



Model NL450 Operator's/Parts Manual

UNIT SERIAL NUMBER _____

MANUAL NUMBER: 320753-A

EFFECTIVE 02/2023



1330 76TH AVE SW
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NOTE:

This manual incorporates several interactive features to provide supplemental information and ease of navigation. The information below is to aid in the identification and use of these features.

Hyperlinks

Hyperlinks provide direct access to a specific destination when clicked. The entire Table of Contents of this manual is hyperlinked to provide quick access to all sections of this manual when viewing the electronic version.

Hyperlinks within the content are denoted by **blue, bold underlined text**. Electronic format viewers can click these links for direct access to New Leader online features. Internet access is required.

Insert Current New Leader Warranty

PLEASE ! ALWAYS THINK SAFETY FIRST !!

The purpose of this manual is to familiarize the person (or persons) using this unit with the information necessary to properly install, operate, and maintain this system. The safety instructions indicated by the safety alert symbol in the following pages supersede the general safety rules. These instructions cannot replace the following: the fundamental knowledge that must be possessed by the installer or operator, the knowledge of a qualified person, or the clear thinking necessary to install and operate this equipment. Since the life of any machine depends largely upon the care it is given, we require that this manual be read thoroughly and referred to frequently. If for any reason you do not understand the instructions, please call your authorized dealer or our Product Sales and Support Department at 1-888-363-8006.

It has been our experience that by following these installation instructions, and by observing the operation of the spreader, you will have sufficient understanding of the machine enabling you to troubleshoot and correct all normal problems that you may encounter. Again, we urge you to call your authorized dealer or our Product Sales and Support Department if you find the unit is not operating properly, or if you are having trouble with repairs, installation, or removal of this unit.

We urge you to protect your investment by using genuine NLM parts and our authorized dealers for all work other than routine care and adjustments.

New Leader Manufacturing reserves the right to make alterations or modifications to this equipment at any time. The manufacturer shall not be obligated to make such changes to machines already in the field.

This Safety Section should be read thoroughly and referred to frequently.

ACCIDENTS HURT !!!

ACCIDENTS COST !!!

ACCIDENTS CAN BE AVOIDED !!!

Important Safety Information

⚠ WARNING

Before using this equipment, read, understand and follow all instructions in the Operator's Manual provided with this equipment. If the user and/or assistants cannot read or understand the warnings and instructions, the employer of the user and/or assistants must provide adequate and necessary training to ensure proper operation and compliance with all safety procedures pertaining to this equipment. If Operator's Manual has been lost, visit www.newleader.com or call your authorized dealer or our Product Sales & Support Department at (800) 363-1771 for replacements. Serious injury or death can result from the failure to read, understand, and follow instructions provided in this manual.

Figure 1.1 - The need for safety cannot be stressed strongly enough in this manual. At New Leader Manufacturing, we urge you to make safety your top priority when operating any equipment. We firmly advise that anyone allowed to operate this machine carefully read, learn and understand all messages and information in this manual and on machine's safety decals before operating machine, as well as familiarize themselves with the location and function of all machine controls.

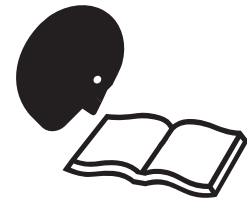


Figure 1.1

The following guidelines are intended to cover general usage and to assist you in avoiding accidents. There will be times when you will run into situations that are not covered in this section. At those times the best standard to use is common sense. If, at any time, you have a question concerning these guidelines, please call your authorized dealer or our Product Sales & Support Department at (800) 363-1771.

Safety Alert Symbols



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

In this manual and on the safety signs placed on the unit, the words "DANGER," "WARNING," "CAUTION," and "NOTICE" are used to indicate the following:



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to physical injury.

NOTE:

Provides additional information to simplify a procedure or clarify a process.

Operations

PREPARE FOR EMERGENCIES

Figure 1.2 - Be prepared if a fire starts. Keep a fully charged fire extinguisher and first aid kit in accessible place on the vehicle at all times.

Fire extinguisher must be Type ABC or Type BC.

Keep emergency numbers for doctors, ambulance service, hospital and fire department available at all times.

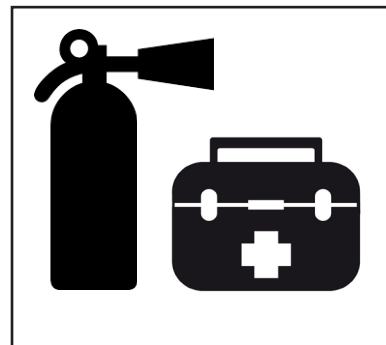


Figure 1.2

INSPECT HARDWARE BEFORE USE

Figure 1.3 - Inspect all bolts, screws, fasteners, keys, chain drives, body mounts and other attachments periodically. Immediately replace any missing or damaged parts with NLM specified parts.

Inspect spinner fins, spinner frame mounting and spinner fin hardware daily. Look for missing or loose fasteners, wear and cracks. Replace immediately with NLM specified parts.

Tighten all bolts, nuts and screws to specified torques. Refer to "Standard Torques" in Maintenance section of this manual.

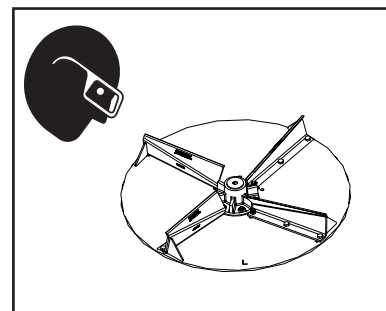


Figure 1.3

HANDLE FLAMMABLE MATERIALS SAFELY

Figure 1.4 - Handle fuel and hydraulic oil with care. They are highly flammable.

Exposure to toxic fluids or fumes may occur during the normal operation of this system. Before attempting to fill, use, or service this system, read Safety Data Sheets (SDS) to know the specific hazards of the fluids you are using. Always use proper Personal Protective Equipment when attempting to fill, use, or service this system.

Always stop engine before refueling machine or filling hydraulic reservoir.

Never smoke while adding fuel or oil to machine. Add fluids in a safe place away from open flame and sparks.

Do not allow overflow. Clean up spilled fuel and oil immediately.

Always have a multipurpose dry chemical fire extinguisher filled and available during machine operation and when adding fuel. Know how to use it.

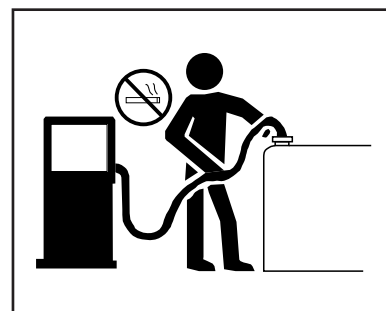


Figure 1.4

Operations

HANDLE HAZARDOUS MATERIALS SAFELY

Figure 1.5 - Materials to spread can be dangerous.

Improper selection, application, use or handling may be a hazard to persons, animals, plants, crops or other property.

A Safety Data Sheet (SDS) provides specific details on chemical products: physical and health hazards, safety procedures and emergency response techniques.

Check all SDS's before starting any job using a hazardous material. Follow all instructions and precautions given by the material manufacturer.



Figure 1.5

WORK IN WELL-VENTILATED AREAS

⚠ WARNING

Never run machine engine inside a building unless adequate ventilation is provided to safely and properly remove exhaust fumes. Failure to comply with this requirement could result in death or serious injury.

Figure 1.6 - Always work in a properly ventilated area.

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, use proper equipment to safely remove exhaust fumes from the working area.

Open building doors and get fresh air into the working area whenever possible.



Figure 1.6

PROTECT AGAINST NOISE

Figure 1.7 - Long periods of exposure to high decibels or loud noise can cause hearing impairment or loss.

Wear proper hearing protection such as earmuffs or earplugs during periods of exposure to high decibels or loud noise.

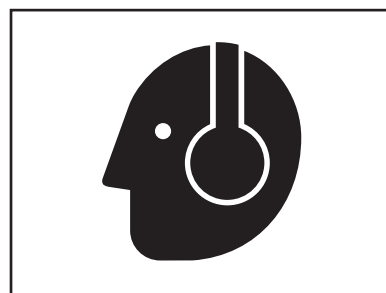


Figure 1.7

Operations

AVOID MOVING PART HAZARDS

Figure 1.8 - Entanglement in rotating drive lines or moving parts will cause serious injury or death.

Stay clear of all moving parts, such as shafts, couplings and universal joints.

Make sure all personnel are clear of machine before starting.



Figure 1.8

Figure 1.9 - Do not operate machine without all guards and shields closed and secured.

Disconnect and lock out power source before removing guards.

Disconnect and lock out power source before adjusting or servicing.

Keep hands, feet, hair and clothing away from moving parts.

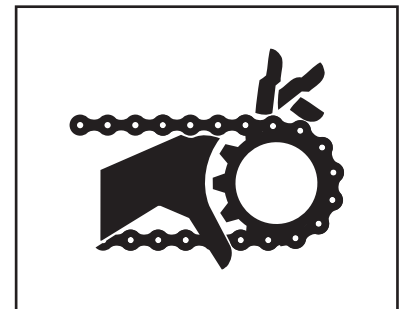


Figure 1.9

Figure 1.10 - Keep away from spinners while they are turning.

Rocks, scrap metal and other material can be thrown from the spinners violently. Stay away from discharge area.

Stop machine before servicing or adjusting. Wear eye protection.

Make sure discharge area is clear before spreading.

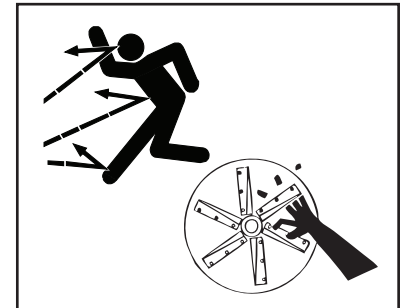


Figure 1.10

Figure 1.11 - Stay out of spreader.

If necessary to enter the spreader, return to shop, empty body, turn off all power, engage brakes, shut down engine and remove keys before entering.

Tag all controls to prohibit operation. Tags should be placed, and removed, by the person working in the body.

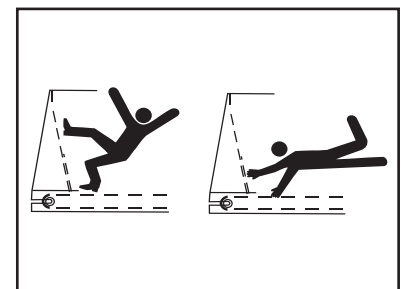


Figure 1.11

Operations**DO NOT CLIMB OR STAND ON MACHINE**

Figure 1.12 - Never allow any personnel to ride in or on the machine.

Use inspection ladder or portable ladder to view the unit. Use caution when getting on and off the ladder, especially in wet, icy, snowy or muddy conditions. Clean mud, snow and ice from steps and footwear.

Always maintain three-point contact with steps, ladders and handholds. Face the machine when mounting and dismounting inspection ladder. Do not jump off machine.



Figure 1.12

OPERATE MACHINE SAFELY

Always walk around and visually inspect machine before using. Check the immediate vicinity of machine for people and obstructions. Ensure adequate visibility.

Avoid distractions such as reading, eating or operating personal electronics while operating machine. Never operate the machine under the influence of alcohol, drugs or while otherwise impaired.

Always come to a complete stop before reversing. Be sure that all personnel are clear of machine path. Turn around and look directly for best visibility. Ensure all rear view mirrors are properly installed and adjusted. Use a signal person when backing if view is obstructed or when in close quarters.

Always disengage hydraulics before shutting down engine. DO NOT start engine with hydraulics engaged.

Transportation & Handling**TRAVELING & TRANSPORTING ON PUBLIC ROADS**

Always walk around and visually inspect the machine before traveling on public roads. Check for damage and/or faulty components that can fail and create a hazard or unsafe condition. Make sure all machine systems operate properly, including but not limited to: headlights, tail and brake lights, hazard warning lights, turn indicators, parking brake, horn and rear view mirrors. Repair or replace any component that is not in proper working order.

Never drive machine at a speed that causes it to bounce or cause loss of control.

Obey all traffic safety laws and regulations. Operate the machine with hazard warning lights on, unless prohibited by law. It is the operator's responsibility to activate and use road lights properly while traveling on public roads.

Cover all loads that may spill or blow away. Environmental damage may result. Do not spread dusty materials where dust may create pollution, visibility issues or interfere with traffic on public roads.

When transporting equipment or machine on a trailer, ensure it is properly secured. Be sure that SMV signs on equipment or machine are covered while in transport on a trailer.

Be aware of overhead structures and power lines. Make sure machine can safely pass under. Refer to "Dimensions & Capacities" pages in the Operations section of this manual.

NAVIGATING ROUGH & UNEVEN TERRAIN

Figure 2.1 - Turn slowly and be careful when traveling on rough surfaces and side slopes. Avoid holes, ditches and obstructions that may cause machine to roll over, especially with a loaded spreader.

Never drive near the edge of a gully or steep embankment.

Load may shift, causing vehicle to tip.

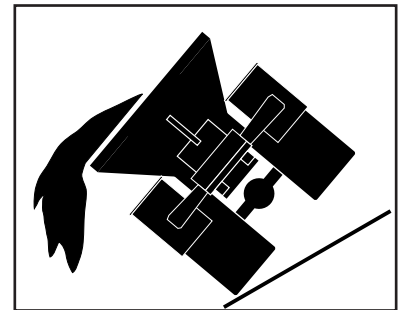


Figure 2.1

Maintenance

READ AND UNDERSTAND MAINTENANCE PROCEDURES

Figure 3.1 - Read the maintenance and safety instructions and understand them before performing any maintenance procedure.

Never perform any maintenance procedure or repair if the instructions and safety procedures are not fully understood. Only trained and qualified personnel should perform any maintenance procedure or repair.

Never modify any equipment or add attachments not approved by New Leader Manufacturing.

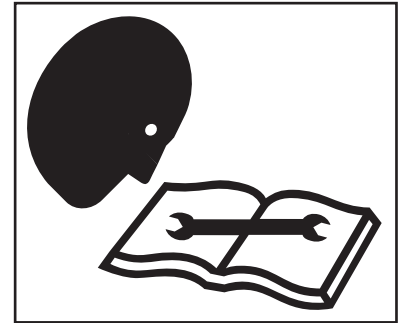


Figure 3.1

DO NOT SERVICE OR ADJUST MACHINE WHILE IN MOTION

Figure 3.2 - Never lubricate, service or adjust the machine or any of its components while they are moving.

Never wear loose clothing or jewelry when working near machine tools or moving parts.

Remove rings and other jewelry to prevent electrical shorts and other personal injury when in contact with machine tools or moving parts.

Close and secure all guards removed for service. Check all screws, bolts, nuts and fasteners for proper torques before operating machine.

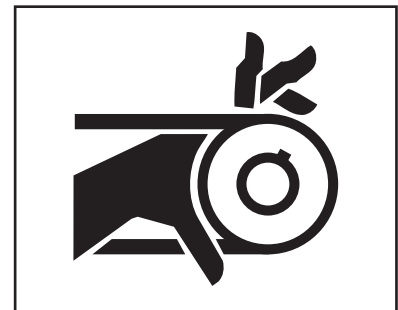


Figure 3.2

WEAR PROPER PROTECTIVE EQUIPMENT

Figure 3.3 - Wear close-fitting clothing and proper safety equipment for the job.

Always wear eye protection when working on or around the machine.

Wear a suitable hearing protection device such as earmuffs or earplugs to protect against high decibels or loud noises.

Prolonged exposure to high decibels or loud noise can cause hearing impairment or loss of hearing.

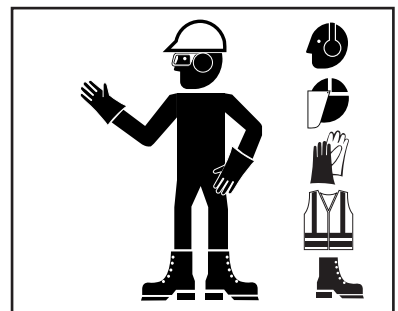


Figure 3.3

Wear protective gloves to protect hands from cuts, abrasions and minor burns.

Maintenance**HANDLE FLAMMABLE SOLVENTS SAFELY**

Figure 3.4 - Never use diesel fuel, kerosene, gasoline or any flammable solvents for cleaning.

Exposure to toxic fluids or fumes may occur during the normal operation of this system. Before attempting to fill, use, or service this system, read Safety Data Sheets (SDS) to know the specific hazards of the fluids you are using. Always use proper Personal Protective Equipment when attempting to fill, use, or service this system.

Perform work using flammable fluids and solvents in a safe place away from open flame and sparks. Do not smoke.

Do not weld, grind or flame cut on any tank containing oil, fuel, fumes or any other flammable material, or any container that contents or previous contents are unknown. Move all flammable materials and containers away from work area.

Clean up spilled fuel and oil immediately.

Always have a multipurpose dry chemical fire extinguisher filled and available. Know how to use it.

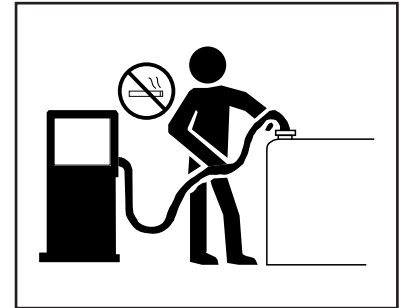


Figure 3.4

USE PROPER LIFTING EQUIPMENT

Figure 3.5 - Use only lifting devices that meet or exceed OSHA standard 1910.184 or ASME B30.20-2013.

Never lift equipment over people.

Never lift a loaded unit. Never lift unit with any loose objects or persons in the body. Loads may shift or fall if improperly supported, causing death, serious injury or machine damage.

Before unfastening heavy parts or assemblies, support with adequate hoist or other device to prevent falling, tipping, swinging or any other movement that may cause injury or damage.



Figure 3.5

USE PROPER TOOLS FOR THE JOB

Figure 3.6 - Use of improper tools (such as a screwdriver instead of a pry bar, pliers instead of a wrench, a wrench instead of a hammer) can cause serious injuries or machine damage.

Use power tools only to loosen threaded parts and fasteners. Using power tools to tighten may cause over-tightening and component damage.

Use only service parts meeting New Leader specifications.

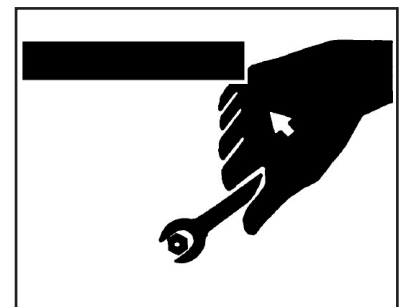


Figure 3.6

Maintenance

HIGH PRESSURE FLUID HAZARDS

Figure 3.7 - Escaping fluid under pressure can penetrate the skin causing serious injury.

Always stop machine, allow to cool and relieve pressure before servicing hydraulic system. Never open hydraulic lines under pressure. Make sure all connections are tight and all hoses are in good condition before pressurizing system.

Always use a piece of cardboard or wood to search for leaks instead of hand. Wear impervious gloves and eye protection when servicing system.

Seek medical attention immediately if fluid penetrates your skin. Gangrene may result if wound is left untreated.



Figure 3.7

AVOID HEATING NEAR HIGH PRESSURE FLUID LINES

Figure 3.8 - Flammable spray can be generated by heating near pressurized fluid lines, resulting in burns to yourself and bystanders.

Do not heat by welding, soldering or using a torch near pressurized fluid lines or other flammable materials.

Pressure lines can suddenly burst when heat goes beyond the immediate flame area.

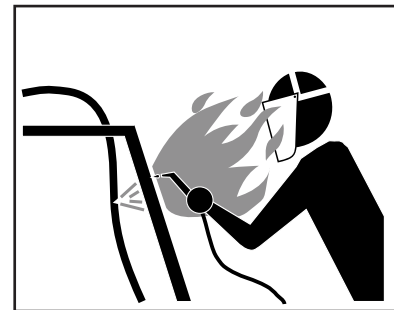


Figure 3.8

AVOID TOXIC FUMES & DUST

Figure 3.9 - Hazardous fumes can be generated when paint is heated from welding, soldering or using a torch.

Remove paint before heating:

- Remove a minimum of 4 in (100 mm) from area to be affected by heating. If paint cannot be removed, wear an approved respirator while heating or welding.
- Avoid breathing dust from sanding or grinding on paint.
- If a solvent or paint stripper is used, wash stripper away with soap and water before heating or welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse for at least 15 minutes before heating or welding.

Do not use chlorinated solvents in areas where welding will take place.

Perform all work in a well-ventilated area that will carry all toxic fumes and dust away.



Figure 3.9

General Safety Rules

Maintenance

CLEAN MACHINE OF HAZARDOUS CHEMICALS

CAUTION

During application of hazardous chemicals, residue can build up on the inside or outside of the vehicle. Clean vehicle according to use instructions of hazardous chemical. Failure to comply with this requirement may result in minor or moderate injury.

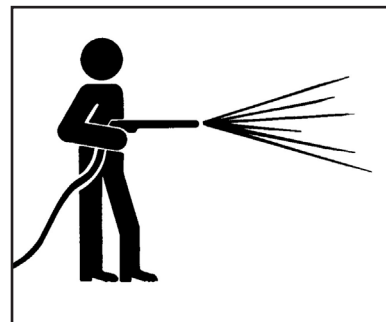


Figure 3.10

Figure 3.10 - When exposed to hazardous chemicals, clean exterior and interior of vehicle daily to keep free of the accumulation of visible dirt and contamination.

1. Clean operator's station to maintain unobstructed visibility of all windows and mirrors, and safe operation of all controls.

NOTICE

Directing pressurized water at electronic/ electrical components, bearings and hydraulic seals or other sensitive parts and components may cause product malfunctions. Reduce pressure and spray at 45 to 90 degree angles.

2. Wash entire exterior of vehicle.
3. Dispose of any wash water with hazardous concentrations of active or non-active ingredients according to published regulations or directives.

HANDLE BATTERIES SAFELY

WARNING

Sulfuric acid in battery electrolyte is poisonous. It can burn skin, eat holes in clothing, and cause blindness if it contacts eyes. Keep sparks and flame away from batteries. Wear proper safety equipment. Failure to comply with this requirement could result in death or serious injury.

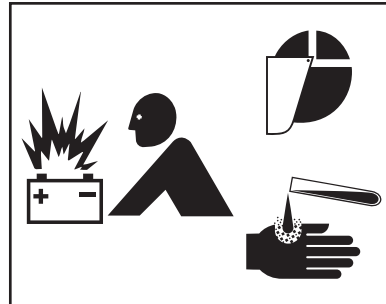


Figure 3.11

Figure 3.11 - Lead acid batteries generate flammable and explosive gases. Keep sparks and flame away from batteries. Do not smoke.

If acid contacts eyes, skin or clothing, flush with water immediately. Seek immediate medical attention if acid contacts eyes.

PROPER TIRE MAINTENANCE

Figure 3.12 - Never weld on a wheel or rim that has a tire on it.

Never attempt to mount or remove a tire unless using the proper equipment, tire safety cage, instructions, training, and you are qualified to perform the work safely. Failure to follow the correct procedures when mounting a tire on a wheel or rim can cause an explosion and serious injury.

Tire service procedures must be performed by trained and qualified personnel.

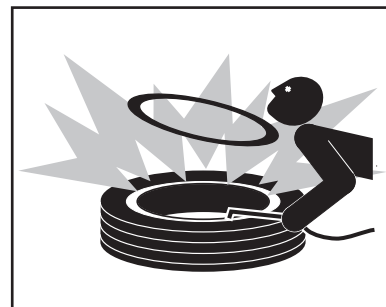


Figure 3.12

Storage

PARK VEHICLE SAFELY

Figure 4.1 - When leaving the vehicle unattended for any reason, be sure to:

- Shut down PTO.
- Shut off vehicle's engine, and unit's engine if applicable.
- Place vehicle transmission in "Neutral" or "Park".
- Set parking brake firmly.
- Remove ignition key and take it with you.
- Block wheels.

These actions are recommended to avoid unauthorized use, runaway, vandalism, theft and unexpected operation during startup.

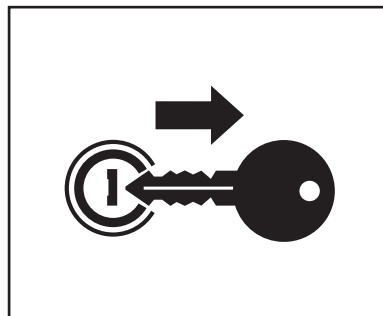


Figure 4.1

SUPPORT MACHINE PROPERLY

Figure 4.2 - When machine is removed from vehicle, always store on adequate supports on a firm level surface. Improper supporting or storage of spreader may cause machine to fall, resulting in serious injury or death.

Never use lifting device to free machine from a chassis, storage stands or frozen ground, or to lift the chassis in any way. Shock loading is prohibited and sudden accelerations must be avoided. Lifting in such a manner could result in injury or machine damage.



Figure 4.2

DISPOSE OF WASTE PROPERLY

Figure 4.3 - Improper disposal of waste can threaten the environment and ecology. Potentially harmful waste used with equipment include items such as fuel, oil, filters and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source.

Comply with all OSHA, local, City, State, Province, Country and jurisdiction regulations, ordinances and standards, related to your particular work area and environment. Inquire on proper disposal methods from your local environmental or recycling center, or from your local dealer.

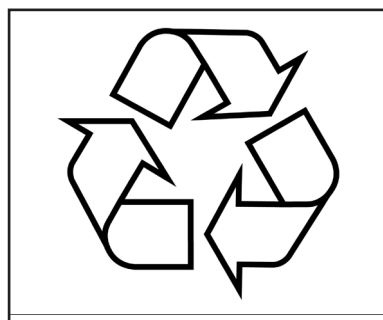


Figure 4.3

Safety Decal Maintenance

Keep safety decals and signs clean and legible at all times.

Replace safety decals and signs that are missing or have become illegible.

Replaced parts that displayed a safety sign should also display the current sign.

Safety decals or signs are available from your dealer's Parts Department or from New Leader Manufacturing by calling (800) 363-1771.

Safety Decal Installation

Clean Surface

Wash the installation surface with a synthetic, free-rinsing detergent. Avoid washing the surface with a soap containing creams or lotion. Allow to dry.

Position Safety Decal

Decide on the exact position before application. Application marks may be made on the top or side edge of the substrate with a lead pencil, marking pen, or small pieces of masking tape. **NOTE:** Do not use chalk line, china marker, or grease pencil. Safety decals will not adhere to these.

Remove the Liner

A small bend at the corner or edge will cause the liner to separate from the decal. Pull the liner away in a continuous motion at a 180-degree angle. If the liner is scored, bend at score and remove.

Apply Safety Decal

Tack decal in place with thumb pressure in upper corners. Using firm initial squeegee pressure, begin at the center of the decal and work outward in all directions with overlapping strokes. **NOTE:** Keep squeegee blade even—nicked edges will leave application bubbles. Pull up tack points before squeegeeing over them to avoid wrinkles.

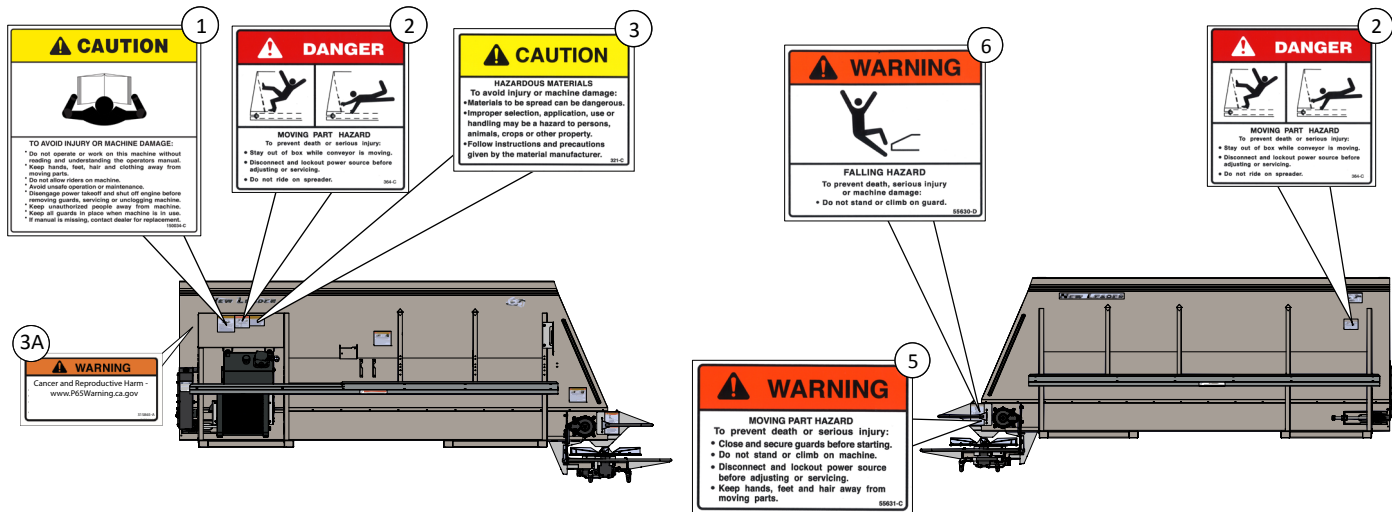
Remove Pre-mask

If safety decal has a pre-mask cover remove it at this time by pulling it away from the decal at a 180 degree angle. **NOTE:** It is important that the pre-mask covering is removed before the decal is exposed to sunlight to avoid the pre-mask from permanently adhering to the decal.

Remove Air Pockets

Inspect the decal in the flat areas for bubbles. To eliminate the bubbles, puncture the decal at one end of the bubble with a pin (never a razor blade) and press out entrapped air with thumb moving toward the puncture.

Re-Squeegee All Edges



1. CAUTION: TO AVOID INJURY OR MACHINE DAMAGE:

- Do not operate or work on this machine without reading and understanding the operator's manual.
- Keep hands, feet, hair and clothing away from moving parts.
- Do not allow riders on machine.
- Avoid unsafe operation or maintenance.
- Disengage power takeoff and shut off engine before removing guards, servicing or unclogging machine.
- Keep unauthorized people away from machine.
- Keep all guards in place when machine is in use.
- If manual is missing, contact dealer for replacement.

2. DANGER: MOVING PART HAZARD

To prevent death or serious injury:

- Stay out of box while conveyor is moving.
- Disconnect and lock out power source before adjusting or servicing.
- Do not ride on the spreader.

3. CAUTION: HAZARDOUS MATERIALS

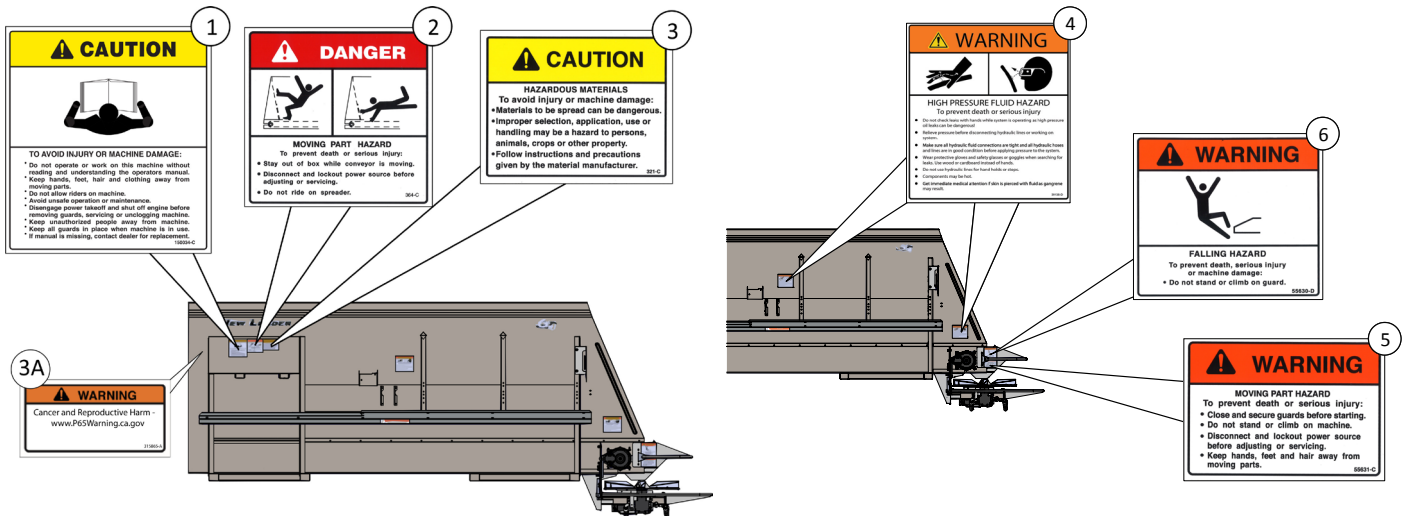
To avoid injury or machine damage:

- Materials to be spread can be dangerous.
- Improper selection, application, use or handling may be hazardous to persons, animals, crops or other property.
- Follow instructions and precautions given by material manufacturer.

3A. WARNING: HAZARDOUS MATERIALS

To avoid injury:

- Cancer and Reproductive Harm - www.P65Warning.ca.gov



4. WARNING: HIGH-PRESSURE FLUID HAZARD

To prevent death or serious injury:

- Do not check leaks with hands while system is operating as high pressure oil leaks can be dangerous!
- Relieve pressure before disconnecting hydraulic lines or working on system.
- Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- Wear protective gloves and safety glasses or goggles when searching for leaks. Use wood or cardboard instead of hands.
- Do not use hydraulic lines for hand holds or steps.
- Components may be hot.
- Get immediate medical attention if skin is pierced with fluid as gangrene may result.

5. WARNING: MOVING PART HAZARD

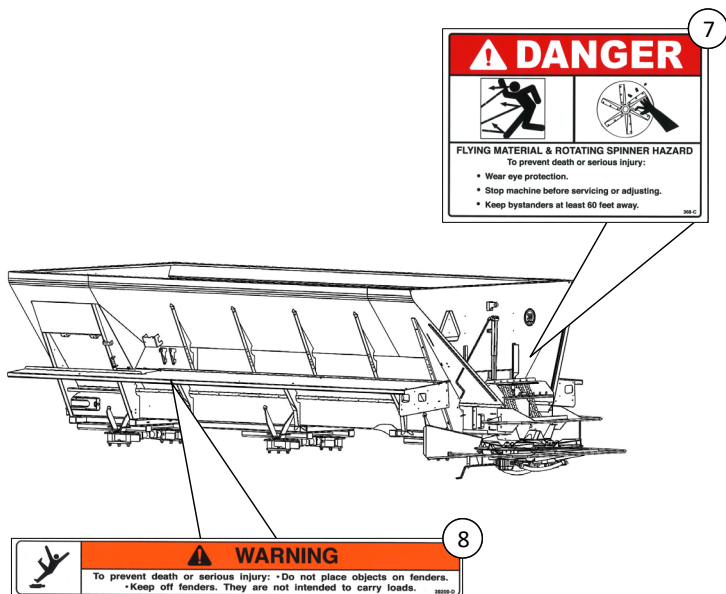
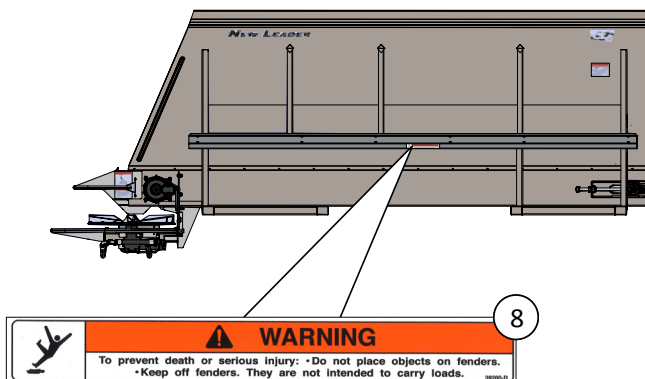
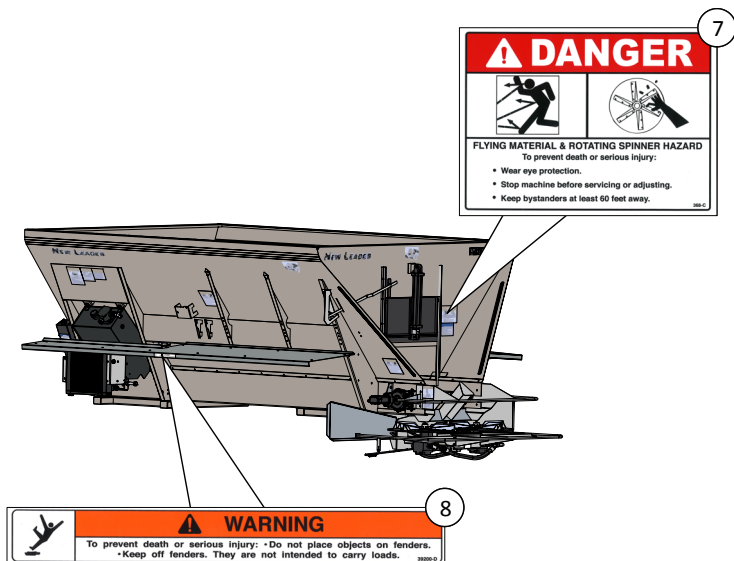
To prevent death or serious injury:

- Close and secure guards before starting.
- Do not stand or climb on machine.
- Disconnect and lockout power source before adjusting or servicing.
- Keep hands, feet and hair away from moving parts.

6. WARNING: FALLING HAZARD

To prevent death, serious injury or machine damage:

- Do not climb or stand on guard.



7. DANGER: FLYING MATERIAL AND ROTATING SPINNER HAZARD

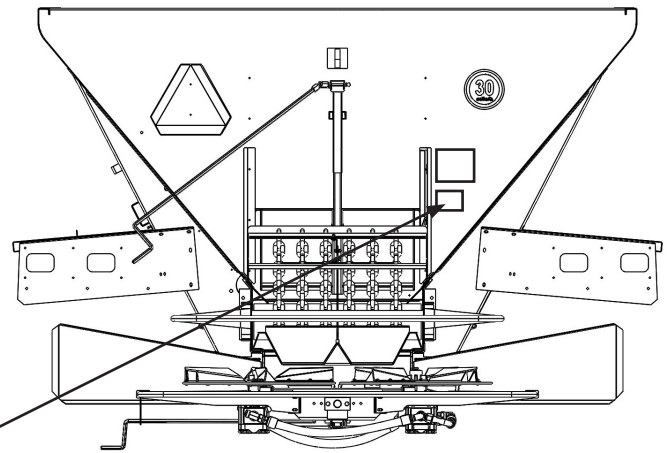
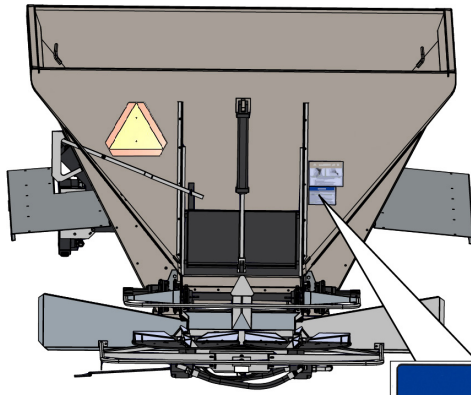
To prevent death or serious injury:

- Wear eye protection.
- Stop machine before servicing or adjusting.
- Keep bystanders at least 60 feet away.

8. WARNING: FALLING HAZARD

To prevent death or serious injury:

- Do not place objects on fenders.
- Keep off fenders. They are not intended to carry loads.



NOTICE

Spinner assembly and material flow divider have NOT been adjusted at the factory. Before assembling unit, read and follow assembly instructions in the operation and maintenance manual for this unit.

Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. Refer to the "How to Check Your Spread Pattern" manual for adjustment instructions. A spread pattern test kit is available from your New Leader dealer.

Wind, humidity, rain and other adverse weather conditions can affect spread pattern, resulting in uneven crop growth and loss of yields.

THE MANUFACTURER OF THIS SPREADER WILL NOT BE LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER OR ADVERSE WEATHER CONDITIONS.

It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, and periodically during the spreading season. Spread pattern tests must be conducted whenever a new product is to be applied.

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1. NOTICE: SPREAD PATTERN TESTING

To obtain optimal machine performance:

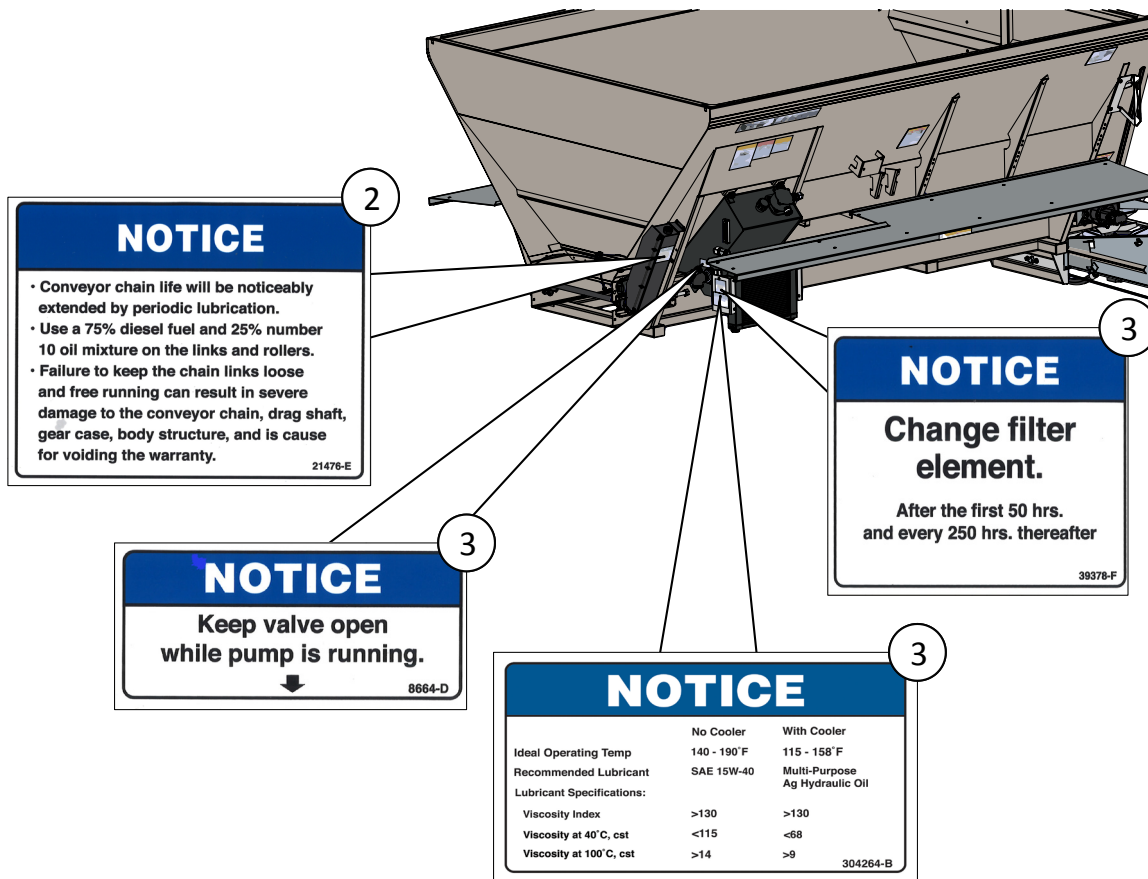
Spinner assembly and material flow divider have NOT been adjusted at the factory. Before assembling unit, read and follow assembly instructions in the operation and maintenance manual for this unit.

Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. Refer to the "How to Check your Spread Pattern" manual for adjustment instructions. A spread pattern test kit is available from your New Leader dealer.

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It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, and periodically during the spreading season. Spread pattern tests must be conducted whenever a new product is to be applied.



2. NOTICE: CONVEYOR CHAIN LUBRICATION

To avoid machine damage and premature wear:

- Conveyor chain life will be noticeably extended by periodic lubrication.
- Use a 75% diesel fuel and 25% SAE 10w clean engine oil mixture on the links and rollers.
- Failure to keep the chain links loose and free running can result in severe damage to the conveyor chain, drag shaft, gearcase and body structure, and is cause for voiding the warranty.

3. NOTICE: HYDRAULIC RESERVOIR

To avoid machine damage:

- Change the filter element after the first 50 hours of operation, and every 250 hours thereafter.
- Keep all reservoir valves open while the pump is running.
- See "Lubricant & Hydraulic Oil Specifications" in this manual for ideal operating temperatures.

INSTALLATION

Connecting Implement

Hydraulic Requirements

- Low pressure drop motor return port.
- Zero pressure case drain port.
- Equipped with optional hydraulic trailer brake system.

FUNCTION	Tractor Side User Supplied		Implement Side Factory Supplied	
	DESCRIPTION	COUPLER	COUPLER	DESCRIPTION
Spreader Pressure	Tractor High Flow SCV	ISO 5675 1/2" Body Female	ISO 5675 1/2" Body Male	3/4" 100R12 Pressure Line
Spreader Return	Motor Return on Tractor Valve Block	ISO 7241/1 Series A 3/4" Body Female	ISO 7241/1 Series A 3/4" Body Male	3/4" 100R2 Return Line
Spreader Case Drain	Zero Pressure Case Drain on Tractor Valve Block	ISO 16028 3/8" Body Female	ISO 16028 3/8" Body Male	3/8" 100R1 Case Drain Line
Trailer Brakes (Optional)	Hydraulic Brake Supply on Tractor	ISO 5676 3/8" Body Male	ISO 5676 3/8" Body Female	3/8" 100R1 Brake Line

Hydraulics		GPM (LPM) (Gallons/Liters per Minute)	Maximum Pressure (PSI)
Spinner	Tractor Supplied	40.0 (151.4)	2900
Conveyor	Tractor Supplied	25.0 (94.6)	2900
Spinner	PTO Gear Pump 1000 RPM	42.0 (159)	2500 Continuous
			3100 Intermitent

Hitch Requirements

- The implement is equipped with a category 4 receiver hitch, requiring a 2" (51mm) hitch pin.

Electrical Requirements

- The implement is equipped with a standard 7-pin connector for operation of lights.
- See "ISOBUS Connections" for controller connections.

Controller Requirements

The spreader is equipped with an ISO 11783 compatible control system and will connect to any ISO 11783 compliant virtual terminal with a task controller that supports multi-channel dry granular applicators.

Implement Preparation and Connection

! DANGER DO NOT wear loose clothing. Keep hands and other body parts away from connecting parts of tractor and implement. Entanglement could cause serious injury.

! DANGER DO NOT stand on PTO, PTO driveline, tongue, or draw bar. Falling could cause death or serious injury.

! WARNING Make sure area is clear between the tractor and implement when backing up to implement.

! WARNING DO NOT use intermediate support as attaching point.

NOTICE Make sure safety chain is stored safely when not in use.

NOTICE Inspect the cleanliness of connecting parts. All areas must be free of debris and dirt to ensure a secure connection.

Implement Hitch Adjustment

Factory installs implement hitch in lower three holes of hitch holder. Dealer/customer must adjust hitch position to match tractor drawbar. When hitch is in correct position, tighten grade 8 bolts to torque per "Standard Torques" chart in this manual.

NOTICE Hitch MUST be fastened to trailer with all three bolts.

Implement Connection

1. Check for visible wear and make sure hitch and draw pin are clear of debris and dirt.
2. Crank the jack to adjust hitch height to match the tractor.
3. Pull out draw pin on tractor hitch. (Figure 1)
4. Back up tractor and align holes on implement hitch and hitch on tongue of implement. (Figure 2)
5. Insert draw pin through implement hitch and tractor drawbar. Insert hitch pin and lock to secure. (Figure 3)
6. Lower handle on draw pin into locking position. Insert securing pin through hole at bottom of draw pin and lock. (Figure 4)

7. Lube implement hitch.
8. Retract jack to storage position.



Figure 1



Figure 2



Figure 3



Figure 4

9. Attach safety chain.
10. On left side of hitch, loop safety chain through tractor intermediate support (Figure 5).
11. On left side of hitch, loop safety chain around tractor drawbar (Figure 6).
12. Hook on chain (Figure 7). Allow only adequate slack for articulation.
13. Slide clasp on safety chain to secure locked position (Figure 8). Excess chain will hang between tractor and implement (Figure 9).

NOTE: Replace safety chain if one of more links are damaged, deformed or damaged.



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9

ISOBUS Connections

A: Factory Supplied CAN-ISO Connector
Connects to: ISOBUS Implement Extension
Harness, Supplied with implement.

- Pin 1 - Battery Ground
- Pin 2 - ECU Return (ECU Ground)
- Pin 3 - 60-amp fused power
- Pin 4 - ECU Power (Switched 12v)
- Pin 5 - N/A
- Pin 6 - TBC Power
- Pin 7 - TBC Return
- Pin 8 - ISO-BUS Can High
- Pin 9 - ISO-BUS Can Low

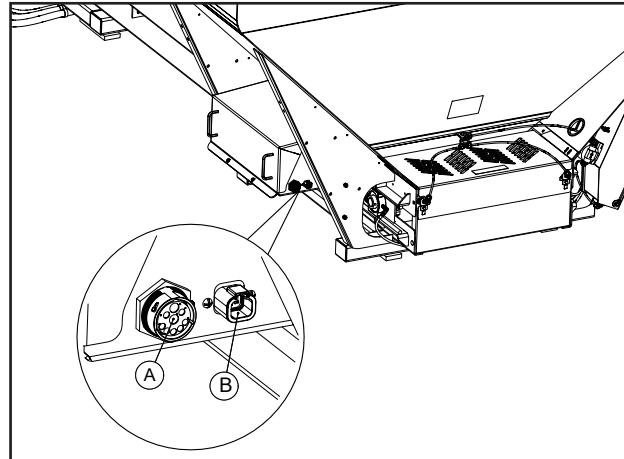


Figure 14

Connects to: Nuhn Trailer Main Harness, supplied with implement.

- Pin 1 - Hydraulic cooler fan power (Switched 12v)
- Pin 2 - Hydraulic cooler fan ground
- Pin 3 - N/A
- Pin 4 - N/A

30-amp power on pin 1 must be fused at battery.

Power Take-Off Connection

1. Inspect, clean and lubricate PTO and PTO driveline.
2. Inspect all guards, making sure they are in proper working order.
3. Lift tractor's PTO cover.
4. Slide PTO driveline coupler onto tractor PTO and lock into place on driveline groove (Figure 10-12).
5. Place tractor's PTO cover back into lowered position.
6. Attach PTO driveline guard chain to tractor.



Figure 10



Figure 11

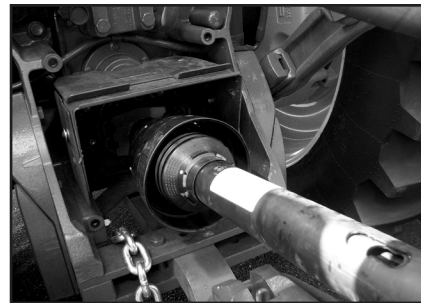


Figure 12

NOTICE

Route all hoses and wiring through hose support (Figure 13). Avoid entanglement of hoses and wiring with the PTO driveline, hitch, or tongue. Damage to equipment can occur if hoses and wires are not routed correctly.

7. Make sure all hoses and wires run through the hose support to remain clear of PTO driveline. If needed, add additional clamps. (Figure 13)

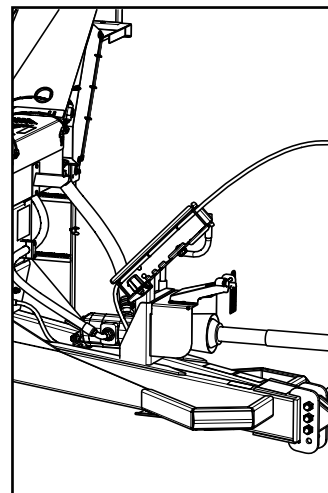
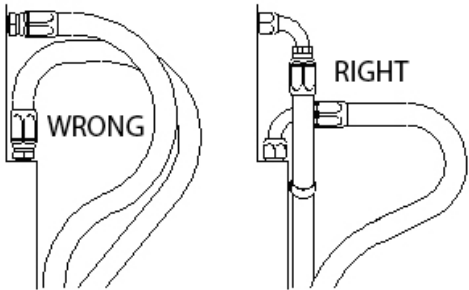
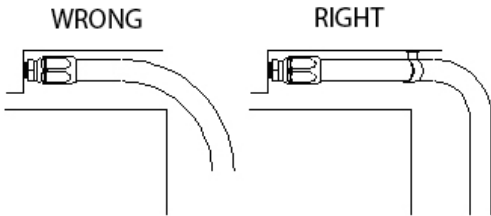
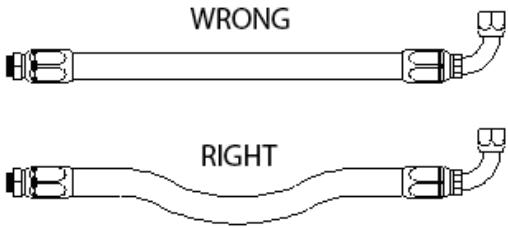
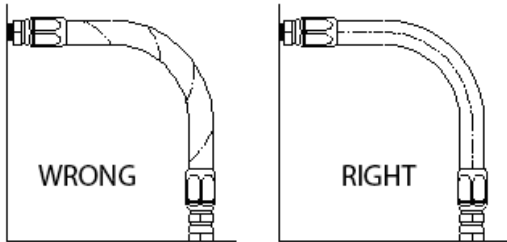
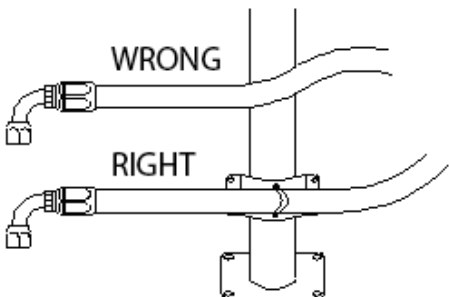
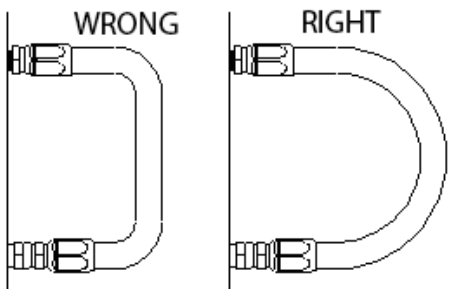


Figure 13

Hydraulic Hose Installation Guide

	
1. Use elbows and adapters in the installation to relieve strain on the assembly, and to provide easier and neater installations that are accessible for inspection and maintenance. Remember that metal end fittings cannot be considered as part of the flexible portion of the assembly.	2. Install hose runs to avoid rubbing or abrasion. Clamps are often needed to support long runs of hose or to keep hose away from moving parts. It is important that the clamps be of the correct size. A clamp that is too large will allow the hose to move in the clamp causing abrasion at this point.
	
3. In straight hose installations allow enough slack in the hose line to provide for changes in length that will occur when pressure is applied. This change in length can be from +2% to -4%.	4. Do not twist hose during installation. This can be determined by the printed layline on the hose. Pressure applied to a twisted hose can cause hose failure or loosening of the connections.
	
5. Keep hose away from hot parts. High ambient temperature will shorten hose life. If you cannot route it away from the heat source, insulate it.	6. Keep the bend radii of the hose as large as possible to avoid hose collapsing and restriction of flow. Follow catalog specs on minimum bend radii.

(Used with the permission of The Weatherhead Company.)

**OPERATIONS
&
MAINTENANCE**

General Description

The NL450 is a hopper type spreader that can be setup for spreading either Compost or Fertilizer.

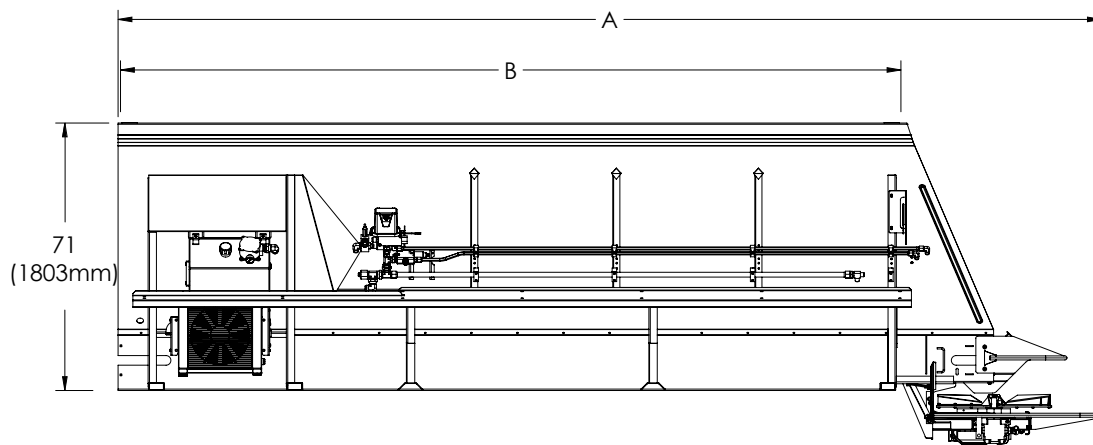
The unit is hydraulically powered and provides independent variable speed control for the spinner and full automatic ground speed control for the conveyor.

The 34" wide (86 cm) conveyor runs the full length of the hopper bottom to deliver material to the spinners through a metering gate at the rear of the hopper body. A feedgate sight gauge allows monitoring of the feedgate from the cab for compost units. Fertilizer units have a scale near the feedgate for manual adjustments. The conveyor is driven by dual 6-to-1 ratio spur gear cases, each driven by a orbital type hydraulic motor.

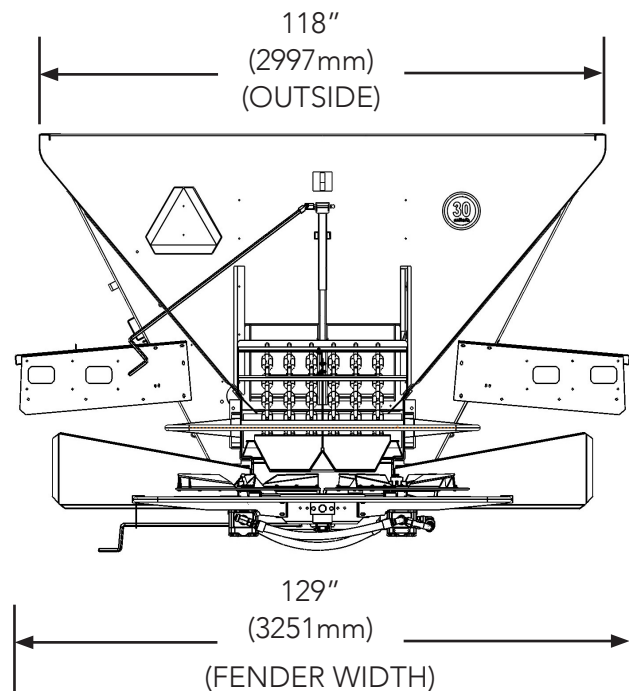
Three conveyor options are available: pintle type chain joined by cross bars every third link (#1), every other link (#2), or every link (#3).

The distributor spinner assembly has two 30" (76cm) diameter discs. Each disc has the option of four or six formed and heat treated fins that are adjustable to radial angle. The spinner is fully adjustable by means of a rotating handle.

This product is intended for commercial use only.



Unit Length	Overall Length A	Body Length B
16'	232" (5893mm)	180" (4572mm)



Unit Length	Struck Capacity Cu Ft (Cu M)	Approximate Weight Pounds (kilograms)
16' (6.40 m)	453 (12.8)	6400 (2903) 17600 (7983) with trailer

**WARNING**

Stand clear of moving machinery. Failure to comply with this requirement could result in death or serious injury.

NOTE: Do not load spreader with material.

1. Check entire unit to make sure all fasteners are in place and properly tightened per "Standard Torques" in this manual.
2. Make sure no other persons are in vicinity of spreader.
3. Make sure no loose parts are in unit or on conveyor or spinner.
4. Check oil level in hydraulic reservoir; fill as necessary. Refer to "Lubricant & Hydraulic Oil Specifications" in this manual for proper oil. Completely open reservoir valves as necessary.
5. Start engine and turn on hydraulics. Run hydraulic system to bring oil up to operating temperature.
6. Run spinner only at 300RPM. Allow to run until spinner is operating smoothly and all air has been purged from system.
7. Run conveyor at 20RPM and spinner at 300RPM. Run until conveyor is operating smoothly.
8. Run conveyor at 20RPM and spinner at 700RPM. Allow both conveyor and spinner to run until operating smoothly.
9. Run conveyor at 0RPM and spinner at 0RPM. Make sure both conveyor and spinner do not move.
10. Calibrate spreader as defined in the manual for the controller that is supplied with your machine.
11. Complete spread pattern test per "Spread Pattern Testing" in this manual.
12. Shut system down.

**WARNING**

DO NOT check leaks with hands while system is operating as high pressure oil leaks can be dangerous! If skin is pierced with hydraulic fluid at high pressure seek immediate medical attention as fluid injected into the skin could cause gangrene if left untreated. Relieve pressure before disconnecting hydraulic lines or working system. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Failure to comply with this requirement could result in death or serious injury.

**WARNING**

DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of entanglement! Failure to comply with this requirement could result in death or serious injury.

13. Check all connections in hydraulic system to make sure there are no leaks.

The following procedure is a guide:

NOTE: Do NOT fill spreader with material

1. Field test over any suitable course which allows vehicle to be driven at speeds to be used while spreading.
2. Ensure unit has been properly serviced, that the hydraulic reservoir is full and gate valve under reservoir is fully open as applicable. Do not load spreader.
3. Run spinners at 500 RPM.

DANGER

Take proper safety precautions when observing conveyor and spinner speed while vehicle is in motion! These may include use of suitable mirrors clamped to permit observation by a safely seated observer, following the spreader in another vehicle at a safe distance, or other suitable means. Do not stand on fenders, in body or on any part of spreader as there is danger of falling off the vehicle or into moving parts! Use great care in performing this test!

Start engine. Turn control to "on" position. Engage hydraulics and allow to run at fast idle long enough to bring hydraulic oil up to operating temperature. Spinners should revolve at moderate speed and the conveyor should not move.

Refer to controller's operation manual for conveyor operating instructions.

Set program to operational mode and begin forward travel. Move conveyor switch to "on" position. Conveyor should start immediately when vehicle moves and should continue to run at speeds which should vary directly with the vehicle's ground speed; the conveyor should speed up as vehicle speed increases and slow down as vehicle speed reduces. Spinner speed should remain constant when engine speed is above minimum operating range.

1. Make sure unit has been properly serviced and is in good operating condition. It is highly recommended to run the spreader prior to loading material to ensure acceptable operation.
2. Program controller with correct data for material(s) and application.
3. Adjust feedgate to appropriate setting.
4. Adjust spinner to give spread pattern desired. Calibrate and spread pattern test for any new material.
5. Fill applicable bins with material to be spread.
6. Engage hydraulics.
7. Begin spreading.



Drive only at speeds which permit secure control of vehicle.

NOTICE

CHANGE HYDRAULIC OIL FILTER AFTER FIRST WEEK (OR NOT MORE THAN 50 HOURS) OF OPERATION ON A UNIT.

Preventative Maintenance Pays!

The handling and spreading of commercial fertilizers is a most severe operation with respect to metal corrosion. Establish a frequent, periodic preventative maintenance program to prevent rapid deterioration to spreading equipment. Proper cleaning, lubrication and maintenance will yield longer life, more satisfactory service and more economical use of your equipment.

⚠ WARNING

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.

Hydraulic System

Proper oil in the hydraulic system is one of the most important factors for satisfactory operation. Utmost cleanliness in handling the oil cannot be stressed enough. Keep hydraulic oil in original closed containers, clean top of container before opening and pouring, and handle in extremely clean measures and funnels.

Check hydraulic oil level and filter condition regularly.

Refer to "Lubricant and Hydraulic Oil Specifications" for selection of the proper hydraulic fluid for use in the hydraulic system.

⚠ WARNING

DO NOT check leaks with hands while system is operating as high pressure oil leaks can be dangerous! If skin is pierced with hydraulic fluid at high pressure seek immediate medical attention as fluid injected into the skin could cause gangrene if left untreated. Relieve pressure before disconnecting hydraulic lines or working system. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.

⚠ WARNING

DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

Periodically inspect hydraulic hoses and fittings for leaks. Repair and replace components as necessary.

Check hydraulic oil daily by means of sight gauge on reservoir. Add oil as necessary to maintain level around mid-point of sight gauge. Periodically inspect hoses and fittings for leaks.

NOTICE

CHANGE HYDRAULIC OIL FILTER AFTER FIRST WEEK (OR NOT MORE THAN 50 HOURS) OF OPERATION ON A UNIT.

After first filter change, replace filter when indicator reaches Red Zone.

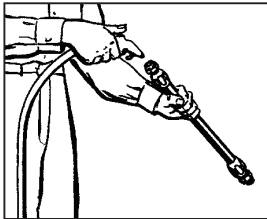
Drain reservoir through drain plug (not through suction outlet), flush, and refill and change filter element annually. Oil and filter should also be changed whenever oil shows any signs of breaking down under continued high-pressure operation. Discoloration of oil is one sign of breakdown.

Hydraulic Hose

Hose assemblies in operation should be inspected frequently for leakage, kinking, abrasion, corrosion or other signs of wear or damage. Worn or damaged hose assemblies should be replaced immediately.

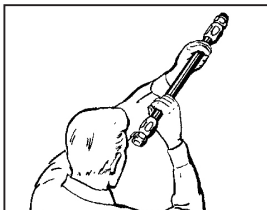
⚠ WARNING

Testing should be conducted in approved test stands with adequate guards to protect the operator.



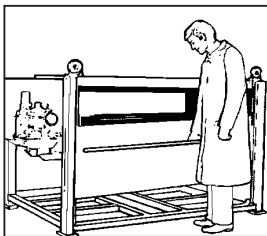
Clean

Clean assembly by blowing out with clean compressed air. Assemblies may be rinsed out with mineral spirits if the tube stock is compatible with oil, otherwise hot water at 150°F (65.55° C) maximum may be used.



Inspect

Examine hose assembly internally for cut or bulged tube, obstructions, and cleanliness. For segment style fittings, be sure that the hose butts up against the nipple shoulder; band and retaining ring are properly set and tight, and segments are properly spaced. Check for proper gap between nut and socket or hex and socket. Nuts should swivel freely. Check the layline of the hose to be sure the assembly is not twisted. Cap the ends of the hose with plastic covers to keep clean.



Test

The hose assembly should be hydrostatically tested at twice the recommended working pressure of the hose.

Test pressure should be held for not more than one minute and not less than 30 seconds. When test pressure is reached, visually inspect hose assembly for: 1. Any leaks or signs of weakness. 2. Any movement of the hose fitting in relation to the hose. Any of these defects are cause for rejection.

Storage and Handling

Hose should be stored in a dark, dry atmosphere away from electrical equipment, and the temperature should not exceed 90° F (32° C).

Conveyor Chain

⚠ WARNING

Stay out of the hopper body. If it's necessary to enter the hopper, return to the shop, empty body, turn off all power, set vehicle brakes, lock engine starting switch and remove keys before entering. Tag all controls to prohibit operation. Tags should be placed, and later removed, only by person working in the body.

Hose down unit and remove any material build-up on sprockets and under chain.

NOTICE

The conveyor will move away from the bottom panel if material accumulates under the conveyor or on the sprockets. The more material that accumulates, the closer the chain will come to the chain shields. If the conveyor should catch a chain shield, it could permanently damage the conveyor, the chain shields or the unit. Do not remove material while conveyor or spinner is running!

Lubrication

Make sure unit is clean and completely dry. Lubricate conveyor chain at the end of each day of usage using a mixture of 75% diesel fuel and SAE 10w clean engine oil. Shut down spinner and run conveyor at 20 RPM for two full revolutions to lubricate chain. After each unit washing, allow to dry, then lubricate.

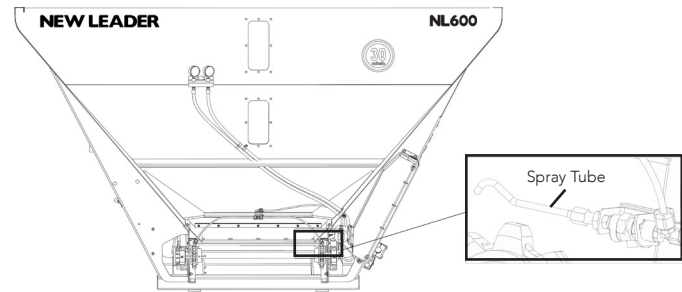


Figure 1 - Spray Tube

Lubricate chain through two full revolutions. After each unit washing, allow to dry, then lubricate.

Before filling the unit with spreading material, activate the controller or power switch to run the pump oiler. Bleed all air from the lines and adjust the two spray nozzles so that the oil mixture sprays vertical onto the sprockets and chain.

Tension

Proper chain tension is also a factor in chain and sprocket life. This adjustment is made by turning the idler screws on each side of the unit at the front idler bearings. See Figure 2.

Loosen the idler jam nut (A) and turn the idler adjustment screw (B) to adjust tension. Turn clockwise to increase tension and, turn counterclockwise to decrease tension. Adjust idlers equally on each side.

Measure from rear of sill to point where conveyor chain contacts bottom flange of sill. Verify that measurements on both sides of conveyor are equal and within specified range. See Figure 3.

