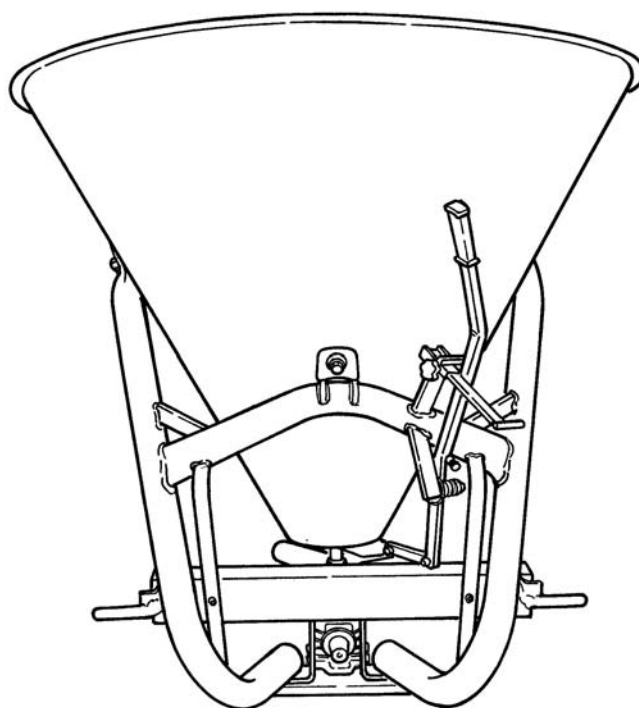


# Operator's Manual

Model: ABI-BS-PTO-549



# SAFETY

Take note! This safety alert symbol found throughout this manual is used to call your attention to instructions involving your personal safety and the safety of others. Failure to follow these instructions can result in injury or death.



*This symbol means:  
**ATTENTION!**  
**BECOME ALERT!**  
**YOUR SAFETY IS INVOLVED!***

## Signal Words

Note the use of the signal words DANGER, WARNING and CAUTION with the safety messages. The appropriate signal words for each have been selected using the following guidelines:



**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, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.



**CAUTION:** Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

# 1 - GENERAL INFORMATION

Thank you and congratulations for having chosen our implement. Your new fertilizer spreader is a technologically advanced machine constructed of high quality sturdy components that will fulfill your working expectations. Read this manual carefully. It will instruct you on how to operate and service your fertilizer spreader safely and correctly. Failure to do so could result in personal injury and/or equipment damage.

## 1.01 - General

The implement described in this manual is to be used with tractors with PTO at 540 rpm and clockwise rotation.



**CAUTION:** Always ensure that the coupling of the implement with the tractor is done at the same PTO speed and direction of rotation. Do not operate this implement at a PTO speed or direction of rotation other than that shown on the implement. Serious damage can occur to the machine and/or the operator.



**CAUTION:** Unless otherwise specified, all hardware is metric. Use only metric tools on metric hardware. Other tools that do not fit properly can slip and cause injury.



**CAUTION:** Right hand and left hand sides of the implement are determined by facing in the direction the implement will travel when going forward (see fig. 2).

## 1.02 - Warranty Information

Carefully read the Warranty section<sup>1</sup>, detailing coverage and limitations of this warranty. **Warranty** is provided for customers who operate and maintain their equipment as described in this manual. Warranty registration is accomplished by the dealer by completing and forwarding the **Warranty Registration** form to the Company, along with a copy of the dealer's invoice. It is in your best interest to insure that this has been done.

Warranty does not cover the following:

1. Cleaning, transporting, mailing and service call charges.
2. Normal wear items such as bearings, drivelines, shear pins, etc.

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<sup>1</sup> See Chapter 8 - Warranty.

3. Depreciation or damage caused by normal wear, accidents, improper maintenance, improper protection or improper use.
4. The use of non-original spare parts and accessories.

Your Authorized Company Dealer has genuine parts in stock. Only these approved replacement parts should be used.

This limited warranty covers defective material and workmanship. The cost of normal maintenance or repairs for accidents or improper use and related labor will be borne by the owner.

### **1.03 - Model and Serial Number ID**

Attached to the hopper is an ID plate showing the model and the serial number. Record your implement model and serial number in the space provided below. Your dealer needs this information to give you prompt, efficient service when you order parts.

<b>MODEL:</b>	
<b>SERIAL:</b>	
<b>VERSION:</b>	

## 2 - SAFETY PRECAUTIONS

Safety is the primary concern in the design and manufacture of our products. Unfortunately our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It is the operator's responsibility to read and understand all safety and operating instructions in the manual and to follow these.

Allow only properly trained personnel to operate the fertilizer spreader. Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your tractor, before assembly or operation, to acquaint yourself with the machines. It is the spreader owner's responsibility, if this machine is used by any person other than yourself, is loaned or rented, to make certain that the operator, prior to operating, reads and understands the operator's manuals and is instructed in safe and proper use.

### 2.01 - Preparation



1. Before operating equipment read and understand the operator's manual and the safety signs (**see fig. 2**).
2. Thoroughly inspect the implement before initial operation to assure that all packaging materials, i.e., wires, bands, and tape have been removed.
3. Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining and/or repairing the implement.
4. Operate the fertilizer spreader only with a tractor equipped with an approved Roll-Over-Protective-System (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off the tractor.
5. Clear area of stones, branches or other debris that might be thrown, causing injury or damage.
6. Operate only in daylight or good artificial light.
7. Ensure fertilizer spreader is properly mounted, adjusted and in good operating condition.
8. Ensure that all safety shielding and safety signs are properly installed and in good condition.
9. Chemicals may cause eye, skin or breathing problems. Always wear a face mask, gloves and goggles when filling hopper.
10. Before loading the fertilizer in the hopper read carefully the instructions printed on the fertilizer canvas bag concerning the precautions to be taken in case of toxicity or

corrosivity of the product. Before loading switch off the engine and remove the ignition key.

11. Load hopper with product only after the spreader has been properly attached to the tractor.

## 2.02 - Starting and Stopping



1. Be sure that no one is near the machine prior to engaging or while the machine is working.
2. Be sure the tractor is in "Neutral" before starting engine.
3. The operating power is supplied from tractor PTO. Refer to your tractor manual for PTO engagement and disengagement instructions. Always operate PTO at 540 rpm. Know how to stop the tractor and machine quickly in case of an emergency.
4. When engaging PTO, the engine rpm should always be low. Once engaged and ready to start operating, raise PTO speed to 540 rpm and maintain throughout operation.
5. Check the tractor master shield over the PTO stub shaft. Make sure it is in good condition and fastened securely to the tractor. Purchase a new shield if old shield is damaged or missing.
6. After striking an obstacle, disengage the PTO, shut the tractor down and thoroughly inspect for damage before restarting.
7. To park the vehicle safely, stop vehicle on a level surface (not on a slope), disengage PTO, engage the parking brake, stop the engine, remove the key, and wait for engine and all moving parts to stop before leaving the operator's seat.
8. Stay clear of rotating drivelines. Entanglement in rotating driveline can cause serious injury or death. Wear close fitting clothing. Stop the engine and be sure PTO driveline is stopped before getting near it.

