1998

Owner Operator's Manual

With

Parts Breakdown

AUTO ALIGN BALE SKOOP

Model 16K

PLEASE READ CAREFULLY BEFORE OPERATING MACHINE

AC-D-10775

Dear Owner,

Thank you for buying the Auto Align Bale Skoop. We sincerely believe you will be pleased with your investment. We did our best to make the Bale Skoop an easy-to-use, durable piece of equipment. Please take the time to read this manual. The manual will give you valuable advice for operating your Bale Skoop safely and efficiently.

Happy hay harvesting!

Staff of Pro Ag Designs, Inc.

YOUR AUTO ALIGN BALE SKOOP INFORMATION

Fill out the following information about your Auto Align Bale Skoop. This information may assist us in helping you in the future:

Model: _____

Serial Number: _____

Date Manufactured: _____

Purchased From: _____

Purchase Date: _____

Operator's Manual reorder information:

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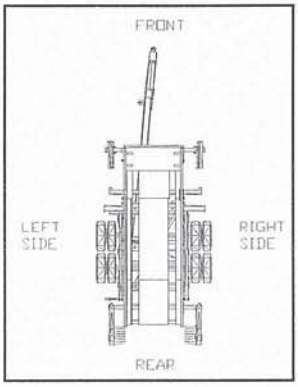
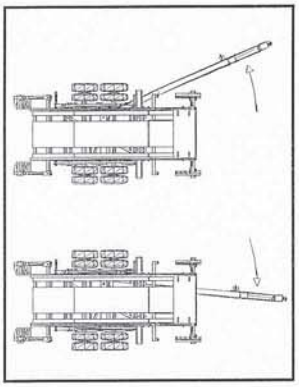
Auto Align Bale Skoop Directional Conventions



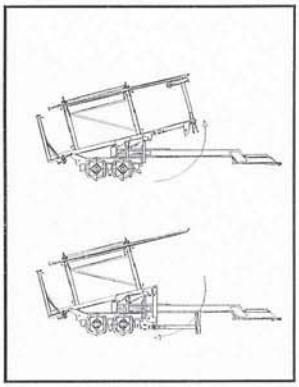
"Right and Left" The right and left side of the Bale Skoop is your right or left when standing behind the Bale Skoop and looking toward the front of the machine.

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



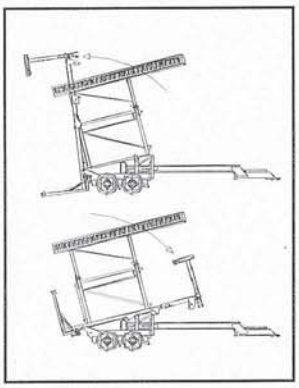
"Offset" The machine configuration when the Hitch is maneuvered to allow machine to pick up bales. The end of the Hitch is to the left of the left side tire.

"In-line" The machine configuration when the Hitch is centered between the wheels of the Bale Skoop.



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

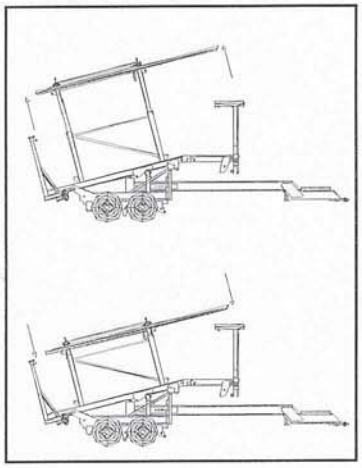
"Lower the Loader" Move the hydraulic control to move, or allow Loader to rest in the lowered position.



"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 in to the lowered position.

MACHINE CONVENTIONS

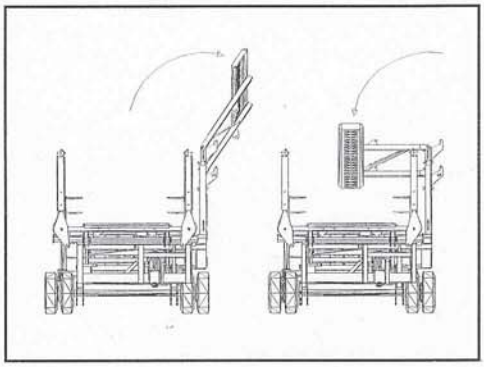


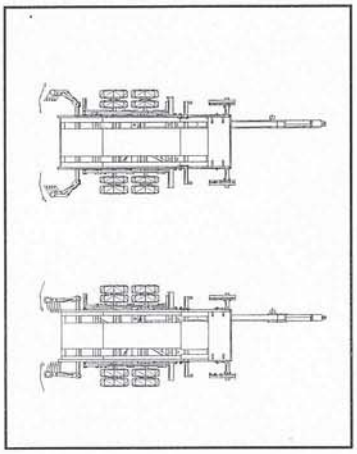
"Raise Top Slider" Move the hydraulic control to lift the Top Slider and adjust for different sized bales.

"Lower Top Slider" Move the hydraulic control to lower the Top Slider and adjust for different sized bales as well as preparing Bale Skoop for road transport.

"Open Top Slider" Move the hydraulic control to open the Top Slider to allow the Bed to be raised and the bales stacked.

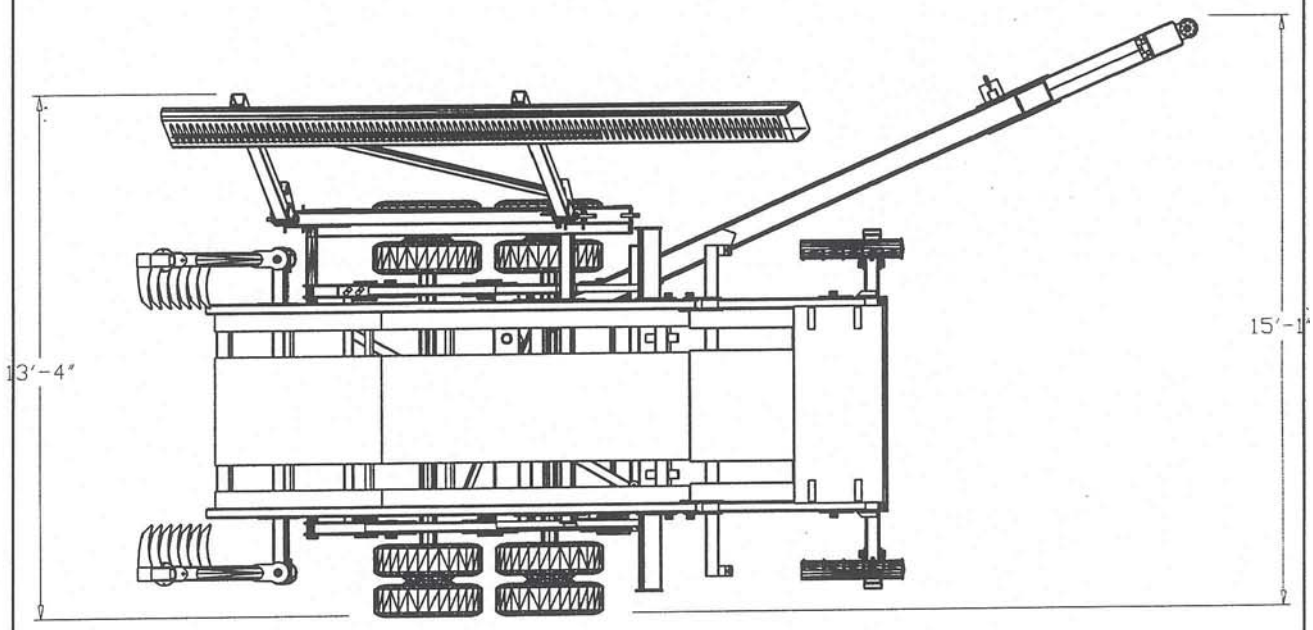
"Close Top Slider" Move the hydraulic control to close the Top Slider after stacking and preparing the Bale Skoop for road transport.

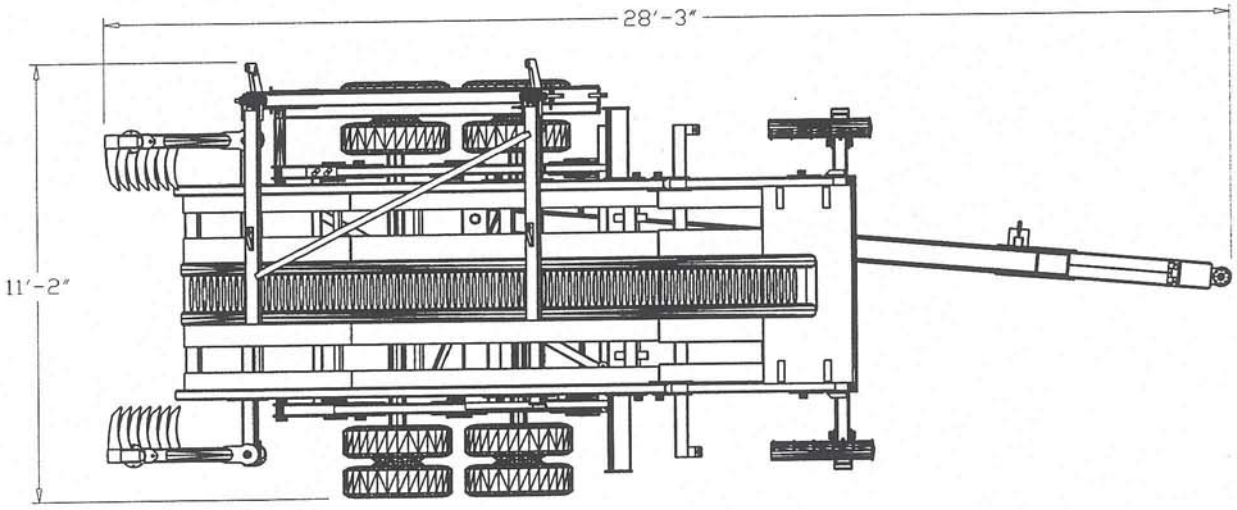




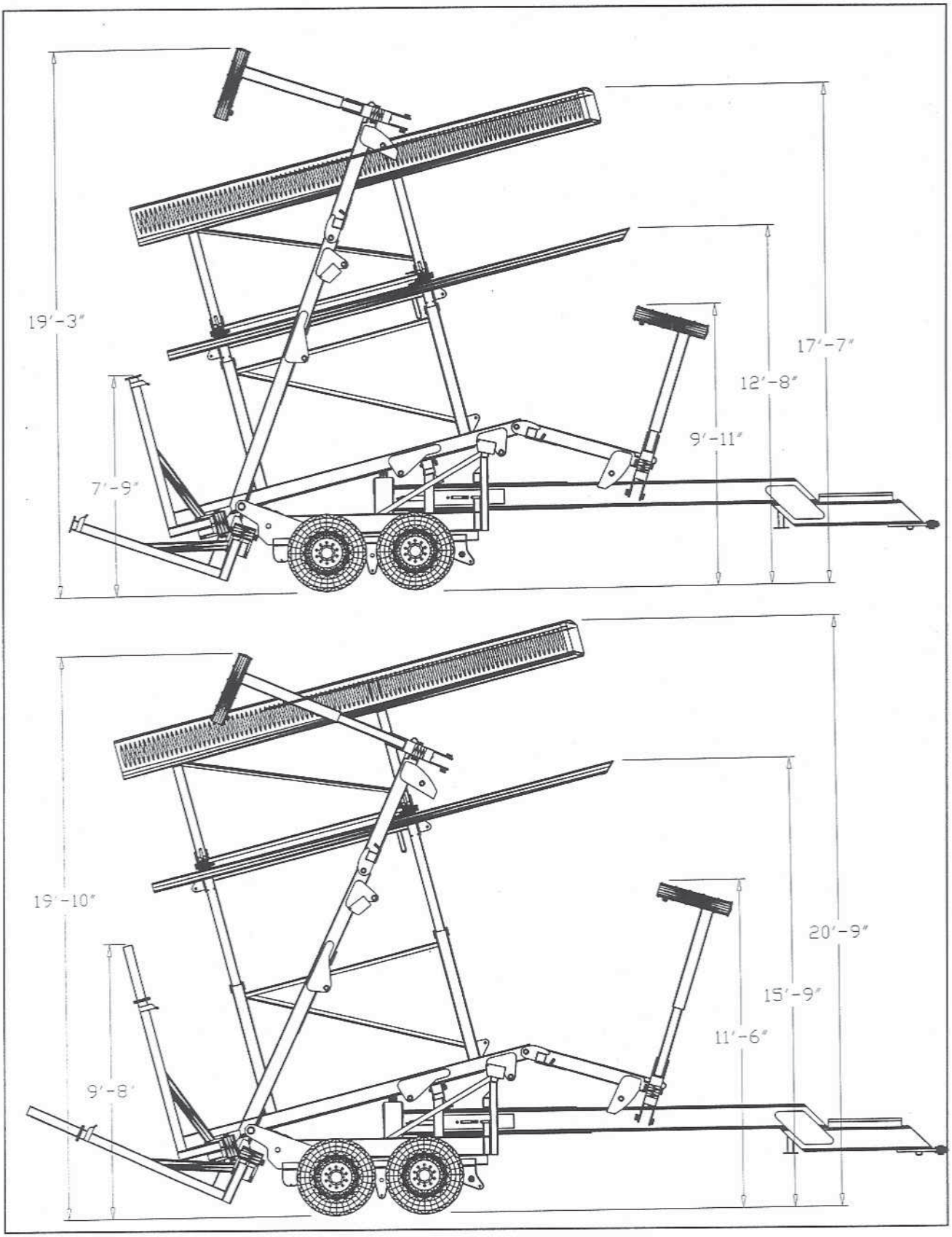
"Open Retriever" Move the hydraulic control to open the Retriever Arms and release the load.

"Close Retriever" Move the hydraulic control to close the Retriever Arms so bales can accumulate on the Bed and for retrieval of bales from the stack.


13'-4"
15'-1


28'-3"
11'-2"

BALE SKOOP DIMENSIONS



Bale Skoop Model 16K

Maximum lift capacity of the Loader	4,000 lbs
Maximum stacker load	17,500 lbs
Maximum Gross Vehicle Weight	30,000 lbs
Axles	Two, semi trailer type with full suspension
Brakes	Electric brakes standard with air brake option
Tires	Dual Truck/Tandem Axle
Stacker weight	12,500 lbs
Tongue weight empty	1,500 lbs

Pulling Unit Requirements

HP requirements	180 minimum
Hydraulic pressure	2,200 psi min to 3000 psi max
Hydraulic flow	20 Gal/min
Hydraulic controls	3 remotes minimum

Tire Specifications

Truck tire size	10R17.5 14 ply
Maximum tire pressure	115 psi
Minimum tire pressure	85 psi

❖ ❖ ❖ SAFETY ❖ ❖ ❖

SAFETY!

TAKE NOTE! THE SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

THIS SYMBOL MEANS

-ATTENTION!

-BECOME ALERT!

-YOUR SAFETY IS INVOLVED!

If you have questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Pro Ag Designs, Inc. 1700 Amsterdam Rd. Belgrade, MT 59714 Telephone (406) 388-7799, Fax (406) 388-0952.

❖ . . . . . SIGNAL WORDS

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

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components which, for functional purposes, cannot be guarded.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potentially hazardous situations that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

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 it 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 it's 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 customer to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Always add extra lights when transporting at night or during periods of limited visibility.

❖ ..... 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 or Dealer Parts Department or the manufacturer.

❖ ..... INSTALLING SAFETY DECALS

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 of replacements, refer to the Decal Location Guide section later in this manual.

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.*

BALE SKOOP OPERATION SAFETY ❖

Before Operating

- Carefully study and understand this manual.
- Install the safety warning light to indicate when the Hitch is offset and when the Top Slider is open.
- Do not wear loose-fitting clothing which may catch in moving parts.
- Always wear protective clothing and substantial shoes.
- It is recommended that suitable protective hearing and sight protectors (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.
- Assure that agricultural implement tires are inflated evenly.
- 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 area is clear, **especially children** 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 it's attachment. Completely familiarize yourself and other operators with its operation before using.
- Make sure that the brakes are evenly adjusted (if equipped with brakes).
- Use a tractor equipped with a Roll Over Protective System (ROPS) and fasten your seat belt prior to starting the engine.
- The manufacturer does not recommend usage of tractor with ROPS removed.
- 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 tongue or hitch and the towing vehicle when backing up to the equipment.

⚠ During Operation

- **SAFETY CHAIN:** If the Bale Skoop is going to be transported on a public highway, a safety chain should be obtained and installed. 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 unit and towed machine in the event of separation of the primary attaching system.
- Install the safety chain by crossing the chains under the tongue 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.

BALE SKOOP OPERATION SAFETY ..... ❖

- 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 Skoop.
- Keep hands and clothing clear of moving parts.
- Do not clean, lubricate or adjust your equipment while it is moving.
- When halting operation, even periodically, set the tractor's or towing vehicle's brakes, disengage the PTO, shut off the hydraulics and the engine, and remove the 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.
- 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 of unit.

❖ . . . . . BALE SKOOP OPERATION SAFETY

- 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 keys.
- 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. Damage and livestock injury could result.
- 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.

❖ . . . . . TRANSPORTATION SAFETY

 Highway and Transportation Safety

- 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 state and local laws governing highway safety and movement of farm machinery on public roads.

TRANSPORTATION SAFETY

- Use approved accessory lighting, flags and necessary warning devices to protect operators of other vehicles on the highway during daylight and nighttime 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 (40 kph) at night or during the day, use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem.

- Plan your route to avoid heavy traffic.

- Be a safe courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersection, etc.

- Watch for obstructions overhead and to the sides 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 to 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 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.

- Follow the torque chart in this manual when tightening bolts and nuts.
- Never use your hands to locate a hydraulic leak on attachments. Use a small 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.
- 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.

❖ ❖ ❖ OPERATION ❖ ❖ ❖

❖ . . . . . HOOKING UP FOR THE FIRST TIME

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

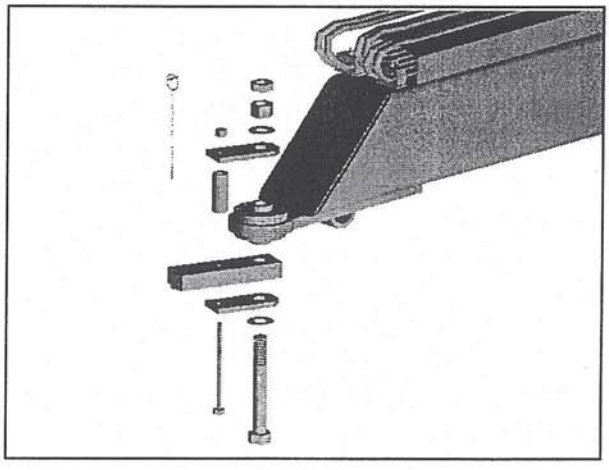
WARNING: **Remember to set parking brake, turn off hydraulic system and tractor, and remove keys from ignition before working on the Bale Skoop.**

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	Spacer Bolt Nut	5/8" Nylock
1	Hitch Spacer	3/4" ID x 3 9/16" tube
2	Hitch Plates	1/2" x 3" x 6 3/8"
1	Bolt Safety Pin	
1	Warning Light Box	
1	4-Button Remote Command Stick (RCS)	
1	3-Button RCS	
6	Male Hydraulic Connections	
15	Gallons of Hydraulic Fluid	

✓ Attach Bale Skoop to Tractor

- ☞ Line up the Ball Hitch on the machine with the tractor draw bar. 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, (1) 3/4" OD x 3 9/16" tubing, and (1) 5/8" nylock nut.



HOOKING UP FOR THE FIRST TIME . . . . . ❖

✓ Connect Safety Chain

CAUTION: Operating Bale Skoop 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 the tractor to turn without the chain dragging on the ground.

☞ Raise the Jack on the side of the Hitch by turning handle. Remove the retaining pin and raise the drop leg completely. Replace retaining pin.

✓ Lubricate Joints

WARNING: Be sure the Loader is sitting on the hitch while greasing machine.

☞ Grease all joints using the Grease Zerks as shown in the Maintenance and Adjustment section of the Owner/Operator's Manual.

✓ Hooking Up Warning Light Assembly and Hydraulic Controls

CAUTION: DO NOT operate machine without the Warning Light Assembly installed and operational.

CAUTION: Use care when working with electricity. Disconnect battery of tractor before attempting to connect electrical circuits.

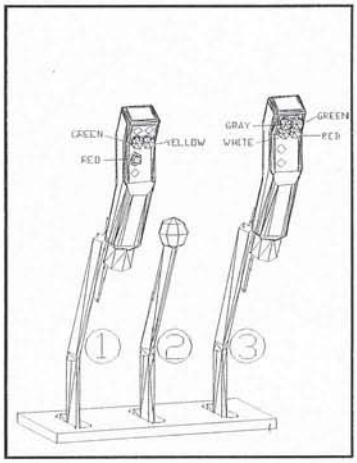
Warning Light Assembly

The Warning Light Assembly consists of two warning lights (one red, one yellow) and one audio warning. The yellow light, when illuminated, warns the operator that the Hitch is not in the "in-line" position. The red light and audio warning, when activated, warns the operator that the Top Slider is not closed. Caution should be taken when warning devices are activated to avoid collisions.

☞ The Warning Light Assembly should be mounted or placed in a position where it is visible to the operator at all times.

Hydraulic Controls

The Bale Skoop model 16K utilizes electric over hydraulic valves. The valves do not control the circuits but they select which function occurs when the tractor's hydraulic remotes are activated. The Remote Command Sticks (RCS) come with the hardware needed to mount them to the hydraulic remote levers of the tractor. The 4 button RCS should be mounted to the tractor remote lever 3 and the 3 button RCS should be mounted to the tractor remote lever 1. Although you may have your preference of tractor lever control setup, the typical lever configuration is "forward for lowering" and "back for lifting". If this is not your standard, be aware that the lever operation instructions listed in this manual represent this configuration.



- ☞ Route the wiring from each of the Remote Command Sticks and the Warning Light Box to the Hitch. They should then be plugged into the appropriate receptacle on the end of the wiring harness. The bare end wires should be routed to a power source and ground. Secure the wiring with the cable ties provided.
- ☞ The two wire cable with bare ends coming out of the Hitch is connected to the brake axles. To increase control, it is recommended that the brakes are hooked up and utilized.
- ☞ The Warning Light Assembly and the electric over hydraulic valves and controls are designed to operate on a 12-volt, NEGATIVE GROUND SYSTEM only. Connection to any other type of electrical system will likely result in severe and immediate damage to electrical components. Power for the Warning Light Assembly and hydraulic valves should be taken from a location at the fuse panel or key switch that is only "hot" when the engine is running. This is to prevent the battery from being drained when the tractor is not in use. The power connection on the hydraulic controls (red wires) MUST BE FUSED (provided in kit) to protect the wiring in case of a short. Locate the fuse as close as possible to the source of power. The three ground connections (black wires) should be connected directly to the frame of the tractor or to the engine block. Clean the paint off of the surface to insure a good connection.

WARNING: To avoid serious injury or death, use extreme care to make sure all individuals are safely clear from equipment and nearby area whenever operating remote valve control switches! Operating electrical controls (even when the remote lever is in neutral or the engine is stopped) will result in valves operating and may result in equipment moving suddenly without warning.

HOOKING UP FOR THE FIRST TIME . . . . . ❖

✓ **Prime Hydraulic System**

CAUTION: Check hydraulic fluid frequently while priming system.

☞ Attach Male Hydraulic Connectors to Hitch Hydraulic Hoses using thread sealer.

☞ Connect hydraulic hoses to tractor as paired. (See Chart Below)

Lever 1 Manifold Valve		Lever 2 Bed Cylinder		Lever 3 Quad Selector Valve	
GREEN	**RED**	**BLUE**	**BLACK**	**YELLOW**	**WHITE**

☞ With the Loader in the UP position, cycle the Hitch in and out of the offset position until the motion is continuous without any jerking. Cycle the Retriever Arms, the Top Slider Adjustment, and the Top Slider in the same fashion. ***Note:*** When cycling the Top Slider Adjustment, hold lever 1 forward until the system fills with oil. Both cylinders should raise at the same rate when filled with oil.

