Farm King

OPERATOR AND PARTS MANUAL

Fertilizer Applicator

Model 1460

032016 88663040

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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's 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 1460 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.

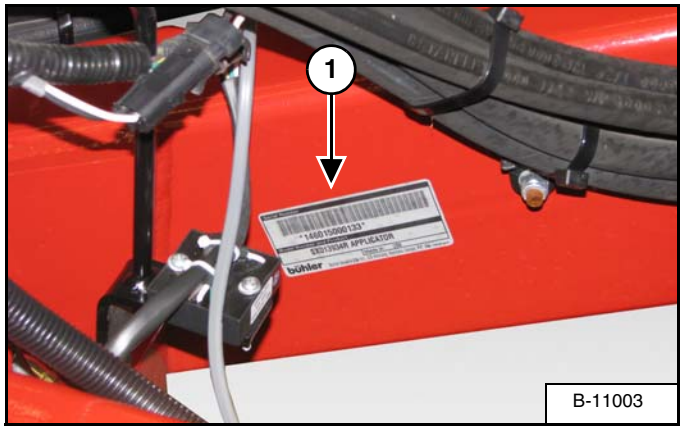
Keep this manual available for frequent reference. All new operators or owners must review the manual before using the equipment and annually thereafter. Contact your Farm King Dealer if you need assistance, information, or additional copies of the manual. Visit our website at **www.farm-king.com** for 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 fertilizer applicator.

Serial Number Location

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

Figure 1



Model Number: _____

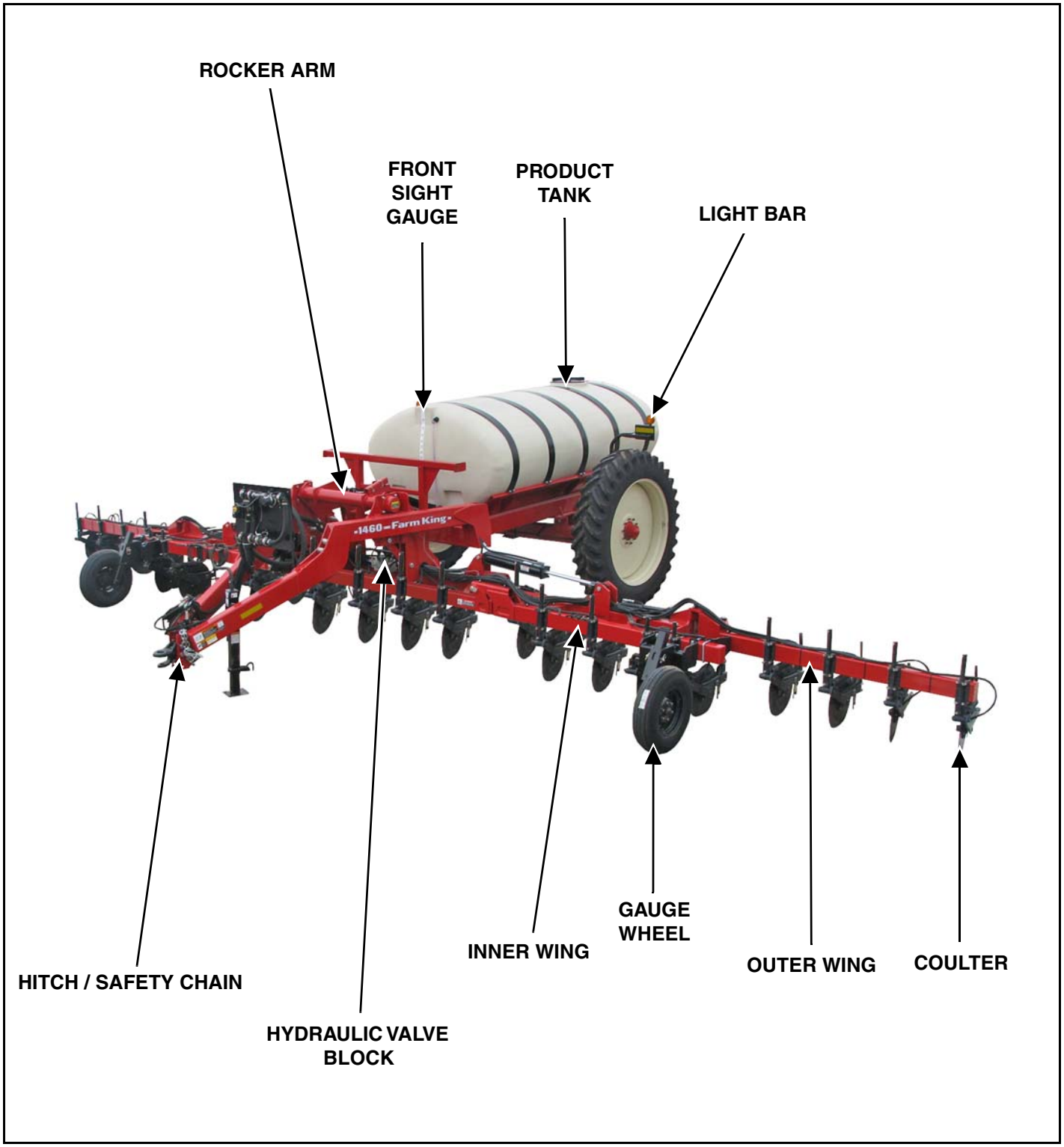
Serial Number: _____

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

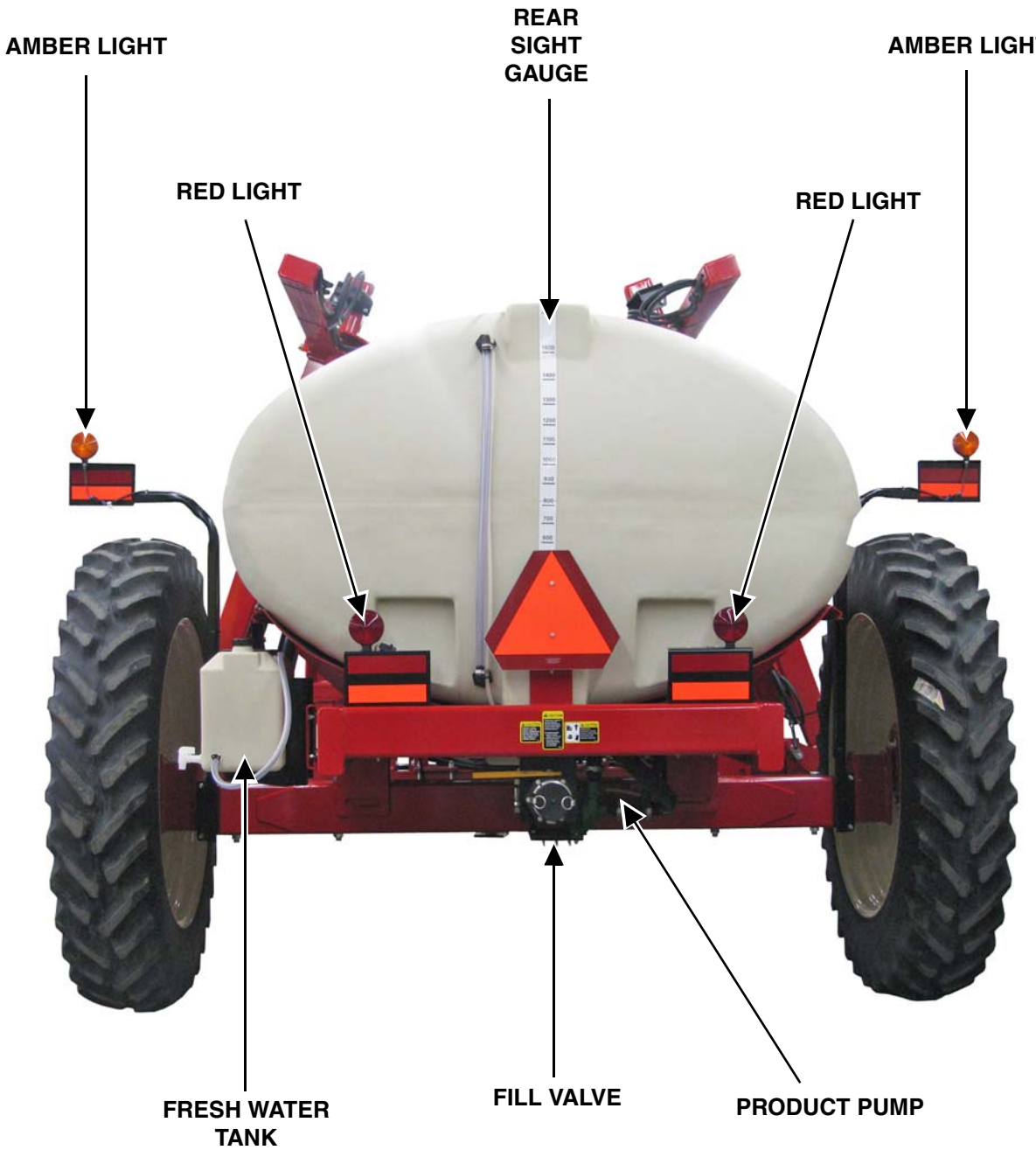
Always use your serial number when requesting information or when ordering parts.

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 machine signs (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.
- Machine's three-point hitch must be equipped with sway bars or chains.
- 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. (See "SERVICE SCHEDULE" on page 69.)

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

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

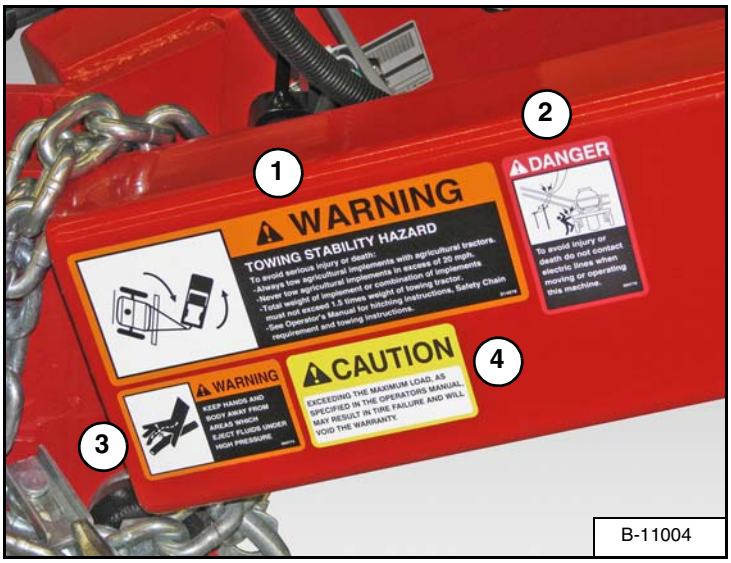
- **If in eyes or mouth, read manufacturer's instructions and follow them exactly.**
- **Seek immediate medical attention.**
- **A poison control number is usually inside the front cover of your telephone book.**

- 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.

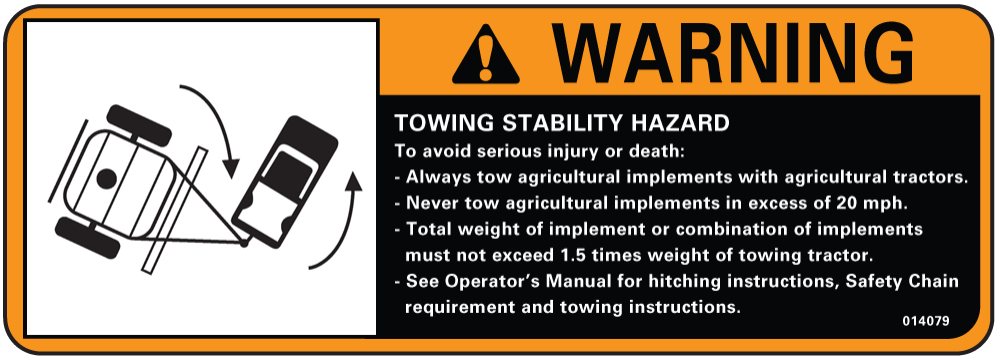
Front Left Side Of Hitch



2

p/n SX004776

1



p/n SX014079

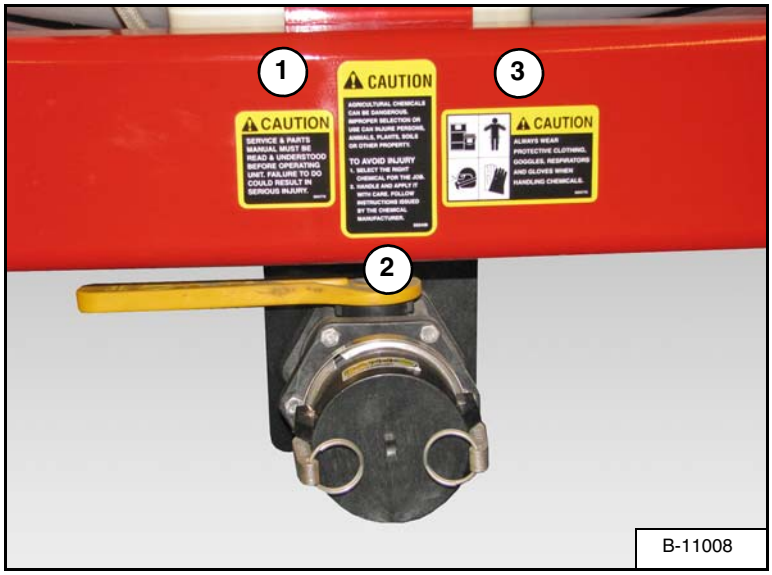
3

p/n SX004774

4

p/n SX008553

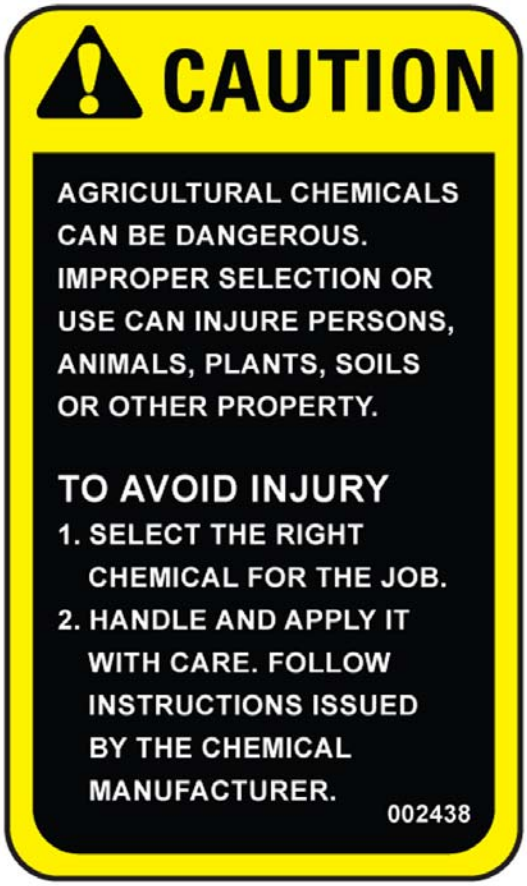
Rear Of Chassis Frame (Rear Of Machine)



1

p/n SX004772

2

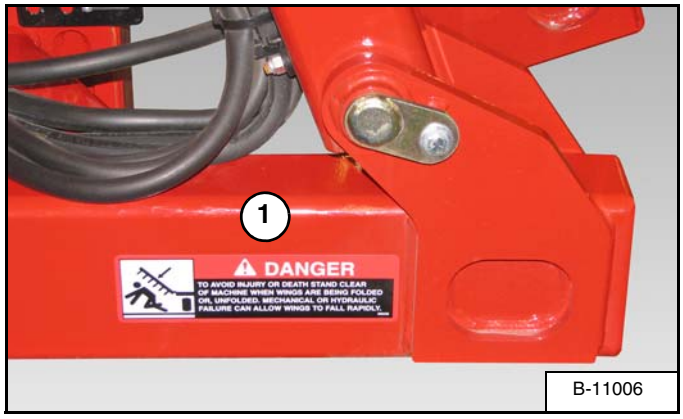


p/n SX002438

3

p/n SX004775

Pivot Points On Wings (Front and Back)



1

p/n 002439

Rocker Shaft End Cap

1

p/n SX004302

EQUIPMENT DECALS AND SIGNS

NOTE: All safety related decals are shown in the Safety Signs Section. (See "SAFETY SIGNS (DECALS)" on page 21.)

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

Part Number SX815066 (Left Side)

Part Number SX815067 (Right Side)

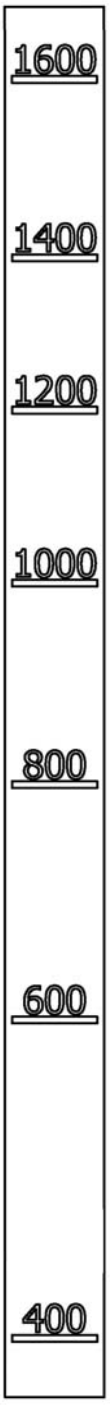
Part Number SX17 - 5910B (Amber)

Part Number SX17 - 5915B (Red)

Part Number SX17 - 5920B (Day Orange)

Part Number JD5403

Part Number SX017672



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 1460 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**

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ASSEMBLY

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COMPONENT INSTALLATION

Preparing For Assembly

IMPORTANT

1460 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” on page 46.)

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.**

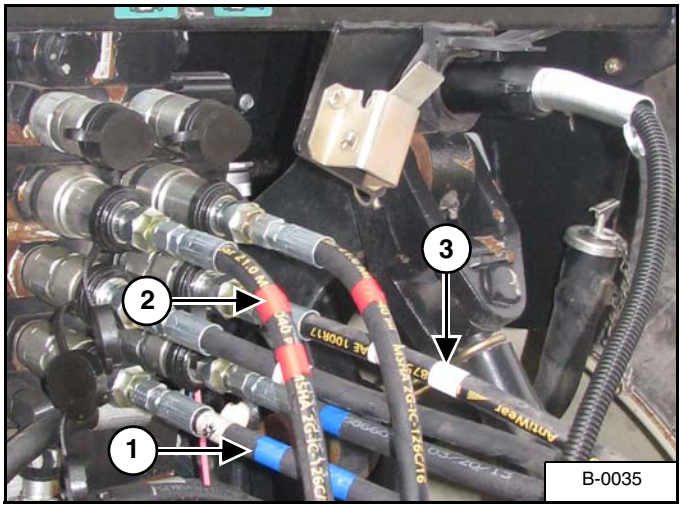
IMPORTANT

- **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 2



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

NOTE: Do not connect the hydraulic hoses (pump) with White 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" on page 45.)

Engage the tractor hydraulics. Adjust the maximum hydraulic flow to the "work" and "transport" circuits to a maximum of 6 gpm. (See the tractor's operator's manual for the correct procedure.)

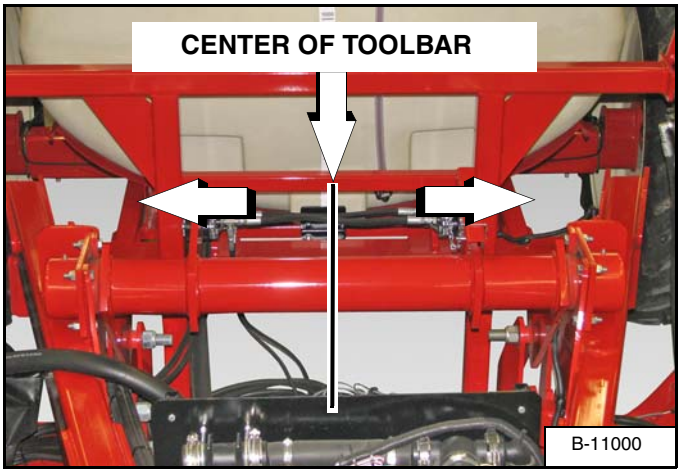
Unfold the wings with "Transport Circuit" (hydraulic hoses with the "Red" markers). (See "Unfold Wings" on page 52.)

Raise the toolbar with 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 3



Locate the center of the toolbar. Measure out from the center of the toolbar and place a mark at the desired spacing (30”, 22”, 20”) **[Figure 3]**.

IMPORTANT

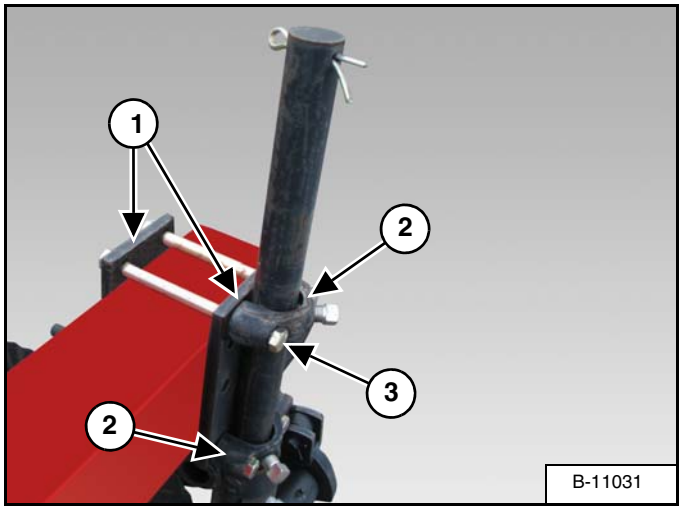
When installing the coulters, the toolbar and wings must be level and supported.

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 4



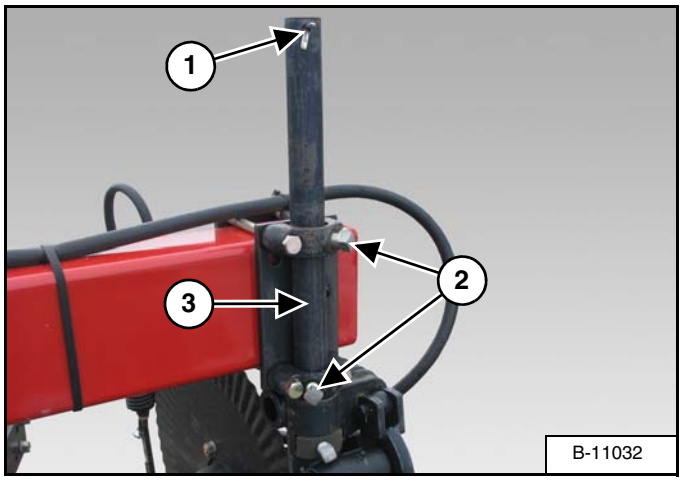
Align two clamp plates (Item 1) **[Figure 4]** on either side of the toolbar at a marked location (30”, 22”, 20”).

Align two clamp castings (Item 2) **[Figure 4]** over the holes of the front plate.

Install four 1/2” x 7” bolts (Item 3) **[Figure 4]** through the clamp castings and clamp plates. Attach using four 1/2” lock nuts.

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

Figure 5



Remove cotter pin (Item 1). Loosen the two clamp set screws (Item 2), then slide the shaft (Item 3) **[Figure 5]** of the coulter assembly up, into the clamps.

Tighten set screws and reinstall cotter pin.

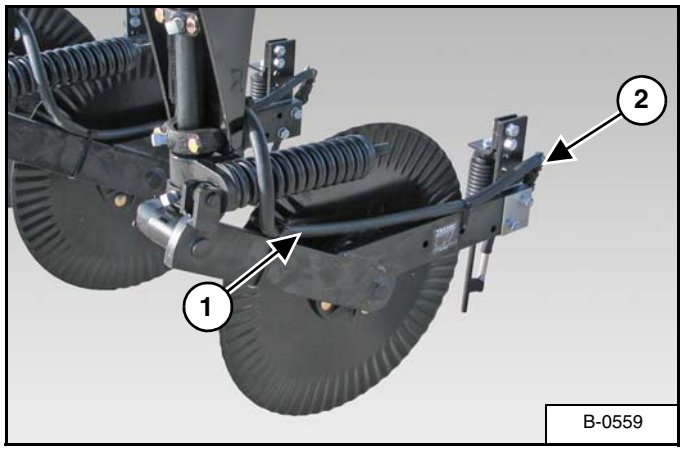
Continue to install shaft / coulter assemblies along the toolbar.

Supply Hose Installation

IMPORTANT

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

Figure 6

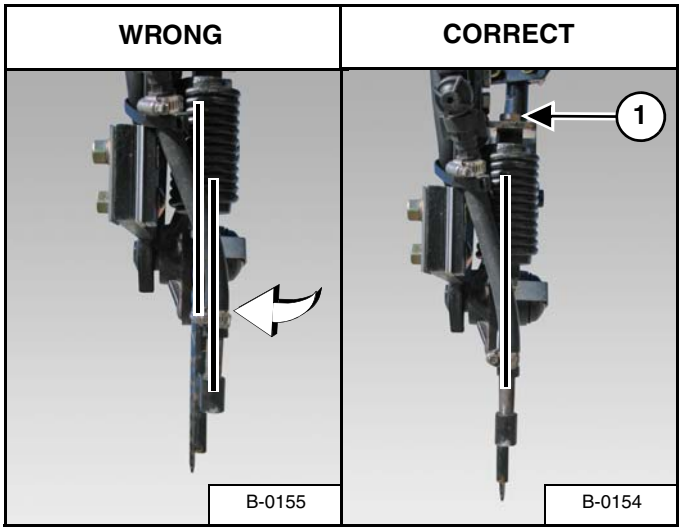


Route the supply hose (Item 1) **[Figure 6]** behind the coulter assembly, down to the knife / injector. Fasten in place with cable ties.

Apply petroleum jelly to fittings and install hose onto the adapter (Item 2) **[Figure 6]** and secure in place with hose clamp.

Coulter Injector Alignment

Figure 7



Injector is not aligned (WRONG) with coulter **[Figure 7]**.

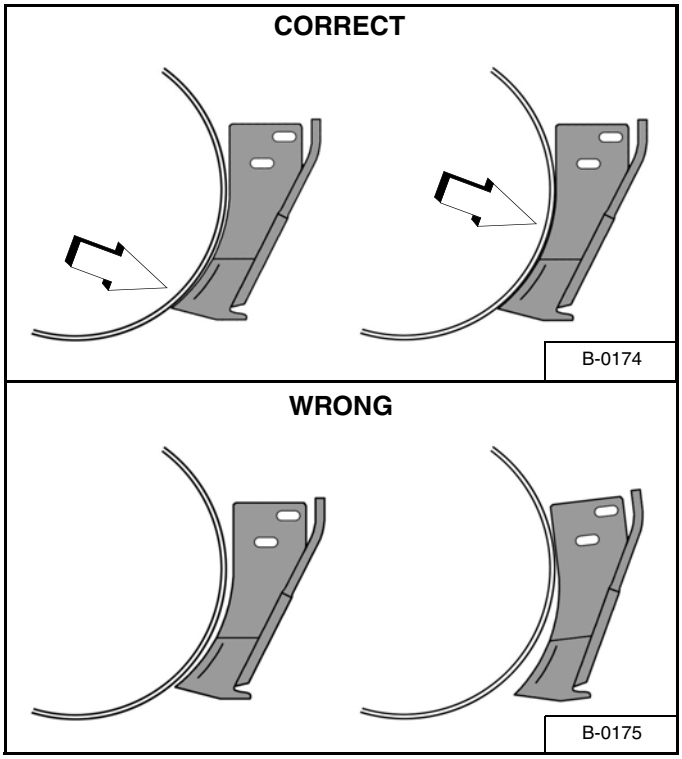
Loosen bolt (Item 1) **[Figure 7]** and align the knife with coulter blade. Tighten bolt.

Injector is now aligned (CORRECT) with coulter **[Figure 7]**.

Coulter Knife Alignment

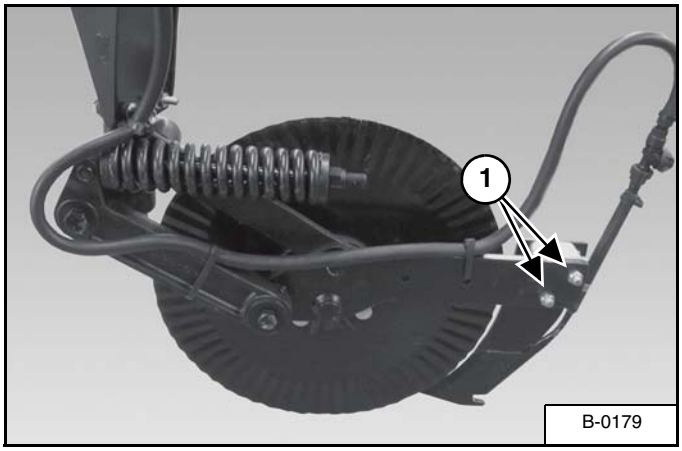
NOTE: The following images may not show your exact coulter assembly as it appears but the procedure is correct.

Figure 8



Knives should rub slightly on blade at bottom of knife (CORRECT) **[Figure 8]**.

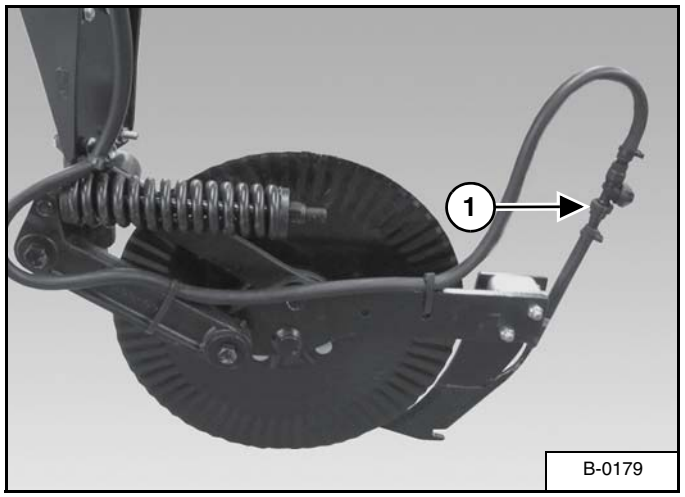
Figure 9



Loosen the two bolts (Item 1) **[Figure 9]** and adjust knife to rub slightly on blade. Tighten bolts.

Orifice Installation (Coulters / Knives)

Figure 10



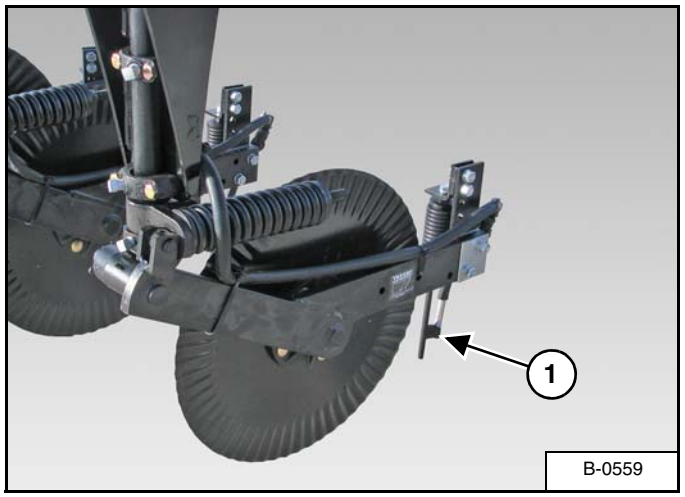
Loosen hose fitting by 1/4 turn (Item 1) **[Figure 10]** and disconnect.

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)

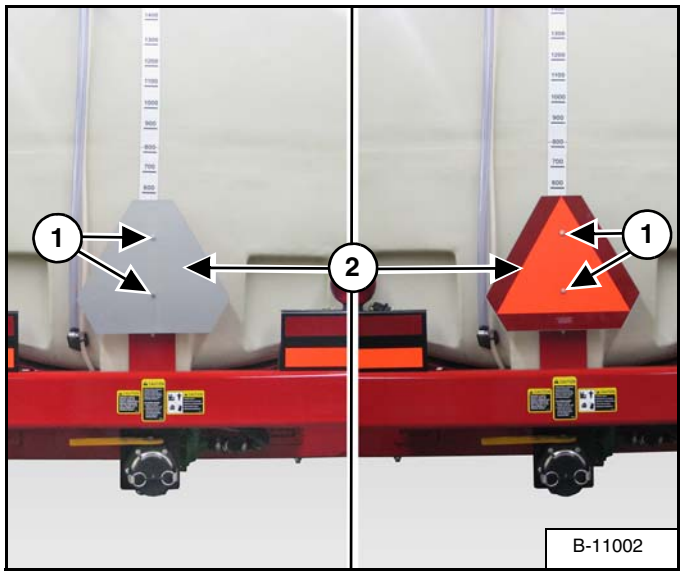
Figure 11



Install spray tip, I.E. TeeJet StreamJet tip into female threads located at the bottom of the assembly (Item 1) **[Figure 11]**.

Slow Moving Vehicle Sign Installation

Figure 12



Remove the two bolts (Item 1) and slow moving vehicle sign (Item 2) **[Figure 12]**.

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" on page 158.) and (See "NOZZLE SPECIFICATIONS" on page 159.) for additional information.

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.

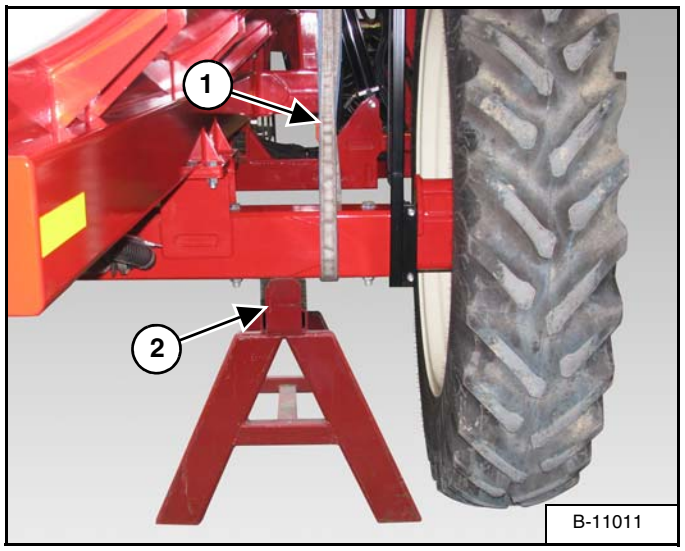
NOTE: Support stands and chock blocks are required when adjusting axle width.

Move the tractor and fertilizer applicator to a flat level surface.

Stop the engine, engage the park brake and leave the operator's position. (See "Leaving The Operator's Position" on page 45.)

Place chock blocks in front and behind the tractor tires to prevent tractor and fertilizer applicator from moving when adjusting axle width.

Figure 13



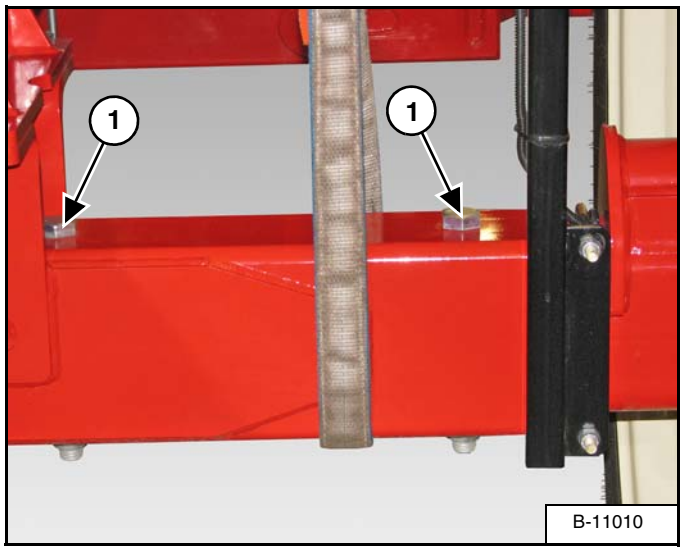
Using approved chains / straps (Item 1) **[Figure 13]** and lifting devices, raise one tire off the ground.

Place a support stand (Item 2) **[Figure 13]** under elevated side of the fertilizer applicator.

Lower the fertilizer applicator down onto the support stands (leaving chains, straps and lifting devices installed) while adjusting axle width.

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

Figure 14



Loosen and remove the two bolts (Item 1) **[Figure 14]** 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 lock nuts with new bolts and lock nuts.

IMPORTANT

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

Tighten all axle adjustment bolts to the required torque (See “HARDWARE TORQUE VALUES” on page 155.).

Replace any bolts or lock 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 the fertilizer applicator 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 the fertilizer applicator 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 forklift access.

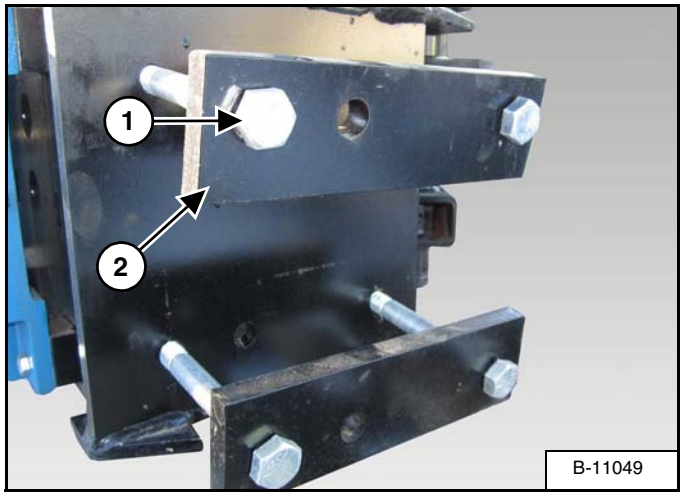
Stop the tractor and engage the park brake.

Fully raise the toolbar, stop the engine and leave the operator's position. (See "Leaving The Operator's Position" on page 45.)

Place chock blocks in front and behind the tractor tires to prevent tractor and fertilizer applicator from moving during installation.

Fully raise the jack.

Figure 15

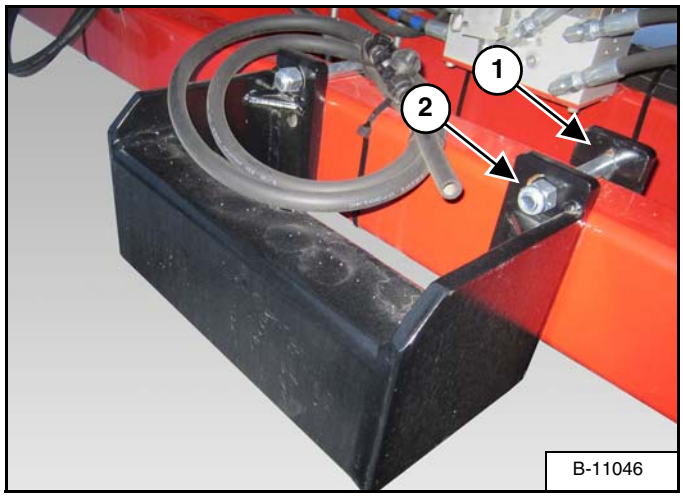


Remove the four 5/8" bolts / lock nuts (Item 1) and the two backing plates (Item 2) **[Figure 15]** from the pump assembly.

IMPORTANT

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

Figure 16

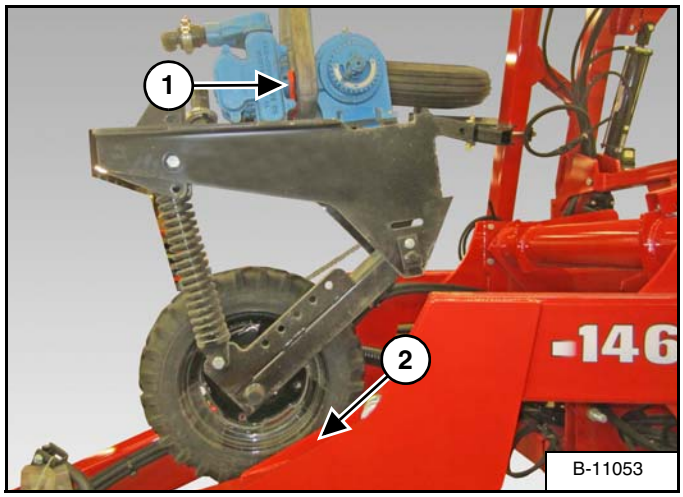


Place the two backing bolt plates (Item 1) **[Figure 16]** on the backside of the toolbar and insert four 5/8" bolts through the plates and mount.

Install four 5/8" lock nuts (Item 2) **[Figure 16]** on the bolts.

Tighten bolts and lock nuts until the backing plates are securely fastened to the toolbar.

Figure 17



Install a strap (Item 1) **[Figure 17]** around the center of the ground driven pump.

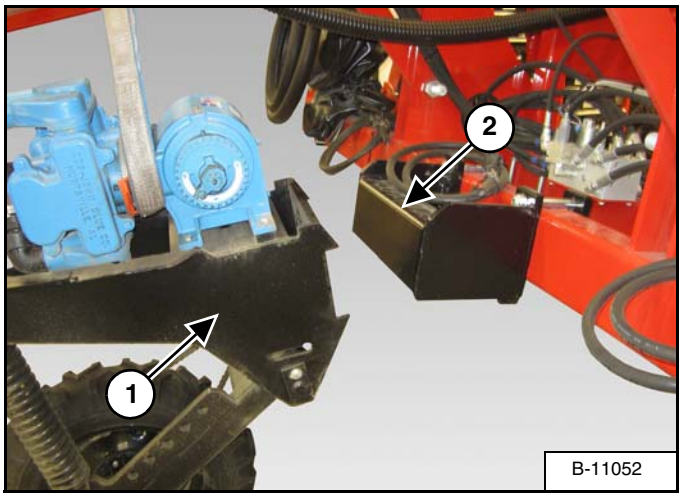
Connect the strap to an approved lifting device.

Raise and move the ground driven pump to the assembly area.

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 (Item 2) **[Figure 17]**.

Figure 18

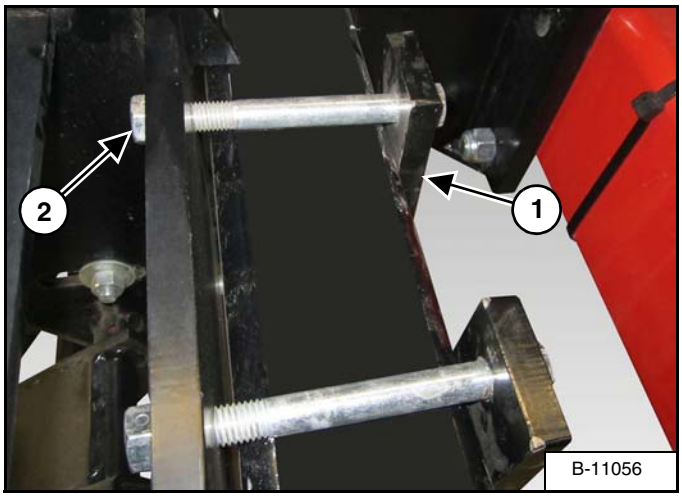


Move the pump back (Item 1) **[Figure 18]** until it is up against the front of the toolbar (Item 2) **[Figure 18]**.

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

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

Figure 19



Place the two backing bolt plates (Item 1) **[Figure 19]** on the backside of the toolbar and insert four 5/8" bolts through the plates and mount.

