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Safety

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Safety

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 follow 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 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

Failure to comply may result in serious injury or death.

Read Operator’s Manual and decals on **Ammonia** tank before operating air cart. 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.
**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 mph (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 hydraulic 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.

```
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.
```

```
Caution

Keep service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.
```

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 stored implement.
- Refer to Storage Section for more details.
Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.

![Safety Signs]

- **DANGER**
  - CONFINED SPACE HAZARD
  - To Prevent Serious Injury or Death:
    - Do not enter tank.
    - Be aware of and follow safety precautions
    - Read and follow chemical manufacturer’s safety instructions.

- **DANGER**
  - 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.

- **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**
  - BURN HAZARD
  - To Prevent Serious Injury:
    - Do Not Touch hydraulic motor or oil lines.
    - Hydraulic motor and oil lines become extremely hot from operation.

- **WARNING**
  - CRUSHING HAZARD
  - To prevent serious injury:
    - Keep hands clear of auger arm top when moving auger.
    - Use handle.

- **CAUTION**
  - CRUSHING HAZARD
  - STAND CLEAR - Stairway may fall rapidly when unlatching lock pin.

- **CAUTION**
  - Secure Auger in storage position before transporting by:
    1. Locking auger cradle latch
    2. Locking auger arm latch

- **CAUTION**
  - To avoid injury, do not open lids while fan is operating. Air gust may contain dust and particles.
Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.

**IMPORTANT**

BEFORE FILLING TANK
- Ensure each meter is set correctly as described in the Operator’s Manual.
- Ensure Tank clean out door is fully closed.

BEFORE APPLYING PRODUCT
- Set rate according to the procedure and rate chart described in the Operator’s Manual.
- Take a sample and adjust the rate, if necessary.

AIR LEAKS AFFECT METERING ACCURACY
- Ensure all seals are properly positioned and all lids are tightly closed.

**IMPORTANT**

ENSURE THAT ALL WHEEL NUTS ARE TORQUED TO THE FOLLOWING:
- 5/8” Tapered Wheel Nut - 150 ft-lbs (203 Nm)
- 3/4” Flanged Wheel Nut - GR.8 - 450 ft-lbs (610 Nm)
- 7/8” Flanged Wheel Nut - GR.8 - 525 ft-lbs (711 Nm)
- 22mm Flanged Wheel Nut - GR.10.9 - 500 ft-lbs (677 Nm)

**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.

**IMPORTANT**

TANK BOLTS MUST BE A LOOSE FIT. DO NOT REPLACE WITH SHORTER BOLTS.
Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.
### Decals

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<td>N53157</td>
<td>Decal - “9365” (2 tank Small Frame)</td>
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<td>N53159</td>
<td>Decal - “9450” (3 tank Small Frame)</td>
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<td>N53160</td>
<td>Decal - “9535” (4 tank Small Frame)</td>
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<td>N53158</td>
<td>Decal - “9445” (2 tank Large Frame)</td>
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<td>N53180</td>
<td>Decal - “9550” (3 tank Large Frame)</td>
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<td>N53181</td>
<td>Decal - “9650” (4 tank Large Frame)</td>
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<td>N55820</td>
<td>Decal - “9555” (2 tank)</td>
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<tr>
<td>N53182</td>
<td>Decal - “9680” (3 tank)</td>
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<td>N53183</td>
<td>Decal - “9800” (4 tank)</td>
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<td>N53195</td>
<td>Decal - “91000” (4 tank)</td>
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<tr>
<td>N53185</td>
<td>Decal - Tank Size - 86 Bu.</td>
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<td>N53186</td>
<td>Decal - Tank Size - 107 Bu.</td>
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<td>N53187</td>
<td>Decal - Tank Size - 133 Bu.</td>
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<td>N53188</td>
<td>Decal - Tank Size - 162 Bu.</td>
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<td>N53189</td>
<td>Decal - Tank Size - 182 Bu.</td>
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<td>N53190</td>
<td>Decal - Tank Size - 221 Bu.</td>
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<td>N53191</td>
<td>Decal - Tank Size - 265 Bu.</td>
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<td>N53192</td>
<td>Decal - Tank Size - 284 Bu.</td>
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<td>N53193</td>
<td>Decal - Tank Size - 331 Bu.</td>
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<td>N53194</td>
<td>Decal - Tank Size - 349 Bu.</td>
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### Rate Charts - Imperial

- N36021 - Slow Speed
- N36022 - Seed
- N36023 - Fertilizer

### Rate Charts - Metric

- N37146 - Slow Speed
- N37147 - Seed
- N37148 - Fertilizer

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
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<tr>
<td>N56050</td>
<td>Decal - Wheel Torque</td>
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<td>N56999</td>
<td>Decal - Warning - “Stand Clear”</td>
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### Safety Signs - Continued

#### Decals - Continued

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<td>C31201</td>
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<td>D13705</td>
<td>Decal - Warning - “No Riders”</td>
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<td>N19023</td>
<td>Decal - Danger</td>
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<td>N24301</td>
<td>Decal - Warning</td>
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<tr>
<td>N36261</td>
<td>Decal - Warning - “Over Head Hazard”</td>
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<td>N36264</td>
<td>Decal - Important - “Cycle Collector Valve Daily”</td>
<td>1 per metering Body</td>
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<td>N36263</td>
<td>Decal - Warning - “Burn Hazard”</td>
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<tr>
<td>N36255</td>
<td>Decal - Warning - “Crushing Hazard”</td>
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<td>N36259</td>
<td>Decal - “Open/Close”</td>
<td>2 per metering Body</td>
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<tr>
<td>N36262</td>
<td>Decal - Danger - “Confined Space Hazard”</td>
<td>1 per Lid</td>
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<tr>
<td>N15094</td>
<td>Decal - Caution - “To Avoid Injury”</td>
<td>1 per Lid</td>
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<tr>
<td>N42356</td>
<td>Decal - Important - “Before Filling Tank”</td>
<td>1 per Lid</td>
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<tr>
<td>N21604</td>
<td>Decal - Important - “Prevent Corrosion”</td>
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<td>N45429</td>
<td>Decal - Patented</td>
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<td>N55496</td>
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<td>N29355</td>
<td>Decal - Warning - “Moving Part Hazard” (VRT ONLY)</td>
<td>1 per transmission</td>
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<td>N32799</td>
<td>Decal - Danger - “Guard Missing” (VRT ONLY)</td>
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<td>N45427</td>
<td>Decal - “Seed Plate Usage” (VRT ONLY)</td>
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<td>N36254</td>
<td>Decal - “Calibrate/Fan” (VRT ONLY)</td>
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<td>N19029</td>
<td>Decal - “Rotation” (VRT Drive)</td>
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<td>Decal - “Rotation” (Standard Drive)</td>
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<td>N53933</td>
<td>Decal - “Rotation” (Standard Drive) 9445, 9550 and 9650 Behind</td>
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<td>N19028</td>
<td>Decal - “Hair Pin Location” (Large Frame)</td>
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<td>Decal - “Hair Pin Location” (Small Frame)</td>
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<td>N27864</td>
<td>Decal - “Hair Pin Location” (Large Frame Tow Between)</td>
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<tr>
<td>N44287</td>
<td>Decal - “Hair Pin Location” (Large Frame Tow Behind)</td>
<td>1 rear transmission</td>
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<td>N36256</td>
<td>Decal - “Quick Change Sprocket”</td>
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<td>N36257</td>
<td>Decal - “Meter Shaft Sprocket”</td>
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<td>N42291</td>
<td>Decal - “Auger Position”</td>
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<td>N36453</td>
<td>Decal - “Fan/Auger”</td>
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<td>N50875</td>
<td>Decal - Conveyor - Lock/Unlock - Raise/Lower</td>
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<td>N36443</td>
<td>Decal - “Lever Position”</td>
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<td>N36258</td>
<td>Decal - Caution - “Secure Auger”</td>
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<td>N19033</td>
<td>Decal - Danger - “Electrocution Hazard”</td>
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<td>N19034</td>
<td>Decal - Danger - “Rotating Flighting Hazard”</td>
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<td>C25809</td>
<td>Decal - “Grease 50 Hours”</td>
<td>2 per transmission</td>
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<tr>
<td>C25810</td>
<td>Decal - “Grease 100 Hours”</td>
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<td>N37492</td>
<td>Decal - “Open/Closed” - Plenum</td>
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<td>N55695</td>
<td>Decal - Wheel Torque Chart</td>
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<td>N34476</td>
<td>Reflector - Red</td>
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<td>N34477</td>
<td>Reflector - Yellow</td>
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<td>N34478</td>
<td>Reflector - Orange</td>
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<tr>
<td>N34475</td>
<td>SMV Sign</td>
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</table>

The following pages provide basic Decal Location information, for more details contact Morris’ Customer Service.
Safety

Safety Signs - Continued

Left Side - Tow Between
Safety Signs - Continued

Right Side - Tow Behind
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 taillights secured on the machine promote correct transportation of this implement.

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

Amber warning and red taillights 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 damaged 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
Conveyor Safety

General

- As the owner and/or operator it is your responsibility to know what requirements, hazards and precautions exist, and to inform all personnel associated with the equipment or are in the area.

- Avoid any alteration to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

- Untrained operators subject themselves and other to serious injury or death. NEVER ALLOW untrained personnel to operate this equipment.

- Keep children and other unqualified personnel out of the working area at all times.

- NEVER start equipment until ALL persons are clear of the work area.

- Be sure ALL operators are adequately rested and prepared to perform all functions of operating this equipment.

- Keep hair, loose clothing, and shoestrings away from rotating and moving parts. Never wear loose fitting clothing when working around conveyors.

- NEVER allow anyone inside a bin, truck, or wagon which is being unloaded by a conveyor. Flowing grain can trap and suffocate in seconds.

- Keep hands and feet away from the conveyor intake and other moving parts.

- NEVER attempt to assist machinery operation or to remove trash from the equipment while in operation.

- Keep the area around intake free of obstacles that might trip workers.

- Components of this equipment have sharp edges which can scrape and/or cut an operator.

- A moving conveyor can sever an operator's limb or even kill.

- Always keep all shields and guards in place during operation.

![Overhead Hazard Warning]

**WARNING**

To prevent serious injury or death:

- Ensure lift cylinder is fully extended before unlatching Auger/Conveyor.
- Stay clear of cradle pad when locking and unlocking.
- Keep others away.
Safety

Conveyor Safety - Continued

Safety Signs

The Safety Decals listed below are included with the conveyor, the following pages show the location of the decals on the conveyor. Inspect all decals and replace any that are worn, illegible, or missing. Contact your dealer or the factory to order replacement decals.

KS-0008

KS-0002

KS-0007
Conveyor Safety - Continued

Safety Signs - Continued

**DANGER**

FALLING CONVEYOR CAN CRUSH OR KILL!

ALWAYS SECURE INTAKE END SO THAT THE CONVEYOR CANNOT FALL.

EMPTY THE CONVEYOR BEFORE ATTEMPTING TO TRANSPORT IT.

NEVER PUSH THE UNDERCARRIAGE. ALWAYS USE PROPER TRANSPORTING METHODS.

USE CAUTION WHEN LIFTING THE INTAKE END. NEVER LIFT HIGHER THAN THE VEHICLE. TOW BAR, DO NOT RELEASE UNTIL CONVEYOR IS SECURELY ATTACHED TO THE TOW BAR OR ON THE GROUND.

LOWER THE CONVEYOR FOR TRANSPORTING IMMEDIATELY AFTER MOVING IT AWAY FROM THE STORAGE BIN.

FAILURE TO HEED WILL RESULT IN SERIOUS INJURY OR DEATH!

**CAUTION**

1. READ AND UNDERSTAND THE INSTALLATION & OPERATION MANUAL AND ALL SAFETY INSTRUCTIONS BEFORE OPERATING EQUIPMENT.
2. DO NOT OPERATE WHILE UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.
3. DO NOT OPERATE UNLESS ALL SAFETY EQUIPMENT, SWITCHES, GUARDS AND SHIELDS ARE SECURELY IN PLACE AND OPERATIONAL.
4. BE SURE EVERYONE IS CLEAR OF THE EQUIPMENT BEFORE ATTEMPTING TO OPERATE OR MOVING THE MACHINE.
5. ALLOW ONLY TRAINED PERSONNEL IN THE OPERATING AREA.
6. KEEP HANDS, FEET, HAIR AND CLOTHING AWAY FROM MOVING PARTS.
7. DISCONNECT AND LOCKOUT POWER BEFORE ADJUSTING OR SERVICING.
8. ELECTRICAL WIRING OR SERVICE WORK MUST BE PERFORMED BY A QUALIFIED ELECTRICIAN. IT MUST MEET ALL STATE AND LOCAL ELECTRICAL CODES.
9. EMPTY CONVEYOR AND LOWER TO TRANSPORT POSITION BEFORE TRANSPORTING.
10. MAKE CERTAIN ALL ELECTRIC MOTORS ARE GROUNDED.
11. NEVER MOVE MACHINE MANUALLY. ALWAYS USE A TOWING VEHICLE.
12. KEEP CHILDREN AWAY FROM THE WORK AREA AT ALL TIMES.
Safety

Conveyor Safety - Continued

Safety Signs - Continued

---

**WARNING**

HYDRAULIC FLUID LEAKING UNDER PRESSURE CAN PENETRATE SKIN. IF THIS HAPPENS, SEEK MEDICAL ATTENTION IMMEDIATELY.

ALWAYS RELEASE PRESSURE FROM HYDRAULIC LINES BEFORE DISCONNECTING.

ALWAYS INSPECT THE HYDRAULIC LINES BEFORE AND AFTER USING THIS EQUIPMENT AND PERFORM ANY NECESSARY MAINTENANCE ON THE HYDRAULIC SYSTEM BEFORE OPERATING.

FAILURE TO HEED WILL RESULT IN SERIOUS INJURY OR DEATH!

---

**DANGER**

SHEAR POINT

KEEP FINGERS, HANDS, HAIR AND LOOSE CLOTHING AWAY FROM MOVING PARTS.

FAILURE TO HEED WILL RESULT IN SERIOUS INJURY OR DEATH!

---

**WARNING**

Moving belt can cut or entangle.

Stay Away

Disconnect & lockout power source before adjusting or servicing.

Failure to heed will result in personal injury or death!
Conveyor Safety - Continued

Safety Signs - Continued

**DANGER**

Do not operate with door open!

- Stop machine and lockout power to adjust, service or clean.
- Keep hands, feet, hair and clothing away from moving parts.

Failure to heed will result in serious injury or death!

KS-0006

**WARNING**

Moving parts can crush or dismember.

Do not operate without guards in place. Stay clear of moving parts.

Disconnect & lockout power source before adjusting or servicing.

Failure to heed may result in death or personal injury!

KS-0016
Section 2: Specifications

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- 9365 and 9450 - Tow Between.................................................................2-3
- 9445, 9550 and 9650 - Tow Behind.................................................................2-4
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# Specifications

## 9365, 9450 and 9535 - Tow Behind Specifications and Options

<table>
<thead>
<tr>
<th>Model</th>
<th>9365</th>
<th>9450</th>
<th>9535</th>
</tr>
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<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td>Tow Behind</td>
<td>Tow Behind</td>
<td>Tow Behind</td>
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<tr>
<td><strong>Length (Hitch pin to end of Auger)</strong> (Hitch Removed)</td>
<td>34' 6&quot; (10.52 m)</td>
<td>34' 6&quot; (10.52 m)</td>
<td>36' 10&quot; (11.15 m)</td>
</tr>
<tr>
<td><strong>Height - Rails up</strong></td>
<td>15' 2&quot; (4.623 m)</td>
<td>15' 2&quot; (4.623 m)</td>
<td>15' 2&quot; (4.623 m)</td>
</tr>
<tr>
<td><strong>Height - Rails Lowered</strong></td>
<td>14' 2&quot; (4.318 m)</td>
<td>14' 2&quot; (4.318 m)</td>
<td>14' 2&quot; (4.318 m)</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>13' 7&quot; (4.14 m)</td>
<td>13' 7&quot; (4.14 m)</td>
<td>13' 7&quot; (4.14 m)</td>
</tr>
<tr>
<td><strong>Weight (Hydraulic Drive)</strong></td>
<td>10900 lbs (4944 kg)</td>
<td>11900 lbs (5398 kg)</td>
<td>13000 lbs (5897 kg)</td>
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<tr>
<td><strong>Safety Lights</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Safety Chain</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
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<tr>
<td><strong>Tank Capacity</strong></td>
<td>182 bu (6414 l)</td>
<td>182 bu (6414 l)</td>
<td>182 bu (6414 l)</td>
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<tr>
<td><strong>Fan Impeller Diameter</strong></td>
<td>17&quot; (43 cm)</td>
<td>16cc - 21 U.S. gal./min. (80 l/min) at 2,750 p.s.i. (18,960 kpa) Dual Fans require 42 U.S. gal./min. (160 l/min) VRT requires an additional 6 U.S. gal/min (23 l/min)</td>
<td>20&quot; (51 cm)</td>
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<td><strong>Loading Auger</strong></td>
<td>Optional (16&quot;) (40.6 cm) x 23 ft long</td>
<td>Optional (16&quot;) (40.6 cm) x 23 ft long</td>
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<td><strong>Tires</strong></td>
<td>2) 500/70 R24 Lug</td>
<td>2) 28LR26 Lug</td>
<td>2) 800/65R32 - LI 172 Lug</td>
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<td><strong>Tanks</strong></td>
<td>N/A</td>
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<td>N/A</td>
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<tr>
<td><strong>Frame</strong></td>
<td>4&quot; x 6&quot; (10 cm x 15.2cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
<td>4&quot; x 6&quot; (10 cm x 15.2cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
<td>4&quot; x 6&quot; (10 cm x 15.2cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
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<tr>
<td><strong>Easy Clean Out System</strong></td>
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<td><strong>Metering</strong></td>
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<tr>
<td><strong>Meter Shut Off</strong></td>
<td>Electric</td>
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<tr>
<td><strong>Number Secondary Runs - Single Shoot</strong></td>
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<td>21 to 99 (ICT 21 - 90)</td>
<td>21 to 99 (ICT 21 - 90)</td>
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<tr>
<td><strong>Number Secondary Runs - Double Shoot</strong></td>
<td>42 to 198 (ICT 42 - 180)</td>
<td>42 to 198 (ICT 42 - 180)</td>
<td>42 to 198 (ICT 42 - 180)</td>
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<td><strong>Primary Hose - Diameter</strong></td>
<td>2 1/2&quot; (6.4 cm)</td>
<td>2 1/2&quot; (6.4 cm)</td>
<td>2 1/2&quot; (6.4 cm)</td>
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<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>
<td>Standard - 15/16&quot; (2.4 cm)</td>
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<td><strong>Frame - Trussed</strong></td>
<td>4&quot; x 6&quot; (10 cm x 15.2cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
<td>4&quot; x 6&quot; (10 cm x 15.2cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
<td>4&quot; x 6&quot; (10 cm x 15.2cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
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<td><strong>Hitch Stand</strong></td>
<td>Optional - N/A for 9535</td>
<td>Optional - N/A for 9535</td>
<td>Optional - N/A for 9535</td>
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## Specifications

### 9365 and 9450 - Tow Between

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<tr>
<th>Specifications</th>
<th>9365</th>
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<tbody>
<tr>
<td><strong>Model</strong></td>
<td>9365</td>
<td>9450</td>
</tr>
<tr>
<td><strong>Configuration</strong></td>
<td>Tow Between</td>
<td>Tow Between</td>
</tr>
<tr>
<td><strong>Length (with auger)</strong></td>
<td>31' 5&quot; (9.58 m)</td>
<td>31' 5&quot; (9.58 m)</td>
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<tr>
<td><strong>Height - Rails up</strong></td>
<td>15' 2&quot; (4.623 m)</td>
<td>15' 2&quot; (4.623 m)</td>
</tr>
<tr>
<td><strong>Height - Rails Lowered</strong></td>
<td>14' 2&quot; (4.318 m)</td>
<td>14' 2&quot; (4.318 m)</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>- Single Axle - 800/65 R32</td>
<td>13' 7&quot; (4.14 m)</td>
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<tr>
<td></td>
<td>- Single Axle - 900/65 R32</td>
<td>13' 10&quot; (4.22 m)</td>
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<td></td>
<td>- Dual Axle - 520/85 R38</td>
<td>15' 1&quot; (4.81 m)</td>
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<td></td>
<td>- Dual Axle - 800/65 R32</td>
<td>20' (6.10 m)</td>
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<td><strong>Safety Lights</strong></td>
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<td>Standard</td>
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<tr>
<td><strong>Safety Chain</strong></td>
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<td><strong>Tank Capacity</strong></td>
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<td></td>
<td>- Tank 2</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>- Tank 3</td>
<td>182 bu (6414 l)</td>
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<tr>
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<td>- Tank 4</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td>364 bu (12828 l)</td>
</tr>
<tr>
<td><strong>Tank Screens</strong></td>
<td>Standard</td>
<td></td>
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<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>- piston type orbit motor (Closed Centre or Closed Centre Load Sensing systems required)</td>
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<td>Hydraulic requirements for Air Cart only at Rated Fan Speed.</td>
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<tr>
<td></td>
<td><strong>16cc</strong> - 21 U.S. gal./min. (80 l/min) at 2,750 p.s.i. (18,960 kpa)</td>
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<tr>
<td></td>
<td><strong>VRT</strong> requires an additional 6 U.S. gal/min (23 l/min)</td>
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<tr>
<td><strong>Loading Auger</strong></td>
<td>- Standard (10&quot; Dia) (25.4 cm Dia)</td>
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<td></td>
<td>- Optional - extended hopper on hydraulic assisted auger</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Conveyor</strong></td>
<td>Optional (16&quot;) (40.6 cm) x 23 ft long</td>
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<tr>
<td><strong>Tires</strong></td>
<td>- Standard (Rear)</td>
<td></td>
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<tr>
<td></td>
<td>(2) 800/65R32 - LI 172 Lug Distance Center-Center 128&quot; (325 cm)</td>
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<td></td>
<td>- Optional (Rear)</td>
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<tr>
<td></td>
<td>(2) 900/65R32 - LI 172 Lug Distance Center-Center 132&quot; (335 cm)</td>
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<td></td>
<td>- Optional (Rear)</td>
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<td></td>
<td>Duals - (4) 800/65R32 - LI 172 Lug Distance Center-Center Inner 132&quot; (335 cm)</td>
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<tr>
<td></td>
<td>Distance Center-Center Outer 208&quot; (516 cm)</td>
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<td><strong>Metering</strong></td>
<td>- Ground Driven Standard</td>
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<td></td>
<td>- Variable Rate (VRT) Optional</td>
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<td></td>
<td>- GPS Compatible VRT Optional</td>
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</tr>
<tr>
<td></td>
<td>- ICT (Input Control Technology) Optional with VRT</td>
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<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 99 (ICT 21 - 90)</td>
<td></td>
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<tr>
<td><strong>Number Secondary Runs - Double Shoot</strong></td>
<td>42 to 198 (ICT 42 - 180)</td>
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<tr>
<td><strong>Primary Hose - Diameter</strong></td>
<td>2 1/2&quot; (6.4 cm)</td>
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<tr>
<td><strong>Secondary Hose - Diameter</strong></td>
<td>Standard - 15/16&quot; (2.4 cm)</td>
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<tr>
<td></td>
<td>Optional - 1 1/8&quot; (2.8 cm)</td>
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<tr>
<td><strong>Frame - Trussed</strong></td>
<td>4&quot; x 6&quot; (10 cm x 15.2cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
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<tr>
<td><strong>Easy Clean Out System</strong></td>
<td>Standard</td>
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<tr>
<td><strong>Meter Drive Options</strong></td>
<td>- Second Clutch (For spot fertilizing on the go) Standard</td>
<td></td>
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<tr>
<td><strong>Monitor</strong></td>
<td>(Shaft Motion (3), Bin Level (3), Fan Speed, Acre Tally, Ground Speed) Standard</td>
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<td></td>
<td>Optional Seed Flow</td>
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</tr>
<tr>
<td><strong>Work Switch (Mounted to Seeding Machine)</strong></td>
<td>Optional</td>
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</tr>
<tr>
<td><strong>Rear Tow Hitch</strong></td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Max 26,000 lb Draft Load)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Max 11,818 kg Draft Load)</td>
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</tr>
<tr>
<td><strong>Hitch Jack - Hydraulic</strong></td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td><strong>Work Lights - LED</strong></td>
<td>Optional</td>
<td></td>
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<tr>
<td><strong>Hitch Clevis</strong></td>
<td>Standard - Category 4</td>
<td>Optional - Category 5</td>
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## 9445, 9550 and 9650 - Tow Behind Specifications and Options

