

ATHENS

OPERATOR'S MANUAL

SET-UP INSTRUCTIONS

and

Repair Parts List

for

137-187

Offset Disk Harrow



ATHENS PLOW COMPANY, INC.

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Safety Rules

Section 1

All farm machines are potentially hazardous. There is no substitute for a cautious, safety-minded operator. The manufacturer has designed this implement to be used with all safety equipment properly installed to minimize hazards during operation and transport.

BEFORE YOU START - Read the Decals on your implement (and shown in this Manual) and observe the rules of safety.....



WARNING

Observe all CAUTION, WARNING, &/or DANGER instructions and other reasonable safety practices concerning the operation of this machine. Rhino Products, Inc. accepts no responsibility for damages to this machine, any other property damage, &/or bodily injury due to careless or improper operation. Read and understand your Operator's Manual!

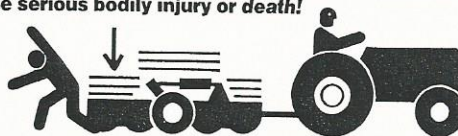
1. Stop tractor, disengage PTO, lock brakes, wait until all movement has stopped and support raised implement safely before starting to service, unclog, or adjust this implement.
2. Do not allow anyone to ride on the implement. Do not allow anyone on tractor except operator.
3. Make certain that everyone is clear before moving implement or activating any controls that may cause movement of implement, hydraulics, or any components.
4. Operate with increased caution when on slopes where there is a possibility that the tractor could drop into a hole or ditch and overturn.
5. Before operating or moving on highways, clean off reflectors, make certain SMV emblem is clearly visible, install mechanical transport devices, and install safety chain if required by state law. The towing vehicle *must weight more* than the implement!
6. Maximum transport speed 20 MPH.

(1984) 999205 (ALL UNITS)



WARNING

Failure of hydraulic components or accidental operation of hydraulic controls can allow implement to fall and cause serious bodily injury or death!



1. Keep everyone clear when implement is being raised or lowered. Raise or lower slowly and cautiously.
2. Install Mechanical Transport devices and/or block securely in place when working on implement in the raised position or transporting.

(1984) 999201 (ALL WHEELED UNITS)

WARNING: Never work on or under any raised component(s) unless unit is securely blocked into position.





LIGHTING:

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. Add extra lights when transporting during periods of limited visibility. Clean dirt and debris off lights before transporting disk harrow. The position of the AG Light Kit is shown below in Figure 1 and the assembly is shown in the Assembly Section (Section 2) of this manual on page 17A in Figure 22A.

Figure 1

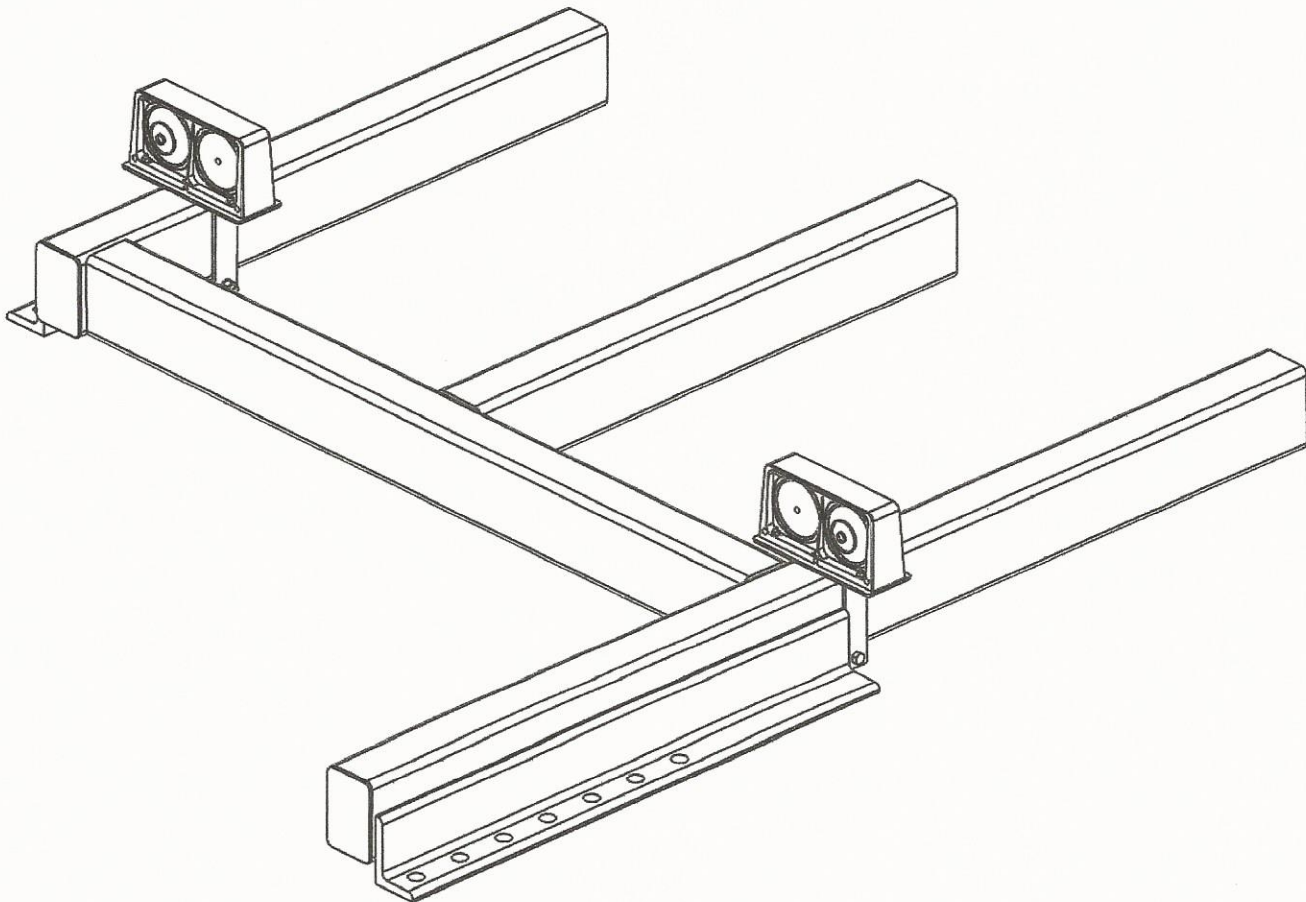


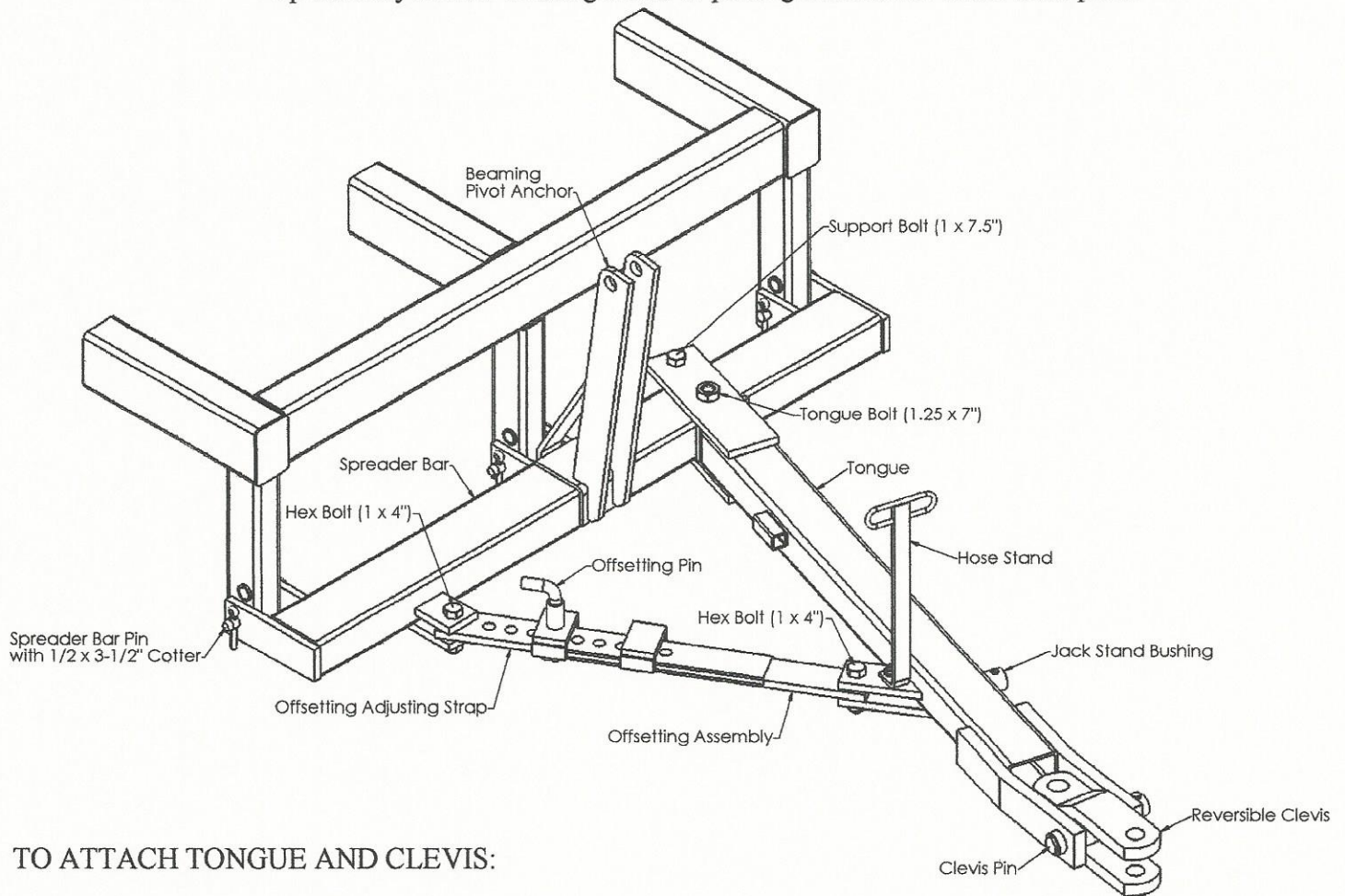
Figure 1 above shows the rear of the Main Frame and the Transport Lighting which is extra equipment. Note that the Red Light (Brake) is positioned toward the inside and the Orange Light (Blinker or Caution) is positioned toward the outside.

ASSEMBLY INSTRUCTIONS

TO ATTACH SPREADER BAR AND LEVELING PARTS:

Attach Spreader Bar to Main Frame with three Spreader Bar Pins so that the Beaming Pivot Anchor is positioned upward and aligned with the Center Tube on the Main Frame. Insert and spread all $\frac{1}{2}$ x $3\frac{1}{2}$ " Cotters securely.

WARNING! The components of these machines are extremely heavy. Block all components up securely before working under or putting extremities under such parts.



TO ATTACH TONGUE AND CLEVIS:

Attach Tongue to Spreader Bar with a $1\frac{1}{4}$ x 7" Bolt Assembly, Nut, and Lock Washer. Tighten securely. Then attach the 1 x $7\frac{1}{2}$ " Support Bolt and secure with a 1" Lock Washer and Hex Nut. Next, attach the Offsetting Adjusting Strap to the Spreader Bar with a 1 x 4" Hex Bolt, Hex Nut, and Lock Washer. Attach the Offsetting Assembly to the Tongue with a 1 x 4" Bolt, Hex Nut, and Lock Washer. Remove the Quick Hitch Pin from the Offsetting Pin and rotate the Tongue until Clevis is approximately six to eight inches right of center (standing behind the machine facing the tractor). Replace Offsetting Pin in the nearest hole and replace Quick Hitch Pin.

TO ASSEMBLE LEVELING PARTS

A. Hydraulic (Assembly for machines shipped after September 1985) Figure 3.

- (1) Attach Leveling Bracket Assembly with Springs and Rod to the Center Tube of the Mainframe with (4) $5/8 \times 2$ Bolts, Nuts, and Lock Washers with the Cylinder Anchor forward. The Spring should be compressed just enough to prevent excessive bounce when the machine is in transport.
- (2) Install Butt End of 3 x 8 Cylinder to Lug on end of Leveling Rod Assembly and Rod End to Cylinder Pivot on the Spreader Bar. Insert Retaining Pins securely. Tighten Clevis Locking Bolt.

ATTENTION: Coat internal and external Pipe Threads with sealant.
DO NOT USE THREAD TAPE.

Install a $3/8$ " Street Elbow into each Port securely. Then, in order: Nipple, $3/8 \times 1/2$ Adapter, Restrictor (with free flow Out of Cylinder), another Adapter, a 144" Hose, and another Adapter on End of Hose to each Street Elbow. Tighten Caps securely.

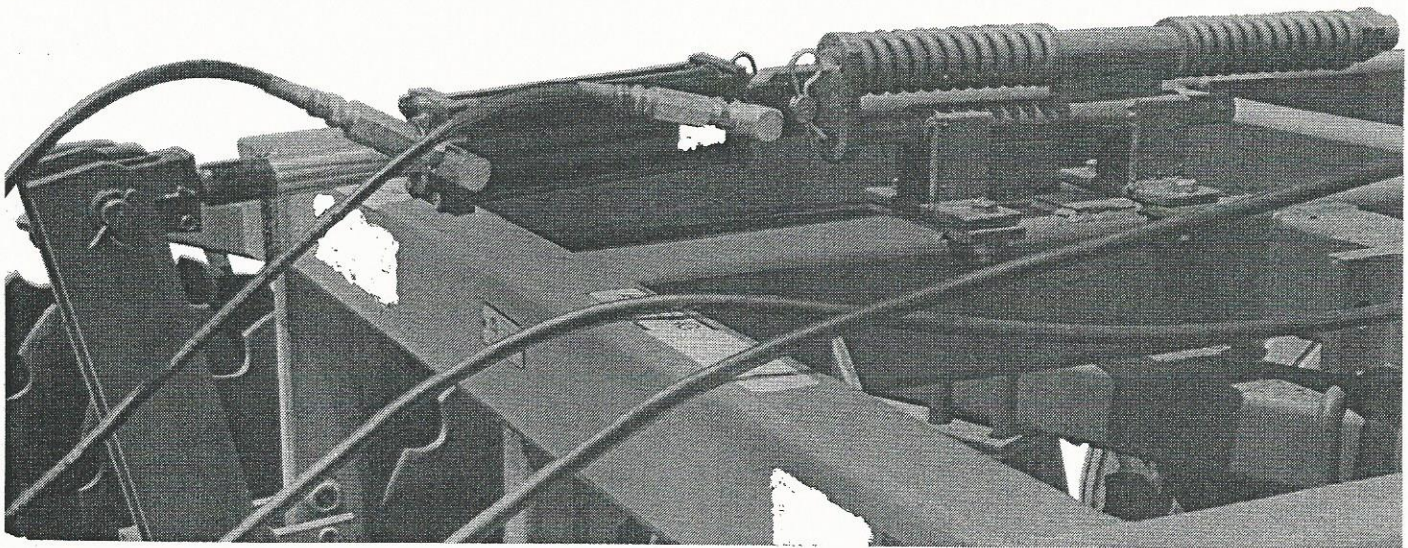


Figure 3

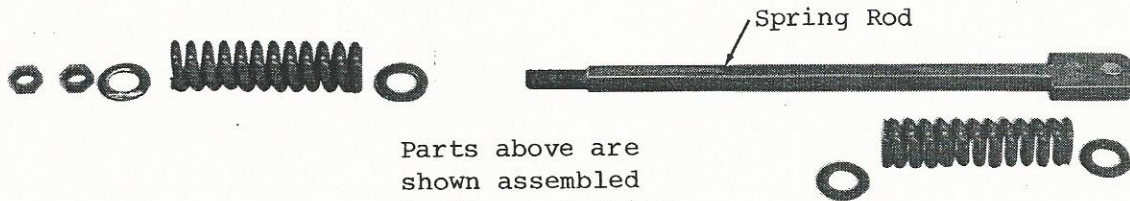
Assembly

Section 2

B. Hydraulic (Repairs only for machines shipped in 1981 - September 1985)

The leveling of the Offset Disk Harrow is either by Hydraulics (Figures 3 & 5) or Optional Turnbuckle (Figure 6). For Hydraulic Leveling follow the instructions below:

Install a 1-1/4" Flat Washer, Spring and another Flat Washer onto 1" Square Spring Rod. Install Spring Rod into Housing on Frame. Install another Washer, Spring, Washer, Nut, and Jam Nut. See Figure 4.



Parts above are shown assembled in Figure 5 below.

Figure 4

Install Leveling Cylinder with Butt End attached to end of Spring Rod and Rod Clevis to Pivot on the Spreader Bar.