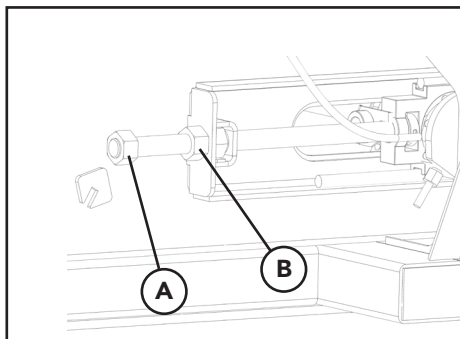


Figure 2

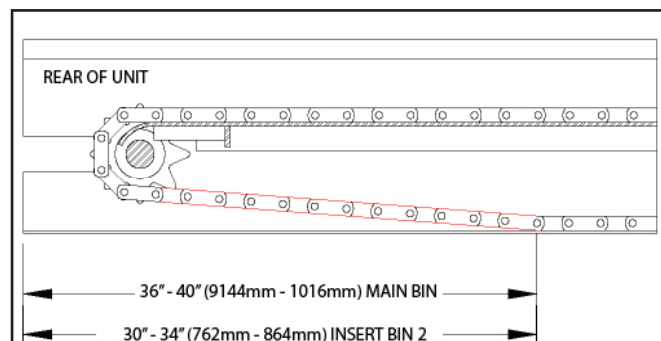


Figure 3

NOTICE

Over-tensioning of conveyor chain will lead to excessive load on the system, causing excessive chain and sprocket wear and can cause extremely high starting pressures. Under-tensioning allows conveyor chain to "wrap" around drive sprockets and not exit sprocket freely, causing excessive chain stretch and surging of the conveyor which will result in interrupted flow of material to the spinners.

Conveyor Gearcase

Drain oil in a new unit after first two weeks (or not more than 100 hours) of operation, and flush gear case thoroughly with light oil. Refer to "Lubricant and Hydraulic Oil Specifications" section for proper grade oil and recommended amounts of lubricant. After initial change, oil should be changed every 2,000 hours of operation or annually, whichever occurs first. Check gearcase oil level monthly.

Spinner Sensor

NOTICE

Wipe sensor clean periodically to prevent accumulation of product. Avoid wet material as it may stick to sensor. If material sticks to sensor it won't warn user when bin is low.

Clean sensor with brush or hose from outside of spreader. Do not aim high pressure sprayer directly at sensor—it could damage the components.

Lubrication of Bearings

Grease in a bearing acts to prevent excessive wear of parts, protects ball races, and balls from corrosion and aids in preventing excessive heat within the bearing. It is very important the grease maintain its proper consistency during operation. It must not be fluid and it must not channel.

Make sure all fittings are thoroughly cleaned before grease is injected. Points to be lubricated by means of a grease gun have standard grease fittings.

Lubricate bearings by pumping grease slowly until it forms a slight bead around the seals. This bead indicates adequate lubrication and also provides additional protection against the entrance of dirt.

Fasteners

Tighten all screws fasteners to recommended torques after first week of operation and annually thereafter. If loose fasteners are found at anytime, tighten to recommended torque. Replace any lost or damaged fasteners or other parts immediately. Check body mounting hardware every week.

Clean-Up

NOTICE

High pressure wash can inject water and/or fertilizer into control components, causing damage. Use caution when cleaning these areas.

Thoroughly wash unit every two to three days during the operating season to maintain minimal maintenance operation. Hose unit down under pressure to free all sticky and frozen material.

It is important the unit be thoroughly cleaned at the end of each operating season. All lubrication and maintenance instructions should be closely followed. Repaint worn spots to prevent formation of rust.

NOTICE

The lubricant distributor and/or supplier is to be held responsible for the results obtained from their products. Procure lubricants from distributors and/or suppliers with unquestionable integrity, supplying known and tested products. Do not jeopardize your equipment with inferior lubricants. No specific brands of oil are recommended. Use only products qualified under the following oil viscosity specifications and classifications and recommended by reputable oil companies.

Hydraulic System

Use premium quality lubricants with 100-200 SUS or 20-43 cSt viscosity at operating temperatures. The hydraulic fluid's specifications in the table below are for normal operating conditions. Extreme environments or dirty conditions may require the use of different oils. Consult your New Leader dealer or the Product Support Department at Highway Equipment Company for systems operating outside normal conditions.

Ideal Oil Operating Temperature	115-158°F (46.11-70° C)
Recommended Premium Lubricant	Multi-Purpose Agriculture Hydraulic & Transmission Oil
Lubricant Specifications Viscosity Index Viscosity at 40°C, cst Viscosity at 100°C, cst	Greater than 130 Less than 68 Greater than 9
Acceptable Fluid Example	Mobil 424

Gearcase Lubricant

Fill the gearcase with non-corrosive type extreme pressure (E.P.) gear oil conforming to MIL-L2105 B multi-purpose gear lubricating oil requirements (API Service GL 4) based on ambient temperatures listed below:

- Single Pinion: 1 Pint (.50 L)
- Dual Pinion: 1.5 Pints (.70 L)

Ambient Temperature	Oil Type
Below 40°F (4.4°C)	SAE 80 E.P.
40° - 100° F (4.4° - 38° C)	SAE 90 E.P.
Above 100° F (38° C)	SAE 140 E.P.

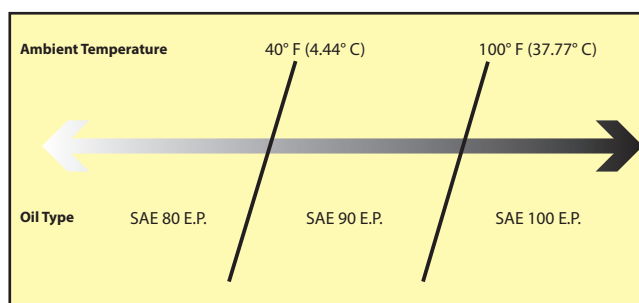


Figure 4

Grease Gun Lubricant

Use a waterproof ball and roller bearing lithium base lubricant with a minimum melting point of 300°F (150° C). This lubricant should have a viscosity which assures easy handling in the pressure gun at prevailing atmospheric temperatures. The grease should conform to NLGI No. 2 consistency.

Conveyor Chain Oiler

Use a 75% diesel fuel and SAE 10w clean engine oil mixture on the links and rollers.



WARNING

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.

The spreader should be regularly lubricated with the lubricants recommended in this manual in accordance with the following chart:

Location	Places	Method	Frequency
Transmission PTO			
Slip Yoke	1	Grease Gun	Weekly
Universal Joint	2	Grease Gun	Monthly
Hydraulic System			
Reservoir	1		Check Daily. Change Annually
Filter	1	Check daily; Change when indicated (Red)	
Conveyor			
Grease Zerks - Driveshaft Bearings	2	Grease Gun	Weekly
Grease Zerks - Idler Shaft Bearings	2	Grease Gun	Weekly
Take-Up Screws	2	Hand Grease	Weekly
Gearcase	1	Gear Oil	Check Monthly; Change Annually
Conveyor Chain Strands	2	Oil Mixture	Daily
Spinner			
Grease Zerks - Shaft	2	Grease Gun	Weekly
Grease Zerks - Jack	2	Grease Gun	Weekly
Grease Zerk - Jack (Fertilizer Unit)	1	Grease Gun	Weekly

NOTE: Unusual conditions, such as excessive dust, temperature extremes or excessive moisture may require more frequent lubrication of specific parts.

*See "Lubricant and Hydraulic Oil Specifications" for types of lubricants and oil to be used.

This chart is to help determine which conveyor is best for specific applications. Find the closest description of the type of material to be spread.

- X indicates the preferred conveyor.
- O indicates a suitable alternative conveyor.
- NR indicates the conveyor and/or spreader is not recommended for the specified application.

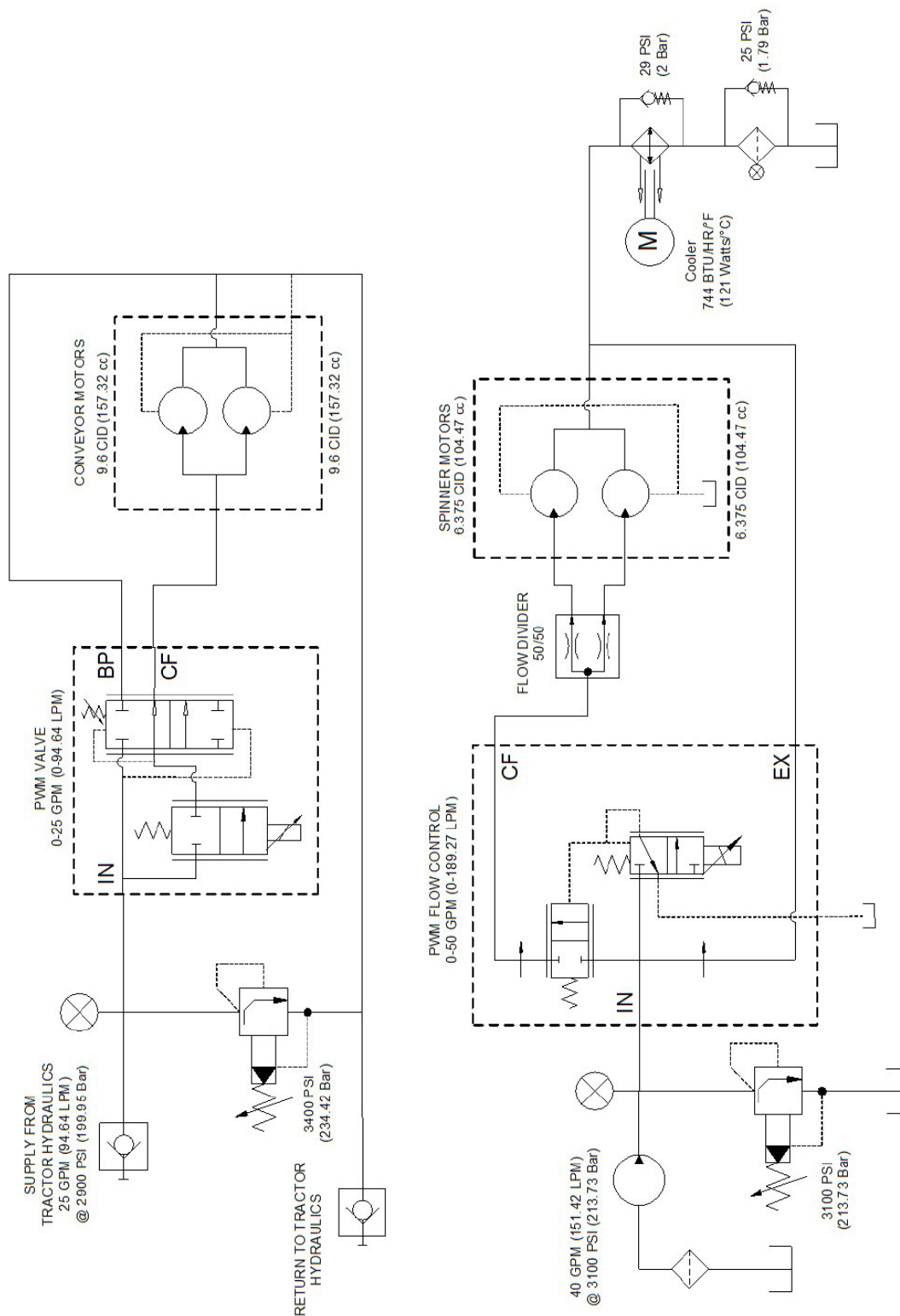
The density provided was used to make the conveyor recommendation. If the density of the material to be spread is outside of those in the table, contact your New Leader dealer for the best conveyor for your application.

Product	Density lbs/ft³ (kg/m³)	#1 Chain	#2 Chain	#3 Chain*
Poultry Litter	16 - 54 (256 - 865)	X	O	O
Waste Sludge	40 - 65 (641 - 1041)	X	O	O
Paper Pulp	approx. 42 (673)	X	O	O
Compost Cattle Manure	36 - 65 (577 - 1041)	X	O	O
Gin Trash	35 - 50 (561 - 801)	NR	O	X
Fly Ash**	38 - 45 (609 - 769)	NR	X	O
Gypsum**	65 - 80 (1041 - 1281)	NR	O	X
Fertilizer	65-80 (1041-1281)	NR	O	X

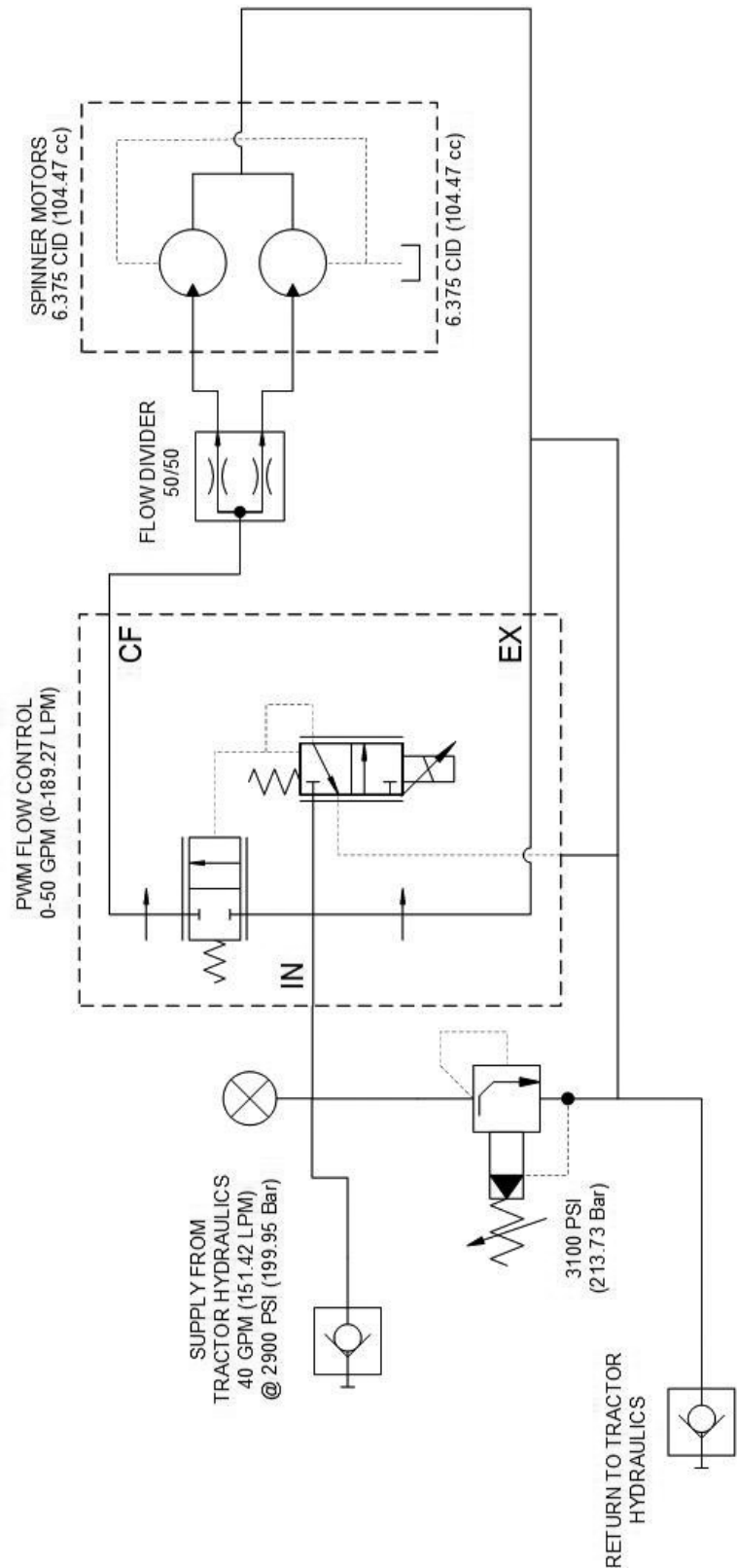
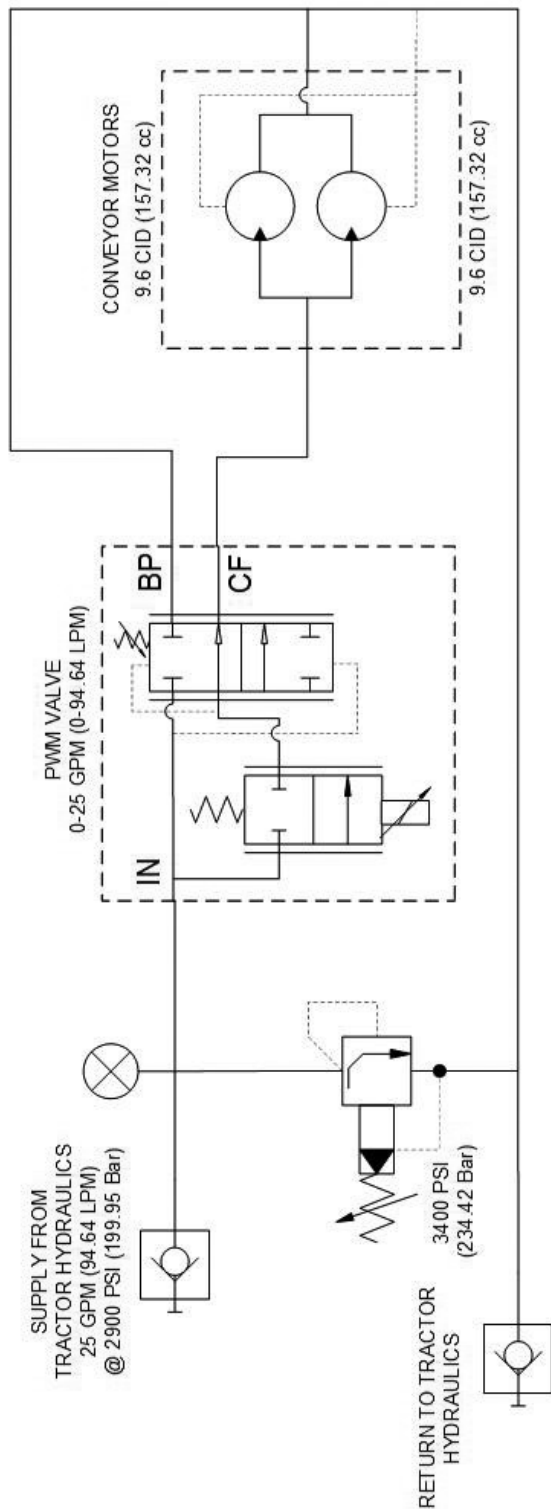
** - Trial and error is necessary to determine the spreader's maximum capacity for each material so as not to exceed the system pressures of the hydraulic system and stall the conveyor.

NOTE: Field experience has shown that payload capacity can be increased with the use of chain shields in some applications.

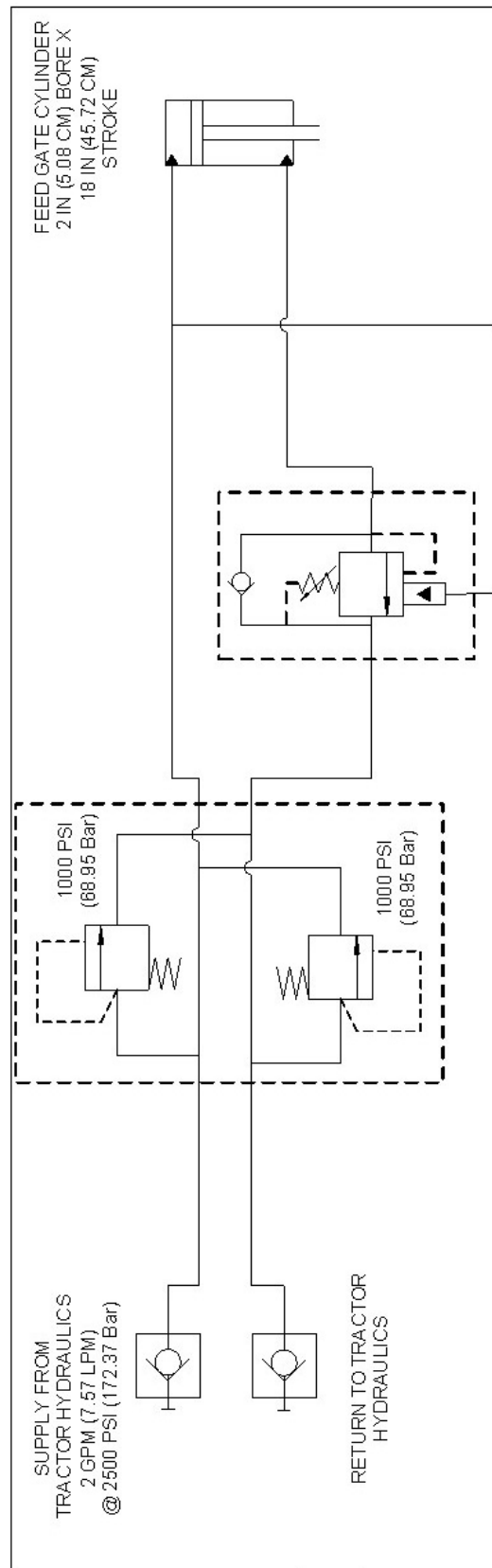
Hydraulic Schematic - PTO/SCV



Hydraulic Schematic - SCV



Hydraulic Schematic - SCV Feedgate



Spinner motors do not turn when spinner control valve is in running position or conveyor does not run when placed in "On" position. See reasons 1, 2, 3, 4, 6, 7, 8 & 9.

Spinners turn but conveyor does not run in manual mode. See reasons 5, 7, 9 & 10.

Console in operation mode, but the conveyor does not move when the machine moves. See reasons 5, 7, 9 & 10.

Spinner speed does not stay constant. See reasons 4, 8, 11, 12 & 13.

Spinners run with cab control in "Off" position. See reason 14.

Hydraulic oil overheats (200° F (93.33° C) or hotter). See reasons 1, 5, 8, 15, 16, 17 & 18.

Light flashes and buzzer sounds intermittently. Conveyor runs in jerks. See reasons 19.

Conveyor does not run with cab control "On", PTO engaged and vehicle driving forward. See reasons 20.

Conveyor runs when control switch in cab is in "Off" position. See reasons 15.

Conveyor starts to run when PTO is engaged. See reasons 15, 20.

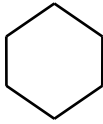
Controller application or programming. Refer to the control manual's Troubleshooting section.

Reason:	Correction:
1. Hydraulic oil level low.	Add hydraulic oil to reservoir to maintain level around mid-point of sight gauge.
2. Shut Off valve on oil reservoir not open.	Open valve fully by turning counter clockwise until it stops.
3. Hydraulic Pump is not rotating.	1. PTO is disengaged. Shift into engagement. 2. Drive line has failed. Repair or replace. 3. Key in pump shaft has failed. Replace key. 4. U-joint pin or key has failed. Replace pin or key.
4. Worn pump.	With flow meter arranged to check relief valve setting above, open load valve fully. Read flow rate with truck engine running at max RPM. Close load valve until pressure reads 1000 PSI (69 bar). Flow rate should not decrease more than three (3) GPM. If flow loss is greater, replace pump.
5. Conveyor relief valve open to return line.	Using relief valve testing adapter and flow meter, test valve for opening pressure. If not 3100 PSI (214 bar), replace relief valve.
6. Jammed or frozen spinner motors.	Free up. If not possible, replace as required.
7. Jammed or frozen conveyor.	Free up conveyor.
8. Defective radar.	Check speed on console. Repair or replace radar as required.
9. Control processor's power is in "Off" position.	Turn on control processor.

Reason:	Correction:
10. In line relief valve set too low.	In line relief valve pressure should be 3100 PSI (214 bar). Set spinner control valve to "0". Disconnect pressure line, coming from rear port on spinner control valve, at control. Reconnect this line to flow meter inlet port. Disconnect return line from control where it joins the return tube running to the reservoir. Connect flow meter load valve to return tube. Open load valve fully, run truck engine at max RPM. Slowly close load valve until pressure reaches 3100 PSI (214 bar). If this pressure cannot be reached, set up relief valve adjustment until gauge reads 3100 PSI (214 bar). CAUTION: Do not set pressure above 3100 PSI (214 bar).
11. Jammed or frozen conveyor hydraulic motor.	Replace motor.
12. Conveyor hydraulic motor shaft key sheared.	Replace key.
13. Pump speed is not adequate to provide sufficient flow to maintain spinner speed.	Increase engine speed or resize hydraulic pump to meet system requirements.
14. Insufficient hydraulic oil flow at normal driving speeds.	Check PTO-Pump matching. If insufficient flow results, install higher percent PTO or use larger pump (Special).
15. Defective spinner control valve.	Replace valve metering spool spring. If no improvement, replace spinner control valve.
16. Cab control is for conveyor only—spinners run anytime vehicle engine is running, PTO is engaged and spinner control valve is in a running position.	None required. This is a normal condition. To stop spinners, set spinner control valve at "O" position, disconnect PTO, or shut off vehicle engine.
17. Excessive oil is being pumped.	1. PTO percentage too high. Change PTO to smaller percentage or use smaller pump. 2. Pump is too large. Do not exceed 40 GPM (151 LPM) pumping rate. Change to smaller pump or use smaller percentage PTO. 3. Pressure drop in control valve is sufficient to run lightly loaded conveyor motor. Shut off pump drive by disengaging PTO shaft.
16. Worn motor (spinner or conveyor).	Motor heats up at an excessive rate (check for this heating when system is cold). Replace motor.
17. Improper or deteriorated hydraulic oil.	Replace hydraulic oil with proper specification oil and replace filter.
18. Pinched or obstructed hose, hydraulic line or fitting.	Clear obstruction or replace part. Straighten kinked hoses.
19. Driving too fast for application rate.	Shift truck transmission to a lower gear. Will not normally occur if within maximum application rates.
20. Involves the controller.	Refer to control manual.

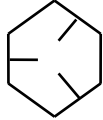
CAP SCREW GRADE IDENTIFICATION - MARKINGS ON HEAD

SAE
GRADE 2



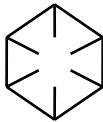
NO MARKINGS

SAE
GRADE 5



THREE MARKS - 120 DEGREES APART

SAE
GRADE 8



SIX MARKS - 60 DEGREES APART

USE GRADE 2 TORQUES FOR STAINLESS STEEL FASTENERS AND CARRIAGE BOLTS.

CAP SCREW SIZE	TORQUE - FOOT-POUNDS					
	GRADE 2		GRADE 5		GRADE 8	
	DRY	LUBE	DRY	LUBE	DRY	LUBE
1/4"	5	4	8	6	12	9
5/16"	11	8	17	13	25	18
3/8"	20	15	30	23	45	35
7/16"	30	24	50	35	70	55
1/2"	50	35	75	55	110	80
9/16"	65	50	110	80	150	110
5/8"	90	70	150	110	220	170
3/4"	100	120	260	200	380	280
7/8"	140	110	400	300	600	460
1"	220	160	580	440	900	650

CONTROLLER

Introduction

ISOBUS is a protocol standardizing communication between chassis, displays, farm management software, and implements. Adhering to ISO 11783 standards, ISOBUS allows chassis and implements of different colors to share information through a common display. The use of ISOBUS technology allows the end user to minimize the number of necessary monitors in the cab of the chassis, while still enabling full functionality of the implements. The data displays the same way on any monitor.

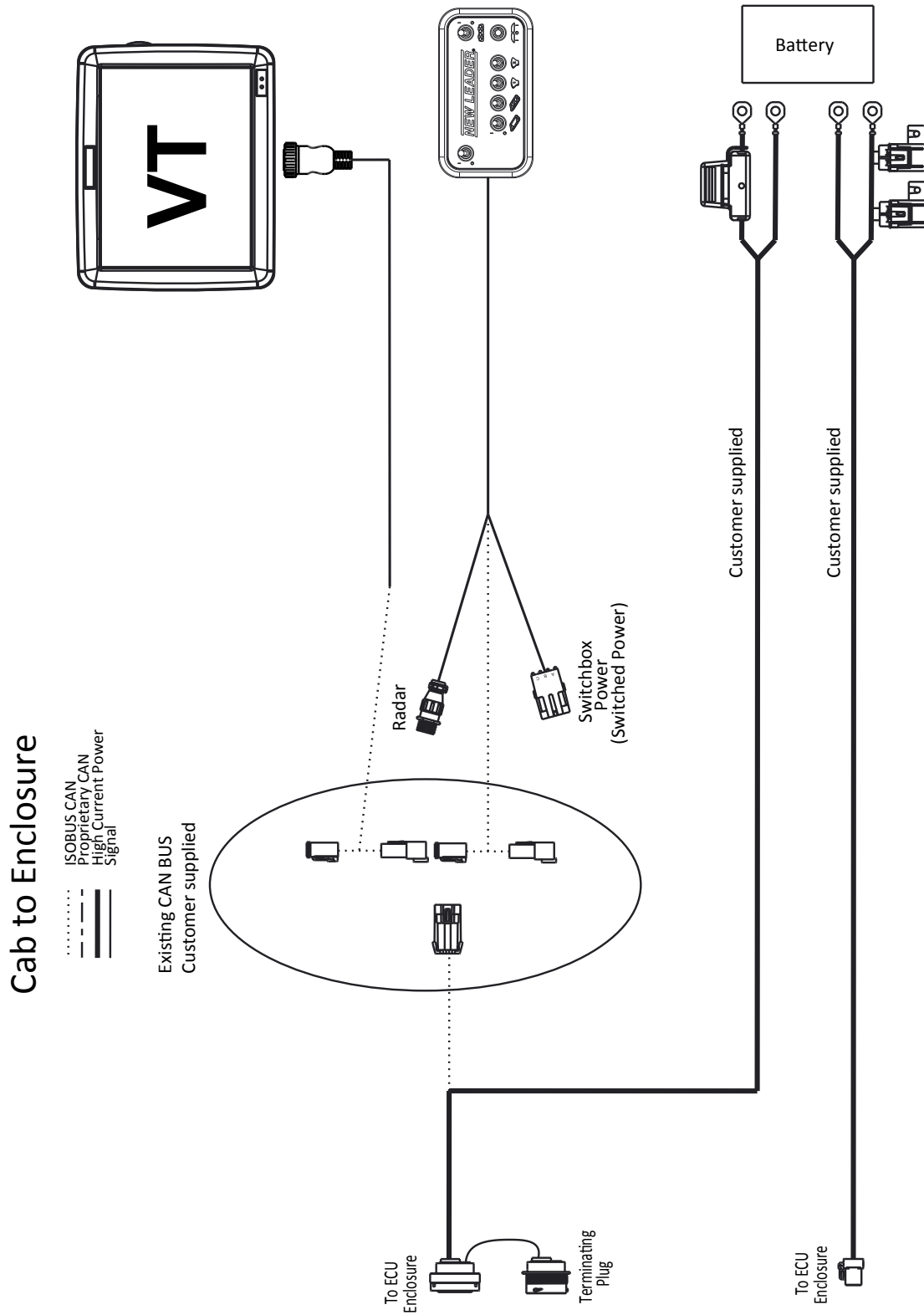
How the ISOBUS Works

The BUS is a distinct set of conductors designed to carry data and control signals within a system of parallel connected equipment. Information from the equipment modules is transmitted through the BUS to a Virtual Terminal (VT) in the cab. The Virtual Terminal (VT) uploads a User Interface (UI) which feeds into any Display Monitor. From one Display Monitor, the user can read information and make control changes to the implement(s). Since everything is virtual, multiple implements can be controlled with one monitor by switching back and forth between different VT's.

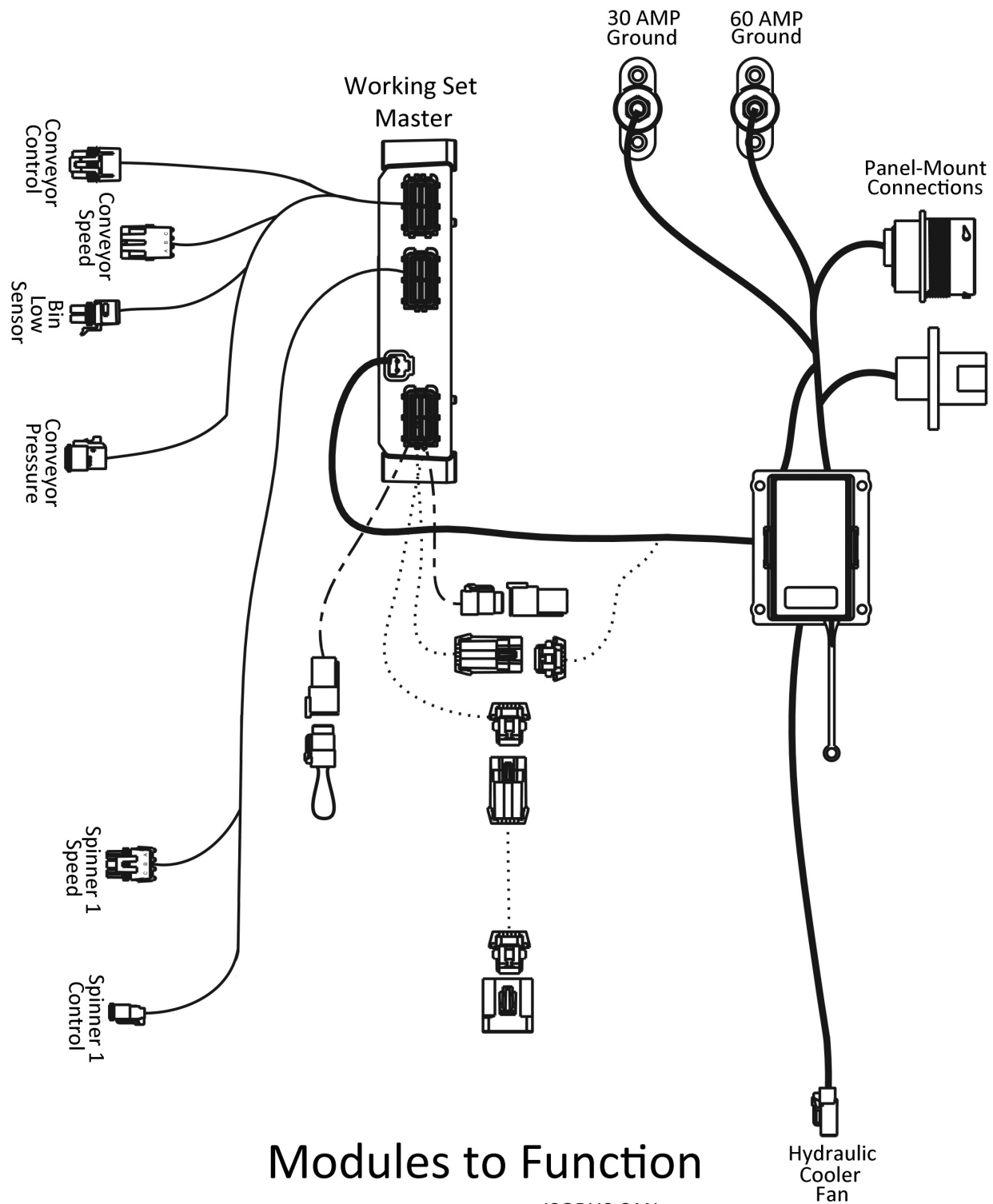
Terminologies

- ISOBUS - An electronic communications network used on agricultural and forestry equipment that adheres to the ISO 11783 standards.
- VT (Virtual Terminal) - The electronic interface that resides within the system, rather than on the Display Monitor. By being virtual, the information will display consistently the same on any monitor being used.
- UI (User Interface) - The displayed information and controls the user interacts with on the Display Monitor to make any necessary changes to implement performance.
- ECU (Electronic Control Unit) - New Leader module that controls specific functions of the implement and is attached to the BUS.
- Task Controller - A crucial software component that resides within the Virtual Terminal and is required to provide support for Data Logging, Variable rate application via prescription maps, and on/off implement section control via AutoSwath.
- CANBUS - A CAN (Controller Area Network) BUS system is a vehicle bus standard that allows microcontrollers and devices to communicate with each other within a vehicle without a host computer.
- Display Monitor - The physical monitor used in the cab that communicates with the VT to run the implement(s) and display data from the operations.

Cab to Enclosure Diagram



Modules to Function Diagram



Modules to Function

..... ISOBUS CAN
 Proprietary CAN
 _____ High Current Power
 _____ Signal

Requirements

System Requirements:

- Virtual Terminal version 3 that supports AUX-N functionality
- Task Control (Multi-product up to 4 bins)
 - TC-BAS
 - TC-GEO
 - TC-SC

Function:

- VT will load New Leader UI and assign functions to in-cab switches.
 - Ability to track totals.
 - Ability to log as-applied maps and load prescription maps.
 - Ability to activate section control or AutoSwath.

Navigation

To activate the New Leader Controller Interface, power up the monitor and activate the VT settings. For instructions on how to activate the VT, see the Manufacturer's Operations Manual for the specific monitor being used.

Activation of VT will bring up the New Leader Home Screen, also called the "Run Screen", as shown in Figure 1.

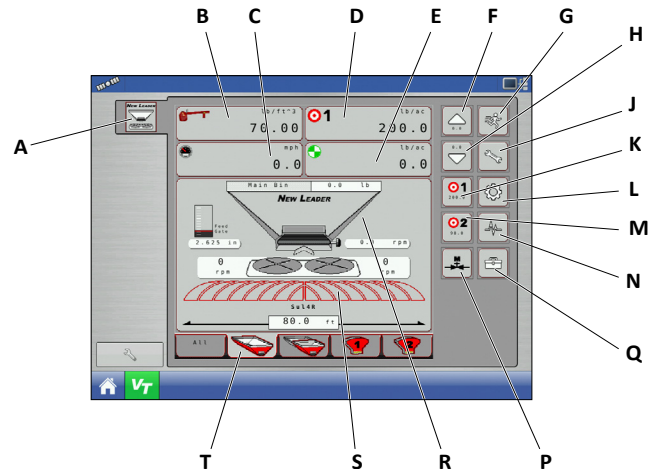


Figure 1 - Home Screen

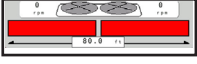
A		Spreader Operations	K		Target Rate 1
B		Density	L		Calibration
C		Speed Source	M		Target Rate 2
D		Target Rate	N		Diagnostics
E		Actual Rate	P		Manual Conveyor Mode
F		Increase Rate Value	Q		Tools
G		Run Screen	R		Bin/Gate settings
H		Decrease Rate Value	S		Spinner Settings
J		Settings	T		Bin Selection

Figure 2 - New Leader Home Screen

An on-screen Numeric Keypad is made available for changing configuration settings and calibration numbers. Press the keypad button to access the on-screen numeric entry screen. Keypads may look different depending on VT being used.

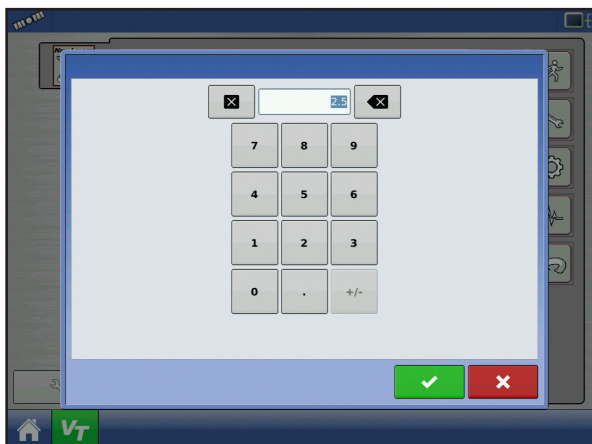


Figure 3 - Numeric Keypad

Navigation Control Buttons



Back Button



Forward Button



Return to Previous Screen



Accept Entry



Cancel

Machine Configuration

NOTE: Refer to default settings table at end of controller section for factory setup defaults.

NOTE: Before use, Display Monitor must be setup to enable VT connection and a machine configuration may need to be built. See Manufacturer's Operations Manual for detailed instructions on these processes.

Initial Configuration/Factory Setup

(Only seen on first boot, or if system is reset/reconfigured)

- Power up Display Monitor and activate VT.
- Alert screen appears identifying that system is not configured. Press  to continue.



Overview of attached modules:

- Number of spreader modules will be shown along with any add on modules. Press  to continue.



Bin Settings

Bin settings include Name, Capacity, Bin Sensor, Feedgate enabled/disabled, and Pressure Transducer calibration.

- Enter Capacity for Main Bin using keypad. Enable or disable bin level sensor as required. Press  to edit pressure transducer settings. If standard transducers are being used, press  to continue.
- Enable transducers and set calibration settings as necessary (adjust only if standard HECO provided transducers are not being used). Press  to continue.

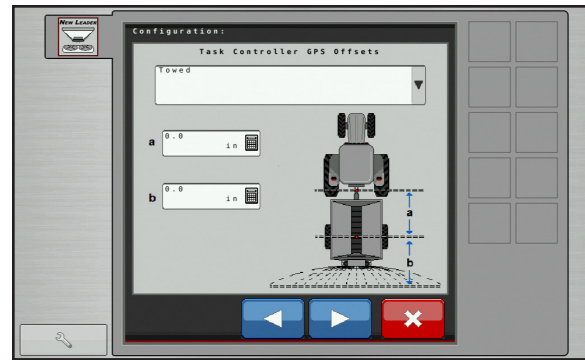


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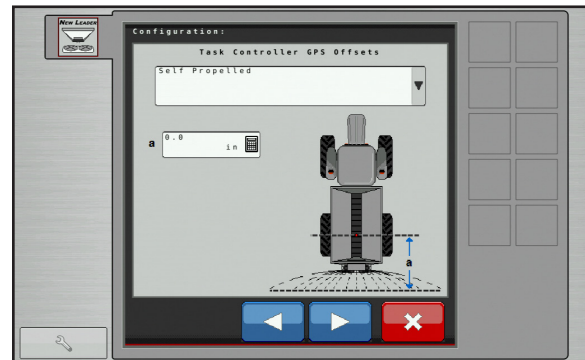
GPS Offsets

Editing the task controller GPS offset settings will determine drop point of material behind chassis.

- Select Towed or Self Propelled and enter GPS Offset using keypad.
- For single axle towed units, enter the distance from the center of the hitch pin to the center of the axle (a). Then enter the distance from the center of the axle to the center of the spinner disc (b).
- For self-propelled units, enter the distance from the center of the rear axle to the center of the spinner disc (a).
- NOTE: For units and trailers with tandem axles, use the center of the tandem for measurement reference point.
- Press  to continue.



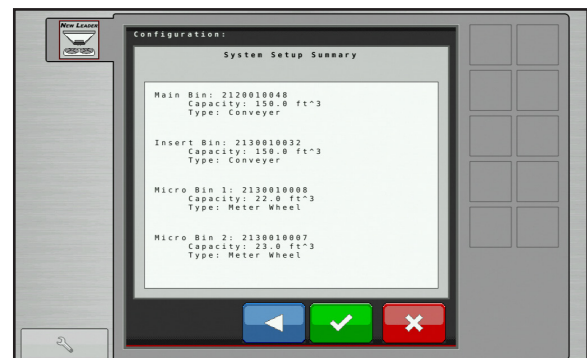
Towed



Self-Propelled

System Setup Summary

- Verify all settings are correct. Press  to continue or  to go back and adjust as necessary.



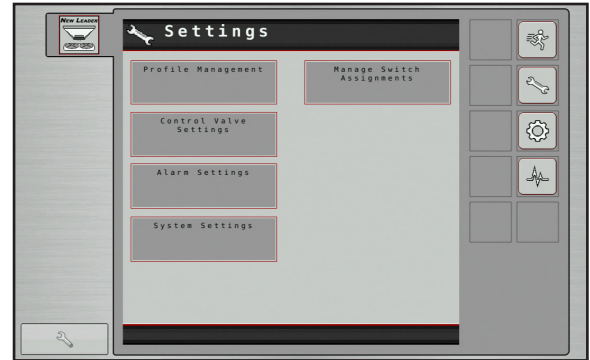
Configuring Auxiliary Switches

- Switches must be configured before calibration.
- Switchbox switches need to be mapped. Use the Display Monitor's operations manual to map all switches as necessary.

Settings

Changing machine calibrations allows operator to enable/disable bins, adjust valve calibration numbers, change alarm settings and reset modules. On the Home Screen, press  to change these settings:

Press  to enable/disable bins.



Enable/Disable Bins

- Each Installed Bin (as set up in Step 4) will appear. Press each "Enable" button to enable or disable each bin as appropriate for the current job.



Valve Calibration Adjustment

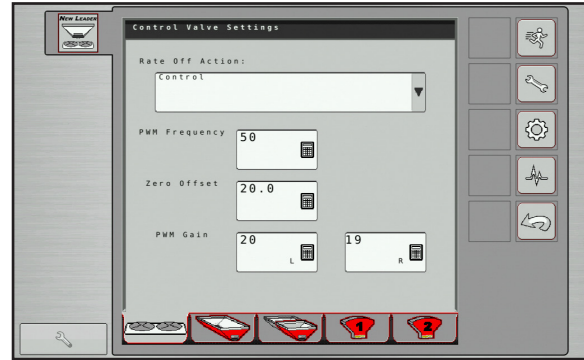
- Press  to adjust valve calibration numbers.

NOTE:

Default values are not fine tuned and may result in a slower response time than desired. Adjust at first time start up and when valve is replaced.



- Press  to set spinners. Enter appropriate settings:
 - PWM Valve settings:
 - "Monitor" - no PWM control
 - "Control" - tries to maintain spinner speed at all times regardless of available hydraulic flow. Best for hydrostatic or CVT drives.
 - "Hold" - Preserves last PWM signal to valve when conveyor is deactivated. Best for geared transmissions with gear pumps.



- PWM Frequency - Frequency that PWM control valve is pulsed at. Settings can be found from valve manufacturer.
- Zero Flow Offset - Represents maximum duty cycle sent to control valve without producing any hydraulic flow from. Increase this number to hit target rate sooner.

IMPORTANT! Setting Zero Flow Offset too high will cause spinners to overshoot Low Spinner Speeds and could cause delay in reaching set speed. Adjust as needed in small increments.

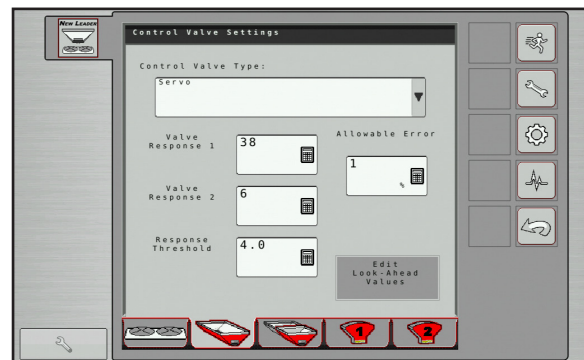
- PWM Gain - Determines how aggressively control valve responds when making rate adjustments. Higher value means more aggressive system response.

IMPORTANT! Setting PWM Gain too high spinners will become erratic. Adjust as needed in small increments.

- Set Conveyors by selecting each bin at bottom of screen.

NOTE:

If using PWM valves instead of Servo valved, select "PWM" from "Control Valve Type" list and enter settings as per notes on Spinner valves and test for accuracy.



NOTE:

Setting value too low can cause product control system to continually hunt for target application rate.
Setting too high will cause excessive product application error and a delay in target rate being reached.

SERVO

Enter appropriate settings:

- Valve Response 1 - Determines speed of servo valve when product control error exceeds Response Threshold setting. Represents fast speed of servo valve. Decreasing value will cause servo valve to run slower. Default setting is 40%.
- Valve Response 2 - Determines speed of servo valve when product control error is less than

Response Threshold setting. Represents slow speed of servo valve. Decreasing value causes servo valve to run slower. Default setting is 8%.

- Response Threshold - Determines where control channel switches between using Valve Response 1 and Valve Response 2 speed setting. Leaving all other valve control settings at default value and making small adjustments to this setting is usually all that is required to fine-tune system performance. Default setting is 4.

NOTE:

Decreasing Response Threshold value will have overall effect of speeding up servo valve response. Increasing Response Threshold value will have overall effect of slowing servo valve response.

- Allowable Error - Determines the percent of error that is allowed prior to product control system making any flow rate changes. 2% - 3% is normal dead band setting range.

PWM

- **PWM Frequency**

- Frequency that the PWM control valve is pulsed.
- Settings can be found from valve manufacture
- Do not adjust

- **Zero Offset**

- Represents the maximum duty cycle sent to the control valve with out producing any hydraulic flow.

- Increase this number to hit target rate sooner

- Note: Setting this value too high will result in constant overshooting of the target rate.

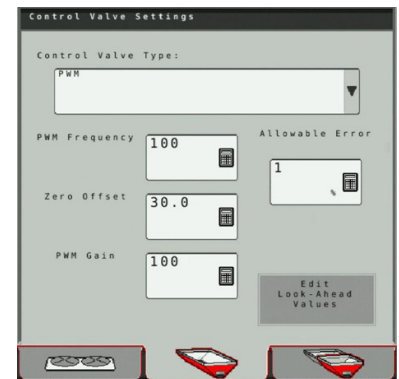
- **PWM Gain**

- Gain determine how aggressively the control valve responds when making rate changes. Higher the value means more aggressive system response.

- Note: Setting this value too high will result in erratic operation.

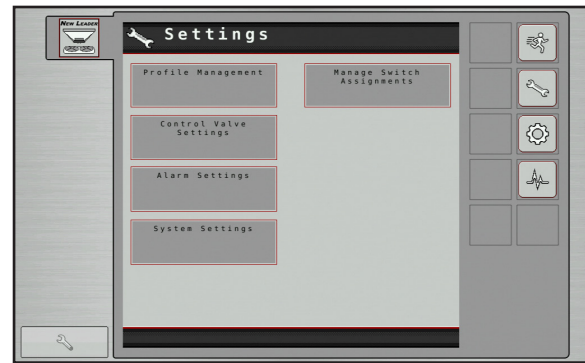
- **Allowable Error**

- Is the percent of error that is allowed before the product control system makes any flow rate changes.

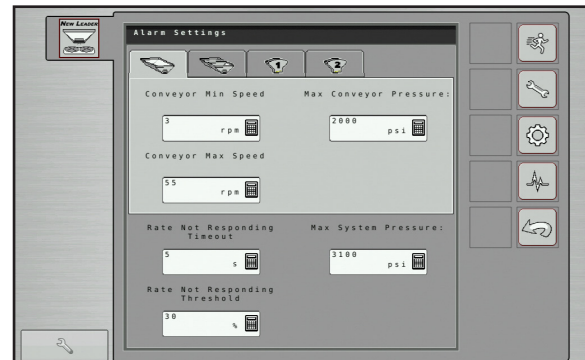


Alarm Settings

- Press **Alarm Settings** to adjust alarm settings.



- Edit each Alarm setting as desired.

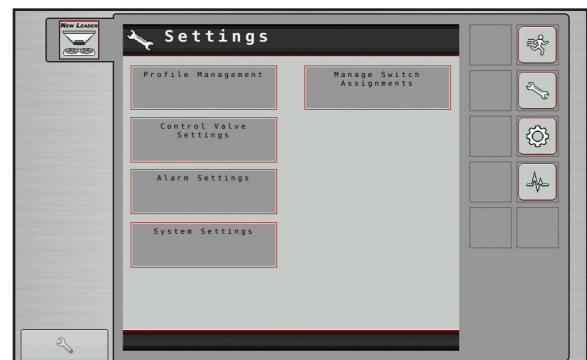


Reconfigure System

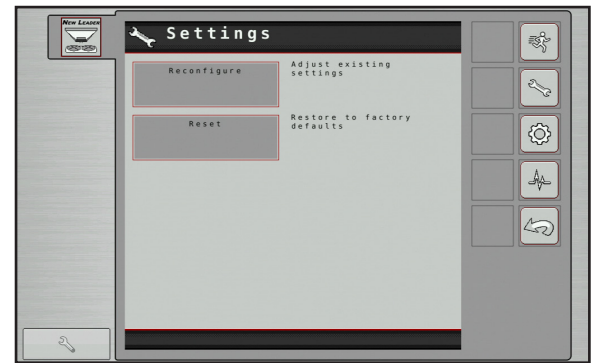
NOTICE!

Pressing "Reset" under "System Settings" will restore all settings to factory default and all calibration numbers will be lost. It should only be pressed if instructed to do so by service technician or New Leader product support.

- Press **System Settings** to reset/reconfigure system.

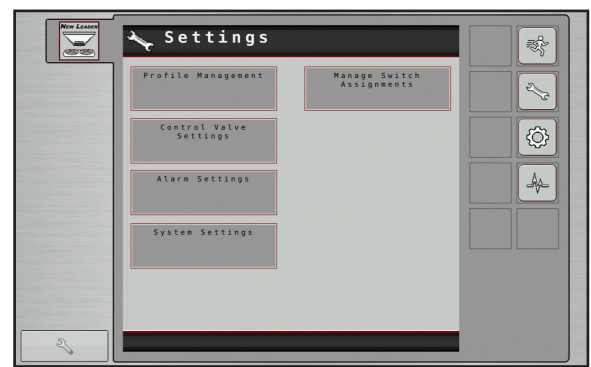


- "Reconfigure" allows the user to adjust any of the system settings made during first time start up ("Machine Configuration" steps). "Reset" will restore all settings to factory default and all calibration numbers will be lost.
- Display will then jump to GPS offset screen. See "GPS Offsets" in this section for details.



Switch Assignment

- Press  to show connected devices.



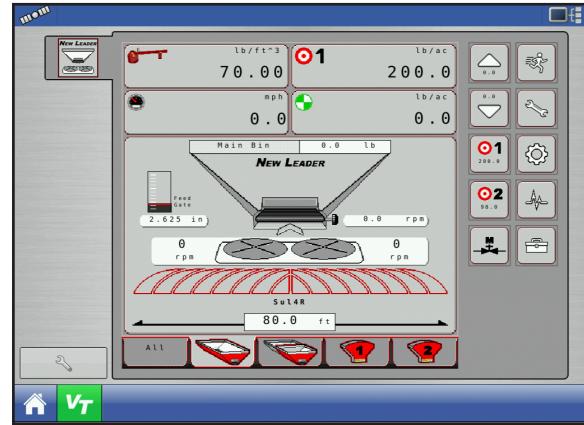
- Connected devices will appear in the device list.
- If using a New Leader switch box, press  to automatically map the switches to the correct function.



Component Calibration

NOTE: Before regular use, system must be calibrated to ensure accurate spreading.

- Power up Display Monitor and activate VT.
- The Run screen will appear. Press  to continue.



Spinner Disc Calibration

- Press  to calibrate spinner discs.



- Use keypad to edit numeric setting as necessary:
 - Standard spinner discs, set to 4.
 - If using 5 fin discs, set to 5.
 - If using 6 fin discs, set to 6.
 - Press  to accept change and continue,
 - or  to cancel.

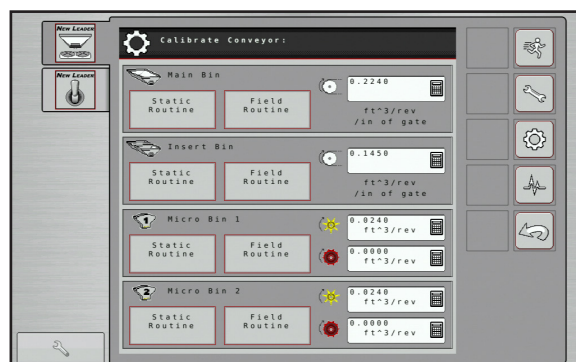


Conveyor Calibration

IMPORTANT!

For best results, a catch test must be done for each product to be spread before season begins, or any time a new supply of product is received.

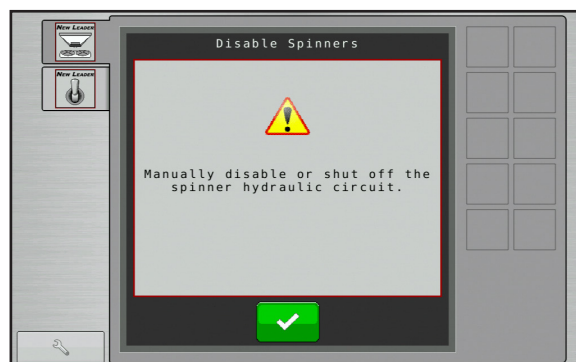
- Press **Conveyor** to calibrate conveyor.
- Manually enter cubic feet per revolution (CFR) rate using keypad.
- To begin catch test, press **Static Routine** for the bin to be tested.
- To perform in-field calibration, press **Field Routine** for the bin to be tested.



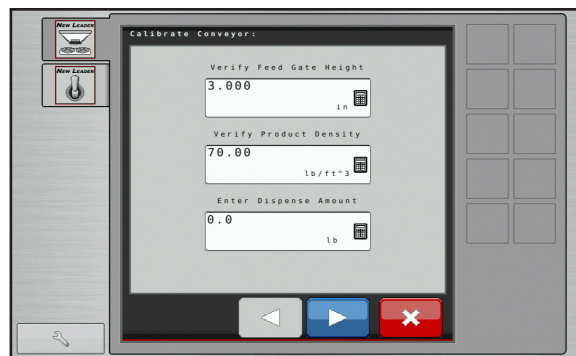
WARNING

Do not work near rotating spinners. Severe injury can result from contact with moving parts.

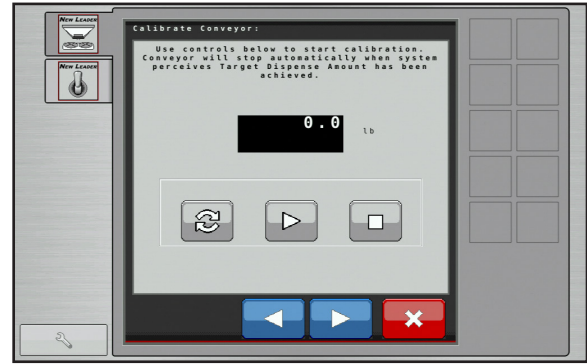
- Spinners will automatically shut off. For added safety, disconnect PWM valves. Press **✓** to continue.



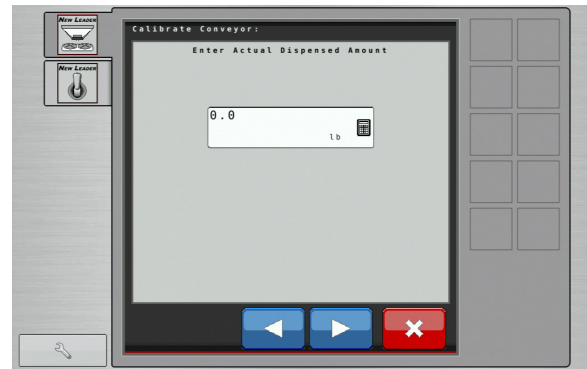
- Verify Feed Gate Height and Product Density are correct. Use keypad to edit as needed. Enter Dispense Amount using keypad. Press **▶** to continue.
- Bring engine up to full operating RPM.



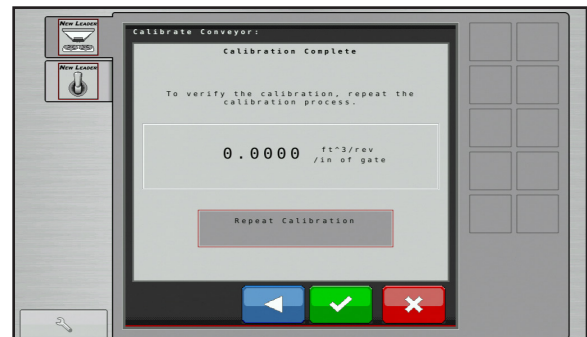
- Using the control buttons    (Reset, Run, Stop), run a catch test. If spreading product that has already been tested, press  to continue. To begin a test, press . Conveyor will run.
- Once controller dispenses specific amount, conveyor will stop. Press  to continue.



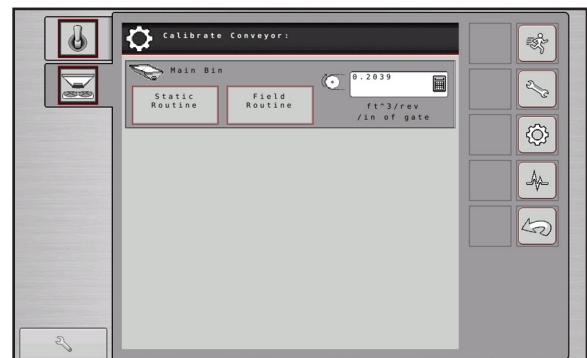
- Weigh material dispensed and enter actual weight of material dispensed. Press  to continue.



- It is recommended a minimum of three (3) tests be done PER PRODUCT to ensure accuracy. Once each test is done, press "Repeat Calibration" to run a subsequent test. When finished, press .

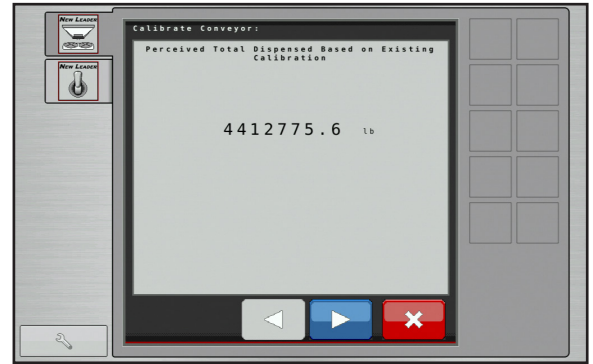


- The main Calibration screen will appear. To calibrate with a known amount brought to a field, press .

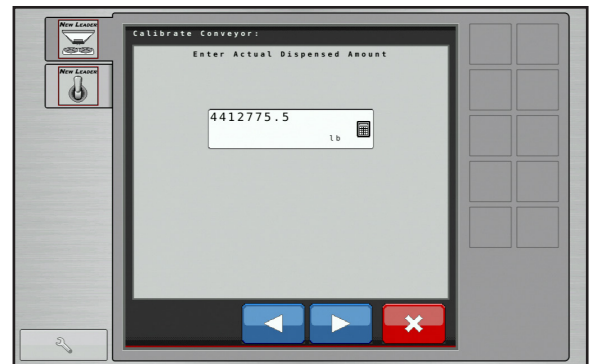


Note: Field totals can be reset from Summary Screen if needed.

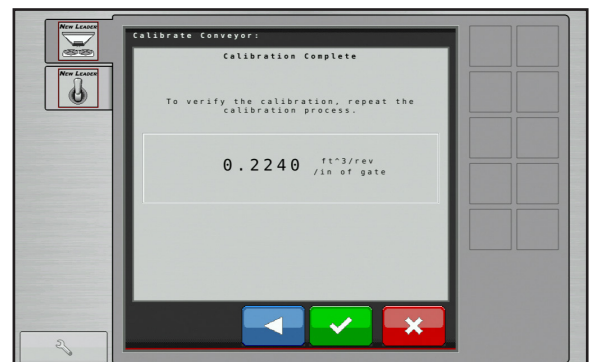
- After dispensing product in field, screen displays system perceived total of dispensed product. To enter actual dispensed amount, press .



- Using keypad, enter actual weight of product dispensed. Press  to continue.



- New cubic feet per revolution (CFR) rate will be displayed. Press  when finished.



Operations/Features

Create New Job

The following is a guide for running system for first time.

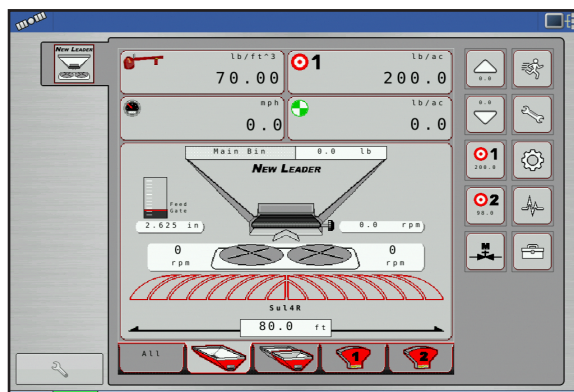
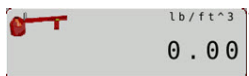
1. Create Job in display.

This operation will vary from display to display. Refer to display manual on how to create a job using Task Control. When finished, activate VT.

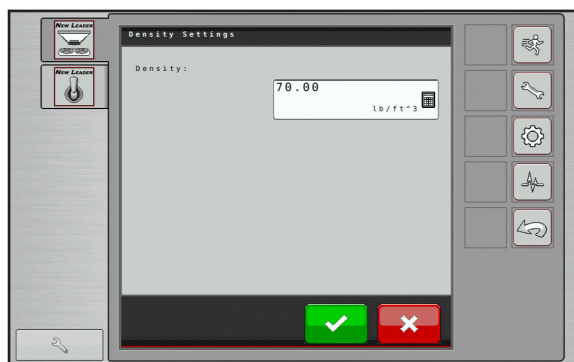
2. Verify Product Density.

Material Density will vary from product to product. It is imperative that correct density is entered in controller for rates to come out correctly.

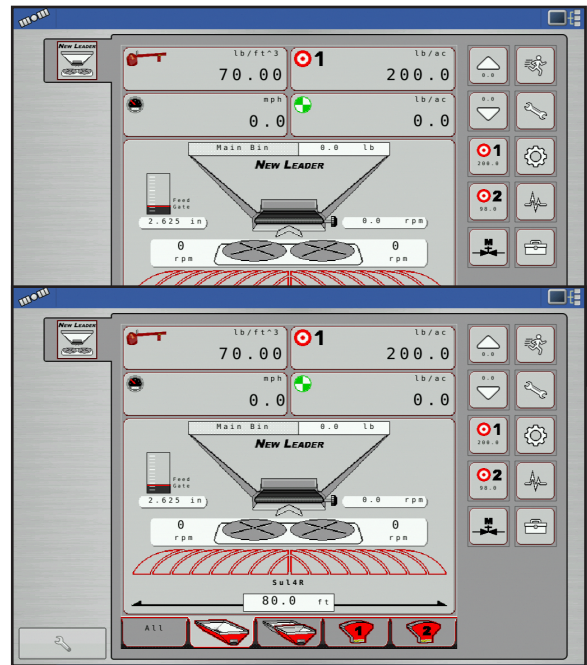
- To change product density, press



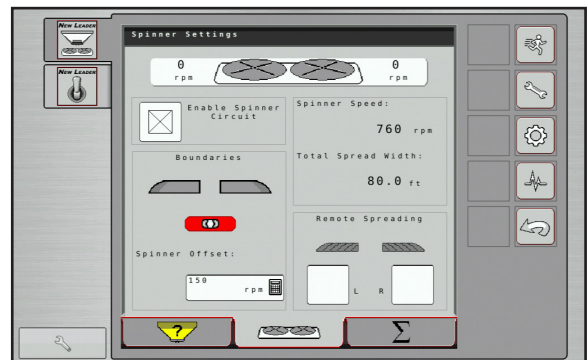
- Use keypad to enter density. Press  to accept change and continue, or  to cancel.



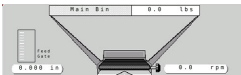
3. Verify task control in Target Rate 1.
 - Rate will be driven by job setup in display. To verify this, TC should show in place of target rate 1. If not, verify job has been created correctly. Refer to display manual.
4. Verify total spread width and spinner speed:
 - Different products may require different spread widths or spinner speeds. Always verify the material profile is configured correctly before applying product.
 - Edit current profile or create a new one if necessary. See "Material Profile Management" for details.

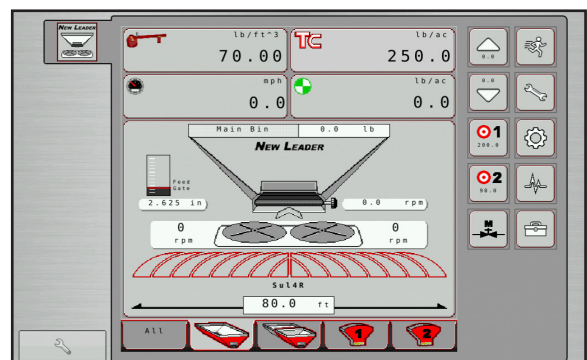


- Enable Spinner Circuit. Using keypads, enter Spinner Speed and Total Spread Width. If desired, enter Spinner Offset (see Boundary Spreading section of this manual for instructions).

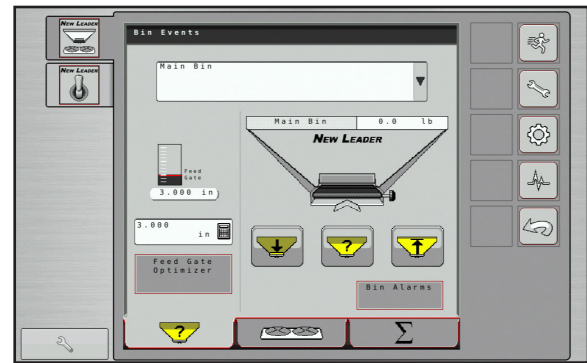


5. Verify gate opening:

- Press  to set bin levels and change gate opening.



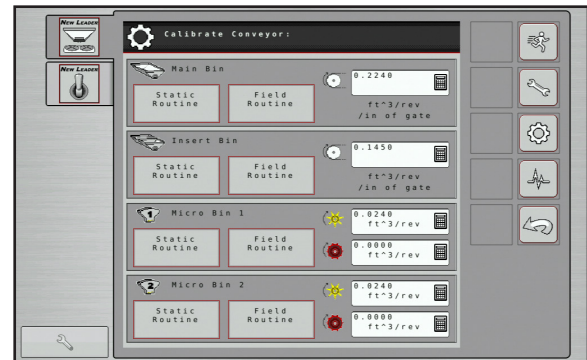
- Use keypad to set feedgate opening to correct reading.



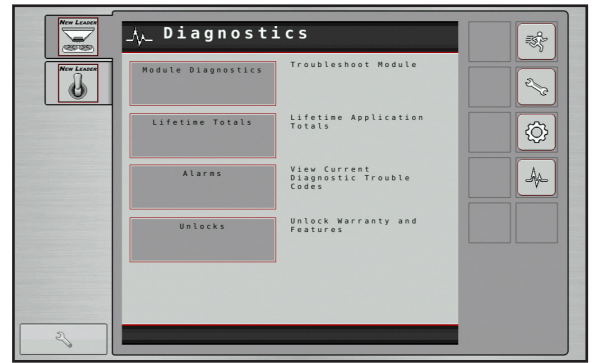
6. Verify CFR number is correct:

Different products may require different calibration numbers. Verify the CFR number is correct before applying product.