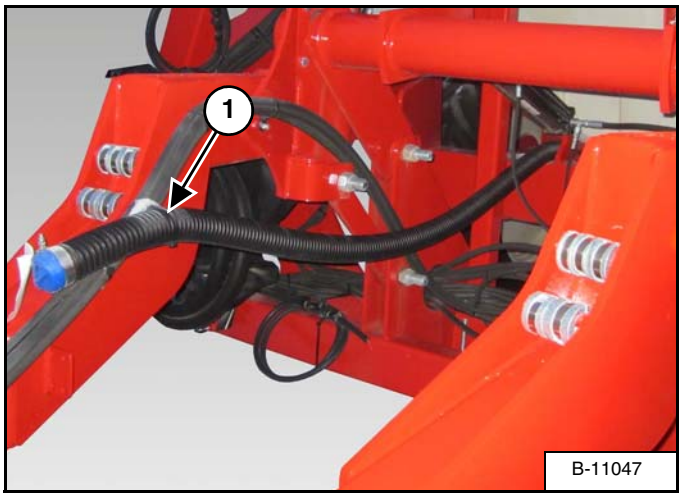
Install four 5/8" lock nuts (Item 2) **[Figure 19]** on the bolts.

Tighten bolts and lock nuts until the backing plates are securely fastened to the toolbar.

Remove strap and lifting device.

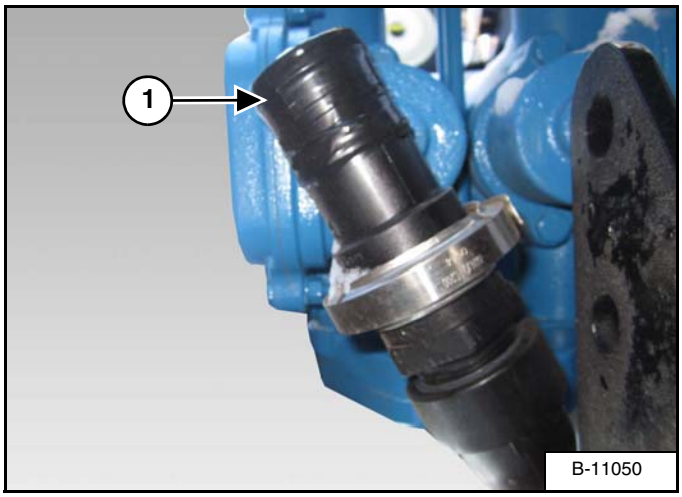
Twin Piston Pump

Figure 20



Cut the zip tie (Item 1) **[Figure 20]** holding the suction hose to the toolbar and route it to the right and over the top of the assembly and pump mount.

Figure 21

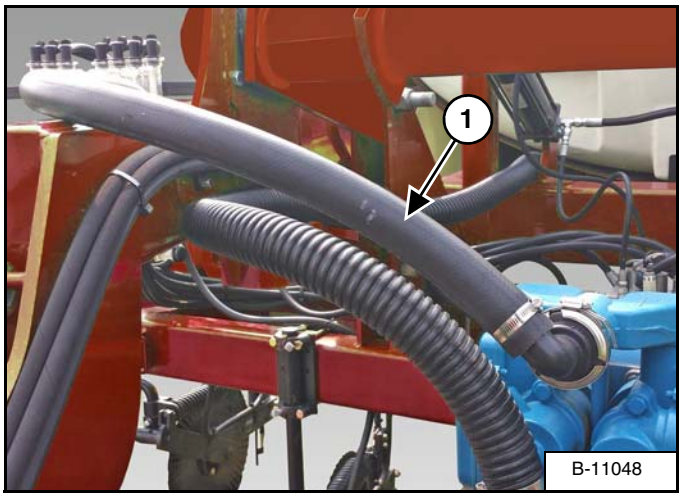


Remove the tape from the hose and loosen the 11/32” t-bolt clamp with a 3/8” wrench. Insert the hose into the 2” hose barb (Item 1) **[Figure 21]** attached to the bottom side of the pump assembly.

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

Installing Monitor Hose

Figure 22



Cut the zip tie holding the hose to the monitor and route the hose (Item 1) **[Figure 22]** between the frame assembly and the parallel links.

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

Insert the hose into the 1 1/2” hose barb attached to the top side of the pump assembly. Slide the clamp over the hose and barb. Tighten until secure **[Figure 22]**.

Farm King

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. (See “SERVICE SCHEDULE” on page 69.)
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. Realign 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

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. (567 N•m) torque.
8. Check tire pressure. Inflate per manufacturer’s specification.

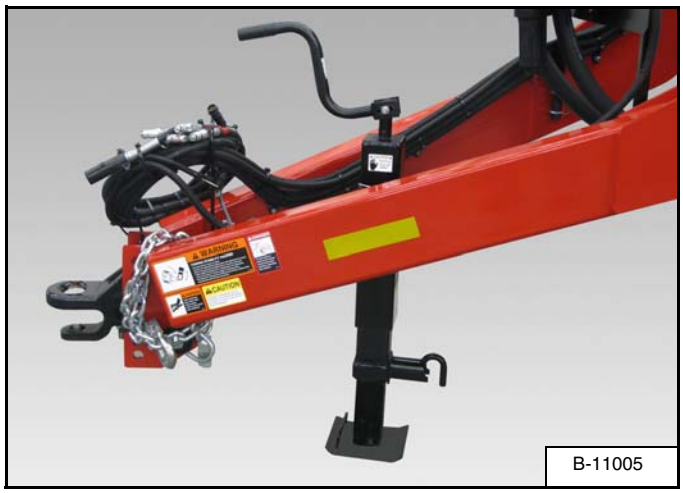
Break - In Checklist

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 23



2. Check the fertilizer applicator hitch for damaged, loose or missing parts **[Figure 23]**. Repair as needed before operation.
3. Check condition of all chemical / fertilizer components for pinching, crimps or leaks. Realign 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. (567 N•m) torque.
6. Clean screen in-line strainer.
7. Check the coulters and gauge wheels. Remove any twine, wire or other material that has become entangled.
8. Check condition of all hydraulic components for leaks. Tighten fittings to correct leaks or replace components. Do not operate with hydraulic leaks.
9. Check tire pressure. Inflate per manufacturer's specification.

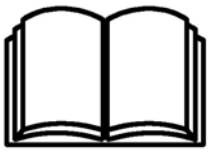
Tractor Requirements

The 1460 fertilizer applicators will require two auxiliary hydraulic functions, Category IV rated drawbar and a 7-Pin electrical connection. A third auxiliary hydraulic function is used to power the hydraulic centrifugal pump kit (option).

- Closed center hydraulic system set at 4 to 6 GPM rate (excess flow will cause improper function).
- System hydraulic pressure: 2,000 PSI, minimum.
- Two directional valves; one valve can be spring centered, but the other valve needs to have detent capability (detent maintained at system pressure).
- 7-pin, implement lights, female connector with pin #7 being 12V source and pin #1 being ground.

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

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

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.**

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.

INITIAL SET-UP

Connecting The Fertilizer Applicator To The 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 The Operator's Position" on page 45.)

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.

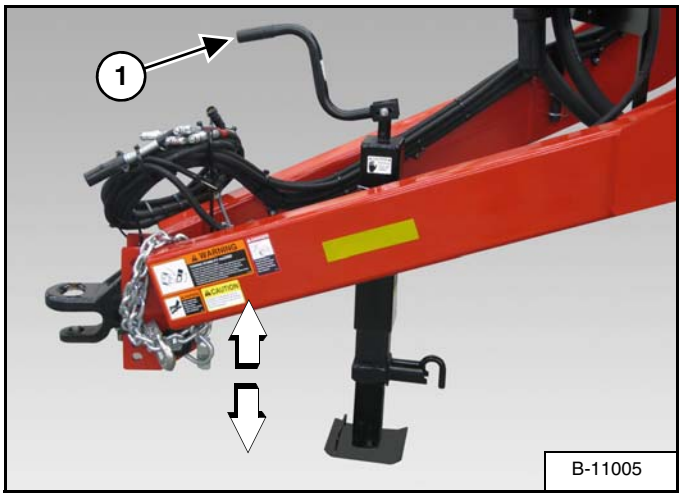
NOTE: The jack may need to be lowered or raised for proper alignment of the drawbar and hitch.

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" on page 45.)

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

Figure 24



Turn the jack handle (Item 1) **[Figure 24]** clockwise to raise the hitch or counterclockwise to lower the hitch.

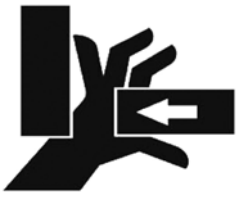
Lower or raise the fertilizer applicator hitch until aligned with the tractor's drawbar.

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

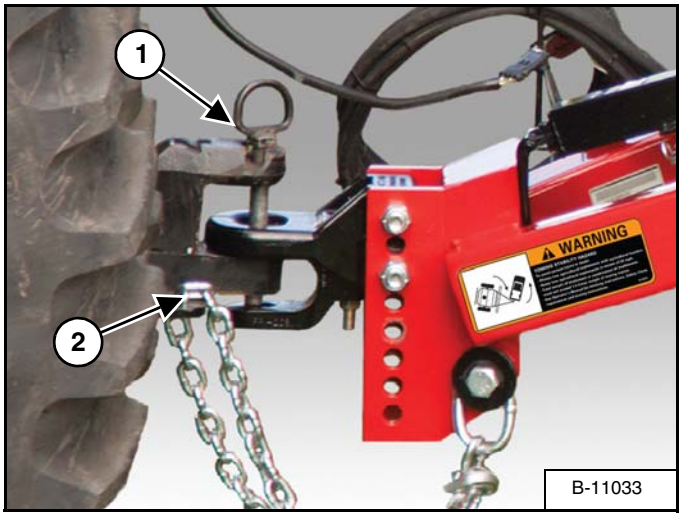


AVOID INJURY OR DEATH

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 25



Install the hitch pin (Item 1) **[Figure 25]** and retaining pin to securely fasten the fertilizer applicator hitch to the tractor drawbar.

Attach the safety chain (Item 2) **[Figure 25]** around the drawbar.

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

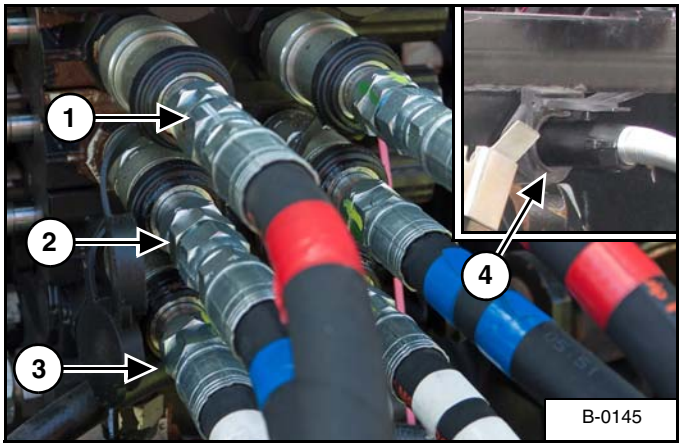
- **Contain and dispose of any oil leakage in an environmentally safe manner.**
- **Thoroughly clean the quick couplers before making connections. Dirt can quickly damage the system.**

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.

To Connect:

Figure 26



Push coupler into female coupler on the tractor until they are fully engaged and locked **[Figure 26]**.

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).

Connect the return line (single wrap) of the pump circuit to “case drain” if available.

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 26]** to the tractor’s electrical system.

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.

JOHN BLUE PUMP SETTING

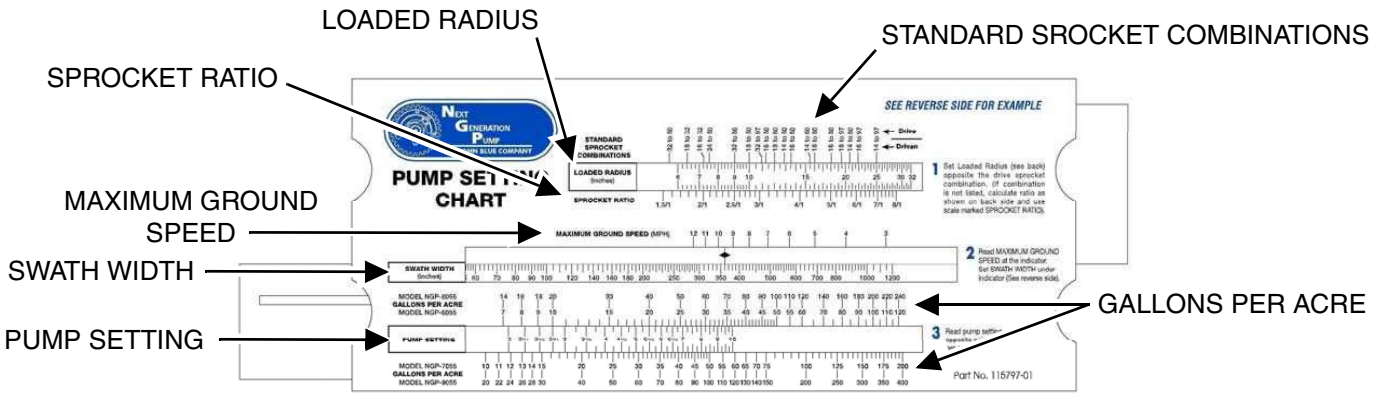
The NGP pump output is determined by the drive sprocket ratio and the stroke setting. There are two ways to find the proper setting for your pump.

On-line Flow Chart Calculator

Figure 27

ON-LINE FLOW RATE CALCULATOR

www.cds-johnblue.com



PUMP SETTING CHART

The icon shown in **[Figure 28]** will give you access to the on-line flow rate calculator when setting pump output.

Slide Chart (Supplied With Pump)

Using the slide chart shown in **[Figure 28]**, supplied with pump - follow example below:

SPROCKET RATION

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.

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

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

FERTILIZER APPLICATOR OPERATION

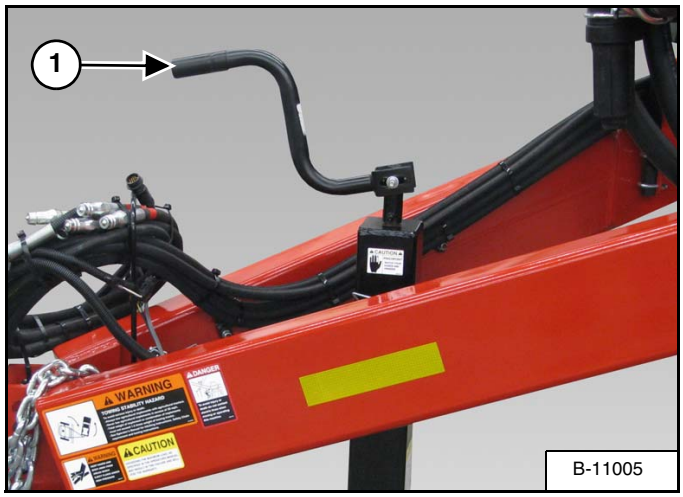
Leveling The Fertilizer Applicator

IMPORTANT

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

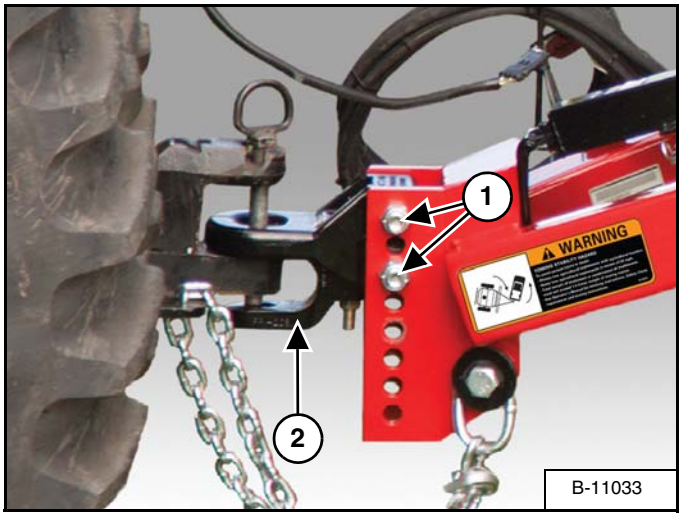
Lower the toolbar. (See “Raising And Lowering The Toolbar” on page 53.)

Figure 28



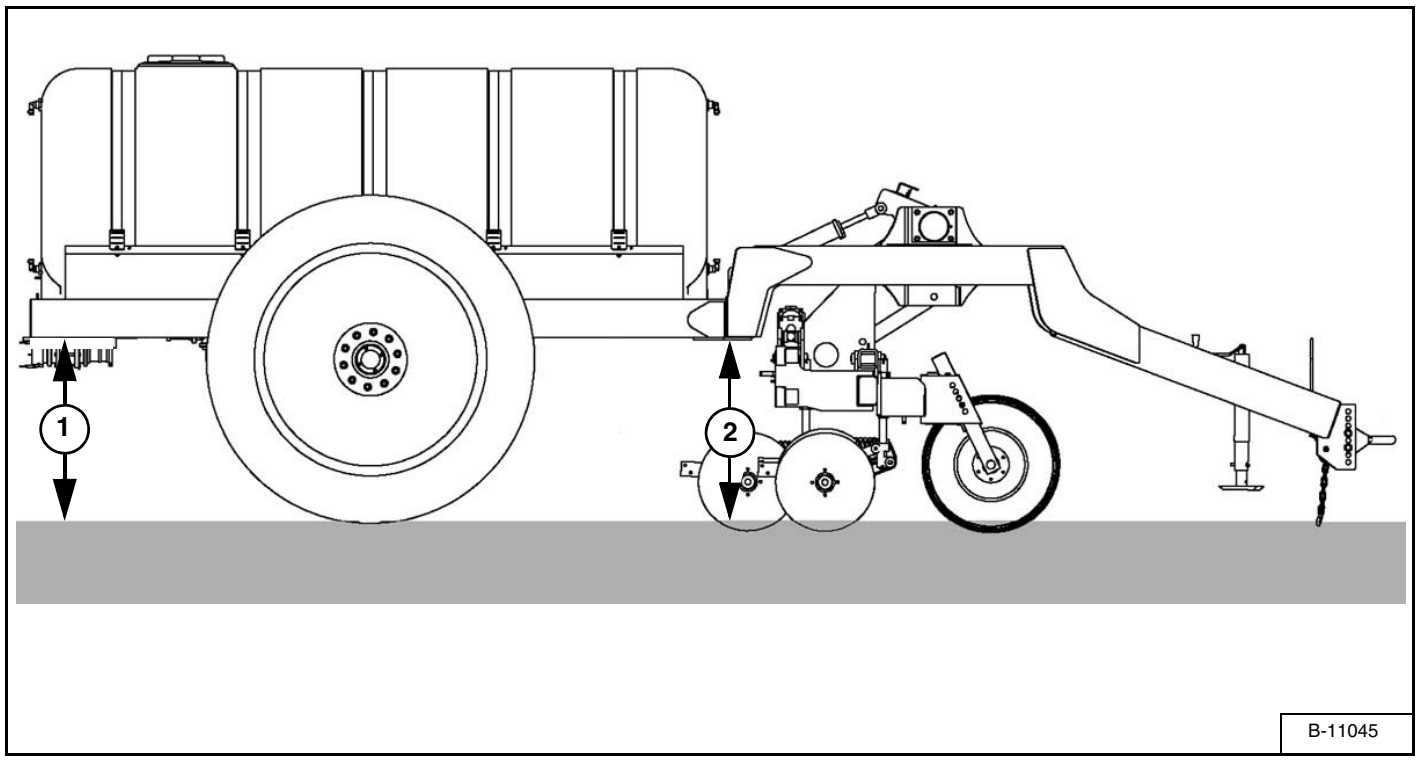
With the fertilizer applicator attached to the tractor, lower the jack (Item 1) **[Figure 28]** from the transport position. Raise the jack until the weight of the fertilizer applicator is on the jack. This will allow the clevis mounting bolts to be loosened and moved for leveling (if required).

Figure 29



Loosen the two clevis mounting bolts (Item 1) **[Figure 29]**.

Figure 30



Measure the distance (Items 1 & 2) **[Figure 30]** from the ground to the bottom of the fertilizer applicator frame in the two locations shown.

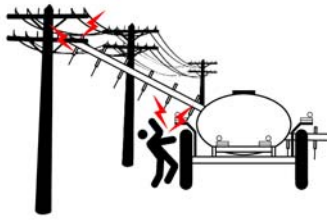
NOTE: The two measurements should be approximately the same when the frame is level.

Raise or lower the jack until the fertilizer applicator frame is parallel with the ground. Raise or lower the clevis (Item 2) **[Figure 29]** and align the closest clevis mounting holes with frame. Install the two bolts.

Tighten the two clevis mounting bolts to the correct torque and raise the jack into the storage position.

Unfold Wings

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.

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.

Adjust the tractor's hydraulic flow to the “Transport” and “Work” circuits to 4 - 6 gpm flow. Engage the tractor hydraulics. (See the tractor’s operator’s manual for the correct procedure.)

Unfold the wings with the “Transport Circuit” (hydraulic hoses with the “Red” markers), until the wings are fully extended.

Raising And Lowering The Toolbar

⚠ 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.

Using the “Work Circuit” (hydraulic hoses with the “Blue” markers) control of the tractor, slowly lower the toolbar until the center coulters are contacting the ground (Reverse tractor control to raise the toolbar). The tractor/implement must be moving when the coulters engage the ground or damage may occur.

NOTE: During normal operation, the wings will lower first, the center section will follow.

IMPORTANT

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

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

⚠ WARNING

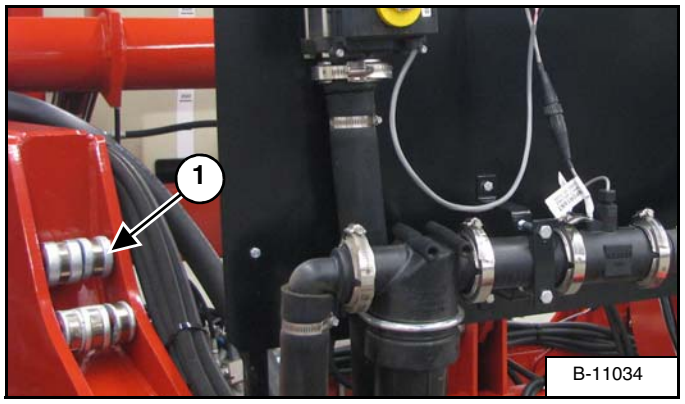
Never attempt to fold / unfold the wings unless the toolbar is in the FULLY RAISED FIELD position. Failure to comply may result in severe equipment damage.

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 and adjusting the height of the gauge wheels. Use equal lengths of segments on both cylinders.

Figure 31

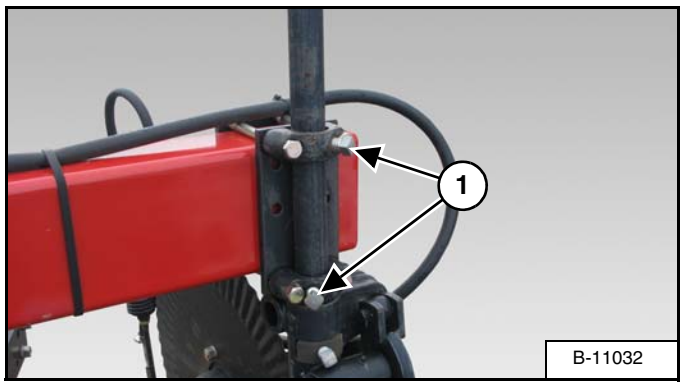


Stroke control segments (Item 1) **[Figure 31]** are stored on both sides of the hitch frame.

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. Adjust individual coulters as needed to obtain the desired depth.

Figure 32



Loosen set screws (Item 1) **[Figure 32]** on a coulter assembly. Move the assembly up or down to the desired depth. Tighten the set screws.

Hydraulic Cylinder Functions

Use the following table to check the tractor valve function against the cylinder behavior. The hydraulic flow to the Transport and Work Circuits should not exceed 6 gpm. The system pressure will need to be 2000 psi minimum.

DIRECTIONAL VALVE FUNCTION IN TRACTOR	DESIRED DIRECTIONAL VALVE CONFIGURATION	TOOLBAR ACTION	DESIRED CYLINDER ACTION		
			CENTER CYLINDER	INNER WING CYLINDER	OUTER WING CYLINDER
Transport Circuit	Spring Centered	Fold Up For Transport	Extend	Retract	Retract
	Spring Centered	Unfold For Operation	No Movement	Extend, Stops When Toolbar Raised Approx. 10°	Extend
Work Circuit	Spring Centered (Detent Is Optional)	Lift For End Row Turn	Extend	Retract, Stops When Toolbar Raised Approx. 6°	No Movement
	Detented (Must Be Detented Throughout Application Cycle)	Down For Fertilizer Application	Retract	Extend	Extend

⚠ CAUTION

1. **Operate only on a pressure compensated, load sensing, or flow compensated closed center pump system. Use of an open center tractor hydraulic system will result in the hydraulic flow continuously bypassing through the relief valve resulting in an increase engine horsepower requirement to turn the pump at the relief valve pressure. This will overheat the oil and the tractor very quickly.**

2. **It is important to note that some older tractors will have a detented valve that will kick out when system pressure is achieved. This valve must be over-ridden. The valve must remain in detented position during field operations. Maintaining pressure will allow the system to keep the toolbar at a constant depth.**

Centrifugal Pump (Option)

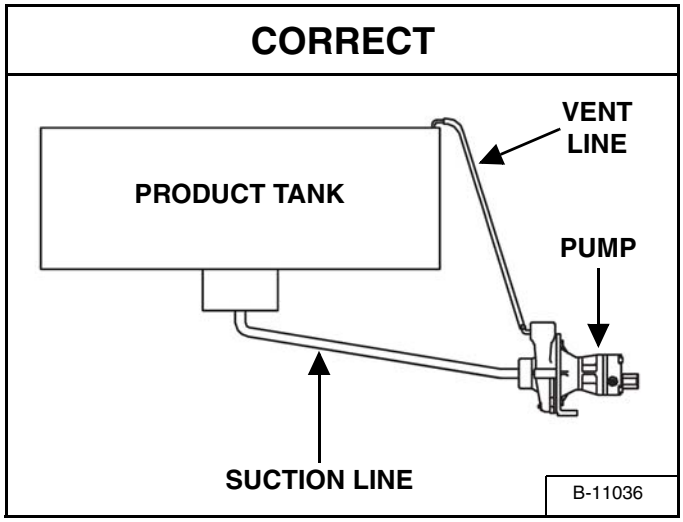
The pump must always run in a “flooded” condition. Operating the pump in a “non-flooded” condition will cause severe seal damage and possible pump damage.

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 the following guidelines:

Figure 33



The pump inlet must be mounted below the product tank sump to allow gravity to naturally fill the pump with liquid **[Figure 33]**.

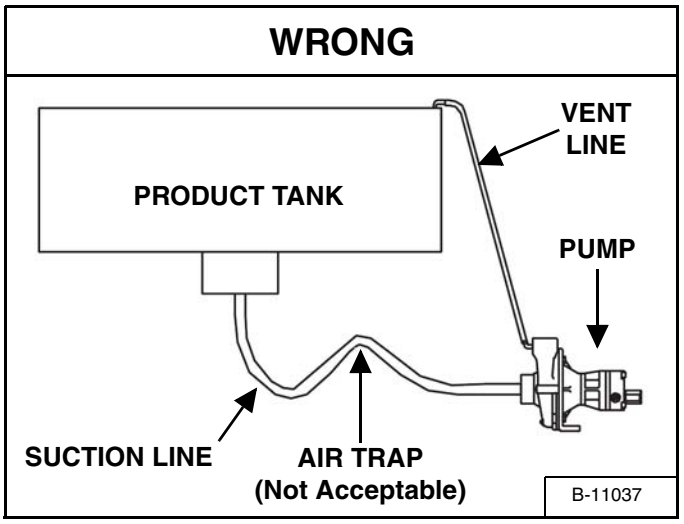
The suction line must have a continual rise from the pump inlet to the tank sump **[Figure 33]**.

The pump must have the vent line plumbed to it **[Figure 33]**.

⚠ WARNING

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

Figure 34



An air trap point will occur if the suction line does not gradually rise from the pump inlet **[Figure 34]**.

Spray Monitor

IMPORTANT

Cover the monitor daily to prevent damage to the equipment.

Figure 35

Cover the monitor daily or when not in use to prevent UV damage to the equipment **[Figure 35]**.

FLOW TABLE FOR WATER					
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

FLOW TABLE FOR LIQUID FERTILIZER			
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 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.**

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.

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 "Entering And Leaving The Operator's Position" on page 45.)

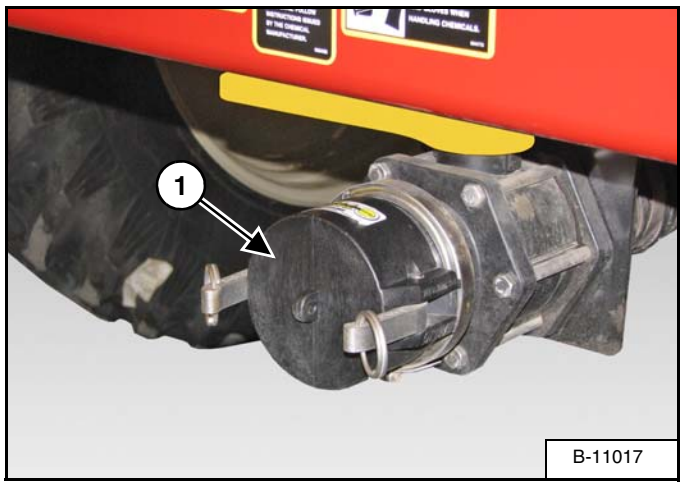
IMPORTANT

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

IMPORTANT

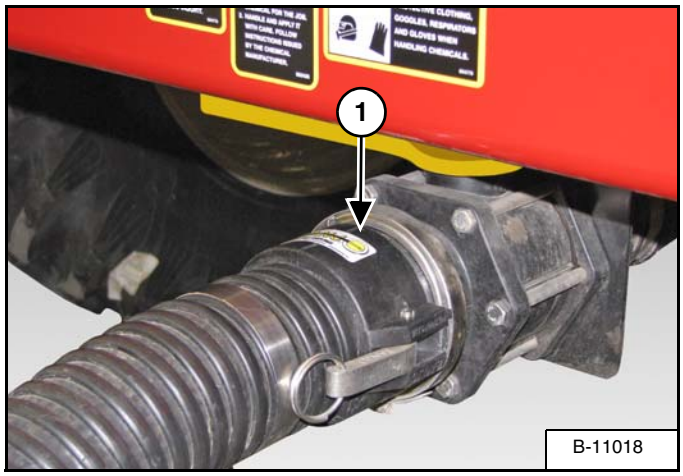
Some items have been partially disassembled and/or removed to prevent damage to the tank, pump, and other components caused by freezing temperatures. Please install/assemble prior to first use.

Figure 36



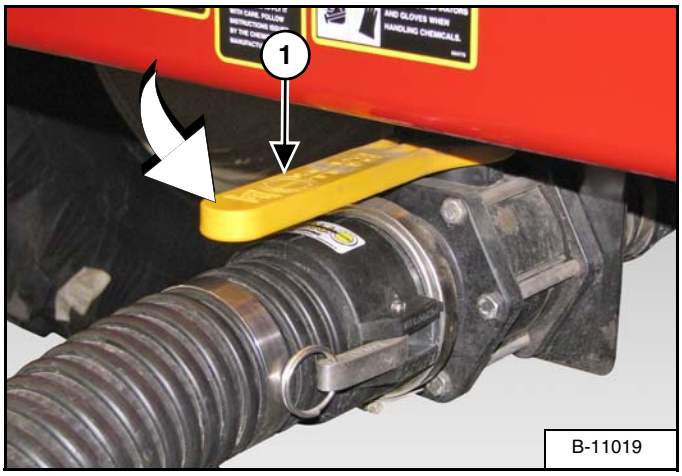
Remove fill cap (Item 1) **[Figure 36]**.

Figure 37



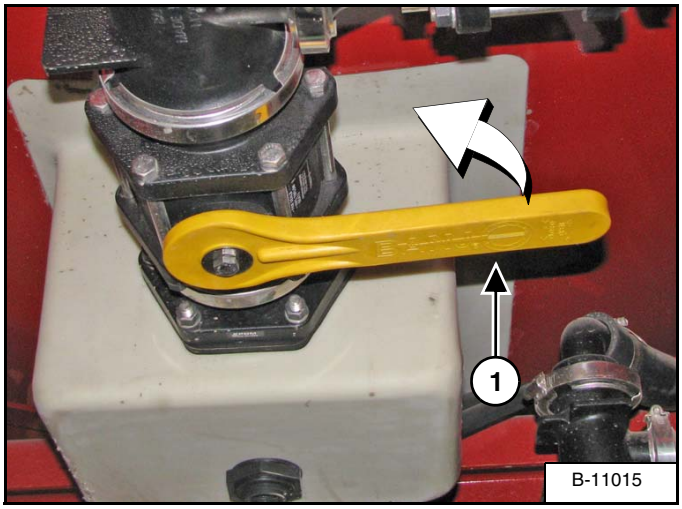
Install the fill hose (Item 1) **[Figure 37]**.

Figure 38



Open fill valve (Item 1) **[Figure 38]**.

Figure 39



Open tank valve (Item 1) **[Figure 39]**.

Fill the product tank to the desired level.

Monitor the rear sight gauge while filling the product tank. Do not over-fill.

Once the product tank has been filled to the desired level, close the tank valve (Item 1) **[Figure 39]** and the fill valve (Item 1) **[Figure 38]**.

Disconnect the fill hose (Item 1) **[Figure 37]**.

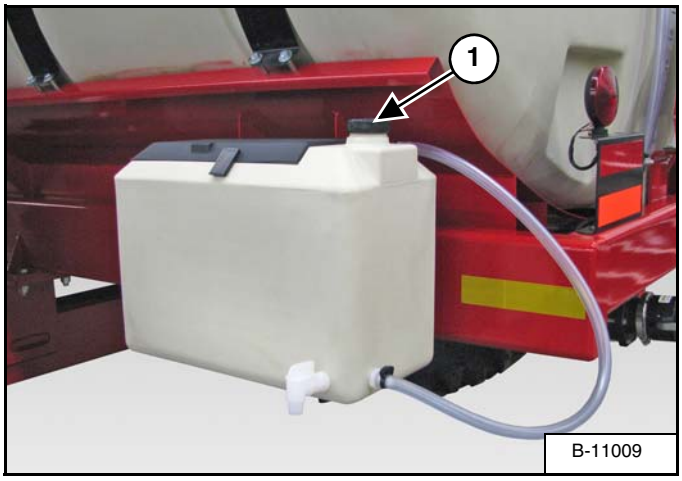
Install fill cap (Item 1) **[Figure 36]**.

Filling Fresh Water Tank

IMPORTANT

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

Figure 40



Remove fill cap (Item 1) **[Figure 40]**.

Fill fresh water tank with clean fresh water daily (Do not allow tank to run low on fresh water). Install fill cap.

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. (See “TRANSPORTING” on page 64.)

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

Unfold and fully extend the wings. (See “Unfold Wings” on page 52.)

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.

Move the tractor and fertilizer applicator forward and fully lower the toolbar. (See “Raising And Lowering The Toolbar” on page 53.)

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, injectors or knives are approximately 2” to 3” below the soil surface.

Adjust coulters as needed to obtain the desired depth. (See “Setting The Toolbar / Coulter Depth” on page 53.)

Adjust wing down-load as needed to maintain the desired depth. (See “ADJUSTING HYDRAULIC PRESSURE” on page 72.)

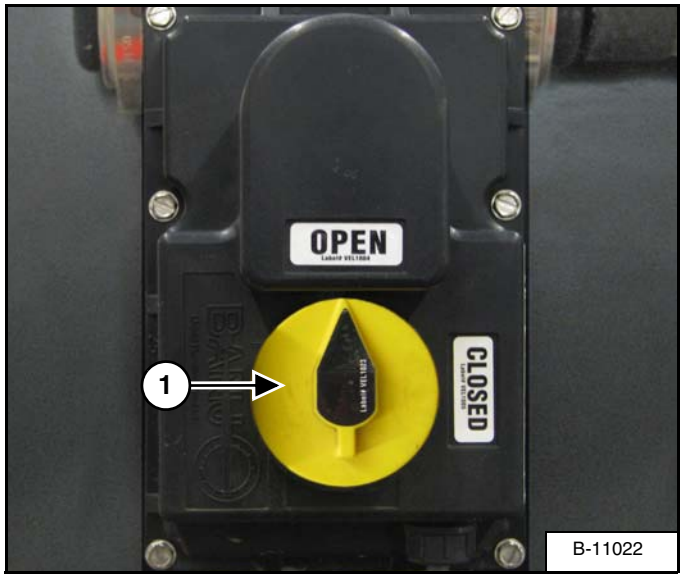
Spray System Test - Ace Centrifugal Pump (Option)

IMPORTANT

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

Dry Test

Figure 41



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

Turn the spray controller "ON".

Press wing section switches on the controller, one at a time and operate each of the manifold valves (Item 1) **[Figure 41]**.

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

Add approximately 300 gallons of clean water to the product tank. (See "Filling The Product Tank" on page 57.)

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

Verify that there is liquid in the pump vent line.

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.

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.

Turn all wing section switches "ON".

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

Engage product pump hydraulic circuit (White markers) and place into "detent" position. (See the tractor's operator's manual for the correct procedure.)

Operate the product pump for one minute to flush debris from supply lines (If required). 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 "nozzle output check 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.

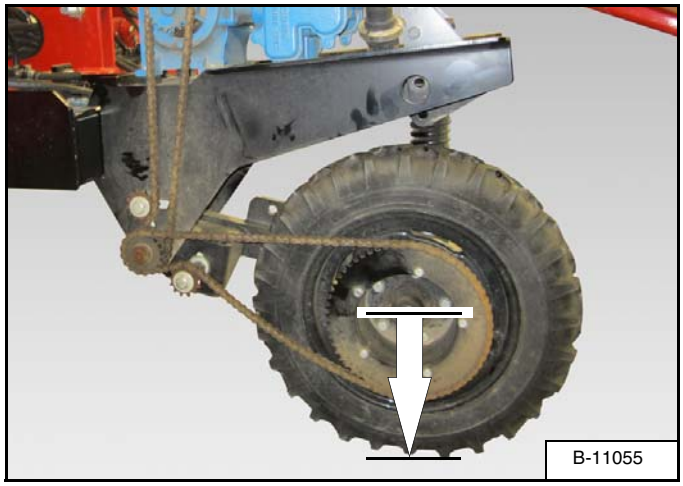
John Blue Twin Piston Pump Test (Option)

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 42



Measure the loaded radius from the center of the hub to the bottom of the tire where it rests on the ground **[Figure 42]**.

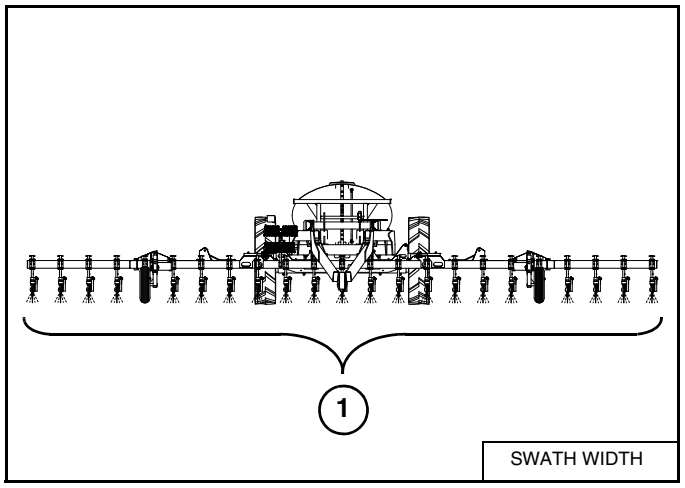
Press Wheel Drive Arrangement

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

Figure 43



To determine the swath width, 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 the outlets are not evenly spaced, figure the entire length of the boom or toolbar from end nozzle to end nozzle and allow for coverage beyond the ends (Item 1) **[Figure 43]**.

Example: an 11 row boom at 30 inch spacing, would have a swath width of 330 inches.

Setting The Pump

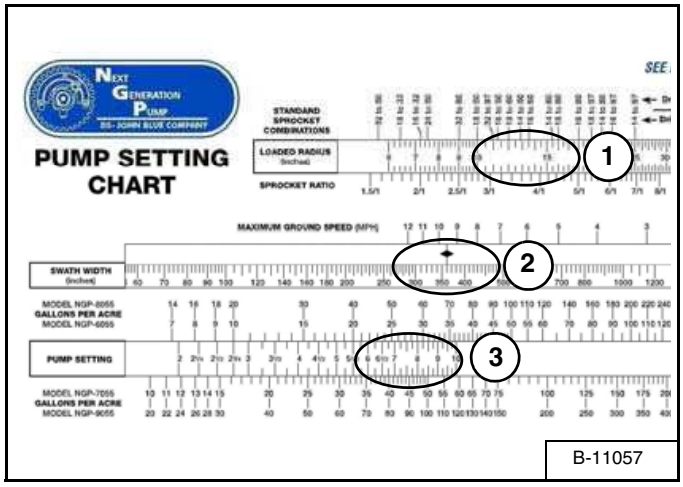
Read the desired pump setting from the bottom scale on the pump setting chart.

Loosen the setting pointer nut and rotate the setting hub until the setting pointer is over the desired setting. 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 inch swath.

The following steps will determine correct pump setting:

Figure 44



1. Set loaded radius of tire (13.5”) under the sprocket combination of 16 to 60 in the top window (Item 1) **[Figure 44]**.

2. Set the swath width (360”) under the diamond in the middle window (Item 2) **[Figure 44]**.

3. Read that the pump setting is approximately 9 at 33 gallons per acre on the NGP-6055 scale in the bottom window (Item 1) **[Figure 44]**.

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 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.

NOTE: When lowering the toolbar in the field, the wings will come down first then the center section (Normal operation).

As the front tires of the tractor make contact with the field / rows (starting point), fully lower the toolbar by placing the "Work Circuit" switch directly into detent.

NOTE: Placing the "Work Circuit" switch into detent will maintain constant down pressure during the application process.

Engage the product pump and turn on the sectional control valves using the spray controller to start application process.

As the tractor approaches the end of the field / rows, turn the sectional control valves "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 and place the "Work Circuit" switch into detent.

Continue the application process until the desired area / field is complete.

IMPORTANT

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

Stop the tractor and fertilizer applicator on a level surface in the field.

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" on page 77.)

Place the toolbar and wings in the transport position. (See "TRANSPORTING" on page 64.)

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 7 pin electrical harness is connected and safety lights are working properly.

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 the transport position. (See "Raising And Lowering The Toolbar" on page 53.)

WARNING

Never attempt to fold / unfold the wings unless the toolbar is in the FULLY RAISED FIELD position. Failure to comply may result in severe equipment damage.

Fold wings. (See "Unfold Wings" on page 52.)

