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Section 1: Safety

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SAFETY- ALERT SYMBOL

Watch for this symbol. It identifies potential hazards to health or personal safety. It means:

ATTENTION - BE ALERT.
Your Safety is involved.

Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.

Signal Words
The words DANGER, WARNING or CAUTION are used with the safety alert symbol. Learn to recognize the safety alerts, and follow the recommended precautions and safe practices.

Three words are used in conjunction with the safety-alert symbol:

⚠️ DANGER Indicates an imminently hazardous situation that, if not avoided, will result in DEATH OR SERIOUS INJURY.

⚠️ WARNING Indicates a potentially hazardous situation that, if not avoided, could result in DEATH OR SERIOUS INJURY.

⚠️ CAUTION Indicates a potentially hazardous situation that, if not avoided, may result in MINOR OR MODERATE INJURY.

Replace any DANGER, WARNING, CAUTION or instructional decal that is not readable or is missing. The location and part number of these decals is identified later in this section of the manual.

The words Important and Note are not related to personal safety but are used to give additional information and tips for operating or servicing this equipment.

IMPORTANT: Identifies special instructions or procedures which, if not strictly observed could result in damage to, or destruction of the machine, process or its surroundings.

NOTE: Indicates points of particular interest for more efficient and convenient repair or operation.
**General Operation**

- **DO NOT RIDE!!** Do not allow riders on the implement when in motion.
- Do not allow extra riders in the tractor unless an instructor seat and seat belt are available.
- **Check behind** when backing up.
- **Reduce speed** when working in hilly terrain.
- Never allow anyone within the immediate area when operating machinery.
- **Keep all shields in place**, replace them if removed for service work.
- Always lock auger attachment in raised position.
- Keep hands clear of tank opening when closing lid. Keep lid seal clean to ensure proper sealing.
- **Do Not enter tank unless another person is present and the tractor engine has been shut off.**

**Tractor Operation**

- Be aware of the correct tractor operating procedures, when working with implements.
- Review tractor operator’s manual.
- Secure hitch pin with a retainer and lock drawbar in centre position.
Safety

Chemicals

- **Use extreme care** when cleaning, filling or making adjustments.

- **Always read** granular chemical or treated seed manufacturer's warning labels carefully and remember them.

- Wear close fitting clothing and appropriate personal protective equipment for the job as specified by the chemical and/or seed manufacturer.

- **Always wear** safety goggles, breathing apparatus and gloves when handling with granular chemical or treated seed.

- **Do not feed** any treated seed to livestock. Treated seed is poisonous and may cause harm to persons or livestock.

- **Wash exposed skin immediately** - do not leave chemicals on your skin.

- **Properly store** chemicals in original containers with labels intact per the manufacturer's instructions.

- Always follow the manufacturer's operating instructions and warning labels when operating an ammonia tank with the equipment.

- **Do Not enter tank unless another person is present and the tractor engine has been shut off.**

---

![Danger]

**Danger**

Failure to comply may result in death or serious injury.

Read Operator's Manual and decals on Ammonia tank before operating Air Drill. Become familiar with all warnings, instructions, and controls.

- **Always** wear gloves and goggles when transferring or handling ammonia.

- **Always** stay clear of hose and valve openings.

- **Always** be sure pressure is relieved before disconnecting hoses or parts.

- **Always** secure connecting parts and safety chains before towing ammonia trailer.

- **Always** have ample water available in case of exposure to ammonia liquid or gases.
Safety

Transporting

- **Be aware** of the height, length and width of implement. Make turns carefully and be aware of obstacles and overhead electrical lines.
- Empty tanks before transporting. Do Not Exceed 20 M.P.H. (32 kph) with an empty air cart.
- Use an agricultural tractor that is large enough with sufficient braking capacity so that the weight of the loaded equipment towed does not exceed 1.5 times the weight of the tractor.
- Use flashing amber warning lights, turn signals and SMV emblems when on public roads.
- Do not transport in poor visibility.
- The slow moving vehicle (SMV) emblem and reflectors must be secured and be visible on the machine for transport.
- Avoid soft surfaces, the additional wing weight on the centre wheels could cause the machine to sink.
- Ensure safety chain is attached correctly to the towing vehicle and the hitch of the air cart.
- Check that wings are firmly seated in transport wing stops, and lock pins installed.
- Secure transport locks on depth control cylinders.
- Be familiar with and adhere to local laws.

Hydraulics

- **Do not** search for high pressure hydraulic leaks without hand and face protection. A tiny, almost invisible leak can penetrate skin, thereby requiring immediate medical attention.
- Use cardboard or wood to detect leaks - never your hands.
- Double check that all is clear before operating hydraulics.
- **Never** remove hydraulic hoses or ends with machine elevated. Relieve hydraulic pressure before disconnecting hydraulic hoses or ends.
- Maintain proper hydraulic fluid levels.
- Keep all connectors clean for positive connections.
- Ensure all fittings and hoses are in good condition.
- Do not stand under wings.
Safety

Maintenance

- **Shut tractor engine off** before making any adjustments or lubricating the machine.
- **Block** machine securely to prevent any movement during servicing.
- Wear close fitting clothing and appropriate personal protective equipment for the job.
- Always wear safety goggles, breathing apparatus and gloves when working on seeder filled with granular chemical or treated seed per the manufacture’s instructions.
- Do not modify the machine.

Storage

- Store implement away from areas of main activity.
- Level implement and block up securely to relieve pressure on jack.
- Do not allow children to play on or around implement.
Safety Signs

Transmission Side

Tow Behind Shown

**CAUTION**

To avoid injury, do not open lids while fan is operating. Air gust may contain dust and particles.

**WARNING**

To prevent serious injury or death from moving parts:
- Secure any guards and shields before starting.
- Keep hand, feet, hair and clothing away from moving parts.
- Disconnect and lockout power source before adjusting or servicing.
- Sprockets and chains CAN START MOVING even though Air Cart is stationary.

**GUARD MISSING**

When this is visible DO NOT OPERATE

**DANGER**

Keep off while machine is moving or mechanism is running.

**WARNING**

Located on each Transmission

**WARNING**

Personal injury or property damage may result from loss of control.
- Always use large enough tractor with sufficient braking capacity.
- Weight of fully loaded implement should not be more than 1.5 times weight of tractor.
- Maximum recommended towing speed is 20 mph (32 km/h).
- Use flashing amber warning lights and SMV emblem when on public roads, except where prohibited by law.
- Refer to tractor and implement Operator’s Manuals for weights and further information.

**WARNING**

This implement may exceed maximum road regulations. Before you transport this implement contact a local agency regarding road regulations concerning maximum allowable implement dimensions.

**WARNING**

ENSURE THAT ALL WHEEL NUTS ARE TORQUED TO THE FOLLOWING:
- 5/8” Tapered Wheel Nuts - 150 ft-lbs
- 3/4” Flanged Wheel Nuts - 270 ft-lbs

Note: The Transmission Chain Guards are not shown inorder to show Safety Signs. Transmission Chain Guards must be in place before operation of machine.
Safety

Safety Signs - Continued

Auger Side

Tow Behind Shown

- AUGER TRANSPORT LOCK PIN MUST BE IN PLACE WHEN AIRSEEDER IS IN MOTION.
- USE CAUTION WHEN RELEASING AUGER CRADLE LEVER.
- AUGER CRADLE LEVER MUST BE IN PLACE WHEN AIRSEEDER IS IN MOTION.

WARNING
Keep off while machine is moving or mechanism is running.

CAUTION
- Keep off while machine is moving or mechanism is running.
- Keep auger side of machine while machine is moving or mechanism is running.
- Keep intake shield in place and in good working order. Do not modify.
- Fully lower equipment before moving. Electrocution can occur without direct contact.
- Keep away from auger intake. Keep intake shield in place and in good working order. Do not modify. FAILURE TO KEEP AWAY WILL RESULT IN SERIOUS INJURY OR DEATH.
- This equipment is not insulated. Keep equipment away from overhead power lines and devices. Electrocution can occur without direct contact. Fully lower equipment before moving. FAILURE TO KEEP AWAY WILL RESULT IN SERIOUS INJURY OR DEATH.
- MADE IN CANADA 17098
- MADE IN CANADA 17102
- ELECTROCUTION HAZARD
- KEEP AWAY FROM AUGER INTAKE. KEEP INTAKE SHIELD IN PLACE AND IN GOOD WORKING ORDER. DO NOT MODIFY.
- FAILURE TO KEEP AWAY WILL RESULT IN SERIOUS INJURY OR DEATH.
- ROTATING FLIGHTING HAZARD
- Keep away from auger intake. Keep intake shield in place and in good working order. Do not modify. FAILURE TO KEEP AWAY WILL RESULT IN SERIOUS INJURY OR DEATH.
Safety Signs - Continued

Fan

Tow Behind Shown

- Hydraulic motor or engine and exhaust system becomes extremely hot from operation.
- Keep hands, feet and clothing away from moving parts.
- Keep all covers, shrouds and guards in place.

DANGER
Safety

**Lighting and Marking**

MORRIS recommends the use of the correct lighting and marking to meet the ASAE standard for roadway travel. Be familiar with, and adhere to, local laws.

Amber warning and red tail lights secured on the machine promote correct transportation of this implement.

**Note:** Always replace missing or damaged lights and/or connectors.

Amber warning and red tail lights must be mounted to the rear of the implement and be visible from front and rear. The lights must be within 16 inches (41 cm) of the extremities of the machine and at least 39 inches (99 cm) but not over 10 feet (3 m) above ground level.

**Note:** Always replace missing or damage front, side, rear reflectors and SMV emblem.
Safety

Lighting and Marking - Continued

Seeding Unit - Tow Between
with Packer Bar

Seeding Unit - Tow Behind
with Packer Bar
Section 2: Specifications

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## Specifications

### 9240s Specifications and Options

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<th>9240</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td>Tow Behind</td>
<td>Tow Between</td>
</tr>
<tr>
<td>Length - with auger</td>
<td>25' 8&quot; (7.82 m)</td>
<td>26' 10&quot; (8.18 m)</td>
</tr>
<tr>
<td>Height</td>
<td>11' 4&quot; (3.45 m)</td>
<td>11' 4&quot; (3.45 m)</td>
</tr>
<tr>
<td>Width</td>
<td>12' (3.66 m)</td>
<td>12' (3.66 m)</td>
</tr>
<tr>
<td>Weight (Hydraulic Drive)</td>
<td>7,315 lbs (3,325 kg)</td>
<td>6,825 lbs (3,071 kg)</td>
</tr>
<tr>
<td><strong>Safety Lights</strong></td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Safety Chain</strong></td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td>Rear Tow Hitch</td>
<td>Optional</td>
<td>Standard</td>
</tr>
<tr>
<td>Tank Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tank 1</td>
<td>95 bu (3,460 l)</td>
<td>95 bu (3,460 l)</td>
</tr>
<tr>
<td>- Tank 2</td>
<td>145 bu (5,270 l)</td>
<td>145 bu (5,270 l)</td>
</tr>
<tr>
<td>- Tank 3</td>
<td>Optional 40 cu.ft. (1,129 l)</td>
<td>Optional 40 cu.ft. (1,129 l)</td>
</tr>
<tr>
<td>- Total</td>
<td>240 bu (8,730 l)</td>
<td>240 bu (8,730 l)</td>
</tr>
<tr>
<td><strong>Tank Screens</strong></td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td><strong>Tank Access Ladder - Right Hand Side</strong></td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td><strong>Fan Impeller Diameter</strong></td>
<td>17&quot; (43 cm) - Up to 5,000 r.p.m.</td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Drive</strong></td>
<td>12cc - piston type orbit motor</td>
<td>15.5 U.S. gal./min. (59 l/min) at 2,100 p.s.i. (14,469 kpa)</td>
</tr>
<tr>
<td>(Closed Centre or Closed Centre Load Sensing systems required)</td>
<td>VRT requires an additional 5.5 U.S. gal/min (21 l/min)</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Auger</strong></td>
<td>Standard (8&quot; Dia x 20 ft) (20.32 cm Dia x 609.6 cm)</td>
<td></td>
</tr>
<tr>
<td><strong>Tires</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Standard (Front)</td>
<td>(2) 21.5 x 16.1 AWT - 10 ply rating</td>
<td></td>
</tr>
<tr>
<td>- Standard (Rear)</td>
<td>Optional 3M Axles Center-Center 118° (3 m)</td>
<td></td>
</tr>
<tr>
<td>- Optional (Front)</td>
<td>(2) 23.1 x 26 AWT - 12 ply rating</td>
<td></td>
</tr>
<tr>
<td>- Optional (Rear)</td>
<td>Distance Center-Center 121° (307 cm)</td>
<td></td>
</tr>
<tr>
<td>3 Meter Axles</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td><strong>Metering</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ground Driven</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>- Variable Rate (VRT)</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>- GPS Compatible VRT</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td><strong>Meter Shut Off</strong></td>
<td>Electric</td>
<td></td>
</tr>
<tr>
<td><strong>Number Secondary Runs - Single Shoot</strong></td>
<td>21 to 80</td>
<td></td>
</tr>
<tr>
<td><strong>Number Secondary Runs - Double Shoot</strong></td>
<td>42 to 160</td>
<td></td>
</tr>
<tr>
<td><strong>Primary Hose - Diameter</strong></td>
<td>2 1/2&quot; (6.4 cm)</td>
<td></td>
</tr>
<tr>
<td><strong>Secondary Hose - Diameter</strong></td>
<td>Standard - 15/16&quot; (2.4 cm)</td>
<td>Optional - 1 1/8&quot; (2.8 cm)</td>
</tr>
<tr>
<td><strong>Frame - Trussed</strong></td>
<td>4&quot; x 8&quot; (10 cm x 20 cm) tubing</td>
<td></td>
</tr>
<tr>
<td><strong>Easy Clean Out System</strong></td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td><strong>Meter Drive Options</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Second Clutch (For spot fertilizing on the go)</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td><strong>Monitor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Shaft Motion (3), Bin Level (3), Fan Speed, Acre Tally, Ground Speed)</td>
<td>Standard</td>
<td>Optional Seed Flow</td>
</tr>
<tr>
<td><strong>Work Switch (Mounted to Seeding Machine)</strong></td>
<td>Optional</td>
<td></td>
</tr>
</tbody>
</table>
# Specifications

