PROAG

Product of Morris Industries

# OPERATOR'S MANUAL

## Auto Align Bale Runner

### Model 16K

K34992-01

# Table of Contents

# Table of Contents

**Notes**

# Section 1: Safety

## Section Contents

**SAFETY-ALERT SYMBOL**

**Watch for this symbol. It identifies potential hazards to health or personal safety. It means:**

ATTENTION - BE ALERT.
YOUR SAFETY IS INVOLVED.

**Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.**

## Signal Words

The words **DANGER, WARNING** or **CAUTION** are used with the safety alert symbol. Learn to recognize the safety alerts, and follow the recommended precautions and safe practices.

**Three words are used in conjunction with the safety-alert symbol:**

**DANGER** — **Indicates an imminently hazardous situation that, if not avoided, will cause DEATH OR VERY SERIOUS INJURY.**

**WARNING** — **Indicates a potentially hazardous situation that, if not avoided, could cause DEATH OR SERIOUS INJURY.**

**CAUTION** — **Indicates a potentially hazardous situation that, if not avoided, may cause a MINOR OR MODERATE INJURY.**

Replace any **DANGER, WARNING, CAUTION** or instructional decal that is not readable or is missing. The location and part number of these decals is identified later in this section of the manual.

The words **Important** and **Note** are not related to personal safety but are used to give additional information and tips for operating or servicing this equipment.

**IMPORTANT:** Identifies special instructions or procedures which, if not strictly observed could result in damage to, or destruction of the machine, process or its surroundings.

**NOTE:** Indicates points of particular interest for more efficient and convenient repair or operation.

## General Equipment Safety

# ⚠ SAFETY. . . YOU CAN LIVE WITH IT!

### General Equipment Safety Guidelines

Safety of the operator is one of the main concerns in designing and developing a new piece of equipment. Designers and manufacturers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions presented in this section. To avoid personal injury, study the following precautions and insist those working with you, or for you, follow them.

- Replace any **CAUTION, WARNING, DANGER** or instruction safety decal that is not readable or is missing. Location of such decals is indicated in this booklet.
- Do not attempt to operate this equipment under the influence of drugs or alcohol.
- Review the safety instructions with all users annually.
- This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible adult familiar with farm machinery and trained in the equipment's operations. **Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how the machine works.**
- To prevent injury or death, use a tractor equipped with a Roll Over Protective System (ROPS).
- Do not paint over, remove or deface any safety signs or warning decals on your equipment. Observe all safety signs and practice the instructions on them.
- Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question **- DON'T TRY IT.**

## Lighting and Marking

- It is the responsibility of the operator to know the lighting and marking requirements of the local highway authorities and to install and maintain any additional equipment to provide compliance with the regulations. Aftermarket lighting kits are often available from your dealer.
- This machine is equipped with lighting, marking, and signs in compliance with standards published by the American Society of Agricultural Engineers for Slow Moving Agricultural Implements on Public Roadways.

## Wheels and Tires

### Tire Safety

- Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
- Do not attempt to mount a tire unless you have the proper equipment and experience.
- Inflating or servicing tires can be dangerous. Only trained personnel should be called to service and/or mount tires.
- Only install tires and wheels with appropriate capacity to meet or exceed the anticipated weight to be placed on the equipment.

**DON'T FORGET!** *Your best assurance against accidents is a careful and responsible* operator. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer.

## Brake Safety

**Brakes are Important!** Brakes are an option on this machine. If your machine is equipped with brakes, please observe the following guidelines regarding operation, maintenance, and adjustment.

- Follow all connection procedures under "Hooking Up for the First Time" in Section 5 of this manual. For the brakes to operate properly, they must be connected properly.
- Be sure all the brakes are adjusted properly, following the procedures outlined under "Air Brake Maintenance" in Section 6 of this manual. If the brakes are not adjusted properly, they will not operate properly.
- Use caution whenever operating this machine. Even though brakes are available for use, this machine can still be driven too quickly for the conditions. Always allow plenty of time to slow down for emergency situations.
- Test the brakes before operation.
- Applying the brakes to lockup will cause the stacker to slide and behave erratically. Avoid this situation.

## Bale Runner Operation Safety

### Before Operating

- Carefully study and understand this manual.
- Install and test the control box to indicate when the hitch is offset.
- Do not wear loose-fitting clothing which may catch in moving parts.
- Always wear protective clothing and foot wear.
- It is recommended that suitable protective hearing and eye protection be worn.
- The operator may come in contact with certain materials which may require specific safety equipment, relative to the handling of such materials (examples: extremely dusty molds, fungus, bulk fertilizers, etc.)
- Keep wheel lug nuts or bolts tightened to specified torque.
- Ensure that the tires are inflated to the recommended pressure.
- Give the unit a visual inspection for any loose bolts, worn parts or cracked welds, and make necessary repairs. Follow the maintenance safety instructions included in this manual.
- Be sure that there are no tools lying on or in the equipment.
- Do not use the unit until you are sure that the operating area is clear, especially of people and animals.
- Because it is possible that this equipment may be used in dry areas or in the presence of combustibles, special precautions should be taken to prevent fires and fire fighting equipment should be readily available.
- Don’t hurry the learning process or take the unit for granted. Ease into it and become familiar with your new equipment.
- Practice operation of your equipment and its attachment. Completely familiarize yourself and other operators with its operation before using.
- Make sure that the brakes are evenly adjusted.
- Use a tractor equipped with a Roll Over Protective System (ROPS) and fasten your seat belt prior to starting the engine.
- Move tractor wheels to the widest recommended settings to increase stability.
- Securely attach to towing unit. Use the plates, bolts and nuts provided with the machine.
- Do not allow anyone to stand between the hitch and the towing vehicle when backing up to the equipment.

## Bale Skoop Operation Safety - Continued

### During Operation

- **SAFETY CHAIN:** If the Bale Runner is going to be transported on a public highway, the safety chain should be connected. Always follow state and local regulations regarding a safety chain and auxiliary lighting when towing farm equipment on a public highway. Only a safety chain (not an elastic or nylon/plastic tow strap) should be used to retain the connection between the towing and towed machines in the event of separation of the primary attaching system.
- Install the safety chain by crossing the chains under the hitch and secure to the draw bar cage, hitch or bumper frame.
- Beware of bystanders, **particularly children!** Always look around to make sure that it is safe to start the engine of the towing vehicle or move the unit. This is particularly important with high noise levels and quiet cabs, as you may not hear people shouting.
- **NO PASSENGERS ALLOWED:** Do not carry passengers anywhere on or in the tractor or equipment.
- The tops of the bed and loader are extremely slippery, do not climb, stand, or crawl on them.
- Keep bystanders at least twenty-five feet away from an operating machine or stacked hay. This allows bystanders time to get away from a falling stack or away from a moving machine. The operator is a very busy person and it is easy to miss seeing an observer while operating the Bale Runner.
- Keep hands and clothing clear of moving parts.
- Do not clean, lubricate or adjust your equipment while it is moving.
- When halting operation, even for a short period of time, set the tractor's or towing vehicle's brakes, disengage the PTO, shut off the engine and remove ignition key.
- Be especially observant of the operating area and terrain - watch for holes, rocks or other hidden hazards. Always inspect the area prior to operation.
- **DO NOT** operate near the edge of drop-offs or banks.
- **DO NOT** operate on steep slopes as overturn may result.
- Operate up and down (not across) intermediate slopes. Avoid sudden starts and stops.
- Pick the flattest possible route when transporting across fields. Avoid the edges of ditches or gullies and steep hillsides.
- Always return the hitch to the in-line position whenever moving from the stack to the bales or the bales to the stack.
- Be extra careful when working on inclines.
- Periodically clear the equipment of brush, twigs or other materials to prevent buildup of dry combustible materials.
- Maneuver the tractor or towing vehicle at safe speeds.
- Avoid overhead wires or other obstacles. Contact with overhead lines could cause serious injury or death.
- Avoid loose fill, rocks and holes; they can be dangerous for equipment operation or movement.
- Allow for unit length when making turns.
- Do not walk or work under raised components or attachments unless securely positioned and blocked.
- Keep all bystanders, pets and livestock clear of the work area.

## Bale Skoop Operation Safety - Continued

### During Operation - Continued

- Operate the towing vehicle from the operator's seat only.
- Never stand alongside of unit with engine running or attempt to start engine and/or operate machine while standing alongside the unit.
- Never leave running equipment attachments unattended.
- As a precaution, always recheck the hardware on equipment following every 100 hours of operation. Correct all problems. Follow the maintenance safety procedures.

### After Operation (Storage)

- Following operation, or when unhitching, stop the tractor or towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition key.
- Store the unit in an area away from human activity.
- Do not park equipment where it will be exposed to livestock for long periods of time. Equipment damage and livestock injury could result.
- The tops of the bed and loader are extremely slippery, do not climb, stand, or crawl on them.
- Do not permit children to play on or around the stored unit.
- Make sure all parked machines are on a hard, level surface and engage all safety devices.
- Wheel chocks may be needed to prevent unit from rolling.

## Transport Safety

### Highway and Transportation Safety

**CAUTION: Exceeding speeds of 20 mph (32 km/h) is not legal or safe on public roads. DO NOT exceed 20 mph (32 km/h) with this machine.**

**WARNING: This machine is over width. Use extreme caution transporting on public roadways and through narrow areas.**

- Adopt safe driving practices. . .
- Keep the brake pedals latched together at all times. **NEVER USE INDEPENDENT BRAKING WITH MACHINE IN TOW AS LOSS OF CONTROL AND /OR UPSET OF UNIT CAN RESULT.**
- Always drive at a safe speed relative to local conditions and ensure that your speed is low enough for an emergency stop to be safe and secure.
- Reduce speed prior to turns to avoid the risk of overturning.
- Avoid sudden uphill turns on steep slopes.
- Always keep the tractor or towing vehicle in gear to provide engine braking when going downhill. Do not coast.
- Do not drink and drive!
- Comply with local laws governing highway safety and movement of farm machinery on public roads.
- Be sure stock lights as well as accessory lights are connected and operating properly.
- Use approved accessory lighting, flags and necessary warning devices to protect operators of other vehicles on the highway during daylight and night time transport. Various safety lights and devices are available from your dealer.
- The use of flashing amber lights is acceptable in most localities, however some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
- When driving the tractor and equipment on the road or highway under 20 mph (32 km/h) at night or during the day, use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem.
- Be sure stock lights as well as accessory lights are connected and operating properly.
- Plan your route to avoid heavy traffic.
- Be a safe courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc.
- Watch for obstructions overhead and to the side while transporting.
- Always operate equipment in a position to provide maximum visibility at all times. Make allowances for increased length, width and weight of the equipment when making turns, stopping the unit, etc.

## Maintenance Safety

### Performing Maintenance

- Good maintenance is your responsibility. Poor maintenance is an invitation for trouble.
- Make sure there is plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.
- Before working on this machine, stop the towing vehicle, set the brakes, disengage the PTO and all power drives, **shut off the engine and remove the ignition keys**.
- Be sure the bed is supported by a block positioned between the bed rest and the loader.
- Be certain all moving parts on attachments have come to a complete stop before attempting to perform maintenance.
- **Always** use a safety support and block the wheels. Never use a jack to support the machine.
- Always use the proper tools or equipment for the job at hand. Use extreme caution when making adjustments.
- A torque chart is provided in Section 6 of this manual for reference when tightening bolts and nuts.
- Never use your hands to locate a hydraulic leak on attachments. Use a piece of cardboard or wood. Hydraulic fluid escaping under pressure can penetrate the skin.
- When disconnecting hydraulic lines, shut off hydraulic supply and relieve all hydraulic pressure (see Maintenance Section 6 for instructions).
- Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. If injured by escaping hydraulic fluid, see a doctor at once. Without immediate medical treatment, serious infection, gangrene and allergic reactions can occur.
- Replace **all shields** and guards after servicing and before moving.
- After servicing, be sure all tools, parts and service equipment are removed.
- Do not allow grease or oil to build up on any step or platform.
- Never replace hex bolts with less than grade eight bolts unless otherwise specified. Refer to bolt torque chart for head identification marking.
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not claim responsibility for use of unapproved parts and/or accessories and other damages as a result of their use.
- If equipment has been altered in any way from original design, the manufacturer does not accept any liability for injury or warranty.
- A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.

### Air System Components

- Stop engine when working under a vehicle. Always block the vehicle wheels against a fore or aft roll. Bleeding off system air pressure may cause the vehicle to roll. Keep hands away from brake chamber, push rods, and slack adjusters; they may apply as system pressure drops.
- Never connect or disconnect a hose or line containing air pressure. It may whip as air escapes. Never remove a component or a pipe plug unless you are certain all system air pressure has been exhausted.
- Never exceed recommended working air pressure and always wear safety glasses when working with air pressure. Never look directly into component ports or direct a pressurized air flow at anyone.
- Never attempt to disassemble a component until you have read and understood all recommended procedures. Some components contain powerful springs and injury can result if not properly disassembled. Use only proper tools and observe all precautions pertaining to the use of those tools.

## Safety Signs

### Safety Decals

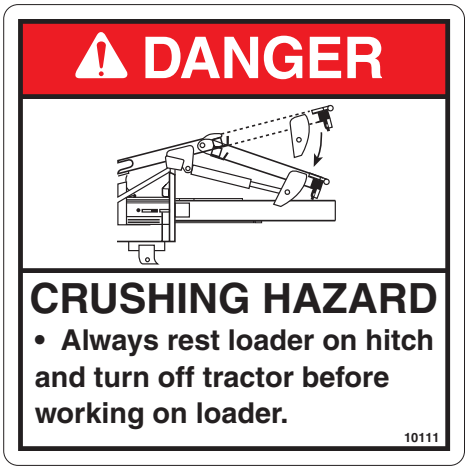
- Keep safety decals and signs clean and legible at all times.
- Replace safety decals and signs that are missing or have become illegible.
- Parts that have been replaced that once displayed a safety sign should have the sign replaced as well.
- Safety decals or signs are available from your distributor, dealer parts department, or the manufacturer.

### How to install a new decal

1. Be sure that the installation area is clean and dry.
2. Decide on the exact position before you remove the backing paper.
3. Remove the smallest portion of the split backing paper.
4. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
5. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
6. Small air pockets can be pierced with a pin and smoothed out using the decal backing paper.

**To determine missing decals, or to locate proper locations for replacements refer to the "Decal Location Guide" later in this section.**


Part # 10110 – Danger Falling Bale Hazard
Location: Both sides of bed.




Part # 10111 Danger Crushing Hazard
Location: Left side of bed.

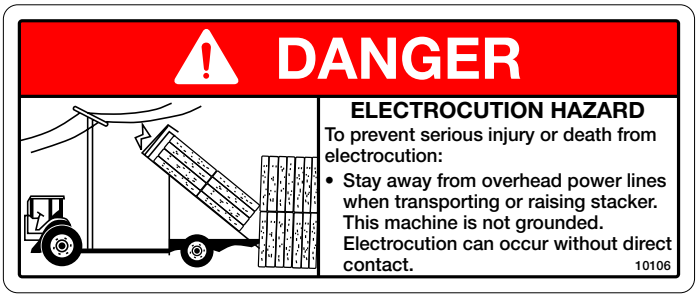
## Safety Signs


Part # 10119 – Danger Hitch Hazard
Location: Top of hitch.


Part # 10108 - Danger Pinch Injury
Location: Both sides of bed.


Part # 10109 - Danger Offset Machine
Location: Right side of bed.

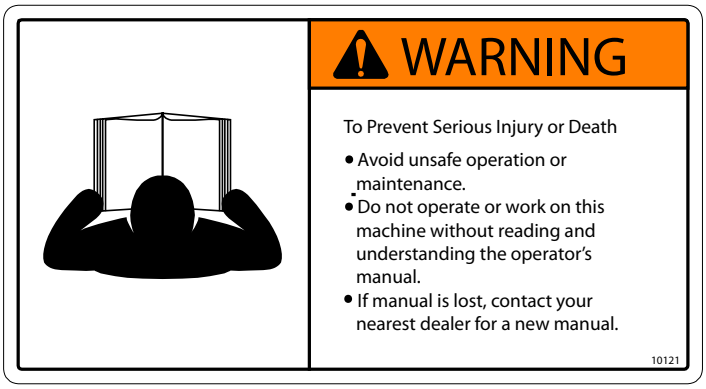

Part # 11549 - Danger Mechanism May Move
Location: Top of hitch.




Part # 10106 - Danger Electrocution Hazard
Location: Top of hitch.

**Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.**

## Safety Signs - Continued

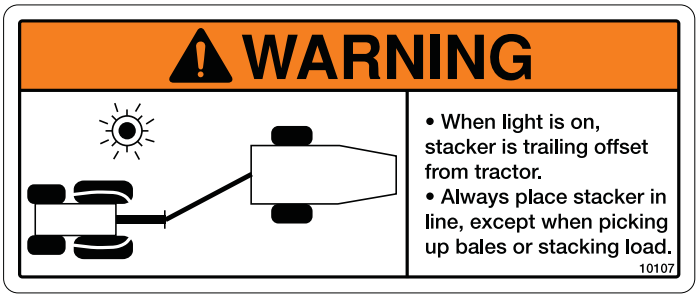



Part # 10121 – Warning To Prevent Serious Injury
Location: Top of hitch.


Part # 11839 - Warning No Brakes
Location: Top of hitch.


Part # 10120 - Warning High Pressure Fluid
Location: Top of hitch.


Part # 10123 - Warning Hitch Safety Pin
Location: Front of frame above hitch.




Part # 10107 - Warning Offset Machine
Location: Top of hitch.

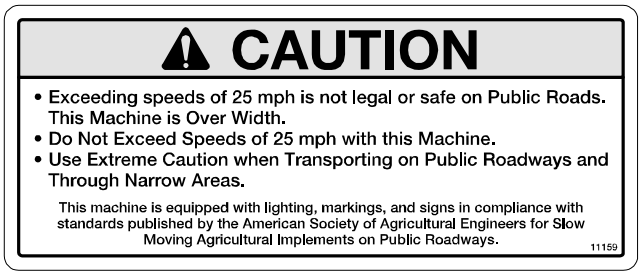

Part # 11546 - Warning Drag Chain Hazard
Location: Both sides of hitch.

**Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.**

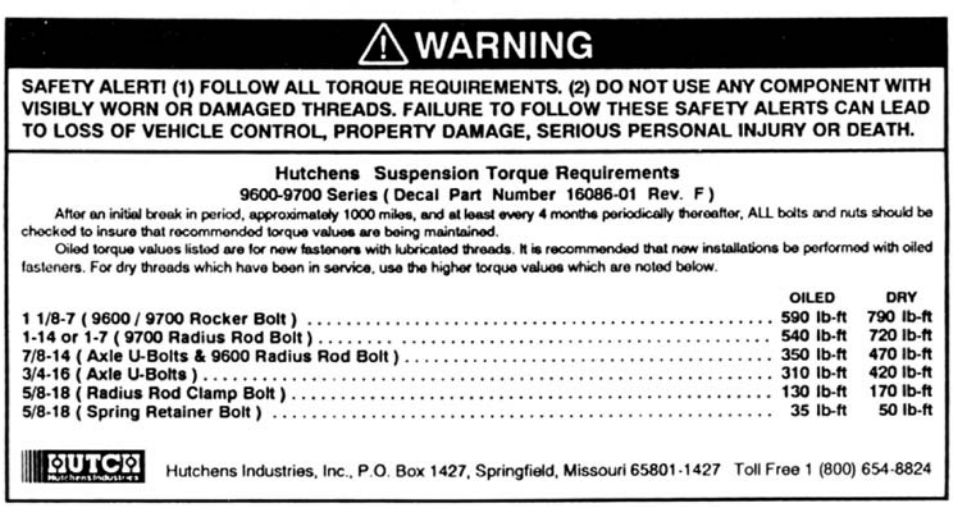
## Safety Signs - Continued


Part # 10122 – Caution Read Op Manual
Location: Top of hitch.


Part # 10112 - Caution Slippery Surface
Location: Both sides of bed.




Part # 11159 - Caution Speed
Location: Top of hitch.

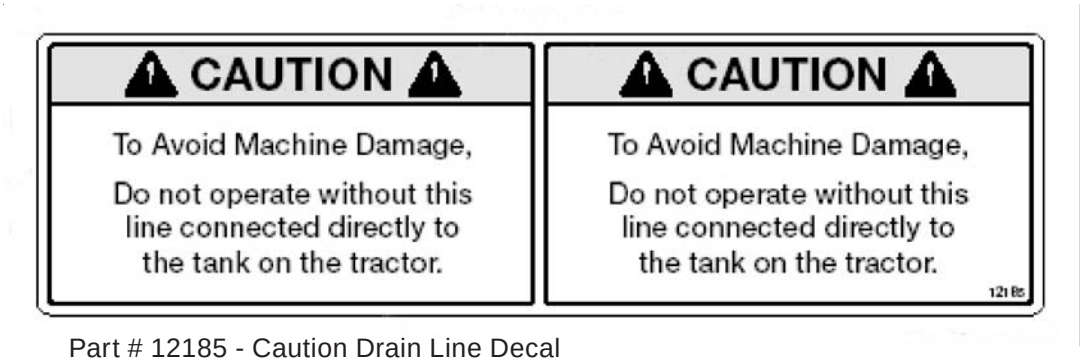



Part# 10774 Warning Torque Requirement Decal
Location: On frame next to suspension

**Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.**

## Safety Signs - Continued


Part # 11548 - Caution Connecting Hoses
Location: Top of hitch.




Part # 12185 - Caution Drain Line Decal
Location: End of drain line.

**Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.**

## Safety Signs - Continued


Part # 12194 - ProAG Logo Decal
Location: Rear sides of bed.

A UTO LIGN BALE RUNNER 16K

Part# 11550 - Auto Align Bale Runner 16K
Location: Both sides of bed

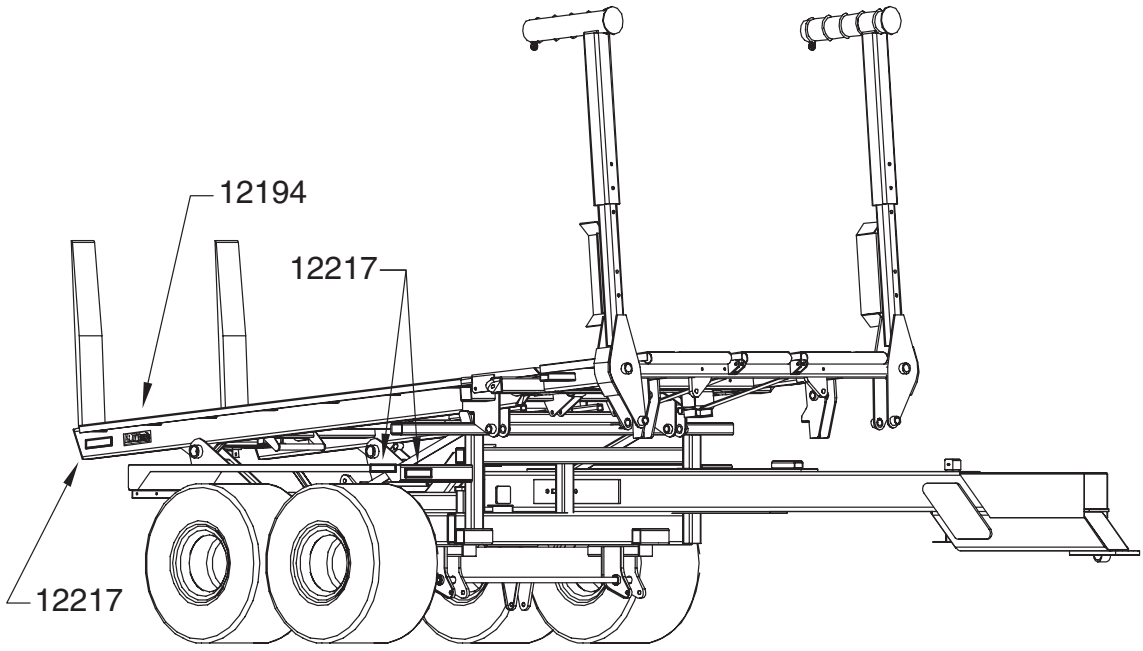

Part # 12195 - Replacement Manual
Location: On frame by op manual box


Part # 11547 - Patent Pending Decal
Location: Both sides of bed.

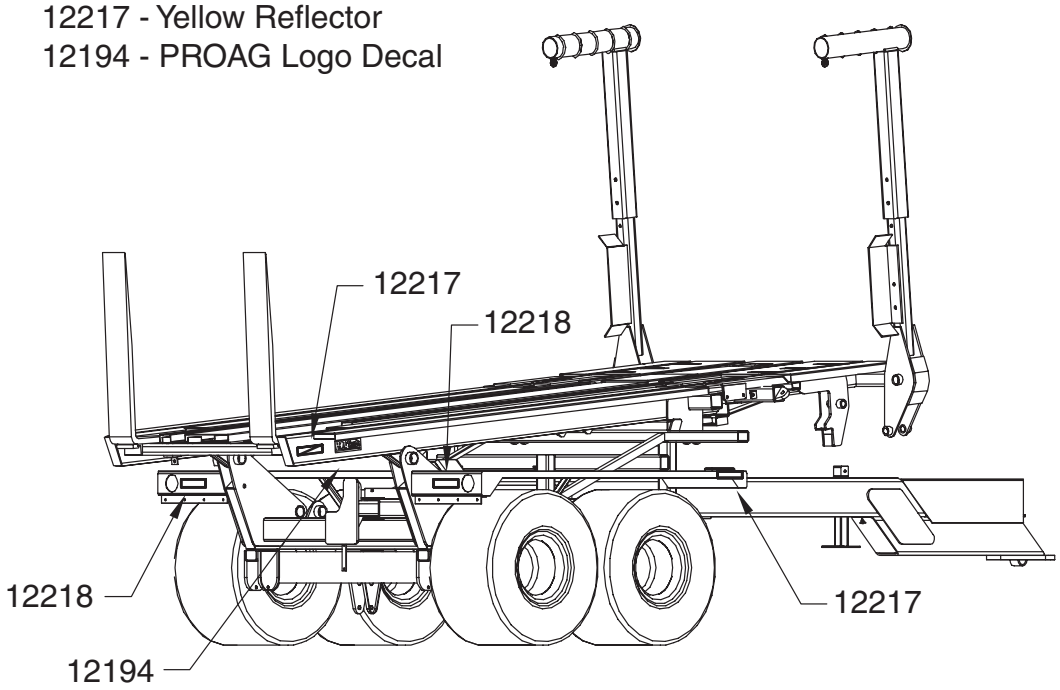
**Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.**

## Safety Signs - Continued

### Reflector Location Guide

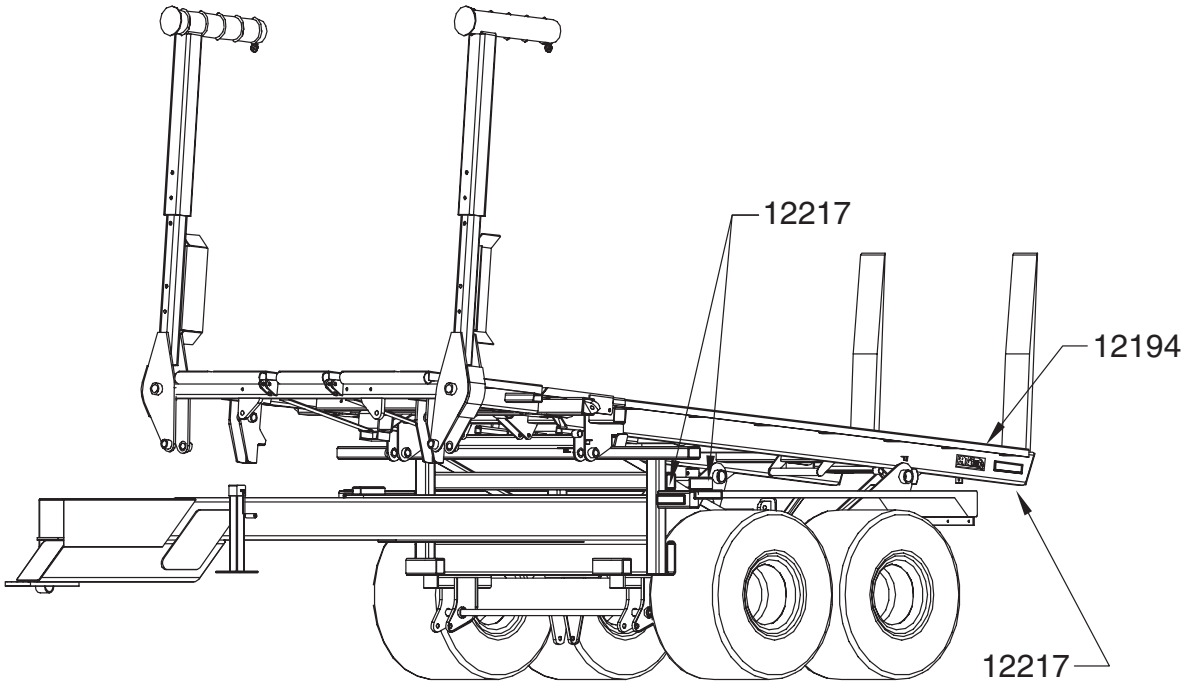



12218 - Red Reflector
12217 - Yellow Reflector
12194 - PROAG Logo Decal

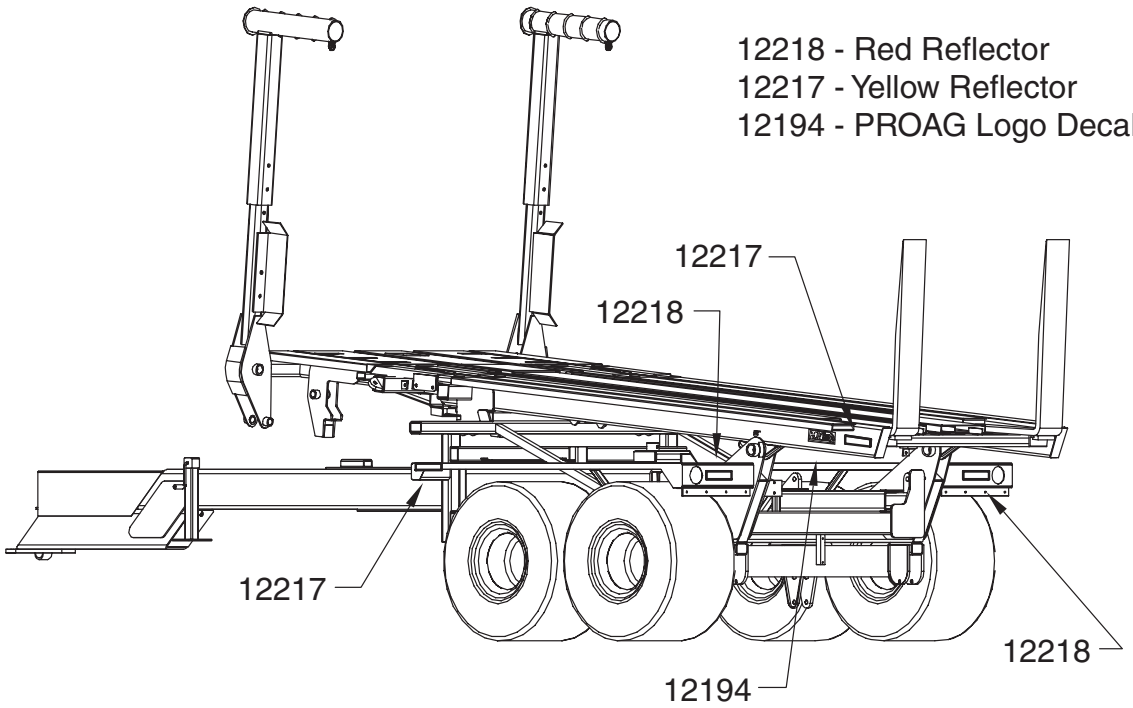


## Safety Signs - Continued

### Reflector Location Guide - Continued

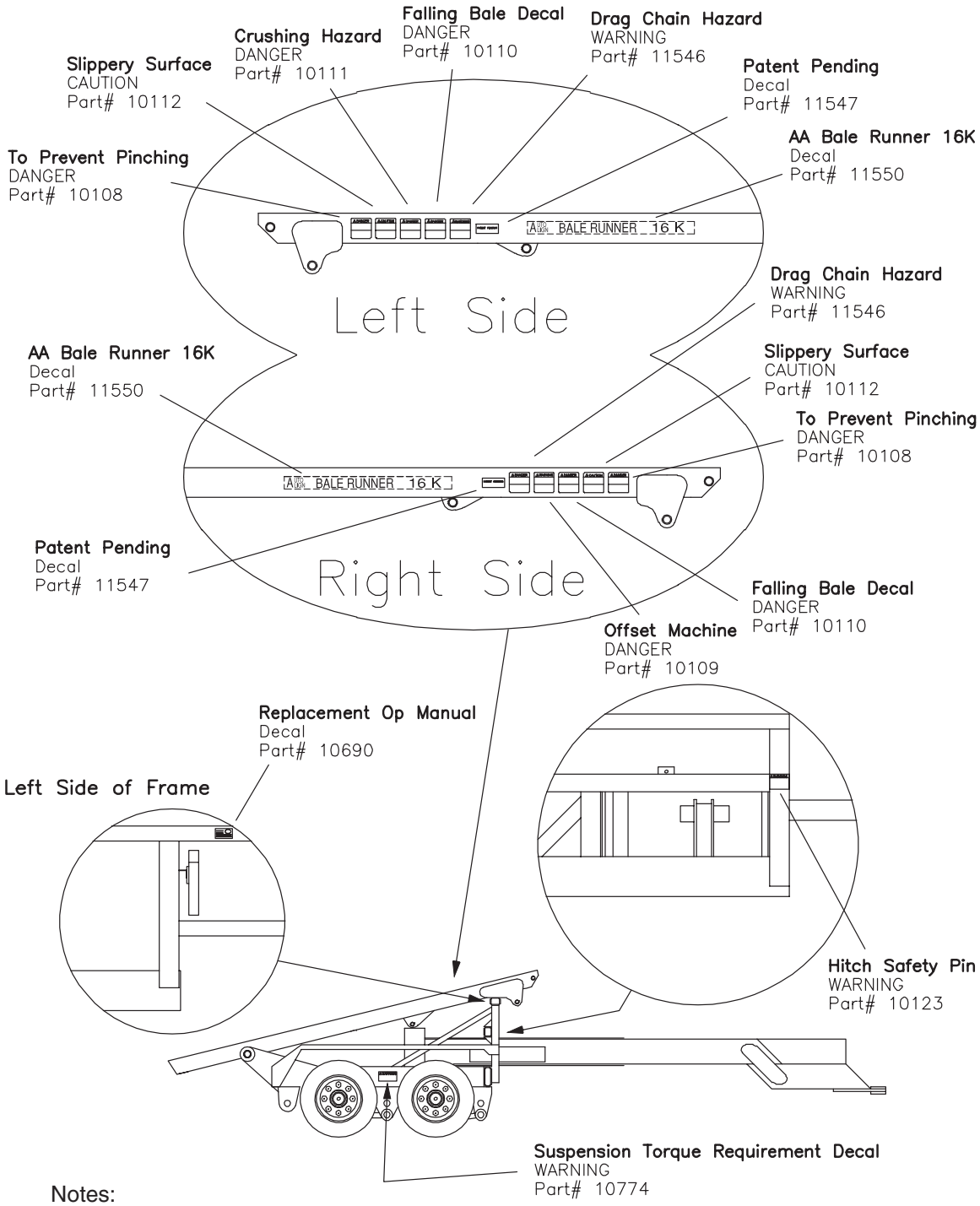



12218 - Red Reflector
12217 - Yellow Reflector
12194 - PROAG Logo Decal



## Safety Signs - Continued

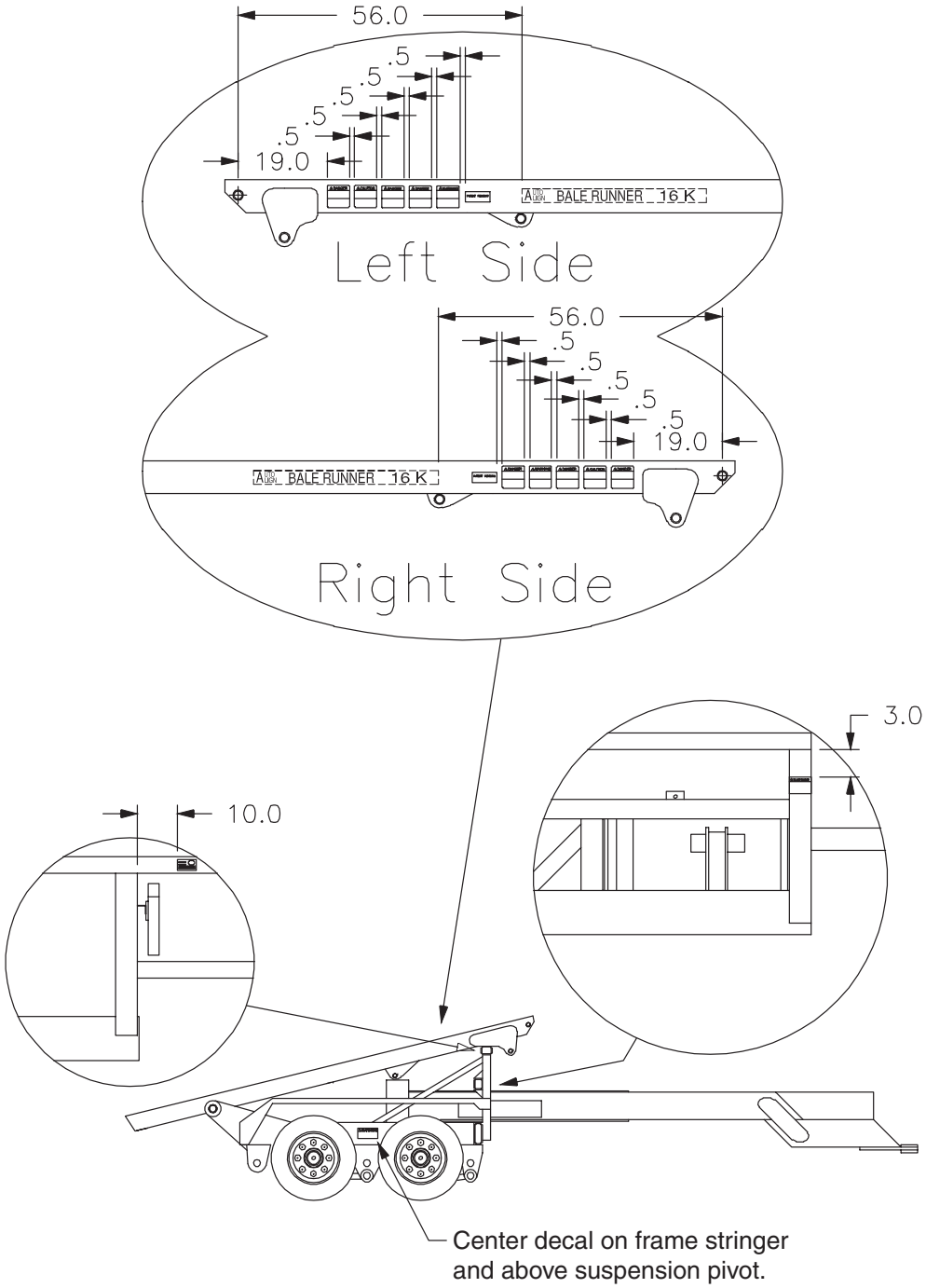
### Decal Location Guide




Notes:
1. Some parts not shown for clarity.
2. Dimensional tolerance: ±1/2”

## Safety Signs - Continued

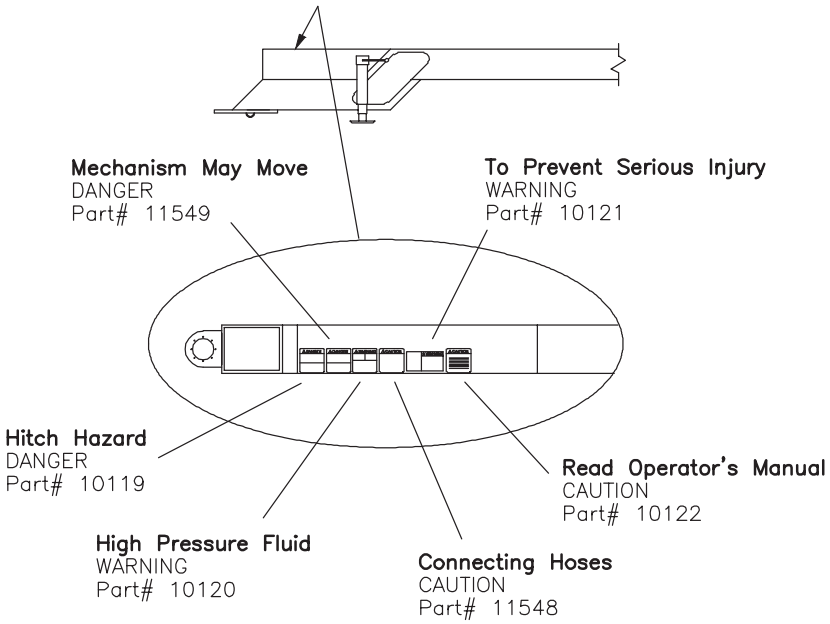
### Decal Location Guide - Continued

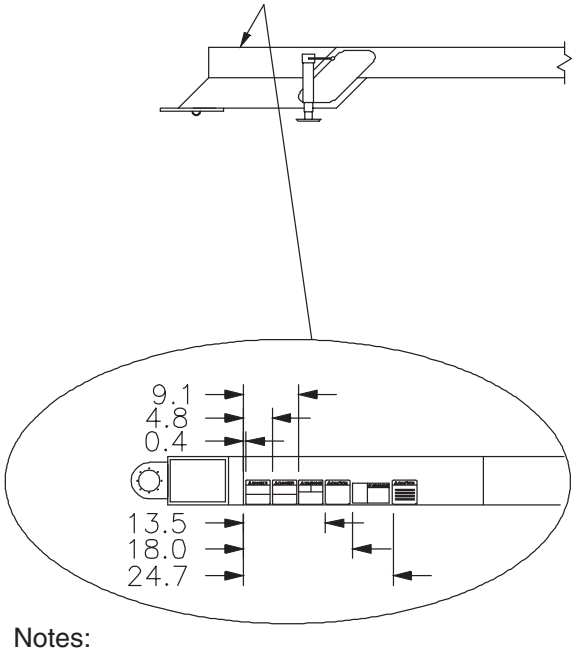



Note:
1. Dimensional tolerance: ±1/2”

## Safety Signs - Continued

### Decal Location Guide - Continued

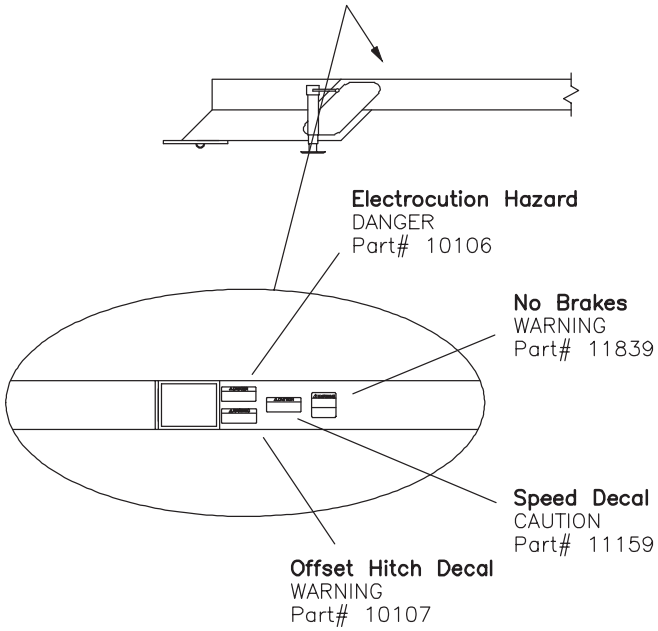


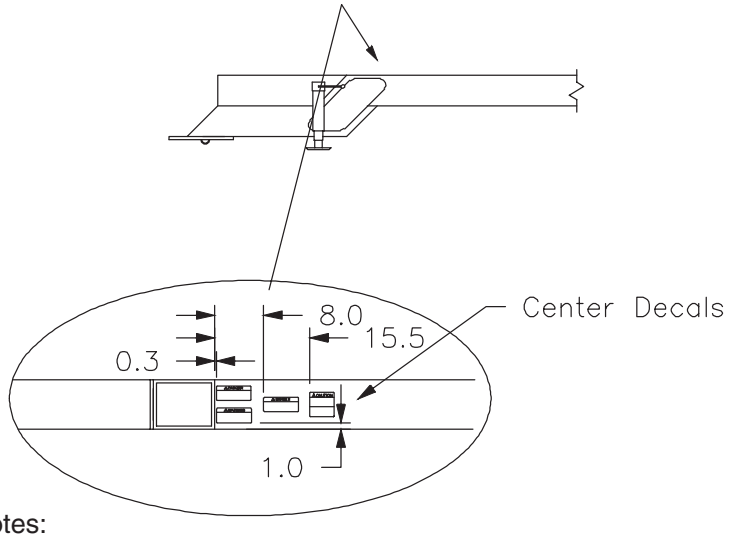




Notes:
1. Not all objects shown for clarity.
2. Dimensional tolerance: ±1/2”

## Safety Signs - Continued

### Decal Location Guide - Continued




Notes:
1. Not all objects shown for clarity.
2. Dimensional tolerance: ±1/2”

**Notes**

# Section 2: Specifications

## Section Contents

# Specifications

## Machine Specifications

### 16K

Maximum lift capacity of the loader ..... 4,000 lbs (1814 kg)
Maximum payload ..... 18,000 lbs (8165 kg)
Road-siding capacity in tons/hour ..... 70-90 (64 t/h to 82 t/h)
Stacker weight ..... 13,000 lbs (5897 kg)
Tongue weight empty ..... 1,300 lbs (590 kg)
Tongue weight loaded ..... 2,500 lbs (1134 kg)

### Tractor Requirements

HP requirements ..... 180HP (134kW) minimum
Minimum tractor weight w/o brakes ..... 20,000 lbs (9072 kg)

### Hydraulic Requirements

External drain port
Pressure and return ports
Minimum requirements
- Hydraulic pressure ..... 2,250 psi (15.51 MPa)
- Hydraulic flow ..... 20 Gpm (1.26 L/s)
- Hydraulic controls ..... 3 remotes (2 with double selector valve)

### Tire Specifications

Tire brand ..... Alliance
Tire size ..... 500/45-22.5, 16 ply
Minimum tire pressure - Max speed 20 mph (32 km/h) ..... 35 psi (241 kPa)
Recommended tire pressure - Max speed 25 mph (40 km/h) ..... 46 psi (317 kPa)
Maximum tire pressure ..... 71 psi (489 kPa)

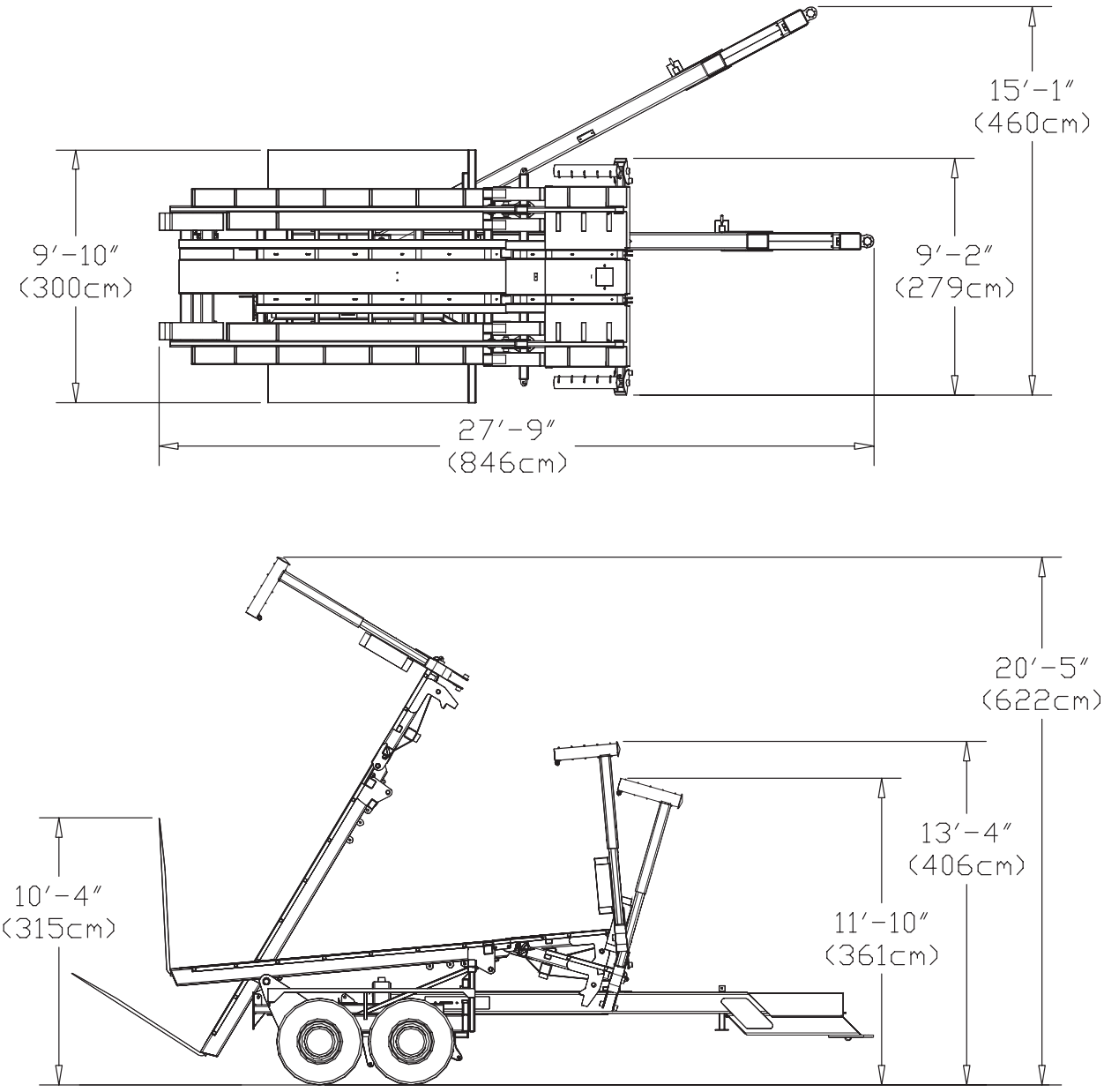
### Bale Size

Minimum Bale Length ..... 6 1/2 ft (198 cm)
Maximum Bale Length ..... 8 1/2 ft (259 cm)

### Lubricants

Hydraulic oil ..... High quality that meets or exceeds tractor specifications
Axle hub oil ..... 80-90 gear lube
Grease ..... Non clay based

## Bale Runner Dimensions



## Notes

# Section 3: Checklist

## Section Contents

## SAFETY-ALERT SYMBOL

**Watch for this symbol. It identifies potential hazards to health or personal safety. It points out safety precautions. It means:**

**ATTENTION - BE ALERT.**

**Your safety is involved.**

## Manuals

**Note: Pre-Delivery Inspection Form must be completed and submitted to Morris Industries within 30 days of delivery date.**

**Warranty Void if Not Registered**

## Pre-Operation Checklist

Please read the Operator's Manual carefully and become a "SAFE" operator.

