

A note to our customers, parts managers and dealers:

This manual has been prepared to assist you in the proper use, daily care, and operation of your new Krause equipment. It contains specific information on the many built-in features of your equipment, the accessories and options that are available, general specifications, and instructions for making minor adjustments.

Read this manual carefully before operating your Krause equipment, and keep it in a convenient location for later reference.

In order to ensure that you have the most current owner's manual available for your implement, we have added a revision code to each manual. Please note the information listed below and specify when placing service calls or ordering parts.

Manual for Model: 8100

This manual covers models beginning with Serial No. 1001

Owner's Manual #: 8100-1

Parts Manual #: 8100-2

Rev.:

ISSUED TO:

ISSUED BY:

Owner's Name

Krause Dealer

Mailing Address

City

City

State

State

Date of Purchase

Warranty Policy

(Krause Serial Numbered Wholegoods purchased subsequent to May 1, 2008)

Note: This warranty is limited to the equipment and parts sold in North America and all warranty work must be accomplished by a Krause Corporation Authorized Service Center rated to perform maintenance on Krause Corporation Products.

A. KRAUSE CORPORATION (“KRAUSE”) LIMITED WARRANTY.

- (1) Subject to the limitations and conditions hereinafter set forth, Krause warrants, at the time of delivery by Krause to be free from (i) defects in materials or workmanship, and (ii) defects in design that in the view of the state of the art as of the date of manufacture should have been foreseen provided, however, that the defect must be discovered and reported to Krause within the periods specified as follows. For a period of one year all new serial numbered production agricultural units covered by this warranty; for a period of thirty-six (36) months the tongue weldment, center frame weldment, wing frame weldments, disc harrow gang bearings and K-Tine field cultivator shanks.
- (2) Krause does not warrant disc blades, shanks, hydraulic cylinders, accessories and other parts not manufactured by it, but supplied with or as a part of its products. Krause will, however, obtain and pass on any adjustments provided by the manufacturers of such parts under these manufacturer's warranties. Tires supplied on Krause products, will be warranted by the tire manufacturer's retail outlets.
- (3) The entire extent of Krause's liability shall be limited to that of either reimbursing Buyer for its costs of purchasing a rebuilt, over-hauled or repaired part from either Krause or a proper Krause Authorized Service Center or, at Krause's election, reimbursing buyer for its costs of having the part repaired at a proper Krause Authorized Service Center. If Krause elects not to repair the part and if neither a rebuilt, over-hauled or repaired part is, in Krause's opinion, timely available then Krause will reimburse buyer for its costs of purchasing a new part from either Krause or a proper Krause Authorized Service Center. The labor necessary to remove from the product such part or parts and to install in the product such part or parts, as well as any repair made as the result of improper installations by Krause, shall be covered by this warranty, provided the work is performed at a proper Krause Authorized Service Center.★ If return of the defective part is required, it must be returned shipping prepaid to Krause. Krause's limited warranty will apply to any part repaired or replaced by a proper Krause Authorized Service Center pursuant to Krause's Limited Warranty: however, the applicable warranty for such part repaired or replaced shall be limited to the unexpired portion of Krause's Limited Warranty described in paragraph (1) or (2) above, as applicable. In other words, the warranty period of the part repaired or replaced does not start over from the date of reinstallation.

★[Krause Corporation will repair or replace, free of charge, any part of the product found to be defective, within the specified warranty periods, after an inspection of the part has deemed it to be defective. Inspection must be performed by an authorized agent of Krause Corporation, or returned to the Krause factory for inspection and disposition. Warranty labor will be considered during the first year of warranty only. Krause Corporation will establish and publish an hourly flat rate for shop labor and reimbursement during the first year of the warranty period. Krause Corporation does not allow credit for the cost of travel time, mileage or hauling as a warranty allowance. During the remaining second and third year, when applicable, Krause will repair or replace the defective part, without consideration of labor charges.]

- (4) Routine services (such as inspections, field settings, adjustments, etc.) and replacement of items which deteriorate from expected normal wear and tear or exposure (such as paint, tires, hoses, blades, sweeps, etc.) are not covered by this Limited Warranty. Such routine services and replacements required during the course of operation are not considered to be the result of any defect in the product.

B. LIMITATIONS APPLICABLE TO KRAUSE'S LIMITED WARRANTY.

- (1) This Warranty Policy only applies to equipment and parts sold in North America. Krause will be relieved of all obligations and liability under this warranty if:
 - (i) The alleged defect in the part is due to misuse or neglect on the part of someone other than Krause; or
 - (ii) Krause's identification mark or name or serial number has been removed from the part in question; or
 - (iii) The product and/or equipment have not been maintained, operated or stored either in accordance with applicable manuals, communications or other written instructions of Krause or any manufacturer of the part involved, or in accordance with applicable regulations and advisory circulars unless buyer shows that such maintenance, operation or storage was not a contributory cause of the defect; or
 - (iv) The part in question has been modified or altered after delivery other than by the manufacturer or in accordance with a modification or alternation scheme approved in writing by the manufacturer; or
 - (v) The product is used for purposes other than conventional owner/operator usage. Usage not considered conventional owner/operator includes, but is not limited to, operation conditions that consist of rocks or other obstructions.
- (2) For the purpose of this Warranty, no part of the product or equipment will be regarded as breaching the limited warranty merely because, subsequent to its delivery, some modification or alteration becomes necessary for product improvements or in order to meet a change in the requirements of any applicable regulation.
- (3) TO THE EXTENT ALLOWED BY APPLICABLE LAW, BUYER WAIVES AS TO KRAUSE ALL OTHER WARRANTIES, WHETHER OF MERCHANTABILITY, FITNESS OR OTHERWISE, THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACT HEREOF.
- (4) TO THE EXTENT ALLOWED BY APPLICABLE LAW, THE OBLIGATIONS OF KRAUSE SET FORTH HEREIN SHALL BE THE EXCLUSIVE REMEDIES FOR ANY BREACH OF WARRANTY HEREUNDER, AND, TO THE SAME EXTENT, KRAUSE SHALL NOT BE LIABLE FOR ANY GENERAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY DAMAGES FOR DIMINUTION OF MARKET VALUE, LOSS OF USE OR LOSS OF PROFITS, OR ANY DAMAGES TO THE PRODUCT CLAIMED BY BUYER OR ANY OTHER PERSON OR ENTITY UPON THE THEORIES OF NEGLIGENCE OR STRICT LIABILITY IN TORT.
- (5) ANY ACTION BY BUYER FOR BREACH OF THIS WARRANTY BY EITHER KRAUSE OR SELLER MUST BE COMMENCED WITHIN (1) YEAR AFTER THE CAUSE OF ACTION ACCRUES.

Establishing Customer Warranty

Dealer's Obligation

1. It is the responsibility of the dealer to complete a **Delivery Report and Warranty Registration** form. The form should contain the model, serial number, delivery date, along with the complete dealer and customer address. This form must be signed by the dealer and customer upon physical delivery of the product to the customer. The dealer must complete the **pre-delivery check list** provided on the Delivery Report and Warranty Registration form.
2. Dealer will review the **Predelivery Check List** located in the front of the operation manual with the customer and / or operator. This should be signed by the dealer at time of delivery to the retail customer.
3. The dealer will review the **Customer Review Sheet** located at the front of the operation manual with the customer and / or operator. This should be signed by the dealer representative and the customer.
4. An authorized Krause dealer will submit **warranty claims** on behalf of the customer. All claims must be handled through the dealer. They will then be given to the Krause District Manager for inspection and approval. Warranty requests must be filed within 60 days from completion of the repair for consideration.
5. It is the dealer's responsibility to **service** the warranty on products sold through said dealership.

This warranty gives you specific rights, and you may also have other rights which vary from state to state.

Establishing Customer Warranty

Customer's Obligation

1. The customer is responsible for reading the operation manual supplied with each serial numbered unit. The manual describes the safe and correct operating procedures of the specific product. The operation manual will also instruct the user on recommended lubrication and maintenance of the product.
2. The customer will advise the dealer of the anticipated start date of the product so a dealer representative can be on hand to make necessary field adjustments.
3. The owner is also responsible for inspecting the product during and after use. If a part has failed or is in need of repair, it should be replaced. When continued use of the product would result in excessive wear of other components, the part should be replaced before operation is continued. Continued use of the product may void warranty on other parts damaged from this condition. The user must make the machine available to the dealer for a warranty repair.
4. It is the customer's responsibility to deliver his machine to an authorized Krause dealer for completion of a warranty repair. If the dealer agrees to make a service trip to the customer's residence, it is an agreement between the dealer and the customer. Krause will not allow warranty credit for the cost of travel, mileage, or hauling.
5. Warranty labor consideration will only be given during the first year of warranty. Any labor charge for the 2nd or 3rd year on the limited warranty will be at the customer's expense.

This warranty gives you specific rights, and you may also have other rights which vary from state to state.

8100 SERIES TANDEM DISC HARROW DEALER PREDELIVERY CHECK SHEET

TO BE CHECKED BY DEALER

CUSTOMER _____ DATE _____

ADDRESS _____

DEALER _____

ADDRESS _____

MODEL _____ SERIAL NUMBER _____

DEALER CHECK:

1. ___ Check to see that all rocker shaft bolts are tight.
2. ___ Check to see that hydraulic cylinders are full of oil (air bled out of cylinders). Clevis pins with cotter pins should be in place and spread.
3. ___ Examine hydraulic hoses to see that they are protected from damage.
4. ___ Bolts attaching the spindle weldments to the rocker shaft should be tight. Check to see that bearings have been adjusted and greased.
5. ___ Check lug bolts holding wheels to the hub to see that they are torqued to 120 Ft. Lbs.
6. ___ The correct size of tires 9.5L x 15, 8-Ply tires inflated to 44 PSI / 303 kPa should be on the implement.
7. ___ Check to see that bolts attaching tongue to frame and bolts attaching clevis weldment to tongue are in place and secured.
8. ___ Jack should be operational for support of tongue when implement is not attached to a tractor.
9. ___ All decals are in place per page P20 of this owner's manual.
10. ___ Road locks are correctly installed and operate satisfactorily.
11. ___ Customer review sheet filled out and signed.
12. ___ Review lighting requirements. Light kits are standard.
13. ___ Check to see that the Owner's Manual is in the storage tube on the implement.
14. ___ Check to see that the SMV emblem is clean and in place.

DELIVERED BY _____

DATE _____

8100 SERIES TANDEM DISC HARROW CUSTOMER REVIEW SHEET

CUSTOMER _____ DATE _____

ADDRESS _____

DEALER _____

ADDRESS _____

MODEL _____ SERIAL NUMBER _____

1. ___ Owner's manual provided.
2. ___ Warranty card filled out and mailed.
3. ___ Review safety warnings and cautions as listed in this owner's manual.
4. ___ Review recommended maximum road speed, width, and height for this implement.
5. ___ Review field operation speeds, horsepower, depth and rock conditions.
6. ___ Demonstrate the proper use of the road lock.
7. ___ Explain the mechanical cylinder stroke control adjustment for depth control of the implement in the field.
8. ___ Review the limitations of additional weight and transport speed when adding attachments.
9. ___ Explain the importance of maintaining the implement through lubrication, checking periodically for loose bolts and tightening them, and replacing worn or broken parts.
10. ___ Recommend that a safety chain be used with the implement.
11. ___ Check wheel lug bolts frequently until they become set.
12. ___ Explain the adjustment procedure for gang beams and tongue.
13. ___ Explain lighting requirements for your area.

DEALER _____ DATE _____

CUSTOMER _____ DATE _____

Table of Contents

Rev.1/08

WARRANTY		DUAL SCRAPER ASSEMBLY	P12
DEALER PREDELIVERY CHECK SHEET		EXTENSION TRASH BAR ASSEMBLY	P13
CUSTOMER REVIEW SHEET		PRINCE CYLINDER ASSEMBLY	P14
TABLE OF CONTENTS		HYDRAULICS	P15
SPECIFICATIONS		HYDRAULIC HOSES W/ PLASTIC GRIP HANDLES	P16
GENERAL INFORMATION DRAWING		DECALS & REFLECTORS	P17
<u>OPERATION SECTION</u>		LIGHT KIT ACCESSORY	P18
SAFETY DECALS	01	<u>ASSEMBLY SECTION</u>	
SAFETY FIRST	02	SAFETY & ASSEMBLY AREA INFORMATION	A1
PREPARING FOR OPERATION	02	MODEL NUMBERS	A1
HITCHING & UNHITCHING	02	ASSEMBLY	A2
TRANSPORTING	03	Self Supporting Frame	A2
Disengage Road Lock	03	Tongue	A3
Engage Road Lock	04	Disc Gang Beams	A4
Wheel Bolts	04	Disc Gangs	A5
Transporting From Field to Field	04	CYLINDER LUG	A7
FIELD ADJUSTMENTS	05	LAMP BRACKET SOCKET	A7
Leveling	05	HYDRAULIC CYLINDER	A7
Front to Rear Leveling	05	DECALS	A7
Soft Soil Condition	05	LIGHT KIT INSTALLATION INSTRUCTIONS	A7
Disc Gang Angles	05	PLACEMENT DRAWINGS FOR MODELS:	
Controlled Depth	05	8100-12NR	A9
Rigid Scraper Adjustments	05	8100-14NR	A10
Dual Scraper Adjustment	05	8100-15NR	A11
FIELD OPERATIONS	06	8100-16NR	A12
Working Depth	06	8100-12WR	A13
Turning In The Field	06	8100-14WR	A14
Troubleshooting	06	8100-15WR	A15
SERVICING	06	8100-18WR	A16
General Maintenance	06		
Lubrication	07		
Wheel Bearings	07		
Disc Gangs	07		
Repair Parts	07		
HYDRAULIC SAFETY PLEASE READ CAREFULLY	08		
SUGGESTED REMEDIES FOR FIELD PROBLEMS	09		
<u>PARTS SECTION</u>			
MAIN FRAME	P1		
ROCKER SHAFT	P2		
HUB ASSEMBLY	P3		
TONGUE, ADJUSTMENT SCREW, HITCH & JACK	P5		
GANG BEAMS	P6		
ROCK FLEX BEARING ARM ASSEMBLY	P7		
TIE RODS	P8		
SPACER SPOOLS	P9		
DISC BLADES & EXTENSION ASSEMBLY	P10		
SCRAPERS	P11		

SPECIFICATIONS

Rev.9/07

MODEL	SPACING	NO. OF DISC	DISC SIZE	NUMBER OF BEARING ARMS	CUT WIDTH		APPROXIMATE TRANSPORT WIDTH
				22"	FT. & IN.	METRES	
8100-12NR	8"	38	22"	8	12' - 4"	3.76	13' - 11"
8100-14NR	8"	42	22"	8	13' - 7"	4.14	15' - 2"
8100-15NR	8"	46	22"	12	14' - 10"	4.52	16' - 5"
8100-16NR	8"	50	22"	12	16' - 2"	4.93	17' - 9"
8100-12WR	9-1/8"	34	22"	8	12' - 3"	3.74	13' - 10"
8100-14WR	9-1/8"	38	22"	8	13' - 9"	4.19	15' - 4"
8100-15WR	9-1/8"	42	22"	12	15' - 3"	4.65	16' - 10"
8100-18WR	9-1/8"	50	22"	12	18' - 1"	5.50	19' - 8"

ALL MODELS: TIE RODS ARE 1-3/4" DIAMETER. STANDARD WHEEL SIZE IS 15 X 8. STANDARD TIRE SIZE IS 9.5L X 15. WHEEL SPACING IS 74" ON INSIDE AND 115" ON OUTSIDE.

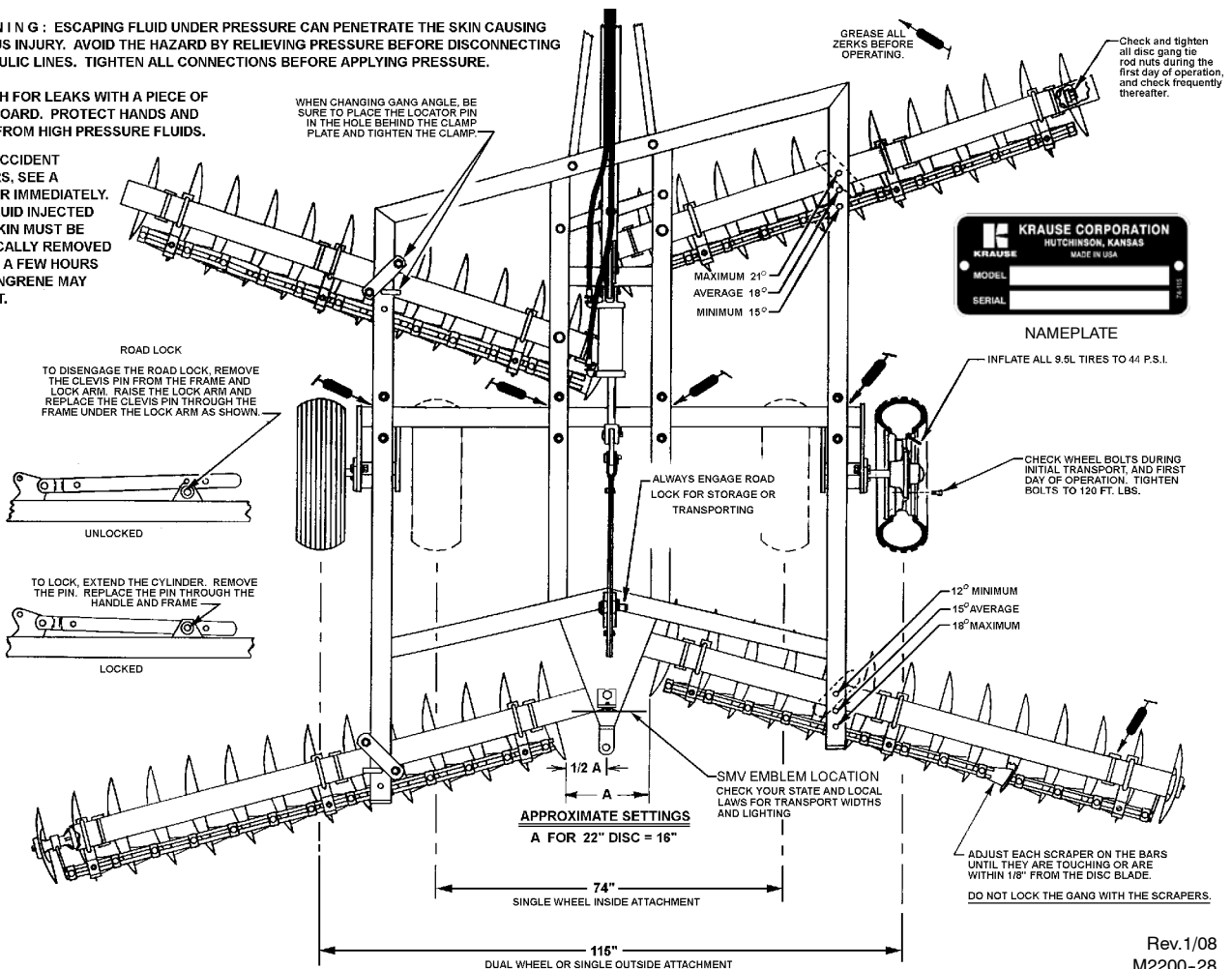
GENERAL INFORMATION

LEVELING FROM FRONT TO BACK: The implement should be level from front to back when tilling the soil. Check the leveling by standing well away from the harrow while it is still in the plow position. If the front is lower than the back, turn the leveling screw counter-clockwise until the implement is level. (Determine rotation by looking in the direction of travel.) **NOTE:** For ease of leveling, adjust with the harrow in the raised position, then replot to check leveling. To lower the front, turn the leveling screw in the clockwise rotation until the frame is level from front to back.

WARNING: ESCAPING FLUID UNDER PRESSURE CAN PENETRATE THE SKIN CAUSING SERIOUS INJURY. AVOID THE HAZARD BY RELIEVING PRESSURE BEFORE DISCONNECTING HYDRAULIC LINES. TIGHTEN ALL CONNECTIONS BEFORE APPLYING PRESSURE.

SEARCH FOR LEAKS WITH A PIECE OF CARDBOARD. PROTECT HANDS AND BODY FROM HIGH PRESSURE FLUIDS.

IF AN ACCIDENT OCCURS, SEE A DOCTOR IMMEDIATELY. ANY FLUID INJECTED INTO SKIN MUST BE SURGICALLY REMOVED WITHIN A FEW HOURS OR GANGRENE MAY RESULT.



Rev.1/08
M2200-28

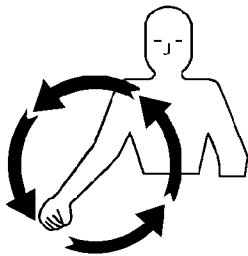
OPERATING SECTION

SAFETY ALERT SYMBOL

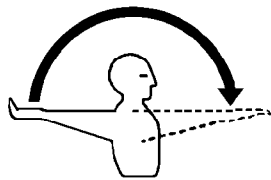


BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY.
THIS SYMBOL IDENTIFIES IMPORTANT SAFETY MESSAGES.
CAREFULLY READ THE MESSAGE THAT FOLLOWS.

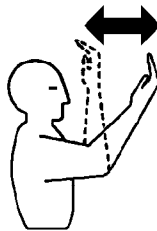
TEN MOST COMMON HAND SIGNALS USED IN THE FIELD



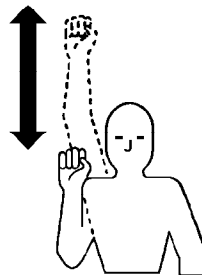
**START
THE
ENGINE**



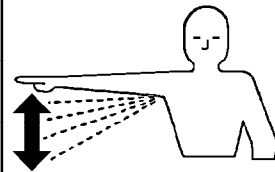
**MOVE OUT
OR
TAKE OFF**



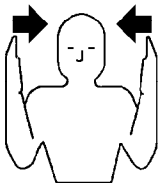
**MOVE
TOWARD
ME**



**SPEED
IT UP**



**SLOW IT
DOWN**



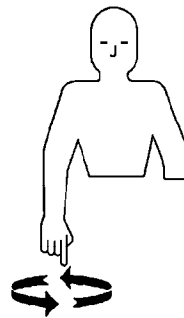
**THIS FAR
TO GO**



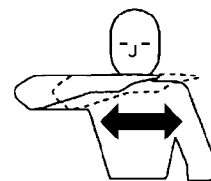
STOP



**RAISE
THE
EQUIPMENT**




**LOWER
THE
EQUIPMENT**



**STOP
THE
ENGINE**

SAFETY DECALS



⚠ WARNING

- Do not exceed maximum transport speed of 25 mph ~ 32 km/h
- Do not transport with motor vehicle
- Refer to the Operator's Manual

74-117

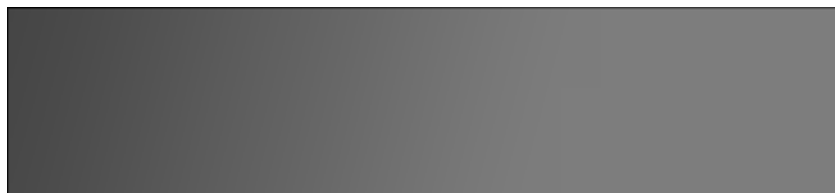


⚠ WARNING

AVOID SERIOUS INJURY FROM INJECTION OF HYDRAULIC FLUID. DO NOT USE HANDS TO SEARCH FOR LEAKS.