Tighten Spring Rod Nut only until snug and then tighten Jam Nut securely. Make additional adjustment only if there is bouncing in transport.

Adjust Cylinder extension until implement is level or close to level for transport.

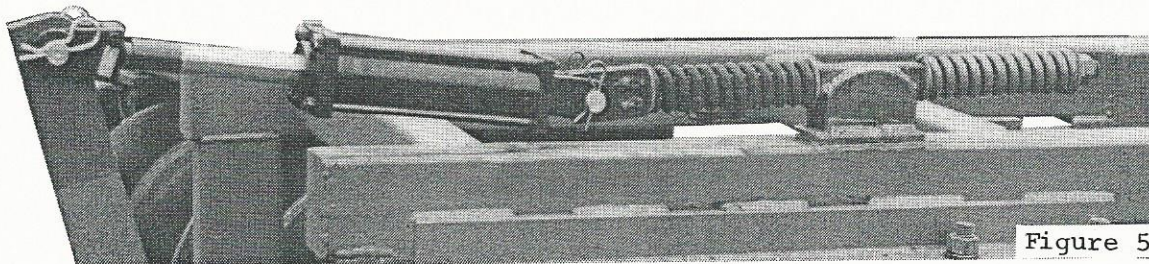
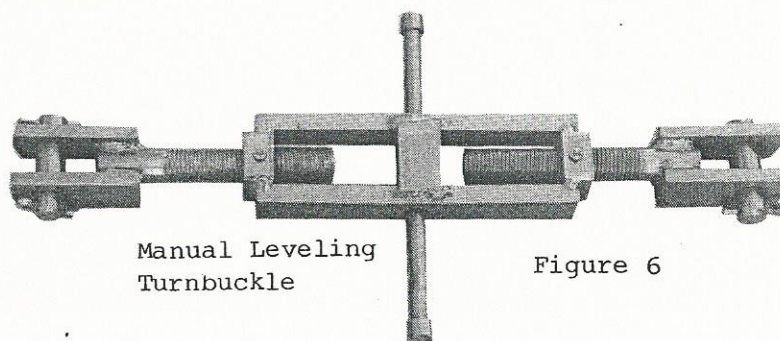


Figure 5

C. MANUAL LEVELING

If the Optional Leveling Turnbuckle is used (Figure 6), it will assemble in the same Mounting Holes as the Hydraulic Cylinder. See "Operating Instructions" for proper adjustment.



Manual Leveling Turnbuckle

Figure 6

Assembly

Section 2

TO ATTACH WHEEL CARRIAGES, WHEEL CARRIAGE ADJUSTING PARTS, HUBS, AND WHEELS:

Attach Right and Left Carriages (Figure 7) to Mainframe with four Wheel Carriage Pivot Pins and four 1/2 x 3-1/4" Bolts, Nuts, and Lock Washers.

Install Grease Fittings into Wheel Carriage Pivot Tubes. Grease thoroughly.

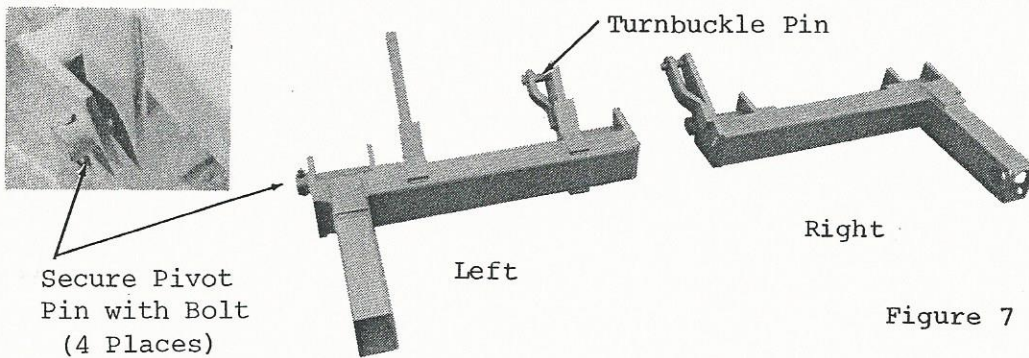


Figure 7

When installing the Wheel Carriage Connecting Turnbuckle, it is very important to attach the long Rod End (with left hand threads) to the Right Wheel Carriage with Turnbuckle Pin and Lock Pin and pointing to the front of the Disk. Attach the short Rod End (with a Jam Nut and right hand threads) likewise to the left Wheel Carriage with Turnbuckle Pin and Lock Pin and pointing to the rear of the Disk. See Figure 8. Lubricate Turnbuckle Housing.

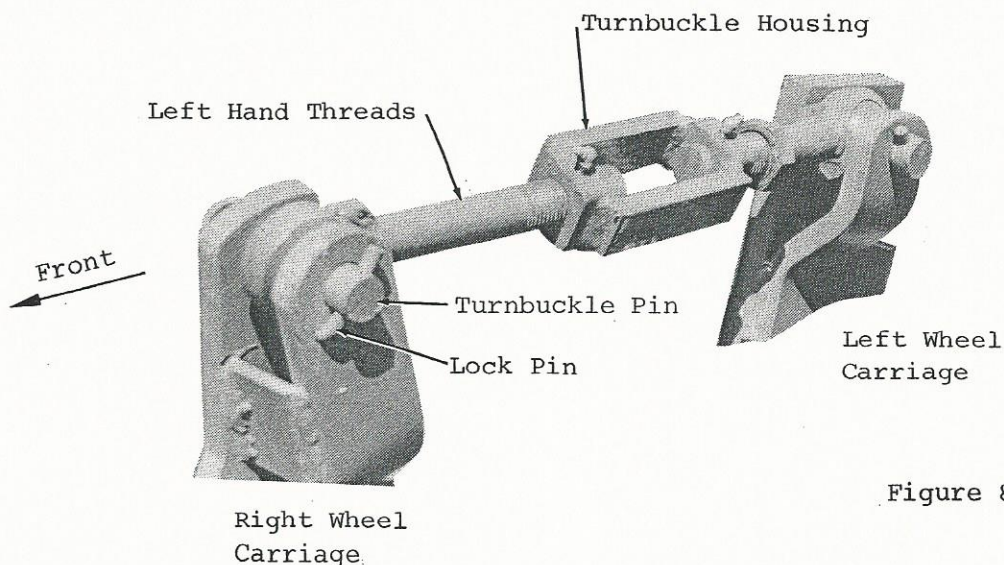


Figure 8

Install Tires on Wheels. See Figure 9.

NOTE: Tires not furnished. 9.5L x 15, 6 Ply Tires recommended.

CAUTION: On any tire used, do not inflate over 32 PSI to give a softer ride to protect hydraulics and framework and to provide better guaging and flotation. USE AS LITTLE TIRE PRESSURE as allowed by the manufacturer that will carry the load.



Attach Wheels to Wheel Hubs with Lug Bolts and Nuts loosely. Tighten Nuts slightly from first Nut to opposite Nut and then in rotation.

After all Nuts are snug, tighten to minimum of 90 ft. lbs. in same order. Fill Hubs and flush Seals with #2 Lithium-Based Bearing Grease until grease escapes from Hub.

NOTE: Hubs cannot be over-lubricated. Seals will allow excess grease to escape. Check Wheel Bearings for proper adjustment and adjust to a snug but free-rolling fit if needed.

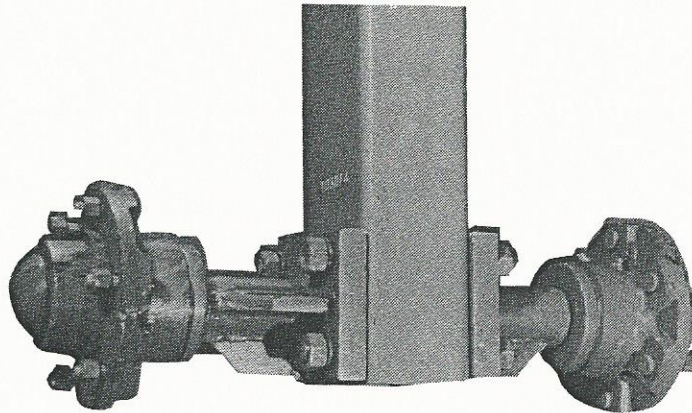


Figure 9

Assembly

Section 2

TO INSTALL HYDRAULICS:

A. TO INSTALL HYDRAULICS FOR LIFTING (Figure 10)

- (1) A 3-1/2 x 16 D.A. Cylinder with Stroke Control and 1" Pins is furnished (31-1/2" collapsed, 47-1/2" expanded). Install Butt End to Anchor on Mainframe and Rod End to Cylinder Pivot Arm on left Wheel Carriage with Ports up or to the right. Tighten Clevis Locking Bolt.

CAUTION: Install Mechanical Transport (Figure 10) and block securely in place before working under or around components. Implement could fall if Hydraulic Cylinder fails resulting in possible bodily injury or death.

- (2) TO INSTALL HOSES AND FITTINGS

Install Street Elbows in both ports. Tighten securely. Attach a 156" Hose to Street Elbow in Butt End of Cylinder. Attach 176" Hose to Street Elbow in Rod End of Cylinder. Tighten securely.

CAUTION: Use thread lube on all threaded joints to prevent costly and unsightly leaks. Tighten securely. Do not use hand to check for leaks. High-pressure oil can penetrate skin and cause a serious infection or gangrene.

ATTENTION: Do not use Thread Tape.

Attach Hose Stand (Figure 11) to Tongue with 1/2 x 2" Bolt, Nut, and Lock Washer.

Mechanical Transport Assembly

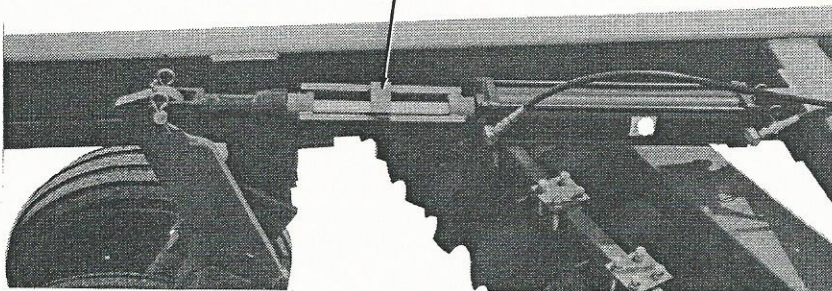


Figure 10

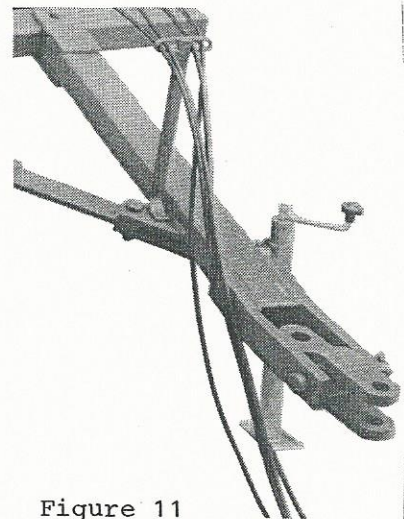


Figure 11

Assembly

Section 2

TO ATTACH DISK GANG FRAMES:



WARNING: Disk Gang Frames are quite heavy. Handle carefully.

Attach Angling Anchors in MAXIMUM ANGLE positions loosely. See Figure 12. Slide one end of Disk Gang Frame through one Angling Anchor and on through the opposite one.

NOTE: The following dimensions are average and will perform satisfactorily under nearly all conditions.

However, these dimensions may be changed a few inches right or left to suit any particular need.

Set the Front Disk Gang Frame so that it extends out to the right (Figure 12) from Right Front Angling Plate as follows:

"137" (9-1/2" Spacing):

48 and 49-Disk - 68"
44 and 45-Disk - 58-1/2"
40 and 41-Disk - 49"
36 and 37-Disk - 39-1/2"
32 and 33-Disk - 30"

Right Front
Angling Plate

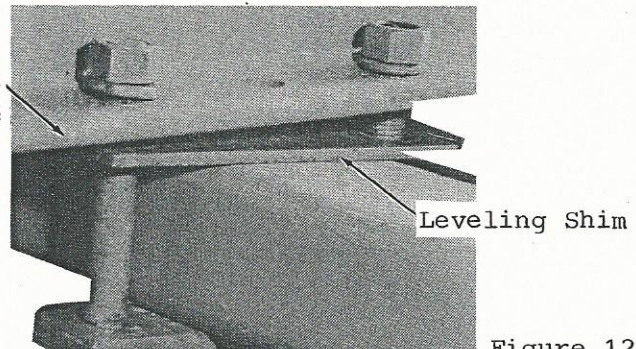


Figure 12

"187" (10-1/2" Spacing):

40 and 41-Disk - 62"
36 and 37-Disk - 51-1/2"
32 and 33-Disk - 41"
28 and 29-Disk - 30-1/2"

Tighten 1" Bolts in Angling Anchors securely
(to at least 250 ft. lbs.).

"207" (11-1/2" Spacing):

24 and 25-Disk - 26"
28 and 29-Disk - 37"
32 and 33-Disk - 47"
34 and 35-Disk - 58"

Set the Rear Disk Frame so that it extends to the left from Left Rear Attaching Plate (Figure 13) as follows (on units with even number of Disks, the Right Rear Disk should extend to the right approximately ONE DISK SPACING further than front). On units with odd number of Disks, the Right Rear Disk should extend to the right approximately TWO DISK SPACINGS more than the front.

"137" (9-1/2" Spacing):

48 and 49-Disk - 62"
44 and 45-Disk - 52-1/2"
40 and 41-Disk - 43"
36 and 37-Disk - 33-1/2"
32 and 33-Disk - 24"

"187" (10-1/2" Spacing):

40 and 41-Disk - 46"
36 and 37-Disk - 35-1/2"
32 and 33-Disk - 25"
28 and 29-Disk - 14-1/2"

"207" (11-1/2" Spacing):

24 and 25-Disk - 19"
28 and 29-Disk - 27"
32 and 33-Disk - 36"
34 and 35-Disk - 46"

Tighten 1" Bolts in Angling Anchors securely (to at least 250 ft. lbs.).

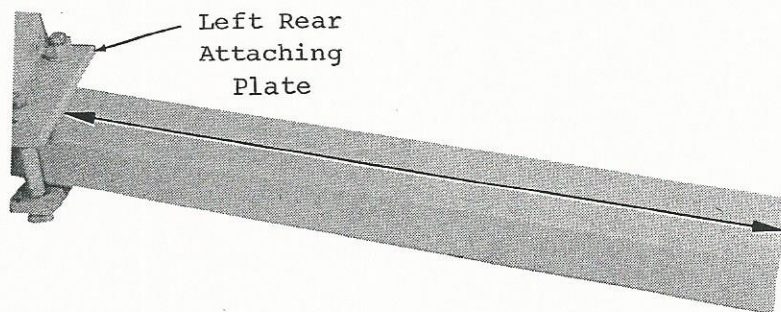


Figure 13

TO ASSEMBLE QUADRASEAL® BALL BEARINGS

ATTENTION: When installing Ball Bearings, press or drive against the outer ring of the Bearing only. Pressing or driving against Inner Ring causes brinelling and vastly shortens bearing life!

Install a Snap Ring, A Ball Bearing, and the second Snap Ring. Make certain the lube hole in the Bearing aligns with grease groove in the Housing.

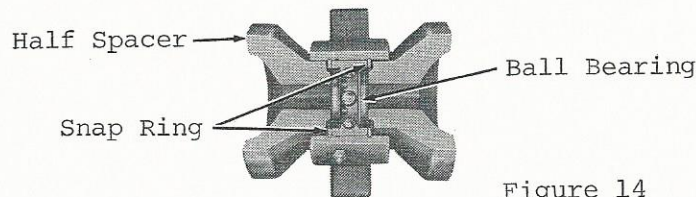


Figure 14

TO ASSEMBLE QUADRASEAL® DOUBLE-ROW ROLLER BEARINGS

To assemble a Quadraseal® Double-Row Bearing, install a Snap Ring, then press a Bearing Cup into the Bearing Housing until it contacts the Snap Ring. Install the Bearing Cone, then another Bearing Cup. See Figure 15.

This Cup should be pressed in only far enough to allow installation of the second Snap Ring. Press the Triple Lip Seals into the Housing with the flared side of the Seals outward. If the Bearing is too tight, hit the assembled Bearing and Housing sharply on a table on each end to drive caps back tightly against the Snap Rings.