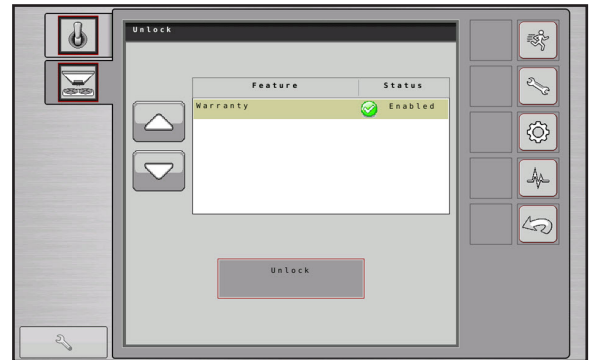
- Press  then .
- Use keypad to change CFR number as needed.



- To view unlocked features, press .



- Current unlocked features will display. Press "Unlock" to display module serial number and registration number. Press  to return.

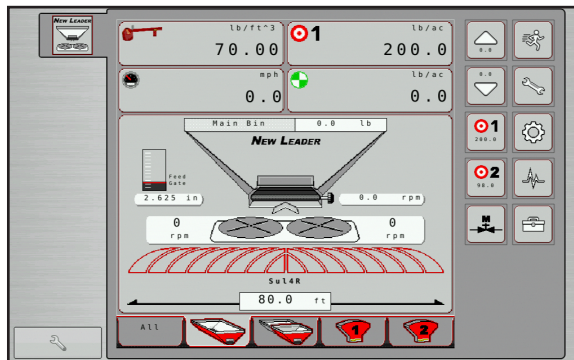


Hydraulics

NOTE:

This program will show a visual representation of hydraulic monitoring, including system pressure, temperature, conveyor pressure, and indicators for low fluid level and filter restriction. Individual bins can be viewed by pressing the bin icons along the bottom of the screen.

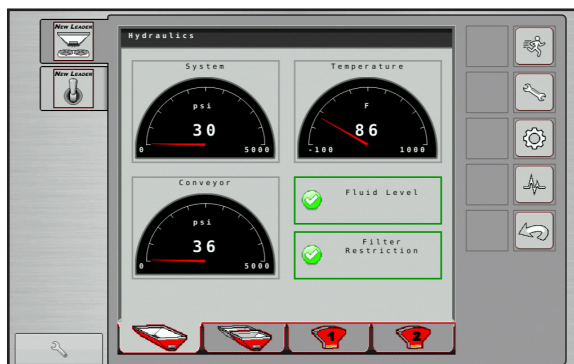
1. Power up Display Monitor and activate VT.
 - The Run screen will appear. Press  to continue.



- The Tools main screen will appear. Press  to continue.



2. View hydraulic monitoring:
 - Hydraulics - System pressure, Temperature, and status of Fluid Level and Filter Restrictions will show system wide.
 - Conveyor Pressure will display for Bin 1, and cumulatively for Bins 2 - 4 as equipped.
 - Fluid Level and Filter Restriction status are shown in the lower right hand corner. When within acceptable levels, the boxes are outlined in green and display a  (as shown). If fluid level is low or if filter is restricted, the box will be outlined in red and display a .
 - Press  to return to Tools Screen.



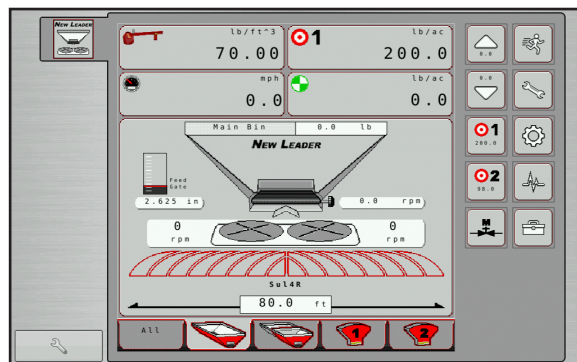
NOTE:

If the spreader does not have an onboard hydraulic reservoir, fluid temperature, fluid level and filter restriction are not accurately displayed.

Bin Flush

NOTE: This program is used to quickly empty each bin. Spinners will automatically shut off and allow the operator to select which bins to empty.

1. Power up Display Monitor and activate VT.
- The Run screen will appear. Press  to continue.



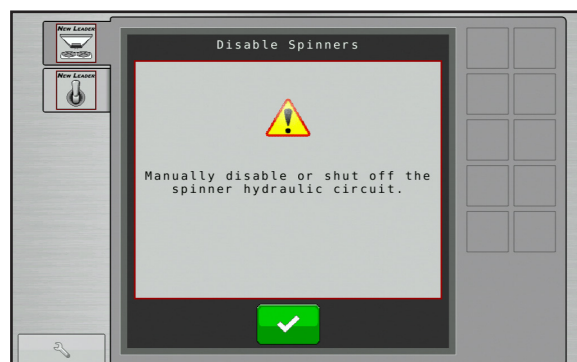
- The Tools main screen will appear. Press  to continue.



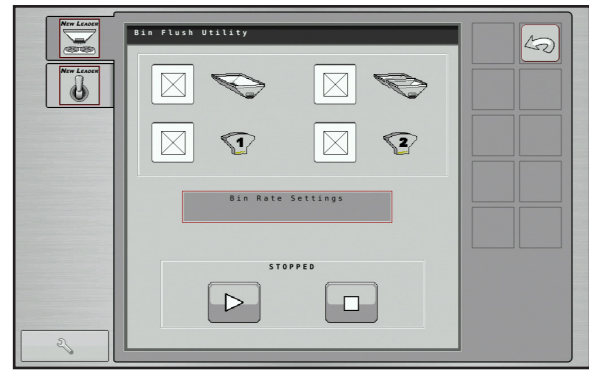
⚠ WARNING Do not work near rotating spinners. Severe injury can result from contact with moving parts.

⚠ WARNING For added safety, unplug PWM valves to ensure spinners cannot run while in Bin Flush mode to avoid injury.

- Bin Flush will automatically disable spinners. Press  to continue.

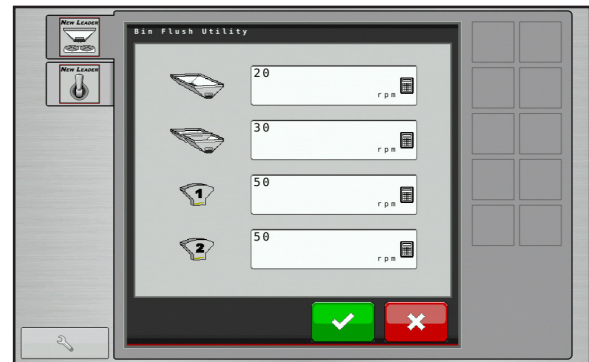


2. Select bins:
 - Select bins to be flushed by pressing enable buttons next to each. To adjust conveyor RPM for flush, press .



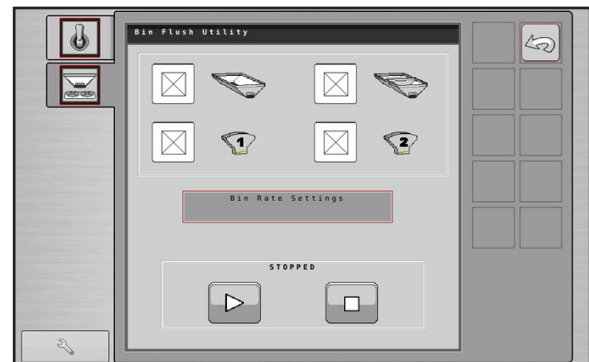
3. Set conveyor RPM:
 - Use keypads to set conveyor RPM for each bin. 20 RPM is default.
 - Bin 1 Maximum = 50 RPM
 - Bin 2 Maximum = 60 RPM
 - Bins 3 & 4 Maximum = 85 RPM

Press  to continue.



4. Perform bin flush:
 - To flush bins, press . Conveyors will run until  is pressed.

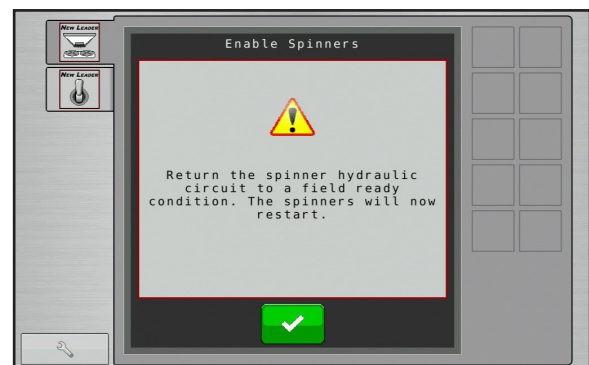
When process completes, press  to continue.



WARNING

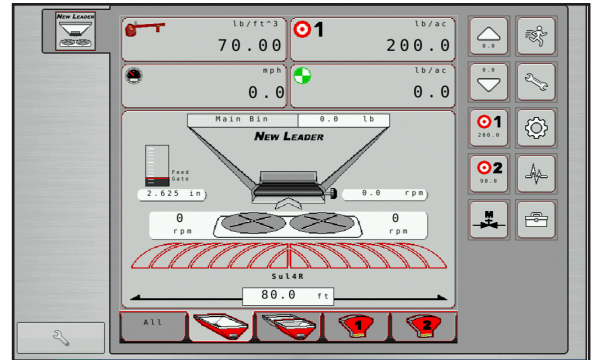
Do not work near rotating spinners. Severe injury can result from contact with moving parts.

- When exiting Bin Flush process, spinners will restart. Plug PWM valves back in if it was previously disabled. Press  to continue.



Body Module

1. Power up Display Monitor and activate VT.
 - The Run screen will appear. Press  to continue.

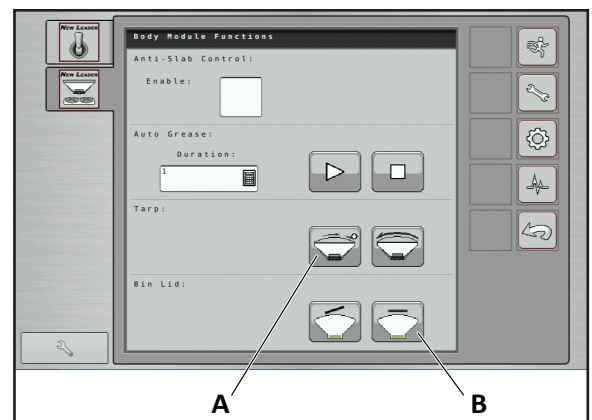


- The Tools main screen will appear. Press  to continue.



Bin Cover Control

- If equipped, press  (A) to open and close tarp.
- If MultiBin insert is installed, press  (B) to open and close Micro cover.

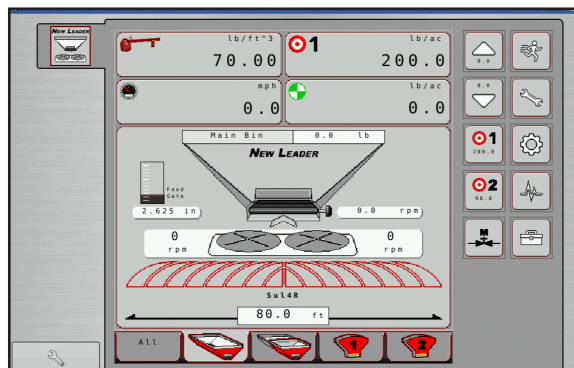


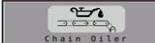
Chain Oiler

NOTE: This program is used to manually oil the chain, set alarm frequency, and set auto-lube settings.

1. Power up Display Monitor and activate VT.

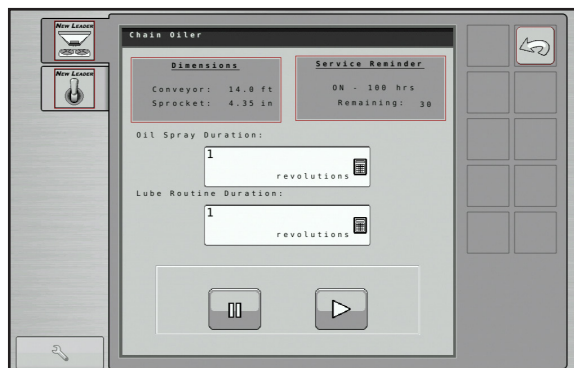
- The Run screen will appear. Press  to continue.



- The Tools main screen will appear. Press  to continue.



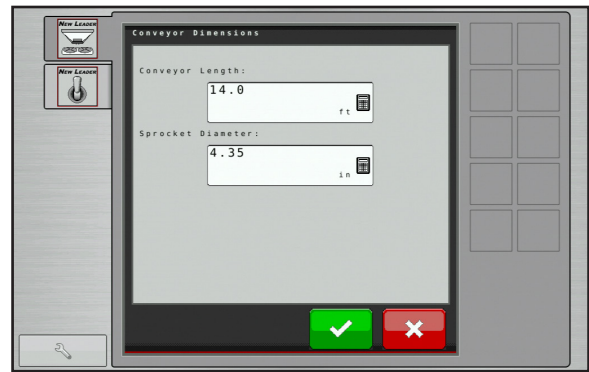
2. Set duration:
 - Use keypads to set oil chain duration (recommended 1 revolution). Lube routine is not used at this time.



3. Set conveyor dimensions:
 - Press "Dimensions" to input conveyor dimensions. Use keypads to input conveyor length and sprocket diameter.

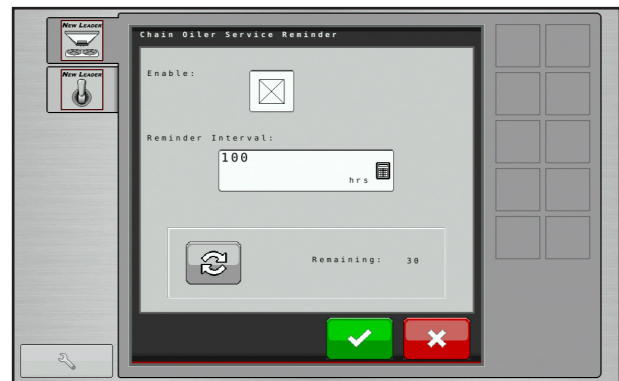
Press  to return to Chain Oiler screen.

Press  to return to Tools Screen.



4. Set service reminder:
 - Press "Service Reminder" to set chain oiler reminder. Enable Reminder and use keypad to enter interval hours desired. To restart reminder after manually oiling conveyor, press .

Press  to return to Chain Oiler Screen.



General Alarms

Alarm	Title	Description
WSM Spreader Module	Local CAN Bus Error	Check the local CAN bus connection.
WSM Spreader Module	Module Software Reset	The module software reset due to an unhandled error.
WSM Spreader Module	Local CAN Bus Warning	Check the local CAN bus connection.
WSM Spreader Module	Local ISOBUS Error	Check the ISOBUS connections.
WSM Spreader Module	Local ISOBUS Warning	Check the ISOBUS connections.
WSM Spreader Module	CAN Power Voltage Low	The CAN power voltage is below 8.0 volts. Check CAN bus power supply.
WSM Spreader Module	High Power Voltage Low	The high power voltage is below 10.0 volts. Check high power supply connections.
WSM Spreader Module	Bin Not on Bus	Bin set as installed is not on bus. Check wiring or edit the profile.
WSM Spreader Module	Body Module Offline	The body module is no longer available. Check power supply and communication wiring.
WSM Spreader Module	Module Indexing Failure	System has not indexed itself properly. This can be caused by a missing index pin in the cabling.

General Product Control Alarms

Alarm	Description	Trigger
Rate sensor error during calibration	"Calibration error, lost or intermittent signal from rate sensor. Check sensor and related wiring prior to calibrating conveyor."	Rate sensor signal is lost for a period of two or more consecutive seconds during the Static Conveyor Calibration Routine.
Rate Sensor Error During Conveyor Flush	"Lost or intermittent signal from rate sensor. Check sensor and related wiring prior to continuing Conveyor Flush Routine."	Rate sensor signal is lost for a period of two or more consecutive seconds during the Conveyor Flush Routine.
Low Bin Sensor	"Low Bin Sensor." [Channel Name].	Bin Level Sensor is installed, metering circuit is commanded on, and the product in the bin does not cover the sensor for a consecutive period of time greater than current [Low Bin Time Delay] setting.
Disable Spinners	"Manually disable or shut off the spinner hydraulic circuit."	At the beginning of the Static Conveyor Calibration and Conveyor flush routine.
Enable Spinners	"Return the spinner hydraulic control to a field ready condition. The spinners will now restart."	At the end of the Static Conveyor Calibration routine and Conveyor flush routine.
Boundary Spinner Not Responding	"Boundary Spinner Not Responding." + [Spinner Name].	Automatic control for spinners must be enabled. At least one conveyor must be commanded on. Perceived spinner speed is greater than 30RPM in error from the [Boundary Spreading Spinner RPM Offset].
Rate Not Responding	"Rate Not Responding" + [Channel Name].	Control channel is commanded on using automatic control mode. Application rate is +/- [Rate Not Responding Threshold] from target rate for a period of [Rate Not Responding Timeout] or more.
Maximum Conveyor Speed	"Conveyor At Maximum RPM, Slow Down" + [Channel Name].	Product channel is commanded on and conveyor is run at or above maximum speed for a period of 5 or more consecutive seconds.
Minimum Conveyor Speed	"Conveyor At Minimum RPM", + [Channel Name].	Product channel is commanded on and conveyor is run at or below minimum speed for a period of 5 or more consecutive seconds.
Conveyor Not Responding	"Conveyor Running While Turned Off" + [Channel Name].	Product bin is commanded off and conveyor speed >0 and <1 RPM for a period of 30 or more consecutive seconds. Or conveyor speed is ≥1 RPM for a period of 5 or more consecutive seconds.

Spinner Alarms

Alarm	Description	Trigger
CLF Basic Single Spinners Not Responding	"Spinners Not Responding"	Automatic control for spinners must be enabled. [CLF Mode] [Basic Single] must be selected. At least one product bin must be commanded on. Perceived spinner speed is greater than 30 rpm in error from [Target Spinner Speed] for a period of five consecutive seconds or longer.
CLF Basic Independent Spinners Not Responding	"Spinner Not Responding" + [Spinner Name]	enabled. [CLF Mode] [Basic Independent] must be selected. At least one product bin must be commanded on. Perceived spinner speed is greater than 30 rpm in error from [Target Spinner Speed] for a period of five consecutive seconds or longer.
Spinners Off	"Stop Application, Spinners Off!"	CLF is enabled, no spinner speed detected, one or more control channels is commanded on.
Spinners On	"Turn spinner switch off to prevent spinners from running!"	Upon system start up, [CLF Mode] enabled, spinner functionality switch detected in the ON position.

Hydraulic Alarms

Alarm	Description	Trigger
Conveyor Hydraulic Pressure Exceeds Maximum	"Conveyor Hydraulic Pressure Exceeds Maximum Operating Range."	Conveyor hydraulic pressure exceeds [Max Conveyor Hydraulics Pressure] setting for a period of five consecutive seconds or longer.
System Hydraulic Pressure Exceeds Maximum	"System Hydraulic Pressure Exceeds Maximum Operating Range."	System hydraulic pressure exceeds [Max System Hydraulics Pressure] setting for a period of five consecutive seconds or longer.
Hydraulic Fluid Level Low	"Hydraulic Fluid Level Low."	Hydraulic fluid level has fallen below lowest level tank sensor.
Hydraulic Fluid Temperature Below Minimum	"Hydraulic Fluid Temperature Below Minimum Operating Range."	Hydraulic temperature is below 65°F (18°C). Hydraulic fluid too cold to operate machine.
Hydraulic Fluid Temperature Exceeds Maximum	"Hydraulic Fluid Temperature Exceeds Maximum Operating Range."	Hydraulic temperature exceeds maximum operating range, greater than or equal to 200°F (93°C).
Hydraulic Filter Restriction Detected	"Hydraulic Filter Restriction Detected."	Hydraulic filter pressure is greater than or equal to 25 psi for five consecutive seconds or longer.

Chain Oiler Alarms

Alarm	Description	Trigger
Disable Spinners	Manually disable or shut off the spinner hydraulic circuit.	The point the user selects to run the chain oiler routine.
Enable Spinners	Return the spinner hydraulic circuit to a field ready condition.	The point the user exits the chain oiler routine.
Conveyor Lubrication Required	Conveyor Chain Lubrication Is Required.	[Service Reminder On] setting is enabled and [Service Reminder Interval] has expired.

Default Settings

NOTE: Compatible Insert Bin configurations vary per model. See "General Description" in Operations section of this manual for details.

Refer to "Dimensions & Capacities" in Operations section of this manual for capacities on all applicable bin configurations.

Pressure Transducer Settings	
Min PSI	0
Max PSI	5000
Min voltage	1
Max voltage	5
Spinner Settings	
PWM Frequency	100 Hz
Zero Flow Offset	30
PWM Gain	20

Calibration

CFR Values	
Bin	Value
Main Bin	0.291

Control Valve Settings	
	Control Valve
Control Variable	Main
Control Valve Type	Servo
Valve Response 1	40
Valve Response 2	8
Response Threshold	4.0
Allowable Error	1

Sensor Settings	
Encoder pulses	180 or 360 - verify by looking on encoder
Spinner pulses	4

Alarms

Alarm Settings	
Alarm Variable	Bin
	Main (PSI)
Min Conveyor Speed	5
Max Conveyor Speed	50
Max Conveyor Pressure - Std Hydraulics	2000
Max Conveyor Pressure - HP Hydraulics	3400
Rate Responding Time	5
Rate Responding Threshold	30
Max System Pressure - Spinner	3100

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**SPREAD
PATTERN**

⚠ WARNING

Use great caution while working around the spreader. Contact with spinners and other moving parts is very dangerous. Do not adjust while machinery is moving, wear eye protection and avoid discharge from spinners. Do not ride on moving spreader. Failure to comply with this requirement could result in death or serious injury.

A Catch Test is required prior to each season, before using a new product, or if a significant visible change has occurred with a product.

Catch Test

The CFR number, or cubic feet per revolution number, is a calibration number entered into the controller to determine rate output from the spreader's conveyor. A catch test is performed to verify accurate rate output per the controller.

NOTE: An optional calibration chute (P/N 312688) is available to simplify the catch test process. The calibration chute fits all New Leader spreader models with 30" wide conveyor bottoms. Contact your local New Leader dealer for details.

⚠ WARNING

To prevent injury, disable the spinners by unplugging the PWM valve before beginning the catch test procedure. Failure to comply with this requirement could result in death or serious injury.

1. Disable the spinners by unplugging the PWM valve(s).
2. Move the spinner assembly to the 4" (102 mm) position.
3. Remove the Material Divider back plate, and Vane Assembly (if applicable). Install calibration chute if available.
4. Position an end loader or other suitable device beneath the spinners to catch material.
5. Load material into all applicable bins.
6. Prime the conveyor as specified per the controller.
 - If using a calibration chute, run the conveyor just until material reaches the end. Remove any excess material that falls into the catching device.
 - If not using a calibration chute, run the conveyor until the spinner discs are full of material. Remove any excess product from the catching device. Do not remove material from spinner discs.
7. Measure the depth of material on the end of the conveyor to verify the constant number feedgate height information entered into the controller. Adjust feedgate height or recalibrate feedgate as necessary.
8. Verify that all other product settings entered into the controller are correct.
9. Select the correct bin in the controller for the first bin to be tested. Enter the anticipated weight of product to be dispensed from the conveyor.
10. Start the engine and engage hydraulics. Allow to run for several minutes to bring hydraulic oil up to operating temperature. Bring engine up to operating RPM.
11. Following the setup wizard on the controller, run the catch test. The conveyor will start dispensing material, and automatically shut off when the estimated amount of product is dispensed.
12. If not using a calibration chute, leave the material on the spinner discs. Weigh the amount of product that the conveyor actually dispensed into the catching device, and note the result.
13. Enter the actual weight of material dispensed into the controller. The controller will then automatically perform the calibration.
14. Repeat Steps 5 - 12 for all other applicable bins, if an insert bin is installed.
15. Once satisfactory results have been achieved for all applicable bins, turn the engine off, replace the back plate on the Material Divider, return the spinner assembly to its original position setting, and plug the PWM valve(s) back in.

NOTE: For more information on controller operations and setup, contact your local dealer.

⚠ WARNING

Use great caution while working around the spreader. Contact with spinners and other moving parts is very dangerous. Do not adjust while machinery is moving, wear eye protection and avoid discharge from spinners. Do not ride on moving spreader. Failure to comply with this requirement could result in death or serious injury.

NOTICE

Spinner assembly and material divider have NOT been adjusted at the factory. Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. A spread pattern test kit is available for this purpose.
THE MANUFACTURER OF THIS SPREADER WILL NOT BE HELD LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER.

Spread Pattern

Product quality will affect spread pattern and product performance. Spread pattern testing is required to ensure proper application of material. Larger products will produce wider swath widths.

Spread pattern is adjusted using one or more of the following:

- Point of material delivery on spinner discs
- Spinner speed
- Angle of the distributor fins on the spinner discs

Since adjustments will vary for each job, trial and experience must be used to determine the adjustments required to obtain the swath width and spread pattern desired.

Spread Pattern Test Kit

Spread Pattern Test Kit, part no. 313960, includes the following:

DESCRIPTION	QTY	DESCRIPTION	QTY
Box - Plastic Storage	1	Scale – Density	1
Center Collection Tray - Blue	1	Data Sheet – 100 Ct. Booklet	1
Collection Tray - Brown	22	Funnel	1
Divider Screen	23	Flag	5
Assy – Test Tube Rack	1	Rope – 120' marked	1
Test Tube	23	Stake	2

NOTE: If desired, a material calibration kit is available to aid in measuring product quality. Contact your local dealer for details.

Spinners

NOTICE

Spinner discs and fins must be kept clean and polished. Even a small build-up on a spinner fin can significantly affect the spread pattern. Rusty, rough, bent or worn fins will produce poor spread patterns.

In general, critical spinner speed will fall somewhere between 600 and 900 RPM. Spinner speed is adjusted by changing the settings in the controller. Proper spinner speed adjustment is critical in obtaining optimal spread patterns. The best spinner speed to use will depend entirely on the material being spread, and must be determined by testing.

Spreader Preparation

The spreader to be tested must be in good mechanical condition and properly adjusted. Refer to operator's manual for details.

All damaged and worn parts must be replaced. Spinner discs and fins must be free of any material build-up, rust or paint.

Fill the hopper with the material to be spread. Run the material out to the end of the conveyor.

Set the feedgate and the in-cab controller to deliver the required rate per acre. Make sure the feedgate is level and the indicator reflects the actual gate opening measured by standing a tape measure vertically in the material.

NOTE: Do not match slope of endgate when making this measurement. Measurement must be perpendicular to conveyor.

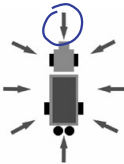
Adjust the spinner assembly by turning the crank or, if an actuator is installed, change the setting in the controller. To begin testing, position the spinner according to following chart.

NOTE: This chart is to be used as a reference only to begin testing.

			SIMPLE START SETTINGS			
Material	Density	Ground Speed (mph)	Rate (lbs)	Feedgate (in)	Spinner Frame Setting	Spinner RPM
Lime	90	11*	1000-5000	6	.5"	600
			2000-8000	12	.5"	600
Urea	46	18	110	2.5	4	800
			225	2.5	3.5	800
			450	2.5	2.5	800
Corn Blend	53	18	125	2.5	3.5"	800
			250	2.5	2.5"	800
			500	2.5	0.7	800
All other fertilizer types and blends	64	18	150	2.5	3.5"	800
			300	2.5	2.5"	800
			600	2.5	1.2	800
* 15 mph when using high performance (HP) hydraulics.						

Test Procedure

Using the data sheets supplied with the kit, document all spreader information and adjustments as necessary. See Figure 1.

		SPREAD PATTERN DATA SHEET New Leader Manufacturing		1330 76th Ave SW Cedar Rapids, IA 52404-7052 (319) 363-8281	
Pattern Test No. 1	Rev.	Spreader Model: L4000G4	 (Circle Direction of Wind Relative to Spreader)		
Site: NLM		Serial No. 432165			
Date: 10/07/2016	Time: 10am	Conveyor Type: #4 BOC			
Material Name: MAP		Fan Frame Setting: 3.25 in.			
Density: 65 lb/ft ³		Feedgate Height: 3" in.			
Crush Strength: 6		Fin Position: 1-2-1-2	Wind: From Straight at 5 MPH Relative Humidity: 41% % Temperature: 67 °F		
SGN: 324					
Application Rate: 320 lbs/acre		CFR/Constant: .232			
Spinner Speed: 780 RPM		Controller Vehicle Speed: 12 MPH	Controller Swath Width: 90 ft.		

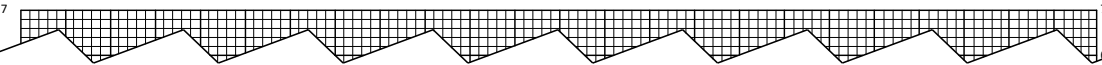


Figure 1

Select an area for testing measuring at least 120 feet x 200 feet (37 m x 61 m), and with a slope of less than two degrees.

All testing should be done when the wind velocity is less than 5 MPH (8.05 km). If wind is present, testing must be done with spreader traveling parallel (within ± 15 degrees) to the wind direction.

Do not allow loaded spreader to sit for more than one hour prior to testing.

At this stage of testing, drive the spreader over the collection trays in ONLY ONE DIRECTION.

Insert a plastic grid into each of the 23 collection trays. Position the blue collection tray in the center of the spreader's path with the longest dimension of the tray parallel to the direction of travel. Position the first left-hand and right-hand trays 10' (3m) from center, and all subsequent trays on 5' (1.5m) centers.

Four-Wheeled Vehicles

For four-wheeled application vehicles, position the spreader at the beginning of the course so that the vehicle will straddle the center collection tray. See Figure 2.

Engage spinners before navigating the course. As the vehicle approaches the flag positioned 75' before the row of collection trays, engage the conveyor(s). Do not shut the conveyor(s) off until the vehicle approaches the second flag.

Drive spreader completely through course at normal operating speeds.

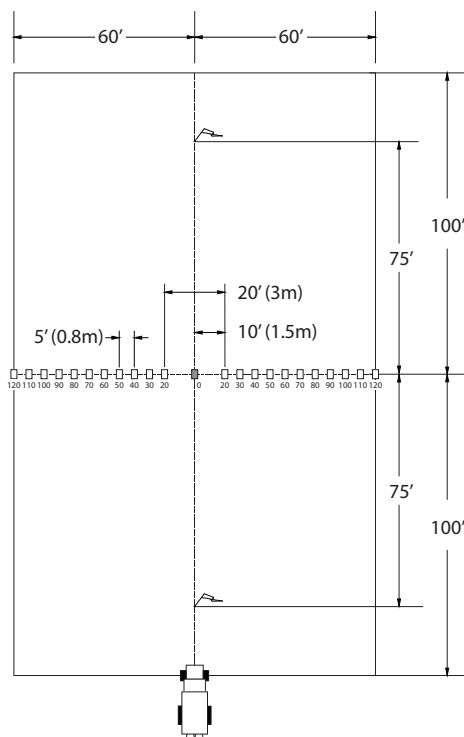


Figure 2 – Four-Wheeled Vehicles

Three-Wheeled Vehicles

For three-wheeled application vehicles, straddling the center tray is not possible. Place the center collection tray beneath the vehicle just behind the front tire when the spreader is in position at the beginning of the course. See Figure 3.

Engage both the spinners and conveyor(s) before navigating the course. Do not shut the conveyor(s) off until the vehicle approaches the second flag.

Drive spreader completely through course at normal operating speeds.

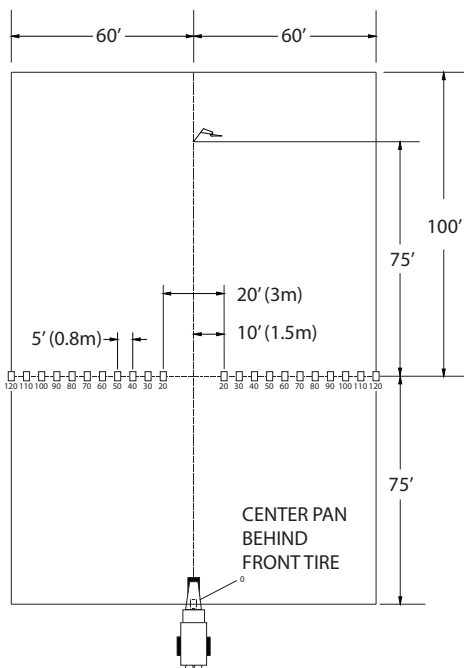


Figure 3 – Three-Wheeled Vehicles

Test Results

After navigating the course, shut the spreader down and park in a secure location.

Using the funnel, transfer the contents of each collection tray into its corresponding test tube beginning at one end of the trays and working towards the opposite end.

If spreading a blend of materials, inspect all tubes to determine if the blend is consistent across the entire swath width. If the blend is not consistent, use a narrower swath width. The swath width should be based on the material thrown the shortest distance.

Record each test tube's volume in the box on the data sheet under the corresponding tray position and graph the spread pattern profile. See Figure 4.

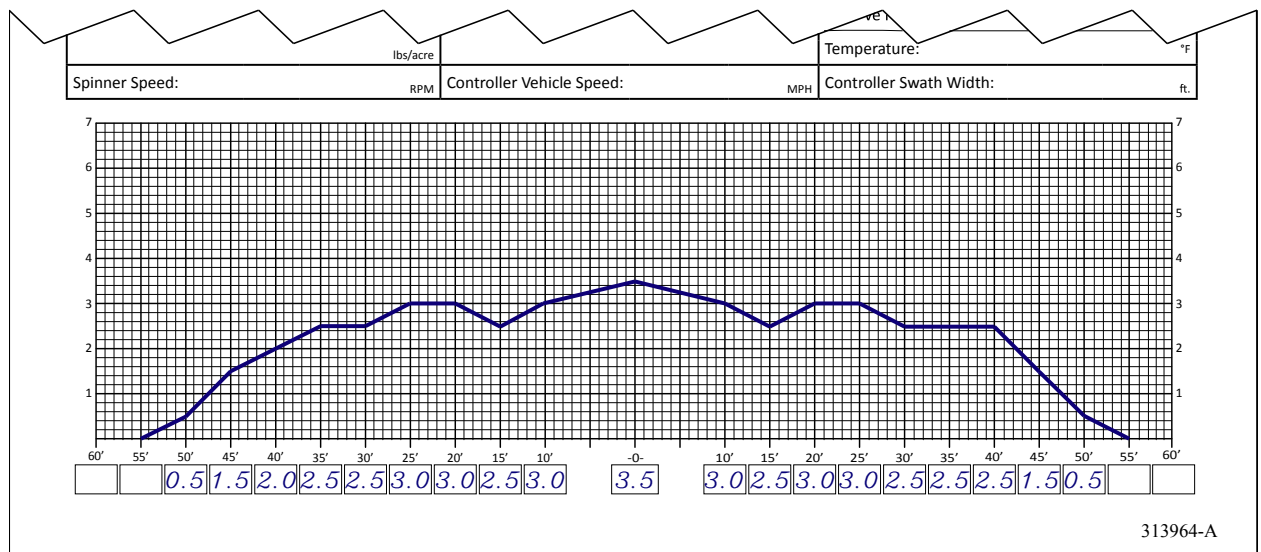


Figure 4

Looking at the material in the test tubes and the graphed profile on the data sheet, compare the overall shape of the spread pattern to the three acceptable patterns, shown in Figure 5. If an acceptable pattern has not been achieved, proceed to "Troubleshooting". Once an acceptable pattern has been achieved, proceed to "Determining Driving Centers".

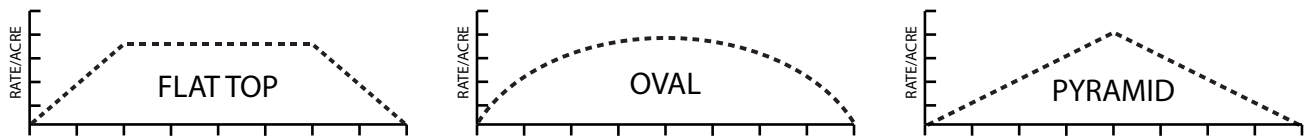


Figure 5 – Acceptable Patterns

Troubleshooting

NOTE: It is highly recommended that ONLY ONE ADJUSTMENT be made between test samples taken. If more than one adjustment is made, it will be difficult to determine which adjustment was responsible for the change in pattern shape.

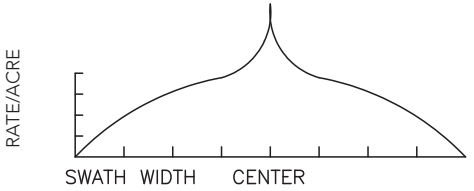
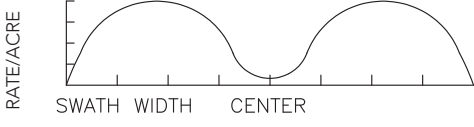
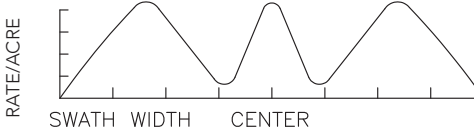
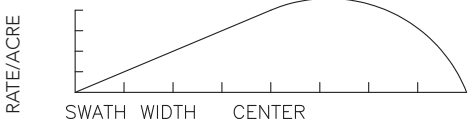
Problem	Pattern	Recommended Adjustments
Heavy Directly Behind the Vehicle		1. Move the spinner forward (toward the conveyor).
Light Directly Behind the Vehicle		1. Move the spinner rearward (away from conveyor).
Light Outside Vehicle's Tire Tracks		1. Check spinner fins for material buildup, rust or paint. 2. Increase spinner RPM. 3. Move spinner fins to 2 - 3 - 2 - 3 positions. See Figure below.
Pattern Off Center		1. Check to see feedgate is level and free of caked material. 2. Make sure hillside divider spinner assembly and material divider are mounted squarely and centered. 3. Testing should be done parallel to wind.

Figure 6

Spinner fins are adjustable to radial angle as shown in Figure 7. Refer to Figure 6 for fin adjustment recommendations.

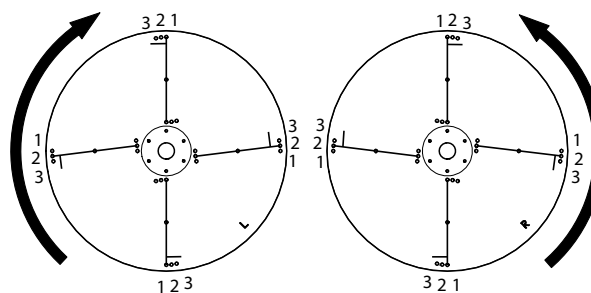


Figure 7 - Spinner Fin Adjustment

Determining Driving Centers

Once an acceptable pattern is obtained, as shown in Figure 5, driving centers can be determined. To determine optimum driving centers (effective swath width), determine the average amount of material in the center of the pattern. Figure 8 shows an example data sheet recorded from the profile shown in Figure 9. Based on the example, the average amount of material in the center of the pattern is 3.0, as indicated with the red dotted line.

Next, locate the points on both the left and right side of the pattern where the amount of material is half the average amount at the center of the pattern. In the example shown in Figure 8, these points are located 45' to the left of center, and 45' to the right of center. The distance between these two points (90') represents the driving centers to use.

NOTE: Once the effective swath width has been established, a change in the controller may be required.

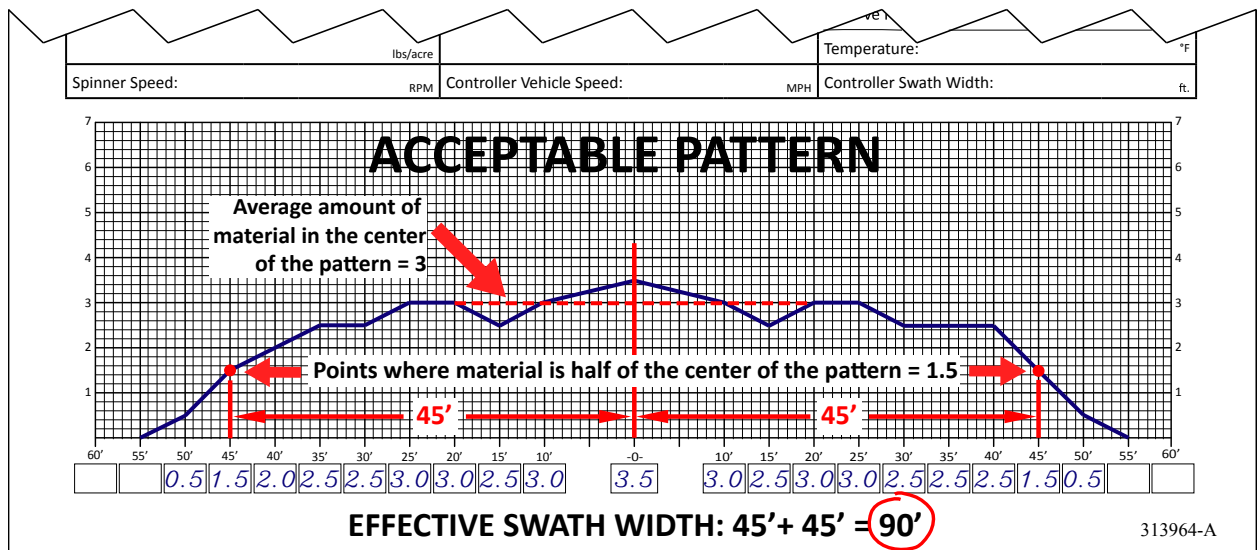


Figure 8 - Effective Swath Width

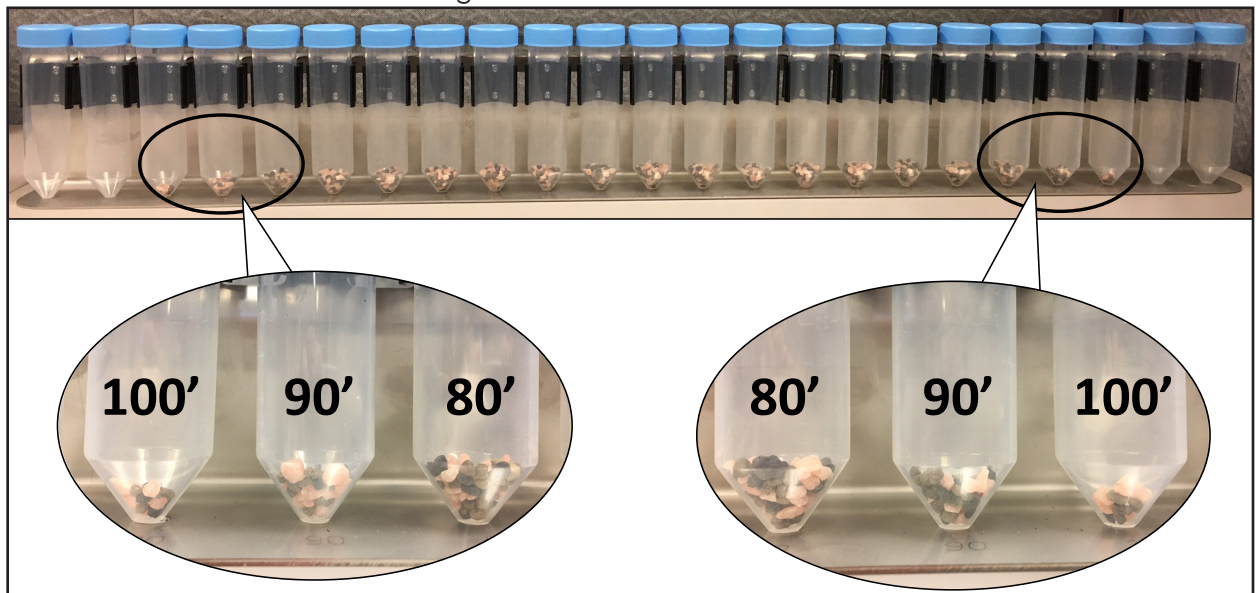


Figure 9

Verifying Driving Centers

Once optimum driving centers (effective swath width) have been established, conduct a final "S" pass over the trays to verify. Refer to Figure 10.

1. With both the spinners and conveyor turned off, drive the spreader through the center of the course, establishing an "AB" line. If the spreader vehicle is a three-wheel type, remove the center pan.
2. Line the vehicle up with either end of the row of collection trays, at a distance from the "AB" line equal to the effective swath width.
3. With both the spinner and conveyor engaged, drive past the trays.
4. Switch back and drive over the center of the trays, down the "AB" line.
5. Drive through the row of trays and switch back once again, driving past the trays on the opposite side, at an equal distance from the "AB" line as the first pass.

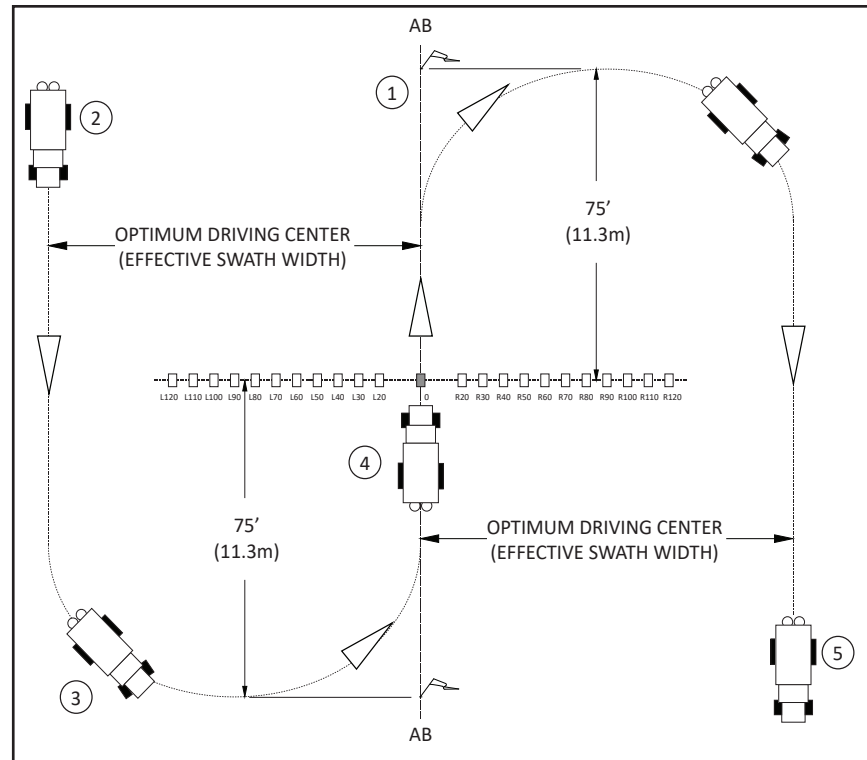


Figure 10

If the driving centers were determined correctly, all trays should have a similar amount of material, showing a near flat profile in the test tubes. If the trays near the center of the row contain more material than the others, increase driving centers. If the trays near the center of the row contain less material, decrease driving centers.

NOTE: If spreading a blend of materials, verify blend of all products is consistent across all tubes.

PARTS

Instructions for Ordering Parts**ORDER FROM THE AUTHORIZED DEALER IN YOUR AREA.**

Always give the pertinent model and serial number.

Give part name, part number and the quantity required.

Give the correct address to where the parts are to be shipped, and the carrier if there is a preference.

Unless claims for shortages or errors are made immediately upon receipt of goods they will not be considered. Any part returns should be directed through the dealer from which they were purchased.

When broken goods are received, a full description of the damage should be made by the carrier agent on the freight bill. If this description is insisted upon, full damage can always be collected from the transportation company.

No responsibility is assumed for delay or damage to merchandise while in transit. Our responsibility ceases upon delivery of shipment to the transportation company from whom a receipt is received showing that shipment was in good condition when delivered to them, therefore, claims (if any) should be filed with the transportation company and not with New Leader Manufacturing.

If your claims are not being handled (by the transportation company) to your satisfaction, please call our Product Sales & Support Department at New Leader Manufacturing at 888-363-8006 for assistance.

In the parts list the following symbols and abbreviations stand for:

* - Not Shown

AR – As Required

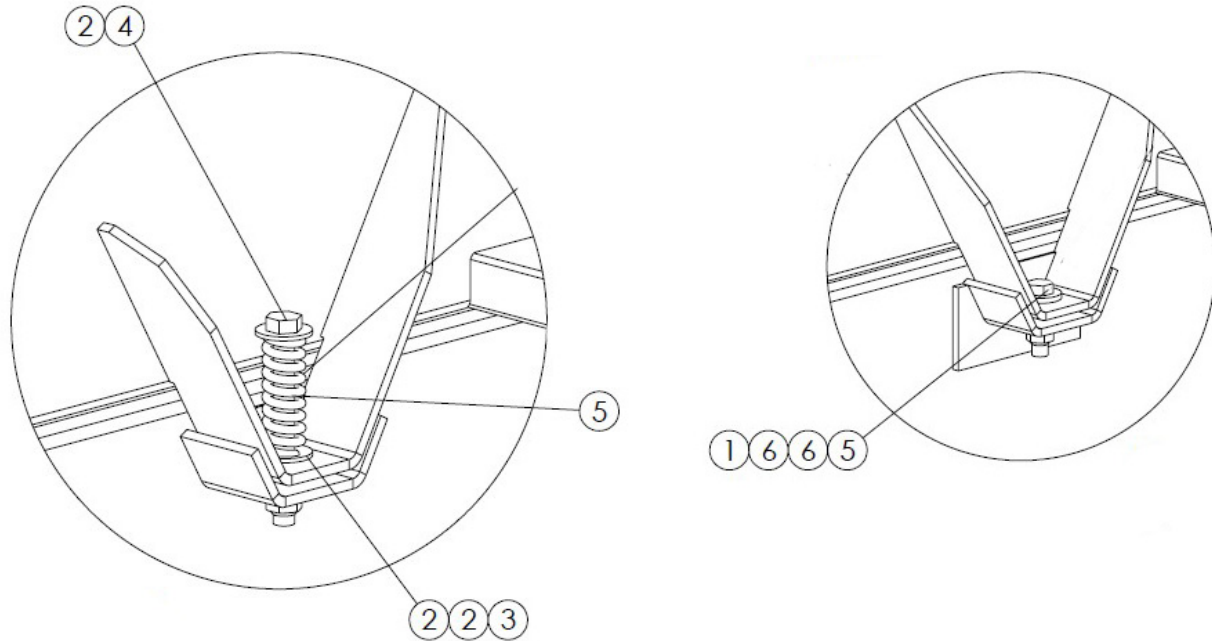
CS – Carbon Steel

SS – Stainless Steel

NS – Not Serviced

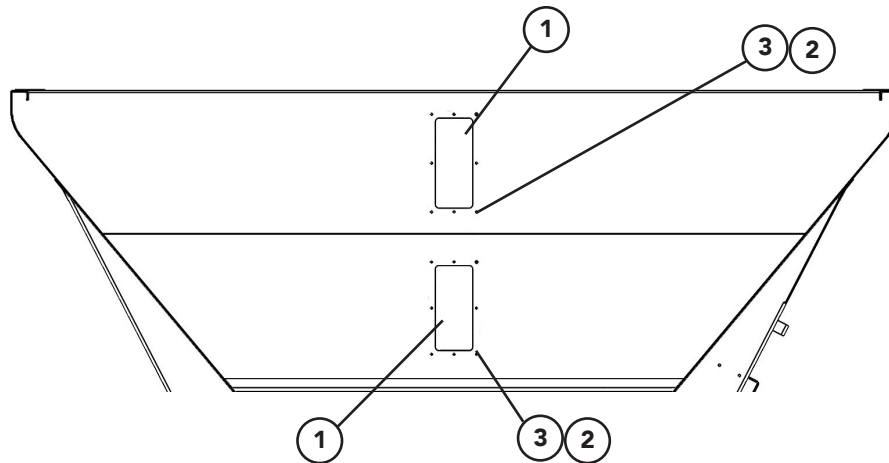
The parts listed under the different steel types (CS, 409 SS and 304 SS) are for that type of unit and do not necessarily mean the part is made of that type of steel.

Mounting



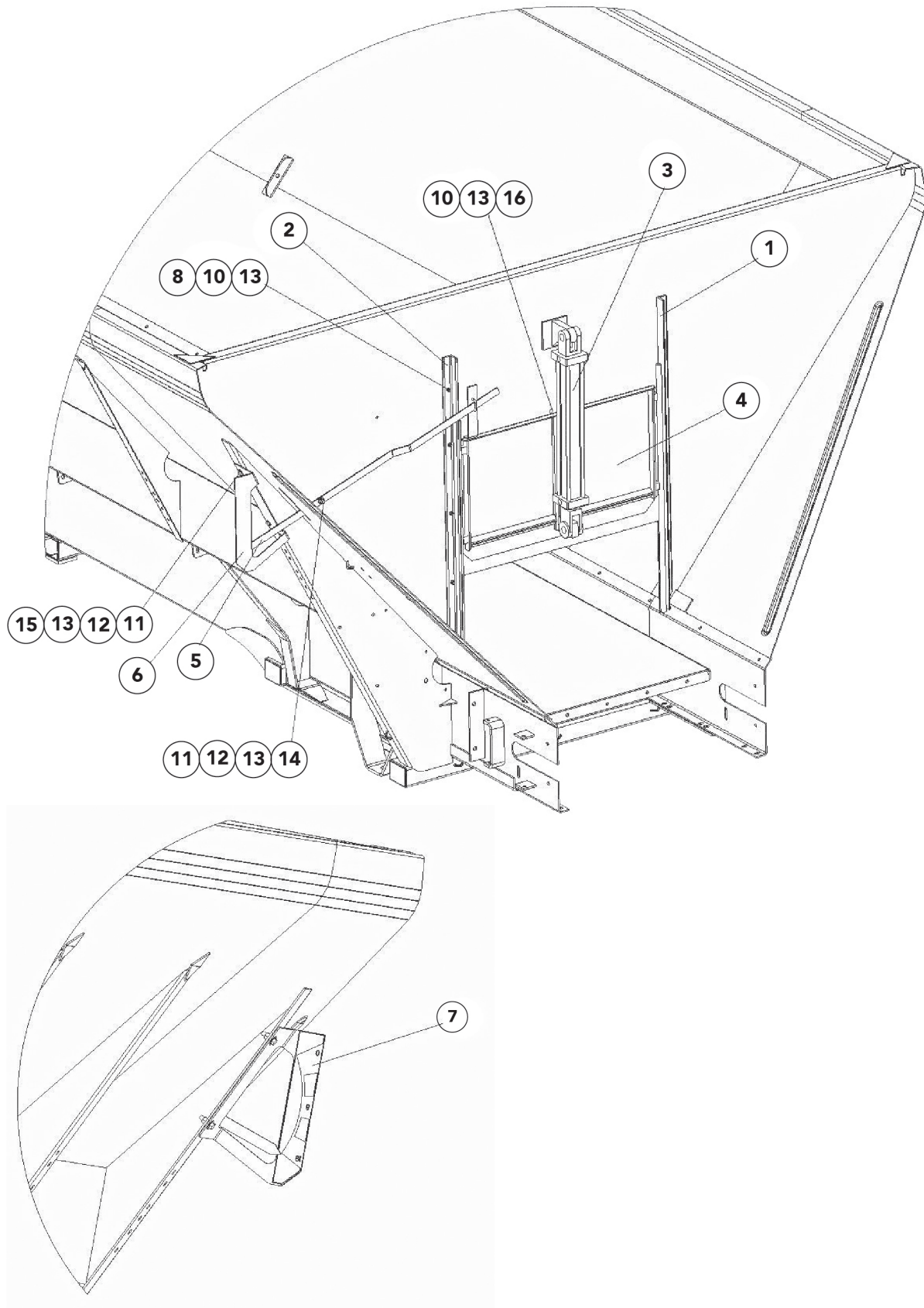
ITEM	PART NO.	DESCRIPTION	QTY
1	20683	Nut - Lock .75-10NC	6
2	58560	Capscrew - .75-10NC X 7	4
3	20698	Washer - Flat .75	12
4	305220	Spring - Compression	4
5	20209	Capscrew - .75-10NC X 3	2
6	310487	Washer - Flat .781 X 2 304	4

Sight Window



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	302686	Window - Sight 5 x 12	2
2	36394	Capscrew - .25-20NC X .875 SS	16
3	42034	Nut - Lock 1/4 SS	16

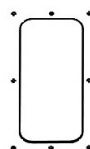
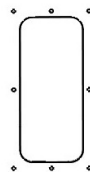
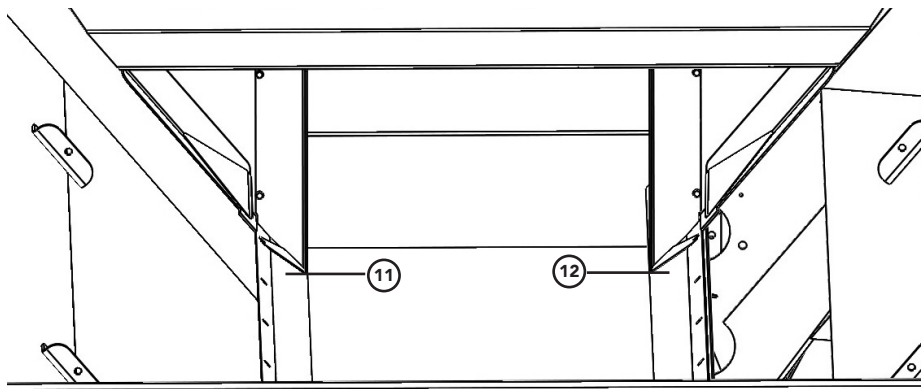
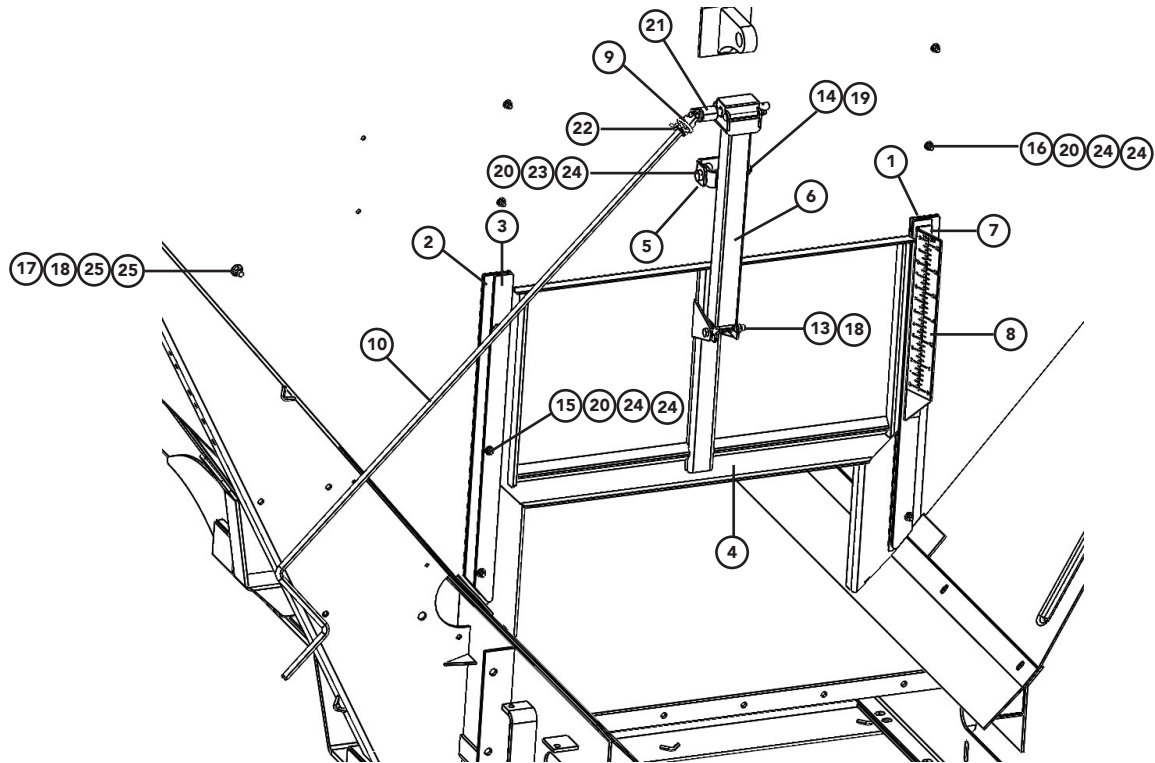
Feedgate - Hydraulic



Feedgate - Hydraulic Cont.

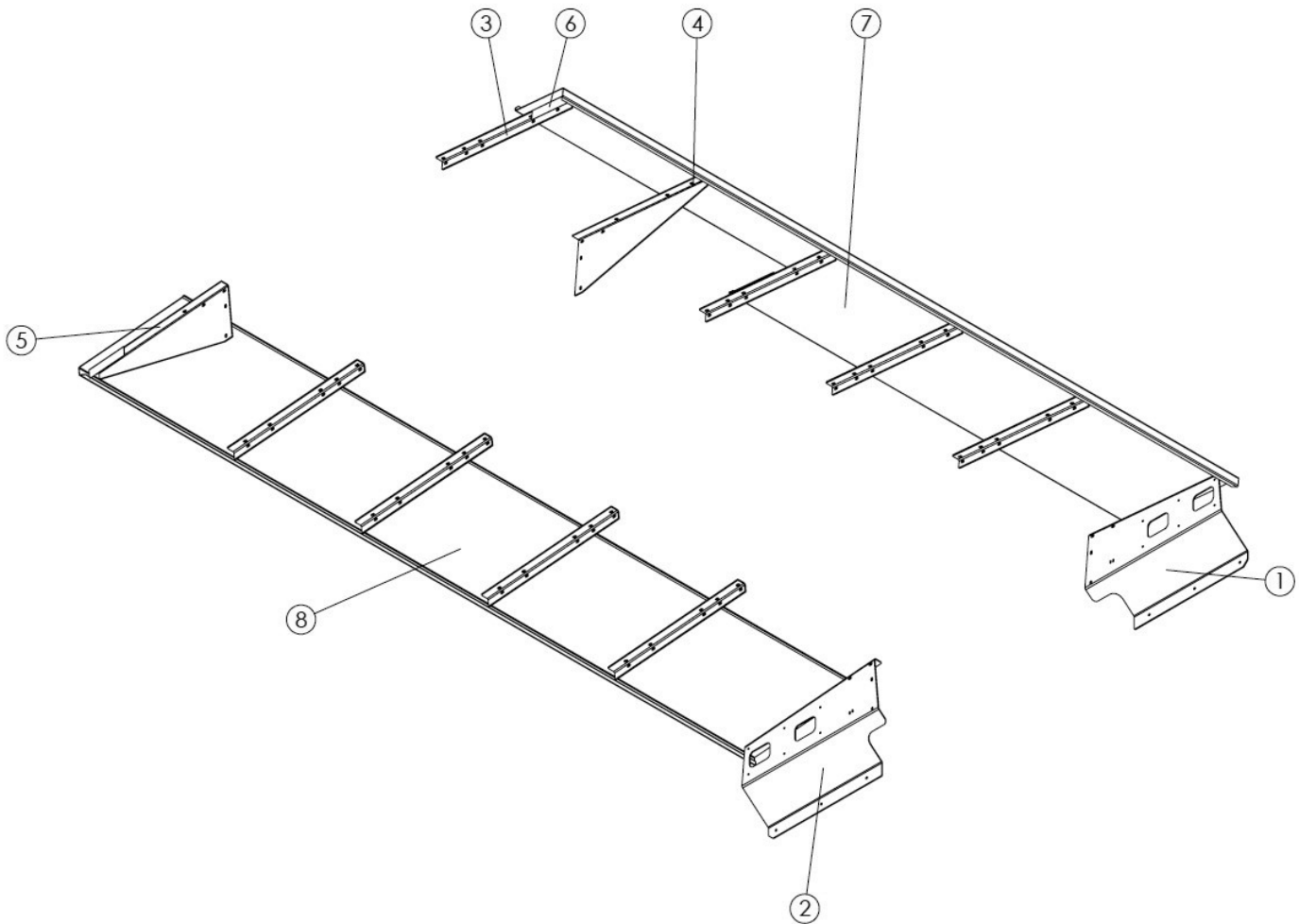
<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	SS	CS		
1	70287-X1	70287	Slide – Wldmt Feedgate RH w/ chain shields	1
2	70289-X1	70289	Slide – Wldmt Feedgate LH w/ chain shields	1
3	320506	320506	Cylinder – Hydraulic	1
4	305486	305488	Feedgate – Wldmt 34" w/ chain shields	1
5	303323	303324	Indicator – Feedgate	1
6	303325	303379	Bracket – Indicator	1
7	55395	55395	Decal – Indicator	1
8	36393	20003	Cap Screw – 1/4-20 x 3/4	11
9	36399	20068	Cap Screw – 3/8-16 x 1-1/4	3
10	36412	20642	Nut – Hex 1/4-20	13
11	36414	20644	Nut – Hex 3/8-16	3
12	72054	20678	Nut – Lock 3/8-16	1
13	36418	20710	Washer – Lock 1/4	13
14	36420	20712	Washer – Lock 3/8	2
15	36425	20693	Washer – Flat 3/8	6
16	71733	20264	Bolt - Carriage .25-20NC X 1	2

Feedgate - Manual



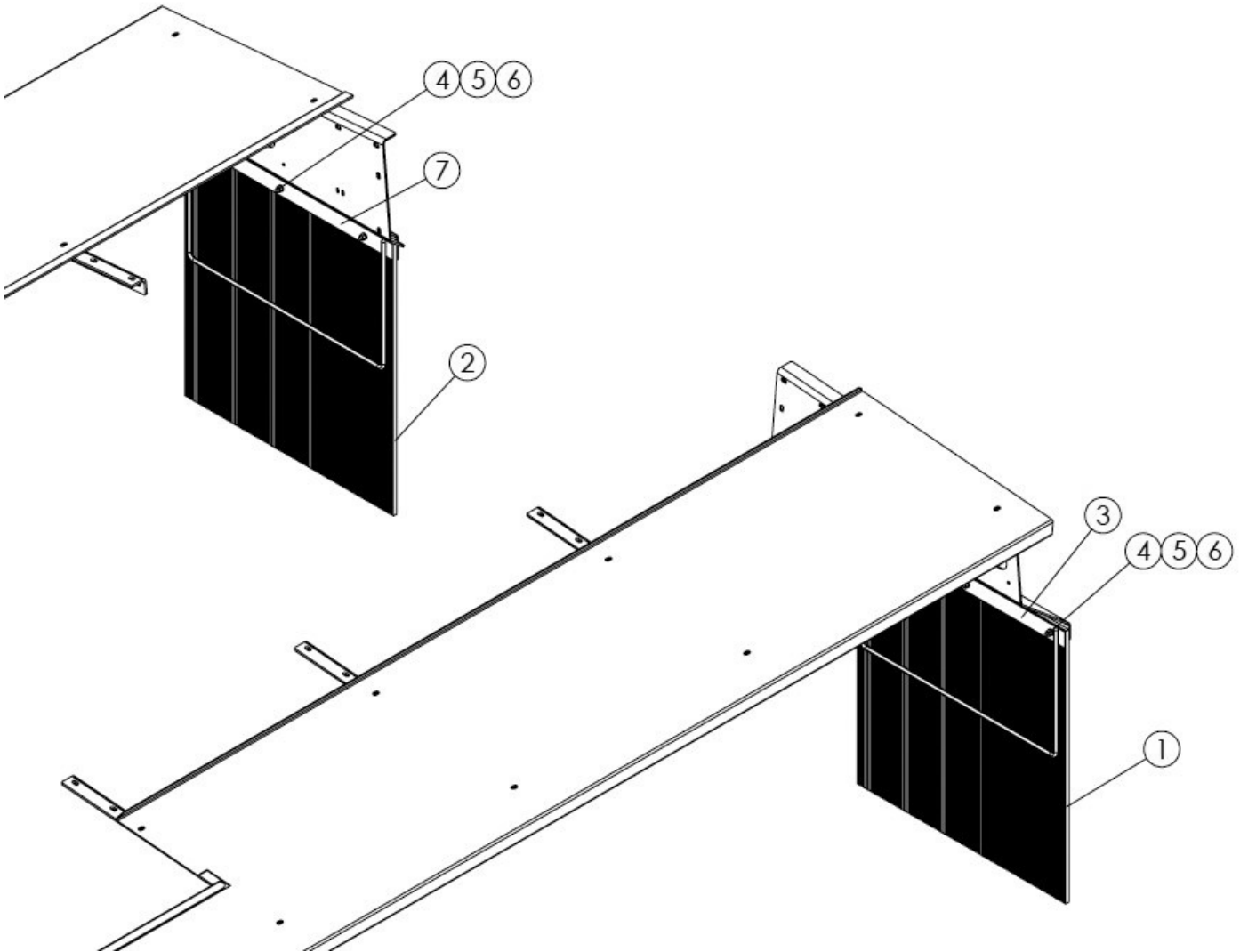
Feedgate - Manual Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	317277	Spacer - Shim Plastic	2
2	317276	Bar - Feedgate Guide 304	2
3	317275	Bar - Feedgate Slide 304	2
4	317273	Feedgate - Wldmt 34" 304	1
5	317274	Bracket - Jack 304	1
6	312994	Jack - Assy 13.38 304	1
7	317281	Plate - Decal 304	1
8	311604	Scale - 0 To 12 304	1
9	85002	Joint - U	1
10	311605	Handle - Jack Feedgate 304	1
11	317282	Wedge - Wldmt RH 304	1
12	317283	Wedge - Wldmt LH 304	1
13	71827	Capscrew - .375-16NC X 3 SS	1
14	36404	Capscrew - .5 X 4 SS	1
15	42448	Capscrew - .25-20NC X 1.5 SS	6
16	36393	Capscrew - .25-20NC X .75 SS	4
17	36398	Capscrew - .375-16NC X 1 SS	1
18	72054	Nut - Lock .375-16NC SS	2
19	39016	Nut - Lock .5-13NC SS	1
20	42034	Nut - Lock .25-20NC SS	12
21	312268	Pin - Roll .188 X 1.0 SS	1
22	86878	Pin - Hair .178 X 3.75	1
23	71733	Bolt - Carriage .25-20NC X 1	2
24	36423	Washer - Flat .25 SS	22
25	36425	Washer - Flat .375 SS	2



Fenders Cont.

