

ATHENS

OPERATOR'S MANUAL

MODEL 62
PULL-TYPE TANDEM
DISK HARROW

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All farm implements are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly installed and attached to minimize the chance of accidents during operation and transport.



BEFORE YOU START!! Read the safety messages on the implement and shown in this manual. Observe the rules of safety and common sense!



THIS SYMBOL MEANS: ATTENTION! – BECOME ALERT! – YOUR SAFETY IS INVOLVED!

WARNING

Observe all CAUTION, WARNING, &/or DANGER instructions and other reasonable safety practices concerning the operation of this machine. Athens Plow Co., 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 weigh more than the implement.
6. Maximum transport speed 20 MPH.

999205 (ALL UNITS) ATHENS PLOW CO., INC.

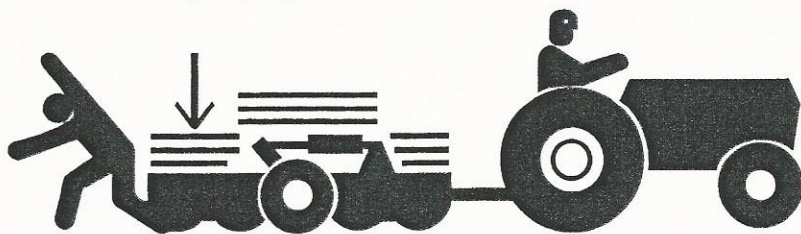
1. Stop tractor, disengage PTO, lock brakes, wait until all movement has stopped and support raised implement safely before starting to service, unclog, or adjust this implement.
2. Do not allow anyone to ride on the implement. Do not allow anyone on tractor except operator.
3. Make certain that everyone is clear of implement before activating any controls that may cause movement of implement, hydraulics, or any components.
4. Operate with extreme 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/lights, make certain that SMV emblem is clearly visible, install mechanical transport devices, and install safety chain if required by state law. The towing vehicle *must weigh more* than the implement.
6. Maximum transport speed 20 MPH.

Read and understand your Operator's Manual !!!

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 the implement in the raised position or transporting.

 **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.

999201 (ALL WHEELED UNITS) ATHENS PLOW CO., INC.

 **WARNING**



HIGH-PRESSURE FLUID HAZARD

To prevent serious injury or death:

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

SW700 ATHENS PLOW CO., INC.

1. Relieve pressure on system before repairing or adjusting or disconnecting.
2. Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
3. Keep all components in good repair.

Read and understand your Operator's Manual !!!



WARNING: To Prevent Serious Injury or Death:

1. Avoid unsafe operation or maintenance.
2. Do not operate or work on this machine without reading and understanding the operator's manual.
3. If manual is lost, contact your nearest dealer or the dealer in which you purchased your "Athens" Disc Harrow from for a new manual.



WARNING: To Avoid Injury or Machine Damage:

1. When servicing machine use proper tools and equipment.
2. Refer to operations manual for instructions.

In addition to the design and configuration of this "Athens" Disc Harrow, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent on the awareness, concern, and proper training of the person or persons involved in the assembly/set-up, transport, operation, storage, and maintenance of this "Athens" Implement. Refer to and become knowledgeable with the Safety Signs/Messages and the operation instructions in each of the appropriate sections of this manual. Pay extra attention to the Safety Signs attached to the "Athens" Disc Harrow.

- **REMEMBER:** If any of these Safety Signs are unreadable or missing during any stage of ownership, contact your local dealer for replacements. The location of all Safety Signs/Decals is shown on page 4 in this manual.
- **Listed on the following page are the locations of the Safety Signs!**

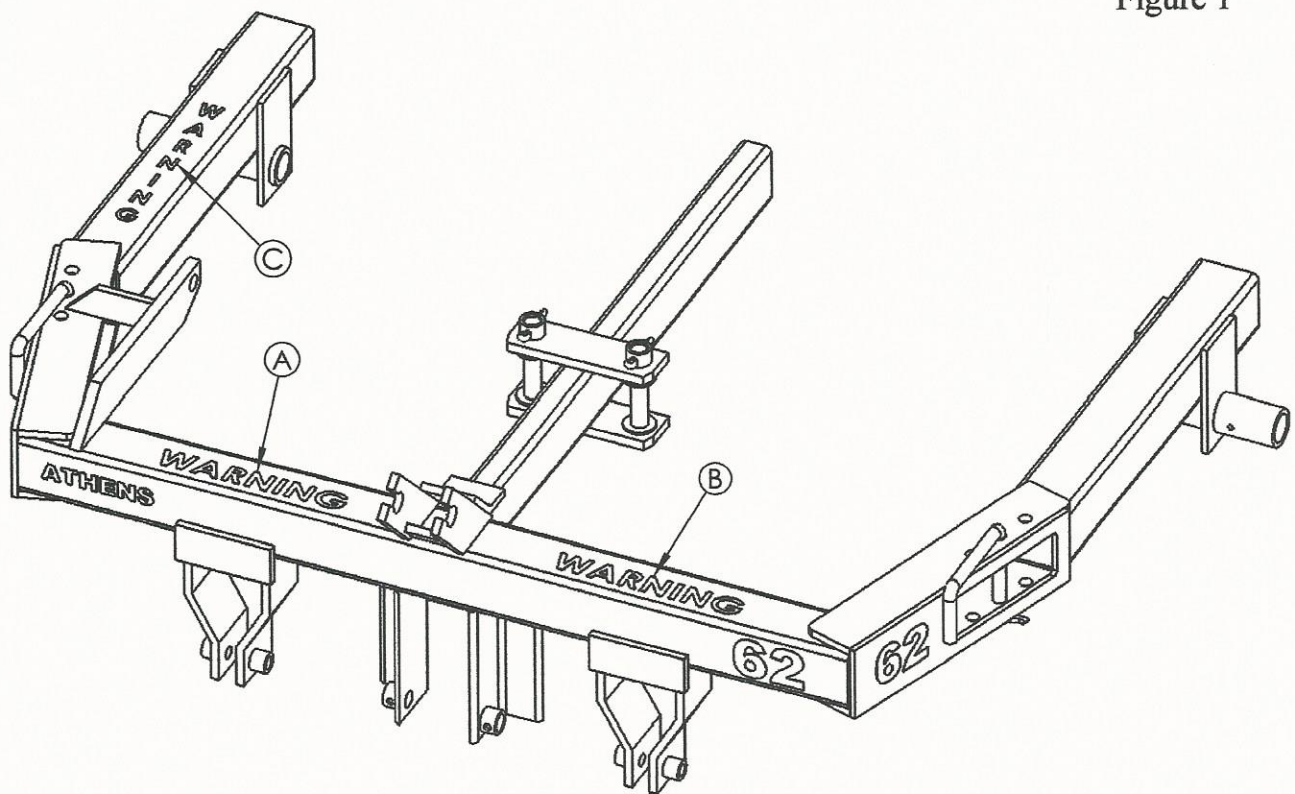
Read and understand your Operator's Manual !!!



SAFETY SIGN LOCATIONS

The types of Safety Signs and locations on the *ATHENS 62* are shown below in Figure 1. Good safety requires that you familiarize yourself with the various Safety Signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

Figure 1



- A. Refer to Page 1 for details and the listing of rules referencing Safety Sign A.
- B. Refer to Page 2 for details and the listing of rules referencing Safety Sign B.
- C. Refer to Page 2 for details and the listing of rules referencing Safety Sign C.

A) Main Frame (Refer to Figure 2)

- 1) The Main Frame (1) for the *ATHENS 62* consists of one large welded assembly. The structure of the Main Frame is extremely heavy and such heavy parts can pinch, sever, mash the extremities, or even cause death in a serious accident.



WARNING: Be very careful when handling, working on or around, or adjusting this and other such machinery. **DO NOT USE FINGERS FOR ALIGNING HOLES!** Block the Frame and other parts securely and safely in place. Always have jacks or blocks underneath any raised component(s) and never use any type of hoist by itself.

B) To Attach the Wheel Carriage to the Main Frame (Refer to Figure 2)

- 1) Position the Wheel Carriage (2) with the Ram Anchor up and aligned with the Cylinder Anchor welded on the right side of the Main Frame. Attach the Wheel Carriage to the Wheel Carriage Pivots on the Main Frame with two 1 $\frac{3}{4}$ x 16" Wheel Carriage Pivot Pins (3). Insert the $\frac{1}{2}$ x 3" Hex Bolts, $\frac{1}{2}$ " Lock Washers, and $\frac{1}{2}$ " Hex Nuts (4). Tighten all hex nuts securely.

C) To Attach Wheel Hubs to the Wheel Carriage (Refer to Figures 2)

- 1) Attach one Wheel Hub Assembly (5) to the outside of each Wheel Carriage Drop-Leg with four $\frac{1}{2}$ x 3 $\frac{3}{4}$ " Hex Bolts, $\frac{1}{2}$ " Lock Washers, and $\frac{1}{2}$ " Hex Nuts (6). Tighten all hex nuts equally until Wheel Hubs are secure.

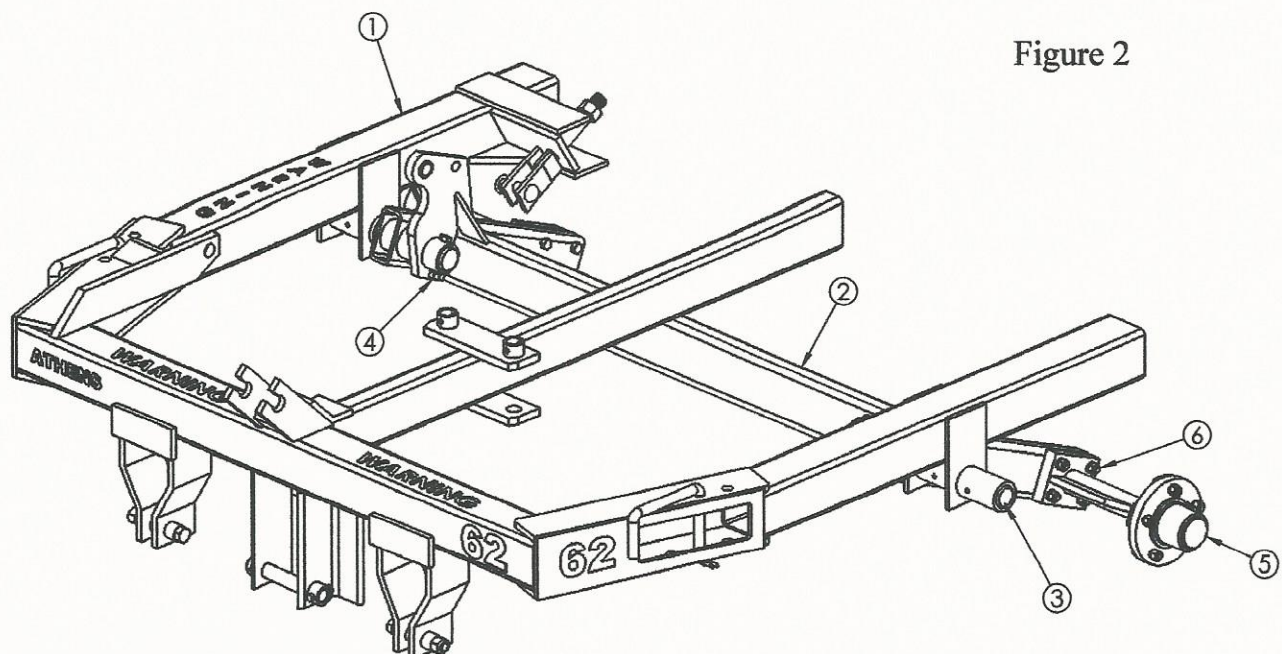


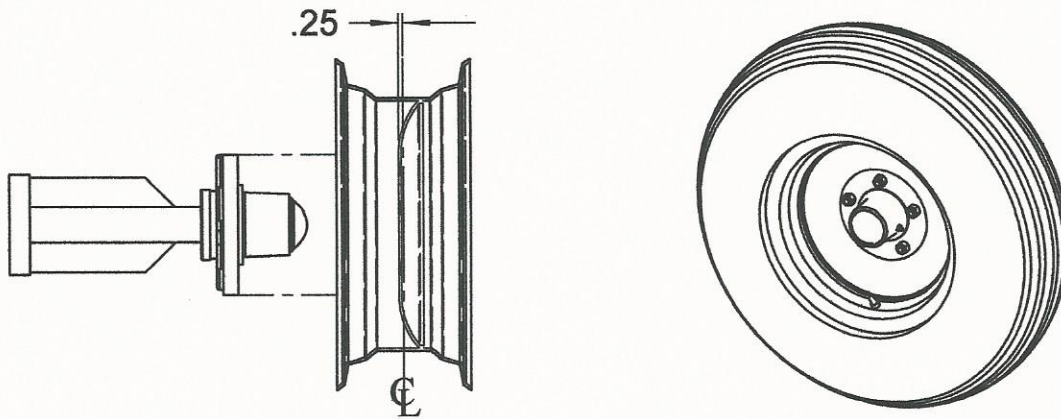
Figure 2

D) To Attach Wheels and Tires (Refer to Figure 3)

Note: Use tires of proper capacity to handle loads and to provide gauging as needed. Two 9.5L x 15 six-ply tires are adequate to carry any *Model 62*.

- 1) Mounting Wheels and Tires to Wheel Carriage (Refer to Figure 3)
Mount tires (9.5L x 15") on 5-Lug Wheels, and mount Wheels to the 5-Lug Wheel Hubs with Wheel Lug Bolts and Lug Nuts. When attaching the Hub, turn Rim as shown so that the Hub does not reach the centerline of the Rim.

Figure 3



E) To Attach Mechanical Transport (Refer to Figure 4)

- 1) Attach Mechanical Transport (1) using 1" Hex Nut (2). Make certain that the $\frac{3}{4}$ x 2 $\frac{1}{2}$ " Rivot Bolt (3) with the Hair Pin Clip is inserted in the Transport.

