Serial Numbers:
CPS230 SN Earlier – 23011018
CPS235 SN Earlier – 120023513003
CPS238 SN Earlier – 120023813002
CPS240 SN Earlier – 24012032
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Safety and Guidelines
Safety is **YOUR** responsibility!

**READ AND UNDERSTAND THIS MANUAL BEFORE YOU OPERATE THIS MACHINE.**

Learn how to operate and service your machine correctly. Failure to do so could result in personal injury and/or equipment and property damage. **HORSCH** will not accept any responsibility for any damage or malfunctions resulting from failure to comply with the Operator’s Manual.

If the information found in this manual is not completely understood or if there are any questions, contact **HORSCH** Customer Service.

**HORSCH** cares about your safety! This machine is designed to provide maximum possible safety; but no machine design can prevent operator error or carelessness.

The Operator’s Manual provides instructions for the safe operation and maintenance of this machine.

Make sure the machine is in good operation condition.

Check service schedule in book.

This manual should be considered a permanent part of your machine and should remain with the machine if you no longer own it.

Right hand and left hand are determined by facing the direction of forward travel respectively.

**HORSCH** reserves the right to alter illustrations as well as technical data and weights contained in this manual at any time without notice.

This data is the property of **HORSCH**. All use and/or reproduction not specifically authorized by **HORSCH** are prohibited.

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Some illustrations may show optional equipment. Illustrations may show shields, guards, etc., opened or removed. All shields, guards, etc. must be in place during operation.

**Machine Registration**
Please complete the Machine Registration Form on the next few pages and return to **HORSCH**. Accurately record all the numbers to help in tracing the machine. Your dealer needs these numbers when you order parts. **NO WARRANTY CLAIMS WILL BE ACCEPTED IF THIS MACHINE REGISTRATION IS NOT RETURNED.** The warranty period begins on the date of delivery.
Warranty Guidelines

1. The period of warranty for material defects relating to HORSCH products will be 12 months. In the case of written deviations from the statutory provisions, these agreements shall apply.

They shall become effective upon delivery of the machine to the end customer. All wear item parts are excluded from the warranty. These parts include but are not limited to disc blades and Rollflex packer tongues.

2. Warranty claims must be submitted to the HORSCH Customer Service Department in Andover, SD via your dealer. It is only possible to process claims which have been completed correctly and submitted no later than four weeks after the damage occurred.

3. In the case of deliveries made under the warranty which are subject to the return of the old parts, the warranty claim, together with the old parts, must be returned to HORSCH within 4 weeks after the damage occurred.

4. In the case of deliveries made under the warranty, which are not subject to the return of the old parts, these parts must be kept for the purpose of further decisions for a period of four weeks after receipt of the warranty claim.

5. Warranty repairs to be carried out by outside companies, or repairs which are expected to take more than 2 working hours, must be approved in advance with HORSCH Customer Service Department.

HORSCH, LLC
200 Knutson St.
Mapleton, ND 58059 USA
(701) 532-1000
service.us@horsch.com
www.horsch.com

For other related warranty items such as tire warranty issues, contact your nearest dealer.

A complete list of dealers can be found at the following web sites.


Titan Tires - http://www.titan-intl.com/ or 1-800-USA-BEAR.
Machine Registration Form: Customer Copy

No Warranty Claims will be accepted if this Machine Registration Form is not returned!

To:

HORSCH, LLC
200 Knutson St. Tel: 701-532-1000 Email: service.us@horsch.com
Mapleton, ND 58059 Fax: 701-532-1101

Machine Product & Model: __________________________  □ New Machine Final Sale – Initial use
□ Customer’s Machine – Transfer
□ Demonstration Machine – Initial use

Serial Number: ___________________________________  □

Sold Date: _______________________________________________________________________

In Service Date: ___________________________  Est. Acres: ____________________

Operating Instructions:
I hereby confirm receipt of the Owner’s Manual and Parts Catalog for the above mentioned machine.
I have been instructed and informed by a HORSCH factory trained Service Technician / authorized Dealer representative in the operation and functions of the machine, as well as in the safety requirements.

________________________________________________________________________________

Name of the Service Technician / Dealer representative

Dealer Customer
Name: ______________________________________  Name: ______________________________________
Address: ____________________________________  Address: ____________________________________
City/State/Zip: ________________________________ City/State/Zip: ________________________________
County: _____________________________________  County: _____________________________________
Tel: _________________________________________  Tel: _________________________________________
Fax: _________________________________________  Fax: _________________________________________
E-mail: _____________________________________  E-mail: _____________________________________

Customer No: ________________________________  Customer No: ________________________________

I am aware that a Warranty Claim will only be valid if, after the receipt of the machine, this form has been fully completed, signed and returned to HORSCH, LLC.

________________________________________________________________________________

Place, Date Customer’s Signature

NOTE: After Signing, remove and/or copy this page. Keep signed delivery checklist in machine file at the dealership.
Machine Registration Form: Dealer Copy

No Warranty Claims will be accepted if this Machine Registration Form is not returned!

To:

HORSCH, LLC
200 Knutson St.    Tel: 701-532-1000    Email: service.us@horsch.com
Mapleton, ND 58059    Fax: 701-532-1101

Machine Product & Model: __________________________
☐ New Machine Final Sale – Initial use
☐ Customer’s Machine – Transfer

Serial Number: ___________________________________
☐ Demonstration Machine – Initial use

Sold Date: _______________________________________

In Service Date: ____________________________    Est. Acres: ____________________

Operating Instructions:
I hereby confirm receipt of the Owner’s Manual and Parts Catalog for the above mentioned machine.
I have been instructed and informed by a HORSCH factory trained Service Technician / authorized Dealer representative in the operation and functions of the machine, as well as in the safety requirements.

________________________________________________
Name of the Service Technician / Dealer representative

Dealer                   Customer
Name: ______________________________    Name: ______________________________

Address: ____________________________    Address: ____________________________

City/State/Zip: _______________________    City/State/Zip: _______________________

County: ______________________________    County: _____________________________

Tel: ________________________________    Tel: ________________________________

Fax: ________________________________    Fax: ________________________________

E-mail: ______________________________    E-mail: ______________________________

Customer No: _________________________    Customer No: _________________________

I am aware that a Warranty Claim will only be valid if, after the receipt of the machine, this form has been fully completed, signed and returned to HORSCH, LLC.

__________________________________________    ______________________________________
Place, Date      Customer’s Signature

NOTE: After Signing, remove and/or copy this page. Keep signed delivery checklist in machine file at the dealership.
Machine Registration Form: HORSCH’s Copy
No Warranty Claims will be accepted if this Machine Registration Form is not returned!

To:
HORSCH, LLC
200 Knutson St.  Tel: 701-532-1000  Email: service.us@horsch.com
Mapleton, ND 58059  Fax: 701-532-1101

Machine Product & Model: __________________________  □ New Machine Final Sale – Initial use
□ Customer’s Machine – Transfer

Serial Number: ____________________________  □ Demonstration Machine – Initial use

Sold Date: ________________________________

In Service Date: ___________________________  Est. Acres: ____________________

Operating Instructions:
I hereby confirm receipt of the Owner’s Manual and Parts Catalog for the above mentioned machine.
I have been instructed and informed by a HORSCH factory trained Service Technician / authorized Dealer representative in the operation and functions of the machine, as well as in the safety requirements.

________________________________________
Name of the Service Technician / Dealer representative

Dealer
Name: ________________________________
Address: ______________________________
City/State/Zip: ________________________
County: ______________________________
Tel: ________________________________
Fax: ________________________________
E-mail: ______________________________

Customer
Name: ________________________________
Address: ______________________________
City/State/Zip: ________________________
County: ______________________________
Tel: ________________________________
Fax: ________________________________
E-mail: ______________________________

Customer No: ______________________________

I am aware that a Warranty Claim will only be valid if, after the receipt of the machine, this form has been fully completed, signed and returned to HORSCH, LLC.

______________________________________              ______________________________________
Place, Date      Customer’s Signature

NOTE: After Signing, remove and/or copy this page. Keep signed delivery checklist in machine file at the dealership.
Delivery Form: DEALERS’s Copy

At the time the machine is delivered, the following checklist is a reminder of information which should be conveyed directly to the customer. Check off each item as it is fully explained to customer.

[ ] Make the customer aware of all safety precautions that must be exercised while using this machine. Point out all Warning and Caution safety labels/decals on the machine.

[ ] Point out the location of the Serial Number Tag (product identification numbers), for future reference of the machine.

[ ] Give the Operator’s Manual to the customer. Encourage customer to read the manual in its entirety.

[ ] Explain all operating adjustments.

[ ] Review recommended procedures for attaching and detaching machine from tractor.

[ ] Make the customer aware of all safety precautions that must be observed when transporting the machine in field and on public roads.