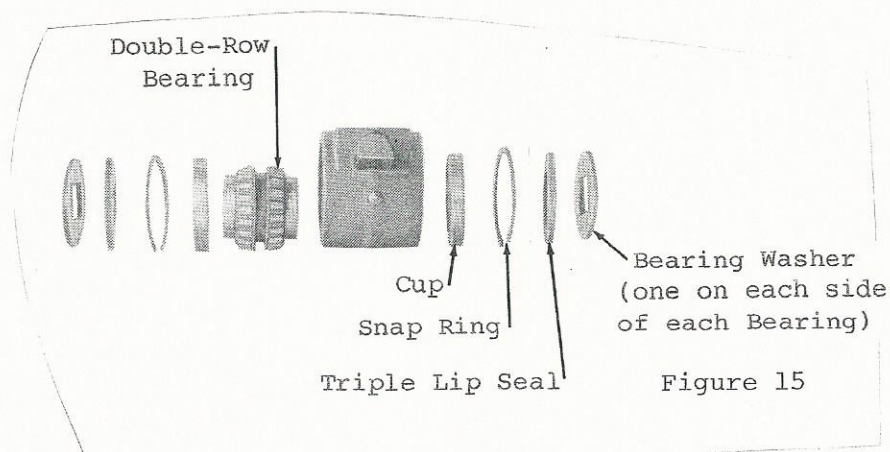


Figure 15

TO ASSEMBLE DISK GANGS:

Disk Gangs are normally shipped assembled from the factory (Figure 17).

The following information is for use in assembling exported units and for reassembly in the field.

UNITS WITH QUADRASEAL® BALL BEARINGS ("137" OR "187")

NOTE: QUADRASEAL® Ball Bearings not used on 207. (See following page for "Double Row" Bearings)

Remove all parts from Axle and place them down in the order of removal to simplify reassembly.

To assemble four, five, six, and seven Disk Gangs with QUADRASEAL® Ball Bearings, put a Disk on an Axle, then a Convex Half Spacer, and a QUADRASEAL® Ball Bearing assembled into a Bearing Housing. Rotate the Bearing Assembly 90° from its normal operating position, insert it into the Keyhole Slot, then rotate it 90° so that the rounded portion of the Ear matches the Hole in the Bearing Hanger or Cuff and so that the Grease Fitting shows in the slot to the rear. Then install a Concave Half Spacer, a Disk, a Full Spacer, a Disk and repeat to the next to the last Disk. Then install a Convex Half Spacer, and Bearing Hanger. Install a Disk, End Washer, End Washer Spacer, and Disk Assembly Nut (Figure 16). Tighten to 1,000 ft. lbs. with wrench provided and a six-foot pipe.

NOTE: A 175 lb. man on a six-foot handle equals 1,000 ft. lbs.

Install and spread 3/8 x 2-1/4" Cotter.

To assemble Eight and Nine Disk Gangs on "137", place Bearing locations as indicated below and follow same procedure.

(-(x(-(-(-(x(Eight-Disk Gangs
(-(x(-(-(-(x(-(Nine-Disk Gangs
x(-(-(-(x(-(-(x(Ten-Disk Gangs

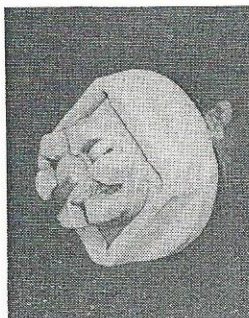


Figure 16

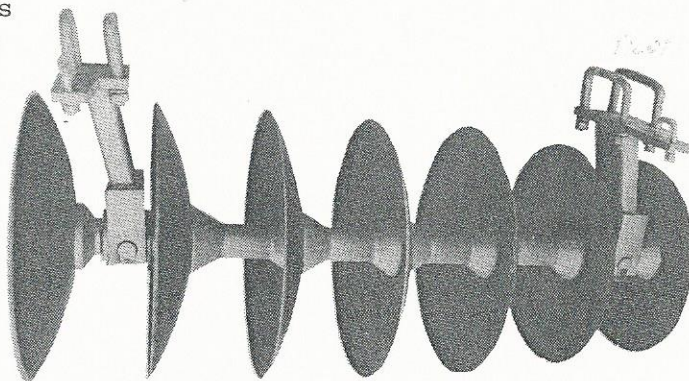


Figure 17

Assembly

Section 2

UNITS WITH QUADRASEAL® DOUBLE ROW TAPERED ROLLER BEARINGS ("207" MACHINES ONLY)

To assemble Gangs with QUADRASEAL® Double Row Bearings in Rigid Bearing Hangers, follow same procedure except make certain that a Bearing Washer is installed on BOTH SIDES of every Bearing.

SPRING BEARING HANGERS WITH QUADRASEAL® DOUBLE ROW TAPERED BEARINGS (Figures 18 & 19)

NOTE: 3/4 x 4 Hex Bolts must be installed in Trunnion Cuffs before installing Cuffs onto Bearing Housings.

ATTENTION: QUADRASEAL® Bearing Housings must be installed in the Trunnion Cuff or Bearing Hanger so that the Grease Fitting is to the rear before installing Bearing on Axle.

Attach each Offset Spring Bearing Hanger and Scraper Bar Hanger to the Trunnion Cuff with two 3/4 x 4 Hex Bolts. Tighten to 85 foot/pounds with Locknut and Lock Washer. Install an assembled QUADRASEAL® Double-Row Bearing into the keyhole slot in the Trunnion Cuff and rotate until the flat side of the Ear of the Trunnion Housing is downward. Note that the Bearings must be assembled so that the Grease Fittings are aligned with the keyhole slot in the Trunnion Cuff and so that they are pointing toward the rear for ease of lubrication.

NOTE: Offset Spring Bearing Hangers are installed with the open end and the Scraper Bar Hanger to the rear. Front (or Right) Offset Spring Hangers offset to the RIGHT and toward the back of the Disk. Rear (or Left) Offset Spring Hangers offset to the LEFT and toward back of Disk.

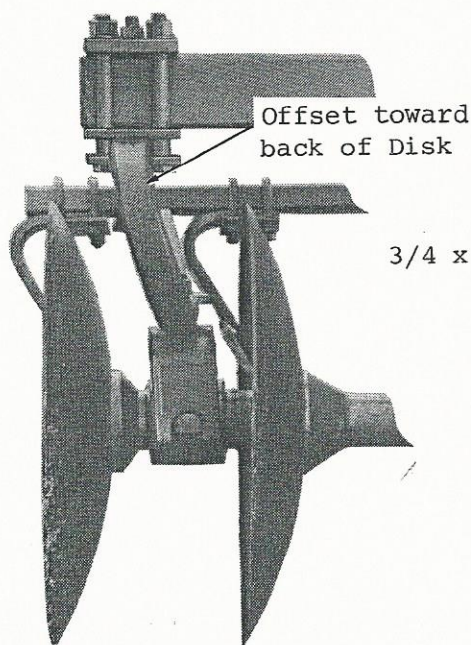


Figure 18

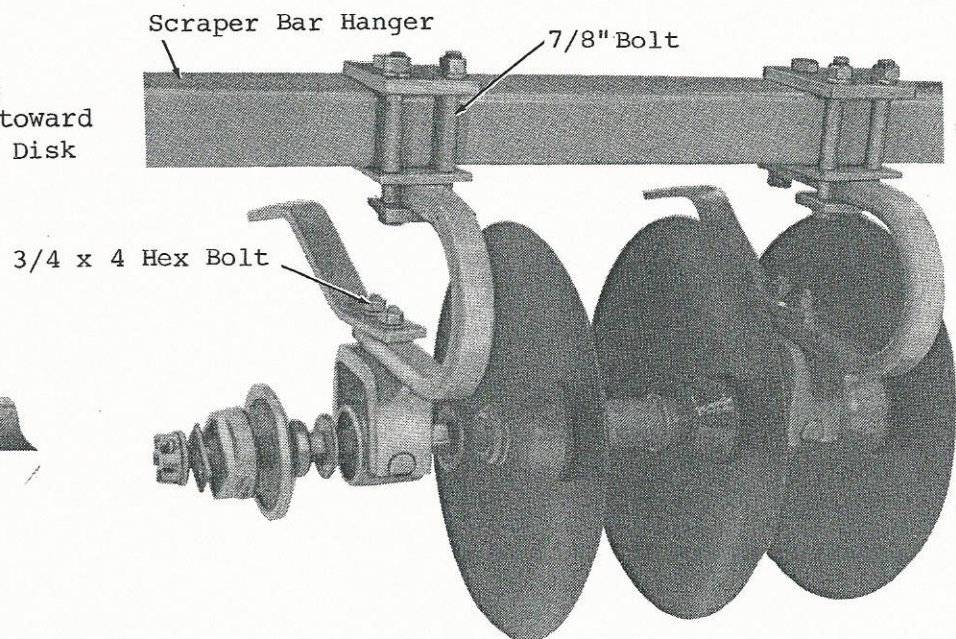


Figure 19

Assembly

Section 2

TO ATTACH DISK GANGS:

Locate Disk Gangs as follows:

A. "137" (9-1/2" Spacing)

Size Unit	FRONT GANGS			REAR GANGS		
	Left	Center	*Right	Left	Center	**Right
32-Disk	8		*8	8		8
33-Disk	8		8	8		9
36-Disk	9		9	9		9
37-Disk	9		9	9		10
40-Disk	10		10	10		10
41-Disk	10		10	7	7	7
44-Disk	7	8	7	8	7	7
45-Disk	7	8	7	8	7	8
48-Disk	8	8	8	8	8	8
49-Disk	8	8	8	8	8	9

B. "187" (10-1/2" Spacing)

Size Unit	FRONT GANGS			REAR GANGS		
	Left	Center	*Right	Left	Center	**Right
28-Disk	7		7	7		7
29-Disk	7		7	5	5	5
32-Disk	6	5	5	6	5	5
33-Disk	6	5	5	6	5	6
36-Disk	5	7	6	6	6	6
37-Disk	5	7	6	6	6	7
40-Disk	6	7	7	7	6	7
41-Disk	6	7	7	7	6 and 4	4

C. "207" (11-1/2" Spacing)

Size Unit	FRONT GANGS			REAR GANGS		
	Left	Center	*Right	Left	Center	**Right
24-Disk	6		6	6		6
25-Disk	6		6	6		7
28-Disk	7		7	7		7
29-Disk	7		7	5	5	5
32-Disk	6	5	5	6	5	5
33-Disk	6	5	5	6	5	6
34-Disk	6	5	6	6	5	6
35-Disk	6	5	6	6	6	6

*All right front Disk Gangs will have single tapered Disk on the Nut end.

**All right rear Disk Gangs will have a Cover Disk Attaching Plate welded onto Butt Washer and two tapered Disks next to Butt Washer.

Attach right front Disk Gang on right outside end of Disk Gang Frame with the outside edge of outside Bearing Hanger approximately 2-1/2" from end of Disk Gang Frame (except 9-Disk Gangs on "137" are 12") until Nuts are snug only. Attach inside Bearing Hangers to Disk Gang Frame loosely. Align Bearing Hanger vertically and tighten securely. Rotate Disk Gang to make certain that it turns freely. If the Disk Gang binds or is hard to turn, loosen "U" Bolts and realign Bearing Hanger.

Continue attaching Disk Gangs following same procedure and making certain that the proper spacing is maintained between Disk Gangs.

Attach left rear Disk Gang on the left outside end of Disk Gang Frame with the outside edge of outside Bearing Hanger 2-1/2" from end of Disk Gang Frame (12" for 8-and 9-Disk Gangs on "137"). Follow same as above to attach remaining Gangs.

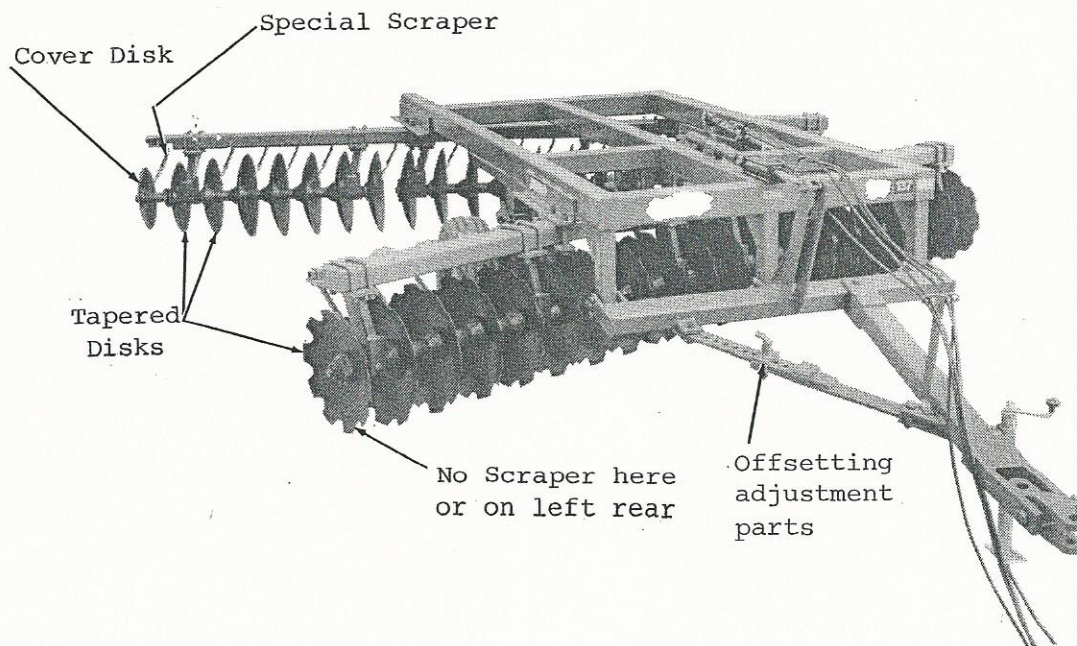


Figure 20

NOTE: Tongue should be offset to the right far enough so that Clevis runs 4-10" to the RIGHT of the center of the front Disk Gang.

Assembly

Section 2

TO ATTACH SCRAPERS (EXTRA EQUIPMENT):

Identify Scraper Bars as follows (length in inches):

A. "137" (9-1/2" Spacing):

Size Unit	FRONT SCRAPER BARS			REAR SCRAPER BARS		
	Left	Center	Right	Left	Center	Right
32-Disk	74"		69.5"	69.5"		83"
33-Disk	74"		69.5"	69.5"		91"
36-Disk	83"		74"	74"		91"
37-Disk	83"		74"	74"		100"
40-Disk	91"		83"	83"		100"
41-Disk	91"		83"	54.5"	61"	74"
44-Disk	61"	74"	54.5"	69.5"	74"	74"
45-Disk	61"	74"	54.5"	69.5"	74"	83"
48-Disk	74"	74"	69.5"	69.5"	74"	83"
49-Disk	74"	74"	69.5"	69.5"	74"	91"

B. "187" (10-1/2" Spacing)

Size Unit	FRONT SCRAPER BARS			REAR SCRAPER BARS		
	Left	Center	Right	Left	Center	Right
28-Disk	74"		64"	64"		79"
29-Disk	74"		64"	43"	47"	61"
32-Disk	61"	47"	43"	54.5"	47"	61"
33-Disk	61"	47"	43"	54.5"	47"	69.5"
36-Disk	47"	74"	54.5"	54.5"	61"	74"
37-Disk	47"	74"	54.5"	54.5"	61"	79"
40-Disk	61"	74"	64"	64"	61"	79"
41-Disk	61"	74"	64"	64"	61"&38"	47"

C. "207" (11-1/2" Spacing)

Size Unit	FRONT SCRAPER BARS			REAR SCRAPER BARS		
	Left	Center	Right	Left	Center	Right
24-Disk	64"		61"	61"		74"
25-Disk	64"		61"	61"		83"
28-Disk	74"		69.5"	69.5"		83"
29-Disk	74"		69.5"	47"	54.5"	61"
32-Disk	64"	54.5"	47"	61"	54.5"	61"
33-Disk	64"	54.5"	47"	61"	54.5"	74"
34-Disk	64"	54.5"	61"	61"	54.5"	74"
35-Disk	64"	54.5"	61"	61"	69"	74"

Attach Scraper Bars on top of Bearing Hanger Top Plate or on top of Scraper Bar Hanger for units with 5/8" U-Bolts. See Figure 21. Attach End Scrapers to Scraper Bar with Scraper Plate and 1/2 x 3-1/2" Carriage Bolts, Hex Nuts, and Lock Washers loosely. Move Scrapers and Scraper Bars to align Scraper edge to the contour of the Disk on each Disk Gang (except no Scraper on right front or left rear Disk). Tighten close to but not touching Disks. Follow the same procedure to assemble and adjust the remaining Scrapers.

NOTE: For shallow Disking in extremely sticky soils (and possibly other conditions) the Scrapers may perform better if Scraper Bars are mounted UNDERNEATH the Scraper Bars to peel the soil off closer to the ground.

NOTE: The right rear Scraper Bar is longer than its Disk Gang (Figure 22) and should extend to the right far enough to mount Cover Disk Scraper which is a special Scraper for Cover Disk only.