<table>
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<tr>
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<th>9252s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td><strong>9252</strong></td>
</tr>
<tr>
<td>Configuration</td>
<td>Tow Behind</td>
</tr>
<tr>
<td>Length - with auger</td>
<td>25' 8&quot; (7.82 m)</td>
</tr>
<tr>
<td>Height</td>
<td>11' 4&quot; (3.45 m)</td>
</tr>
<tr>
<td>Width</td>
<td>12' (3.66 m)</td>
</tr>
<tr>
<td>Weight (Hydraulic Drive)</td>
<td>8,828 lbs. (4,013 kg)</td>
</tr>
<tr>
<td>Safety Lights</td>
<td>Standard</td>
</tr>
<tr>
<td>Safety Chain</td>
<td>Standard</td>
</tr>
<tr>
<td>Rear Tow Hitch</td>
<td>Option</td>
</tr>
<tr>
<td>Tank Capacity</td>
<td>- Tank 1 71.3 bu (2580 l)</td>
</tr>
<tr>
<td></td>
<td>- Tank 2 71.3 bu (2580 l)</td>
</tr>
<tr>
<td></td>
<td>- Tank 3 109 bu (3,970 l)</td>
</tr>
<tr>
<td></td>
<td>- Total 252 bu (9,130 l)</td>
</tr>
<tr>
<td>Tank Screens</td>
<td>Optional</td>
</tr>
<tr>
<td>Tank Access Ladder - Right Hand Side</td>
<td>Standard</td>
</tr>
<tr>
<td>Fan Impeller Diameter</td>
<td>17&quot; (43 cm) - Up to 5,000 r.p.m.</td>
</tr>
<tr>
<td>Hydraulic Drive</td>
<td>12cc - piston type orbit motor</td>
</tr>
<tr>
<td></td>
<td>Hydraulic requirements for Air Cart only at Rated Fan Speed.</td>
</tr>
<tr>
<td>Loading Auger</td>
<td>Standard (7&quot; Dia x 18.5 ft) (18 cm Dia x 564 cm)</td>
</tr>
<tr>
<td>Tires</td>
<td>- Standard (Front) (2) 21.5 x 16.1 AWT - 10 ply rating</td>
</tr>
<tr>
<td></td>
<td>- Standard (Rear) (2) 23.1 x 26 AWT - 12 ply rating</td>
</tr>
<tr>
<td></td>
<td>- Optional (Front) (2) 21.5 x 16.1 Rice - 12 ply rating</td>
</tr>
<tr>
<td></td>
<td>- Optional (Rear) (2) 23.1 x 26 Rice- 10 ply rating</td>
</tr>
<tr>
<td>3 Meter Axles</td>
<td>Optional</td>
</tr>
<tr>
<td>Metering</td>
<td>- Ground Driven Standard</td>
</tr>
<tr>
<td></td>
<td>- Variable Rate (VRT) Optional</td>
</tr>
<tr>
<td></td>
<td>- GPS Compatible VRT Optional</td>
</tr>
<tr>
<td>Meter Shut Off</td>
<td>Electric</td>
</tr>
<tr>
<td>Number Secondary Runs - Single Shoot</td>
<td>21 to 80</td>
</tr>
<tr>
<td>Number Secondary Runs - Double Shoot</td>
<td>42 to 160</td>
</tr>
<tr>
<td>Primary Hose - Diameter</td>
<td>2 1/2&quot; (6.4 cm)</td>
</tr>
<tr>
<td>Secondary Hose - Diameter</td>
<td>Standard - 15/16&quot; (2.4 cm)</td>
</tr>
<tr>
<td>Frame - Trussed</td>
<td>4&quot; x 8&quot; (10 cm x 20 cm) tubing</td>
</tr>
<tr>
<td>Easy Clean Out System</td>
<td>Standard</td>
</tr>
<tr>
<td>Meter Drive Options</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Second Clutch (For spot fertilizing on the go) Standard</td>
</tr>
<tr>
<td>Monitor</td>
<td>(Shaft Motion (3), Bin Level (3), Fan Speed, Acre Tally, Ground Speed) Standard</td>
</tr>
<tr>
<td>Work Switch (Mounted to Seeding Machine)</td>
<td>Optional</td>
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</table>
## Specifications

### 9300s Specifications and Options

<table>
<thead>
<tr>
<th>Model</th>
<th>9300</th>
<th>9300</th>
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<tbody>
<tr>
<td>Configuration</td>
<td>Tow Behind</td>
<td>Tow Between</td>
</tr>
<tr>
<td>Length - with auger</td>
<td>25' 8&quot; (7.82 m)</td>
<td>26' 10&quot; (8.18 m)</td>
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<tr>
<td>Height</td>
<td>12' (3.66 m)</td>
<td>12' (3.66 m)</td>
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<tr>
<td>Width</td>
<td>12' (3.66 m)</td>
<td>12' (3.66 m)</td>
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<tr>
<td>Weight (Hydraulic Drive)</td>
<td>7,770 lbs. (3,479 kg)</td>
<td>7,325 lbs. (3,296 kg)</td>
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<tr>
<td>Safety Lights</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td>Safety Chain</td>
<td>Standard</td>
<td>Standard</td>
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<tr>
<td>Rear Tow Hitch</td>
<td>Optional</td>
<td>Standard</td>
</tr>
<tr>
<td>Tank Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tank 1</td>
<td>120 bu (4,360 l)</td>
<td>120 bu (4,360 l)</td>
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<tr>
<td>- Tank 2</td>
<td>180 bu (6,550 l)</td>
<td>180 bu (6,550 l)</td>
</tr>
<tr>
<td>- Tank 3</td>
<td>Optional 40 cu.ft. (1,129 l)</td>
<td>Optional 40 cu.ft. (1,129 l)</td>
</tr>
<tr>
<td>- Total</td>
<td>300 bu (10,910 l)</td>
<td>300 bu (10,910 l)</td>
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<tr>
<td>Tank Screens</td>
<td>Optional</td>
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</tr>
<tr>
<td>Tank Access Ladder - Right Hand Side</td>
<td>Standard</td>
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<tr>
<td>Fan Impeller Diameter</td>
<td>17&quot; (43 cm) - Up to 5,000 r.p.m.</td>
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</tr>
<tr>
<td>Hydraulic Drive</td>
<td>12cc - piston type orbit motor</td>
<td>15.5 U.S. gal./min. (59 l/min) at 2,100 p.s.i. (14,469 kpa)</td>
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<tr>
<td>Loading Auger</td>
<td>Standard (8&quot; Dia x 20 ft) (20.32 cm Dia x 609.6 cm)</td>
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<tr>
<td>Tires</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Standard (Front)</td>
<td>(2) 21.5 x 16.1 AWT - 10 ply rating</td>
<td>(2) 23.1 x 26 AWT - 12 ply rating</td>
</tr>
<tr>
<td>- Standard (Rear)</td>
<td>Distance Center-Center 38&quot; (97 cm)</td>
<td>Distance Center-Center 121&quot; (307 cm)</td>
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<td>Optional 3M Axles Center-Center 118&quot; (3 m)</td>
<td>Optional 3M Axles Center-Center 118&quot; (3 m)</td>
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<tr>
<td>- Optional (Rear)</td>
<td>(2) 21.5 x 16.1 Rice - 12 ply rating</td>
<td>(2) 23.1 x 26 Rice- 10 ply rating</td>
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<tr>
<td>3 Meter Axles</td>
<td>Optional</td>
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</tr>
<tr>
<td>Metering</td>
<td></td>
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<tr>
<td>- Ground Driven</td>
<td>Standard</td>
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<td></td>
</tr>
<tr>
<td>Primary Hose - Diameter</td>
<td>2 1/2&quot; (6.4 cm)</td>
<td>Standard - 15/16&quot; (2.4 cm)</td>
</tr>
<tr>
<td>Secondary Hose - Diameter</td>
<td>Optional - 1 1/8&quot; (2.8 cm)</td>
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<tr>
<td>Frame - Trussed</td>
<td>4&quot; x 8&quot; (10 cm x 20 cm) tubing</td>
<td></td>
</tr>
<tr>
<td>Easy Clean Out System</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>Meter Drive Options</td>
<td>- Second Clutch (For spot fertilizing on the go)</td>
<td>Standard</td>
</tr>
<tr>
<td>Monitor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Shaft Motion (3), Bin Level (3), Fan Speed, Acre Tally, Ground Speed)</td>
<td>Standard</td>
<td>Optional Seed Flow</td>
</tr>
<tr>
<td>Work Switch (Mounted to Seeding Machine)</td>
<td>Optional</td>
<td></td>
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SAFETY-ALERT
SYMBOL

Watch for this symbol. It identifies potential hazards to health or personal safety. It points out safety precautions. It means:

ATTENTION - BE ALERT.
Your safety is involved.

Manuals

Note: Pre-Delivery Inspection Form must be completed and submitted to Morris Industries within 30 days of delivery date. Warranty Void if Not Registered

Parts Manual  Order Part Number N58348
Assembly Manual  Order Part Number N58347
Please read the Operator’s Manual carefully and become a “SAFE” operator.

Adopt a good lubrication and maintenance program.

General
____ Check if assembled correctly.
____ Proper chain tension.
____ Check hose connections
  Ensure cleanout door and tank lid are connected correctly.

Lubrication: Grease
____ Metering Drive
____ Axle Pivots
____ Auger Pivots

Lubrication: Oil
____ Drive chains

Tire Pressure:
____ See maintenance, section 7

Transport:
____ Tighten wheel bolts.
____ Check hose connections.

OWNER REFERENCE
Model:
Serial No:
Dealer:
Town: State: 
Phone:
OWNER/OPERATOR
Date:

TAKE SAFETY SERIOUSLY.
DO NOT TAKE NEEDLESS CHANCES!!
Section 4: Introduction

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Introduction

This Operator’s Manual has been carefully prepared to provide the necessary information regarding the operation and adjustments, so that you may obtain maximum service and satisfaction from your new MORRIS 9s Series Air Cart.

To protect your investment, study your manual before starting or operating in the field. Learn how to operate and service your 9s Series Air Cart correctly, failure to do so could result in personal injury or equipment damage.

If you should find that you require information not covered in this manual, contact your local MORRIS Dealer. The Dealer will be glad to answer any questions that may arise regarding the operation of your MORRIS 9s Series Air Cart.

MORRIS Dealers are kept informed on the best methods of servicing and are equipped to provide prompt efficient service if needed.

Occasionally, your 9s Series Air Cart may require replacement parts. Your Dealer will be able to supply you with the necessary replacement parts required. If the Dealer does not have the necessary part, the MORRIS Factory will supply the Dealer with it promptly.

Your MORRIS 9s Series Air Cart is designed to give satisfaction even under difficult conditions. A small amount of time and effort spent in protecting it against rust, wear and replacing worn parts will increase the life and trade-in value.

Keep this book handy for ready reference at all times. It is the policy of Morris Industries Ltd. to improve its products whenever it is possible to do so. The Company reserves the right to make changes or add improvements at any time without incurring any obligation to make such changes on machines sold previously.
The MORRIS 9s Series Air Cart represents the latest in Air Cart design technology. There are three sizes available, a 240 bushel (8,730 liters) cart, a 252 bushel (9,130 liters) cart and a 300 bushel (10,910 liters) cart with hydraulic fan drive. The carts incorporate a four wheel, wide-stance high clearance frame. The high clearance frame gives easy access to the metering wheels and cleanout. The 9240 and 9300 carts have a 60:40 tank split. The 9252 cart has a 30:30:40 tank split. The tank lids are easily accessed by the convenient stairs and tank walk-through.

Each tank has its own metering system and metering drive. Included with the unit is a sample collector box that an operator can use to confirm seeding rates.

The metering system incorporates spiral fluted wheels. The size of the metering wheel is matched to the number of outlets on the secondary divider giving the best in accuracy. The spiral fluted metering wheels combined with the multi-range transmission allows a full range of products such as Canola to peas to be seeded without having to change the metering wheels.

The VRT system enables the operator the ability to increase or decrease application rates from the tractor seat by pressing a button. Application rates can be changed on the go in increments of 5% from the operator set application rate (Max/Min - 50%). This enables the producer the ability to match application rates to varying soil requirements.

The VRT monitor with its easy to read display and Smart Sensors make basic operation effortless with unmatched reliability. Advanced functions are simple to program and the monitor can be quickly plugged into the harness at the Air Cart for ease of calibration. The monitor constantly monitors shaft rotation and bin levels, and with just a push of a button displays; fan speed, ground speed, field acres seeded, total acres seeded and actual application rates per acre. Real time actual application rate of two tanks can be displayed simultaneously on the monitor display.

Each metering shaft (up to three) is independently driven by a hydraulic motor. The hydraulic motors are independently controlled through electric solenoid valves. The VRT system senses ground speed and adjusts the hydraulic valves to maintain precise meter shaft rotation vs ground speed at a frequency of 20 times per second. The VRT system has the flexibility to allow the use of either tank for fertilizer or seed as well as the third tank or granular tank.
Introduction
# Section 5: Operation

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CAUTION

BE ALERT

SAFETY FIRST
REFER TO SECTION 1 AND REVIEW ALL SAFETY RECOMMENDATIONS.

Application
The Morris 9s Series Air Cart applies a wide range of seed and granular fertilizer products. It has the capacity to single shoot or double shoot. With the addition of the 9s Series Granular Applicator the Morris 9s Series Air Cart can apply granular herbicide or other fine seeds. With the addition of the Third Tank the Morris 9s Series Air Cart can apply seed and starter fertilizer, while deep banding additional fertilizer at the same time.

Tractor

Tires
- Proper ballast and tire pressure are required when pulling heavy implements.
- Consult your tractor operator’s manual and follow all recommended procedures.

Hydraulics
- Wipe all hydraulic fittings and couplers with a clean cloth to avoid contaminating the system.
- Check that hydraulic reservoir is filled to the proper level.

Drawbar
- Centre and pin in a fixed position for easier hitching and greater stability.

Warning
Do not permit smoking, sparks or an open flame where combustible fuels are being used. Keep the work area well ventilated.

Warning
Do not search for high pressure hydraulic leaks without hand and face protection. A tiny, almost invisible leak can penetrate skin, that requires immediate medical attention.
Monitor Installation

X30 Monitor

1. Install AGA5072 Power / Comms Harness on tractor. Connect directly to the tractor battery.

   **Important:** Battery leads from the Harness must be connected directly to the battery.
   Do not connect directly to starter switch.

2. Mount monitor in tractor cab in an easily visible position.


4. Refer to X30 manual N55777 for more details.

---

**Important**

Some tractors have a 24 volt starting system. Neither the monitor nor the VRT control will operate if they are connected to a 24 volt system. If in doubt, always connect to one battery only.

---

**Important**

Ensure harness extensions, when routed over the seeding tool and air cart, are clear of moving parts and protruding objects that may cut wires.
Monitor Installation - Continued

Monitor Harness

TOW BEHIND - TOPCON

Tractor Harness A464

Implement Extension Harness A467

A3738 Chassis Harness

Bin 1 Bin 2 Bin 3 Bin 4

MDECU

A3695 Sensor Harness

Connect to feedback wheels and VRT Valve Solenoids.

TOW BETWEEN - TOPCON

Tractor Harness A464

A3738 Chassis Harness

A3737 Sensor Harness

Connect to feedback wheels and VRT Valve Solenoids.
Hitching

Caution

A safety chain will help control towed machines should it accidentally separate from the drawbar while transporting. A runaway machine could cause severe injury or death. Use a safety chain with a strength rating equal to or greater than the gross weight of the towed machines.

Hitching to Tractor (Seeding Tool or Tow Between Cart)

- Ensure swinging drawbar is locked in the centre position.
- Insure hitch pin is in good condition.
- Level clevis with tractor drawbar using hitch jack.
- Back tractor into position and attach hitch clevis to drawbar, using an adequate hitch pin.
- Lock hitch pin in place with a hairpin or other proper locking device.
- After tractor to implement connection is made, relieve pressure off the hitch jack.
- Place hitch jack in raised position.
- Route Safety Chain through chain support and drawbar support.
- Lock safety hook onto chain.