[ ] When the machine is transported on a road or highway at night, or during the day, accessory lighting and devices should be used for adequate warning to operators of other vehicles. In this regard, tell the customer to check local governmental regulations. The machine should be equipped with road lighting and slow moving vehicle sign.

[ ] Explain to the customer that the life expectancy of this or any other machine depends on regular lubrication as directed in the Operator’s Manual. Follow all maintenance and lubrication schedules for the machine.

[ ] Discuss with the customer the use of proper tools and equipment for service of the machine.

[ ] Have customer record Serial Number(s) in the Product Specification section.

[ ] To the best of my knowledge, this machine has been delivered ready for field use and the customer has been fully informed as to proper operation and care.

Signed: ................................................................................. (Customer)

Signed: ................................................................................. (Dealer Representative)

Date: .....................................................................................
Product Specification

Each machine manufactured and assembled is serialized and provided a number for tracking purposes. There is a model number, which is the category for product family of the machine, and there is a serial number.

The serial number may also be known as, or part of, a Product Identification Number. This number is a formulated number which details the machines build information for tracking purposes and easy identification later during time of service, maintenance and replacement part ordering. The Serial number, along with Model number of the machine, can be found on the Serial Number Tag.

HORSCH LLC has placed a Serial Number Tag (reference picture below) on the machine with the above mentioned information. It is located on the main frame cross member tube directly behind the front hitch, just off center towards the left hand side of each machine.

Record the Model and Serial number of the machine below. Retain this page for customer use only! For future reference, the information will be used whenever the machine is being serviced, for ordering replacement parts or when requesting information for the machine such as replacement Owner’s Manual or a Parts Catalog. Be sure to provide both, the model number and serial number, when contacting your dealer, for better assistance and quicker support of your machine.

Date of Purchase: _________________________

Dealer Information:

Name: ________________________________

Address: ______________________________

Phone: _______________________________
In These Operating Instructions
The operating instructions distinguish between three different types of warning and safety instructions. The following graphic symbols are used:

- Important instructions!
- If there is a risk of injury!
- If there is a risk to life and limb!

It is important that all the safety instructions contained in these operating instructions and all the warning signs on the machine are read thoroughly and understood prior to operation of the machine.

Ensure that the warning signs are legible and replace any signs that are missing or damaged.

These instructions must be followed in order to prevent accidents. Inform other users of the warnings and safety instructions and the location of this Owner’s Operators Manual.

Do not carry out any operations which may affect the safe use of the machine.

Authorized Operators
Only those persons who have been authorized and instructed by the operator may operate the Machine. Operators must be at least 16 years of age.

The operator must hold a valid driving license. They are responsible for third parties in the operating area.

The person in charge must:
- Make the operating instructions available to the operator.
- Ensure that the operator has read and understood the operating instructions.

The operating instructions are a component part of the machine.

Protective Clothing
For operation and maintenance of this machine, you will need:
- Snug fitting clothing; no loose articles or strings.
- Safety gloves and goggles to protect against dirt and sharp edged machine parts.
Information Regarding Safety
The following warnings and safety instructions apply to all sections in these operating instructions.

Safety Symbols on the Machine:

- ! 读 and adhere to the operating instructions before starting up the machine!
- ! Stay clear of swinging area of retractable and extendible machine parts!
- ! Switch the engine off and pull out the key before starting maintenance and repair work!
- ! Never reach into areas where there is a risk of crushing, as long as parts could still be moving!
- ! Watch out for fluids spraying out under high pressure, follow the operating instructions!
- ! It is only permitted to remain in the danger zone if the safety support is in place!
- ! When hitching up the drill and when operating the hydraulic system, no persons should be between the machines!
- ! No passengers are allowed to ride on the machine!
- ! Do not climb on rotatable parts. Use mounting steps provided for this purpose!
- ! Lifting hook; attach lifting tackle (chains, ropes, etc.) here when performing loading work!
Operational Safety
The machine must only be put into operation after receiving instructions by employees of the authorized dealer or a HORSCH employee. The Machine Registration Form has to be completed and returned to HORSCH.

Road Traffic Safety
The valid road traffic regulations are to be observed when travelling on public roads, paths and areas.

Do not exceed the maximum permissible transportation widths and heights and install road lighting equipment, warnings and safety covers where necessary.

Do not exceed the permissible axle loads, tire carrying capacities and total weights, in order to ensure sufficient steering and braking capabilities. Handling is affected by the implement connected. It is important to take into account the large overhang and the centrifugal mass of the implement, particularly when cornering. **DO NOT EXCEED A MAXIMUM SPEED OF 20 MPH DURING TRANSPORTATION. LOSS OF VEHICLE/MACHINE CONTROL CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH!**

The whole machine is to be cleaned of soil that has been collected before travel on public roads. Passengers are strictly forbidden to ride on the machine.

Accident Prevention
In addition to the operating instructions, it is important to observe the accident prevention regulations specified by agricultural trade associations!

Hitching/Unhitching
There is risk of injury to persons when hitching/unhitching the machine to the three-point hitching device of the tractor.

- Secure the machine against rolling away.
- Take special care when reversing the tractor. Never stand between tractor and machine.
- Only park the machine on a firm and level surface.
- For further information see Page 30.

Changing Implements

- Secure the machine against unintended rolling!
- Secure lifted frame parts, under which you will be working, with suitable supports!
- Caution! Danger of injury caused by protruding parts (tines, discs)!
- Do not use the packer or other rotating parts when climbing onto the machine. These could start to rotate and you could fall and be seriously injured.

In Operation

- Check the area around the machine (for children!) before setting off and starting operation of the machine. Ensure sufficient visibility!
- Stay clear of the operating range of hydraulically operated parts.
- Passengers are not allowed to ride on the machine during operation!
Extracting Stuck Machine Safety & Guidelines

Follow proper hooking and towing recommendations below for extracting stuck machines. If damage is incurred to a machine during extraction due to improper procedure, any applicable warranties may be void!

- Avoid wet, water logged and muddy ground conditions so as not to get stuck.
- Assess the situation around the stuck machine before attempting extraction.
- Know when to call a professional for assistance in towing, lifting and extraction.
- Use properly rated equipment – larger tractor/truck, tow ropes/straps, clevises, chains, cables, etc.
- Practice proper hooking and pulling techniques. Know where proper hooking points are at on a machine so as not to damage the machine.

Do not hook or pull the machine from the transport axle or rear toolbar. Attach to a tie down location or the main frame. Do not pull the machine sideways. Pull in a straight line as much as possible.

- Pull force should not exceed normal operating conditions.
- Be aware of overhead power lines to avoid risk of serious damage and/or personal injury.
- Be aware of ditches or rocks to avoid tipping hazards of equipment.
- All bystanders are at risk of serious injury and must stand clear of extraction area for their own personal safety.
- Inspect machinery after recovery. Make any necessary repairs before putting the machine back into service.

Service and Maintenance

- Ensure that regular tests and inspections are always carried out to schedule, as specified in the operating instructions.
- Prior to performing maintenance and servicing work, ensure that the machine is positioned on firm, level ground and that it is properly secured against rolling away.
- Prior to working on the electrical system, disconnect it from the electric power supply.
- Retighten screwed connections which had been loosened during servicing and maintenance work.
- For further Service and maintenance information see Page 35.

Do not wash new machines with a steam-jet or high-pressure cleaner. The paint takes approximately 3 months to cure and could thus be damaged if this time has not yet expired.
Installation

Instruction of the operator and initial installation of the machine are done by an authorized dealer or HORSCH representative.

The machine can be released for operation only after instruction by our service technician or authorized distributor has been completed and the operating instructions have been read and understood.

When carrying out installation and maintenance work there is a higher risk of injury.

It is important that you familiarize yourself with the machine and read this Owner’s Manual before operating the machine.

The instructions in respect of initial installation should also be followed if the machine has not been used (stored) for a longer period of time. Dismantle the removable parts supplied with the machine.

- Check all important screw connections.
- Grease all zerks.
- Check air pressure in tires.
- Prepare connection for the lighting equipment.
- Check all hydraulic connections and hoses for correct attachment and proper functioning.
- Ensure that any deficiencies are remedied immediately.

Hydraulic Functions

When handling the machine, ensure that nobody is in the danger zone. The hydraulic functions are controlled at tractor hydraulic controls from inside the cab.

Safety Measures in Case of Injury from Oil

Eyes: Should any oil be splashed into your eyes, rinse with water for 15 minutes. If the eye is still irritated, contact a doctor immediately.

If Oil is Ingested: If oil is swallowed, it is important not to induce vomiting. Contact a doctor immediately.

Skin Irritation caused by Oil: In case of prolonged skin contact, wash off the oil with soap and water.

