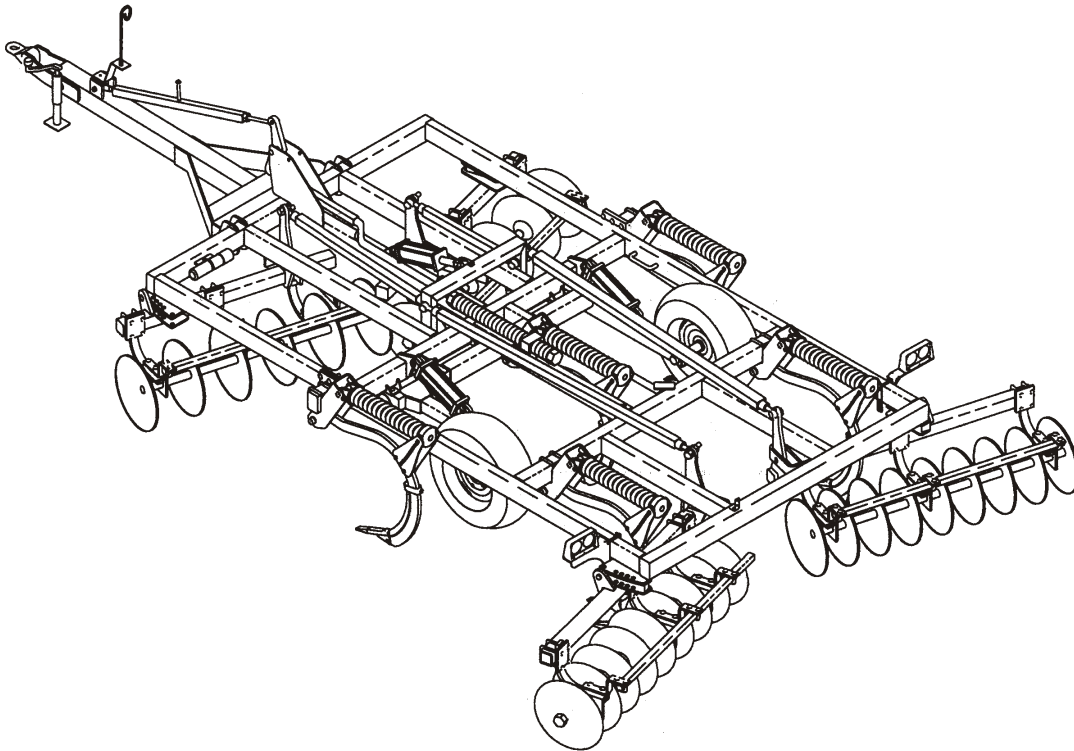




**MODEL 2220 SERIES
DISC CHISEL
OPERATOR'S MANUAL**



**1900 NORTH STREET
MARYSVILLE, KANSAS 66508
(785) 562-5381**

WARRANTY

MANUFACTURER'S GUARANTEE POLICY

LANDOLL CORPORATION WARRANTY

LANDOLL warrants each new and unused LANDOLL machine, when properly assembled, adjusted, and operated, to be free of defects in material and workmanship, in normal use and when properly serviced, for a period of twelve (12) months after date of delivery by the Dealer to the original retail purchaser. LANDOLL shall repair or replace, at its option, freight on board (f.o.b.) at its factory or designated DEALER location, any part or parts of such new and unused machine which shall have been reported in writing to LANDOLL within thirty (30) days from date of failure thereof and which LANDOLL inspection shall disclose to have been defective. Defective parts must be returned to the LANDOLL factory, freight prepaid. LANDOLL will not be liable for labor, transportation, or any other charges resulting from replacement of a defective part. This warranty is void if any part not supplied by LANDOLL is used in assembly or repair, or if the machine has been altered, abused, or neglected. LANDOLL repair parts are warranted for ninety (90) days from date of replacement or for the unexpired warranty period of the applicable LANDOLL machine, whichever period is longer. LANDOLL makes no warranty, whatsoever, as to purchased component parts and other trade accessories, except to the extent that such items are warranted by the manufacturer thereof. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED, IMPLIED, OR STATUTORY (INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE), AND LANDOLL SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND ON ACCOUNT OF ANY LANDOLL PRODUCT.

NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY, VERBALLY OR IN WRITING, OR GRANT ANY OTHER WARRANTY.

LANDOLL CORPORATION, WHOSE POLICY IS ONE OF CONTINUOUS IMPROVEMENT, RESERVES THE RIGHT TO MAKE CHANGES WITHOUT OBLIGATION TO MODIFY PREVIOUSLY PRODUCED EQUIPMENT.



MODEL 2220 SERIES DISC CHISEL OPERATOR'S MANUAL

PURCHASED FROM: _____ **DATE** ____ / ____ / ____

ADDRESS: _____

PHONE NO.: _____ **SERIAL NO.:** _____

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SAFETY PRECAUTIONS



THIS IS THE SAFETY ALERT SYMBOL. IT IS USED TO ALERT YOU TO POTENTIAL INJURY HAZARDS. OBEY ALL SAFETY MESSAGES THAT FOLLOW THIS SYMBOL TO AVOID POSSIBLE INJURY OR DEATH.

DANGER

DANGER INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

WARNING

WARNING INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.

CAUTION

CAUTION INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY.

CAUTION

CAUTION USED WITHOUT THE SAFETY ALERT SYMBOL INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN PROPERTY DAMAGE.



INTRODUCTION

1

The Landoll 2220 Series Disc Chisel is a quality product designed to give years of trouble free performance. By following each section of this manual, your system will perform as designed for you and your operation.

SECTION 1 gives basic instructions on the use of this manual.

SECTION 2 gives product specifications. These specifications supply lengths and measures for your equipment. A Standard Bolt Torque Table is provided to give guidelines for bolt torques to be used when servicing this product.

SECTION 3 contains assembly instructions for your 2220 Series Disc Chisel. When these procedures are correctly followed, your equipment should provide you years of trouble-free operation and service.

SECTION 4 instructs how to operate your equipment before using it, and describes adjustments needed. It also gives practical advice for the care and maintenance of your Landoll equipment. Drawings in this section locate adjustment points on the equipment.

NOTE: IF THE EQUIPMENT IS IMPROPERLY ASSEMBLED OR MAINTAINED, THE WARRANTY IS VOID. IF YOU HAVE ANY QUESTIONS CONTACT:

**LANDOLL CORPORATION
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
or phone:
(785) 562-5381 or
(800) 428-5655
or FAX:
(785) 562-3240**

SECTION 5 is a troubleshooting guide to aid in diagnosing and solving problems with the equipment.

PARTS LIST is a separate manual showing the various assemblies, subassemblies, and systems. Refer to that manual when ordering Landoll replacement parts. Order parts from your Landoll dealer or call the Landoll Parts Distribution Center at:

**(785) 562-4650 or
(800) 423-4320 or
FAX: (913) 562-4654**

WARRANTY The Warranty Registration form is included with the product documents. Fill it out and mail it within 15 days of purchase. The Warranty is printed inside the front cover.

NOTE: IMPROPER ASSEMBLY, MODIFICATION, OR MAINTENANCE OF YOUR LANDOLL MACHINE CAN VOID YOUR WARRANTY.

COMMENTS Address comments or questions regarding this publication to:

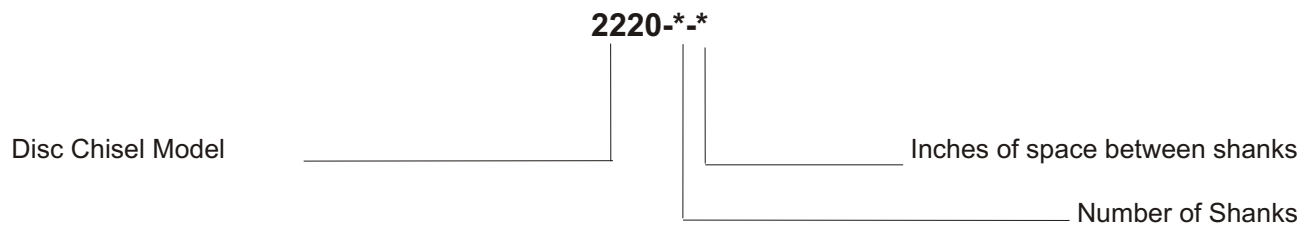
**LANDOLL CORPORATION
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
ATTENTION: PUBLICATIONS -DEPT. 55**

STANDARD SPECIFICATIONS

2

MODEL NUMBER	WORKING WIDTH	TRANSPORT WIDTH (ft.-in.)	NO. OF SHANKS	NO. OF DISCS	WEIGHT (APPROX.) (lbs.)
2225-7R-15	11'-7"	12'-5"	7	28	7,520
2225-7A-15	11'-7"	12'-5"	7	28	7,590
2225-9R-15	14'-9"	15'-7"	9	32	8,120
2225-9A-15	14'-9"	15'-7"	9	32	8,210
2225-11R-15	16'-5"	17'-3"	11	36	8,600
2225-11A-15	16'-5"	17'-3"	11	36	8,690
2227-11R-15	16'-5"	17'-3"	11	36	10,440
2227-11A-15	16'-5"	17'-3"	11	36	10,550
2227-13R-15	19'-11"	20'-9"	13	42	11,150
2227-13A-15	19'-11"	20'-9"	13	42	11,280
2227-15R-15	21'-7"	22'-5"	15	46	11,750
2227-15A-15	21'-7"	22'-5"	15	46	11,900

MODEL NUMBER CODE



LANDOLL CORPORATION GENERAL TORQUE SPECIFICATIONS (REV. 4/97)

THIS CHART PROVIDES TIGHTENING TORQUES FOR GENERAL PURPOSE APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.

ASSEMBLY TORQUES APPLY TO PLATED NUTS AND CAPSCREWS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED. WHEN FASTENERS ARE DRY (SOLVENT CLEANED), ADD 33% TO AS RECEIVED CONDITION TORQUE.

BOLT HEAD IDENTIFICATION MARKS INDICATE GRADE AND MAY VARY FROM MANUFACTURER TO MANUFACTURER.

THICK NUTS MUST BE USED ON GRADE 8 CAPSCREWS.

USE VALUE IN [] IF USING PREVAILING TORQUE NUTS.

TORQUE IS SPECIFIED IN FOOT POUNDS

UNC Size	SAE Grade 2	SAE Grade 5	SAE Grade 8	UNF Size	SAE Grade 2	SAE Grade 5	SAE Grade 8
1/4-20	4 [5]	6 [7]	9 [11]	1/4-28	5 [6]	7 [9]	10 [12]
5/16-18	8 [10]	13 [16]	18 [22]	5/16-24	9 [11]	14 [17]	20 [25]
3/8-16	15 [19]	23 [29]	35 [43]	3/8-24	17 [21]	25 [31]	35 [44]
7/16-14	24 [30]	35 [43]	55 [62]	7/16-20	27 [34]	40 [50]	60 [75]
1/2-13	35 [43]	55 [62]	80 [100]	1/2-20	40 [50]	65 [81]	90 [112]
9/16-12	55 [62]	80 [100]	110 [137]	9/16-18	60 [75]	90 [112]	130 [162]
5/8-11	75 [94]	110 [137]	170 [212]	5/8-18	85 [106]	130 [162]	180 [225]
3/4-10	130 [162]	200 [250]	280 [350]	3/4-16	150 [188]	220 [275]	320 [400]
7/8-9	125 [156]	320 [400]	460 [575]	7/8-14	140 [175]	360 [450]	500 [625]
1-8	190 [237]	408 [506]	680 [850]	1-14	210 [263]	540 [675]	760 [950]
1-1/8-7	270 [337]	600 [750]	960 [1200]	1-1/8-12	300 [375]	660 [825]	1080 [1350]
1-1/4-7	380 [475]	840 [1050]	1426 [1782]	1-1/4-12	420 [525]	920 [1150]	1500 [1875]
1-3/8-6	490 [612]	110 [1375]	1780 [2225]	1-3/8-12	560 [700]	1260 [1575]	2010 [2512]
1-1/2-6	650 [812]	1460 [1825]	2360 [2950]	1-1/2-12	730 [912]	1640 [2050]	2660 [3325]

METRIC

COARSE THREAD METRIC CLASS 10.9 FASTENERS AND CLASS 10.0 NUTS AND THROUGH HARDENED FLAT WASHERS, PHOSPHATE COATED, ROCKWELL "C" 38-45.

USE VALUE IN [] IF USING PREVAILING TORQUE NUTS.

Nominal Thread Diameter mm	Standard Torque		Nominal Thread Diameter mm	Standard Torque	
	Newton-Meters	Foot-Pounds		Newton-Meters	Foot-Pounds
6	10 [14]	7 [10]	20	385 [450]	290 [335]
7	16 [22]	12 [16]	24	670 [775]	500 [625]
8	23 [32]	17 [24]	27	980 [1105]	730 [825]
10	46 [60]	34 [47]	30	1330 [1470]	990 [1090]
12	80 [101]	60 [75]	33	1790 [1950]	1340 [1450]
14	125 [155]	90 [115]	36	2225 [2515]	1730 [1870]
16	200 [240]	150 [180]	39	3010 [3210]	2240 [2380]
18	275 [330]	205 [245]			

Table 2-1 General Torque Specifications

**LANDOLL CORPORATION
HYDRAULIC FITTING TORQUE SPECIFICATIONS
37° JIC, ORS, & ORB (REV. 10/97)**

THIS CHART PROVIDES TIGHTENING TORQUES FOR HYDRAULIC FITTING APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.
ASSEMBLY TORQUES APPLY TO PLATED CARBON STEEL AND STAINLESS STEEL FITTINGS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED.
BRASS FITTINGS AND ADAPTERS - 65% OF THE TORQUE VALUE FOR STEEL. STAINLESS STEEL, ALUMINUM AND MONEL - THREADS ARE TO BE LUBRICATED.
TORQUE IS SPECIFIED IN FOOT POUNDS

PARKER BRAND FITTINGS

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-13	15-17	13-15
-5	14-16	—	21-23
-6	20-22	34-36	25-29
-8	43-47	58-62	40-44
-10	55-65	100-110	57.5-62.5
-12	80-90	134-146	75-85
-16	115-125	202-218	109-121
-20	160-180	248-272	213-237
-24	185-215	303-327	238-262
-32	250-290	—	310-340

**LANDOLL CORPORATION
HYDRAULIC FITTING TORQUE SPECIFICATIONS
37° JIC, ORS & ORB (REV. 10/97)**

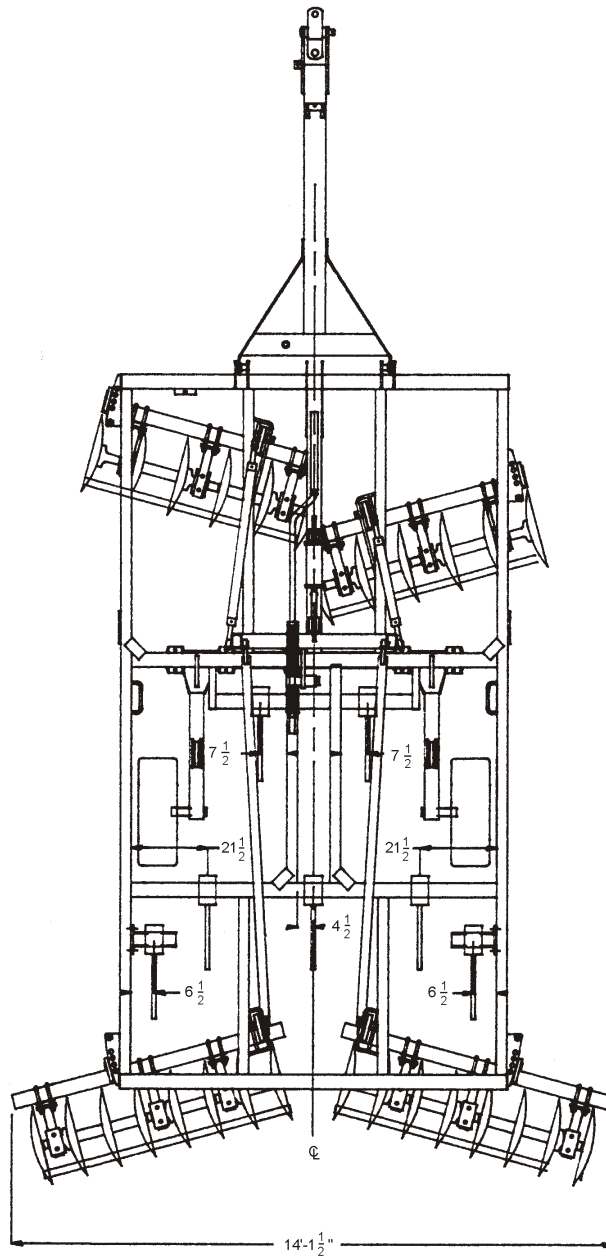
THIS CHART PROVIDES TIGHTENING TORQUES FOR HYDRAULIC FITTING APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.
ASSEMBLY TORQUES APPLY TO PLATED CARBON STEEL AND STAINLESS STEEL FITTINGS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED.
BRASS FITTINGS AND ADAPTERS - 65% OF THE TORQUE VALUE FOR STEEL.
TORQUE IS SPECIFIED IN FOOT POUNDS.