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
Coulters float out of the ground during field operation.	Tractor hydraulic valve is not placed into detent.	Make sure that the Work Circuit is in detent during the entire work cycle.
	Reducing / relieving valve pressure is not set high enough for soil conditions.	Adjust the valve pressure up by 100 psi increments until gauge wheels maintain constant contact with the ground.
Outer wings drift back during field operation.	Tractor hydraulic valve is not placed into detent.	Make sure that the Work Circuit is in detent during the field operation.
Wings do not raise or lower evenly.	Flow divider is not functioning properly.	Check, replace if necessary.
When the wings are horizontal and the directional valves are not being used, the wings drift oppositely, one up, one down.	The pilot operated check valves are not operating properly.	Check, replace if necessary.
During the initial unfold with wings completely folded, the outer wing cylinders begin to extend immediately.	Tractor's hydraulic flow is set too high.	Reduce tractor's flow until wings fold properly, 4 to 6 GPM.
	Sequence valve enabling pressure is set too low.	Adjust the valve pressure by 1/2 turns (180°) clockwise until outer wings remain fixed during the initial unfold stage.
During transport unfold, toolbar does not stop before toolbar wings achieve the unfolded, level position.	No power to microswitch, solenoid valve (2) is not enabled.	Check to make sure all electrical connections are good.
	Microswitch is improperly adjusted.	Adjust microswitch position to enable solenoid valves at the correct height.
	Solenoid valve (2) is not functioning properly.	Check, replace if necessary.

PROBLEM	CAUSE	CORRECTION
During field operation, lifting the toolbar for end row turns, the wings do not stop slightly above level.	No power to microswitch, solenoid valve (1) is not enabled.	Check to make sure all electrical connections are good.
	Microswitch is improperly adjusted.	Adjust microswitch position to enable solenoid valves at the correct height.
	Solenoid valve (2) is not functioning properly.	Check, replace if necessary.
When lowering toolbar to field operation position, the center cylinder chatters or does not lower.	Counter balance valve is cycling in rapid succession, insufficient oil flow.	Increase oil flow from tractor SCV.
	Counter balance valves out of adjustment.	Increase the tractor engine rpm to increase hydraulic oil flow.
	Defective counter balance valve.	Replace valve.
Outer coulters run, too deep or center section runs too shallow. The toolbar does not seem to be parallel to the soil profile.	Improper depth settings.	Change depth control stops on the center cylinders.
		Reset wing gauge wheel height.
During transport unfold, toolbar does not move from folded position.	Reducing/relieving valve pressure set beneath pressure needed to extend mid-wing.	Increase valve setting by turning set screw clockwise by quarter turns until toolbar unfolds.
During transport unfold, toolbar chatters and / or bounces.	Tractor oil flow through transport cicuit valve is set too high.	Reduce tractor flow rate until chatter or bounce stops, 4 to 6 GPM

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	Locations
Daily Maintenance (or every 8 hours)								
1	Fresh Water Tank				•		•	
2	Coulter Lower Parallel Arm			•				
3	Coulter Pivots			•				
4	Spray Monitor					•		
Weekly (or every 50 hours)								
4	Line Strainer Screen		•					
5	Inner Wing Fold Bushings			•				
5	Outer Wing Fold Bushings			•				
Every 250 hours								
6	Wheel Bearings (Running gear and gauge wheels)			•				
7	Coulter Hub Bearings			•				
Annually (or every 500 hours)								
8	Product Tank		•					
9	Machine	•	•					
10	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.

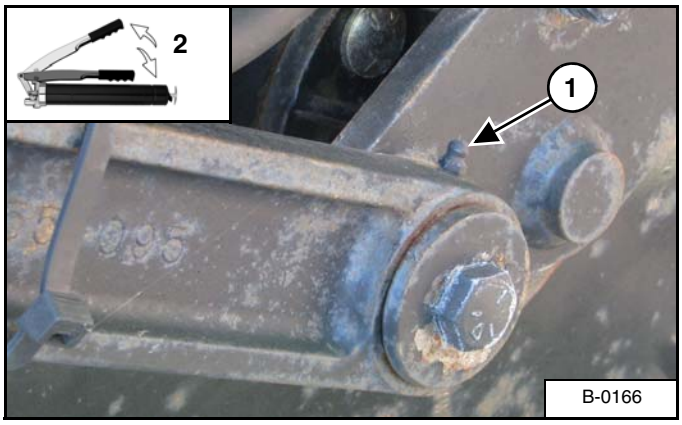
Locations

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.

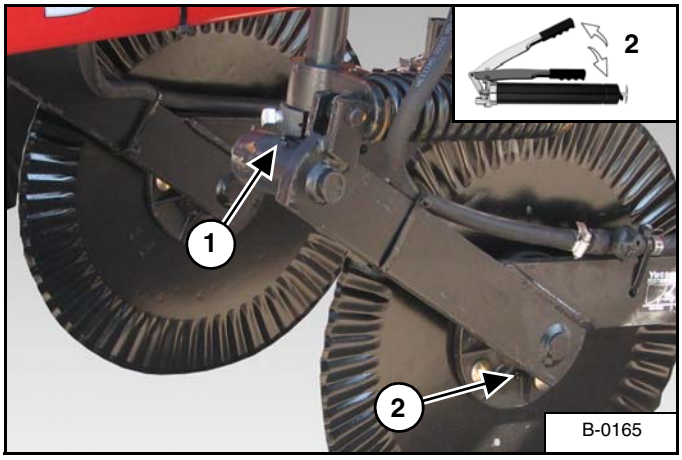
Lubricate the following grease locations EVERY 8 HOURS:

Figure 45



Apply two pumps of grease to the coulter lower parallel arm (Item 1) **[Figure 45]**.

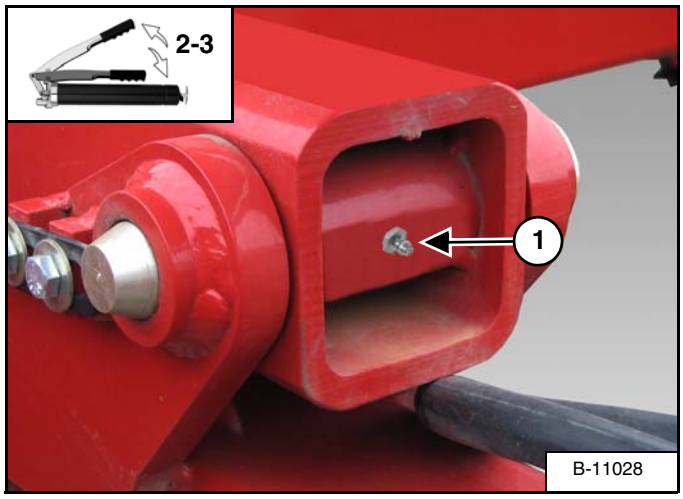
Figure 46



Apply two pumps of grease to the coulter pivots (Item 1) and to the pressed hub assembly (Item 2) **[Figure 46]**.

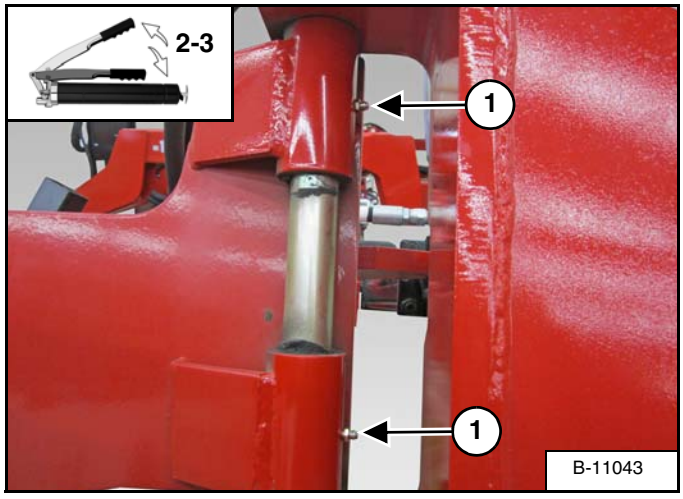
Lubricate the following grease locations EVERY 50 HOURS:

Figure 47



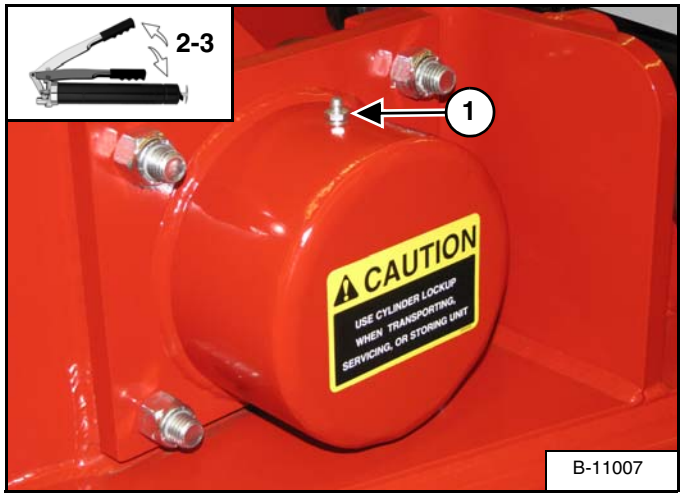
Apply two - three pumps of grease to the inner wing fold bushings (Item 1) **[Figure 47]**.

Figure 48



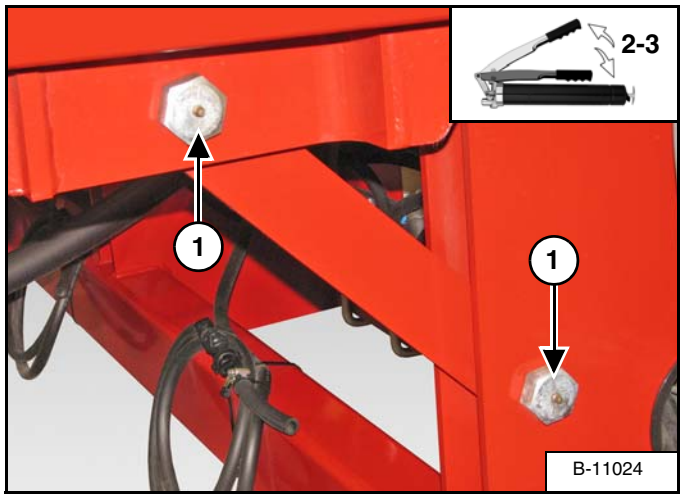
Apply two - three pumps of grease to the outer wing fold bushings (Item 1) **[Figure 48]**.

Figure 49



Apply two - three pumps of grease to the rockshaft caps (Item 1) **[Figure 49]**.

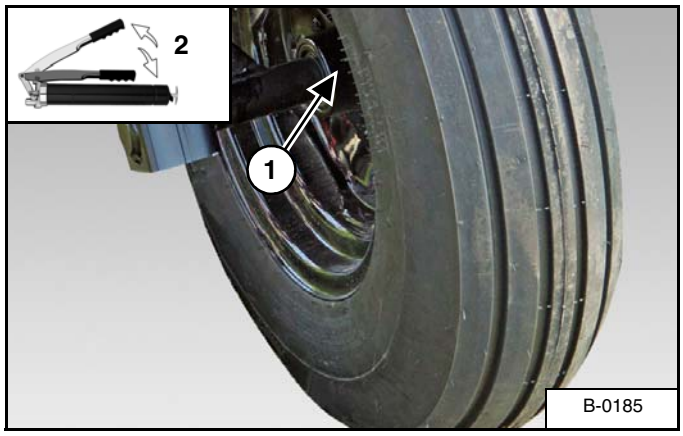
Figure 50



Apply two - three pumps of grease to the lift assist bushings (Item 1) **[Figure 50]**.

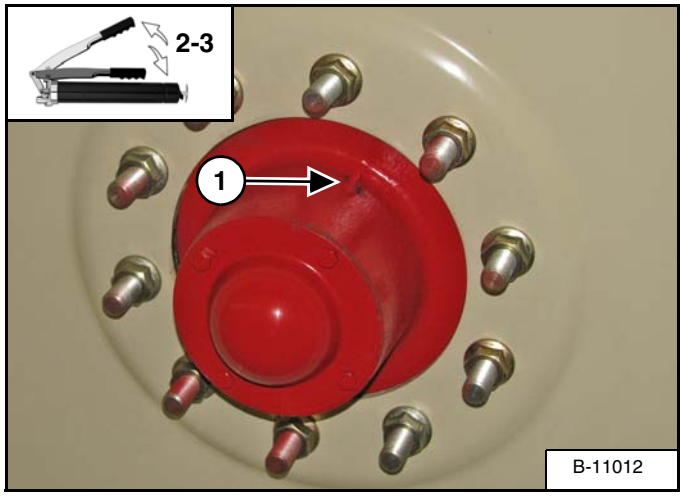
Lubricate the following grease locations EVERY 250 HOURS:

Figure 51



Apply two pumps of grease to the gauge wheel hubs (Item 1) **[Figure 51]**.

Figure 52



Apply two - three pumps of grease to the running wheel bearings (Item 1) **[Figure 52]**.

ADJUSTING HYDRAULIC PRESSURE

Procedure

NOTE: The pressure reducing valve (PR1) controls the amount of downward pressure applied to the outer coulters. The adjustment range is from 800 to 1,500 PSI. The factory setting is 800 to 1,100 PSI, which is adequate for most conditions.

IMPORTANT

DOWN PRESSURE ON OUTER COULTERS

- **Too much down pressure will put unnecessary stress on the machine and will put more load on the gauge wheels.**
- **Too little pressure may not keep the coulters in the ground at the proper depth.**

IMPORTANT

Always check with a pressure gauge while the SCV control lever is left in the detented position. DO NOT adjust the pressure without a pressure gauge.

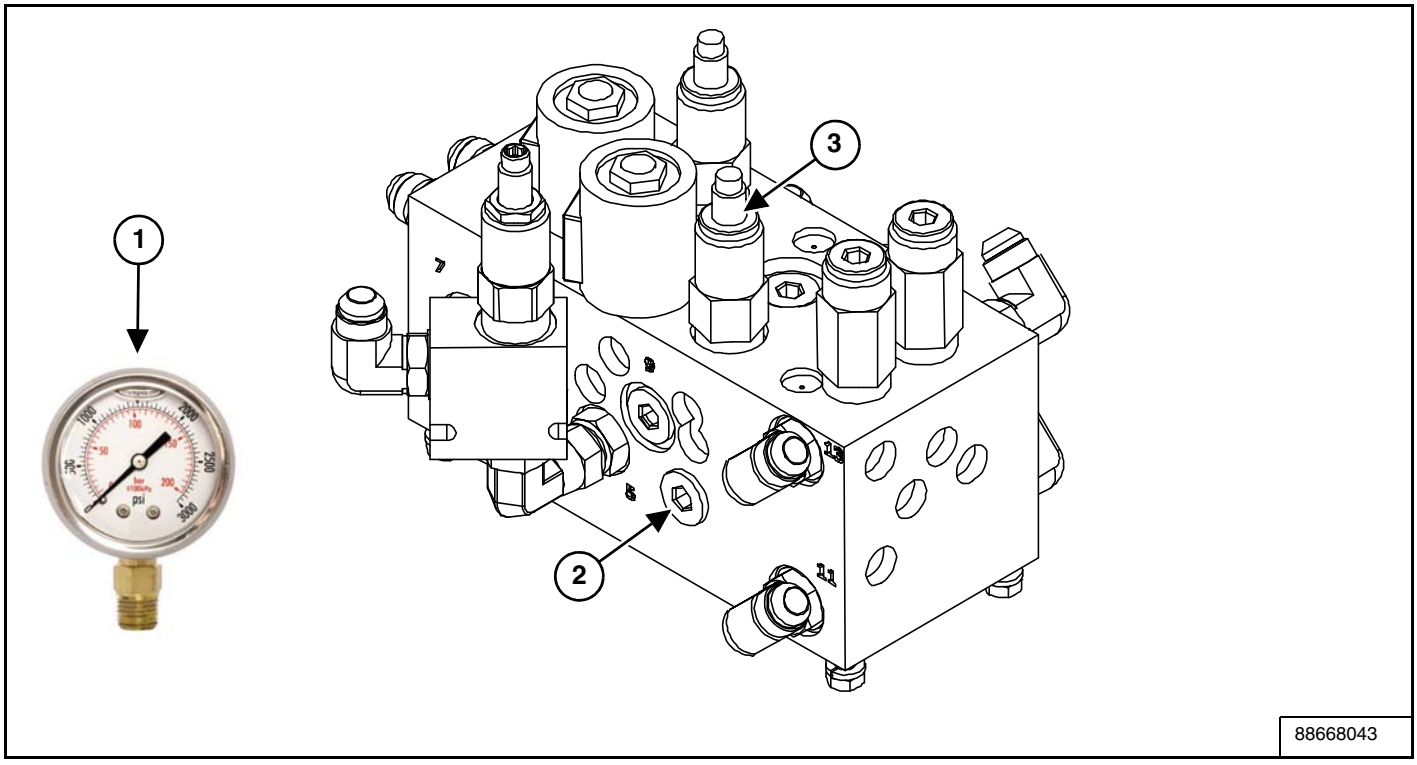
IMPORTANT

DO NOT MAKE HYDRAULIC PRESSURE ADJUSTMENTS ON HARD / PAVED SURFACE.

Move the tractor and fertilizer applicator to a soft level area.

Engage the parking brake, relieve hydraulic pressure, turn engine off and leave the operator's position. (See "Entering And Leaving The Operator's Position" on page 45.)

Figure 53



Install a 3000 PSI gauge (Item 1) in gauge port 15 (Item 2) **[Figure 53]** of the hydraulic block.

NOTE: This plug is ORB, use the correct fitting when installing the 3000 PSI gauge.

Verify that all hydraulic hoses and electrical harnesses are connected to the tractor.

Enter the tractor, start the engine and engage the tractor's auxiliary hydraulics.

Unfold wings and lower the toolbar to the ground.

Lock or place the SCV control lever in detent (Work Circuit). Run engine at operating speed.

Leave the operator's position.

Using a 3/4" (19 mm) wrench, loosen the lock nut on the pressure reducing valve (Item 3) **[Figure 53]**.

While watching the 3000 PSI gauge,

- Turn the set screw clockwise to increase pressure or turn set screw counter-clockwise to decrease pressure until the desired pressure is achieved

Tighten lock nut on the pressure reducing valve.

Enter the operator's position, release parking brake, raise the toolbar and move the tractor and fertilizer applicator to the field (work area). Test the fertilizer applicator in the field (work area).

NOTE: If further adjustment is required, repeat the above procedure until the desired pressure is achieved.

Dealer / Grower Supplied Coulters Procedure

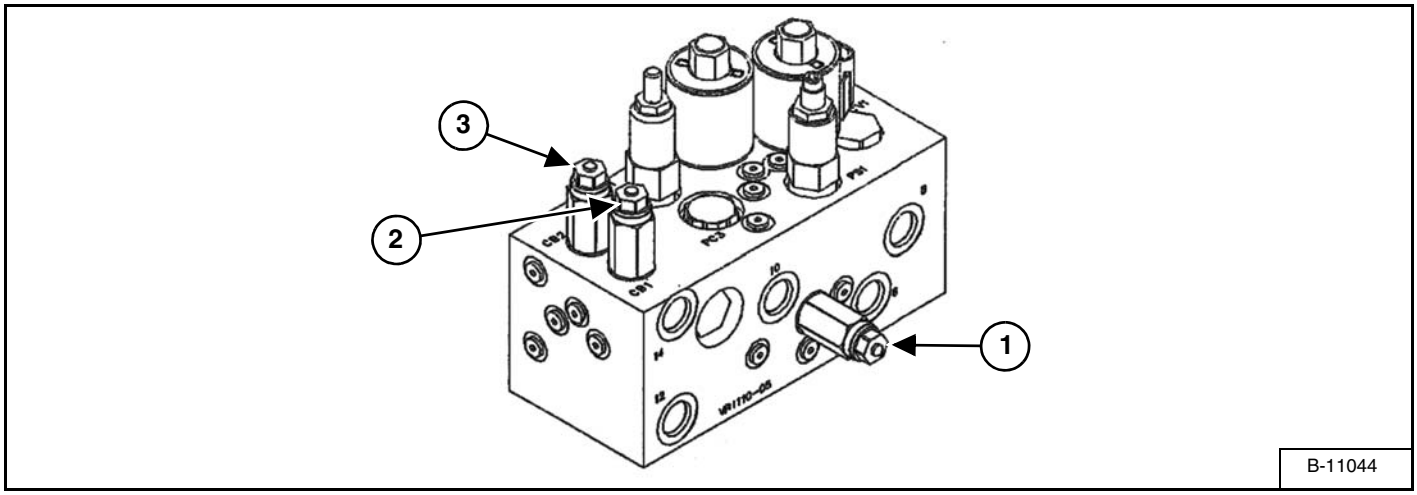
IMPORTANT

Delivery of the fertilizer applicator without factory supplied coulters may require additional adjustment of the hydraulic system to accommodate the weight of the coulters used. This unknown weight directly affects the hydraulic pressures in the folding / unfolding and raising / lowering of the toolbar.

WARNING

Folding and unfolding of the fertilizer applicator toolbar functions are controlled hydraulically by control valves that rely on pressure to open and close. The different hydraulic pressures in the cylinders may cause the folding and unfolding functions of the fertilizer applicator toolbar to not function correctly.

Figure 54



Follow these steps to adjust the counter balance valves:

1. Begin with the fertilizer applicator in the fully folded, transport position.

NOTE: Verify that all cylinder stops are in place before continuing to step 2.

2. Adjust counterbalance valve 3 (CB3) (Item 1) **[Figure 54]**. Turn adjustment screw all the way in (clockwise). After adjustment screw is turned all the way in, back the adjustment screw out 1-1/4 turns (counterclockwise).
3. Adjust counterbalance valves 1 & 2 (CB1 & CB2) (Items 2 & 3) **[Figure 54]**. Turn adjustment screw out (counterclockwise) so that there are 9 to 10 threads showing above the jam nut on the valve when the jam nut is tightened.
4. Remove all stops.
5. Using the Transport Circuit, unfold the fertilizer applicator.
6. For further adjustments (See “TROUBLESHOOTING” on page 67.)

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.**

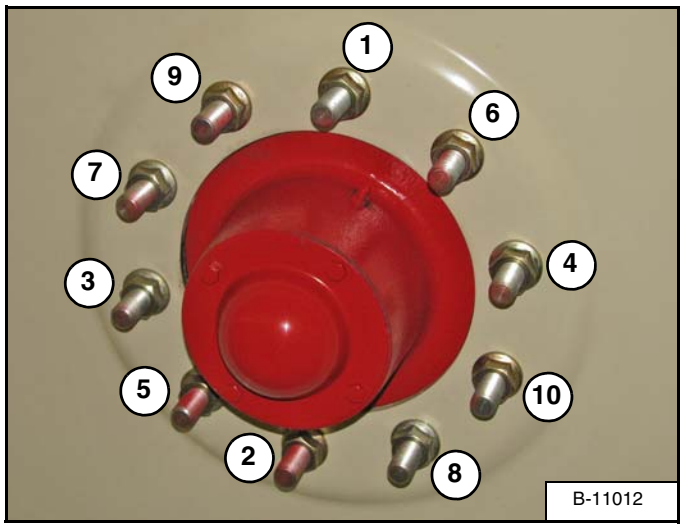
Place chock blocks behind and in front of the opposite tire to be removed.

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 ten wheel nuts and tire assembly.

Figure 55



Install the new tire with the valve stem facing out.

Reinstall ten wheel nuts (Items 1 - 10) **[Figure 55]**.

Tighten wheel nuts in a criss-cross pattern **[Figure 55]**. 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 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.**

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" on page 57.)

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.

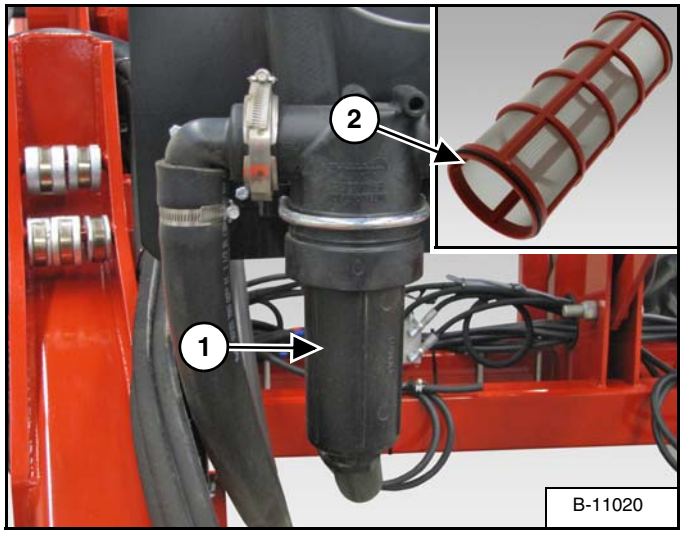
Cleaning The Line Strainer Screen

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 56



Loosen and remove the line strainer canister (Item 1) **[Figure 56]** by hand (do not use a wrench).

Remove screen (Item 2) **[Figure 56]** 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.

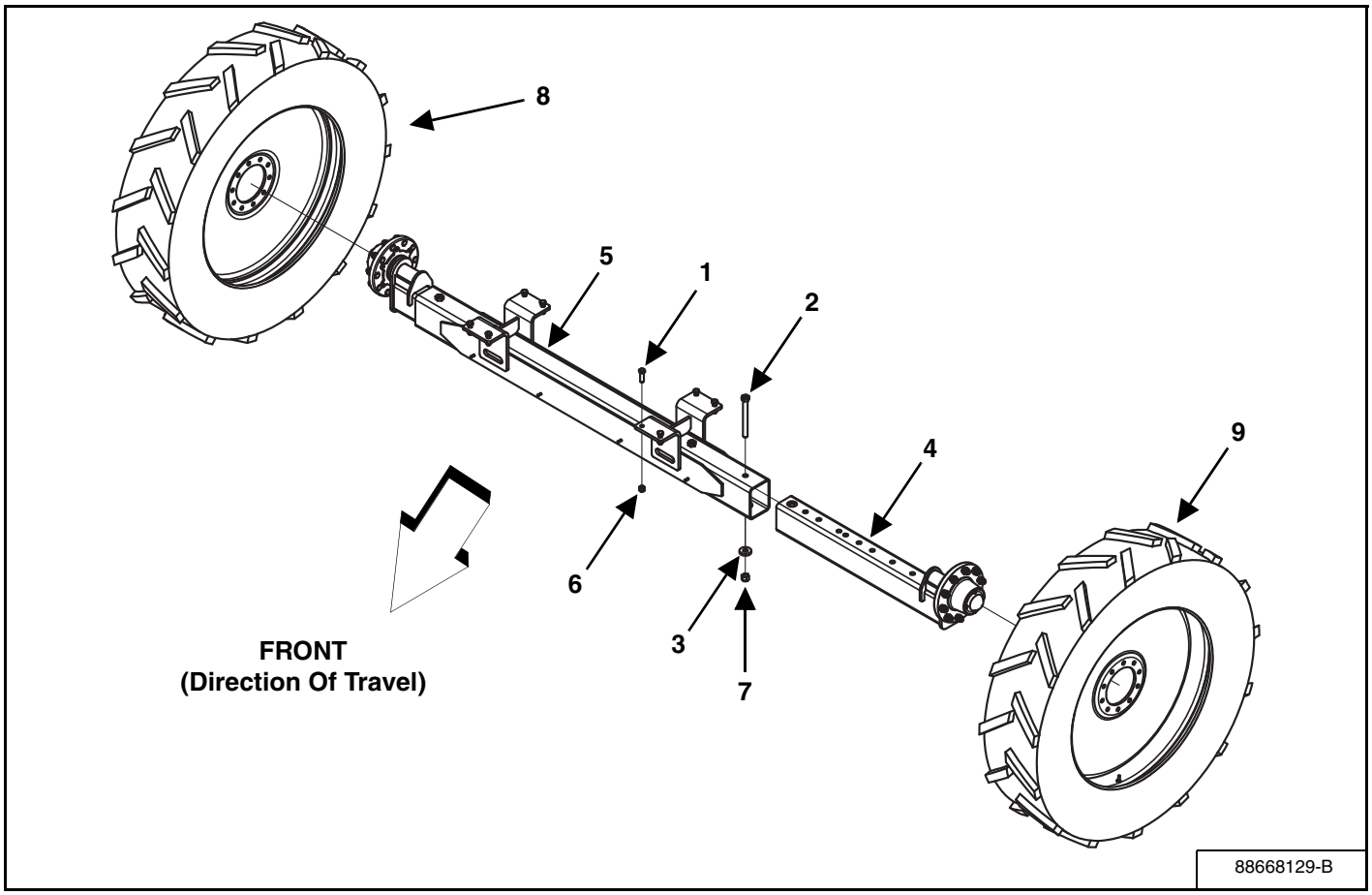
Farm King

PARTS IDENTIFICATION

GENERAL PARTS INFORMATION

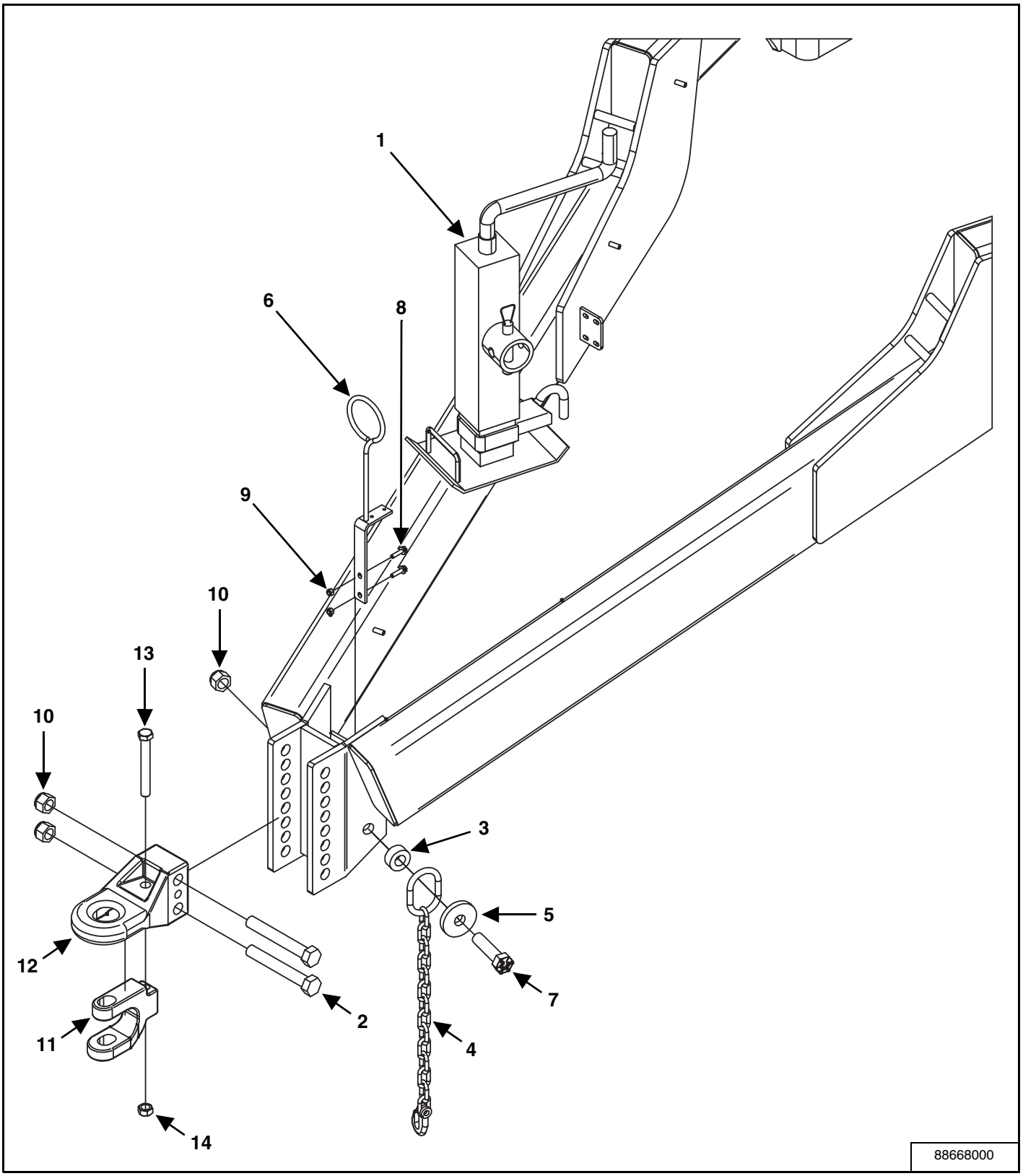
The parts identification section list descriptions, part numbers and quantities for all North America Base Model 1460 fertilizer applicators. Contact your Farm King dealer for additional fertilizer applicator parts information.

ADJUSTABLE AXLE



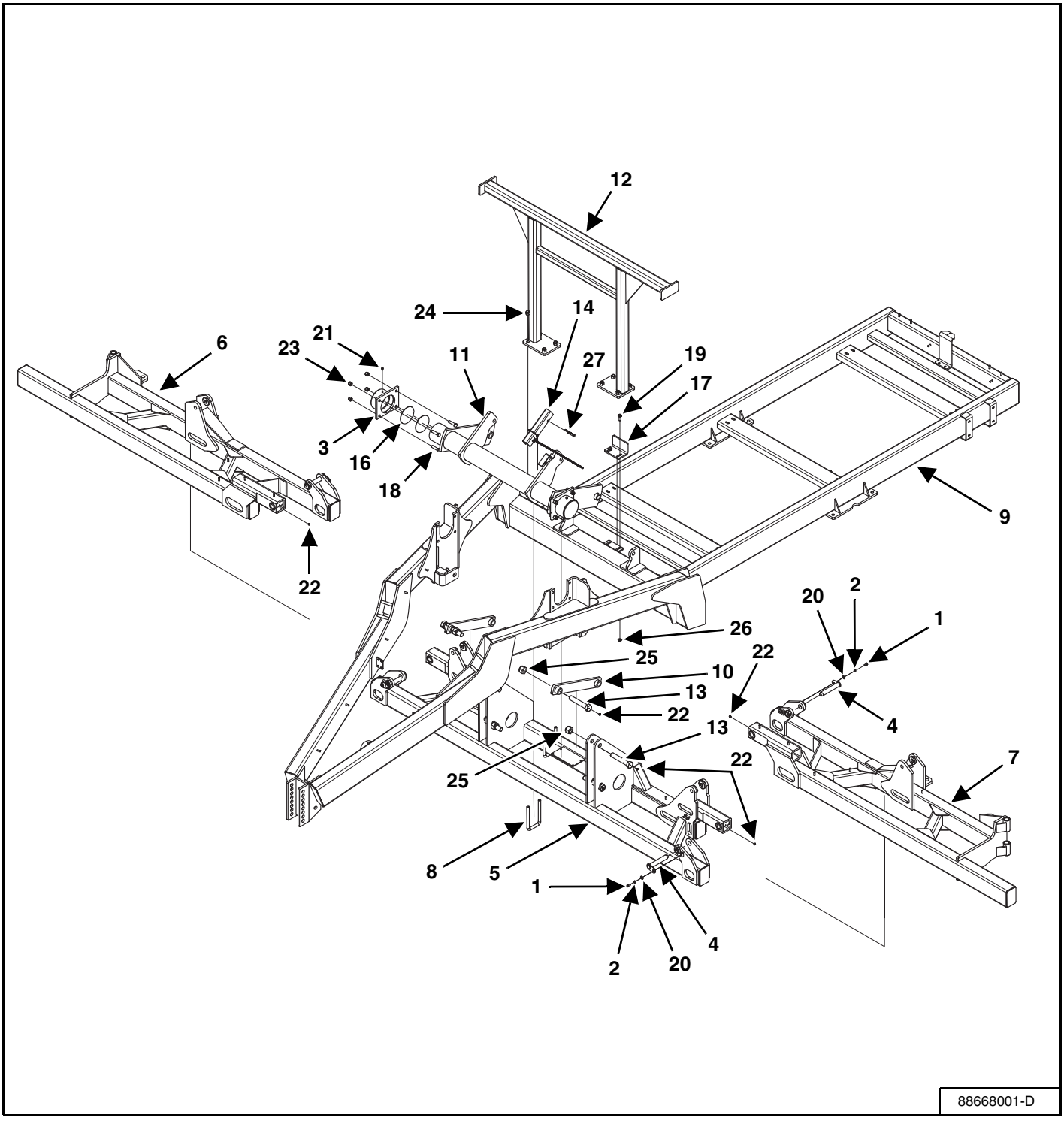
ITEM	PART NUMBER	DESCRIPTION	QTY
1	09706701	BOLT, CSHH G5 P 0.75” x 2.50”	8
2	88666423	BOLT, HEX, 1” x 9.50” G8 YZ	4
3	SX013733	WASHER; 2.50” x 0.5”, 1.047” HOLE	4
4	SX013949G	AXLE INSERT ASSEMBLY, GREEN	2
	SX013949R	AXLE INSERT ASSEMBLY, RED	2
5	SX014027G	AXLE WELDMENT, GREEN	1
	SX014027R	AXLE WELDMENT, RED	1
6	SXLN-075-NI-YZ	LOCKNUT, 3/4” NYLON INSERT YZ	8
7	SXLN-100-NI-YZ	LOCKNUT, 1 NYLON INSERT	4
8	SX018238C	LH TIRE / WHEEL ASSEMBLY, 380 CREAM	1
9	SX018239C	RH TIRE / WHEEL ASSEMBLY, 380 CREAM	1

PINTLE HITCH ASSEMBLY



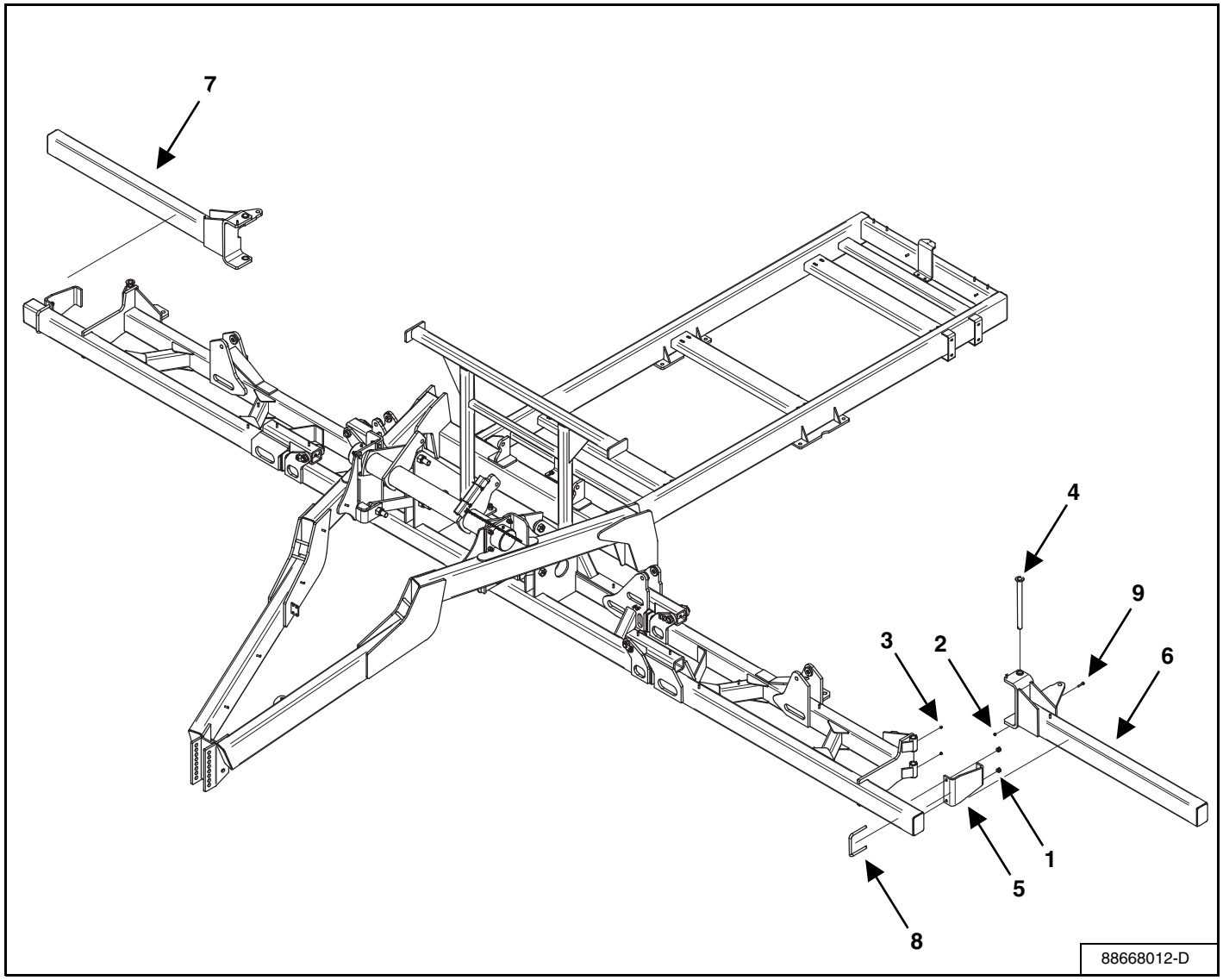
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88666482	5 TON JACK WELDMENT, TW	1
2	88668004	BOLT, 1.00” x 7.00” HEX GR 8 YZ	2
3	SX014072	TUBE RD, 2.00” OD x 1.020” ID x 0.88	1
4	SX014119	SAFETY CHAIN, 21000#	1
5	SX014120	PLATE, 0.50” x 3.25” DIA W/HOLE	1
6	SX014121	PIGTAIL WELDMENT	1
7	SXBH1004008YZ	BOLT, 1.00” x 4.00” HEX GR 8 YZ	1
8	SXBHF0311255YZ	BOLT’ 5/16” x 1.25” FLG GR 5 YLLX ZN	2
9	SXLN-031-NIYZ	LOCKNUT, 5/16” NYLON INSERT YZ	2
10	SXLN-100-NI-YZ	LOCKNUT, 1” NYLON INSERT	3
11	SXPPI-208VR	PINTLE CLEVIS OPTION	1
12	SXPPI-331VH	PINTLE HITCH CASTING	1
13	SXWB85	BOLT, WB82 CLEVIS OPTION	1
14	SXWB91	NUT, 3/4”-10 GR 8 CLEVIS, OPTION	1

FRAME ASSEMBLY



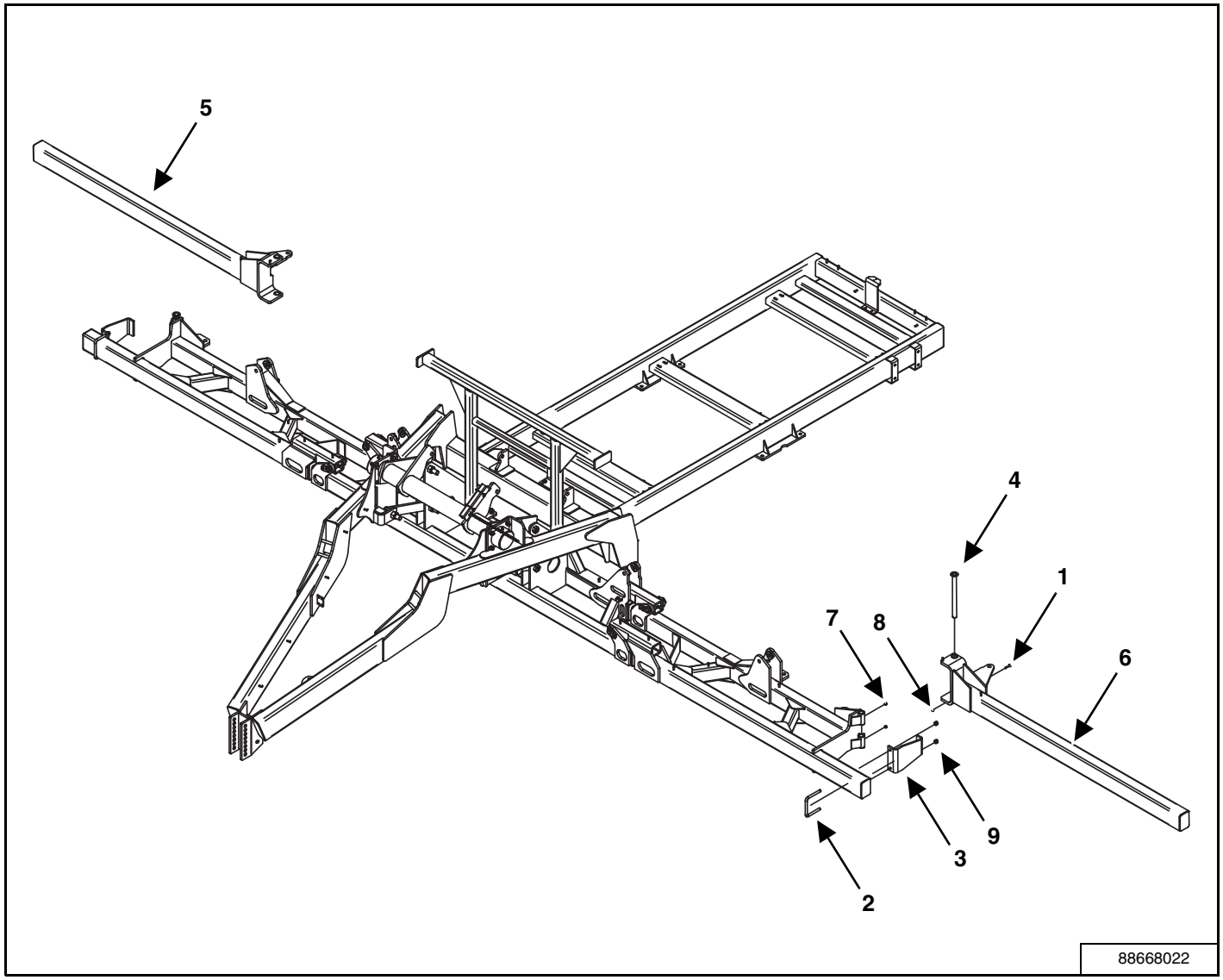
ITEM	PART NUMBER	DESCRIPTION	QTY
1	00012012	BOLT, 0.38” x 0.75” CSHH G5 P	4
2	00080680	LOCKWASHER, 0.375” PL	4
3	88666347	ROCKSHAFT CAP, GREEN	2
	88666346	ROCKSHAFT CAP, RED	2
4	88666434	PIN WELDMENT, 1.25” W / FLAG	4
5	88667986	CENTER DB WELDMENT, GREEN	1
	88667985	CENTER DB WELDMENT, RED	1
6	88669846	RH SEC. DB WELDMENT, GREEN	1
	88669845	RH SEC. DB WELDMENT, RED	1
7	88669843	LH SEC. DB WELDMENT, GREEN	1
	88669842	LH SEC. DB WELDMENT, RED	1
8	88668018	U-BOLT, 3/4” x 4” x 8” G5 SQ YZ	4
9	SX013935G	1460 FRAME WELDMENT, GREEN	1
	SX013935R	1460 FRAME WELDMENT, RED	1
10	SX014010G	LIFTING LINK WELDMENT, GREEN	2
	SX014010R	LIFTING LINK WELDMENT, RED	2
11	SX014040G	ROCKSHAFT WELDMENT, GREEN	1
	SX014040R	ROCKSHAFT WELDMENT, RED	1
12	SX014064G	WING BRACE WELDMENT, GREEN	1
	SX014064R	WING BRACE WELDMENT, RED	1
13	SX014082	PIN, 1.25” x 7” GR. 5 W/GREASE	6
14	SX014129	CYLINDER STOP ASSEMBLY	1
15	SX014551	CAULK, 12 OZ TUBE SEAM SEALER	1
16	SX014579	SHIM PLATE, 11 GA	4
17	SX014739	PLATE, 1/4” x 6” W / SLOTS	1
18	SXBH0622505YZ	BOLT, 5/8” x 2-1/2” GR 5	8
19	SXBHF0501508YZ	BOLT, 1/2” x 1.50” FLG GR8 YLLW ZN	2
20	SXFW-038YZ	FLATWASHER, 3/8” GR 5	4
21	SXG1610	STRAIGHT GREASE ZERK, 1/8” N	2
22	SXG1641	STRAIGHT GREASE ZERK, 1/4”-28	10
23	SXLN-062-NI-YZ	LOCKNUT, 5/8” NYLON INSERT YZ	8
24	SXLN-075-NI-YZ	LOCKNUT, 3/4” NYLON INSERT YZ	8
25	SXLN-125-NI-YZ	LOCKNUT, 1-1/4” NYLON INSERT	6
26	SXNTFTL050138Y	TOP LOCK NUT, 1/2”-13 FLG GR 8	2
27	SXPLI-031-250	LYNCH PIN, 5/16” x 2-1/2”	2

TOOLBAR ASSEMBLY (431.31 IN.)