<table>
<thead>
<tr>
<th>Model</th>
<th>9445</th>
<th>9550</th>
<th>9650</th>
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<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td><strong>Tow Behind</strong></td>
<td><strong>Tow Behind</strong></td>
<td><strong>Tow Behind</strong></td>
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<tr>
<td><strong>Length (Hitch pin to Dual Fan) (Hitch Removed)</strong></td>
<td>39’ 3” (11.96 m)</td>
<td>39’ 3” (11.96 m)</td>
<td>39’ 3” (11.96 m)</td>
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<tr>
<td><strong>Height - Rails up</strong></td>
<td>15’ 2’” (4.623 m)</td>
<td>15’ 2’” (4.623 m)</td>
<td>15’ 2’” (4.623 m)</td>
</tr>
<tr>
<td><strong>Height - Rails Lowered</strong></td>
<td>14’ 2’” (4.318 m)</td>
<td>14’ 2’” (4.318 m)</td>
<td>14’ 2’” (4.318 m)</td>
</tr>
<tr>
<td><strong>Width - Single Axle - 900/65 R32</strong></td>
<td>13’ 10” (4.22 m)</td>
<td>13’ 10” (4.22 m)</td>
<td>13’ 10” (4.22 m)</td>
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<tr>
<td><strong>- Dual Axle - 520/85 R38</strong></td>
<td>15’ 11” (4.81 m)</td>
<td>15’ 11” (4.81 m)</td>
<td>15’ 11” (4.81 m)</td>
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<tr>
<td><strong>- Dual Axle - 800/65 R32</strong></td>
<td>20’ (6.10 m)</td>
<td>20’ (6.10 m)</td>
<td>20’ (6.10 m)</td>
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<tr>
<td><strong>Weight (Hydraulic Drive)</strong></td>
<td>17,300 lbs (7,847 kg)</td>
<td>18,000 lbs (8,165 kg)</td>
<td>18,700 lbs (8,482 kg)</td>
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<td><strong>Safety Lights</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Safety Chain</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Tank Capacity</strong></td>
<td>N/A</td>
<td>221 bu (7788 l)</td>
<td>221 bu (7788 l)</td>
</tr>
<tr>
<td><strong>- Tank 1</strong></td>
<td>N/A</td>
<td>221 bu (7788 l)</td>
<td>221 bu (7788 l)</td>
</tr>
<tr>
<td><strong>- Tank 2</strong></td>
<td>N/A</td>
<td>107 bu (3772 l)</td>
<td>107 bu (3772 l)</td>
</tr>
<tr>
<td><strong>- Tank 3</strong></td>
<td>221 bu (7788 l)</td>
<td>107 bu (3772 l)</td>
<td>107 bu (3772 l)</td>
</tr>
<tr>
<td><strong>- Tank 4</strong></td>
<td>221 bu (7788 l)</td>
<td>221 bu (7788 l)</td>
<td>221 bu (7788 l)</td>
</tr>
<tr>
<td><strong>- Total</strong></td>
<td>442 bu (15,576 l)</td>
<td>549 bu (19348 l)</td>
<td>656 bu (23,120 l)</td>
</tr>
<tr>
<td><strong>Tank Screens</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Fan Impeller Diameter</strong></td>
<td>17” (43 cm) - Up to 5,000 r.p.m.</td>
<td>16cc</td>
<td>21 U.S. gal./min. (80 l/min) at 2,750 p.s.i. (18,960 kpa)</td>
</tr>
<tr>
<td><strong>Hydraulic Drive - piston type orbit motor</strong></td>
<td>(Closed Centre or Closed Centre Load Sensing systems required)</td>
<td></td>
<td>Dual Fans require 42 U.S. gal./min. (160 l/min)</td>
</tr>
<tr>
<td><strong>Hydraulic requirements for Air Cart only at Rated Fan Speed.</strong></td>
<td></td>
<td>VRT requires an additional 6 U.S. gal/min (23 l/min)</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Auger</strong></td>
<td>Standard (10” Dia) (25.4 cm Dia)</td>
<td>Optional - extended hopper on hydraulic assisted auger</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Conveyor</strong></td>
<td>Optional (16”) (40.6 cm) x 23 ft long</td>
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<tr>
<td><strong>Tires</strong></td>
<td>- Quad Steer (Front) (2) 28LR26 Lug</td>
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<td></td>
</tr>
<tr>
<td><strong>- Standard (Rear)</strong></td>
<td>Single - (2) 900/65R32 - LI 172 Lug</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>- Optional (Rear)</strong></td>
<td>Duals - (4) 800/65R32 - LI 172 Lug</td>
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</tr>
<tr>
<td><strong>- Optional (Rear)</strong></td>
<td>Single - (2) 710/70R38 - DT - 824 TL Lug</td>
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<tr>
<td><strong>Metering</strong></td>
<td>- Ground Driven Standard</td>
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<td></td>
</tr>
<tr>
<td><strong>- Variable Rate (VRT)</strong></td>
<td>Optional</td>
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<td></td>
</tr>
<tr>
<td><strong>- GPS Compatible VRT</strong></td>
<td>Optional</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>- ICT (Input Control Technology)</strong></td>
<td>Optional with VRT</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meter Shut Off</strong></td>
<td>Electric</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number Secondary Runs - Single Shoot</strong></td>
<td>21 to 99 (ICT 21 - 90)</td>
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<td><strong>Primary Hose - Diameter</strong></td>
<td>2 1/2” (6.4 cm)</td>
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<tr>
<td><strong>Secondary Hose - Diameter</strong></td>
<td>Standard - 15/16” (2.4 cm)</td>
<td>Optional - 1 1/8” (2.8 cm)</td>
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<tr>
<td><strong>Frame - Trussed</strong></td>
<td>4” x 6” (10 cm x 15.2cm) tubing by 4” x 4” (10 cm x 10 cm) tubing</td>
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<tr>
<td><strong>Easy Clean Out System</strong></td>
<td>Standard</td>
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<td></td>
</tr>
<tr>
<td><strong>Meter Drive Options</strong></td>
<td>- Second Clutch (For spot fertilizing on the go) Standard</td>
<td></td>
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<tr>
<td><strong>Monitor</strong></td>
<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>
<td></td>
</tr>
<tr>
<td><strong>Rear Tow Hitch</strong></td>
<td>Standard (Max 26,000 lb Draft Load)</td>
<td>(Max 11,818 kg Draft Load)</td>
<td></td>
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<tr>
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<tr>
<td><strong>Configuration</strong></td>
<td>Tow Between</td>
<td>Tow Between</td>
<td>Tow Between</td>
</tr>
<tr>
<td><strong>Length (with auger)</strong></td>
<td>34’ 6” (10.52 m)</td>
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</tr>
<tr>
<td><strong>Height - Rails up</strong></td>
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<td><strong>Height - Rails Lowered</strong></td>
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</tr>
<tr>
<td><strong>Width - Dual Axle</strong></td>
<td>20’ (6.10 m)</td>
<td>20’ (6.10 m)</td>
<td>20’ (6.10 m)</td>
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<tr>
<td><strong>Weight (Hydraulic Drive)</strong></td>
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<td>20700 lbs (9389 kg)</td>
<td>21400 lbs (9707 kg)</td>
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<td>Standard</td>
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<td><strong>Safety Chain</strong></td>
<td>Standard</td>
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<td><strong>Meter Drive Options</strong></td>
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<td></td>
</tr>
<tr>
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<td>Optional Seed Flow</td>
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<td>Optional</td>
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<tr>
<td><strong>Rear Tow Hitch</strong></td>
<td>Standard</td>
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<td><strong>Work Lights - LED</strong></td>
<td>Optional</td>
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<tr>
<td><strong>Hitch Clevis</strong></td>
<td>Standard - Category 4</td>
<td>Optional - Category 5</td>
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## Specifications

### 9555, 9680 and 9800 - Tow Behind

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<th>9800</th>
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<td><strong>Configuration</strong></td>
<td>Tow Behind</td>
<td>Tow Behind</td>
<td>Tow Behind</td>
</tr>
<tr>
<td><strong>Length (Hitch pin to Dual Fan)</strong></td>
<td>43' 6&quot;(13.28 m)</td>
<td>43' 6&quot;(13.28 m)</td>
<td>43' 6&quot;(13.28 m)</td>
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<tr>
<td>(Hitch Removed)</td>
<td>34' 6&quot;(10.52 m)</td>
<td>34' 6&quot;(10.52 m)</td>
<td>34' 6&quot;(10.52 m)</td>
</tr>
<tr>
<td><strong>Height - Rails up</strong></td>
<td>15' 8&quot; (4.77 m)</td>
<td>15' 8&quot; (4.77 m)</td>
<td>15' 8&quot; (4.77 m)</td>
</tr>
<tr>
<td><strong>Height - Rails Lowered</strong></td>
<td>14' 8&quot; (4.47 m)</td>
<td>14' 8&quot; (4.47 m)</td>
<td>14' 8&quot; (4.47 m)</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- Dual Axle - 800/65 R32 - Prior to 2016</td>
<td>20' 10&quot; (6.35 m)</td>
<td>20' 10&quot; (6.35 m)</td>
<td>20' 10&quot; (6.35 m)</td>
</tr>
<tr>
<td>- Dual Axle - 800/70R38</td>
<td>22' 4&quot; (6.81 m)</td>
<td>22' 4&quot; (6.81 m)</td>
<td>22' 4&quot; (6.81 m)</td>
</tr>
<tr>
<td>- Dual Axle - 850/80R38</td>
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<td>22' 4&quot; (6.81 m)</td>
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<tr>
<td><strong>Weight (Hydraulic Drive)</strong></td>
<td>27652 (12543 kg)</td>
<td>28946 (13130 kg)</td>
<td>30240 lbs (13720 kg)</td>
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<tr>
<td><strong>Safety Lights</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Safety Chain</strong></td>
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<td><strong>Tank Capacity</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- Tank 1</td>
<td>265 bu (9339 l)</td>
<td>265 bu (9339 l)</td>
<td>265 bu (9339 l)</td>
</tr>
<tr>
<td>- Tank 2</td>
<td>N/A</td>
<td>N/A</td>
<td>133 bu (4700 l)</td>
</tr>
<tr>
<td>- Tank 3</td>
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<td>133 bu (4700 l)</td>
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<td>- Tank 4</td>
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<td>284 bu (10008 l)</td>
<td>284 bu (10008 l)</td>
</tr>
<tr>
<td>- Total</td>
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<td>682 bu (24047 l)</td>
<td>815 bu (28747 l)</td>
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<tr>
<td><strong>Tank Screens</strong></td>
<td>Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fan Impeller Diameter</strong></td>
<td>17&quot; (43 cm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Drive</strong></td>
<td>16 cc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Closed Centre or Closed Centre Load Sensing systems required)</td>
<td>21 U.S. gal./min. (80 l/min) at 2,750 p.s.i. (18,960 kpa)</td>
<td>VRT requires an additional 6 U.S. gal/min (23 l/min)</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Auger</strong></td>
<td>Standard</td>
<td>Optional - extended hopper on hydraulic assisted auger</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Conveyor</strong></td>
<td>Optional (16&quot;) (40.6 cm)</td>
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<tr>
<td><strong>Brakes - Rear</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Tires</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Standard Quad Steer (Front) (Tow Behind only)</td>
<td>(2) 800/65 R32 - LI 172 Lug Distance Center-Center Inner 155&quot; (393 cm)</td>
<td>(2) 800/70R38 - LI 172 Lug Distance Center-Center Inner 155&quot; (393 cm)</td>
<td></td>
</tr>
<tr>
<td>- Optional Quad Steer (Front) (Tow Behind only)</td>
<td>Distance Center-Center Inner 154&quot; (391.2 cm)</td>
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<tr>
<td>- Standard (Rear)</td>
<td>Distance Center-Center Outer 234&quot; (594.4 cm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Optional (Rear)</td>
<td>Distance Center-Center Outer 154&quot; (391.2 cm)</td>
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</tr>
<tr>
<td><strong>Metering</strong></td>
<td>Standard</td>
<td>Optional</td>
<td>Optional with VRT</td>
</tr>
<tr>
<td>- Ground Driven</td>
<td></td>
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</tr>
<tr>
<td>- Variable Rate (VRT)</td>
<td>Optional</td>
<td></td>
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<td>- GPS Compatible VRT</td>
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<td>Optional with VRT</td>
<td></td>
<td></td>
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<tr>
<td><strong>Meter Shut Off</strong></td>
<td>Electric</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number Secondary Runs - Single Shoot</strong></td>
<td>21 to 110 (ICT 21-100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number Secondary Runs - Double Shoot</strong></td>
<td>42 to 220 (ICT 42-200)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Primary Hose - Diameter</strong></td>
<td>2 1/2&quot; (6.4 cm)</td>
<td></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>
<td></td>
</tr>
<tr>
<td><strong>Frame - Trussed</strong></td>
<td>4&quot; x 10&quot; (10 cm x 25.4cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Easy Clean Out System</strong></td>
<td>Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meter Drive Options</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Second Clutch</td>
<td>Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monitor</strong></td>
<td>Standard</td>
<td>Optional Seed Flow</td>
<td></td>
</tr>
<tr>
<td>(Shutt Motion (3), Bin Level (3), Fan Speed, Acre Tally, Ground Speed)</td>
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<td></td>
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</tr>
<tr>
<td><strong>Work Switch (Mounted to Seeding Machine)</strong></td>
<td>Optional</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rear Tow Hitch</strong></td>
<td>Standard</td>
<td>(Max 26,000 lb Draft Load)</td>
<td>(Max 11,818 kg Draft Load)</td>
</tr>
<tr>
<td><strong>Mechanical Acre Meter</strong></td>
<td>Optional (Ground Drive Only)</td>
<td></td>
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</table>
### Specifications

#### 9555, 9680 and 9800 - Tow Between

<table>
<thead>
<tr>
<th>Specification</th>
<th>9555</th>
<th>9680</th>
<th>9800</th>
</tr>
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<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td>Tow Between</td>
<td>Tow Between</td>
<td>Tow Between</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>43' 6&quot; (13.28 m)</td>
<td>43' 6&quot; (13.28 m)</td>
<td>43' 6&quot; (13.28 m)</td>
</tr>
<tr>
<td><strong>Height - Rails up</strong></td>
<td>15' 8&quot; (4.77 m)</td>
<td>15' 8&quot; (4.77 m)</td>
<td>15' 8&quot; (4.77 m)</td>
</tr>
<tr>
<td><strong>Height - Rails Lowered</strong></td>
<td>14' 8&quot; (4.47 m)</td>
<td>14' 8&quot; (4.47 m)</td>
<td>14' 8&quot; (4.47 m)</td>
</tr>
<tr>
<td><strong>Width - Dual Axle - 800/65 R32 - Prior to 2016</strong></td>
<td>20' 10&quot; (6.35 m)</td>
<td>20' 10&quot; (6.35 m)</td>
<td>20' 10&quot; (6.35 m)</td>
</tr>
<tr>
<td><strong>Width - Dual Axle - 800/70R38</strong></td>
<td>22' 4&quot; (6.81 m)</td>
<td>22' 4&quot; (6.81 m)</td>
<td>22' 4&quot; (6.81 m)</td>
</tr>
<tr>
<td><strong>Weight (Hydraulic Drive)</strong></td>
<td>27152 lbs (12316 kg)</td>
<td>28446 lbs (12903 kg)</td>
<td>29740 lbs (13490 kg)</td>
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<tr>
<td><strong>Safety Lights</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Safety Chain</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Tank Capacity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tank 1</td>
<td>265 bu (9339 l)</td>
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<td>N/A</td>
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<td>133 bu (4700 l)</td>
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<td>N/A</td>
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<td>- Tank 4</td>
<td>284 bu (10008 l)</td>
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<td></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>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Drive - piston type orbit motor</strong></td>
<td>16cc</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic requirements for Air Cart only at Rated Fan Speed.</strong></td>
<td>21 U.S. gal./min. (80 l/min) at 2,750 p.s.i. (18,960 kpa)</td>
<td>VRT requires an additional 6 U.S. gal/min (23 l/min)</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Auger</strong></td>
<td>Standard (10&quot; Dia) (25.4 cm Dia)</td>
<td>Optional - extended hopper on hydraulic assisted auger</td>
<td></td>
</tr>
<tr>
<td><strong>Loading Conveyor</strong></td>
<td>Optional (16&quot;) (40.6 cm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Brakes - Rear</strong></td>
<td>Standard - 22&quot; (55.9 cm) Diameter Disc - 4 piston caliper</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tires</strong></td>
<td>- Standard (Rear)</td>
<td>- Optional (Rear)</td>
<td></td>
</tr>
<tr>
<td>- Optional (Rear)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Metering</strong></td>
<td>Standard</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>- Variable Rate (VRT)</td>
<td></td>
<td></td>
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<tr>
<td>- GPS Compatible VRT</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>- ICT (Input Control Technology)</td>
<td>Optional with VRT</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meter Shut Off</strong></td>
<td>Electric</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number Secondary Runs - Single Shoot</strong></td>
<td>21 to 110 (ICT 21-100)</td>
<td></td>
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<td><strong>Primary Hose - Diameter</strong></td>
<td>2 1/2&quot; (6.4 cm)</td>
<td></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>
<td></td>
</tr>
<tr>
<td><strong>Frame - Trussed</strong></td>
<td>4&quot; x 10&quot; (10 cm x 25.4cm) tubing by 4&quot; x 4&quot; (10 cm x 10 cm) tubing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Easy Clean Out System</strong></td>
<td>Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meter Drive Options</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Second Clutch (For spot fertilizing on the go)</td>
<td>Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monitor</strong></td>
<td>Standard</td>
<td>Optional Seed Flow</td>
<td></td>
</tr>
<tr>
<td><strong>Work Switch (Mounted to Seeding Machine)</strong></td>
<td>Optional</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rear Tow Hitch</strong></td>
<td>Standard (Max 26,000 lb Draft Load)</td>
<td>(Max 11,818 kg Draft Load)</td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical Acre Meter</strong></td>
<td>Optional (Ground Drive Only)</td>
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## 91000 - Tow Behind
### Specifications and Options

<table>
<thead>
<tr>
<th>Model</th>
<th>91000</th>
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<tbody>
<tr>
<td>Configuration</td>
<td>Tow Behind</td>
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<tr>
<td>Length (Hitch pin to Dual Fan)</td>
<td>43' 6&quot; (13.28 m)</td>
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<tr>
<td></td>
<td>(Hitch Removed)</td>
</tr>
<tr>
<td>Height - Rails up</td>
<td>16' 6&quot; (5.03 m)</td>
</tr>
<tr>
<td>Height - Rails Lowered</td>
<td>15' 6&quot; (4.73 m)</td>
</tr>
<tr>
<td>Width - Dual Axle - 800/70R38</td>
<td>22' 4&quot; (6.81 m)</td>
</tr>
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<td>- Dual Axle - 850/80R38</td>
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<tr>
<td>Weight (Hydraulic Drive)</td>
<td>31240 lbs (14170 kg)</td>
</tr>
<tr>
<td>Safety Lights</td>
<td>Standard</td>
</tr>
<tr>
<td>Safety Chain</td>
<td>Standard</td>
</tr>
<tr>
<td>Tank Capacity</td>
<td>331 bu (11664 l)</td>
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<tr>
<td></td>
<td>- Tank 1</td>
</tr>
<tr>
<td></td>
<td>- Tank 2</td>
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<tr>
<td></td>
<td>- Tank 3</td>
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<tr>
<td></td>
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<tr>
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<td>Hydraulic requirements for Air Cart only at Rated Fan Speed.</td>
</tr>
<tr>
<td>Loading Auger</td>
<td>Standard (12&quot; Dia) (30.5 cm Dia)</td>
</tr>
<tr>
<td></td>
<td>Optional - extended hopper on hydraulic assisted auger</td>
</tr>
<tr>
<td>Loading Conveyor</td>
<td>Optional (16&quot;) (40.6 cm) x 25 ft long</td>
</tr>
<tr>
<td>Tires</td>
<td>- Standard Quad Steer (Front) (Tow Behind only)</td>
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<td>Standard</td>
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<td>Meter Drive Options</td>
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<td>Work Switch (Mounted to Seeding Machine)</td>
<td>Optional</td>
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<tr>
<td>Rear Tow Hitch</td>
<td>Standard</td>
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<td></td>
<td>(Max 26,000 lb Draft Load)</td>
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<td></td>
<td>(Max 11,818 kg Draft Load)</td>
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</table>
Section 3: Checklist

Section Contents
Manuals..........................................................................................................................3-2
Parts Manual...................................................................................................................3-2
Assembly Manual.........................................................................................................3-2
Checklist.......................................................................................................................3-3
Checklist

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 N53349
Assembly Manual  Order Part Number N53348
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
_____ Lock-up pins must be in place.
_____ 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
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 9 Series Air Cart.

To protect your investment, study your manual before starting or operating in the field. Learn how to operate and service your 9 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 9 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 9 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 9 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.
Introduction - Continued

The MORRIS 9 Series Air Cart represents the latest in Air Cart design technology. Each cart incorporates a four wheel, wide-stance high clearance frame. The high clearance frame gives easy access to the metering wheels and the easiest cleanout in the industry. The tank lids are easily accessed by the convenient stairs and tank walkway.

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 meter drives are positive, convenient, simple to set and are ground driven through an electric clutch. 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 and peas to be seeded without having to change the metering wheels.

The Air Cart comes equipped with a monitor that senses all bin levels, motion of all metering shafts and fan speed. It also gives ground speed and provides an acre meter. High quality 2 1/2" diameter hose is standard equipment for the distribution system. The patented flat fan divider, which is matched in size to the metering wheel, ensures final accurate distribution of the product.

Standard Features

Second Clutch

The second clutch is mounted to any one of the tanks metering shaft.

This enables the operator to stop or start the metering of that tank while the metering continues from the other tanks. This is especially useful for spot fertilizing.

The clutch is electric operated and is switched from inside the tractor cab.

Note: The primary clutch still controls the input to all tank transmissions.

Hydraulic Auger

The hydraulic auger is designed to make loading and unloading product from the Air Cart tank very simple and easy. Shown here with optional extended hopper.
Introduction

Standard Features - Continued

Full Bin Indicator
The Morris 9 Series Air Cart can be equipped with an optional full bin indicator to alert when bins are full during loading.

Blank Off Cover - N40980
The blank off cover closes off any unused openings in the collector body. The blank off cover prevents the unused run from filling with product.

Note: The blank off cover and run caps must be removed before storage to clean out any particles that accumulated during use.