Note: Provide only enough slack in chain to permit turning.

- Ensure hydraulic hose quick couplers are dirt free.
- Inspect all fittings and hoses for leaks and kinks. Repair as necessary
- Connect the hydraulic hoses to the tractor quick couplers.

Caution

Dirt in the hydraulic system could damage O-rings, causing leakage, pressure loss and total system failure.
Hitching to Seeding Tool (Tow Between Cart)

- Connect seed cart to tractor.
- Back seed cart into position, aligning seeding tool hitch with seed cart.
- Attach hitch to seed cart with 1 1/2” x 6 1/2” pin and retain with a 1/4” hair pin.
- Attach Safety Chain to seed cart.

Note: Provide only enough slack in chain to permit turning.

- Connect hydraulic hose quick couplers.
- Connect the primary hose couplers.
- Loop retaining chain around the primary hoses with the secondary hose over the bottom half of the chain.
Hitching to Seeding Tool (Tow Behind Cart)

- Connect seeding tool to tractor.
- Attach hitch to air cart with 1 1/4” x 4” pin.
- Back seeding tool into position with seed cart.
- Extend the telescopic hitch arms and connect the seed cart to seeding tool using 1 1/8” x 3 11/16” pins.
- Block the tires of the seed cart and insert the 1” x 5 13/32” pins into their bushings.
- Slowly back seeding tool toward seed cart until the telescopic arms are fully retracted and the pins drop through the hitch tube locking the hitch poles.
- Retain the pins with Click Pins.
- Attach Safety Chain to seed cart.

**Note:** Provide only enough slack in chain to permit turning.

<table>
<thead>
<tr>
<th>Pin Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1 1/8” x 3 11/16”</td>
</tr>
<tr>
<td>B</td>
<td>1 1/4” x 4”</td>
</tr>
<tr>
<td>C</td>
<td>1” x 5 13/32”</td>
</tr>
<tr>
<td>D</td>
<td>1” x 3 3/4”</td>
</tr>
</tbody>
</table>

**Hitch Extended**

**Safety Chain**

ROUTE SAFETY CHAIN BETWEEN HITCH POLES
Hitching to Seeding Tool (Tow Behind Cart) - Continued

- Route clutch and monitor wires and hydraulic lines through rear retaining chain with the secondary hose over the bottom half of the chain.
- Route clutch and monitor wires through the loops on the left hand hitch pole.
- Route the hydraulic lines (if any) through the loops on the left hand hitch pole.
- Connect the primary hose couplers.
- Loop retaining chain around the primary hoses with the secondary hose over the bottom half of the chain.
- Connect the monitor and clutch quick connectors at both the tractor/seeding tool and the seeding tool/air cart connections.

Hoses with correct amount of sag

Primary Hose Coupler - Tow Between Shown
Hitching to Seeding Tool (Tow Behind Cart) - Continued

Hydraulic Connections

- Connect the monitor and clutch quick connectors at both the tractor/seeding tool and the seeding tool/air cart connections.

- If hydraulic fan drive, then connect the fan hydraulic quick couplers at both the tractor/seeding tool and the seeding tool/air cart connections. Ensure couplers are clean and dirt free.

CAUTION
Hydraulic oil under pressure can penetrate the skin causing serious injury. Avoid personal injury by relieving all pressure, before disconnecting hydraulic hoses.

Note: The 3/8” (10 mm) diameter hose must be run directly into the hydraulic tank otherwise damage will occur to the seal in the motor. If the hose is run through the filler cap then ensure the cap is VENTED. A quick coupler can still be used between the tractor and the seeding tool.
Unhitching from Tractor (Seeding Tool or Tow Between Cart)

- Pin hitch jack in storage position.
- Lower hitch jack taking the weight off the air cart clevis.

Note: For added Safety it is recommended to unload any material that may be in the tanks.

- Ensure all transport locks are properly secured. Refer to seeding tool manual for more details.
- Relieve pressure in the hydraulic hoses by positioning tractor hydraulic lever in “float” position or turn tractor engine off and cycle lever back and forth several times.
- Disconnect the hydraulic hoses.
- Disconnect the clutch and monitor cables.
- Remove the safety chain.
- Remove the drawbar pin.
- Slowly move tractor away from seeding tool or tow between cart.

Unhitching from Seeding Tool (Tow Between Cart)

- Lower hitch jack taking the weight off the seeding tool hitch poles.
- Relieve pressure in the hydraulic hoses by positioning tractor hydraulic lever in “float” position or turn tractor engine off and cycle lever back and forth several times.
- Disconnect the primary hose couplers.
- Disconnect the hydraulic hoses.
- Remove the hitch pin.
- Slowly move seed cart away from seeding tool.
Unhitching from Seeding Tool (Tow Behind Cart)

- Lower hitch stands, if so equipped, taking the weight off the hitch poles.
- Relieve pressure in the hydraulic hoses by positioning tractor hydraulic lever in “float” position or turn tractor engine off and cycle lever back and forth several times.
- Disconnect the primary hose couplers.
- Disconnect the hydraulic hoses.
- Disconnect the clutch and monitor cables.
- Remove the hitch pins.
- Move hitch poles to the side of seed cart, if not equipped with hitch stands.
- Slowly move seeding tool away from seed cart.
Transport

Observe all applicable safety precautions under transport heading in Safety, Section 1.

- Refer to Specifications, Section 2 for weight, transport height and width.
- Transport with tractor only!
- Use Tow Hitch when transporting without seeding tool. (Tow Behind Units)
- Always connect safety chain provided to the towing vehicle and the hitch of the seed cart.
- Do not transport with the fan running.
- Disconnect main drive chain when towing air cart a long distance.
- Ensure all transport pins are secured.

Speed

- Always travel at a safe speed. Do Not Exceed 20 M.P.H. (32 kph) with an empty air cart.
- The combined weight of the implements being towed, including material in tank, must not exceed 1.5 times the weight of towing vehicle.
- REDUCE SPEED with material in tank. Do Not Exceed a speed of 10 M.P.H. (16 kph).
- Use additional caution when towing loads under adverse surface conditions, when turning, and on inclines.

Lights

- Ensure proper reflectors are in place, refer to Safety Section 1.
- Be familiar with and adhere to local laws.

Tow Hitch (Tow Behind Units)

- Attach tow hitch to front axle with two 1” x 2 1/4” pins.
- Retain the pins with klik-pins.
- Use tow hitch when towing without seeding tool.
- Do not use tow hitch with material in tank.
- Do not install transport lock pin in front castor fork when using tow hitch.
Operation

Metering System

The 9s Series Air Cart uses a combination of metering wheels and spacers shown below. The metering wheel is individually sized to correspond to the number of outlets at the connected secondary head and the spacers make up the space between the wheel and the body. Some openings may be blanked off depending on the number of secondary divider heads used on the seeding tool.

The 9s Series Air Cart can meter all types of seeds and fertilizers by simply adjusting the slider plates. See "Slider Settings" for more details.

Different rates are easily obtained using the selection of quick change sprockets that attach to either of the two meter transmissions.

Note: Before putting product into the tanks check the following:
(a) The slider plates are set correctly for product being applied.
(b) The Clean-out doors are fully closed and sealed.
(c) The plastic bag covering the fan is removed.

Important

Ensure distribution system is balanced. It is very important that head outlets only vary by one. (i.e. use only 7 and 8 together, 8 and 9 together, 9 and 10 together)

Note: The number of outlets on the divider head must match the metering wheel size.
Secondary Hose Installation

The lengths of the 15/16” (24 mm) diameter hoses are very important.

For accurate distribution, the secondary hoses have to be arranged by length symmetrically about the centre line.

The longest hoses have to be in the centre of the divider head. These hoses would normally feed the openers furthest away from the head.

- Ensure that the secondary hoses 15/16” (24 mm) diameter do not run higher than 3” (76 mm) above the height of the flat fan divider head.
- Allow an extra 3” (76 mm) of hose before cutting secondary hose for fitting in the seed boot.
- Always ensure that the secondary hoses are sufficiently long to accommodate tripping of trips.
- Avoid sharp bends in any of the hoses.
- Check for pinch points and clearances when folding in and out of transport.

Important

Hot water is the only acceptable lubricant for the installation of the secondary hose.

The supplier advised MORRIS that WD-40 or any other lubricant (i.e. liquid detergent) will have a negative effect on the chemical stability of the hose, resulting in the degradation and failure of the hose due to Environmental Stress Cracking.

Important

Distribution uniformity will be adversely affected if hoses are incorrectly installed.
Slider Setting

The slider plates come in 4 different sizes. Each slider plate matches a specific metering wheel.

**Note:** The slider plates must match the metering wheel size.

The slider plates have three positions to allow all types of seeds and fertilizers to be metered.

The slider plate positions are closed, open, and removed as indicated on diagrams. (See next page)

- Position slider as indicated below and tighten nut to hold slider tightly in place.
- Position cover plate as indicated below and tighten wing nuts to hold cover plate in place.

**Note:** For Oats or Coarse Grains, if it appears bridging is occurring, remove sliders and recalibrate.

---

**Important**

When adjusting the sliders to the closed position follow the procedures below:

1) Locate the key-way in the metering wheel. Rotate shaft until high spot is located, this is the key-way location. Mark shaft for future reference.

2) Rotate metering shaft until key-way is in location shown below.

3) Keep the slider mounting plate flat on the metering body surface. See diagram A.

If the slider is tipped up when set to the closed position interference with the metering wheel will occur.

**Note:** In the closed position there is a gap of .070” (1.778 mm) between the metering wheel and the top edge of the slider plate.
Slider Setting - Continued

A Slider Closed & Cover Plate Down

B Slider Closed & Cover Plate Up

C Slider Open & Cover Plate Up

D Slider Removed & Cover Plate Up

Note: For Oats or Coarse Grains, if it appears bridging is occurring, remove sliders and recalibrate.

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<thead>
<tr>
<th>Diagram</th>
<th>Product</th>
<th>Slider Setting</th>
<th>Cover Plate</th>
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<tr>
<td>A</td>
<td>Canola, Flax, Mustard</td>
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<tr>
<td>B</td>
<td>Nitragin, Nodulator</td>
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<td>Up</td>
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<tr>
<td>C</td>
<td>Barley, Lentils, Milo, Oats, Rice, Wheat, Fine Fertilizer</td>
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<td>D</td>
<td>Beans, Peas, Soybeans, Sunflowers, 10-46-0-0, 11-51-0, Fertilizers containing Sulphur and/or Potash</td>
<td>Removed</td>
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</table>
Operation

Preparing VRT

Zero Shaft Hydraulic Motor Solenoids

Upon initial setup the preload of the solenoid valves must be set to match the tractor hydraulics.

**Note:** Tanks must be empty during this process.

Zero the shaft of the hydraulic motors by using the following procedure:

- Ensure there is no product in any tanks.
- Warm up hydraulic system by running fan system for 5-10 minutes. Hydraulic hoses at fan motor should be warm to touch.
- **Turn OFF** Monitor, VRT Console and Controller.
- Start with all adjusting screws **turned out fully**.
- Adjust each valve individually by following the procedure below:
  - Start with rear tank first adjusting screw ‘3’ for three valve bank or screw ‘4’ for four valve bank.
  - Remove cap nut and then loosen jam nut.
  - Turn adjusting screw IN until motor starts to turn.
  - Allow motor to turn for 1-2 minutes to allow for motor to reach optimal operating temperature.
  - Then turn adjusting screw OUT until motor stops turning.
  - Tighten jam nut to secure adjusting screw in place. Replace cap nut.
- Repeat the above procedure for the other valves.

**Note:** It is recommended to check the zero of the valves at the start of each season or if a different tractor is used on the system.

**Note:** If Air Cart is **NOT** equipped with a Third Tank or Granular Tank solenoid ‘1’ must be unplugged and the adjusting Knob turned out fully.
Preventing VRT - Continued

Verify VRT Hydraulic Assembly

VRT system should be run to confirm correct rotation of meter shafts.

The diagram below illustrates the correct hose orientations for the VRT valve body.

**Note:** The pressure line from the tractor is the front port of the valve body.

To ensure correct hose installation, the meter shafts will turn counterclockwise when viewed from transmission side during system operation.
Operation

Filling Tank
The Morris 9s Series Air Cart is equipped with 2 or 3 tanks. Typically the front tank is for seed and the middle and rear tank is for fertilizer. However, ALL tanks can be used for the same product.

The capacity of the air cart tanks are listed in the specification tables in Section 2.

- Open lid fully on tank being filled.
- Check and remove any debris inside tank.
- Remove clean-out door.
- Check for debris inside metering body.
- Check for sheared metering wheels.
- Check the slider plates are set correctly.
- Fully close and seal the Clean-out door.
- Ensure the auger screen is in place.
- Always use screen to filter debris when filling.
- Adjust bin level sensor to desired alarm point.

Note: Even small fertilizer lumps can cause problems with plugging. All possible precautions should be taken to prevent lumpy fertilizer from entering the tank.

Important
Before putting product into the tanks check the following:

(a) The slider plates are set correctly for product being applied.
(b) The clean-out doors are fully closed and sealed.
(c) The plastic bag covering the fan is removed.
(d) Inspect all augers used in handling the products for seeding. Run augers to clean out any debris inside auger so it does not get transferred to air cart tanks.

Warning
Do not enter tank unless another person is present.
Filling Tank - Continued

- Position right hand access ladder in line with the tank walkway.
- Position auger as described below, if so equipped.
- Unlock auger arm lock. (Located 7240, 7252 & 7300 only)
- Unlatch the auger from its transport position.
- Swing out the auger making sure the motor end of the auger is still engaged at the arm pivot.
- Once the auger pivot is central to the Air Cart, tilt auger and swing into position with spout centrally located over the walkway.
- Lock auger arm lock. (Located 7240, 7252 & 7300 only)

Important
Check Metering Wheel keyways in the event the primary lines plug.
Keyways may shear if the collector becomes plugged.

Auger Cradle
Front Pivot
Operation

Filling Tank - Continued

- Open lids on tank and insert spout.
- Back truck to the hopper and engage the hydraulic motor on the auger.
  1. If hydraulic fan drive then ensure selector valve is in correct position for auger operation and engage tractor hydraulics.
  2. If engine fan drive then engage tractor hydraulics to operate auger.
- Auger product into tank until product is visible in site glass.
- Stop the flow of product into the auger and allow auger to empty. The tank should be close to full.

Important
Do not exceed 10 mph with tanks full.
Filling Tank - Continued

- Clean lid seal and ensure lid seal is positioned correctly before closing tank lid.
- Reverse the auger to clean out the hopper.
- Unlock auger arm lock.
- Swing auger out making sure the motor end of the auger engages the arm pivot.
- Secure auger in transport position.
- Lock auger arm lock.
- Remove the plastic bag covering fan.
- Check lid for air leaks with your hands once Air Cart fan is operational. See Section 7
- Check metering body for air leaks.

