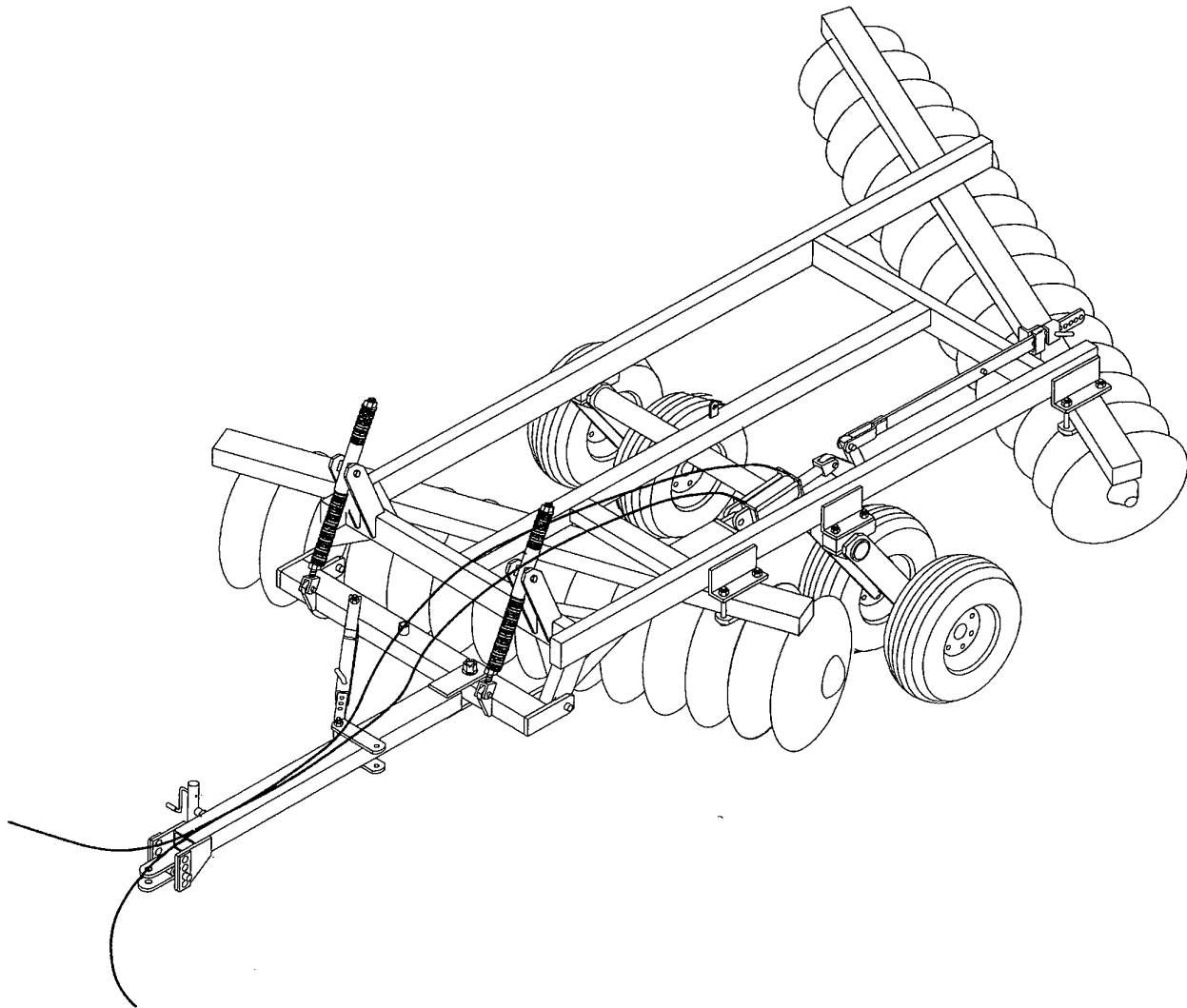


TAYLOR PITTSBURGH MFG. INC.
P.O. BOX 1866
ATHENS, TN. 37371
423-745-3110

650 SERIES HEAVY DUTY LEVELING OFFSET HARROW



OWNER'S MANUAL

Form Number #000312
March 2004

TO THE DEALER:

The harrow assembly and proper hookup to the tractor is the responsibility of the TAYLOR PITTSBURGH dealer. Read manual instructions and safety rules. Make sure all items on the Pre-delivery and Delivery Check Lists are completed before releasing equipment to the owner.

TO THE OWNER:

Read this manual before operating your TAYLOR PITTSBURGH harrow. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all the adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer or by calling 1-423-745-3110, in the USA and Canada only.

The harrow you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the harrow and tractor.

For service, your authorized TAYLOR PITTSBURGH dealer has trained mechanics, genuine TAYLOR PITTSBURGH service parts, and the necessary tools and equipment to handle all your needs.

Provide this information to your dealer to obtain correct repair parts.

LIMITED WARRANTY

TAYLOR PITTSBURGH MFG. INC., the manufacturer, warrants only to the Original Purchaser that this equipment, under normal use and service, will be free from defects in material and workmanship for one (1) year from date of purchase providing this equipment is purchased for individual and not for commercial use. This warranty does not apply to any equipment which has been damaged or which has been subjected to change, misuse, negligence, abnormal wear and tear, alterations, tampering, or failure to follow operating instructions. This warranty does not cover any product or parts not manufactured by Taylor Pittsburgh Manufacturing Inc..

Under this warranty, the manufacturer will repair or replace any part which the manufacturer determines has failed during the period of the warranty due to defects in material or workmanship. After written approval by the manufacturer, the equipment or defective part must be returned to Taylor Pittsburgh Mfg. Inc., Athens, Tennessee 37371.

PURCHASER'S EXCLUSIVE REMEDY FOR BREACH OF WARRANTY, OTHER DEFECT, OR CONDUCT GIVING RISE TO LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT SOLD, AND THE MANUFACTURER UNDER NO CIRCUMSTANCES SHALL BE LIABLE FOR ECONOMIC LOSS OR INCIDENTAL OR CONSEQUENTIAL DAMAGES. THE MANUFACTURER DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR PURPOSE.

Taylor Pittsburgh Mfg. Inc. reserves the right to make improvements and changes in specifications without notice or obligation to modify previously sold units.

This manual describes the proper assembly procedures for your implement and furnishes operating and maintenance recommendations to help you obtain long and satisfactory service.

SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.



The Safety-Alert Symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

CAUTION

Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury if proper precautions are not taken.

WARNING

Denotes a hazard exists which can result in injury or death if proper precautions are not taken.

DANGER

Denotes an extreme intrinsic hazard exists which would result in high probability of death or irreparable injury if proper precautions are not taken.

GENERAL INFORMATION

INTRODUCTION

READ THIS MANUAL carefully to learn how to operate and service your harrow correctly. Failure to do so could result in personal injury or equipment damage.

Throughout this manual, references are made to right and left direction. **RIGHT - HAND AND LEFT - HAND** sides are determined by standing behind the harrow facing the direction the harrow will travel when going forward.

The purpose of this manual is to assist you in operating and maintaining your Series 650 Offset Disc Harrow. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance. These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying operating conditions.

However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

Maintain your harrow with original repair parts to insure safety and optimum performance.

WARNING

- **Some illustrations in this manual show the harrow with safety components removed to provide a better view. The harrow should never be operated with any safety components removed.**

The illustrations and data used in this manual were current at the time of printing, but due to possible production changes, your harrow may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

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SPECIFICATIONS

MODEL 650

Standard Equipment

| | |
|-------------------------|---|
| Cutting Width Range: | 8' 9" to 17' 11" |
| Average Weight Range: | 186 pounds per blade |
| Gang Axle Size: | 1-1/2" Square Alloy Steel |
| Disc Spacing: | 9" or 10-1/2" |
| Disc Blades: | 24" or 26" x 1/4" Thick -- Round or Cut Out |
| Tapered Blades: | (1) 2" on front (3) on rear (2", 4", & 6" Reduction) |
| Back Up Disc: | Front Outer Disc Support |
| Bearing Hangers: | Rigid and Cushion Flex |
| Gang Bearings: | Trunion Mounted |
| Frame Construction: | 4" x 6" Tube |
| Gang Tubes: | 4" x 7" Tube |
| Gang Working Angle: | Variable--14 to 26 Degrees |
| Wheel Lift Pivot: | Ductile Cast Bearing |
| Disc Scrapers: | Heat Treated |
| Tongue Pivot: | Telescopic for easy adjustment of side draft |
| Depth Control: | Simple Adjusting Cuff and Pin |
| Front to Rear Leveling: | Dual Spring Adjustment Rods |
| Hitch/Tongue: | Self Leveling, with adjustment mechanism |
| Hitch: | Adjustable Height Clevis |
| Jack/Tongue: | 3000 # |

Optional Equipment

| | |
|------------------------|---|
| Wheel Rims: | (4) 15" x 10" 6 Bolt |
| Wheel & Rim: | (4) 15" x 10" Rim & 11.5L x 15 (6 Ply) Tire |
| Wheel Lift Hydraulics: | (1) 5" x 8" Hydraulic Cylinder |
| Wrench: | Gang Bolt Wrench |

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said **“The best safety device is an informed, careful operator.”** We ask you to be that kind of an operator.

The designed and tested safety of this equipment depends on it being operated within the limitations as explained in this manual.

TRAINING

- **Safety instructions are important! Read this manual and the tractor manual; follow all safety rules and safety decal information. (Replacement manuals are available from dealer or call 1-800-456-7929.) Failure to follow instructions or safety rules can result in serious injury or death.**
- **If you do not understand any part of this manual and need assistance, see your dealer.**
- **Know your controls and how to stop engine and attachment quickly in an emergency.**
- **Operators must be instructed in and be capable of the safe operation of the equipment, its attachments and all controls. Do not allow anyone to operate this equipment without proper instructions.**
- **Do not allow children or untrained persons to operate equipment.**

PREPARATION

- **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing and head.**
- **Ensure implement is properly mounted, adjusted and in good operating condition.**
- **Tighten all bolts, nuts and bolts, and check that all cotter pins are installed securely to ensure equipment is in a safe condition before operating.**
- **Tractor must be equipped with ROPS or ROPS CAB and seat belt. Keep seat belt securely fastened. Falling off tractor can result in death from being run over or crushed. Keep foldable ROPS systems in “locked up” position at all times.**
- **Remove accumulated debris from this equipment, tractor and engine to avoid fire hazard.**
- **Ensure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**

OPERATIONAL SAFETY

- **Operate only in daylight or good artificial light.**
- **Always comply with all state and local lighting and marking requirements.**
- **No riders on equipment.**
- **Always sit in tractor seat when operating controls or starting engine. Place transmission in park or neutral, engage brake and ensure all other controls are disengaged before starting tractor engine.**

(Safety Rules continued on next page)



SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

(Safety Rules continued from previous page)

- Look down and to the rear and make sure area is clear before operating in reverse.
- Do not operate on steep slopes
- Do not stop, start or change directions suddenly on slopes.
- Use extreme care and reduce ground speed on slopes and rough terrain.
- Watch for hidden hazards on the terrain during operation.
- Stop tractor and implement immediately upon striking an obstruction. Turn off engine, remove key, inspect and repair any damage before resuming operation.
- Disengage power to implement. Lower all raised components to the ground. Operate valve levers to release any hydraulic pressure. Stop engine, set parking brake and remove key before dismounting tractor or performing any service or maintenance.

MAINTENANCE SAFETY

- Before working underneath, raise harrow to highest position, install transport locks, and block securely. Blocking up prevents harrow dropping from hydraulic leak down or mechanical failure.
- Serious injury can be inflicted by disc blades and disc gangs if not handled safely. Watch for unsafe conditions. Keep your coworkers safety in mind. Do not handle disc blades with bare hands.
- Keep all persons away from operator control area while performing adjustments, service or maintenance.
- Your dealer can supply genuine replacement disc blades. Substitute blades may not meet original equipment specifications.

- Do not stand on or straddle a tongue when unhitching.
- Never operate harrow until hydraulic cylinders and lines are full of oil and free of air. See operating instructions.
- Do not climb or walk on harrow frame, or tires.