Adopt a good lubrication and maintenance program.

**TAKE SAFETY SERIOUSLY.**

**DO NOT TAKE NEEDLESS CHANCES!!**

### OWNER REFERENCE

Model: _____

Serial No: _____

Dealer: _____

Town: _____ State: _____

Phone: _____

OWNER/OPERATOR: _____

Date: _____

Before operating Bale Skoop check the following items:

### Pre-Operation Check

____ **Lug nuts** - Check that all lug nuts are present and torqued to the appropriate specification.

____ **Pin retaining bolts** - Check for any missing or loose bolts or pins, replace or tighten as necessary.

____ **Hydraulic hoses** - Inspect all hydraulic hoses and replace any worn hoses. *Remember:* Use a piece of cardboard or wood to look for leaks, replace leaky hoses.

____ **Jack** - Check that the jack has been raised to its hightest position and that the extension leg has been fully retracted.

____ **Hitch Safety Pin** - If traveling, check that the Hitch Safety Pin is securely in place. If gathering or stacking, check that the Hitch Safety Pin has been removed.

____ **Warning Light** - Check that the Warning Light functions properly.

____ **Lighting** - Make sure the lighting is hooked up and functioning properly.

____ **Tire Pressure** - Check tire pressure to make sure it is within the specified range given on page 3 in the Machine Specifications section.

____ **Hitch Connection** - Check the bolt system that connects the stacker to the tractor drawbar. A loose connection will wear faster and possibly uncouple.

____ **Breakaway Device** - Make sure the hitch safety chain is connected.

____ **Brakes** - Check to see that the brake system is hooked up and functioning properly if so equipped.

**Notes**

# Section 4: Introduction

## Section Contents

## Introduction

This Operator's Manual has been carefully prepared to provide the necessary information regarding the operation and adjustments, so that you may obtain maximum service and satisfaction from your new ProAG Bale Runner 16K.

To protect your investment, study your manual before starting or operating in the field. Learn how to operate and service your Bale Runner 16K correctly, failure to do so could result in personal injury or equipment damage.

If you should find that you require information not covered in this manual, contact your local ProAG Dealer. The Dealer will be glad to answer any questions that may arise regarding the operation of your ProAG Bale Runner 16K.

ProAG Dealers are kept informed on the best methods of servicing and are equipped to provide prompt, efficient service if needed.

Occasionally, your Bale Runner 16K may require replacement parts. Your Dealer will be able to supply you with the necessary replacement parts required. If the Dealer does not have the necessary part, the ProAG Factory will promptly supply the Dealer with it.

Your ProAG Bale Runner 16K is designed to give satisfaction even under difficult conditions. A small amount of time and effort spent in protecting it against rust, wear and replacing worn parts will increase the life and trade-in value.

**Keep this book handy for ready reference at all times.** It is the policy of ProAG to improve its products whenever it is possible to do so. The Company reserves the right to make changes or add improvements at any time without incurring any obligation to make such changes on machines sold previously.

# Section 5: Operation

## Section Contents

## Section Contents

**CAUTION**

**BE ALERT**

**SAFETY FIRST**

**REFER TO SECTION 1 AND REVIEW ALL SAFETY RECOMMENDATIONS.**

## Tractor

### Tires

- Proper ballast and tire pressure are required when pulling heavy implements.
- Consult your tractor operator's manual and follow all recommended procedures.

### Hydraulics

- Wipe all hydraulic fittings and couplers with a clean cloth to avoid contaminating the system.
- Check that the hydraulic reservoir is filled to the proper level.

### Drawbar

- Center and pin in a fixed position for easier hitching and greater stability.

**Warning**

**Do not permit smoking, sparks or an open flame where combustible fuels are being used. Keep the work area well ventilated.**

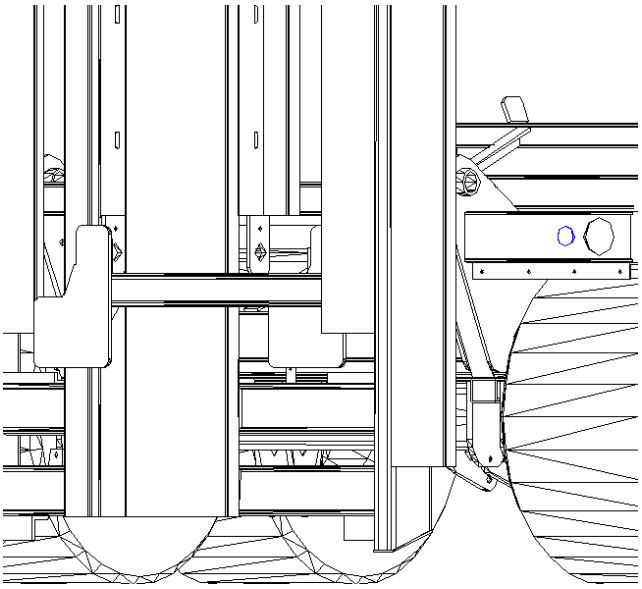
**Warning**

**Do not search for high-pressure hydraulic leaks without hand and face protection. A tiny, almost invisible leak can penetrate skin, thereby requiring immediate medical attention.**

## Machine Conventions

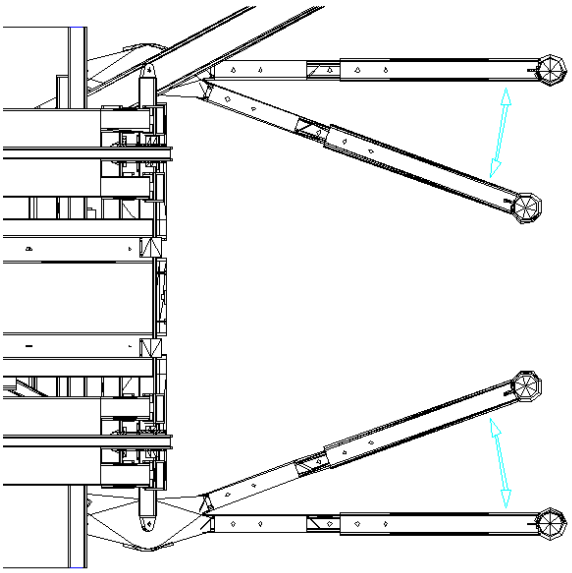
**“Pushoff In”** The pushoff is retracted into the pushoff tube.

**“Pushoff Out”** The pushoff is extended from the pushoff tube and penetrates through the hole in the rear of the bed. The bed must be fully raised before the pushoff tube can be extended, otherwise component collision is possible.



**“Power Slider Home”** The power slider is fully returned underneath the loader.

**“Power Slider Back”** The power slider has gone through half of its cycle and is positioned on top of the bed. This position varies along the bed depending on the number of bales that have already been gathered.



**“Alignment Arms Open”** The alignment arms are open when the portion of the alignment arms that are closest to the tractor are at their widest position.

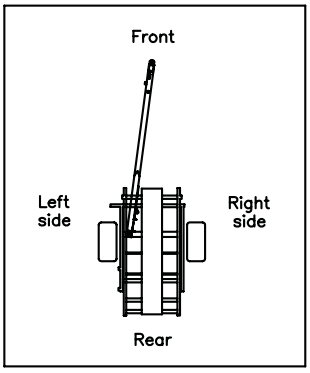
**“Alignment Arms Closed”** The alignment arms are closed when the portion of the alignment arms that are closest to the tractor are at their narrowest position.

**“Grab Hooks In”** The grab hooks are in when they are engaged, or grabbing the bale through the front of the loader.

**“Grab Hooks Out”** The grab hooks are out when they are disengaged back behind the loader, or have released the bale.

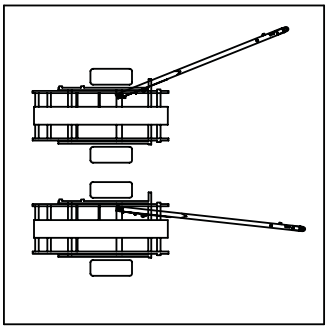
## Machine Conventions

### Auto Align Bale Runner Directional Conventions




**"Right and Left"** The right and left side of the Bale Runner is your right or left when standing behind the Bale Runner and looking toward the front of the machine.

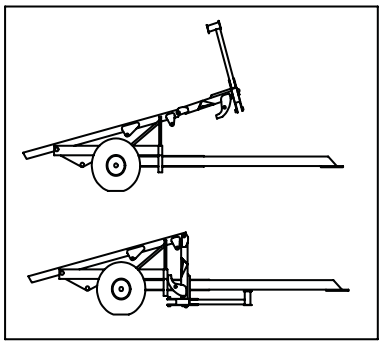
**"Front and Rear"** The front is the high end of the bed. The rear of the Bale Runner is the low end of the bed.



*Hitch Offset — Hitch Inline*

**"Offset"** The machine configuration when the Hitch is maneuvered to allow machine to pick up bales. The end of the Hitch is to the left of the left side tire.

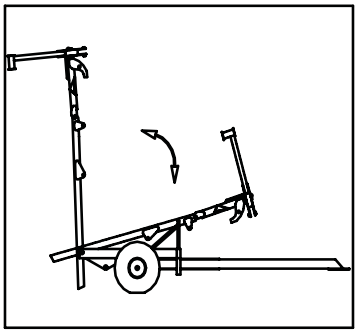
**"Inline"** The machine configuration when the end of the Hitch is centered between the wheels of the Bale Runner.



*Loader Raised — Loader Lowered*

**"Raise the Loader"** Move the hydraulic control to move, or physically lift the Loader into the raised position.

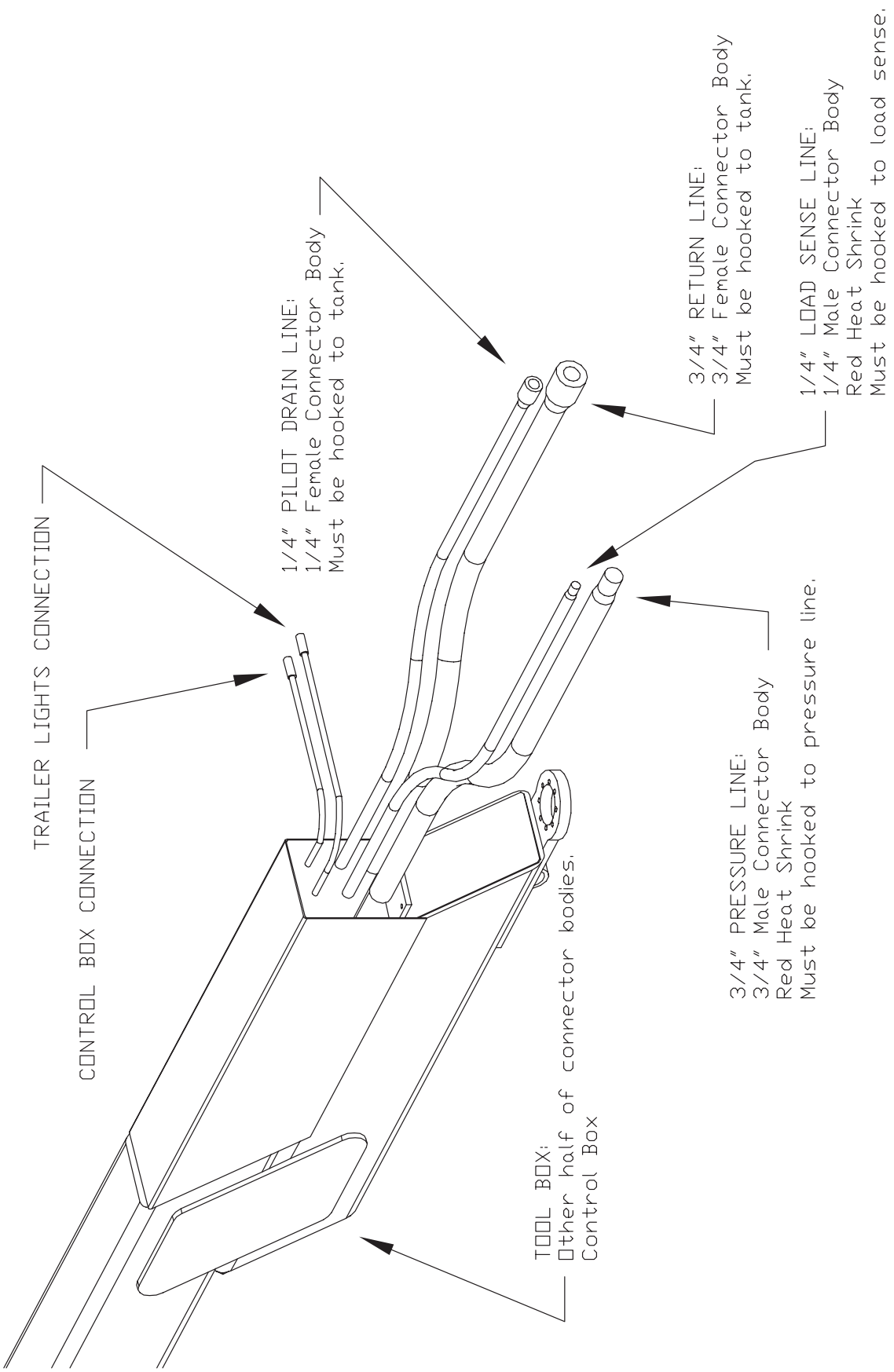
**"Lower the Loader"** Move the hydraulic control to move, or allow Loader to rest in the lowered position.



*Bed Raised — Bed Lowered*

**"Raise the Bed"** Move the hydraulic control to move the Bed into the raised position.

**"Lower the Bed"** Move the hydraulic control to move the Bed into the lowered position.


TRAILER LIGHTS CONNECTION
CONTROL BOX CONNECTION
1/4" PILOT DRAIN LINE:
1/4" Female Connector Body
Must be hooked to tank.
3/4" RETURN LINE:
3/4" Female Connector Body
Must be hooked to tank.
1/4" LOAD SENSE LINE:
1/4" Male Connector Body
Red Heat Shrink
Must be hooked to load sense.
3/4" PRESSURE LINE:
3/4" Male Connector Body
Red Heat Shrink
Must be hooked to pressure line.
TOOL BOX:
Other half of connector bodies,
Control Box

## Hooking Up for the First Time

Use the following outline as a checklist to ensure your Auto Align Bale Runner is properly set up for use.

**Warning**

**Remember to turn off hydraulic system and tractor and remove the key from ignition before working on the Bale Runner.**

### Parts Needed

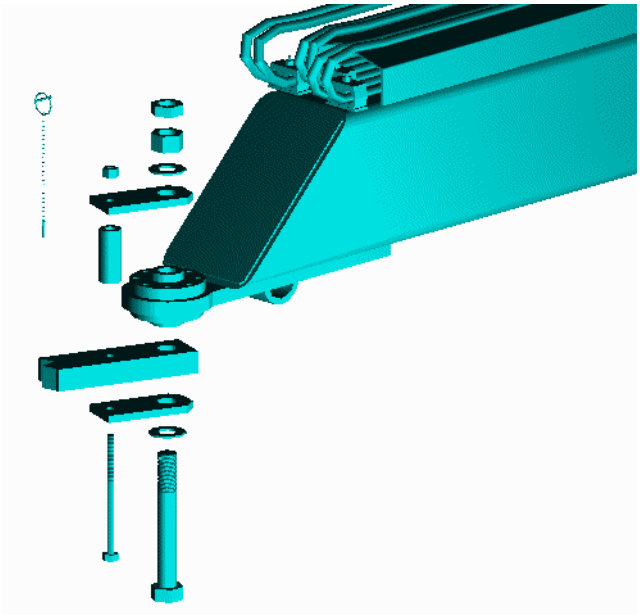
| | | |
|---|---|---|
| 1 | Hitch Bolt | 1 1/4" x 9" special |
| 2 | Hitch Washer | 1 1/4" flat washer |
| 1 | Hitch Nut | 1 1/4" plain |
| 1 | Hitch Jam Nut | 1 1/4" special |
| 1 | Hitch Spacer Bolt | 5/8" x 8" |
| 1 | Hitch Spacer | 3/4" ID x 3 9/16" tube |
| 2 | Hitch Plates | 1/2" x 3" x 6 3/8" |
| 1 | Spacer Bolt Nut | 5/8" Nylock |
| 1 | Bolt Safety Pin | 3/16" Snaplock Pin |

### Step 1: Attach Bale Runner to Tractor

- Line up the Ball Hitch on the machine with the tractor draw bar.

**WARNING: Do not allow anyone to stand between the tractor and the stacker while backing the tractor to the machine hitch.**

- Secure the machine to the tractor with the 1 1/4" x 9" bolt threaded up through (1) - 1 1/4" flat washer, lower hitch plate, tractor draw bar, ball, the upper hitch plate, (1) - 1 1/4" flat washer, 1 1/4" nut, 1 1/4" jam nut, and insert bolt safety pin through eyelet in bolt.
- Secure the hitch plates into position with the (1) - 5/8" x 8" bolt threaded up through lower hitch plate, tractor draw bar, (1) - 3/4" ID x 3 9/16" tubing, upper hitch plate, and (1) - 5/8" nylock nut.



## Hooking Up for the First Time - Continued

### Step 1: Attach Bale Runner to Tractor - Continued

**CAUTION: Operating Bale Runner without Safety Chain connected to tractor can be hazardous. Always attach Safety Chain to tractor.**

- Secure Hitch Safety Chain to tractor or tractor draw bar. ***Note:*** Chain should be loose enough to allow tractor to turn without allowing chain to drag on the ground.
- Connect the trailer light cable to the tractor and test the system to be sure the lights are operating properly.
- Read the “Air Brake Maintenance” section to adjust the air brakes properly if the machine is so equipped.

**DANGER: Improperly set up brakes can cause loss of control of the stacker and towing unit. Be sure to adjust brakes according to the procedures described in this manual.**

**CAUTION: Operating Bale Runner without brakes and lights connected to the tractor can be hazardous. Always attach the electrical cables to the tractor.**

- Lift jack to its highest position, then remove pin and fully retract the extension leg.

### Step 2: Set Up Control Box Assembly

**CAUTION: Use care when working with electricity. Disconnect battery of tractor first if attempting to connect control box assembly directly to battery.**

Parts Needed - 1 Control Box Assembly

- Mount the control box in the cab (preferably to the right of the driver) on a clean smooth surface using the vacuum cups. The control box must be mounted in a safe place out of harm’s way and the weather. Pump vacuum cups until red line is no longer showing.
- Route the connecting cable from the cab to an area near the hitch. The flanged end of the cable should be located near the hitch, and the free-hanging end should be located in the cab.
- Bolt the connector bracket to the tractor frame near the hitch. Ensure that the flanged housing of the connecting cable is securely attached to the connector bracket.
- Plug the control cable on the stacker into the connecting cable on the tractor.
- Plug the multifunction grip into the control box.
- Connect the power cable from the control box to the auxiliary power connector in the tractor.
- If it is necessary to connect the controls directly to the battery, then be sure to ground properly to prevent damage to the computer circuits.
- The controls should now be functional and the warning light will turn on when the power is switched on and the hitch is not in the inline position.

**CAUTION: DO NOT operate machine without the Control Box Assembly installed and fully operational.**

## Hooking Up for the First Time - Continued

### Step 3: Connect Hydraulics

**CAUTION: Be sure the hydraulic system is off and all moving parts are at their lowest position before working on the hydraulic system. Also, turn off tractor, place in park, and remove key.**

**CAUTION: Refer to diagram on page 5-6 before hooking up hydraulics. Make sure hydraulic lines are hooked up properly to avoid component damage.**

- First connect 3/4" female connector (non-pressure line) to tank or return.
- Connect 3/4" male connector (red line) to pressure line.
- Connect 1/4" female connector (drain line) to tank or return.
- Connect 1/4" male connector (red line) to load sense of tractor.
- Check the hydraulic oil level in the tractor.
- The “Operation of Controls” on page 5-19 will be helpful. If the hydraulics don’t work or don’t seem to sequence properly, see the “Troubleshooting Guide” Section 8.

**DANGER: Keep bystanders away from moving parts**

- When the bed is raised, and the Bale Runner is parked on level ground, be sure the forks on the back of the bed are within 2" (5 cm) of the ground. If they aren’t you will need to raise the hitch by turning over the drawbar on the tractor.

### Step 4: Lubricate Stacker

**WARNING: Before working on this machine, stop the towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition keys.**

- Use the “Lubrication Points” in Section 6 and grease all pivots on the machine.
- Check the oil in the axle hubs. See the “Daily Maintenance” in Section 6 for recommendations on oil.

### Getting Started

The first thing the operator needs to do is to turn on electrical and hydraulic power to the stacker.

- The power switch on the control box will turn the electrical system on.
- Hydraulic power will be on when the tractor is running if the stacker is connected to the power beyond system of the tractor.

**WARNING: Always pressurize the system the correct way. Reversing the pressure and return lines could cause damage to hydraulic components.**

After hydraulic and electrical power has been established, the operator must navigate through a couple of safety screens on the control box before the controls are operational. The stacker will initially start in automatic mode. If the user wants to run the machine in manual mode, he must press the manual button on the screen.

The section starting on page 5-19 goes into greater detail on the differences between automatic and manual operation.

## Pre-Operation Checklist

Before operating Bale Runner check the following items:

### Pre-Operation Check

| | | |
|---|---|---|
| ☐ | **Lug nuts** | Check that all lug nuts are present and torqued to the appropriate torque rating. |
| ☐ | **Pin retaining bolts** | Check for any missing or loose bolts or pins, replace or tighten as necessary. |
| ☐ | **Hydraulic hoses** | Inspect all hydraulic hoses and replace any worn hoses. *Remember:* Use a piece of cardboard or wood to look for leaks, replace leaky hoses. |
| ☐ | **Hitch Jack** | Check that the hitch jack has been raised to its hightest postion and that the extension leg has been fully retracted. |
| ☐ | **Warning Light** | Check that the Warning Light functions properly. |
| ☐ | **Hitch Safety Pin** | If traveling, check that the hitch safety pin is securely in place.<br>If gathering or stacking, check that the hitch safety pin has been removed. |
| ☐ | **Tire Pressure** | Check tire pressure to make sure it is within the specified range given in the “Machine Specifications” Section 2. |
| ☐ | **Hitch Connection** | Check the bolt system that connects the stacker to the tractor drawbar. A loose connection will wear faster and possibly uncouple. |
| ☐ | **Breakaway Device** | Make sure the hitch safety chain is connected. |
| ☐ | **Lighting** | Make sure the lighting is hooked up and functioning properly. |
| ☐ | **Brakes** | Check to see that the brake system is hooked up and functioning properly if so equipped. |

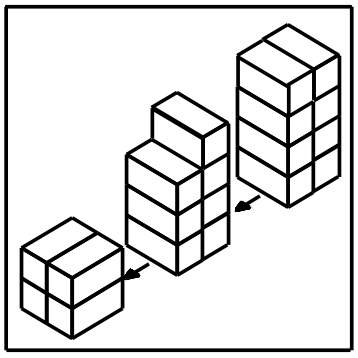
## Building Stacks

**CAUTION: Return stacker to the "in-line" position when moving between bales in field and stack. This reduces the chance of running over anybody or anything in the field.**

### Starting Stacks

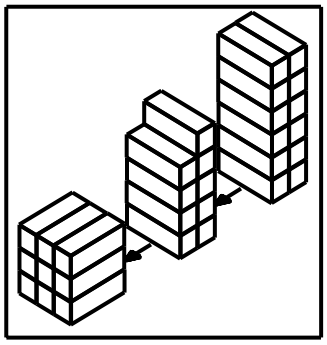
1. Choose a level area, with enough room to maneuver a tractor and Bale Runner even after the stack is finished. *Note:* If completely level ground is not available, then build your stack uphill (front of tractor and Bale Runner facing uphill).
2. Begin stack by building a "backstop". The proper backstop should be built to withstand backing into the stack every time a load is delivered. We recommend the following back stop configurations:

**1 Ton Squares:** A 2 bale by 2 bale square set at one end, perpendicular to the length of the bales in the stack. The first load in the stack should be only 7 bales.



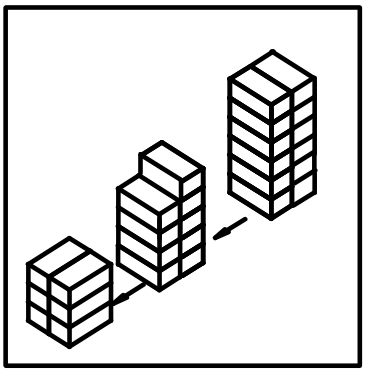
*1 Ton Backstop*

**1/2 Ton Squares:** A 3 bale by 3 bale square set at one end, perpendicular to the length of the bales in the stack. The first load in the rest of the stack should only be 2 bales by 4 bales, with one extra in the fifth tier.



*1/2Ton Backstop*

**3 X 4 Bales:** A 2 bale by 3 bale stack set at one end, perpendicular to the length of the bales in the stack. The first load in the stack should be 9 bales, and the rest should be 12 bales.



*3X4 Backstop*

## Stacking Bales

1. At the stacking location offset the stacker only 50 to 60 percent. This will allow the operator to see his existing stack. Line up stacker to the existing stack and start to raise the bed.
2. The stacker can be steered with the hitch and/or the tractor.
3. Raise the bed to 70 or 80 degrees (so it is almost vertical, but the weight of the bales is still clearly against the bed).
4. Back up until the corner of the bottom bale on the Bale Runner comes into contact with the back stop.
5. Continue to raise the bed and back up until the load is vertical. ***Important:*** It is critical that the first load into the stack is vertical. To avoid the stack tipping over, **DO NOT ALLOW THE BED TO GO PAST VERTICAL ON THE FIRST LOAD**.
6. Lower the loader to release the alignment arms from the stack.
7. Extend pushoff and pull forward slowly.
8. Lower the bed after the forks are out from under the stack. The computer will automatically return the pushoff first and then lower the bed. After the bed starts to lower, release the Dump Reset switch and the computer will automatically lower the bed and return the hitch to the inline position. Now go and gather another load.

**CAUTION: Avoid overhead wires to prevent serious injury or death. Electrocution can occur without direct contact.**

**CAUTION: Keep bystanders at least twenty-five feet away from an operating machine or stacked hay.**

## Gathering Bales

### Approaching Bales

1. The easiest way to pick up bales is by driving the Bale Runner perpendicular to the path of the baler.
2. Before arriving at a bale offset the hitch and lower the loader all the way down until it is perpendicular to the ground.
3. Bales are picked up on their 8 foot side.
4. The Auto Align system will allow the operator to approach the bale from almost any direction.
5. The Bale Runner will need to be configured for each type of bales picked up. See the configuration chart on page 5-17 to set up the Bale Runner for the type of bales you are picking up.

**WARNING: Keep bystanders at least twenty-five feet away from an operating machine or stacked hay.**

**WARNING: Avoid rocks rough terrain, steep slopes, banks and drop offs when possible. Always maneuver tractor at safe speeds.**

## Gathering Bales - Continued

### Loading Bales in Automatic Mode

1. Position a bale all the way against the loader between the alignment arms.
2. Activate the Auto Load switch and hold, this will cause the alignment arms to close. Once the alignment arms are closed, the computer will engage the grab hooks and raise the loader. The loader will go up slowly to allow the operator to pause the loader after the bale is just a couple of inches off the ground. Releasing the loader switch will stop the loader from raising and allow the grab hooks to continue to engage. The operator must release the loader switch before 1.5 seconds or the loader will continue to raise at high speed automatically. This motion can be stopped by pressing the Load Reset switch on the hand held controller.
3. Activate the Load Reset switch to open the alignment arms. After the alignment arms are open release the switch to keep the first bale off the ground. The loader will start to lower after the alignment arms are opened if the switch is not released.
4. Position a second bale between the alignment arms.
5. Activate the Auto Load switch to cause the alignment arms to close and the loader to go up. If the switch is released after 1.5 seconds the loader will continue up at high speed automatically.

**CAUTION: When the first bales are held by the loader prior to sliding onto the bed of the Bale Runner it makes it very front heavy. Sharp left turns should be avoided. Use extra caution when moving the Bale Runner during this loading situation.**

6. After the loader is all the way up, the computer will position the power slider in front of the bales and remove the grab hooks.
7. Activate the Load Reset switch to open the alignment arms all the way. This will signal the computer to push the row of bales back, return the power slider and lower the loader. The Load Reset switch can be released as soon as the alignment arms are all the way open. The computer will automatically do all the other motions.
8. Repeat the cycle until a full load is achieved.
9. After a full load is achieved, the power slider will return under the loader when the hitch is moved inline.
10. Check to make sure the hitch is inline and drive to the stacking location.

## Transporting Bale Runner

**WARNING: Attach safety chain to Bale Runner and Tractor before moving on highway.**

**CAUTION: Exceeding speeds of 20 mph (32 km/h) is not legal or safe on public roads. DO NOT exceed 20 mph (32 km/h) with this machine.**

**WARNING: Use Hitch Safety Pin to lock hitch in the in-line position before transporting Bale Runner on public roads. This will secure hitch in case of accidental activation or failure of hitch cylinder.**

**REMEMBER:** When transporting any piece of oversized equipment:

- Be familiar with local laws by contacting local authorities before transporting Bale Runner on public roads. Obey all regulations as they pertain to the Bale Runner. The specifications at the front of the manual contain most of the information that may be needed.
- This machine is equipped with lighting, markings, and signs in compliance with standards published by the American Society of Agricultural Engineers for Slow Moving Agricultural Implements on Public Roadways.
- Use flags, warning lights and slow moving vehicle signs as they are needed. Flag-persons may be required by local authorities and may be helpful even if they aren't required.
- Always remember the extra width of the Bale Runner. The widest part of the Bale Runner is approximately 9 feet 10 inches (300 cm) wide.
- Drive carefully at an appropriate speed for the size and weight of the Bale Runner. Allow for the extra length of the trailer when making corners. Reduce speed when navigating corners to prevent overturning machine. Link brakes to prevent loss of control during panic braking.
- Plan route to avoid heavy traffic. Drive in a courteous manner.
- Never drink and drive!

## Tips and Techniques

It takes some time, generally about a week, for an operator to become familiar with the controls, the movements, and the capabilities of the Auto Align Bale Runner.

### Rotating Bales

- If approaching the bale “end-on” is desired, the bale may be rotated, or spun, by closing the alignment arms slightly and bumping the end of the bale with the right alignment arm. When contact is made, open the arms to push the end to the right causing the bale to rotate into the loader.

### Quarter Turning Bales

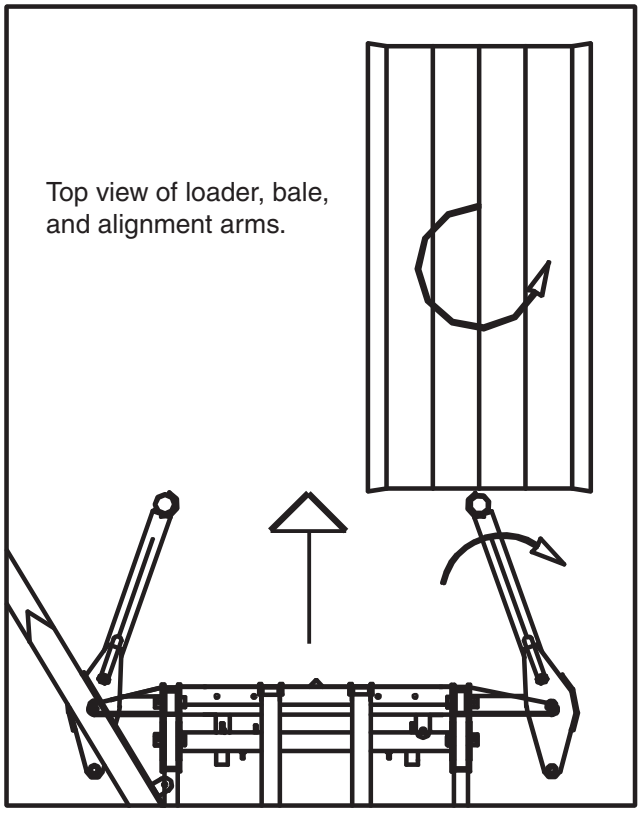
- To quarter turn a bale on the ground raise the loader until the alignment arms squeeze together. With the ends of the alignment arms positioned about halfway up the side of the bale, move forward while raising the loader. ***Note:*** Quarter turning with a Bale Runner is very time consuming and is not recommended for a large number of bales in a row.

### Repositioning Bales

- If bales are located in a corner or tight place, the alignment arms can be used to grab a bale and reposition it in a better working location.

### Tipping or Rolling Bales

- If the bales do not have enough stair-step, they may tumble sliding down the bed. If you have to fix the amount of stair-step after picking up two bales between the alignment arms, just raise the loader a few inches, then open the alignment arms so that the second bale can slide down in front of the first. Raise the loader again and the alignment arms will re-squeeze the bales.
- Always try to have the stacker level when sliding the bales back.
- If the bales do not slide back, the bed can be raised to lessen the power needed to move the bales to the rear by the power slider.

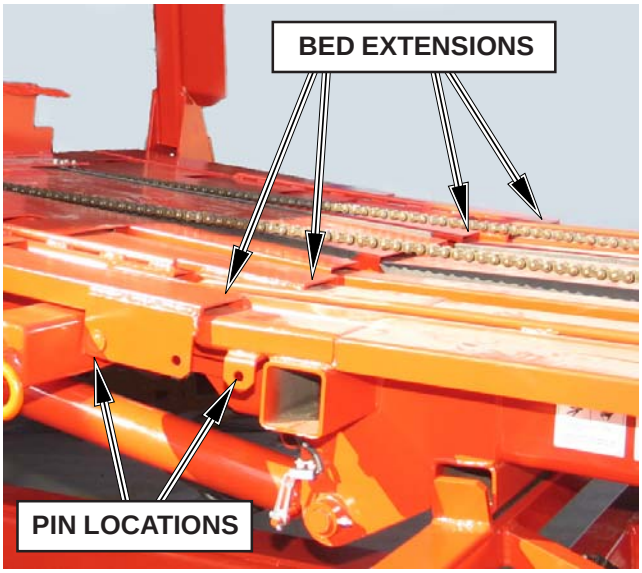



*Rotating bales*

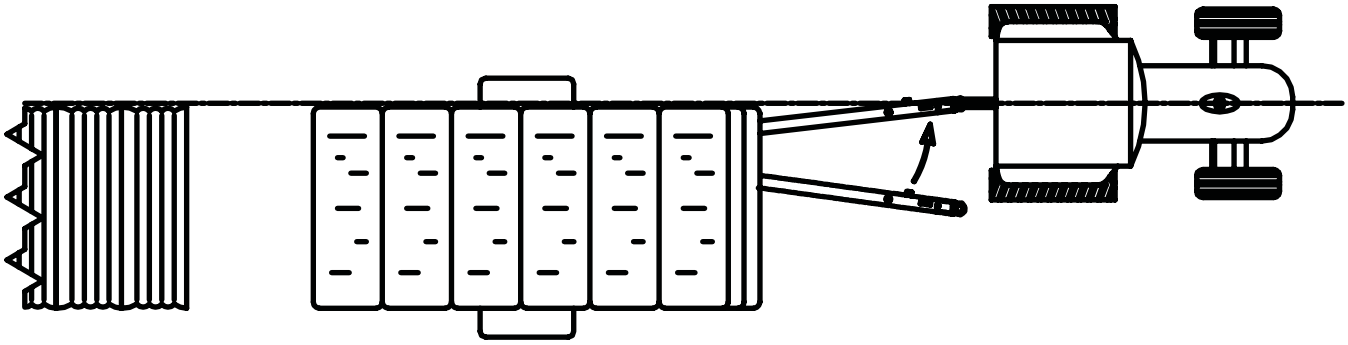
## Tips and Techniques - Continued

### Stacking

- For better visibility while building stacks, center the tractor against the edge of the stack with the hitch slightly offset; it is much easier to see what you are doing. . . stacks turn out straighter too!
- Fine tune your stack by making minor adjustments in your steering with the hitch control.
- The bales should be stacked on level ground. When stacking on a slight incline, stack with the tractor facing uphill. Stacking downhill or on a slight side incline will make it difficult to build good stacks.
- If the stack is not tight enough, raise the bed all the way up, pull the tractor and Bale Runner forward three feet, and back into the stack to push the bales tight.
- When stacking a full load with no back stop or existing stack, raise the bed to a 60 - 70 degree angle. Lower the loader slightly and raise again to secure the bales between the alignment arms and forklift teeth before dumping.




**Bed Extensions**



*Lining up the center of the tractor with the edge of the stack*

## Tips and Techniques - Continued

### Stacking Bales of Different Sizes

In order for the computer to maintain an accurate bale count, the operator must adjust the configuration on the Bale Count Adjust screen on the control box to match the number of bales on the stacker.