AEROQUIP BRAND FITTINGS

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-12	10-12	14-16
-5	15-16	—	18-20
-6	18-20	18-20	24-26
-8	38-42	32-35	50-60
-10	57-62	46-50	72-80
-12	79-87	65-70	125-135
-14	—	—	160-180
-16	108-113	92-100	200-220
-20	127-133	125-140	210-280
-24	158-167	150-165	270-360
-32	245-258	—	—

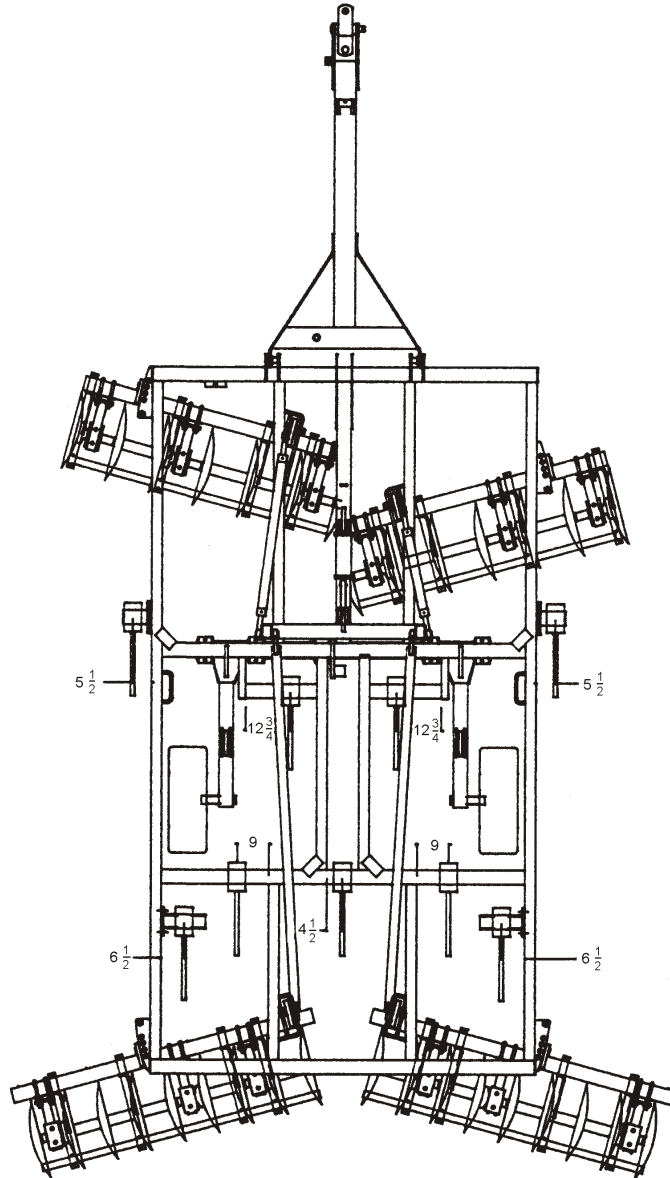
Table 2-2 Hydraulic Fitting Torque Specifications

NOTES:



