Farm King

OPERATOR AND PARTS MANUAL

Fertilizer Applicator

Model 1410

062017 SXL-26089

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Manufacturer's Statement: For technical reasons, Buhler Industries Inc. reserves the right to modify machinery design and specifications provided herein without any preliminary notice. Information provided herein is of descriptive nature. Performance quality may depend on soil fertility, applied agricultural techniques, weather conditions, and other factors.

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WARRANTY REGISTRATION FORM

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer Name:

Dealer Name:

Customer Address:

Dealer Address:

City:

Prov / State:

City:

Prov / State:

Postal / Zip Code:

Phone:

Postal / Zip Code:

Phone:

Fertilizer Applicator Model:

Serial Number:

Delivery Date:

I have thoroughly instructed the buyer on the above described equipment which review included the Operator and Parts Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Dealer Inspection Report

- ☐ Toolbar Moves Up / Down Freely
- ☐ Inner And Outer Wings Fold / Extend Freely
- ☐ Wheel Bolts Are Tight
- ☐ Monitors Function Correctly
- ☐ Hydraulic / Application Hoses And Fittings Tight
- ☐ All Fasteners Are Tight
- ☐ Lubricate Machine
- ☐ Check Tire Pressure

Safety

- ☐ All Lights And Reflectors Installed
- ☐ All Lights And Reflectors Cleaned And Working
- ☐ Safety Chain On Hitch
- ☐ All Decals Installed
- ☐ Guards And Shields Installed And Secure
- ☐ Review Operating And Safety Instructions
- ☐ Check For Hydraulic Leaks

Date:

Dealer Rep. Signature:

The above equipment and Operator And Parts Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date:

Customer / Owner Signature:

Remove this Warranty Registration Form from the Operator And Parts Manual. Make two copies of the form. Send original Warranty Registration Form to Farm King. Give one copy to the customer and the dealer will keep one copy.

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INTRODUCTION

This Operator And Parts Manual was written to give the owner / operator instructions on the safe operation, maintenance and part identification of the Farm King equipment. READ AND UNDERSTAND THIS OPERATOR AND PARTS MANUAL BEFORE OPERATING YOUR FARM KING EQUIPMENT. If you have any questions, see your Farm King dealer. This manual may illustrate options and accessories not installed on your Farm King equipment.

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OWNER'S INFORMATION

Thank you for your decision to purchase a Farm King 1410 Fertilizer Applicator. To ensure maximum performance of your equipment, it is mandatory that you thoroughly study the Operator And Parts Manual and follow the recommendations. Proper operation and maintenance are essential to maximize equipment life and prevent personal injury.

Operate and maintain this equipment in a safe manner and in accordance with all applicable local, state, and federal codes, regulations and / or laws. Follow all on-product labeling and instructions.

Make sure that all personnel have read this Operator And Parts Manual and thoroughly understand safe and correct operating, installation and maintenance procedures.

Farm King is continually working to improve its products. Farm King reserves the right to make any improvements or changes as deemed practical and possible without incurring any responsibility or obligation to make any changes or additions to equipment sold previously.

Although great care has been taken to ensure the accuracy of this publication, Farm King makes no warranty or guarantee of any kind, written or expressed, implied or otherwise with regard to the information contained within this manual. Farm King assumes no responsibility for any errors that may appear in this manual and shall not be liable under any circumstances for incidental, consequential or punitive damages in connection with, or arising from the use of this manual.

Keep this manual available for frequent reference. All new operators or owners must review the manual before using the equipment and annually thereafter. Contact your Farm King Dealer if you need assistance, information, or additional copies of the manual.

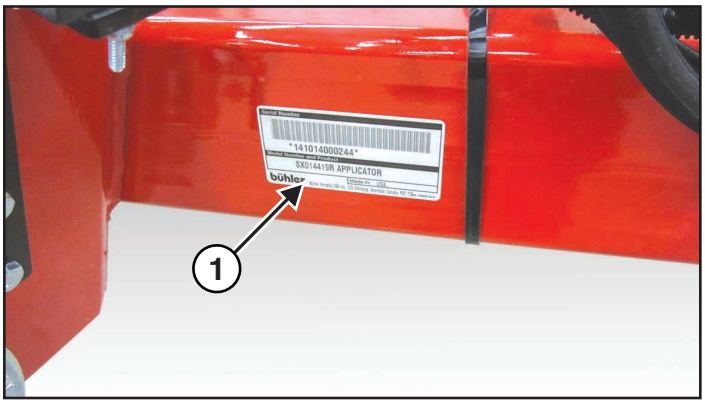
Visit our website at **www.farm-king.com** for a complete list of dealers in your area.

The directions left, right, front and rear, as mentioned throughout this manual, are as viewed by the operator sitting in the tractor seat while towing the implement.

Serial Number Location

Please enter the model and serial number in the space provided for easy reference

Figure 1



Model Number: _____

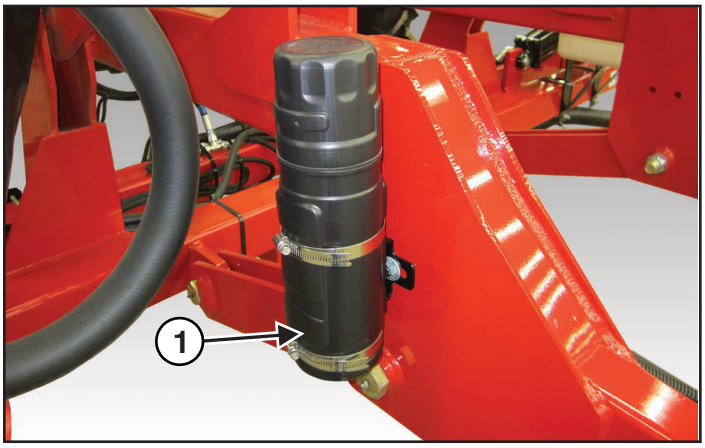
Serial Number: _____

The serial number plate (Item 1) **[Figure 1]** is located on the front right lower hitch frame, forward of the jack.

Always use your serial number when requesting information or when ordering parts.

Manual Storage

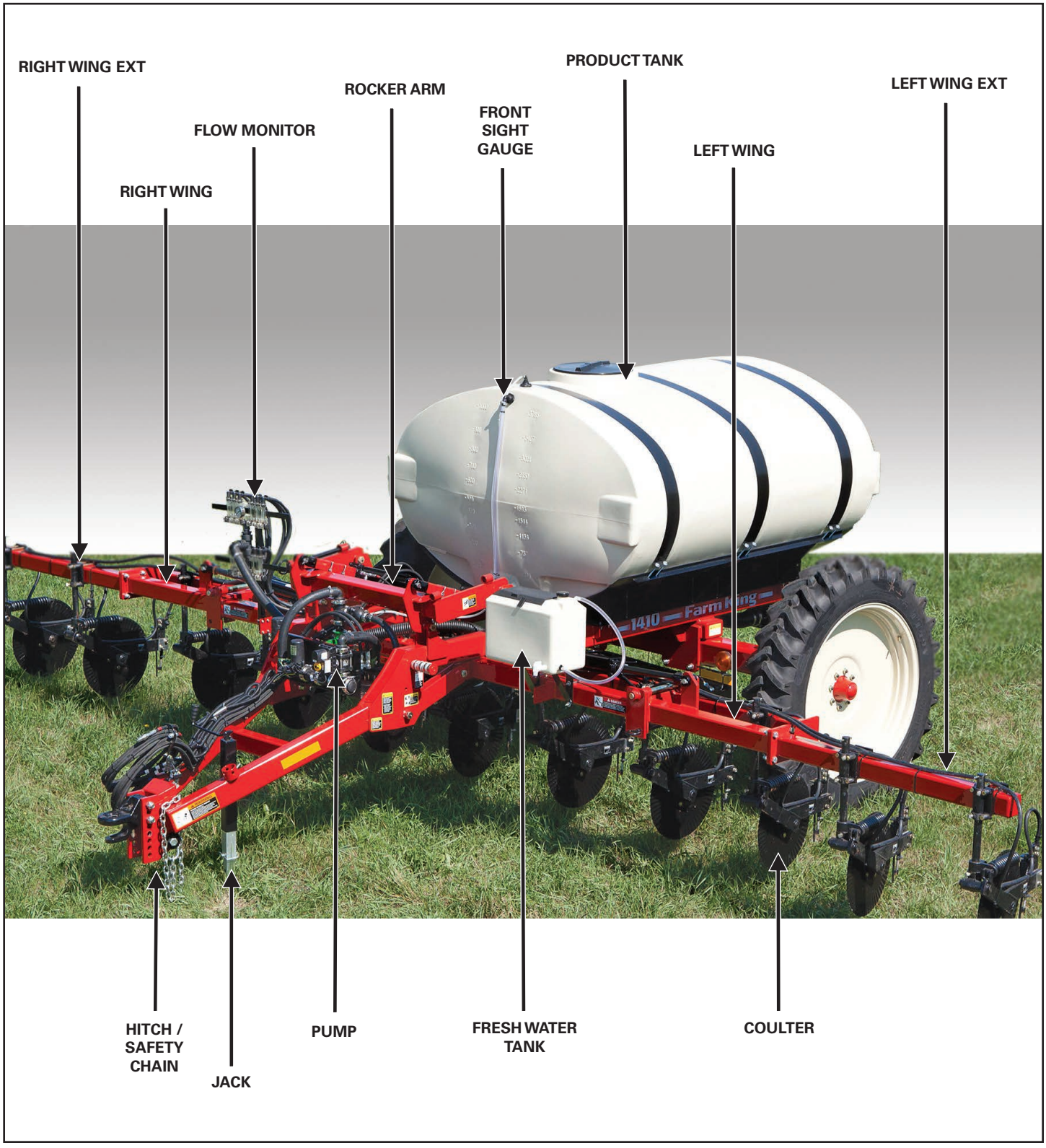
Figure 2



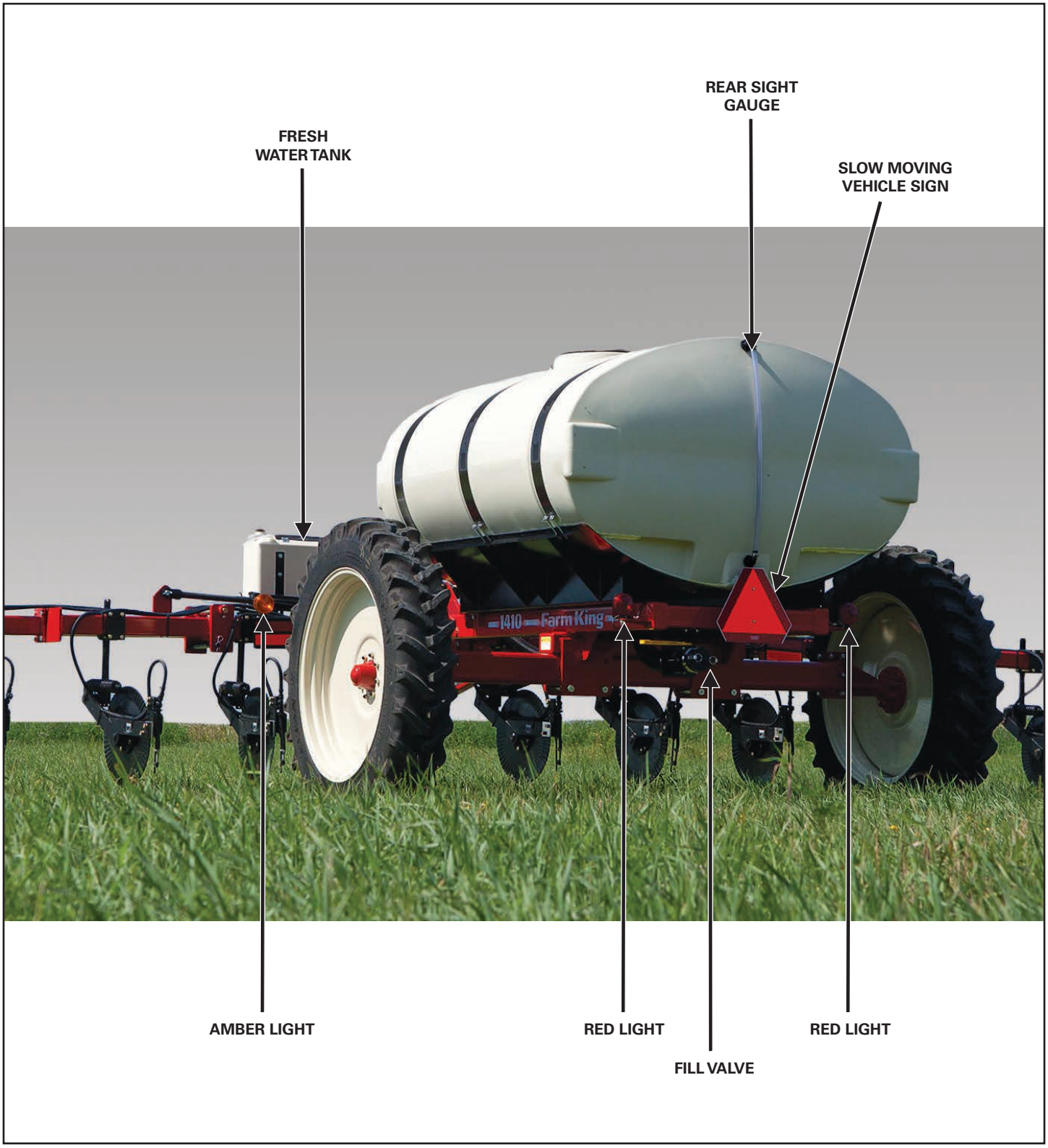
The operator and parts manual and other documents can be stored in the canister (Item 1) **[Figure 2]** located behind the hitch on the front of the fertilizer applicator.

EQUIPMENT IDENTIFICATION

Component Location



Component Location



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SAFETY

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SAFETY INSTRUCTIONS

Safe Operation is The Operator's Responsibility

Safety Alert Symbol

This symbol with a warning statement means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CAUTION

The signal word CAUTION on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

DANGER

The signal word DANGER on the machine and in the manuals indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

The signal word WARNING on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.

Safe Operation Needs A Qualified Operator

WARNING

Operators must have instructions before operating the machine. Untrained operators can cause injury or death.

For an operator to be qualified, he or she must not use drugs or alcohol which impair alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he or she can safely operate a machine and the equipment.

A Qualified Operator Must Do The Following:

Understand the written instructions, rules and regulations

- The written instructions from Farm King include the Warranty Registration, Dealer Inspection Report, Operator And Parts Manual and decals.
- Check the rules and regulations at your location. The rules may include an employer's work safety requirements. Regulations may apply to local driving requirements or use of a Slow Moving Vehicle (SMV) emblem. Regulations may identify a hazard such as a utility line.

Have Training with Actual Operation

- Operator training must consist of a demonstration and verbal instruction. This training is given by the machine owner prior to operation.
- The new operator must start in an area without bystanders and use all the controls until he or she can operate the machine safely under all conditions of the work area. Always fasten seat belt before operating.

Know the Work Conditions

- Clear working area of all bystanders, especially small children and all obstacles that might be hooked or snagged, causing injury or damage.
- Know the location of any overhead or underground power lines. Call local utilities and have all underground power lines marked prior to operation.
- Wear tight fitting clothing. Always wear safety glasses when doing maintenance or service.

Use Safety Rules

- Read and follow instructions in this manual and the tractor's Operators Manual before operating.
- Read chemical manufacturers warnings, instructions and procedures before starting and follow them exactly.
- Under no circumstances should young children be allowed to work with this equipment.
- This equipment is dangerous to children and persons unfamiliar with its operation.
- If the elderly are assisting with work, their physical limitations need to be recognized and accommodated.
- Check for overhead and / or underground lines before operating equipment (if applicable).
- 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.
- Check that the equipment is securely fastened to the tractor / towing vehicle.
- Make sure all the machine controls are in the NEUTRAL position before starting the machine.
- Operate the equipment only from the operator's position.
- Operate the equipment according to the Operator And Parts Manual.
- When learning to operate the equipment, do it at a slow rate in an area clear of bystanders, especially small children.
- DO NOT permit personnel to be in the work area when operating the equipment.
- The equipment must be used ONLY on approved tractors / transport vehicles.
- DO NOT modify the equipment in any way. Unauthorized modification may impair the function and / or safety and could affect the life of the equipment.
- Stop tractor engine, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing, unplugging or filling.
- DO NOT make any adjustments or repairs on the equipment while the machine is running.
- Keep shields and guards in place. Replace if damaged.
- Keep hands, feet, hair and clothing away from all moving parts.

Transport Safety

- Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.
- Comply with state and local laws governing highway safety and movement of machinery on public roads.
- The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use.
- Local laws should be checked for all highway lighting and marking requirements.
- Do not transport with fluid in the tank.
- Always install transport locks, pins or brackets before transporting.
- Always yield to oncoming traffic in all situations and move to the side of the road so any following traffic may pass.
- Always enter curves or drive up or down hills at a low speed and at a gradual steering angle.
- Never allow riders on either tractor or equipment.
- Keep tractor / towing vehicle in a lower gear at all times when traveling down steep grades.
- Maintain proper brake settings at all times (if equipped).

Machine Requirements And Capabilities

- Fasten seat belt securely. If equipped with a foldable Roll-Over Protective Structure (ROPS), only fasten seat belt when ROPS is up and locked. DO NOT wear seat belt if ROPS is down.
- Stop the machine and engage the parking brake. Install blocks in front of and behind the rear tires of the machine. Install blocks underneath and support the equipment securely before working under raised equipment.
- Keep bystanders clear of moving parts and the work area. Keep children away.
- Use increased caution on slopes and near banks and ditches to prevent overturn.
- Make certain that the Slow Moving Vehicle (SMV) emblem is installed so that it is visible and legible. When transporting the equipment, use the flashing warning lights (if equipped) and follow all local regulations.
- Operate this equipment with a machine equipped with an approved Roll-Over Protective Structure (ROPS). Always wear seat belt when the ROPS is up. Serious injury or death could result from falling off the machine.
- Before leaving the operator's position:
  1. Always park on a flat level surface.
  2. Place all controls in neutral.
  3. Engage the parking brake.
  4. Stop engine.
  5. Wait for all moving parts to stop.
- Carry passengers only in designated seating areas. Never allow riders on the machine or equipment. Falling off can result in serious injury or death.
- Start the equipment only when properly seated in the operator's seat. Starting a machine in gear can result in serious injury or death.
- Operate the machine and equipment from the operator's position only.
- The parking brake must be engaged before leaving the operator's seat. Rollaway can occur because the transmission may not prevent machine movement.

FIRE PREVENTION

Maintenance

- The machine and some equipment have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.
- Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard. The operator's area, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.
- All fuels, most lubricants and some coolant mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

- The Farm King machine must be in good operating condition before use.
- Check all of the items listed on the service schedule under the 8 hour column before operation. (See Maintenance section)
- Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.

Starting

- Do not use ether or starting fluids on any engine that has glow plugs. These starting aids can cause explosion and injure you or bystanders.
- Use the procedure in the tractor's operator's manual for connecting the battery and for jump starting.

Electrical

- Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.
- Battery gas can explode and cause serious injury. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

Hydraulic System

- Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.
- Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.

Fueling

- Stop the engine and let it cool before adding fuel. No smoking! Do not refuel a machine near open flames or sparks. Fill the fuel tank outdoors.

Spark Arrester Exhaust System

- The spark arrester exhaust system is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.
- Check the spark arrester exhaust system regularly to make sure it is maintained and working properly. Use the procedure in the machine's Operator And Parts Manual for cleaning the spark arrester muffler (if equipped).

Welding And Grinding

- Always clean the machine and equipment, disconnect the battery, and disconnect the wiring from the machine controls before welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the machine when welding.
- Have good ventilation when grinding or welding painted parts. Wear dust mask when grinding painted parts. Toxic dust or gas can be produced.
- Dust generated from repairing nonmetallic parts such as hoods, fenders or covers can be flammable or explosive. Repair such components in a well ventilated area away from open flames or sparks.

Fire Extinguishers

- Know where fire extinguishers and first aid kits are located and how to use them. Inspect the fire extinguisher and service the fire extinguisher regularly. Obey the recommendations on the instructions plate.

Rules For Safe Use Of Chemicals

DANGER

CHEMICAL HAZARD

To prevent serious injury or death:

WEAR PERSONAL PROTECTIVE EQUIPMENT

- **Do not allow chemical or solution to touch skin.**
- **Some chemicals can be absorbed through the skin.**
- **Wear rubber gloves and protective gear at all times.**

DON'T BREATHE VAPOR

- **Avoid chemical splash and vapor. Keep others away.**
- **Do not breathe vapor.**
- **Wear proper respirator when working with chemicals.**
- **Chemicals can be toxic.**

DON'T INGEST CHEMICAL

- **If in eyes or mouth, read manufacturer's instructions and follow them exactly.**
- **Seek immediate medical attention.**
- **A poison control number is usually inside the front cover of your telephone book.**

- Always read the label before using chemicals. Follow instructions from chemical manufacturer on how to select, use and handle each chemical. Note protection information each time before opening the container.
- Verbal warnings must be given if written warnings cannot be understood by workers.
- Do not spill chemicals on skin or clothing. If chemicals are spilled, remove contaminated clothing immediately and wash skin (and clothing) thoroughly with soap and water. Wash hands and face with soap and water and change clothing after spraying. Wash clothing each day before reuse.
- The product tank and system should be emptied of chemical mixture and flushed with clean water before servicing the spray system or spray components.
- Clean machine of all chemical residue before servicing.
- Keep all chemical lines, fittings and couplers tight and free of leaks before starting and operating.
- Rinse the applicator off before leaving the fertilized field. Never contaminate the farmyard or drainage system with applicator rinse.
- Avoid inhaling chemicals. When directed on the label, wear protective clothing, face shield or goggles.
- Never smoke while applying or handling chemicals.
- Cover food and water containers when applying chemicals around livestock or pet areas.
- If symptoms of illness occurs during or shortly after chemical application, call a physician or go to a hospital immediately.
- Follow label directions and advise to keep residues on edible portions of plants within the limits permitted by law.
- Keep chemicals out of the reach of children, pets and unauthorized personnel. Store them outside of the home, away from food and feed and lock them in a secure area.
- Keep bystanders away from spray drift.
- Always store chemicals in original containers and keep them tightly closed. Never keep them in anything but the original container. Read labels for hazards about chemical reaction with certain types of metals.
- Always dispose of empty containers according to manufacturer's directions.

SAFETY SIGNS (DECALS)

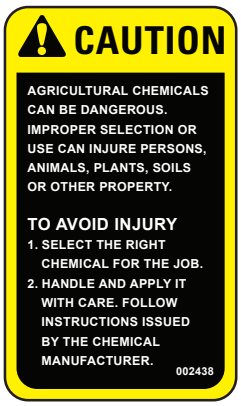
Follow the instructions on all the signs (decals) that are on the equipment. Replace any damaged signs (decals) and be sure they are in the correct locations. Equipment signs are available from your Farm King equipment dealer.

Front Left Side Of Frame

Figure 3

SX004776 (Item 1) **[Figure 3]**

SX002438 (Item 3) **[Figure 3]**

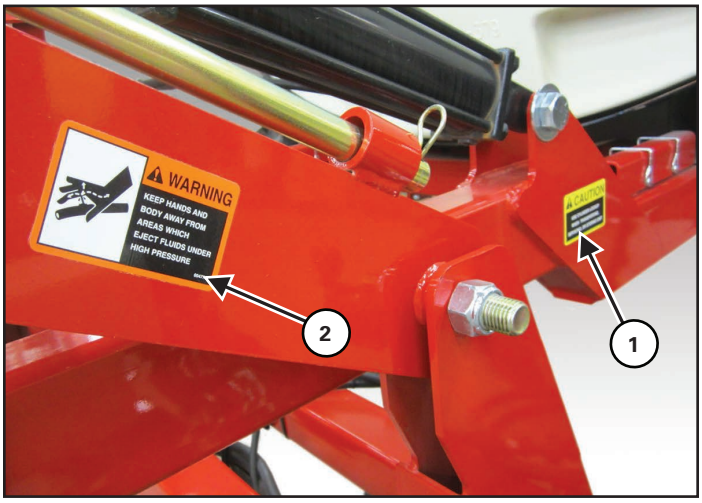


SX004775 (Item 2) **[Figure 3]**

SX004772 (Item 4) **[Figure 3]**

Left Side Of Rocker Frame

Figure 4



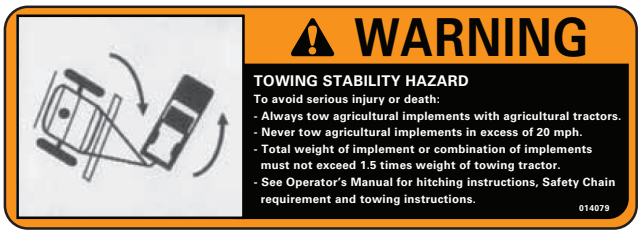
SX004302 (Item 1) **[Figure 4]**

SX004774 (Item 2) **[Figure 4]**

Left Side Of Hitch

Figure 5

SX014079 (Item 1) **[Figure 5]**



Front Of Left Wing

Figure 7

SX002439 (Item 1) **[Figure 7]**

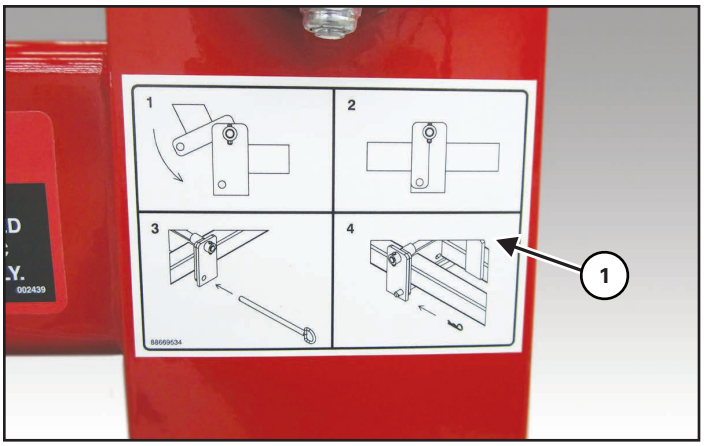
Left Side Of Axle

Figure 6

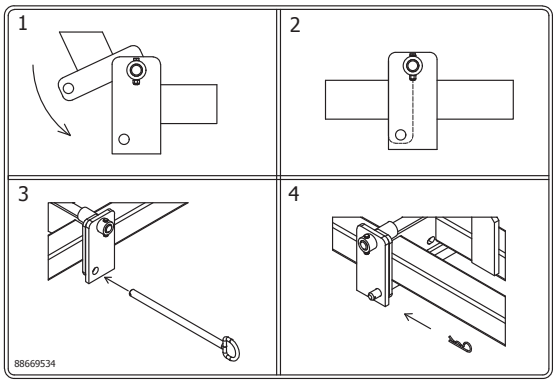
SX008553 (Item 1) **[Figure 6]**

Toolbar Hinge

Figure 8



88669534 (Item 1) **[Figure 8]**



EQUIPMENT DECALS AND SIGNS

Check and replace any worn, torn, missing, or hard to read decals on your equipment.

NOTE: All safety related decals are shown in the Safety Signs Section. (See "SAFETY SIGNS (DECALS)" on page 19)

SX019944 (Left Side)

SX019945 (Right Side)

SX17 - 5910B Amber Decal

SX17 - 5915B Red Decal

SX17 - 5920B Orange Decal

JD5403 SMV Sign

SAFETY SIGN-OFF FORM

WARNING

Instructions are necessary before operating or servicing equipment. Read and understand the Operator And Parts Manual and safety signs (decals) on equipment. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

Farm King follows the general Safety Standards specified by the American Society of Agricultural and Biological Engineers (ASABE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and / or maintaining the 1410 Fertilizer Applicator must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Annually, review this information before the season start-up and make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. An untrained operator is unqualified to operate this machine.

The following sign-off sheet is provided for your record and to show that all personnel who will be working with the equipment have read and understand the information in this Operator And Parts Manual and have been instructed in the operation of the equipment.

SIGN-OFF SHEET		
Date	**Employee's Signature**	**Employer's Signature**

ASSEMBLY

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COMPONENT INSTALLATION

Preparing For Assembly

IMPORTANT

1410 fertilizer applicators are shipped without some components installed due to transporting height and width restrictions.

- **Using the packing list, locate and count the individual components and verify that you have received the correct number of each component.**
- **Check all the components for damage. If any components are damaged or missing, contact your Farm King dealer.**

WARNING

AVOID INJURY OR DEATH

Before moving the tractor, look in all directions and make sure no bystanders, especially small children are in the work area. Do not allow anyone between the tractor and the equipment when backing up to the equipment for connecting.

Connect the fertilizer applicator to the tractor. (See "Connecting The Fertilizer Applicator To The Tractor" in Operation section)

Move the tractor, fertilizer applicator and coulters to an area large enough that will allow the toolbar and wings to be fully extended and sufficient clearance for forklift access.

WARNING

AVOID INJURY OR DEATH

Before you leave the operator's position:

- **Always park on a flat level surface.**
- **Place all controls in NEUTRAL.**
- **Engage the park brake.**
- **Stop the engine and remove the key.**
- **Wait for all moving parts to stop.**

Park the tractor / equipment on a flat level surface.

Place all controls in neutral, engage the park brake, stop the engine and wait for all moving parts to stop. Leave the operator's position.

WARNING

AVOID INJURY OR DEATH

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- **When fluids are under pressure.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

WARNING

HIGH PRESSURE FLUID HAZARD

To prevent serious injury or death from high pressure fluid:

- **Relieve pressure on system before repairing or adjusting.**
- **Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.**
- **Keep all components in good repair.**

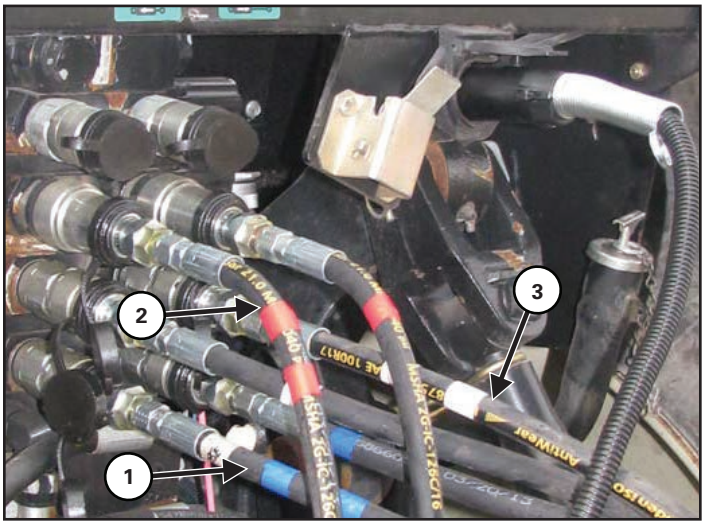
IMPORTANT

- **Contain and dispose of any oil leakage in an environmentally safe manner.**
- **Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.**

NOTE: Make sure the quick couplers are fully engaged. If the quick couplers do not fully engage, check to see that the couplers are the same size and type.

NOTE: Hydraulic hoses marked with two colored markers (tape) is the pressure line. Hydraulic hoses marked with single colored marker (tape) is the return line.

Figure 9



Connect the Blue (Work Circuit) and Red (Transport Circuit) marked hydraulic hoses (Item 1 & 2) **[Figure 9]**.

NOTE: Do not connect the hydraulic hoses with White (pump) markings. Doing so could result in damage to the components.

1. Work Circuit (Blue): Raise / Lower Toolbar
2. Transport Circuit (Red): Fold / Unfold Wings
3. Pump Circuit (White): Pump

Move to the operator's seat and start the engine. (See "Entering And Leaving The Operator's Position" in Operation section.)

Engage the tractor hydraulics. (See the tractor's operator's manual for the correct procedure.)

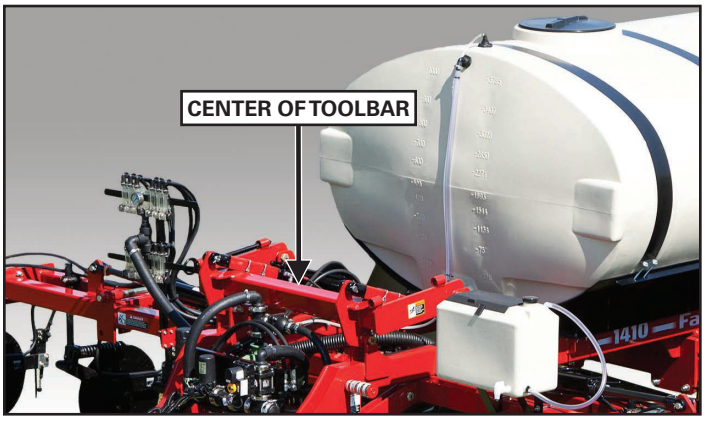
Unfold the wings using the Transport Circuit (hydraulic hoses with the "Red" markers). (See "Fold And Unfold Wings" in Operation section.)

Raise the toolbar using the Work Circuit (Hydraulic hoses with the "Blue" markers.)

Stop the engine, wait for all moving parts to stop and leave the operator's position.

Coulter installation

Figure 10



Locate the center of the toolbar. Measure out from the center of the toolbar and place a mark at the desired spacing (30″, 22″, 38″).

IMPORTANT

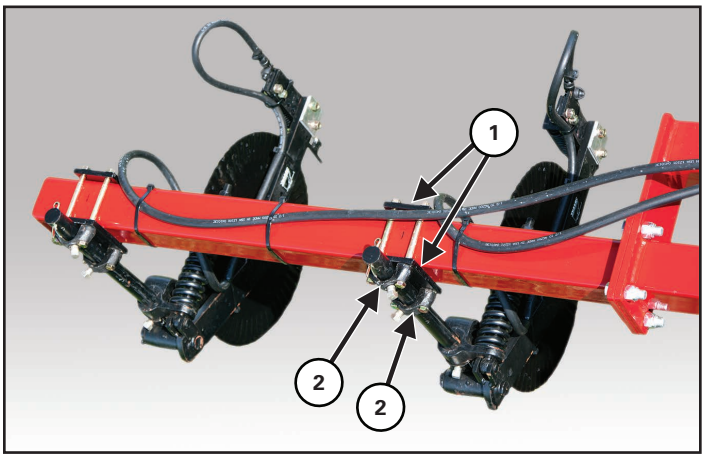
When installing the coulters, the toolbar and wings must be level and supported.

IMPORTANT

Coulters cannot be installed if there is an obstruction along the toolbar.

If an obstruction is in the way of the desired spacing, install the coulter mount just past the obstruction along the toolbar. Use an offset shank and swing the assembly back to align with the proper spacing.

Figure 11



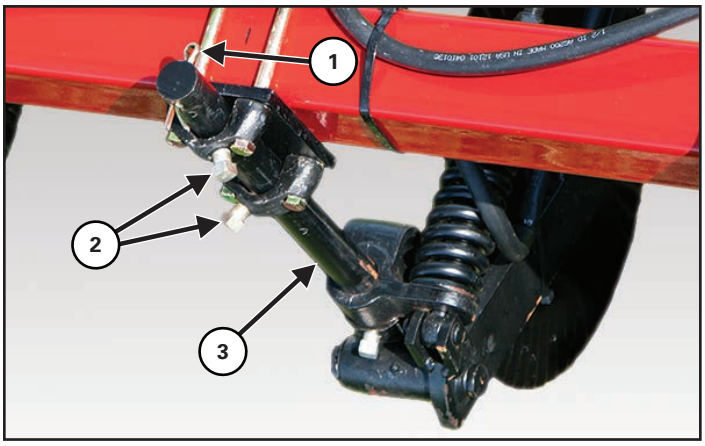
Align two clamp plates (Item 1) **[Figure 11]** on either side of the toolbar at a marked location (30″, 22″, 20″).

Align two clamp castings (Item 2) **[Figure 11]** over the holes of the front plate.

Install four 1/2″ x 7″ bolts through the clamp castings and clamp plates. Attach using four 1/2″ locknuts.

Continue to install clamp plate / casting assemblies along the toolbar at the desired spacing (30″, 22″, 20″).

Figure 12



Remove cotter pin (Item 1). Loosen the two clamp set screws (Item 2), then slide the shaft (Item 3) **[Figure 12]** of the coulter assembly up, into the clamps.

Tighten set screws and reinstall cotter pin.

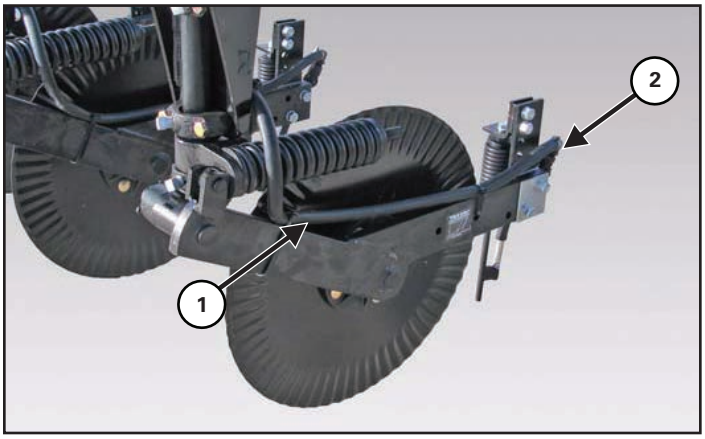
Continue to install shaft / coulter assemblies along the toolbar.

Supply Hose Installation

IMPORTANT

Review the supply line routing on the installed coulters or main toolbar before attaching lines to inner wing coulters.

Figure 13

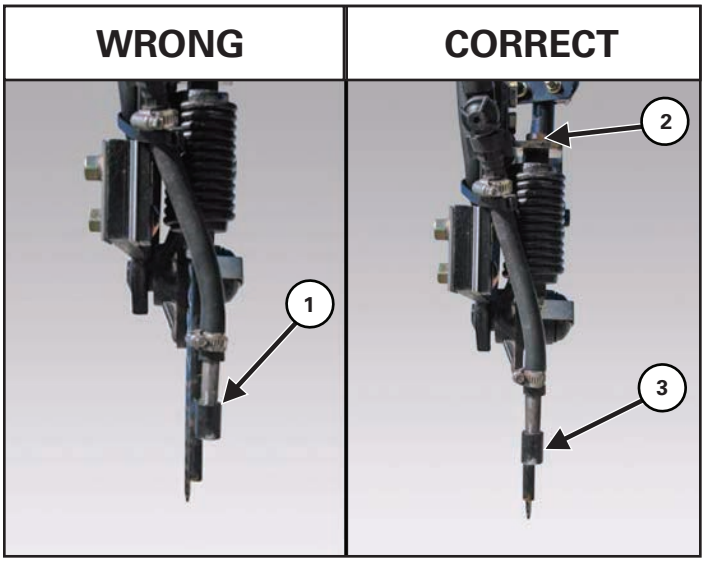


Route the supply hose (Item 1) **[Figure 13]** behind the coulter assembly, down to the knife / injector. Fasten in place with cable ties.

Apply petroleum jelly to fittings and install hose onto the 90 degree hose barb (Item 2) **[Figure 13]** and secure in place with hose clamp.

Coulter Injector Alignment

Figure 14



Injector is not aligned with coulter (Item 1).

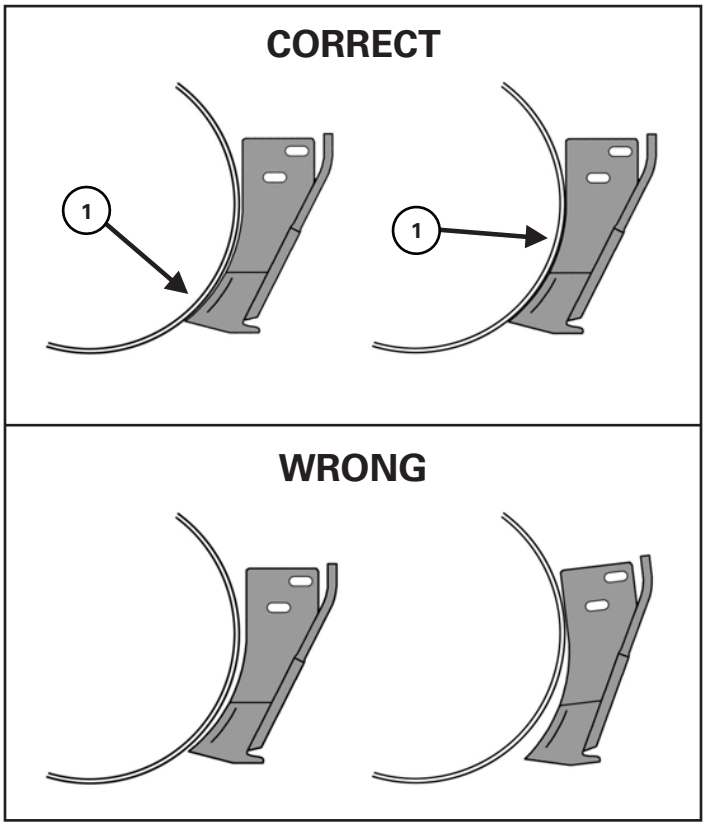
Loosen bolt (Item 2) and align the injector with coulter blade. Tighten bolt.

Injector is now aligned with coulter (Item 3) **[Figure 14]**.

Coulter Knife Alignment

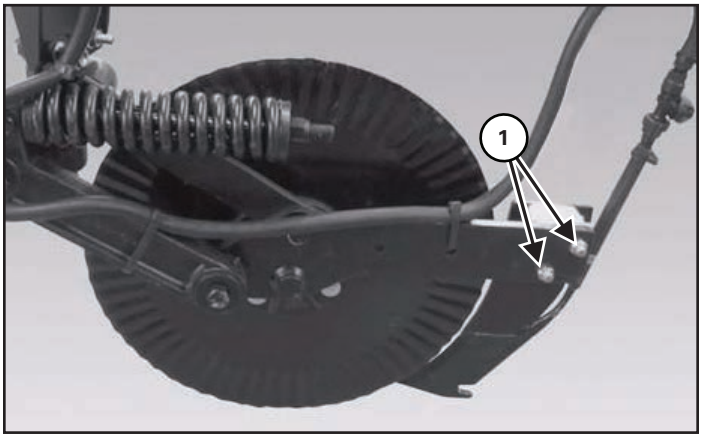
NOTE: The following images may not show your exact coulter assembly as it appears but the procedure is correct.

Figure 15



Knives should rub slightly on blade at bottom of knife (Item 1) **[Figure 15]**.