Remember: Check the Hydraulic Fluid frequently and add as needed (it takes approx. 15 gallons to prime the entire system).

WARNING: Keep the Hitch in the OFFSET position while cycling the Loader. Severe damage may occur if components collide.

☞ Leave the Hitch in the OFFSET position, and cycle the Loader in the same fashion. While cycling the Loader, cycle the Grab Hooks and the Bed. Leave the Loader in the raised position when it's motion becomes continuous.

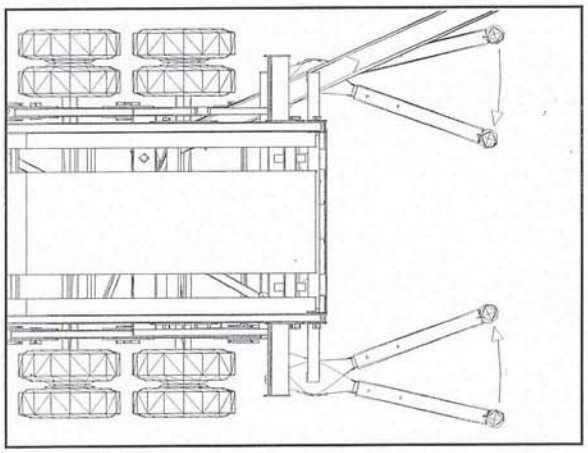
WARNING: Keep the Top Slider completely open while cycling the Bed. Severe damage may occur if components collide.

☞ With the Top Slider open, cycle the Bed until fluid has completely filled the system.

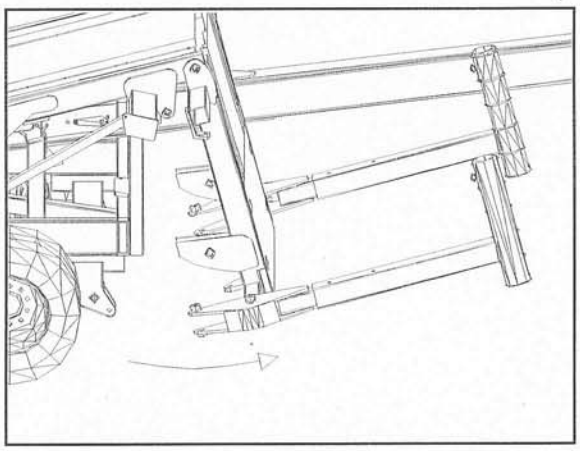
Hydraulic Sequencing and Lever Operation

Lever 1 - Back, closes the Alignment Arms and then raises the Loader. Forward, opens the Alignment Arms and lowers the Loader. The 3 button RCS mounted on lever 1 allows the operator to manually select when the Grab Hooks are engaged and disengaged. It also allows the Bed incline to be increased without using lever 2.

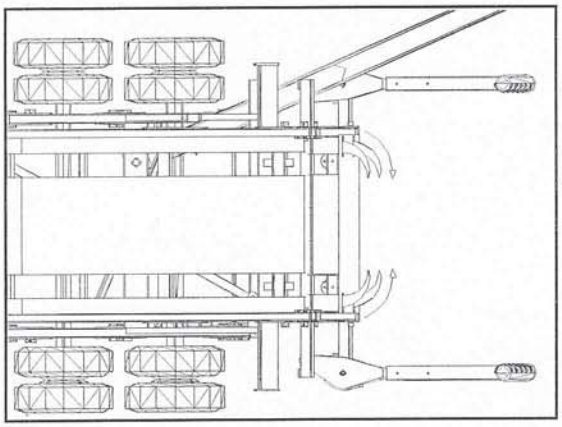
Alignment Arms Close



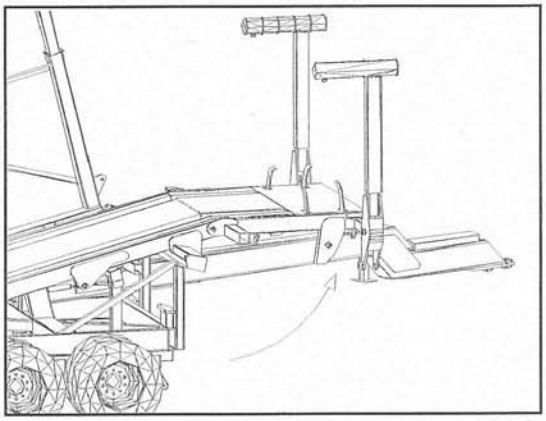
Loader starts to Raise



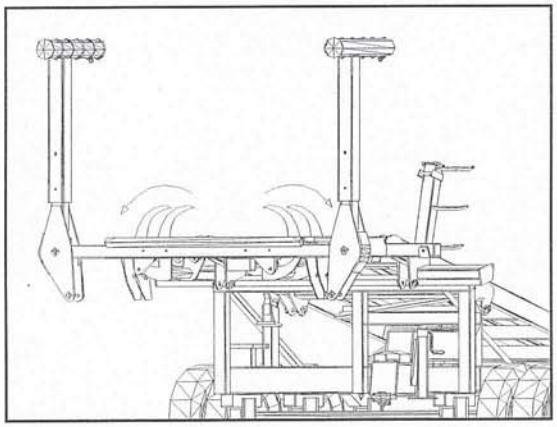
Green button - Grab Hooks engaged



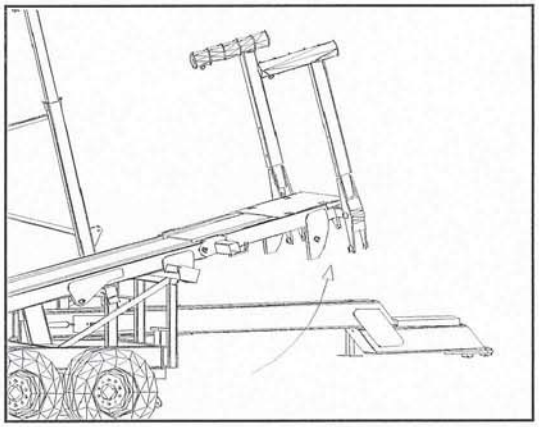
Loader Raises to level



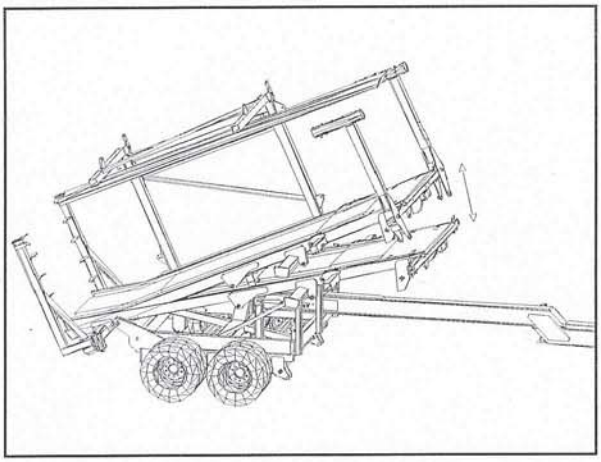
Red button - Grab Hooks disengaged



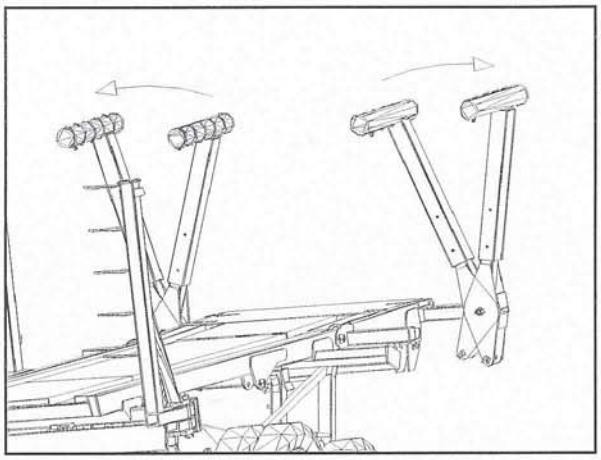
Loader Raises all the way



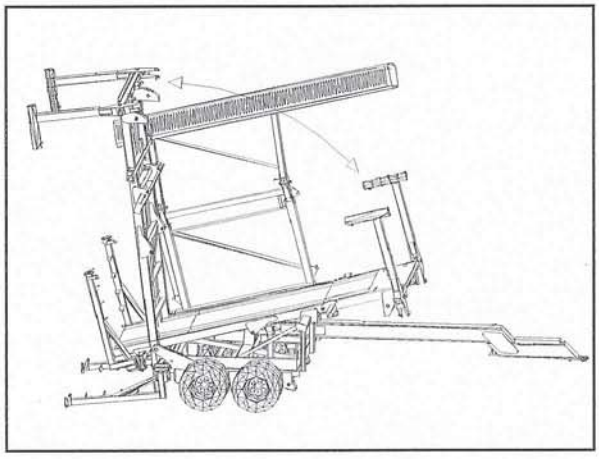
Yellow button - Raise and lower the Bed



Change direction of Lever 1
Alignment Arms Open

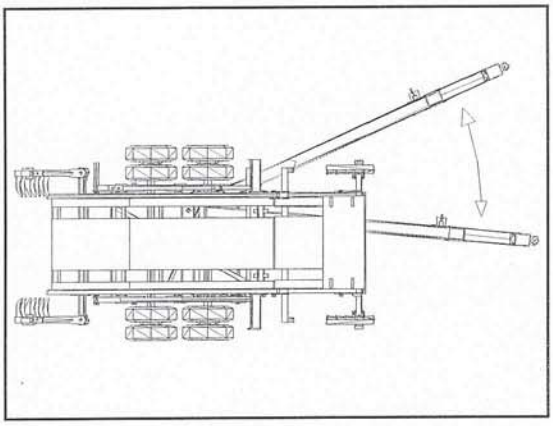


Lever 2 - Back, raises the Bed and when pushed, lowers the Bed. ***Note:*** Make sure the Top Slider is open before raising the Bed all the way to vertical.

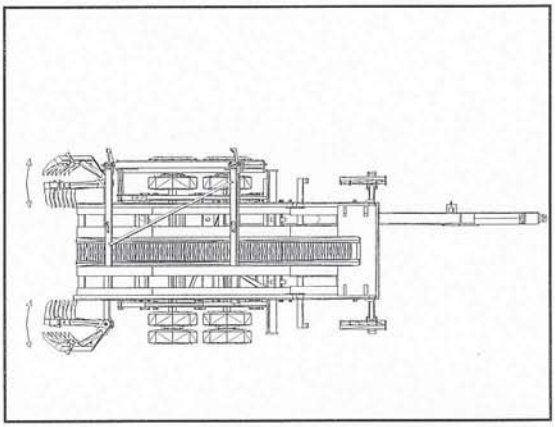


Lever 3 - When activated, does not affect any of the functions of the Bale Skoop until one of the 4 buttons on the RCS is pressed.

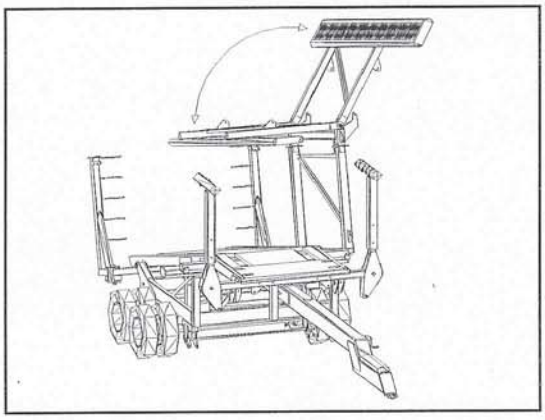
White button - Hitch "offset" and "in-line"



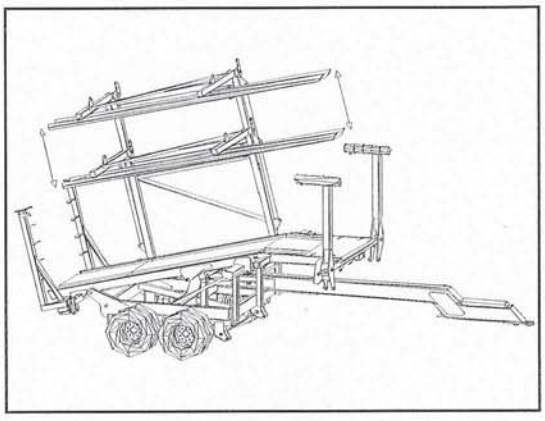
Gray button - Retriever Arms open and close



Green button - Top Slider open and close



Red button - Top Slider Adjustment up and down



PRE-OPERATION CHECKLIST ..... ❖

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 foot/lbs.
☐Tires	Check for improperly inflated tires. Repair or replace as needed.
☐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 and look for leaks, replace leaky hoses.
☐Jack	Check that the jack has been raised completely.
☐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.
☐Hydraulic Functions	Check to make sure machine functions as described.
☐Warning Light	Check that the Warning Light functions properly.
☐Hitch Connection	Check the bolt system that connects the stacker to the tractor drawbar. A loose connection will wear faster and possibly uncouple.

Machine Adjustments for Different Sized Bales

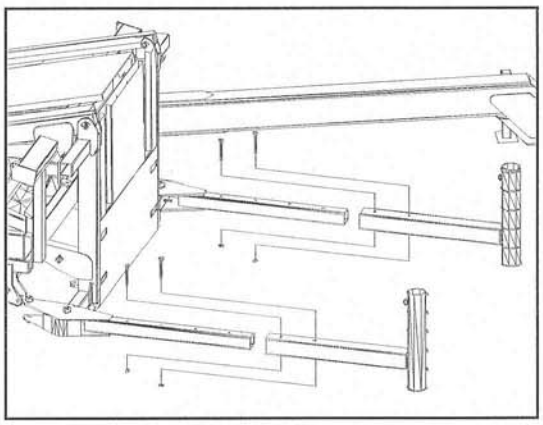
Before heading to the field, make sure the Alignment Arms and Retriever Arms are adjusted to the right length for the bale sizes being stacked.

Stacking 8 - 1 Ton, 10 or 12 - 3x4, or 18 - ½ Ton Bales

The Retriever Arms should have the extensions attached and the Alignment Arms should be in the last two holes.

Stacking 12 - ½ Ton Bales

The Retriever Arm Extensions should be removed and the Alignment Arms should be in the first two holes.

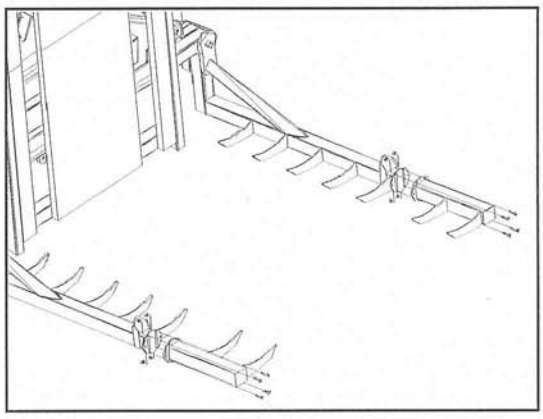


Adjusting the Alignment Arms

- ☞ Before adjusting the Alignment Arms, "off-set" the Hitch and lower the Loader all the way. Unhook the Alignment Arm Chains so that they can be re-adjusted after the lengths of the Alignment Arms are adjusted. Remove the bolts that hold the Alignment Arm ends on and position them to the desired length required as described above. Replace the bolts and re-tighten.
- ☞ Raise the Loader enough to be able to place a block under the Alignment Arm. Lower the Loader with the Alignment Arm on the block until the weight of the Alignment Arm is clearly off of the Alignment Arm Pivot. Re-hook the Alignment Arm Chain and get it as tight as possible. Do this for both Alignment Arms.

Adjusting the Retriever Arms

- ☞ Remove or replace the Retriever Arm Extensions that are held on by the 4 bolts on top of each Retriever Arm.



- ☞ The Retriever Arm Chains should be tight enough to take the weight of the Retriever Arms off of the Retriever Arm Pivots. If the Chains appear loose, open the Retriever Arms and grab the next link on the Chain. Close the Retriever Arms and see if the Chain is tight enough. Repeat if necessary.

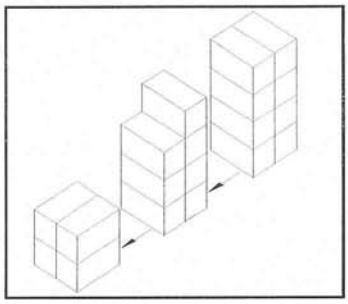
BUILDING STACKS

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.

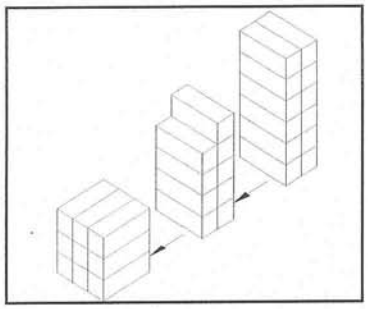
Starting Stacks

1. Choose a level area, with enough room to maneuver a tractor and Bale Skoop even after the stack is finished. ***Note:*** If completely level ground is not available, then build your stack uphill (front of tractor and Bale Skoop 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 only be 2 bales by 3 bales tall with one extra bale in the fourth tier.

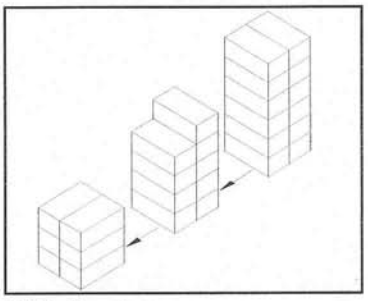


1 Ton Backstop



½ Ton Backstop

½ 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 stack should only be 2 bales by 4 bales, with one extra in the fifth tier. When stacking 18 - ½ ton bales, the same backstop can be used.



3X4 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 only be 2 bales by 4 bales, with one extra in the fifth tier.

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

Approaching Bales

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

1. The easiest way to pick up bales is by driving the Bale Skoop perpendicular to the path of the baler.

2. Approach and load bales traveling straight up or down slopes to help eliminate side shift of bales on the Bed.

3. Before arriving at a bale, "offset" the Hitch and lower the Loader all the way down. The Alignment Arms should be open and the Grab Hooks disengaged. ***Note:*** Make sure the Top Slider is raised high enough to allow the bales to slide under it when they are lifted by the Loader.

4. Bales are picked up on their 8 foot side.

5. The Auto Align system will allow the operator to approach the bale from almost any direction.

Loading Bales

1. When the bale is between the Alignment Arms and against the Loader, pull back on lever 1. The Alignment Arms will automatically squeeze the bale and then the loader will start to raise.

CAUTION: The first two bales, that are lifted by the loader, make the Bale Skoop front heavy. Caution must be exercised when the Bale Skoop is in this position.

2. Push the green button on lever 1 to engage the Grab Hooks. Hold until Loader starts to raise (the Grab Hooks should be fully engaged to hold the first bale).

3. Release the green button and lever 1. As you approach the next bale, push lever 1 forward to open the Alignment Arms and lower the Loader.

4. Once the second bale is between the Alignment Arms, raise the Loader so that it is level with the ground and push the red button on lever 1 to release the Grab Hooks. ***Note:*** Make sure the Top Slider is out of the way before raising the Loader all the way.

5. After the Loader is fully raised, float the Top Slider down on top of the bales by pushing the red button on lever 3 and pushing lever 3 forward. ***Note:*** This only has to be done for the first two bales of each load. Once this height is adjusted, it should not have to be changed until different sized bales are stacked or the Top Slider is lowered for road transport.

6. Once the Top Slider is in place to keep the bales from tumbling, lever 1 can be pulled back and the yellow button pushed resulting in the bed incline to be increased. ***Note:*** This increase in the bed incline should only be a few degrees but depends on the weight and moisture content of the bales.

7. When the incline of the bale sliding surface appears sufficient enough to allow the bales to slide back, push lever 1 forward while still holding the yellow button in. This opens the Alignment Arms and releases the bales from the Loader. As soon as the Alignment Arms are open, the bed will lower until it rests on the Frame. Release the yellow button keeping lever 1 forward and the Loader will lower to start the bale loading process over.

8. After gathering the next two bales, the Top Slider should already be adjusted so the operator can just hold back on lever 1 until the Loader is all the way up. Then push the yellow button. The Bed will start to raise. As soon as the incline is high enough, reverse direction of lever 1 and the bales will be released. If it happens that there isn't enough incline for the bales to slide, release lever 1 and pull back on lever 2 until the bales begin to slide. This will increase the incline without closing the Alignment Arms.

9. Repeat step 8 until the Bale Skoop is full. The Loader should not be lowered after the last bales are raised as it becomes part of the bale accumulation platform.

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.

10. Move the hitch "in-line" by pushing the white button on lever 3 and lever 3 forward before traveling to the stacking area.

Stacking Bales

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.

1. After the last bale(s) is/are picked up, raise the Loader all the way up. This squeezes the load between the Retriever Teeth and the Alignment Arms making a compact load.

2. Position the tractor and Bale Skoop in front of the backstop.

3. Open the Top Slider by pushing the green button on lever 3 and pulling lever 3. ***Note:*** If the Bed is raised before the Top Slider is open, lower the Bed completely before opening the Top Slider.

4. Raise the Bed by pulling on lever 2 to 70 or 80 degrees (so it is almost vertical, but the weight of the bales is still clearly against the Bed).

5. Back up until the corner of the bottom bale on the Bale Skoop comes into contact with the back stop.

6. 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.

7. Push on lever 1 to open the Alignment Arms and release the top of the stack.

8. Push the gray button on lever 3 and pull lever 3 to open the Retriever Arms under the stack.

9. Pull forward slowly and lower the Bed all the way. ***Note:*** Be sure the Loader is raised enough not to hit the Hitch when the Bed is lowered all the way.

10. Close the Top Slider, close the Retriever Arms, and place the Hitch "in-line". You are ready to go gather another load of bales.

TRANSPORTING BALE SKOOP . . . . . ❖

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

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

WARNING: Lower the Top Slider all the way. This will reduce the risk of collision with overhead objects.

REMEMBER: When transporting any piece of oversized equipment:

1. Local laws differ from state to state so check with local authorities before transporting Bale Skoop on public roads. Obey all regulations as they pertain to the Bale Skoop. The specifications at the front of the manual contains most of the information that may be needed.

2. 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.

3. In the specified transport position, the Bale Skoop is 12 feet 4 inches tall. If loaded, the Bale Skoop has the potential to be 15 feet 8 inches tall. Use caution when transporting under bridges and power lines.

4. Always remember the extra width of the Bale Skoop. The full width of the Bale Skoop is approximately 11 feet 4 inches wide.

5. Drive carefully at an appropriate speed for the size and weight of the Bale Skoop. 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.

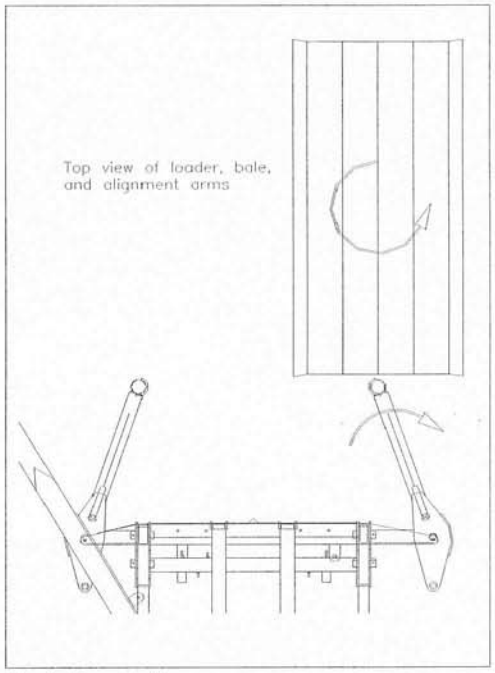
6. Plan route to avoid heavy traffic. Drive in a courteous manner.