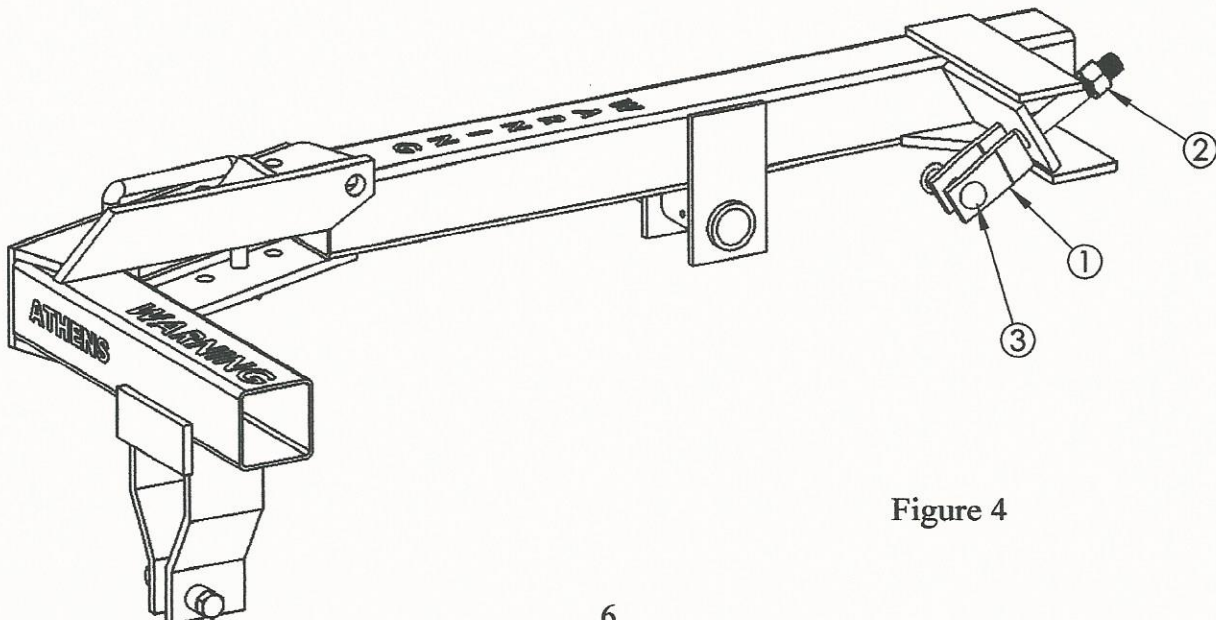


Figure 4

F) To Attach Tongue and Self-Leveling Parts (Refer to Figure 5)

1) Tongue

Attach the Tongue (1) to the Main Frame with the Tongue Connecting Pin (2). Secure the Tongue Connecting Pin with a $\frac{3}{8}$ " x 2" Hex Bolt, $\frac{3}{8}$ " Lock Washer and $\frac{3}{8}$ " Hex Nut. Next, attach the Tongue Braces (3) to the Tongue with a $\frac{3}{4}$ " x $6\frac{1}{2}$ " Hex Bolt, $\frac{3}{4}$ " Lock Washer, and $\frac{3}{4}$ " Lock Nut (4). Then, insert a Bushing (5) into each Tongue Brace, and secure each Tongue Brace to the Main Frame with a $\frac{3}{4}$ " x 5" Hex Bolt and $\frac{3}{4}$ " Lock Nut (6).

Self-Leveling Parts

Attach the Self Leveling Bundle by removing the Threaded Trunnion (12) from the Leveling Rod (10). Insert the Plain Trunnion (9) into the Frame Leveling Anchors (11) and rotate assembly down toward the Tongue (1). Insert the Threaded Trunnion (12) into the Tongue Leveling Anchors (13) and rotate to secure it. **Note: Place threaded end up so that dirt and debris does not build up in the open end. Also place grease fitting side out for easy access.** Screw Leveling Rod into Threaded Trunnion until the Tongue is approximately level with the Main Frame. Compress the Leveling Spring (14) approximately $\frac{1}{2}$ " by tightening the Hand Nuts (15).

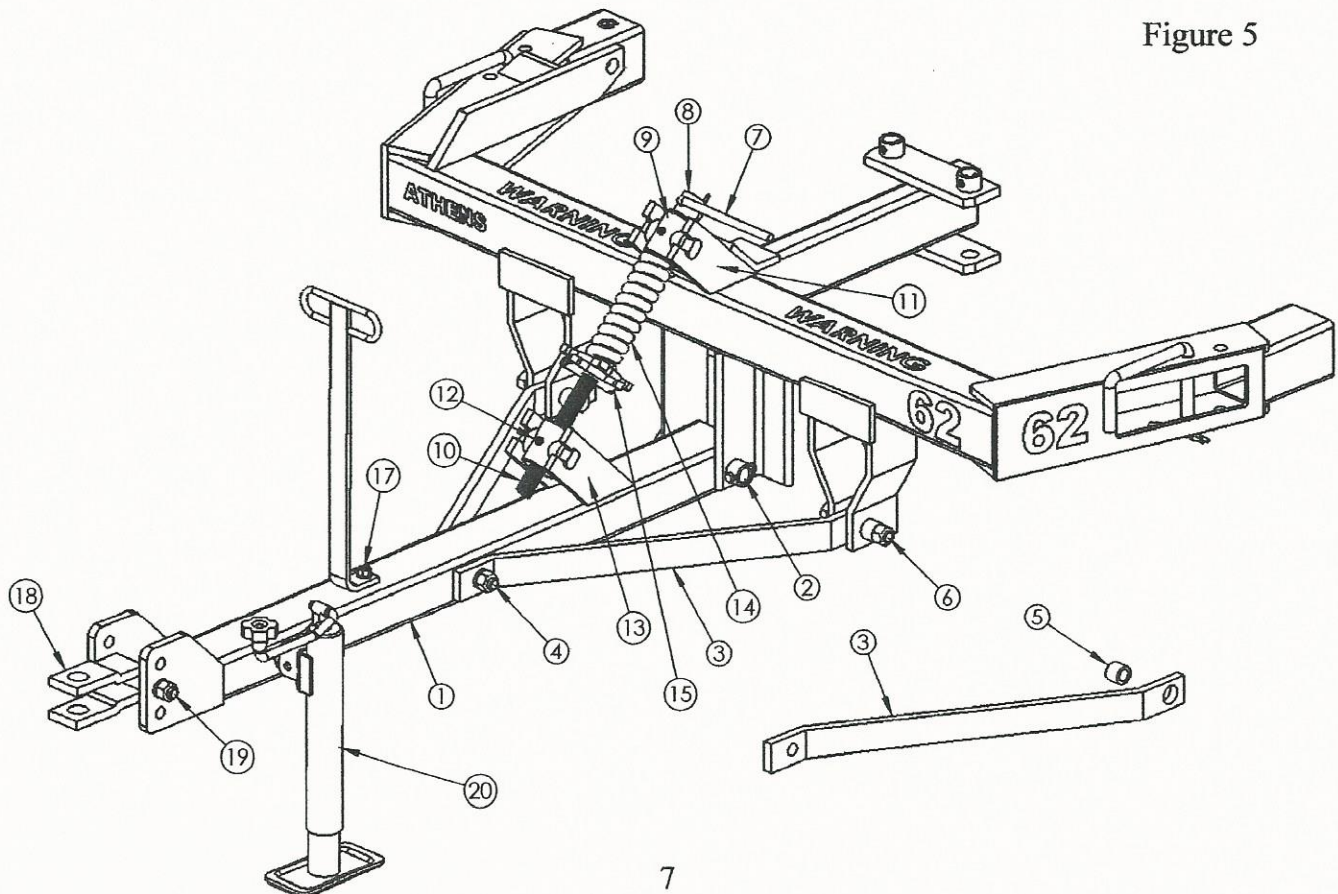


Figure 5

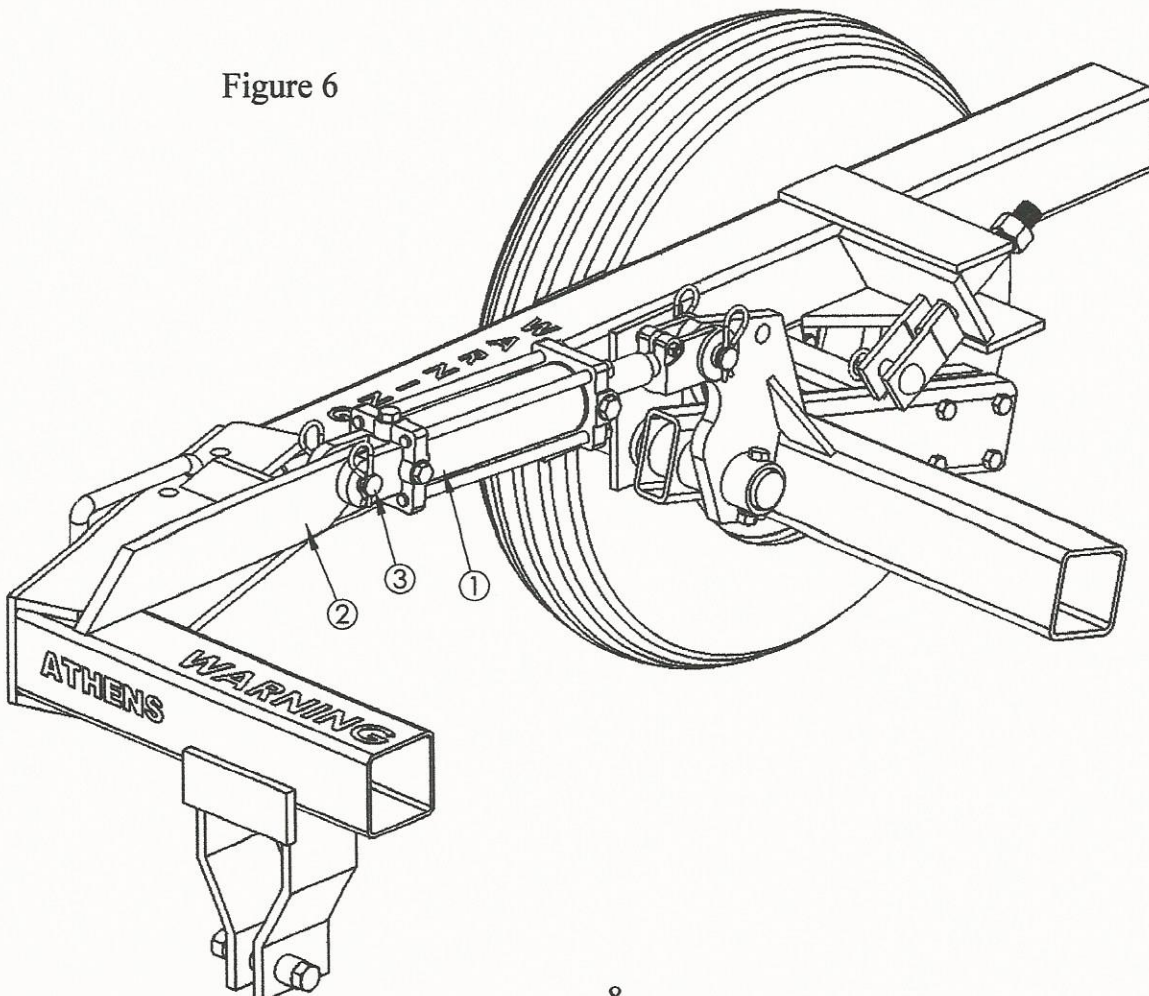
G) To Attach Hose Stand and Tongue Jack (Refer to Figure 5)

- 1) Attach the Hose Stand (16) to the Tongue with the $\frac{1}{2}$ x 4" Hex Bolt (17), $\frac{1}{2}$ " Lock Washer, and a $\frac{1}{2}$ " Hex Nut. Secure the Clevis (18) to the Tongue with the $\frac{3}{4}$ x 6 $\frac{1}{2}$ " Hex Bolt, $\frac{3}{4}$ " Lock Washer and $\frac{3}{4}$ " Lock Nut (19). Insert the Tongue Jack (20) into the Jack Tube Bushing as shown. Secure with the Ball Spring Pin supplied with the Jack.

H) Attaching Hydraulic Lifting Cylinder (Refer to Figure 6)

- 1) Connect the 2 $\frac{1}{2}$ x 8" Lifting Cylinder (1) to the Cylinder Anchor (2) that is welded to the front tube on the Main Frame. Note that the cylinder ports must be positioned toward the inside, the clevis end of the Cylinder to the rear, and the clevis bolt accessible for future tightening. Insert the Cylinder Pins (3) and Hair Pin Clips to secure. Make certain the Clevis Bolt is tightened before use.

Figure 6



I) To Attach Hydraulic Lifting Hoses (Refer to Figure 7)

1) To Attach Fittings to Cylinder

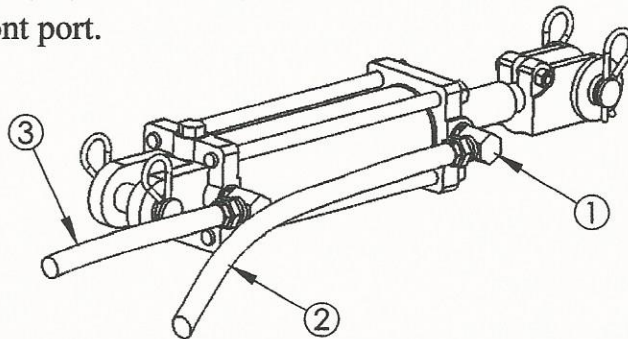
Install a ½" NPT 90° Swivel Street Elbow (1) into each cylinder port.

- Note: Do Not Use Thread Tape. Elbows are complete with O-Rings. Thread Tape shreds causing damage to hydraulic components.