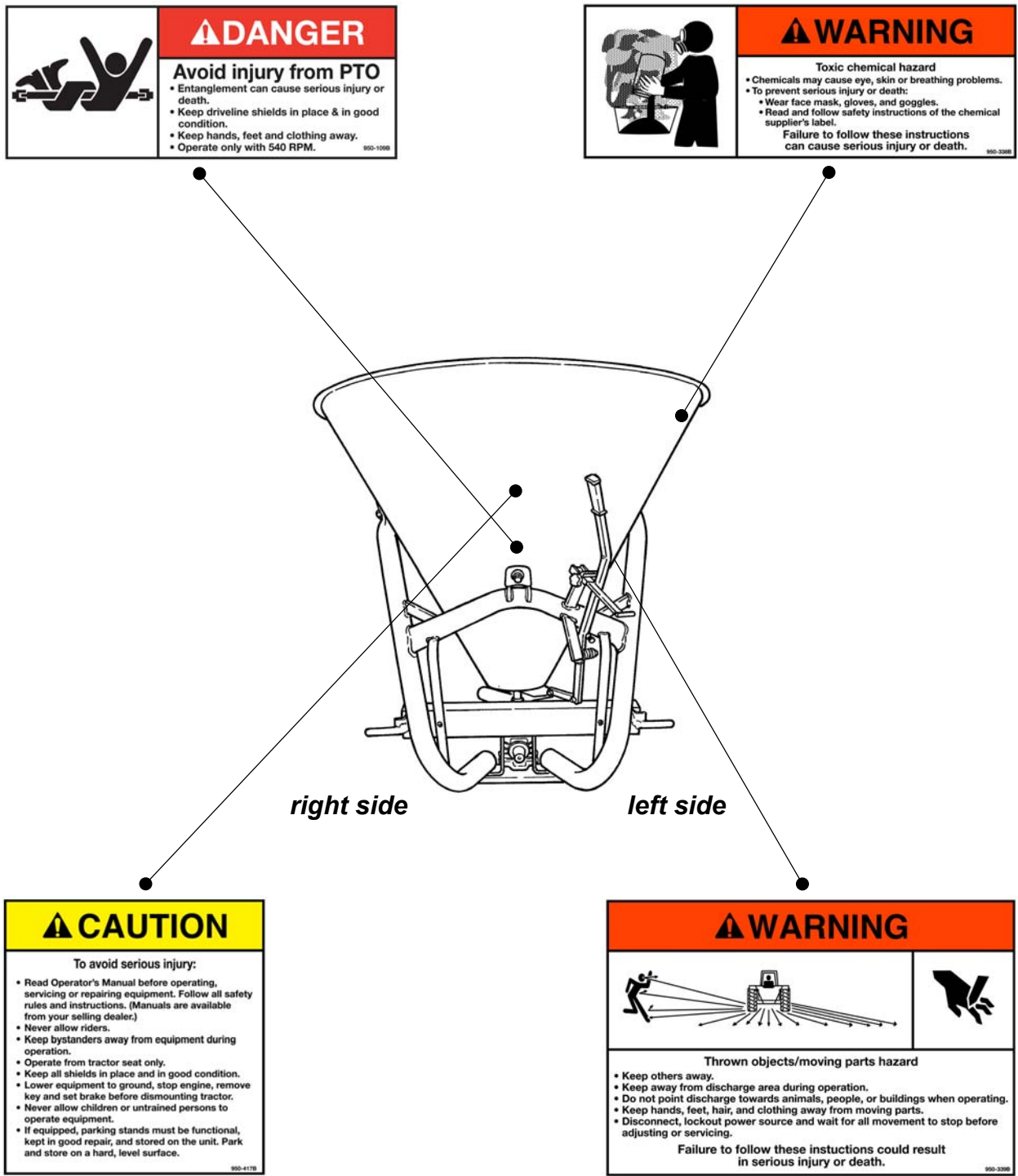
## 2.03 - Messages and Signs



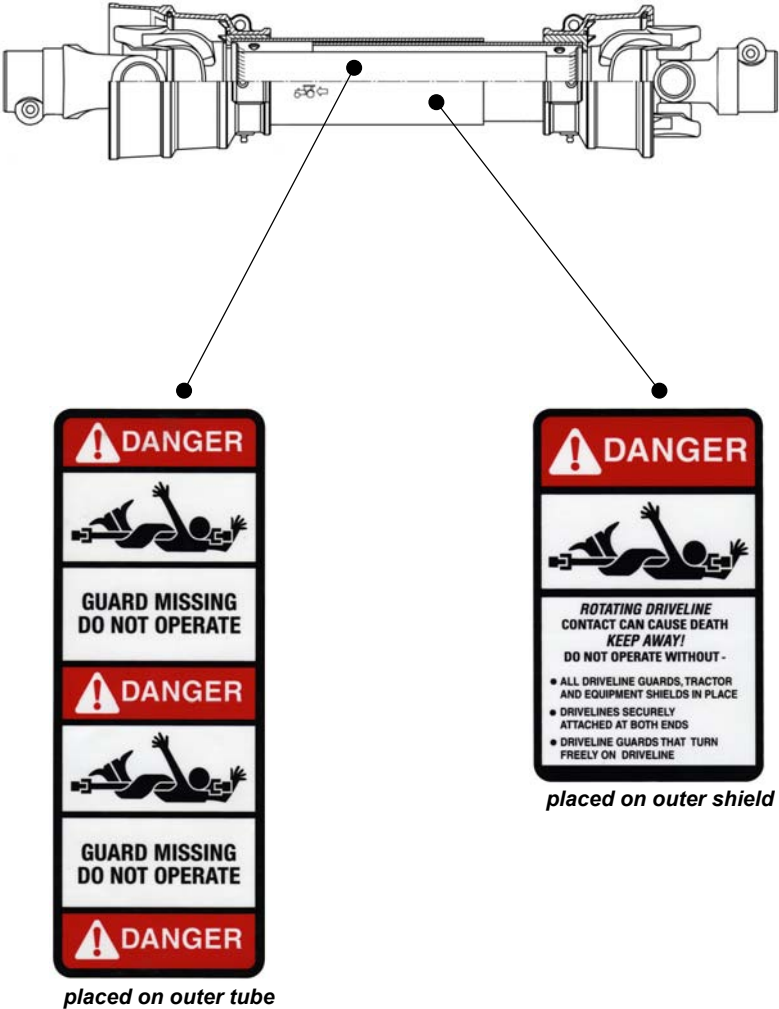
1. Read and adhere to all safety and operating decals on this machine (**see fig. 2**).
2. Before dismounting tractor: Stop engine, set brake and remove the key of unattended equipment.
3. Keep away from rotating parts and driveline.
4. Keep guards and shields in place and in good condition.
5. Do not use with bystanders in area.
6. Allow no riders on tractor or fertilizer spreader.
7. Allow moving parts to stop before repair.
8. Securely support fertilizer spreader before working underneath.

Additional warning and operating decals are available at no extra charge. Please specify model and serial number when ordering.

Fig. 2 - Safety decals - implement; replace immediately if damaged.



**Safety decals - driveline; replace immediately if damaged.**



## 3 - OPERATION

The fertilizer spreader is versatile and ideal for granular or powdered fertilizers, seed and sand. It may also be used as a salt spreader for snow or ice covered roads during winter months. Our spreaders are designed for tractors from 16 to 50 PTO HP with a category 1 three point hitch. The 209 and 212 series are also cat. 1 quick hitch compatible.

Spreaders can be used for broadcast spreading or may be used to spread prevalently to the left or to the right with a simple adjustment.

The wide range of hopper capacities and numerous spread adjustments make our fertilizer spreaders ideal for use on farms, athletic fields, municipalities and many other commercial or residential applications.

### 3.01 - Operational Safety



**CAUTION:** Our spreaders are designed considering safety as the most important target and are the safest available in today's market. Unfortunately, human carelessness can override the safety features built into our machines. Injury prevention and work safety, aside from the features on our spreaders, are very much due to the responsible use of the equipment. It must always be operated prudently following with great care, the safety instructions laid out in this manual.



1. The use of this equipment is subject to certain hazards which cannot be prevented by mechanical means or product design. All operators of this equipment must read and understand this entire manual, paying particular attention to safety and operating instructions, prior to using.
2. Do not operate the tractor and spreader when you are tired, sick or when using medication.
3. This spreader is designed for use only on tractors with 540 rpm power take off.
4. Only properly trained people should operate this machine.
5. Accidents are most likely to occur with machines that are loaned or rented to someone who has not read the operator's manual and is not familiar with a spreader.
6. Always stop the tractor, set brake, shut off the tractor engine, remove the ignition key, and allow spreader moving parts to come to a complete stop before dismounting tractor. Never leave equipment unattended with the tractor running.
7. Never place hands or feet into hopper with tractor engine running or before you are sure all motion has stopped. Stay clear of all moving parts.
8. Never allow any person inside the hopper for any reason. Serious injury or death can result from someone becoming entangled in the agitator.

9. Do not allow riders on the spreader or tractor at any time. There is no safe place for riders.
10. Never allow anyone within 50 yards of the spreader while the PTO is engaged. Product thrown from the spreader can cause serious injury or death.
11. Before backing up, look behind carefully.
12. Install and secure all guards and shields before starting or operating.
13. Keep hands, feet, hair and clothing away from moving parts.
14. Never operate tractor and spreader under trees with low hanging limbs. Operators can be knocked off the tractor and then run over.
15. Stop spreader immediately upon striking an obstruction. Turn engine off, remove key, inspect and repair any damage before resuming operation.
16. Stay alert for holes, rocks and roots in the terrain and other hidden hazards. Keep away from drop-offs.
17. Use extreme care and maintain minimum ground speed when transporting on hillside, over rough ground and when operating close to ditches or fences. Be careful when turning sharp corners.
18. Reduce speed on slopes and sharp turns to minimize tipping or loss of control. Be careful when changing directions on slopes. Do not start or stop suddenly on slopes. Avoid operation on steep slopes.
19. Inspect the entire machine periodically<sup>2</sup>. Look for loose fasteners, worn or broken parts, and leaky or loose fittings.
20. Pass diagonally through sharp dips and avoid sharp drops to prevent "hanging up" tractor and spreader.
21. Avoid sudden starts and stops while traveling up or downhill.
22. Always operate down slopes; never across the face. Avoid operation on steep slopes. Slow down on sharp turns and slopes to prevent tipping and/or loss of control.
23. All remote control devices (cables, ropes, rods, flexible lines, etc.) should be positioned in a way to prevent maneuvers which could lead to accidents or damages.
24. Chemicals may cause eye, skin or breathing problems. Always wear a face mask, gloves and goggles when filling hopper.
25. Before loading the fertilizer in the hopper read carefully the instructions printed on the fertilizer canvas bag concerning the precautions to be taken in case of toxicity or corrosivity of the product. Before loading switch off the engine and remove the ignition key.
26. Load hopper with product only after the spreader has been properly attached to the tractor.

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<sup>2</sup>

See Chapter 4 - Maintenance.

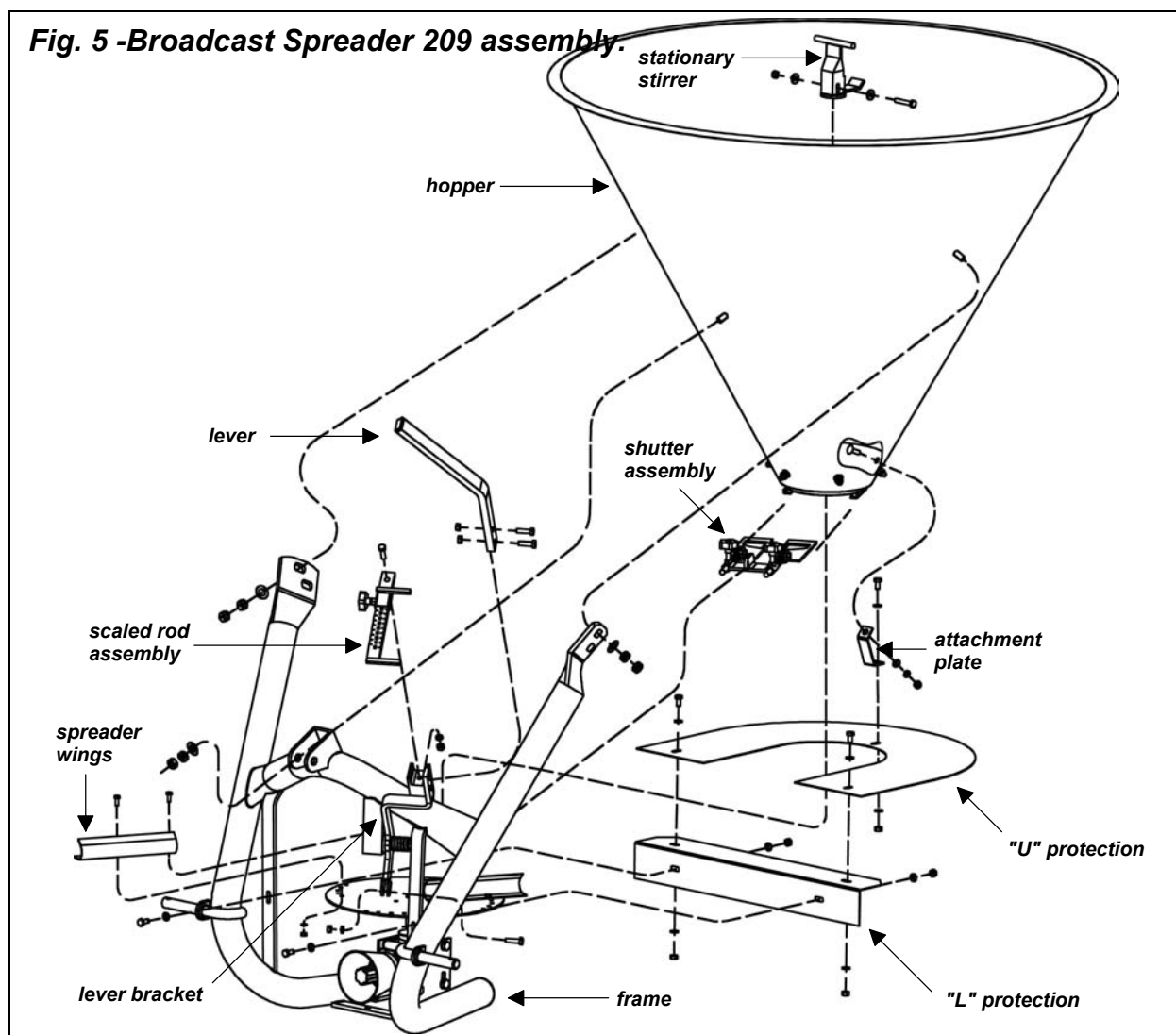
### 3.05 - Assembly Instructions for Broadcast Spreader 209

NOTE: Assembly will be easier if all parts are loosely assembled before tightening the hardware. All hardware needed for assembly will be found in the hardware bag or on the machine.