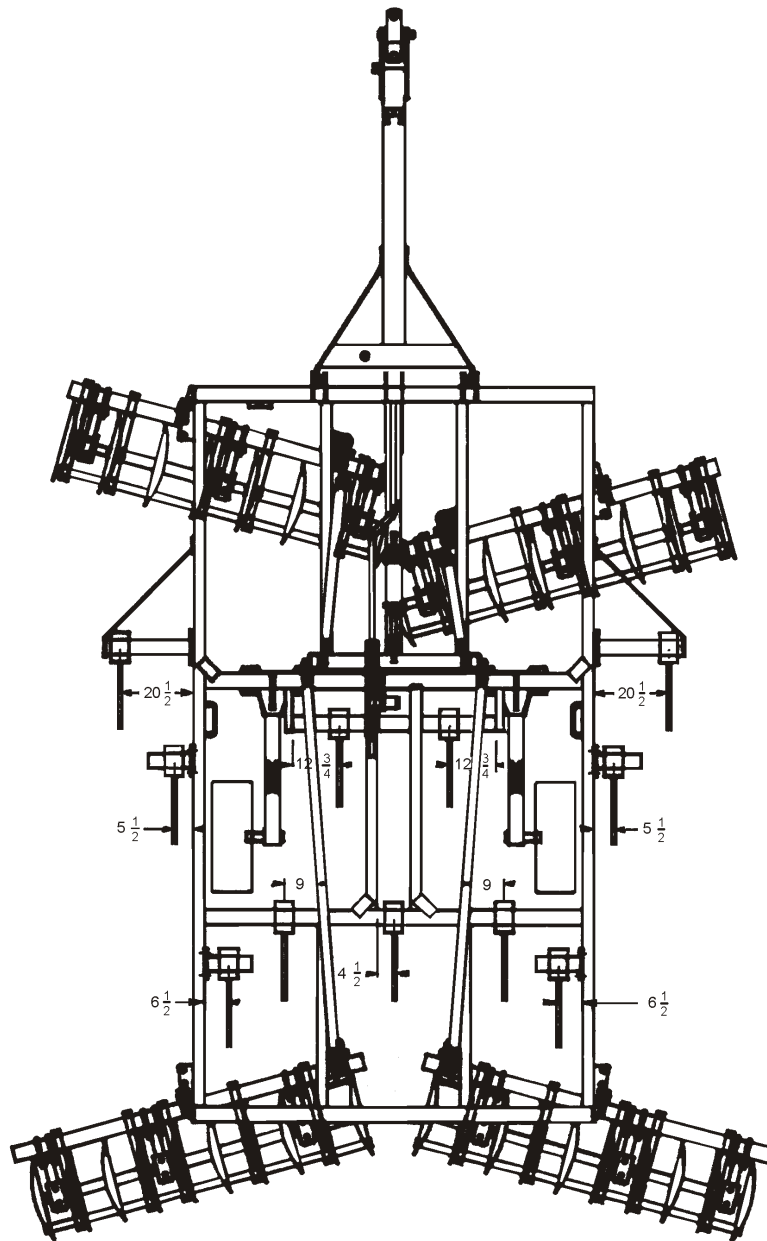
5-7a-15dc shkspc

Figure 2-1 - 2225-7A-15DC Shank Spacing



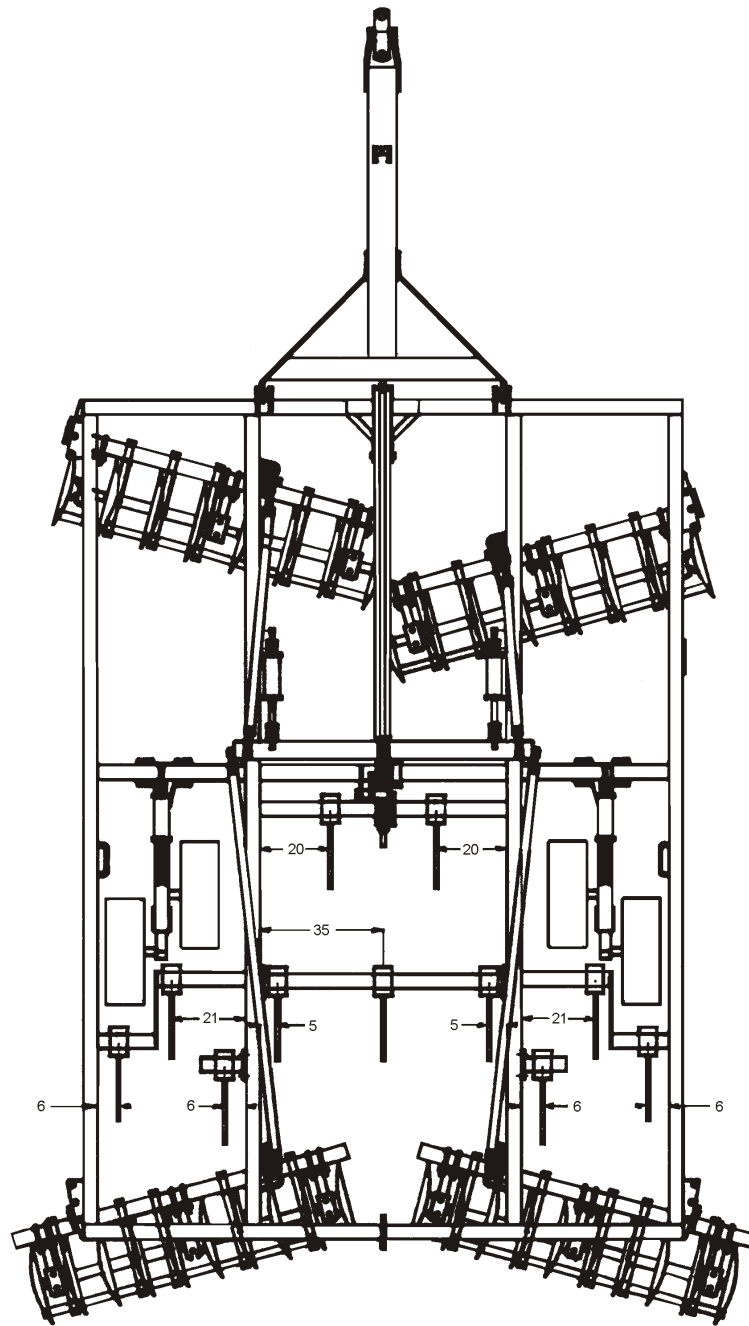
5-9a-15dc shkspc

Figure 2-2 - 2225-9A-15DC Shank Spacing



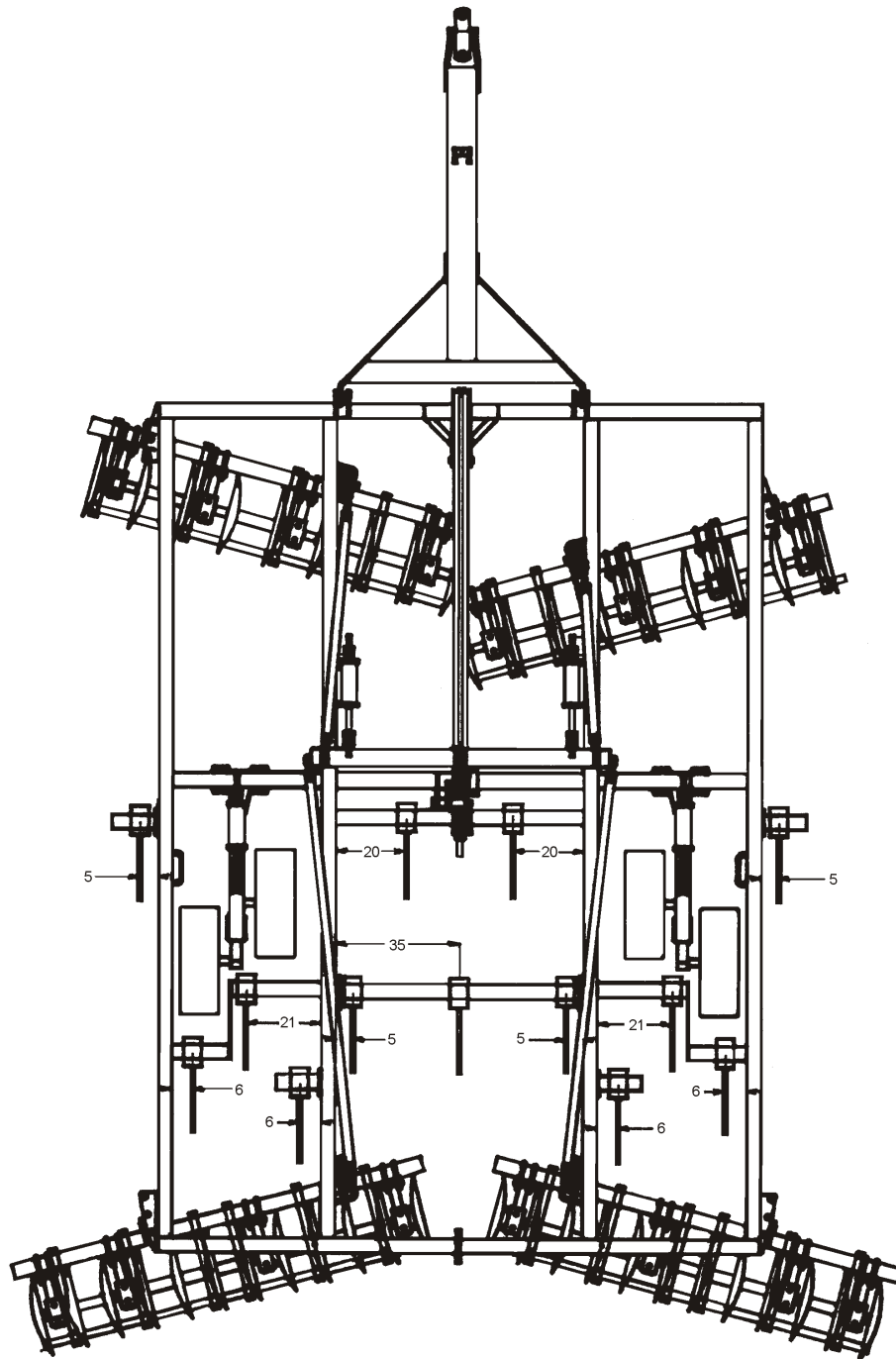
5-11a-15dc shkspc

Figure 2-3 - 2225-11A-15DC Shank Spacing



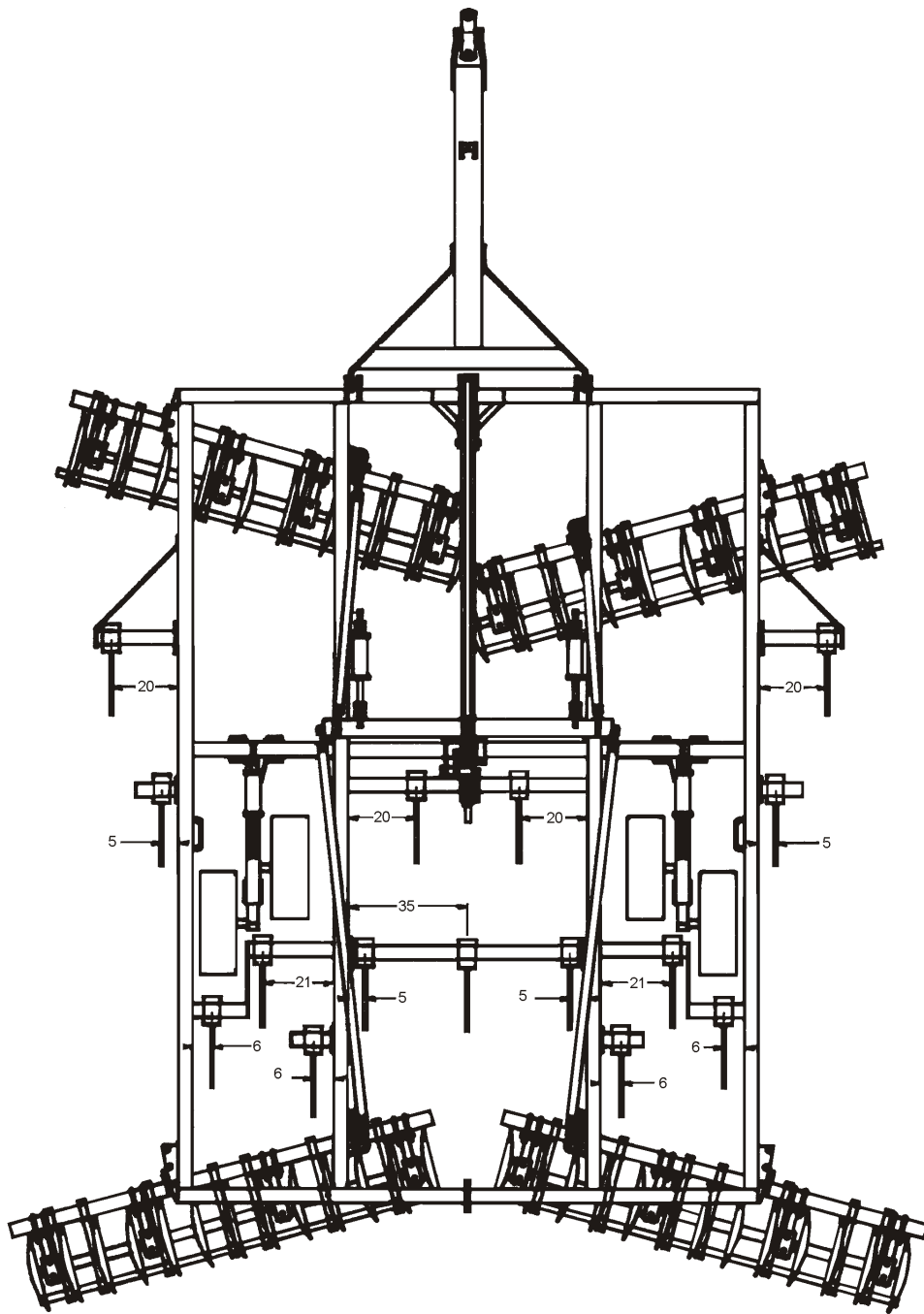
7-11a-15dc shkspc

Figure 2-4 - 2227-11A-15DC Shank Spacing



7-13a-15dc shkspc

Figure 2-5 - 2227-13A-15DC Shank Spacing



7-15a-15dc shkspc

Figure 2-6 - 2227-15A-15DC Shank Spacing

ASSEMBLY INSTRUCTIONS

3

It is very important that your new **2220 Series Disc Chisel** be properly assembled, adjusted and lubricated before use. Illustrations to assist with the assembly process are provided in **Section 2, "Standard Specifications"**. They show proper shank, disc gang and mounting bracket spacings. Illustrations in this section show proper assembly procedures. Remove paint from grease fittings. Replace any grease fittings that are damaged or missing. Be sure to return bolts, clips, etc., to their original locations.

To insure alignment of assemblies, **leave the nuts loose until completion** of final assembly. Use lock washers or flatwashers as specified. Spread all cotter pins.

After completion of final assembly, **tighten all nuts evenly** to prevent misalignment, distortion or binding. Tighten all bolts and nuts to the recommended torques shown in **Table 2-1, "Standard Bolt Torques"**.

DANGER

DISC BLADES ARE EXTREMELY SHARP. EXERCISE EXTREME CARE WHEN WORKING ON OR NEAR DISC BLADES. DO NOT ALLOW DISCS TO ROLL OVER OR FALL ONTO ANY BODILY PART. DO NOT ALLOW WRENCHES TO SLIP WHEN WORKING NEAR DISC BLADES. NEVER PUSH WRENCHES TOWARD DISC BLADES. DO NOT CLIMB OVER MACHINE ABOVE DISC BLADES. FAILURE TO STAY CLEAR OF DISC BLADE EDGES CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.

CAUTION

INCORRECT ADJUSTMENT OF DISC ADJUST RODS WILL CAUSE PERMANENT EQUIPMENT DAMAGE.

WARNING

DO NOT ATTEMPT TO LIFT HEAVY PARTS (SUCH AS THE FRAME, DISC GANGS, ROCK SHAFT, AND PULL HITCH) MANUALLY. USE A HOIST OR A FORK LIFT TO MOVE THESE PARTS INTO POSITION.

DANGER

TO PREVENT ACCIDENTAL LOWERING:

1. ALL HYDRAULICALLY ELEVATED EQUIPMENT MUST BE LOCKED OUT USING THE CYLINDER LOCKOUTS:
2. LOWER EQUIPMENT TO THE GROUND WHILE SERVICING OR WHEN IT IS IDLE.

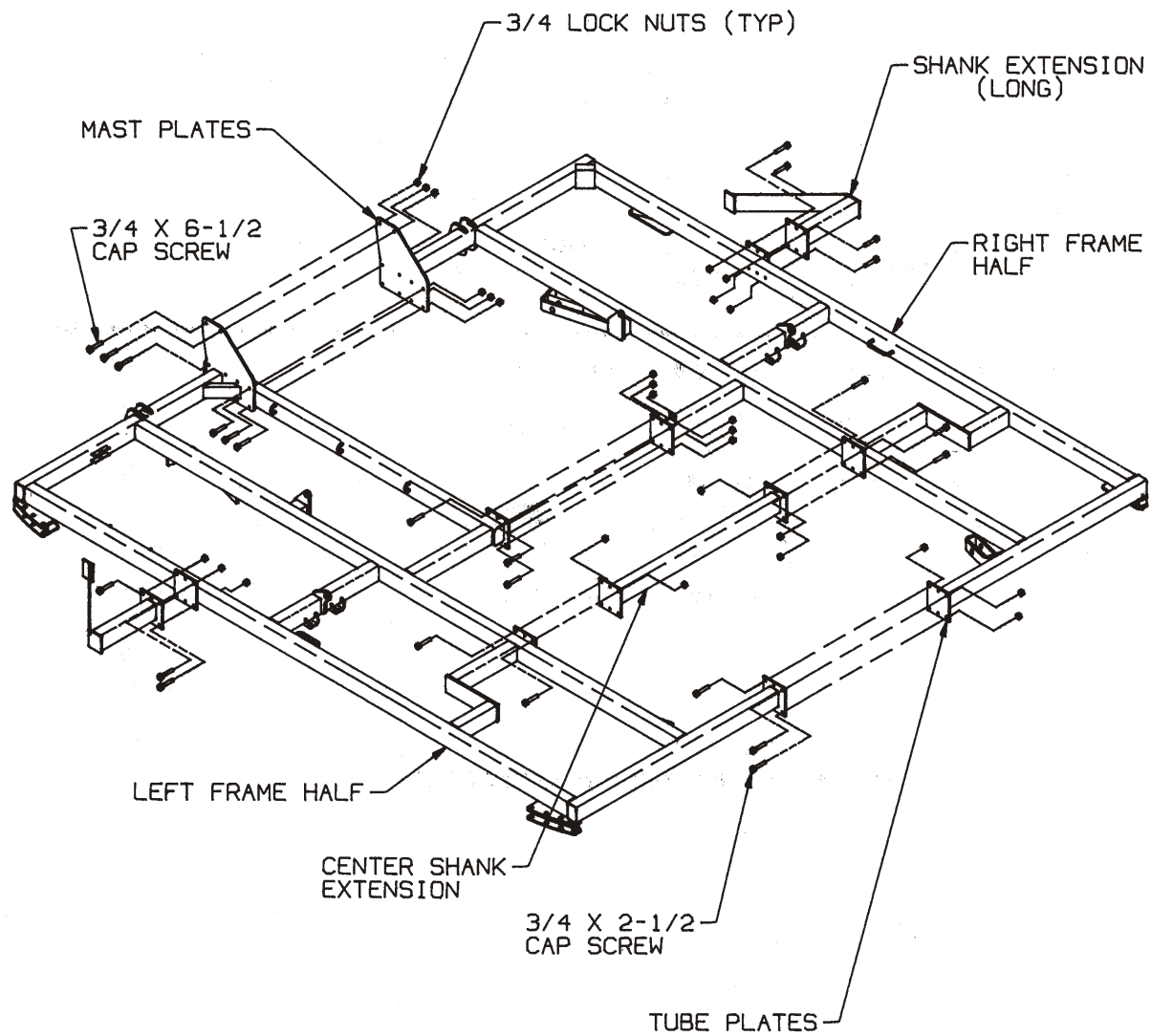
FAILURE TO TAKE MEASURES TO PREVENT ACCIDENTAL LOWERING MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

CAUTION

BE SURE DEPTH STOPS ARE EQUAL LENGTHS ON ALL CYLINDERS. USING UNEQUAL DEPTH STOP LENGTHS CAN CAUSE PERMANENT EQUIPMENT DAMAGE.

CAUTION

BE SURE TO BLEED THE HYDRAULIC SYSTEM OF ALL AIR IN LINES AFTER INSTALLATION. FAILURE TO BLEED THE SYSTEM OF ALL AIR CAN RESULT IN IMPROPER MACHINE OPERATION.



2m410-011167

Figure 3-1 2227 Frame Assembly

3-1 2225 FRAME ASSEMBLY

No assembly is needed for the 2225 frame. However, it needs to be placed on stands about 36" high in an open, level area. If your Disc Chisel is equipped with frame extensions, see **Section 3-2.4 and 3-2.5 for their proper installation procedures.**

3-2 2227 FRAME ASSEMBLY

IMPORTANT

READ ALL SAFETY PRECAUTIONS AT THE FRONT OF THIS SECTION BEFORE ATTEMPTING ANY OF THE FOLLOWING PROCEDURES.

IMPORTANT

SEE FIGURE 3-1 FOR PART NAMES.

- 3-2.1** Place both frame halves on stands about 36" high in an open, level area.
- Use 3/4" x 2-1/2" cap screws and 3/4" locking nuts in the tube plates
 - Use 3/4" x 6-1/2" cap screws with locking nuts in the mast plates.
 - Install bushing on rear top mast cap screw and bushing with front leveler link on front top cap screw.

IMPORTANT

LONG ARM OF LEVELER SHOULD BE DOWN WITH GREASE ZERK FACING FORWARD. (SEE FIGURE 3-8)

CAUTION

FRONT LEVELING LINKAGE MUST BE INSTALLED ON FRONT MAST PLATE BOLT OR DAMAGE WILL OCCUR DURING OPERATION.

- Bolt the two halves together. Leave all bolts loose, initially.

3-2.2 Level the frame halves.

3-2.3 Tighten all connecting bolts to the torques listed in **Table 2-1, "Standard Bolt Torques"**.

IMPORTANT

BE SURE TO TIGHTEN THE TOP AND BOTTOM BOLTS EQUALLY.

3-2.4 Mark the spacing for shank mounts on the tool bars. **See Figures 2-1 through 2-6 for their proper locations.**

3-2.5 FRAME EXTENSIONS: If your 2220 Series Disc Chisel needs frame extensions to add extra shanks:

- Install the extensions by securing them to the plates provided on the sides of the frames. Use cap screws and locking nuts to secure the plates.
- Secure the braces on the long frame extensions to the frame with U-bolts and locking nuts.

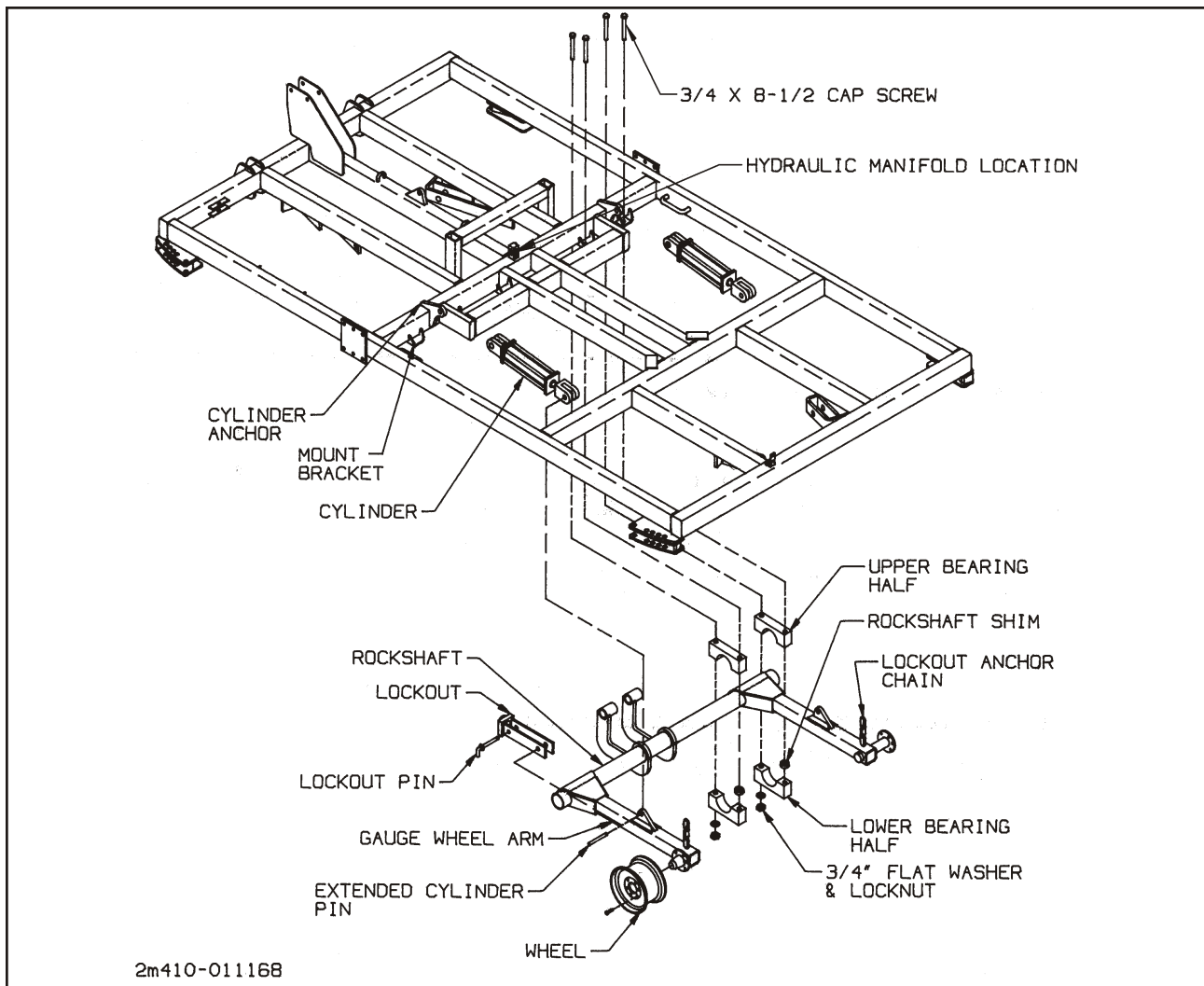


Figure 3-2 2225 Rockshaft Installation

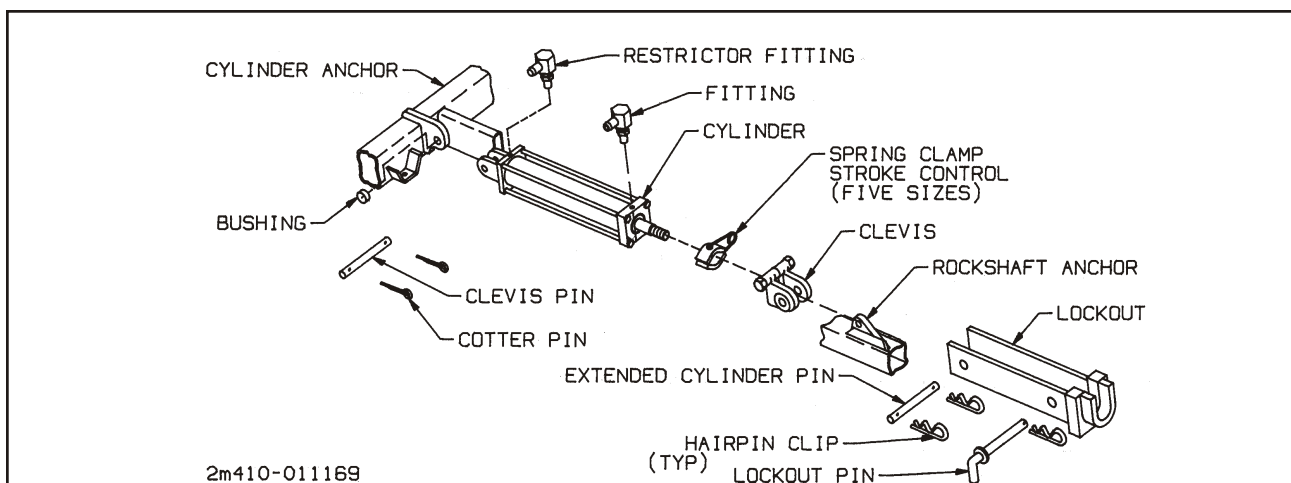


Figure 3-3 2225 Gauge Wheel Cylinder Installation

3-3 2225 ROCKSHAFT INSTALLATION

IMPORTANT

READ ALL SAFETY PRECAUTIONS AT THE FRONT OF THIS SECTION BEFORE ATTEMPTING ANY OF THE FOLLOWING PROCEDURES.