6. Never drink and drive!

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

Rotating Bales

☞ If approaching the bale "end-on" is desired, the bale may be rotated, or spun, by closing the Alignment Arms slightly and hitting 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.



Rotating bales

Quarter Turning Bales

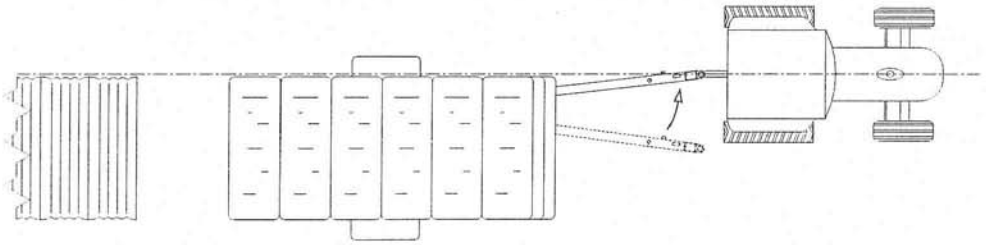
☞ To quarter turn a bale on the ground, raise the Loader until the Alignment Arms squeeze together. With the ends of the Alignment Arms positioned about halfway up the side of the bale, move forward, while raising the Loader. Be careful not to catch and break any strings. ***Note:*** Quarter turning with a Bale Skoop 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.

Stacking

☞ For better visibility while building stacks, position the tractor in front of the stack with the Hitch slightly offset. Center the tractor against the edge of the stack and it is much easier to see what you are doing. . . stacks turn out straighter too!



Lining up the center of tractor with edge of stack

☞ 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 Skoop forward three feet and back into the stack to push the bales tight.

MAINTENANCE
❖ ❖ ❖ AND ❖ ❖ ❖
ADJUSTMENTS

Preventative Maintenance

Before operating your Bale Skoop 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.

Hydraulic System Preventative Maintenance

DANGER: Remember to set parking brake, turn off hydraulic system and tractor, and remove keys from ignition before servicing the Bale Skoop. The bed and loader should be lowered to their lowest position or securely blocked in position.

✓ Your tractor hydraulic system and fluid should be maintained according to manufacturers specifications.

✓ Check the fluid level in the tractor with the Bed and Loader cylinders retracted.

WARNING: Hydraulic fluid escaping under pressure can 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 locate suspected high pressure leaks.

✓ Replace all hoses or hydraulic components that show any sign of wear, cracks, leaking, etc.

IMPORTANT! RELIEVING HYDRAULIC PRESSURE FROM LINES

1. Always relieve hydraulic line pressure at the male end connectors located on the end of each of the 6 Hitch hoses.

2. Use a bucket to catch leaking hydraulic fluid.

DAILY MAINTENANCE . . . . . ❖

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

✓ **Daily Check**	
☐ Lubricate	Lubricate all grease points with all purpose grease. See page 49 for location of grease zerks.
☐ 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 Hydraulic	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 Skoop 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. Also examine the wheel lug nuts making sure all are tight and none are missing.
☐ Tire Air-pressure	Check air pressure in tires. Tire pressures are listed in the Machine Specification section at the front of this manual.

General Check

✓ Lug nuts should be tightened to 450-500 ft-lbs.

✓ U-bolts should be tightened to 350 ft-lbs. oiled and 470 ft-lbs. dry.

✓ 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 the Alignment Arm Chains

Place a block under each of the Alignment Arms and lower the Loader until the weight of the Alignment Arms is clearly off of the Alignment Arm Pivots. Unhook the Alignment Arm Chains and re-hook to the next link to get as tight as possible.

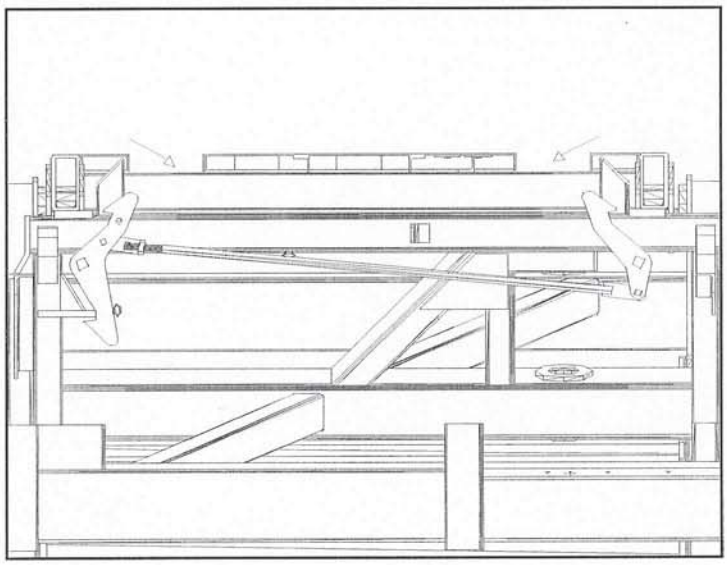
✓ Check all plastic wear surfaces used in the machine. These parts are located at the Hitch pivot point, between the Hitch and the Frame, at the Alignment Arm pivots, in the Grab Hook pivots on the Top Slider Frame, and on the Bed Extensions.

✓ Periodically check all bolts. Use grade eight bolts for replacements. Use torque chart in the Appendix as a guide when tightening bolts.

Top Slider Hooks Adjustment

WARNING: Make sure the Hitch is in-line and the Loader is resting on the Hitch before climbing underneath the Loader to adjust the Top Slider Hooks.

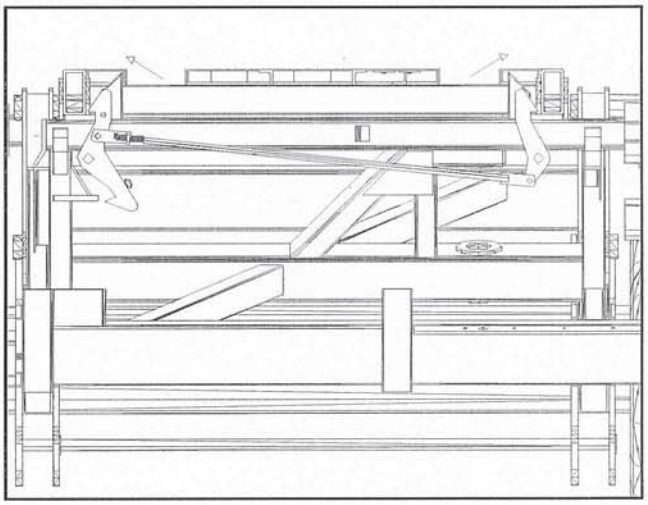
✓ The Right Top Slider Hook, under the Bed, should engage the frame when the Top Slider is open. This holds the Top Slider tight against the Frame when stacking. If the Hook doesn't engage the Frame completely, an adjustment in the linkage listed on pg 86 in the **Parts Breakdown** section can be made to correct the problem. Make sure that the Top Slider is all the way open when making the initial adjustment.



GENERAL MAINTENANCE

Top Slider Hooks Adjustment

✓ When the Top Slider is down, the Top Slider Hooks should engage the Bed allowing the Top Slider to rotate with the same degree of incline as the Bed. Make sure both Hooks engage the Bed. If they don't, the Tie Rod can be adjusted so they do.



YEAR END MAINTENANCE

Storage

✓ Park the Bale Skoop on level ground.

✓ Make sure the Bed is resting on the Frame and lower the Top Slider to its lowest possible position.

✓ Place the Loader on the Hitch with the Hitch in the "in-line" position.

✓ Lock Hitch in the "in-line" position with Hitch Safety Pin.

WARNING: Keep children away from the stored Bale Skoop. 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

✓ Paint Bed with a graphite impregnated paint to keep it from rusting.

✓ Touch up any scratches or flaking paint.

✓ Grease all zerks.

✓ Cover tires to prevent sun damage.

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

DANA CORPORATION

SPICER TRAILER AXLE DIVISION

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. Clen 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. Retighten 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.

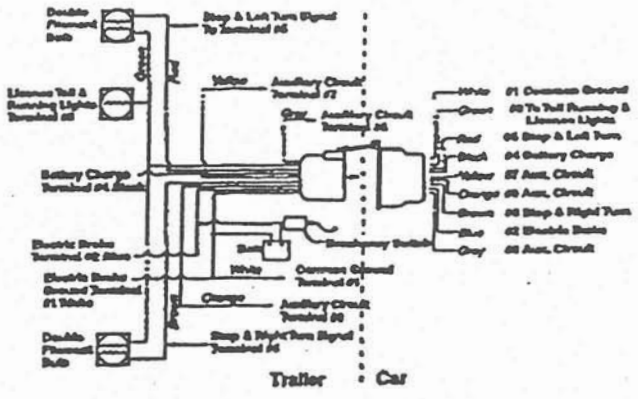
6. Install the retaining fastener or fasteners onto the spindle according to the fastener used. If washers are used, be sure they are facing in the right direction and are clean. Make sure any washers with dowels fit properly into the mating holes.

7. Install the outer spindle nut. Using a torque wrench, tighten this nut to 250-300 ft. lbs. Resulting end play should be .001" to .005"

NOTE: If end play is not .001" to .005", disassemble and repeat this procedure.

COMP BY	CHK BY			DATE		ENGINEERING SPECIFICATION	
NO		CHANGE	BY	CK	DATE	Wheel Bearing Adjustment Procedure (Double Nut Arrangement) MGM-100	SHT 1 OF 1
REVISED			TL	TL	3/21/86		
REVISED			TL	TL	6/15/88		
REVISED			CD	DG	8/01/93		

Trailer Wiring / Connector Wiring Diagram



Trailer Wire Size Chart

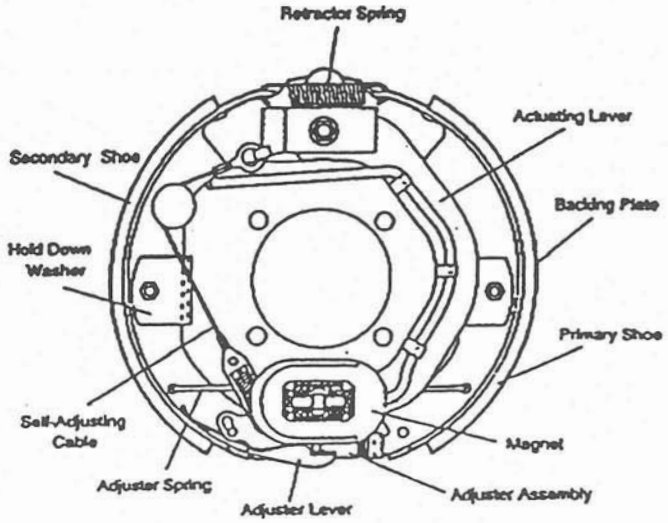
Number of Brakes	Hitch-to-Axle Distance in Feet	Recommended Minimum Hookup Wire Size (Copper)
2		12 AWG
4	Under 30	12 AWG
4	30-50	10 AWG
6	Under 30	10 AWG
6	30-50	8 AWG

How To Use Your Electric Brakes Properly

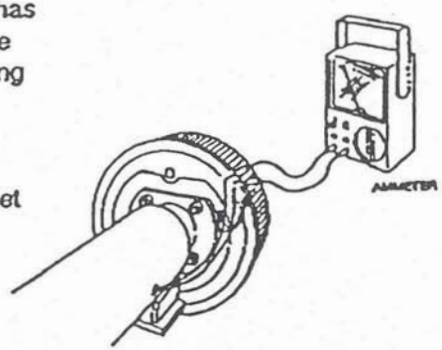
Your trailer brakes are designed to work in synchronization with your tow vehicle brakes. Never use your tow vehicle or trailer brakes alone to stop the combined load.

Your trailer and tow vehicle will seldom have the correct amperage flow to the brake magnets to give you comfortable, safe braking unless you make proper brake system adjustments. Changing trailer load and driving conditions as well as uneven alternator and battery output can mean unstable current flow to your brake magnets. It is therefore imperative that you maintain and adjust your brakes as set forth in this manual, use a properly modulated brake controller, and perform the synchronization procedure noted below.

In addition to the synchronization adjustment detailed below, electric brake controllers provide a modulation function that varies the current to the electric brakes with the pressure on the brake pedal or amount of deceleration of the tow vehicle. It is important that your brake controller provide approximately 2 volts to the braking system when the brake pedal is first depressed and gradually increases the voltage to 12 volts as brake pedal pressure is increased. If the controller "jumps" immediately to a high voltage output, even during a gradual stop, then the electric



System amperage draw should be as noted in the following table. Make sure your ammeter has sufficient capacity and note polarity to prevent damaging your ammeter.



If a resistor is used in the brake system, it must be set at zero or bypassed completely to obtain the maximum amperage reading. Individual amperage draw can be measured by inserting the ammeter in the line at the magnet you want to check. Disconnect one of the magnet lead wire connectors and attach the ammeter between the two wires. Make sure that the wires are properly reconnected and sealed after testing is completed.

By far, the most common electrical problem is low or no voltage and amperage at the brakes. Common causes of this condition are:

1. Poor electrical connections; bad ground
2. Open circuits
3. Insufficient wire size
4. Broken wires
5. Blown fuses (Fusing of brakes is not recommended.)
6. Improperly functioning controllers or resistors

Another common electrical problem is shorted or partially shorted circuits (indicated by abnormally high system amperage). These are occasionally the most difficult to find. Possible causes are:

1. Shorted magnet coils
2. Defective controllers
3. Bare wires contacting a grounded object

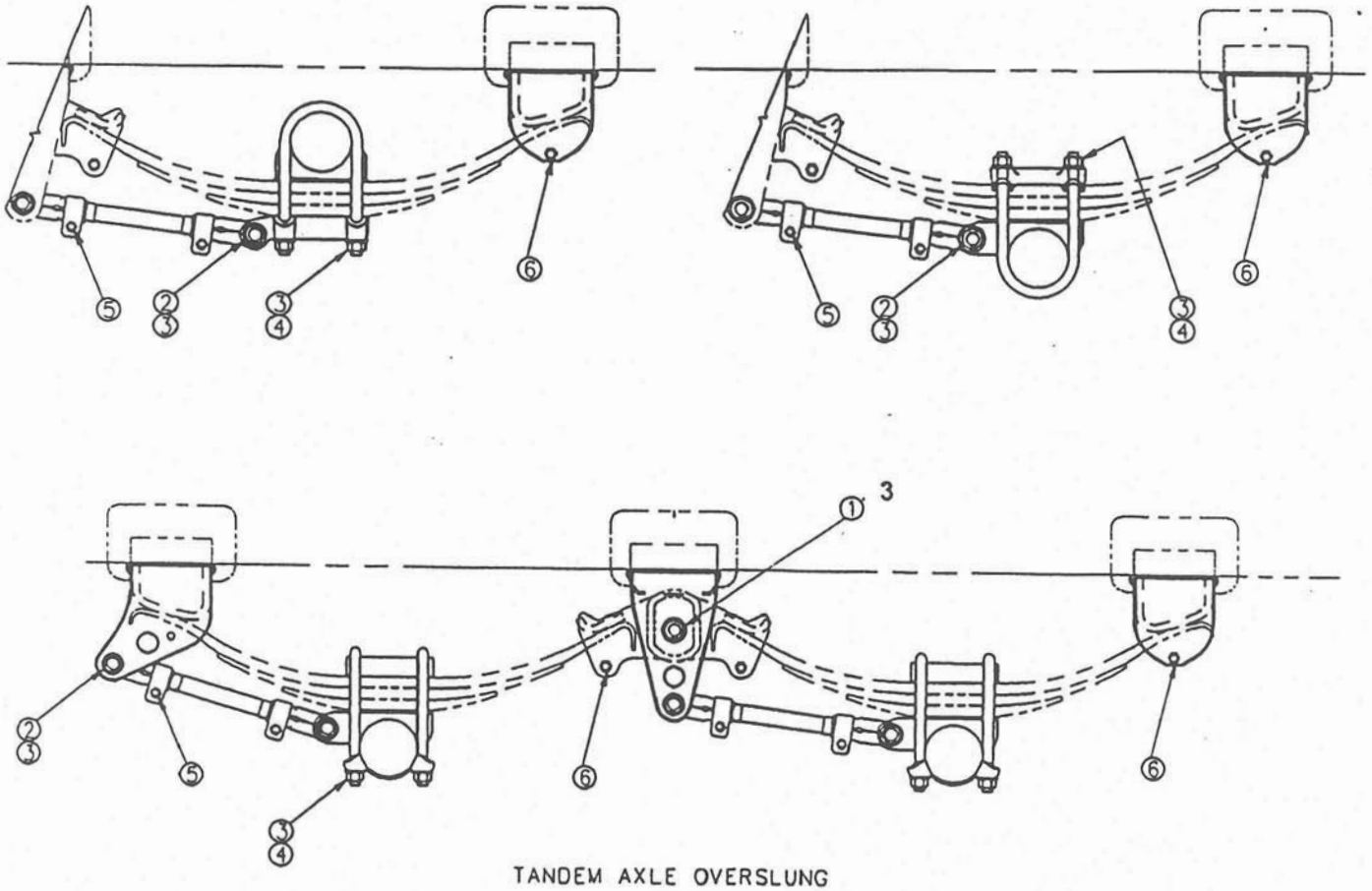
Finding the system short is a matter of isolation. If the high amperage reading drops to zero by unplugging the trailer, then the short is in the trailer. If the amperage reading remains high with all the brake magnets disconnected, the short is in the trailer wiring.

All electrical troubleshooting procedures should start at the controller. Most complaints regarding brake harshness or malfunction are traceable to improperly adjusted or non-functioning controllers. See your controller manufacturer's data for proper adjustment and testing procedures. If the voltage and amperage is not satisfactory, proceed on to the connector and then to the individual magnets to isolate the problem source. 12 volts output at the controller should equate to 10.5 volts minimum at each magnet. Nominal system amperage at 12 volts with cold magnets, system resistor at zero and controller at maximum gain should be as detailed in the following chart:

Magnet Amperes Chart

Brake Size	Amps/ Magnet	Two Brakes	Four Brakes	Six Brakes
12¼ x 3⅜	3.0	6.0	12.0	18.0
12¼ x 4	3.0	6.0	12.0	18.0
12¼ x 5	3.0	6.0	12.0	18.0

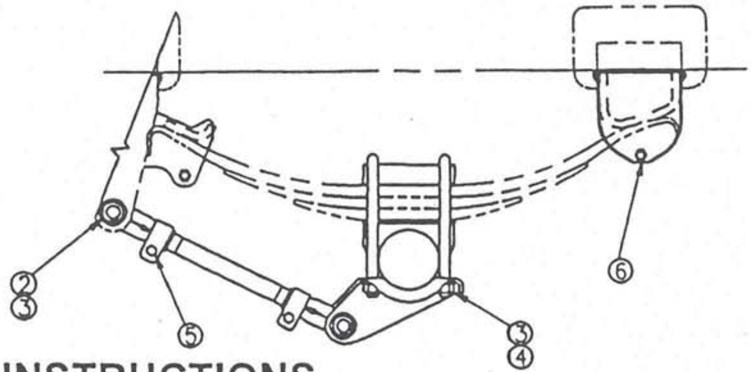
FASTENER IDENT. & TORQUE SPEC.



TANDEM AXLE OVERSLUNG

TORQUE SPECIFICATIONS

ITEM #	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



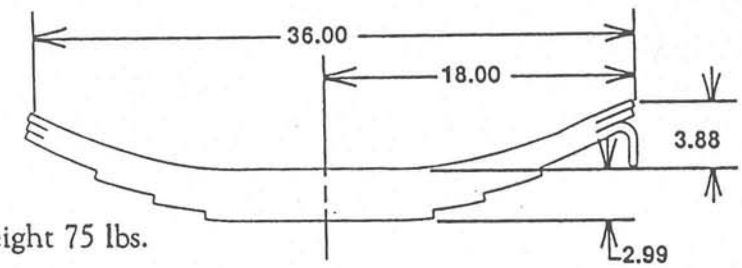
ASSEMBLY INSTRUCTIONS

Notes
1. To achieve the most consistent clamp loads, lubricate the threads and torque fasteners to the oiled specifications.
2. Tighten U-bolt nuts in an alternating pattern.
3. Not required if rocker and hanger are assembled at Hutchens.
4. Install decal #16086-01 in clear view on the road side of the trailer immediately above the suspension.

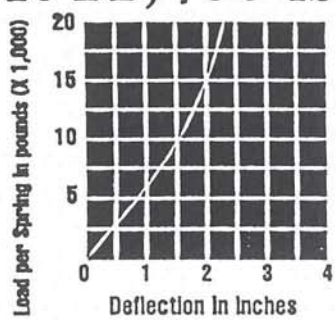
51-04 6 leaf

GAWR 22,400 lbs.

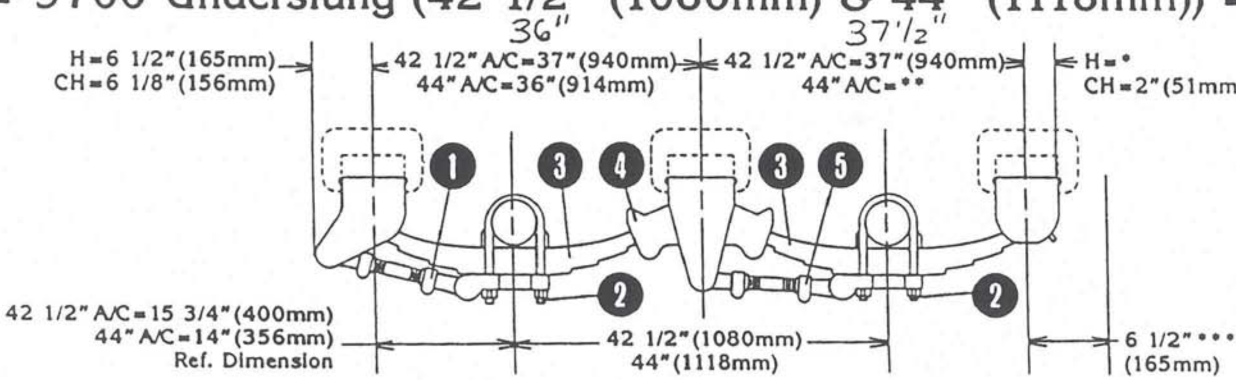
42 1/2" & 44" Axle Center All Positions - Hook to Rear



Weight 75 lbs.



9700 Underslung (42 1/2" (1080mm) & 44" (1118mm))



* Str/mt = 3 1/2"(89mm), Un/mt & Sl/mt = 3 7/8"(99mm), Fl/mt = 5 1/2"(140mm)
** This dimension when using the 751-04 spring is 37 1/2"(953mm). When using the 7051-42 spring it is 36"(914mm).
*** Recommended spring clearance.