Oil Spills: Use either sand or a suitable granular absorbent to soak up any spilled oil. Dispose of the oil contamination absorbent in the proper manner.

Oil Fires: Never use water to extinguish an oil fire. The oil will float on water causing the fire to spread. Burning oil-lubricant must be extinguished using a carbon dioxide power or foam extinguisher. Always wear respiratory equipment when dealing with fires of this type.

Waste Oil Disposal: Oil-contaminated waste and used oil must be disposed of in accordance with current legislation. Check with your local hazardous waste management coordinator. Waste oils must be collected and disposed of with local regulations. Never pour used oil in to a sewage system or drains or on to the ground.
Connecting Hydraulics to Tractor

![Diagram of hydraulics connected to a tractor]

<table>
<thead>
<tr>
<th>Legend</th>
<th>Tie Band</th>
<th>Type</th>
<th>Color</th>
<th>SCV Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>I</td>
<td>Pressure</td>
<td>Green</td>
<td>Depth Pressure</td>
</tr>
<tr>
<td>B</td>
<td>I</td>
<td>Return</td>
<td>Green</td>
<td>Depth Return</td>
</tr>
<tr>
<td>C</td>
<td>II</td>
<td>Pressure</td>
<td>Yellow</td>
<td>Wing Fold Pressure</td>
</tr>
<tr>
<td>D</td>
<td>II</td>
<td>Return</td>
<td>Yellow</td>
<td>Wing Fold Return</td>
</tr>
<tr>
<td>E</td>
<td>III</td>
<td>Pressure</td>
<td>Blue</td>
<td>Fan 1 Pressure</td>
</tr>
<tr>
<td>F</td>
<td>III</td>
<td>Return</td>
<td>Blue</td>
<td>Fan 1 Return</td>
</tr>
<tr>
<td>III</td>
<td>IV</td>
<td>Pressure</td>
<td>Red</td>
<td>Fan 2 Pressure</td>
</tr>
<tr>
<td>H</td>
<td>IV</td>
<td>Return</td>
<td>Red</td>
<td>Fan 2 Return</td>
</tr>
</tbody>
</table>
IMPORTANT! The electronics must be hooked to battery power. Never connect to the starter.
Operation & Configuration

Description

The HORSCH Cougar Planting System Air Seeder is built for seeding and fertilizer applications in a single pass. The Cougar can be joined with the 500i Commodity Cart for seed and fertilizer storage.

Triple Shoot Openers are used together with a fertilizer seed wagon. Here it is possible to apply fertilizer accurately using an electronically controlled device, which enables it to be placed below the seed during sowing.

The specified amount of seed/liquid fertilizer can be discharged at speeds according to the electronic control device and monitoring system settings.

Depending upon the seed cart type, the Cougar can be operated in front of or behind, hitched up to the back of the seed wagon.

Triple Shoot Opener

The point of the Triple Shoot Opener is secured with a roll pin. The opener point is not to be struck when changing the points and driving in the roll pins. This is very hard and is, consequently, susceptible to fracture if struck. Therefore, use an appropriate tool and device to drive in the roll pins.

The baseplates are fastened to the opener with either a 5/16”-18 or 3/8”-16 hex bolts depending on the model year. A ½” or 9/16” socket wrench and a 7/32” hex socket screw key (Allen Key) are needed for repair.
Coulter Operation
The cutting coulters may be operated in three different settings:

1. Top – the coulter blade is just even with the opener knife tip. This is the proper settings to run in most field conditions. As wear occurs on the blade the coulter may be set in to the middle setting.
2. Middle – as wear occurs on the coulter blade this setting is 1.5” lower.
3. Bottom – used when the coulter blade is nearing the end of its working life.

Coulter Adjustment
The cutting coulters are preassembled and adjusted from the factory. However, adjustment to spring tension is available and may be necessary.

1. Set spring tension by adjusting the ¾” lock nut until the spring is compressed to a length of 8-3/4”. This should be the minimum set pre-load for this spring. If the spring can be rotated on the push rod by hand, it is too loose and must be tightened.
2. Tighten 3/4” lock nut if greater spring pre-load is required, depending on field conditions and desired seed depth.
3. Inspect the spring for pre-load before each operation. Maximum spring pre-load is up to 1-1/4” of thread exposed from the lock nut.

**NOTE:** Replace any damaged or broken springs or other components immediately. For a complete list of serviceable items, see Panther Planting System Parts Catalog, or your nearest authorized HORSCH dealer.

*Picture to right indicates an assembled coulter unit with spring installed and pre-load set to the minimum setting, (8-3/4”).*

*The ¾” lock nut is installed and tightened against the outer coil spring keeper.*
Transportation & Installation

Transportation

The Air Seeder, together with its mounted options, is normally delivered completely assembled.

If components or subassemblies have been dismantled for transportation, these will be installed onsite by an authorized dealer or HORSCH representative.

Depending on the design of the low-bed truck, the machine can be towed off with a tractor. Otherwise, it must be lifted off with a suitable lifting crane.

Ensure that the hoisting and lifting gear used has adequate load-carrying capacity. When choosing these points, keep in mind the high center of gravity and weight distribution.

IMPORTANT! When transporting on public roads, the seed cart must be empty. With the seed cart hitched to the rear of the Cougar, central packer tires can fail due to increased weight transferred from a loaded/partially loaded seed cart.

Attaching the Machine

The Air Seeder can be hitched up to a tractor or the seed cart.

When hitching up the machine, ensure that nobody is between the tractor and the machine.

When close to the machine, avoid sharp edges which can injure you.

1. Hitch the air seeder and the cart to the tractor.
2. Connect the monitoring system.
3. Connect the hydraulic system.
4. Connect the lighting equipment.
5. Raise the front hitch lift jack in to transport position.
6. Fold the side sections of the frame and secure with safety pins. Pay attention to height and width of the machine during transportation.
7. Drive only with an empty seeder. (The maximum speed when transporting the machine is 16 mph.)
Connecting the Hydraulic System

In order to prevent confusion, the quick couplers should be properly identified. See the chart on the previous pages for proper identification.

Raise the machine. Install the spacers on to the lifting cylinder. Lower the machine on to the transportation stops.

Wing Section Folding
The folding action on the side wings are connected to double-acting cylinders.

Do not stand in the area around the folding sections.

Folding:
1. Raise the air seeder to its up position.
2. Install cylinder stops on the main frame.
3. Lower the hydraulics down on to the stops and the inner wings.
4. Activate the control lever and gradually fold the outer and inner wings.
5. Attach the folding safety bolts.

Unfolding:
1. Raise the air seeder to its up position.
2. Remove the cylinder stops.
3. Remove the safety pins for the wings.
4. Gradually lower the wings with the control lever.
Connect the Road Lighting System

Connect the 7-pin lighting system plug to the socket on the tractor.

Before transporting the air seeder on public roads it is important to check the function of the lighting and the condition of the red tail lights and amber flashing lights. Repair all lights that are not functional before transporting.
Parking the Planting System

The air seeder should be parked indoors or under cover to prevent moisture collecting in the distributor, metering units or seed tubes.

The Cougar Planting System with Commodity Cart/Seed Wagon, can be parked separately or together.

1. Park the seeder on level and solid ground and switch off the tractor.
2. Lower the Cougar to the ground and position the seeder stabilizer in the park position.
3. Disconnect the tractor hydraulic and electric lines and hook them on to the brackets on the front hitch of the cougar.
4. Unhitch the air seeder and lower the jack.
5. Empty the distributor.
6. Clean the metering units.
7. Close the distributor cover.
8. Store electrical and electronic components in a dry storage area.

When maneuvering the air seeder, pay attention to your surroundings. Ensure that nobody is in the maneuvering area.
**Adjustment/Operation**

**Walking Tandem Packer Wheels**

The packer wheels are made up of several flexing sections.

The packer consolidates the soil and leaves a level and water permeable seedbed.

In the transportation position the center packer acts as a chassis. The two outer packers are folded and the center packer supports the machine.

The soil must be uniformly consolidated over the entire working width.

---

**IMPORTANT!** Before machine is to be transported on public roads, check the center packer tires for proper tire air pressure. Any tires that are not sufficiently pressurized or flat need to be repaired. Avoid any obstructions on the road so as not to harm the tires or damage the machine. Tire inflation is typically 30 psi.

**Adjustable Link**

The adjustable link is used to adjust the alignment of the rear packer gang to the main frame of the machine.

There are two adjustable links on each inner and outer wing. Turning the adjustable link clockwise will shorten the link up. Turning the adjustable link counterclockwise will lengthen the link up between the packer and frame.
There is a locking nut on each arm that must be locked with a hammer to ensure that it does not come loose.

Using a tape measure, measure distance from the walking tandem to the frame. Align and adjust the packer gang as needed using the adjustable links.