NOTE: Special Scrapers are also provided for the two tapered Disks on the right rear Gang on the 207 only.

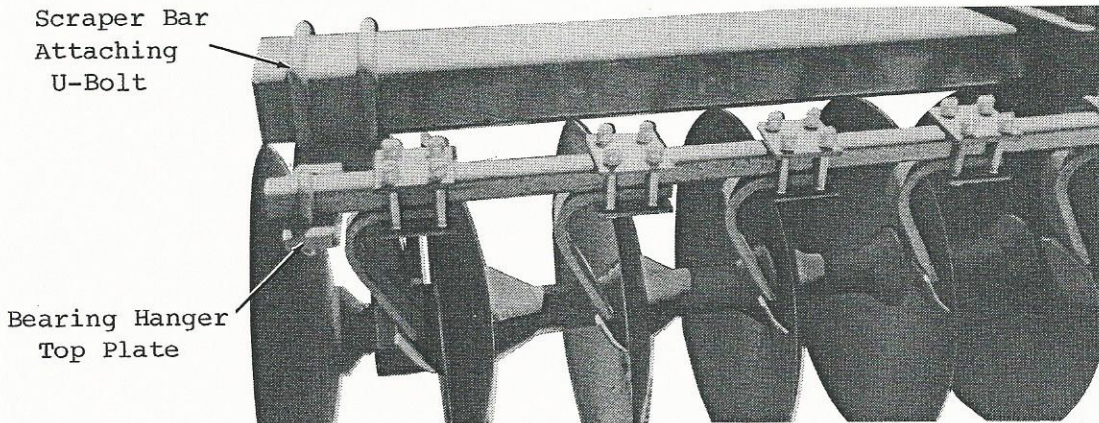


Figure 21

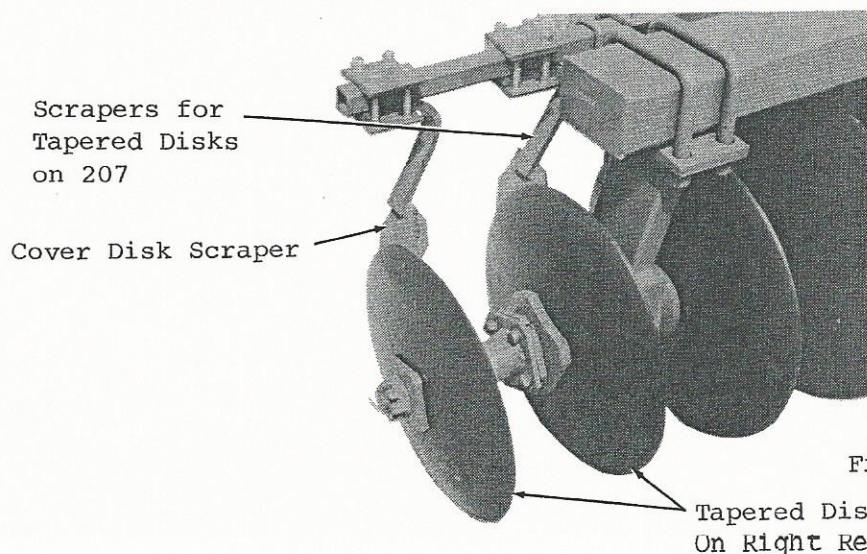


Figure 22

A) To Attach Safety Lighting (Refer to Figure 22A)

- 1) Attach each Transport Lighting Assembly (1) to the Safety Lighting Brackets with four $\frac{1}{4}$ x $1 \frac{1}{4}$ " Hex Bolts, $\frac{1}{4}$ " Flatwasher, and a $\frac{1}{4}$ " Lock Nut (2). Secure Transport Lighting by tightening $\frac{1}{4}$ " Lock Nuts. Place each Lighting Assembly on the outside tubes of the Main Frame as shown. Attach each Lighting Bracket to the Main Frame with a $\frac{1}{2}$ x $5 \frac{1}{2}$ " Hex Bolt, $\frac{1}{2}$ " Lockwasher, and a $\frac{1}{2}$ " Hex Nut (3). Tighten securely.

- NOTE: **Red Light (Brake)** is positioned toward the inside.
Orange Light (Blinker or Caution) is positioned toward the outside.

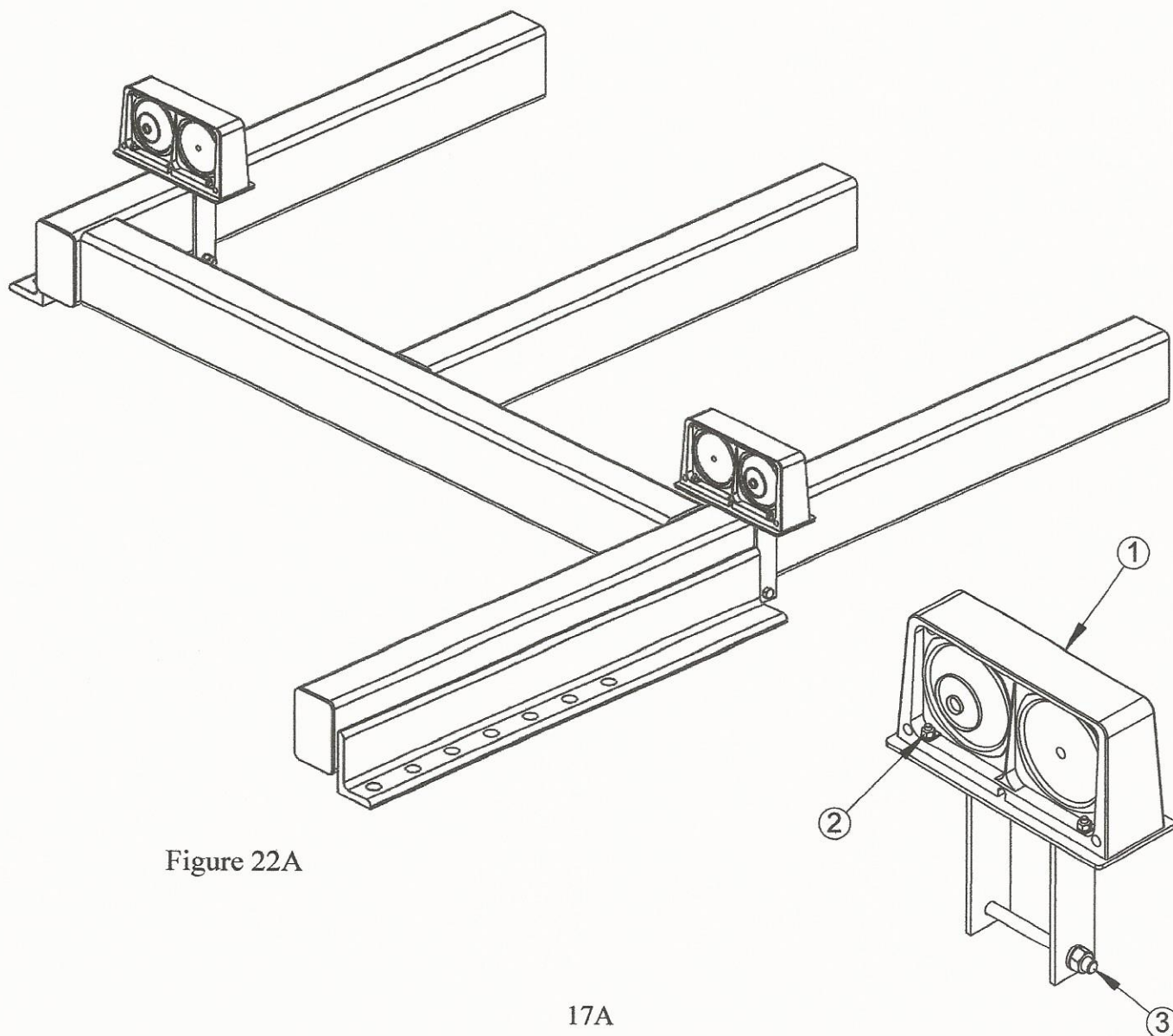



Figure 22A

Operating Instructions

Section 3

HITCH TO TRACTOR:

Attach hydraulic Hoses to tractor, lift to full transport height and remove Mechanical Transport from Hydraulic Cylinder. Lower slightly until unit is balanced on Wheels and attach Clevis to tractor Drawbar or use the Tongue Jack to raise/lower Clevis to correct height.

 **CAUTION:** Attach Clevis to tractor Drawbar with minimum of a 1-1/2" Bolt with Nut or 1-1/2" Pin with retaining device. It is better to use 1-3/4" Pin or Bolt with Retainer with industrial or split tractor Drawbar.


TO ADJUST ANGLE:

With the unit sitting on the ground, remove Angling Anchor from Front and/or Rear Angling Plate. To increase angle in front section, back unit up until desired angle is reached.

 **CAUTION:** Do not lift Harrow on Wheels while changing angle.


CAUTION: Do not loosen Angling Anchor on left side when changing angle.

Pull unit forward to decrease angle in front section. Use the opposite procedure to change angle in the rear section.

 **CAUTION:** Never use more angle than necessary. Excessive angle wastes fuel, increases wear, and reduces width of cut.

TO SHIFT GANGS LATERALLY:

Loosen Nuts on both Angling Anchors on the Disk Gang Frame to be shifted.

 **CAUTION:** Do not lift Harrow on Wheels.

Drive forward in short jerks to shift Front Section to the left and back up to shift to the right. Tighten Nuts on Angling Anchors securely.

Use opposite procedure to shift Rear Section.

TO OFFSET TONGUE:

Remove Quick Hitch Pin from Offsetting Pin. Pull forward and back up to offset Tongue as desired. The unit will perform best if the Clevis is adjusted to run approximately 6" to the right of the center of the Harrow.

Operating Instructions

Section 3

TO LEVEL FRONT TO REAR:

For operation, the implement will normally trail satisfactorily if the Leveling Hydraulic Cylinder or Leveling Turnbuckle is adjusted so that the Frame is slightly low in front when Disk is fully lifted.

To move the rear of the implement to the RIGHT so that it trails properly:

1. Extend Cylinder out slightly longer a little at the time while disking so that you can see the effect of the change. Stop to make the same adjustment on the Turnbuckle.
2. Increase angle in rear section and/or decrease angle in front section.
3. Raising tractor Drawbar has the same effect as (1) and (2).
4. Install Leveling Shims between Gang Frame and left front and/or right rear Angling Plates.

To move the rear of the implement to the LEFT so that it trails properly:

1. Shorten Cylinder or Turnbuckle.
2. Decrease Angle in rear section and/or increase angle in front section.
3. Lower tractor Drawbar.
4. Install both Leveling Shims between Gang Frame and right front and/or left rear Angling Plates.

TO LEVEL SIDE-TO-SIDE AND GAUGING ON WHEELS:

Level side-to-side by shortening or lengthening Wheel Carriage Adjusting Parts. Shorten to lower right wheels to reduce depth of cut on the right.

Lengthen Stroke Control on Cylinder to reduce maximum depth when gauging on wheels.

Normally, it is better to reduce angle of cut rather than gauging heavily on wheels. If wheels are carrying a very heavy load while plowing (due to excessive angle of cut), the finished job will show wheel tracks, reduce speed of tractor, increase slippage, and waste fuel.

Gauging on wheels should be necessary only to set maximum depth of cut desired, not for leveling. Gauging is mostly needed to prevent excessive penetration in soft places in a field that also has very hard places.

TRANSPORTING:

Never transport unit on Wheels for a long distance without attaching Mechanical Transport. Adjust unit until it is level front to rear for maximum clearance.



CAUTION: Do not attempt to lower unit when Mechanical Transport is attached.

Operating Instructions

Section 3

AFTER FIRST DAY OF OPERATION:

Tighten Disk Gang Axle Nuts to 1,000 ft. lbs. with Wrench provided and six foot pipe.

CAUTION: Loose Disks will cause failure of Disks, Axles, Bearings, Spacers, and associated parts.



Check all Bolts for tightness. See Bolt chart, Page 24.
Check Wheel Bearing adjustment. Tighten to a snug but free rolling adjustment.

EVERY DAY:

Lubricate Wheel Pivot Tube.
Inspect for loose bolts and broken or worn parts.
Replace broken or worn parts at once to prevent more serious damage.
Inspect for hydraulic leaks and broken or worn base.

EVERY 100 HOURS:

Inspect entire unit carefully. Replace broken or worn parts.
Lubricate Disk Gang Bearings with #2 Lithium-based grease.

CAUTION: Wipe fittings and grease gun clean before lubricating.



CAUTION: Buy clean grease and keep it clean.

Lubricate and adjust Wheel Bearings.
Oil or grease threaded Adjusting Rods.

NOTE: Over-lubrication will not cause damage. Pump grease in until dirty grease is pushed out of Seals. In very wet conditions, Disk Gang Bearings should be lubricated every 40 hours for maximum life.

AT THE BEGINNING AND END OF EACH SEASON:

Make certain all Bolts are tight and all parts properly lubricated. See Bolt Chart.
Make certain all parts are properly lubricated. See Lubrication Section.

TROUBLESHOOTING

SIDE DRAFT ON TRACTOR:

Change offset of Tongue.
Reduce angle of Front Disk Gangs.
Increase angle of rear Disk Gangs.
Shorten Beaming Rod.
Add front Weights to tractor.
Adjust Tongue height.

FURROW NOT FILLED:

Increase angle of rear Disk Gangs.
Offset rear Disk Gang Frame to right.
Shorten Beaming rod slightly.
Reduce size of right rear Disk and/or add Cover Disk Bundle.
Gauge right side of harrow upward.

FURROW OVER-FILLED:

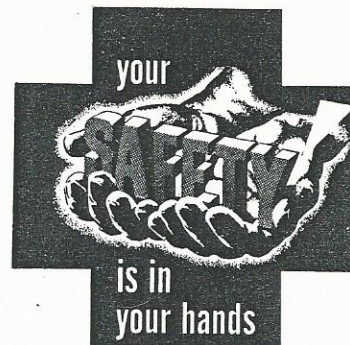
Adjust opposite to "FURROW NOT FILLED"

RIDGING ON RIGHT REAR:

Reduce angle of rear Disk Gangs.
Taper Disks on right rear Disk Gang.
Decrease size of right front Disk.
Lengthen Beaming Rod.
Add Cover Disk Bundle.

PLOWING CROOKED FURROW (unstable side-to-side):

Correct Tongue heights.
Reduce excessive angle.
Reduce length of Leveling Cylinder
or Leveling Turnbuckle.



**be careful.....
avoid accidents**

LUBRICATION

DISK GANG BEARINGS

Lubricate Disk Gang Bearings (Figure 23) before operation for first time. Every 40 hours of operation in wet or alkaline soils, and every 100 hours of operation in average conditions and at the beginning and end of each season. Use clean Lithium-based #2 Bearing Grease such as Shell Alvania #2, Gulf-crown #2, Kendall #L-412 and others.

CAUTION: Before operating lubricate Disk Gang Bearings until grease shows between Bearing Washers and Bearing Housing. Buy clean Lithium-based #2 Grease and keep it clean.



CAUTION: Clean Fitting and Gun before lubrication begins.

NOTE: Over-lubrication will not damage Seals.

NOTE: If difficulty is encountered in lubricating Bearings, make certain that Nipple fits properly by bending grease gun tube or using flexible Hose.

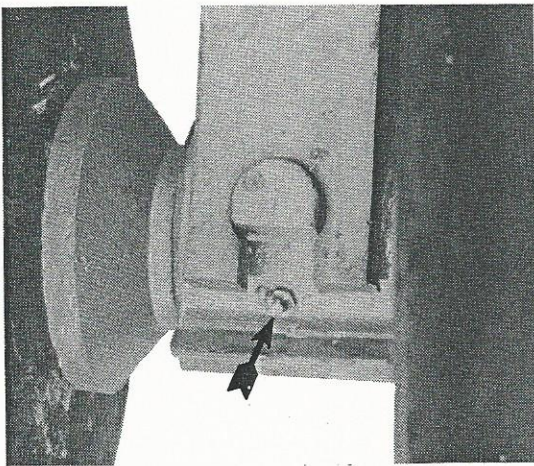


Figure 23

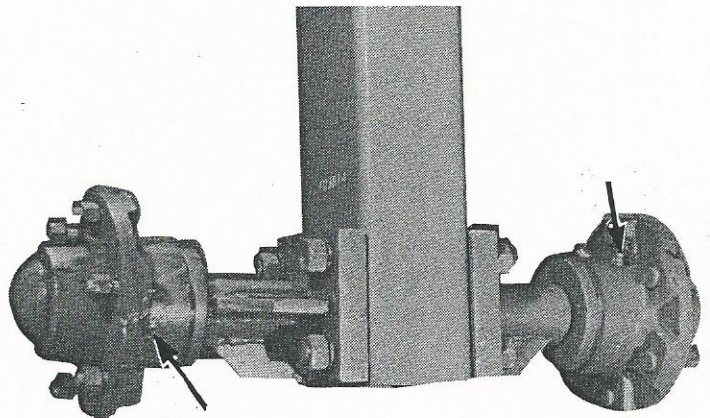


Figure 24

WHEEL BEARINGS

Lubricate with a #2 Bearing Grease or the equivalent every 100 hours. See Figure 24. There is no danger of over-lubrication, so make certain grease comes out around Seals to flush out dirt and dirty grease.