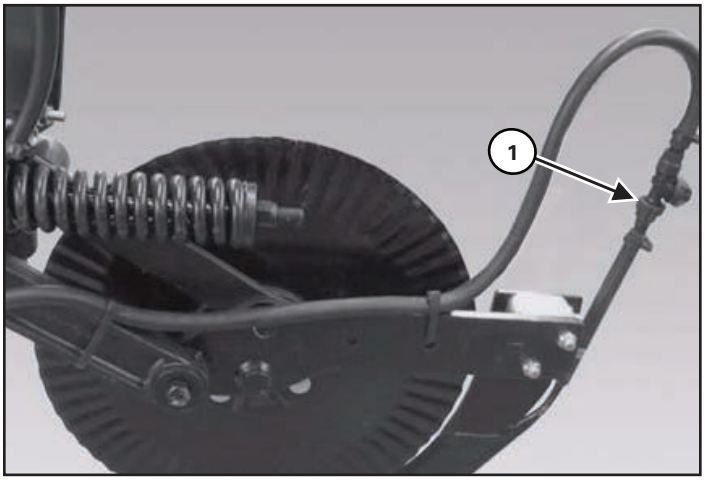
Figure 16



Loosen the two bolts (Item 1) **[Figure 16]** and adjust knife to rub slightly on blade. Tighten bolts.

Orifice Installation (Coulters / Knives)

Figure 17



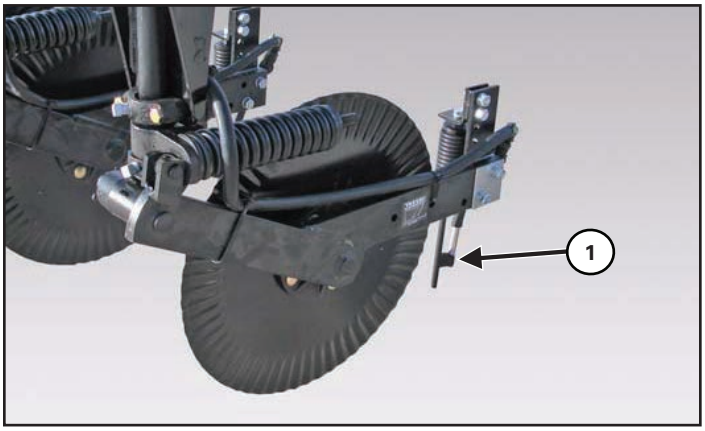
Loosen hose fitting by 1/4 turn (Item 1) **[Figure 17]** and disconnect.

Install orifice between hose fitting and diaphragm check valve, for the desired application rate and travel speed.

Connect and tighten hose fitting by 1/4 turn back on to the check valve.

Tip Installation (Coulters / Injectors)

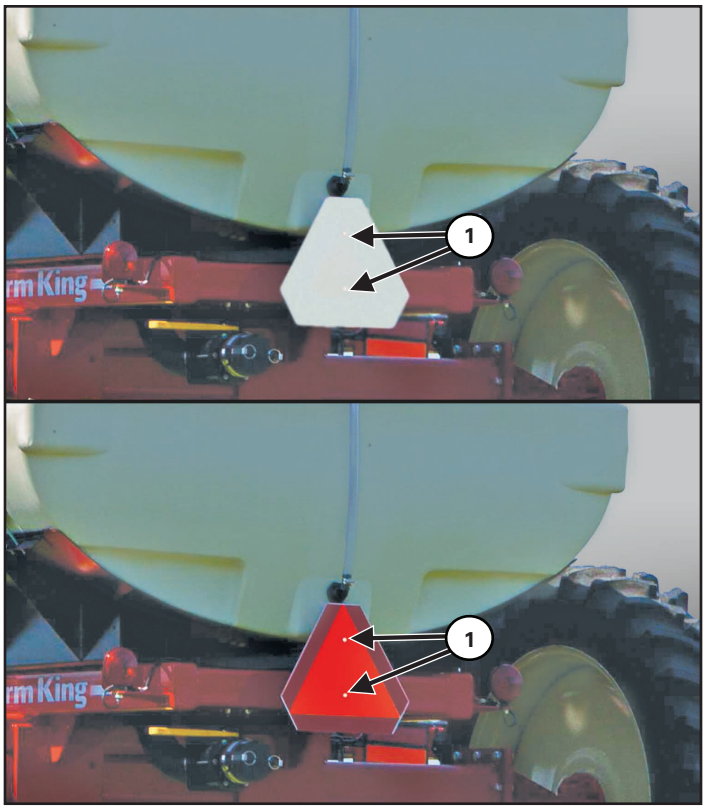
Figure 18



Install spray tip, I.E. TeeJet StreamJet tip into female threads located at the bottom of the assembly (Item 1) **[Figure 18]**.

Slow Moving Vehicle Sign Installation

Figure 19



Remove the two bolts (Item 1) **[Figure 19]** and slow moving vehicle sign.

Rotate the slow moving vehicle sign 180°, align mounting holes and install bolts to secure the slow moving vehicle sign in the operation position.

Spray Controller Console Installation (Option)

Install the spray controller console in the cab of the tractor according to the manufacturers specifications. (See the spray controller Installation and Operator's manual for the correct procedure.)

Review the spray controller operator's manual provided with fertilizer applicator for calibration and operating instructions before operating the fertilizer applicator.

Mount speed device to unit. Connect input to controller and calibrate.

Calibrate the system for the speed and rate desired. (See the spray controller Operator's manual for the correct procedure.)

See "NOZZLE SELECTION" and "NOZZLE SPECIFICATIONS" in the Specifications section.

Adjusting Axle Width

WARNING

AVOID SERIOUS INJURY OR DEATH

To prevent serious injury or death when adjusting axle width:

- **Always park on a flat level surface.**
- **Fully empty the liquid tank.**
- **Always secure fertilizer applicator with support stands, braces or equivalent when working around suspended equipment.**

WARNING

- **DO NOT permit bystanders to be in the work area.**
- **DO NOT work under suspended parts.**
- **Always use lifting devices / vehicles, chains or straps of adequate size and strength when lifting the equipment.**

IMPORTANT

Always use chains, straps and lifting devices that are in good condition and of adequate size to lift the fertilizer applicator components.

NOTE: Support stands and chock blocks are required when adjusting axle width.

Secure applicator on level ground, attached to the tractor with the wheels chocked and the tractor in park. Ensure that NO fore or aft rolling of the applicator can occur when raising a tire.

Using a jack, hoist or forklift, raise one tire off the ground.

Secure elevated side with jack stands, braces, or equivalent, ensuring that the applicator cannot fall while the tire and spindle are moved. Damage to the applicator and serious injury or death to personnel can occur if the applicator falls.

The spindle assembly/hub and wheel is very heavy and should be moved with the aid of a floor jack or equivalent lifting system.

Loosen and remove the two bolts that hold the spindle / hub assembly to the axle sub-frame. Slide the assembly in or out to the desired row spacing.

Replace the bolts and nuts with new bolts and locknuts.

IMPORTANT

Always replace the adjustment bolts with new bolts and lock- nuts.

Tighten all axle adjustment bolts to the required torque, see Specifications section.

Replace any bolts or nuts that have signs of physical damage, especially noting damage due to corrosion.

Remove jack stands and braces and lower the unit to the ground.

Repeat for the other side making certain the same center line distance is maintained.

John blue Ground Driven Pump Installation

WARNING

DO NOT permit bystanders to be in the work area when unloading and assembling components.

DO NOT work under suspended parts.

Keep away from moving parts.

Always use lifting devices / vehicles, chains or straps of adequate size and strength when unloading and assembling components.

WARNING

AVOID INJURY OR DEATH

Keep fingers and hands out of pinch points when assembling the equipment.

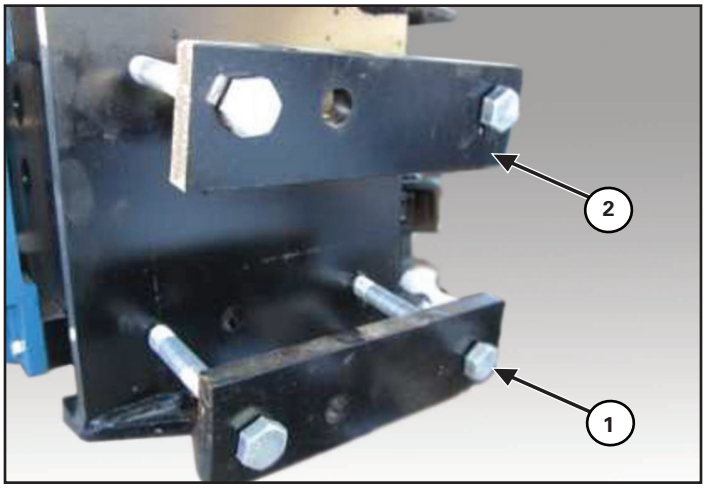
IMPORTANT

An approved lifting device and compressed air are required when installing the ground driven pump.

Move the fertilizer applicator and John Blue Ground Driven Pump to a flat, level area with access to compressed air and a hoist (or an area with sufficient clearance for forklift access).

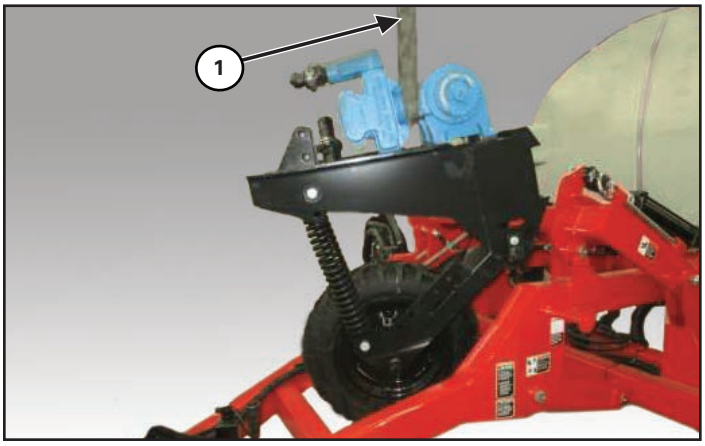
Raise the toolbar and hitch jack to maximum height.

Figure 20



Remove the four 5/8" lock nuts / bolts (item 1) and the two backing plates (item 2) **[Figure 20]** from the pump assembly.

Figure 21



Install a strap (Item 1) **[Figure 21]** around the center of the pump.

Connect strap to an approved lifting device.

IMPORTANT

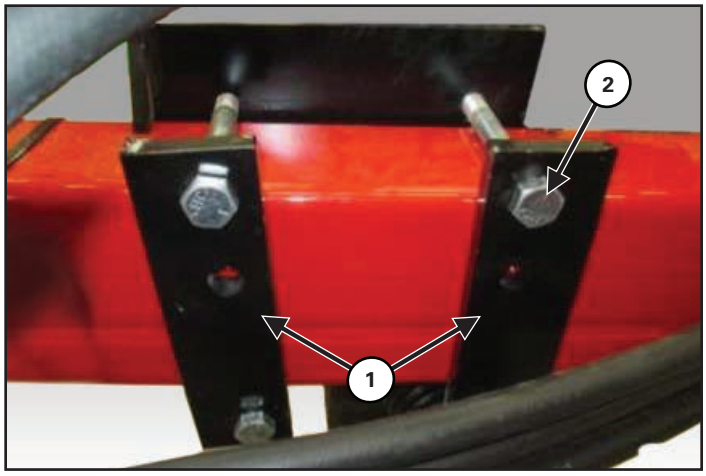
Always use chains, straps and lifting devices that are in good condition and of adequate size to lift the fertilizer applicator components.

Raise the pump assembly high enough to clear the frame assembly.

Lower the unit in between the rockshaft and cross member of the frame assembly. Move the pump back until it is up against the front of the toolbar.

Center the pump assembly so that the wheel is in line with the middle of the coulter.

Figure 22



Using the lifting devise, adjust the pump assembly until the mount is aligned with the toolbar.

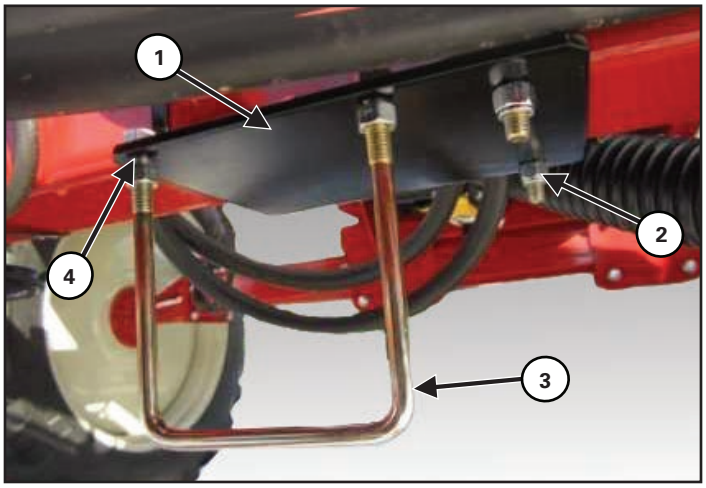
Place the two backing bolt plates (Item 1) on the backside of the toolbar and insert four 5/8" bolts (Item 2) **[Figure 22]** through the plates and mount. Install four 5/8" lock nuts on the bolts.

Tighten up the plates and mount until they are secured against the toolbar.

Lower and remove lifting devise once pump assembly is secured to toolbar.

Single Piston Pump

Figure 23

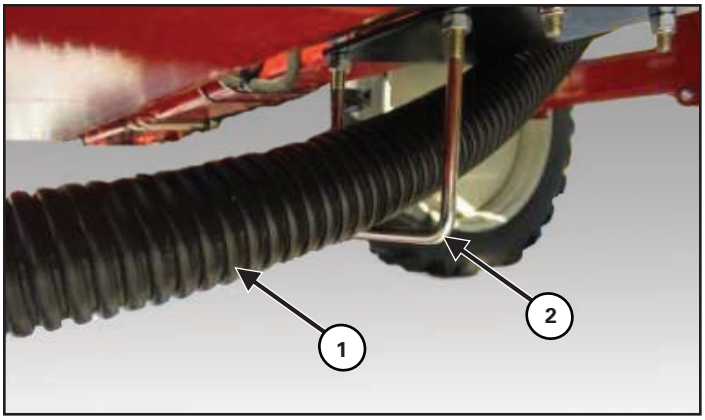


Align the suction hose support bracket (Item 1) underneath the toolbar, on the left side, between the coulter mount and frame.

Install a 4" x 5" u-bolt over the top of the toolbar and through the holes of the bracket. Attach with two 3/8" nylon insert locknuts (Item 2).

Add another 4" x 5" u-bolt (Item 3) under the support bracket (item 1) on the front side of the toolbar. Attach with four 3/8" centerlock nuts (Item 4) **[Figure 23]** (two on top of the plate, two on the bottom of the plate).

Figure 24



Cut the zip tie holding the suction hose (Item 1) to the toolbar and route it though the 4" x 5" u-bolt (Item 2) **[Figure 24]** attached to the bottom side of the suction hose support bracket.

Figure 25

Remove the tape from the hose and loosen the 11/32″ t-bolt clamp with a 3/8″ wrench **[Figure 25]**.

Insert hose through the center of the mount and into 2″ hose barb attached to the bottom side of the pump assembly. Slide clamp over the hose and barb and tighten until secure.

Adjust suction hose support bracket and u-bolts until hose is centered. Tighten all four 3/8″ centerlock nuts and two nylon insert locknuts.

Twin Piston Pump

Figure 26

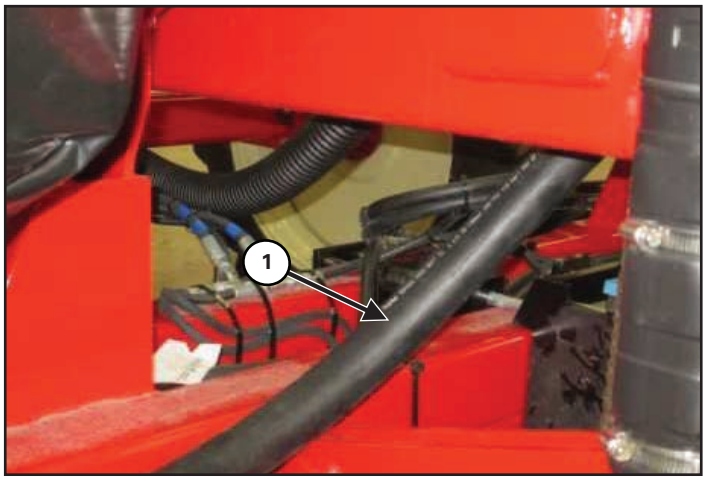
Cut the zip tie holding the suction hose to the toolbar and route it to the right and over the top of the assembly and pump mount.

Remove the tape from the hose and loosen the 11/32″ t-bolt clamp with a 3/8″ wrench. Insert the hose into the 2″ hose barb attached to the bottom side of the pump assembly (Item 1) **[Figure 26]**.

Slide the clamp over the hose and barb. Tighten until secure.

Installing Monitor Hose

Figure 27



Cut the zip tie holding the hose to the monitor and route the hose (Item 1) **[Figure 27]** between the frame assembly and the parallel links.

Figure 28

Remove the tape from hose and loosen the 1-3/4″ stainless clamp with a standard screwdriver.

Insert the hose into the 2″ hose barb attached to the top side of the pump assembly. Slide the clamp over the hose and barb. Tighten until secure **[Figure 28]**.

OPERATION

Farm King

GENERAL INFORMATION

Pre - Operation Checklist

Before operating the fertilizer applicator for the first time and each time thereafter, check the following items:

WARNING

AVOID INJURY OR DEATH

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- **When fluids are under pressure.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

1. Lubricate the equipment per the schedule outline in the Maintenance Section.
2. Check the fertilizer applicator hitch for damaged, loose or missing parts. Repair as needed before operation.
3. Check condition of all chemical / fertilizer components for pinching, crimps or leaks. Re-align as required. Tighten fittings to correct leaks or replace components. Straighten lines to eliminate pinching or crimps.

NOTE: Do not operate with leaks.

4. Make sure that all guards and shields are in place, secured and functioning as designed.

WARNING

HIGH PRESSURE FLUID HAZARD

Leaking fluids under pressure can enter the skin and cause serious injury or death. Immediate medical attention is required. Wear goggles. Use cardboard to check for leaks.

5. Check condition of all hydraulic components for leaks. Repair as required.

NOTE: Do not operate with hydraulic leaks.

6. Check that all electrical connections are tight.
7. Check and tighten all wheel bolts to 420 ft.-lb. torque.
8. Check tire pressure. Inflate per manufacturer's specification.

Break - In Checklist

Check and tighten all wheel bolts to their specified torque after transporting for five (5) miles (11km).

Check the following mechanical items after 1 hour of operation and again after 10 hours of operation:

1. Check that all electrical connections are tight.

Figure 29

2. Check the fertilizer applicator hitch for damaged, loose or missing parts **[Figure 29]**. Repair as needed before operation.
3. Check condition of all hydraulic components for leaks. Repair as required. Check condition of all chemical / fertilizer components for pinching, crimps or leaks. Re-align as required. Tighten fittings to correct leaks or replace components. Straighten lines to eliminate pinching or crimps.
4. Check for loose fasteners and hardware. Tighten as required.
5. Check wheel bolts for tightness. Tighten to 420 ft.-lb. torque.
6. Clean screen in-line strainer.
7. Check the coulters. Remove any twine, wire or other material that has become entangled.
8. Check condition of all hydraulic components for leaks.
9. Tighten fittings to correct leaks or replace components. Do not operate with hydraulic leaks.
10. Check tire pressure. Inflate per manufacturer's specification.

Tractor Requirements

The 1410 Fertilizer Applicator requires three auxiliary hydraulic functions, a category IV rated drawbar, and a 7-pin electrical connection.

Entering And Leaving The Operator's Position

IMPORTANT

Follow the instructions in your tractor's operation manual for the correct procedure.

Entering The Operator's Position

Enter the operator's position, start the engine, and release the parking brake.

Leaving The Operator's Position

Always perform the following steps when leaving the operator's position:

WARNING

AVOID INJURY OR DEATH

Before you leave the operator's position:

- **Always park on a flat level surface.**
- **Place all controls in NEUTRAL.**
- **Engage the park brake.**
- **Stop the engine and remove the key.**
- **Wait for all moving parts to stop.**

INITIAL SET-UP

Connecting The Fertilizer Applicator To Tractor

Always inspect the tractor's drawbar and fertilizer applicator hitch before connecting. See the tractor's owner's manual.

Enter the operator's position (see "Entering Operator's Position" in Operation section). Move the tractor into position in front of the fertilizer applicator.

WARNING

AVOID INJURY OR DEATH

Before moving the tractor, look in all directions and make sure no bystanders, especially small children are in the work area.

Do not allow anyone between the tractor and the equipment when backing up to the equipment for connecting.

Move the tractor backwards, aligning the drawbar with the fertilizer applicator hitch.

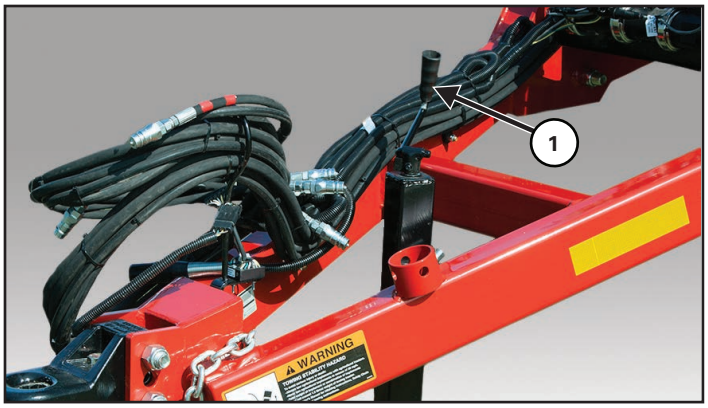
NOTE: The jack may need to be lowered or raised for proper alignment of the drawbar and hitch.

If the fertilizer applicator hitch needs to be adjusted, stop the tractor when drawbar is just in front of the fertilizer applicator hitch.

Leave the operator's position (See "Leaving The Operator's Position" in Operation section).

NOTE: The following images may not show your fertilizer applicator hitch exactly as it appears but the procedure is correct.

Figure 30



Turn the jack handle (Item 1) **[Figure 30]** clockwise to raise the hitch or counterclockwise to lower the hitch.

Lower or raise the fertilizer applicator hitch until aligned with the tractor's drawbar.

Move to the operator's seat, start the engine and release the parking brake. Move the tractor backwards, aligning the drawbar hitch pin hole with the fertilizer applicator hitch pin hole(s).

Stop the tractor and leave operator's position.

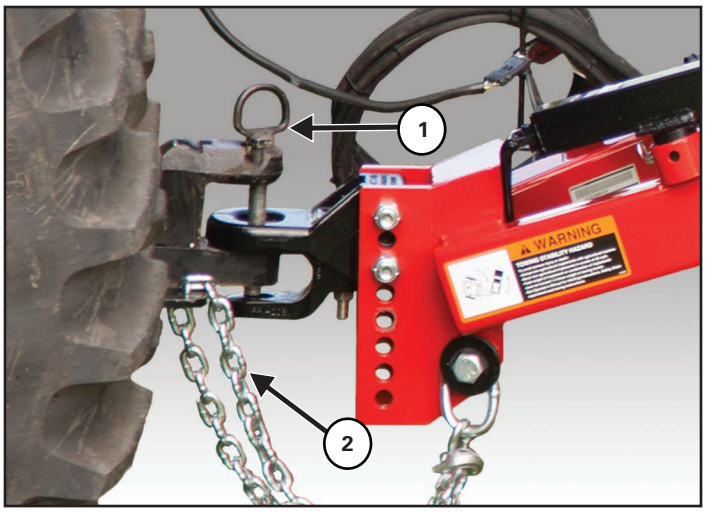
WARNING

AVOID INJURY OR DEATH

Keep fingers and hands out of pinch points when connecting and disconnecting equipment.

NOTE: Always use a hitch pin of adequate size and strength and a retaining pin with a locking device.

Figure 31



Install the hitch pin (Item 1) **[Figure 31]** and retaining pin to securely fasten the fertilizer applicator hitch to the tractor drawbar.

Attach the safety chain (Item 2) **[Figure 31]** around the drawbar.

WARNING

For pintle/clevis style hitch, towing of the applicator by any type of vehicle requires safety chains.

Lower jack until weight of equipment is resting on tractor drawbar. Pull lock pin on jack and rotate to storage position and secure with lock pin.

Connecting Hydraulic Hoses

WARNING

HIGH PRESSURE FLUID HAZARD

To prevent serious injury or death from high pressure fluid:

- **Relieve pressure on system before repairing or adjusting.**
- **Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.**
- **Keep all components in good repair.**

IMPORTANT

Contain and dispose of any oil leakage in an environmentally safe manner.

Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.

NOTE: Make sure the quick couplers are fully engaged. If the quick couplers do not fully engage, check to see that the couplers are the same size and type.

NOTE: Hydraulic hoses marked with two colored markers (tape) is the pressure line. Hydraulic hoses marked with a single marker (tape) is the return line.

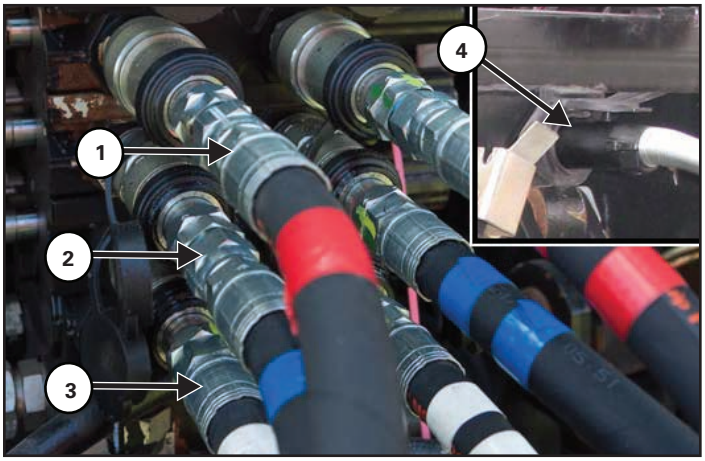
IMPORTANT

The hydraulic flow to the liquid pump (hydraulic hoses marked with White tape) will need to be reduced to 7 gpm.

The flow to the liquid pump must not exceed 7 gpm.

To Connect

Figure 32



Push coupler into female coupler on the tractor until they are fully engaged and locked.

1. Transport Circuit (Red Tape): Wing Fold / Unfold (Item 1).
2. Work Circuit (Blue Tape): Toolbar Raise / Lower (Item 2).
3. Pump Circuit (White Tape): Liquid Pump (Item 3) **[Figure 32]**. Connect the pump return line (one wrap of white tape) to the case drain port, if tractor is so equipped.

To Disconnect

WARNING

AVOID BURNS

Hydraulic fluid, tubes, fittings and quick couplers can get hot when running equipment. Be careful when connecting and disconnecting quick couplers.

Release pressure and pull the male coupler out to disconnect.

Connecting Electrical Harness

Connect the fertilizer applicator's 7 pin electrical harness (Item 4) **[Figure 32]** to the tractor's electrical system.

If the tractor is not equipped with such a connector, see your tractor dealer.

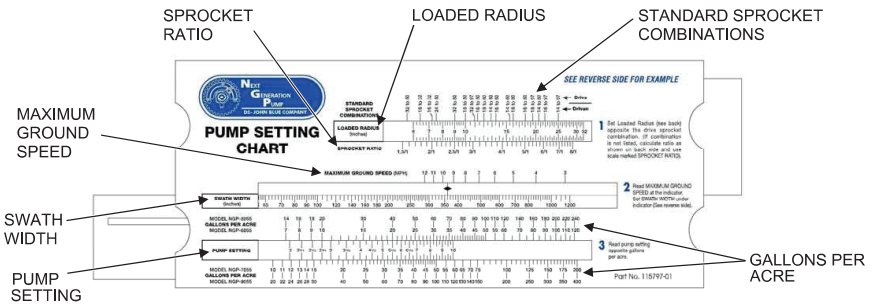
JOHN BLUE PUMP SETTING

The NGP pump output is determined by the drive sprocket ratio and the stroke setting. There are two ways to find the proper setting for your pump:

Online Flow Rate Calculator

Figure 33

ON-LINE FLOW RATE CALCULATOR
www.cds-johnblue.com



PUMP SETTING CHART

Use the online flow rate calculator at **www.cds-johnblue.com**. There is a mobile version available at the barcode **[Figure 33]**.

Slide Chart (Supplied With Pump)

Using the slide chart (115698-91) **[Figure 33]** supplied with the pump - follow the example below:

SPROKET RATIO

Standard Sprocket Combinations

Standard sprocket combinations may be used for equipment with only one chain from the ground or press wheel sprocket to the pump. For example: an applicator with a 60 tooth drive sprocket on the tire driving a 16 tooth driven sprocket on the pump can use the 16 to 60 mark on the slide chart.

Non-Standard Sprocket Combinations

If using sprocket combinations with multiple sprockets, such as a jack shaft, use the following formula to determine sprocket ratio:

$$\frac{\text{Drive Sprocket}}{\text{Driven Sprocket}} = \text{Sprocket Ratio}$$

For example: an applicator with a 50 tooth drive wheel, driving to a 24 tooth sprocket on the jack shaft, then a 36 tooth sprocket on the jack shaft driving up to a 16 tooth pump driven sprocket, would yield a 4.69 drive ratio.

$$\frac{\text{50 T (@ Drive Wheel)}}{\text{24 T (@ Driven Shaft)}} \text{ X } \frac{\text{36 T (@ Drive Shaft)}}{\text{16 T (@ Driven Pump)}} = \frac{50}{24} \text{ X } \frac{36}{16} = \text{4.69 Sprocket Ratio}$$

Set the sprocket ratio on the slide chart using the 4.69 calculation for the example above.

FERTILIZER APPLICATOR OPERATION

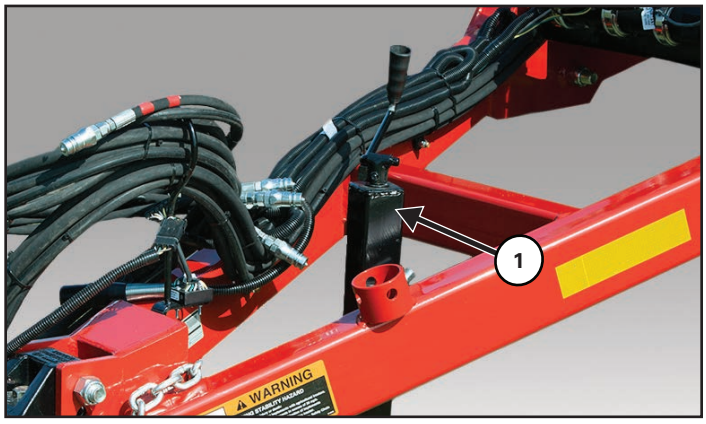
Leveling The Fertilizer Applicator

IMPORTANT

The fertilizer applicator frame must be adjusted down or up until the fertilizer applicator is parallel with the ground prior to operation.

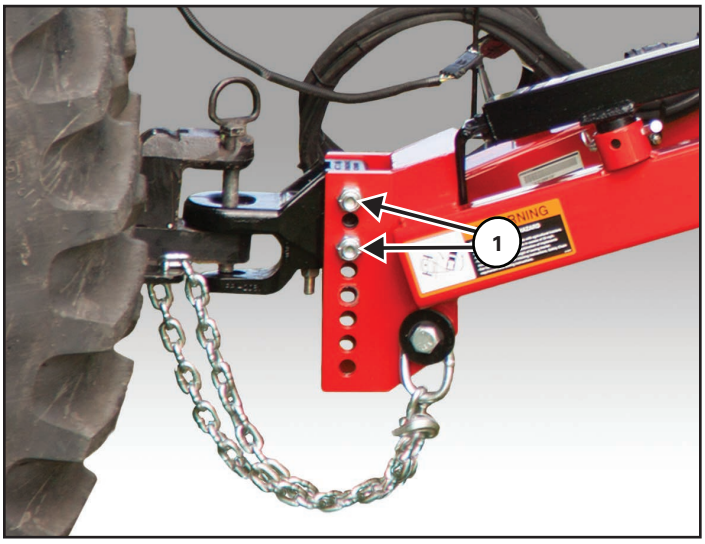
Lower the toolbar.

Figure 34



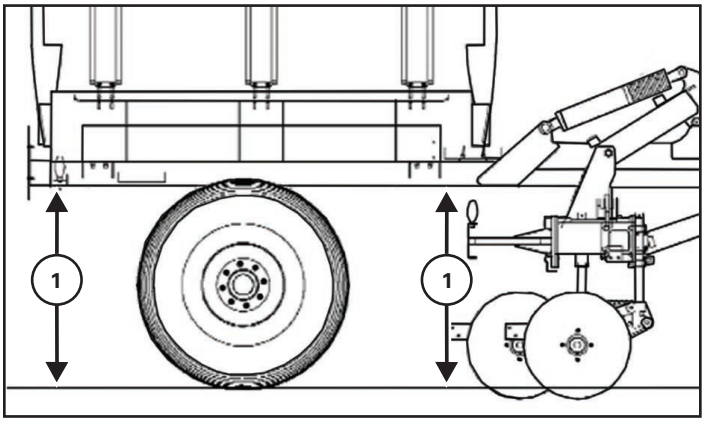
With the fertilizer applicator attached to the tractor, lower the jack (Item 1) **[Figure 34]** , until the weight of the fertilizer applicator is on the jack. This will allow the clevis mounting bolts to be loosened and moved for leveling.

Figure 35



Loosen the pintle hitch mounting bolts (Item 1) **[Figure 35]**.

Figure 36



Measure the distance from the ground to the bottom of the fertilizer applicator frame in the two locations shown (Item 1) **[Figure 36]**.

NOTE: The two measurements should be approximately the same when the frame is level.

Raise or lower the jack until the fertilizer applicator frame is parallel with the ground. Raise or lower the pintle hitch **[Figure 35]** and align the closest mounting holes with frame. Install the bolts.

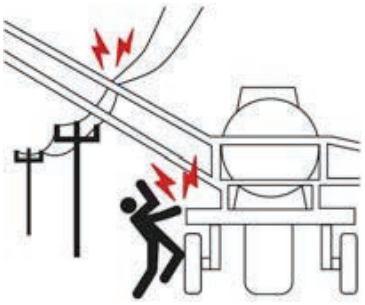
Tighten the pintle hitch mounting bolts to the correct torque and raise the jack into the storage position.

Fold And Unfold The Wings

Lower the wings with the "Wing Transport Circuit" (hydraulic hoses with the "Red" markers), until the wings are fully extended.

Raise the wings by using the reverse function on the circuit.

DANGER



ELECTROCUTION HAZARD

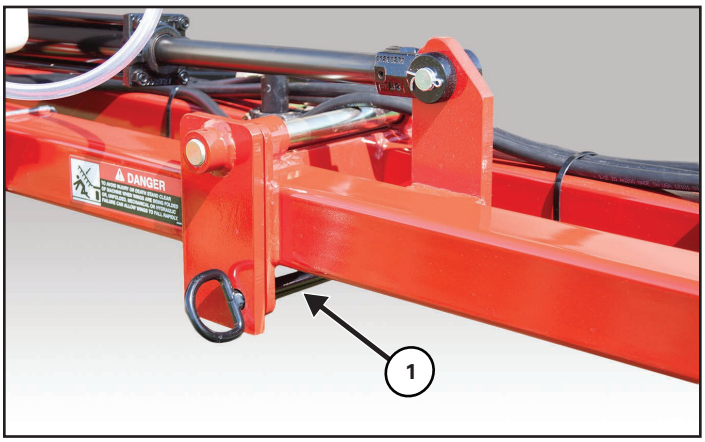
To prevent serious injury or death from electrocution:

- **Be aware of overhead powerlines.**
- **Keep away from powerlines when transporting or folding or unfolding wings.**
- **Electrocution can occur without direct contact.**

DANGER

To avoid serious injury or death, keep everyone clear of machine when folding or extending wings.

Figure 37



Insert wing lock pin (Item 1) **[Figure 37]** through both wing / toolbar hinge points, when wings are fully extended in operating position.

The wing lock pins ensure that the toolbar and wings remain rigid during operation.

WARNING

Ensure wing lock pins are installed on both right and left wings during operation.

Operating equipment without wing lock pins in place may result in severe damage to components.

Raising And Lowering The Toolbar

Lower the toolbar with the "Toolbar Work Circuit" (hydraulic hoses with the "Blue" markers), until the coulters are contacting the ground.

Raise the toolbar by using the reverse function on the circuit.

WARNING

AVOID INJURY OR DEATH

Before operating the fertilizer applicator, look in all directions and make sure no bystanders, especially small children, are in the work area.

NOTE: If the coulter assemblies need to be adjusted, the toolbar will need to be raised.

IMPORTANT

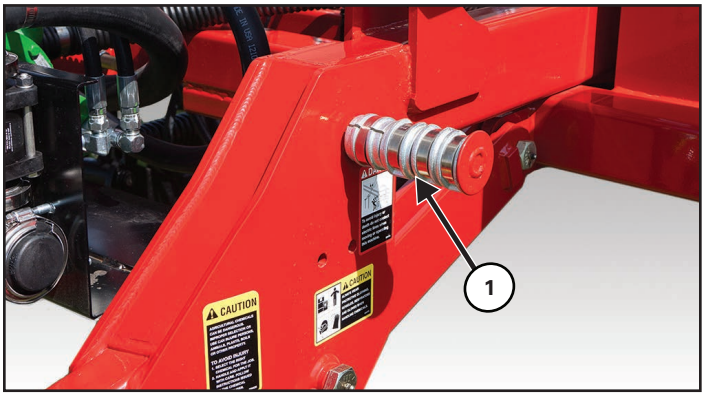
Make sure all air is bled from the hydraulic system before adjusting toolbar height.

Setting The Toolbar / Coulter Depth

Check depth while operating in the field.

Adjust toolbar height by adding or removing stroke control segments to the lift cylinders. Use equal lengths of segments on both cylinders.

Figure 38

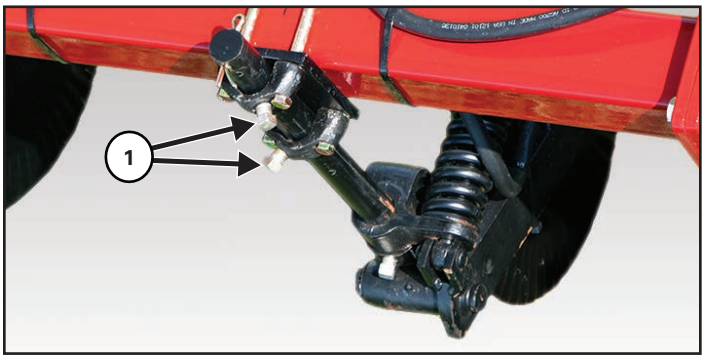


Stroke control segments (Item 1) **[Figure 38]** are stored on the side of the hitch frame.

IMPORTANT

It is recommended that the coulters are set so the injectors or knives place the fertilizer 2" to 3" (50 - 75 mm) below the soil surface.

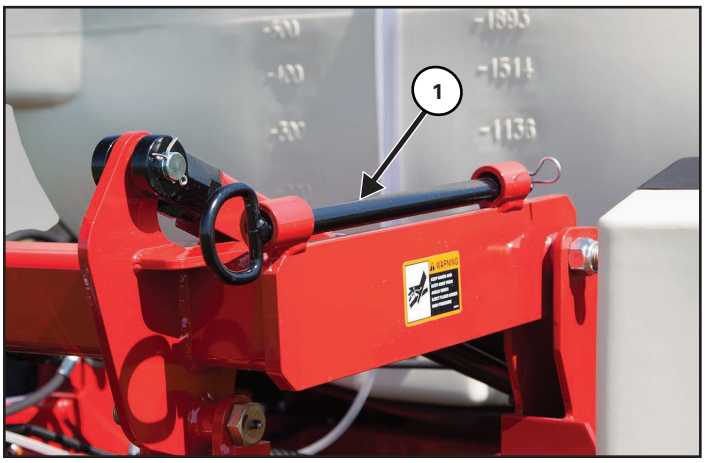
Figure 39



Adjust individual coulters as needed to obtain the desired depth.

Loosen set screws (Item 1) **[Figure 39]** on a coulter assembly. Move the assembly up or down to the desired depth. Tighten the set screws.

Figure 40



Two wing lock pins (Item 1) **[Figure 40]** are stored on the front rocker arm.

WARNING

Ensure wing lock pins are removed when raising the wings.

Raising the wings with wing lock pins in place may result in damage to components.

Centrifugal Pump (Option)

IMPORTANT

Be familiar with the pump manufacturer's operating instructions.

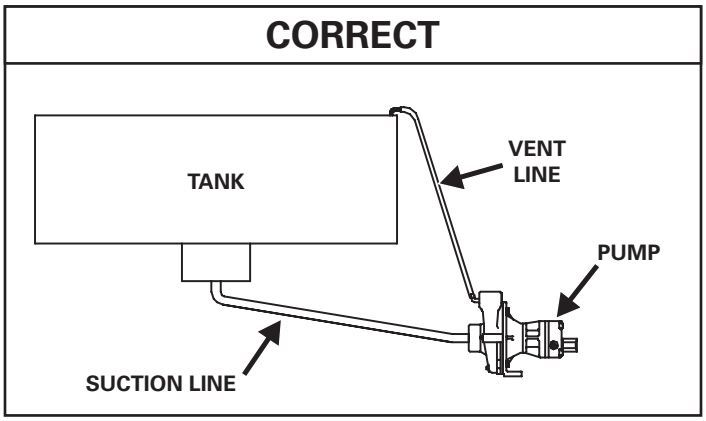
The pump must always run in a "flooded" condition. Operating the pump in a "non-flooded" condition will cause excessive seal damage and possible pump damage.

A "flooded" condition is when the centrifugal pump is completely full of fluid and no pockets of air are present in the pump.

To verify that the pump is flooded, visually check the pump vent line for fluid. Fluid will appear in the vent line when pump is flooded.

