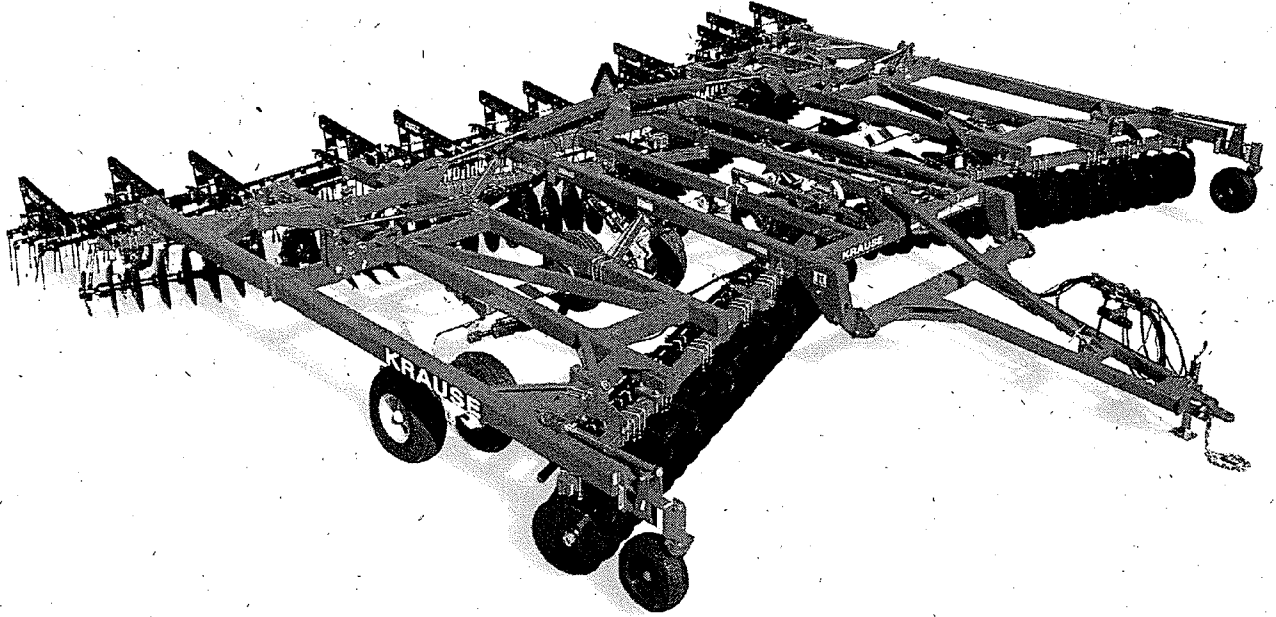


8200-1
OWNER'S MANUAL

8200



FLEX-WING TANDEM DISC HARROW 8200 SERIES

KRAUSE

305 SOUTH MONROE / P.O. BOX 2707 / HUTCHINSON, KS 67504-2707

Congratulations

You have just purchased a quality designed and manufactured Krause tillage tool. Advanced features have been designed into the implement for modern farming operations. As with any investment, a return is expected, and the return received from this investment will be in the form of maximum tillage performance during many years of dependable service.

In order to maintain quality performance of the new Krause implement, it is important that all of the information in the manual be reviewed and studied carefully before operation. The contents provide operating instructions, maintenance instructions, and information on how to make adjustments.

SAFETY ALERT SYMBOL



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

MODEL NUMBER _____ SERIAL NUMBER _____

PURCHASE RECORD -- DATE _____

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 : 8200

Owner's Manual #: 8200-1

Parts Manual #: 8200-2

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 7/1/99)

Note: 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) 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.

8200 SERIES WING 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 bolts are tight and pins are in place.
2. ___ Check to see that hydraulic cylinders are full of oil (air bled out of cylinders). Clevis pins with hair pin clips should be in place. Wing lift cylinder pins should be retained with roll pins. This hydraulic system requires 43 Quarts of oil for 31-34' models and 55 Quarts of oil for 36-38' models.
3. ___ Examine hydraulic hoses to see that they are protected from damage.
4. ___ Bolts attaching the wheel hubs to the wheel arms should be tight.
5. ___ Check lug bolts holding wheels to the hub to see that they are torqued as follows:
9/16" Wheel bolts to 120 Ft. Lbs (6-Bolt Wheels)
5/8" Wheel Nuts to 145 Ft. Lbs. (8-Bolt Wheels)
6. ___ The correct size tire, 10.00 x 15, 8-Ply with 40 PSI pressure, and 12.5L x 15 FI with 90 PSI pressure, should be on the implement.
7. ___ Check to see that bolts attaching clevis casting to hitch are tightened.
8. ___ Jack should be operational for support of tongue when implement is not attached to a tractor.
9. ___ Make sure wing hinges and wing lift parts are properly secured.
10. ___ Check to see if the Transport Lock Valves have been correctly installed and operate satisfactorily.
11. ___ Restrictors should be installed in all wing lift cylinder ports.
12. ___ All safety decals and reflectors should be in place and easily visible.
13. ___ Make sure that the Safety Chain is in place.
14. ___ Customer review sheet is filled out and signed.
15. ___ Review lighting requirements. Light kits are standard.
16. ___ Check to see that the Operator's Manual is in the storage tube on the implement.
17. ___ Make sure that the SMV emblem is clean and in place.

DELIVERED BY _____

DATE _____

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4/06

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8200 SERIES WING TANDEM DISC HARROW CUSTOMER REVIEW SHEET

CUSTOMER _____ DATE _____

ADDRESS _____

DEALER _____

ADDRESS _____

MODEL _____ SERIAL NUMBER _____

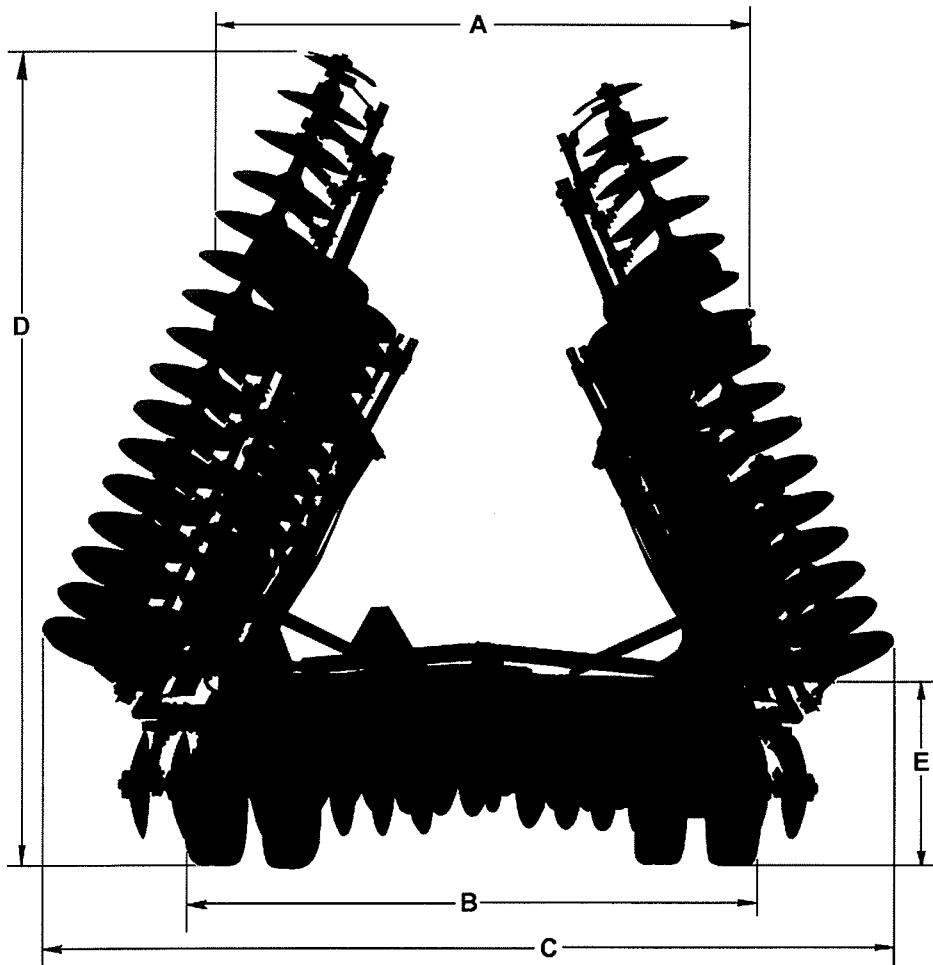
1. ___ Operator's manual provided.
2. ___ Warranty card filled out and mailed.
3. ___ Review safety warnings and cautions as listed in this operator's manual.
4. ___ Review recommended maximum road speed, width, and height for this implement.
5. ___ Review field operation speeds, horsepower, depth and rock conditions.
6. ___ Demonstrate the proper use of the lift and wing fold transport lock valves.
7. ___ Demonstrate the proper use of the maintenance lock.
8. ___ Explain the hydraulic depth control system (See page O9 in this manual).
9. ___ Review limitations of additional weight and transport speed when adding attachments.
10. ___ Explain the importance of maintaining the tool through lubrication, checking that bolts are kept tight, and replacement of worn or broken parts.
11. ___ Recommend that a safety chain be used with the implement.
12. ___ Check wheel lug bolts frequently until they become set.
13. ___ Check walking beam pivot bearings frequently until they become set.
14. ___ Explain lighting requirements for your area.

DEALER _____ DATE _____

CUSTOMER _____ DATE _____

MODEL	SPACING	TOTAL NO. OF DISC BLADES INCLUDING EXTENSIONS	DISC BLADE SIZE	ASAE CUT WIDTH	CENTER SECTION CUT WIDTH	WING SECTION CUT WIDTH	WHEEL SPACING CENTER SECTION	WHEEL SPACING WING SECTION
8200-31N	8"	98	22"	31' 4"	12' 4"	9' 6"	75 / 132	266 / 322
8200-31W	9-1/8"	86	22"/24"	31' 4"	12' 6"	9' 5"	75 / 132	266 / 322
8200-34N	8"	106	22"	33' 10"	12' 4"	10' 9"	75 / 132	266 / 322
8200-34W	9-1/8"	94	22"/24"	34' 2"	12' 6"	10' 10"	75 / 132	266 / 322
8200-36NQF	8"	114	22"	36' 5"	12' 4"	12' 1"	70 / 132	321 / 364
8200-36WQF	9-1/8"	98	22"/24"	35' 8"	12' 6"	11' 7"	70 / 132	321 / 364
8200-38NQF	8"	118	22"	37' 8"	12' 4"	12' 8"	70 / 132	321 / 364
8200-38WQF	9-1/8"	106	22"/24"	38' 6"	12' 6"	13' 0"	70 / 132	321 / 364

TRANSPORT INFORMATION					
MODEL	A	B	C	D	E
8200-31	14' 0"	12' 2"	16' 9"	13' 6"	4' 0"
8200-34	14' 0"	12' 2"	16' 9"	14' 9"	4' 0"
8200-36 QUAD-FOLD	17' 2"	12' 2"	17' 5"	13' 5"	3' 9"
8200-38 QUAD-FOLD	17' 2"	12' 2"	17' 5"	13' 5"	3' 9"



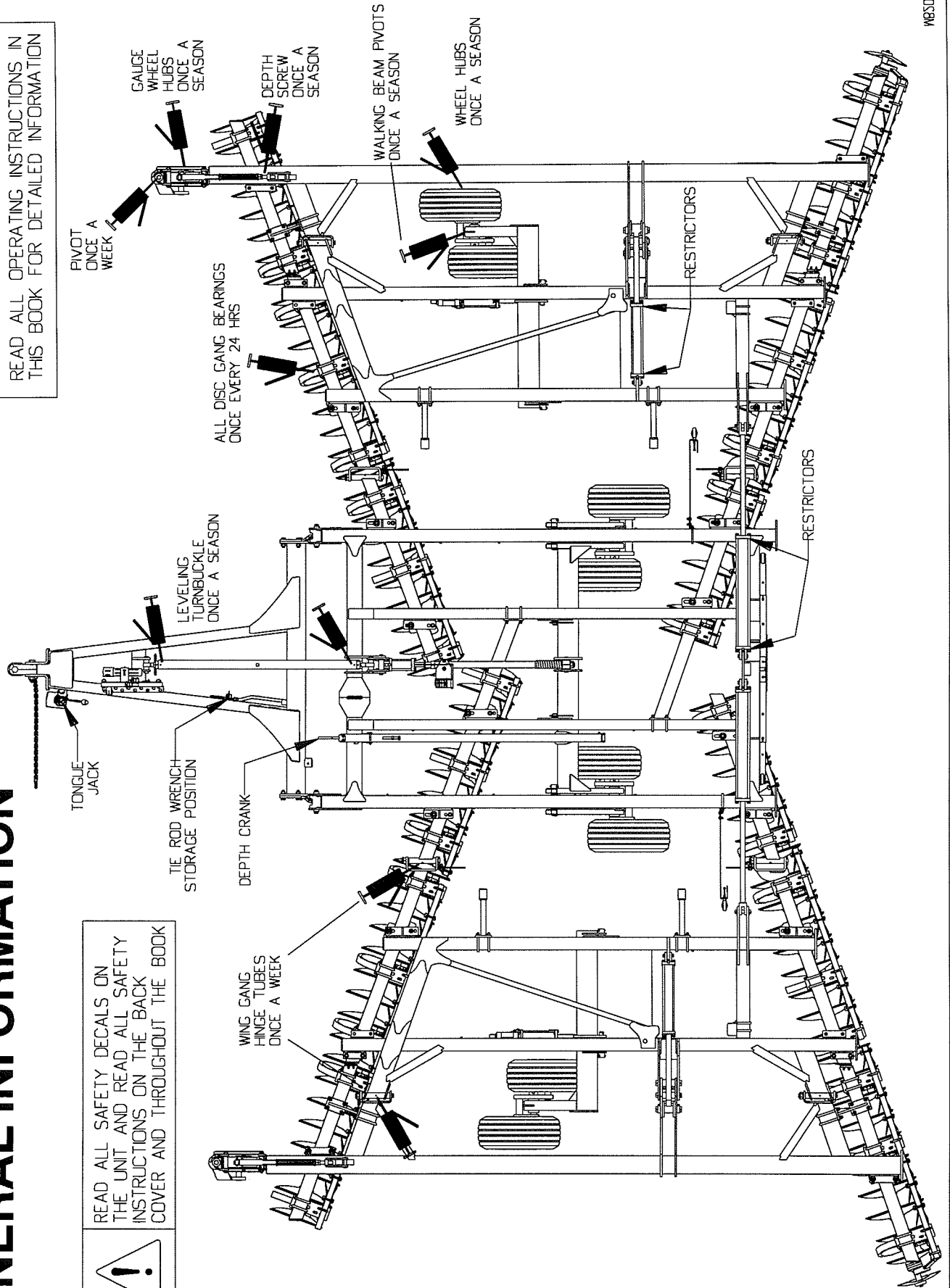
NOTE: Addition of tine or spike attachments may increase overall transport width and height of the implement.

GENERAL INFORMATION

READ ALL SAFETY DECALS ON THE UNIT AND READ ALL SAFETY INSTRUCTIONS ON THE BACK COVER AND THROUGHOUT THE BOOK



READ ALL OPERATING INSTRUCTIONS IN THIS BOOK FOR DETAILED INFORMATION



SAFETY DECALS

⚠ WARNING

DO NOT OPERATE OR WORK ON THIS MACHINE UNLESS YOU HAVE READ AND UNDERSTAND THE INSTRUCTIONS AND WARNINGS IN THE OPERATION AND MAINTENANCE MANUALS.

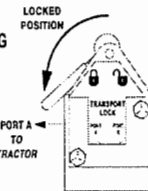
FAILURE TO FOLLOW THE INSTRUCTIONS OR HEED THE WARNINGS COULD RESULT IN INJURY OR DEATH. CONTACT YOUR DEALER FOR REPLACEMENT MANUALS.

PROPER CARE IS YOUR RESPONSIBILITY.

205-8740 74-570

⚠ WARNING

TO AVOID INJURY DUE TO ACCIDENTAL LOWERING OF IMPLEMENT, MOVE LEVER TO LOCKED POSITION BEFORE TRANSPORTING OR SERVICING IMPLEMENT.




205-8738 74-465

⚠ WARNING


Escaping fluid under pressure can penetrate the skin causing serious injury or death. Relieve pressure before disconnecting hydraulic lines, tighten all connections before applying pressure, and inspect all lines before each use. See "Safety" section in operation manual for additional information.

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.



205-8735 74-276

⚠ WARNING



CONTACT WITH A POWER LINE OR OTHER OBSTRUCTION CAN CAUSE DAMAGE, SERIOUS BODILY INJURY OR DEATH. Be aware of implement transport width and height. Rear attachments will add to transport height, and transport width on some implements. See Operation Manual.

205-8734 74-121

⚠ WARNING

AIR TRAPPED INSIDE HYDRAULIC CYLINDERS CAN ALLOW IMPLEMENT OR WINGS TO FALL AND CAUSE SERIOUS BODILY INJURY OR DEATH. Purge air from hydraulic system by following detailed steps in the Operation Manual.

205-0923 74-113

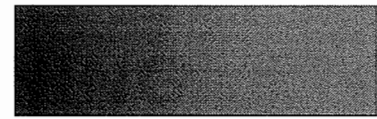
⚠ WARNING



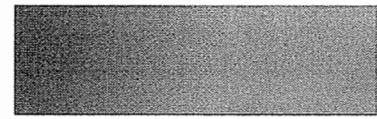
FAILURE OF HYDRAULIC COMPONENTS OR ACCIDENTAL OPERATION OF HYDRAULIC CONTROLS CAN ALLOW IMPLEMENT OR WINGS TO FALL AND CAUSE SERIOUS BODILY INJURY OR DEATH!

1. Install all maintenance locks when working on or under implement. See operation manual.
2. Keep everyone clear when raising or lowering implement. Check for adequate overhead and side to side clearance before raising or lowering wings. Make certain all hydraulic systems are full of oil and free of air before raising or lowering wings or implement. Check operation manual for detailed instructions.

205-8731 74-102



74-575 Red Reflector Tape 2" x 9"



74-576 Fluorescent Orange Tape 2" x 9"



74-577 Yellow Reflector Tape 2" x 9"

⚠ WARNING



PINCH POINT

STAY CLEAR OF THIS AREA!

SERIOUS PERSONAL INJURY MAY OCCUR.

74-348

NOTICE

Check wheel bolts frequently during initial transport and operation. Torque Wheel bolts to: 95 FT. LBS. See Operation Manual for proper tire inflation pressure.

202-4351 74-109

NOTICE

MAINTENANCE LOCK

See Operation Manual for instructions.

205-8737 74-387

See page P43 in this manual for proper location of decals.

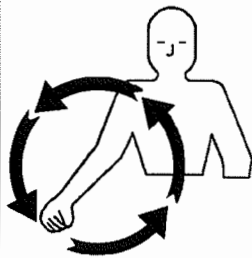
OPERATING SECTION

SAFETY ALERT SYMBOL

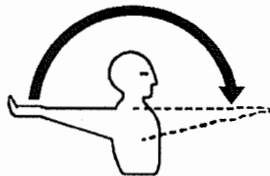


BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY.
THIS SYMBOL IDENTIFIES IMPORTANT SAFETY MESSAGES.
CAREFULLY READ THE MESSAGE THAT FOLLOWS.

TEN MOST COMMON HAND SIGNALS USED IN THE FIELD



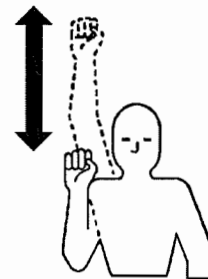
START
THE
ENGINE



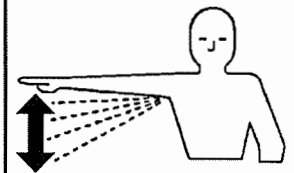
MOVE OUT
OR
TAKE OFF



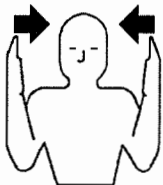
MOVE
TOWARD
ME



SPEED
IT UP



SLOW IT
DOWN



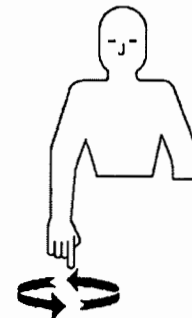
THIS FAR
TO GO



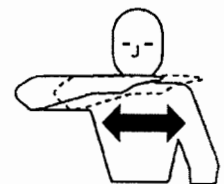
STOP



RAISE
THE
EQUIPMENT



LOWER
THE
EQUIPMENT



STOP
THE
ENGINE

SAFETY 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 bolt before and during transport.
13. Always use road lock 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

Elimination of the hazards listed in this manual should not be construed as providing guarantees that the equipment will meet or exceed all standards or regulations, or will be completely safe to all personnel. The operator should inspect and review the implement after it is in his possession for adequacy in safety for the function for which it will be used.



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

ABOUT YOUR TANDEM DISC

This tandem disc was designed for medium primary to finish work and can be pulled over a wide range of field speeds ranging from 3.5 to 6 m.p.h. , with maximum working depth under normal conditions of 6.5 inches. Do not exceed 5 m.p.h. in rocky conditions.

Horsepower requirements will be about 9–13 Engine – 7.5–11 PTO, or 6–9 drawbar HP per foot of cut in average soil conditions. See your Krause dealer for information on selecting the right disc harrow, or visit our website at www.krauseco.com; then select Disc Harrows for a handy online tillage width calculator.

Adding attachments should be limited to KRAUSE original equipment options, or light duty tine or spike harrows that weigh no more than 60 pounds per foot of cut width. Additions of harrows will make the disc “tail heavy” and the tongue jack must then be moved to the rear when the disc is parked or stored. (See “Hitching and Unhitching”)

PREPARING THE TANDEM DISC FOR OPERATION



Caution: Lower implement to the ground before making the following inspections. If implement is not lowered, any hydraulic failure could cause the unit to drop suddenly, causing personal injury.

1. Inspect for any loose bolts.
2. Check disc gangs for tight tie rod nuts and clinched cotter pins.
3. Look at the top of each bearing arm and check to see if it is flush with the bottom of the frames. See page O14 “DISC GANGS”.
4. Check tire pressure. Inflate 10.00 x 15, 8-Ply tires to 40 PSI. Inflate 12.5L x 15 FI tires to 90 PSI.



Caution: Frequently check to see that the wheel lug bolts are properly torqued (6-bolt wheels to 120 Ft. Lbs.; 8-bolt wheels to 145 Ft. Lbs.) particularly during initial transporting and operation of the tillage tool. The bolts may work loose resulting in the loss of a wheel and subsequent loss of control of the tool and/or tractor.

5. Make sure that all grease zerk locations have been sufficiently greased. Grease zerks will be found on regreaseable disc gang bearings, adjustment screws, and wheel hubs. USE EXTREME CAUTION WHEN WORKING AROUND DISC BLADES.

PREPARING THE TRACTOR

Read your tractor owner's manual. It will describe safe methods of operation. Make sure your tractor has proper added ballast, and that its hydraulic system is full of oil and working properly. Check tractor brakes and warning lights, make sure they are in working order.

HYDRAULIC SYSTEM

Inspect the hydraulic system for tell-tale leaks and loose fittings. Tighten if needed. When assembling your hydraulic system, the JIC and O-Ring fittings and hoses do not require tape or liquid sealers. **MAKE SURE** a restrictor (YELLOW COLOR) is installed in all wing lift cylinder ports. If not previously filled, your hydraulic system will require 43 quarts (single wing models) or 55 quarts (Quad-fold models) of your tractor manufacturer's recommended oil. Read the Service Section of your tractor operator's manual for identification of the manufacturer's recommended oil. Read the Service Section "HYDRAULICS" on page O15 before filling your hydraulic system.