2) To Attach Lifting Hoses

First, connect the 108" Hose (2) securely to the 90° Swivel Elbow on the clevis end of the cylinder. Next, connect the 96" Hose (3) to the 90° Swivel Elbow on the butt end of the cylinder. Make sure that the 108" Hose connects to the rear port on the cylinder and the 96" Hose connects to the front port.

Figure 7



3) Connecting Hydraulic Lifting Hoses to the Tractor

Insert the Lifting Hoses through the Hose Stand Guide Loop and connect to the remote outlets on the Tractor.

- Note: ATHENS Lifting Hoses are equipped with ½" NPT Male Ends. Attach the Hydraulic Couplers to the ½" NPT threads on the Hoses securely and insert the Hydraulic Couplers into the Hydraulic Remote Outlets on the Tractor.



WARNING: Do not actuate hydraulics until everyone is cleared from the area and until all components assembled thus far are securely tightened and lubricated.

With the Tractor idling, lift and lower the unit slowly and carefully after making certain everyone is clear and that all parts turn freely. If any leaks occur tighten the fittings securely. *You can now lift and lock the unit in Transport if needed.*



WARNING: Do not check for leaks with your hands. High pressure oil can penetrate skin and cause serious infection and/or death.

J) To Attach Gang Frames (Refer to Figure 8)



WARNING: Be very careful when handling, working on or around, or adjusting this and other such machinery. **DO NOT USE FINGERS FOR ALIGNING HOLES!** Block the Frame and other parts securely and safely in place. Always have jacks or blocks underneath any raised component(s) and never use any type of hoist by itself.

- 1) Slide each Gang Frame (1) through the slots in the Main Frame as shown. Next, insert a Gang Anchor Pin (2) along with a Spacer Bushing (3) and a 1" Flat Washer (4) on top of the Gang Frame and a second 1" Flat Washer underneath. Secure Pins with $\frac{3}{8}$ x 2" Cotter. Finally, insert the Gang Angling Pins (5) as shown to achieve maximum angle and secure with Hair Pin Clips. The Gang Frames are as follows:

WIDTH OF CUT	NUMBER OF DISCS	GANG FRAMES
7' 11"	20	39"
8' 2"	22 or 24	39"
9' 4"	24, 26, or 28	47"
10' 6"	30 or 32	55.50"
10' 9"	28	55.50"
12' 2"	32	65.38"
12' 11"	36 or 40	70.38"

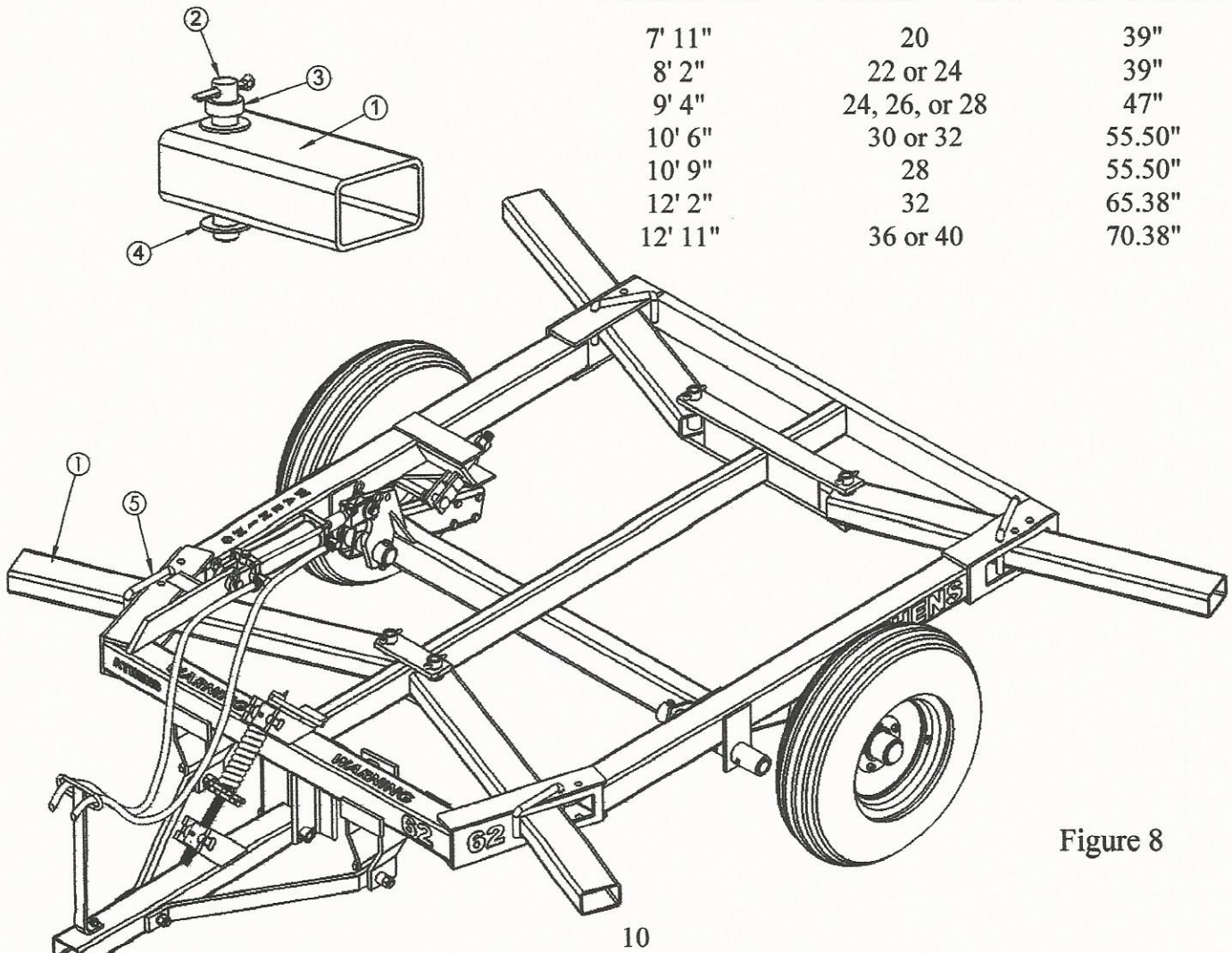


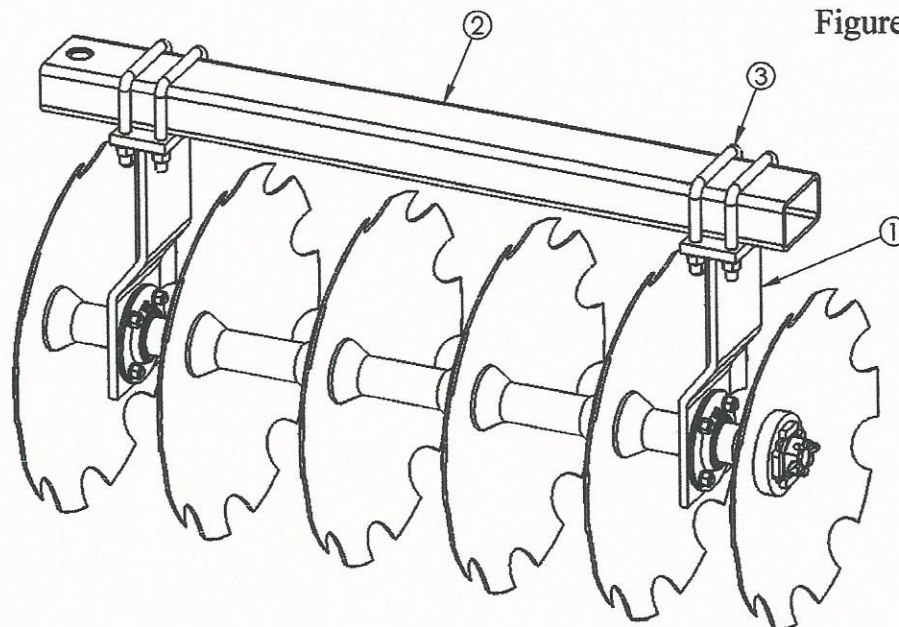
Figure 8

K) To Attach Disc Gangs (Refer to Figure 9)



WARNING: Use gloves when handling Disc Gangs. Disc Gangs are very heavy and sharp, **HANDLE WITH CARE!**

- 1) Disc Gangs are assembled from the factory. Attach Rigid Bearing Hangers (1) to the Gang Frame (2) with $\frac{5}{8}$ " U-Bolts (3), and $\frac{5}{8}$ " Lockwashers and Hex Nuts. **Make sure the longer leg of the U-Bolt goes toward the rear for Scrapers.** Set the Bearing Hanger Top Plate flush with the bottom-side of the Gang Frame. Tighten each U-Bolt equally until both are securely fastened.



The following information is to be used in reassembly if the Disc Gangs are disassembled. Remove all parts from the Disc Axle and line up parts in the order of removal. Put a Disc on the Axle, then a Convex Half Spacer, a Bearing Hanger, a Concave Half Spacer, and a Disc. Next, put a Full Spacer on followed by another Disc. Repeat this process until the next Bearing Hanger location. Then, put another Convex Half Spacer, a Bearing Hanger, and a Concave Half Spacer followed by a Disc. When the last Disc is put on, install an End Washer, End Washer Spacer(s), and the Axle Nut. Secure with a Cotter Pin. Tighten Discs Gangs to 1200 to 1500 ft. lbs. (A 200 lb. Man on a 7 ft. handle equals 1400 ft. lbs.)

- **NOTE:** Page 13 shows the layout of the Bearing Hanger and Scraper locations for the 9' 4" (24 disc) unit.

L) To Attach Scrapers (Refer to Figure 10)

- 1) Attach Scraper Bar Hangers (1) to the rear side of the Bearing Hanger (2) and under the bearing Hanger top plate as shown. **NOTE: Long leg of U-Bolt (3) must be to the rear.** Replace $\frac{1}{2}$ " Lockwasher and $\frac{1}{2}$ " Hex Nut on Bearing Hanger U-Bolts and tighten securely. Next, attach Scraper Bar (4) loosely below the Scraper Bar Hanger by placing a Scraper Clamp (5) underneath the Scraper Bar and inserting a $\frac{1}{2} \times 2 \frac{1}{4}$ " Hex Bolt (6) up through the Scraper Bar and the Scraper Bar Hanger. Secure loosely with a $\frac{1}{2}$ " Lockwasher and $\frac{1}{2}$ " Hex Nut. Mount Scraper (7) just inside the end of the Scraper Bar (on butt end of disc gang) with two $\frac{1}{2} \times 2 \frac{1}{4}$ " Carriage Bolts (8) and secure these with two Scraper Clamps (5), $\frac{1}{2}$ " Lockwashers and $\frac{1}{2}$ " Hex Nuts. Adjust each Scraper close to but not touching the disc blades and tighten securely. Making sure the end of the Scraper Bar is close to the first Scraper tighten both Hex Bolts to secure the Scraper Bar. Install, adjust and tighten remaining Scrapers and hardware. **NOTE: Do Not Scrape Outside Front or Inside Rear Discs.**

SHOWN: RIGHT FRONT GANG
6 DISC W/ 9" SPACING

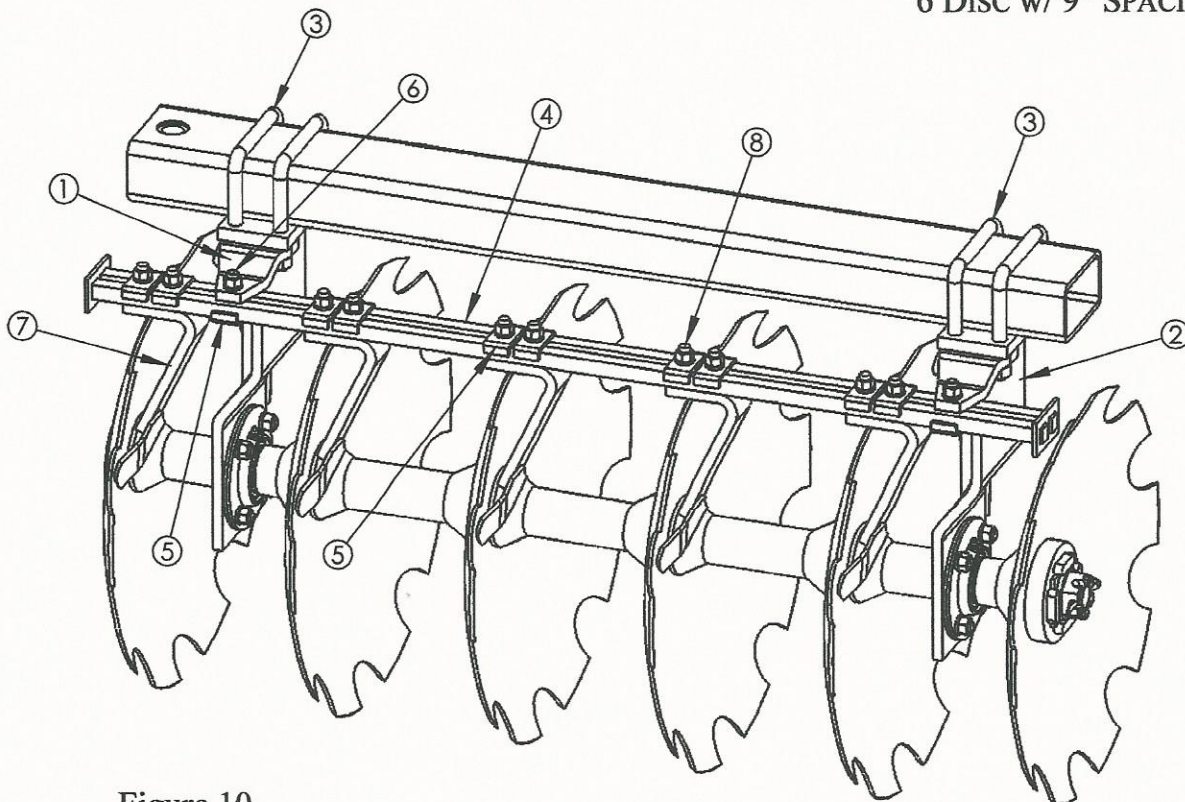


Figure 10

M) Disc Gang Layout (Refer to Figure 11)