**Each unit is shipped with the following components:**

	209-421 Qty.
1. Frame assembly	1
2. Hopper	1
3. "U" Protection (rear protection)	1
4. Driveline	1
5. Component bag (as follows):	
a. Spreader wings	4
b. Shutter assembly	1
c. Stationary stirrer	1
d. "L" Protection (front protection)	1
e. Scaled rod assembly	1
f. Lever	
g. Hardware bag (as follows):	
Attachment plate (001-4338)	-
Attachment plate (001-4339)	1
Bolt CR M12-1.75x30 C4.6 Z (005-1073)	-
Bolt CR M12-1.75x40 C8.8 Z (004-4115)	3
Bolt CR M08-1.25x20 C4.6 Z (008-4289)	-
Bolt HH M08-1.25x16 C8.8 Z F (004-6454)	3
Bolt HH M08-1.25x20 C8.8 Z F (001-5012)	2
Bolt HH M06-1.00x16 C8.8 Z F (003-6319)	-
Bolt HH M06-1.00x16 C8.8 SS F (001-4320)	8
Nut HH M12-1.75 C6 Z MD (000-1106)	6
Nut HH M08-1.25 C6 Z MD (004-6545)	5
Nut HH M06-1.00 C6 Z TK (501-603B)	-
Nut HH M06-1.00 C6 SS TK (001-4322)	8
Washer lock Ø6 (004-6536)	-
Washer lock Ø6 SS (001-4321)	8
Washer lock Ø8 (000-3144)	-
Washer flat Ø8 (001-5230)	10
Washer flat Ø14 (009-1435)	3

<sup>5</sup> See Section 4.03 - Driveline, for instructions on how to determine correct driveline length and procedures for shortening the driveline.

**Fig. 5 -Broadcast Spreader 209 assembly.**

To assemble the spreader do the following (see fig. 5 for Broadcast Spreader 209 and fig. 6 for Broadcast Spreader 212):

1. Attach four spreader wings to the spreader disc with eight M6x16 hex bolts, Ø6 lock washers and M6 hex nuts.
2. Locate scaled rod assembly in hardware bag. Install scaled rod to main frame using M8x30 hex bolt, Ø8 lock washer and M8 hex nut that are already installed on the scaled rod assembly.
3. Install the "L" protection on spreader frame using two M8x20 hex bolts, four Ø8 flat washers and two M8 hex nuts.
4. Slide hopper onto the output shaft of the gearbox.
5. Secure hopper to frame using three M12x30 carriage bolts on model 209-121 or M12x40 on models 209-221 & 209-421, three Ø14 flat washers, and six M12 hex nuts. Install five M12x30 carriage bolts on model 212-121 or M12x40 on model 212-421, five Ø14 flat washers and ten M12 hex nuts.
6. Install stationary stirrer using M8x45 bolt, two Ø8 flat washers and M8 elastic stop nut that are already bolted to the stirrer.

7. Install the "U" protection using three M8x16 hex bolts, six Ø8 flat washers, one Ø8 lock washer and three M8 hex nuts. Install M8x20 carriage bolt on models 209-121 & 212-121 or M8x25 on models 209-221, 209-421 & 212-421 through hopper and into attachment plate. On models 209-221, 209-421 & 212-421 use bolt already installed on hopper.
8. Install shutter assembly, found in hardware bag, by sliding shutters into the slots at the bottom of the hopper then assemble it to the lever bracket, which is already installed on the frame, using M8x30 hex bolt, Ø8 lock washer and M8 hex nut.
9. Install lever to lever bracket using two M8x25 hex bolts and two M8 hex nuts which are already installed on the lever.
10. Tighten all hardware.
11. Install driveline and ensure it has at least 2" from bottoming out in its shortest working position and has the minimum 6" overlap in its longest working position<sup>6</sup>.

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<sup>6</sup> See Section 4.03 - Driveline, for instructions on how to determine correct driveline length and procedures for shortening the driveline.

### 3.06 - Pre-Operational Check

Check each of the following, carefully, prior to engaging the equipment:

1. No wrappings or foreign objects are around the spreader.
2. All hardware is tight.
3. All safety shields and guards are in place and tightly attached.
4. No people or animals are in the work area.



**DANGER:** Shut off the tractor and remove the key before making adjustments, servicing or cleaning the machine.

### 3.07 - Attaching to the Tractor

Units may be used on tractors ranging from 16 to 50 HP equipped with a standard rear PTO and category 1 three point hitch<sup>7</sup>. The 209 and 212 series are also cat. 1 quick hitch compatible. **Never use this spreader with tractors over 50 HP.**



**DANGER:** Do not allow anyone to stand between spreader and tractor while attaching implement.



**WARNING:** Never attempt to attach the implement to the tractor or make an adjustment to it without first turning the tractor off.



**CAUTION:** Check the tractor PTO rpm to ensure it is set at 540 rpm and turns clockwise.



**CAUTION:** Be sure the tractor tire pressure is correct. It is important to strictly follow the safety guidelines and instructions laid out in the tractor manual.

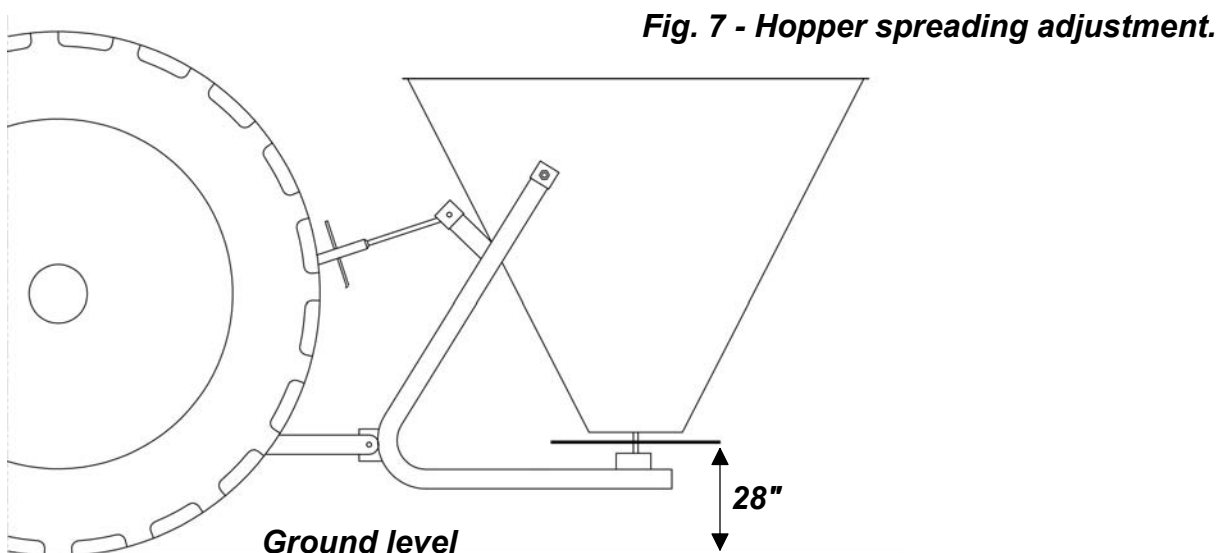
To attach the implement to the tractor do the following:

Back the tractor up to the implement in order to slip the tractor hitch arms over the hitch pins bolted to the frame. **Turn off the tractor engine and engage the park brake.** Secure the two tractor hitch arms to the implement with lynch pins. Tighten the tractor arms side movement with either the sway chains or blocks to limit side swing.

<sup>7</sup>

See Table 2, page 35.

Connect the top link, locking it in place with the top hitch pin. Adjust it so the implement is as near parallel to the ground as possible with the spreading disc at a distance of 28" above ground level (**see fig. 7**).



Install the end of the driveline to the spreader and the opposite end to the tractor PTO. Be sure each end is connected securely with either the locking pin or bolt and nut. Connect the driveline shielding chains to the tractor and to the implement to prevent the protective shielding from rotating during operation. If it was necessary to remove the PTO shielding to do any of the above operations, do not forget to replace it.

### 3.08 - Start Up



**CAUTION:** Load hopper with product only after the spreader has been properly attached to the tractor.



**WARNING:** Chemicals may cause eye, skin or breathing problems. Always wear a face mask, gloves and goggles when filling hopper. Refer to chemical manufacturer's label for specific safety information.

Before starting to use, never forget that the **operator is responsible** for the following:

1. Safe and correct driving of the tractor and spreader.
2. To learn precise, safe operating procedures for both the tractor and the spreader.
3. To ensure all maintenance and lubrication has been performed on the spreader.
4. To have read and understood all safety aspects for the spreader in the operator's manual.

5. To have read and understood all safety decals on the spreader.
6. Checking the tractor tires for the proper pressure in accordance with the tractor operator's manual.
7. **Checking that all safety shields are on the machine and securely in place.**
8. Making sure the proper attire is worn. Avoiding loose fitting clothing which can become entangled. Wearing sturdy, tough-soled work shoes and protective equipment for eyes, hands, ears and head. Never operate tractor or implements in bare feet, sandals or sneakers.
9. Ensuring proper lighting is available, sunlight or good artificial lighting.



**WARNING:** Use a tractor with a cab and appropriate filters on the ventilation system or wear a breathing mask capable of filtering toxic powders to prevent inhalation of product.

