

Ezee-On

**MODEL 4590 DISC
MEDIUM DUTY TANDEM
3 SECTION FRAME**

OWNER'S MANUAL

includes
OPERATION
&
ASSEMBLY

**Manufactured
by**

Ezee-On Mfg

**Vegreville, Alberta
Canada**

Printed in Canada

727G

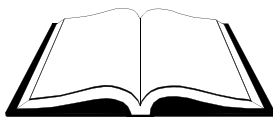
INTRODUCTION

THANK YOU for choosing to purchase this Ezee-On implement, we are confident you will be impressed with its performance.

In addition to the traditional values of simplicity, reliability and durability, your new EZEE-ON implement incorporates a number of operational and safety features. We urge you to familiarize yourself with the maintenance and operation of your implement by reading this Manual thoroughly and completely. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL contains important information regarding assembly, maintenance, operating instructions, and troubleshooting problems, and should be considered a permanent part of your implement.

Remember that it is the responsibility of the Operator to ensure that any new implement is field ready, prior to first operation. However, should you encounter a problem, please contact your dealer immediately.



READ THIS MANUAL CAREFULLY TO ENSURE THAT YOUR NEW IMPLEMENT IS ASSEMBLED AND ADJUSTED CORRECTLY PRIOR TO FIRST OPERATION.

RIGHT and LEFT is determined by standing behind the machine and facing FORWARD in the direction of travel.



This symbol is used to identify safety messages. When you see this symbol, read the safety message carefully.

INDEX

	PAGE
Safety	2
Specifications	5
General Operating Instructions	6
Adjustments	10
Maintenance	13
Trouble Shooting	16
Assembly Index	20
Parts List Index	46

EZEE-ON MFG. LTD. RESERVES THE RIGHT to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication, but are subject to change without notice.

SAFETY RECOMMENDATIONS



WATCH FOR THIS SYMBOL. IT IDENTIFIES IMPORTANT SAFETY MESSAGES. WHEN YOU SEE THIS SYMBOL, READ THIS SAFETY MESSAGE CAREFULLY.

GENERAL SAFETY

1. Never allow anyone to ride on the tractor drawbar, or on the disc. The person(s) riding may fall and be seriously or fatally injured.
2. Disc should be operated ONLY by persons responsible and qualified to do so.
3. Never allow anyone to climb or play on the tractor or disc. They may fall and be seriously injured.
4. Follow all safety precautions in your tractor manual.
5. Keep a First Aid Kit in the tractor at all times.

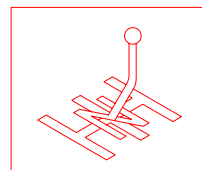


ASSEMBLY SAFETY

1. When assembling disc, use aligning punch to line up holes. Keep fingers out of holes. Any sudden movement of heavy components will severely injure or sever your fingers.
2. Use adequate manpower or hoist to lift the heavy components into place. Attempting to lift heavy components by yourself could cause serious injury.
3. Be sure all bolts and hydraulic fittings are tight, and all cotter pins are installed in the slotted nuts and pins.
4. Support the main and wing frames securely before assembling the components. Inadequate support may result in the heavy components falling and causing serious injury to you or person(s) nearby.
5. Be sure all wheel bolts are checked for tightness during initial transport or when first discing. Loose wheel bolts may result in the wheel falling off, causing serious damage to the disc and may cause serious injury to the operator or person(s) nearby.
6. To fill the wing lift cylinders with hydraulic fluid, remove the pin from the shaft end of each wing lift cylinder and pump fluid into the cylinders. Extend and contract the cylinders until they are completely filled with hydraulic fluid. The wings will free-fall if the cylinders are not completely filled with fluid, resulting in serious damage to machine or serious injury or death to person(s) nearby.
7. Do not raise or lower the main or wing frames until all components are securely tightened. Loose components will cause serious damage to the disc and serious injury or death to you and person(s) nearby if the main or wing frames fell.
8. Hydraulic oil escaping under pressure has sufficient force to cause serious injury. Relieve pressure in all hydraulic components before disconnecting any hydraulic components. Before applying pressure to hydraulic system, be sure all connections are tight and components are not damaged. If injured by escaping hydraulic fluid, see a medical doctor immediately.
9. When attaching gang assemblies, wear protective gloves to prevent injury from cutting edges of blades.
10. Before applying pressure to the hydraulic system, be sure all connections are tight and the components are not damaged.
11. Wings will free fall if wing cylinder is not full of oil causing serious damage to machine or serious injury or death to person(s) nearby.
12. If hydraulic cylinder shafts are unpinned and cycled to fill them with oil, they can be seriously damaged if clevis of shaft strikes rockshaft arm or wing cylinder lug.
13. Do not stand under folded wings when working on disc. If hydraulic system failed or if hydraulic lever was accidentally operated, wings may fall resulting in serious injury or death to person(s) near disc.
14. When assembling gangs ensure adequate support is placed under main frame and wing frame. Do not use lock out valves as safety devices to prevent frame from falling. If any hydraulic components failed, disc could drop causing serious injury or death to person(s) nearby.

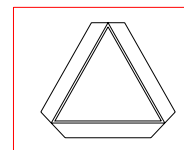
MAINTENANCE SAFETY

1. Do not loosen or disassemble hydraulic components when there is pressure within those components. Hydraulic components under pressure may cause parts and hydraulic fluid to fly out at a high velocity, which could cause serious injury. Always relieve the pressure in the hydraulic system before making adjustments to the hydraulic system. If injured by escaping hydraulic fluid, see a medical doctor immediately.
2. Check all hydraulic hoses periodically for signs of ruptures and leaks. Always use wood or cardboard as a backstop, and wear gloves and eye protection when searching the hydraulic system for leaks. Spurting hydraulic fluid can cause injury if it penetrates the skin or the eyes. If injured by escaping hydraulic fluid, see a medical doctor immediately.
3. Always relieve the pressure in the hydraulic system when the disc is not being operated.
4. Always permit parts which contain hot fluid to cool to a safe temperature before handling or disconnecting these parts.
5. Always wear safety glasses or goggles and gloves when working on the hydraulic system.
6. To fill wing lift cylinder with hydraulic oil, extend and contract cylinder within slot on wing until cylinders are completely filled with oil. Do not fold wings until cylinders are completely filled, wings will free fall if cylinders are not filled with oil, causing serious damage to machine or serious injury or death to person(s) nearby.
7. Lower the disc to the ground when servicing or making adjustments. If the disc must be serviced in the raised position, place blocks under frame. Do not rely on hydraulics lock up valves as a safety device. If the hydraulic system failed, or if the hydraulic lever was accidentally operated, the disc could drop.
8. Do not lubricate disc while it is in motion. You may fall in front of disc and be seriously or fatally injured.
9. Always place all tractor controls in neutral and lock brakes when hitching disc to tractor. Tractor could roll backwards when hitching disc.
10. If wing lift cylinder(s) or wing lift hydraulic hoses are removed when wings are folded into transport position, always install a safety chain between each wing frame and main frame to prevent wing(s) from falling. If wing(s) fell, serious injury or death could occur to person(s) nearby and machine would be damaged severely.
11. When inflating tires use a clip-on chuck and air hose extension which will allow operator to stand clear of tire and wheel assembly. Do not stand in front of or over tire when inflating. Exploding tire and wheel parts can cause serious injury or death.



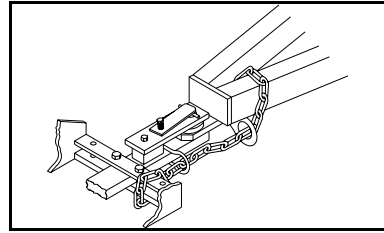
TRANSPORT SAFETY

1. When trailing the disc over public roads, use the SMV emblem and warning light for protection of tractor and other motor vehicle operators. Check local laws for width and height maximums.
2. When transporting disc always place both hydraulic lock up valves in "closed" position. See Section 6 of Operating Instructions on page 6. If hydraulic lever was accidentally operated the disc could drop or wings could fall causing serious injury or death to operator and person(s) nearby.
3. Do not exceed 10 mph (16 km/h) when transporting the disc on smooth surfaces. Reduce speed when transporting on rough surfaces. Excessive speed could cause loss of tractor control and damage to disc and tractor. Do not transport the disc with any other vehicle except a tractor.
4. When transporting disc always install the complete package of depth control stops - 17" long (431.8 mm) on shaft of centre frame cylinder. If any components of hydraulic system failed disc could drop and causing serious injury or death to operator or persons near by.
5. Disc may fall rearward suddenly and hitch may rise abruptly if disc is unpinned from tractor when disc is fully raised and wings unfolded. Always use caution and besure other person(s) are not standing near disc when unhitching from tractor.



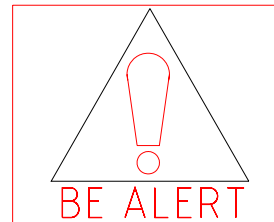
5. When transporting the disc with the wings folded (UP), be sure there is sufficient clearance under all power lines and other overhead obstructions. Serious injury or death can result from contact with electrical lines. Use care to avoid contact with electrical lines when moving or operating the disc. Refer to specification chart on page 5 for approximate transport height for your machine.

6. Always attach a safety chain to the tractor drawbar and the disc hitch before transporting the disc. The safety chain will help control disc should it accidentally separate from the drawbar. Use a chain with a strength rating greater than the gross weight of the towed machine. Serious damage, injury or death could result from the disc separating from the tractor drawbar.



7. Check all reflectors and visibility and cleanliness before transporting the disc. It is important that the reflectors are clean and visible, especially during the evening hours.

8. Regulate your speed on hillsides and curves when transporting the disc. Loss of tractor control could result in serious damage to the disc and possible serious injury or death to you or person(s) nearby.



9. Never allow anyone to ride on drawbar of the tractor or on the disc. The person riding may fall and be seriously injured.

OPERATION SAFETY

1. Be sure person(s) are standing clear before starting or moving the tractor and disc.
2. Only one (1) person (the operator) should be permitted on the tractor when the disc is in operation, and he/she should be familiar with repair procedures and temporary first aid treatment.
3. Never stand between the tractor and disc when hitching disc to the tractor UNLESS all tractor controls are in neutral and the park brake is set. The tractor could roll backwards which could result in serious injury or death to you or persons nearby.
4. When operating on hillsides, use extreme care. The tractor may tip over if it strikes a hole, ditch or other irregularity.
5. To avoid personal injury or death, always stay clear of the folding wings when they are being raised, lowered or in the folded position. If the hydraulic system failed, or if the hydraulic lever was accidentally operated, the wings could drop, resulting in serious injury or death to you or person(s) nearby.
6. Do not stand under wing while wing is being raised or lowered. If any components of hydraulic system should fail, or if hydraulic lever should accidentally be operated, wing could drop causing serious injury or death.
7. Always relieve the pressure in hydraulic system and close both hydraulic lockup valves when the disc is not being operated.

SAFETY DECALS

1. Keep all decals clean and in good condition to provide you with a constant reminder of safe operating procedures.
2. Replace any destroyed, missing or illegible decals.

STORAGE

1. Wings may unfold due to thermal expansion of hydraulic oil causing damage to disc, property or severe injury or death to person(s) nearby. Release pressure in all cylinders then close hydraulic lockup valves before unhitching from tractor or when parking with tractor.

SPECIFICATIONS

MODEL	WING WIDTH	BLADE SPACING	APPROX. CUTTING WIDTH	NO. OF BLADES	NO. OF GANG BEARINGS	GANG BEARING TYPE	APPROX. TRANSPORT WIDTH	APPROX. TRANSPORT HEIGHT
						STD.		
4590 -62N 4590 - 94N 4590 -106W 4590 -114W 4590 -122W	Narrow Narrow Wide Wide Wide	8" (203mm) 8" (203mm) 8" (203mm) 8" (203mm) 8" (203mm)	28' (8.53 m) 32' (9.75m) 35-1/2' (10.82 m) 38' (11.85 m) 40- 1/2' (12.34m)	6.3e + 2 2	2.22e + 19	4.104e + 29	17'0" (5.18 m) 17'0" (5.18 m) 17'0" (5.18 m) 17'0" (5.18 m) 17'0" (5.18 m)	12'3" (3.74 m) 14'4" (4.37 m) 15'8" (4.78 m) 17'1" (5.21 m) 17'9" (5.41 m)
4590 -74N 4590 -86N 4590 -94W 4590 -102W 4590 -106W	Narrow Narrow Wide Wide Wide	9" (230mm) 9" (230mm) 9" (230mm) 9" (230mm) 9" (230mm)	28' (8.53 m) 32- 1/2' (9.91m) 35-1/2' (10.82 m) 38-1/2' (11.73 m) 40' (12.19 m)				17'0" (5.18 m) 17'0" (5.18 m) 17'0" (5.18 m) 17'0" (5.18 m) 17'0" (5.18 m)	12'7" (3.84 m) 14'2" (4.32 m) 15'10" (4.83 m) 17'5" (5.31 m) 18'3" (5.56 m)

TIRE LOCATION	TIRE SIZES	PRESSURE
Centre Frame 28' -35-1/2' (8.53m x 10.8m)	(4) 11L x 15 F1, Load Range "D"	50 PSI (345 KPA)
Centre Frame 38' -40-1/2' (11.58m x 12.3m)	(4) 11L x 15 F1, Load Range "F"	60 PSI (414 KPA)
Wing Frame 28' -35-1/2' (8.53m x 10.8m)	(2) 11L x 15 F1 Load Range "C"	45 PSI (310 KPA)
Wing Frame 38' -40-1/2' (11.58m x 12.3m)	(4) 11L x 15F1, Load Range "C"	45 PSI (310 KPA)

HYDRAULIC CYLINDERS		
Application	Size	Req'd
Centre Frame Lift	4" x 24" (101.6 mm x 610 mm) Rephasing	1
L.H. Wing Frame Lift	3-1/2" x 24" (88.9 mm x 610 mm) Rephasing	1
R.H. Wing Frame Lift	3" x 24" (76.2 mm x 610 mm) Rephasing	1
Wing Lift	5" x 36" (127 mm x 914 mm)	2

CAUTION: WHEN INFLATING TIRES USE A CLIP-ON CHUCK AND HOSE EXTENSION WHICH WILL ALLOW OPERATOR TO STAND CLEAR OF TIRE AND WHEEL ASSEMBLY. DO NOT STAND IN FRONT OF OR OVER TIRE WHEN INFLATING. EXPLODING TIRE AND WHEEL PARTS CAN CAUSE SERIOUS INJURY OR DEATH.

GANG ANGLE: Front Gang -----21 Degree (Fixed)
Rear Gang ----- 19 Degree (Fixed)

BOLT TORQUES: Gang Bolts ----- 1-15/16" (49 mm) Diameter 3200 ft. lbs (4339 N · m)
Gang Beam Bolts ----- 1-1/4" (31.7 mm) Diameter 840 ft. lbs (1139 N · m)
Levelling Crank Bolts ----- 1-1/4" (31.7 mm) Diameter 840 ft. lbs (1139 N · m)
Wheel Bolts ----- 9/16" (14.2 mm) Diameter 130 ft. lbs (176.3 N · m)
Bearing Hanger U-Bolts -- 3/4" (19.0 mm) Diameter 260 ft. lbs (30 m. kgs) - stone flex hangers
-- 5/8" (15.7 mm) Diameter 150 ft. lbs (20.75 m. kgs) - solid hangers

GANG BEARINGS

GENERAL OPERATING INSTRUCTIONS

1. Before operating disc, refer to Safety Precautions on pages 2 to 4. Review disc safety items applicable to road transport and field operation of disc.
2. **IMPORTANT:** WHEN LOWERING WING TO FIELD POSITION, BE SURE WING LIFT CYLINDERS ARE FULLY EXTENDED. AFTER WING TIRES HAVE HIT THE GROUND CONTINUE TO HOLD HYDRAULIC LEVER. THERE WILL BE A SHORT PAUSE BEFORE CYLINDERS FULLY EXTEND. IF CYLINDERS ARE NOT FULLY EXTENDED, THE WING WILL HANG ON CYLINDERS AND WILL NOT FLEX DOWN.



CAUTION: NEVER STAND BETWEEN THE TRACTOR AND DISC WHEN HITCHING DISC TO THE TRACTOR *UNLESS* ALL TRACTOR CONTROLS ARE IN NEUTRAL AND THE BRAKE IS SET. THE TRACTOR COULD ROLL BACKWARDS WHICH COULD RESULT IN SERIOUS INJURY OR DEATH TO YOU OR PERSONS NEARBY.

3. Do not make sharp turns with the disc in ground. Sharp turns put excess pressure on the gangs.

IT IS ADVISABLE TO ALWAYS LIFT MACHINE OUT OF GROUND FOR MAKING SHARP TURNS. EXCESSIVE SIDE THRUST IS APPLIED TO BEARINGS AND MACHINE IF DISC IS TURNED WHILE IT IS IN THE GROUND.

4. For best performance, the tractor drawbar should be pinned at centre of tractor.

5. Ensure disc is level fore and aft and side to side and cutting depth is properly adjusted. If further adjustments are required, see pages 10 and 11.

6. See Fig. 1. When transporting disc, always place hydraulic lockup valves in closed position. Lockup valves are located at the front end of centre frame.



CAUTION: WHEN TRANSPORTING DISC ALWAYS PLACE BOTH HYDRAULIC LOCKUP VALVES IN "CLOSED POSITION". IF HYDRAULIC LEVER WAS ACCIDENTALLY OPERATED THE DISC COULD DROP OR WINGS COULD FALL CAUSING SERIOUS INJURY OR DEATH TO OPERATOR OR PERSON(S) NEARBY.

7. See Fig. 2. When transporting disc always place the complete depth control package 17" (431.80 mm) long on shaft of 4" x 24" (102 mm x 610 mm) centre frame lift cylinder.



WARNING: WHEN TRANSPORTING DISC ALWAYS INSTALL THE COMPLETE PACKAGE OF DEPTH CONTROL STOPS 17" (432 mm) LONG ON SHAFT OF CENTRE FRAME CYLINDER. IF ANY COMPONENT OF HYDRAULIC SYSTEM FAILED DISC COULD DROP CAUSING SERIOUS INJURY OR DEATH TO OPERATOR OR PERSONS NEAR BY.

FIG. 1

HYDRAULIC LOCKUP VALVES

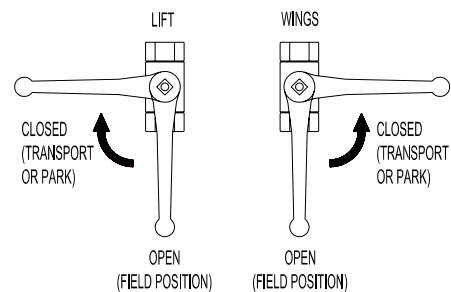
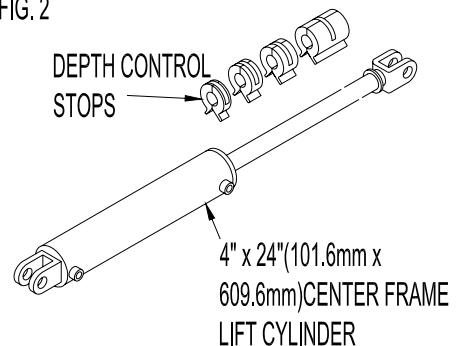


FIG. 2



8. **IMPORTANT:** When transporting disc, do not exceed speed of 10 mph (16 km/h).
9. **IMPORTANT:** Do not operate disc in field with wings folded in transport position. Severe damage will occur when discing with wings folded.
10. **IMPORTANT:** Do not disc with front gangs cutting deeper than rear gangs. Disc must be level. If front gangs are lower, excessive strain will be placed on blades, gang bearings and frame hitch, which could lead to premature parts failure, especially outside blades of front gangs.
11. **IMPORTANT:** When disc is parked with blades resting on frozen ground, do not attempt to lift disc out of frozen ground by lowering transport wheels. Lifting disc out of frozen ground with transport wheels may cause serious damage to disc components. Damage will most likely occur to main lift cylinders and rockshaft cylinder arms.

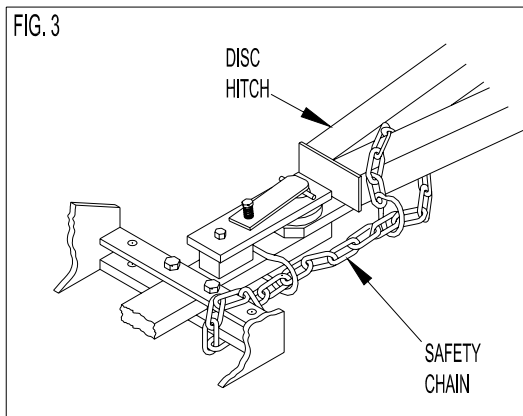
Do not park disc with blades on ground that may freeze. Leave disc parked on transport wheels.

12. To avoid serious damage to hitch jack, be sure jack is locked in horizontal position and crank of jack is not hanging below hitch when disc is in motion. See page 23, section 11.

13. See Fig. 3. Attach a safety chain to the tractor drawbar and to the disc's hitch before transporting the disc. Use a chain with strength rating greater than the gross weight of disc. (Safety chain available as an option).



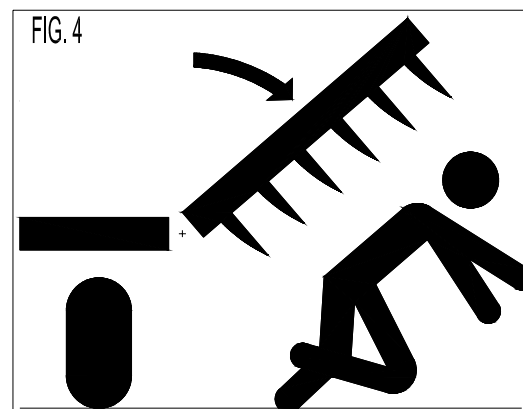
DANGER: WHEN TRANSPORTING A DISC, BE SURE TO ATTACH A SAFETY CHAIN TO TRACTOR DRAWBAR AND DISC HITCH. THE SAFETY CHAIN WILL HELP CONTROL DISC SHOULD IT ACCIDENTALLY SEPARATE FROM THE DRAWBAR. USE A CHAIN WITH A STRENGTH RATING GREATER THAN THE GROSS WEIGHT OF THE TOWED MACHINE.