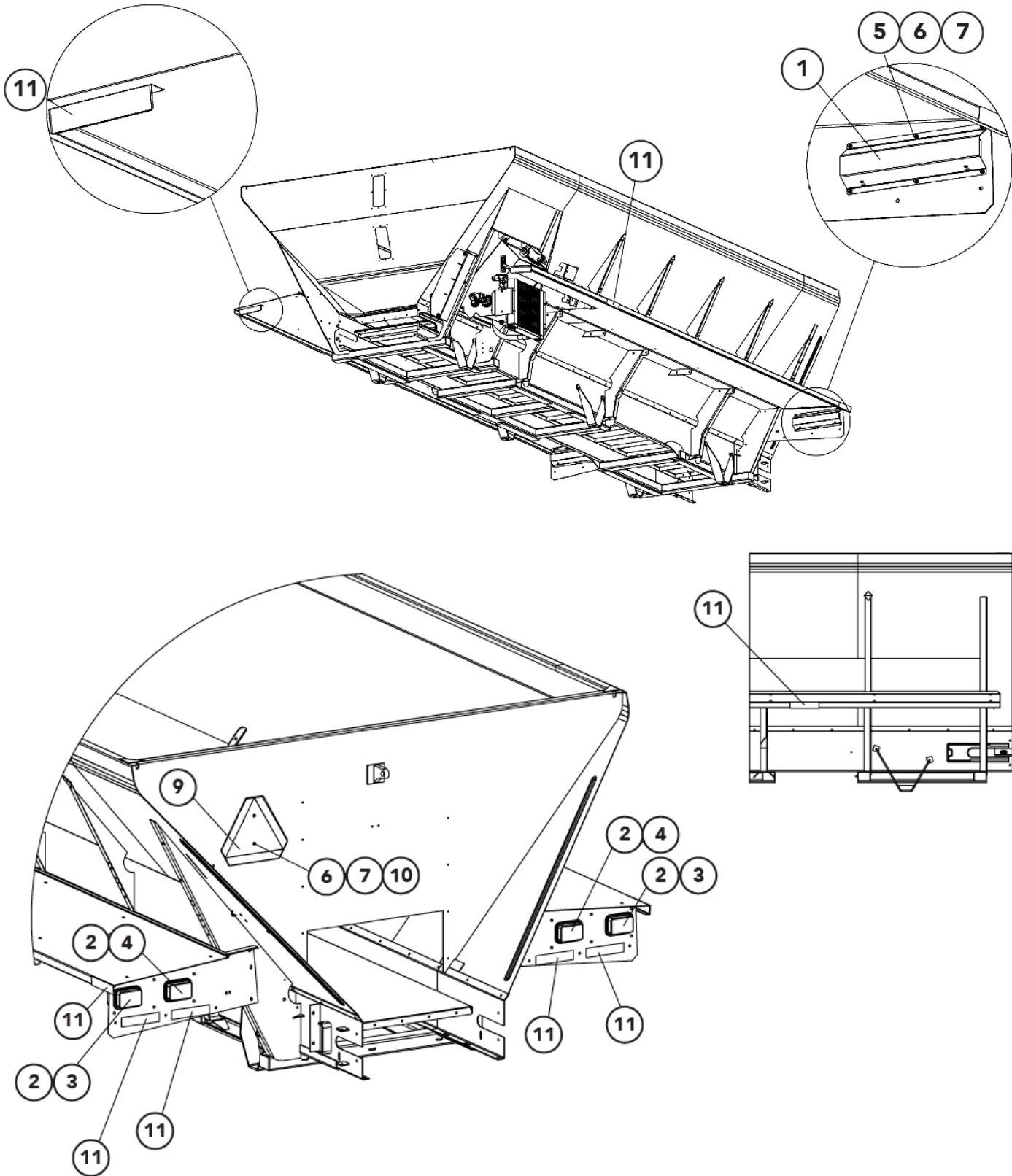
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	320634	Support - LH 304	1
2	320635	Support - RH 304	1
3	96969	Angle - Fender 124 30 Btm 304	8
4	96966	Bracket - Fender Front LH 304	1
5	96965	Bracket - Fender Front 124	1
6	305276	Angle - Decal Mount 304	2
7	83083	Fender - 16' 124 Lh 12ga 409	1
	83089	Fender - 16' 124 LH 13GA 201	1
8	83080	Fender - 16' 124 Rh 12ga 409	1
	83086	Fender - 16' 124 RH 13GA 201	1
9	83116	Hardware - Kit Fender 14-16'	1



Mudflaps Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	317413-AB	Mudflap - 34 X 30 LH Charted	1
2	317413-AA	Mudflap - 34 X 30 RH Charted	1
3	320681	Antisail - Wldmt LH	1
4	34858	Capscrew - .375-16nc X 1.5 SS	6
5	36420	Washer - Lock .375 SS	6
6	36414	Nut - Hex .375-16nc SS	6
7	320682	Antisail - Wldmt RH	1

Lights - Group With Fenders

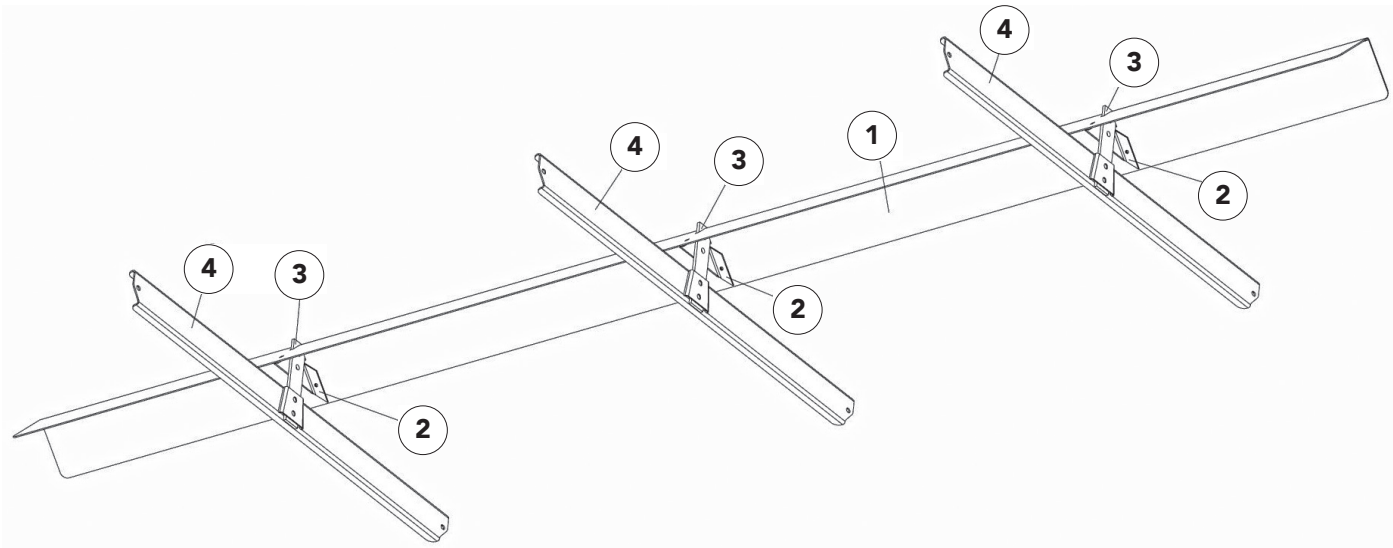


Lights - Group With Fenders Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	305213	Guard - Tail Light 304 JD	2
2	304704	Grommet - Super 45	4
3	304715	Light - Super 45	2
4	300150	Light - STT Red	2
5	36393	Capscrew - .25-20NC X .75 SS	12
6	36418	Washer - Lock .25 Ss	14
7	36412	Nut - Hex .25-20NC SS	14
8	Not used		
9	305229	Sign - S.M.V.	1
10	32446	Screw - Truss Head .25-20NC X .75 SS	2
11	305186	Kit - Reflective Farm Implement	1
12	*305414-AB	Harness - LH Lights Tr-3000	1
13	*305414-AC	Harness - RH Lights Tr-3000	1
14	*99674	Tie - Wire Plastic Black 8"	6

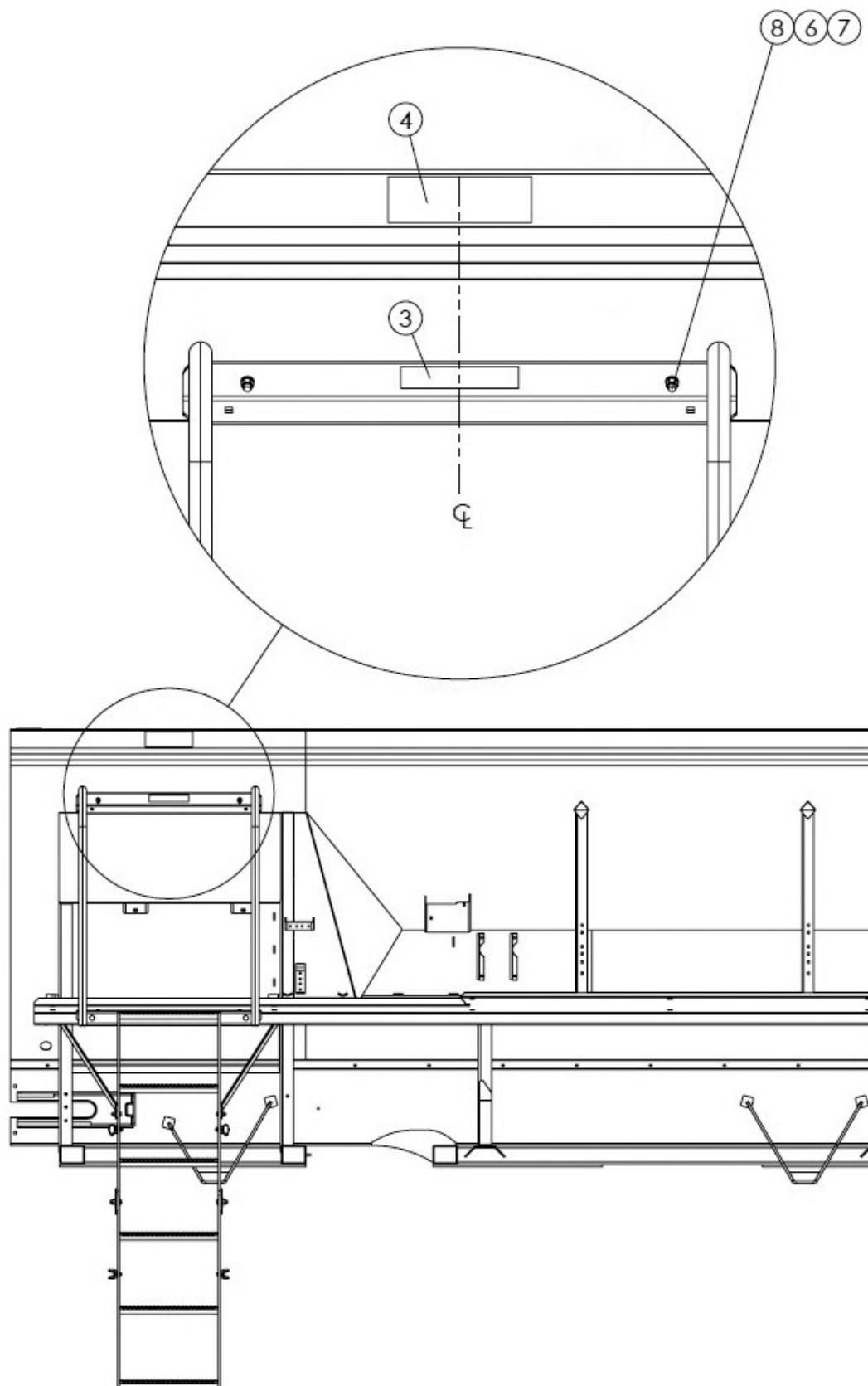
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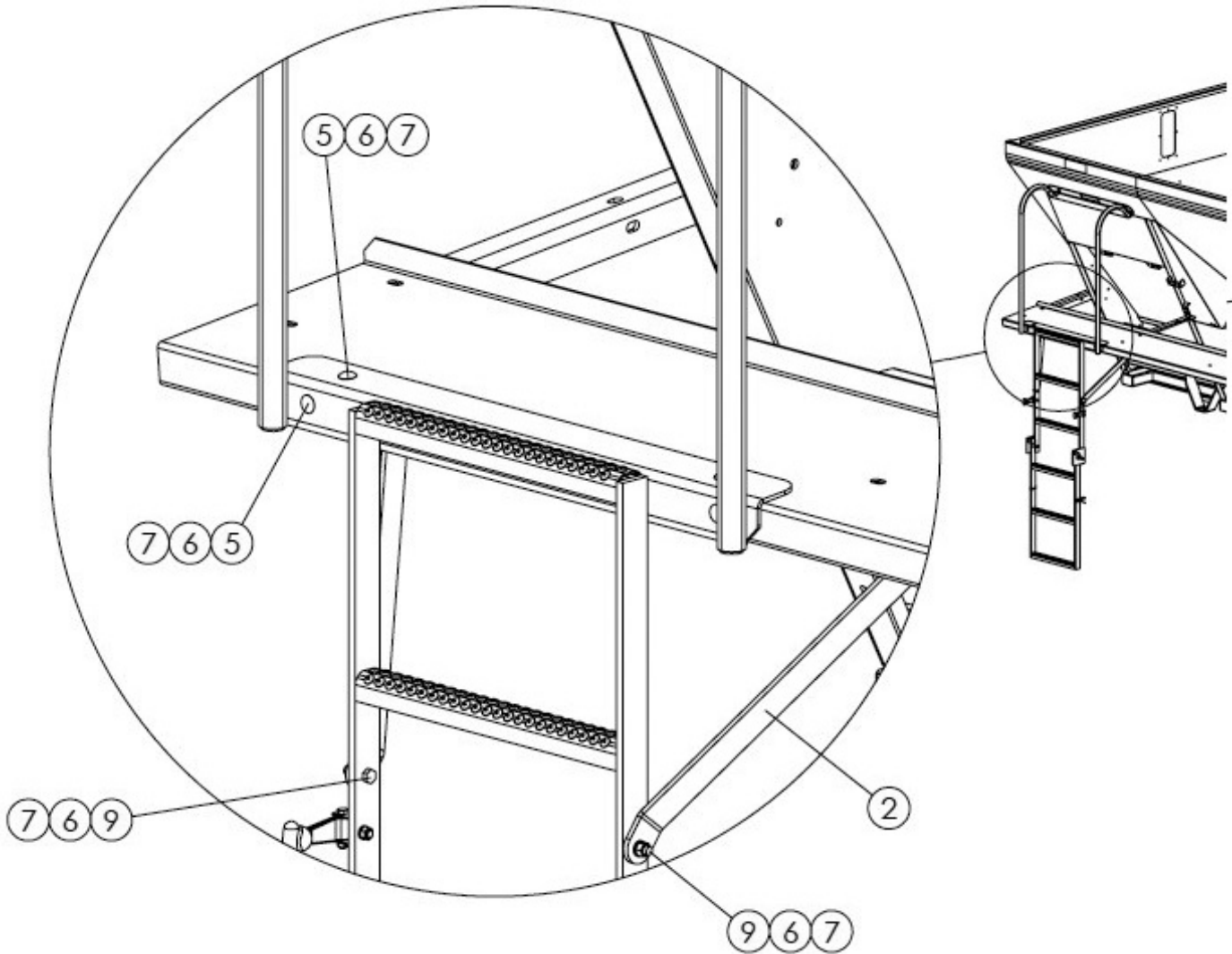
Inverted - V

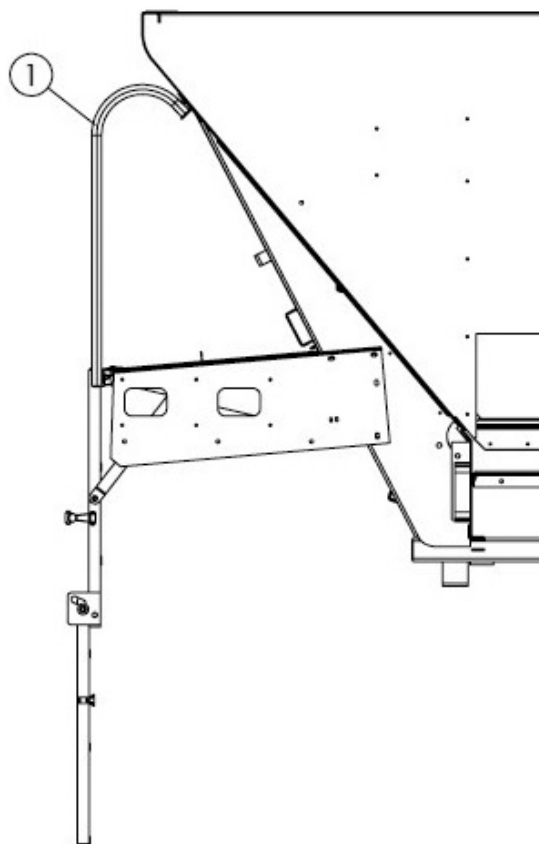
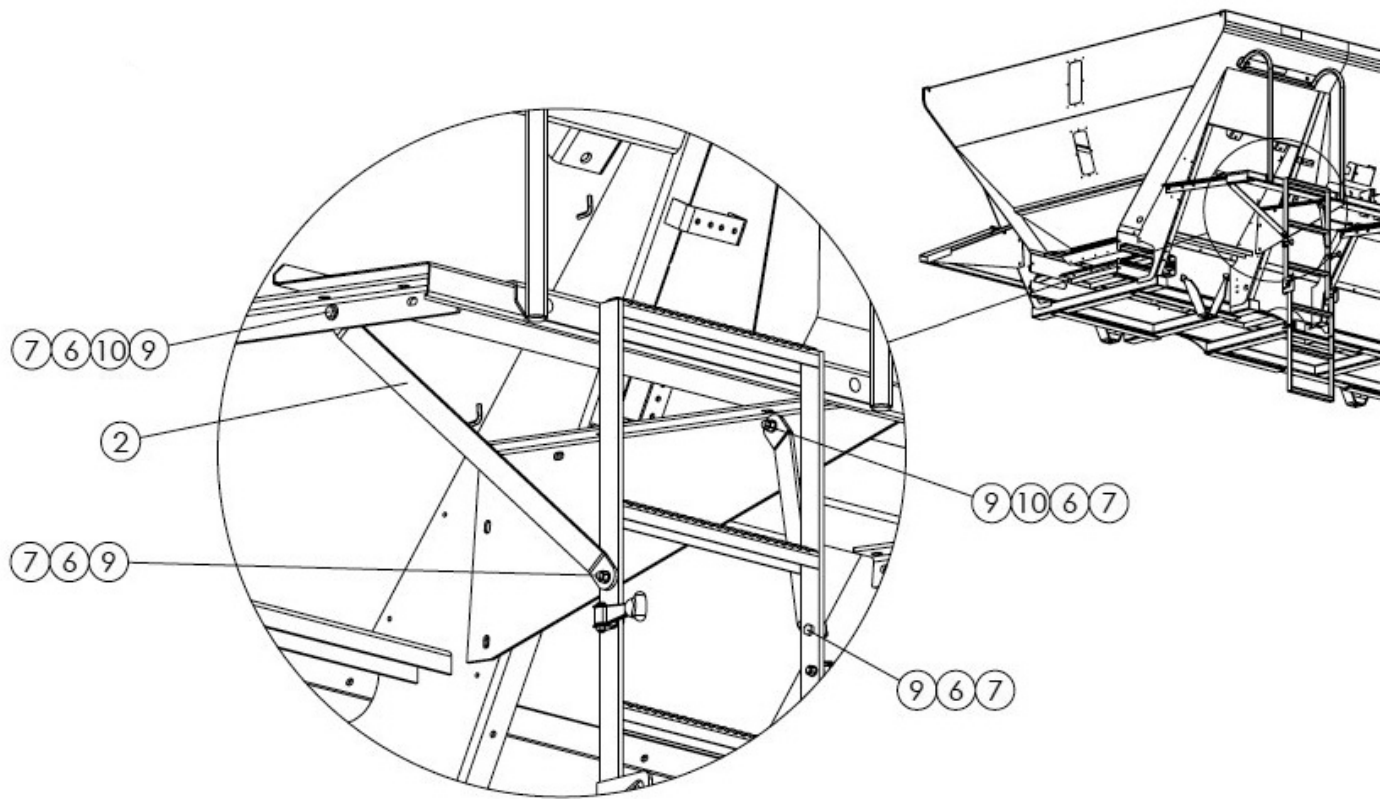


ITEM	PART NO.	DESCRIPTION	QTY
1	320625	V - Inverted 16' 304	1
2	302371	Bracket - V Bolt-On 304	3
3	308646	Bar - Mounting 304	3
4	317251	Hanger - Wldmt V 304	3
5	*302375	Hardware - Kit 13-16' Inv V SS	1

* - Not Shown



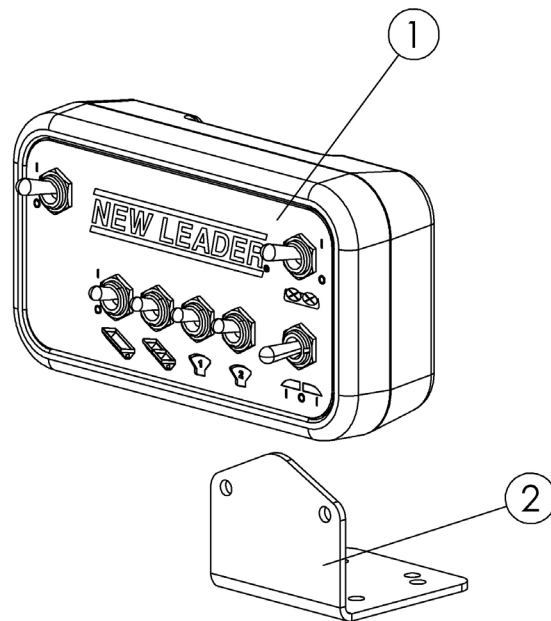




Body**NL450****Ladder**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	321196	Ladder - Assy Folding	1
2	321189	Strap - Support Ladder	2
3	305272	Decal - Do Not Ride	1
4	305274	Decal - Warning Falling Hazard	1
5	36408	Bolt - Carriage .375-16nc X 1	4
6	36420	Washer - Lock .375 SS	10
7	36414	Nut - Hex .375-16nc SS	10
8	36398	Capscrew - .375-16nc X 1 SS	2
9	36399	Capscrew - .375-16nc X 1.25 SS	4
10	36425	Washer - Flat .375 SS	2

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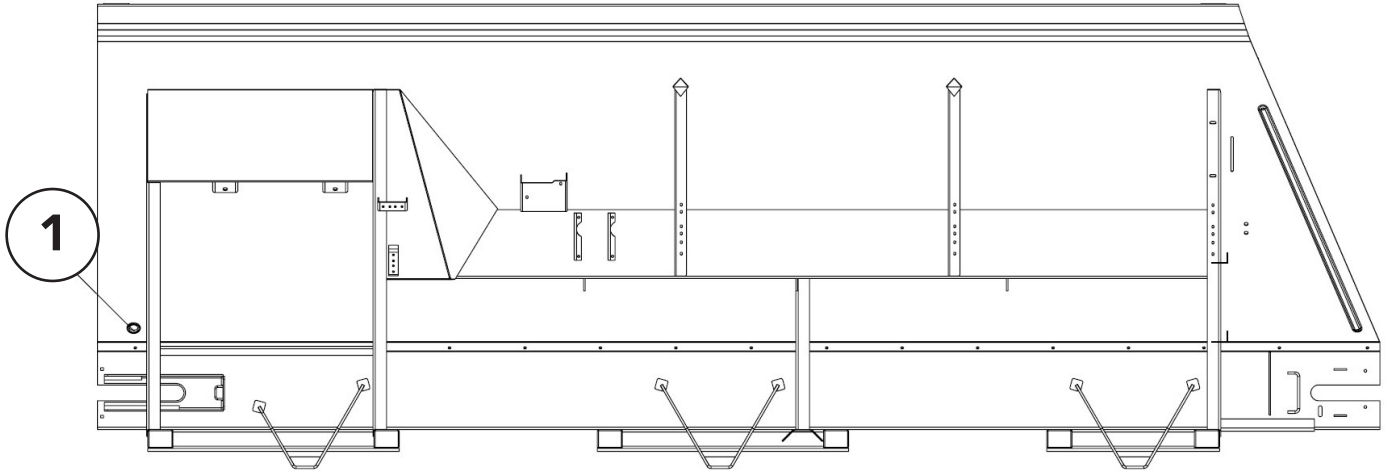


Switch Box Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	318604	Switchbox - Kit 6 Pin Deutsch Universal	
1	310742	Switchbox - New Leader G5	1
2	313884	Mount - Switch Box	1
3	*318432	Harness - Iso Aux Console	1
4	*318602	Harness - Extension	1
5	*313581	Hardware - Kit Switch Box	1

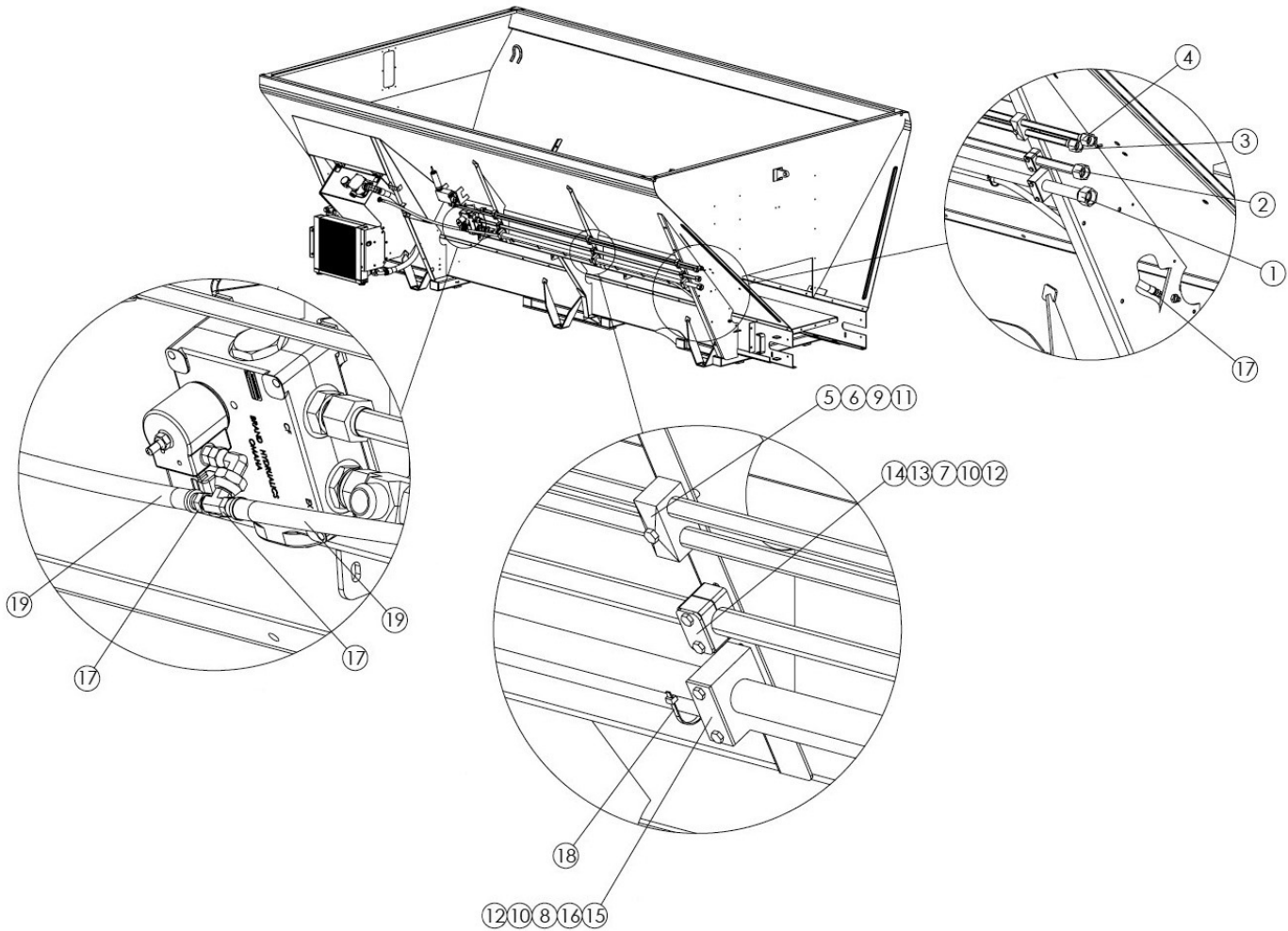
* Not Shown

Grommet Group



ITEM	PART NO.	DESCRIPTION	QTY
1	34129	Grommet - Rubber	1

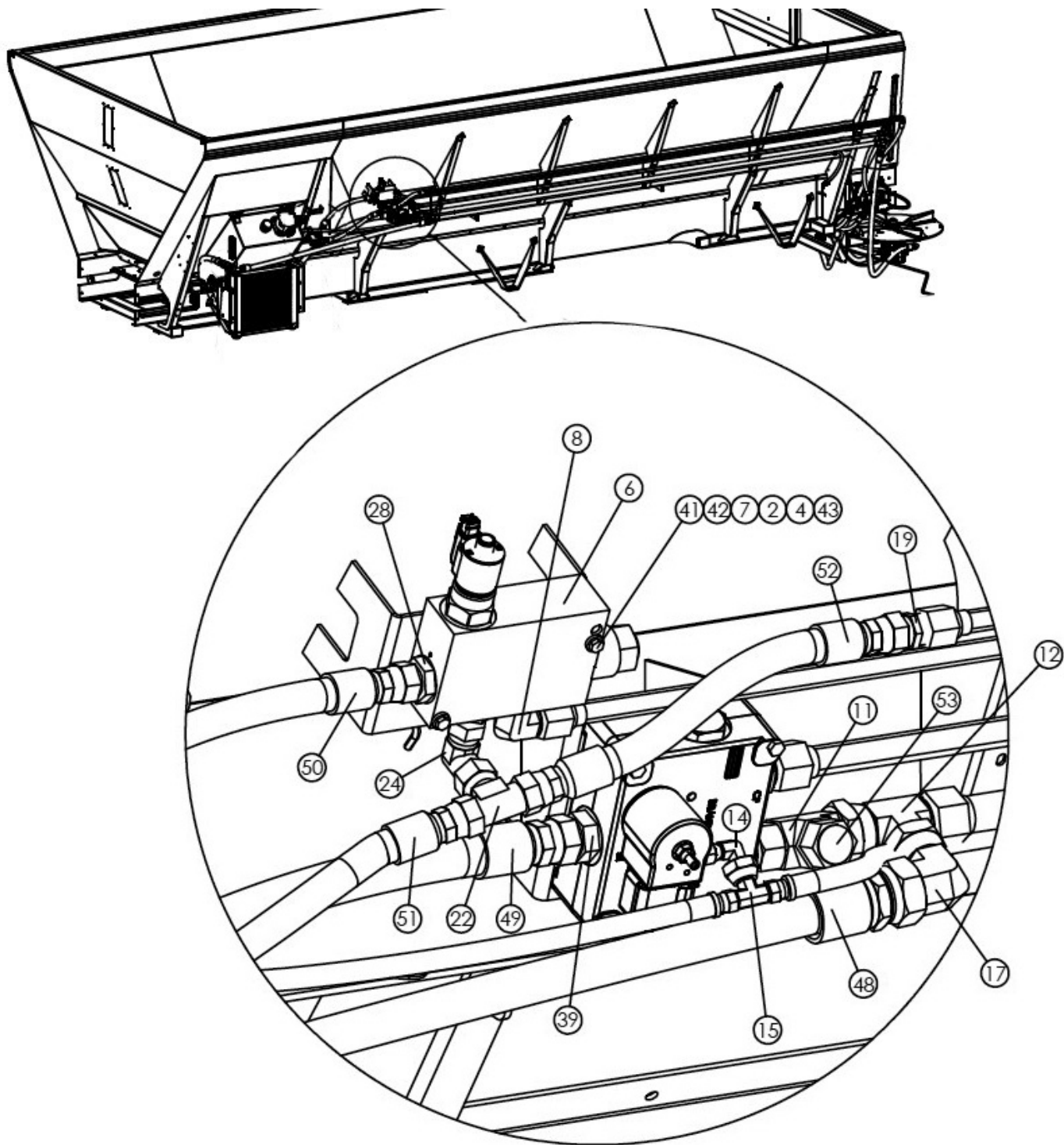
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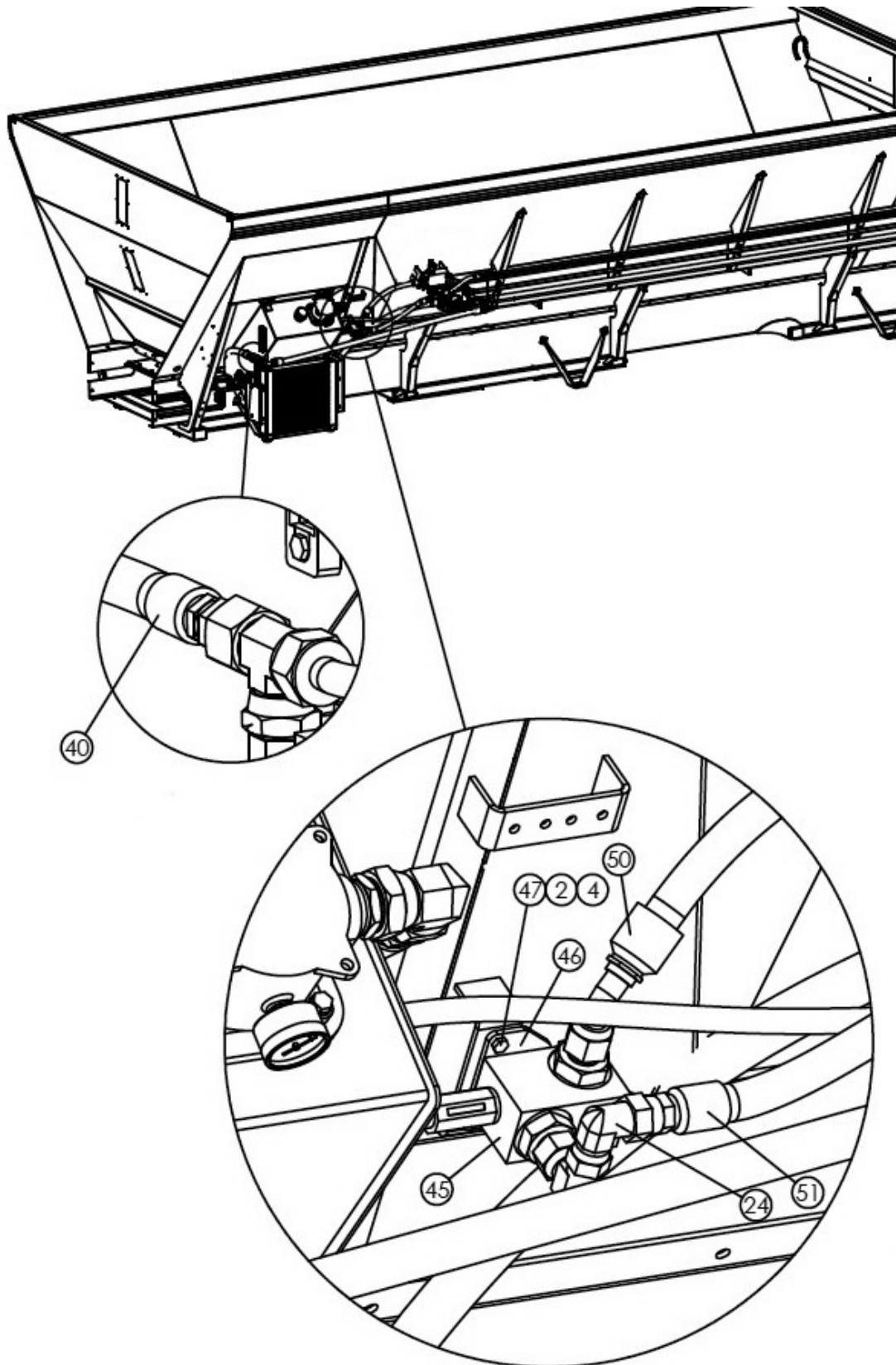
Tube Group 16' Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	305502-AD	Tube - Assy 1.25od X .065 X 94	1
2	315795	Tube - Assy 1od X .083 X 101	1
3	305504-AD	Tube - Assy .75od X .065 X 112	1
4	304231	Tube - Assy .75od X .049 X 100.5 304	1
5	75036	Clamp - Tubing Twin .75	3
6	71830	Capscrew - .313-18nc X 2.5 SS	3
7	34865	Capscrew - .25-20nc X 2.25 SS	6
8	36396	Capscrew - .25-20nc X 3 SS	6
9	36419	Washer - Lock .313 SS	3
10	36418	Washer - Lock .25 SS	12
11	36413	Nut - Hex .313-18nc SS	3
12	36412	Nut - Hex .25-20nc SS	12
13	86557	Clamp - Tube 1 2pcs=1set	3
14	86556	Plate - Cover Hyd Tube Clamp	3
15	96925	Plate - Top 1.25 Tube SS	3
16	96926	Clamp - Pair 1.25 Tube	3
17	34761	Fitting - Socketless .56 Jic X 3/8 HOSE	4
18	99674	Strap - Zip Tie 8 Black	7
19	34195	Hose - .375	14'

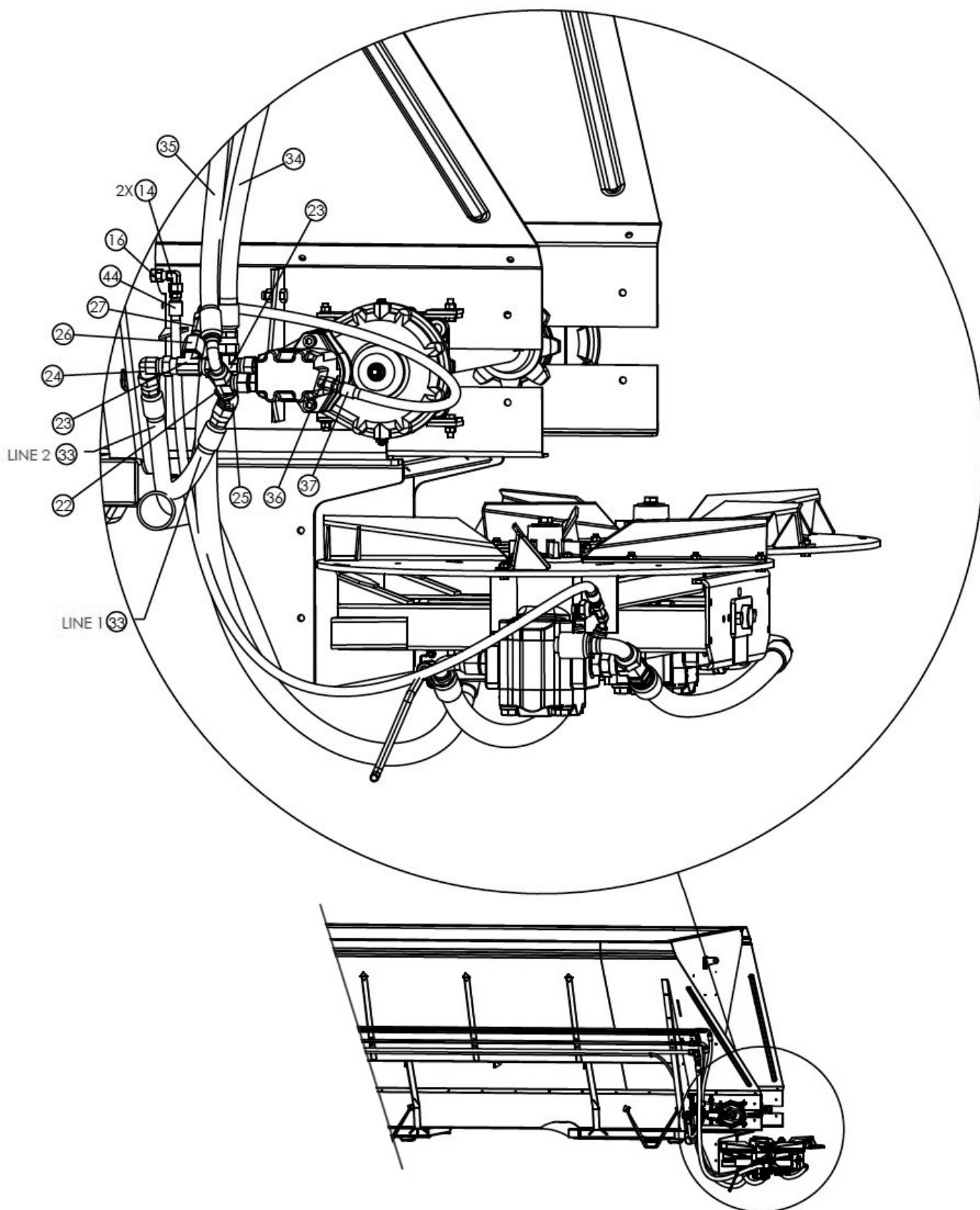
Main Bin PTO

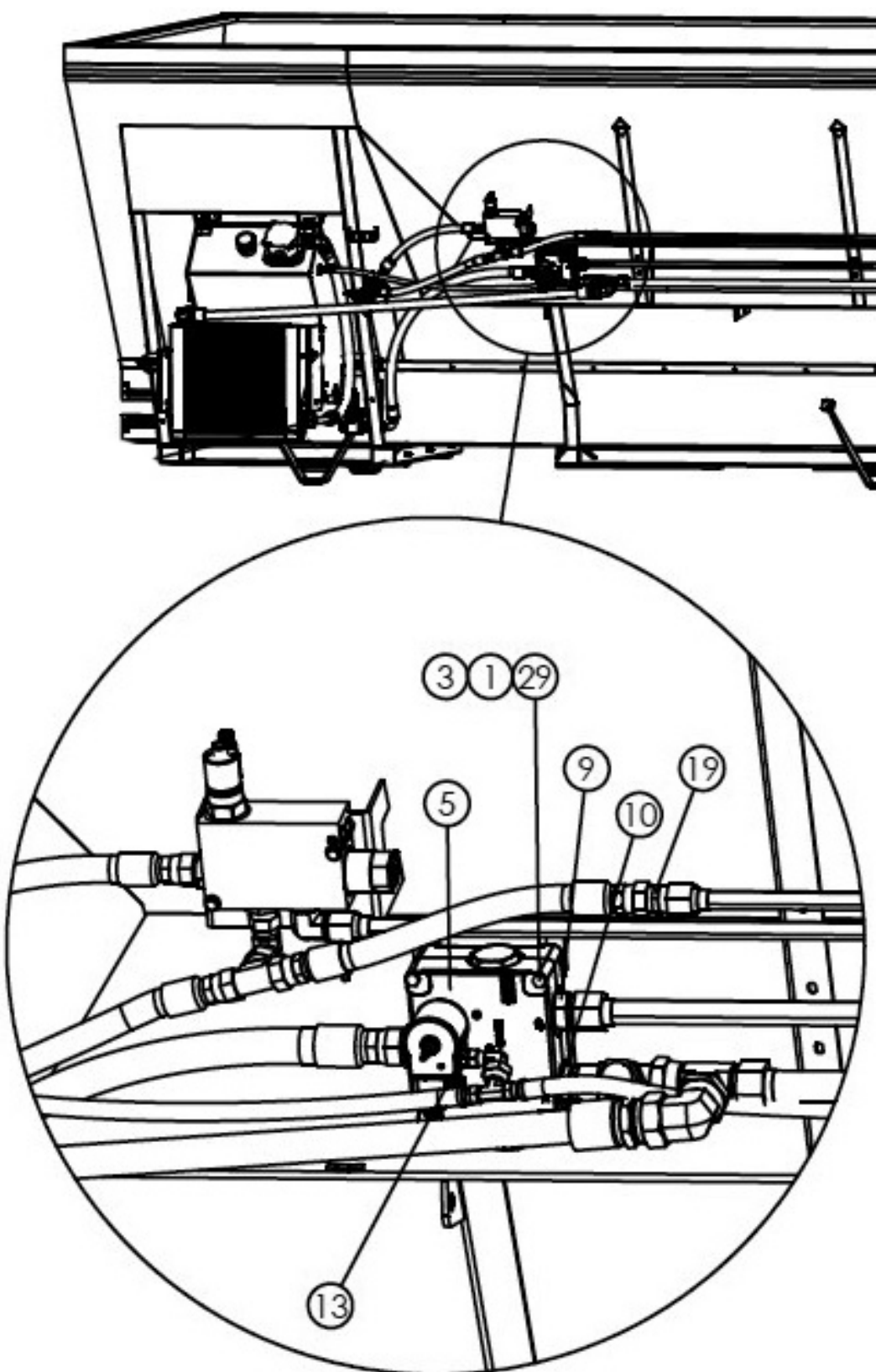


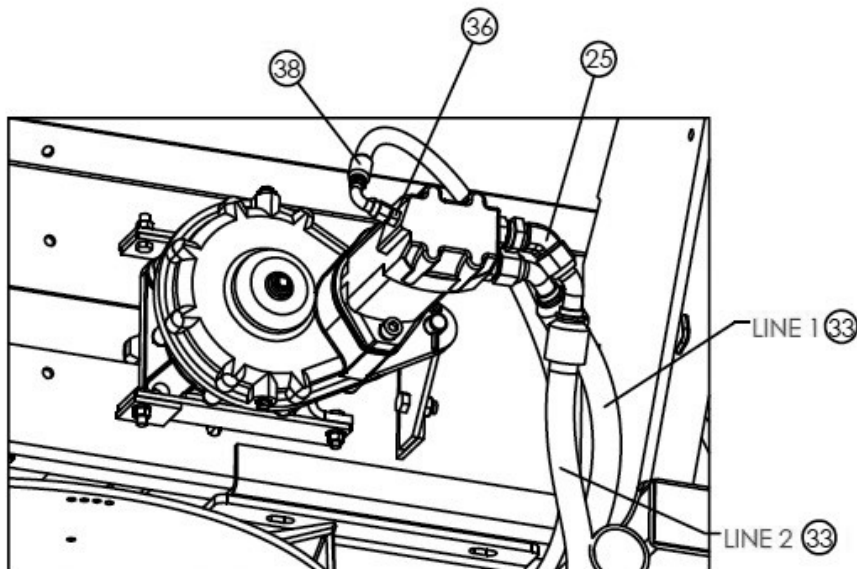
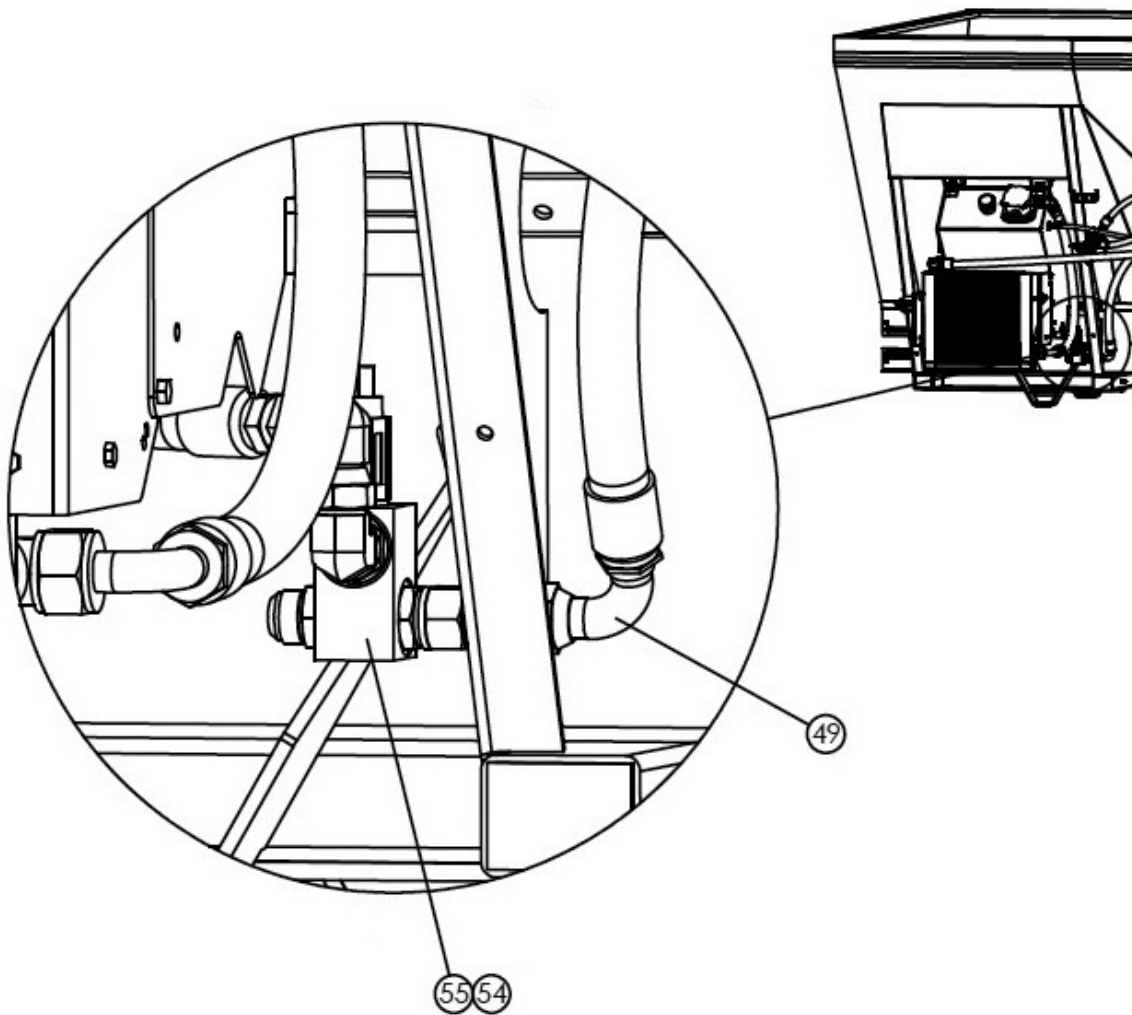
Main Bin PTO



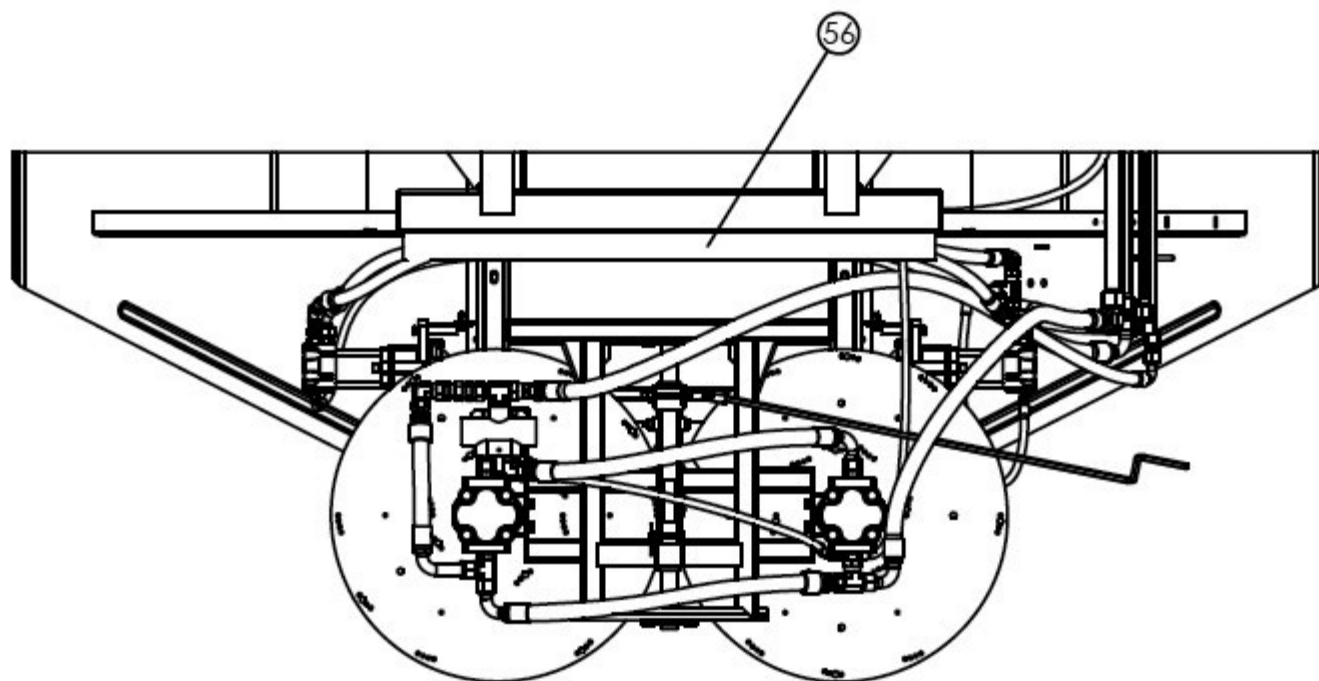
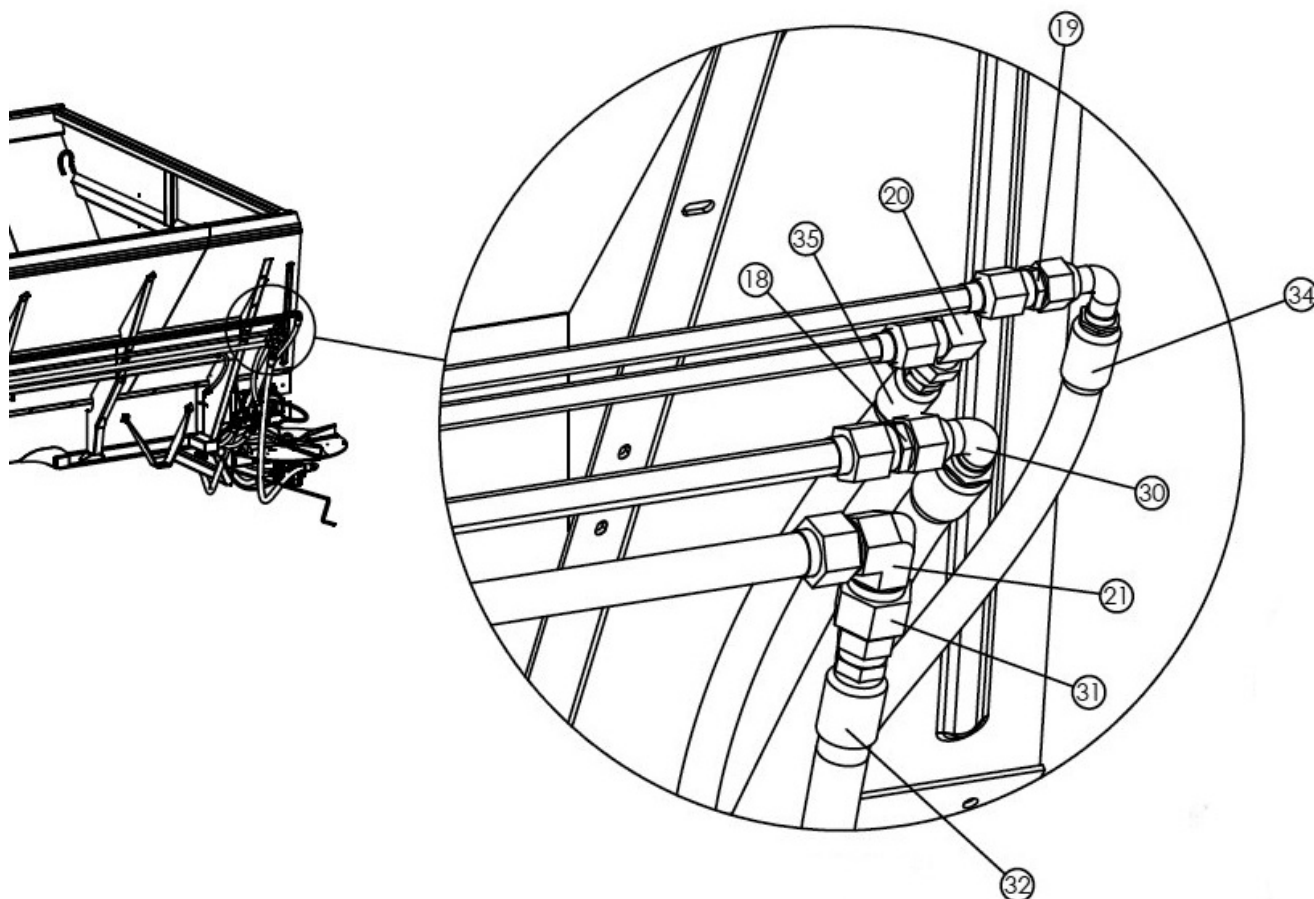
Main Bin PTO



Body Hydraulics**Main Bin PTO**



Main Bin PTO



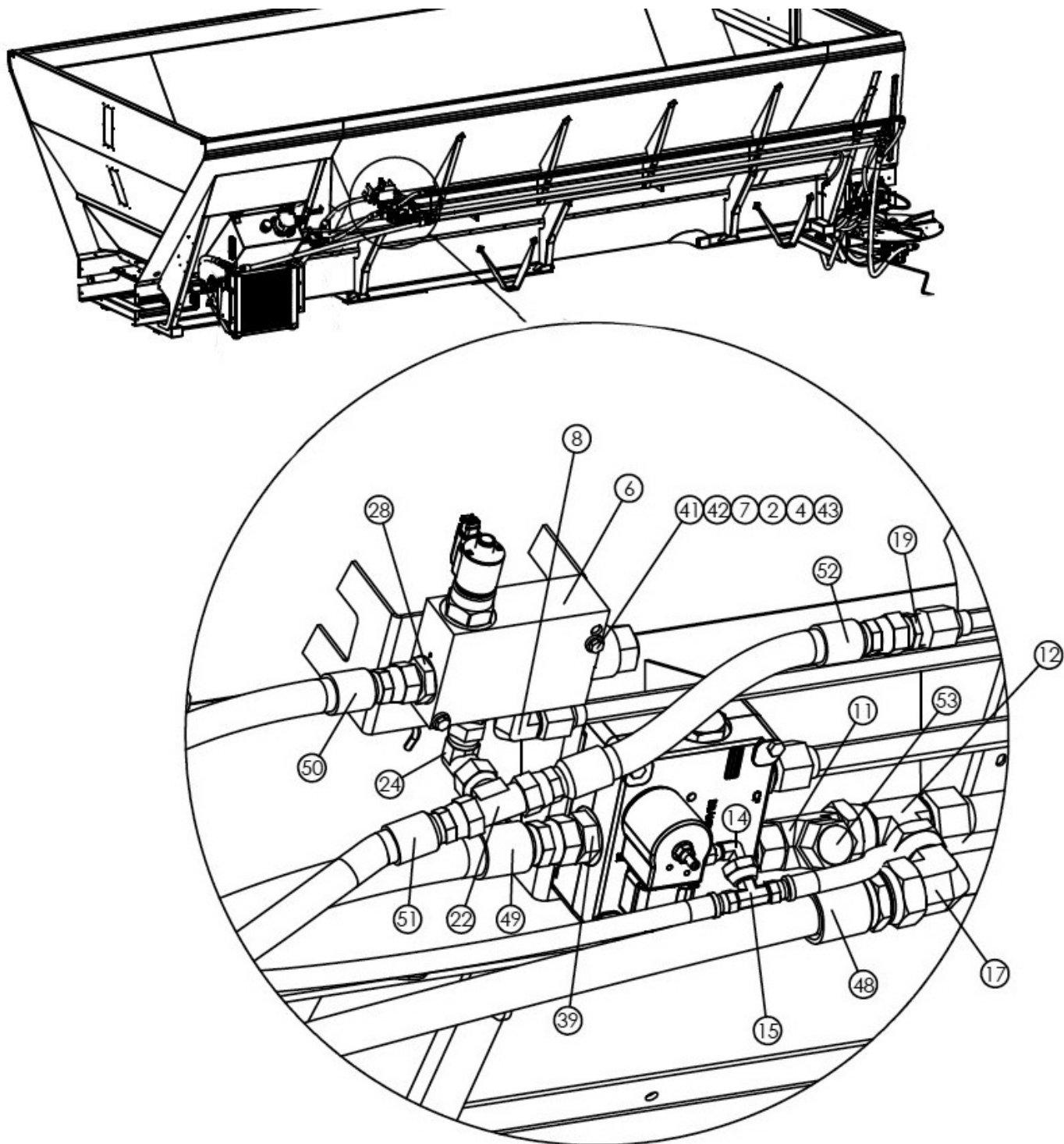
Main Bin PTO

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	36419	Washer - Lock .313 SS	4
2	36418	Washer - Lock .25 SS	6
3	36413	Nut - Hex .313-18nc SS	4
4	36412	Nut - Hex .25-20nc SS	4
5	38576-X4	Valve - Hydraulic 1 Pwm Elec	1
6	317773	Valve - Assy Control 30gpm Pwm	1
7	302098	Washer - Step .25id X .40od X .5THK	2
8	29847	Fitting - 12-12 070220	1
9	29803	Fitting - 16-16 070120	1
10	34810	Fitting - 16-16 Non Standard	1
11	96912	Fitting - 16-20-16 070401	1
12	96909	Tee - Run 1.63jic X 1.63jicf	1
13	34757	Fitting - 6-4 070120	1
14	34816	Fitting - 6-6 070221	3
15	29825	Fitting - 6-6-6 070433	1
16	305514	Fitting - 6-6 070601 Bulkhead	1
17	98568	Fitting - 20-20 070221	1
18	34719	Fitting - 16-16 070101	1
19	29817	Fitting - 12-12 070101	2
20	29785	Fitting - 12-12 070201	1
21	56279	Fitting - 20-20 070201	1
22	29809	Fitting - 12-12-12 070433	2
23	29781	Fitting - 12-12-12 070432	2
24	34709	Fitting - 12-12 070221	3
25	29782	Fitting - 12-12 070321	2
26	56407	Fitting - 12-6 070123	1
27	98724	Fitting - 6-6-6 070432	1
28	29789	Fitting - 12-12 070120	2
29	42794	Capscrew - .313-18nc X 3.75 SS	4
30	56441	Hose - Assy 1 X 86 100r12	1
31	34819	Fitting - 20-16 070123	1

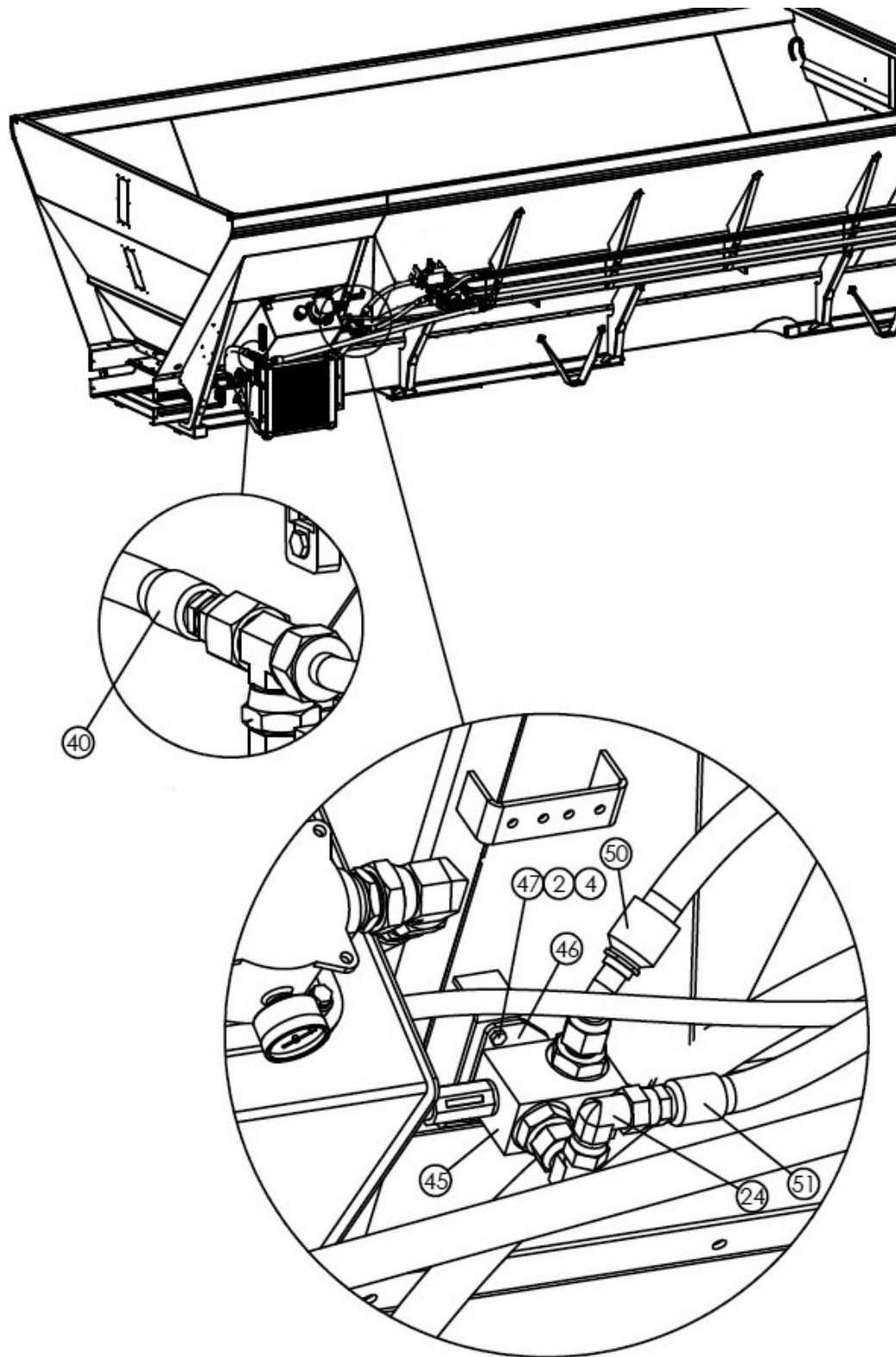
Main Bin PTO

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
32	95958	Hose - Assy 1 X 72.7 100r2	1
33	305752	Hose - Assy .75 X 71.5 100r12	2
34	88315	Hose - Assy .75 X 36 100r2	1
35	98710-X2	Hose - Assy .75 X 33.5 100r12	1
36	34757	Fitting - 6-4 070120	2
37	305531	Hose - Assy .38 X 24 100r1	1
38	97315	Hose - Assy .375od X 84 100r1	1
39	29803	Fitting - 16-16 070120	1
40	82377-X2	Hose - Assy 1 X 48.63 Cb	1
41	56396	Capscrew - .25-20nc X 3.25 SS	2
42	302097	Washer - Step .25id X .40od X .13THK	2
43	36423	Washer - Flat .25 SS	2
44	96338-X1	Hose - Assy .38 X 62 100r1	1
45	310459	Valve - Assy Relief 3400psi	1
46	310451	Plate - Valve	1
47	36393	Capscrew - .25-20nc X .75 SS	4
48	98662-X1	Hose - Assy 1.25od X 73 2cb	1
49	305524	Hose - Assy 1 X 54 100r12	1
50	310458	Hose - Assy .75 X 22 100r12	1
51	56132	Hose - Assy .75 X 22 100r2 Hp	1
52	58960	Hose - Assy .75 X 15.5 100r2	1
53	29802	Fitting - 16 070112	1
54	34747	Fitting - 16-16 070601	1
55	307324	Valve - Assy Relief Sprn	1
56	96906	Sleeve - Abrasive 2.19id X .180 WALL	4'