Prior to start working do the following:

1. Make sure there are no obstructions.
2. Run machine under a no-load condition for a short while to assure that everything is functioning properly.
3. Adjust all settings for the desired quantity distribution and spread pattern.
4. Shift the transmission to a slow speed gear and start forward, increase the ground speed by shifting upward until the desired speed is obtained. Do not use in reverse unless absolutely necessary and only after careful observation of the area behind the spreader.
5. Ballast may need to be added to tractor to maintain steering control.

### **3.09 - Operating Techniques**



**WARNING:** Before adjusting the spreader or filling the hopper, be sure the tractor PTO is not engaged, the tractor is shut off, and the key is removed from the tractor ignition.



**WARNING:** Before engaging the PTO, be sure no persons or animals are behind or beside the spreader.



**DANGER:** Never allow anyone within 50 yards of the spreader while the PTO is engaged. Product thrown from the spreader can cause serious injury or death.



**DANGER:** Never allow any person inside the hopper for any reason. Serious injury or death can result from someone becoming entangled in the agitator.

The quantity of material distributed per acre depends on the following factors:

1. Position of the lever connected to the hopper gates.
2. Ground speed.
3. Weight and size of the material to be spread.
4. Spreading width.

The working speed depends on ground conditions. Only a test run will enable you to gauge the optimal working speed for your conditions.

The spreading is adjustable in three ways by:

1. Adjusting the **amount of material to be spread**.
2. Adjusting the **spread pattern**.
3. Adjusting the **spreading width**.

To adjust the **amount of material to be spread**, loosen the knob below the flow control assembly and open or close the shutter lever to adjust the size of the opening at the bottom of the hopper. So for example, if it is determined that the appropriate opening is position #6, loosen the knob on the blocking plate and push the lever in until the hole is completely closed. Tighten the knob on the blocking plate in position #6. To begin spreading, pull the lever back until the blocking plate stops it in position #6.

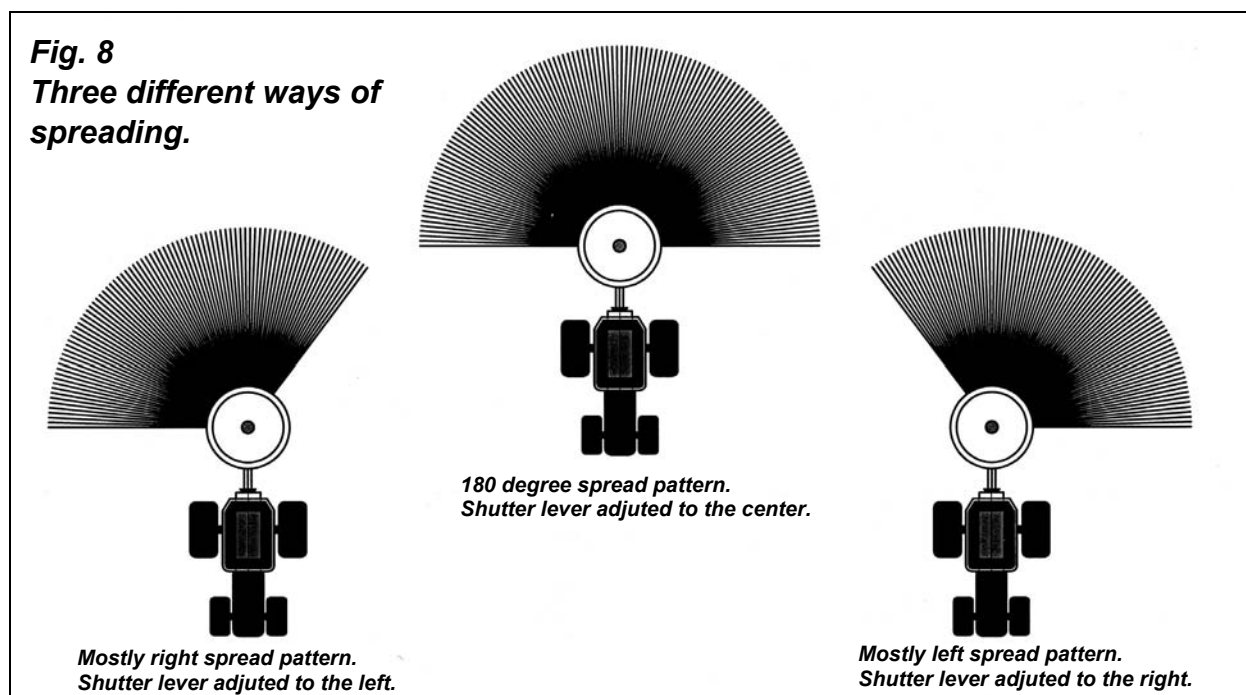
To help the operator set the spreader correctly, Table 3<sup>8</sup> shows the amount of material distributed for each of the ten lever positions. So for example, with the shutter lever in position #6 and a ground speed of 2.5 mph, the output should be approximately 553 lbs/acre.

To adjust the **spread pattern**, loosen the knob that holds the flow control assembly to the guard and slide the lever to the left or to the right. Doing this, closes the spread pattern from 180° when the shutter lever is in the center, to either mostly right when the lever is shifted all the way to the left, or mostly left when the lever is shifted all the way to the right. (see fig. 8).

To reduce the **spreading width** use the optional rear deflector. Adjust the deflector up and down to obtain the desired spreading distance. The higher up the deflector is, the further the spread width, the lower the deflector is, the closer the material will be spread.

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**Fig. 8**  
**Three different ways of spreading.**



## Spread adjustment

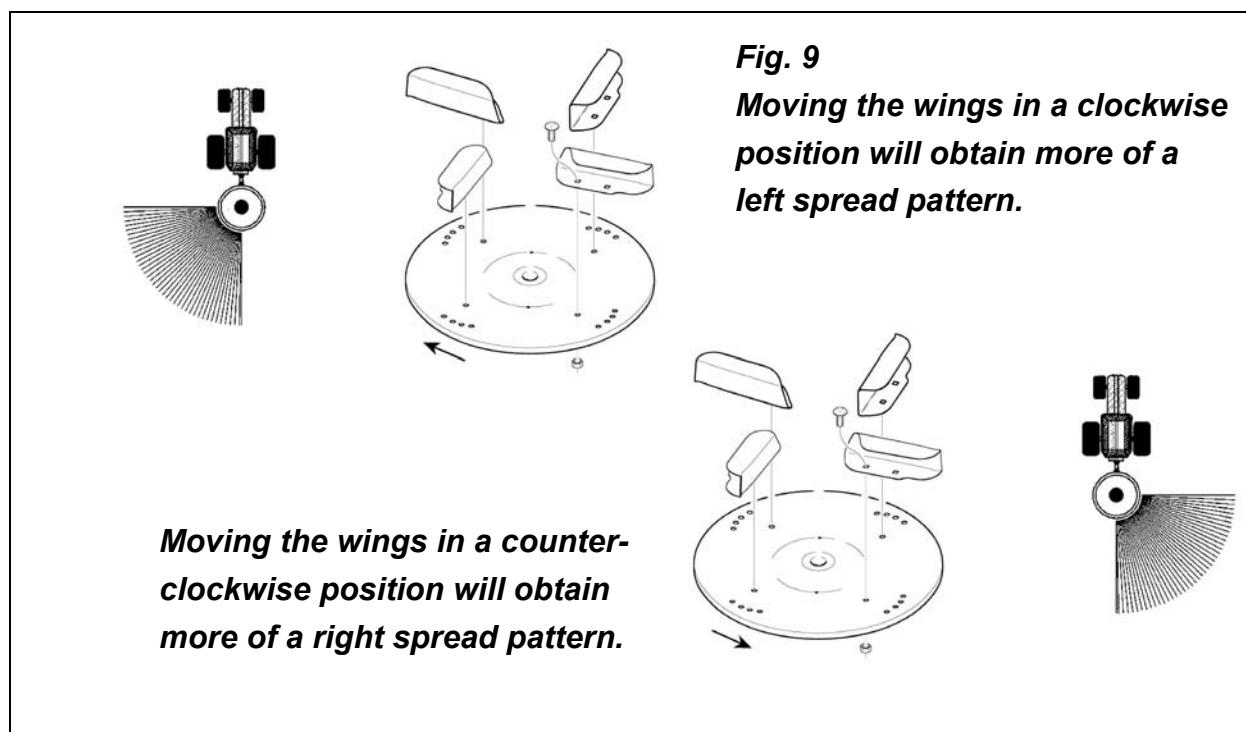
To adjust the **amount of material being spread** move the lever in and out to open or close the gates located at the bottom of the hopper.

Use the scaled rod to set the desired opening of the gates and tighten the knob on the lever stop on the preset number on the scale. When the lever is pulled open it will stop against the lever stop to the preset number on the scale.

To help the operator set the spreader correctly, Table 4<sup>9</sup> shows the amount of material distributed for each of the ten lever positions. So for example, with the lever in position #5, a ground speed of 5 mph, the output should be approximately 246 lbs/acre.

**Adjusting the spread pattern:** The machine can be adjusted to spread to the center or to either of the two sides. To spread 180° behind the tractor, both gates should be open. To spread more towards the right, operate the spreader with the right gate open and the left gate closed. To spread more to the left, close the right gate and leave the left gate open. Loosen the knob on the gate to be left closed. When lever is pushed open, the gate with the loose knob will remain closed.

Moving the wings clockwise makes the material spread more to the left, whereas moving the wings counterclockwise will move the spread pattern more towards the right (**see fig. 9**). So for example, if the material being spread tends to be thrown center-right and the desired direction is more towards the left, try moving the wings clockwise and, if the result is still not satisfactory, loosen the knob on the right gate to keep it closed while the spreader is in use.



To reduce the **spreading width** use the optional rear deflector. Adjust the deflector up and down to obtain the desired spreading distance. The higher up the deflector is, the further the spread width, the lower the deflector is, the closer the material will be spread.