When working with rephasing rocker cylinders, be sure all of the cylinders are mounted in proper sequence. Hoses must be attached in the proper order, and all air bled from the hoses and cylinders. See pages O15 under HYDRAULICS. If after some time, one cylinder of the series should start to close for no apparent reason, oil is probably leaking past the seal and a seal kit should be installed by a Krause Dealer.

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

HYDRAULIC HOSE AND CYLINDER DRAWINGS CAN FOUND ON PAGES P29 THROUGH P37 OF THE PARTS SECTION IN THIS MANUAL.

⚠ Caution: Air in hydraulic system could allow implement or wings to drop suddenly.

Do not operate the wing hydraulics until you have read wing lift and lock operating instructions under "Transporting".

HITCHING & UNHITCHING

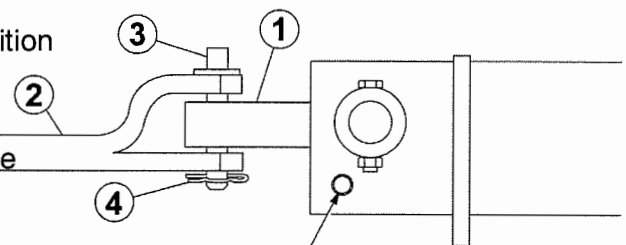
⚠ Warning: Do not allow any person to stand between the tractor and implement while backing into position. Sudden loss of control could cause serious injury or death to a person caught between the tractor and implement. Tell your helper to wait until you give him the signal that the tractor is in park or neutral and the hand brake is set and engine is shut off.

Note: Hydraulic hose grips are color coded as shown below:

Black / Black Lower Unit	Red / Black Raise Unit
Yellow / Yellow . . . Lower Wings	Red / Yellow Raise Wings
Blue / Blue Raise Rear Disc Gangs	Red / Blue Lower Rear Disc Gangs

Hitching To The Tractor

1. The implement must be in a raised position and the transport lock valve in locked position before hitching to the tractor.
2. Unpin the tractor drawbar so it can be moved from side-to-side.
3. Back the tractor to the implement.
4. Attach the clevis to the tractor drawbar with clevis pin that fits the hole size in the tractor drawbar. Make sure pin is locked or bolted in place to prevent loss.

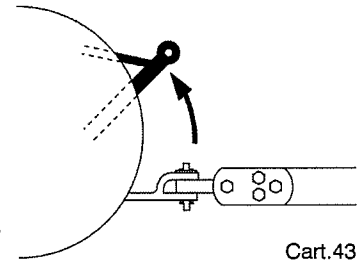


(GUARDIAN HITCH ONLY)

USE CLEVIS PIN TO SUPPORT CLEVIS. REMOVE PIN & STORE IN LOWER FRONT HOLE ON HOSE STAND AFTER IMPLEMENT IS HITCHED TO TRACTOR.

5. **Optional Guardian Hitch ONLY:** Remove clevis support pin and place in storage position.
6. Connect hydraulic hoses to the tractor.
7. Attach the safety chain and light connection. See page O6.

IMPORTANT: BEFORE MOVING THE IMPLEMENT BE SURE THAT THE LOWER ARMS OF THE THREE POINT HITCH HAVE BEEN RAISED TO THE TOP AND SECURED TO PREVENT DAMAGE TO THE CLEVIS AND TONGUE WHEN MAKING TURNS.



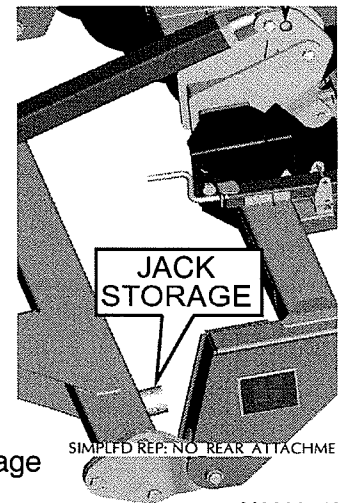
Cart.43

Move the tongue jack to the storage location at the back of the tongue after hitching to the tractor.

IMPORTANT: DAMAGE TO THE JACK OR TRACTOR TIRE COULD OCCUR IF JACK IS LEFT IN THE FRONT JACK MOUNT LOCATION DURING FIELD OPERATION.

Unhitching From The Tractor

If the implement is not to be used for the remainder of the day, select a good parking place that will permit the lowering of the wings. The implement should be parked in the storage position with the transport lock valve closed. If the implement is to remain parked for storage over a long period of time, be sure to read the storage suggestions listed on page O13.



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1. To unhitch the implement from the tractor, place the tractor in park or neutral and set the brake. If you are not parking on level ground, block the implement tires to prevent damage to the jack.
2. Close Transport Lock Valve, turn off the tractor power and relieve any pressure that might be in the implement hydraulic system. Refer to your tractor operation manual.
3. Using the tongue jack, raise the tongue height until the clevis pin can be removed.

NOTE: If rear attachments have been added, and the implement is tail heavy, move the tongue jack to the mounting tube located at the back of the frame.

4. Disconnect the hydraulic hoses, safety chain, and light connector. The tractor may be moved away.



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.

Caution: Do not stand on or straddle the tongue when unhitching. If rear attachments have been added to the rear of the implement, it may affect the balance of the implement, causing the tongue to raise up suddenly when unhitching.

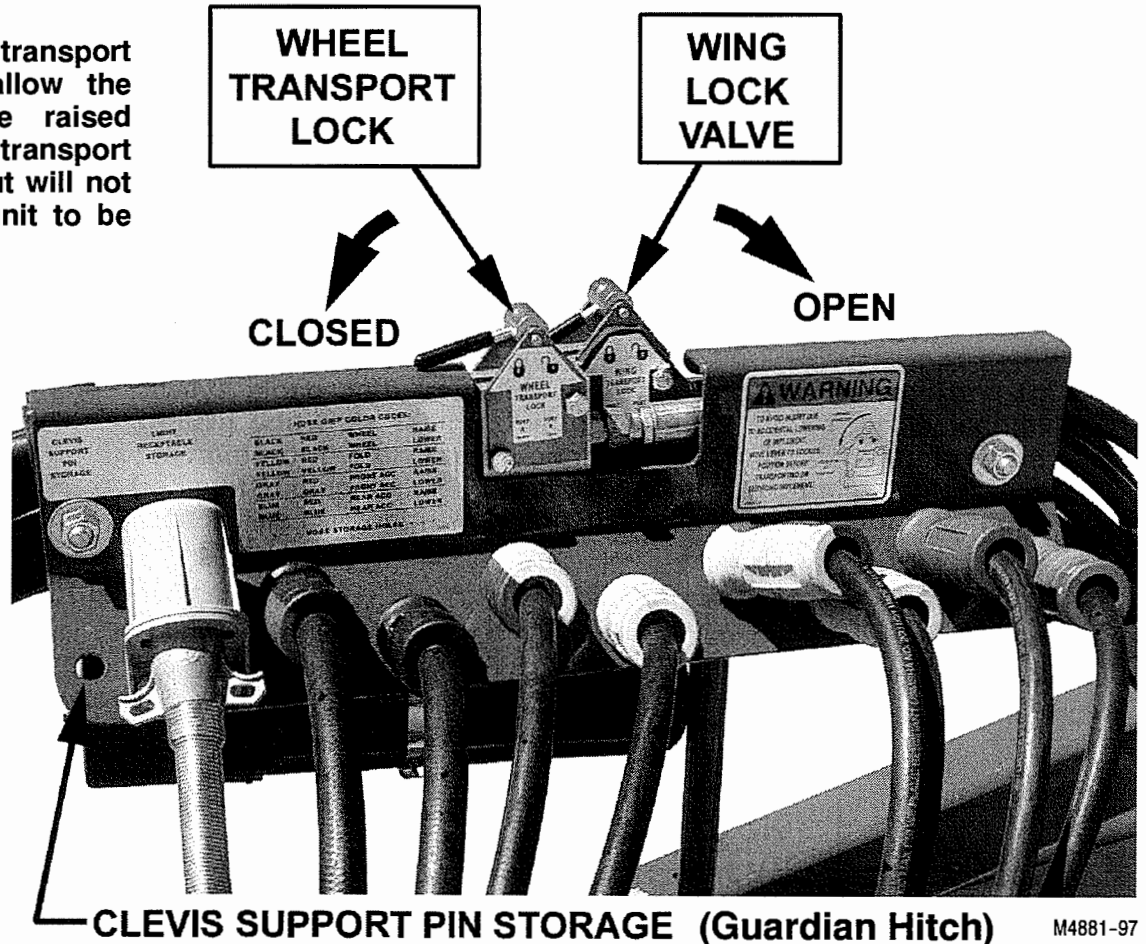
TRANSPORTING

⚠ Warning: Always close both transport lock valves when transporting to prevent unit from falling due to hydraulic failure, or accidental activation of the operator's control. Lowering of the tool during transport could result in loss of control of implement and/or tractor. The tractor drawbar must always be pinned for transport.

TRANSPORT LOCK VALVES

The transport locks are hydraulic valves. Turning the handle to release the poppet (handle towards the tractor) will close the valve. Turning the handle to engage the poppet (handle towards the implement) will open the transport lock for field use.

NOTE: The transport lock will allow the unit to be raised when in the transport position, but will not allow the unit to be lowered.



Raising The Wings

The implement should be in the raised position with the wheel transport lock valve closed. If the system is full of oil, you are ready to raise the wings. The wings will be secured in the raised position with the wing transport lock valve.

⚠ Warning: Always stand clear of wings when they are in the raised position. A hydraulic failure or activation of hydraulic controls by someone could result in serious injury or death to anyone under the wings.

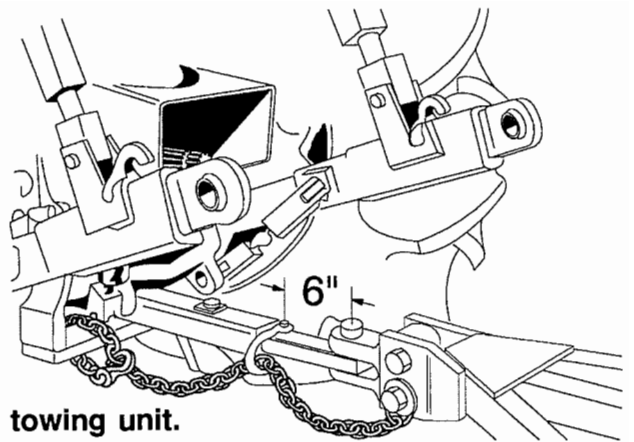
Lowering The Wings

Open the wing lock valve to unlock both wings then lower the wings with all persons standing at a safe distance away from the implement.

Transport Safety

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.

Warning: Always use a safety chain with a tensile strength equal to the gross weight of the unit, plus any attachments, when transporting. Do not tow this implement if its weight exceeds the weight of the towing unit.



Attach the ASAE Slow Moving Vehicle (SMV) emblem. 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. A bracket has been provided.

M4990-76

Danger: Always check conditions of transport lock valves, tires, wheels, hubs, safety chain, hitch bolts, and clevis pin before transporting the implement.

Be aware of the transport height as well as the width of your model of disc. Care should be taken not to snag low hanging telephone lines or electrical service lines.

It is best to use a tractor to transport the disc to another location. If using another type of towing unit it should never be allowed to exceed 25 M.P.H., since implement tires are not constructed to be operated at higher speeds. The towing vehicle should always equal or exceed the gross weight of the disc and attachments.

Always check the tire pressure before transporting and look for damaged tires. Wobble the tires from side to side. If excessive play is noted, adjust the hub spindle nut before transporting to prevent damage to the hub or bearings.

Caution: Frequently check to see that the wheel lug bolts are properly torqued (6-bolt wheels to 120 Ft. lbs.; 8-bolt wheels to 145 Ft. Lbs.) particularly during initial transporting and operation of the tillage tool. The bolts may work loose resulting in the loss of a wheel and subsequent loss of control of the tool and/or tractor.

Hitch Pin

Use the proper size hitch pin with a means for holding it in place so it cannot work itself out during transport. The hitch pin should be inspected for wear or cracks before using it to transport your implement.

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, orange 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.



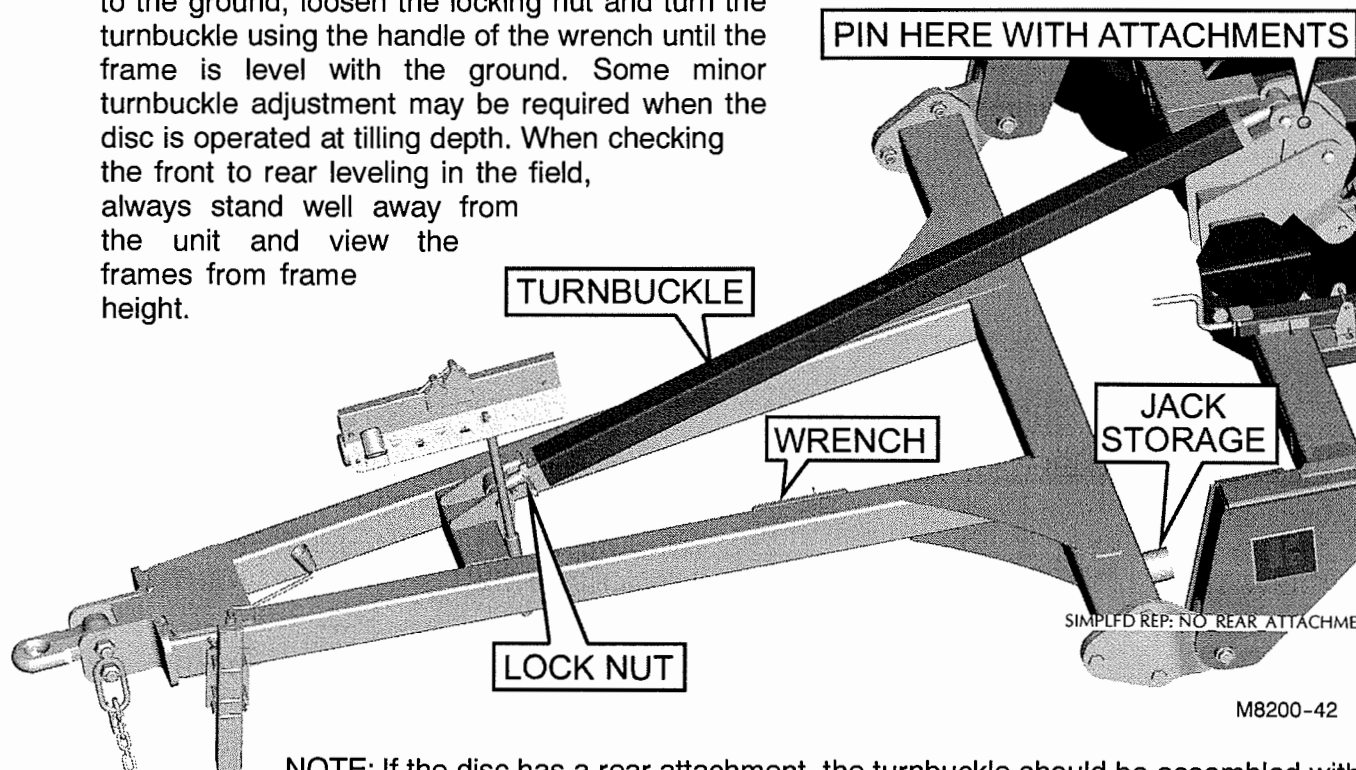
FIELD ADJUSTMENTS

THERE ARE (3) IMPORTANT RULES TO FOLLOW FOR PROPER FIELD ADJUSTMENT:

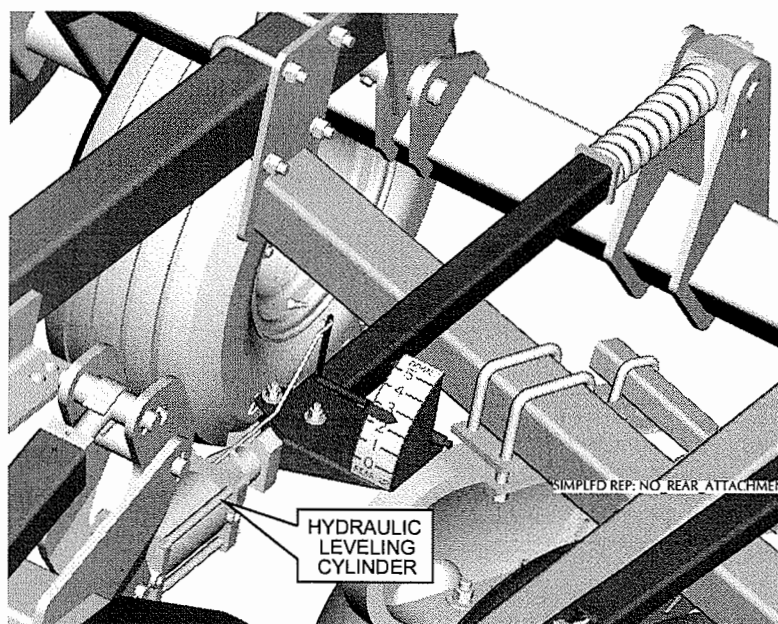
1. LEVEL THE IMPLEMENT FROM FRONT TO REAR.
2. LEVEL THE IMPLEMENT FROM SIDE TO SIDE.
3. SET THE STOP ON THE HYDRAULIC CYLINDER, AND CARRY THE IMPLEMENT WEIGHT ON THE WHEELS.

Front to Rear Leveling

Remove the provided wrench from its storage position on the tongue. With the implement close to the ground, loosen the locking nut and turn the turnbuckle using the handle of the wrench until the frame is level with the ground. Some minor turnbuckle adjustment may be required when the disc is operated at tilling depth. When checking the front to rear leveling in the field, always stand well away from the unit and view the frames from frame height.



NOTE: If the disc has a rear attachment, the turnbuckle should be assembled with the rear pin placed in the lower rear hole of the level link lugs. This will help level the disc in raised position.



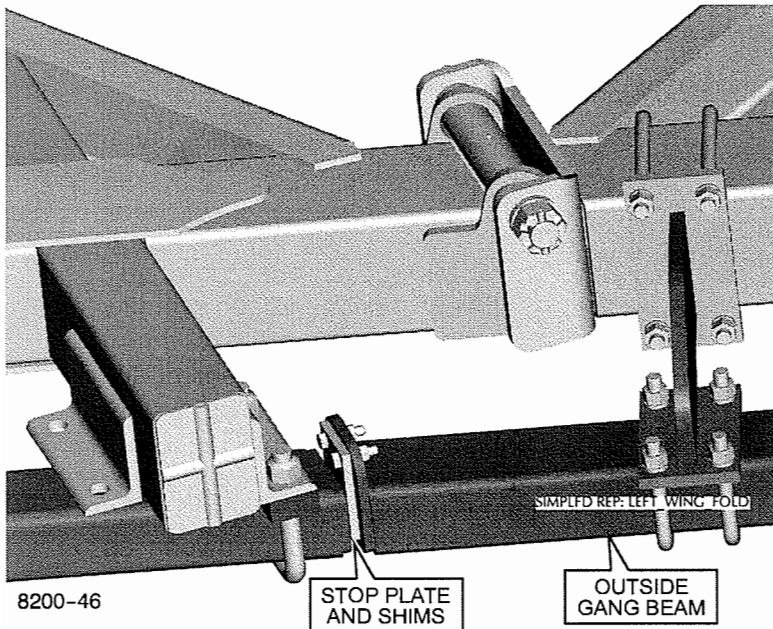
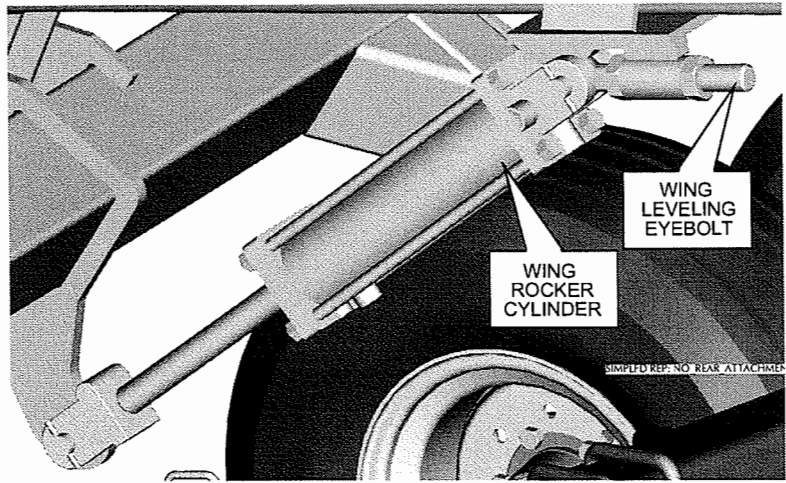
Hydraulic Leveling

Extend or retract the cylinder to move it to the middle of its adjustment range. Level the implement front-to-rear as shown above. During field operation the cylinder is activated to lower the rear gangs and fill a furrow or raise the rear gangs to eliminate a ridge. If the hydraulic leveling is constantly in an extreme position, readjust the turnbuckle.

M8200-45

Leveling The Wings

The wings should operate level with the center section. View the frame with the disc stopped, but still in the ground. Determine if the wing needs to be higher or lower. Using the provided wrench adjust the eyebolt at the base of the wing rocker cylinder as shown in the accompanying illustration.



Quad-Fold Outer Wings

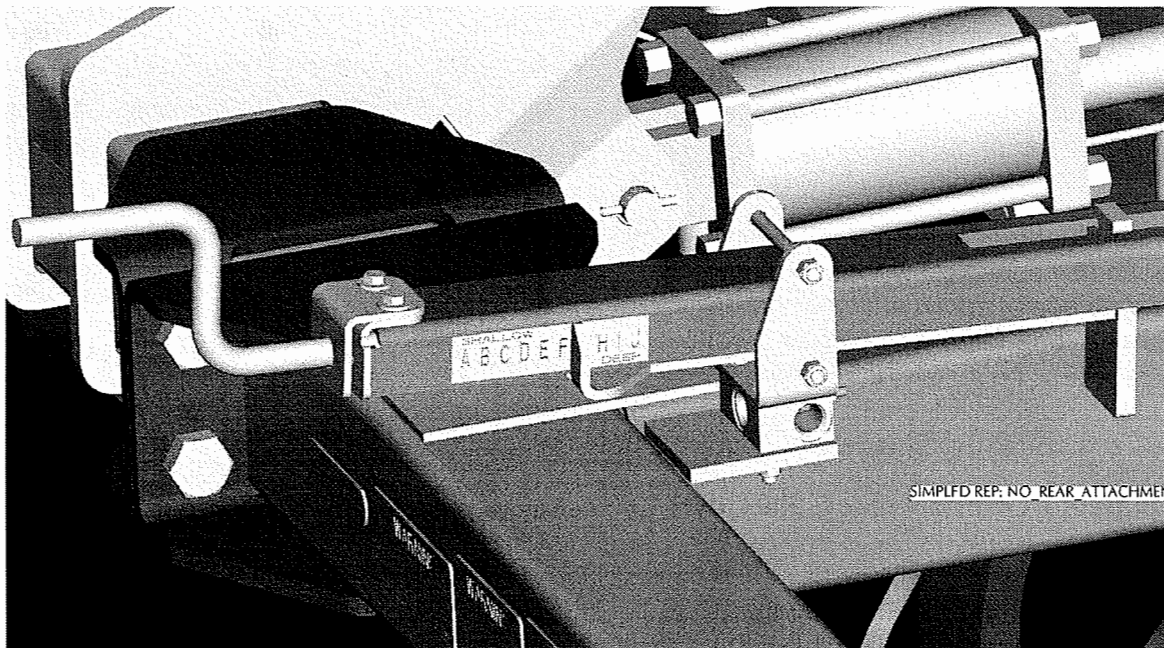
IMPORTANT: The outer wing fold cylinders need to be fully extended to lock the outer wings to the inner wings during field operation.