TRANSPORTING SAFETY

- Use a Slow - Moving - Vehicle (SMV) emblem and proper lighting when transporting the harrow.
- Always use a safety chain of tensile strength equal to the gross weight of the disc harrow plus any attachments when transporting. Make sure that the weight of the towing vehicle EXCEEDS the weight of the harrow being towed. Stopping distance increases with increased speed as the weight of the towed load increases, especially on hills and slopes.
- Check tire pressure and wheel bolts before and during transport.
- Do not road the harrow over 20 miles per hour on the best surface conditions. Reduce speed when going up or down hills and when approaching ditches or corners. Towing vehicle must weigh more than towed implement.
- Check condition of hitch pins and bolts, tires and hubs, and safety chain before transporting.
- Keep your harrow in proper working condition. Unauthorized modifications to the harrow may impair the function and/or safety and affect harrow life. Do not add excessive weight to harrow. Additional weight could cause frame or axle to fail resulting in loss of control of harrow/tractor during transport.

(Safety Rules continued on next page)



SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

(Safety Rules continued from previous page)

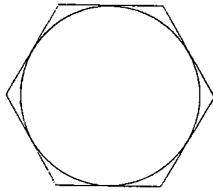
- Watch low hanging Overhead Power Lines during transport. Avoid contact as this can cause serious injury or death.

STORAGE

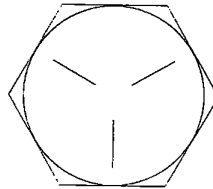
- Block equipment securely for storage.
- Keep playing children and bystanders away from storage area.

BOLT TORQUE CHART

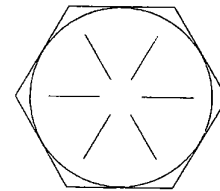
GRADE 2



GRADE 5



GRADE 8



TORQUE IN FOOT POUNDS

| BOLT SIZE | | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1 |
|-----------------------|---|------|-----|-------|-------|--------|-------|
| HEX HEAD | | 9/16 | 3/4 | 15/16 | 1-1/8 | 1-5/16 | 1-1/2 |
| G R A D E | 2 | 18 | 45 | 89 | 160 | 252 | 320 |
| | 5 | 30 | 68 | 140 | 240 | 360 | 544 |
| | 8 | 40 | 100 | 196 | 340 | 528 | 792 |



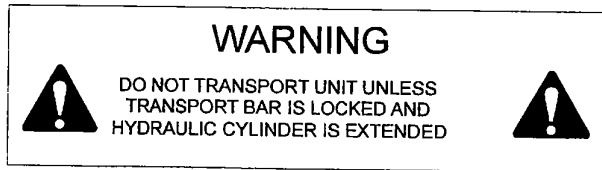
SAFETY DECALS



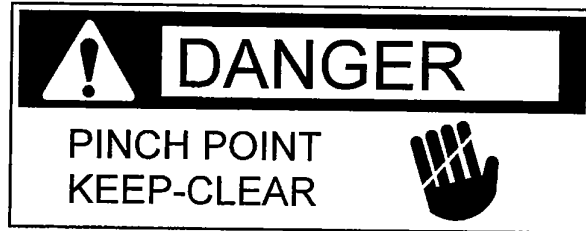
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
Replace Immediately If Damaged!

DECAL LOCATIONS

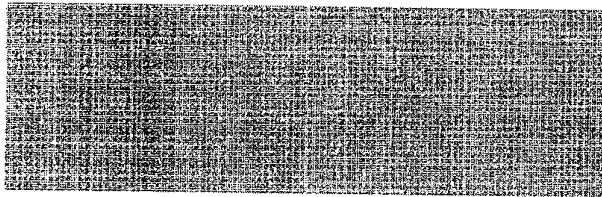
The following decals are located on your implement. Read them and follow their instructions for your safety. Keep all decals in place and legible. Replace worn or missing decals. Order by number listed.



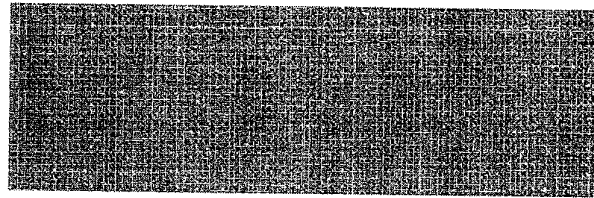
605176 Front of Frame



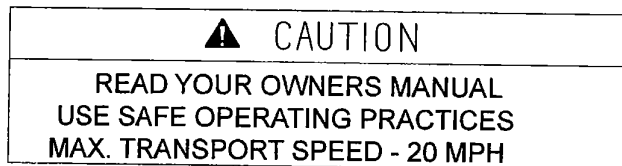
029772 On Cylinder Bracket



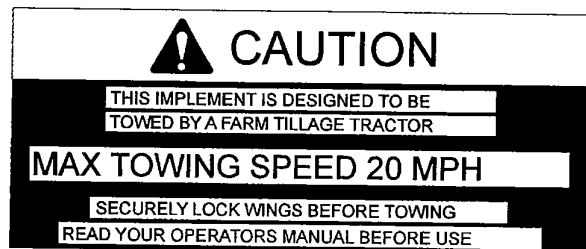
029770 Amber Reflector - Front Side Ends of Front Gang Tubes



029771 Red Reflector - Rear Side End of Rear Gang Tubes



009537 Front of Frame



029775 Front of Frame

OPERATION

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said **“The best safety device is an informed, careful operator.”** We ask you to be that kind of an operator.

The operator is responsible for the safe operation of this harrow. The operator must be properly trained. Operators should be familiar with the harrow and tractor and all safety practices before starting operation. Read the safety information on pages 2, & 5 through 8.

This harrow is designed for normal farm usage. Optional blades are available for different conditions.

Recommended harrowing speed for most conditions is from two to five mph.

Maintain your implement with original repair parts to insure safety and optimum performance.

ASSEMBLY

General

Your Series 650 Offset Disc Harrow is shipped in bundles for assembly. Remove all wiring from bundles as they are called for. Choose a level area to arrange the parts conveniently. Assemble parts for each step loosely to insure fit. Use flatwashers with slotted holes. Always use lockwashers unless a lock nut is called for. Tighten hardware after parts are installed according to the torque chart on Page 7. Unless otherwise stated, all hardware is grade 5. The following assembly steps are given to minimize the need for adjustment after assembly. Remember that **LEFT** and **RIGHT** are determined by standing at the rear of the implement and facing it.

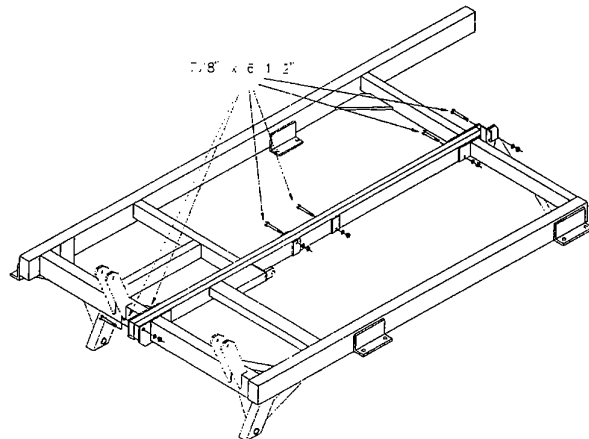


Fig. 1 Large frame assembly

Frame & Gangs

Small Frame Models

Center frame is a single welded structure. No assembly required.

Large Frame Models (Fig 1):

Position left and right frame assemblies together on supports. Bolt frame halves together with six 7/8" x 6-1/2" bolts, lockwashers, and hex nuts. Tighten hardware before proceeding.

All Models:

- 1) Identify the front and rear disc gangs. The scraper blades are on the rear side of the gangs and the front gang blades are concave toward the right.
- 2) Decide which way you want the assembled offset harrow to face so that attaching with a tractor is easiest.
- 3) Position the gangs in a "V" pattern in the middle of the assembly area as shown in Figure 2 with the scraper blades to the rear. The narrow part of the "V" should be to the left with about 2 feet between the gangs.

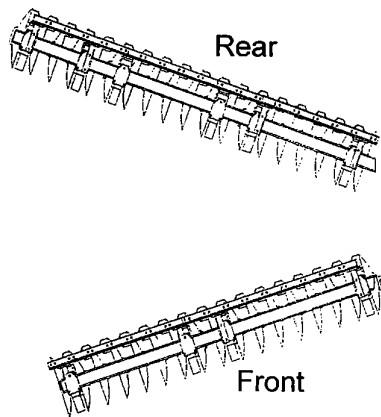


Figure 2 - Positioning Gangs for Assembly

4) Rotate the gang tubes up and block the disc blades on both sides to prevent rolling. Be sure supports are secure with gang assemblies upright before proceeding. Both gang tubes should be positioned directly on top of the gangs.

5) Place the main frame on top of the gang assemblies so that the front of the frame projects over the front gang and the rear of the frame extends past the rear gang. Position the frame on the gangs as shown on pp. 18-20 for your model.

6) As shown in Figure 3, bolt the gangs to the left side of the main frame using the gang tube plate, 1-1/8" x 7-1/2" bolts, lockwashers, and hex nuts provided. Do not tighten bolts.

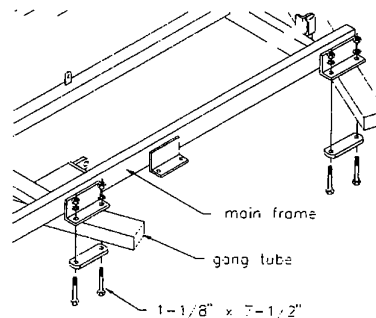


Fig. 3 Mounting gangs to frame

7) Adjust the right side of the gangs to the medium angle setting on the mounting plates. Secure to frame using gang tube plate, 1-1/8" x 7-1/2" bolts, lockwashers, and hex nuts provided.

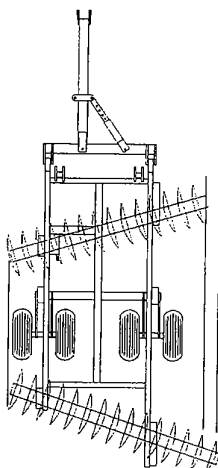
8) The rear gang should be aligned with the front gang as shown in Figure 4. Move the gangs as needed to achieve alignment. This relationship should be maintained at all times to insure that the furrow created by the front blade is filled by the rear blade.

9) Tighten all hardware.

Hitch (See Figure 5)

1) Position hinge bar on main frame as shown with the spring rod mounts up. Pin the hinge bar to the main frame as shown with the 1-3/8" diameter x 8" pins provided. Secure with 3/8" x 2" cotter pins.

Back edge of rear blade aligns with center of corresponding front blade. The furrow created by the front blade is then filled by the back blade.



The two outside rear tapered blades align outside the front tapered blade. The rear blades then level out the ridge created by the front blade.

