't touch the soil while rotating
	4. High soil moisture content	4. Better to operate the THS in relatively less soil moisture. It should be relatively less than the conditions where we operate ordinary zero till planter

Problem	Cause	Remedy
	5. PTO is not engaged before moving the machine in field.	5. Engage the PTO gear, set the tractor engine RPM at 1800-2000 and move the tractor in 2nd low gear.
	6. Worn out machine flails	6. Flail blades should be reversed/ changed after planting of 100 acres of crop in rice residues residues. It could be little more for other crop residues.
	7. Depth of seeding is more	7. Adjust the depth of seeding with depth control wheels
	8. Uneven residue load	8. Ensure that residues are spread uniformly and there is no piling of residues.
	9. Use of single clutch tractor	9. It is always advised to use double clutch tractor for THS
Clogging of residues in particular tyne	1. It may be due to improper alignment of tyne behind the flails	1. Contact the machinery supplier to rectify this fault
	2. Broken/worn out flail blades	2. Replace the flail blade
	3. Excess clearance between tyne and flail blades	3. Contact the machinery supplier to rectify this fault
Excessive vibrations in the machine	1. It may be due to broken or imbalanced flail blades	1. Replace the faulty flail blade.
Machine uprooting the anchored residue	1. Flails are hitting the ground/ clearance is not optimum	1. Use lift to prevent the flails touching the ground. The optimum clearance is 2.5 to 3 cm.
	2. Excess soil moisture	2. Operate the planter under optimal soil moisture condition & the operations under excess soil moisture
Seed/fertilizer is not delivered in slit/furrow opener	1. The seed/fertilizer box is Empty.	1. Refill the seed/fertilizer box
	2. The furrow opener or seed tube is blocked due to wet soil / mud or bending of fertilizer/ seed pipes delivery	2. Clean mud out of the opener and/or seed tubes. Unbent the delivery pipes or replace if required

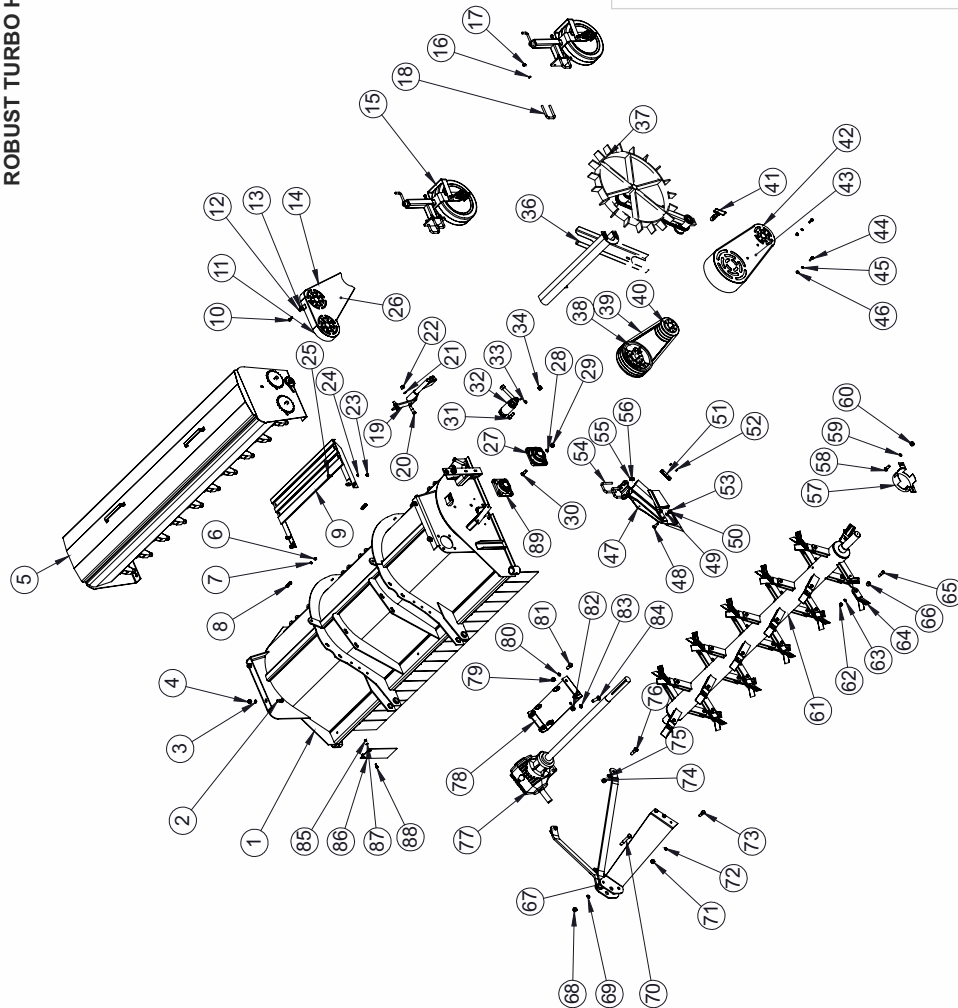
Problem	Cause	Remedy
	3. The drive wheel does not touch the ground	3. Lower down the hitch to get the drive wheel in contact with the soil
	4. Broken chain/sprocket	4. Change the broken part
	5. Fertilizer fluted roller is blocked.	5. Clean the fluted rollers