The outer wing gangs should be level with the inner wing gangs when locked down. View the wings to see if they are low or high on the outer end. Shims can be added or removed between the gangs to make them level. Fold the outer wings to make this process easier.

Hydraulic Depth Control Adjustment

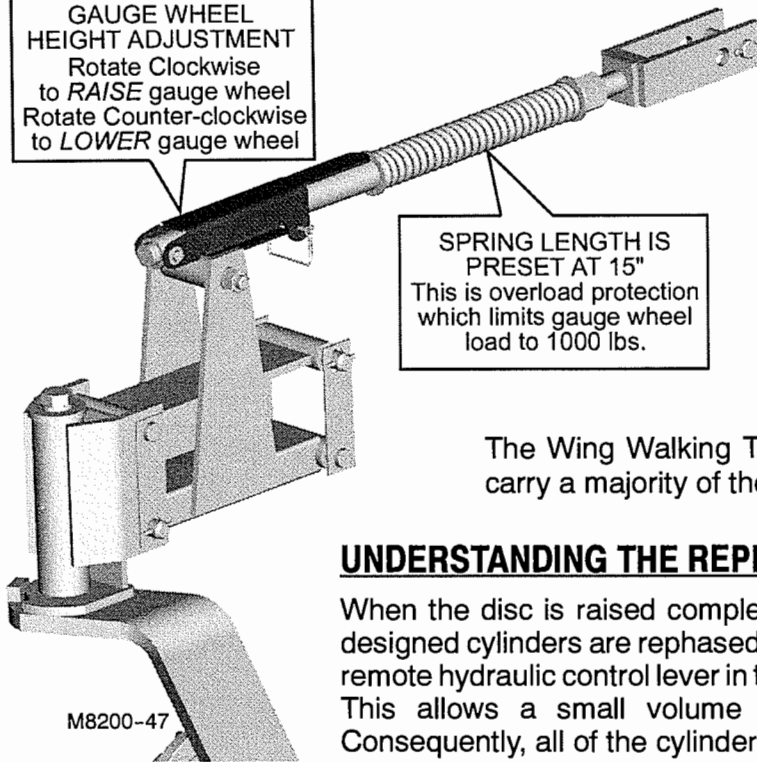
A hydraulic stop valve controls the unit depth. When a depth change is required, turn the crank on the depth control link to change the depth. Five

turns of the crank equals approximately 1" of depth change. A pointer and decal on the side of the depth link are used as an indicator of depth. "A" is shallow and "J" is deepest.



Adjustment of Front Gauge Wheel

GAUGE WHEEL HEIGHT ADJUSTMENT
 Rotate Clockwise to *RAISE* gauge wheel
 Rotate Counter-clockwise to *LOWER* gauge wheel



SPRING LENGTH IS PRESET AT 15"
 This is overload protection which limits gauge wheel load to 1000 lbs.

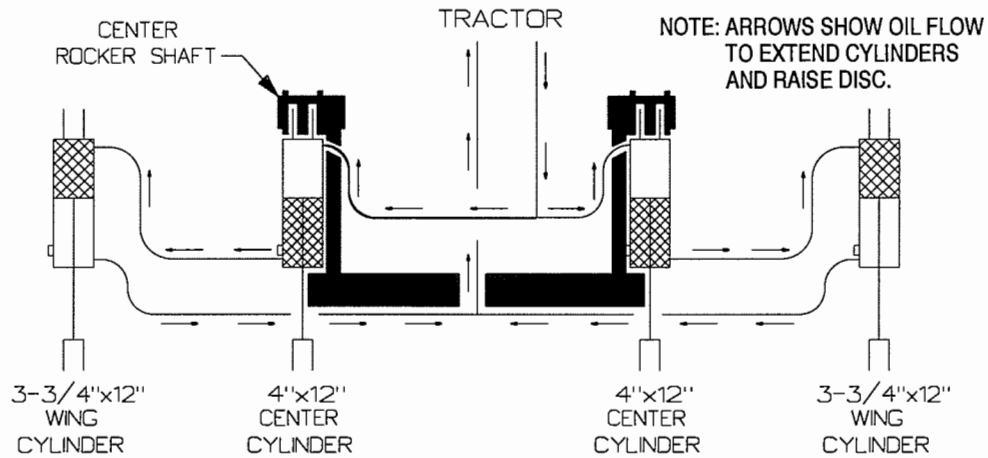
NOTE: The **FRONT GAUGE WHEEL** will help to control the depth of the front wing gangs.

The Wing Walking Tandem wheels should be adjusted to carry a majority of the wing weight.

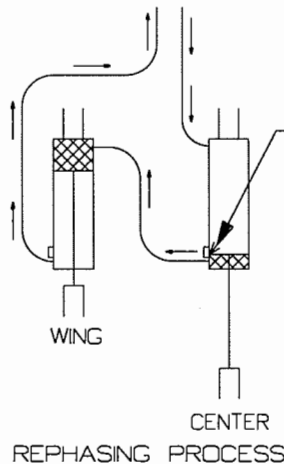
UNDERSTANDING THE REPHASING CYLINDER SYSTEM

When the disc is raised completely out of the ground these specially designed cylinders are rephased for uniform lifting by holding the tractor remote hydraulic control lever in the raised position for 20 to 30 seconds. This allows a small volume of oil to bypass the piston seals. Consequently, all of the cylinders can be fully extended.

REPHASING CYLINDERS WITH DUAL SERIES PLUMBING CONNECTED WITH CENTER ROCKER

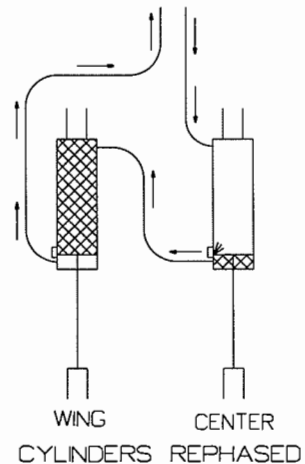


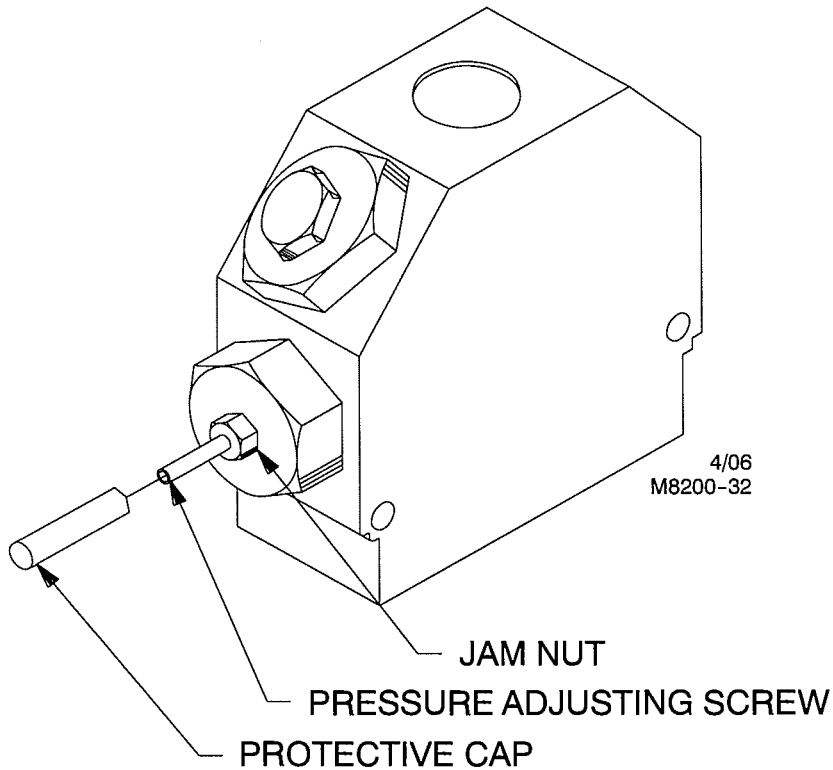
WING CYLINDER NOT IN PHASE WITH CENTER CYLINDER



When The cylinder is fully extended, oil can flow around the piston seal through the rephasing cylinder port in the cylinder wall. As the oil continues to be forced past the rephasing port, other cylinders in the system can also fully extend.

CENTER & WING CYLINDERS ARE BOTH FULLY REPHASED.





Quad-Fold Sequence Valve Adjustment

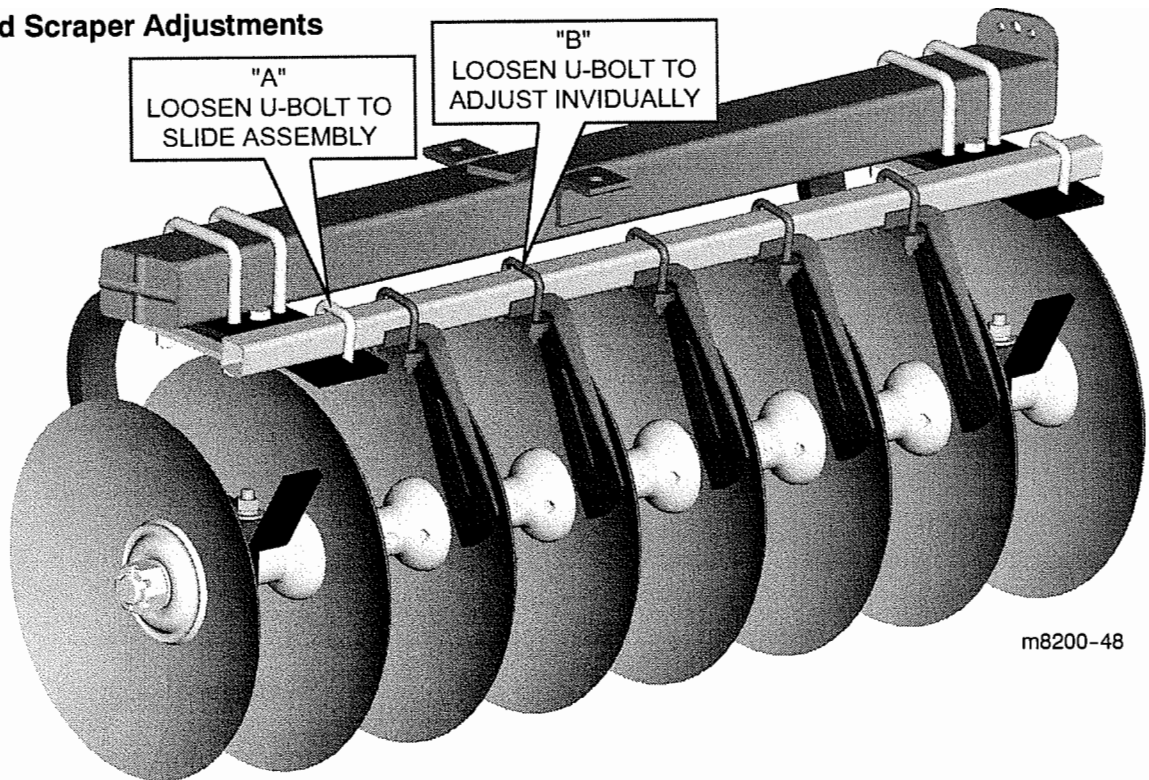
The timing of the unfolding of the outer wings is controlled by a sequence valve located at the rear center of the disc. If the pressure is set too low the outer wings will try to unfold before the inner wings and if set too high, the outer wings will not unfold. To adjust the valve:

1. Relieve the fold system pressure by turning off the tractor and moving the hydraulic control lever back and forth.

! Warning: Have all personnel stand clear of wings when relieving pressure, or folding and unfolding wings. A hydraulic failure or activation of hydraulic controls by someone can cause serious injury or death.

2. Remove the protective cap to the pressure adjusting screw and loosen the jam nut.
3. Using an allen wrench, turn the adjusting screw clockwise (IN) to increase the pressure and stop the outer wing from unfolding.
4. Fold the inner wings out (the outer wings will not unfold) and turn the adjusting screw 1/4 turn at a time counter-clockwise (OUT) until the outer wings start to unfold.
5. Cycle the wings to assure the proper sequencing.
6. When the desired setting is reached, tighten the jam nut and replace the protective cap.

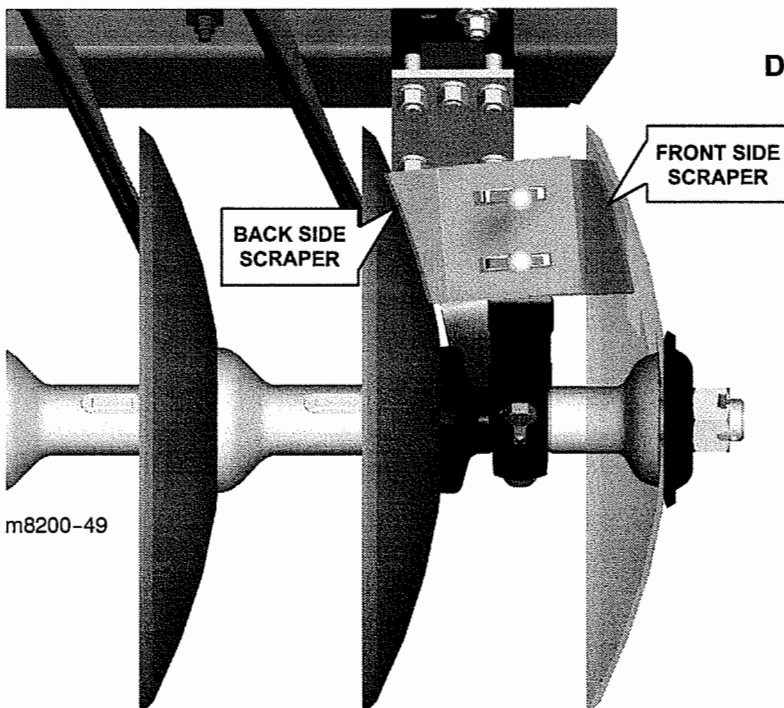
Rigid Scraper Adjustments



m8200-48

1. Scrapers can be adjusted by moving the entire assembly "A" from side to side at the bracket location.
2. Also, each scraper blade "B" 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 1"-2" in from the cutting edge and approximately 1/8" from the surface of the disc blades.

Each field requires some individual scraper adjustment. Moving scrapers one way or the other will help solve your individual scraper problems. Frequent examination will prevent damage to scraper assemblies and spacer spools.



m8200-49

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 OPERATION

Working Depth

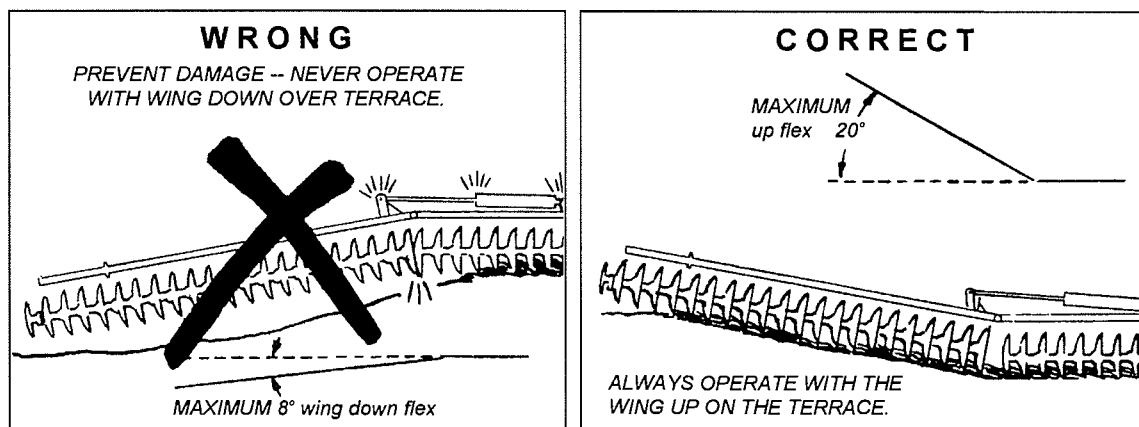
The depth of your disc harrow is controlled by the remote cylinder control lever(s) of the tractor. The wheels will act as gauge wheels to regulate working depth. Your disc harrow will not work uniformly, unless some weight of the unit is carried on the wheels. Speed will affect working depth. Do not expect maximum depth at high field speeds. Other factors affecting working depth are moisture conditions, amount of trash on surface, polish of disc blades, blade spacing and blade sharpness.

Remember to reduce speeds when working in extremely rocky conditions. Field speeds should not exceed 5 m.p.h. You will get better penetration and less blade breakage at lower speeds.

Flexibility

ALWAYS WORK WITH WINGS DOWN: Major damage may occur to disc blades and bearing arms if used with the wings up. For maximum flexibility, make sure the wing fold hydraulic cylinders are fully extended after the wing is down.

When working terraced ground, place the wing up on the terrace, not down over the terrace, as the wings are more limited in their downward movement, than in their upward movement.



Turning In The Field

Short turns at working depth may result in driving the front blades deeper in the ground, causing damage to disc blades or bearings. If short turns must be executed, raise the disc out of the ground and complete the turn before engaging the tool for further tilling.

IMPORTANT: 4-WHEEL DRIVE TRACTORS CAUSE SEVERE SIDE STRAIN ON TONGUE AND CLEVIS UNLESS THE DRAWBAR IS FREE TO SWING. ALWAYS ALLOW DRAWBAR TO SWING DURING FIELD OPERATION. DRAWBAR MUST BE PINNED FOR TRANSPORTING.

General Information

Different soil types require different blade sizes, thickness, and spacing.

As a general rule, heavy wet soils require wider spacing. For a finer seed bed preparation, narrow spacing should be used.

1/4" thick blades should be used in extremely hard or rocky conditions. Blade diameter is an individual preference.

⚠ Caution: Never add weight to the implement to gain added penetration. Overloading of tires and axles may cause damage to the disc harrow.

STORAGE SUGGESTIONS

Wings should **not** be stored in the raised position. Make sure transport lock valve is in the closed position.

For long term storage, coat disc blades and hydraulic cylinder rods with rust preventative. For added safety lower the disc to the ground. Cylinder rods may also be unpinned and retracted to protect the polished rod surfaces. Inspect the disc for worn or damaged parts and replace as needed to avoid delays the next season.

SERVICING

General Maintenance

All nuts should be checked and tightened during and after the first 1/2 day of operation, and periodically thereafter. Keep tires inflated to the recommended pressure, and check the wheel bolts until they are firmly seated. Hydraulic hoses should be checked for wear and pinched areas and replaced if necessary. Check disc gang tie rods frequently and keep tight at all times. Torque tie rods to 1,200 Ft. Lbs.

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

FOR YOUR SAFETY: when lubricating or making adjustments on your disc harrow, watch for obstructions and protrusions. Lower wings and implement to the ground and enter framework by stepping over. Do not walk on tires.

Lubrication

The initial lubrication of all grease fittings will assure long life and satisfactory performance from the disc. Minimum lubrication is required. Use a multi-purpose type grease at all grease zerk locations.

Frequency and Points of lubrication are:

Once every 24 hours - Disc gang bearings. Grease these until grease is visible escaping the seals. The seals are designed to release internal pressure and cannot be over-greased.

Once a week - wing gang hinge tubes, gauge wheel pivot.

Once a season - wheel hubs, walking beam pivots, leveling turnbuckle, and gauge wheel depth screw.

No Grease - rocker shaft pivot points. Hardened pins and sleeves at these locations require no grease.

Walking Beams

When checking the bearings, lower the unit onto the disc blades and raise the walking beams off the ground. Check each walking beam for any slack in the pivot bearings. When the slack is found, tighten the axle nut until slack is eliminated and tighten 5 to 10 Ft. Lbs. of preload on the bearings. **DO NOT BACK THE AXLE NUT OFF.** Check, clean, and repack the walking beam bearings each year in a procedure that is similar to that of the wheel bearings.

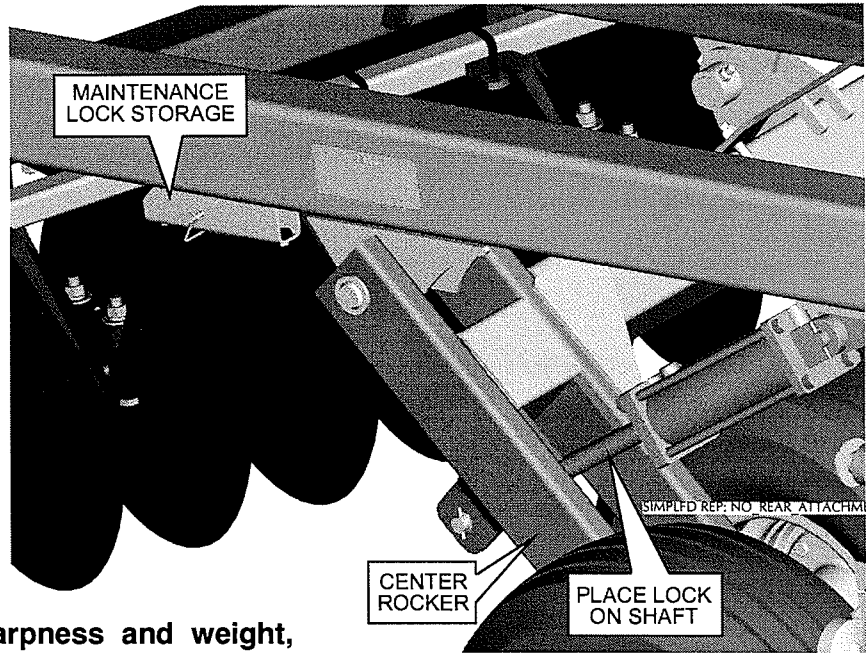
Wheel Bearings

Regularly check for excessive end play. Once a year, clean and repack wheel bearings with EP#2 Grease. Replace seals each time bearings are removed. Replace any worn or damaged parts. 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 outer bearing, flat washer, and slotted nut. Tighten nut while turning hub until there is resistance to rotation. Then back off nut from 1 to 2 slots until hub turns freely without end play. Secure nut with clinched cotter pin.

Disc Gangs

Before attempting to work on the disc gang components, remove the maintenance locks from their storage position and install them on the center extended cylinder rods as shown below right. Both locks must be installed.

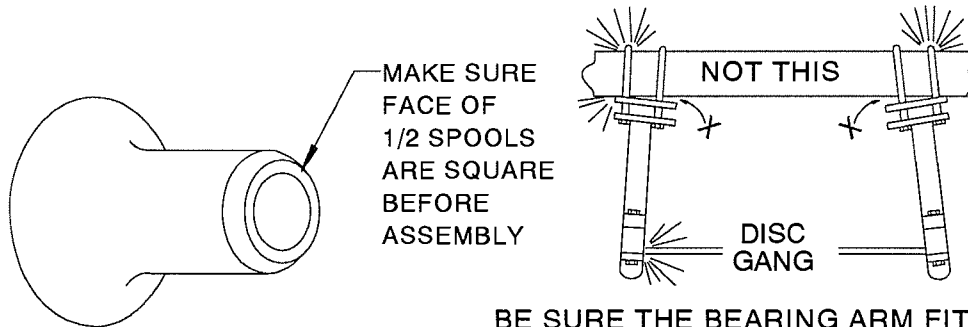
Block the center tires and support the outer wing frame beams with stands.



M8200-50

Warning: 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.

Use the same procedure as described when setting up a new unit. Make sure the top of the bearing arms are parallel with the bottom of the frame before tightening the bolts.



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

Disc Blades

Disc blades are made from boron steel and are very durable. However, sharpening or rolling of the blades can cause failure and voids the warranty.