**Maintenance**

The factory settings on the packer top links do not usually need to be adjusted.

Check the tightness of all the top link counternuts (upper link) regularly.

- Check the tightness of the wheels and flange bearings.
- Check the tightness of the screw connections and setting spindles.
- Check the tire air pressure:
  - Outer packer – approximately 25-30 psi.
  - Center packer – approximately 30 psi.
- Check tires for any damage.
Manifold System
The Manifold System consists of a head unit and distribution chutes. The manifold heads provide the air and seed to the openers. Double Shoot systems have four manifold heads, while a Single Shoot system only have two manifold heads.
**Depth Setting**

When in operation, the air seeder is supported by 12 hydraulic cylinders which raise the machine for sowing.

The rear main cylinders divide the lift hydraulic system into two separate circuits. In each circuit all the cylinders are arranged in series.

The diameter of each following (series) cylinder is smaller to enable the lifting distance to remain constant across the entire working width.

Each cylinder is filled through a rephasing orifice which also compensates for any leaks.

In the extended position the rephasing orifice are exposed to allow the oil to flow into the next cylinder. The cylinders are filled with oil, vented and aligned with the end stop.

The cylinders are balanced automatically as soon as the control device is activated for a longer period during lifting. This should be done several times a day in order to ensure that the machine is always raised and lowered evenly. For more information see ‘Rephasing the Hydraulic Cylinders’ further in this section.

**NOTE:** It is necessary to rephase the cylinders before adjusting the depth.

**Basic Setting**

The basic frame settings are adjusted from the manufacturer. This involves adjusting the cylinder piston bosses and brackets to create an even gap between the frame and ground so as to achieve a level setting at both the front and the rear using the cylinder spacers.

**Check Basic Setting:**

1. Check the air pressures on the caster tires and packer tires and inflate to recommended pressure noted in this manual if necessary.
2. Hitch up the machine and unfold it on level ground.
3. Raise the air seeder and level off the cylinders.
4. Place identical combinations and equal number spacers on the hydraulic cylinders for the depth guide.
5. Lower the air seeder until it is just off the ground. The openers should all be at approximately the same height. The cylinders should be flush against the spacers on all the connecting rods.
6. Adjust the connecting rods and mounting plates if necessary.

* All other adjustments are made in the field. Further information is detailed in ‘Setting the Seed Depth’ explained in this section.
**Depth Stop Chart**

- Every step on the depth stop chart moves the air seeder approximately 0.31” or 5/16” either up or down.

<table>
<thead>
<tr>
<th>Step</th>
<th>Color</th>
<th>Depth (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Silver</td>
<td>2”</td>
</tr>
<tr>
<td>2-11</td>
<td>Black</td>
<td>1.125”</td>
</tr>
<tr>
<td>12-17</td>
<td>Yellow</td>
<td>0.750”</td>
</tr>
<tr>
<td>18-23</td>
<td>Red</td>
<td>0.375”</td>
</tr>
<tr>
<td>24-34</td>
<td>Blue</td>
<td>0.250”</td>
</tr>
</tbody>
</table>
Setting the Seed Depth

To adjust the depth, remove the same number and color combinations of spacers from all the depth guides.

The ratio is approximately 2:1.

Adjusting the connecting rod 1” alters the heights of the machine by approximately 2”.

The various spacer combinations (see diagram on hydraulic cylinder) enable the height to be adjusted by approximately 0.31” at each level (as described on previous pages).

Remove spacers to adjust the machine to the desired working depth.

First, you must check phase of the hydraulic cylinders to determine proper lift. Follow the procedure, ‘Rephasing the Hydraulic Cylinders’ in this section.

Procedure:

1. It is best recommended after rephasing the lift cylinders the machine is leveled. Before using the machine in field operation, find a hard, flat surface such as a concrete slab. Unfold the machine. Lift the machine up completely to be certain it is phased. Then lower the machine 3/4”-1”. You must use some of the depth stops provided with the machine. With the machine opener tips now 3” from the ground from high lift, measure for levelness across the machine.

2. The main frame of the seeder is your starting point. **ALWAYS START FROM THE MIDDLE OF THE MACHINE AND WORK YOUR WAY OUTWARD TO THE OUTER WINGS (WHERE EQUIPPED).** Work front to back, center to outer wings. Adjust the front, then the back. The front of the machine has been set from the factory to the center position. For now this will be our predetermined depth setting.

3. Use the diagrams on the following pages for reference. From location 1 (front hitch drawbar), find the nearest opener on the left hand side and measure from tip to the ground. Record your measurement in the chart. Then measure the opener closest to the adjustment plate on the right hand side and record its measurement. Next, move to location 2 and repeat the procedure. Record measurements.

4. To adjust depth, loosen the clamping bolts (x4), see pictures on the next page. Then loosen the jam nut of the adjusting bolt on the appropriate adjustment plate. Use the opposite jam nut, by threading in/out, to adjust the height on that corner location. **Remember the 2:1 ratio, an adjustment of ½” adjusting bolt thread will adjust the machine height by 1”.** Repeat for each of locations 1 and 2 to adjust accordingly. Measure each opener tip point again for verification and adjust as needed. When done be sure to tighten the jam nuts and the clamping bolts.

5. Move to the next section outward to location 3. Find the opener tip measuring point noted in the diagrams on the following pages. Repeat steps above for locations 3 and 4. Adjust accordingly.
6. If working on a 40ft machine, repeat the step above one more time to level the machine. For comparison, review the difference in machine height between locations 1 and 5 for both sides and locations 2 and 6. After they have been adjusted, the height difference should be the same from one end of the machine to the other, front to back. Adjust accordingly. Be sure to tighten all jam nuts and clamping bolts on adjusting plates when done.

7. You should now be ready for field use. You will make the last determining measurements for machine level when in the field. After making a pass in the field, stop to check the seed depth. See ‘Checking Seed Depth’ on the next few pages in this section. If the machine is not level to operator’s satisfaction, adjust the machine starting from location 1/2, then 3/4, and finally 5/6 respectively. These measurements will be determined by the seed depth gauge explained below on the following page.

It is best recommended the machine seed depth be checked several times throughout the season, and especially throughout the first day of use. Be sure to check the machine across its entire width and length. Typically when making adjustments it will be easier to make the adjustments by letting the machine down on the ground so as to relieve pressure off the adjustment plates. This may not be effective for first time measurements and adjustments prior to field use unless the correct amount and size depth stop spacers are used on each cylinder, as suggested from Step 1 above.
HINT: When making adjustments, to raise the machine adjust the bolt inward toward hydraulic cylinder; to lower the machine adjust the bolt outward away from the hydraulic cylinder.

* For further information on adjusting points see the diagrams listed on the following page(s).
Measuring Points from Openers - (1, 2, 3, 4)

Adjusting Points from Drawbar, Casters & Packers – (A, B, C, D)

Front Hitch & Drawbar
Timing of the Front Hitch

Timing of the front hitch is required for proper leveling of the machine and rear packer. This will also aid in the proper setting desired for seed depth.
Checking the Seed Depth of the Machine

Front to back – The red and blue lines pointing to the front and back openers of the air seeder are the ones that need to be checked to determine the levelness of the machine from front to back. (See picture on previous pages.)

If it is determined that one is deeper than the other and you have found that the seed depth is incorrect, you will need to raise or lower the area of the machine where the opener is putting the seed deeper/shallower. See previous pages for adjustment procedure – Setting the Seed Depth.

This is only determined by the operator! Please thoroughly read this manual and understand the procedures and machine before proceeding. Proper machine leveling is the responsibility of the customer/dealer.

Checking for Seed

The opener will place the seed on a shelf made by the base plate which will be approximately 3-4 inches from the center of the opener where the fertilizer is being placed, 1.5-2” below the seed. Determining the depth of this shelf will help in the setting of the machine.

By slowly brushing the dirt away from where the opener has gone you will find the seed. Doing this across the width of the machine in the places noted in the diagram on the previous page, will give a good idea of what adjustments will need to be made to raise or lower the machine.

NOTE: This is especially critical when planting corn and should be done several times during the day while planting.

HINT: Use the provided Depth Gauge to help in determining seed depth. It can also be used as a digging tool. Check all seed hoses to insure seed is present in the seed row. On double shoot units check the deep band point trench to insure fertilizer is present and no seed is present. Proper placement of openers and seed/fertilizer is the responsibility of the customer/dealer.
Machine Work Instructions

Driving Speed:
Seeder speed depends on the field conditions (type of soil, harvesting residues, etc.), the seed, seed rate, the openers used, and other determining factors.