In order to get maximum pump efficiency, the mounting and plumbing must meet following guidelines:

Figure 41

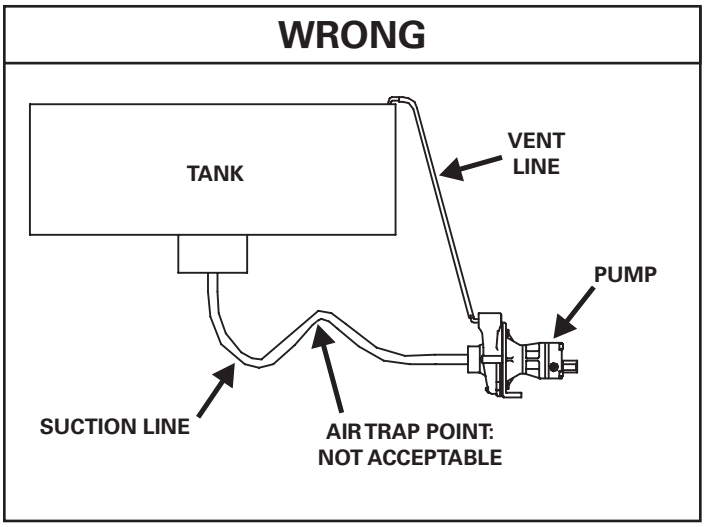


The pump inlet must be mounted below the product tank sump to allow gravity to naturally fill the pump with liquid.

The suction line must have a continual rise from the pump inlet to the tank sump.

The pump must have the vent line plumbed to it **[Figure 41]**.

Figure 42



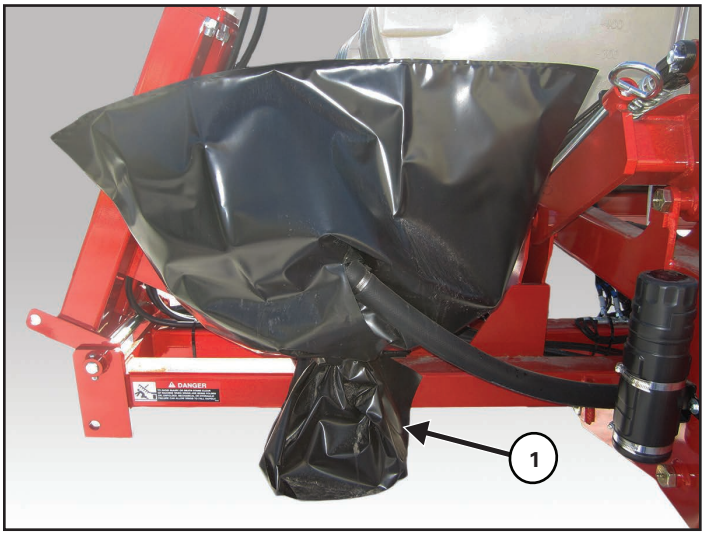
An air trap point will occur if the suction line does not gradually rise from the pump inlet **[Figure 42]**.

WARNING

DO NOT allow an air trap point to occur. Air will be allowed into the pump and may damage components.

Spray Monitor

Figure 43



IMPORTANT

Cover the monitor daily to prevent damage to the equipment (Item 1) [Figure 43].

The Spray Monitor is an effective flow indicator for an operator applying liquid chemicals and fertilizer.

The operator observes the location of the floating balls. If there is no change in the ball level, then the flow rate has not changed.

Use the following tables to determine flow rate:

Figure 44

Flow Table For Water (GPM)					
LEVEL	Green Plastic Balls	Black Plastic Balls	Red Plastic Balls	Red Glass Balls	Steel Balls
7	0.34	0.47	0.51	0.91	3.33
6	0.24	0.35	0.39	0.71	2.48
5	0.18	0.27	0.28	0.56	1.68
4	0.13	0.20	0.21	0.39	1.09
3	0.08	0.13	0.14	0.27	0.60
2	0.04	0.08	0.08	0.19	0.45
1	0.02	0.03	0.03	0.11	0.30

Figure 45

Flow Table For Liquid Fertilizer (GPM)			
LEVEL	Red Plastic Balls	Red Glass Balls	Steel Balls
7	0.19	0.84	2.17
6	0.14	0.61	1.70
5	0.12	0.45	1.26
4	0.07	0.32	0.82
3	0.04	0.19	0.58
2	0.02	0.11	0.32
1	0.00	0.05	0.25

Filling The Product Tank

DANGER

CHEMICAL HAZARD

To prevent serious injury or death:

WEAR PERSONAL PROTECTIVE EQUIPMENT

- **Do not allow chemical or solution to touch skin.**
- **Some chemicals can be absorbed through the skin.**
- **Wear rubber gloves and protective gear at all times.**

DON'T BREATH VAPOR

- **Avoid chemical splash and vapor. Keep others away.**
- **Do not breathe vapor.**
- **Wear proper respirator when working with chemicals.**
- **Chemicals can be toxic.**

DON'T INGEST CHEMICAL

- **If in eyes or mouth, read manufacturer's instructions and follow them exactly.**
- **Seek immediate medical attention.**
- **A poison control number is usually inside the front cover of your telephone book.**

WARNING

Do not spill chemicals on skin or clothing. If chemicals are spilled, remove contaminated clothing immediately and wash skin (and clothing) thoroughly with soap and water. Wash hands and face with soap and water and change clothing after spraying.

WARNING

Always read the label before using chemicals. Follow the instructions from the chemical manufacturer on how to select, use and handle each chemical. Note protection information each time before opening the container.

Before filling product tank, park the tractor / equipment on a flat level surface.

Place all controls in neutral, engage the park brake, stop the engine and wait for all moving parts to stop.

Leave the operator's position. (See "Leaving The Operator's Position" in Operation section)

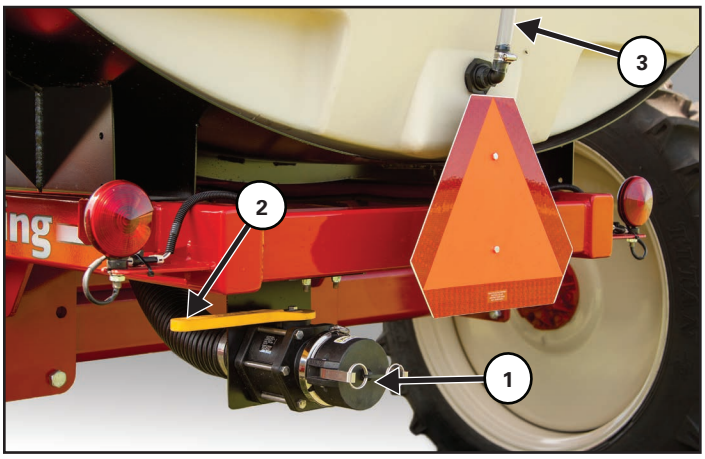
IMPORTANT

Add chemical solution to the product tank according to the manufacturer's recommendations.

IMPORTANT

Some items have been partially disassembled and / or removed to prevent damage to the tank, pump, and other components caused by freezing temperatures. Please install / assemble prior to first use.

Figure 46



Remove fill cap (Item 1).

Install the fill hose.

Open fill valve (Item 2).

Fill the spray tank to the desired level.

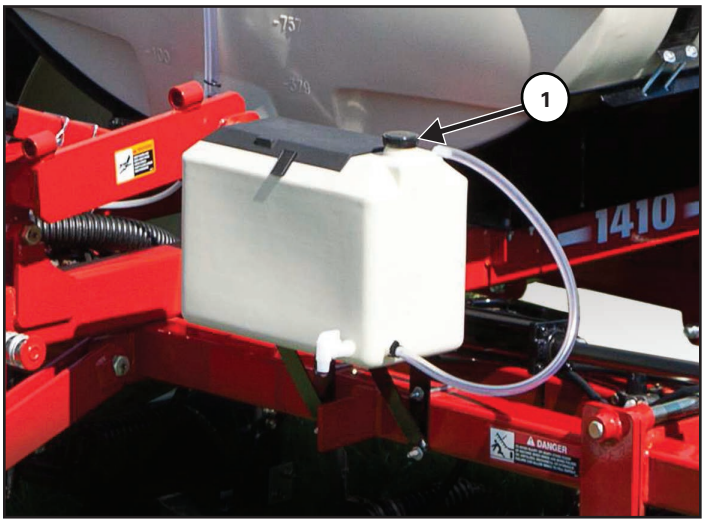
Monitor the rear sight gauge (Item 3) while filling the spray tank. Do not over-fill.

Once the spray tank has been filled to the desired level, close the fill valve (Item 2) and disconnect the fill hose.

Install fill cap (Item 1) **[Figure 46]**.

Filling The Fresh Water Tank

Figure 47



IMPORTANT

Always use clean, fresh water when filling the fresh water tank.

Tank volume is 9 gal.

Remove fill cap (Item 1).

Fill fresh water tank with clean fresh water whenever rinse water has been used (Do not allow tank to run low on fresh water).

Install fill cap (Item 1) **[Figure 47]**.

NOTE: Use water from fresh water tank to clean, rinse or wash anything that has become contaminated.

FIELD OPERATION

Pre-Operation

Move the tractor and fertilizer applicator to a level area in the field.

Engage the tractor hydraulics. (See the tractor's operator's manual for the correct procedure.)

Unfold and fully extend the wings.

IMPORTANT

Always have the tractor moving forward at a minimum of 3 mph when lowering the toolbar to prevent damage to the coulters.

Move the tractor and fertilizer applicator forward and fully lower the toolbar.

Place all controls in neutral, engage the park brake, stop the engine and wait for all moving parts to stop. Leave the operator's position.

Verify that the coulters are approximately 2" to 3" below the soil surface.

Adjust coulters as needed to obtain the desired depth.

Centrifugal Pump System Test

IMPORTANT

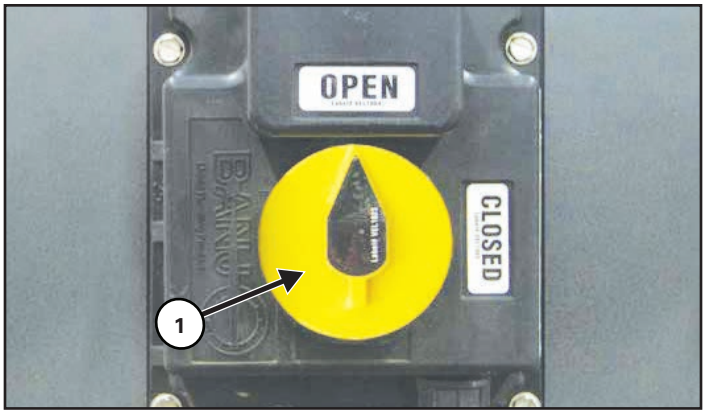
Review the spray controller operator's manual and be familiar with spray controller calibration and operation before starting.

Dry Test

Enter the operator's position and turn the tractor ignition switch to the "ON" position (Do Not start engine).

Turn the spray controller "ON".

Figure 48



Press wing section switches on the controller, one at a time and operate each of the manifold valves (Item 1) **[Figure 48].**

Verify that each manifold valve fully opens and closes. Also verify that the correct switch on the controller is operating the correct section manifold valve.

Wet Test

Verify that the pump is flooded and vent line is filled with fluid.

Add approximately 100 gallons of clean water to the product tank. (See "Filling The Spray Tank" in Operation section)

Inspect the system for leaks. Repair as needed before operating fertilizer applicator.

Verify that there is liquid in the pump vent line, equal to the level in the tank, as indicated by the rear site gauge.

IMPORTANT

The pump must be filled with liquid during operation to cool the seals. Without liquid to cool the seals, pump failure will occur immediately.

NOTE: Maximum hydraulic flow for the pump is 11 gpm. Start with 5 gpm hydraulic flow and increase / decrease as needed.

Enter the operator's position, start the engine and release the parking brake.

Engage the tractor hydraulics. (See the tractor's operator's manual for the correct procedure).

Turn the spray controller "ON".

Place the spray controller in "TEST" mode.

Using the controller, open the manifold valve.

Turn off the pump by moving the hydraulic control to the "float" position.

Determine targeted GPM flow rate. Select and install properly sized orifices / tips. Perform a "catch test" to verify application rate.

Inspect spray system components for leaks, loose fittings and possible pinch points. Tighten loose fittings.

Drain system and clean the line strainer screen.

NOTE: Cover spray monitors daily to prevent damage to components.

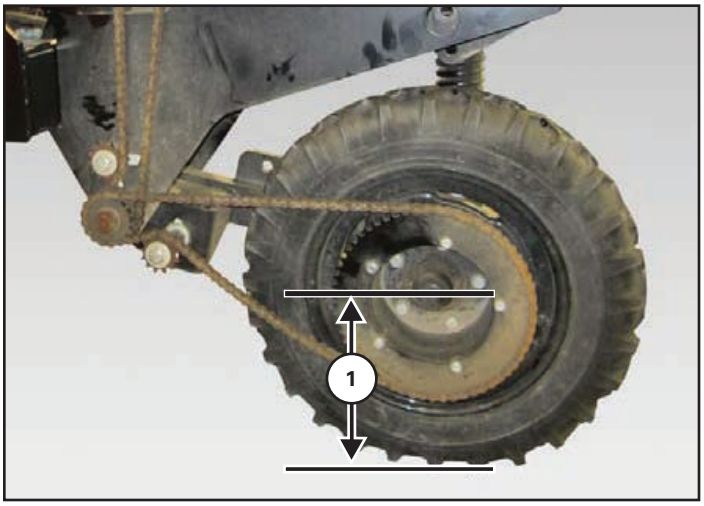
John Blue Twin Piston Pump Test (Option)

IMPORTANT

The measurement for the loaded radius must be from the manufacturer of the tire or be measured under loaded conditions. The Loaded radius tire is always the tire that has the first drive sprocket attached to its hub.

Ground Wheel Drive Arrangement

Figure 49



Measure the loaded radius from the center of the hub to the bottom of the tire where it rests on the ground (Item 1) **[Figure 49]**.

Press Wheel Drive Arrangement

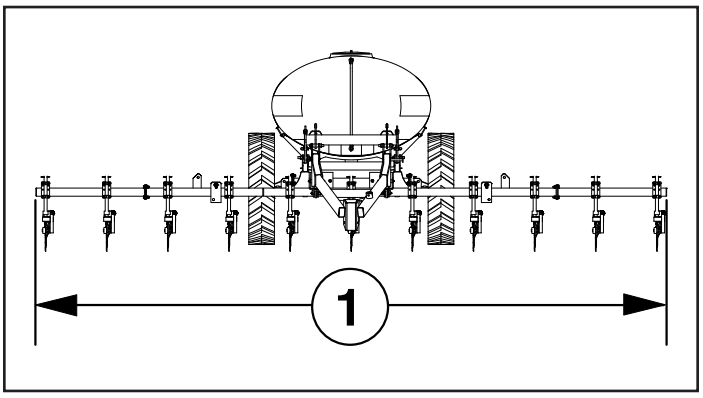
Measure the loaded radius from the center of the press wheel shaft to where the wheel rests against the tire.

NOTE: The press wheel must be engaged for normal operation to give an accurate reading.

Swath Width

To determine the swath width (Item 1) **[Figure 50]**, count the number of outlets and multiply by the distance (inches) between any two outlets, nozzles, or shanks. This assumes that all outlets are equally spaced. If outlets are not evenly spaced, measure the entire length of the boom or toolbar from end nozzle to end nozzle and allow for coverage beyond the ends. For example, an 11 row boom at 30" would have a swath width of 330".

Figure 50



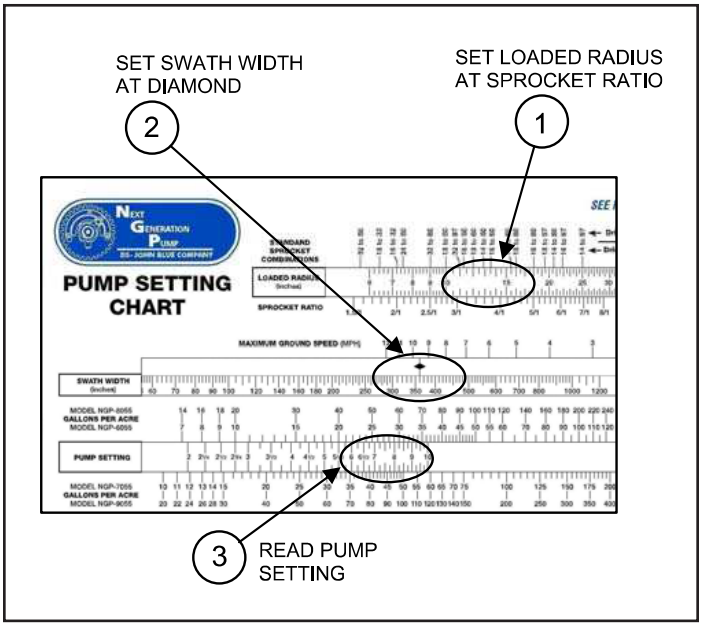
Setting The Pump

Read the desired pump setting from the bottom scale on the pump setting chart. Loosen the setting pointer nut and rotate the setting hub until the setting pointer is over the desired setting. The setting wrench will facilitate rotation of the setting hub. Once proper pump setting is achieved, tighten the setting pointer nut.

Example: An applicator is equipped with a NGP-6050 series pump, 11L x 15" tires, a 60 tooth drive sprocket, and a 16 tooth pump driven sprocket. It is desired to apply 33 gallons per acre on a 360" swath.

The following steps will determine correct pump setting:

Figure 51



1. Set loaded radius of tire (13.5") under the sprocket combination of 16 to 60 in the top window (Item 1) **[Figure 51].**
2. Set the swath width (360") under the diamond in the middle window (Item 2) **[Figure 51]**.
3. Read that the pump setting is approx. 9 at 33 gallons per acre on the NGP-6055 scale in the bottom window (Item 3) **[Figure 51]**.
4. Set the pump to setting 9 to achieve 33 gallons per acre.

NOTE: The maximum ground speed is read above the diamond as approximately 9 mph to avoid exceeding 450 pump rpm.

Operating The Fertilizer Applicator In The Field

Enter the operator's position, start the engine and release the parking brake.

Engage the tractor hydraulics. (See the tractor's operator's manual for the correct procedure.)

Fully raise the toolbar. Move the tractor and fertilizer applicator to the starting area in the field.

Align the tractor and fertilizer applicator with field / rows.

IMPORTANT

Always have the tractor moving forward at a minimum of 3 mph or more when lowering the toolbar to prevent damage to the coulters.

Drive the tractor and fertilizer applicator forward, towards the starting point.

As the front tires of the tractor make contact with the field / rows (starting point), fully lower the toolbar.

Engage the product pump and open the manifold valve to start the application process.

As the tractor approaches the end of the field / rows, turn the manifold valve off and fully raise the toolbar.

CAUTION

PREVENT COULTER DAMAGE

Always fully raise the toolbar before turning the tractor and fertilizer applicator and when moving the tractor and fertilizer applicator to starting point in the field.

Align the tractor and fertilizer applicator with next application area.

As the front tires of the tractor make contact with the field / rows (next application area), fully lower the toolbar.

Open the manifold valve to continue the application process.

IMPORTANT

Always flush spray tank and system with fresh water before leaving the application area / field.

Once application is finished: place all controls in neutral, engage the park brake, stop the engine, and wait for all moving parts to stop.

Leave the operator's position.

Clean the product tank. (See "Cleaning The Product Tank" in Maintenance section).

Place the toolbar and wings into transport position.

TRANSPORTING

Requirements

Always comply with federal, state, local and provincial laws regarding the transport of farm equipment on pubic roadways.

IMPORTANT

Never exceed 20 mph (32 kph).

WARNING

Use of an unapproved hitch or tractor / tow vehicle can result in loss of control, leading to serious injury or death.

Tractor / tow vehicle and hitch must have the rated capacity to tow equipment.

Verify that the tractor / tow vehicle is approved for transporting the equipment and that the equipment is securely attached to the tractor / tow vehicle.

Verify safety chain is installed and properly connected before transporting equipment.

Verify that the SMV (Slow Moving Vehicle) emblem, all lights and reflectors are clean and visible.

Enter the operator's position, start the engine and release the parking brake.

Engage the tractor hydraulics. (See the tractor's operator's manual for the correct procedure.)

Fully raise the toolbar into transport position.

WARNING

AVOID SERIOUS INJURY OR DEATH

DO NOT transport a loaded fertilizer applicator on public roadways. Excess weight will greatly increase tractor stopping distance and may cause the operator to lose control of the tractor or tow vehicle.

The ratio of the tractor / tow vehicle weight to the loaded equipment weight plays an important role in defining acceptable travel speed.

TRAVEL SPEED - Acceptable travel speed.

WEIGHT RATIO - Weight of fully equipped or loaded implement(s) relative to weight of tractor / tow vehicle.

Travel Speed	Weight Ratio
Up to 20 mph (32 kph)	1 to 1 (or less)
Up to 10 mph (16 kph)	2 to 1 (or less)
DO NOT TOW	More than 2 to 1

MAINTENANCE

Farm King

TROUBLESHOOTING

Chart

WARNING

Instructions are necessary before operating or servicing equipment. Read and understand the Operator And Parts Manual and safety signs (decals) on equipment. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

NOTE: If a problem is encountered that is difficult to solve, even after having read through this troubleshooting section, please call your local Farm King dealer. Before you call, please have this Operator And Parts Manual and the serial number of your machine at hand.

PROBLEM	CAUSE	CORRECTION
Flow Monitor ball gauges are not even	Orifice / tip is plugged	Clean or replace orifice
	Check Valve Plugged	Clean or replace check valve
	Filter screen is plugged	Clean filter screen
	Spray line is loose or disconnected	Check spray line connections
	Spray line is cut or damaged	Repair or replace spray line
Trash Plugging	Excessive knife / blade clearance	Check and adjust knife / blade clearance
	Knife not correctly aligned behind blade	Use shims to align knife behind blade
Monitor will not turn on	No power	Connect power line directly to battery
Coulter does not penetrate far enough	Toolbar set to High	Remove segments from main lift cylinders
Coulter penetrates to far	Toolbar set to Low	Add segments to main lift cylinders
Holes do not line up on wings and toolbar	Not set properly	Add or remove 12ga and 10ga shims as needed

SERVICE SCHEDULE

Maintenance Intervals

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The service schedule is a guide for correct maintenance of the Fertilizer Applicator.

WARNING

Instructions are necessary before operating or servicing equipment. Read and understand the Operator and Parts Manual and safety signs (decals) on equipment. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

#	DESCRIPTION	SERVICE PROCEDURES					
		WINTERIZE	CLEAN	LUBE	CHANGE	COVER	DRAIN
Daily Maintenance (or every 8 hours)							
1	Fresh Water Tank				●		●
2	Coulter Lower Arm			●			
3	Coulter Pivots			●			
4	Coulter Pressed Hub			●			
5	Rocker Frame			●			
6	Spray Monitor					●	
Weekly (or every 50 hours)							
7	Line Strainer Screen		●				
8	Wing Fold			●			
Every 250 hours							
9	Wheel Bearings			●			
10	Coulter Hub Bearings			●			
Annually (or every 500 hours)							
11	Product Tank	●	●				●
12	Machine	●	●				
13	Spray Monitor	●	●			●	

LUBRICATION

Recommendations

Always use a good quality multi-purpose / lithium base grease when lubricating the equipment.

IMPORTANT

Do not over-grease bearings. Greasing too often can damage seals and lead to premature bearing failure.

IMPORTANT

Only sealed bushings are used on the applicator. Do not over-grease.

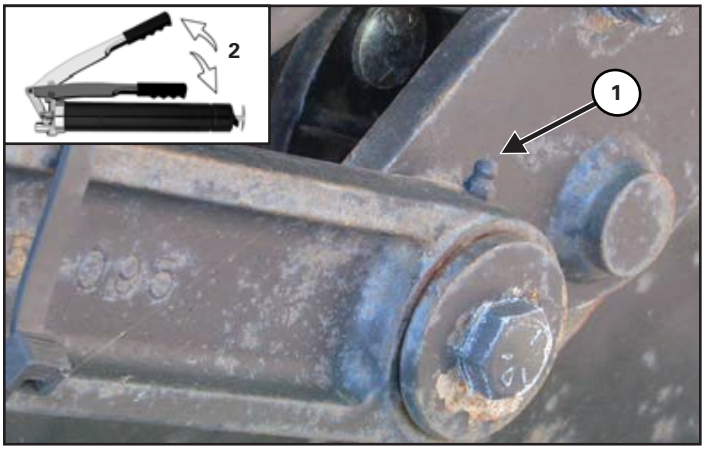
- Always use a hand-held grease gun.
- Clean fitting before greasing, to avoid injecting dirt and grit.
- Replace and repair broken fittings immediately.
- If fittings will not take grease, remove and clean thoroughly. Replace fitting if necessary.

Locations

IMPORTANT

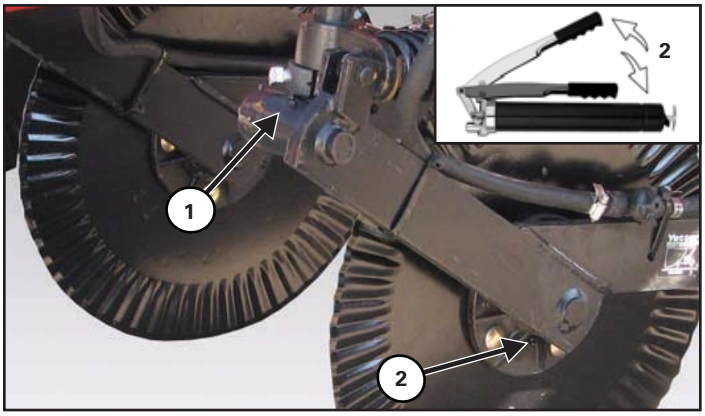
Fluid such as engine oil, hydraulic fluid, coolants, grease, etc. must be disposed of in an environmentally safe manner. Some regulations require that certain spills and leaks on the ground must be cleaned in a specific manner. See local, state and federal regulations for the correct disposal.

Figure 52



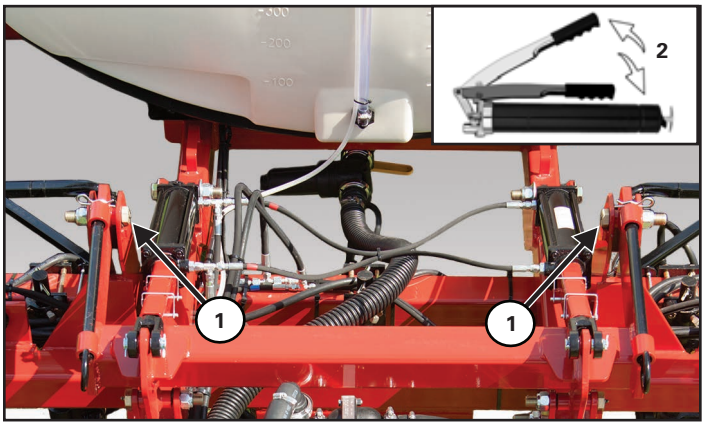
Apply two pumps of grease to the coulter lower parallel arm (Item 1) **[Figure 52]**. Grease every **8 hours**.

Figure 53



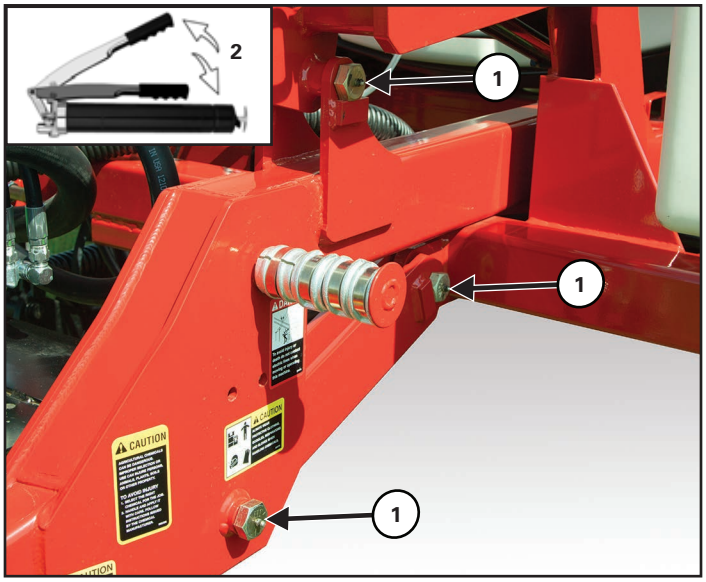
Apply two pumps of grease to the coulter pivots (Item 1) and to the pressed hub assembly (Item 2) **[Figure 53]**. Grease every **8 hours.**

Figure 54



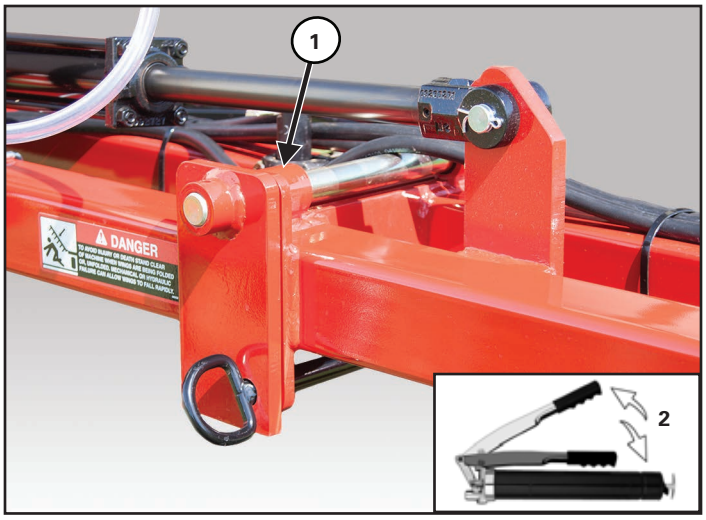
Apply two pumps of grease to both inside rocker frame pins (Item 1) **[Figure 54]**. Grease every **8 hours.**

Figure 55



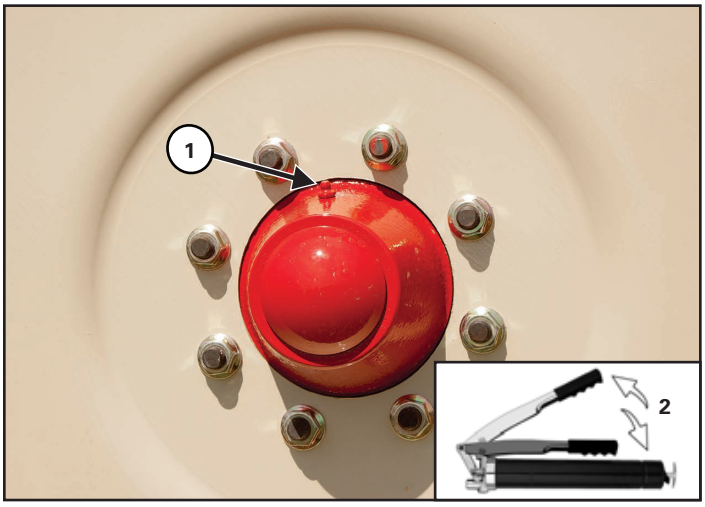
Apply two pumps of grease to the three outside rocker frame pins (Item 1) **[Figure 55]** (both sides). Grease every **8 hours.**

Figure 56



Apply two pumps of grease to the two zerks on each wing fold pin (Item 1) **[Figure 56]** (both sides). Grease every **50 hours.**

Figure 57



Apply two pumps of grease to the wheel bearings (Item 1) **[Figure 57]**. Grease every **250 hours.**

AXLES

Wheel Nut Torque

IMPORTANT

Check Wheel Nuts After:

1. **First 3 (three) hours of field operation.**
2. **First 10 (ten) hours of field operation.**
3. **First 50 (fifty) hours of field operation.**
4. **Every 200 (two hundred) hours of operation.**

REPEAT PROCEDURE IF A WHEEL IS REMOVED OR REINSTALLED

Tighten wheel nuts to 420 ft.-lb. (567 N•m) torque.

Tire / Wheel Replacement

Periodically check tires for cuts, bulges and damaged rims.

WARNING

AVOID INJURY OR DEATH

Before you leave the operator's position:

- **Always park on a flat level surface.**
- **Place all controls in NEUTRAL.**
- **Engage the park brake.**
- **Stop the engine and remove the key.**
- **Wait for all moving parts to stop.**

Park the tractor / equipment on a flat level surface.

Place all controls in neutral, engage the park brake, stop the engine and wait for all moving parts to stop. Leave the operator's position.

Fully raise wings into transport position and secure.

WARNING

AVOID INJURY OR DEATH

Always chock tires before performing any maintenance or service.

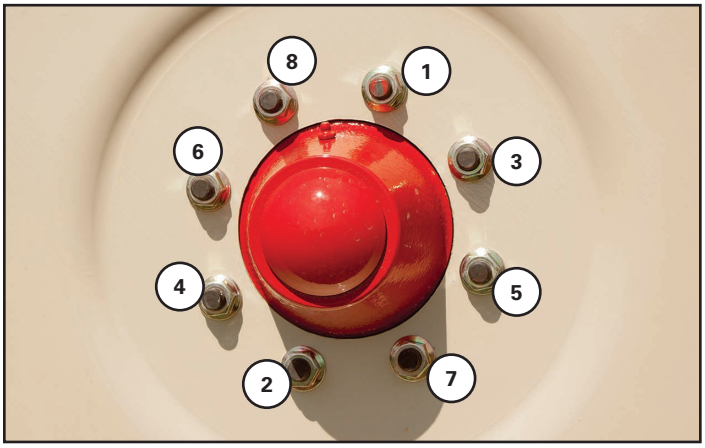
Place chock blocks behind and in front of the opposite tire to be removed.

Raise axle frame with jack until the tire / wheel is slightly off the ground.

NOTE: Place blocks / stands under the frame to secure the fertilizer applicator when tire / wheel is raised off the ground.

Remove the eight wheel nuts and tire assembly.

Figure 58



Install the new tire with the valve stem facing out.

Reinstall eight wheel nuts (Items 1 - 8) **[Figure 58]**. Tighten wheel nuts in a criss-cross pattern.

Tighten wheel nuts to 420 ft.-lb. (567 N•m) of torque.

Lower tire / wheel assembly to the ground.

After tightening the wheel nuts, pull the fertilizer applicator approximately one (1) mile and re-tighten the wheel nuts to 420 ft.-lb. (567 N•m) of torque.

Tire Pressure

CAUTION

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly.

Check tire pressure daily. Fill tires per tire manufacturer's recommendation. See side wall of tire for inflation requirements.

CLEANING

DANGER

CHEMICAL HAZARD

To prevent serious injury or death:

WEAR PERSONAL PROTECTIVE EQUIPMENT

- **Do not allow chemical or solution to touch skin.**
- **Some chemicals can be absorbed through the skin.**
- **Wear rubber gloves and protective gear at all times.**

DON'T BREATH VAPOR

- **Avoid chemical splash and vapor. Keep others away.**
- **Do not breathe vapor.**
- **Wear proper respirator when working with chemicals.**
- **Chemicals can be toxic.**

DON'T INGEST CHEMICAL

- **If in eyes or mouth, read manufacturer's instructions and follow them exactly.**
- **Seek immediate medical attention.**
- **A poison control number is usually inside the front cover of your telephone book.**

WARNING

The tank and system must be emptied of chemical mixture and flushed with clean water before servicing the spray system or spraying components.

WARNING

Do not spill chemicals on skin or clothing. If chemicals are spilled, remove contaminated clothing immediately and wash skin (and clothing) thoroughly with soap and water. Wash hands and face with soap and water and change clothing after spraying.

IMPORTANT

Rinse and clean any exterior surfaces and components immediately if any liquid fertilizer spills or leaks occur.

Cleaning The Product Tank

Fill product tank approximately half full, with clean water (See "Filling The Product Tank" in Operation section).

Engage product pump and flush out through the nozzles.

Add a proper cleaning agent and fill product tank approximately half full one more time.

Engage product pump and flush out through the nozzles. Fill product tank approximately half full, with clean water, engage product pump and flush out through the nozzles for the final rinse.

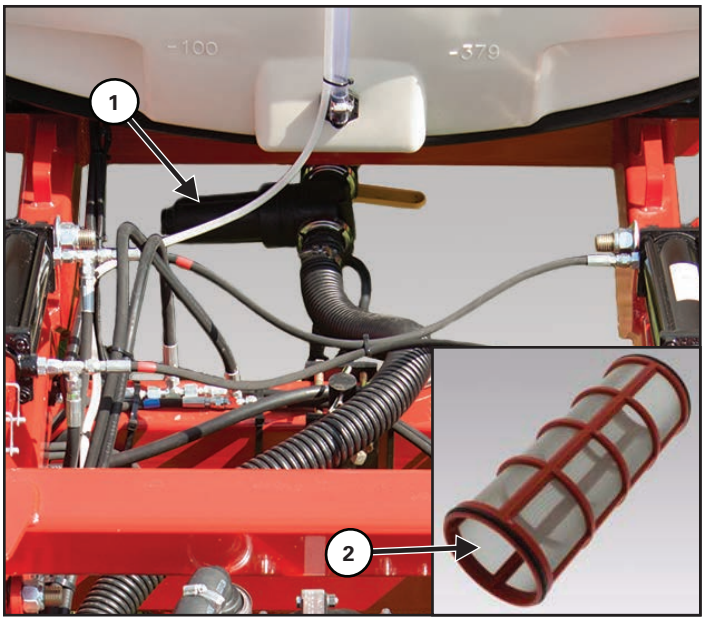
Cleaning The Line Strainer Screen

Clean the line strainer screen every 50 hours of operation.

WARNING

The tank and system must be emptied of chemical mixture and flushed with clean water before servicing the spray system or spraying components.

Figure 59



Loosen and remove the line strainer canister (Item 1) by hand (do not use a wrench).

Remove screen (Item 2) **[Figure 59]** and clean from the inside with clean water.

Inspect the screen for holes or tears. If the screen is damaged, replace the screen.

Install screen and line strainer canister. Hand tighten the line strainer canister (do not use a wrench).

Cleaning The Fertilizer Applicator

Clean and rinse all exterior surfaces and components with clean water and cleaning agent to prevent corrosion.

SAFETY SIGN (DECAL) INSTALLATION

Procedure

IMPORTANT

When replacing safety signs (decals), the temperature must be above 10° C (50° F).

- Remove all portions of the damaged safety sign (decal).
- Thoroughly clean the area with adhesive remover and glass cleaner. Remove all adhesive residue.
- Allow the area to dry completely before installing the new safety sign (decal).
- Position the safety sign (decal) in the correct location.
- Remove a small portion of the backing paper on the safety sign (decal).
- Press on the safety sign (decal) where the backing paper has been removed.
- Slowly remove the remaining backing paper, pressing on the safety sign (decal) as the backing paper is removed.
- Using the backing paper, pressing firmly, move the backing paper over the entire safety sign (decal) area.

NOTE: Small air pockets can be pierced with a pin and smoothed out using the piece of the backing paper.

STORAGE AND RETURN TO SERVICE

Storage

Sometimes it may be necessary to store your Farm King Fertilizer Applicator for an extended period of time. Below is a list of items to perform before storage.

IMPORTANT

DO NOT permit children to play on or around the stored machine.

- Add 20 gal (75 liters) of clean water to the fertilizer tank and flush out toolbar / wings. Repeat three times.
- Thoroughly wash the machine with a pressure washer or water hose to remove all dirt, mud, debris or residue.
- Remove knives, injectors and orifices from the coulter assembly. Wash thoroughly. Apply a thin layer of grease to coulter blades/knives and exposed cylinder shafts to prevent rust.
- Winterize with RV antifreeze.
- Lubricate all bushings to remove any water residue from washing.
- Remove any material that has become entangled around any moving part.
- Raise and fold the toolbar and wings into their fully up and retracted configuration.
- Clean, flush, drain and cover spray monitors to protect from UV exposure.
- Place hydraulic hoses and 7-pin connector in the storage brackets.
- Inspect the hitch and all welds on the equipment for wear and damage.

- Check for loose hardware, missing guards, or damaged parts.
- Check for damaged or missing safety signs (decals). Replace if necessary.
- Replace worn or damaged parts.
- Touch up all paint nicks and scratches to prevent rusting.
- Place the equipment in a dry protected shelter.

NOTE: If a dry protected shelter is not available, cover with a waterproof tarp and tie down securely.

- Place the equipment flat on the ground.
- Support the jack / frame with planks if required.

Return To Service

After the Farm King Fertilizer Applicator has been in storage, it is necessary to follow a list of items to return the equipment to service.

- Be sure all shields and guards are in place.
- Lubricate the equipment.
- Connect to a tractor and operate equipment, verify all functions operate correctly.
- Check for leaks. Repair as needed.