IMPORTANT

SEE FIGURE 3-2 FOR PART NAMES.

- 3-3.1** Position the rockshaft under the gauge wheel mounting brackets.

IMPORTANT

THE GAUGE WHEEL ARMS SHOULD POINT TOWARD THE REAR OF THE MACHINE WITH THE CYLINDER ANCHORS FACING UP.

- 3-3.2** Install the upper bearings.
- Slip the 3/4" x 8-1/2" cap screws through the holes provided for them in the mounting brackets.
 - Place the upper bearing halves (with the grease zerk in the side) on top of the rockshaft with grease zerks away from the gauge wheel arms. There are five bearing assemblies on the rockshaft.

IMPORTANT

BE SURE TO INSTALL THE FIFTH BEARING IN THE CENTER, TO ITS PROPER MOUNTING BRACKET.

- Use a hoist or forklift to raise the rockshaft. Use the cap screws to guide the rockshaft and top bearing halves into place.
- 3-3.3** Set a lower bearing half (with a grease zerk between the bolt holes) under the rockshaft and through the hanging ends of the cap screws.
- 3-3.4** Secure each set of bearings tight enough to the rockshaft to hold the assembly together. Use the washers and locking nuts provided.

- 3-3.5** Insert the rockshaft shims, as needed, between each set of bearings. Use the shims to allow the rockshaft to rotate freely, yet not loosely, in the bearing halves. Repeat this step for each set of bearings. **Then tighten the cap screws.**

- 3-3.6** Mount the tires on the wheel rims and assemble to the hubs. Tighten wheel bolts evenly to assure proper wheel alignment. Wheel bolts should be tightened to 90 ft-lbs of torque. The hoist can then be removed.

IMPORTANT

AN 11L X 15" FARM SERVICE TIRE SHOULD BE USED ON THE 15" X 8" RIM. INFLATE THE TIRE TO ITS MANUFACTURER'S RECOMMENDED PRESSURE.

- 3-3.7** Install the base end of the gauge wheel cylinders on the frame cylinder anchors. Face the rod end down, towards the gauge wheel, and face the ports upwards (**See Figure 3-3**). Secure each cylinder to the cylinder anchor with the clevis pins and cotter pins supplied with the cylinder.

CAUTION

BE SURE EACH CYLINDER HAS A RESTRICTOR FITTING IN THE BASE END. FAILURE TO DO SO WILL CAUSE THE ROCKSHAFT TO FAIL.

- 3-3.8** Position the lockout assemblies above the gauge wheel arms and the rod ends of the cylinders (**See Figures 3-2 and 3-3**). The open end of the lockouts should be over the gauge wheel arms with the U-shaped cutout on the opposite end facing upwards.
- 3-3.9** Insert the extended cylinder pin through the lockout assembly, the cylinder clevis and the gauge wheel arm bracket (**See Figure 3-3**). Secure with hairpin clips.

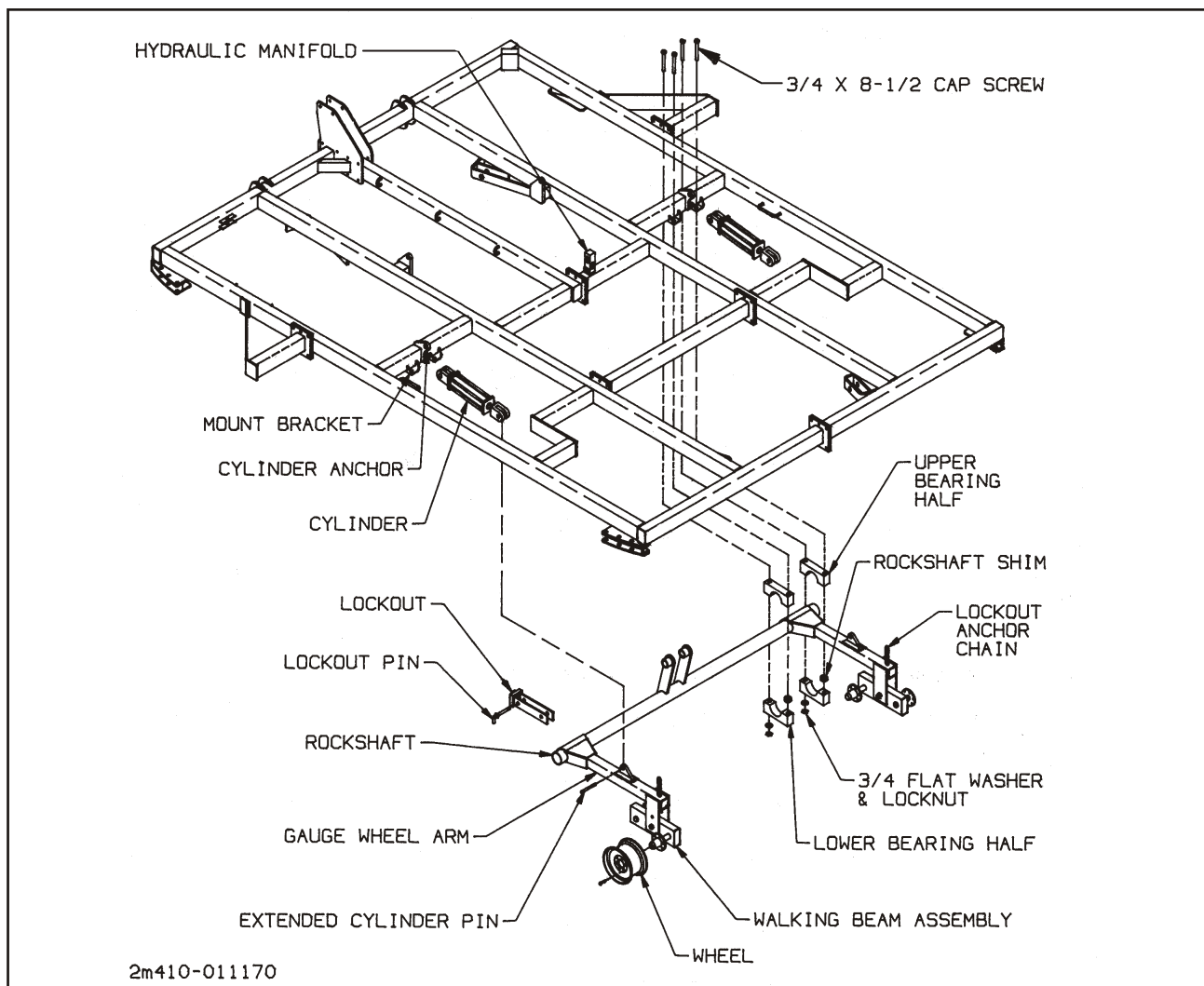


Figure 3-4 2227 Rockshaft Installation

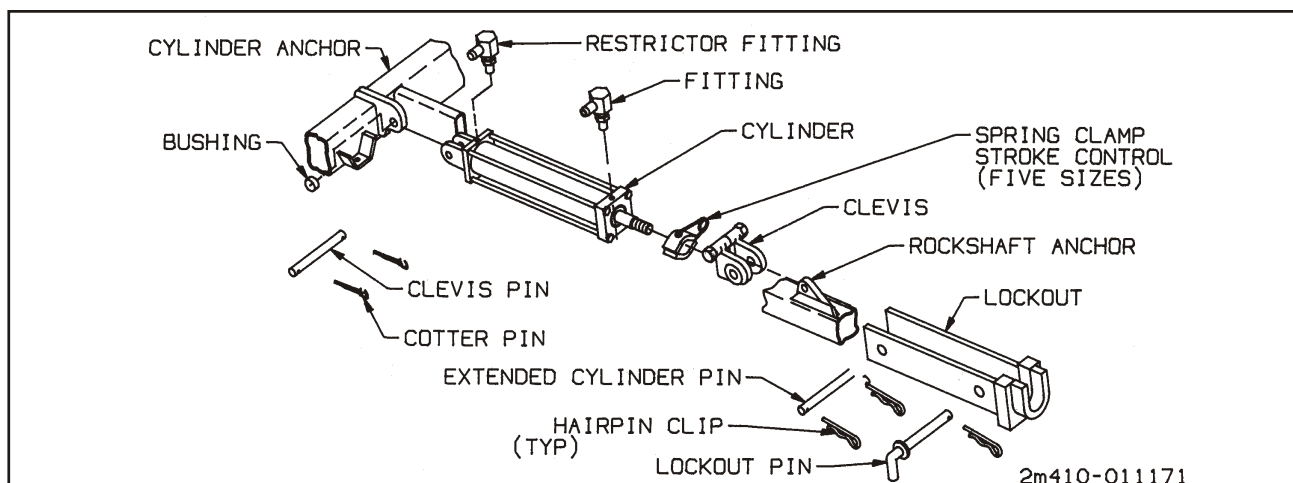


Figure 3-5 2227 Gauge Wheel Cylinder Installation

3-4 2227 ROCKSHAFT INSTALLATION

IMPORTANT

READ ALL SAFETY PRECAUTIONS AT THE FRONT OF THIS SECTION BEFORE ATTEMPTING ANY OF THE FOLLOWING PROCEDURES.

IMPORTANT

SEE FIGURE 3-4 FOR PART NAMES.

- 3-4.1** Position the rockshaft under the gauge wheel mounting brackets.

IMPORTANT

THE GAUGE WHEEL ARMS SHOULD POINT TOWARD THE REAR OF THE MACHINE WITH THE CYLINDER ANCHORS FACING UP.

- 3-4.2** Install the upper bearings.
- Slip the 3/4" x 8-1/2" cap screws through the holes provided for them in the mounting brackets.
 - Place the upper bearing halves (with the grease zerk in the side) on top of the rockshaft with grease zerks away from the gauge wheel arms. There are five bearing assemblies for the rockshaft.
 - Use a hoist or forklift to raise the rockshaft. Use the cap screws to guide the rockshaft and top bearing halves into place.
- 3-4.3** Set a lower bearing half (with a grease zerk between the bolt holes) under the rockshaft and through the hanging ends of the cap screws.
- 3-4.4** Secure each set of bearings tight enough to the rockshaft to hold the assembly together. Use the washers and locking nuts provided.

- 3-4.5** Insert the rockshaft shims, as needed, between each set of bearings. Use the shims to allow the rockshaft to rotate freely, yet not loosely, in the bearing halves. Repeat this step for each set of bearings. Then tighten the cap screws.

- 3-4.6** Install the hub and spindle in the walking beam and secure with bolts & nuts provided.

- 3-4.7** Mount the tires on the wheel rims and assemble to the hubs. Tighten wheel bolts evenly to assure proper wheel alignment. Wheel bolts should be tightened to 90 ft-lbs of torque. The hoist can then be removed.

IMPORTANT

AN 11L X 15" FARM SERVICE TIRE SHOULD BE USED ON THE 15" X 8" RIM. INFLATE THE TIRE TO ITS MANUFACTURER'S RECOMMENDED PRESSURE.

- 3-4.8** Install the base end of the gauge wheel cylinders on the frame cylinder anchors. Face the rod end down, towards the gauge wheel, and face the ports upwards (**See Figure 3-5**). Secure each cylinder to the cylinder anchor with the clevis pins and cotter pins supplied with the cylinder.

CAUTION

BE SURE EACH CYLINDER HAS A RESTRICTOR FITTING IN THE BASE END. FAILURE TO DO SO WILL CAUSE THE ROCKSHAFT TO FAIL.

- 3-4.9** Position the lockout assemblies above the gauge wheel arms and the rod ends of the cylinders (**See Figures 3-4 and 3-5**). The open end of the lockouts should be over the gauge wheel arms with the U-shaped cutout on the opposite end facing upwards.
- 3-4.10** Insert the extended cylinder pin through the lockout assembly, the cylinder clevis and the gauge wheel arm bracket (**See Figure 3-5**). Secure with hairpin clips.

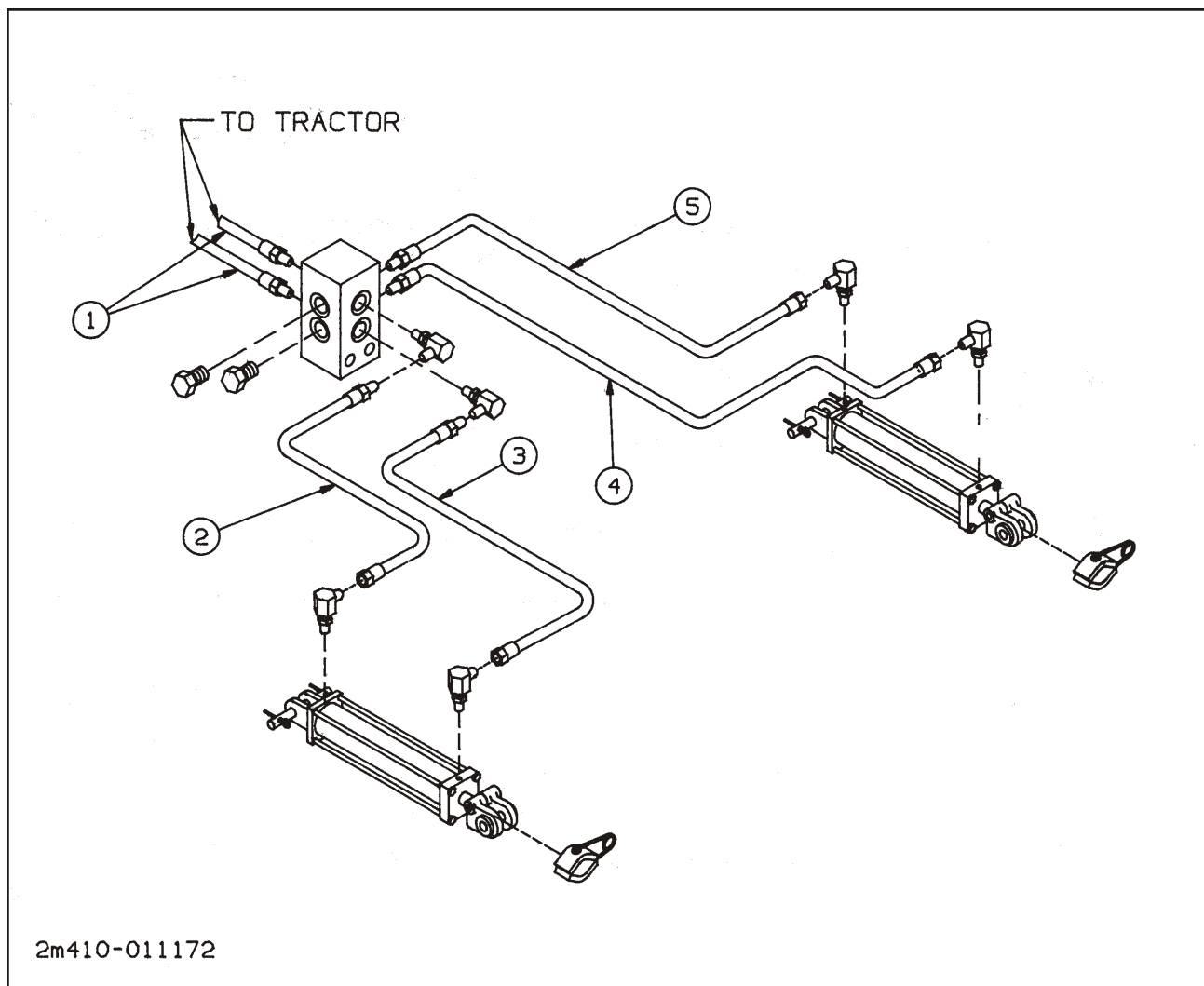


Figure 3-6 2225 Hydraulic Hose Installation

2225 HYDRAULIC HOSE		
HOSE NO.	PART NUMBER	DESCRIPTION
1	1-397-010300-09	HOSE 234"
2	1-397-010104	HOSE 50"
3	1-397-010081	HOSE 60"
4	1-397-010299-10	HOSE 41"
5	1-397-010299-01	HOSE 36"

Table 3-1 2225 Gauge Wheel Hydraulic Hoses

3-5 2225 HYDRAULIC PLUMBING INSTALLATION

IMPORTANT

1. Pipe sealant is not required to install hoses to manifold and cylinders equipped with hydraulic O-ring fittings.

2. In the following procedure, left- and right-hand are determined standing at the back of the machine, looking towards the front.