**NOTE:** If the conditions are difficult, slowing down the speed may assist in better seed distribution.

Checks:
The seeding quality essentially depends on the adjustments and checks made prior to and during seeding, as well as on regular servicing and maintenance of the machine. Therefore, the relevant maintenance work should be carried out prior to commencing seeding and lubricating of the machine.

Check Points

Planting System:
- Is the air seeder correctly hitched up and the coupling device locked?
- Have the hydraulic hoses been connected?
- Have the locking pins been installed for road transport?
- Is the lighting system functioning and lights visible? Be sure to clean the lenses.
- Check the air pressure in the tires. Do NOT over-inflate!
- Has the air seeder been aligned in operating position and the sowing depth set correctly?

Cultivation Tools:
- Are the openers and other cultivation tools and optional equipment still in serviceable condition?
- Are the packer wheels and the guide wheels running correctly?
**Fans:**
- Is the fan drive in order?
- Has the hydraulic fan been connected to an unpressurized return line?

**Pneumatic System:**
- Has the correct distribution head cover been installed?
- Are the seed hoses sagging and are they free from water and deposits?
- Are all the air lines from the fan to the openers tight and firmly attached?
- Is air emerging uniformly from all the openers?
- Has the correct air volume been set on the fan? Are the seeds being blown out of the furrow, or remaining in the hoses and blocking them?

**Rephasing the Hydraulic Cylinders**
The air seeder chassis is fitted with hydraulic rephasing cylinders.

The cylinders are all connected in series and therefore operate up/down in parallel. Here, the hydraulic oil is forced out of the piston rod chamber of one cylinder into the piston chamber of the next cylinder, and so on and so forth, for however many cylinders are connected in series (typically three).

The diameter of each following cylinder is smaller to enable the lifting distance to remain constant.

In the extended position the rephasing orifices are exposed to allow the oil to flow into the next cylinder. The cylinders are filled with oil, vented and aligned with the end stop.
It is important to level off the cylinders after assembly and carry out repairs on the hydraulic system. This should also be done regularly while the machine is in operation and before setting the depth.

The procedure must be repeated several times depending upon the number of cylinders, mounting position and hydraulic pump rate. The machine will rephase on its own every time it is lifted.

**Rephasing:**
- Set tractor at a medium rpm.
- Activate the lift control device and maintain the pressure for approximately 30 seconds. (This will lift the machine and apply pressure to the first series cylinders. Once they have fully extended and reached maximum pressure, the relief/rephasing port of the cylinder then sends pressure to the next series cylinder. The process is repeated. When the final series cylinder has phased the relief sends pressure back to the tractor and completes the series rephase of the cylinder circuit.
- Reposition the cylinders and repeat the procedure several times. (The system should NOT need to be bled out during phasing. This was done at the factory.)

**NOTE:** Once the unit has been phased you may want to verify seed depth setting again.

**Disc Leveler**
The discs are arranged behind the shanks, slanting in the direction of travel and prevent the soil, which is thrown upwards, from forming ridges at high speeds.
Rear Drawbar
A drawbar can be mounted on the center packer in order to hitch the commodity cart or seed wagon.

Hitch the bottom of the drawbar and the ball eyes up to the bracket on the packer frame. Then hitch the upper link to the bracket on the central frame and secure with the pins.

When planting corn use the right pin hole in the rear hitch to prevent tires on the cart from running on top of the rows. To prevent the 5-1/2” main seed tubes from pulling off, you may have to move the hose from the left side to the right side of the upright. On a single air system, there will be two hoses on the right side of the upright, and on a dual air system there will be three hoses on right side of the upright, and one hose on the left side.
Hydraulic Cylinders
Troubleshooting:
If several rephasing hydraulic cylinders are connected in series and one cylinder has an internal leak, it is only possible to locate the defective cylinder using a shut-off valve. A Shut-off Valve (Cylinder Test Kit) is available for purchase through your local authorized Horsch dealer at http://www.horschanderson.com/locate-a-dealer.html, PN 05945100.

- Mount a shut-off valve between the first and second cylinder.
- Open the shut-off valve and level off the cylinder (align and vent).
- Fully extend the cylinder and disconnect the hydraulics.
- If the cylinder continues to fall, depressurize the system and mount a shut-off valve between the second and third cylinder. Realign and vent the cylinders.
- Repeat procedure until the wings are no longer lowered.
- The defective cylinder is the last one which is sealed off.
- Remove the cylinder and fit a new seal kit. This can be done in a single operation provided there are enough shut-off valves available. Simply mount valves between all the cylinders and seal them off one by one until the entire process is completed.
Cylinders & Seal Kits:

Required checks:

- Check the pin retainers on the hitching bolt and the frame connector regularly.
- Ensure that the lock nuts on the upper link are firmly attached.
Work switch

This picture shows the location of the Work Switch on the air seeder drawbar, right side.

This picture shows position of the Work Switch in regards to the magnet that sends the signal to the drill manager to engage it. If the operator desires to run the machine manually with the switch on the switch box, they could unhook the minidin cable connected to the work switch (shown in picture above), cap the minidin cable and cover the hole in the work switch so it is not penetrated with dirt and debris.
Seed Sensor System

Dual Manifold with Seed Sensor System installed.

Seed Flow Module with extra Y-Cable for dual air system. (96 sensors installed.)

When operator wishes to disconnect half of the seed sensors in the system, operator must disconnect cable 7 and 14. Connecting the ends of 7 & 14 together.

By connecting male 7 to female 14 you will bypass the fertilizer sensors 49-96. You will find these connections in the upper right hand corner of the main frame.

Dual Blockage Monitor

To bypass 49-96 sensors, connect Male #7 to Female #14.
Openers

Types of Openers
Different types of opener designs and variations have been developed for the various seeds and soils. The openers are available in several working widths and can be mounted on the shanks using adapters.

Contact your local authorized Horsch dealer for any further information and specific questions you may have for your conditions.

Anderson Triple Shoot Opener
The Triple Shoot Opener is a combined seeding and fertilizing opener.

Models of Openers
AE Twin Openers
AE-15 Dry (7 – 7-1/2 Paired Row Spacing)
AE-15 NH3-LQ (7 – 7-1/2 Paired Row Spacing)
AE-12 Dry (6 – 6-1/2 Paired Row Spacing)
AE-12 NH3-LQ (6 – 6-1/2 Paired Row Spacing)
AE-10 NH3-LQ (5 – 5-1/2 Paired Row Spacing)
AE-15 DP (NH3-LQ and Dry w/ 7 – 7-1/2 Paired Row Spacing)

AE Single Shoot Openers
AE-SS LQ or NH3
AE-SS Seed Only
AE-SS Double Shoot
The AE-15, 12 and 10 are used for Double Shoot applications using either dry or liquid fertilizers. It places the fertilizer just below the seed and also places starter fertilizer with the seed in paired rows.

The Double Shoot Reverse Drop is used for planting legumes, corn and also mid row banding fertilizer between 30” rows on a double shoot configured Cougar Models 60-15 or 40-15.
The AE-15, 12 and 10 Opener is used for planting small grains in 15” paired rows, and corn or beans in 30” paired rows with the NH3 or liquid below the seed.

The AE-SS Opener is used for planting corn or beans in 15” rows and mid banding the NH3 or liquid between 30” rows.

* For more Opener options visit your local authorized Horsch dealer.
Troubleshooting & Maintenance

Maintenance and Service
Follow the safety instructions for servicing and maintenance.

The Cougar air seeder has been designed and constructed for maximum performance, operational efficiency and operator friendliness under a wide variety of operating conditions.

Prior to delivery, the machine has been checked at the factory and by an authorized dealer to ensure that you receive an air seeder in optimum condition.

To ensure trouble-free operation, it is important that service and maintenance work is performed at the recommended intervals.

Cleaning
In order to ensure that the machine is always in operating condition and to achieve optimum performance, perform the cleaning work at regular intervals.

IMPORTANT! Do not use high pressure hoses or water jets to clean electrical components such as magnetic valves and seed flow sensors or the seal on the hydraulic cylinders and wheel hubs. The housing, screwed connections and ball bearings are not water tight.

- Clean the outside of the machine with low pressure water, regarding the notification stated above.

Preparation for Storage
If you want to store the machine for a longer period of time, pay attention to the following points:

- Park the machine inside a building if possible.
- Empty the distributors completely.
- Protect the air seeder against rust. If you want to spray the machine with oil, use only oils that are easily biodegradable, i.e., rapeseed oil.

Removing from Storage

1. Check tires and inflate as necessary.
2. Clean the machine thoroughly.
3. Perform required lubrication. See the Lubrication and Maintenance Section.
4. Check all hardware and torque bolts as needed.
5. Review the Owner’s Manual, giving special attention to safety precautions.
Operator Support

*Horsch* wants you to be completely satisfied with your air seeder. Should you have any problems, please contact our distributors and service technicians who will be pleased to assist you at any time.