8. Part Manual

Robust Turbo Happy Seeder



OPTIONAL



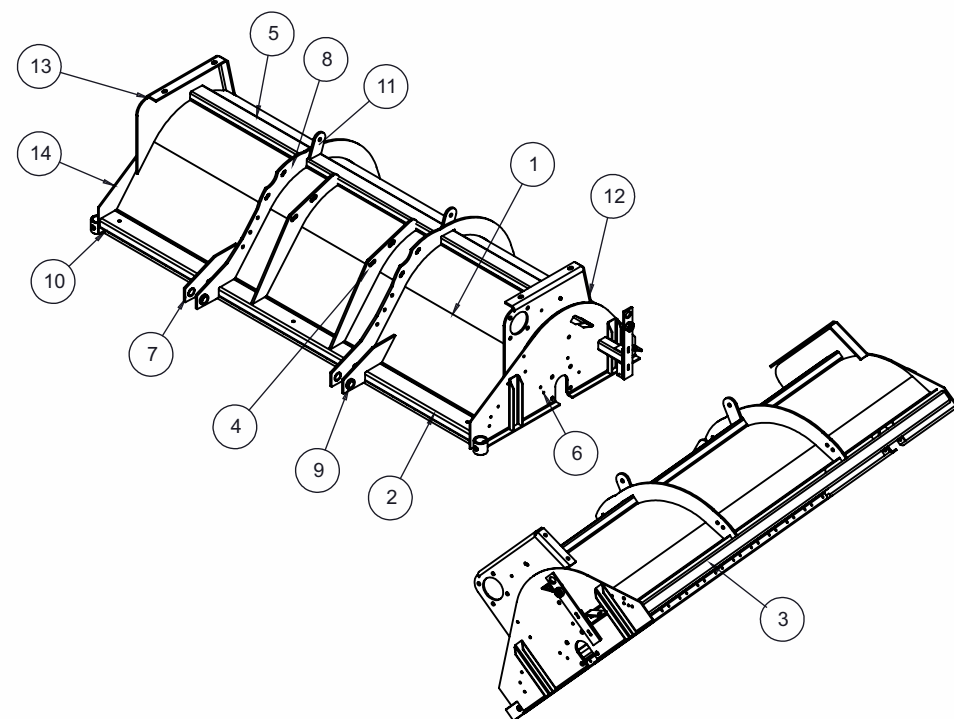
ROBUST TURBO HAPPY SEEDER ASSEMBLY

S.NO.	DESCRIPTION	ITEM CODE	QTY.
1	"MAIN FRAME ASSEMBLY (HAPPY SEEDER)"	10301216	1
2	HEX HEAD BOLT M14X50 L	10261008	4
3	SPRING WASHER 14MM	10270004	4
4	NYLOCK NUT M14X1.5 (P)	10280004	4
5	"ROBUST TURBO HAPPY SEEDER (10 ROW) HOPPER SYSTEM"	10660022	1
6	NYLOCK NUT M10X1.5MM	10280002	4
7	SPRING WASHER 10MM	10270002	4
8	HEX HEAD BOLT M10X35-8.8 -SB	10260673	4
9	PLATFORM ASSEMBLY	78800196	1
10	NYLOCK NUT M10X1.5MM	10280002	2
11	BIG SUPPORT CHAIN COVER	78800206	2
12	SPRING WASHER 10MM	10270002	2
13	HEX HEAD BOLT M10X35-8.8 -SB	10260673	2
14	CHAIN COVER ASSEMBLY	78800152	1
15	DEPTH WHEEL ASSEMBLY	78800018	1
16	SPRING WASHER 12MM	10270003	8
17	NYLOCK NUT M12X1.75 (P)	10280025	8
18	U-CLAMP 100X62X12MM	10220028	4
19	"DRIVE WHEEL AXLE SUPPORT ASSEMBLY "	78800153	1
20	HEX HEAD BOLT M14X50 L	10261008	2
21	SPRING WASHER 14MM	10270004	2
22	NYLOCK NUT M14X1.5 (P)	10280004	2