Note: Before seeding it is recommended that after a rain or dew that fan be run for a few minutes to eliminate moisture in the system.
Unloading Tanks

Emptying tanks is quick and easy to do.

- Move access ladder forward.
- Position auger under the tank to be emptied.
- Start auger.
- Loosen Clean-out door on metering body by moving lock to notch 1.
- Regulate flow from the tank by loosening or tightening Clean-out door as required.
- Once all material stops flowing, remove Clean-out door completely and brush out remaining material in the corners.

Complete Clean-out:

- Remove all sliders and blank off plates.
- Remove the collector bottom.
- Run fan until all remaining material has been blown out of the system.
- Reinstall the sliders, blank off plates, collector bottom, and clean-out doors.

Danger

Keep all shields in place. Keep hands, feet and clothing away from auger intake, failure to do so will result in serious injury or death.
Rate Calibration

The practice of doing a rate calibration is strongly recommended, as it will confirm the actual amounts of product dispensed per motor revolution (Weight/Rev).

Weight/Rev (Calibration Factor) is used by the monitor to determine the shaft motor rpm required to deliver the correct application rate.

The following procedure should be followed for every change of product.

- Engage hydraulic lever to run air cart.
- Turn off fan by switching selector valve (located in the fan supply line) to calibration position.
- Open collector bottom.
- Slide rate check box on the collector body.
- Prime metering wheels first by using the run switch on the Run-Reset Box to start and stop the meter drive. Allow the drive to run until material begins to fall through the collector body. Press the rest button for 5 seconds to zero monitor count before collecting sample.

Note: The Topcon monitor must be turned ON in order for the primer switch to work.

Note: Ensure the fan is not running.

- Empty material from rate check box and reinstall it on the same collector.
Rate Calibration - Continued

- Perform calibration as outlined in the Topcon manual.
- Remove the rate check box from the collector body. Weigh the sample by using tarp straps to hook rate check box to spring scale.

**Note:** Remember to subtract the weight of the rate check box from the total sample weight.

- Enter “Weight” of product collected as outlined in the Topcon manual.

**Note:** The Calibration Factor (Weight/Rev) is automatically calculated for the value being entered.

- Remove rate calibration insert and close collector bottom ensuring that the seals are free from debris and leaks.
- Place rate check box into storage bracket.

Follow the above procedure to check the rate of the other tanks.

---

**Important**

Proper measurement of sample weight is critical for application rate accuracy.

Prime metering wheels before taking actual sample.

Remember to subtract the weight of the rate check box from the total sample weight.
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### SEED TANK/FERTILIZER TANK/THIRD TANK - SLOW SPEED DRIVE

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### GRANULAR APPLICATOR - SLOW SPEED DRIVE

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### ALL STANDARD TANKS: DIRECT DRIVE

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<tr>
<td>51 - 56</td>
<td>SSSEED TANK/THIRD TANK: SLOW SPEED DRIVE</td>
</tr>
<tr>
<td>53 - 56</td>
<td>92/94</td>
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<td>55 - 56</td>
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<td>108/108</td>
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<td>110/110</td>
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<td>73 - 56</td>
<td>112/112</td>
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<td>75 - 56</td>
<td>114/114</td>
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<td>77 - 56</td>
<td>116/116</td>
</tr>
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<td>79 - 56</td>
<td>118/118</td>
</tr>
<tr>
<td>81 - 56</td>
<td>120/120</td>
</tr>
</tbody>
</table>

**Operation Chart - Calibration**

**January 2015**
**Operation**

### Metering Rate Adjustment

The metering rate adjustment for all tanks is done in the same manner. A new rate is achieved by changing the APPLICATION RATE and or the Calibration Factor as outlined in the Topcon manual.

**Note:** It is recommended to set “Calibration Factor” by doing a “Rate Calibration”.

### Seeding Fine Seeds (Canola, Mustard, etc.)

When seeding fine seeds such as canola or mustard, the slow speed transmission has to be engaged to ensure the low rates required for these products.

The slow speed transmission is incorporated in the FRONT Posi-Drive Transmission.

- To engage the slow speed, remove the large hairpin from the front shaft and install through the sleeve and shaft located at the rear of the transmission.

**Note:** Shaft will have to be rotated to align holes for pin insertion.

- To disengage the slow speed, reverse the above procedure.
- Rate checks can be performed the same way as for other seeds.
- Usually it is necessary to reduce the fan rpm when seeding fine seeds. See Fan Speed for specific fan speeds.

**Note:** Seed must be placed in the front tank.

### Applying Inoculant

When inoculant is applied at the time of seeding, then once the Air Cart has been filled, the fill-lids should be left open and the fan run for 5-10 minutes at full rpm to dry the seed.

Calibration must be done after the seed is dried, otherwise the calibration will be incorrect.

**Note:** If the seed is not dried then the seed will have a tendency to bridge and not meter into the air stream.
Hydraulic Fan Drive

The piston type orbit motor on the fan requires tractor to have either a load sensing hydraulic system or a closed center hydraulic system with flow control.

The flow required is 18 U.S. gpm (68 liters) for the 12 cc motor at a pressure of 2,750 p.s.i. (18,960 kPa) However, smaller flows can be used depending on the product being metered.

Note: An additional 6 gpm (23 liters/min) is required for the VRT system.

For correct operation of the fan the hydraulic motor must be coupled to the priority valve (if tractor is so equipped) in the hydraulic valve bank.

Check with the tractor manual or manufacturer to determine if or which spool is a “priority valve”.

Speed fluctuations will result if the fan is not connected to the priority valve if hydraulic system is equipped with a priority valve.

Ensure couplers are free of dirt and are clean when connecting the fan hydraulics to the tractor.

Fan speed is adjusted by increasing the amount of oil being delivered to the motor by adjusting the respective flow control valve until the desired rpm is displayed on the monitor.

Note: There is a one-way check valve installed in the hydraulic circuit. If the fan does not rotate, then move hydraulic lever in the opposite direction; this will engage the fan. This valve prevents damage to the hydraulic systems when the fan is shut OFF, by allowing the fan to freewheel.

A piston motor creates leakage past the internal components for lubrication. This oil needs to go back to the oil reservoir at the lowest pressure possible. The motor has a 3/8” diameter case drain line. This line must be connected directly into the tractor hydraulic reservoir to ensure that there is zero back pressure in the drain line; otherwise damage will result to the motor.

IMPORTANT

Run hydraulic fan drive at lowest rpm possible (1,000-2,000) for 5-10 minutes before operating at set rpm. This is required to warm up the hydraulic fluid. Cold hydraulic fluid will cause pressure spikes in the system that will damage the case drain seal in the orbit motor.
### Fan Speed

Adequate air volume is necessary at all times to carry the product in the air stream. Air volume can be controlled by adjusting hydraulic oil flow on hydraulic fan drives or adjusting engine speed on engine fan drive models.

Air volume hence fan speed requirements will vary with:

(a) Ground speed  
(b) Metering rate  
(c) Number of primary runs  
(d) Width of machine  
(e) Density and size of material

Excessive fan speed can cause seed damage, seed bouncing and premature wear of the system.

Generally fan speed is adequate if product flows through the hoses without surging and the hoses empty quickly and evenly when the system shuts down.

The table lists **suggested minimum fan speeds** for certain products. **The table should be used only as a guide.** If plugging or surging occurs increase the fan speed to eliminate the problem.

**Note:** It is recommended that after a rain or dew the fan be run two to three minutes to expel any moisture in the system.

---

**Important**

Keep fan impeller blades clean at all times.

**Note:** Once fan speed is properly set, be sure to adjust the monitor fan alarm setting accordingly. See Monitor Section “Monitor Programming”.

---

**Suggested Fan RPM @ 5 mph (8 kph) on a 41 ft unit**

<table>
<thead>
<tr>
<th>Product</th>
<th>Application Rate</th>
<th>Fan Speed Setting</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seed</td>
<td>Fertilizer</td>
<td>Single Shoot</td>
</tr>
<tr>
<td>Fine Seeds</td>
<td>All Rates</td>
<td>50 lbs/acre 56 kg/ha</td>
<td>3400 RPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 lbs/acre 112 kg/ha</td>
<td>3800 RPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 150 lbs/acre 168 kg/ha</td>
<td>4300 RPM</td>
</tr>
<tr>
<td>Lentils</td>
<td>All Rates</td>
<td></td>
<td>3800 RPM</td>
</tr>
<tr>
<td>Coarse Grains</td>
<td>90 lbs/acre 100 kg/ha</td>
<td>50 lbs/acre 56 kg/ha</td>
<td>4300 RPM</td>
</tr>
<tr>
<td></td>
<td>90 lbs/acre 100 kg/ha</td>
<td>100 lbs/acre 112 kg/ha</td>
<td>4500 RPM</td>
</tr>
<tr>
<td></td>
<td>90 lbs/acre 100 kg/ha</td>
<td>&gt; 150 lbs/acre 168 kg/ha</td>
<td>4800 RPM</td>
</tr>
<tr>
<td>Large Seeds</td>
<td>180 lbs/acre 200 kg/ha</td>
<td>40 lbs/acre 45 kg/ha</td>
<td>4400 RPM</td>
</tr>
<tr>
<td>Fertilizer Light</td>
<td>* * * *</td>
<td>&lt;100 lbs/acre 112 kg/ha</td>
<td>4000 RPM</td>
</tr>
<tr>
<td>Fertilizer Heavy</td>
<td>* * * *</td>
<td>&gt; 100 lbs/acre 112 kg/ha</td>
<td>4500 RPM</td>
</tr>
</tbody>
</table>

**Note:** Fan Speeds given are when applying product. It is normal for fan speed to drop when not applying product.
**Double Shoot Settings**

Double Shooting is done with a few simple adjustments as follows:

1. Plenum Setting
2. Diverter Setting
3. Quick Coupler Position (Tow Behind Only)

**Plenum Damper Settings**

Adequate air volume is necessary at all times to carry the product in the air stream. Air volume can be controlled by adjusting the plenum damper settings.

The table below lists initial plenum damper settings for certain products.

**Note:** The settings in table should be used only as a guide.

- If fertilizer plugging or surging occurs decrease the seed damper setting to eliminate the problem.
- If seed plugging or surging occurs increase the seed damper setting to eliminate the problem.

**Diverter Settings**

Located between the metering bodies in each primary line are two diverter valves. The diverters must be correctly set in order for product to flow correctly as outlined on next two pages.

1. Double Shoot - Handles in Double Shoot Position.

**Suggested Plenum Settings**

<table>
<thead>
<tr>
<th>Product</th>
<th>Seed</th>
<th>Fertilizer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate lb/acre</td>
<td>Damper Setting</td>
</tr>
<tr>
<td>Fine Seeds</td>
<td>All Rates</td>
<td>1/4</td>
</tr>
<tr>
<td>Coarse Grains</td>
<td>90 lb (100 kg/ha)</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>90 lb (100 kg/ha)</td>
<td>Open</td>
</tr>
<tr>
<td>Large Seeds</td>
<td>180 lb (200 kg/ha)</td>
<td>1/4</td>
</tr>
<tr>
<td>Single Shoot</td>
<td>Tow Behind</td>
<td>Top Damper Closed</td>
</tr>
<tr>
<td></td>
<td>Tow Between</td>
<td>Top Damper Open</td>
</tr>
</tbody>
</table>

**Note:** See “Fan Speeds” for Fan RPM.
Double Shoot Settings - Continued

Double Shoot Tow Behind

1. Coupler: Top Position
2. Diverter Setting: Handles are in Double Shoot Position.
3. Plenum Setting: Refer to table.

Single Shoot Tow Behind

1. Coupler: Lower Position
2. Diverter Setting: Handles are in Single Shoot Position.
3. Plenum Setting: Refer to table.
Double Shoot Settings - Continued

Double Shoot Tow Between

1. Diverter Setting: Handles are in Double Shoot Position.
2. Plenum Setting: Refer to table.

Single Shoot Tow Between

1. Diverter Setting: Handles are in Single Shoot Position.
2. Plenum Setting: Refer to table.
Operating Guidelines

There are a number of areas that can cause problems when seeding. Listed below are specific points that should be addressed at all times. Following these guidelines will ensure better crop emergence and consequently the potential for better yields.

An improperly levelled seeding tool cause uneven depth which could result in poor emergence.

It is important that the seeding tool is levelled both side to side and front to back.

Check Tire Pressures

- Ensure all tires are inflated to their specified pressure. Incorrect tire pressure can cause depth variations.

Level Seeding Tool Side to Side

- Check the depth of each shovel on the back row.
- Adjust side to side level as necessary. See seeding tool manual for more details.

Level Seeding Tool Front to Rear

- Poor front to rear levelling causes ridging as shown.
- Check the depth of two adjacent shanks normally one on the front row and one on the rear row.
- Adjust level as necessary. See seeding tool manual for more details.

Worn Seeding Tool Parts

- Shanks that are bent cause uneven depth and they should be repaired or replaced.
- Trip mechanisms that are worn can also cause poor depth control and any worn parts should be repaired or replaced.

Packing

- Packing behind the seeding unit is strongly recommended. This improves germination and helps reduce moisture loss and erosion.
- In wet conditions the head land should be done last to prevent over packing.
Operating Guidelines - Continued

Turning

- Avoid sharp turns. Backing up of the outer wings with the seeding tool in the ground has a tendency to plug the seed boot with soil.
- Raise seed boots fully before making sharp turns or backing machine.

Seed Rate Settings

- Remove any caked-on material from sliders and metering wheels.
- Ensure all sliders are properly set and wheels turn freely.
- Check product rates carefully by performing a calibration check.

Fertilizer Application

- Avoid using fertilizers that absorb moisture readily, especially during periods of high humidity.
- Also avoid fertilizers that contain a high percentage of fine dust, as these materials can plug metering wheels and coat the inside of seed distribution system.

Fan Setting

- Run fan at recommended speed. If plugging or surging occurs increase the fan speed to eliminate the problem.
- Allow tractor hydraulic oil to warm-up thoroughly prior to seeding. Cold oil will cause slower fan speeds (Hydraulic driven fan).

Product Application

- Control product application with the clutch switch in tractor.
- Have machine moving forward before lowering seed boots to avoid plugging.
- To prevent skipping, allow 15 feet of forward travel to ensure air system has delivered product to seed boots.

Note: Do not attempt to meter product when fan is not running. Damage to the metering wheels may occur.

Note: It is strongly recommended to consult local agricultural extension offices for allowable product rates, which are dependent on soil moisture and type.

Note: If equipped with a granular tank, the lines must be blocked off when not in use.
Adjustments and Operational Checks

- When changing fields and periodically throughout the day the seeding tool should be checked for level and depth and the seed boots for blockage.

Checking Seed Flow

The following procedure should be implemented throughout the day typically at each fill of the air cart:
- Raise the seeding tool out of the ground.
- With the fan running and monitor off, engage meter drives with the primer switch, rotating meter drives 4 to 5 times.
- Seed and/or fertilizer should appear at each outlet on the ground.
- If no seed or fertilizer appears on the ground at any of the openers check for hose blockage in both the 15/16” (24 mm) diameter secondary and the 2 1/2” (64 mm) diameter primary hose, as well as in the flat fan divider.
- See Trouble Shooting Section for possible causes of the blockage.