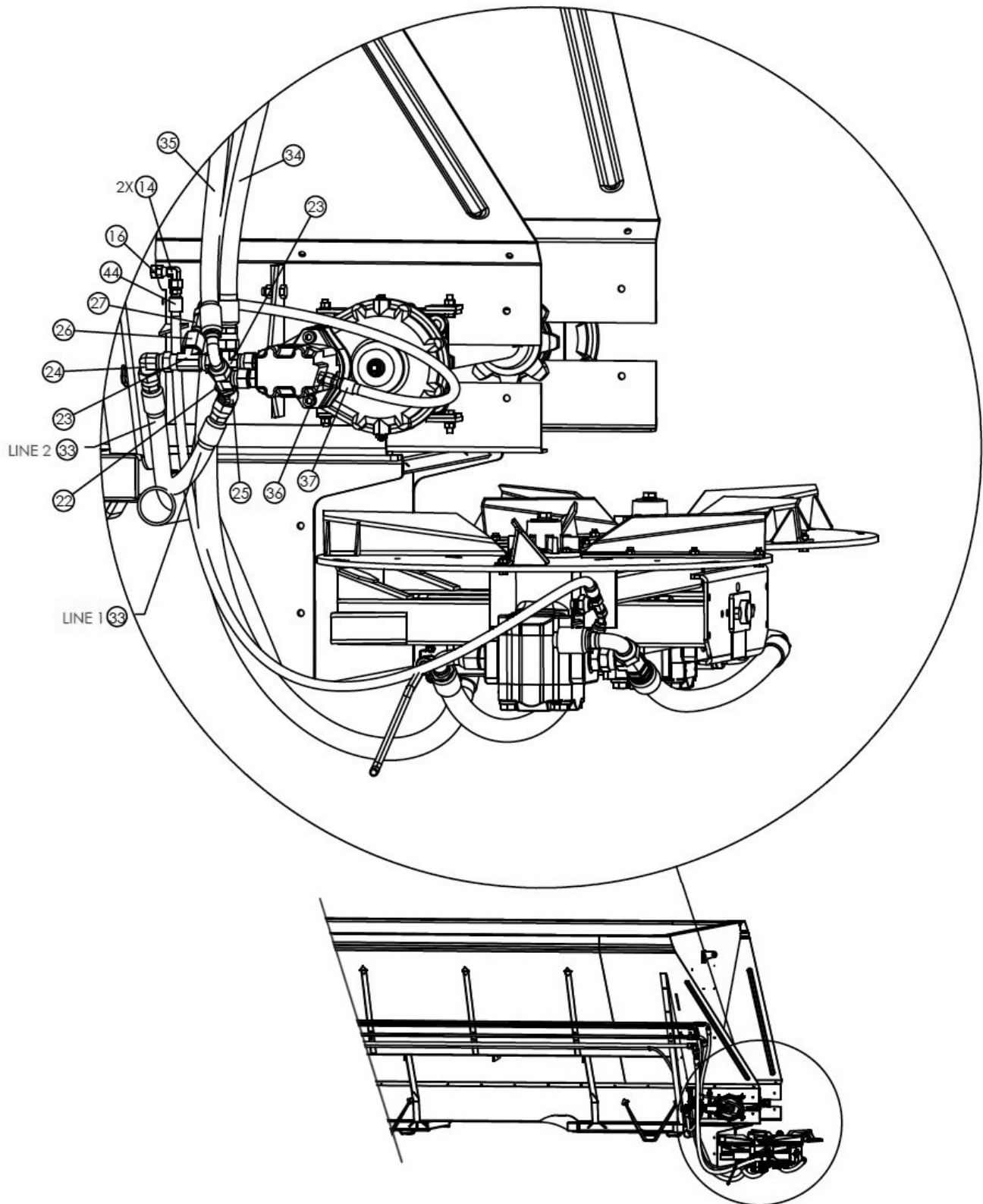
Main Bin Tractor



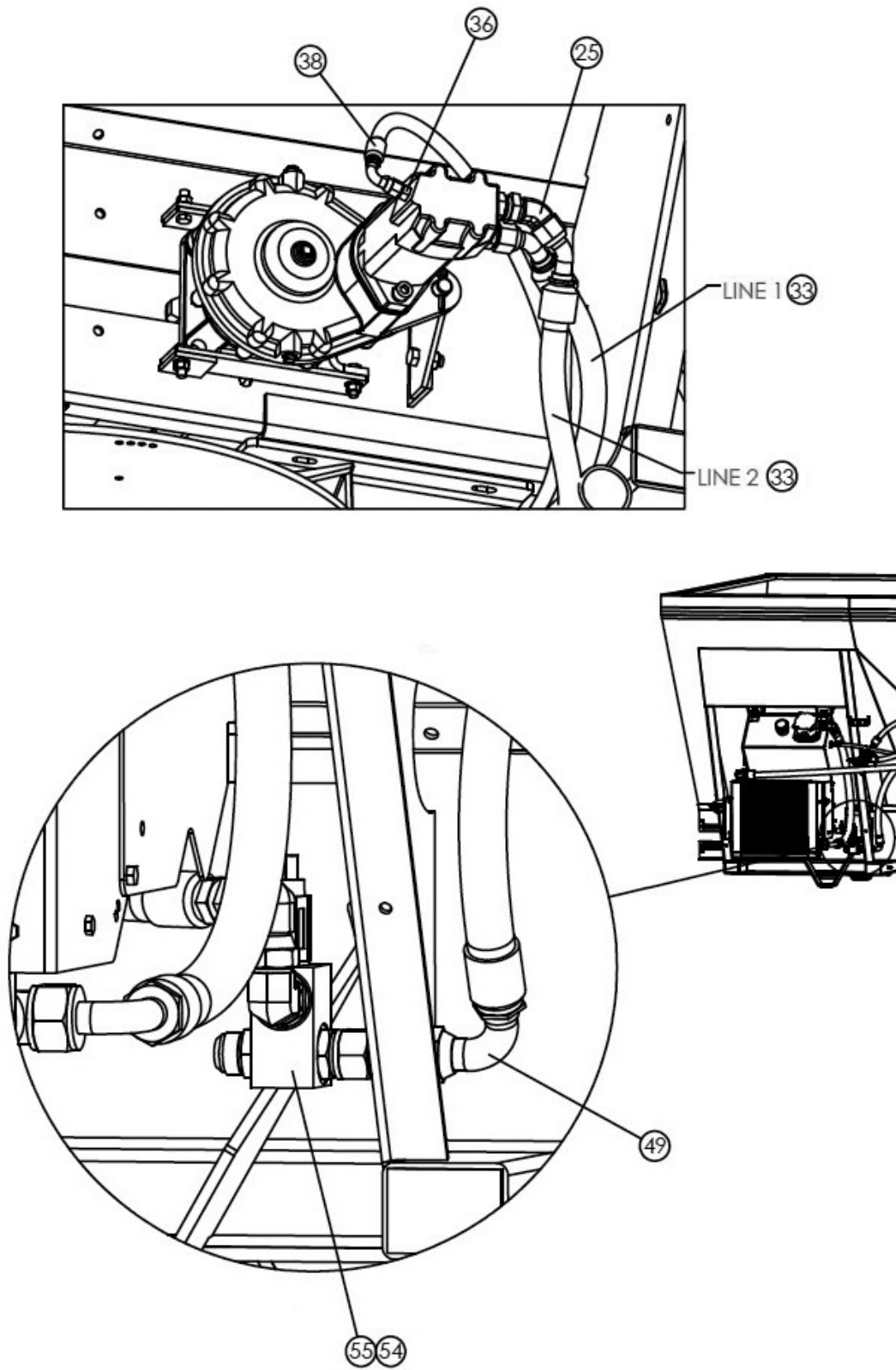
Main Bin Tractor



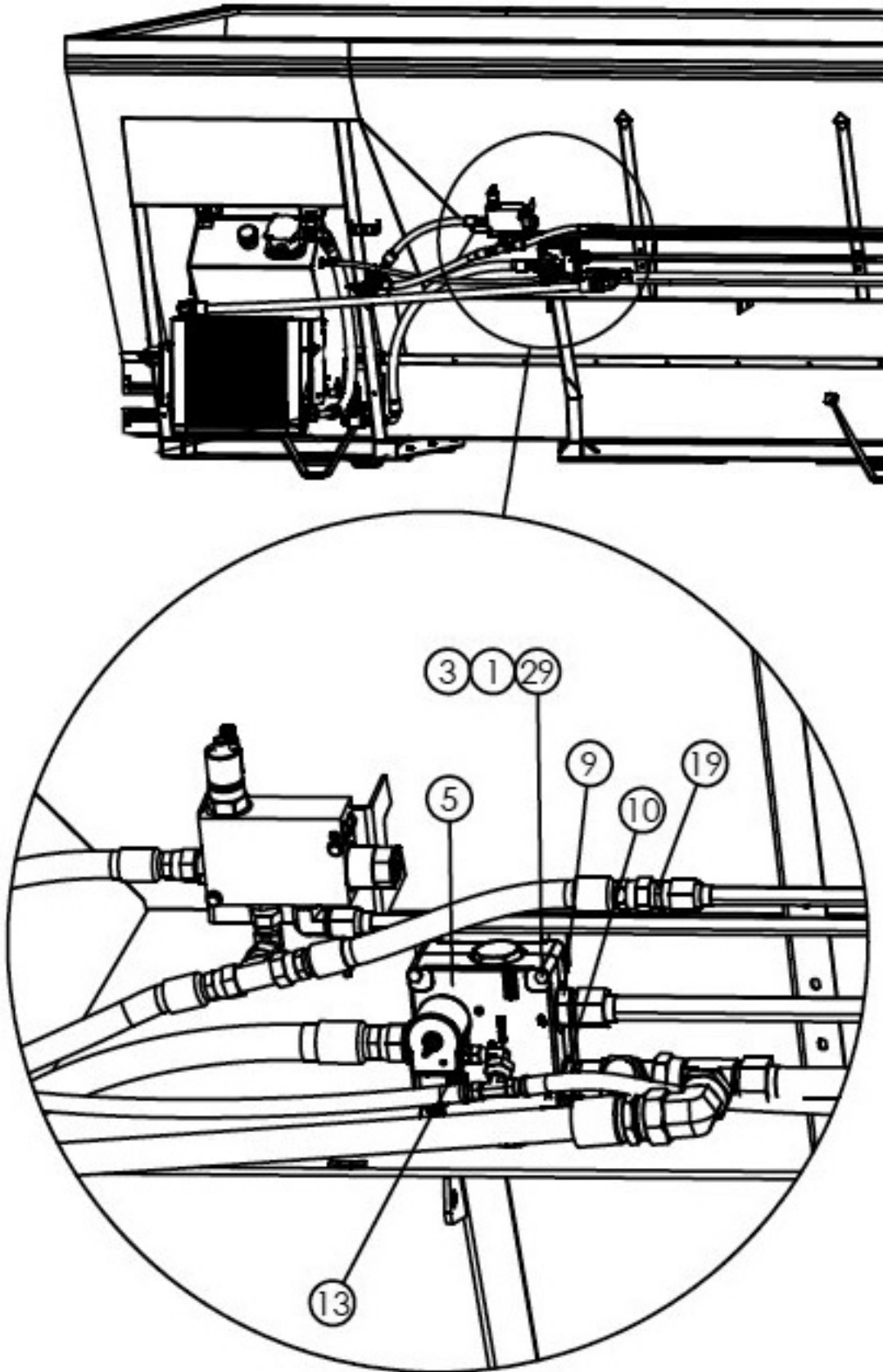
Main Bin Tractor



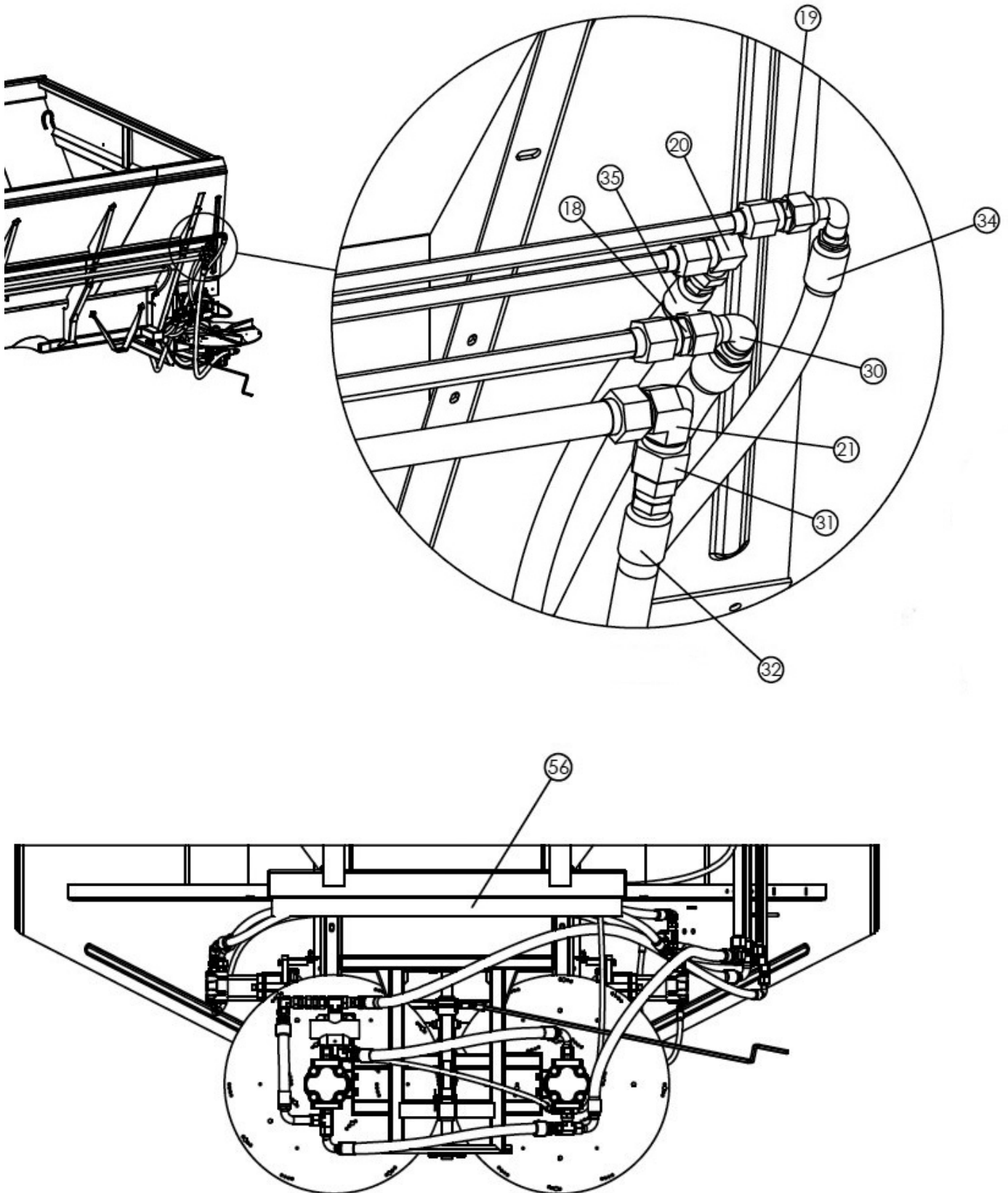
Main Bin Tractor



Main Bin Tractor



Main Bin Tractor



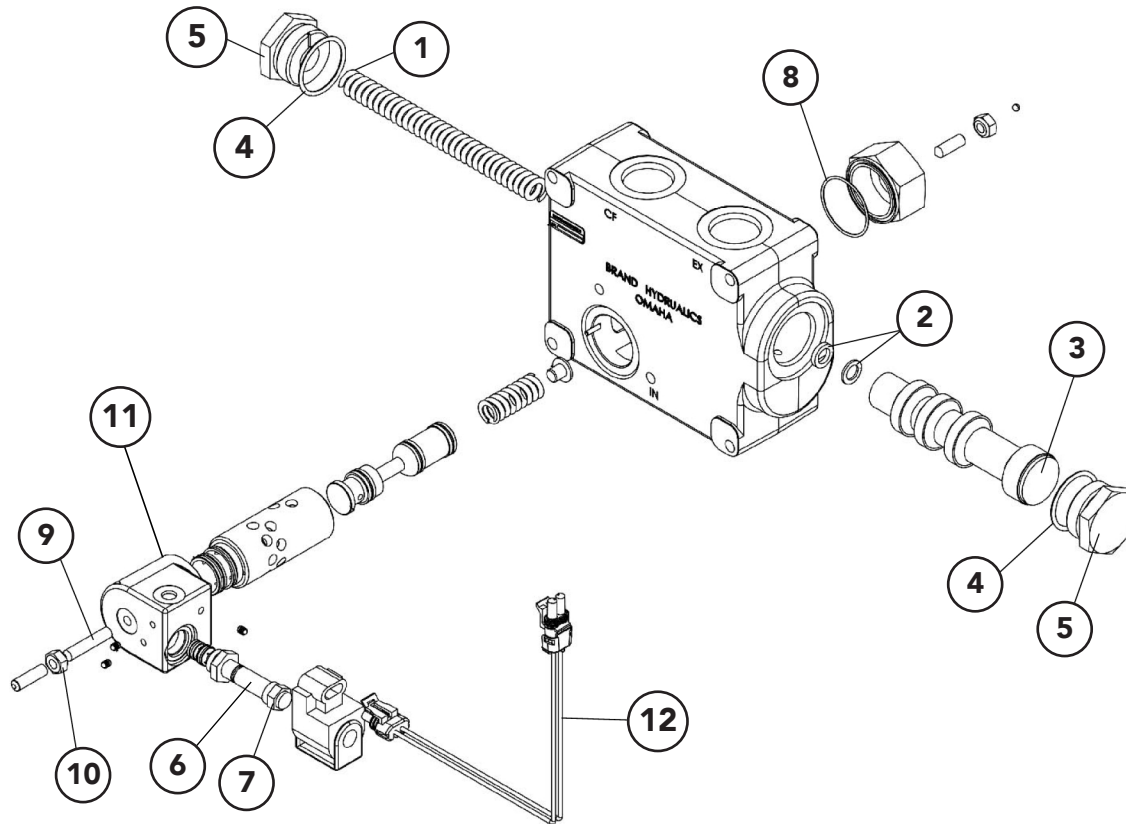
Main Bin Tractor - Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	36419	Washer - Lock .313" SS	4
2	36418	Washer - Lock .25 SS	6
3	36413	Nut - Hex .313-18nc SS	4
4	36412	Nut - Hex, .25-20nc SS	4
5	38576-X4	Valve - Pwm	1
6	317773	Valve - Assy Control 30GPM PWM	1
7	302098	Washer - Step .25id X .4od X .5thk	2
8	29847	Fitting - 12-12 070220	1
9	29803	Fitting - 16-16 070120	1
10	34810	Fitting - 16-16 S1040-30 Non Standard	1
11	96912	Tee - Union 1.63 Jic X 1.31 Jic X 1.31 Jic	1
12	96909	Fitting - 20-20-20 0 70432	1
13	34757	Fitting - 6-4 070120	1
14	34816	Fitting - 6-6 070221	3
15	29825	Fitting - 6-6-6 070433	1
16	305514	Fitting - 6-6 070601	1
17	98568	Fitting - 20-20 070123	1
18	34719	Fitting - 16-16 070101	1
19	29817	Fitting - 12-12 070101	2
20	29785	Adapter- El&Ow	1
21	56279	Fitting - 20-20 070201	1
22	29809	Fitting - 12-12-12 070433	2
23	29781	Fitting - 12-12-12 070432	2
24	34709	Fitting - 12-12 070221	3
25	29782	Fitting - 12-12 070321	2
26	56407	Fitting - 12-6 070123	1
27	98724	Fitting - 6-6-6 070432	1
28	29789	Fitting - 12-12 070120	2
29	42794	Capscrew - .313-18nc X 3.75" SS	4
30	56441	Hose - 1"Dia 100r12 X 86" Assy	1
31	34819	Fitting - 20-16 070123	1

Main Bin Tractor - Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
32	95958	Hose - 1"Dia 100r2 X 72.7" Assy	1
33	305752	Hose - .75"Dia 100r12 X 71.5" Assy	2
34	88315	Hose - Assy .75 x 36 100R2	1
35	98710-X2	Hose - .75"Dia 100r12 X 33.5" Assy	1
36	34757	Fitting - 6-4 070120	2
37	305531	Hose - Assy .38., X 24" 1 00 RI	1
38	97315	Hose - .38" X 84" Drain Line	1
39	29803	Adapter-Cnctr 1.31 Sae X 1.31 Jic	1
40	82377-X2	Hose - 1" X 48.63" 2CB Return	1
41	56396	Cap Screw - .25-20 X 3.25 SS	2
42	302097	Washer - Step .25id X .4od X .13thk	2
43	36423	Washer - Flat .25 SS	2
44	96338-X1	Hose - Assy .38" X 62 100 RI	1
45	310459	Valve - Assy Relief 3400 Psi	1
46	310451	Plate - Valve	1
47	36393	Cap Screw - .25-20nc X .75" SS	4
48	98662-X1	Hose - 1.25 2CB X 48	1
49	305524	Hose - 1"Dia 100r12 X 50" Assy	1
50	310458	Hose -Assy .75 X 23" 100r12	1
51	56132	Hose - .75"Dia 100r2 X 24" Assy	1
52	58960	Hose - .75"Dia 100r2 X 15.5" Assy	1
53	29802	Fitting - 16 070112	1
54	34747	Adapter- Un Ion &Ulthead L .31jic	1
55	307324	Valve - Assy Relief	1
56	96906	Sleeve - Abrasive 2.19id X .180 WALL	4'

PWM Spinner Valve

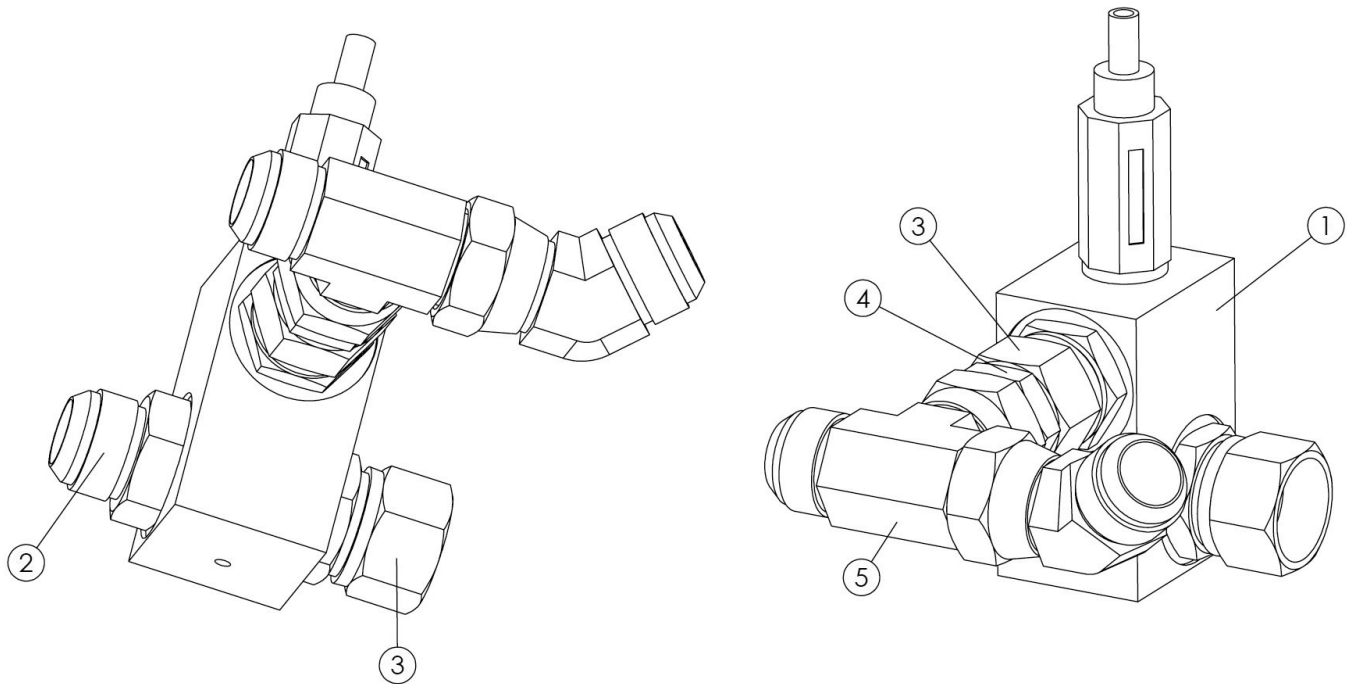


ITEM	PART NO.	DESCRIPTION	QTY
	38576-X4	Valve - Flow Control Electric Actuated	1
1	53960	Spring	1
2	90696	Shim	2
3	90697	Spool	1
4	90698	O-Ring	1
5	90699	Plug	2
6	38576-AA	Cartridge	1
7	38576-AG	Nut - Cartridge	1
8	38576-AC	O-Ring	1
9	38576-AD	Screw - Set	1
10	38576-AE	Nut - Jam	1
11	38576-AF	Cartridge Valve Body	1
12	38576-AI	Cable Assy	1
13	*38576-AH	Valve - Kit Seal	1

Body Hydraulics

Relief Valves

NL450

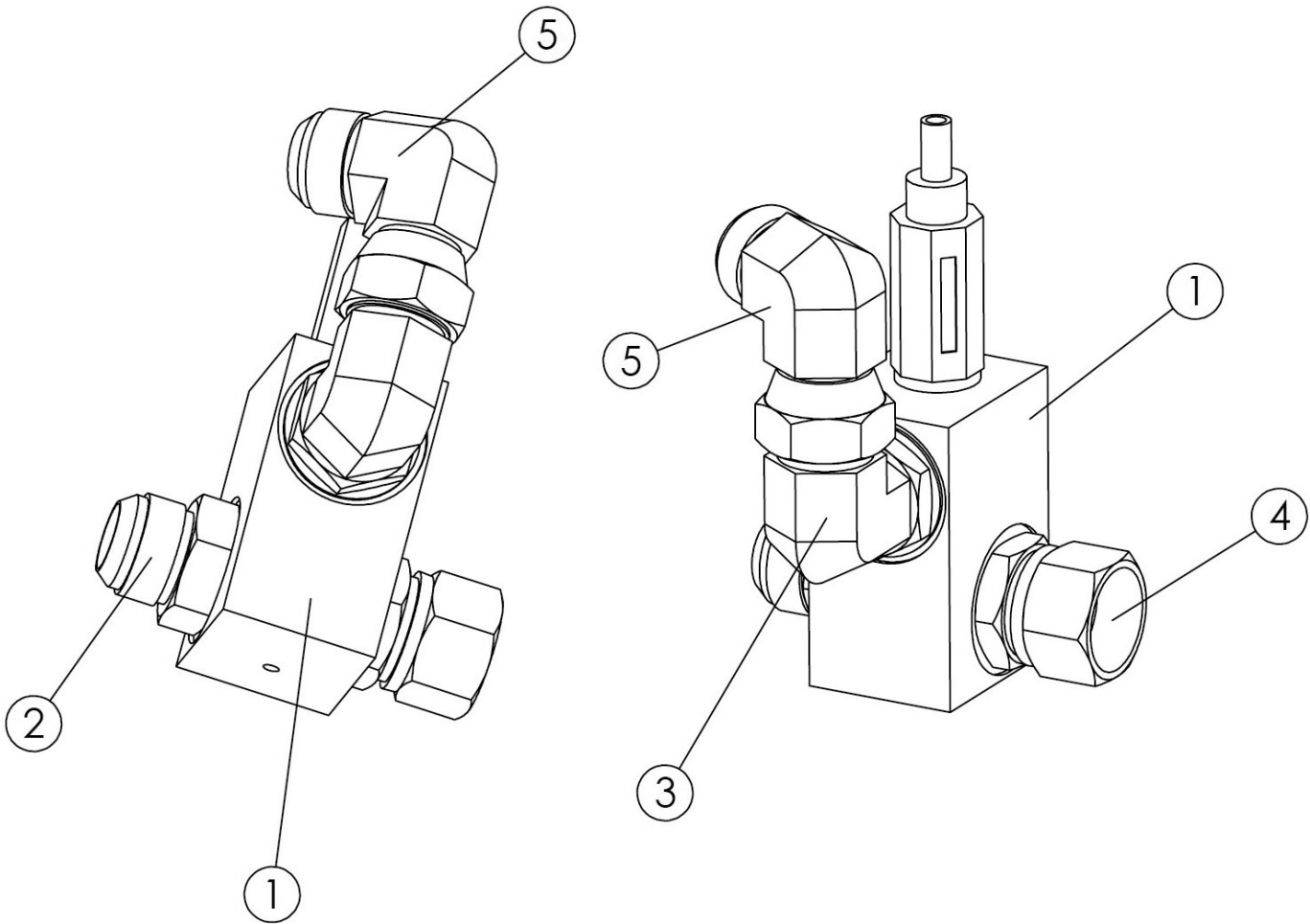


ITEM	PART NO.	DESCRIPTION	QTY
	317416	Valve - Assy Relief SPRN 3100PSI	
1	98109	Valve - Soft Start 3100psi @ 40GPM	1
2	29803	Fitting - 16-16 070120	1
3	34810	Fitting - 16-16 Non Standard	2
4	34719	Fitting - 16-16 070101	1
5	29836	Fitting - 16-16-16 070433	1
6	29806	Fitting - 16-16 070321	1

Body Hydraulics

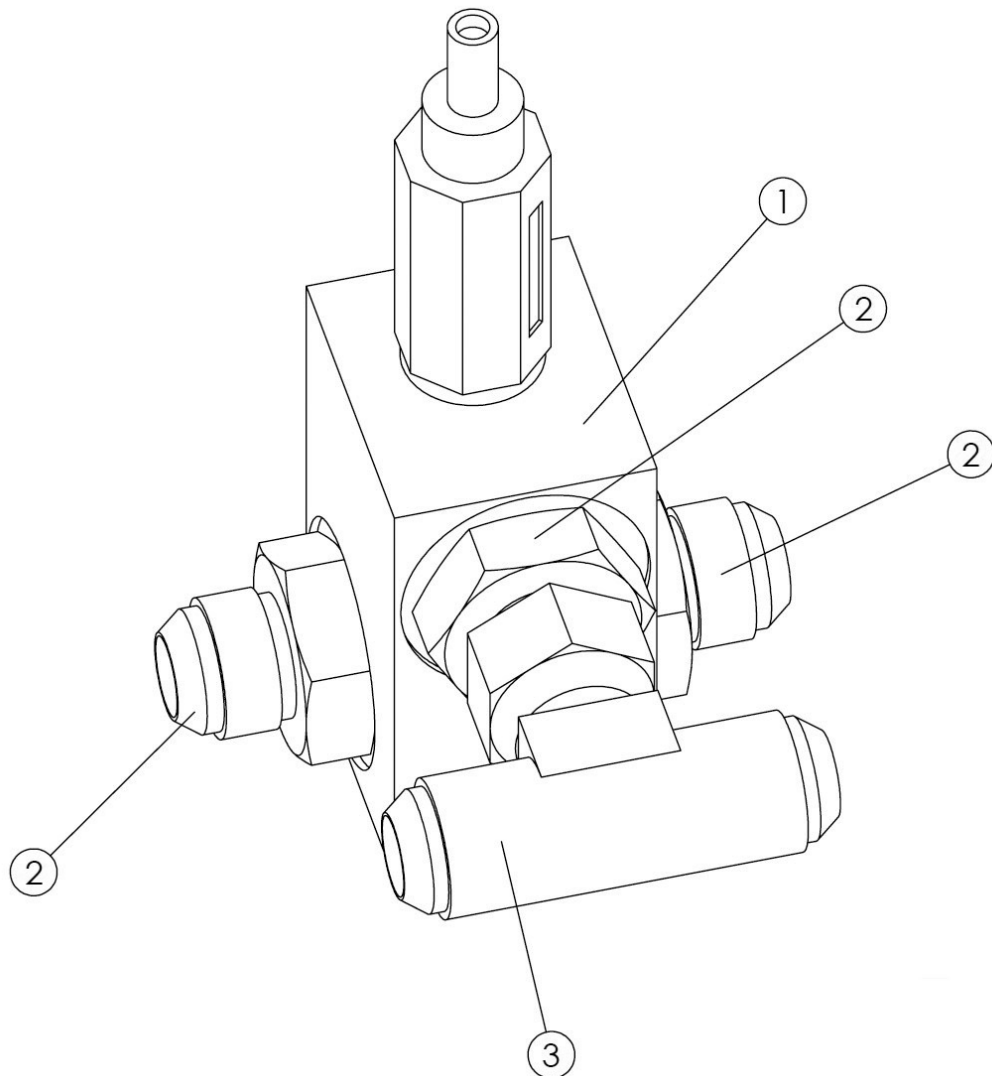
Relief Valves

NL450



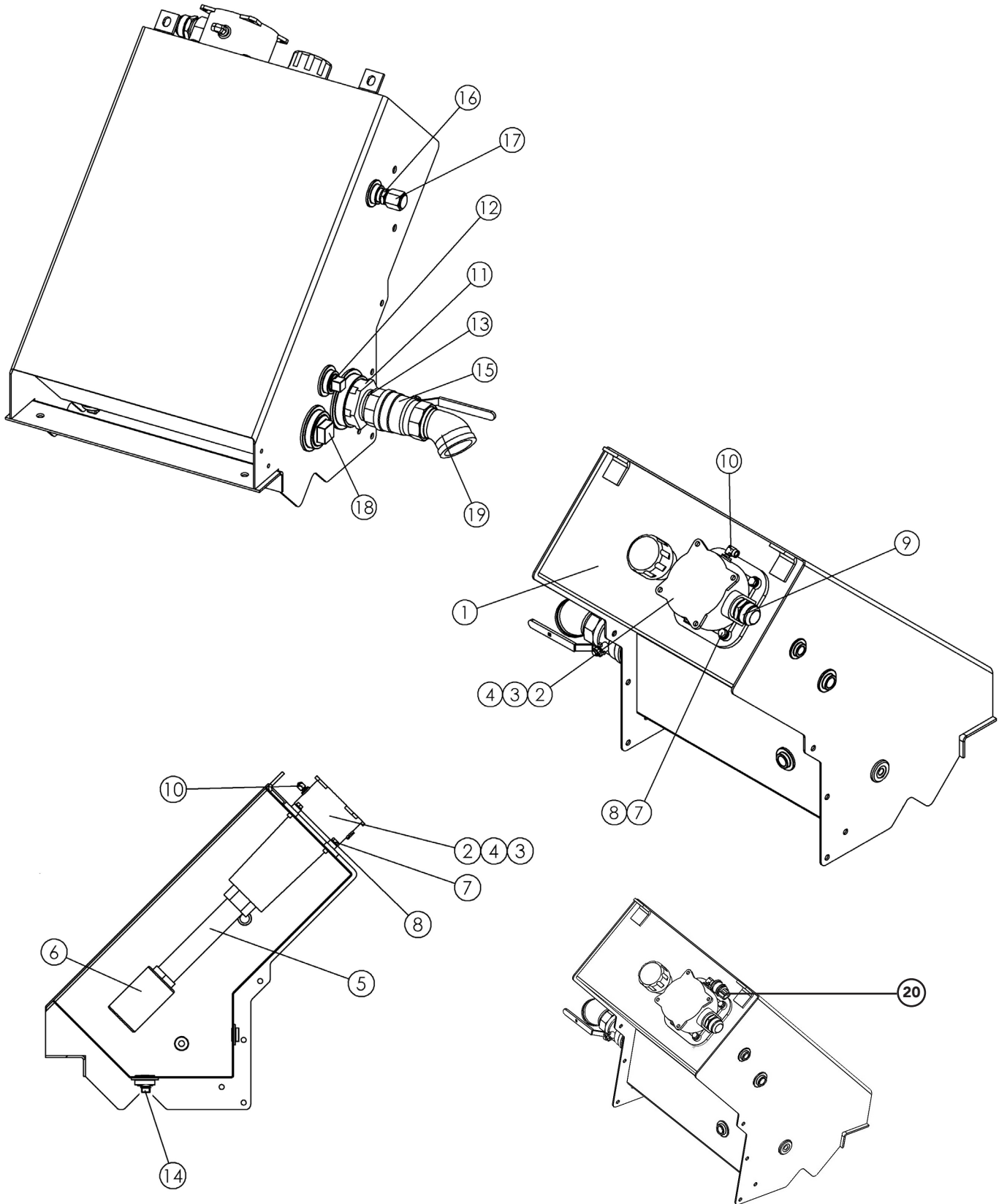
ITEM	PART NO.	DESCRIPTION	QTY
	307324	Valve - Assy Relief SPRN 3100PSI	
1	98109	Valve - Soft Start 3100PSI @ 40GPM	1
2	29803	Fitting - 16-16 070120	1
3	29840	Fitting - 16-16 070220	1
4	34810	Fitting - 16-16 NON STANDARD	1
5	29807	Fitting - 16-16 070221	1

Relief Valves



ITEM	PART NO.	DESCRIPTION	QTY
	310459	Valve - Assy Relief 3400PSI	
1	98705	Valve - Soft Start 3400psi @ 20GPM	1
2	29835	Fitting - 12-16 070120	3
3	29809	Fitting - 12-12-12 070433	1

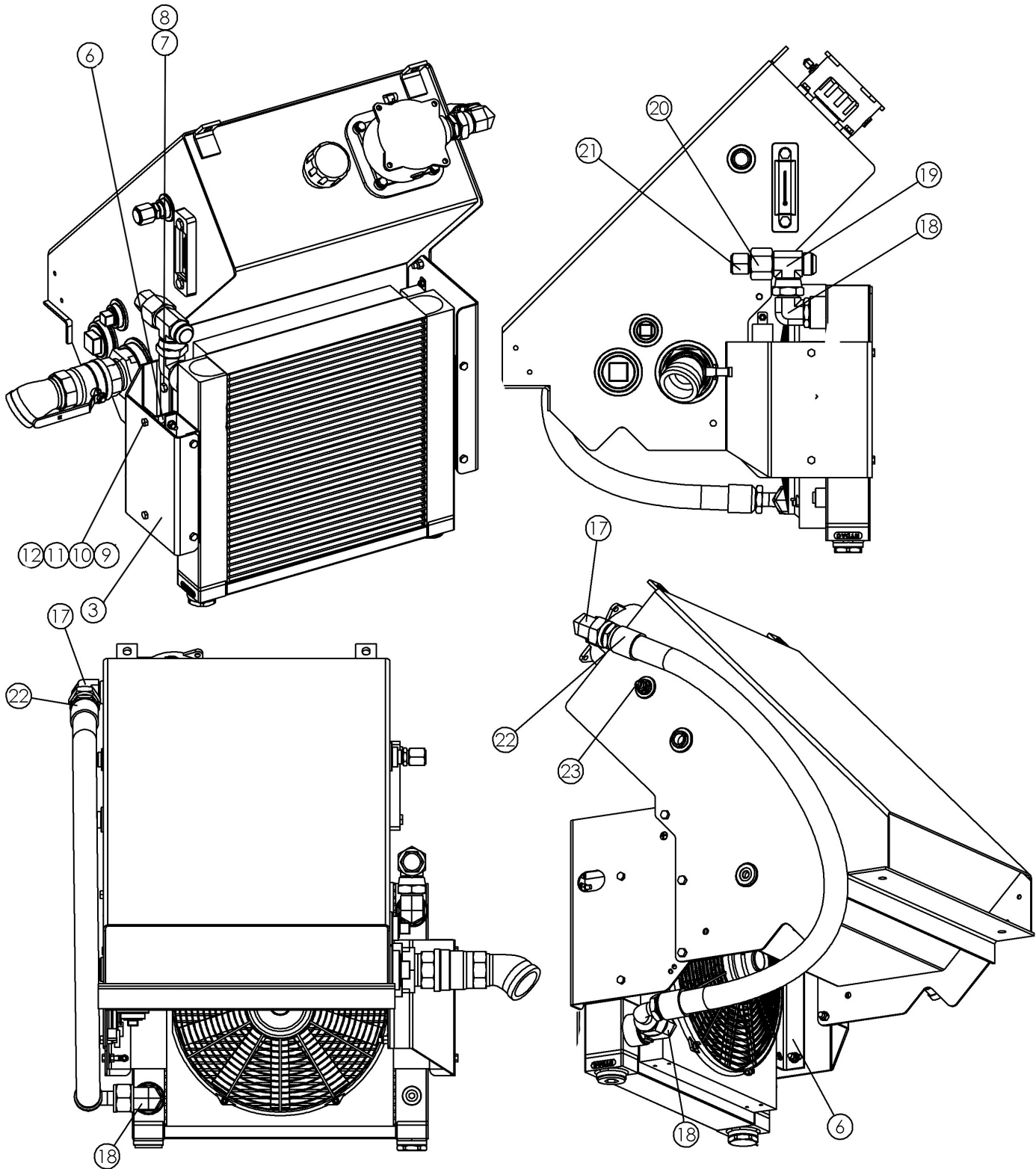
Hydraulic Reservoir ISO



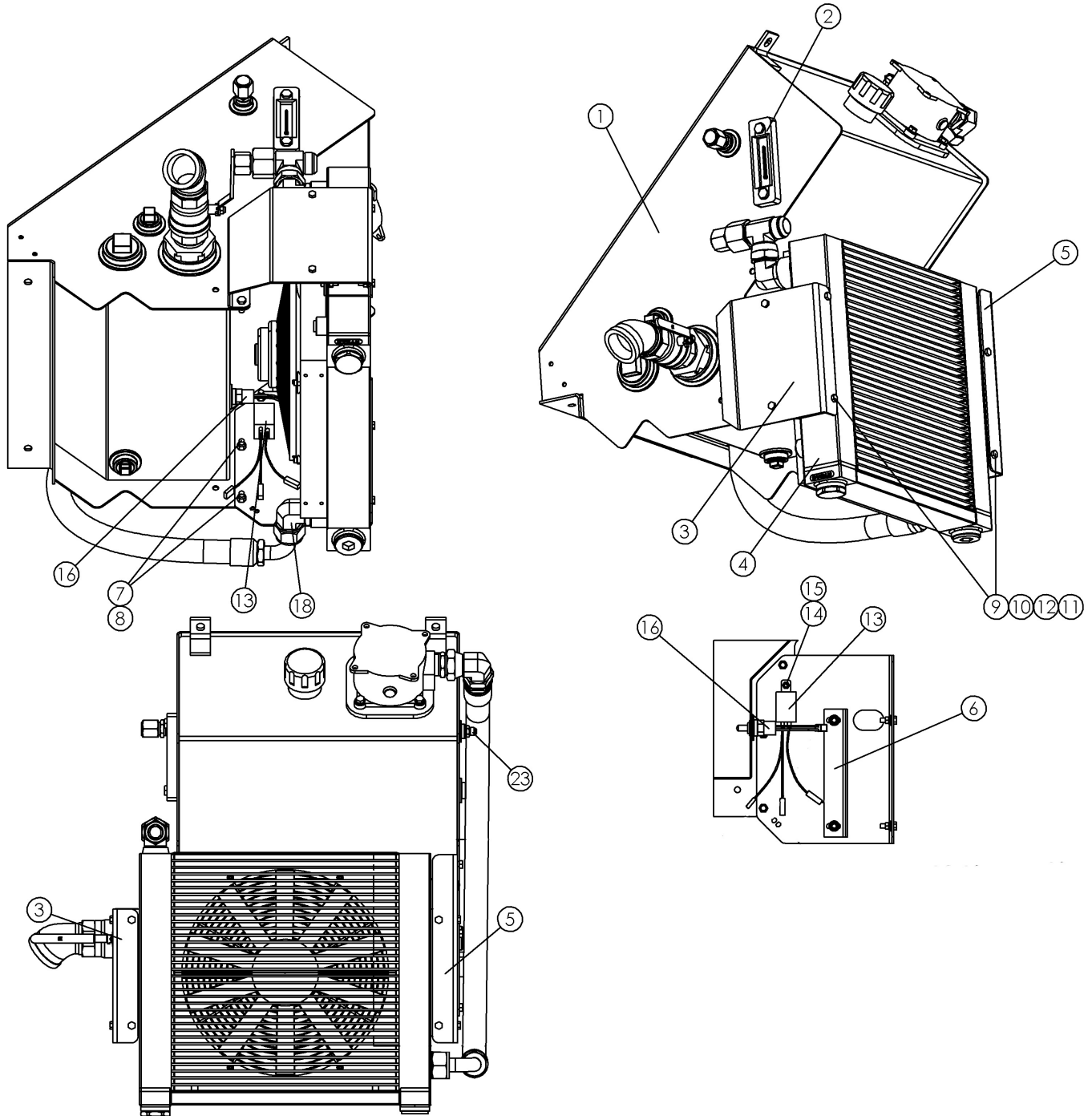
Hydraulic Reservoir ISO Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	317399	Tank - Assy Hydraulic ISO	1
1	311736	Tank - Wldmt Hydraulic	1
2	88838	Filter - Return In Tank	1
3	306186	Gasket Maker - Silicone Rtv	0.06
4	305066	Filter - Element	1
5	305058	Pipe - 1.5 Sch40 10"	1
6	305057	Diffuser - Tank	1
7	20068	Capscrew - .375-16nc X 1.25	4
8	20712	Washer - Lock .375	4
9	29768	Fitting - 20-20 070102	1
10	311214	Fitting - 2-2 140239c	1
11	305063	Strainer - 2" Npt	1
12	6034	Plug - Pipe 1"Npt	1
13	22324	Nipple - Close 2"Npt Std	1
14	305061	Plug - Magnetic 1" Npt	1
15	305060	Valve - Ball 2" Npt	1
16	29752	Fitting - 12-12 070102	1
17	29801	Fitting - 12 070112	1
18	6321	Pipe - Plug 2"	1
19	305241	Elbow - 2" Npt 45deg Str.	1
20	311076	Pressure Switch	1

Hydraulic Reservoir ISO w/ Cooler



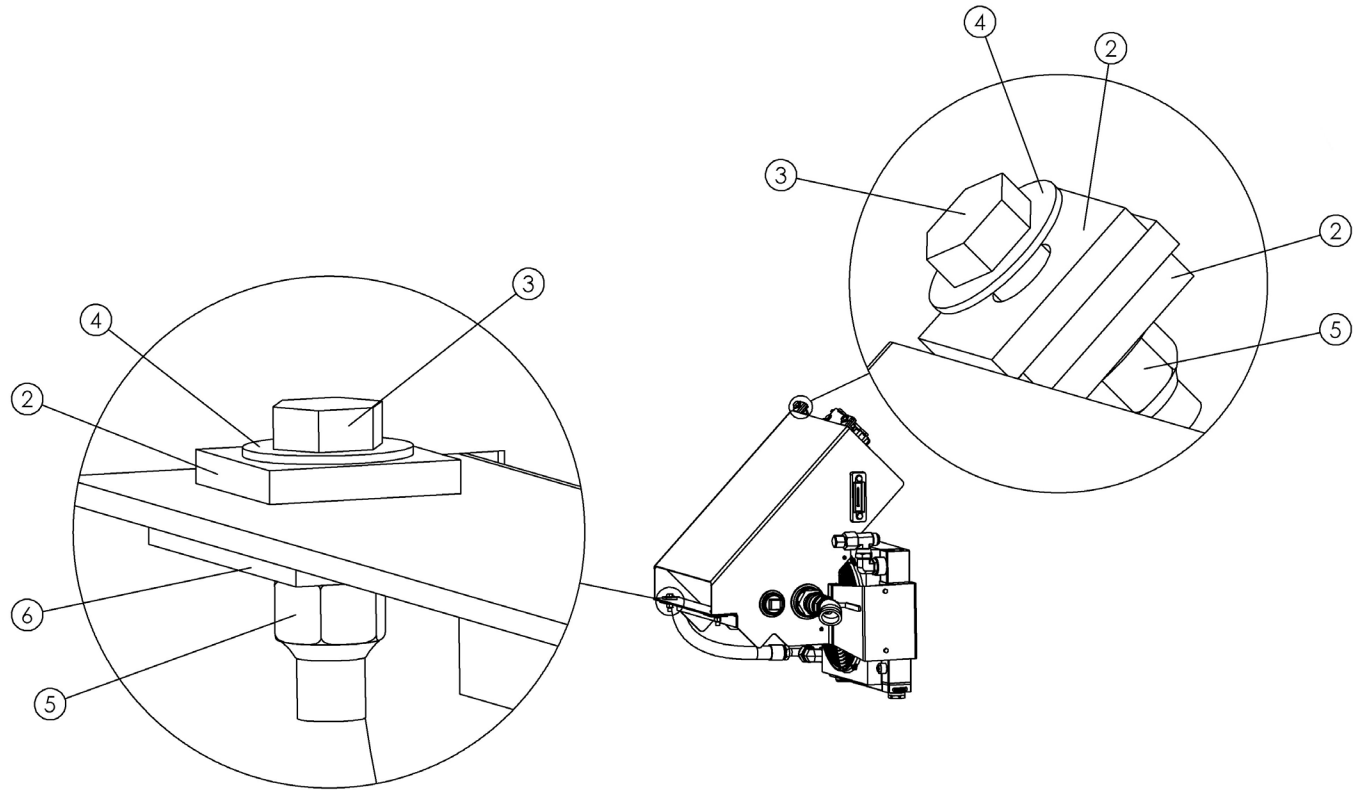
Hydraulic Reservoir ISO w/ Cooler Cont.



Hydraulic Reservoir ISO w/ Cooler Cont.

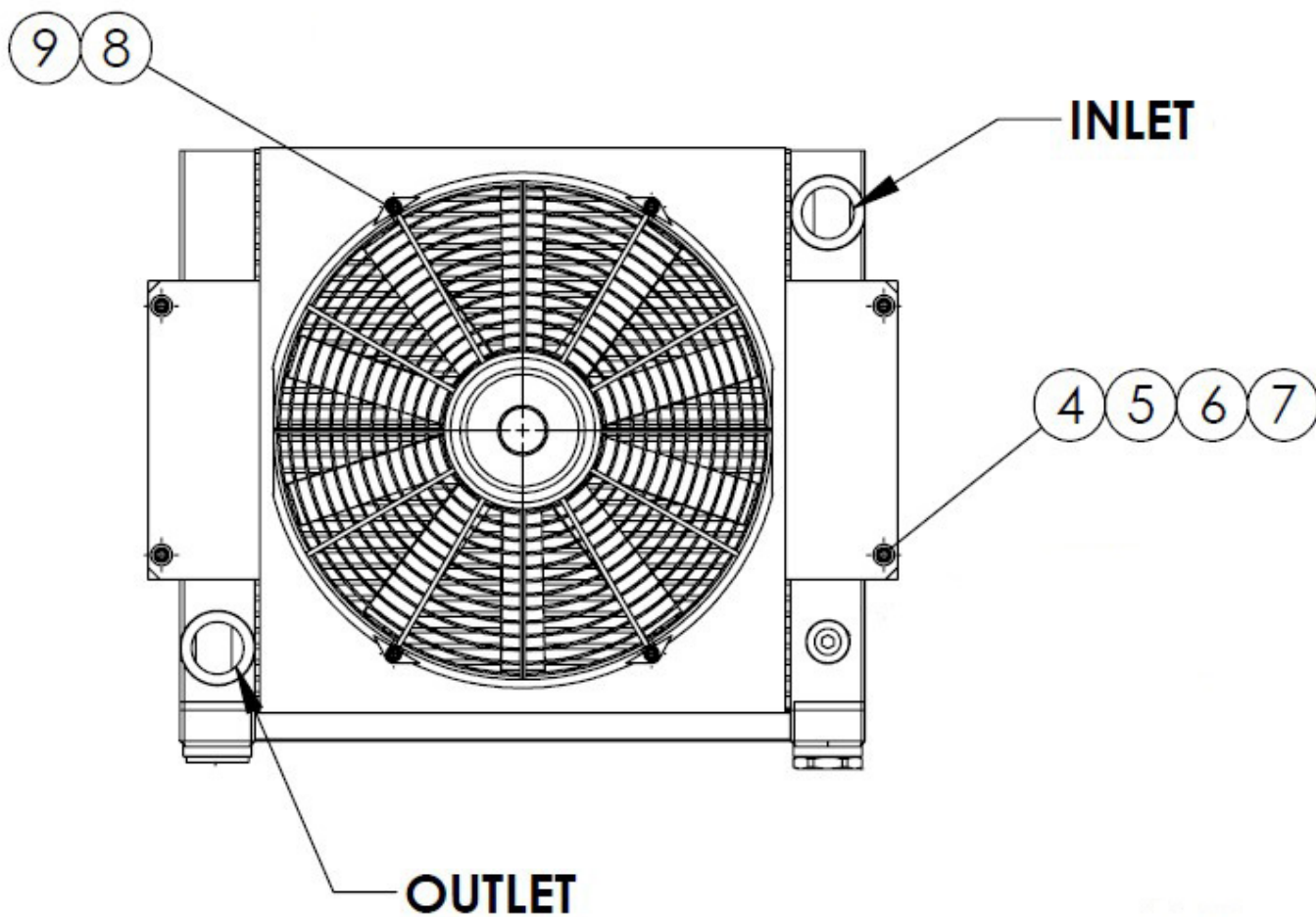
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	317398	Tank Assy with Cooler ISO	
1	317399	Tank - Assy Hyd. Iso	1
2	38575	Gauge - Sight & Temperture	1
3	305761	Bracket - Cooler Lh	1
4	305767	Cooler - Assy Hydac Eld4.5	1
5	305760	Bracket - Cooler Rh	1
6	306447	Bracket - Cooler Mount	2
7	36398	Capscrew - .375-16NC X 1 SS	5
8	72054	Nut - Lock .375-16NC SS	5
9	34580	Capscrew - .313-18NC X 1 SS	8
10	36424	Washer - Flat .313 SS	8
11	36419	Washer - Lock .313 SS	8
12	36413	Nut - Hex .313-18NC SS	8
13	312271	Relay - 12vdc 40a	1
14	56258	Screw - Truss Head .25-20NC X .5 SS	1
15	42034	Nut - Lock .25-20NC SS	1
16	305074	Switch - Temperature 114~	1
17	98568	Fitting - 20-20 070221	1
18	96916	Fitting - 20-20 070220	2
19	56267	Fitting - 20-20-20 070433	1
20	34819	Fitting - 20-16 070123	1
21	29802	Fitting - 16 070112	1
22	98662	Hose - 1.25 2cb X 48	1
23	29766	Fitting - 6-6 070102	1

Hydraulic Reservoir Mounting Hardware



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	317398	Tank - Assy W/ Cooler	1
2	39159	Belt - Spacer	6
3	36403	Capscrew - .5-13nc X 2 Ss	4
4	36426	Washer - Flat .5 Ss	6
5	39016	Nut - Lock .5-13nc Ss	4
6	39158	Belt - Flex Mount	2

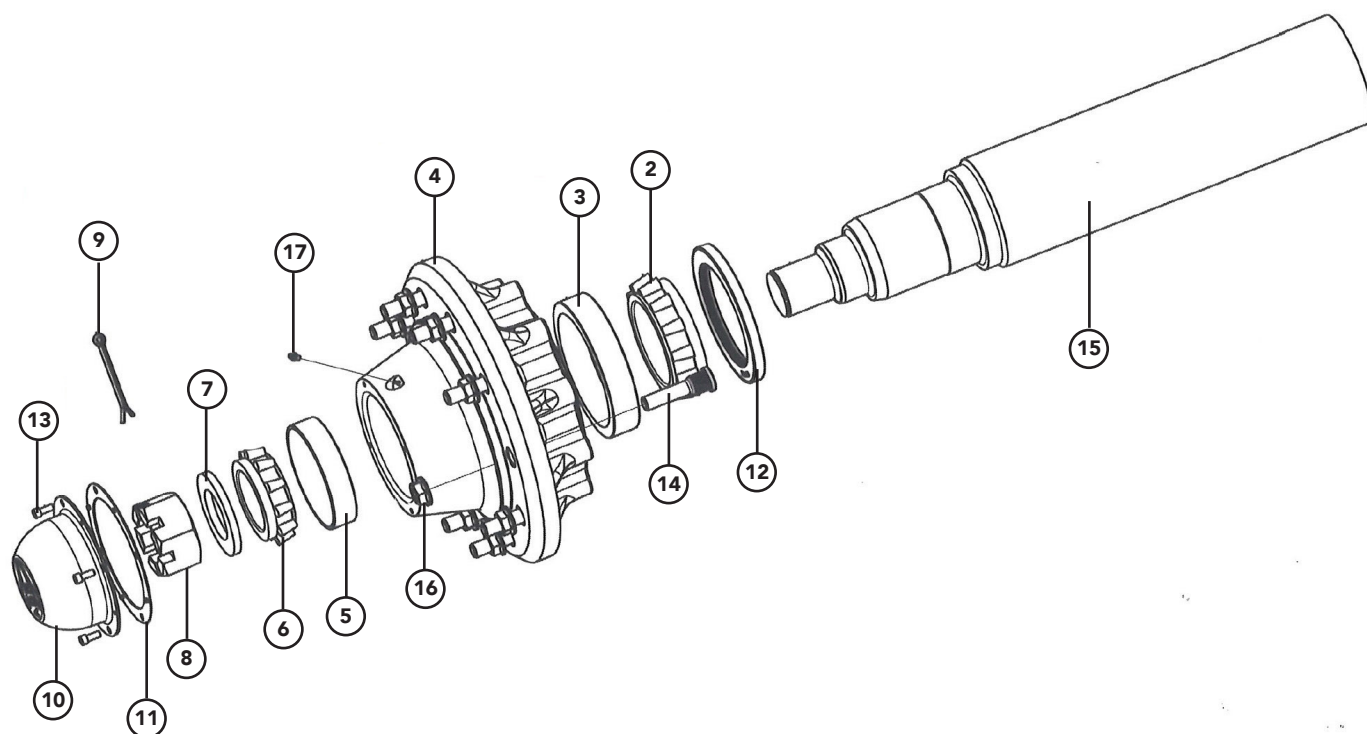
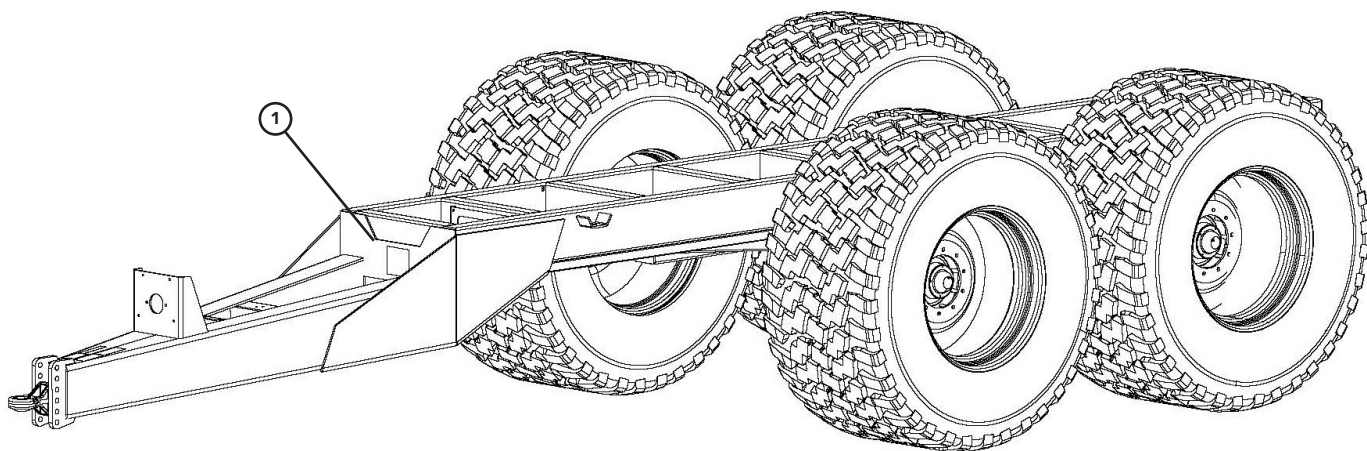
Hydraulic Cooler



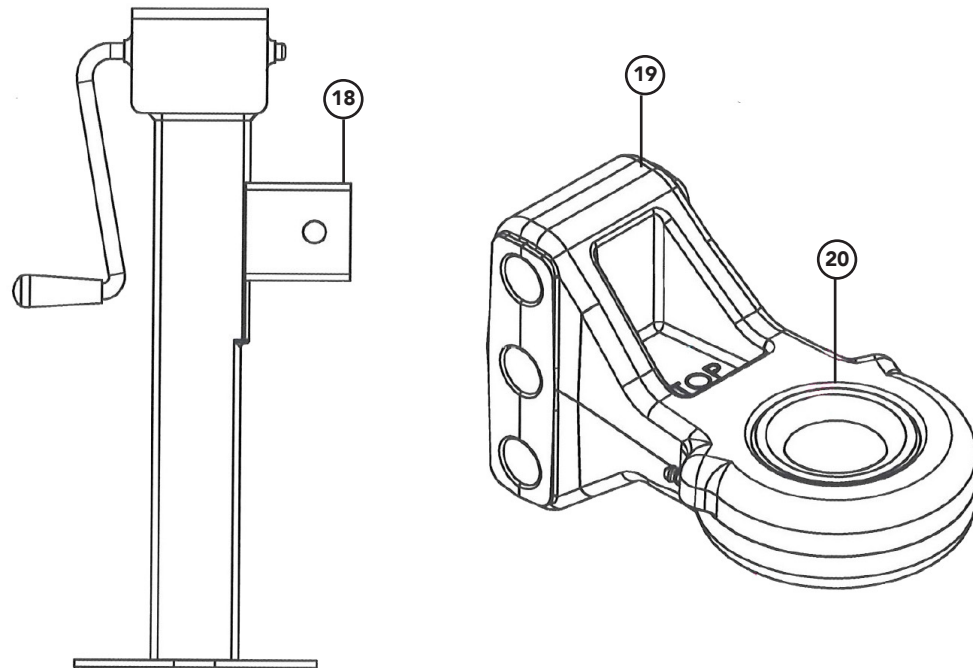
Hydraulic Cooler

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	*305767-AA	Core - Cooler	0
2	*305767-AB	Fan - Assy Cooler	0
3	*305767-AC	Housing - Cooler	0
4	319927	Screw - Sockethead .313-18nc	4
5	319928	Washer - Lock M6	4
6	319929	Screw - Sockethead M6-1 X 20	4
7	20711	Washer - Lock .313 Zn	4
8	20677	Nut - Lock .313-18nc Zn	4
9	20692	Washer - Flat .313 Zn	8

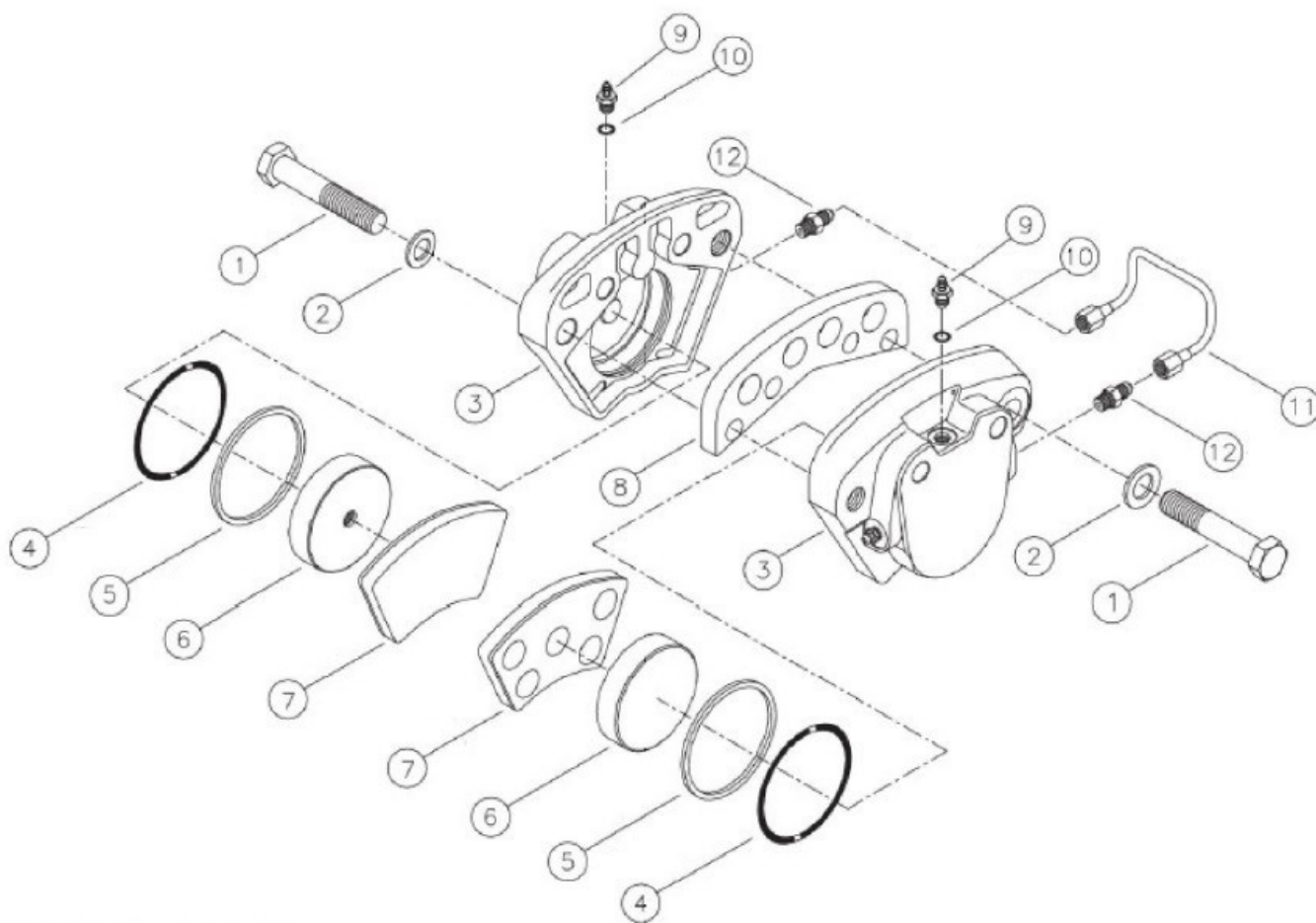
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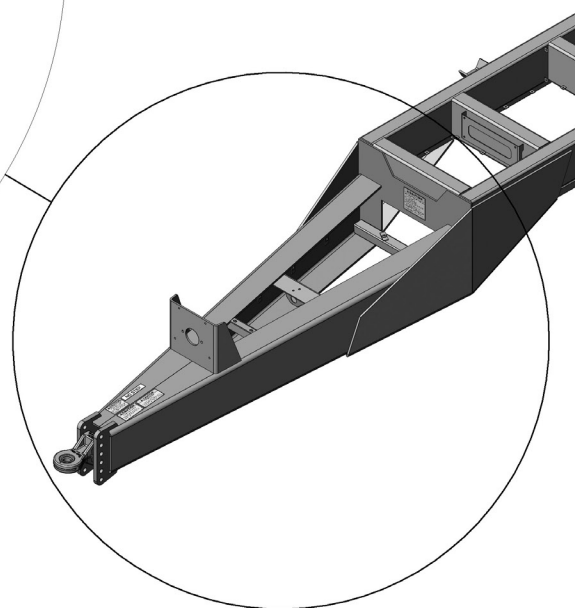
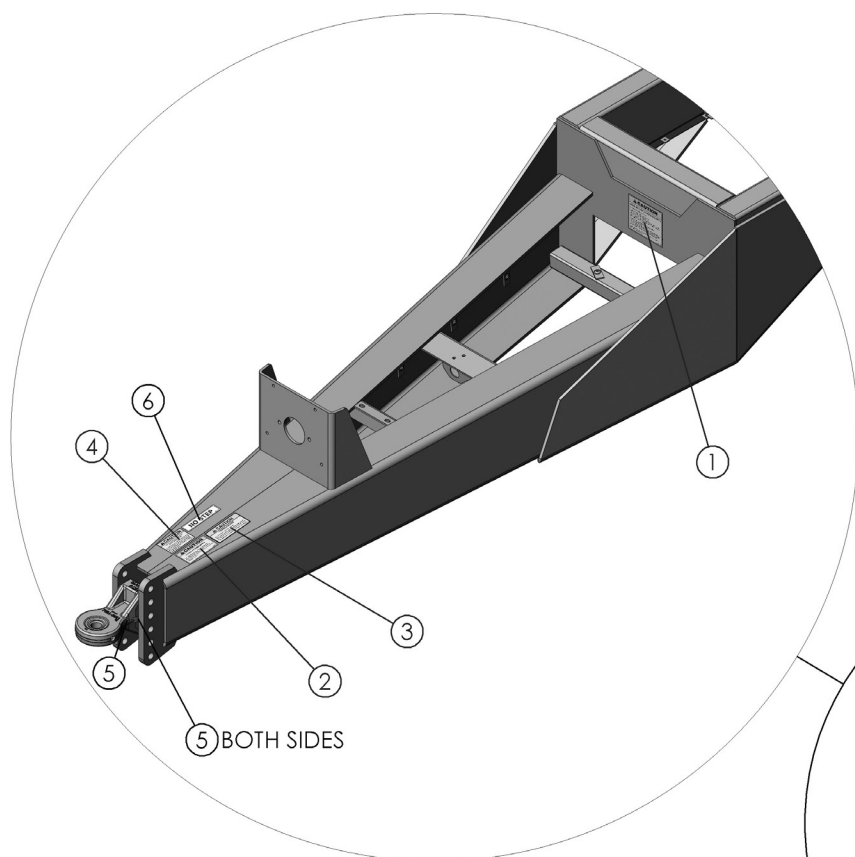
ITEM	PART NO.	DESCRIPTION	QTY
1	318959	Trailer - Tr0952 W/Brakes 16'	1
-	318960	Trailer - Tr0932 W/O Brake 16'	1
2	318591-AA	Inner Bearing	1
3	318591-AB	Inner Race	1
4	318591-AC	Hub (with Races)	1



ITEM	PART NO.	DESCRIPTION	QTY
5	318591-AD	Outer Race	1
6	318591-AE	Outer Bearing	1
7	318591-AF	Washer - Spindle	1
8	318591-AG	Nut - Spindle 2.5" - 12	1
9	318591-AH	Cotter Pin	1
10	318591-AI	Dust Cap	1
11	318591-AJ	Dust Cap Gasket	1
12	318591-AK	Seal	1
13	318591-AL	Bolts	1
14	318591-AM	Wheel Stud	1
-	318591-AN	Wheel Stud - Spherical Washer	1
15	318591-AO	Spindle	1
16	318591-AP	Wheel Nut	1
17	318591-AQ	Hyd. Fitting - Grease - 0.25" MP Straight	1
18	318592-AA	Jack - 9000 lb - With Sleeve	1
19	318593-AA	Hitch - Articulating Power Pin - Category 4 - 3 Hole (2" Ball)	1
20	318593-AB	Hitch - Articulating Ball Insert - 2" - Power Pin - Category 4	1