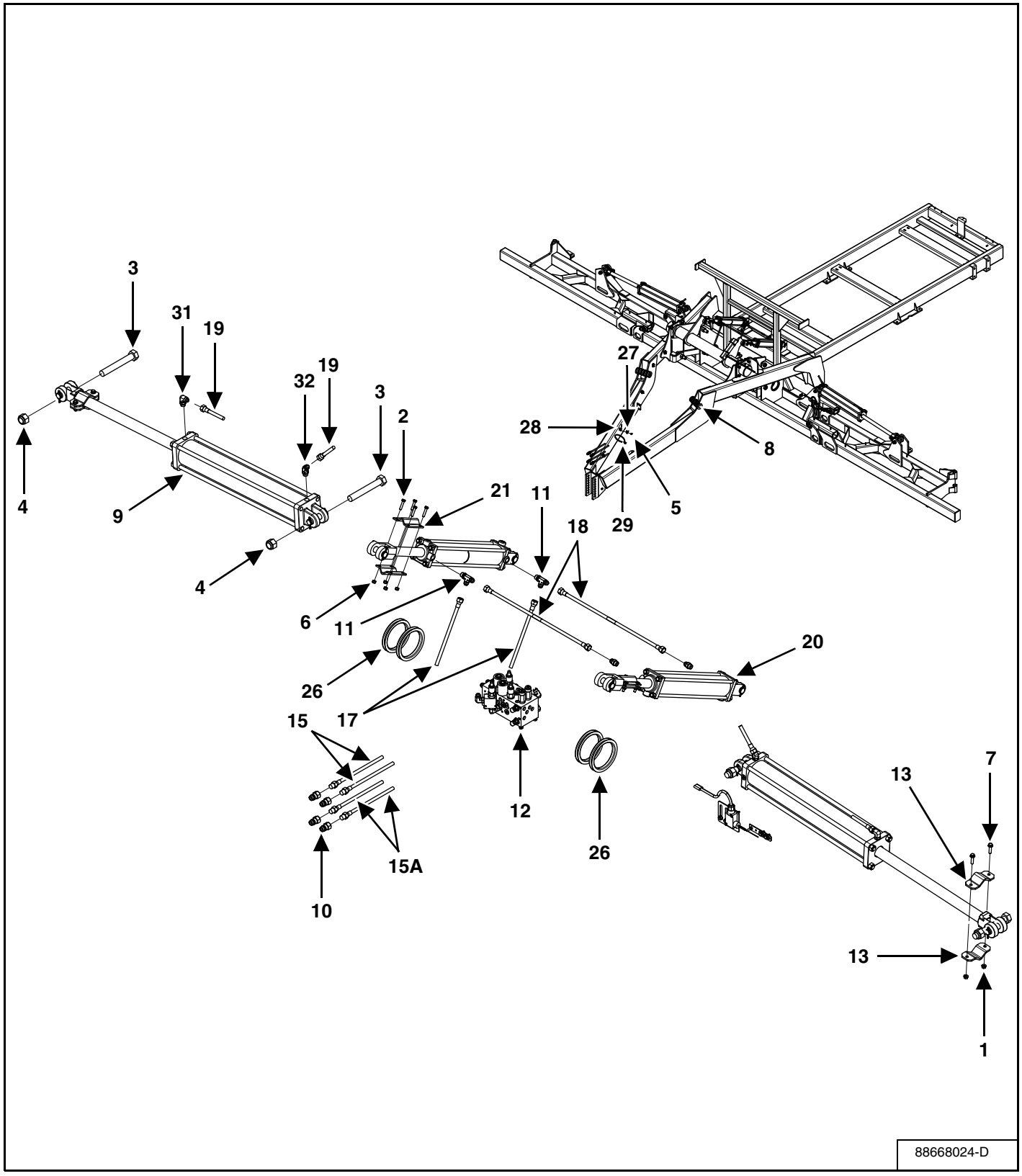
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SXLN-062-NI-YZ	LOCKNUT, 5/8” NYLON INSERT YZ	4
2	SXLN-031-NIYZ	LOCKNUT, 5/16” NYLON INSERT YZ	2
3	SXG1641	GREASE ZERK, 1/4”-28 STRAIGHT	4
4	SX014126	WING PIN WELDMENT	2
5	SX014049	WING STOP PLATE, 0.50”	2
6	SX014000G	LEFT WING DB WELDMENT, GREEN	1
	SX014000R	LEFT WING DB WELDMENT, RED	1
7	SX013995G	RIGHT WING DB WELDMENT, GREEN	1
	SX013995R	RIGHT WING DB WELDMENT, RED	1
8	88668019	U-BOLT, 5/8” x 6” x 5.50” G5 SQ YZ	2
9	09707515	BOLT, CSHH G5 P 0.31” x 1.75” 86505344	2

TOOLBAR ASSEMBLY (491.31 IN.)



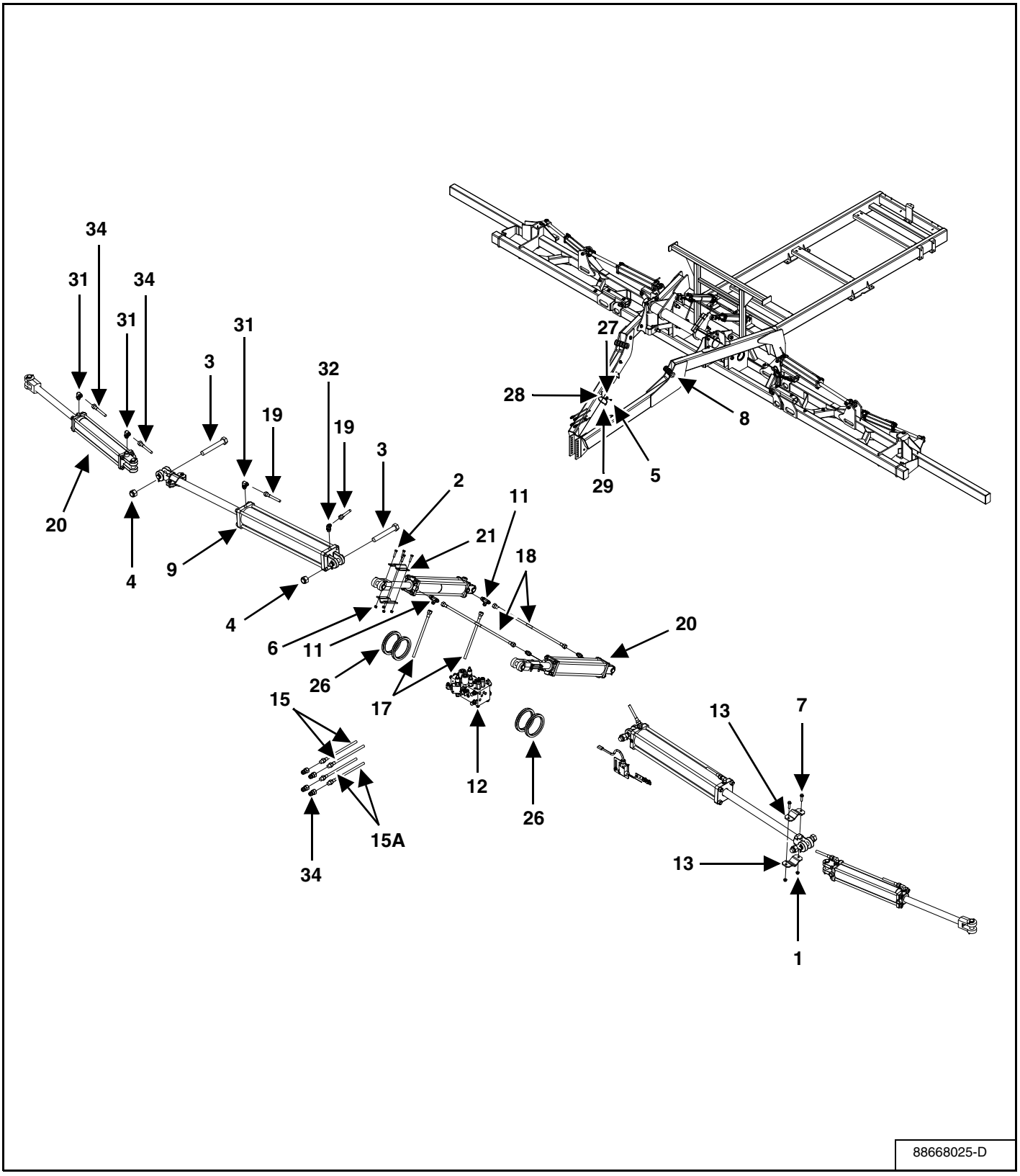
ITEM	PART NUMBER	DESCRIPTION	QTY
1	09707515	BOLT, CSHH G5 P 0.31” x 1.75” 86505344	2
2	88668019	U-BOLT, 5/8” x 6” x 5.50” G5 SQ YZ	2
3	SX014049	WING STOP PLATE, 0.50”	2
4	SX014126	WING PIN WELDMENT	2
5	SX014503R	8 FT. RIGHT WING WELDMENT, RED	1
	SX014503G	8 FT. RIGHT WING WELDMENT, GREEN	1
6	SX014504R	8 FT. LEFT WING WELDMENT, RED	1
	SX014504G	8 FT. LEFT WING WELDMENT, GREEN	1
7	SXG1641	GREASE ZERK, 1/4”-28 STRAIGHT	4
8	SXLN-031-NIYZ	LOCKNUT, 5/16” NYLON INSERT YZ	2
9	SXLN-062-NI-YZ	LOCKNUT, 5/8” NYLON INSERT YZ	4

HYDRAULIC PLUMBING ASSEMBLY (W/O OUTER WINGS)



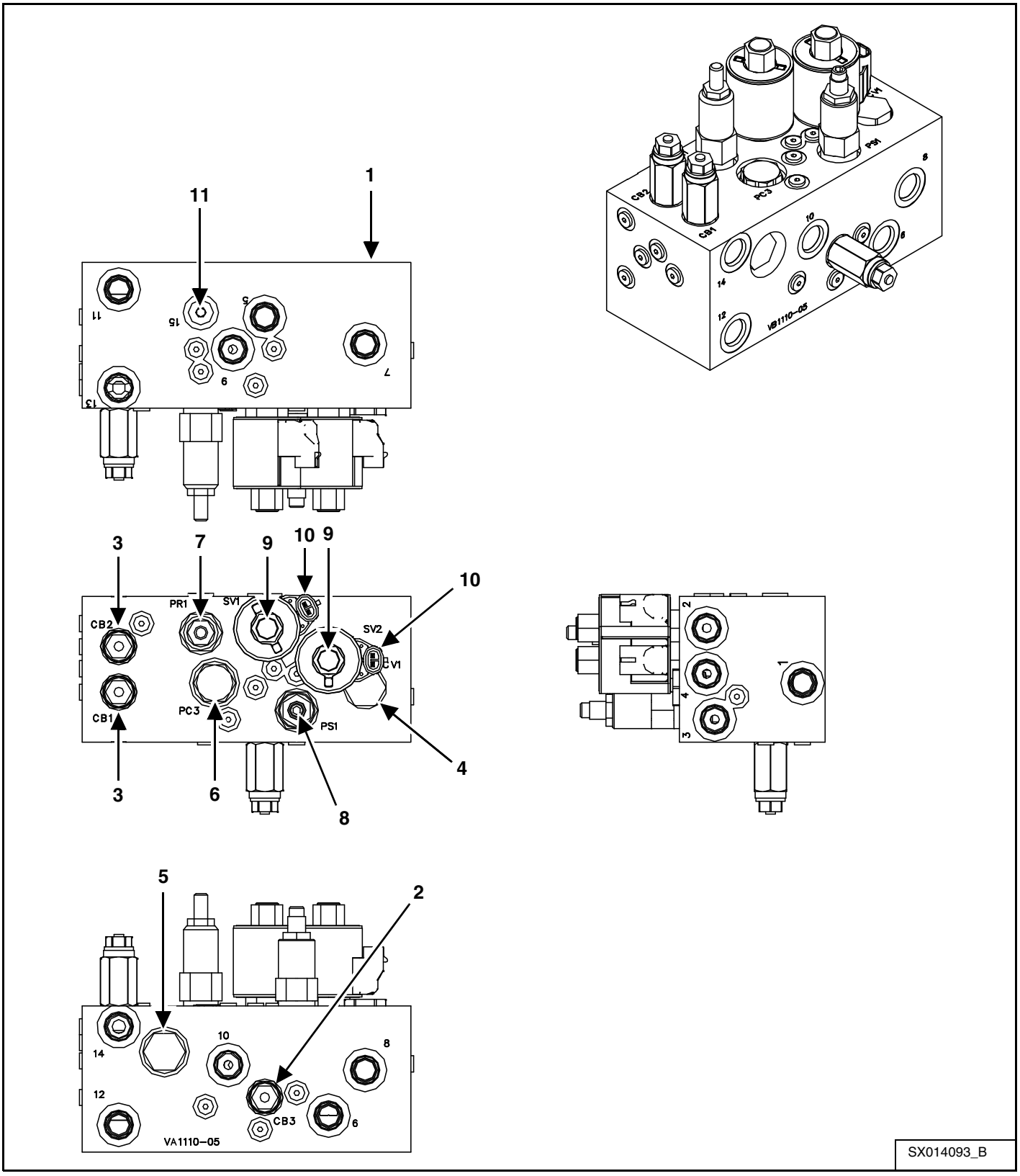
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SXNTFTL038168YZ	LOCKNUT, 3/8”-16 UNC TOP, FLG GR 8 YZ	4
2	00088275	BOLT, 0.31” x 1.50” CSHH GR5 P 86505344	8
3	09602223	BOLT, 1” x 7” CSHH GR5 P	4
4	SXLN-100-NI-YZ	LOCKNUT,1” NYLON INSERT	4
5	SXLN-038-NIYZ	LOCKNUT, 3/8” NYLON INSERT YZ	14
6	SXLN-031-NIYZ	LOCKNUT, 5/16” NYLON INSERT YZ	8
7	SXBHF0381508YZ	BOLT, 3/8” x 1.50” FLG GR 8 YLLWZN	4
8	88666478	STROKE CONTROL KIT 1.50”	2
9	88667540	HYDRAULIC CYLINDER, 4” x 24”	2
10	SX8010-15P	HYDRAULIC QUICK COUPLER, UNIV. POPPET	4
11	SX6804-8	HYDRAULIC FITTING, 08 MJ x 08 MORB x 08 MJ RUN TEE	2
12	88668043	HYDRAULIC BLOCK ASSEMBLY, W / O WINGS	1
13	88669639	CYLINDER STOP PLATE, TWO	4
14	SX002350	HYDRAULIC OIL, HYGUARD JD	4
15	SX004656	HYDRAULIC HOSE, 1/2” x 180” 08 FJX X (Blue Tape)	4
15A	SX004656	HYDRAULIC HOSE, 1/2” x 180” 08 FJX X (Red Tape)	4
16	SX005813	5’ SPECIAL EXTENSION HARNESS	1
17	SX007475	HYDRAULIC HOSE, 1/4” x 34” 1/2 FJI	2
18	SX009600	HYDRAULIC HOSE, 1/2” x 24” 08 FJX 08FJX	2
19	SX011588	HYDRAULIC HOSE, 1/2” x 96” 08 FJIC	4
20	SX011958	HYDRAULIC CYLINDER, 3” x 16” 3000 PSI	2
21	SX014124	BOLT ON CYLINDER STOP	4
22	SX014608	ABRASION SLEEVE, -24 CORDURA	17
23	SX014610	15' EXTENSION HARNESS	1
24	SX014611	SOLENOID TEE HARNESS	1
25	SX014612	TRACTOR / IMPLEMENT HARNESS	1
26	SX014678	HOSE GUARD, 1-1/2” SD1450	5.5
27	SX21294	HEAVY DUTY CABLE TIE MOUNT	14
28	SX3NS12	STRAP, 11-1/4” BLA 21	8
29	SX3NS21	STRAP, BLACK 21-1/2”	16
30	SX6400-8	ADAPTER, STRGHT, 08 MJIC - 08 ORB	2
31	SX6801-8	HYDRAULIC FITTING, 3/4” MO x 1/2” JIC EL	2
32	SX6802-8	HYDRAULIC FITTING, 08 MJIC x 08 MORB - 45	2
33	SX6804-8	HYDRAULIC FITTING, 08 MJ x 08 MORB x 08 MJ RUN TEE	2

HYDRAULIC PLUMBING ASSEMBLY (W / OUTER WINGS)



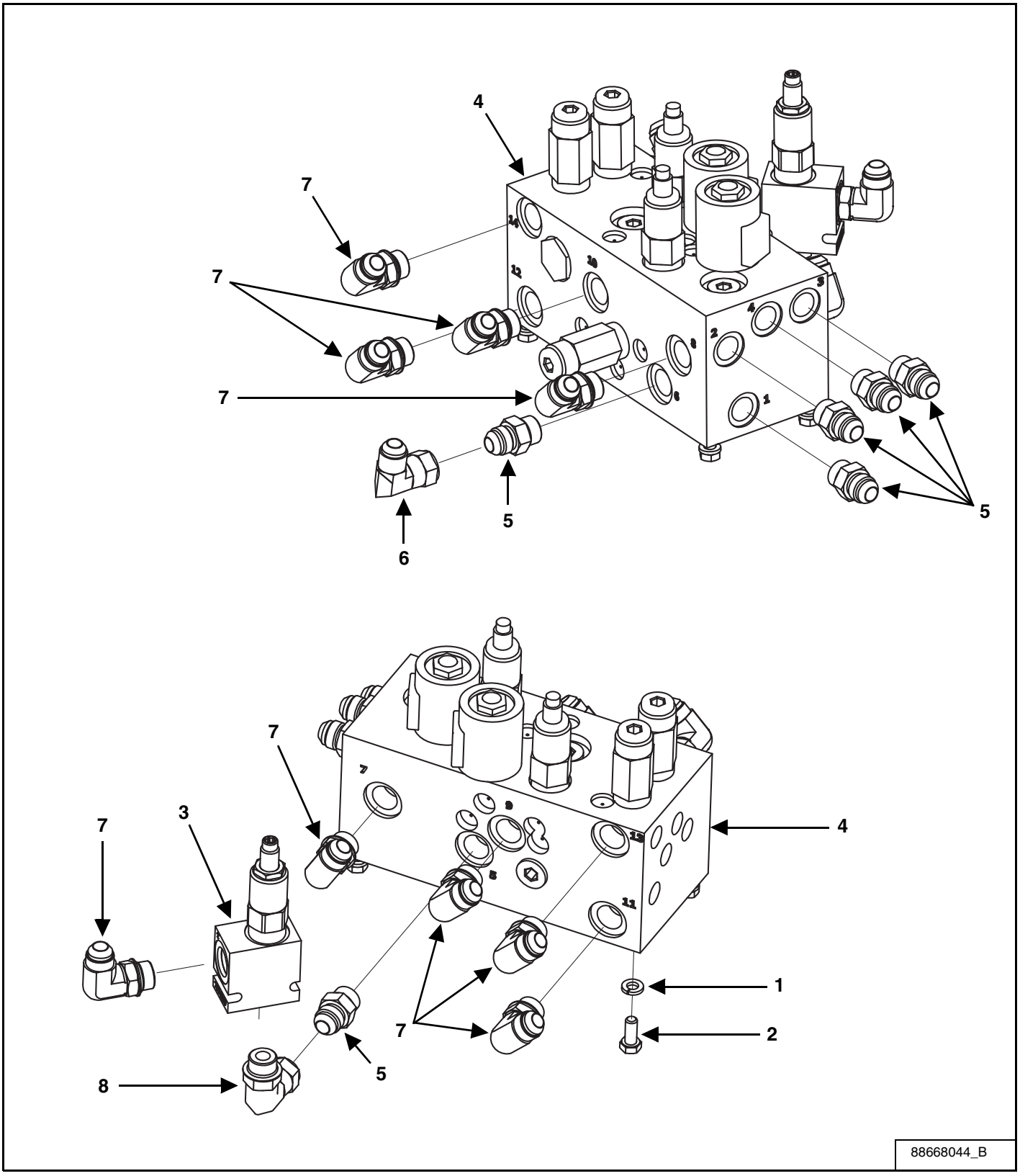
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SXNTFTL038168YZ	LOCKNUT, 3/8”-16 UNC TOP, FLG GR 8 YZ	4
2	00088275	BOLT, 0.31” x 1.50” CSHH GR5 P 86505344	8
3	09602223	BOLT, 1” x 7” CSHH GR5 P	4
4	SXLN-100-NI-YZ	LOCKNUT,1” NYLON INSERT	4
5	SXLN-038-NIYZ	LOCKNUT, 3/8” NYLON INSERT YZ	14
6	SXLN-031-NIYZ	LOCKNUT, 5/16” NYLON INSERT YZ	8
7	SXBHF0381508YZ	BOLT, 3/8” x 1.50” FLG GR 8 YLLWZN	4
8	88666478	STROKE CONTROL KIT 1.50”	2
9	88667540	HYDRAULIC CYLINDER, 4” x 24”	2
10	SX8010-15P	HYDRAULIC QUICK COUPLER, UNIV. POPPET	4
11	SX6804-8	HYDRAULIC FITTING, 08 MJ x 08 MORB x 08 MJ RUN TEE	2
12	88668043	HYDRAULIC BLOCK ASSEMBLY, W / O WINGS	1
13	88669639	CYLINDER STOP PLATE, TWO	4
14	SX002350	HYDRAULIC OIL, HYGUARD JD	4
15	SX004656	HYDRAULIC HOSE, 1/2” x 180” 08 FJX X (Blue Tape)	4
15A	SX004656	HYDRAULIC HOSE, 1/2” x 180” 08 FJX X (Red Tape)	4
16	SX005813	5’ SPECIAL EXTENSION HARNESS	1
17	SX007475	HYDRAULIC HOSE, 1/4” x 34” 1/2 FJI	2
18	SX009600	HYDRAULIC HOSE, 1/2” x 24” 08 FJX 08FJX	2
19	SX011588	HYDRAULIC HOSE, 1/2” x 96” 08 FJIC	4
20	SX011958	HYDRAULIC CYLINDER, 3” x 16” 3000 PSI	4
21	SX014124	BOLT ON CYLINDER STOP	4
22	SX014608	ABRASION SLEEVE, -24 CORDURA	17
23	SX014610	15' EXTENSION HARNESS	1
24	SX014611	SOLENOID TEE HARNESS	1
25	SX014612	TRACTOR / IMPLEMENT HARNESS	1
26	SX014678	HOSE GUARD, 1-1/2” SD1450	5.5
27	SX21294	HEAVY DUTY CABLE TIE MOUNT	14
28	SX3NS12	STRAP, 11-1/4” BLA 21	8
29	SX3NS21	STRAP, BLACK 21-1/2”	16
30	SX6400-8	ADAPTER, STRGHT, 08 MJIC - 08 ORB	2
31	SX6801-8	HYDRAULIC FITTING, 3/4” MO x 1/2” JIC EL	6
32	SX6802-8	HYDRAULIC FITTING, 08 MJIC x 08 MORB - 45	2
33	SX6804-8	HYDRAULIC FITTING, 08 MJ x 08 MORB x 08 MJ RUN TEE	2
34	SX005563	HYDRAULIC HOSE 1/2” X 160” 08 FJICX	4

HYDRAULIC MANIFOLD BLOCK (W/O OUTER WINGS)



ITEM	PART NUMBER	DESCRIPTION	QTY
1	88661438	COMBINATION VALVE BODY	1
2	88661439	VALVE, C-BALANCE 2.5:1 RATIO	1
3	88661440	VALVE, C-BALANCE 10.0:1 RATIO	2
4	88661441	CHECK VALVE, #10	1
5	88661442	FLOW DIVIDER, #10 COMBINER	1
6	88661443	CHECK VALVE, #10 PILOT-OPEN	1
7	88661444	PRESSURE REDUCING VALVE, #10	1
8	88661445	SEQUENCE VALVE, #10 PILOT-DRAIN	1
9	88661446	2-WAY POPPET SOLENOID, #10 N.O.	2
10	88661447	METRI-PACK, #10 150, 12 VDC, E-COIL	2
11	88661448	PLUG, SAE-06	1
NS	88661449	SEAL KIT, SK1079	-
	88661450	SEAL KIT, SK10-2N-T	-
	88661451	SEAL KIT, SSK10-4N-MMM	-
	88661452	SEAL KIT, SK10-3N-TM	-
	88661453	SEAL KIT, SK10-3N-BM	-
	88661454	SEAL KIT, SK10-2N-T	-

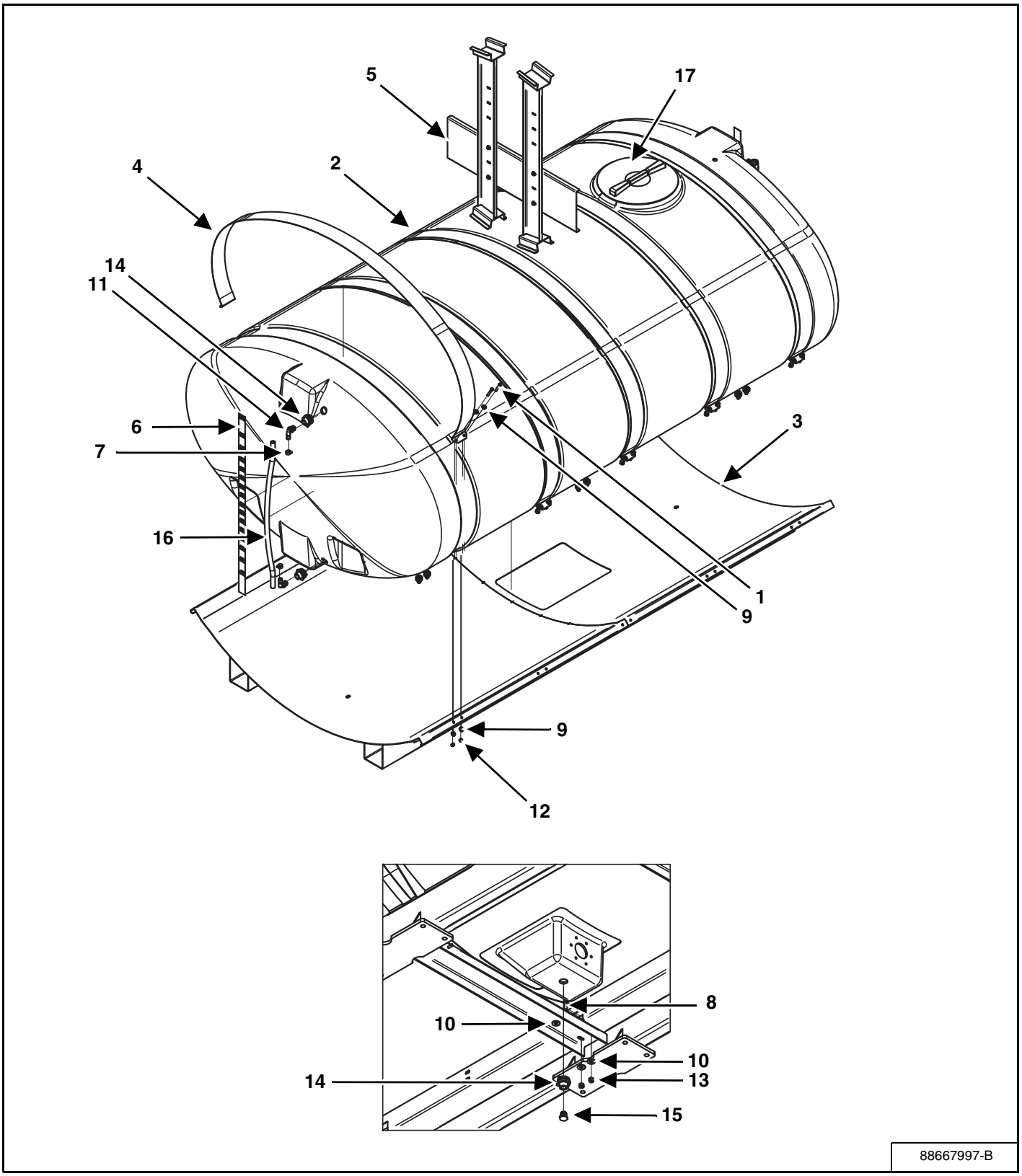
HYDRAULIC MANIFOLD BLOCK (W / OUTER WINGS)



ITEM	PART NUMBER	DESCRIPTION	QTY
1	00080681	LOCK WASHER, 0.31 PL	4
2	00087872	BOLT, 0.31” x 0.75” HEX GR 5 PL	4
3	88662270	RELIEF VALVE, SAE 08 1200 PSI	1
4	SX014093	HYDRAULIC MANIFOLD BLOCK W / REDUCING	1
5	SX6400-8	ADAPTER, STRAIGHT, 08 MJIC - 08 ORB	6
6	SX6500-8	HYDRAULIC FITTING, 08 FJIC x 08 MJIC	1
7	SX6801-8	HYDRAULIC FITTING, 3/4” MO x 1/2” JIC EL	9
8	SX6809-8-8	ELBOW, 08 SAE x 08 FJIX	1

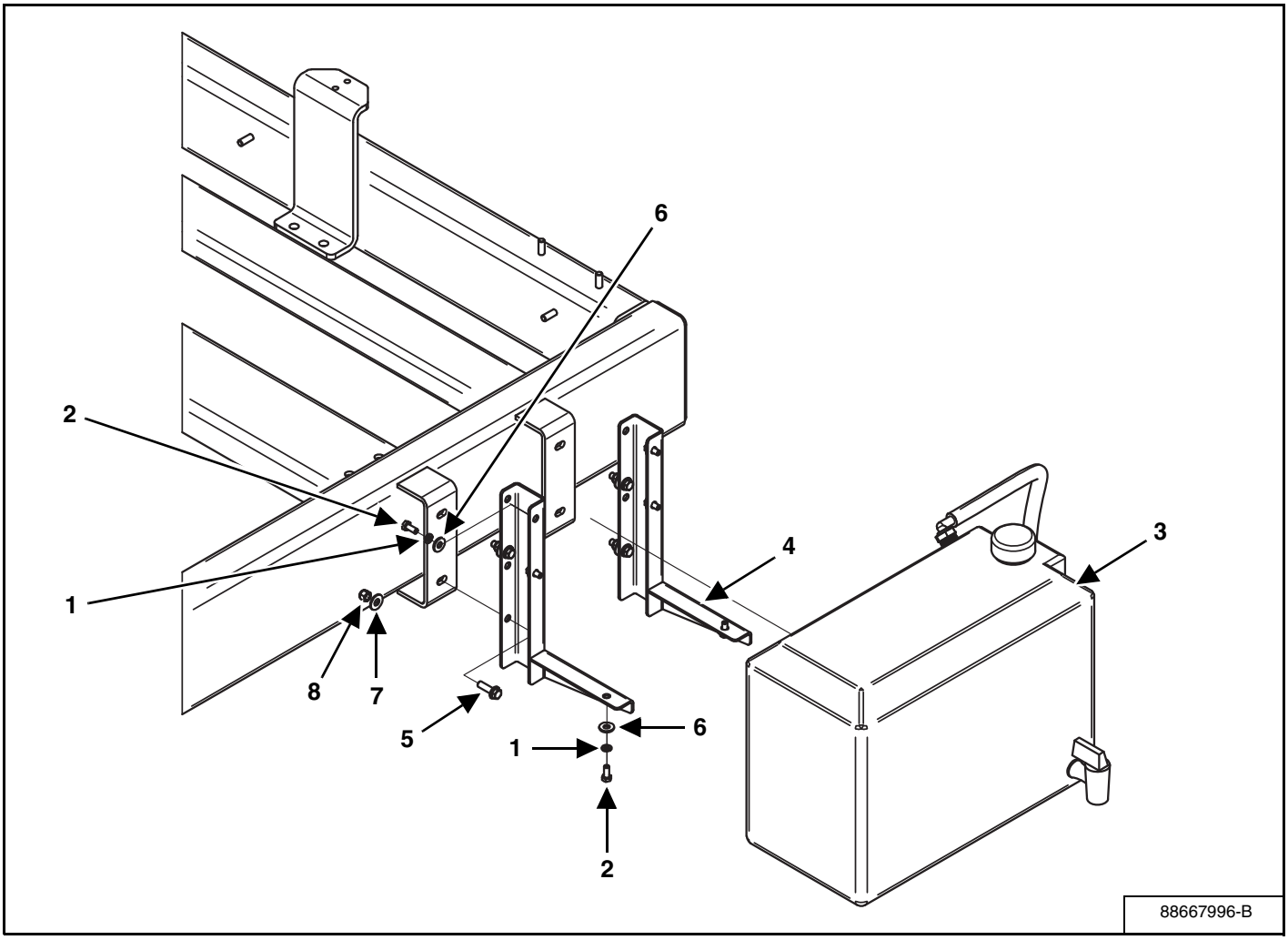
PORT#	ROUTING LOCATION
1	EXTEND (INTO GROUND) SCV #2 HOSE
2	RETRACT (RAISE) SCV #2 HOSE
3	RETRACT (FOLD IN) SCV #1 HOSE
4	EXTEND (FOLD OUT) SCV # 1 HOSE
5	ROCKSHAFT CYLINDER BASE END
6	ROCKSHAFT CYLINDER SHAFT END
7	LH OUTER WING CYLINDER BASE END
8	RH OUTER WING CYLINDER BASE END
9	LH OUTER WING CYLINDER SHAFT END
10	RH OUTER WING CYLINDER SHAFT END
11	LH INNER WING CYLINDER SHAFT END
12	RH INNER WING CYLINDER SHAFT END
13	LH INNER WING CYLINDER BASE END
14	RH INNER WING CYLINDER BASE END
15	NOT USED (PRESSURE GAUGE PORT)

TANK AND PLUMBING ASSEMBLY



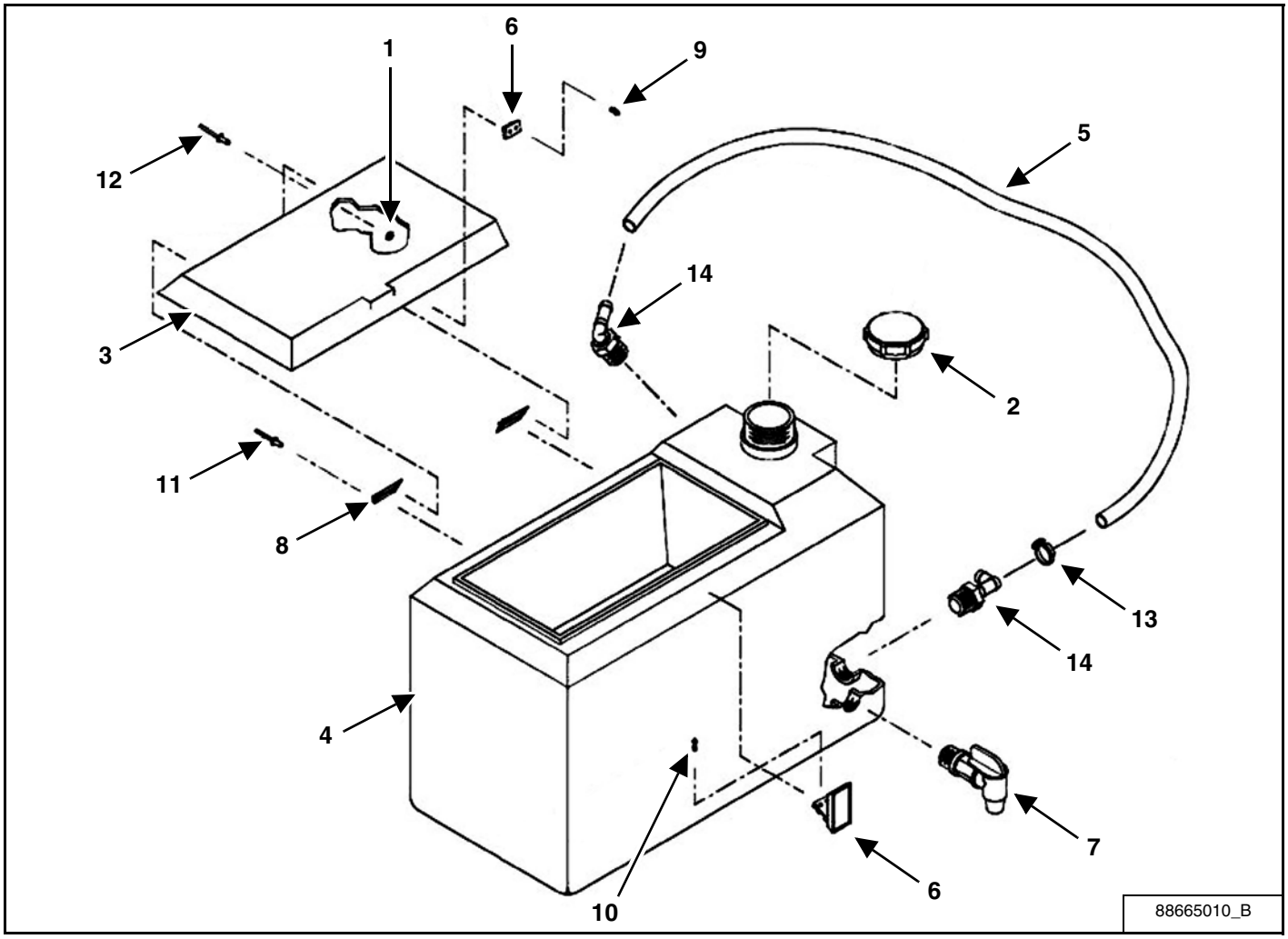
ITEM	PART NUMBER	DESCRIPTION	QTY
1	00087936	BOLT, CSHHP 0.38x 2.5” LG	20
2	88667999	TANK; 1600 ELLIP, 1460 DRILL, CREAM	1
3	88668127	1600 GAL SADDLE / TANK WELDMENT, GREEN	1
	88668128	1600 GAL SADDLE / TANK WELDMENT, RED	1
4	SX008882	STRAP, 1000 GAL	5
5	SX013799	TANK BAFFLE, 1600 GALLON ELIP	1
6	SX017672	TANK MEASURE DECAL	2
7	SX12J	CLAMP, 3/4” HOSE WORM SCREW	4
8	00087689	BOLT, 0.50” x 1.50” GR 5 HEX PL	12
9	SXFW-038YZ	FLATWASHER, 3/8” GR 5	40
10	SXFW-050Y	FLATWASHER, 1/2” YZ	24
11	SXHB-075-90	HOSE BARB, 3/4” MPT x 3/4” HB, ELL	4
12	SXLN-038-NIYZ	LOCKNUT, 3/8” NYLON INSERT YZ	20
13	SXLN-050-NI-YZ	LOCKNUT, 1/2” NYLON INSERT YZ	12
14	SXNW60401	THREADED BULKHEAD, 3/4”	5
15	SXPLUG075	PLUG, 3/4” MPT POLY	1
16	SXSIGHT-34	SIGHT HOSE, 3/4” ID x 1/8”	6.8’
17	SXNW60011	VENTED TANK LID, 16”	1