➤ MODEL 62: 9' 4" 24 Blades with Scrapers and Cover Discs

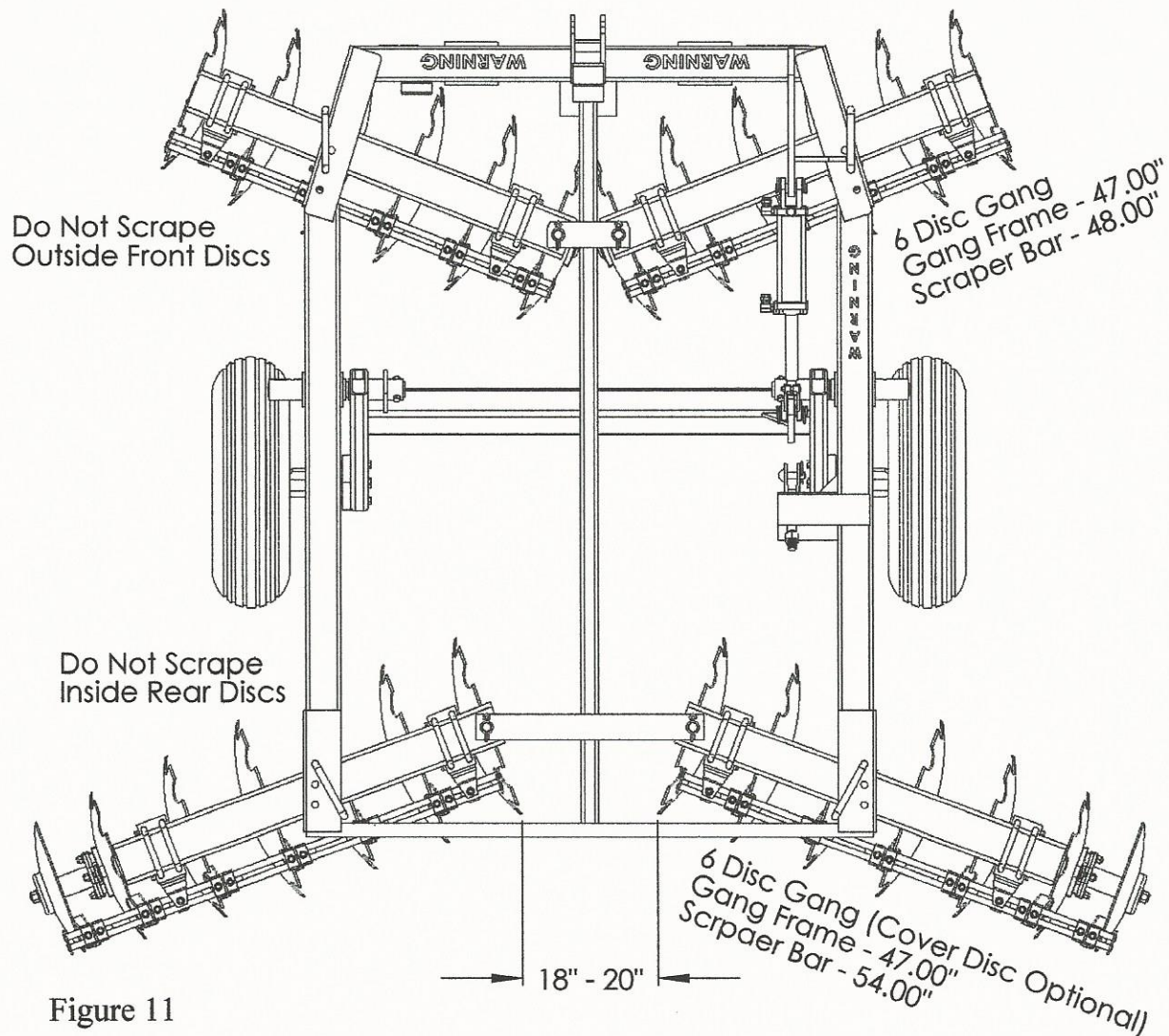


Figure 11

- 1) The *Model 62* is configured in seven (7) different widths of cut with 7 ½" Disc Spacing, 9" Spacing, or a combination of 9" Spacing on the front disc gangs and 7 ½" Spacing on the rear. **Refer to Table 1 for Disc Gang information.** After attaching the Right Front and Left Front Disc Gangs slide the inside two (2) Blades close to but not touching one another as shown in Figure 11 above. Next, attach the Right Rear and Left Rear Disc Gangs and slide the inside two (2) Blades approximately **18 to 20 inches** apart as shown in Figure 11. For further information on the positioning of the Disc Gangs refer to the Operation Section of this Manual (Section 3).

M) Disc Gang Layout continued...

- Table 1 below lists the Disc Gang Layouts for all the configurations of the *Model 62*. One can also find similar information in the Parts Section (Section 5) of this Operators Manual.

The Model 62 is configured in seven (7) different widths of cut:

TABLE 1

Width of Cut	Number of Discs	Disc Spacing		Gang Frames	Scrapper Bars	
		Front	Rear		Front	Rear
7' 11"	20	9"	9"	39.00"	38.63"	48.00"
8' 2"	22	9"	7 ½"	39.00"	38.63"	48.00"
	24	7 ½"	7 ½"			
9' 4"	24	9"	9"	47.00"	48.00"	54.00"
	26	9"	7 ½"			
10' 6"	28	7 ½"	7 ½"	55.50"	54.00"	63.50"
	30	9"	7 ½"			
10' 9"	28	9"	9"	65.38"	63.50"	73.00"
	32	7 ½"	7 ½"			
12' 2"	32	9"	9"	70.38"	63.50"	73.00"
	36	9"	7 ½"			
12' 11"	36	9"	7 ½"	70.38"	68.38"	82.50"
	40	7 ½"	7 ½"			

➤ DISC GANG INFORMATION CONTINUED...

- Units ordered with 20" diameter discs are equipped with a single tapered disc on the rear gangs.
For example: If the *Model 62* is ordered with 20" diameter discs, the outside disc on the rear gangs will be an 18" diameter disc.
- Units ordered with 22" diameter discs are equipped with a single tapered disc on the front gangs and a double taper on the rear gangs.
For example: If the *Model 62* is ordered with 22" diameter discs, the outside front discs will be 20" in diameter, and the last two discs on the rear will taper twice, with a 20" and an 18" diameter disc.

➤ BEARING LOCATIONS ARE LISTED ON PAGE 15.

N) Bearing Locations for the *Model 62*

9" Spacing Front & Rear

A) 20 Disc (7' 11" Harrow)

(x (((x (Front
) x))) x) Rear

B) 24 Disc (9' 4" Harrow)

(x ((((x (Front
) x)))) x) Rear

C) 28 Disc (10' 9" Harrow)

(x (((((x (Front
) x))))) x) Rear

D) 32 Disc (12' 2" Harrow)

(x ((((x (((x (Front
) x))) x))) x) Rear

9" Spacing Front & 7 ½" Rear

A) 22 Disc (8' 2" Harrow)

(x (((x (Front
) x)))) x) Rear

B) 26 Disc (9' 4" Harrow)

(x ((((x (Front
) x))))) x) Rear

C) 30 Disc (10' 6" Harrow)

(x (((((x (Front
) x))))) x) Rear

D) 36 Disc (12' 11" Harrow)

(x (((x (((x (Front
) x))) x)))) x) Rear

7 ½" Spacing Front & Rear

A) 24 Disc (8' 2" Harrow)

(x ((((x (Front
) x)))) x) Rear

B) 28 Disc (9' 4" Harrow)

(x (((((x (Front
) x))))) x) Rear

C) 32 Disc (10' 6" Harrow)

(x (((x (((x (Front
) x))) x))) x) Rear

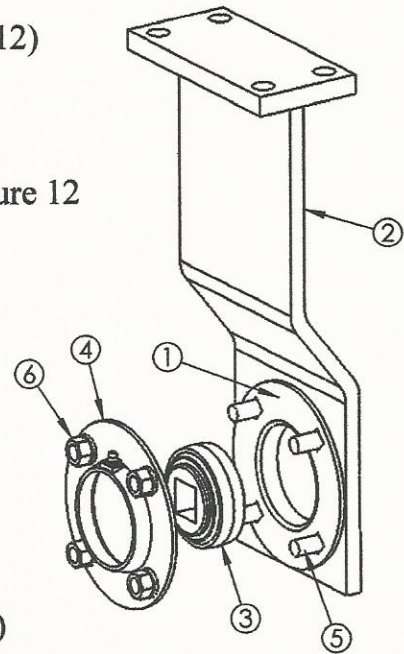
D) 40 Disc (12' 11" Harrow)

(x ((((x ((((x (Front
) x)))) x)))) x) Rear

O) To Assemble Flangette Ball Bearings (Refer to Figure 12)

- 1) First, place the Flangette without the Grease Fitting (1) on the Bearing Hanger (2). Next, insert the Ball Bearing (3) into the Flangette and then place the Flangette with the Grease Fitting (4) over the Bearing and flush with the first Flangette. Finally, insert the $\frac{1}{2} \times 2 \frac{1}{2}$ " Carriage Bolts (5) through the assembly and secure with $\frac{1}{2}$ " Lockwashers and $\frac{1}{2}$ " Hex Nuts (6). Tighten Hex Nuts equally until assembly is secured.

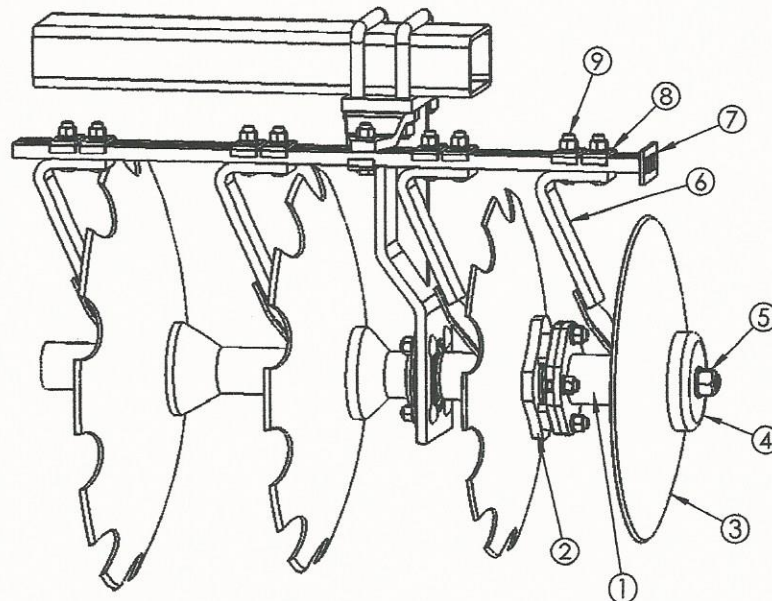
Figure 12



P) To Attach Cover Disc with Scraper (Refer to Figure 13)

- 1) Attach the Cover Disc Mounting Assembly (1) to the Cover Disc Mounting Plate (2) (which is welded to the axle butt plate) with four $\frac{1}{2} \times 1 \frac{3}{4}$ " Carriage Bolts, and $\frac{1}{2}$ " Hex Nuts and $\frac{1}{2}$ " Lockwashers. Next, attach the Cover Disc (3), Cover Disc End Washer (4), a $\frac{3}{4}$ " Flatwasher and secure with a $\frac{3}{4}$ " Locknut (5). Tighten all nuts securely. Bolt the Cover Disc Scraper (6) to the Scraper Bar (7) with two Scraper Clamps (8) and two $\frac{1}{2} \times 2 \frac{1}{4}$ " Carriage Bolts (9), and secure with $\frac{1}{2}$ " Lockwashers and $\frac{1}{2}$ " Hex Nuts.