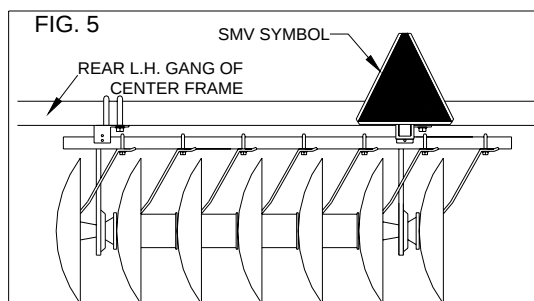
SERIOUS DAMAGE, INJURY OR DEATH COULD RESULT FROM THE DISC SEPARATING FROM THE TRACTOR DRAWBAR.



DANGER: SEE FIG. 4. DO NOT STAND UNDER THE WING(S) WHILE IT IS BEING RAISED OR LOWERED. IF ANY COMPONENT OF THE HYDRAULIC SYSTEM FAILED OR IF THE HYDRAULIC LEVER WAS ACCIDENTALLY OPERATED, WING COULD FALL CAUSING SERIOUS INJURY OR DEATH.



14. See Fig. 5. Install the "SMV" emblem (not supplied by Ezee-On) in the "SMV" bracket bolted to rear L.H. gang of centre frame.



CAUTION: USE THE "SMV" EMBLEM (NOT SUPPLIED BY EZZE-ON) AND WARNING LIGHTS FOR THE PROTECTION OF TRACTOR AND OTHER MOTOR VEHICLE OPERATORS WHEN TRANSPORTING THE CULTIVATOR OVER PUBLIC ROADS. CHECK LOCAL LAWS REGARDING TRANSPORTING REGULATIONS.



CAUTION: DISC MAY FALL REARWARD SUDDENLY AND HITCH MAY RISE ABRUPTLY IF DISC IS UNPINNED FROM TRACTOR WHEN DISC IS FULLY RAISED AND WINGS UNFOLDED.

ALWAYS USE CAUTION AND ENSURE OTHER PERSON(S) ARE NOT STANDING NEAR DISC WHEN UNHITCHING FROM TRACTOR.



CAUTION: WHEN TRAILING THE DISC OVER PUBLIC ROADS, USE THE SMV EMBLEM AND WARNING LIGHTS FOR PROTECTION OF TRACTOR AND OTHER MOTOR VEHICLE OPERATORS. CHECK LOCAL LAWS FOR WIDTH AND WEIGHT MAXIMUMS AND HEIGHT MAXIMUMS.

GENERAL OPERATING INSTRUCTIONS CONTINUED:



CAUTION: DO NOT EXCEED 10 mph (16 km/h) WHEN TRANSPORTING DISC ON SMOOTH ROADS, REDUCE SPEED WHEN TRANSPORTING ON ROUGH ROADS. EXCESSIVE SPEED COULD CAUSE LOSS OF TRACTOR CONTROL AND DAMAGE TO DISC AND TRACTOR. DO NOT TRANSPORT DISC WITH ANY OTHER VEHICLE EXCEPT TRACTOR.



DANGER: WHEN TRANSPORTING DISC WITH WINGS RAISED, BE SURE THERE IS SUFFICIENT CLEARANCE UNDER ALL POWER LINES AND OTHER OVERHEAD OBSTRUCTIONS. SERIOUS INJURY OR DEATH CAN RESULT FROM CONTACT WITH ELECTRICAL LINES. USE CARE TO AVOID CONTACT WITH ELECTRICAL LINES WHEN MOVING OR OPERATING DISC. MODELS EQUIPPED WITH FOLDING GANG BEAMS MUST HAVE THESE BEAMS FOLDED TO GIVE MINIMUM TRANSPORT HEIGHT.



WARNING: WHEN TRANSPORTING DISC, ALWAYS PLACE HYDRAULIC LOCK UP VALVES IN “CLOSED” POSITION. SEE SECTION 6 OF OPERATING INSTRUCTIONS ON PAGE 6. IF THE HYDRAULIC LEVER WAS ACCIDENTALLY OPERATED, THE DISC COULD DROP OR WINGS COULD FALL CAUSING OR DEATH INJURY TO OPERATOR AND PERSON(S) NEARBY.

15. **REPHASING ROCKSHAFT CYLINDERS** - Periodically, the hydraulic lift cylinders on wing frame will not be synchronized with center frame cylinder. This will cause uneven cutting depth. If this happens it will be necessary to rephase the lift cylinders. Rephasing is done by lifting disc completely out of the ground and holding the hydraulic control lever until all (3) three rockshaft cylinders are fully extended.



WARNING: NEVER ALLOW ANYONE TO RIDE ON DRAWBAR OF THE TRACTOR OR ON THE DISC. THE PERSON RIDING MAY FALL AND BE SERIOUSLY INJURED.



WARNING: LOWER THE DISC TO THE GROUND WHEN SERVICING OR MAKING ADJUSTMENTS . IF THE DISC MUST BE SERVICED OR ADJUSTED IN THE RAISED POSITION, PLACE BLOCK UNDER FRAME. DO NOT RELY ON HYDRAULIC LOCK UP VALVES AS A SAFETY DEVICE. IF THE HYDRAULIC SYSTEM FAILED, OR IF THE HYDRAULIC LEVER WAS ACCIDENTALLY OPERATED, THE DISC COULD DROP.



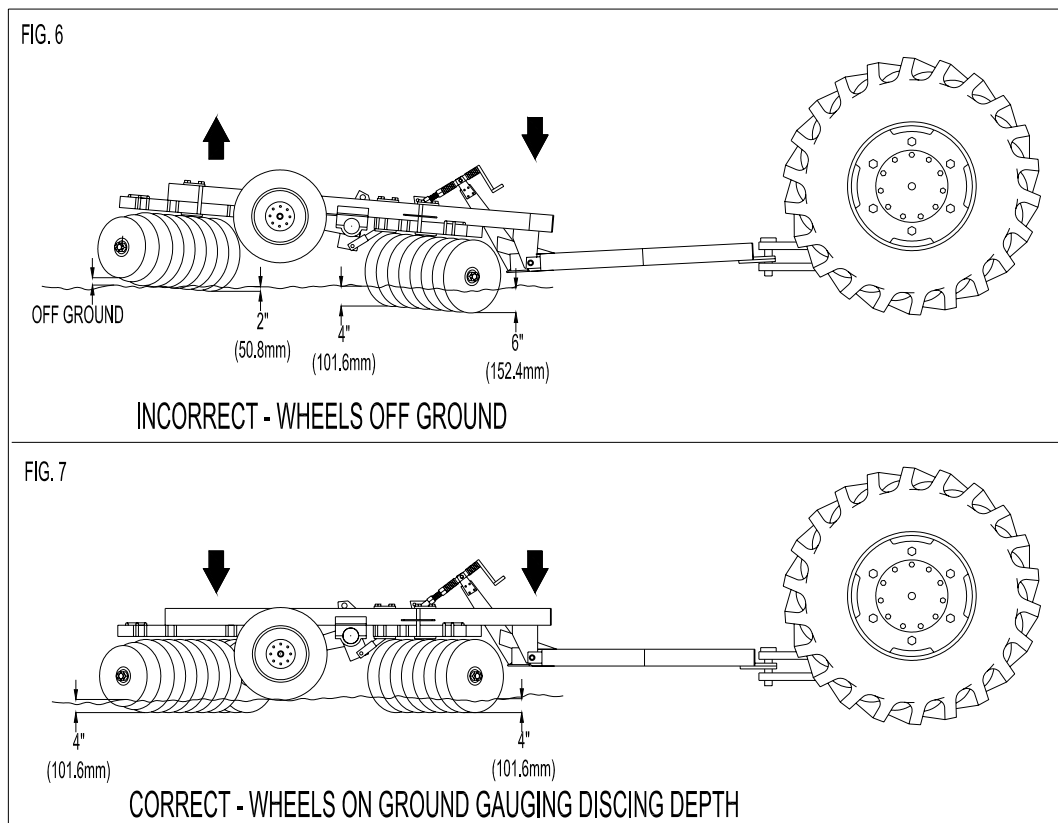
CAUTION: WHEN OPERATING ON HILLSIDES, USE EXTRA CARE. TRACTOR MAY TIP SIDEWAYS IF IT STRIKES A HOLE, DITCH OR OTHER IRREGULARITIES.

16. **VERY IMPORTANT:** WHEN PARKING DISC ALWAYS RELEASE PRESSURE IN HYDRAULIC CYLINDERS. SERIOUS DAMAGE COULD OCCUR TO HYDRAULIC CYLINDER IF THERMAL EXPANSION OF HYDRAULIC OIL TAKES PLACE DUE TO WARMER WEATHER OR IF DISC IS STORED IN HEATED BUILDING.

17. **IMPORTANT:** *When parking disc always place both hydraulic lockup valves in “Closed Position”. See Fig. 1 on page 6.*

18. In discing conditions where extreme wing flexibility is required, remove cylinder pin from shaft end of each wing lift cylinder and retract cylinders.

When reattaching shaft end of wing lift cylinders to wing frame, be sure cylinder shaft does not strike cylinder lug on wing frame. Serious damage may occur to cylinder if cylinder shaft strikes cylinder lug. Before extending cylinder shafts block up cylinder so that cylinder shaft passes over cylinder lugs.



19. **To keep disc level transport wheels must be riding on ground gauging desired discing depth, as shown in Fig. 7.**

If conditions are such that disc can not penetrate to maximum depth, do not raise transport wheels off ground as shown in Fig. 6. Raised transport wheels may cause front of disc to drop causing front gangs to cut deeper than rear gangs.

Front of disc may drop because rockshaft and hitch levelling arm is linked. As the wheels are raised, the hitch levelling arm is pulled back allowing hitch to float. If hitch is allowed to float it will not support front of disc allowing front gang to drop.

With front of disc lower than the rear, the front outside blades will cut much deeper than the front inside blades. This means that more of the disc's weight is placed on the front outside blades, forcing them deeper into the ground.

Uneven and deep front gang penetration in tough conditions will place excessive strain on blades, gang bearings, frame and hitch, and will lead to a premature failure of parts especially outside blades and bearings of front gangs.

IMPORTANT: *Operating disc with transport wheels off ground will cause uneven discing job and place undue strain on machine which could lead to parts failure. Always operate disc with transport wheels on ground even if soil conditions will not allow disc to penetrate to maximum depth.*

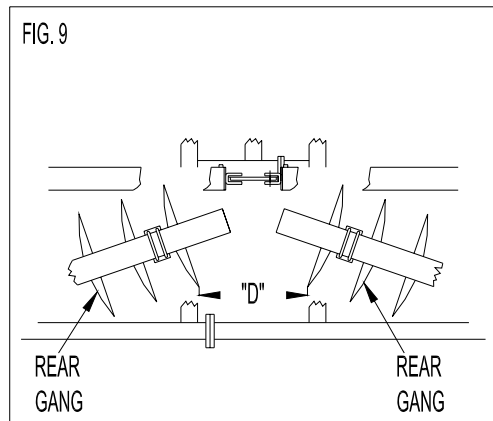
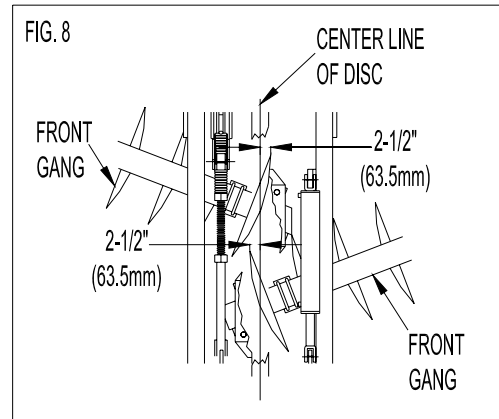
ADJUSTMENTS

1. LATERAL ADJUSTMENT OF THE FRONT AND REAR GANGS

- a) **FRONT GANGS** - See Fig. 8. Loosen bearing hanger U-bolts and adjust front gangs so that leading edge of inside blades are, arrow 1, approximately 2-1/2" (63.5 mm) past centre of disc. The centre of disc is shown in Fig. 8. If the above adjustment is made correctly, the front gang will not leave any unbroken ground at centre of disc.
- b) **REAR GANGS** - See Fig. 9. To adjust rear gangs, loosen bearing hanger U-bolts.

The opening between the rear gang dimensions "D" must be set at a distance that will allow furrow left by the front gangs to be filled evenly. The distance the rear gangs are set apart is determined by the discing speed, discing depth, gang angle and soil conditions. If the rear gangs are set too close together, the rear gangs will leave a ridge at centre. If rear gangs are set too far apart, the furrow at centre left by the front gangs will not be filled. Take note of the amount of soil the rear inside blades are packing up. It may be necessary to increase distance between rear gangs in order to collect enough soil to fill furrow. To start with this, distance should be set at 2" (50.8 mm) less than diameter of blades. For example, if your machine's equipped with 24" (610 mm) blades then the opening (Dimension "D") should be 22" (559 mm).

An increase in discing speed may required rear gangs to be set further apart. A decrease in discing speed may require rear gangs to be set closer together.



NOTE: Be sure the blade to blade distance between individual gangs are adjusted to match your disc's blade spacing.

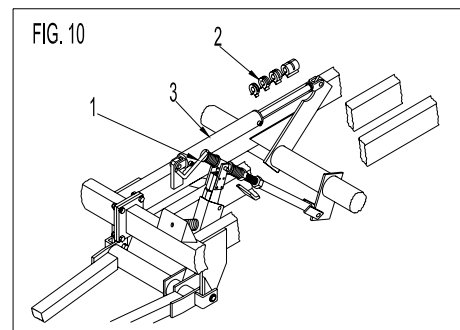
- c) When gang adjustments are complete, tighten all bearing hanger U-Bolts. Before tightening bearing hanger U-Bolts, check each hanger to make sure hanger is sitting square under gang beam. Also ensure hangers are not turned to one side. Tighten U-Bolt to 430 ft. lbs. (583.0 Nm). Next, see section 40 on page 34 for gang bearing alignment procedures.

2. **IMPORTANT:** WHEN RAISING WINGS FOR TRANSPORT FOR FIRST TIME AFTER ADJUSTING GANGS, RAISE WINGS SLOWLY MAKING SURE WING GANGS CLEAR CENTRE FRAME GANGS.

3. **LEVELLING DISC - FRONT to REAR** - See Fig. 10. When discing, the front and rear gangs should be cutting at same depth. The levelling crank, arrow 1, is used to level disc.

TO LOWER FRONT GANGS: Turn crank, arrow 1, "IN" (clockwise)

TO RAISE FRONT GANGS: Turn crank, arrow 1, "OUT" (counter clockwise)



VERY IMPORTANT: ALWAYS KEEP DISC LEVEL FROM FRONT TO REAR. DISCING WITH FRONT GANGS LOWER THAN REAR GANGS WILL CAUSE RIDGING AT OUTSIDE AND MAY CAUSE DAMAGE TO DISC COMPONENTS.

4. **SETTING DISCING DEPTH** - See Fig. 10. To set discing depth, lower disc into the ground while moving forward until disc reaches desired discing depth. Install the necessary depth control stops on centre frame lift cylinder shaft to maintain the desired cutting depth.

ADJUSTMENTS CONTINUED:

5. LEVELLING WING FRAMES - See Fig. 11.

Before this adjustment is made, be sure centre frame is level from front to rear. After adjustments are complete tighten nuts on cylinder I-Bolt.

For even blade penetration, outside of wing frames must be level with centre frame or even 1/2" (12.7 mm) higher than centre frame.

To level wing frame with centre frame, adjust wing rockshaft cylinder I-Bolt, arrow 1. If outside of wing frame needs to be raised, loosen rear nut of I-Bolt and tighten front nut. This will lower the wheels raising outside of wing. If outside of wing frame needs to be lowered, loosen front nut of I-Bolt and tighten rear nut. This will raise the wheels allowing outside of wing lower. After adjustments are complete, lock I-Bolt by tightening rear nut against I-Bolt holder.

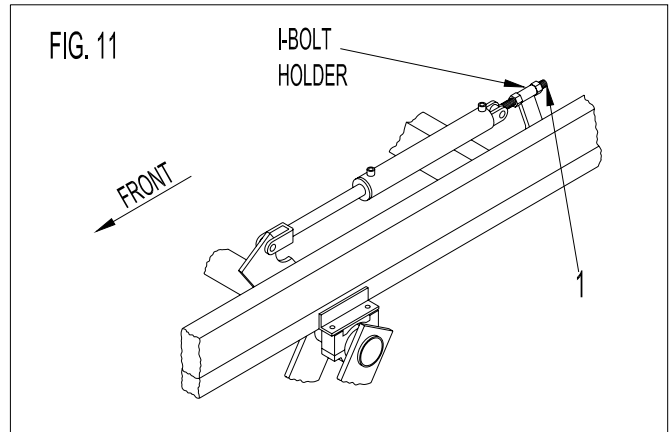


FIG. 11

IMPORTANT: Be sure axis of clevis pin is horizontal and cylinder ports are facing up. If cylinder and I-Bolt are not positioned properly, cylinder will not be free to pivot when activated, causing serious damage.



CAUTION: ALWAYS PLACE TRACTOR CONTROLS IN NEUTRAL AND LOCK BRAKES WHEN HITCHING DISC TO TRACTOR, TRACTOR COULD ROLL BACKWARDS WHEN HITCHING DISC.



CAUTION: WHEN OPERATING ON HILLSIDES, USE EXTRA CARE. TRACTOR MAY TIP SIDEWAYS IF IT STRIKES HOLE, DITCH OR OTHER IRREGULARITY.

6. REMOVE RIDGE AT CENTRE OF DISC - Make one or more of the following adjustments:

- Level disc from front to rear using levelling crank, see Section 3 of adjustments.
- Reduce discing speeds.
- Increase distance between rear gangs, see Section 1 of adjustments.

7. REMOVE FURROW AT CENTRE OF DISC - Make one or more of the following adjustments:

- Level disc from front to rear using levelling crank, see Section 3 of adjustments.
- Increase discing speed.
- Decrease distance between rear gangs, see Section 1 of adjustments.

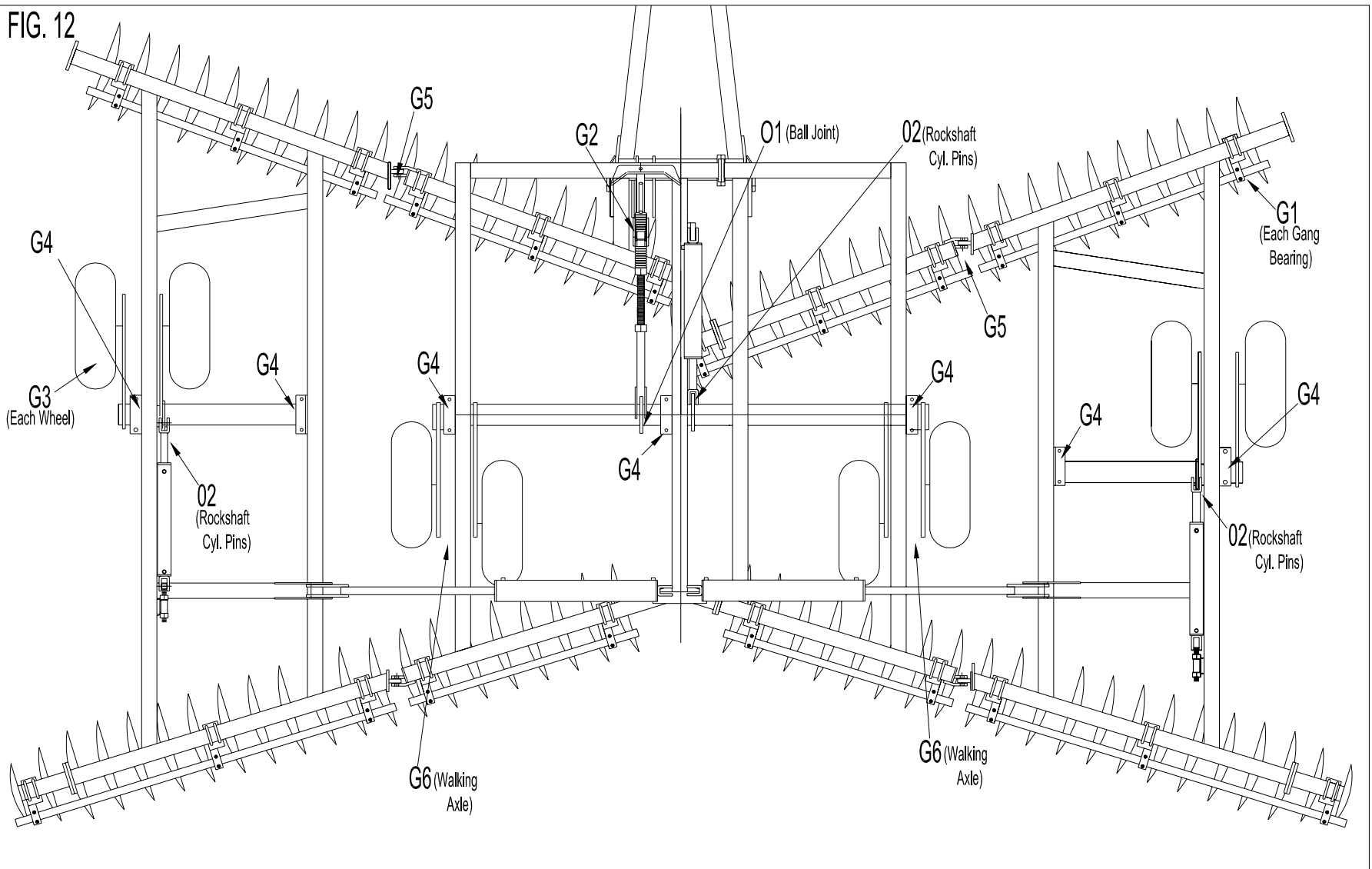
8. REMOVE UNBROKEN GROUND LEFT BY FRONT GANGS - Make the following adjustments:

- Adjust leading edge of inside blade of each front gang so it is 2-1/2" (63.5mm) past centre of disc, see Section 1 of adjustments.