REFER TO OPERATOR'S MANUAL.

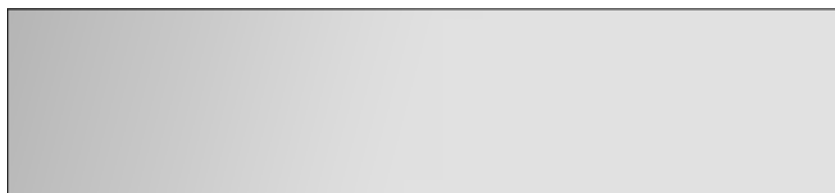
74-276



74-575 Red Reflector Tape



74-576 Fluorescent Orange Tape



74-577 Yellow Reflector Tape

See Decal Parts Listing in this manual for proper location on the implement.

SAFETY FIRST



WATCH FOR THIS SYMBOL AND CAREFULLY READ THE MESSAGES.

1. **UNDERSTAND SIGNAL WORDS.** A signal word -- **DANGER**, **WARNING**, or **CAUTION** is used with the safety alert symbol. **DANGER** identifies the most serious hazards.
DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.
2. Read and understand this owner's manual before operating the machine.
3. Be sure that the safety decals and reflectors are clean and in place.
4. Do not climb or walk on disc frame, or tires.
5. Never position yourself under any portion of the implement unless the cylinder lock is placed over the cylinder rod, or the entire unit is lowered to the ground.
6. Stop tractor engine and set parking brake before leaving operator's position to adjust, lubricate, clean or unclog the machine.
7. Do not stand between the implement and the tractor unless the tractor brakes are locked and the engine is shut off.
8. Do not stand on or straddle a tongue when unhitching.
9. Never operate unit until hydraulic cylinders and lines are full of oil and free of air. See operating instructions.
10. Use a Slow-Moving-Vehicle (SMV) emblem and proper lighting when transporting the disc harrow.
11. Always use a safety chain of tensile strength equal to the gross weight of the disc harrow plus any attachments when transporting.
12. Check wheel bolts before and during transport.
13. Always use road locks to hold disc harrow in the raised position.
14. Do not road an implement over 25 miles per hour on the best surface conditions. Reduce speed when going up or down hills and when approaching ditches or corners.
15. Check condition of hitch pins and bolts, tires and hubs, and safety chain before transporting.
16. Do not add excessive additional weight to the disc. Additional weight could cause frame or axle to fail resulting in loss of control of implement / tractor during transporting.
17. Serious injury can be inflicted by disc blades and disc gangs if not handled safely. Watch for unsafe conditions. Keep your co-worker's safety in mind.

OPERATING INSTRUCTIONS



READ ALL THE SAFETY DECALS ON THE IMPLEMENT AND REVIEW THE TRACTOR SAFETY AND SAFETY FIRST SUGGESTIONS ON THE BACK OF THIS MANUAL TO REFRESH YOUR MEMORY. WATCH FOR THE SAFETY SYMBOL, AND READ THE INFORMATION THAT FOLLOWS IT. THIS IS FOR YOUR OWN SAFETY.

PREPARING THE TANDEM DISC FOR OPERATION


Inspect the new harrow before operating. The road lock should be engaged, the tongue jack lowered and the extended hydraulic cylinder should be full of oil with the rod end pinned to the rocker shaft cylinder lug.

Before entering the frame of the harrow, always check to make sure that the road lock handle has been engaged and pinned.


Inspect the harrow for any loose bolts and nuts, and tighten if needed. Check all disc gang tie rod nuts for tightness, with cotter pins clinched. Be sure all bearing bolts are tight.

All grease zerks locations should be sufficiently greased. Grease zerks will be found on the rocker shaft clamps and tongue adjustment screw.

Operate the depth control cylinder several times and check for tell-tale leaks and loose fittings. Tighten if needed. Since this implement will be plumbed with JIC and O-Ring fittings, the use of tape or liquid sealers is not necessary.

 **Caution: Lower implement to the ground before making the following inspections. With implement lowered, enter the framework by stepping over. Do not crawl under framework. If implement is not lowered, any hydraulic failure could cause the unit to drop suddenly, causing personal injury.**

HITCHING & UNHITCHING

 **Caution: Do not allow any person(s) to stand between the tractor and harrow while backing into hitching position until the tractor is neutral and the hand brake is set. Ask your helper to wait until you give him the signal that it is safe for hitching.**

 **Warning: Always use a safety chain equal to the gross weight of the implement, plus any rear attachments when transporting.**

TRANSPORTING

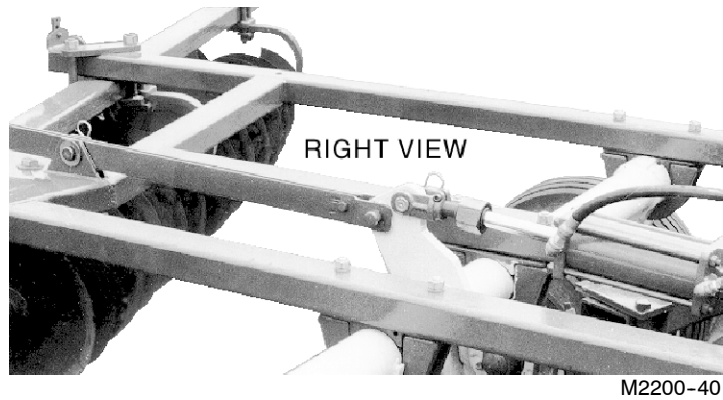
The road lock is used to hold the harrow in the raised position during storage or transport operations. Do not depend on the hydraulic cylinder to hold the raised position, except when turning in the field. Always pin the road lock.

Disengage the Road Lock

Extend the hydraulic cylinder to the maximum stroke. Go to the back of the harrow frame at the center. Remove the hair pin cotter and clevis pin with flat washer from the road lock handle and road lock lugs (at the back of the frame). Raise the handle and replace the clevis pin and flat washers back into the lugs, resting on the clevis pin. Do not remove the road lock handle from rocker shaft cylinder lug, or damage will occur to the handle.

Engage the Road Lock

Extend the cylinder to the maximum stroke. Remove the clevis pin and flat washer from the lugs that the handle has been sliding in. Lower the handle down between the lugs and pin through the holes in the lugs and handle. Be sure to replace the flat washer and hair pin cotter. See photograph at right showing road locking position. Always use the road lock whenever transporting, during storage and whenever performing maintenance or adjustments.



Wheel Bolts

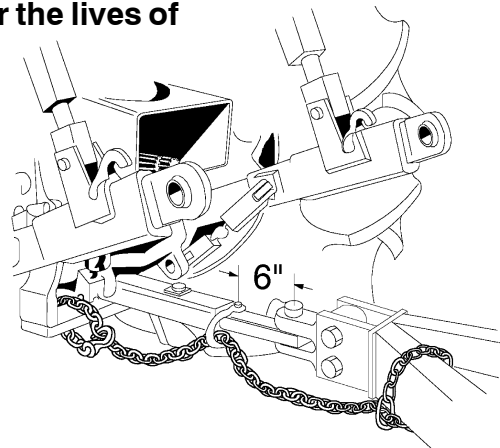
It is very important that the wheel hub bolts be checked before and several times during the delivery of a new harrow, or a harrow that has had the wheels removed for repairs or replacement. Keep the wheel bolts torqued to 120 Ft. Lbs., and check daily until they are firmly seated.

Warning: The loss of a wheel and tire while transporting on road or highway can endanger your life or the lives of others. Keep wheel bolts tight.

Transporting From Field to Field

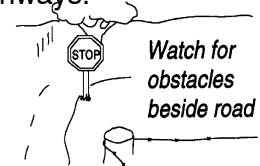
Warning: Always use a safety chain with tensile strength equal to the gross weight of the unit, plus any attachments, when transporting.

NOTE: A safety chain, SMV emblem, and a light kit were furnished as standard equipment with your implement. Make sure they are in place, clean and in working order.



Insert the ASAE Slow Moving Vehicle (SMV) emblem into the bracket provided. The emblem is to be mounted point up in a plane that is perpendicular to the direction of travel $\pm 10^\circ$. It shall be placed centrally at the rear of the vehicle, unobscured, and 2' to 6' (0.61 to 1.8m) above the ground, measured from the lower edge of the emblem. The SMV emblem should be wiped clean before entering the road or highways.

Comply with state and local laws pertaining to lighting and road widths. Turn on flashing lights whenever traveling on a highway except where it is prohibited by law. If the implement obscures the tractor warning lamp, a lamp must be added to the left of the implement. Transport during daylight hours only. Watch your clearance. Be aware of obstacles along the side of the roadway that might be caught by the disc harrow when passing by. Pull over to the side of the road to permit safe clearance for oncoming traffic. Keep the red and yellow reflectors clean and visible. Replace the reflectors if they become faded or damaged. Watch for pedestrians on the side of the road that need to be warned of your presence.



Moving the harrow over rough terrain at high speed can result in major damage to the harrow frame.

Danger: Do not exceed 25 m.p.h. in transport even on best road surfaces. Exceeding this speed can result in failure in wheel hubs or spindles and loss of control of implement and/ or tractor. Do not tow this implement if its weight exceeds 1-1/2 times the weight of the towing unit. Pin tractor drawbar to prevent side sway during transport.

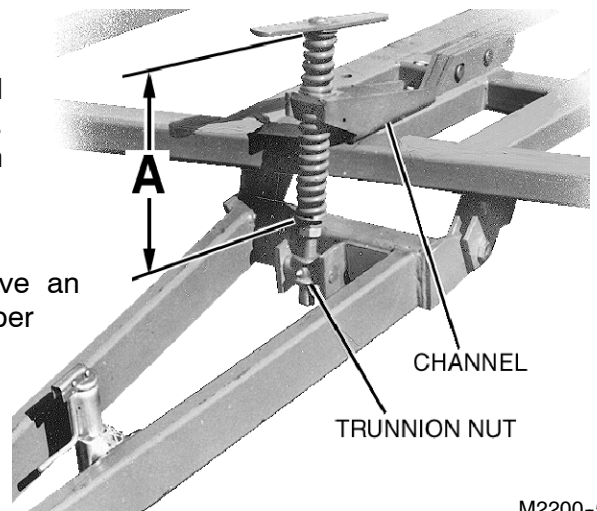
FIELD ADJUSTMENTS

Leveling

Front-to-rear and side-to-side leveling will effect the operation and leveling of the field. Running the harrow low in the front may result in ridging on the outside.

Front-To-Rear Leveling

The angle of the front frame member will give an illusion that the front gangs are running deeper than the back. When adjusting the front-to-rear leveling, stand well away from the disc harrow in the plowing position, and view the implement from frame height. The implement must be level when plowing, not when in the raised position.



NOTE: It is easier to adjust with the adjustment screw when the harrow is raised out of the ground, but it will be necessary to lower and plow to the desired depth each time the adjustment is made out of the ground. Verify spring preload is set at 14" (Dimension A).

To raise the back gangs, turn the leveling screw clockwise. To raise the front gangs, turn the adjustment screw counter-clockwise.

Soft Soil Condition

When operating in soft soil conditions it will be necessary to adjust the leveling screw dimension "A" to 13" (as shown in the photograph at the upper right).

Disc Gang Angles

The gang angle locations are clearly shown on the general information drawing. The disc gangs can be changed to a different angle by loosening the gang beam clamps on the outside frame members and moving the gang backwards or forwards. Normally, the average gang angle will have the locator pin placed in the middle hole at each clamp location. The holes at each location have been predetermined and drilled into the frame to provide simple gang angle changes in the field. It is important to make sure that all the locator pins are behind the clamps, and that all locator pins are in the same number of holes away from the rocker shaft.

Controlled Depth

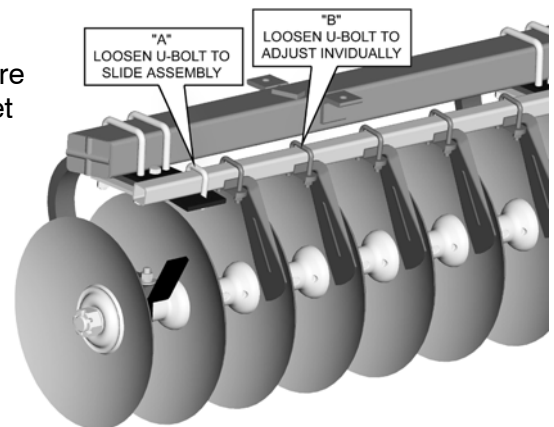
Carry some weight of the harrow on the tires for uniform tracking behind the tractor, and even depth penetration. Determine the depth of operation, stop the tractor with the harrow in the ground. Adjust the stroke control collar on the hydraulic cylinder rod.

Rigid Scraper Adjustments

- A. Scrapers can be adjusted by moving the entire assembly from side to side at the bracket locations.
- B. Also, each scraper blade can be adjusted individually along its mounting frame.

When scrapers are required, adjust blades so that the scraping edge of each scraper blade is flush against the disc blade, but not tight enough to prevent the gang from revolving freely. When scrapers are not required, adjust the scraper frame to move scraper blades away from disc blades.

Under most conditions scrapers should be positioned approximately 2" in from the cutting edge and approximately 1/8" from the surface of the disc blade.

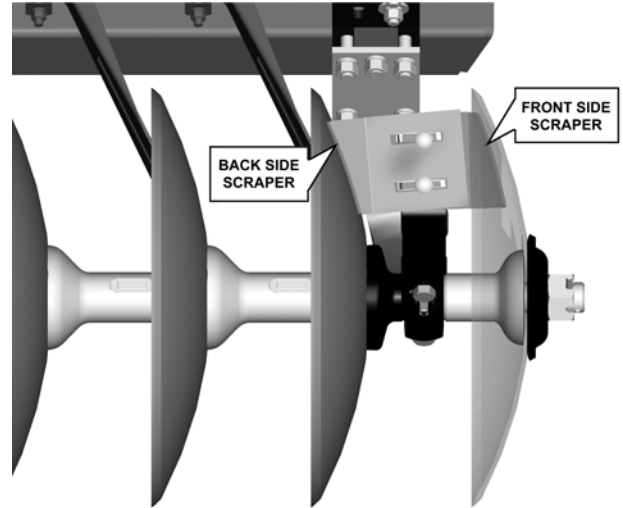


Each field requires some individual scraper adjustment. Moving scrapers one way or the other will help solve your individual scraper problems. The removal of the scraper blade at a bearing arm location may be necessary in some conditions. Frequent examination will prevent damage to scraper assemblies and spacer spools.

Some wet or heavy trash conditions may require use of chain trash guard option (part # 1582-146-0).

Dual Scraper Adjustment

The dual scrapers at the disc gang bearing locations are adjusted individually. The scraper half that scrapes the front cutting side of the blade should be set approximately 1/8" from the surface of the blade. The scraper half that scrapes the back side of the blade may be adjusted from 1/8" to 3/4" away from the back surface depending on field conditions.



FIELD OPERATIONS

Working Depth

The depth of the tandem disc harrow is controlled by the remote cylinder control lever of the tractor. Operate the harrow in the working position until the desired depth is acquired.

NOTE: Be sure the tires were acting as gauge wheels with some weight of the harrow on the tires.

Set the stroke collar at the rod end of the cylinder to prevent any further retracting of the rod. The stroke controller will automatically stop the cylinder at the same depth each time the harrow is raised, and then lowered back to the working position for uniform depth penetration.

Turning In The Field

It is inevitable that short turns will be executed in the field at one time or another. It is therefore necessary to inform the operator that short turns with the harrow in the plowing position may cause damage to the disc blades and disc gang bearings. If short turns must be made, raise the harrow from the soil until the turn is complete. Raising the blades from the soil will prevent driving the leading blades into the ground which causes excess thrust on the gangs. It will also prevent a large ridge thrown out at the perimeter of the turn.

Troubleshooting

See the special troubleshooting section at the end of the Operating Section entitled, "TROUBLESHOOTING" on page O9 in this manual.

SERVICING

General Maintenance

ALL NUTS SHOULD BE CHECKED AND TIGHTENED AFTER THE FIRST DAY OF OPERATION AND PERIODICALLY THEREAFTER. CHECK DISC GANG TIE RODS FREQUENTLY AND KEEP TIGHT AT ALL TIMES. TORQUE THE TIE RODS TO 1,200 FT. LBS. TORQUE ALL WHEEL BOLTS TO 120 FT. LBS..

The Krause Disc is a ruggedly designed implement which will perform efficiently if properly adjusted and maintained. Keep blades sharp.

Lubrication



Regreaseable gang bearings should be greased after each use and after long periods of storage. Rocker shaft bearing clamps, and tongue adjustment screws should be lubricated with multi-purpose type grease after each 24 hours of operation.



Caution: For your safety, lower wings and implement to the ground and enter framework by stepping over. When lubricating or making adjustments on your disc harrow, watch for obstructions and protrusions.

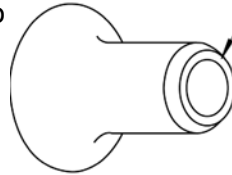
Wheel Bearings

Grease wheel bearings every 24 ours of use. Check for excessive end play each time bearings are greased. Once a year, clean and repack wheel bearings. Replace seals each time bearings are removed. Replace any worn or damaged parts. Repack bearings with high-quality wheel bearing grease. After repacking, replace hub with seal and rear bearing already assembled. Use light oil on seal surface and use extreme care when pushing seal over the spindle. Install front bearing, flat washer, and slotted nut. Tighten nut while turning hub until there is resistance to rotation. Then back off nut 1 to 2 notches until hub turns freely without end play. Install new cotter pin and hub cap.

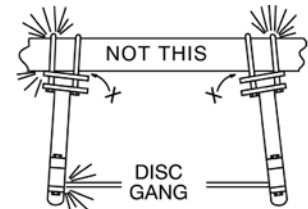
Disc Gangs

Refer to the Placement Pages at the back of this manual when replacing disc blades, bearings, or spools. Leave bearing bolts one turn loose until bearing arms are in place on the frame. Tighten tie rods to 1,200 Ft. Lbs. Tighten one bearing arm to the frame, and then tighten its bearing bolts.

Make sure each bearing arm top plate on the gang is parallel with the bottom of the frame before tightening their U-Bolts. Tighten other bearing bolts.



MAKE SURE
FACE OF
1/2 SPOOLS
ARE SQUARE
BEFORE
ASSEMBLY



BE SURE THE BEARING ARM FITS FLAT
AGAINST THE GANG BEFORE TIGHTENING
THE U-BOLTS.



Danger: Due to their sharpness and weight, serious injury can be inflicted by disc blades and disc gangs if not handled safely. Watch for unsafe conditions. Keep your co-workers safety in mind. Should personal injury occur, have medical treatment administered immediately.

Repair Parts

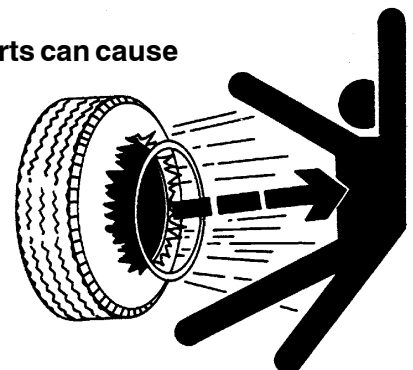
Refer to the Assembly Section of this manual when repairing or replacing parts, and follow the same procedure as used when assembling a new unit. Reverse this procedure for disassembly. The Parts Section of this manual will show a breakdown of assemblies, location of parts and part numbers. It recommended that KRAUSE replacement parts be used. KRAUSE PARTS WERE DEVELOPED AND TESTED FOR THESE HARROWS.

IMPORTANT: REPAIR OF HYDRAULIC CYLINDERS SHOULD BE MADE BY AN AUTHORIZED KRAUSE DEALER.



Caution: Explosive separation of a tire and rim parts can cause serious injury or death.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Inspect tires and wheels daily. Do not operate with low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



HYDRAULIC SAFETY (PLEASE READ CAREFULLY)

If the implement hydraulic system has never been used, stored over a period of time or disassembled for any reason, unpin the rod ends of the cylinders and support the cylinders so the rod ends will clear frame members when fully extended. Back the tractor to the front of the implement and connect the hydraulic hoses. Check the tractor hydraulic reservoir and make sure it is full of the manufacturer's recommended oil. If you are sure the implement hydraulic hose connections are tight, begin filling the system by extending and retracting the cylinders. Hold the control lever open and pause at the end of each stroke to bleed the air from the system. Continue the cycles until the cylinders respond with immediate solid actuation. When you are sure the systems are free of air, pin the rod ends of the cylinders to the implement cylinder lugs.



Warning: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

Avoid Heating Near Pressurized Fluid Lines

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

The following WARNINGS pertain to the more common abuses of hydraulic hose:

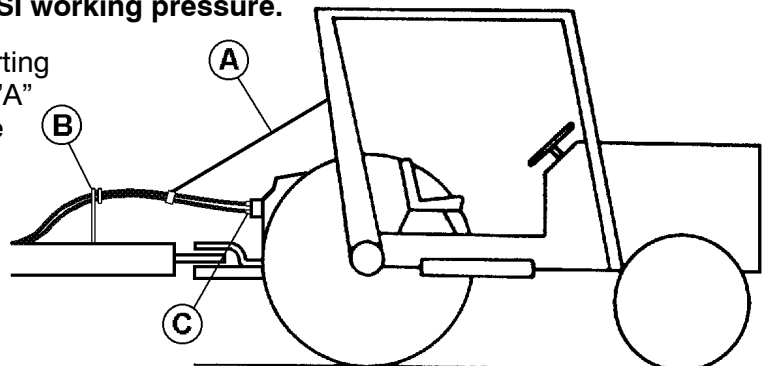
1. **INSPECT** the hose assembly before each use.
2. **REPLACE** the hose assembly immediately if:

a) The jacket of the hose appears abnormal.	d) The couplings are damaged.
b) You have reason to believe it may be abnormal.	e) The hose is damaged or kinked.
c) There is any fluid leakage.	f) The reinforcement is visible through the jacket

3. DO NOT **EXCEED** the maximum recommended working pressure of the hose.
4. DO NOT **KINK** the hose assembly.
5. DO NOT **BEND** the hose assembly beyond its minimum recommended bend radius of 3.25".
6. DO NOT **EXPOSE** to temperatures in excess of 225° Fahrenheit.
7. DO NOT USE AS A **STRENGTH MEMBER** for pulling or lifting equipment.

Caution: If replacing hydraulic hose, use only hose that meets or exceeds 3,000 PSI working pressure.

Prevent damage to trail hoses by supporting them from the tractor with an elastic strap "A". Avoid having excess hose between the implement support "B" and the tractor connection "C". Either reposition the hose farther back on the implement or request a shorter hose from your dealer.