Fig. 4 Proper front-to-rear gang alignment

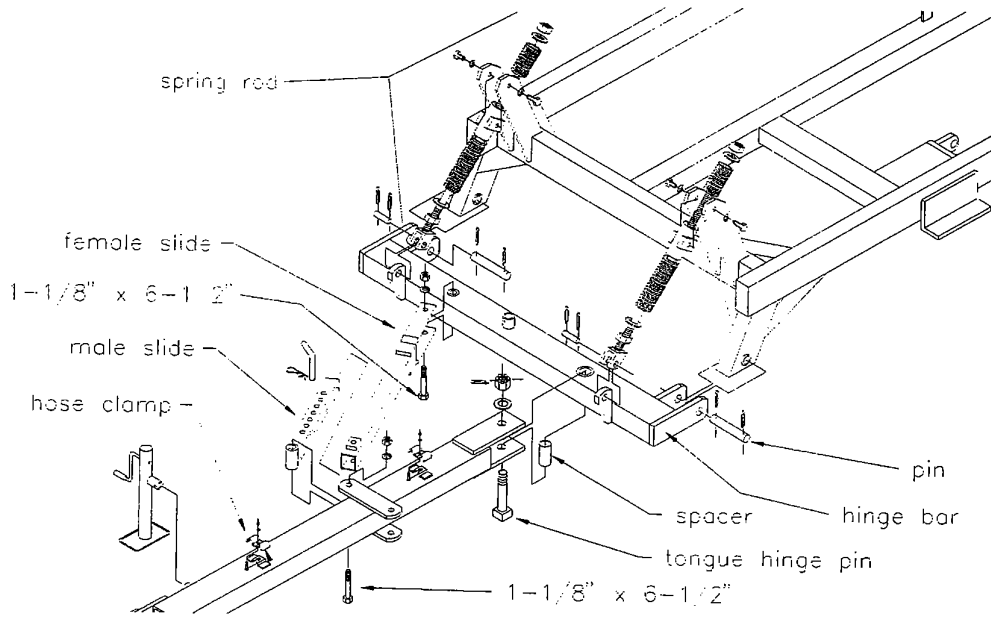


Fig. 5 Hitch assembly

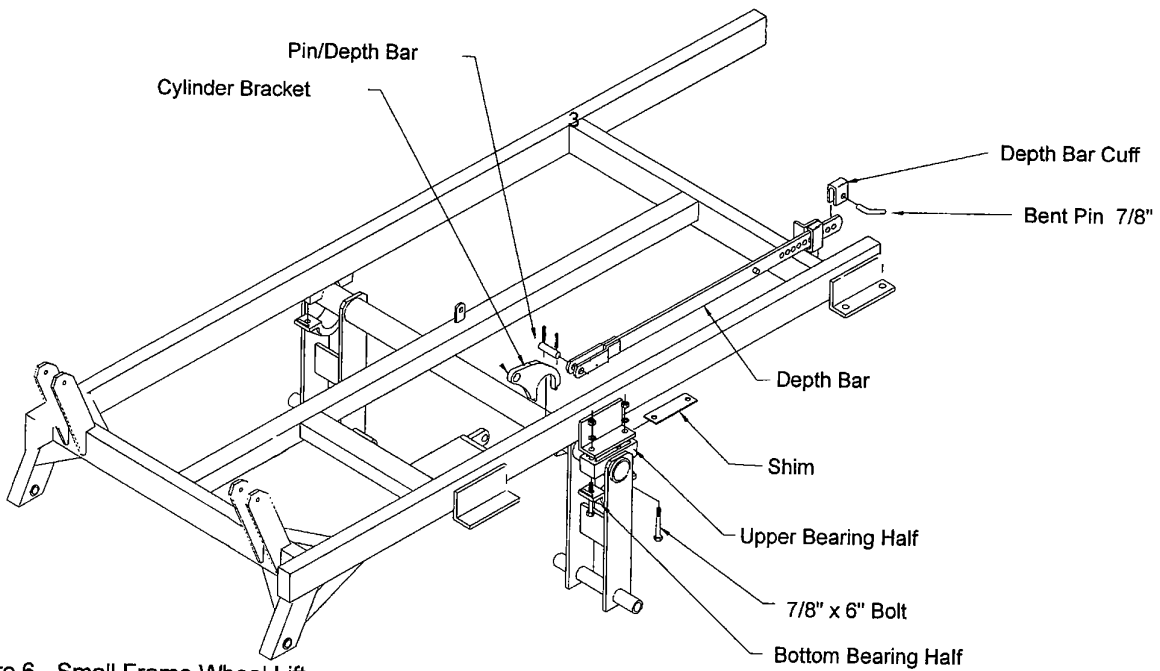


Figure 6 - Small Frame Wheel Lift

2) Mount the tongue to the hinge bar. The tongue may be mounted either side up to accommodate a wide range of drawbar heights. Check the height of your tractor's drawbar to decide how to mount the tongue. Secure the tongue with the 1-1/2" bolt with the slotted hex nut and cotter pin.

3) Secure the telescoping arm between the tongue and the hinge bar using two 1-1/8" x 6-1/2" bolts with lockwashers and nuts.

4) Install jack stand on tongue and use to support tongue at tractor drawbar height.

5) Remove bolts from spring rod tabs on main frame. Align slide assembly on spring rods with holes in tabs making sure grease fitting is toward the front. Reinstall bolts and tighten.

6) Remove pin from clevis end of spring rods. Adjust spring rods as needed to align with tabs on hinge bar. Reinstall pins and secure with cotter pins.

Small Frame Wheel Lift (See Figure 6)

1) Position wheel lift assembly under main frame with the cylinder anchor to the left and

wheel arms pointed to the rear. Align wheel arms under mounting plates on frame.

2) With wheel lift supported near main frame, fit top half of bearings between mounting plate and wheel lift. Place bottom half of bearings under wheel lift and install 7/8" x 6" bolts, lockwasher, and hex nuts. (Save bearing shim so you can use if have leveling problems.)

3) Tighten hardware and apply grease at fittings in bearings.

4) Remove the pins and depth adjustment cuff from the depth bar. Insert the end of the depth bar with the depth adjustment holes through the cuff provided on the rear of the main frame.

5) Pin the clevis end of the depth bar to the wheel lift at the upright. Secure with cotter pins.

6) Pin the depth adjustment cuff to the rear end of the depth bar behind the main frame cuff. Secure with hairpin clip.

7) Mount rims with tires to axle hubs and torque lug nuts.

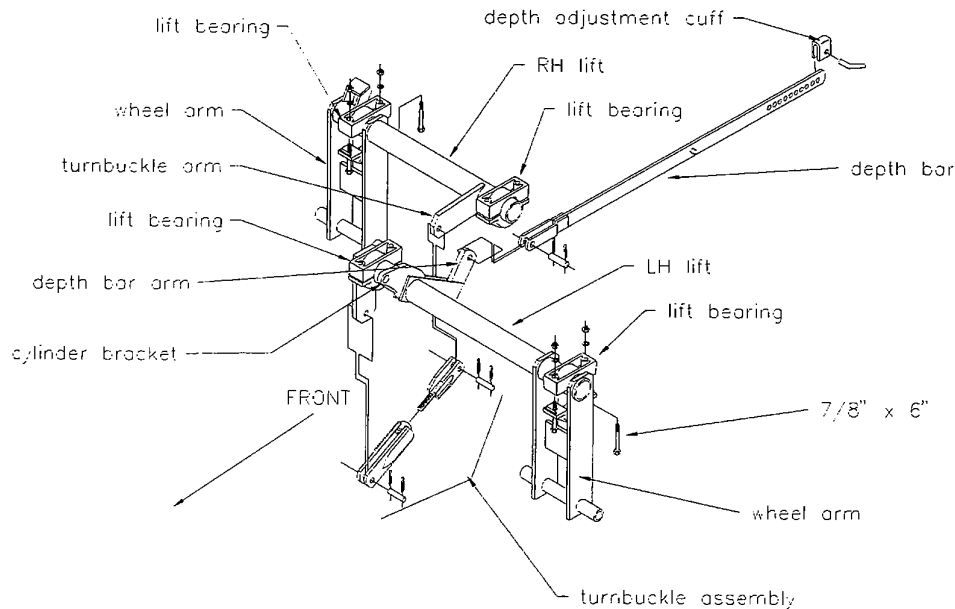


Fig. 7 Large frame wheel lift

Large Frame Wheel Lift (See Figure 7)

1) Position left-hand wheel lift under frame and align with mounting plates. Be sure wheel arm points to the rear.

2) Position top half of bearings between mounting plates and wheel lift. Align bottom half of bearings with top half and install 7/8" x 6" bolts, lockwashers, and hex nuts.

3) Repeat steps 1 & 2 for right-hand wheel lift making sure to point the wheel arm to the front.

4) Install rims with tires onto hubs and torque lug nuts.

5) With all four wheels on the ground, install turnbuckle assembly between right and left wheel lifts. Adjust length of turnbuckle to achieve alignment. Do not rotate either wheel lift as this will cause the machine to be unlevel.

6) Remove pins and depth bar cuff from depth bar.

7) Slide end of depth bar through cuff on main frame. Pin clevis end of depth bar to arm on wheel lift and secure using cotter pins.

8) Install depth bar cuff on depth bar behind main frame cuff. Secure with pin and clip.

Hydraulic System

Your offset harrow is designed for use with a standard ASAE 5" x 8" cylinder, either single or double action. Do not use a cylinder with a bore less than 5" and a stroke other than 8".

When installing fittings, use a thread sealant to prevent leaking. Use care not to over tighten fittings.

1) Mount butt end of cylinder to main frame anchor. Be sure line ports are facing up.

2) Remove port plugs from cylinder ports and extend rod to align clevis with anchor on wheel lift. If necessary, rotate wheel lift up to achieve alignment. Pin cylinder rod clevis to wheel lift.

3) Install reducer bushings in cylinder ports and tighten.

4) Install hydraulic lines into reducer bushings.

5) Secure lines to tongue using hose clamps provided. Be sure to leave slack for hinge motion of offset harrow. Also allow enough extra line for pivot of tractor.

WARNING

It is important that all air be out of the hydraulic system before performing wheel lift.

Operate the wheel cylinder lift from extended to retract a number of times. Go over tractor relief at end of each stroke each way to ensure air is being eliminated. Observe tractor hydraulic system oil level and replenish as needed. The cylinder is functioning properly when 8" stroke is measured at wheel lift cylinder in extend position. Make sure it is 8".

Watch fittings for leaks. If leaks are noticed, shut off tractor, relieve pressure from hydraulic lines, and make repair before proceeding.

Check that all hydraulic connections are tight.

WARNING

Check for small high pressure leaks by passing a piece of cardboard or wood over lines rather than hands. High pressure oil can penetrate skin and can only be removed surgically.

ATTACHING

WARNING

Be sure bystanders are clear. Do not stand between implement and tractor. Shut off tractor and engage parking brake prior to dismounting.

1) Back tractor to align drawbar with clevis.

2) Attach offset harrow using suitable hitch pin. Secure with hairpin clip.

3) Attach hydraulic lines to tractor.

4) Relieve weight from jack. Remove pin and store jack in storage position on cross tube.. Replace pin.

HYDRAULIC SYSTEM CHECK

1) Start tractor engine and slowly lift offset harrow.

⚠ WARNING

Perform all tractor operations only while seated in the tractor seat. Do not stand beside tractor.

2) Watch fittings for leaks. If leaks are noticed, shut tractor off, relieve pressure from hydraulic lines, and make repairs before proceeding.

3) Check movement of wheel lift to be sure there is no interference.

4) Move wheel lift through full range of motion several times to purge air from system.

5) After hydraulic system has been fully charged, check fluid level in tractor's reservoir and refill if necessary.

TRANSPORTING

1) Lift offset harrow as high as possible. Move depth bar cuff as far forward as possible. Lower offset harrow to rest weight on cuff.

2) Level harrow using top spring on spring rod.

3) Transport at no more than 20 mph. Use caution on rough terrain.

4) Check local laws governing transport of farm equipment on public roads.

5) Use caution and be aware of oncoming traffic and roadside obstructions.

6) Always use an SMV (Slow Moving Vehicle) emblem when transporting on roads. A bracket is provided on the rear of the implement for mounting the SMV emblem.

7) **DO NOT** transport on public roads at night.

ADJUSTMENTS

General

Several factors will directly affect the performance of an offset harrow. Some of these are disc gang angle, weight of harrow, height of hitch point on the tractor, speed of travel, soil condition, and amount of trash on the ground.

When possible, pull the offset harrow through the swinging drawbar and allow the drawbar to swing freely. The drawbar may be locked in place after the harrow has been pulled enough to determine the position of the tongue where the side draft on the tractor is eliminated. Usually this can be straight to 3" - 4" to left of center on the tractor.

Depth of Cut

Depth of cut is controlled by setting the cuff on the depth control bar. Move the cuff forward to decrease working depth and backward to increase working depth.

1) Lift offset harrow to relieve weight from cuff.

2) Move cuff to desired position. The hole in the cuff is drilled off center so the cuff may be turned around and returned to the same hole for a "half hole" adjustment.

3) Once the cuff is set, lower the offset harrow.

4) Never position the cuff in front of the main frame cuff.

Front To Rear Height Adjustment

The spring rod assemblies on the hitch control front to rear height. The bottom spring controls this setting in operating position, and the top

spring is strictly for leveling the unit in transport. In normal conditions, the offset harrow performs best when the front gang cuts slightly deeper than the rear. This helps the offset harrow to properly trail behind the tractor.

When making adjustments always adjust both spring rods the same amount.

1) To increase penetration of the rear gangs and decrease penetration of the front gangs, tighten the lower spring. To increase penetration of the front gangs, loosen the lower spring.

2) To level the offset harrow in transport position, tighten or loosen the top spring as needed.

Elimination of Side Draft

When the offset harrow is not adjusted properly, it will not follow the tractor properly. This is because of excessive side draft imposed on the offset harrow when the front and rear gangs are not doing the same amount of work. When the rear section of the offset harrow is pulling to the right, the rear gang is cutting too deep, the pulling point on the harrow is too far to the right, or the rear gang has too much angle. If this condition exists, make adjustments in the following order.

1) Decrease the pressure on the bottom spring of the spring rod in small increments until the desired cutting depth for the rear gang is obtained.