THREADED PARTS

For long life, rust prevention, and ease of adjustment, coat all threaded Rods with grease every 40 hours and at the beginning and end of each season. If Harrow is stored outside, oil these threaded Rods each time the Harrow is to be parked for several days. Grease threaded Trunnion every 40 hours.

WHEEL CARRIAGE PIVOTS

For long life and ease of lifting, lubricate each Wheel Pivot and Cylinder Pivot Pin with #2 or #3 general purpose grease daily. Grease Fittings provided. For locations, see Figure 25.

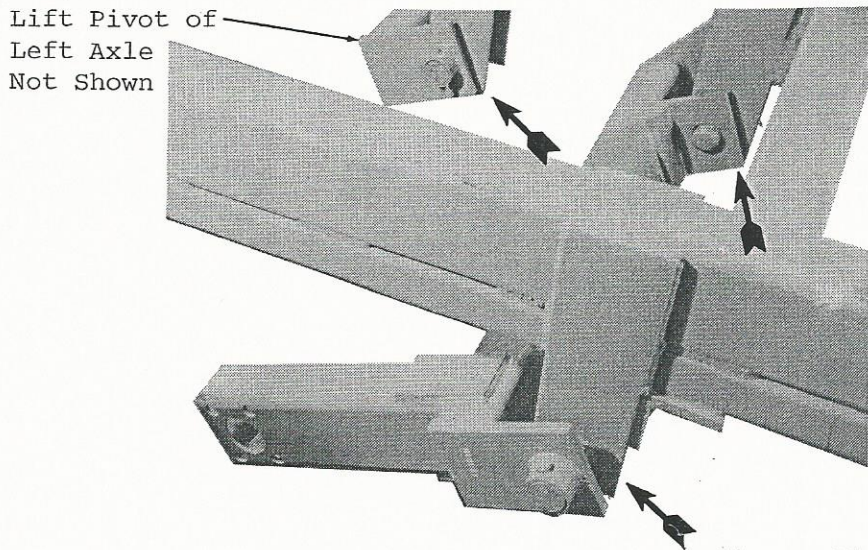


Figure 25.

TRUNNIONS AND PIVOTS

Grease Leveling Trunnions every 40 hours and at beginning and end of each season with #2 or #3 general purpose grease.

BEFORE OPERATING THE HARROW BE CERTAIN THAT:

- All Bolts are tight and cotters spread.
- Disk Gang Axles are tight and Gangs turn freely.
- Wheel Bearings are adjusted and lubricated.
- Disk Gang Bearings are lubricated (#2 Lithium-base grease)
- That all Hoses and Fittings are not leaking.
- That front Hoses are neither dragging nor too short to turn.
- That tires are inflated to 28-32 PSI as desired.
- Wheel Pivot Tubes are lubricated.
- Threaded Adjusting Rods are coated with oil or grease.

HARDWARE

Check Hardware tightness regularly. Loose Hardware is easily lost or bent, causes excessive wear on parts and increases the chance of breakage. Also, there is a potential hazard which could result in personal injury. Use the Torque Chart, Figure 26, to tighten Hardware.




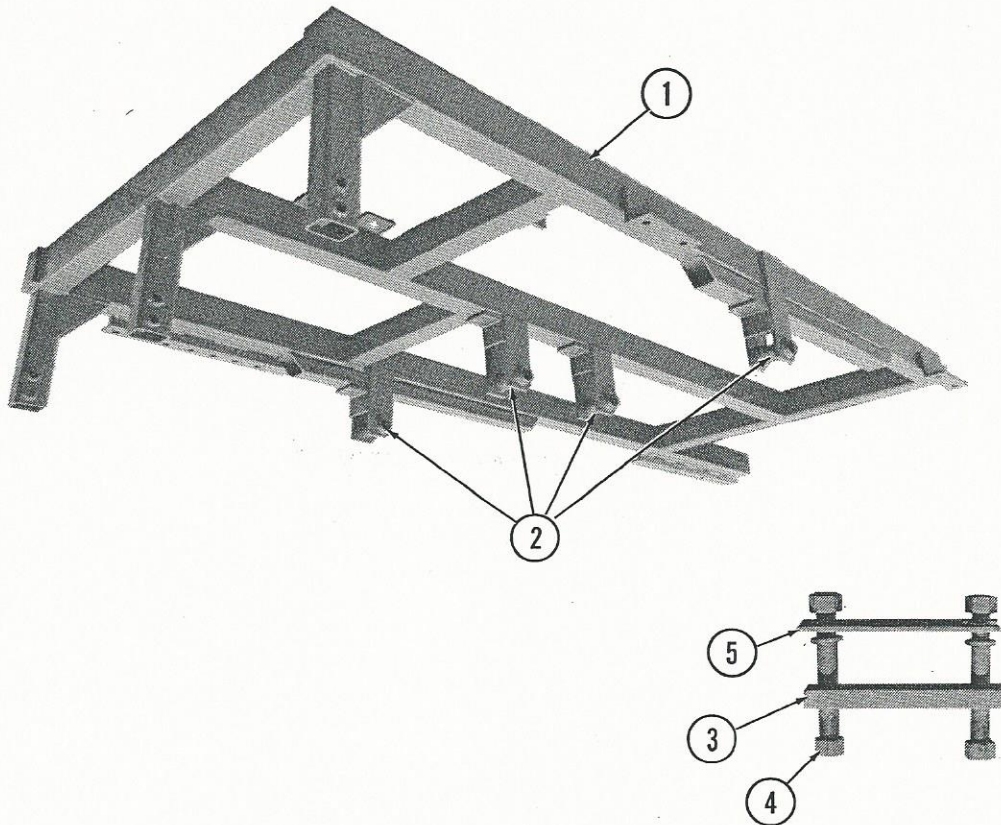
RECOMMENDED TORQUE IN FT-LBS (Nm) COARSE AND FINE THREADS			
2 (B)  5 (D)  8 (F) 			
Bolt Diameter	Plain Head	Three Dashes	Six Dashes
1/4	Not used	10 (14)	14 (19)
5/16	Not used	20 (27)	30 (41)
3/8	Not used	35 (47)	50 (68)
7/16	35 (47)	55 (75)	80 (108)
1/2	55 (75)	85 (115)	120 (163)
9/16	75 (102)	130 (176)	175 (237)
5/8	105 (142)	170 (230)	240 (325)
3/4	185 (251)	300 (407)	425 (576)
7/8	160 (217)	445 (603)	685 (929)
1	250 (339)	670 (908)	1030 (1396)
1-1/8	330 (447)	910 (1234)	1460 (1979)
1-1/4	480 (651)	1250 (1695)	2060 (2793)

Figure 26



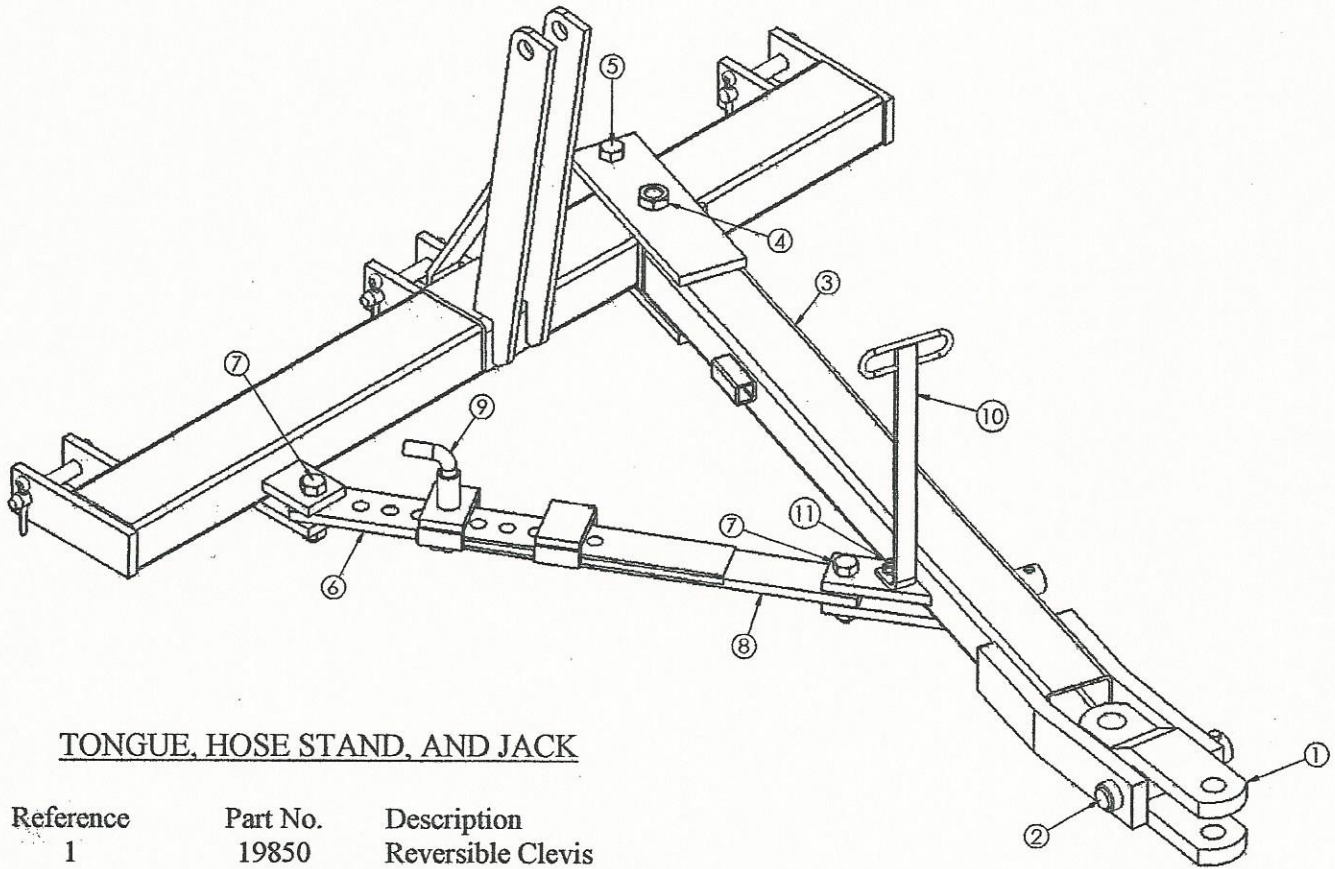
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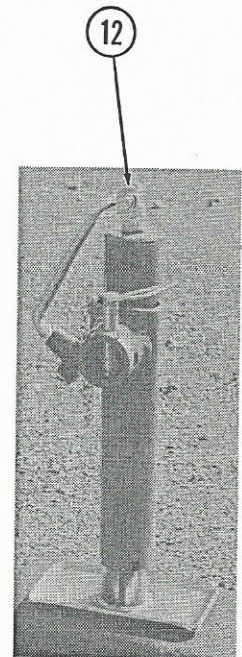
MAINFRAME

REF.	PART NO.	REQ'D.	DESCRIPTION
1	19276	1	Mainframe
2	11610	4	Grease Fitting, 1/8" NPT
3	18532	4	Angling Anchor
4	21333	8	Bolt Assy., 1 x 7-1/2
	80685	8	Nut, 1"
	81040	8	Lockwasher, 1"
5	21828	4	Leveling Shim



TONGUE, HOSE STAND, AND JACK

Reference	Part No.	Description
1	19850	Reversible Clevis
2	20911	Clevis Pin
	80114	Hex Bolt, 1/2 x 2 3/4"
	81005	Lockwasher, 1/2"
	80590	Hex Nut, 1/2"
3	19847	Tongue
4	19846	Tongue Bolt, 1 1/4 x 7"
	81050	Lockwasher, 1 1/4"
	80745	Hex Nut, 1 1/4"
5	80216	Hex Bolt, 1 x 7 1/2"
	81705	Lockwasher, 1"
	80686	Hex Nut, 1"
6	18567	Offsetting Adjusting Strap
7	80209	Hex Bolt, 1 x 4"
	81705	Lockwasher, 1"
	80686	Hex Nut, 1"
8	18566	Offsetting Assembly
9	18574	Offsetting Pin
	12057	Hair Pin Clip
10	21273	Hose Stand
11	80114	Hex Bolt, 1/2 x 2 3/4"
	81005	Lockwasher, 1/2"
	80590	Hex Nut, 1/2"
12	19752	Parking Jack, 5000#

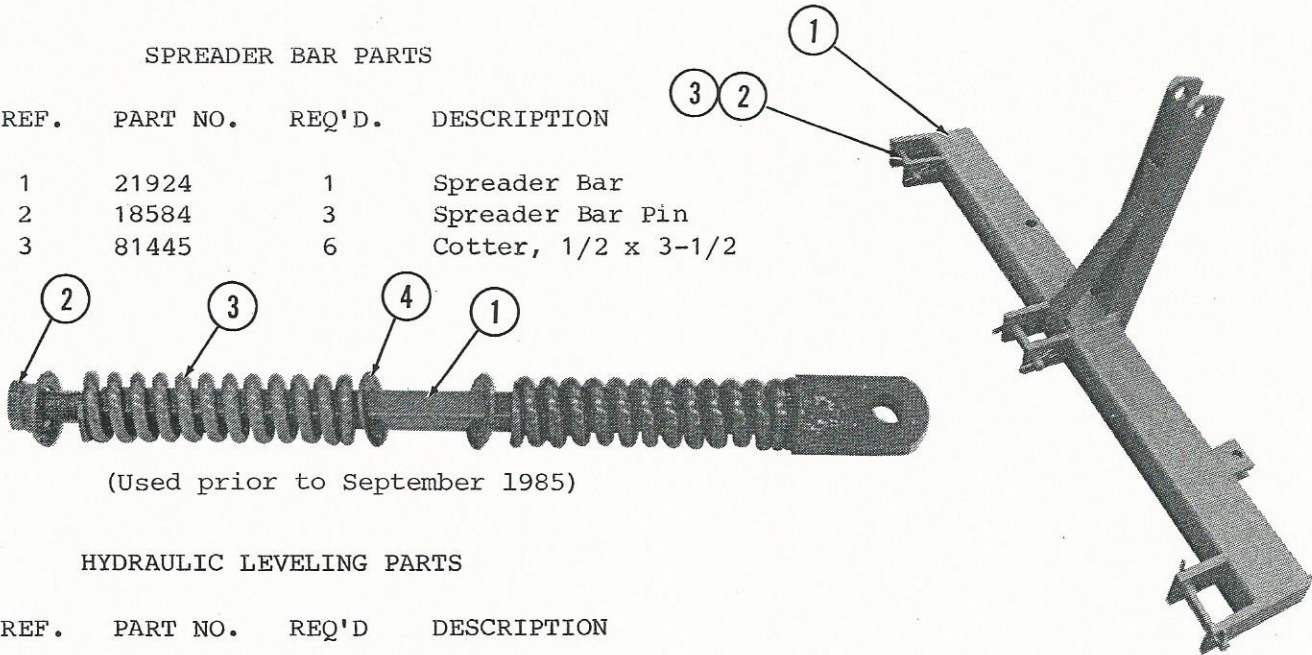


Parts Listing

Section 5

SPREADER BAR PARTS

REF.	PART NO.	REQ'D.	DESCRIPTION
1	21924	1	Spreader Bar
2	18584	3	Spreader Bar Pin
3	81445	6	Cotter, 1/2 x 3-1/2