23	NYLOCK NUT M10X1.5MM	10280002	4
24	SPRING WASHER 10MM	10270002	4
25	HEX HEAD BOLT M10X35-8.8 -SB	10260673	4
26	CHAIN COVER	78800205	1
27	UC BEARING F210	10050031	2
28	SPRING WASHER 16MM	10270005	12
29	NYLOCK NUT M16X2MM	10280005	12
30	HEX HEAD BOLT 16X50X2MM (8.8 GRADE) HALF THREAD	10260358	12
31	HEX HEAD BOLT M14X50 L	10261008	1
32	TENSIONER PULLEY ASSEMBLY	78800156	1
33	SPRING WASHER 14MM	10270004	1
34	NYLOCK NUT M14X1.5 (P)	10280004	1
35	"FLEXIBLE PVC WATER SUCTION HOSE PIPE 36 O/D X 31 I/D (SEED DRILL)"	10200056	20
36	DRIVE WHEEL CHAIN COVER	78800126	1
37	"DRIVE WHEEL ASSEMBLY (HAPPY SEEDER)"	78800114	1
38	"3 GROOVE COLLER BUSH TYPE PULLEY 10 INCH (HAPPY SEEDER)"	10301210	1
39	.V BELT C-60	20060006	3
40	"3 GROOVE COLLER BUSH TYPE PULLEY 6 INCH (HAPPY SEEDER)"	10301211	1
41	SPRING LOADED PIN ASSEMBLY	10301209	1
42	M-BELT COVER ASSY (HAPPY SEEDER)	78800151	1
43	PULLEY COVER PART-1	10301227	1
44	HEX HEAD BOLT M10X35-8.8 -SB	10260673	2
45	SPRING WASHER 10MM	10270002	2
46	NYLOCK NUT M10X1.5MM	10280002	2