In order for us to be able to better support you the customer and deal with technical problems as quickly as possible, we should ask you to provide the service technician with precise machine specifications and a detailed description to the problem.

Help us avoid having to make unnecessary requests for further details. Always specify the following:

- Customer Number
- Name of authorized dealer
- Machine Model Number
- Date of Purchase and Operating Hours
- Type of Problem

You can contact your local authorized *Horsch* dealer by clicking the following link, [http://www.horschanderson.com/locate-a-dealer.html](http://www.horschanderson.com/locate-a-dealer.html).

Machine Schedule

Apart from daily maintenance, the maintenance intervals are based on the number of operating hours and time on the machine.

Keep a record of your operating hours to ensure that the specified maintenance intervals are followed as closely as possible.

Tire Inflation Pressure

Never use a machine that is due for maintenance. Ensure that all deficiencies found during regular checks are fixed immediately.

<table>
<thead>
<tr>
<th>Size</th>
<th>Bar</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>395/550-16.5</td>
<td>2.77</td>
<td>40</td>
</tr>
<tr>
<td>215/70 D15</td>
<td>2.08</td>
<td>30</td>
</tr>
<tr>
<td>26/7.75-15</td>
<td>2.08</td>
<td>30</td>
</tr>
</tbody>
</table>

Tightening Wheel Hardware
Torque the wheel hardware using the following procedure (continued on next page):

**IMPORTANT!** Wheel bolts MUST be clean and oil-free when torqueing. Torque values specified in the following steps are for clean, dry wheels. Lubricating oil reduces friction and thread bite to overload bolts.

**Initial Wheel Bolt Torque:**

Use the tightening sequence shown in the picture below. Torque evenly in a crisscross pattern.

Caster Wheel Bolts – 150 ft-lbs. Dry

Packer Wheel Bolts – 100 ft-lbs. Dry

---

**Final Wheel Bolt Torque:**

**IMPORTANT!** Using hand tools and a torque wrench is required. To achieve high torque results, final torquing must be done with the tire on the ground.

**Checking Wheel Attaching Hardware and Bearings:**

Check the tightness of all wheel hardware and wheel bearings during the first week of operation, and annually after that.

To adjust wheel bearings, move center hub cap and cotter pin. Raise the wheel and turn. Tighten the nut until there is a slight drag on the bearing. Back off to the first hole on the castle nut and spindle. Insert the cotter pin. Replace hub cap.

**Lubricants and Hydraulic Oil**

**Hydraulic System:**

The hydraulic fluid from the tractor is mixed with the hydraulic fluid from the machine.

**Lubricants:** The grease points on the air seeder can be greased with multi-grade lubricating grease.

---

**Repair Instructions**
Changing the Triple Shoot Opener

The points of the opener are secured with a roll pin. The opener point is not to be struck when changing the points and driving in the roll pins. This is very hard and is consequently, susceptible to fracture if struck. Therefore, use an appropriate tool and device to drive in the roll pins.

The baseplates are fastened with Whitworth screws. A ½” socket wrench and a 7/32” hex key is needed for the repair work.

Tightening Hardware

Check the tightness of all bolts, U-bolts and nuts after the first 10-15 hours of operation and again at the end of the first week (50 hours) of operation. Tighten all bolts to the torques specified unless otherwise noted.

Perform lubrication and maintenance procedures.

Do not clean, lubricate or adjust machine while in motion.

The recommended service intervals are based on normal conditions; severe or unusual conditions may require more frequent lubrications. Perform each lubrication and service procedure illustrated in this section at the beginning of each season.

Clean grease fittings before using grease gun. Replace any lost or broken fittings immediately. If a new fitting fails to take grease, remove and check failure of adjoining parts.

Grease

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

The following greases are recommended:

- HD MOLY GREASE
- HD LITHIUM COMPLEX GREASE
- HD WATER RESISTANT GREASE
- GREASE GARD

Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB

**IMPORTANT!** Some types of grease thickener are not compatible with others. Grease is used to lubricate wheel bearings. Recommended maintenance for grease lubricated wheel bearings is to repack annually, using Multipurpose High Temperature EP Grease.
Wheel Bearing Maintenance

IMPORTANT! Be sure to tighten wheel bolts to proper specification. Refer to Tightening Wheel Hardware in this manual and follow the written procedures.

Prevent Hydraulic System Contamination

Cleanliness is very important when working on the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers and valves in a clean work area.

IMPORTANT! Leave protective caps on the fluid openings until ready to make the connection. When changing the system, use a tractor or other source that contains clean oil, free of abrasive materials. Keep couplers clean. Abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal damage to the cylinder and leakage of hydraulic oil.

Walking Tandem Adjustment

Walking tandems should occasionally be adjusted by using wrenches supplied, located on the front hitch.

Loosen jam nut A and tighten jam nut B until a slight drag is applied to the tandem. The retighten the jam nut A. See picture for reference.
### Maintenance Schedule Chart

<table>
<thead>
<tr>
<th>After First Operation</th>
<th>Instructions</th>
<th>Interval</th>
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<tbody>
<tr>
<td>Check all hardware</td>
<td>Tighten if necessary</td>
<td></td>
</tr>
<tr>
<td>Lubricate Air Seeder</td>
<td>See Overview of Lubricating Points</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Before Each Operation</th>
<th>Instructions</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lubricate Air Seeder</td>
<td>See Overview of Lubricating Points</td>
<td></td>
</tr>
<tr>
<td>Raise Seeder to top position several times</td>
<td>Balance hydraulic cylinders (height adjustment)</td>
<td>daily</td>
</tr>
<tr>
<td>Upper Links</td>
<td>Tighten if necessary</td>
<td>daily</td>
</tr>
<tr>
<td>Coupling of Drawbar</td>
<td>Ensure bolts are firmly tight</td>
<td>daily</td>
</tr>
<tr>
<td>Depth adjustment basic position</td>
<td>Check by lowering to 3/8” above the ground (flat surface)</td>
<td>daily</td>
</tr>
<tr>
<td>Hydraulic lines and components</td>
<td>Check seals, function &amp; condition, and check for crushing/chafing</td>
<td>daily</td>
</tr>
<tr>
<td>Seed Hoses</td>
<td>Check</td>
<td>daily</td>
</tr>
<tr>
<td>Coulters &amp; Leveling Disc</td>
<td>Check condition &amp; wear</td>
<td>daily</td>
</tr>
<tr>
<td>Distributor, Distributor Lid</td>
<td>Check for blockages</td>
<td>daily</td>
</tr>
<tr>
<td>Road Lighting</td>
<td>Check condition and function</td>
<td>daily</td>
</tr>
<tr>
<td>Grab Swing Brake on Swivel Caster Wheels</td>
<td>Check function and setting</td>
<td>Every 50 hrs.</td>
</tr>
<tr>
<td>Check Air Pressure</td>
<td>Packer: 30 PSI</td>
<td>weekly</td>
</tr>
<tr>
<td></td>
<td>Caster Wheels: 40 PSI</td>
<td>weekly</td>
</tr>
<tr>
<td>Wheel Bearings on Packer</td>
<td>Check condition and make sure it is firmly seated.</td>
<td>before season</td>
</tr>
<tr>
<td></td>
<td>Torque to 60 ft./lbs.</td>
<td></td>
</tr>
<tr>
<td>Bearings on Caster Wheels</td>
<td>Check condition, adjust bearings.</td>
<td>before season/200 hrs.</td>
</tr>
<tr>
<td></td>
<td>Grease wheel bearings</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>After Season</th>
<th>Instructions</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical control devices (Drill Manager, GPS)</td>
<td>Store in dry place</td>
<td></td>
</tr>
<tr>
<td>Entire Machine</td>
<td>Carry out cleaning and maintenance</td>
<td></td>
</tr>
<tr>
<td>Spray Drill machine with oil</td>
<td>Use biological oil if possible</td>
<td></td>
</tr>
<tr>
<td>After 3–5 years</td>
<td>Instructions</td>
<td>Interval</td>
</tr>
<tr>
<td>Hydraulic Hoses on Hydraulic Cylinders</td>
<td>Replace</td>
<td></td>
</tr>
</tbody>
</table>
Overview of Lubricating Points

<table>
<thead>
<tr>
<th>Figure</th>
<th>Lubricating Points</th>
<th>Quantity</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drawbar Pins for Front Hitch Pivot</td>
<td>2</td>
<td>Daily</td>
</tr>
<tr>
<td>2</td>
<td>Folding Pins on Inner Sections</td>
<td>2 each</td>
<td>Daily</td>
</tr>
<tr>
<td>3</td>
<td>Front Swivel Hitch</td>
<td>1</td>
<td>Daily</td>
</tr>
<tr>
<td>4</td>
<td>Parallel Guide Pins on Distributor Lift</td>
<td>4 each</td>
<td>100 Hours</td>
</tr>
<tr>
<td>5</td>
<td>Parallel Guide Pins on Caster Wheels</td>
<td>4 each</td>
<td>Daily</td>
</tr>
<tr>
<td>6</td>
<td>Caster Axle</td>
<td>1 each</td>
<td>Daily</td>
</tr>
<tr>
<td>7</td>
<td>Packer Walking Tandem Pivot Pins</td>
<td>2 each</td>
<td>100 Hours</td>
</tr>
<tr>
<td>8</td>
<td>Rear Hitch Drawbar Pins (Optional)</td>
<td>2</td>
<td>100 Hours</td>
</tr>
<tr>
<td>9</td>
<td>Caster Axle</td>
<td>1 each</td>
<td>Daily</td>
</tr>
<tr>
<td>10</td>
<td>Wheel Hub</td>
<td>1 each</td>
<td>Daily</td>
</tr>
<tr>
<td>11 &amp; 12</td>
<td>Cutting Coulter Disc Hub &amp; Shank</td>
<td>1 each</td>
<td>Daily</td>
</tr>
</tbody>
</table>

Pivot Pins on Drawbar for front A-Frame Hitch. Item 1 (x2).