Mounting Height (See [illegible]) (Inches(mm))
U-Bolt Part#

Axle Size	Spring Assembly	Spring Seat Height (inches) 3/4	1-1/4	1-3/4	2-1/4
5" Rd.	751-04 (6 leaf)	[illegible]	[illegible]	[illegible]	[illegible]
		7816-11	7816-12	7816-13	7816-14
	7051-42 (single leaf)	[illegible]	[illegible]	[illegible]	[illegible]
		7816-08	7816-09	7816-10	7816-11
5" x 5" Square	751-04 (6 leaf)	[illegible]	[illegible]	[illegible]	[illegible]
		7840-07	7840-08	7840-09	7840-10
	7051-42 (single leaf)	[illegible]	[illegible]	[illegible]	[illegible]
		7840-04	7840-05	7840-06	7840-07
4" x 6" Rect.	751-04 (6 leaf)	[illegible]	[illegible]	[illegible]	[illegible]
		7040-11	7040-12	7040-13	7040-14
	7051-42 (single leaf)	[illegible]	[illegible]	[illegible]	[illegible]
		7040-08	7040-09	7040-10	7040-11

Mechanical Specifications for Externally Threaded Fasteners with Grade Markings

Specification	Material	Size Range (Inches)	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 7/8–1-1/2	55,000 33,000	74,000 60,000	B80 B70	B100 B100	57,000 36,000	
ASTM A307-Grade A	Low or medium carbon steel	1/4–4		60,000	B69 *See Note 1*	B100		A307A
ASTM A307-Grade B	Low or medium carbon steel	1/4–4		60,000(min) 100,000(max)	B69 *See Note 1*	B95		A307B
SAE J429-Grade 5 ASTM A449-Type1	Medium carbon steel: quenched & tempered	1/4–1 1-1/8–1-1/2	85,000 74,000	120,000 105,000	C25 C19	C34 C30	92,000 81,000	
ASTM A449-Type 1 *See Note 2*		1-3/4–3	55,000	90,000			58,000	
ASTM A325-Type 1	Medium carbon steel: quenched and tempered	1/2–1 1-1/8–1-1/2	85,000 74,000	120,000 105,000	C25 C19 *See Note 3*	C34 C30	92,000 81,000	A 325
ASTM A354 Grade BC	Medium carbon alloy steel: quenched and tempered	1/4–2-1/2 2-1/2–4	105,000 95,000	125,000 115,000 *See Note 2*	C26 C22	C36 C33	109,000 99,000	B C
ASTM A354 Grade BD	Medium carbon alloy steel: quenched and tempered	1/4–2-1/2 2-1/2–4	120,000 105,000	150,000 140,000	C33 C31 *See Note 2*	C39 C39	130,000 115,000	B D *See Note 4*
SAE J429-Grade 8	Medium carbon alloy steel: quenched and tempered	1/4–1-1/2	120,000	150,000	C33	C39	130,000	
SAE J429-Grade 8.2	Low carbon boron steel: quenched and 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) 170,000(max)	C33 *See Note 3*	C39	130,000	A 490
ASTM A574 Socket Head Cap Screw	Low alloy steel: quenched and tempered	#0–1/2 over 1/2–2		180,000 170,000	C39 C37	C45 C45	162,000 153,000	

Note 1: No minimum hardness is required on bolts and studs 3 times the diameter and longer.

Note 2: Bolts less than 3 times the diameter in length and studs less than 4 times the diameter in length shall have hardness values not less than minimum and not more than maximum.

Note 3: Bolts 3 times the diameter in length and over are not required to meet minimum hardness requirements.

Note 4: ASTM A354-Grade BD with diameters 1/4" through 2-1/2" 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 2-1/2" in diameter.

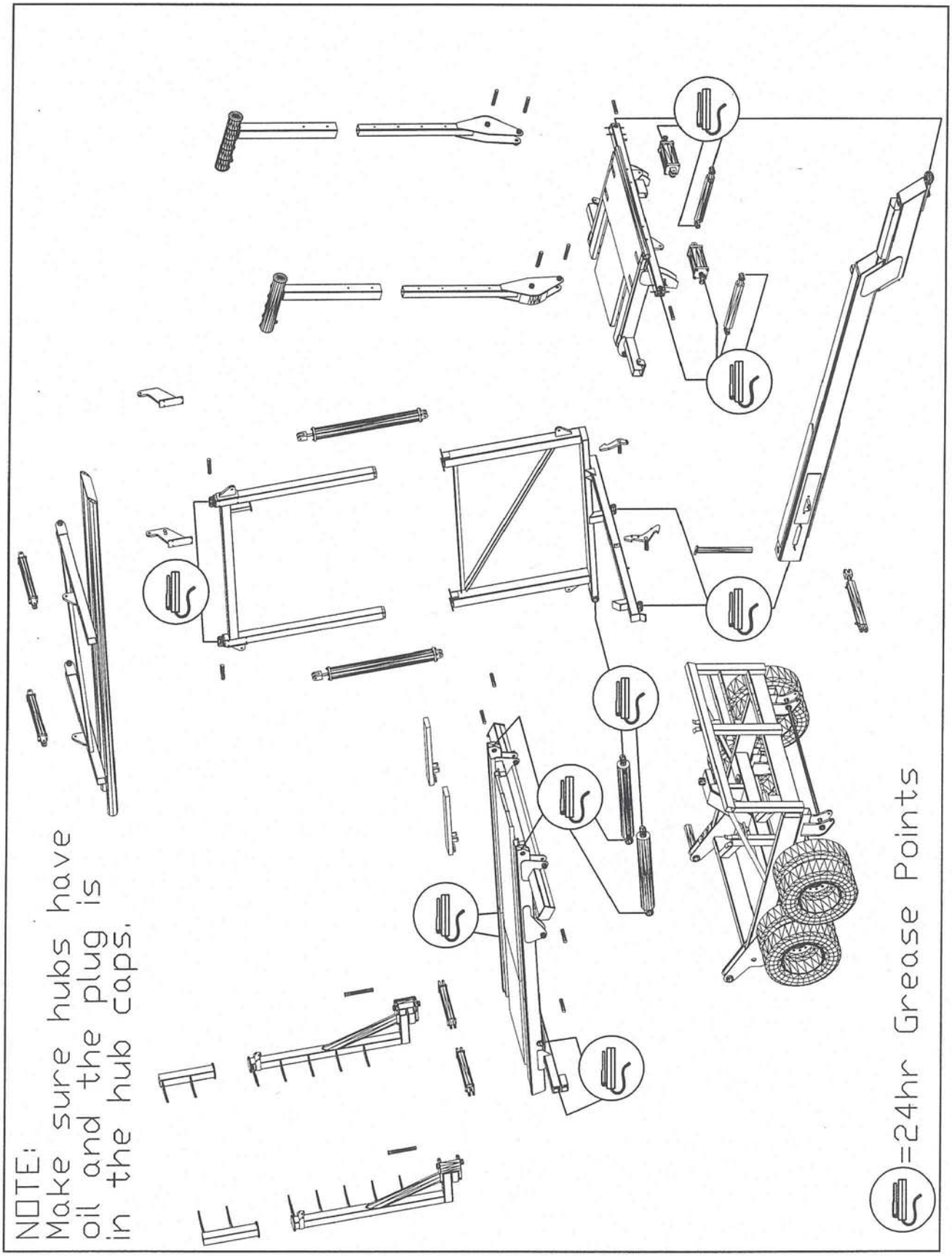
Torque-Tension Relationships for SAE J429 Grade Bolts

Nominal Thread Size	SAE J429 Grade 2 Clamp Load (lbs.)	SAE J429 Grade 2 Tightening Torque K = .15	SAE J429 Grade 2 Tightening Torque K = .20	SAE J429 Grade 5 Clamp Load (lbs.)	SAE J429 Grade 5 Tightening Torque K = .15	SAE J429 Grade 5 Tightening Torque K = .20	SAE J429 Grade 8 Clamp Load (lbs.)	SAE J429 Grade 8 Tightening Torque K = .15	SAE J429 Grade 8 Tightening Torque 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

Clamp load estimated as 75% of proof load for specified bolts.

Torque values for 1/4 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 and K = 0.20 for "dry" conditions.


NOTE:
Make sure hubs have
oil and the plug is
in the hub caps.
=24hr Grease Points

TROUBLESHOOTING

❖ ❖ ❖ GUIDE ❖ ❖ ❖

Hydraulic System Overview

The movement of the Loader on the Auto Align Bale Skoop model 16K is controlled by the Manifold Valve and Double Selector Valve located under the Bed. The Manifold consists of 2 pressure relief valves which are set to open when the fluid pressure against them reaches a designated pressure. These internal pressure relief valves are adjustable, allowing for fine-tuning of the hydraulically actuated sequence of motions of the Loader.

Troubleshooting the Hydraulics

Most problems with the hydraulic system for the Bale Skoop are rooted either in mis-adjusted pressure relief valve(s) in the manifold, switched hoses entering the manifold, or faulty electrical connection(s) to the electric over hydraulic valves.

Hose Routing

When troubleshooting hydraulic problems always start with the hose routing. Use the Hydraulic Hose Routing diagram in the Parts Breakdown section to confirm the proper hose routing. Also, inspect tips and couplers for proper mating.

Electric Over Hydraulic Valves

If a function that is controlled by any of the 3 electric over hydraulic valves doesn't work, check to make sure that all the electrical connections are secure and that the valves are properly grounded. If the valve was previously working, the trouble is most likely the result of a blown fuse, damaged wiring or a bad switch.

If the valves seem to be wired correctly and the hoses are routed properly, the solenoid on the valve body for which the function not operating is controlled, may be faulty. A simple way to determine if a solenoid is being energized is by touching the large mounting nut on top of the coil with a screwdriver. The coil is an electromagnet and will attract the screwdriver when the power is on. If the screwdriver does not stick to the top of the coil, use a voltmeter to check for voltage between the coil terminal and the mounting nut. If the voltage is at least 11 volts, the valve should be functioning. When the coil is energized, a click should be heard from the valve. The sound may be muffled, however, if the valve is full of oil or under pressure. If the voltage is low, check the voltage at the source where the power wire for the control was connected. If no voltage is found, try measuring voltage between the coil terminal and the tractor frame. If voltage is indicated, the valve is not being grounded. Ground the valve by running a wire from the mounting nut on top of the coil to the frame of the tractor. If no voltage is indicated between the coil wire and ground, first check the fuse and then the hot wire to the control. On the 4-way valve, which operates the Grab Hooks, check the coils diagonally. ie When upper left is energized, lower right should be energized. When upper right is energized, lower left should be energized.

If none of the circuits work and the solenoid coils are being operated with at least 11 volts (measured at the coils), check that the supply connections from the tractor remote to the valve are correct. If one circuit works and the other does not, try swapping the wiring between the working and non-working circuits, then swapping the solenoid coils (torque to 5 ft-lbs. only). Finally try swapping valve cartridges (torque to 25 ft-lbs.). Be careful not to over tighten the coil nut. Over tightening could crack the coil housing which could cause premature coil failure.

DANGER: Use extreme care when checking for oil leaks! Use a piece of cardboard or wood to look for leaks and not your hands. Oil under pressure can penetrate skin resulting in infection or gangrene. Always wear gloves and protective clothing including eye protection when working near hydraulic components. Tips can be ejected forcefully from tractor remotes when under pressure. Stay clear of all valves, lines, and cylinders when operating controls.

Valves and Valve Functions

Manifold Valve

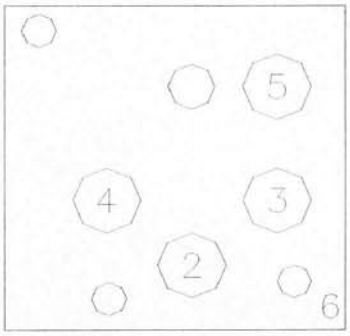
Valve 2. Plug.

Valve 3. Sequence check valve causes the Alignment Arms to close first and then the Loader to raise.

Valve 4. Counter balance valve which holds the Loader up while the Alignment Arms open.

Valve 5. Plug.

Valve 6. Check valve which causes the oil to flow in the right direction.



Manifold Valve (bottom)

Double Selector Valve

Allows hydraulic oil to go to the Loader cylinders or the Bed cylinders.

4-Way Valve

Directs hydraulic oil to the rod end or to the butt end of the Grab Hook Cylinder.

Quadruple Selector Valve

Directs hydraulic oil to the Top Slider Cylinders, the Top Slider Adjustment Cylinders, the Hitch Cylinder, or the Retriever Cylinders.

❖ . . . . . HYDRAULIC TROUBLESHOOTING CHART

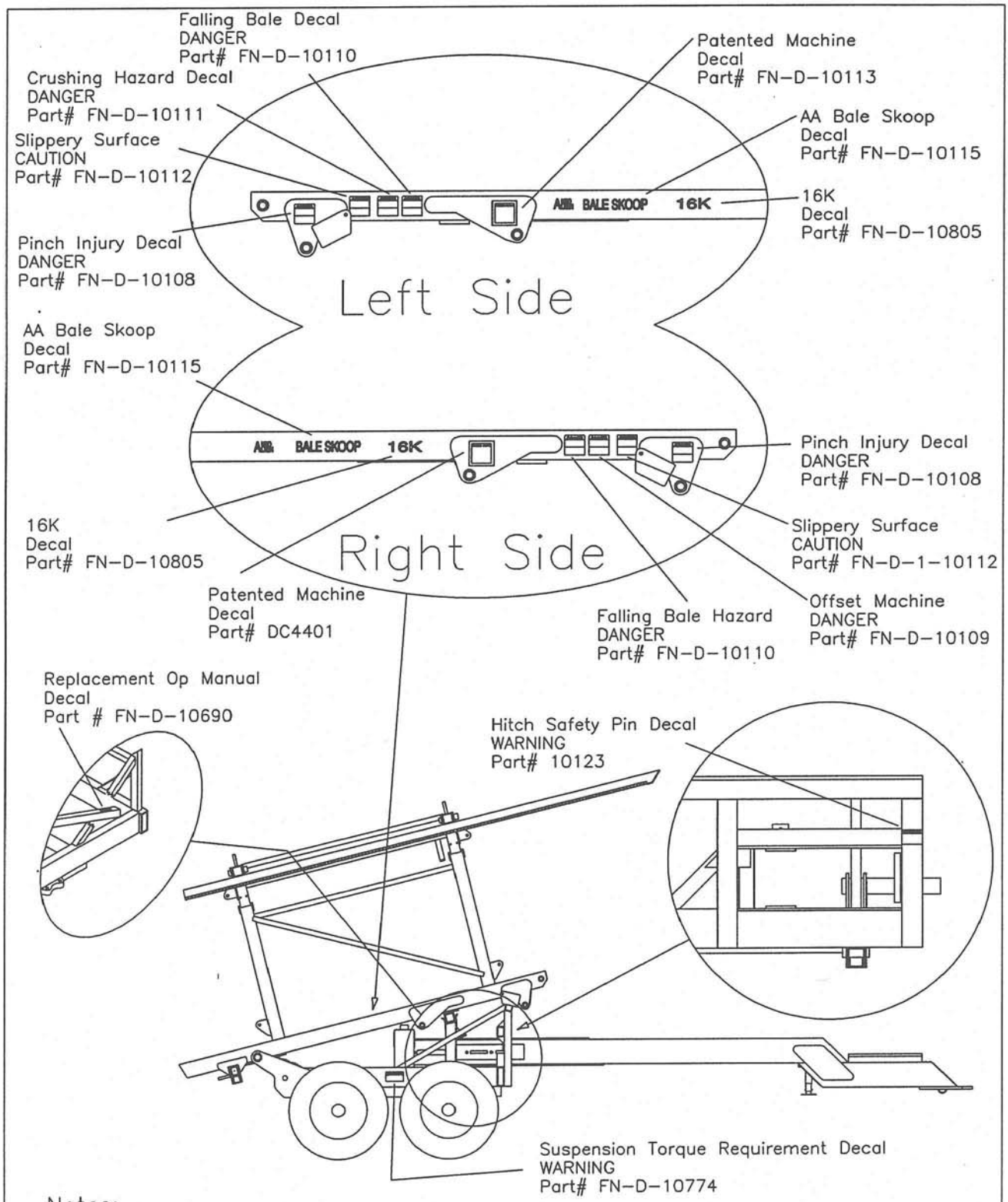
Use the Troubleshooting Chart below to correlate the problem with a potential solution.

Symptom	Problem	Solution
Loader will not raise	Valve #3 is set too high	Turn adjustment screw OUT on valve #3
	Double Selector valve not functioning properly	Make sure valve is wired correctly and grounded properly
Loader raises slow	Valve #3 is set too high	Turn adjustment screw OUT on valve #3
	Tractor hydraulic flow or pressure is slow or low	Contact tractor manufacturer or dealer
Loader lowers when Alignment Arms are opening	Valve #4 is set too low	Turn adjustment screw OUT on valve #4
Loader lowers before Alignment Arm open	Valve #4 is set too low	Turn adjustment screw OUT on valve #4
Loader will not lower	Valve #4 set too high	Turn adjustment screw IN on valve #4
Loader lowers slow	Valve #4 set too high	Turn adjustment screw IN on valve #4
Alignment Arms do not center bales, or squeeze bales tight	Valve #3 set too low	Turn adjustment screw IN on valve #3
Alignment Arms open as Loader raises, and close as Loader lowers	Wrong hose routing	Check hose routing against diagram
Grab Hooks push bale away from Loader	Valve #3 set too low	Turn adjustment screw IN on valve #3
Grab Hooks will not engage	Wrong hose routing	Check hose routing against diagram
	4-Way valve not functioning properly	Make sure valve is wired correctly and grounded properly
Grab Hooks will not disengage	Wrong hose routing	Check hose routing against diagram
	4-Way valve not functioning properly	Make sure valve is wired correctly and grounded properly

SAFETY SIGNS

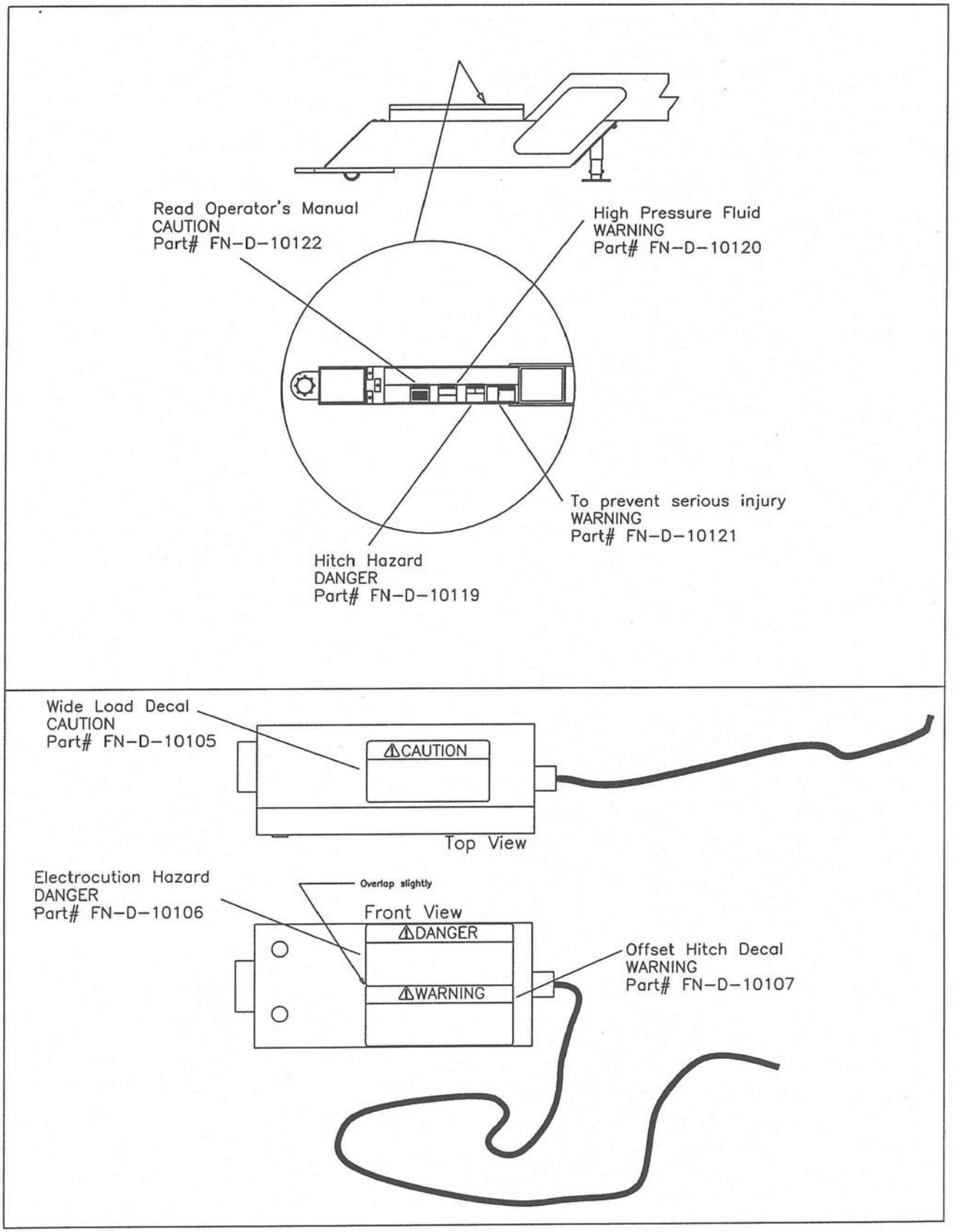
❖ ❖ ❖ AND ❖ ❖ ❖

DECALS



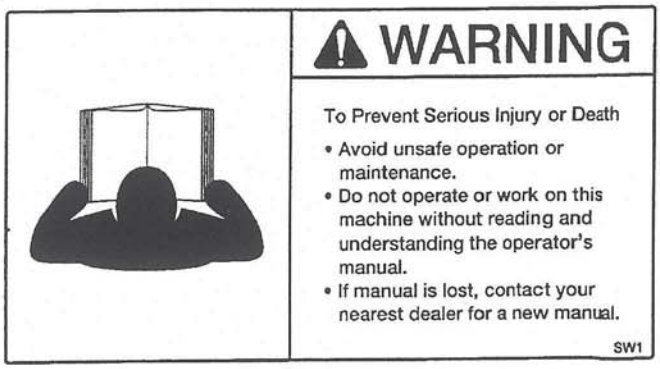
Notes:
1. Some parts not shown for clarity.

DECAL LOCATION GUIDE



Part # FN-D-10110 - Danger falling bale hazard
Location: Both sides of Bed.

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



Part # FN-D-10121 - Warning To Prevent Serious Injury
Location: Top of hitch.

Part # FN-D-10119 - Danger Hitch Hazard
Location: Top of hitch.

Part # FN-D-10122 - Caution Read Operator's Manual
Location: Top of hitch.

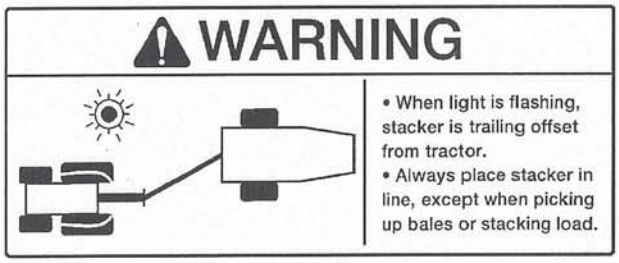
Part # FN-D-10112 - Caution
Slippery Surface Decal
Location: Both sides of Bed

Part # FN-D-10109 - Danger
Offset Machine Decal
Location: Right Side of Bed

Part # FN-D-10113 - Patented Machine Decal
Location: Both Sides of Bed

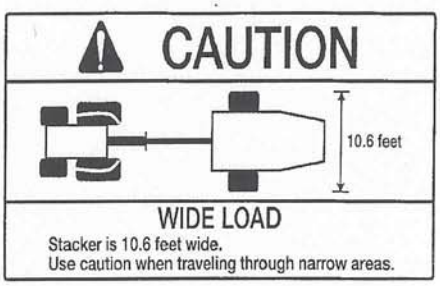
Part # FN-D-10108 - Danger
Pinch Injury Decal
Location: Both sides of Bed

Part # FN-D-10120 - Warning
High Pressure Fluid
Hazard
Location: Top of Hitch

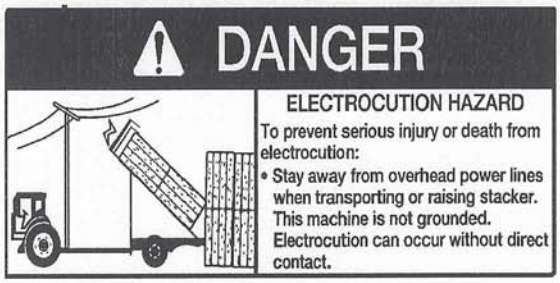


Part # FN-D-10109 - Warning Offset Machine Decal
Location: On warning light box.

Part # FN-D-10123 - Warning Hitch Safety Pin
Location: Front of Frame above Hitch.