9. REDUCE GANG PLUGGING - Make the following adjustment:

- Adjust scrapers so they contact blades.

FIG. 12



MAINTENANCE

1. LUBRICATION See Fig. 12 - All grease lubricating points on disc are marked with arrow G, use high quality SAE multi-purpose grease. The oil lubrication points are marked with arrow O.

G1) 410 SERIES GANG BEARINGS - Lubricate every 20 hours of operation with 6 to 10 strokes of hand grease gun.



CAUTION: FOR 410 BEARINGS ONLY. IF GANG BEARINGS ARE OVER LUBRICATED, THERE IS A POSSIBILITY THAT THE SEALS CAN BE PUSHED OUT. THIS IS MORE LIKELY TO HAPPEN WHEN BEARINGS ARE NEW.

G2) Lubricate levelling crank every 100 hours of operation.

G3) Lubricate wheels every 50 hours of operation.

G4) Lubricate top and bottom half of each rockshaft bearing every 20 hours of operation.

G5) Lubricate wing hinge points every 100 hours of operation.

G6) Lubricate walking axles every 50 hours of operation.

NOTE: When you receive your new disc, grease all lubricating points before starting to disc. However, use caution when lubricating 410 series gang bearings. These gang bearings are filled with grease at the factory and seals may be damaged if over lubricated.

O1) Lubricate levelling crank ball joint (with oil) at the end and beginning of each season.

O2) Lubricate rockshaft cylinder pins (with oil) every 50 hours of operation.

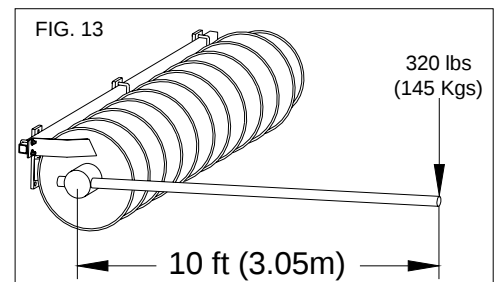
2. All bolts and nuts should be checked periodically to make sure they are tight. Special attention should be given to gang bolts, bearing bolts and bearing hanger U-bolts, and wheel bolts.

They should be tightened as follows:

- Gang bolts 1-15/16" (49 mm) Diameter - tighten to 3200 ft. Lbs. torque (4339N . m)

See FIG. 13. To tighten gang bolt to 3200 ft. Lbs. (4339N.m) install a 10ft. (3.048m) bar in socket wrench and apply 320 Lbs. (145Kgs) of force to end of bar.

IMPORTANT: After repairing a gang, the gang bolt should be retightened after 2 hours of operation.



IMPORTANT!!!
SEVERE DAMAGE WILL OCCUR IF GANG BOLTS ARE LOOSE.

- Levelling crank bolt 1-1/4" (31.7 m) Diameter ----- 840 ft. lbs torque(minimum/maximum) (1139 N · m)
- Wheel bolts 9/16" (14.2 m) Diameter ----- 130 ft. lbs torque (176.2 N · m)
- Bearing hanger u-bolts- 5/8" (15.7mm) Diameter ----- 150 ft. lbs torque(20.75m.kgs)-solid hangers
- 3/4" (19mm) Diameter ----- 260 ft. lbs torque (36m. Kgs) - stone flex hangers

3. When storing disc for a long period of time, grease all lubricating points.
4. Keep the pressure equal on all wheels. See specifications on page 5 for tire pressure. Check the tire tread periodically for nicks, cuts or abrasions.



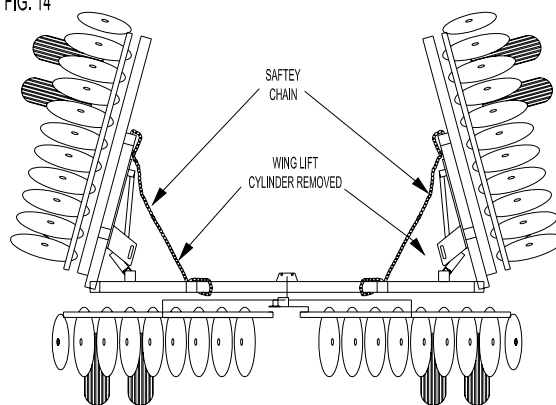
CAUTION: DO NOT SERVICE DISC WHILE IT IS MOTION. YOU MAY FALL IN FRONT OF DISC AND BE SERIOUSLY INJURED.



CAUTION: LOWER THE DISC TO THE GROUND WHEN SERVICING OR MAKING ADJUSTMENTS. IF THE DISC MUST BE SERVICED OR ADJUSTED IN THE RAISED POSITION, PLACE BLOCKS UNDER FRAME. DO NOT RELY ON HYDRAULIC LOCK UP VALVES AS A SAFETY DEVICE. IF THE HYDRAULIC SYSTEM FAILED, THE DISC COULD DROP.

5. **WING LIFT CYLINDER REMOVAL** - See Fig. 14. If possible lower wings to field position if the wing lift cylinder hydraulic system must be serviced or repaired. If wing lift cylinder hydraulic system must be serviced or repaired with wings in folded position, install a safety chain between each wing frame and main frame to prevent wings from falling down. Always install a chain on both wings even if only one cylinder is being worked on.

FIG. 14



CAUTION: IF WING LIFT CYLINDER(S) OR WING LIFT HYDRAULIC HOSES ARE REMOVED WHEN WINGS ARE FOLDED INTO TRANSPORT POSITION, ALWAYS INSTALL A SAFETY CHAIN BETWEEN EACH WING FRAME AND MAIN FRAME TO PREVENT WINGS FROM FALLING. IF WINGS FELL SERIOUS INJURY OR DEATH COULD OCCUR TO PERSON(S) NEARBY AND MACHINE WOULD BE DAMAGED SEVERELY.

6. Keep all safety decals clean and in good condition to provide a constant reminder of safe operating procedures.
7. Replace any destroyed, missing or illegible decals and reflectors.

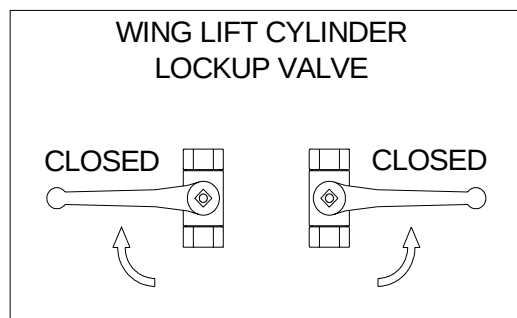


CAUTION: ALWAYS RELIEVE THE PRESSURE IN HYDRAULIC SYSTEM AND CLOSE BOTH HYDRAULIC LOCKUP VALVES WHEN THE DISC IS NOT BEING OPERATED.

8. At the end of each season do following:
 - a) Relieve pressure in all hydraulic cylinders. Disconnect hydraulic hoses from tractor and cap them.
 - b) If disc is to be stored outdoors, cover hydraulic cylinders and hoses with weather proof material and coat all exposed cylinder shafts with grease.
 - c) Set planks under each wheel.
 - d) Lubricate all grease points.
 - e) Check disc for worn or damaged parts. Replace damaged parts during the off season.
 - f) Touch up any scratches with EZEE-ON paint.
 - g) **VERY IMPORTANT:** WHEN STORING DISC, DO NOT LEAVE CYLINDERS UNDER HYDRAULIC PRESSURE, ESPECIALLY IF CYLINDERS ARE ACTIVATED DURING COOL TEMPERATURES. THE THERMAL EXPANSION OF OIL WHICH TAKES PLACE WHEN MACHINE IS IN A WARMER ENVIROMENT MAY CAUSE SERIOUS DAMAGE TO CYLINDERS OR HOSES. ALWAYS RELEASE HYDRAULIC PRESSURE AND CLOSE LOCKUP VALVES BEFORE UNHITCHING FROM TRACTOR.



IMPORTANT: WINGS MAY UNFOLD DUE TO THERMAL EXPANSION OF HYDRAULIC OIL CAUSING DAMAGE TO DISC, PROPERTY OR SEVERE INJURY OR DEATH TO PERSON(S) NEARBY. RELEASE PRESSURE IN ALL CYLINDERS AND CLOSE HYDRAULIC LOCKUP VALVES BEFORE UNHITCHING FROM TRACTOR OR WHEN PARKING TRACTOR.



9. TIRE MAINTENANCE AND SAFETY:

- a) Keep the pressure equal on all wheels. See specifications on page 5 for correct tire pressure.
- b) Do not inflate tires above recommended pressure.
- c) Only experienced personal should attempt to repair a tire or mount a tire on wheel.
- d) Do not weld or heat tire and wheel assembly when tire is inflated. The heat may cause an increase in tire pressure causing tire to explode.
- e) Periodically check tires for cuts, bulges and damaged rims.

- f)  **CAUTION: WHEN INFLATING TIRES USE A CLIP ON CHUCK AND HOSE EXTENSION WHICH WILL ALLOW OPERATOR TO STAND CLEAR OF TIRE AND WHEEL ASSEMBLY. DO NOT STAND IN FRONT OF OR OVER TIRE WHEN INFLATING. EXPLODING TIRE AND WHEEL PARTS CAN CAUSE SERIOUS INJURY OR DEATH.**

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
OUTSIDE BLADES OF FRONT WINGS ARE CUTTING TOO DEEP CAUSING DISC TO RIDGE AT OUTSIDE	- wheels raised off ground causing front of disc to drop - tire pressure is low on outer wheels causing disc to cut deep at outside - disc is lower at front than at rear - wing wheel not adjusted for proper cutting depth - wing rockshaft cylinders are not synchronized with centre from rockshaft cylinders	- lower wheels to ground so they gauge discing depth, see section 18 of general operating instructions on page 9 - inflate tire, see tire pressures on page 5 - using levelling crank raise front of disc - see Fig. 10 on page 10 - raise outside of wing by adjusting lift cylinder l-bolt, see section 5 on page 11 - rephase rockshaft cylinders, section 16 on page 8
OUTSIDE BLADES OF FRONT WINGS ARE NOT CUTTING DEEP ENOUGH	- disc is higher at front than at rear	- using levelling crank raise front of disc - see Fig. 10 on page 10
OUTSIDE BLADES ON FRONT AND REAR GANGS ARE CUTTING TOO DEEP	- tire pressure is low for wing wheels causing wings too cut deeper - outside of wing frame is lower than main frame - wing rockshaft cylinder are not synchronized with main frame rockshaft cylinder	- check tire inflation for all wheels, see tire pressure on page 5 - raise outside of wing with wing rockshaft cylinder anchor bolt see section 5 on page 11 - rephase rockshaft cylinder, see section 15 on page 8
OUTSIDE BLADES ON FRONT AND REAR GANGS ARE NOT CUTTING DEEP ENOUGH	- tire pressure is lower on centre section wheels than wing section wheel causing centre section to cut deeper - outside of wing frame(s) is higher than main frame - wing rockshaft cylinder is not synchronized with main frame rockshaft cylinder	- check tire inflation for all wheels, see tire pressure on page 5 - lower outside of wing with wing rockshaft cylinder anchor bolt, see section 5 on page 11 - rephase rockshaft cylinder, see section 15 on page 8
DISC IS LEAVING A RIDGE AT CENTRE OF DISCING	- rear gangs are cutting deeper than front gangs - a high discing speed is causing disc to throw dirt further resulting in a pile at centre - rear gangs are too close together	- level disc using levelling crank - see Fig. 10 on page 10 - reduce discing speed - increase distance between rear gangs see section 1 on page 10
REAR GANGS ARE NOT FILLING FURROW LEFT BY FRONT GANGS AT CENTRE OF DISC	- front gangs are cutting deeper than rear gangs - a low discing speed is causing disc to not throw dirt far enough to fill furrow left by front centre blades - rear gangs are too far apart	- level disc using levelling crank - see Fig. 10 on page 10 - increase discing speed - decrease distance between rear gangs - see section 1 on page 10

TROUBLE SHOOTING CONTINUED

PROBLEM	POSSIBLE CAUSE	REMEDY
FRONT GANGS ARE LEAVING UNBROKEN GROUND AT CENTRE OF DISC	- front gangs are either overlapped too much or not enough	- adjust overlap of front gangs - see section 1 on page 10
DISC GANGS ARE PLUGGING	- scrapers are too far from blades - thrash conditions too heavy for your machine cylinder(s)	- adjust scrapers so they are contacting blades - contact your Ezee-On Dealer
WHEN RAISING DISC OUT OF GROUND, MAIN FRAME COMES OUT OF GROUND WHILE OUTSIDE OF WING(S) LAGS BEHIND OR DOES NOT COME OUT OF GROUND	- piston seals on wing rockshaft cylinder(s) are damaged	- replace piston seals of wing rockshaft cylinder
WHEN RAISING DISC OUT OF GROUND, OUTSIDE OF WING(S) COMES OUT OF GROUND WHILE MAIN FRAME LAGS BEHIND OR DOES NOT COME OUT OF GROUND	- piston seals on main frame rockshaft cylinder is damaged	- replace piston seals of main frame rockshaft cylinder
WHEN RAISING DISC OUT OF GROUND, MAIN FRAME ROCKSHAFT CYLINDER IS FULLY EXTENDED WHILE WING ROCKSHAFT CYLINDER(S) ARE NOT FULLY EXTENDED	- rockshaft cylinders are not synchronized	- rephrase rockshaft cylinders, see section 15 on page 8
WHEN RAISING DISC OUT OF GROUND WING ROCKSHAFT CYLINDER IS FULLY EXTENDED WHILE MAIN FRAME ROCKSHAFT CYLINDER(S) ARE NOT FULLY EXTENDED	- rockshaft cylinders are not synchronized	- rephrase rockshaft cylinders, see section 15 on page 8
OUTER WING BLADES WILL NOT PENETRATE SOIL	- soil condition too hard for your machine	- add weights to outside of wing frame - Ezee-On makes weights available. Contact your Ezee-On Dealer
ALL SECTION OF DISC WILL NOT PENETRATE SOIL	- soil condition too hard for your machine	- contact your Ezee-On Dealer

Pages 18 to 19 have been left out intentionally

**Illustration numbers from 15 - 19 have
been left out intentionally.**

ASSEMBLY INDEX
MODEL 4590

DESCRIPTION	PAGE
Assembling Main Frame and Main Rockshaft	21
Assembling Hitch and Levelling Crank	22
Assembling Wing Frame and Wing Frame Gang Beams	23
Assembling Wing Rockshafts	23
Attaching Wing Lift Brackets	24
Attaching Hydraulic Hoses to Rockshaft Cylinders & Wing Cylinders	29
Attaching Lift and Wing Lift Cylinders	29
How Main Lift Hydraulic System Works	30
Attaching Gang Beam Extensions	32
Attaching Gang Assemblies	33
Attaching SMV Bracket	35
Warning Light Kit Assembly (Optional)	36
Reflector Decal Installation	38
Gang Beam Extension Chart	38
Gang Patterns	39

ASSEMBLY INSTRUCTIONS

1. See Fig. 20. Fasten L.H. center frame, arrow 1, and R.H. center frame half, arrow 2, together as shown. Center frame halves are fastened with four (4) 1" x 3-1/4" (25.4mm x 82.3mm) hex. bolts c/w nuts and lockwashers at each front, rear and inner connecting plates, arrow 3. **Do not tighten bolts until after rockshaft bearings have been installed.**
2. See Fig. 20. Raise frame assembly, arrow 1 and 2, approximately 36" (914.4mm) from ground and block securely.
3. See Fig. 20. Fasten center frame rockshaft assembly, arrow 4, to bottom of main frame, with three (3) sets of 5-1/2" (139.7mm) rockshaft bearing halves, arrow 5. Position rockshaft so that outside bearings are positioned between wheel legs. Fasten each rockshaft bearing assembly to bearing bracket, arrow 6, with two (2) 3/4" x 6-1/2" (19.1mm x 165.1mm) hex bolts c/w nuts and lockwashers.

NOTE: Position top half bearing so grease hole is on rear side of rockshaft and bottom half so grease hole is on front side of rockshaft.

4. See Fig. 20. Tighten bolts which fasten rockshaft bearing halves, arrow 5, to frame. Next, tighten bolts which fasten frame connecting plates, arrow 3. If there is a gap between the plates, arrow 3, at top or bottom, install a 1-1/2" x 5" (38.1mm x 125.5mm) shim, arrow 9, to take up this gap.

NOTE: If gap is closed by tightening bolts, a preload will be placed on rockshaft bearing. Frame must be level after frame connecting plate bolts have been tightened.

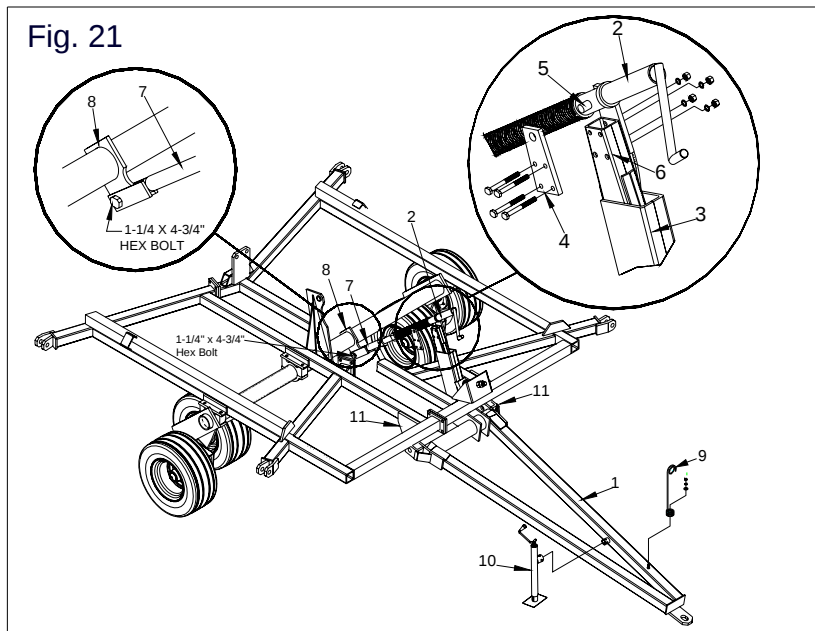
IMPORTANT: AFTER TIGHTENING ROCKSHAFT BEARING BOLTS, ROCKSHAFT SHOULD BE FREE TO PIVOT IN BEARINGS. IF BEARINGS ARE TOO TIGHT, PLACE TWO (2) 2" X 3" (50.8mm X 76.8mm) SHIM(S), ARROW 7, (AS REQUIRED) BETWEEN BEARING HALVES, ARROW 5.

NOTE: Before installing rockshaft bearings, place a coat of grease on bearing surface.



WARNING: SUPPORT CENTER FRAME SECURELY BEFORE ASSEMBLING COMPONENTS. INADEQUATE SUPPORT MAY RESULT IN THE HEAVY COMPONENTS FALLING AND CAUSING SERIOUS INJURY TO YOU OR PERSON(S) NEARBY

5. See Fig. 20. Install one (1) 1/4" x 28 (6.35mm x 28) grease fitting, arrow 8, in each top rockshaft bearing half. Install one (1) 1/4" x 28 (6.35mm x 28) grease fitting, arrow 9, in each bottom rockshaft bearing half.
6. See Fig. 20. Install one (1) eight bolt tire and wheel assembly, arrow 10, to hub assembly, arrow 11, on each side of each wheel leg. Center frame uses four (4) 12.5L x 15FI, range F tires. Secure with eight (8) 9/16" x 1-11/16" (14.3mm x 17.5mm) wheel bolts, arrow 12. Tighten wheel bolts to 130 ft. Lbs (176.3 N.m). Lock each wheel bolt by installing one (1) 9/16" (14.3mm) N.F. hex nut, arrow 13, on thread that extends past hub. Tighten nuts.



IMPORTANT: WHEEL BOLTS MUST BE KEPT TIGHT. IF BOLTS ARE NOT TIGHT, BOLTS WILL LOOSEN CAUSING SEVERE DAMAGE TO HUB, WHEEL AND TIRE.

CHECK WHEEL BOLTS PERIODICALLY, ESPECIALLY THE FIRST FEW HOURS OF EITHER TRANSPORT OR FIELD WORK.