Farm King

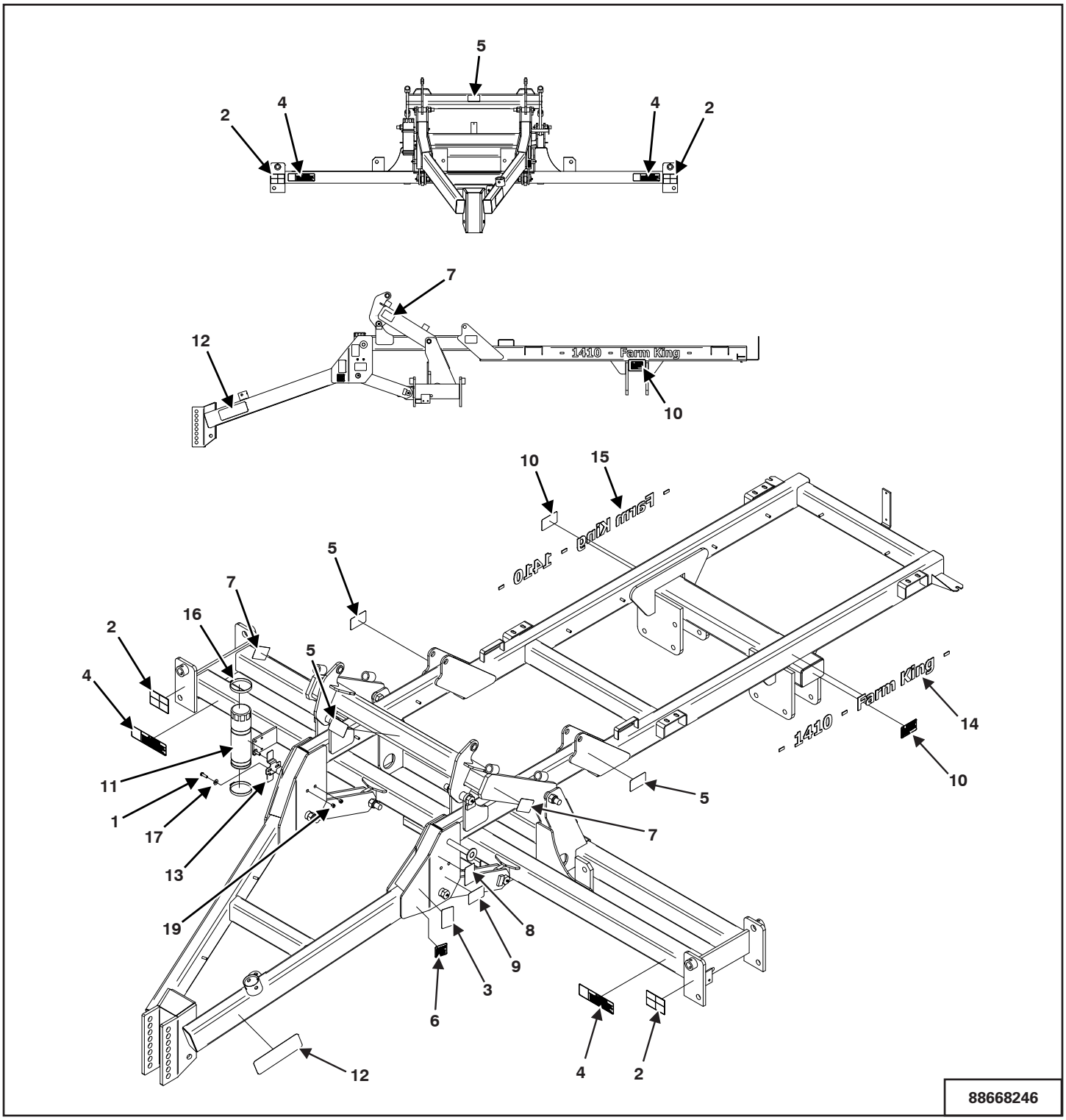
PARTS IDENTIFICATION

Farm King

GENERAL PARTS INFORMATION

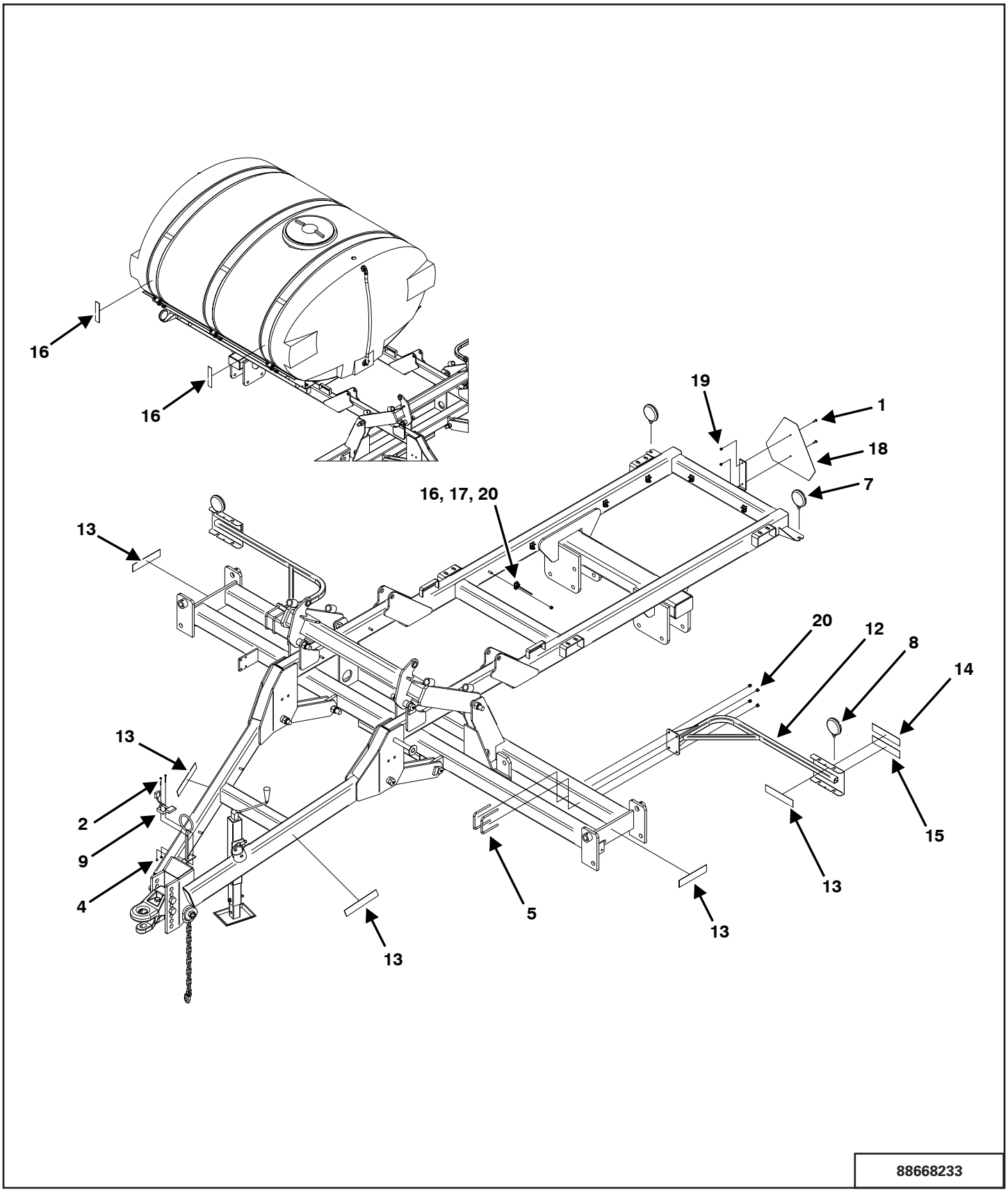
The parts identification section list descriptions, part numbers and quantities for all North America Base Model 1410 fertilizer applicators. Contact your Farm King dealer for additional fertilizer applicator parts information.

IDENTIFIER/SAFETY DECALS, MANUAL STORAGE TUBE



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88011	CSHH G5 P .38X1.25 86505344	2
2	88669534	DECAL; ADD PIN TO WING	2
3	SX002438	DECAL, CAUTION AG CHEMICALS	1
4	SX002439	DECAL, DANGER WING FALLING	2
5	SX004302	DECAL, USE CYLINDER LOCKS	3
6	SX004772	DECAL; CAUTION, READ MANUAL	1
7	SX004774	DECAL, WARNING KEEP HANDS AWA	2
8	SX004775	DECAL, CAUTION CHEMICAL HANDL	1
9	SX004776	DECAL, DANGER ELECTRICAL LINE	1
10	SX008553	DECAL, CAUTION INSTRUCTIONS	2
11	SX013049	PLASTIC MANUAL-PAK 3 11/16 OD	1
12	SX014079	DECAL, WARNING	1
13	SX015162	BRACKET; MANUAL HOLDER 1410	1
14	SX019944	DECAL 1410 FARM KING LHS	1
15	SX019945	DECAL 1410 FARM KING RHS	1
16	SX64J	CLAMP, HOSE, 4" WORM SCREW	2
17	SXFW-038YZ	FLATWASHER; 3/8 GRADE 5	2
18	SXL-26089	LIT; MANUAL, 1410	1
19	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERT YZ	2

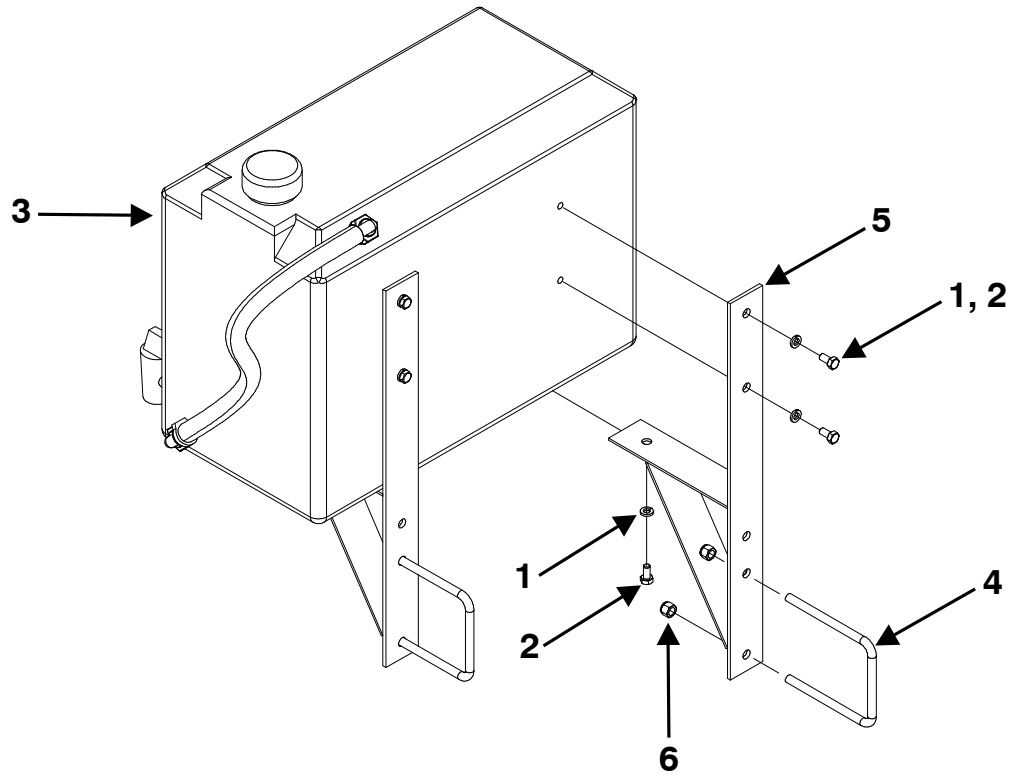
LIGHTING MARKING GROUP



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	9707580	BOLT HEX 0.25 X 0.75GR5 PL	2
2	86511926	BOLT; MACH. 10-24 X 1.75"YZ	2
3*	88667494	HARNESS 1410 FRAME	1
4	88668038	LOCKNUT; 10-24 NYLON INSERTYZ	2
5	88668254	U-BOLT; 3/8 X 4"X5" G5 SQYZ	4
6*	SX004559	HARNESS;TRACTOR/IMPLEMENT, 5'	1
7	SX004560	LAMP;TURN/TAIL	2
8	SX004561	LAMP; FLASH/WARNTAIL, AMBER	2
9	SX006978	MODULE;TURN SIGNAL (PWI)	1
10*	SX014098	HARNESS, RED LIGHT, 1460	1
11*	SX014099	HARNESS, AMBER LIGHT 1460	1
12	SX014364	WLDMT; LIGHT BRACKET	2
13	SX17-5910	DECAL; REFLECT AMBER, 2" X 9"	10
14	SX17-5915	DECAL; REFLECT RED, 2" X 9"	2
15	88668615	DECAL; DAY ORANGE, 2" X 9"	2
16	SX21294	MOUNT, CABLETIE HEAVY DUTY	6
17	SX3NS12	STRAP; 11 1/4 BLA21	40
18	SXJD5403	SIGN, SMV	1
19	SXLN-025-NIYZ	LOCKNUT; 1/4" NYLON INSERT	2
20	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERTYZ	14

* NOT SHOWN

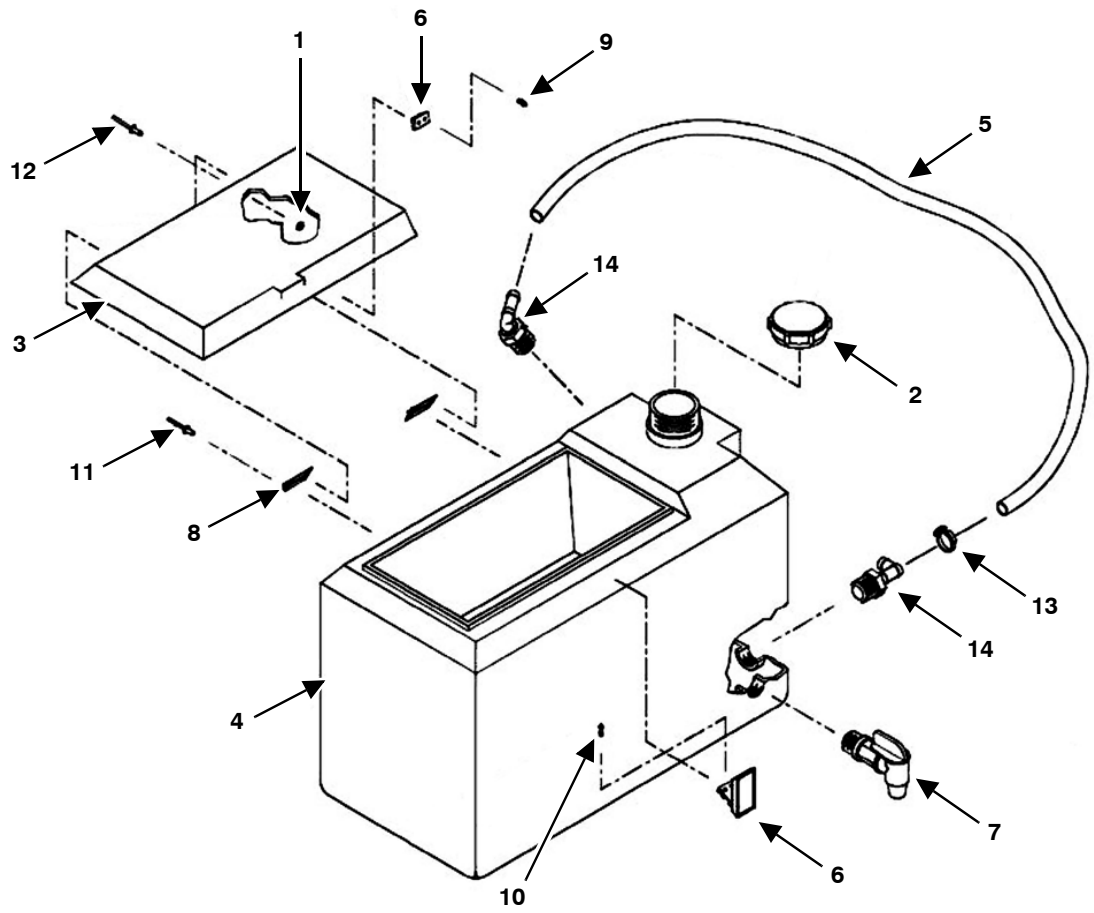
FRESH WATER TANK MOUNTS



88668235

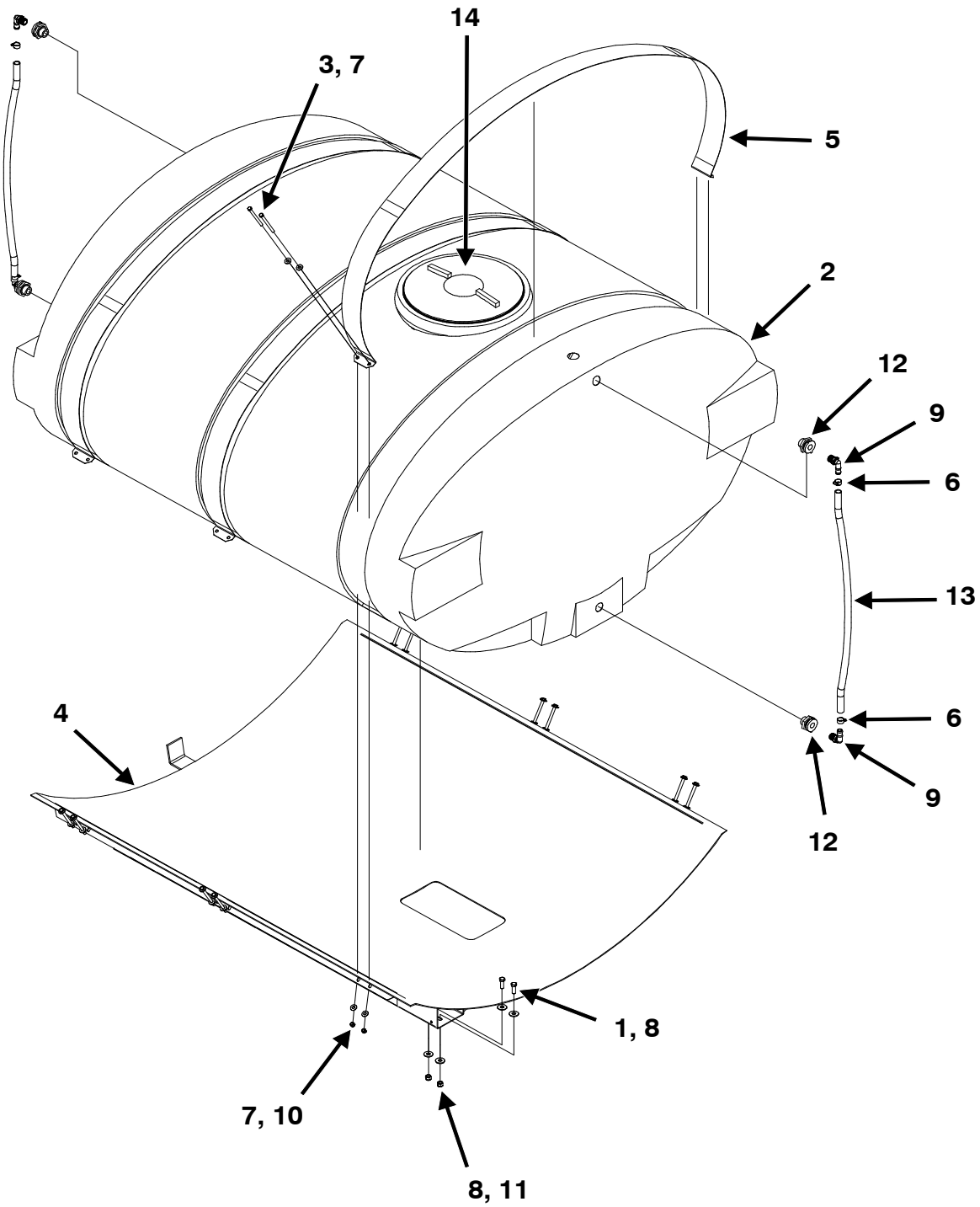
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00080681	WASHER LOCK 0.31 PL	6
2	09627874	CSHH G5 P .31 X 62 86505344	6
3	88665010	FRESH WATER TANK ASSY COMPLETE - CREAM	1
4	88668254	U-BOLT; 3/8 X 4" X 5" G5 SQ YZ	2
5	SX001203	WLDMT; 9 GAL FR WATER TK FRAME	2
6	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERT YZ	4

FRESH WATER TANK ASSEMBLY



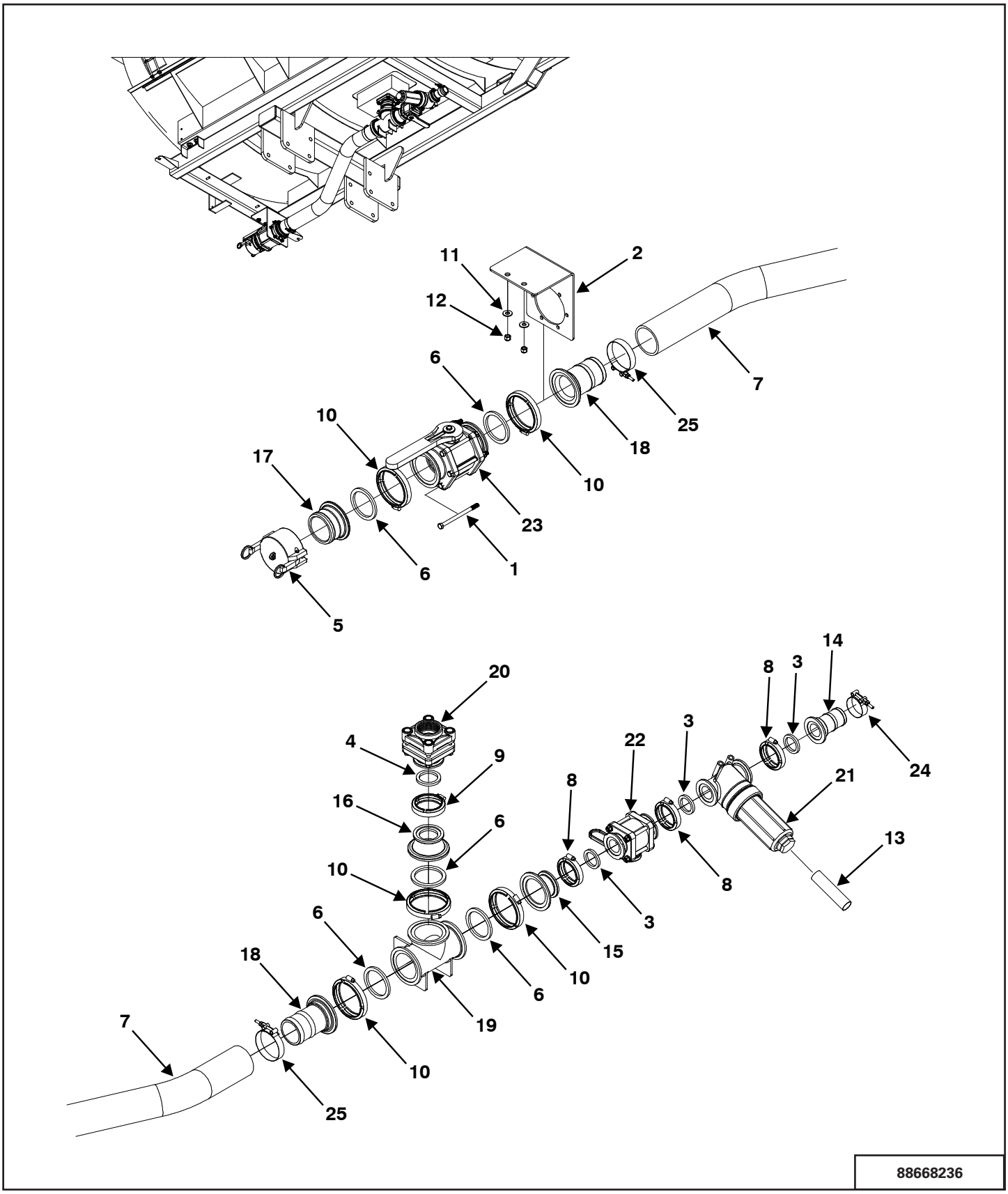
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88664993	RIVET WASHER, 3/8OD X 3/16 ID	4
2	88664994	COVER, 9 GA TANK SCREW CAP	1
3	88664995	LID; 9 GAL TANK, MOLDED	1
4	88665008	TANK; 9 GAL BUHLER CREAM	1
6	88664997	LATCH; 07-10-201-12 LIVING BLK	1
7	88664998	SPIGOT; MATURAL 3/4"	1
8	88664999	HINGE; BUTT H03-30200-171 ZINC	2
9	88665000	RIVET; AB4-6A	2
10	88665001	RIVET; DRIVE 1/8 X .359-.391	2
11	88665002	RIVET; 3/16 X AD64-AH CLOSED	4
12	88665003	RIVET; 3/16 X .440LG DOMEHEAD	4
14	88665005	HOSE FITTING; 3/4 MPT X 1/2 HB	2
15	88665006	CLAMP; SPEEDY FITS 1/2" HOSE	1
16	88665019	HOSE; 1/2"ID X 1/8" WALL SIGHT	1

PRODUCT TANK, PLUMBING



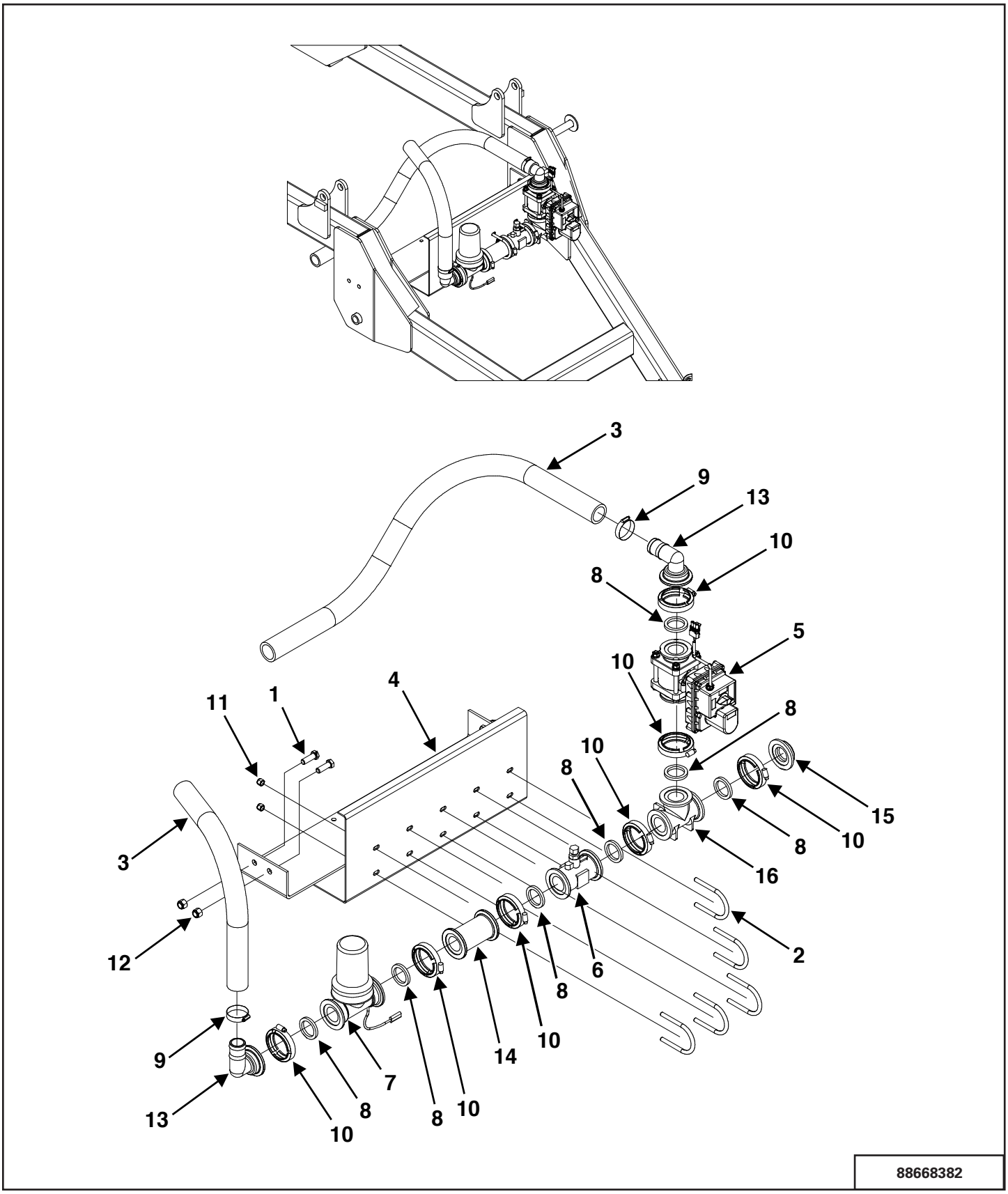
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00087689	BOLT HEX 0.50 X 1.50GR5 PL	8
2	88668230	TANK; 1000 GAL ELLIP. DRILL	1
3	88668255	BOLT, TAP, HEX; 3/8X5.00 G5 YZ	12
4	SX008809	WLDMT; TANK SKID; 1000 GAL	1
5	SX008882	STRAP; 1000 GAL	3
6	SX12J	CLAMP, 3/4" HOSE WORM SCREW	4
7	SXFW-038YZ	FLATWASHER; 3/8 GRADE 5	24
8	SXFW-050YZ	FLATWASHER; 1/2" YZ	16
9	SXHB-075-90	HOSE BARB, 3/4 MPT X 3/4 HB, ELL	4
10	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERT YZ	12
11	SXLN-050-NI-YZ	LOCKNUT; 1/2" NYLON INSERT YZ	8
12	SXNW60401	BULKHEAD, 3/4" THREADED	4
13	SXSIGHT-34	HOSE; 3/4 ID X 1/8 SIGHT	7.3'
14	SXNW60012	Rim for 16" Lid	1
	SXSFPI-10ST	Screw; 1" x #10 FH PH Self Tap, SS Rope; 1/8" Nylon	8
	SX0254-1035	Rope; 1/8” Nylon	1
	SXNW60011	Lid; 16" with Air Vent	1
	SXNW60019	Air Vent Assembly	1

TANK FILL VALVE, PLUMBING



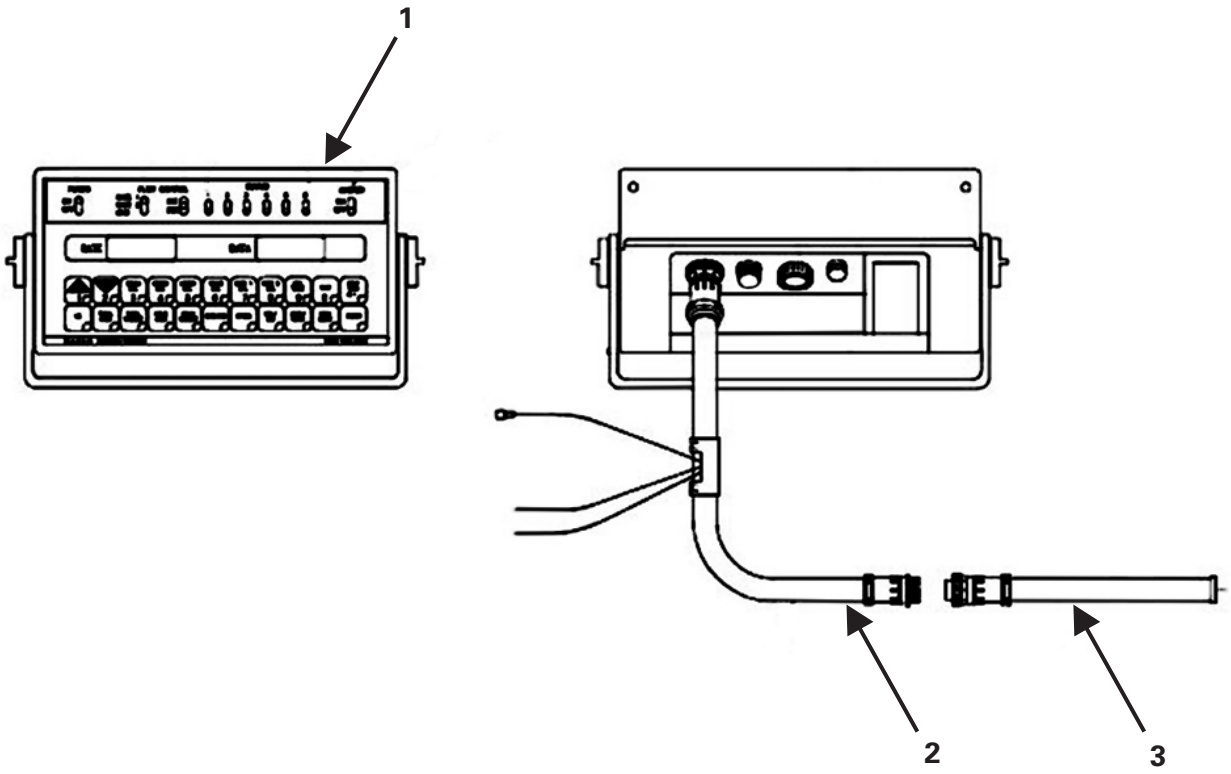
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88662075	CSHH 316SS .38 X 5.50	6
2	SX014105	PLATE, VALVE MT	1
3	SX150G	GASKET; FOR 2" FLANGED VALVE	3
4	SX200G	GASKET; 2" COUPLING EPDM	1
5	SX300CAP	COUPLING; 3" CAM LEVER CAP	1
6	SX300G	GASKET, 3" BANJO	5
7	SX600448	HOSE; 3" EPDM W/POLY HELIX & FABR	4.2'
8	SXFC200BJ	CLAMP, 2" BANJO	3
9	SXFC220	CLAMP; 2" SERIES WORM SCREW	1
10	SXFC300BJ	CLAMP, 3" BANJO	5
11	SXFW-038YZ	FLATWASHER; 3/8 GRADE 5	2
12	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERT YZ	2
13	SXLST1550	SCREEN; 50 MESH, 1_1/4 & 1_1/2 T	1
14	SXM200BRB	HOSE BARB, 2" FLG X 2" HB	1
15	SXM300200CPG	MANIFOLD FITTING; 3" X 2" FULL	1
16	SXM300220CPG	FLANGE; 3" X 2" FULL PORT RED. FL	1
17	SXM300A	COUPLER, 3" FLG X 3" CAM CPLR BANJO	1
18	SXM300BRB	HOSE BARB; 3" FLG X 3" HB, POLY	2
19	SXM300TEE	TEE; 3" FLANGED	1
20	SXMBF220	MANIFOLD, 2" FP FLG, 2" FPT	1
21	SXMLST150-HB	STRAINER; 2" T-HEAD & BODY, FLGED	1
22	SXMV200CF	VALVE; 2" FLANGED, VITON	1
23	SXMV300	VALVE; 3" STD PORT MANIFOLD VLV	1
24	SXTBC256	CLAMP; T-BOLT 2 11/32-25/8	1
25	SXTBC350	CLAMP; T-BOLT 3 1/2 - 3 13/16"	2

RAVEN CONTROL, PLUMBING



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	87689	BOLT HEX 0.50 X 1.50GR5 PL	4
2	88668020	U-BOLT; 3/8 X 2_1/2 X 4 RNDYZ	5
3	SX012412	HOSE; 1_1/2" 150# EPDM	8.2'
4	SX014342	WLDMT; PLUMBING MOUNT	1
5	SX016663	VALVE; 2" ELEC. BANJO W/ PACKARD	1
6	SX063-0171-793	FLOW METER, RFM 60P	1
7	SX063-0171-894	VALVE; CONTROL, 1 1/2" POLY	1
8	SX150G	GASKET; FOR 2" FLANGED VALVE	7
9	SX28J	CLAMP; 1 3/4" X 1/2 STAINLESS	2
10	SXFC200BJ	CLAMP, 2" BANJO	7
11	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERTYZ	10
12	SXLN-050-NI-YZ	LOCKNUT; 1/2" NYLON INSERTYZ	4
13	SXM200150BRB90	HOSE BARB, 2" FLG X 1 1/2 HB, EL	2
14	SXM200CPG	FLANGE; 2" X 2" POLY	1
15	SXM200PLG	PLUG; BANJO FLANGE 2"	1
16	SXM200TEE	TEE, 2" FLG, BANJO	1

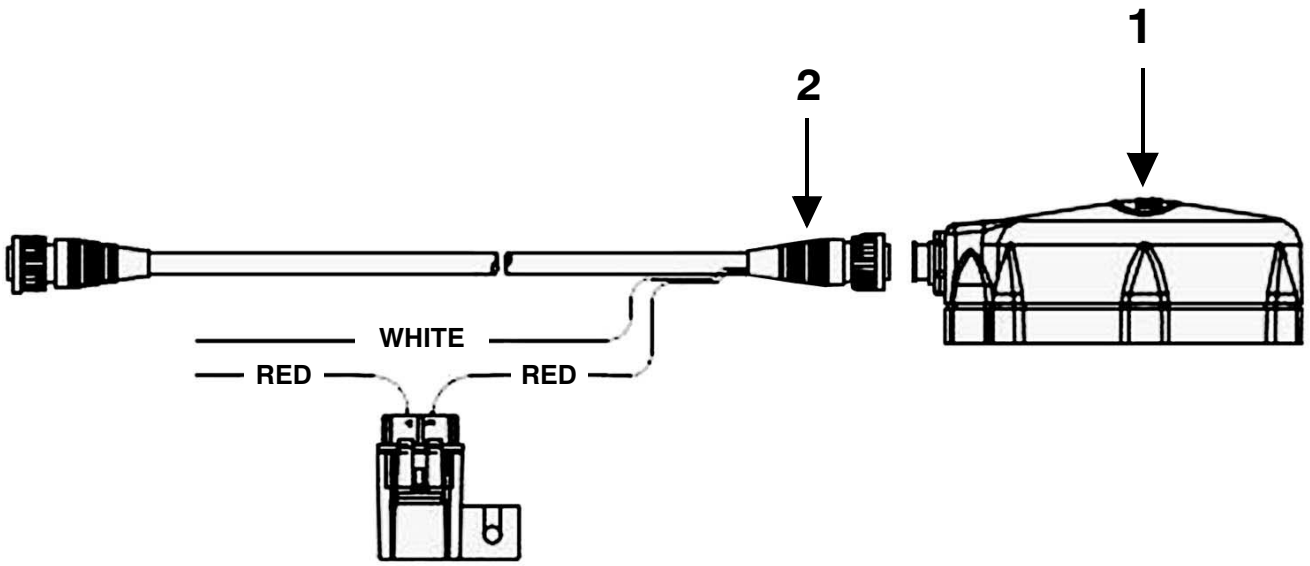
RAVEN 450



88664957

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX063-0171-220	CONSOLE ASY; 450 W/SER PORT	1
2	SX115-0171-085	CABLE, RAVEN 450 CONTROL CABLE	1
3	88668923	CABLE, 16' EXTENTION, 7 BOOM, SCS 440	1

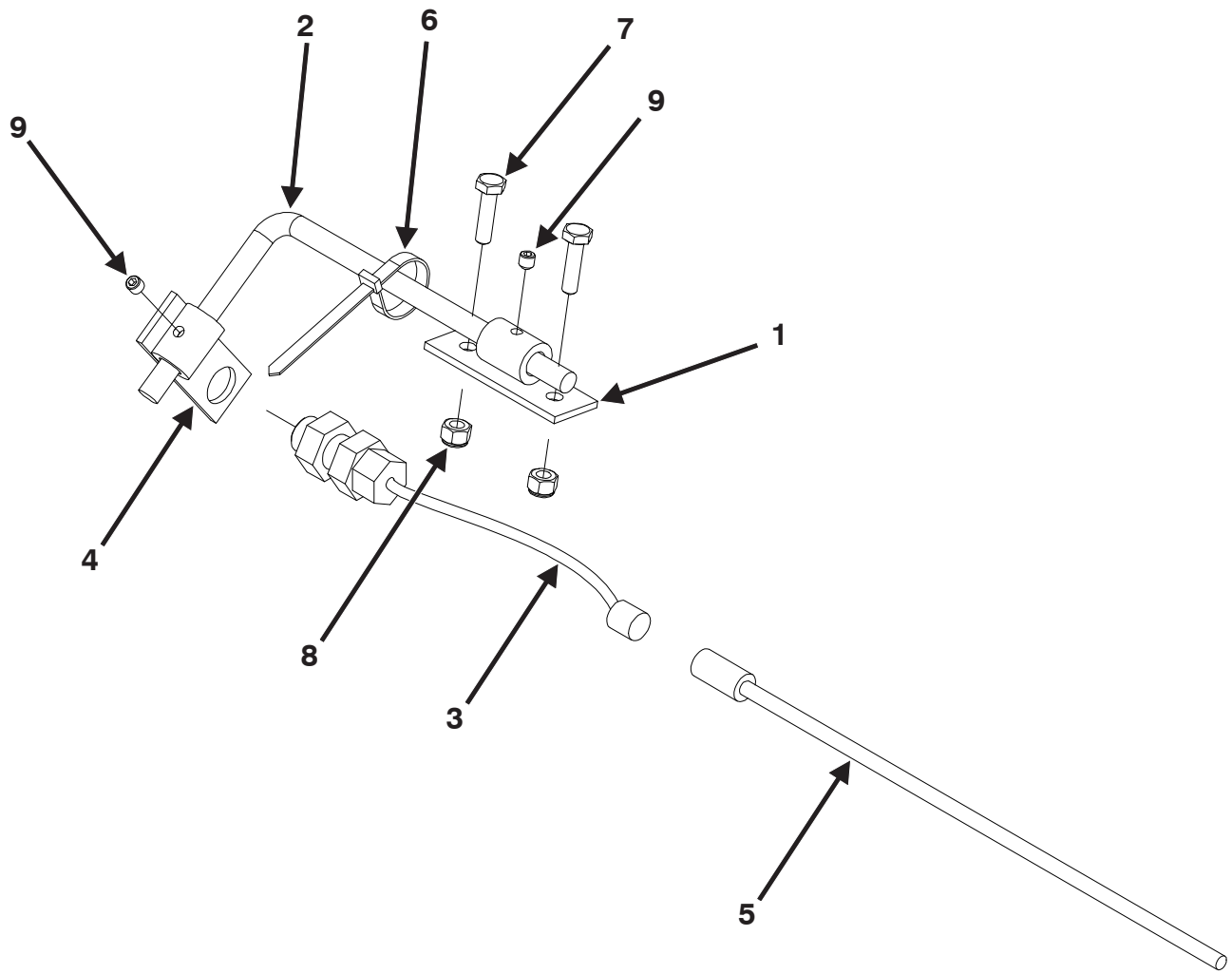
GPS SPEED SENSOR KIT



88666442

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88666443	PHOENIX 10 RECEIVER	1
2	88666444	RECEIVER CABLE	1