### 3.10 - Uneven Terrain



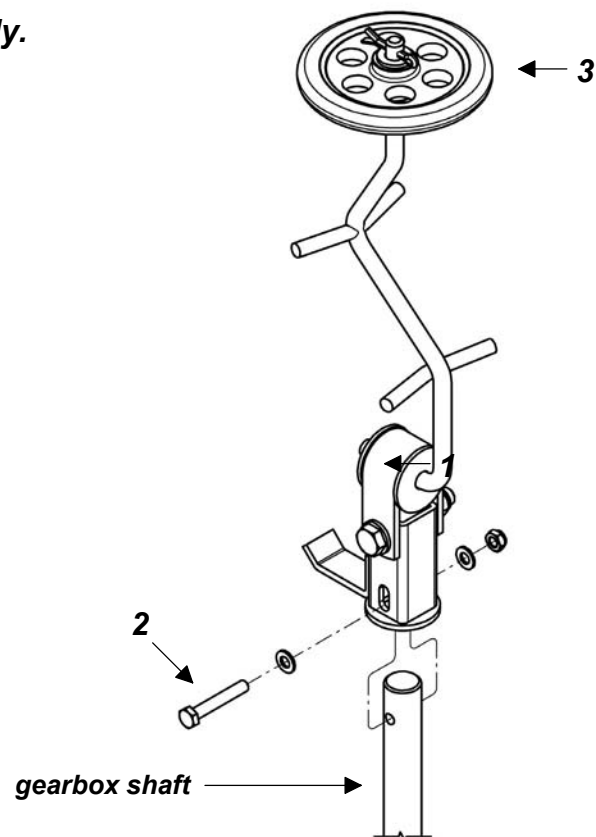
**WARNING:** Be careful of roll-over when operating tractor and spreader over uneven ground.

The following precautions should always be observed when working on uneven terrain:

1. In extremely uneven terrain rear wheel weights, front tractor weights, and/or tire ballast should be used to improve stability.
2. Observe the type of terrain and develop a safe working pattern.
3. Whenever traction or stability is doubtful, first test drive over the terrain.
4. Operate the implement up and down steep slopes, not across slopes, to prevent the tractor from tipping. Avoid sudden stops and starts, and slow down before changing directions on a slope.
5. Pass diagonally through sharp dips and avoid sharp drops to prevent hanging up the tractor and implement.
6. Slow down on sharp turns and slopes to prevent tipping or loss of control.
7. Watch for holes, roots or other hidden objects. Do not use near the edge of a gully, ditch or stream bank.

### 3.13 Agitator

**Fig. 12 -** *agitator assembly.*



To assemble the optional agitator to the spreader proceed as follows (**see fig. 12**):

1. Remove original stationary stirrer from spreader by unbolting the bolt that holds it to the spreader.
2. Replace optional agitator (**#1**) (pre-assembled at the factory) in the same position of the original stationary stirrer.
3. Insert hex bolt (**#2**), two flat washers (one per each side) and tighten nut.
4. Ensure that the stirrer wheel (**#3**) turns freely.



**CAUTION:** Do not run optional tumbling agitator with an empty hopper. Damage to the spreader can occur due to excessive friction between the agitator wheel and the hopper.

## 4 - MAINTENANCE



**DANGER:** Stop engine, lock parking brake and remove key before performing any service or maintenance.

**Always use personal protection devices, such as a breathing mask capable of filtering toxic powders, safety glasses and gloves, when performing maintenance.**

**Refer to chemical manufacturer's label for specific safety information.**

**Keep fingers out of slots to prevent injury.**

### 4.01 - Maintenance Safety



1. Good maintenance is your responsibility.
2. Keep service area clean and dry. Be sure electrical outlets and tools are properly grounded. Use adequate light for the job at hand.
3. Make sure there is plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.
4. Make no repair or adjustments with the tractor engine running. Before working on the machine, disengage the PTO, shut off the engine, set the brakes, and remove the ignition key.
5. Be certain all moving parts on attachment have come to a complete stop before attempting to perform maintenance.
6. Never work under equipment unless it is blocked securely.
7. Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance.
8. Never trust the tractor hydraulics alone to support the machine. Before repairing or adjusting the machine, it should be lowered and allowed to rest on a stand.
9. Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.
10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.
11. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
12. Inflating or servicing tires can be dangerous. Whenever possible, trained personnel should be called to service and/or mount tires.
13. After servicing, be sure all tools, parts and service equipment are removed.
14. Never replace hex bolts with less than grade five bolts unless otherwise specified, i.e., shear bolts<sup>10</sup>.

15. Where replacement parts are necessary for periodic maintenance and servicing, genuine replacement parts must be used to restore your equipment to original specifications. The Company will not claim responsibility for use of unapproved parts and/or accessories and other damages as a result of their use.
16. Unauthorized modifications to the machine may impair the function and/or safety of the machine and reduce its life. If equipment has been altered in any way from original design, the manufacturer does not accept any liability for injury or warranty.

## 4.02 - Service

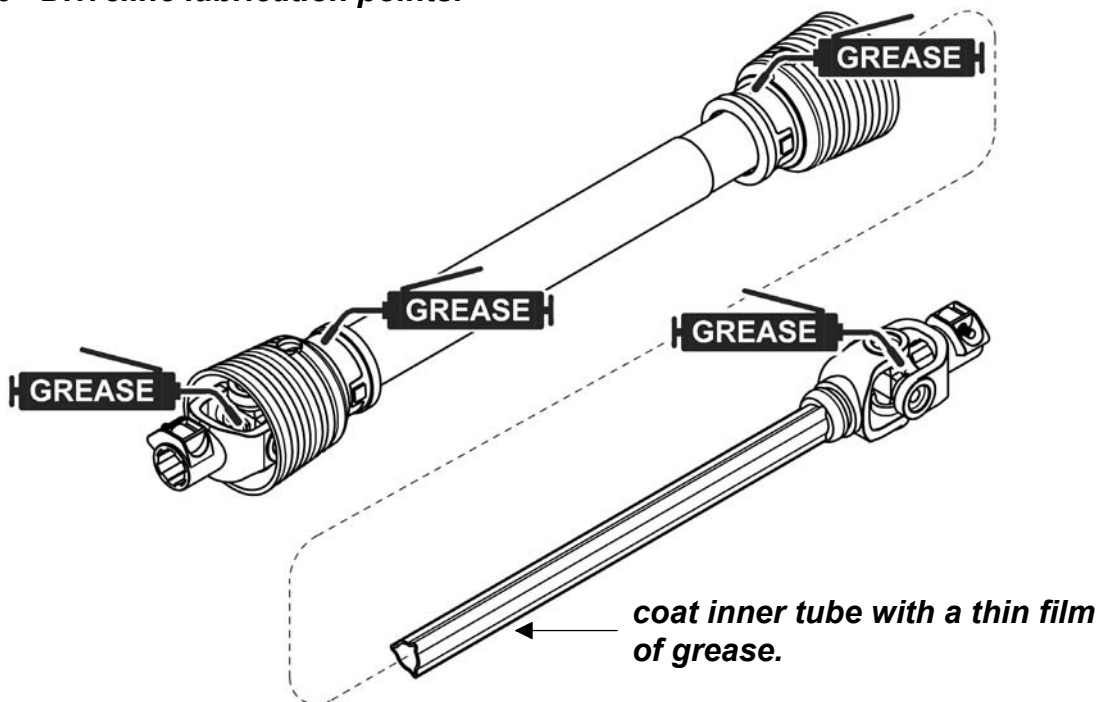
### Before beginning work:

1. Apply a thick layer of grease to all exposed moving parts.
2. Apply a film of biodegradable oil in crevices and corners in order to keep corrosive material from rusting areas that are difficult to clean.

### After each use:

1. Be sure to thoroughly wash the machine without using excessive pressure especially on the moving parts. It is particularly important to wash the implement after using salt or fertilizer. This will help prevent the caustic chemicals in the salt and fertilizer from destroying the metal of the machine.
2. Carefully dry the machine.
3. Apply a thick layer of grease to all exposed moving parts.
4. Apply a film of biodegradable oil in crevices and corners.
5. Grease the driveline cross and bearing and shielding (**see fig. 16**).
6. Grease the telescoping inner and outer tubes (**see fig. 16**).

**Fig. 16 - Driveline lubrication points.**



**After seasonal use it is important to perform the following for prolonged storage:**

1. Wash and dry the spreader carefully.
2. Inspect the spreader and replace worn or damaged parts. If corrosive material has eaten under the paint, clean off the area with a wire brush and touch up with primer and paint.
3. Tighten all hardware.
4. Apply a thick layer of grease to all exposed moving parts.
5. Apply a film of biodegradable oil in crevices and corners.
6. Cover the spreader from the elements in order to have it in perfect condition for the start of the next season.

**NOTE:** The gearbox has been filled with EP grade grease from the factory. The grease never needs replacing unless internal work is done to the gearbox. If necessary add SAE 90 oil through the suitable cap by giving the proper inclination to the fertilizer spreader.

### 4.03 - Driveline



**DANGER:** Only use the original driveline supplied with this implement and always with the safety shielding. Carefully read and file away the driveline operator's manual supplied by the manufacturer. The following does not substitute the information found in the driveline manual.

**IMPORTANT:** Always check driveline length during initial setup and when connecting to a different tractor.

In the collapsed position the driveline should be approximately 2" from bottoming out to prevent possible damage to the tractor or implement. When the driveline is in the maximum extended position, the ideal minimum overlap of the two halves should be approximately 6" (**see fig. 17**).

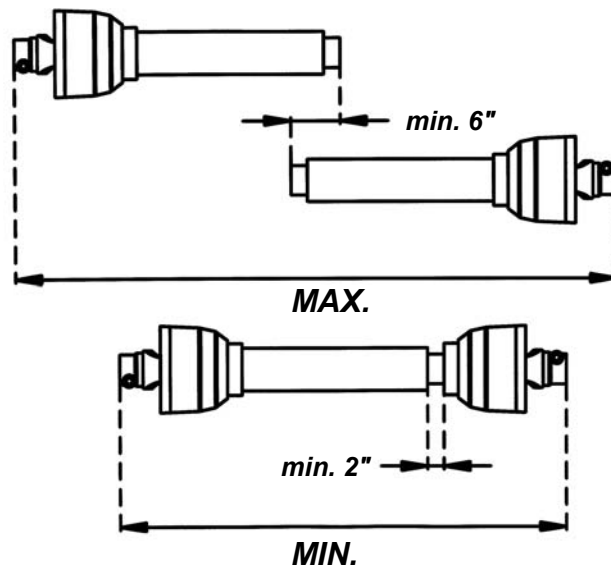
If determined that the driveline is too long, follow these procedures to adjust the length:

1. Separate the two driveline halves. Connect one half to the tractor PTO and the other half to the implement.
2. Raise and lower the implement with the 3 point hitch to find the position where the driveline is shortest. Hold the half shafts side by side and mark the desired length on the outer female tube guard leaving a 1 ½" gap between the end of the guard tube and bell guard.
3. Cut off both guard tubes the same amount as marked in step 2.
4. Shorten both drive tubes the same amount as guard tubes.
5. De-burr and clean filings from drive tubes and apply grease to outside of inner telescoping tube.