Part # FN-D-10105 Caution Wide Load Decal
Location: On warning light box



Part # FN-D-10106 Electrocution Hazard Decal
Location: On warning light box.

Part # FN-D-10115 - "Auto Align Bale Skoop" Decal
Location: Both sides of bed.

Part # FN-D-10805 - "16K" Decal
Location: Both sides of Bed

Part # FN-D-10690 - Replacement Op Manual
Location: On frame by op manual box.

⚠ 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. F)

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.

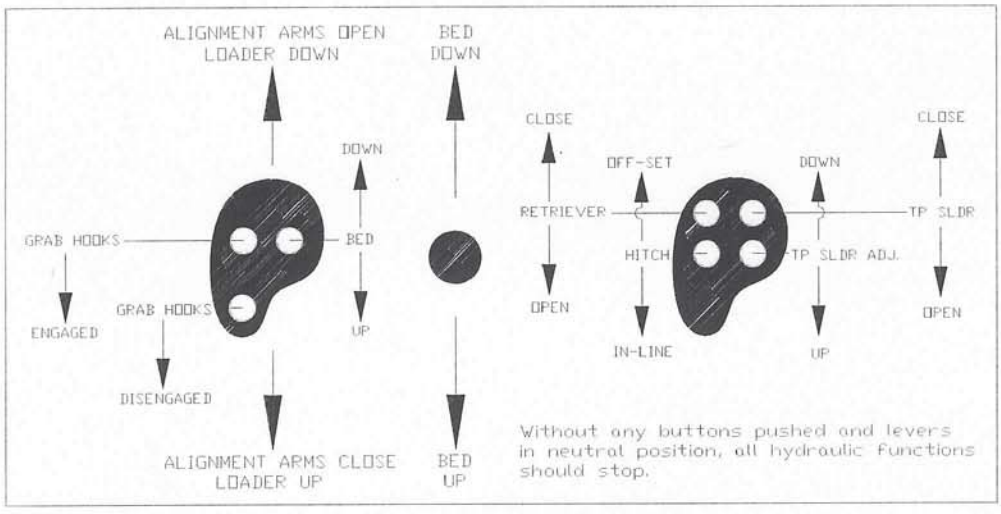
Oiled torque values listed are for new fasteners with lubricated threads. It is recommended that new installations be performed with oiled fasteners. For dry threads which have been in service, use the higher torque values which are noted below.

	OILED	DRY
1 1/8-7 (9600 / 9700 Rocker Bolt)	590 lb-ft	790 lb-ft
1-14 or 1-7 (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

Part # FN-D-10774 - Suspension Torque Requirements Decal
Location: Right Side of Frame

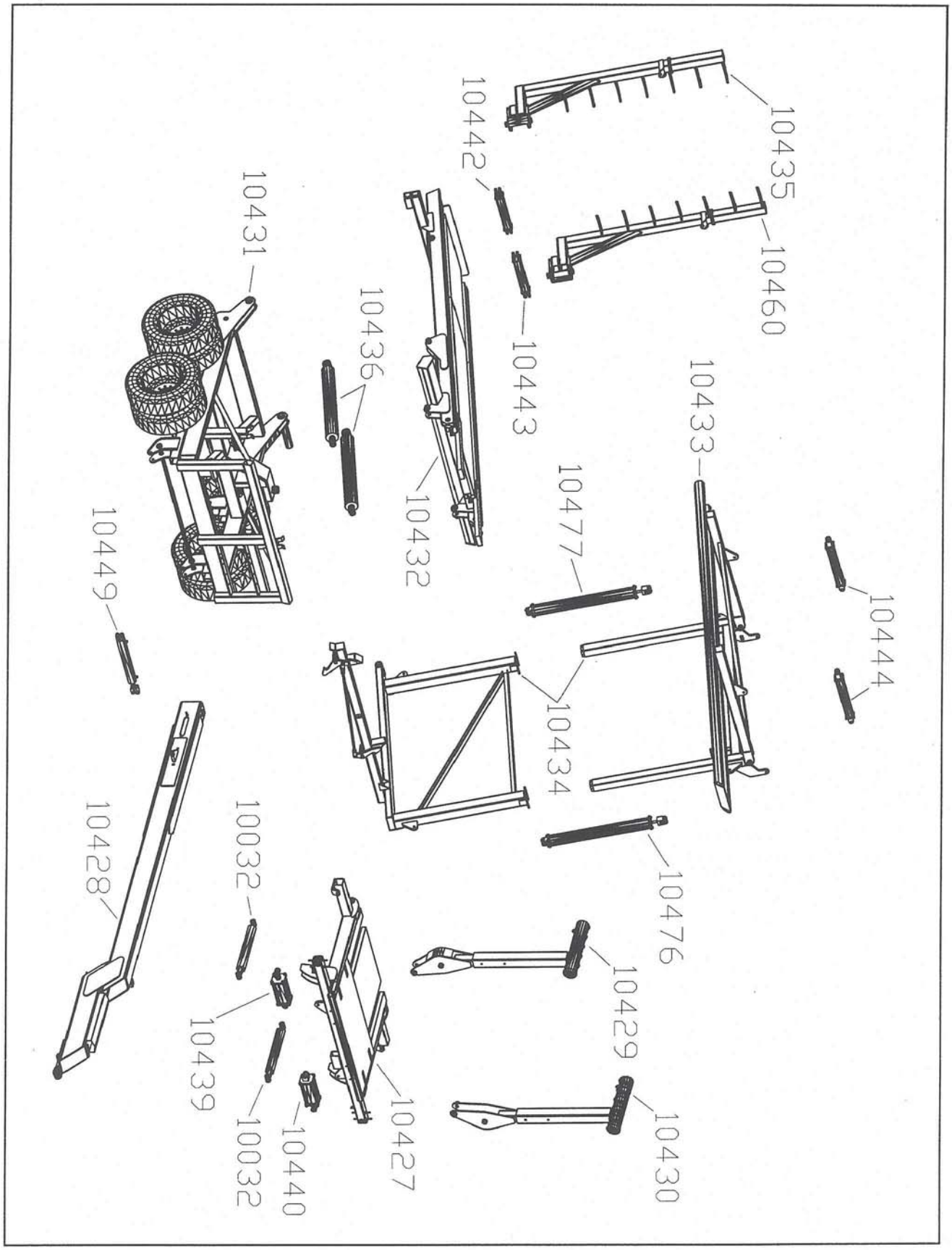


Part # FN-D-10806 - Magnetic Operation Instructions
Part # FN-D-10807 - Sticker Operation Instructions
Location: Inside Cab of Tractor

PARTS

❖ ❖ ❖ BREAKDOWN ❖ ❖ ❖

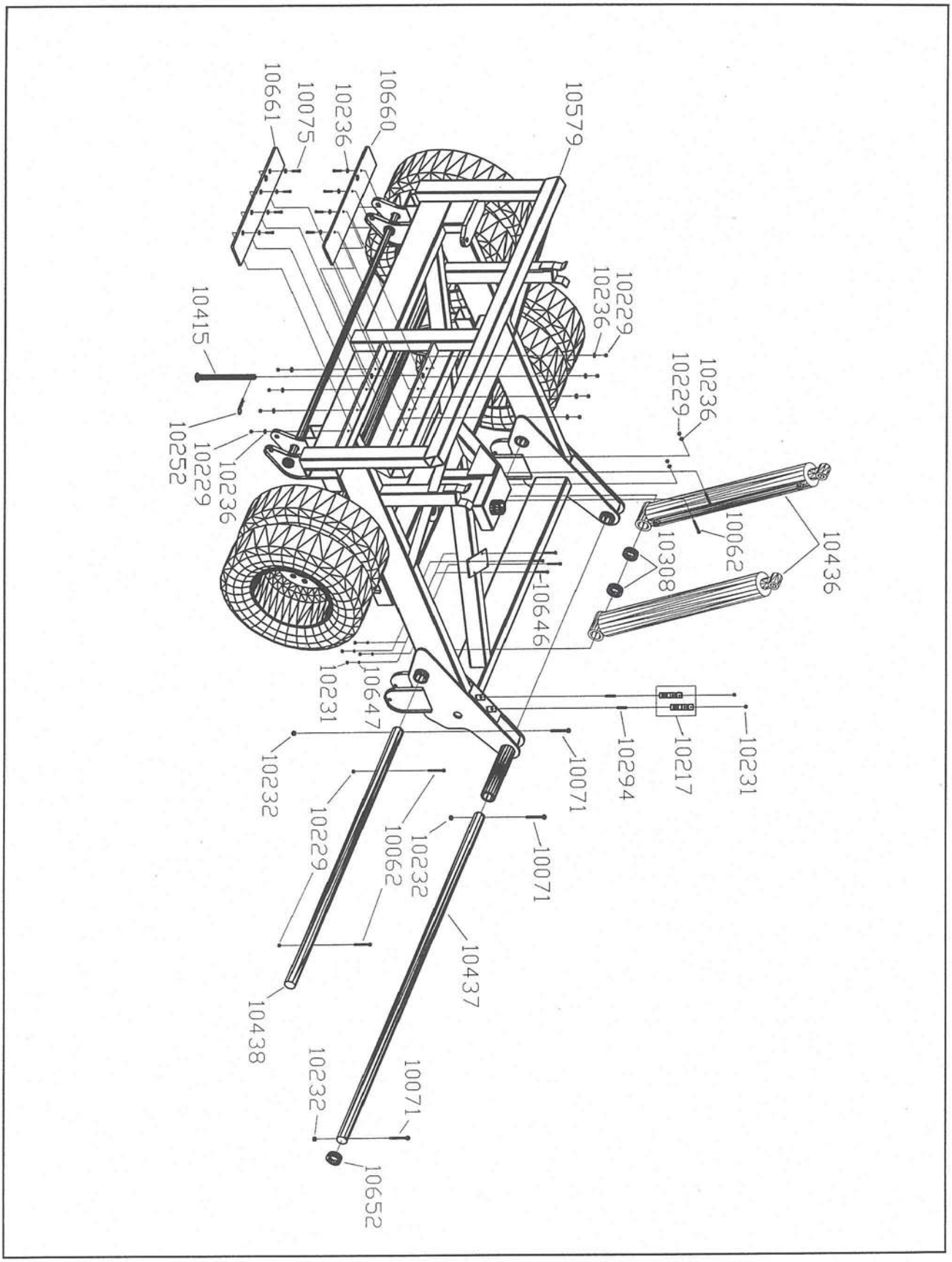
16K ASSEMBLY



16K Assembly

Part #	Description	Qty
10428	16K HITCH ASSEMBLY	1
10427	16K LOADER ASSEMBLY	1
10434	TOP SLIDER FRAME ASSEMBLY	1
10433	TOP SLIDER WELDMENT PAINTED	1
10431	16K FRAME ASSEMBLY	1
10432	16K BED ASSEMBLY	1
10460	LT RETRIEVER ASSEMBLY	1
10435	RT RETRIEVER ASSEMBLY	1
10430	LT ADJUSTABLE ALIGNMENT ARM ASSEMBLY	1
10429	RT ADJUSTABLE ALIGNMENT ARM ASSEMBLY	1
10436	16K BED CYLINDER	2
10032	LOADER CYLINDER	2
10449	16K HITCH CYLINDER	1
10439	16K RT ALIGNMENT ARM CYLINDER	1
10440	16K LT ALIGNMENT ARM CYLINDER	1
10442	RT RETRIEVER CYLINDER	1
10443	LT RETRIEVER CYLINDER	1
10444	TOP SLIDER CYLINDER	2
10476	FRONT TOP SLIDER ADJ. CYLINDER	1
10477	REAR TOP SLIDER ADJ. CYLINDER	1

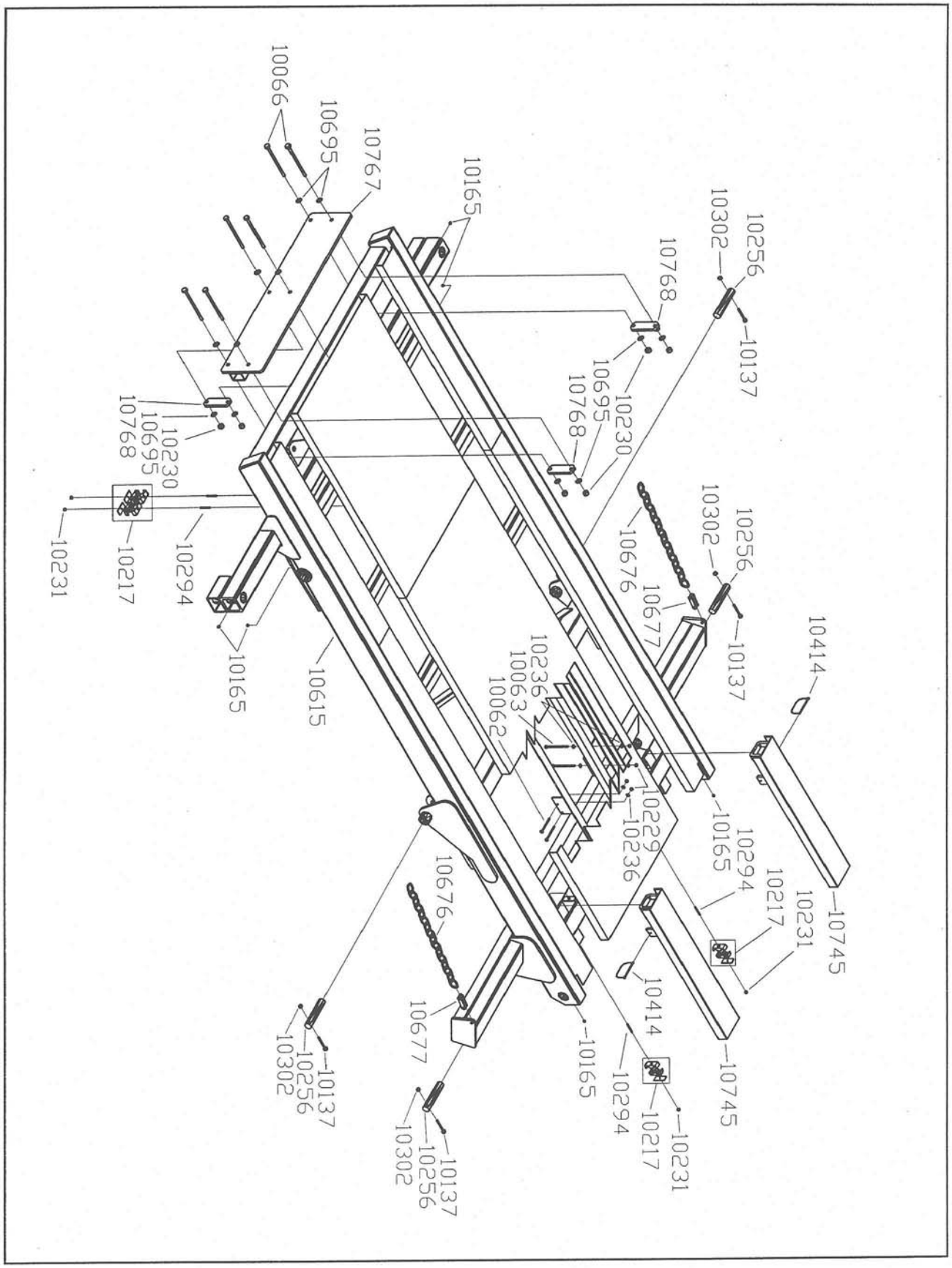
16K FRAME ASSEMBLY . . . . . ❖



16K Frame Assembly

Part #	Description	Qty
10579	16K FRAME PAINTED	1
10437	16K BED PIVOT SHAFT	1
10438	16K HOIST SHAFT	1
10071	1/2" x 4" GR. 8 HEX BOLT PLAIN	3
10232	1/2" NYLOCK NUT	3
10062	3/8" x 3 1/2" GR.8 HEX BOLT PLAIN	4
10415	HITCH SAFETY PIN PAINTED	1
10252	#9 HAIR PIN CLIP	1
10661	16K LOWER FRAME SLIDER	1
10660	16K UPPER FRAME SLIDER	1
10075	3/8" x 1 1/2" Gr. 8 LOW ALLEN HEAD CAP SCREW PLAIN	8
10229	3/8" NYLOCK NUT	12
10236	3/8" USS FLAT WASHER PLATED	18
10652	TOP SLIDER COLLAR	1
10308	HOIST SPACER	2
10217	3/4" PLASTIC HOSE CLAMP	2
10294	5/16" -18 x 2 1/4" PLAIN STEEL FULLY THREADED STUD	2
10231	5/16" NYLOCK HEX NUT	6
10646	5/16" X 3" GR.8 HEX BOLT	4
10647	5/16" USS FLAT WASHER PLATED	4
10436	16K BED CYLINDER	2

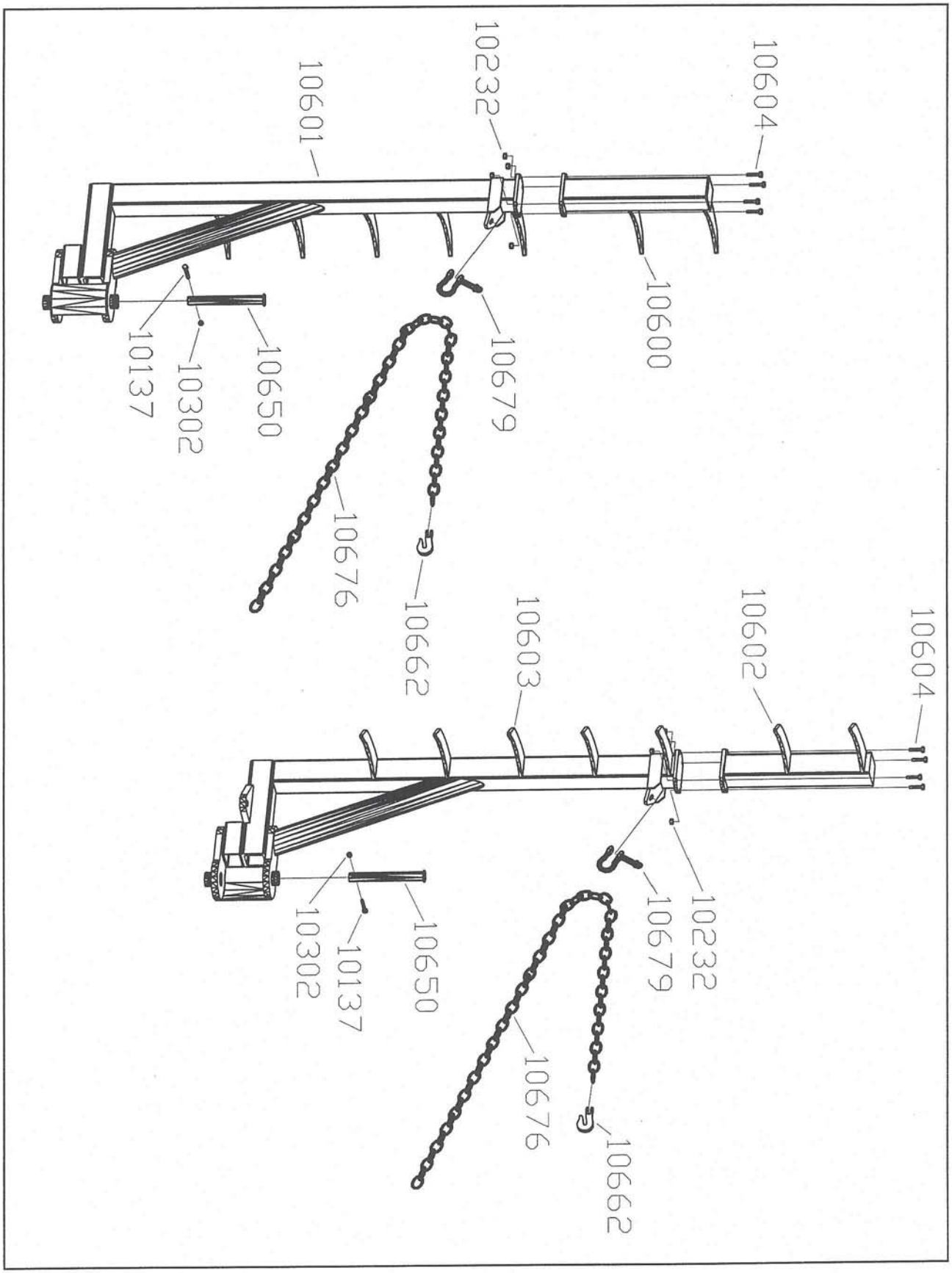
16K BED ASSEMBLY . . . . . ❖



16K Bed Assembly

Part #	Description	Qty
10615	16K BED PAINTED	1
10745	BED EXTENSION FINAL ASSEMBLY	2
10414	SNAP LOCK PINS	2
10767	BALE STOP PAINTED	1
10768	BALE STOP WASHER PLATE PAINTED	3
10066	5/8" x 8" GR8 HEX BOLT PLAIN	6
10230	5/8" NYLOCK NUT	6
10695	5/8" USS FLAT WASHER PLATED	12
10676	14FT 3/8" GR.70 CHAIN	2
10677	7/16"-1/2" TWIN CLEVIS	2
10165	1/4" X 28 GREASE ZERK	6
10062	3/8" x 3 1/2" GR.8 HEX BOLT PLAIN	2
10063	3/8" x 5" Gr.8 HEX BOLT PLAIN	2
10229	3/8" NYLOCK NUT	4
10236	3/8" USS FLAT WASHER PLATED	6
10256	1 7/16" x 7" PIN	4
10137	7/16" X 3" GR. 8 HEX BOLT PLAIN	4
10302	7/16" PLAIN NYLOCK NUT	4
10217	3/4" PLASTIC HOSE CLAMP	4
10231	5/16" NYLOCK HEX NUT	4
10294	5/16" -18 x 2 1/4" PLAIN STEEL FULLY THREADED STUD	4