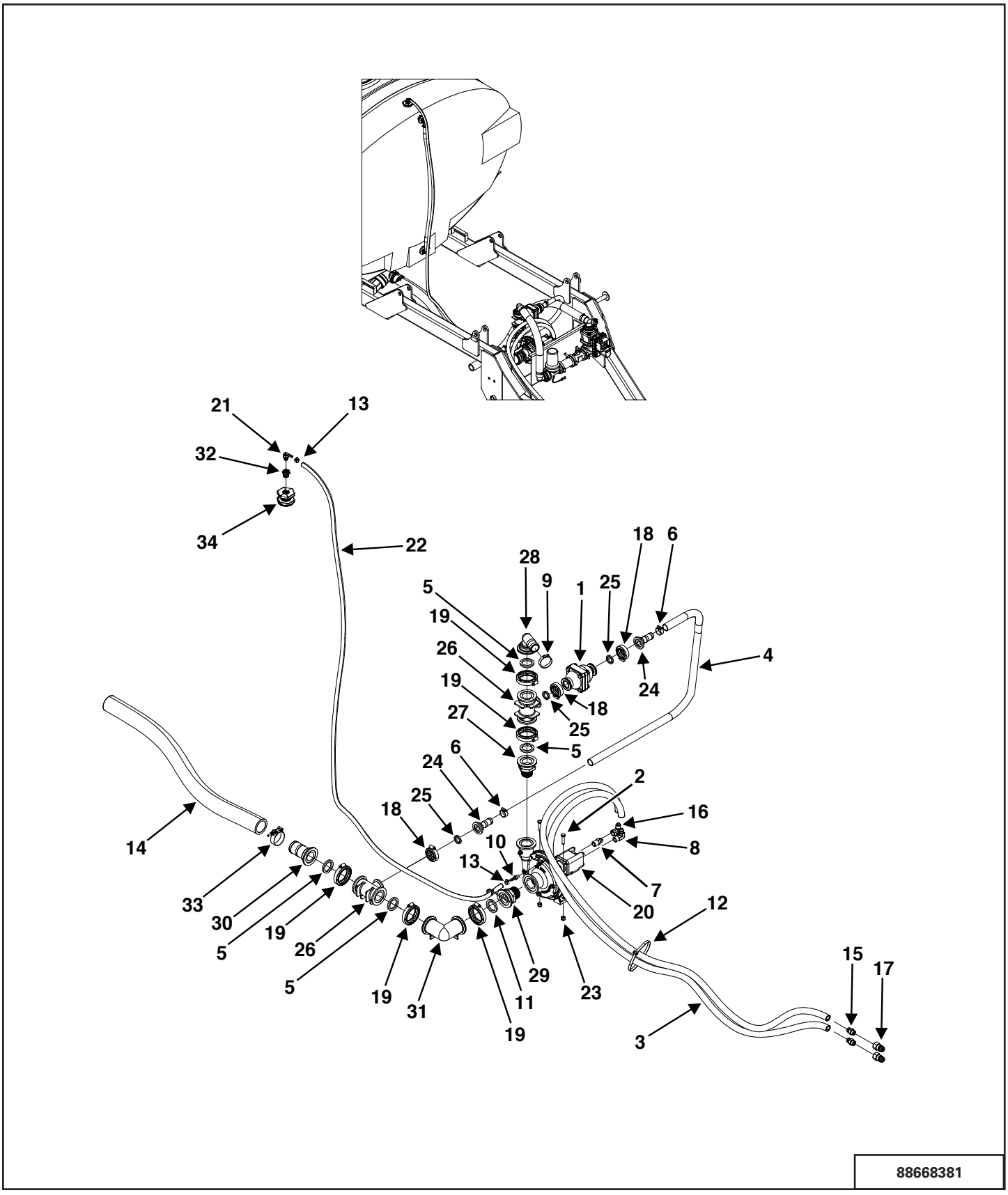
WHEEL PROXIMITY SPEED SENSOR KIT



88668375

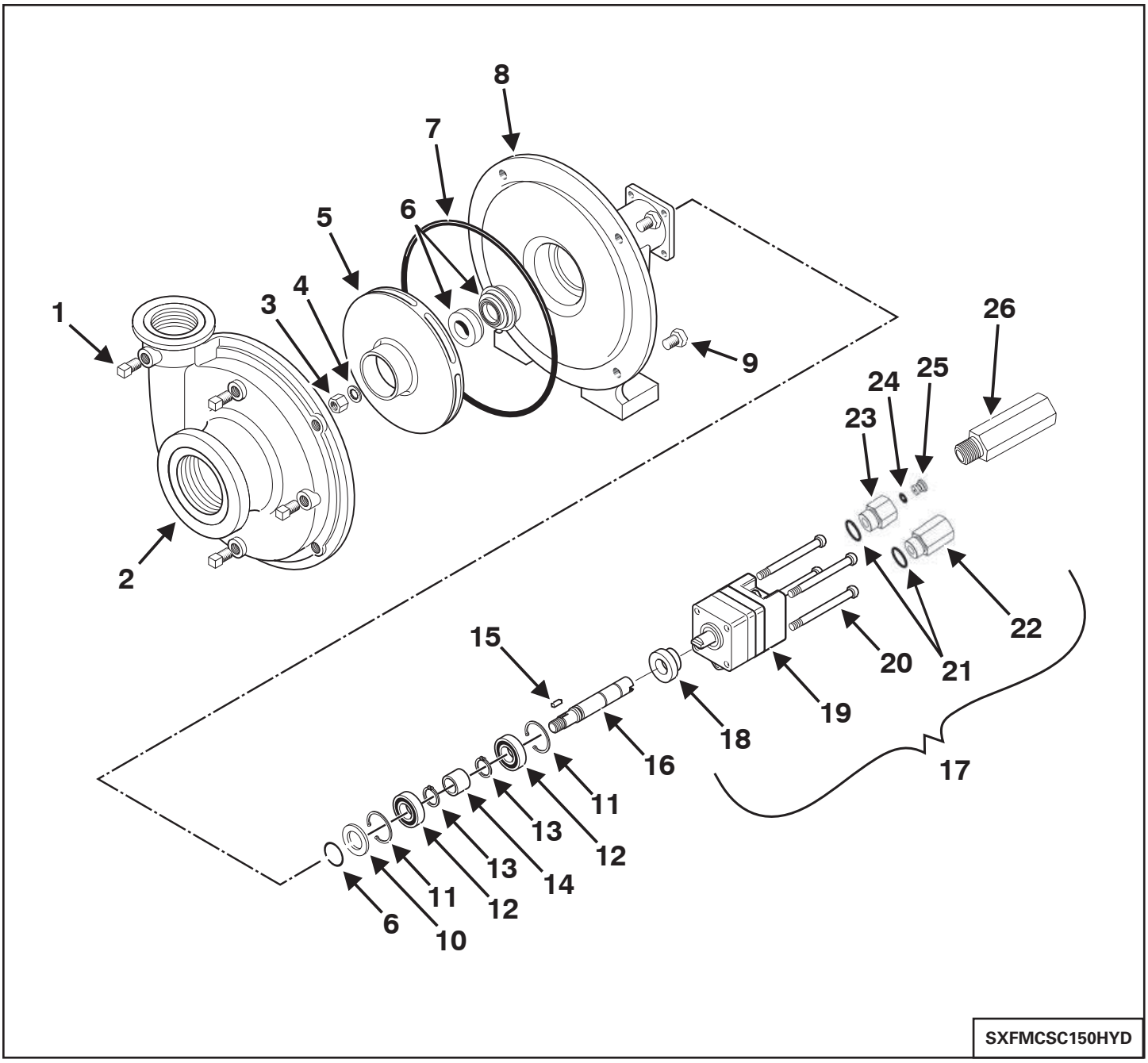
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX010439	MOUNT, SPEED SENSOR	1
2	SX010442	ROD, ADJUSTMENT	1
3	88668905	SENSOR SPEED; GEAR TOOTH/PROX	1
4	SX019563	WLDMT; MNT, SPEED SENSOR	1
5	SX115-0159-018	CABLE; SPD SENSOR 24' EXT CABLE	1
6	SX3NS8	STRAP; BLACK 7 1/4"	12
7	SXBH0251005YZ	BOLT; 1/4 X 1.00 GR5	2
8	SXLN-025-NIYZ	LOCKNUT; 1/4" NYLON INSERT	2
9	SXSTS-025-038	SETSCREW; 1/4 X 1/4 ALLEN HD	2

ACE CENTRIFUGAL PUMP & PLUMBING ASSEMBLY (OPTION)



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88661393	1" PRESSURE SPIKE VALVE, 100 PSI	1
2	88663901	CSHH G5P .38X1.50	2
3	88667149	HOSE ASSY -8 HYD 145.0 LG	2
4	SX011612	HOSE; 1" 150# BLACK RUBBER	3.3'
5	SX150G	GASKET; FOR 2" FLANGED VALVE	5
6	SX16J	CLAMP; 1" X 1/2 STAINLESS	2
7	SX2404-8-8	HYD FITTING; -8MNPTX-8JIC, STEEL	1
8	SX2501-8-8	HYD ADAPTER;-8 MJIC X -8MNPT	1
9	SX28J	CLAMP; 1 3/4" X 1/2 STAINLESS	1
10	SX3A1814	HOSEBARB; 1/8 X 1/4, POLY	1
11	SX3NS12	STRAP; 11 1/4 BLA21	20
12	SX3NS21	STRAP; BLACK 21 1/2"	5
13	SX4JM	CLAMP; 1/4" X 5/16 STAINLESS	2
14	SX600432	HOSE; 2" ENFORCER, FERT SOL.	4.5'
15	SX6400-8	ADPTR, STRGHT; -08MJIC-08ORB	2
16	SX6500-8	HYD. FITTING; -8FJIC X -8MJIC	1
17	SX8010-15P	HYD QUICK COUPLER; UNIV. POPPET	2
18	SXFC100BJ	CLAMP; 1"	3
19	SXFC200BJ	CLAMP, 2" BANJO	5
20	SXFMCSC150HYD	PUMP, CAST, SC SEAL, 1.5" ACE	1
21	SXHB-025-90	HOSE BARB ELL; 1-4MPT X 1/4HB	1
22	SXK3150-025	HOSE; 1/4 VINYL REINFORC CLR	10.2'
23	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERT YZ	2
24	SXM100BRB	HOSE BARB; 1" X 1" STRAIGHT	2
25	SXM100G	GASKET; FOR 1" FLANGED VALVE	3
26	SXM200100TEE	TEE; 2" X 1" TEE	2
27	SXM200125MPT	MANIFOLD, 2" FLG, 1 1/4 MPT	1
28	SXM200150BRB90	HOSE BARB, 2" FLG X 1 1/2 HB, EL	1
29	SXM200150MPT	MANIFOLD, 2" FLG, 1 1/2 MPT	1
30	SXM200BRB	HOSE BARB, 2" FLG X 2" HB	1
31	SXM200CPG90	ELBOW; FLANGE, 2" X 2" POLY	1
32	SXRB050-025	REDUCER BUSHING; 1/2 X 1/4 POL	1
33	SXTBC256	CLAMP; T-BOLT 2 11/32-25/8	1
34	SXTF050	1/2" POLY BULKHEAD TANK FITTING	1

PRODUCT PUMP ASSEMBLY



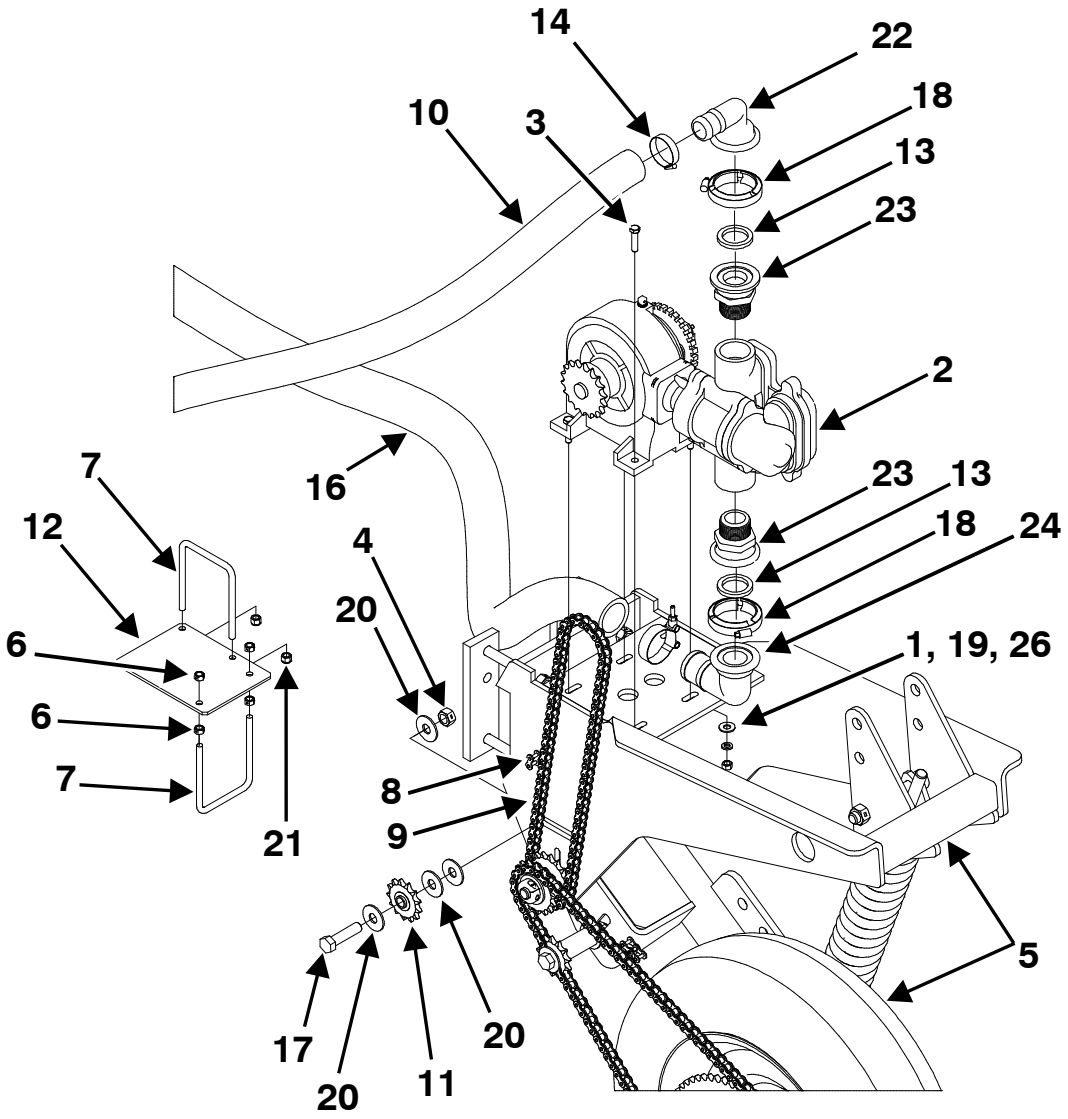
ITEM	PART NUMBER	DESCRIPTION	QTY.
2	88661304	BAC-12-150-FLG - FLANGED VOLUTE	1
5	88661305	BAC-26-150-P - VALOX IMPELLER	1
6, 7	88661310	RK-FMCSC-150 - SEAL REPLACEMENT KIT	-
*	88661311	RK-BAC-75-HYD-L - HYD SEAL REPAIR KIT	-

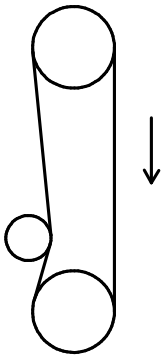
* NOT SHOWN

ITEM	DESCRIPTION	QTY.
	THE FOLLOWING PARTS ARE FOR IDENTIFICATION PURPOSES ONLY	
1	BAC-53 - PIPE PLUG	4
	41120 - PIPE PLUG, STAINLESS STEEL	4
2	BAC-12-150-FLG - VOLUTE, CAST IRON, NPT & FANGED	1
	BAC-12-150-SS - VOLUTE, 316 STAINLESS STEEL , NPT & FANGED	1
3	BAC-23-A - NUT, 3/8" NF, CAD PLATED	1
	BAC-23-B-SS - NUT, 3/8" NF, STAINLESS STEEL	1
4	BAC-24-HYD-SS - WASHER, 3/8" STAR, STAINLESS STEEL	1
	BAC-24-B-SS - WASHER, 3/8", STAINLESS STEEL, VIBRATION PROOF	1
5	BAC-26-150-P - IMPELLER, VALOX, KEYWAY	1
	BAC-26-150-CI - IMPELLER, CAST IRON, KEYWAY	1
	BAC-26-150-PI - IMPELLER, POLYPROPYLENE, KEYWAY	1
6	BAC-7V - SEAL, CARBON/CERAMIC/VITON (INCLUDES 40160 0-RING)	1
	BAC-7SC - SEAL, SILICON CARBIDE/VITON (INCLUDES 40160 0-RING)	1
	40160 - 0-RING, SHAFT SEAL	1
7	BAC-4-150 - 0-RING, BODY SEAL	1
8	BAC-14-150-HYD - MOUNTING FRAME, CAST IRON	1
	BAC-14-150-HYD-SS - MOUNTING FRAME, 316 STAINLESS STEEL	1
9	40950 - CAP SCREW, 3/8" NC X 3/4" HEX HEAD	4
	40930 - CAP SCREW, 3/8" NC X 3/4" HEX HEAD, STAINLESS STEEL	4
10	BAC-54 - SLINGER	1
11	BAC-33 - SNAP RING, INTERNAL, BAC-14 MOUNTING FRAME	2
12	BAC-37 - BALL BEARING, SEALED, BAC-6 SHAFT	2
13	BAC-32 - SNAP RING, EXTERNAL, BAC-6 SHAFT	2
14	BAC-32-S - SPACER FOR BAC-6 SHAFT	1
15	BACH-25 - KEY, 1/8" X 1/8" X 1/2"	1
16	BAC-6-HYD-SS - SHAFT, 5/8" DIAMETER, KEYWAY AND TANG SLOT, SS	1
17	BAC-75-HYD-206 - HYDRAULIC MOTOR, 7 GPM (INCLUDES PARTS 18 - 25)	1
18	S200 - SEAL SUPPORT SPACER FOR 200 SERIES HYO MOTOR	1
19	BAC-75-HYD-206N - HYDRAULIC MOTOR, 7 GPM (MOTOR ONLY)	1
20	41255 - CAP SCREW, 5/16" N. C. X 3-3/4" SOCKET HEAD	4
21	41875 - 0-RING, #8 SAE FITTING	2
22	BAC-78-8SAE - REVERSE CHECK VALVE, #8 SAE MALE X 1/2" NPT FEMALE	1
23	BAC-80-8SAE - ADAPTER, RESTRICTOR BODY, #8 SAE MALE X 1/2" NPT FEMALE	1
24	41448 - 0-RING, ORIFICE INSERT	1
25	BAC-79-7 - 0RIFICE, RESTRICTOR INSERT, .109 (206N)	1
26	LS-206N - FLOW LIMITING VALVE (206N), #8 SAE MALE X 1/2" NPT FEMALE	1
*	RK-FMC-150 - REPAIR KIT FOR FMC-150 SERIES PUMP	-
*	RK-FMCSC-150 - REPAIR KIT FOR FMC-150 SERIES WITH SILICON CARBIDE SHAFT SEAL	-
*	RK-BAC-75-HYD-L - REPAIR KIT FOR 200-L SERIES MOTOR	-

* NOT SHOWN

JOHN BLUE SINGLE PUMP ASSEMBLY (OPTION)



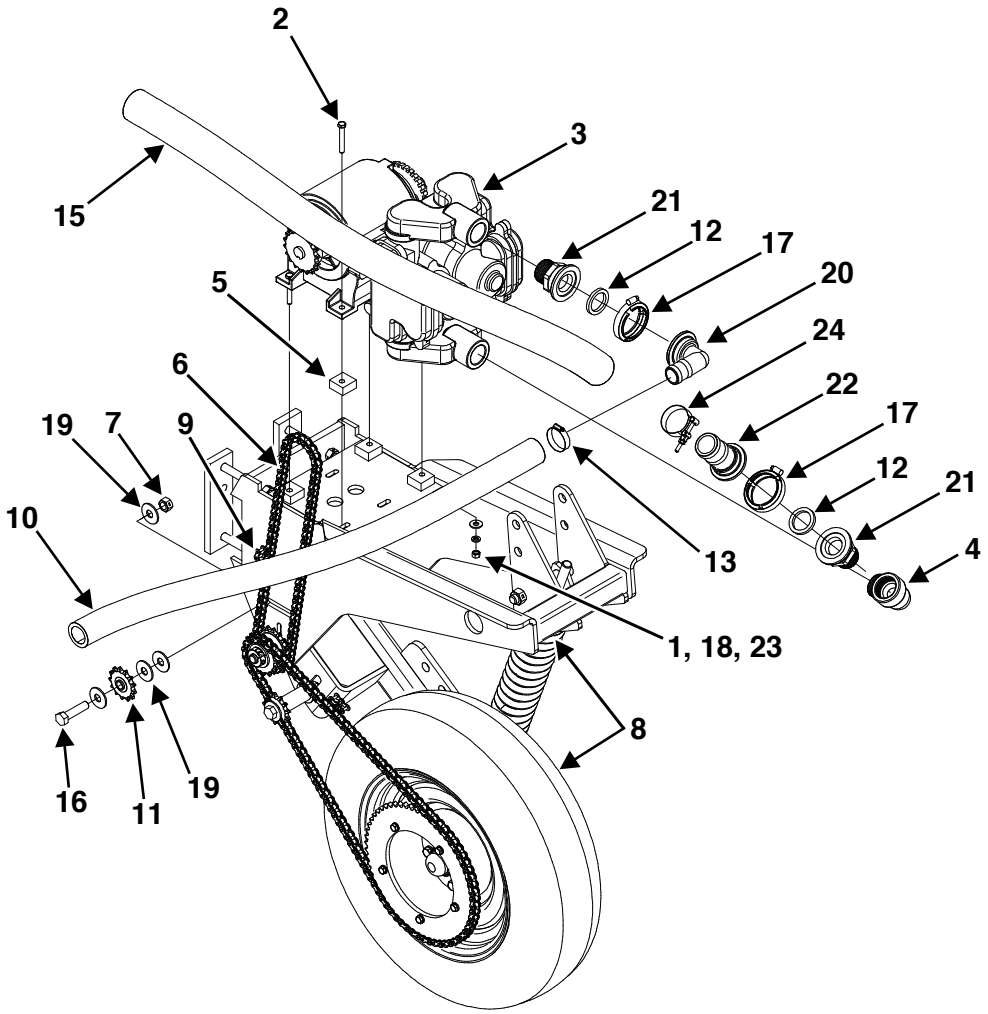


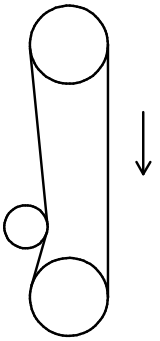
↓ CHAIN ROUTING
(RIGHT SIDE)

88668384

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	0080680	WASHER LOCK 0.375 PL	4
2	88660949	PUMP, SINGLE PISTON	1
3	88663901	CSHH G5P .38X1.50	4
4	88668120	LOCKNUT; 5/8 CENTERLOCK YZ	1
5	88668141	ASSY; GROUND DRIVE MOUNT	1
6	88668172	LOCKNUT; 3/8 CENTERLOCKNUT YZ	4
7	88668254	U-BOLT; 3/8 X 4"X5" G5 SQ YZ	2
8	SX008053	CONNECTING LINK; #50	1
9	SX008223	CHAIN; PUMP TO IDLER	1
10	SX012412	HOSE; 1_1/2" 150# EPDM	4.2'
11	SX013520	SPROCKET; IDLER,50-13,5/8 BORE	1
12	SX015128	PLATE; SUCTION HOSE SUPPORT	1
13	SX150G	GASKET; FOR 2" FLANGED VALVE	2
14	SX28J	CLAMP; 1 3/4" X 1/2 STAINLESS	1
15	SX3NS12	STRAP; 11 1/4 BLA21	8
16	SX600432	HOSE; 2" ENFORCER, FERT SOL.	6.8'
17	SXBH0622505YZ	BOLT; 5/8 X 2 1/2 GRADE 5	1
18	SXFC200BJ	CLAMP, 2" BANJO	2
19	SXFW-038YZ	FLATWASHER; 3/8 GRADE 5	4
20	SXFW-062YZ	FLATWASHER; 5/8" YLLWZN	4
21	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERT YZ	2
22	SXM200150BRB90	HOSE BARB, 2" FLG X 1 1/2 HB, EL	1
23	SXM200150MPT	MANIFOLD, 2" FLG, 1 1/2 MPT	2
24	SXM200BRB90	HOSE BARB, 2" HB, 2" FLG, EL	1
25	SXNUT-038YZ	NUT; 3/8" GRADE 5	4
26	SXTBC256	CLAMP; T-BOLT 2 11/32-25/8	1

JOHN BLUE TWIN PUMP ASSEMBLY (OPTION)



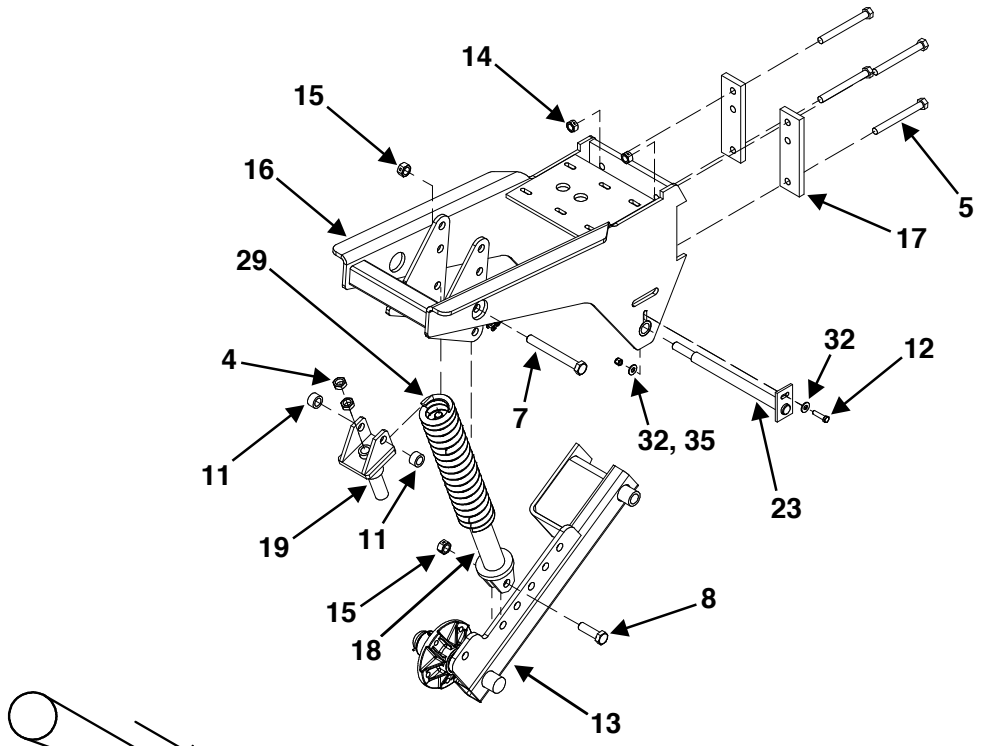


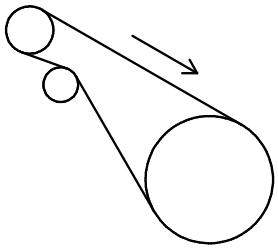
CHAIN ROUTING
(RIGHT SIDE)

88668383

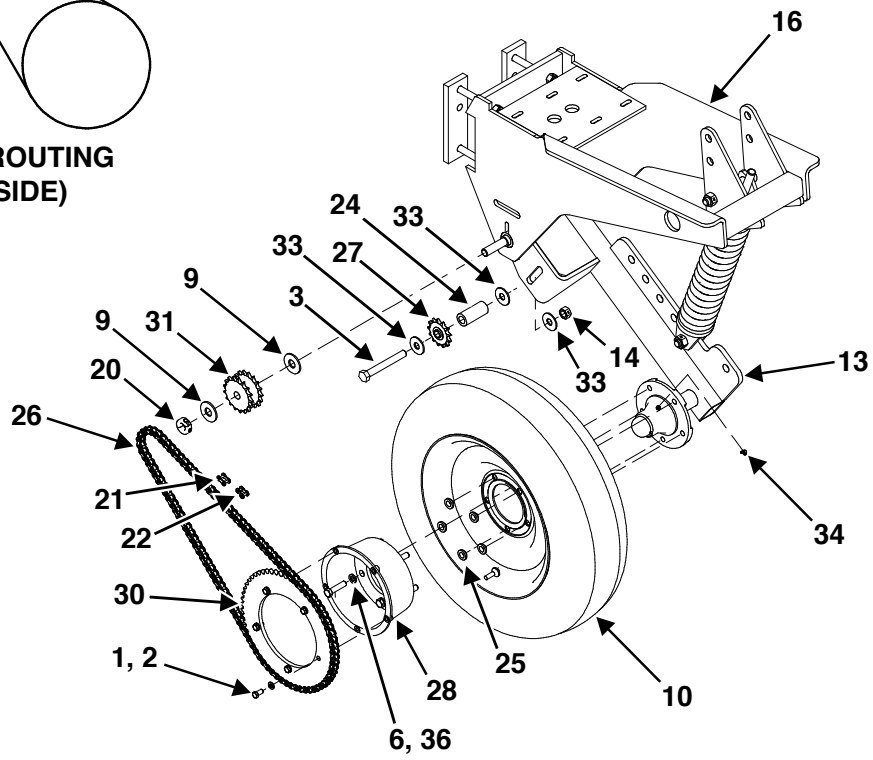
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00080680	WASHER LOCK 0.375 PL	4
2	00087936	CSHHP .38X2.5"LG	4
3	88660940	PUMP,DUAL PISTON	1
4	88660945	ELBOW, 90; 1.50"MPT X 1.50"FPT- POLY	1
5	88660946	SPCR; PUMP MNT	4
6	88660948	CHAIN, 50 SERIES; 81 PITCH	1
7	88668120	LOCKNUT; 5/8 CENTERLOCK YZ	1
8	88668141	ASSY; GROUND DRIVE MOUNT	1
9	SX008053	CONNECTING LINK; #50	1
10	SX012412	HOSE; 1_1\2" 150# EPDM	4.2'
11	SX013520	SPROCKET; IDLER,50-13,5/8 BORE	1
12	SX150G	GASKET; FOR 2" FLANGED VALVE	2
13	SX28J	CLAMP; 1 3/4" X 1/2 STAINLESS	1
14	SX3NS12	STRAP; 11 1/4 BLA21	8
15	SX600432	HOSE; 2" ENFORCER, FERT SOL.	6.8'
16	SXBH0622505YZ	BOLT; 5/8 X 2 1/2 GRADE 5	1
17	SXFC200BJ	CLAMP, 2" BANJO	2
18	SXFW-038YZ	FLATWASHER; 3/8 GRADE 5	4
19	SXFW-062YZ	FLATWASHER; 5/8" YLLWZN	4
20	SXM200150BRB90	HOSE BARB, 2" FLG X 1 1/2 HB, EL	1
21	SXM200150MPT	MANIFOLD, 2" FLG, 1 1/2 MPT	2
22	SXM200BRB	HOSE BARB, 2" FLG X 2" HB	1
23	SXNUT-038YZ	NUT; 3/8" GRADE 5	4
24	SXTBC256	CLAMP; T-BOLT 2 11/32-25/8	1

JOHN BLUE GROUND DRIVE PUMP MOUNT ASSEMBLY





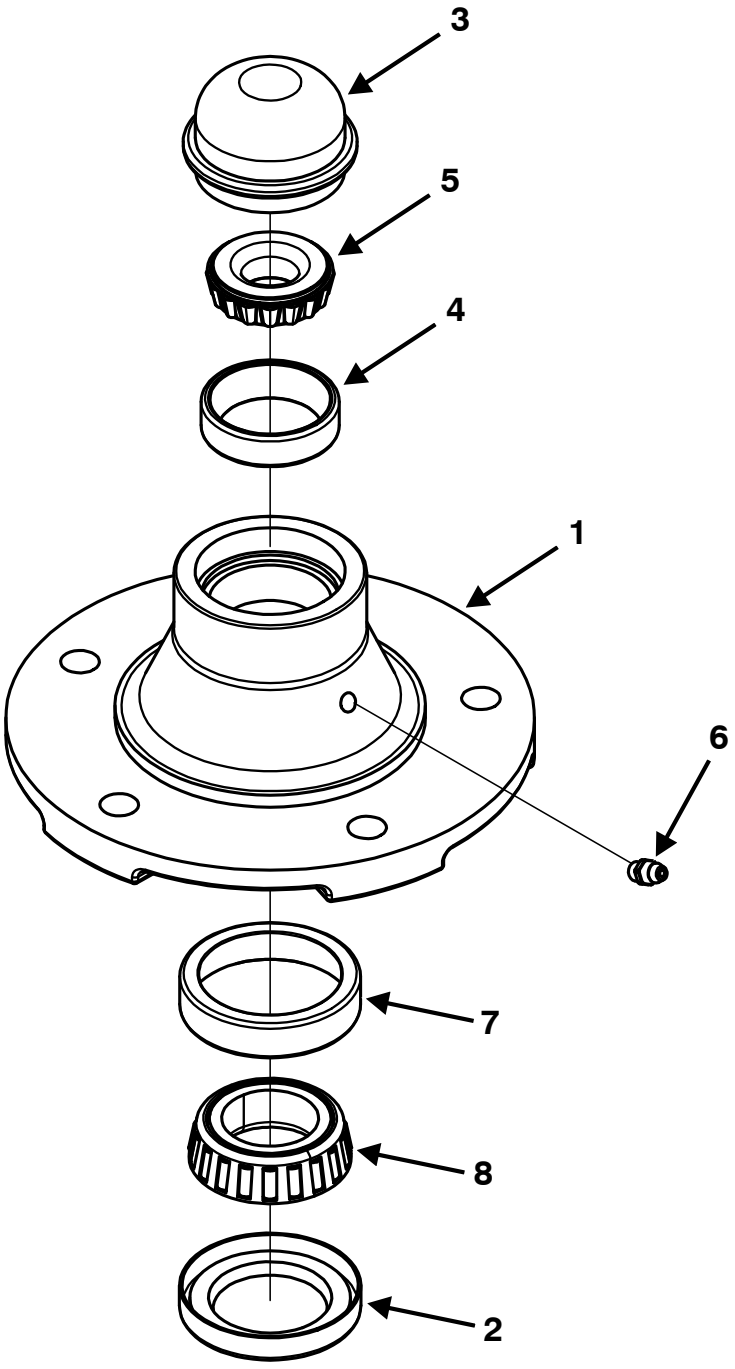
CHAIN ROUTING
(RIGHT SIDE)



88668141

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00012012	CSHH G5 P .38X.75	5
2	00080680	WASHER LOCK 0.375 PL	5
3	00088729	CSHH G5 P .625X5.00 86505344	1
4	00084972	NUT; 3/4-10 JAM YZ	2
5	00088264	BOLT, HEX, 5/8-11 X 6.00 G5 YZ	4
6	00088848	BOLT, HEX; 1/2-20 X 2.00 G5 YZ	5
7	00280223	CSHH G5 P .75X6.50 NA2024	1
8	09706701	CSHH G5 P .75 X 2.50	1
9	86511191	WASHER STD 0.75	2
10	88660947	ASSY, TIRE; 5 X 15	1
11	88661526	TUBE, SPACER, PIVOT, SPRING	2
12	88663901	CSHH G5P .38X1.50	1
13	88668115	ASSY; SWINGARM & HUB	1
14	88668120	LOCKNUT; 5/8 CENTERLOCK YZ	5
15	88668121	LOCKNUT; 3/4" CENTERLOCK YZ	2
16	SX008013	WLDMT; FRAME AND PUMP MOUNT	1
17	SX008014	PLATE; BACKING BOLT PLATE	2
18	SX008018	WLDMT; THREADED ROD HALF	1
19	SX008022	WLDMT; MAINFRAME MOUNT END	1
20	SX008025	COLLAR; 2PC CLAMP ON, 3/4"	1
21	SX008053	CONNECTING LINK; #50	1
22	SX008054	CONNECTING LINK; HALF LINK #50	1
23	SX008170	WLDMT; SHAFT	1
24	SX008221	TUBE; SPACER BUSHING	1
25	SX008222	TUBE; SPACER COLLAR	5
26	SX008224	CHAIN; IDLER TO WHEEL	1
27	SX013520	SPROCKET; IDLER,50-13,5/8 BORE	1
28	SX106190-01	HUB SPROCKET ADAPTER; 5 BOLT	1
29	SX73362B	SPRING; 1400 GROUND DRIVE, BLK	1
30	SXA-1342-AP-BLK	SPROCKET; 60 TOOTH, GRND DRV	1
31	SXDS50A17	IDLER SPROCKET; W/BEARINGS	1
32	SXFW-038YZ	FLATWASHER; 3/8 GRADE 5	2
33	SXFW-062YZ	FLATWASHER; 5/8" YLLWZN	3
34	SXG1637	ZERK; 1/4-28 45 DEG. GREASE	1
35	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERT YZ	1
36	SXLW-050-YZ	WASHER, LOCK; 1/2" YZ	5

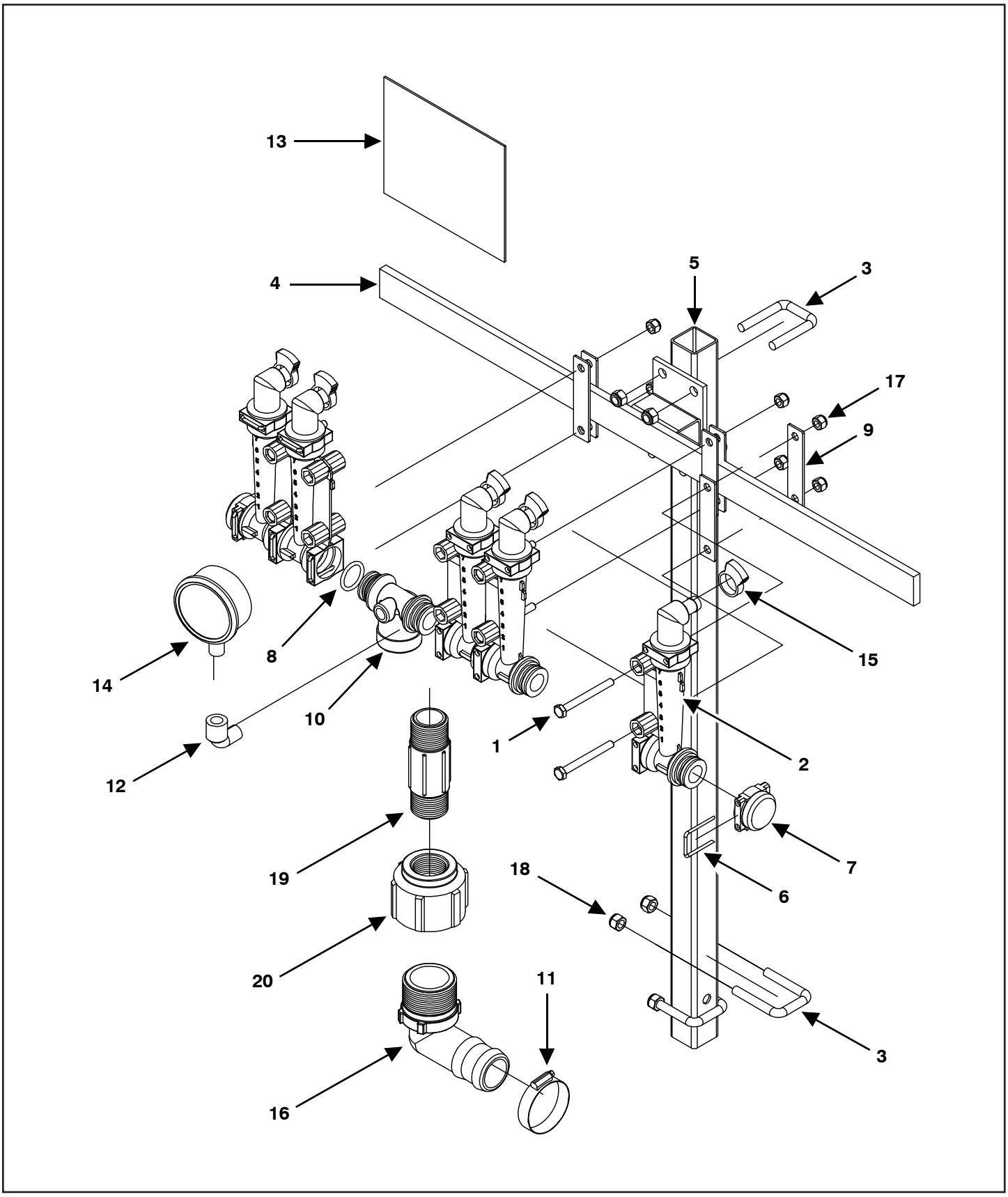
JOHN BLUE GROUND DRIVE PUMP HUB ASSEMBLY



SX047

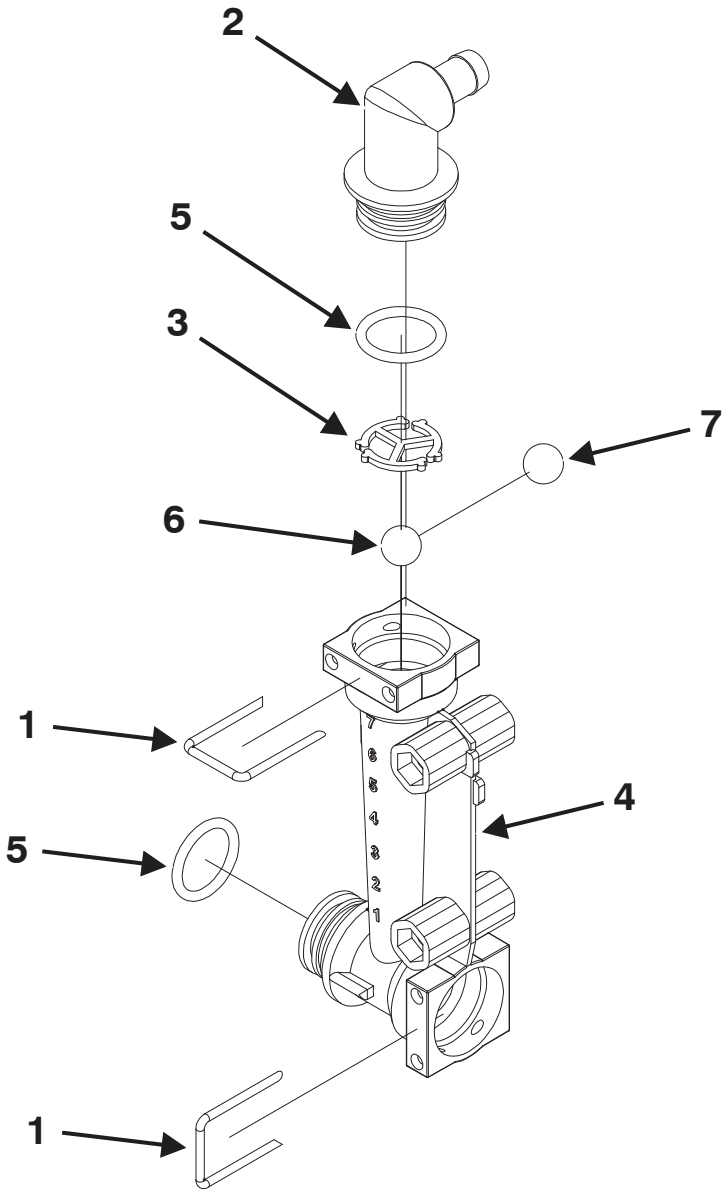
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88668104	HUB; MODEL 511	1
2	88668105	SEAL; FOR HUB MODEL #511	1
3	88668106	CAP; HUB	1
4	88668107	CUP; OUTER	1
5	88668108	CONE, OUTER	1
6	88668109	GREASE FITTING, 1/8-27 NPT	1
7	88668154	CUP; BEARING	1
8	88668155	CONE; BEARING	1