SUGGESTED REMEDIES FOR POSSIBLE FIELD PROBLEMS

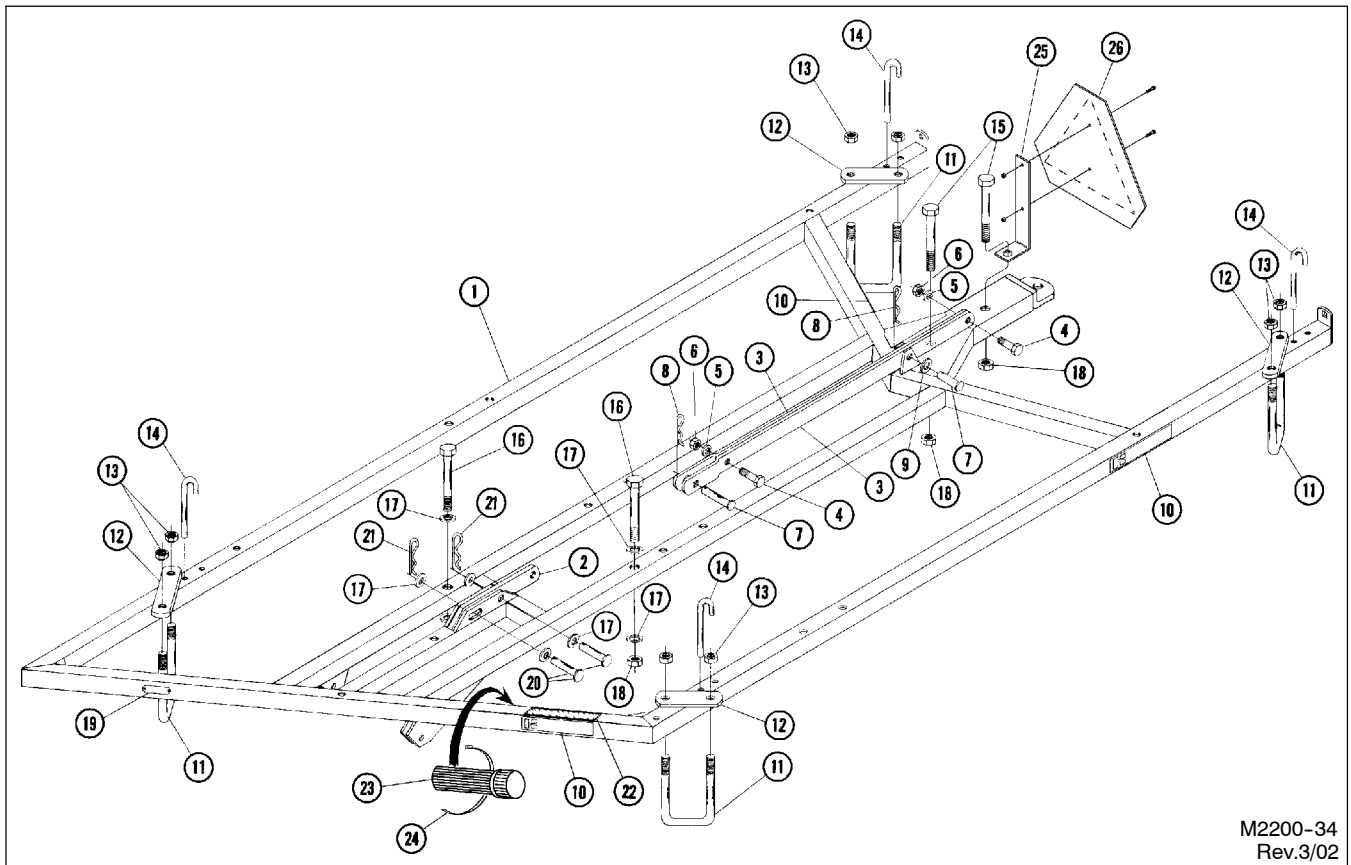
PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Leaving center ridge	Excessive speed	Reduce speed
	Rear gangs cutting too deep	Shorten turnbuckle on tongue
	Rear discs are set too close together	Readjust distance between inside disc blades
Leaving center furrow	Discing too slowly	Increase speed, not to exceed 6 m.p.h., 5 m.p.h. in rocky conditions
	Rear gang not cutting deep enough	Lengthen turnbuckle on tongue
Leaving untilled center strip	Discing too shallow	Increase depth
	Front center gangs too far apart	Move front center gangs in
Leaving ridge on outside	Front running too deep	Adjust turnbuckle
	Not enough overlap	Move tractor toward plowed ground
	Incorrect size of blade on extension disc	Increase size of extension disc
	Excessive speed	Reduce speed
Leaving furrow on outside	Rear running too deep	Readjust tongue leveling screws
	Incorrect size of blade on extension disc	Decrease size of extension disc blades
Leaving outside furrow	Back running too deep	Readjust leveling screw
	Incorrect size of extension disc blade	Decrease size of extension disc blade.
Harrow will not level from side to side	Incorrect tire pressure	Inflate all tires to 44 PSI
	Unequal tire sizes	Match tire sizes to $\pm 1/8$ " in diameter
Harrow will not level from front to rear while operating	Tongue Adjustment Screw	Lengthen tongue adjustment screw to raise front and/or shorten to lower
Gangs plugging	Extremely wet conditions	Decrease depth of work, or allow field to dry if possible
	Worn or improper adjustment of scrapers	Readjust scrapers, replace worn parts
Gang does not revolve	Obstruction in disc gang	Check for rocks, mud, roots, etc.
	Scrapers	Scrapers adjusted too tight against scrapers
	Seized bearing	Replace
	Plugging at bearing arm	Try removing scraper at these locations
Disc will not penetrate or penetrates too much	Incorrect stroke control setting on cylinder rod	Readjust stroke setting on cylinder rod
Harrow will not lower	Road lock engaged	Disengage road lock
Inadequate transport clearance Front or Back	Cylinder not extended	Extend to maximum stroke and engage road lock
	Tire pressure low	Check tire pressure. Inflate to 44 PSI
	Harrow not level from front to back	Change leveling screw adjustment
Wheels have excessive wobble	Loose wheel bolts	Retorque wheel bolts to 120 Ft. Lbs.
	Loose spindle nut	Tighten spindle nut until tight, then back off one notch and secure with a cotter pin
Disc blades wobble	Tie rod nut loose	Retorque tie rod nut to 1,200 Ft. Lbs.

This page intentionally left blank.

PARTS SECTION

THE FOLLOWING ILLUSTRATED PARTS SECTION HAS BEEN COMPILED TO REFLECT PART NUMBERS REQUIRED TO ORDER PARTS, AND TO SUPPORT THE ASSEMBLY SECTION FOR DIMENSIONS AND DESCRIPTIONS OF ALL PARTS, BOLTS, PINS, ETC. THE OPERATOR CAN ALSO IDENTIFY PART NAMES TO CLARIFY PROPER OPERATIONAL STEPS.

MAIN FRAME



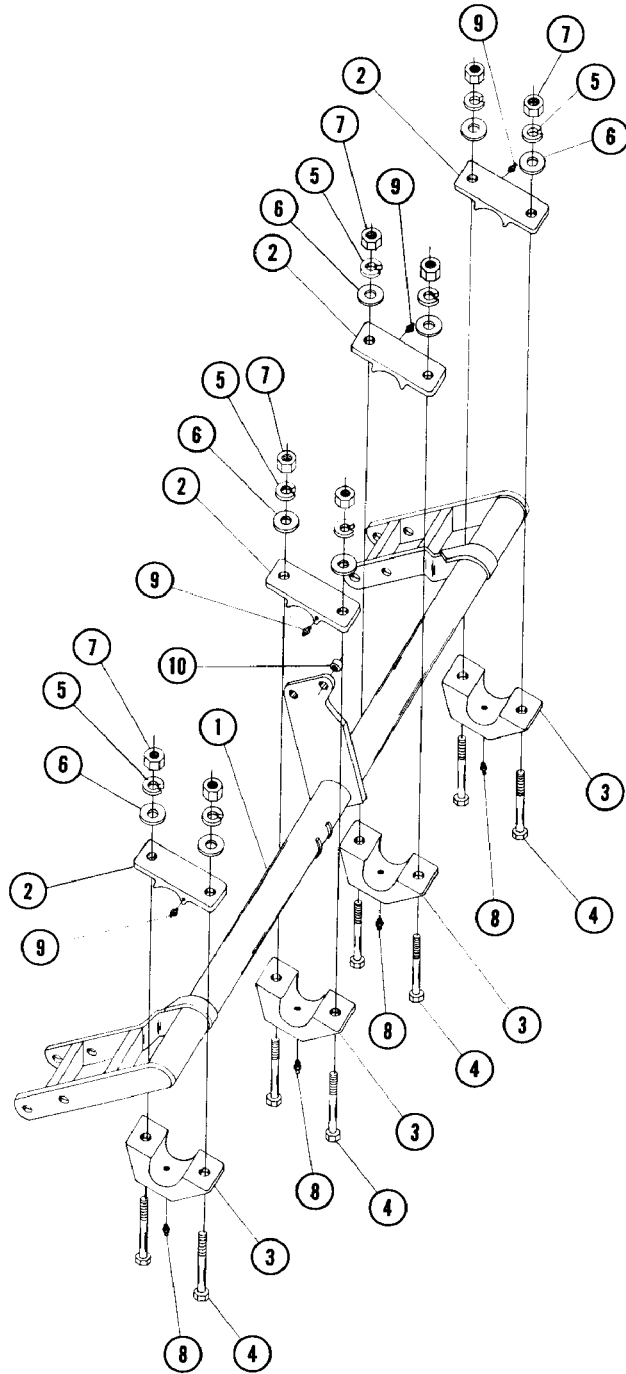
M2200-34
Rev.3/02

FOR MODELS - ALL

3/02

Item	Part Number	Part Description	Qty.
1	2225-1-0	Main Frame Weldment	1
2	2212-0-4	Cylinder Lug	1
3	2212-15-1	Lock Arm	2
4	62-420	1/2NC x 1-1/4" GD.5 Cap Screw	2
5	64-107	1/2"STD. Lock Washer	2
6	63-106	1/2NC Hex Nut	2
7	60-200	1" DIA. x 2-1/2" Clevis Pin	2
8	60-716	#3 Hair Pin Cotter	2
9	64-119	1" STD. Flat Washer	1
10	74-100	Krause Decal	3
11	61-164	1" DIA. U-Bolt	4
12	2212-13-1	Gang Clamp Plate	4
13	63-119	1NC Self Locking Nut	8
14	2212-0-6	Locator Pin	4
15	62-261	1NC x 9-1/2" Machine Bolt	2
16	62-258	1NC x 8-1/2" Machine Bolt	2
17	64-119	1" STD. Flat Washer	8
18	63-119	1NC Self Locking Nut	4
19	74-115	Name Plate	1
20	60-221	1" DIA. x 3" Clevis Pin	2
21	60-717	#4 Hair Pin Cotter	2
22	74-117	Implement Safety Decal	1
23	99-192	Owner's Manual Storage Tube	1
24	25-1163	Hose Clamp	1
25	2212-0-8	SMV Bracket	1
26	74-487	SMV Sign	1

ROCKER SHAFT



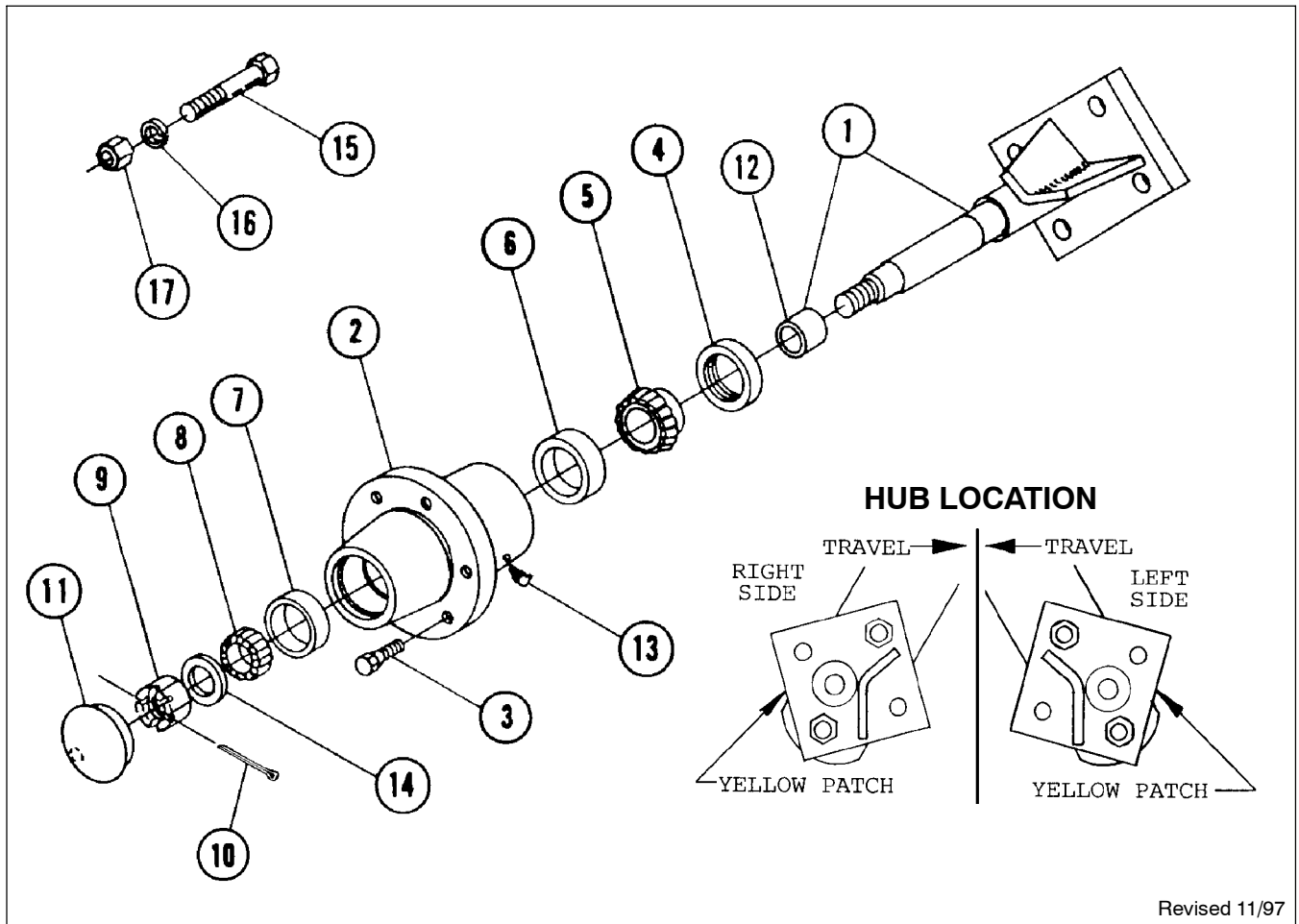
M2200-35

FOR MODELS - ALL

12/96

Item	Part Number	Part Description	Qty.
1	2212-10-0B	Rocker Shaft	1
2	595-0-11	Rocker Bearing Plate	4
3	1112-0-7A	Rocker Shaft Clamp	4
4	62-210	3/4" NC x 6" GD.5 Cap Screw	8
5	64-112	3/4" STD. Lock Washer	8
6	64-113	3/4" STD. Flat Washer	8
7	63-112	3/4" NC Hex Nut	8
8	65-103	1/4" NPT x 90° Zerk	4
9	65-100	1/8" NPT x 45° Zerk	4
10	53-102	Wear Bushing	1

HUB ASSEMBLY

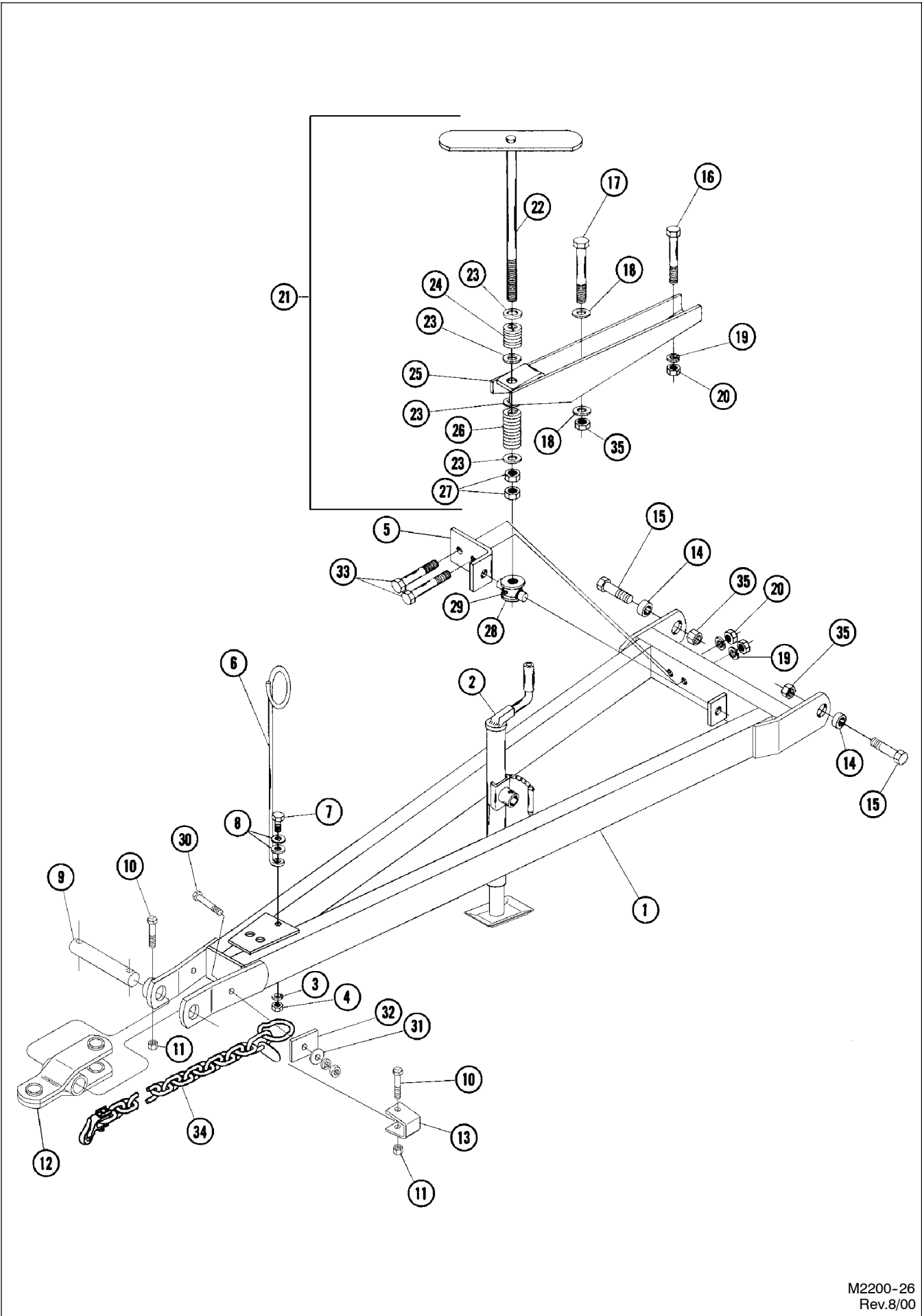


Revised 11/97

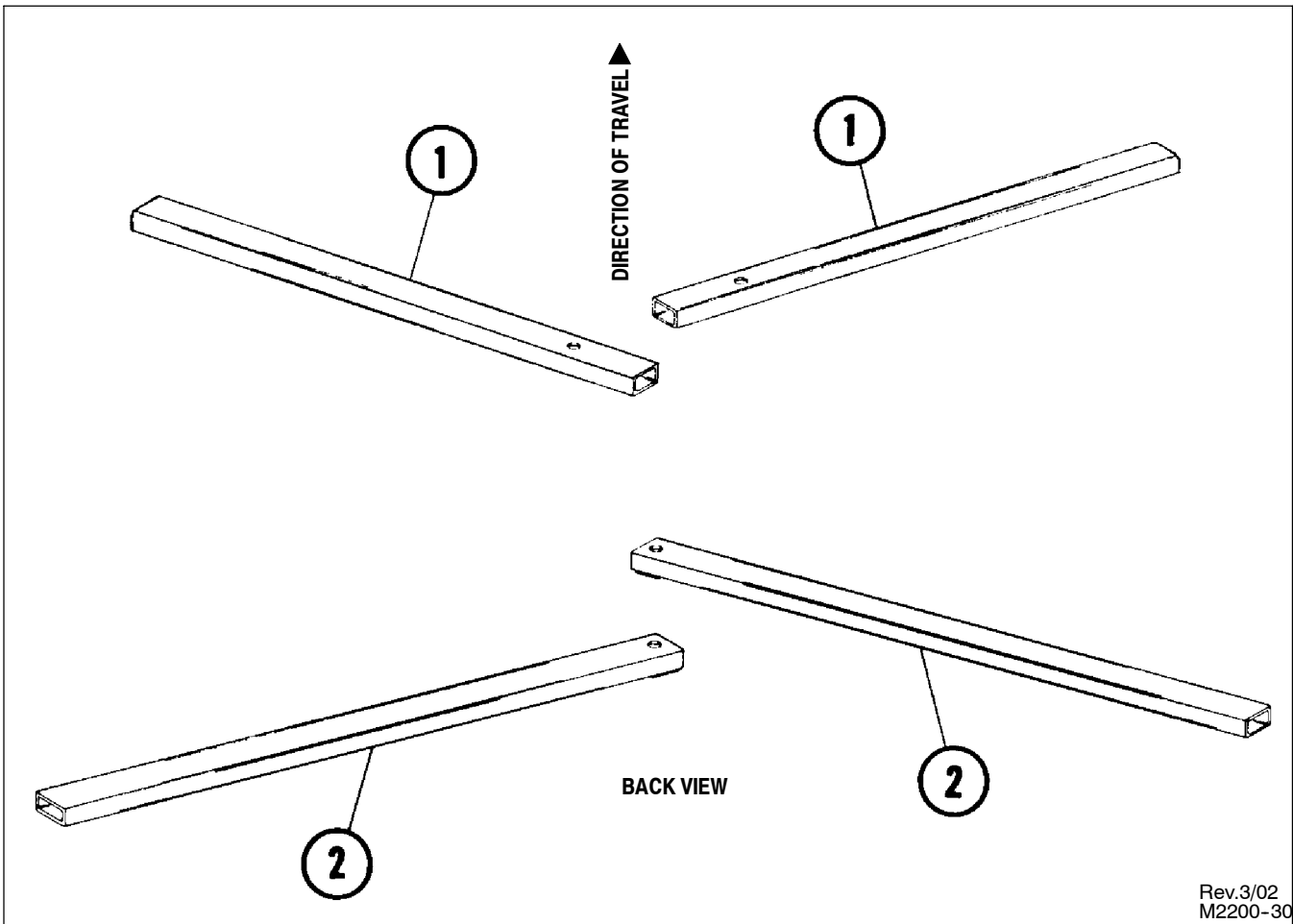
FOR MODELS - ALL

8/00

Item	Part Number	Part Description	Qty.
	1918-17-0	Hub and Axle Assembly	2
1	1918-15-0	Repair Spindle and Sleeve Assembly (Includes Items 1 and 12)	1
2	1918-14-0A	Repair Hub Assembly (Includes Items 2, 3, 6, 7 and 13)	1
3	62-295	Wheel Bolt	6
4	42-108	Seal	1
5	41-113	Rear Cone	1
6	41-209	Rear Cup	1
7	41-208	Front Cup	1
8	41-112	Front Cone	1
9	63-204	1NF Slotted Nut	1
10	60-702	3/16" DIA. x 1-1/2" Cotter Key	1
11	52-302	Hub Cap	1
12	53-105	Wear Ring	1
13	65-122	1/4NPT x 65° Drive Zerk	2
14	64-120	1" SAE Flat Washer	1
15	★ 62-195	3/4NC x 2-1/2" GD.5 Cap Screw	2
	● 62-294	3/4NC x 10" Axle Stud Bolt	4
16	64-112	3/4" STD. Lock Washer	4 / 8
17	63-112	3/4NC Hex Nut	4 / 8
	1918-84-0	Repair Hub Bearing Kit (Includes Items 4, 5, 6, 7 and 8)	