Repair Parts

Refer to the Assembly Section of this book 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.

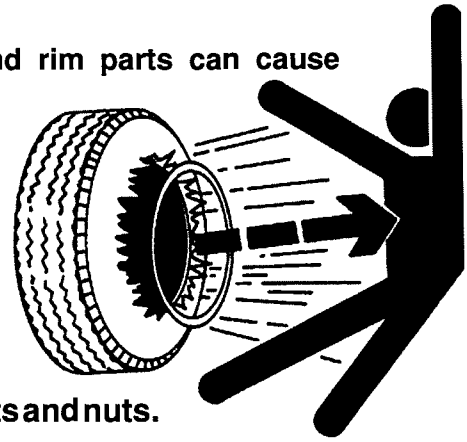
KRAUSE PARTS WERE DEVELOPED AND TESTED FOR THESE HARROWS, therefore, it is recommended that KRAUSE replacement parts be used..

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

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.



Hydraulics

If the implement wing lift 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 that the rod ends will clear frame members or lugs when fully extended. Back the tractor to the front of the disc and connect the hydraulic hoses to the tractor. Check the tractor hydraulic reservoir and make sure it is full of the tractor 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 of the cycles 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.
 - B. You have reason to believe it may be abnormal.
 - C. There is any fluid leakage.
 - D. The couplings are damaged.
 - E. The hose is damaged or kinked.
 - 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 bend radius of 3.25 inches.
6. **DO NOT EXPOSE** to temperatures in excess of 225° F
7. **DO NOT USE AS A STRENGTH MEMBER** for pulling or lifting equipment.

SUGGESTED REMEDIES FOR HYDRAULIC PROBLEMS

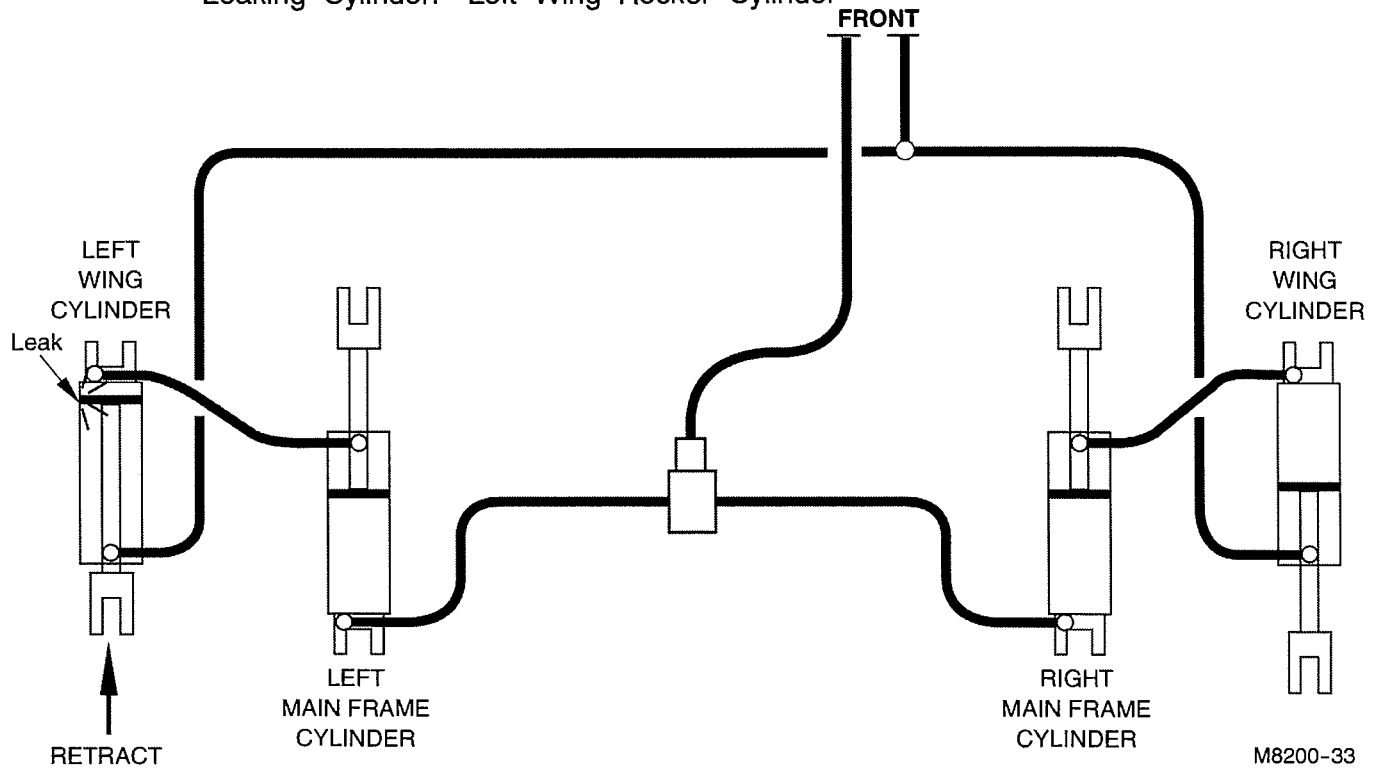
PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Disc raises / lowers slowly	Restrictor fitting in rocker shaft cylinder	Check for restrictor ell and replace with standard fitting. Note: All wing lift cylinder ports should have restrictor ells.
Rocker cylinders are settling after rephasing	Rephasing groove in cylinder	It is normal for a rephasing cylinder to settle approximately 3/8" until the piston is past the rephasing groove.
All rocker cylinders settling at mid-stroke	Tractor valve leaking	Repair tractor valve
Cylinder has spongy or erratic movement	Air in the hydraulic system	Purge the system of air as described on page O9.
Cylinder retracting or extending out of sequence	Leaking seal	Check for external leaks Locate internal piston leak as described on the following pages.
	.. Air in hydraulic system	Purge air from system. See page O9
	.. Scarred cylinder wall	Locate internal leak as described on the following pages.

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

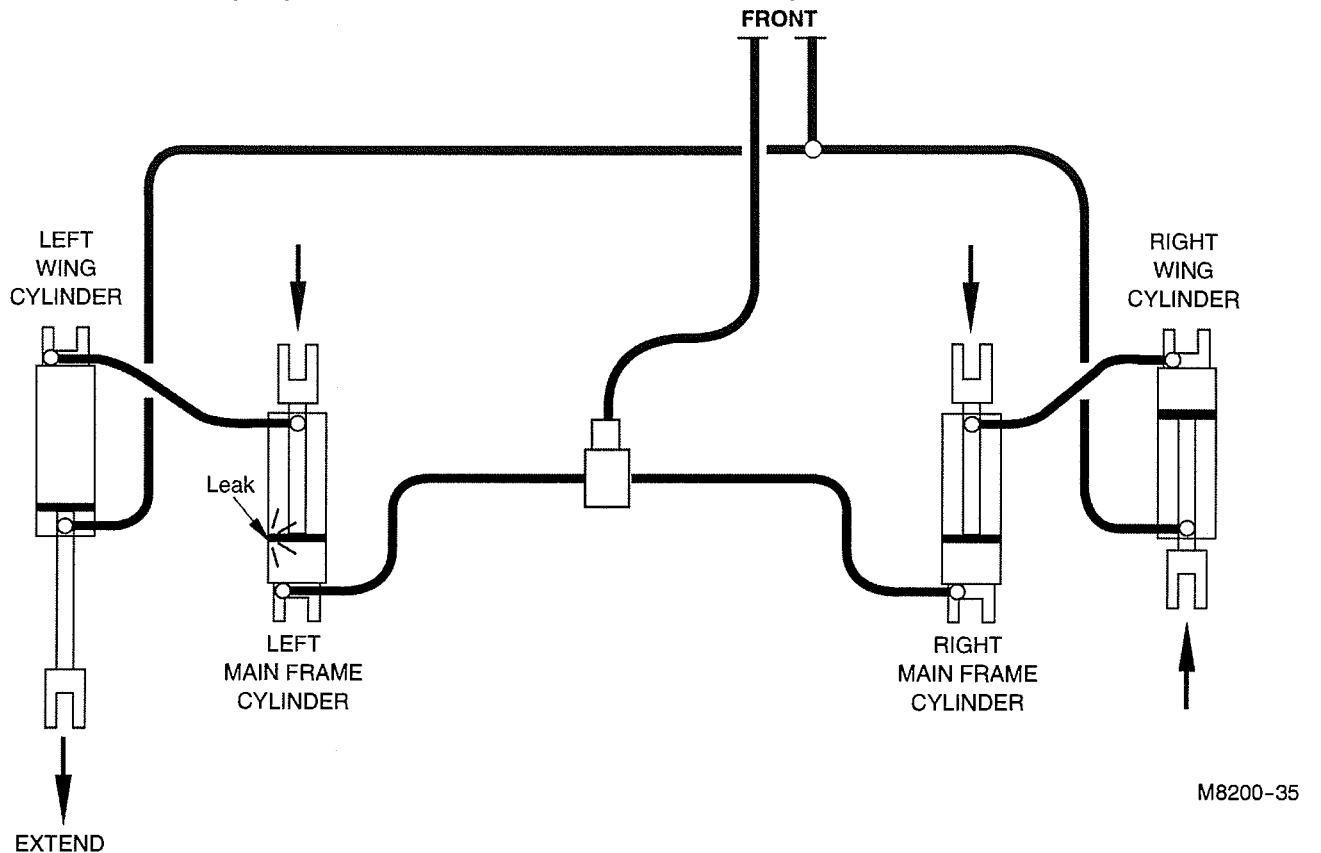
TEST PROCEDURE TO LOCATE INTERNAL LEAKING CYLINDER IN A REPHASING SYSTEM

1. Raise the unit until the disc blades are 4" to 5" above the ground, but do not fully extend the cylinder.
2. Measure the length of the four rocker cylinders and tongue cylinder; record those lengths.
3. Allow the unit to sit for a period of time until there is a measurable change in one of the cylinder lengths. This may require an hour or two. (Preferably overnight)
4. Measure the length of each cylinder again and note whether or not the cylinder extended or retracted.
5. Match your results to one of the five case studies shown on the following pages to locate the leaking cylinder.

CASE 1: Symptom: Left wing lowering as the disc is pulled in field
 Probable Causes: (A) Left wing cylinder piston seal leak
 Test Results: (See page O16) Left cylinder retracts, all other cylinders do not change.
 Leaking Cylinder: Left Wing Rocker Cylinder



CASE 2: Symptom: Left wing raising as the disc is pulled in the field
 Probable Causes: Left main frame cylinder piston seal leak
 Test Result: (See page O16) Left wing cylinder extends, all other cylinders retract.
 Leaking Cylinder: Left Main Frame Rocker Cylinder

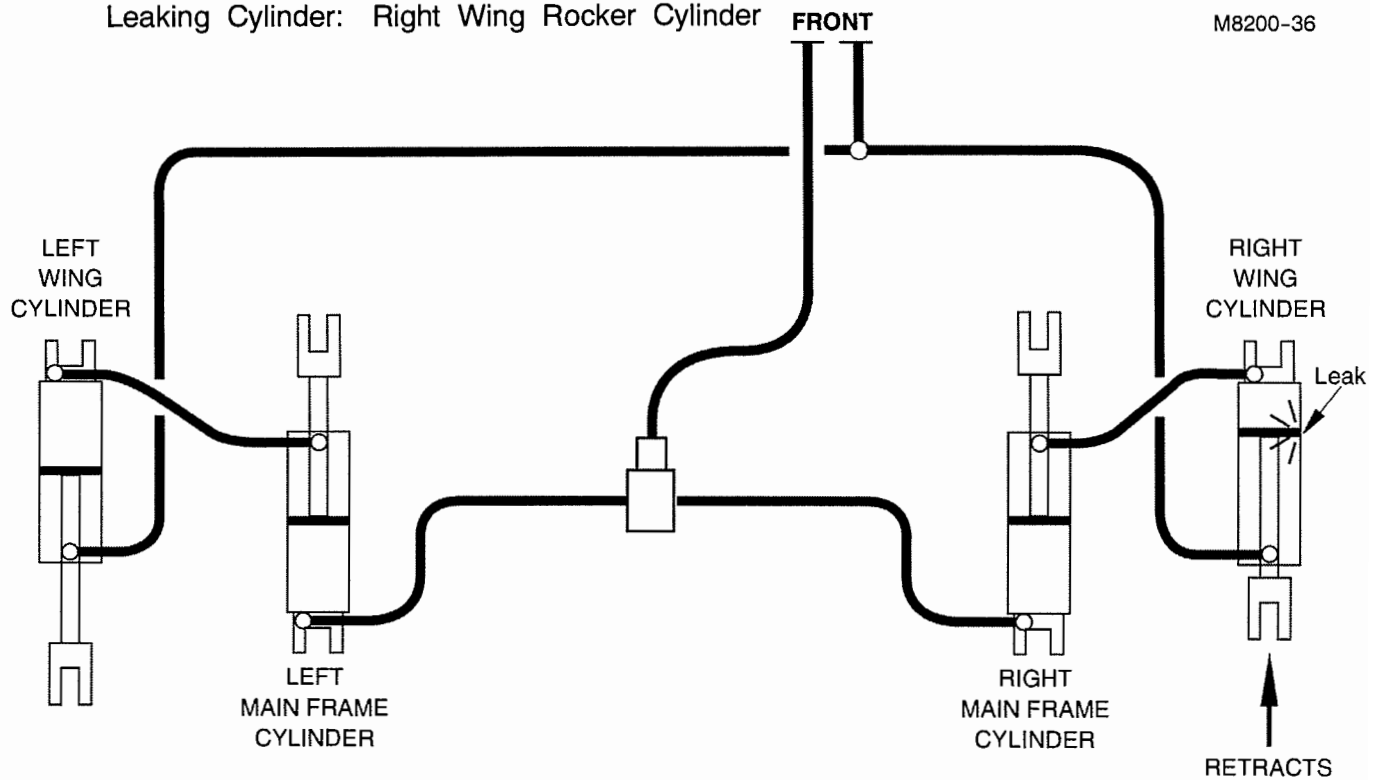


CASE 3: Symptom: Right wing lowering as the disc is pulled in field.

Probable Cause: Right wing cylinder piston seal leak.

Test Result: (See page O16) Right wing cylinder retracts, all other cylinders do not change.

Leaking Cylinder: Right Wing Rocker Cylinder

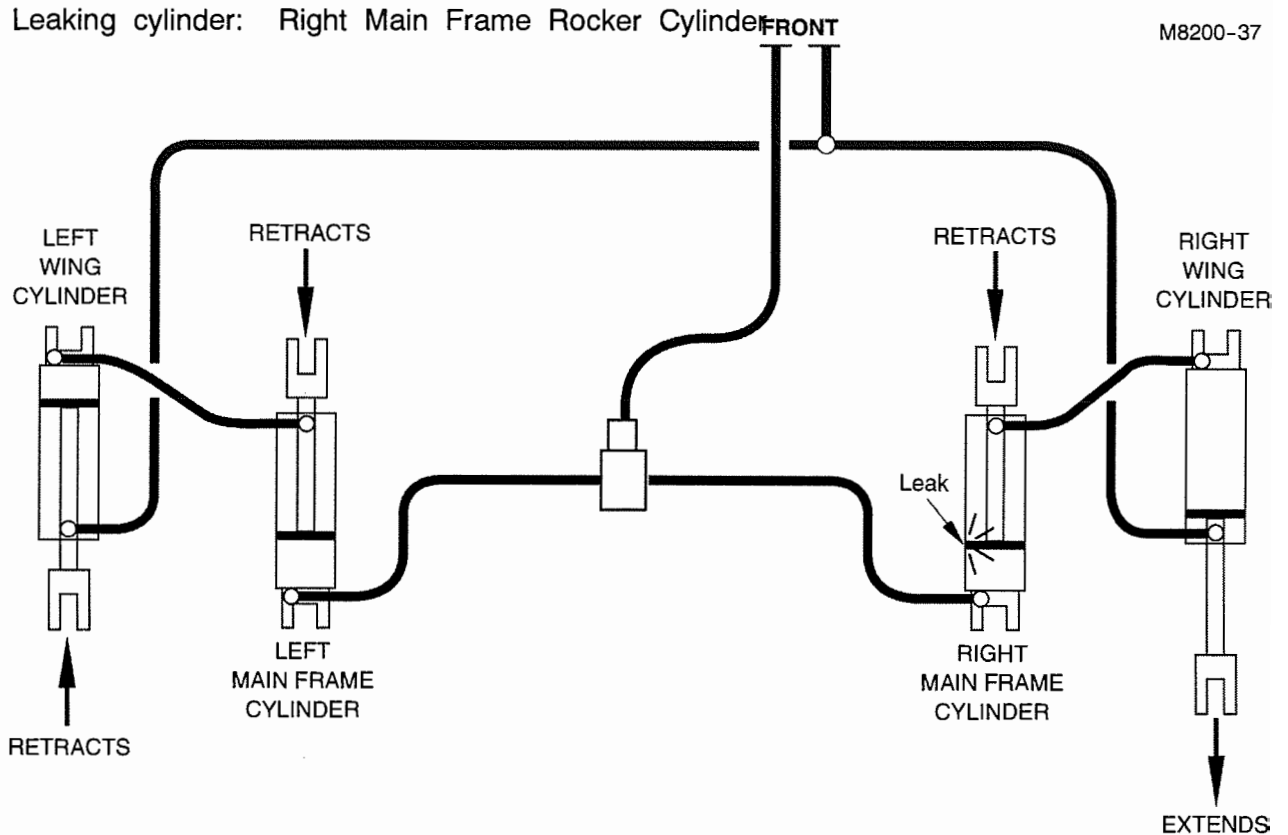


CASE 4: Symptom: Right wing raising as the disc is pulled in field.

Probable Cause: Right main frame cylinder piston seal leak.

Test Result: (See page O16) Right wing cylinder extends. All other cylinders retract.

Leaking cylinder: Right Main Frame Rocker Cylinder

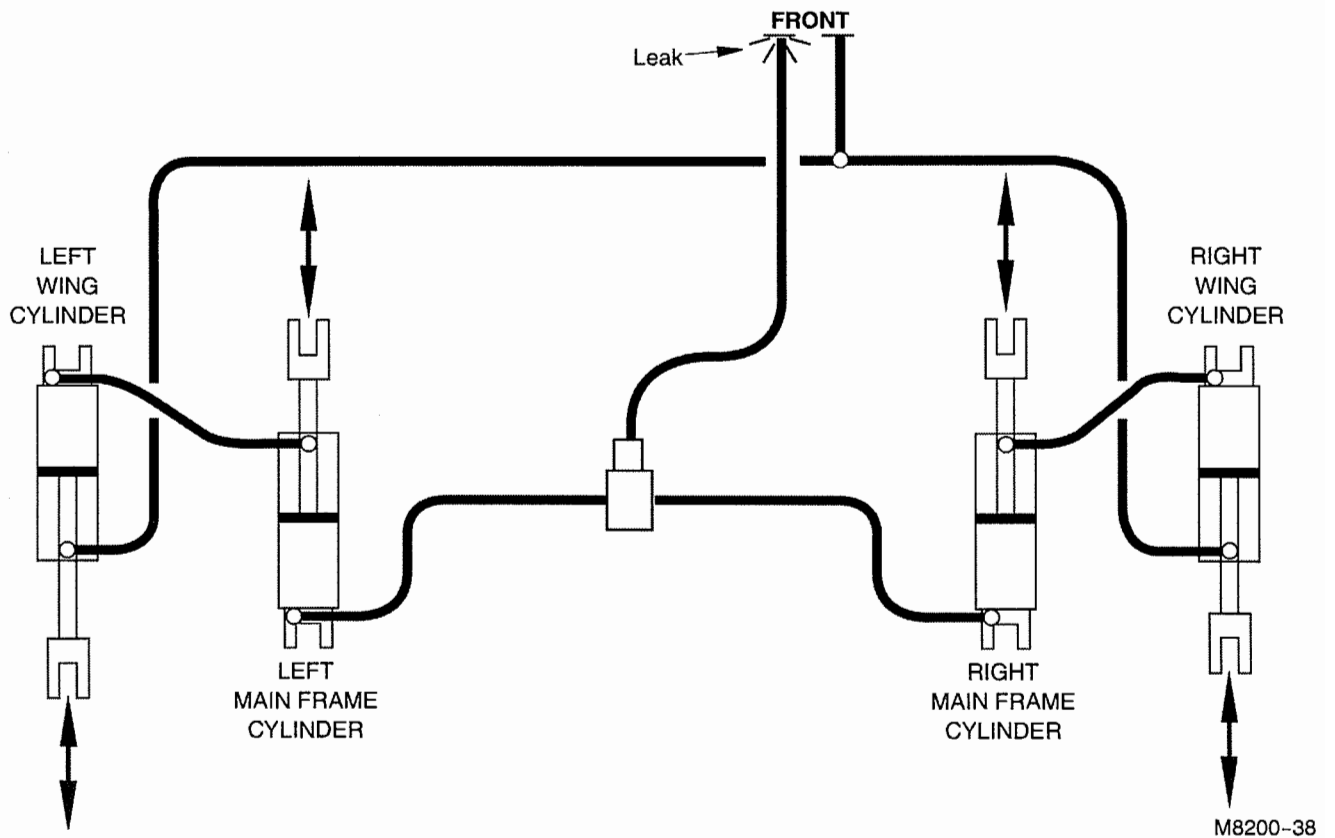


CASE 5: Symptom: Entire disc will not maintain set depth

Probable Cause: Tractor Valve leaking

Test Results: (See page O16) All cylinders are retracting or extending at the same time.