SPRAY MONITORS



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	87845	BOLT, 1/4" X 2-1/2" HEX GR 5	AS REQ.
2	88668003	ASSY; MONITOR, SINGLE COLUMN	AS REQ.
	88668887	ASSY, MONITOR, 3 COLUMN	AS REQ.
	88664836	ASSY, MONITOR, 4 COLUMN	AS REQ.
	88664835	ASSY, MONITOR, 5 COLUMN	AS REQ.
	88664838	ASSY, MONITOR, 6 COLUMN	AS REQ.
	88664834	ASSY, MONITOR, 7 COLUMN	AS REQ.
	88664837	ASSY, MONITOR, 8 COLUMN	AS REQ.
3	88668033	U-BOLT, 5/16" X 1-1/4" X 2"YZ	4
4	SX000418	MONITOR CROSS BAR WELDMENT, 27"	1
5	SX000419	MONITOR STAND UPRIGHT, 30"	1
6	SX002037	SINGLE MONITOR, U-PIN	2
7	SX002138	MONITOR CAP, PLUG	2
8	SX002140	MONITOR O-RING, BUNA	2
9	SX003930	MONITOR BAND CLIP	6
10	SX007306	MONITOR TEE PORT W / GAUGE	1
11	SX28J	STAINLESS CLAMP, 1-3/4" X 1/2"	1
12	SX3SE14	STREET ELBOW, 1/4" X 1/4" POLY	1
13	SXC2040673	MONITOR BLACK BAG, 40" X 46" X 0.008	1
14	SXGG100	100 PSI GAUGE, 2-1/2" LIQUID FILLED	1
15	SXH	HOSE CLAMP, 1/2" SPEEDY	5
16	SXHB-150-90	HOSE BARB ELBOW; 1-1/2" MPT XHB POL	1
17	SXLN-025-NIYZ	LOCKNUT, 1/4" NYLON INSERT	AS REQ.
18	SXLN-031-NIYZ	LOCKNUT, 5/16" NYLON INSERT YZ	1
19	SXNIP100-4	NIPPLE, 1" X 4" MPT POLY	1
20	SXRC150-100	REDUCING COUPLING, 1-1/2" X 1"	1

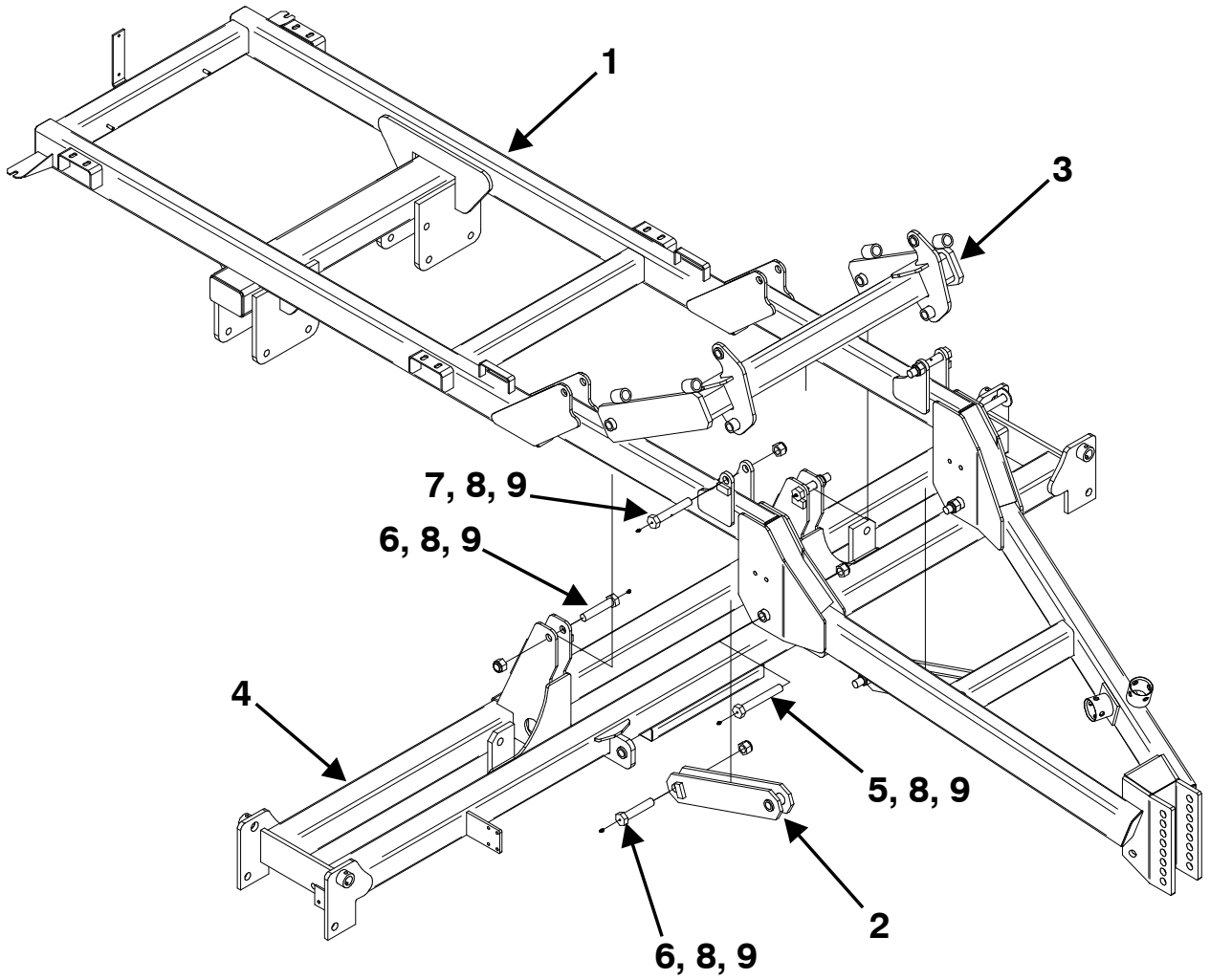
SINGLE COLUMN MONTIOR ASSEMBLY



88668003

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX002037	MONITOR; U-PIN, SINGLE	2
2	SX002135	MONITOR; 1/2" HOSE BARB	1
3	SX002137	MONITOR; FLOAT STOP, SINGLE	1
4	SX002139	MONITOR; SINGLE COLUMN	1
5	SX002140	MONITOR; O-RING, BUNA	2
6	SX8165105	MONITOR; BALL, RED GLASS	1
7	SXSS316-200	BALL; STAINLESS STEEL MONITOR	1

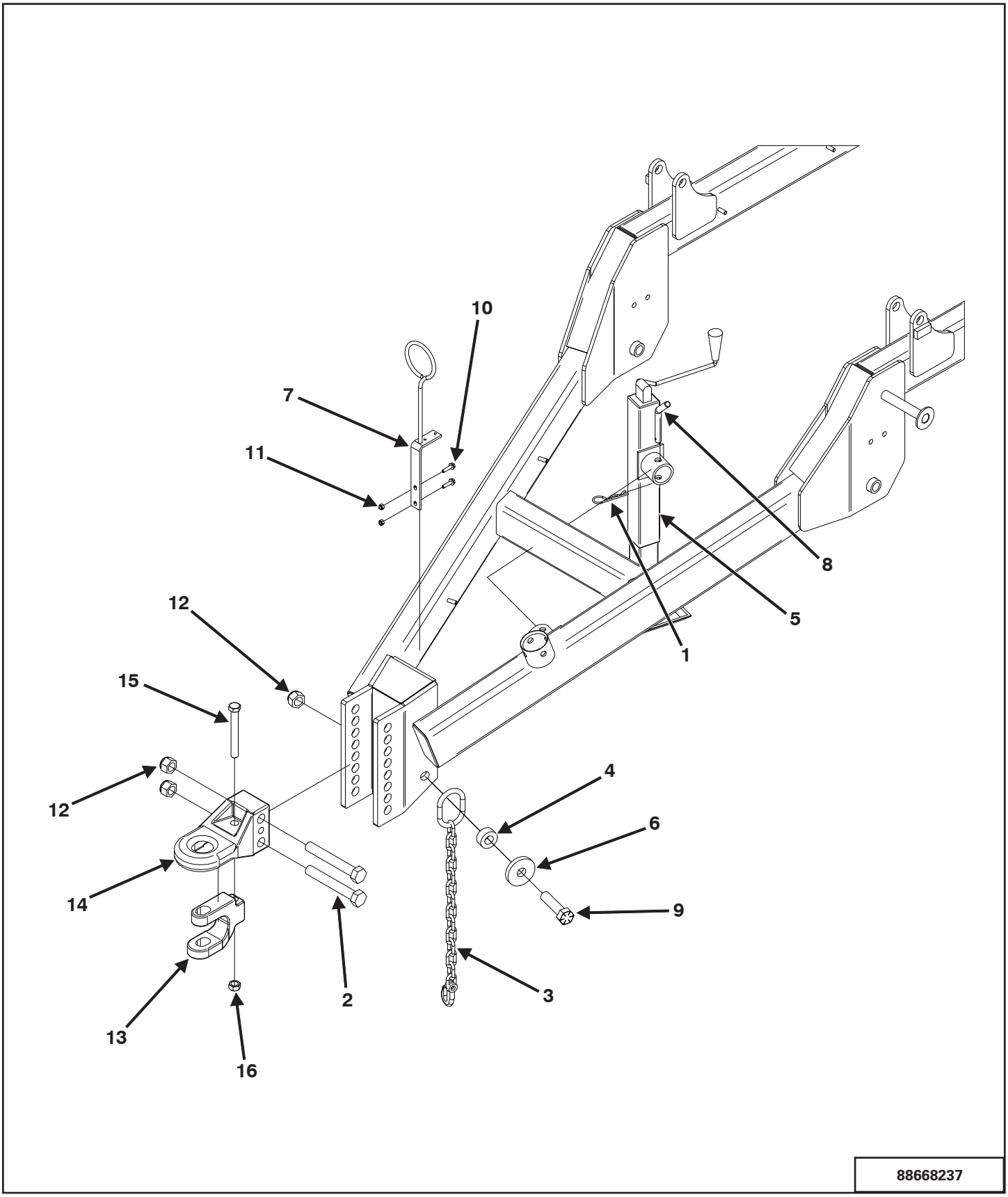
FRAME ASSEMBLY



88668231 (Red), 88668232 (Green)

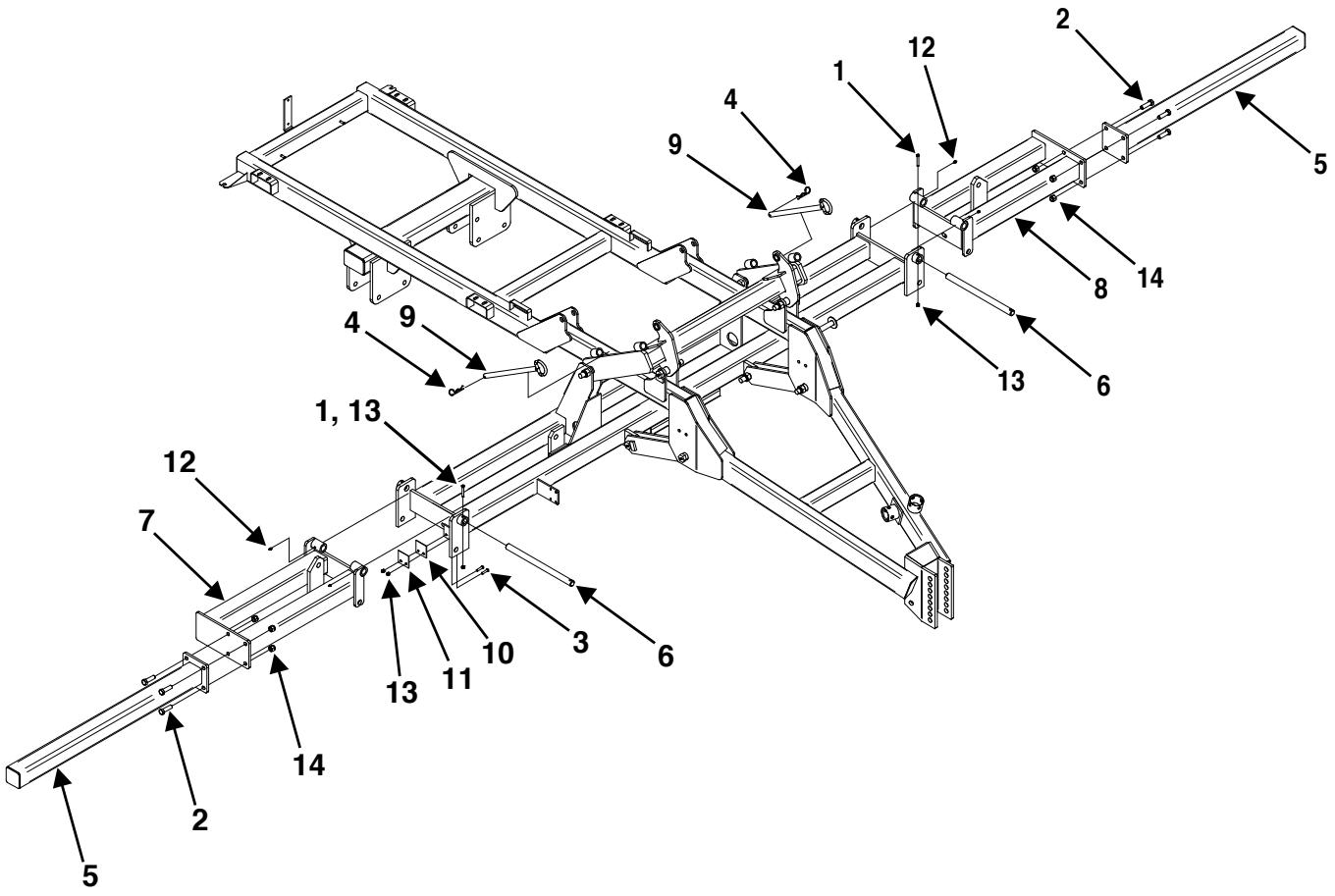
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX014284R	WLDMT; MAINFRAME, 1410, RED	1
	SX014284G	WLDMT; MAINFRAME, 1410, GREEN	1
2	SX014331R	WLDMT; LOWER PARALLEL RED	2
	SX014331G	WLDMT; LOWER PARALLEL GREEN	2
3	SX014334R	WLDMT; ROCKER ARM RED	1
	SX014334G	WLDMT; ROCKER ARM GREEN	1
4	88671335	WLDMT; BAR MAINFRAME RED	1
	88671336	WLDMT; BAR MAINFRAME GREEN	1
5	SX014361	BOLT, 1 X 7 GR 5 DRILLED	2
6	SX014362	BOLT, 1 X 5 GR 5 DRILLED	4
7	SX014363	BOLT, 1 X 6 GR 5 DRILLED	2
8	SXG1641	ZERK; GREASE; 1/4"-28 STRAIGHT	8
9	SXLN-100-NI-YZ	LOCKNUT,1 NYLON INSERT	8

PINTLE HITCH ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88665916	PIN, HAIR, 0.875"	1
2	88668004	BOLT; HEX, 1_00X7.00 G8YZ	2
3	SX013239	SAFETY CHAIN; 32 1/2"	1
4	SX014072	TUBE RD, 2.00 OD x 1.020 ID x .88	1
5	SX014115	WLDMT; JACKSTAND	1
6	SX014120	PLATE; .50 X 3.25 DIA W/HOLE	1
7	SX014121	WLDMT; PIGTAIL	1
8	SX014125	PIN, JACK	1
9	SXBH1004008YZ	BOLT, HEX; 1.00X4.00 G8YZ	1
10	SXBHF0311255YZ	BOLT; FLG, 5/16X1.25 GR5YLLX ZN	2
11	SXLN-031-NIYZ	LOCKNUT; 5/16" NYLON INSERTYZ	2
12	SXLN-100-NI-YZ	LOCKNUT,1 NYLON INSERT	3
13	SXPPI-208VR	PINTLE CLEVIS OPTION	1
14	SXPPI-331VH	HITCH CASTING, PINTLE	1
15	SXWB85	BOLT; CLEVIS OPTION, WB82	1
16	SXWB91	NUT; CLEVIS OPTION, 3/4-10 GR8	1

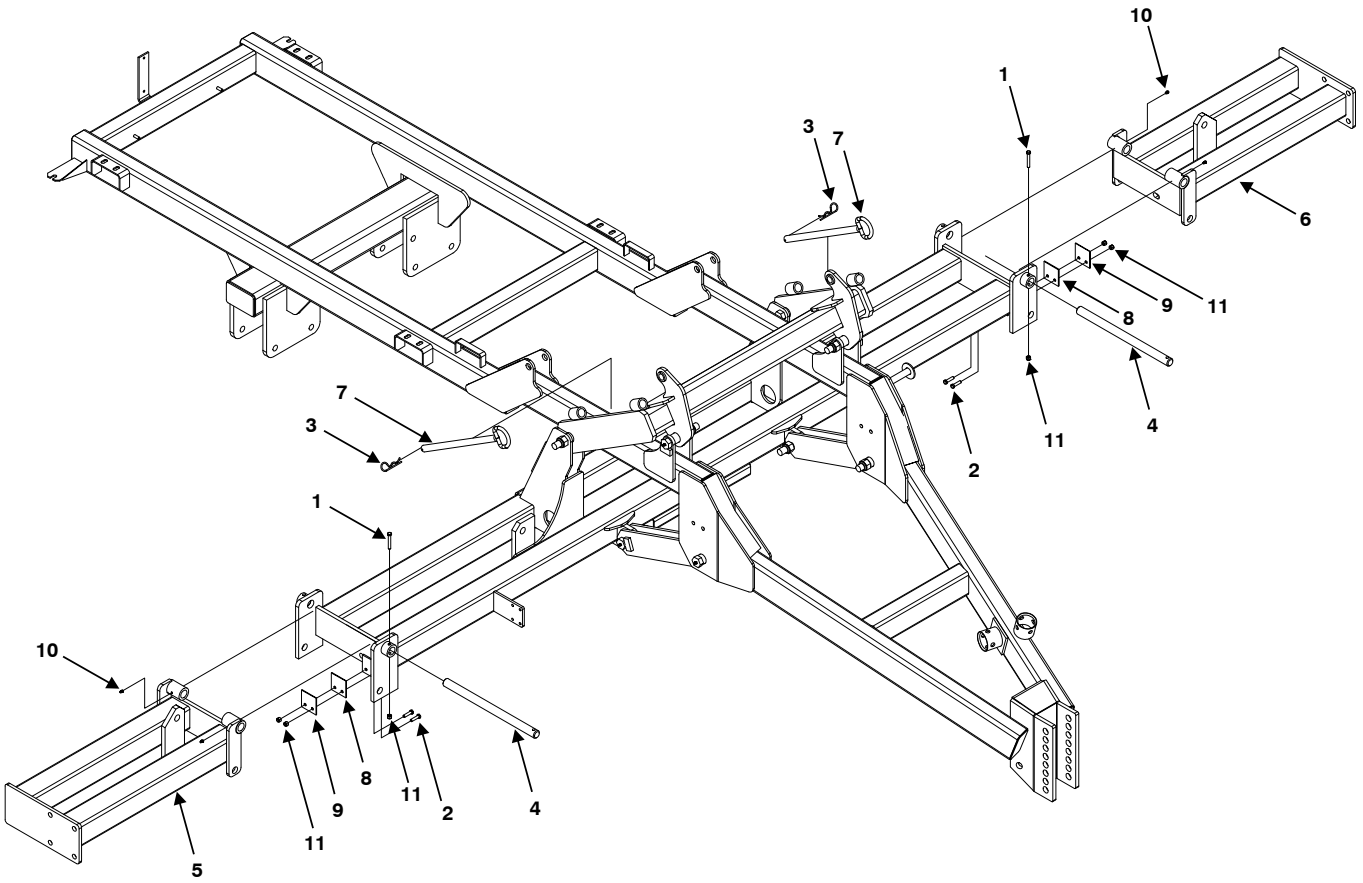
TOOLBAR ASSEMBLY (309.50 IN.)



88668240 (Red), 88668241 (Green)

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00087936	CSHHP .38 X 2.5" LG	2
2	09706701	CSHH G5 P .75 X 2.50	8
3	88663901	CSHH G5P .38 X 1.50	4
4	88665916	PIN, HAIR, 0.875"	2
5	SX014318R	WLDMT; 53" WING EXTENSION, RED	2
	SX014318G	WLDMT; 53" WING EXTENSION, GREEN	2
6	SX014321	PIN, WING FOLD	2
7	SX014329R	WLDMT; 40.5 WING RIGHT, RED	1
	SX014329G	WLDMT; 40.5 WING RIGHT, GREEN	1
8	SX014330R	WLDMT; 40.5 WING LEFT, RED	1
	SX014330G	WLDMT; 40.5 WING LEFT, GREEN	1
9	SX014340	WLDMT; LOCKDOWN PIN	2
10	SX014367	PLATE, FOLD-SHIM, 10-GA	2
11	SX014368	PLATE, FOLD SHIM, 12-GA	2
12	SXG1641	ZERK; GREASE; 1/4" - 28 STRAIGHT	4
13	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERTYZ	6
14	SXLN-075-NI-YZ	LOCKNUT; 3/4" NYLON INSERTYZ	8

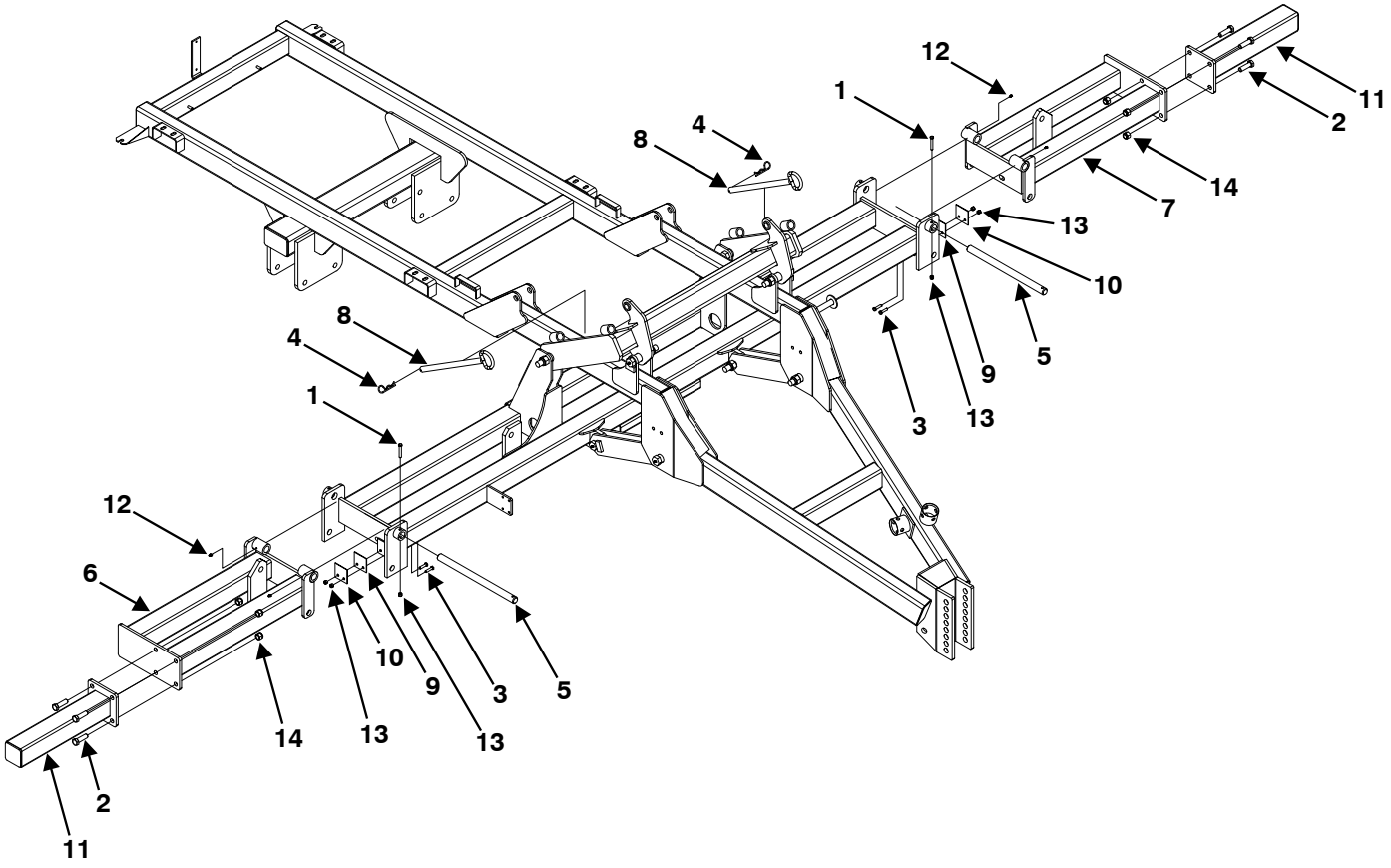
TOOLBAR ASSEMBLY (202.00 IN.)



88668242 (Red), 88668243 (Green)

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00087936	CSHHP .38X2.5"LG	2
2	088663901	CSHH G5P .38X1.50	4
3	88665916	PIN, HAIR, 0.875"	2
4	SX014321	PIN, WING FOLD	2
5	SX014329R	WLDMT; 40.5 WING RIGHT, RED	1
	SX014329G	WLDMT; 40.5 WING RIGHT, GREEN	1
6	SX014330R	WLDMT; 40.5 WING LEFT, RED	1
	SX014330G	WLDMT; 40.5 WING LEFT, GREEN	1
7	SX014340	WLDMT; LOCKDOWN PIN	2
8	SX014367	PLATE, FOLD-SHIM, 10-GA	2
9	SX014368	PLATE, FOLD SHIM, 12-GA	2
10	SXG1641	ZERK; GREASE; 1/4"-28 STRAIGHT	4
11	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERTYZ	6

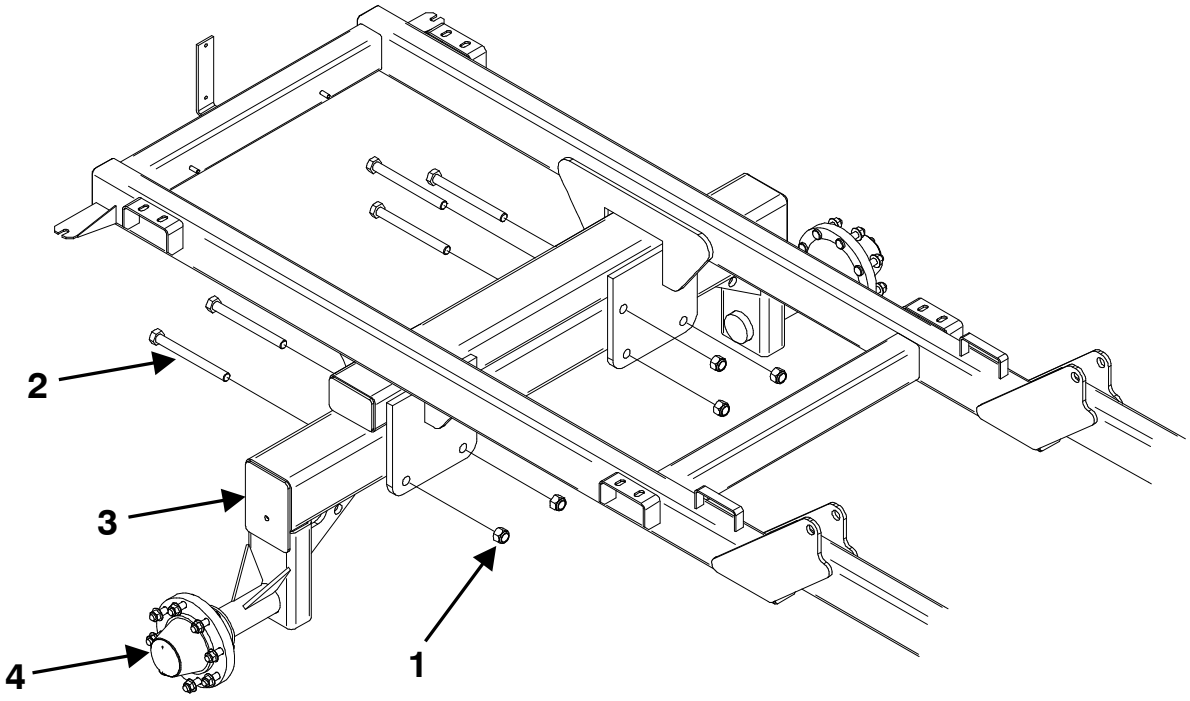
TOOLBAR ASSEMBLY (247.50 IN.)

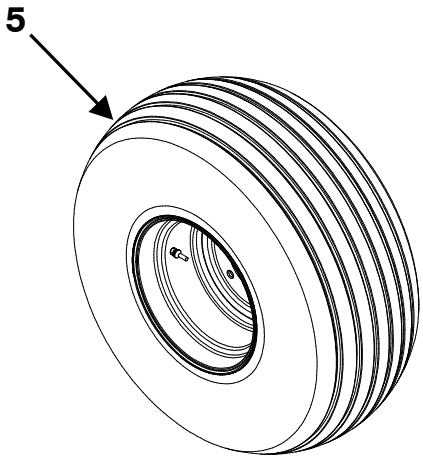


88668244 (Red), 88668245 (Green)

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00087936	CSHHP .38X2.5"LG	2
2	09706701	CSHH G5 P .75 X 2.50	8
3	88663901	CSHH G5P .38X1.50	4
4	88665916	PIN, HAIR, 0.875"	2
5	SX014321	PIN, WING FOLD	2
6	SX014329R	WLDMT; 40.5 WING RIGHT, RED	1
	SX014329G	WLDMT; 40.5 WING RIGHT, GREEN	1
7	SX014330R	WLDMT; 40.5 WING LEFT, RED	1
	SX014330G	WLDMT; 40.5 WING LEFT, GREEN	1
8	SX014340	WLDMT; LOCKDOWN PIN	2
9	SX014367	PLATE, FOLD-SHIM, 10-GA	2
10	SX014368	PLATE, FOLD SHIM, 12-GA	2
11	SX014370R	WLDMT; 23" WING EXTENSION, RED	2
	SX014370G	WLDMT; 23” WING EXTENSION, GREEN	2
12	SXG1641	ZERK; GREASE; 1/4"-28 STRAIGHT	4
13	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERTYZ	6
14	SXLN-075-NI-YZ	LOCKNUT; 3/4" NYLON INSERTYZ	8

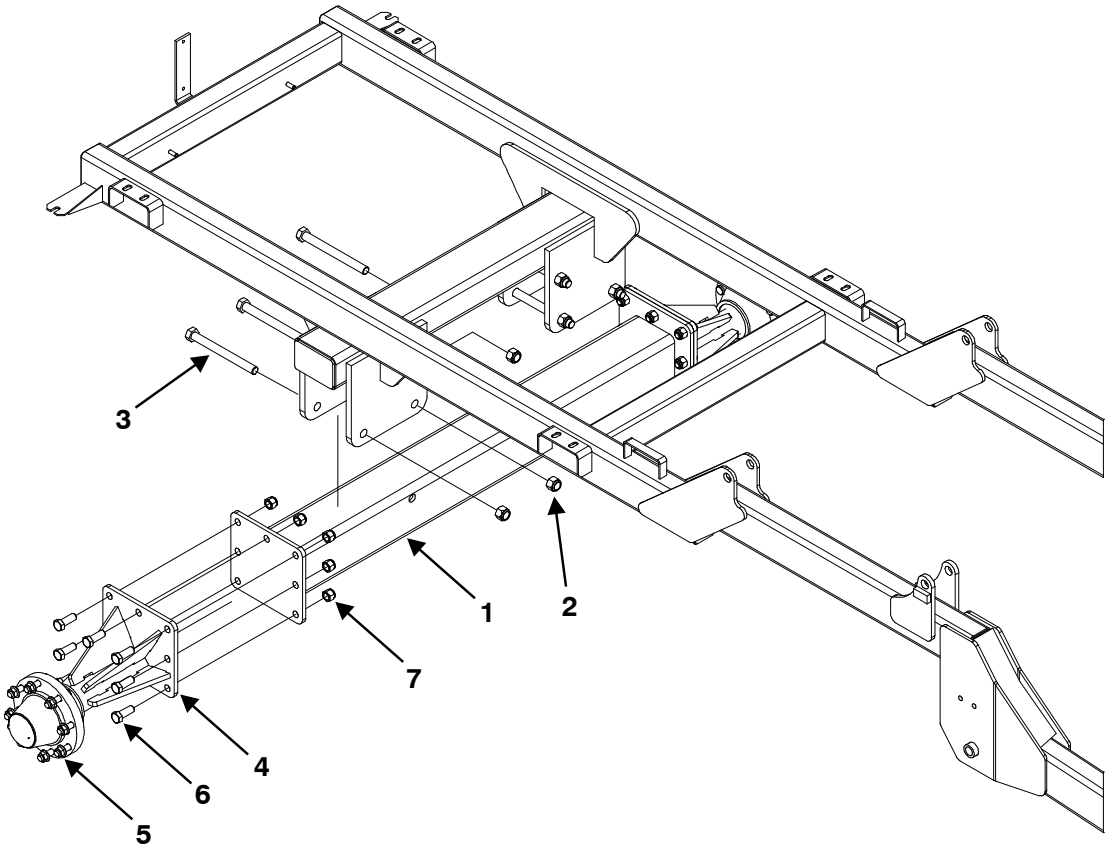
FIXED AXLE 88", 16.5-TYPE TIRES

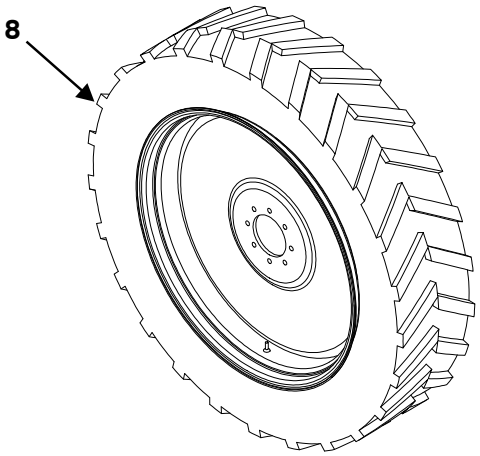




ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88668356	LOCKNUT; 7/8" NYLON INSERTYZ	6
2	88668357	BOLT, HEX; 7/8 X 9.00 G5YZ	6
3	88668364	WLDMT; 88" FIXED AXLE, RED	1
	88668365	WLDMT; 88" FIXED AXLE, GREEN	1
4	88668335	HUB; 680, 750G & 1000G 8-8-6 RED	2
	88668336	HUB; 680, 750G & 1000G 8-8-6 GREEN	2
5	SX014377C	TIRE & WHEEL COMPLETE: 16.5-16.1SL,8 BC	2

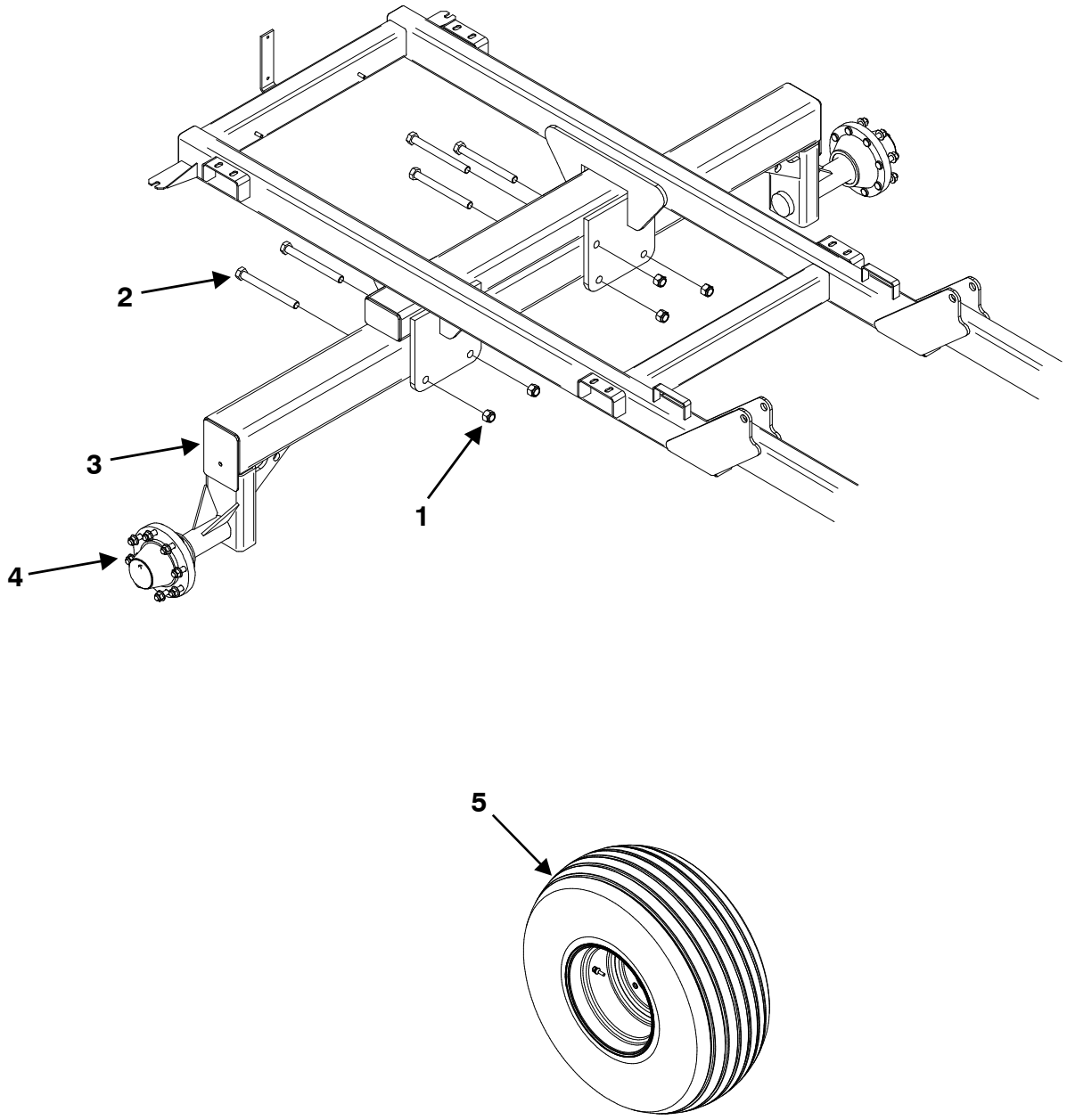
FIXED AXLE 88", 320-TYPE TIRES





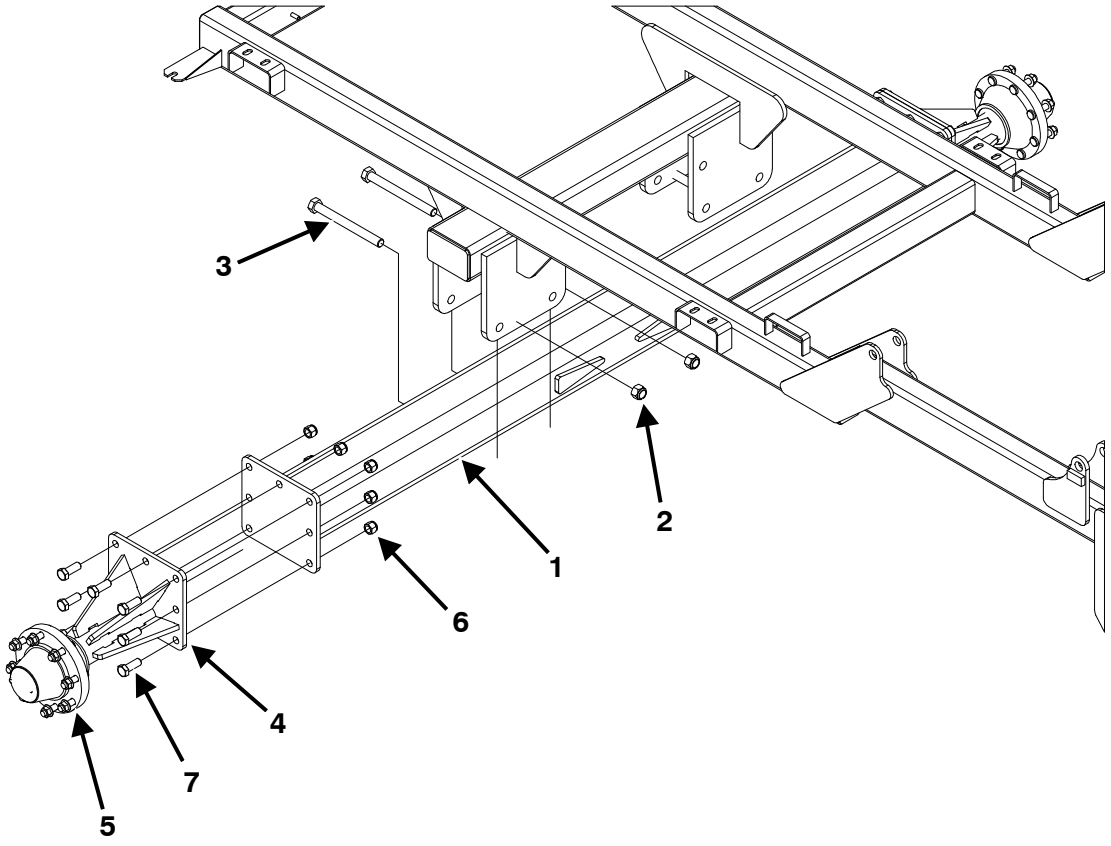
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88660858R	WLDMT; AXLE, 88" FIXED RED	1
	88660858G	WLDMT; AXLE, 88" FIXED GREEN	1
2	88668356	LOCKNUT; 7/8" NYLON INSERTYZ	6
3	88668357	BOLT, HEX; 7/8 X 9.00 G5YZ	6
4	88660857R	WLDMT; SPINDLE, RED	2
	88660857G	WLDMT; SPINDLE, GREEN	2
5	88668335	HUB; 680, 750G & 1000G 8-8-6 RED	2
	88668336	HUB; 680, 750G & 1000G 8-8-6 GREEN	2
6	SXBH0752005YZ	BOLT; 3/4 X 2 GRADE 5	14
7	SXLN-075-NI-YZ	LOCKNUT; 3/4" NYLON INSERTYZ	14
8	88661241	TIRE & WHEEL COMPLETE: 320, LH	1
	88661240	TIRE & WHEEL COMPLETE: 320, RH	1