GANG BEAMS



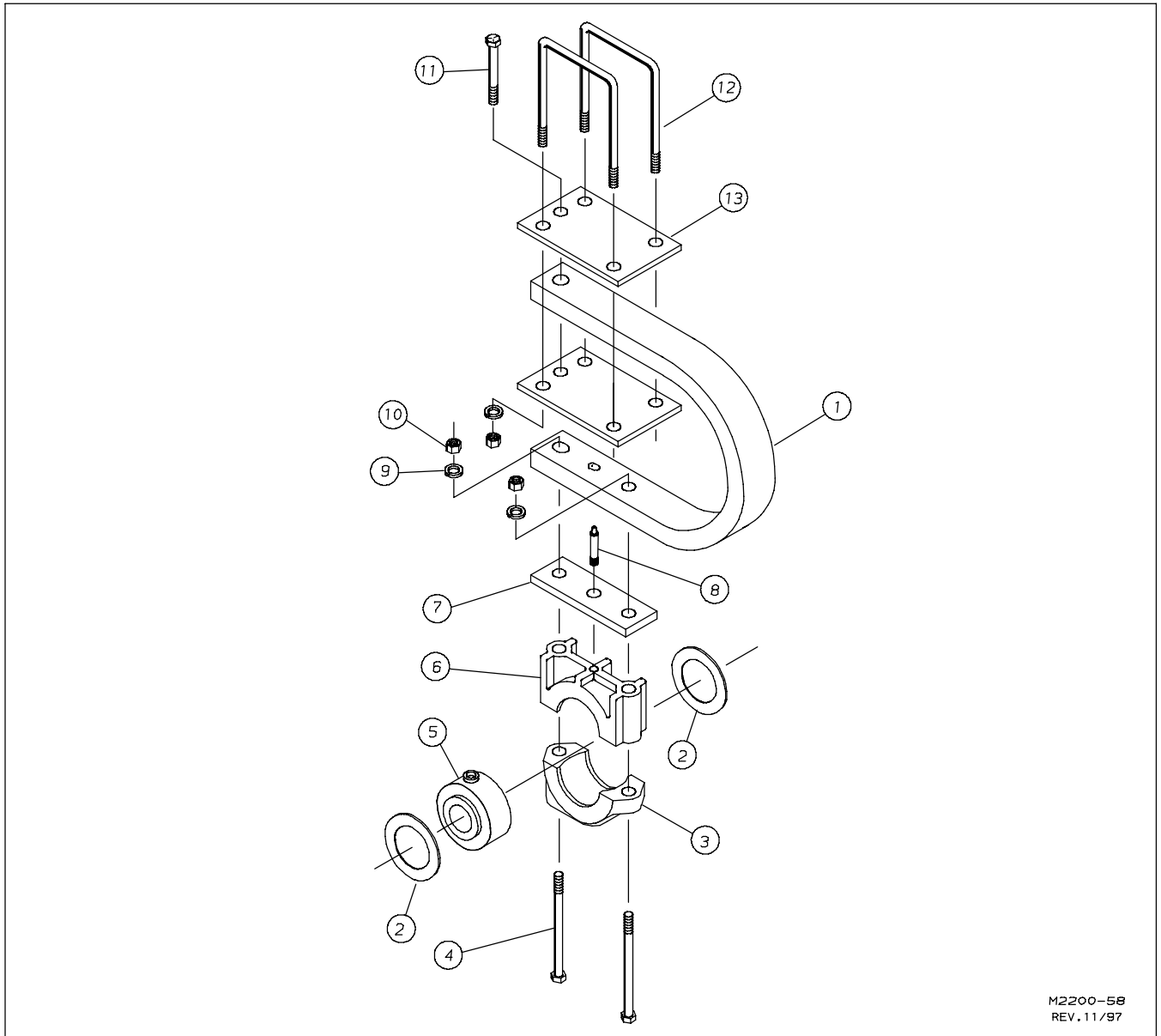
Rev.3/02
M2200-30

FOR MODELS - ALL

1/08

Item	Part Number	Length	Location	For Models
1	2212-0-2	64"	FRONT	8100-12NR, 8100-12WR
2	2212-28-0	82"	BACK	
1	2214-0-2	73"	FRONT	8100-14NR, 8100-14WR
2	1580-28-0	92"	BACK	
1	2215-0-2	82"	FRONT	8100-15NR, 8100-15WR
2	1581-28-0	100"	BACK	
1	2216-0-2	92"	FRONT	8100-16NR
2	1582-28-0	108"	BACK	
1	2217-0-2	100"	FRONT	8100-18WR
2	1583-28-0	117"	BACK	

ROCK FLEX BEARING ARM ASSEMBLY



M2200-58
REV. 11/97

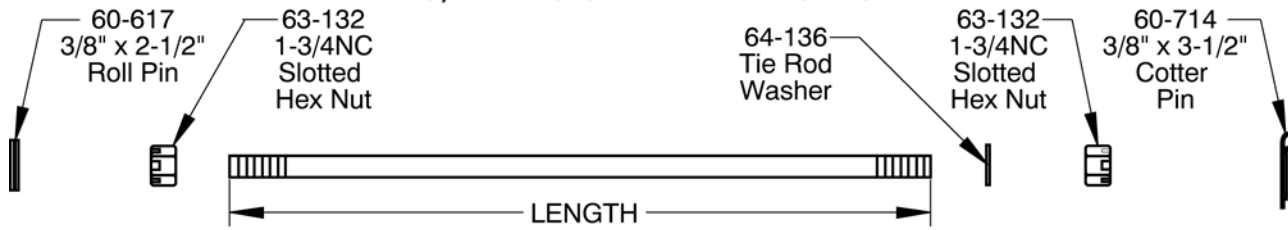
FOR MODELS - ALL

1/08

Item	Part Number	Part Description	Qty.
1	31-213	Disc Shank	1
2	45-105	Side Ring	2
3	4850-10-1	Lower Bearing Housing	1
4	62-210	3/4NC x 6" GD5 Cap Screw	2
5	40-167	Bearing Assembly	1
6	4850-10-2	Upper Bearing Housing	1
7	2200-81-1	Bolt Plate	1
8	65-123	Zerk	1
9	64-112	3/4" STD. Lock Washer	7
10	63-112	3/4NC Hex Nut	7
11	62-197	3/4NC x 3" GD5 Cap Screw	1
12	61-122	U-Bolt, 3/4"DIA. x 5-1/16"W x 5-15/16"L	2
13	7404-0-27	Bolt Plate	2

1-3/4" ROUND TIE RODS

Rev.11/02



Rev.1/08

MODEL	LOCATION		LENGTH	DISC SPACING	NO. OF DISC	*ALLOY TIE ROD
8100-12NR	ROCK FLEX	Front	70-1/2"	8"	9	4995-0-5
		Rear	70-1/2"	8"	9	4995-0-5
8100-14NR	ROCK FLEX	Front	78-1/2"	8"	10	4995-0-6
		Rear	78-1/2"	8"	10	4995-0-6
8100-15NR	ROCK FLEX	Front	86-1/2"	8"	11	1541-20-1
		Rear	86-1/2"	8"	11	1541-20-1
8100-16NR	ROCK FLEX	Front	94-1/2"	8"	12	1546-20-1
		Rear	94-1/2"	8"	12	1546-20-1
8100-12WR	ROCK FLEX	Front	70-1/2"	9-1/8"	8	4995-0-5
		Rear	70-1/2"	9-1/8"	8	4995-0-5
8100-14WR	ROCK FLEX	Front	79-1/2"	9-1/8"	9	4995-0-7
		Rear	79-1/2"	9-1/8"	9	4995-0-7
8100-15WR	ROCK FLEX	Front	88-5/8"	9-1/8"	10	4995-0-8
		Rear	88-5/8"	9-1/8"	10	4995-0-8
8100-18WR	ROCK FLEX	Front	106-1/2"	9-1/8"	12	1027-18-1
		Rear	106-1/2"	9-1/8"	12	1027-18-1

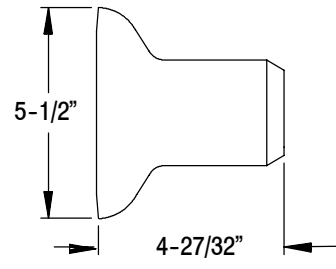
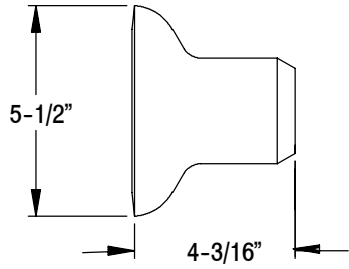
* Note: Tie Rod Number does not include nuts or pins.

SPACER SPOOLS

Rev.1/08
M2200-55

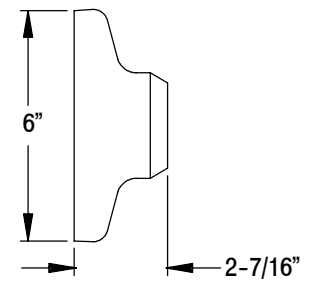
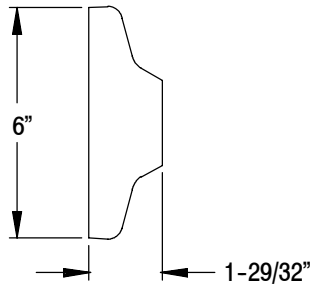
8" SPACING

9-1/8" SPACING



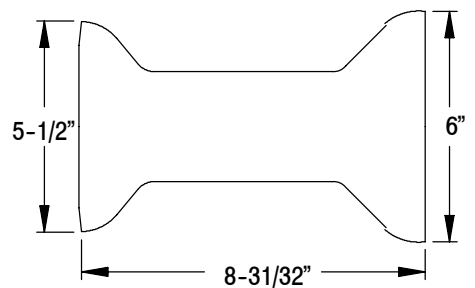
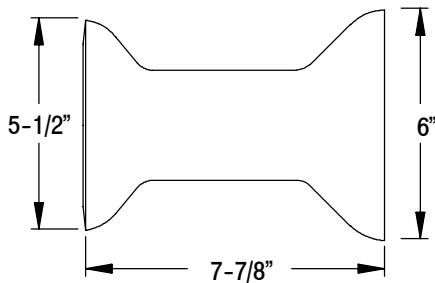
7404-0-30 LONG HALF SPOOL

7404-0-33 LONG HALF SPOOL



7404-0-29 SHORT HALF SPOOL

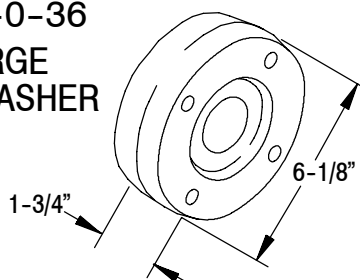
7404-0-32 SHORT HALF SPOOL



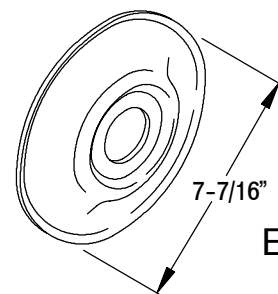
7404-0-28 CAST SPACER SPOOL

7404-0-31 CAST SPACER SPOOL

7404-0-36
LARGE
END WASHER

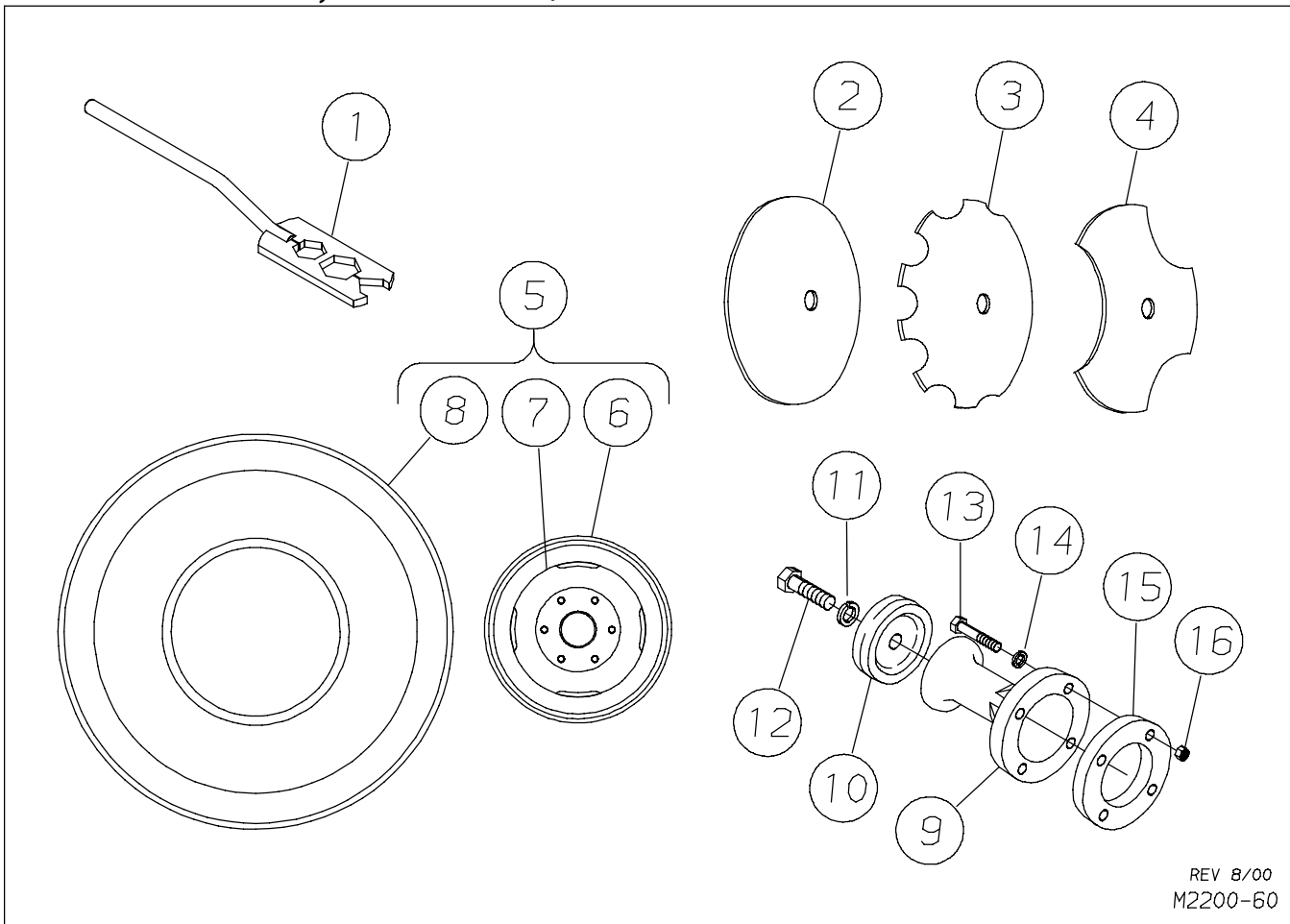


END WASHERS
ALL MODELS



45-107
END WASHER

DISC BLADES, WHEELS / TIRES & EXTENSION ASSEMBLY



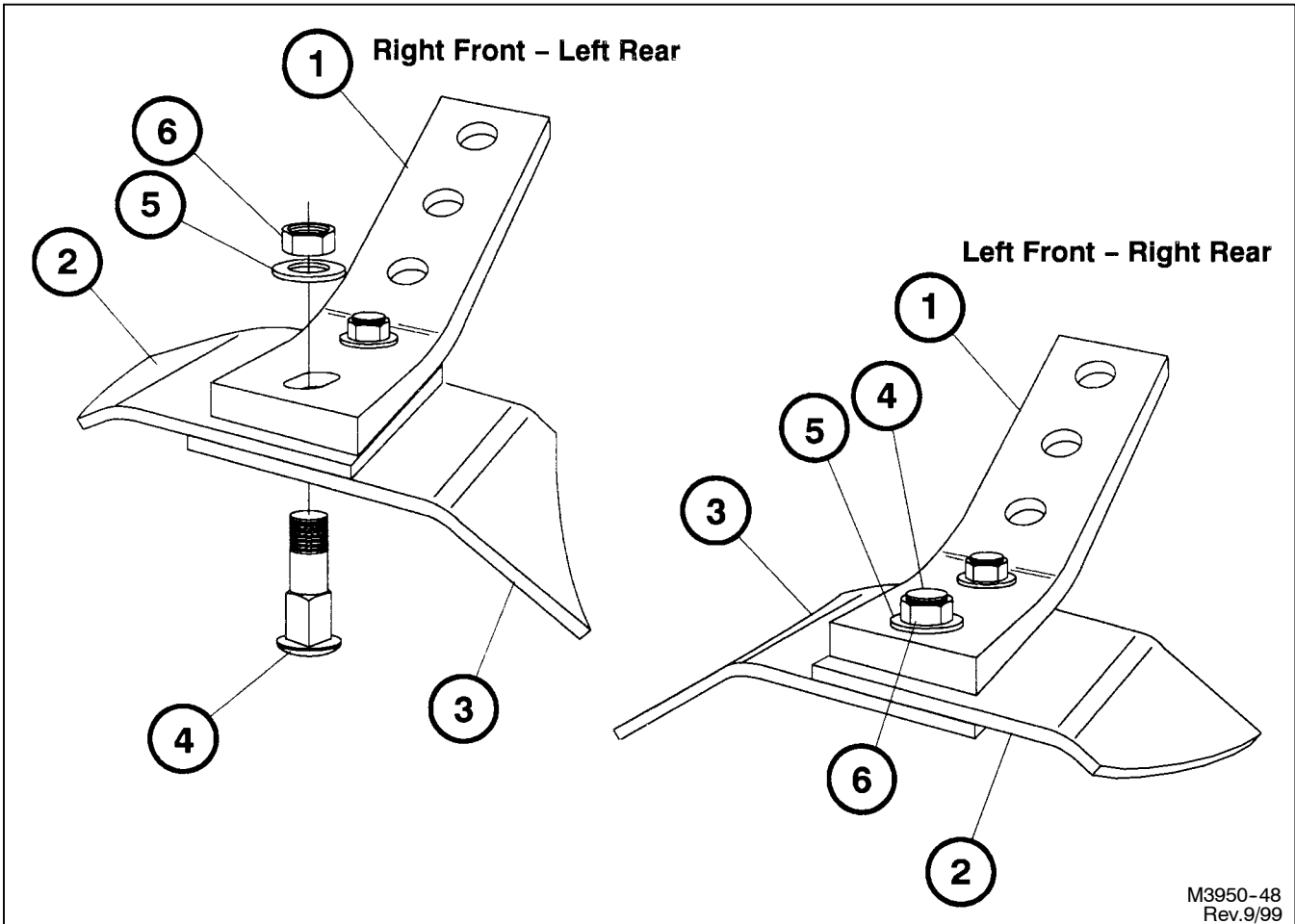
REV 8/00
M2200-60

FOR MODELS - ALL

1/08

Item	Part Number	Part Description	Old Blade Number	Qty.
1	2191-35-0	Tie Rod Wrench		1
2	30-235	18" Plain Sharp 7 Ga.	184517COM-PS	Spec.
	30-225	20" Plain Sharp 6 Ga.	205017COM-PS	
	30-223	22" Plain Sharp 7 Ga.	224517COM-PS	
	30-240S	22" Residue Razor Sharp 6 Ga.	225017COM-PS	
3	30-242	22" Plain Notched 1/4"	226517COM-NS	
	30-245	18" Plain Notched 7 Ga.	184515-NS	
	30-226	20" Plain Notched 6 Ga.	205017COM-NS	
4	30-148	16" Cut-Out Blade 7 Ga.	164511-NS	
	30-242	16" Plain Blade 7 Ga.	164511-PS	
5	1000-95588-0	Wheel & Tire Assembly		Spec.
6	52-102	15" x 8" Wheel		1
7	51-107	Valve Stem		1
8	51-102	9.5L x 15, 8-Ply Tire		1
9	7404-0-34	Extension Spool Casting		1
10	7404-0-35	Spool Washer		1
11	64-112	3/4" STD. Lock Washer		1
12	62-195	3/4NC x 2-1/2" GD.5Cap Screw		1
13	62-372	1/2NC x 2-1/2" GD.5 Cap Screw		4
14	64-107	1/2" STD. Lock Washer		4
15	7404-0-37	Spacer		1
16	63-106	1/2NC Hex Nut		4

DOUBLE SCRAPER ASSEMBLY



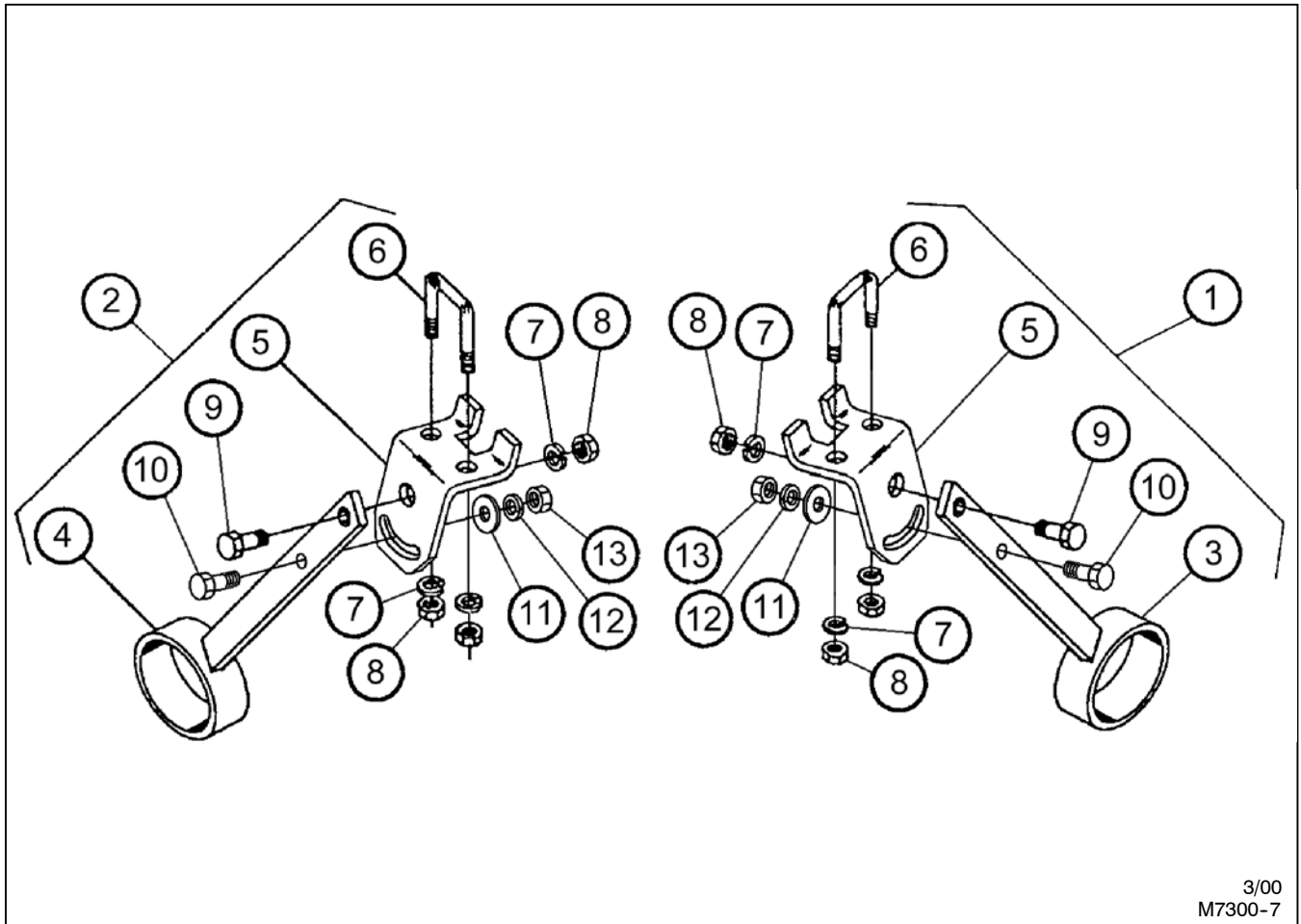
M3950-48
Rev.9/99

FOR MODELS - ALL

1/08

Item	Part Number	Part Description	Qty.
1	4950-185-1A	Bracket	1
2	■ 4950-186-2A	Convex Scraper Blade for Right Front - Left Rear Assm.	1
	● 4950-185-2A	Convex Scraper Blade for Left Front - Right Rear Assm.	1
3	■ 4950-186-3A	Concave Scraper Blade for Right Front - Left Rear Assm.	1
	● 4950-185-3A	Concave Scraper Blade for Left Front - Right Rear Assm.	1
4	62-139	1/2NC x 1-3/4" Carriage Bolt	2
5	64-108	1/2" STD. Flat Washer	2
6	63-108	1/2NC Nylon-Top Lock Nut	2