3. In the steps below, refer to Table 3-1 for hose part numbers and to Figure 3-6 to insure proper location of each hose during installation.

4. Owner of tractor is required to supply some of the parts in this procedure for its proper completion. Please read through this procedure before installing hoses.

3-5.1 Install the hydraulic manifold on the frame and secure with 1/2" x 3-1/2" cap screws and locking nuts. The manifold mount is at the center of the frame above the rock-shaft (**See Figure 3-2**).

3-5.2 Install a 90° elbow to both rear ports on the hydraulic manifold. Both elbows should angle downward and to the left approximately 45°.

3-5.3 Install a 90° restrictor fitting to the base end ports of both gauge wheel cylinders.

3-5.4 Install a 90° unrestricted fitting to the rod end ports of both cylinders.

3-5.5 Install No. 2 hose to the base port of the left-hand cylinder and to the top elbow on the back side of the hydraulic manifold.

3-5.6 Install No. 3 hose to the rod end of the left-hand cylinder and to the lower elbow in the back side of the hydraulic manifold.

3-5.7 Install No. 4 hose to the rod port of the right-hand cylinder and to the lower port on the right side of the hydraulic manifold.

3-5.8 Install No. 5 hose to the base end of the right-hand cylinder and to the upper port on the right side of the hydraulic manifold.

3-5.9 Install No. 1 coupling hoses to the appropriate ports in the front of the hydraulic manifold (couplers for the 1/2" coupling hoses on the tractor end must be supplied by the owner to match the tractor).

3-5.10 Secure all four cylinder hoses to the frame, with the plastic tie wraps, to eliminate slack and/or rubbing that could cause damage or interference.

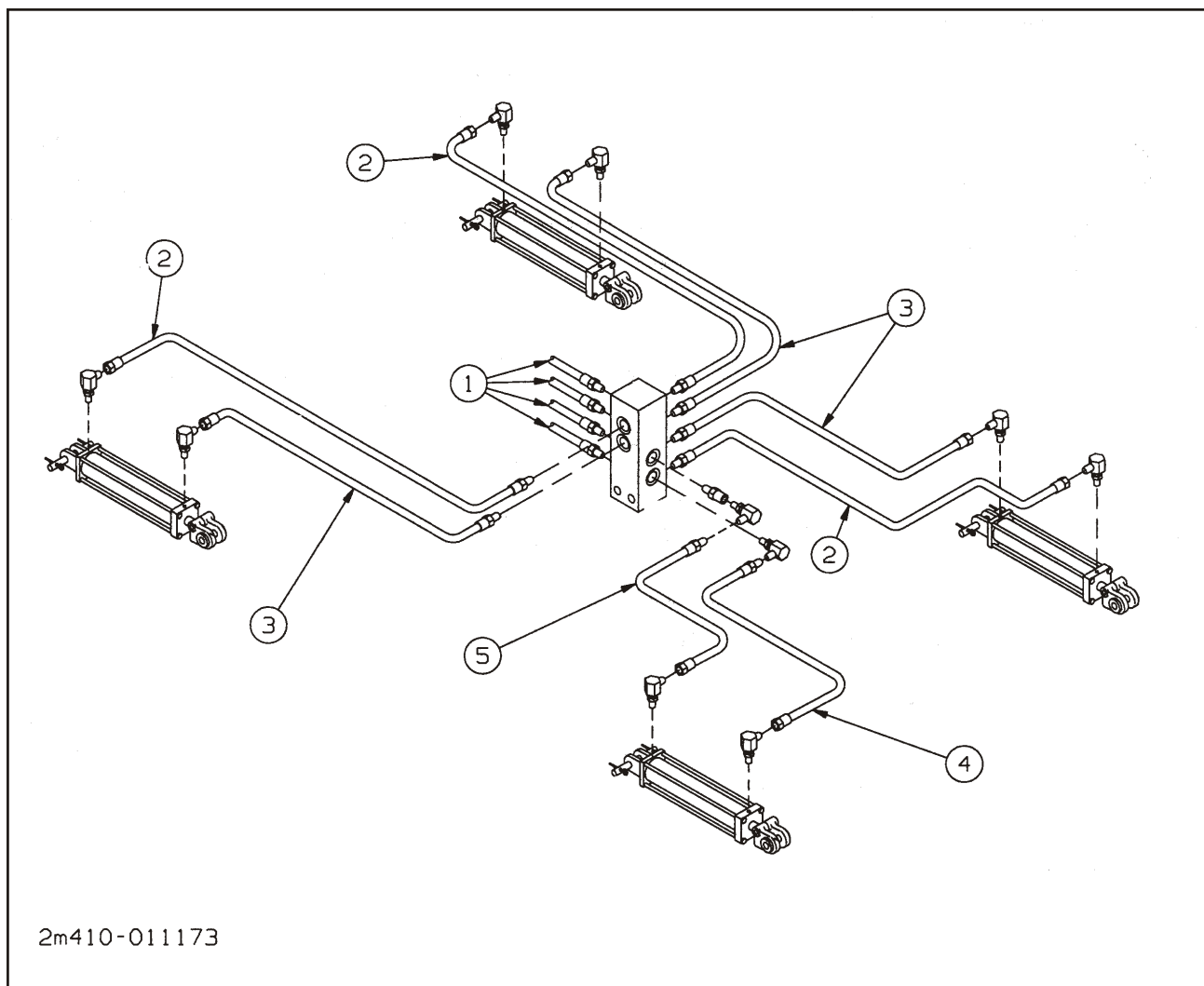


Figure 3-7 2227 Hydraulic Hose Installation

2227 HYDRAULIC HOSE		
HOSE NO.	PART NUMBER	DESCRIPTION
1	1-397-010300-02	HOSE 300"
2	1-397-010299-13	HOSE 74"
3	1-397-010299-02	HOSE 60"
4	1-397-010071	HOSE 94"
5	1-397-010088	HOSE 84"

Table 3-2 2227 Gauge Wheel Hydraulic Hoses

3-6 2227 HYDRAULIC PLUMBING INSTALLATION

IMPORTANT

1. Pipe sealant is not required to install hoses to manifold and cylinders equipped with hydraulic O-ring fittings.

2. In the following procedure, left- and right-hand are determined standing at the back of the machine, looking towards the front.

3. In the steps below, refer to Table 3- for hose part numbers and to Figure 3- to insure proper location of each hose during installation.

4. Owner of tractor is required to supply some of the parts in this procedure for its proper completion. Please read through this procedure before installing hoses.

3-6.1 Install the hydraulic manifold on the frame and secure with 1/2" x 3-1/2" cap screws and locking nuts. The manifold mount is at the center of the frame above the rock-shaft (See Figure 3-4).

3-6.2 Install a 90° o-ring elbow in the bottom rear port and a 90° elbow and a straight adapter in the top rear port of the hydraulic manifold.

3-6.3 Install a 90° restrictor o-ring fitting to the base end of all four cylinders.

3-6.4 Install a 90° unrestricted o-ring fitting to the rod end of all four cylinders.

3-6.5 Install a No. 2 hose to the base port of the right-hand disc adjust cylinder and to the top-right port of the hydraulic manifold.

3-6.6 Install a No. 3 hose to the rod port of the right-hand disc adjust cylinder and to the second port down on the right side of the hydraulic manifold.

3-6.7 Install a No. 2 hose to the rod port of the right-hand gauge wheel cylinder and to the lower port on the right side of the hydraulic manifold.

3-6.8 Install a No. 3 hose to the base end of the right-hand gauge wheel cylinder and the third port down on the right side of the hydraulic manifold.

3-6.9 Install No. 2 hose to the base end of the left-hand disc adjust cylinder and the top elbow on the left side of the hydraulic manifold.

3-6.10 Install No. 3 hose to the rod end of the left-hand disc adjust cylinder and the bottom elbow on the left side of the hydraulic manifold.

3-6.11 Install No. 4 hose to the rod end of the left-hand gauge wheel cylinder and the bottom elbow on the rear of the hydraulic manifold.

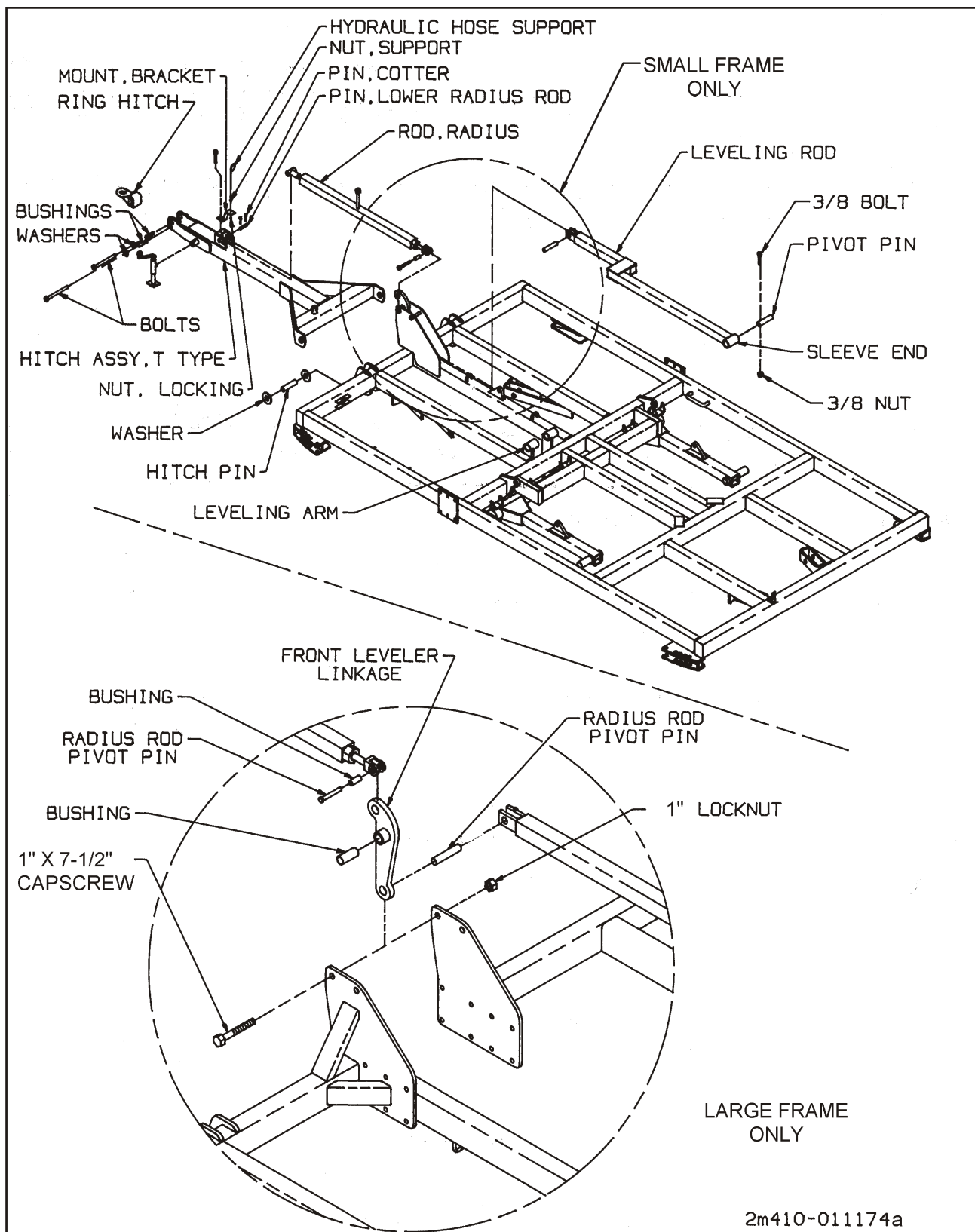
3-6.12 Install No. 5 hose to the base end of the left-hand gauge wheel cylinder and the top elbow on the rear of the hydraulic manifold.

3-6.13 Install No. 1 coupling hoses to the appropriate ports in the front of the hydraulic manifold (couplers for the 1/2" coupling hoses on three tractor end must be supplied by the owner to match the tractor).

CAUTION

IMPROPER RESTRAINT OF CYLINDER HOSES CAN CAUSE THEM TO GET TANGLED IN THE MACHINE DURING OPERATION.

3-6.14 Secure all cylinder hoses to the frame, with the plastic tie wraps, to eliminate slack and/or rubbing that could cause damage or interference.



2m410-011174a

Figure 3-8 Pull Hitch Installation

3-7 PULL HITCH INSTALLATION

IMPORTANT

READ ALL SAFETY PRECAUTIONS AT THE FRONT OF THIS SECTION BEFORE ATTEMPTING ANY OF THE FOLLOWING PROCEDURES.

IMPORTANT

SEE FIGURE 3-8 FOR PART NAMES.

IMPORTANT

In the following procedure: right-hand and left-hand are determined standing at the rear of the machine, looking toward the front.

3-7.1 Use the pivot pin and bushing to attach the clevis end of the leveling rod to the long end of the front linkage. Secure this with a 3/8" bolt.

IMPORTANT

BE SURE THE LEVELING ROD IS SET ON THE LEFT SIDE OF THE FRAME ON MODEL 2225'S, AND OVER THE CENTER OF THE FRAME ON MODEL 2227'S, WHEN STANDING AT THE BACK OF THE MACHINE. THE FRONT LEVELING LINKAGE SHOULD ALSO HAVE ITS LONG END FACING DOWN AND ANGLED BACK.

3-7.2 Put the sleeve end of the leveling rod between the leveling arms on the rockshaft. Slide the pivot pin through the leveling arms and the sleeve of the leveling rod. Install 3/8" bolts through the leveling arm and the pivot pin. Secure with 3/8" nuts.

3-7.3 (2227 Only) Install the front leveler link between the mast plates:

IMPORTANT

YOU MAY NEED TO LOOSEN OTHER MAST PLATE CAPSCREWS.

- a. Insert the leveling linkage bushing into the front leveler link.
- b. Place the front leveler link between the two mast plates. The short arm should face up and forward.
- c. Install 1" x 7-1/2" capscrew through the top, forward mast plate holes, and through the leveling linkage bushing.
- d. Tighten the mast plate capscrews to specified torque. **(See Table 2-1)**

3-7.4 Install the pull hitch to the main frame mounting brackets. Use two hitch pins and secure with 1/4" cotter pins and washers.

3-7.5 Attach the clevis end of the radius rod to the top hole of the leveler linkage (short end). Secure the radius rod with the radius rod pin and bolt.

3-7.6 Attach the sleeve end of the radius rod to the lower radius rod plates with the front hitch pin and 1/4" cotter pins.

3-7.7 Adjust front radius rod to set for level field operation.

3-7.8 Install ring hitch in hitch assembly with bushings, bolts, washers, and nuts.

3-7.9 Hook up the coupling hoses to a tractor. Bleed the hydraulic system of all air in the lines or cylinders, as follows:

- a. Disconnect the rod ends of the gauge wheel cylinders from the anchors on the rockshaft. Raise the ends until they are higher than the base end of the cylinders.
- b. Fully extend and retract the cylinders at least twice to work the air out of the system.
- c. Reinstall the rod ends of the gauge wheel cylinders. Cycle the cylinders at least twice to work the air out of the pressure side of the system.