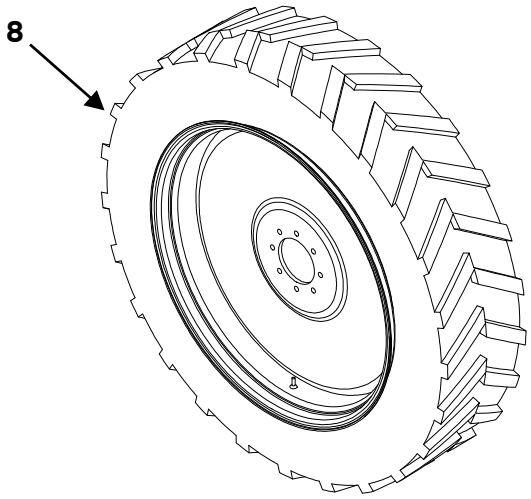
FIXED AXLE 120", 16.5-TYPE TIRES



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88668356	LOCKNUT; 7/8" NYLON INSERTYZ	6
2	88668357	BOLT, HEX; 7/8 X 9.00 G5YZ	6
3	88668361	WLDMT; 120" FIXED AXLE, RED	1
	88668360	WLDMT; 120" FIXED AXLE, GREEN	1
4	88668335	HUB; 680, 750G & 1000G 8-8-6 RED	2
	88668336	HUB; 680, 750G & 1000G 8-8-6 GREEN	2
5	SX014377C	TIRE & WHEEL COMPLETE: 16.5-16.1SL,8 BC	2

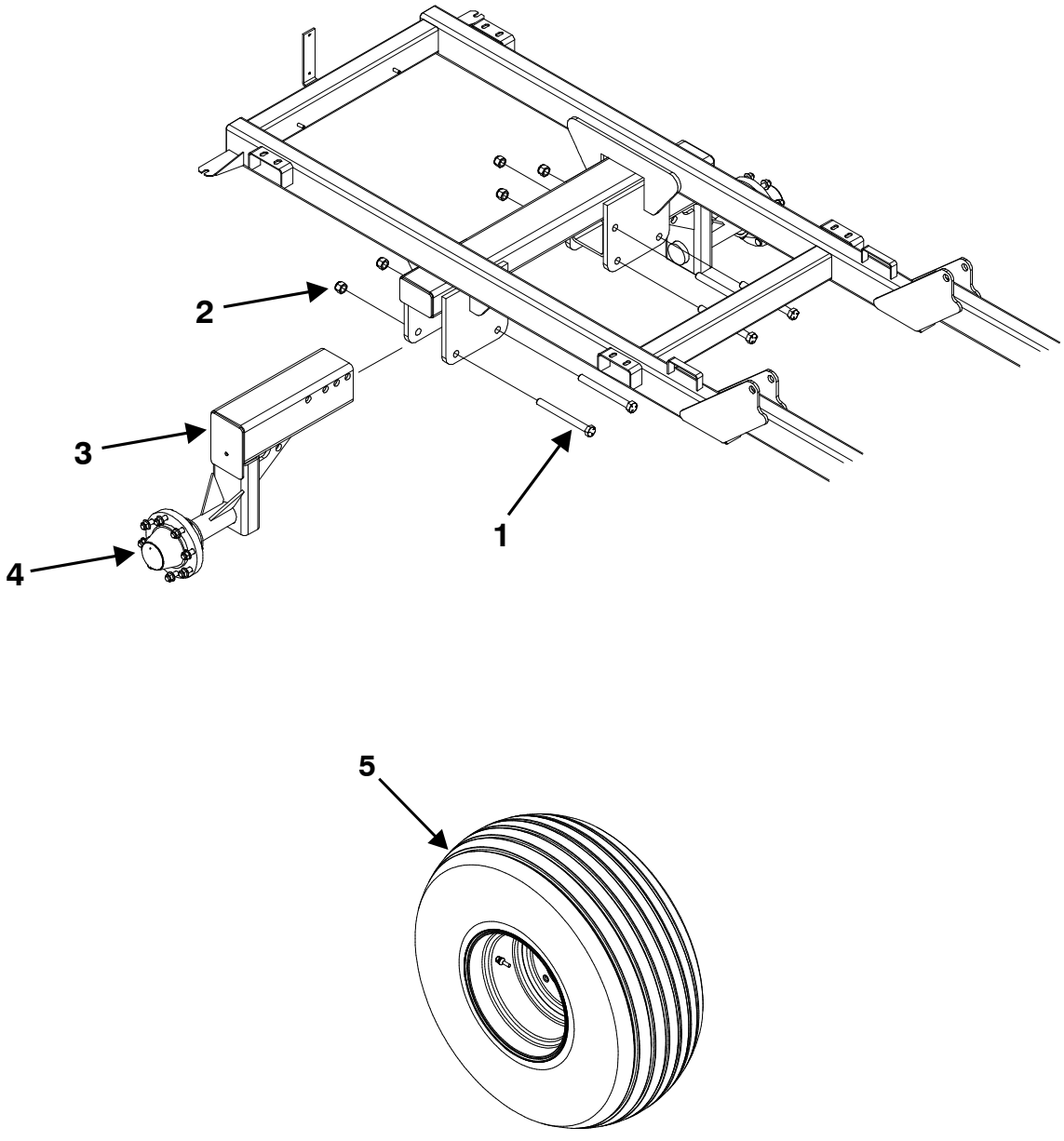
FIXED AXLE 120", 320-TYPE TIRES





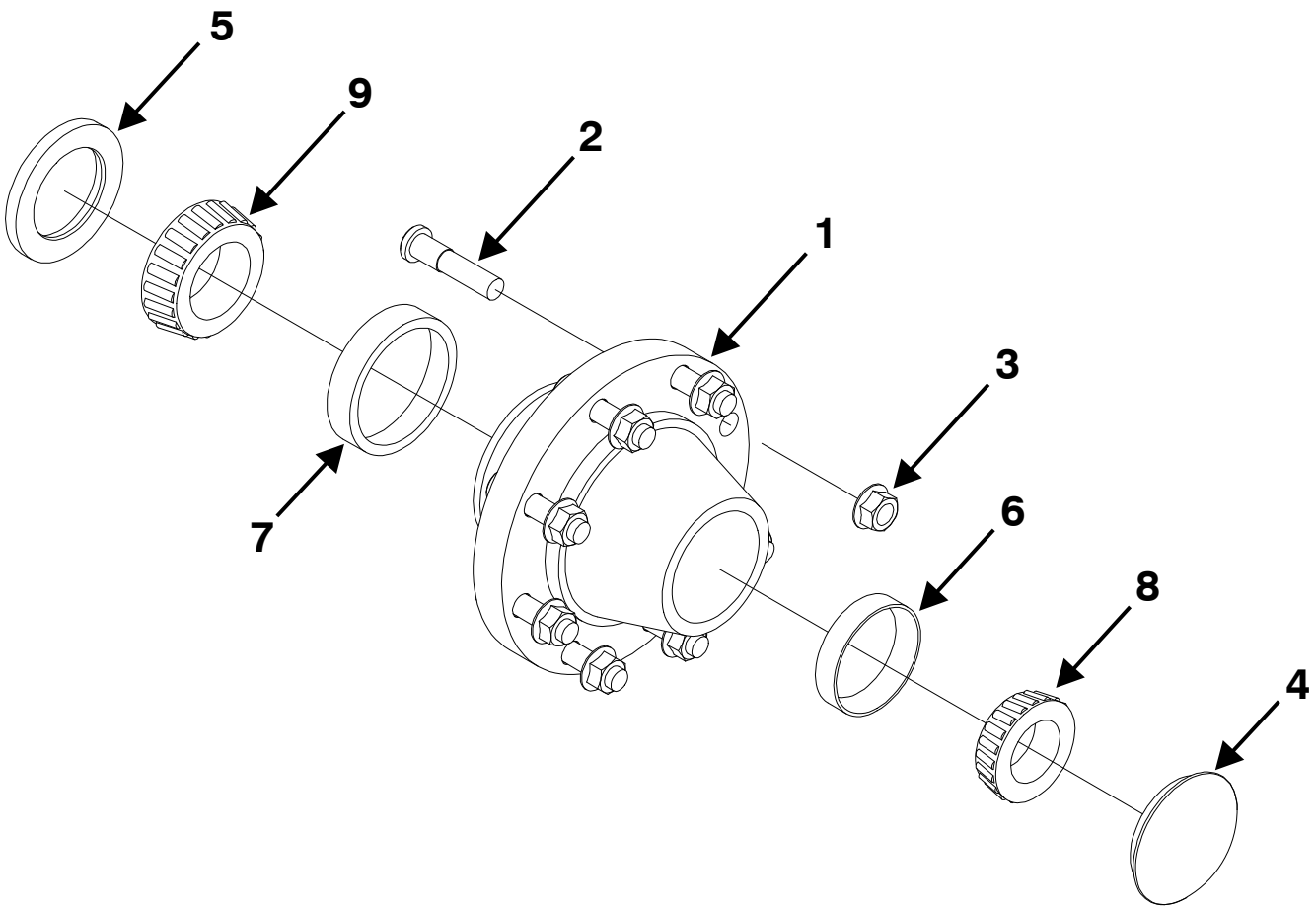
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88661549	WLDMT; AXLE, 120" FIXED RED	1
	88661548	WLDMT; AXLE, 120" FIXED GREEN	1
2	88668356	LOCKNUT; 7/8" NYLON INSERTYZ	4
3	88668357	BOLT, HEX; 7/8X9.00 G5YZ	4
4	88660857R	WLDMT; SPINDLE, RED	2
	88660857G	WLDMT; SPINDLE, GREEN	2
5	88668335	HUB; 680, 750G & 1000G 8-8-6 RED	2
	88668336	HUB; 680, 750G & 1000G 8-8-6 GREEN	2
6	SXBH0752005YZ	BOLT; 3/4 X 2 GRADE 5	14
7	SXLN-075-NI-YZ	LOCKNUT; 3/4" NYLON INSERTYZ	14
8	88661241	TIRE & WHEEL COMPLETE: 320, LH	1
	88661240	TIRE & WHEEL COMPLETE: 320, RH	1

ADJUSTABLE AXLE 62” - 80”, 16.5-TYPE TIRES



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88668356	LOCKNUT; 7/8" NYLON INSERT YZ	6
2	88668357	BOLT, HEX; 7/8 X 9.00 G5 YZ	6
3	88668543	WELDMT; ADJUST. AXLE, RED	2
	88668544	WELDMT; ADJUST. AXLE, GREEN	2
4	88668335	HUB; 680, 750G & 1000G 8-8-6 RED	2
	88668336	HUB; 680, 750G & 1000G 8-8-6 GREEN	2
5	SX014377C	TIRE & WHEEL COMPLETE: 16.5-16.1SL,8 BC	2

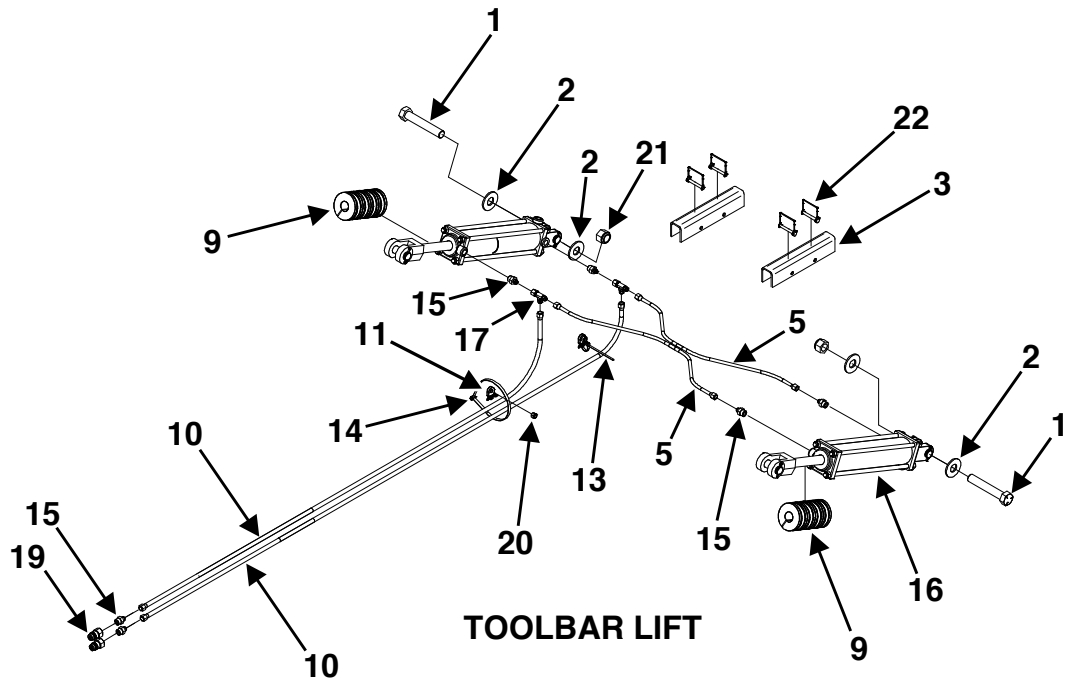
HUB ASSEMBLY

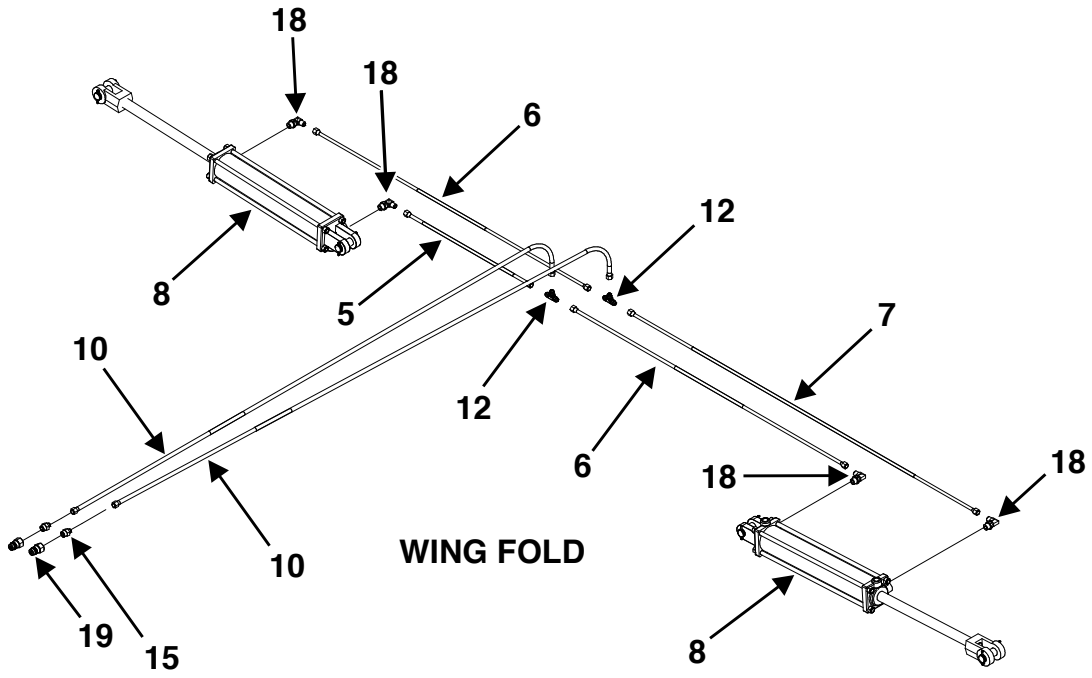


88668335 (Red), 88668336 (Green)

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX281180	HUB; 8 BOLT COMPLETE	1
2	SXP151407	STUD BOLT 5/8-2.50,DRIVE IN	8
3	SXP201601	NUT; WHEEL 5/8-18 UNF	8
4	SXP502008	DUST CAP; HUB, 8-8-6, 680 HUB	1
5	SXP602122	GREASE SEAL; T-047 HUB, 758200	1
6	SXP702204	RACE; OUTER, (T-047) 758200-8	1
7	SXP702217	RACE; INNER (T-047-) 758200-8	1
8	SXP752306	BEARING; SM CONE, (T-047)	1
9	SXP752320	BEARING; LGE CONE, (T-047)	1

HYDRAULICS, PLUMBING

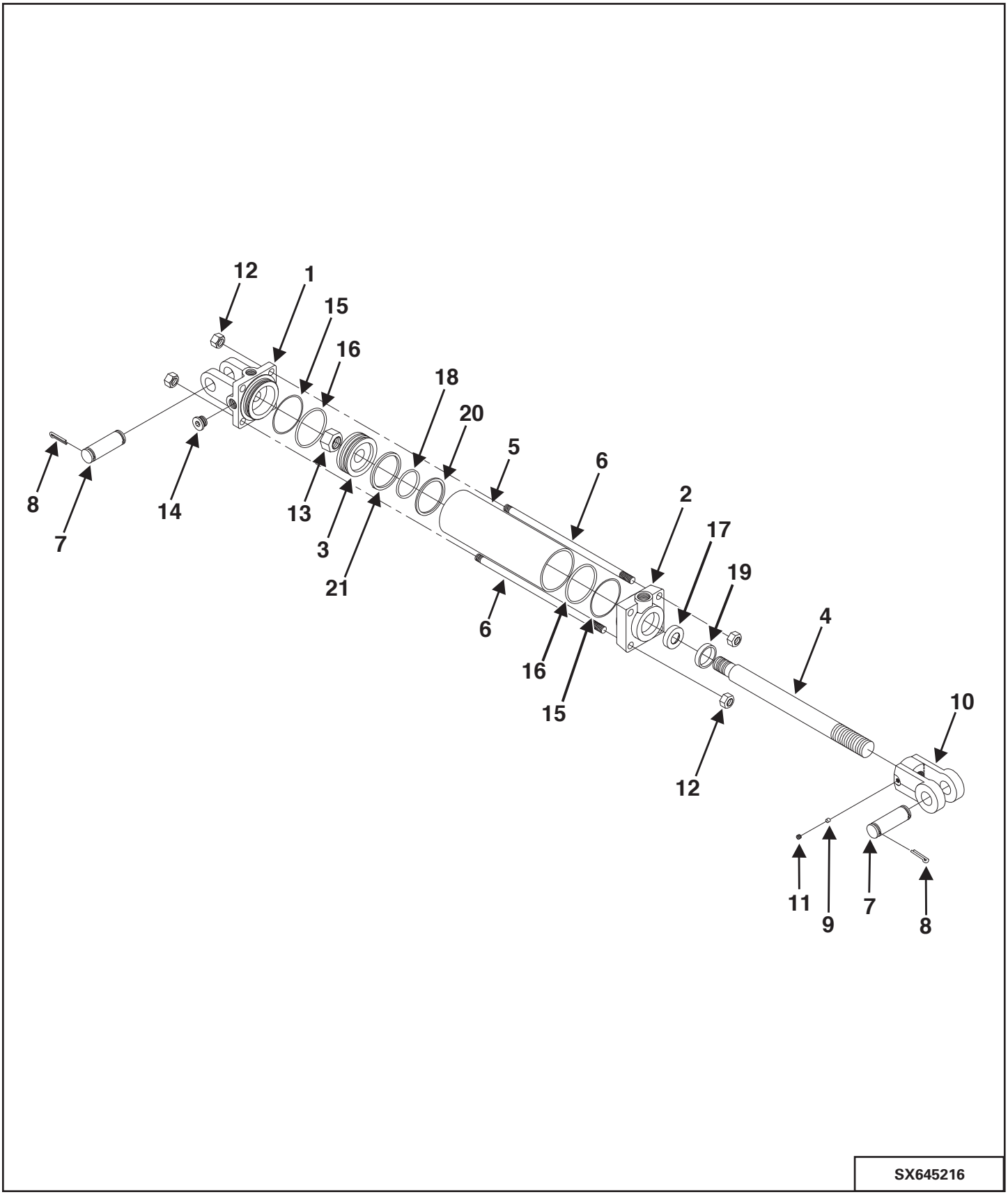




88668239

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00050204	CAPSCREW, HEX 1.00X6.00 G5YZ	2
2	00087374	WASHER 1.062 X 2.50 X .165 PL	4
3	88665691	PLATE, CYLINDER STOP	2
4	SX002350	OIL; HYDRAULIC HYGUARD JD	4
5	SX004050	HYD HOSE; 3/8" X 34" JICX-FEM	3
6	SX004052	HYD HOSE; 3/8" X 54" JICX-FEM	2
7	SX004061	HYD HOSE; 3/8" X 68" JICX-FEM	1
8	SX011958	CYLINDER, HYD; 3X16 3000 PSI	2
9	SX014183	STROKE CONTROL SPACER KIT	2
10	SX018826	HOSE; HYD. -06 X 148"	4
11	SX21294	MOUNT, CABLE TIE HEAVY DUTY	4
12	SX2603-6	TEE; 3/8 JIC X 3/8 JIC	2
13	SX3NS12	STRAP; 11 1/4 BLA21	6
14	SX3NS21	STRAP; BLACK 21 1/2"	15
15	SX6400-6-8	HYD ADAPTER; 3/8JIC&3/4ORB MAL	8
16	SX645216	CYLINDER; 3X12 3000 NITRO	2
17	SX6602-6	ADPTR, RUN TEE; -06MJIC-06FJX-06MJIC	2
18	SX6801-6-8R.06	HYD ELBOW REST; 3/8JIC-3/4ORB	4
19	SX8010-15P	HYD QUICK COUPLER; UNIV. POPPET	4
20	SXLN-038-NIYZ	LOCKNUT; 3/8" NYLON INSERTYZ	4
21	SXLN-100-NI-YZ	LOCKNUT,1 NYLON INSERT	2
22	SXPLI-031-250	PIN; LINCH PIN; 5/16 X 2 1/2	4

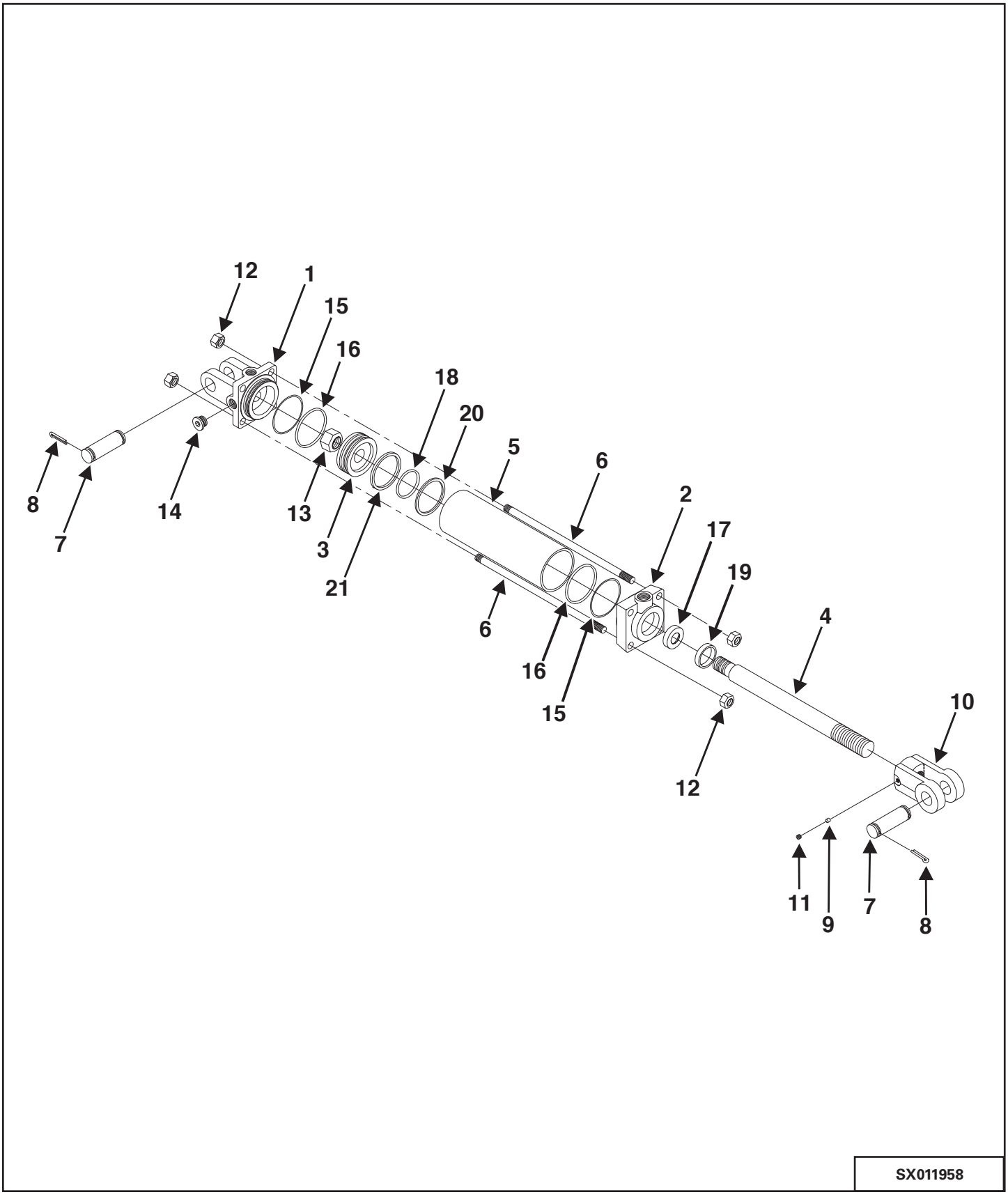
TOOLBAR LIFT CYLINDER



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX492675	CLEVIS CAP	1
2	SX492670	ROD CAP	1
3	SX494719	PISTON	1
4	SX493272	CYLINDER ROD	1
5	SX491742	CYLINDER TUBE	1
6	SX492282	TIE ROD	4
7	SX134953	CYLINDER PIN	2
8	SX135995	PIN	4
9	SX498006	THIRD LOCK-NYLON	1
10	SX492652	ROD CLEVIS	1
11	SX148390	SC SCKT SET 3/8 UNC	1
12	SXNUT-050	NUT, HEX (TIE ROD)	8
13	SX130560	NUT, HEX (CLY. ROD)	1
14	SX186562	PLUG 3/4"-16, SOC HD	1
*	SX639558	SEAL REPAIR KIT	1
15	-	SEAL	2
16	-	O-RING	2
17	-	SEAL HALLITE	1
18	-	O-RING	1
19	-	SEAL NOK	1
20	-	SEAL PTFE PISTON RING	1
21	-	WEAR RING	1

*Seal Repair Kit includes Items 15 - 21 (Items not sold separately).

WING FOLD CYLINDER

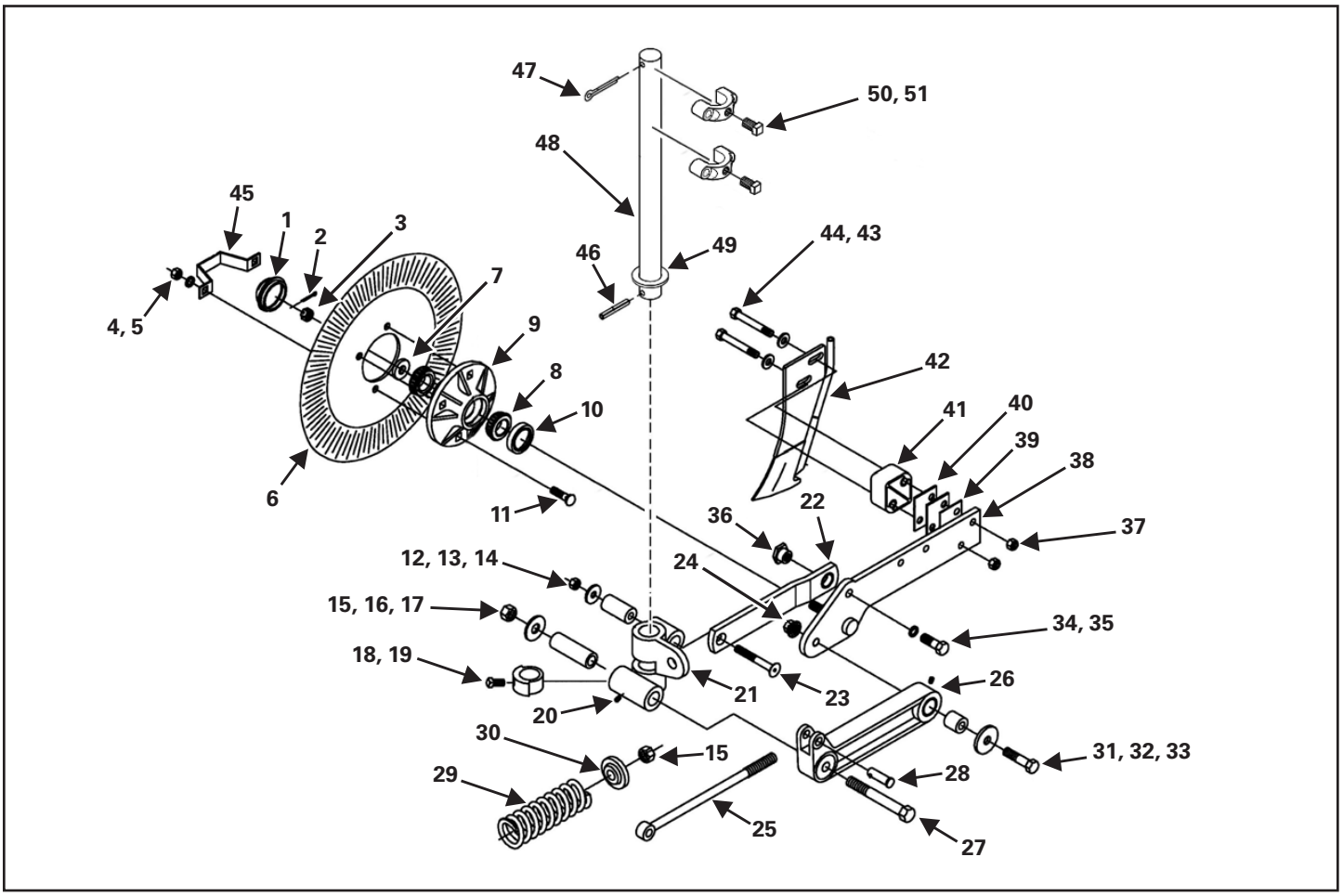


ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX492675	CLEVIS CAP	1
2	SX492728	ROD CAP	1
3	SX494719	PISTON	1
4	SX493597	CYLINDER ROD	1
5	SX491746	CYLINDER TUBE	1
6	SX492286	TIE ROD	4
7	SX134953	CYLINDER PIN	2
8	SX135995	PIN	4
9	SX498006	THREAD LOCK-NYLON	1
10	SX492652	ROD CLEVIS	1
11	SX148390	SC SCKT SET 3/8" UNC	1
12	SX125250	NUT, HEX (TIE ROD)	8
13	SX130560	NUT, HEX (CYL. ROD)	1
14	SX186562	PLUG 3/4" - 16, SOC HD	1
*	SX639558	SEAL REPAIR KIT	1
15	-	SEAL	2
16	-	O-RING	2
17	-	SEAL HALLITE	1
18	-	O-RING	1
19	-	SEAL NOK	1
20	-	SEAL PTFE PISTON RING	1
21	-	WEAR RING	1

*Seal Repair Kit includes Items 15 - 21 (Items not sold separately).

COULTER ASSEMBLY (STRAIGHT)

RH W/ Knife

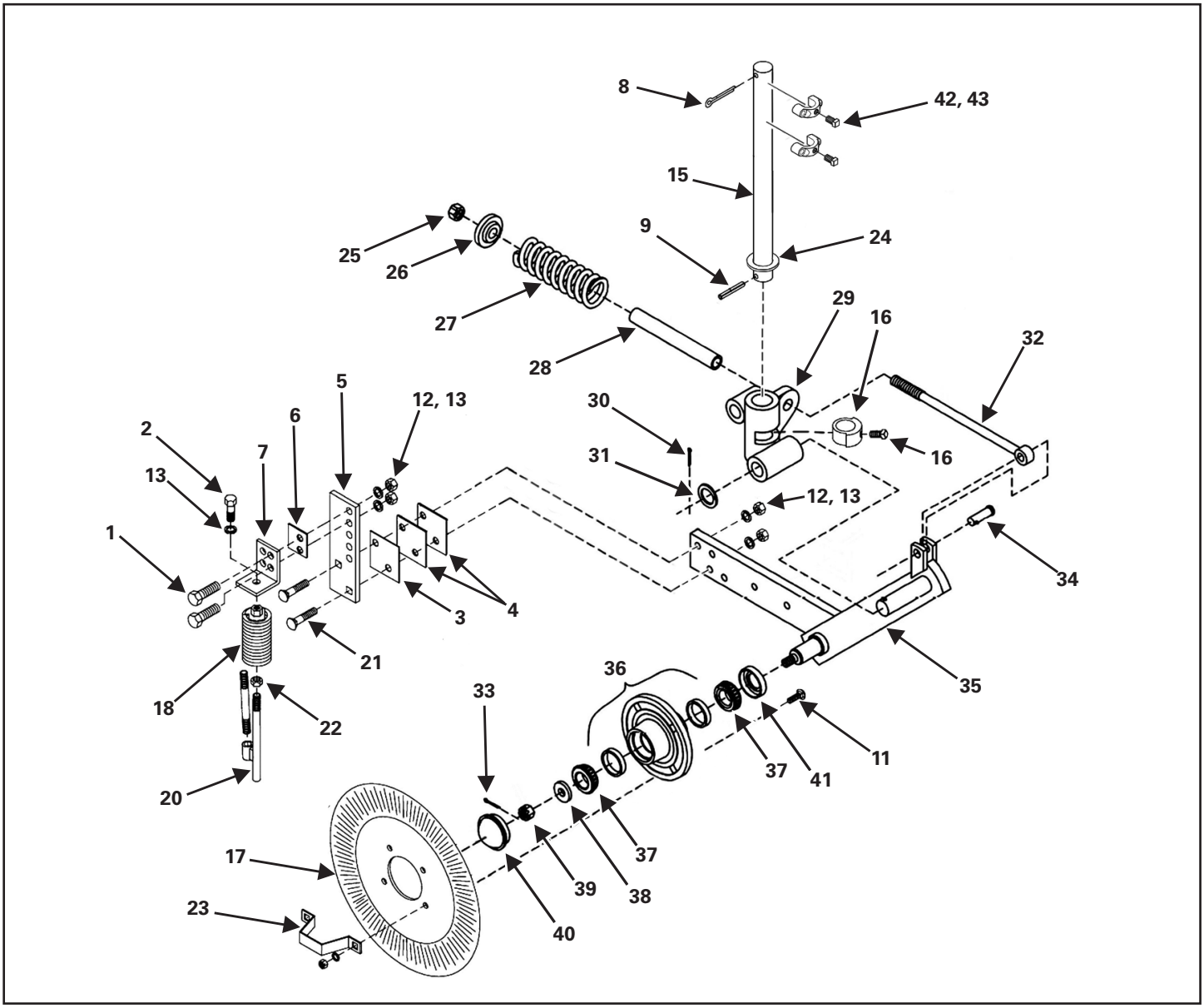


ITEM	PART NUMBER	DESCRIPTION	QTY.
1	SX2570-375	HUB CAP	1
2	88664879	1/8" x 1 1/4" COTTER PIN, BLACK	1
3	88664880	5/8"-18 SLOTTED HEX NUT BLK	4
4	88664881	1/2" MED LOCKWASHER ZP	4
5	88664882	1/2"-13 HEX NUT ZP	4
6	88661371	RIPPLE BLADE 20"	1
	88667047	SMOOTH BLADE 20"	1
7	88664883	5/8" FLATWASHER, 1/4" +/- 0.010 THICK	1
8	SX2550-027	CONE, LM67048	2
9	88664884	HUB PRESSED ASSY	1
	SX2550-029	CUP (PRE-ASSY W/9) LM67010	2
10	88664885	TRIPLE LIP SEAL, NTI #1812-4	1
11	88664886	1/2"-13 x 1 1/4" CAR BOLT GR5 ZP	4
12	88664887	1/2"-13 LOCK HEX NUT ZP	1
13	88664888	1/2" ID x 1 1/2" OD x 10 GA MA BU ZP	1

14	88664889	PIVOT SLEEVE	1
15	88664890	3/4″-10 LOCK HEX NUT ZP	2
16	SXFW-075-SAE-YZ	3/4″ STANDARD FLATWASHER ZP	1
17	88664891	PIVOT SLEEVE	1
18	88664892	5/8″-11 x 1″ SQ. HCPSS GR5 ZP	1
19	SX2975-303	LOCKING COLLAR, 2975	1
20	88664893	1/4″-28 ZERK STRAIGHT SELF-TAP	3
21	88664894	COULTER PIVOT, RH (SHOWN)	1
	88664895	COULTER PIVOT, LH	1
22	88664896	UPPER COULTER ARM ASSY	1
	88664897	1″ ID x 1 1/4″ OD x 1/2″ BRNZ BUSH	1
23	88664898	1/2″-13 x 4″ HSFHCS	1
24	88664899	5/8″-11 WHIZLOCK HEX NUT ZP	1
25	88664900	SPRING ROD, 13 1/2″	1
26	SX2995-110	LOWER COULTER ARM ASSY	1
	88664901	ARM BRNZ BUSHING, 2995	1
27	88664902	3/4″-10 x 6″ HHCS G5 ZP	1
28	88664903	5/8″ x 1 3/4″ SLIC PIN YYD	1
29	SX2550-795	SPRING, 0.562 WIRE x 11″ LONG	1
30	88664904	SPRING BUSHING PAINTED, 2975	1
31	88664905	5/8″-11 x 2 1/2″ HHCS GR5 ZP	1
32	88664906	21/32″ ID x 2 1/4″ OD x 1/4″ MA BU	1
33	88664907	LOWER ARM PIVOT	1
34	88664908	5/8″-18 x 1 1/2″ HHCS GR5 ZP	1
35	88664909	5/8″ MED LOCKWASHER ZP	1
36	88664910	UPPER ARM PIVOT/WASHER ZP	1
37	88664911	1/2″-13 HEX NIF, LOCK NUT ZP	2
38	SX2996-205	RH KNIFE ARM/SPINDLE WA, 2996 (SHOWN)	1
	88664912	LH KNIFE ARM/SPINDLE WA, 2996	1
39	88664913	KNIFE SHIM 16 GA ZP	1
40	88664914	KNIFE SHIM, 1/8″ ZP	1
41	SX2995-309	SPACER BLOCK, 1.531″	1
42	SX2996-200	LIQUID FERTILIZER KNIFE WA, 20″	1
43	88664915	1/2″ FLAT WASHER, HARDENED PC	2
44	88664916	1/2″-13 x 3 1/2″ HHCS GR8 ZDP	2
45	88664920	HUB CAP RETAINER	1
46	88664918	ROLL PIN FOR SHANK	1
47	88664919	COTTER PIN FOR SHANK	1
48	88661373	SHANK, 1 1/2″ x 27-1/8 (SHOWN)	1
	88661374	SHANK OFFSET, 5 1/2″	1
49	88664859	BUSHING; MACH 1.50 ID x 2.25 OD YZ	1
50	SX2990-360	CLAMP CASTING, DRILLED	2
51	88664892	5/8″-11 X 1″ SQ. HD. CUPPOINT SETSC.	2

COULTER, INJECTOR

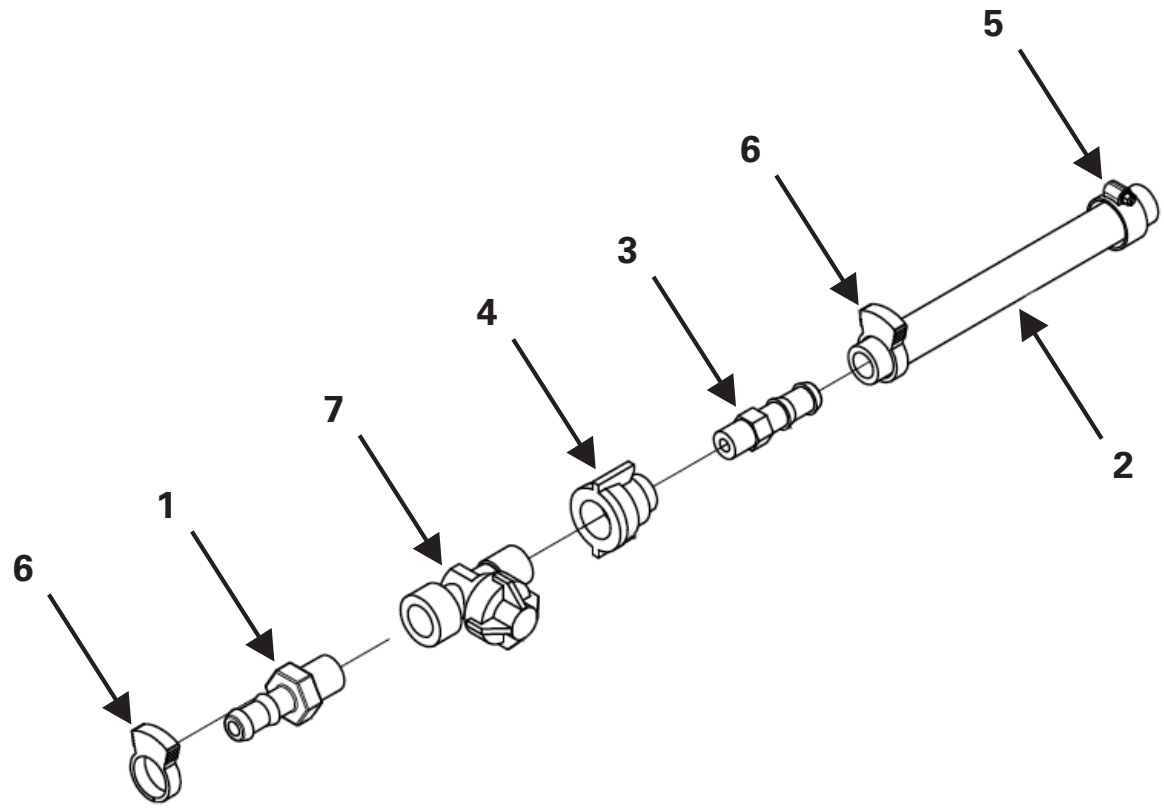
RH W/ Injector



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	00012008	1/2″-13 x 1 1/2″ HHCS GR5 ZP	2
2	00012071	1/2″-13 x 1″ HHCS GR5 ZP	2
3	88664913	KNIFE SHIM, 16 GA. ZP	1
4	88664914	KNIFE SHIM, 1/8″ ZP	2
5	88664922	ADJUSTMENT PLATE, INJECTOR	2
6	SX2995-320	SPACER, INJECTOR	1
7	SX2995-301	INJECTOR MOUNT PLATE	1
8	88664919	5/16″ x 2-1/2″ COTTER PIN ZP	1