EXTENSION TRASH BAR ASSEMBLIES



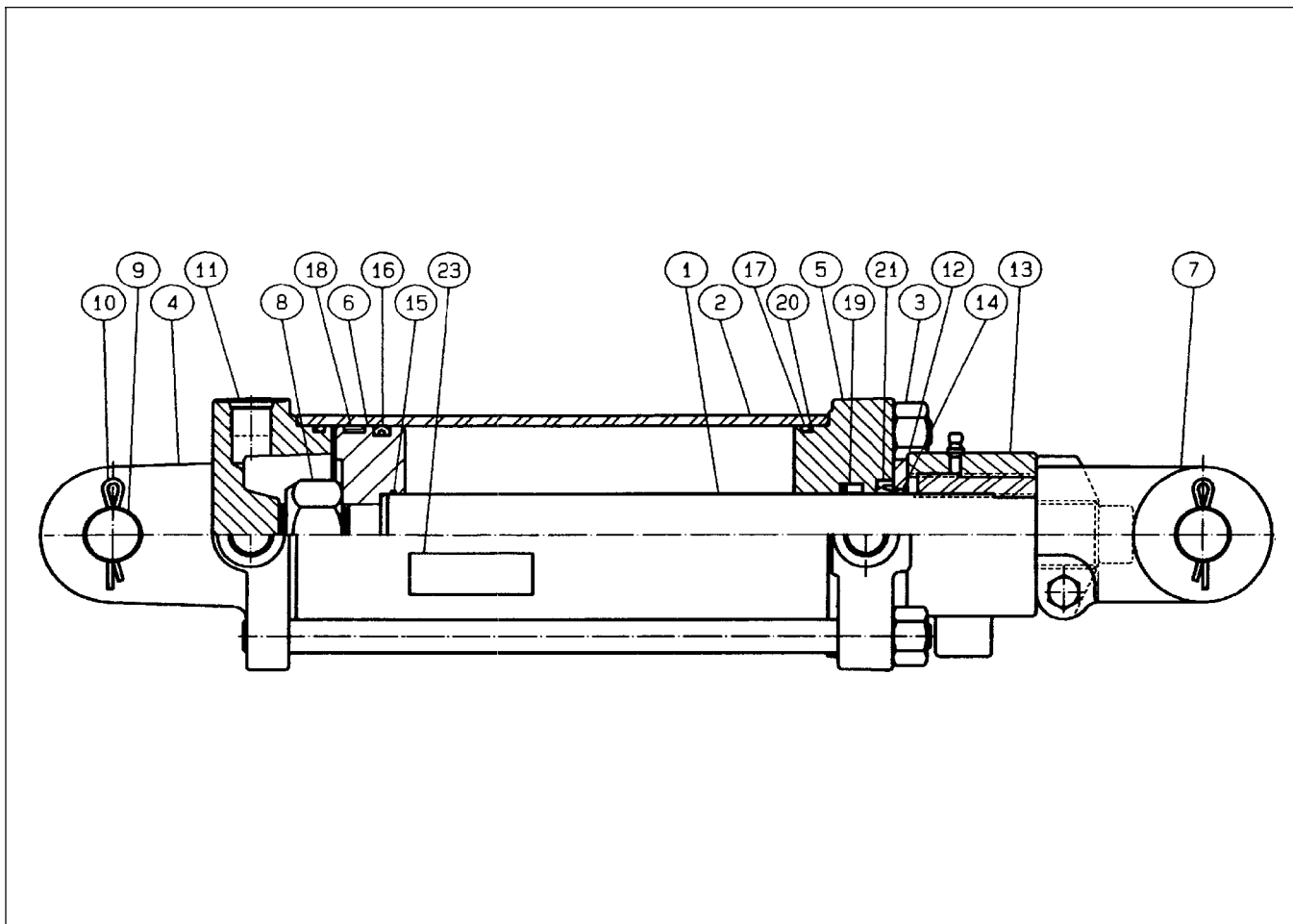
3/00
M7300-7

FOR MODELS - ALL

1/08

Item	Part Number	Part Description	Qty.
1	★ 2200-44-0	Right Extension Trash Bar Assembly	Spec.
2	★ 2200-43-0	Left Extension Trash Bar Assembly	Spec.
3	2200-46-0	Right Extension Trash Bar	1
4	2200-45-0	Left Extension Trash Bar	1
5	2200-43-1	Bracket	1
6	61-116	5/8" DIA. U-Bolt	1
7	64-109	5/8" STD. Lock Washer	3
8	63-109	5/8NC Hex Nut	3
9	62-169	5/8NC x 2"GD5 Cap Screw	1
10	62-414	1/2NC 1-3/4"GD5 Cap Screw	1
11	64-108	1/2" STD. Flat Washer	1
12	64-107	1/2" STD. Lock Washer	1
13	63-106	1/2NC Hex Nut	1

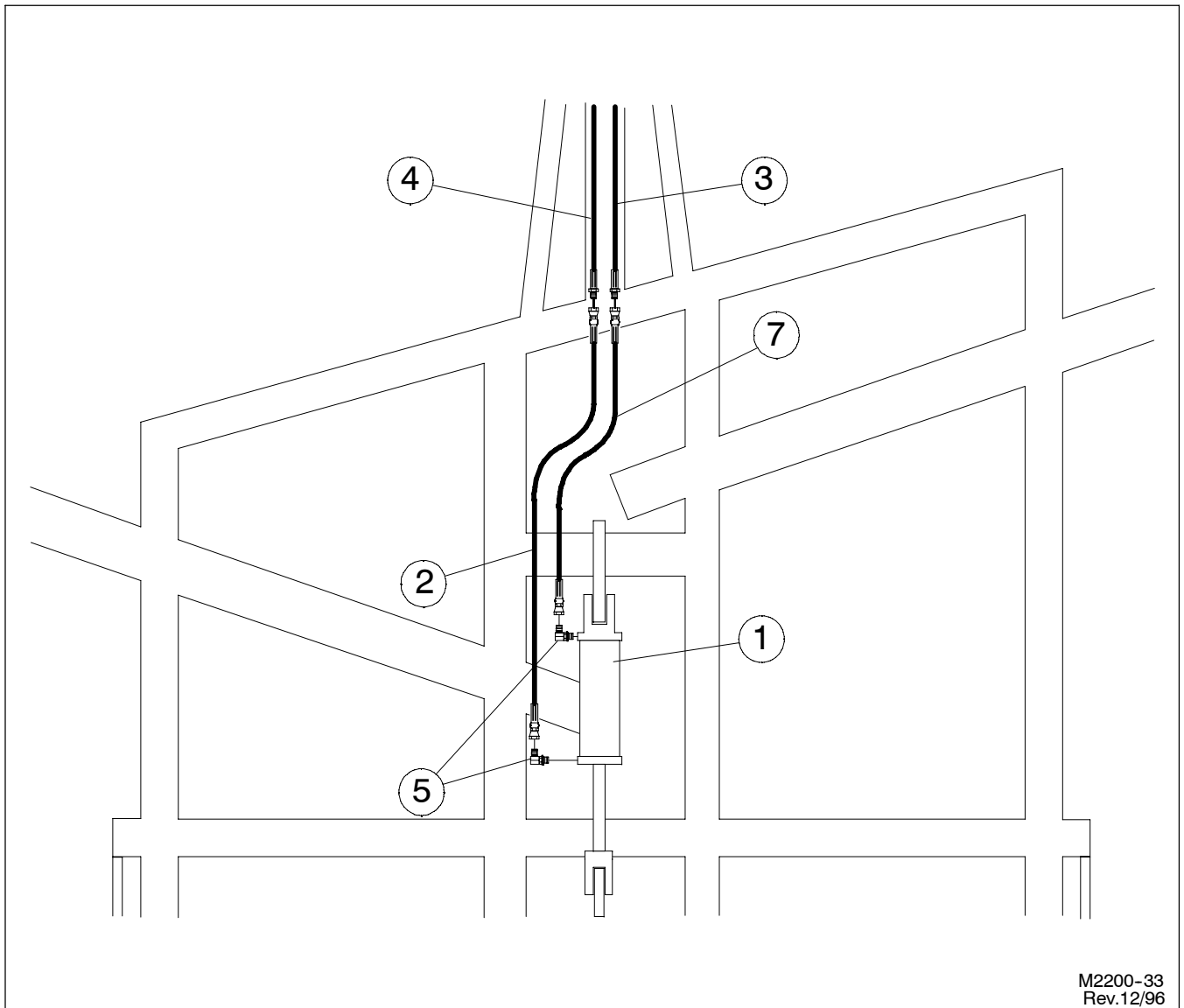
PRINCE HYDRAULIC CYLINDER ASSEMBLY



21-170 4" X 8" PRINCE HYDRAULIC CYLINDER ASSEMBLY (Screw Stop) 12/00
Retracted - 20-1/4" Stroke - 8" Extended - 28-1/4" Rod Diameter - 1-1/2"

Item	Part Number	Part Description	Qty.
1	21-925	Piston Rod	1
2	21-256	Tube	1
3	21-272	Tie Rod Assembly	4
4	21-337	Butt	1
5	21-996	Gland	1
6	21-927	Piston	1
7	21-527	Clevis Assembly	1
8	21-819	Lock Nut	1
9	21-696	Clevis Pin	2
10		3/16" DIA. x 1-3/4" Cotter Pin	4
11	21-404	Port Plug	3
12	21-263	Dust Cover	1
13	21-261	Stroke Control	1
14	★	O-Ring	1
15	★	O-Ring	1
16	★	Crown Seal	1
17	★	O-Ring	2
18	★	Bearing Ring	1
19	★	U-Cup	1
20	★	Back-Up Washer	2
21	★	Wiper	1
22	74-113	Cylinder Warning Decal	1
	● 21-930	Seal Kit (★ Items Included in Kit)	
	●	Not Included in Cylinder Assembly	

HYDRAULICS



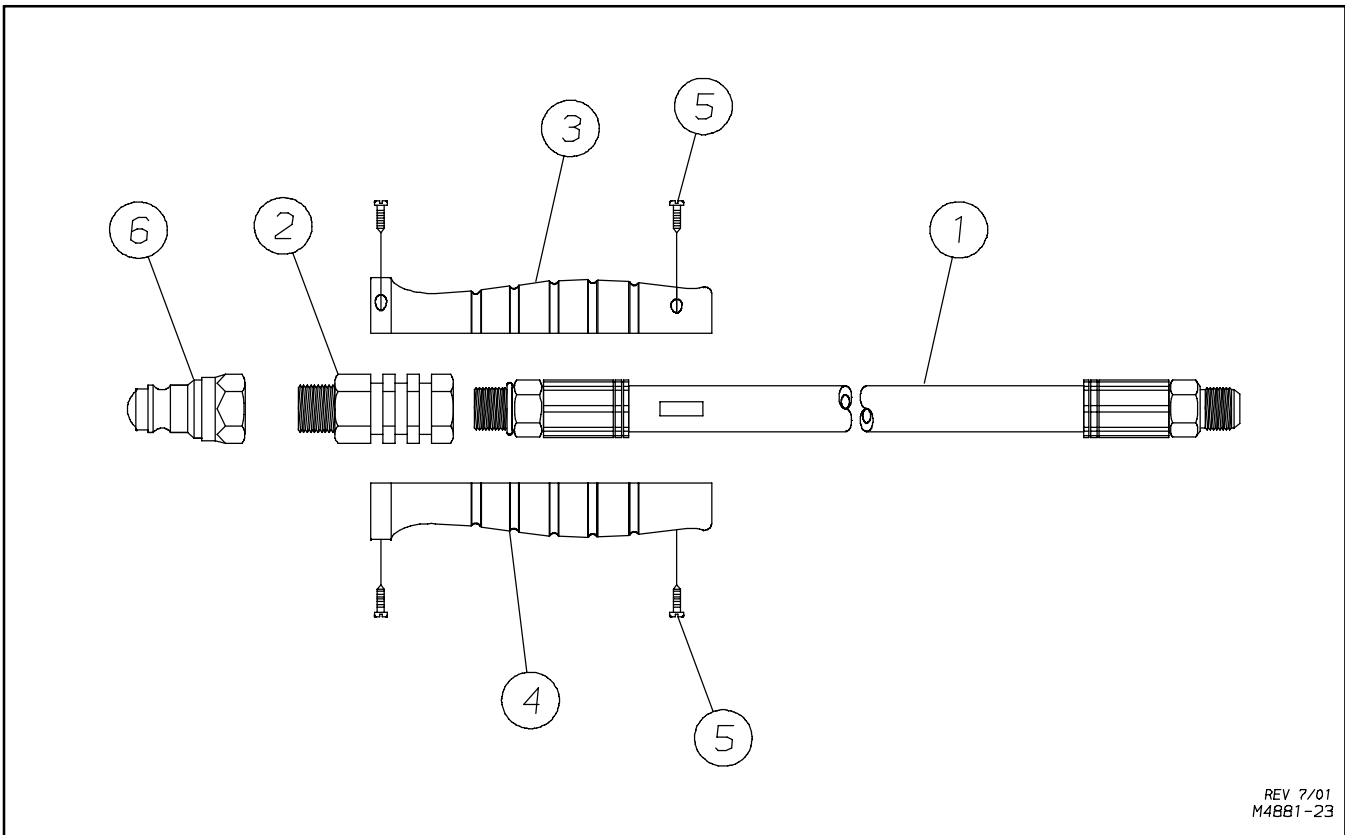
M2200-33
Rev.12/96

FOR MODELS - ALL

1/08

Item	Part Number	Part Description	Qty.
1	21-170	Hydraulic Cylinder 4" x 8"	1
	2212-47-0	Hydraulic Hose Kit	1
2	24-210R	Hydraulic Hose 76" Long	1
3	★ 4990-75-0	Hydraulic Hose w/ Red Plastic Grip Assembly	1
4	★ 4990-76-0	Hydraulic Hose w/ Yellow Plastic Grip Assembly	1
5	● 25-301	O-Ring 37° Flare 90° Adapter	2
6	▲ 25-300	O-Ring 37° Flare Adapter (Not Shown)	2
7	24-209R	Hydraulic Hose 68" Long	1
★ See page P16 for Parts Listing			
● Used with Standard Manual Stroke Control Cylinder ONLY			
▲ Used with Optional Hydraulic Stroke Control Cylinder ONLY			

HYDRAULIC HOSE WITH PLASTIC GRIP ASSEMBLIES



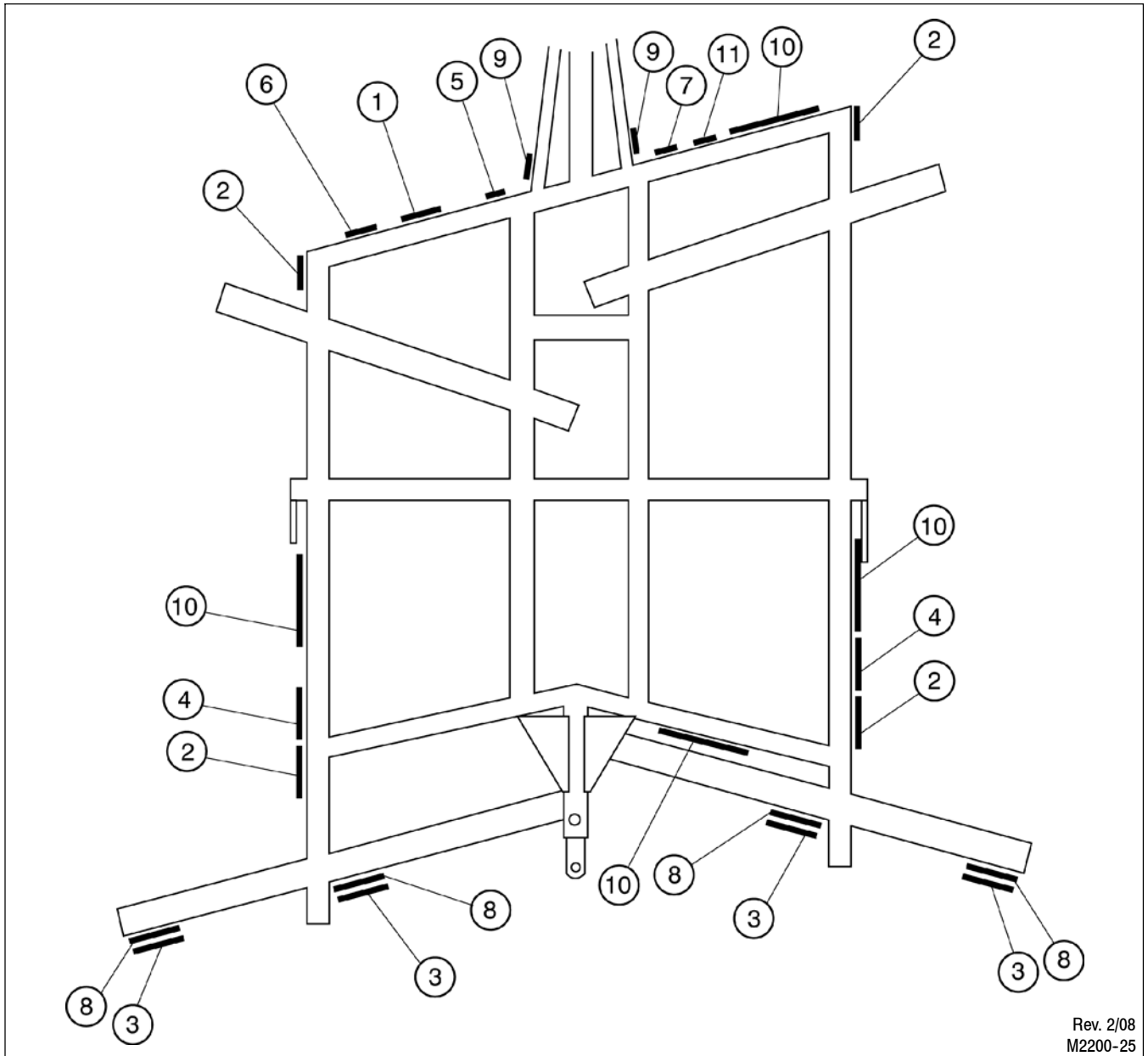
REV 7/01
M4881-23

FOR MODELS - ALL

9/07

Item	Part Number	Part Description	Qty.
	4990-75-0	1/2" x 96" 100R2 Hose with Red/Red Grip Assembly	1
1	24-330R	1/2" DIA. x 96" JIC/ORB 100R2 Hose	1
2	25-2295	3/4ORB to 1/2NPT Hydraulic Fitting	1
3	25-2289	Hose Grip Half - Red	1
4	25-2289	Hose Grip Half - Red	1
5	62-656	Screw	4
6	25-221	Male Coupler	1
	4990-76-0	1/2" x 96" 100R2 Hose with Yellow/Yellow Grip Assembly	1
1	24-330R	1/2" DIA. x 96" JIC/ORB 100R2 Hose	1
2	25-2295	3/4ORB to 1/2NPT Hydraulic Fitting	1
3	25-2290	Hose Grip Half - Yellow	1
4	25-2290	Hose Grip Half - Yellow	1
5	62-656	Screw	4
6	25-221	Male Coupler	1

DECALS & REFLECTORS

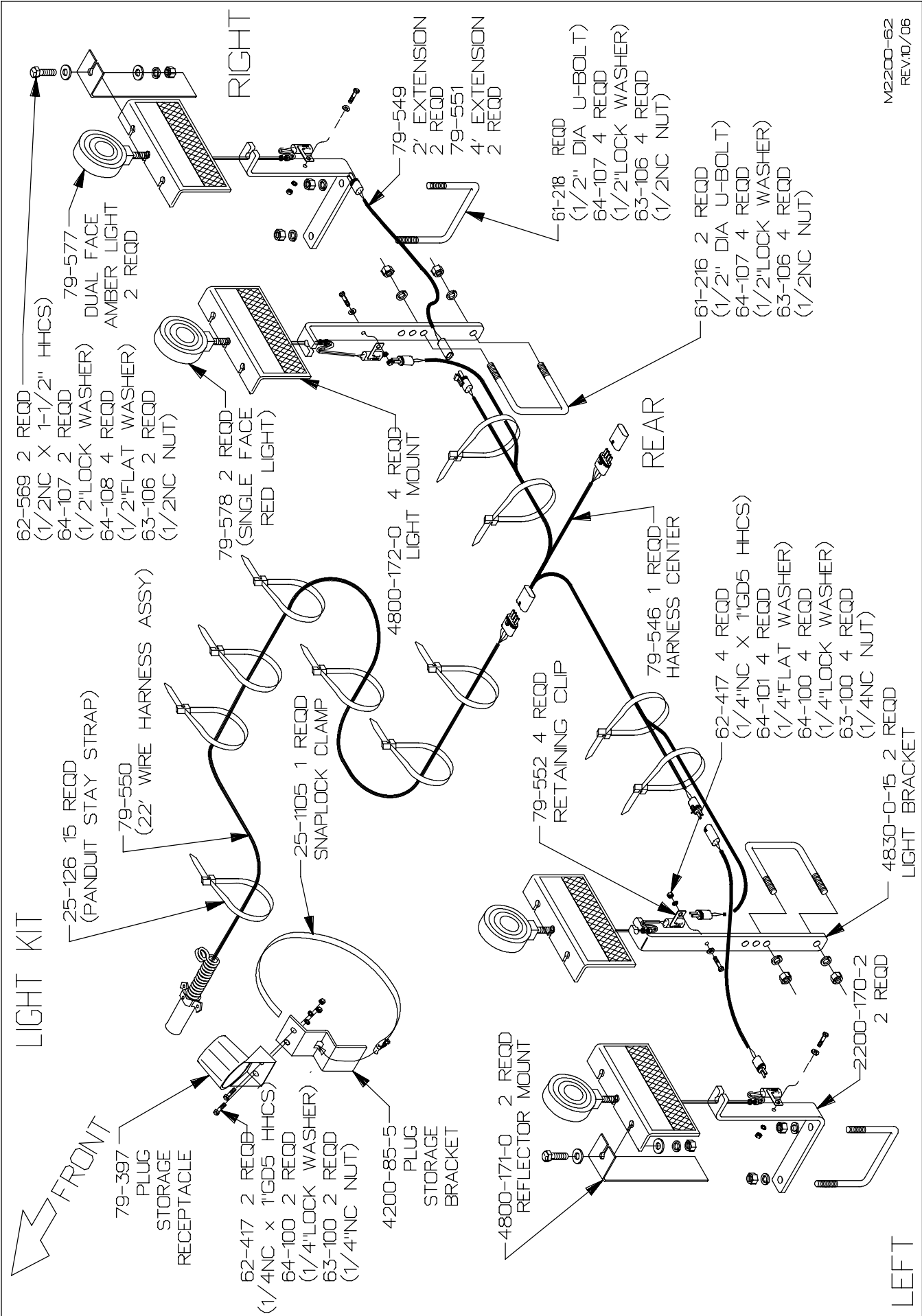


Rev. 2/08
M2200-25

FOR MODELS - ALL

2/08

Item	Part Number	Part Description	Qty.
1	74-117	Implement Safety Decal	1
2	74-577	Yellow Reflector	4
3	74-575	Red Reflector	4
4	74-651	8100 Series Decal	2
5	74-155	Adjustment Screw Decal	1
6	74-276	Hydraulic Safety Decal	1
7	74-128	Patent Decal	1
8	74-576	Fluorescent Orange Tape Decal	4
9	74-648	Krause Trademark Decal	2
10	74-100	KRAUSE Decal	2
11	74-115	Name Plate	1



M2200-62
REV.10/06

ASSEMBLY SECTION

THE FOLLOWING SECTION ILLUSTRATES A GENERAL METHOD FOR THE ASSEMBLY OF THIS SERIES KRAUSE TILLAGE TOOL. YOU MUST KNOW THE MODEL NUMBER OF THE UNIT BEING ASSEMBLED WHENEVER MAKING REFERENCE TO THIS SECTION. THE FOLLOWING PICTURES AND DRAWINGS WILL SHOW BOLTS, PINS, NUTS AND ETC., WITH THE DESCRIPTIVE SIZE AND LENGTHS IN THE ACCOMPANYING PARAGRAPH AND A PARTS LISTING REFERENCE PAGE NUMBER. IF ANY DIFFICULTY SHOULD BE ENCOUNTERED DURING THE ASSEMBLY, RECHECK THE ILLUSTRATIONS, ASSEMBLY STEPS AND PARTS LIST DRAWINGS.