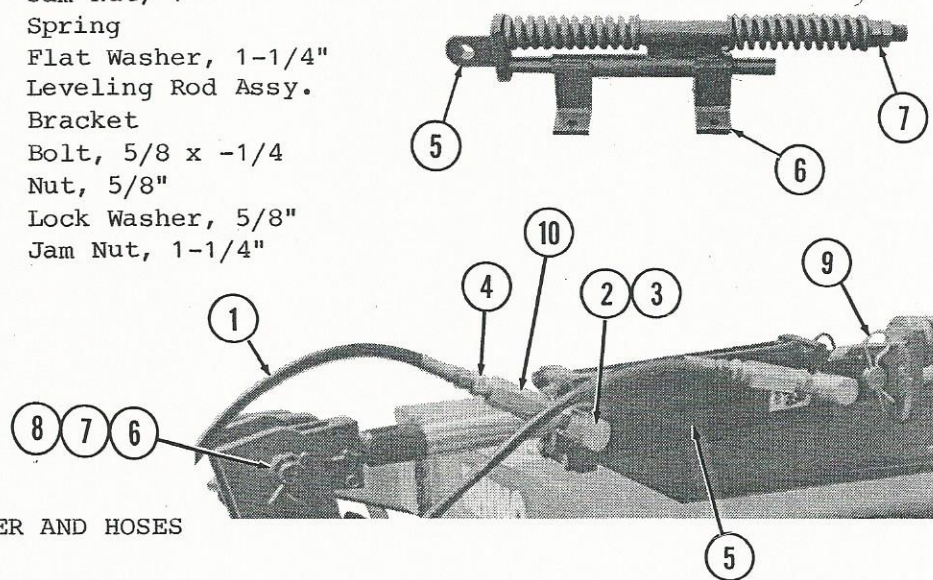


(Used prior to September 1985)

HYDRAULIC LEVELING PARTS

REF.	PART NO.	REQ'D	DESCRIPTION
1	21861	1	Leveling Rod
2	80705	2	Jam Nut, 1"
3	15729	2	Spring
4	81245	4	Flat Washer, 1-1/4"
5	22044	1	Leveling Rod Assy.
6	22045	1	Bracket
	80133	4	Bolt, 5/8 x -1/4
	80605	4	Nut, 5/8"
	81010	4	Lock Washer, 5/8"
7	80755	2	Jam Nut, 1-1/4"

(Used September 1985 & On)

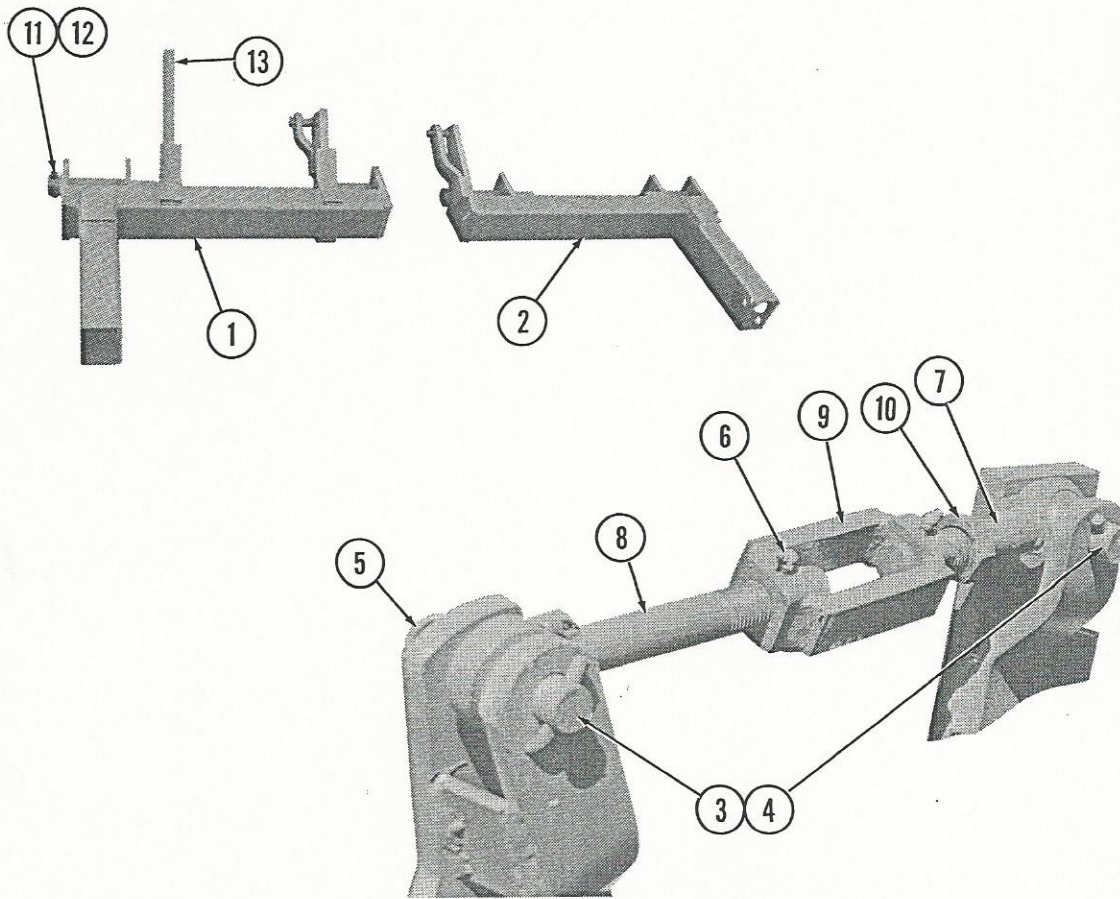


HYDRAULIC LEVELING CYLINDER AND HOSES

REF.	PART NO.	REQ'D.	DESCRIPTION
1	94219	2	Hydraulic Hose, 144"
2	94507	4	Adapter 1/2 - 3/8" NPTF
3	94511	2	St. Elbow, 1/2" NPTF 90°
4	94510	2	Nipple, 1/2" NPTF
5	90004	1	Hydraulic Cylinder, 3 x 8
6	18852	2	Bushing
7	21920	1	Pin
8	81370	2	Cotter, 3/16 x 2
9	95005	2	Spring Klip Pin
10	96004	2	Restrictor

Parts Listing

Section 5



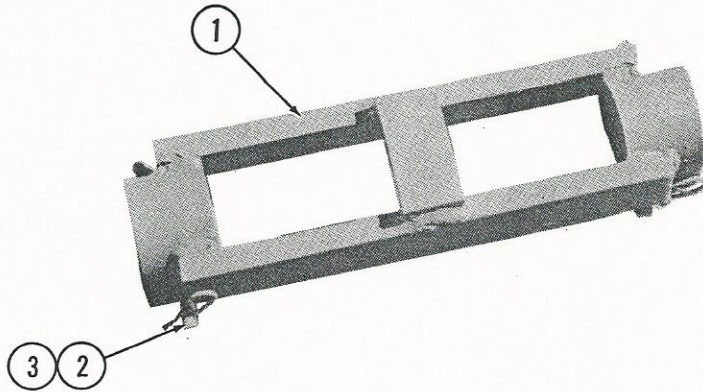
WHEEL CARRIAGE AND TURNBUCKLE PARTS

REF.	PART NO.	REQ'D.	DESCRIPTION
1	20992	1	Wheel Carriage, Left
2	20989	1	Wheel Carriage, Right
3	23257	1	Turnbuckle Pin
4	23257	1	Turnbuckle Pin
5	20284	2	Klip Pin (Not Shown)
6	11610	2	Grease Fitting, 1/8"
7	20984	1	Turnbuckle End, Right
8	21836	1	Turnbuckle End, Left
9	21702	1	Turnbuckle Body
10	80755	1	Nut, 1-1/4"
11	19286	4	Wheel Carriage Pivot Pins
12	80116	4	Bolt, 1/2 x 3-1/4
	81000	4	Lock Washer, 1/2"
	80585	4	Nut, 1/2"
13	21953	1	Bushing, Cylinder Pivot

105012 - Turnbuckle complete - contains items 7,8,9, & 10.

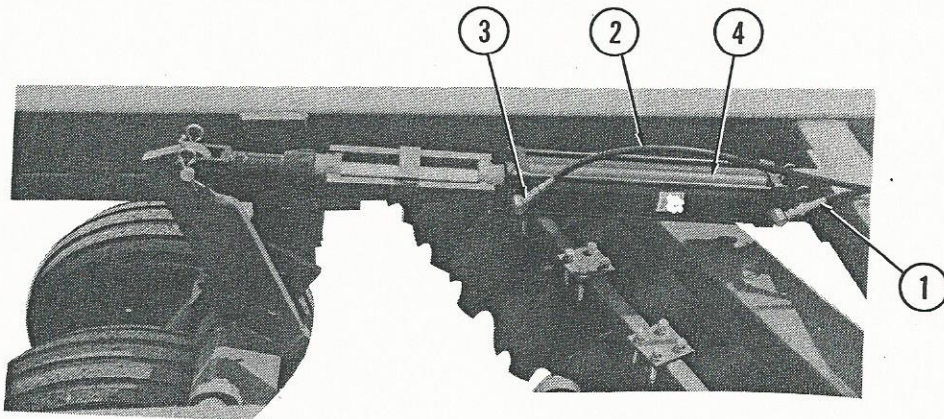
Parts Listing

Section 5



TRANSPORT PARTS

REF.	Part #	Req'd.	Description
1	19790	1	Mechanical Transport
2	19778	2	Transport Pin
3	19791	2	Quick Hitch Pin

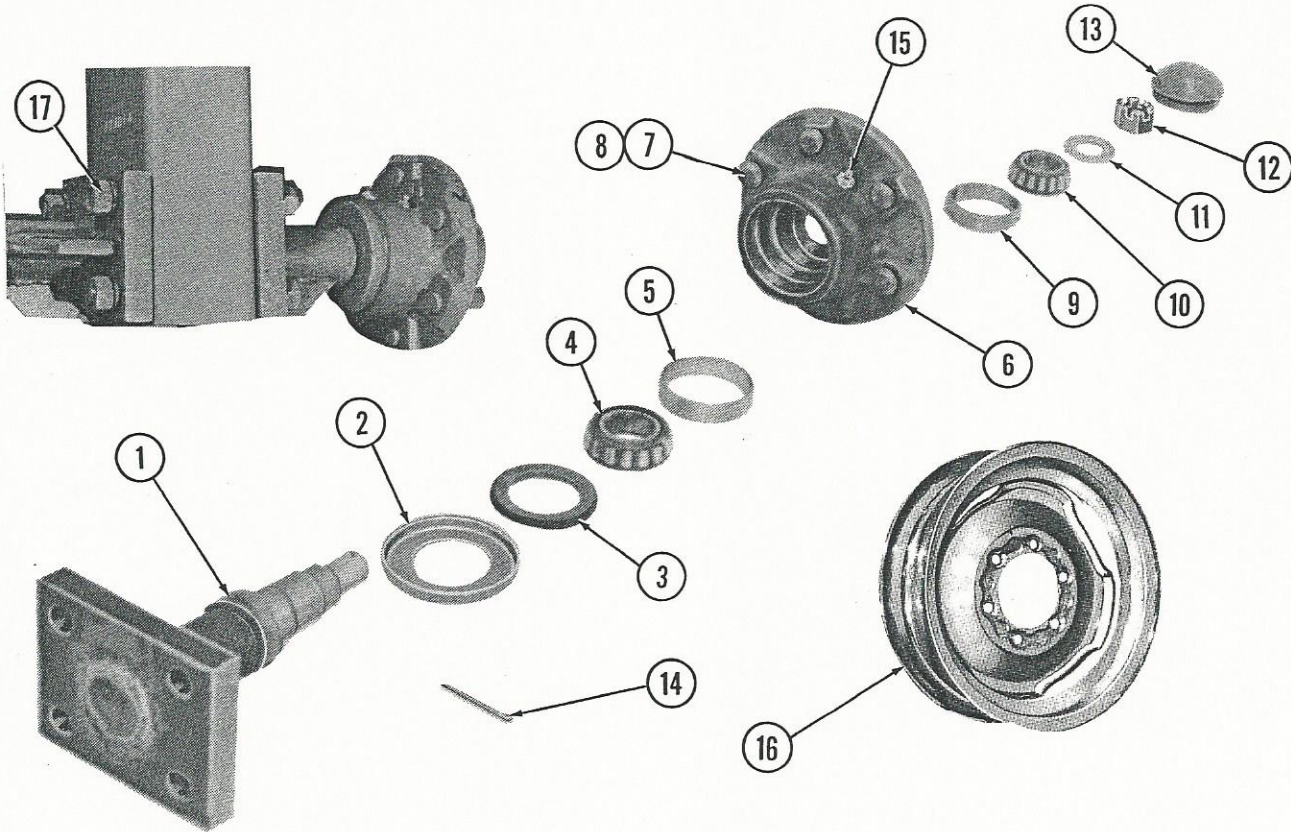


HYDRAULIC CYLINDER AND HOSES

REF.	PART NO.	REQ'D.	DESCRIPTION
1	94112	1	Hose Assembly, 156"
2	94115	1	Hose Assembly, 176"
3	94511	2	St. Elbow, 1/2" NPTF, 90°
4	91016	1	Hyd. Cyl. 3-1/2 x 16

Parts Listing

Section 5



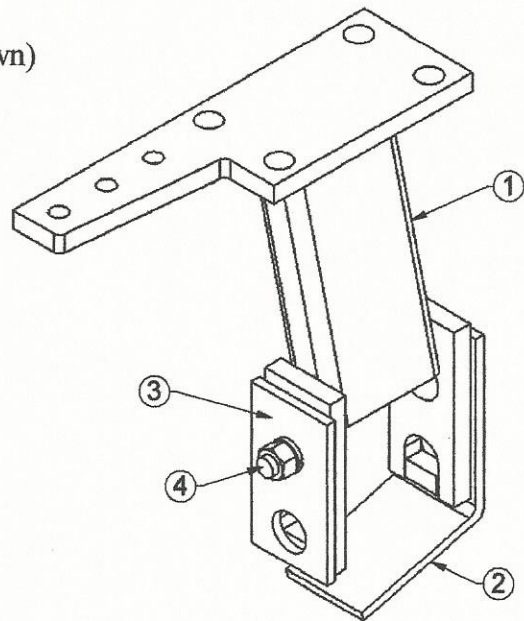
WHEEL AND WHEEL HUB PARTS

REF.	PART NO.	REQ'D	DESCRIPTION
1	19022	4	Wheel Axle
2	19019	4	Press-on Flinger
3	19021	4	Seal (NAT 200763X)
4	70002	4	Bearing Cone (342)
5	70000	4	Bearing Cup (332)
6	900076	4	Wheel Hub w/Cups/Bolts
7	13198	24	Wheel Bolt
8	15793	24	Wheel Bolt Nut
9	70025	4	Bearing Cup (14276)
10	70024	4	Bearing Cone (14137A)
11	81230	4	Flatwasher, 1" SAE
12	80715	4	Nut, 1"
13	19020	4	Hub Cap
14	81360	4	Cotter, 3/16 x 1-1/2
15	11610	4	Grease Fitting, 1/8 NPT
16	18184	4	Wheel, 15 x 8
17	19016	8	Bolt, Wheel Axle, 3/4 x 7
	80620	16	Nut, 3/4"
	81025	16	Lockwasher, 3/4"

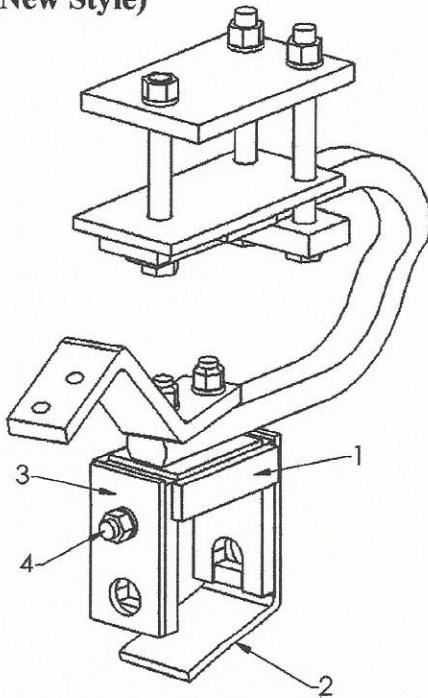
Rigid Bearing Hanger

Reference	Part No.	Description
1	23404	Rigid Bearing Hanger, Left (Shown)
	23403	Rigid Bearing Hanger, Right
2	23408	Wear Plate
3	23406	Rear Plate
4	80339	Carriage Bolt, 3/4 x 2 1/4"
	81025	3/4" Lockwasher
	80625	3/4" Hex Nut