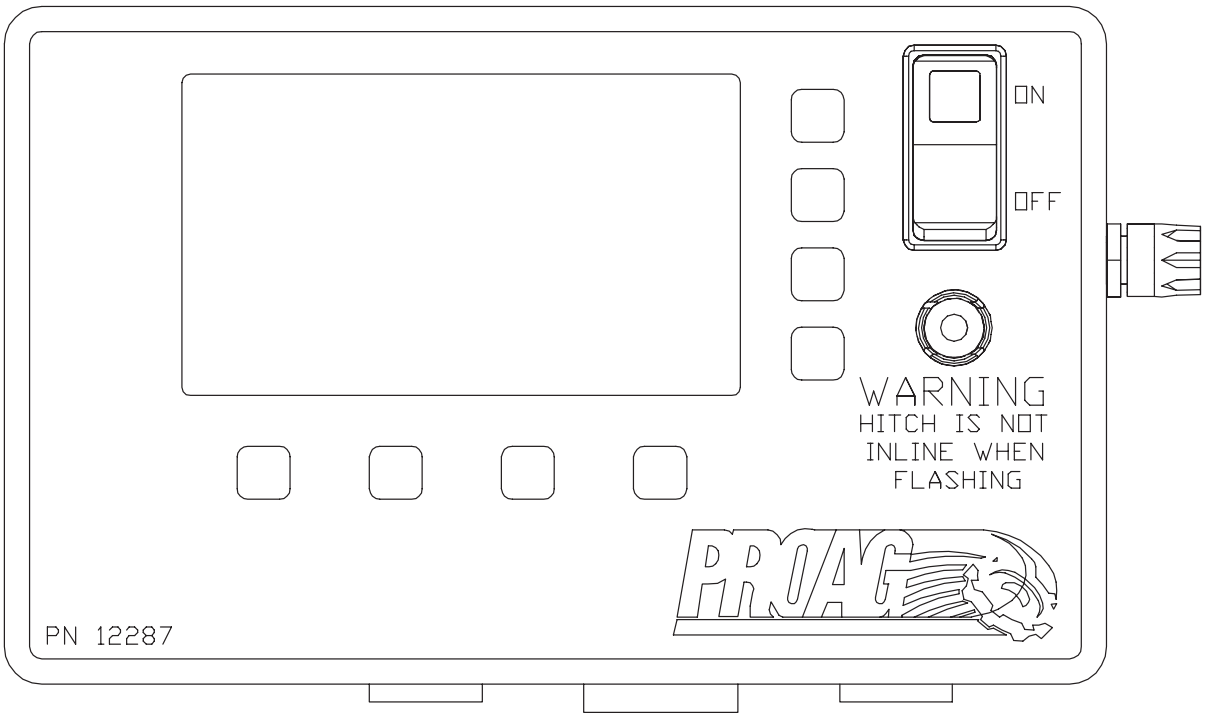
| Bales Size | Stack Size | Changes needed |
|---|---|---|
| Freeman 3x4<br>38"x46"<br>**(3)** On Strings | 5 High x 2 Deep | **(4)** Engage Bed Extensions |
| NH 595 3x4<br>35"x47"<br>**(3)** On Strings | 6 High x 2 Deep | **(4)** Engage Bed Extensions |
| Hesston 4900 4x4<br>51"x48"<br>**(3)** On or Off Strings | 4 High x 2 Deep | **(1)** Standard Configuration |
| Hesston 4755 3x3<br>35"x32"<br>**(3)** On Strings | 6 High x 2 Deep | **(2)** Shorten Length of Alignment Arms<br>**(4)** Engage Bed Extensions<br>**(5)** Shorter Fork on Bed |
| Hesston 4755 3x3<br>35"x32"<br>**(3)** On Strings | 6 High x 3 Deep | **(4)** Engage Bed Extensions |

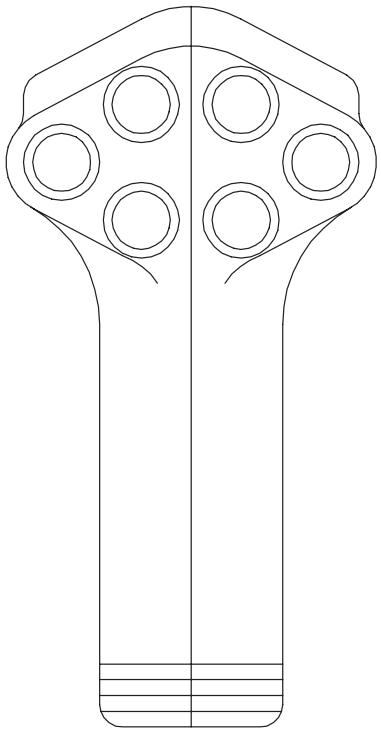
Note: Other manufacturer's balers create the same size bales - these were used for illustration purposes only.

**Table Key:**

1. **Standard Configuration**
   The way the machine is normally set up. Long alignment arms are set, and bed extensions are non-functional.
2. **Lengthen/Shorten Alignment Arms**
   To adjust the alignment arms, remove the alignment arm adjustment bolts and slide the arms to their next position. Reinsert the bolts and torque to specification.
3. **On/Off Strings**
   The bales come out of the baler "On Strings". If you want to pick up the bales "Off Strings" you must have a turner for your baler.
4. **Remove/Add Bed Extensions**
   With the hitch offset and the loader lowered all the way, remove the pins from the rear hole in the bottom of the bed extensions. Slide the bed extensions forward, with the tip of the bed extension under the loader sheet. Reinsert the pins using the forward holes in the bed extensions.
5. **Shorter Fork on Bed**
   With the bed in the raised position, remove the fork retaining bolts and washers from the back of the bed. Slide forks to the center of the bed and off the fork tabs **(Warning: bed forks are heavy, use caution)**. Install other forks on bed by sliding forks over the fork tabs from the center of the bed out. Reinstall fork retaining bolts and washers (6 per bolt). Torque to specification.

## Operation of Controls

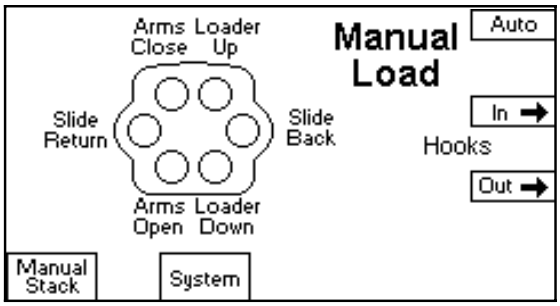


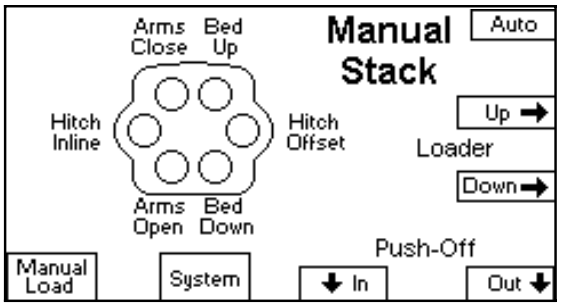



## Operation of Controls - Continued

### Operating the Machine in Manual Mode

The manual functions are available when one of the following screens is displayed.




Manual functions on the machine will only operate when the operator is pressing the corresponding button. When the operator releases the button, the function will stop. There is no sequencing in manual mode.

**Arms Close** - Squeezes the alignment arms shut.

**Arms Open** - Opens the alignment arms.

**Loader Up** - Raises the loader.

**Loader Down** - Lowers the loader.

**Bed Up** - Raises the bed.

**Bed Down** - Lowers the bed

**Slide Back** - Pushes bales back towards the rear of the bed.

**Slide Return** - Returns the slider to its home position.

**Hitch Inline** - Moves the hitch inline.

**Hitch Offset** - Moves the hitch offset.

**Hooks In** - Engages the grab hooks.

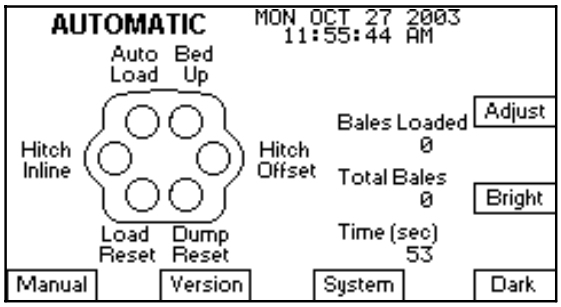
**Hooks Out** - Releases the grab hooks.

**Push-Off In** - Retracts the pushoff.

**Push-Off Out** - Extends the pushoff

## Operation of Controls - Continued

### Operating the Machine in Automatic Mode




**1. Setting up the stacker to load bales.**

A. The operator checks if the loader is up.
   1. If the loader is not up go to step B.
   2. If it is up go to step E.

B. The operator presses the Manual button on the box.
C. The operator raises the loader with the Loader Up switch while in manual mode.
D. The operator returns to the automatic screen by pressing the Auto button on the box.
E. The operator moves the hitch offset using the switch on the hand held remote.
F. The operator lowers the loader by pressing the Load Reset switch.
G. The alignment arms open.
H. The loader lowers.
I. The operator releases the Load Reset switch.
J. The computer continues to lower the loader for the time specified in the Configuration screen.

**2. Auto Load Sequence**

A. The loading sequence starts with the loader down and the alignment arms open.
   1. The operator places a bale between the alignment arms ensuring that it is actuating the Bale On sensor by pressing against loader platform.
   2. The operator engages the Auto Load switch.
   3. The alignment arms close.
   4. The grab hooks engage and the loader goes up.
   5. The operator releases the Auto Load switch to stop the loader before it starts to raise automatically after 1.5 seconds.
   6. The computer continues to engage the grab hooks for the time specified in the Configuration screen.
   7. The operator engages the Load Reset switch.
   8. The alignment arms open.
   9. The operator releases the Load Reset switch before the alignment arms are all the way open to keep the first bale off the ground.
   10. The operator places the second bale between the arms.
   11. The operator engages the Auto Load switch.
   12. The alignment arms close.
   13. The loader goes up.
   14. After 1.5 seconds, the operator may release the Auto Load switch.
   15. The computer continues to raise the loader automatically until it is all the way up.
   16. The computer positions the power slider foot in front of the bales.
   17. The computer releases the grab hooks.

## Operation of Controls - Continued

### Operating the Machine in Automatic Mode - Continued

18. The operator engages the Load Reset switch.
19. The alignment arms open.
20. After 1 second, the operator may release the Load Reset switch.
21. The computer controls the power slider foot to force the bales to the rear stacker. It speeds the foot up as the bales are slid to the rear.
22. The power slider stalls out when bales reach their most rearward position.
23. The computer returns the power slider foot to its home position under loader.
24. The computer lowers the loader for the time specified in the Configuration screen.

B. This sequence is to be used when the power slider does not move the bales back because the bales are sticky and/or the operator is picking up bales going downhill.

1. The operator picks up a row of bales and the computer positions the power slider foot in front of them.
2. The operator engages the Bed Up switch.
3. The bed raises.
4. The operator releases the Bed Up switch when the bed is inclined enough for the bales to slide back.
5. The operator engages the Load Reset switch.
6. The alignment arms open.
7. The computer activates the power slider foot to push the bales back.
8. If the bales do not go back, the bed can be raised higher with the Bed Up switch.
9. After the bales are pushed back, the computer returns the power slider to its home position under loader.
10. The computer lowers the bed if necessary.
11. The computer lowers the loader for time specified in the Configuration screen.

**3. Setting the stacker to go to the stack after a full load is picked up.**

A. The last row is picked up.
B. The computer raises the loader.
C. The computer positions the power slider foot in front of the bales.
D. The computer releases the grab hooks.
E. The operator engages the Load Reset switch.
F. The alignment arms open.
G. The operator may release the Load Reset switch after 1 second.
H. The computer pushes the last row back slightly with the power slider foot.
I. The operator engages the Auto Load switch.
J. The alignment arms close.
K. The operator releases the Auto Load switch when the arms have closed.
L. The operator briefly engages the Hitch Inline switch.
M. The computer returns the power slider to its home position under the loader.
N. The computer moves the hitch to the inline position.

## Operation of Controls - Continued

### Operating the Machine in Automatic Mode - Continued

**4. Bed Up**

A. Stacking sequence: loader up with a full load, bed down, alignment arms closed.

1. The operator engages the Bed Up switch.
2. If the pushoff is not in, the computer retracts it first.
3. The bed goes up as long as the switch is engaged.
4. When the bed is raised above the midway position, the loader can be lowered with the Load Reset switch which will first open the alignment arms.
5. The operator releases the Bed Up switch when the bed is completely raised.
6. The screen indicates a change in button functions by replacing the “Hitch Inline” and “Hitch Offset” text with “Pushoff Retract” and “Pushoff Extend”.
7. The operator engages the Pushoff Extend switch.
8. The pushoff goes out as long as the Pushoff Extend switch is engaged.
9. The operator engages the Dump Reset switch.
10. The computer first retracts the pushoff.
11. When the pushoff is fully retracted the bed starts down.
12. The operator may release the Dump Reset switch after the bed has lowered for 1 second.
13. The computer continues to lower the bed automatically.
14. When the bed has been lowered below the midway position, the computer stops the bed from lowering.
15. The computer raises the loader.
16. After the loader has been raised, the computer continues to lower the bed until it is all the way down.
17. The computer closes the alignment arms.
18. The computer moves the hitch inline.

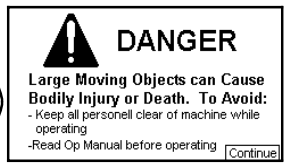
## Operation of Controls - Continued

### Screen Map

1) Logo Screen
2) First Warning Screen
3) Second Warning Screen
4) Main Operating Screen
5) Bale Count Adjust Screen
6) Manual Load Screen
7) Manual Stack Screen
8) Manual System Screen
9) Automatic System Screen
10) Configuration Screen
11) Preference Screen
12) Calender Screen
13) Number Pad Screen

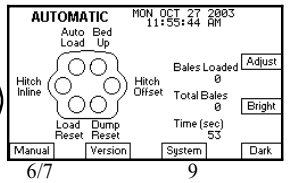
The numbers located next to the buttons indicate which screen is displayed when that button is pressed.


1 — 2

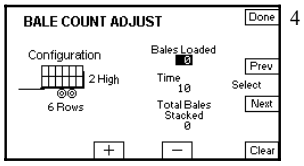



2 — 3

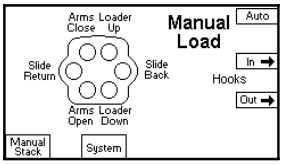

3 — 4



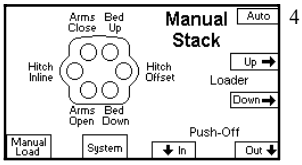

4 — 5 — 6/7 — 9




5 — 4

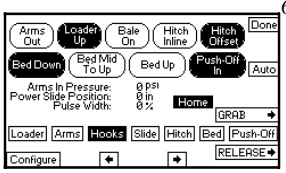



6 — 4 — 7 — 8

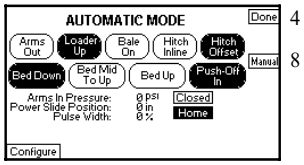



7 — 4 — 6 — 8

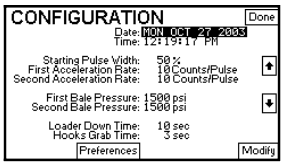
6/7/4



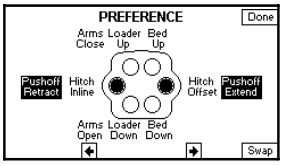

8 — 9 — 10



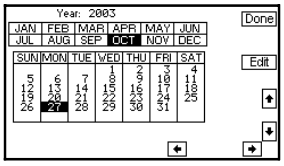

9 — 4 — 8 — 10



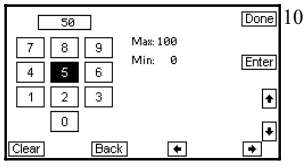

10 — 8/9 — 11 — 12/13




11 — 10 — 12 — 10




12 — 10 — 13 — 10



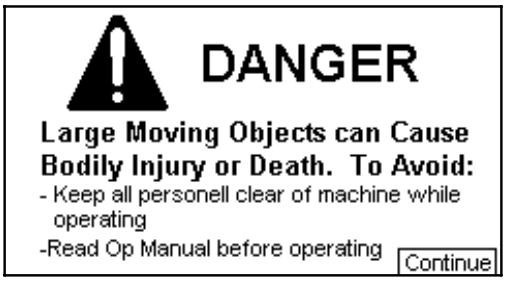

13 — 10

## Operation of Controls - Continued

### Initial Screens

The first screen that the user sees is our Logo screen:


Pressing **Continue** will display the next screen. This is the first of two warning screens:




Pressing **Continue** will display the second warning screen. Notice that the **Continue** button for each screen is not the same button as that of the previous screen.

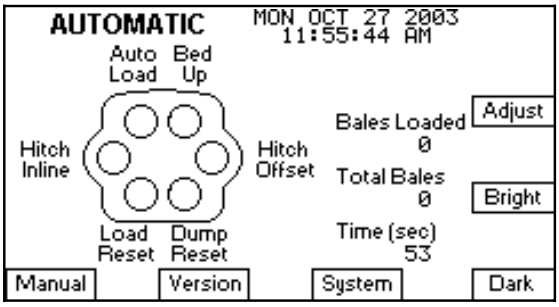

The warning screens are arranged so that the user must physically press a button to move on to the next screen. This is to ensure that he has the opportunity to read the information on the screens. The user is not able to operate the machine until he has viewed both warning screens. Pressing **Continue** will display the Main Operation screen.

## Operation of Controls - Continued

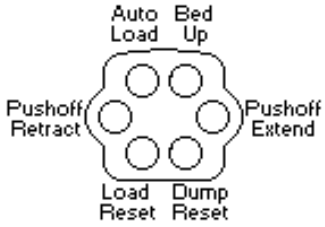
### Operation Screens

#### Main Operation Screen - Automatic Sequencing Mode

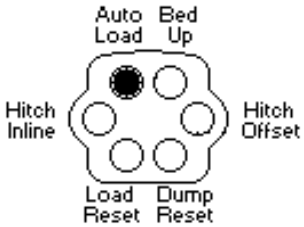
This is the first screen the user sees after he has navigated the warning screens. At this point the user can operate the stacker in automatic mode:




The graphic on the left is a representation of the handle which is used to control the stacker. The labels around the picture indicate the functions of the individual buttons. For instance, when the bed has been completely raised up, the functions of the left and right buttons change from *Hitch* to *Pushoff*. The descriptions next to those buttons also change:




The circles in the diagram are filled in when the user presses the buttons on the handle. As an example, when the user is closing the arms and raising the loader, the screen would display the following:




There are times in automatic mode when certain functions operate by themselves. In these cases, the user can release the buttons and the stacker will continue to move. When the stacker is in one of these automatic sequences, the circle which most closely represents the movement will start to flash.

The number labeled *Bales Loaded* tells how many bales are on the stacker. This number is updated each time the loader is raised and the power slider positions itself at the foot of the bales.

## Operation of Controls - Continued

### Operation Screens - Continued

*Total Bales* is the number of bales that have been stacked. When the bed is raised above the mid position, the computer updates *Total Bales* by adding the number of *Bales Loaded* to it. *Bales Loaded* is then set to zero.

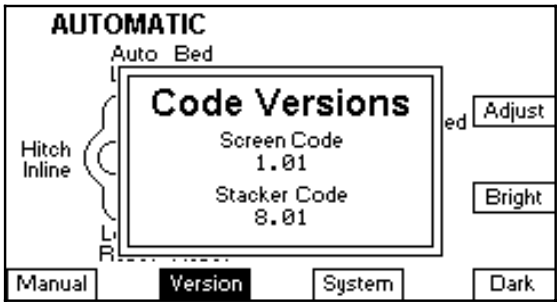
The *Time* indicates how many seconds it has been since the last load was stacked. This number is reset to zero whenever the bed is raised above the mid position.

The buttons around the edges of the screen perform the following functions:

**Manual** - This button brings up one of the two manual operation screens. If the stacker has a full load, it will bring up the Manual Stack screen. Otherwise it will display the Manual Load screen.

**Version** - This button displays the code versions for both the control box and the stacker.

If the stacker is not connected, the stacker code will read DISCONNECTED:




The code versions will be displayed as long as the user is pressing the **Version** Button.

**System** - This button brings up a system diagnostic screen so the user can view the states of the stacker's sensors.

**Dark** & **Bright** - These two buttons adjust the contrast of the LCD screen for better visibility.

**Adjust** - This button brings up the Bale Count Adjust screen which allows the user to modify the number of bales on the machine or in the stack. These adjustments are reflected in the *Bales Loaded* and *Total Bales* values when the user returns to the Main Operation screen.

## Operation of Controls - Continued

### Operation Screens - Continued

The user can perform the following functions from the buttons on the handle:

**Auto Load** - Pressing the Auto Load button on the handle will close the alignment arms. Once the arms are closed, the loader will start to move up. If there is a bale in the arms, the grab hooks will also extend. When the loader has been rising for 1.5 seconds it will continue to go up even if the button is released. It can be stopped by pressing the Load Reset button. If there are bales in the arms, the power slider will position itself at the foot of the bales when the loader is all the way up. Once the power slider is positioned, the grab hooks will retract.

**Load Reset** - Pressing the Load Reset button will open the alignment arms. If there are bales on the loader and the loader is all the way up, the power slider will push the bales down the bed and return back to its home position. Once the power slider is home, the loader will drop. If the loader is up and the Load Reset button is pressed for 1 second, all of these functions will operate automatically. Pressing the Auto Load button will stop the automatic sequencing with the exception of the power slider. Once the power slider is pushing the bales back it will continue until it has returned home again even if the Auto Load button is pressed.

**Bed Up** - The Bed Up button raises the bed. If the pushoff is not in, it will be retracted before the bed goes up.

**Dump Reset** - The Dump Reset button will lower the bed. If the pushoff is not in, it will be retracted first. When the bed has been lowering for 1 second it will continue to lower automatically. Pressing the Bed Up button will stop this automatic movement. If the bed descends past the bed-mid position while the loader is down, it will stop and raise the loader automatically before continuing down. If the bed was initially above the bed mid position when it started, the hitch will move inline and the arms will close automatically after the bed is all the way down.

**Hitch Inline** - The Hitch Inline button moves the hitch inline. When the hitch is all the way inline, the valve will remain on for 1 second to ensure that there is pressure pushing the hitch in. If the Hitch Inline button is pressed while the power slider is trying to push the last tier of bales back, then the slider will return home, and the hitch will move all the way inline automatically. Pressing the Hitch Offset button will stop the hitch from moving inline.

**Hitch Offset** - The Hitch Offset button moves the hitch offset. When the hitch is all the way offset, the valve will remain on for 1 second to ensure that there is pressure pushing the hitch out

**Pushoff Retract** - The Pushoff Retract button retracts the pushoff. This option is only available when the bed has been raised all the way up. Once the pushoff has started to retract, it will continue to do so automatically until it is all the way in. Pressing the Pushoff Extend button will stop the pushoff from moving in automatically.

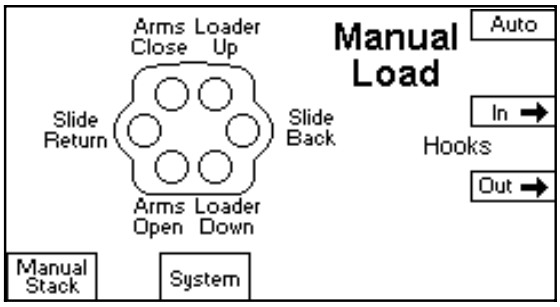
**Pushoff Extend** - The Pushoff Extend button extends the pushoff. This option is only available when the bed has been raised all the way up.

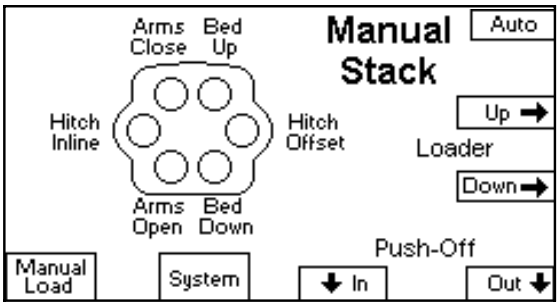
## Operation of Controls - Continued

### Operation Screens - Continued

#### Manual Operation Screens

When the user presses the **Manual** button from the Main Operation screen, one of the manual operation screens is displayed. If the stacker has a full load, then the Manual Stack screen is displayed. Otherwise, The Manual Load screen is displayed:




When either of these screens is displayed, the machine is in manual mode. Functions on the machine will only operate when the user is pressing the corresponding button. When the user releases the button, the function will stop. There is no sequencing in manual mode.

The functions on the Manual Load screen are those typically needed to pick bales up off the field, while the functions on the Manual Stack screen are those used for stacking a full load of bales:

**Arms Close** - Squeezes the alignment arms shut.

**Arms Open** - Opens the alignment arms.

**Loader Up** - Raises the loader.

**Loader Down** - Lowers the loader.

**Bed Up** - Raises the bed.

**Bed Down** - Lowers the bed

**Slide Back** - Pushes bales back down the bed.

**Slide Return** - Returns the slider to its home position.

**Hitch Inline** - Moves the hitch inline.

**Hitch Offset** - Moves the hitch offset.

**Hooks In** - Engages the grab hooks.

**Hooks Out** - Releases the grab hooks.

**Push-Off In** - Retracts the pushoff.

**Push-Off Out** - Extends the pushoff

From this screen the user can get to three other screens:

**Manual Load / Manual Stack** - Toggles between the two manual operation screens.

**System** - Displays the Manual System screen.

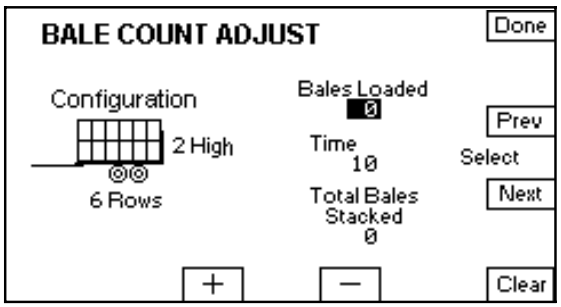
**Auto** - Returns the user to the Main Operation screen.

## Operation of Controls - Continued

### Operation Screens - Continued

#### Bale Count Adjust Screen

This screen is displayed when the user presses the **Adjust** button in the Main Operation screen:




From this screen, the user is able to adjust the number of bales that he has stacked.

The **Done** button will return the user to the Main Operation screen.

The **Next** button selects the *Bales Loaded*, *Time*, *Total Bales Stacked*, *X High*, *Y Rows* options in that order. The value selected will be highlighted.

The **Prev** button moves through those selections in the reverse direction. Again, the value selected will be highlighted.

The **Clear** button replaces the selected value with zero. It is only effective for the *Bales Loaded*, *Time*, and *Total Bales Stacked* options.

The **+** and **-** buttons increase or decrease the selection. They do not modify the *Time* value.

The Following information can be modified:

**Bales Loaded** - The number of bales currently on the stacker. This number is increased automatically by the *X High* value each time the loader is raised and the power slider is positioned at the foot of the bales. This number can be increased, decreased, or cleared. It is not, however, allowed to increase above a full load. For example, in the illustration above, the *Bales Loaded* value could not be increased above 12. The stacker *Configuration* would have to be changed to a configuration that allows more bales in order for the *Bales Loaded* to be allowed above 12.

**Total Bales** - This is the number of bales stacked. Whenever the bed is raised above the mid position, the *Total Bales* is increased by the number of *Bales Loaded*. The *Bales Loaded* value is then reset to zero. This number can be increased, decreased or cleared.

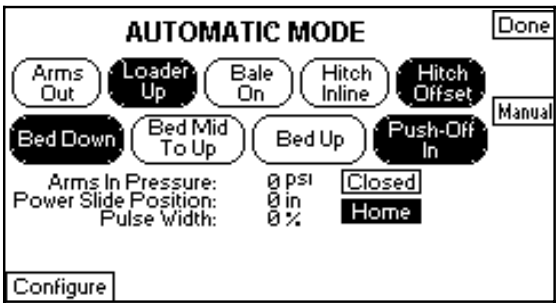
**Time** - This is the time in seconds since the last load was stacked. Whenever the bed goes up above the mid position, this value is reset to zero. This value can only be cleared. It cannot be increased or decreased.

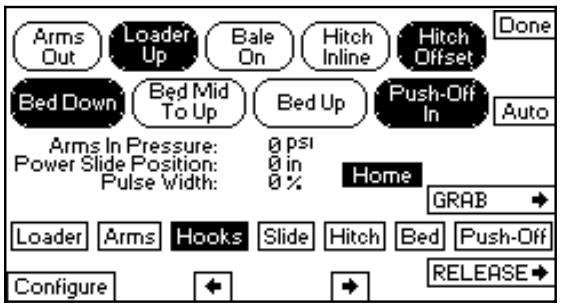
**Configuration** - This is a description of how the bales are loaded on the stacker. Different sized bales will have different configurations. The user can increase or decrease the number of bales on the stacker by adjusting the *High* and *Rows* values. The user is limited to 2 or 3 *High* and between 4 and 7 *Rows*. The icon is updated to reflect the chosen configuration, making it less ambiguous. It is important to keep the *Configuration* current because that is how the computer automatically updates the *Bales Loaded* value. Each time the loader is up and the power slider positions itself, the *Bales Loaded* value is increased by the number of bales specified in the *High* value of the *Configuration*. This assumes that the user is usually picking up that number of bales. Additionally, the *Bales Loaded* value is not allowed to exceed the maximum number of bales that the stacker is configured to hold. These features help to keep an accurate total of bales stacked with minimal user intervention as long as the *Configuration* is accurate.

## Operation of Controls - Continued

### System Screens

There are two system diagnostic screens. The first one is the Automatic System screen. From this screen, the user is able to watch the states of the stacker inputs while still operating the machine in its automatic sequencing mode from the buttons on the handle. The second is the Manual System screen. When this screen is displayed, the user is unable to run any functions from the handle, but can select individual functions to run from the buttons on the box.




Each of the rounded rectangles indicate the state of a ferrous sensor input. If the rectangle is filled in, the switch has been actuated:

**Arms Out** - A sensor located near the alignment arm pivot which senses when the arms are opened completely.

**Loader Up** - A sensor located near the loader pivot which senses when the loader has been raised all the way up.

**Bale On** - A sensor located under the rectangular paddle in the loader which senses that there is a bale on the loader.

**Hitch Inline** - A sensor located on the frame above the hitch which senses when the hitch is all the way inline.

**Hitch Offset** - A sensor located on the frame above the hitch which senses when the hitch is all the way offset.

**Bed Down** - A sensor located on the frame which senses when the bed has been lowered all the way down.

**Bed Mid To Up** - A sensor located at the bed pivot which senses when the bed is far enough up that the loader will not crash into the frame if it is lowered.

**Bed Up** - A sensor located at the bed pivot which senses when the bed has been raised all the way up.

**Push-Off In** - A sensor located near the pushoff tube which senses when the pushoff is completely retracted.

## Operation of Controls - Continued

### System Screens - Continued

The three numbers below the indicator rectangles are not simple on/off values from sensors:


**Arms In Pressure** - The pressure of the hydraulic fluid in the line that closes the alignment arms. This value is received from a pressure transmitter located near the Hawe valve bank.

**Power Slide Position** - The distance in inches that the power slider is away from its home position. This number is taken from a "Hall Effect" sensor located near the power slider's hydraulic motor. The "Hall Effect" sensor toggles on and off as each tooth of a wheel passes in front of it. The Power Slide Position value is increased or decreased each time the sensor toggles on.

**Pulse Width** - The percentage value which indicates how far open the power slider valve is. The computer controls the flow of oil into the hydraulic motor by varying the opening of the valve. A value of 0 indicates that the valve is shut. A value of 100 indicates that it is wide open.

The two rectangular boxes beside these numbers indicate the state of two flags in the computer:

**Closed** - This box is filled in when the computer considers the arms to be closed. The Closed indicator is not visible on the Manual System screen.

**Home** - This box is filled in when the computer considers the power slider to be home.

From either of the system screens the user can move to three other screens:

**Configure** - This button moves the user to the Configuration screen where he can modify various stacker settings.

**Manual/Auto** - This button toggles the user between the Automatic and Manual System screens.

**Done** - If the user has opened the Automatic System screen, this button will return him to the Main Operation screen. Otherwise, it will return him to the operation screen he was in before pressing the System button.

On the Manual System screen the user can select an individual valve to actuate by pressing the buttons next to the arrows on the bottom of the screen.


As a different valve is selected it is highlighted and the text in the right hand boxes changes to an appropriate description of the valve's function. Pressing the button on the box next to that description will actuate the valve in that particular direction:

**Loader**

**Raise** - Raises the loader.
**Lower** - Lowers the loader.

**Arms**

**Close** - Squeezes the alignment arms shut.
**Open** - Opens the alignment arms.

**Hooks**

**Grab** - Engages the grab hooks.
**Release** - Releases the grab hooks.

**Slide**

**Push** - Pushes the power slider down the bed.
**Return** - Returns the power slider to the home position.

**Hitch**

**Offset** - Moves the hitch towards the offset position.
**Inline** - Moves the hitch towards the inline position.

**Bed**

**Up** - Raises the bed.
**Down** - Lowers the bed.

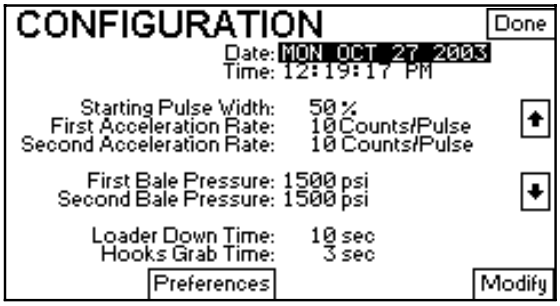
**Push-Off**

**Extend** - Pushes the pushoff out of the tube.
**Retract** - Pulls the pushoff back into the tube.

## Operation of Controls - Continued

### Configuration Screen

From the system screens, the user can modify configuration settings by pressing the **Configuration** button:




While in this screen, the user can select the setting he wishes to modify with the up and down arrows. As the selection changes, the screen will highlight it. The user can then press the **Modify** button to change the value.

Pressing **Modify** will do one of three things:

1. Display the Calender screen if the date is selected.
2. Toggle the text between AM and PM if that item is selected.
3. Display the Number Pad screen if anything else is selected.

Pressing the **Preferences** button will display the Preference screen.

Pressing the **Done** button will return the user to the system screen he came from.

The items that can be changed are the following:

**Date** - This allows the user to change the current date. The day, month, and year are all changed at the same time in the Calender screen.

**Time** - This allows the user to change the current time. The hour, minute, second, and AM/PM values are selected and changed individually.

**Starting Pulse Width** - This allows the user to modify the starting pulse width of the power slider. When the power slider pushes the bales back down the bed, it starts by pushing softly against the bales. This is accomplished by limiting how far the power slider valve opens. As the power slider progresses down the bed, the valve opens up allowing the power slider to speed up as it moves. The Starting Pulse Width is a percentage value (0% = closed, 100% = wide open) that controls how wide the valve opens when the power slider starts to move.

## Operation of Controls - Continued

### Configuration Screen - Continued

**Acceleration Rates** - These values allow the user to modify how quickly the power slider accelerates when it is pushing a bale down the bed. Each time that the “Hall Effect” sensor at the shaft of the hydraulic motor senses a new tooth in front of it, the pulse width that controls how wide the power slider valve is opened increases by this setting. The user can set the acceleration rate values between 0 and 10. A larger number means that the valve will open more quickly resulting in a faster acceleration of the power slider. A smaller number opens the valve more slowly resulting in a slower acceleration. There are two acceleration values. The first number applies to the first 60 inches of travel. If the power slider is within the first 5 feet, it will accelerate using the First Acceleration Rate. If it has moved beyond 5 feet, it will accelerate using the Second Acceleration Rate.

**Bale Pressures** - These values allow the user to modify how tightly the bales are squeezed by the alignment arms. When the stacker is in its automatic sequencing mode, it uses the hydraulic pressure of the arms squeezing shut to determine when they are closed so that the stacker can stop the arms and move on to the next step of raising the loader and engaging the grab hooks. We allow two bale pressure settings because there is less pressure needed to hold the first bale than to hold the second. The first bale is closer to the arms’ pivots, and is held in place by the grab hooks. The second bale needs to be squeezed tighter to prevent it from slipping out of the arms. Sometimes the pressure needed to hold the second bale is so high that if that setting were also used for the first bale, the arms would bow it.

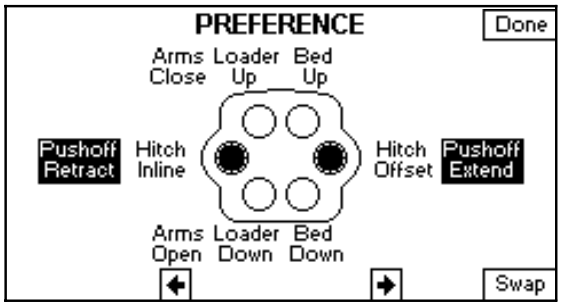
**Loader Down Time** - This allows the user to adjust how long the loader down valve stays on while the loader is lowering in automatic mode. There is no sensor to indicate when the loader has been lowered all the way down. Instead, the valve remains open for a set number of seconds.

**Hooks Grab Time** - This allows the user to adjust how long the grab hooks valve stays open while the hooks are engaging in automatic mode. There are no sensors on the grab hooks. In automatic mode, they extend and retract for a specified time. There is no need to specify a time for the hooks to retract. That time is automatically set to 1/2 second longer than the grab time to ensure that they retract completely.

## Operation of Controls - Continued

### Preference Screen

This screen is displayed when the user presses the **Preference** button from the Configuration screen:




This is a diagram of the handle with a description of each button's function located nearby.

The functions on the buttons are paired up. One of the buttons in a pair actuates a valve in one direction and the other actuates it in the opposite direction. The direction associated with each button can be swapped if the user prefers it that way.

Pressing one of the arrows selects a different pair of functions, highlighting those descriptions and the associated pair of buttons. The right arrow selects the *Pushoff*, *Hitch*, *Arms/Loader*, and *Bed* in that order. The left arrow selects them in the opposite order.

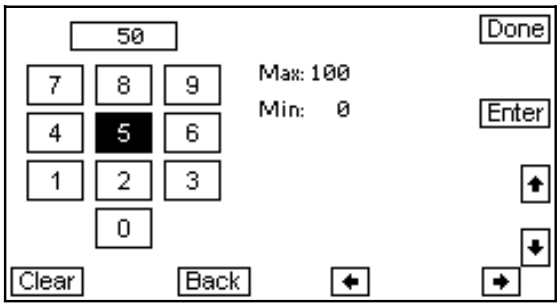
Once a selection has been made, the functions of the buttons can be swapped by pressing the **Swap** button. The labels will be re-drawn to indicate the change.

Pressing **Done** returns the user to the Configuration screen.

## Operation of Controls - Continued

### Number Pad Screen

When the user needs to change a numerical value, the Number Pad screen is displayed:




This screen consists of a number pad on the left hand side with the active digit highlighted.

The box located above the pad shows the new number as the user enters it. Initially, the number in this box is the old value that is being replaced. This allows the user to exit the screen without having to re-enter the number if he did not intend to change it.

The *Max* and *Min* values depend on the value being entered. For instance, if a percentage was being entered, the user could enter a number between 0 and 100. If an hour value was being entered, he would be limited to a number between 1 and 12.

The **Clear** button replaces the number in the box with zero.

The **Back** button removes the least significant digit from the number in the box.

The arrow buttons change the selected digit of the number pad. The selection moves in the direction indicated by the arrow.

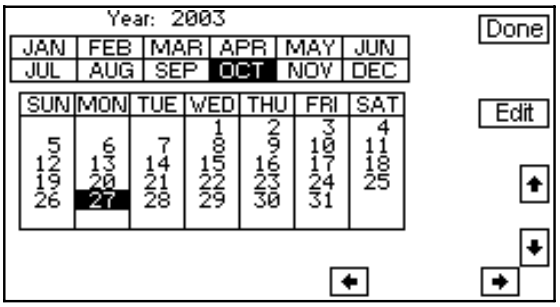
The **Enter** button enters the selected digit as the least significant digit of the new number. If the Enter button is pressed while the original number is still displayed in the box, the original number will be deleted and the selected digit entered as the new number. Otherwise, the selected digit will be added to the right side of the number in the box.

The **Done** button returns the user to the screen he was in before. The number in the box is then saved into the variable being changed. If the user presses the Enter button before changing the old value, then the variable's value is left unchanged.

## Operation of Controls - Continued

### Calender Screen

When the user changes the date, he does so from the Calender screen:




From this screen, the user can change the *Year*, the *Month*, or the *Day*. The selected item in the field that is being changed will flash rapidly. The user can select a different one of these three fields by pressing the up and down arrows.

If the *Year* is selected, the user can modify it by pressing the **Edit** button. This will bring up the Number Pad screen, allowing the user to enter a number between 2000 and 2099. The **Edit** button does nothing if the *Month* or *Day* is selected.

If the *Month* or the *Day* is selected, the user can choose the specific month or day by pressing the right and left arrows. Holding the button down will cause the selection to keepmoving in the specified direction.

As the *Year* or the *Month* is changed, the layout of the *Days* will be modified so that the day of the week is accurately depicted.

The **Done** button will save the year, month, and day represented on the screen as the current date. It will then return the user to the screen he was previously in.

# Section 6: Maintenance

## Section Contents

**CAUTION**

**BE ALERT**

**SAFETY FIRST**

**REFER TO SECTION 1 AND REVIEW ALL SAFETY RECOMMENDATIONS.**

## General

This section deals with two goals, maximum life and dependable operation. Adopt a regular maintenance and lubrication program. Care and sufficient lubrication is the best insurance against delays.

## Safety

- Always shut off the tractor and remove key before dismounting.
- Guard against hydraulic high pressure leaks with hand and face protection.
- Never work under the implement unless it is in the down position or securely blocked in place. Do not depend on the hydraulic system to support the frame.

**Warning**

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

**Caution**

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

## Tighten Bolts

- Before operating the unit.
- After the first two hours of operation.
- Check tightness periodically thereafter.
- Use Bolt Torque Chart on page 6-20 for correct values on various bolts.
- Note dashes on hex heads to determine correct grade.

**Note: DO NOT use the values in the Bolt Torque Chart if a different torque value or tightening procedure is given for a specific application.**

- Fasteners should be replaced with the same or higher grade. If higher grade is used, only tighten to the strength of the original.

## Tires

- Inspect tires and wheels daily for tread wear, side wall abrasions, damaged rims or missing lug bolts and nuts. Replace if necessary.
- Tighten wheel bolts - refer to Bolt Torque Chart.
- Check tire pressure daily, when tires are cold. Tire pressures for specific tires are listed in the "Machine Specification" section at the front of this manual.
- Correct tire pressure is important.
- Do not inflate tire above the recommended pressure.

**⚠ Warning**

**After the first 100 hours of use, re-torque all wheel lug nuts.**

**⚠ Caution**

**Tire replacement should be done by trained personnel using the proper equipment.**

## Preventative Maintenance

Before operating your Bale Runner carefully inspect the entire machine, and its components for any sign of excessive wear or weakness. Always follow the Daily Maintenance, General Maintenance, and Year End Maintenance Checklists to allow for early detection of possible hazards.

**WARNING: Always wear eye protection and proper protective clothing while performing maintenance on the Bale Runner. Protective clothing includes but is not limited to; heavy pants and shirt, steel toed boots, and gloves.**

**WARNING: When working with hydraulic fluid you should wear rubber gloves to prevent oil from getting in cuts and scratches in your skin and causing infections or allergic reactions.**

## Hydraulic System Preventative Maintenance

**DANGER: Remember to turn off hydraulic system and tractor and remove key from ignition before servicing the Bale Runner. The Bed and Loader should be lowered to their lowest position or securely blocked in position.**

- Maintain tractor hydraulic system and fluid according to manufacturers specifications. Always use a good quality hydraulic fluid.
- Check the fluid level in the tractor with the bed and loader cylinders retracted.

**WARNING: Hydraulic fluid escaping under pressure can easily penetrate skin. Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. If injured by escaping hydraulic fluid, see a doctor at once. Without immediate medical treatment, serious infection and allergic reaction can occur.**

- Check for chaffing or kinking of the hydraulic hoses, these are a source of leaks in hoses.
- Check hoses and cylinders for leaks and repair as necessary. *Remember* that hydraulic fluid escaping under pressure can penetrate human skin. Use a piece of cardboard or wood to look for a suspected high pressure leak.
- Replace all hoses or hydraulic components that show any sign of wear, cracks,leaking, etc.

## Hydraulic Pressure Relief

**IMPORTANT! RELIEVING HYDRAULIC PRESSURE FROM LINES**

Repairs to hoses and cylinders will usually require disconnecting a fitting connection. Fittings should not be disconnected until the pressure in the hydraulic circuit has been relieved. Follow this procedure to relieve pressure in the hydraulic lines.

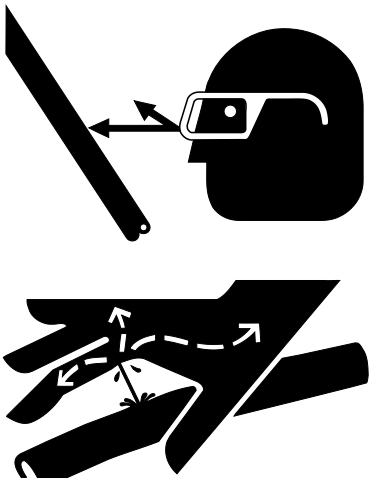
**WARNING: Hydraulic fluid escaping under pressure can easily penetrate skin. Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. If injured by escaping hydraulic fluid, see a doctor at once. Without immediate medical treatment, serious infection and allergic reaction can occur.**

**WARNING: Always wear eye protection and proper protective clothing while performing maintenance on the Bale Runner. Protective clothing includes but is not limited to; heavy pants and shirt, steel toed boots, and gloves.**

**WARNING: When working with hydraulic fluid you should wear rubber gloves to prevent oil from getting in cuts and scratches in your skin and causing infections or allergic reactions.**

**WARNING: Be sure the loader is resting on the hitch or lowered to its lowest position. When the fluid is released from the system it will allow any part to lower uncontrollably to its lowest position.**

1. Park the tractor and Bale Runner on level ground, place the transmission in park, set the parking brake, turn off the tractor, and remove the key. When the tractor is off, move each of the hydraulic levers forward and back approximately four times.
2. Uncouple the hoses from the tractor. Slowly unscrew the male hydraulic tips on the ends of the stacker hydraulic hoses, turning them 1/8 th of a turn at a time watching for oil to start leaking out.
3. Use a bucket to catch leaking hydraulic fluid.
4. Crack the hydraulic lines to the loader cylinders as they can have oil under pressure caught by the load check valve.