PROPER BOLT USE

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

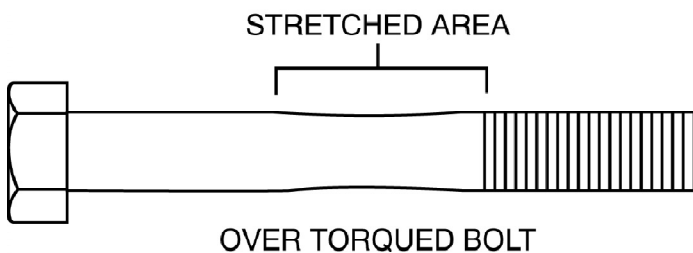
Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

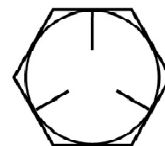
Tighten plastic insert or crimped steel-type lock nuts to approximately 110 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

NOTE: "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication. **Tighten lubricated bolts to approximately 80% of dry bolts.**

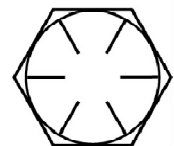
BOLT SIZE	WRENCH SIZE	BLACK OR PLATED BOLTS		
		GRADE 2	GRADE 5	GRADE 8
3/8"	9/16"	20	33	45
7/16"	5/8"	32	52	70
1/2"	3/4"	50	80	105
5/8"	15/16"	100	150	210
3/4"	1-1/8"	160	260	375
7/8"	1-5/16"	175	415	600
1"	1-1/2"	250	625	880
1-1/8"	1-11/16"	375	850	1400
1-1/4"	1-7/8"	530	1100	1765
1-1/2"	2-1/4"	930	1400	2540



SAE
GRADE 2



SAE
GRADE 5



SAE
GRADE 8

ASSEMBLY INSTRUCTIONS

STUDY THE NAMES AND LOCATIONS OF THE PARTS AND FAMILIARIZE YOURSELF WITH THE TANDEM BEFORE STARTING THE ASSEMBLY. READING THE STEP BY STEP INSTRUCTIONS THAT FOLLOW WILL BE HELPFUL.

SAFETY



READ ALL OF THE SAFETY NOTATIONS IN THE ASSEMBLY INSTRUCTIONS FOR YOUR OWN PROTECTION. ACCIDENTS CAN BE PREVENTED BY RECOGNIZING THE CAUSE OF AN ACCIDENT BEFORE IT CAN HAPPEN.

ASSEMBLY AREA

Select an area for the assembly that will be large enough to accommodate the completed unit. The surface of the work area should be as level as possible. Use the proper hand tools to insure proper bolt tightness. Refer to the page titled 'Proper Bolt Use' for the recommended torque values for the different size bolts.

PART LOCATIONS

FRONT - A name plate has been attached to the FRONT frame member at the factory.

TOP - The top of the frame has cylinder lugs, road lock bar lugs and a lamp bracket tab.

RIGHT & LEFT - Standing behind the frame looking toward the direction of travel, will determine the right from left reference.

ASSEMBLY STEPS

The assembly steps that follow are listed in order to provide the assembly crew with a uniform method of assembly for completion of the harrow with established average field settings.

Each part to be attached will be shown in order of assembly with a brief statement and a photo or drawing for clarification. See example below.

GANG BEAMS & CLAMPS

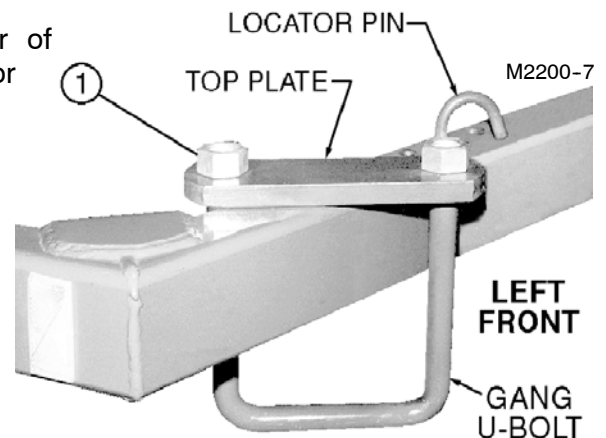
Step 1.

Place the **GANG BEAM U-BOLT** around

the frame from the bottom up, with

TOP PLATES on top of the frame.

Secure with **1NC Self Locking Nuts**.



The part is named in the picture A. The bolts and attaching hardware B in the statement are keyed with numbers C that are reflected in the picture.

MODEL NUMBER

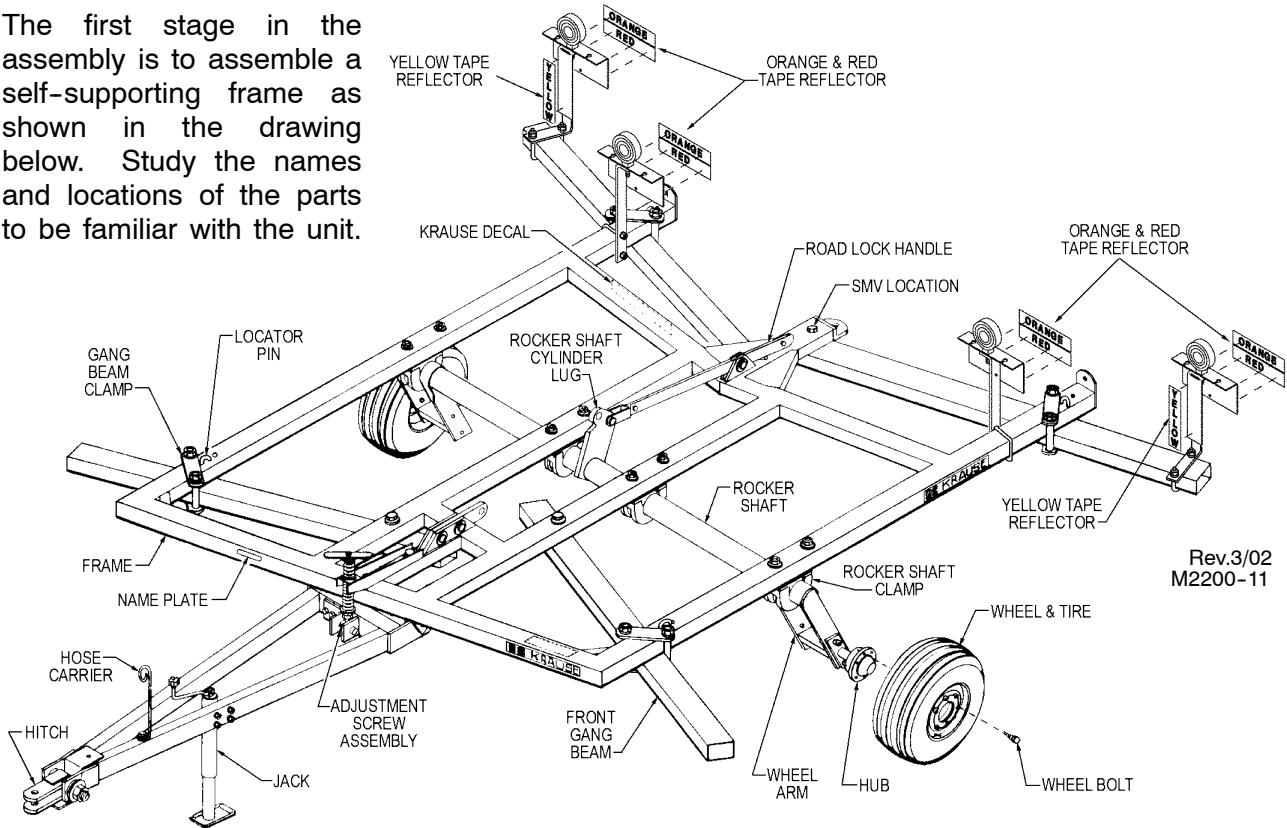
Know the MODEL NUMBER of the harrow being assembled. Use the model number whenever referring to the assembly section, parts listing or placement drawings. The number of the models will be stamped on the NAME PLATE located on the front frame member.



ASSEMBLY

The following information relates one of several methods of assembly for these disc harrows.

The first stage in the assembly is to assemble a self-supporting frame as shown in the drawing below. Study the names and locations of the parts to be familiar with the unit.



Self-Supporting Frame

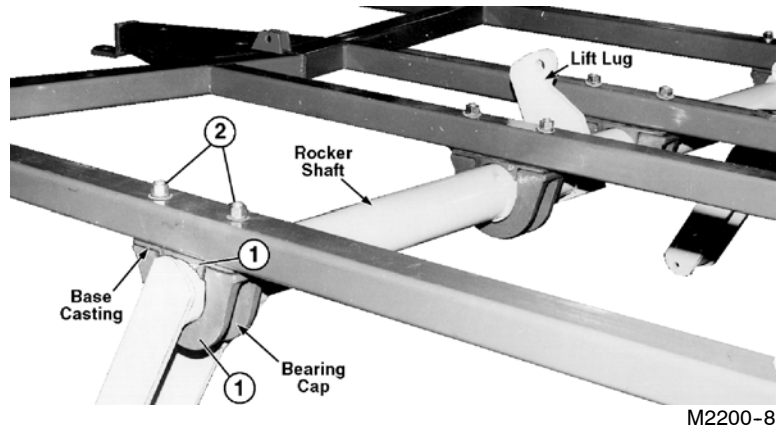
STEP 1.

Position the FRAME in the center of the assembly area on sturdy stands approximately 30" high. Make sure the frame is right side up.

IMPORTANT: THE STANDS WILL BE REQUIRED TO SUPPORT APPROXIMATELY 1,000 FT. LBS. OF CONSOLIDATED ASSEMBLY BEFORE ROAD LOCKING.

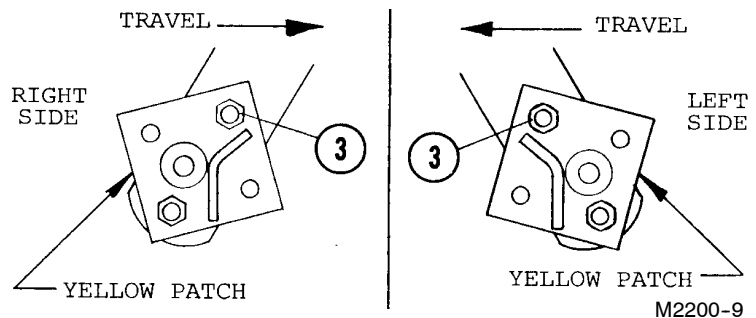
STEP 2.

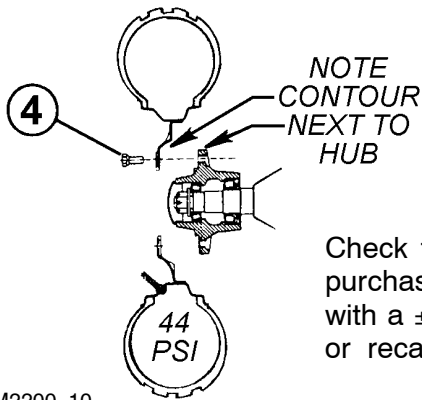
Position the ROCKER SHAFT under the frame with the large lift lug pointing up and the wheel arms pointing toward the back. Add Zerks (1) to the BEARING CAPS and BASE CASTINGS, then raise the rocker up under the frame and clamp in place with 3/4NC x 5" Cap Screws (2), Lock Washers and Hex Nuts.



STEP 3.

Bolt the single or (dual) HUBS to the outside of the rocker shaft wheel arm. Use 3/4NC x 2-1/2" Cap Screws (3), Lock Washers and Hex Nuts for attachment.





STEP 4.

Remove the WHEEL BOLTS④ from the hubs and mount the WHEEL and TIRE assemblies to the hubs.

IMPORTANT: TIGHTEN THE WHEEL BOLTS IN A CRISS-CROSS PATTERN AND TORQUE EACH WHEEL BOLT TO 120 FT. LBS.

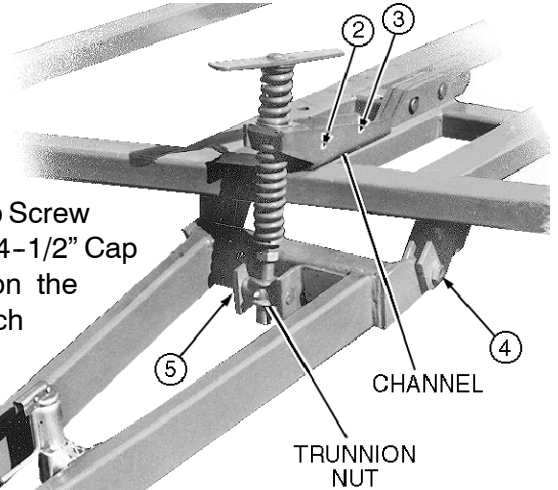
Check the TIRES for proper inflation and correct if necessary. Krause purchased tires should be inflated to 44 PSI. All tires should be 9.5L x 15 with a $\pm 1/2$ " diameter from each tire. Krause does not recommend used or recapped tires.

M2200-10

Tongue

STEP 5.

Attach the channel of the ADJUSTMENT SCREW ASSEMBLY on top of the frame with a 1NC x 5" Cap Screw (2), Lock and Flat Washer, Hex Nut and a 3/4NC x 4-1/2" Cap Screw (3), Lock Washer and Hex Nut. Position the TONGUE in front of the frame and bolt the hitch brackets with 1NC x 3" Cap Screws (4), and Self Locking Nuts. Be sure the tongue is right side up. CHECK PARTS LISTING PAGE P5, in the PARTS SECTION. Raise the tongue, and place the TRUNNION NUT of the adjustment screw assembly between the tongue bracket and the CENTER BRACKET, securing them with a 3/4NC x 4-1/2" Cap Screw (5), Lock Washer and Hex Nut through the bracket and tongue.



M2200-4

M2200-65



IMPORTANT: BE SURE THE ZERK ON THE TRUNNION NUT IS FACING THE FRONT, BEFORE SECURING.

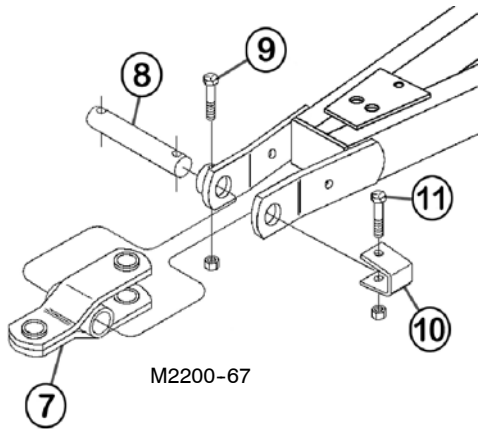
Turn handle on the ADJUSTMENT SCREW ASSEMBLY until 19-1/4" initial field setting is obtained (see photo at right).

19-1/4" INITIAL FIELD SETTING

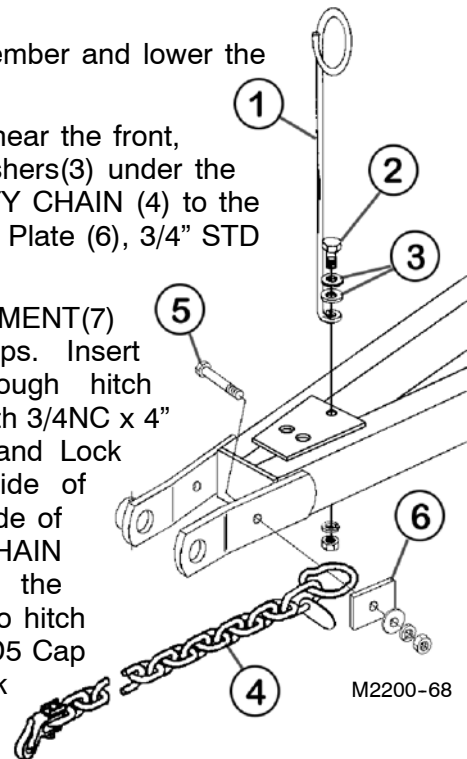
STEP 6.

Pin the JACK to the clevis on inside of left tongue member and lower the pad of the jack to the ground.

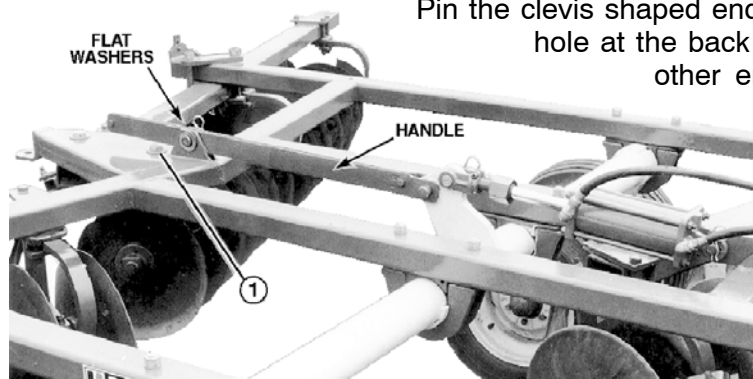
Bolt the HOSE CARRIER(1) to the top of the tongue near the front, using a 1/2NC x 6-1/2" Cap Screw(2), TWO Flat Washers(3) under the head, and Lock Washer and Hex Nut. Bolt the SAFETY CHAIN (4) to the hitch strap with a 3/4NC x 3" GD5 Cap Screw (5), Bolt Plate (6), 3/4" STD Flat Washer and Lock Nut



Place HITCH WELDMENT(7) between the hitch straps. Insert HITCH PIN (8) through hitch straps. Bolt in place with 3/4NC x 4" GD5 Cap Screw (9) and Lock Nut on right hand side of hitch straps. On left side of hitch straps add the CHAIN CLEVIS (10) around the safety chain and bolt to hitch pin with 3/4NC x 4" GD5 Cap Screw (11) and Lock Nut.



STEP 7.



Pin the clevis shaped end of the ROAD LOCK HANDLE to the hole at the back of the rocker shaft lift lug. Allow the other end of the handle to lay between the two lugs at the back of the frame.

Check all nuts and bolts for the tongue, rocker shaft, hubs and wheels to be sure that they are tight. Add 1NC x 8" Cap Screw① before pinning road lock. Then raise the back of the harrow frame and secure the road lock handle to the lugs at the back. Be sure to

M2200-6

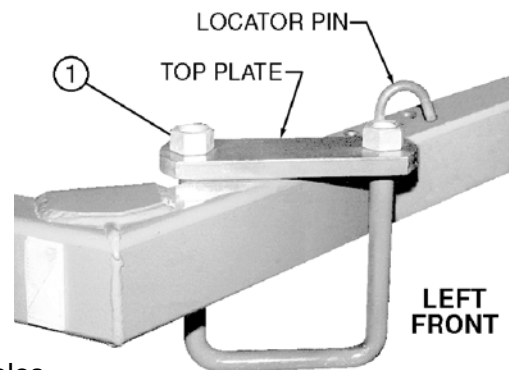
add a flat washer on both sides of the CLEVIS PIN before securing with a #4 HAIR PIN COTTER.

IF ALL PRECEDING STEPS WERE COMPLETED, THE FRAME SHOULD BE SELF-SUPPORTING AND THE STANDS CAN BE REMOVED FROM THE FRAME.

DISC GANG BEAMS

STEP 1.

Assemble one GANG BEAM U-BOLT and TOP PLATE at each corner of the outside front to rear frame members. Loosely add 1NC Self Locking Nuts① to the clamps.



LEFT FRONT

M2200-7

STEP 2.

At each of the clamp locations are three holes on top of the frame and through the bottom. Be sure the gang beam clamps are in front of these holes, then place a LOCATOR PIN in the center hole at each location.

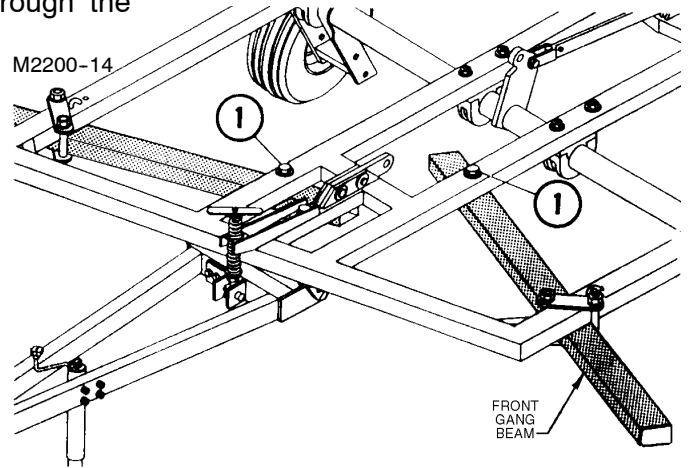
STEP 3.