2) If the rear gang continues to pull to the right, decrease the gang angle by moving the right-hand end of the gang forward one setting at a time. See **Gang Angle**.

3) If the condition is still not corrected, change the pulling point of the offset harrow. Do this by lengthening the slide assembly on the tongue one setting at a time.

If the rear gang of the offset harrow is pulling to the left, the above adjustments should be

made opposite as described but in the same order.

1) Increase pressure on the lower spring.

2) Increase rear gang angle one setting at a time.

3) Shorten slide assembly on tongue one setting at a time.

Gang Angle

In general, the offset harrow is operated in minimum gang angle under normal conditions, medium gang angle under moderately tough conditions, and maximum gang angle under extreme conditions.

As a rule, never set the rear gang with less angle than the front gang and do not change angle in both gangs at the same time.

1) Lower offset harrow harrow to the ground.

2) Remove both right-hand gang tube bolts.

3) Place one bolt at new setting to keep the gang from traveling beyond the new setting while adjustment is being made. (eg. If moving the gang forward, place bolt in forward hole of new setting).

4) Move disc gang to new setting by pulling the offset harrow forward or backing it up. Replace remaining bolt at new setting.

Scraper Blades

The scraper blades should be adjusted into the disc blades periodically to compensate for wear.

1) Loosen the two bolts holding the bar to the hangers.

2) Slide the scraper assembly in toward the blade. Do not force the scrapers into the disc blades.

3) Retighten hardware.

Lubrication

Clean all grease fittings with a clean rag prior to performing lubrication. Use a good grade lithium base multipurpose grease.

- **Spring Rods** - Apply grease at slide assembly before each use.
- **Wheel Lift Bearings** - Apply grease at all bearings before each use.
- **Disc Gang Bearings** - Lubricate every 50 hours under normal conditions, every 16 hours under muddy conditions. With offset harrow in transport position, apply grease while slowly rotating disc gang. Apply until fresh grease emerges from seal around bearing.
- **Wheel Hubs** - The wheel hubs are packed with grease at the factory and do not require any initial maintenance. As a rule maintain the hubs on the same schedule as the front wheels on the tractor. Keep bearings properly adjusted with bearing adjustment nut for long life.

MAINTENANCE

General

Your offset harrow harrow is designed for minimum maintenance. By taking a few minutes prior to beginning operations and performing the following maintenance check, you will insure improved performance and longer life of your offset harrow.

Tires

The tires should be checked prior to beginning daily operations. Be sure that all tires have the correct pressure (35 psi maximum).

Disc Gang Axles

The disc gang axles are torqued at the factory. During the first few hours of operation, the spacer spools will seat themselves and may cause the axle to loosen. After the first day of operation check the gang axles and retorqued if necessary.

- 1) Lift the offset harrow to transport position.
- 2) Strike each blade with a light hammer. If a ringing sound is heard the gang is tight. If not, the blade is loose and the gang should be retorqued.
- 3) Lower unit to ground.
- 4) Remove the cotter pin from the nut at one end of the gang. Retorque the axle to 1000 ft.-lbs.

After this "break in" period, the gang axles should not require tightening unless the nut is removed for some reason.

Hydraulic System

The hydraulic system requires no regular maintenance but should be checked periodically for leaks. A leaky hydraulic system is unsafe and unreliable.

- 1) Inspect fittings for leaks and make repairs before using offset harrow.
- 2) Hydraulic lines subjected to high pressure over time may develop small leaks. These leaks will be detectable only when the lines are under pressure. To locate small high pressure leaks within the lines, move a piece of cardboard over the length of the line.

WARNING

Do not run bare hand over lines to check for leaks. Fluid leaking under high pressure can penetrate the skin causing poisoning. In such cases, fluid must be removed surgically.

If hydraulic lines begin to develop leaks they should be replaced.

- 3) Inspect cylinders for leaks around piston rod and cylinder body. If cylinder leaks, order the seal kit and rebuild the cylinder

STORAGE

1) Wash offset harrow prior to storage. Clean all debris from disc gangs especially around bearings.

2) Apply grease to disc gang bearings for storage between seasons.

3) Store offset harrow under shelter from weather.

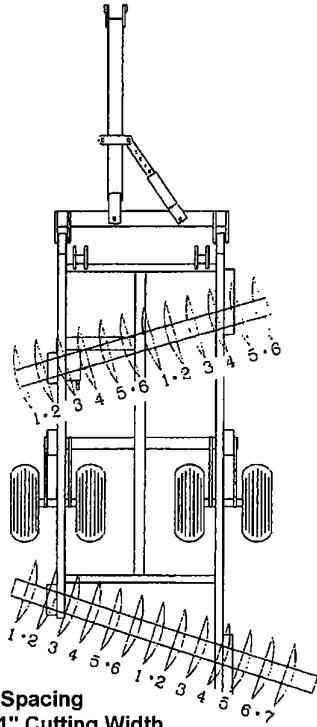
4) Coat soil engaging surfaces as well as exposed portion of cylinder piston rod with a rust inhibitor.

5) Block equipment securely for storage.

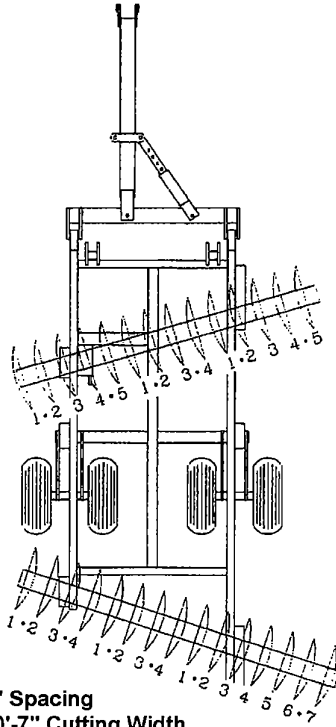
6) Keep playing children and bystanders away from storage area.

| TROUBLESHOOTING | | |
|---------------------------------|------------------------------|---------------------------------------|
| Problem | Possible Cause | Remedy |
| BACK GANG PULLS TO THE RIGHT | REAR GANG SET TOO DEEP | DECREASE LOWER SPRING PRESSURE PG. 15 |
| | REAR GANG ANGLE TOO BIG | DECREASE GANG ANGLE PG. 15 |
| | PULLING POINT TOO FAR RIGHT | LENGTHEN SLIDE ASSEMBLY PG. 15 |
| BACK GANG PULLS TO THE LEFT | REAR GANG SET TOO SHALLOW | INCREASE LOWER SPRING PRESSURE PG. 15 |
| | REAR GANG ANGLE TOO SMALL | INCREASE GANG ANGLE PG. 15 |
| | PULLING POINT TOO FAR LEFT | SHORTEN SLIDE ASSEMBLY PG. 15 |
| OFFSET NOT LEVEL IN TRANSPORT | TOP SPRING NOT ADJUSTED | LOOSEN OR TIGHTEN TOP SPRINGS PG. 15 |
| HYDRAULIC SYSTEM NOT RESPONSIVE | DEPTH BAR LOCKED | MOVE DEPTH BAR CUFF |
| | TRACTOR LINE NOT INSTALLED | CHECK HOOK UPS |
| | INTERFERENCE WITH WHEEL LIFT | CHECK WHEEL LIFT TRAVEL PATH |

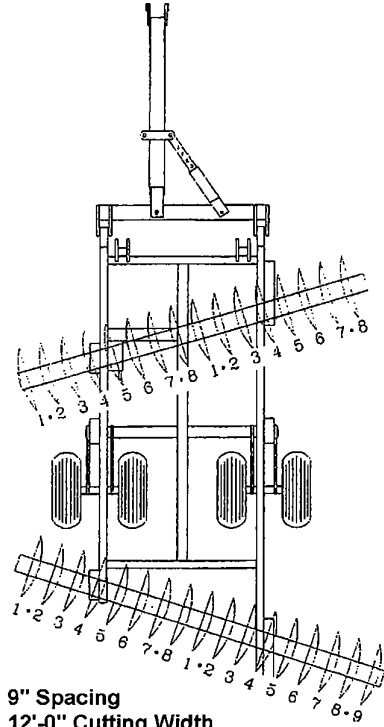
| MISCELLANEOUS HARDWARE BY SIZE | | | | |
|--------------------------------|---------------------|------------|-----------------|-------------|
| Size | Part Number By Item | | | |
| | LOCKWASHER | FLATWASHER | REGULAR HEX NUT | HEX LOCKNUT |
| 1/4" | 303951 | - | 304003 | - |
| 5/16" | 303952 | 303968 | 304004 | - |
| 3/8" | 303953 | 303969 | 304005 | 304018 |
| 7/16" | 303954 | 303970 | 304006 | 304019 |
| 1/2" | 303955 | 303971 | 304007 | 304020 |
| 5/8" | 303956 | 303972 | 304008 | 304021 |
| 3/4" | 303957 | 303973 | 304009 | 304022 |
| 7/8" | 303958 | 303974 | 304010 | 304023 |
| 1" | 303959 | 303975 | 304011 | 304024 |
| 1-1/8" | 303960 | 303976 | 304012 | 304025 |
| 1-1/4" | 303961 | 303977 | 304013 | 304026 |



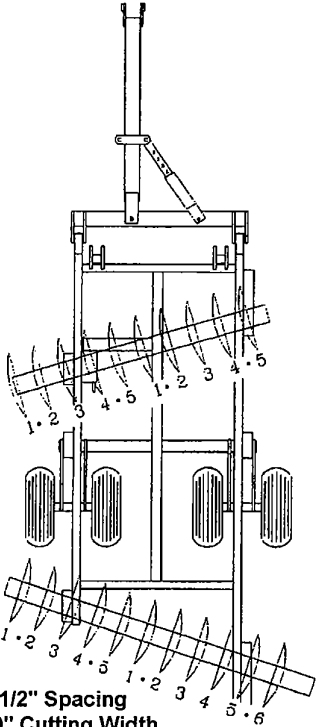
9" Spacing
9'-1" Cutting Width
650-S-25-9 (Rigid Hangers)
650-F-25-9 (Spring Hangers)



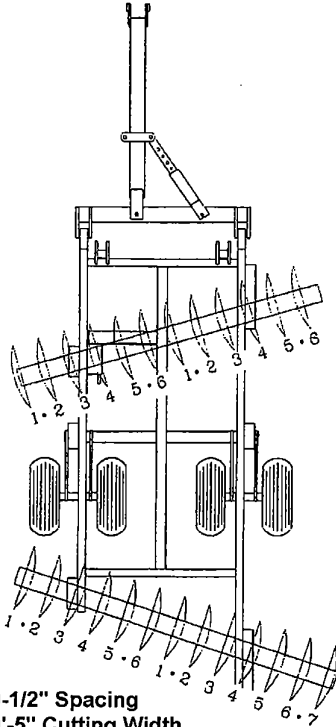
9" Spacing
10'-7" Cutting Width
650-S-29-9 (Rigid Hangers)
650-F-29-9 (Spring Hangers)



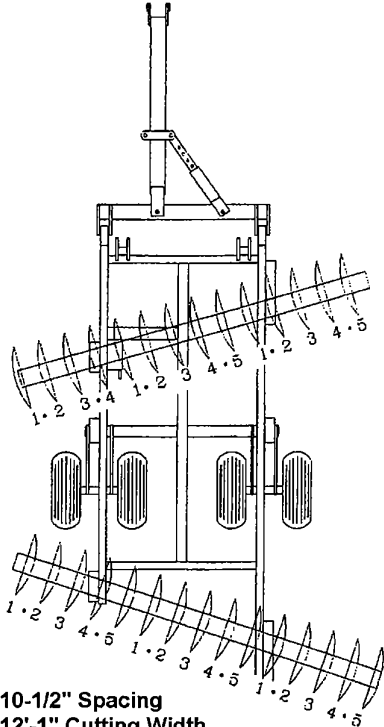
9" Spacing
12'-0" Cutting Width
650-S-33-9 (Rigid Hangers)
650-F-33-9 (Spring Hangers)