**Warning**

**HIGH-PRESSURE FLUID HAZARD**

**To prevent serious injury or death:**

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

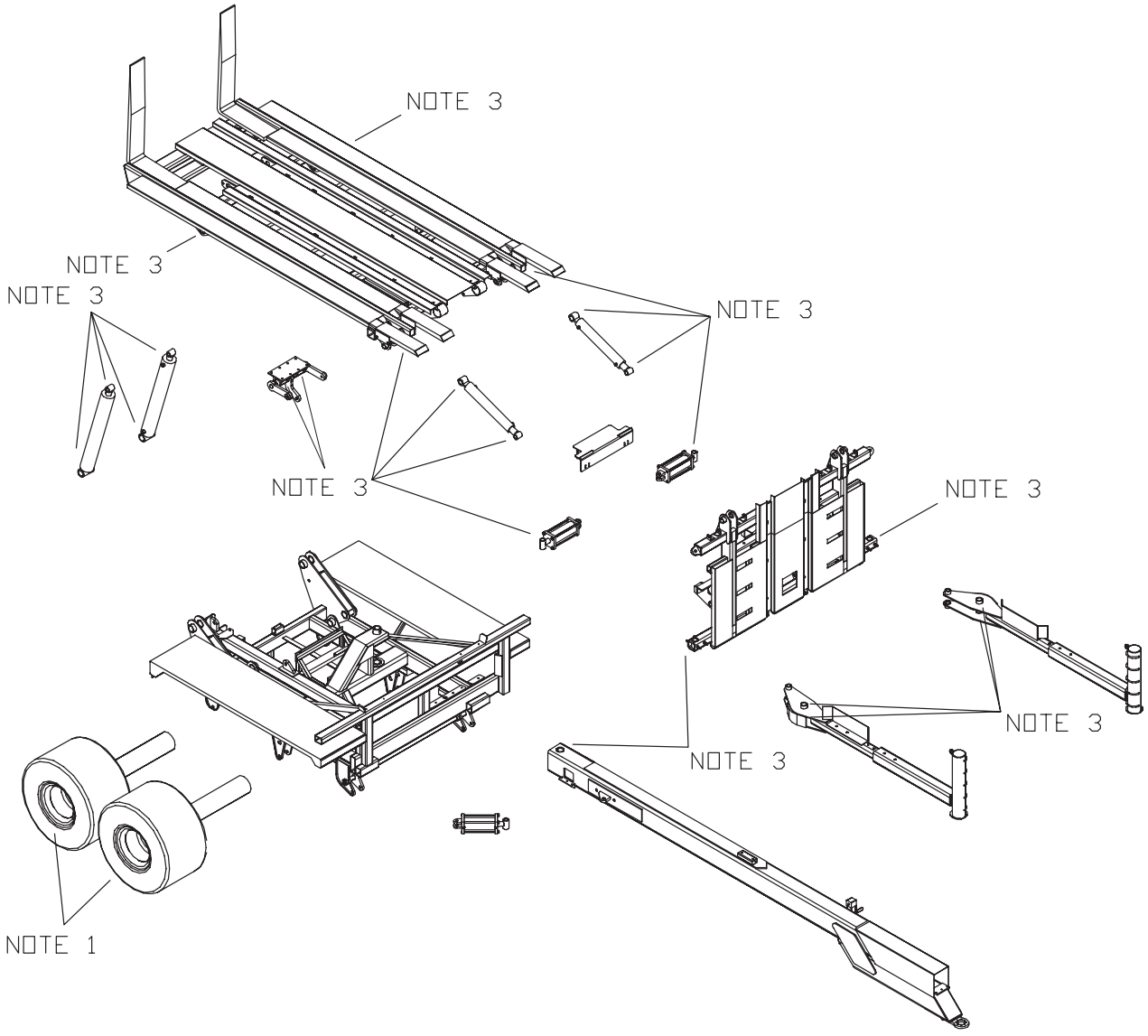
## Daily Maintenance

**WARNING: After the first 100 hours of use, re-torque all wheel lug nuts.**

### Daily Check

| | | |
|---|---|---|
| ☐ | **Lubricate** | Lubricate all grease points with all-purpose, non-clay based grease. See “Lubrication” section for location of grease zerks. |
| ☐ | **Hitch Connection** | Check the bolt system that connects the stacker to the tractor drawbar. A loose connection will wear faster and possibly uncouple. |
| ☐ | **Inspect Pins** | Check to make sure all pins and bolts are secure in their proper places. Inspect the pivot pins for wear and replace as necessary. |
| ☐ | **Inspect Plastic** | Check all plastic wear plates for wear or breakage. See section in general maintenance. |
| ☐ | **Inspect Hydraulics** | Inspect all hydraulic hoses, fittings, and couplings for signs of wear and fix as necessary. Check hydraulic fluid in tractor and general hydraulic system as outlined above. |
| ☐ | **Clean** | Keep the Bale Runner clean and free from mud and dirt, especially around hydraulic cylinder rods and moving parts. |
| ☐ | **Axle Bearings** | Check the oil level in the axle hubs and fill with 80-90 gear lube as necessary. |
| ☐ | **Wheel Lug Nuts** | Examine the wheel lug nuts making sure all are tight and none are missing. |
| ☐ | **Tire Air Pressure** | Check air pressure in tires. Tire pressures for specific tires are listed in the “Machine Specification” section at the front of this manual. |
| ☐ | **Wiring Harness** | Make sure wires are not rubbing on sharp metal objects etc. |
| ☐ | **Lighting** | Check to be sure all lights (brake, turn and clearance) are intact and functioning properly. |
| ☐ | **Brakes** | Check brakes for adjustment periodically. |
| ☐ | **Sensors** | Wipe off dust and metal from all ferrous metal sensors. |

## Lubrication Points




Notes:

1. Make sure hubs have oil and the plug is in the hub caps. Changing bearings is dificult and requires large size tools.
2. Grab hooks have no grease zerks. See grab hook assembly for location of plastic bushings.
3. 10 hour grease point.
4. 2 Grease points on tensioner and chain drive shaft bearings.

### Lubricants

Hydraulic oil ..... High quality that meets or exceeds tractor specifications
Axle hub oil ..... 80-90 gear lube
Grease ..... Non clay based

## General Maintenance

### General Check

- Lug nuts should be tightened to 450-500 ft-lbs.
- Bolts in axle suspension system should be tightened to the values on decal 10774 shown below.

**⚠ WARNING**

**SAFETY ALERT! (1) FOLLOW ALL TORQUE REQUIREMENTS. (2) DO NOT USE ANY COMPONENT WITH VISIBLY WORN OR DAMAGED THREADS. FAILURE TO FOLLOW THESE SAFETY ALERTS CAN LEAD TO LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, SERIOUS PERSONAL INJURY OR DEATH.**

**Hutchens Suspension Torque Requirements**
**9600-9700 Series ( Decal Part Number 16086-01 Rev. J )**

After an initial break in period, approximately 1000 miles, and at least every 4 months periodically thereafter, ALL bolts and nuts should be checked to insure that recommended torque values are being maintained.

Oiled torque values listed are for new fasteners with lubricated threads. It is recommended that new installations be performed with oiled fasteners. For dry threads which have been in service, use the higher torque values which are noted below.

| | OILED | DRY |
|---|---|---|
| 1 1/8-7 ( 9600 / 9700 Rocker Bolt ) | 590 lb-ft | 790 lb-ft |
| 1-14 or 1-8 ( 9700 Radius Rod Bolt ) | 540 lb-ft | 720 lb-ft |
| 7/8-14 ( Axle U-Bolts & 9600 Radius Rod Bolt ) | 350 lb-ft | 470 lb-ft |
| 3/4-16 ( Axle U-Bolts ) | 310 lb-ft | 420 lb-ft |
| 5/8-18 ( Radius Rod Clamp Bolt ) | 130 lb-ft | 170 lb-ft |
| 5/8-18 ( Spring Retainer Bolt ) | 35 lb-ft | 50 lb-ft |

HUTCH Hutchens Industries — Hutchens Industries, Inc., P.O. Box 1427, Springfield, Missouri 65801-1427 Toll Free 1 (800) 654-8824

- Alignment Arm Chains should be kept tight to prevent cracking of the Loader. Check the chain tightness by visually inspecting the chains when the Loader is fully raised. The chains should have little or no slack.

**To tighten Alignment Arm Chains**

1. Jack up the ends of the Alignment Arms and block them in place. This should create the most slack in the chain.
2. Release the safety latch and unhook the grab hook. Determine the link that would eliminate the most slack in the chain.
3. Remove the double clevis pin in the end of the chain, hook the grab hook on the desired link, and re-lock the safety latch.
4. Re-install the pin on the double clevis on the end of the chain through the pad eye on the Alignment Arm.

- Check all plastic wear surfaces used in the machine. These parts are located at the Hitch pivot point, between the Hitch and the Frame, at the Alignment Arm pivots, and in the Grab Hook pivots.
- Periodically check all bolts. Use grade eight bolts for replacements. A torque chart is provided on page 6-21.

### Cylinder Repair

The diagnosis and repair of the hydraulic cylinders on the Auto Align Bale Runner should only be attempted by a qualified service technician familiar with this type of repair.

### Bed Extensions

The bed extensions are used to hold the fifth tier in a load, depending on the dimensions of the bales being stacked. Refer to the chart on page 5-17 to determine if your application requires the use of bed extensions. The bed extensions can easily be removed, and re-pinned to the loader if it is desired to stack a different sized bale.

## Air Brake Maintenance

### Every Three Months or 25,000 Miles

1. Check the condition of the foundation brakes, including drums, shoes and linings, cams, rollers, bushings, etc.
2. Check for structural damage of the housing, worn clevis, worn clevis bushings and condition of the boot for cuts or tears. Replace if necessary.
3. After allowing the brake drum to cool to room temperature, check for correct chamber stroke following the procedure on page 6-10. Due to different operating conditions, chamber stroke tests may be necessary at earlier intervals. See charts on page 6-10 for the recommended stroke measurements.

**Note: An automatic slack adjuster should not have to be manually adjusted except for initial installation and at the time of brake reline.**

### Every Six Months or 50,000 Miles

Gunite slack adjusters are factory lubricated and extensively sealed to protect against dirt, water, salt and other corrosive elements. Nevertheless, periodic lubrication is recommended.

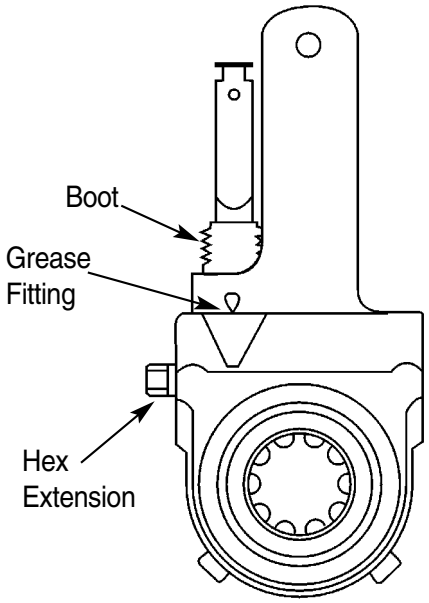



Figure 1 - Lubrication Points

### Greasing the Slack Adjuster

1. A grease fitting is provided to allow lubrication during normal chassis servicing (see fig. 1). With a conventional grease gun, lubricate until grease appears on the camshaft, or grease flows from the grease relief.

**Note: Slack Adjusters with a grooved and drilled worm wheel will not have a grease relief on the end cap opposite the adjusting hex.**

2. The newest Gunite slack adjusters are produced without a grease relief, forcing lubricant through the drilled worm wheel onto the camshaft. Previous designs incorporated a grease relief (see fig. 2).
3. Lubriplate Aero is the grease used in the manufacture of Gunite slack adjusters. It is recommended for use in temperatures as low as -40 degrees F (-40 degrees C).

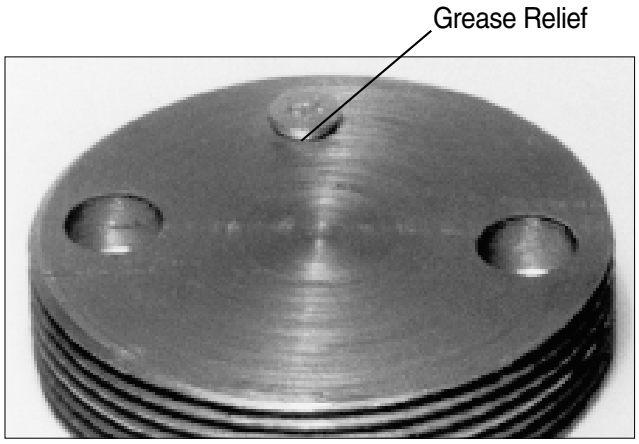



Figure 2 - Grease Relief

## Air Brake Maintenance - Continued

**Adjust the brakes as follows:**

1. Rotate the hex extension clockwise until the brake linings contact the brake drum. Back off the slack adjuster by rotating the hex counterclockwise 1/2 turn.
2. Backing off the slack will require approximately 25 to 30 ft lbs of torque. When backing off the slack adjuster, a ratcheting sound will be heard.
3. Using a ruler, measure the distance from the face of the air chamber to the center of the large pin in the clevis (A) (see fig. 3). Make an 85 psi brake application and allow the chamber push rod to travel its maximum stroke. Measure to the center of the large pin (B). The difference between (A) and (B) is the push rod stroke. Check the following chart for proper maximum stroke after adjustment of the brakes.

**Measuring the Free Stroke**

4. Free stroke is the amount of movement of the slack adjuster required to move the brake shoes against the drum. With brakes released, measure from the face of the chamber to the center of the clevis pin. Use a ruler to measure the movement of the slack adjuster until the brake shoes contact the drum (fig. 4). The difference between the released and applied measurements is the free stroke. The free stroke should be 3/8" to 5/8". If the free stroke is good, but the applied stroke is too long, there is a problem with the foundation brake. Check the foundation brake for missing or worn components, cracked brake drums, or improper lining to drum contact. If the free stroke is greater than the recommended distance (3/8" to 5/8"), a function test of the slack adjuster should be performed (see page 6-11). If the free stroke is less than 3/8", a dragging brake can occur. Check to see that the manual adjustment procedure was followed correctly. Manually readjust the brake following the procedure on this page.

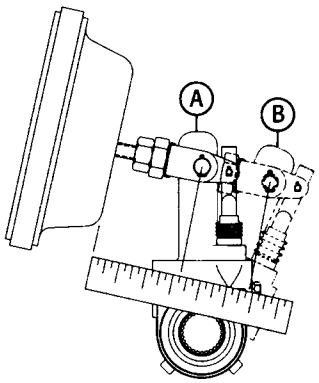



Figure 3 - Measuring Maximum Stroke

**"STANDARD" CLAMP TYPE BRAKE CHAMBER DATA**

| Type | Outside Diameter | Rated Stroke | Maximum stroke at which brakes must be readjusted |
|---|---|---|---|
| 9 | 5-1/4 | 1.75 | 1-3/8 |
| 12 | 5-11/16 | 1.75 | 1-3/8 |
| 16 | 6-3/8 | 2.25 | 1-3/4 |
| 20 | 6-25/32 | 2.25 | 1-3/4 |
| 24 | 7-7/32 | 2.25 | 1-3/4 |
| 30 | 8-3/32 | 2.50 | 2 |
| 36* | 9 | 3.00 | 2-1/4 |

**Note: If type 36 chamber is used, slack length should be less than 6".*

**"LONG STROKE" CLAMP TYPE BRAKE CHAMBER DATA**

| Type | Outside Diameter | Rated Stroke | Maximum stroke at which brakes must be readjusted |
|---|---|---|---|
| 16 | 6-3/8 | 2.50 | 2 |
| 20 | 6-25/32 | 2.50 | 2 |
| 24 | 7-7/32 | 2.50 | 2 |
| 24* | 7-7/32 | 3.00 | 2-1/2 |
| 30* | 8-3/32 | 3.00 | 2-1/2 |

**Note: Identified by square air port bosses.*

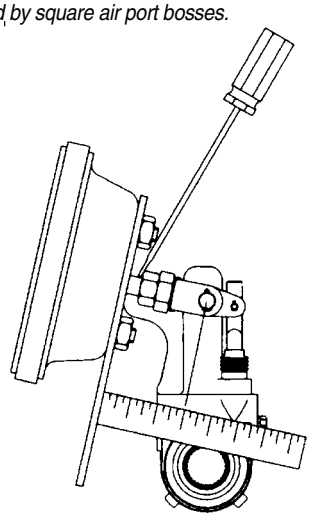


Figure 4 - Free Stroke

## Air Brake Maintenance - Continued

### Slack Adjuster Function Test

If the maximum stroke, with an 85 psi brake application is less than the distance shown in the chart on page 6-10, the Gunite slack adjuster is functioning properly.

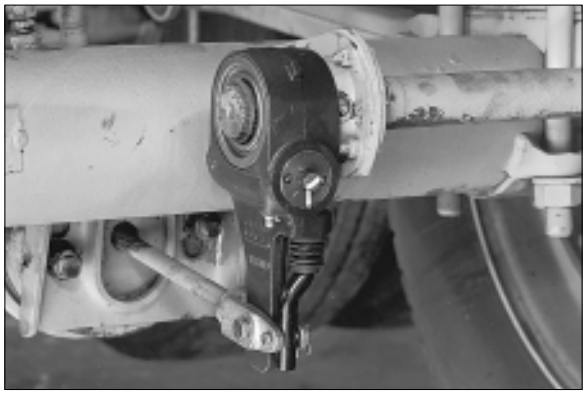
### Troubleshooting

1. **The Gunite slack adjuster should not require manual readjustment.** If the maximum chamber stroke is within the range for the size chamber used (see fig. 3), the slack adjuster should not be manually readjusted. If the chamber stroke exceeds the limit, measure the free stroke. If the free stroke is good, but the applied stroke is too long, there is a problem with the foundation brake. Check the foundation brake for missing or worn components, cracked brake drums, or improper lining to drum contact.

   If the free stroke is **greater** than the recommended distance (3/8" to 5/8"), a function test of the slack adjuster should be performed. To test the function of the slack adjuster, place a 7/16" box wrench on the hex extension and rotate it 3/4 of a turn counterclockwise. A ratcheting sound will be heard. Mark the 7/16" hex extension with chalk and apply the brakes several times and watch for the hex to rotate clockwise.

   The hex extension must rotate clockwise. The adjustment is intentionally made in small increments so it will take several cycles to bring the adjuster within the stroke limit shown in the chart.

   If the free stroke is **less** than 3/8", a dragging brake can occur. Check to see that the manual adjustment procedure was followed correctly. Manually readjust the brake following the procedure on page 6-10.



2. Check the torque by attaching a torque wrench to the hex extension and turning it in a counterclockwise direction and record the measurement.
3. If the hex extension did not rotate clockwise during brake application or there is less than 15 ft lbs of torque required to rotate the hex extension in the counterclockwise direction, the slack adjuster must be replaced. If immediate replacement is not possible, proper brake adjustment must be maintained by manual adjustment.
4. If the hex extension rotates clockwise and has a torque of greater than 15 ft lbs when rotated counterclockwise, the slack is functioning properly. Check the foundation brake for proper function, worn cam bushing, pins and rollers, broken springs, worn quick connect clevis, worn clevis bushings and clevis pins. Repair as necessary and repeat the function test.
5. Readjust the brake after the function test.

## Air Brake Maintenance - Continued

### FF2 Full Function Valve Fitting General Installation Guidelines

**1.** Dependent on sealant type, the basic guidelines for FF2 pipe fitting installation is finger tight, plus one or two turns **maximum**. Sealant is the variable with the greatest effect on fitting installation. Characteristics of different sealants are as follows:

**Teflon Pipe Sealant**

Teflon pipe sealant acts as a lubricant. Fittings go in farther with the same torque. They may not have to go a full turn past finger tight to seal.

**Fittings Without Sealant**

Fittings without sealant will seal adequately in plastic ports. They arrive at finger tight in less turns than lubricated fittings. Unlike lubricated fittings, fittings without sealant require more turns past finger tight to achieve a seal, typically one or two turns.

**Fittings With Dry Sealant**

Fittings with dry sealant become finger tight in less turns than fittings without sealant. The dry sealant increases the fitting size so it starts tightening sooner. As the fitting is wrench tightened the sealant compresses, Having variable effects on turns required to seal. Sealing still requires one to two turns past finger tight, but more attentions must be paid to fitting torque.

**2.** Start fittings straight to prevent crossed threads. Fittings should be started by hand for at least one turn before use of wrenches.

**3.** Dry sealant must be applied properly. If dry sealant is applied to the first thread of a fitting, it will be hard to start the fitting straight.

**4.** Any pipe fitting or sealant can be used in the installation of the FF2 Full Function Valve. The consistent use of one type of sealant will help you install fittings successfully.

**5.** The use of teflon tape on a regular basis is not recommended. Bits of tape break off during installation.

**6.** When the last thread or hex of a fitting is flush with the surface, the fitting has been installed past the point required to seal. **Do not install the fitting farther!**

**Max Torque (in-lbs)**

1/4"NPTF - 120

3/8"NPTF - 180

## Wheel Bearing Adjustment

### Wheel Bearing Adjustment Procedure (Double Nut Arrangement)

1. Prior to installing any wheel-end fasteners, make sure the spindle area is free of dirt and debris. As well, make sure all nuts and washers are free of dirt. Clean mating surfaces are important for proper wheel-end assembly.
2. After properly installing the bearing cones and wheel-end seal onto the spindle, and the wheel-end is slid onto the spindle, tighten the inner spindle nut with a torque wrench to 150-200 ft. lbs. to set the bearings and wheel-end. **CAUTION: DO NOT USE AN AIR IMPACT WRENCH TO TIGHTEN THIS NUT!**
3. Loosen this inner nut to allow the brake drum to rotate freely. Backing off one (1) full turn is recommended.
4. Re-tighten the inner spindle nut to 50 ft. lbs. by hand using a torque wrench to position the bearings for final adjustment. **CAUTION: DO NOT USE AN AIR IMPACT WRENCH TO TIGHTEN THIS NUT!**
5. Back the inner spindle nut off 1/4 turn.
6. Install the retaining fastener or fasteners onto the spindle according to the fastener used. If washers are used, be sure they are facing in the right direction and are clean. Make sure any washers with dowels fit properly into the mating holes.
7. Install the outer spindle nut. Using a torque wrench, tighten this nut to 250-300 ft. lbs. Resulting end play should be .001" - .005".

**Note: If end play is not .001" - .005", disassemble and repeat this procedure.**

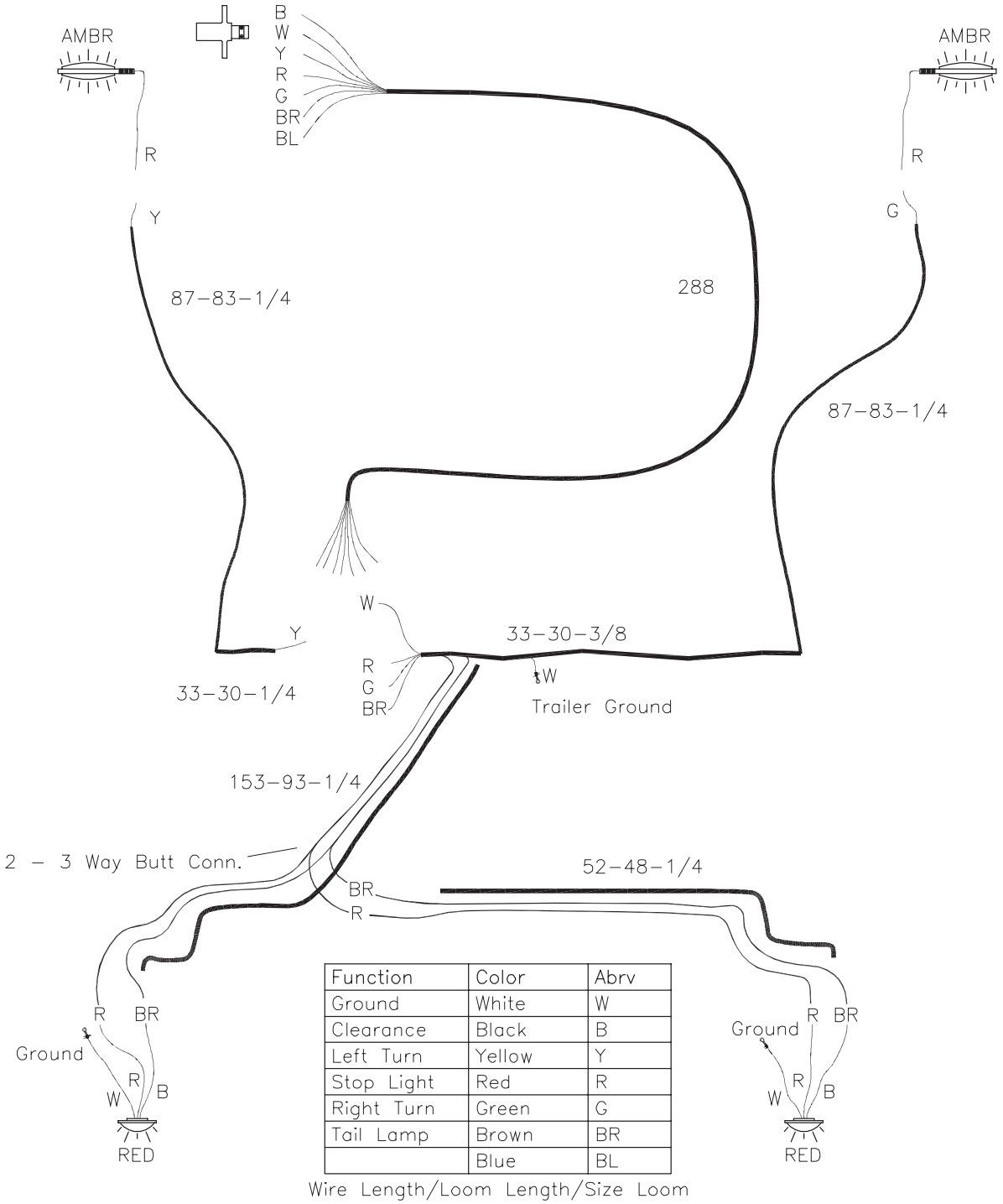
## Electrical Maintenance

Electrical components on the 16K Bale Runner do not need regular maintenance unless wires or cable are worn or broken. This section briefly outlines the function of the electrical systems and gives some basic guidelines for maintenance and repair.

### Basic Maintenance and Notes

- Always check the wires for wear from rubbing on different components. When wear is detected, move the wires or shield them.
- When troubleshooting, always check the wires for good connections.
- Use the Electrical Diagrams to rebuild wires if needed.

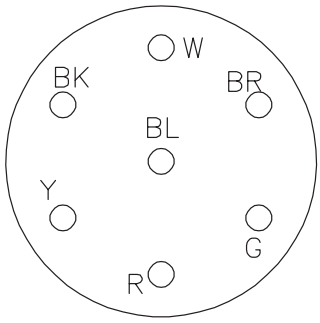
## Electrical Diagrams



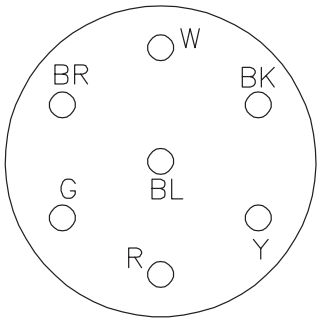

| Function | Color | Abrv |
|---|---|---|
| Ground | White | W |
| Clearance | Black | B |
| Left Turn | Yellow | Y |
| Stop Light | Red | R |
| Right Turn | Green | G |
| Tail Lamp | Brown | BR |
| | Blue | BL |

Wire Length/Loom Length/Size Loom

## Electrical Diagrams - Continued

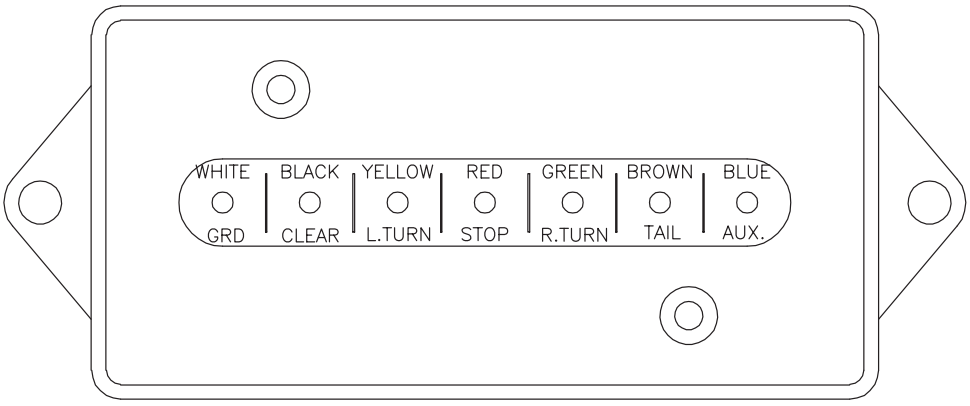



7 Pole Socket Markings



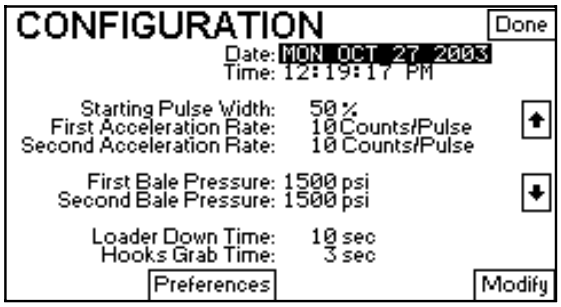

7 Pole Plug Markings

| Function | Color | Abrv |
|---|---|---|
| Ground | White | W |
| Clearance | Black | BK |
| Left Turn | Yellow | Y |
| Stop Light | Red | R |
| Right Turn | Green | G |
| Tail Lamp | Brown | BR |
| | Blue | BL |



## Alignment Arm Pressure, and Motor Chain Tension Adjustment

- When the stacker picks up a bale in automatic mode, the arms will squeeze until the hydraulic pressure in the cylinder exceeds the set-point. The arms then stop squeezing, and the loader starts raising. There are two pressure set-points for the stacker. The First Bale Pressure is used for the first bale picked up, and the Second Bale Pressure is used for the next one. In the case of 3 X 3 bales, the Second Bale Pressure is also used for the third bale. If the alignment arms don't appear to be squeezing the bales tight enough or the bales are slipping through the alignment arms, the pressure probably needs to be increased. If the alignment arms appear to be squeezing the bales too tight and the bales are bowing in the middle, the pressure probably needs to be decreased.




- The **Alignment Arm Pressure** can be adjusted from the Configuration screen. To modify the pressure, press the down arrow until the value for the target Bale Pressure is highlighted. Then press the Modify button. This will bring up the Number Pad screen into which the new pressure value may be entered.
- When making adjustments on the Bale Runner, always stop the towing vehicle, set the parking break, disengage the PTO and all power drives, shut off the engine and remove the ignition keys.
- If the power slider chains are jumping teeth or appear to be over tightened, then the power slider chain tension may need to be adjusted.
- The **Power Slider Chain Tension** is controlled by a hydraulic pressure reducing and relief valve located on the side of the pushoff. The aluminum valve has an adjustment screw protruding from the rear of the valve. Once the 9/16" jam nut is loosened, the adjustment screw can be turned with a 5/32" allen wrench. When adjusting the system use small increments (1/4 turn), bottoming out the adjustment nipple or over pressurizing the system could potentially damage hydraulic components. Turning the adjustment screw in (clockwise) increases pressure, and turning the screw out (counter clockwise) decreases the pressure.
- Adjusting the **Motor Chain Tension** can be accomplished with two 3/4" wrenches. First loosen the four (4) bolts holding the motor mount to the bed. Then adjust the threaded rod until the appropriate amount of tension is achieved in the chain. (Approximately 3/4"of slack in the middle of the slack side of the chain.) Re-tighten all bolts and torque to specs. (Page 6-20)
- When the stacker slides the bales back, the power slider foot starts off slowly and is accelerated down the bed. If it accelerates too quickly or starts too suddenly, the bottom bale could be kicked out from under the pile, causing the bales to tumble. If it accelerates too slowly, the bales could outrun the power slider foot leaving them susceptible to tipping if they were to catch on the bed.
- There are three variables associated with the power slider foot that can be adjusted. The **Starting Pulse Width** controls the starting speed of the foot. If that value is too low, the foot will not be able to start sliding. If it is too high, the foot will start too suddenly. The **First Acceleration Rate** controls how quickly the power slider foot speeds up during the first five feet of travel. A larger value causes the foot to pick up speed more quickly, and a smaller number causes it to speed up more slowly. Similarly, the **Second Acceleration Rate** applies to the power slider foot after it has traveled 5 feet. To modify these values, press the down arrow until the target value is highlighted. Then press the Modify button. This will bring up the Number Pad screen into which a new value may be entered.
- If you continue to have problems please contact an authorized ProAG dealer or the Morris Technical Support Department.

## Year End Maintenance

### Storage

- Park Bale Runner on level ground.
- Lock Hitch in the “in-line” position with Hitch Safety Pin.
- Set Loader on the Hitch.
- Relieve pressure in lines to prevent “thermal” lock.

**WARNING: Keep children away from the stored Bale Runner. Many of the surfaces on the machine are slippery and injuries may result from climbing on or around machine.**

**CAUTION: Keep livestock away from machine so they will not injure themselves or damage the machine.**

### Preventative Maintenance

- Touch up any scratches or flaking paint.
- Grease all zerks with an all-purpose, non-clay based grease. The non-clay based grease should help eliminate the plugging of grease zerks.
- Cover tires to prevent sun damage.

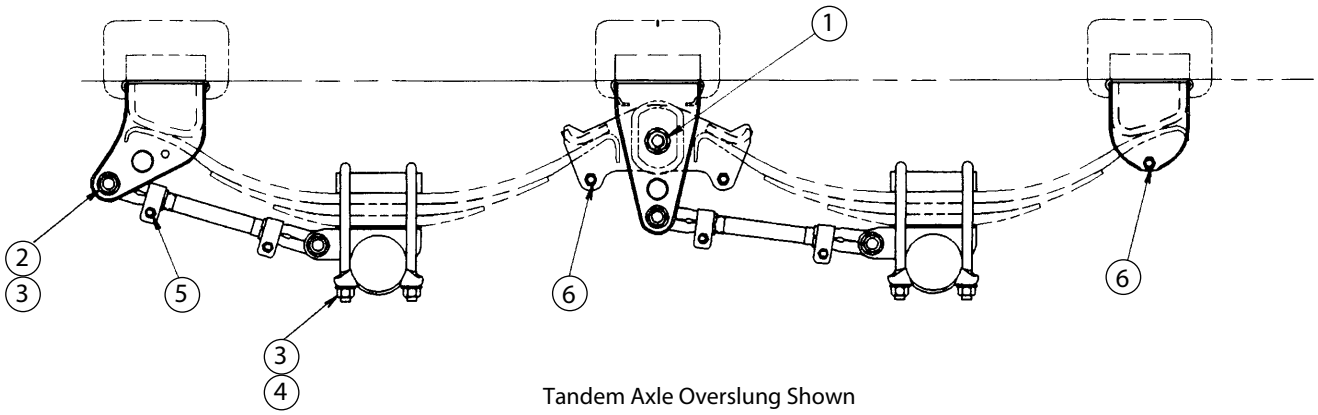
**CAUTION: Direct sunlight will cause tires and hoses to deteriorate more quickly.**

## Suspension Maintenance

The 16K uses a Hutchens Industries trailer suspension similar to below.

For detailed information visit Hutchens website resource centre at www.hutchensindustries.com.

Suspension used is H-9700 underslung with 44” centers and 2 1/4” spring seat height with 5”round axles.



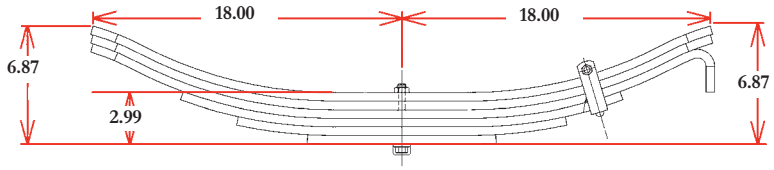

Tandem Axle Overslung Shown

### Torque Specifications

| Item No. | Fastener | Oiled | Dry |
|---|---|---|---|
| 1 | 1 1/8-7 (9600/9700 Rocker Bolt) | 590 Lb-Ft | 790 Lb-Ft |
| 2 | 1-14 (9700 Radius Rod Bolt) | 540 Lb-Ft | 720 Lb-Ft |
| 3 | 7/8-14 (Axle U-Bolt & 9600 Radius Rod Bolt) | 350 Lb-Ft | 470 Lb-Ft |
| 4 | 3/4-16 (Axle U-Bolt) | 310 Lb-Ft | 420 Lb-Ft |
| 5 | 5/8-18 (Radius Rod Clamp Bolt) | 130 Lb-Ft | 170 Lb-Ft |
| 6 | 5/8-18 (Spring Retainer Bolt) | 35 Lb-Ft | 50 Lb-Ft |

### 12146 Spring Leaf Pack - Low Arch, 6 Leaf

44" Axle Center All Positions. Hook to Rear.



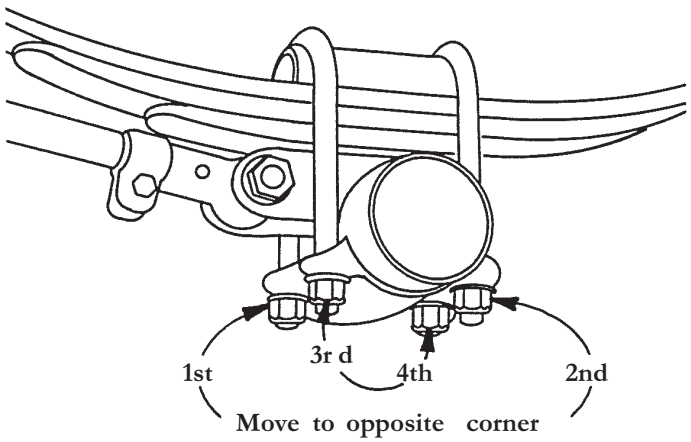
## Suspension Maintenance - Continued

Periodically check suspension components and torque bolts to specifications as follows especially after first using a new machine.

### Axle Clamp Group and Springs

1. Check the torque on the U-bolt nuts by alternately tightening opposing corners of the clamp assembly. **See Figure 1.**
   a. When using 7/8" – 14 U-bolts, the nuts should be torqued to a **dry** level of 470 lb-ft.
   b. When using 3/4" – 16 U-bolts, the nuts should be torqued to a **dry** level of 420 lb-ft.

**Fig. 1**

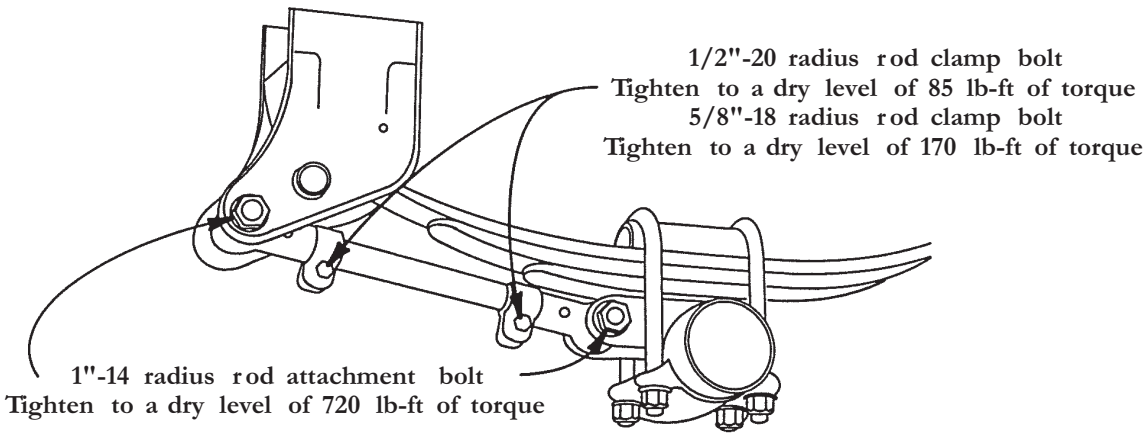



Always carefully inspect the spring and axle clamp components for any signs of wear or cracks, and replace if visible wear or cracks are present.

### Radius Rods

2a. The 1" – 14 radius rod attachment bolts at the hangers and spring seats should be tightened to a **dry** level of 720 lb-ft of torque on both the adjustable and non-adjustable radius rods. **See Figure 2.**

**Fig. 2**




Loose operation of this bolt can result in wear requiring that new components be installed to avoid structural damage. During your visual inspection, if you observe any visible wear or loosening in the bushing, it is imperative that you immediately replace the radius rod bushing and bolt. Failure to replace these components will result in damage to the hanger, spring seat, and/or radius rod.

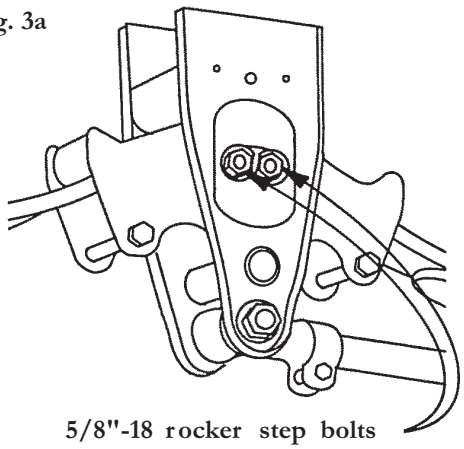
2b. Next check the 1/2" – 20 radius rod clamp bolt, which should be tightened to a **dry** level of 85 lb-ft of torque. The 5/8" – 18 radius rod clamp bolt should be tightened to a **dry** level of 170 lb-ft of torque. **See Figure 2.** If the clamp bolt has not been properly maintained, then wear between the radius rod screw and the eye end may be observed. If so, then the entire radius rod must be replaced. **Simply retightening or replacing the clamp bolt will not correct the problem.**

## Suspension Maintenance - Continued

### Rocker Bushings

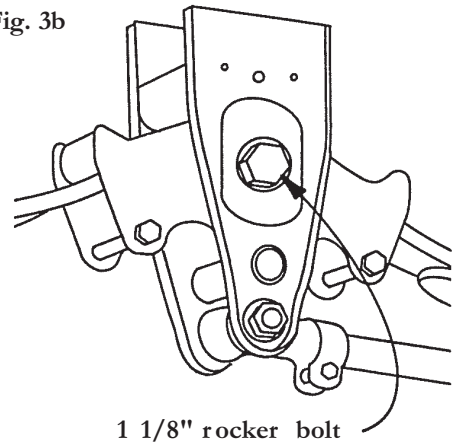
3. The recommended torque values for the rocker bushing clamp bolts are different for each model.
   a. If you are working on the 7700 model suspension, the 5/8" – 18 rocker step bolts should be tightened to a **dry** level of 170 lb-ft of torque. **See Figure 3a.**
   b. If you are working on the 9700 model suspension, the single 1 1/8" – 7 rocker bolt should be tightened to a **dry** level of 790 lb-ft of torque. **See Figure 3b.**

**Fig. 3a**



**5/8"-18 rocker step bolts**
**Tighten to a dry level of 170 lb-ft of torque**

**Fig. 3b**



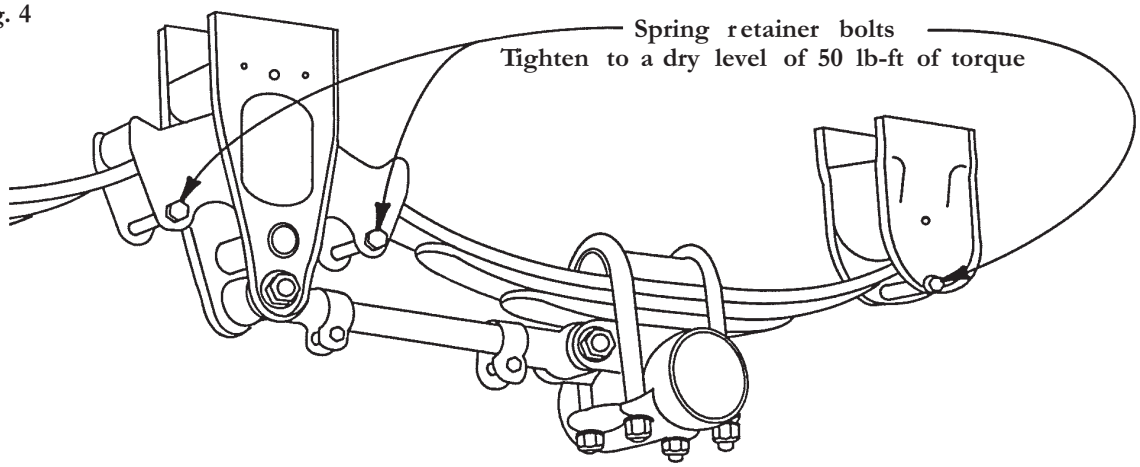
**1 1/8" rocker bolt**
**Tighten to a dry level of 790 lb-ft of torque**

During your check, if the bolts are loose a detailed inspection of the rocker is important to ensure that no structural damage has occurred. One way this can be done is by raising the trailer until the trailer weight is taken off the springs. If the rocker is displaced or if the joint is loose, then the rocker should be removed and the rocker and/or rocker bushing be replaced. Again, visually inspect the condition of all rocker/rocker hanger assembly components and replace if visible wear is present.