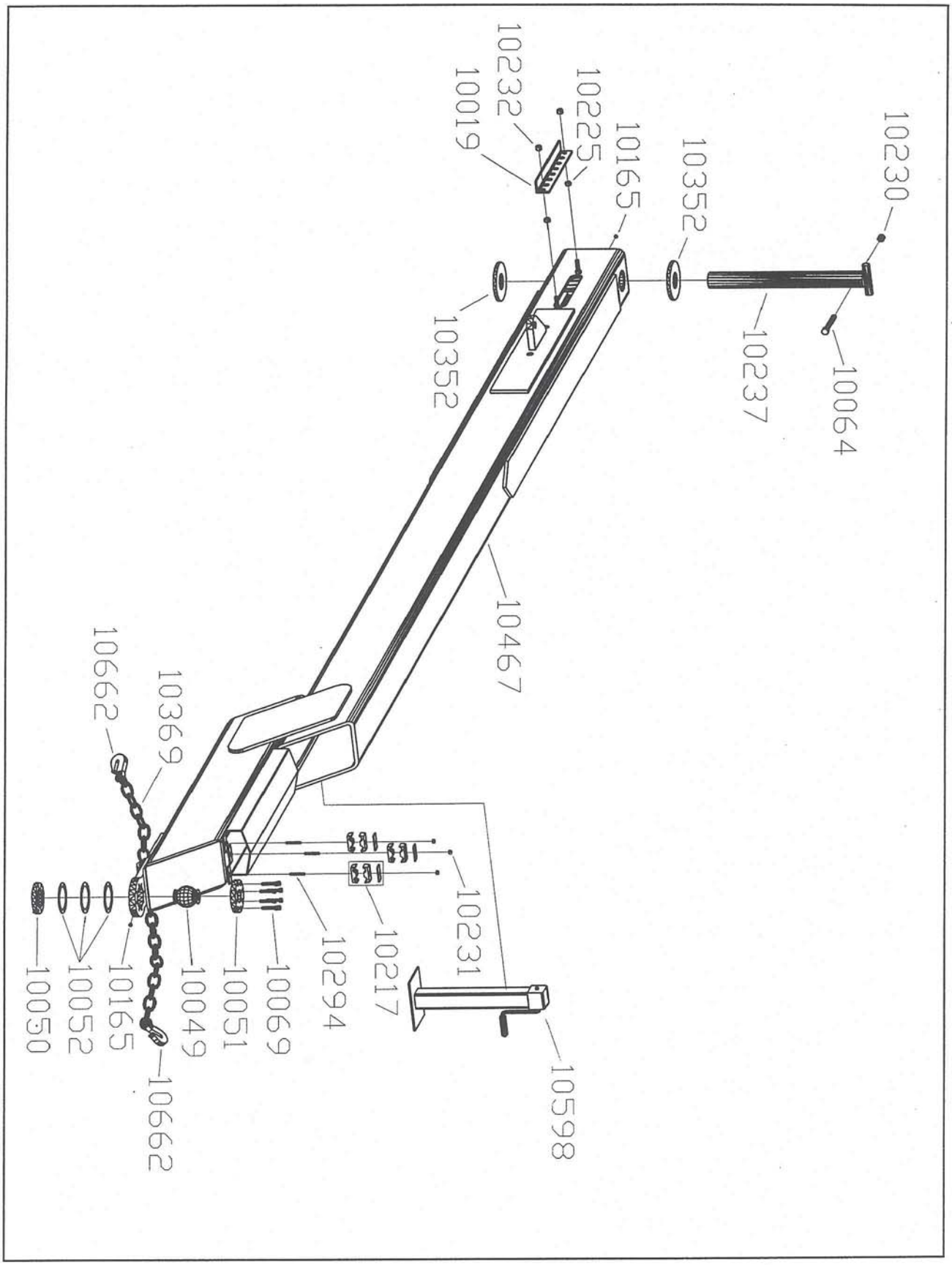
RETRIEVER ASSEMBLY



Retriever Assembly

Part #	Description	Qty
10600	RT UPPER RETRIEVER PAINTED	1
10601	RT LOWER RETRIEVER PAINTED	1
10602	LT UPPER RETRIEVER PAINTED	1
10603	LT LOWER RETRIEVER PAINTED	1
10650	RETRIEVER HINGE PIN WELDMENT	2
10676	14FT 3/8" GR.70 CHAIN	2
10679	3/4" SCREW PIN ANCHOR SHACKLE	2
10662	3/8" CHAIN LOCKING GRAB HOOK	2
10137	7/16" X 3" GR. 8 HEX BOLT PLAIN	2
10302	7/16" PLAIN NYLOCK NUT	2
10604	1/2" X 2" GR.8 HEX BOLT	8
10232	1/2" NYLOCK NUT	8

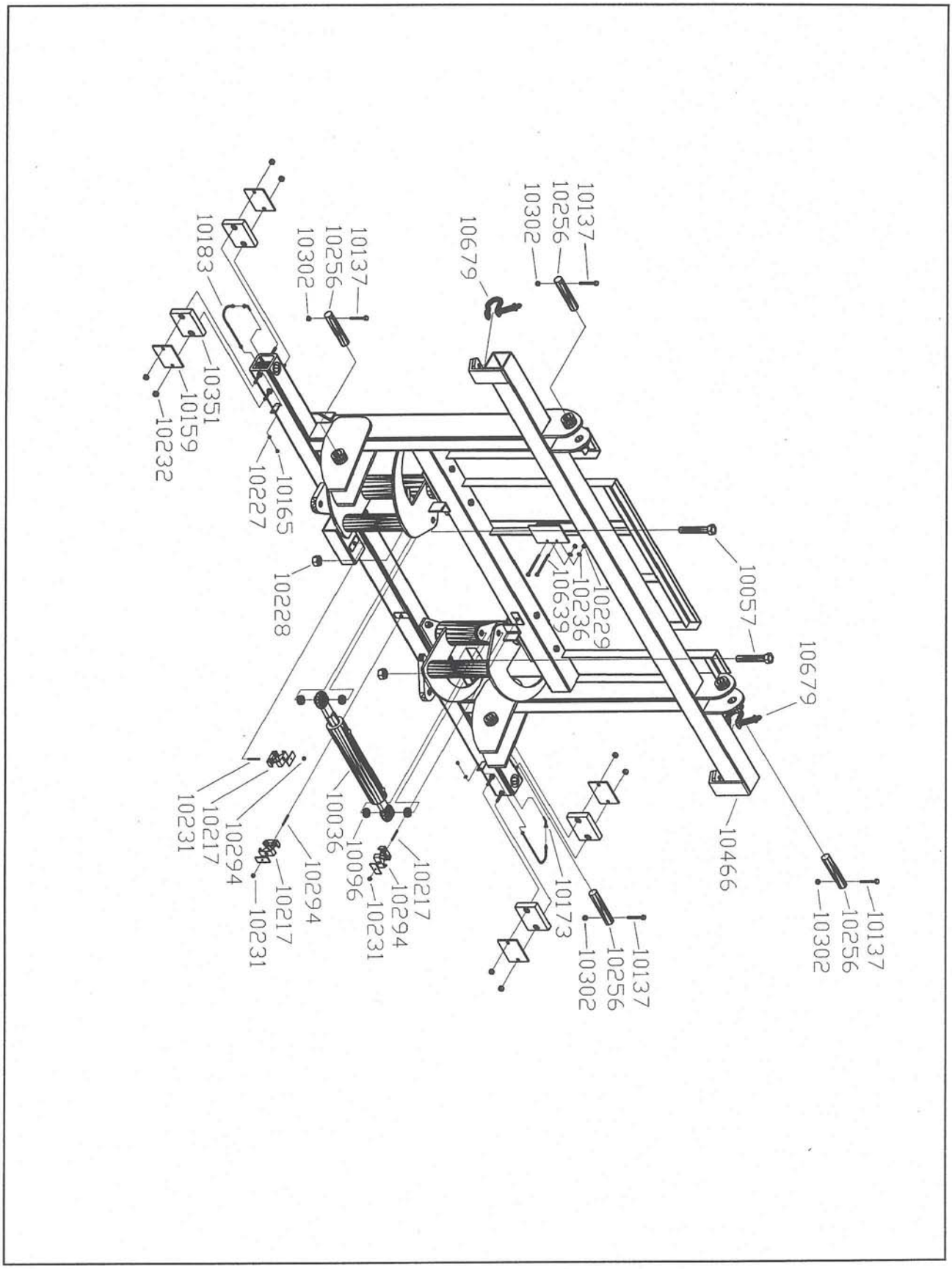
HITCH ASSEMBLY



16K Hitch Assembly

Part #	Description	Qty
10467	16K HITCH PAINTED	1
10237	HITCH PIN PAINTED	1
10352	HITCH PIVOT WASHER	2
10064	5/8" x 5" GR8 HEX BOLT PLAIN	1
10230	5/8" NYLOCK NUT	1
10019	HITCH HOSE MANIFOLD PAINTED	1
10225	1/2" PLAIN HEX NUT	2
10232	1/2" NYLOCK NUT	2
10165	1/4" X 28 GREASE ZERK	2
10598	16K JACK	1
10069	3/8" x 2" GR.8 ALLEN HEAD CAP SCREW PLAIN	8
10051	RING-HITCH UPPER	1
10049	HITCH BALL	1
10052	BALL HITCH SHIM	3
10050	RING -HITCH LOWER	1
10369	8 FOOT 3/8" CHAIN	1
10662	3/8" CHAIN LOCKING GRAB HOOK	2
10217	3/4" PLASTIC HOSE CLAMP	3
10294	5/16" -18 x 2 1/4" PLAIN STEEL FULLY THREADED STUD	3
10231	5/16" NYLOCK HEX NUT	3

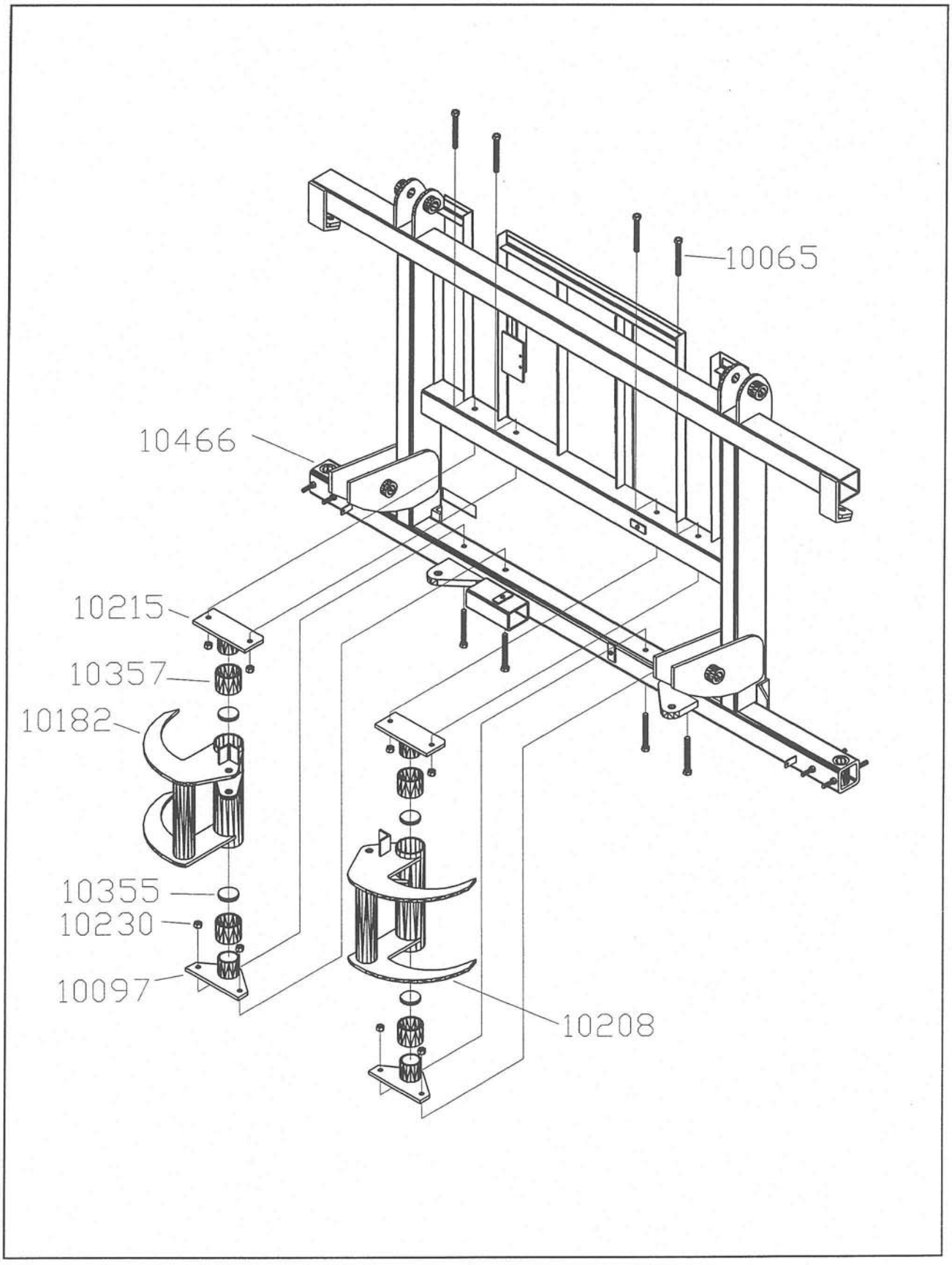
16K LOADER ASSEMBLY



16K Loader Assembly

Part #	Description	Qty
10351	ALIGNMENT SLIDER	4
10159	ALIGNMENT SLIDER HOLDER PAINTED	4
10466	16K LOADER PAINTED	1
10232	1/2" NYLOCK NUT	8
10183	1/8" X 12" REMOTE GREASE HOSE	2
10173	NPTF 45 STREET ELBOW	2
10227	3/8" GREASE HOSE JAM NUT	2
10165	1/4" X 28 GREASE ZERK	2
10679	3/4" SCREW PIN ANCHOR SHACKLE	2
10096	CYLINDER BOLT SPACER	4
10256	1 7/16" x 7" PIN	4
10137	7/16" X 3" GR. 8 HEX BOLT PLAIN	4
10302	7/16" PLAIN NYLOCK NUT	4
10217	3/4" PLASTIC HOSE CLAMP	3
10294	5/16" -18 x 2 1/4" PLAIN STEEL FULLY THREADED STUD	3
10231	5/16" NYLOCK HEX NUT	3
10639	3/8" X 4 1/2" GR.8 HEX BOLT	2
10236	3/8" USS FLAT WASHER PLATED	2
10229	3/8" NYLOCK NUT	2
10057	1" X 6" GR 8 HEX BOLT PLAIN	2
10228	1" NYLOCK NUT	2
10036	GRAB HOOK CYLINDER	1

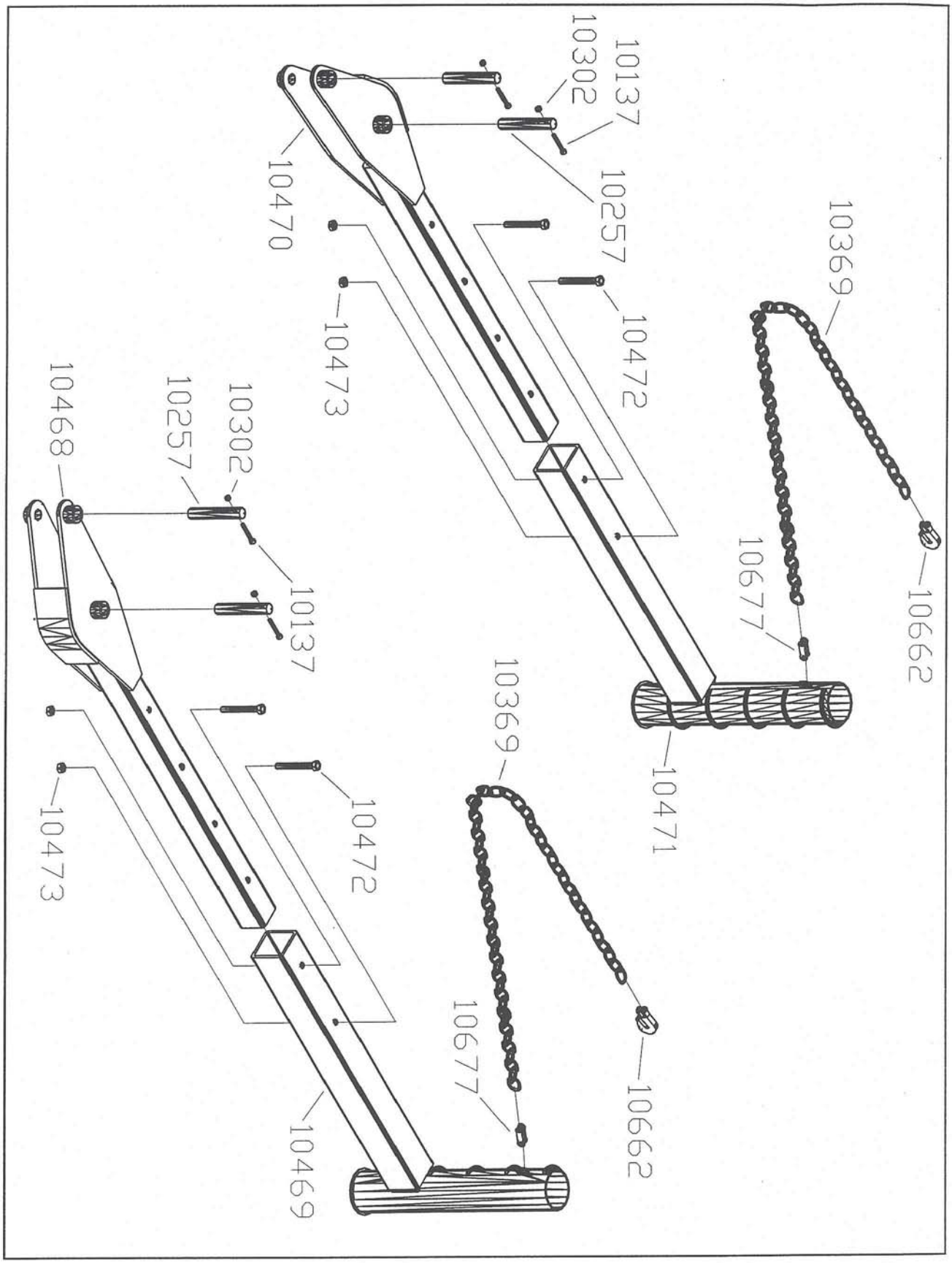
GRAB HOOK ASSEMBLY ..... ❖



Grab Hook Assembly

Part #	Description	Qty
10208	RT GRAB HOOK PAINTED	1
10182	LT GRAB HOOK PAINTED	1
10466	16K LOADER PAINTED	1
10097	LOWER GRAB HOOK PIVOT PAINTED	2
10215	UPPER GRAB HOOK PIVOT PAINTED	2
10065	5/8" X 5 1/2" GR 8 HEX BOLT PLAIN	8
10230	5/8" NYLOCK NUT	8
10357	GRAB HOOK BUSHING	4
10355	GRAB HOOK THRUST BEARING	4

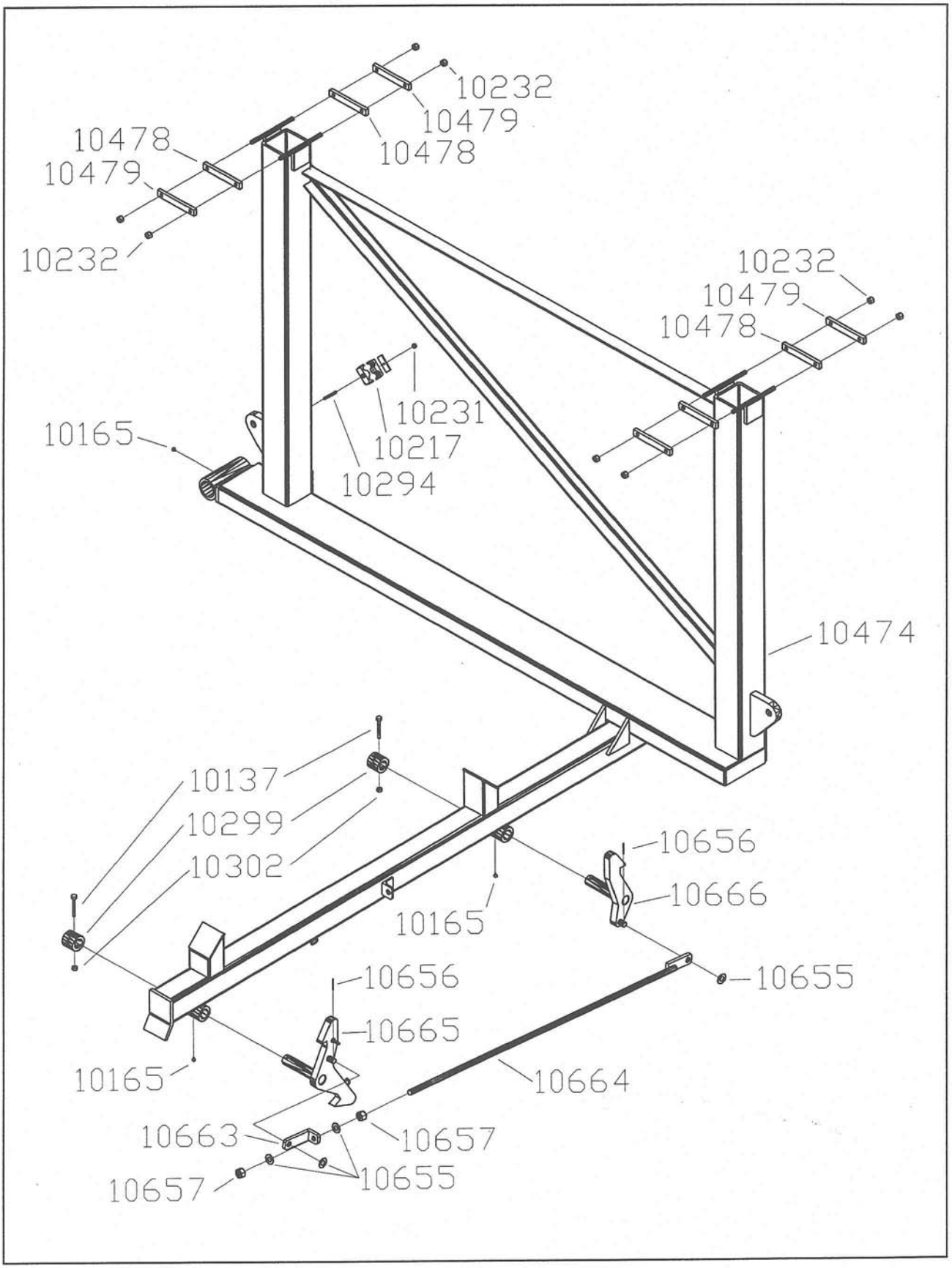
ADJUSTABLE ALIGNMENT ARM ASSEMBLY . . . . . ❖



Adjustable Alignment Arm Assembly

Part #	Description	Qty
10468	RT ADJ. ARM PIVOT STUB PAINTED	1
10469	RT ADJ. ARM END PAINTED	1
10470	LT ADJ. ARM PIVOT STUB PAINTED	1
10471	LT ADJ. ARM END PAINTED	1
10369	8 FOOT 3/8" CHAIN	2
10662	3/8" CHAIN LOCKING GRAB HOOK	2
10677	7/16"-1/2" TWIN CLEVIS	2
10257	1 7/16" x 8 1/4" PIN	4
10472	3/4" X 6" GR.8 HEX BOLT PLAIN	4
10473	3/4" NYLOCK NUT	4
10137	7/16" X 3" GR. 8 HEX BOLT PLAIN	4
10302	7/16" PLAIN NYLOCK NUT	4

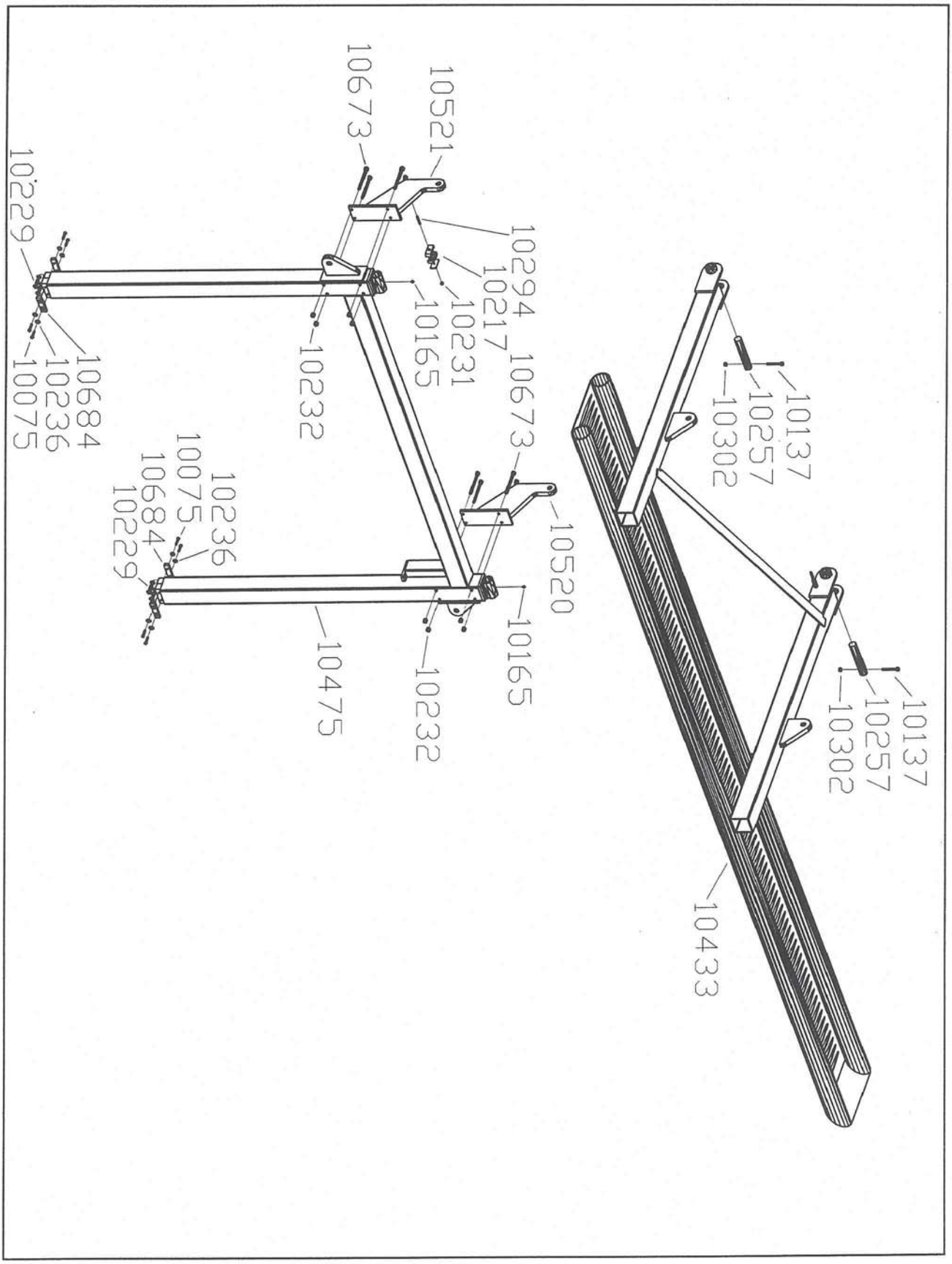
TOP SLIDER LOWER FRAME ASSEMBLY . . . . . ❖