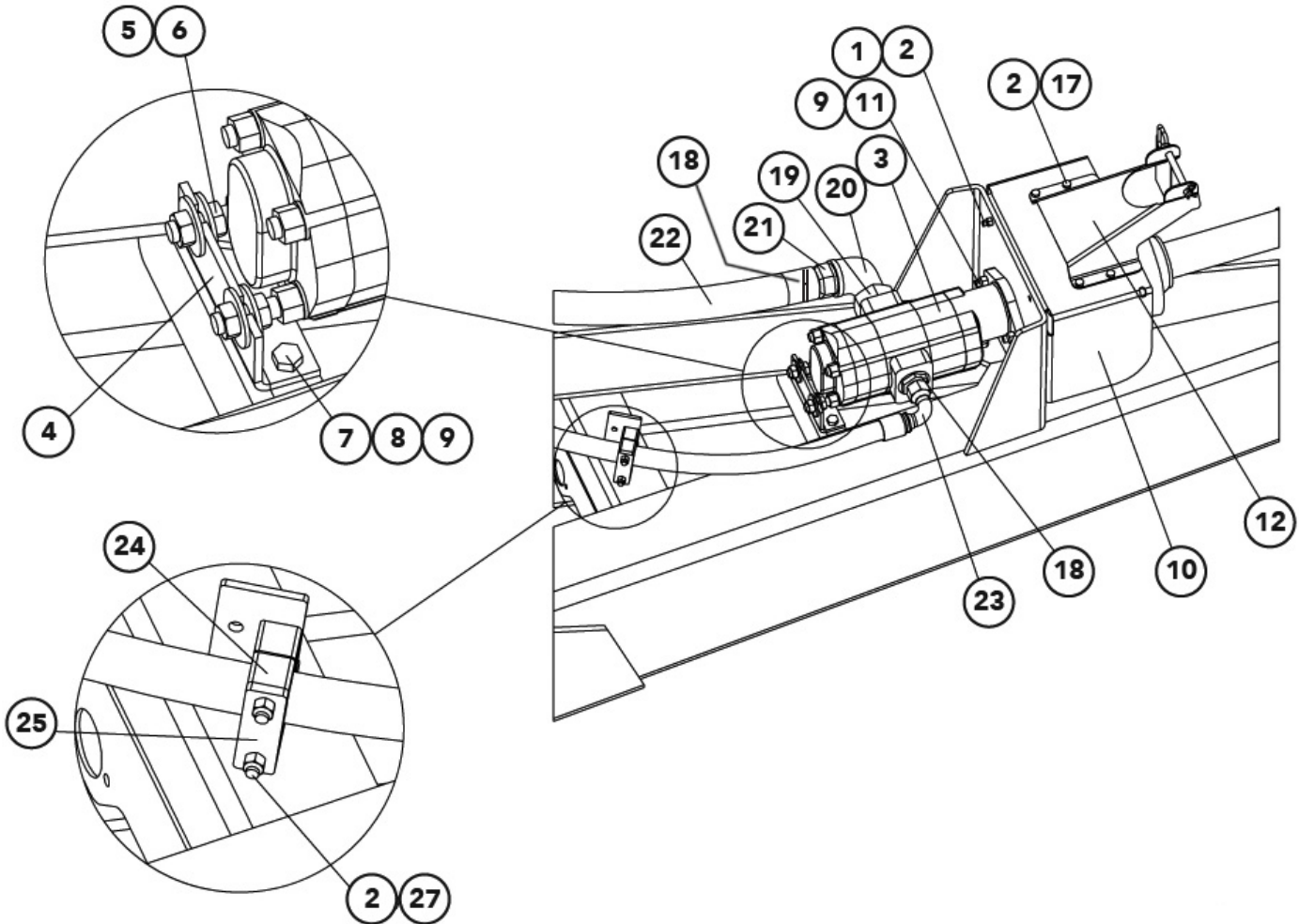
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
4,5,10	318590-AA	Brake - Kit Micro Repair Seal Kit	1
6	318590-AB	Brake - Micro Piston Service	1
7	318590-AC	Brake - Kit Micro Lining 2	1
11	318590-AD	Brake - Assy Micro Tubing	1
12	318590-AE	Brake - Micro Connector Fittng	1
1-12	318590-AF	Brake - Micro 520 Series Calip	1



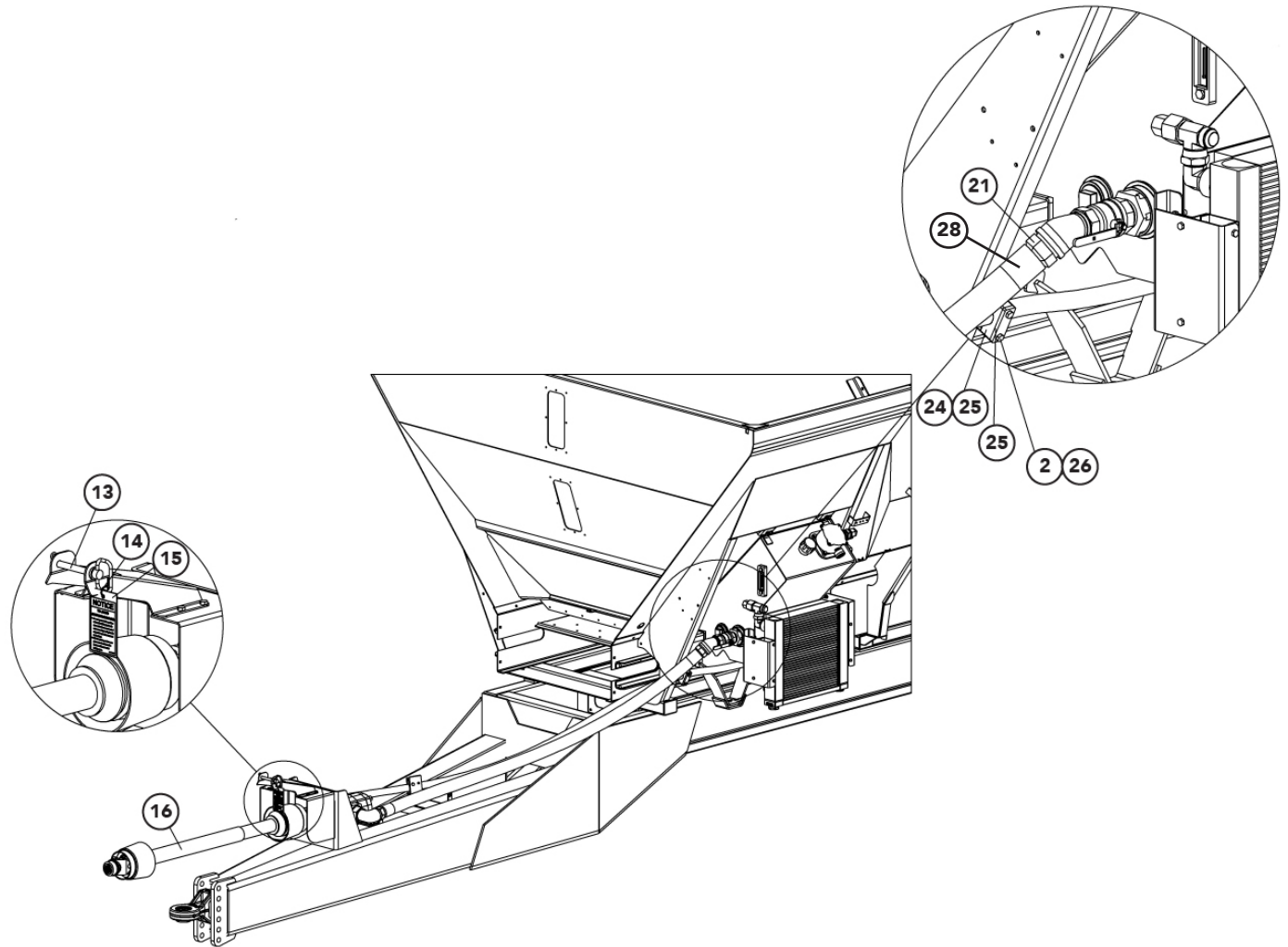
ITEM	PART NO.	DESCRIPTION	QTY
1	305281	Decal - Caution Braking	1
2	313858	Decal - Caution Tow Requirements	1
3	305289	Decal - Caution Tipping	1
4	39017	Decal - No Step	1
5	305239	Decal - Grease	2
6	305298	Decal - Weight Restrictions	1

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Hydraulics-GRP Spinner-PTO



Hydraulics-GRP Spinner-PTO

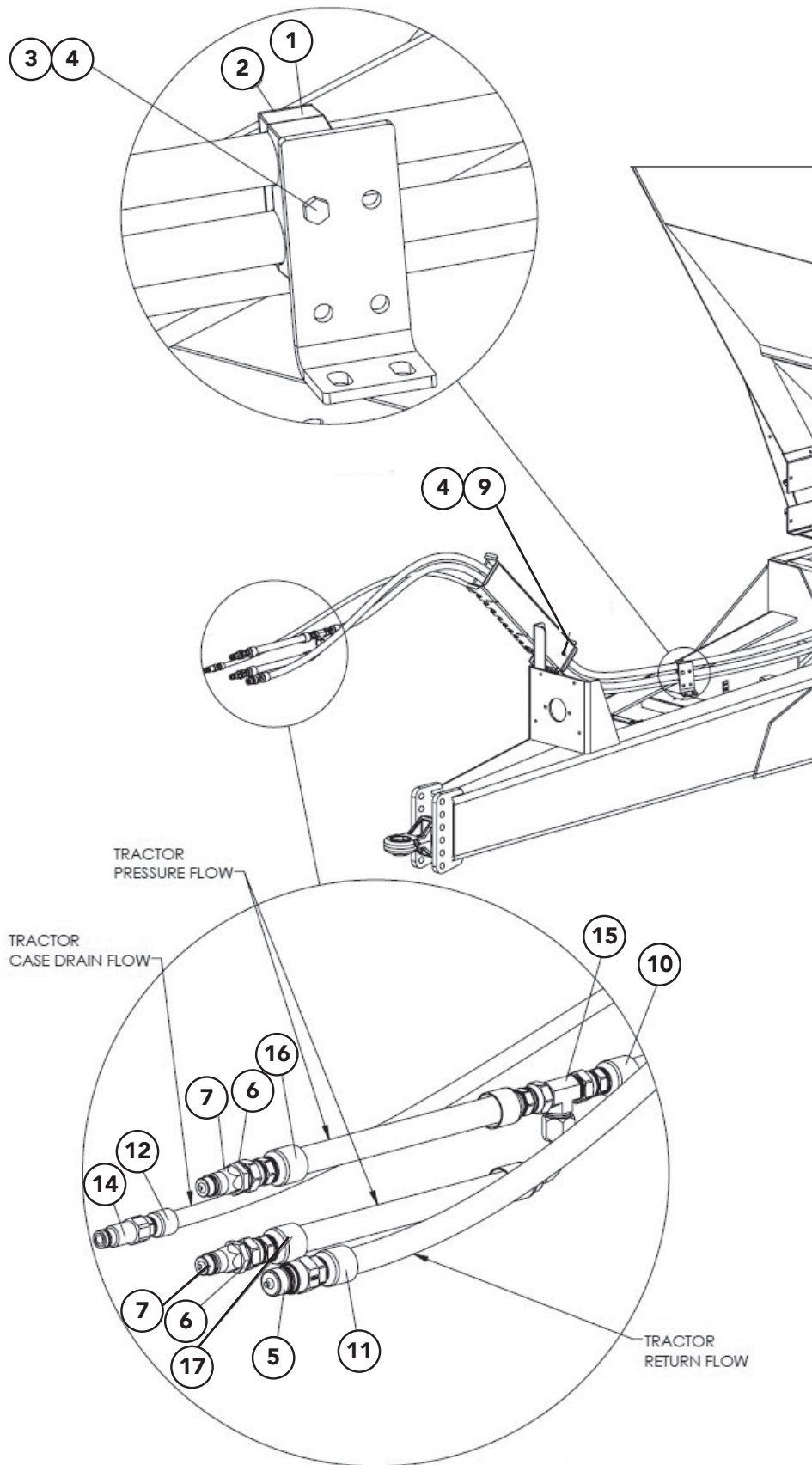


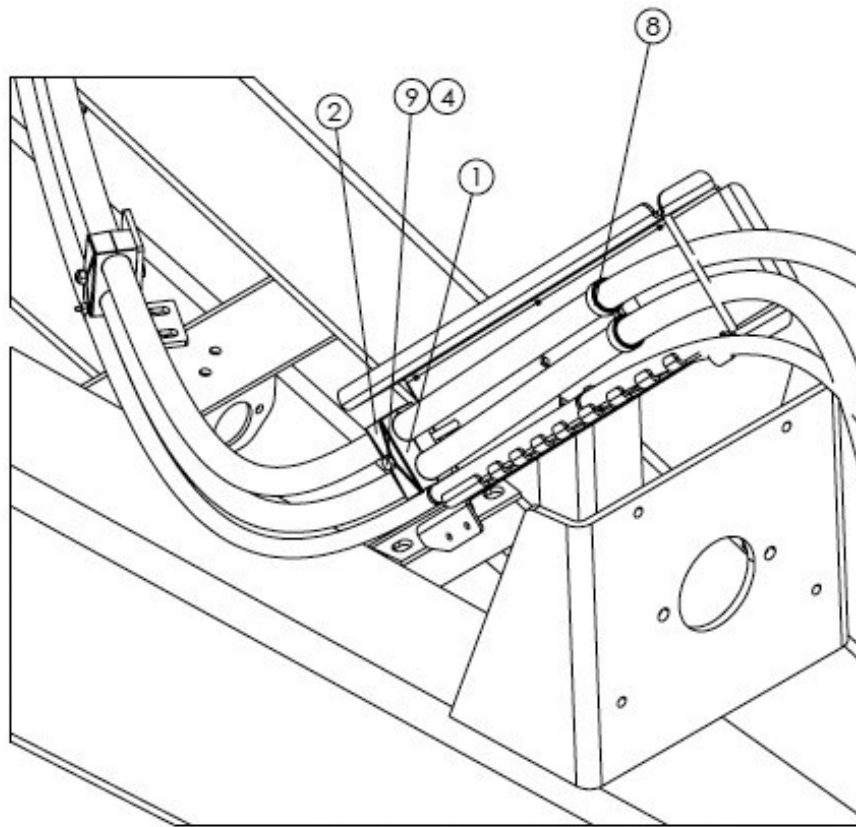
Hydraulics-GRP Spinner-PTO

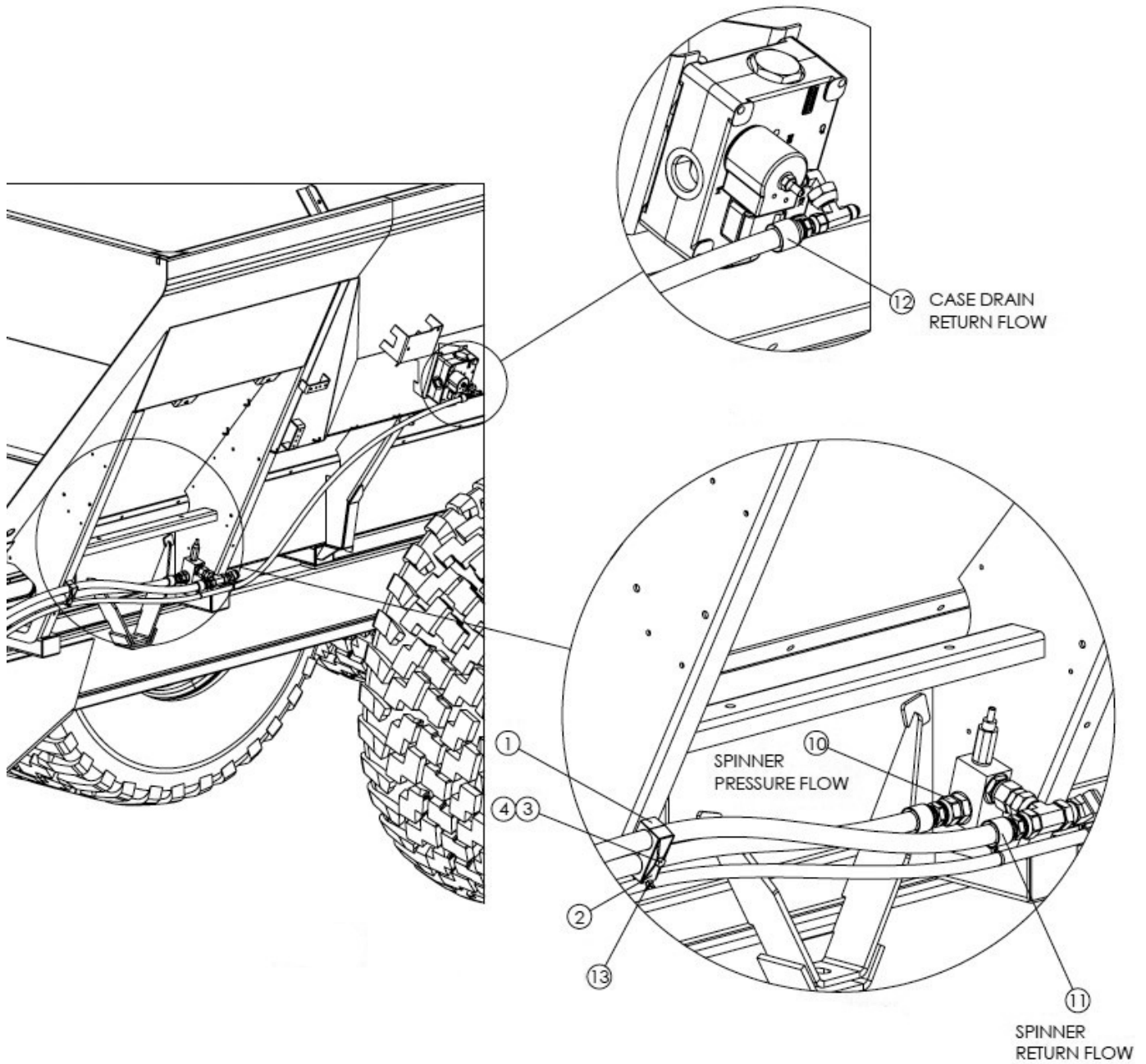
ITEM	PART NO.	DESCRIPTION	QTY
	317405	HYDRAULICS - GROUP SPINNER PTO	
1	20068	Capscrew - .375-16NC X 1.25	2
2	20678	Nut - Lock .375-16NC	10
3	304921	Hydraulic Pump	1
4	305173	Support - Pump	1
5	20697	Washer - Flat .625	4
6	20674	Nut - Hex .625-11NC Plain	4
7	20129	Capscrew - .5-13NC X 1.5	2
8	20695	Washer - Flat .5	2
9	20680	Nut - Lock .5-13NC	4
10	307300	Guard - PTO	1
11	20131	Capscrew - .5-13NC X 2	2
12	307302	Retainer - PTO	1
13	305228	Pin - Hitch .50" X 4"	1
14	308221	Wire Tie - 4 Black	1
15	307322	Tag - Notice To Avoid Machine Damage	1
16	307294	Driveline - CV	1
17	20067	Capscrew - .375-16NC X 1	4
18	34845	Adapter	1
19	305261	Adapter - 2.5" Sae X 2" Npt	1
20	22244	Street Elbow 2" 150#	1
21	29811	End - Hose 2"NPT X 2"Hose	2
22	317288	Hose - 2 X 80 100R4	1
23	317289	Hose - 1" 100R12 X 119" Assy	1
24	305255	Clamp - Hose 1.5"	2
25	305257	Plate - Cover	3
26	20079	Capscrew - .375-16NC X 4	2
27	20077	Capscrew - .375-16NC X 3.5	2
28	22380	Clamp - Hose	4

Trailer Hydraulics

Hydraulics-GRP Spinner-Tractor



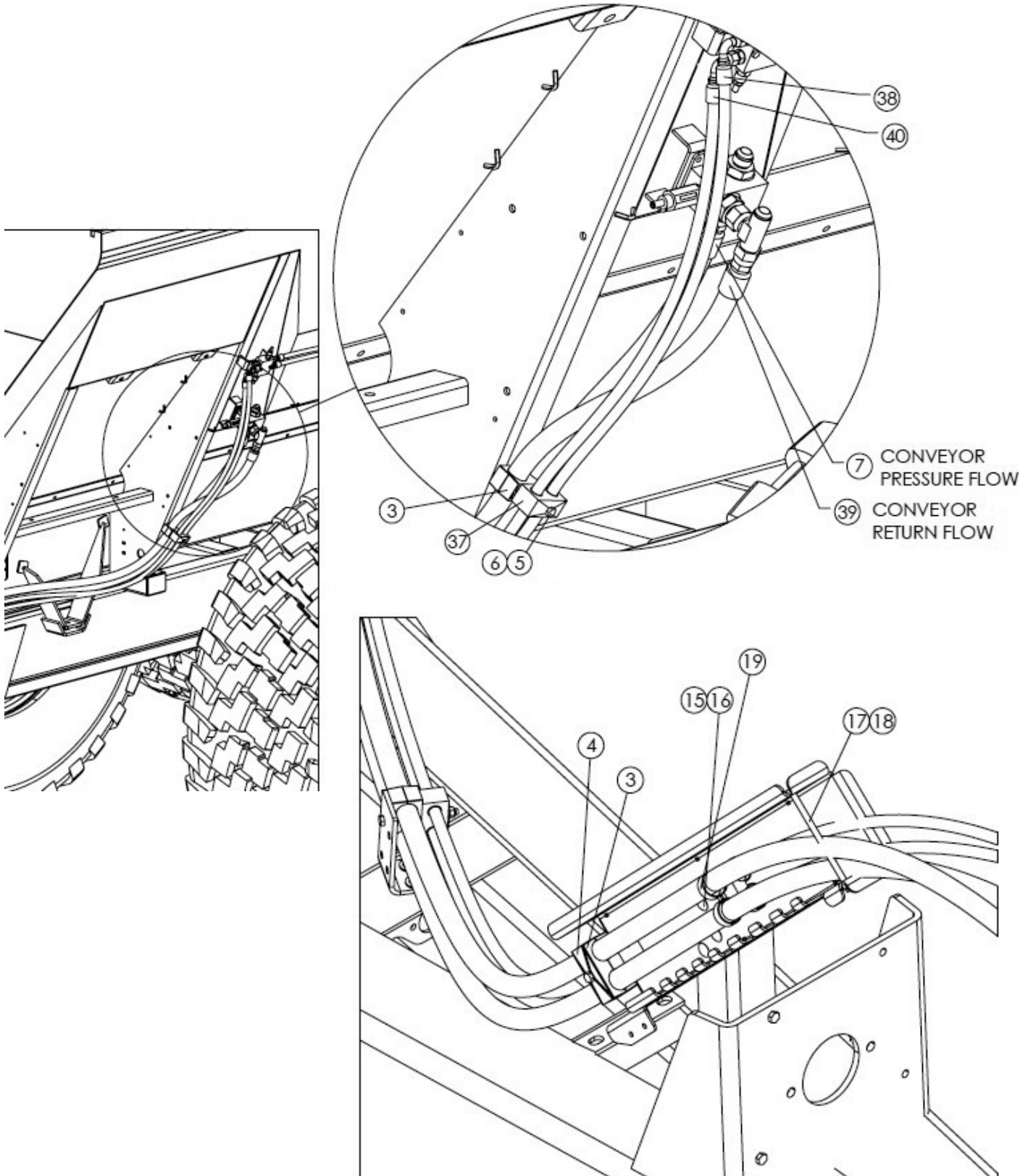




Hydraulics-GRP Spinner-Tractor

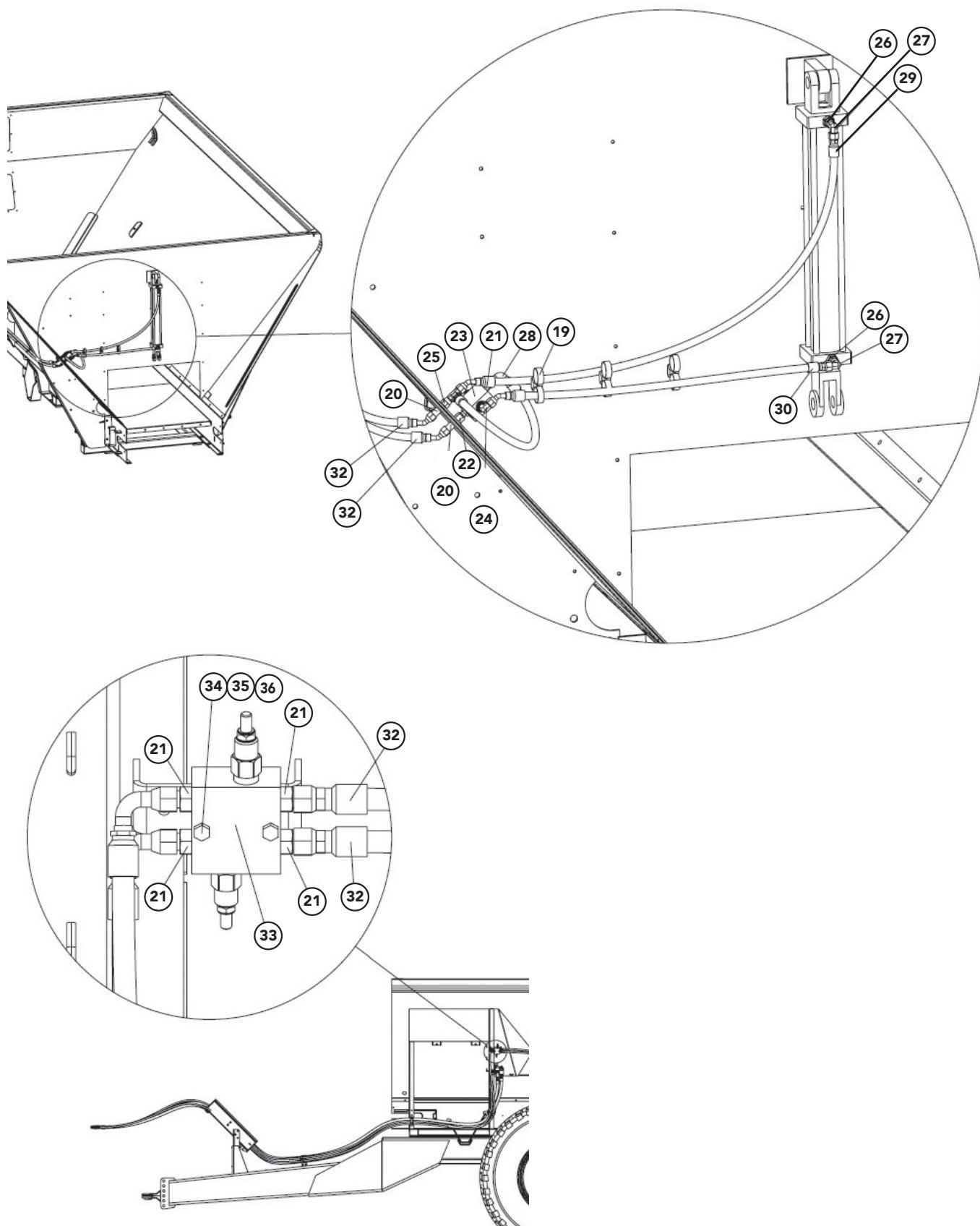
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	317488	HYDRAULICS - GROUP SPINNER TRACTOR	
1	305266	Clamp - Hose 1.18 Double	3
2	305267	Plate - Cover Hose Clamp 304	3
3	71830	Capscrew - .313-18nc X 2.5 SS	2
4	42221	Nut - Lock .313-18nc SS	3
5	309294	Disconnect - Quick .75 Male	1
6	34811	Fitting - 12-8 070120	2
7	305262	Nipple - Qd 1/2 Ag 8 Orb	2
8	310648	Tie - Dual Clamp	10
9	310583	Capscrew - .313-18nc X 4.0 SS	1
10	321185	Hose - Assy .75 X 173 100r12	1
11	317419	Hose - Assy .75 X 223 100r1	1
12	317420	Hose - Assy .375 X 276 100r1	1
13	99674	Strap - Zip Tie 8 Black	16
14	309295	Disconnect - Quick .375 Male	1
15	29792	Fitting - 12-12-12 070401	1
16	321186	Hose - Assy .75 X 48 100r12	1
17	321187	Hose - Assy .75 X 49 100r12	1

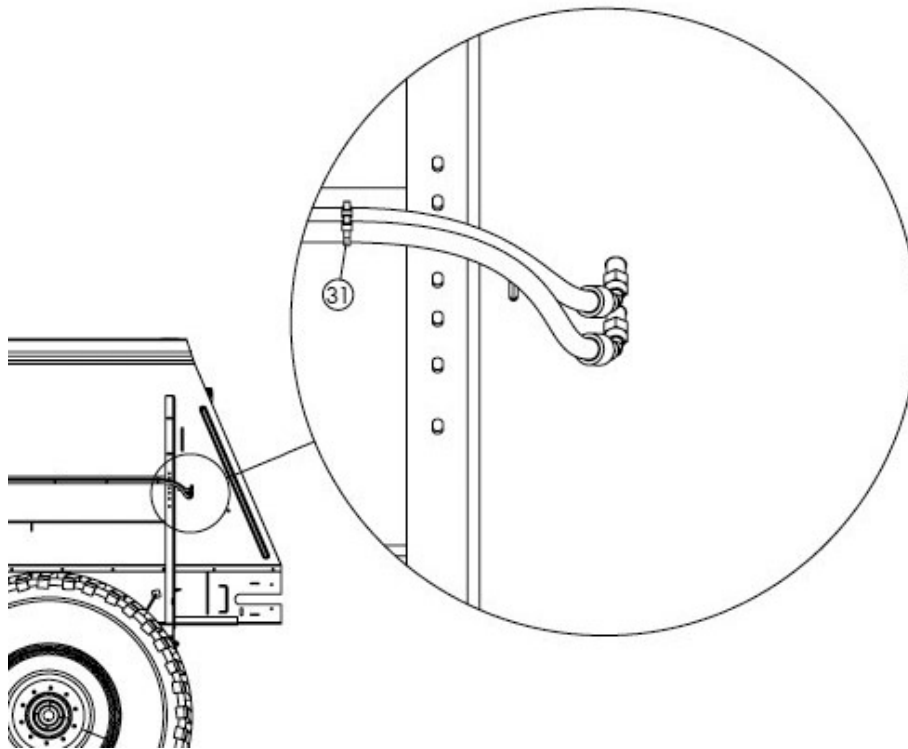




Trailer Hydraulics

Hydraulics - 16' TR0859 PTO - Conveyor - Compost



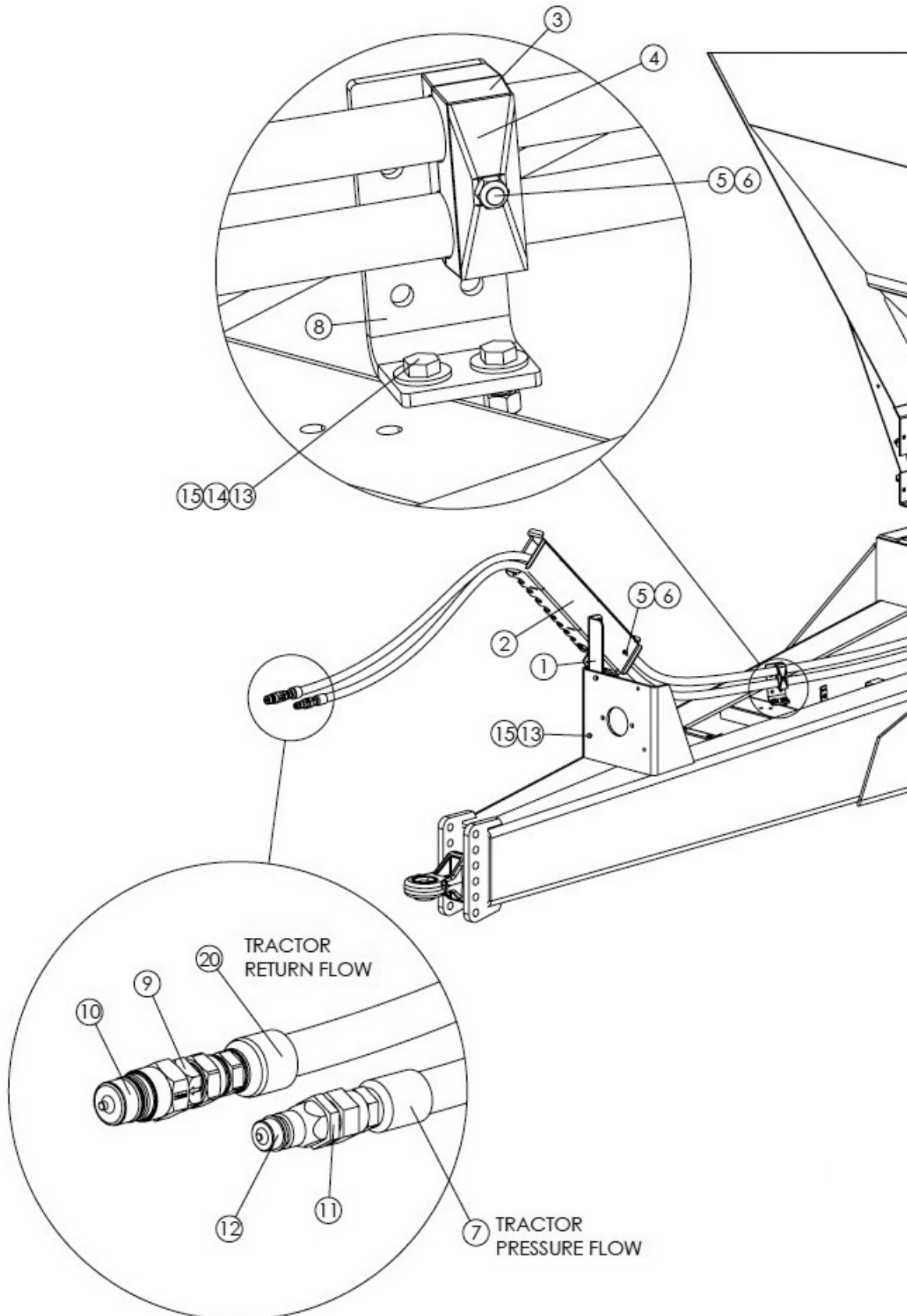
Hydraulics - 16' TR0859 PTO - Conveyor - Compost


ITEM	PART NO.	DESCRIPTION	QTY
	320662	Hydraulics - Group 16'Conveyor	
1	312885	Angle - Upright	1
2	313843	Channel - Hose Guide	1
3	305266	Clamp - Hose 1.18 Double	4
4	305267	Plate - Cover Hose Clamp 304	1
5	310583	Capscrew - .313-18nc X 4.0 SS	4
6	42221	Nut - Lock .313-18nc SS	4
7	317291	Hose - Assy .75 X 259 100r2	1
8	317396	Plate - Clamp	1
9	305263	Valve - Check 12jic X 12orb	1
10	309294	Disconnect - Quick .75 Male	1
11	34811	Fitting - 12-8 070120	1
12	305262	Nipple - Qd 1/2 Ag 8 Orb	3
13	20068	Capscrew - .375-16nc X 1.25	4
14	20693	Washer - Flat .375 Zn	2
15	20678	Nut - Lock .375-16nc Zn	7

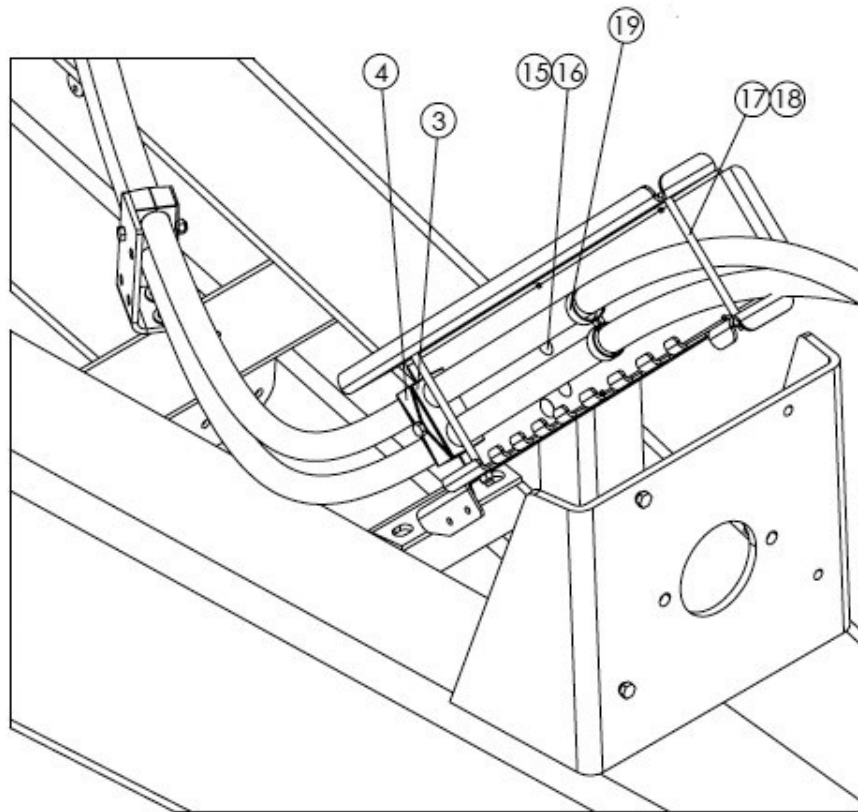
Hydraulics - 16' TR0859 PTO - Conveyor - Compost

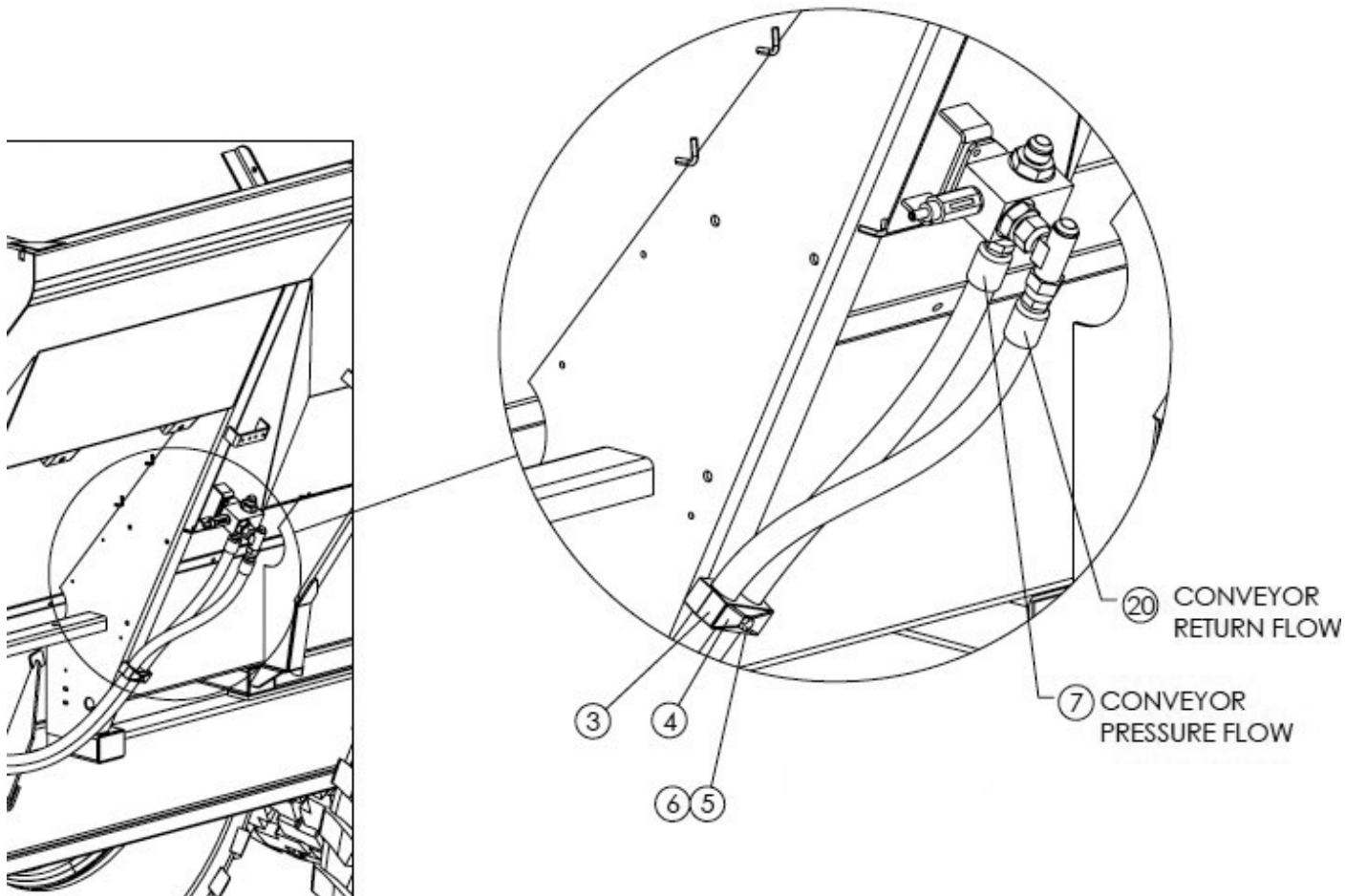
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
16	20318	Bolt - Carriage .375-16nc X 1	3
17	20056	Capscrew - .313-18nc X 6	1
18	20677	Nut - Lock .313-18nc Zn	1
19	310648	Tie - Dual Clamp	16
20	305514	Fitting - 6-6 070601 Bulkhead	2
21	29824	Fitting - 6-6 070120	5
22	315984	Fitting - 6-6 S1040-30 Non Std	1
23	315987	Valve - Counter Balance	1
24	29774	Fitting - 6-6 070220	1
25	314850	Fitting - 6-6-6 070432s 304	1
26	84246	Adapter - Connector .75sae X .5625JIC	4
27	34816	Fitting - 6-6 070221	2
28	308841	Hose - Assy .38 100r1 X 20.5	1
29	305521	Hose - Assy .38 X 48.75 100r1	1
30	304907-X1	Hose - Assy .375 X 31 100r1	1
31	99674	Strap - Zip Tie 8 Black	10
32	305528	Hose - Assy .38 X 140 100r1	2
33	310452	Valve - Cross Relief 1000psi	1
34	41669	Capscrew - .25-20nc X 1.75 SS	2
35	36418	Washer - Lock .25 SS	2
36	36412	Nut - Hex .25-20nc SS	2
37	75036	Clamp - Tubing Twin .75	4
38	317294	Hose - Assy .38 X 271 100r1	1
39	320287	Hose - Assy .75 X 259 100r2	1
40	320288	Hose - Assy .38 X 271 100r1	1

Hydraulics - 16' TR0859 PTO - Conveyor - Fertilizer



Hydraulics - 16' TR0859 PTO - Conveyor - Fertilizer

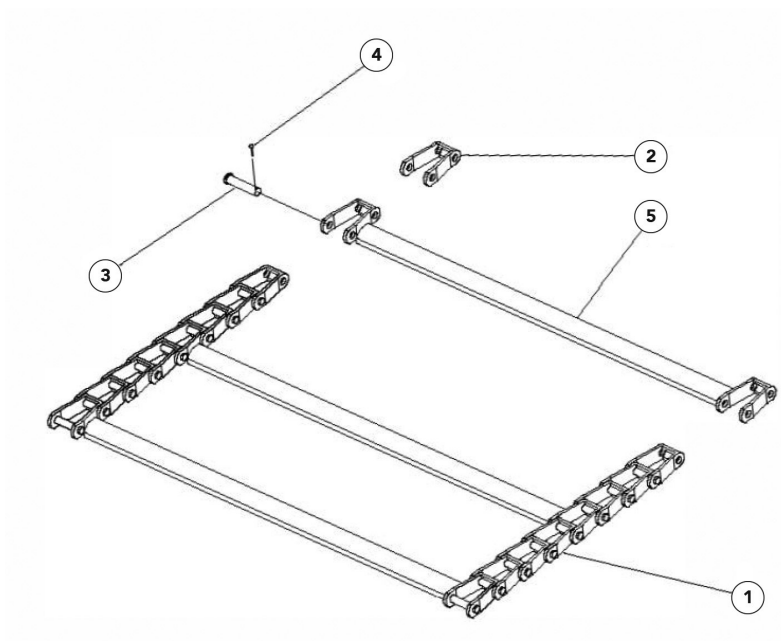




Hydraulics - 16' TR0859 PTO - Conveyor - Fertilizer

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	317290	Hydraulics - Assy Conveyor	
1	312885	Angle - Upright	1
2	313843	Channel - Hose Guide	1
3	305266	Clamp - Hose 1.18" Double	4
4	305267	Plate - Cover Hose Clamp 304	4
5	71830	Capscrew - .313-18NC X 2.5 SS	4
6	42221	Nut - Lock .313-18NC SS	4
7	317291	Hose - Assy .75 X 259 100r2	2
8	317396	Plate - Clamp	1
9	305263	Valve - Check, 12 JIC X 12 ORB	1
10	309294	Disconnect - Quick .75 Male	1
11	34811	Adapter - Connector	1
12	305262	Nipple - QD 1/2" Ag, 8 ORB	1
13	20068	Capscrew - .375-16NC X 1.25	4
14	20693	Washer - Flat .375	2
15	20678	Nut - Lock .375-16NC	7
16	20318	Bolt - Carriage .375-16NC X 1	3
17	20056	Capscrew - .313-18NC X 6.0	2
18	20677	Nut - Lock .313-18NC	2
19	310648	Tie - Dual Clamp	8
20	320287	Hose - Assy .75 X 259 100R2	1

#1 Bar Chain Conveyor

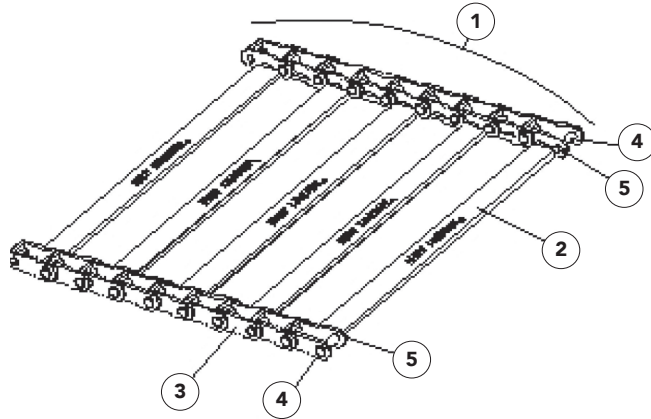


#1 – Cross bars every 3rd link

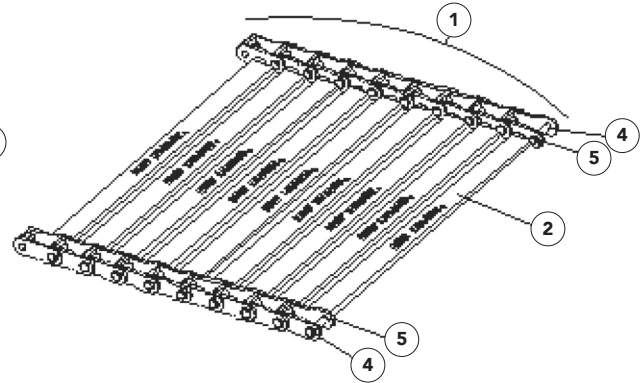
ITEM	PART NO.	DESCRIPTION	QTY
1	305769	Chain - 44LK #1 D667K 34 NL	4
2	36699	Link – Pintle	AR
3	36697	Pin – Chain	8
4	20817	Pin – Cotter	8
5	95850-X1	Cross Bar Wldmt	AR

AR – As required

#2 & #3 Bar Chain Conveyors



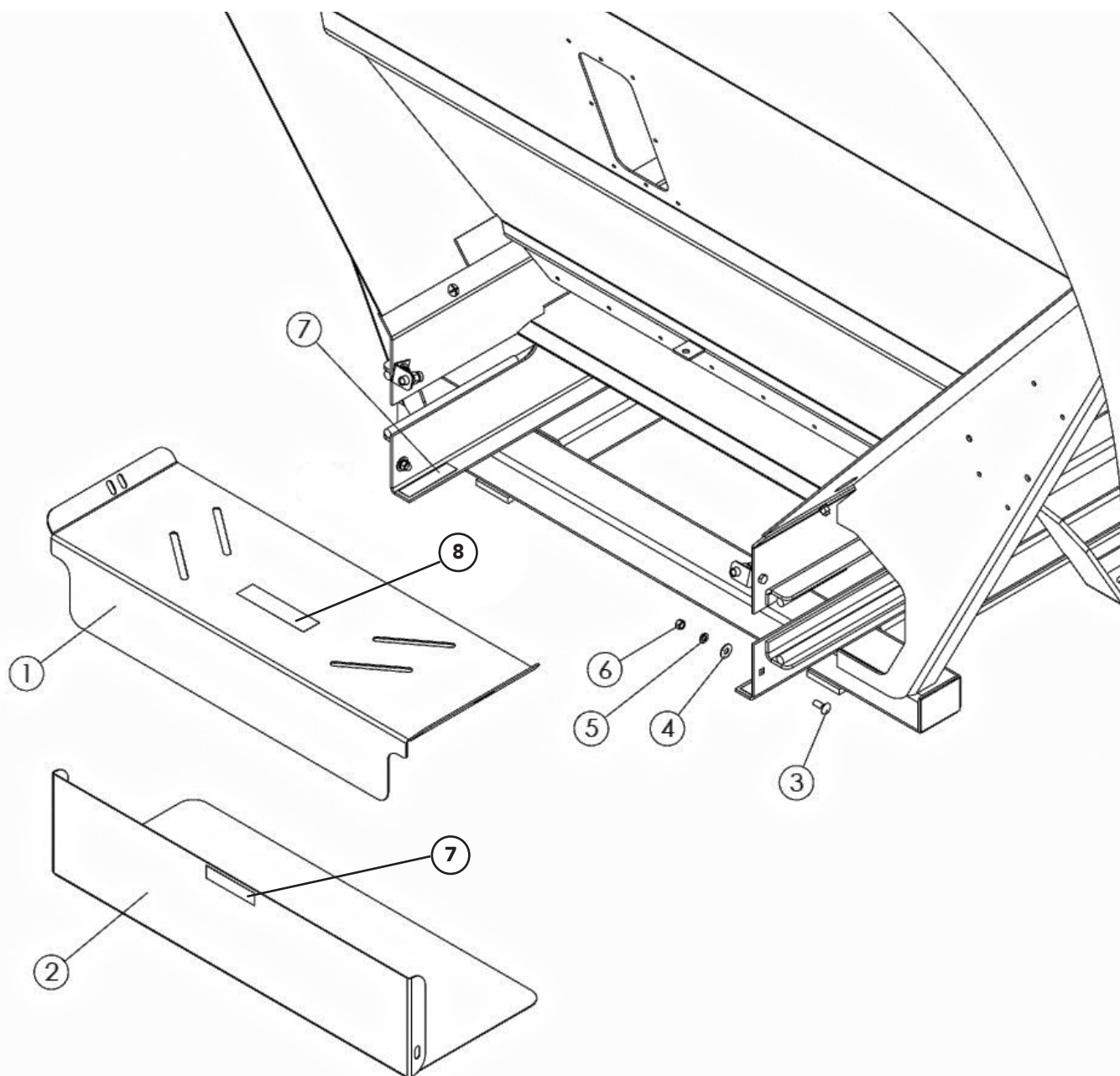
#2 – Cross bars every other link



#3 – Cross bars every link

ITEM	PART NO.		DESCRIPTION	QTY	
	#2	#3		#2	#3
1	304465-AD	304466-AD	Chain - Assy 16'	1	1
2	95850	95850	Crossbar Wldmt	22	44
3	36699	36699	Link – Pintle Chain	AR	AR
4	36697	36697	Pin – Pintle Chain	8	8
5	20817	20817	Pin – Cotter	8	8

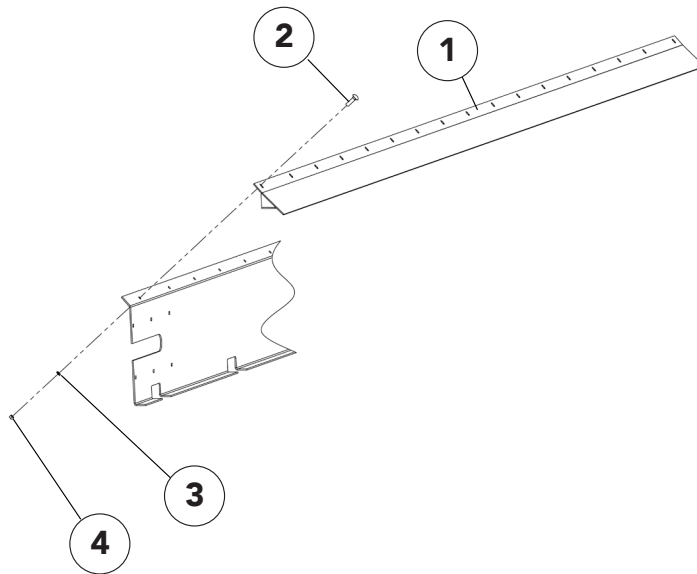
AR - As Required



Guard - Group Front Cont.

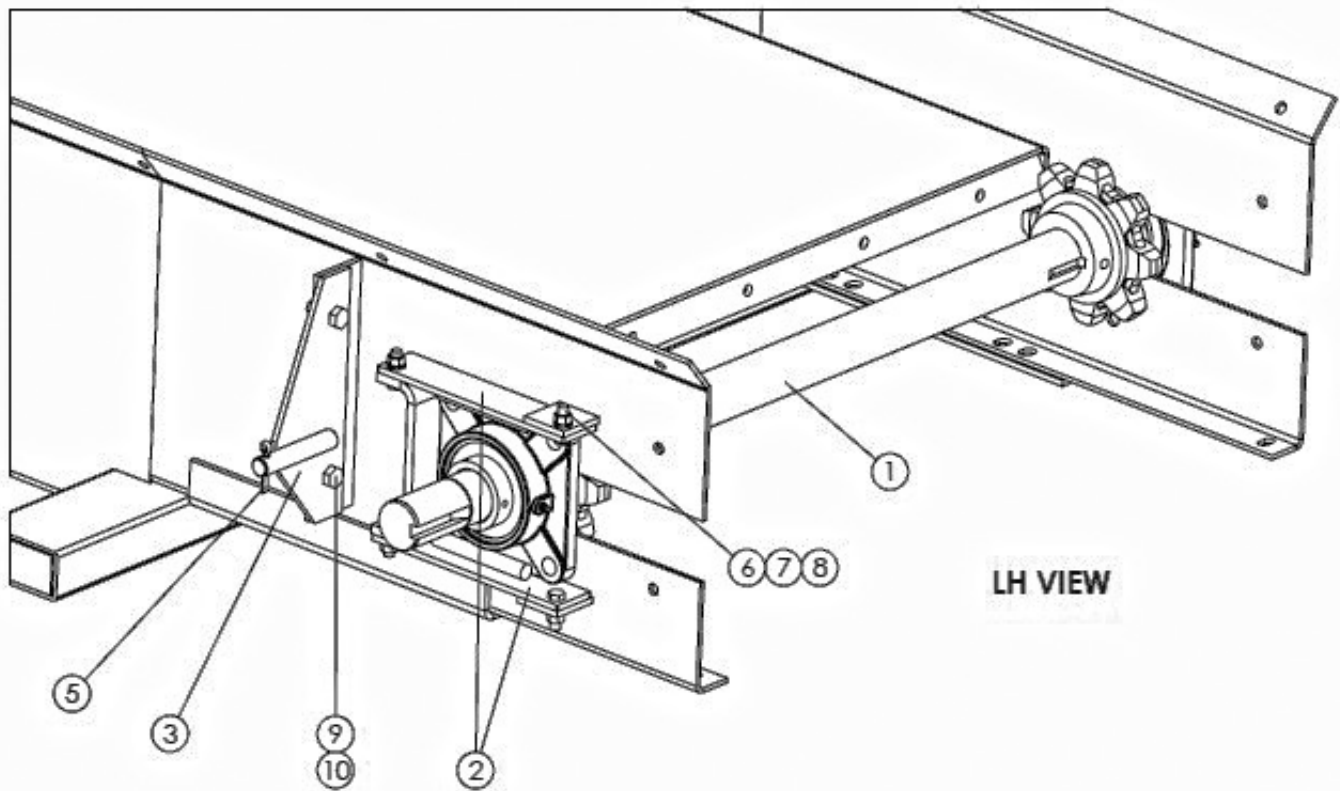
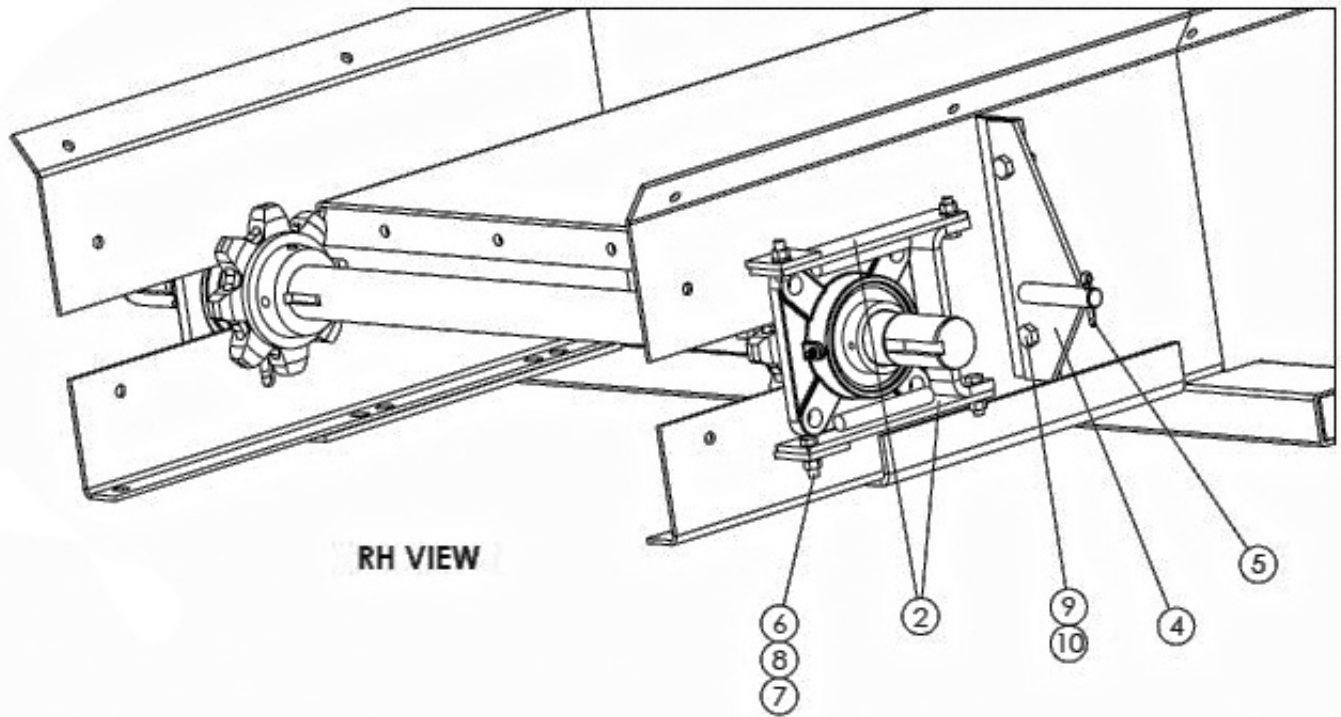
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	315280	Guard - Front Conveyor Top	1
2	315281	Guard - Front Conveyor Bottom	1
3	36408	Bolt - Carriage .375-16NC X 1	2
4	36425	Washer - Flat .375 SS	2
5	36420	Washer - Lock .375 SS	2
6	36414	Nut - Hex .375-16NC SS	2
7	308191	Decal - Guard Is Missing	3
8	39017	Decal - No Step	1

Chain Shields



ITEM	PART NO.	DESCRIPTION	QTY
1	305450-AD	Shield - Chain Wldmt 16' 304	2
2	71829	Screw - Truss Head .375-16NC X 1 SS	17
3	36420	Washer – Lock 3/8 SS	34
4	36414	Nut – Hex 3/8 SS	34
5	*98321	Screw - Truss Head .375 X 1.25	17
6	*313047	Mount - Cable Tie .375	17
7	*312964	Clip - Harness Mounting	2
8	*56858	Capscrew - .313-18NC X .75 SS	2
9	*42221	Nut - Lock .313-18NC SS	2

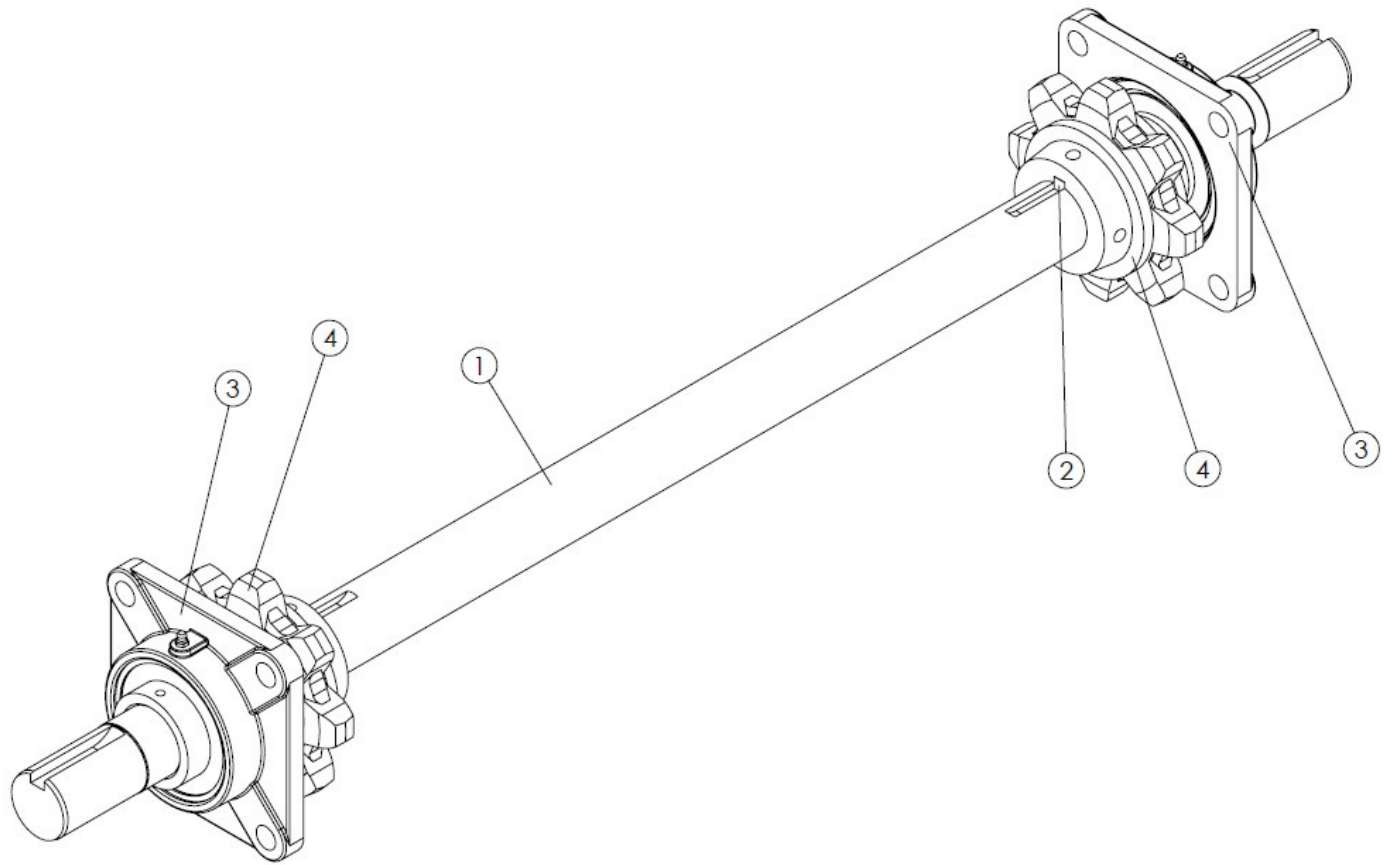
* - Not Shown



Conveyor Drive

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	303319	Shaft - Assy Drive 34" Bottom	1
2	82882	Guide - Wldmt Bearing CS	4
3	82550	Mount - Wldmt Torque Arm LH	1
4	82549	Mount - Wldmt Torque Arm RhH CS	1
5	20833	Pin - Cotter .25 X 1.5 ZN	2
6	20068	Capscrew - .375-16NC X 1.25	8
7	20644	Nut - Hex .375-16NC ZN	8
8	20712	Washer - Lock .375 ZN	8
9	20128	Capscrew - .5-13NC X 1.25 GR5	4
10	20680	Nut - Lock .5-13NC ZN	4

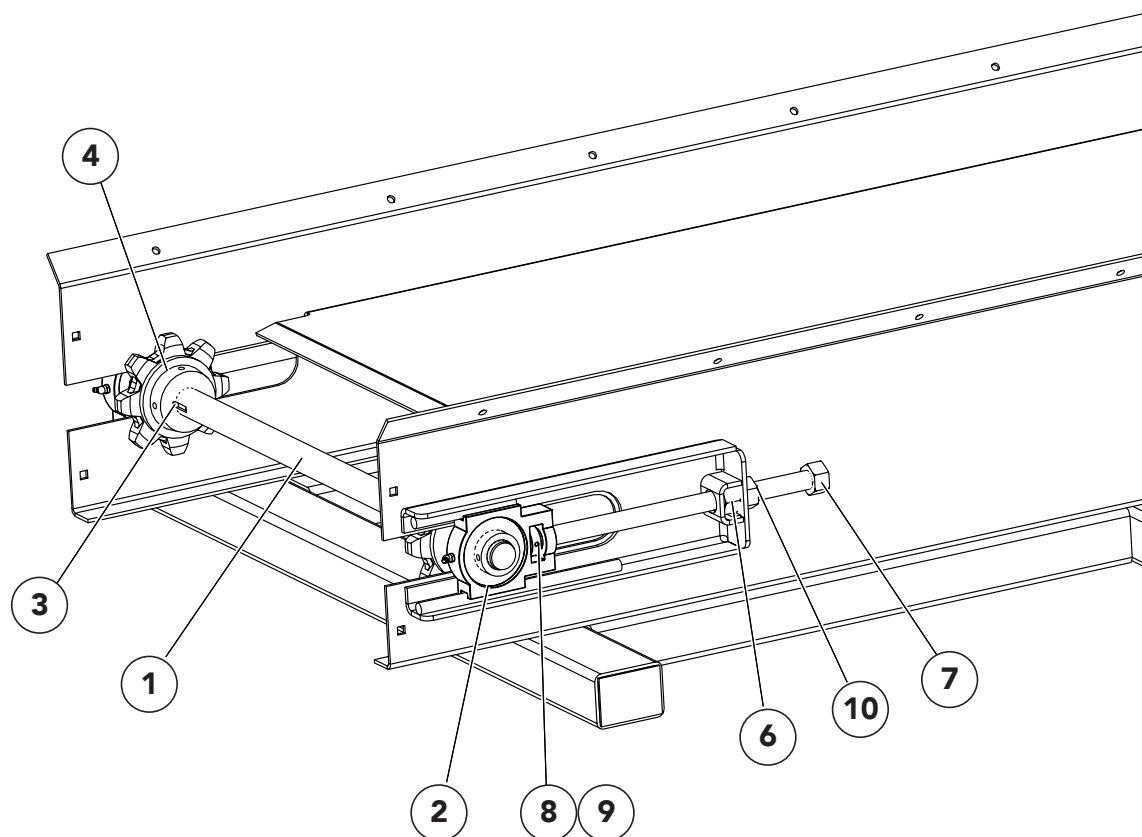
Conveyor Drive Shaft



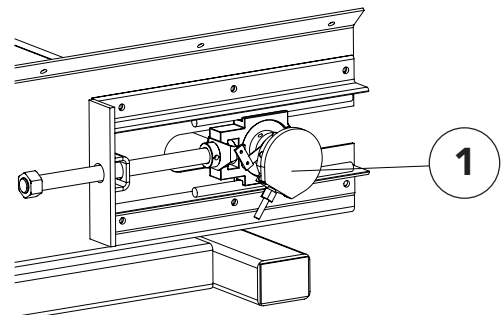
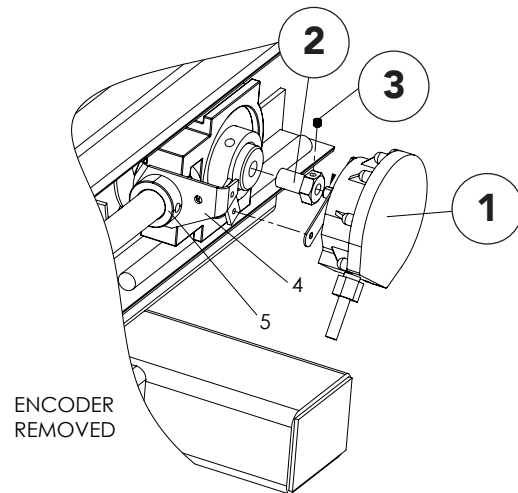
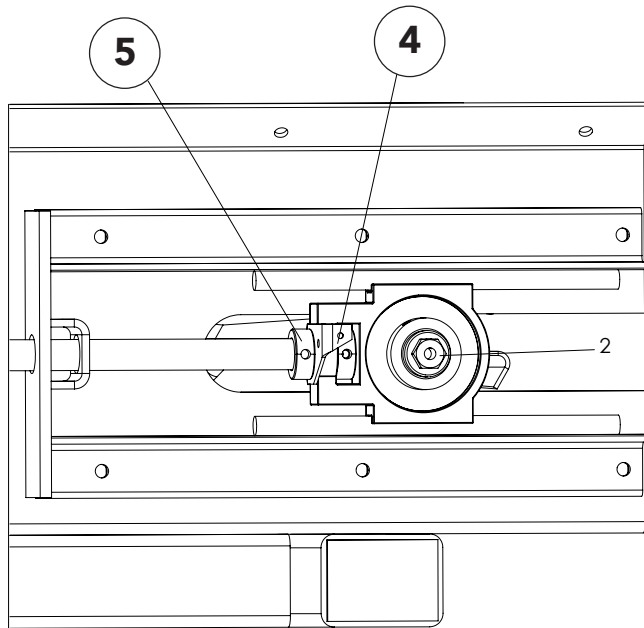
ITEM	PART NO.	DESCRIPTION	QTY
1	303304	Shaft - Drive 2 X 46.875	1
2	6131	Key - Sq .375 X 2.5	2
3	*20748	Screw - Set .375-16nc X .375	4
4	6465	Bearing - 4bf 2 Bore	2
5	88276	Sprocket - 8 Tooth 2 Bore	2