6. Reassemble the driveline halves and connect to tractor and implement. Raise and lower implement again to be sure driveline does not bottom out in its shortest position and has a minimum overlap of 6" in the longest position.
7. Install both driveline safety chains. One should be hooked in a hole on the outer driveline yoke shield and to the tractor to restrict outer shield rotation. The second one should be hooked in a hole on the inner driveline yoke shield and to the implement to restrict inner shield rotation.

If determined that the driveline is too short for your tractor, contact your local dealer.

**Fig. 17**



**CAUTION:** Always work with the driveline as straight as possible. This will prolong its life and that of its components. It is advised not to work at an angle greater than 15 degrees.

## 4.04 - Transport









**CAUTION:** Do not tow tractor and spreader behind other vehicles. Use a properly equipped trailer with heavy tie-downs for towing operations.

Before transporting:

1. Always select a safe ground speed that is appropriate for the terrain.
2. Beware of traffic on public roads. Install a SMV (Slow Moving Vehicle) sign when traveling on roads or streets. Comply with all federal, state and local laws.
3. Reduce ground speed when turning and take care that the spreader does not strike obstacles such as trees, fences or buildings.
4. Always disengage PTO before raising spreader to transport position.

**TABLE 1 - TORQUE SPECIFICATIONS**

Metric (ISO) treaded bolts head marking							Inch (SAE) treaded bolts head marking								
	Class 5.8		Class 8.8		Class 10.9			Grade 2		Grade 5		Grade 8			
Bolt size mm	Thread mm	N.m	ft-lb	N.m	ft-lb	N.m	ft-lb	Bolt size inch	Thread inch tpi	N.m	ft-lb	N.m	ft-lb	N.m	ft-lb
M5	0.8	4	3	6	4	9	7	1/4"	20	7	5	11	8	16	12
M6	1	6	4	10	7	15	11	1/4"	28	8	6	13	10	19	14
M8	1.25	16	12	25	18	36	27	5/16"	18	15	11	24	17	33	25
M8	1	17	13	26	19	38	28	5/16"	24	17	13	26	19	37	27
M10	1.5	31	23	48	35	71	52	3/8"	16	27	20	42	31	59	44
M10	1.25	33	24	51	38	75	55	3/8"	24	31	23	47	35	67	49
M10	1	35	26	53	39	78	58	7/16"	14	43	32	67	49	95	70
M12	1.75	54	40	84	62	123	91	7/16"	20	48	36	75	55	106	78
M12	1.5	56	41	87	64	128	94	1/2"	13	66	48	102	75	144	106
M12	1.25	59	44	90	66	133	98	1/2"	20	75	55	115	85	163	120
M14	2	84	62	133	98	195	144	9/16"	12	95	70	147	109	208	154
M14	1.5	94	69	142	105	209	154	9/16"	18	106	79	164	121	232	171
M16	2	131	97	206	152	302	223	5/8"	11	132	97	203	150	287	212
M16	1.5	141	104	218	161	320	236	5/8"	18	149	110	230	170	325	240
M18	2.5	181	133	295	218	421	310	3/4"	10	233	172	361	266	509	376
M18	2	196	145	311	229	443	327	3/4"	16	261	192	403	297	569	420
M18	1.5	203	150	327	241	465	343	7/8"	9	226	167	582	430	822	606
M20	2.5	256	189	415	306	592	437	7/8"	14	249	184	642	473	906	668
M20	1.5	288	212	454	335	646	476	1"	8	339	250	873	644	1232	909
M22	2.5	344	254	567	418	807	595	1"	12	371	273	955	704	1348	995
M22	1.5	381	281	613	452	873	644	1-1/8"	7	480	354	1077	794	1746	1288
M24	3	444	327	714	526	1017	750	1-1/8"	12	539	397	1208	891	1958	1445
M24	2	488	360	769	567	1095	808	1-1/4"	7	677	500	1519	1120	2463	1817
M27	3	656	484	1050	774	1496	1103	1-1/4"	12	750	553	1682	1241	2728	2012
M27	2	719	530	1119	825	1594	1176	1-3/8"	6	888	655	1992	1469	3230	2382
M30	3.5	906	668	1420	1047	2033	1499	1-3/8"	12	1011	746	2268	1673	3677	2712
M30	2	1000	738	1600	1180	2250	1659	1-1/2"	6	1179	869	2643	1949	4286	3161
M36	4	1534	1131	2482	1830	3535	2607	1-1/2"	12	1326	978	2974	2194	4823	3557

When using lock washers with nuts, increase torque values by 5%.

When using lock washers with nuts, increase torque values by 5%.

**TABLE 2 - FERTILIZER SPREADER - TECHNICAL FEATURES**

Series Hop, for tractors from 16 to 50 HP, PTO 540 rpm, 3 point hitch cat. 1									
Model	HP	Hopper	Hopper capacity cu. ft.	Carrying weight lbs.	Weight lbs.	Loading height	Loading width	Spreading width ft.	Driveline 1 3/8"
209-421	20-50	polyethylene	8.58	549	125	40"	42"	46'	ASAE cat. 1

**TABLE 4** **SWATH SPREAD PATTERNS (lbs/acre)**

Lever position	Spreading width 46 feet		
	2.5 mph	5 mph	7.5 mph
1	50	39	16
2	123	61	43
3	246	123	82
4	369	184	123
5	492	246	166
6	-	307	201
7	-	369	246
8	-	430	282
9	-	492	323

## 5 - REPAIR PROCEDURES



**CAUTION:** All repair procedures must be done by authorized dealerships. It is not recommended that untrained individuals perform any repair work.

## 5.01 - Suggested Spare Parts

It is suggested that the following spare parts be kept on hand for the spreader at all times to prevent a minor problem from delaying work:

Description	Quantity
<b>Models 209 and 212:</b>	
Spreader disc wings (501-598B or 001-4414)	4
Stationary stirrer (501-597B)	1

## 5.02 - Storage

After seasonal use it is important to perform the following for prolonged storage:

1. Empty hopper of product before unhooking it from the tractor.
2. Wash and dry the spreader carefully.
3. Inspect the spreader and replace worn or damaged parts. If corrosive material has eaten under the paint, clean off the area with a wire brush and touch up with primer and paint.
4. Tighten all hardware.
5. Grease or oil all areas indicated under Maintenance<sup>11</sup>.
6. Apply a thick layer of grease to all exposed moving parts.
7. Cover the spreader from the elements in order to have it in perfect condition for the start of the next season.

<sup>11</sup> See Chapter 4 - Maintenance.

8. Make sure all parked machines are on a hard, level surface, and engage all safety devices.
9. Do not permit children to play on or around the stored unit.