Top Slider Lower Frame Assembly

Part #	Description	Qty
10474	TOP SLIDER LOWER FRAME PAINTED	1
10663	TIE ROD END WELDMENT PAINTED	1
10664	TIE ROD WELDMENT PAINTED	1
10665	RT HOOK WELDMENT PAINTED	1
10666	LT HOOK WELDMENT PAINTED	1
10656	7/64" COTTER PIN	2
10655	3/4" USS FLAT WASHER PLATED	4
10657	3/4" PLAIN HEX NUT	2
10165	1/4" X 28 GREASE ZERK	3
10299	OUTSIDE PIVOT	2
10217	3/4" PLASTIC HOSE CLAMP	1
10294	5/16" -18 x 2 1/4" PLAIN STEEL FULLY THREADED STUD	1
10231	5/16" NYLOCK HEX NUT	1
10137	7/16" X 3" GR. 8 HEX BOLT PLAIN	2
10302	7/16" PLAIN NYLOCK NUT	2
10478	1/2" X 1" X 7" TOP SLIDER SLIDE PLASTIC	4
10479	SLIDE PLASTIC WASHER PAINTED	4
10232	1/2" NYLOCK NUT	8

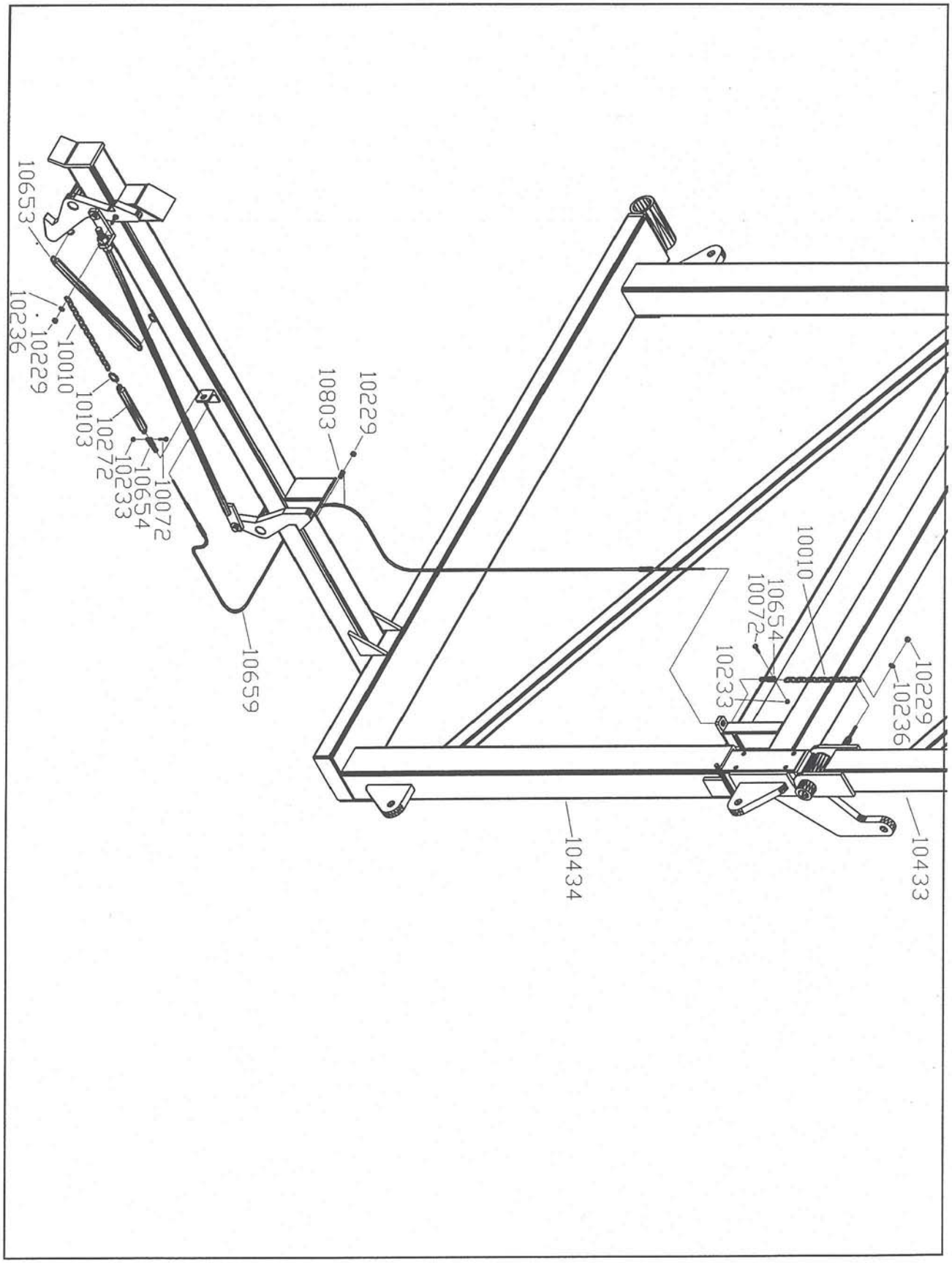
TOP SLIDER ASSEMBLY . . . . . ❖



Top Slider Assembly

Part #	Description	Qty
10475	TOP SLIDER UPPER FRAME PAINTED	1
10433	TOP SLIDER WELDMENT PAINTED	1
10520	FRONT TOP SLIDER CYLINDER PIVOT PAINTED	1
10521	REAR TOP SLIDER CYLINDER PIVOT PAINTED	1
10684	INSIDE SLIDER PLASTIC	4
10075	3/8" x 1 1/2" Gr. 8 LOW ALLEN HEAD CAP SCREW PLAIN	8
10236	3/8" USS FLAT WASHER PLATED	16
10229	3/8" NYLOCK NUT	8
10165	1/4" X 28 GREASE ZERK	2
10673	1/2" X 5 1/2" GR8 HEX BOLT	8
10232	1/2" NYLOCK NUT	8
10217	3/4" PLASTIC HOSE CLAMP	1
10294	5/16" -18 x 2 1/4" PLAIN STEEL FULLY THREADED STUD	1
10231	5/16" NYLOCK HEX NUT	1
10137	7/16" X 3" GR. 8 HEX BOLT PLAIN	2
10302	7/16" PLAIN NYLOCK NUT	2
10257	1 7/16" x 8 1/4" PIN	2

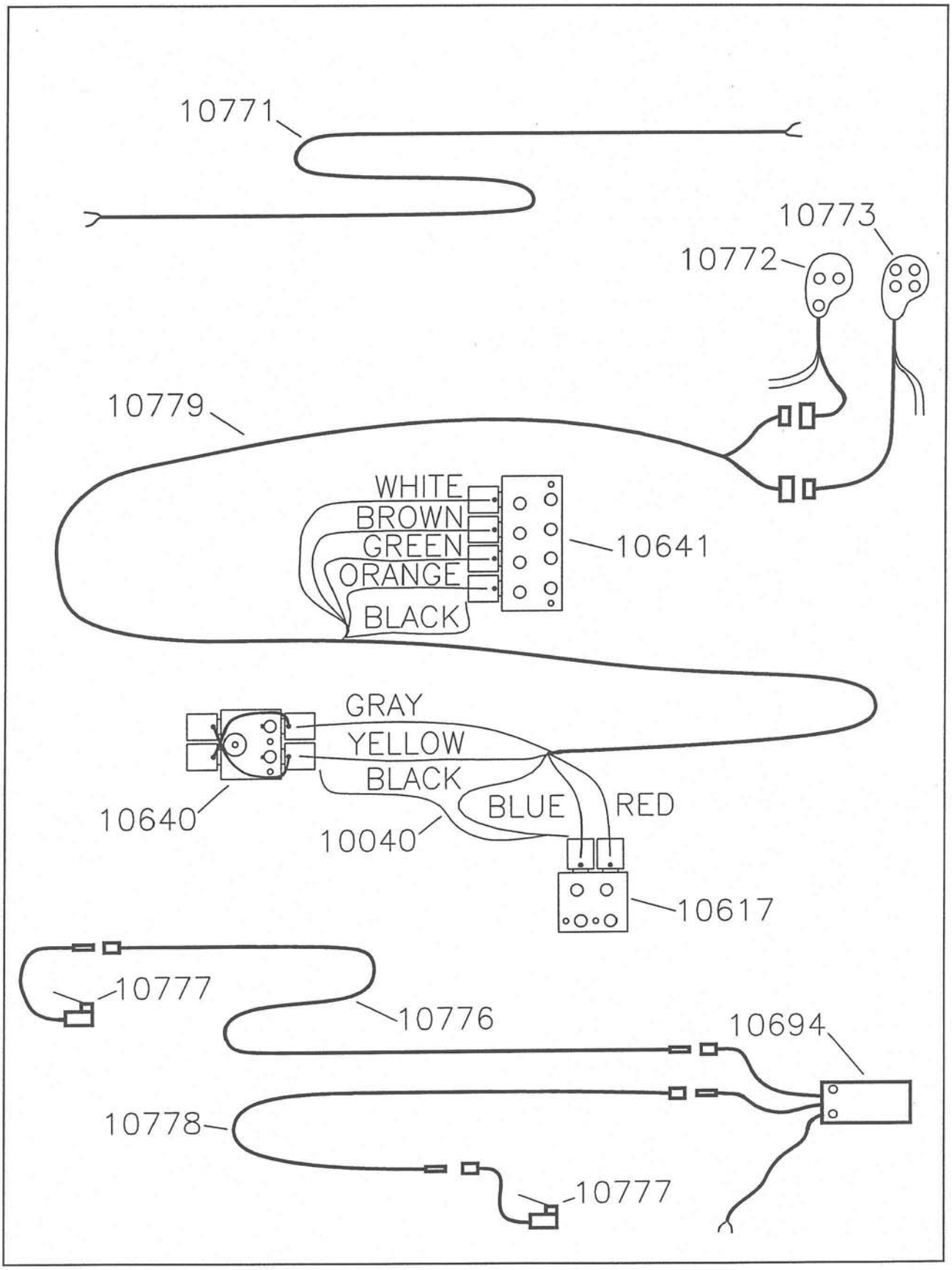
TOP SLIDER HOOK LINKAGE ASSEMBLY . . . . . ❖



Top Slider Hook Linkage Assembly

Part #	Description	Qty
10659	PUSH PULL CABLE	1
10434	TOP SLIDER FRAME ASSEMBLY	1
10433	TOP SLIDER WELDMENT PAINTED	1
10654	1/4-28 YOKE END	2
10272	1" X 7" SPRING	1
10653	TOP SLIDER HOOK SPRING	1
10010	15" 3/16" CHAIN	2
10103	1/4" QUICK LOOP	1
10803	1/2" INSULATED CLAMP	1
10236	3/8" USS FLAT WASHER PLATED	2
10229	3/8" NYLOCK NUT	3
10072	1/4"x 1" Gr 8 HEX BOLT PLAIN	2
10233	1/4" NYLOCK NUT	2

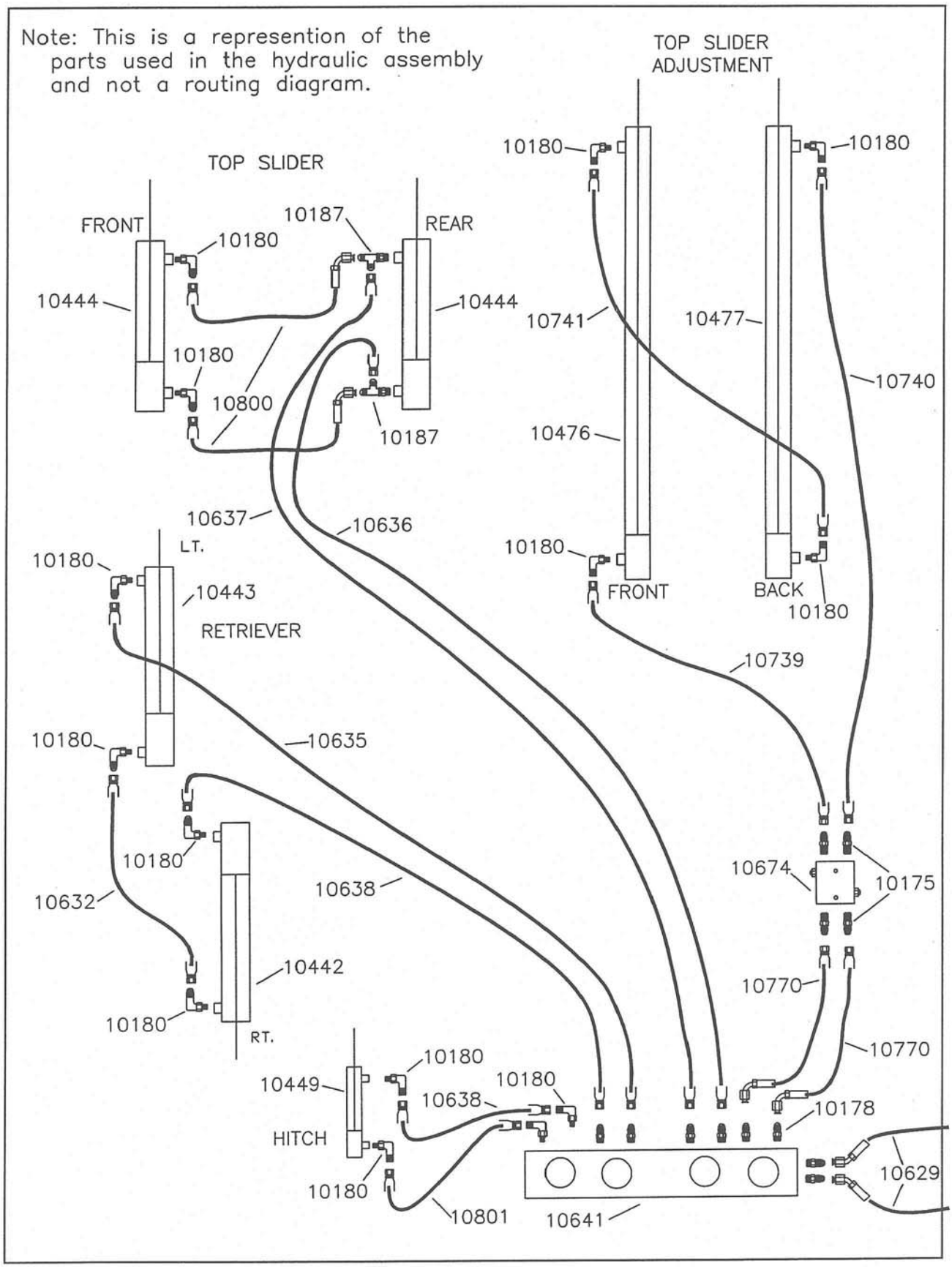
16K ELECTRICAL ASSEMBLY ..... ❖

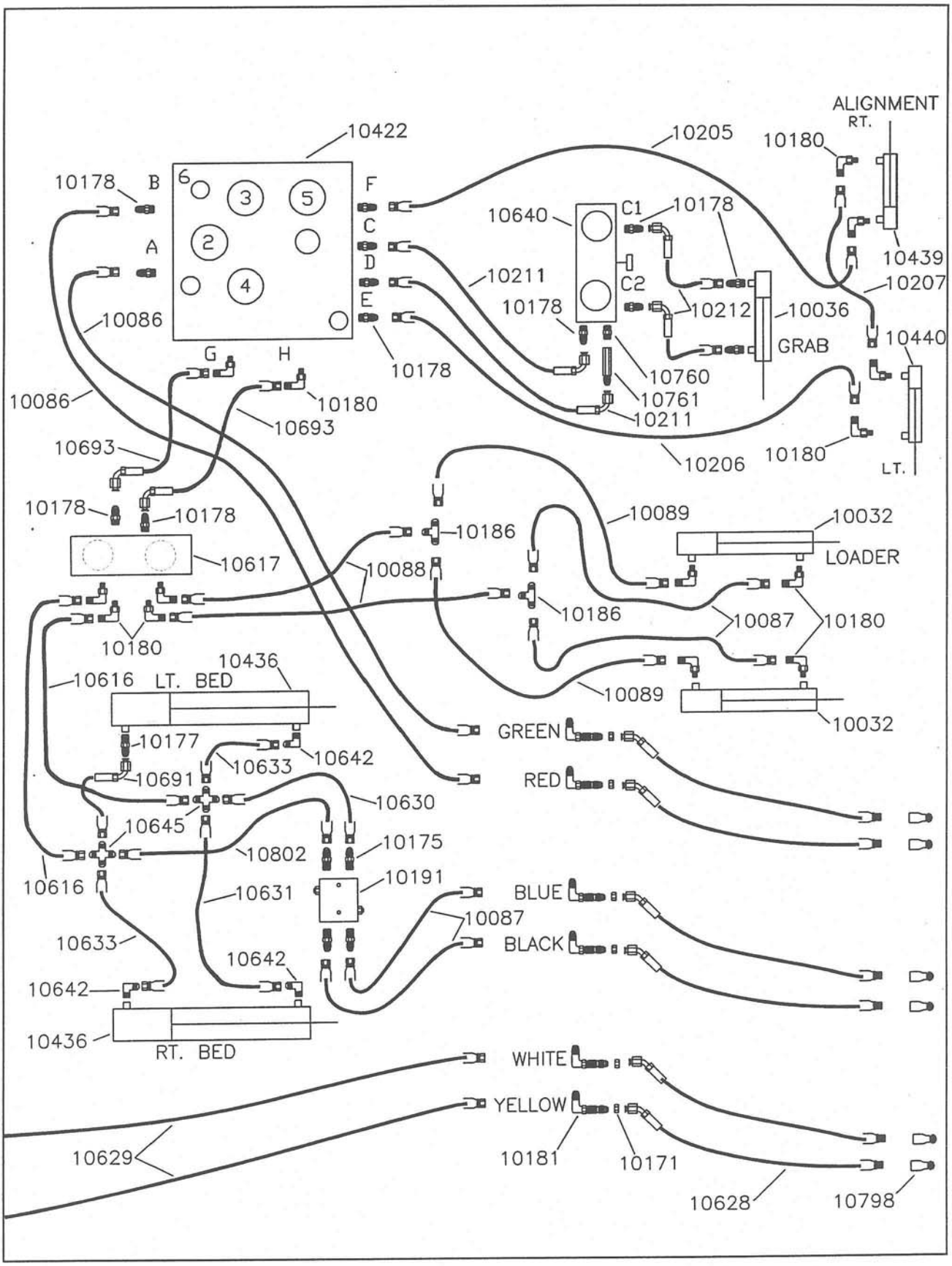


16K Electrical Assembly

Part #	Description	Qty
10694	16K WARNING BOX	1
10617	DOUBLE SELECTOR VALVE	1
10640	ELECTRIC 4-WAY VALVE	1
10641	QUAD SELECTOR VALVE	1
10772	4-BUTTON RCS	1
10773	3 BUTTON RCS	1
10771	25' 12GA TWO-WIRE CABLE	1
10779	16K WIRING HARNESS	1
10776	41' MICRO WIRE	1
10778	24' MICRO WIRE	1
10777	OFFSET MICROSWITCH	2
10040	16K VALVE GROUND WIRE	1

16K HYDRAULIC ASSEMBLY ..... ❖




ALIGNMENT
RT.
10422
10205
10180
10178
B
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5
F
C
A
2
D
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C1
10178
10439
10211
C2
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10212
10036
10086
GRAB
10440
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H
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10211
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10206
10180
LT.
10178
10178
10089
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10186
LOADER
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10088
10186
10087
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LT. BED
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GREEN
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10691
RED
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10802
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10191
10631
BLUE
10087
10633
BLACK
10642
10642
10436
RT. BED
WHITE
YELLOW
10629
10181
10171
10628
10798