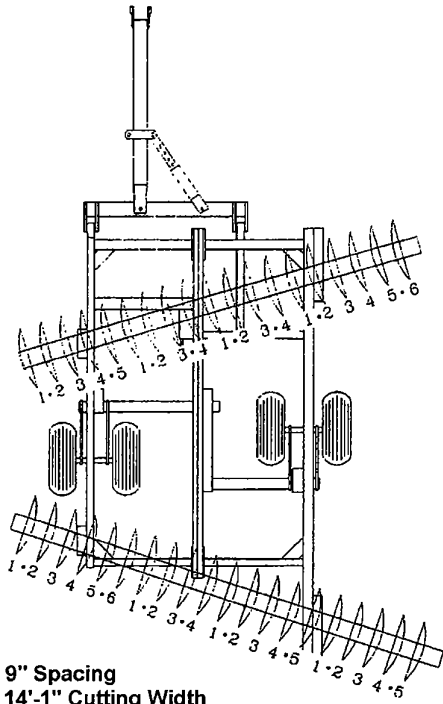
10-1/2" Spacing
8'-9" Cutting Width
650-S-21-10 (Rigid Hangers)
650-F-21-10 (Spring Hangers)



10-1/2" Spacing
10'-5" Cutting Width
650-S-25-10 (Rigid Hangers)
650-F-25-10 (Spring Hangers)

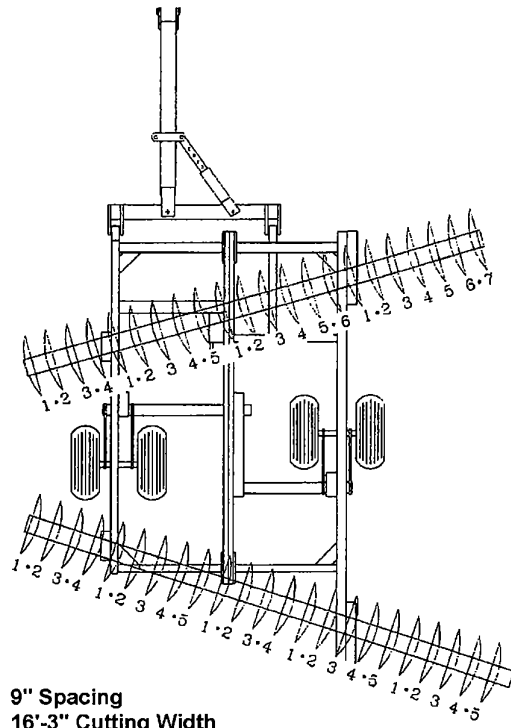


10-1/2" Spacing
12'-1" Cutting Width
650-S-29-10 (Rigid Hangers)
650-F-29-10 (Spring Hangers)



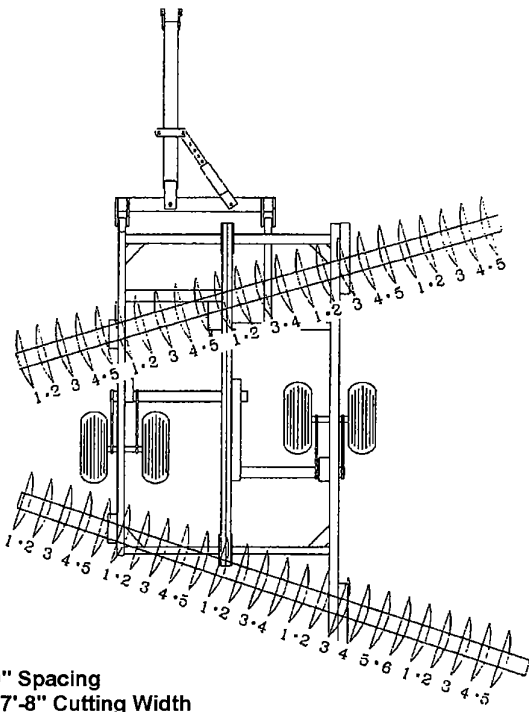
9" Spacing
14'-1" Cutting Width

650-S-39-9 (Rigid Hangers)
650-F-39-9 (Spring Hangers)



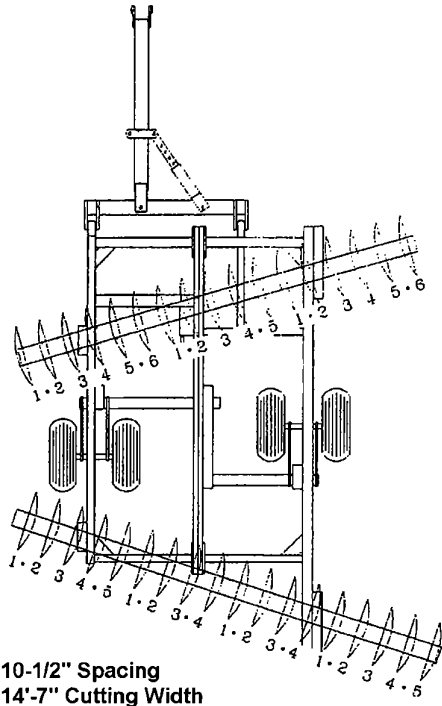
9" Spacing
16'-3" Cutting Width

650-S-45-9 (Rigid Hangers)
650-F-45-9 (Spring Hangers)



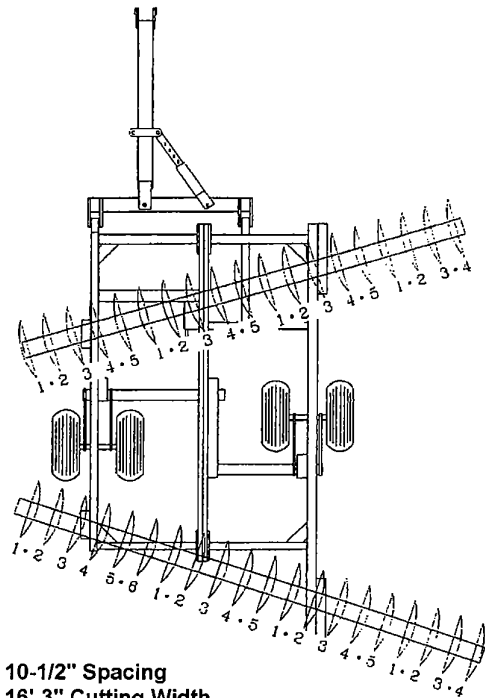
9" Spacing
17'-8" Cutting Width

650-S-49-9 (Rigid Hangers)
650-F-49-9 (Spring Hangers)



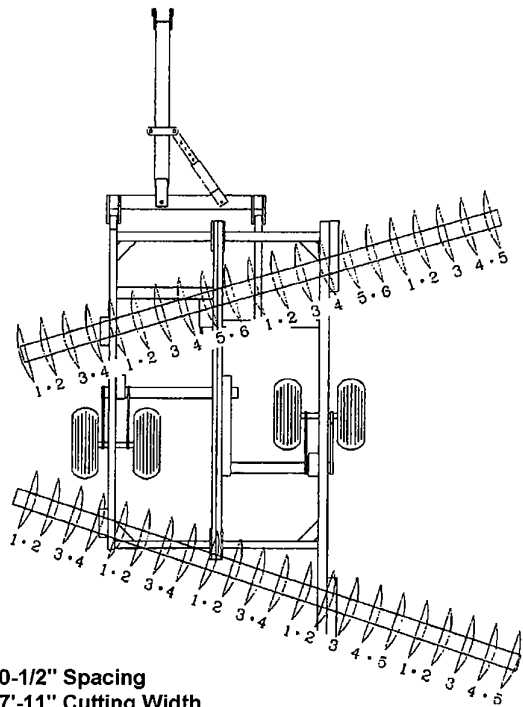
10-1/2" Spacing
14'-7" Cutting Width

650-S-35-10 (Rigid Hangers)
650-F-35-10 (Spring Hangers)



10-1/2" Spacing
16'-3" Cutting Width

650-S-39-10 (Rigid Hangers)
650-F-39-10 (Spring Hangers)



10-1/2" Spacing
17'-11" Cutting Width

650-S-43-10 (Rigid Hangers)
650-F-43-10 (Spring Hangers)

PN-000312 (Rev. 3/01)

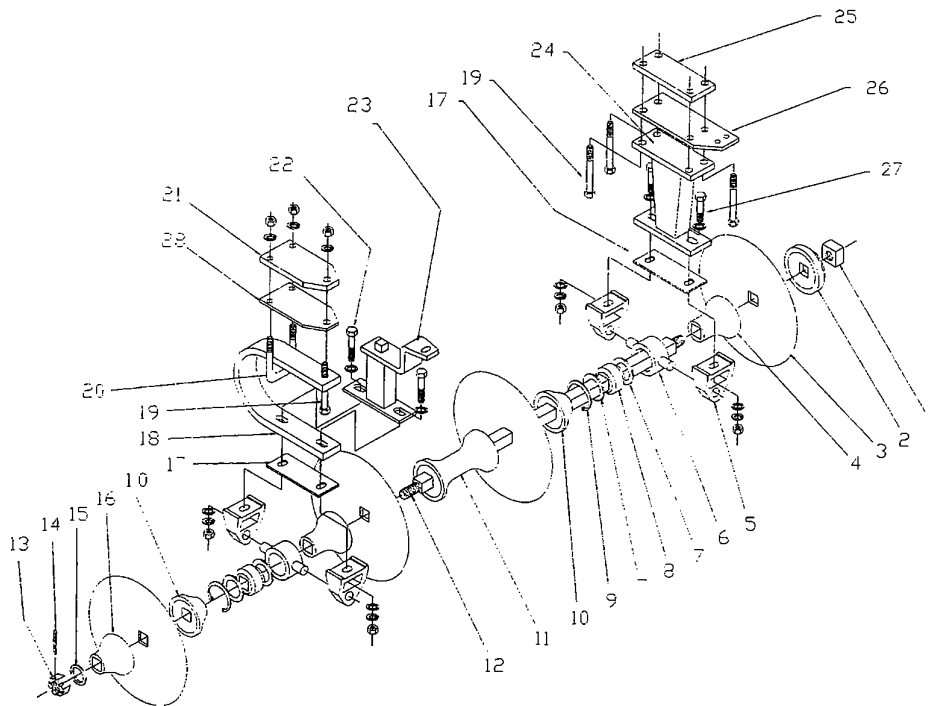


FIGURE 8 DISC GANG COMPONENTS

| Item | Part # | Description | Item | Part # | Description |
|------|-----------|--------------------------------|------|--------|-----------------------|
| 1 | 208930 | NUT/SQUARE 1-1/2" | 14 | 304142 | PIN/COTTER 5/16" X 3" |
| 2 | 206765 | BUTT PLATE | 15 | 303979 | WASHER/FLAT 1-1/2" |
| 3 | SEE TABLE | DISC BLADE | 16 | 204438 | END WASHER |
| 4 | 207930 | SPACER/HALF CONVEX 9" SP | 17 | 211618 | SUPPORT PLATE |
| | 206631 | SPACER/HALF CONVEX 10-1/2" SP | 18 | 207800 | SPRING BEARING HANGER |
| 5 | 211587 | BEARING SUPPORT | 19 | 303738 | HHCS 7/8" X 7" |
| 6 | 211595 | HSG/TRUNNION BEARING | | 303958 | WASHER/LOCK 7/8" |
| 7 | 211615 | WASHER/ FLAT SPECIAL | | 304010 | NUT/HEX 7/8" NC |
| 8 | 211617 | BEARING GW211PP17 | 20 | 208737 | U BOLT 3/4" |
| 9 | 211616 | RETAINING RING | | 303957 | WASHER/LOCK 3/4" |
| 10 | 206630 | SPACER/HALF CONCAVE 9" SP | | 304009 | NUT/HEX 3/4" NC |
| | 204437 | SPACR/HALF CONCAVE 10-1/2" SP | 21 | 208736 | TOP PLATE |
| 11 | 207932 | SPACER/FULL 9" SP | 22 | 303748 | HHCS 7/8" X 3-3/4" |
| | 207347 | SPACER/FULL 10-1/2" SP | | 303958 | WASHER/LOCK 7/8" |
| 12 | 209311 | AXLE/3 DISC 9" SP 24-13/16" | | 303974 | WASHER/FLAT 7/8" |
| | 208267 | AXLE/4 DISC 9" SP 33-13/16" | | 304010 | NUT/HEX 7/8" NC |
| | 208178 | AXLE/5 DISC 9" SP 42-13/16" | 23 | 210649 | HANGER/SPRING SCRAPER |
| | 208174 | AXLE/6 DISC 9" SP 51-13/16" | 24 | 210701 | HANGER/RIGID BEARING |
| | 208175 | AXLE/7 DISC 9" SP 60-13/16" | 25 | 208495 | TOP PLATE |
| | 207633 | AXLE/3 DISC 10-1/2" SP 28" | 26 | 210623 | SCRAPER BAR PLATE |
| | 207631 | AXLE/4 DISC 10-1/2" SP 38-1/2" | 27 | 303730 | HHCS 7/8" X 3" |
| | 207632 | AXLE/5 DISC 10-1/2" SP 49" | 28 | 208806 | SHIM |
| | 207877 | AXLE/6 DISC 10-1/2" SP 59-1/2" | | | |
| 13 | 304042 | NUT/HEX SLOTTED 1-1/2" | | | |

| TABLE 1 DISC BLADES | | |
|--------------------------------|----------------------------|---|
| PART NUMBER | | DESCRIPTION |
| SHALLOW CONCAVITY - FRONT GANG | DEEP CONCAVITY - REAR GANG | |
| 207905 | 204007 | 26" HEAVY DUTY CUT OUT DISC |
| 207906 | 205011 | 26" HEAVY DUTY ROUND DISC |
| 207901 | 204006 | 24" HEAVY DUTY CUT OUT DISC |
| 207902 | 204009 | 24" HEAVY DUTY ROUND DISC |
| 205024 | 205024 | 22" HEAVY DUTY CUT OUT DISC |
| 205025 | 205025 | 22" HEAVY DUTY ROUND DISC |
| | 207911 | 20" CUT OUT TAPER DISC |
| | 207912 | 20" ROUND TAPER DISC |
| | 207913 | 18" CUT OUT TAPER DISC |
| | 207914 | 18" ROUND TAPER DISC |
| 208173 | - | 12" BACK UP DISC - BEHIND FRONT LEAD DISC |

INSTRUCTIONS FOR ORDERING DISC BLADES

When ordering blades, remember that the rear gang gets three "taper" blades and the front gang gets one "taper blade". Blades are tapered in 2" diameter increments. Be sure to order shallow concavity blades for the front and deep concavity blades for the rear (18" and 20" come in one concavity only).