3-7.10 Raise the machine to fully extend the cylinders, and to lock the cylinders on with the cylinder lockouts. Secure the lockouts with the lockout pins **(See Figure 3-3).**

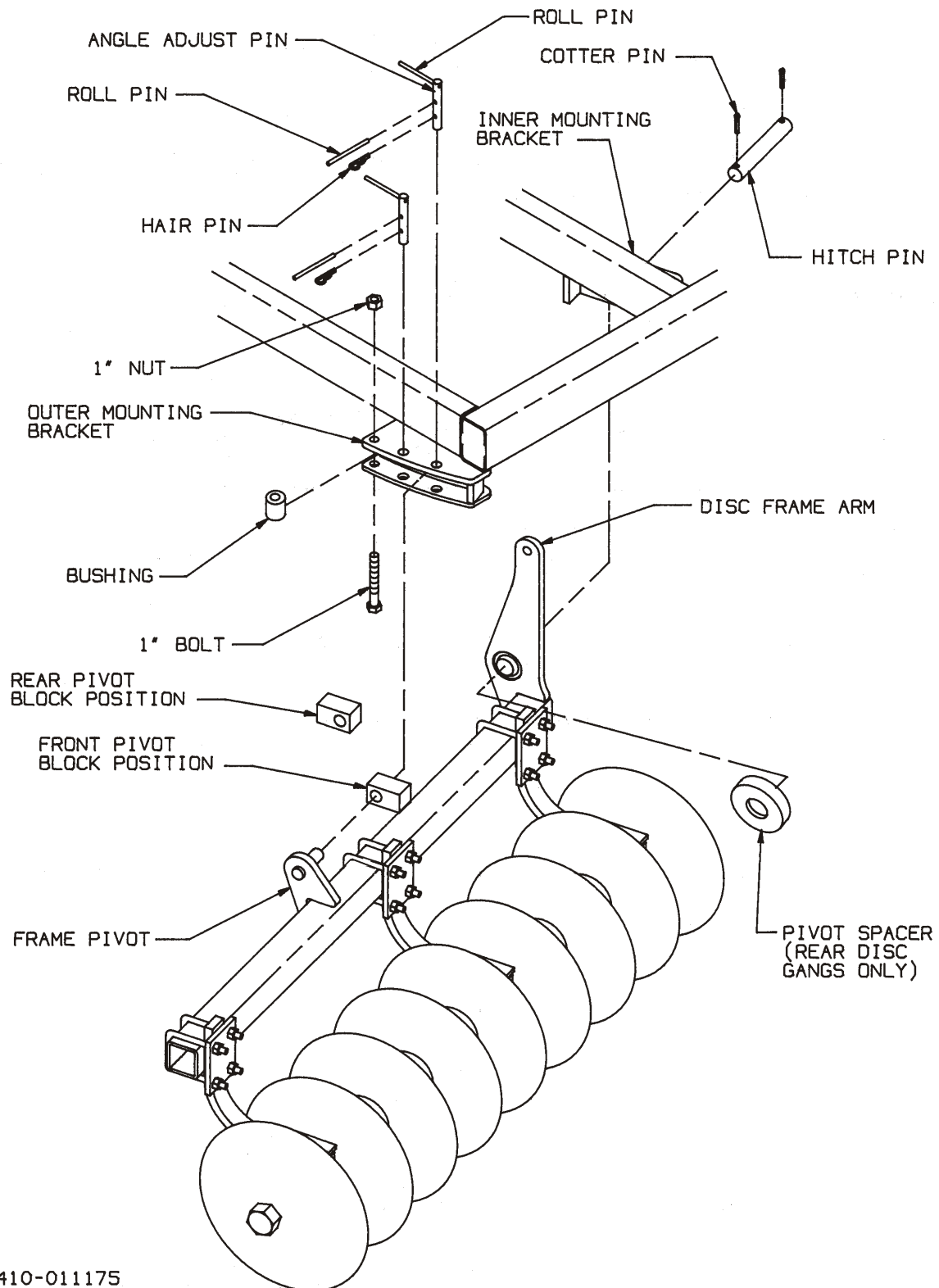


Figure 3-9 Disc Gang Installation

3-8 DISC GANG INSTALLATION

IMPORTANT

READ ALL SAFETY PRECAUTIONS AT THE FRONT OF THIS SECTION BEFORE ATTEMPTING ANY OF THE FOLLOWING PROCEDURES.

DANGER

DISC BLADES ARE EXTREMELY SHARP. EXERCISE EXTREME CARE WHEN WORKING ON OR NEAR DISC BLADES. DO NOT ALLOW DISCS TO ROLL OVER OR FALL ONTO ANY BODILY PART. DO NOT ALLOW WRENCHES TO SLIP WHEN WORKING NEAR DISC BLADES. NEVER PUSH WRENCHES TOWARD DISC BLADES. DO NOT CLIMB OVER MACHINE ABOVE DISC BLADES. FAILURE TO STAY CLEAR OF DISC BLADE EDGES CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.

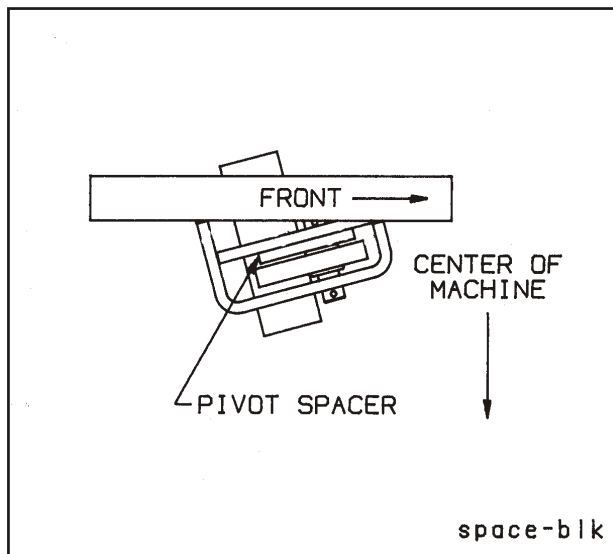


Figure 3-10 Pivot Spacer Block Installation

3-8.1 FRONT DISC GANG INSTALLATION.

IMPORTANT

THE FRONT DISC GANG FRAMES ARE THE SHORTER PAIR.

- Install the pivot block on the outer disc gang frame pivot so the long end is facing the rear of the frame.
- Hoist the disc frame up until the disc frame arm goes into the inner mounting bracket on the main frame. Locate the disc gang so that the pivot block is behind the outer mounting bracket.
- Align the pivot block with the outer mounting bracket and slide it forward.
- Install a hitch pin through the inner mounting bracket and the ball socket of the disc frame arm. Secure with cotter pins.
- Install a bushing in the outer frame bracket by putting a 1" x 6" bolt up through the bracket and a nut on the top.

IMPORTANT

MAKE SURE THE NUT IS ON TOP.

- Two angle adjust pins are installed in the outer mounting bracket with hair pins. Make sure angle adjust pins are assembled as shown in **Figure 3-9**. These angle adjust pins are used to adjust the angle of the disc gangs. (See **Section 4-4.7**).

3-8.2 REAR DISC GANG INSTALLATION.

- Install the pivot block on the outer disc gang frame pivot so the long end is facing the front of the frame.
- Hoist the disc frame up until the disc frame arm goes into the inner mounting bracket on the main frame. Locate the disc gang so that the pivot block is in front of the outer mounting bracket.
- Align the pivot block with the outer mounting bracket and slide it rearward into the bracket.
- Install a hitch pin through the inner mounting bracket, the ball socket of the disc frame arm and the pivot spacer (See **Figure 3-10**). Secure with cotter pins.

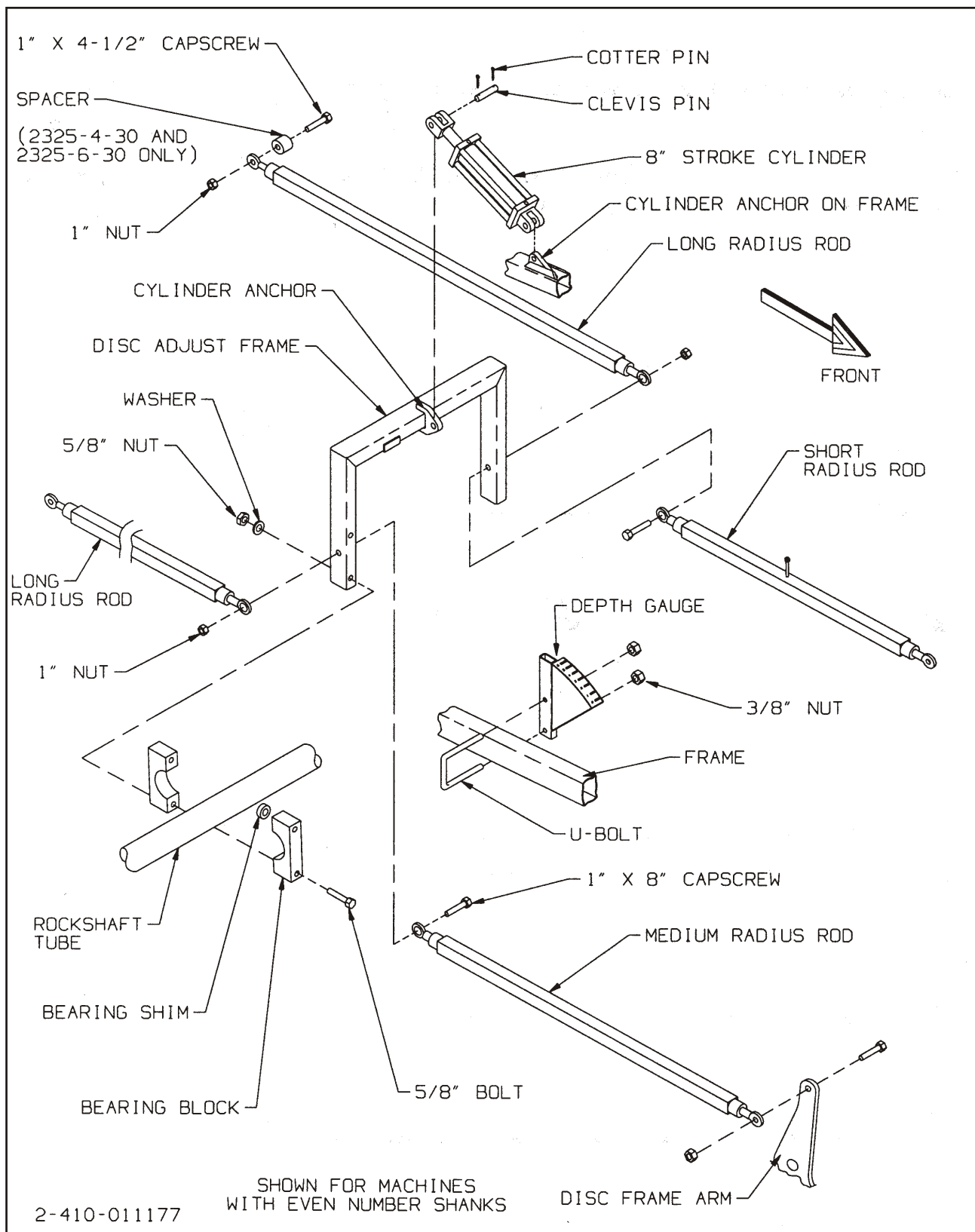


Figure 3-11 Disc Gang Hydraulic Installation

- e. Install a bushing in the outer frame bracket by putting a 1" x 6" bolt up through the bracket and a nut on the top.

IMPORTANT

MAKE SURE THE NUT IS ON TOP.

- f. Two angle adjust pins are installed in the outer mounting bracket with hair pins. Make sure angle adjust pins are assembled as shown in **Figure 3-9**. These angle adjust pins are used to adjust the angle of the disc gangs (**See Section 4-4.7**).

3-9 DISC GANG HYDRAULIC ADJUSTMENT/INSTALLATION

CAUTION

BE SURE TO BLEED THE HYDRAULIC SYSTEM OF ALL AIR IN LINES AFTER INSTALLATION. FAILURE TO BLEED THE SYSTEM OF ALL AIR CAN RESULT IN IMPROPER MACHINE OPERATION.

- 3-9.1 Assemble the bearing blocks onto the gauge wheel rockshaft tube and install the disc adjust frame using 5/8" x 11-1/2" bolts and nuts on the 2225 or 5/8" x 14-1/4" bolts and nuts on the 2227. (**See Figure 3-11**).

- 3-9.2 Insert the bearing shims as needed between each set of bearings. Use only enough shims to allow the bearings to rotate freely on the rockshaft. Then tighten the cap screws.

- 3-9.3 Install the base end of the 8" stroke cylinder(s) on the cylinder anchors(s) on the frame and the rod end(s) to the anchor on the disc adjust frame. The hose ports should face up. An optional ratchet jack may be used in place of the hydraulic cylinder on the 2225 series.

- 3-9.4 2225 Radius Rod Installation Only — For machines with odd number of shanks:

- a. Install the adjustable end of the (2) long radius rods to the inside of the disc adjust frame with 1" x 8" cap screws, nuts. Install the fixed end to the inside of the rear disc frame arm with 1"x 4-1/2" cap screws and nuts.
- b. Install one end of the short radius rod to the outer right side of the disc adjust frame using the same bolt the long radius rod is on. Install the other end of the short radius rod to the outside of the right front disc frame arm with a 1" x 4-1/2" cap screw and nut.
- c. Install one end of the medium radius rod to the outer left side of the disc adjust frame using the same bolt that the long radius rod is on. Install the other end of the medium radius rod to the outside of the left front disc frame arm with a 1" x 4-1/2" cap screw and nut.

3-9.5 2225 Radius Rod Installation Only —
For machines with even number of shanks
(See Figure 3-11).

- a. Install the adjustable end of the (2) long radius rods to the outside of the disc adjust frame with 1" x 8" cap screws, nuts, and flat washers. Install the fixed end to the outside of the rear disc frame arm with 1" x 4-1/2" cap screw and nuts.
- b. Install one end of the short radius rod to the inside of the disc adjust frame using the same bolt the long radius rod is on. Install the other end of the short radius rod to the inside of the right front disc frame arm with a 1" x 4-1/2" cap screw and nut.
- c. Install one end of the medium radius rod to the inside of the disc adjust frame using the same bolt that the long radius rod is on. Install the other end of the medium radius rod to the inside of the left front disc frame arm with a 1" x 4-1/2" cap screw and nut.

3-9.6 2227 Radius Rod Installation Only —
Any number of shanks:

- a. Install the adjustable end of the (2) long radius rods to the outside of the disc adjust frame with 1" x 8" cap screws, nuts, and flat washers. Install the fixed end to the outside of the rear disc frame arms with 1" x 4-1/2" cap screws and nuts.

- b. Install one end of the short radius rod to the inside of the disc adjust frame using the same bolt the long radius rod is on. Install the other end of the short radius rod to the outside of the right front disc frame arm with a 1" x 4-1/2" cap screw and nut.
- c. Install one end of the medium radius rod to the inside of the disc adjust frame using the same bolt that the long radius rod is on. Install the other end of the medium radius rod to the outside of the left front disc frame arm with a 1" x 4-1/2" cap screw and nut.

3-9.7 Retract the disc adjust cylinder completely. Adjust the radius rods to raise the disc gangs to maximum height. (The disc gang frame tubes should be 1/8" from the main frame brackets.) Adjust left and right disc gangs to the same height.

CAUTION

TO PREVENT DAMAGE TO THE MACHINE NEVER ADJUST THE RADIUS RODS TO RAISE THE DISC GANGS HIGHER THAN THE ADJUSTMENT IN SECTION 3-9.7.

3-9.8 To operate the front and rear disc gangs at different depths, adjust the front disc gangs lower by shortening the front disc radius rods. Front gangs should be set to run 1" to 2" lower than rear discs.

3-9.9 Assemble the depth gauge to the main frame using a u-bolt and nuts. Position the gauge under the pointer on the disc adjust frame.

3-10 SPRING CUSHION CLAMP INSTALLATION

IMPORTANT

READ ALL SAFETY PRECAUTIONS AT THE FRONT OF THIS SECTION BEFORE ATTEMPTING ANY OF THE FOLLOWING PROCEDURES.