ROBUST TURBO HAPPY SEEDER ASSEMBLY

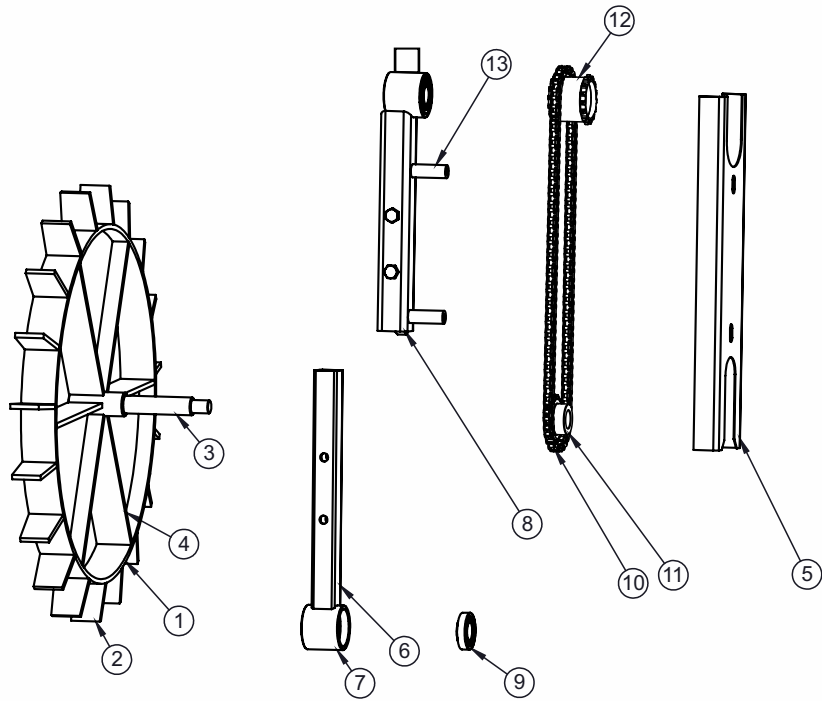
S.NO.	DESCRIPTION	ITEM CODE	QTY.
47	TYNE ASSEMBLY (HAPPY SEEDER)	78800008	10
48 & 50	"CARRIAGE BOLT 1/2X1.75 INCH WITH SQUARE NECK & WITH NYLOCK NUT"	10261018	20
49	SPRING WASHER 14MM	10270004	20
51	TYNE SERRATED BLADE	10060060	10
52	CSK FLAT HEAD RIVET Ø6X16 (IS:2998)	10301213	20
53	SHOE ASSEMBLY	78800238	10
54	U-CLAMP 100X62X12MM	10220028	20
55	SPRING WASHER 12MM	10270003	20
56	NYLOCK NUT M12X1.75 (P)	10280025	20
57	ROTOR COVER (HAPPY SEEDER)	78800015	2
58	"HEX HEAD BOLT M10X30X1.5MM (8.8 GRADE)"	10260396	4
59	SPRING WASHER 10MM	10270002	4
60	NYLOCK NUT M10X1.5MM	10280002	4
61	"HAPPY SEEDER ROTOR ROW 3"	78800204	1
62	NYLOCK NUT M12X1.75 (P)	10280025	30
63	SPRING WASHER 12MM	10270003	30
64	"SERRATED GAMMA BLADE (HAPPY SEEDER)"	10060059	30
65	"HEX HEAD BOLT M12X50X1.75MM (8.8 GRADE) HALF THREAD"	10260363	30
66	BUSH(25X14X16)	10060051	30
67	"FRONT LINK BUSH Ø32 OD X Ø 17 ID X 27.5 L"	10070159	1
68	NYLOCK NUT M16X2MM	10280005	1
69	SPRING WASHER 16MM	10270005	1
70	"HEX HEAD BOLT 16X105X2MM (8.8 GRADE)- HALF THREAD"	10260134	1
71	NYLOCK NUT M14X1.5 (P)	10280004	6
72	SPRING WASHER 14MM	10270004	6
73	HEX HEAD BOLT M14X50 L	10261008	6
74	NYLOCK NUT M16X2MM	10280005	2
75	SPRING WASHER 16MM	10270005	2
76	"HEX HEAD BOLT 16X50X2MM (8.8 GRADE) HALF THREAD"	10260358	2
77	"GEAR BOX ASSEMBLY 11X20(HAPPY SEEDER)"	10490030	1
78	"GEAR BOX MOUNTING PLATE"	10301222	1
79	NYLOCK NUT M16X2MM	10280005	4
80	SPRING WASHER 16MM	10270005	4
81	"HEX HEAD BOLT 16X50X2MM (8.8 GRADE) HALF THREAD"	10260358	4
82	NYLOCK NUT M16X2MM	10280005	4
83	PLAIN WASHER 16MM	10270020	4
84	CSK ALLEN BOLT M16X60	10261016	4
85	NYLOCK NUT M8X1.25MM	10280027	34
86	"FRONT RUBBER GUARD (HAPPY SEEDER)"	10301142	17
87	SPRING WASHER 8MM	10270001	34
88	"HEX HEAD BOLT M8X25X1.25MM (10.9 GRADE) (17MM THREAD)"	10260090	34
89	UC BEARING F209	10050333	1
90	PRESS WHEEL ASSEMBLY-9 W	78800146	1