Outer Wing Pivot Pins/Bushing Grease Points. Item 5 (x2 per wing).
Fig. 6
Caster Tower Shaft

Fig. 7
Packer Walking Tandem Pivot Pins.
Item 7 (x2).

Fig. 8
Rear Hitch Drawbar Pins.
Item 8 (x2).
Caster Axle – 1 each

Fig. 9

Wheel Hub – Caster & Packer (1 each)

Fig. 10

Cutting Coulter Di Shank (x1 each)

11 & 12
Lubricating the Machine
Please read the section titled ‘Handling Lubricants’ below carefully before lubricating the machine.

The machine must be greased regularly in order for it to remain serviceable. Regular greasing also contributes towards extending the service life of your machine.

After it has been cleaned using a water hose or high pressure or steam, the machine along with joints and all grease points must be greased and oiled to remove any water that may have penetrated so as not to cause rust or deterioration.

Handling Lubricants
Please ensure that you read the following instructions as well as the relevant information.

This also applies to any of technicians or persons handling lubricants.

Hygiene

In the case of prolonged skin contact, lubricants, especially low-viscosity oils, may remove the natural layer of fat contained in the skin, resulting in dryness and possible irritation.

It is important to take extreme care when handling waste oil as it may contain irritants.

Vapors given off by cleaning agents and oils are also a potential hazard. You should always wear the proper protective clothing when handling chemicals and lubricants/oils, etc.

Always exercise extreme care and observe the recommended hygiene rules when handling mineral oil products.

Storage and Handling

- Always store lubricants where they cannot be accessed by children.
- Never store lubricants in open or unlabeled containers.

CAUTION Oil is a toxic substance. Should you swallow any oil, do not induce vomiting. Contact a doctor immediately. Protect your hands with barrier cream or wear gloves to avoid skin contact. Wash off any traces of oil thoroughly with soap and hot water. Do not clean your skin with petrol, fuel oil or paraffin.
Fresh Oil:

- Apart from taking the usual care and observing hygiene rules, there is no need to take any special precautions when handling fresh oil.

Waste Oil:

- Waste oil can contain harmful contaminants which may cause skin cancer, allergies and other illnesses.
- Wash your skin thoroughly with hot water and soap.
- Use special cleaning agents to clean any dirt off your hands.
- Never wash oil residue from your skin with petrol, fuel oil or paraffin.
- Avoid skin contact with any oily clothing.
- Do not keep any oil rags in your pockets.
- Wash soiled clothing before wearing it again.
- Ensure that any oil footwear is disposed of in the proper manner.
- Dispose of waste oil according to local laws. Contact your local Hazardous Waste Management Coordinator.
**Troubleshooting**

Follow the safety instructions.

The following charts are intended to enable you to quickly remedy any malfunctions. If you are unable to find a particular malfunction in the charts, contact your local authorized dealer for further assistance.

### PPF Opener

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizer not flowing</td>
<td>Fertilizer hose/outlet hole blocked</td>
<td>Clean hose/hole</td>
</tr>
<tr>
<td></td>
<td>Fertilizer hose kinked/pinched</td>
<td>Re-lay/replace</td>
</tr>
<tr>
<td></td>
<td>Fertilizer hose worn</td>
<td>Replace</td>
</tr>
<tr>
<td>Unsatisfactory seed/fertilizer application depth</td>
<td>Coulter points, Wear inserts, Slide Plates, or Bottom Plate worn</td>
<td>Replace wom parts</td>
</tr>
</tbody>
</table>

### Seed Delivery

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed Hoses blocked with seed</td>
<td>Foreign material in seed hose</td>
<td>Remove foreign material</td>
</tr>
<tr>
<td></td>
<td>Seed hose bent, pinched or leaking</td>
<td>Reposition seed hose</td>
</tr>
<tr>
<td></td>
<td>Seed hose sagging</td>
<td>Reposition seed hose</td>
</tr>
<tr>
<td></td>
<td>Fan speed too low</td>
<td>Increase fan speed</td>
</tr>
<tr>
<td></td>
<td>Opener outlets blocked</td>
<td>Clean opener outlets</td>
</tr>
</tbody>
</table>

### Work Switch

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch not engaging motors</td>
<td>Work switch out of adjustment</td>
<td>Readjust work switch</td>
</tr>
<tr>
<td></td>
<td>Magnet missing</td>
<td>Install new magnet</td>
</tr>
<tr>
<td></td>
<td>Minidin cable loose or damaged</td>
<td>Check connection</td>
</tr>
</tbody>
</table>
| Seeder says up when putting in the ground | go into second menu, go to work switch, change to seeder down, Hit OK. | Work switch in second menu not in correct mode.
Service & Related Information
Metric Bolt Torque Values

<table>
<thead>
<tr>
<th>Class 8.8 or 9.8</th>
<th>Class 10.9</th>
<th>Class 12.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Lubricated</td>
<td>Dry</td>
</tr>
<tr>
<td></td>
<td>N·m (lb-ft)</td>
<td>N·m (lb-ft)</td>
</tr>
<tr>
<td>M6</td>
<td>9 (6.6)</td>
<td>11.5 (8.5)</td>
</tr>
<tr>
<td>M8</td>
<td>22 (16)</td>
<td>28 (20.5)</td>
</tr>
<tr>
<td>M10</td>
<td>43 (32)</td>
<td>55 (40)</td>
</tr>
<tr>
<td>M12</td>
<td>75 (55)</td>
<td>95 (70)</td>
</tr>
<tr>
<td>M14</td>
<td>120 (88)</td>
<td>150 (110)</td>
</tr>
<tr>
<td>M16</td>
<td>190 (140)</td>
<td>240 (175)</td>
</tr>
<tr>
<td>M18</td>
<td>265 (195)</td>
<td>330 (245)</td>
</tr>
<tr>
<td>M20</td>
<td>375 (275)</td>
<td>475 (350)</td>
</tr>
<tr>
<td>M22</td>
<td>510 (375)</td>
<td>650 (480)</td>
</tr>
<tr>
<td>M24</td>
<td>650 (480)</td>
<td>820 (600)</td>
</tr>
<tr>
<td>M27</td>
<td>950 (700)</td>
<td>1200 (885)</td>
</tr>
<tr>
<td>M30</td>
<td>1290 (950)</td>
<td>1630 (1200)</td>
</tr>
<tr>
<td>M33</td>
<td>1750 (1300)</td>
<td>2200 (1625)</td>
</tr>
<tr>
<td>M36</td>
<td>2250 (1650)</td>
<td>2850 (2100)</td>
</tr>
</tbody>
</table>

*a “Lubricated” means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

b “Dry” means plain or zinc plated without any lubrication.
Unified/Standard Bolt Torque Values

<table>
<thead>
<tr>
<th>Size</th>
<th>Grade 5, 5.1 or 5.2</th>
<th>Grade 8 or 8.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lubricated(^b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N·m (lb-ft)</td>
<td></td>
</tr>
<tr>
<td>1/4</td>
<td>9.5 (7)</td>
<td></td>
</tr>
<tr>
<td>5/16</td>
<td>19.5 (14.5)</td>
<td></td>
</tr>
<tr>
<td>3/8</td>
<td>35 (26)</td>
<td></td>
</tr>
<tr>
<td>7/16</td>
<td>56 (41)</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>85 (63)</td>
<td></td>
</tr>
<tr>
<td>9/16</td>
<td>125 (92)</td>
<td></td>
</tr>
<tr>
<td>5/8</td>
<td>170 (125)</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>300 (220)</td>
<td></td>
</tr>
<tr>
<td>7/8</td>
<td>490 (360)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>730 (540)</td>
<td></td>
</tr>
<tr>
<td>1 - 1/8</td>
<td>910 (670)</td>
<td></td>
</tr>
<tr>
<td>1 - 1/4</td>
<td>1280 (945)</td>
<td></td>
</tr>
<tr>
<td>1 - 3/8</td>
<td>1700 (1250)</td>
<td></td>
</tr>
<tr>
<td>1 - 1/2</td>
<td>2250 (1650)</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Grade 2 applies for hex cap screw (not hex bolts) up to 6 in. (152mm) long. Grade 1 applies for hex cap screws over 6 in. (152mm) long, and for all other types of bolts and screws of any length.