IMPORTANT

SEE FIGURE 3-12 FOR PART NAMES. SEE FIGURES 2-1 THROUGH 2-6 FOR SHANK PLACEMENT.

- a. For locating the shank position on the frame, refer to the shank location diagrams (See Figures 2-1 - 2-6). Mark shank holder locations on the frame as indicated.
- b. If using twisted shovels, install all shanks so shovels throw soil inward except shovels near wheels. Position those shovels to throw outward.
- c. To ensure the chisel plow pulls evenly, install correct number of RH and LH twisted shovels.
- d. Mount shank assembly to frame with two 5/8" bent bolts and two 5/8" x 3-3/4" Grade 8 bolts, lock nuts and plate. Tighten to 170 ft-lb (231 Nm) (See Figures 3-12 and 3-13).

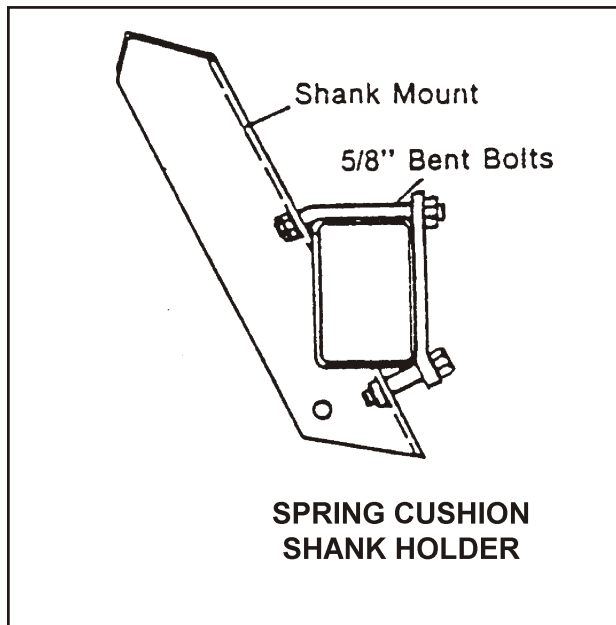


Figure 3-12 Spring Clamp Installation

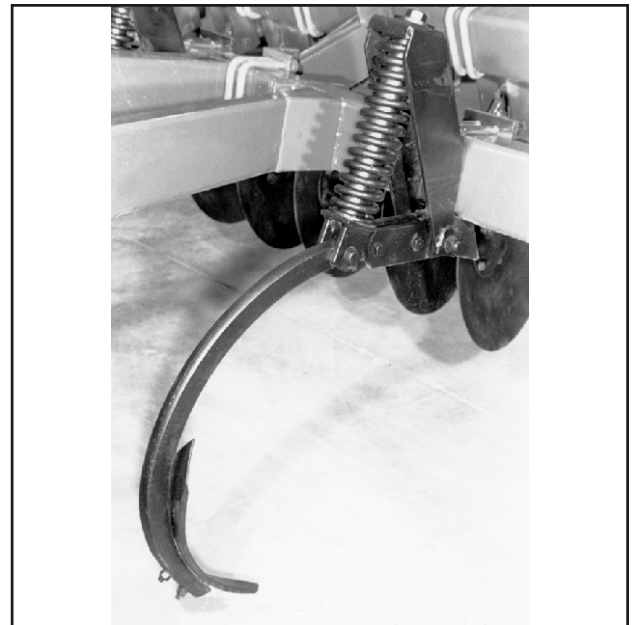


Figure 3-13 Spring Cushion Clamp

3-11 DECALS

Decals are provided for your safety and for machine identification. Be sure to keep safety decals legible and clean. The following decals must be installed before transporting your machine:

3-11.1 Install red and amber reflector decals on outermost parts of the disc frames (See **Figure 3-14**). Red decals go on the rear disc frames only. They must face traffic coming from behind the machine.

3-11.2 Amber decals must go on the left disc gang frames facing on-coming traffic.

IMPORTANT

DECALS CAN BE REPLACED IF NECESSARY THROUGH THE LANDOLL PARTS DISTRIBUTION CENTER OR YOUR LANDOLL DEALERSHIP.

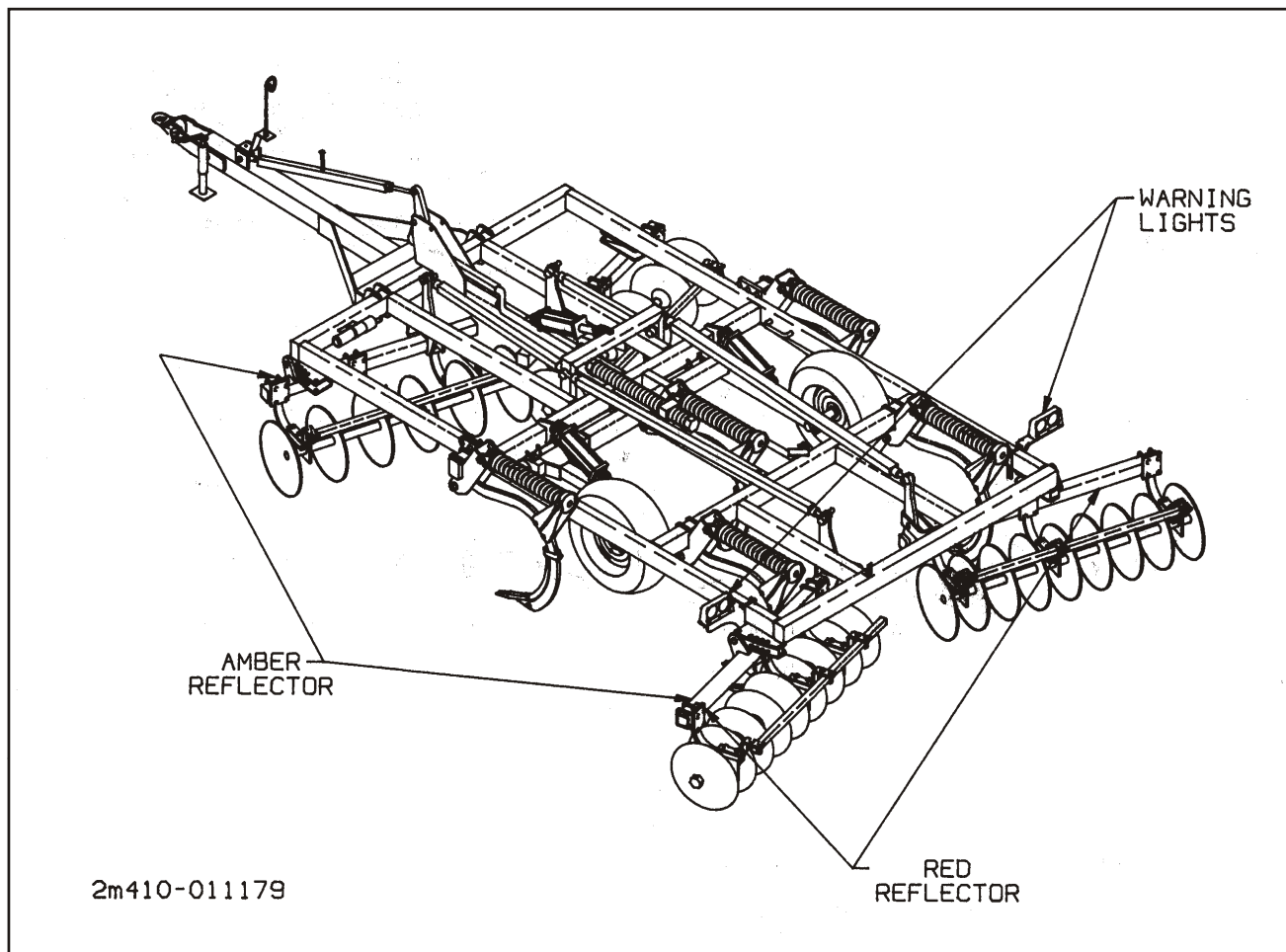


Figure 3-14 Reflector and Light Placement on Frame Assy

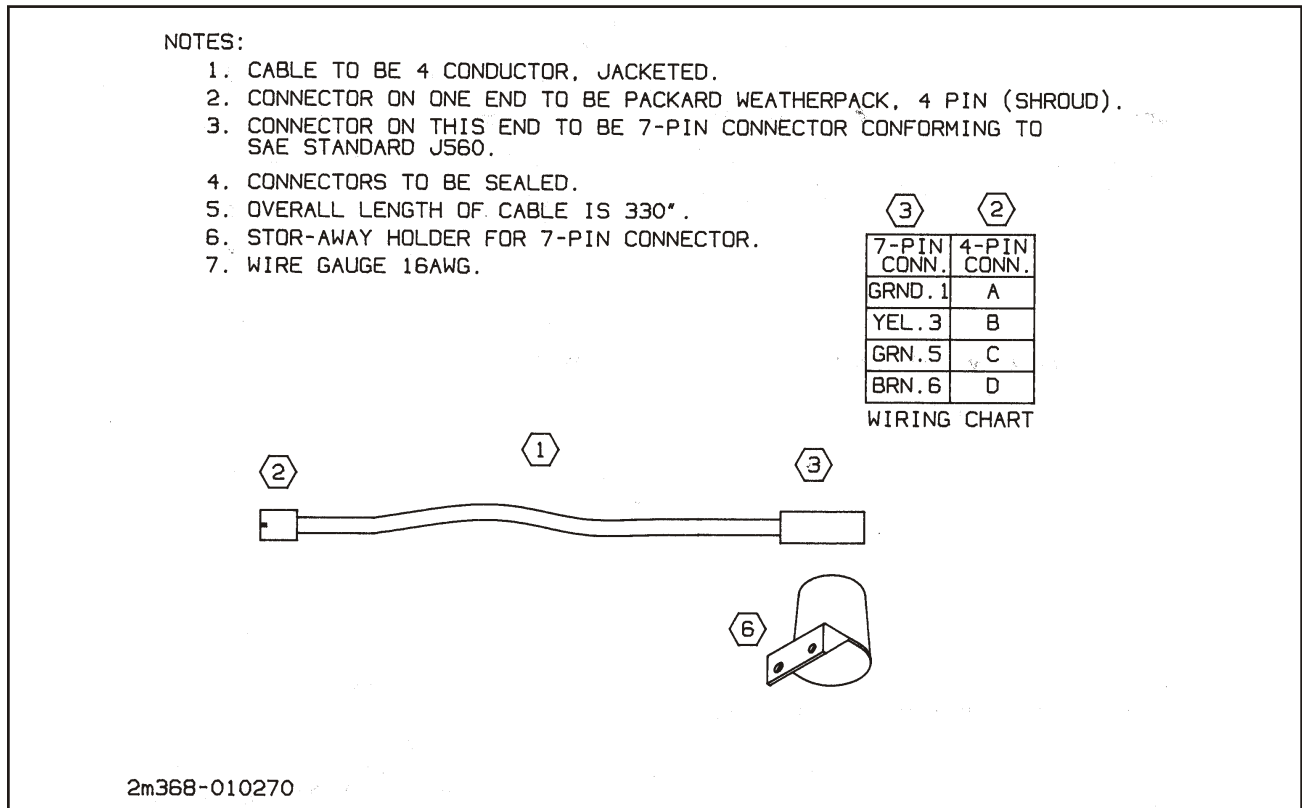


Figure 3-15 Wiring Diagram

3-12 WARNING LIGHTS INSTALLATION

- 3-12.1** Assemble lights to the light bracket using 1/4 X 1-3/4 capscrews and nuts. Insure the wires are in the groove in the base of the light toward the mounting surface of the bracket. Assemble one light for left side and one for right side. The red light should be to the rear with the amber light being the outer most light.
- 3-12.2** Install the assembled lights on the outside of the frame just forward of the rear disc adjust plates. (See Figure 3-14).

IMPORTANT

MAKE SURE LIGHTS ARE POSITIONED FOR MAXIMUM VISIBILITY FROM THE REAR.

- 3-12.3** Install the rear wiring harness between the lights.
- 3-12.4** Assemble the harness extension to the center plug on the rear harness.
- 3-12.5** Install the main harness by starting at the hitch and routing the harness through the hose loops to the extension harness. See wiring diagram as shown in **Figure 3-15**.
- 3-12.6** Insure the harnesses are clear of any moving parts and secure the harnesses with tie wraps provided.

3-13 LUBRICATION

The Disc Chisel must be lubricated before using it for the first time, and at regular intervals

thereafter. Use a standard multi-purpose grease. (See Section 4-6) to lubricate your Disc Chisel.

NOTES:

OPERATION AND MAINTENANCE

4

DANGER

NEVER ALLOW ANYONE TO RIDE ON THE 2220 SERIES DISC CHISEL AT ANY TIME. ALLOWING A PERSON TO RIDE ON THE MACHINE CAN INFLICT SERIOUS PERSONAL INJURY OR DEATH TO THAT PERSON.

DANGER

DISC BLADES ARE EXTREMELY SHARP. EXERCISE EXTREME CARE WHEN WORKING ON OR NEAR DISC BLADES. DO NOT ALLOW DISCS TO ROLL OVER OR FALL ONTO ANY BODILY PART. DO NOT ALLOW WRENCHES TO SLIP WHEN WORKING NEAR DISC BLADES. NEVER PUSH WRENCHES TOWARD DISC BLADES. DO NOT CLIMB OVER MACHINE ABOVE DISC BLADES. FAILURE TO STAY CLEAR OF DISC BLADE EDGES CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.

WARNING

ALL HYDRAULICALLY ELEVATED EQUIPMENT MUST HAVE CYLINDER LOCKOUTS INSTALLED OR BE LOWERED TO THE GROUND, WHEN SERVICING OR WHEN EQUIPMENT IS IDLE. FAILURE TO TAKE PREVENTIVE MEASURES AGAINST ACCIDENTAL LOWERING CAN RESULT IN SERIOUS PERSONAL INJURY.

DANGER

WHEN TRANSPORTING THE UNIT, PLACE CYLINDER LOCKOUTS IN THE TRANSPORT LOCK POSITION AFTER FULLY EXTENDING THE CYLINDERS. INSERT THE LOCKOUT PINS TO SECURE THE CYLINDER LOCKOUTS. FAILURE TO LOCKOUT THE CYLINDERS CAN CAUSE THE UNIT TO SETTLE DURING TRANSPORT, WHICH CAN RESULT IN SERIOUS INJURY OR DEATH AND CAUSE DAMAGE TO THE EQUIPMENT.

CAUTION

WHEN TRANSPORTING FARM IMPLEMENTS ON PUBLIC ROADS, IT IS THE RESPONSIBILITY OF THE OPERATOR TO ABIDE BY STATE AND LOCAL LAWS CONCERNING WIDE LOADS, SPEED, SAFETY EMBLEMS AND SAFETY LIGHTING EQUIPMENT. DRIVE AT SAFE SPEEDS. PARTICULARLY WHEN ROUNDING CORNERS, CROSSING ROUGH GROUND OR DRIVING ON HILLSIDES, TO PREVENT TIPPING THE TRACTOR.

DANGER

ALWAYS LOCK THE TRACTOR DRAWBAR IN THE CENTER POSITION WHEN TRANSPORTING THE UNIT. FAILURE TO DO SO CAN RESULT IN SERIOUS INJURY OR DEATH AND CAUSE DAMAGE TO THE EQUIPMENT.

4-1 TRACTOR PREPARATION

The Landoll 2220 Series Disc Chisel is designed to be pulled by tractor equipped with a double lip or clevis type hitch. If your tractor is not equipped as such, you need to purchase the hitch from your local tractor dealer. If your Disc Chisel is equipped with the clevis option, this should be removed. The clevis option is only for transport use. Before attaching the Disc Chisel, prepare the tractor as follows:

- 4-1.1 Inflate the rear tractor tires equally and add ballast according to the tractor operator's manual.
- 4-1.2 Lock the tractor drawbar in the center position.