### Hangers

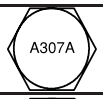
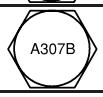
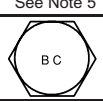
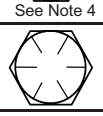
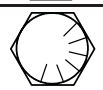
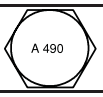
4. Check all of the spring retainer bolts found in the rockers and rear hangers. A **dry** value of 50 lb-ft of torque should be maintained on all of these bolts. **See Figure 4.**

**Fig. 4**




Loose fasteners that are allowed to operate for any period of time will result in irreversible suspension damage and possible loss of vehicle control. **Retightening a worn fastener will not correct a situation created by loose operation!**

**Mechanical Specifications for Externally Threaded Fasteners with Grade Markings**

| Specification | Material | Size Range (in.) | Min. Proof Strength (psi) | Min. Tensile Strength (psi) | Core Hardness Rockwell Min. | Core Hardness Rockwell Max. | Min. Yield Strength (psi) | Grade Identification Marking |
|---|---|---|---|---|---|---|---|---|
| SAE J429-Grade 1 | Low or medium carbon steel | 1/4 - 1 1/2 | 33,000 | 60,000 | B70 | B100 | 36,000 |  |
| SAE J429-Grade 2 | | 1/4 - 3/4<br>7/8 - 1 1/2 | 55,000<br>33,000 | 74,000<br>60,000 | B80<br>B70 | B100<br>B100 | 57,000<br>36,000 | |
| ASTM A307-Grade A | Low or medium carbon steel | 1/4 - 4 | | 60,000 | B69<br>See Note 1 | B100 | |  |
| ASTM A307-Grade B | Low or medium carbon steel | 1/4 - 4 | | 60,000(min)<br>100,000(max) | B69<br>See Note 1 | B95 | |  |
| SAE J429-Grade 5<br>ASTM A449-Type1 | Medium carbon steel: quenched & tempered | 1/4 - 1<br>1 1/8 - 1 1/2 | 85,000<br>74,000 | 120,000<br>105,000 | C25<br>C19 | C34<br>C30 | 92,000<br>81,000 |  |
| ASTM A449-Type 1<br>See Note 2 | | 1 3/4 - 3 | 55,000 | 90,000 | | | 58,000 | |
| ASTM A325-Type 1 | Medium carbon steel: quenched & tempered | 1/2 - 1"<br>1 1/8 - 1 1/2 | 85,000<br>74,000 | 120,000<br>105,000 | C25<br>C19<br>See Note 3 | C34<br>C30 | 92,000<br>81,000 |  <br>See Note 5 |
| ASTM A354<br>Grade BC | Medium carbon alloy steel: quenched & tempered | 1/4 - 2 1/2<br>2 1/2 - 4 | 105,000<br>95,000 | 125,000<br>115,000 | C26<br>C22<br>See Note 2 | C36<br>C33 | 109,000<br>99,000 |  |
| ASTM A354<br>Grade BD | Medium carbon alloy steel: quenched & tempered | 1/4 - 2 1/2<br>2 1/2 - 4 | 120,000<br>105,000 | 150,000<br>140,000 | C33<br>C31<br>See Note 2 | C39<br>C39 | 130,000<br>115,000 |  <br>See Note 4 |
| SAE J429-Grade 8 | Medium carbon alloy steel: quenched & tempered | 1/4 - 1 1/2 | 120,000 | 150,000 | C33 | C39 | 130,000 |  |
| SAE J429-Grade 8.2 | Low carbon boron steel: quenched & tempered | 1/4 - 1 | 120,000 | 150,000 | C33 | C39 | 130,000 |  |
| ASTM A490-Type 1 | Medium carbon alloy steel: quenched & tempered | 1/2 - 1 1/2 | 120,000 | 150,000(min)<br>170,000(max) | C33<br>See Note 3 | C38 | 130,000 |  |
| ASTM A574 Socket Head Cap Screw | Low alloy steel: quenched & tempered | #0 - 1/2<br>over 1/2 - 2 | 140,000<br>135,000 | 180,000<br>170,000 | C39<br>C37 | C45<br>C45 | 162,000<br>153,000 | |

**Note 1**: No minimum hardness is required on bolts and studs 3 x diameter and longer.
**Note 2**: Bolts less than 3 diameter in length and studs less than 4 diameter in length shall have hardness values not less than minimum and not more than maximum. This hardness testing is the only mechanical testing requirement for these bolts and studs.
**Note 3**: Bolts less than 3 x diameter are subject only to maximum/minimum hardness testing.
**Note 4**: ASTM A354-Grade BD with diameters ¼" thru 2 ½" shall be marked with six radial lines and, in addition may be marked with the grade symbol "BD." BD shall be marked on bolts over 2 ½" in diameter.
**Note 5**: Bolts shall be marked "A325." Additionally, the bolts may be marked with 3 radial 120 degrees apart (as shown).

**Torque-Tension Relationships for SAE J429 Grade Bolts**

| Nominal Thread Size | SAE J429 Grade 2 | | | SAE J429 Grade 5 | | | SAE J429 Grade 8 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Clamp Load (lbs) | Tightening Torque | | Clamp Load (lbs) | Tightening Torque | | Clamp Load (lbs) | Tightening Torque | |
| | | K = .15 | K = .20 | | K = .15 | K = .20 | | K = .15 | K = .20 |
| **Unified Coarse Thread Series** | | | | | | | | | |
| 1/4-20 | 1,300 | 49 in-lbs | 65 in-lbs | 2,000 | 75 in-lbs | 100 in-lbs | 2,850 | 107 in-lbs | 143 in-lbs |
| 5/16-18 | 2,150 | 101 | 134 | 3,350 | 157 | 210 | 4700 | 220 | 305 |
| 3/8-16 | 3,200 | 15 ft-lbs | 20 ft-lbs | 4,950 | 23 ft-lbs | 31 ft-lbs | 6,950 | 32.5 ft-lbs | 44 ft-lbs |
| 7/16-14 | 4,400 | 24 | 30 | 6,800 | 37 | 50 | 9,600 | 53 | 70 |
| 1/2-13 | 5,850 | 36.5 | 49 | 9,050 | 57 | 75 | 12,800 | 80 | 107 |
| 9/16-12 | 7,500 | 53 | 70 | 11,600 | 82 | 109 | 16,400 | 115 | 154 |
| 5/8-11 | 9,300 | 73 | 97 | 14,500 | 113 | 151 | 20,300 | 159 | 211 |
| 3/4-10 | 13,800 | 129 | 173 | 21,300 | 200 | 266 | 30,100 | 282 | 376 |
| 7/8-9 | 11,425 | 125 | 166 | 29,435 | 321 | 430 | 41,550 | 454 | 606 |
| 1-8 | 15,000 | 187.5 | 250 | 38,600 | 482.5 | 640 | 54,540 | 680 | 900 |
| **Unified Fine Thread Series** | | | | | | | | | |
| 1/4-28 | 1,500 | 55 in-lbs | 75 in-lbs | 2,300 | 85 in-lbs | 115 in-lbs | 3,250 | 120 in-lbs | 163 in-lbs |
| 5/16-24 | 2,400 | 112 | 150 | 3,700 | 173 | 230 | 5,200 | 245 | 325 |
| 3/8-24 | 3,600 | 17 ft-lbs | 22.5 ft-lbs | 5,600 | 26 ft-lbs | 35 ft-lbs | 7,900 | 37 ft-lbs | 50 ft-lbs |
| 7/16-20 | 4,900 | 27 | 36 | 7,550 | 42 | 55 | 10,700 | 59 | 78 |
| 1/2-20 | 6,600 | 41 | 55 | 10,200 | 64 | 85 | 14,400 | 90 | 120 |
| 9/16-18 | 8,400 | 59 | 79 | 13,000 | 92 | 122 | 18,300 | 129 | 172 |
| 5/8-18 | 10,600 | 83 | 110 | 16,300 | 128 | 170 | 23,000 | 180 | 240 |
| 3/4-16 | 15,400 | 144 | 193 | 23,800 | 223 | 298 | 33,600 | 315 | 420 |
| 7/8-14 | 12,610 | 138 | 184 | 32,480 | 355 | 473 | 45,855 | 500 | 668 |
| 1-12 | 16,410 | 205 | 273 | 42,270 | 528 | 704 | 59,670 | 745 | 995 |

Clamp load estimated as 75% of proof load for specified bolts.
Torque values for ¼ and 5/16 inch series are in inch-pounds. All other torque values are in foot-pounds.
Torque values calculated from formula T = KDF where: K=0.15 for "lubricated" conditions K=0.20 for "dry" conditions

**Notes**

# Section 7: Storage

## Section Contents

## Preparing for Storage

- To insure longer life and satisfactory operation, store the implement in a shed.
- If building storage is impossible, store away from areas of main activity on level, firm, dry ground.
- Lock Hitch in the “in-line” position with Hitch Safety Pin.
- Set Loader on the Hitch.
- Relieve pressure in lines to prevent “thermal” lock.
- Clean machine thoroughly.
- Inspect all parts for wear or damage.
- **Avoid delays** - if parts are required, order at the end of the season.
- Lubricate grease fittings. (Refer to Maintenance Section).
- Tighten all bolts to proper specifications (Refer to Maintenance Section).
- For a safer storage, lower the implement into field position and release the hydraulic pressure.
- Level implement using hitch jack and block up.
- Relieve pressure from hydraulic system.
- Raise frames, block up and relieve weight from the tires.
- Cover tires with canvas to protect them from the elements when stored outside.
- Coat exposed cylinder shafts **(Refer to Cylinder Shaft Protection).**
- Touch up any scratches or flaking paint.

**Note: Direct sunlight will cause tires and hoses to deteriorate more quickly.**

**⚠ Warning**

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

**⚠ Caution**

**Keep livestock away from machine so they will not injure themselves or damage the machine.**

## Cylinder Shaft Protection

The steps summarized below should be followed when protecting chrome plated shafting on equipment:

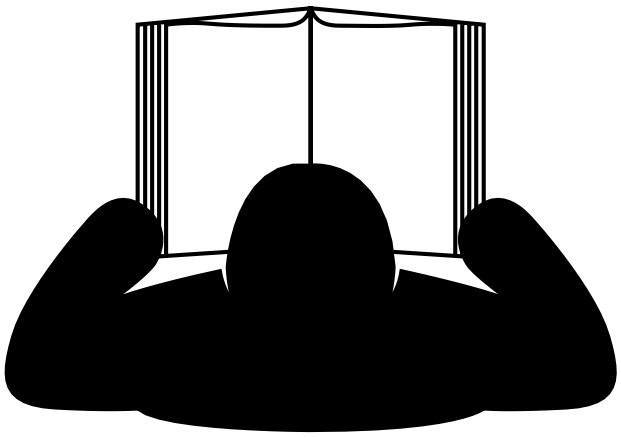
- Position the equipment as it will be stored, and identify all the exposed portions of the chrome plated shafts.
- Clean dirt and dust from the exposed portions of the shaft using a dry cloth or a cloth which has been dampened with an appropriate solvent.
- Prepare a mixture of 60% oil-based rust inhibitor and 40% Kerosene. Apply a thin coating of this mixture to the exposed surfaces of the chrome plated shaft. No. 1 fuel oil may be substituted for Kerosene. A cloth dipped in the mixture can be used to apply the coating.
- Inspect the shaft surfaces after six months and apply additional corrosion preventative mixture.
- If the equipment is to be moved and then stored again for an extended period of time, the steps above should be repeated for all shafts that were stroked during the move.
- **Before retracting the cylinders the protective coating should be removed.** This will prevent fine sand and dirt that has accumulated in the coating, from damaging the shaft seal. **Under no circumstances should sandpaper or other abrasive material be used to clean the surfaces.** Plastic or copper wool in combination with an appropriate solvent will remove most of the dirt.

**⚠ Caution**

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

## Removing from Storage

- Review Operator's Manual.
- Check tire pressure (Refer to Tire Pressure List).
- Clean machine thoroughly. Remove coating from exposed cylinder shafts **(Refer to Cylinder Shaft Protection).**
- Lubricate grease fittings. (Refer to Lubricating Section).
- Tighten all bolts to proper specifications (Refer to Bolt Torque Chart).



**Notes**

# Section 8: Troubleshooting

## Section Contents

## Overview of the 16K Control System

The 16K is operated by a control box and a hand held controller in the cab of the tractor. The control box talks to the computer on the stacker via a serial communication cable. Meanwhile, the computer is also monitoring eleven sensors on the machine. The computer determines which mechanism to move based on the information it is receiving from the control box and the signals it is reading from the sensors. This allows the computer to do two things:

1. The computer sequences the stacker's movements in automatic mode.
2. The computer will not allow a mechanism to move if it will crash into some other part of the machine.

The only exception to the second point is that the loader can be raised in manual mode regardless of the hitch position. If this was not the case, the machine would not be able to run if the loader was down and the hitch inline.

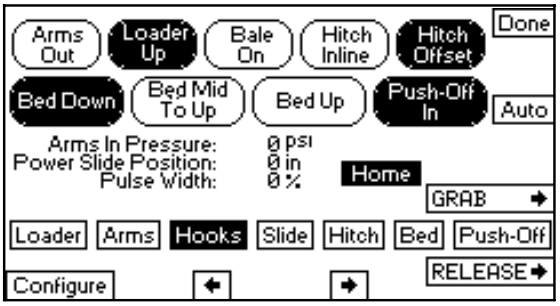
### Notices

The LCD screen of the control box will display a message if the user is pressing a button to move a mechanism, but the machine is not able to move it. These messages are as follows:

| Message | Mode | Explanation |
|---|---|---|
| Communication Failure | Auto | There is a problem with the serial communication connection between the control box and the stacker. |
| | Manual | |
| Loader Must Be Up | Auto | The operator is trying to move the hitch or bed while the loader is down |
| | Manual | |
| Hitch Must Be Offset | Auto | The operator is trying to move the loader while the hitch is not offset. |
| | Manual | The operator is trying to lower the loader while the hitch is not offset. |
| Bed Must Be Down | Auto | The operator is trying to raise the loader while the bed is not down |
| | Manual | The operator is trying to lower the loader while the bed is not down |
| Push-Off Must Be In | Auto | N/A |
| | Manual | The operator is trying to move the bed while pushoff is not retracted |
| Bed Is Down | Auto | The operator is trying to lower the bed while it is already down |
| | Manual | N/A |
| Bed Is Up | Auto | The operator is trying to raise the bed while it is already up |
| | Manual | N/A |
| Loader Is Up | Auto | The operator is trying to raise the loader while it is already up |
| | Manual | N/A |
| Table Is Full | Auto | The operator is trying to lower the loader when the stacker is full |
| | Manual | |
| Slide Is Positioning | Auto | The operator is trying to move the loader while the slider foot is positioning |
| | Manual | N/A |
| Slide Is Pushing | Auto | The operator is trying to move the loader while the slider foot is pushing |
| | Manual | N/A |
| Slide Is Returning | Auto | The operator is trying to move the loader while the slider foot is returning |
| | Manual | N/A |
| Slide Is Not Home | Auto | The operator is trying to lower the loader before the slider foot is home |
| | Manual | N/A |
| Push-Off Is Retracting | Auto | The computer must retract the pushoff before it can move the bed |
| | Manual | N/A |

## Steps to Troubleshoot Outputs

1. Go to the Manual System screen:




2. Ensure that the following preconditions are met. If they are not, the screen will display a notice describing which precondition has not been met when the operator attempts to actuate the output. If the screen indicates a “Communication Failure” when the output is actuated, then the problem is with the serial connection between the control box and the machine.

| To Move | The Following Preconditions Must Be Met |
|---|---|
| Arms Open | None |
| Arms Close | None |
| Loader Up | None |
| Loader Down | Hitch must be offset **and** Bed must be down<br>**or** Bed must be above the mid position. |
| Grab Hooks Engaged | None |
| Grab Hooks Release | None |
| Power slider Back | None |
| Power slider Return | None |
| Hitch Offset | Loader must be up<br>**or** bed must be above the mid position. |
| Hitch Inline | Loader must be up<br>**or** Bed must be above the mid position. |
| Bed Up | Loader must be up **and** Push-Off must be in<br>**or** Bed must be above the mid position and Push-Off must be in. |
| Bed Down | Loader must be up **and** Push-Off must be in<br>**or** Bed must be above the mid postion **and** Push-Off must be in. |
| Push-Off Out | None |
| Push-Off In | None |

3. If the machine is configured correctly but the indicators on the screen do not match the physical state of the machine, then troubleshoot the inputs.
4. Select the desired valve bank by pressing the arrow buttons below the screen. The descriptions on the lower right will change to describe the functions of that valve section.
5. Actuate the valve by pressing the appropriate button at the lower right of the screen. If the machine moves in response to the operator pressing the button, then the output is working correctly.
6. If the output is not working, then check the inline fuse for that function in the red output cable. If it is blown replace with a 2.5A fuse.

## Steps to Troubleshoot Outputs - Continued

**7.** If the fuse is intact, check the output voltage between the fuse holder of the output cable and chassis ground when the output is actuated.

– For most outputs this voltage will be in excess of 12V.

– For the output which raises the loader this voltage will be around 6V for the first 1.5 seconds and then it will increase to the system voltage (12V). If the loader is all the way up, this voltage will stay around 6V.

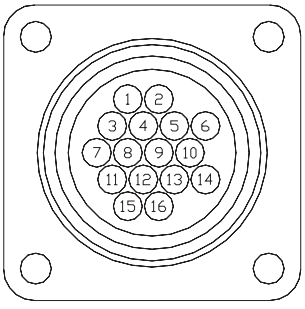
– For the power slider output, the output voltage will depend on the Starting Pulse Width setting on the Configuration screen. A lower setting will result in a lower starting voltage. As the power slider moves down the bed, the voltage will increase depending on the acceleration rates specified on the Configuration screen. A larger setting will cause the voltage to grow more quickly.

**8.** If the voltage is inadequate, check the cable for shorts and for continuity. Use the following table for reference.

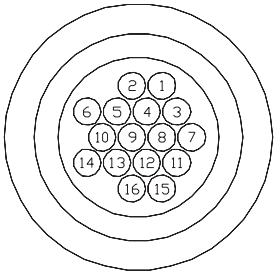
**9.** If the cable is intact, check the output voltage on the 16 pin connector of the computer board. If there is no voltage on the connector, the computer board may need to be replaced.

| To Check the following Valve: | Check for 12V between GND and Pin: |
|---|---|
| Arms In | 5 |
| Arms Out | 6 |
| Hooks Grab | 4 |
| Hooks Release | 1 |
| Loader Up | 3 |
| Loader Down | 8 |
| Power Slider Back | 10 |
| Power Slider Return | 1 |
| Bed Up | 15 |
| Bed Down | 12 |
| Pushoff Out | 6 |
| Pushoff In | 9 |
| Hitch Inline | 13 |
| Hitch Offset | 14 |

**Circuit Board**

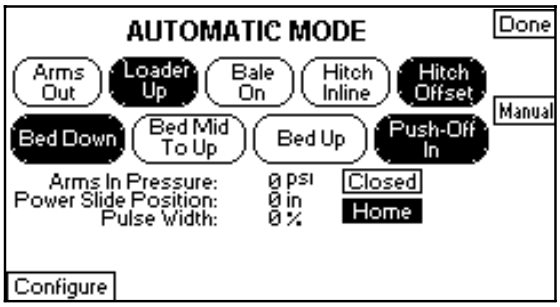


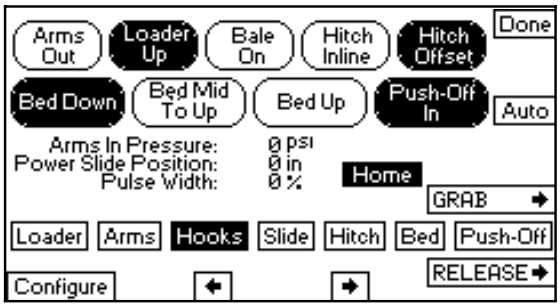

**Cable**



## Steps to Troubleshoot Inputs

1. Ensure that the control box is talking to the stacker by actuating an output on the stacker from the control box. If the screen indicates a “Communication Failure”, the problem is with the serial connection between the control box and the machine.




2. Otherwise, go to one of the two system screens. The following table describes each of the indicators on the screen.

| Indicator Description | Indicator is Highlighted When | Indicator is Clear When |
|---|---|---|
| Arms Out | Alignment arms are open. | Alignment arms are not open. |
| Loader Up | Loader is up. | Loader is not up. |
| Bale On | Bale paddle on loader is depressed. | Bale paddle on loader is not depressed. |
| Hitch Inline | Hitch is inline. | Hitch is not inline. |
| Hitch Offset | Hitch is offset. | Hitch is not offset. |
| Bed Down | Bed is down. | Bed is not down. |
| Bed Mid to Up | Bed is above mid position. | Bed is below mid position. |
| Bed Up | Bed is raised all the way up. | Bed is not raised all the way up. |
| Push-Off In | Pushoff is retracted. | Pushoff is not retracted. |
| Closed | Arms In Pressure exceeds the set-point for the specified bale. This is only indicated in automatic mode. | Arms In Pressure has not yet reached the set-point for the specified bale. |
| Home | The power slider is at its home position under the loader. This indicator represents a flag in the computer memory, and will be highlighted whenever the computer is powered up. | The power slider is not at its home position. |

3. Verify that the indicator is working correctly by moving the appropriate mechanism in and out of the range of the sensor. The indicator should highlight when the sensor is actuated and clear when it is not. In the case where it is impractical to actuate the mechanism hydraulically, the sensor can be manipulated manually. Placing a ferrous washer on the target of the sensor will actuate it, disconnecting the sensor will simulate a non-active state.

**Before actuating sensors manually, verify that the machine is in manual mode so that mechanisms do not move unexpectedly.**

4. When the arms are being closed, the Arms In Pressure value should increase when the arms close completely. In automatic mode it will only increase to the Bale Pressure set-point before raising the loader. At that point the Closed indicator should highlight. In manual mode, the Arms In Pressure value will keep going up as long as the valve is actuated until it reaches the system pressure.

## Steps to Troubleshoot Inputs - Continued

**5.** When moving the power slider, The Power Slide Position value should increase as the power slider moves towards the rear of the bed and should decrease as it moves towards the front. When the value goes down to zero, the Home indicator should highlight.

**6.** When pushing the power slider toward the rear, the Pulse Width value should start at the number specified in the Configuration screen and increase as the foot moves back. It will increase faster or slower depending on the values specified in the Acceleration Rates. If the Acceleration Rate is zero, the Pulse Width value will not increase.

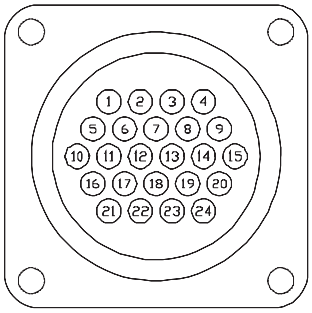
**7.** If the information on the screen does not match what the machine is doing, troubleshoot it by referring to the following chart:

| Symptom | Possible Problem | Diagnosis | Solution |
|---|---|---|---|
| Indicator is clear when it should be highlighted. | Disconnected sensor | Visually check connections. | Reconnect sensor. |
| | Break in the wire | Visually check wires.<br>Check continuity through cable. | Splice wires or replace cable. |
| | Bad sensor | Place washer on sensor and check continuity of sensor. | Replace sensor. |
| | Sensor position | Move sensor and watch indicator. | Move sensor. |
| Indicator is highlighted when it should be clear. | Short in the wire | Visually check wires.<br>Check for short in cable. | Separate wires or replace cable. |
| | Bad sensor | Disconnect sensor and check continuity. | Replace sensor. |
| | Sensor position | Move sensor and watch indicator. | Move sensor. |
| | Dirty sensor | Visually inspect sensor. | Wipe sensor off. |
| Arms In Pressure always reads zero, or behaves erratically. | Disconnected sensor | Visually check connection of Arms In Pressure sensor. | Reconnect sensor. |
| | Break in the wire | Visually check wires to Arms In Pressure sensor.<br>Check continuity through cable. | Splice wires or replace cable. |
| | Short in the wire | Visually check wires to pressure sensor.<br>Check for short in cable. | Separate wires or replace cable. |
| | Bad Sensor | | Replace sensor. |
| Power Slide Position does not increase and decrease properly as power slider moves. | Disconnected sensor | Visually check connection of Power Slide Position sensor. | Reconnect sensor. |
| | Break in the wire | Visually check wires to Power Slide Position sensor.<br>Check continuity through cable. | Splice wires or replace cable. |
| | Short in the wire | Visually check wires to Power Slide Position sensor.<br>Check for short in cable. | Separate wires or replace cable. |
| | Bad sensor | | Replace sensor. |
| | Sensor position | Sensor is too close or too far from teeth on wheel. | Move sensor. |

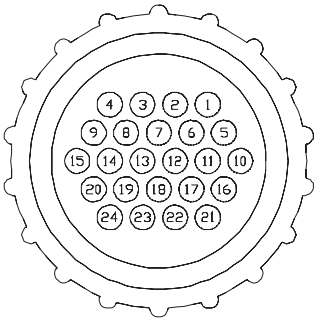
## Steps to Troubleshoot Inputs - Continued

**8.** When checking the integrity of the cable, switch off the machine and disconnect the 24 pin sensor cable from the computer board. Measure continuity between the pins on the 24 pin connector as indicated in the table below when the sensor is actuated manually.

| To Check the following Sensor: | Check for Continuity Between Pins: |
|---|---|
| Arms Out | 4, 5 |
| Loader Up | 9, 10 |
| Bale On | 21, 22 |
| Hitch Inline | 15, 16 |
| Hitch Offset | 17, 18 |
| Bed Down | 23, 24 |
| Bed Mid To Up | 13, 14 |
| Bed Up | 11, 12 |
| Push-Off In | 19, 20 |




**Circuit Board**




**Cable**

The Power Slide Position sensor (Pins 1,2,3) and the Arms In Pressure sensor (Pins 6,7) require power to run, and so cannot be checked for continuity.

**9.** If there is no communication error, and the sensor state is accurately being transmitted through the sensor cable, but the sensor is still indicating incorrectly on the screen, the computer board may need to be replaced.

## Steps to Troubleshoot Inputs - Continued

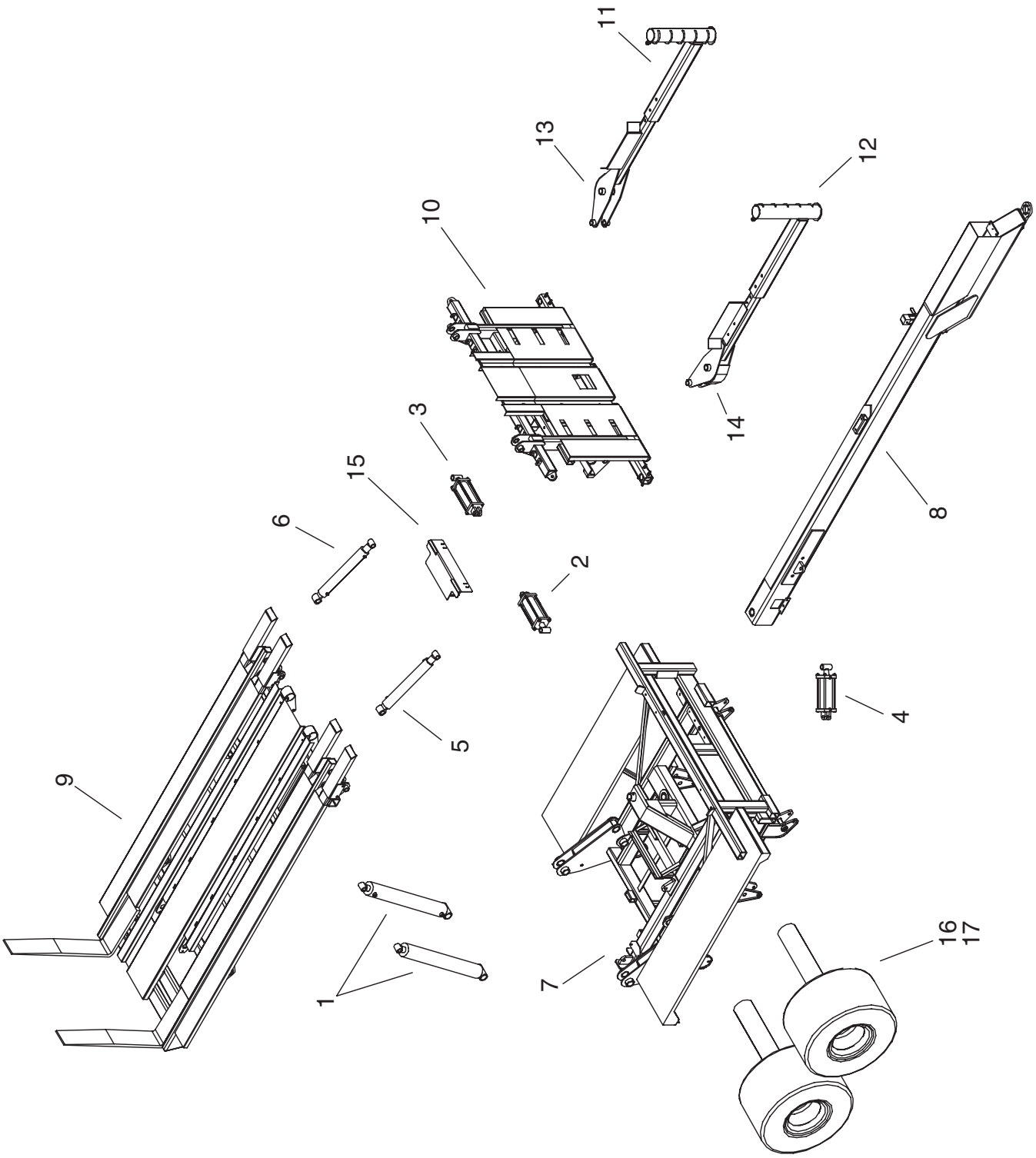
The following conditions must be met before the valves will operate in Automatic mode.

| In Order For: | The Following Preconditions Must Be Met |
|---|---|
| Arms to Open | Alignment arms cannot be open. |
| Arms to Close | Alignment arms cannot be closed. |
| Loader to Move Up | Alignment arms must be closed, loader cannot be up, hitch must be offset, **and** bed must be down<br>**or** alignment arms must be closed, loader cannot be up, **and** bed must be above the mid position. |
| Loader to Move Down | Alignment arms must be open, hitch must be offset, bed must be down, **and** power slider must be home<br>**or** alignment arms must be open, **and** bed must be above the mid position. |
| Grab Hooks to Engage | Alignment arms must be closed, loader cannot be up, bale must be on, **and** bed must be below the mid position. |
| Grab Hooks to Release | Loader must be up, power slider must be positioned at the foot of the bales, **and** slider position counter must be counting. |
| Power Slider to Position | Loader must be up, hitch must be offset, **and** bed must be below the mid position. |
| Power Slider To Push Back | Alignment arms must be open, loader must be up, hitch must be offset, bed must be below mid position, power slider must be positioned at the foot of the bales, and slider position counter must be counting. |
| Power Slider to Return | Loader must be up, power slider must be stalled against a bale **and** slider position counter must be counting<br>**or** loader must be up, power slider must be pushing against the bales, **and** Hitch Inline switch must be pressed. |
| Hitch to Move Offset | Loader must be up<br>**or** bed must be above the mid position. |
| Hitch to Move Inline | Loader must be up<br>**or** bed must be above the mid position. |
| Bed to Raise | Loader must be up **and** pushoff must be in<br>**or** bed must be above the mid position **and** pushoff must be in. |
| Bed to Lower | Loader must be up, bed cannot be down, **and** pushoff must be in<br>**or** bed must be above the mid position, bed cannot be down **and** pushoff must be in. |
| Pushoff to Move Out | Bed must be up. |
| Pushoff to Move In | None |

# Section 9:
# Parts Breakdown

## Section Contents

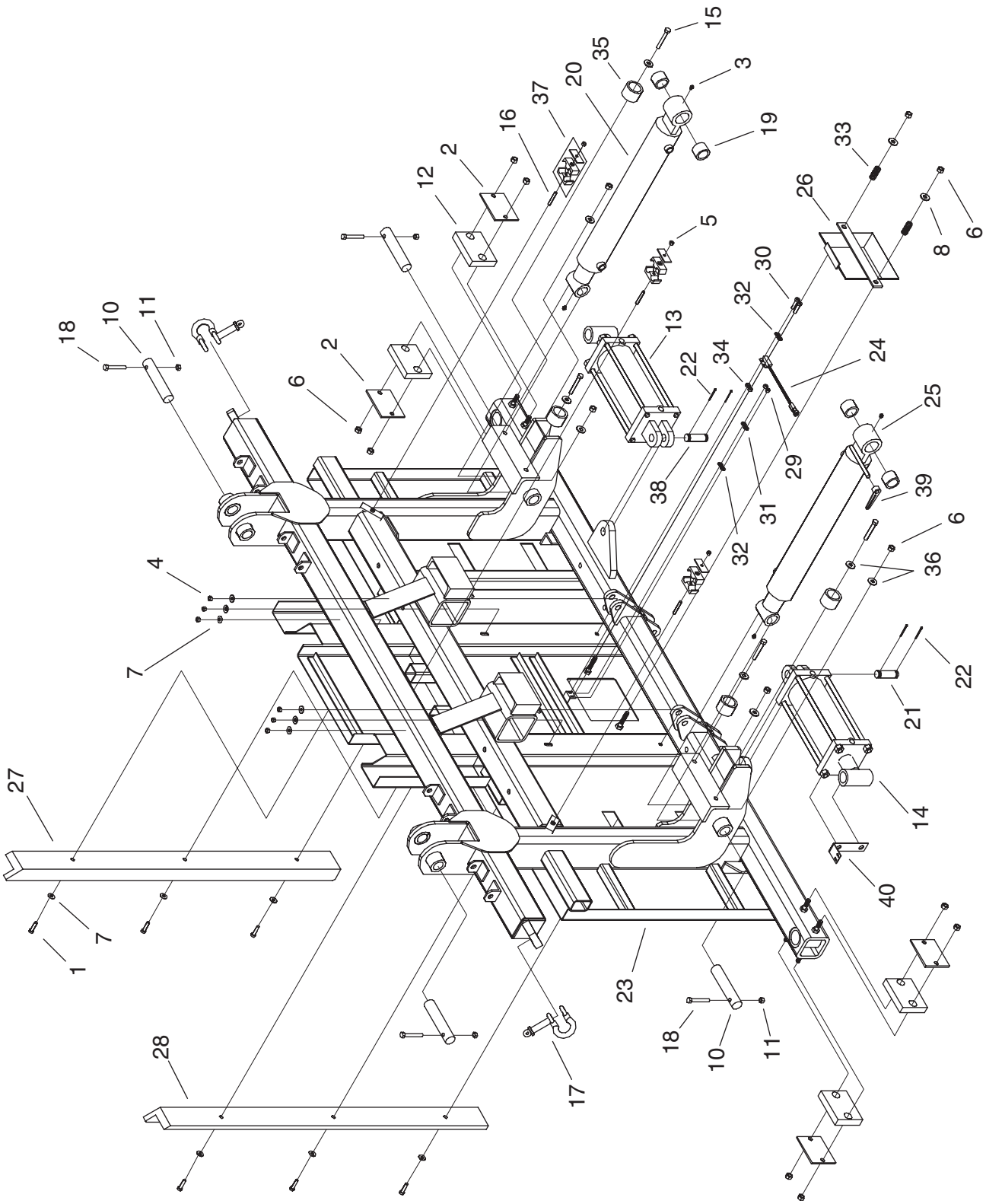
# 16K
# Final Assembly - 2001 to Present



## 16K - Final Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10436 | Bed Cylinder | 2 |
| 2 | 10439 | Right AA Cylinder | 1 |
| 3 | 10440 | Left AA Cylinder | 1 |
| 4 | 10449 | Hitch Cylinder | 1 |
| 5 | K44042 | Loader Cylinder - 2007 to present | 1 |
| | 10941 | Loader Cylinder - 2001 to 2006 | 1 |
| 6 | K44046 | 16K Left Loader Cylinder - 2007 to present | 1 |
| | 11526 | 16K Left Loader Cylinder - 2002 to 2006 | 1 |
| | 10941 | 16K Left Loader Cylinder - 2001 | 1 |
| 7 | 11266 | 16K Frame | 1 |
| 8 | 11281 | 16K Bumper Pull Hitch | 1 |
| 9 | 11282 | 16K Bed | 1 |
| 10 | 11309 | 16K Loader | 1 |
| 11 | 11310 | 16K Left AA End | 1 |
| 12 | 11319 | 16K Right AA End | 1 |
| 13 | 11324 | 16K Left AA Stub | 1 |
| 14 | 11332 | 16K Right AA Stub | 1 |
| 15 | 11751 | Slider Foot - 2002 to present | 1 |
| | 11447 | Slider Foot - 2001 | 1 |
| 16 | 11569 | 16K Axle Assembly - 2001 to present | 2 |
| 17 | 12011 | 16K Air Brake Axle Assembly - 2002 to present | 2 |
| 18 | 11423 | Fender - Right | 1 |
| 19 | 11422 | Fender - Left | 1 |
| 20 | 12549 | Light Bar - Right | 1 |
| 21 | 12548 | Light Bar - Left | 1 |
| | | **Hardware to mount fenders and light bars** | |
| | M-3388 | Locknut - 3/8 Unitorque | 20 |
| | D-5489 | Flatwasher - 3/8 | 40 |
| | W-477 | Hex bolt - 3/8 x 1 1/2 | 18 |
| | C-3664 | Hex bolt - 3/8 x 5 1/2 | 2 |

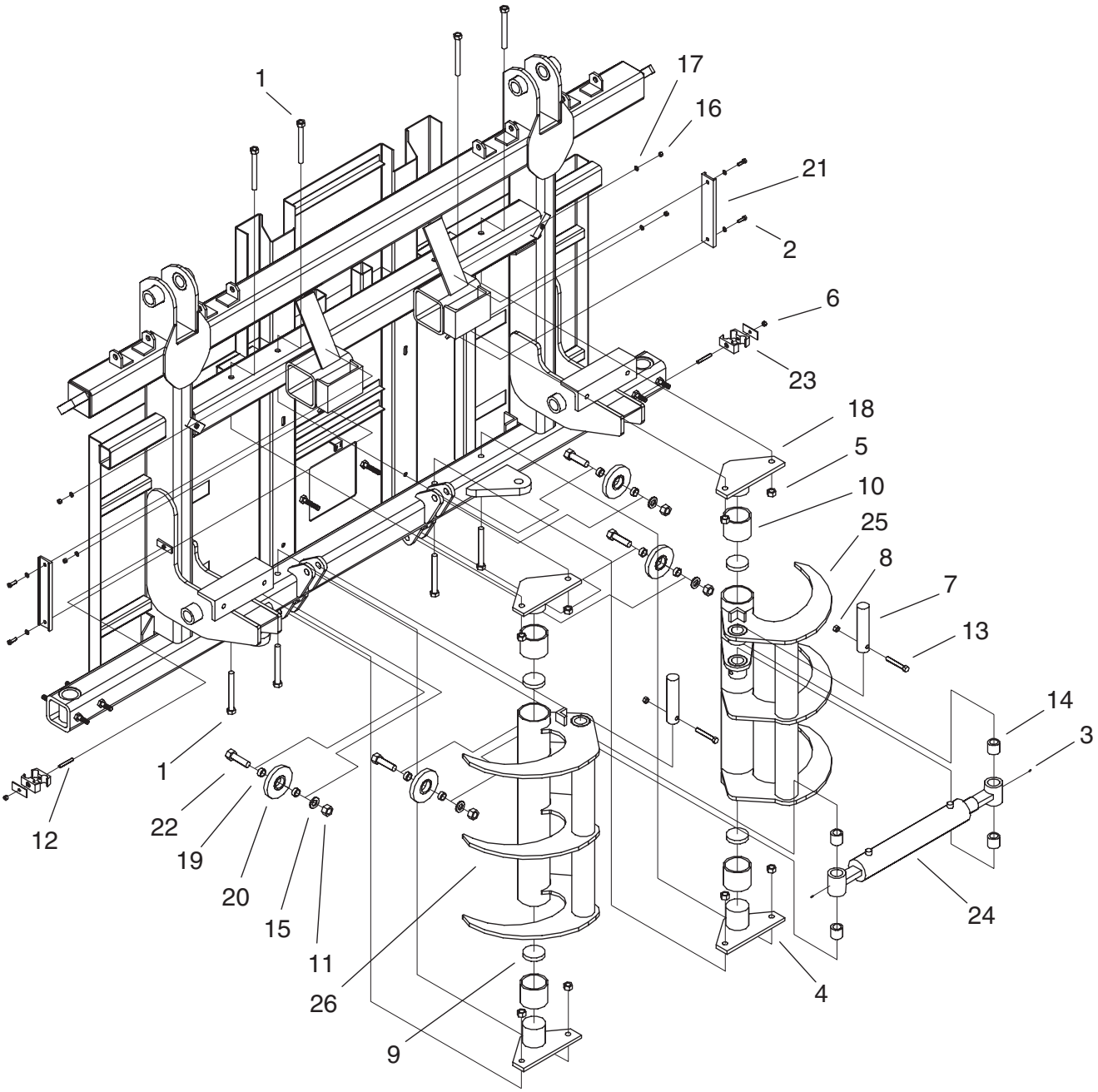
# 16K
# Loader Assembly - 2001 to Present



## 16K - Loader Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10075 | 3/8" x 1 1/2” Low Allen Head Cap Screw | 6 |
| 2 | 10104 | Alignment Slider Holder - 2004 to present | 4 |
| | 10159 | Alignment Slider Holder - 2001 to 2003 | 4 |
| 3 | 10165 | 1/4" x 28 Grease Zerk | 4 |
| 4 | 10229 | 3/8" Nylock Nut | 6 |
| 5 | 10231 | 5/16" Nylock Nut | 3 |
| 6 | 10232 | 1/2” Nylock Nut | 14 |
| 7 | 10236 | 3/8" USS Flat Washer | 12 |
| 8 | 10246 | 1/2” Flat Washer | 2 |
| 9 | * * * * * | | |
| 10 | 10256 | 1-7/16" x 7" Pin | 4 |
| 11 | 10302 | 7/16" Nylock Nut | 4 |
| 12 | 10351 | Alignment Slider | 4 |
| 13 | 10439 | Right Alignment Cylinder | 1 |
| 14 | 10440 | Left Alignment Cylinder - 2002 to present | 1 |
| | 10180 | Left Alignment Cylinder - 2001 | 1 |
| 15 | 10604 | 1/2” x 2" Gr 8 Plated Bolt - 2002 to present | 4 |
| | 11163 | 5/16"-18 x 3/4" SHCS Bolt - 2001 | 4 |
| 16 | 10811 | 5/16"-18 x 2-1/2" Fully Threaded Set Screw | 3 |
| 17 | 10827 | 3/4" Round Pin Shackle | 2 |
| 18 | 10847 | 7/16" x 3" Gr 8 Hex Bolt Plated | 4 |
| 19 | 10936 | Loader/LDR Cyl Pvt Bushing | 4 |
| 20 | K44042 | Loader Cylinder - 2007 | 1 |
| | 10941 | Loader Cylinder - 2002 to 2006 | 1 |
| | 11526 | Loader Cylinder - 2001 | 1 |
| 21 | 10967 | 1" x 3-1/2" Cylinder Pin | 1 |
| 22 | M10968 | 3/16" x 2-1/2" Cotter Pin | 4 |
| 23 | 11309 | 16K Loader - 2004 to present | 1 |
| | 10309 | 16K Loader - 2001 to 2003 | 1 |
| 24 | 11505 | Ferrous Sensor Assembly | 1 |
| 25 | K44046 | 16K Left Loader Cylinder - 2007 | 1 |
| | 11526 | 16K Left Loader Cylinder - 2002 to 2006 | 1 |
| | 10941 | 16K Left Loader Loader Cylinder - 2001 | 1 |
| 26 | 11527 | Bale On Weldment | 1 |
| 27 | 11533 | Right Loader Slider Plastic | 1 |
| 28 | 11534 | Left Loader Slider Plastic | 1 |
| 29 | 11570 | Brass HN 12-24 | 2 |
| 30 | 11571 | Brass MS 12-24 x 1" | 2 |
| 31 | 11572 | Brass L-Washer #12 | 2 |
| 32 | 11573 | Brass Flat Washer #12 | 4 |
| 33 | 11574 | Bale On Spring | 2 |
| 34 | 11575 | Nylon Spacer | 2 |
| 35 | 11678 | 12K Loader/Frame Bumper - 2002 to present | 4 |
| | 11152 | 12K Loader/Frame Bumper - 2001 (Not Shown) | 2 |
| 36 | 11700 | 1/2” SAE Plated Flat Washer | 8 |
| 37 | 11740 | 13/16" Plastic Hose Clamp - 2002 to present | 3 |
| | 10217 | 3/4" Plastic Hose Clamp - 2001 | 3 |
| 38 | 11774 | 1" x 4" Cylinder Pin | 1 |
| 39 | 12008 | LDR Cyl Sensor Target | 1 |
| 40 | 12461 | Arms Open Sensor Bracket | 1 |