137 Rigid Bearing Hanger Addendum (New Style)



137 Spring Bearing Hanger Addendum (New Style)



Spring Bearing Hanger

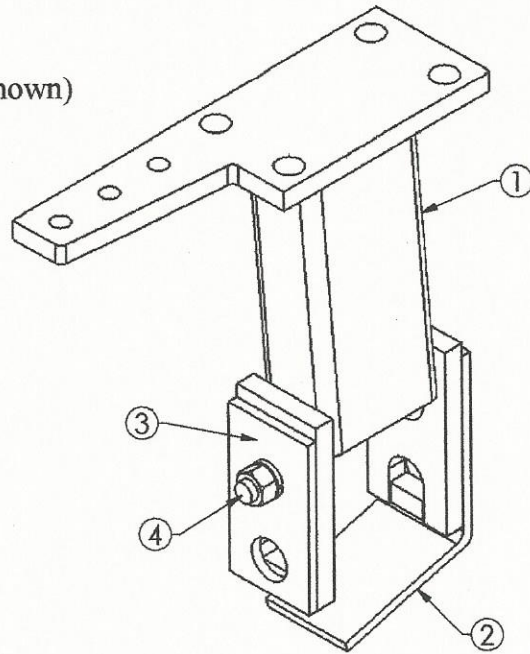
Reference	Part No.	Description
1	23416	Spring Trunion Cuff
2	23408	Wear Plate
3	23406	Rear Plate
4	80339	Carriage Bolt, 3/4 x 2 1/4"
	81025	3/4" Lockwasher
	80625	3/4" Hex Nut

Reference No's 1-4 = 900098 Replaces 20388

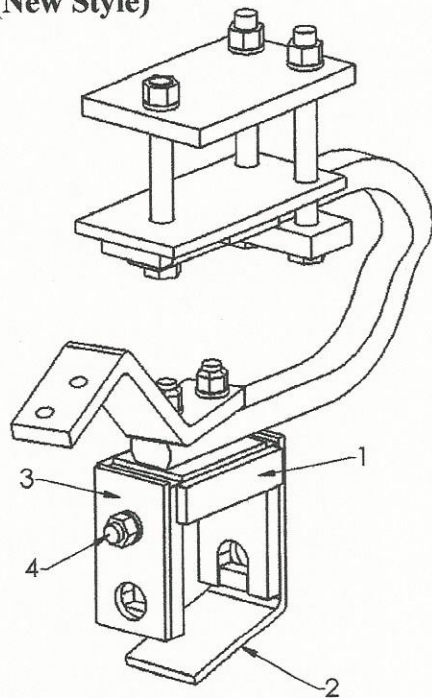
Rigid Bearing Hanger

Reference	Part No.	Description
1	23412	Rigid Bearing Hanger, Left (Shown)
	23411	Rigid Bearing Hanger, Right
2	23408	Wear Plate
3	23406	Rear Plate
4	80339	Carriage Bolt, 3/4 x 2 1/4"
	81025	3/4" Lockwasher
	80625	3/4" Hex Nut

187 Rigid Bearing Hanger Addendum (New Style)



187 Spring Bearing Hanger Addendum (New Style)



Spring Bearing Hanger

Reference	Part No.	Description
1	23416	Spring Trunnion Cuff
2	23408	Wear Plate
3	23406	Rear Plate
4	80339	Carriage Bolt, 3/4 x 2 1/4"
	81025	3/4" Lockwasher
	80625	3/4" Hex Nut

Reference No's 1-4 = 900098 Replaces 20388

Parts Listing

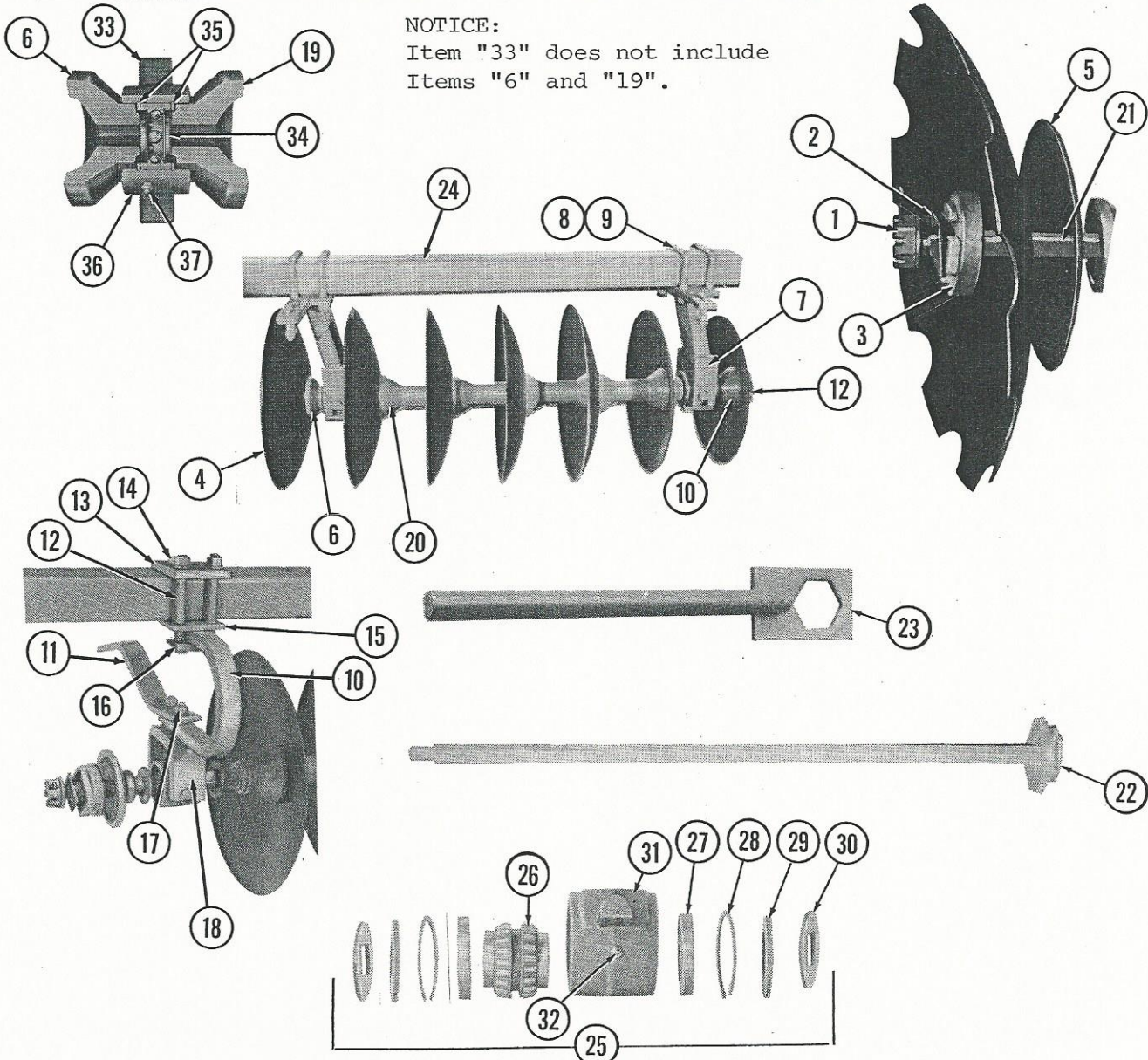
Section 5

DISK GANG PARTS		"137" Quantity, 9-1/2" Spacing										"187" Quantity, 10-1/2" Spacing							Description				
Item No.	Part No.	32	33	36	37	40	41	44	45	48	49	28	29	32	33	36	37	40	41	No Of Disk On Unit			
1	17067	4	4	4	4	4	5	6	6	6	6	4	5	6	6	6	6	6	7	Nut, Disk Assembly			
	81420	4	4	4	4	4	5	6	6	6	6	4	5	6	6	6	6	6	7	Cotter, 3/8 x 2-1/2			
2	16701	4	4	4	4	4	5	6	6	6	6	4	5	6	6	6	6	6	7	End Washer Spacer			
3	15004	4	4	4	4	4	5	6	6	6	6	4	5	6	6	6	6	6	7	End Washer			
4	18505	1 For Taper Only																			20 x 9 Ga. Sm. Disk, 3-1/4" Con.		
	15589	1 For Taper Only																			22 x 8 Ga. Cutout Disk, 2-1/2" Con.		
	15590	1 For Taper Only																			22 x 8 Ga. Sm. Disk, 2-1/2" Con.		
	16727	30	31	34	35	38	39	42	43	46	47	1 For Taper Only									24 x 3/16 Cutout Disk, 3-1/4" Con.		
	15797	30	31	34	35	38	39	42	43	46	47	1 For Taper Only									24 x 3/16 Sm. Disk, 3-1/4" Con.		
	16700	30	31	34	35	38	39	42	43	46	47	1 For Taper Only									24 x 1/4 Cutout Disk, 3-1/4" Con.		
	17093	30	31	34	35	38	39	42	43	46	47	1 For Taper Only									24 x 1/4 Sm. Disk, 3-1/4" Con.		
	08256																				26 x 1/4 Cutout Disk, 4" Con.		
	18119																				26 x 1/4 Sm. Disk, 4" Con.		
5	15309	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Disk, Back-up (not w/1/4" Disks)			
6*	16305	8	8	8	9	12	12	12	12	12	12	8	10	12	12	12	12	12	14	Spacer, Concave Half, 9-1/2"			
	21442																				Spacer, Concave Half, 10-1/2"		
*	21930	8	8	8	9	12	12	12	12	12	12	8	10	12	12	12	12	12	14	Spacer, Concave Half, 9-1/2"			
**	21898	4	4	4	4	6	6	6	6	6	6	4	4	6	6	6	6	6	6	Bearing Hanger, Front, 9-1/2"			
	21899	4	4	4	5	6	6	6	6	6	6	4	4	6	6	6	6	6	6	Bearing Hanger, Rear, 9-1/2"			
	21896																				Bearing Hanger, Front, 10-1/2"		
	21897																				Bearing Hanger, Rear, 10-1/2"		
8	19559	Two per Bearing Hanger																			U-Bolt, Brg Hgr, 7/8"		
9	80645	Four per Bearing Hanger																			Nut, 7/8"		
	81035	Four per Bearing Hanger																			Lock Washer, 7/8"		
10	20753	4	4	4	4	6	6	6	6	6	6	4	5	6	6	6	6	6	6	Spring Brg Hgr, Right Offset (Front)			
	20752	4	4	4	5	6	6	6	6	6	6	4	5	6	6	6	6	6	8	Spring Brg Hgr, Left Offset (Rear)			
11	20696	One per Left Bearing Hanger																			Scraper Bar Hanger, Left		
	20695	One per Right Bearing Hanger																			Scraper Bar Hanger, Right		
12	18858	Two per Bearing																			Bolt, 7/8 x 9		
13	21337	One per Bearing																			Top Plate		
14	20413	One per Bearing																			Bolt, 7/8 x 7-3/4		
15	20376	One per Bearing																			Bottom Plate		
16	21338	One per Bearing																			Clamp Plate		
17	80645	Three per Bearing																			Nut, 7/8"		
	81035	Three per Bearing																			Lock Washer, 7/8"		
	80340	Two per Bearing																			3/4 x 4 Carriage Bolt		
	80620	Two per Bearing																			Nut, 3/4"		
	81025	Two per Bearing																			Lock Washer, 3/4"		
18	20388	One per Bearing																			Trunnion Cuff		
19*	19915	8	8	8	9	12	12	12	12	12	12	8	10	12	12	12	12	12	14	Spacer, Convex Half, 9-1/2"			
*	19939																				Spacer, Convex Half, 10-1/2"		
**	21931	8	8	8	9	12	12	12	12	12	12	8	10	12	12	12	12	12	14	Spacer, Convex Half, 9-1/2"			
**	21932																				Spacer, Convex Half, 10-1/2"		
20	16307	20	21	24	24	24	24	22	23	30	31	16	14	14	15	18	19	22	20	Spacer, Full, 9-1/2"			
	16761																				Spacer, Full, 10-1/2"		
21	16313																				Axle, 7 x 9-1/2, 60-1/8"		
	16372	3	3																				Axle, 8 x 9-1/2, 69-3/4"
	16374																				Axle, 9 x 9-1/2, 79-1/4"		
	16376																				Axle, 10 x 9-1/2, 89-1/4"		
	15469																				Axle, 4 x 10-1/2, 34-1/2"		
	15007																				Axle, 5 x 10-1/2, 45"		
	16459																				Axle, 6x 10-1/2, 55-5/8"		
	18253																				Axle, 7 x 10-1/2, 66-1/8"		
22	17631																				Axle, Cvr Disk, 7 x 9-1/2		
	18450	1																				Axle, Cvr Disk, 8 x 9-1/2	
	18508																				Axle, Cvr Disk, 9 x 9-1/2		
	18509	1	1																				Axle, Cvr Disk, 10 x 9-1/2
	17878																				Axle, Cvr Disk, 4 x 10-1/2		
	17879																				Axle, Cvr Disk, 5 x 10-1/2		
	18254																				Axle, Cvr Disk, 6 x 10-1/2		
	18255																				Axle, Cvr Disk 7 x 10-1/2		
23	18266	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Disk Assy Wrench			
24	19572	2	1																				Disk Gang Frame, 142"
	19573																				Disk Gang Frame, 151-1/2"		
	19574																				Disk Gang Frame, 136"		
	19575																				Disk Gang Frame, 146-1/2"		
	19576																				Disk Gang Frame, 161"		
	19577																				Disk Gang Frame, 170-1/2"		
	19578																				Disk Gang Frame, 180"		
	19579																				Disk Gang Frame, 157"		
	19580																				Disk Gang Frame, 167-1/2"		
	19581																				Disk Gang Frame, 178"		
	19582																				Disk Gang Frame, 189-1/2"		
	19583																				Disk Gang Frame, 199"		
	19584																				Disk Gang Frame, 209"		
	19585																				Disk Gang Frame, 218"		
	19506																				Disk Gang Frame, 227-1/2"		

Parts Listing

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DISK GANG PARTS		"137"										"187"							Description		
Item No.	Part No.	32	33	36	37	40	41	44	45	48	49	28	29	32	33	36	37	40	41	No of Disk on Unit	
* Indicates parts that are used with QUADRASEAL® Double-Row Tapered Bearings																					
25*	920287	8	8	8	9	12	12	12	12	12	12	8	10	12	12	12	12	12	14	QUAD® Double-Row Bearing Assembly	
26*	70051	8	8	8	9	12	12	12	12	12	12	8	10	12	12	12	12	12	14	Bearing Cone, 385-SD	
27*	70052	Two Per Bearing																			Bearing Cup, 382A
28*	19832	Two Per Bearing																			Snap Ring
29*	19833	Two Per Bearing																			Bearing Seal (C/R 26310)
30*	19831	Two Per Bearing																			Bearing Washer
31*	19364	One Per Bearing																			Bearing Housing
32*	11610	One Per Bearing																			Grease Fitting, 1/8 NPT
** Indicates parts that are used with QUADRASEAL® Ball Bearings																					
33**	900090	8	8	8	9	12	12	12	12	12	12	8	10	12	12	12	12	12	14	QUAD® Ball Brng Assembly	
34**	70508	One Per Bearing																			Relube Ball Brg (GW211PP3)
35**	19832	Two Per Bearing																			Snap Ring (100mm x .120)
36**	21687	One Per Bearing																			Ball Bearing Housing
37**	11610	One Per Bearing																			Grease Fitting, 1/8 NPT



Parts Listing

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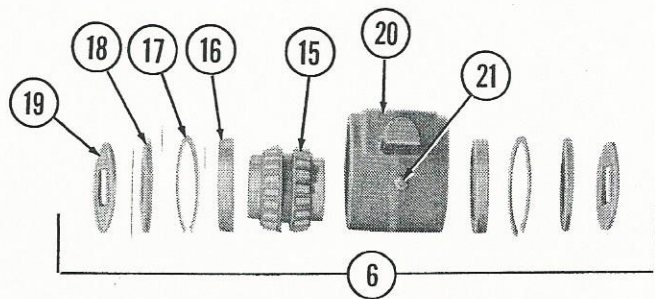
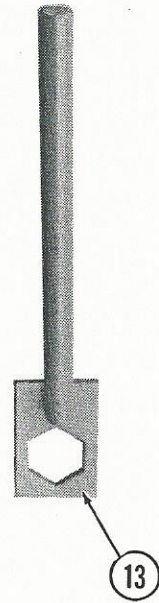
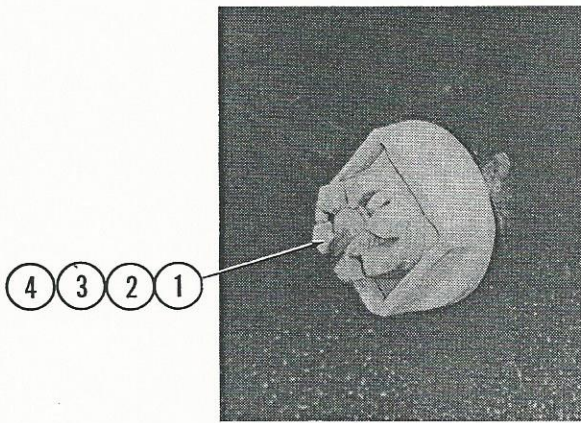
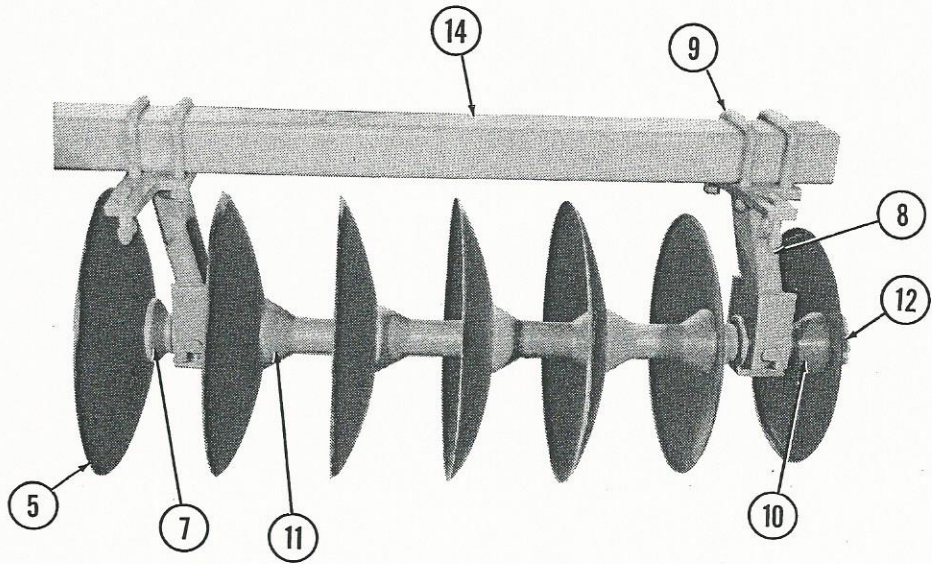
DISK GANG PARTS (continued)