Figure 13



Q) To Attach Balk Buster and Gang Wrench (Refer to Figure 14)

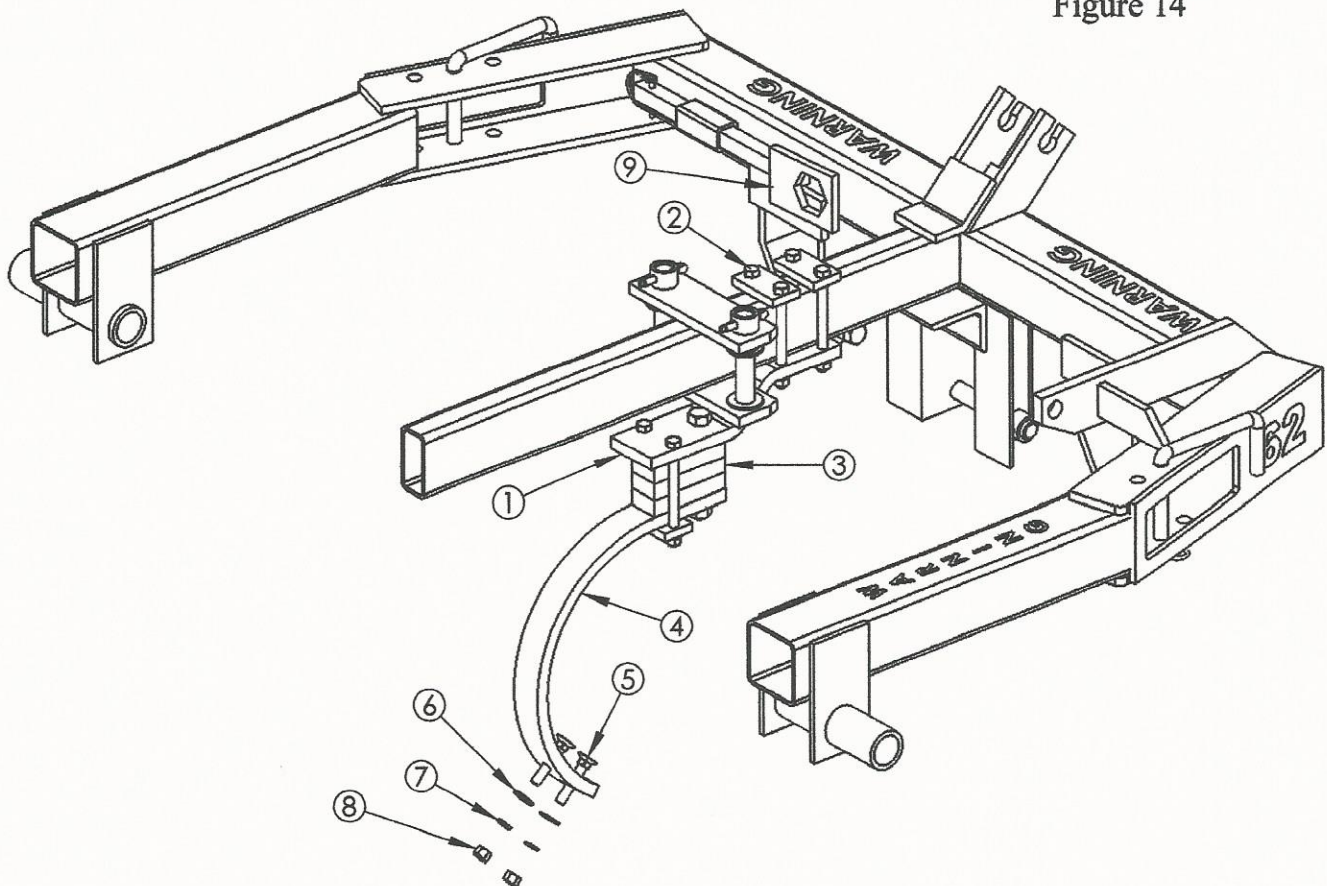
- 1) Attach the Balk Buster Assembly (1) to the Main Frame with four $\frac{1}{2}$ x 6" Hex Bolts, $\frac{1}{2}$ " Lockwashers, and $\frac{1}{2}$ " Hex Nuts (2). Next, position the Balk Buster Assembly directly in front of the front disc gangs as shown.

➤ **Note:** The Balk Buster comes completely assembled for use with 22" Diameter Discs. If the unit is ordered with 20" Diameter Discs, remove one or more Spacer Blocks (3) from above the Balk Buster Tine (4) and re-attach them below the Tine. Tighten all Bolts.

Finally, attach a 6" Sweep or a 2" Cultivator Point (not furnished) on **Top** of the Tine with $\frac{1}{2}$ x 2 $\frac{1}{2}$ " Plow Bolts (5), $\frac{1}{2}$ " Flatwashers (6), $\frac{1}{2}$ " Lockwashers (7), and $\frac{1}{2}$ " Locknuts (8).

- 2) Insert the Disc Gang Wrench (9) into the Gang Wrench Holder welded on the Main Frame, as shown below. Use a Lock Clip to secure the Gang Wrench.

Figure 14



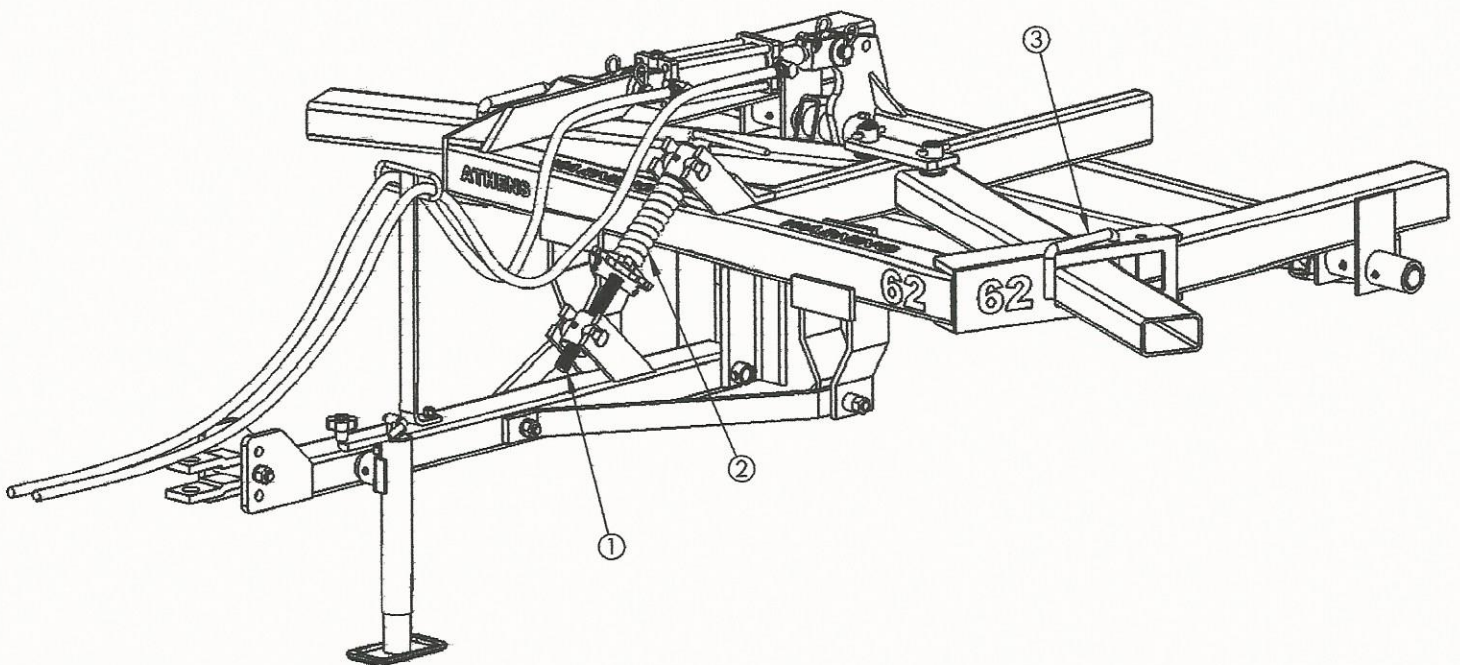
BEFORE OPERATING THE HARROW BE CERTAIN THAT:

- All Bolts are tight, Cotters are spread, and all Klik Pins are inserted.
- Disk Gang Axles are tight and Gangs turn freely.
- Disk Gang Bearings are lubricated (use a good quality Lithium-base grease).
- Threaded Adjusting Rods are coated and all other Grease Fittings are lubricated.

A) To Level Disk Harrow Front-to-Rear (Refer to Figure 15)

- 1) The **Athens 62** is leveled front-to-rear by leveling members between the Tongue and the Main Frame. With the unit raised on its wheels, shorten or lengthen the Leveling Rod (1) until the frame is level and the Spring (2) is compressed approximately $\frac{1}{2}$ " to 1". Lengthening the Leveling Rod and/or compressing the Leveling Spring will add more weight to the rear of the harrow. This will increase the penetration of the rear Disk Gangs and aid in filling the balk in the rear. Keep Hand Nuts tight to prevent thread wear.

Figure 15



B) Adjusting the Angle (Refer to Figure 15)

- 1) Remove Hair Pin Clips from the Angling Pins (3) and slide Gang Frames to the desired angle. **Make certain** that both front and rear gang frames are set at the same angle. Replace the Angling Pins and insert Hair Pin Clips to secure.

C) To Level Individual Disc Gangs (Refer to Figure 16)

- 1) Individual Gang Level is adjusted by placing the Leveling Spacers (1) and Leveling Washers (2) above or below the Disc Gang Frame (3) as desired. The Gang Frame is level when one Leveling Washer and Leveling Spacer is placed above the Gang Frame and the second Leveling Washer is below the Gang Frame as shown in Figure 16. Install one Leveling Washer and Leveling Spacer above the Gang Frame and the second Leveling Washer below the Gang Frame to lower the inside discs slightly.

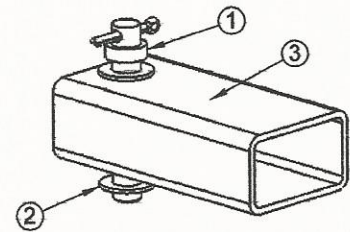


Figure 16

D) Adjusting Scrapers

- 1) Adjust Scrapers close to but not touching the Discs, with Scraper curvature aligned with the Disc Blade. Make certain all bolts are retightened.

POINTS TO CHECK IN OBTAINING THE BEST PERFORMANCE

E) Leaving a Valley in the Center

- 1) Review A1 (Page 18). Adjust more weight to the rear.
- 2) Adjust rear balk (slide rear gangs in).

F) Leaving a Ridge in the Center

- 1) Adjust rear balk (slide gangs out).
Review A1 (Page 18). Adjust more weight to the front.




G) Clogging between Discs

- 1) Adjust Scrapers close to but not touching the Discs.
- 2) Lower Wheels when crossing wet areas.
- 3) Disk at an angle to the rows.
- 4) Wait until the soil dries enough for proper operation.

A) Bolts and Cotters

- 1) Tighten all Bolts securely before entering the field. Check Bolt tightness at regular intervals. Replace any damaged Bolt or Cotter immediately to prevent loss or any further damage from occurring.
- **HARDWARE:** Check Hardware tightness regularly. Loose Hardware is easily lost or bent, causes excessive wear on parts, and increases the chance of failure. Use the Torque Chart (Table2) below, to tighten Hardware. Failure to maintain is not covered by manufacturer's warranty.

TABLE 2

RECOMMENDED TORQUE IN FT-LBS (Nm) COARSE AND FINE THREADS			
2  5  8 			
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)

B) Disc Gang

- 1) Make certain that Disc Gang Assembly Nut is tightened securely (750 ft. lbs.). Tighten with the gang wrench provided and a five-foot extension (a 150 lb. man on a five wrench equals 750 ft. lbs.).
- **Note:** Before tightening Disc Gang, loosen Bearing Hangers slightly to allow Bearing Hangers to be re-positioned while tightening. After re-tightening Bearing Hangers, make sure that Disc Gang turns freely.



WARNING: A loose Axle Nut can cause failure to the Axle and Spacers, destroy and/or lead to complete Bearing failure.

B) Disc Gang continued... (Refer to Figure 17)

- 2) Lubricate Disc Gang Bearings before operating the first time, every 40 hours of operation, and at the beginning and end of each season with a good quality clean Lithium-Based Bearing Grease.

- **NOTE:** Lubricate Disc Gang Bearings until grease shows between the Bearing and Flangettes before operating. Grease will force dirt out, which increases the life of the Bearing. Always clean the Grease Gun and the Grease Fitting before lubrication begins.

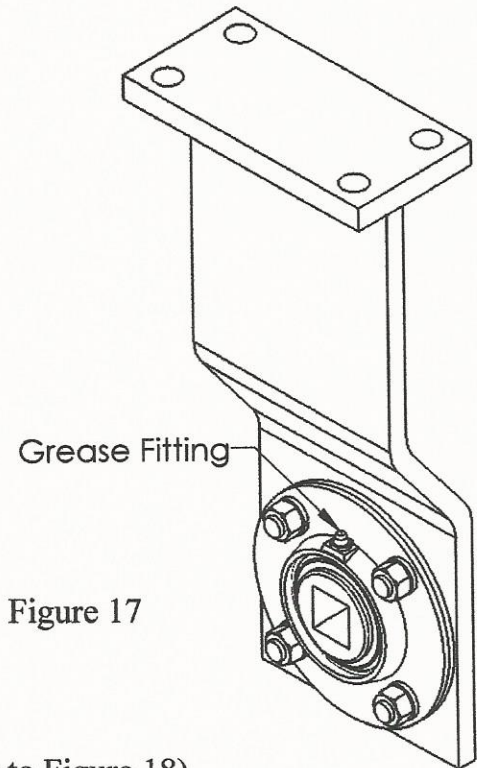


Figure 17

C) Wheel Bearing Adjustment and Lubrication (Refer to Figure 18)

Adjust Wheel Bearings every 500 acres and at the start of every season as follows:

- 1) Make certain that Disc Gang Assembly Nut is tightened securely.
- 2) Tighten Wheel Bearing Adjustment Nut until Wheel “drags” slightly.
- 3) If needed, back off nut to the first hole and insert Cotter.
- 4) Replace Hub Cap.
- 5) Lubricate Wheel Bearings with a #2 Lithium-based grease every 40 hours and at the beginning and end of each season. Make certain that the grease is forced out around the Seals in order to flush out dirt and old grease. There is no danger of over-lubrication. **CLEAN** Grease Fitting and Grease Gun before lubrication.

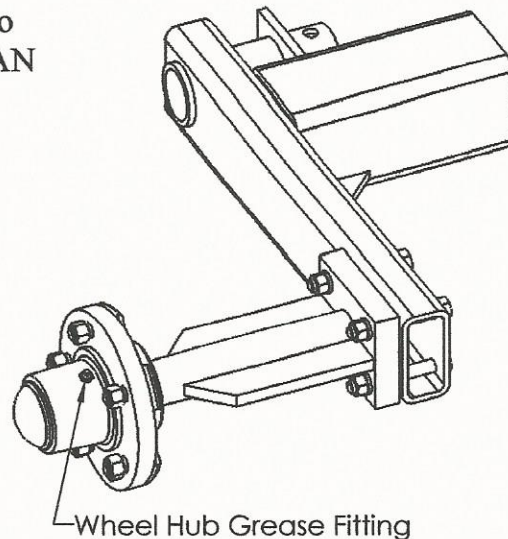


Figure 18

D) Self-Leveling Parts (Refer to Figure 19)

- 1) Lubricate Self-Leveling Grease Fittings weekly and at the beginning and end of each season with a #2 Lithium-based grease.