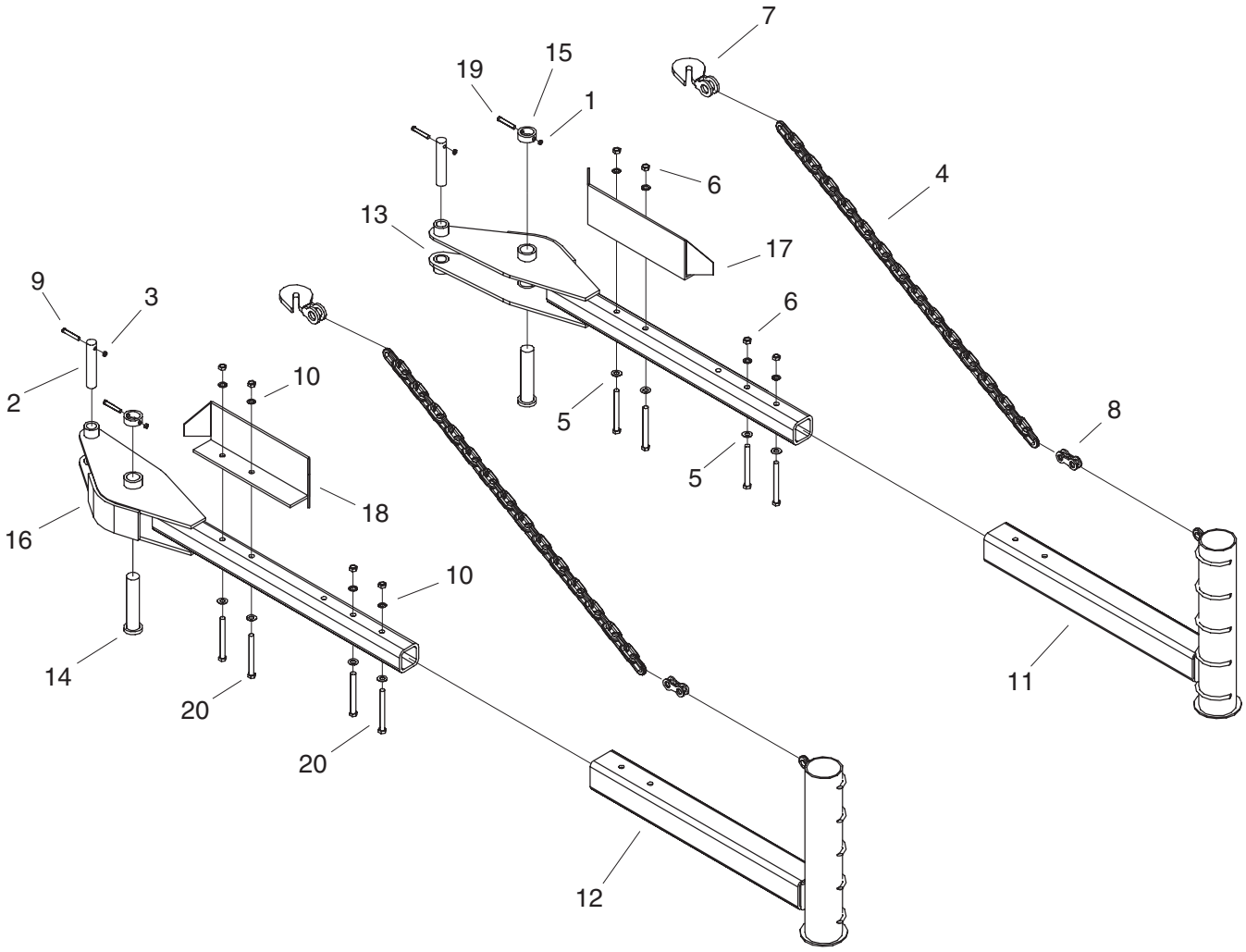
# 16K
# Grab Hook Assembly - 2001 to Present



## 16K - Grab Hook Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10065 | 5/8" x 5 ½" Gr 8 Hex Bolt Plated | 8 |
| 2 | 10072 | 1/4" x 1" Gr 8 Hex Bolt Plain | 4 |
| 3 | 10165 | 1/4" x 28 Grease Zerk | 2 |
| 4 | 10210 | Lower Grab Hook Pivot Painted - 2003 to present | 2 |
| | 11210 | Lower Grab Hook Pivot Painted - 2002 | 2 |
| | 11279 | Lower Grab Hook Pivot Painted - 2001 | 2 |
| 5 | 10230 | 5/8" Nylock Nut | 8 |
| 6 | 10231 | 5/16" Nylock Nut | 2 |
| 7 | 10256 | 1 7/16" x 7" Pin - 2003 to present | 2 |
| | 10057 | 1" x 6" Gr 8 Hex Bolt Plated - 2001 to 2002 | 2 |
| 8 | 10302 | 7/16" Nylock Nut | 2 |
| 9 | 10355 | Grab Hook Thrust Bearing | 4 |
| 10 | 10357 | Grab Hook Bushing | 4 |
| 11 | 10657 | 3/4" NC Nut Plated - 2002 to present | 4 |
| | 10473 | 3/4" Nylock Nut - 2001 | 2 |
| 12 | 10811 | 5/16" - 18 x 2 1/2" Fully Thread Set Screw | 2 |
| 13 | 10847 | 7/16" x 3" Gr8 HHCS Plated - 2003 to present | 2 |
| | 10228 | 1" Nylock Nut - 2001 to 2002 | 2 |
| 14 | 10936 | Loader Pivot Bushing - 2002 to present | 4 |
| | 10096 | Loader Pivot Bushing - 2001 | 4 |
| 15 | 10962 | 3/4" Lock Washer | 4 |
| 16 | 11005 | 1/4" NC Nylock | 4 |
| 17 | 11164 | 1/4" Flat Washer | 8 |
| 18 | 11279 | 16K Grab Hook Stop Pivot - 2002 to | 2 |
| | 10209 | 16K Grab Hook Stop Pivot - 2001 | 2 |
| 19 | 11497 | LDR Idler Spacer | 8 |
| 20 | 11512 | Idler Sprocket - 2002 to present | 4 |
| | 11512 | Idler Sprocket - 2001 | 2 |
| 21 | 11541 | Upper Chain Plastic 10" | 2 |
| 22 | 11576 | 3/4" x 3 ½" HHCS | 4 |
| 23 | 11740 | 13/16" Plastic Hose Clamp | 2 |
| 24 | 12166 | Grab Hook Cylinder 03 | 1 |
| | 10036 | Grab Hook Cylinder - 2001 to 2002 | 1 |
| 25 | 12200 | RT Triple Grab Hook 03 | 1 |
| | 11278 | RT Triple Grab Hook - 2001 to 2002 | 1 |
| 26 | 12201 | LT Triple Grab Hook 03 | 1 |
| | 11277 | LT Triple Grab Hook - 2001 to 2002 | 1 |

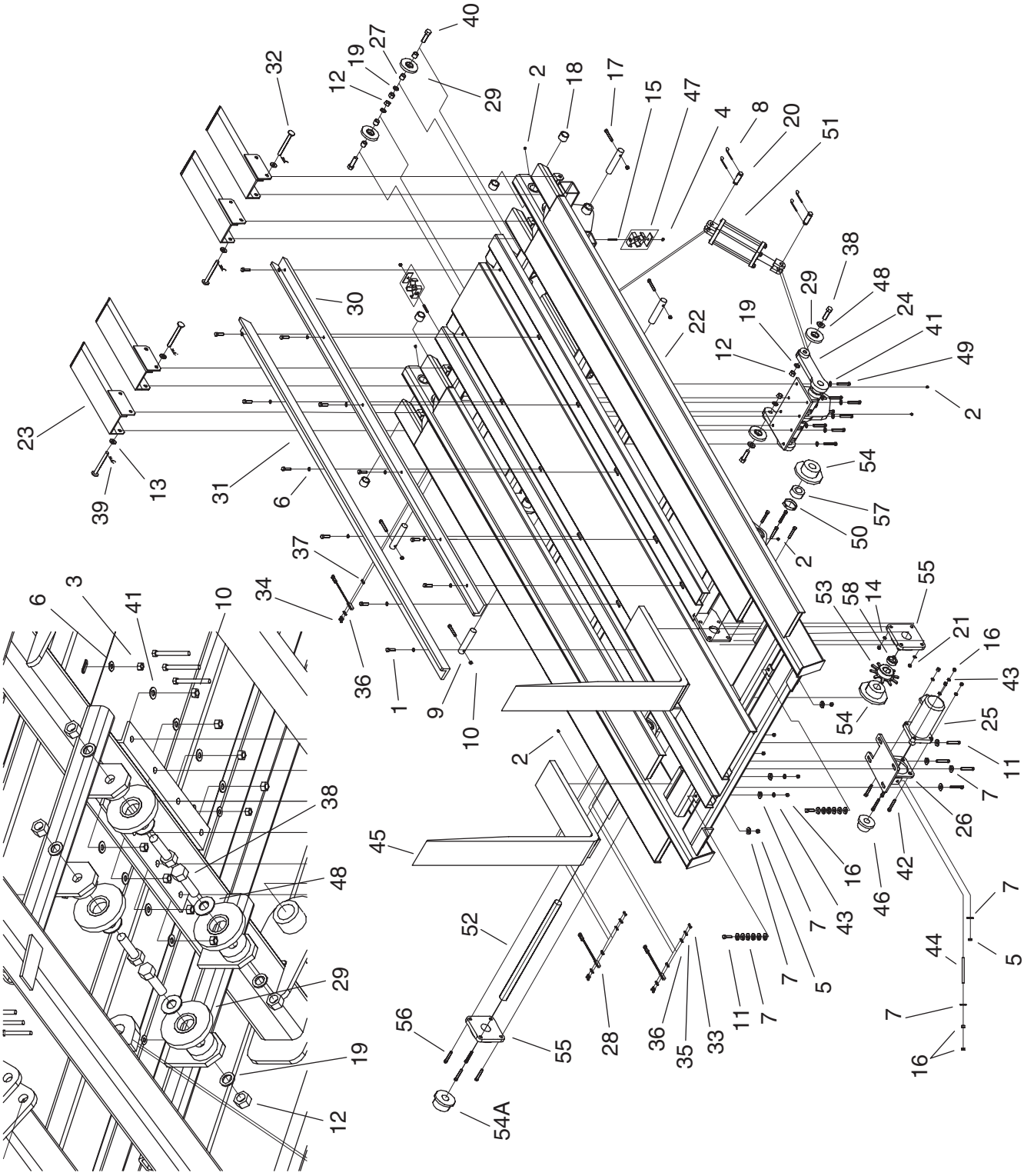
# 16K
# Alignment Arm Assembly - 2001 to Present



## 16K - Alignment Arm Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10232 | 1/2" Nylock Nut | 2 |
| 2 | 10257 | 1 7/16" x 8 1/4" Pin | 2 |
| 3 | 10302 | 7/16" Nylock Nut | 2 |
| 4 | 10369 | 8 Foot 3/8" Chain | 2 |
| 5 | 10655 | 3/4" USS Flat Washer Plated | 8 |
| 6 | 10657 | 3/4" Hex Nut Plated | 8 |
| 7 | 10662 | 3/8" Chain Locking Grab Hook | 2 |
| 8 | 10677 | 7/16" - 1/2" Twin Clevis | 2 |
| 9 | 10847 | 7/16" x 3" Gr 8 Hex Bolt Plated | 2 |
| 10 | 10962 | 3/4" Lock Washer Plated | 8 |
| 11 | 11310 | LT AA End | 1 |
| 12 | 11319 | RT AA End | 1 |
| 13 | 11324 | LT AA Stub | 1 |
| 14 | 11328 | 16K AA Pin | 2 |
| 15 | 11331 | 16K AA Pin Collar | 2 |
| 16 | 11332 | RT AA Stub | 1 |
| 17 | 11441 | LT AA Add On | 1 |
| 18 | 11442 | RT AA Add On | 1 |
| 19 | 11577 | 1/2" x 3 1/2" HHCS | 2 |
| 20 | 60063 | 3/4" x 7" Gr-8 HHCS Plated | 8 |

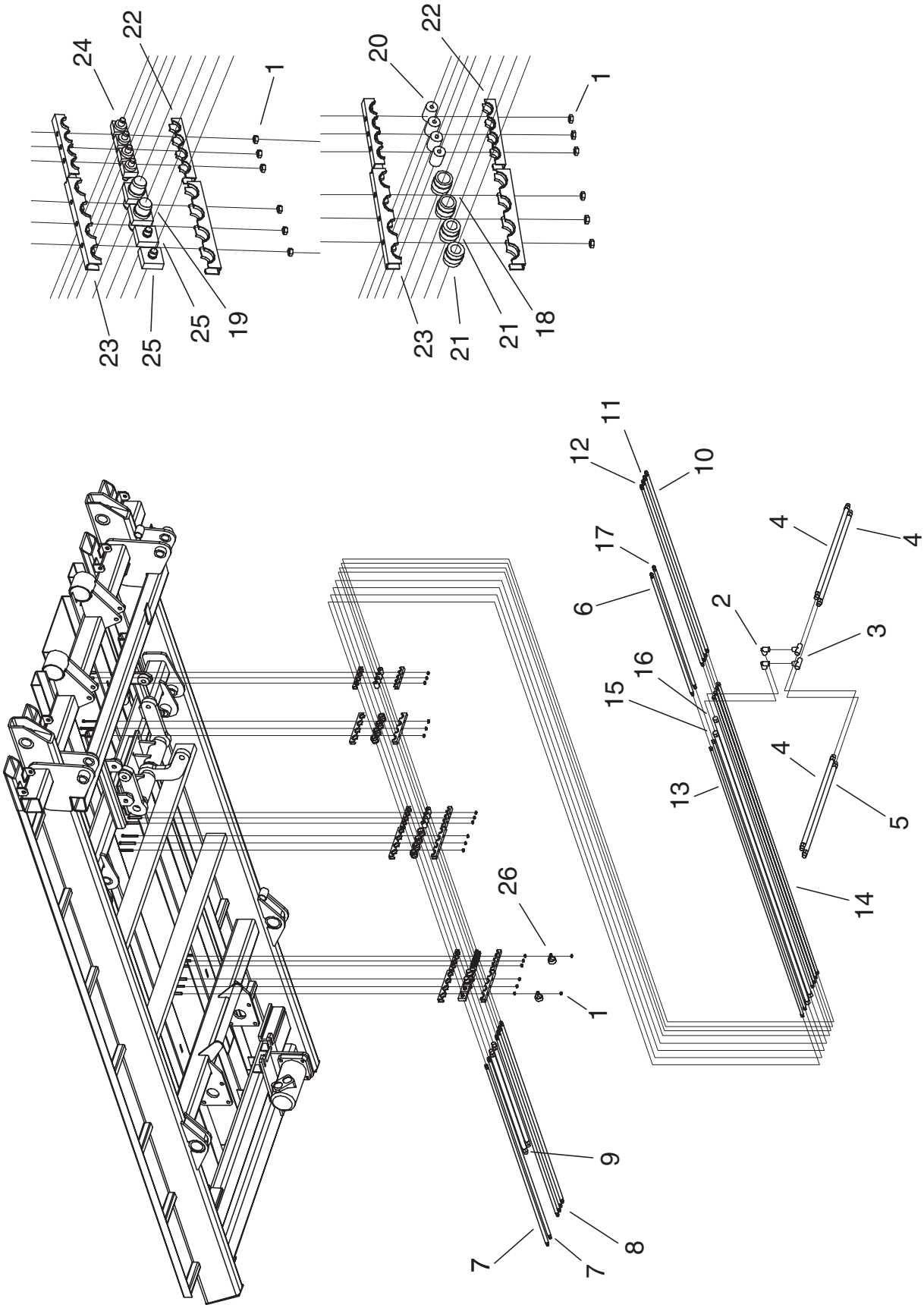
# 16K
# Bed Assembly - 2001 to Present



# 16K - Bed Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10075 | 3/8" x 1 1/2" Low AHCS | 12 |
| 2 | 10165 | 1/4" - 28 Grease Zerk | 6 |
| 3 | 10229 | 3/8 Nylock Nut | 12 |
| 4 | 10231 | 5/16" Nylock Nut | 2 |
| 5 | 10232 | 1/2" Nylock Nut | 3 |
| 6 | 10236 | 3/8" USS Flat Washer | 24 |
| 7 | 10246 | 1/2" USS Flat Washer Plated | 24 |
| 8 | M10968 | 3/16" x 2-1/2" Cotter Pin | 4 |
| 9 | 10256 | 1 7/16" x 7" Pin | 4 |
| 10 | 10302 | 7/16" Nylock Nut | 12 |
| 11 | 10604 | 1/2" x 2" Gr 8 Hex Bolt | 6 |
| 12 | 10657 | 3/4" Hex Nut Plated | 8 |
| 13 | 10695 | 5/8" USS Flat Washer Plated | 4 |
| 14 | 10723 | 5/8" Lock Washer | 8 |
| 15 | 10811 | 5/16" - 18 x 2 1/2" Fully Thread Set Screw | 2 |
| 16 | 10812 | 1/2" Hex Nut Plated | 10 |
| 17 | 10847 | 7/16" x 3" Gr 8 Hex Bolt Plated | 4 |
| 18 | 10936 | Loader / LDR C PVT Bushing | 4 |
| 19 | 10962 | 3/4" Lock Washer Plated | 8 |
| 20 | 10967 | 1" x 3 1/2" Cylinder Pin | 2 |
| 21 | 11006 | 5/8" NC Plated Hex Nut | 8 |
| 22 | 11282 | 16K Bed Weldment | 1 |
| 23 | 11333 | Bed Extensions | 4 |
| 24 | 11342 | Tensioner Weldment | 1 |
| 25 | 11409 | Motor - 2002 to present | 1 |
| | 11514 | Motor - 2001 | 1 |
| 26 | 11414 | Motor Mount | 1 |
| 27 | 11498 | Bed Idler Sprocket | 4 |
| 28 | 11505 | Ferrous Sensor Assembly | 3 |
| 29 | 11512 | Idler Sprocket | 8 |
| 30 | 11531 | RT Bed Slider Plastic | 1 |
| 31 | 11532 | LT Bed Slider Plastic | 1 |
| 32 | 11543 | Bed Extension Pin | 4 |
| 33 | 11570 | Brass HN 12-24 | 6 |
| 34 | 11571 | Brass MS 12-24 x 1" | 6 |
| 35 | 11572 | Brass L-Washer #12 | 6 |
| 36 | 11573 | Brass F-Washer #12 | 12 |
| 37 | 11575 | Nylon Spacer | 6 |
| 38 | 11576 | 3/4" x 3 1/2" HHCS Gr8 Plated | 6 |
| 39 | 11578 | #10 Hair Pin Clip | 4 |
| 40 | 11579 | 3/4" x 5" HHCS | 2 |
| 41 | 11580 | 7/16" Flat Washer Plated | 16 |
| 42 | 11582 | 1/2" x 2 1/2" Flat Head Socket Cap Screw | 4 |
| 43 | 11583 | 1/2" Lock Washer | 8 |
| 44 | 11592 | 1/2" x 6 1/4" All Thread | 1 |
| 45 | 11724 | 7 Foot Bed Forks - 2002 to present | 2 |
| | 11551 | 6 Foot Bed Forks - 2001 | 2 |
| 46 | 11734 | #80 - 11 Tooth Taperlock Sprocket - 2002 to present - (12050 - Hub) | 1 |
| | 11508 | 11 Tooth Sprocket - 2001 | 1 |
| 47 | 11740 | 13/16" Plastic Hose Clamp | 2 |
| | 10217 | 3/4" Plastic Hose Clamp - 2001 | 2 |
| 48 | 11766 | 3/4" SAE Flat Washer Plated | 6 |
| 49 | 12038 | 7/16" x 2" HHCS | 8 |
| 50 | 12053 | Ring Clamp 2 9/16" - 3 1/2" - 2002 to present | 1 |
| 51 | 12167 | Tensioner Cylinder 03 | 1 |
| | 11752 | Tensioner Cylinder - 2002 | 1 |
| | 11411 | Tensioner Cylinder - 2001 | 1 |
| 52 | 12211 | 2" Keyed Shaft 16K 03 | 1 |
| | 11418 | 1 3/4" D-Keyed Shaft - 2001 to 2002 | 1 |
| 53 | 12214 | Counter Wheel 03 | 1 |
| | 11421 | Counter Wheel - 2001 to 2002 | 1 |
| 54 | 12236 | 26 Tooth Sprocket 2", Timed To Tooth - 2002 to present | 2 |
| | 11511 | 20 Tooth Sprocket - 2001 | 2 |
| 54A | 12236 | 26 Tooth Sprocket 2", Timed To Tooth - 2003 to present | 1 |
| | 11733 | #80 - 20 Tooth Taperlock Sprocket - 2002 | 1 |
| | 11509 | 14 Tooth Sprocket - 2001 | 1 |
| 55 | 12237 | Dodge 4 Bolt Flange Bearing 2" - 2002 to present | 2 |
| | 11510 | 2 Bolt Flange Bearing 1 3/4" - 2001 | 2 |
| 56 | 12241 | 5/8" x 2 1/2" Gr8 HHCS Plated | 8 |
| | 10604 | 1/2" x 2" Gr 8 Hex Bolt | 4 |
| 57 | 12242 | 2" Shaft 1 1/16" W Plastic Spacer - 2003 to present | 1 |
| | 12052 | Plastic Split Spacer Ring 1 1/16" - 2002 | 1 |
| 58 | 12243 | 2" Shaft Metal Spacer 11/16" W | 1 |
| 59 | 10217 | 3/4" Plastic Hose Clamp | 4 |
| 60 | 10647 | 5/6" USS Flatwasher Plated | 4 |
| 61 | 10949 | 1" Plastic Hose Clamp | 4 |

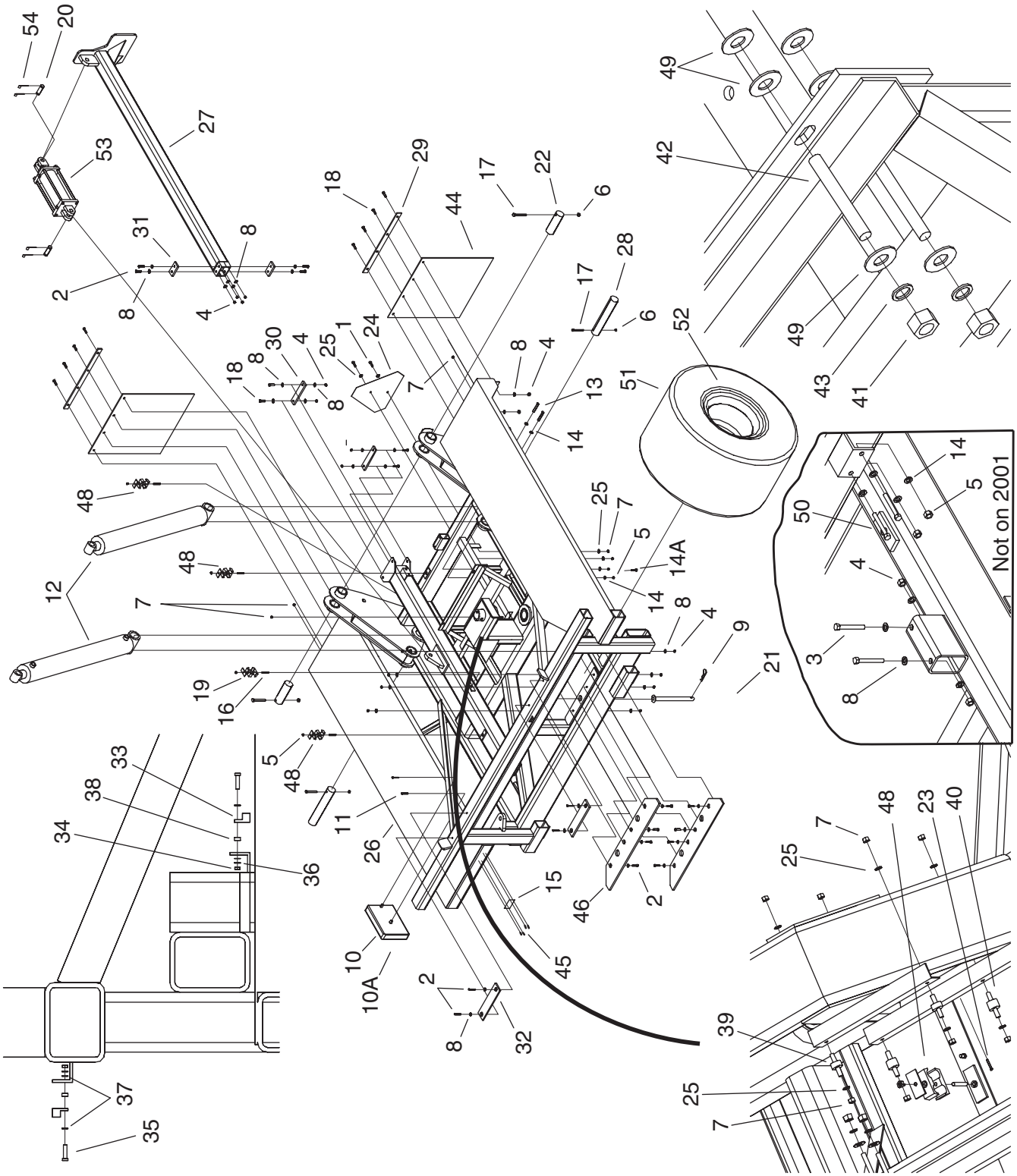
# 16K
# Bed Hard Line Assembly - 2001 to Present



## 16K - Bed Hard Line Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10231 | 5/16" Nylock Nut | 20 |
| 2 | 11359 | Fitting - 90 Elbow - #12 FJICx #12 JIC | 2 |
| 3 | 11368 | Fitting Union Tee #12 | 2 |
| 4 | 11845 | 1/2” LDR LB, LR, RB | 3 |
| 5 | 11846 | 1/2” LDR RR | 1 |
| 6 | 11847 | 1/2” Tensioner Return | 1 |
| 7 | 11851 | 1/2” P/R To Bed HL TEN RET | 2 |
| 8 | 11855 | 1/2” Hawe To Bed HL-GH, AA | 4 |
| 9 | 11864 | 3/4" LC To Bed HL | 2 |
| 10 | 11872 | 1/2” AA Piston (Right) | 1 |
| 11 | 11873 | 1/2” AA Rod (Left) | 1 |
| 12 | 11874 | 1/2” Grab Hook | 2 |
| 13 | 11875 | Bed Hard Line 1/2” TEN | 2 |
| 14 | 11876 | Bed Hard Line 1/2” GH, AA | 4 |
| 15 | 11879 | Bed Hard Line 3/4" LD Rod | 1 |
| 16 | 11880 | Bed Hard Line 3/4" LD Piston | 1 |
| 17 | 11886 | 1/2" Tensioner Pressure | 1 |
| 18 | 12024 | Rubber 2", 3/4" Tubing | 4 |
| 19 | 12025 | Bulk Head, 2" Clamp, 12 JIC | 2 |
| 20 | 12026 | Rubber 1 1/2”, 1/2” Tubing | 8 |
| 21 | 12028 | Rubber 2", 1/2” Tubing | 4 |
| 22 | 12029 | Clamp 1 1/2”, 4 Hole, 3 Bolt | 3 |
| 23 | 12030 | Clamp 2", 4 Hole, 3 Bolt | 3 |
| 24 | 12031 | Bulk Head, 1 1/2” Clamp, 08 JIC | 4 |
| 25 | 12033 | Bulk Head, 2" Clamp, 08 JIC | 2 |
| 26 | 12034 | Strap Hose Clamp 1.25 OD | 2 |

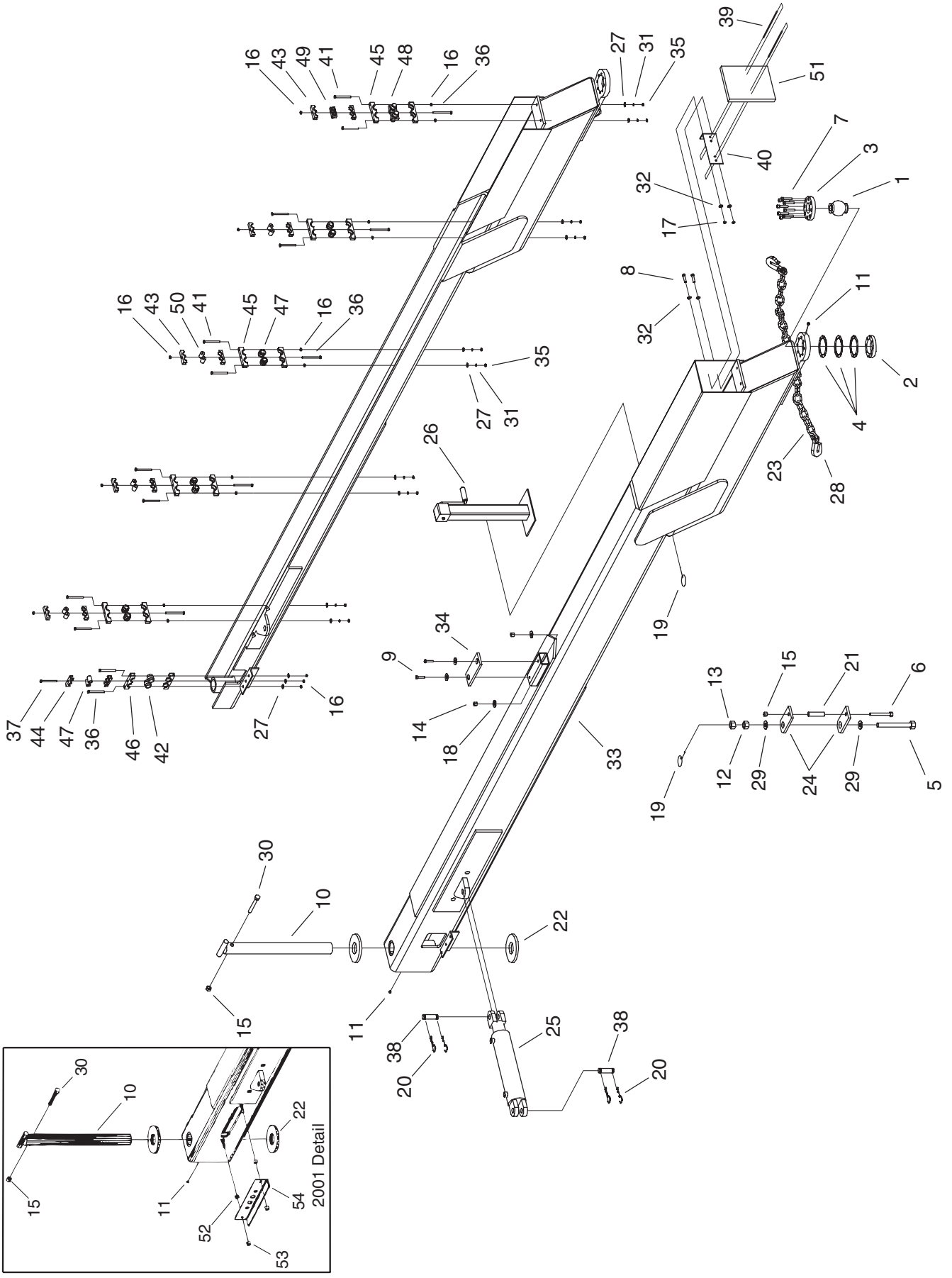
# 16K
# Frame Assembly - 2001 to Present



## 16K - Frame Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10072 | 1/4" x 1" Gr 8 HHCS | 2 |
| 2 | 10075 | 3/8" x 1 1/2” Gr 8 Low Allen Head Cap Screw | 16 |
| 3 | 10091 | 3/8" x 2 1/2” Gr 8 HHCS Plated | 2 |
| 4 | 10229 | 3/8" Nylock Nut | 26 |
| 5 | 10231 | 5/16" Nylock Nut | 9 |
| 6 | 10232 | 1/2" Nylock Nut | 4 |
| 7 | 10233 | 1/4" Nylock Nut | 13 |
| 8 | 10236 | 3/8" USS Flat Washer Plated | 56 |
| 9 | 10252 | #9 Hair Pin Clip | 1 |
| 10 | 10295 | Operator’s Manual Box | 1 |
| 10A | K34992 | 16K Operator’s Manual | 1 |
| 11 | 10297 | 1/4" - 20 x 3/4" Screw | 2 |
| 12 | 10436 | Bed Cylinder | 2 |
| 13 | 10646 | 5/16" x 3" Gr 8 Hex Bolt Plated | 2 |
| 14 | 10647 | 5/16" Flat Washer Plated | 8 |
| 14A | 10646 | 5/16" x 3" Gr 8 Hex Bolt Plated - 2001 | 2 |
| 15 | 10688 | Serial Plate | 1 |
| 16 | 10811 | 5/16"- 18" x 2 1/2" Fully Thread Set Screw | 5 |
| 17 | 10848 | 1/2" x 4" Gr 8 Hex Bolt Plated | 4 |
| 18 | 10867 | 3/8" x 1 1/2" Gr 5 HHCS | 12 |
| 19 | 10949 | 1 1/8" Plastic Hose Clamp | 1 |
| 20 | 10967 | 1" x 3 1/2" Cylinder Pin | 2 |
| 21 | 11065 | Hitch Safety Pin | 1 |
| 22 | 11115 | Bale Runner Bed Pin | 2 |
| 23 | 11154 | 5/16" x 1" Gr 5 HHCS Plt | 2 |
| 24 | 11162 | SMV Emblem | 1 |
| 25 | 11164 | 1/4" Flat Washer | 12 |
| 26 | 11266 | Main Frame Weldment | 1 |
| 27 | 11373 | Pushoff | 1 |
| 28 | 11382 | 16K Hoist Pin | 2 |
| 29 | 11429 | 16K Mud Strip | 2 |
| 30 | 11469 | Pushoff Tube Plastic | 2 |
| 31 | 11470 | Pushoff Plastic | 2 |
| 32 | 11471 | 16K Bed Cushion Plastic | 2 |
| 33 | 11505 | Ferrous Sensor Assembly | 5 |
| 34 | 11570 | Brass HN 12-24 | 8 |
| 35 | 11571 | Brass MS 12-24 x 1" | 8 |
| 36 | 11572 | Brass L-Washer #12 | 8 |
| 37 | 11573 | Brass F-Washer #12 | 16 |
| 38 | 11575 | Nylon Spacer | 8 |
| 39 | 11584 | 1/2" Rubber Computer Mount | 2 |
| 40 | 11585 | 3/4" Rubber Computer Mount | 2 |
| 41 | 11586 | 10MM Nut | 3 |
| 42 | 11587 | SSS Cone M10-1.5 x 60 | 3 |
| 43 | 11588 | 10MM Lock Washer | 3 |
| 44 | 11589 | 16K Mud Flap | 2 |
| 45 | 11696 | Metal Tacks | 4 |
| 46 | 11701 | 16K Cradle Plastic 02 | 2 |
| | 10946 | 16K Cradle Plastic - 2001 | 2 |
| 47 | 11735 | #80H WCB2-2 Hole Attachment Link | 2 |
| 48 | 11740 | 13/16" Plastic Hose Clamp | 4 |
| 49 | 11767 | 3/8" SAE Flat Washer Plated | 9 |
| 50 | 11808 | 5/16" x 2" Gr 8 HHCS Plated | 2 |
| 51 | 11843 | 40Mph 16K Tire (Air Brakes) | 4 |
| | 11590 | TT 404 12PR 500/45-22.5 Tire | 4 |
| 52 | 11844 | 40 mph 16K Wheel (Air Brakes) | 4 |
| | 11591 | 500/45-22.5 Wheel | 4 |
| 53 | 12168 | Pushoff Cylinder 03 | 1 |
| | 11753 | Pushoff Cylinder - 2002 | 1 |
| | 11401 | Pushoff Cylinder - 2001 | 1 |
| 54 | M10968 | 3/16" x 2-1/2" Cotter Pin | 4 |

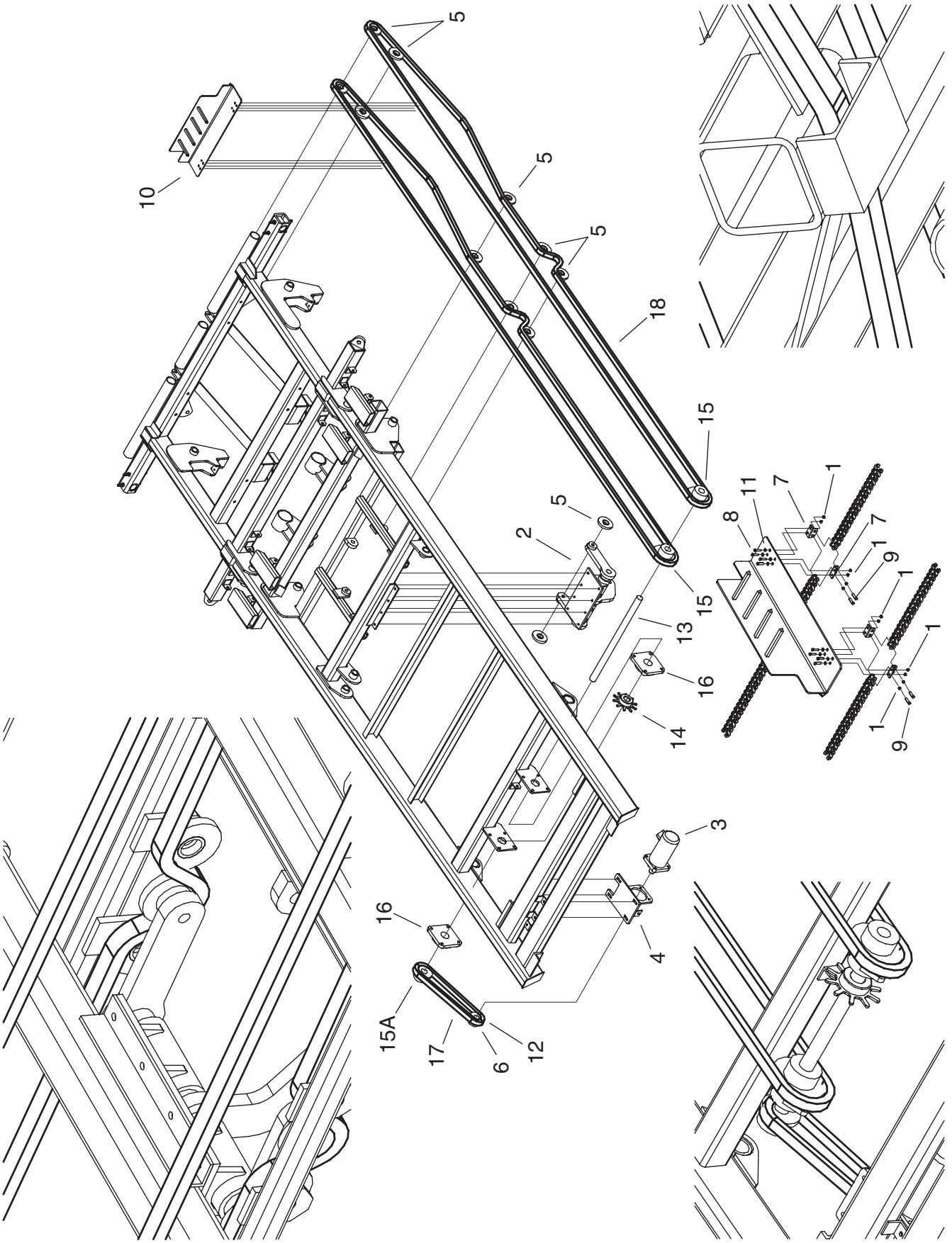
# 16K
## Bumper Pull Hitch Assembly - 2001 to Present



## 16K - Bumper Pull Hitch Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10049 | Hitch Ball | 1 |
| 2 | 10050 | Ring-Hitch Lower | 1 |
| 3 | 10051 | Ring-Hitch Upper | 1 |
| 4 | 10052 | Ball Hitch Shim | 1-6 |
| 5 | 10055 | Bolt 1 1/4" x 9" | 1 |
| 6 | 10066 | Bolt 5/8" x 8" | 1 |
| 7 | 10069 | 3/8" x 2" Gr 8 Allen Head Cap Screw Plain | 8 |
| 8 | 10072 | 1/4" x 1" Gr 5 Hex Bolt Pln | 2 |
| 9 | 10075 | 3/8" x 1 1/2" Gr8 Low Ahcs | 2 |
| 10 | 10129 | Hitch Pin Painted | 1 |
| 11 | 10165 | 1/4" - 28 Grease Zerk | 2 |
| 12 | 10224 | Nut 1 1/4" | 1 |
| 13 | 10226 | Jam Nut 1 1/4" | 1 |
| 14 | 10229 | 3/8" Nylock Nut | 2 |
| 15 | 10230 | 5/8" Nylock Nut | 2 |
| 16 | 10231 | 5/16" Nylock Nut | 18 |
| 17 | 10233 | 1/4" Nylock Nut | 2 |
| 18 | 10236 | 3/8" USS Flat Washer | 4 |
| 19 | 10247 | Pin And Chain Assembly | 2 |
| 20 | M10968 | 3/16" x 2-1/2" Cotter Pin | 4 |
| 21 | 10313 | Hitch Plate Spacer | 1 |
| 22 | 10352 | Hitch Pivot Washer | 2 |
| 23 | 10369 | 8 Foot 3/8" Chain | 1 |
| 24 | 10413 | Hitch Plate | 2 |
| 25 | 10449 | K Hitch Cylinder | 1 |
| 26 | 10598 | Bale Runner Jack | 1 |
| 27 | 10647 | 5/16" USS Flat Washer Plated | 13 |
| 28 | 10662 | 3/8" Chain Locking Grab Hook | 2 |
| 29 | 10682 | Flat Washer 1 1/4" - SAE | 2 |
| 30 | 10816 | 5/8" x 5" Gr 8 Hex Bolt Plated | 1 |
| 31 | 10964 | 5/16" Lock Washer | 10 |
| 32 | 11164 | 1/4" Flat Washer Plated | 4 |
| 33 | 11281 | 16K Bumper Pull Hitch | 1 |
| 34 | 11468 | 16K Loader Stop Plastic | 1 |
| 35 | 11770 | 5/16" Hex Nut Plated | 10 |
| 36 | 11771 | 5/16" - 18 x 4" Zink HHCS Gr 5 | 7 |
| 37 | 11772 | 5/16" - 18 x 6" Zink HHCS Gr 5 | 1 |
| 38 | 11774 | 1" x 4" Cylinder Pin | 2 |
| 39 | 11901 | Cable Tie 5 1/2" x 0.14", Black | 2 |
| 40 | 11921 | 16K Foam Holder | 1 |
| 41 | 12015 | 5/16" x 3 1/2" HHCS Plated Fully Threaded | 10 |
| 42 | 12018 | Rubber 3", 3/4" Hose And Sheathing | 2 |
| 43 | 12019 | Clamp 1 1/2", 2 Hole, 1Bolt | 5 |
| 44 | 12020 | Clamp 2", 2 Hole, 1 Bolt | 1 |
| 45 | 12021 | Clamp 2", 2 Hole, 3 Bolt | 5 |
| 46 | 12022 | Clamp 3", 2 Hole, 3 Bolt | 1 |
| 47 | 12024 | Rubber 2", 3/4" Tubing | 10 |
| 48 | 12025 | Bulk Head, 2" Clamp, 12 JIC | 2 |
| 49 | 12035 | Bulk Head, 1 1/2" Clamp, 06 JIC | 2 |
| 50 | 12036 | Rubber 1 1/2", 3/8" Tubing | 8 |
| 51 | 12055 | Foam Insert For 16K Hitch | 1 |
| 52 | 10225 | 1/2" Hex Nut - 2001 | 2 |
| 53 | 10232 | 1/2" Nylock Nut - 2001 | 2 |
| 54 | 11417 | 16K Hose Manifold - 2001 | 1 |