\(^b\) "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

\(^c\) "Dry" means plain or zinc plated without any lubrication.

Do NOT use these values if a different torque specification or value or tightening procedure is given for a specific application. Torque values listed are for general use only. Use the above chart as a reference. Check tightness of fasteners periodically.
Shear bolts are designed to fail under predetermined loads. Always replace a shear bolt with identical property class.

Fasteners should be replaced with the same or higher class. If the higher property class fasteners are used, these should be tightened to the strength of the original.

Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque value shown in the chart, applied to the nut, not to the bolt head. Tighten toothed and serrated-type lock nuts to the full torque value.

**Metric Conversion Factors**

To convert from English to Metric measurements, multiply by the following factors:

<table>
<thead>
<tr>
<th>To Convert</th>
<th>To</th>
<th>Multiply by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches</td>
<td>Millimeters</td>
<td>25.4</td>
</tr>
<tr>
<td>Feet</td>
<td>Meters</td>
<td>0.3048</td>
</tr>
<tr>
<td>Yards</td>
<td>Meters</td>
<td>0.9144</td>
</tr>
<tr>
<td>Miles</td>
<td>Kilometers</td>
<td>1.609</td>
</tr>
<tr>
<td>Square Foot</td>
<td>Square Meters</td>
<td>0.0929</td>
</tr>
<tr>
<td>Acres</td>
<td>Hectares</td>
<td>0.4047</td>
</tr>
<tr>
<td>Pounds</td>
<td>Kilograms</td>
<td>0.4536</td>
</tr>
<tr>
<td>Cubic Foot</td>
<td>Cubic Meter</td>
<td>0.02832</td>
</tr>
<tr>
<td>Bushels</td>
<td>Cubic Meters</td>
<td>0.03524</td>
</tr>
<tr>
<td>Pounds/Square Inch</td>
<td>Kilopascals</td>
<td>6.8948</td>
</tr>
<tr>
<td>Pounds/Square Inch</td>
<td>Bar</td>
<td>0.06895</td>
</tr>
<tr>
<td>Pounds-Force-Foot</td>
<td>Newton-Meters</td>
<td>1.3568</td>
</tr>
<tr>
<td>Miles-Per-Hour</td>
<td>Kilometer-Per-Hour</td>
<td>1.609</td>
</tr>
<tr>
<td>Pounds-Per-Acre</td>
<td>Kilograms-Per-Hectare</td>
<td>1.1209</td>
</tr>
<tr>
<td>Acre-Per-Hour</td>
<td>Hectare-Per-Hour</td>
<td>0.405</td>
</tr>
<tr>
<td>Feet-Per-Minute</td>
<td>Meters-Per-Second</td>
<td>0.005</td>
</tr>
<tr>
<td>Feet-Per-Second</td>
<td>Meters-Per-Second</td>
<td>0.305</td>
</tr>
<tr>
<td>Horsepower</td>
<td>Kilowatt</td>
<td>0.746</td>
</tr>
</tbody>
</table>

27 in. of Water + 1 psi
Item 32 shown is a filter screen used to prevent foreign material from entering the hydraulic system of the air seeder. If the air seeder starts to raise and lower at a slower than normal rate, this screen could be plugged and should be removed and cleaned thoroughly.
Hydraulic Schematic – Fold
**Cylinder Rod Maintenance**

**PRP (Piston Rod Protection)**

Chrome plated piston rod and bar products normally contain a minimum of 20 microns to 50 microns hard chrome plate, depending upon the product specifications. This hard chrome plating is applied primarily for wear resistance, though it does considerable corrosion resistance as well. Once the shaft is assembled into a cylinder and put into service, the hydraulic fluid on the surface provides additional corrosion resistance that is normally sufficient to protect the shaft during its entire life. However, there are occasions when the shaft is not being worked and when the surface is exposed to a corrosive environment. For example, brand new equipment may be stored outside for a considerable period of time from the manufacturing plant or the dealer, and may hold as inventory until sold. In these instances, it is best recommended to provide some additional corrosion protection. An inexpensive application of PRP can be applied to prevent corrosion and thereby preserve the quality of the hard chrome plated piston rod.

Protection of the cylinder rod is important. If the rod was to be damaged or pitted it will damage the wiper seal of the cylinder housing and create a leak in the system. Taking the necessary precautions of preventative maintenance will ensure a longer life of the machine.

**Protection of new equipment:**
The steps summarized below should be followed when protecting chrome plate shafting on new equipment.

- Position the equipment as it will be stored, and identify all the exposed portions of the chrome plated shafts.
- Clean dirt and dust from the exposed portions of the shafts using a dry cloth.
- Apply a thin coating of PRP mixture to the exposed surfaces of the chrome shaft. Depending on the type of PRP used, it can be applied directly to the shaft either by spray or rubbed on to the surface.
- Inspect the shaft surface after 5 month and apply additional corrosion protection PRP.
- If the equipment is to be moved and then stored again for an extended period of time, the steps above should be repeated for all shafts that were stroked or cycled during the move.

**Protection of older equipment:**

- Occasionally it might be necessary to store some equipment that has seen some service. The procedure described above can be useful, but more careful cleaning of the shaft surface should be taken into consideration. If there are any damaged areas to the shaft further attention will be required.
- Under no circumstances should sandpaper or other abrasive materials be used to clean the shaft, however, plastic or copper wool may be used.
- After the surface is clean, it should be inspected for damages to the chrome plate. If damage is detected, more frequent application of PRP will be necessary to prevent corrosion during storage.
Protect Your Hydraulic Cylinders from Rust

Many types of equipment have hydraulic cylinders. A hydraulic cylinder is a piston that slides within a cylindrical body. A rod attached to the piston passes through a seal at the end of the cylindrical body and moves in and out to do useful work. The rods on most hydraulic cylinders are highly polished plated steel. They must be uniformly smooth to provide a good seal with the cylinder body.

A common problem with hydraulic cylinders is rust and pitting of the cylinder rods (Figure 1). If equipment that incorporates hydraulic cylinders is stored outside with the cylinder rods extended, the rods are exposed to weathering. Eventually, the rods will begin to show specks of rust that develop into pits. Once rusting and pitting occur, the rod will destroy the cylinder seal the next time it is activated. Once pitted, it is virtually impossible to restore a cylinder rod to an acceptably smooth condition through repolishing.

This problem of cylinder-rod pitting is most common with hydraulic cylinders on equipment that is both stored outside and seldom used or used only seasonally. If the hydraulic cylinders are operated every few days, the rods will always have a thin coating of oil that will provide protection, and rust will not start. Good examples are backhoes and bulldozers that are always stored out in the weather but are used almost daily.

The solution to this problem is to prevent rust and pitting. There are three ways to accomplish this, and it is possible to use more than one of these approaches simultaneously. The best way to avoid corrosion and pitting of the cylinder rods is to store the implement with the cylinder rods retracted. If the rods are retracted, the sensitive plated surface of the rod will be inside the cylinder, immersed in hydraulic fluid and thus fully protected. Unfortunately, it is not always possible to store equipment with the cylinders retracted. In some cases, the cylinders must be extended to unhitch an implement or must be extended to park the equipment. Another way to reduce the chance of corrosion is to park equipment with hydraulic cylinders inside a building where the cylinders are protected. This will significantly reduce corrosion and pitting, although humidity and condensation can still occur in some storage sheds. A final method of protecting cylinders is somewhat less effective but can be used in all situations. The exposed cylinder rods can be coated with heavy grease whenever the equipment will not be used for a few weeks or longer (Figure 2). The grease should be as heavy and sticky (tacky) as possible. Wheel bearing grease is better for this purpose than general chassis grease because it tends to be tackier. A heavy coat of grease will provide several months of protection, but for a machine used only one season a year, it may be necessary to renew the grease every three to four months.

Hydraulic cylinders can be ruined by pit rust if left extended and not protected. They are expensive to replace. You can protect your cylinders by (a) storing them in a retracted position, (b) storing them inside or (c) coating any exposed portion of the rods with heavy grease.