Turn to the parts listing, or the placement drawing at the end of this section, and locate the model being assembled to obtain the correct GANG BEAM and location for attachment.

IMPORTANT: THE HARROW FRAME IS SELF-SUPPORTING ON THE JACK AND WHEELS. ANY EXCESS PRESSURES AGAINST THE FRAME CAN CAUSE DAMAGE TO THE JACK. BLOCKING WHEELS WILL HELP PREVENT DAMAGE.

STEP 4.

Select the correct GANG BEAM to be attached at the front. Note that one end has a bolt hole. Slide the end with the hole through the gang beam clamp, and bolt to the inside frame member with a 1NC x 8" Cap Screw (1), Lock Washer and Nut. Attach the remaining beams the same way. Use Flat Washers as shown on the parts list.



Caution: Always add parts to the front of the harrow first. Adding parts to the back of the frame first can cause the harrow to tip over backwards and possibly cause injury.

STEP 5.

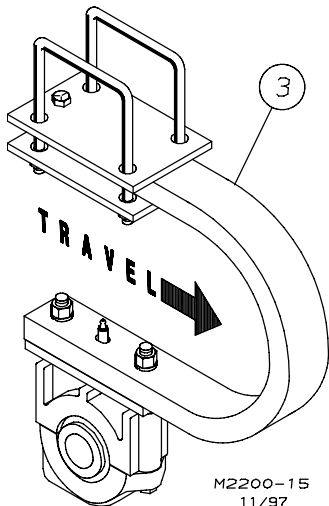
With the gang beams attached to the frame, pull the beams back against the locator pins that have been placed in the center locator pin holes and tighten the clamp nuts and beam bolts.

Disc Gangs

Danger: Serious injury can be inflicted by disc blades and disc gangs if not handled safely. Watch for unsafe conditions and be aware of the unexpected. Keep your co-workers safety in mind. Should personal injury occur, have medical treatment administered immediately.

STEP 1.

A PLACEMENT DRAWING at the end of this section is furnished for each model in this series, that will serve as a guide for proper gang assembly, gang locations and adjustments. Turn to the drawing that reflects the model number stamped on the name plate, and study the information.



NOTE: This step is not necessary for regreaseable type bearing arms.

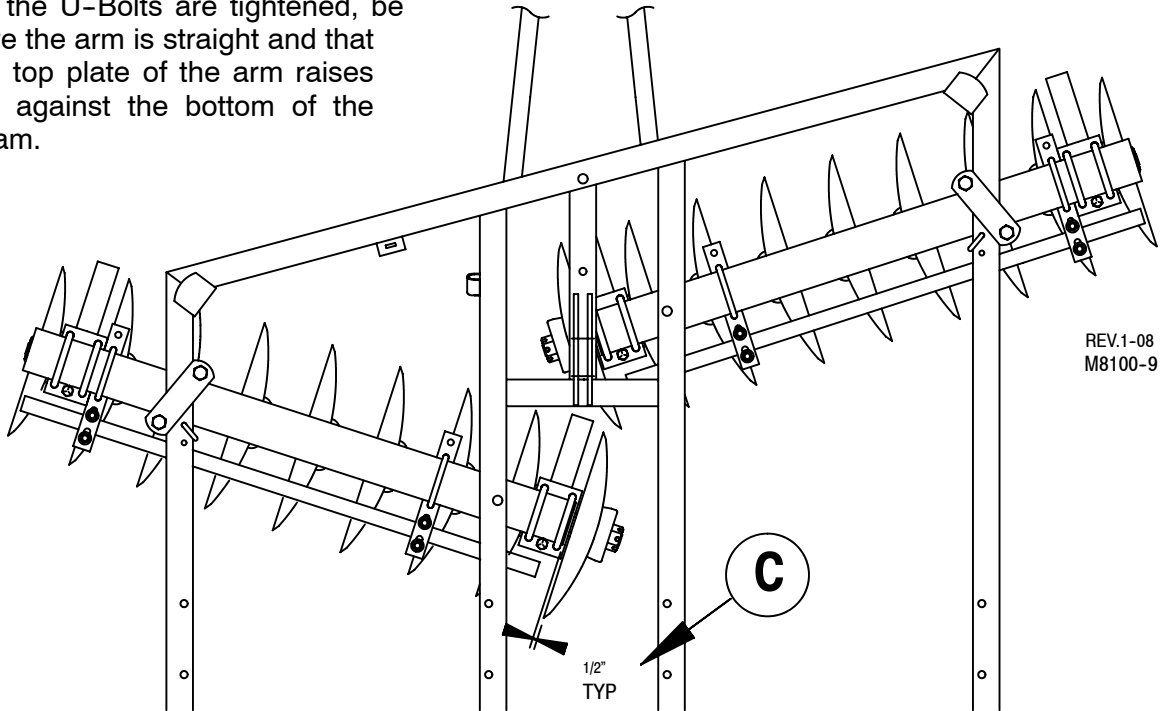
If the name plate reads 8100-12NR through 8100-16NR, or 8100-12WR through 8100-18WR the gangs will have rock flex type bearings arms³. The round portion of the arm will always face the front of the implement.

When assembling the disc gangs, always keep the direction of travel in mind, and the correct position of the bearing arms on the tie rods as they are being assembled.

! Danger: Never attach disc gang assemblies to the back of the frame first. The added weight of the gangs could cause the frame to tip backwards unexpectedly and cause injury.

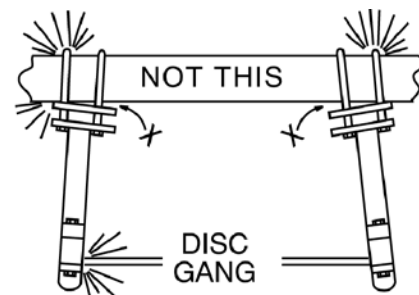
STEP 2.

Roll the front gang assemblies under the front gang beams. Loop a length of chain under the center spool and over the gang beam. Attach the lift to the chain and raise the disc gang until the top of the bearing arms touch the bottom of the gang beam. Adjust the top of the bearing arms so that they are square with the gang beam and attach with U-Bolts, 3/4" Lock Washers and Hex Nuts. Leave loose. Check the inside disc blade and adjust the gang so that the blade is at the 1/2" dimension (C) as shown to the lower right. If necessary, shift the gang to acquire the correct overhang and tighten the inside bearing arm U-Bolts. As the U-Bolts are tightened, be sure the arm is straight and that the top plate of the arm raises flat against the bottom of the beam.



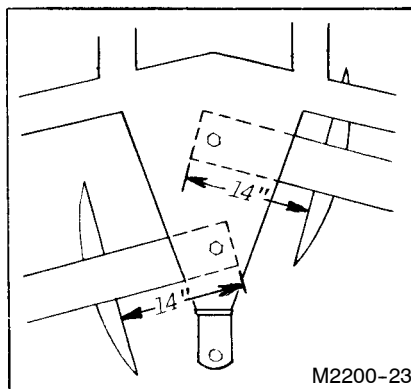
REV.1-08
M8100-9

IMPORTANT: REMOVE THE CHAIN FROM THE GANG AND TIGHTEN THE MIDDLE OR SECOND BEARING ARM. BE SURE THE ARM IS STRAIGHT AND DOES NOT TOUCH THE BEAM AT A TILT. A TILTED TOP PLATE CAN CAUSE A LEVER ACTION AS THE U-BOLTS ARE TIGHTENED, AND WILL PRE-LOAD THE BEARINGS THAT WILL SHORTEN THE LIFE OF THE BEARINGS AND CAUSE DAMAGE.



M2200-22

Adjust inside edge of 22" blade to 14" from the end of the gang beam. →

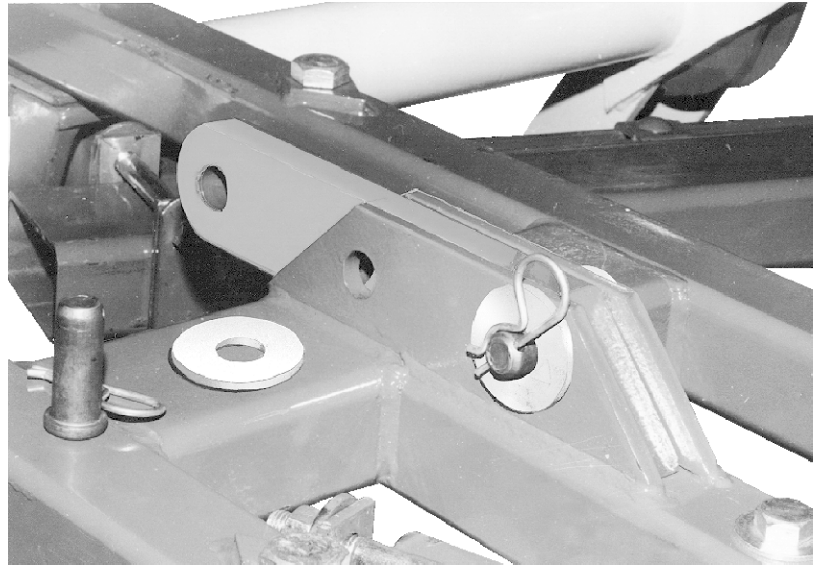


After adjusting and tightening each of the bearing arm U-Bolts, retighten the flangette carriage bolts if they were loose for the assembly.

Attach the back gangs in the same manner, adjusting the gang on the beam to 14" for 22" disc blades as shown in the illustration to the left.

CYLINDER LUG

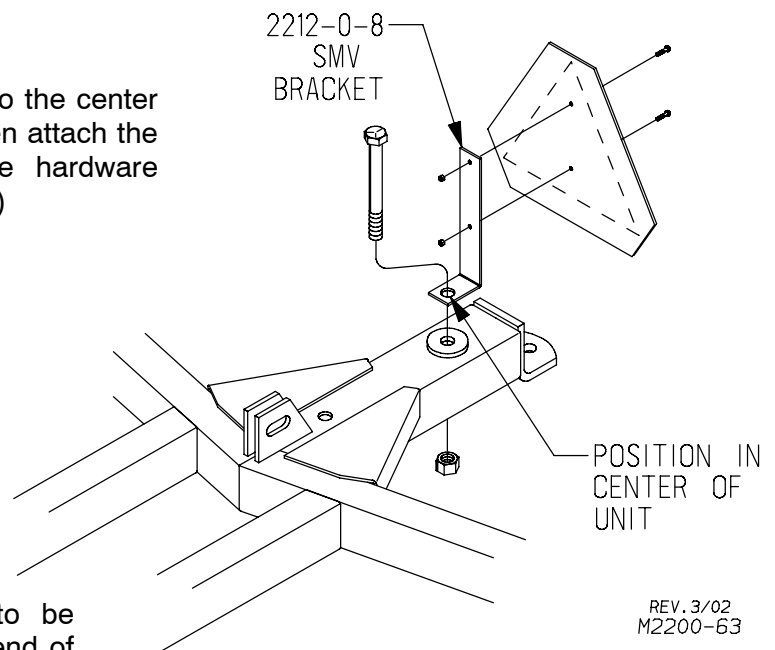
Place the CYLINDER LUG between the two lugs on top of the frame as shown at right. Place a 1" Flat Washer on the CLEVIS PIN and push the pin through the slotted holes. Add a second Flat Washer to the pin and secure with a #4 Hair Pin Cotter. Put a Flat Washer on a second clevis pin and push through the back hole of the lug. Do not add a flat washer, but secure the back pin with a #4 Hair Pin Cotter.



M2200-24

SMV SIGN INSTALLATION

Bolt the SMV BRACKET (2212-0-8) to the center of the frame (see parts page P1). Then attach the SMV SIGN to the bracket with the hardware supplied in the Light Kit (4830-170-0)



REV. 3/02
M2200-63

HYDRAULIC CYLINDER

If the HYDRAULIC CYLINDER is to be attached to the harrow, pin the base end of the cylinder to the sliding cylinder lug. DO NOT PIN THE ROD END OF THE CYLINDER UNTIL THE SYSTEM IS FULL OF HYDRAULIC OIL. Refer to the hydraulic operating page and fill the system as instructed. Be sure to place a block under the cylinder tube so that the rod will work in and out without striking the rocker shaft lift lug. When the system is full of oil and free of air, then pin the rod clevis to the rocker lift lug.

DECALS

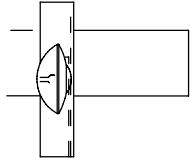
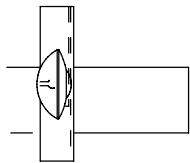
Part of the DECALS have been attached at the factory. Check for damage and replace if needed. Add the remaining decals to the harrow. See the drawing on page P17 of the Parts Section in this owner's manual for the proper locations.

LIGHT KIT

Always comply with state and local laws pertaining to lighting. Install light kit as shown on page P18 and A8 in this manual.

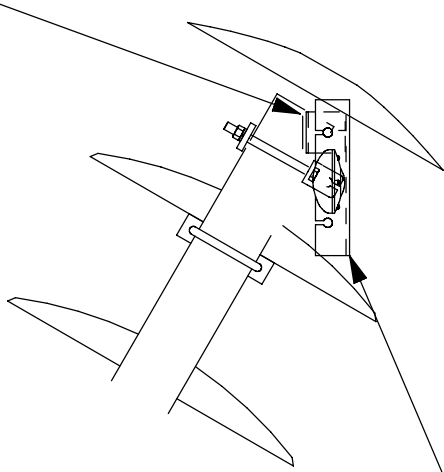
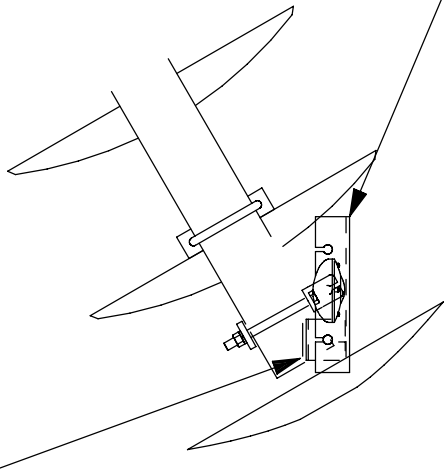
LEFT REAR GANG BEAM

RIGHT REAR GANG BEAM



4800-171-0

4800-171-0



TOP VIEW

LOCATE AS NEAR
END AS POSSIBLE

RED

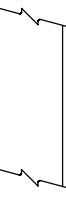
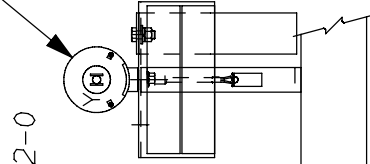
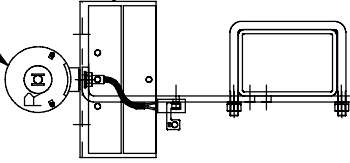
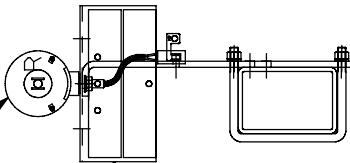
RED