Leaking Cylinder: Tractor Valve



M8200-38

SUGGESTED REMEDIES FOR FIELD PROBLEMS

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Leaving Center Ridge	<ul style="list-style-type: none"> Excessive Speed .. Rear gangs cutting too deep .. Rear discs are set too close together 	<ul style="list-style-type: none"> Reduce Speed Shorten length of Turnbuckle Readjust distance between inside disc blades.
Leaving center furrow	<ul style="list-style-type: none"> Discing too slowly .. Rear gang not cutting deep enough .. Rear blades are too far apart 	<ul style="list-style-type: none"> Increase speed, do not exceed 6 m.p.h./ 5 m.p.h. in rocky conditions Lengthen Turnbuckle Readjust distance between disc blades
Leaving untilled center strip	<ul style="list-style-type: none"> .. Discing too shallow .. Front center gangs too far apart .. Front center gangs overlapped too much 	<ul style="list-style-type: none"> Increase depth Move front center gangs in Move front center gangs out
Leaving furrow on outside	<ul style="list-style-type: none"> .. Rear running too deep .. Extension disc blade incorrect size 	<ul style="list-style-type: none"> Readjust Turnbuckle Decrease size of extension disc blade
Leaving ridge on outside	<ul style="list-style-type: none"> .. Front running too deep .. Not enough overlap .. Wing section running too deep .. Excessive speed 	<ul style="list-style-type: none"> Adjust Turnbuckle Move tractor toward tilled ground Level wing Reduce speed
Center section not level from side to side	<ul style="list-style-type: none"> .. Incorrect air pressure in tires 	<ul style="list-style-type: none"> Inflate 12.5L x 15 FI tires to 90 PSI
Wings not level from side to side	<ul style="list-style-type: none"> .. Wing too high .. Wing too low .. Wing lift cylinder not fully extended .. Slave cylinders out of phase 	<ul style="list-style-type: none"> To lower wing, shorten wing adjustment screw To raise wing, lengthen wing adjustment screw Extend cylinder to maximum length and hold open briefly Raise unit out of ground and hold control lever open until all cylinders are completely extended
Disc not level from front to rear during operation	<ul style="list-style-type: none"> .. Turnbuckle setting 	<ul style="list-style-type: none"> Lengthen screw to RAISE front, Shorten screw to LOWER front
Disc not level during transport	<ul style="list-style-type: none"> .. Turnbuckle setting .. Weight of rear attachment 	<ul style="list-style-type: none"> Lengthen screw to Raise front Shorten screw to Lower front Move adjustment screw rear pin to lower hole
Gangs plugging	<ul style="list-style-type: none"> .. Extremely wet field conditions .. Worn or improper adjustment of scraper blades 	<ul style="list-style-type: none"> Decrease depth of work or allow field to dry if possible Readjust scrapers and replace worn parts

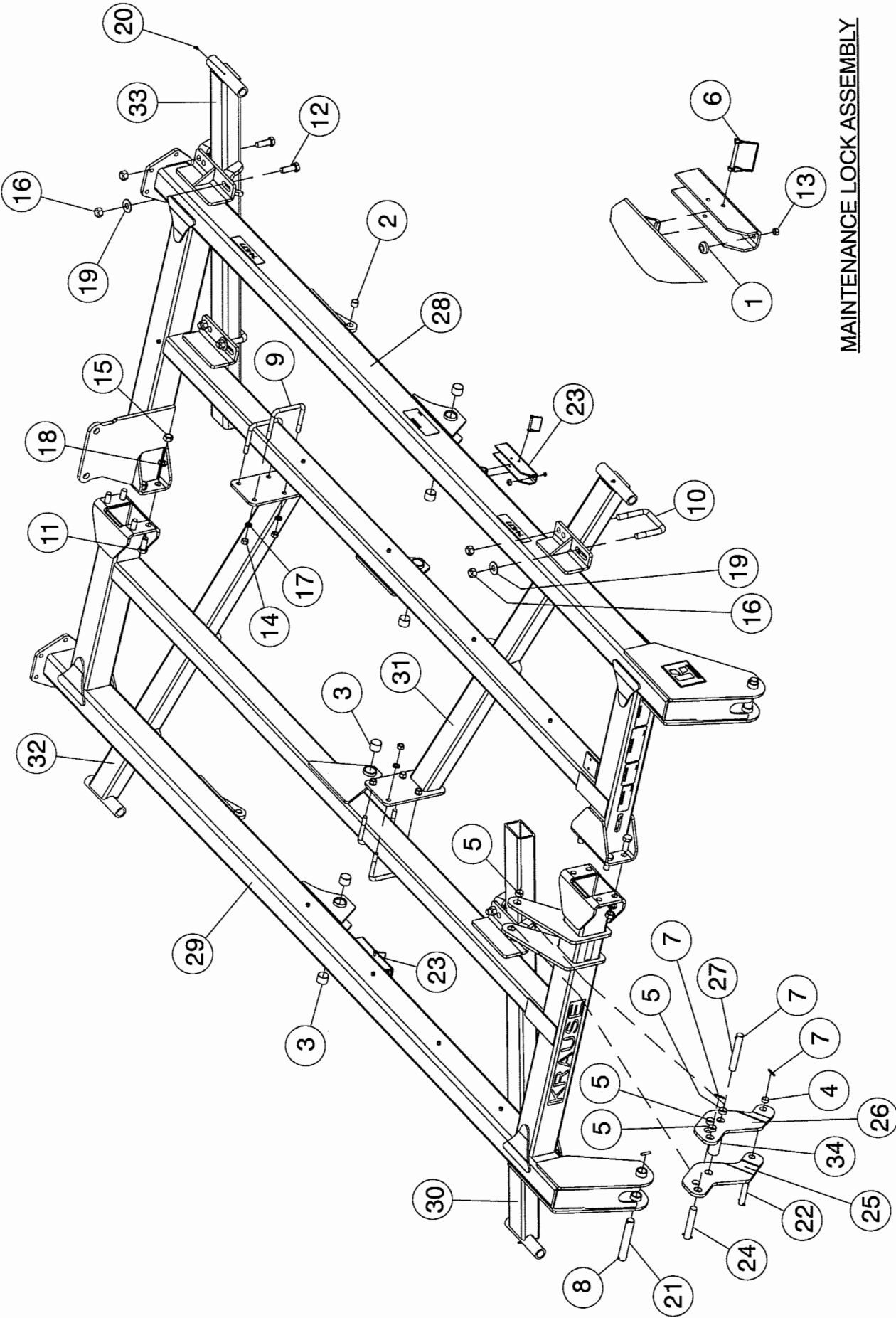
PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Gang does not revolve	Obstruction in disc gang .. Scrapers .. Seized bearing	Check for rocks, mud, roots, etc. Check for scrapers adjusted too tight to disc blades Replace
Wing will not flex down far enough	Wing lift cylinder	Make sure cylinders are fully extended
Disc will not penetrate or penetrates too much	Depth valve striker setting on wheel control cylinders	Readjust depth control striker (see page O8)
Wheels have excessive wobble	Loose wheel bolts .. Loose spindle nut	Immediately stop. Torque wheel bolts Tighten nut until tight, then back off one notch
Discs have excessive wobble	Tie rod nut loose	Re-torque nut on tie rod to 1200 Ft. Lbs.
Disc will not lower or wings will not lower	Transport locks engaged	Open transport lock valve .. Remove maintenance locks
Wings will not raise to transport position	Plugged restrictor .. Insufficient hydraulic pressure	Remove restrictors from ends of cylinder check orifice for foreign material Check tractor hydraulic system
Inadequate transport clearance	Wheel control cylinders not extended .. Tire pressure low	Extend cylinders Inflate 10.00 x 15, 8-ply tires to 40 PSI . & 12.5L x 15 FI tires to 90 PSI
Outside wings unfold before inside wings	Sequence valve pressure too low	Increase pressure setting
Outside wings will not unfold	Sequence valve pressure too high	Decrease pressure setting
Outside wings will not level with inside wings	Fold cylinders not fully extended .. Incorrect number of shims between inside and outside gang beams	Extend cylinder to lock wing Put in correct shims

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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.

MAINTENANCE LOCK ASSEMBLY



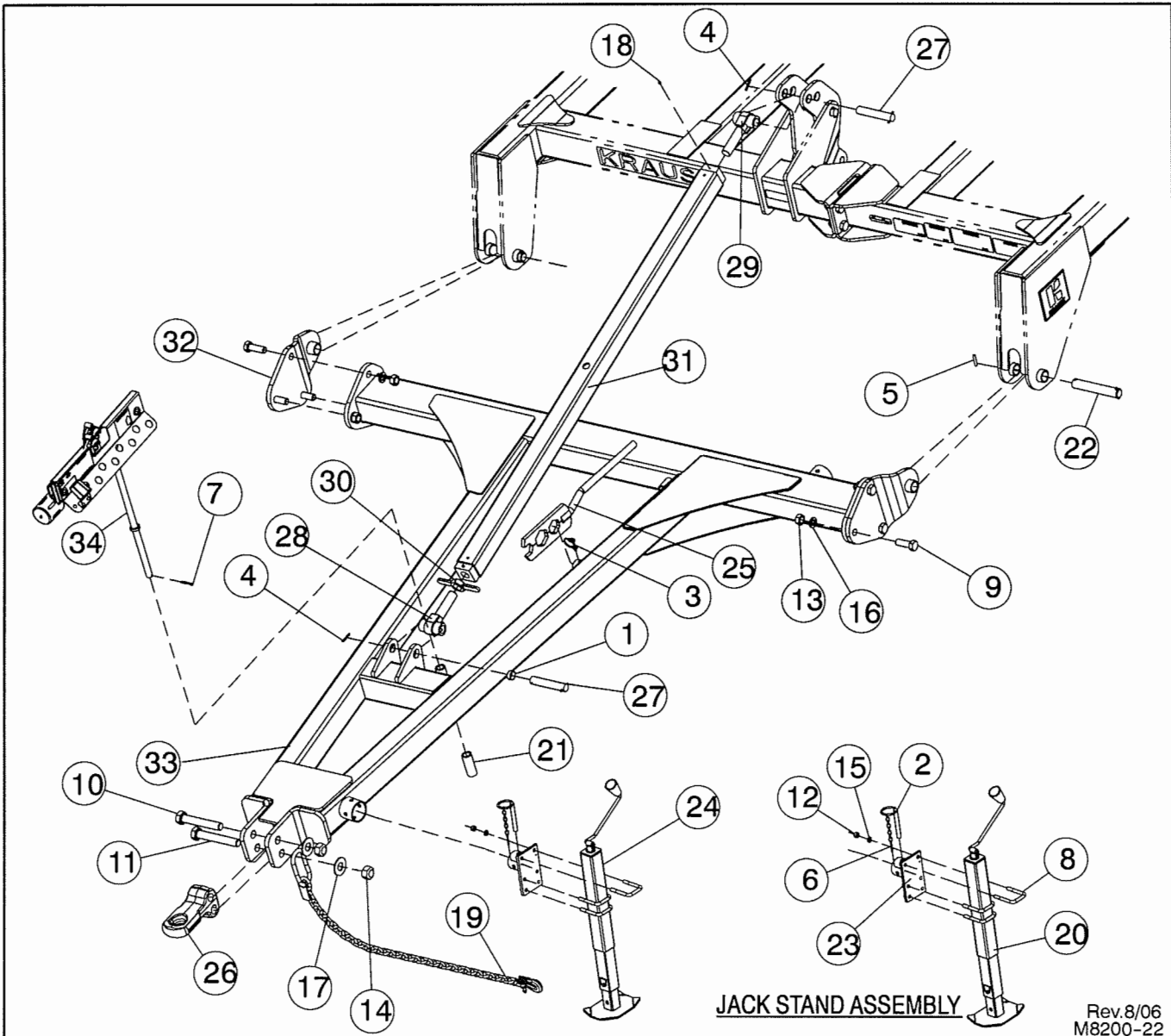
MAIN FRAME AND GANG BEAM ASSEMBLY

FOR MODELS - ALL

4/06

<i>Item</i>	<i>Part Number</i>	<i>Part Description</i>	<i>Qty.</i>
1	44-107	Rubber Bumper	4
2	53-102	Wear Sleeve 1.25od x 1.02id x 1.00	2
3	53-110	Wear Sleeve 2.00od x 1.81id x 1.50	6
4	53-127	Wear Sleeve 1.25od x 1.01id x .62	2
5	53-135	Wear Sleeve 1.50od x 1.28id x .62	8
6	60-103	5/16"DIA x 3" P.T.O. Pin	2
7	60-606	1/4"DIA x 2" Roll Pin	6
8	60-615	3/8"DIA x 2" Roll Pin	4
9	61-120	U-Bolt, 3/4"DIA x 6-1/16"w x 5-7/8"L	4
10	61-262	U-Bolt, 1"DIA x 5-7/16"w x 6"L	4
11	62-236	1NC x 2-1/2" GD5 Cap Screw	8
12	62-238	1NC x 3" GD5 Cap Screw	8
13	63-102	3/8NC Hex Nut	4
14	63-112	3/4NC Hex Nut	8
15	63-117	1NC Hex Nut	8
16	63-119	1NC GDB Lock Nut	16
17	64-112	3/4" STD Lock Washer	8
18	64-118	1" STD Lock Washer	8
19	64-119	1" STD Flat Washer	8
20	65-100	1/8" x 45 Grease Zerk	3
21	3991-0-6	1-1/2"DIA x 9" Pin	2
22	4616-0-12A	1"DIA x 5-7/16" Top Link Pin	1
23	5800-17-0	Maintenance Lock (Includes items 1,6,13)	2
24	6127-0-11	1-1/4"DIA x 6-3/4" Pin	1
25	7404-0-20	Leveling Link Lug Assembly	1
26	7404-0-21	Leveling Link Lug Assembly	1
27	7404-0-3	1-1/4"DIA x 8" Pin	1
28	7404-1-0	Center Frame Weldment, Left	1
29	7404-2-0	Center Frame Weldment, Right	1
30	7404-246-0	Gang Beam Weldment (FRC) 31' - 34'	1
	7404-46-0	Gang Beam Weldment (FRC) 36' - 38' Quad-Fold	1
31	7404-247-0	Gang Beam Weldment (FLC) 31' - 34'	1
	7404-47-0	Gang Beam Weldment (FLC) 36' - 38' Quad-Fold	1
32	7404-48-0	Gang Beam Weldment (RRC)	1
33	7404-49-0	Gang Beam Weldment (RLC)	1
34	960A-0-15	Hitch Tube	1

TONGUE ASSEMBLY



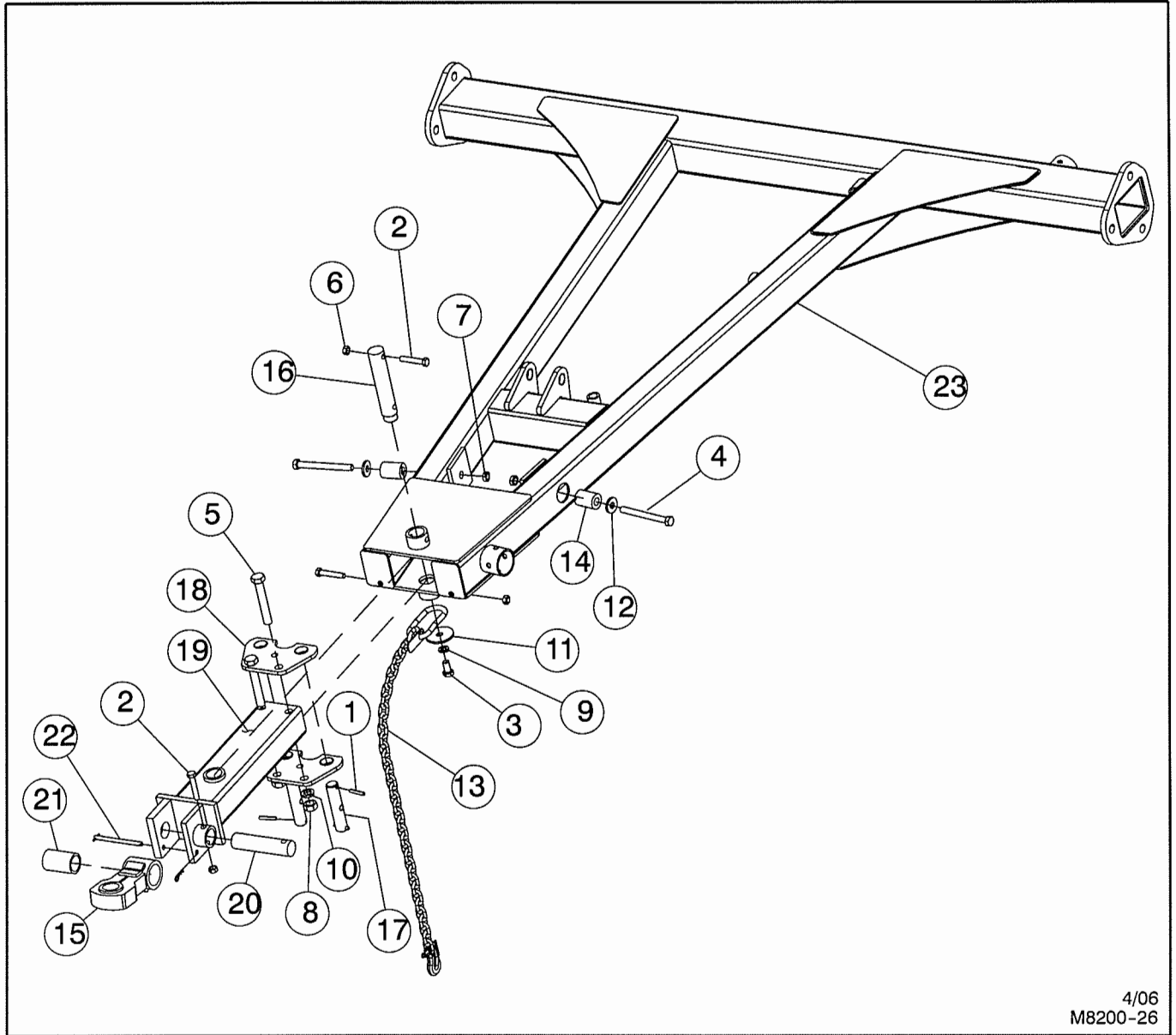
Rev.8/06
M8200-22

FOR MODELS - ALL

8/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	53-135	Wear Sleeve, 1.50od x 1.28id x .62	2	19	72-352	20,000# Safety Chain (31' & 34')	1
2	60-106	FAS Pin	1		72-356	30,000# Safety Chain (36' & 38')	1
3	60-109	P.T.O. Pin	1	20	73-111	Jack Assembly	1
4	60-606	1/4"DIA. x 2" Roll Pin	6	21	570-0-8	Spacer	1
5	60-615	3/8"DIA. x 2" Roll Pin	4	22	3991-0-6	Pin, 1-1/2"DIA x 9"	2
6	60-702	3/16"DIA x 1-1/2" Cotter Pin	1	23	4956-55-0A	Jack Mounting Bracket	1
7	60-708	1/4"DIA x 1-3/4" Cotter Pin	1	24	4956-56-0	Jack Stand Assm (Includes 2,6,8,12,15,20,23)	1
8	61-172	U-Bolt, 1/2"DIA. x 2-9/16"W x 3-3/4"L	3	25	4995-25-0	Tie Rod Wrench	1
9	62-238	1NC x 3" GD5 Cap Screw	6	26	5215-0-4007A	Hitch Clevis Casting	1
10	62-275	1-1/4NC x 7-1/2" GD5 Cap Screw	1	27	6127-0-11	Turnbuckle Pin, 1-1/4"DIA x 6-3/4"	2
11	62-277	1-1/4NC x 8" Machine Bolt	1	28	6142-82-0	R.H. Threaded End	1
12	63-106	1/2NC Hex Nut	10	29	6142-83-0	L.H. Threaded End	1
13	63-117	1NC Hex Nut	6	30	7404-34-0	Lock Nut Weldment	1
14	63-126	1-1/4NC Lock Nut	2	31	7404-35-0	Turnbuckle Weldment	1
15	64-107	1/2" STD Lock Washer	6	32	7500-31-0	Plate Weldment	2
16	64-118	1" STD Lock Washer	6	33	7500-30-0	Hitch Weldment	1
17	64-126	1-1/4" STD Flat Washer	2	34	SEE PG P28	Hose Stand	1
18	65-114	1/4" Thread Cutting Zerk	2				

OPTIONAL GUARDIAN HITCH



4/06
M8200-26

FOR MODELS - ALL

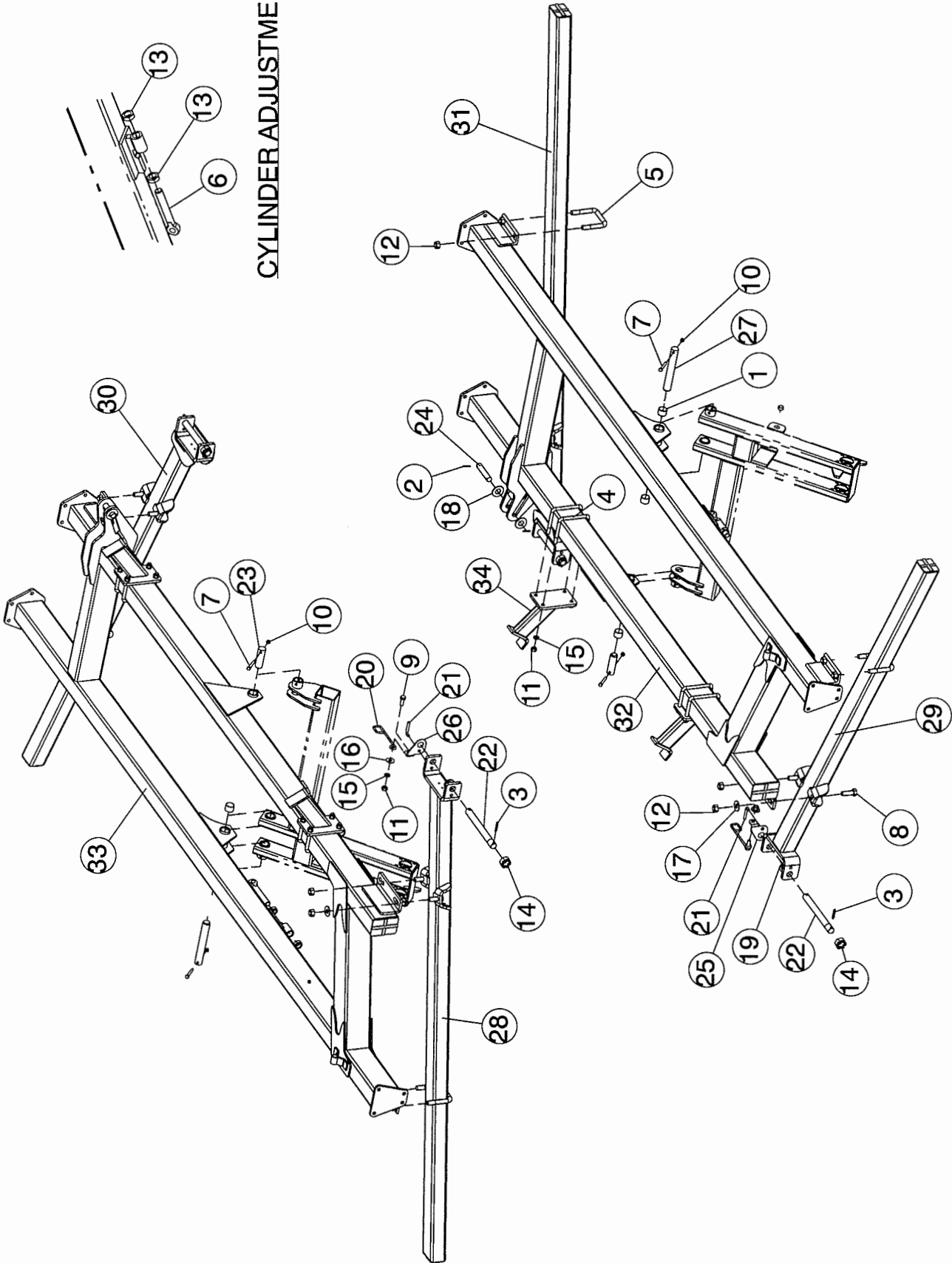
4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	60-616	3/8" DIA x 2-1/4" Roll Pin	4	14	76-231	Urethane Spring	2
2	62-176	5/8NC x 3-1/2" GD5 Cap Screw	3	15	2135-54-0	Crawler Clevis for 2" Pin	1
3	62-191	3/4NC x 1-1/2" GD5 Cap Screw	1	16	4881-0000-3	Hitch Pin	1
4	62-217	3/4NC x 7-1/2" GD5 Cap Screw	2	17	4881-0000-5	Pivot Pin	2
5	62-251	1NC x 6-1/2" GD5 Cap Screw	2	18	4881-7086-0A	Hitch Shock Mount	2
6	63-110	5/8NC Lock Nut	3	19	4881-9032-0	Swing Hitch Weldment	1
7	63-113	3/4NC Hex Jam Nut	2	20	4885-0-5	Hitch Pin	1
8	63-117	1NC Hex Nut	2	21	4885-0-6	Hitch Bushing	1
9	64-112	3/4" STD Lock Washer	1	22	6200-90-0	Pin Assembly	1
10	64-118	1" STD Lock Washer	2	23	7500-33-0	Guardian Hitch Weldment	1
11	64-147	Spec Washer 3.50 x .81 x .25	1				
12	64-215	Spec Washer 2.00 x .81 x .2	2				
13	● 72-352	#20,000 Safety Chain (31'-34')	1				
	■ 72-356	#30,000 Safety Chain (36'-38' QF)	1				