HAND RINSE TANK ASSEMBLY



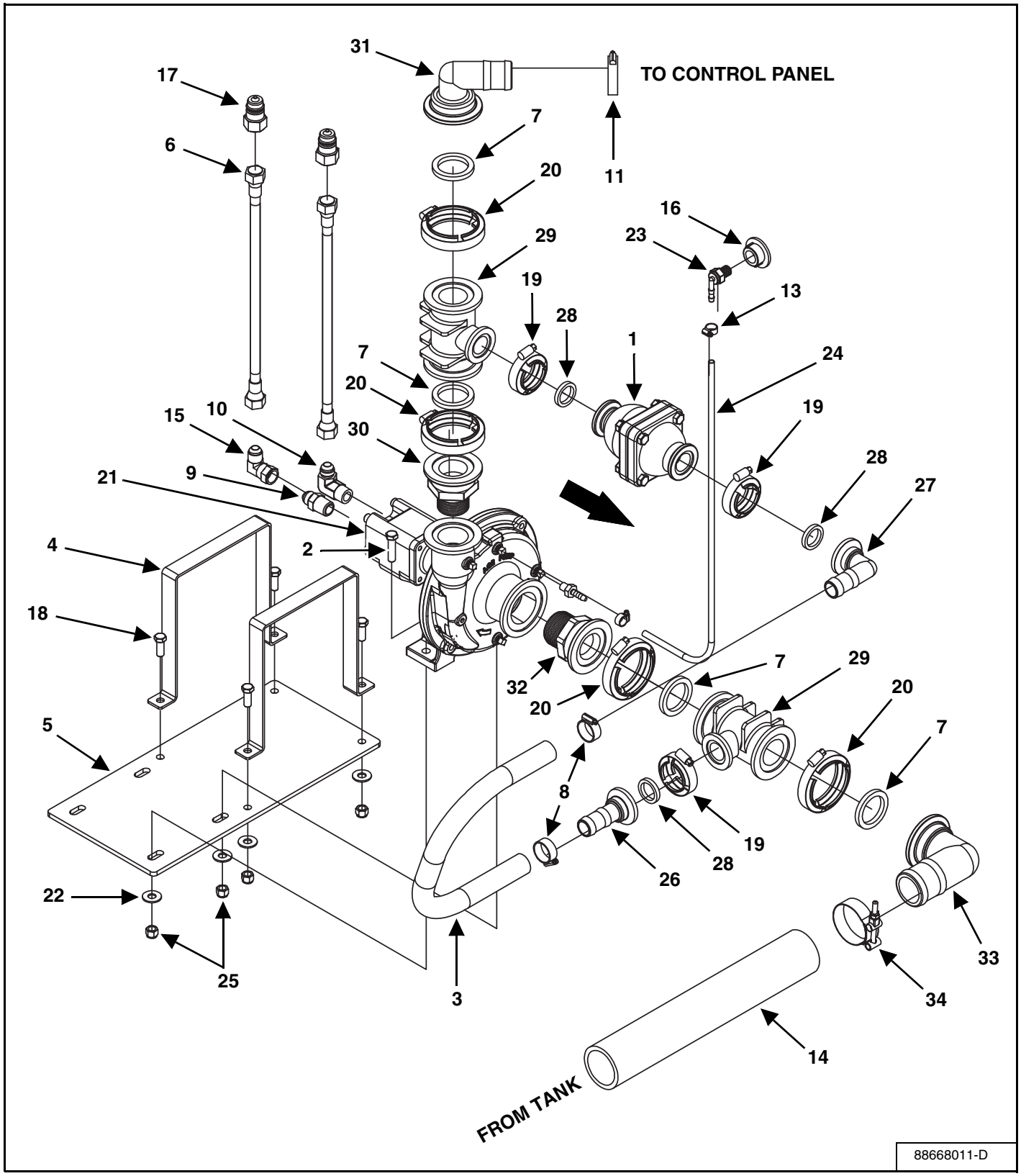
ITEM	PART NUMBER	DESCRIPTION	QTY
1	00080681	LOCK WASHER, 5/16” PL	6
2	00087872	BOLT, 5/16” x 0.75” HEX GR 5 PL	6
3	88665010	HAND EYE RINSE TANK ASSEMBLY, - CRM	1
4	SX014666	TANK BRACKET WELDMENT, 9 GAL.	2
5	SXBHF0381258YZ	BOLT, 3/8” x 1.25” GR 8 YLLWZN	4
6	SXFW-031-YZ	FLAT WASHER, 5/16” YZ	6
7	SXFW-038YZ	FLAT WASHER, 3/8” GRADE 5	4
8	SXLN-038-NIYZ	LOCKNUT, 8” NYLON INSERT YZ	4

HAND / EYE RINSE TANK ASSEMBLY



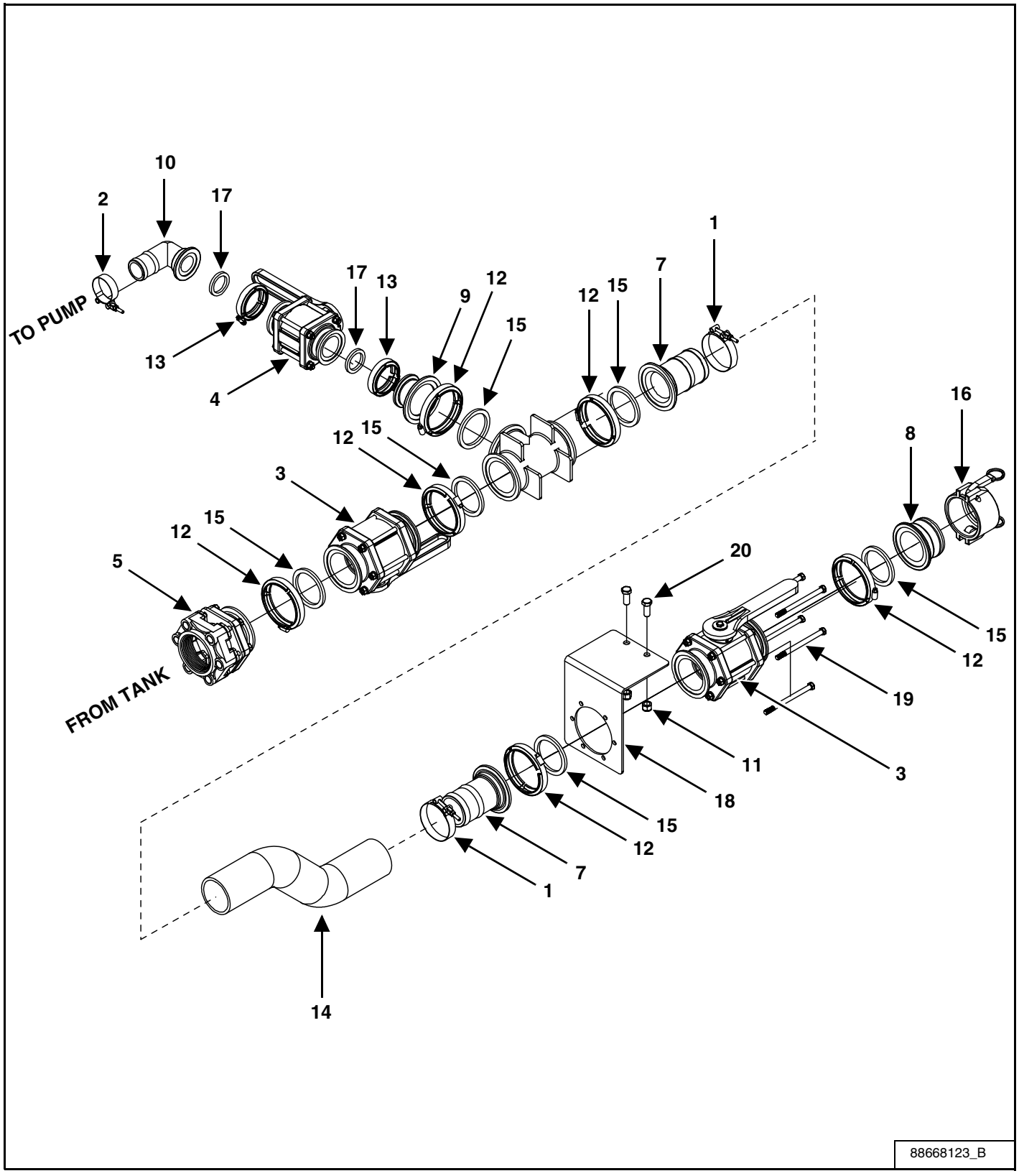
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88664993	RIVET WASHER, 3/8” OD x 3/16” ID	4
2	88664994	TANK COVER, 9 GAL SCREW CAP	1
3	88664995	TANK LID, 9 GAL MOLDED	1
4	88665008	TANK, 9 GAL BUHLER CREAM	1
5	88665019	SIGHT HOSE, 1/2” ID x 1/8” WALL	1
6	88664997	LATCH, 07 - 10 - 201 - 12 LIVING BLACK	1
7	88664998	SPIGOT, 3/4” MATURAL	2
8	88664999	BUTT HINGE, H03 - 30200 - 171 ZINC	2
9	88665000	RIVET, AB4 - 6A	2
10	88665001	DRIVE RIVET, 1/8” x 0.359 - 0.391	4
11	88665002	RIVET, 3/16” x AD64 - AH CLOSED	4
12	88665003	RIVET, 3/16” x 0.440 LG DOMEHEAD	2
13	88665006	SPEEDY HOSE CLAMP, 1/2”	1
14	88665005	HOSE FITTING, 3/4” MPT x 1/2” HB	1

ACE CENTRIFUGAL PUMP & PLUMBING ASSEMBLY (OPTION)



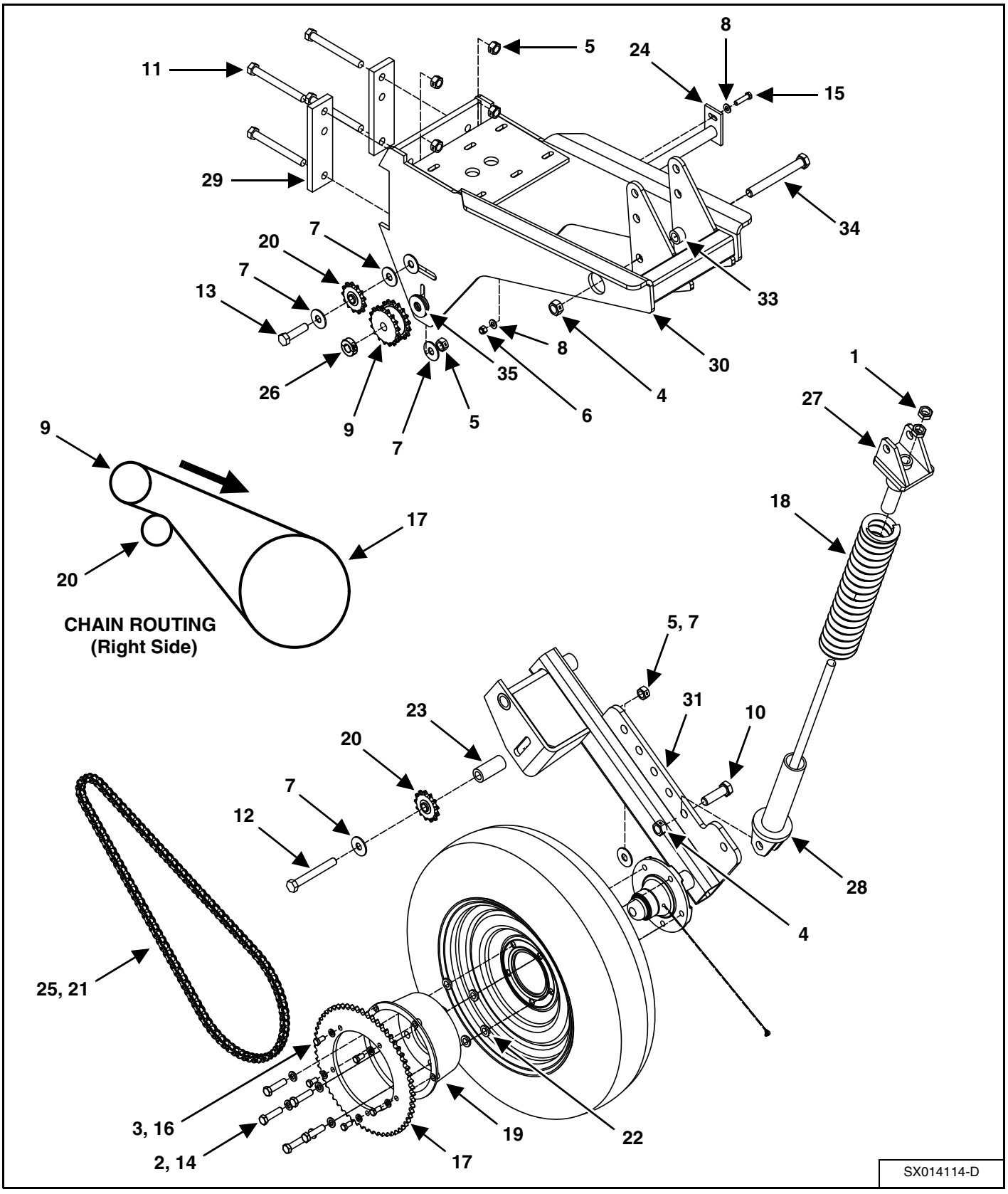
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88661393	1” PRESSURE SPIKE VALVE, 100 PSI	1
2	88663901	BOLT, 3/8” x 1.50” CSHH GR 5 P	2
3	SX011612	BLACK RUBBER HOSE, 1” 150#	2’
4	SX015747	PRODUCT PUMP MOUNT STRAP	2
5	SX015748	PRODUCT PUMP MOUNT WELDMENT	1
6	SX016538	HYDRAULIC HOSE, 1/2” x 320” 08 FJIC - 08 MORB	2
7	SX150G	2” FLANGED VALVE GASKET	4
8	SX16J	CLAMP; 1" X 1/2 STAINLESS	2
9	SX2404-8-8	HYDRAULIC FITTING, 08 MNPT x 08 JIC, STEEL	1
10	SX2501-8-8	HYDRAULIC ADAPTER, 08 MJIC X 08MNPT	1
11	SX28J	CLAMP, 1-3/4” x 1/2” STAINLESS	1
12	SX3A1814	HOSEBARB; 1/8” x 1/4” POLY	1
13	SX4JM	CLAMP, 1/4” x 5/16” STAINLESS	2
14	SX600432	HOSE, 2” ENFORCER FERT SOL.	2.5’
15	SX6500-8	HYDRAULIC FITTING, 08 FJIC x 08 MJIC	1
16	SX73HD	SPINWELD; 1/4” FPT RAISED	1
17	SX8010-15P	HYDRAULIC QUICK COUPLER, UNIV. POPPET	2
18	SXBH0381005YZ	BOLT, 3/8” x 1” YLLW ZNC	4
19	SXFC100BJ	CLAMP, 1”	3
20	SXFC200	COUPLING, 2” x 2” FPT NYLON	4
21	SXFMCSC150HYD	PUMP, CAST, SC SEAL, 1.5” ACE	1
22	SXFW-038YZ	FLATWASHER, 3/8” GR 5	6
23	SXHB-025-90	HOSE BARB, 1-4 MPT x 1/4” HB EL	1
24	SXK3150-025	HOSE; 1/4” VINYL REINFORC CLR	12.5’
25	SXLN-038-NIYZ	LOCKNUT, 3/8” NYLON INSERT YZ	6
26	SXM100BRB	HOSE BARB, 1” x 1” STRAIGHT	1
27	SXM100BRB90	HOSE BARB, 1” FLANGE ELBOW	1
28	SXM100G	1” FLANGED VALVE GASKET	3
29	SXM200100TEE	TEE, 2” x 1”	2
30	SXM200125MPT	MANIFOLD, 2” FLG, 1-1/4” MPT	1
31	SXM200150BRB90	HOSE BARB, 2” FLG x 1-1/2” HB, EL	1
32	SXM200150MPT	MANIFOLD, 2” FLG, 1-1/2” MPT	1
33	SXM200BRB90	HOSE BARB, 2” HB, 2” FLG, EL	1
34	SXTBC256	T-BOLT CLAMP, 2-11/32” - 25/8	1

TANK QUICK FILL PLUMBING ACE CENTRIFUGAL PLUMBING ASSEMBLY



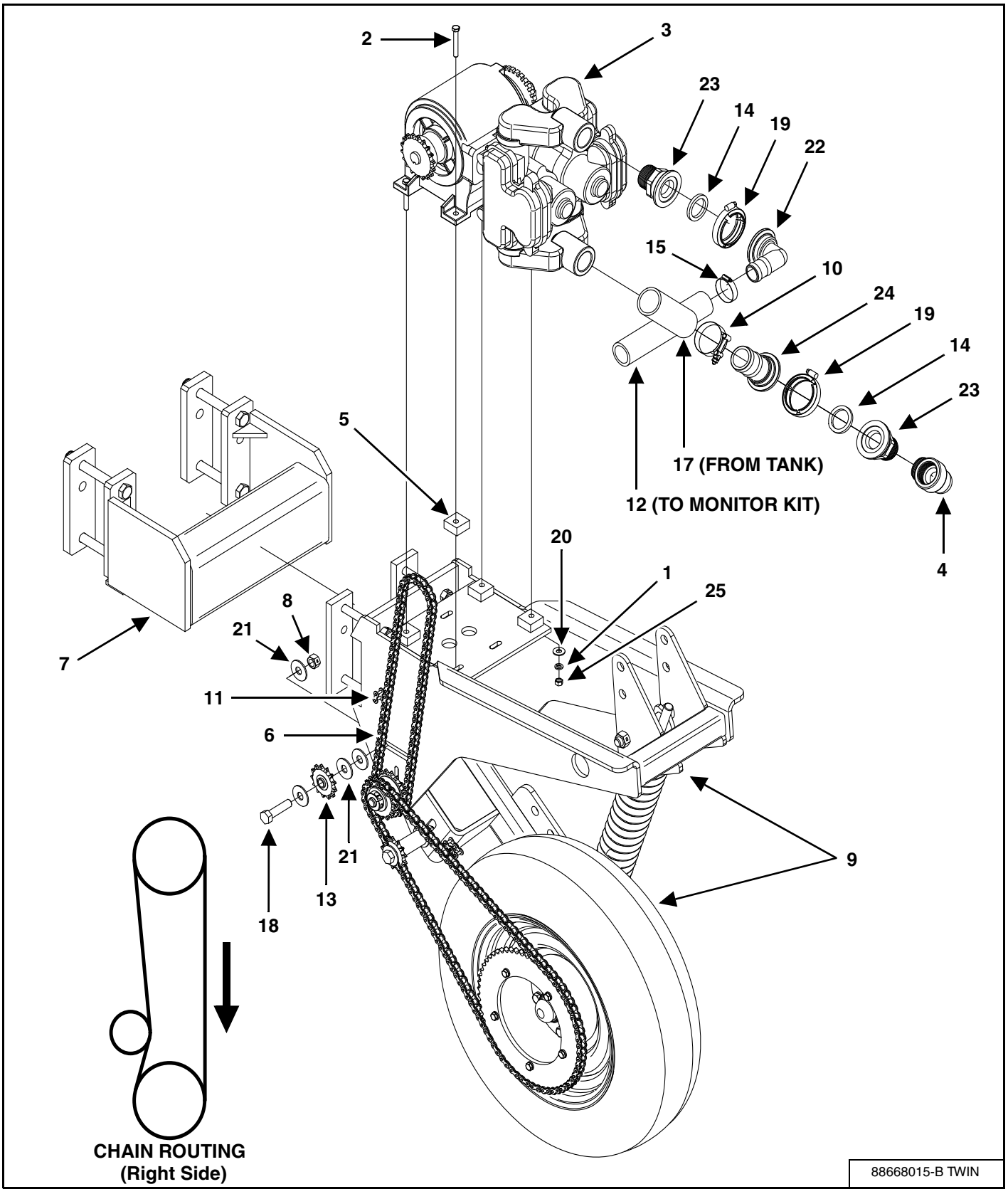
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SXTBC350	T-BOLT CLAMP, 3-1/2” x 3-13/16”	2
2	SXTBC256	T-BOLT CLAMP, 2-11/32” x 2-5/8”	1
3	SXMV300	VALVE, 3” STANDARD PORT MANIFOLD VALVE	2
4	SXMV220CF	VALVE, 2” FP FLG BANJO	1
5	SXMBF300BD	BULKHEAD, 3” BOLT FLANGED BD	1
6	SXM300TEE	TEE, 3” FLANGED	1
7	SXM300BRB	HOSE BARB, 3” FLG x 3” HB POLY	2
8	SXM300A	COUPLER, 3” FLG x 3” CAM COUPLER BANJO	1
9	SXM300200CPG	MANIFOLD FITTING, 3” x 2” FULL	1
10	SXM200BRB90	HOSE BARB, 2” HB x 2” FLG EL	1
11	SXLN - 050 NI - YZ	LOCKNUT, 1/2” NYLON INSERT YZ	2
12	SXFC300BJ	CLAMP, 3” BANJO	6
13	SXFC200BJ	CLAMP, 2”	6
14	SX600448	HOSE, 3” EPDM W / POLY HELIX & FABR	3’
15	SX300G	GASKET, 3” BANJO	6
16	SX300CAP	COUPLING, 3” CAM LEVER CAP	1
17	SX150G	GASKET, 2” FLANGED VALVE	2
18	SX014105	VALVE MOUNTING PLATE	1
19	88662075	BOLT, 0.38” x 5.50” CSHH 316SS	6
20	00087670	BOLT, 0.50” x 1.25” HEX GR 5 PL	2

JOHN BLUE GROUND DRIVE MOUNT ASSEMBLY



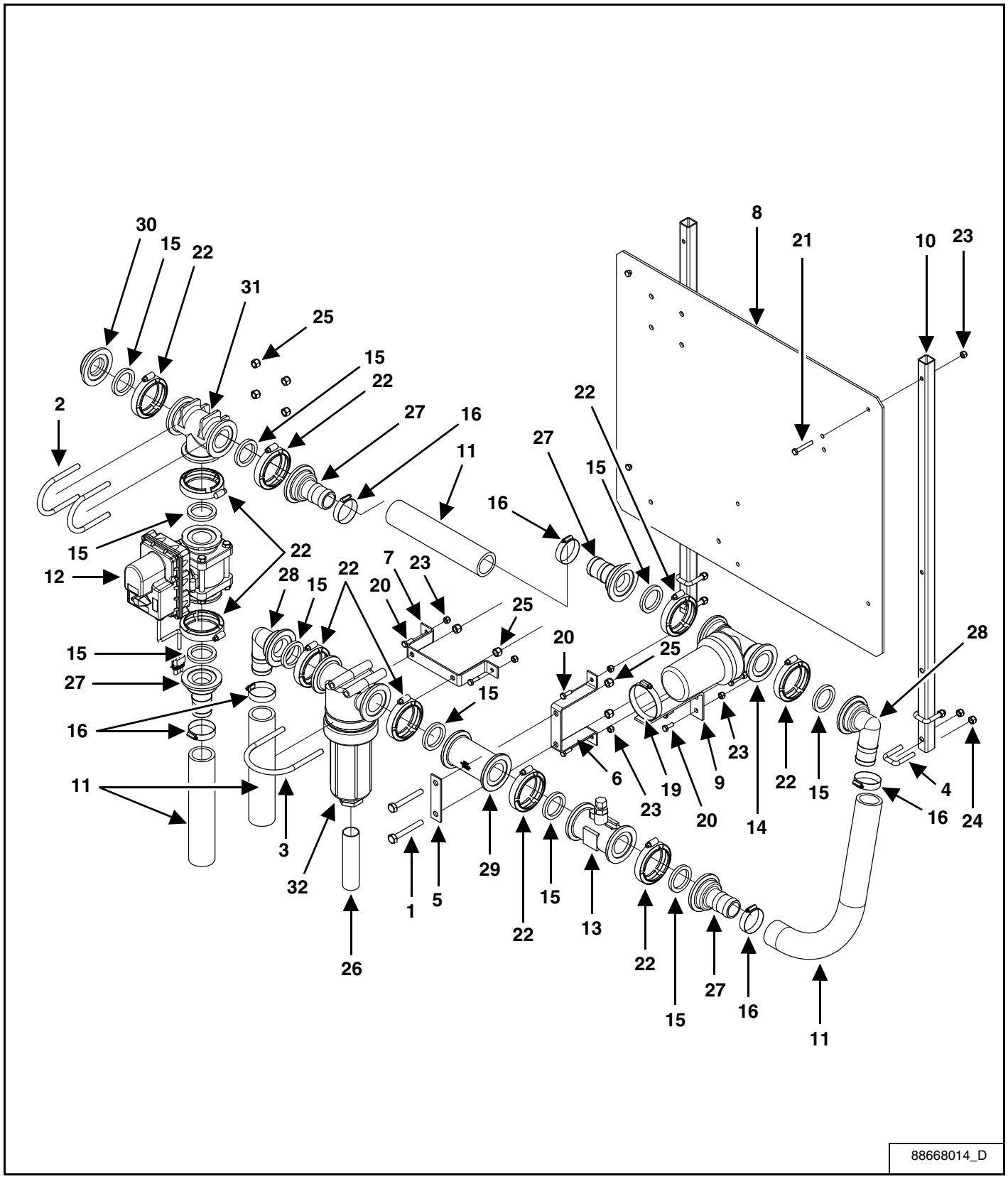
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SXNUT-075-J	NUT, 3/4”	2
2	SXLW-050	LOCK WASHER, 1/2”	5
3	SXLW-038	LOCK WASHER, 3/8”	5
4	SXLN-075-CL	LOCKNUT, 3/4” CENTER LOCKNUT	2
5	SXLN-062-CL	LOCKNUT, 5/8” CENTER LOCKNUT	2
6	SXLN-038-NI	LOCKNUT, 3/8” NYLON INSERT	1
7	SXFW-062	FLAT WASHER, 5/8”	10
8	SXFW-038	FLAT WASHER, 3/8”	2
9	SXDS50A17	IDLER SPROCKET, W / BEARINGS	1
10	SXBH-075-250-5	BOLT; 3/4” x 2-1/2” GR 5	1
11	SXBH-062-600-5	BOLT, 5/8” x 6” HEX GR 5	4
12	SXBH-062-500-5	BOLT, 5/8” x 5” HEX GR 5	1
13	SXBH-062-250-5	BOLT, 5/8” x 2-1/2” HEX GR 5	1
14	SXBH-050-200-20	BOLT, 1/2” x 2” GR 5	5
15	SXBH-038-150-5	BOLT, 3/8” x 1-1/2” GR 5	1
16	SXBH-038-075-5	BOLT, 3/8” x 3/4” GR 5	5
17	SXA-1342-AP-BLK	SPROCKET, 60 TOOTH, GRND DRV	1
18	SX73362B	SPRING, 1400 GROUND DRIVE, BLK	1
19	SX106190-01	HUB SPROCKET ADAPTER, 4 BOLT	1
20	SX013520	SPROCKET, IDLER,50-13,5/8 BORE	2
21	SX008224	CHAIN, IDLER TO WHEEL	1
22	SX008222	TUBE, SPACER COLLAR	5
23	SX008221	TUBE, SPACER BUSHING	1
24	SX008170	SHAFT WELDMENT	1
25	SX008053	#50 CONNECTING LINK	1
26	SX008025	COLLAR, 3/4” 2 PC CLAMP ON	1
27	SX008022	MAIN FRAME END MOUNT WELDMENT	1
28	SX008018	THREADED ROD HALF WELDMENT	1
29	SX008014	BACKING BOLT PLATE	2
30	SX008013	FRAME AND PUMP MOUNT WELDMENT	1
31	SX008003	SWING ARM AND SPINDLE WELDMENT	1
32	88660947	TIRE ASSEMBLY, 5 x 15	1
33	88661526	TUBE, SPACER, PIVOT, SPRING	2
34	SXBH-075-650-5	BOLT, 3/4” x 6.-1/2” GR 5	1
35	SXFW-075	FLATWASHER, 3/4”	2
36	SXG1637	45 DEG GREASE ZERK, 1/4” - 28	1

JOHN BLUE TWIN PUMP ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY
1	00080680	LOCK WASHER, 0.375” PL	4
2	00087936	BOLT, CSHHP 0.38” x 2.5” LG	4
3	88660940	DUAL PISTON PUMP	1
4	88660945	90° ELBOW, 1.50” MPT x 1.50” FPT- POLY	1
5	88660946	PUMP MOUNT SPACER	4
6	88660948	50 SERIES / 81 PITCH CHAIN	1
7	88668053	GROUND DRIVE ADAPTER ASSEMBLY	1
8	88668120	LOCKNUT, 5/8” CENTER LOCK YZ	1
9	88668141	GROUND DRIVE MOUNT ASSEMBLY	1
10	88669452	T-BOLT CLAMP, 2.38” x 2.69”	1
11	SX008053	#50 CONNECTING LINK	1
12	SX012412	HOSE, 1-1/2” 150# EPDM	6.5’
13	SX013520	IDLER SPROCKET, 50-13, 5/8” BORE	1
14	SX150G	2” FLANGED VALVE GASKET	2
15	SX28J	STAINLESS CLAMP; 1-3/4” x 1/2”	1
16	SX3NS12	STRAP, 11-1/4” BLACK 21	8
17	SX600432	HOSE, 2” ENFORCER, FERT SOL.	15’
18	SXBH0622505YZ	BOLT, 5/8” x 2-1/2” GR 5	1
19	SXFC200BJ	2” BANJO CLAMP	2
20	SXFW-038YZ	FLAT WASHER, 3/8” GR 5	4
21	SXFW-062YZ	FLAT WASHER, 5/8” YLLWZN	4
22	SXM200150BRB90	HOSE BARB, 2” FLG x 1-1/2” HB, EL	1
23	SXM200150MPT	MANIFOLD, 2” FLG x 1-1/2” MPT	2
24	SXM200BRB	HOSE BARB, 2” FLG x 2” HB	1
25	SXNUT-038YZ	NUT, 3/8” GR 5	4

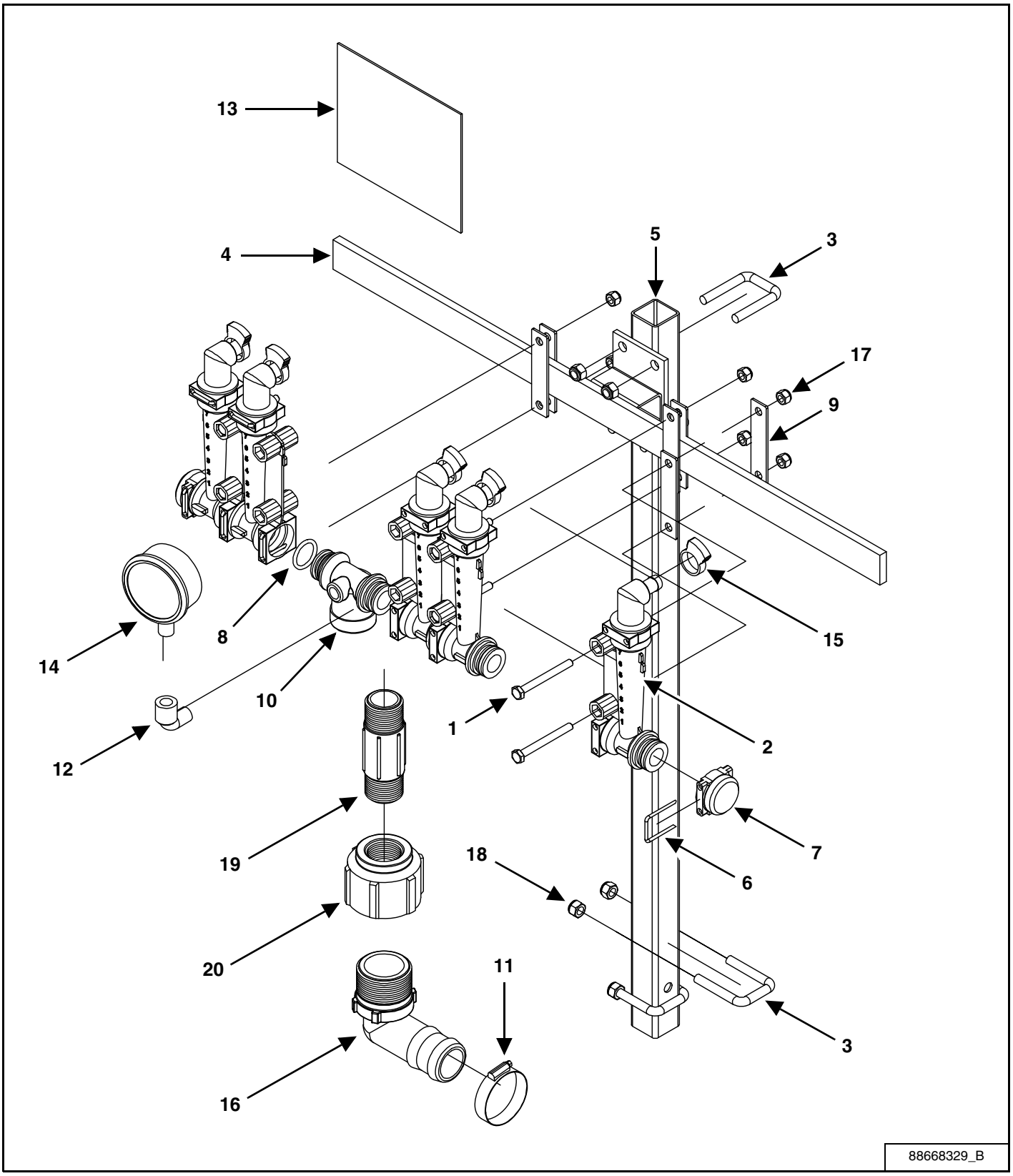
RAVEN CONTROL PLUMBING ASSEMBLY



88668014_D

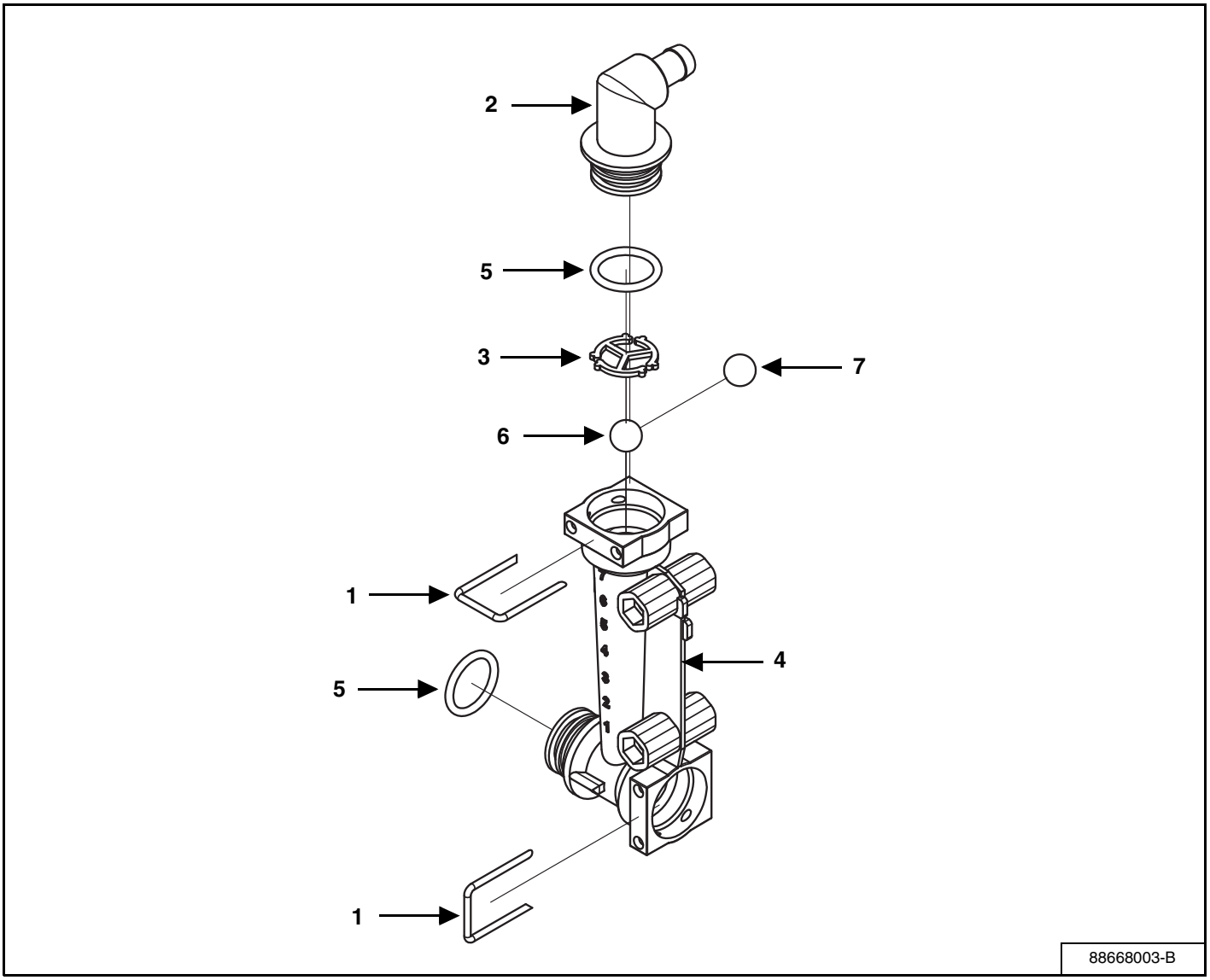
ITEM	PART NUMBER	DESCRIPTION	QTY
1	00280260	BOLT, 3/8” x 3” CSHH GR 8 PL	2
2	88668020	U-BOLT, 3/8” x 2-1/2” x 4” RND YZ	2
3	88668021	U-BOLT, 3/8” x 3-3/4” x 5” RND YZ	1
4	88668032	U-BOLT, 5/16” x 1” x 1-3/4” YZ	4
5	SX004108	STRAINER MOUNTING PLATE	1
6	SX004114	3” FLOW METER MOUNT	1
7	SX006069	FLANGED STRAINER MOUNT	1
8	SX007601	VALVE MOUNTING PLATE	1
9	SX007659	RAVEN REGULATING VALVE BRACKET	1
10	SX007777	PANEL MOUNTING TUBE	2
11	SX012412	HOSE, 1-1/2” 150# EPDM	28’
12	SX01663	2” ELECTRIC VALVE, BANJO W / PACKARD	1
13	SX063 - 0171 - 793	FLOW METER, RFM 60P	1
14	SX063 - 0172 - 125	1” CONTROL VALVE POLY	1
15	SX150G	2” FLANGED VALVE GASKET	10
16	SX28J	STAINLESS CLAMP, 1-3/4” 1/2”	6
17	SX3NS12	STRAP, 11-1/4” BLACK 21	10
18	SX3NS8	STRAP, 7-1/4” BLACK	15
19	SX48J	HOSE CLAMP, 3” WORK SCREW	1
20	SXBH0250758YZ	BOLT, 1/4” x 3/4” GR 8	6
21	SXBH0251758YZ	BOLT, 1/4” x 1-3/4” GR 8 ZINC	4
22	SXFC200BJ	2” BANJO CLAMP	10
23	SXLN - 038 - NIYZ	LOCKNUT, 1/4” NYLON INSERT	10
24	SXLN - 031 - NIYZ	LOCKNUT, 5/16” NYLON INSERT YZ	8
25	SXLN - 025 - NIYZ	LOCKNUT, 3/8” NYLON INSERT YZ	8
26	SXLST1550	SCREEN, 1-1/4” & 1-1/2” T 50 MESH	1
27	SXM200150BRB	HOSE BARB, 2” FLG x 1-1/2” HB EL	4
28	SXM200150BRB90	HOSE BARB, 2” FLG x 1-1/2” HB	2
29	SXM200CPG	FLANGE, 2” x 2” POLY	1
30	SXM200PLG	2” BANJO PLUG, FLANGE	1
31	SXM200TEE	2” FLANGED BANJO TEE	1
32	SXMLST150 - HB	2” HEAD & BODY FLANGED STRAINER	1