Moisture Alert

- Whenever Air Cart has been standing for an hour or more during period of high humidity or damp, rainy days, or after sitting overnight, run fan at recommended rpm, with machine stationary for 5 minutes.

Air Leaks

It is imperative that no air leaks occur in the Air Cart tank as even the smallest air leak from the lid will lead to material bridging in the tank thereby causing misses in the field.

Check the following areas for air leaks:
- Tank clean-out door
- Metering body assembly seals
- Collector assembly seals
- Tank lid

Tank Low in Product

- Refill tank before metering wheels are exposed.
- The metering wheels must be completely covered to avoid unseeded strips.

Important

Check Metering Wheel flutes in the event the primary lines plug.
Flutes may shear if the collector becomes plugged.

Note: Check Seed Flow as described above, after running fan for 5 minutes.
Monitor

- Familiarize yourself with all monitor functions as outlined in the Topcon manual.
- Ensure all monitor “settings” are correctly set for the air cart/seeding tool combination.
- Recognize and correct alarm conditions as indicated on the monitor.
- Check all wire harness connections for corrosion and use a dielectric spray to clean. Inspect all sensors for proper gap.

General Field Operation

- Follow guidelines outlined in “Operating Guidelines”.
- Switch monitor on as outlined in the Monitor Section.
- Start Fan.

**Note:** Load sensing hydraulic systems require “warming up” before they function smoothly. See “Hydraulic Fan Drive” for more details.

- Move forward with seeding tool.
- Engage metering systems as outlined in the “Monitor Section” under “Identifying Variable Rate Console Switches”.
- Lower seeding tool into ground.
- Rates can be varied across field as desired by using the boost and cut buttons for the appropriate product. See “Identifying Variable Rate Console Switches” under Monitor Section.
- Turning at headland: Switch metering systems off with the Master On/Off Switch, immediately raise seeding tool fully rephasing hydraulics (see seeding tool manual).
- Once turned engage metering systems with the Master On/Off Switch and lower seeding tool into ground.

**Note:** Do not attempt to meter product when fan is not running. Damage to the metering wheels may occur.

**Note:** Engage console master switch early enough to avoid misses. Forward travel should be equal to half the width of the seeding tool. [i.e. for a 40 ft (14 m) wide seeding tool the forward travel should be a minimum of 20 feet (7 m)].
Manual Override

If the variable rate control system fails, the independent manual override system can be used to maintain seeder operation.

The manual override system provides the ability to run the hydraulic motors at a fixed rate (not proportional to ground speed) and to turn the manual system ON and OFF from the tractor cab.

Rate Setting

To set the manual override system use the following procedure:

- Turn Monitor OFF.
- Empty product from tanks or close tank shut-offs.
- Refer to the appropriate “Ground Speed Chart” on the following pages or use the calculations below to determine the meter shaft RPM for the desired product.
- Adjust meter shaft RPM using following procedure:
  - Place hand held tachometer onto meter shaft.
  - Remove cap nut and then loosen jam nut.
  - Turn adjusting screw IN (Clockwise) until meter shaft turns desired RPM.
  - Tighten jam nut to secure adjusting screw in place. Replace cap nut.
- Repeat the above procedure for the other meter shafts.

Note: Re-zero shaft hydraulic motors once normal operation of system is resumed.

Calculating Meter Shaft RPM

If it is desired to calculate the exact rpm for a more specific ground speed use the following:

Know parameters:

- Working Width: The operating width of seeding tool. (feet)
- Working Speed: Operating ground speed. (mph)
- Application Rate: Weight of product. (lbs/acre)
- Product WT/REV: Known from calibration mode or can determine from Calibration Chart. (lbs/rev)
Manul Override - Continued

Calculating Meter Shaft RPM

Determine in the following order:
1) Travel Distance (feet per acre) = 43560 ft² / Working Width (ft)
2) Travel Speed (feet per minute) = Working Speed (mph) x 5280 ft/mile / 60 min/hr
3) Travel Time (minutes per acre) = Travel Distance ft/acre / Travel Speed (ft/min)
4) Motor revs per acre = Application rate (lbs/acre) / WT/REV (lbs/rev)
5) Motor RPM = Motor Revs (revs/acre) / Travel Time (min/acre)
6) Meter Shaft RPM
   Direct Drive = Motor RPM / 2
   Slow Speed Drive = Motor RPM / 16

Operating in Manual Override

- Connect Manual Override switch to AUX connection on monitor harness.
- Refill tanks or open the tank shut-offs.
- Ensure Manual Override switch is in the OFF position, this will shut off the shaft motors.
- Start Fan.
- Move forward with seeding tool at desired speed.

Note: It is important to maintain a constant ground speed since product application rate will not adjust to any changes in ground speed.
- Engage metering system by turning ON the Manual Override switch.
- Lower seeding tool into ground.
- Turning at headland:
  - Disengage metering system by turning OFF the Manual Override switch, immediately raise seeding tool fully rephasing hydraulics (see seeding tool manual).
  - Once turned engage metering system by turning ON the Manual Override switch, and lower seeding tool into ground.

Note: Re-zero shaft hydraulic motors once normal operation of system is resumed.
Ground Speed Chart - Direct Drive 6 mph
Manual Override - Continued

Ground Speed Chart - Direct Drive 5 mph

![Ground Speed Chart - Direct Drive 5 mph]
Manual Override - Continued

Ground Speed Chart - Direct Drive 4 mph
Manual Override - Continued

Ground Speed Chart - Slow Speed 6 mph

![Ground Speed Chart - Slow Speed 6 mph](image)
Ground Speed Chart - Slow Speed 5 mph
Manual Override - Continued

Ground Speed Chart - Slow Speed 4 mph
Section 6: Maintenance

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<th>Page</th>
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<td>6-20</td>
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<tr>
<td>Coated Metering Body</td>
<td>6-21</td>
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<tr>
<td>Auger Arm Lock</td>
<td>6-24</td>
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<td>Auger Pre-Load Adjustment</td>
<td>6-24</td>
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<td>6-25</td>
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<tr>
<td>Castor Fork Adjustment</td>
<td>6-25</td>
</tr>
</tbody>
</table>
General
This section deals with two goals, maximum life and dependable operation. Adopt a regular maintenance and lubrication program. Care and sufficient lubrication is the best insurance against delays.

Safety
- Always shut off the tractor and remove key before dismounting.
- Guard against hydraulic high pressure leaks with hand and face protection.
- Never work under the Implement unless it is in the down position or transport lock pins are in place and secured with hair pins. Do not depend on the hydraulic system to support the frame.
- Always wear safety goggles, breathing apparatus and gloves when working on seeder filled with chemical. Follow manufactures recommended safety procedures when working with chemicals or treated seeds.
- Do not feed left over treated seed to livestock, treated seed is poisonous and may cause harm to persons or livestock.

Warning
Securely support any machine elements that must be raised for service work.

Caution
Keep service area clean and dry. Wet or oily floors are slippery.
**Maintenance**

**Tighten Bolts**
- Before operating the Air Cart.
- After the first two hours of operation.
- Check tightness periodically thereafter.
- Use Bolt Torque Chart for correct values on various bolts.
- Note dashes on hex heads to determine correct grade.

**Note:** DO NOT use the values in the Bolt Torque Chart if a different torque value or tightening procedure is given for a specific application.

- Fasteners should be replaced with the same or higher grade. If higher grade is used, only tighten to the strength of the original.

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Grade 5 Bolt Marking</th>
<th>Nm</th>
<th>lb. ft.</th>
<th>Grade 8 Bolt Marking</th>
<th>lb. ft.</th>
<th>Nm</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>11</td>
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<td>2850</td>
<td>2100</td>
<td>3350</td>
<td>4550</td>
<td></td>
</tr>
</tbody>
</table>

**Tires**
- Inspect tires and wheels daily for tread wear, side wall abrasions, damaged rims or missing lug bolts and nuts. Replace if necessary.
- Tighten wheel bolts - refer to Bolt Torque Chart.
- Check tire pressure daily, when tires are cold.
- Correct tire pressure is important.
- Do not inflate tire above the recommended pressure.

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Tire Style</th>
<th>Rating</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.5L x 16.1</td>
<td>Softrac II</td>
<td>10 ply</td>
<td>28 psi</td>
</tr>
<tr>
<td></td>
<td>Sure Grip Traction</td>
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<td>32 psi</td>
</tr>
<tr>
<td>23.1L x 26</td>
<td>AWT (Implement)</td>
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<td>24 psi</td>
</tr>
<tr>
<td></td>
<td>Rice (TD8 Sure Grip)</td>
<td>10 ply</td>
<td>28 psi</td>
</tr>
</tbody>
</table>

**Caution**
Tire replacement should be done by trained personnel using the proper equipment.
Daily Maintenance

- Check for and remove any water in primary collectors after rainy weather. Remove both front and rear clean-out doors and collector bottom to drain water from the tanks and collectors.
- Reinstall collector bottoms and clean-out doors.

Important: Care must be taken when reinstalling collector bottoms to prevent damage to the inside of the collector.

- Assure fan screen is clear of debris.

Note: Start fan and run for 3 - 5 minutes prior to loading machine to get rid of accumulated moisture.

- Check lid seals for damage, and that they are sitting properly on steel ring.
- Check tank pressure hoses for leaks, cracks or plugging.
- Check the following areas for air leaks:
  - Tank clean-out door
  - Metering body assembly seals
  - Collector assembly seals
  - Tank lid

Refer to “Air Leak Check” under Air System Maintenance.

- Check monitor wiring that all sensor wires are properly routed and retained.
- Check for plugged hoses.
- Assure drive chains are cleared of debris.
- Inspect wheel bolts for looseness.
Lubrication

Greasing pivot points prevents wear and helps restrict dirt from entering. However, once dirt does enter a bearing, it combines with the lubricant and becomes an abrasive grinding paste, more destructive than grit alone.

- Apply new lubricant frequently during operation to flush out old contaminated lubricant.
- Use a good grade of lithium based grease.
- Use a good grade of machine oil.
- Clean grease fittings and lubricator gun before applying lubricant.

Refer to the photos on page 7-6 and 7-7 for grease fitting locations.

1. Drive Chains
   - Oil every 50 hours.

2. Slow Speed Drive
   - Grease every 50 hours.
Lubrication - continued

3. Front Castor Wheel Bearings
   • Grease every 50 hours.

4. Castor Fork Pivot
   • Grease every 50 hours.

5. Auger Pivots
   • Grease every 100 hours.
Air Delivery System

General

The air delivery system of all Air Carts is extremely important for the proper metering of product to the openers. The metering system on all pressurized Air Carts is sensitive to air leaks. Loss of tank air pressure could affect feed rates, which could become erratic or even stop.

- Regularly check that all hoses are free from kinks or blockages throughout the day. To check for blockages raise seeding tool out of the ground and with the fan running turn crank a couple of turns. Equal amounts of material should be deposited under each boot if not check the following for blockage:
  1. Seed openers and secondary hoses.
  2. Divider heads by removing access doors.
  3. Primary hoses and collectors.
  4. Metering wheels for damage to key-way and the flutes of the wheel.
- Keep fan inlet screen clear and free from debris.
- Place a plastic bag over the fan when the unit is not in use. This helps prevent moisture from entering the system.
- Check periodically and at the end of each season for air leaks at hose connections.
- Check periodically and at the end of each season for air leaks at the following:
  1. Tank Lid Seals.
  2. Metering body shaft seals.
  3. Metering body to tank seals.
  4. Collector to metering body seals.
  5. Fan to plenum.
  6. Plenum to collector.
  7. Clean-out doors, for leaks and loss of seal memory.
  8. Collector door seals.
  10. Couplers between seeder and cultivator.
  11. Access Doors on Divider Heads.

Note: There must not be any air leaks from the tank. This air leakage causes air turbulence in the tank which can result in inaccurate metering rates.

- Once a year check for wear of primary and secondary hoses.

Caution

Care should be taken when working near the Air Cart while the fan is running. Product blowing out of the system could cause personal injury.

Note: Extended life can be obtained if the hoses are rotated 1/4 turn once a year.
Air Delivery System - Continued

Tank Lids

The lid seal is probably the area that sees the most abuse due to the activity associated with filling the tanks. With each fill the lid seals should be inspected for cuts, abrasions, debris in the seal and ensure the seal is positioned properly on the steel rim around the tank opening.

Tank Lid Adjustment

Check Tank Lid tension on all tanks at beginning of each season and periodically during season for air leaks. The following checks and adjustments must be made to prevent air leaks from occurring:

- Check for any foreign material embedded into seal. Clean out foreign material from seal surface.
- Check seal for cuts and abrasions. If seal is cut or severely worn, then replace seal.
- Ensure seal is positioned properly on steel rim around tank opening.
- Use a 0 - 100 lb. (45 kg) spring scale to check the tank lid opening force. With the lid closed place one end of the scale one inch from the end of the tank lid lever. Pull straight up on the scale and note the maximum force it takes to open the lid. The force needed to open the lid must be greater than 65 lbs (29 kg). Adjust the lid latch adjusting bolt as necessary. The lid latch should close with a snap. This will ensure that the lid is sufficiently tight and prevent any leaks.
- Re-check for leaks. If lids still leak turn down bolt one or two more turns. Re-check for leaks.

Important

It is imperative that no air leaks occur in the Air Cart tank as even the smallest air leak from the lid will lead to material bridging in the tank thereby causing misses in the field.

Note: When Air Cart is not in use, leave lid latches loose to help maintain resilience of the seals.

Note: This bolt should be loose enough to allow lid to float in the slot.

Adjust the lid latch adjusting bolt to obtain a force greater than 65 lbs (29 kg) to open the lid.

These bolts and lock nuts must be tightened to maintain a friction fit so the lid latch stays stationary when in open position.
Inspection Door Adjustment

Check Inspection Door on all metering bodies at beginning of each season and periodically during season for air leaks. The following checks and adjustments must be made to prevent air leaks from occurring:

- Check for any foreign material embedded into seal. Clean out foreign material from seal surface.
- Check seal for cuts and abrasions. If seal is cut or severely worn, then replace seal.
- Ensure seal is positioned properly on steel rim around tank opening.
- Use a 0-100 lb. (0-45 kg) spring scale to check the tank lid closing force. With the Door near the closed position, place one end of the scale on the Door handle. Pull down on the scale and note the maximum force it takes to latch handle lock. The force needed to latch handle lock must be 25 lbs to 30 lbs (12-14 kg).
- Adjust the door latch adjusting bolts as necessary. This will ensure that the lid is sufficiently tight and prevent any leaks.
- Re-check for leaks. If Doors still leak adjust latch bolts one or two more turns. Re-check for leaks.