9	88664918	3/8" x 2-1/2" ROLL PIN ZP	1
10	88664892	5/8"-11 x 1" SQ HCPSS GR5 ZP	1
11	88664886	1/2"-13 x 1 1/4" CAR BOLT GR5	4
12	88664882	1/2"-13 HEX NUT ZP	8
13	88664881	1/2" MED LOCKWASHER ZP	9
14	88664923	GEN III COULTER ARM ASSY (W/INJECT)	1
15	88661373	SHANK, 1 1/2" x 27-1/8 (SHOWN)	1
	88661374	SHANK OFFSET, 5 1/2"	1
16	SX2975-303	2975 LOCKING COLLAR	1
17	88661371	RIPPLE BLADE 20"	1
	88667047	SMOOTH BLADE 20"	1
18	SX2995-131	SPRING INJECTOR ASSEMBLY	1
19	88664924	3" NIPPLE, 1/4 NPT SS	1
20	88664925	INJECTOR ROD W A 1/2"-13	1
21	88664926	1/2"-13 x 2" CAR BOLT GR5 ZP	2
22	88664927	1/2"-13 JAM HEX NUT ZP	1
23	88664920	HUB CAP RETAINER	1
24	88664859	BUSHING; MACH 1.50 ID x 2.25 ODYZ	1
25	88664927	1/2"-13 JAM HEX NUT ZP	1
26	88664904	2975 SPRING BUSHING PAINTED	1
27	SX2550-795	SPRING, 0.562" WIRE x 11" LONG	1
28	88667464	10" POLY HELPER SPRING	1
29	88664929	COULTER PIVOT, RH (SHOWN)	1
	88664895	COULTER PIVOT, LH	1
30	812435	1/4" x 1 3/4" COTTER PIN ZYD	1
31	88667463	1 17/64" ID x 1 7/8" OD x 14GA MB	1
32	88664900	SPRING ROD, 13-1/2"	1
33	88664879	1/8" x 1 1/4" COTTER PIN BLACK	1
34	88664903	5/8" x 1 3/4" SLIC PIN ZYD	1
35	88664932	GEN III W / KNIFE ARM WA RH (SHOWN)	1
	88664933	GEN III W / KNIFE ARM WA LH	1
36	88664884	HUB PRESSED ASSEMBLY	1
	88664893	1/4"-28 ZERK STRAIGHT SELF-TAP	1
	SX2550-029	CUP, LM67010	2
	88664934	PLOW COULTER HUB CASTING	1
37	SX2550-027	CONE, LM67048	2
38	88664883	5/8" FLATWASHER, 1/4" +/- 0.010 THICK	1
39	88664880	5/8"-18 SLOTTED HEX NUT, BLACK	1
40	SX2570-375	HUB CAP, WILTON #909902	1
41	88664885	TRIPLE LIP SEAL, NTI #1812-4	1
42	SX2990-360	CLAMP CASTING, DRILLED	2
43	88664892	5/8"-11 X 1" SQ. HD. CUPPOINT SETSC.	2

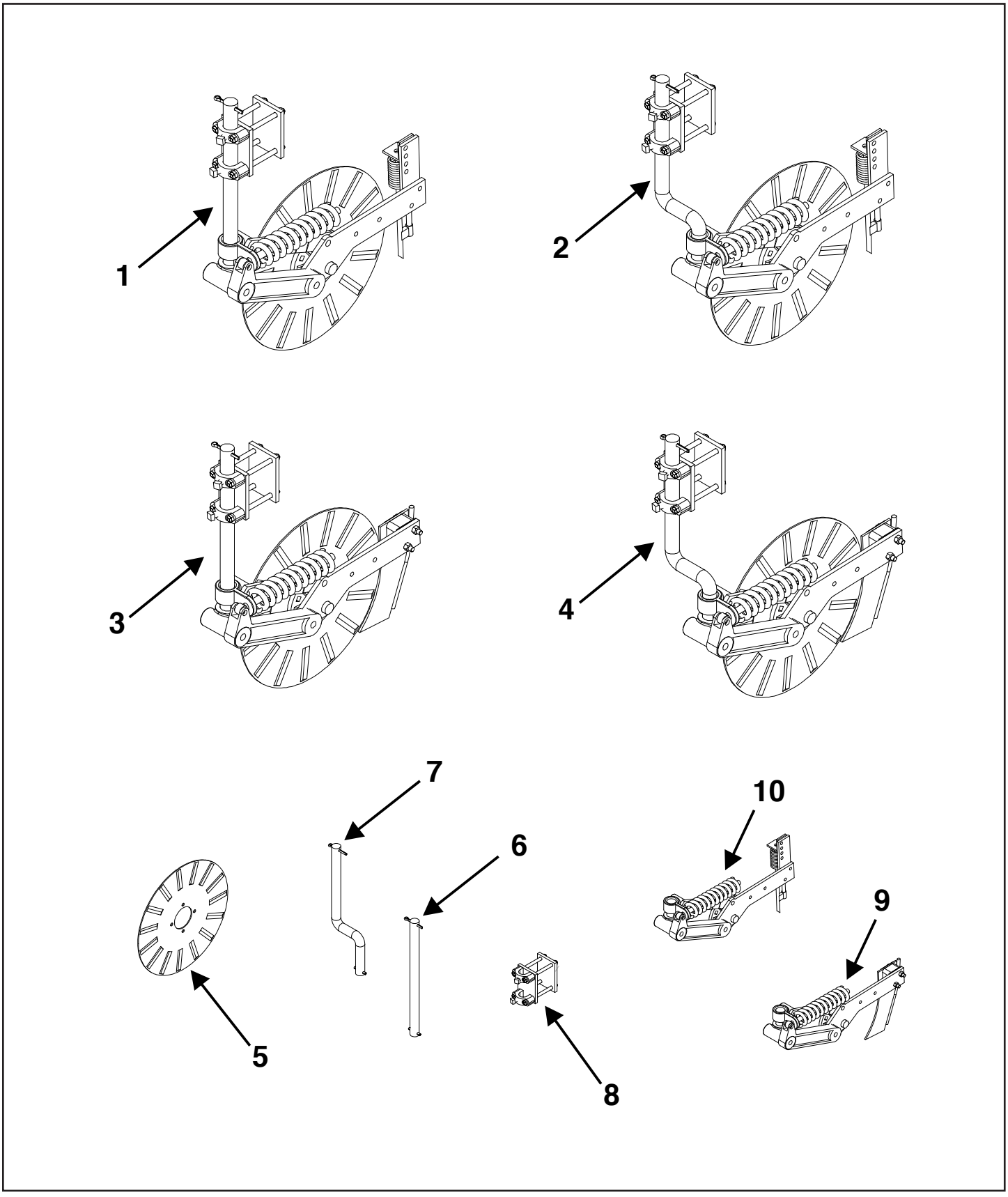
COULTER, PLUMBING



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88661128	HOSE BARB; 11/16" MPST X 1/2" HB	*
2	SX000812	HOSE; 1/2" 150# EPDM	*
3	SX3A1412G	HOSE BARB; 1/4 MPT X 1/2 HB	*
4	SX402910	CAP & GASKET; QT 1/4" THRD, BLK	*
5	SX8J	CLAMP, 1/2 X 1/2 STAINLESS	*
6	SXH	CLAMP; SPEEDY, FITS 1/2' HOSE	*
7	SXQJT8360-NYB	DIAPHRAGM; CHECK VALVE	*

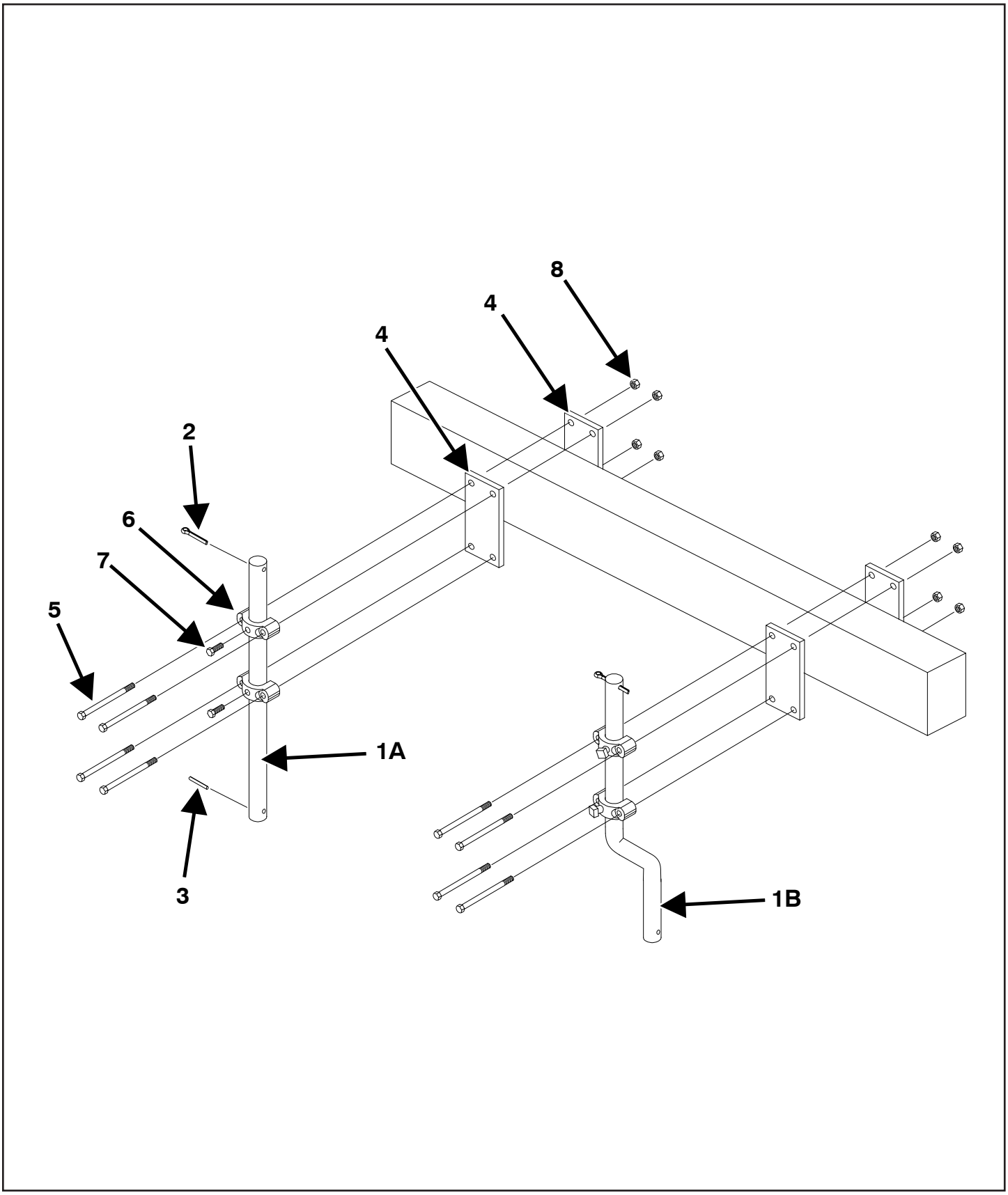
* Order as required.

COULTER, COMPLETE ASSEMBLIES



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	88661368	ASSY, COULTER STRAIGHT; RH; W/ INJECTOR	1
2	88661369	ASSY, COULTER OFFSET; RH; W/ INJECTOR	1
3	88661366	ASSY, COULTER STRAIGHT; RH; W/ KNIFE	1
4	88661367	ASSY, COULTER OFFSET; RH; W/ KNIFE	1
5	88661371	RIPPLE BLADE; .157 X 20″	1
6	88661373	STRAIGHT COULTER SHANK	1
7	88661374	OFFSET COULTER SHANK	1
8	88661372	CLAMP KIT; 4 X 4 BAR	1
9	88661370	RH 2996 FERT COULTER LIQ KNIFE	1
10	88661375	GEN III COULTER W/ INJECTOR	1

COULTER CLAMP KIT (4X4 BAR)



ITEM	PART NUMBER	DESCRIPTION	QTY.
1A	88661373	STRAIGHT COULTER SHANK	*1
1B	88661374	OFFSET COULTER SHANK	*1
2	88664919	5/16″ X 2-1/2″ COTTER PIN Z P	*1
3	88664917	3/8″ X 2-1/2″ ROLL PIN Z P	*1
4	SX2990-314	CLAMP PLATE, FOR 6" TUBE	*2
5	SXBH-050-700-5	1/2"-13 X 7" HEX HD. CAPSC, GR. 5 Z P	*4
6	SX2990-360	CLAMP CASTING, DRILLED	*2
7	88664892	5/8″-11 X 1″ SQ. HD. CUPPOINT SETSC.	*2
8	88664887	1/2"-13 LOCK HEX NUT Z P	*4

* Quantity Per Coulter

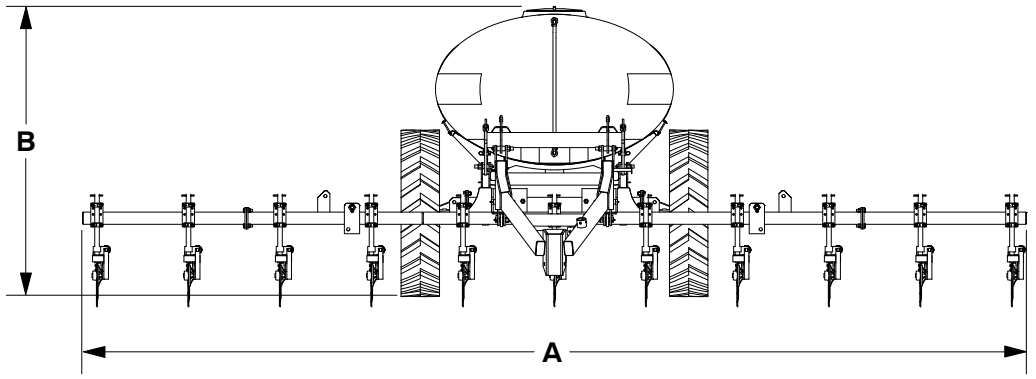
Farm King

SPECIFICATIONS

Farm King

SPECIFICATIONS

Dimensions



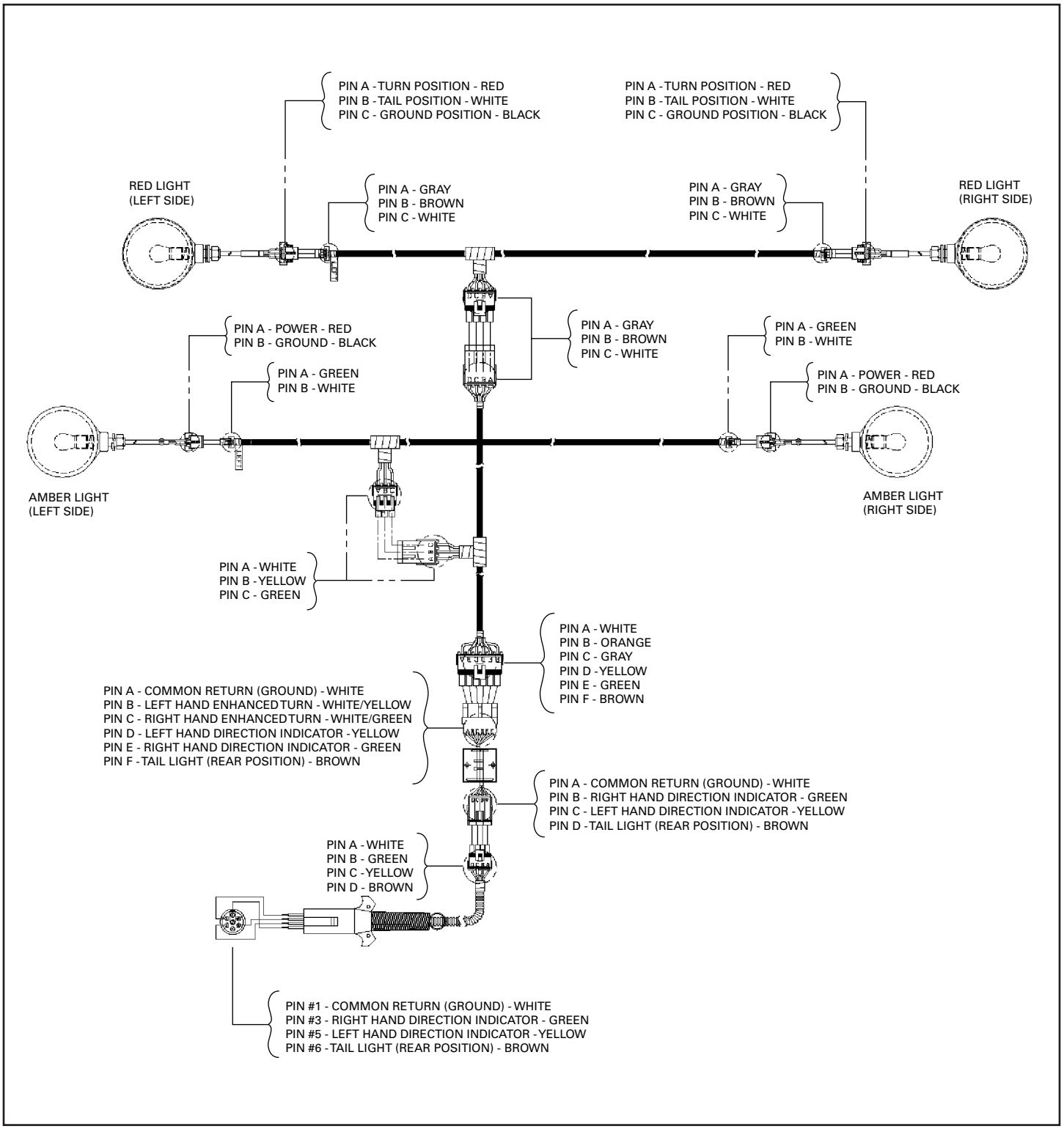
DESCRIPTION	1410
Overall Field Width (A)	14 ft. 10 in.
Overall Field Height (B)	11 ft. 5 in.
Transport Width	11 ft. 8 in.
Transport Height	8 ft. 3 in.
Transport Length	13 ft.

NOTE: Dimensions are approximate measurements.

Performance

DESCRIPTION	1410
Product Tank	1000 gal.
Fresh Water Safety Tank	9 gal.
Pump / Plumbing	Ground drive pump or centrifugal pump with Raven controller.
Coulters	20 in. Ripple, Spring - Cushioned (Knives or Injectors)
Tires	320-type or 16.5-type tires.
Wheel Spacing	Adjustable axle from 62 in. - 80 in. or fixed axles at 88 in. and 120 in.
Ground Clearance	Fully raised position - 38 in. Fully lowered position - 17.5 in. (No coulters or blocks) Below axle tube - 28.5 in.
Electrical Harness	7 - Pin

ELECTRICAL SCHEMATIC



HARDWARE TORQUE VALUES

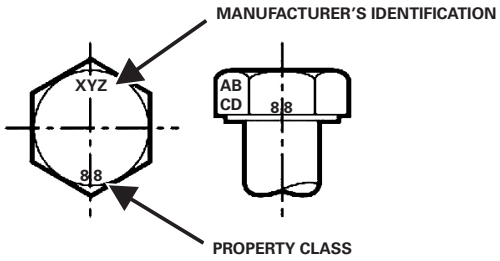
Metric Chart

NOTE: Do not use the values listed in the charts if a different torque value or tightening procedure is specified in this manual for a specific application. Torque values listed are for general use only.

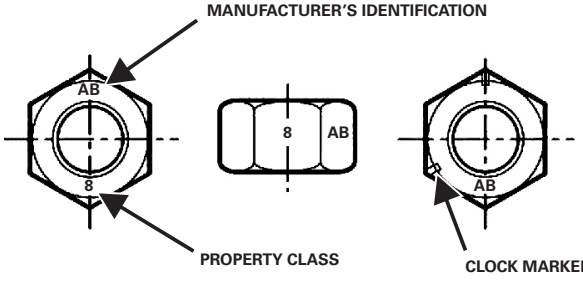
Use the following charts to determine the correct torque when checking, adjusting or replacing hardware. **Torque values are listed in newton-meters (inch* or foot pounds) for normal assembly applications.**

Nominal Size	Class 5.8		Class 8.8		Class 10.9		Lock nuts
	Unplated	Plated W / ZnCr	Unplated	Plated W / ZnCr	Unplated	Plated W / ZnCr	CL.8 W/ CL. 8.8 Bolt
M4	1.7 (15*)	2.2 (19*)	2.6 (23*)	3.4 (30*)	3.7 (33*)	4.8 (42*)	1.8 (16*)
M6	5.8 (51*)	7.6 (67*)	8.9 (79*)	12 (102*)	13 (115*)	17 (150*)	6.3 (56*)
M8	14 (124*)	18 (159*)	22 (195*)	28 (248*)	31 (274*)	40 (354*)	15 (133*)
M10	28 (21)	36 (27)	43 (32)	56 (41)	61 (45)	79 (58)	30 (22)
M12	49 (36)	63 (46)	75 (55)	97 (72)	107 (79)	138 (102)	53 (39)
M16	121 (89)	158 (117)	186 (137)	240 (177)	266 (196)	344 (254)	131 (97)
M20	237 (175)	307 (226)	375 (277)	485 (358)	519 (383)	671 (495)	265 (195)
M24	411 (303)	531 (392)	648 (478)	839 (619)	897 (662)	1160 (855)	458 (338)
NOTE: Torque values shown with * are inch pounds.							

Identification of Hex Cap Screws and Carriage Bolts - Classes 5 and up



Identification of Hex Nuts and Lock Nuts - Classes 5 and up



HARDWARE TORQUE VALUES (CONT'D)

Imperial Chart

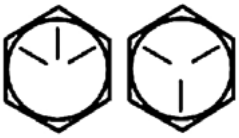
NOTE: Do not use the values listed in the charts if a different torque value or tightening procedure is specified in this manual for a specific application. Torque values listed are for general use only.

Use the following charts to determine the correct torque when checking, adjusting or replacing hardware. **Torque values are listed in newton-meters (inch* or foot pounds) for normal assembly applications.**

Nominal Size	SAE Grade 5		SAE Grade 8		LOCK NUTS			
	Unplated or Plated Silver	Plated W / ZnCr Gold"	Unplated or Plated Silver	Plated W / ZnCr Gold"	Unplated or Plated Silver	Plated W / ZnCr Gold"	Grade W / Gr. 5 Bolt	Grade W / Gr. 8 Bolt
1/4	6.2 (55*)	8.1 (72*)	9.7 (86*)	12.6 (112*)	13.6 (121*)	17.7 (157*)	6.9 (61*)	9.8 (86*)
5/16	13 (115*)	17 (149*)	20 (178*)	26 (229*)	28 (250*)	37 (324*)	14 (125*)	20 (176*)
3/8	23 (17)	30 (22)	35 (26)	46 (34)	50 (37)	65 (48)	26 (19)	35 (26)
7/16	37 (27)	47 (35)	57 (42)	73 (54)	80 (59)	104 (77)	41 (30)	57 (42)
1/2	57 (42)	73 (54)	87 (64)	113 (83)	123 (91)	159 (117)	61 (45)	88 (64)
9/16	81 (60)	104 (77)	125 (92)	163 (120)	176 (130)	229 (169)	88 (65)	125 (92)
5/8	112 (83)	145 (107)	174 (128)	224 (165)	244 (180)	316 (233)	122 (90)	172 (127)
3/4	198 (146)	256 (189)	306 (226)	397 (293)	432 (319)	560 (413)	217 (160)	306 (226)
7/8	193 (142)	248 (183)	495 (365)	641 (473)	698 (515)	904 (667)	350 (258)	494 (364)
1	289 (213)	373 (275)	742 (547)	960 (708)	1048 (773)	1356 (1000)	523 (386)	739 (545)
NOTE: Torque values shown with * are inch pounds.								

Identification of Hex Cap Screws and Carriage Bolts

GRADE 2 SAE BOLT



GRADE 5 SAE BOLTS

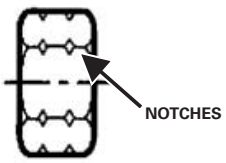
GRADE 8 SAE BOLTS

GRADE 2 SAE NUTS

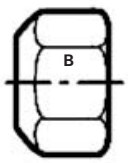
GRADE 5 SAE HEX NUTS

GRADE 8 SAE HEX NUTS

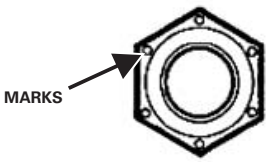
Identification of Hex Nuts and Lock Nuts



GRADE IDENTIFICATION
GRADE A: NO NOTCHES
GRADE B: ONE CIRCUMFERENTIAL NOTCH
GRADE C: TWO CIRCUMFERENTIAL NOTCHES



GRADE IDENTIFICATION
GRADE A: NO MARK
GRADE B: LETTER B
GRADE C: LETTER C



GRADE IDENTIFICATION
GRADE A: NO MARKS
GRADE B: THREE MARKS
GRADE C: SIX MARKS
MARKS NEED NOT BE LOCATED AT CORNERS

HYDRAULIC CONNECTION SPECIFICATIONS

O-Ring Fitting (Straight Thread)

Lubricate the O-ring before installing the fitting. Loosen the jam nut and install the fitting. Tighten the jam nut until the washer is tight against the surface.

O-Ring Face Seal Connection

Figure 60

O-ring Face Seal Tightening Torque		
Tubeline O.D.	Thread Size	N•m (ft-lb)
1/4″	9/16″ - 18	13 (18)
3/8″	11/16″ - 16	22 (30)
1/2″	13/16″ - 16	40 (54)
5/8″	1″ - 14	60 (81)
3/4″	1-3/16″ - 12	84 (114)
7/8″	1-3/16″ - 12	98 (133)
1″	1-7/16″ - 12	118 (160)
1-1/4″	1-11/16″ - 12	154 (209)
1-1/2″	2″ - 12	163 (221)

When the fitting is tightened, you can feel when the fitting is tight to eliminate leakage caused by under or over torqued fittings. Use petroleum jelly to hold the O-ring in position until the fittings are assembled **[Figure 60]**.

Flare Fitting

Figure 61

Flare Fitting Tightening Torque		
Tubeline O.D.	Thread Size	N • m (ft-lb)
1/4″	7/16″ - 20	13 (18)
5/16″	1/2″ - 20	17 (23)
3/8″	9/16″ - 18	22 (30)
1/2″	3/4″ - 16	40 (54)
5/8″	7/8″ - 14	60 (81)
3/4″	1-1/16″ - 12	84 (114)
7/8″	1-3/16″ - 12	98 (133)
1″	1-5/16″ - 12	118 (160)
1-1/4″	1-5/8″ - 12	154 (209)
1-1/2″	1-7/8″ - 12	163 (221)
2″	2-1/2″ - 12	252 (342)

Tighten until the nut makes contact with the seat. Use the chart to find the correct tightness needed **[Figure 61]**.

Port Seal (O-Ring Boss) Fitting

Figure 62

Port Seal And O-ring Boss Tightening Torque		
Tubeline O.D.	Thread Size	N•m (ft-lb)
1/4″	7/16″ - 20	13 (18)
3/8″	9/16″ - 18	22 (30)
1/2″	3/4″ -16	40 (54)
5/8″	7/8″ - 14	60 (81)
3/4″	1-1/16″ - 12	84 (114)
7/8″	1-3/16″ - 12	98 (133)
1″	1-5/16″ - 12	118 (160)
1-1/8″	1-7/16″ - 12	154 (209)
1-1/4″	1-5/8″ - 12	163 (221)

NOTE: Port seal and nut, washer and O-ring (O-ring Boss) fittings use the same tightening torque valve chart [Figure 62].

If a torque wrench cannot be used, use the following method.

Tighten the nut until it just makes metal to metal contact, you can feel the resistance.

Tighten the nut with a wrench no more than one hex flat maximum.

Do not over tighten the port seal fitting.

NOTE: If a torque wrench cannot be used, use the hex flat tightening method as an approximate guideline.

NOTE: Port seal fittings are not recommended in all applications. Use O-ring boss fittings in these applications.

Tubelines And Hoses

Replace any tubelines that are bent or flattened. They will restrict flow, which will slow hydraulic action and cause heat.

Replace hoses which show signs of wear, damage or weather cracked rubber.

Always use two wrenches when loosening and tightening hose or tubeline fittings.

NOZZLE SELECTION

To select a nozzle rated for gallons per minute (GPM) based on your target pounds per acre desired output, use the following formulas to convert pounds per acre to GPM:

$$\text{Total lb. per acre of nitrogen} = \frac{\text{Target lb. per acre}}{\text{Percent of nitrogen}} \qquad \frac{\text{Total lb. per acre}}{\text{Pound per gallon}} = \text{GPA}$$

EXAMPLE - The desired output is 100 pounds of nitrogen per acre. In order to get 100 pounds of nitrogen you need to apply 357 pounds of 28% nitrogen solution per acre. 357 pounds per acre of a solution that weighs 10.65 pounds per gallon equals 33.53 gallons per acre (GPA). Select a nozzle that will provide 33.53 GPA at your desired system pressure.

$$\text{Total lb. per acre of nitrogen} = \frac{357}{100} \qquad \frac{357}{10.65} = 33.53 \text{ GPA}$$
$$0.28$$

Density Correction Chart

WEIGHT OF SOLUTION PER GALLON	EXAMPLE	SPECIFIC GRAVITY	CONVERSION FACTOR
7.00 lb.		0.84	0.92
8.00 lb.		0.96	0.98
8.34 lb.	Water	1.00	1 .00
9.00 lb.		1.08	1.04
10.00 lb.		1.20	1.10
10.65 lb.	28% Nitrogen	1.28	1.13
11.00 lb.	7 - 27 - 7 Fertilizer	1.32	1.15
11.06 lb.	32% Nitrogen	1.33	1.15
11.40 lb.	10 - 34 - 0 Fertilizer	1.37	1.17
11.50 lb.	12 - 0 - 0 - 26 Fertilizer	1.38	1.17
11.60 lb.	11 - 37 - 0 Fertilizer	1.43	1.20
12.00 lb.		1.44	1.20
14.00 lb.		1.68	1.30

Additional Useful Formula:

$$\text{GPA} = \frac{\text{GPA x MPH x W}}{5940} \quad \text{(per nozzle)} \qquad \text{GPA} = \frac{\text{GPA (per nozzle) x 5940}}{\text{MPH x W}} \qquad \text{MPH} = \frac{\text{Distance in Feet x 60}}{\text{Time in Seconds x 88}}$$

W = Nozzle spacing in inches

Spacing Correction Chart

Other Spacing	Conversion Factor	GPA Target Conversion Factor = Corrected GPA
22	1.36	
36	0.83	
38	0.79	

For spacings not listed, use the following formula: $\text{Conversion factor} = \frac{\text{Nozzle spacing in table}}{\text{Your nozzle spacing}}$

NOZZLE SPECIFICATIONS

NOZZLE*	PSI	GPM PER NOZZLE	GPA AT 30" NOZZLE SPACING**								
			4 MPH	6 MPH	8 MPH	10 MPH	12 MPH	14 MPH	16 MPH	18 MPH	20 MPH
TP0001-SS	10	0.050	2.5	1.7	1.2	0.99	0.83	0.71	0.62	0.55	0.5
	20	0.071	3.5	2.3	1.8	1.4	1.2	1.0	0.88	0.78	0.7
	30	0.087	4.3	2.9	2.2	1.7	1.4	1.2	1.1	0.96	0.86
	40	0.100	5.0	3.3	2.5	2.0	1.7	1.4	1.2	1.1	0.99
TP00015-SS	10	0.075	3.7	2.5	1.9	1.5	1.2	1.1	0.93	0.83	0.74
	20	0.110	5.4	3.6	2.7	2.2	1.8	1.6	1.4	1.2	1.1
	30	0.130	6.4	4.3	3.2	2.6	2.1	1.8	1.6	1.4	1.3
	40	0.150	7.4	5.0	3.7	3.0	2.5	2.1	1.9	1.7	1.5
H1/4U-SS0002 TP0002-SS	10	0.100	5.0	3.3	2.5	2.0	1.7	1.4	1.2	1.1	0.99
	20	0.140	6.9	4.6	3.5	2.8	2.3	2.0	1.7	1.5	1.4
	30	0.170	8.4	5.6	4.2	3.4	2.8	2.4	2.1	1.9	1.7
	40	0.200	9.9	6.6	5.0	4.0	3.3	2.8	2.5	2.2	2.0
H1/4U-SS0003 TP0003-SS	10	0.150	7.4	5.0	3.7	3.0	2.5	2.1	1.9	1.7	1.5
	20	0.210	10.4	6.9	5.2	4.2	3.5	3.0	2.6	2.3	2.1
	30	0.260	12.9	8.6	6.4	5.1	4.3	3.7	3.2	2.9	2.6
	40	0.300	14.9	9.9	7.4	5.9	5.0	4.2	3.7	3.3	3.0
H1/4U-SS0004 TP0004-SS	10	0.200	9.9	6.6	5.0	4.0	3.3	2.8	2.5	2.2	2.0
	20	0.280	13.9	9.2	6.9	5.5	4.6	4.0	3.5	3.1	2.8
	30	0.350	17.3	11.6	8.7	6.9	5.8	5.0	4.3	3.9	3.5
	40	0.400	19.8	13.2	9.9	7.9	6.6	5.7	5.0	4.4	4.0
H1/4U-SS0006 TP0006-SS	10	0.300	14.9	9.9	7.4	5.9	5.0	4.2	3.7	3.3	3.0
	20	0.420	21.0	13.9	10.4	8.3	6.9	5.9	5.2	4.6	4.2
	30	0.520	26.0	17.2	12.9	10.3	8.6	7.4	6.4	5.7	5.1
	40	0.600	30.0	19.8	14.9	11.9	9.9	8.5	7.4	6.6	5.9
H1/4U-SS0008 TP0008-SS	10	0.400	19.8	13.2	9.9	7.9	6.6	5.7	5.0	4.4	4.0
	20	0.570	28.0	18.8	14.1	11.3	9.4	8.1	7.1	6.3	5.6
	30	0.690	34.0	23.0	17.1	13.7	11.4	9.8	8.5	7.6	6.8
	40	0.800	40.0	26.0	19.8	15.8	13.2	11.3	9.9	8.8	7.9
H1/4U-SS0010 TP0010-SS	10	0.500	25.0	16.5	12.4	9.9	8.3	7.1	6.2	5.5	5.0
	20	0.710	35.0	23.0	17.6	14.1	11.7	10.0	8.8	7.8	7.0
	30	0.870	43.0	29.0	22.0	17.2	14.4	12.3	10.8	9.6	8.6
	40	1.000	50.0	33.0	25.0	19.8	16.5	14.1	12.4	11.0	9.9

* Nozzle or tip (TP). Tip used with the standard TeeJet® cap. Nozzles are threaded with BSPT threads.

** Use the conversion factor for other nozzle spacings.

NOZZLE*	PSI	GPM PER NOZZLE	GPA AT 30" NOZZLE SPACING**								
			4 MPH	6 MPH	8 MPH	10 MPH	12 MPH	14 MPH	16 MPH	18 MPH	20 MPH
H1/4U-SS0015 TP0015-SS	10	0.750	37	25	19	14.9	12.4	10.6	9.3	8.3	7.4
	20	1.060	52	35	26	21	17.5	15	13.1	11.7	10.5
	30	1.300	64	43	32	26	21	18.4	16.1	14.3	12.9
	40	1.500	74	50	37	30	25	21	18.6	16.5	14.9
H1/4U-SS0020 TP0020-SS	10	1.000	50	33	25	19.8	16.5	14.1	12.4	11	9.9
	20	1.410	70	47	35	28	23	19.9	17.4	15.5	14
	30	1.730	86	57	43	34	29	24	21	19	17.1
	40	2.000	99	66	50	40	33	28	25	22	19.8
H1/4U-SS0030 TP0030-SS	10	1.500	74	50	37	30	25	21	18.6	16.5	14.9
	20	2.120	105	70	52	42	35	30	26	23	21
	30	2.600	129	86	64	51	43	37	32	29	26
	40	3.000	149	99	74	59	50	42	37	33	30
H1/4U-SS0040 TP0040-SS	10	2.000	99	66	50	40	33	28	25	22	20
	20	2.830	140	93	70	56	47	40	35	31	28
	30	3.460	171	114	86	69	57	49	43	38	34
	40	4.000	198	132	99	79	66	57	50	44	40
H1/4U-SS0050	10	2.500	124	83	62	50	41	35	31	28	25
	20	3.540	175	117	88	70	58	50	44	39	35
	30	4.330	214	143	107	86	71	61	54	48	43
	40	5.000	248	165	124	99	83	71	62	55	50
H1/4U-SS0060	10	3.000	149	99	74	59	50	42	37	33	30
	20	4.240	210	140	105	84	70	60	52	47	42
	30	5.200	257	172	129	103	86	74	64	57	51
	40	6.000	297	198	149	119	99	85	74	66	59

* Nozzle or tip (TP). Tip used with the standard TeeJet® cap. Nozzles are threaded with BSPT threads.

** Use the conversion factor for other nozzle spacings.

WARRANTY

Farm King

WARRANTY

Farm King

Limited Warranty

BASE LIMITED WARRANTY

Farm King provides this warranty only to original retail purchasers of its products. Farm King warrants to such purchasers that all Farm King manufactured parts and components used and serviced as provided for in the Operator's Manual shall be free from defects in materials and workmanship for a period following delivery to the original retail purchaser of one (1) year. This limited warranty applies only to those parts and components manufactured by Farm King. Parts and components manufactured by others are subject to their manufacturer's warranties, if any.

Farm King will fulfill this limited warranty by, at its option, repairing or replacing any covered part that is defective or is the result of improper workmanship, provided that the part is returned to Farm King within thirty (30) days of the date that such defect or improper workmanship is, or should have been, discovered. Parts must be returned through the selling representative and the buyer must prepay transportation charges.

Farm King will not be responsible for repairs or replacements that are necessitated, in whole or part, by the use of parts not manufactured by or obtained from Farm King. Under no circumstances are component parts warranted against normal wear and tear. There is no warranty on product pump seals, product pump bearings, rubber product hoses, pressure gauges, or other components that require replacement as part of normal maintenance.

REPAIR PARTS LIMITED WARRANTY

Farm King warrants genuine Farm King replacement parts purchased after the expiration of the Farm King Limited Warranty, and used and serviced as provided for in the Operator's Manual, to be free from defects in materials or workmanship for a period of thirty (30) days from the invoice date for the parts. Farm King will fulfill this limited warranty by, at its option, repairing or replacing any covered part that is defective or is the result of improper workmanship, provided that the part is returned to Farm King within thirty (30) days of the date that such defect or improper workmanship is, or should have been, discovered. Such parts must be shipped to the Farm King factory at the purchaser's expense.

WHAT IS NOT COVERED

Under no circumstances does this limited warranty cover any components or parts that have been subject to the following: negligence; alteration or modification not approved by Farm King; misuse; improper storage; lack of reasonable and proper maintenance, service, or repair; normal wear; damage from failure to follow operating instructions; accident; and/or repairs that have been made with parts other than those manufactured, supplied, and or authorized by Farm King.

AUTHORIZED DEALER AND LABOR COSTS

Repairs eligible for labor under this limited warranty must be made by Farm King or an authorized Farm King dealer. Farm King retains the exclusive discretion to determine whether it will pay labor costs for warranty repairs or replacements, and the amount of such costs that it will pay and the time in which the repairs will be made. If Farm King determines that it will pay labor costs for warranty work, it will do so by issuing a credit to the dealer's or distributor's account. Farm King will not approve or pay invoices sent for repairs that Farm King has not previously approved. Warranty service does not extend the original term of this limited warranty.

Farm King

Limited Warranty

WARRANTY REQUIREMENTS

To be covered by warranty, each new product must be registered with Farm King within thirty (30) days of delivery to original retail purchaser. If the customer decides to purchase replacement components before the warranty disposition of such components is determined, Farm King will bill the customer for such components and then credit the replacement invoice for those components later determined to be covered by this limited warranty. Any such replacement components that are determined not be covered by this limited warranty will be subject to the terms of the invoice and shall be paid for by the purchaser.

EXCLUSIVE EFFECT OF WARRANTY AND LIMITATION OF LIABILITY

TO THE EXTENT PERMITTED BY LAW, FARM KING DISCLAIMS ANY WARRANTIES, REPRESENTATIONS, OR PROMISES, EXPRESS OR IMPLIED, AS TO THE QUALITY, PERFORMANCE, OR FREEDOM FROM DEFECT OF THE COMPONENTS AND PARTS COVERED BY THIS WARRANTY AND NOT SPECIFICALLY PROVIDED FOR HEREIN.

TO THE EXTENT PERMITTED BY LAW, FARM KING DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ON ITS PRODUCTS COVERED HEREIN, AND DISCLAIMS ANY RELIANCE BY THE PURCHASER ON FARM KING'S SKILL OR JUDGMENT TO SELECT OR FURNISH GOODS FOR ANY PARTICULAR PURPOSE. THE PURCHASER'S ONLY AND EXCLUSIVE REMEDIES IN CONNECTION WITH THE BREACH OR PERFORMANCE OF ANY WARRANTY ON FARM KING'S PRODUCTS ARE THOSE SET FORTH HEREIN. IN NO EVENT SHALL FARM KING BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BY WAY OF EXAMPLE ONLY AND NOT LIMITATION, LOSS OF CROPS, LOSS OF PROFITS OR REVENUE, OTHER COMMERCIAL LOSSES, INCONVENIENCE, OR COST OF REPLACEMENT OF RENTAL EQUIPMENT). IN NO EVENT SHALL FARM KING'S CONTRACT OR WARRANTY LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT. (Note that some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusion may not apply to you.) This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

Farm King neither assumes nor authorizes any person or entity, including its selling representatives, to assume any other obligations or liability in connections with the sale of covered equipment, or to make any other warranties, representations, or promises, express or implied, as to the quality, performance, or freedom from defect of the components and parts covered herein. No one is authorized to alter, modify, or enlarge this limited warranty, or its exclusions, limitations and reservations.

Corrections of defects and improper workmanship in the manner, and for the applicable time periods, provided for herein shall constitute fulfillment of all responsibilities of Farm King to the purchaser, and Farm King shall not be liable in negligence, contract, or on any other basis with respect to the subject equipment.

This limited warranty is subject to any existing conditions of supply which may directly affect Farm King's ability to obtain materials or manufacturer replacement parts.

Buhler Industries Inc. reserves the right to make improvements in design or changes in specifications to its products at anytime, without incurring any obligation to owners of units previously sold.

ALPHABETICAL INDEX

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