AMBER

AMBER

4800-172-0

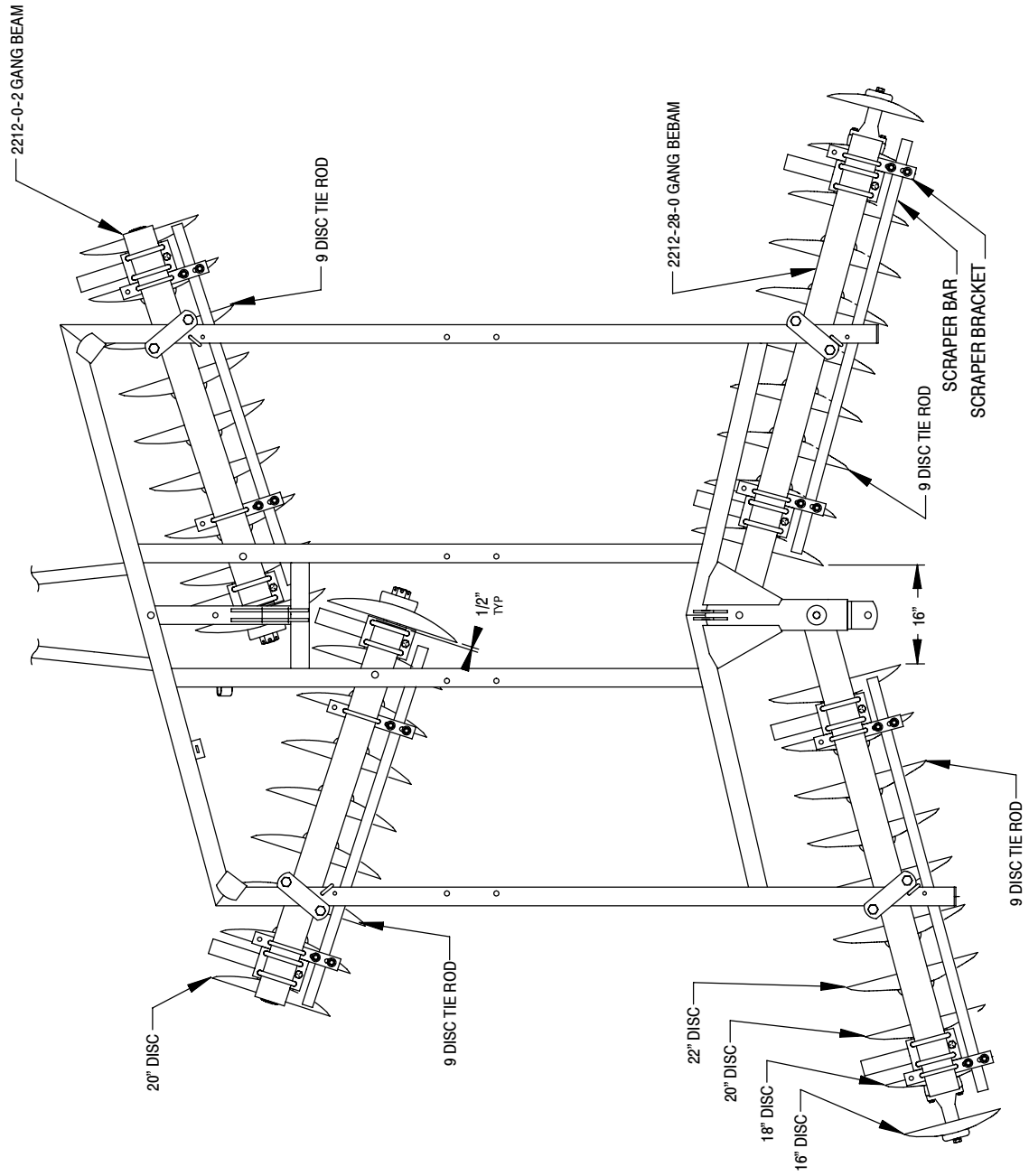
4800-172-0



REAR VIEW

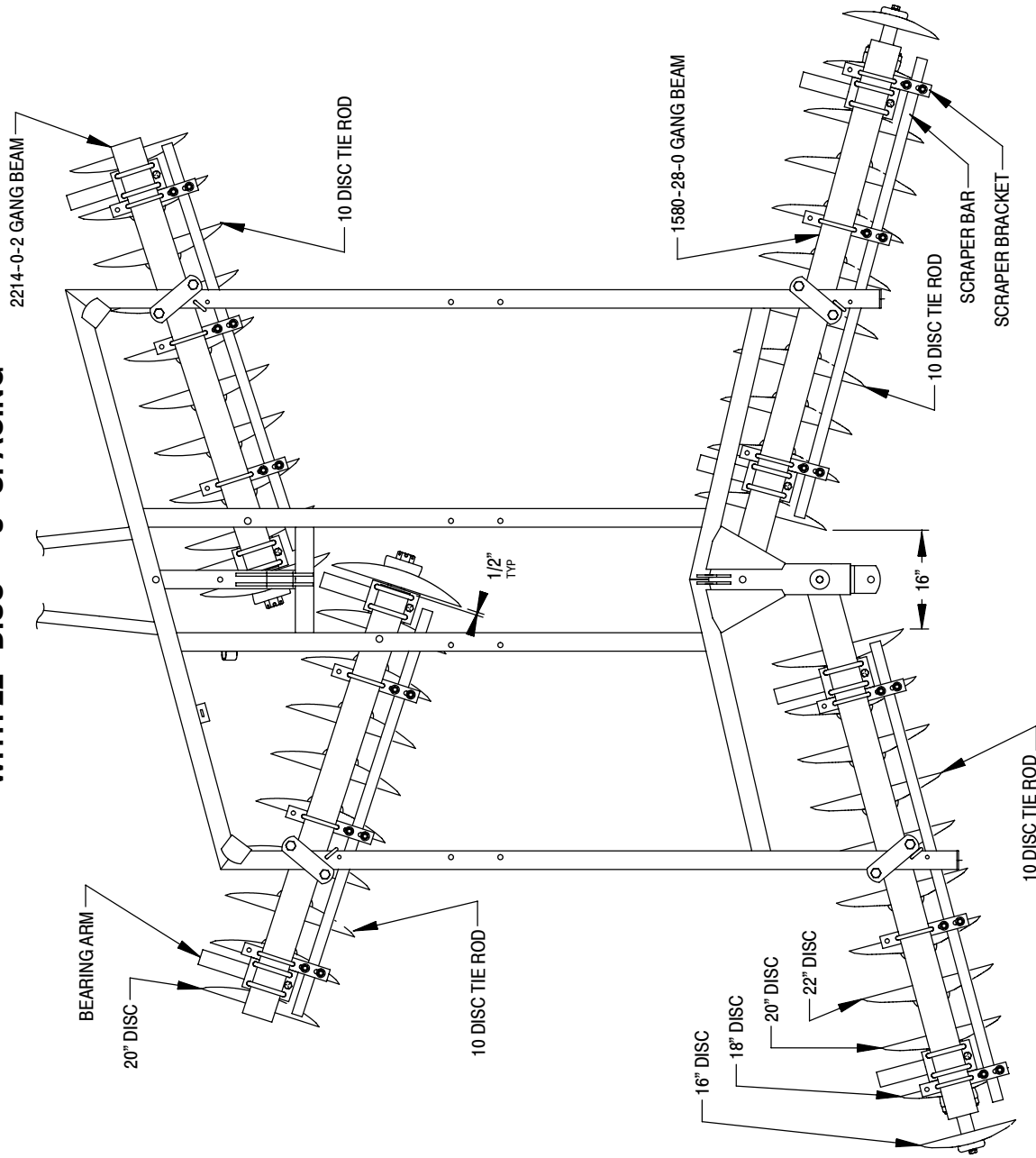
MODEL 8100-12NR

WITH 22" DISC 8" SPACING



MODEL 8100-14NR

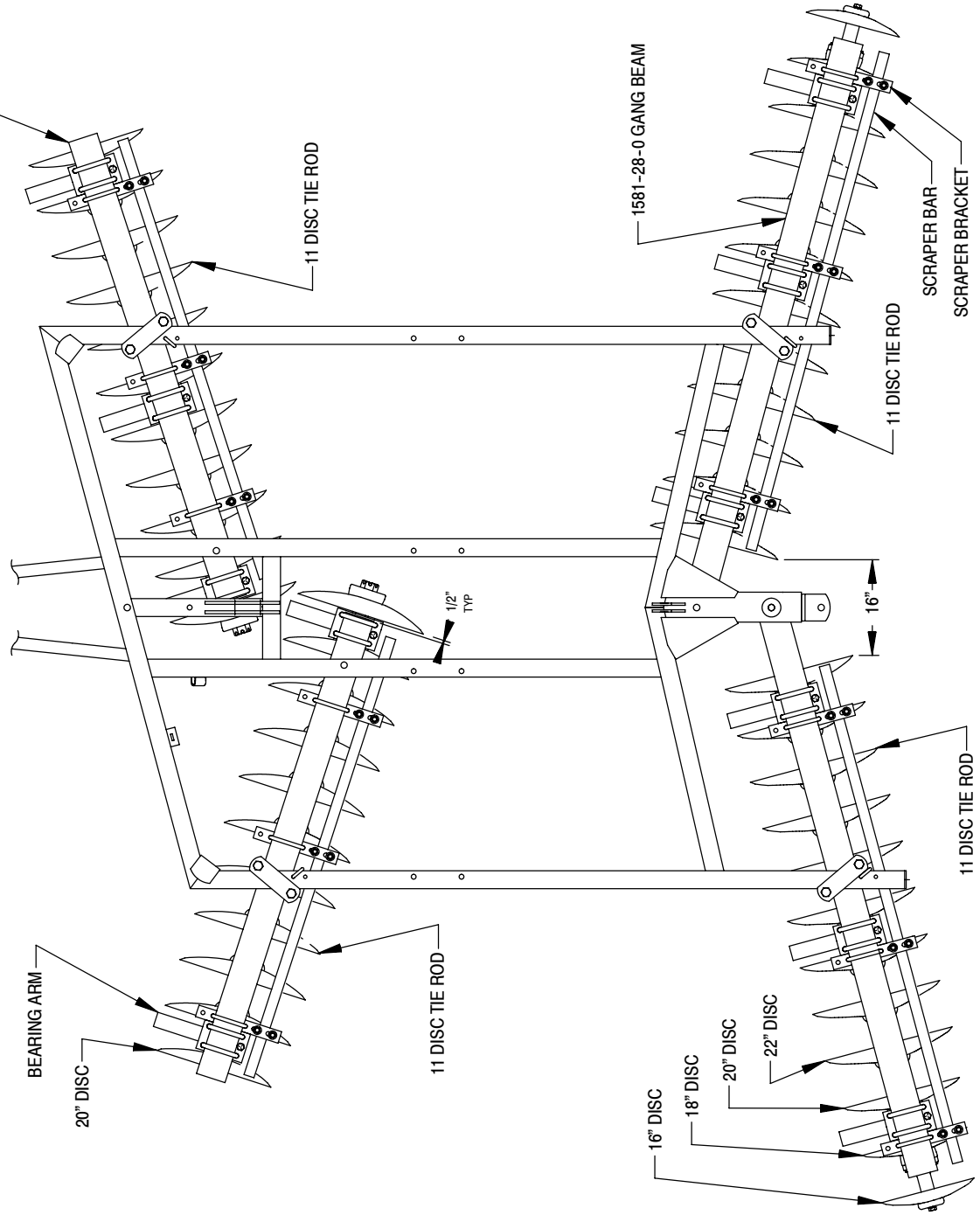
WITH 22" DISC 8" SPACING



REV.1-08
M8100-2

MODEL 8100-15NR

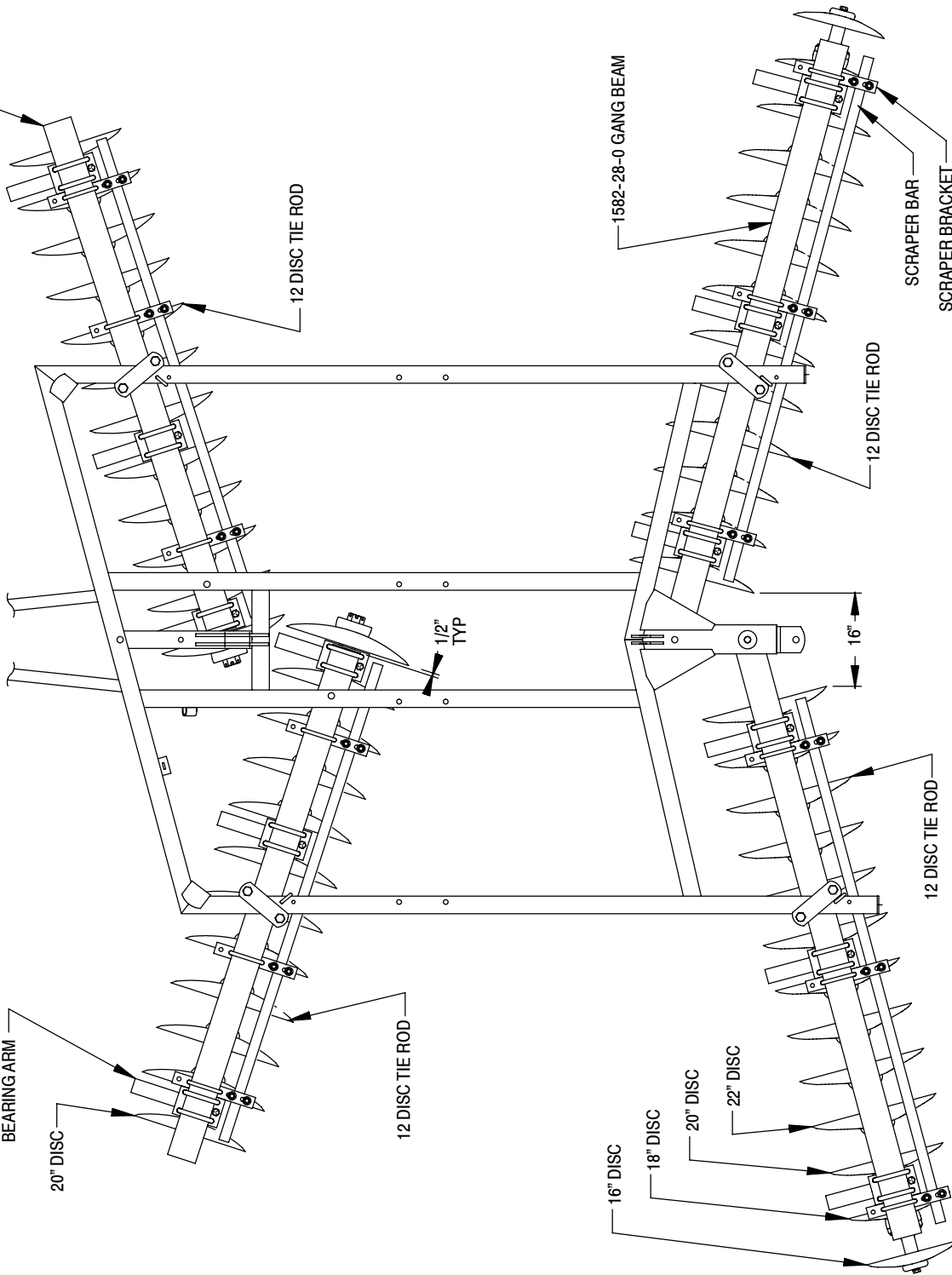
WITH 22" DISC 8" SPACING



MODEL 8100-16NR

WITH 22" DISC 8" SPACING

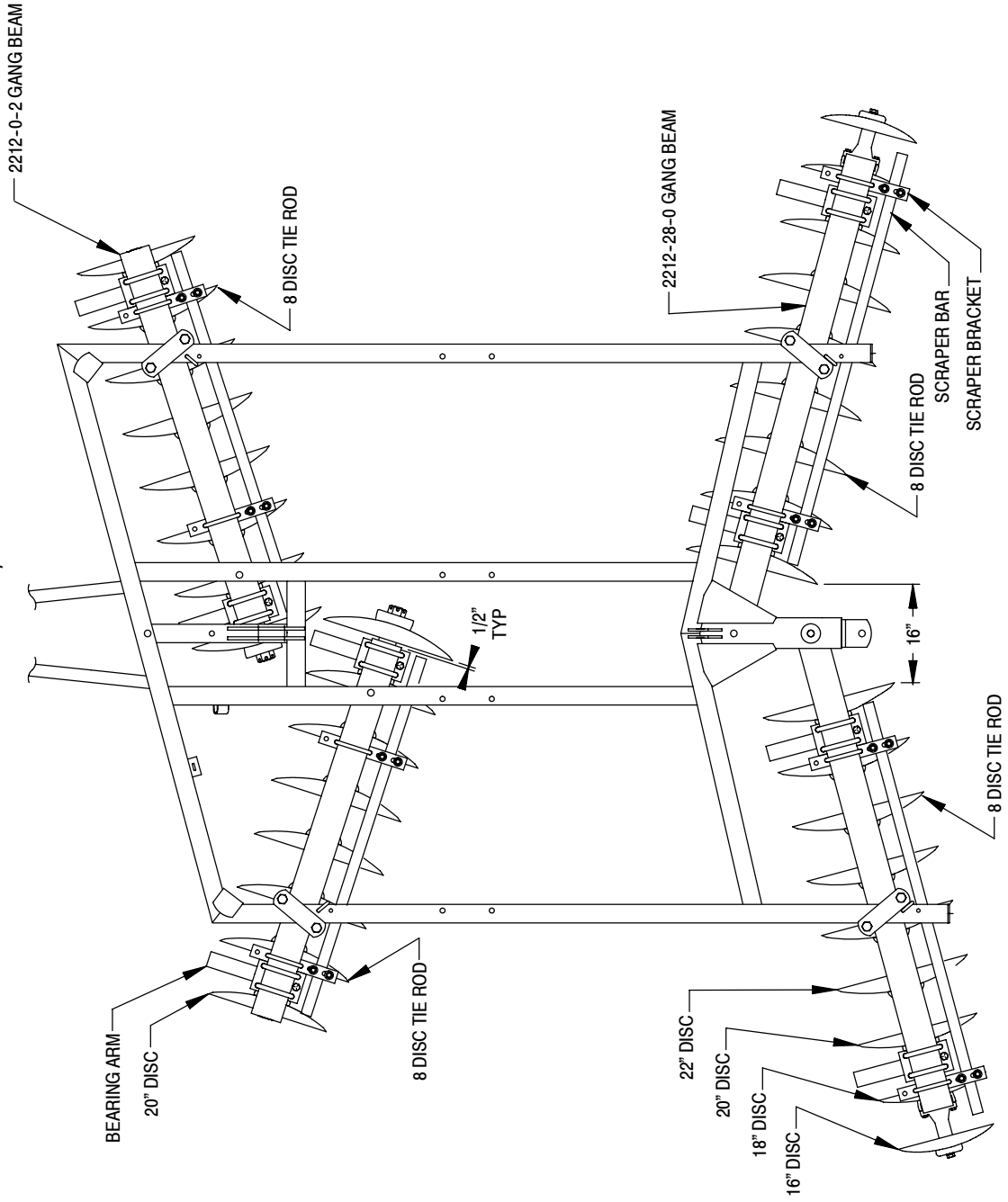
2216-0-2 GANG BEAM



REV.1-08
M8100-4

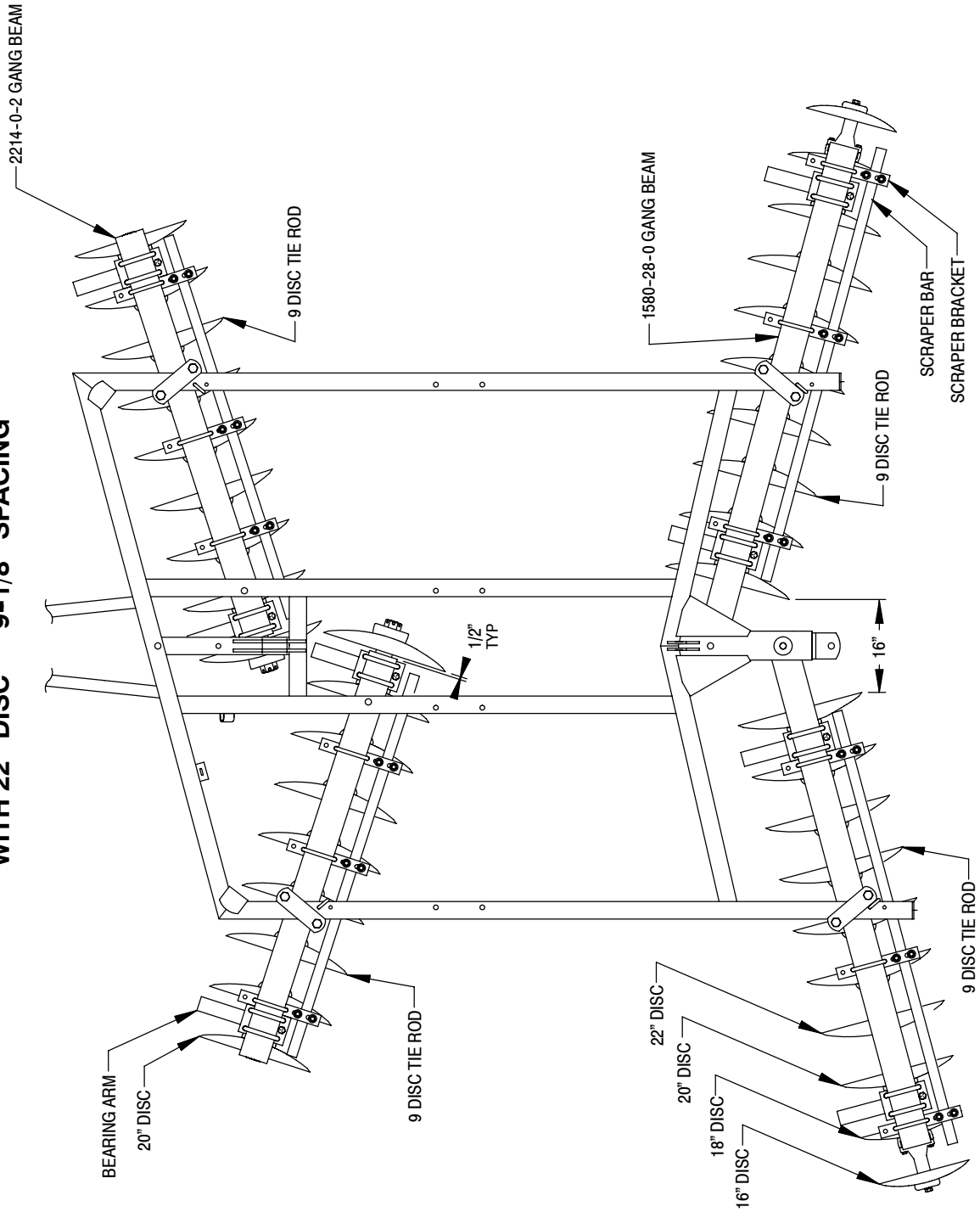
MODEL 8100-12WR

WITH 22" DISC 9-1/8" SPACING



MODEL 8100-14WR

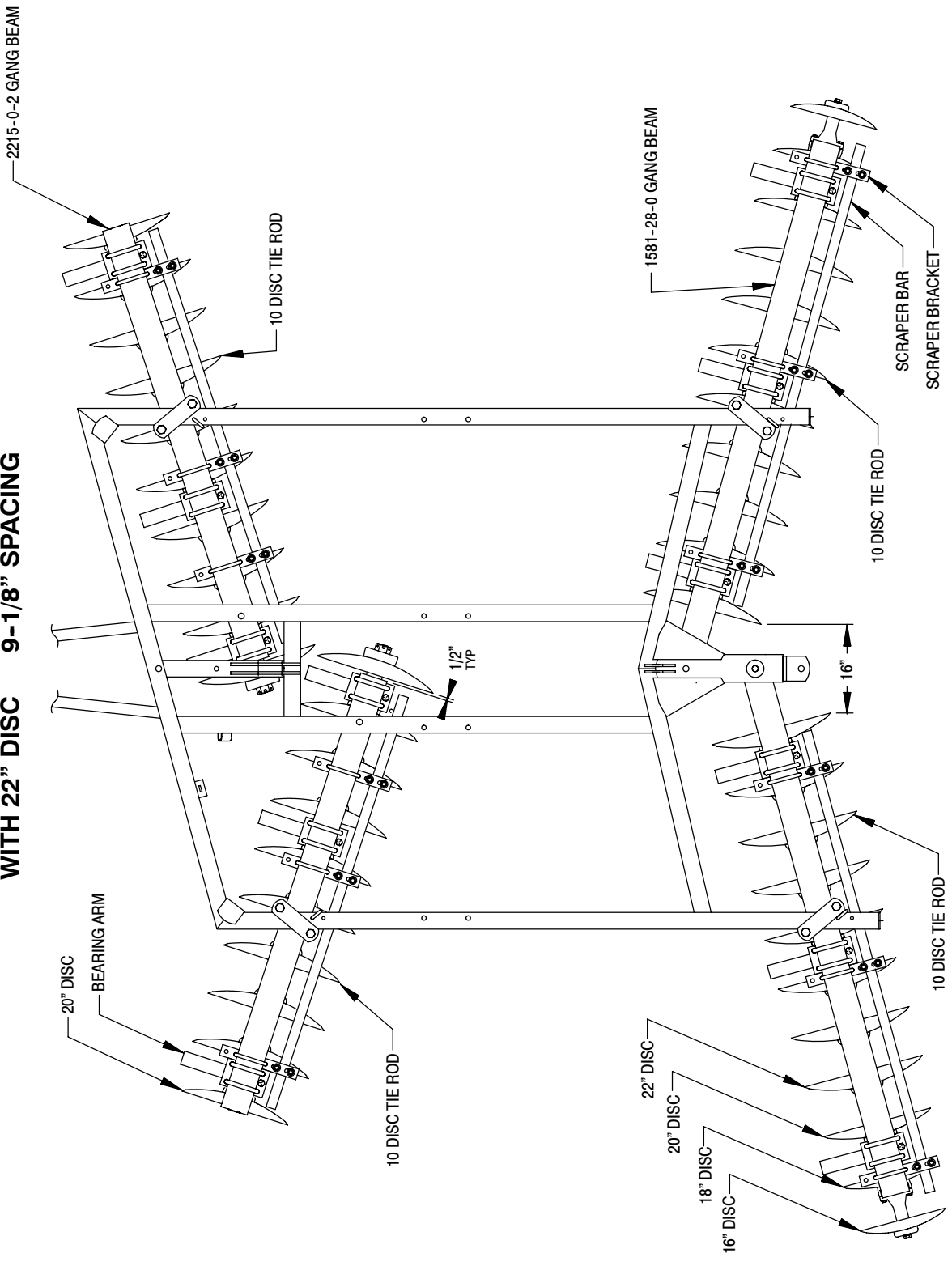
WITH 22" DISC 9-1/8" SPACING



REV.1-08
M8100-6

MODEL 8100-15WR

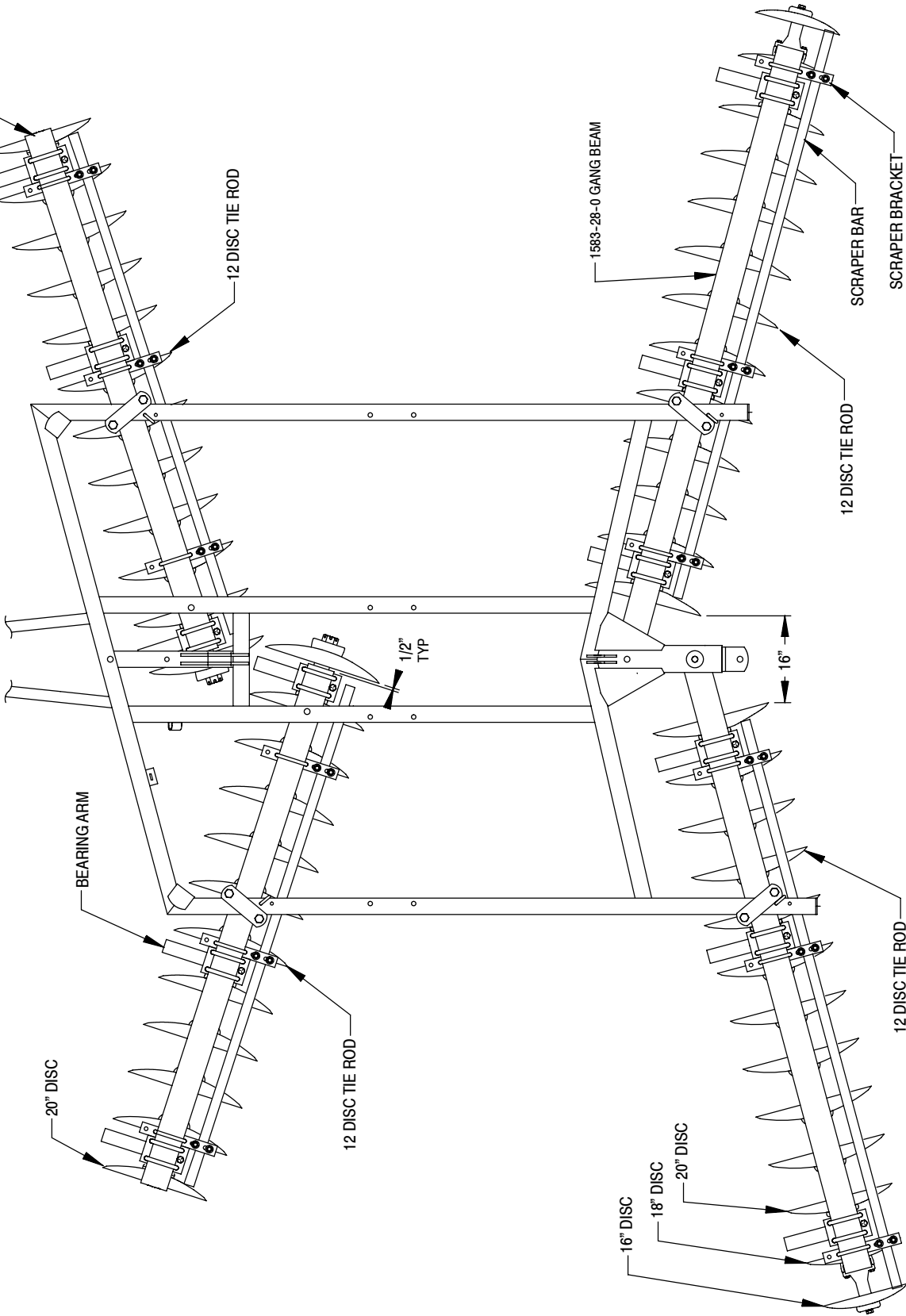
WITH 22" DISC 9-1/8" SPACING



MODEL 8100-18WR

WITH 22" DISC 9-1/8" SPACING

2217-0-2 GANG BEAM



1583-28-0 GANG BEAM

SCRAPER BAR
SCRAPER BRACKET

12 DISC TIE ROD

1/2" TYP

16"

BEARING ARM

20" DISC

12 DISC TIE ROD

16" DISC

18" DISC

20" DISC

12 DISC TIE ROD

REV.1-08
M8100-8