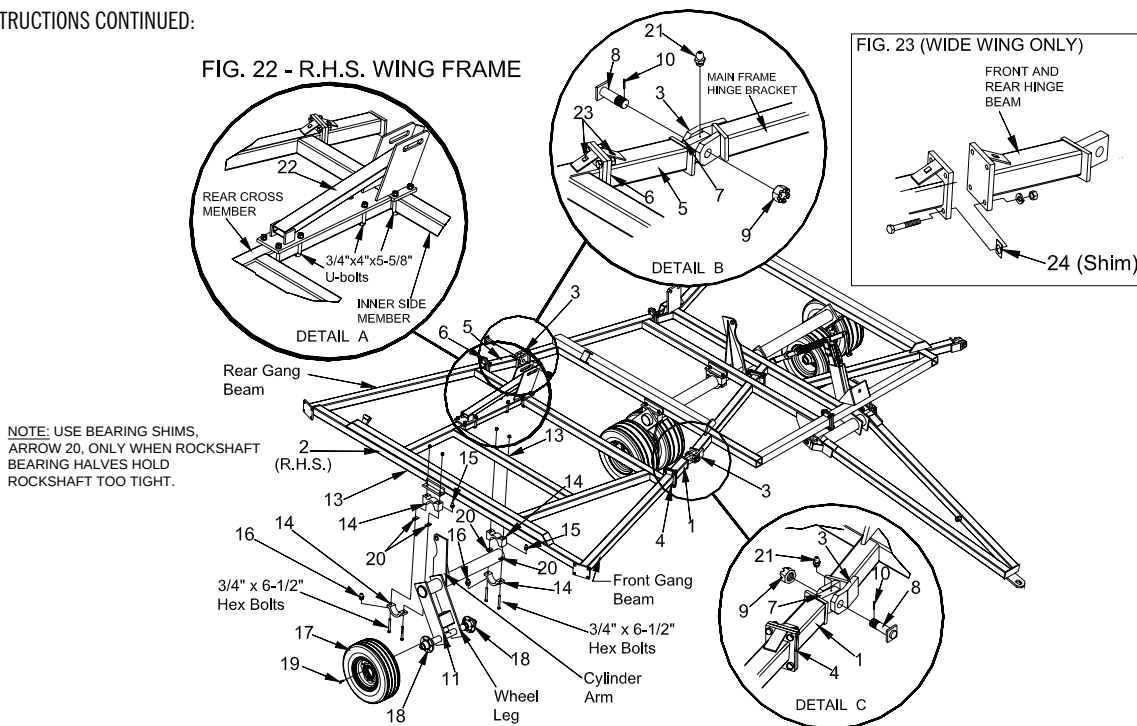
WARNING: USE ADEQUATE MANPOWER OR A HOIST TO LIFT HEAVY COMPONENTS IN PLACE. ATTEMPTING TO LIFT HEAVY COMPONENTS BY YOURSELF COULD CAUSE SERIOUS INJURY,

7. See Fig. 21. Attach hitch assembly, arrow 1, to hitch lugs, arrow 11, on center frame with two (2) 1-1/2" dia. x 5" (31.8mm x 127mm) pins. Secure each pin with one (1) 7/16" (11.1mm) lynch pin.
8. See Fig. 21. To attach levelling crank, arrow 2, to levelling arm, arrow 3, remove bolt-on lug, arrow 4, of hitch levelling arm. Next, install 1" (25.4mm) diameter pin of bearing tube, arrow 5, into weld-on lug, arrow 6, of levelling arm. Position bearing tube so grease fitting is facing up. Place bolt on lug, arrow 4, over outside of levelling arm. Install 1" diameter pin of bearing tube into bolt on lug. Fasten the bolt-on lug to the levelling arm with four (4) 1/2" x 5" (12.7mm x 127mm) N.C. hex bolts c/w nuts and lockwashers. Tighten bolts.
9. See Fig. 21. Attach clevis end of levelling link, arrow 7, to arm, arrow 8, on rockshaft. Fasten with one (1) 1-1/4" x 4-3/4" (31.8mm x 120.7mm) hex bolt c/w nut and lockwasher. Tighten bolt to 840 foot pounds (1139 N.m)

NOTE: The 1-1/4" x 4-3/4" (31.6mm x 120.7mm) bolt must be tightened so that the clevis is drawn up tight against the ball joint in arm, arrow 7. Tighten bolt to 840 foot pounds (1139 N.m). Ball must also be free to pivot in socket. Lubricate ball with oil and turn in socket to make sure ball is free to pivot.

10. See Fig. 21. Fasten hose support, arrow 9, to a bolt welded to top of hitch. Secure with one (1) 5/8" (15.9mm) nut, one (1) 11/16" (17.5mm) I.D. flatwasher, and one (1) 5/8" (15.9mm) lockwasher. Tighten nut.
11. See Fig 21. Mount hitch jack, arrow 10, on round tube welded to inside of hitch. Jack pivots on mounting tube can be placed in vertical position for supporting disc hitch or horizontal position while disc is in motion. Lock jack in desired position with pin.

IMPORTANT: JACK MUST BE IN HORIZONTAL POSITION WHEN DISC IS IN MOTION. IF JACK IS IN VERTICAL POSITION WHEN DISC IS IN MOTION, JACK MAY STRIKE GROUND OR OBSTRUCTION ON GROUND, CAUSING SEVERE DAMAGE TO JACK, BE SURE CRANK OF JACK IS NOT HANGING BELOW HITCH WHEN JACK IS IN HORIZONTAL POSITION. PLACE CRANK ON TOP OF HITCH TO AVOID DAMAGE.



NOTE: There are two types of wing frames, wide wing and narrow wing. Wide wing machines use bolt-on type hinge beams, arrows 5 and 6. Narrow wing machines have beams that are part of the frame. Refer to specifications on page 5 to determine type of wing your machine uses.

12. See Fig.22 and Detail C. **FOR WIDE WING DISCS ONLY.** Fasten rear hinge beam, arrow 5, to a four (4) hole attaching plate, arrow 6, at rear inside of R.H. wing frame, arrow 2. The rear hinge beams are made L.H. and R.H., be sure R.H. beam is used for R.H. wing. Rear hinge beam can be identified by locating a small plate, arrow 23, that is welded to top connecting plate brace. The same type of plate is welded to connecting plate brace on wing frame. Fasten hinge beam with four (4) 1" x 3-1/4" (25.4mm x 82.6mm) hex bolts c/w lockwasher. **IMPORTANT:** See Fig. 22. Before tightening bolts check rear hinge beam alignment. Hinge beam must be aligned and level with rear gang beam of wing frame. Install shim(s), arrow 24, as required between attaching plates to align hinge beams. Tighten bolts.
13. See Fig. 22 and Detail C. **FOR WIDE WING DISCS ONLY.** Fasten front hinge beam, arrow 1, to a four (4) hole attaching plate, arrow 4, at front inside of R.H. wing frame, arrow 2. The front hinge beams are made L.H. and R.H., be sure R.H. beam is used for R.H. wing. The front hinge beam does not have a small plate, arrow 23, welded to top connecting plate brace like rear beam. Fasten hinge beam with four (4) 3/4" x 2-1/2" (19.1mm x 63.5mm) hex bolts c/w nuts and lockwashers. **IMPORTANT:** See Fig. 22. Before tightening bolts check front hinge beam alignment. Hinge beams must be aligned and level with front gang beam of wing frame. Install shim(s), arrow 24, as required between attaching plates to align hinge beams. Tighten bolts.
14. See Fig. 22 and Detail B and C. Fasten R.H. wing assembly, arrow 2, to center frame by connecting wing hinge brackets to center frame hinge brackets, arrow 3. Insert hinge lug, arrow 7, of wing frame into clevis of center frame hinge brackets. Fasten each hinge assembly to center frame with one (1) 1-1/2" x 5" (38.1mm x 120.7mm) threaded pin, arrow 8, and slotted nut, arrow 9. Install front bolt from front side and install rear bolt from rear side. Secure slotted nuts with one (1) 5/16" x 2" (7.94mm x 50.8mm) cotter pin, arrow 10. See Details B and C.
15. See Fig. 22. Fasten R.H. wing rockshafts, arrow 11, to bottom of R.H. wing frame. Be sure correct rockshaft is used for each wing. Wheel leg must point forward with cylinder arm on top. Secure each rockshaft to two (2) bearing brackets, arrow 13, with two (2) sets of 5-1/2" (139.7mm) rockshaft bearing halves, arrow 14. Fasten each rockshaft bearing assembly with two (2) 3/4" x 6-1/2" (19mm x 165mm) hex bolts c/w nuts and lockwasher. Position top half of rockshaft bearing so grease hole is at front. Position bottom half of rockshaft bearing so grease hole is at rear. Tighten rockshaft bearing bolts.
AFTER TIGHTENING ROCKSHAFT BEARING BOLTS, ROCKSHAFT SHOULD BE FREE TO PIVOT IN BEARINGS. IF BEARINGS ARE TOO TIGHT, PLACE TWO (2) 2" x 3" (50.8mm x 76.2mm) SHIM(S), ARROW 20, (AS REQUIRED) BETWEEN BEARING HALVES.

NOTE: Before installing rockshaft bearings place a coat of grease on bearing surface.

ASSEMBLY INSTRUCTIONS CONTINUED:

16. See Fig. 22. Install one (1) 1/4" X 28 (6.35mm X 28) grease fitting, arrow 21, in each hinge lug, arrow 7, of front and rear wing hinge brackets. See Details B and C.
17. See Fig. 22. Install one (1) 1/4" x 28 (6.35mm x 28) grease fitting, arrow 15, in each top rockshaft bearing half. Install one (1) 1/4" x 28 (6.35mm x 28) grease fitting, arrow 16, in each bottom rockshaft bearing half.
18. See Fig. 22. Install one (1) 6 bolt tire and wheel assembly, arrow 17, to hub assembly, arrow 18, on each side of wheel leg. Wing frames use 11L x 15 FI Range C Tires. Secure with six (6) 9/16" x 1-1/8" (14.9mm x 28.6mm) wheel bolts, arrow 19. Tighten wheel bolts to 130 ft. Lbs. (176.3 N.m).
19. See Fig. 22 and Detail A. Fasten wing lift bracket, arrow 22 to top of rear cross member of each wing frame, arrows 1 and 2. Position bracket as shown. Secure each bracket with five (5) 3/4" x 4" x 5-5/8" (19mm x 101.6mm x 142.9mm) U-Bolts c/w nuts and lockwashers. Three (3) U-Bolts are used to fasten bracket to rear cross member and two (2) U-Bolts are used to fasten bracket to inner side member. Tighten U-bolts.



WARNING: USE ADEQUATE MANPOWER OR A HOIST TO LIFT HEAVY COMPONENTS INTO PLACE. ATTEMPTING TO LIFT HEAVY COMPONENTS BY YOURSELF COULD CAUSE SERIOUS INJURY.



WARNING: SUPPORT MAIN FRAME SECURELY BEFORE ASSEMBLING COMPONENTS. HEAVY FRAME COULD CAUSE SERIOUS INJURY IF IT FELL.



CAUTION: WHEN ASSEMBLING DISC, USE ALIGNING PUNCH TO LINE UP HOLES. KEEP FINGERS OUT OF HOLES.

FIG. 24 - L.H.S. WING FRAME

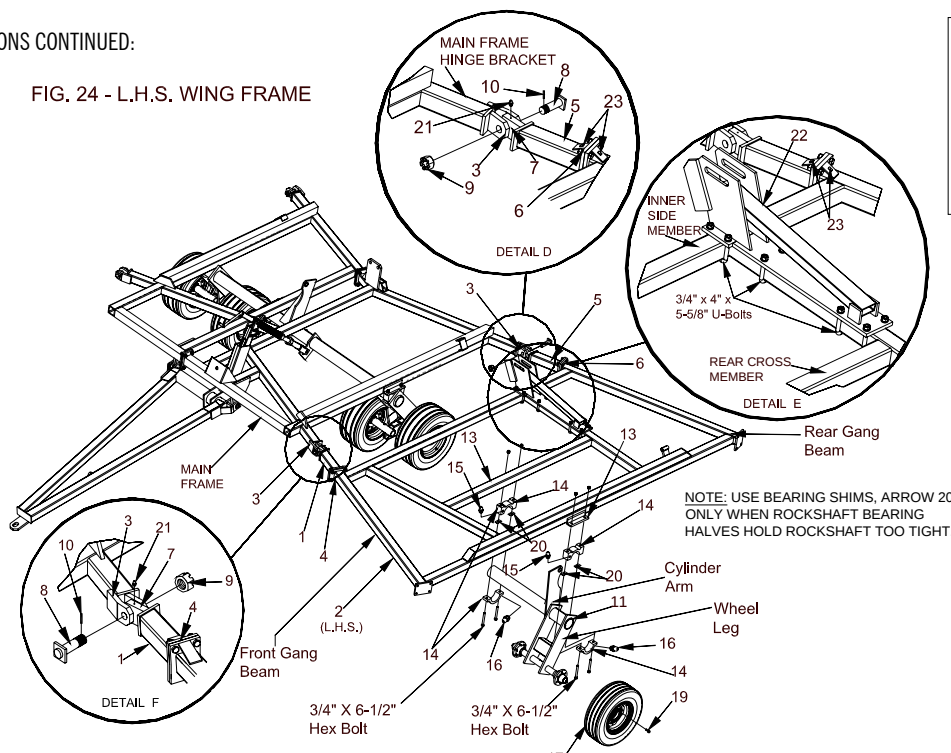
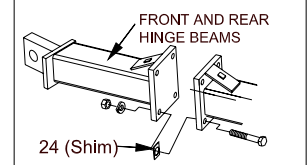


FIG. 25 (WIDE WING ONLY)



NOTE: There are two types of wing frames, wide wing and narrow wing. Wide wing machines use bolt-on type hinge beams, arrows 5 and 6. Narrow wing machines have beams that are part of the frame. Refer to specifications on page 5 to determine type of wing your machine uses.

20. See Fig.24 and Detail D. **FOR WIDE WING DISCS ONLY.** Fasten rear hinge beam, arrow 5, to a four (4) hole attaching plate, arrow 6, at rear inside of R.H. wing frame, arrow 2. The rear hinge beams are made L.H. and R.H., be sure R.H. beam is used for R.H. wing. Rear hinge beam can be identified by locating a small plate, arrow 23, that is welded to top connecting plate brace. The same type of plate is welded to connecting plate brace on wing frame. Fasten hinge beam with four (4) 1" x 3-1/4" (25.4mm x 82.6mm) hex bolts c/w lockwasher. IMPORTANT: See Fig. 22. Before tightening bolts check rear hinge beam alignment. Hinge beams must be aligned and level with rear gang beam of wing frame. Install shim(s), arrow 24, as required between attaching plates to align hinge beams. Tighten bolts.
21. See Fig.24 and Detail F. **FOR WIDE WING DISCS ONLY.** Fasten front hinge beam, arrow 1, to a four (4) hole attaching plate, arrow 4, at front inside of R.H. wing frame, arrow 2. The front hinge beams are made L.H. and R.H., be sure R.H. beam is used for R.H. wing. The front hinge beam does not have a small plate, arrow 23, welded to top of connecting plate brace like rear beam. Fasten hinge beam with four (4) 3/4" x 2-1/2" (19.1mm x 63.5mm) hex bolts c/w nuts and lockwashers. IMPORTANT: See Fig. 22. Before tightening bolts check front hinge beam alignment. Hinge beams must be aligned and level with front gang beam of wing frame. Install shim(s), arrow 24, as required between attaching plates to align hinge beams. Tighten bolts.
22. See Fig. 24 and Detail D and F. Fasten R.H. wing assembly, arrow 2, to center frame by connecting wing hinge brackets to center frame hinge brackets, arrow 3. Insert hinge lug, arrow 7, of wing frame into clevis of center frame hinge brackets. Fasten each hinge assembly to center frame with one (1) 1-1/2" x 5" (38.1mm x 120.7mm) threaded pin, arrow 8, and slotted nut, arrow 9. Install front bolt from front side and install rear bolt from rear side. Secure slotted nuts with one (1) 5/16" x 2" (7.94mm x 50.8mm) cotter pin, arrow 10. See Detail D and F.
23. See Fig. 24. Fasten R.H. wing rockshafts, arrow 11, to bottom of R.H. wing frame. Be sure correct rockshaft is used for each wing. Wheel leg must point forward with cylinder arm on top. Secure each rockshaft to two (2) bearing brackets, arrow 13, with two (2) sets of 5-1/2" (139.7mm) rockshaft bearing halves, arrow 14. Fasten each rockshaft bearing assembly with two (2) 3/4" x 6-1/2" (19mm x 165mm) hex bolts c/w nuts and lockwasher. Position top half of rockshaft bearing so grease hole is at front. Position bottom half of rockshaft bearing so grease hole is at rear. Tighten rockshaft bearing bolts.
AFTER TIGHTENING ROCKSHAFT BEARING BOLTS, ROCKSHAFT SHOULD BE FREE TO PIVOT IN BEARINGS. IF BEARINGS ARE TOO TIGHT, PLACE TWO (2) 2" X 3" (50.8mm X 76.2mm) SHIM(S), ARROW 19, (AS REQUIRED) BETWEEN BEARING HALVES.

NOTE: Before installing rockshaft bearings place a coat of grease on bearing surface.

ASSEMBLY INSTRUCTIONS CONTINUED:

24. See Fig. 24. Install one (1) 1/4" X 28 (6.35mm x 28) grease fitting, arrow 21, in each hinge lug, arrow 7, of front and rear wing hinge brackets. See Details D and F.
25. See Fig. 24. Install one (1) 1/4" x 28 (6.35mm x 28) grease fitting, arrow 15, in each top rockshaft bearing half. Install one (1) 1/4" x 28 (6.35mm x 28) grease fitting, arrow 16, in each bottom rockshaft bearing half.
26. See Fig. 24. Install one (1) 6 bolt tire and wheel assembly, arrow 17, to hub assembly, arrow 18, on each side of wheel leg. Wing frames use 11L x 15 FI Range C Tires. Secure with six (6) 9/16" x 1-1/8" (14.9mm x 28.6mm) wheel bolts, arrow 19. Tighten wheel bolts to 130 ft. Lbs. (176.3 N.m).
- 27 See Fig. 24 and Detail E. Fasten wing lift bracket, arrow 22, to top of rear cross member of each wing frame, arrows 1 and 2. Position bracket as shown. Secure each bracket with five (5) 3/4" x 4" x 5-5/8" (19mm x 101.6mm x 142.9mm) U-Bolts c/w nuts and lockwashers. Three (3) U-Bolts are used to fasten bracket to rear cross member and two (2) U-Bolts are used to fasten bracket to inner side member. Tighten U-bolts.



WARNING: USE ADEQUATE MANPOWER OR A HOIST TO LIFT HEAVY COMPONENTS INTO PLACE. ATTEMPTING TO LIFT HEAVY COMPONENTS BY YOURSELF COULD CAUSE SERIOUS INJURY.



WARNING: SUPPORT MAIN FRAME SECURELY BEFORE ASSEMBLING COMPONENTS. HEAVY FRAME COULD CAUSE SERIOUS INJURY IF IT FELL.



CAUTION: WHEN ASSEMBLING DISC, USE ALIGNING PUNCH TO LINE UP HOLES. KEEP FINGERS OUT OF HOLES.

28. See Fig. 26. Fasten one (1) 4" x 24" (101.6mm x 609.6mm) lift cylinder, arrow 1, to main frame and rockshaft arm. Attach barrel end of cylinder to lug, arrow 2, Position cylinder so ports face L.H.S. Attach shaft end of cylinder to rockshaft arm, arrow 3. Fasten each end of cylinder with one (1) 1-1/4" x 4-3/4" (31.8mm x 120.7mm) pin. Secure cylinder pins with two (2) 5/16" x 2" (7.94mm x 50.8mm) cotter pins.
29. See Fig. 26. Fasten one (1) 3-1/2" x 24" (88.9mm x 609.6mm) rockshaft cylinder, arrow 4, to L.H. wing frame and rockshaft arm. Attach barrel end of cylinder to 1-1/4" x 8" (31.8mm x 203.2mm) I-Bolt, arrow 5. Position cylinder so ports face up. Attach shaft end of cylinder to rockshaft arm, arrow 6. Fasten each end of cylinder with one (1) 1-1/4" x 4-3/4" (31.8mm x 120.7mm) pin. Secure cylinder with two (2) 5/16" x 2" (7.94mm x 50.8mm) cotter pins.
30. See Fig. 26. Fasten one 3" x 24" (76.2mm x 609.6mm) rockshaft cylinder, arrow 7, to R.H. wing frame and rockshaft arm. Attach barrel end of cylinder to 1-1/4" x 8" (31.8mm x 203.2mm) I-Bolt, arrow 8. Position cylinder so ports face up. Attach shaft end of cylinder to rockshaft arm, arrow 9. Fasten each end of cylinder with one (1) 1-1/4" x 4-3/4" (31.8mm x 120.7mm) pin. Secure cylinder pins with two (2) 5/16" x 2" (7.94mm x 50.8mm) cotter pins.
31. See Fig. 26. Fasten two (2) 5" x 36" (120.7mm x 914.4mm) wing lift cylinders, arrows 10 and 11, to each side of lug, arrow 12, at rear of main frame. Position each cylinder so ports face towards front of disc. Fasten barrel end to each cylinder with one (1) 1-1/4" x 4-3/4" (31.8mm x 120.7mm) pin. Secure each pin with two (2) 5/16" x 2" (7.94mm x 50.8mm) cotter pins. Do not attach shaft ends at this time.



WARNING: DO NOT STAND UNDER WING WHILE WING IS BEING RAISED OR LOWERED. IF ANY COMPONENT SHOULD FAIL, OR IF HYDRAULIC LEVER SHOULD ACCIDENTALLY BE OPERATED, WING COULD DROP.



CAUTION: WING WILL FREE FALL IF WING CYLINDERS ARE NOT FULL OF OIL, CAUSING SERIOUS DAMAGE.



CAUTION: WHEN TRANSPORTING DISC, ALWAYS PLACE HYDRAULIC LOCK UP VALVES IN "CLOSED" POSITION. IF HYDRAULIC LEVER WAS ACCIDENTALLY OPERATED, DISC COULD DROP OR WINGS COULD FALL.