## 6 - TROUBLESHOOTING

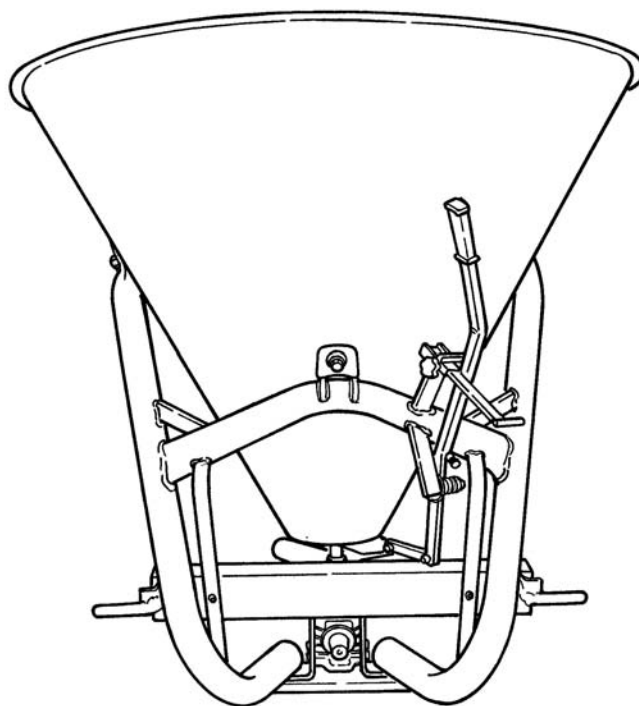


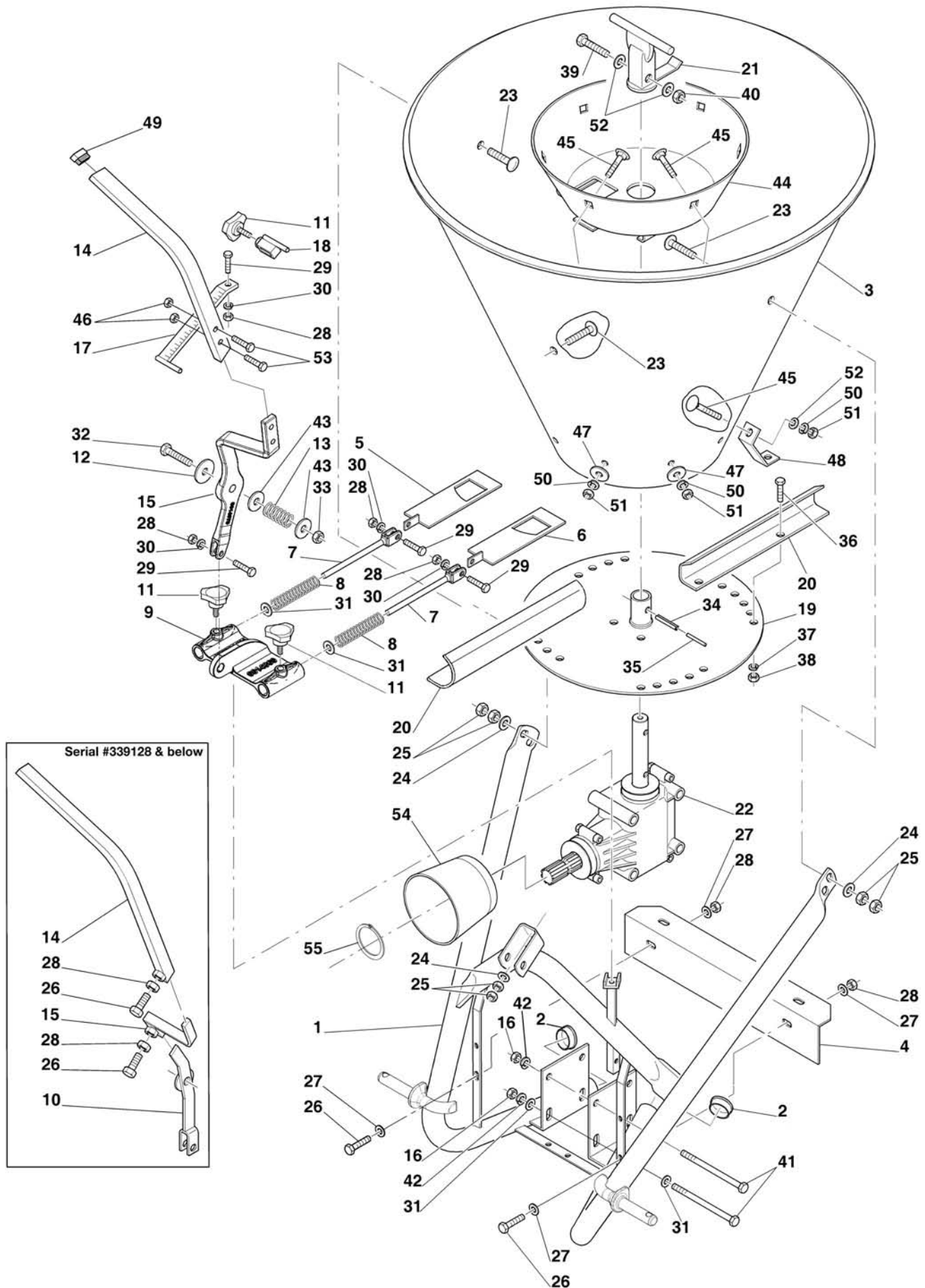
**WARNING:** Be sure tractor engine is off, parking brake is locked, and key is removed before making any adjustments.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Non uniform spread pattern.	Spreader disc wings not positioned properly.	Position spreader disc wings to the proper setting (see section 3.09 - Operating Techniques).
	Wrong gate opening.	Adjust gate openings.
Product not flowing to spreader disc.	Wet product. Powdered product.	Use dry product only. Use optional tumbling agitator.
PTO shaft turning but not the gearbox output shaft.	Roll pin missing or sheared on the spreader disc shaft.	Replace roll pin.
	Broken ring or pinion gear.	Replace ring or pinion gear.
Narrow spread width.	Incorrect PTO speed.	Increase PTO speed to 540 rpm.
	Hopper too far backwards.	Shorten the tractor's top link to position spreader so it runs level or inclined slightly forward toward the tractor.

# Parts Manual

## Fertilizer Spreader





Ref.	Part #	Description	Qty.
1	502-011B	Frame; 209, 212 #339128 & below <sup>14</sup>	1
	001-4300	Frame; 209, 212 #339129 & above	1
2	502-020B	Rubber cap Ø60	2
3	011-4326	Hopper polyethylene; 209-221, 209-421	1
	021-4326	Hopper polyethylene; 212-421	1
4	502-013B	Protection	1
5	011-4340	Shutter stainless steel, right	1
6	021-4340	Shutter stainless steel, left	1
7	502-004B	Tie rod; #339128 & below <sup>15</sup>	2
	001-4346	Tie rod; #339129 & above	2
8	502-024B	Tension spring	2
9	502-025B	Guide plate, shutter; #339128 & below <sup>16</sup>	1
	001-4360	Guide plate, shutter; #339129 & above	1
10	502-002B	Bracket, shutter adjustment lever; #339128 & below <sup>17</sup>	1
11	501-589B	Adjustment knob M08x16	3
12	501-585B	Washer flat nylon Ø12	1
13	501-586B	Spring	1
14	001-4380	Lever, shutter adjustment; #339128 & below	1
	001-4375	Lever, shutter adjustment; #339129 & above	1
15	001-4384	Hitch, shutter adjustment lever; #339128 & below <sup>18</sup>	1
	001-4370	Hitch, shutter adjustment lever; #339129 & above	1
16	009-0150	Nut HH M10-1.50 C6 Z MD	4
17	001-4396	Scaled rod	1
18	502-008B	Lever stop	1
19	501-599B	Spreader disc, steel; 209-221	1
	001-4410	Spreader disc, stainless steel; 209-421, 212-421	1
20	501-598B	Spreader wing, steel; 209-221	4
	001-4414	Spreader wing, stainless steel; 209-421, 212-421	4
21	501-597B	Stationary stirrer	1
22	001-4690	Gearbox, complete	1
23	004-4115	Bolt CR M12-1.75x40 C8.8 Z; 209-221, 209-421	3
	004-4115	Bolt CR M12-1.75x40 C8.8 Z; 212-421	5
24	009-1435	Washer flat Ø14 Z; 209-221, 209-421	3
	009-1435	Washer flat Ø14 Z; 212-421	5
25	000-1106	Nut HH M12-1.75 C6 Z MD; 209-221, 209-421	6
	000-1106	Nut HH M12-1.75 C6 Z MD; 212-421	10
26	001-5012	Bolt HH M08-1.25x20 C8.8 Z F	2
27	001-5230	Washer flat Ø8 Z	4
28	004-6545	Nut HH M08-1.25 C6 Z MD	6
29	004-6543	Bolt HH M08-1.25x30 C8.8 Z F	4
30	000-3144	Washer lock Ø8 Z	4
31	000-2034	Washer flat Ø10 Z	6
32	000-7128	Bolt HH M12-1.75x80 C8.8 Z F	1
33	001-3345	Nut ES M12-1.75 Z TK	1
34	002-9247	Roll pin Ø8x40	1

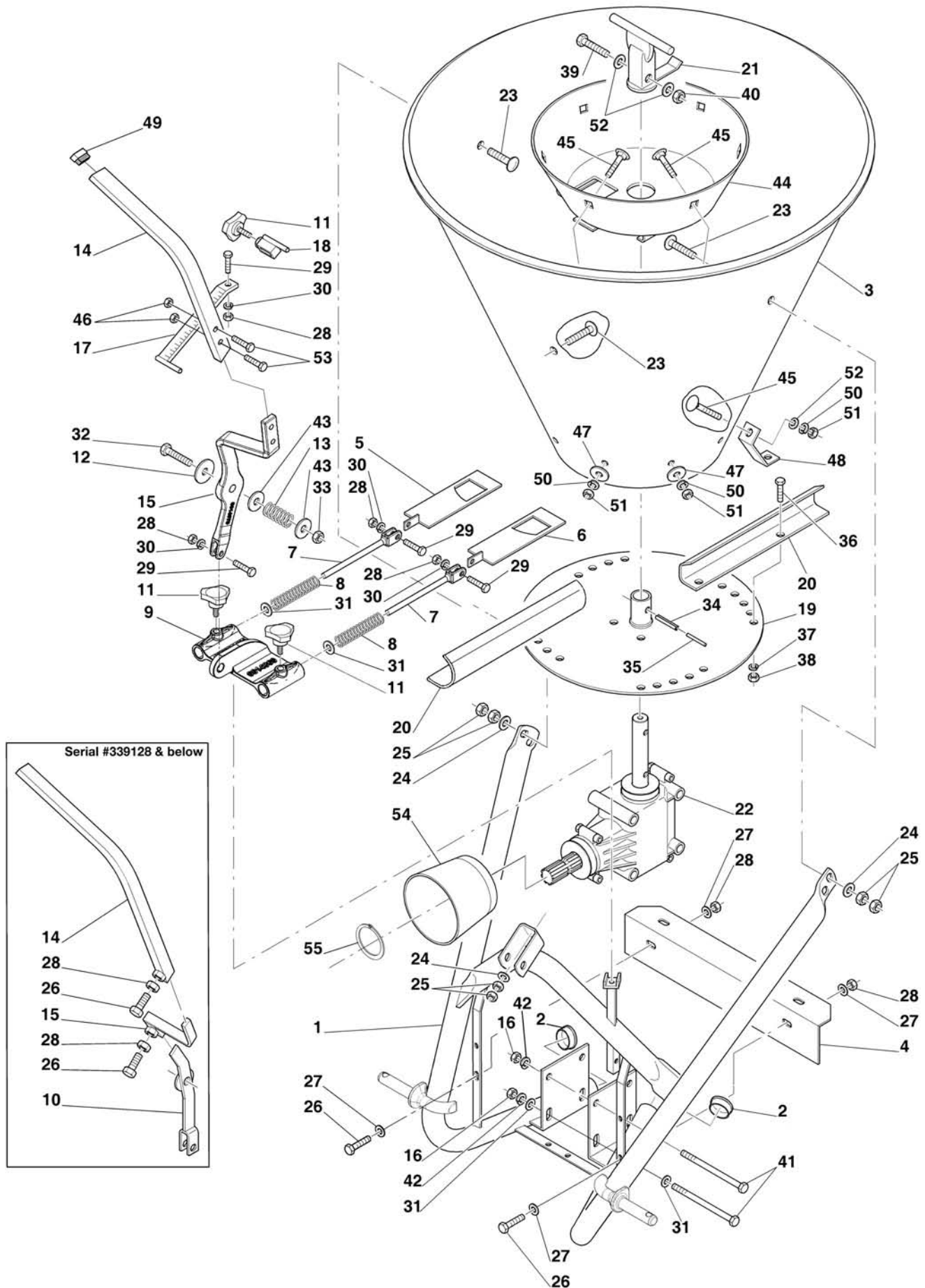
<sup>14</sup> Interchangeable with frame #001-4300.

<sup>15</sup> Interchangeable with tie rod #001-4346.

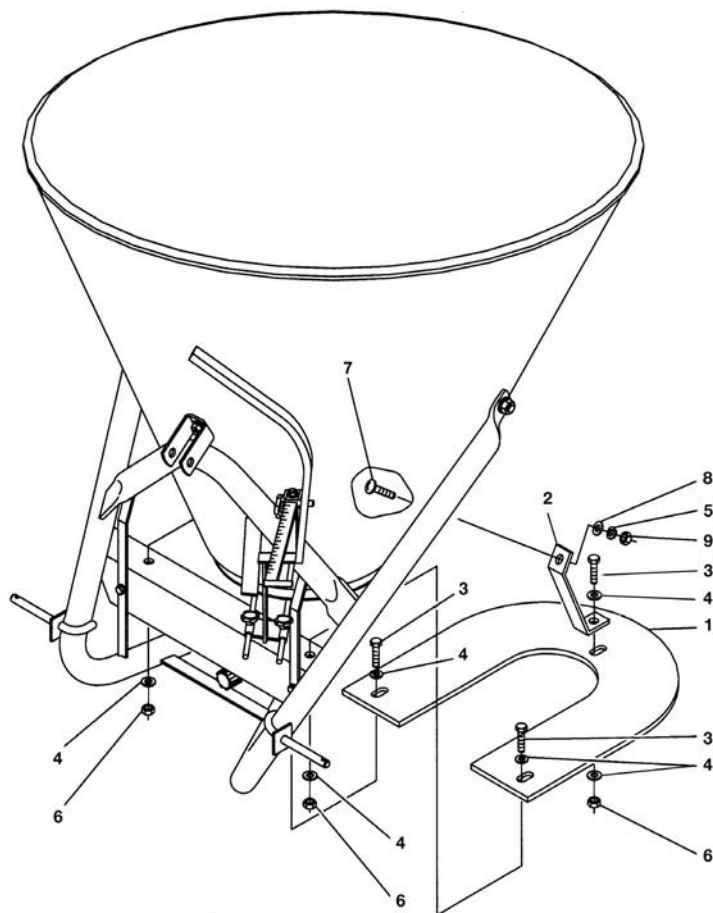
<sup>16</sup> Interchangeable with guide plate #001-4360.