- 1) Determine the total number of blades required regardless of blade size.
- 2) For the main disc size, order four LESS than the total required.
- 3) Order a shallow concavity blade 2" smaller for the front taper.
- 4) Order one deep concavity blade 2" smaller, one 4" smaller, and one 6" smaller for the three rear taper blades.

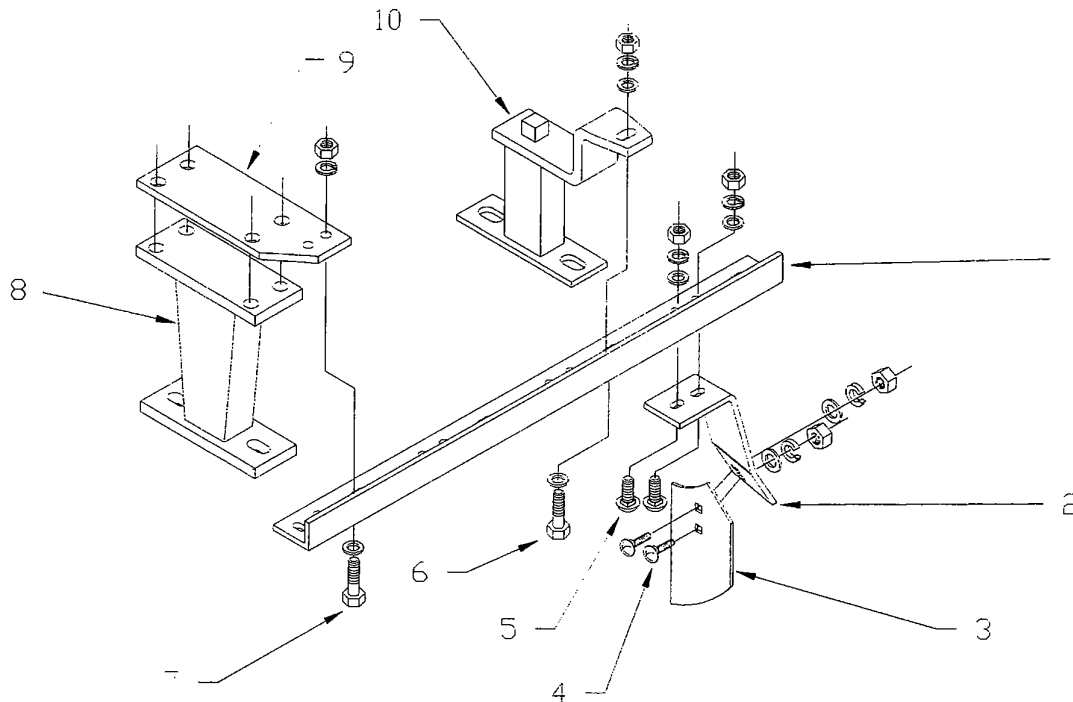


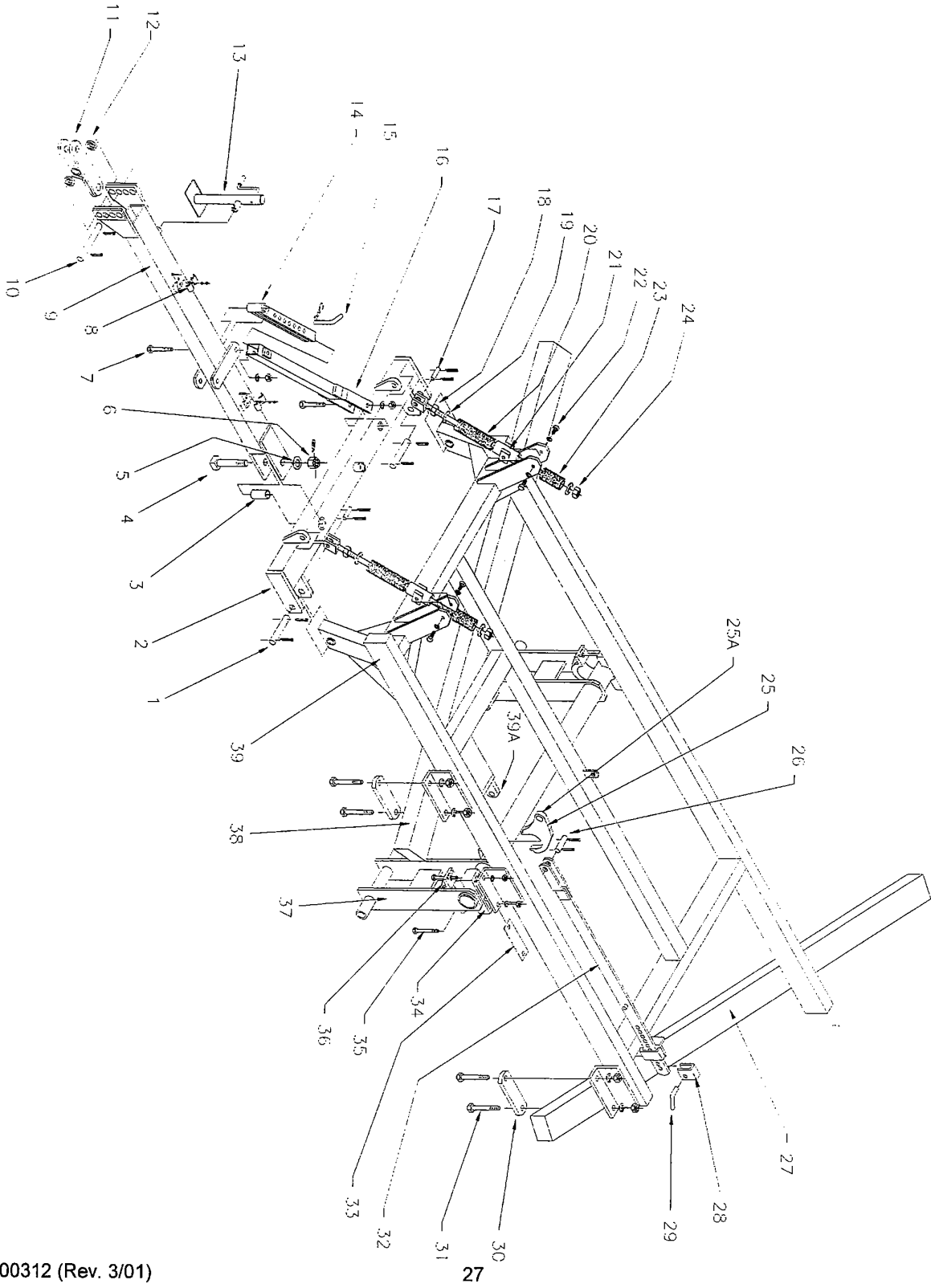
FIGURE 9 SCRAPER COMPONENTS (Rear Assy Shown)

| Item | Part # Front Assy | Part # Rear Assy | Description |
|------|----------------------|---------------------|-------------------------------------|
| 1 | ----- | 209792 | SCRAPER BAR 9" SPACING 25-1/2" |
| | 209797 | 209796 | SCRAPER BAR 9" SPACING 43-1/2" |
| | 209795 | 209794 | SCRAPER BAR 9" SPACING 34-1/2" |
| | 209799 | 209798 | SCRAPER BAR 9" SPACING 52-1/2" |
| | ----- | 209800 | SCRAPER BAR 9" SPACING 61-1/2" |
| | 209503 | ----- | SCRAPER BAR 10 1/2" SPACING 29" |
| | 209505 | 209506 | SCRAPER BAR 10 1/2" SPACING 39-1/2" |
| | 209507 | 209508 | SCRAPER BAR 10 1/2" SPACING 50" |
| | 209510 | 209509 | SCRAPER BAR 10 1/2" SPACING 60-1/2" |
| 2 | 209889 | 209888 | SCRAPER HANDLE |
| 3 | 209851 | | SCRAPER BLADE |
| 4 | 303858 | | BOLT/CARRIAGE 1/2" X 1-1/4" |
| | 303955 | | WASHER/LOCK 1/2" |
| | 304007 | | NUT/HEX 1/2" NC |
| 5 | 303859 | | BOLT/CARRIAGE 1/2" X 1-1/2" |
| | 303955 | | WASHER/LOCK 1/2" |
| | 304007 | | NUT/HEX 1/2" NC |
| 6 | 303676 | | HHCS 5/8" X 2" |
| | 303956 | | WASHER/LOCK 5/8" |
| | 303972 | | WASHER/FLAT 5/8" |
| | 304008 | | NUT/HEX 5/8" NC |
| 7 | 303675 | | HHCS 5/8" X 1-3/4" |
| | 303956 | | WASHER/LOCK 5/8" |
| | 303972 | | WASHER/FLAT 5/8" |
| | 304008 | | NUT/HEX 5/8" NC |
| 8 | 210701 | | HANGER/RIGID BEARING |
| 9 | 210623 | | SCRAPER BAR PLATE |