● For 31' & 34' Models

■ For 36' & 38' Quad-Fold Models

CYLINDER ADJUSTMENT

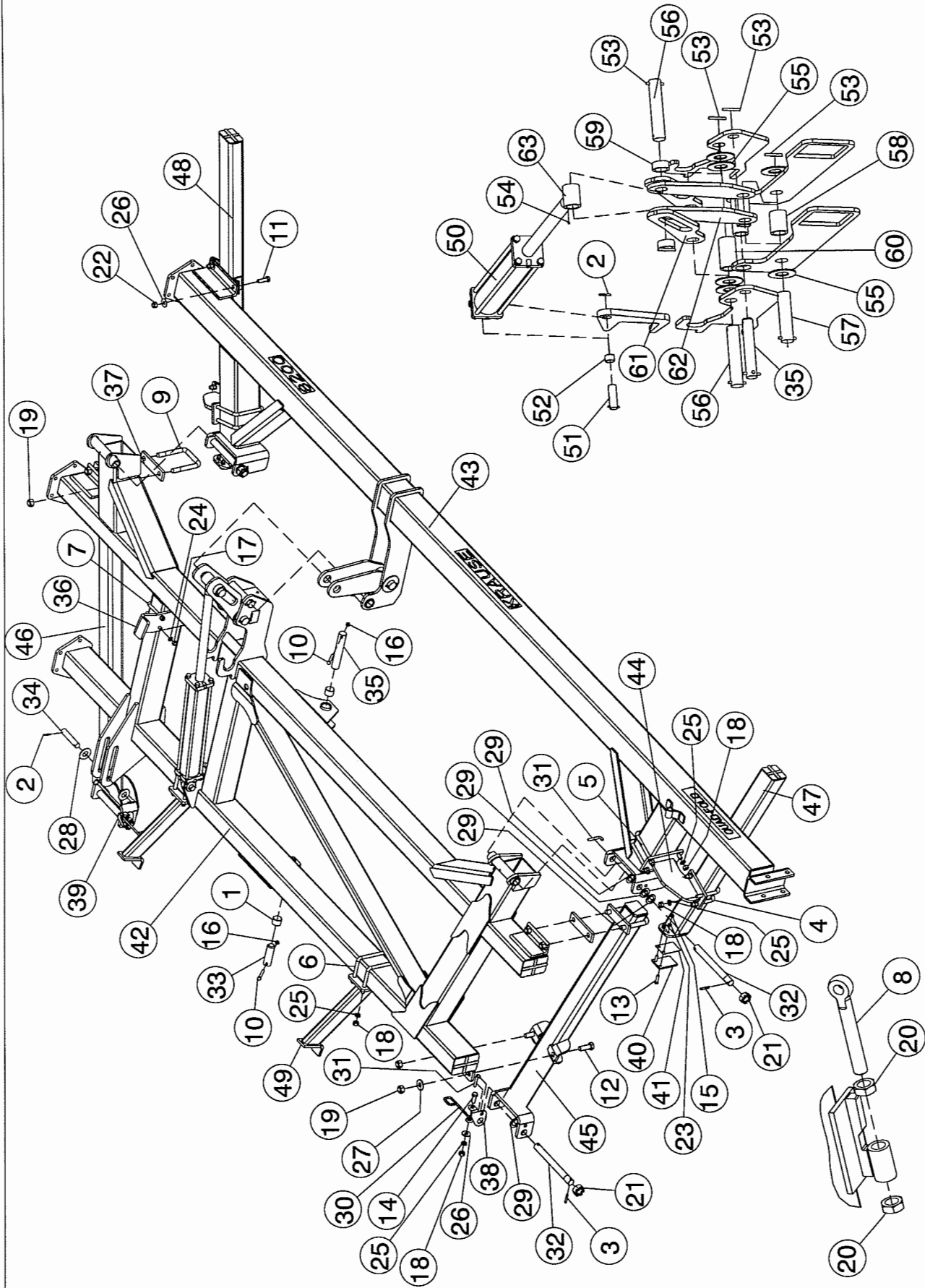


WING FRAMES & GANG BEAMS

FOR MODELS - 31' & 34'

4/06

<i>Item</i>	<i>Part Number</i>	<i>Part Description</i>	<i>Qty.</i>
1	53-110	Wear Sleeve 2.00od x 1.81id x 1.50	6
2	60-606	1/4" DIA. x 2" Roll Pin	4
3	60-617	3/8" DIA x 2-1/2" Roll Pin	4
4	61-196	U-Bolt, 3/4" DIA x 7-1/16" W x 6-13/16" L	8
5	61-262	U-Bolt, 1" DIA x 5-7/16" W x 6" L	4
6	61-288	Eyebolt, 1-1/4" DIA	2
7	62-154	1/2NC x 3-1/2" GD5 Cap Screw	4
8	62-238	1NC x 3" GD5 Cap Screw	8
9	62-421	3/4NC x 2" GD5 Cap Screw	2
10	63-107	1/2NC Lock Nut	4
11	63-112	3/4NC Hex Nut	18
12	63-119	1" GDB Lock Nut	16
13	63-124	1-1/4NC Hex Jam Nut	4
14	63-128	1-1/2NC Slotted Hex Nut	4
15	64-112	3/4" STD Lock Washer	18
16	64-113	3/4" STD Flat Washer	2
17	64-119	1" STD Flat Washer	4
18	64-126	1-1/4" STD Flat Washer	4
19	64-145	Wear Washer, 2-1/2"od x 1-5/8"id	4
20	76-216	Hose Support	2
21	1901-0-2	Hinge Pin Lock	4
22	4901-0-1	Hinge Pin	4
23	4987-0-3	Rocker Pivot Pin	2
24	6327-0-2	Wing Lift Pin	2
25	7404-0-22	R.R. / L.F. Bracket	1
26	7404-0-23	L.R. / R.F. Bracket	1
27	7404-0-51	Rocker Pivot Pin	2
28	7404-146-0	Gang Beam Weldment (FRW) 31'	1
	7404-150-0	Gang Beam Weldment (FRW) 34'	1
29	7404-147-0	Gang Beam Weldment (FLW) 31'	1
	7404-151-0	Gang Beam Weldment (FLW) 34"	1
30	7404-148-0	Gang Beam Weldment (RRW) 31'	1
	7404-152-0	Gang Beam Weldment (RRW) 34'	1
31	7404-149-0	Gang Beam Weldment (RLW) 31'	1
	7404-153-0	Gang Beam Weldment (RLW) 34'	1
32	7404-23-0	Left Wing Frame Weldment (31' - 34')	1
33	7404-24-0	Right Wing Frame Weldment (31' - 34')	1
34	7404-69-0	Wing Rest Weldment (31' - 34')	4



QUAD FOLD LINKAGE

ROCKER CYLINDER SUPPORT

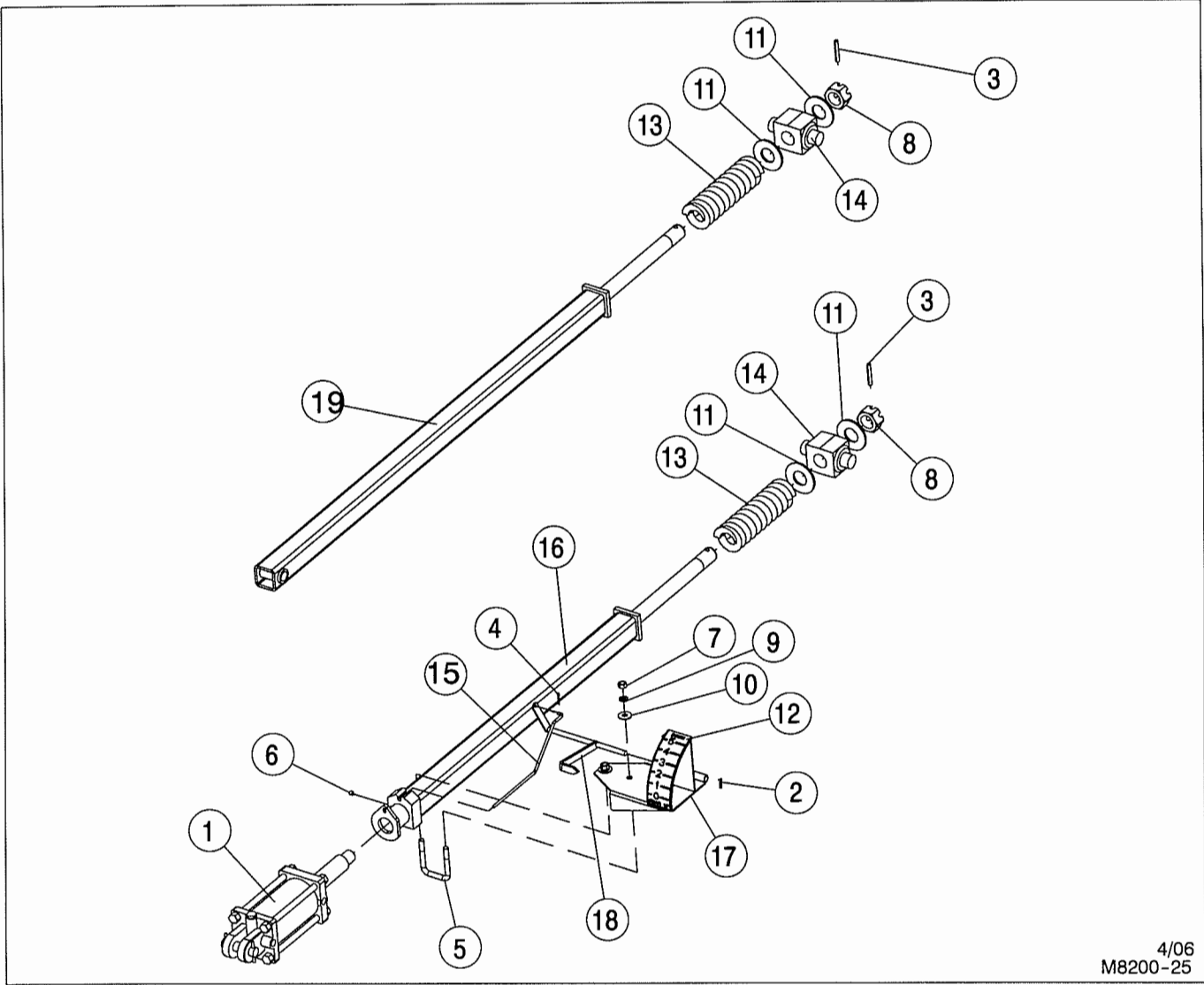
WING FRAMES & GANG BEAMS

FOR QUAD-FOLD MODELS - 36' & 38'

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	53-110	Wear Sleeve 2.00od x 1.81id x 1.50	3	41	7404-0-26	Hinge Shim	4
2	60-606	1/4"DIA x 2" Roll Pin	4	42	7404-19-0	Left Inner Wing Frame (36' & 38')	1
3	60-617	3/8"DIA x 2-1/2" Roll Pin	4		7404-20-0	Right Inner Wing Frame (36' & 38')	1
4	61-122	U-Bolt, .75D x 5.06W x 6.12L	4	43	7404-21-0	Left Outer Wing Frame (36' & 38')	1
5	61-190	U-Bolt, .75D x 7.06W x 8.88L	4		7404-22-0	Right Outer Wing Frame (36' & 38')	1
6	61-196	U-Bolt, .75D x 7.06W x 6.81L	4	44	7404-36-0A	Gang Mount	2
7	61-201	U-Bolt, .62D x 7.06W x 6.38L	2	45	7404-51-0	Front Left Wing Gang Beam	1
8	61-288	1-1/4"DIA Eye-Bolt	1		7404-50-0	Front Right Wing Gang Beam	1
9	61-290	U-Bolt, 1.00D x 5.44W x 7.25L	2	46	7404-53-0	Rear Left Wing Gang Beam	1
10	62-154	1/2NC x 3-1/2" GD5 Cap Screw	2		7404-52-0	Rear Right Wing Gang Beam	1
11	62-195	3/4NC x 2-1/2" GD5 Cap Screw	4	47	7404-155-0	Front Lt Outside Gang Beam - 36'	1
12	62-238	1NC x 3" GD5 Cap Screw	4		7404-154-0	Front Rt Outside Gang Beam - 36'	1
13	62-343	1/2NC x 2" GD5 Cap Screw	4		7404-55-0	Front Lt. Outside Gang Beam - 38'	1
14	62-421	3/4NC x 2" GD5 Cap Screw	2		7404-54-0	Front Rt. Outside Gang Beam - 38'	1
15	63-106	1/2NC Hex Nut	4	48	7404-157-0	Rear Lt. Outside Gang Beam - 36'	1
16	63-107	1/2NC Lock Nut	2		7404-156-0	Rear Rt. Outside Gang Beam - 36'	1
17	63-109	5/8NC Hex Nut	4		7404-57-0	Rear Lt. Outside Gang Beam - 38'	1
18	63-112	3/4NC Hex Nut	26		7404-56-0	Rear Rt. Outside Gang Beam - 38'	1
19	63-119	1NC GD8 Lock Nut	8	49	7404-68-0	Wing Rest	2
20	63-124	1-1/4NC Hex Jam Nut	2	50	21-174	4" x 24" Hydraulic Cylinder (no clevis)	1
21	63-128	1-1/2NC Slotted Hex Nut	4	51	21-859	Clevis Pin	1
22	63-162	3/4NC Nylon-Top Lock Nut	4	52	53-101	Wear Sleeve 1.50od x 1.28id x 1.00	1
23	64-107	1/2" STD Lock Washer	4	53	60-618	3/8" DIA x 3" Roll Pin	8
24	64-109	5/8" STD Lock Washer	4	54	62-360	1/4" DIA x 1/4" Set Screw	1
25	64-112	3/4" STD Lock Washer	26	55	64-132	2" STD Flat Washer	6
26	64-113	3/4" STD Flat Washer	6	56	7404-0-10	Fold Lock Pin 2" DIA x 10-3/16"	2
27	64-119	1" STD Flat Washer	2	57	7404-0-12	Fold Link Pin 2" DIA x 8-5/16"	1
28	64-126	1-1/4" STD Flat Washer	2	58	7404-0-13	Spacer	1
29	64-145	2-1/2"od x 1-5/8"id Wear Washer	8	59	7404-0-16	Spacer	2
30	76-216	Hose Support	2	60	7404-0-17	Tube	1
31	1901-0-2	Hinge Pin Lock	4	61	7404-0-5	Fold Lock Pin	2
32	4901-0-1	Hinge Pin	4	62	7404-0-7	Fold Link	2
33	4987-0-3	1-3/4"DIA x 5-1/2" Pin	1	63	7404-39-0	Cylinder End	1
34	6327-0-2	Wing Lift Pin 1-1/4"DIA x 6-1/4"	1				
35	7404-0-11	1-3/4" DIA x 10-1/16" Hinge Pin	2				
36	7404-0-15	Wing Stop - Left Outer Wing	1				
	7404-0-14	Wing Stop - Right Outer Wing	1				
37	7404-0-19	Spacer	4				
38	7404-0-22	R.R. / L.F. Bracket	1				
39	7404-0-23	L.R. / R.F. Bracket	1				
40	7404-0-25	Stop Plate	2				

LEVELING LINKAGE



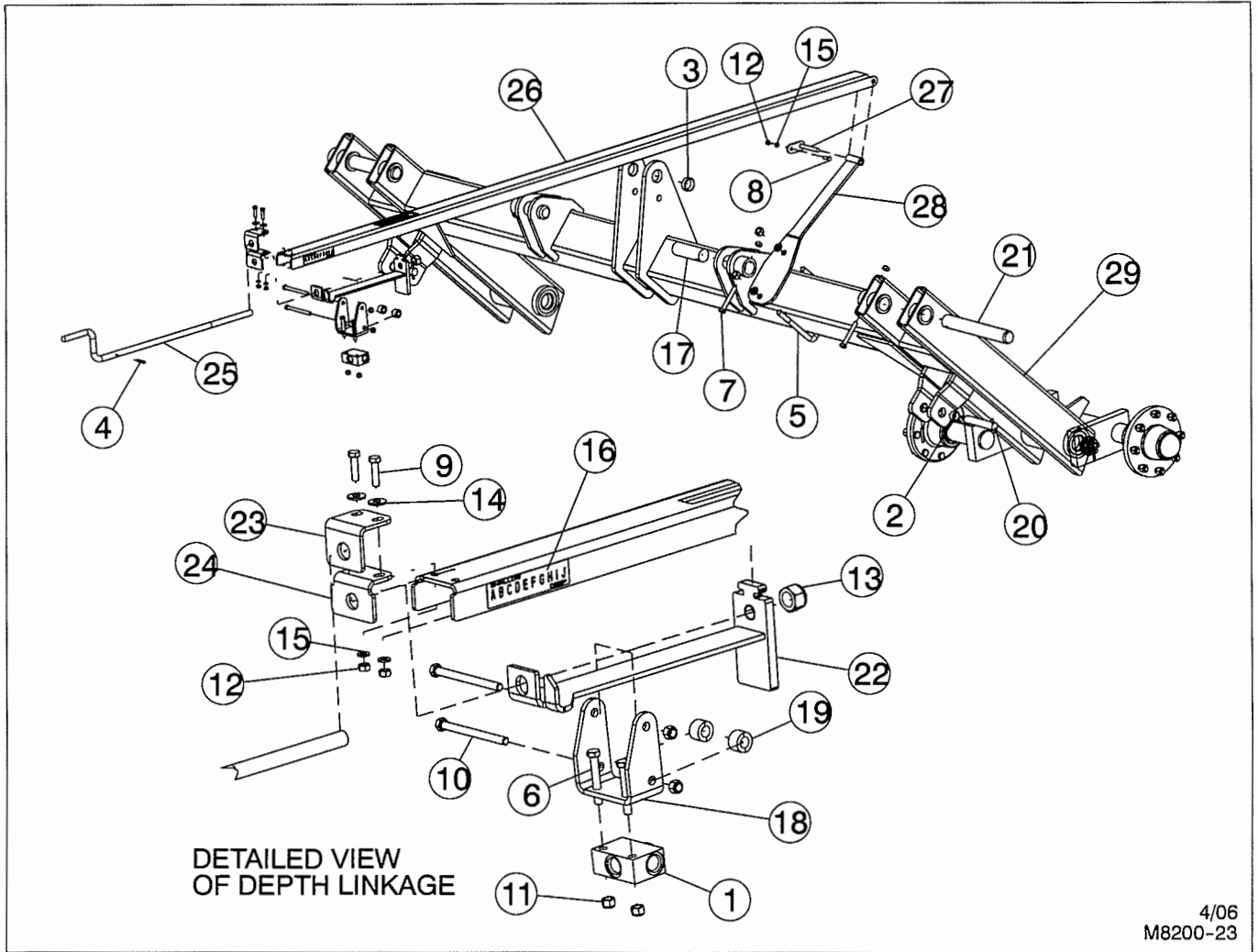
4/06
M8200-25

FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.
1	21-180	4 X 5 Hydraulic Cylinder Assembly (No Clevis)	1
2	60-602	3/16" DIA x 1" Roll Pin	1
3	60-617	3/8" DIA x 2-1/2" Roll Pin	1
4	60-700	1/8" DIA x 1" Cotter Pin	1
5	61-141	U-Bolt, 1/2" DIA x 2-9/16"W x 3-5/8"L	1
6	62-310	3/8-24NF x 3/8" Set Screw	1
7	63-106	1/2NC Hex Nut	2
8	63-128	1-1/2NC Slotted Hex Nut	1
9	64-107	1/2" STD Lock Washer	2
10	64-108	1/2" STD Flat Washer	2
11	64-129	1-1/2" STD Flat Washer	2
12	74-530A	Depth Gauge Decal	1
13	76-164	Spring 3-1/8"od x 3/4" w x 10-3/8" l	1
14	2145-52-1	Trunnion Casting	1
15	7404-139-1	Indicator Push Rod	1
16	7404-140-0	Leveling Linkage Weldment	1
17	7404-141-0	Gauge Base Weldment	1
18	7404-142-0	Gauge Indicator Weldment	1
19	7404-40-0	Link Weldment	1