Options

Hydraulic Conveyor
The 16" wide conveyor is designed to make loading and unloading product from the Air Cart tank very simple and easy.
Options - Continued

Digi-Star Weigh Scale
The Morris 9 Series Air Cart can be equipped with an optional Digi-Star Weigh Scale to track product usage.

Digi-Star Weigh Scale

Dual Fan
The dual fan system allows for higher application rates on larger five frame seed units.

Hydraulic Rate Calibration
The Hydraulic Rate Calibration feature automates the process for performing application rate checks.

Note: Hydraulic Rate Calibration option requires monitor Version 0.25 or higher installed.
Options - Continued

Meter Shut-Off

The meter shut-off provides a convenient means to shut off part of the metering system from the tractor to finish narrow strips at the end of the field.

Important: It is strongly recommended to have the seeding unit equipped with a blockage monitor system to ensure product flow.
# Section 5: Operation

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Operation

CAUTION

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

BE ALERT

Application

The Morris 9 Series Air Cart applies a wide range of seed and granular fertilizer products. It has the capacity to single shoot and double shoot. See “Double Shoot Settings” for more details.

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.
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.

Attach safety chain to the tractor drawbar support or other specified anchor location with the appropriate parts.

Hitching to Tractor (Tow Between Cart)

Tractor Drawbar Requirements
Tractor drawbar vertical load requirements for loaded Tow Between Air Carts are as follows:

9365....................8,500 lbs (3,864 kg) minimum
9450......................11,000 lbs (5,000 kg) minimum
9445, 9550 & 9650 ...8,900 lbs (4,050 kg) minimum
9555, 9680 & 9800 ...12,000 lbs (5,443 kg) minimum
**Hitching to Tractor (Tow Between Cart) - Continued**

**9365 and 9450 - Tow Between**

- Ensure swinging drawbar is locked in the centre position.
- Ensure 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.

---

**Important**

Raise Stairs before moving Cart.

Stair damage will occur in lowered position.
Hitching to Tractor (Tow Between Cart) - Continued

9445, 9550 and 9650 - Tow Between
9555, 9680 and 9800 - Tow Between

(Optional for 9365 and 9450)

- Ensure swinging drawbar is locked in the centre position.
- Ensure hitch pin is in good condition.
- Back tractor into position with drawbar a couple of feet in front of cart hitch clevis.
- 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.
- Unlock hydraulic hitch jack line lock valve.
- Operate tractor hydraulics to extend hydraulic hitch jack.
- Disengage hydraulic hitch jack lock.
- Operate tractor hydraulics to level clevis with tractor drawbar using hydraulic 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 cart connection is made, raise hydraulic hitch jack fully.
- Lock hydraulic hitch jack line lock valve.
- Route Safety Chain through chain support and drawbar support.
- Lock safety hook onto chain.

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

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 air cart to tractor.
- Back air cart into position, aligning seeding tool hitch with air cart.
- Attach hitch to air cart with 1 1/2” x 6 1/2” pin and retain with a 1/4” hair pin.
- Attach safety chain to air 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 Front Castor (Tow Behind Cart)

- Assemble hitch components to the front castor axle as shown in the accompanying diagram. Item (7) is 1 1/2” x 5 1/8” lg pin. Item (8) is 1 1/2” x 6 7/16” lg pin and Item (9) is 1 1/2” x 8 3/8” lg pin.

Note: Pin item (9) holding item (4) cannot be installed or removed with the wheel assembly mounted.

- Assemble safety chain to item (1) using 1” Unitorque nut and 1 1/16” ID flatwasher.
**Hitching to Seeding Tool (Tow Behind Cart)**

- Connect seeding tool to tractor.
- Attach hitch to air cart with 1 1/4” x 5” pin.
- Back seeding tool into position with air cart.
- Extend the telescopic hitch arms and connect the air cart to seeding tool using 1 1/8” x 3 11/16” pins.
- Block the tires of the air cart and insert the 1” x 5 13/32” pins into their bushings.
- Slowly back seeding tool toward air 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 air cart.

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

<table>
<thead>
<tr>
<th>PIN SIZE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>A</td>
<td>1 1/8” x 3 11/16”</td>
</tr>
<tr>
<td>B</td>
<td>1 1/2” x 5 5/8”</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>
**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.

---

**Important**

Extreme care is required when backing up unit. Hitch damage will occur if castor jackknifes.

---

**Important**

Raise Stairs before moving Cart. Stair damage will occur in lowered position.
Hydraulic Connections

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

- **Hydraulic fan drive**, 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” diameter hose for fan motor case drain, 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.
Operation

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 air cart away from seeding tool.

Unhitching from Tractor (Seeding Tool or Tow Between Cart)

9365 and 9450 - Tow Between

- Pin hitch jack in working 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 Tractor (Seeding Tool or Tow Between Cart) - Continued

9445, 9550 and 9650 - Tow Between

9555, 9680 and 9800 - Tow Between

(Optional for 9365 and 9450)

- Unlock hydraulic hitch jack line lock valve.
- Operate tractor hydraulics to lower hydraulic 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.

- Disconnect the clutch and monitor cables.
- Remove the safety chain and drawbar pin.
- Slowly move tractor one foot (30 cm) away from cart.
- Operate tractor hydraulics raising cart hitch to fully extend hydraulic hitch jack.
- Engage hydraulic hitch jack lock.
- 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.
- Lock hydraulic hitch jack line lock valve.
- Disconnect the hydraulic hoses.
- Slowly move tractor away from seeding tool or tow between cart.
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 air cart, if not equipped with hitch stands.
- Slowly move seeding tool away from air cart.
Quad Steer Operation

- Ensure safety chains are used at hitch pole connection to seeding tool.
- Retorque axle pivot bolts after first 2 hours and periodically afterwards. See “Quad Steer” in Maintenance Section for details.
- Retorque wheel nuts to 400 ft-lbs (542 Nm) after first fifteen minutes of operation and every fifteen minutes for the next 2 hours. Check periodically afterwards.
- Avoid sharp turns which cause the steering to reach its limits and drag the front tires of the cart.
- Do not tow any implements behind cart.
- Do not tow cart in excess of 20 mph (32 kph).
- Do not transport fully loaded cart on roadways.
- Use manufacturer’s rims and tires only.

Important

Extreme care is required when backing up unit.

Hitch damage will occur if axle jackknifes.
Operation

**Brakes**

Morris is using Titan's BrakeRite II brake actuation system located on back of frame near rear tires. The Titan BrakeRite II is an electric over Hydraulic brake system. The BrakeRite system is actuated when the brake pedal of the tractor is depressed. The Air Cart brakes can also be applied independently by applying the manual over-ride on the In-Cab Brake Controller.

**In-Cab Brake Controller**

The In-Cab Brake Control is equipped with a gain control to adjust the braking of the Cart to match operating conditions. The Controller is also equipped with a manual override button to apply the brakes on the Air Cart without applying the brakes on the tractor.

**Toggle Switch Functions**

- Switch Up (Towards the Operator) brake signal in is turned OFF (RED light flashes). Towing brake signal is used elsewhere. Control will operate in the manual mode only (PUSH button).
- Switch Down (Away from Operator) control responds normally to external brake signal.

**Turn Power ON**

GREEN LED is ON, indicates control is powered up.
RED LED Light Bar turns on for 3/5 seconds and displays last gain setting. Also, power out to brakes is on for this period.

**Set Gain**

Press the + symbol to increase braking if inadequate Cart braking is being experienced.
Press the - symbol to decrease braking if excessive Cart braking is being experienced.

*Note: These Buttons must be pressed repeatedly to change setting. Holding the buttons pressed only moves 1 step. Gain settings can be changed only when there is no external brake signal present.*

**Manual Operation**

Press “PUSH” button with variable force to apply brakes manually. This button is pressure sensitive.

*Higher Pressure on button = Higher brake pressure*

GREEN LED is ON when 12v power is in control.
RED LED flashes when brake switch is in the OFF position.
RED 10 positions LED Bar displays gain and level of braking.
Operation - Continued

Operation

Before using the Air Cart always check:

1) Proper Brake Fluid Level:
   Must be between 3/8 & 3/4 inch of filler opening.

2) Prior to Moving the Coupled Unit:
   a. Verify the brake system is working properly.
   To assure proper connections have been made, check In-Cab Controller green LED should light when switch is in ON position. Before moving the Cart depress the Tractor brake pedal, the BrakeRite unit should start (you can hear the unit running). Release the Tractor brake pedal and activate the BrakeRite unit by operating the “manual override” on the In-Cab Controller, again you will hear the unit turn on. With the manual override you are able to tell by the change in tone that the system is building pressure relative to the amount of “activation” initiated on the override switch. Do Not attempt to move the unit until the brake system performs in the tests described above.

3) When Operating/Transporting the Air Cart:
   a. Do not rely on the Air Cart brakes for deceleration of the entire combined unit braking. The Air Cart Brakes are designed for braking of the Air Cart only and not the entire combined unit.
   b. Always operate the combined unit within the specified parameters outlined in the Tractor Owner Manuals and OBEY ALL LAWS.

PROPER ELECTRICAL WIRING is CRITICAL for the performance of any of these systems. Improper wiring can result in damage to the actuation system or system failure after initial use. A “pure ground” and direct power (+12 VDC) with fuse or circuit breaker (30 amp) are necessary to ensure good performance.

Important:

Use only DOT III brake fluid.
Maintain fluid level within 3/8 to 1/2 inch below the filler opening.
Use caution when removing the filler cap to prevent contaminants entering into the fluid reservoir.
Getting the feel of the system and setting the In-Cab controller:

After the system responds to the tests previously described proceed with moving the unit to establish a feel for the brake system and set the desired brake response by setting the gain on the In-Cab Brake Controller.

Do Not attempt to operate this unit in traffic until totally familiarized with the “feel” and performance of the system. Every operator must be familiarized with the feel of the unit, the performance of the brake system, and the proper operation and setting selections of the In-Cab Brake Controller.

Operation:

Air Cart brakes are meant to assist the Tractor in the stopping of the combined units, they are not intended to stop the entire combined unit.

Thoroughly know the In-Cab Contorlrs performance and “feel” before any extensive travel is considered.

Manual override should be fully understood for safe operation. When operating on wet/slippery surfaces or going down a steep incline it is desirable to brake only with the Air Cart brakes to maintain alignment of the implements and help prevent a jack-knife condition. By maintaining adequate braking on the Cart, sway or the tendency of the Cart to “push” the Tractor is greatly reduced.
### Brakes - Continued

#### Installation - Continued

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<td>24</td>
<td>N53571</td>
<td>Battery Cable...</td>
<td>1</td>
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<tr>
<td>25</td>
<td>N53569</td>
<td>Holder Plate - Battery...</td>
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<tr>
<td>26</td>
<td>N53578</td>
<td>Bracket - Battery...</td>
<td>2</td>
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<td>27</td>
<td>N53579</td>
<td>Clamp Strap - Battery...</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>N19723</td>
<td>U-Bolt- 3/8 Dia x 4.063 x 6.938 UL...</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>N15716</td>
<td>Seal Strip - 1/4 x 1/foot...</td>
<td>3 FT</td>
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<tr>
<td>30</td>
<td>D-5488</td>
<td>Washer - .344 x .688 x 16 Gauge...</td>
<td>2</td>
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<tr>
<td>31</td>
<td>D-5579</td>
<td>Washer - .406 ID x 1 OD x 16 Gauge...</td>
<td>4</td>
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<tr>
<td>32</td>
<td>D-5279</td>
<td>Locknut - 3/8 Serrated...</td>
<td>8</td>
</tr>
<tr>
<td>33</td>
<td>C32925</td>
<td>Locknut - 5/16 Center...</td>
<td>3</td>
</tr>
<tr>
<td>34</td>
<td>W-475</td>
<td>Bolt - 3/8 x 1 Lg...</td>
<td>4</td>
</tr>
</tbody>
</table>

N52683 | Brake Hose Kit - (Contains Items 5, 6, 11, 13, 14 &15) |
N53391 | Brakerite SD Kit - (Contains Items 9 & 10) |
**Transport**

Observe all of the 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 air cart.
- Do not transport with the fan running.
- Ensure meter drive clutch switch is turned OFF.
- 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 mph (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 the towing tractor.
- 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)**

- Disconnect main hitch and remove the two pins connecting the hitch tube to the yard hitch tube.
- Attach hitch clevis to the yard hitch tube with two 1 1/2” x 5 1/8” and 1 1/2” x 6 7/16” pins.
- Retain the pins with klik-pins.
- Use tow hitch when towing without seeding tool.
- **Do not** use transport hitch with material in tank.

---

**Important**

*Raise Stairs before moving Cart.*

Stair damage will occur in lowered position.

MORRIS INDUSTRIES LTD. WILL NOT BE RESPONSIBLE FOR ANY DAMAGES OR OPERATOR INJURY RESULTING FROM NON-USE OR IMPROPER USE OF TRANSPORT LOCKS.
Transport - Continued

Disconnect Main Drive Chain

When traveling any distance the drive chain should be removed to prevent premature wear on the drive.

- Remove spring from the bottom idler.
- Remove chain from the jackshaft.
- Insert end of spring through the chain and hook other end of spring to the top idler as shown.

Main Drive Chain Installation

9365 and 9450 - Tow Between

9365, 9450 and 9535 - Tow Behind

9445, 9550 and 9650 - Tow Behind

- Unhook idler spring.
- Position chain on the jackshaft and idler sprockets as shown.
- Connect idler spring to transmission brace with idlers as shown.
Main Drive Chain Installation - Continued
9445, 9550 and 9650 - Mid Mounted Rear Axle
9800 Tow Behind and Tow Between

Note: Plate removed for clarity.

9650 Shown
**Metering System**

The 9 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 9 Series Air Cart can meter all types of seeds and fertilizers by simply installing the correct seed plate. See “Seed Plate 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:

1. The correct Seed Plates are installed for the product being applied.
2. The clean-out doors are fully closed and sealed.
3. 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 around 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.
Metering System - Continued

Seed Plate Sizes

The seed plate comes in 3 different sizes, fine, medium and coarse. Each seed plate is designed for use with specific product types.

The seed plate has only one position, fully closed against the back plates assembled to the metering body.

The polyurethane seed plates are identified by a part number on the front face as indicated:
N37670 - Coarse Seed Plate (plate only) - Yellow
N40845 - Medium Seed Plate (plate only) - Orange
N40840 - Fine Seed Plate (plate only) - Blue

Seed Plate Usage

<table>
<thead>
<tr>
<th>Product</th>
<th>Seed Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canola</td>
<td>Fine</td>
</tr>
<tr>
<td>Canary Seed</td>
<td></td>
</tr>
<tr>
<td>Clover/Alfalfa</td>
<td></td>
</tr>
<tr>
<td>Flax</td>
<td></td>
</tr>
<tr>
<td>Mustard</td>
<td></td>
</tr>
<tr>
<td>Nitrigin</td>
<td></td>
</tr>
<tr>
<td>Edge</td>
<td></td>
</tr>
<tr>
<td>Fortress</td>
<td></td>
</tr>
<tr>
<td>Rival</td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>Medium</td>
</tr>
<tr>
<td>Lentils</td>
<td></td>
</tr>
<tr>
<td>Milo</td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td></td>
</tr>
<tr>
<td>Safflower</td>
<td></td>
</tr>
<tr>
<td>Nodulator</td>
<td></td>
</tr>
<tr>
<td>Tag Team</td>
<td></td>
</tr>
<tr>
<td>Fine Fertilizer (no Sulphur or Potash)</td>
<td></td>
</tr>
<tr>
<td>28-0-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>46-0-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>34-17-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>20.5-0-0-24 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>Coarse</td>
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<tr>
<td>Peas</td>
<td></td>
</tr>
<tr>
<td>Soybeans</td>
<td></td>
</tr>
<tr>
<td>Sunflowers</td>
<td></td>
</tr>
<tr>
<td>0-0-60 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>0-45-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>10-46-0-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>11-51-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>Fertilizers containing Sulphur and/or Potash</td>
<td></td>
</tr>
</tbody>
</table>

Seed Plate Assembly complete with clips:
N37696 - Coarse Seed Plate Assembly
N40957 - Medium Seed Plate Assembly
N40956 - Fine Seed Plate Assembly
Seed Plate Installation

- Ensure Tank Shut-Offs are closed if there is product in the tanks.

**Note:** Tank Shut-Offs are only for use when inspecting/servicing meter body with product in tank.

- Install seed plate with hook to the top of the metering body.
- Rotate seed plate towards the metershaft with top part of seed plate hooked to the shaft running through the top of the meter body.
- Let the seed plate hang in the metering body.
- Rotate seed plate lock down to push seed plate against the back plate.
- Install the “J” bolts into the slotted lug welded to the meter body and tighten the wing nuts. Do not adjust the flange nuts on the “J” bolts. These nuts are preset on assembly. Refer to Maintenance Section under “Seed Plate Adjustment” for details.
- Ensure Tank Shut-Offs are opened.

**Important**

Seed Plate Position

Once “J” bolt wing nuts are tightened, indents in the side plates should just be visible in the slotted area of the hook.
Bin Level Adjustment

- Adjust bin level sensor to desired alarm point.
  - Top position for large seeds, high rates of fertilizer.
  - Middle position for cereal grains.
  - Lower position for fine seeds.

Full Bin Indicator

The Morris 9 Series Air Cart is equipped with a fill indicator to alert when bins are full during loading.

- Sensor position in tank can be adjusted by loosening U-Bolts and moving up or down on ladder.
- On some tractor models the tractor working lights need to be on in order to have power at the auger switch box - check by turning auger lights on.
- Turn fill switch to on position during filling.
- The appropriate light will illuminate when bin is full.
- Turn off while seeding.
The Morris 9 Series Air Cart can be equipped with an optional Digi-Star Weigh Scale to track product usage. Refer to the Digi-Star manual for setting and operating the scale.

The Digi-Star system requires the following numbers listed below to get the best feedback from the system - for the load cell setups utilized.

**Calibration Number**
- All Tow Between units - 46584
- 9650 Tow Behind - 62107
- 9800 / 91000 Tow Behind units - 62111

**Setup Number**
- 9650 Tow Behind / Tow Between - 147060
- 9800 Tow Behind / Tow Between - 147080
- 91000 Tow Behind - 147090

**Note:** The last three numbers represent the maximum weight that the system is measuring. Therefore for 147060 - it is weighing a max of 60,000 lbs. This can be changed to whatever maximum the operator wants - but as the total capacity increases sensitivity increments decrease.
Hydraulic Assist Conveyor/Auger

Remote Controller Operation

- Familiarize yourself with the remote functions.
- On initial startup of the system the remote needs to learn the transmitter signal of the solenoid by:
  1. Power up the solenoids Receiver located on Air Cart frame by turning on Tractor or unplugging and plugging in the receiver. This opens a 20 second registration window in the Receiver processor. If looking at the Receiver the Fault LED will be flashing.
  2. Immediately PRESS and HOLD the Controller’s Reset Button then within 2 seconds PRESS and HOLD the F1 Button, continue to hold BOTH BUTTONS for a MINIMUM of 5 seconds during this 20 second window. When the Transmitter is Registered the Receiver Fault LED will be illuminated for 3 seconds.

Note: Red light will flash on control box located on Cart frame when any arrow button is pressed indicating it is communicating with the remote controller.

Note: The remote will need to learn the transmitter signal each season of use and when batteries are replaced.

Operation

- Familiarize yourself with the remote functions.
- Ensure selector valve is in correct position for auger operation and engage tractor hydraulics.
- Press round green button to turn controller On.
- Press round red button to turn controller Off.
- Green arrows control inner arm.
- Blue arrows control outer arm.
- Red arrows control lift and lower.
- Store remote controller in tractor cab.

Note: The valve block has a restrictor valve to prevent excessively quick movement of the arms. If arms move rapidly hydraulic flow from tractor is reversed.
Auger

Manual Arms
Available only with standard hopper.

- Ensure lock pin is unlocked to allow free movement of the inner arm.
- Unlatch front cradle lock.
- Lift auger out of front cradle and pull away from cart.
- Refer to decal on frame for inner arm positions.
- Move inner arm to desired slot position by either pulling on auger or pushing on inner arm itself.
- Engage inner arm lock pin into slot for the tank to be loaded/unloaded.
- Complete auger positioning by swinging outer arm and auger into place as required.
- To place auger into storage position. Disengage lock pin, swing inner arm back to slot #1 and relock pin.
- Swing outer arm back fully toward cart.
- Lift auger until it contacts rear rest and swing front end into cradle.
- Latch front cradle lock before transporting.
Auger - Continued

Hydraulic Assisted Arms

- Ensure Fan/Auger selector valve is in correct position for auger operation and engage tractor hydraulics.
- Unlatch front cradle lock. Keep head and upper body clear of pad and cradle handle movement.
- Swing out the auger using controller to extend/retract cylinders as required. See “Remote Controller Operation” for details.

Note: The valve block has a restrictor valve to prevent excessively quick movement of the arms. If arms move rapidly hydraulic flow from tractor is reversed.

- Whether filling or dumping tanks, start by positioning inner arm then move outer arm as required. Refer to “Semi Trailer Filling Positions” for approximate auger arm positions (Conveyor shown).
- All tanks can be filled from a central hopper location. Keeping hopper anchored move both arms in small increments from one tank to the next.

Auger Storage Position

- Swing auger into storage position using remote control to extend/retract cylinders as required.
- Refer to “Semi Trailer Filling Positions” (Conveyor shown).

Note: Auger system does not have Lock/Unlock selector valve.

- Manually lock front cradle before transporting.

WARNING

OVERHEAD HAZARD

To prevent serious injury or death:
- Ensure lift cylinder is fully extended before unlatching Auger/Conveyor.
- Stay clear of cradle pad when locking and unlocking.
- Keep others away.
Auger - Continued

Extension Hopper

- Hopper flying speed is controlled by a flow control valve shown. Flow control range is from 0-2 gpm.
- Recommended initial setting is 1 gpm or # 5 on the range scale.
- With auger running, adjust flying speed as required for smooth feeding of material into main flying. The rpm can be estimated by counting revs for 15 seconds and multiplying by 4, it should be 100 + rpm.

Note: Correct lower auger speed should be between 100 to 120 rpm when valve is set to maximum flow. Excessive hopper flying speed may reduce main flying speed noticeably. Keep hopper flying speed at the minimum required for proper feeding.

- Hopper is supplied with a bottom cleanout door for easy removal of material.
Conveyor

Hydraulic Assisted Arms

- Ensure Fan/Auger selector valve is in correct position for conveyor operation and engage tractor hydraulics.
- Switch conveyor valve to the “Lock/Unlock” position.
- Unlock cradle pads on the conveyor by operating red arrow buttons on remote control.
- Check to ensure both locks are fully released.
- Swing out the conveyor using controller to extend/retract cylinders as required. See “Remote Controller Operation” for details.

Note: The valve block has a restrictor valve to prevent excessively quick movement of the arms. If arms move rapidly hydraulic flow from tractor is reversed.
Operation

Conveyor - Continued

- Whether filling or dumping tanks, start by positioning inner arm as indicated then move outer arm as required. Refer to “Semi Trailer Filling Positions” for approximate arm positions.
- All tanks can be filled from a central hopper location. Keeping hopper anchored move both arms in small increments from one tank to the next.

Conveyor Storage Position

- Swing conveyor into Storage position using remote control to extend/retract cylinders as required. Refer to “Semi Trailer Filling Positions” for approximate arm positions.
- Check to ensure both locks are fully engaged before transporting.