SMALL FRAME, HITCH, & WHEEL LIFT (Refer to Figure 10)

| Item | Part | Description | Qty | Item | Part | Description | Qty |
|------|--------|-----------------------------|-----|------|--------|------------------------|-----|
| 1 | 209125 | HINGE BAR PIN | 2 | 22 | 203748 | BOLT- 7/8" SPECIAL | 4 |
| | 304151 | PIN/COTTER 3/8" X 2" | 4 | | 303958 | WASHER/LOCK 7/8" | |
| 2 | 210157 | HINGE BAR | 1 | 23 | 206612 | SM COMPRESSION SPRG | 2 |
| 3 | 209578 | BUSHING | 1 | 24 | 304053 | NUT/HEAVY HEX 1-3/8" | 2 |
| 4 | 209596 | TONGUE HINGE PIN | 1 | 25 | 208862 | HYD CYLDR BRKT W/ BUSH | 1 |
| 5 | 303979 | WASHER/FLAT 1-1/2" | 1 | 25A | 208935 | TENSION BUSHING | 1 |
| 6 | 304042 | NUT/HEX SLOTTED 1-1/2" | 1 | 26 | 208098 | DEPTH BAR CLEVIS PIN | 1 |
| | 304142 | PIN/COTTER 5/16" X 2" | 1 | | 304151 | PIN/COTTER 3/8" X 2" | 2 |
| 7 | 303779 | HHCS 1-1/8" X 6-1/2" | 2 | 27 | 208743 | TUBE/REAR GANG 126" | |
| | 303960 | WASHER/LOCK 1-1/8" | 2 | | 208747 | TUBE/REAR GANG 133" | |
| | 304012 | NUT/HEX 1-1/8" NC | 2 | | 208751 | TUBE/REAR GANG 154" | |
| 8 | 208259 | HOSE CLAMP | 2 | 28 | 208706 | DEPTH ADJUSTMENT CUFF | 1 |
| | 303859 | BOLT/CARRIAGE 1/2" X 1-1/2" | 2 | 29 | 210806 | DEPTH ADJUSTMENT PIN | 1 |
| | 303955 | WASHER/LOCK 1/2" | 2 | | 205829 | HITCH PIN CLIP | 1 |
| | 304007 | NUT/HEX 1/2" NC | 2 | 30 | 210721 | GANG TUBE PLATE | 4 |
| 9 | 209574 | TONGUE | 1 | 31 | 303781 | HHCS 1-1/8" X 7-1/2" | 8 |
| 10 | 209742 | CLEVIS PIN | 1 | | 303960 | WASHER/LOCK 1-1/8" | 8 |
| | 304165 | PIN/COTTER 1/2" X 3" | 2 | | 304012 | NUT/HEX 1-1/8" NC | 8 |
| 11 | 209013 | SGL/ DBL DRAWBAR CLEVIS | 1 | 32 | 210716 | DEPTH BAR | 1 |
| 12 | 210724 | TONGUE CLEVIS SPACER | 2 | 33 | 208500 | SHIM | 4 |
| 13 | 808026 | JACK | 1 | 34 | 209235 | WHEEL LIFT BEARING TOP | 2 |
| 14 | 209592 | MALE SLIDE | 1 | 35 | 303736 | HHCS 7/8" X 6" | 4 |
| 15 | 209598 | SLIDE ADJUSTMENT PIN | 1 | | 303958 | WASHER/LOCK 7/8" | |
| | 205829 | HITCH PIN CLIP | 1 | | 304012 | NUT/HEX 7/8" NC | |
| 16 | 209587 | FEMALE SLIDE | 1 | 36 | 209236 | WHEEL LIFT BRG BOTTOM | 2 |
| 17 | 203100 | SPRING ROD CLEVIS PIN | 2 | 37 | 210128 | WHEEL LIFT | 1 |
| | 304137 | PIN/COTTER 5/16" X 1-1/2" | 4 | 38 | 208740 | TUBE/FRONT GANG 103" | |
| 18 | 209603 | SPRING ROD ASSEMBLY | 2 | | 208745 | TUBE/FRONT GANG 124" | |
| 19 | 205163 | SPECIAL FLAT WASHER | 4 | | 208749 | TUBE/FRONT GANG 145" | |
| 20 | 209148 | LG COMPRESSION SPRING | 2 | 39 | 210169 | MAIN FRAME | 1 |
| 21 | 203742 | SLIDE ASSY W/ ALEMITE | 2 | 39A | 208935 | TENSION BUSHING | 1 |
| | 304194 | ALEMITE | 2 | | | | |

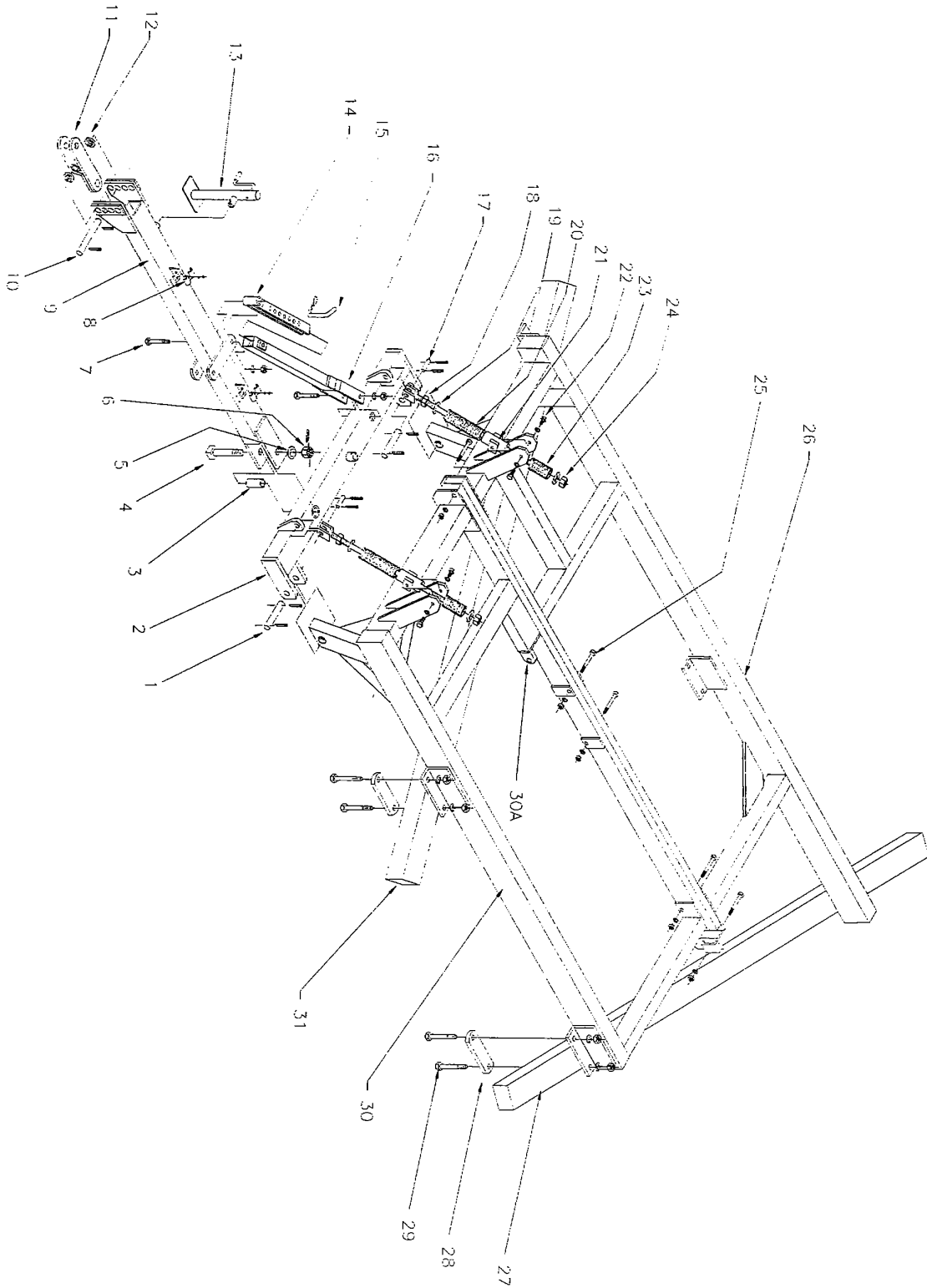
FIGURE 10 - SMALL FRAME & HITCH



LARGE FRAME & HITCH (Refer to Figure 11)

| Item | Part # | Description | Qty |
|------|--------|-----------------------------|-----|
| 1 | 209125 | HINGE BAR PIN | 2 |
| | 304151 | PIN/COTTER 3/8" X 2" | 4 |
| 2 | 210157 | HINGE BAR | 1 |
| 3 | 209578 | BUSHING | 1 |
| 4 | 209596 | TONGUE HINGE PIN | 1 |
| 5 | 303979 | WASHER/FLAT 1-1/2" | 1 |
| 6 | 304042 | NUT/HEX SLOTTED 1-1/2" | 1 |
| | 304142 | PIN/COTTER 5/16" X 3" | 1 |
| 7 | 303779 | HHCS 1-1/8" X 6-1/2" | 2 |
| 8 | 208259 | HOSE CLAMP | 2 |
| | 303859 | BOLT/CARRIAGE 1/2" X 1-1/2" | 2 |
| | 303955 | WASHER/LOCK 1/2" | 2 |
| | 304007 | NUT/HEX 1/2" NC | 2 |
| 9 | 209574 | TONGUE | 1 |
| 10 | 209742 | CLEVIS PIN | 1 |
| | 304165 | PIN/COTTER 1/2" X 3" | 2 |
| 11 | 209013 | SGL OR DBL DRAWBAR CLEVIS | 1 |
| 12 | 210724 | TONGUE CLEVIS SPACER | 2 |
| 13 | 808026 | JACK | 1 |
| 14 | 209592 | MALE SLIDE | 1 |
| 15 | 209598 | SLIDE ADJUSTMENT PIN | 1 |
| | 205829 | HITCH PIN CLIP | 1 |
| 16 | 209587 | FEMALE SLIDE | 1 |
| 17 | 203100 | SPRING ROD CLEVIS PIN | 2 |
| | 304137 | PIN/COTTER 5/16" X 1-1/2" | 4 |
| 18 | 209603 | SPRING ROD ASSEMBLY | 2 |
| 19 | 205163 | SPECIAL FLAT WASHER | 4 |
| 20 | 209148 | LG COMPRESSION SPRING | 2 |
| 21 | 203742 | SLIDE ASSY WITH ALEMITE | 2 |
| | 304194 | ALEMITE | 2 |
| 22 | 203748 | BOLT - 7/8" SPECIAL | 4 |
| | 303958 | WASHER/LOCK 7/8" | 4 |
| 23 | 206612 | SM COMPRESSION SPRING | 2 |
| 24 | 304053 | NUT/HEAVY HEX 1-3/8" | 2 |
| 25 | 303737 | HHCS 7/8" X 6-1/2" | 6 |
| | 303958 | WASHER/LOCK 7/8" | 6 |
| | 304012 | NUT/HEX 7/8 NC | 6 |
| 26 | 211199 | RIGHT MAIN FRAME | 1 |
| 27 | 208755 | TUBE/REAR GANG 187" | |
| | 208759 | TUBE/REAR GANG 208" | |
| | 208763 | TUBE/REAR GANG 229" | |
| 28 | 210721 | GANG TUBE PLATE | 4 |
| 29 | 303781 | HHCS 1-1/8" X 7-1/2" | 8 |
| | 303960 | WASHER/LOCK 1-1/8" | 8 |
| | 304012 | NUT/HEX 1-1/8" NC | 8 |
| 30 | 211200 | LEFT MAIN FRAME | 1 |
| 30A | 208935 | TENSION BUSHING | 1 |
| 31 | 208753 | TUBE/FRONT GANG 173" | |
| | 208757 | TUBE/FRONT GANG 194" | |
| | 208761 | TUBE/FRONT GANG 215" | |