SPRAY MONITORS



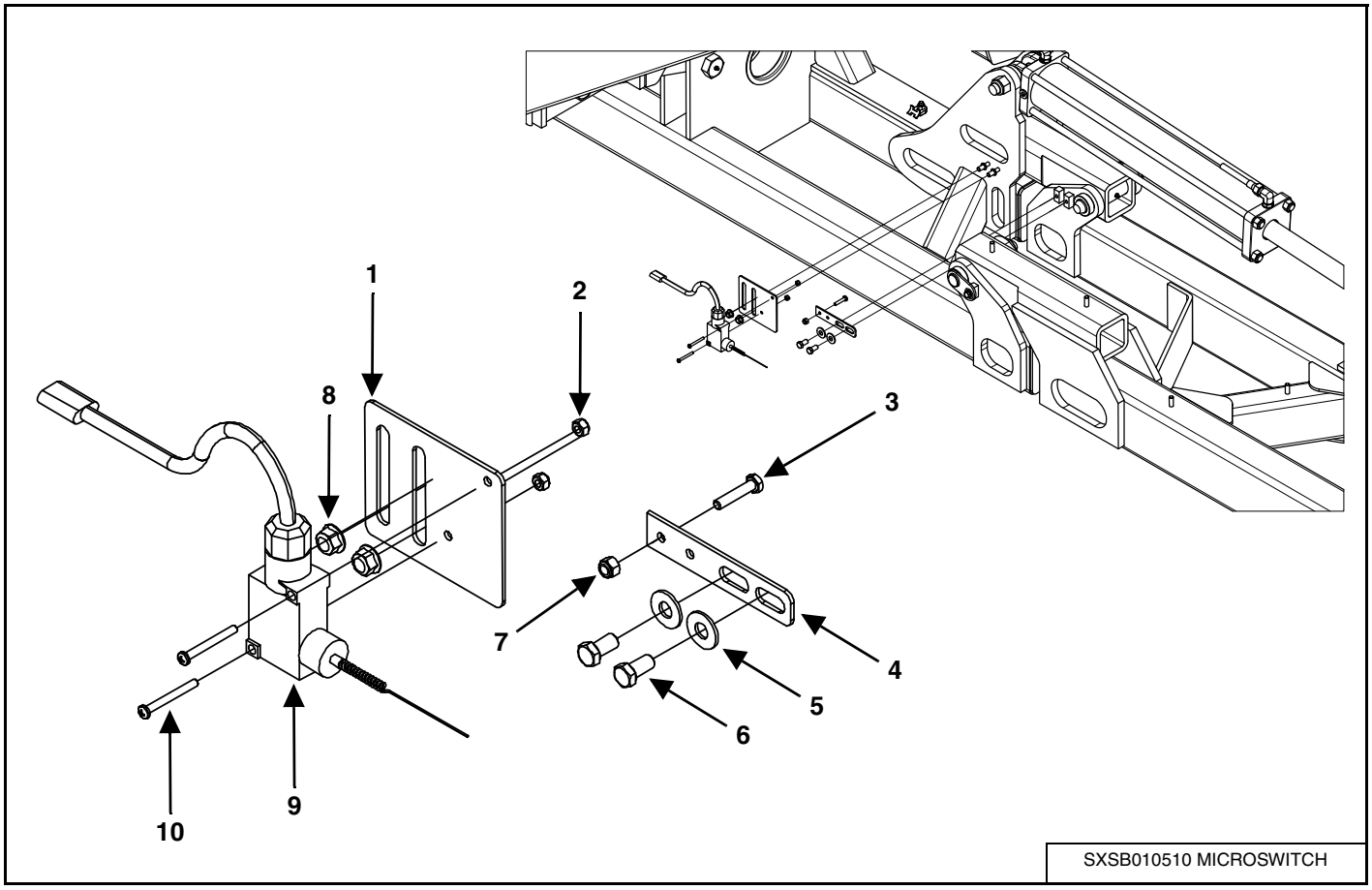
ITEM	PART NUMBER	DESCRIPTION	QTY
1	00087845	BOLT, 1/4” x 2-1/2” HEX GR 5	AS REQ.
2	88668003	ASSY; MONITOR, SINGLE COLUMN	AS REQ.
	88668887	ASSY, MONITOR, 3 COLUMN	AS REQ.
	88664836	ASSY, MONITOR, 4 COLUMN	AS REQ.
	88664835	ASSY, MONITOR, 5 COLUMN	AS REQ.
	88664838	ASSY, MONITOR, 6 COLUMN	AS REQ.
	88664834	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 MONITOR ASSEMBLY



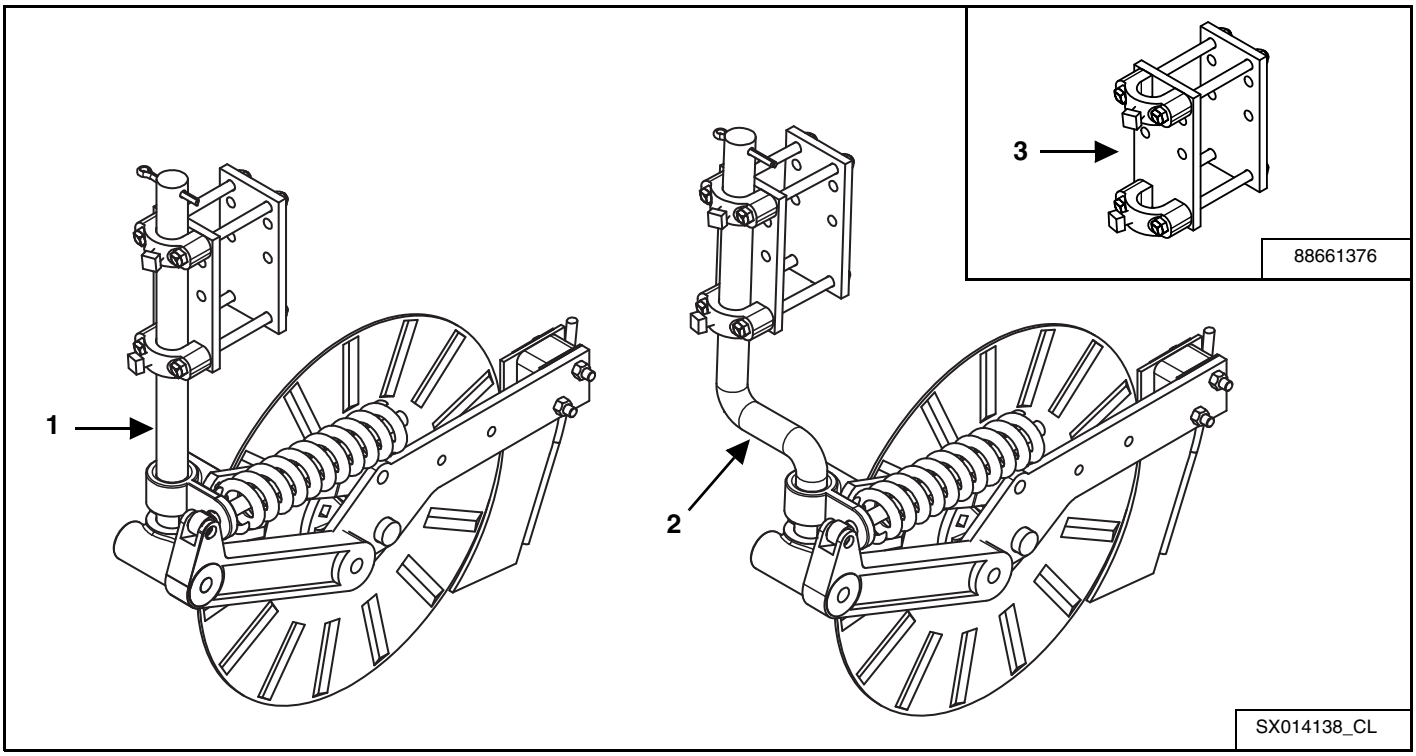
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SX002037	SINGLE MONITOR U-PIN	2
2	SX002135	1/2” HOSE BARB	1
3	SX002137	SINGLE MONITOR FLOAT STOP	1
4	SX002139	SINGLE COLUMN MONITOR	1
5	SX002140	MONITOR O-RING, BUNA	2
6	SX8165105	RED GLASS MONITOR BALL	1
7	SXSS316-200	STAINLESS STEEL MONITOR BALL	1

MICROSWITCH



ITEM	PART NUMBER	DESCRIPTION	QTY
1	88666365	SWITCH MOUNTING PLATE, 12 GA	1
2	88668038	LOCKNUT, 10-24 NYLON INSERT YZ	2
3	88668039	BOLT, 1/4” x 1.25” TAP GR 5 YZ	1
4	88666366	SWITCH ACTIVATION PLATE, 12 GA	1
5	SXFW-038YZ	FLATWASHER, 3/8” GR 5	2
6	00012012	BOLT, CSHH 3/8” x 0.75” GR 5 P	2
7	SXLN-025-NIYZ	LOCKNUT; 1/4” NYLON INSERT	1
8	88662125	LOCKNUT, 3/8” NYLON INSERT FLG GR 5 YZ	2
9	SXSB010510	MICROSWITCH SMARTBO WIRE ASSEMBLY, 42 1	1
10	86511926	BOLT; 10-24 x 1.75” MACH YZ	2

COULTER W / KNIFE GROUP



12 Row - 30” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660890	RH STRAIGHT SHANK COULTER ASSEMBLY, W/ KNIFE	5
2	88660892	RH OFFSET SHANK COULTER ASSEMBLY, W/ KNIFE	6
3	88661376	4 x 6 CLAMP KIT	11

12 Row - 36” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660890	RH STRAIGHT SHANK COULTER ASSEMBLY, W/ KNIFE	7
2	88660892	RH OFFSET SHANK COULTER ASSEMBLY, W/ KNIFE	4
3	88661376	4 x 6 CLAMP KIT	11

12 Row - 38” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660890	RH STRAIGHT SHANK COULTER ASSEMBLY, W/ KNIFE	9
2	88660892	RH OFFSET SHANK COULTER ASSEMBLY, W/ KNIFE	2
3	88661376	4 x 6 CLAMP KIT	11

12 Row - 40” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660890	RH STRAIGHT SHANK COULTER ASSEMBLY, W/ KNIFE	11
2	88660892	OFFSET SHANK COULTER ASSEMBLY, W/ KNIFE	-
3	88661376	4 x 6 CLAMP KIT	11

16 Row - 22” Spacing / 15 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660890	RH STRAIGHT SHANK COULTER ASSEMBLY, W/ KNIFE	9
2	88660892	RH OFFSET SHANK COULTER ASSEMBLY, W/ KNIFE	6
3	88661376	4 x 6 CLAMP KIT	15

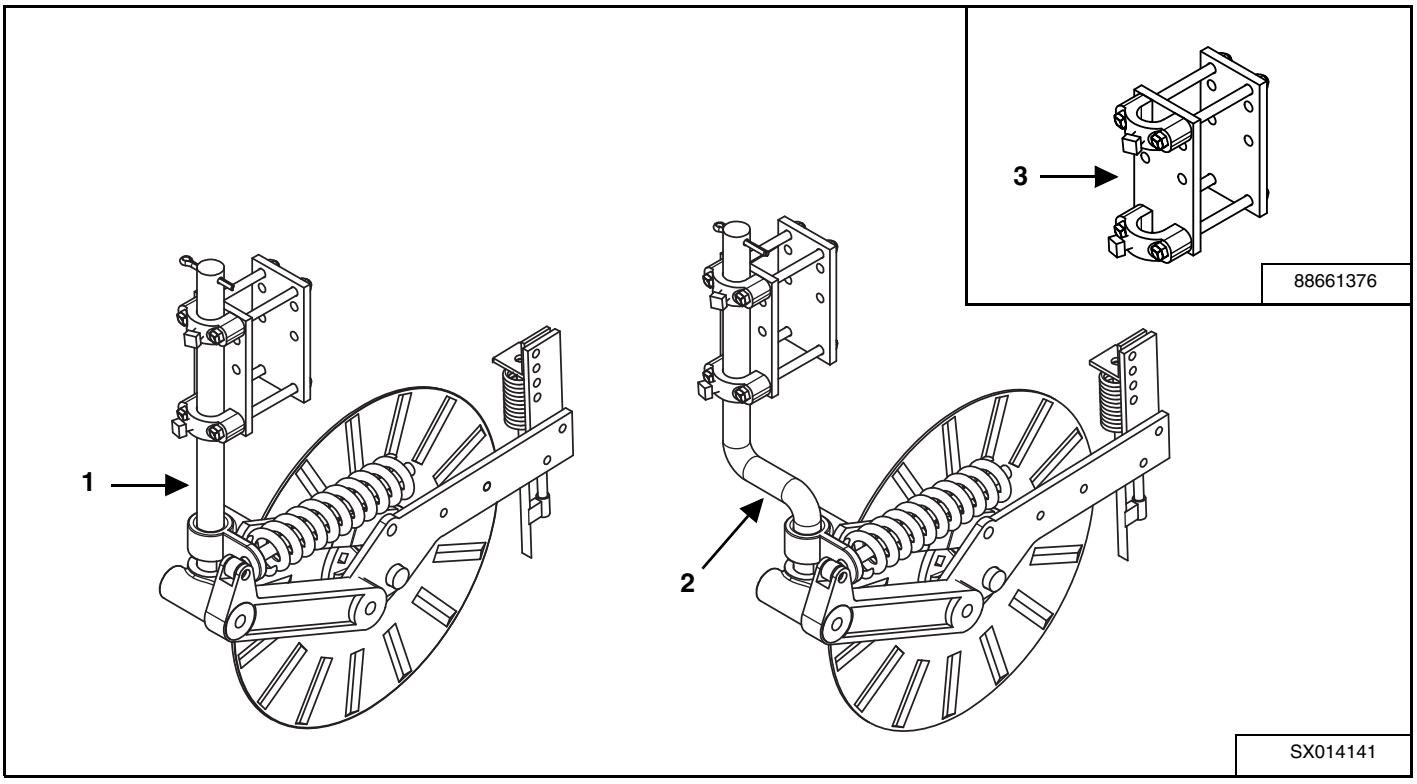
16 Row - 30” Spacing / 17 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	10
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	7
3	88661376	4 x 6 CLAMP KIT	17

24 Row - 22” Spacing / 23 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660890	RH STRAIGHT SHANK COULTER ASSEMBLY, W/ KNIFE	5
2	88660892	RH OFFSET SHANK COULTER ASSEMBLY, W/ KNIFE	6
3	88661376	4 x 6 CLAMP KIT	23

COULTER W / INJECTOR GROUP



12 Row - 30” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	5
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	6
3	88661376	4 x 6 CLAMP KIT	11

12 Row - 36” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	7
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	4
3	88661376	4 x 6 CLAMP KIT	11

12 Row - 38” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	9
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	2
3	88661376	4 x 6 CLAMP KIT	11

12 Row - 40” Spacing / 11 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	11
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	-
3	88661376	4 x 6 CLAMP KIT	11

16 Row - 22” Spacing / 15 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	9
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	6
3	88661376	4 x 6 CLAMP KIT	15

16 Row - 30” Spacing / 15 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	9
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	6
3	88661376	4 x 6 CLAMP KIT	15

16 Row - 30” Spacing / 17 Coulters

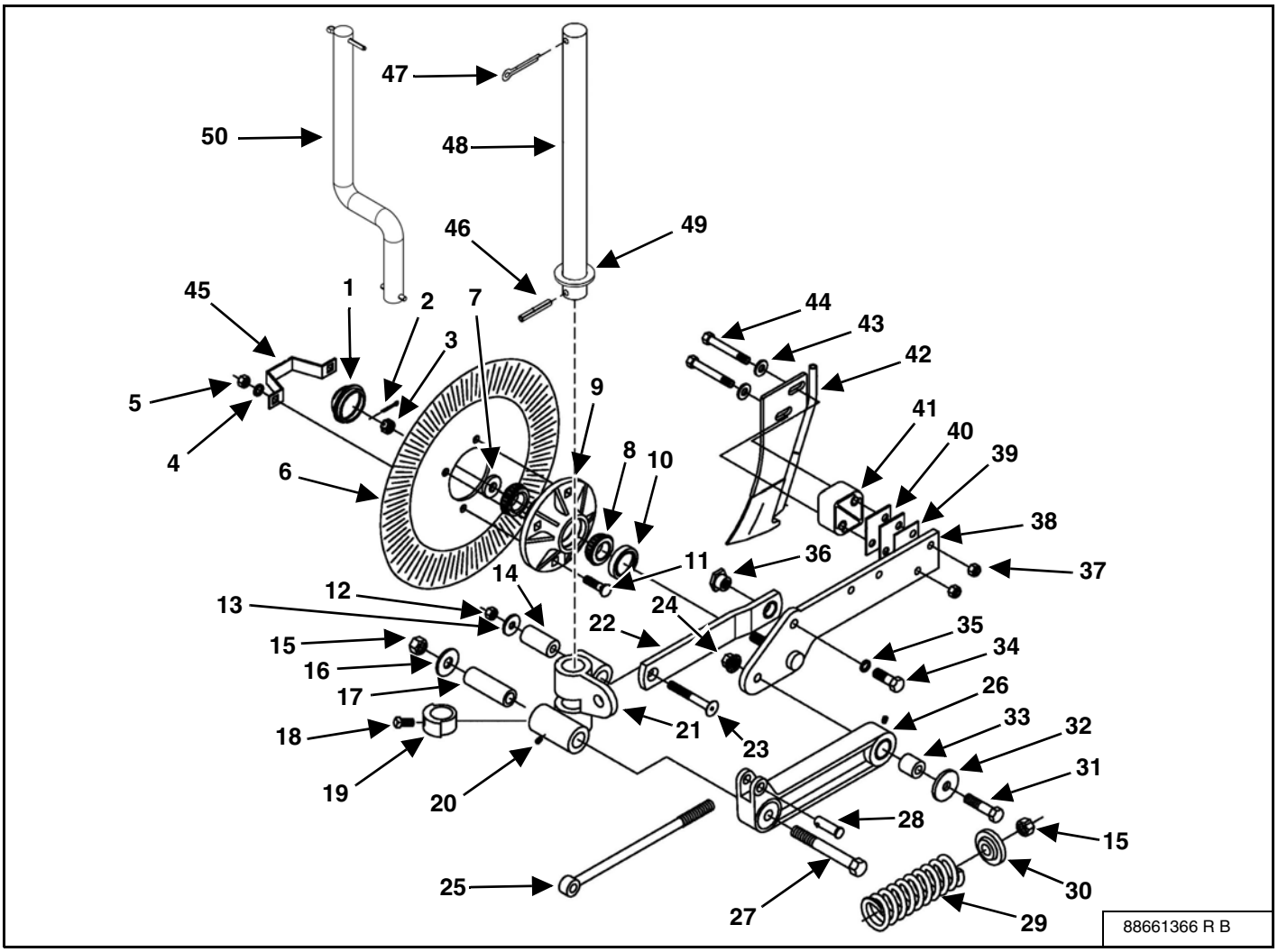
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	10
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	7
3	88661376	4 x 6 CLAMP KIT	17

24 Row - 22” Spacing / 23 Coulters

ITEM	PART NUMBER	DESCRIPTION	QTY
1	88660894	STRAIGHT SHANK COULTER ASSEMBLY, W/ INJECTOR	9
2	88660895	OFFSET SHANK COULTER ASSEMBLY, W/ INJECTOR	6
3	88661376	4 x 6 CLAMP KIT	15

COULTER ASSEMBLY (STRAIGHT)

RH W / Knife

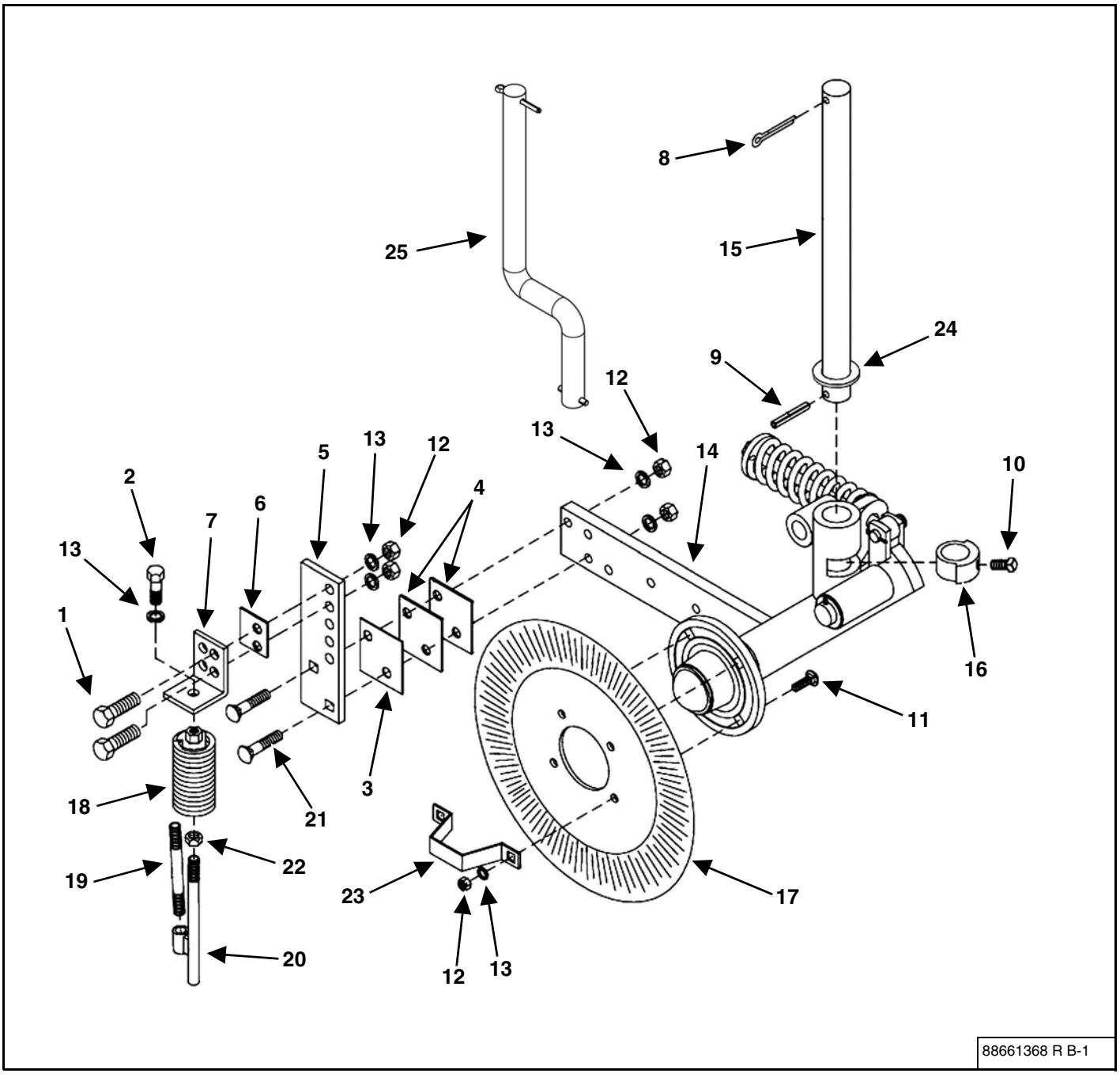


ITEM	PART NUMBER	DESCRIPTION	QTY
1	SX2570-375	HUB CAP	1
2	88664879	1/8” x 1 1/4” COTTER PIN, BLACK	1
3	88664880	5/8”-18 SLOTTED HEX NUT BLK	4
4	88664881	1/2” MED LOCKWASHER ZP	4
5	88664882	1/2”-13 HEX NUT ZP	4
6	88661371	RIPPLE BLADE 20”	1
	88667047	SMOOTH BLADE	
7	88664883	5/8” FLATWASHER, 1/4” +/- 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

ITEM	PART NUMBER	DESCRIPTION	QTY
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	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	1
49	88664859	BUSHING; MACH 1.50 ID x 2.25 OD YZ	1
50	88661374	OFFSET SHANK	AS REQ.
	88664917	CRITICAL ADJUSTMENT DECAL (NOT SHOWN)	1

COULTER ASSEMBLY (STRAIGHT) (CONT'D)

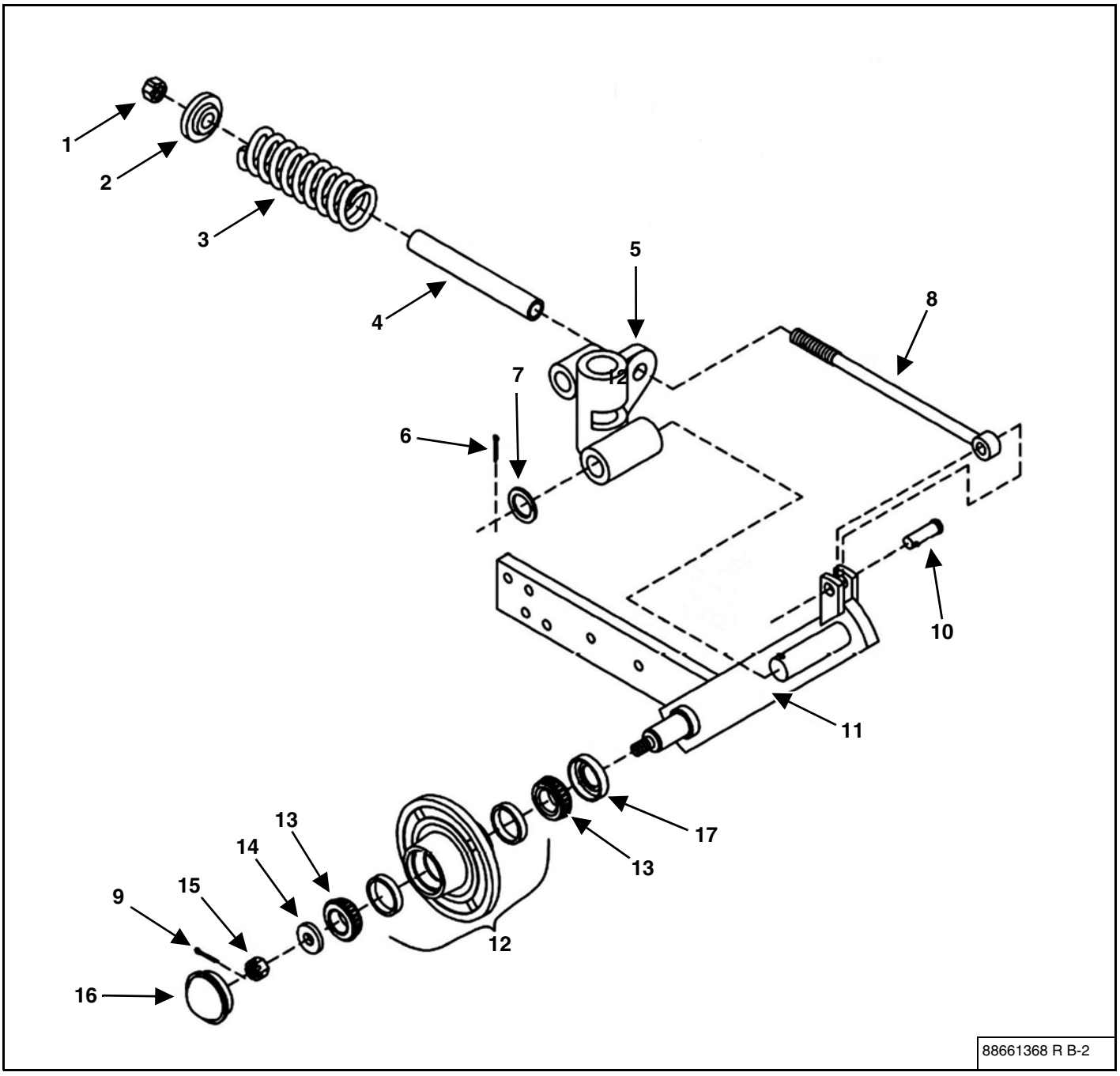
RH W / Injector



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	1
16	SX2975-303	2975 LOCKING COLLAR	1
17	88661371	.157” x 20" RIPPLE BLADE	1
	88667047	SMOOTH BLADE	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 OD YZ	1
25	88661374	OFFSET SHANK	AS REQ.

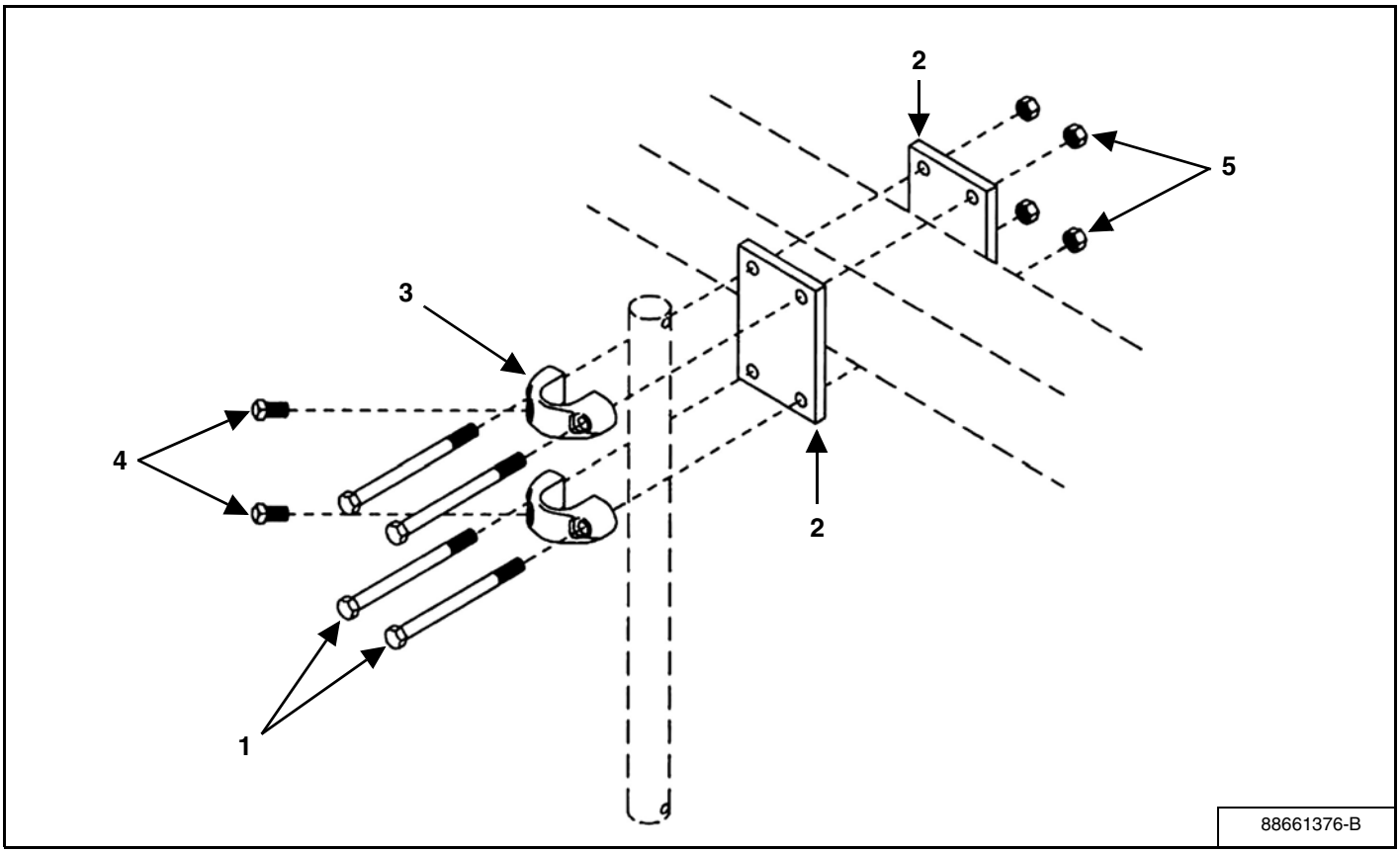
COULTER ARM ASSEMBLY

RH W / Injector



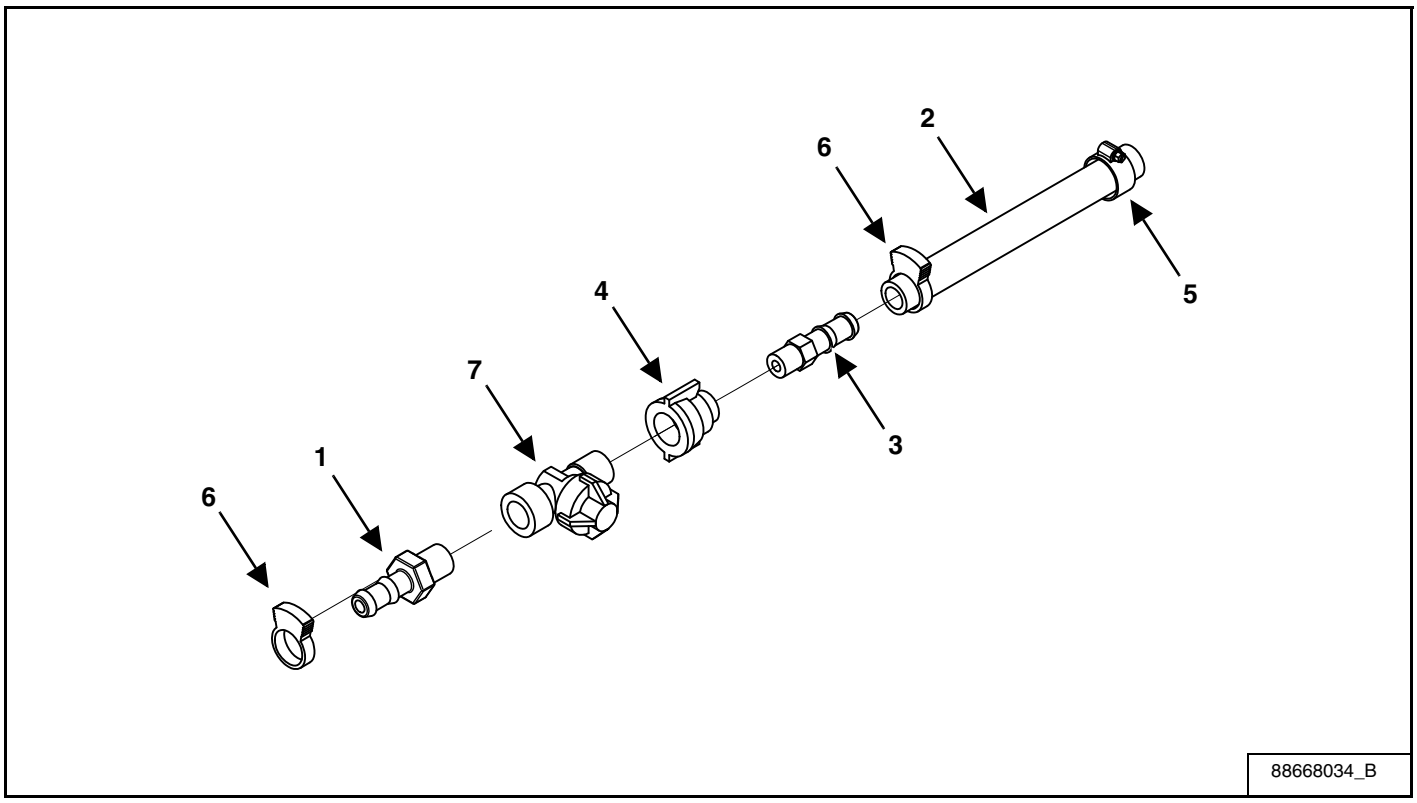
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88664927	1/2”-13 JAM HEX NUT ZP	1
2	88664904	2975 SPRING BUSHING PAINTED	1
3	SX2550-795	SPRING, 0.562” WIRE x 11” LONG	1
4	88667464	10” POLY HELPER SPRING	1
5	88664929	COULTER PIVOT, RH (SHOWN)	1
	88664895	COULTER PIVOT, LH	1
6	812435	1/4” x 1 3/4” COTTER PIN ZYD	1
7	88667463	1 17/64” ID x 1 7/8” OD x 14GA MB	1
8	88664900	SPRING ROD, 13-1/2”	1
9	88664879	1/8” x 1 1/4” COTTER PIN BLACK	1
10	88664903	5/8” x 1 3/4” SLIC PIN ZYD	1
11	88664932	GEN III W / KNIFE ARM WA RH (SHOWN)	1
	88664933	GEN III W / KNIFE ARM WA LH	1
12	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
13	SX2550-027	CONE, LM67048	2
14	88664883	5/8” FLATWASHER, 1/4” +/- 0.010 THICK	1
15	88664880	5/8”-18 SLOTTED HEX NUT, BLACK	1
16	SX2570-375	HUB CAP, WILTON #909902	1
17	88664885	TRIPLE LIP SEAL, NTI #1812-4	1

COULTER CLAMP KIT (4X6 BAR)



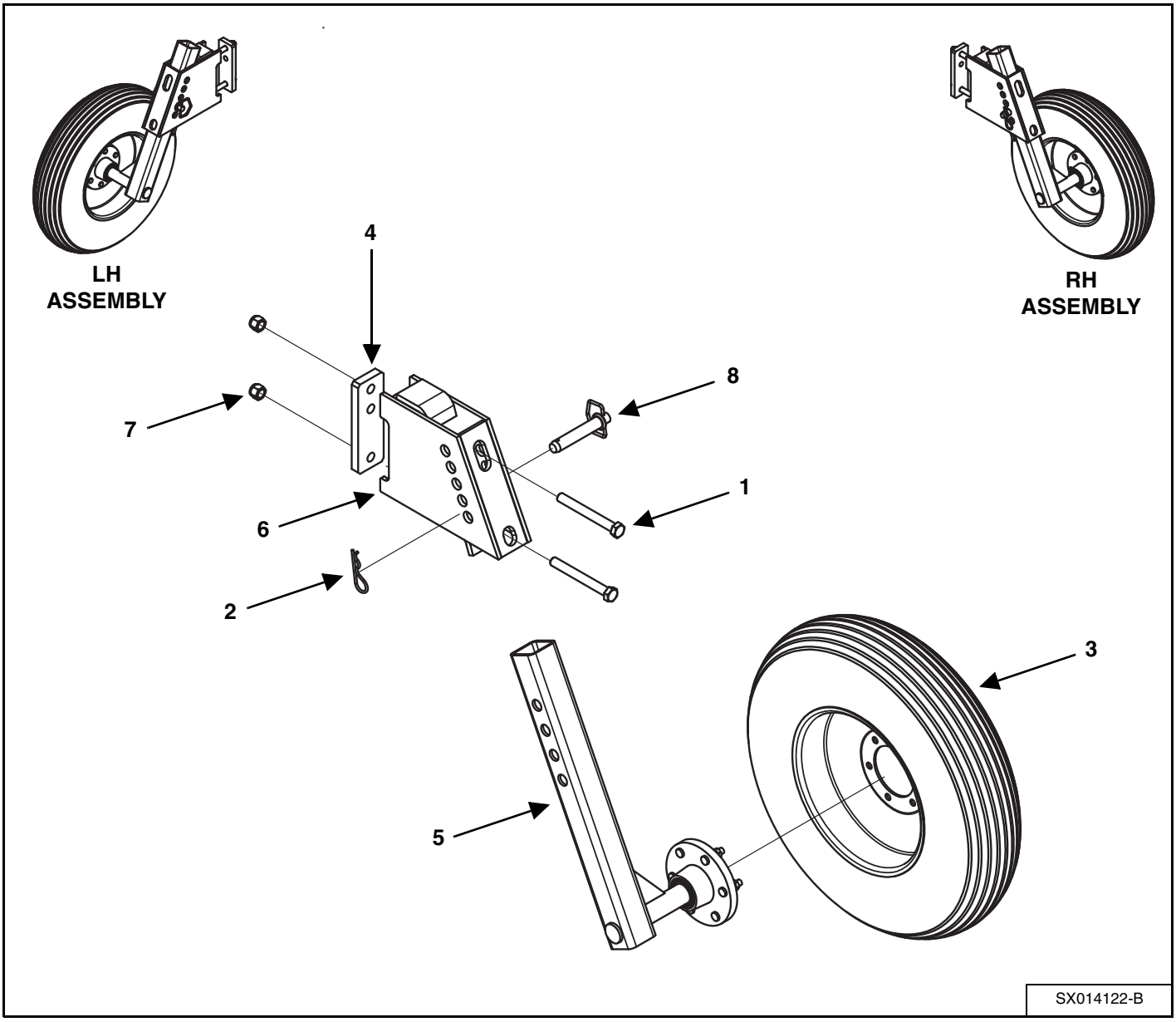
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88664921	BOLT, 1/2”-13 x 7” HHCS GR 5 ZP	*4
2	88664928	UNIVERSAL CLAMP PLATE	*2
3	SX2990-360	DRILLED CLAMP CASTING	*2
4	88664892	SET SCREW, 5/8”-11 x 1” SQ. HCPSS GR 5 ZP	*2
5	88664887	LOCKNUT, 1/2”-13 HEX ZP	*4
* Quantity Per Coulter.			