Conveyor Belt Speed

The conveyor only requires a flow of 10-15 gpm for optimum feed rate. To ensure the belt does not exceed the maximum speed, a Flow Control Valve is incorporated into the hydraulic circuit maintaining 15 gpm of flow to the conveyor when fan speeds are greater than 3500 rpm.

The recommended conveyor belt speed range for optimum feed rate is as follows:

<table>
<thead>
<tr>
<th>CLEATED BELT SPEED</th>
<th>CLEATED BELT - TIME / REV</th>
<th>CORRESPONDING FAN SPEED</th>
<th>HYDRAULIC FLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum 400 FT/MIN</td>
<td>7 SEC 8 SEC</td>
<td>2400 RPM</td>
<td>10 GPM</td>
</tr>
<tr>
<td>Maximum 600 FT/MIN</td>
<td>4.5 SEC 5.5 SEC</td>
<td>3500 RPM</td>
<td>15 GPM</td>
</tr>
</tbody>
</table>

Note: Exceeding the recommended belt speed will reduce product capacity and increase seed damage and may cause hydraulic motor seal failure. Motor Seal Kit Number is N55718.

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.

Warning

OVERHEAD HAZARD

To prevent serious injury or death:
- Ensure lift cylinder is fully extended before unlatching Auger/Conveyor.
- Stay clear of cradle pad when locking and unlocking.
- Keep others away.
Operation

Set Conveyor Belt Speed before operating. Refer to “Conveyor Belt Speed” for details.

One person must be in a position to monitor the operation of the conveyor at ALL times. The operator should be alert to any unusual vibrations or noises that might indicate the need for service or repair during the initial startup and break-in period.

For smoother startups, keep the conveyor from starting totally full. This will also ensure efficient operation.

In cold weather, run empty conveyor for five minutes to warm up belt. Otherwise, do not operate the conveyor empty for long periods of time.

You must “break-in” the conveyor when it is new and at the beginning of each season. Refer to “Startup and Break-In” below.

Make sure the drive end is empty before shutting down the conveyor.

Be certain to close ALL clean-out and inspection doors in the main conveyor hopper before operating.

The operator should not add power before viewing the entire work area and checking that ALL personnel are clear of the designated work area.

The operator should regulate the grain flow to the main conveyor by controlling the amount of grain fed into the hopper. Avoid plugging the main conveyor by overfeeding the hopper.

Be certain that all safety shields and devices remain in place during operation.

Ensure that hands, feet, and clothing are kept away from moving parts.

Stop the engine and lockout the power source whenever the equipment must be serviced or adjusted.

Startup and Break-In

A. Any conveyor that is new or has set idle for a season needs to go through a “break-in” period.

B. Engage the Conveyor at a slow RPM to minimize shock loads.

C. Do not allow the conveyor belt to “load up” at a low speed. If this occurs, high torque must be used to turn the belt and this can damage the conveyor.

D. Run the conveyor at partial capacity until several hundred bushels of grain have been conveyed and the belt and tube are polished.

E. Retighten belt to restore original belt tension.

F. When the belt and tube are polished and smooth, slowly work up to the recommended speed and run the conveyor at full speed.

Warning

NEVER perform maintenance on the conveyor unless all safety shields are in place.

Replace any that are damaged or lost. Do not clean, adjust, or lubricate any part of the machine.
Conveyor - Continued

Conveyor Adjustments and Maintenance

Belt Tension/Tracking - Inspect Daily when cleaning out seed/fertilizer

*Damage to the belt caused by improper tracking is not covered under warranty.*

Adjust tension of 2" cleated belt in conveyor tube to 23 ft-lbs torque on idler roller adjustment bolts. Adjust both sides evenly.

Adjust tension of crescent belt in hopper to 50 inch-lbs torque on idler roller adjustment bolts or until center of belt rises off the support underneath it. Adjust both sides evenly.

Check/adjust belt tracking alignment on idler rollers.

1. **Rollers must be square with the housing and parallel to each other to insure proper belt tracking.**

2. Belt Tension must be great enough to prevent slippage. Check tension of the belts before running the conveyor.

3. Run the conveyor. Check to see that the belt runs centered on the drive roller. Turn off the conveyor. Adjust drive roller to be square with the housing if necessary. **Normally, once the drive roller is tracked at the factory it rarely needs adjustment.**

4. To adjust drive roller, loosen the four nuts on the bearing holder plate, and the jam nut on the threaded adjuster. Retighten after adjusting is complete.

5. Run the conveyor for two minutes.

6. Turn the conveyor off and open the Tail End Cleanout Door to view the idler roller. Check to see that the belt is running centered on the idler roller. **There should be approximately 1/2” gap between the housing and the belt on both sides. Rubbing on the side of the housing can cause severe damage to the belt and/or affect filling capacity.**

7. If adjustment is necessary, **TIGHTEN the roller on the side of the housing that the belt is closest to, or rubbing on.** Adjust bolt in 2-3 turn increments. Run the conveyor after each adjustment to see the result.

8. Once the belt is centered, run the conveyor for at least two more minutes to insure the belt remains in position.

9. Lock adjustment bolt jam-nuts and reinstall the clean out door.

**NOTE: Adjust the tracking on the hopper crescent belt in a similar fashion.**
Conveyor - Continued

Cleaning/Inspecting the Conveyor - 8 hours or Daily

- The conveyor tail areas must be inspected and cleaned out before use each day or preferably at the end of the day. This will help prevent material residue from building up, freezing and causing belt damage and/or difficulty driving the belt.

- The conveyor drive end should be inspected and cleaned every 40 hours or weekly for the same reasons.

Conveyor Belt/Tail End Care

- It is highly recommended that both conveyor belts be washed off and the entire tail end be cleaned out at the end of the season.

- This will help prevent material residue from building up and causing rust/paint and/or belt damage.

- In order for water to drain from the lower crescent belt, position the splice on the top side by running and then stopping the conveyor when the splice appears in the hopper.

- WHEN CLEANING, INSURE ALL HARDENED OR STUCK-ON MATERIAL IS REMOVED.
Semi Trailer Filling Positions

Below is a typical filling sequence from a semi trailer. Due to variations in trailers this procedure may vary.

NOTE: RECOMMENDED MOVEMENT IS SHOWN BY THE TIGHT ARROWS. MINIMUM ARM MOVEMENT WILL SIMPLIFY THE OPERATIONAL ANGLE. DIMENSIONS ARE SHOWN FOR RELATIVE MOVEMENT. ONLY VALUES MAY VARY.
Filling Sequence - Continued

Step 2

1. Align the cylinder with the lift cylinder in the center.
2. Lower the conveyor to the trailer.
3. Parallel to the air cart.
4. Hold the conveyor appox. 4 ft.

Rail Frame

Guide Cylinder From Cylinder

Clear Cylinder Pads

With lift cylinder fully

Lower conveyor fully

Switch selector valve
FILLING SEQUENCE

STEP 3

- Lift weight of conveyor just off the ground with lift cylinder under trailer and toward front chute as close as possible.
- Arms remain unmoved.

13-14 ft rail centered on tank openings.

65°

43°

38°
FILLING SEQUENCE

STEP 4

MOVE BOTH INNER AND OUTER ARMS AS SHOWN AND GUIDE CONVEYOR HOPPER TO CHUTE. LIFT CYLINDER UNTIL HOPPER IS LINED UP WITH TANK OPENING. LOWER CONVEYOR TO THE GROUND COMPLETELY WITH FRAME FROM 12-14 FT RAIL TO FRONT TRAILER CENTERED ON TANK OPENINGS.

CENTER OF TANK OPENING

FRONT CHUTE CENTERED ON TANK OPENINGS

TRAILER FRONT
Semi Trailer Filling Positions - Continued

- When moving from 2nd to 3rd tank extend inner arm first then extend outer arm as required.

12-14 ft from frame rail

1st arm 88°

2nd arm 85°

Center of tank filled

Chute centered on tank openings

Front trailer front
Operation

Semi Trailer Filling Positions - Continued

- Fully retract inner arm.
- Outer arm should be slightly extended as shown.
- Swing conveyor from parallel to air cart.
- Frame and cranes parallel to lift conveyor fully with lift cylinder.

TRANSPORT POSITION

13'-14' from leading rail.

CENTER OF TANK OPENINGS

FRONT TRAILER CHUTE CENTERED ON TANK OPENINGS

38°

65°
Semi Trailer Filling Positions - Continued

STEP 2

Transport Position

- Guide conveyor into outlet arm fully as shown
crADLES BY RETRACTING
- Front pad while
- Lower conveyor onto
- Outlets arm fully as shown
- Switch selector valve
- Rear pad
- Lift/lower buttons
- Close locks with
- 10 conveyor lock/unlock
- ON REMOTE

Front Trailer

ON TANK OPENINGS
CUTTER CENTERED
FRONT TRAILER

ON TANK OPENINGS
CUTTER CENTERED
FRONT TRAILER

Operation

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Semi Trailer Filling Positions - Continued

Operation

June 2018
Semi Trailer Dump Positions

**DUMP REAR TANK**

- To dump rear tank on tow between models, conveyor must be moved under air cart before trailer is positioned.
- In front of light bracket and around behind wheels and conveyors must be moved from frame rail.

**13-14 FT**

**167°**

**42°**

Center of tank openings.

**TRAILER FRONT**
Semi Trailer Dump Positions - Continued

- TO DUMP 4TH TANK SWING CONVEYOR UNDER FRONT CRADLE

13'-14' FROM FRAME RAIL

115°

TRAILER FRONT
Filling Tank

The Morris 9 Series Air Cart is equipped with 2, 3 or 4 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 tank capacity chart.

- Open lid fully on tank being filled.
- Check and remove any debris inside tank.
- Remove clean-out door.
- Remove seed plate.
- Check for debris inside metering body.
- Ensure Tank Shut-Offs work freely.

Note: Tank Shut-Offs are only for use when inspecting/servicing meter body with product in tank.

- Check that the correct seed plate is installed for the product being applied.
- 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:

1. The correct seed plate is installed for product being applied.
2. The clean-out doors are fully closed and sealed.
3. The plastic bag covering the fan is removed.
4. 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.
Filling Tank - Continued

- Unlatch auger/conveyor lock.
- Swing out the auger/conveyor.
- Open lid on tank to be filled and place auger spout in tank.
- Position truck with the hopper and engage the hydraulic motor on the auger.
- Ensure selector valve is in correct position for auger operation and engage tractor hydraulics.

DANGER

ROTATING FLIGHTING HAZARD
Keep away from auger intake.
Keep intake shield in place and in good working order. Do not modify.
FAILURE TO HEED WILL RESULT IN SERIOUS INJURY OR DEATH.
Filling Tank - Continued

- Auger product into tank until desired level in tank is reached. (If equipped with the optional fill indicator fill until indicator light turns on. See “Full Bin Indicator”)
- Stop the flow of product into the auger/conveyor and allow auger/conveyor to empty.
- Auger operation can be controlled from either the top or bottom of the auger/conveyor.
- Clean lid seal and ensure lid seal is positioned correctly before closing tank lid.
- AUGER ONLY - Reverse auger flow to clean out the hopper.
- Place auger/conveyor in transport position.
- Secure auger/conveyor cradle locks.
- Remove the plastic bag covering fan.
- Check lid for air leaks with your hands once air cart fan is operational. See Maintenance Section 7.
- Check metering body for air leaks. See Maintenance Section 7.

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.

Important
Do not exceed 10 mph (16 kph) in field operation.
Filling Tank - Continued

- Raise stairs into storage position.
- Engage stair lock to secure stairs in storage position.

Note: Stairway down indicator will flash when stairs are in lowered position.
Unloading Tanks
Emptying tanks is quick and easy to do.

- Move flapper valves to “Clean-Out” position on the collector body. (Double Shoot Only)
- Open collector bottom.
- Install Clean-Out Chute to collector bottom, if so equipped.
- Open inspection door
- Position auger under the tank to be emptied.
- Start auger.
- Open seed plate to first lock point, this will allow material to flow through the metering body into the auger.
- Once all material stops flowing, move “Shut-off” levers in and out a few times to dislodge any product and ensure free movement.
- Remove seed plate completely.
- Rotate meter shaft using crank to empty meter wheel flutes.
- Brush out remaining material in the corners and on top of the back plate.
- Reset flapper valves to correct position for product delivery. Ensure that the flapper settings are correct. This can be done by visually checking that the flappers are fully over and touching the side walls, sealing off the individual airstreams. The flappers can be adjusted by loosening the individual adjusting setscrews and applying pressure to the flapper forcing it against the side wall while tightening the setscrew.
- Reinstall correct seed plate for product being metered.
- Reinstall inspection door and collector bottom ensuring that the seals are free from leaks.
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.

Operation

Unloading Tanks - Continued

Metering Rate Adjustment
The metering rate adjustment for all tanks is done in the same manner. The rate varies with the speed of the metering wheels. A new rate is achieved by changing a sprocket on the Posi-Drive Transmission. Refer to the rate charts for desired application rate and sprocket selection.

- Loosen metering chain on posi-drive transmission, by loosening the idler.
- Spin off wing nut and remove rate change sprocket.
- Install desired rate change sprocket and tighten wing nut.
- Tighten chain by adjusting idler.

Note: Do not over tighten chain, just take slack out of chain.
Rate Charts

Spacing Sprocket

The rate chart applies to all spacings listed below.

Check that the correct spacing sprocket is installed on your machine. This sprocket is located on the inner side of the rear transmission on the clutch output shaft.

The spacing sprocket must be matched to the seeding tool trip spacing.

Determining Spacing Sprocket

To determine spacing sprocket for other spacings not listed in the chart use the following equation:

New Spacing Sprocket = \left( \frac{\text{New Spacing}}{12''} \right) \times 20

The rate charts and drive rates are all based upon 12" spacing - 20 tooth sprocket.

Note: Incorrect spacing sprocket will cause inaccurate application rates.

Note: Due to ratios of spacing the value may not be a whole number and should be rounded to nearest value.

<table>
<thead>
<tr>
<th>Spacing Sprocket</th>
<th>Opener Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.2&quot; (183 mm)</td>
</tr>
<tr>
<td></td>
<td>7.5&quot; (191 mm)</td>
</tr>
<tr>
<td></td>
<td>8&quot; (203 mm)</td>
</tr>
<tr>
<td></td>
<td>9&quot; (229 mm)</td>
</tr>
<tr>
<td></td>
<td>10&quot; (254 mm)</td>
</tr>
<tr>
<td></td>
<td>12&quot; (305 mm)</td>
</tr>
<tr>
<td></td>
<td>15&quot; (381 mm)</td>
</tr>
</tbody>
</table>

Note: The rate charts should only be used as a guide. Variation in seed size, density, shape, tire pressure and wheel sinkage are all factors that can influence the seed rate.
Rate Charts - Continued

Spacing Sprocket - Continued

9450, 9550 and 9650

9650 shown

9800 and 91000

N19064 58 LINK

N55812 288 LINK

N55813 316 LINK

N19064 58 LINK

N55812 288 LINK

N55813 316 LINK

N55161 Transmission Assembly

Spacing Sprocket

N50955 Transmission Assembly

Tire Sprocket

Tire Sprocket

Tire Sprocket
Rate Charts - Continued

Tire Size Sprocket

In conjunction with the spacing sprocket is the tire size sprocket as illustrated in the previous diagram.

Check that the correct tire sprockets are installed on your machine. These sprockets are located on the inner side of each transmission input shaft and are driven by the spacing sprocket.

The tire sprocket must be matched to the tire size of the air cart.

Determining Tire Circumference

Factors that may affect the tire circumference and in turn metering rates and monitor PP400 values are as follows:

- Manufacturing tire size tolerances can vary +/- 4%.
- Tire pressure.
- Field soil conditions (firm-unworked versus soft-worked).
- Tank capacity (empty tanks versus full tanks).
- Tire manufacturer (Good Year versus Firestone).

Note: The values used for monitor PP400 values and tire size sprockets is based upon the tire circumference of Good Year tires at proper pressure with half full tanks in normal working field conditions.

To determine tire sprocket for other tires not listed in the chart or to check the actual tire circumference use the following equation:

- The tire circumference should be checked under normal field conditions with tanks half full.
- Mark tire and starting point.
- Drive air cart 10 revolutions of tire.
- Mark ending point.
- Measure distance from starting point to ending point and divide by 10 to get the rolling circumference of the tire.

New Tire Sprocket Size:

For 32” Rim = \( \frac{5992}{Tc} \)

For 38” Rim = \( \frac{5992}{Tc} \)

\( Ts = \frac{Tc}{Tc} \)

\( Tc = \) Tire Circumference measured in inches

Note: Incorrect tire size sprocket will cause inaccurate application rates.

Important

Tire circumference affects metering accuracy. Tire Circumference should be determined for your field conditions by following procedure below. Then determine “New Crank Rotations” outlined under Crank Calibration Table. Also determine new “PP400” see “PP400 Calculation” in Monitor Section 6.

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Tire Style</th>
<th>Rating</th>
<th>Tire Sprocket</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.5 x 32</td>
<td>AWT (Implement)</td>
<td>12 ply</td>
<td>28 teeth</td>
</tr>
<tr>
<td>30.5 x 32</td>
<td>Lug (Dyna Torque II)</td>
<td>14 ply</td>
<td>28 teeth</td>
</tr>
<tr>
<td>520/85 R38</td>
<td>Radial (Ultra Torque)</td>
<td>155 A8</td>
<td>28 teeth</td>
</tr>
<tr>
<td>710/70 R38</td>
<td>Radial (Dyna Torque)</td>
<td>166 A8</td>
<td>26 teeth</td>
</tr>
<tr>
<td>800/65 R32</td>
<td>Radial (Dyna Torque)</td>
<td>172 A8</td>
<td>28 teeth</td>
</tr>
<tr>
<td>800/65 R32</td>
<td>Radial (Dyna Torque)</td>
<td>172 A8</td>
<td>28 teeth</td>
</tr>
<tr>
<td>800/70R38</td>
<td>Radial (Dyna Torque)</td>
<td>173 A8</td>
<td>24 teeth</td>
</tr>
<tr>
<td>850/80R38</td>
<td>Radial (Dyna Torque)</td>
<td>180 A8</td>
<td>22 teeth</td>
</tr>
<tr>
<td>900/60 R32</td>
<td>Radial (Dyna Torque)</td>
<td>176 A8</td>
<td>26 teeth</td>
</tr>
</tbody>
</table>
Rate Charts - Continued

Rate Chart Use

The rate chart applies to all spacings listed below.

The spacing sprocket must be matched to the seeding tool trip spacing see “Spacing Sprocket”.

The charts should only be used as a guide. Specific rates can be achieved by using the rate check method as outlined under “Rate Calibration”.

To determine a seed/fertilizer rate from the chart:

• Go to the desired rate along the line marked “Standard” of a specific graph. (i.e. 95 lbs/acre of wheat)
• Go straight up from that point to where that line is intersected by the graph. This will give the sprocket size required to give the particular rate chosen.
• At this intersection go straight across to the vertical line of the graph. This will give the sprocket size required to give the particular rate chosen. (i.e. 95 lbs/acre of wheat requires a 29 tooth sprocket)
• Change the Quick Change Sprocket see “Metering Rate Adjustment”.
• Perform a rate check to confirm the seed rate see “Rate Calibration”.
• Repeat the above procedure for the other tank.
• For very low or very high rates, see next page “Extra Low Rates” and “Extra High Rates”.

Note: The rate charts should only be used as a guide. Variation in seed size, density, shape, tire pressure and wheel sinkage are all factors that can influence the seed rate.
Extra Low Rates

Although the charts show a minimum rate of 35 lbs. per acre for fertilizer and 20 lbs. per acre for seed, sometimes this is not low enough, especially when product is being metered from both tanks.

Rates under the values mentioned can be achieved by replacing the standard 25 tooth meter shaft sprocket on the front of the transmission with either a 35 or 40 tooth sprocket.

The rates obtained when using the 35 and 40 tooth sprocket are shown on the rate charts beside the respective size sprocket.

When both tanks are being used to meter the same product then the 25 tooth sprocket on each transmission must be changed. Now both transmissions will have the same size metershaft sprocket.

The same metering chain can be used with these larger sprockets up to a certain size of quick change sprocket.

To determine a rate from the chart:

- Go to the desired rate along the line next to the size of metershaft sprocket used.
- Go straight up from that point to where that line is intersected by the graph line of the particular product being metered.
- At this intersection go straight across to the vertical line of the graph. This will give the sprocket size required to give the particular rate chosen.
- Change the quick change sprocket and repeat the rate check to confirm the seed rate.
- Repeat the above procedure for the other tanks.

Extra High Rates

In areas where higher rates of product are required the metershaft sprocket is changed from the standard 25 tooth to a 15 tooth.

Use the method described under EXTRA LOW RATES to determine the required metering rate.

<table>
<thead>
<tr>
<th>Rate</th>
<th>Metershaft Sprocket Size</th>
<th>Maximum Size of Quick Change Sprocket</th>
<th>Minimum Size of Quick Change Sprocket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>25 Tooth</td>
<td>45 Tooth</td>
<td>12 Tooth</td>
</tr>
<tr>
<td>Low Rate (1)</td>
<td>35 Tooth</td>
<td>33 Tooth</td>
<td>12 Tooth</td>
</tr>
<tr>
<td>Low Rate (2)</td>
<td>40 Tooth</td>
<td>26 Tooth</td>
<td>12 Tooth</td>
</tr>
<tr>
<td>High Rate</td>
<td>15 Tooth</td>
<td>45 Tooth</td>
<td>18 Tooth</td>
</tr>
</tbody>
</table>
**Rate Charts - Continued**

**Fertilizer Rate Chart**

<table>
<thead>
<tr>
<th>Fertilizer Type</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 F2 F3 F4 F5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>(COARSE AGGREGATE BLENDS)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F4 COARSE 5611-51-0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 MEDIUM 4846-0-0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F5 COARSE 670-0-60</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2 MEDIUM 4846-0-0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3 MEDIUM 6020.5-0-0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F4 COARSE 670-0-60</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Blend</th>
<th>Rate Chart Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 MEDIUM 4846-0-0</td>
<td></td>
</tr>
</tbody>
</table>

- **Density**: LBS/FT
- **Seed Air Seeder Rate Chart**
- **Diameter**: 5-66
- **June 2018 9 Series Air Cart**
- **Rate (LBS/ACRE)**

**NOTE**: 1) RATE CHART APPLIES TO 7-1/2", 8", 9", 10" & 12" SPACINGS.
2) CLUTCH OUTPUT SPROCKETS FOR 7-1/2" SPACING - 12 TOOTH
   8" SPACING - 13 TOOTH
   9" SPACING - 15 TOOTH
   10" SPACING - 17 TOOTH
   12" SPACING - 20 TOOTH
3) THIS RATE CHART SHOULD ONLY BE TAKEN AS A GUIDE FOR FINDING THE APPROPRIATE SPROCKET. RATE WILL VARY WITH DIFFERENT MATERIAL DENSITIES AND SEED SIZES. SEE PROCEDURE DESCRIBED IN THE OPERATORS MANUAL TO OBTAIN A PRECISE RATE.
4) THIS RATE CHART IS NOT INDICATIVE OF THE MAXIMUM AMOUNT OF PRODUCT THAT CAN BE APPLIED. CAPACITY WILL VARY WITH GROUND SPEED AND CULTIVATOR WIDTH.
5) METER SHAFT SPROCKET QUICK CHANGE SPROCKETS
   - 25 TOOTH - 45 TOOTH MAX.
   - 40 TOOTH - 26 TOOTH MAX.
   - 35 TOOTH - 33 TOOTH MAX.
   - 15 TOOTH - 45 TOOTH MAX.