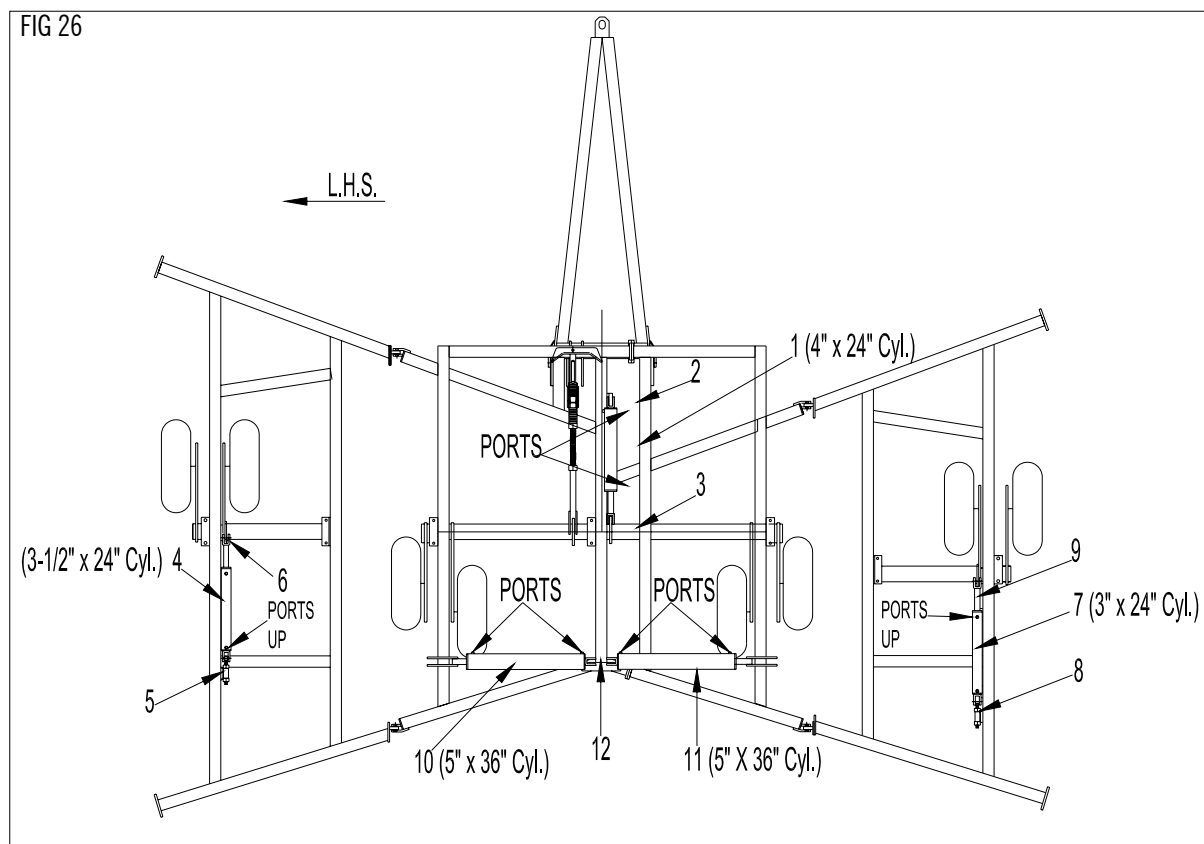
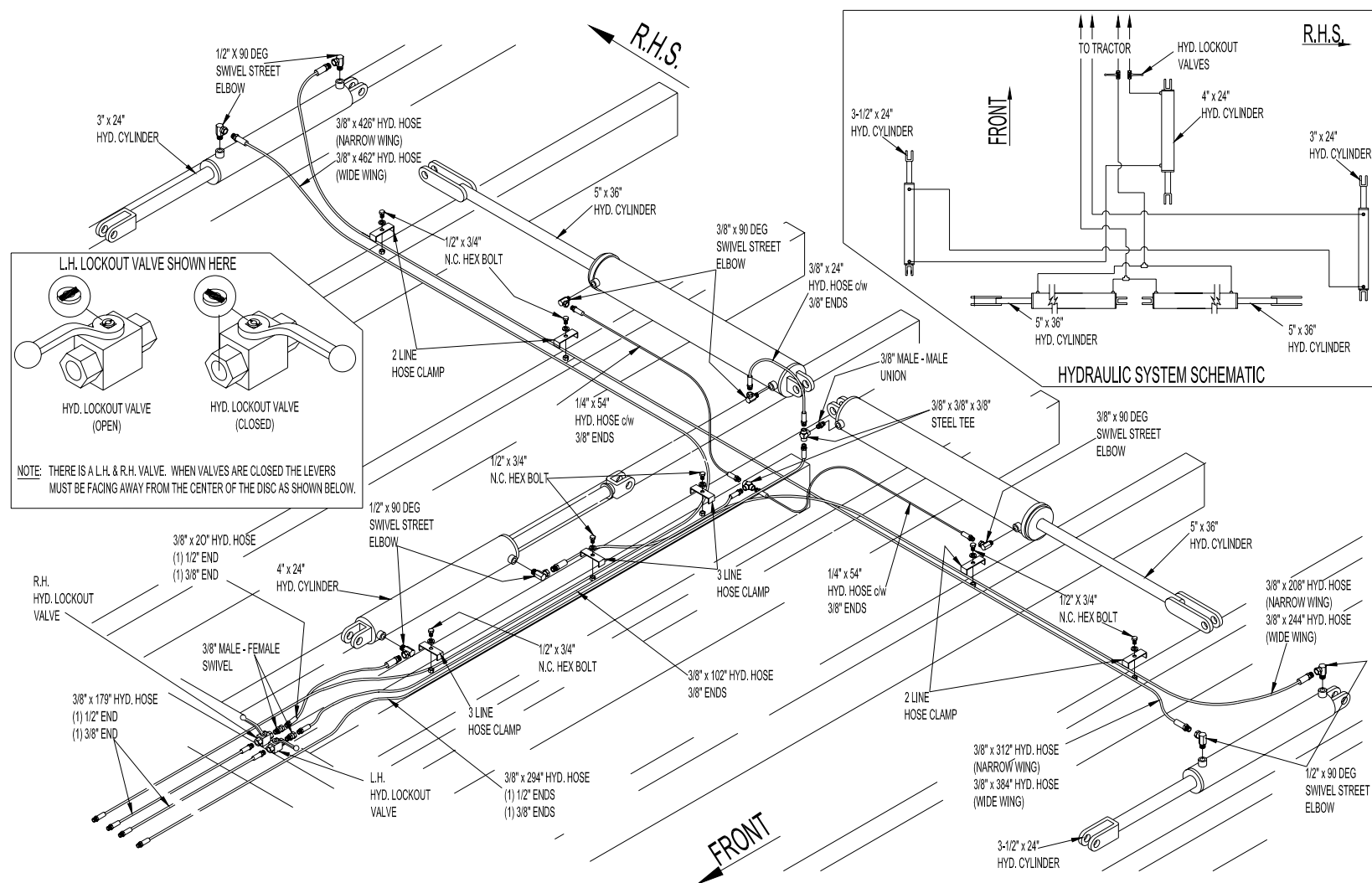
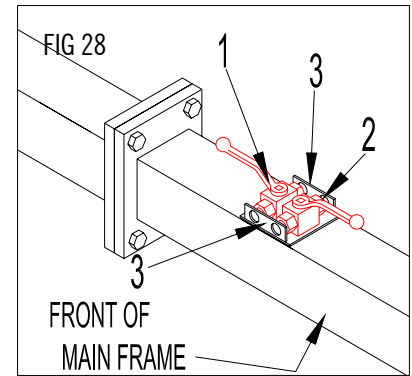


FIG. 27.



32. See Fig. 28. Place two (2) hydraulic lockup valves, arrows 1 and 2, between brackets, arrow 3, welded to front center of main frame. Each valve is held in place with incoming hoses.



33. ATTACHING HYDRAULIC HOSES TO ROCKSHAFT CYLINDERS AND WING CYLINDERS - See Fig. 19.

IMPORTANT: Do not use teflon tape to seal hydraulic hoses and fittings. If pieces of tape get into the hydraulic system they may plug small orifices.

NOTE: To determine if your machine has a narrow or wide wing frame see Specifications Chart on Page 5.

NOTE: To ensure that the hydraulic system does not leak, seal fittings and hoses with sealing liquid.

- a) See Fig. 27. Install one (1) 1/2" (12.7mm) x 90 degree swivel street elbow, into the shaft end port of the 3" x 24" (76.2mm x 609.6mm) cylinder on R.H. wing. Connect one (1) 3/8" x 426" (9.53mm x 10820mm) hydraulic hose to the 1/2" (12.7mm) x 90 degree swivel street elbow. Narrow wing machines use a 3/8" x 426" (9.53mm x 10820mm) hose and wide wing machines use 3/8" x 462" (9.53mm x 11735mm) hose. Then run the hose across the wing frame to the center of the main frame, and to front of hitch.
- b) See Fig. 27. Install one (1) 1/2" (12.7mm) x 90 degree swivel street elbow in shaft end port of the 3-1/2" x 24" (88.9mm x 609.6mm) cylinder on L.H. wing. Install one (1) 1/2" (12.7mm) x 90 degree swivel street elbow, in the barrel end port of the 3" x 24" (76.2mm x 609.6mm) cylinder on L.H. wing. Connect one (1) hydraulic hose, to swivel elbow, on R.H. cylinder. Narrow wing machines use a 3/8" x 312" (9.53mm x 7925mm) hose and wide wing machines use 3/8" x 384" (9.53mm x 9754mm) hose. Next, run hose across frame to the 1/2" (12.7mm) x 90 degree swivel elbow on L.H. cylinder.
- c) See Fig. 27. Install one (1) 1/2" (12.7mm) x 90 degree swivel street elbow to barrel end port of the 3-1/2" x 24" (88.9mm x 609.6mm) cylinder on L.H. wing. Install one (1) 1/2" (12.7mm) x 90 degree swivel street elbow to shaft end port of 4" x 24" (101.6mm x 609.6mm) cylinder on main frame. Connect one (1) hydraulic hose, to swivel elbow, on main frame cylinder. Narrow wing machines use a 3/8" x 208" (9.53mm x 5283mm) hose and wide wing machines use 3/8" x 294" (9.53mm x 7468mm) hose. Next run same hose across frame to the 1/2" (12.7mm) x 90 degree swivel elbow on the 3-1/2" x 24" (88.9mm x 609.6mm) wing rockshaft cylinder.
- d) See Fig. 27. Install one (1) 1/2" (12.7mm) x 90 degree swivel street elbow to barrel end port of 4" x 24" (101.6mm x 609.6mm) cylinder on main frame. Connect one (1) 3/8" x 20" (9.53mm x 508mm) hydraulic hose, to rear port of R.H. lock-up, with one (1) 3/8" (9.53mm) male-female swivel. Next connect same hose to 1/2" (12.7mm) x 90 degree swivel elbow on front port of main frame cylinder.
- e) See Fig. 27. Install one (1) 3/8" (9.53mm) male x 3/8" (9.53mm) male union, in the barrel end port of the 5" x 36" (127mm x 914.4mm) L.H. wing lift cylinder. Then install one (1) 3/8" x 3/8" x 3/8" (9.53mm) tee, to the 3/8" (9.53mm) union. Install one (1) 3/8" (9.53mm) x 90 degree street elbow into the shaft end of the 5" x 36" (127mm x 914.4mm) L.H. wing lift cylinder.
- f) See Fig. 27. Install one (1) 3/8" (9.53mm) x 90 degree swivel street elbow into barrel end port of the 5" x 36" (127mm x 914.4mm) R.H. wing lift cylinder. Install one (1) 3/8" (9.53mm) x 90 degree street elbow into the shaft end port of same cylinder.
- g) See Fig. 27. Install one (1) 1/4" x 54" (6.35mm x 1372mm) hydraulic hose to the shaft end port of the 5" x 36" (127mm x 914.4mm) L.H. wing lift cylinder and fasten opposite end to one (1) 3/8" x 3/8" x 3/8" (9.53mm) tee. Fasten one (1) 1/4" x 54" (6.35mm x 1372mm) hydraulic hose to the shaft end port of the 5" x 36" (127mm x 914.4mm) R.H. wing lift cylinder and fasten opposite end to same 3/8" x 3/8" x 3/8" (9.53mm) tee.
- h) See Fig. 27. Install one (1) 3/8" x 24" (9.53mm x 609.6mm) hydraulic hose, to the barrel end port of the L.H. 5" x 36" (127mm x 914.4mm) wing lift cylinder and fasten opposite end to the barrel end port of the R.H. 5" x 36" (127mm x 914.4mm) wing lift cylinder.

- i) See Fig. 27. Install one (1) 3/8" male x 3/8" (9.53mm) female swivel adapter, in to the L.H. lockup valve. Fasten one (1) 3/8" x 102" (9.53mm x 2591mm) hydraulic hose in 3/8" (9.53mm) tee. Fasten opposite end of same hose to the 3/8" male x 3/8" (9.53mm) female swivel adapter in lockup valve.
- j) See Fig. 27. Install two (2) 3/8" x 179" (9.53mm x 4547mm) hydraulic hoses to the front port of hydraulic lockup valves, and run hoses to front of hitch.
- k) See Fig. 27. Install one (1) 3/8" x 294" (9.53mm x 7468mm) hydraulic hose, from the 3/8" tee, to front of disc.

34. **SECURING HYDRAULIC HOSES TO FRAME** - See Fig. 27

Fasten hoses to frame with one U-shaped hose clamp at each hose hold down point. Each hold down point has a 1/2" (12.7mm) hex. nut welded to the top of frame. The hold down clips are supplied in two widths, one for two hoses and the other for three hoses. Place hose clamp over hoses and fasten clamp to weld-on nut with one 1/2" x 3/4" (12.7mm x 19.1mm) bolt.

35. **HOW MAIN LIFT HYDRAULIC SYSTEM WORKS** - See Fig. 27

When raising the disc, oil is pumped into the barrel end port of center frame cylinder causing the cylinder to extend. Oil is then forced from the shaft end port of same cylinder into the barrel end port of the 3-1/2" x 24" (88.9mm x 610mm) cylinder on L.H. side causing wing cylinder to extend. Oil is then forced from the shaft end port of the 3-1/2" x 24" (88.9mm x 610mm) cylinder into the piston end port of the 3" x 24" (76.2mm x 610mm) wing cylinder on R.H.S. causing wing cylinders to extend. The oil from shaft end port of the 3" x 24" (76.2mm x 610mm) cylinder on R.H. S. is returned to the tractor.

When lowering the disc, oil flows from tractor to shaft end port of the 3" x 24" (76.2mm x 610mm) wing cylinder, causing wing cylinder to contract. Oil forced from piston end port of the 3" x 24" (76.2mm x 610mm) wing cylinder flows to shaft end port of L.H. 3-1/2" x 24" (88.9mm x 610mm) cylinder, causing cylinder to contract. The oil forced from the piston end port of the L.H. 3-1/2" x 24" (88.9mm x 610mm) wing cylinder flows to shaft end port of main frame 4" x 24" (101.6mm x 610mm) cylinder causing cylinder to contract. The oil from piston end port of the 4" x 24" (101.6mm x 610mm) cylinder is returned to the tractor.

NOTE: Lockup valve must be open to allow oil flow to and from lift cylinders.

All cylinders extend and contract at the same rate because the amount of oil flowing between the shaft end ports and the piston end ports is equal in volume. For example, the 4" x 24" (101.6mm x 610mm) main frame cylinder has a 2" (50.8mm) diameter piston shaft which displaces enough oil from the shaft side to fully extend the 3-1/2" x 24" (88.9mm x 610mm) L.H. wing cylinder. The same method is used between the 3-1/2" x 24" (88.9mm x 610mm) L.H. wing cylinder and the 3" x 24" (76.2mm x 610mm) R.H. wing cylinder.

Each lift (rockshaft) cylinder contains a by-pass to allow oil to flow past piston when each cylinder is fully extended. If all cylinders are not fully extended when disc is raised, continue to pump oil into lift cylinders until all cylinders are fully extended.

36. **FILLING HYDRAULIC CYLINDERS WITH OIL** - See Fig. 27

NOTE: *Before filling cylinders with oil, remove clevis pins from shaft end of each lift cylinder so that the cylinders may be extended and contracted **WITHOUT ACTUATING** rockshaft. Also place blocks under each hydraulic cylinder so shafts do not strike disc component when cylinders are extended.*

- A) **LIFT CYLINDERS-** To fill rockshaft cylinders with oil remove depth control stops to allow cylinders to work full length of stroke. Next, pump oil into the cylinders, extending cylinders. Hold hydraulic lever for (3) minutes allowing all cylinders to fully extend. Next, fully retract all cylinders then fully extend them and hold hydraulic level another (3) minutes. This procedure will purge air from all cylinders and fully synchronize them. Attach shaft end of each cylinder to rockshaft arm with one (1) 1-1/4" x 4-3/4" (31.7 mm x 121 mm) pin. Secure each pin with two (2) 5/16" x 1-3/4" (7.57 mm x 44.4 mm) cotter pins.
- B) **WING LIFT CYLINDER-** Pump oil in each direction into wing lift cylinders. After cylinders are **completely filled** with oil, fully extend them and fasten shaft end of each cylinder to wing lift bracket bolted to wings. Place clevis of cylinder shaft between two lugs which have slotted holes. Secure each cylinder shaft to slotted holes with one (1) 1-1/4" x 6" (31.8mm x 152.4mm) pin. Place one (1) 1-5/16" (33.3mm) I.D. flatwasher over pin on outside of cylinder lug. Secure each pin with one (1) 5/16" x 2" (7.94mm x 50.8mm) cotter pins.



CAUTION: DO NOT DISCONNECT HYDRAULICALLY OPERATING COMPONENTS WHEN THERE IS PRESSURE WITHIN THOSE COMPONENTS. HYDRAULIC COMPONENTS UNDER PRESSURE MAY CAUSE PARTS AND HYDRAULIC FLUID TO FLY OUT AT A HIGH VELOCITY WHICH COULD CAUSE SERIOUS INJURY.



CAUTION: HYDRAULIC OIL ESCAPING UNDER PRESSURE HAS SUFFICIENT FORCE TO CAUSE SERIOUS INJURY. IF INJURED BY ESCAPING FLUID, OBTAIN MEDICAL TREATMENT IMMEDIATELY.

CHECK HYDRAULIC HOSES PERIODICALLY FOR SIGNS OF RUPTURE AND LEAKS. USE A CARDBOARD BACKSTOP TO CHECK FOR ESCAPING HIGH PRESSURE OR HOT FLUID.



CAUTION: WINGS WILL FREE FALL IF WING LIFT CYLINDERS ARE NOT FULL OF OIL, CAUSING SERIOUS DAMAGE.



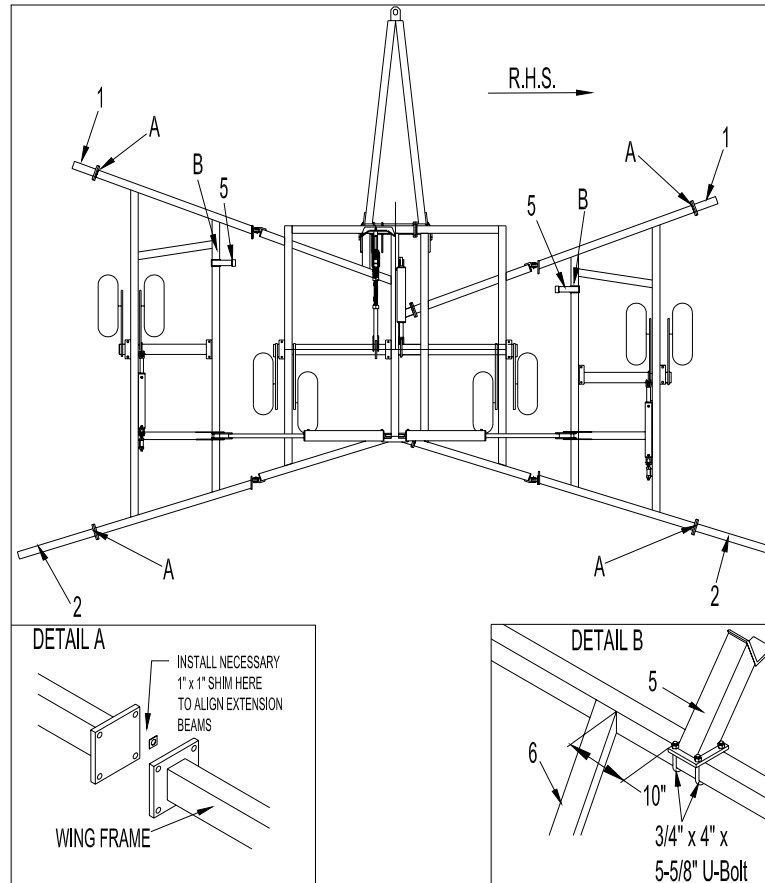
WARNING: TO ASSEMBLE BALANCE OF DISC, EXTEND MAIN LIFT CYLINDERS RAISING FRAME. BE SURE MAIN LIFT CYLINDERS ARE COMPLETELY FILLED WITH OIL. NEXT PLACE ADEQUATE SUPPORT UNDER CENTER FRAME AND EACH WING FRAME.

DO NOT USE LOCK OUT VALVE AS SAFETY DEVICE TO PREVENT FRAME FROM FALLING. IF ANY HYDRAULIC COMPONENT FAILED DISC COULD DROP CAUSING SERIOUS INJURY OR DEATH TO PERSON(S) NEARBY.



WARNING: DO NOT STAND UNDER WINGS WHILE WINGS ARE BEING RAISED OR LOWERED. IF ANY COMPONENTS OF HYDRAULIC SYSTEM SHOULD FAIL OR IF HYDRAULIC LEVER SHOULD ACCIDENTALLY BE OPERATED, WINGS COULD DROP.

FIG 28



37. **ATTACHING GANG BEAM EXTENSIONS** - See Fig. 28.

NOTE: See gang beam chart on Page 38 to determine length of gang beam extensions for the size of your disc.

- A) FRONT WING: Attach front gang beam extension, arrow 1, to attaching plates that are welded to each wing frame. Fasten with four (4) 3/4" x 2-1/2" (19mm x 254mm) hex bolts c/w nuts and lockwashers. Tighten bolts.
- B) REAR WING: Attach rear gang beam extension, arrow 2, to attaching plates that are welded to each wing frame. Fasten with four (4) 3/4" x 2-1/2" (19mm x 254mm) hex bolts c/w nuts and lockwashers. Tighten bolts.

NOTE: Use necessary 1" x 1" (25.4mm x 25.4mm) shim plates to align and level each beam extension. See Fig. 20, Detail A.