		"207"									DESCRIPTION
		Quantity, 11-1/2" Spacing									
Item No.	Part No.	24	25	28	29	32	33	34	35		
1	17067	4	4	4	4	4	4	4	4	Nut, Disk Assembly	
2	81420	4	4	4	4	4	4	4	4	Cotter, 3/8 x 2-1/2	
3	16701	4	4	4	4	4	4	4	4	Spacer, End Washer	
4	15004	4	4	4	4	4	4	4	4	End Washer	
5	20898									Cutout Disk, 28 x .313	
	08256									Cutout Disk, 26 x .256	
	20899									Smooth Disk, 28 x .313	
	18119									Smooth Disk, 26 x .256	
	16700									Cutout Disk, 24 x .256	
	17093									Smooth Disk, 24 x .256	
6	*920287	8	8	8	10	12	12	12	12	QUAD® Bearing Package	
7	21442	8	8	8	10	12	12	12	12	Spacer, Concave Half	
8	21809	4	4	4	4	6	6	6	6	Bearing Hanger, Front	
	21810	4	4	4	4	6	6	6	6	Bearing Hanger, Rear	
9	19559	16	16	16	20	24	24	24	24	U-Bolt, Bearing Hanger	
	80645	32	32	32	40	48	48	48	48	Nut, 7/8"	
	131400	32	32	32	40	48	48	48	48	Lockwasher, 7/8"	
10	19827	8	8	8	10	12	12	12	12	Spacer, Convex Half	
11	19828	12	13	16	14	14	15	16	17	Full Spacer	
12	19857				2	3	3	2	1	Axle, 5 x 11-1/2, 50-1/8"	
	19859	3	3			2	2	3	4	Axle, 6 x 11-1/2, 61-5/8"	
	19861			3	2					Axle, 7 x 11-1/2, 73-1/8"	
12A	19863				1	1				Axle, 5 x 11-1/2, Cover Disk	
	19864	1					1	1	1	Axle, 6 x 11-1/2, Cover Disk	
	19865		1	1						Axle, 7 x 11-1/2, Cover Disk	
13	18266	1	1	1	1	1	1	1	1	Wrench, Disk Assembly	
14	19574	1	1							Disk Gang Frame, 136"	
	19575	1								Disk Gang Frame, 146-1/2"	
	19579		1	1	1					Disk Gang Frame, 157"	
	19580			1						Disk Gang Frame, 167-1/2"	
	19581				1	1	1			Disk Gang Frame, 178"	
	19582					1		1	1	Disk Gang Frame, 189-1/2"	
	19583						1	1		Disk Gang Frame, 199"	
	19584								1	Disk Gang Frame, 209"	
15	*70051	8	8	8	10	12	12	12	12	Bearing Cone, 385-SD	
16	*70052	16	16	16	20	24	24	24	24	Bearing Cup, 382A	
17	*19832	16	16	16	20	24	24	24	24	Snap Ring	
18	*19833	16	16	16	20	24	24	24	24	Bearing Seal (C/R 26310)	
19	*19831	16	16	16	20	24	24	24	24	Bearing Washer	
20	*19364	8	8	8	10	12	12	12	12	Bearing Housing	
21	*11610	8	8	8	10	12	12	12	12	Grease Fitting, 1/8"	

*(Item #6 is made up of items 15 - 21)

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"137" SCRAPERS AND SCRAPER BARS

ITEM NO	PART NO	Quantity, 9-1/2" Spacing										Description	
		32	33	36	37	40	41	44	45	48	49		
1	20730						1	1	1				Scraper Bar, 54.5"
	20731								1	1			Scraper Bar, 61"
	21703						1		1		2		Scraper Bar, 64"
	20732	2	2						1	1	2	2	Scraper Bar, 69.5"
	20733	1	1	2	2		1	3	2	3	3		Scraper Bar, 74"
	20735	1		1	1	2	1			1	1		Scraper Bar, 83"
	20737		1	1			1	1				1	Scraper Bar, 91"
	20738					1	1						Scraper Bar, 100"
2	20680	15	15	17	17	19	19	21	21	23	23	Scraper, Front	
	20682	15	16	17	18	19	20	21	22	23	24	Scraper, Rear	
3	21844	32	32	32	36	38	40	42	44	46	48	Scraper Attaching Plate	
4	80335	Four Per Scraper										Carriage Bolt, 1/2 x 3-1/2	
	80864	Four Per Scraper										Locknut, 1/2"	
	81005	Four Per Scraper										Lock Washer, 1/2"	
5	20676	One Per Bearing Hanger										U-Bolt, Scraper Bar	
	80865	Two Per Bearing Hanger										Nut, 5/8"	
	81015	Two Per Bearing Hanger										Lock Washer, 5/8"	

"187" SCRAPERS AND SCRAPER BARS

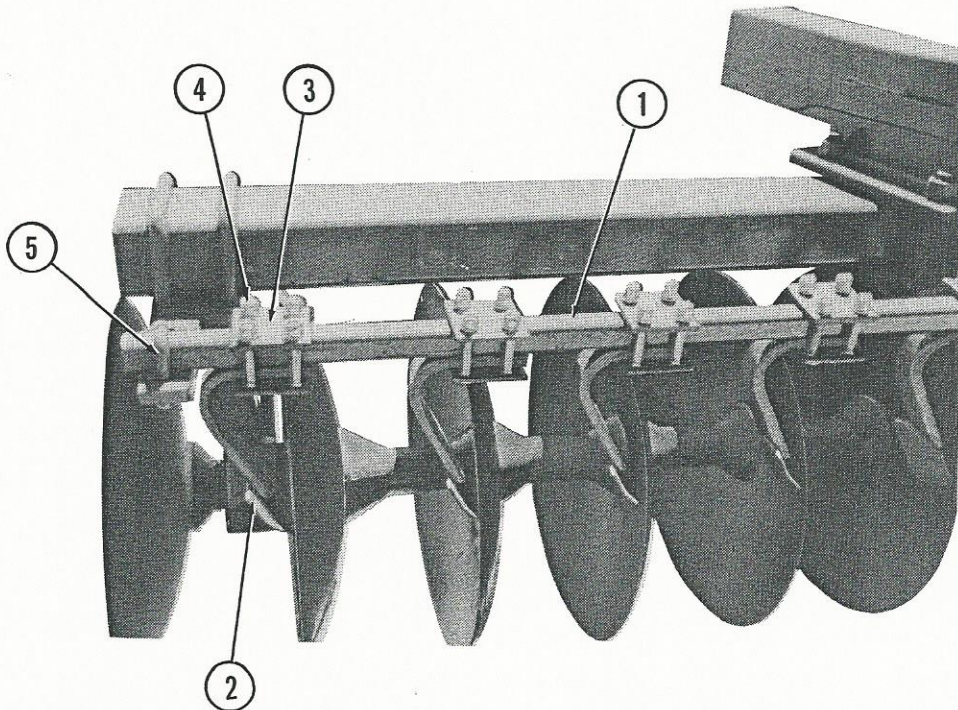
ITEM NO	PART NO	Quantity, 10-1/2" Spacing									Description	
		28	29	32	33	36	37	40	41			
1	20685									1		Scraper Bar, 38"
	20686		1	1	1							Scraper Bar, 43"
	20729			2	2	1	1			1		Scraper Bar, 47"
	20730			1	1	2	2					Scraper Bar, 54.5"
	20731			2	1	1	1	2	2			Scraper Bar, 61"
	21703	2	1						2	2		Scraper Bar, 64"
	20732				1							Scraper Bar, 69.5"
	20733	1	1			2	1	1	1			Scraper Bar, 74"
	20734	1							1			Scraper Bar, 79"
	21735							1				Scraper Bar, 83"
	21737		1									Scraper Bar, 91"
2	20680	13	13	15	15	17	17	19	19			Scraper, Front
	20682	13	14	15	16	17	18	19	20			Scraper, Rear
3	21844	One Per Scraper									Scraper Attaching Plate	
4	80335	Four Per Scraper									Carriage Bolt, 1/2 x 3-1/2	
	80864	Four Per Scraper									Locknut, 1/2"	
	81005	Four Per Scraper									Lock Washer, 1/2"	
5	20676	One Per Bearing Hanger									U-Bolt, Scraper Bar	
	80865	Two Per U-Bolt									Nut, 5/8"	
	81015	Two Per U-Bolt									Lock Washer, 5/8"	

Parts Listing

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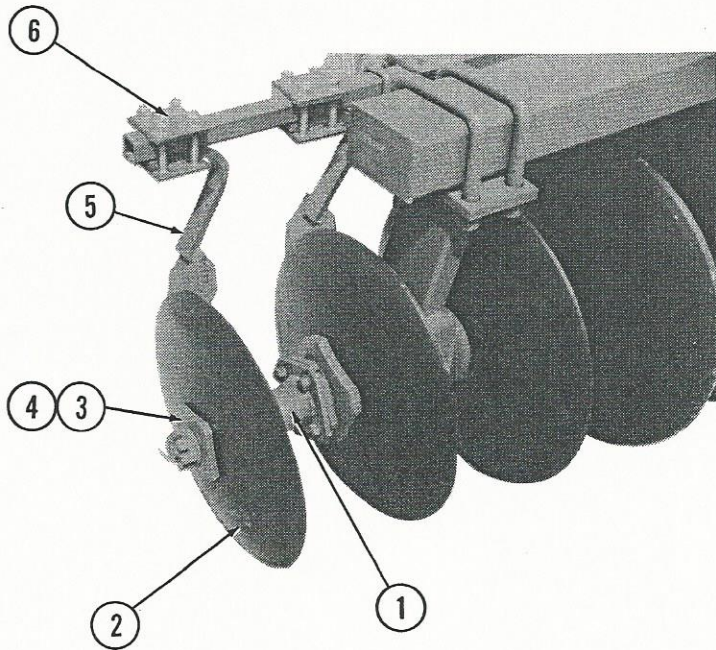
"207" SCRAPERS AND SCRAPER BARS

ITEM NO	PART NO	Quantity, 11-1/2" Spacing								Description
		24	25	28	29	32	33	34	35	
1	20729				1	1	1			Scraper Bar, 47"
	20730				1	2	2	2	1	Scraper Bar, 54.5"
	20731	2	2		1	2	1	2	2	Scraper Bar, 61"
	21703	1	1			1	1	1	1	Scraper Bar, 64"
	20732			2	1				1	Scraper Bar, 69.5"
	20733	1		1	1		1	1	1	Scraper Bar, 74"
	20735		1	1						Scraper Bar, 83"
2	20896	11	11	13	13	15	15	16	16	Scraper, Front
	20897	9	10	11	12	13	14	14	15	Scraper, Rear
	20682	2	2	2	2	2	2	2	2	Scraper, Tapered Rear (Used only on one 26" and one 24" Tapered Disks on the rt. rear)
3	21844	One Per Scraper								Scraper Attaching Plate
4	80335	Four Per Scraper								Carriage Bolt, 1/2 x 3-1/2
	80864	Four Per Scraper								Locknut, 1/2"
	81005	Four Per Scraper								Lock Washer, 1/2"
	5	20676	One Per Bearing Hanger							
80865		One Per Bearing Hanger								Nut, 5/8"
81015		One Per Bearing Hanger								Lock Washer, 5/8"



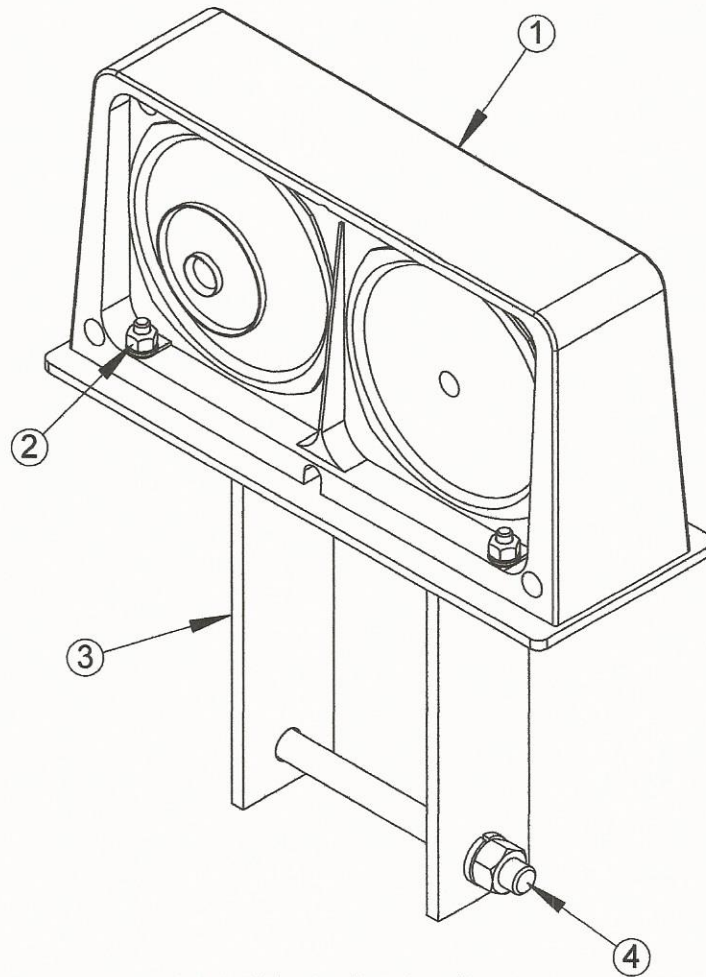
Parts Listing

Section 5



COVER DISK PARTS

REF.	PART NO.	QUANTITY			DESCRIPTION	
		137	187	207		
1	17877	1	1	1	Cover Disk Mounting Assembly	
	80321	4	4	4	Carriage Bolt, 1/2 x 1-1/2	
	80585	4	4	4	Nut, 1/2"	
	81005	4	4	4	Lock Washer, 1/2"	
2	15985	1			Cover Disk (18")	
	15966		1		Cover Disk (20")	
	15664			1	Cover Disk (22")	
3	17873	1	1	1	Cover Disk End Washer	
4	17099	1	1	1	Nut, Disk Assembly	
	81375	1	1	1	Cotter, 3/16 x 2-1/2	
5	20698	1	1	1	Scraper, Cover Disk	
6	21844	1	1	1	Scraper Plate	
	80335	4	4	4	Carriage Bolt, 1/2 x 3-1/2	
	80864	4	4	4	Locknut, 1/2"	
	81005		4	4	4	Lock Washer, 1/2"



SAFETY LIGHTING

Reference	Part No.	Description
1	106166	AG Safety Lighting Bundle*
2	80089	1/4 x 1 1/4" Hex Bolt
	81154	1/4" SAE Flatwasher
	80754	1/4" Locknut
3	23744	Light Bracket
4	80123	1/2 x 5 1/2" Hex Bolt ZP
	81005	1/2" Lockwasher
	80590	1/2" Hex Nut

* Bundle Includes Left Hand and Right Hand Dual Lamp Units, 35' Wishbone Wire Harness
 7-Pin Ag Plug and Tri-Plugs
 Convoluted Tubing for Protection of Wire Harness
 Reference Items #2, #3, & #4 Complete