**R39023**
Rate Charts - Continued

Seed Rate Chart

Rate Chart

DIRECT DRIVE

NOTE:
1) RATE CHART APPLIES TO 7-1/2", 8", 9", 10" & 12" SPACINGS.
2) CLUTCH OUTPUT SPROCKETS FOR: 7-1/2" SPACING – 12 TOOTH
     8" SPACING – 13 TOOTH
     9" SPACING – 15 TOOTH
     10" SPACING – 17 TOOTH
     12" SPACING – 20 TOOTH
3) THIS RATE CHART SHOULD ONLY BE TAKEN AS A GUIDE FOR
   FINDING THE APPROPRIATE SPROCKET. RATE WILL VARY WITH
   DIFFERENT MATERIAL DENSITIES AND SEED SIZES.
   SEE PROCEDURE DESCRIBED IN THE OPERATOR’S MANUAL
   TO OBTAIN A PRECISE RATE.
4) THIS RATE CHART IS NOT INDICATIVE OF THE MAXIMUM
   AMOUNT OF PRODUCT THAT CAN BE APPLIED. CAPACITY WILL
   VARY WITH GROUND SPEED AND CULTIVATOR WIDTH.
5) METER SHAFT SPROCKET QUICK CHANGE SPROCKET

<table>
<thead>
<tr>
<th>METER SHAFT SPROCKET</th>
<th>25 TOOTH</th>
<th>45 TOOTH MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 TOOTH</td>
<td>12 TOOTH MIN.</td>
<td></td>
</tr>
<tr>
<td>40 TOOTH</td>
<td>12 TOOTH MIN.</td>
<td></td>
</tr>
<tr>
<td>35 TOOTH</td>
<td>12 TOOTH MIN.</td>
<td></td>
</tr>
<tr>
<td>15 TOOTH</td>
<td>18 TOOTH MIN.</td>
<td></td>
</tr>
</tbody>
</table>

N36022
Operation

Rate Charts - Continued

Slow Speed Seed Rate Chart

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>25 TOOTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW RATE</td>
<td>45 TOOTH</td>
</tr>
<tr>
<td>HIGH RATE</td>
<td>40 TOOTH</td>
</tr>
<tr>
<td>METER SHAFT SPROCKET</td>
<td>RATE (LBS/ACRE)</td>
</tr>
<tr>
<td>15 TOOTH</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: 1) RATE CHART APPLIES TO 7-1/2", 8", 9", 10", & 12" SPACING.
2) CLUTCH OUTPUT SPROCKETS FOR 7-1/2"SPACING - 12 TOOTH
5"SPACING - 13 TOOTH
9"SPACING - 15 TOOTH
10"SPACING - 17 TOOTH
12"SPACING - 20 TOOTH
3) THIS RATE CHART SHOULD ONLY BE TAKEN AS A GUIDE FOR FINDING THE APPROXIMATE SPROCKET, RATE WILL VARY WITH DIFFERENT MATERIAL DENSITIES AND SEED SIZES.
4) METER SHAFT SPROCKET QUICK CHANGE SPROCKETS

RATE CHART AIRSEEDER

- CANOLA - C - RINE 52
- MUSTARD - M - RINE 56
- CANARY SEED - M - 44
- ALFALFA - A - RINE 42
- CLOVER - A - 45
- NODULATOR - N - MEDIUM 70
- TAG TEAM - T - MEDIUM 53
- EDGE - E - RINE 78
- FORTRESS - F - RINE 50
- RIVAL - R - RINE 55

SLOW SPEED DRIVE
Rate Calibration

- Ensure tires are at correct pressure.
- Determine Tire Circumference (Tc) as follows:
  - Check under normal field conditions with tanks half full.
  - Mark tire and starting point.
  - Drive air cart 10 revolutions of tire in a straight line.
  - Mark ending point.
  - Measure distance from starting point to ending point and divide by 10 to get the rolling circumference of the tire (Tc).

- Calculate the number of rotations (R) of the calibration crank for 1/10 Acre. Record value below for future reference.
  Note: For reference nominal (R) values are listed in Section 12 of the manual.
- Calculate required tire sprocket size (Ts) and to ensure correct sprockets are installed on the Air Cart. Record value below for future reference.
  Note: Due to ratios the value may not be a whole number and should be rounded to nearest value.
- Calculate the monitor PP400 setting. Record value below for future reference. Change monitor to new PP400 value as outlined under “Changing Monitor Settings” under Monitor Section.

Example:
For a 9450 with 800/65 R32 Tires and a 51 ft wide seeding tool (W) with:
  The measured Tire Circumference (Tc) was 211.6 inches.
  For 32” Rim
  Crank Rotations (R) = (82328.4/W)/Tc
  = (82328.4/51)/211.6
  = 7.63
  Monitor PP400 = 80640/Tc
  = 80640/211.6
  = 381

Note: Formulas are different for Air Carts with BRAKES, this is due to the difference in drive sprocket teeth.

Calibration Formulas - Imperial

Rotations of Crank for 1/10 Acre:
For 32” Rim = (82328.4/W)/Tc
For 38” Rim = (82328.4/W)/Tc  R =

Tire Sprocket Size:
For 32” Rim = 5992/Tc
For 38” Rim = 5992/Tc  Ts =

Monitor PP400 Setting:
For 32” Rim = 80640/Tc
For 38” Rim = 80640/Tc  PP400 =

Tc = Tire Circumference measured in inches
W = Working Width measured in feet
Optional Acre Tally Factor:
F = 56/R  F =

See Metric Section 11 for metric formulas.
### Rate Calibration - Continued

#### Seed Plate Usage

<table>
<thead>
<tr>
<th>Product</th>
<th>Seed Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canola</td>
<td>Fine</td>
</tr>
<tr>
<td>Canary Seed</td>
<td></td>
</tr>
<tr>
<td>Clover/Alfalfa</td>
<td></td>
</tr>
<tr>
<td>Flax</td>
<td></td>
</tr>
<tr>
<td>Mustard</td>
<td></td>
</tr>
<tr>
<td>Nitragin</td>
<td></td>
</tr>
<tr>
<td>Edge</td>
<td></td>
</tr>
<tr>
<td>Fortress</td>
<td></td>
</tr>
<tr>
<td>Rival</td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>Medium</td>
</tr>
<tr>
<td>Lentils</td>
<td></td>
</tr>
<tr>
<td>Milo</td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td></td>
</tr>
<tr>
<td>Safflower</td>
<td></td>
</tr>
<tr>
<td>Nodulator</td>
<td></td>
</tr>
<tr>
<td>Tag Team</td>
<td></td>
</tr>
<tr>
<td>Fine Fertilizer (no Sulphur or Potash)</td>
<td></td>
</tr>
<tr>
<td>28-0-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>46-0-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>34-17-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>20.5-0-0-24 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>Coarse</td>
</tr>
<tr>
<td>Peas</td>
<td></td>
</tr>
<tr>
<td>Soybeans</td>
<td></td>
</tr>
<tr>
<td>Sunflowers</td>
<td></td>
</tr>
<tr>
<td>0-0-60 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>0-45-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>10-46-0-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>11-51-0 Fertilizer</td>
<td></td>
</tr>
<tr>
<td>Fertilizers containing Sulphur and/or Potash</td>
<td></td>
</tr>
</tbody>
</table>

Note: Seed Plate Chart is a suggested usage. Product variations could require a different seed plate to be used for proper metering.

i.e. Clean 11-51-0 Fertilizer may require a Medium seed plate to reduce product flow.

- Ensure correct seed plates are installed.
- Fill tank 1/2 full and drive 600 - 1000 feet to compact product in the tanks.
- Select and install meter rate sprocket per Rate Chart.
- Set Flapper Valves to the "Calibration" position.
- Remove the collector bottom from the bottom of the collector body.
- Hook the Rate Calibration Insert on collector bottom and rotate up into postion. Secure in place with slide lock.
Rate Calibration - Continued

- Remove the metering chain from the transmissions that are **not** being checked.

**Note:** For Hydraulic Rate Calibration see “Rate Calibration” in Section 6 - Monitor.

- Attach the crank to the calibration shaft.
- Turn the crank in direction of the arrow until material begins to fall through the collector body.
- Slide rate check box on the collector body.
- Turn the crank in direction of the arrow the required number of turns (**R**).

**Note:** The fan must not be running when a rate check is performed.

**Note:** Incorrect rates will occur if crank is rotated clockwise or not turned precisely the correct number of turns.
Rate Calibration - Continued

- Weigh the sample by using tarp straps to hook rate check box to scale.

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

- Check this rate against rate required.
  
  **For 1/10 acre sample:**
  
  \[ \text{Rate} = \frac{\text{Sample Weight (lbs)}}{10} \]

- If a different rate is required then increase or decrease the size of the rate change sprocket. Increasing the sprocket size will increase the rate and vice versa.

- Remove rate calibration insert and close collector bottom ensuring that the seals are free from debris and leaks.

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

- Once calibration checks have been completed place rate check box into storage bracket.

- Secure transmission covers in place.

- After seeding a few acres recalibrate for more accurate results.

---

For all **Low Rates** (less than 10 lb/ac) it is recommended to take a large sample. Typically to take a sample for 1/2 acre or 1 acre.

**Example:**

**For 1/2 acre sample for a 71ft wide seeding tool with a 9650 with 520/85R38 Dual Tires:**

The number of crank turns required for a 1/2 acre is the number of turns required for 1/10 acre for a specific machine width x 5.

From the Calibration Table

- Turns required for 1/10 acre = 5.42
- Turns required for 1/2 acre = 5.42 x 5 = 27.1

\[ \text{Rate} = \frac{\text{Sample Weight (lbs)}}{2} \]

**9450 Shown**

- Secure Covers
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 All the Posi-Drive Transmissions.

- 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.

### Applying Inoculant

When inoculant is applied at the time of seeding, 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.
Operation

Hydraulic Fan Drive

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

The flow required is 18 U.S. gpm (68 liters) for the 12 cc motor and 21 U.S. gpm (80 liters) for the 16 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.

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. This is done 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 drain line. This line must be connected directly into the tractor hydraulic reservoir to ensure that there is zero back pressure in the drainline, 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 Recommendations

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.

Air volume; hence fan speed requirements will vary with:
1. Ground speed
2. Metering rate
3. Number of primary runs
4. Secondary hose size
5. Width of machine
6. 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.

Morris recommends the following operating guidelines for fan speed:
1. Do not operate the fan below 3000 rpm with 1 inch diameter secondary hose.
2. Do not operate the fan below 3500 rpm with 1 1/8 inch diameter secondary hose. Add an additional 500 rpm to speeds shown on the charts.
3. If equipped with a dual fans, keep the speed difference between the two fans within 1000 rpm.
4. Units equipped with VR drives the recommended minimum fan speed is 3500 rpm to ensure sufficient hydraulic flow to the VRT hydraulic valve block.

The charts on the next page list suggested fan speeds for various application rates.

Note: The charts should be used only as a guide. If plugging or surging occurs increase the fan speed to eliminate the problem.

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”.

Dual Fans
Use application rate of individual air stream to determine fan speed for that air stream.

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.
Fan Speed Recommendations - Continued
Charts are based on a 41 foot machine traveling at 5 mph (8 kph).

### 17 inch Diameter Impeller
**Suggested Fan RPM @ 5 mph (8 kph) on a 41 ft unit**
1 inch (25 mm) Secondary Hose

***For 1 1/8 inch (28.6 mm) Secondary Hose add an additional 500 rpm to values below.***

<table>
<thead>
<tr>
<th>Combined Application Rate</th>
<th>Fan Speed Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Shoot</td>
</tr>
<tr>
<td>3 - 50 lbs/acre&lt;br&gt;3 - 56 kg/ha</td>
<td>3000 - 3250 RPM</td>
</tr>
<tr>
<td>50 - 100 lbs/acre&lt;br&gt;56 112 kg/ha</td>
<td>3250 - 3500 RPM</td>
</tr>
<tr>
<td>100 - 150 lbs/acre&lt;br&gt;112 - 168 kg/ha</td>
<td>3500 - 3750 RPM</td>
</tr>
<tr>
<td>150 - 200 lbs/acre&lt;br&gt;168 - 224 kg/ha</td>
<td>3750 - 4000 RPM</td>
</tr>
<tr>
<td>200 - 250 lbs/acre&lt;br&gt;224 - 280 kg/ha</td>
<td>4000 - 4250 RPM</td>
</tr>
<tr>
<td>250 - 300 lbs/acre&lt;br&gt;280 - 336 kg/ha</td>
<td>4250 - 4500 RPM</td>
</tr>
<tr>
<td>300 - 350 lbs/acre&lt;br&gt;336 - 392 kg/ha</td>
<td>4500 - 4750 RPM</td>
</tr>
<tr>
<td>&gt; 350 lbs/acre&lt;br&gt; &gt; 392 kg/ha</td>
<td>4750 - 5000 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.

### Note:
In a variable rate application set fan speed to match maximum product rate being applied.

### Important:
Morris recommends not to operate the fan below 3000 rpm and if equipped with a dual fan setup to keep the speed difference within 1000 rpm.

**Dual Fans**
Use application rate of individual air stream to determine fan speed for that air stream.
Fan Speed Recommendations - Continued
Charts are based on a 71 foot machine traveling at 4.5 mph (7.2 kph).

17 inch Diameter Impeller
Suggested Fan RPM 4.5 mph (7.2 kph) on a 71 ft unit
for 1 inch (25 mm) Secondary Hose

***For 1 1/8 inch (28.6 mm) Secondary Hose add an additional 500 rpm to values below.***

<table>
<thead>
<tr>
<th>Combined Application Rate</th>
<th>Fan Speed Setting</th>
<th>Single Shoot</th>
<th>Double Shoot</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 50 lbs/acre 3 - 56 kg/ha</td>
<td>3250 - 3500 RPM</td>
<td>3000 - 3250 RPM</td>
<td></td>
</tr>
<tr>
<td>50 - 100 lbs/acre 56 - 112 kg/ha</td>
<td>3500 - 3750 RPM</td>
<td>3250 - 3500 RPM</td>
<td></td>
</tr>
<tr>
<td>100 - 150 lbs/acre 112 - 168 kg/ha</td>
<td>3750 - 4000 RPM</td>
<td>3500 - 3750 RPM</td>
<td></td>
</tr>
<tr>
<td>150 - 200 lbs/acre 168 - 224 kg/ha</td>
<td>4000 - 4250 RPM</td>
<td>3750 - 4000 RPM</td>
<td></td>
</tr>
<tr>
<td>200 - 250 lbs/acre 224 - 280 kg/ha</td>
<td>4250 - 4500 RPM</td>
<td>4000 - 4250 RPM</td>
<td></td>
</tr>
<tr>
<td>250 - 300 lbs/acre 280 - 336 kg/ha</td>
<td>4500 - 4750 RPM</td>
<td>4250 - 4500 RPM</td>
<td></td>
</tr>
<tr>
<td>300 - 350 lbs/acre 336 - 392 kg/ha</td>
<td>4750 - 5000 RPM</td>
<td>4500 - 4750 RPM</td>
<td></td>
</tr>
<tr>
<td>&gt; 350 lbs/acre &gt; 392 kg/ha</td>
<td>-</td>
<td>4750 - 5000 RPM</td>
<td></td>
</tr>
</tbody>
</table>

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

Note: In a variable rate application set fan speed to match maximum product rate being applied.

Important:
Morris recommends not to operate the fan below 3000 rpm and if equipped with a dual fan setup to keep the speed difference within 1000 rpm.

Dual Fans
Use application rate of individual air stream to determine fan speed for that air stream.
Plenum Settings

Plenum Damper Settings

18 Outlet Plenum

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 the 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.

<table>
<thead>
<tr>
<th>Product</th>
<th>Seed</th>
<th>Fertilizer</th>
<th>Seed Damper Setting</th>
<th>Fertilizer Damper Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate lb/acre</td>
<td>Damper Setting</td>
<td>Rate lb/acre</td>
<td>Damper Setting</td>
</tr>
<tr>
<td>Fine Seeds</td>
<td>All Rates</td>
<td>1</td>
<td>All Rates</td>
<td>Open</td>
</tr>
<tr>
<td>Coarse Grains</td>
<td>90 lb (100 kg/ha)</td>
<td>Open</td>
<td>50 lb (56 kg/ha)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>90 lb (100 kg/ha)</td>
<td>4</td>
<td>100 lb (112 kg/ha)</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>90 lb (100 kg/ha)</td>
<td>3</td>
<td>150 + lb (168 kg/ha)</td>
<td>Open</td>
</tr>
<tr>
<td>Large Seeds</td>
<td>180 lb (200 kg/ha)</td>
<td>Open</td>
<td>40 lb (45 kg/ha)</td>
<td>2</td>
</tr>
<tr>
<td>Single Shoot</td>
<td>Lower Pipes - Top Damper Closed</td>
<td>- Bottom Damper Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper Pipes - Top Damper Open</td>
<td>- Bottom Damper Closed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Collector Valve Settings

Located in each upper collector body are flapper valves for machines equipped with Double Shoot. The flapper valve must be properly set in order for product to flow correctly.

See illustrations on following pages for specific settings for various combinations for Double and Single Shoot set ups.

Flapper valves must be cycled daily to free valves of any fertilizer and grain dust accumulations.

Whenever valves are cycled or reset to a new position the position should be visually inspected as follows:

- Set flapper valves to correct position for product delivery.
- Remove the inspection door and visually check that the flappers are fully over and touching the side walls, sealing off the individual air streams.
- The flappers can be adjusted by loosening the individual adjusting setscrews and applying pressure to the flapper forcing it against the side wall while tightening the setscrew.

Note: The bottom air stream should be used to carry the higher rate of product.

Flapper Valve Run Test

Use the following procedure to check that the flapper valves do not move when air pressure is applied to under side of flappers.

- Check flapper valves in both directions with air running.
  - If valve is set to direct product into the bottom pipe, have the plenum damper open for the top pipes and closed to the bottom pipes.
  - If valve is set to direct product into the top pipe, have the plenum damper open for the bottom pipes and closed to the top pipes.
- Always wear safety goggles, breathing apparatus and gloves when working with granular chemical or treated seed per the manufacture’s instructions.
- With fan running check flapper valve position.
- The flappers can be adjusted by loosening the individual adjusting setscrews and applying pressure to the flapper forcing it against the side wall while tightening the setscrew.

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.
Operation

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 leveled seeding tool cause uneven depth, which could result in poor emergence.

It is important that the seeding tool is leveled 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.

Front to Rear

• Poor front to rear leveling 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 seed plate and metering wheels.
- Ensure correct seed plate is installed and metershaft turns 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. If plugging or surging continues reduce ground 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 a minimum of 15 feet (5 m) of forward travel to ensure air system has delivered product to seed boots.

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).]

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.

Important
Raise Stairs before moving Cart.
Stair damage will occur in lowered position.
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 turn the crank on the rear transmission 4 or 5 turns.
- 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.

When the slidders are closed product will still be metered until the wheels empty.
OPERATING GUIDELINES - CONTINUED

Meter Shut-Off

- Familiarize yourself with the remote functions.
- On initial startup of the system the remote needs to learn the transmitter signal of the solenoid by:
  1. Power up solenoid
  2. Press and hold the remote ON button for 10 seconds.

Note: The remote will need to learn the transmitter signal each season of use and when batteries are replaced.
- To close a meter shut-off section press and hold the remote CLOSE button for approximately 30 seconds. The fan rpm will drop slightly while the cylinders are closing and will resume full rpm once cylinders are closed.
- To open a meter shut-off section press and hold the remote OPEN button for approximately 30 seconds. The fan rpm will drop slightly while the cylinders are opening and will resume full rpm once cylinders are opened.
- Ensure solenoid is correctly wired to match remote. (i.e. Left buttons controlling left shut off)
- Check all wire harness connections for corrosion and use a dielectric spray to clean.
- Periodically throughout the day typically at each fill of the air cart, visually check shut-offs to ensure they are functioning correctly.

Important: It is strongly recommended to have the seeding unit equipped with a blockage monitor system to ensure product flow.

Important

Metering Wheels require purging once meter shut-offs are opened. A half revolution of the metering wheel is required before product begins to meter. Coarse seeds and fertilizer will require forward travel of the seeding tool of 10 feet (3.5 m) minimum. Fine seeds require forward travel of the seeding tool of 110 feet (34 m) minimum.

Products and rates may vary forward travel distance. Operator must familiarize one-self with distance required for products being used.

Note: Acres are tabulated using total implement width and does not account for meter shut-off usage.
Operation

Operating Guidelines - Continued

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.
- 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.
- 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 system clutch (MAIN).
- Lower seeding tool into ground.
- Turning at headland: Switch metering system clutch off (MAIN), immediately raise seeding tool fully rephasing hydraulics (see seeding tool manual).
- Once turned engage metering system clutch (MAIN) and lower seeding tool into ground.

Clutch Switches
Main
- Controls the main clutch which engages and disengages the ground drive.

Auxiliary
- Controls the optional second clutch.

Granular
- Controls a secondary auxiliary clutch

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

Note: It takes a minimum of 15 feet (5 m) of forward travel @ 6 mph (10 kph) before product reaches the seed openers. 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).]
Section 6:
Monitor

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Introduction

The monitor utilizes a multiplexed data communication system to monitor the functions of the Air Cart. In the multiplexed system, all sensors communicate with the monitor on the same three wires.

The system can monitor and display status of the following functions:

- Fan speed
- Ground speed
- Shaft speeds (up to 4)
- Bin levels (up to 4)
- Flow Blockage (up to 192 runs)

An audio alarm will sound upon detection of: low or high fan speed, low shaft speed, low bin level and failure of sensors. Also, loss of flow in any runs that are being monitored with Blockage Modules will generate alarms. Audio alarms persist until the alarm condition is removed or until the alarm is acknowledged by the operator by pressing the appropriate soft key.

In addition, the monitor can determine and display:

- Field Area
- Total Area
- Application Rate (weight per unit area) (VRT systems only)

The monitor allows the following settings to be changed:

- High and Low fan speed alarm point
- Low shaft speed alarm point for 4 meter shafts
- Ground speed pulses per 400 ft and pulses per revolution
- Pulses per revolution of fan and 4 meter shafts
- Low bin alarm for 4 bins
- The number of Blockage Modules that are connected to the monitor
- The width of the implement
- Imperial or metric units
- English or Russian language

The settings listed above, as well as field and accumulated areas are stored in nonvolatile memory. This means that the information is retained even when power is disconnected.

Two cables exit the rear of the monitor. There is a two wire power cable that connects to the tractor power supply. The other is a three wire cable that brings power and communications to the remote sensors through the main harness.
Monitor

Identifying Monitor Switches
The five keys on the monitor face are used for controlling the monitor.

**Power Key**  • Used to turn monitor on and off.

**Up Key**  • Used for moving function selection icon. Also used to increment parameter when changing settings.

**Down Key**  • Used for moving function selection. Also used for decrementing parameter when changing settings.

**Soft Keys**  • Used to enter menus and selections. Also used for going to next parameter in program mode.

Identifying Monitor Displays
The Operating Screen is divided into the following areas:

- Two small display sections or one enlarged display section
- Active alarm window or, if there are no active alarms, the current ground speed is displayed
- Bin level icon window
- Soft key label windows

Pressing soft key under “Enlarge” will switch the screen to the enlarged display section.

Pressing soft key under “Smaller” will switch the screen to the 2-display sections.
Operating Screen

Display Section
The display has two Display Sections on the operating screen. These windows have their data periodically refreshed at ½ to 1-second intervals. Each window has the following information in it:

- Display object name (e.g. Shaft)
- Display object instance (e.g. 1), if applicable
- Display object data (e.g. 7)
- Display object units (e.g. RPM), if applicable

Active Alarm Window
All acknowledged alarms are displayed on the operating screen's "active alarm window" until the alarm condition is removed. If there is only one acknowledged alarm, it will flash on the display in order to draw the user's attention to the continued error. If there is more than one acknowledged alarm they will cycle on the display, with each alarm being displayed on the screen for 2 seconds.