COULTER HOSE ASSEMBLY



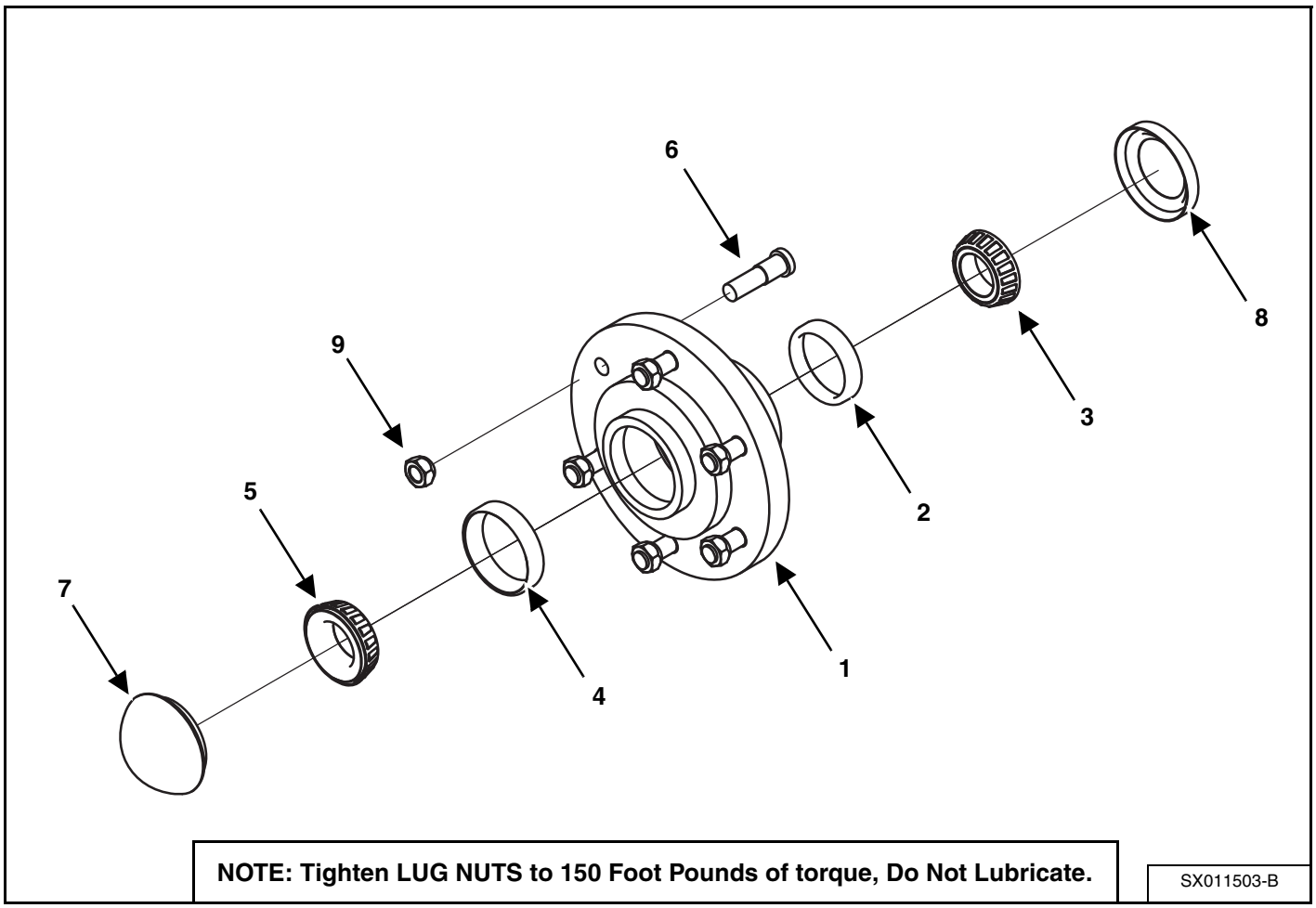
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88661128	HOSE BARB, 11/16” MPST x 1/2” HB	1
2	SX000812	HOSE, 1/2” 150# EPDM	0.6’
3	SX3A1412G	HOSE BARB, 1/4” MPT x 1/2” HB	1
4	SX402910	CAP & GASKET 1/4” THRD QT BLK	1
5	SX8J	STAINLESS CLAMP, 1/2” x 1/2”	1
6	SXH	HOSE CLAMP, 1/2” SPEEDY	2
7	SXQJT8360-NYB	CHECK VALVE DIAPHRAGM	1

GAUGE WHEEL GROUP LH / RH



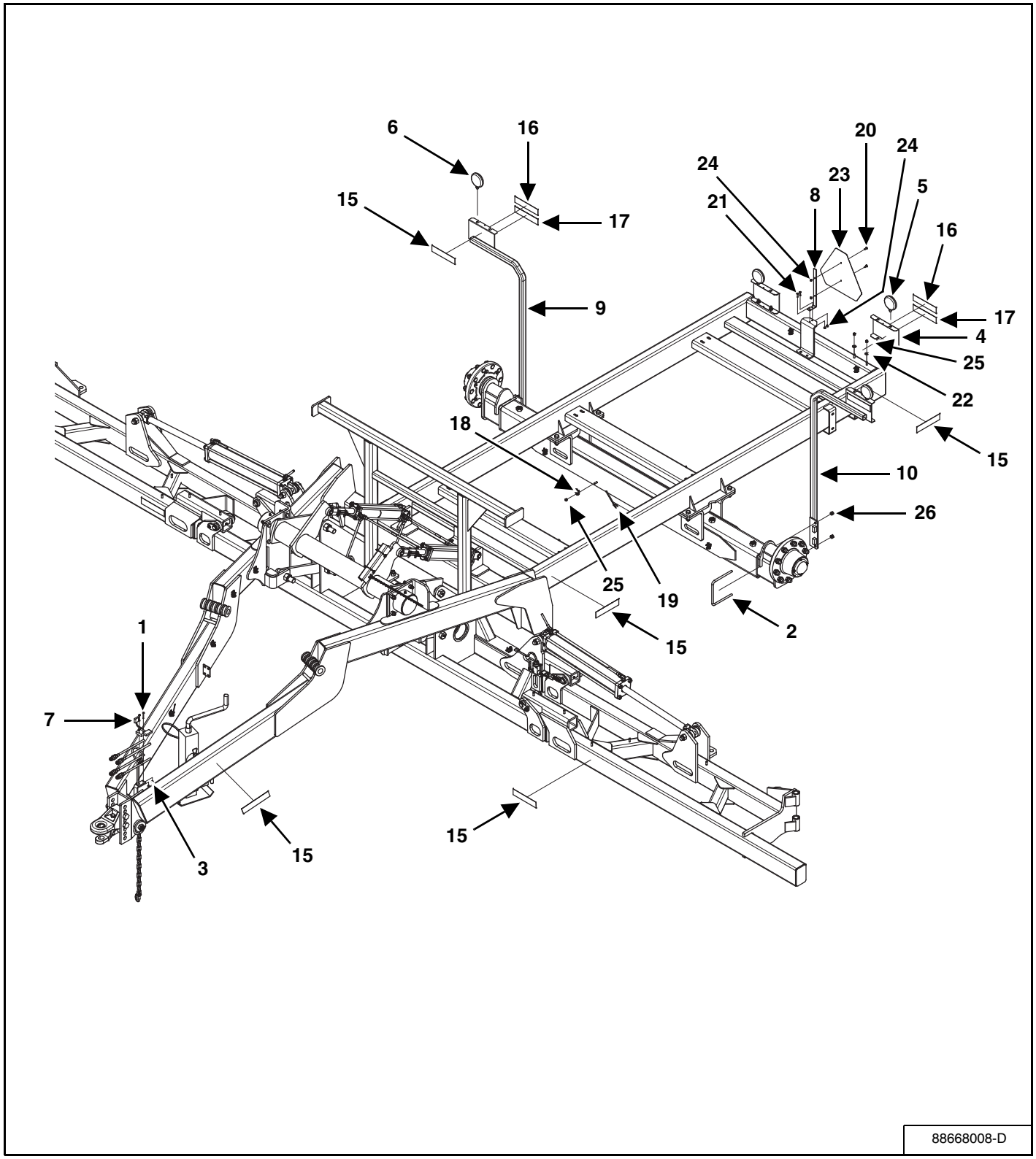
ITEM	PART NUMBER	DESCRIPTION	QTY
1	00280223	BOLT, 3/4” x 6.50” CSHH GR 5 P NA2024	2
2	88668005	PIN CLIP, 0.177” x 3-3/4” ZINC	1
3	SX011506	TIRE & WHEEL ASSEMBLY, 7.6-15SL	1
4	SX014057	FLAT, 0.75” x 9.25” W / HOLES BLACK	1
5	SX014123	SPINDLE TUBE WELDMENT	1
6	SX015872	LONG GAUGE WHEEL BRACKET WELDMENT	1
7	SXLN-075-NI-YZ	LOCKNUT, 3/4” NYLON INSERT YZ	2
8	SXPHI-100-525	HITCH PIN, 1” x 5-1/4”	1

GAUGE WHEEL HUB ASSEMBLY (256 - 6 - 6 - 4.62)



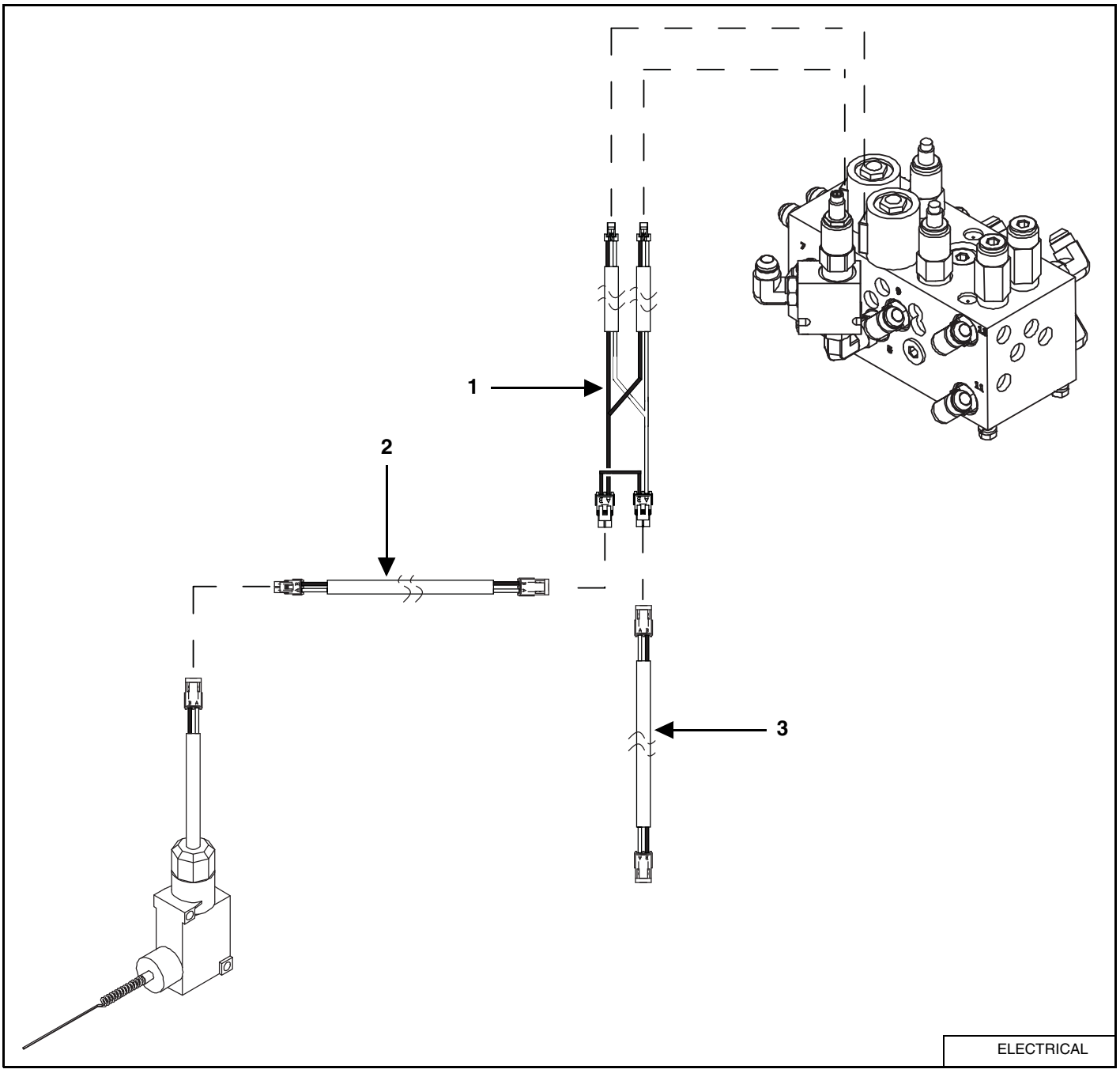
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88665707	HUB W / CUPS	1
2	88665708	OUTER CUP	1
3	88665709	OUTER CONE	1
4	88665710	INNER CUP	1
5	88665711	INNER CONE	1
6	88665712	STUD	6
7	88665713	HUB CAP	1
8	88665714	GREASE SEAL	1
9	88665715	NUT	6

LIGHTING MARKING GROUP



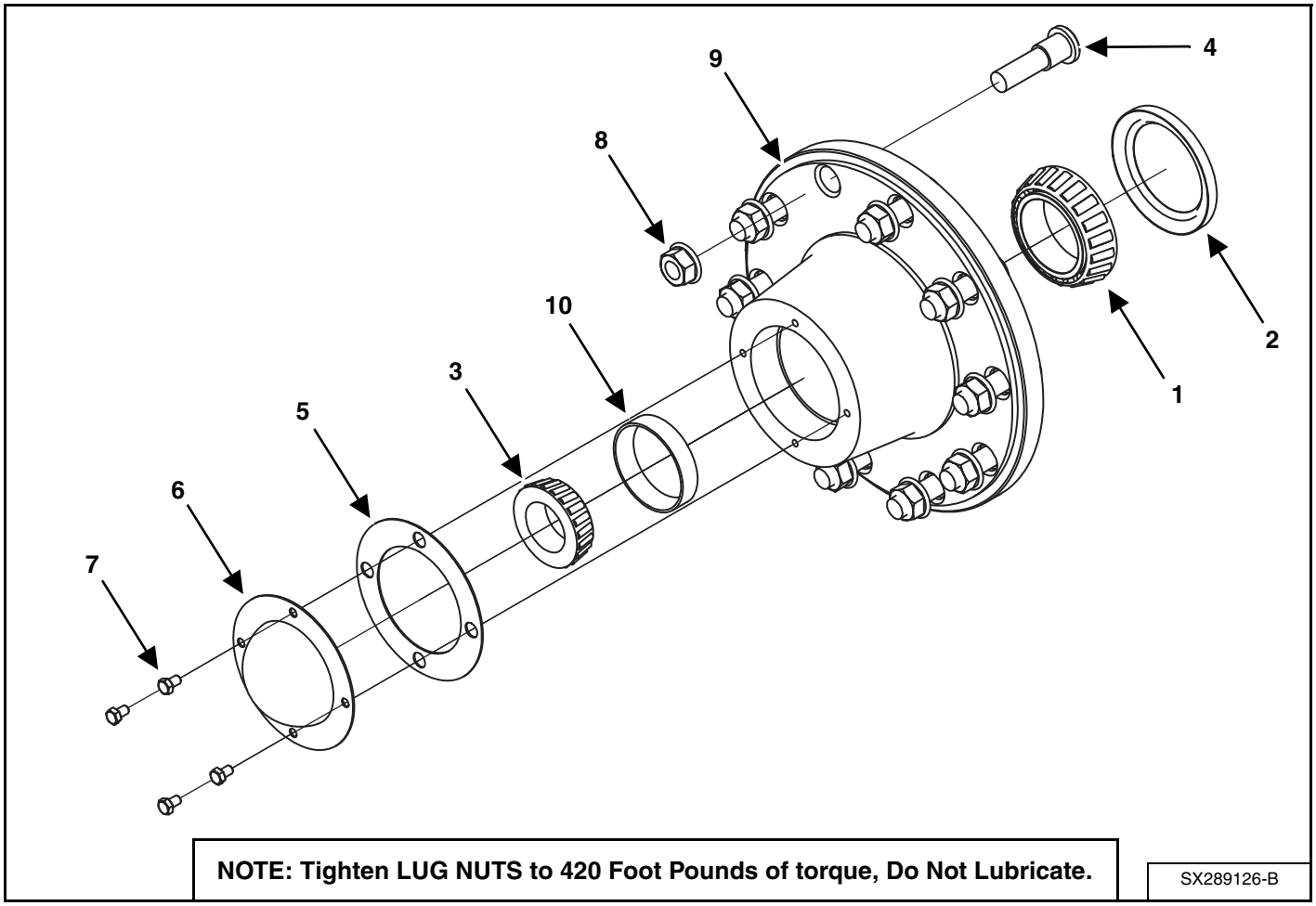
ITEM	PART NUMBER	DESCRIPTION	QTY
1	86511926	MACHINE BOLT, 10-24 x 1.75” YZ2	2
2	88668009	U-BOLT, 1/2” x 7.38” x 7.25” GR 5 YZ	2
3	88668038	LOCKNUT, 10-24 NYLON INSERT YZ	2
4	SX004499	LIGHT / DECAL SHEET, BLACK	2
5	SX004560	TURN / TAIL LAMP	2
6	SX004561	AMBER FLASH / WARNING TAIL LAMP	2
7	SX006978	TURN SIGNAL MODULE, (PWI)	1
8	SX013588	SLOW MOVING VEHICLE (SMV) SIGN MOUNT	1
9	SX014076	RS LIGHT BRACKET WELDMENT	1
10	SX014081	LS LIGHT BRACKET WELDMENT	1
11	SX014098	1460 RED LIGHT HARNESS	1
12	SX014099	1460 AMBER LIGHT HARNESS	1
13	SX014100	FRONT TO REARHARNESS	1
14	SX014612	TRACTOR / IMPLEMENT HARNESS	1
15	SX17-5910	AMBER REFLECTOR DECAL, 2” x 9”	10
16	SX17-5915	RED REFLECTOR DECAL, 2” x 9”	4
17	SX17-5920	DAY ORANGE DECAL, 2” x 9”	4
18	SX21294	HEAVY DUTY CABLE TIE MOUNT	12
19	SX3NS12	STRAP, 11-1/4” BLACK 21	20
20	SXBH0250758YZ	BOLT, 1/4” x 3/4” GR 8	2
21	SXBH0251005YZ	BOLT, 1/4” x 1” GR 5	2
22	SXFW-038YZ	FLATWASHER, 3/8” GR 5	4
23	SXJD5403	SLOW MOVING VEHICLE (SMV) SIGN	1
24	SXLN-025-NIYZ	LOCKNUT, 1/4” NYLON INSERT	4
25	SXLN-038-NIYZ	LOCKNUT, 3/8” NYLON INSERT YZ	16
26	SXLN-050-NI-YZ	LOCKNUT, 1/2” NYLON INSERT YZ	4

ELECTRICAL HARNESSES / ROUTING



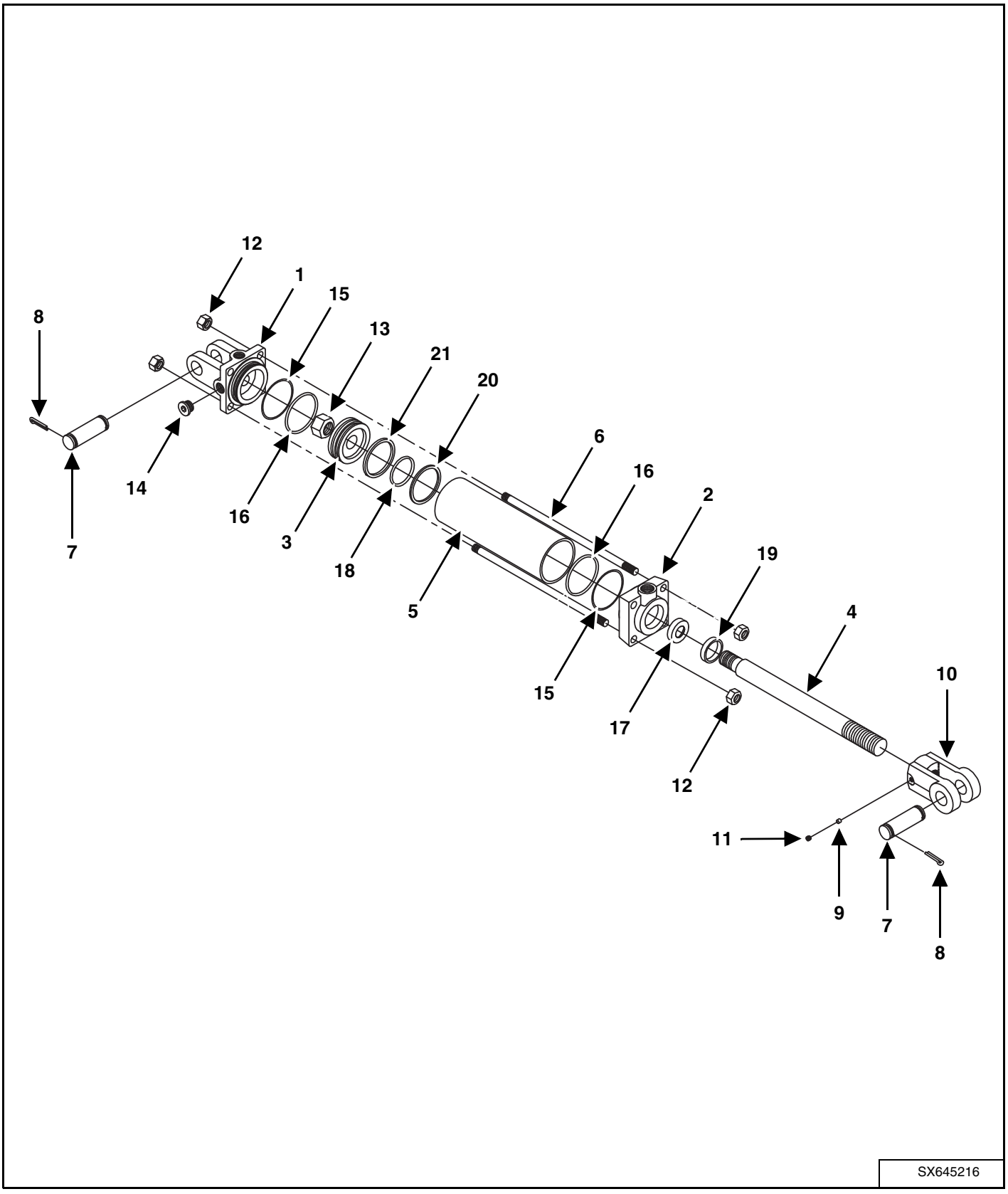
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SX014611	HYDRAULIC SOLENOID TEE HARNESS	1
2	SX005813	MICRO SWITCH 5’ EXTENSION HARNESS, SPECIAL	1
3	SX014610	MICRO SWITCH 15’ EXTENSION HARNESS, SPECIAL	1

RUNNING GEAR HUB ASSEMBLY (11.25BC, 15000#)



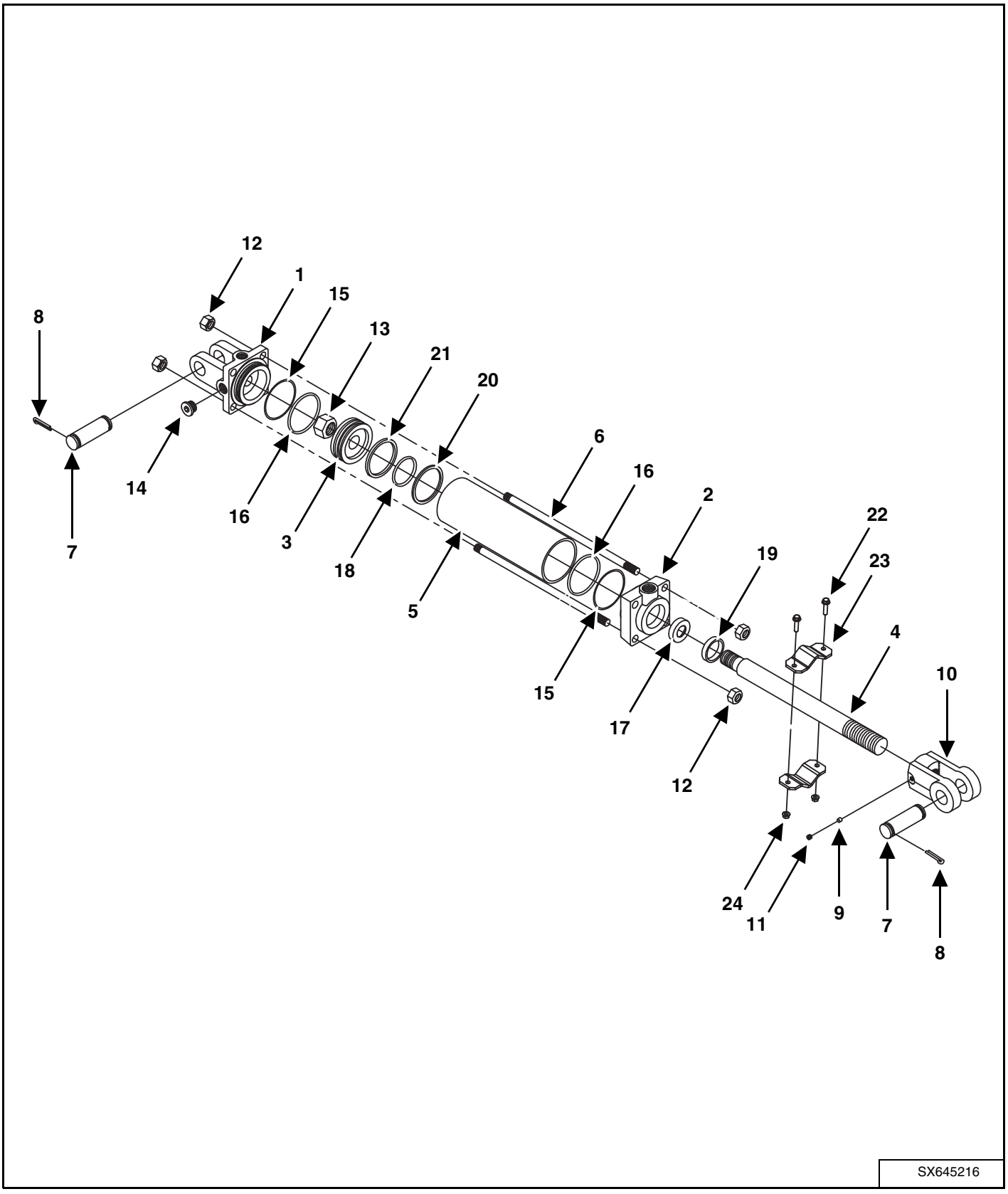
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88665668	BEARING CONE	1
2	88665669	GREASE SEAL	1
3	88665670	OUTER CONE BEARING	1
4	88665671	WHEEL STUD	10
5	88665672	HUBCAP GASKET	1
6	88665673	HUB CAP	1
7	SXBH031-050-5	BOLT, 5/16” x 1/2” GR 5	4
8	SX913571	LUG NUT, 3/4”-16 FLANGED	10
9	88665675	HUB, W / CUPS	1
10	88665676	OUTER CUP	1

OUTER WING FOLD CYLINDERS



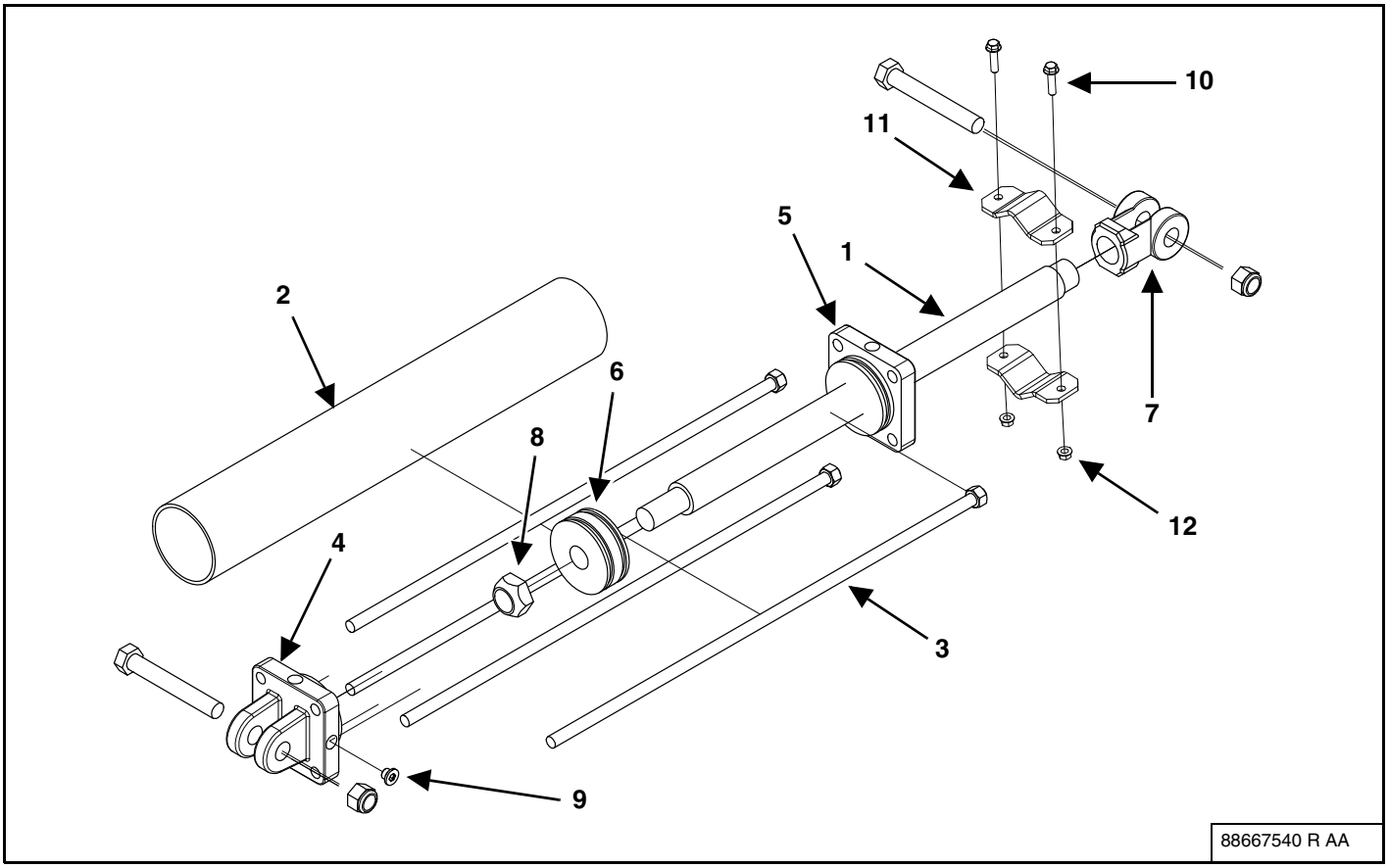
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SX492675	CLEVIS CAP	1
2	SX492728	ROD CAP	1
3	SX494719	PISTON	1
4	SX493597	CYLINDER ROD	1
5	SX491746	CYLINDER TUBE	1
6	SX492286	TIE ROD	4
7	SX134953	CYLINDER PIN	2
8	SX135995	PIN	4
9	SX498006	THREAD LOCK-NYLON	1
10	SX492652	ROD CLEVIS	1
11	SX148390	SOCKET SET SCREW, 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	1
* Seal Repair Kit includes Items 15 - 21 (Items not sold separately).			

TOOLBAR LIFT CYLINDERS



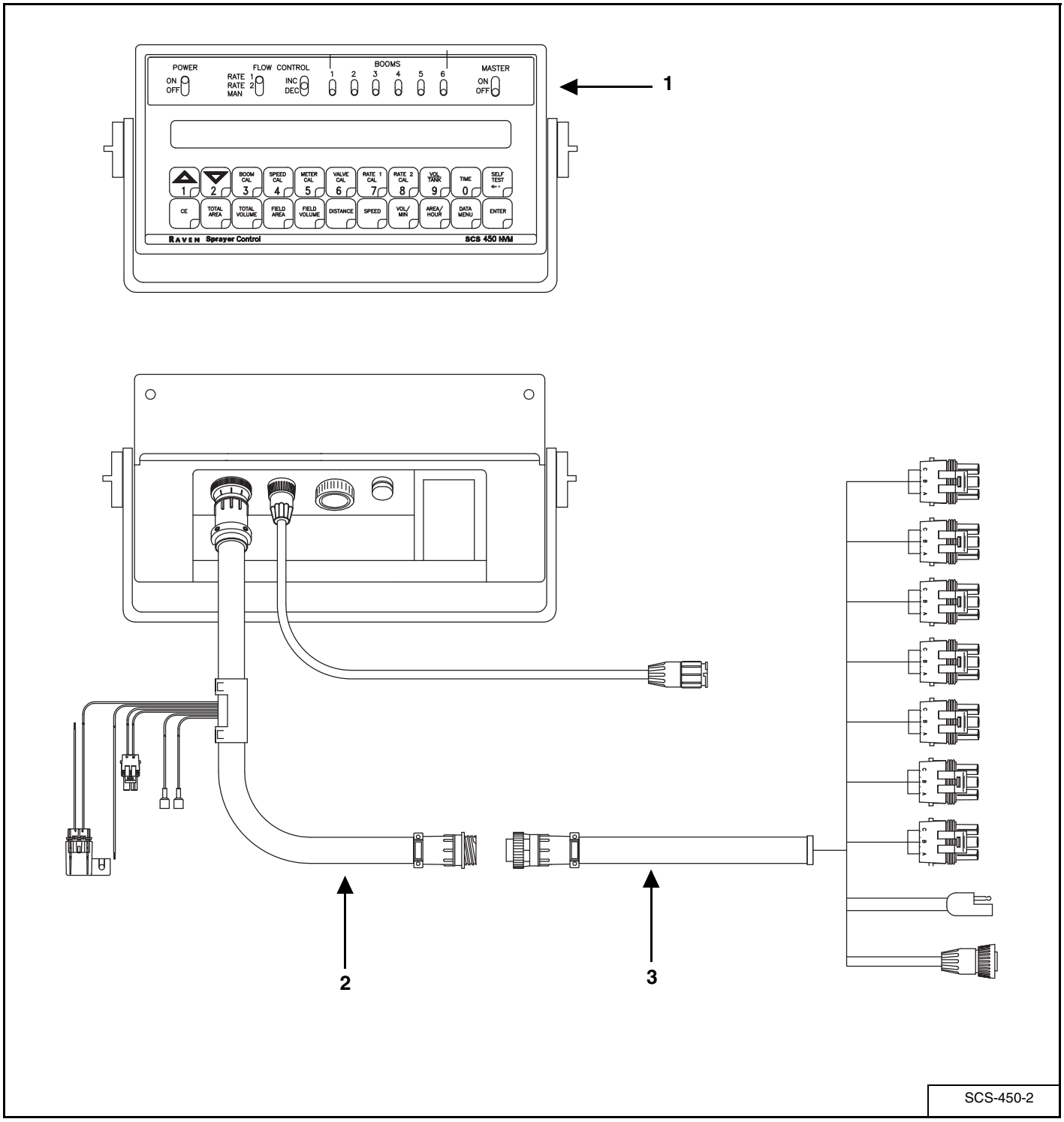
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SX492675	CLEVIS CAP	1
2	SX492728	ROD CAP	1
3	SX494719	PISTON	1
4	SX493597	CYLINDER ROD	1
5	SX491746	CYLINDER TUBE	1
6	SX492286	TIE ROD	4
7	SX134953	CYLINDER PIN	2
8	SX135995	PIN	4
9	SX498006	THREAD LOCK-NYLON	1
10	SX492652	ROD CLEVIS	1
11	SX148390	SOCKET SET SCREW, 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	1
22	SXBHF0381508YZ	BOLT, 3/8” x 1.50” FLG GR 8 YLLW ZN	4
23	88669639	CYLINDER STOP PLATE	4
24	SXNTFTL038168YZ	LOCKNUT, 3/8”-16 UNC FLG, TP LCK GR 8 YZ	4
* Seal Repair Kit includes Items 15 - 21 (Items not sold separately).			

INNER WING FOLD CYLINDERS



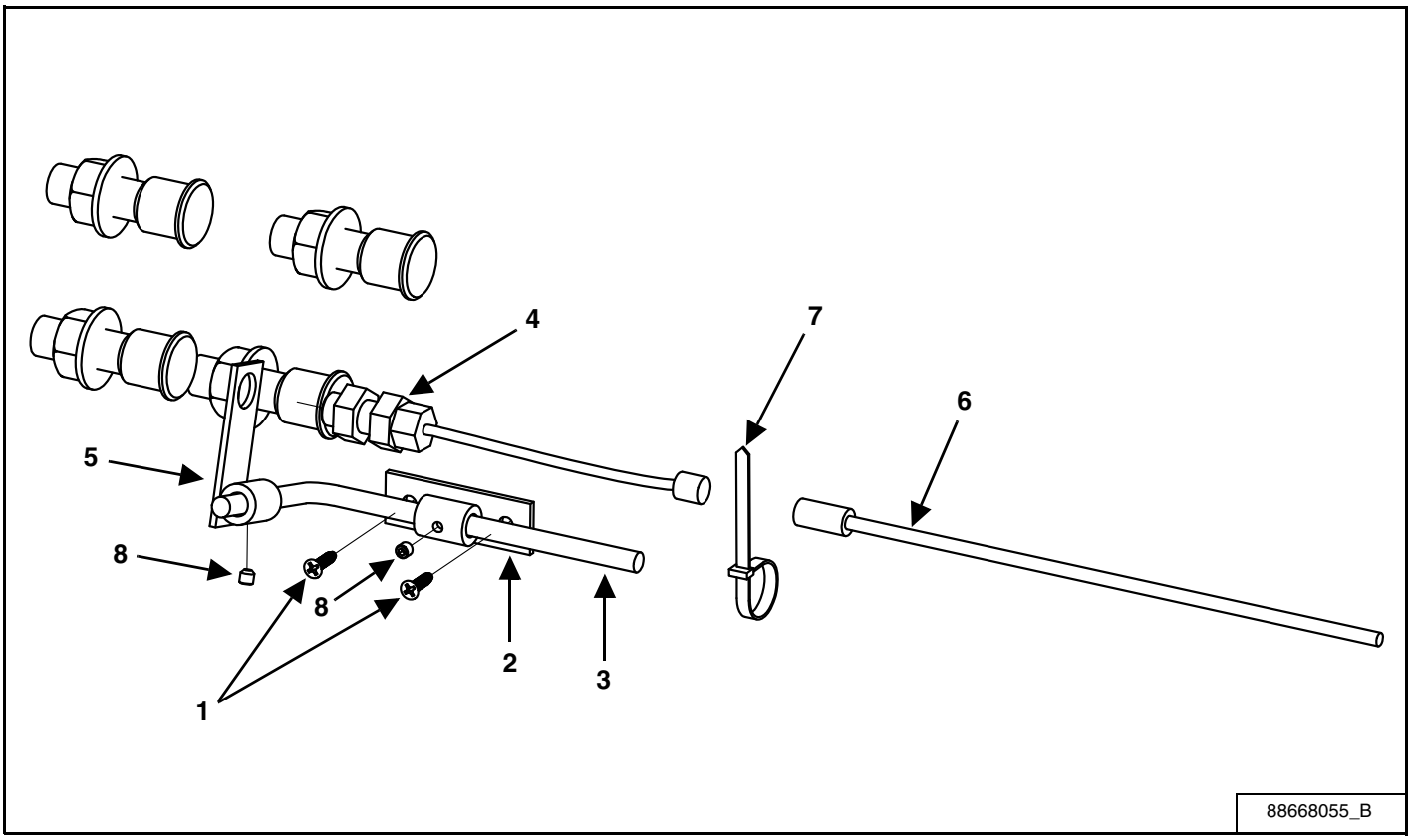
ITEM	PART NUMBER	DESCRIPTION	QTY
1	88667541	PISTON ROD	1
2	88667542	TUBE	1
3	88667543	TIEROD ASSY	4
4	88667544	BUTT	1
5	88667545	GLAND	1
6	88667546	PISTON	1
7	88667547	CLEVIS ASSEMBLY	1
8	88667548	LOCKNUT, 1.25-12	1
9	SX6408-8	HYD FIT; 08 O-RING PLUG, SCKT	1
10	SXBHF0381508YZ	BOLT, 3/8” x 1.50” FLG GR 8 YLLW ZN	4
11	88669639	CYLINDER STOP PLATE	4
12	SXNTFTL038168YZ	LOCKNUT, 3/8”-16 UNC FLG, TP LCK GR 8 YZ	4
NS	88667491	SEAL REPAIR KIT 88667540	1

RAVEN 450



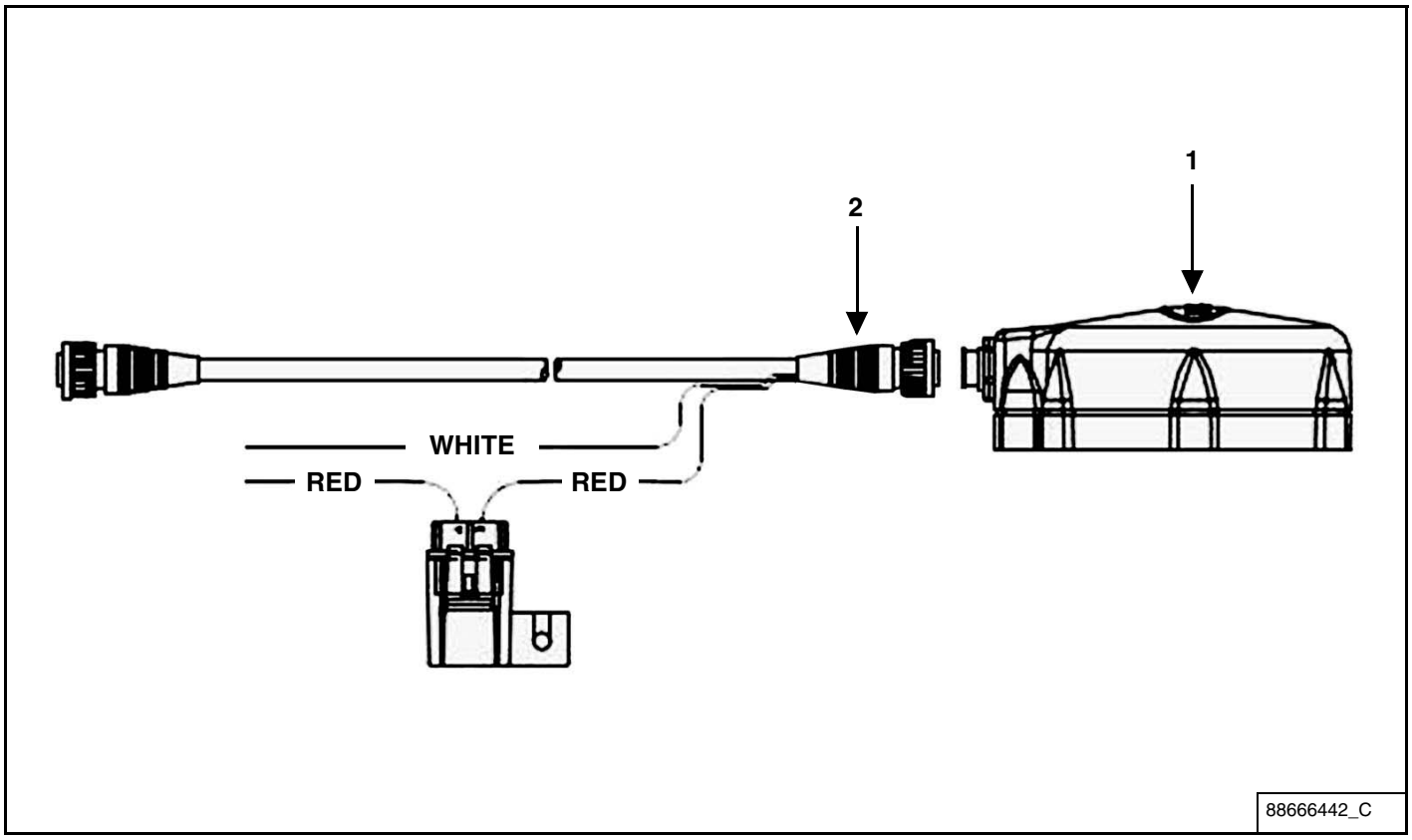
ITEM	PART NUMBER	DESCRIPTION	QTY
1	SX063-0171-220	CONSOLE ASSY, 450 W/SERIAL PORT	1
2	SX115-0171-085	CABLE, RAVEN 450 CONTROL CABLE	1
3	88664958	CABLE, FLOW CONTROL 43 FT 6 SECT	1

WHEEL PROXIMITY SENSOR ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY
1	88663223	TAPPING SCREW, 10-24 x 0.75” FH SS	2
2	SX010439	SPEED SENSOR MOUNT	12
3	SX010442	ADJUSTMENT ROD	1
4	88668905	GEAR TOOTH / PROXIMITY SPEED SENSOR	1
5	SX019563	SPEED SENSOR MOUNT WELDMENT	1
6	SX115-0159-018	24’ EXTENSION SPEED SENSOR CABLE	1
7	SX3NS8	STRAP, BLACK 7-1/4”	1
8	SXSTS-025-038	SETSCREW, 1/4” x 1/4” ALLEN HD	2

GPS SPEED SENSOR ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY
1	88666443	PHOENIX 10 RECEIVER, 063-0172-988	1
2	88666444	RECEIVER CABLE, 115-0171-817	1

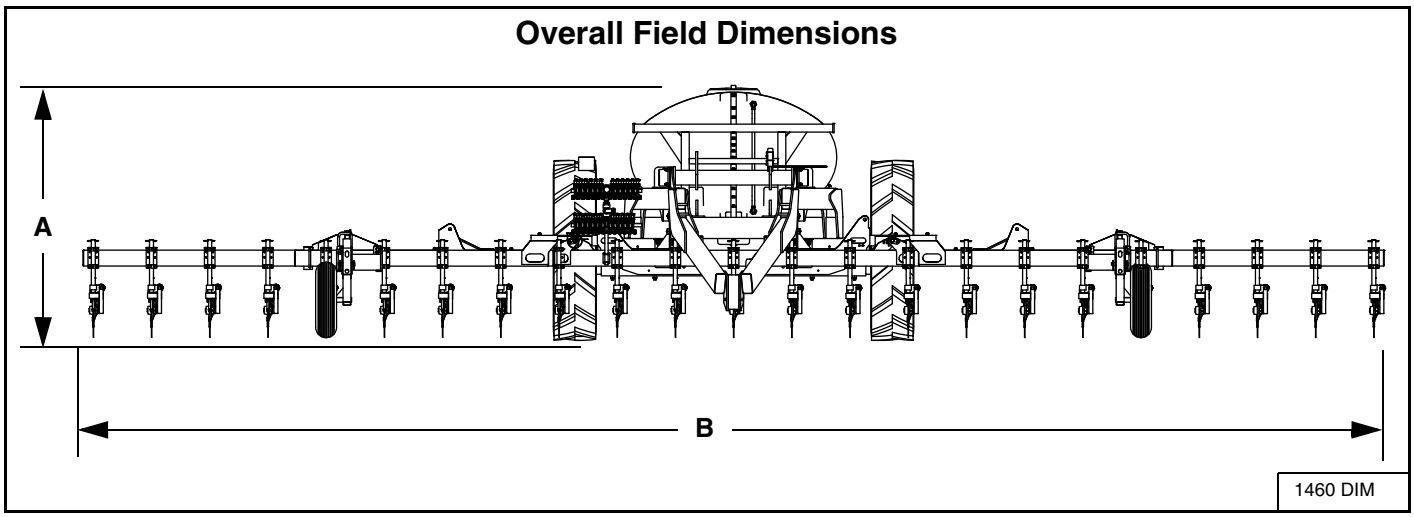
Farm King

SPECIFICATIONS

Farm King

SPECIFICATIONS

Dimensions

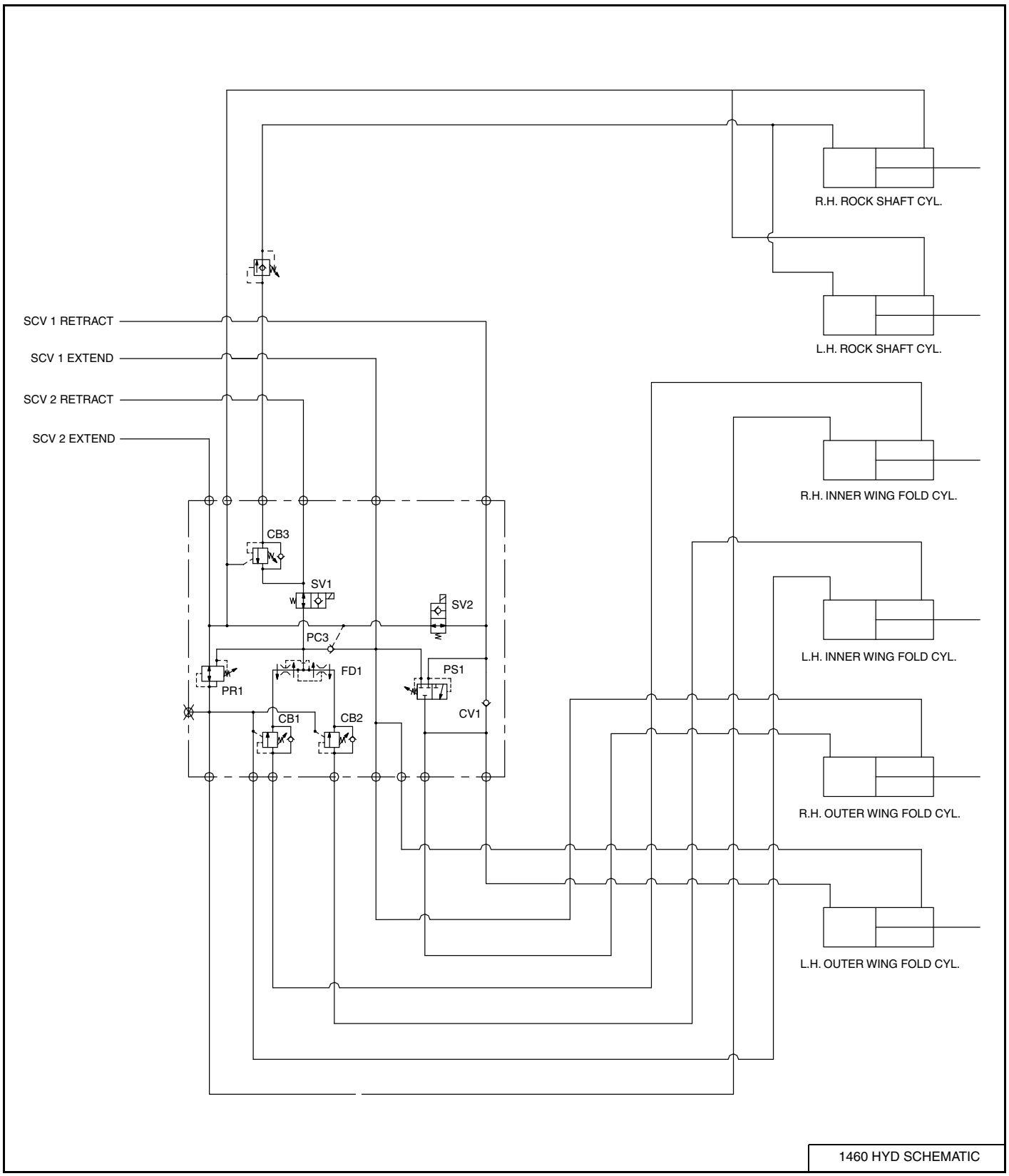


DESCRIPTION	1460
Overall Field Height (A)	8 ft. 6 in.
Overall Field Width (B)	40 ft. 11 in.
Transport Width	16 ft. 5 in.
Transport Height	12 ft. 10 in.
Transport Length	23 ft. 6 in.
Pin To Axle	17 ft. 3 in.
NOTE: Dimensions are approximate measurements.	