Adjust the latch bolts to obtain a force of 25 lbs to 30 lbs (12-14 kg) to close the Door.
Air Delivery System - Continued

Clean Out Door Adjustment

Check Clean Out Door on all metering bodies at beginning of each season and periodically during season for air leaks. The following checks and adjustments must be made to prevent air leaks from occurring:

- Check for any foreign material embedded into seal. Clean out foreign material from seal surface.
- Check seal for cuts and abrasions. If seal is cut or severely worn, then replace seal.
- Ensure seal is positioned properly on steel rim around tank opening.
- Use a 0-100 lb. (0-45 kg) spring scale to check the tank lid closing force. With the Door near the closed position, place one end of the scale on the Door handle. Pull down on the scale and note the maximum force it takes to latch handle lock. The force needed to latch handle lock must be 25 lbs to 30 lbs (12-14 kg).
- Adjust the door latch adjusting bolts as necessary. This will ensure that the lid is sufficiently tight and prevent any leaks.
- Re-check for leaks. If Doors still leak adjust latch bolts one or two more turns. Re-check for leaks.
Air Delivery System - Continued

Air Leak Check

It is imperative that no air leaks occur in the Air Cart tank. Any air leaks could cause loss of tank air pressure affecting feed rates, which could become erratic or stop.

To prevent this from occurring, it is strongly recommended that a pressure test be conducted prior to seeding time. This can be performed very easily and simply by completing the following steps:

- Clean fan impeller and adjust tank lids.
- Disconnect the 2 1/2" (64 mm) diameter primary hoses from the rear of the cultivator at the primary hose coupler(s) by loosening the four 3/8" bolts.
- Install the blank off plate that is supplied with the Air Cart at each coupler and retighten the 3/8" bolts. If the blank off plates are not readily at hand a piece of cardboard can be used in its place.
- Once the blank off plates have been installed, start the fan and run at 4,500 rpm.

Check the following areas for air leaks:
1. Tank lid seals.
2. Metering body shaft seals.
3. Metering body to tank seals.
4. Collector to metering body seals.
5. Fan to plenum and plenum to collector.
6. Clean-out doors, for leaks and loss of seal memory.
7. Collector door seals.
8. Diverter valves and double shoot mounting plates.
9. Tanks union plate.
10. Tank site glasses.

Air leaks can be detected by spraying a soapy water solution onto the seal area. If bubbling of soap occurs, the seal has a leak. Another method is to use your hand to feel for any air movement around the seal. This method requires a calm day, as the wind can make it difficult to detect a small leak.

- If any of the above areas leak, remove the parts and replace the seal. Ensure upon reassembly that the parts are tightened sufficiently to prevent air leakage.
- Remove the blank off plates before using the Air Cart.

Once the pressure test is complete, check the following areas for air leaks:
11. Couplers between seeder and cultivator.

Important

It is imperative that no air leaks occur in the Air Cart tank, as even the smallest air leak will lead to material bridging in the tank, thereby causing misses in the field.

Note: When Air Cart is not in use leave lid latches and clean-out doors loose to help maintain resilience of the seals.
Air Delivery System - Continued

Fan
Debris can build up on the fan screen and blades causing reduced output of the fan. The lack of air flow even at higher fan speeds will cause material plugging of the air system.

The build up of material during operation can cause the following:

1. Fan rpm will increase without increasing oil flow to orbit motor.
2. Air Cart distribution system plugging from a lack of air flow (Increasing fan rpm has little or no effect).

Fan Screen
- Ensure fan screen is clear of debris. Check periodically through the day.

Fan Impeller
The fan blades may become plugged under high humidity/dusty conditions/high insect counts.

Under severe conditions the fan blades should be inspected daily and cleaned as required.
Under normal conditions the fan should be inspected and cleaned at least once a season.
- Care should be taken in cleaning all fan blades thoroughly to restore the fans peak performance.
- Ensure that the balance clips located on the fan blades are not removed, as this will put the fan out of balance.

Storage
To prevent water entering the air system, cover the fan intake with a plastic bag, whenever the seeder is not in use.

Note: Be sure to remove fan cover prior to starting fan. Serious damage could result to the fan.

Material on the Fan Blades

Note: Material build up on the fan blades could cause the fan to be out of balance. The added vibration of the out of balance impeller will reduce the life of the fan components.
Air Delivery System - Continued

Impeller Clearance

The impeller should be centred inside the housing to avoid contact between the impeller and housing.

The distance “X” between the impeller and housing inlet, when centred, will be approximately 3/8” (9 mm) to 1/2” (12 mm).

When assembling fan ensure flange surfaces of housing are clean.

Apply a 1/4” (6 mm) silicone bead to one flange surface of housing including outlet seam.

Mate surfaces and secure in place with 1/4” x 1” hex bolts (G) and 1/4” serrated lock nuts (H).

**Note:** Torque 1/4” bolts to 49 in. lb.

Set clearance “X” between the impeller and housing inlet from 3/8” (9mm) to 1/2” (12 mm).

Hoses

Inspect air delivery hoses for wear and replace as required. Check areas where hoses maybe exposed to moving parts such as hitch hinge area. At the Air Cart hitch area, place a piece of 2 1/2” (64 mm) hose 12” (305 mm) long over top of the two hitch extension pins to protect air hoses from contacting pins.

Also, inspect hoses for blockage as rodents/birds may nest in hoses that have not been properly capped during storage.

To optimize the 9s Series Air Cart air system on single shoot units the difference in length between the longest primary hose and the shortest primary hose **should not exceed six feet**.

In conjunction with this, it is important to eliminate the use of the centre port of the plenum. Check plenum hose routing, if centre port of the plenum is used change hose location.

DO NOT USE CENTRE PORT ON ALL PLENUMS
Hydraulic Orbit Motor

The motor requires no maintenance itself. It does, however, require clean oil so the tractor hydraulic filters must be replace regularly.

Repair/Replacement

- Remove orbit motor from the fan.

**Note:** The shaft should never be hammered on or forced in as this will result in motor damage upon startup.

- Remove the snap ring and front cover.
- Push out the old shaft seal and press in the new one.

**Note:** The bearings should never be removed from the shaft as they are pretensioned to the shaft with the motor spinning.

- Replace the O ring.
- Both the O ring and shaft seal should be greased with a "very clean" grease.
- Care must be taken when the front cover is installed so the shaft seal is not damaged.
- Reinstall the snap ring.
- Fill the motor case with "clean" oil before running.

**Note:** Any time a motor is replaced the case must be filled with oil before it is started, if not, a bearing failure could occur.
Maintenance

Hydraulics
Refer to Section 1 regarding hydraulic safety. In addition:

- Inspect hydraulic system for leaks, damaged hoses and loose fittings.
- Damaged Hoses and hydraulic tubing can only be repaired by replacement. DO NOT ATTEMPT REPAIRS WITH TAPE OR CEMENTS. High pressure will burst such repairs and cause system failure and possible injury.
- Leaking cylinders - install a new seal kit.
- Fittings - use liquid Teflon on all NPT hydraulic joints. Do not use liquid Teflon or Teflon tape on JIC or ORB ends.
- Hydraulic Hose Connections - when connecting the hoses to the cylinders, tubing, etc. always use one wrench to keep the hose from twisting and another wrench to tighten the union. Excessive twisting will shorten hose life.
- Keep fittings and couplers clean.
- Check the Tractor Manual for proper filter replacement schedule.

Refer to the Trouble Shooting Section.

Caution
Dirt in the hydraulic system could damage O-rings, causing leakage, pressure loss and total system failure.

Note: Extreme care must be taken to maintain a clean hydraulic system. Use only new hydraulic fluid when filling reservoir.

Warning
HIGH-PRESSURE FLUID HAZARD
To prevent serious injury or death:
- Relieve pressure on hydraulic system before servicing or disconnecting hoses.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
- Keep all components in good repair.

Contact your nearest Dealer for genuine repair parts. Dealers carry ample stocks and are backed by the manufacture and regional associations.
**Wheel Bearings**

- Shut tractor off and remove key.
- Block wheel on tractor.
- Raise the Air Tank wheels enough to clear the surface.
- Securely block Air Tank frame.
- Remove wheel from hub.
- Remove the dust cap, cotter pin, and the slotted nut and washer.
- Be careful when pulling the hub off as not to drop the outer bearing.
- Clean spindle and bearing components with solvent.
- Inspect for wear on bearings, spindle and cups, replace parts as required.
- Do not reuse old seals. Use only new seals when assembling.
- Pack inner hub with bearing grease.
- Be sure bearing and cup are dry and clean.
- Work grease into the bearing rollers, until each part of the bearing is completely full of grease.
- Install inner bearing and cup first, then press new seals in place.
- Place hub on spindle.
- Install outer bearing, washer and slotted nut.
- Tighten nut while turning the wheel until a slight drag is felt.
- Back nut off one slot and install a cotter pin. Bend cotter pin up around nut.
- Pack grease inside the dust cap and tap into position.
**Front Castor Brake Adjustment**

The Dual Axle Front Castor is equipped with a brake which prevents the tires from shimmy under normal operation. It is important the front castor brake be properly adjusted. If the brake is not adjusted correctly the tires will shimmy excessively and may cause the axle assembly to fail.

Adjust the castor brake as follows:

- Check and ensure there is no paint/grease where the brake pad rides, as the paint/grease will reduce the effectiveness of the brake.
- Inspect brake pad (N25465) ensuring it is not damaged or worn, replace if required.

**Note:** Maximum allowable wear is 1/8” (6 mm). (New pad is 3/8” (9 mm) thick)

- Check and ensure the hex socket brake pad mounting screws (N25463) are securely tightened.
- Check preload on castor fork top pivot bearings (with brake pad assembled loosely). Tighten as required using wheel bearing tightening procedure (springs will compress to a length of approximately 2 3/8” (60 mm)).
- Adjust the jam nuts until the spring length is 2-1/8” (54 mm). See Below.
- Increase the spring pressure on the brake to stop the castor wheels from shimmying in the field or on the road.

**Note:** Do not overtighten the springs. Excessive spring pressure will prevent wheels from castoring.

---

**Important**

Dual wheel brake will provide sufficient pressure to stabilize castor at all travel speeds up to 18 m.p.h. (28 kph). Avoid setting more pressure on brake pad than required to maintain stability. Tow only with all tanks empty. If a unit must be towed loaded over a short distance, the transport speed must be reduced to 10 m.p.h. (16kph) or slower.
The metering wheels come in 4 different sizes. Each wheel matches to a specific distribution head mounted on the Seeding Tool.

If the metering wheel and distribution head are not matched correctly, the distribution accuracy will be adversely affected.

Spacer plates are used to take up the extra space in each metering cup. These spacer plates vary in size according to the size of the metering wheel.

**Metering Wheel Replacement**

- Remove the monitor donut from the Right Hand Side of the metering body.
- Disconnect meter shaft coupler from the meter shaft and transmission drive shaft.
- Loosen the locking collars on the meter shaft bearings.
- Remove the bolts holding the meter shaft bearings and remove both bearings.
- Remove the meter shaft from the Right Hand Side.
- Remove the slider plates from all cups with metering wheels.
- Remove the metering wheels. Inspect wheels and replace if required.
- Clean cups in metering body thoroughly prior to re-assembly.
- Smear a very-very thin layer of silicone on the pin side of the spacer plates for the 7, 8 and 9 metering cups. The side with the silicone must be installed against the metering body.
- Place all metering wheels and spacers back into the metering body in the same order they came out of.

**The location of each primary run and wheel size must be the same for both metering bodies.**

**Assembly Hint:** Mark the metering wheels on the outside of the rib that is next to the key.

---

**Table 1**

<table>
<thead>
<tr>
<th>Dividers Head</th>
<th>Metering Wheel</th>
<th>Spacer</th>
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</thead>
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</tr>
<tr>
<td>7</td>
<td>1 3/4&quot; (45 mm)</td>
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</tr>
<tr>
<td>8</td>
<td>2&quot; (51 mm)</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>2 1/4&quot; (57 mm)</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>2 1/2&quot; (64 mm)</td>
<td>-</td>
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</table>
Maintenance

Metering - Continued

Standard Metering Body

Note: The metering wheels can be installed with the metering body mounted to the Air Cart.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
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<td>Metering Body</td>
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<tr>
<td>2</td>
<td>N19687</td>
<td>Metering Shaft - 8 Outlet</td>
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<tr>
<td>3</td>
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<td>Bearing Assembly - NTN - 2 Bolt Flange</td>
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</tr>
<tr>
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<td>Asreq</td>
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<td>Asreq</td>
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<td>Cover - Blank Off</td>
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<td>Roll Pin - used in Spacer Plates (Not Shown)</td>
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<td>23</td>
<td>D-5488</td>
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<td>W-522</td>
<td>Lockwasher - 5/16</td>
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<td>W-523</td>
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<tr>
<td>28</td>
<td>N28831</td>
<td>Cover Plate - Shown on Hopper Assemblies</td>
<td>8 ft</td>
</tr>
</tbody>
</table>
Coated Metering Body

Note: The metering wheels can be installed with the metering body mounted to the Air Cart.

---

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<td>Spacer Plate - #8 Wheel (Single - Right)</td>
<td>Asreq</td>
</tr>
<tr>
<td>18</td>
<td>N27097</td>
<td>Spacer Plate - #7 Wheel (Double - Left)</td>
<td>Asreq</td>
</tr>
<tr>
<td>19</td>
<td>N28927</td>
<td>Plastic Spacer - Wheel (Left)</td>
<td>8</td>
</tr>
<tr>
<td>20</td>
<td>N28929</td>
<td>Plastic Spacer - Wheel (Right)</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>N28492</td>
<td>Roll Pin - Used in Spacer Plates (Not Shown)</td>
<td>Asreq</td>
</tr>
<tr>
<td>22</td>
<td>W-477</td>
<td>Hex Bolt - 3/8 x 1 1/2 Lg</td>
<td>4</td>
</tr>
<tr>
<td>23</td>
<td>D-5488</td>
<td>Flatwasher - 5/16</td>
<td>8</td>
</tr>
<tr>
<td>24</td>
<td>W-522</td>
<td>Lockwasher - 5/16</td>
<td>8</td>
</tr>
<tr>
<td>25</td>
<td>W-523</td>
<td>Lockwasher - 3/8</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>N15114</td>
<td>Hex Nut - 5/16 Stainless Steel</td>
<td>8</td>
</tr>
<tr>
<td>27</td>
<td>N28924</td>
<td>Plastic Spacer - Wheel (Without Pin)</td>
<td>7</td>
</tr>
<tr>
<td>28</td>
<td>N15716</td>
<td>Seal Strip - 1/4 x 1 x 152 Lg (Bulk/Fl)</td>
<td>8 ft</td>
</tr>
<tr>
<td>29</td>
<td>N29457</td>
<td>Kit Coated Metering Body Assy (Includes 1, 2, 3, 6, 21, 22, 28 &amp; 29)</td>
<td>1</td>
</tr>
</tbody>
</table>
Metering - Continued

Assembly Hint: Mark metering wheel size on the metering body. This will help in connecting the main distribution hose and secondary divider heads.

- Align the shaft keyway with the marks on the metering wheels. Slide the metering shaft through the metering wheels.

Note: Care must be taken that the key ways are aligned, otherwise damage to the key in the wheels may occur.

- The metering shaft must be pushed through until the shoulder on the shaft hits the side of the metering body.

- Install the washer on the shaft and into the housing on the Right Hand Side of the metering body.