Note: If there are no active alarms, the current ground speed is displayed

See "Alarms" for more details on when an alarm is first observed.

Bin Level Icon Window
The display has one window dedicated to graphically showing the status of product in up to 3 bins. When a bin is empty an alarm will be generated and the corresponding bin icon will flash.

Soft Key Label Windows
The display has two windows displaying the current function of the two available soft keys. The function of the soft keys change depending on the screen being viewed. On Operating Screen, MENU can be accessed with left soft key or bottom display ENLARGED.

Note: Monitor will show "communication errors" if the system installation (Sensor Learn Mode) was not completed. See Sensor Installation.
Monitor

Navigating the Operating Screen

When the UP or DOWN key is pressed in the Operating Screen, this allows the user to select what is shown on the Top Display Section and the Bottom Display Section.

Example: Change the top display from Fan to Shaft 2

1. Press the UP key to enter the “Top Display Section”.

2. Use the UP/DOWN keys to scroll to other display items. Press the DOWN key to highlight “Shaft RPM”.

3. Press the SELECT key to enter “Shaft RPM”, which will display the instances of Shaft RPM.

4. Use the UP/DOWN keys to change the selected shaft to 2.

5. Press the SELECT key to choose shaft 2. This will return the monitor to the main screen and the Top Display Section is no longer displaying Fan, but is now displaying Shaft 2 RPM.

Note: If the DOWN key were pressed in step 1 to enter into this mode, the title of the menu would be “Bottom Display Section” and the bottom display would be changed.
Enlarged Operating Screen

If the ENLARGE key is pressed, the Bottom Display Section will expand up into the Top Display Section and the text will increase in size.

When in the enlarged mode, the right most soft key will be re-labeled SMALLER. Press the key, to return to display of top and bottom sections.

In Enlarged mode, the UP and DOWN keys allow changing function displayed on screen.

Press soft key under ENLARGE to enlarge bottom section.

Pressing soft key under SMALLER will switch the screen back to the two - display sections.
Installing Monitor

- Locate monitor and clutch switch in a convenient location in cab.
- Connect power cables directly to a 12V battery.
  - White or Red wires positive.
  - Black wires negative.
- Route cable harness to seeding tool and Air Cart. Ensure cables clear any pinch points (i.e. tractor articulation point, hitch point, etc.)
- Program monitor as described in System Installation and Monitor Programming Sections.

Note: Locate monitor, power and ground wires away from radio and antenna if tractor is so equipped.

Note: Do not connect monitor directly to starter switch.

CLUTCH SWITCH LOCATED IN CLOSE PROXIMITY TO OPERATOR FOR EASY ACCESS.

MONITOR LOCATED IN EASILY VIEWED AREA.
## Startup

### Power On

Press the Power Key to turn the monitor on.

When the unit is turned on, the following display sequence takes place:

- MORRIS is briefly displayed along with the Version number of the monitor software. **This number should be included with any reports of faulty or unexpected system operation.**

  This Splash Screen is displayed for a short time – long enough to go through the system startup and wakeup all of the sensors (approximately 3 seconds).

- If any sensors are found, the monitor proceeds to the “Operating” screen
- If no sensors are found, the monitor proceeds to the “Installation” Screen.

### Power Off

Press and hold the Power Key for a couple of seconds until the monitor turns off.

### Force Language

The user can press and hold the following keys when turning monitor on to force the display to a certain language:

**Force English Language**
- Press and hold the UP and DOWN keys. Push the power button. Release the UP and DOWN keys after the correct language is shown.

**Force Russian Language**
- Press and hold Soft key 1 and Soft key 2. Push the power button. Release the UP and DOWN keys after the correct language is shown.

**Note:** This language setting will not be retained when the monitor is turned off. To retain language setting, go to “Global Settings” and choose “Language” and select “Exit and Save” option.
Startup Menu Screen

The startup menu screen provides the user with four different options:

1) **System Startup** – this will not install any sensors.

2) **Learn New System** – this is used to learn a new compliment of sensors, but not modify the menu parameters that have already been customized by the user.

3) **Default Settings** – this is used to restore all of the menu parameters to the factory configuration.

4) **Learn New System and Default Settings** – this performs the actions of number 2 and number 3 above.
Sensor Installation

The installation procedure is required to configure the monitor to the sensors attached to it.

The operator may have to redo the installation if:

1) An extra tank is added to the Air Cart.
2) Replacing or adding sensors.
3) Replacing monitor with a new monitor.

Installation Precautions

1) During installation the monitor has a predetermined order in which it wants the sensors attached. The installer must be sure that the proper sensor is plugged in the proper sequence.

   i.e. If during installation the installer plugs in the Front Shaft and Ground Speed sensors in the wrong order, the monitor would not know this. The monitor would interpret Front Shaft rpm from the Ground Speed shaft and vice versa.

2) There may be occasions when the operator will not have use of all the sensors.

   i) During sensor installation when the monitor prompts for an unused sensor to be plugged in, the operator can press the SELECT key to skip over the sensor. **The sensor will be assigned a disabled status.** A sensor disabled by this method can only be enabled by repeating the installation procedure.

   ii) During operation the operator can disable shaft sensors by setting the pulses per revolution to zero. When pulses are set to zero alarms for that sensor and corresponding Bin Level sensor are ignored and no monitoring occurs.

3) Blockage modules attached to the harness are handled differently than the sensors attached to the harness. See Assembly Section “Blockage Module”.

   **Optical Sensors** - the blockage modules **have to be unplugged from the harness** before sensor installation can be performed and are connected like the other sensors requested by the monitor during sensor installation.

Note: Each monitor is unique to the sensors installed. If monitor is moved to another Air Cart it has to be reprogrammed to match the sensors.

<table>
<thead>
<tr>
<th>Sensor Installation Order</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speed (Ground)</strong></td>
<td></td>
</tr>
<tr>
<td>Fan 1</td>
<td></td>
</tr>
<tr>
<td>Fan 2</td>
<td></td>
</tr>
<tr>
<td>Shaft 1</td>
<td></td>
</tr>
<tr>
<td>Shaft 2</td>
<td></td>
</tr>
<tr>
<td>Shaft 3</td>
<td></td>
</tr>
<tr>
<td>Shaft 4</td>
<td></td>
</tr>
<tr>
<td>Tank 1</td>
<td></td>
</tr>
<tr>
<td>Tank 2</td>
<td></td>
</tr>
<tr>
<td>Tank 3</td>
<td></td>
</tr>
<tr>
<td>Tank 4</td>
<td></td>
</tr>
<tr>
<td><strong>VarCon (Variable Rate)</strong></td>
<td></td>
</tr>
<tr>
<td>(Unit calls for installation only if var controller is installed)</td>
<td></td>
</tr>
</tbody>
</table>

   **Optical Blockage Modules**

   **Rate Calibration**
Installation Procedure

1. **Disconnect** all the sensors (3 pin connector) from the harness before turning monitor on.

   Turn monitor on. With no sensors found, the monitor proceeds to the “Startup menu” screen.

   Use the Up/Down keys to select “Learn New System”. Press the soft key below SELECT to enter the “Install New System” mode.

2. The monitor will ask if you want to proceed or exit.

   With “Proceed” highlighted, press the SELECT key to enter the “Install New System” mode.

3. The display will indicate to install the speed sensor indicating that the ground speed sensor may now be connected. Connect the ground speed sensor.

   The monitor will give a double beep when it acknowledges the sensor.

Continued on next page.

**Note:** Disconnect Hydraulic Rate Calibration at sensor connection indicated below.

**Note:** Hydraulic Rate Calibration option requires monitor Version 0.25 or higher installed.
Sensor Installation - Continued

Installation Procedure - Continued

4. The display will indicate to install the fan sensor indicating that the fan sensor may now be connected. Connect the fan sensor.

The process is the same for rest of the sensors in the sequence.

5. When the monitor requests a sensor that **will not be used** in the configuration, use the Up/Down keys to select “Skip this Sensor” and press the soft key below SELECT and the monitor will skip the sensor and advance to the next one in the sequence.

**Note:** There are **12 Blockage Modules**. To skip past the blockage modules use the Up/Down keys to select “Skip this Type of Sensors” and press the SELECT key, the monitor will skip all of the blockage modules and advance to the next type of sensor in the sequence.

6. When all sensors in the list have either been learned or skipped, the monitor will display “Installation Complete”. Use the Up/Down keys to select “Exit” press the SELECT key to return to the main “Startup Menu”.

To verify the installation, turn the monitor off, then turn it on again. The monitor will now proceed to the “Operating” screen.
Monitor Settings

Navigating Settings Screens

The settings screens contain all the configuration information required to tailor the monitoring capabilities to the installed system and user preferences. Only setting parameters that are relevant are displayed (i.e. if no Shaft 3 is installed, there will not be any Shaft 3 setting parameters made available).

Pressing the MENU key when in the “Operating Screen” enters this mode.

The menu system is made up of screens that have the following content:

1) A menu title
2) The body of the menu
3) The soft key descriptions - changed to “Select” and “Cancel”.

The Menu Title

The menu title is at the very top of the screen.

This indicates to the user what the rest of the screen is referring to. For example, if the user is in the “Speed Settings” menu, the field “Pulses Per Rev” refers to the ground speed sensor and if the user were in the “Seed Shaft Settings” menu, the field “Pulses Per Rev” would refer to the seed shaft speed sensor.

The menu title line is always highlighted so that it stands out from the rest of the screen.

The Body of the Menu

The main body of the menu is a list of objects. The objects in the menu system will take up 1 or more lines of space. The scroll bar on right hand side of screen indicates where the object is in the list and when the list has been wrapped.

When a menu is entered, the top object is always highlighted. The highlighting of the object indicates to the user the current object that they are on.

- If the Select key is pressed, the current object is selected.
- If the Up or Down arrow keys are pressed, the object above or below the current object is highlighted.
- If Cancel is pressed, the menu exits without saving anything and reverts back to the previous menu that was displayed.
Navigating Settings Screens - Continued

The Body of the Menu - Continued

When an object is selected, the value becomes highlighted.

- Highlighted value can be changed with the Up and Down keys.
- Press “Select” key after changing value to enter value and return to object list.
- Select “Exit and Save” to keep any changes.

There are multiple ways to exit from the menu screens:

1) If the changes that were made on the menu screen need to be saved, the “Exit and Save” menu link must be selected.

2) If the changes are to be discarded or if the current operation is to be terminated (such as a calibration), the “Cancel” key can be pressed, or if it exits, the “Exit” link can be chosen.

The Menu Soft Key Descriptions

Like in the “Operating Screen”, the Menu also has two soft keys. These keys allow the user to select an item or object (the Select key) or to Cancel out of the current operation without saving anything (the Cancel key).

Important

The use of “Restore Default Settings” restores ALL of the menu parameters to the factory configuration.

(i.e. Implement width, Pulses Per Rev, Wheel Pulses Per 400 Feet, etc.)

Note: The list shown has been wrapped. The scroll bar indicates that the highlighted Item “Exit” is actually the last item in the list.
Monitor Settings - Continued

See charts on following pages for monitor settings.

Changing Monitor Settings

The following example explains the procedure for changing settings.

Entering the “Settings Menu”

Example: Change the implement width to 41.5 ft.

1. From the “Operating Screen” press the MENU key to enter the “Settings Menu”.

   Use the Up/Down keys to select the desired function. Press the soft key below SELECT to enter the function “Implement Setup”.

2. Under each function there is a list of parameters that can be changed, see “Settings Menu” chart.

3. Use the Up/Down keys to select the parameter. “Implement Width”.

4. Press the SELECT key to highlight the value. Use the Up/Down keys to change the value to “41.5 Ft”.

5. Press the soft key below SELECT to enter the value and move to the next parameter in the list.

   Set all parameters in the list as indicated in the above steps.

6. When all parameters in the list have been set, use the Up/Down keys to highlight “Exit and Save” press the SELECT key to save the changes and return to “Settings Menu”.

   Proceed to set all function parameters as indicated in “Settings Menu” chart.

Saved settings are retained even after power has been removed from the monitor.

Note: When the operator is in any of the “Settings Menu” modes, the monitor will not generate normal monitor alarms (i.e. low fan speed, shaft speed and so on).
Important
Select “Exit and Save” in each Menu Setting to save changes.

Settings Menu Chart - Standard Drive

Installation
- Install New System: See “Sensor Installation”
- Replace a Sensor: See “Sensor Replacement”
- Add a Sensor: See “Sensor Replacement”
- Remove a Sensor: See “Sensor Replacement”

Implement Setup
- Units: Select Imperial or Metric
- Implement Width: Set to width of seeding tool
- Clear Field Area: See “Resetting Area”
- Clear Total Area: See “Resetting Area”

Speed Settings
- Pulses Per Rev: Set to 4
- Wheel Pulses Per 400 Feet: See PP400 Chart
- Speed Calibration: See “Pulse Counting Mode for PP 400”

Fan Settings
- Pulses Per Rev: Set to 2
- Low Alarm Point: Set to 3000 rpm
- High Alarm Point: Set to 5000 rpm

Bin Settings
- Tank 1, Tank 2, Tank 3 and Tank 4
- Alarm Setting: Enabled (default) Set to Disabled if tank is not in use.

Shaft Settings
- Shaft 1, Shaft 2, Shaft 3 and Shaft 4
- Settings: Pulses Per Rev Set to 4
- Low Alarm Point: 2.0 rpm - Can be adjusted to 0.5 rpm for low rates.

Blockage Module Settings
- Runs per Module Setup: Set individual Module number of Runs
- Individual Runs Setup: Allows Runs to be Enabled/Disabled
- Blockage Module Test: See “Blockage Module Test”
- Blockage Calibration: See “Blockage Calibration”

Global Settings
- Language: Select English or Russian
- Volume/Pitch: 50% (default) Set as desired.
- Backlight: 50% (default) Set as desired.
- Contrast: 100% (default) Set as desired.
- Restore Default Settings: Resets ALL Monitor Settings to defaults

Note: Only setting parameters that are relevant are displayed (i.e. if no Shaft 3 is installed, there will not be any Shaft 3 setting parameters made available).
Wheel Pulses Per 400 Feet (PP400)  
Standard Drive

The chart contains average PP400 values, for the tire options offered by Morris.

Note: Air Carts without brakes use a 63 tooth drive sprocket. Air Carts with brakes use a 64 tooth drive sprocket.

PP400 Math Calculation

To determine PP400 value, first determine the tire circumference as outlined in “Determining Tire Sprocket” under Operation Section.

Note: The PP400 can also be determined using the speed calibration feature.

### Monitor PP400 Formula - Standard Drive

For 32” Rim = 80640/Tc  
For 38” Rim = 80640/Tc  
**PP400 =** ____________

Tc = Tire Circumference measured in inches

### Monitor PP400 Formula - Standard Drive with Brakes

For 32” Rim = 81920/Tc  
For 38” Rim = 81920/Tc  
**PP400 =** ____________

Tc = Tire Circumference measured in inches

See Metric Section 11 for metric formulas.
Monitor Settings - Continued

**Speed Calibration**

If the operator does not know what the pulses per 400 feet should be, or, if more accuracy is desired for present levels of tire inflation or soil conditions, the monitor can be put into “Speed Calibration” mode, pulses will be counted while driving a specified distance.

To start the Pulse Counting Mode:

1. Measure and mark out 400 feet (121.92 m).
   Select “Speed Settings” under the “Settings Menu”.
2. Then select “Speed Calibration”.
   Use the Up/Down keys to select “Continue Calibration” at which point the monitor will request “Start Driving”.
3. Drive the marked distance and the monitor will count the number of pulses.
4. When the distance has been travelled, stop, press the SELECT key to stop the pulse counting. This will “Exit and Save” the new pulse count under the “Speed Settings” menu.
5. The new value will now be displayed under “Wheel Pulses Per 400 Feet” (PP400).
6. Select “Exit and Save” to exit “Speed Settings” and return to the main menu.

**Note:** The monitor can accept PP400 values from 50 to 9999. Therefore, if the new count is less than 50, the existing count is not replaced. The monitor will state “Pulses Too Low” and display options to “Continue Driving” or “Cancel Calibration”. 

Introduction

All configured sensors and various other operating conditions are continuously monitored. Alarms fall into one of the following three categories:

- **Sensor alarms** are alarms which are generated when information returned by a sensor exceeds the appropriate threshold.
- **Communication alarms** occur when a sensor repeatedly does not respond to attempts at communication.
- **System alarms** are for various other conditions that are found to be in fault.

When an alarm condition occurs the monitor will beep repeatedly and an alarm screen will pop up indicating the fault condition.

The audio alarm and alarm screen persist until the alarm condition is fixed or until it is acknowledged by the operator. Follow the steps on the screen to fix or acknowledge the alarm.

After acknowledgement, the “Operating Screen” will be displayed with any unfixed alarms shown in the “active alarm window”. If there are more than one acknowledged alarms, they will cycle on the display.

When the alarm condition is corrected, the alarm notification is removed and ground speed will again be displayed in bottom window.

Nuisance Shaft Alarm

Low application rates of Canola may cause the seed shaft to rotate less than 2 rpm.

The low shaft rpm will cause the monitor to give a shaft alarm, since the shaft is rotating below the default alarm threshold of 2 rpm.

To avoid this nuisance alarm change the seed shaft low rpm alarm setting to 0.5 rpm.

**Note:** Change the setting back to 2 rpm when returning to higher application rates.

Note: To “TURN OFF” any shaft not in use set pulses to 0. This will eliminate any nuisance alarms caused by an inactive shaft. Also the corresponding bin should be “Disabled” to eliminate any nuisance alarms caused by an empty bin.
Alarms - Continued

“In Motion” Notification

The “In Motion” condition means that the monitor, based on ground speed and clutch state, considers that the system is supposed to be actively seeding.

The monitor emits a double beep whenever the “In Motion” condition becomes true or false. This condition is defined as speed greater than 2 mph (3.2 Kph) and drive clutch engaged.

1. If ground speed is less than 2 mph (3.2 Kph) for more than 30 seconds the monitor will alarm and display “Should be Seeding”.

2. If ground speed is greater than 2 mph (3.2 Kph) for more than 30 seconds and clutch is not engaged the monitor will alarm and display “Clutch Switch is Off”.

3. Certain alarms are inhibited when the “In Motion” condition is false. These are described elsewhere in this manual, but an example is whether to generate an alarm for a stopped shaft.

If a speed sensor is unavailable the speed is considered to be greater than 2MPH for the purpose of this variable. This allows metering shaft monitoring to work normally, as if there were motion.

Low Fan Alarms

Low fan alarms are handled differently because a stopped fan can result in damage to the metering mechanics as unblown material accumulates. **Low fan alarms can not be acknowledged while the system is “in motion”**. Thus, if a low fan alarm occurs during active seeding, the user will **not be able** to silence the alarm with the soft key, but will need to stop the vehicle or disengage the clutch. When this happens, the monitor accepts it as an acknowledgement of the alarm, and an effective “automatic acknowledge” takes place, resulting in the beeper being silenced and the resumption of normal display with “Fan Low RPM” flashing in the alarm window.
Area Display

There are two area counters, field area and total area. They are both accumulated whenever the system “In Motion” condition is true. Area counts are stored in memory when the unit is turned off.

The area counts can be displayed on the “Operating Screen” as outlined in “Navigating the Operating Screen”. The FIELD AREA and the TOTAL AREA are displayed to the nearest tenth of an acre (or hectare).

Resetting Area

To clear FIELD AREA and/or TOTAL AREA follow the steps below.

- From the “Operating Screen” press the MENU key to enter the “Settings Menu”.
- Use the Up/Down keys to highlight “Implement Setup” press the SELECT key to enter the function.
- Use the Up/Down keys to highlight the desired function of “Clear Field Area” or “Clear Total Area” press the SELECT key to enter the function.
- The monitor will ask “Are you sure?” leave as “Yes”.
- Use the Up/Down keys to highlight “Enter Selection” press the SELECT key to clear area and return to the “Implement Setup” menu.
- Use the Up/Down keys to highlight “Exit and Save” press the SELECT key to save the changes and return to the “Settings Menu”.

Note: Field area will not be reset to zero when total area is reset.
Rate Calibration

The practice of doing a rate calibration is strongly recommended as it will confirm the actual amounts of product being metered.

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

• Ensure correct seed plates are installed.
• Fill tank 1/2 full and drive 600 - 1000 feet to compact product in the tanks.
• Select and install meter rate sprocket per Rate Chart.
• Set Flapper Valves to the “Calibration” position.
• Remove the metering chain from the transmissions that are not being checked.
• Open lower collector door at the bottom of the collector body.
• Hook the Rate Calibration Insert on collector bottom and rotate up into position. Secure in place with slide lock.
• Slide rate check box on the collector body.
• Engage hydraulic lever to run air cart.
• Turn off fan by switching selector valve (located in the fan supply line) to calibration position.
• Prime metering wheels first by using the primer switch to start and stop the meter drive. Allow the drive to run until material begins to fall through the collector body.

Note: Ensure the fan is not running.

• Empty material from rate check box and reinstall it on the same collector.
• The monitor can be relocated to the remote monitor location for ease of calibration. The 10 pin plug connects to the monitor.

Actual Sample

• See following page.

Note: Hydraulic Rate Calibration option requires monitor Version 0.25 or higher installed.
Actual Sample

Example: Calibrate Shaft 1.

1. From the “Operating Screen” press the MENU key to enter the “Settings Menu”.
   Use the Up/Down keys to select “Rate Calibration” press the SELECT key to enter function.

2. Under “Rate Calibration” use the Up/Down keys to select “Shaft 1 Settings” press the SELECT key to enter function.

3. Engage Hydraulic Calibration Motor by holding switch in on position to begin Area count.

4. Release switch when desired Area count is reach on the monitor.

5. 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. Accuracy of sample is critical for actual application rate accuracy.

6. Press the SELECT key to enter “Weight”. Use the Up/Down keys to change the value to the sample weight. The Monitor automatically displays application rate under Area.
   
   **Note:** The monitor only displays 2 decimal places but calculates area to 4 decimal places. This is why in the illustration with an Area of 0.50 acres (the actual area count was 0.5032) with a weight of 20 lbs. the actual rate per acre is 39.75 lb/ac.

7. Use the Up/Down keys to select “Exit” press the SELECT key to return to “Settings Menu”.

8. Replace the bottom of the collector. Place rate check box into storage bracket.
   Follow the above procedure to check the rate of the other tanks.
   
   **Note:** Exit and re-enter the Rate Calibration program between each calibration test. Exiting the program Zeros the Area counter.
Sensor Replacement

The monitor will alarm the operator if there is a faulty sensor in the system by displaying a communication error for the sensor.

To replace a faulty sensor follow the steps below.

Example: Replace Shaft 1 sensor.

1. From the “Operating Screen” press the MENU key to enter the “Settings Menu”.
   Use the Up/Down keys to highlight “Installation” press the SELECT key to enter the function.

2. Use the Up/Down keys to highlight “Replace a Sensor” press the SELECT key to enter the function.

3. The monitor will highlight “Select Sensor” press the SELECT key to enter the function.
   Use the Up/Down keys to display desired sensor to be replaced (i.e. Shaft 1), press the SELECT key to accept selection.

4. “Proceed” will now be highlighted, press the SELECT key to enter mode.