CENTER ROCKER & DEPTH LINKAGE

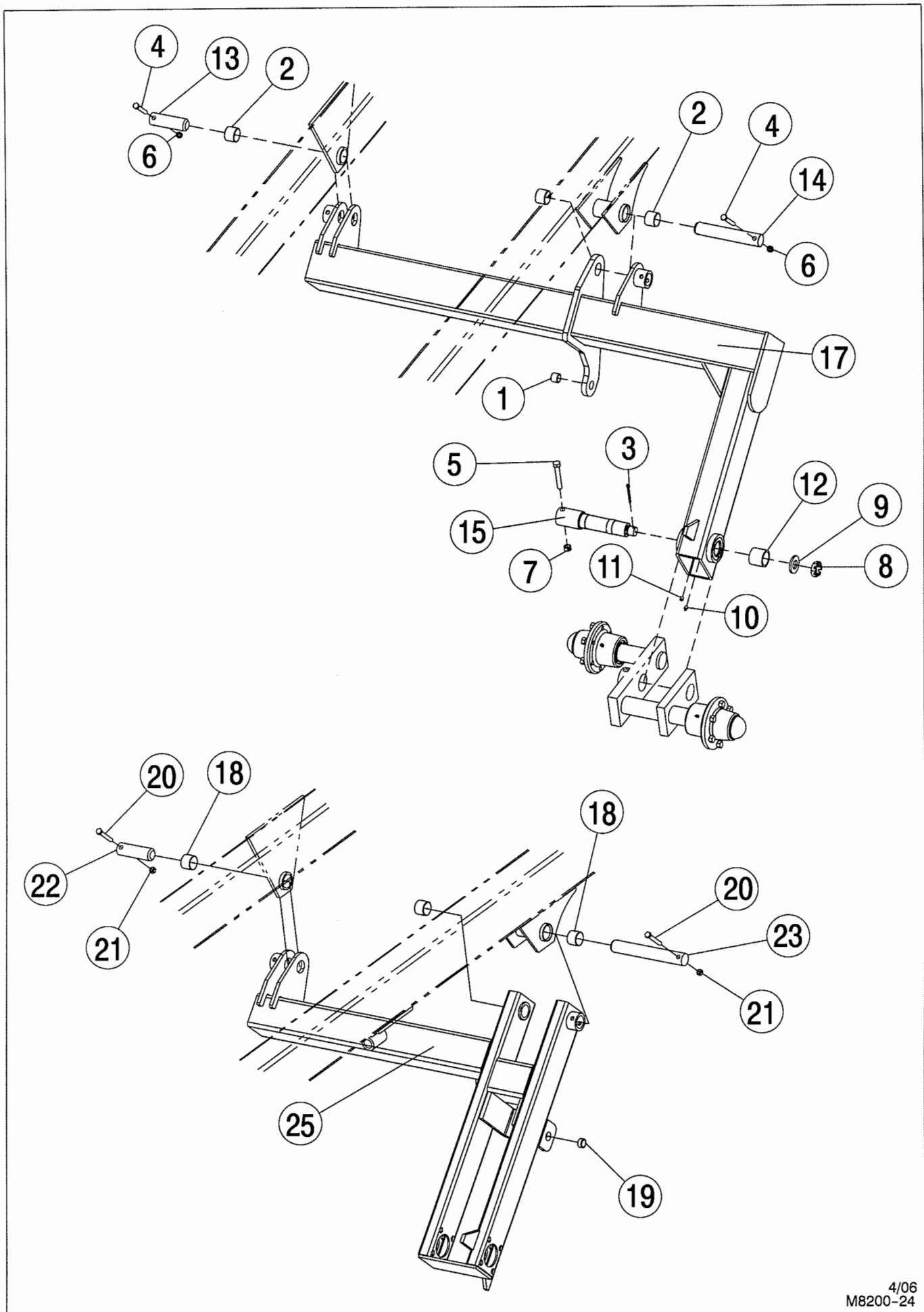


4/06
M8200-23

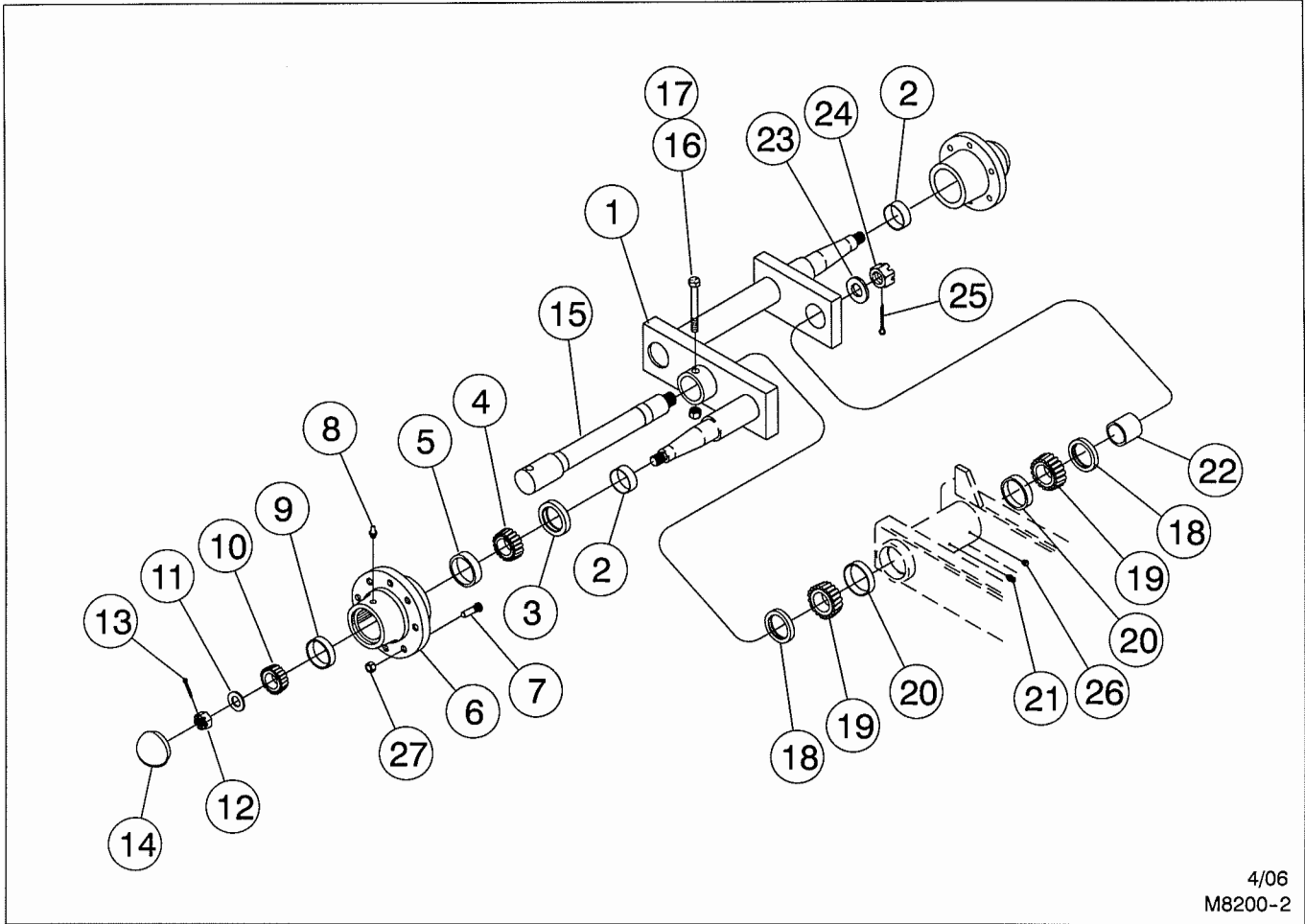
FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	25-2535	Limit Valve	1	16	74-621	Depth Decal	1
2	53-127	Wear Sleeve 1.25od x 1.01id x.62	4	17	4987-0-3	Rocker Pivot Pin	2
3	53-163	Wear Sleeve 1.75od x 1.53id x.62	2	18	7404-0-18	Depth Guide Link	1
4	60-605	1/4" DIA x 1-1/2" Roll Pin	1	19	7404-0-24	Depth Stop Spacer	2
5	61-261	U-Bolt, .62D x 6.06w x 7.50L	1	20	7404-0-4	Cylinder Pin, 1"DIA x 5-1/2"	2
6	62-118	3/8NC x 2-1/2" GD5 Cap Screw	2	21	7404-0-51	Rocker Pivot Pin, 1-3/4"DIA x 12-1/4"	2
7	62-154	1/2NC x 3-1/2" GD5 Cap Screw	4	22	7404-33-0A	Depth Stop Striker Weldment	1
8	62-432	5/16NC x 1" GD5 Cap Screw	1	23	7404-37-1	Outer Crank Support	1
9	62-536	5/16NC x 1-1/4" GD5 Cap Screw	2	24	7404-37-2	Inner Crank Support	1
10	62-562	3/8NC x 4-1/2" GD5 Cap Screw	2	25	7404-37-3A	Crank	1
11	63-134	3/8NC Nylon-Top Lock Nut	4	26	7404-37-4A	Depth Bar	1
12	63-135	5/16NC Hex Nut	3	27	7404-38-0	Pin Weldment	1
13	63-162	3/4NC Nylon-Top Lock Nut	1	28	7404-43-0	Hydraulic Stop Arm	1
14	64-102	5/16" STD. Flat Washer	2	29	7404-10-0	Rocker Weldment	1
15	64-148	5/16" STD. Lock Washer	3				



CENTER SECTION WALKING BEAM ASSEMBLY



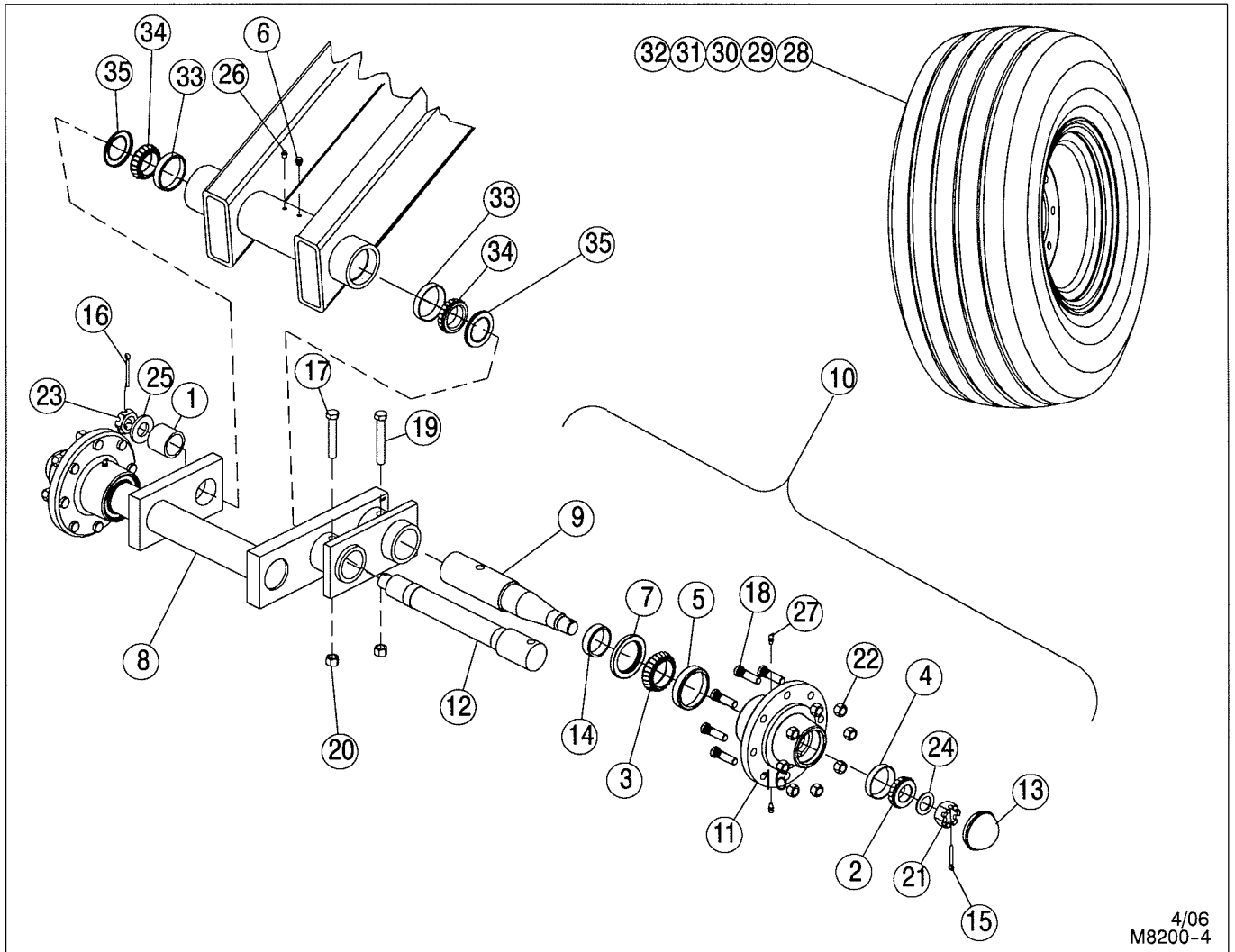
4/06
M8200-2

FOR MODELS - 31' & 34'

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.	
1	4987-54-0	Walking Beam Weldment	1	20	41-210	Cup	2	
2	53-108	Sleeve	2	21	65-100	1/8 x 45 Zerk	1	
3	42-109	Seal	1	22	2490-90-3	Bushing	1	
4	41-114	Cone (Timken #LM-104949)	1	23	64-167	Special Washer	1	
5	41-210	Cup (Timken #LM-104911)	1	24	63-231	1-1/4NF Slotted Hex Nut	1	
6	★ 2490-96-0	Repair Hub	1	25	60-710	1/4"DIA. x 2-1/2" Cotter Pin	1	
7	62-311	Wheel Bolt, 5/8NF x 2-1/4"	8	26	65-117	Pressure Relief Valve	1	
8	65-122	Zerk	2	27	63-208	5/8NF Lug Nut	8	
9	41-208	Cup (Timken #LM48510)	1		2135-84-0	Hub Bearing Repair Kit (Includes Items 3,4, 5, 9, 10)		
10	41-112	Cone (Timken #LM-48548)	1					
11	64-120	1" SAE Flat Washer	1					
12	63-204	1NF Slotted Hex Nut	1					
13	60-702	3/16"DIA. x 1-1/2" Cotter Pin	1					
14	52-302	Hub Cap	1					
15	4987-9-1	Center Spindle	1					
16	62-178	5/8NC x 4"GD5 Cap Screw	1					
17	63-110	5/8NC Lock Nut	1					
18	42-131	Seal	2					
19	41-114	Cone	2					
				★ Includes Items 5, 6, 7, 8, 9, 27				

CENTER SECTION WALKING BEAM



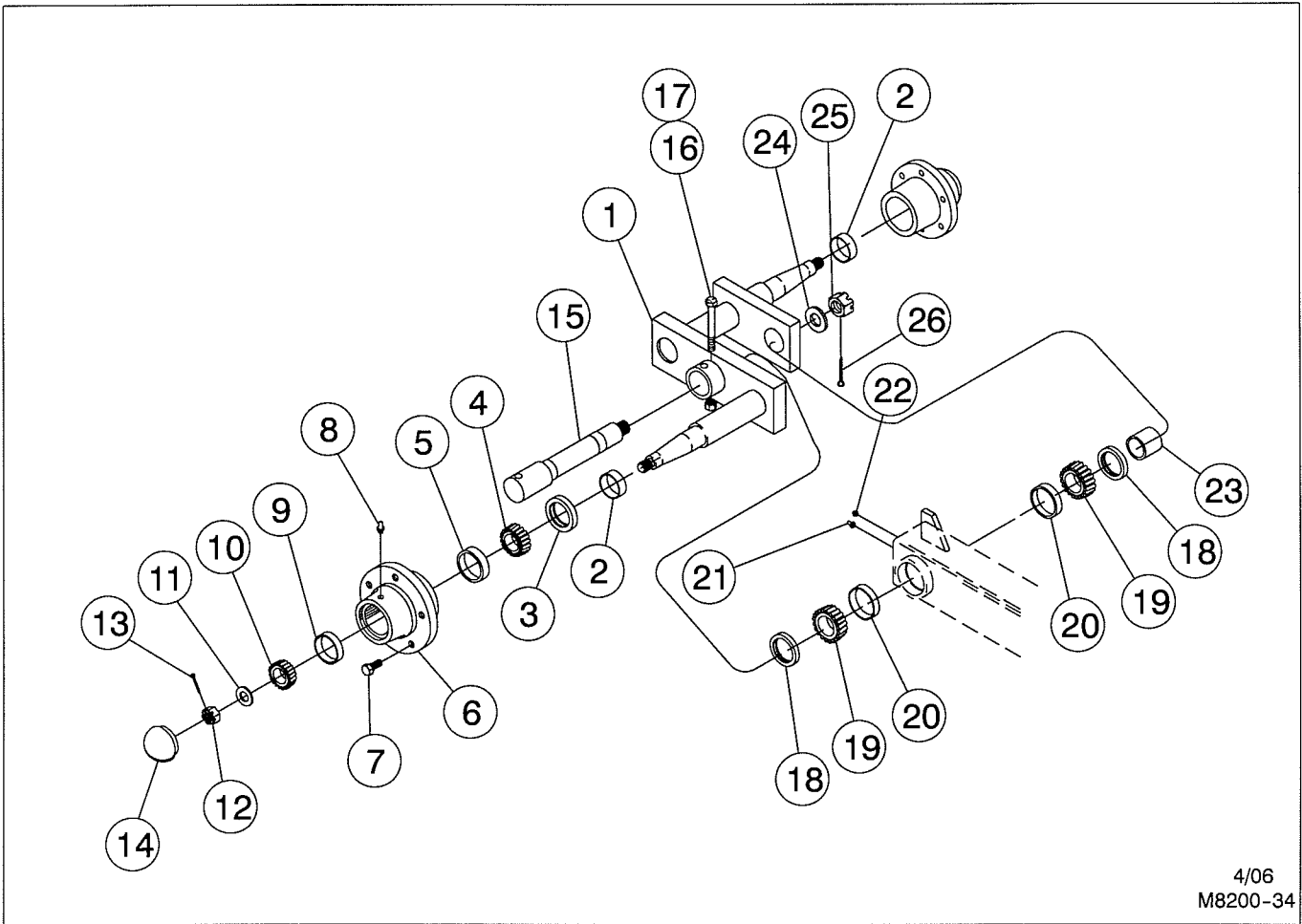
4/06
M8200-4

FOR QUAD-FOLD MODELS - 36' - 38'

8/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	2490-90-3	Bushing	1	19	62-339	5/8NC x 4-1/2" GD5 Cap Screw	1
2	41-123	Cone (Timken #28150)	2	20	63-110	5/8NC Lock Nut	2
3	41-124	Cone (Timken JLM508748)	4	21	63-205	1-1/4NF Slotted Hex Nut	2
4	41-221	Cup (Timken #28300)	2	22	63-208	5/8NF Lug Nut	16
5	41-222	Cup (Timken #LM508710)	4	23	63-231	1-1/4NF Slotted Jam Nut	1
6	65-117	Pressure Relief Valve	1	24	64-138	Special Washer 2 x 1.93 x .125	2
7	42-136	Oil Seal (National 415960)	2	25	64-167	Special Washer 2.5 x 1.93 x .25	1
8	4850-8054-0	Walking Beam Weldment	1	26	65-101	1/8" STD. Zerk	1
9	4850-8056-0	Spindle Assembly (Includes #14)	1	27	65-122	1/4 x 65° Spin Drive Zerk	4
10	4850-8058-0	Heavy Hub & Spindle Assembly	1	28	1000-12540-01	Wheel Assembly	2
11	★ 4881-1096-0	8-Bolt Hub	2	29	51-132	Tire 12.L x 15 FI Load Ranger F	1
12	4987-9-1	Pivot Spindle	1	30	52-114	Wheel 15 x 10 8-Bolt	1
13	52-302	Hub Cap	2	31	51-107	Valve Stem	1
14	53-174	Wear Sleeve 2.75od x 2.36id x .75	2	32	74-109	Decal Caution Wheel Bolts	1
15	60-708	Cotter Pin 1/4"D x 1-3/4"	2	33	41-210	Cup (Timken #LM104911)	2
16	60-710	Cotter Pin 1/4" D x 2-1/2"	1	34	41-114	Cone (Timken #LM104944)	2
17	62-178	5/8NC x 4" GD5 Cap Screw	1	35	42-131	Seal (Clark #CY-LM104911)	2
18	62-311	5/8NF x 2-1/4" Wheel Bolt	16	★ Includes Items 4, 5, 18, 22, 27			

WING SECTION WALKING BEAM ASSEMBLY



4/06
M8200-34

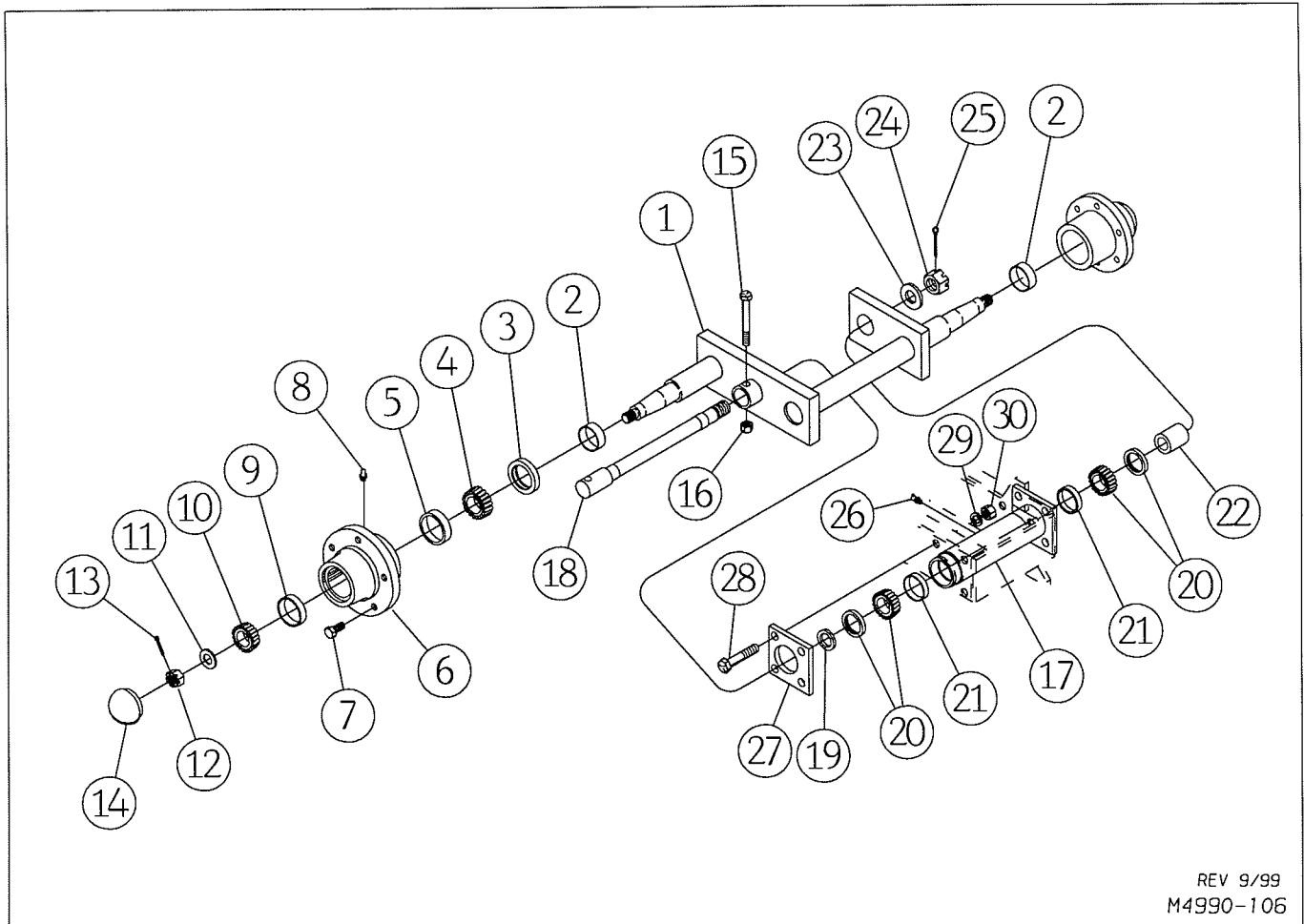
FOR QUAD-FOLD MODELS - 36' & 38'

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	7404-58-0	Walking Beam Weldment	1	20	41-210	Cup	2
2	53-108	Wear Sleeve	2	21	65-100	1/8 x 45 Zerk	1
3	42-109	Seal	1	22	65-117	Pressure Relief	1
4	41-114	Cone	1	23	2490-90-3	Bushing	1
5	41-210	Cup	1	24	64-167	Special Washer	1
6	★ 2135-14-0A	Repair Hub Assembly	1	25	63-231	1-1/4NF Slotted Hex Nut	1
7	62-295	Wheel Bolt	6	26	60-710	1/4"DIA. x 2-1/2" Cotter Pin	1
8	65-122	1/4 x 65 Drive Zerk	2		2135-84-0	Hub Bearing Repair Kit (Includes Items 3,4,5,9 and 10)	
9	41-208	Cup	1				
10	41-112	Cone	1				
11	64-120	1" SAE Flat Washer	1				
12	63-204	1NF Slotted Hex Nut	1				
13	60-702	3/16"DIA. x 1-1/2" Cotter Pin	1				
14	52-302	Hub Cap	1				
15	7404-7-1	Center Spindle	1				
16	62-178	5/8NC x 4" GD5 Cap Screw	1				
17	63-110	5/8NC Lock Nut	1				
18	42-131	Seal	2				
19	41-114	Cone	2				