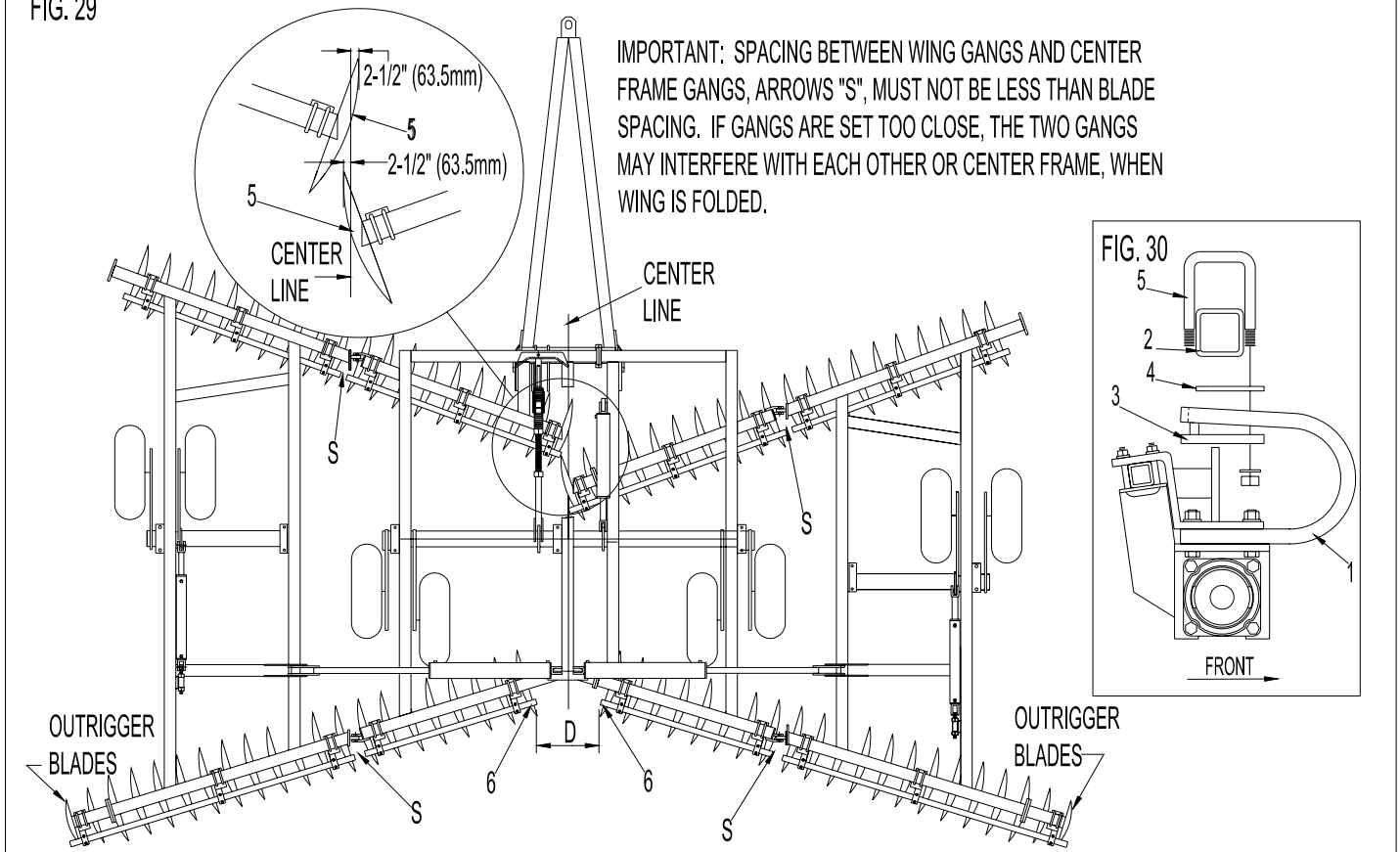
CAUTION: TO PREVENT SERIOUS INJURY OR DEATH FROM FALLING FRAMES, ALWAYS PLACE ADEQUATE SUPPORTS UNDER ALL THREE FRAMES.

38. **INSTALLING FRONT WING SUPPORTS - WIDE WING DISCS ONLY**- See Fig.28

NOTE: See Specifications on Page 5 to determine if your disc uses a wide wing frame.

Attach one (1) front wing support, arrow 5, to each wing frame with two (2) 3/4" x 4" x 5-5/8" (19.1mm x 101.6mm x 142.9mm) U-bolts c/w nuts and lockwashers. Locate attaching plate approximately 10" (254mm) from inside of front cross tube, arrow 6. Tighten U-bolts.

FIG. 29



39. ATTACHING GANG ASSEMBLIES - See Fig. 29

NOTE: See gang patterns on pages 39 to 45 to determine gang position for your disc.

- a) **REAR GANGS** - Roll rear gang assemblies in place under rear gang beams of main and wing frames. Position rear gangs so that the scrapers are at the rear. The gang assemblies with outrigger blades (small diameter blades) must be positioned at the outside. See Fig. 29 for the direction rear gangs face.

Attach bearing hangers to gang beams with two (2) U-bolts per bearing hanger. Leave U-bolts loose. If disc is equipped with optional stone flex bearing hangers, see Step "C" below to attach hangers.

- b) **FRONT GANGS** - Roll front gang assemblies in place under front gang beams of main and wing frames. Position gang assemblies so that the scrapers are at the rear. See Fig. 29 for the direction the front gangs face.

Attach bearing hangers to the gang beams with two (2) U-bolts per bearing hanger. Leave U-bolts loose. If disc is equipped with optional stone flex bearing hangers, see Step "C" below to attach hangers.

- c) See Fig. 30. **OPTIONAL STONE FLEX BEARING HANGER** - Fasten each stone flex hanger assembly, arrow 1, to bottom of gang beam, arrow 2, with one (1) backing plate, arrow 3, two (2) 3/4" x 4" x 7" (19 x 102 x 178mm) U-bolts and one (1) bearing plate, arrow 4. The bearing plate is placed between bottom of gang beam and top of spring shank. When installing U-bolts, be sure rear leg of each U-bolt is installed through a hole in bearing plate. Be sure the pin on backing plate, arrow 3, is inserted in slot of shank.

IMPORTANT: KEEP BEARING HANGER U-BOLTS TIGHT.

- d) See Fig. 29. Set front center frame gangs, so that the leading edge of inside blade, arrow 5, on rear gang is 2-1/2" (63.5mm) past center of disc frame (center line of center frame is shown in Fig. 29).

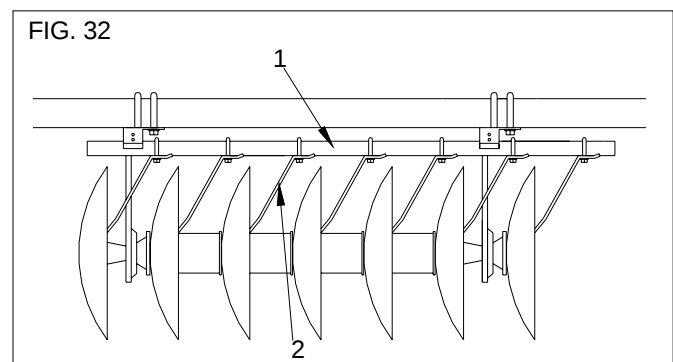
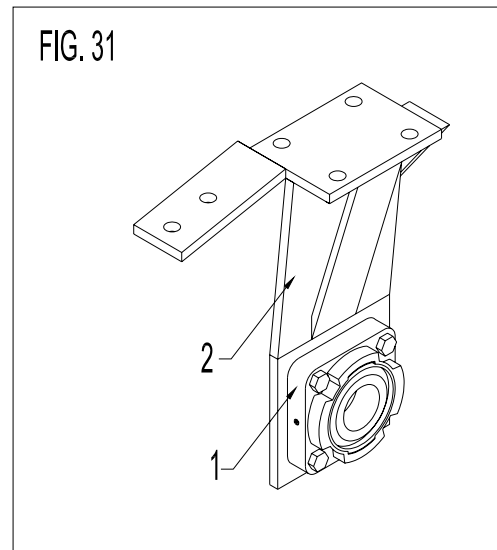
- e) See Fig. 29. Set rear center frame gangs, arrow 6, so that the distance between the rear edge of the two inside blades, dimension "D", is equal to 2" less than diameter of blade. For example, if your disc is equipped with 24" diameter blades, dimension "D" would be set at 22". Be sure rear gangs are centered on frame.
- f) See Fig. 29. Adjust spacing between each individual gang assembly. This spacing should be the same as the blade spacing of the gang assemblies.

IMPORTANT: Space between wing gangs and center frame gangs must not be less than blade spacing. If gangs are set too close the two gangs may interfere with each other when wings are folded.

- g) Before tightening bearing hanger U-bolts, loosen U-bolts which fasten scraper bar bearing hanger. Then check each bearing hanger to make sure hanger is sitting square under gang beam. Also, be sure hanger is not turned to one side. Tighten U-bolts. If your disc is equipped with solid bearing hanger, tighten U-bolts to 150 ft. Lbs (203.25 N.m). If your disc is equipped with stone flex hangers, tighten U-bolts to 260 ft. Lbs (352.3 N.m).

IMPORTANT: If bearing hangers are not sitting square before tightening U-Bolts, thrust will be built into the bearings and the life of the bearing will be shortened.

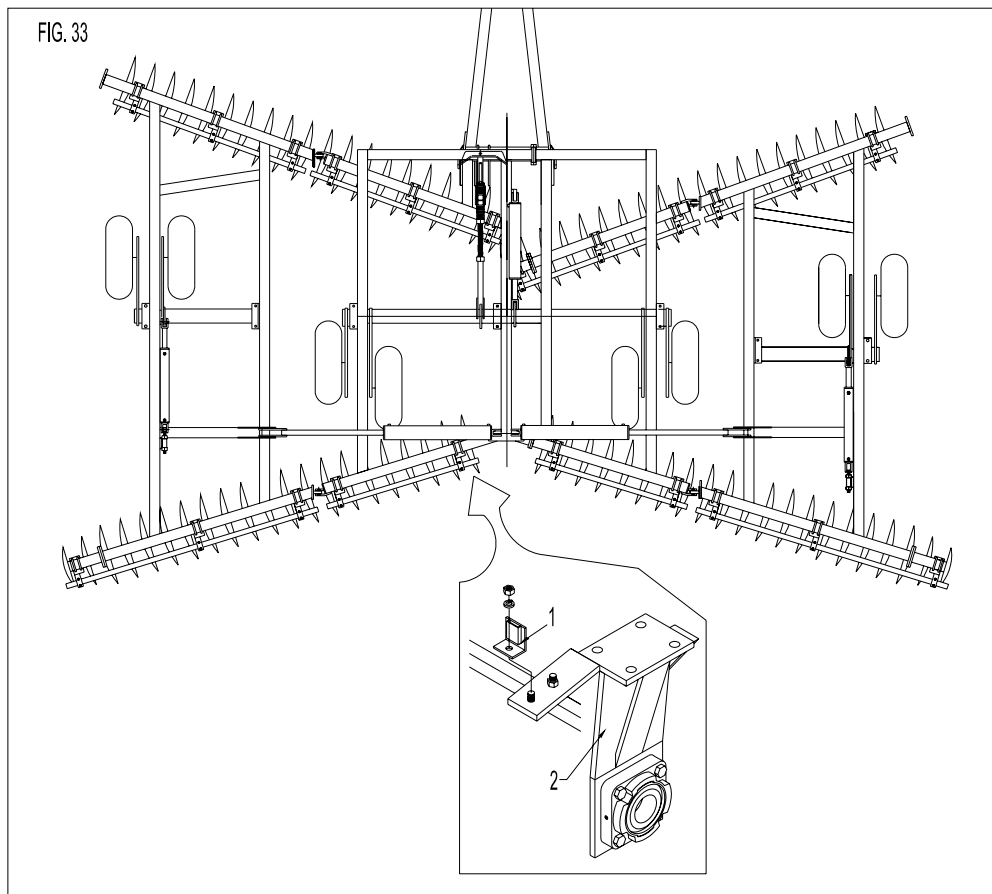
- 40. See Fig. 31. Loosen all the bolts, arrow 1, which fastens the bearings to the hangers, arrow 2. Then turn the disc blades to allow the bearings to align themselves. Next, tighten all the bolts. This will ensure proper bearing alignment, increasing bearing life.
- 41. **IMPORTANT:** WHEN RAISING WINGS FOR TRANSPORT FOR FIRST TIME AFTER ADJUSTING GANGS, RAISE WINGS SLOWLY MAKING SURE WING GANGS CLEAR CENTER FRAME GANGS.
- 42. See Fig. 32. Adjust scraper bar, arrow 1, and scrapers, arrow 2, of each gang so that each scraper blade is in contact with disc blade. Tighten U-bolts.



IMPORTANT: Disc will require less horse power to pull if scrapers are adjusted properly.



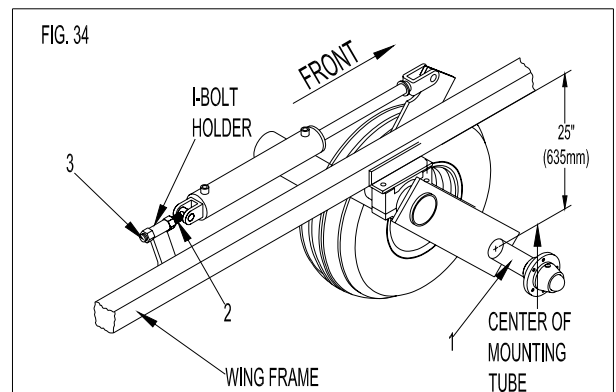
CAUTION: WHEN ATTACHING GANG ASSEMBLIES, WEAR PROTECTIVE GLOVES TO HELP PREVENT INJURY FROM CUTTING EDGES OF BLADES.



43. See Fig.33. Mount the SMV bracket, arrow 1, to the main frame's rear inside bearing hanger on the L.H. rear gang. Secure to the top of the scraper bar support with the same U-bolt used to fasten The scraper bar to the bearing hanger. Tighten nut.

44. See Fig. 34. Level wing frame with main frame as follows:

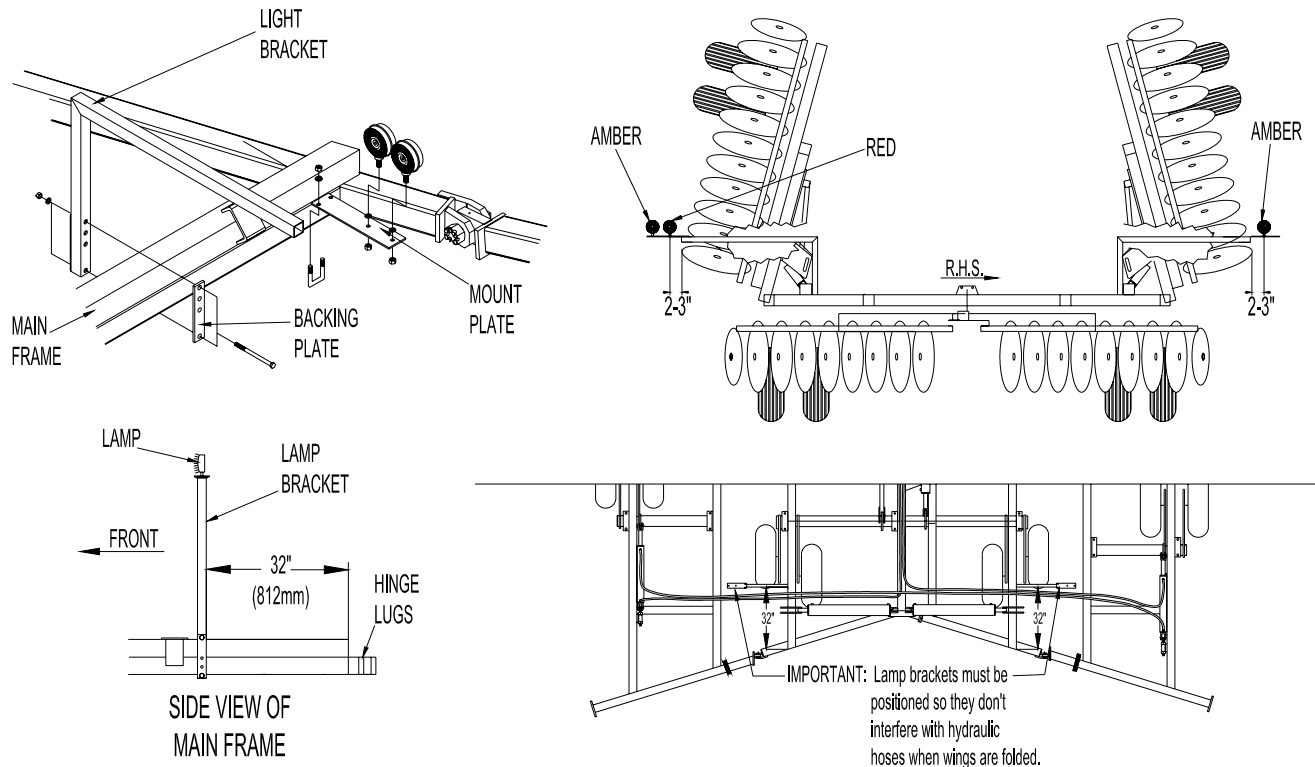
- 1) Raise disc by extending rockshaft cylinder. Be sure wing rockshaft cylinders are fully extended.
- 2) Check the distance the spindle mounting tube, arrow 1, (welded to bottom of rockshaft wheel leg) is from the bottom of each wing frame. This distance should be 25" (635mm).
- 3) If spindle mounting tube location is not correct, adjust length of wing cylinder, I-bolt, arrow 2.
- 4) After adjustment is complete, lock I-bolt by tightening front nut, arrow 3, against I-bolt holder.



NOTE: The above wheel leg setting is an initial setting only. If wing gangs do not cut at same depth as the main frame gangs, further wing cylinder adjustment will be required.

IMPORTANT: Be sure axis of barrel end pin is horizontal and cylinder points are facing up. If cylinder and I-bolt are not positioned properly, cylinder will not be free to pivot when activated causing serious damage.

FIG. 35



45. WARNING LIGHT KIT (OPTIONAL) - MOUNT INSTRUCTIONS - See FIG. 35.



WARNING: DO NOT STAND UNDER WINGS WHEN WORKING ON DISC. IF HYDRAULIC SYSTEM FAILED OR IF HYDRAULIC LEVER WAS ACCIDENTALLY OPERATED, WINGS MAY FALL RESULTING IN SERIOUS INJURY OR DEATH TO PERSON(S) NEAR DISC.

- A) With disc folded, install one lamp support bracket on each side of main frame. Locate each bracket on inside of double 4" x 4" (101.6mm x 101.6mm) tubes 32" (812mm) from rear of main frame. Fasten each support with two (2) 1/2" X 7-1/2" (12.7mm x 190.5mm) hex bolts c/w nuts and lockwashers and one (1) backing plate. **IMPORTANT:** Lamp brackets must be positioned as shown in ILL. 35 so they don't interfere with the hydraulic hoses when wings are folded.
- B) Fasten one (1) mount plate to top of each lamp support bracket with one (1) 1/2" x 2" x 3" (12.7mm x 50.8mm x 76.2mm) U-bolt c/w nuts and lockwasher. Do not tighten U-bolt at this time.
- C) Fasten one (1) amber lamp and one (1) red lamp to the L.H. mount plate. Position amber and red lamps so they face the rear with the amber lamp on the outside. Install lamps through 3/4" (19.1mm) holes in mount plate. Secure with nuts. Leave nuts loose on amber lamp so ring connector on wiring can be installed later.
- D) Fasten one (1) amber lamp to R.H. mount plate. Position so amber lamp faces rear. Install lamp through 3/4" (19.1mm) hole in mount plate. Secure with nuts.

IMPORTANT: Paragraphs "C" and "D" and Fig. 35 describe and show lamp positions for North American public roads. For other countries such as Australia, check local laws and regulations for required warning light mounting positions.

- E) Loosen U-bolt of each mount plate, then with disc folded for transport, position L.H. lamps so center of red lamp is 2 to 3" (50.8mm to 76.2mm) outside widest point of machine. Position R.H. amber lamp so it is 2 to 3" (50.8mm to 76.2mm) outside widest point of machine. Warning lamps must be visible from the front and the rear of the machine. Tighten mount plate U-bolts.