Important: The seal must be installed as shown, with open side of the seal to the outside. Care must be taken when installing the seal. It is recommended that a brass drift be used to minimize any damage to the seal.

Note: The Left Hand Side seal is installed at the factory.

- Reinstall both meter shaft bearings and spacers with the grease fitting towards the rear of the machine.

---

IMPORTANT

PREVENT CORROSION

Clean the Metering Body (Including Air Passages) and the Collector Body. A light coating of Silicone Lubricant or WD-40 or Penetrating Oil should be applied before storage.

N21604
**Metering - Continued**

- Tighten locking collars by turning the collars in the direction of the shaft rotation. Lock the collar by tapping the collar with a punch in the direction of rotation of the shaft.
- Reinstall monitor donut on shaft. Ensure donut is centred to the pick-up. The gap between the pick-up and the donut must not exceed 1/8" (3 mm).
- Install the slider plates to all cups with metering wheels.

**Note:** Install blank-off covers on cups without wheels. Insert the top of the blank-off plate under the tank lip.

- Set sliders to top of slot. Tighten sliders with 5/16" stainless steel nut, lockwasher and flatwasher. (See “Slider Setting” under Operation Section for correct procedure)
- Attach meter shaft coupler over the meter shaft and transmission drive shaft.
- Install the 1/4" x 2 1/4" Special bolt with two flatwashers and locknut. Tighten locknuts to bottom of threads.
Maintenance

Auger Arm Lock

Adjust 5/8 nuts such that the auger arm is unlocked when the handle is horizontal and locked when the handle is pulled down 90 degrees.

Auger Arm Lock

Auger Pre-Load Adjustment

The pre-load must be adjusted to firmly seat the auger on the front pivot pin when locked into storage position.

To adjust the pre-load on the auger the Middle Pivot Saddle washers/bushings must be moved as follows:

- To decrease the pre-load move washers/bushings from bottom to the top of arm.
- To increase the pre-load move washers/bushings from top to the bottom of arm.

Middle Pivot Saddle
2-3 Meter Cart

Castor Fork Adjustment

Adjust castor wheel action to prevent excessive movement.

- Remove dust cap from castor axle.
- Tighten bolt to adjust pressure on castor drag plate to restrict excess castor movement.
- Lossen bolt to adjust pressure on castor drag plate to increase castor movement.
- Check tire pressures. Tires must be inflated evenly to ensure correct tracking.
Section 7: Storage

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Preparing for Storage .......................................................................................................7-2
  General ...................................................................................................................7-2
  Metering Body Storage ..............................................................................................7-3
Removing From Storage ...................................................................................................7-4
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  Monitor ....................................................................................................................7-4
  Clutch ......................................................................................................................7-4
  Auger ......................................................................................................................7-4
Preparation for Storage

General

- To insure longer life and satisfactory operation, store the 9s Series Air Cart in a shed.
- If building storage is impossible, store away from areas of main activity on firm, dry ground.
- Clean machine thoroughly.
- Inspect all parts for wear or damage.
- Avoid delays - if parts are required, order at the end of the season.
- Lubricate grease fittings. (Refer to Lubricating Section).
- Tighten all bolts to proper specifications (Refer to Bolt Torque Chart).
- To prevent corrosion and damage by rodents, clean the hopper boxes and metering systems thoroughly and wash with mild soapy water solution. Rinse with water and dry thoroughly. Refer to Metering Body Storage.
- A light coating of silicone lubricant or WD-40 should be applied to all metal metering system components before storage.
- Avoid lubricant contact with grain and fertilizer tubes.
- Loosen fan tension adjusting bolt. (Engine Drive Only)
- Relieve tension on tank lids.
- Loosen clean-out doors.
- Remove all chains and store in clean oil.
- Relieve pressure from hydraulic system.
- Raise frame, block up and relieve weight from the tires.
- Cover tires with canvass to protect them from the elements when stored outside.
- Paint any surfaces that have become worn.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N53713</td>
<td>Red MORRIS Touch-Up Pen</td>
</tr>
<tr>
<td>N53714</td>
<td>Silver MORRIS Touch Up Pen</td>
</tr>
<tr>
<td>N53715</td>
<td>Red MORRIS Aerosol Can</td>
</tr>
<tr>
<td>N53716</td>
<td>Silver MORRIS Aerosol Can</td>
</tr>
<tr>
<td>N31087</td>
<td>Sky White MORRIS Aerosol Can</td>
</tr>
</tbody>
</table>
Preventing for Storage - Continued

Metering Body Storage

It is extremely important that the metering system is thoroughly cleaned before storing for any length of time. The following procedure should be followed for both tanks:

- Empty tanks. (Refer to Unloading Tanks)
- Remove all sliders and blank off plates.
- Remove cover plate.
- Remove the collector bottom.
- Run fan.
- Wash the interior of both tanks and metering system with soapy water. Wash the collector.
- Rinse with cold water and let the unit air dry.
- Coat metal parts with silicone lubricant or WD-40.

Note: Diesel fuel will harm seals.
- Reinstall all sliders and blank off plates in the same order they were removed.
- Reinstall cover plate.
- Replace the clean-out door and the bottom of the collector.
- Start the fan and operate for 5 minutes to dry out any remaining moisture in the system.
- Leave clean-out doors loose to help prevent condensation building up inside the tank.
- Leave lid latches loose to help maintain resilience of the seals.

Important

At no time should corrosive fertilizer or similar materials be allowed to remain in the tank or metering body cavity.

Important

Prevent corrosion

Clean the Metering Body (Including Air Passages) and the Collector Body. A light coating of Silicone Lubricant or WD-40 or Penetrating Oil should be applied before storage.
Removing From Storage

General
- Check tire pressure (Refer to Tire Pressure List)
- Clean machine thoroughly.
- Tighten lid latches.
- Tighten fan tension adjusting bolt. (Engine Drive Only)
- Lubricate and install chains.
- Spray internal parts or the metering body with WD-40 to loosen any corrosion buildup.
- Check for leaks. (Refer to Maintenance Section)
- Lubricate grease fittings. (Refer to Lubricating Section).
- Tighten all bolts to proper specifications (Refer to Bolt Torque Chart).

Monitor
Familiarize yourself with all monitor functions. Ensure all monitor “settings” are correctly set for the Air Cart/Seeding Tool combination. Recognize and correct alarm conditions as indicated on the machine. See Monitor Section for more details.

Check all wire harness connections for corrosion and use a dielectric spray to clean. Inspect all sensors for proper gap. See Monitor Section for more details.

Clutch
Check friction plates for corrosion and buff with a wire wheel if necessary. Check the resistance of the clutch. See Maintenance Section for more details.

Auger
Inspect all augers used in handling the products for seeding. Run augers to clean out any debris inside auger so it does not get transferred to the tank.
## Section 8: Troubleshooting

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<td>Material not being accurately metered out of the metering body.</td>
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<td>Monitor</td>
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<td>Monitor lights up but does not seem to work.</td>
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<tr>
<td>No fan display</td>
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<td>No ground speed display</td>
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<td>No meter speed display</td>
<td>8-6</td>
</tr>
<tr>
<td>No display, no back light</td>
<td>8-6</td>
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<tr>
<td>No display, no back light</td>
<td>8-6</td>
</tr>
<tr>
<td>Bin indicates always empty</td>
<td>8-6</td>
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<tr>
<td>Bin indicates always full</td>
<td>8-7</td>
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<td>Blown fuse</td>
<td>8-7</td>
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<td>VRT System</td>
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<td>Motors turn continuously in Operation Mode</td>
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<td>Motors turn continuously in Calibration Mode</td>
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## Troubleshooting

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<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery hoses plugged</td>
<td>Insufficient air flow</td>
<td>Clean fan impeller blades.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clean fan intake screen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase fan rpm.</td>
</tr>
<tr>
<td></td>
<td>Hose sag.</td>
<td>Shorten hoses or add additional supports.</td>
</tr>
<tr>
<td></td>
<td>Seed boots plugged with dirt.</td>
<td>Clean seed boots.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See “Seed Boot Plugging” below.</td>
</tr>
<tr>
<td></td>
<td>Hose obstruction.</td>
<td>Remove obstruction from hose.</td>
</tr>
<tr>
<td></td>
<td>Air delivery hose partly off</td>
<td>Reinstall hose properly on manifold.</td>
</tr>
<tr>
<td>manifold.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kinked hoses.</td>
<td>Straighten hoses and properly secure them to framework.</td>
</tr>
<tr>
<td></td>
<td>Obstruction in divider head.</td>
<td>Remove access door and clear obstruction from appropriate outlets - be sure to use appropriate screens when filling.</td>
</tr>
<tr>
<td></td>
<td>Exceeding machine’s delivery</td>
<td>Reduce ground speed and speed up fan.</td>
</tr>
<tr>
<td>capabilities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poorly mounted hoses.</td>
<td>Reroute hoses.</td>
</tr>
<tr>
<td><strong>Hydraulic fan will not turn</strong></td>
<td>Selector valve in wrong position.</td>
<td>Switch the selector to fan position.</td>
</tr>
<tr>
<td></td>
<td>Hydrualic hoses not connected properly to tractor.</td>
<td>Reverse hydraulic hoses.</td>
</tr>
<tr>
<td></td>
<td>Insufficient oil folw.</td>
<td>Perform flow test.</td>
</tr>
<tr>
<td><strong>Fan turning too slow</strong></td>
<td>Flow to hydraulic motor.</td>
<td>Increase flow control setting.</td>
</tr>
<tr>
<td></td>
<td>Low hydraulic pressure.</td>
<td>Check hydraulic pressure 2100 psi. (14469 kPa) min.</td>
</tr>
<tr>
<td><strong>Front Castor moving too freely. (7240 &amp; 7300)</strong></td>
<td>Brake Not adjusted properly.</td>
<td>Adjust brake as necessary. See “Brake Adjustment” in Maintenance Section.</td>
</tr>
<tr>
<td></td>
<td>Worn brake pad.</td>
<td>Replace brake pad. See “Brake Adjustment” in Maintenance Section.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Correction</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Material flowing thru system when unit is stationary and the fan running.</td>
<td>Damaged metering wheel.</td>
<td>Replace metering wheel.</td>
</tr>
<tr>
<td></td>
<td>Sliders not adjusted correctly.</td>
<td>Adjust as required. See “Slider Settings”.</td>
</tr>
<tr>
<td></td>
<td>Small seed plate not installed.</td>
<td>Adjust as required. See “Slider Settings”.</td>
</tr>
<tr>
<td>Material not being divided in distribution head.</td>
<td>Head partially blocked.</td>
<td>Remove blockage and reinstall hose.</td>
</tr>
<tr>
<td></td>
<td>Kinked hose running to shank</td>
<td>Straighten or replace hose.</td>
</tr>
<tr>
<td></td>
<td>Damaged distribution section on head.</td>
<td>Replace head with new one.</td>
</tr>
<tr>
<td></td>
<td>Bent or damaged diffuser pipe.</td>
<td>Straighten or replace diffuser pipe.</td>
</tr>
<tr>
<td></td>
<td>Secondary hose length.</td>
<td>See “Secondary Hose” in Operation Section.</td>
</tr>
<tr>
<td>Clutch slipping.</td>
<td>Low power supply.</td>
<td>Ensure good connections at the power supply. Battery voltage must be 12V.</td>
</tr>
<tr>
<td></td>
<td>Metering drive torque load too high.</td>
<td>See Maintenance Section.</td>
</tr>
<tr>
<td></td>
<td>Corroded, rusty, dirty clutch.</td>
<td>Clean and inspect clutch.</td>
</tr>
<tr>
<td></td>
<td>Faulty clutch.</td>
<td>Replace clutch.</td>
</tr>
<tr>
<td>Material not being metered out.</td>
<td>Metering clutch not engaged.</td>
<td>Engage switch in tractor cab.</td>
</tr>
<tr>
<td></td>
<td>Metering Clutch slipping.</td>
<td>See “Clutch Slipping” below.</td>
</tr>
<tr>
<td></td>
<td>Main drive chain not installed.</td>
<td>Install drive chain properly on Drive Sprocket.</td>
</tr>
<tr>
<td></td>
<td>Drive chain or chains broken.</td>
<td>Install new chain. Ensure connecting link is installed correctly. Curved part of spring clip should face the direction of chain travel.</td>
</tr>
<tr>
<td></td>
<td>Massive air leak in tank, resulting in material being blown up out of the metering cup.</td>
<td>Repair the air leak. See “Air Leaks” in Maintenance Section. See “Tank Lid Adjustment” in Maintenance Section.</td>
</tr>
<tr>
<td></td>
<td>Key sheared on metering wheel.</td>
<td>Change metering wheel and check for cause of metering wheel shearing.</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material not being metered out.</td>
<td>Material caked up in tank.</td>
<td>Remove material and completely clean out the tank.</td>
</tr>
<tr>
<td></td>
<td>Excessively wet material in tank.</td>
<td>Remove wet material and use reasonably dry material.</td>
</tr>
<tr>
<td></td>
<td>Coupler bolt sheared</td>
<td>Replace with Grade 8 bolt.</td>
</tr>
<tr>
<td>Plugged seed boots</td>
<td>Backing up with openers near or in the ground.</td>
<td>Lift machine all the way up before backing up.</td>
</tr>
<tr>
<td></td>
<td>Turning very sharp with openers near or in the ground.</td>
<td>Lift machine all the way up when making sharp turns.</td>
</tr>
<tr>
<td></td>
<td>Lowering machine without any forward motion.</td>
<td>Always have forward motion when lowering machine.</td>
</tr>
<tr>
<td></td>
<td>Worn openers or sweeps.</td>
<td>Replace openers.</td>
</tr>
<tr>
<td></td>
<td>Severely bent or damaged boots.</td>
<td>Straighten or replace as required.</td>
</tr>
<tr>
<td></td>
<td>Excessively wet conditions.</td>
<td>Change openers, operate when drier.</td>
</tr>
<tr>
<td></td>
<td>Opener Adjustment.</td>
<td>See “Opener Adjustment” in Operation Section.</td>
</tr>
<tr>
<td>Material not being accurately metered out of the metering body.</td>
<td>Air delivery hoses loose, cracked or pulled off.</td>
<td>Tighten the hoses, replace cracked hoses or install hoses pulled off their respective locations.</td>
</tr>
<tr>
<td></td>
<td>Metering Clutch slipping.</td>
<td>See “Clutch Slipping” below.</td>
</tr>
<tr>
<td></td>
<td>Inlet screen to fan blocked off.</td>
<td>Clean off material that is blocking the fan screen.</td>
</tr>
<tr>
<td></td>
<td>Metering wheel slider plate adjusted incorrectly.</td>
<td>Adjust sliders so they are all the same for the product being metered. See Operation Section for correct clearances.</td>
</tr>
<tr>
<td></td>
<td>Material caked up above one or more of the metering cups.</td>
<td>Clean out caked up material.</td>
</tr>
<tr>
<td></td>
<td>Excessively damp material in tank.</td>
<td>Use reasonably dry, fresh material only.</td>
</tr>
<tr>
<td></td>
<td>Foreign obstruction in tank above metering wheels.</td>
<td>Remove obstruction, and always fill tanks through the screen.</td>
</tr>
</tbody>
</table>
### Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material not being accurately metered out of the metering body.</td>
<td>Caked up metering wheels on some or all of the metering cups.</td>
<td>Clean out the metering cups and wheels.</td>
</tr>
<tr>
<td>Damaged metering wheels.</td>
<td>Replace broken metering wheels.</td>
<td></td>
</tr>
<tr>
<td>Metering wheels mismatched to secondary outlet.</td>
<td>Install correct wheels to head.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 3/4” wide wheel for 7 outlet head.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2” wide wheel for 8 outlet head.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 1/4” wide wheel for 9 outlet head.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 1/2” wide wheel for 10 outlet head.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Be sure appropriate spacers are also used.</td>
<td></td>
</tr>
<tr>
<td>Incorrect spacing sprocket.</td>
<td>Install correct sprocket on back of transmission.</td>
<td>See Maintenance Section.</td>
</tr>
<tr>
<td>Crank rotated wrong way when taking sample.</td>
<td>Crank must be rotated counter clockwise.</td>
<td></td>
</tr>
<tr>
<td>Double Shooting hoses not routed correctly.</td>
<td>See Set-Up Section.</td>
<td></td>
</tr>
<tr>
<td>Air Leak in System.</td>
<td>Adjust lids and doors as necessary. Replace damaged seals.</td>
<td>See Maintenance Section.</td>
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</tbody>
</table>