MAIN FRAME ASSEMBLY



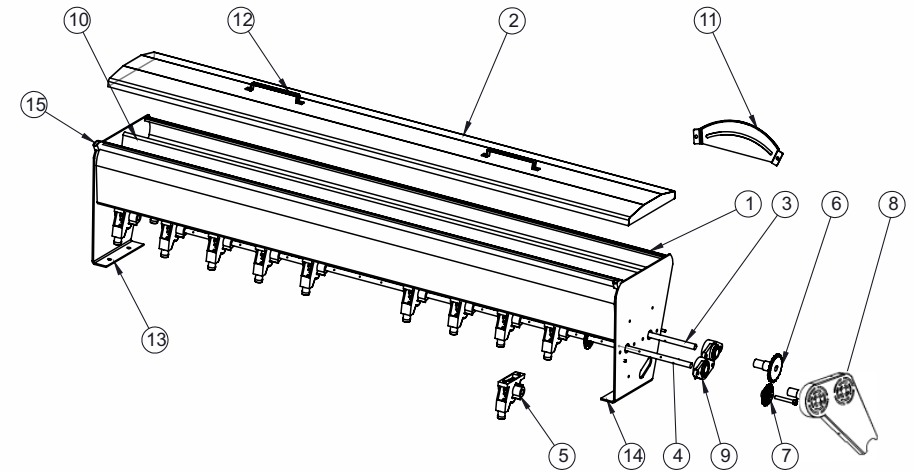
ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	ROTOR COVER SHEET	78800187	1
2	FRONT FRAME PIPE	78800170	1
3	TYNE HOLDING PIPE	78800056	1
4	PLATFORM SUPPORT	10301220	1
5	MIDDLE PIPE SUPPORT	78800174	1
6	FRAME LHS SIDE SUPPORT ASSEMBLY	78800189	1
7	FRONT LOWER CLAMP	78800167	2
8	FRAME TOP SUPPORT	78800166	2
9	FRONT CLAMP WASHER	78800062	4
10	RUBBER GUARD ANGLE	78800171	1
11	REAR FLAT CLAMP	78800169	2
12	TOP LHS SIDE SUPPORT	78800173	1
13	TOP RHS SIDE SUPPORT	78800186	1
14	FRAME RHS SIDE SUPPORT ASSEMBLY	78800190	1

Drive Wheel Assembly



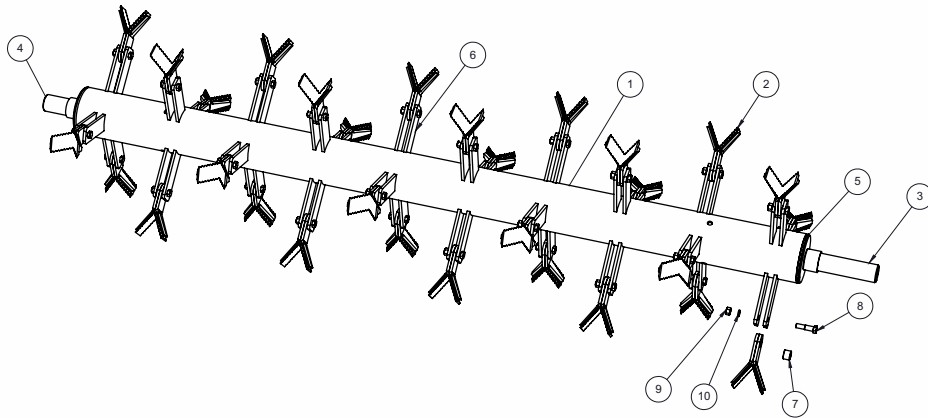
SR.NO.	DESCRIPTION	PART NO.	QUANTITY
1	WHEEL RING	78800105	1
2	DRIVE WHEEL TOP PLATE	78800106	19
3	MIDDLE AXLE SHAFT	78800109	1
4	WHEEL MIDDLE FLAT	78800107	6
5	DRIVE WHEEL CHAIN COVER	78800126	1
6	INNER PIPE	78800103	1
7	BEARING BUSH	78800104	2
8	OUTER PIPE	78800102	1
9	BEARING 6206 Z	10050141	6
10	CHAIN	10140053	1
11	SPROCKET 15T	10170077	1
12	SPROCKET BUSH	78800234	1
13	BUSH OF DRIVE WHEEL CHAIN COVER	78800135	2