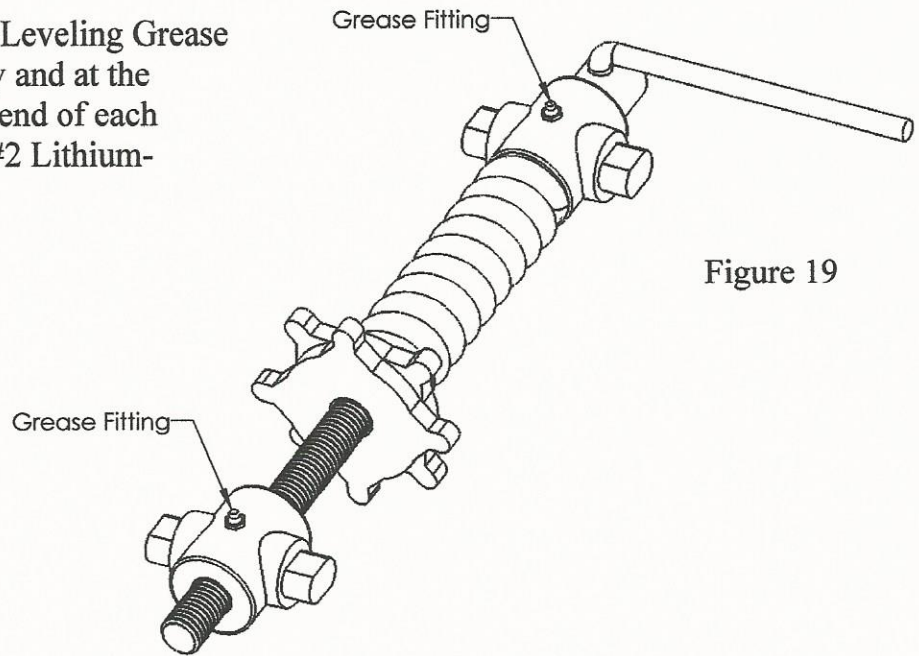
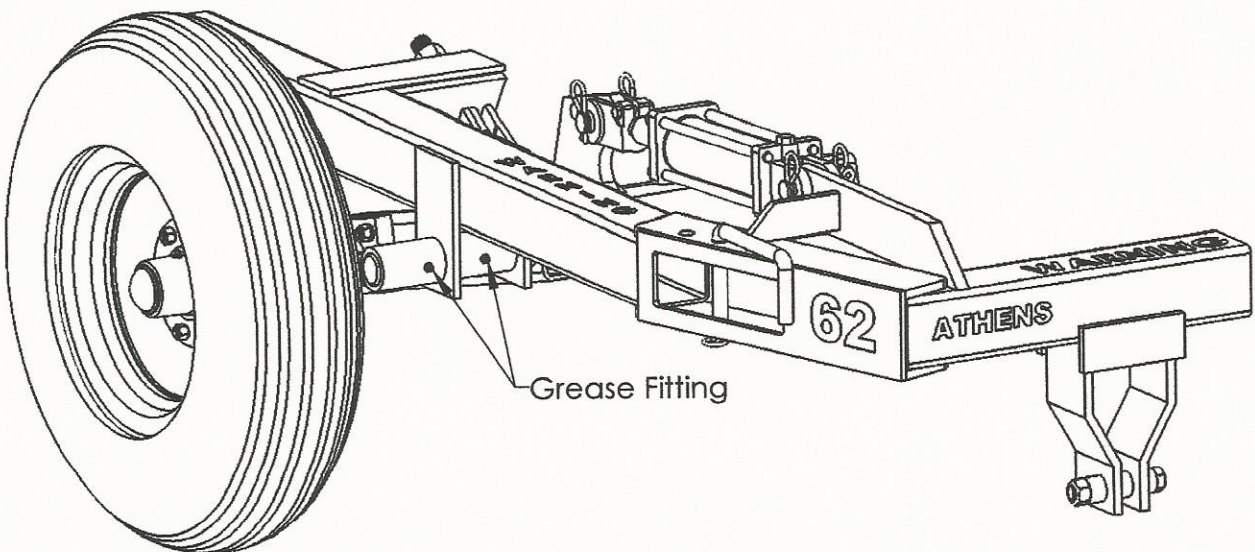


Figure 19

E) Wheel Carriage Pivots (Refer to Figure 20)

- 1) For long life, rust prevention, and ease of lifting, lubricate each Pivot Tube on the Wheel Carriage weekly and at the beginning and end of each season with a #2 Lithium-based grease.

Figure 20



F) Hydraulics (Refer to Figure 21)

- 1) Keep all Hoses and Pipe Fittings tight to prevent lose of oil. Keep Hoses aligned carefully and install through the guides of the Hose Stand to prevent unnecessary bending and wear. Replace any leaking Seal in Hydraulic Cylinder promptly. Do not allow Hydraulic Hoses to be pinched or kinked.



WARNING: Leaking oil is expensive and potentially hazardous. Do not check for a leak with your fingers or any part of the body. High pressure oil can penetrate the skin causing serious cuts and infection.

- Relieve pressure on system before repairing or adjusting or disconnecting.
 - Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
 - Keep all components in good repair.
- 2) Make certain that Hair Pin Clips (1) are in each end of the Clevis Pins. Re-check Cylinder Clevis Bolt (2) to insure tightness.

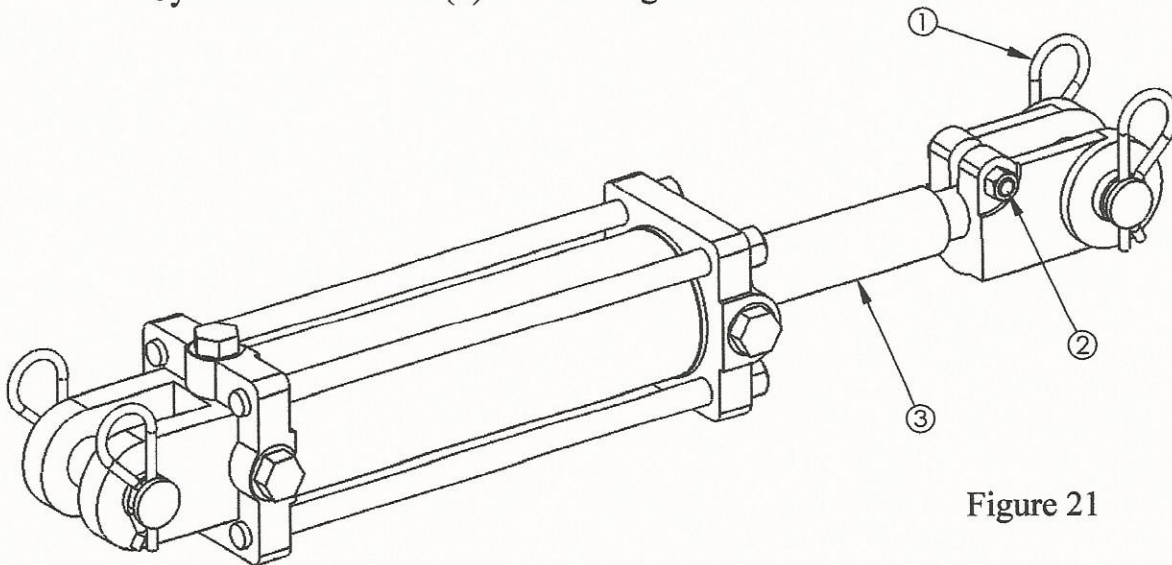


Figure 21

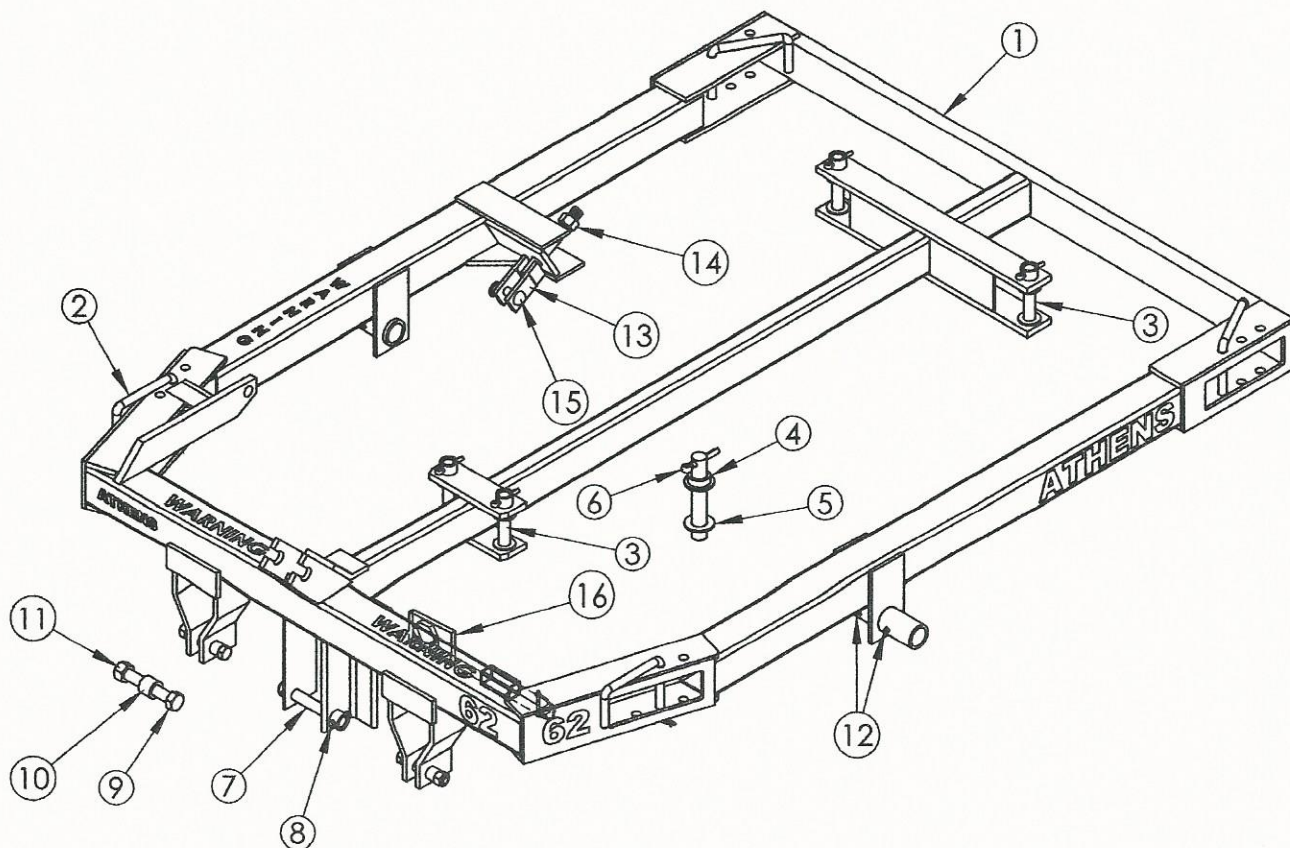
- 3) For storage for more than a weekend, retract the Lifting Cylinder Rod (3) completely. If this is not possible, coat the Cylinder Rod thoroughly with grease. For storage outside over the winter, rust on the Cylinder Rod can be prevented by coating the Rod with grease and then wrapping it with plastic wrap. Rust on the Cylinder Rod will rapidly ruin Rod Seal and Wiper.

Table of Contents

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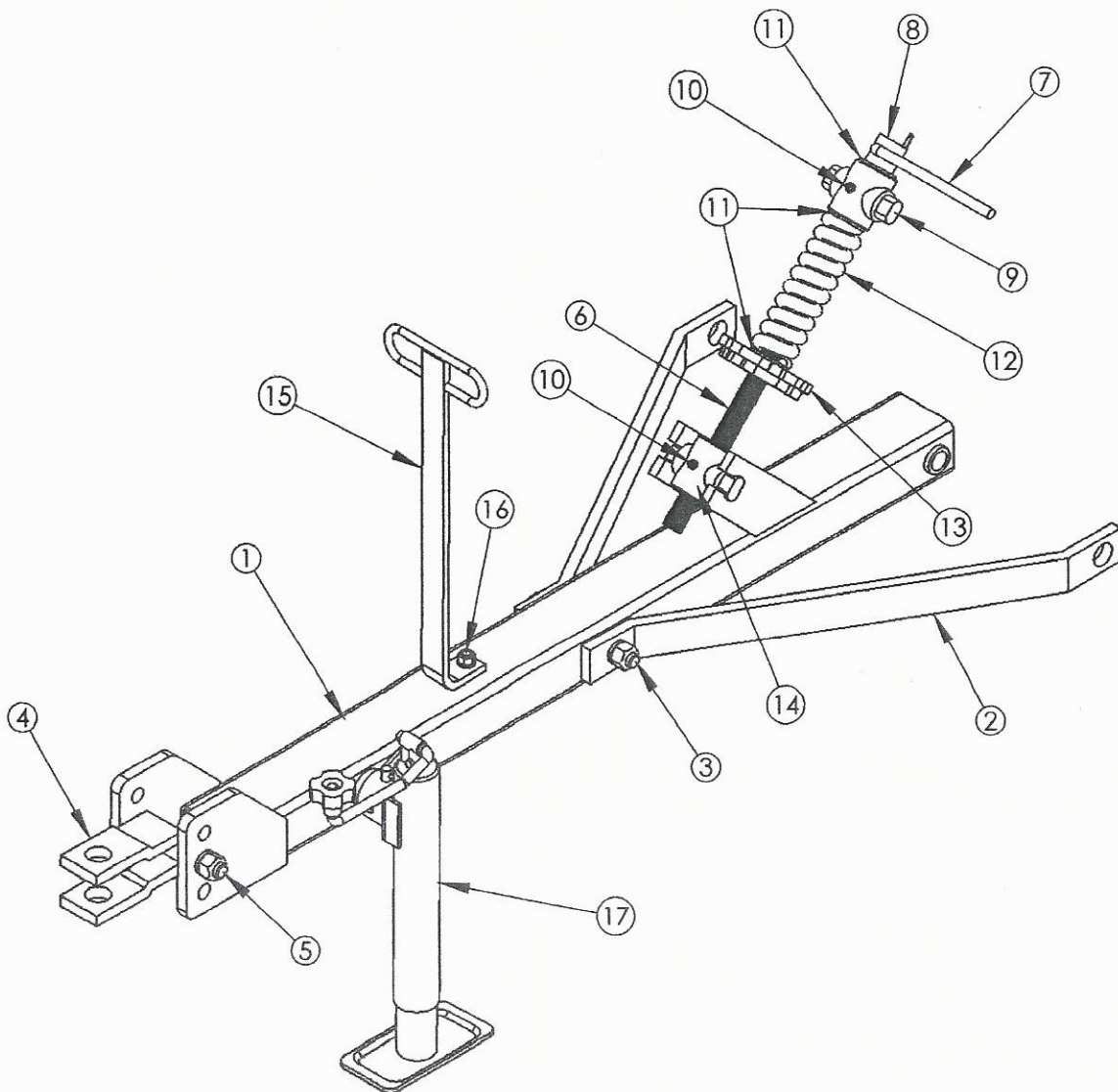
MAIN FRAME AND HITCH