5. The monitor will then display “Plug in new sensor for: Shaft 1”. Unplug the old sensor and plug in the new sensor.

6. Once the monitor acknowledges the new sensor, it will emit a double beep and acknowledge that the sensor has been replaced.
   “Exit and Save” will be highlighted, press the SELECT key to save the changes and return to the “Installation” menu.

7. Use the Up/Down keys to highlight “Exit” press the SELECT key to return to the “Settings Menu”.

Note: Sensors can also be added or removed from the system in the same manner by selecting the choice from step 2.
Sensor Gap Settings

Reed Switch Sensors
These sensors are used on slowly revolving shafts, in this case the meters and ground speed.
Check the gap between the sensor and actuator.
A gap of .030 inch (0.76 mm) is recommended.

Variable Reluctance Sensors
These sensors are used on high speed shafts, in this case the fan.
Target to sensor gap is critical with these sensors.
A gap of .030 inch (0.76 mm) is recommended.
Trouble Shooting Guide
Most electronic problems are usually one of the following:

- Harness connections.
- Damaged harness wires.
- Loose terminal in harness plug.
- Sensor to Actuator clearance.
- Defective sensor.

The monitor will alert the operator of these problems as a communication error.

Checking Harness
First, check for the obvious things like broken connections, loose terminals, insulation rubbed off and so forth.

- Check continuity of wires with ohm meter.

Checking Sensors
The best approach to testing a sensor is to substitute a suspected sensor with a known good one. If the problem goes away, the sensor is faulty. If it does not go away, it is faulty wiring.

Bin Level Sensors ensure there is no foreign material covering the optical sensor. Remove material with a cloth as not to damage lens.

Make sure sensor wires are not damaged.

Checking Blockage System
Check modules by performing a blockage module test on the monitor.

Optical sensors make sure the “optical eyes” are not coated with material or worn down. Remove material with a cloth as not to damage lens.

Pin sensors make sure there is no buildup of material on the pins. Remove material buildup with a knife and gently scraping away the material buildup.

Make sure sensor wires are not damaged.
Section 7: Maintenance

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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.

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

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

### Bolt Torque Chart

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Grade 5 Bolt Marking</th>
<th>Nm</th>
<th>lb. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td></td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>5/16</td>
<td></td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>3/8</td>
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<td>41</td>
<td>30</td>
</tr>
<tr>
<td>7/16</td>
<td></td>
<td>68</td>
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<tr>
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<th>lb. ft.</th>
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</tr>
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</tr>
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<td>155</td>
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### Wheel Bolt Torque

<table>
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<tr>
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<tr>
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<td>110 lb. ft. (149 Nm)</td>
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<tr>
<td>5/8</td>
<td>150 lb. ft. (203 Nm)</td>
</tr>
<tr>
<td>3/4 Grade 8</td>
<td>450 lb. ft. (610 Nm)</td>
</tr>
<tr>
<td>7/8 Grade 8</td>
<td>525 lb. ft. (711 Nm)</td>
</tr>
<tr>
<td>22 mm</td>
<td>500 lb. ft. (677 Nm)</td>
</tr>
</tbody>
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**Important**

Retorque wheel nuts after first fifteen minutes of operation and every fifteen minutes for the next 2 hours. Check periodically afterwards.
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.

![Caution]
Tire replacement should be done by trained personnel using the proper equipment.

<table>
<thead>
<tr>
<th>Tire</th>
<th>Style</th>
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<th>BT 9365 9450</th>
<th>BH 9365 9450</th>
<th>BH 9535</th>
<th>BT 9445 9550</th>
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<td>18 psi</td>
<td>124 kpa</td>
<td>18 psi</td>
<td>124 kpa</td>
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<tr>
<td>710/70R38</td>
<td>Lug</td>
<td>166 A8</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>800/65R32</td>
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<td>20 psi</td>
<td>138 kpa</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20 psi 138 kpa</td>
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<tr>
<td>800/65R32 Dual Wheels</td>
<td>Lug</td>
<td>172 A8</td>
<td>20 psi</td>
<td>138 kpa</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>800/70R38</td>
<td>Lug</td>
<td>173 A8</td>
<td>-</td>
<td>-</td>
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<tr>
<td>800/70R38 Dual Wheels</td>
<td>Lug</td>
<td>173 A8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20 psi 138 kpa</td>
<td></td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>15 psi 103 kpa</td>
<td></td>
</tr>
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<td>-</td>
<td>26 psi</td>
<td>179 kpa</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*BH - Tow-Behind only
*BT - Tow-Between only
STD - Standard
Daily Maintenance

- Check for and remove any water in primary collectors and pressure lines after rainy weather. Remove all inspection doors and collector bottoms to drain water from the tanks and collectors.
- Reinstall collector bottoms and inspection doors.
- Ensure 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 inspection 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.
- Cycle Collector Valve five times to ensure parts are free to move.
- Check for free movement of spring loaded chain tension idlers.
- Ensure drive chains are cleared of debris.
- Check torque on wheel bolts.
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 following photos for grease fitting locations.

1. Drive shaft bearings
   - Grease every 50 hours.

2. Drive Chains
   - Oil every 50 hours.

3. Slow Speed Drive
   - Grease every 50 hours.
Lubrication - Continued

4. Auger Pivot
   • Grease every 100 hours.

5. Fan Bearings (17” Diameter Fan only)
   • Apply 2 pumps of grease every 100 hours.

6. Quad Steer linkage
   • 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 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 in the following areas:
  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. Inspection doors, for leaks and loss of seal memory.
  8. Collector door seals.
  9. Couplers between air cart and seeding tool.
  10. 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.

**ACCESS DOOR**

**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. (0-45 kg) spring scale to check the tank lid closing force. With the lid near the closed position, place one end of the scale on the tank lid handle. Pull down on the scale and note the maximum force it takes to hold the lid. The force needed to close the lid must be 30 lbs (14 kg).
• Adjust the lid latch adjusting bolts as necessary. This will ensure that the lid is sufficiently tight and prevent any leaks.
• Re-check for leaks. If Lids still leak re-adjust latch bolts. 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.
Air Delivery System - Continued

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 Door 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 30 lbs (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 30 lbs (14 kg) to close the Door.
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 Door 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 30 lbs (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.
- In the open position, adjust the adjusting bolts as necessary to hold collector door away from the collector bottom.
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” 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 re-tighten 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. Inspection doors, for leaks and loss of seal memory.
7. Collector door seals.
8. Tanks union plate.

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:

9. Couplers between air cart and seeding tool.
10. Access doors on divider heads.

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 inspection 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 or 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

Rotor Clearance

- Position rotor 1/8” (3 mm) from inlet.
- Check rotor alignment if tipped at an angle to the inlet; adjust inner bearing on blower housing to achieve proper rotor to inlet concentricity.
- If rotor is square to inlet but not concentric to inlet, raise or lower the inlet on the mounting bolts.
- Spin rotor by hand to check for interferences; adjust as required.

Hoses

Inspect air delivery hoses for wear and replace as required. Check areas where hoses may be exposed to moving parts such as hitch hinge area.

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

To optimize the 9 Series Air Cart air system the pressure across the inlets of the quick couplers should be balanced. To achieve this all primary hoses must be equal in length or use equalizers to achieve a balanced air system.

Consult with your MORRIS Dealer for assistance on hose lengths and location of equalizers.

Important

ALL primary hoses must be the same length or use equalizers to achieve a balanced air system.
Equalizers

The equalizers reduce the amount of primary hose required to balance the air system of the air cart.

- Equalizers are installed on the shorter primary hoses of the seeding tool. Consult with your MORRIS Dealer for assistance on hose lengths and location of equalizers.
- Check equalizers seasonally for wear. If flat section is gone replace equalizer.

Insert Equalizers on Coupler Seeding Tool side
Hydraulic Orbit Motor

The motor requires no maintenance itself. It does, however, require clean oil so the tractor hydraulic filters must be replaced 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.
- Clean away paint then remove 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 “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.

Orbit Motor Coupler (17” Diameter Fan only)

- Urethane insert should be inspected every 100 hours or when greasing bearings.
- Inspect that there are no urethane filings or niks or cracks in urethane insert.
- Ensure set screws in each half of the coupler are tight.

Ensure coupler set screws fully engage the motor shaft.
Clutch

To check clutch for slippage check the following:

- Check friction plates for corrosion and buff with a wire wheel if necessary.
- Check clutch for side play. If there is movement on the shaft between the two clutch halves, adjust locking collars to snug halves together.
- Check clutch coil resistance. If the meter reads below 2.40 ohms or above 2.90 ohms, then the clutch has failed and needs to be replaced.
- Check clutch current draw. If the meter reads below 4 amps, there is a problem in the electrical system leading to the clutch.

Note: All values taken at room temperature. Voltage at 12VDC. As temperature increases, resistance increases, and current decreases.

Tie Rod - Tow Between

On the 9365 and 9450 Tow Between Carts the Tie Rod torque procedure as follows:

1. Tighten the nut up to the frame plate.
2. Record the torque just before contacting the plate. (Initial Torque)
3. Add 100 ft-lbs (136 Nm) to the recorded torque and tighten the nut against the plate at this torque.

Check at 10 and 50 hours and periodically afterwards.
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.

Caution

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

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.

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

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

- Shut tractor off and remove key.
- Block wheel on tractor.
- Raise the air cart wheels enough to clear the surface.
- Securely block air cart 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.

Important

Check wheel bearings for play every 5,000 acres (2,000 hectares) or yearly, which ever occurs first. Tighten as required.
Quad Steer

- Periodically check the 1 x 3 bolts, flatwashers and locknuts attaching the axle and pivot assembly.
  Torque Grade 5 bolts to 590 ft-lbs (800 Nm)
- Periodically check the 3/4 x 3 bolts, flatwashers and locknuts attaching the axle and pivot assembly.
  Torque the 3/4 Grade 5 bolts to 270 ft-lbs (366 Nm)
  Torque the 3/4 Grade 8 bolts to 375 ft-lbs (508 Nm)
- Toe-in adjustment should be 1/16” to 1/8” maximum.
- Grease all fittings every 100 hours.

Important
Retorque wheel nuts to 450 ft-lbs (610 Nm) after first fifteen minutes of operation and every fifteen minutes for the next 2 hours. Check periodically afterwards.

Dual Wheels

- Torque wheel nuts as follows:
  - 3/4 wheel bolts to 450 ft. lbs. (610 Nm)
  - 7/8 wheel bolts to 525 ft. lbs. (711 Nm)
  - 22 mm wheel bolts to 500 ft. lbs. (677 Nm)

Important
Retorque wheel nuts after first fifteen minutes of operation and every fifteen minutes for the next 2 hours. Check periodically afterwards.
Metering

The metering wheels come in 5 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

- Close tank Shut-Offs if there is product in tank.
- Remove inspection door and seed plate.
- Clean out any remaining material in the metering body and meterwheels.
- Remove all Blank Off plates.
- Remove the monitor donut and sensor mount 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 both meter shaft bearings.
- Remove monitor donut and right hand metershaft bearing and spacers.
- Remove 3/8” bolts holding the meter shaft end plate on the right hand side and insert into threaded holes in end plate. Tighten down to pull end plate and remove.

Table 1

<table>
<thead>
<tr>
<th>Outlets</th>
<th>Divider Head</th>
<th>Metering Wheel Width</th>
<th>Qty</th>
<th>Spacer Width</th>
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<tbody>
<tr>
<td></td>
<td>Blank Off</td>
<td>-</td>
<td>2</td>
<td>1 1/2” (38 mm)</td>
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<tr>
<td>7</td>
<td>7</td>
<td>1 3/4” (45 mm)</td>
<td>2</td>
<td>5/8” (16 mm)</td>
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<tr>
<td>8</td>
<td>8</td>
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<td>2 3/4” (70 mm)</td>
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<td>1/8” (3.2 mm)</td>
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Remove the meter shaft from the right hand side.

Assembly Hint: Mark metering wheel size on the metering body. This will help in ensuring the correct order of metering shaft assembly.

- Remove nut from meter shaft and disassemble wheels and spacers.
- Replace damaged wheels and reassemble shaft. Ensure correct spacers and wheels are located and assembled in the correct order. See diagram on next page. Note: After each meter wheel configuration, including any “Blank Offs”, add one 5/16” (8 mm) spacer. The distance between the 5/16” (8 mm) spacers should be 3” (76.2 mm) if wheels are assembled correctly.
- Tighten nut on metering shaft until it bottoms out against the shoulder.
- Check if spacers and wheels are tight. If the wheels and spacers are loose, measure shim thickness required. If 1/16” (1.6 mm) shim is required remove nut on meter shaft and install shim between the 1/4” (6.4 mm) end spacer and the spacer used for the run.
- If a 1/8” (3.2 mm) shim is required then remove nut and install 1/16” (1.6 mm) shim between 1/4” (6.4 mm) end spacer and the spacer used for the run. Remove the snap ring at the opposite end of the shaft and install the other 1/16” (1.6 mm) spacer before the 1/4” (6.4 mm) end spacer.
- Reassemble shaft and tighten nut.
- Repeat last two steps above if necessary.
- Clean out any debris remaining in the meterbody.
- Check seed plate setting - See “Seed Plate Adjustment”
- Install ‘O’ Ring onto meter shaft end plate.

Note: Apply thin layer of lubricant on ‘O’ Ring.

- Reinstall meter shaft assembly, snap ring end first into meter body.
- Install meter shaft end plate and monitor sensor bracket.
- Reinstall Blank Off plates. See “Blank Off Installation” for more details.
- Reinstall right hand side meter shaft bearing and spacers.
- Reinstall left hand side meter shaft bearing and spacers.
**Note:** The metering wheels can be installed with the metering body mounted to the air cart.

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</table>
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 the monitor donut on shaft. Ensure donut is centred to pick-up. Set the gap between the pick-up and the donut at 0.030” (0.76 mm).
- Attach metershaft coupler over the metershaft and transmission drive shaft.
- Install the 1/4” x 2 1/4” special bolt with two flatwashers and locknuts. **Tighten locknuts to bottom of threads.**
- Install Correct seed plate for product being metered.

Seed Plate Adjustment

- **Remove** meter shaft from the meter body.
- Install the seed plate and adjust the seed plate locks so that the bottom of the seed plate comes against the bottom of the rear back plate. Tighten nuts so that the surface of the flatwashers are against the bracket.
- Remove the seed plate and set aside.
- Install meter shaft assembly, snap ring end first into meter body.
- Install ‘O’ Ring onto meter shaft end plate.

**Note:** Apply thin layer of lubricant on ‘O’ Ring.
Blank Off Installation

Proper fit between the Blank Off and the spacer on the meter roller is important.

To ensure correct installation of the Blank Off follow the procedures listed below:

- Loosely install the Blank Off covers using (2) 1/4” Hex Socket bolts over the top of all the Blanked Off runs.

- Hold in place on top/back side of the Blank Off to align the radius with meter roller while tightening capscrews.

- Tighten capscrews starting with the left screw when facing body.
Conveyor

Squaring One End of Belt

Lay a framing square along a straight edge of the belt to make a cut line on the back side of the belt. Cut belt along this line using a utility knife. If the belt has uneven edges, create an average centerline, and square off of this line. **A clean, straight, square cut is required for the belt to run true on the pulleys.**

Installing Belt Splice

1. Center and press the fastener strip on the belt.
2. Press the Application Tool on the center of fastener strip with the cam lever in the “up” position.
3. Lower cam lever. Strike staple driver on each staple until staple clinches on Application Tool anvil.
4. Raise cam lever and move tool to outer edge of belt.
5. Clinch staples. Repeat until all staples are complete.

Continued on next page . . .
Installing Belt Splice - Continued

6. Place the splice over a piece of flat steel and clinch each staple with a hammer. Turn belt over and peen staple ends flush with surface of fastener strip.

7. Bend fastener strips until they break apart.

8. Follow the procedure above for installing the second belt splice.

9. Insert the hinge pin. Crimp the pin washers on the ends of the pin using pliers.

10. Tighten the belt tensioning bolts to 20-23 FT-LBS. so that each side is adjusted equally.

11. Re-assemble the tail end Door Assembly.
Installing Belt into the Conveyor

1. Remove the Tail End Door Assembly.

2. Slide a fish tape from the discharge end to the tail end of the conveyor. Pull a rope with a belt splice back through the conveyor. Fasten the conveyor belt to the rope splice, and pull the belt into the top of the conveyor with the rope.

3. Using the fish tape, pull the bottom side of the belt through the conveyor. Make sure the belt is free of extra twists before pulling it in.

4. Check to see that the idler is all the way forward (toward the drive end).

5. Pull the belt up tight at the discharge end and cut off the excess length so that there is 1/2” of overlap after the end is squared.
Tracking the Belt

1. Basic rule: *the belt moves toward the end of the roller that it contacts first.*
2. Rollers must be square with the housing and parallel to each other.
3. Belt tension must be great enough to prevent slippage. Tension to 20-23 ft-lbs. on adjustment bolts.

⚠️ **CAUTION:** Make sure everyone is clear of machine before running.

4. Run the conveyor. Check to see that the belt runs centered on the drive roller. Turn off the machine. Adjust drive roller if necessary.

⚠️ **WARNING:** Do not run the machine while adjusting. Failure to heed may result in personal injury or death.

5. To adjust drive roller, loosen the four nuts on the bearing holder plate, and the jam nut on the threaded adjuster. Retighten after adjusting is complete.

⚠️ **CAUTION:** Make sure everyone is clear of machine before running.

6. Run the machine for two minutes. Make sure belt runs centered on drive pulley.
7. Open the Tail End Door to view the idler.
8. Run the machine. Check to see that the belt is running centered on the idler roller. Turn the machine off.

⚠️ **WARNING:** Do not run the machine while adjusting. Failure to heed may result in personal injury or death.

9. If adjustment is necessary, adjust the tensioning bolts on the idler housing to 20-23 ft-lbs torque.
10. Check adjustment by running the machine. Make sure belt runs centered on idler pulley. The clearance between the belt and the housing should be the same on both sides.
11. Close the Tail End Door when complete.
Conveyor Belt Adjustment

Belt tension and tracking will need periodic adjustment. Follow the guidelines under “Tracking the Belt” to make adjustments.

Important

Belt Alignment and Belt Tension should be checked periodically.

- Belt damage will occur if alignment or tension has not been maintained.
- Belt tension should be 23 ft. lbs. of torque on adjustment bolts.
- Belt should be tracked to be centered on the idle and drive roller.

Bearings

All drive shafts are supported by self-aligning, sealed ball bearings which have been packed at the factory and require no further lubrication. There is no adjustment to be made to the bearings, but check that the retainers are firmly fastened to the bearing stand. Also check that the setscrews in the lock collars are tight against the drive shaft.

Conveyor Belt Care

It is recommended that the conveyor belt be washed off and the tail end be cleaned out at the end of the season. This will help prevent material residue from building up and causing damage to the belt.
**Conveyor Assembly**

25 foot Conveyor shown

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<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
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<td>Carrying Rack</td>
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<td>3</td>
<td>81081-00</td>
<td>Lower End Group</td>
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<td>81082-00</td>
<td>Upper End Group</td>
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<td>81091-01-MR</td>
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<td>Splice Pin - 16 Belts - 24121-75</td>
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**Items Not Shown**

- Belt, Rubber Cleated - 16 x 51 ft 4 inches - for 25' conveyor - 24550-30
- Belt Splice Kit - 16 Cleated Belt - 24387-15
- Splice Pin - 16 Belts - 24121-75
- Canvas
Lower End Group
23 foot Conveyor

For 23 Serial Number 16188 and Higher
## Lower End Group - 23 foot - Continued

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### Items Not Shown

- N56105 Belt-Crescent Cup - 16 x 112 Lg - 24121-92 (for 23' SN 16188 and above)...
- N49469 Belt Splice Kit - 24387-16 (Kit can be used with either belt as it only includes lacing parts)...
- N64090 Belt Splice Tool - 24387-01...
- N53224 Cleated Belt Splice Kit - Includes 24" cleated belt, splices, wire cable, crimp washers...
- 24398-03 Link Connecting #50 Heavy...
- 24356-01 Key - 1" Shaft...
- 24492-03 Hitch Pin - 1/2 x 4 Lg...
- N49477 Cleated Belt Seal Flap - Left Low - 46105-01...
- N49478 Cleated Belt Seal Flap - Right Low - 46105-02...
- N49476 Rear Hopper Belt Seal - 47640-01...
- 81027-01 Flowguard...
- 81029-01 Flap...
- N60938 Collapsible Hopper Cover - Fits Collapsible Hopper serial #16188 and Higher...
- N62290 Collapsible Hopper Cover Kit - Fits Collapsible Hopper serial #16188 and Higher...
## Conveyor - Continued

### Lower End Group - 25 foot - Continued

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<td>Rubber Flap - 81029-01</td>
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<td>Hopper Screen Fine - 81063-01-MR</td>
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<td>N64085</td>
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<td>34</td>
<td>81090-00</td>
<td>Rear Cover</td>
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<td>81090-00-00</td>
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<td>End Strap - 81023-02-MR</td>
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Items Not Shown
- N60642 Canvas - Hopper W/3 Hole Side Rails - 81011-04
- N62290 Hopper Cover Kit
- N49477 Flap - 10" Left Side - 46105-01
- N49478 Flap - 10" Right Side - 46105-02
- 24356-01 Key - 1/4"
- N56105 Belt, 16 Rub Cresct, Skd 9' 4" - 24121-92
- N49469 Belt Splice Kit - Lacing Parts Only - 24387-16
- N40900 Belt Splice Tool - 24387-01
- N58827 Splice Pin 16" Belts - 24121-75
- 24492-03 Hitch Pin
- 24398-01 Heavy Roller Chain - #50
- 24253-01 Hinge
- 24254-01 Rubber Handled Draw Latch
- 82024-01 Backer Hinge Plate
## Upper End Group

23 foot Conveyor

<table>
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<td>N53682</td>
<td>Tube - Shaft Guard - 20077-03</td>
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<td>Bearing Cover - 1 1/4&quot; Bearing - 23150-02</td>
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<td>Bearing - Flange - 1 1/4&quot; - 24112-01</td>
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<td>6</td>
<td>24177-01</td>
<td>Key - 1 1/4&quot; Shaft</td>
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<td>Hydraulic Motor - 7.7 cu. in. - 24495-CaseDrain (Seal Kit - N55718)</td>
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<td>Check Valve - ORB - 24369-02</td>
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<td>Drum Assembly - 5&quot; - 24440-01</td>
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<td>N53683</td>
<td>Coupler - 24473-03</td>
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<td>45076-01</td>
<td>Motor Mount - Hydraulic</td>
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<td>13</td>
<td>N60806</td>
<td>Cover - Top - 46014-01</td>
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### Conveyor - Continued

**Upper End Group**

25 foot Conveyor

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<td>Coupler - 24473-03</td>
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<td>24574-02</td>
<td>Hydraulic Plug - Oring (Not Shown)</td>
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</table>
Brakes

Periodic Inspection should be made of the electrical connecter, wiring, brake lines and hose for the entire brake system to insure there are no abraded or bare wires, damaged steel lines, or cracked and damaged hoses. During inspection assure there are no loose or “hanging” lines or wire that might drag or catch on objects/debris while being towed.

Fill Reservoir

There are two filler caps on the reservoir, either may be used for filling and checking fluid level as they both enter a common reservoir. Use caution when removing a filler cap to prevent the admission of dirt and/or contaminants into the fluid reservoir.

Check the fluid level in the reservoir. The fluid level must be maintained within 3/8 to 1/2 inch below the filler opening. If brake fluid is needed add only NEW, CLEAN, DOT III BRAKE FLUID.

Never reuse brake fluid that has been salvaged or removed from another system. Contaminated or dirty brake fluid may cause damage to the system resulting in system failure.