Hopper Assembly



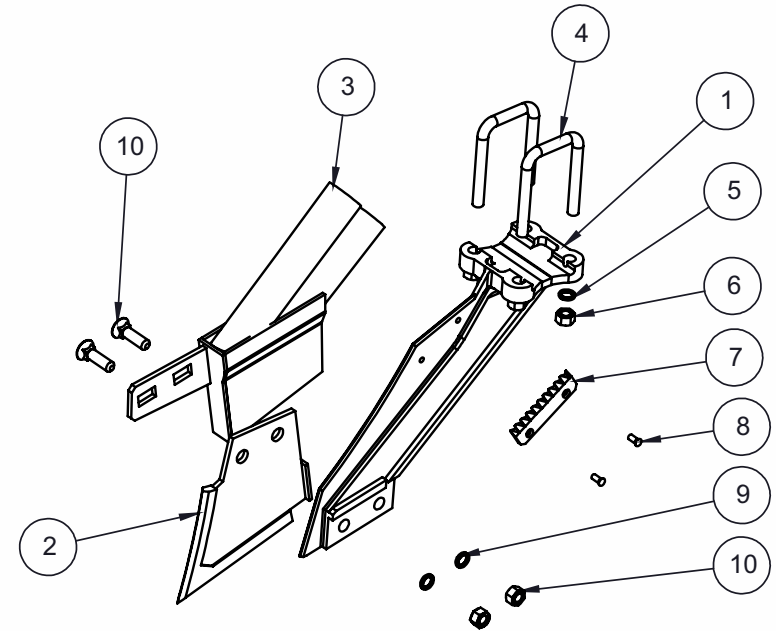
SR.NO.	DESCRIPTION	PART NO.	QTY.
1	HOPPER	78800071	1
2	HOPPER TANK COVER	78800090	1
3	ROTOR SHAFT	78800078	1
4	ROD	78800089	1
5	PISTOL	78800079	20
6	SPROCKET	78800219	2
7	16 TEETH SPROCKET	10170078	1
8	CHAIN COVER	78800152	1
9	BEARING UCFL 205	10050334	2
10	INNER PLATE	78800073	1
11	GAUGE SHEET	78800015	2
12	HOPPER TANK COVER HANDLE	78800136	2
13	HOPPER SIDE SUPPORT LHS	78800072	1
14	HOPPER SIDE SUPPORT LHS	78800137	1
15	HOPPER TANK COVER STOPPER	78800138	2

Rotor Assembly



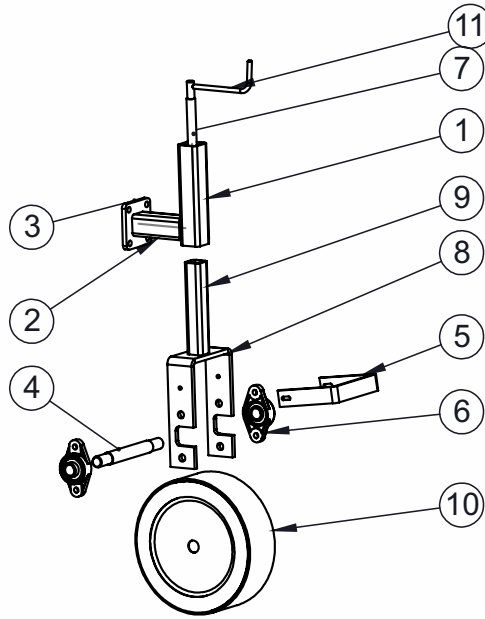
SR.NO.	DESCRIPTION	PART NO.	QUANTITY
1	ROTOR PIPE	78800217	1
2	BLADE	10060059	30
3	SHORT BEARING SHAFT-2	78800148	1
4	BEARING SHAFT-1	78800149	1
5	OUTER PLATE	78800020	2
6	BLADE HOLDING FLAT	78800023	60
7	BLADE BUSH	10060051	30
8	M12 BOLT	10260356	30
9	M12 NYLOCK NUT	10280025	30
10	SPRING WASHER	10270003	30

Tyne Assembly



S. NO.	DESCRIPTION	PART NO.	QTY.
1	TYNE TURBO CASTING (HAPPY SEEDER)	10330045	1
2	TYNE SHOE	78800036	1
3	FURROW ASSEMBLY	78800131	1
4	U-CLAMP 100X62X12MM	10220028	2
5	SPRING WASHER 12MM	10270003	4
6	NYLOCK NUT M12X1.5(P)	10280003	6
7	TYNE SERRATED BLADE	10060060	1
8	CSK RIVET FOR TYNE SERRATED BLADE Ø6X14	10301213	2
9	SPRING WASHER 14MM	10270004	2
10	CARRIAGE BOLT 1.75 INCH WITH SQUARE NECK & WITH NYLOCK NUT	10261018	2