Ref.	Part No.	Description	Ref.	Part No.	Description
1	19360	Main Frame	9	80179	3/4 x 5" Hex Bolt
2	19112	Angling Pin	10	18027	Tongue Brace Bushing
	12057	Hair Pin Clip, 3/16"	11	80870	3/4" Lock Nut
3	19101	Gang Anchor Pin	12	11610	Grease Fitting, 1/8"
4	19151	Leveling Bushing	13	18018	Mechanical Transport
5	81230	1" SAE Flat Washer	14	80685	1" Hex Nut
6	81415	3/8 x 2" Cotter Pin	15	16462	3/4 x 2 1/2" Rivot Bolt
7	19102	Tongue Pin		12057	Hair Pin Clip, 3/16"
8	80104	3/8 x 2" Hex Bolt	16	18445	Gang Wrench
	80985	3/8" Lock Washer		12058	Lock Clip
	80575	3/8" Lock Nut			



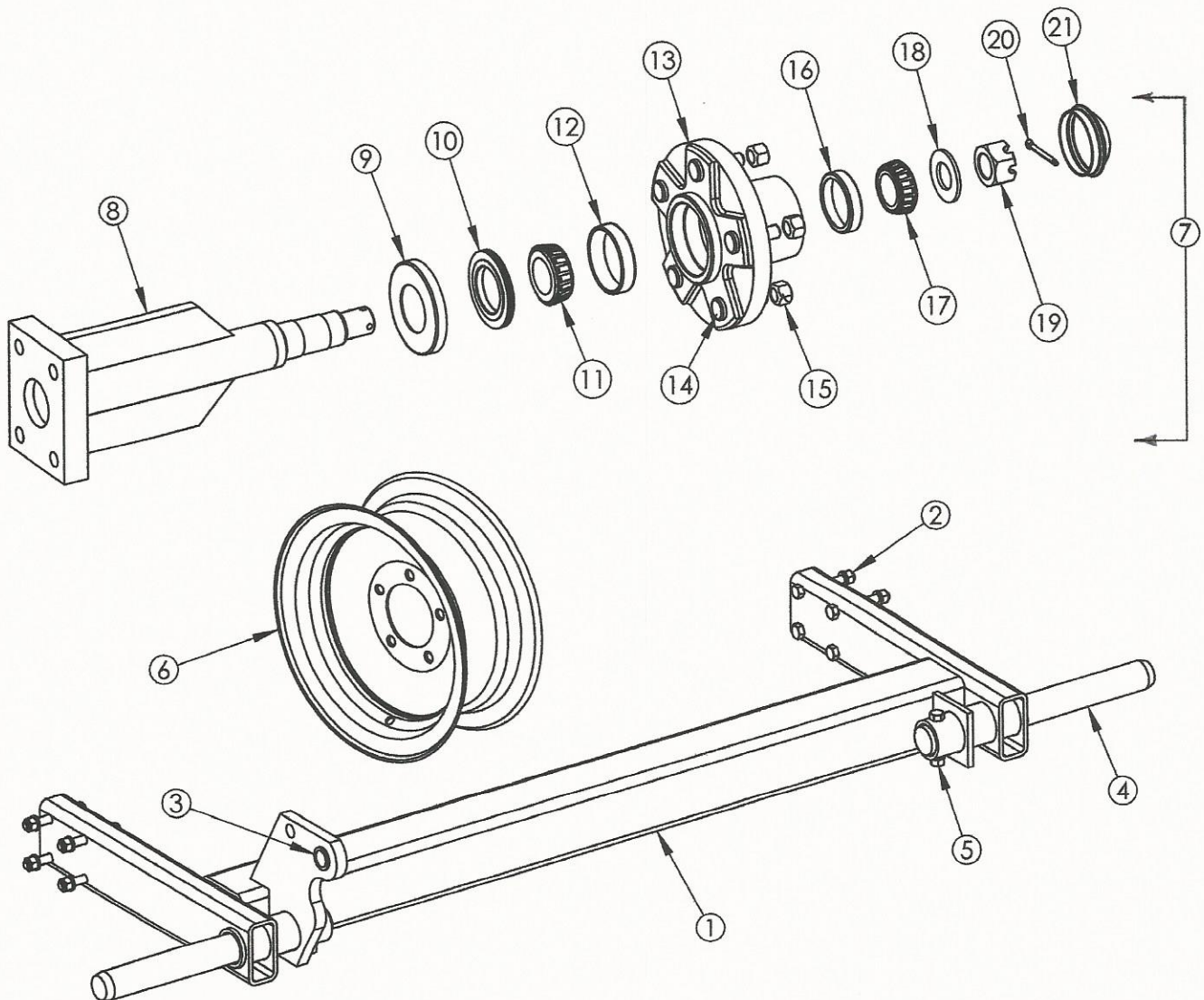
TONGUE & SELF LEVELING

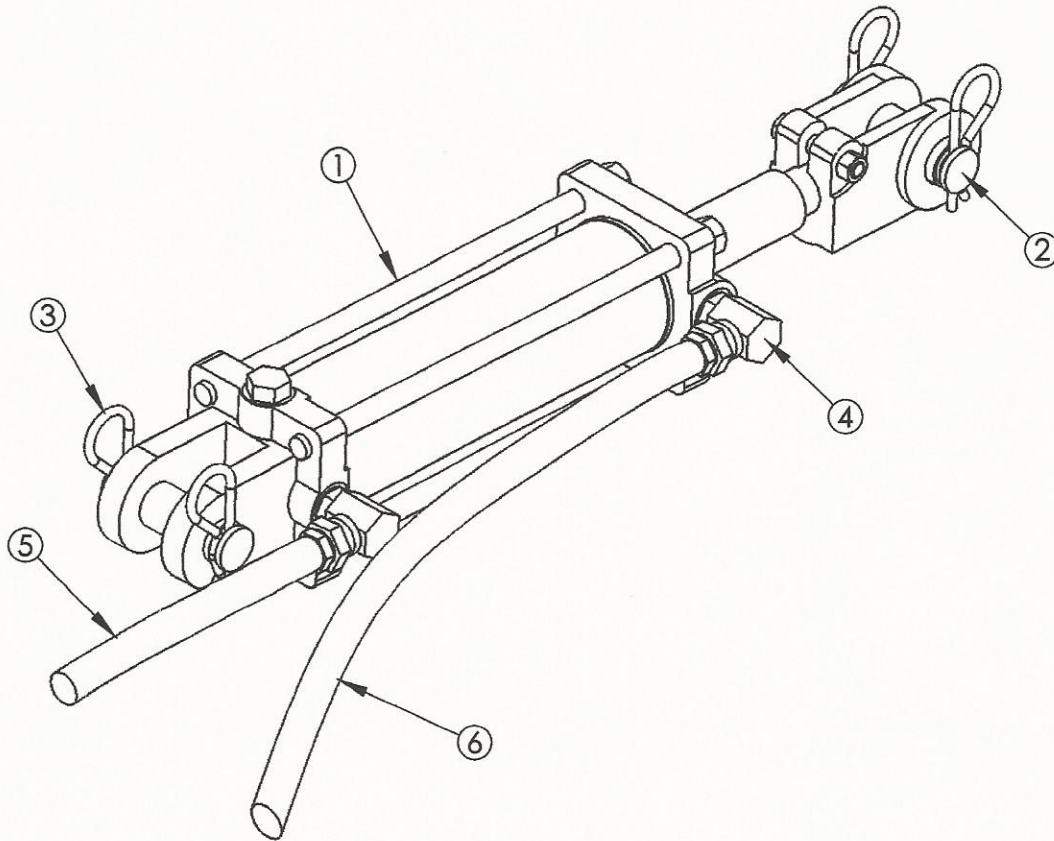
Ref.	Part No.	Description	Ref.	Part No.	Description
1	19130	Tongue	8	19125	Leveling Rod Bushing
2	18041	Tongue Brace	9	15695	Plain Trunnion
3	80183	3/4 x 6 1/2" Hex Bolt	10	11610	Grease Fitting, 1/8"
	81025	3/4" Lock Washer	11	81230	1" SAE Flat Washer
	80870	3/4" Lock Nut	12	15336	Leveling Spring
4	19129	Clevis	13	12301	Hand Nut
5	80183	3/4 x 6 1/2" Hex Bolt	14	15694	Threaded Trunnion
	81025	3/4" Lock Washer	15	21273	Hose Stand
	80870	3/4" Lock Nut	16	80121	1/2 x 4" Hex Bolt
6	19124	Leveling Rod		81005	1/2" Lock Washer
7	18136	Leveling Rod Handle		80590	1/2" Hex Nut
	81360	Cotter Pin	17	19753	Parking Jack, 2000#



WHEEL CARRIAGE, WHEEL HUB PARTS, & WHEEL

Ref.	Part No.	Description	Ref.	Part No.	Description
1	19357	Wheel Carriage	10	19153	Triple-Lip Seal
2	80119	½ x 3 ¾" Hex Bolt	11	70045	Inside Bearing Cone
	81005	½" Lockwasher	12	70044	Inside Bearing Cup
	80590	½" Hex Nut	13	900079	Wheel Hub w/ Cups & Bolts
3	21953	Connex Bushing		11610	⅛" Grease Fitting
4	19353	Pivot Pin	14	13198	Wheel Bolt
5	80128	½ x 3" Hex Bolt	15	15793	Wheel Bolt Nut
	81005	½" Lockwasher	16	70048	Outside Bearing Cup
	80590	½" Hex Nut	17	70049	Outside Bearing Cone
6	15792	15" 5 Lug Wheel	18	81230	1" SAE Flat Washer
7	102450	Wheel Hub Bundle	19	80715	1" Hex Slotted Nut NFT
8	19077	Wheel Axle Assembly	20	81360	Cotter ⅜ x 1 ½"
9	19076	Flinger	21	19075	Hub Cap



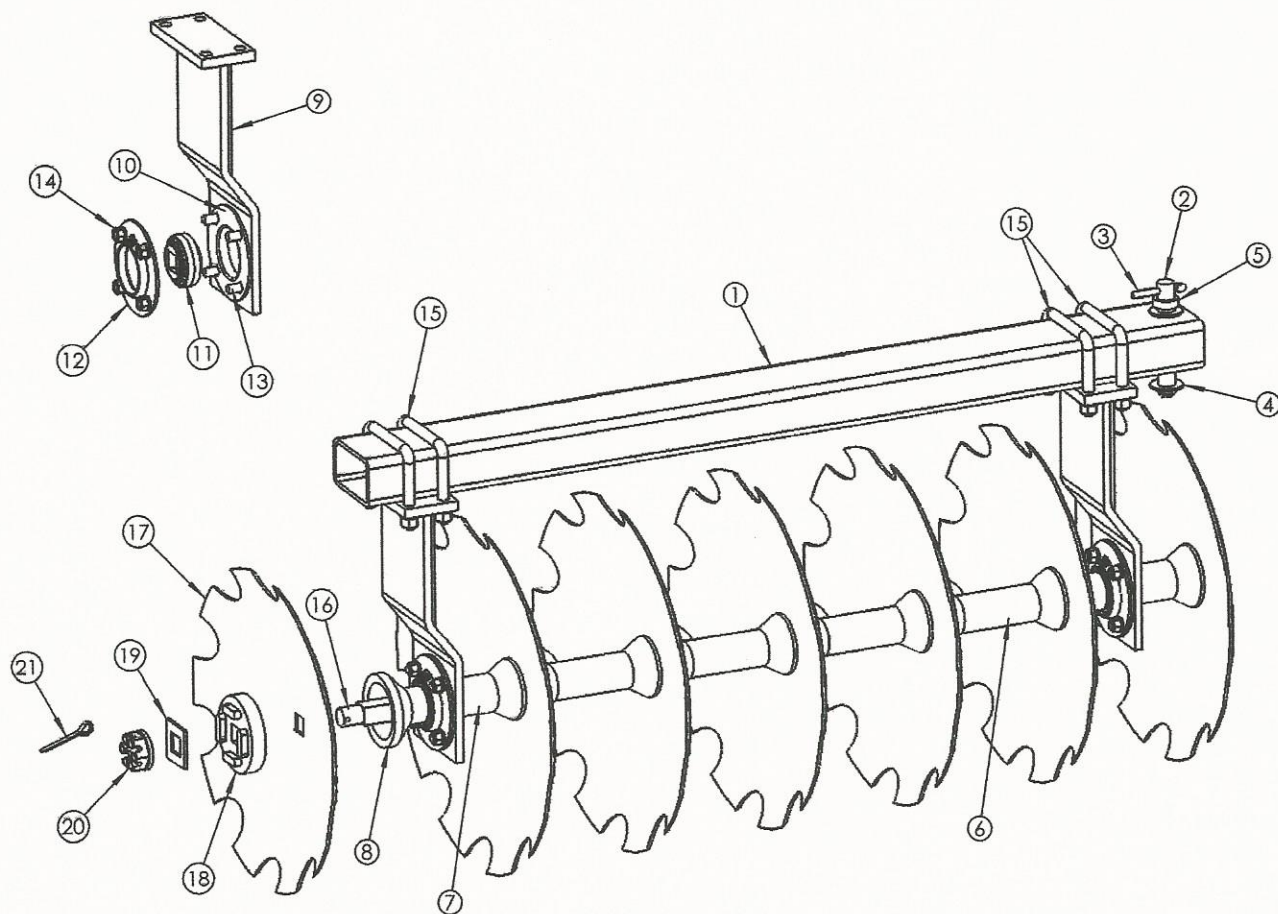


HYDRAULIC CYLINDER & HOSES

Reference	Part No.	Description
1	90006	Hydraulic Cylinder, 2.50 x 8.00 x 1.38
CYLINDER PARTS	95216	Rod
	95199	Clevis 1.12-12
	95217	Packing Kit
2	95110	Clevis Pin
3	12057	Hair Pin Clip
4	94514	½ x ⅜ NPTF Swivel 90° St Elbow
5	94105	Hydraulic Hose, ⅜ x 96"
6	94106	Hydraulic Hose, ⅜ x 108"