### 3 Meter Cart

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
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<tr>
<td>Castor Axles have excessive movement.</td>
<td>Drag plate adjustment.</td>
<td>Adjust pressure on drag plate.</td>
</tr>
<tr>
<td>Not tracking straight.</td>
<td>Tire Pressure uneven.</td>
<td>Inflate tires to correct pressure.</td>
</tr>
</tbody>
</table>

3 Meter Cart

- Castor Axles have excessive movement.
- Drag plate adjustment.
- Adjust pressure on drag plate.
- Not tracking straight.
- Tire Pressure uneven.
- Inflate tires to correct pressure.
## Troubleshooting

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<tr>
<th>Problem</th>
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</thead>
<tbody>
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<td><strong>Monitor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor lights up but does not seem to work.</td>
<td>Faulty monitor</td>
<td>Replace monitor.</td>
</tr>
<tr>
<td></td>
<td>Completely disconnected harness.</td>
<td>Connect harness.</td>
</tr>
<tr>
<td>No fan display.</td>
<td>Incorrect gap between sensor and target.</td>
<td>Gap should be 0.030” (0.76 mm).</td>
</tr>
<tr>
<td></td>
<td>Faulty sensor.</td>
<td>Replace sensor.</td>
</tr>
<tr>
<td></td>
<td>Broken or shorted wire.</td>
<td>Replace or repair harness.</td>
</tr>
<tr>
<td>No ground speed display</td>
<td>Sensor to magnet gap too large.</td>
<td>Gap should be 0.030” (0.76 mm).</td>
</tr>
<tr>
<td></td>
<td>Faulty sensor.</td>
<td>Replace sensor.</td>
</tr>
<tr>
<td></td>
<td>Broken or shorted wire.</td>
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</tr>
<tr>
<td>No meter speed display</td>
<td>Sensor to magnet gap too large.</td>
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</tr>
<tr>
<td></td>
<td>Faulty sensor.</td>
<td>Replace sensor.</td>
</tr>
<tr>
<td></td>
<td>Broken or shorted wire.</td>
<td>Replace or repair harness.</td>
</tr>
<tr>
<td></td>
<td>Switched off</td>
<td>Switch unit on.</td>
</tr>
<tr>
<td>No display, no back light.</td>
<td>Poor power connections at the battery.</td>
<td>Ensure good connections.</td>
</tr>
<tr>
<td></td>
<td>Battery below 8 volts.</td>
<td></td>
</tr>
<tr>
<td>No display, no back light.</td>
<td>Temperature below -10°C or above +40°C.</td>
<td>Check battery voltage.</td>
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<tr>
<td></td>
<td></td>
<td>Operate between -10°C and +40°C.</td>
</tr>
<tr>
<td></td>
<td>Broken wire.</td>
<td></td>
</tr>
<tr>
<td>Bin indicates always empty.</td>
<td>Faulty sensor.</td>
<td>Repair wire.</td>
</tr>
<tr>
<td></td>
<td>Wires not hooked to sensor.</td>
<td>Replace sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hook up correctly.</td>
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</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
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<tbody>
<tr>
<td>Bin indicates always full.</td>
<td>Blocked light beam on photoelectric sensor.</td>
<td>Remove object blocking the beam.</td>
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<tr>
<td></td>
<td>Wire shorted to ground</td>
<td>Repair or replace wire.</td>
</tr>
<tr>
<td></td>
<td>Faulty sensor</td>
<td>Replace sensor.</td>
</tr>
<tr>
<td>Blown fuse.</td>
<td>Power hooked up backwards.</td>
<td>Hook up correctly. RED to positive terminal.</td>
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</table>

### VRT System

<table>
<thead>
<tr>
<th>Motors will not turn in Manual Mode (Controller OFF)</th>
<th>Not equipped with a Third Tank.</th>
<th>Disconnect wire harness from solenoid ‘1’ and turn adjusting knob fully out.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Selector valve (Fan/Auger).</td>
<td>Switch selector valve to fan position.</td>
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<tr>
<td></td>
<td>Hydraulic oil flow.</td>
<td>Ensure hydraulic lever is properly engaged.</td>
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<tr>
<td>Motors will not turn in Operation Mode (Controller ON)</td>
<td>Not equipped with a Third Tank.</td>
<td>Disconnect wire harness from solenoid ‘1’ and turn adjusting knob fully out.</td>
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<tr>
<td></td>
<td>Selector valve.</td>
<td>Switch selector valve to fan position.</td>
</tr>
<tr>
<td></td>
<td>Hydraulic oil flow.</td>
<td>Ensure hydraulic lever is properly engaged.</td>
</tr>
<tr>
<td></td>
<td>VRT Sensor Gap.</td>
<td>Gap should be 0.030” (0.76 mm).</td>
</tr>
<tr>
<td>Motors turn continuously in Operation Mode</td>
<td>Shaft Motor Solenoids.</td>
<td>Zero Shaft Motors.</td>
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<tr>
<td></td>
<td>VRT Sensor Gap.</td>
<td>Gap should be 0.030” (0.76 mm).</td>
</tr>
<tr>
<td>Motors turn continuously in Calibration Mode</td>
<td>VRT Sensor Gap.</td>
<td>Gap should be 0.030” (0.76 mm).</td>
</tr>
</tbody>
</table>
Section 9: Options Assembly

Section Contents

Hitch Stand Kit (Tow Behind)............................................................................................9-2
Second Clutch ..................................................................................................................9-3
Acre Tally ..........................................................................................................................9-3
Rear Tow Hitch (Tow Behind)............................................................................................9-4
  Standard Hitch ...........................................................................................................9-4
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  Extended Hitch ...........................................................................................................9-5
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Hitch Extention (Tow Between)......................................................................................9-7
Auger Spout Extension Kit..............................................................................................9-8
**Hitch Stand Kit (Tow Behind)**

- Attach the mounting plates to the hitch pole using three - 3/8” x 4” bolts, lockwashers and nuts.

**Note:** Locate hitch stands in a position which will clear any attachments on the Seeding Tool. (i.e. Mounted Harrows, Packers, etc.)

- Mount the outer tube between mounting plates with a 1/2” x 4 1/2” bolt, lockwasher and nut.
- Slide inner tube into outer tube retaining with the tightener.
- Retain stand with a 5/8” pin and hair pin.
**Second Clutch**

- Remove the metering shaft coupler from the rear metering shaft.
- Mount coupler to the clutch using 1/4” x 3/4” bolts.
- Install the clutch and coupler to the transmission output shaft with a 1/4” x 1 1/2” spiral pin on either side of the clutch.

**Note:** Install extra flatwashers as required to eliminate excess clearance between clutch components.

- Install the short metering shaft coupler.
- Install the 3/8” x 4” bolt into the hole in the rear transmission plate.
- Run the cable down the left hand Air Seeder hitch pole.
- Run the extension cable along the left hand hitch pole of the Seeding Tool.
- Connect cable to the auxiliary clutch switch quick coupler.

---

**Acre Tally**

- Install the tamper proof acre tally to the crank handle shaft as shown.
Standard Hitch

- Attach the upper brackets to the Air Cart frame with a 5/8" x 4" x 5 9/16" U-bolt, lockwashers and nuts. (Approximately 26" above lower frame member)
- Attach the lower brackets to the Air Cart frame with a 5/8" x 6" x 5 1/2" U-bolt, lockwashers and nuts.
- Attach the hitch tubes to the brackets using 3/4" x 2 1/4" bolts, lockwashers and nuts.
- Install the hitch clevis between the tubes using 3/4" x 2 1/4" bolts, lockwashers and nuts.
- Level hitch clevis and hitch tubes.
- Tighten all bolts securely.

Note: Leave all bolts loose for initial assembly.
Rear Tow Hitch (Tow Behind)

Extended Hitch

- Attach the upper brackets to the Air Cart frame with a 5/8” x 4” x 5 9/16” U-bolt, lockwashers and nuts. (Approximately 26” above lower frame member)
- Attach the lower brackets to the Air Cart frame with a 5/8” x 6” x 5 1/2” U-bolt, lockwashers and nuts.
- Attach the hitch tubes to the brackets using 3/4” x 2 1/4” bolts, lockwashers and nuts.
- Install the hitch tongue between the lower hitch tubes using 3/4” x 2 1/4” bolts, lockwashers and nuts.
- Install the hammer strap to hitch tongue between the upper hitch tubes using a 3/4” x 6 1/2” bolt, bushing - 1 1/4” OD x 3 1/16” lg, lockwasher and nut.
- Secure hammer strap above hitch tongue with a 3/4” x 5 bolt, lockwasher and nut.

Note: Hammer strap can be flipped back to accommodate different hitches.

- Tighten all bolts securely.

Note: Leave all bolts loose for initial assembly.
### Rear Tow Hitch (Tow Behind)

<table>
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<tr>
<th>Item</th>
<th>Part No.</th>
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<th>Qty</th>
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<tbody>
<tr>
<td>1</td>
<td>H18267</td>
<td>Hyd Hose - 1/4 x 96 Lg w/9/16-18 FJIC</td>
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<tr>
<td>2</td>
<td>N15041</td>
<td>Hyd Hose - 1/2 x 293 Lg w/7/8-14 FJIC x 1/2 MNPT</td>
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<td>3</td>
<td>C-4403</td>
<td>Tee - (2) 9/16-18 MJIC x (1) 9/16-18 FJIC</td>
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<td>C-4399</td>
<td>Connector - 7/8-14 MJIC x 1/2 MNPT</td>
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<td>C-719</td>
<td>Reducer - 1/2 MNPT x 3/8 FNPT</td>
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<td>7</td>
<td>S-1379</td>
<td>Pioneer Coupler Assembly</td>
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<td>N16608</td>
<td>Pioneer Clamp</td>
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<td>9</td>
<td>C-817</td>
<td>Male Pioneer Tip - 1/2 FNPT</td>
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<tr>
<td>10</td>
<td>C-818</td>
<td>Pioneer Coupler - 1/2 FNPT</td>
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<td>Mounting Bracket</td>
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<td>N16257</td>
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<td>W-469</td>
<td>Hex Bolt - 1/4 x 3/4</td>
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<td>W-473</td>
<td>Hex Bolt - 5/16 x 1 1/2</td>
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<td>W-187</td>
<td>Hex Bolt - 3/8 x 1 1/4</td>
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<td>17</td>
<td>W-619</td>
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<td>D-5249</td>
<td>Hex Bolt - 3/8 x 3 1/4</td>
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<td>S-1299</td>
<td>Hex Bolt - 3/8 x 4 1/2</td>
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<td>20</td>
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<td>Hex Bolt - 3/8 x 5</td>
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<td>W-514</td>
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<td>28</td>
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<td>9240 / 9252 / 9300</td>
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<tr>
<td></td>
<td>H25645</td>
<td>Kit - Hydraulic Extension 9240 / 9252 / 9300 (Includes All Items)</td>
<td>ORDER THROUGH WHOLEGOODS</td>
</tr>
</tbody>
</table>
**Hitch Extention (Tow Between)**

- Attach extended hitch to Air Cart hitch with a 1 1/2"x 6 1/2" UL pin and #19 Hair Pin.

- Secure extended hitch to Air Cart frame with 5/8" x 6" bolts, lockwashers, nuts and mounting plates.
Options Assembly

Auger Spout Extension Kit

- Remove existing spout from the auger.
- Drill three 1/4” diameter holes 2” from edge of spout and approximately 6 3/8” apart. See fig. 1
- Slide extension onto the spout and install three 1/4” x 3/4” bolts with 1/4” locknuts through the hole in the extension. See fig. 2 & 3

Note: Flatwashers may be required to shim the bolt heads for desired fit.
- Attach the tarp strap to the spout with a 1/4” x 1 1/4” bolt, flatwasher and locknut. See fig. 4
- Install spout assembly onto the auger.
Section 10: Metric

Section Contents
Calibration Chart - Metric .................................................................10-2
## 9s SERIES AIR CART - VARIABLE RATE - CALIBRATION CHART

### WT/REV (KGS./REV)

<table>
<thead>
<tr>
<th>Material</th>
<th>Metric</th>
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<th>610</th>
<th>660</th>
<th>710</th>
<th>760</th>
<th>810</th>
<th>860</th>
<th>910</th>
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<tbody>
<tr>
<td>ADVANCED AGRICULTURE</td>
<td>GROWTH CONTROL</td>
<td>NONE</td>
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<tr>
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### SLOW SPEED DRIVE

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<th>DD-11</th>
<th>DD-12</th>
<th>DD-12</th>
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### SLOW SPEED DRIVE

| 24  | 27  | 30  | 32  | 35  | 38  | 41  | 44  | 47  | 50  |

### DIRECT DRIVE

<table>
<thead>
<tr>
<th>ALL STANDARD TANKS: DIRECT DRIVE</th>
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### CALIBRATION MATERIAL

<table>
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<td>OPENED 25</td>
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</table>

### NOTE:

- **Calibration Chart Applies To**: 3/4" x 3/4" Drift Spreader
- **Drift Spreader Side In Use**: The variable rate control arm will turn 180° clockwise when the variable rate control arm is out of the way. The variable rate control arm will turn 180° counterclockwise when the variable rate control arm is in the way. The variable rate control arm will turn 180° counterclockwise when the variable rate control arm is in the way.
- **Calibration Chart Applicable To**: Use as directed in 1.
- **GMT To The Appropriate 200 Point Calibration Chart**: Go to the 200 point calibration chart and follow the columns to the number of units on the seed tool.
- **All Standard Tanks Direct Drive**: The number of units on the variable rate control was the number of units on the seed tool.
- **All Standard Tanks Direct Drive**: The number of units on the variable rate control was the number of units on the seed tool.

### TOTAL:

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- **All Standard Tanks Direct Drive**: The number of units on the variable rate control was the number of units on the seed tool.
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