Performance

DESCRIPTION	1460
Product Tank	1600 U.S. gal.
Fresh Water Safety Tank	9 U.S. gal.
Pump Options	Ace Hydraulic Driven Centrifugal Pump Kit with Raven 450 Console John Blue Twin Piston Ground Drive Pump Kit
Toolbar	Available in 20”, 22”, 30”, 36”, 38” & 40” row spacings up to 40 ft. wide.
Coulters	20 in. Ripple, Spring - Cushioned (Knives or Injectors)
Gauge Wheels	2
Tires	Single Tire / Rim 380/90R48
Ground Clearance	17 in. in field operation, 42 in. on turn rows
Electrical Harness	7 - Pin

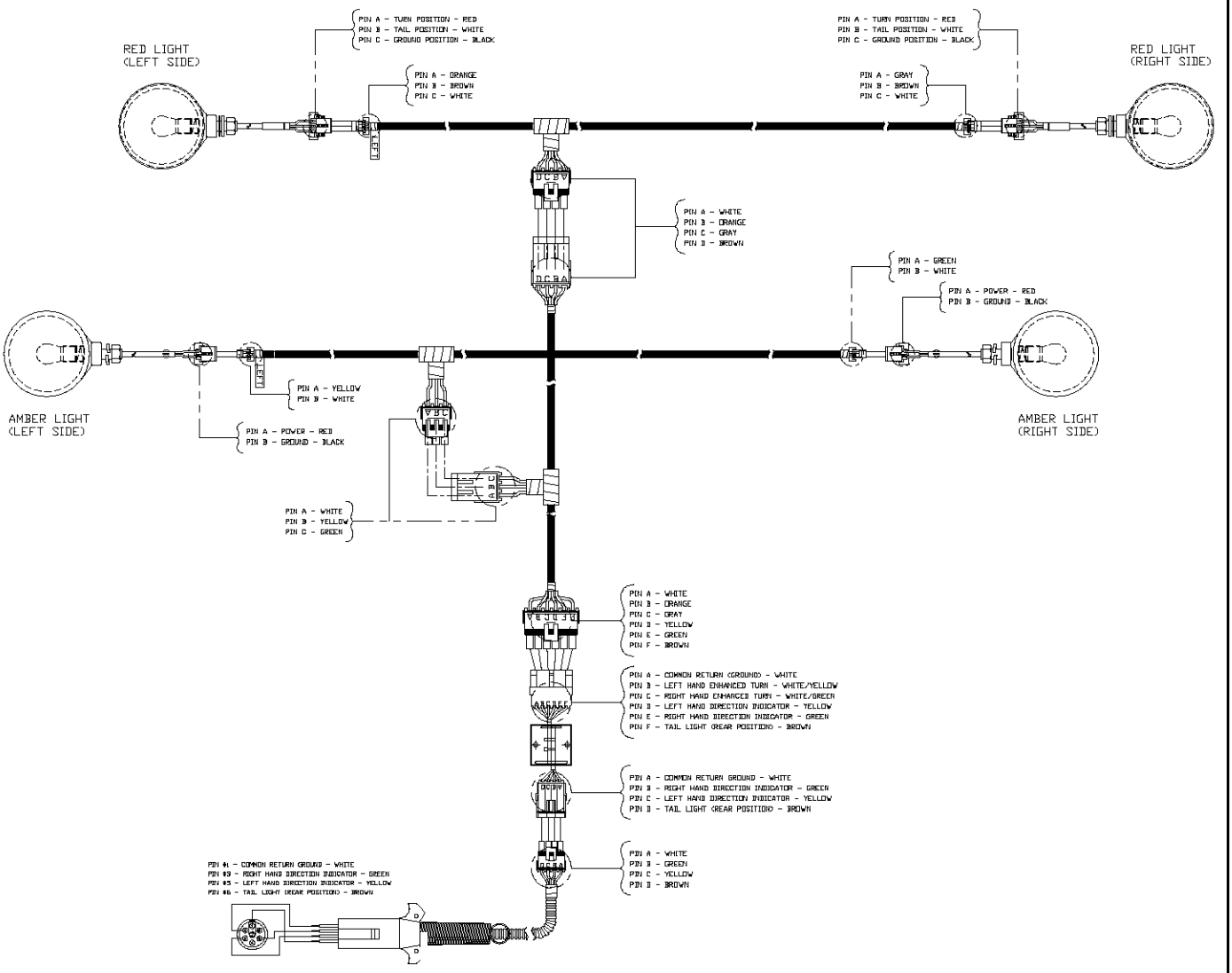
HYDRAULIC SCHEMATIC



1460 HYD SCHEMATIC

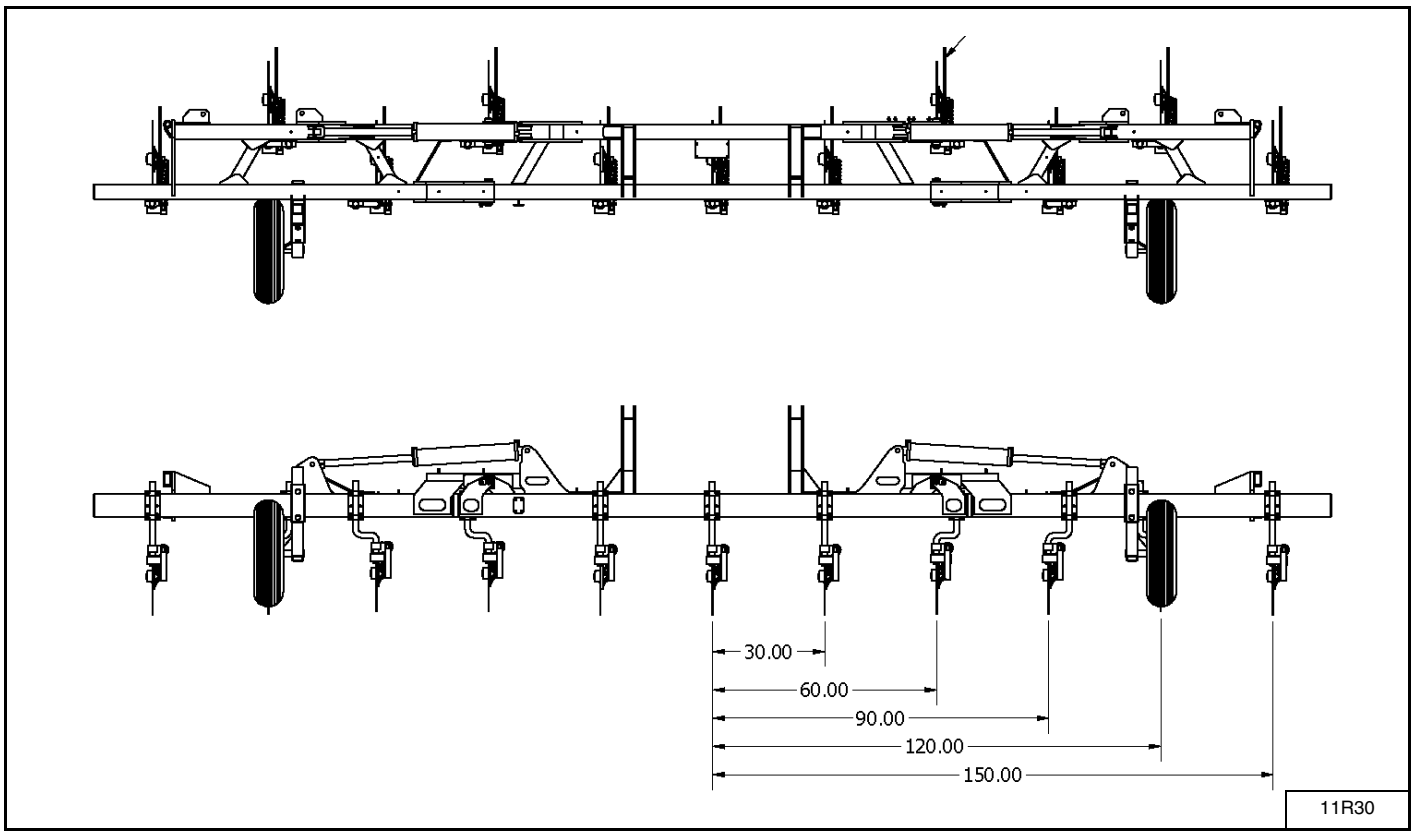
ITEM	PART NUMBER	DESCRIPTION	QTY
CB3	88661439	VALVE, C-BALANCE 2.5:1 RATIO	1
CB1 / CB2	88661440	VALVE, C-BALANCE 10.0:1 RATIO	2
CV1	88661441	CHECK VALVE, #10	1
FD1	88661442	FLOW DIVIDER, #10 COMBINER	1
PC3	88661443	CHECK VALVE, #10 PILOT-OPEN	1
PR1	88661444	PRESSURE REDUCING VALVE, #10	1
PS1	88661445	SEQUENCE VALVE, #10 PILOT-DRAIN	1
SV1 / SV2	88661446	2-WAY POPPET SOLENOID, #10 N.O.	2
SV1 / SV2	88661447	METRI-PACK, #10 150, 12 VDC, E-COIL	2

ELECTRICAL SCHEMATIC

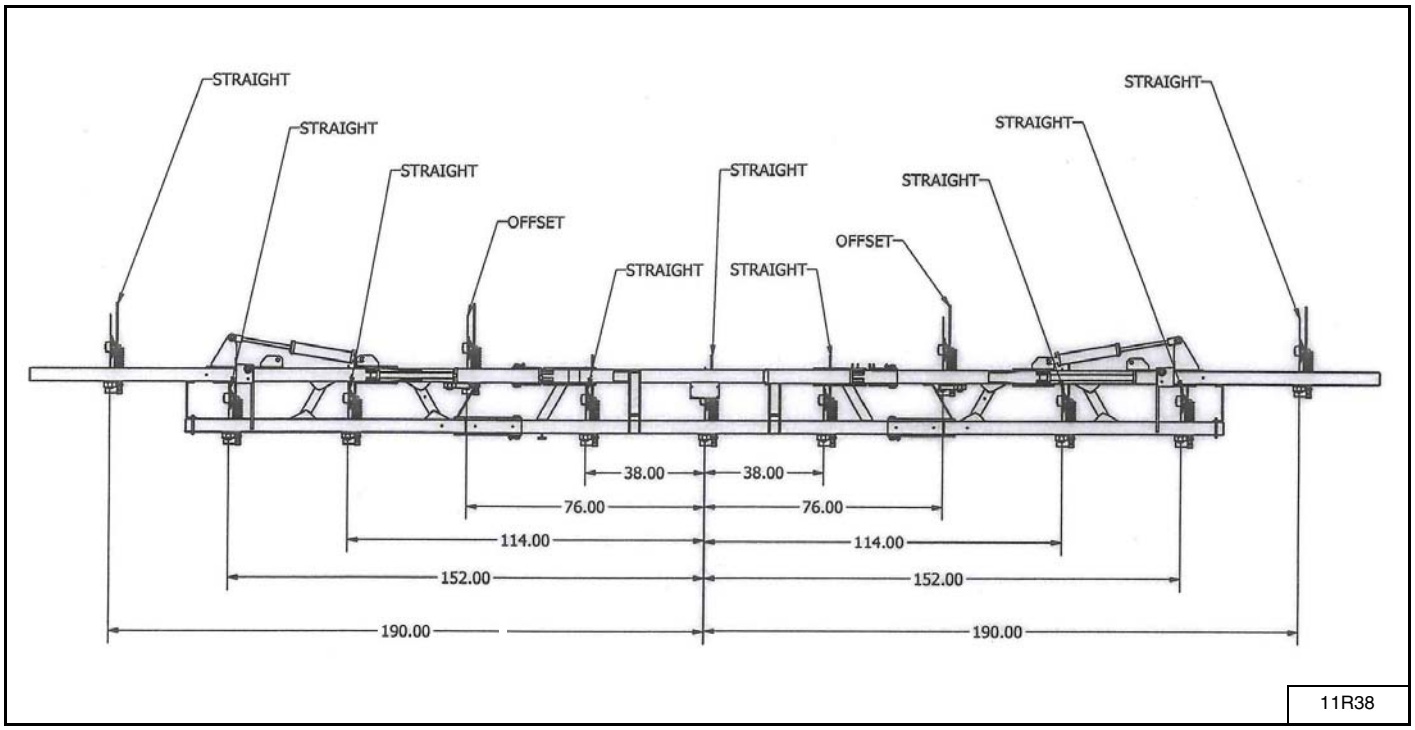


ELECTRICAL SCHEMATIC

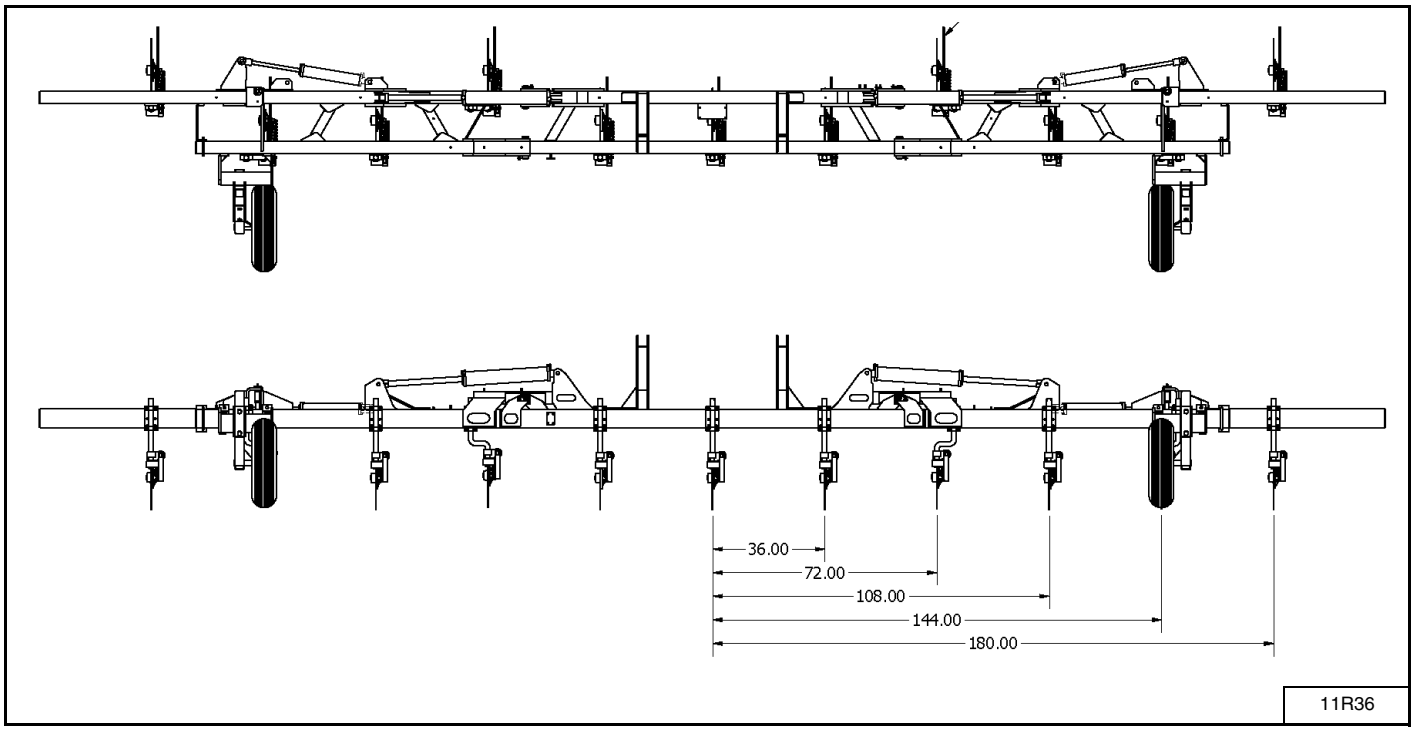
11R30 COULTER SPACING



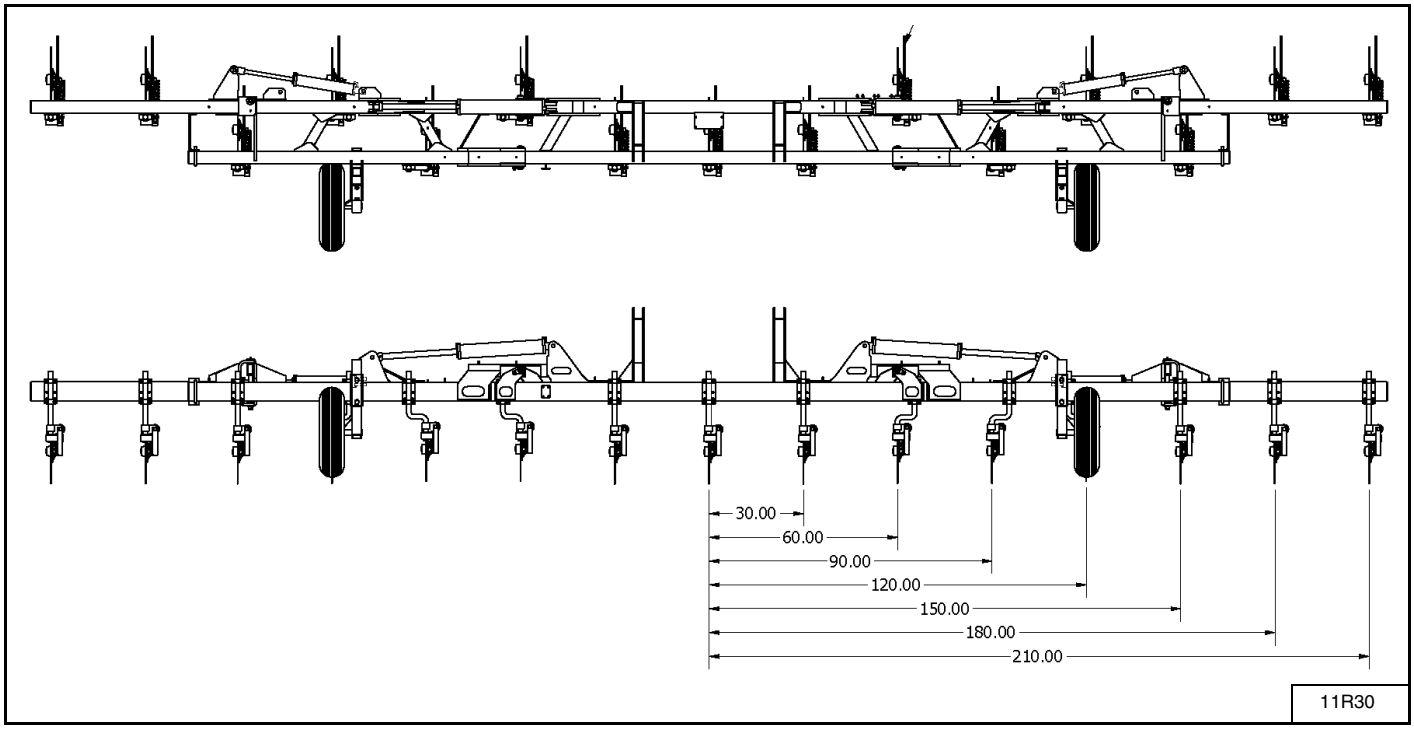
11R38 COULTER SPACING



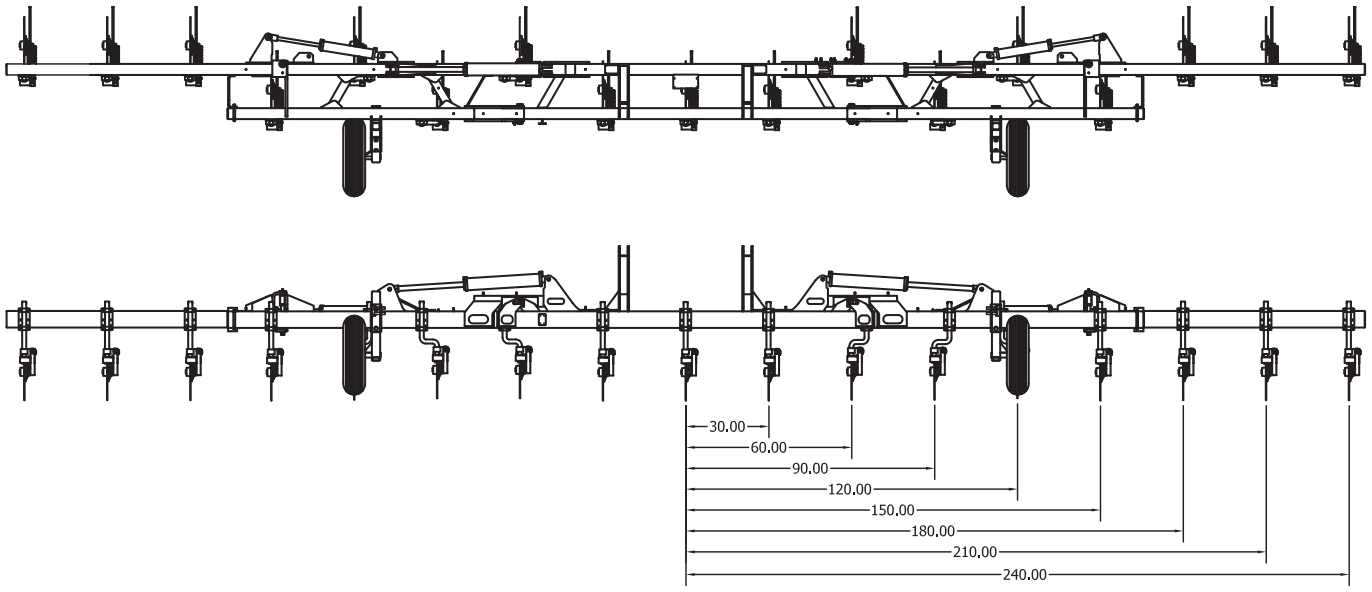
11R36 COULTER SPACING



15R30 COULTER SPACING

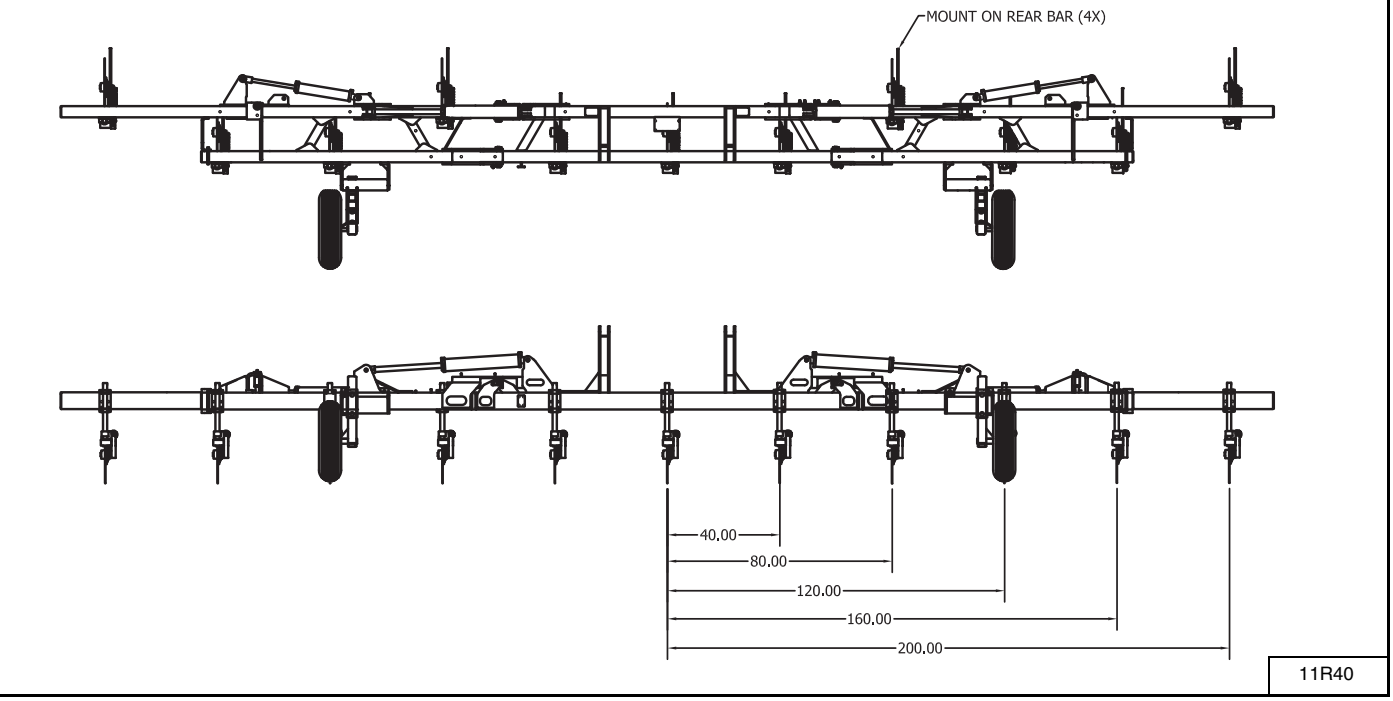


17R30 COULTER SPACING



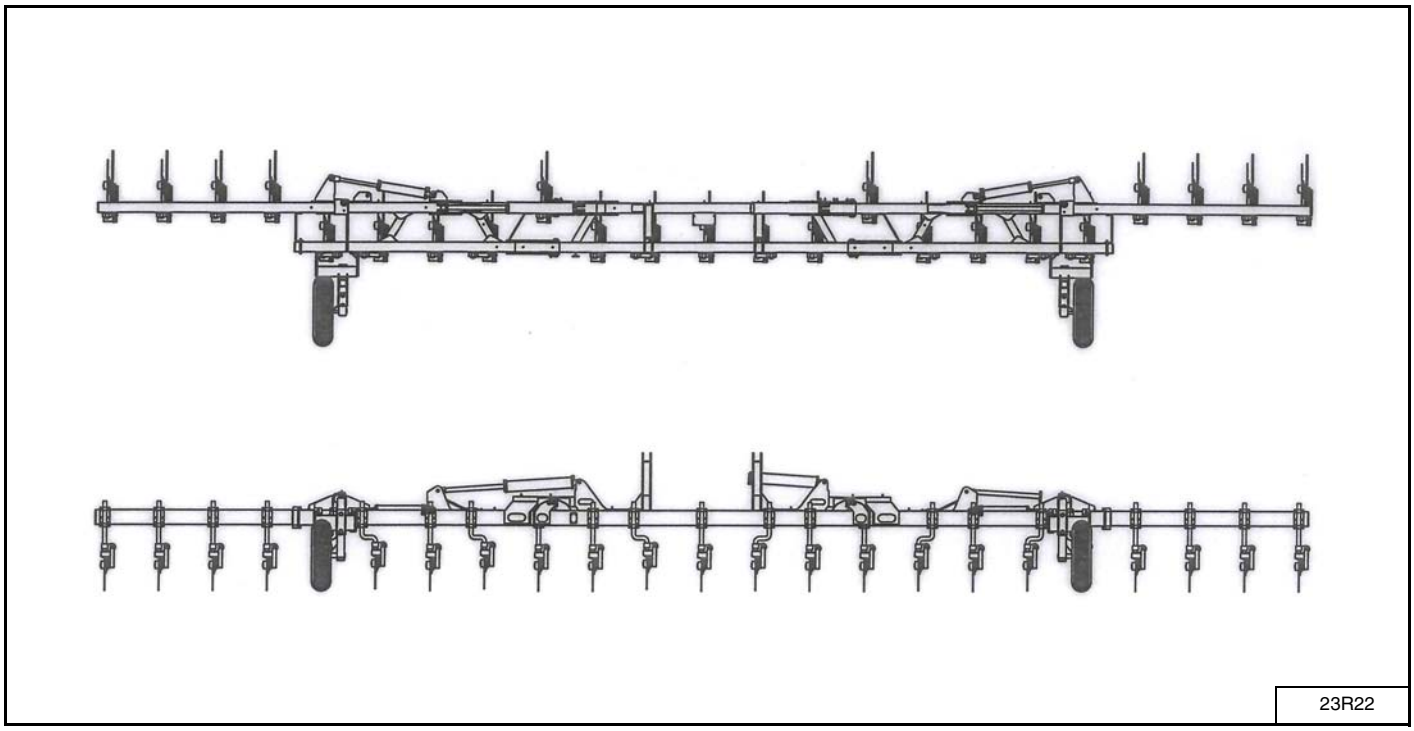
17R30

11R40 COULTER SPACING

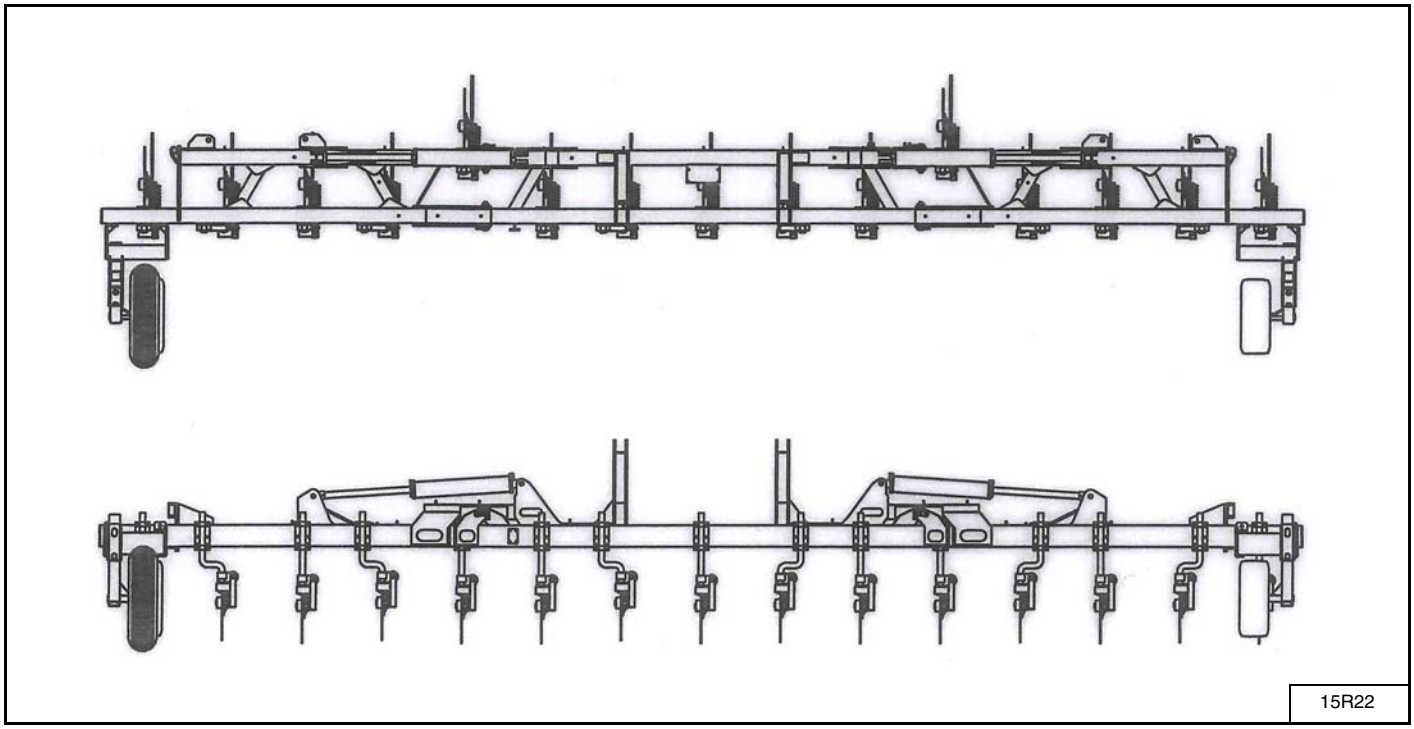


11R40

23R22 COULTER SPACING



15R22 COULTER SPACING



HARDWARE TORQUE VALUES

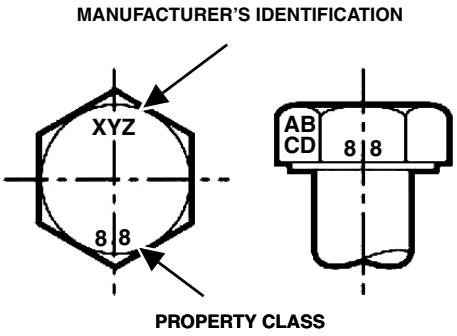
Metric Chart

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.

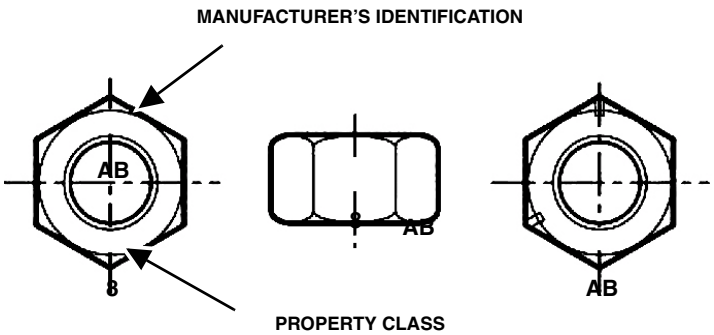
Use the following charts to determine the correct torque when checking, adjusting or replacing hardware. **Torque values are listed in newton-meters (inch* or foot pounds) for normal assembly applications.**

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

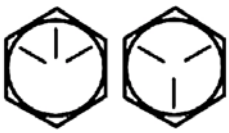
NOTE: Do not use the values listed in the charts if a different torque value or tightening procedure is specified in this manual for a specific application. Torque values listed are for general use only.

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

SAE GRADE 2 BOLTS



SAE GRADE 5 BOLTS

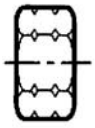
SAE GRADE 8 BOLTS

SAE GRADE 2 NUTS

SAE GRADE 2 NUTS

SAE GRADE 2 NUTS

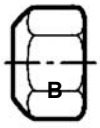
Identification of Hex Nuts and Lock Nuts



Grade A - No Notches

Grade B - One Circumferential Notch

Grade C - One Circumferential Notches



Grade A - No Mark

Grade B - Letter B

Grade C - Letter C

Grade A - No Marks

Grade B - Three Marks

Grade C - Six Marks

(Marks not always 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 57

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 57]**.

Flare Fitting

Figure 58

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 **[Figure 58]** to find the correct tightness needed.

NOTE: If the fitting leaks, disconnect and inspect the seat area for damage.

Port Seal (O-ring Boss) Fitting

Figure 59

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” -1 6	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 59].

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

Use the following formula to covert pounds per acre to gallons per minute (gpm):

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

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

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

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:

$$\text{GPM (per nozzle)} = \frac{\text{GPA x MPH x W}}{5940} \qquad \text{GPA} = \frac{\text{GPM (per nozzle) x 5940}}{\text{MPH x W}}$$

$$\text{MPH} = \frac{\text{Distance in feet x 60}}{\text{Time in seconds x 88}}$$

W = Nozzle spacing in inches

Spacing Correction Chart

NOZZLE SPACING	CONVERSION FACTOR	GPA Target Conversion Factor = Corrected GPA
22 in.	1.36	
36 in.	0.83	
38 in.	0.79	

NOTE: For nozzle spacing not shown, use this 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
H1/4U - SS0004	10	0.20	9.9	6.6	5.0	4.0
	20	0.28	13.9	9.2	6.9	5.5
	30	0.35	17.3	11.6	8.7	6.9
	40	0.40	19.8	13.2	9.9	7.9
H1/4U - SS0006	10	0.30	14.9	9.9	7.4	5.9
	20	0.42	20.8	13.9	10.4	8.3
	30	0.52	25.7	17.2	12.9	10.3
	40	0.60	29.7	19.8	14.9	11.9
H1/4U - SS0008	10	0.40	19.8	13.2	9.9	7.9
	20	0.57	28.2	18.8	14.1	11.3
	30	0.69	34.2	22.8	17.1	13.7
	40	0.80	39.6	26.4	19.8	15.8
H1/4U - SS0010	10	0.50	24.8	16.5	12.4	9.9
	20	0.71	35.1	23.4	17.6	14.1
	30	0.87	43.1	28.7	21.5	17.2
	40	1.00	49.5	33.0	24.8	19.8
H1/4U - SS0015	10	0.75	37.1	24.8	18.6	14.9
	20	1.06	52.5	35.0	26.2	21.0
	30	1.30	64.4	42.9	32.2	25.7
	40	1.50	74.3	49.5	37.1	29.7
H1/4U - SS0020	10	1.00	49.5	33.0	24.8	19.8
	20	1.41	69.8	46.5	34.9	27.9
	30	1.73	85.6	57.1	42.8	34.3
	40	2.00	99.0	66.0	49.5	39.6
H1/4U - SS0030	10	1.50	74.3	49.5	37.1	29.7
	20	2.12	104.9	70.0	52.5	42.0
	30	2.60	128.7	85.8	64.4	51.5
	40	3.00	148.5	99.0	74.3	59.4
H1/4U - SS0040	10	2.50	123.8	82.5	61.9	49.5
	20	3.54	175.2	116.8	87.6	70.1
	30	4.53	224.2	149.5	112.1	89.7
	40	5.00	247.5	165.0	123.8	99.0
H1/4U - SS0050	10	3.00	148.5	99.0	74.3	59.4
	20	4.24	209.9	139.9	104.9	84.0
	30	5.20	257.4	171.6	128.7	103.0
	40	6.00	297.0	198.0	148.9	84.0
H1/4U - SS0060	10	3.00	148.5	99.0	74.3	59.4
	20	4.24	209.9	139.9	104.9	84.0
	30	5.20	257.4	171.6	128.7	103.0
	40	6.00	297.0	198.0	148.9	84.0

* 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.

Farm King

WARRANTY

Farm King

WARRANTY

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.

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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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