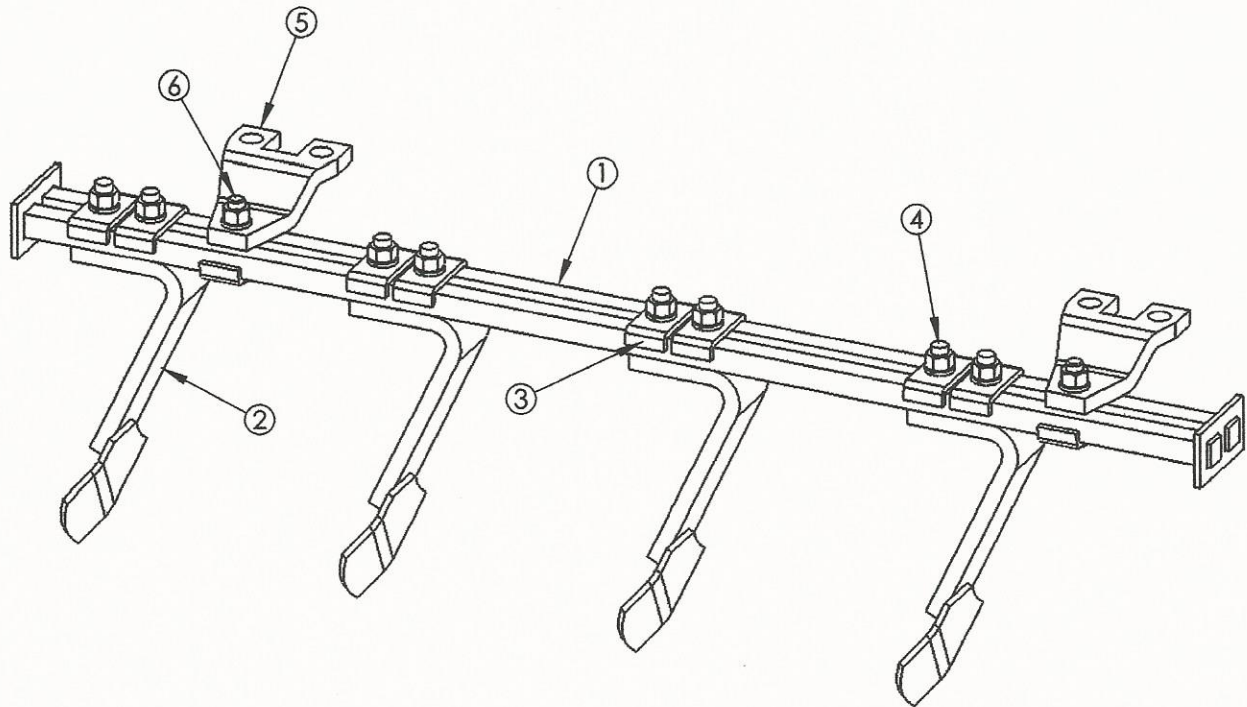
62 DISC GANG REPAIR PARTS

Ref. No.	Part No.	Quantity				Quantity				Quantity				Description
		7 1/2" Spacing				9" Spacing				9" Front & 7 1/2" Rear				
		24	28	32	40	20	24	28	32	22	26	30	36	
1	19081	4				4				4				Gang Frame, 39"
	19083		4				4				4			Gang Frame, 47"
	19085			4				4				4		Gang Frame, 55 1/2"
	20786								4					Gang Frame, 65 3/8"
	20790				4								4	Gang Frame, 70 3/8"
2	18048	4	4	4	4	4	4	4	4	4	4	4	4	Gang Anchor Pin
3	81415	4	4	4	4	4	4	4	4	4	4	4	4	Cotter, 3/8 x 2"
4	81230	8	8	8	8	8	8	8	8	8	8	8	8	Flat Washer, 1" SAE ZP
5	19151	4	4	4	4	4	4	4	4	4	4	4	4	Gang Leveling Bushing
6	17527					8	12	16	20	4	6	8	10	Full Spacer, 9"
	17784	12	16	20	28					6	8	10	14	Full Spacer, 7 1/2"
7	17526					8	8	8	12	4	4	4	6	Convex Half Spacer, 9"
	17783	8	8	8	12					4	4	4	6	Convex Half Spacer, 7 1/2"
8	17525	8	8	8	12	8	8	8	12	8	8	8	12	Concave Half Spacer
9	18775	8	8	8	12	8	8	8	12	8	8	8	12	Bearing Hanger
10	17993	8	8	8	12	8	8	8	12	8	8	8	12	Flangette w/o Fitting
11	70504	8	8	8	12	8	8	8	12	8	8	8	12	Relube Ball Bearing
12	17992	8	8	8	12	8	8	8	12	8	8	8	12	Relube Flangette
	11610	8	8	8	12	8	8	8	12	8	8	8	12	Grease Fitting, 1/8"
13	80321	32	32	32	48	32	32	32	48	32	32	32	48	Carriage Bolt, 1/2 x 1 1/2"
14	81005	32	32	32	48	32	32	32	48	32	32	32	48	Lock Washer, 1/2" ZP
	80590	32	32	32	48	32	32	32	48	32	32	32	48	Hex Nut, 1/2" ZP
15	18776	16	16	16	24	16	16	16	24	16	16	16	24	Bearing Hanger U-Bolt
	81015	32	32	32	48	32	32	32	48	32	32	32	48	Lock Washer, 3/8"
	80610	32	32	32	48	32	32	32	48	32	32	32	48	Hex Nut, 3/8"
16	17574					2				2				5 x 9" Axle
	17576						2				2			6 x 9" Axle
	17578							2				2		7 x 9" Axle
	18753								2				2	8 x 9" Axle
	15550	2												6 x 7 1/2" Axle
	17576		2											7 x 7 1/2" Axle
	17585			2										8 x 7 1/2" Axle
	18757				2									10 x 7 1/2" Axle
	17994					2								5 x 9" Axle, Cover Disc
	17790						2							6 x 9" Axle, Cover Disc
	17791							2						7 x 9" Axle, Cover Disc
	18760								2					8 x 9" Axle, Cover Disc
	17995	2								2				6 x 7 1/2" Axle, Cover Disc
	17790		2								2			7 x 7 1/2" Axle, Cover Disc
	17793			2								2		8 x 7 1/2" Axle, Cover Disc
	18762				2								2	10 x 7 1/2" Axle, Cover Disc



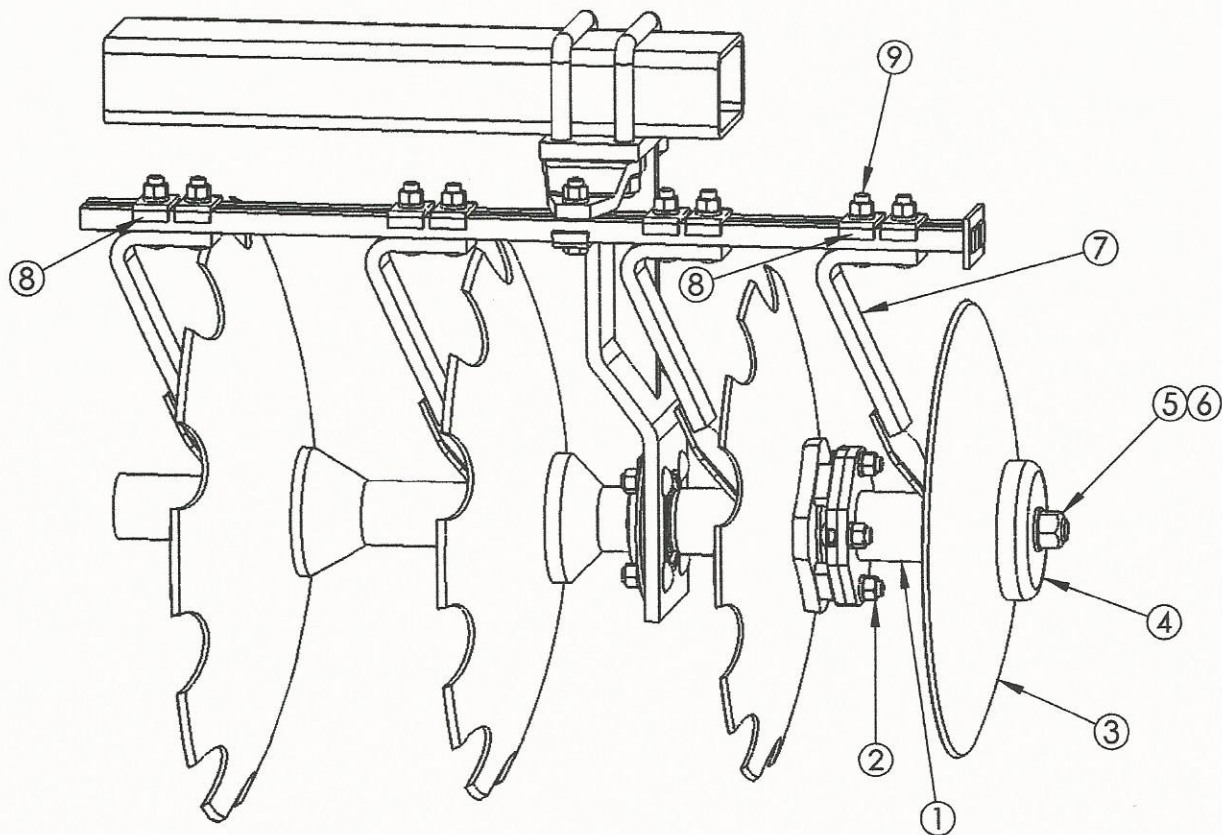
62 DISC GANG REPAIR PARTS

Ref. No.	Part No.	Quantity 7 1/2" Spacing				Quantity 9" Spacing				Quantity 9" Front & 7 1/2" Rear				Description
		24	28	32	40	20	24	28	32	22	26	30	36	
17	15620													Disc, 22" C/O x .157 x 1.13
	15866													Disc, 20" C/O x .138 x 1.13
	15986													Disc, 18" C/O x .134 x 1.13
	15664													Disc, 22" SM x .157 x 1.13
	15966													Disc, 20" SM x .138 x 1.13
	15985													Disc, 22" SM x .134 x 1.13
18	16436													End Washer
19	16437													End Washer Spacer
20	17099													Disc Assembly Nut
21	81395													Cotter 1/4 x 2 1/2"



DISC SCRAPERS (EXTRA EQUIPMENT)

Ref.	Part No.	Description
1	15958	Scraper Bar – 38 5/8"
	15961	Scraper Bar – 48"
	13590	Scraper Bar – 54"
	16391	Scraper Bar – 63 1/2"
	16674	Scraper Bar – 68 3/8"
	16393	Scraper Bar – 73"
	16395	Scraper Bar – 82 1/2"
	2	16530
16531		Left Front / Right Rear Scraper
3	16527	Scraper Clamp
4	80327	Carriage Bolt, 1/2 x 2 1/4"
	81005	Lockwasher, 1/2"
	80590	Hex Nut, 1/2"
5	19136	Scraper Bar Mounting Plate
6	80218	Hex Bolt, 1/2 x 1 1/4"
	81005	Lockwasher, 1/2"
	80590	Hex Nut, 1/2"



COVER DISC PARTS

Reference	Part No.	Description
1	17126	Cover Disc Mounting Assy.
2	80322	½ x 1 ½" Carriage Bolt
	81005	½" Lockwasher
	80590	½" Hex Nut
3	18693	Cover Disc, 16 x 1.12 SM
4	17117	End Washer
5	81205	Flat Washer, ¾" SAE ZP
6	80870	Lock Nut, ¾" ZP
7	16530	Cover Disc Scraper, Left Rear
	16531	Cover Disc Scraper, Right Rear
8	16527	Scraper Clamp
9	80327	½ x 2 ¼" Carriage Bolt
	81005	½" Lockwasher
	80590	½" Hex Nut

BALK BUSTER

Reference	Part No.	Description
1	19131	Balk Buster
2	17726	Clamp Plate
3	17729	Thick Depth Spacer
4	17727	Thin Depth Spacer
5	80227	Hex Bolt $\frac{1}{2}$ x 6 $\frac{1}{2}$ "
	81005	$\frac{1}{2}$ " Lockwasher
	80590	$\frac{1}{2}$ " Hex Nut
6	80182	Hex Bolt $\frac{3}{4}$ x 6"
	81025	$\frac{3}{4}$ " Lockwasher
	80625	$\frac{3}{4}$ " Hex Nut
7	17730	Balk Buster Tine
8	80450	$\frac{7}{16}$ x 2 $\frac{1}{4}$ " Plow Bolt
9	81706	$\frac{7}{16}$ " Flatwasher SAE
10	80995	$\frac{7}{16}$ " Lockwasher
11	80580	$\frac{7}{16}$ " Hex Nut