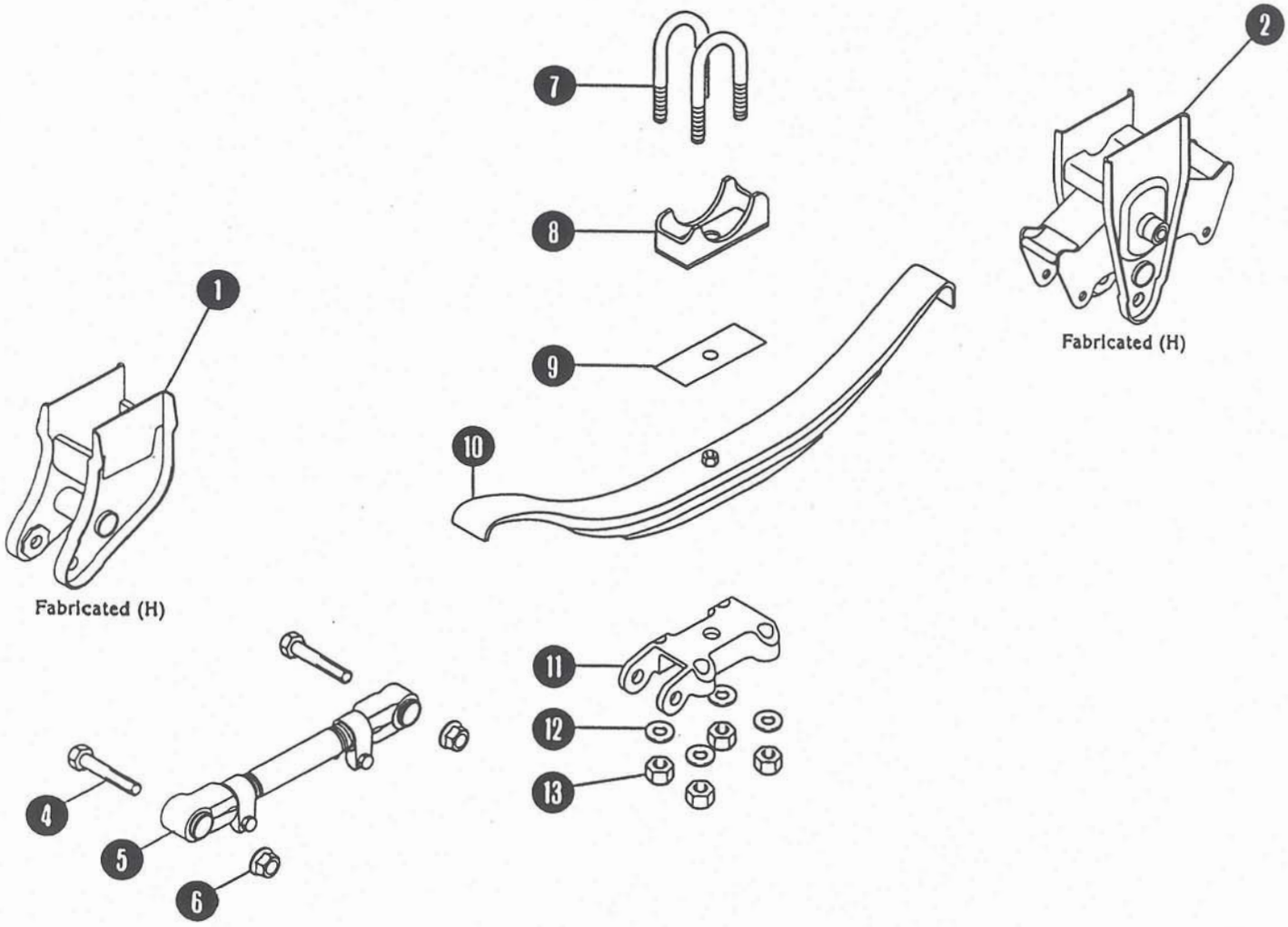
16K Hydraulic Assembly

Part #	Description	Qty
10422	16K MANIFOLD VALVE	1
10617	DOUBLE SELECTOR VALVE	1
10640	ELECTRIC 4-WAY VALVE	1
10641	QUAD SELECTOR VALVE	1
10674	500 PSI CUSHION VALVE	1
10191	2000 PSI CUSHION VALVE	1
10761	16K CHECK VALVE	1
10645	08 JIC CROSS	2
10760	08 ORB TO 08 ORB STRAIGHT PORT ADAPTER	1
10180	90 DEGREE ELBOW ORB ADAPTER	27
10178	08 JIC TO 08 ORB STRAIGHT PORT ADAPTER	21
10181	08 90 DEGREE BULKHEAD FITTING	6
10187	08 ORB TO 08 JIC TO 08 JIC RUN TEE	2
10171	08 BULKHEAD FITTING JAM NUT	6
10177	08 JIC TO 12 ORB STRAIGHT PORT ADAPTER	1
10642	08 ORB TO 12 JIC 90 DEGREE ELBOW	3
10175	08 JIC TO 1/2" PIPE STRAIGHT MALE ADAPTER	8
10186	08JIC TO 08 JIC TO 08 JIC UNION TEE	2
10798	1/2" PIPE MALE ISO HOSE ENDS	6
10436	16K BED CYLINDER	2
10032	LOADER CYLINDER	2
10036	GRAB HOOK CYLINDER	1
10449	16K HITCH CYLINDER	1
10439	16K RT ALIGNMENT ARM CYLINDER	1
10440	16K LT ALIGNMENT ARM CYLINDER	1
10442	RT RETRIEVER CYLINDER	1
10443	LT RETRIEVER CYLINDER	1
10444	TOP SLIDER CYLINDER	2
10476	FRONT TOP SLIDER ADJ. CYLINDER	1
10477	REAR TOP SLIDER ADJ. CYLINDER	1

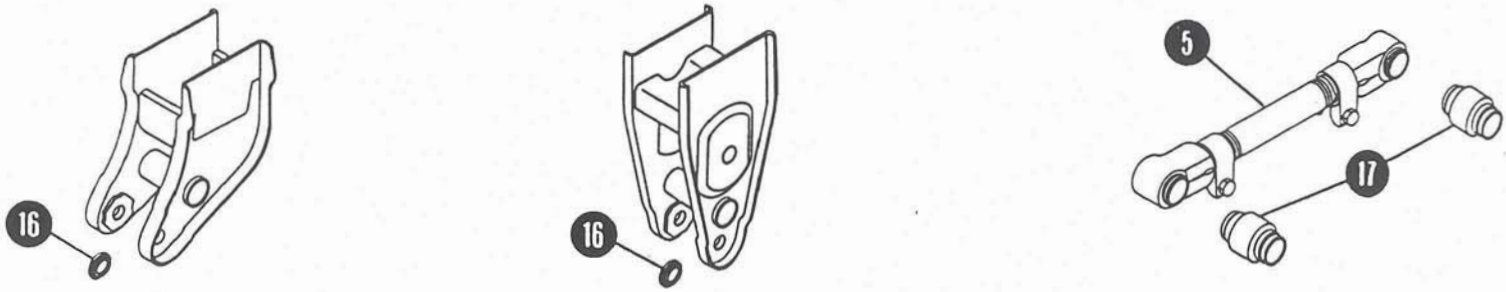
16K Hydraulic Assembly

Part #	Description	Qty
10802	HOSE 8" 608/608	1
10630	HOSE 12" 608/608	1
10770	HOSE 18" 608/668	2
10088	HOSE 21" 608/608	2
10693	HOSE 21" 668/608	2
10691	HOSE 36" 608/668	1
10089	HOSE 38" 608/608	2
10212	HOSE 40" 608/668	2
10211	HOSE 43" 608/668	2
10632	HOSE 47" 608/608	1
10629	HOSE 50" 688/608	2
10087	HOSE 54" 608/608	4
10633	HOSE 60" 608/608	2
10207	HOSE 64" 608/608	1
10801	HOSE 73" 608/608	1
10631	HOSE 79" 608/608	1
10638	HOSE 82" 608/608	3
10800	HOSE 87" 608/668	2
10635	HOSE 101" 608/608	1
10205	HOSE 113" 608/608	1
10740	HOSE 119" 608/608	1
10206	HOSE 131" 608/608	1
10616	HOSE 136" 608/608	2
10741	HOSE 150" 608/608	1
10739	HOSE 167" 608/608	1
10086	HOSE 200" 608/608	2
10636	HOSE 235" 608/608	1
10637	HOSE 241" 608/608	1
10628	HOSE 264" 688/108	6

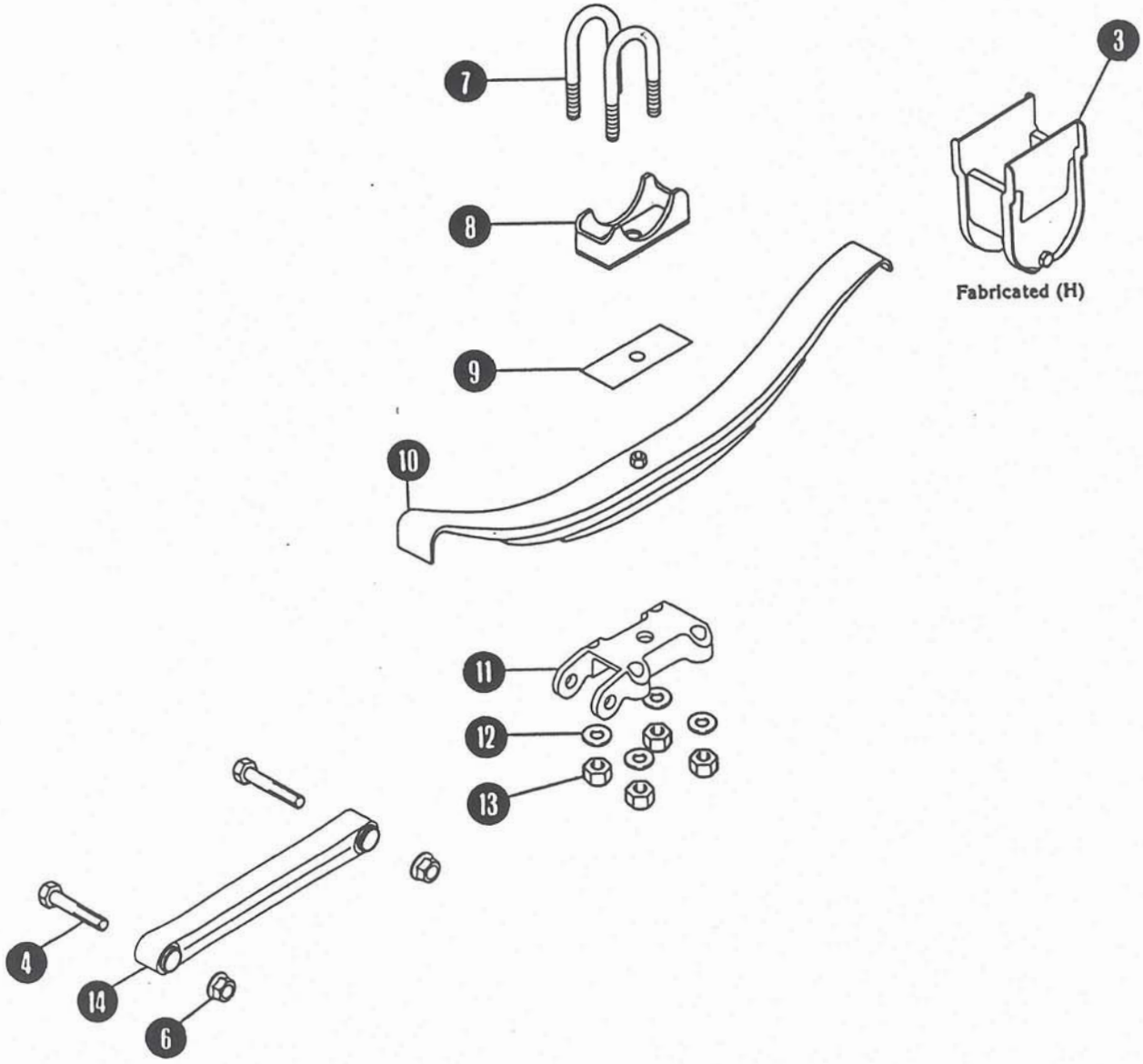
CH-9700US



Replacement Parts



CH-9700US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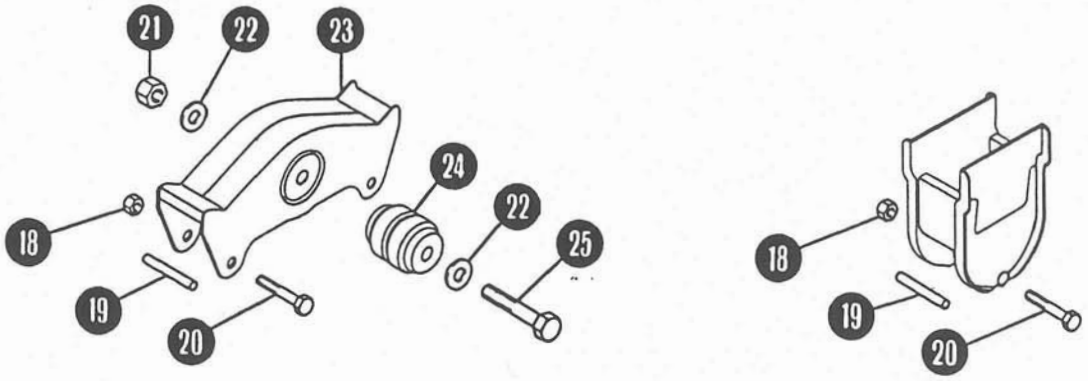
Fabricated (H)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Bill of Materials

Item	Part No.	Quantity Single Axle	Quantity Tandem Axle	Description
1	See Hanger Chart A	2	2	Front Spring Hanger
2	See Hanger Chart A	0	2	Center Rock/Rocker Hanger Assy.
3	See Hanger Chart A	2	2	Rear Spring Hanger Assy.
4	719-02	4	8	Rad. Rod Bolt- Hex Bolt -1-14-UNS x 5
5	16398-04	1	2	Rad. Rod w/Bushing-19.25 Lg.
6	10562-00	4	8	Flange Locknut-1-14UNS, GR.F & CAD PL.
7	See U-Bolt Chart E	4	8	U-Bolt - Std. 0.875 U-Bolt (Shown)
8	See Spring Seat Chart F	2	4	Spring Seat - 5"Rd. (Shown)
9	7052-02	2	4	Delrin Liner [1]
10	See Spring Appendix	2	4	Spring Assy.-Std. 3-Leaf (Shown)
11	706-01	2	4	Bottom Plate Att.
12	35-00 or 817-00	8 8	16 16	Washer-Pl, 15/16 ID x1¾ OD (For Std. 0.875 U-Bolt Shown) Washer-1/8 x 13/16 ID x1½ OD (For Opt. 0.75 U-Bolt)
13	34-04 or 16303-01	8 8	16 16	Hex Nut-7/8"14UNF (For Std. 0.875 U-Bolt Shown) Hex Nut-¾"16UNF (For Opt. 0.75 U-Bolt)
14	715-00	1	2	Non-Adj. Radius Rod w/Rubber Bushing
15	6786-00	2	4	U-Bolt Clamp-4" x 6" Axle Only
16	7717-01	2 per Hanger		Washer Bushing-Replaces Sideplate Washer 10561-00 on Fabricated (H) Front and Center Hangers Only
17	722-00	2 per Rad. Rod		Radius Rod Bushing Only- 3" Lg.
18	37-03	2 per Rocker 1 per Rear Hgr.		Hex Lock Nut-5/8-18UNF, GR B - (Shipped loose, not part of center rocker & hgr. assy.. However, it is part of the rear hanger assy.)
19	756-00	2 per Rocker 1 per Rear Hgr.		Sleeve Spacer-¾ OD x 18GA x 3¼Lg. - (Shipped loose, not part of center rocker & hgr. assy.. However, it is part of the rear hanger assy.)
20	759-00	2 per Rocker 1 per Rear Hgr.		Hex Bolt-5/8-18UNF x 4½Lg., GR 2 - (Shipped loose, not part of center rocker & hgr. assy.. However, it is part of the rear hanger assy.)
21	11154-00	1 per Rocker		Hex Lock Nut-1 1/8- 7UNC, GR 5
22	837-00	2 per Rocker		Washer-1/8 x 1¼ ID x 2¼ OD
23	16158-01 16290-01			Fabricated Rocker Assy. w/Rubber Bushing (Shown) Cast Rocker Assy. w/Rubber Bushing (Not Shown)
24	16146-01	1 per Rocker		Rocker Bushing Only- Rubber
25	16150-01	1 per Rocker		Hex Cap Screw- 1 1/8" x 7 x 6.62" Lg., GR 5

Hanger Chart A (Fabricated (H) and Cast (CH) Hangers)

DESCRIPTION	PART NO.	HANGER CONFIGURATION Str/mt	Un/mt	Un/mt(I-beam)	SI/mt	FI/mt/wo	FI/mt/bo
Front Hgr., Fab. (H)	7701-	-01	-02	16481-01	L-03 R-04	L-05 R-06	L-07 R-08
Front Hgr., Cast (CH)		702-01	L 16291-03 R 16291-04	NA	L 16291-03 R 16291-04	L 702-09 R 702-10	L 702-11 R 702-12
Rocker & Hgr. Assy., Fab. (H)	16319-	-01	-02	-02	-04	-08	-07
Rocker & Hgr. Assy., Cast (CH)	16319-	-51	-52	-52	-52	-58	-57
Rocker Hgr. Only, Fab. (H)		16169-01	16171-01	16171-01	16175-01	16179-01	16178-01
Rocker Hgr. Only, Cast (CH)		16196-03	16197-03	16197-03	16197-03	16199-05	16199-03
Rear Hgr. Assy., Fab. (H)	7703-	-01	-02	16483-01	L-03 R-04	L-05 R-06	L-07 R-08
Rear Hgr. Assy., Cast (CH)		712-01	L 16293-01 R 16293-02	NA	L 16293-01 R 16293-02	L 712-09 R 712-10	L 712-11 R 712-12

[1] Delrin liners are required on the tension (top) side of each plate when taper (i.e., single, two and three leaf) springs are utilized. One spring liner per spring (for top leaf) will be shipped loose from Hutchens or spring vendor. Liners are not required on flat plate (seven or eight leaf) springs.

44"(1118mm) Axle Centers (A/C)

On the Overslung, Underslung and Inverted U-Bolts, H and CH-9700 series suspensions with 44" A/C, the only parts not interchangeable with the standard 49" A/C models are as follows;

Bill of Materials		Quantity	
ITEM	PART NO.	TANDEM	DESCRIPTION
1	16398-01	2	Adj. Radius Rod w/Bushing - 14.00 Lg.
2	See Charts Below&Opposite	8	U-Bolt
3	See Charts Below&Opposite	4	Spring Assembly
4	w/751-04 Spring Assy. use 16159-01 Rocker	2	Rocker w/Rubber Bushing
4	w/7051-42 Spring Assy. use 16159-03 Rocker	2	Rocker w/Rubber Bushing
5	16398-03	2	Adj. Radius Rod w/Bushing - 16.62 Lg.

U-Bolt Chart E

5" Round Axle

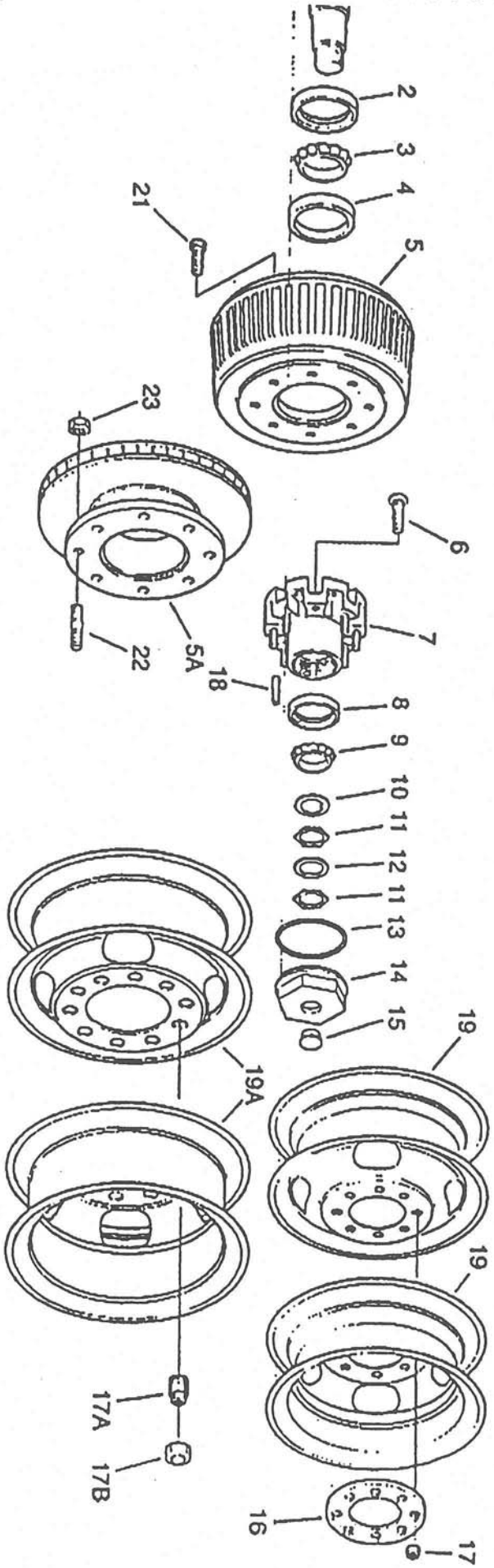
U-BOLTS										
7816-See Below, Std. 7/8 Dia. x 5 Rd. x See Length Below										
Seat Height	Single Leaf Spring	Lgth	Two Leaf Spring*	Lgth	Three Leaf Spring**	Lgth	Seven Leaf Spring	Lgth	Eight Leaf Spring	Lgth
¾	NA	-	-09	11¼	-10	11¾	-12	12¾	-13	13¼
1¼	NA	-	-10	11¾	-11	12¼	-13	13¼	-14	13¾
1¾	NA	-	-11	12¼	-12	12¾	-14	13¾	-15	14¼
2¼	NA	-	-12	12¾	-13	13¼	-15	14¼	-16	14¾

Spring Seat Chart F

SEAT HEIGHT	¾	1¼	1¾	2¼	2¾	3¼	3¾	4¼	4¾
5" Round	301-01	301-02	301-03	310-04	NR	—	—	—	—
5"x 5" Square	7759-01	7759-02	7759-03	7759-04	NR	—	—	—	—
4"x 6" Rect.	NR	7727-02	7727-03	7727-04	NR	—	—	—	—

*When using the 16241-01 2-stage spring use the same length u-bolt as used with 365-00 and 365-01 springs.
**When using 365-00, 365-01 springs or 34-00 Hi-nuts, use 1/2" longer u-bolts.

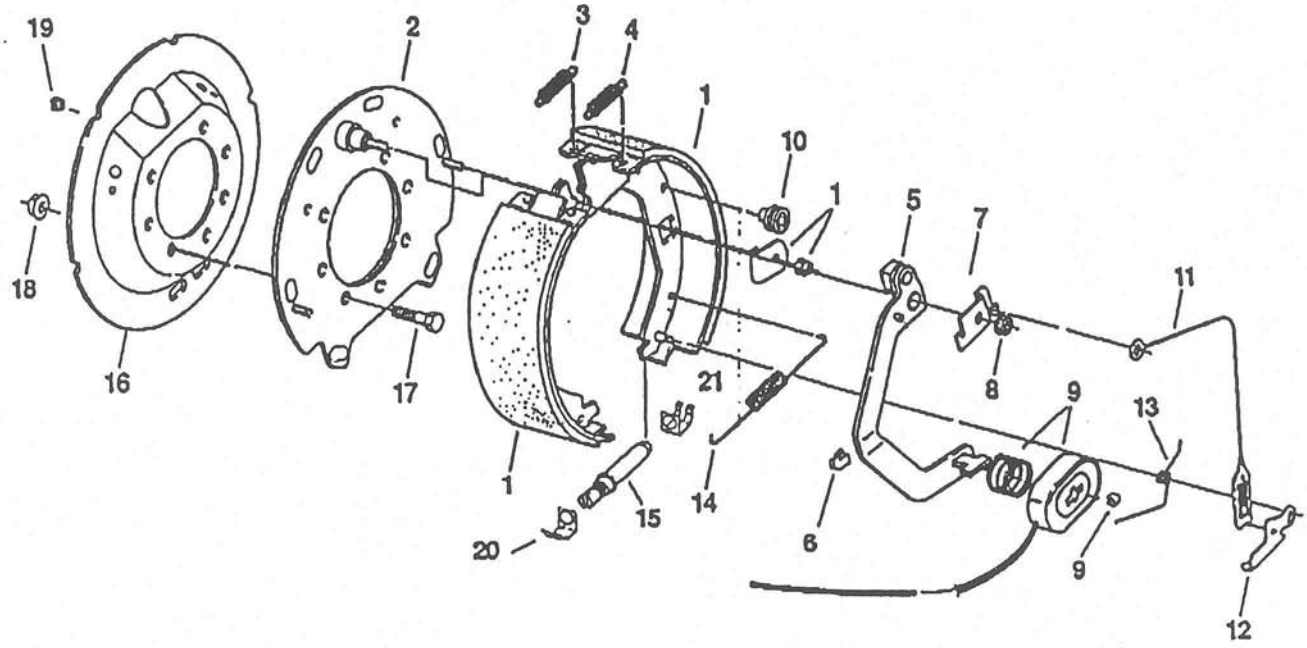
10K, 12K and 15K Hub Groups



Item	Description	10K 8 on 6.50	10K Disc 8 on 6.50	10K 10 on 11.25	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 on 11.25
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 & StudsRH	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 & StudsLH	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

Electric Brake Parts



Item	Description	Qty. Per Brake	12¼ x 3⅜ 9K & 10K GD Part No.	12¼ x 4 10K Part No	12¼ x 5 12K Part No.	12¼ x 5 15K Part No.
1	LH Shoe & Lining Kit containing:	1	K71-049-00	K71-051-00	K71-053-00	K71-053-00
	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	040-108-02	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	071-016-01	071-016-01	071-016-01
8	Flange Nut	1	006-062-00	006-062-00	006-062-00	006-062-00
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	036-115-21	036-115-22	036-115-23	036-115-23
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
nn	Wire Grommet	1	046-016-00	046-016-00	046-016-00	046-016-00