<sup>17</sup> Replace with part #001-4366.

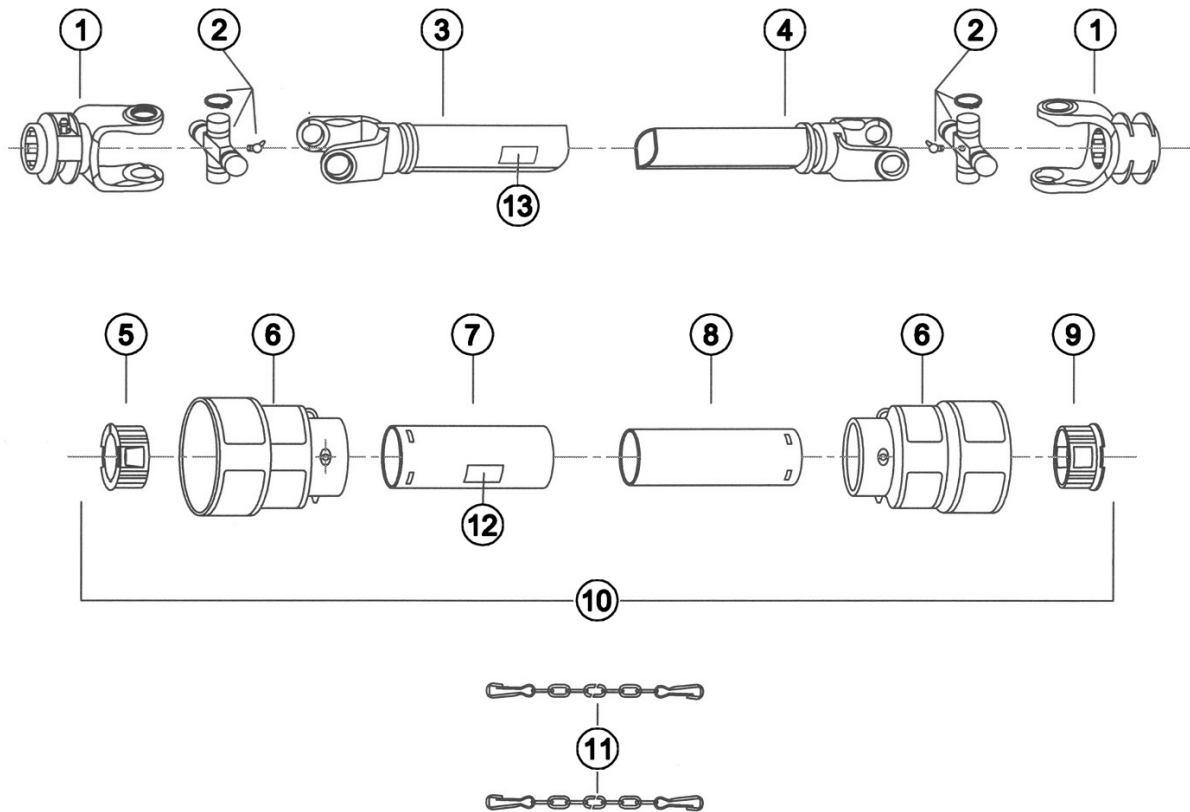
<sup>18</sup> Interchangeable with hitch #001-4370.



<b>Ref.</b>	<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
35	501-596B	Roll pin Ø5x40	1
36	003-6319	Bolt HH M06-1.00x16 C8.8 Z F; 209-221	8
	001-4320	Bolt HH M06-1.00x16 SS F; 209-421, 212-421	8
37	004-6536	Washer lock Ø6 Z; 209-221	8
	001-4321	Washer lock Ø06 SS; 209-421, 212-421	8
38	501-603B	Nut HH M06-1.00 C6 Z TK; 209-221	8
	001-4322	Nut HH M06-1.00 SS TK; 209-421, 212-421	8
39	001-4334	Bolt HH M08-1.25x45 SS P	1
40	001-4335	Nut ES M08-1.25 SS TK	1
41	001-5273	Bolt HH M10-1.50x110 C8.8 Z P	4
42	000-1280	Washer lock Ø10 Z	4
43	000-2265	Washer flat Ø12 Z	2
44	001-4327	Hopper bottom plate, stainless steel	1
45	001-4315	Bolt CR M08-1.25x25 SS	6
46	009-1384	Nut ES M08-1.25 Z TK	2
47	001-4316	Washer fender Ø8 SS	5
48	001-4339	Attachment plate, poly hopper	1
49	001-4391	Rubber cap	1
50	001-4317	Washer lock Ø08 SS	6
51	001-4318	Nut HH M08-1.25 SS MD	6
52	001-4319	Washer flat Ø08 SS	3
53	009-1446	Bolt HH M08-1.25x25 C8.8 Z F	2
54	001-8531	Guard	1
55	001-4464	Snap ring, outer Ø65	1

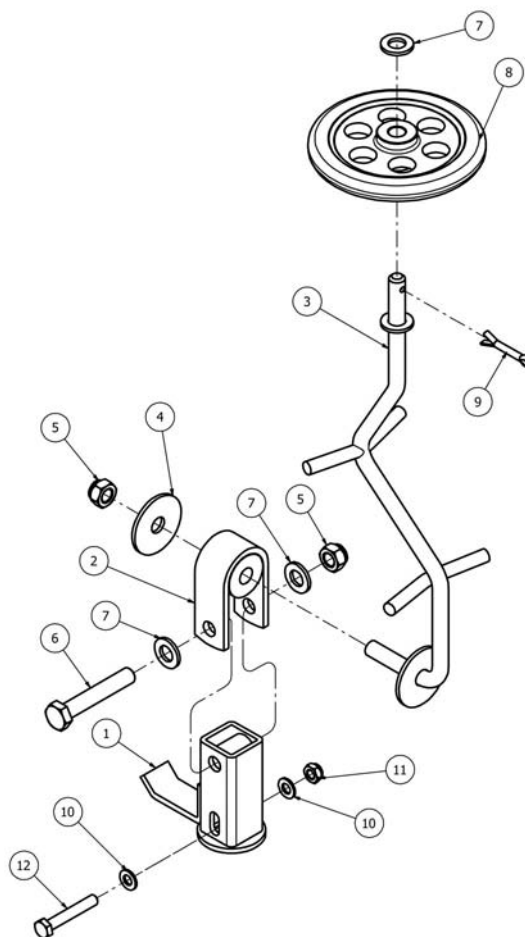


Ref.	Part #	Description	Qty.
1	001-4337	Protection	1
2	001-4338	Attachment plate, steel hopper; 209-121, 212-121	1
	001-4339	Attachment plate, poly hopper; 209-221, 209-421, 212-421	1
3	004-6454	Bolt HH M08-1.25x16 C8.8 Z F	3
4	001-5230	Washer flat Ø8 Z	6
5	000-3144	Washer lock Ø8 Z; 209-121, 212-121	1
	001-4317	Washer lock Ø08 SS; 209-221, 209-421, 212-421	1
6	004-6545	Nut HH M08-1.25 C6 Z MD	3
7	008-4289	Bolt CR M08-1.25x20 C4.6 Z; 209-121, 212-121	1
	001-4315	Bolt CR M08-1.25x25 SS; 209-221, 209-421, 212-421	1
8	001-5230	Washer flat Ø8 Z; 209-121, 212-121	1
	001-4319	Washer flat Ø08 SS; 209-221, 209-421, 212-421	1
9	004-6545	Nut HH M08-1.25 C6 Z MD; 209-121, 212-121	1
	001-4318	Nut HH M08-1.25 SS MD; 209-221, 209-421, 212-421	1



Ref.	Part #	Description	Qty.
1	1021010C	PTO yoke	2
2	1001005C	Cross & bearing	2
3	1981034NC	Outer tube w/yoke; #339128 & below	1
4	1991035NC	Inner tube w/yoke; #339128 & below	1
5	1781210CA	Locking ring, outer tube; from #265830 to #339128	1
6	1784203CA	Cone, outer tube; from #265830 to #339128	2
7	1773032CA	Shield, outer tube; from #265830 to #339128	1
8	1872032CA	Shield, inner tube; from #265830 to #339128	1
9	1781211CA	Locking ring, inner tube; from #265830 to #339128	1
10	90SS1032CA	Shield, complete	1
11	1006065C	Chain, anti-rotation	2
12	950-463B	Decal "DANGER - Rotating driveline, keep away" outer shield	1
13	950-464B	Decal "DANGER - Guard missing, do not operate" outer tube	1
	050-0487	Driveline, complete <sup>21</sup>	-

<sup>21</sup> Complete driveline is no longer available, replace with part #050-0121.



Ref.	Part #	Description	Qty.
1	001-4485	Stirrer, tumbling agitator	1
2	001-4478	Hitch, tumbling agitator	1
3	001-4470	Beam, tumbling agitator	1
4	005-7273	Washer fender Ø12 Z	1
5	003-0064	Nut PT M12-1.75 C6 TK Z	2
6	019-2236	Bolt HH M12-1.75x70 C8.8 Z P	1
7	000-2265	Washer flat Ø12 W	3
8	001-4488	Wheel, tumbling agitator	1
9	000-1174	Cotter pin Ø4x35 Z	1
10	001-5230	Washer flat Ø08 W	2
11	009-1384	Nut ES M08-1.25 Z TK	1
12	001-4490	Bolt HH M08-1.25x50 C8.8 Z P	1
	009-9978	Tumbling agitator, complete	1