Tyre Set Assembly



SR. NO.	DESCRIPTION	PART NO.	QUANTITY
1	OUTER PIPE	78800065	1
2	CLAMP PIPE	78800139	1
3	DEPTH WHEEL PLATE	78800140	1
4	TYRE ROD	78800141	1
5	SCRAPPER FOR TYRE SET	78800068	1
6	UCFL BEARING 205	10050334	2
7	THREADED ROD	78800142	1
8	SUPPORT FOR TYRE SET	78800067	1
9	INNER PIPE	78800066	1
10	TYRE	78800069	1
11	HANDLE ROD	78800143	1

SPREADING CHART

SPREADING CHART FOR FERTILIZER & WHEAT'S SEED CALIBRATION (KG/ACRE, KG/HECTARE)												
SEEDS & FERTILIZER RATE	1	2	3	4	5	6	7	8	9	10	11	12
FERTILIZERS QTY. KG/ACRE	10	20	30	40	50	60	70	80	90	100	110	120
FERTILIZERS QTY. KG/HECTARE	25	50	75	100	125	150	175	200	225	250	275	300
SEEDS QTY. KG/ACRE	8	16	24	32	40	48	56	64	72	80	88	96
SEEDS QTY. KG/HECTARE	19	37	66	84	101	118	138	156	172	189	199	207
QTY. KG/ACRE (WHEEL)												
ACRE SIZE= 220 (L) X 198 (W) FEET												
MACHINE SPREADING WIDTH / 6 FEET												
WHEEL SIZE 27"=1 ROUND 8 FEET AREA COVER												
NOTE-TRACTOR SPEED KMH N/A												

SPARES LIST (HAPPY SEEDER)

S.NO.	DESCRIPTION	ITEM CODE
1	TYNE ASSEMBLY (HAPPY SEEDER)	78800008
2	STAND PIPE ASSEMBLY	78800212
3	UC BEARING F209	10050333
4	UC BEARING F210	10050031
5	HOSE PIPE CLAMP 1 INCH	10301146
6	V BELT C-60	20060006
7	GEAR BOX ASSEMBLY 11X20(HAPPY SEEDER)	10490030
8	FRONT RUBBER GUARD (HAPPY SEEDER)	10301142
9	ROTOR COVER (HAPPY SEEDER)	78800015
10	U-CLAMP 100X62X12MM	10220028
11	3 GROOVE COLLER BUSH TYPE PULLEY 6 INCH(HAPPY SEEDER)	10301211
12	3 GROOVE COLLER BUSH TYPE PULLEY 10 INCH(HAPPY SEEDER)	10301210
13	TENSIONER PULLEY ASSEMBLY	78800156
14	PISTOL ASSEMBLY ALLUMINIUM (HAPPY SEEDER)	78800079
15	16 TEETH SPROCKET (HAPPY SEEDER)	78800088
16	SEEDER PIPE (HAPPY SEEDER)	78800087
17	CSK FLAT HEAD RIVET Ø6X16 (IS:2998)	10301213
18	CARRIAGE BOLT 1/2X1.75 INCH WITH SQUARE NECK & WITH NYLOCK NUT	10261018
19	TYNE SERRATED BLADE	10060060
20	TYNE TURBO CASTING(HAPPY SEEDER)	10330045
21	HAPPY SEEDER SHOE	78800130
22	HAPPY SEEDER FURROW ASSEMBLY	78800131
23	UPPER ASSEMBLY	78800226
24	LOWER ASSEMBLY	78800230
25	WHEEL ASSEMBLY	78800228
26	UCFL BEARING 205 (HAPPY SEEDER)	10050334
27	SERRATED GAMMA BLADE (HAPPY SEEDER)	10060059
28	HEX HEAD BOLT M12X50X1.75MM (8.8 GRADE) HALF THREAD	10260363
29	NYLOCK NUT M12X1.75 (P)	10280025
30	BUSH(25X14X16)	10060051
31	CHAIN 10B-1X10FT	10140053
	PTO	
32	CROSS JOURNAL SET	10310065
33	PTO OUTER TUBE YOKE	10310097
34	PTO INNER TUBE YOKE	10310096
35	PTO PUSH PIN SET SMALL	10310077
36	PTO PUSH PIN SET BIG	10310078
37	HEX HEAD BOLT 10*65*1.5	10260045
38	NYLOCK NUT M10*1.5MM	10280002
39	PTO PUSH PIN YOKE	10310073
40	YOKE FOR B02	10310030
	GEAR BOX SPARE PART LIST	
41	DOUBLE LEAP OIL SEAL (45X80X12)	10010145
42	DOUBLE LEAP OIL SEAL (47.5X80X13)	10010146
43	DEAD SEAL(80X100)	10010147
44	TAPER ROLLER BEARING (32210)	10050116
45	TAPER ROLLER BEARING (32209)	10050013
46	HEX HEAD BOLT M10X30	10260003
47	HEX HEAD BOLT M8X20	10260794
48	CHUCK NUT M 50	10280341
49	LOCK WASHER 50 MM	10270389