4-2 DISC CHISEL PREPARATION

- 4-2.1 Prior to operating the 2220 Series Disc Chisel, inspect it thoroughly for good operating condition.
- 4-2.2 Replace worn or missing parts.
- 4-2.3 When the machine is new, check the bolt tightness after a few hours of operation. Tighten any loose nuts or bolts. Check the gauge wheel lug bolts daily.
- 4-2.4 Check the gauge wheel tire inflation. Inflate all tires equally to avoid side draft. Follow the tire manufacturer's recommended pressures listed on the sidewall of the tires.
- 4-2.5 Check disc scrapers for proper clearance to the disc blade. **See Figure 4-1.**
 - a. Loosen U-bolts. Slide scraper assembly to adjust clearance to 1/8" to 1/4".

IMPORTANT

UNDER CERTAIN CONDITIONS, IT MAY BE BENEFICIAL TO SET SCRAPERS AS MUCH AS 1" AWAY FROM THE DISCS.

- 4-2.6 Lubricate the machine as shown in **Section 4-6 (See Figure 4-4)**.

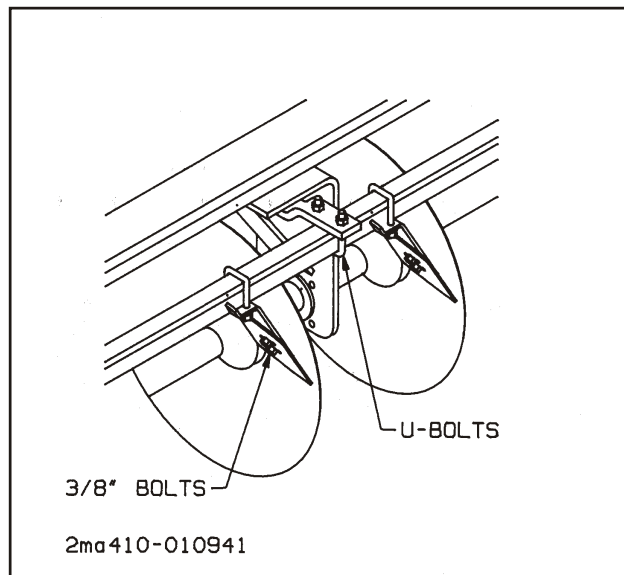


Figure 4-1 Disc Scraper Clearance to Disc Blade

4-3 ATTACHING TO THE TRACTOR

- 4-3.1 Align the tractor drawbar with the machine. Raise or lower the Disc Chisel ring hitch, as needed, using the swivel jack. Attach the unit with proper size hitch pin.
- 4-3.2 Clean all hydraulic couplings and attach to the tractor. When properly attached, the hydraulic control lever should cause the Disc Chisel to:
 - a. Lower to the ground when the control arm is moved forward or downward, and
 - b. Raise when the control arm is moved backward or upward.
- 4-3.3 Fully extend the hydraulic gauge wheel cylinders, and place the cylinder lockouts in the transport lock position over the cylinder rods. Secure the lockouts with the lockout pins.
- 4-3.4 Always place the swivel jack on the interior mount before setting the machine in motion.

4-4 FIELD OPERATION

- 4-4.1** Remove the transport lock pins from the cylinder lockouts. Use them to hook the lockouts to the lockout anchor chains. Lower the Disc Chisel until the points run at the desired depth.
- 4-4.2** Check the front-to-rear leveling of the frame. Level the machine by adjusting the hitch radius rod. Set the frame level at its working depth.
- 4-4.3** Set the depth by changing the stroke control blocks on the gauge wheel cylinders. For stability, it is important that the gauge wheels always apply slight pressure against the soil.
- 4-4.4** Always lift the Disc Chisel completely out of the ground before turning or backing. This prevents shank or disc damage or damage to their respective mounting brackets.
- 4-4.5** Reduce speed at field ends, and lift the Disc Chisel completely out of the ground before turning.
- 4-4.6** After a few hours of operation, check all bolts for tightness, especially the shank u-bolts and pivot bolts. Tighten wheel lug bolts to 90 ft-lbs of torque. Tighten any loose bolts to the torques shown in **Table 2-1**.

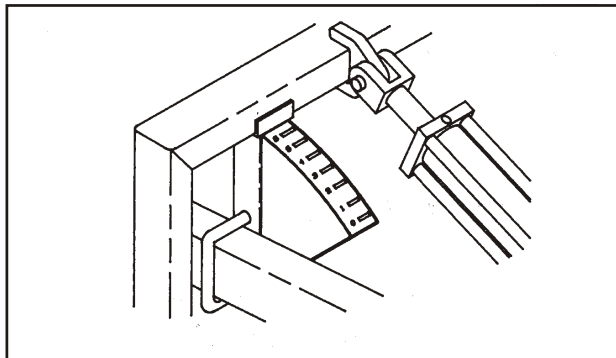


Figure 4-2 Shank Depth Gauge

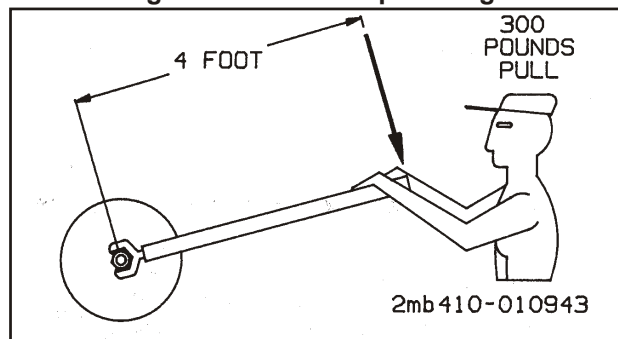


Figure 4-3 1200 Foot-Pounds of Torque

- 4-4.7** Disc Gang Operation. The disc gangs may be set at an angle of 10, 15, or 20 Degrees. The angle is adjusted by removing the disc angle adjust pins and moving the outer end of the disc gangs to the angle desired. Reinstall pins to hold disc at desired angle.

4-4.8 Hydraulic Disc Operation.

- a. Lower the machine until the shanks are at the desired working depth.

IMPORTANT

USE THE DEPTH GAUGE (SEE FIGURE 4-2) FOR RELATIVE DEPTH OF DISCS. IT DOES NOT INDICATE ACTUAL DEPTH OF DISCS.

- b. Position the discs at desired depth by extending or retracting the disc adjust hydraulic cylinder(s).
- c. The front discs can be set deeper than the rear discs by shortening the front discs adjust radius rods.

CAUTION

TO PREVENT DAMAGE TO YOUR MACHINE, DO NOT CHANGE THE REAR RADIUS ROD TO RAISE THE REAR DISCS.

- 4-4.9** Check disc scrapers for proper setting. (See Section 4-2 to adjust).

CAUTION

TIGHTEN ALL 1-1/2" NUTS TO 1200 FOOT-POUNDS OF TORQUE.

4-5 WHEEL BEARING MAINTENANCE

Wheel bearing maintenance should be performed at the beginning of every season of use. Check the wheel bearings periodically for excessive end play. If needed, adjust or replace them using the following procedure:

- 4-5.1** Place the frame on blocks or stands sufficient to lift the tire clear of the ground.
- 4-5.2** Remove the hub cap, cotter pin, slotted nut and washer.
- 4-5.3** Remove the hub. Clean and inspect the bearings and hub cavity. Replace any worn or defective parts.
- 4-5.4** Repack the bearings using a high-quality wheel bearing grease.
- 4-5.5** Replace the hub with a new seal and the inner bearing in place.
- 4-5.6** Install the outer bearing cone, washer and slotted nut.
- 4-5.7** Tighten the slotted nut while rotating the hub until there is a slight resistance to wheel rotation. Then, back the slotted nut off one notch, until the wheel rotates freely without end play.
- 4-5.8** Install a new cotter pin and replace the hub cap.

4-6 LUBRICATION

Several parts of the Model 2220 Series Disc Chisel need periodic lubrication. Use of a high grade multi-purpose grease is recommended. Refer to the Disc Chisel Lubrication Chart (**See Figure 4-4**) to locate lubrication points and for a recommended maintenance schedule.

4-7 HYDRAULIC MAINTENANCE

- 4-7.1** Check the tractor hydraulic fluid level per tractor owners manual and after any leakage. Check fluid level with the cylinders in the retracted position.
- 4-7.2** If a cylinder or valve leaks, disassemble the parts to determine the cause of the leak. Any time a cylinder is opened up, or whenever any seal replacement is necessary, it is advisable to clean all parts and replace all seals. Seal kits are available from your Landoll dealer.
- 4-7.3** Check all hydraulic hoses weekly. Look for binding or cracking. Replace all worn or defective parts immediately.

4-8 STORAGE

- 4-8.1** The service life of the Disc Chisel will be extended by proper off-season storage practices. Prior to storing the unit, complete the following procedures:
 - a.** Completely clean the unit.
 - b.** Inspect the machine for worn or defective parts. Replace as needed.
 - c.** Repaint all areas where the original paint film is worn off.
 - d.** Grease all exposed metal surfaces of shanks, points and discs.
 - e.** Lubricate each point of the machine as stated in **Section 4-6**.
- 4-8.2** Store the unit in a shed or under a tarpaulin to protect it from the weather. The ground tools and tires should rest on boards, or some other object, to keep them out of the soil.

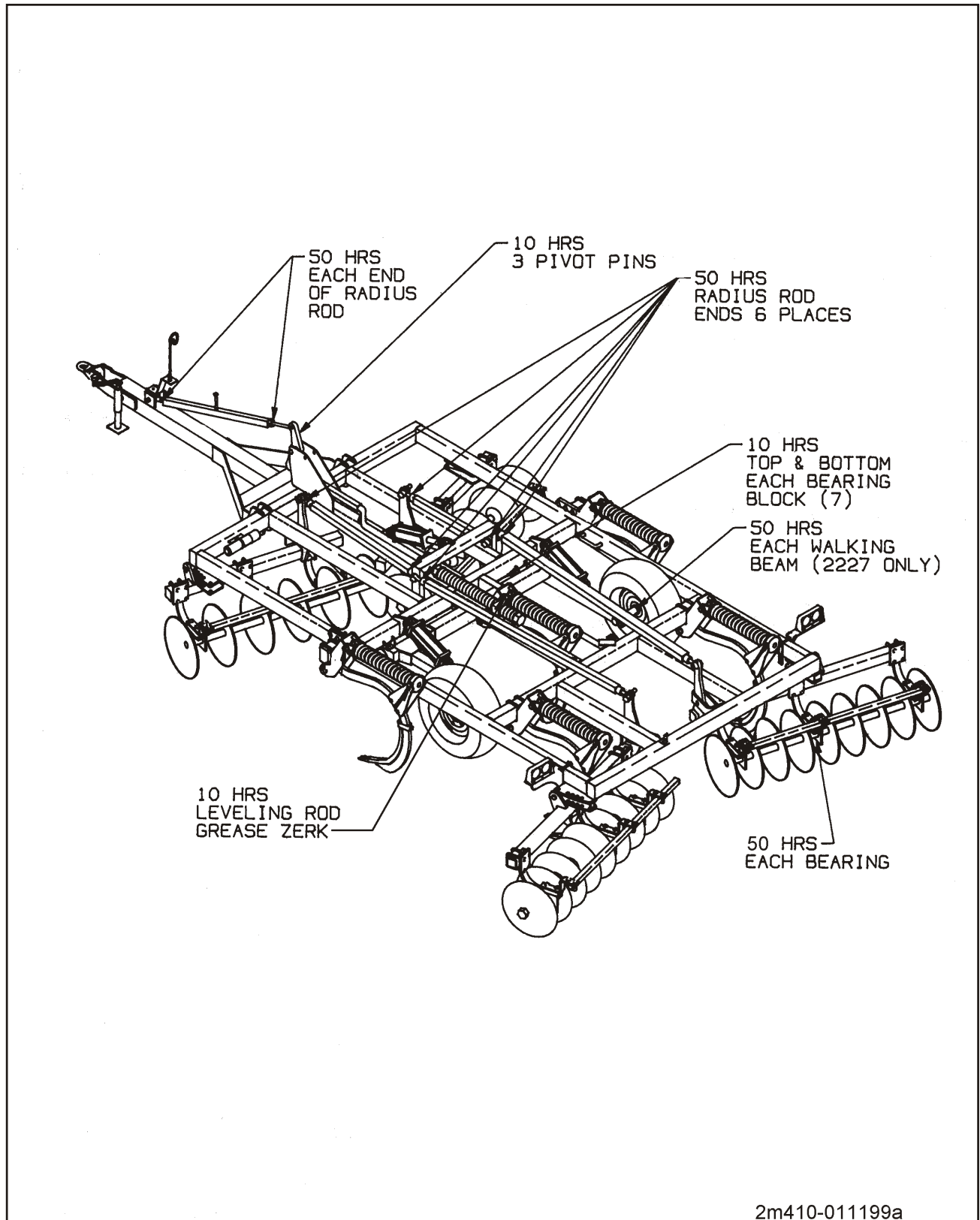


Figure 4-4 Lubrication Schedule

NOTES

TROUBLESHOOTING GUIDE

5

The Troubleshooting Guide, shown below, is included to help you quickly locate problems that can happen using your 2220 Series Disc Chisel. Follow all safety precautions stated in the previous when making any adjustments to your machine.

PROBLEM	PROBABLE CAUSE:SOLUTION
1. FIELD NOT LEVEL BEHIND DISC CHISEL, RIDGE AT CENTER OF SWATH	A. FRAME NOT LEVEL FRONT TO REAR: Lower machine to working depth and drive a short distance. Stop and check if frame is level. Adjust radius rod as required to level machine. B. REAR DISC GANGS AT TOO AGGRESSIVE AN ANGLE: Adjust rear disc gangs to a lesser angle. C. REAR DISC GANGS OPERATING TOO DEEP: Retract hydraulic cylinder to raise rear discs to desired depth and adjust front disc gang radius rods to set front gangs to desired depth. D. REAR DISC GANGS TOO CLOSE TOGETHER: Loosen u-bolts holding disc gang shanks to 4x4 tube and slide disc gangs out.
2. FIELD NOT LEVEL, RIDGE AT OUTSIDE OF SWATH	A. FRAME NOT LEVEL FRONT TO REAR: Lower machine to working depth and drive a short distance. Stop and check if frame is level. Adjust radius rod as required to level machine. B. FRONT DISC GANGS AT TOO AGGRESSIVE AN ANGLE: Adjust front gangs to a lesser angle. C. FRONT DISC GANGS OPERATING DEEPER THAN NECESSARY: Adjust front disc gang radius rods so front discs are at the same depth as rear discs. D. SPEED TOO FAST, CAUSING FRONT DISCS TO THROW SOIL BEYOND REACH OF REAR DISCS: Change to slower gear or change front disc gangs to a lesser angle.
3. STRIPS OF UNTILLED SOIL NEAR CENTER OF SWATH	A. FRAME NOT LEVEL FRONT TO REAR: Lower machine to working depth and drive a short distance. Stop and check if frame is level. Adjust radius rod as required to level machine. B. REAR DISC GANGS OPERATING TOO SHALLOW: Extend hydraulic cylinder to lower all disc gangs and adjust front disc gang radius rods so front and rear discs are at approximately the same level.
4. DISC GANGS STOP TURNING AND PLUG	A. DISCS SET TOO SHALLOW: Lower disc gangs to cut 5" to 6" deep. B. SCRAPERS SET TOO TIGHT: Adjust scrapers to 1/8" to 1/4" clearance to disc blades. C. DISC BLADES WORN: New blades are 22" diameter. Replace when necessary.

PROBLEM	PROBABLE CAUSE:SOLUTION
5. SHANKS PLUG	A. FRONT DISCS SET TOO SHALLOW: Lower disc gangs to get better cutting action, 5" to 6" deep. B. SHANKS NOT SPACED CORRECTLY: See shank placement Figures 2-1 to 2-6. Adjust if necessary.
6. SCRAPERS BEND OR PLUG	A. SCRAPERS NOT ADJUSTED CORRECTLY: Adjust scrapers to 1/8" to 1/4" clearance to disc blades. Under sticky conditions, they may work better with 3/4" to 1" clearance. B. SCRAPERS NOT ASSEMBLED CORRECTLY: Check assembly instructions in Chapter 3.



Intertek

Equipment from Landoll Corporation is built to exacting standards ensured by ISO 9001 registration at all Landoll manufacturing facilities.

Model 2220 Series
Disc Chisel
Operator's Manual

Re-Order Part Number F-312-0605

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