* Not Shown

Conveyor Idler

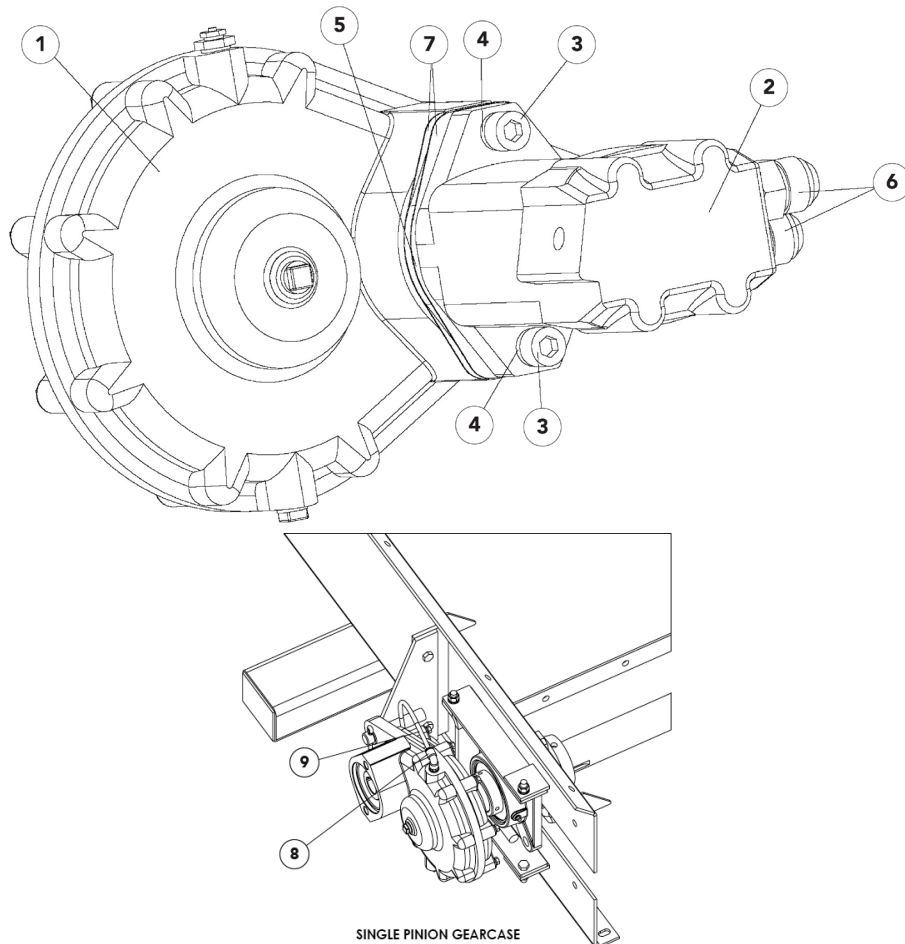


ITEM	PART NO.	DESCRIPTION	QTY
	303320	Idler - Shaft Assy, Includes 1 - 4	
1	310640	Shaft - Idler 1-1/2	1
2	22511	Bearing - Take Up Zerk - Grease 1/8 x 45°	2 2
3	2135	Key - Sq 5/16 x 2-1/2	2
4	97051 20735	Sprocket - 8 Tooth 1-1/2 Bore Screw - Set 1/4-20NC x 1/4	2 2
5	Not Used		
6	39110	Nut - Wldmt	2
7	36508	Screw - Wldmt Adjustment SS	2
8	30725	Collar	2
9	20925	Pin - Roll	2
10	36509	Nut - Hex 1-8NC SS	2



ITEM	PART NO.	DESCRIPTION	QTY
1	303994	Encoder – 180 with Hardware	1
2	310601	Coupler - Rate Sensor SS	1
3	310603	Screw - Set 1/4-20NC x 5/16 SS	1
4	81949	Bracket - Sensor, Idler Mount	1
5	2696	Collar - Set 1"	1

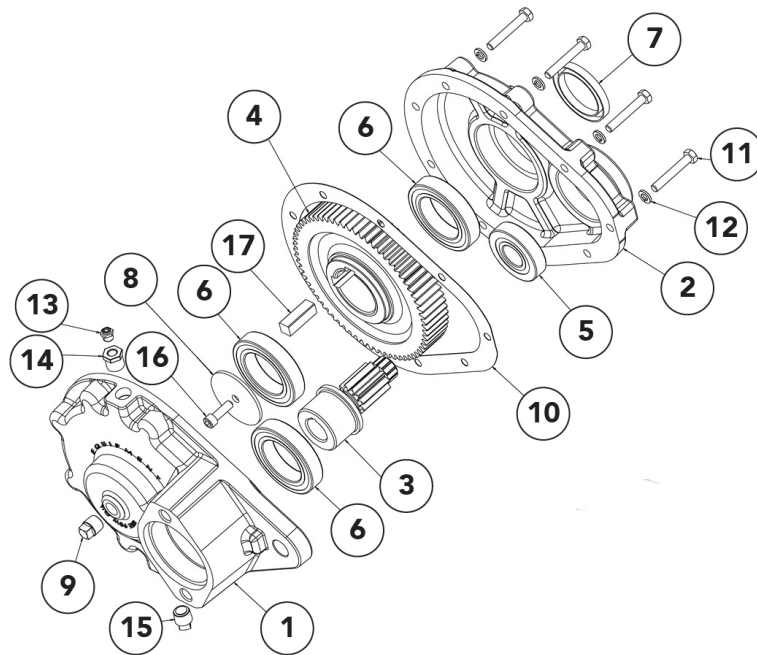
Gearcase Assembly



ITEM	PART NO.	DESCRIPTION	QTY
	305578	Gearcase Assy - 9.6 CID 2000 Series, Includes Items 1 - 7	2
1	36671	Gearcase - 6.1	1
2	56270	Motor - Hydraulic 2000 Series 9.6 CID	1
3	305098	Cap Screw - 1/2-13 x 1-3/4	2
4	30227	Washer - Lock Socket HD 1/2	2
5	34650	Spacer - Gearcase Motor	1
6	29753	Fitting - 12-10 07120	2
7	74524	Gasket	2
8	306891	Fitting - 4-2 630202K	1
9	9005-0-7761	Tubing - 1/4 OD Air Brake Black	1.5 ft.
10	*311174	Seal - Assy V-Ring Gear Case	1
	*311172	Seal - V Ring 2"	

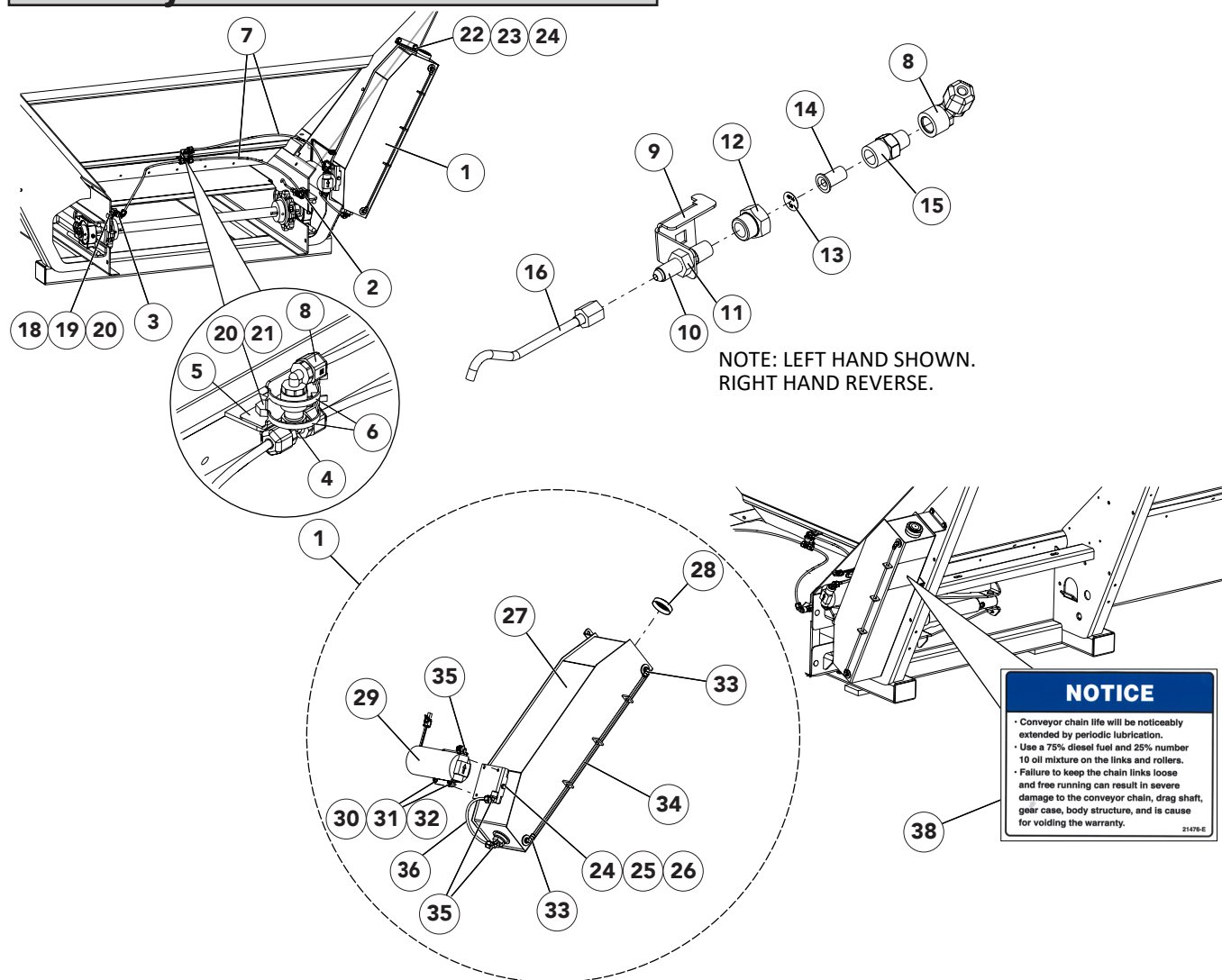
* - Not Shown

Gearcase Service Parts



ITEM	PART NO.	DESCRIPTION	QTY
	36671	Gearcase – Assy Single Pinion	
	304269-AB	Parts – Service, Includes 1–17	
1	304559	Housing – Outboard	1
2	304560	Housing – Inboard	1
3	304561	Gear – Pinion 11 Tooth	2
4	304562	Gear – Driven 67 Tooth	1
5	37007	Bearing	2
6	37008	Bearing	4
7	37006	Seal – Oil	1
8	38979	Washer – Flat 2-1/2 x 11/32	2
9	6031	Plug – Pipe	1
10	304563	Gasket – Housing	1
11	20040	Cap Screw – 5/16NC x 2	10
12	20711	Washer – Lock 5/16	10
13	2564	Cap – Breather	1
14	27465	Bushing – Pipe 1/8 x 3/8	1
15	21490	Plug – Pipe Magnetic	1
16	38980	Screw – Allen Head 5/16-18 x 1	1
17	37010	Key – 1/2 x 1/2 x1-1/2	2

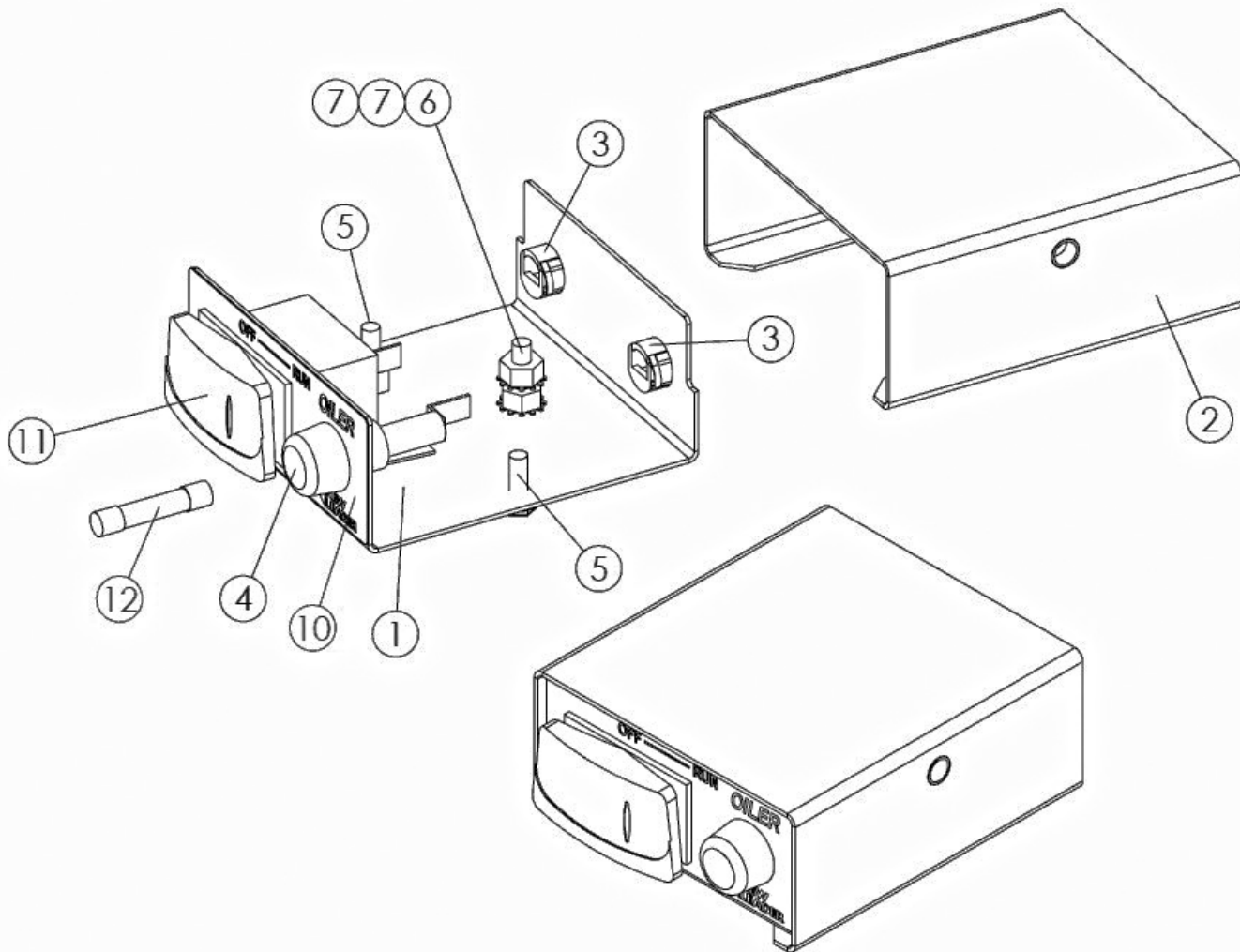
Conveyor Chain Oiler



ITEM	PART NO.	DESCRIPTION	QTY
1	314237	Tank - Assy Chain Oiler, Includes Items 24 - 37	1
2	314019	Nozzle - Assy LH, Includes Items 8 - 16, 37	1
3	314020	Nozzle - Assy RH, Includes Items 8, 10 - 17, 37	1
4	309905	Tee - HDPP 1/4 NPT Male x 1/4 Tube	1
5	306804	Bracket - Coupling	1
6	99674	Tie - Wire	2
7	301338	Tubing - Black 1/4" Nylon	28" 1 22" 2
8	309904	Elbow - HDPP 1/4 NPT Fem x 1/4 Tube	3
9	314016	Angle - Nozzle Mount LH	1
10	314012	Fitting - 4-4 070602	2

Conveyor Chain Oiler Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
11	314261	Fitting - 4 070118	2
12	314014	Fitting - Outlet 1/4 NPT Fem x 1/4 TT Fem Nylon	2
13	314013	Plate - Orifice SS	2
14	306651	Strainer - w/ Check Valve	2
15	314015	Fitting - Adapter 1/4 NPT Male x 1/4 TT Male Nylon	2
16	314018	Nozzle - Tube 304	2
17	314017	Angle - Nozzle Mount RH	1
18	36398	Bolt - Carriage 3/8-16NC x 1 SS	2
19	36425	Washer - Flat 3/8 SS	4
20	72054	Nut - Lock 3/8-16NC SS	3
21	36293	Cap Screw - 3/8-16NC x 3/4 SS	1
22	36423	Washer - Flat 1/4 SS	8
23	42034	Nut - Lock 1/4-20NC SS	4
24	36393	Cap Screw - 1/4-20NC x 3/4 SS	5
25	36418	Washer - Lock 1/4 SS	1
26	304409	Mount - Pump	1
27	305754	Tank - Wldmt Chain Oiler, Includes Item 28	1
28	21980	Cap - Vented	1
29	304390	Pump - Assy w/ Connector	1
	304834	Diaphragm - 1.1 GPM 30 PSI	1
	303730-AB	Connector - Weatherpack Female	1
	303730-CC	Terminal - Fem Sealed Sleeve	2
	303730-EB	Seal - Cable Lt Gray 3.49-2.81	2
30	44454	Screw - Socket Head #10-24NC x 1 SS	4
31	171052	Washer - Flat #10 SS	8
32	56355	Nut - Lock #10-24NC SS	4
33	301337	Fitting - 90° Male 1/8 NPT	2
34	306437	TUBE - .25OD X .18ID CLEAR	2.031'
35	309902	Elbow - HDPP 3/8 NPT Male x 1/4 Tubing	3
36	301338	Tube - 1/4 Black Nylon	8" 1
37	*306670	Tape - Thread Seal PTFE Yellow Gas Line	AR
38	21476	Decal - Notice, Conveyor Chain Life	1
* - Not Shown AR - As Required			

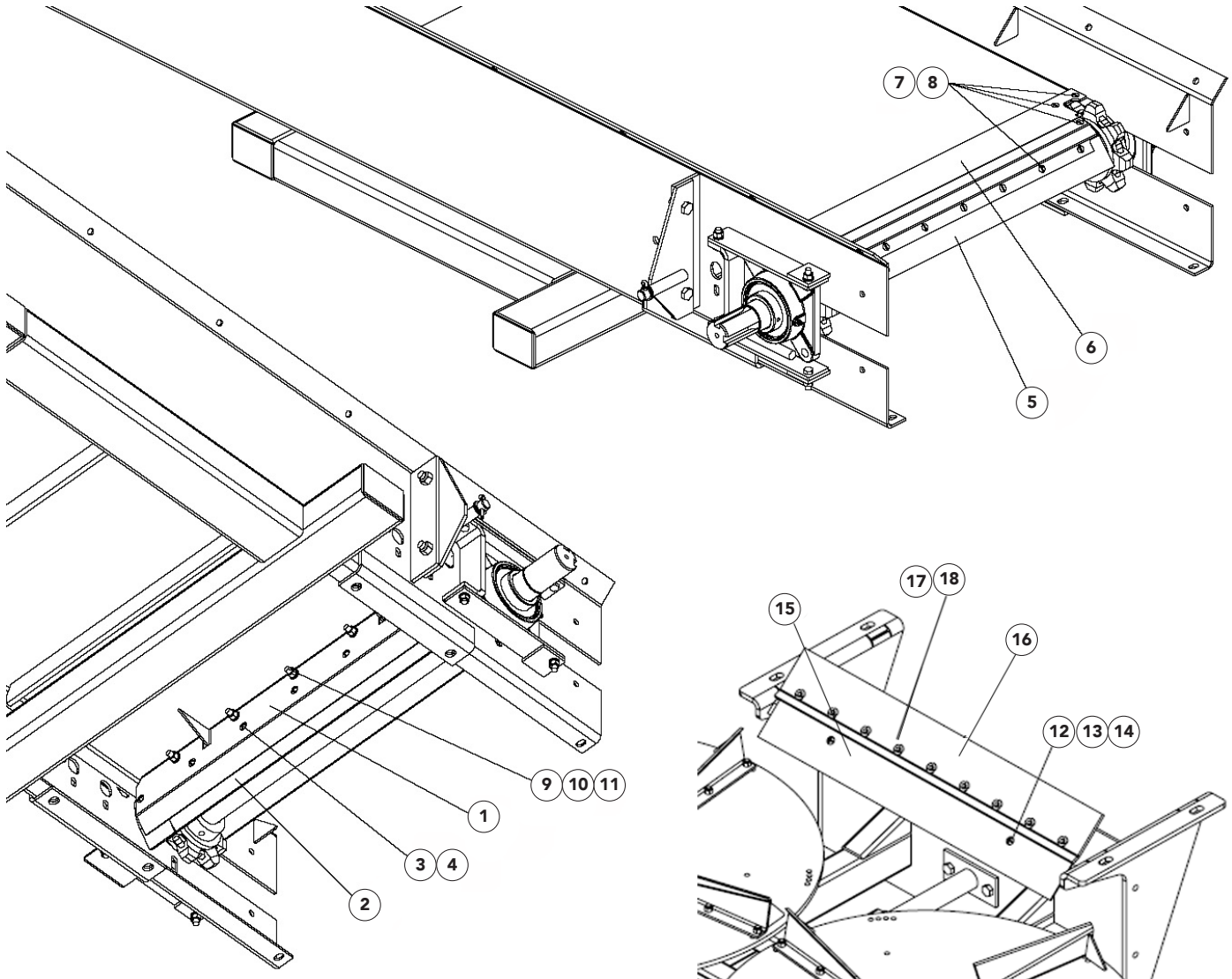


Oiler - Control Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304392	Panel - Front	1
2	304393	Cover - Wldmt Control Panel	1
3	99491	Bushing - .27 Strain Relief	2
4	99492	Holder - Fuse	1
5	87340	Screw - Self Tapping #10-24nc	2
6	20572	Screw - Round Head #10-24nc X .75 ZN	1
7	304571	Nut - Keps #10-24	2
8	*304583	Cable - Assy Battery	1
9	*304394	Cable - Assy Pump	1
10	304396	Decal - Oiler Control Panel	1
11	99493	Switch - Rocker Single Pole	1
12	99676	Fuse - 10 Amp Fast Acting	1
13	*304395	Wire - Assy Power Jumper	1
14	*304406	Wire - Assy Ground Jumper	1
15	*307318	Harness Ext 17'	1

* - Not Shown

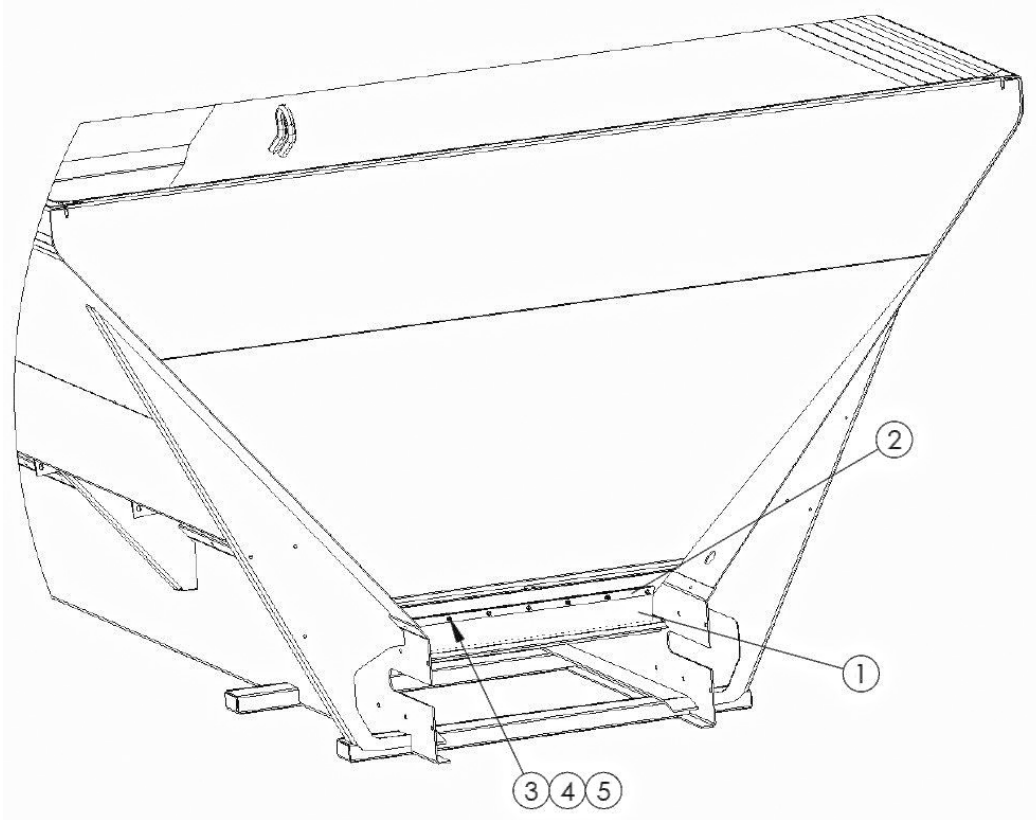
Rear Wipers



Rear Wipers Cont.

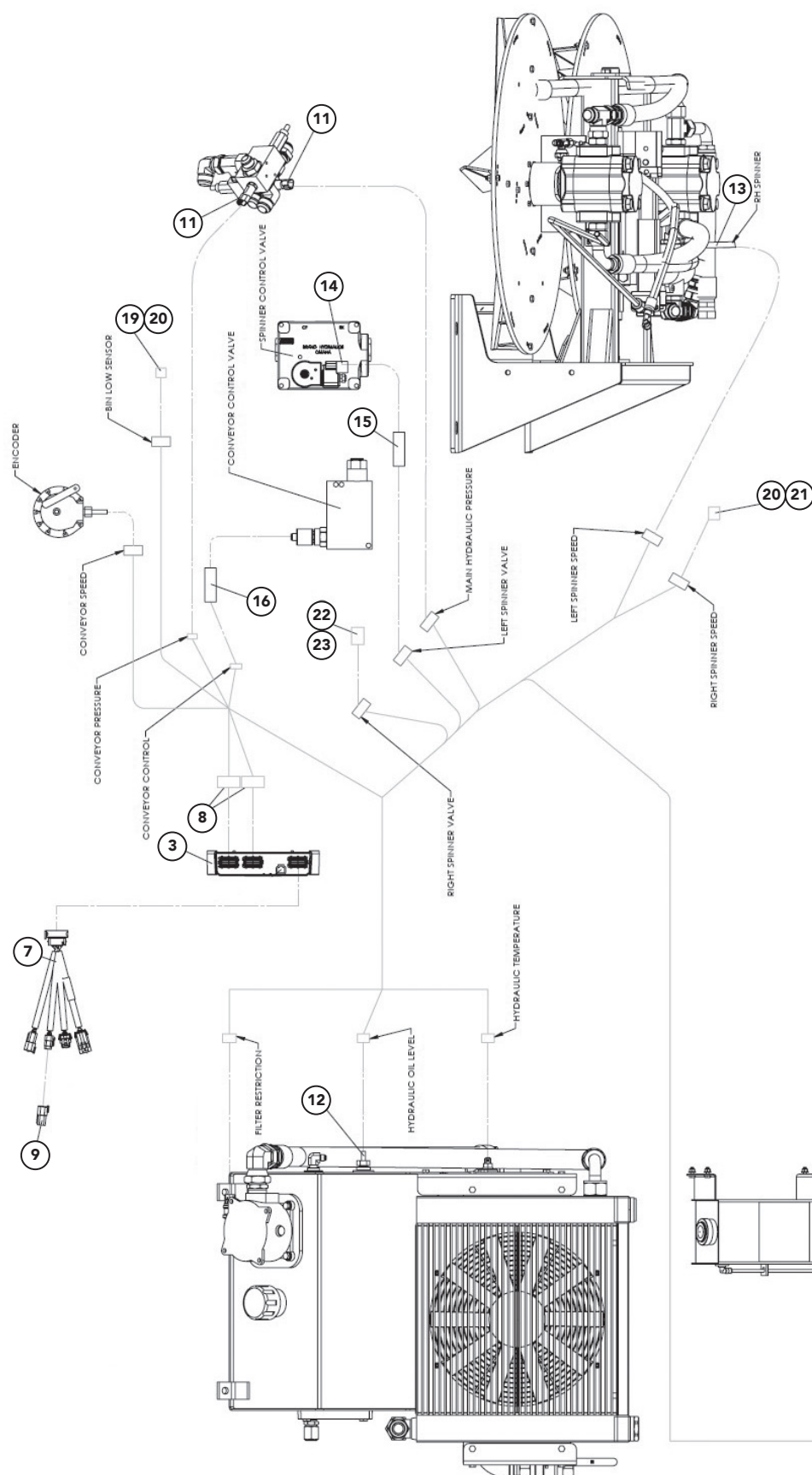
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	304440	Lip - Rear Assy, Includes 5-8	
	304441	Wiper - Assy Rear, Includes 1-4	
1	304444	Mount - 34" Internal Wiper	1
2	304443	Rubber - 34" Internal Wiper	1
3	56258	Screw - Truss Head 1/4-20 x 1/2 SS	9
4	88931	Nut - Tee 1/4 x 1/4	9
5	303306	Wiper - 34" Rear Lip	1
6	303312	Lip - Wldmt Rear 34"	1
7	20617	Screw - Flathead 1/4-20 x 1/2	13
8	88931	Nut - Tee 1/4 x 1/4	13
9	20068	Cap Screw - 3/8-16 x 1-1/4	5
10	20712	Washer - Lock 3/8	5
11	20644	Nut - Hex 3/8-16	5
12	32446	Screw - Truss Head 1/4-20 x 3/4 SS	2
13	36412	Nut - Hex 1/4-20 SS	2
14	36418	Washer - Lock 1/4 SS	2
15	304447	Plate - Wiper Belt Spnr/Conv. 34"	1
16	304446	Belt - Rear Wiper 34"	1
17	88931	Nut - Tee 1/4 x 1/4	9
18	56258	Screw - Truss Head 1/4-20 x 1/2 SS	9

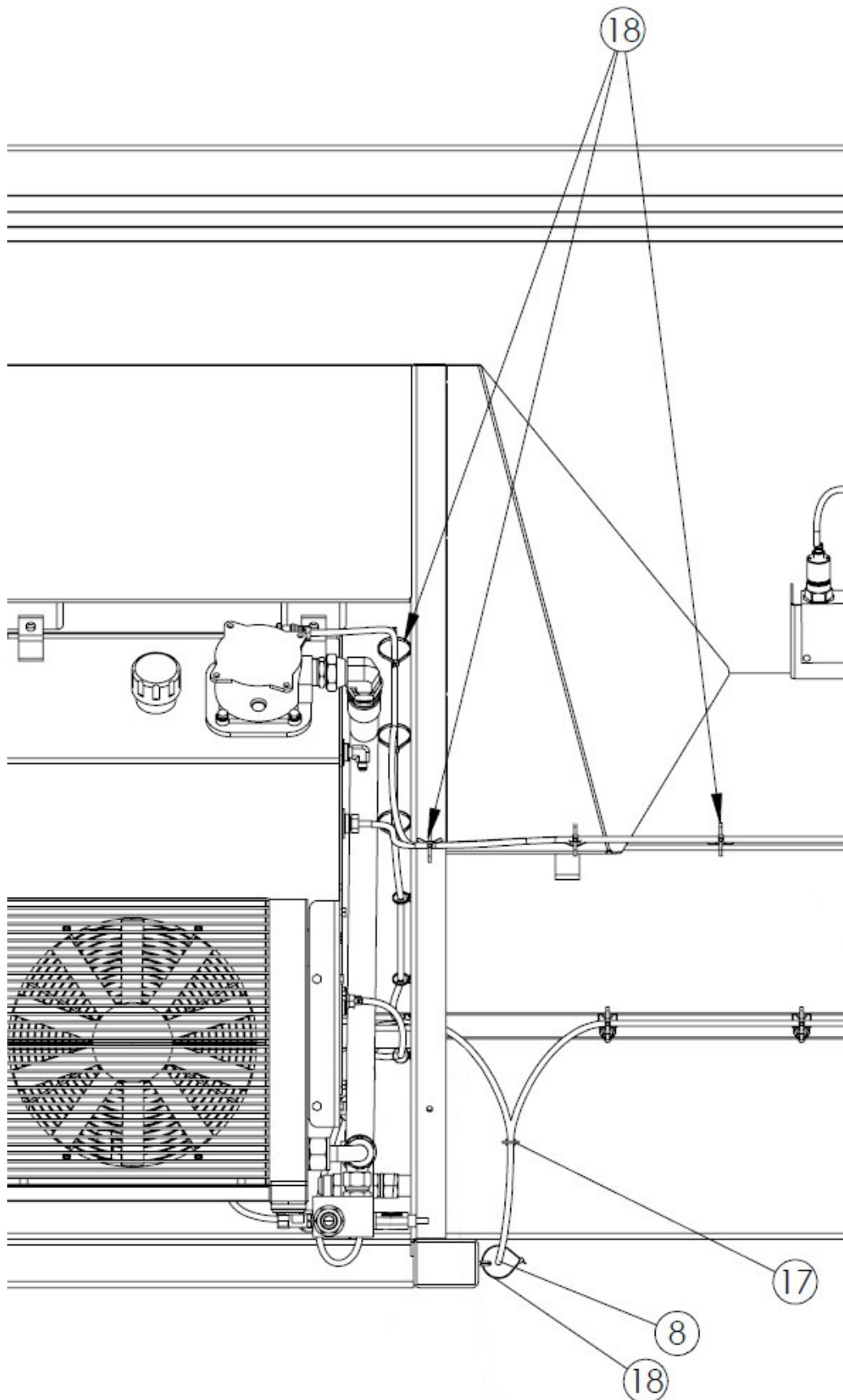
Wiper Front

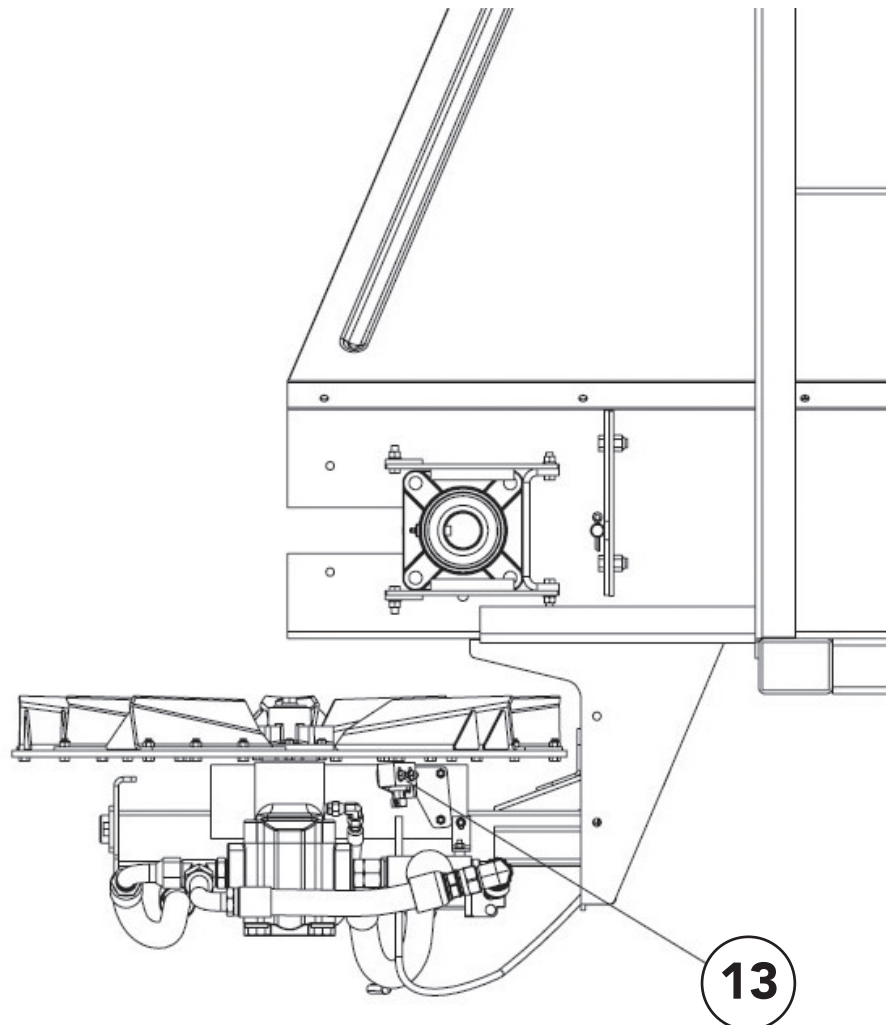
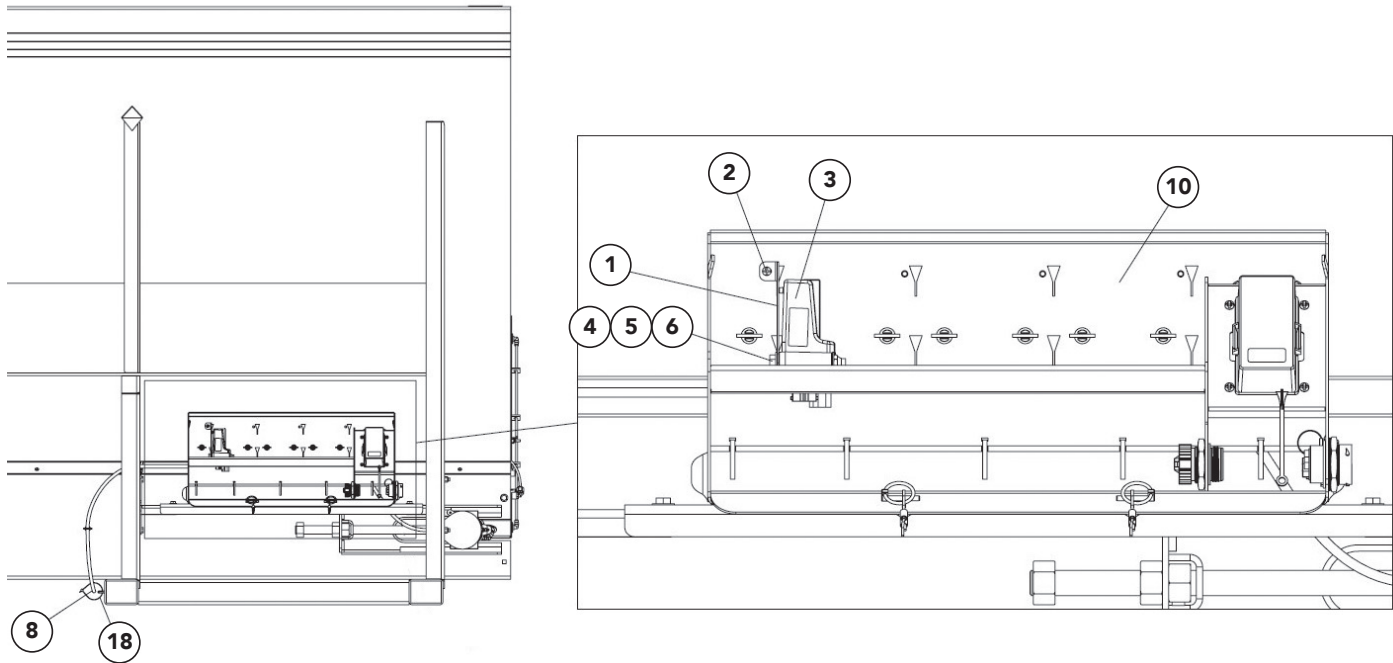


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	303317	Wiper – Belt	1
2	303316	Retainer – Belt	1
3	36393	Cap Screw - 1/4-20NC x 3/4 SS	7
4	36412	Nut – Hex 1/4-20NC SS	7
5	36418	Washer - Lock .25 SS	7

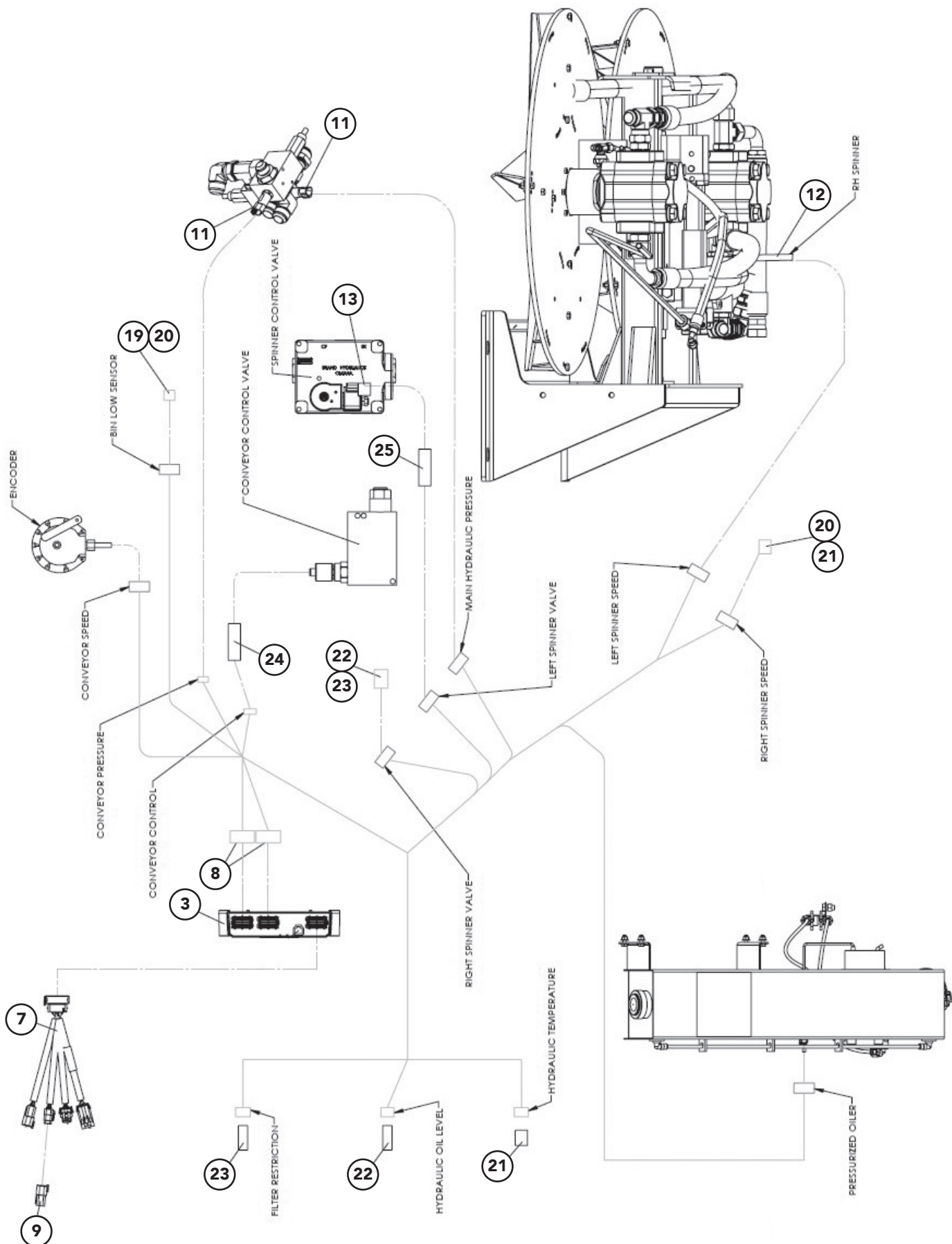
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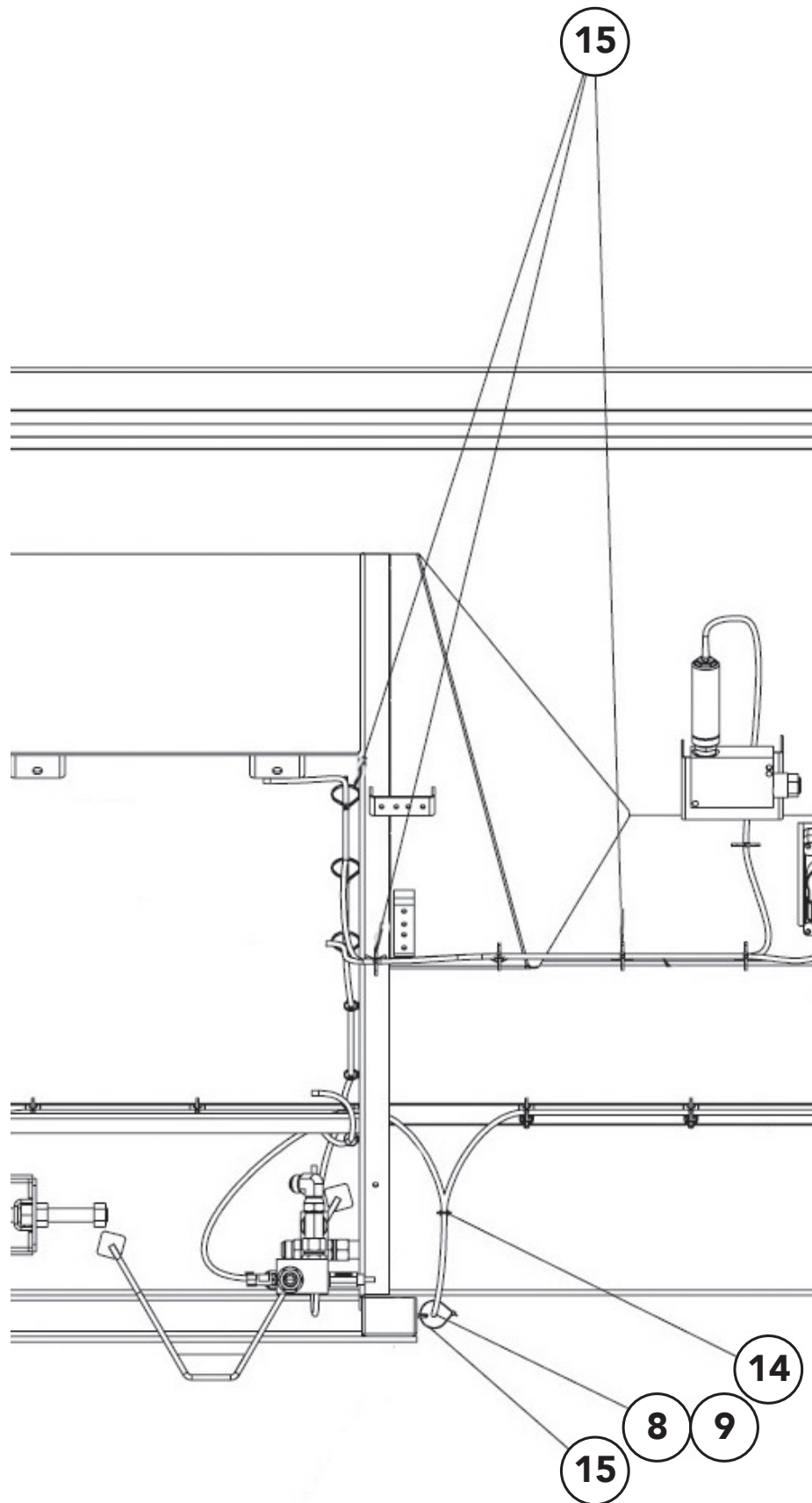


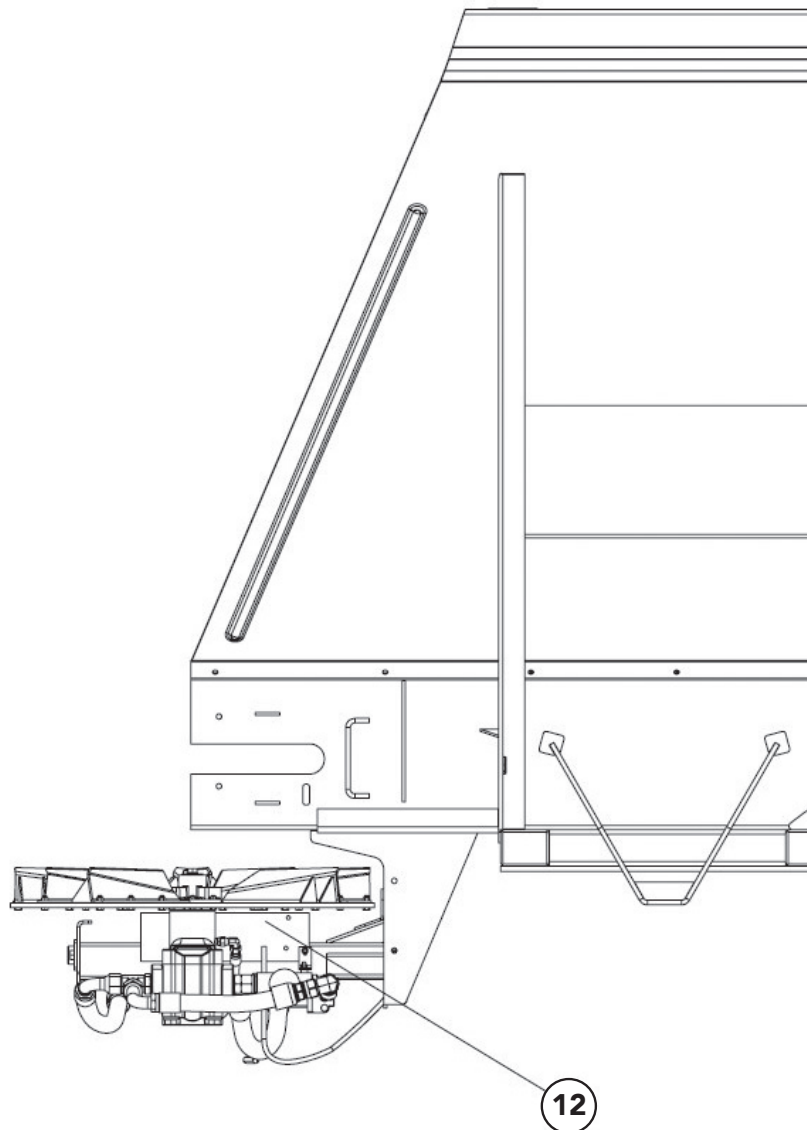
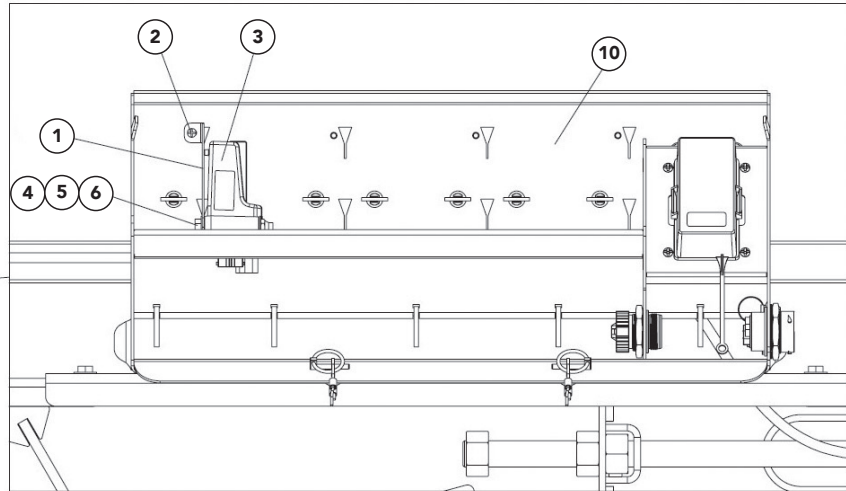
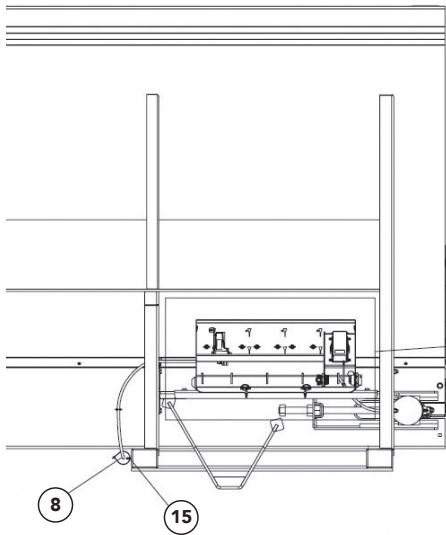




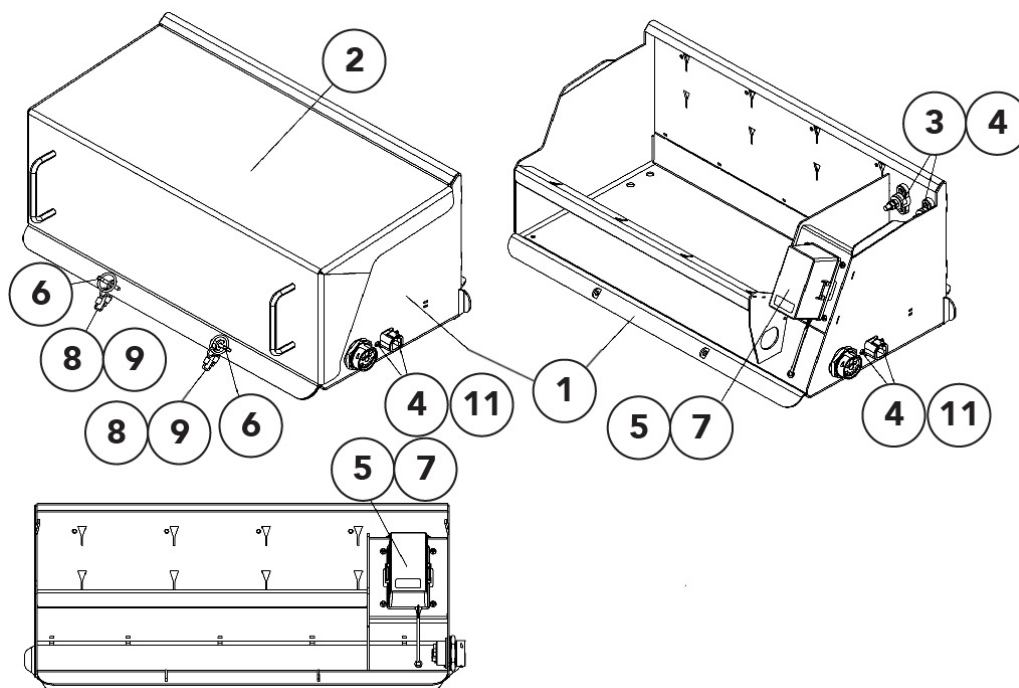
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	316570	Module - Group Master 13'-16'	
1	310718	Bracket - Module 304	1
2	44483	Screw - Round Head #10-24nc X .75 SS	1
3	310734	Module - Wsm	1
4	36296	Capscrew - .3846 X 2.75 SS	2
5	36425	Washer - Flat .375 SS	4
6	307395	Nut - Lock Thin .375-16nc SS	2
7	310754	Harness - Isobus Breakout	1
8	311067	Receptacle - Terminating Local	1
9	311841	Enclosure - Assy	1
10	311074	Transducer - Pressure	2
11	311845	Sensor - Group Hyd Tank	1
12	320223	Sensor - Group Single Spinner	1
13	38576-AI	Cable - Assy Service Part	1
14	316573	Harness - Ext	1
15	316574	Harness - Ext	1
16	311806	Tie - Wire Fir Tree	5
17	99674	Strap - Zip Tie 8 Black	30
18	303730-BD	Connector - Male Sealed Shroud	1
19	303730-FA	Plug - Cavity	7
20	303730-BC	Connector - Male Sealed Shroud	1
21	303665-BG	Connector - Male Sealed Pin	1
22	303665-HA	Plug - Sealing Dt06 Series	2
23	316949	Harness - Master Control	1



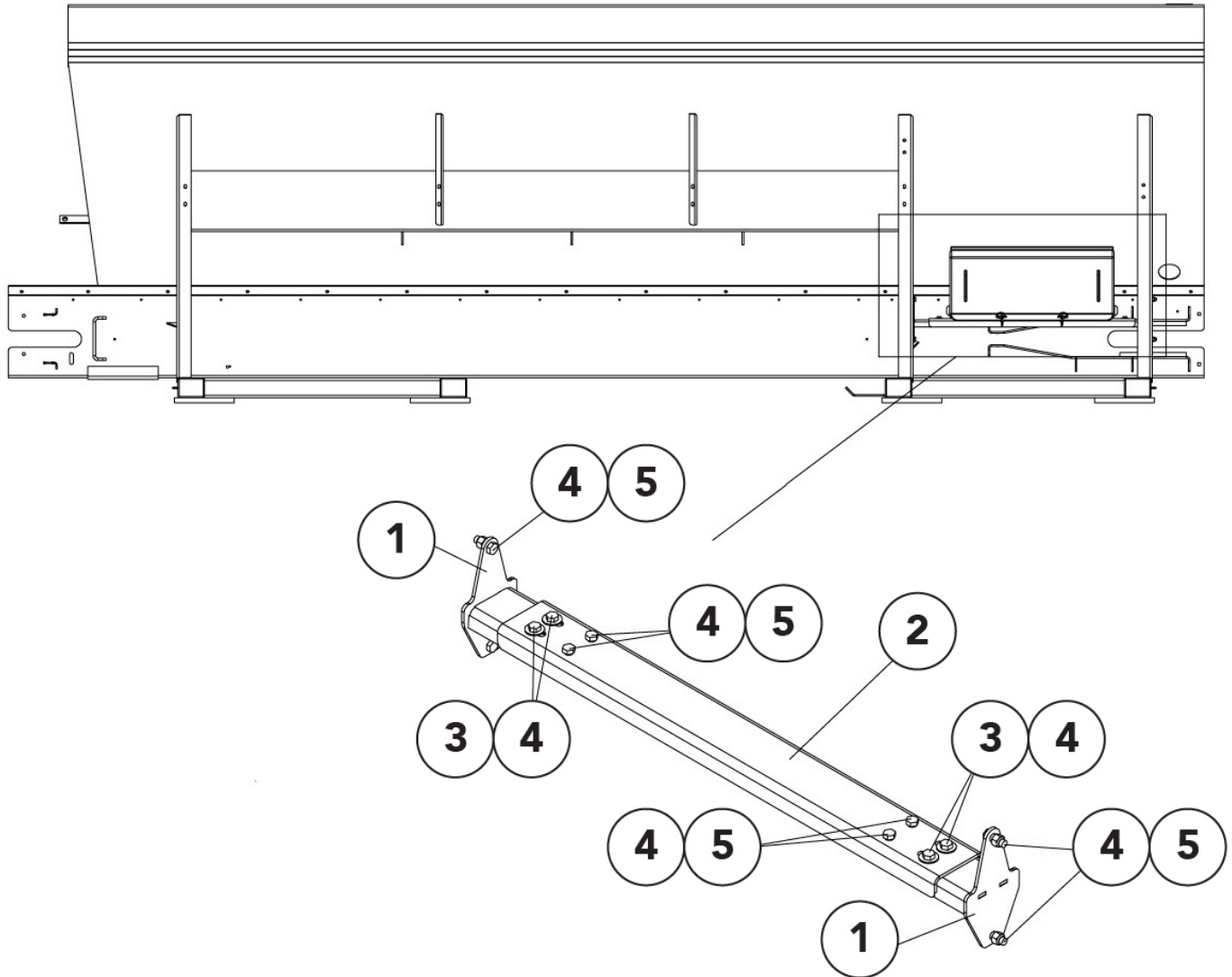




<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	320596	Module - Group Master W/O Tank 15'- 16'	
1	310718	Bracket - Module 304	1
2	44483	Screw - Round Head #10-24nc X .75 SS	1
3	310734	Module - Wsm	1
4	36296	Capscrew - .3846 X 2.75 SS	2
5	36425	Washer - flat .375 SS	4
6	307395	Nut - lock thin .375-16nc SS	2
7	310754	Harness - Isobus Breakout	1
8	311067	Receptacle - Terminating Local	1
9	311841	Enclosure - Assy	1
10	311074	Transducer - Pressure	2
11	320223	Sensor - Group Single Spinner	1
12	38576-AI	Cable - Assy Service Part	1
13	311806	Tie - Wire Fir Tree	5
14	99674	Strap - Zip Tie 8 Black	30
15	303730-BD	Connector - Male Sealed Shroud	1
16	303730-FA	Plug - Cavity	7
17	303730-BC	Connector - Male Sealed Shroud	1
18	303665-BG	Connector - Male Sealed Pin	1
19	303665-HA	Plug - Sealing Dt06 Series	2
20	311176	Receptacle - Amp Jpt 2 Pin	1
21	311177	Receptacle - Deutsch Dtm 2 Pin	1
22	313691	Receptacle - Metripack 2 Pin	1
23	316949	Harness - Master Control	1
24	316573	Harness - Ext	1
25	316574	Harness - Ext	1

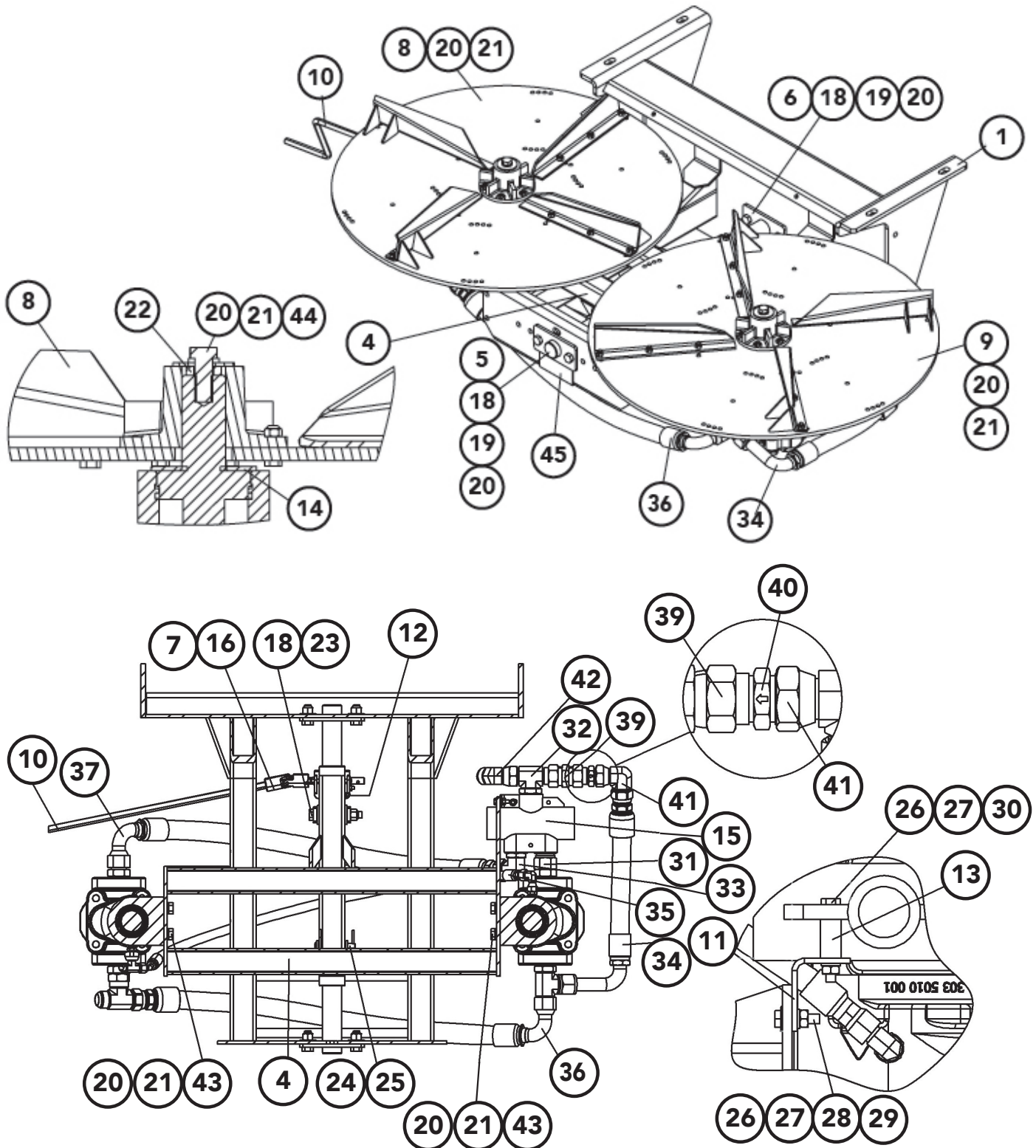


ITEM	PART NO.	DESCRIPTION	QTY
	311841	Enclosure - Assembly 304	
1	310722	Enclosure - Wldmt Controller 304	1
2	310724	Cover - Wldmt 304	1
3	310740	Post - Power Distribution	2
4	44483	Screw - Panhead Phlp #10-24nc X .75 SS	6
5	310739	Harness - New Leader Ecu Enclosure	1
6	310732	Pin - Lynch .188 X 1.25 SS	2
7	310733	Screw - Panhead Phlp #10-32 X .5 SS	4
8	308085	Ferrule - .185 X .374	4
9	311731	Cable - .094 X 12 Coated SS	2
10	99674	Strap - Zip Tie 8" Black	12
11	56355	Nut - Lock #10-24nc SS	2
12	311068	Plug - Terminating Local Can	1
13	311070	Harness - Isobus Active Termination	1
14	312448	Harness - Isobus Diagnostic Tee	1

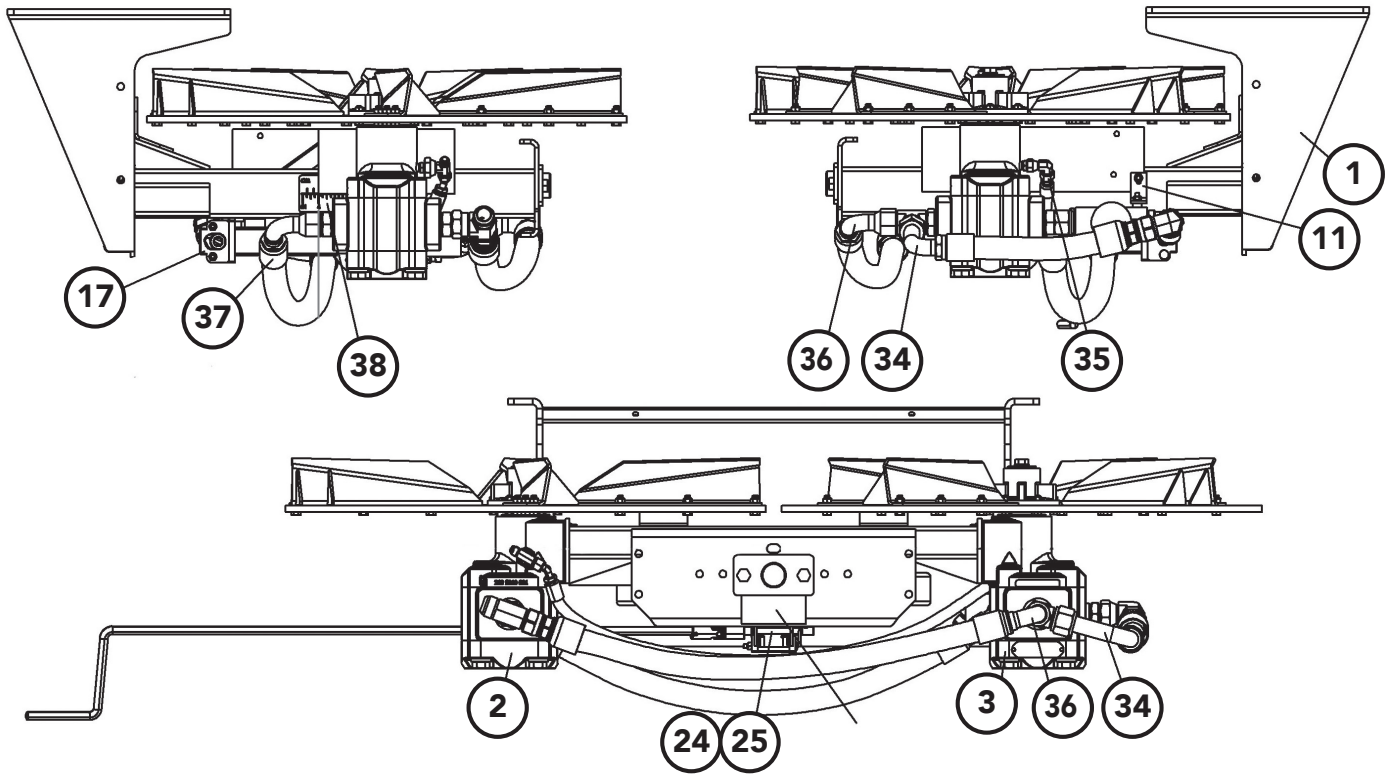


ITEM	PART NO.	DESCRIPTION	QTY
	311839	Enclosure - Group Mounting	
1	311850	Mount - Wldmt 304	2
2	310717	Channel - Mount 304	1
3	36425	Washer - Flat .375 SS	4
4	36398	Capscrew - .375-16NC X 1 SS	12
5	72054	Nut - Lock .375-16NC SS	12

Spinner Assembly



Spinner Assembly - Cont



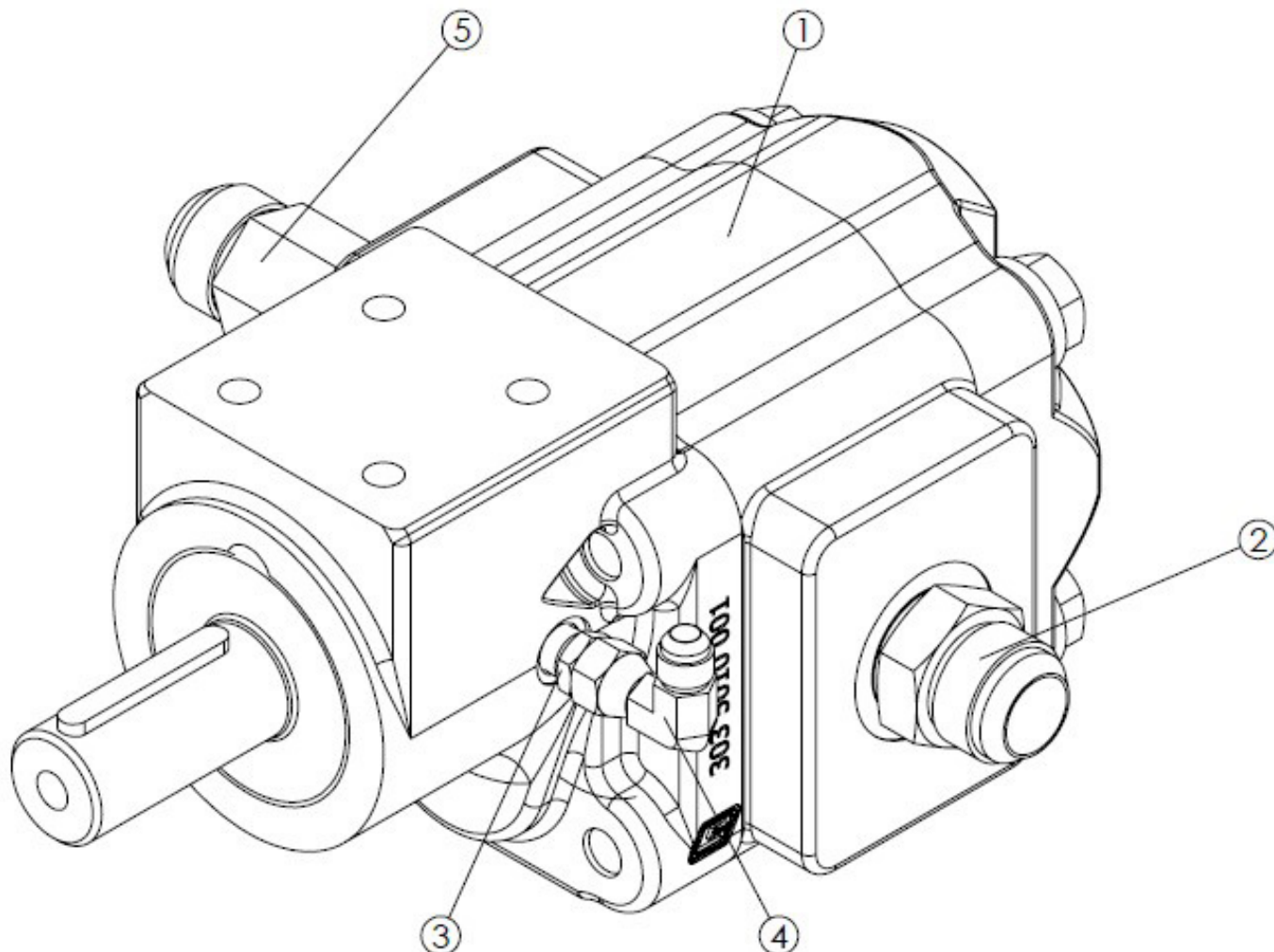
Spinner Assembly Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	314772	Spinner Assembly - 304	
1	304911	Plate - Wldmt Back 34" 304	1
2	305757	Motor - Lh Style II Assy	1
3	305756	Motor - Rh Style II Assy	1
4	304897	Mount - Wldmt Motor 30" Disc	1
5	304898	Shaft - Wldmt 30" Disc 304	1
6	87023	Plate - Mounting Shaft 304	1
7	85002	U-Joint	1
8	304899	Disc - Assy 30" LH	1
9	304900	Disc - Assy 30" RH	1
10	307476	Handle - Jack Feedgate 304	1
11	87025	Angle- Mounting Valve	1
12	6072	Zerk - Grease	2
13	76825	Hinge - Pipe, .25" X 1"	1
14	305571	Washer - Rubber 3"OD X .94"ID X	2
15	71781	Valve - 50/50 Flow Divider	1
16	312268	Pin - Roll .188 X 1 SS	2
17	312975	Jack - Assy 4.50 304	1
18	39016	Nut - Lock .5-13NC SS	5
19	36426	Washer - Flat .5 SS	4
20	36402	Capscrew - .5-13NC X 1.25 SS	14
21	36422	Washer - Lock .5 SS	10
22	56397	Washer - Flat .56"ID X 1"OD X .25"	2
23	80798	Capscrew - .5-13NC X 3.75 SS	1
24	36429	Pin - Hair .148 X 2.688 SS	1
25	6547	Pin - Clevis .375 X 3 SS	1
26	36412	Nut - Hex .25-20NC SS	2
27	36418	Washer - Lock .25 SS	2
28	36423	Washer - Flat .25 SS	1
29	36395	Capscrew - .25-20NC X 1 SS	1
30	308112	Capscrew - .25-20NC X 2 SS	1

Spinner Assembly Cont.