FIGURE 11 LARGE FRAME & HITCH



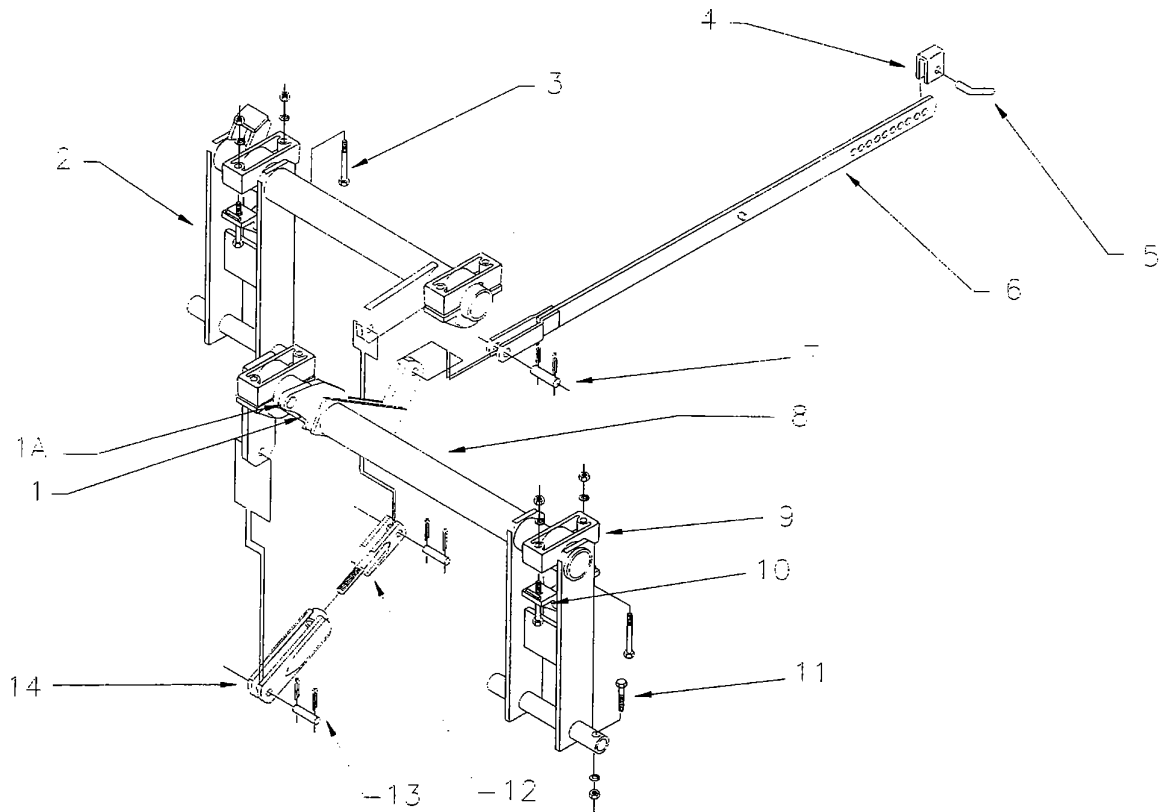


FIGURE 12 LARGE FRAME WHEEL LIFT COMPONENTS

| Item | Part # | Description | Qty |
|------|--------|---|-----|
| 1 | 208862 | HYDRAULIC CYLINDER BRACKET | 1 |
| 1A | 208935 | TENSION BUSHING - 1.5 OD X 1.25 ID | 1 |
| 2 | 211201 | RIGHT-HAND WHEEL LIFT | 1 |
| | 208863 | TENSION BUSHING - 1.25 OD X 1.00 ID | 1 |
| 3 | 303736 | HHCS 7/8" X 6" | 8 |
| | 303958 | WASHER/LOCK 7/8" | 8 |
| | 304010 | NUT/HEX 7/8" NC | 8 |
| 4 | 208706 | DEPTH ADJUSTMENT CUFF | 1 |
| 5 | 210806 | DEPTH ADJUSTMENT PIN - 7/8" OD BENT | 1 |
| | 205829 | HITCH PIN CLIP | 1 |
| 6 | 210720 | DEPTH BAR | 1 |
| 7 | 208098 | DEPTH BAR CLEVIS PIN - 1-1/8" OD X 3-7/8" | 1 |
| | 304151 | PIN/COTTER 3/8" X 2" | 2 |
| 8 | 211202 | LEFT-HAND WHEEL LIFT | 1 |
| | 208863 | TENSION BUSHING - 1.25 OD X 1.00 ID | 1 |
| 9 | 209235 | WHEEL LIFT BEARING TOP | 4 |
| 10 | 209236 | WHEEL LIFT BEARING BOTTOM | 4 |
| 11 | 303658 | HHCS 1/2" X 3-1/2" | 4 |
| | 303955 | WASHER/LOCK 1/2" | 4 |
| | 304007 | NUT/HEX 1/2" NC | 4 |
| 12 | 210956 | MALE TURNBUCKLE HALF | 1 |
| 13 | 210480 | TURNBUCKLE PIN - 1" OD X 4" | 2 |
| | 304151 | PIN/COTTER 3/8" X 2" | 4 |
| 14 | 210955 | FEMALE TURNBUCKLE HALF | 1 |

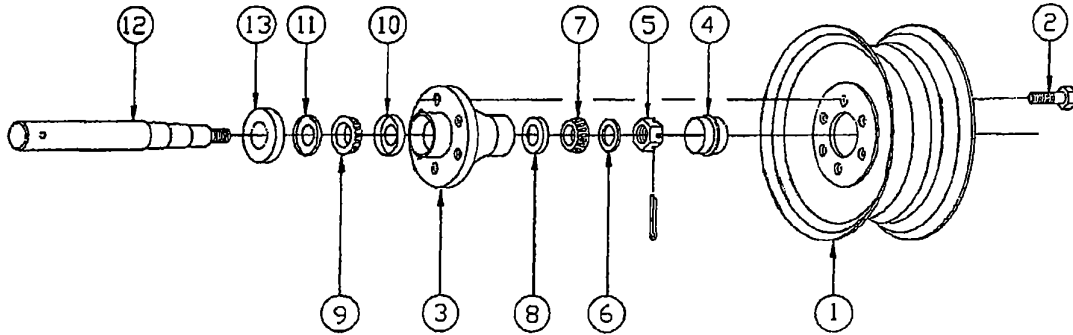


FIGURE 12 - WHEEL COMPONENTS

| Item | Part | Description | Qty |
|------|--------|---|-----|
| 1 | 207857 | RIM/15" x 10"- 6 BOLT | 1 |
| 2 | 403817 | LUG BOLT - 1/2"-20UNF X 1-1/2" | 6 |
| 3 | 207889 | COMPLETE HUB ASSEMBLY (INCL. 2-11 & 13) | 1 |
| 4 | 204523 | HUB CAP | 1 |
| 5 | 304037 | NUT/HEX SLOTTED 7/8" | 1 |
| | 304094 | PIN/COTTER 5/32" X 1-1/4" | 1 |
| 6 | 211422 | FLAT WASHER | 1 |
| 7 | 204524 | BEARING CONE - 14137A | 1 |
| 8 | 203021 | BEARING CUP - 14276 | 1 |
| 9 | 204526 | BEARING CONE - 342A | 1 |
| 10 | 204525 | BEARING CUP - 332 | 1 |
| 11 | 204527 | GREASE SEAL - CR 18823 | 1 |
| 12 | 210477 | WHEEL SPINDLE | 1 |
| | 303658 | HHCS 1/2" X 3-1/2" | 1 |
| | 303955 | WASHER/LOCK 1/2" | 1 |
| | 304007 | NUT/HEX 1/2" NC | 1 |
| 13 | 204520 | DUST COLLAR | 1 |
| | 207889 | COMPLETE HUB ASSEMBLY (INCL. 2-11 & 13) | - |
| | 207937 | BEARING KIT (INCL. 7-11) | - |

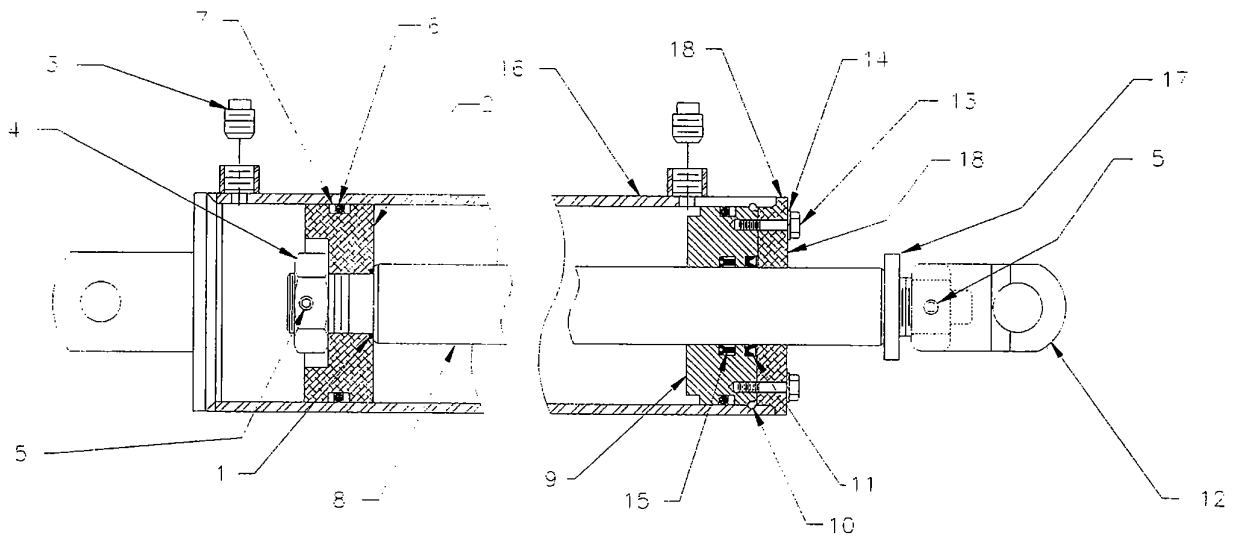


FIGURE 14 - HYDRAULIC CYLINDER & HOSES (WELDED STYLE)

| Item | Part | Description | Qty |
|------|--------|------------------------------|-----|
| 1 | 811418 | SHAFT SEAL | 1 |
| 2 | 811419 | CYLINDER PISTON | 1 |
| 3 | 811422 | 1/2" PORT PLUG | 2 |
| 4 | 811423 | 1 1/2" PISTON NUT | 1 |
| 5 | 811425 | 3/16" SET SCREW | 2 |
| 6 | 811427 | PISTON SEAL | 2 |
| 7 | 811430 | BACKUP WASHER | 3 |
| 8 | 811437 | CYLINDER ROD | 1 |
| 9 | 811438 | GLAND | 1 |
| 10 | 811441 | SNAP RING | 1 |
| 11 | 811444 | 2" CANNED WIPER | 1 |
| 12 | 811447 | ADJUSTABLE CYLINDER YOKE | 1 |
| 13 | 811451 | 3/8" X 1 1/2" HH BOLT | 2 |
| 14 | 811453 | 3/8" WASHER | 2 |
| 15 | 811456 | 2" ROD SEAL | 1 |
| 16 | 811459 | CYLINDER TUBE | 1 |
| 17 | 811465 | DONUT STOP | 1 |
| 18 | 811466 | CYLINDER STOP PLATE | 1 |
| ** | 811469 | SEAL KIT (INCL. 1,6,7,11,15) | - |
| ns | 605408 | HYDRAULIC HOSE - 215" | 2 |
| | 811236 | COMPLETE CYLINDER | - |
| | 813081 | CYL. PIN | 2 |
| | 813082 | ROLL PIN | 4 |

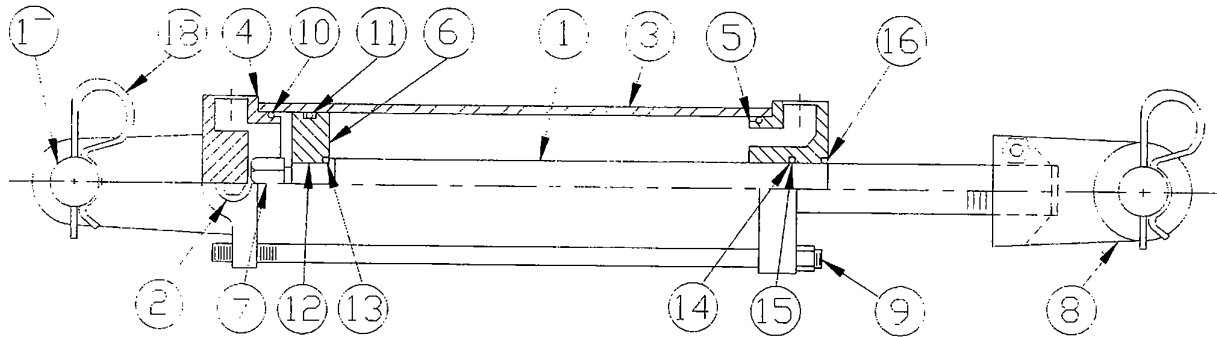


FIGURE 15 - HYDRAULIC CYLINDER & HOSES (TIE-ROD STYLE)

| Item | Part # | Description | Qty |
|-----------|--------|-----------------------------|-----|
| 1 | 805427 | PISTON ROD | 1 |
| 2 | 211217 | PIPE PLUG | 2 |
| 3 | 805428 | TUBE | 1 |
| 4 | 211219 | BUTT | 1 |
| 5 | 805429 | GLAND | 1 |
| 6 | 211220 | PISTON | 1 |
| 7 | 208849 | LOCK NUT | 4 |
| 8 | 805430 | CLEVIS | 1 |
| 9 | 805431 | TIE ROD | 4 |
| 10 | ** | O-RING | 2 |
| 11 | ** | O-RING | 1 |
| 12 | ** | BACK UP WASHER | 2 |
| 13 | ** | O-RING | 1 |
| 14 | ** | O-RING | 1 |
| 15 | ** | O-RING | 1 |
| 16 | ** | WIPER | 1 |
| 17 | 805432 | CLEVIS PIN | 2 |
| 18 | 805433 | HAIR PIN CLIP | 4 |
| ** | 805434 | PACKING KIT (INCL. 10-16) | |
| not shown | 207986 | 1" TO 3/4" REDUCER BUSHING | 2 |
| not shown | 605408 | HYDRAULIC LINE | 2 |
| | 811236 | CYLINDER COMPLETE | - |
| | 299134 | LIFT KIT - CYLINDER & LINES | - |