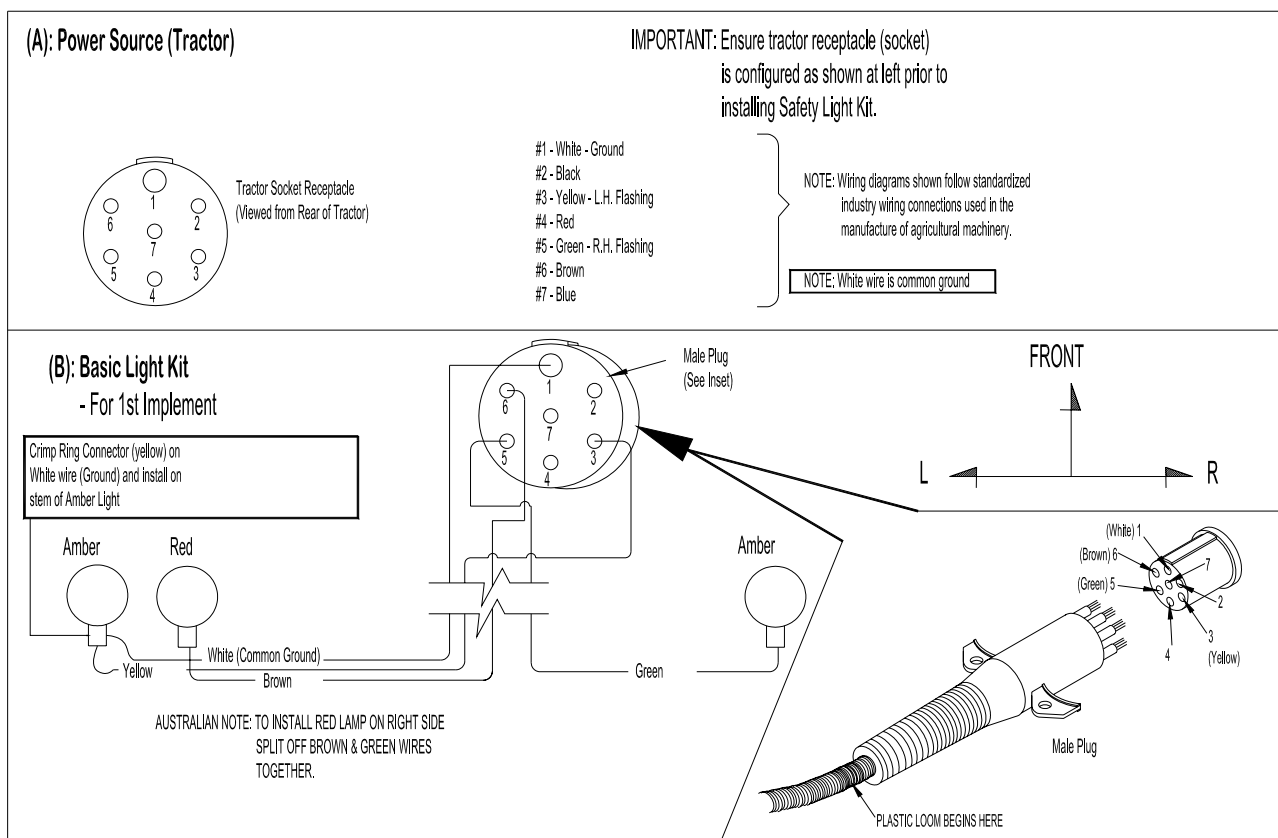


CAUTION: WHEN TRANSPORTING DISC OVER PUBLIC ROADS, USE THE SMV EMBLEM AND WARNING LIGHT FOR PROTECTION OF TRACTOR AND OTHER MOTOR VEHICLE OPERATORS. CHECK LOCAL LAWS FOR WIDTH AND HEIGHT MAXIMUMS.

F) INSTALL ELECTRICAL WIRING AS FOLLOWS:

- F1) See Fig. 36- Run four (4) wire cables (brown, white, yellow, and green) from tractor socket receptacle to rear of disc. Split off green wire and run it to the R.H. amber lamp. Next run white wire to amber lamp on L.H. side, then run yellow wire to L.H. amber lamp and run brown wire to red lamp on L.H. side. Strip wires and fasten ring connector to each wire. Install ring connector of each wire to threaded stem of each lamp.
- F2) Next, disassemble male plug, then insert all wires through spring end of male plug. Strip wires and insert each wire into specific terminal of outer half of male plug. Use Fig.36. to match wire color to proper terminal number. Reassemble both halves of male plug.
- F3) Insert male plug into tractor's socket receptacle. Activate warning light switch and check if all lamps are flashing.
- F4) **IMPORTANT:** Run wires along frame member. Do not run wires across open spaces. Wires that are run across open space will be damaged during discing operations by people working on the disc.
- F5) Install a 1/2" I.D. x 8' (12.7mm x 2.4m) long plastic loom over wires that run from male plug shown in Fig. 36. The plastic loom is installed by pushing the wires into the opening that runs the length of the loom.

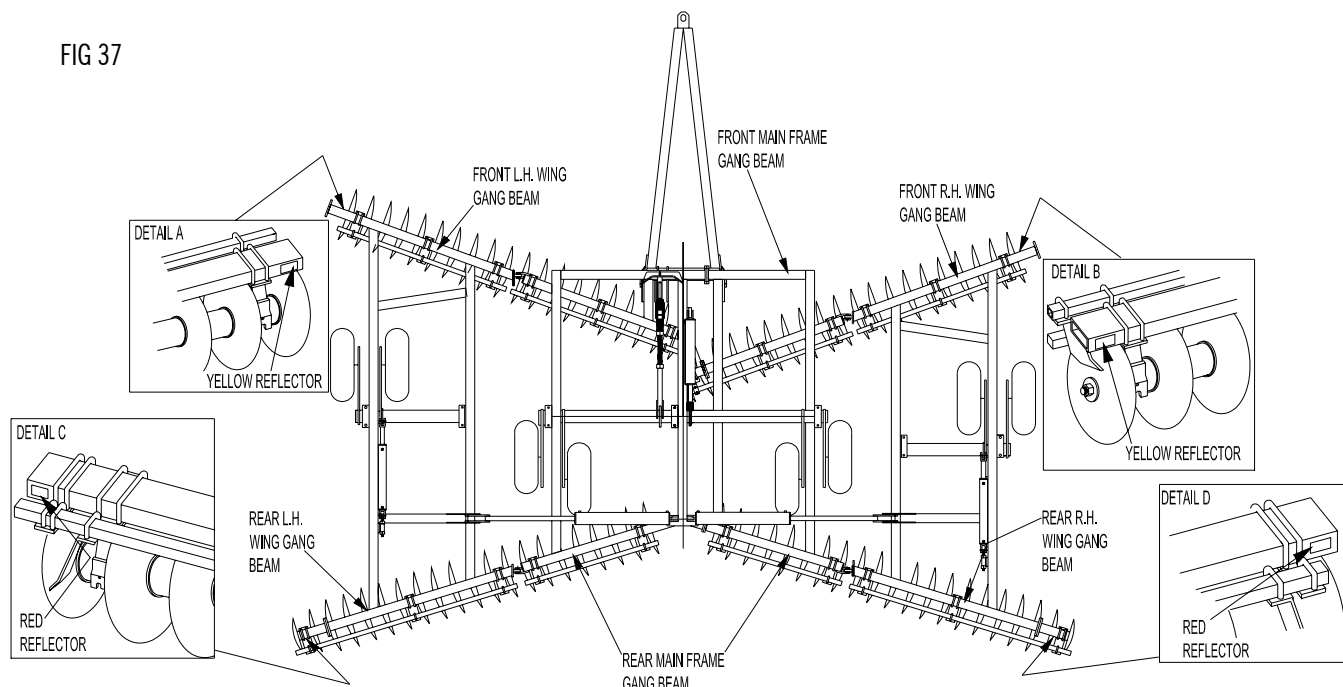
FIG 36



COMPONENTS: BASIC LIGHT KIT

- | | |
|--|---|
| 1 - 7 pin male plug c/w 55ft. (13.7m) 14/4" rib wire | 1- 8' (24.4m) 1/2" (12.7mm) plastic loom |
| 3 - Nylon connectors (closed end) | 1 - Ground Connector - ring type (7/16" - 1/2") (11.1mm - 12.7mm) |
| 2 - Lamps - amber both sides | 1 - Lamp - red one side |
| 10 - Cable ties | |

FIG 37



46. REFLECTOR DECAL INSTALLATION - See Fig 37.

Note: Before installing decals, clean the area they will be placed on.

- A) Place one (1) 2" x 9" (50.8mm x 228.6mm) red reflector decal on rear side of each rear gang beam. Locate decals approximately 1" (25.4mm) from end of gang beam. See detail "C" and "D".
- B) Place one 2" x 9" (50.8mm x 228.6mm) yellow reflector decal on front side of each front gang beam. Locate decals approximately 1" (25.4mm) from end of gang beam. See detail "A" and "B".

4590 GANG BEAM EXTENSION CHART

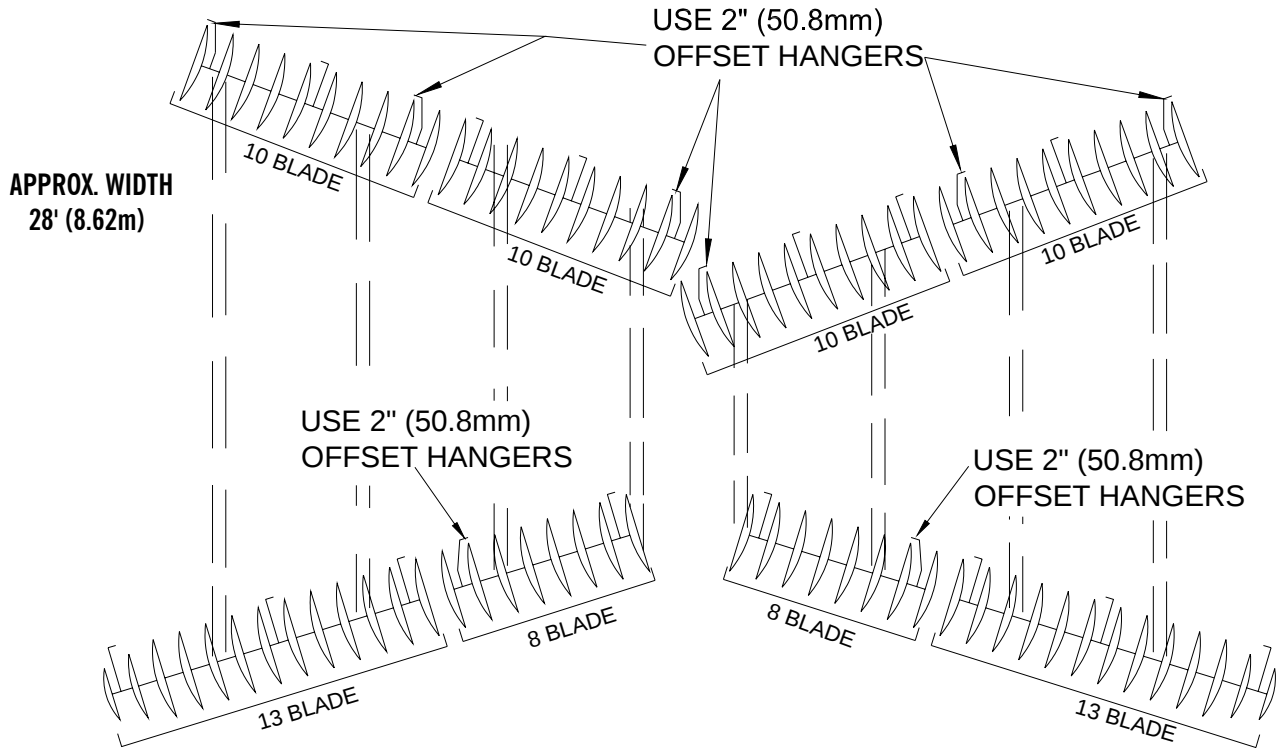
8" SPACING

DISC	FRONT EXTENSION	REAR EXTENSION
82B (Narrow Wing)	--	12" (304.8mm)
94B (Narrow Wing)	12" (304.8mm)	42" (1066.8mm)
106B (Wide Wing)	18" (457.2mm)	42" (1066.8mm)
114B (Wide Wing)	36" (914.4mm)	60" (1524mm)
122B (Wide Wing)	50" (1270mm)	78" (1981.2mm)

9" SPACING

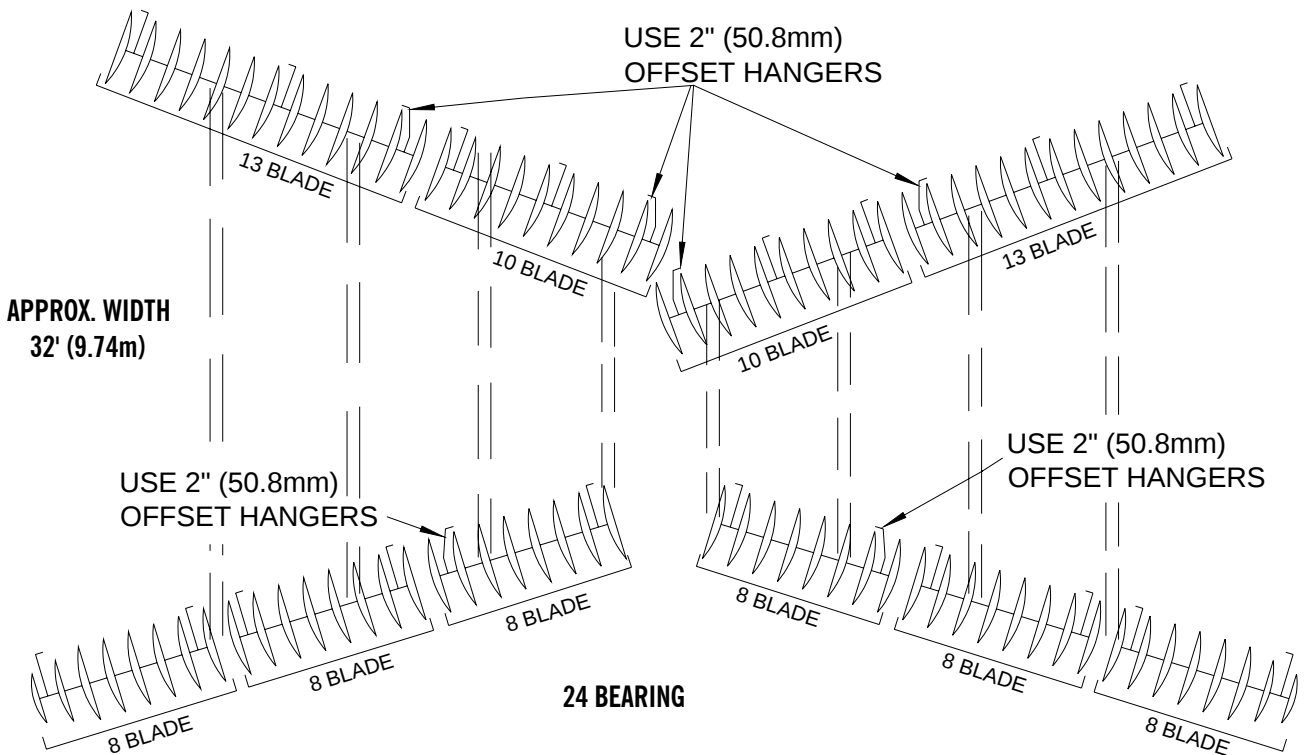
DISC	FRONT EXTENSION	REAR EXTENSION
74B (Narrow Wing)	--	16" (406.4mm)
86B (Narrow Wing)	16" (406.4mm)	42" (1066.8mm)
94B (Wide Wing)	16" (406.4mm)	42" (1066.8mm)
102B (Wide Wing)	36" (914.4mm)	60" (1524mm)
106B (Wide Wing)	42" (1066.8mm)	72" (1828.8mm)