DELIVERY CHECKLIST

Dealer Pre-Delivery (Please Tick)	Please Complete all Dealer information Below
<p>1. Dealer Pre-Delivery Checklist</p> <ol style="list-style-type: none"> 1. The customer or person responsible has been given the operator's manual. 2. The customer undertakes to read the complete operator's manual and understands all aspects of the manual before operation of the machine. 3. All safety, operational and maintenance information have been explained and demonstrated. 4. All greasing and oil points, stickers, guarding and ID plate have been identified and physically pointed out. 5. The customer agrees that it is his responsibility to read and carry out the safety, maintenance and operation as per this operator's manual. 	<p>Dealer Information</p> <p>Dealer's Name.....</p> <p>Address.....</p> <p>State..... Postcode.....</p> <p>Phone..... Fax.....</p> <p>Email.....</p> <p>Service Person.....</p> <p>I confirm that the pre-delivery service was performed on this machine.</p> <p>Signature.....</p> <p>Date.....</p> <p>Comments.....</p>
Customer Delivery (Please Tick)	Please Complete all Customer Information Below
<p>2. Customer Delivery Checklist</p> <ol style="list-style-type: none"> 1. The customer or person responsible has been given the operator's manual. 2. The customer undertakes to read the complete operator's manual and understands all aspects of the manual before operation of the machine. 3. All safety, operational and maintenance information have been explained and demonstrated. 4. All greasing and oil points, stickers, guarding and ID plate have been identified and physically pointed out. 5. The customer agrees that it is his responsibility to read and carry out the safety, maintenance and operation as per this operator's manual. 	<p>Customer Information</p> <p>Customer's Name.....</p> <p>Address.....</p> <p>State..... Postcode.....</p> <p>Phone..... Fax.....</p> <p>Email.....</p> <p>Delivery Person.....</p> <p>I confirm that all of the delivery checks were explained and performed.</p> <p>Signature.....</p> <p>Delivery Date.....</p> <p>Comments.....</p>

FIELDKING

WARRANTY CARD Customer Copy

CUSTOMER NAME Mr./ Mrs. :

ADDRESS :

MOBILE NO. :

Email :

NAME OF IMPLEMENT :

MODEL NO. :

YEAR OF Mfg. :

SERIAL NO. :

REGISTRATION NO. :

DATE OF PURCHASING :

NAME OF DEALER :

Customer's Signature

Dealer's Signature



Beri Udyog Pvt. Ltd.

Corporate Office : Plot No. 235-236 & 238-240, Sec-3, HSIIDC,
Karnal- 132001 (Haryana), India ☎ +91-184-2221571/ 72/ 73

✉ marketing@fieldking.com, exports@fieldking.com, 🌐 www.fieldking.com

FIELDKING

WARRANTY CARD Company Copy

CUSTOMER NAME Mr./ Mrs :

ADDRESS :

MOBILE NO. :

Email :

NAME OF IMPLEMENT :

MODEL NO. :

YEAR OF Mfg. :

SERIAL NO. :

REGISTRATION NO. :

DATE OF PURCHASING :

NAME OF DEALER :

Customer's Signature

Dealer's Signature

  **Beri Udyog Pvt. Ltd.**

Corporate Office : Plot No. 235-236 & 238-240, Sec-3, HSIIDC,
Karnal- 132001 (Haryana), India ☎ +91-184-2221571/ 72/ 73
✉ marketing@fieldking.com, exports@fieldking.com, 🌐 www.fieldking.com

FIELDKING

WARRANTY CARD

Dealer Copy

CUSTOMER NAME Mr./ Mrs :

ADDRESS :

MOBILE NO. :

Email :

NAME OF IMPLEMENT :

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