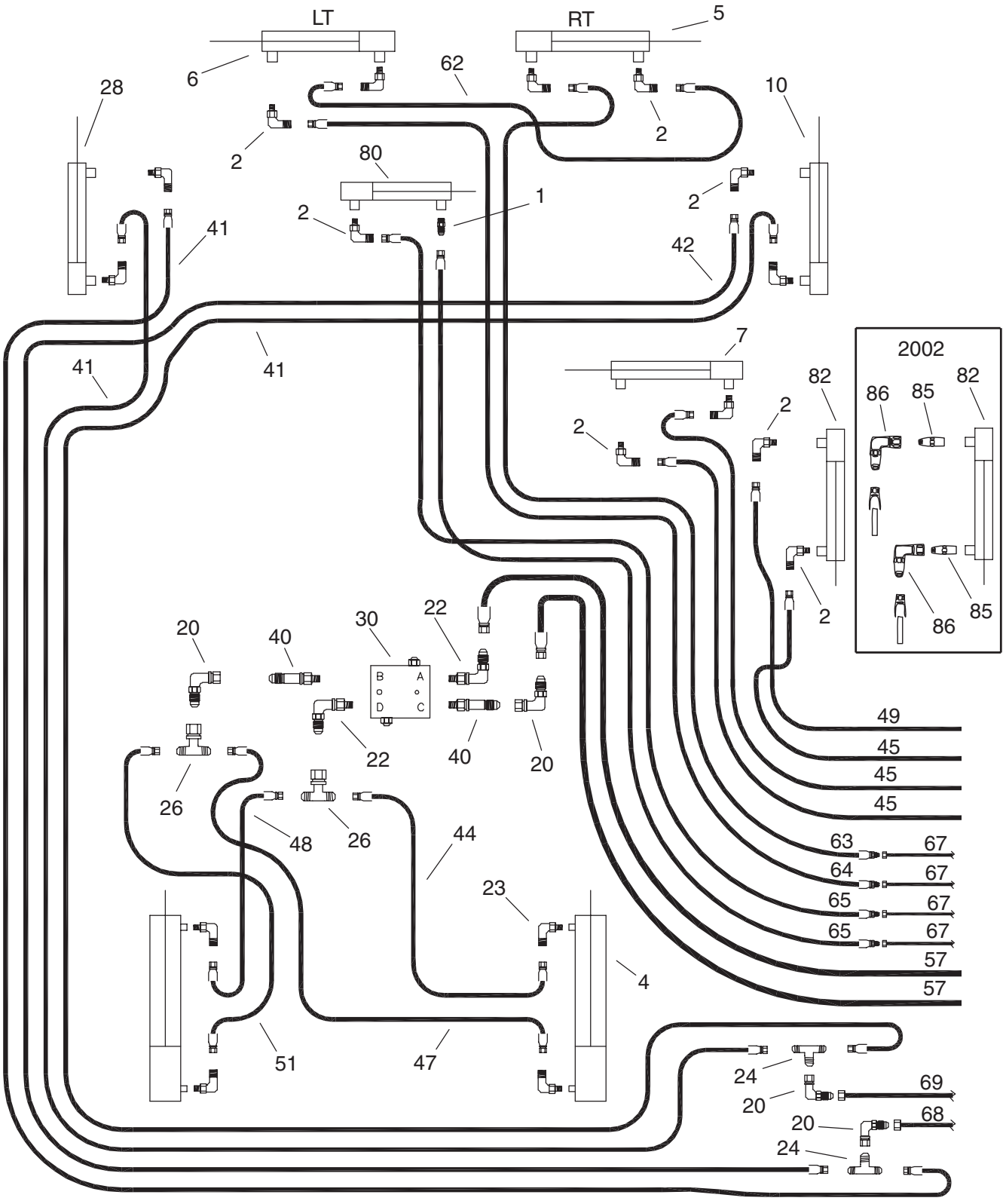
# 16K
# Drive Chain Assembly - 2001 to Present



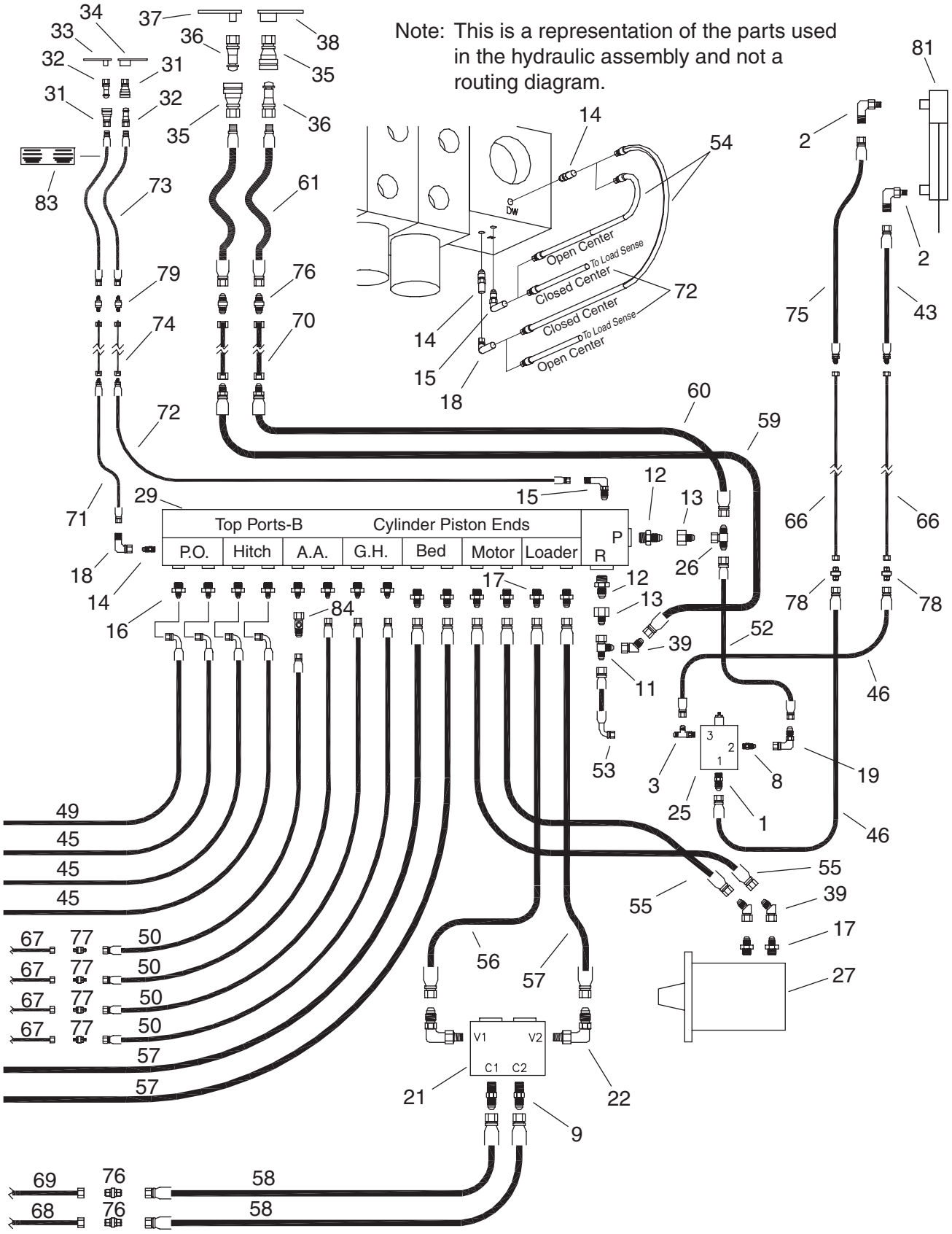
## 16K - Drive Chain Assembly - 2001 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | D-5272 | 5/16 UNC Unitorque Nut | 12 |
| 2 | 11342 | Hyd Tensioner | 1 |
| 3 | 11409 | Motor | 1 |
| | 11514 | Motor - 2001 to 2002 | 1 |
| 4 | 11414 | Motor Mount | 1 |
| 5 | 11512 | Idler Sprocket | 12 |
| 6 | 11734 | 11 Tooth Taperlock Sprocket | 1 |
| | 11508 | 11 Tooth Sprocket - 2001 | 1 |
| 7 | 34986 | Chain Bracket | 4 |
| 8 | 11737 | 5/16" x 1" Gr 8 HHCS | 8 |
| 9 | 44006 | 5/16 Bolt Gr.8, 1-7/8 UL, 1/4 Thread | 4 |
| 10 | 11751 | Power Slider Foot Weldment 02 | 1 |
| | 11447 | Power Slider Foot Weldment - 2001 | 1 |
| 11 | 12040 | 5/16" SAE Flat Washer Plated | 8 |
| 12 | 12050 | Bushing P1-1 1/2" | 1 |
| 13 | 12211 | 2" Keyed Shaft 16K 03 | 1 |
| | 11418 | 1 3/4" D-Keyed Shaft - 2001 to 2002 | 1 |
| 14 | 12214 | Counter Wheel 03 | 1 |
| | 11421 | Counter Wheel - 2001 to 2002 | 1 |
| 15 | 12236 | 26T Sprocket 2", Timed To Tooth | 3 |
| | 11733 | 20 Tooth Timed Taprlock Sprocket - 2002 | 1 |
| | 11509 | Drive Tooth Sprocket - 2001 | 1 |
| 16 | 12237 | Dodge 4 Bolt Flange Bearing 2" | 2 |
| | 11510 | 2 Bolt Flange Bearing - 2001 to 2002 | 2 |
| 17 | 12238 | #80 57P Standard Roller Chain | 1 |
| | 11515 | Short 80 RIV Reel Chain - 2001 | 1 |
| 18 | 12240 | #80 383P Roller Chain Pairs | 1 |
| | 12037 | #80H 380 Pitch Matched Roller Chain - 2002 | 1 |
| | 11513 | Long 80 RIV Reel Chain - 2001 | 1 |
| 19 | 12254 | 2 1/2 x 1/2 Square Undersized Key Stock | 3 |
| 20 | 12255 | 1 1/2 x 1/2 Square Undersized Key Stock | 1 |
| | K41624 | Kit - Chain Bracket (Includes 2 of Items 1, 7 & 9) | |

# 16K
# Hydraulic Assembly - 2002 to Present



# 16K
# Hydraulic Assembly - 2002 to Present



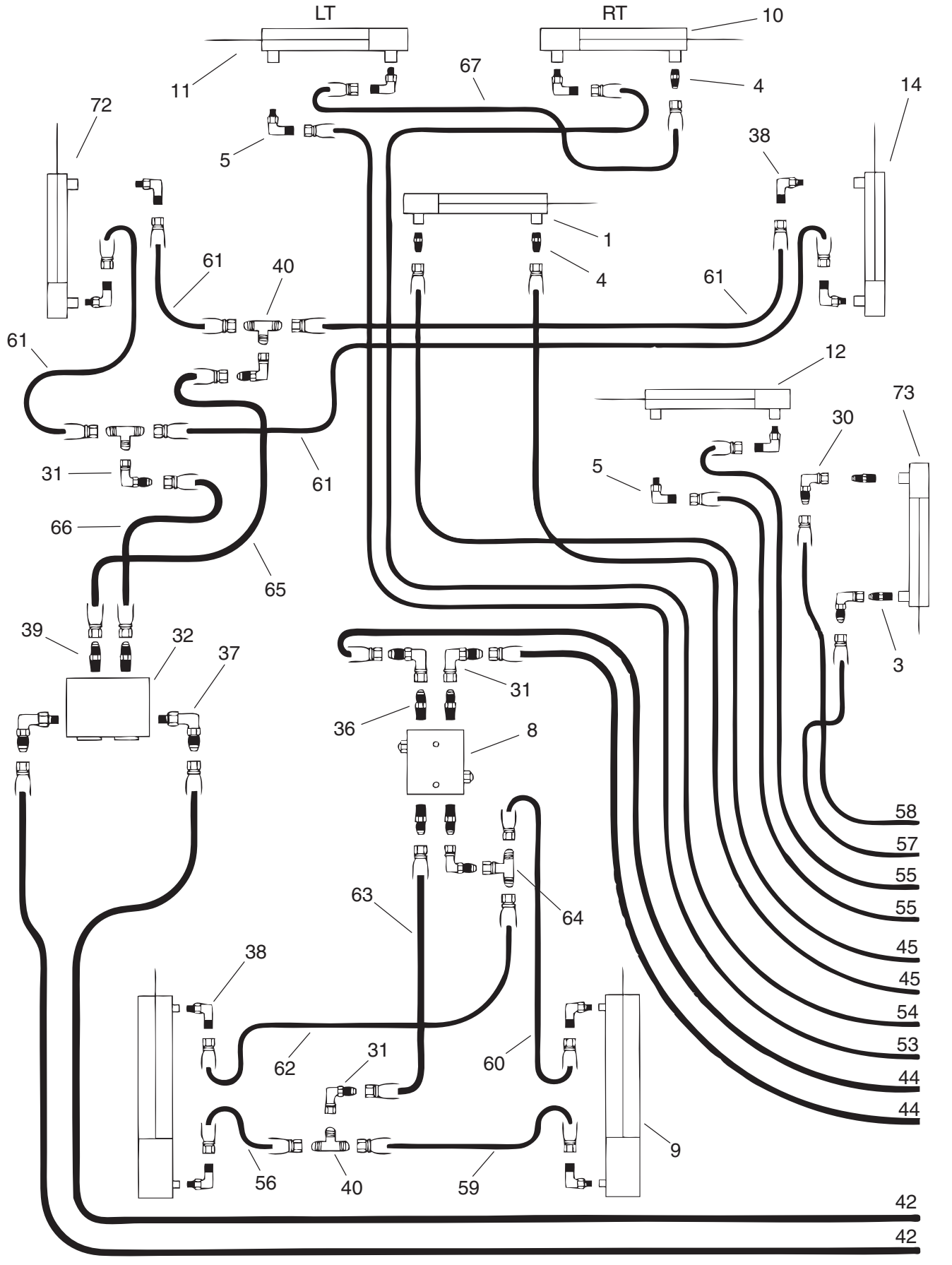
## 16K - Hydraulic Assembly - 2002 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10178 | Fitting Straight #8 ORB x #8 JIC | 2 |
| 2 | 10180 | Fitting 90 Elbow #8 ORB x #8 JIC | 15 |
| 3 | 10187 | Fitting-O-Ring Run Tee #8 JIC | 1 |
| 4 | 10436 | Bed Cylinder | 2 |
| 5 | 10439 | RT AA Cylinder | 1 |
| 6 | 10440 | LT AA Cylinder | 1 |
| 7 | 10449 | Hitch Cylinder | 1 |
| 8 | 10854 | Inline Fitting Check Valve | 1 |
| 9 | 10935 | Fitting - Straight - #12 ORB x #12 JIC | 2 |
| 10 | 10941 | Right Loader Cylinder - (2002 - 2006) | 1 |
| | K44042 | Right Loader Cylinder - (2007) | 1 |
| 11 | 11348 | Fitting - Swivel Nut Run Tee - #12 | 1 |
| 12 | 11350 | Fitting - Straight - #20 ORB x #16 JIC | 2 |
| 13 | 11351 | Fitting - Reducer - #16 x #12 | 2 |
| 14 | 11353 | Fitting - Straight - #4 ORB x #4 JIC | 3 |
| 15 | 11354 | Fitting - 90 Elbow - #4 ORB x #4 JIC | 1 |
| 16 | 11355 | Fitting - Straight - #16 ORB x #8 JIC | 8 |
| 17 | 11356 | Fitting - Straight - #16 ORB x #12 JIC | 8 |
| 18 | 11357 | Fitting - 90 Elbow - #4 FJIC x #4 JIC | 2 |
| 19 | 11358 | Fitting - 90 Elbow - #8 FJIC x #8 JIC | 1 |
| 20 | 11359 | Fitting - 90 Elbow - #12 FJIC x #12 JIC | 4 |
| 21 | 11360 | Load Check | 1 |
| 22 | 11365 | Fitting - 90 Elbow - #12 ORB x #12 JIC | 4 |
| 23 | 11366 | Fitting - 90 Elbow - #12 ORB x #8 JIC | 4 |
| 24 | 11368 | Fitting - Union Tee - #12 | 2 |
| 25 | 11369 | 16K Pressure Reducing Relief Valve | 1 |
| 26 | 11405 | Fitting Swivel Nut Branch Tee #12 | 3 |
| 27 | 11409 | 16K Motor | 1 |
| | 12285 | 16K Motor Body Seal Kit | |
| | 12286 | 16K Motor Shaft Seal Kit | |
| 28 | 11526 | Left Loader Cylinder - (2002 - 2006) | 1 |
| | K44046 | Left Loader Cylinder - (2007) | |
| 29 | 11695 | 16K Hawe Valve 02 | 1 |
| 30 | 11723 | 2000 PSI Cushion Valve Painted 2002 | 1 |
| 31 | 11754 | 1/4" Coupler Female - 1/4" FP | 2 |
| 32 | 11755 | 1/4" Nipple Male - 1/4" FP | 2 |
| 33 | 11756 | 1/4" Dust Plug | 2 |
| 34 | 11757 | 1/4" Dust Cap | 2 |
| 35 | 11758 | 3/4" Coupler Female - 3/4" FP | 2 |
| 36 | 11759 | 3/4" Nipple Male - 3/4" FP | 2 |
| 37 | 11760 | 3/4" Dust Plug | 2 |
| 38 | 11761 | 3/4" Dust Cap | 2 |
| 39 | 11811 | Fitting - 45 Elbow - #12 FJICx #12 JIC | 3 |
| 40 | 11812 | Fitting - Straight - Lng #12 ORB x #12 JIC | 2 |
| 41 | 11845 | 1/2" LDR LB, LR, RB | 3 |
| 42 | 11846 | 1/2" LDR RR | 1 |
| 43 | 11847 | 1/2" Tensioner Return | 1 |
| 44 | 11849 | 1/2" RT Bed Rod | 1 |
| 45 | 11850 | 1/2" Hitch R&B PO Rod | 3 |
| 46 | 11851 | 1/2" P/R To Bed HL Ten Ret | 2 |
| 47 | 11852 | 1/2" RT Bed Piston | 1 |
| 48 | 11853 | 1/2" LT Bed Rod | 1 |
| 49 | 11854 | 1/2" PO Piston | 1 |
| 50 | 11855 | 1/2" Hawe To Bed HL-GH, AA | 4 |

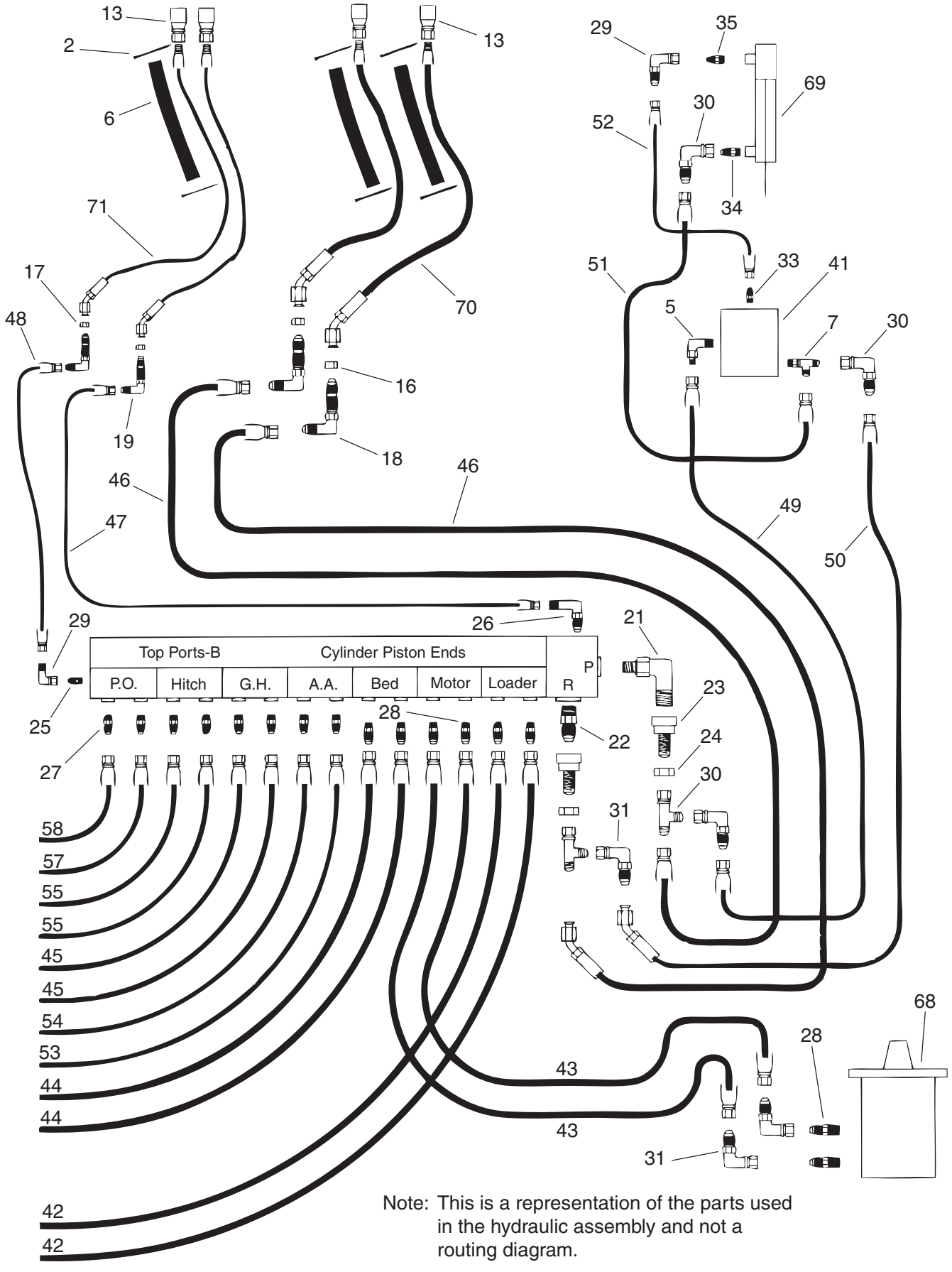
## 16K - Hydraulic Assembly - 2002 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 51 | 11856 | 1/2" LT Bed Piston | 1 |
| 52 | 11857 | 1/2" Hawe To P/R Pressure | 1 |
| 53 | 11858 | 1/2" Hawe To P/R Return | 1 |
| 54 | 11860 | 1/4" Hawe DW To M Port | 1 |
| 55 | 11861 | 3/4" Motor Hoses | 2 |
| 56 | 11862 | 3/4" Hawe To LC V1 (Piston) | 1 |
| 57 | 11863 | 3/4" Hawe To Cush, Lc V2 (Rod) | 3 |
| 58 | 11864 | 3/4" LC To Bed HL | 2 |
| 59 | 11868 | 3/4" Hawe Return | 1 |
| 60 | 11869 | 3/4" Hawe Pressure | 1 |
| 61 | 11870 | 3/4" Hitch To Tractor | 2 |
| 62 | 11871 | 1/2" AA LT RT Connect | 1 |
| 63 | 11872 | 1/2" AA Piston (Right) | 1 |
| 64 | 11873 | 1/2" AA Rod (Left) | 1 |
| 65 | 11874 | 1/2" GH | 2 |
| 66 | 11875 | Bed Hard Line 1/2" TEN | 2 |
| 67 | 11876 | Bed Hard Line 1/2" GH, AA | 4 |
| 68 | 11879 | Bed Hard Line 3/4" LD Rod | 1 |
| 69 | 11880 | Bed Hard Line 3/4" LD PIS | 1 |
| 70 | 11881 | Hitch Hard Line 3/4" x 192" (Made up of the following two lines) | 2 |
| | K44706 | Oil Line 3/4 x 132 | |
| | K44707 | Oil Line 3/4 x 60 | |
| 71 | 11882 | 1/4" Pilot Drain (PD-3/8HL) | 1 |
| 72 | 11883 | 1/4" Load Sense (LS-3/8HL) | 1 |
| 73 | 11884 | 1/4" Hitch To Tractor (3/8HL) | 2 |
| 74 | 11885 | Hitch Hard Line 3/8" x 189" (Made up of the following two lines) | 2 |
| | K44704 | Oil Line 3/8 x 129 | |
| | K44705 | Oil Line 3/8 x 60 | |
| 75 | 11886 | 1/2" Tensioner Pressure | 1 |
| 76 | 12025 | Bulkhead 2" Clamp 12 JIC | 4 |
| 77 | 12031 | Bulkhead 1 1/2" Clamp 08 JIC | 4 |
| 78 | 12033 | Bulkhead 2" Clamp 08 JIC | 2 |
| 79 | 12035 | Bulk Head 2" Clamp 06 JIC | 2 |
| 80 | 12166 | Grab Hook Cylinder 03 | 1 |
| 81 | 12167 | Tensioner Cylinder 03 | 1 |
| | 11752 | Tensioner Cylinder - 2002 | 1 |
| 82 | 12168 | Pushoff Cylinder 03 | 1 |
| | 11753 | Pushoff Cylinder - 2002 | 1 |
| 83 | 12185 | To Avoid Damage Decal | 1 |
| 84 | 12468 | Gageport Adptr: GP-6504-08-08-04 | 1 |
| 85 | 10175 | Fitting - M Connector - 1/2 P x #8 JIC - 2002 | 2 |
| 86 | 11358 | Fitting - 90 Elbow - #8 FJIC x #12 JIC - 2002 | 4 |

# 16K
# Hydraulic Assembly - 2001



# 16K
# Hydraulic Assembly - 2001




Note: This is a representation of the parts used in the hydraulic assembly and not a routing diagram.

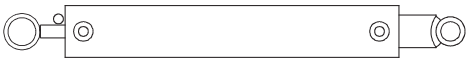
## 16K - Hydraulic Assembly - 2001

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10036 | Grab Hook Cylinder | 1 |
| 2 | 10080 | 11" White Zip Tie | 6 |
| 3 | 10175 | Fitting - M Conn - 1/2 P x # 8 JIC | 2 |
| 4 | 10178 | Fitting Straight #8 ORB x #8 JIC | 3 |
| 5 | 10180 | Fitting 90 Elbow #8 ORB x #8 JIC | 6 |
| 6 | 10185 | 3" Hose Sheathing | 3 |
| 7 | 10187 | Fitting-O-Ring Run Tee #8 JIC | 1 |
| 8 | 10328 | Cushion Valve | 1 |
| 9 | 10436 | Bed Cylinder | 2 |
| 10 | 10439 | RT AA Cylinder | 1 |
| 11 | 10440 | LT AA Cylinder | 1 |
| 12 | 10449 | Hitch Cylinder | 1 |
| 13 | 10789 | Hose Tips 1/2" Body 1/2" F Pipe | 4 |
| 14 | 10941 | Loader Cylinder | 1 |
| 15 | 11165 | Hawe Valve | 1 |
| 16 | 11344 | Fitting - Bulkhead Nut - #12 | 2 |
| 17 | 11345 | Fitting - Bulkhead Nut - #4 | 2 |
| 18 | 11346 | Fitting - Bulkhead - #12 | 2 |
| 19 | 11347 | Fitting - Bulkhead - #12 | 2 |
| 20 | 11348 | Fitting - Swvl Nut Run Tee - #12 | 2 |
| 21 | 11349 | Fitting - 90 Elbow - #20 ORB x #16 JIC | 1 |
| 22 | 11350 | Fitting - Straight - #20 ORB x #16 JIC | 1 |
| 23 | 11351 | Fitting - Reducer - #16 x #12 | 2 |
| 24 | 11352 | Fitting - Reducer Nut - #16 | 2 |
| 25 | 11353 | Fitting - Straight - #4 ORB x #4 JIC | 1 |
| 26 | 11354 | Fitting - 90 Elbow - #4 ORB x #4 JIC | 1 |
| 27 | 11355 | Fitting - Straight - #16 ORB x #8 JIC | 8 |
| 28 | 11356 | Fitting - Straight - #16 ORB x #12 JIC | 8 |
| 29 | 11357 | Fitting - 90 Elbow - #4 FJIC x #4 JIC | 2 |
| 30 | 11358 | Fitting - 90 Elbow - #8 FJIC x #8 JIC | 4 |
| 31 | 11359 | Fitting - 90 Elbow - #12 FJIC x #12 JIC | 10 |
| 32 | 11360 | Load Check | 1 |
| 33 | 11361 | Fitting - Straight - #8 ORB x #4 JIC | 1 |
| 34 | 11362 | Fitting - M Conn - 3/8 P x #8 JIC | 1 |
| 35 | 11363 | Fitting - M Conn - 3/8 P x #4 JIC | 1 |
| 36 | 11364 | Fitting - M Conn - 31/2 P x #12 JIC | 4 |
| 37 | 11365 | Fitting - 90 Elbow - #12 ORB x #12 JIC | 2 |
| 38 | 11366 | Fitting - 90 Elbow - #12 ORB x #8 JIC | 8 |
| 39 | 11367 | Fitting - Straight - #12 ORB x #12 JIC | 2 |
| 40 | 11368 | Fitting - Union Tee - #12 | 3 |
| 41 | 11369 | 16K Pres. Reduce Relief Valve | 1 |
| 42 | 11383 | Hawe - Load Check | 2 |
| 43 | 11384 | Motor | 2 |
| 44 | 11385 | Hawe - Cushion | 2 |
| 45 | 11386 | GH | 2 |

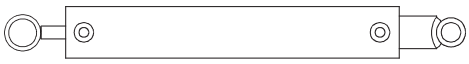
## 16K - Hydraulic Assembly - 2001

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 46 | 11387 | 3/4" Hitch - Hawe | 2 |
| 47 | 11388 | 1/4" LS Hawe | 1 |
| 48 | 11389 | 1/4" PD Hawe | 1 |
| 49 | 11390 | Tension Val Pres | 1 |
| 50 | 11391 | Tension Val Ret | 1 |
| 51 | 11392 | Tension Rod | 1 |
| 52 | 11393 | Tension Piston | 1 |
| 53 | 11394 | AA Rod | 1 |
| 54 | 11395 | AA Piston | 1 |
| 55 | 11396 | Hitch Rod/Piston Hawe | 2 |
| 56 | 11397 | Bed T - LT Butt | 1 |
| 57 | 11398 | PO Rod | 1 |
| 58 | 11399 | PO Piston | 1 |
| 59 | 11400 | Bed T- RT Butt | 1 |
| 60 | 11401 | Bed T- RT Butt | 1 |
| 61 | 11402 | Loader T - RTod/Piston | 4 |
| 62 | 11403 | Bed T - RT Butt | 1 |
| 63 | 11404 | Cushion - Piston T | 1 |
| 64 | 11405 | Fitting Swivel Nut Branch Tee #12 | 1 |
| 65 | 11406 | Check - Rod T | 1 |
| 66 | 11407 | Check - Piston T | 1 |
| 67 | 11408 | AA AT Piston - RT Rod | 1 |
| 68 | 11409 | 16K Motor | 1 |
| | 12285 | 16K Motor Body Seal Kit | |
| | 12286 | 16K Motor Shaft Seal Kit | |
| 69 | 11411 | Tensioner Cylinder | 1 |
| 70 | 11412 | 3/4" BP Hitch | 2 |
| 71 | 11413 | 1/4" BP Hitch | 2 |
| 72 | 11526 | Left Loader Cylinder | 1 |
| 73 | 11538 | Push Off Cylinder | 1 |

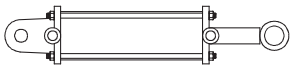
Name: Bed Cyl Part # 10436
Type: Welded Length: 48 3/4"
Bore X Stroke: 5" x 36"
Packing Kit PMCK-AW-0024



Name:16K Left Loader Cyl Part # 11526 - 2002 to 2006
Type: Welded Part # K44046 - 2007
Bore X Stroke: 3 1/2" x 20" Length: 32 7/8"
Packing Kit # PMCK-AR-703
Blind End Journal Bushing # 10936

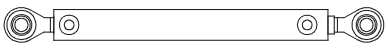


Name:16K Right Loader Cyl Part # 10941 - 2002 to 2006
Type: Welded Part # K44042 - 2007
Bore X Stroke: 3 1/2" x 20" Length: 32 7/8"
Packing Kit # PMCK-AR-703
Blind End Journal Bushing # 10936

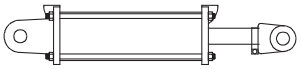


Name: Left Alnmt Cyl Part # 10180 - 2001
Type: Tie-Rod Part # 10440 - 2002
Bore X Stroke: 4" x 8" Length: 19 5/8"
Packing Kit # PMCK-AW-0028

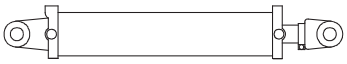
Name: Right Alnmt Cyl Part # 10439
Type: Tie-Rod Length: 19 5/8"
Bore X Stroke: 4.5" x 8"
Packing Kit # PMCK-AW-0027



Name: Grab Hook 03 Cyl Part # 10036 - 2001 to 2002
Type: Welded Part # 12166 - 2003
Bore X Stroke: 2 1/2" x 16" Length: 26 3/4"
Packing Kit # PMCK-AR-707



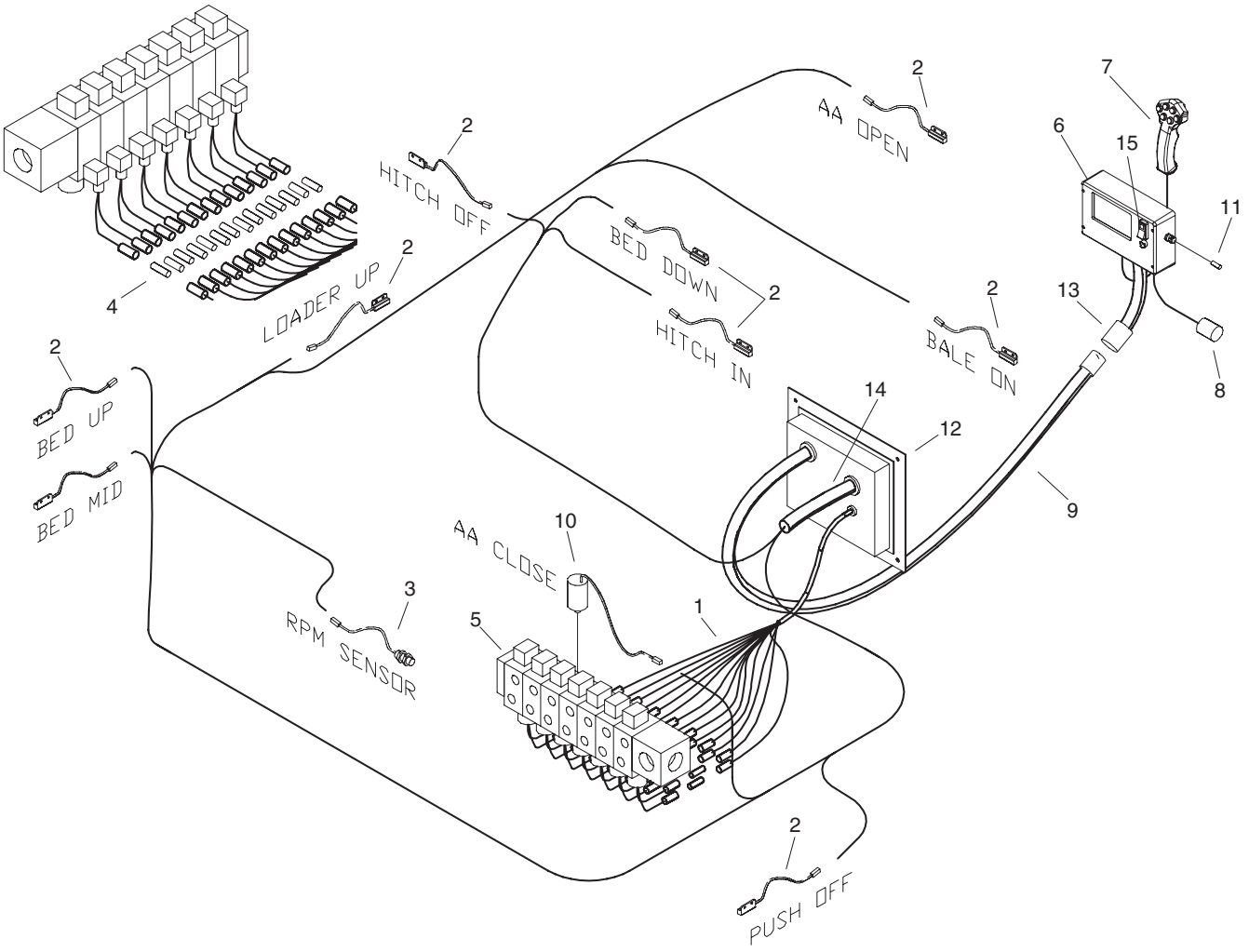
Name: Tensioner Cyl Part # 11411 - 2001 to 2002
Name: Tensioner 03 Cyl Part # 12167 - 2003
Type: Tie-Rod Length: 18 1/4"
Bore X Stroke: 2" x 8"



Name: K Hitch Cyl Part # 10449
Type: Welded Length: 34 7/8"
Bore X Stroke: 3.5" x 18"

Name: Pushoff 03 Cyl Part # 11401 - 2001
Type: Tie-Rod Part # 12168 - 2002
Bore X Stroke: 3" x 30" Length: 40 1/4"

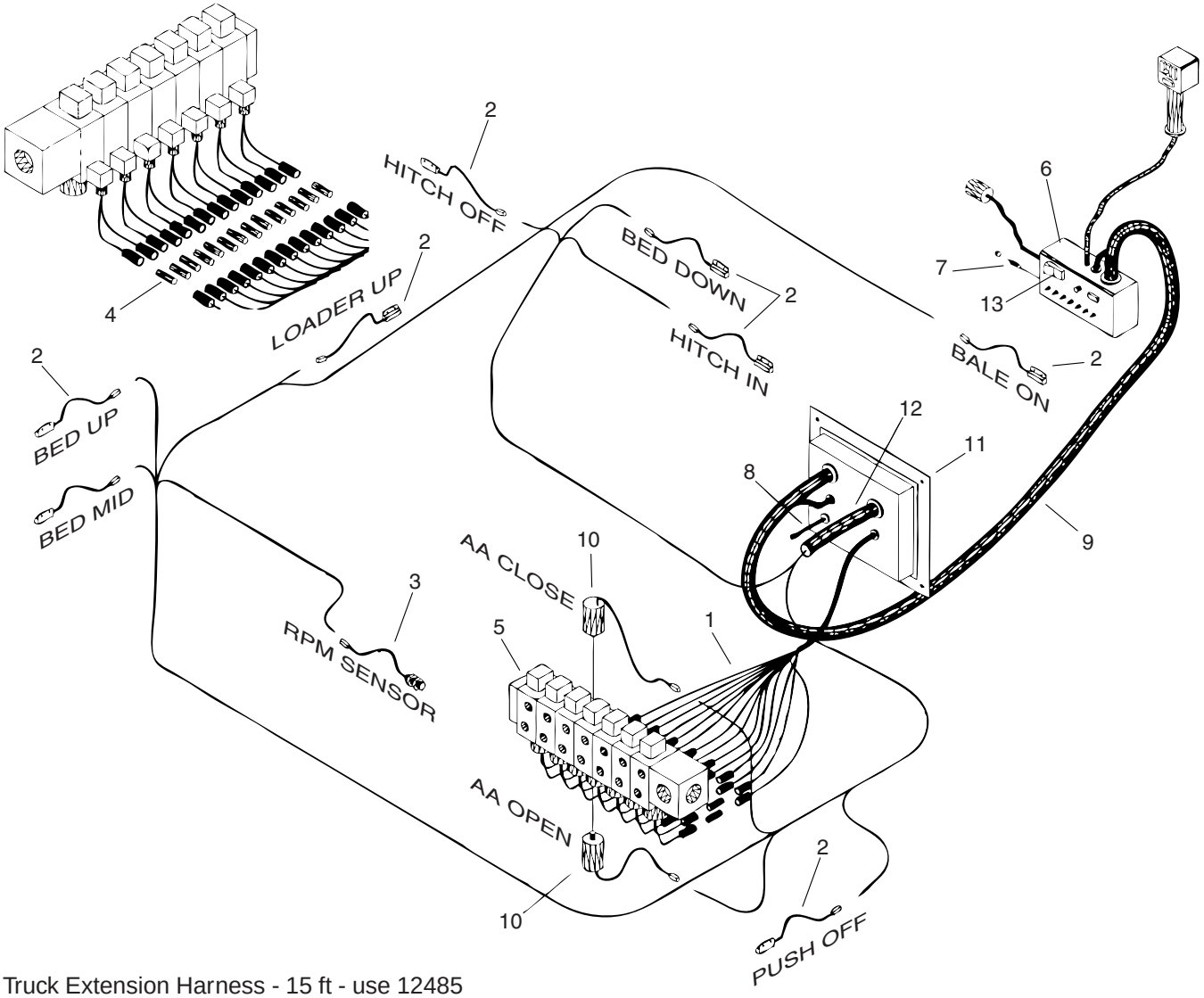
# 16K
# Electrical Control Assembly - 2004 to Present




Truck Extension Harness - 6 ft - use 12456

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 11477 | Output Cable | 1 |
| 2 | 11505 | Ferrous Metal Sensor | 9 |
| 3 | 11558 | Power Slide Position Sensor | 1 |
| 4 | 11559 | 2.5 Amp Fuse | 14 |
| 5 | 11695 | Hawe Valve | 1 |
| 6 | 12287 | Control Box Assembly | 1 |
| 7 | K44708 | Multifunction Grip/Cable | 1 |
| | 12432 | Multifunction Grip/Cable (Prior to 2008) | 1 |
| 8 | 12433 | PWR Cable - Tractor | 1 |
| 9 | 12434 | Control Cable - Hitch | 1 |
| 10 | 12441 | Arms In Pressure Sensor | 1 |
| 11 | 12446 | 15 Amp Fuse, Fast Acting | 1 |
| 12 | 12449 | Computer Box Assembly | 1 |
| 13 | 12456 | Control Cable - Tractor | 1 |
| 14 | 12466 | Sensor Cable | 1 |
| 15 | 11890 | Switch | 1 |

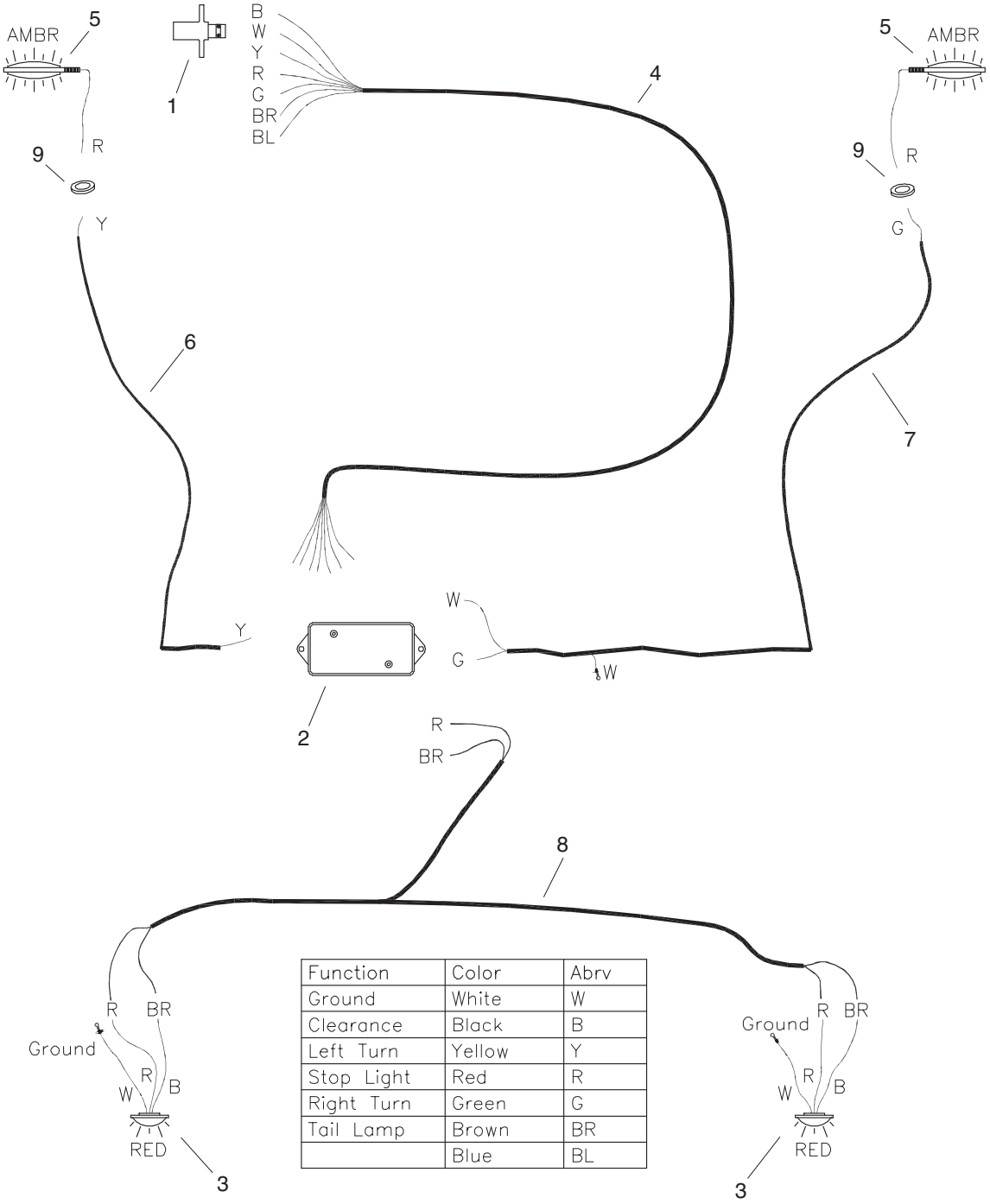
# 16K
# Electrical Control Assembly - 2001 to 2003




Truck Extension Harness - 15 ft - use 12485

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 11477 | Output Cable | 1 |
| 2 | 11505 | Ferrous Metal Sensor - 2001 to 2002 | 7 |
| | 11505 | Ferrous Metal Sensor - 2003 | 8 |
| 3 | 11558 | Power Slide Position Sensor | 1 |
| 4 | 11559 | 2.5 Amp Fuse | 14 |
| 5 | 11165 | Hawe Valve - 2001 | 1 |
| | 11695 | Hawe Valve - 2002 to 2003 | 1 |
| 6 | 11556 | Control Box Assembly - 2001 | 1 |
| | 11475 | Control Box Assembly - 2002 to 2003 | 1 |
| 7 | 11560 | 15 Amp Fuse | 1 |
| 8 | 11557 | Foot Ramp Adjustment Knob | 1 |
| 9 | 11476 | Control Cable | 1 |
| 10 | 11535 | Pressure Switch | 2 |
| 11 | 11555 | Computer Box Assembly - used with 4 button joystick - 2001 to 2002 | 1 |
| | 11473 | Computer Box Assembly - used with 6 button joystick - 2003 | 1 |
| 12 | 11478 | Sensor Cable | 1 |
| 13 | 11890 | Switch | 1 |

# 16K
# Electrical Assembly - 2001 to Present




| Function | Color | Abrv |
|---|---|---|
| Ground | White | W |
| Clearance | Black | B |
| Left Turn | Yellow | Y |
| Stop Light | Red | R |
| Right Turn | Green | G |
| Tail Lamp | Brown | BR |
| | Blue | BL |

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10896 | 7 Pole Plug Connector | 1 |
| 2 | 10897 | 7 Wire Junction Box | 1 |
| 3 | 10930 | 4" Round Red Lamp | 2 |
| 4 | 10932 | K Hitch Wire Harness | 1 |
| 5 | 11155 | 2 Way Amber Light | 2 |
| 6 | 11561 | Left Front Wiring Harness | 1 |
| 7 | 11562 | Right Front Wiring Harness | 1 |
| 8 | 11563 | Rear Wiring Harness | 1 |
| 9 | 12039 | Grommet, Wiring | 2 |

# 16K
# Suspension Assembly

The 16K uses a Hutchens Industries trailer suspension similar to below.