MODEL 4590
DISC GANG PATTERN 8" SPACING
82 BLADE
FRONT



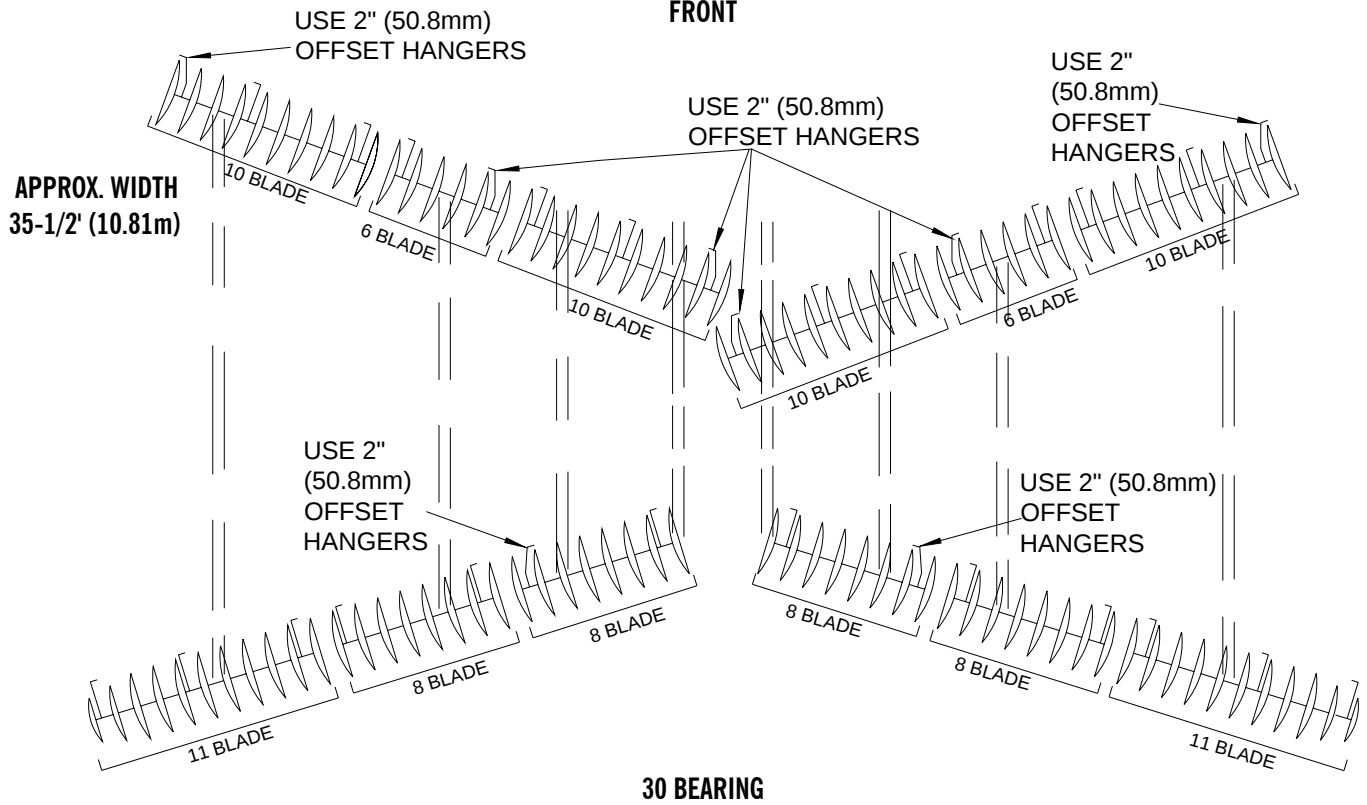
22 BEARING

MODEL 4590
DISC GANG PATTERN 8" SPACING
94 BLADE
FRONT

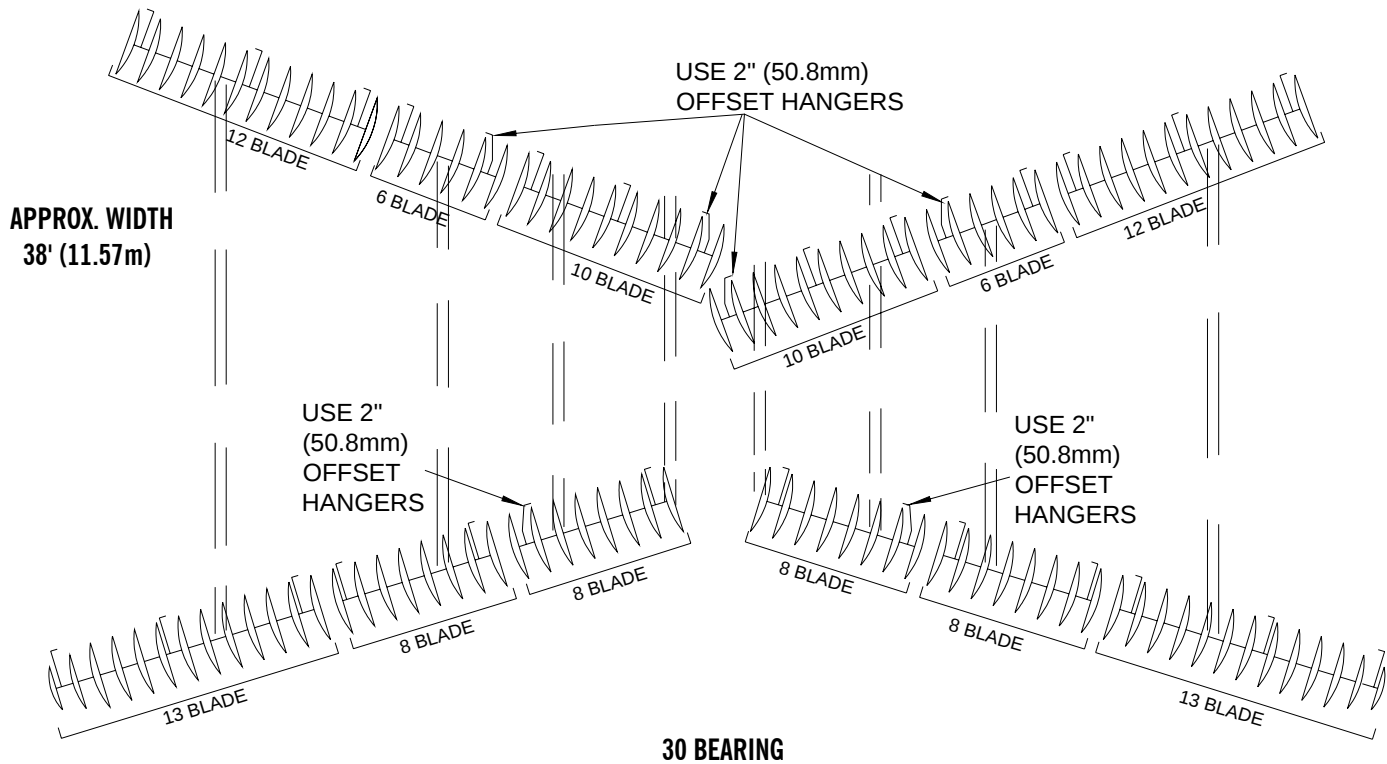


24 BEARING

**MODEL 4590
DISC GANG PATTERN 8" SPACING
106 BLADE
FRONT**

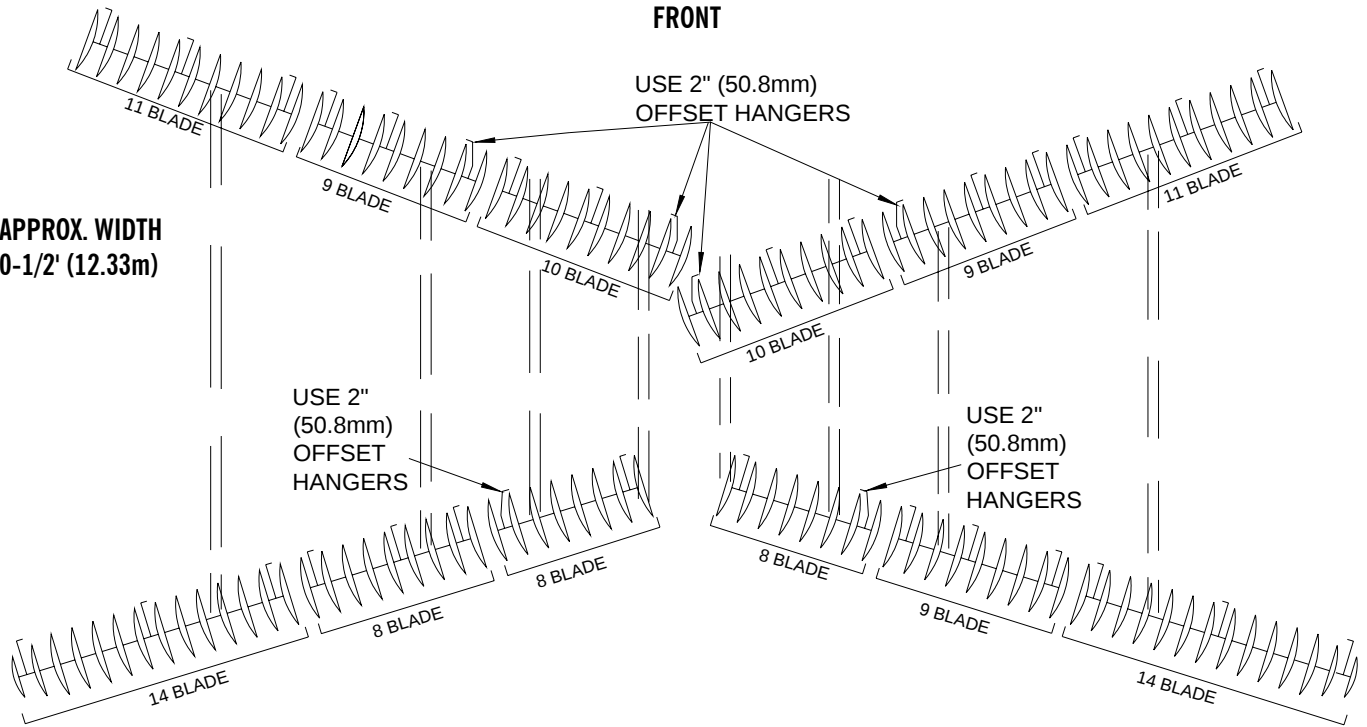


**MODEL 4590
DISC GANG PATTERN 8" SPACING
114 BLADE
FRONT**



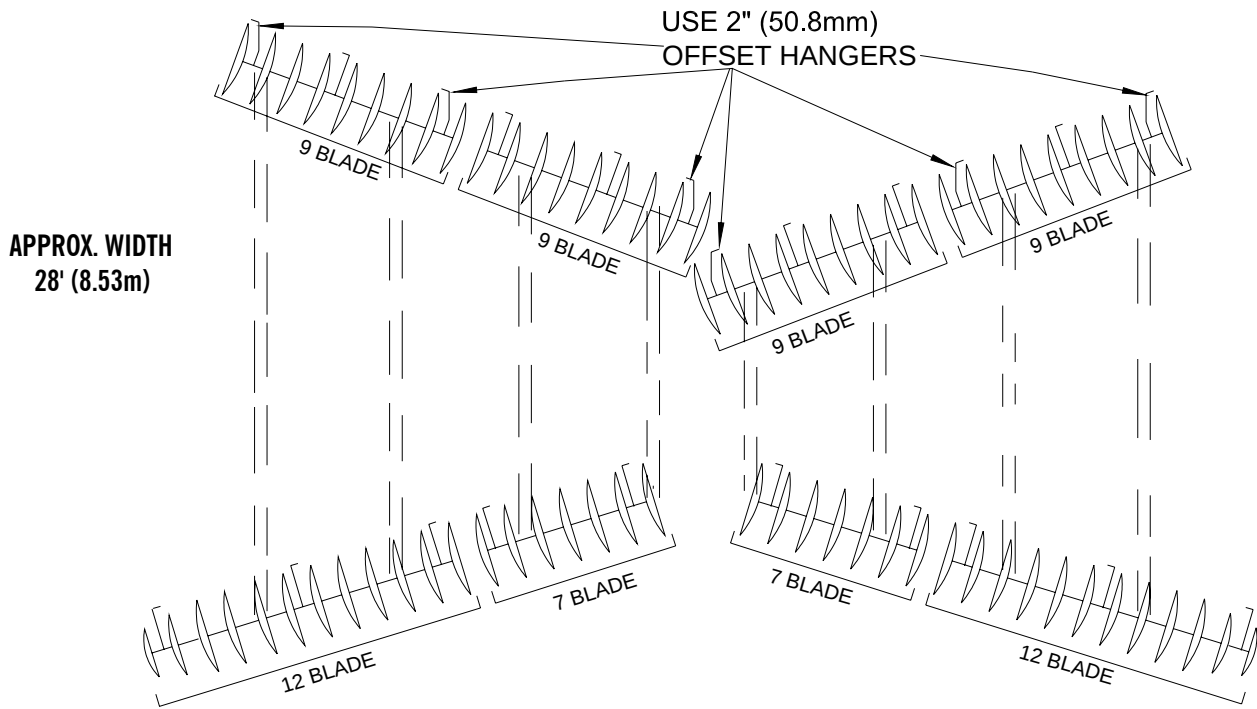
MODEL 4590
DISC GANG PATTERN 8" SPACING
122 BLADE
FRONT

APPROX. WIDTH
40-1/2' (12.33m)



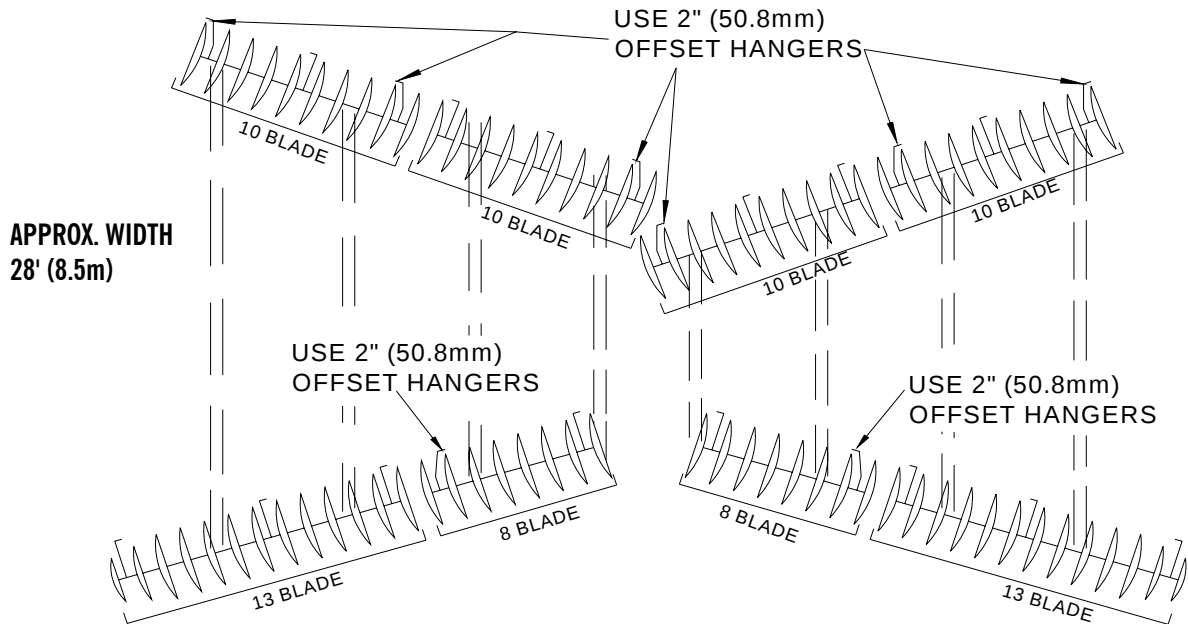
34 BEARING

MODEL 4590
DISC GANG PATTERN 9" SPACING
74 BLADE
FRONT



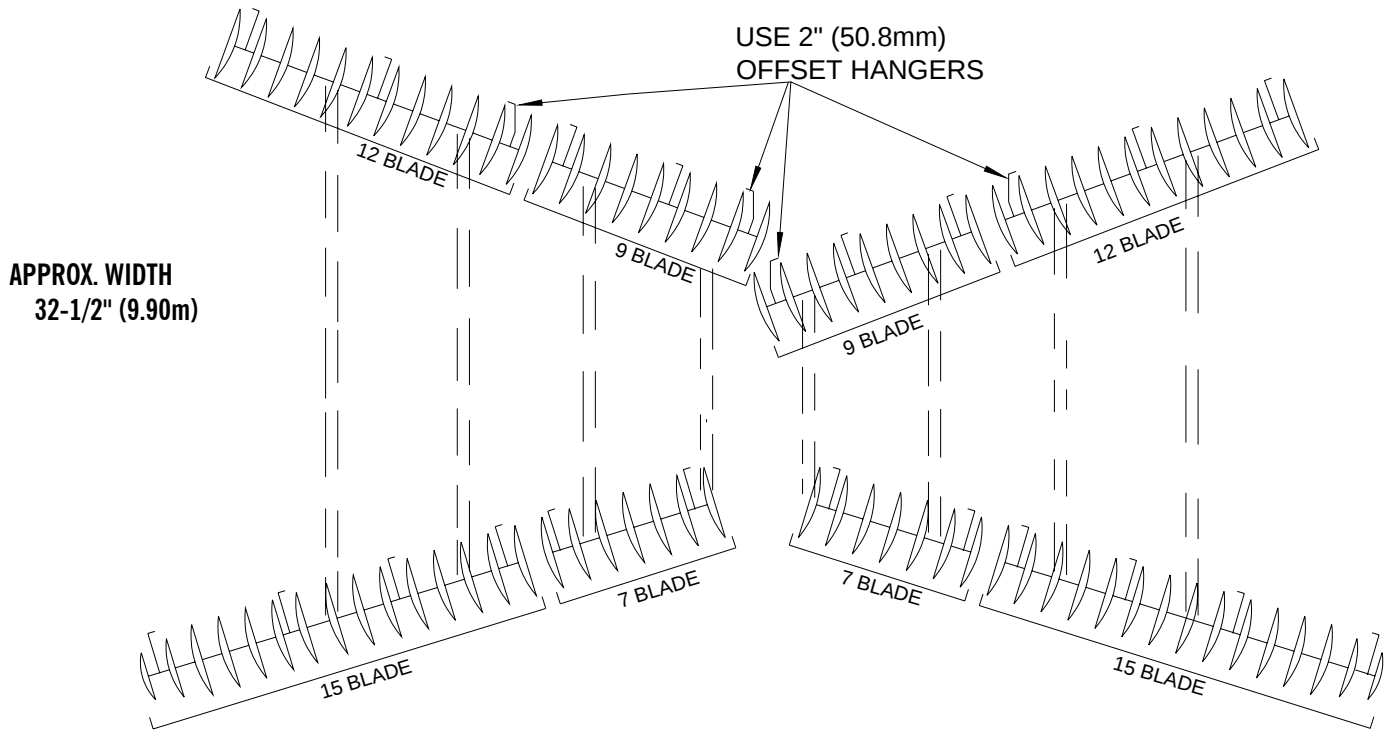
22 BEARING

MODEL 4590
DISC GANG PATTERN 9" SPACING
82 BLADE
FRONT



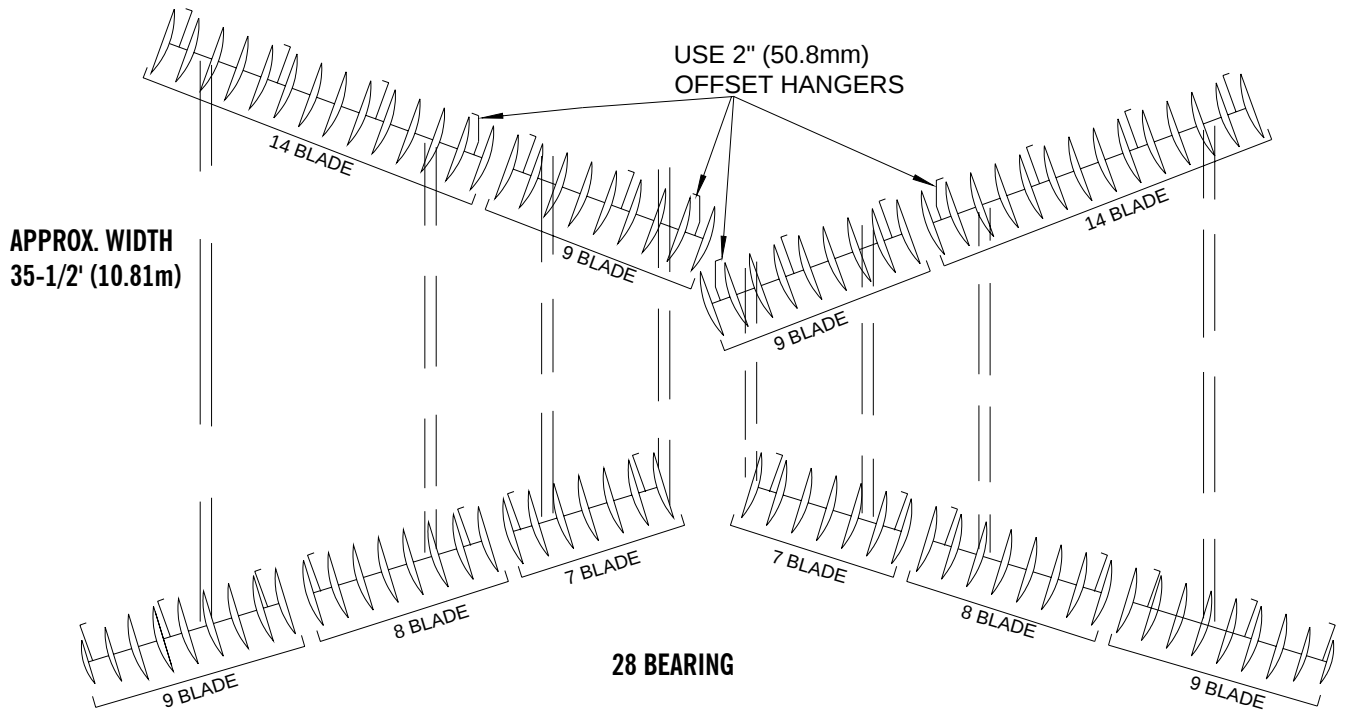
22 BEARING

MODEL 4590
DISC GANG PATTERN 9" SPACING
86 BLADE
FRONT



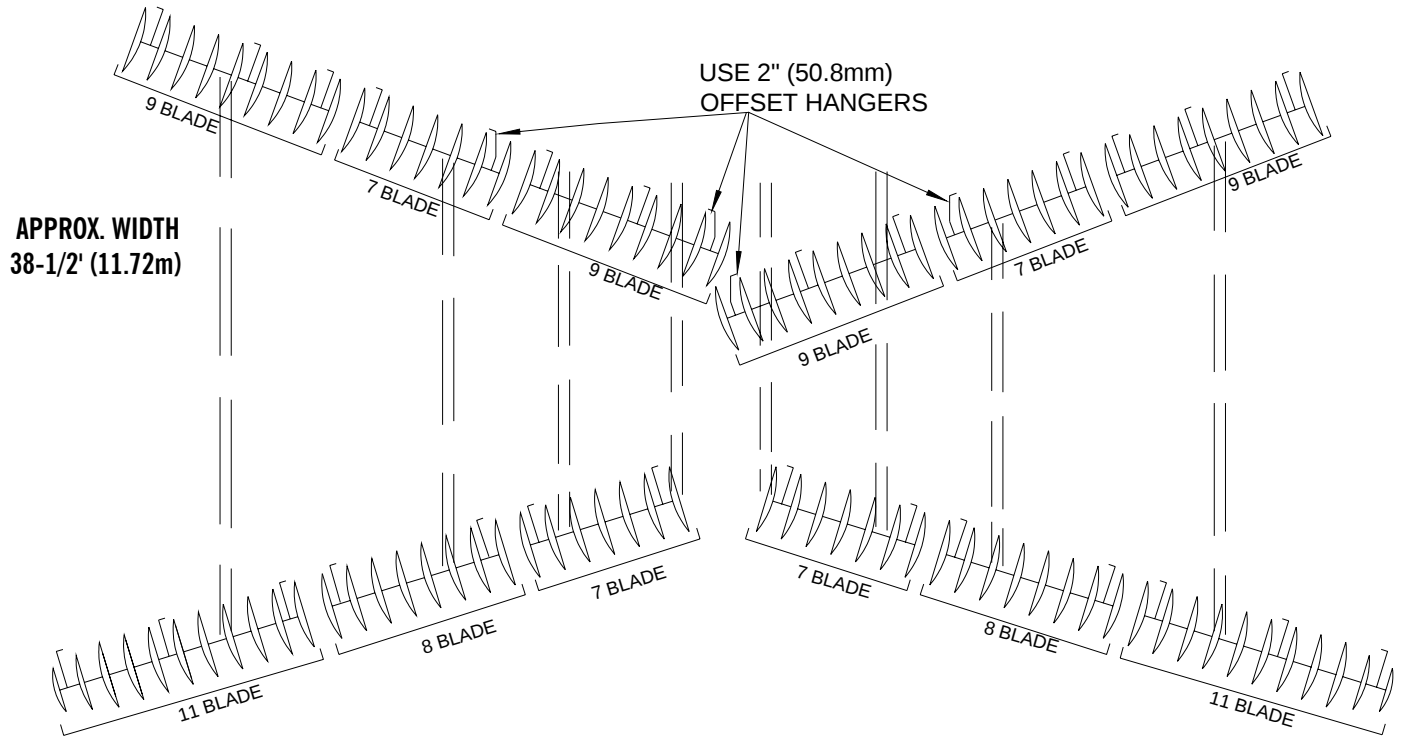
24 BEARING

MODEL 4590
DISC GANG PATTERN 9" SPACING
94 BLADE
FRONT



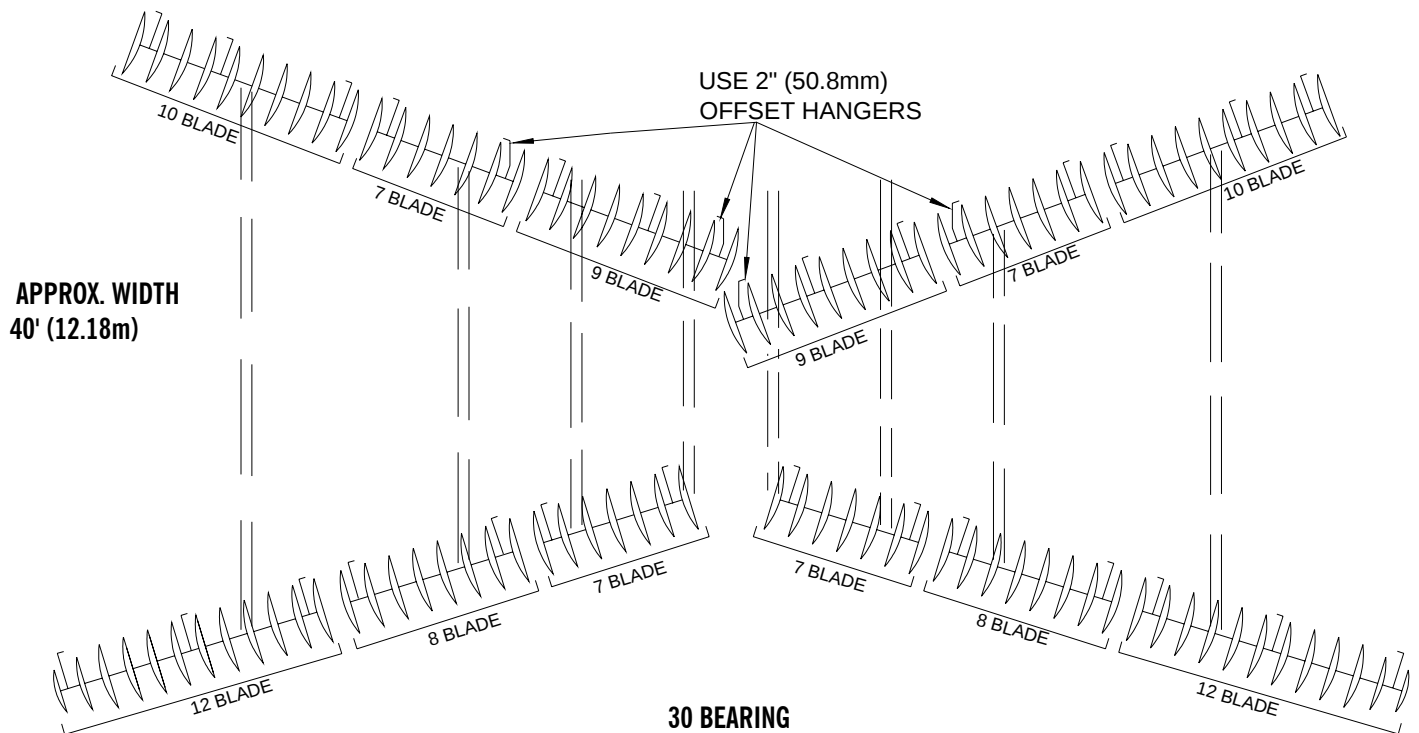
28 BEARING

MODEL 4590
DISC GANG PATTERN 9" SPACING
102 BLADE
FRONT



30 BEARING

MODEL 4590
DISC GANG PATTERN 9" SPACING
106 BLADE
FRONT



30 BEARING