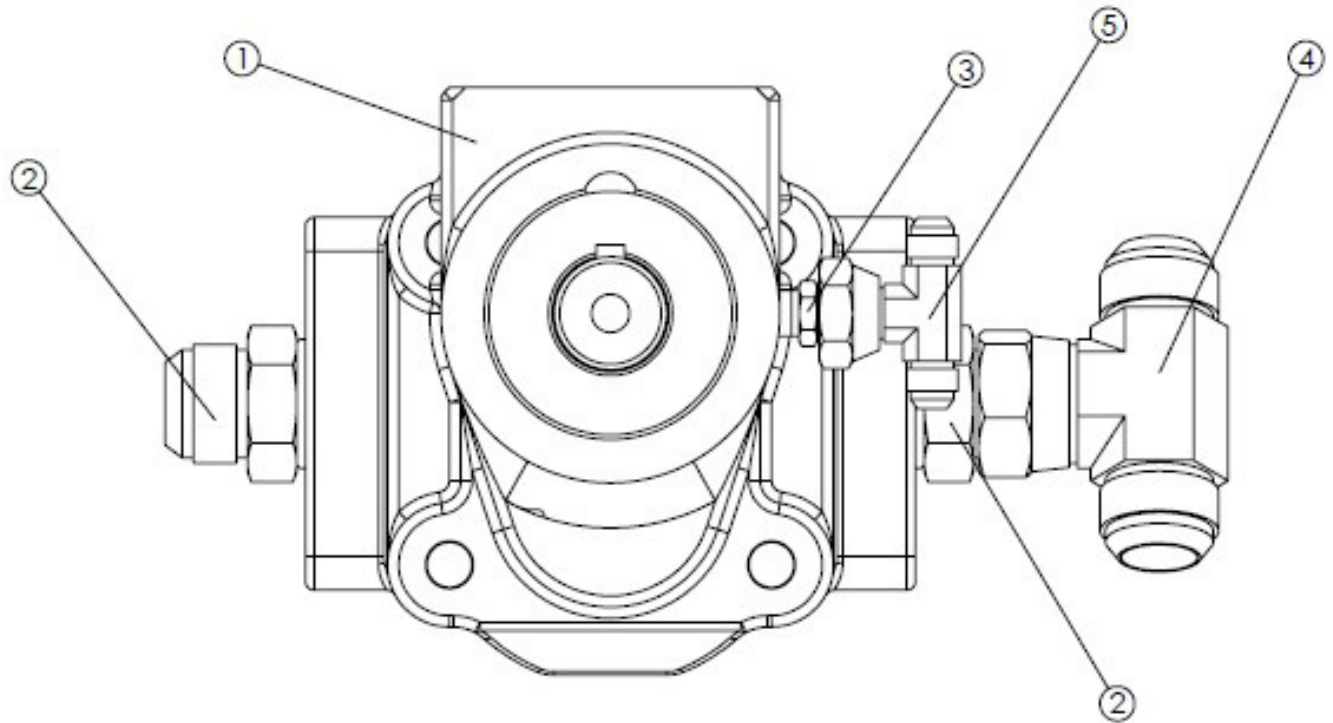
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
31	34810	Fitting - 16-16 S1040-30 Non Standard	1
32	34750	Fitting - 16-16-16 070429	1
33	29840	Fitting - 16-16 070220	1
34	56103-X1	Hose - Assy 1"100r2 X 16.75"	1
35	304907	Hose - .375 X 35.1 Assy	1
36	304905	Hose - 1.00 X 33.5 Assy	1
37	304906	Hose - 1.00 100r12 X 33.5 Assy	1
38	87110	Scale - Spinner Position	1
39	302449	Fitting - 16-16 S1040-38 Non Standard	1
40	302160-AB	Valve - Check 1"	1
41	29807	Fitting - 16-16 070221	1
42	29806	Fitting - 16-16 070321	1
43	301315	Loctite - 243	-
44	311082	Compound - Antiseize Heavy Duty	-
45	98319	Decal - Patent 6,517,281	1

Motor Assembly



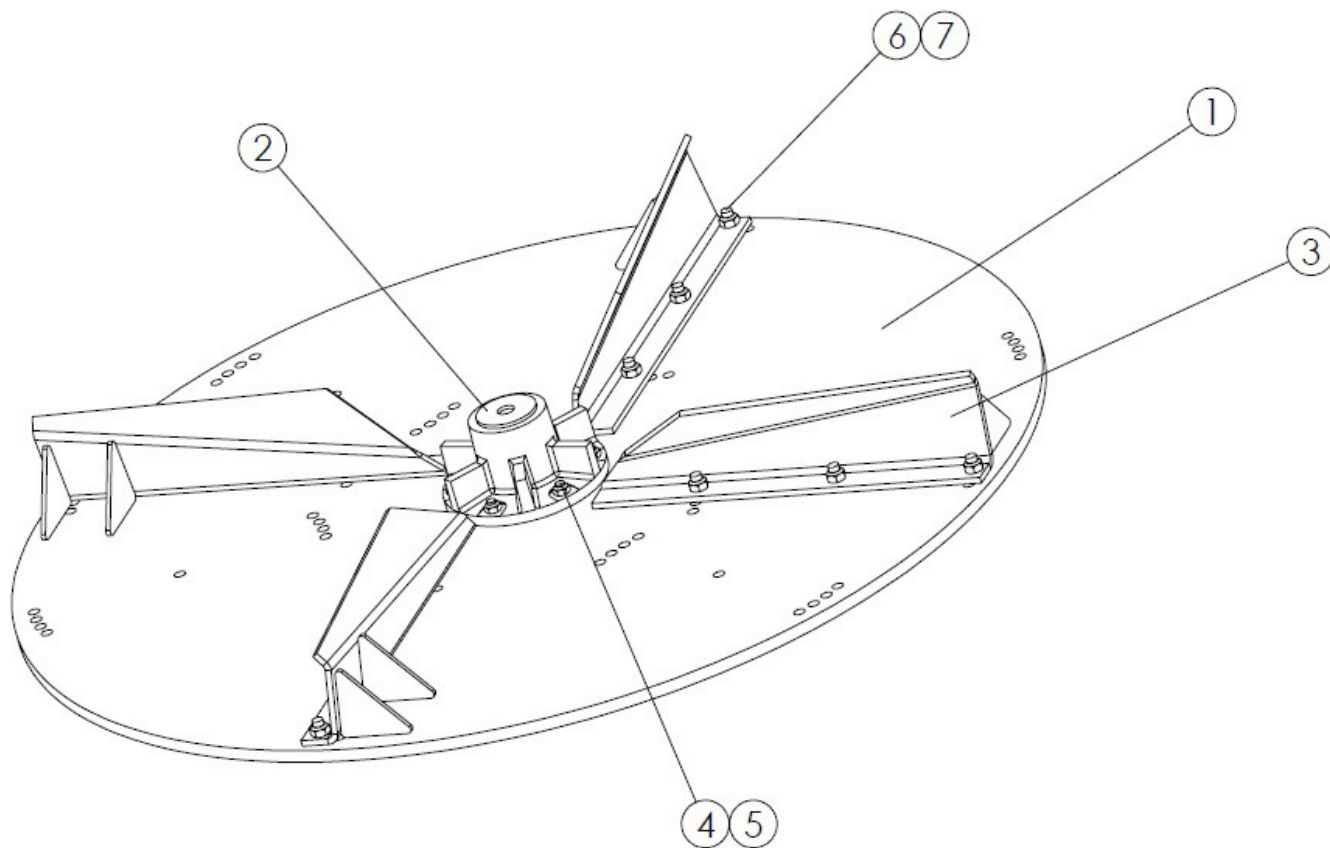
ITEM	PART NO.	DESCRIPTION	QTY
	305756	Motor - Assy Style II RH 6.375 3 Displ	
1	313513	Motor - Spinner 6.375 Cid	1
2	29803	Fitting - 16-16 070120	1
3	34763	Fitting - 6-4 070102	1
4	34816	Fitting - 6-6 070221	1
5	305758	Fitting - 16-16-16 070428	1

Motor Assembly - Cont



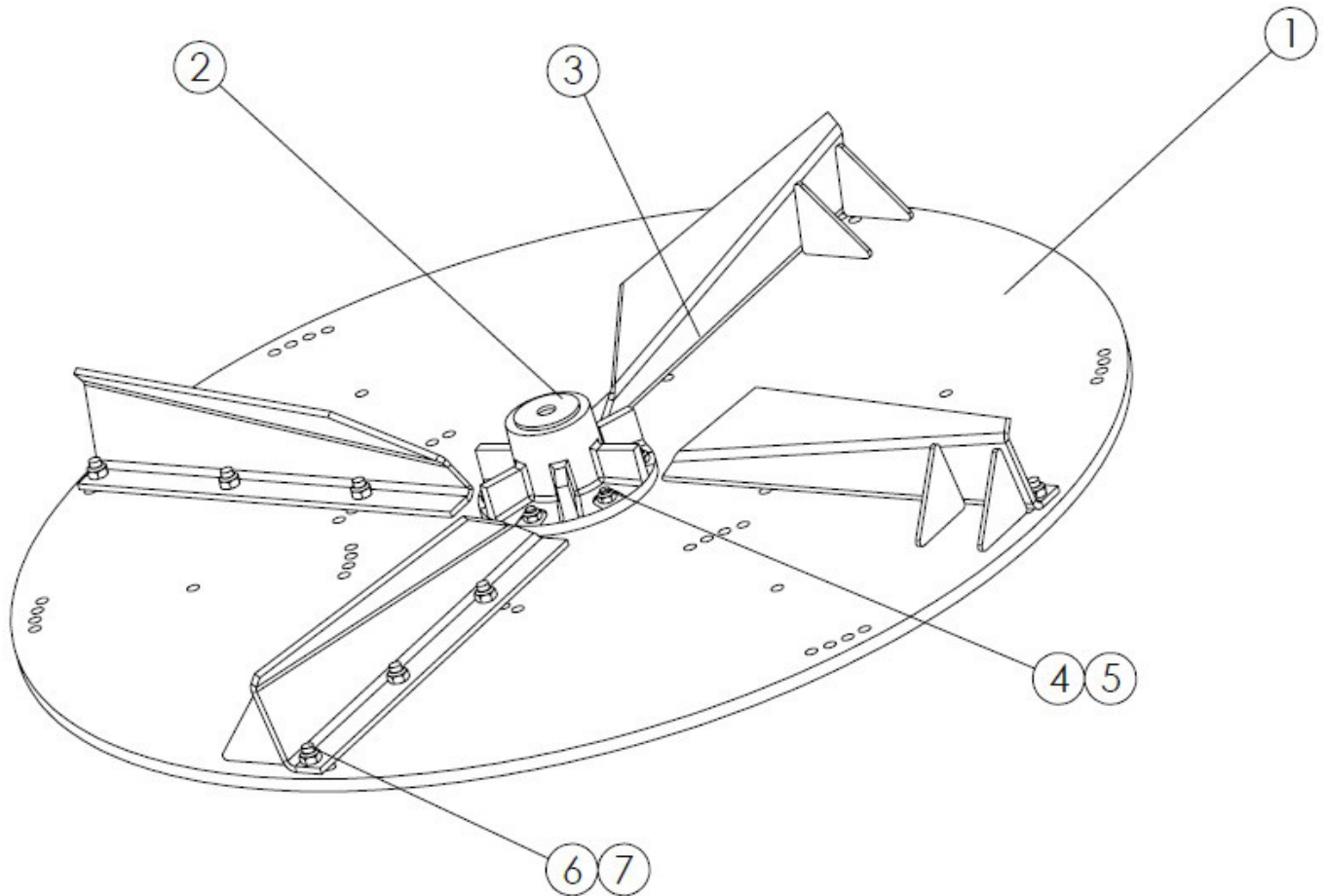
ITEM	PART NO.	DESCRIPTION	QTY
	305757	Motor - Assy Style II LH 6.375 3 Displ	
1	313513	Motor - Spinner 6.375 Cid	1
2	29803	Fitting - 16-16 070120	2
3	34763	Fitting - 6-4 070102	1
4	29836	Fitting - 16-16-16 070433	1
5	29825	Fitting - 6-6-6 070433	1

Disc Assembly



ITEM	PART NO.	DESCRIPTION	QTY
	304899	Disc - Assy 30 Lh	
1	304894	Disc - Spinner 30	1
2	10877	Hub - Wldmt	1
3	307265	Fin - Wldmt Lh 304	4
4	20005	Capscrew - .25-20nc X 1 Gr5 Zn	6
5	20676	Nut - Lock .25-20nc Zn	6
6	20036-X1	Capscrew - .313-18nc X 1 Gr8	12
7	20677	Nut - Lock .313-18nc Zn	12

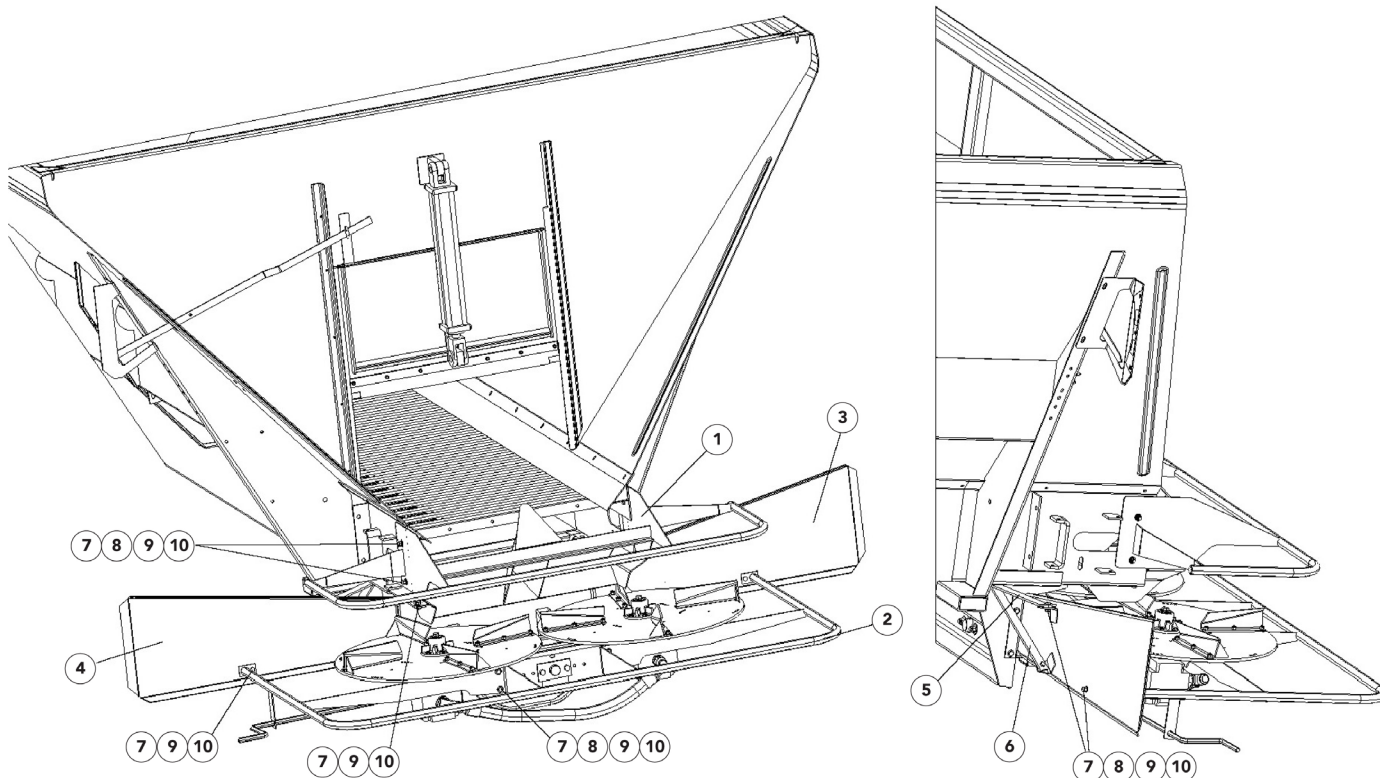
Disc Assembly - Cont



ITEM	PART NO.	DESCRIPTION	QTY
	304900	Disc - Assy 30 Rh	
1	304894	Disc - Spinner 30	1
2	10877	Hub - Wldmt	1
3	307266	Fin - Wldmt Rh 304	4
4	20005	Capscrew - .25-20nc X 1 Gr5 Zn	6
5	20676	Nut - Lock .25-20nc Zn	6
6	20036-X1	Capscrew - .313-18nc X 1 Gr8	12
7	20677	Nut - Lock .313-18nc Zn	12

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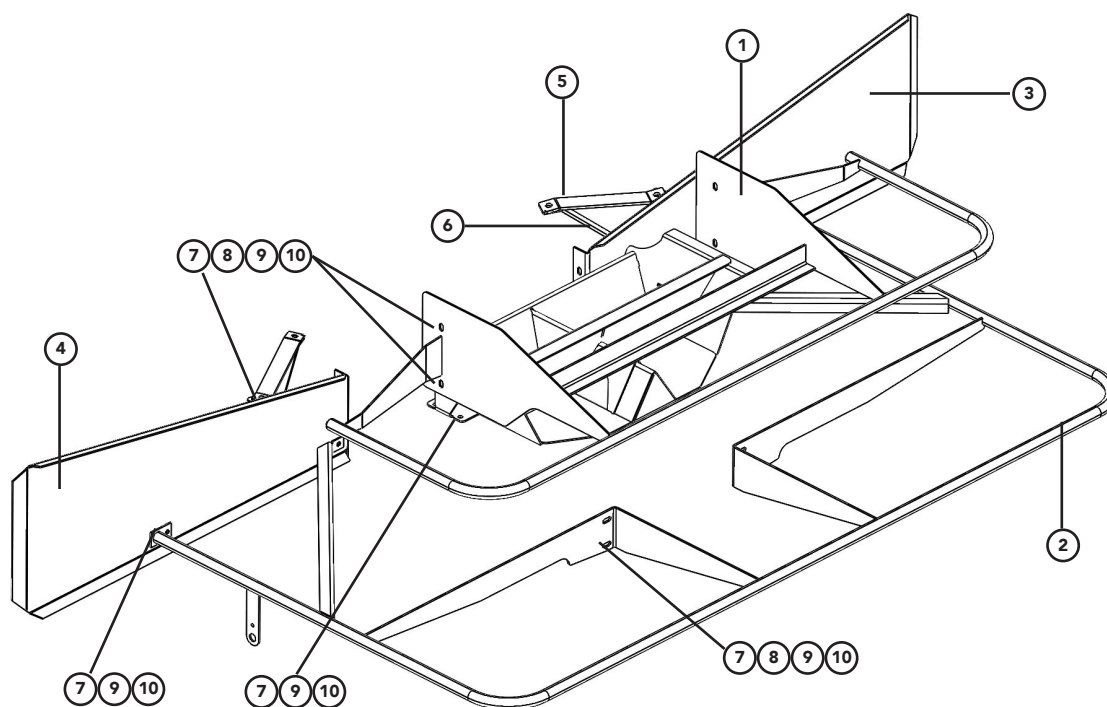
Spinner Guards & Deflectors-Compost



ITEM	PART NO.	DESCRIPTION	QTY
1	305309	Divider – Wldmt w/Guard 34"	1
2	304913	Guard – Wldmt 30" Spinner 304	1
3	305320	Shield – Wldmt RH 304	1
4	305321	Shield – Wldmt LH 304	1
5	87068	Bracket – Shield 304	2
6	305040	Bar – Stiffener Lower 304	2
7	36398	Cap Screw – 3/8 x 1 SS	22
8	36425	Washer – Flat 3/8 SS	20
9	36420	Washer – Lock 3/8 SS	22
10	36414	Nut – Hex 3/8 SS	20
11	*36940	Bolt – Carriage 1/2-13NC x 2 SS	4
12	*36426	Washer – Flat 1/2 SS	4
13	*36422	Washer – Lock 1/2 SS	4
14	*36416	Nut – Hex 1/2-13NC SS	4

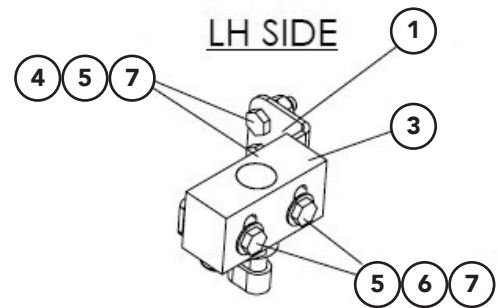
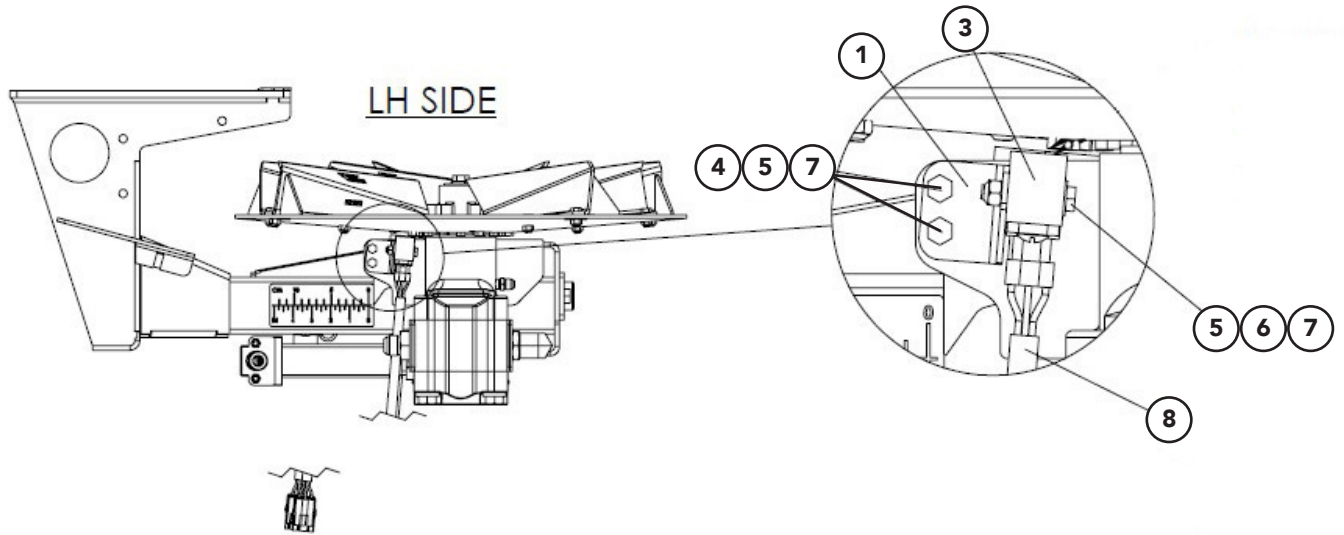
* - Not Shown - used to mount spinner

Spinner Guards & Deflectors-Fertilizer



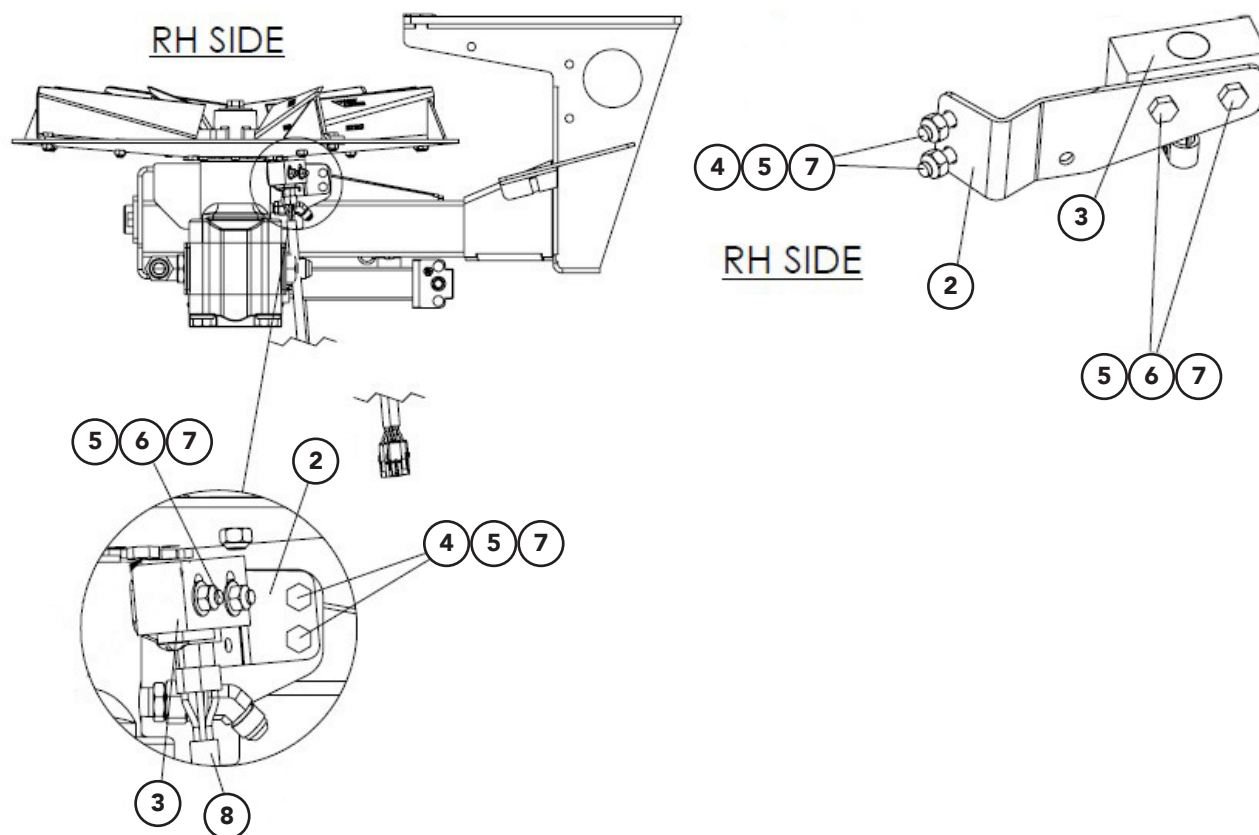
ITEM	PART NO.	DESCRIPTION	QTY
1	317239	Divider – Wldmt w/Guard 34"	1
2	304913	Guard – Wldmt 30" Spinner 304	1
3	305320	Shield – Wldmt RH 304	1
4	305321	Shield – Wldmt LH 304	1
5	87068	Bracket – Shield 304	2
6	305040	Bar – Stiffener Lower 304	2
7	36398	Cap Screw – 3/8 x 1 SS	22
8	36425	Washer – Flat 3/8 SS	20
9	36420	Washer – Lock 3/8 SS	22
10	36414	Nut – Hex 3/8 SS	20

Spinner Speed Sensor

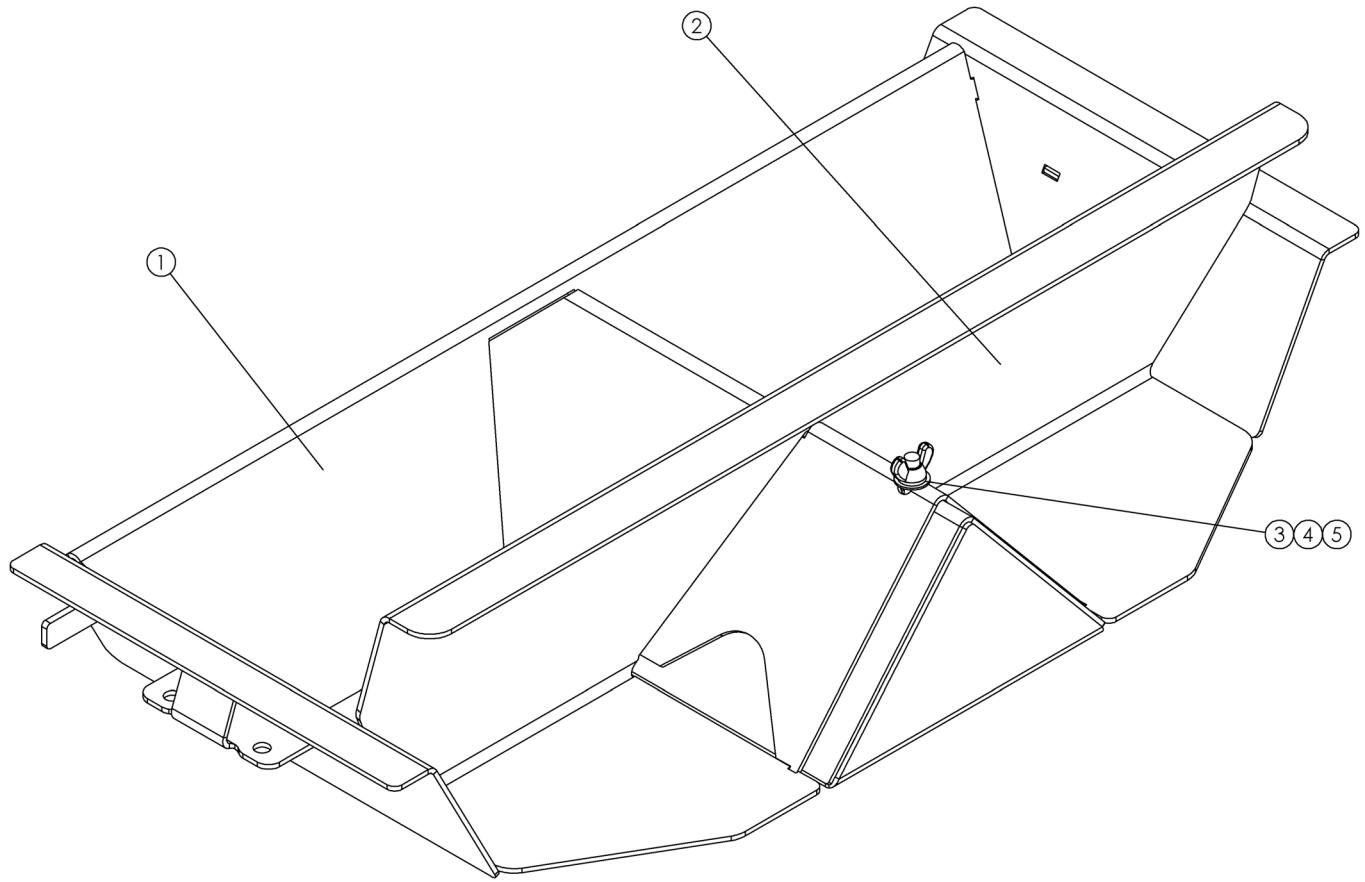


Spinners

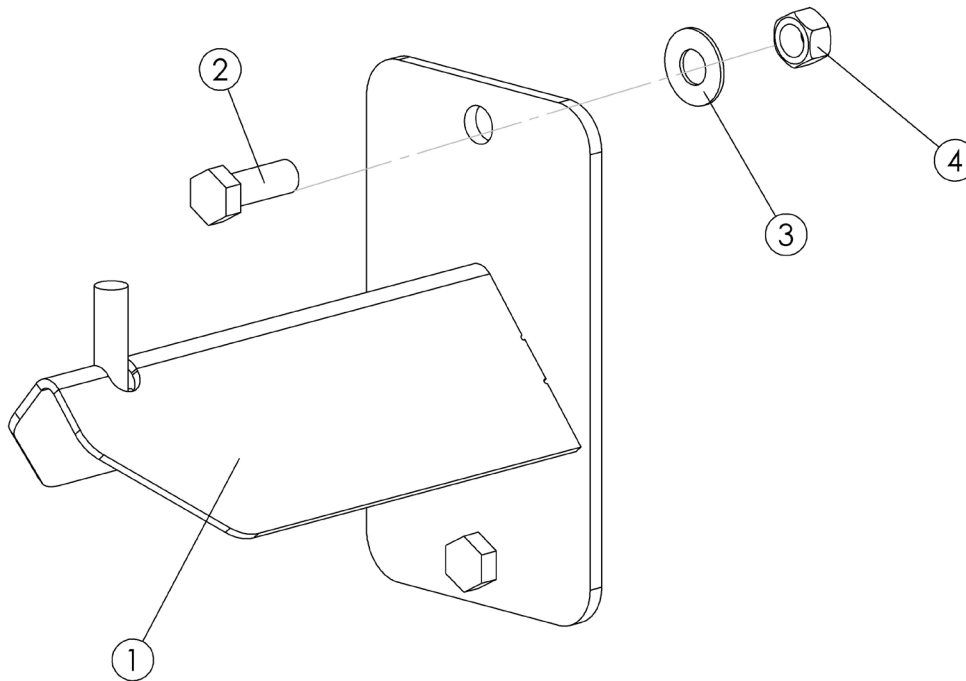
Spinner Speed Sensor



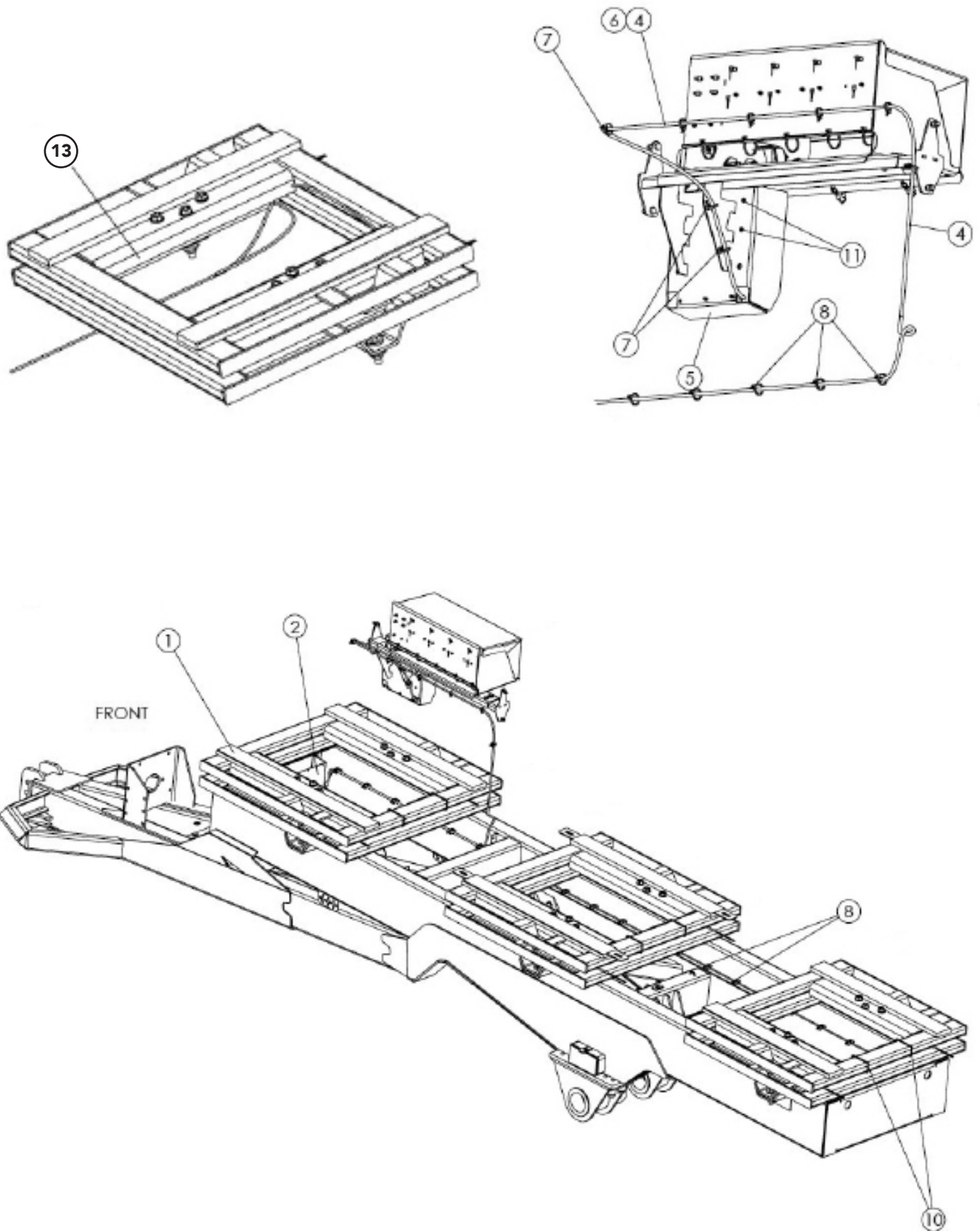
ITEM	PART NO.	DESCRIPTION	QTY
1	311852	Bracket - Speed Sensor LH 304	1
2	318023	Bracket - Speed Sensor RH 304	1
3	316586	Sensor - Assy w/ Block	2
4	36394	Capscrew - .25-20NC X .875 SS	4
5	42448	Capscrew - .25-20NC X 1.5 SS	4
6	36423	Washer - Flat 1/4 SS	4
7	42034	Nut - Lock 1/4-20NC SS	8
8	318007	Harness - Ext	2

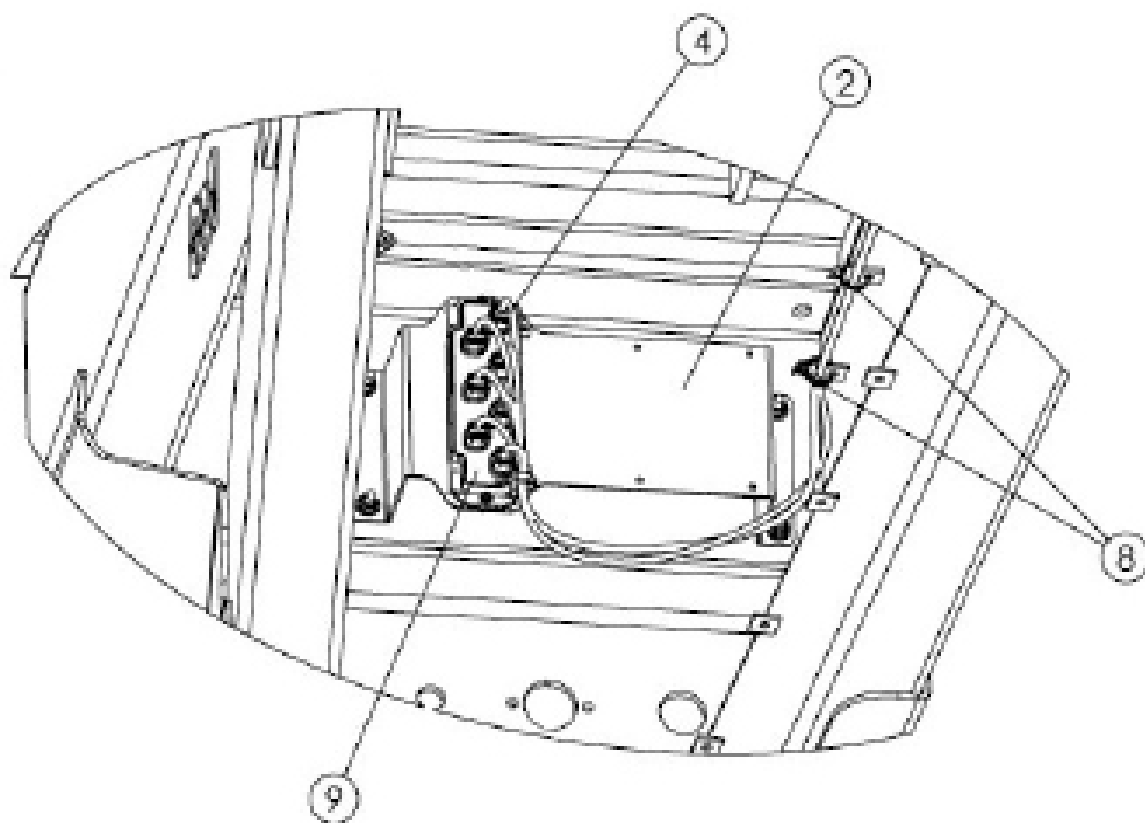
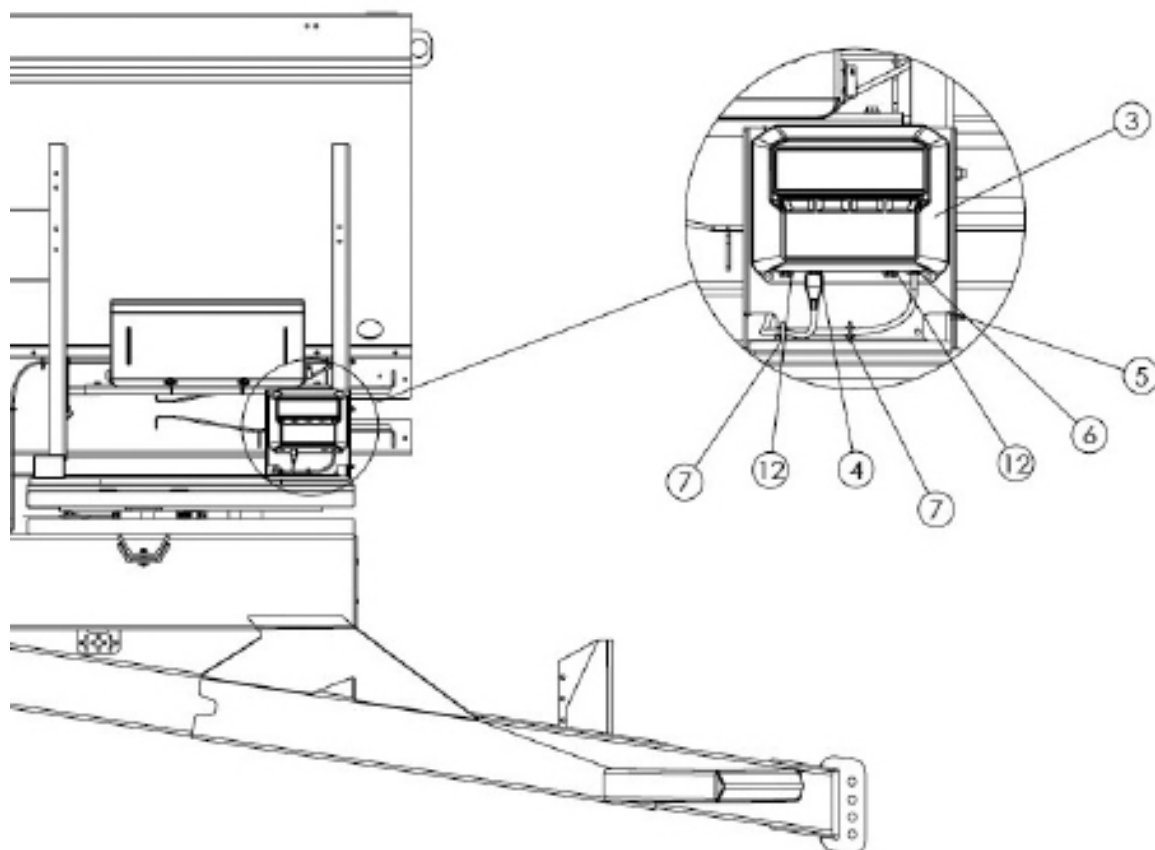


ITEM	PART NO.	DESCRIPTION	QTY
1	317749	Divider - Wldmt 304	1
2	317750	Deflector - Wldmt Rear 304	1
3	36425	Washer - Flat .375 SS	1
4	36420	Washer - Lock .375 SS	1
5	20673	Nut - Wing 3/8" SS	1
6	*36398	Capscrew - .375-16nc X 1 SS	2
7	*36425	Washer - Flat .375 SS	2
8	*36420	Washer - Lock .375 SS	2
9	*36414	Nut - Hex .375-16nc SS	2

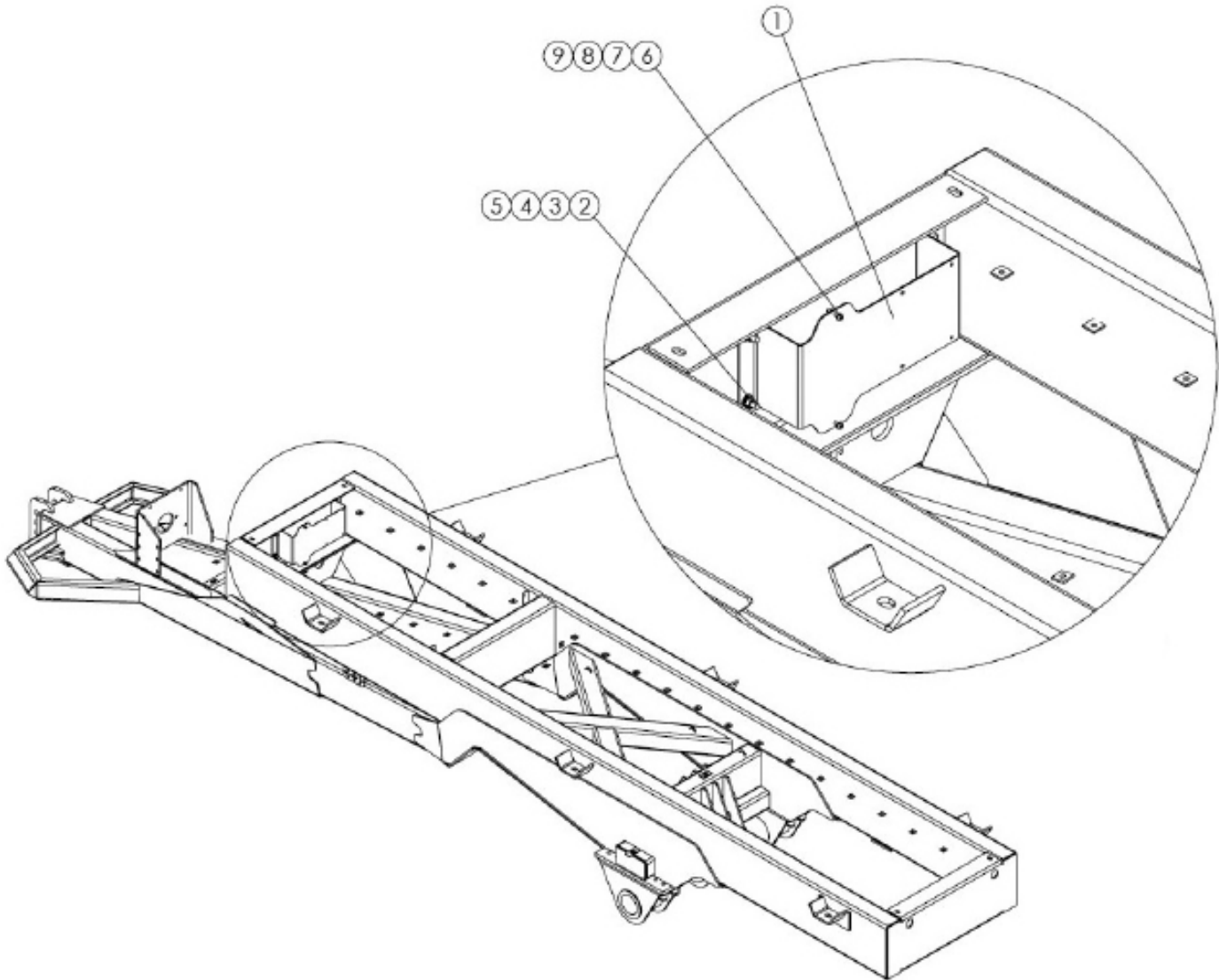


ITEM	PART NO.	DESCRIPTION	QTY
	317744	Kit - Mount Divider Storage	
1	317745	Mount- Wldmt Storage 304	1
2	36398	Capscrew - .375-16nc X 1 SS	2
3	36425	Washer - Flat .375 SS	2
4	36414	Nut - Hex .375-16nc SS	2

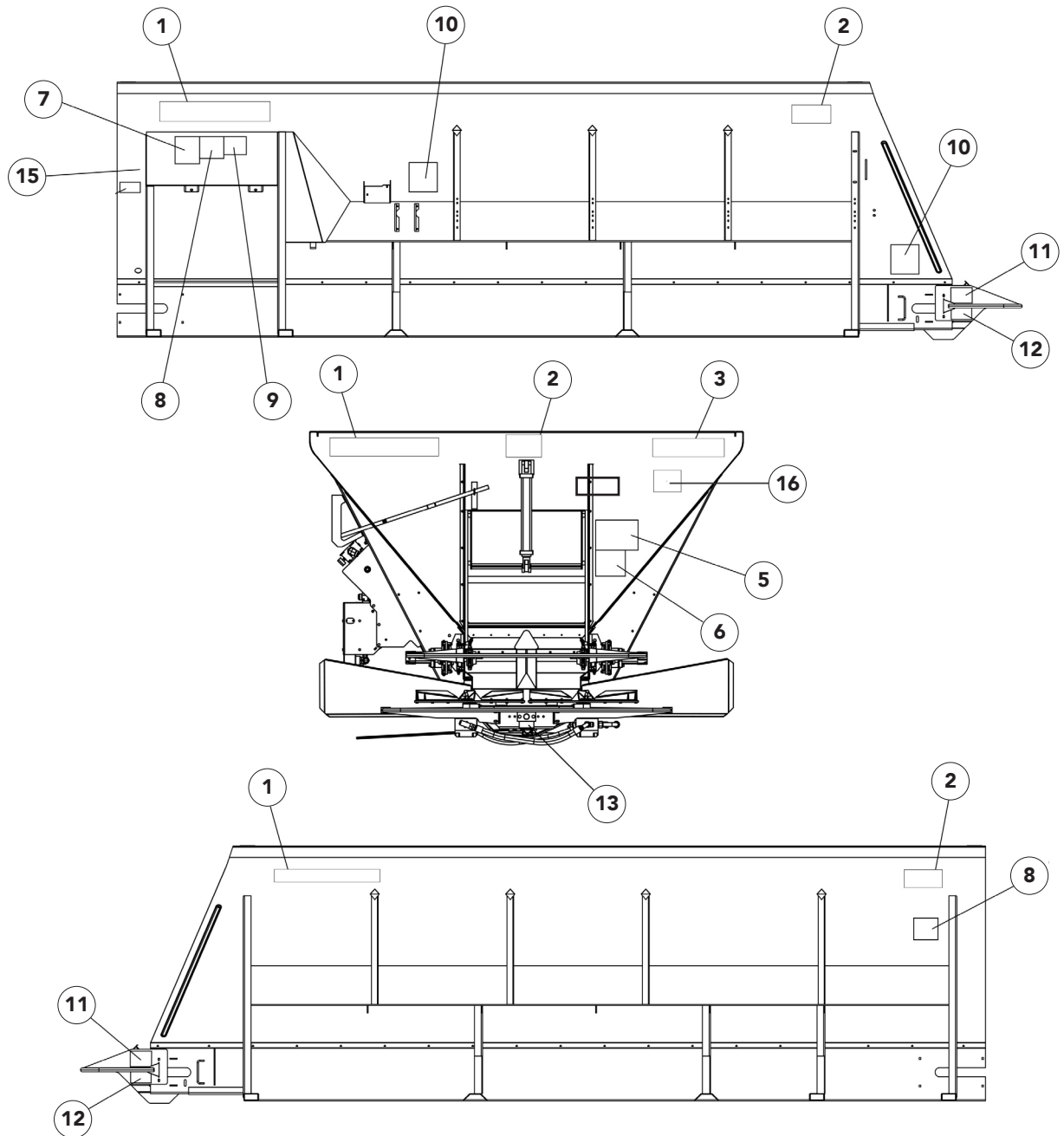


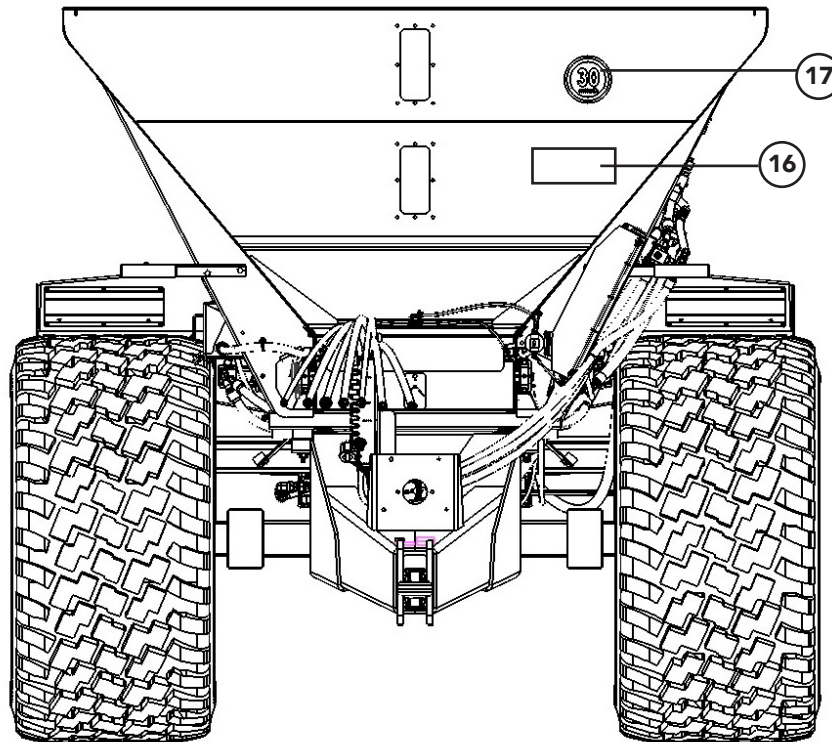


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	318738	Scale - Kit 6 Cell Hd	1
2	318016	Bracket - Group Scale Link	1
3	318654	Scale - Assy Point	1
4	318655	Cable - Scale Dt6	1
5	318656	Mount - Wldmt Scale Display	1
6	318739	Harness - Point Scale Isobus	1
7	311806	Tie - Wire Fir Tree	5
8	99674	Strap - Zip Tie 8 Black	24
9	317105	Junction - Bank 7 Position	1
10	96942	Tie - Wire Hd 29 Long	6
11	313886	Screw - Panhead M5-0.8 X 10 SS	4
12	318752	Plug - Dt06-4s	2
13	318013	Load Cell - Service Part	6



ITEM	PART NO.	DESCRIPTION	QTY
1	318017	Bracket - Scale Link 304	1
2	36399	Capscrew - .375-16nc X 1.25 SS	4
3	36425	Washer - Flat .375 SS	4
4	36420	Washer - Lock .375 SS	4
5	36414	Nut - Hex .375-16nc SS	4
6	44454	Screw - Sockethead #10-24	2
7	171052	Washer - Flat #10 SS	2
8	44451	Washer - Lock #10 SS	2
9	47295	Nut - Hex #10-24nc SS	2

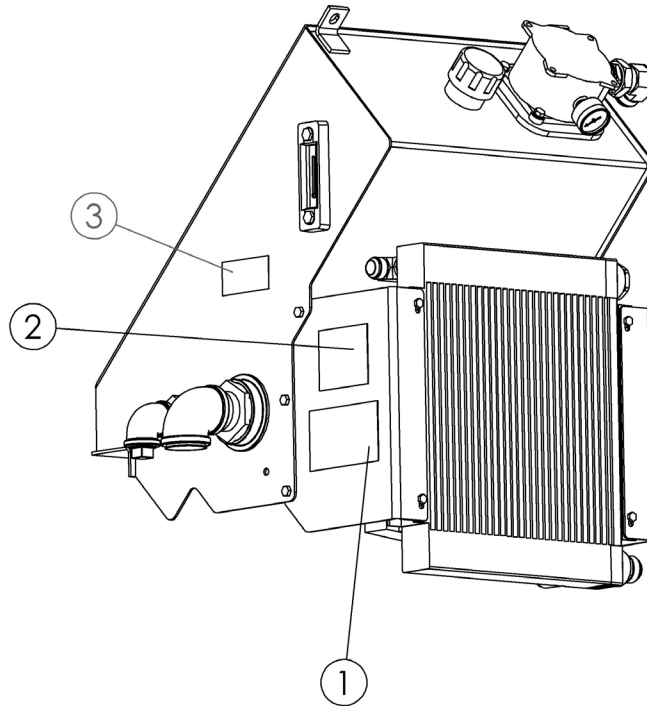




ITEM	PART NO.	DESCRIPTION	QTY
1	312561	Decal - New Leader, Black	4
2	87122	Decal - G4, Black / Red	3
3	320645	Decal - NL450 Black	2
4	Not Used		
5	368	Decal - Danger, Flying Material	1
6	71526	Decal - Notice, Spread Pattern	1
7	150034	Decal - Caution ,Operation & Maintenance	1
8	364	Decal - Danger, Moving Part Hazard	2
9	321	Decal - Caution, Hazardous Material	1
10	39138	Decal - Warning, High Pressure Fluid	2
11	55630	Decal - Warning, Falling Hazard	2
12	55631	Decal - Warning, Moving Part Hazard	2
13	98319	Decal - Patent 6, 517, 281	1
14	*39200	Decal - Warning, Falling Hazard (Fenders)	AR
15	315865	Decal - Warning: Hazardous Materials	1
16	317741	Decal - Warning Speed Limit (w/out brakes)	1
17	317739	Decal - 20 Mile/H (w/out brakes)	2
	305273	Decal - 30 Mile/H (with brakes)	2

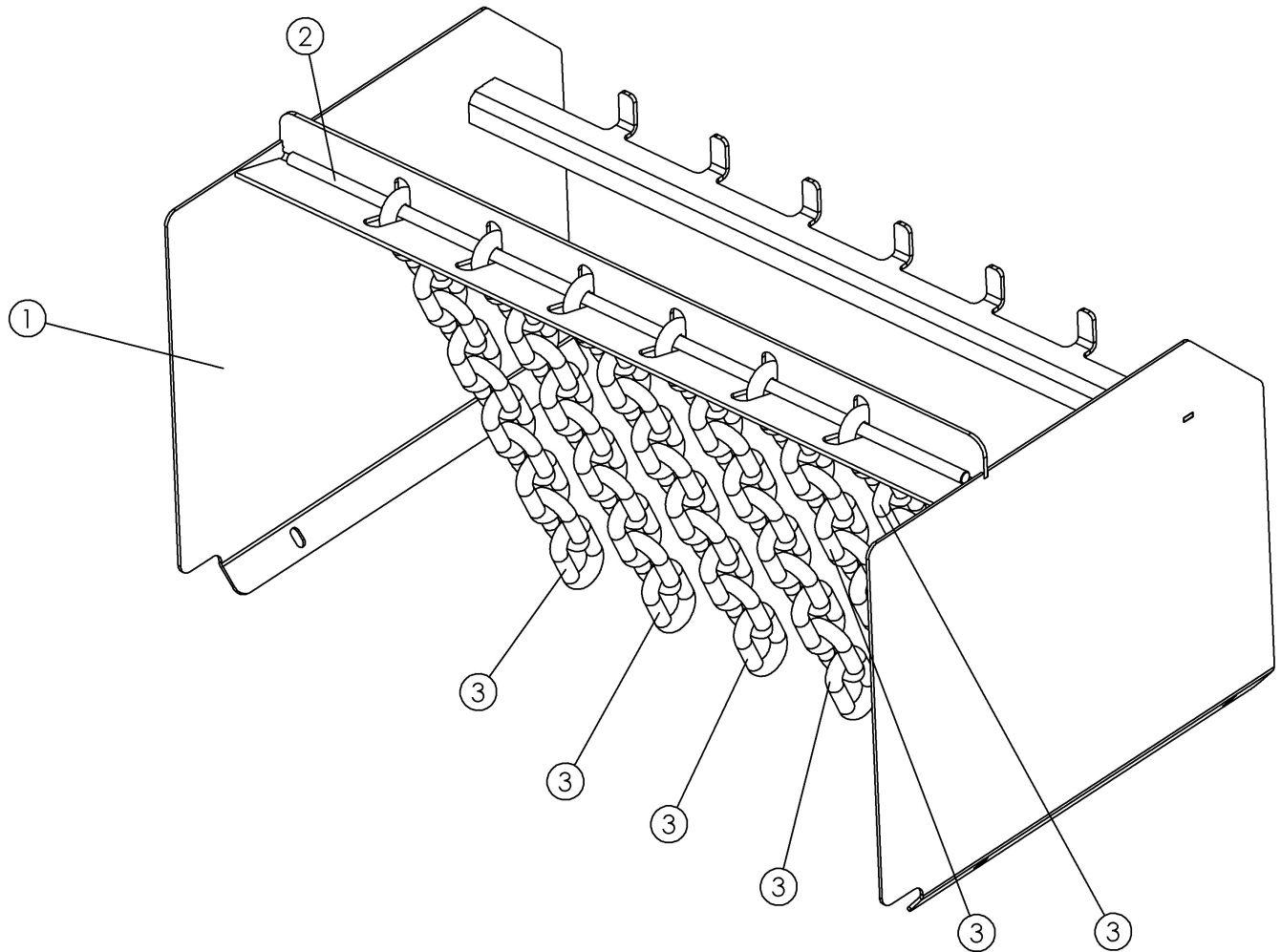
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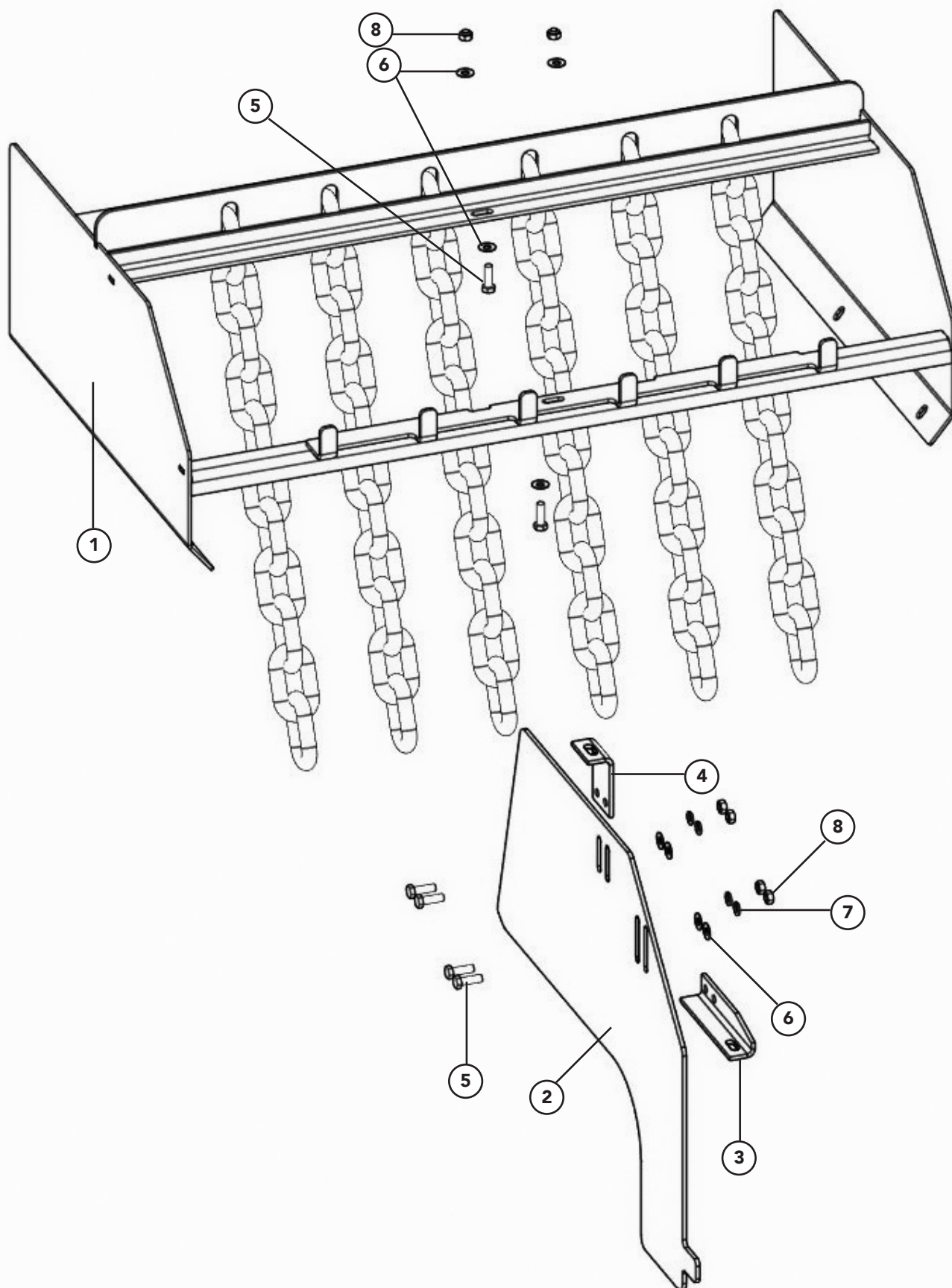
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304264	Decal - Important Cooler	1
2	39378	Decal - Change Filter Element	1
3	8664	Decal - Important Keep Valve Open	1

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Compost Cont.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	316008	Support - Wldmt 304	1
2	316006	Round - .5 X 34.00 304	1
3	312960	Chain - .625 X 11 Links	6



**Antislab
Fertilizer Cont.****NL450**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	317241	Divider - Assy Hillside Antislab 304	
1	317242	Antislab - Assy	1
	317243	Support - Wldmt 304	1
	316006	Round - .5 X 34.00 304	1
	312960	Chain - .625 X 11 Links	6
2	317248	Panel - Flow Divider 304	1
3	56879	Clamp - Bracket 304	1
4	56880	Clamp - Angle 304	1
5	34580	Capscrew - .313-18nc X 1 SS	6
6	36424	Washer - Flat .313 SS	8
7	36419	Washer - Lock .313 SS	2
8	36413	Nut - Hex .313-18nc SS	6