For detailed information visit Hutchens website resource centre at www.hutchensindustries.com.

Suspension used is H-9700 underslung with 44” centers and 2 1/4” spring seat height with 5”round axles.

Parts available through PROAG dealers are as follows:

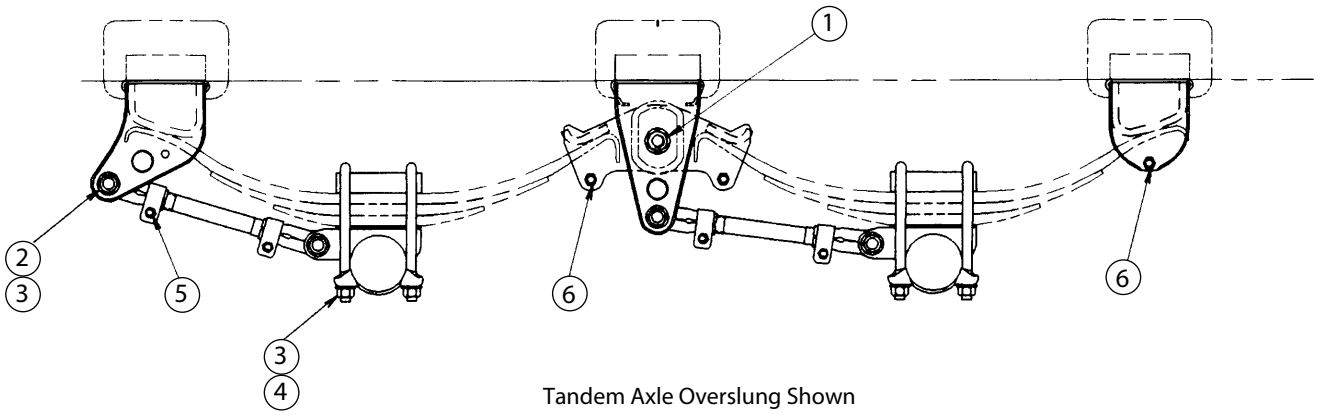
12146 Spring Leaf Pack

12180 Spring Center Bolt

12188 Suspension Bushing Torque Arm

12272 Top Leaf - 16K Spring Back

**All other suspension parts order through a qualified truck trailer shop.**



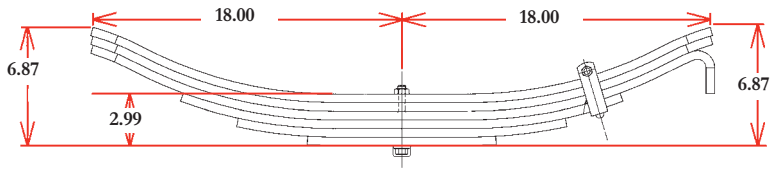

Tandem Axle Overslung Shown

## Torque Specifications

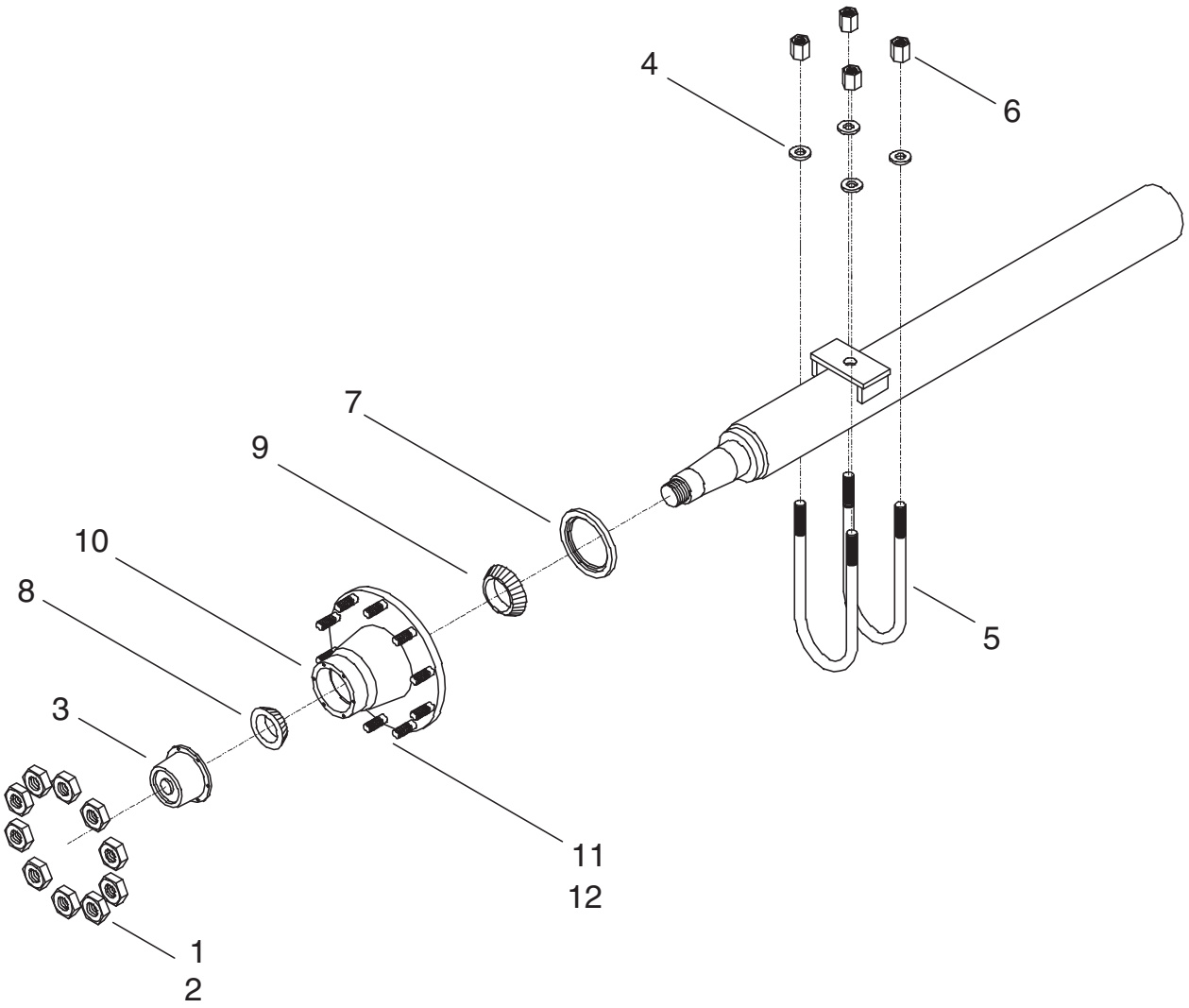
| Item No. | Fastener | Oiled | Dry |
|---|---|---|---|
| 1 | 1 1/8-7 (9600/9700 Rocker Bolt) | 590 Lb-Ft | 790 Lb-Ft |
| 2 | 1-14 (9700 Radius Rod Bolt) | 540 Lb-Ft | 720 Lb-Ft |
| 3 | 7/8-14 (Axle U-Bolt & 9600 Radius Rod Bolt) | 350 Lb-Ft | 470 Lb-Ft |
| 4 | 3/4-16 (Axle U-Bolt) | 310 Lb-Ft | 420 Lb-Ft |
| 5 | 5/8-18 (Radius Rod Clamp Bolt) | 130 Lb-Ft | 170 Lb-Ft |
| 6 | 5/8-18 (Spring Retainer Bolt) | 35 Lb-Ft | 50 Lb-Ft |

## 12146 Spring Leaf Pack - Low Arch, 6 Leaf

44" Axle Center All Positions. Hook to Rear.

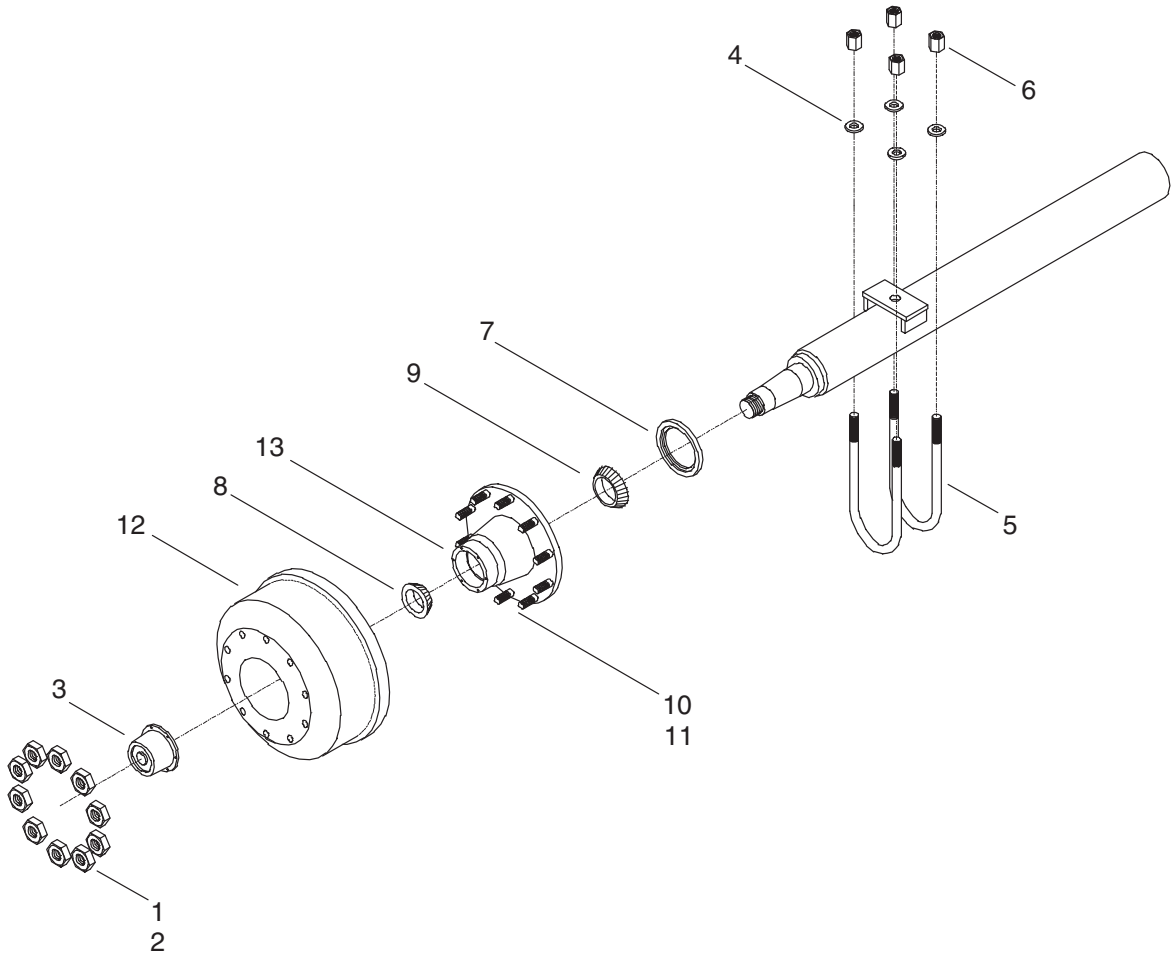


# 16K
# Non Brake Hub Assembly - 2002 to Present




| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10046 | Left Single Lug Nut | 10 |
| 2 | 10047 | Right Single Lug Nut | 10 |
| 3 | 11677 | Oil Cap (Aluminum) | 2 |
| 4 | 12011 | Washer - U-Bolt 12K, 16K | 8 |
| 5 | 12012 | U-Bolt 12K, 16K | 4 |
| 6 | 12013 | Nut - U-Bolt 12K, 16K | 8 |
| 7 | 12096 | Oil Seal | 2 |
| 8 | 12097 | Outer Bearings | 2 |
| 9 | 12098 | Inner Bearings | 2 |
| 10 | 12099 | 16K Non Brake Hub | 2 |
| 11 | 12100 | 16K Break Right Stud | 10 |
| 12 | 12101 | 16K Break Left Stud | 10 |

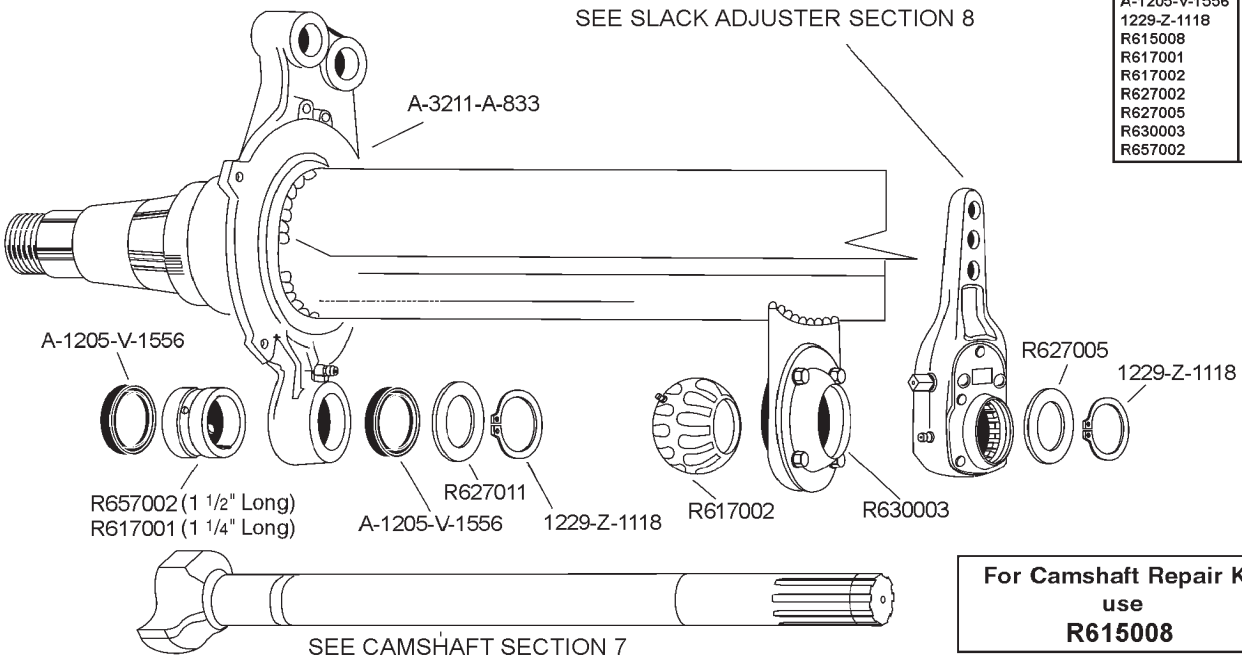
# 16K
# Air Brake Hub Assembly - 2002 to Present




| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10046 | Left Single Lug Nut | 10 |
| 2 | 10047 | Right Single Lug Nut | 10 |
| 3 | 11677 | Oil Cap (Aluminum) | 2 |
| 4 | 12011 | Washer - U-Bolt 12K, 16K | 8 |
| 5 | 12012 | U-Bolt 12K, 16K | 4 |
| 6 | 12013 | Nut - U-Bolt 12K, 16K | 8 |
| 7 | 12096 | Oil Seal | 2 |
| 8 | 12097 | Outer Bearings | 2 |
| 9 | 12098 | Inner Bearings | 2 |
| 10 | 12100 | 16K Break Right Stud | 10 |
| 11 | 12101 | 16K Break Left Stud | 10 |
| 12 | 12102 | Air Brake Drum 16K | 2 |
| 13 | 12103 | Air Brake Hub 16K | 2 |

## CAMSHAFT, BUSHINGS AND BRACKET PARTS

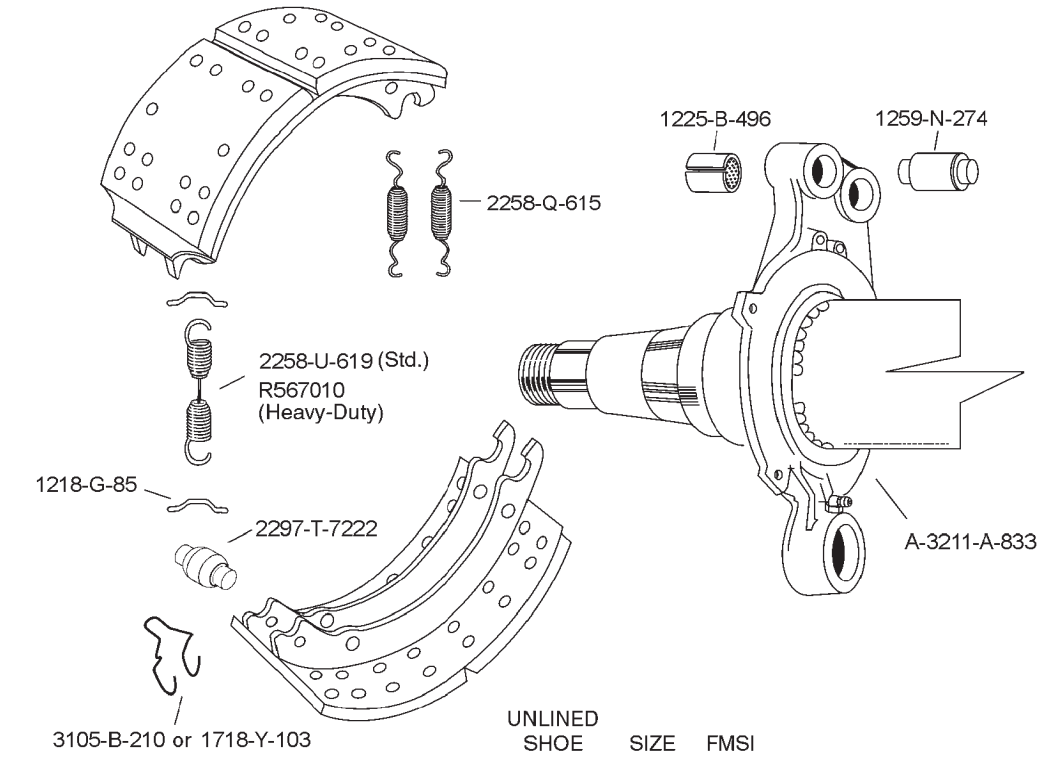
| PAGE REFERENCE | |
|---|---|
| MERITOR NO. | PAGE NO. |
| A-1205-V-1556 | 7-76 |
| 1229-Z-1118 | 7-68 |
| R615008 | 7-58 |
| R617001 | 7-71 |
| R617002 | 7-71 |
| R627002 | 7-66 |
| R627005 | 7-63 |
| R630003 | 7-74 |
| R657002 | 7-70 |




**For Camshaft Repair Kit use R615008**

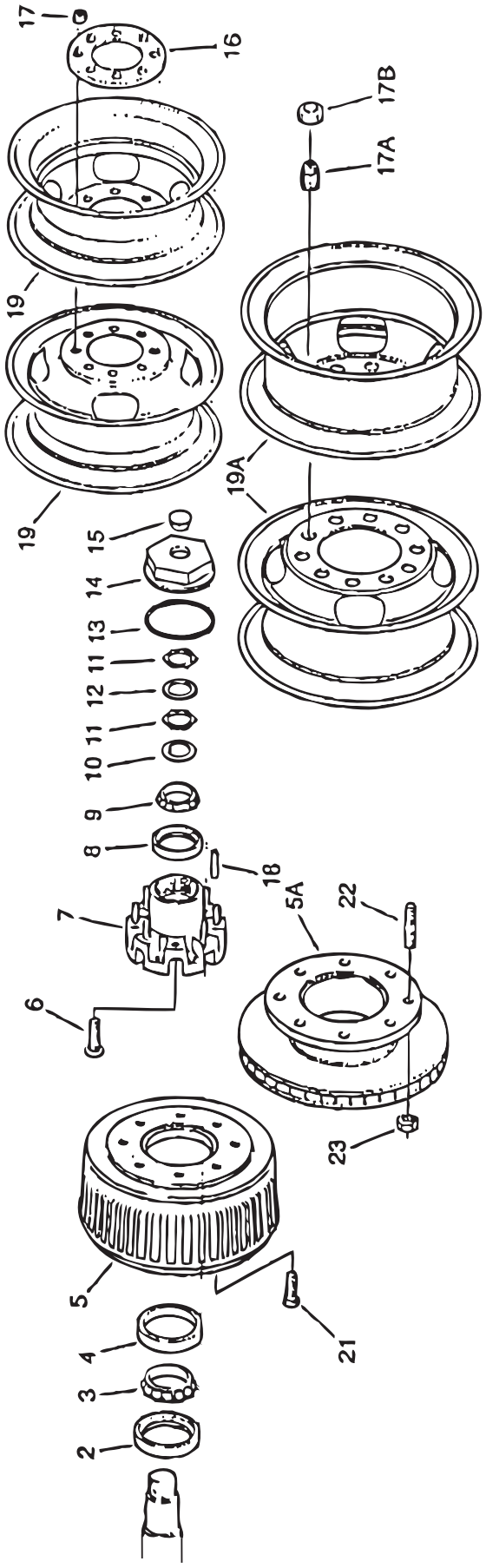
## BRAKE SHOES AND HARDWARE

| PAGE REFERENCE | |
|---|---|
| MERITOR NO. | PAGE NO. |
| 1218-G-85 | 3-17 |
| 1225-B-496 | 3-7 |
| 1259-N-274 | 3-5 |
| 1718-Y-103 | 3-4 |
| 2258-Q-615 | 3-13 |
| 2258-U-619 | 3-15 |
| 2297-T-7222 | 3-2 |
| 3105-B-210 | 3-4 |
| KIT 8000 | 2-24 |
| KIT 8000HD | 2-27 |
| R4515 | 4-18 |
| R567010 | 3-15 |




| UNLINED SHOE | SIZE | FMSI |
|---|---|---|
| R4515 | 7" | 4515E |

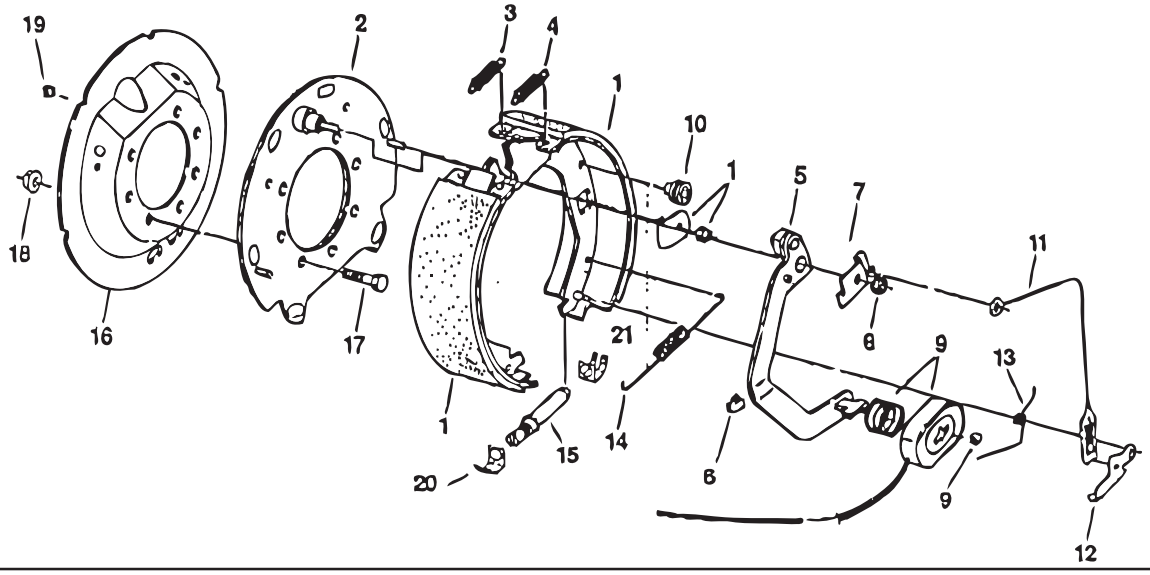
**For Brake Repair Kit use KIT 8000, KIT 8000HD**


17
16
17B
17A
19
19
19A
15
14
13
11
12
11
10
9
8
18
5A
22
7
6
23
5
21
4
3
2

| Ilem | Description | 10K 8 on 6.50 | 10K Disc 8 on 6.50 | 10K 10 on11.25 | 12K 8 on 6.50 | 12K Heavy Duty 8 on 6.50 | 12K Disc Hi-Profile 8 on 6.50 | 15K Hi-profile 10 on 8.75 | 15K 6 on 8.75 | 15K 10 on11.25 |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Unitized Oil Seal | 010-056-00 | 010-056-00 | 010-056-00 | 010-056-00 | 010-056-00 | 010-056-00 | 010-056-00 | 010-056-00 | 010-056-00 |
| 3 | Inner Bearing Cone | 031-022-02 | 031-022-02 | 031-022-02 | 031-020-02 | 031-020-02 | 031-020-02 | 031-020-02 | 031-020- 02 | 031-020-02 |
| 4 | Inner Bearing Cup | 031-022-01 | 031-022-01 | 031-022-01 | 031-020-01 | 031-020-01 | 031-020-01 | 031-020-01 | 031-020-01 | 031-020-01 |
| 5 | Brake Drum | 009-027-01 | 070-006-01 | | 009-028-01 | | 009-028-01 | 009-028-01 | 009-028-01 | 009-028-01 |
| 5A | Brake Drum Rotor | | | 009-028-01 | | 070-006-01 | | | | |
| 6 | Wheel Mtg. Stud RH | 007-115-00 | 007-115-00 | 007-102-01 | 007-115-00 | 007-115-00 | 007-115-00 | 025-013-01 | 025-013-01 | 007-102-01 |
| | Wheel Mtg. Stud LH | None | None | 007-102-02 | None | None | None | 025-013-02 | 025-013-02 | 007-102-02 |
| 7 | Hubs w/Cups & Studs RH | 008-214-05 | 008-214-06 | 008-263-08 | 008-216-08 | 008-214-08 | 008-214-10 | 008-217-05 | 008-217-09 | 008-263-11 |
| | Hubs w/Cups & Studs LH | None | None | 008-263-28 | None | None | None | 008-217-25 | 008-217-29 | 008-263-31 |
| 8 | Outer Bearing Cone | 031-019-01 | 031-019-01 | 031-019-01 | 031-021-01 | 031-021-01 | 031-021-01 | 031-021-01 | 031-021-01 | 031-021-01 |
| 9 | Outer Bearing Cup | 031-019-02 | 031-019-02 | 031-019-02 | 031-021-02 | 031-021-02 | 031-021-02 | 031-021-02 | 031-021-02 | 031-021-02 |
| 10 | Spindle Washer | 005-060-00 | 005-060-00 | 005-060-00 | 005-060-00 | 005-060-00 | 005-060-00 | 005-060-00 | 005-060-00 | 005-060-00 |
| 11 | Spindle Nut | 006-084-00 | 006-084-00 | 006-084-00 | 006-084-00 | 006-084-00 | 006-084-00 | 006-084-00 | 006-084-00 | 006-084-00 |
| 12 | Tang Washer | 005-059-00 | 005-059-00 | 005-059-00 | 005-059-00 | 005-059-00 | 005-059-00 | 005-059-00 | 005-059-00 | 005-059-00 |
| 13 | Oil Cap “O” Ring | 010-050-00 | 010-050-00 | 010-050-00 | 010-050-00 | 010-050-00 | 010-050-00 | 010-050-00 | 010-050-00 | 010-050-00 |
| 14 | Oil Cap | 021-037-00 | 021-037-00 | 021-037-00 | 021-037-00 | 021-037-00 | 021-037-00 | 021-037-00 | 021-037-00 | 021-037-00 |
| 15 | Oil Cap Plug | 046-032-00 | 046-032-00 | 046-032-00 | 046-032-00 | 046-032-00 | 046-032-00 | 046-032-00 | 046-032-00 | 046-032-00 |
| 16 | Wheel Clamp Ring | 033-052-01 | 033-052-01 | | 033-052-01 | 033-052-01 | 033-052-01 | | | |
| 17 | Wheel Nut RH | 006-109-00 | 006-109-00 | 006-064-01 | 006-109-00 | 006-109-00 | 006-109-00 | | | 006-064-01 |
| | Wheel Nut LH | | | 006-064-02 | | | | | | 006-064-02 |
| 17A | Inner Nut RH | | | | | | | 006-069-01 | 006-069-01 | |
| | Inner Nut LH | | | | | | | 006-069-02 | 006-069-02 | |
| 17B | Outer Nut RH | | | | | | | 006-070-01 | 006-070-01 | |
| | Outer Nut LH | | | | | | | 006-070-02 | 006-070-02 | |
| 18 | Locating Pin | 056-008-00 | 056-008-00 | | 056-008-00 | 056-008-00 | | | | |
| 19 | 14.5 x 7.00 MH Dual | | | | 017-186-00 | | | | | |
| | 16 x 6K Dual | | 017-279-00 | | | 017-279-00 | 017-279-00 | | | |
| | 16.5 x 6.75 Dual | 017-157-00 | 017-157-00 | | 017-157-00 | 017-157-00 | | | | |
| | 17.5 x 6.75 HC Dual | | | | | | | 017-185-00 | | |
| NS | 17.5 x 8.25 HC Single | 017-176-00 | 017-176-00 | | 017-176-00 | 017-176-00 | | | | |
| | 17.5 x 6.75 HC | 017-298-00 | 017-298-00 | | | | | | | |
| 21 | Drum Mounting Screw | 007-245-00 | | 007-245-00 | 007-245-00 | 007-245-00 | | 007-245-00 | 007-245-00 | 007-245-00 |
| 22 | Rotor Mounting Screw | | 025-014-00 | | | | 025-014-00 | | | |
| 23 | Rotor Mounting Nut | | 006-046-00 | | | | 006-046-00 | | | |

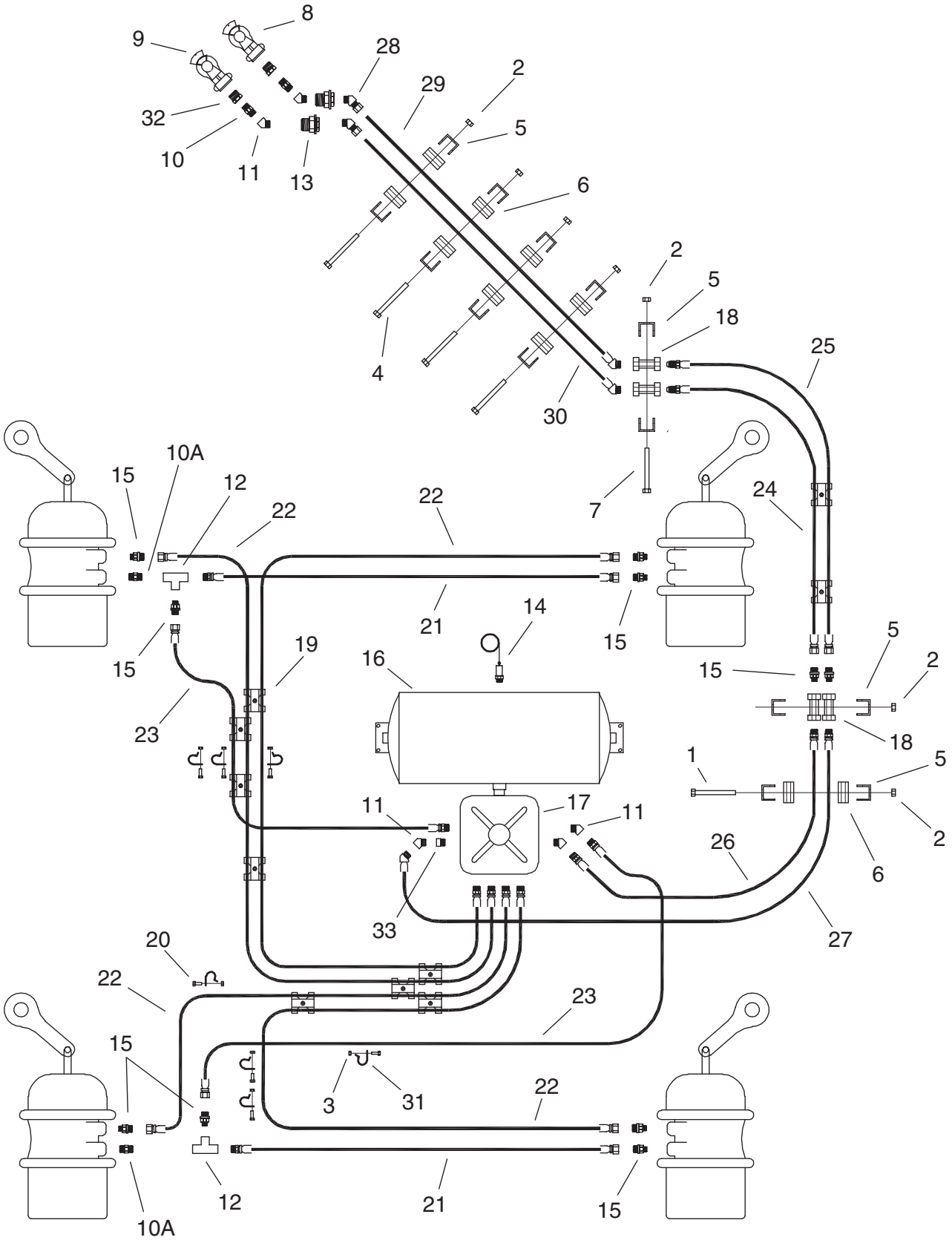
NS - Not Shown

# 16K
# Electric Brake Assembly - 2001




| Item | Description | Qty Per Brake | 9K & 10K GD Part No. | 10K Part No. | 12K Part No. | 16K Part No. |
|---|---|---|---|---|---|---|
| 1 | LH Shoe & Lining Kit containing: | 1 | K71-049-00 | K71-061-00 | K71-063-00 | K71-063-00 |
| | LH Primary | 1 | 040-110-01 | 040-106-01 | 040-102-01 | 040-102-01 |
| | LH Secondary | 1 | 040-111-02 | 040-109-02 | 040-103-02 | 040-103-02 |
| | Shoe Hold Down Washer | 2 | 005-107-00 | 005-107-00 | 005-107-00 | 005-107-00 |
| | Lock Nut | 2 | 006-127-00 | 006-127-00 | 006-127-00 | 006-127-00 |
| 1 | RH Shoe & Lining Kit containing: | 1 | K71-050-00 | K71-052-00 | K71-054-00 | K71-054-00 |
| | RH Primary | 1 | 040-111-01 | 040-109-01 | 040-103-01 | 040-103-01 |
| | RH Secondary | 1 | 040-110-02 | 040-106-02 | 040-102-02 | 040-102-02 |
| | Shoe Hold Down Washer | 2 | 005-107-00 | 005-107-00 | 005-107-00 | 005-107-00 |
| | Lock Nut | 2 | 006-127-00 | 006-127-00 | 006-127-00 | 006-127-00 |
| 2 | Backing Plate Assembly | 1 | 036-072-05 | 036-072-05 | 036-072-06 | 036-072-06 |
| 3 | Shoe Return Spring (Rear-Black) | 1 | 046-071-00 | 046-071-00 | 046-071-00 | 046-071-00 |
| 4 | Shoe Return Spring (Front-Green) | 1 | 046-083-00 | 046-083-00 | 046-083-00 | 046-083-00 |
| 5 | LH Actuator Arm Assembly | 1 | 047-123-38 | 047-123-06 | 047-123-04 | 047-123-04 |
| | RH Actuator Arm Assembly | 1 | 047-123-37 | 047-123-05 | 047-123-03 | 047-123-03 |
| 6 | Wire Clip | 3 | 027-039-00 | 027-039-00 | 027-039-00 | 027-039-00 |
| 7 | LH Arm Shoe Retainer | 1 | 071-455-01 | 071-016-00 | 071-016-00 | 071-016-00 |
| | RH Arm Shoe Retainer | 1 | 071-455-02 | 071-016-00 | 071-016-00 | 071-016-00 |
| 8 | Flange Nut | 1 | 006-062-00 | 006-062-00 | 006-082-00 | 006-082-00 |
| 9 | Magnet Kit containing: | 1 | K71-376-00 | K71-376-00 | K71-377-00 | K71-378-00 |
| | Magnet Retainer Clip | 1 | 027-050-00 | 027-050-00 | 027-050-00 | 027-050-00 |
| | Magnet Assembly | 1 | 042-129-00 | 042-129-00 | 042-130-00 | 042-131-00 |
| | Magnet Mtg. Spring | 1 | 046-117-00 | 046-117-00 | 046-117-00 | 046-117-00 |
| 11 | Adjuster Cable | 1 | 071-020-00 | 071-020-00 | 071-020-00 | 071-020-00 |
| 12 | LH Adjuster Lever | 1 | 071-019-01 | 071-019-01 | 071-019-01 | 071-019-01 |
| | RH Adjuster Lever | 1 | 071-019-02 | 071-019-02 | 071-019-02 | 071-019-02 |
| 13 | LH Adjuster Lever Spring | 1 | 046-073-00 | 046-073-00 | 046-073-00 | 046-073-00 |
| | RH Adjuster Lever Spring | 1 | 046-074-00 | 046-074-00 | 046-074-00 | 046-074-00 |
| 14 | Adjuster Spring | 1 | 046-072-00 | 046-072-00 | 046-072-00 | 046-072-00 |
| 15 | LH Adjuster Assembly | 1 | 048-009-00 | 048-009-00 | 048-009-00 | 048-009-00 |
| | RH Adjuster Assembly | 1 | 048-010-00 | 048-010-00 | 048-010-00 | 048-010-00 |
| 16 | Dust Shield Kit | 1 | 038-115-21 | 038-115-22 | 038-115-23 | 038-115-23 |
| 17 | Brake Mounting Screw | 7 | 007-116-00 | 007-116-00 | 007-116-00 | 007-116-00 |
| 18 | Brake Mounting Nut | 7 | 006-092-00 | 006-092-00 | 006-092-00 | 006-092-00 |
| 19 | Sleeve | 1 | 027-014-00 | 027-014-00 | 027-014-00 | 027-014-00 |
| 20 | Adjuster Clip (Thread End) | 1 | 046-132-00 | 046-132-00 | 046-132-00 | 046-132-00 |
| 21 | Adjuster Clip (Barrel End) | 1 | 046-133-00 | 046-133-00 | 046-133-00 | 046-133-00 |
| 00 | Wire Grommet | 1 | 046-016-00 | 046-016-00 | 046-016-00 | 046-016-00 |

# 16K
# Air Brake Assembly - 2002 to Present



## 16K - Air Brake Assembly - 2002 to Present

| Item | Part No. | Description | Qty |
|---|---|---|---|
| 1 | 10068 | 5/16" x 2 1/2" Gr. 8 Plated HHCS | 1 |
| 2 | 10231 | 5/16" Nylock Nut | 7 |
| 3 | 10233 | 1/4" Nylock Nut | 7 |
| 4 | 11772 | 5/16" -18 x 6" Zink HHCS Gr 5 | 4 |
| 5 | 12019 | Clamp 1 1/2", 2 Hole, 1 Bolt | 7 |
| 6 | 12026 | Rubber 11/2", 1/2" Tubing | 10 |
| 7 | 12041 | 5/16" x 7 1/2" HHCS Gr 5 Plated | 1 |
| 8 | 12065 | Glad Hand Service | 1 |
| 9 | 12066 | Glad Hand - Supply | 1 |
| 10 | 12069 | Brass 3/8" Pipe Hex Nipple | 2 |
| 10A | 12069 | Brass 3/8" Pipe Hex Nipple - 2003 to present | 2 |
| | 12070 | Brass 3/8" Pipe Long Nipple - 2002 | 2 |
| 11 | 12071 | Brass 3/8" Pipe 45 Street Elbow | 5 |
| 12 | 12072 | Brass 3/8" Pipe Female Tee | 2 |
| 13 | 12077 | Brass BH 3/8" FP To 3/8 FP | 2 |
| 14 | 12080 | Brass Drain Valve 1/4" MP 60" Cable | 1 |
| 15 | 12083 | Brass 1/2" ABS To 3/8" MP Adapter | 10 |
| 16 | 12084 | Air Brake Tank | 1 |
| 17 | 12085 | Air Brake Valve | 1 |
| 18 | 12086 | Bulkhead, 1 1/2" Clamp, 3/8" FP | 4 |
| 19 | 12087 | Plastic 2 Air Hose Clamp | 10 |
| 20 | 12088 | 1/4" x 1" Gr. 8 Plated HHCS | 7 |
| 21 | 12089 | Air Brake Hose 16" | 2 |
| 22 | 12090 | Air Brake Hose 56 1/2" | 4 |
| 23 | 12091 | Air Brake Hose 46 1/2" | 2 |
| 24 | 12092 | Air Brake Hose 29 1/2" | 1 |
| 25 | 12093 | Air Brake Hose 32 1/2" | 1 |
| 26 | 12094 | Red Nylon Tubing 1/2" Air Brakes 26" | 1 |
| 27 | 12095 | Blue Nylon Tubing 1/2" Air Brakes 33" | 1 |
| 28 | 12104 | Brass 1/2" ABS To 3/8", 45 Street Elbow | 2 |
| 29 | 12128 | Blue Nylon Tubing 1/2" Air Brakes 200" | 1 |
| 30 | 12129 | Red Nylon Tubing 1/2" Air Brakes 202" | 1 |
| 31 | 12110 | Strap Hose Clamp .88" OD | 7 |
| | 12034 | Strap Hose Clamp - 2002 | 7 |
| 32 | 12156 | Brass Pipe Bushing 1/2" MP To 3/8" FP | 2 |
| | 12073 | Brass 1/2" FP to 3/8" FP Reducer - 2002 | 2 |
| 33 | 12157 | Brass Adapter 3/8" FP To 1/4" MP | 1 |
| | 12073 | Brass 1/2" FP to 3/8" FP Reducer - 2002 | 1 |

# Parts Index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