Bleeding the Brakes

It is essential to remove all air from the brakes and brake-lines prior to operation of the Air Cart. Operate unit with tractor brakes or manual override on Controller. Each Caliper has two (2) bleeder screws, each one should be bleed until fluid is free of air bubbles. Starting with the right brake open bleeder screw #1 and allow it to remain open until seeing brake fluid free of air bubbles coming out of the bleeder screw. Close the bleeder screw and move to the second bleeder screw repeating process. Repeat process for left brake.

While performing the bleeding process monitor the fluid level in the reservoir so that more air is not pumped into the brake lines because of low fluid level.

To prevent spilling brake fluid on the ground one end of a length of plastic tubing should be placed over the end of the bleeder screw and the other end should be placed into a container so that the fluid flow can be monitored for bubbles.

Note: Final stage of brake bleeding must be performed with tractor running to achieve full voltage/amps at BrakeRite pump. Unit will not generate maximum pressure otherwise.

Important:

Use only DOT III brake fluid.
Maintain fluid level within 3/8 to 1/2 inch below the filler opening.
Use caution when removing the filler cap to prevent contaminants entering into the fluid reservoir.
Brakes - Continued

Brake Pads

- Check brake pads for wear. If the thickness of the brake pad is 1/8” or less it is recommended to replace the brake pads.

To replace the brake pads use procedure below:

- Remove the wheels to gain adequate access to the calipers.
- Remove the bolt from each retaining pin.
- Slide the brake pad retaining pins out of the caliper and remove the brake pads.
- Install new brake pads and install retaining pins.
- Secure each retaining pins with bolt.

Caliper Pistons and Seal Replacement

- Remove the wheels to gain access to the calipers.
- Remove brake line and mounting bolts.
- Remove worn brake pads.
- Follow instructions in seal kit for piston removal and seal installation.
- Install new brake pads.
- Mount caliper to mounting plate and attach brake line.
- Bleed brakes.

Battery

The battery acts as an auxiliary power supply to provide extra power to the brake actuator to develop maximum pressure in the brake system to provide optimum braking performance.

In addition the battery provides power supply to the brake actuator if the ‘break-away’ feature of the brake system is installed and utilized.

The brake controller already has a specific lead to plug the battery harness into.

**Note:** The battery ‘must be’ connected as illustrated [Positive (+) to Positive (+) and Negative (-) or Ground to Negative (-)] for it to provide the correct power supply to the brake controller.

The brake controller has a built in charger so that it will keep this battery fully charged as the unit is used in the field. The controller draws power from the tractor battery system and in turn charges this auxiliary battery.
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Preparing for Storage

General

• To insure longer life and satisfactory operation, store the 9 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 or penetrating oil should be applied to all metal metering system components before storage.
• Avoid lubricant contact with seals.
• Avoid lubricant contact with grain and fertilizer hoses and tubes.
• 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.

Warning
Do not allow children to play on or around the machine.

MORRIS PAINT

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<td>Red MORRIS Touch-Up Pen</td>
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<td>N53714</td>
<td>Silver MORRIS Touch Up Pen</td>
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<tr>
<td>N53715</td>
<td>Red MORRIS Aerosol Can</td>
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<td>Silver MORRIS Aerosol Can</td>
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<tr>
<td>N31087</td>
<td>Sky White MORRIS Aerosol Can</td>
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</table>
Preparing 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 seed plates.
- Remove the collector bottom.
- Remove blank off covers and the run caps on the collectors. Clean debris from chamber area.
- 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 blank off covers and the run caps on the collectors.
- Reinstall seed plates.
- Replace the inspection 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 inspection doors and collector bottoms 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.
Removing From Storage

General
- Check tire pressure (Refer to Tire Pressure List).
- Clean machine thoroughly.
- Tighten lid latches.
- Lubricate and install chains.
- Spray internal parts of the metering body with silicone lubricant or WD-40 or penetrating oil 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.

Conveyor
Any conveyor that has sat idle for a season needs to go through a “break-in” period. See “Startup and Break-In” under the Operation Section.

Brakes
Check the fluid level in the reservoir. Verify the brake system is working properly. See Operation Section and Maintenance Section.
Section 9: Troubleshooting

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<th>Cause</th>
<th>Correction</th>
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<td>Insufficient air flow.</td>
<td>Clean fan impeller blades.</td>
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<td>Clean fan intake screen.</td>
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<td>Increase fan rpm.</td>
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<td>Unbalanced air flow (Double</td>
<td>Readjust the plenum damper.</td>
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<td>Shoot)</td>
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<td>High Humidity.</td>
<td>Use moisture resistant fertilizer.</td>
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<td>Hose sag.</td>
<td>Shorten hoses or add additional supports.</td>
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<td>Seed boots plugged with dirt.</td>
<td>Clean seed boots.</td>
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<td>See “Seed Boot Plugging” below.</td>
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<td>Hose obstruction.</td>
<td>Remove obstruction from hose.</td>
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<td>Air delivery hose partly off</td>
<td>Reinstall hose properly on manifold.</td>
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<td>Kinked hoses.</td>
<td>Straighten hoses and properly secure them to</td>
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<td>Obstruction in divider head.</td>
<td>Remove access door and clear obstruction from</td>
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<td>screens when filling.</td>
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<td>Exceeding machine’s delivery</td>
<td>Reduce ground speed and speed up fan.</td>
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<td>capabilities.</td>
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<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</td>
<td>Switch the selector to fan position.</td>
</tr>
<tr>
<td></td>
<td>position.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydraulic hoses not connected</td>
<td>Reverse hydraulic hoses.</td>
</tr>
<tr>
<td></td>
<td>properly to tractor.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insufficient oil flow.</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 minimum 2100 psi.</td>
</tr>
<tr>
<td>**Material flowing thru system when unit is stationary and the fan</td>
<td>Damaged metering wheel.</td>
<td>Replace metering wheel.</td>
</tr>
<tr>
<td>running**</td>
<td>Incorrect Seed Plate installed.</td>
<td>Adjust as required. See “Seed Plate Settings”</td>
</tr>
</tbody>
</table>

---

9-2 June 2018 9 Series Air Cart
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<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></td>
<td>Tanks not pressurized.</td>
<td>Inspect lid seals. Clean pressurization hoses.</td>
</tr>
</tbody>
</table>
| Clutch slipping                              | Low power supply.                               | Ensure good connections at the power supply. Battery voltage must be 12V.
|                                              | Metering drive torque load too high.           | See Maintenance Section.                                         |
|                                              | Corroded, rusty, dirty clutch.                  | Clean and inspect clutch.                                        |
|                                              | Faulty clutch.                                  | Replace clutch.                                                  |
| Material not being metered out               | Metering clutch not engaged.                    | Engage switch in tractor cab.                                   |
|                                              | Metering Clutch slipping.                      | See “Clutch Slipping” above.                                   |
|                                              | Main drive chain not installed.                 | Install drive chain properly on Drive Sprocket.                 |
|                                              | Drive chain or chains broken.                   | Install new chain. Ensure connecting link is installed correctly. Curved part of spring clip should face the direction of chain travel. |
|                                              | Massive air leak in tank, resulting in material being blown up out of the metering cup. | Repair the air leak. See “Air Leaks” in Maintenance Section. See “Tank Lid Adjustment” in Maintenance Section. |
|                                              | Material caked up in tank.                      | Remove material and completely clean out the tank.              |
|                                              | Excessively wet material in tank.               | Remove wet material and use reasonably dry material.            |
|                                              | Coupler bolt sheared.                           | Replace with Grade 8 bolt.                                      |
## 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>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” on previous page.</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>Incorrect Seed Plate installed.</td>
<td>Install correct Seed Plate</td>
</tr>
<tr>
<td></td>
<td>Seed Plate lock not adjusted correctly.</td>
<td>Adjust Seed Plate lock - See Maintenance Section.</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>
<tr>
<td></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></td>
<td>Damaged metering wheels.</td>
<td>Replace broken metering wheels.</td>
</tr>
<tr>
<td></td>
<td>Metering wheels mismatched to secondary outlet.</td>
<td>Install correct wheels to head. Be sure appropriate spacers are also used.</td>
</tr>
<tr>
<td></td>
<td>Incorrect spacing sprocket.</td>
<td>Install correct sprocket on back of transmission. See Maintenance Section.</td>
</tr>
<tr>
<td></td>
<td>Crank rotated wrong way when taking sample.</td>
<td>Crank must be rotated counter clockwise.</td>
</tr>
<tr>
<td></td>
<td>Collector Valves set incorrectly on Double Shoot machines.</td>
<td>See Operation Section.</td>
</tr>
<tr>
<td></td>
<td>Air Leak in System.</td>
<td>Adjust lids and doors as necessary.</td>
</tr>
<tr>
<td></td>
<td>Meterbody pressurization hose disconnected.</td>
<td>Reconnect hose to meterbody/plenum.</td>
</tr>
</tbody>
</table>

---

June 2018

9 Series Air Cart
<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>
# Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<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>
<td>Replace or repair harness.</td>
</tr>
<tr>
<td>No meter 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>
<td>Replace or repair harness.</td>
</tr>
<tr>
<td>No display, no back light</td>
<td>Switched off</td>
<td>Switch unit on.</td>
</tr>
<tr>
<td></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>Check battery voltage.</td>
</tr>
<tr>
<td></td>
<td>Temperature below -10C or above +40C.</td>
<td>Operate between -10C and +40C.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Correction</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Bin indicates always empty</td>
<td>Broken wire.</td>
<td>Repair wire.</td>
</tr>
<tr>
<td></td>
<td>Faulty sensor.</td>
<td>Replace sensor.</td>
</tr>
<tr>
<td></td>
<td>Wires not hooked to sensor.</td>
<td>Hook up correctly.</td>
</tr>
<tr>
<td>Bin indicates always full</td>
<td>Blocked light beam on photoelectric sensor</td>
<td>Remove object blocking the beam.</td>
</tr>
<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>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conveyor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The conveyor is vibrating</td>
<td>Damage can occur to the belting, causing a noise. Damage usually is caused from foreign material being run through the conveyor.</td>
<td>It may be necessary to remove the belting for inspection.</td>
</tr>
<tr>
<td></td>
<td>The belt is not tracking in the center of the conveyor.</td>
<td>Track the belt.</td>
</tr>
<tr>
<td>Capacity is too low</td>
<td>There may not be enough grain reaching the conveyor.</td>
<td>Make sure the intake has not bridged over, restricting flow. The belt needs to be covered to achieve maximum capacity.</td>
</tr>
<tr>
<td></td>
<td>Conveyor belt is moving too slow.</td>
<td>Check the belt speed. Low capacity will result from speeds slower than recommended.</td>
</tr>
<tr>
<td>The conveyor plugs</td>
<td>The conveyor may be “jamming” because too much grain is reaching the conveyor.</td>
<td>Decrease the amount of grain the conveyor is gathering.</td>
</tr>
<tr>
<td></td>
<td>The grain may be wet.</td>
<td>If wet grain or other hard to move materials is being conveyed, reduce the amount of grain being fed into hopper.</td>
</tr>
<tr>
<td></td>
<td>The conveyor may be jammed with foreign material.</td>
<td>Remove any foreign material in the conveyor.</td>
</tr>
<tr>
<td></td>
<td>The discharge end may be plugged.</td>
<td>Unplug any plugs at the discharge end of the conveyor.</td>
</tr>
<tr>
<td></td>
<td>Pulley has spun out and burned the belt in two.</td>
<td>Cut and ressplice the belt, An additional piece of belting may be required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tighten and retrack the belt.</td>
</tr>
<tr>
<td>Driveline shear bolt shears</td>
<td>Grain may be flowing too quickly into the hopper.</td>
<td>Reduce the flow rate of grain into hopper.</td>
</tr>
<tr>
<td>frequently.</td>
<td>The discharge of grain from the conveyor may be restricted.</td>
<td>Inspect conveyor intake and discharge for damage.</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleated belt is slipping or loose.</td>
<td>Belt tension too low.</td>
<td>Tension belt to 23 ft. lbs. on the adjustment bolts. Tension hopper belt to 80 in. lbs. or until center of the belt rises off the support pan underneath.</td>
</tr>
<tr>
<td></td>
<td>Belt is extremely dirty.</td>
<td>Clean traction side of belt.</td>
</tr>
<tr>
<td>Cleated belt is rubbing side of housing or cleats are coming loose or wearing.</td>
<td>Belt misaligned.</td>
<td>Align belt so its tracks center of idle and drive rollers. Tighten the side of the belt that is tracked off the roller.</td>
</tr>
</tbody>
</table>

### Brakes

**Indicator on “In Cab Controller”**

- Shows no connection between towed and towing-vehicle.
  
  Inspect plug and wiring for open circuit. Consult applicable wiring diagram to assure proper wiring connections.

- Poor response time
  
  Check and add brake fluid as required (figure 5.4.2A-pg.22

  Bleed brake lines and devices

  Check input for adequate “charge” (12 VDC)

- Inadequate or excessive Cart braking.
  
  Adjust “gain” control on In-Cab Controller.

- BrakeRite unit runs but does not build pressure.
  
  Assure proper brake fluid level, add fluid and bleed the system as required.

- BrakeRite unit does not run when the Tractor brake pedal is depressed
  
  Verify and connect wire connections in the entire electrical circuit.

- BrakeRite unit does not run when the in-cab manual override is activated.
  
  Verify and connect wire connections in the entire electrical circuit.

Experience has shown that virtually all problems with BrakeRite units are the result of INCORRECT OR FAILED WIRING. If problems arise consult the applicable wiring diagram (Section 9.0) and inspect all wiring and terminations.
Section 10: Metric

Section Contents
Rate Calibration - Metric........................................................................................................10-2
  Calibration Formulas - Metric............................................................................................10-2
  Calibration Formulas - Metric............................................................................................10-2
Rate Charts - Metric .............................................................................................................10-3
  Seed Rate Chart ..................................................................................................................10-3
  Slow Speed Seed Rate Chart ............................................................................................10-4
  Fertilizer Rate Chart ..........................................................................................................10-5
**Rate Calibration - Metric**

- Ensure tires are at correct pressure.
- Determine Tire Circumference (Tc) as follows:
  - Check under normal field conditions with tanks half full.
  - Mark tire and starting point.
  - Drive air cart 10 revolutions of tire in a straight line.
  - Mark ending point.
  - Measure distance from starting point to ending point and divide by 10 to get the rolling circumference of the tire (Tc).
- Calculate the number of rotations (R) of the calibration crank for 1/10 Hectare. Record value below for future reference.
- Calculate required tire sprocket size (Ts) and to ensure correct sprockets are installed on the Air Cart. Record value below for future reference.

**Note:** Due to ratios the value may not be a whole number and should be rounded to nearest value.

- Calculate the monitor PP400 setting. Record value below for future reference. Change monitor to new PP400 value as outlined under “Changing Monitor Settings” under Monitor Section.

**Example:**

For a 9450 with 800/65 R32 Tires and a 51ft (15.54 m) wide seeding tool (W) with:

The measured Tire Circumference (Tc) was 5.375 meters.

For 32” Rim
Crank Rotations (R) = (1574/W)/Tc
= (1574/15.54)/5.375
= 18.84

Monitor PP400 = 2048.256/Tc
= 2048.256/5.375
= 381

**Note:** Formulas are different for Air Carts with BRAKES, this is due to the difference in drive sprocket teeth.

### Calibration Formulas - Metric

**Rotations of Crank for 1/10 Hectare:**
For 32” Rim = (1575/W)/Tc
For 38” Rim = (1575/W)/Tc  \( R = \) __________

**Tire Sprocket Size:**
For 32” Rim = 152.196/Tc
For 38” Rim = 152.196/Tc  \( Ts = \) __________

**Monitor PP400 Setting:**
For 32” Rim = 2048.256/Tc
For 38” Rim = 2048.256/Tc  \( PP400 = \) __________

\( Tc \) = Tire Circumference measured in meters
\( W \) = Working Width measured in meters
Rate Charts - Metric

Seed Rate Chart

NOTE:
1) RATE CHART APPLIES TO 7-1/2", 8", 9", 10" & 12" SPACINGS.
2) CLUTCH OUTPUT SPROCKETS FOR 7-1/2" SPACING = 12 TOOTH
   8" SPACING = 13 TOOTH
   9" SPACING = 15 TOOTH
   10" SPACING = 17 TOOTH
   12" SPACING = 20 TOOTH
3) THIS RATE CHART SHOULD ONLY BE TAKEN AS A GUIDE FOR
   FINDING THE APPROXIMATE SPROCKET RATE WILL VARY WITH
   DIFFERENT MATERIAL DENSITIES AND SEED SIZES.
   SEE PROCEDURE DESCRIBED IN THE OPERATORS MANUAL
   TO OBTAIN A PRECISE RATE.
4) THIS RATE CHART IS NOT INDICATIVE OF THE MAXIMUM
   AMOUNT OF PRODUCT THAT CAN BE APPLIED. CAPACITY WILL
   VARY WITH GROUND SPEED AND CULTIVATOR WIDTH.
5) METER SHAFT SPROCKET
   QUICK CHANGE SPROCKET

<table>
<thead>
<tr>
<th>METER SHAFT SPROCKET</th>
<th>RATE KGS/HA</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 TOOTH</td>
<td></td>
</tr>
<tr>
<td>45 TOOTH MAX</td>
<td></td>
</tr>
<tr>
<td>26 TOOTH MAX</td>
<td></td>
</tr>
<tr>
<td>12 TOOTH MIN</td>
<td></td>
</tr>
<tr>
<td>40 TOOTH</td>
<td></td>
</tr>
<tr>
<td>26 TOOTH MAX</td>
<td></td>
</tr>
<tr>
<td>12 TOOTH MIN</td>
<td></td>
</tr>
<tr>
<td>35 TOOTH</td>
<td></td>
</tr>
<tr>
<td>33 TOOTH MAX</td>
<td></td>
</tr>
<tr>
<td>12 TOOTH MIN</td>
<td></td>
</tr>
<tr>
<td>15 TOOTH</td>
<td></td>
</tr>
<tr>
<td>45 TOOTH MAX</td>
<td></td>
</tr>
<tr>
<td>18 TOOTH MIN</td>
<td></td>
</tr>
</tbody>
</table>

N37147
Rate Charts - Continued

Slow Speed Seed Rate Chart

**SLOW SPEED DRIVE (METRIC)**

<table>
<thead>
<tr>
<th>RATE CHART AIRSEEDER</th>
<th>SEED GRADE</th>
<th>DILLING PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANOLA</td>
<td>C</td>
<td>FINE 671</td>
</tr>
<tr>
<td>MUSTARD</td>
<td>M</td>
<td>FINE 722</td>
</tr>
<tr>
<td>CANARY SEED</td>
<td>H</td>
<td>FINE 568</td>
</tr>
<tr>
<td>ALFALFA</td>
<td>A</td>
<td>FINE 542</td>
</tr>
<tr>
<td>CLOVER</td>
<td>D</td>
<td>FINE 590</td>
</tr>
<tr>
<td>NODULATOR</td>
<td>N</td>
<td>FINE 903</td>
</tr>
<tr>
<td>TAG TEAM</td>
<td>T</td>
<td>MEDIUM 720</td>
</tr>
<tr>
<td>EDGE</td>
<td>E</td>
<td>FINE 1096</td>
</tr>
<tr>
<td>FORTRESS</td>
<td>F</td>
<td>FINE 645</td>
</tr>
<tr>
<td>RIVAL</td>
<td>R</td>
<td>FINE 729</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>25 TOOTH</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW RATE</td>
<td>40 TOOTH</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35 TOOTH</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>HIGH RATE</td>
<td>15 TOOTH</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>24</td>
<td>28</td>
<td>32</td>
<td>36</td>
<td>40</td>
</tr>
</tbody>
</table>

**METER SHAFT SPROCKET**

<table>
<thead>
<tr>
<th>RATE (KGS/HA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 TOOTH</td>
</tr>
<tr>
<td>40 TOOTH</td>
</tr>
<tr>
<td>35 TOOTH</td>
</tr>
<tr>
<td>20 TOOTH</td>
</tr>
<tr>
<td>15 TOOTH</td>
</tr>
</tbody>
</table>

**NOTE:**
1) RATE CHART APPLIES TO 7-1/2*, 8*, 9*, 10*, & 12* SPACINGS.
2) CLUTCH OUTPUT SPROCKETS FOR: 7-1/2 SPACING - 12 TOOTH
   8* SPACING - 13 TOOTH
   9* SPACING - 15 TOOTH
   10* SPACING - 17 TOOTH
   12* SPACING - 20 TOOTH
3) THIS RATE CHART SHOULD ONLY BE TAKEN AS A GUIDE FOR
   FINDING THE APPROPRIATE SPROCKET RATE WILL VARY WITH
   DIFFERENT MATERIALS (SEEDS) AND SEED SIZES.
   SEE PROCEDURE DESCRIBED IN THE OPERATOR'S MANUAL
   TO OBTAIN A PRECISE RATE.

**DIAGRAM:**
- Quick Change Sprocket
- Slow Speed Drive (Metric)
- Rate Chart for Air Seeder

---

10-4  June 2018  9 Series Air Cart
Fertilizer Rate Chart

**Rate Charts - Continued**

### Fertilizer Rate Chart

<table>
<thead>
<tr>
<th>FERTILIZER</th>
<th>COARSE AGGREGATE BLENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>F4 COARSE 72211-51-0</td>
<td></td>
</tr>
<tr>
<td>F1 MEDIUM 61946-0-0</td>
<td></td>
</tr>
<tr>
<td>F5 COARSE 8640-0-60</td>
<td></td>
</tr>
</tbody>
</table>

**Rate Chart AIRSEEKER**

<table>
<thead>
<tr>
<th>FERTILIZER</th>
<th>COARSE AGGREGATE BLENDS</th>
</tr>
</thead>
<tbody>
<tr>
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<td>F2 MEDIUM 671</td>
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<td>F3 MEDIUM 774</td>
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<td>F4 COARSE 722</td>
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<td>F5 COARSE 864</td>
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**Fertilizer Rate Chart**

**DIRECT DRIVE (METRIC)**

| STANDARD 25 TOOTH | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 | 125 |
|-------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| LOW RATE 40 TOOTH | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 | 125 |
| HIGH RATE 35 TOOTH | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 | 125 |
| METER SHAFT SPROCKET 15 TOOTH | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 | 125 |

**RATE (KGS/HA)**

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### Notes:

1. Rate Chart Applies to 7-1/2", 8", 9", 10" & 12" Spacings.
2. Clutch Output Sprockets for: 7-1/2" Spacing - 12 Tooth
   8" Spacing - 13 Tooth
   9" Spacing - 15 Tooth
   10" Spacing - 17 Tooth
   12" Spacing - 20 Tooth
3. This Rate Chart Should Only Be Taken As A Guide For Finding The Approximate Sprocket Rate Will Vary With Different Material Densities And Seed Sizes. See Procedure Described In The Operators Manual To Obtain A Precise Rate.
4. This Rate Chart Is Not Indicative Of The Maximum Amount Of Product That Can Be Applied. Capacity Will Vary With Ground Speed And Cultivator Width.
5. Meter Shaft Sprocket Quick Change Sprockets
   - 25 Tooth - 45 Tooth Max.
   - 40 Tooth - 26 Tooth Max.
   - 35 Tooth - 33 Tooth Max.
   - 15 Tooth - 18 Tooth Min.
It is the policy of Morris Industries Ltd. to improve its products whenever it is possible to do so. Morris Industries reserves the right to make changes or add improvements at any time without incurring any obligation to make such changes on machines sold previously.