★ Repair Hub includes Items 5, 6, 7, 8, 9

WING SECTION WALKING BEAM ASSEMBLY



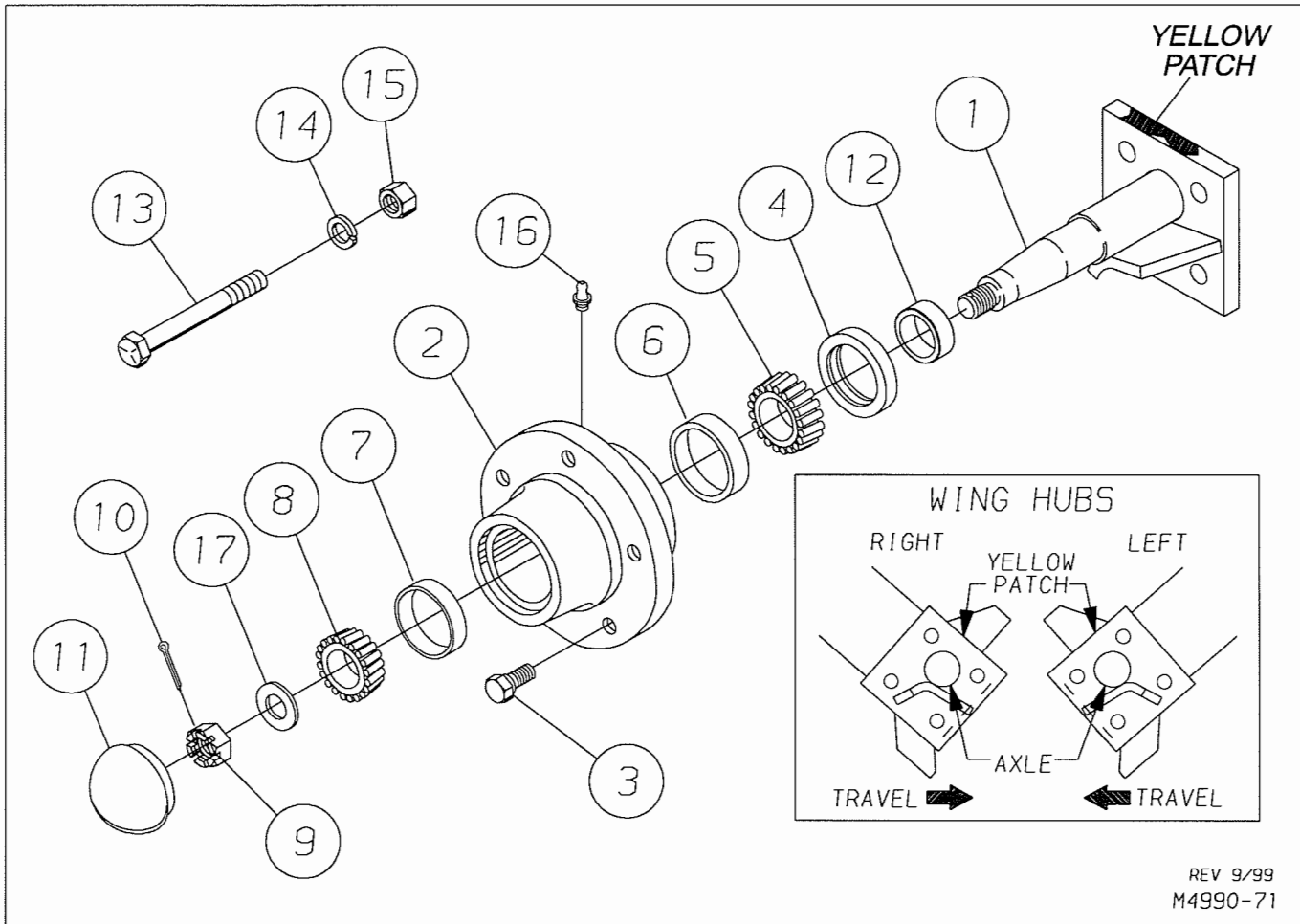
REV 9/99
M4990-106

FOR MODELS - 31' - 34'

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	4987-49-0	Walking Beam Weldment	1	19	4218-13-3	Special Washer	1
2	53-105	Wear Sleeve	2	20	41-121	Cone Assembly	2
3	42-108	Seal	1	21	41-208	Cup	2
4	41-113	Cone	1	22	4987-29-2	Bushing	1
5	41-209	Cup	1	23	64-167	Special Washer	1
6	★ 1918-14-0A	Repair Hub Assembly	1	24	63-231	1-1/4NF Slotted Hex Nut	1
7	62-295	Wheel Bolt	6	25	60-710	1/4"DIA. x 2-1/2" Cotter Pin	1
8	65-122	1/4 x 65 Drive Zerk	2	26	65-100	1/8 x 45 Zerk	1
9	41-208	Cup	1	27	4987-53-2	Plate	1
10	41-112	Cone	1	28	62-201	3/4NC x 4" GD5 Cap Screw	8
11	64-120	1" SAE Flat Washer	1	29	64-112	3/4" STD. Lock Washer	8
12	63-204	1NF Slotted Hex Nut	1	30	63-112	3/4NC Hex Nut	8
13	60-702	3/16"DIA. x 1-1/2" Cotter Pin	1				
14	52-302	Hub Cap	1				
15	62-409	5/8NC x 3" GD5 Cap Screw	1	★ Repair Hub includes Items 5, 6, 7, 8 & 9			
16	63-110	5/8NC Lock Nut	1				
17	4987-53-0	Walking Beam Hub	1				
18	4987-29-1	Pivot Spindle	1				

WING HUB ASSEMBLY



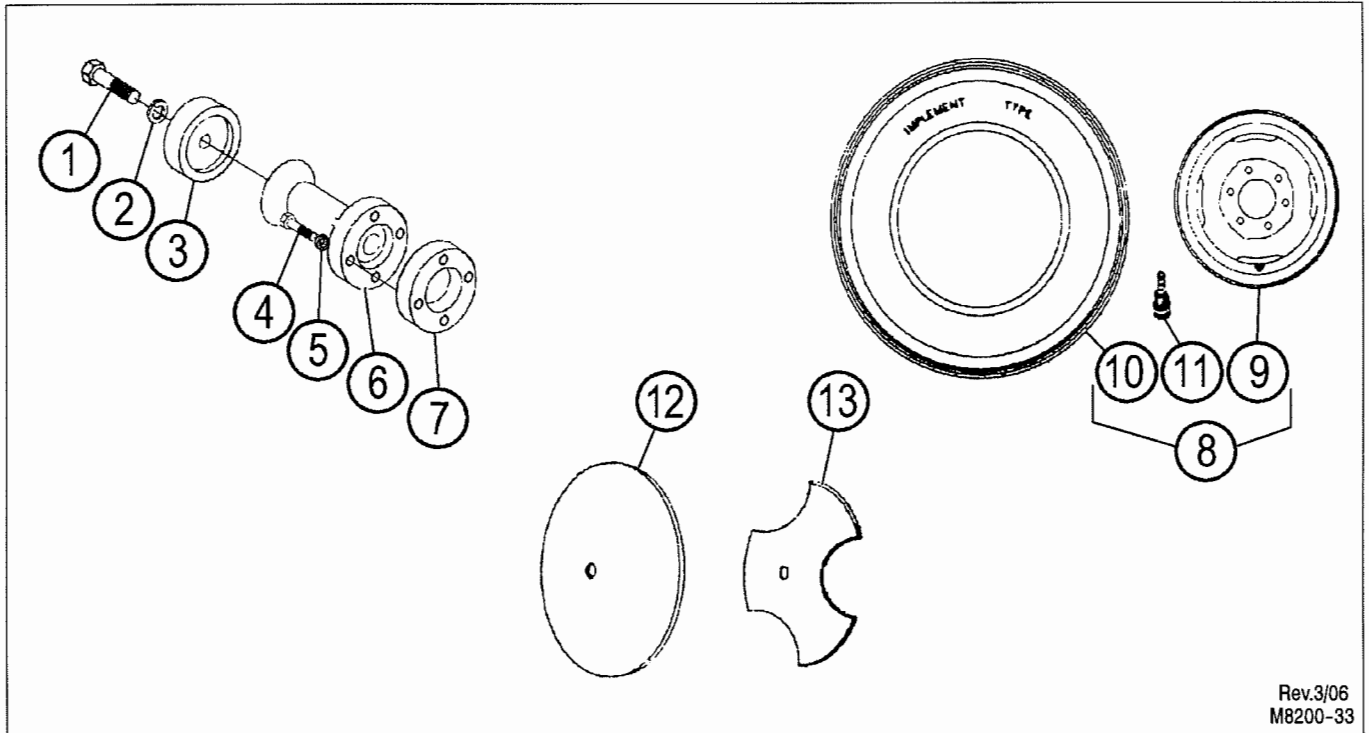
REV 9/99
M4990-71

FOR MODELS - 31'-34'

8/06

Item	Part Number	Part Description	Qty.
	1918-17-0	Hub & Spindle Assembly	1
1	1918-15-0	Repair Spindle and Sleeve Assembly (Includes Items 1 & 12)	
2	1918-14-0A	Repair Hub Assembly (Includes Items 2, 3, 6, 7 & 16)	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 Hex 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 Sleeve	1
13	★ 62-201	3/4NC x 4" GD5 Cap Screw	4
14	★ 64-112	3/4" STD. Lock Washer	8
15	★ 63-112	3/4NC Hex Nut	8
16	65-122	1/4" x 65° Drive Zerk	2
17	64-120	1" SAE Flat Washer	1
	1918-84-0	Hub Bearing Repair Kit (Includes Items 4,5,6,7,8)	
★ Not part of Hub Assembly			

DISC BLADES, WHEELS & TIRES



Rev.3/06
M8200-33

FOR MODELS - 8200

4/06

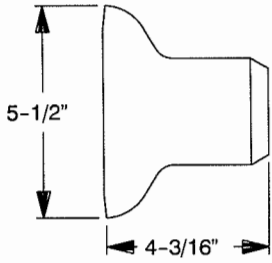
Item	Part Number	Part Description	Qty.
1	62-195	3/4NC x 2-1/2" GD5 Cap Screw	1
2	64-112	3/4" STD. Lock Washer	1
3	7404-0-35	Spool Washer	1
4	62-372	1/2NC x 2-1/2" GD5 Cap Screw	4
5	64-107	1/2" STD. Lock Washer	4
6	7404-0-34	Extension Spool	1
7	7404-0-37	Spacer	
8	1000-10580-0	Wheel and Tire Assembly -- Wing	1
9	52-103	Wheel - 15" x 10" 6-Bolt	1
10	51-103	Tire - 10.00 x 15, 8-Ply	1
11	51-107	#415 Valve Stem	1
12	30-240	Disc Blade 22" 6 Ga. Plain Sharp 225017Com-PS	
	30-241	Disc Blade 22" 1/4" Plain Sharp 226517Com-PS	
	30-243	Disc Blade 24" 6 Ga. Plain Sharp 245017Com-PS	
	30-220	Disc Blade 24" 1/4" Plain Sharp 246517Com-PS	
	30-225	Disc Blade 20" 6 Ga. Plain Sharp 205017Com-PS	
	30-235	Disc Blade 18" 7 Ga. Plain Sharp 184517Com-PS	
13	30-148	Disc Blade 16" 7 Ga. Cut Out 164511-NS	
	30-147	Disc Blade 18" 7 Ga. Cut Out 184511-NS	

SPACER SPOOLS

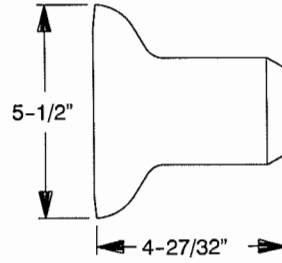
3/06
M8200-30

8" SPACING

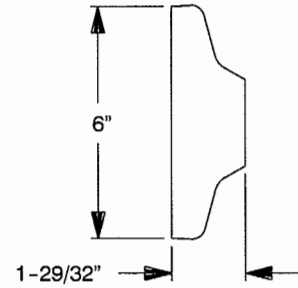
9-1/8" SPACING



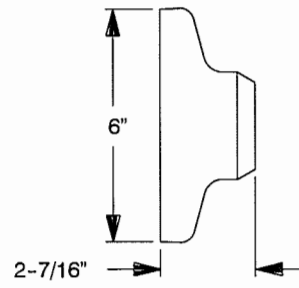
7404-0-30 LONG HALF SPOOL



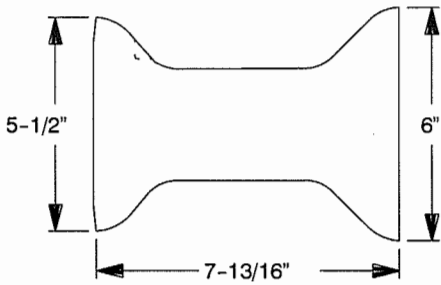
7404-0-33 LONG HALF SPOOL



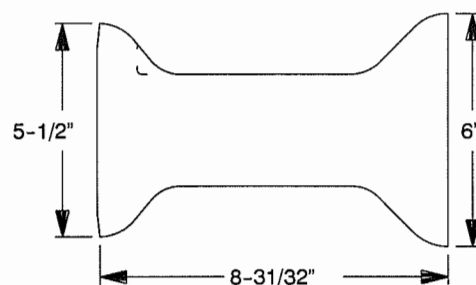
7404-0-29 SHORT HALF SPOOL



7404-0-32 SHORT HALF SPOOL

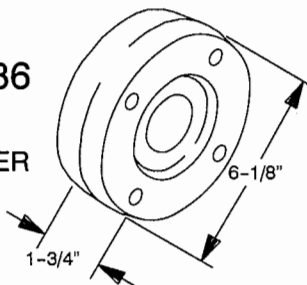


7404-0-28 DUCTILE SPACER SPOOL



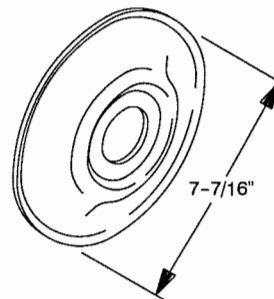
7404-0-31 CAST SPACER SPOOL

7404-0-36
LARGE
END WASHER

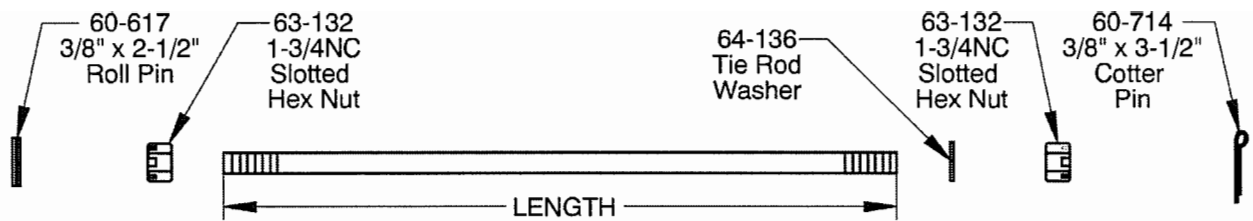


END WASHERS
ALL MODELS

45-107
END WASHER



M8200-30

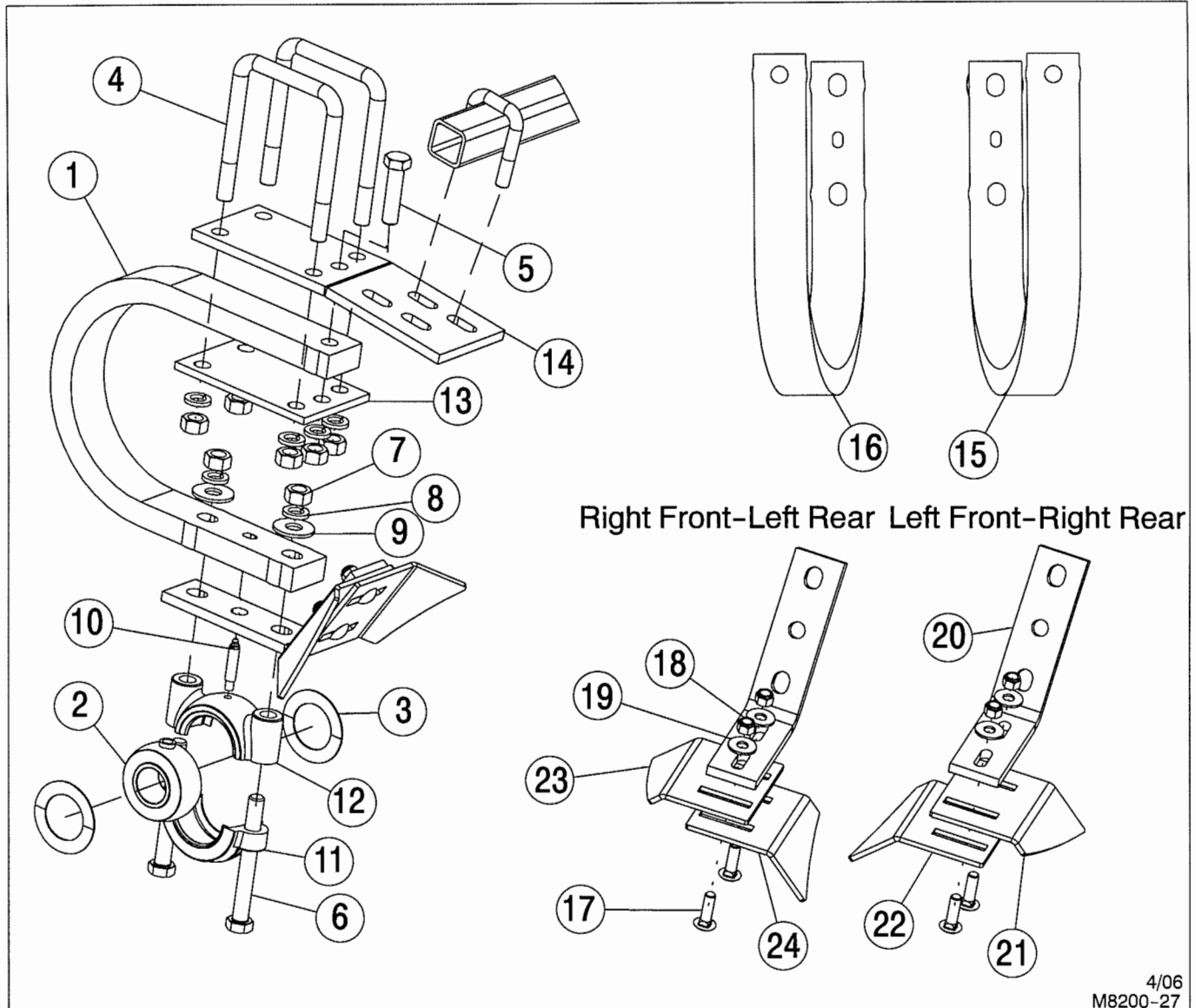


MODEL	LOCATION	Length for 1/4" Blades	DISC SPACING	QTY. DISC	ALLOY TIE ROD	
8200-31N	Center	Front	78-1/2"	8"	10	4995-0-6
		Rear	70-1/2"	8"	9	4995-0-5
	Wing	Front Inside	54-5/8"	8"	7	4995-0-2
		Front Outside	54-5/8"	8"	7	4995-0-2
		Rear Inside	62-5/8"	8"	8	4995-0-4
		Rear Outside	54-5/8"	8"	7	4995-0-2
8200-31W	Center	Front	79-1/2"	9-1/8"	9	4995-0-7
		Rear	70-1/2"	9-1/8"	8	4995-0-5
	Wing	Front Inside	52-1/8"	9-1/8"	6	4995-0-1
		Front Outside	52-1/8"	9-1/8"	6	4995-0-1
		Rear Inside	52-1/8"	9-1/8"	6	4995-0-1
		Rear Outside	61-3/8"	9-1/8"	7	4995-0-3
8200-34N	Center	Front	78-1/2"	8"	10	4995-0-6
		Rear	70-1/2"	8"	9	4995-0-5
	Wing	Front Inside	62-5/8"	8"	8	4995-0-4
		Front Outside	62-5/8"	8"	8	4995-0-4
		Rear Inside	62-5/8"	8"	8	4995-0-4
		Rear Outside	70-1/2"	8"	9	4995-0-5
8200-34W	Center	Front	79-1/2"	9-1/8"	9	4995-0-7
		Rear	70-1/2"	9-1/8"	8	4995-0-5
	Wing	Front Inside	52-1/8"	9-1/8"	6	4995-0-1
		Front Outside	70-1/2"	9-1/8"	8	4995-0-5
		Rear Inside	61-3/8"	9-1/8"	7	4995-0-3
		Rear Outside	70-1/2"	9-1/8"	8	4995-0-5
8200-36NQF	Center	Front	78-1/2"	8"	10	4995-0-6
		Rear	70-1/2"	8"	9	4995-0-5
	Wing	Front Inside	86-1/2"	8"	11	1541-20-1
		Front Outside	54-5/8"	8"	7	4995-0-2
		Rear Inside	86-1/2"	8"	11	1541-20-1
		Rear Outside	62-5/8"	8"	8	4995-0-4
8200-36WQF	Center	Front	79-1/2"	9-1/8"	9	4995-0-7
		Rear	70-1/2"	9-1/8"	8	4995-0-5
	Wing	Front Inside	79-1/2"	9-1/8"	9	4995-0-7
		Front Outside	52-1/8"	9-1/8"	6	4995-0-1
		Rear Inside	79-1/2"	9-1/8"	9	4995-0-7
		Rear Outside	61-3/8"	9-1/8"	7	4995-0-3
8200-38NQF	Center	Front	78-1/2"	8"	10	4995-0-6
		Rear	70-1/2"	8"	9	4995-0-5
	Wing	Front Inside	86-1/2"	8"	11	1541-20-1
		Front Outside	62-5/8"	8"	8	4995-0-4
		Rear Inside	86-1/2"	8"	11	1541-20-1
		Rear Outside	70-1/2"	8"	9	4995-0-5
8200-38WQF	Center	Front	79-1/2"	9-1/8"	9	4995-0-7
		Rear	70-1/2"	9-1/8"	8	4995-0-5
	Wing	Front Inside	79-1/2"	9-1/8"	9	4995-0-7
		Front Outside	70-1/2"	9-1/8"	8	4995-0-5
		Rear Inside	79-1/2"	9-1/8"	9	4995-0-7
		Rear Outside	79-1/2"	9-1/8"	9	4995-0-7

8200 DISC GANG SCRAPER BARS

MODEL	LOCATION	DISC SPACING	QTY. DISC	LENGTH	SCRAPER BAR #	
8200-31N	Center	Front	8"	10	83"	2008-1-83B
		Rear	8"	9	62-1/2"	2008-1-625B
	Wing	Front Inside	8"	7	53-1/2"	4850-1-535
		Front Outside	8"	7	46-1/2"	2008-1-465B
		Rear Inside	8"	8	62-1/2"	2008-1-625B
		Rear Outside	8"	7 + EXT	62-1/2"	2008-1-625B
8200-31W	Center	Front	9-1/8"	9	83"	2008-1-83B
		Rear	9-1/8"	8	62-1/2"	2008-1-625B
	Wing	Front Inside	9-1/8"	6	53-1/2"	4850-1-535
		Front Outside	9-1/8"	6	46-1/2"	2008-1-465B
		Rear Inside	9-1/8"	6	53-1/2"	4850-1-535
		Rear Outside	9-1/8"	7 + EXT	70-1/2"	4850-1-705
8200-34N	Center	Front	8"	10	83"	2008-1-83B
		Rear	8"	9	62-1/2"	2008-1-625B
	Wing	Front Inside	8"	8	62-1/2"	2008-1-625B
		Front Outside	8"	8	53-1/2"	4850-1-535
		Rear Inside	8"	8	62-1/2"	2008-1-625B
		Rear Outside	8"	9 + EXT	79-1/2"	2008-1-795B
8200-34W	Center	Front	9-1/8"	9	83"	2008-1-83B
		Rear	9-1/8"	8	62-1/2"	2008-1-625B
	Wing	Front Inside	9-1/8"	6	53-1/2"	4850-1-535
		Front Outside	9-1/8"	8	62-1/2"	2008-1-625B
		Rear Inside	9-1/8"	7	62-1/2"	2008-1-625B
		Rear Outside	9-1/8"	8 + EXT	79-1/2"	2008-1-795B
8200-36NQF	Center	Front	8"	10	83"	2008-1-83B
		Rear	8"	9	62-1/2"	2008-1-625B
	Wing	Front Inside	8"	11	87-1/2"	2008-1-875B
		Front Outside	8"	7	46-1/2"	2008-1-465B
		Rear Inside	8"	11	87-1/2"	2008-1-875B
		Rear Outside	8"	8 + EXT	70-1/2"	4850-1-705
8200-36WQF	Center	Front	9-1/8"	9	83"	2008-1-83B
		Rear	9-1/8"	8	62-1/2"	2008-1-625B
	Wing	Front Inside	9-1/8"	9	79-1/2"	2008-1-795B
		Front Outside	9-1/8"	6	46-1/2"	2008-1-465B
		Rear Inside	9-1/8"	9	79-1/2"	2008-1-795B
		Rear Outside	9-1/8"	7 + EXT	70-1/2"	4850-1-705
8200-38NQF	Center	Front	8"	10	83"	2008-1-83B
		Rear	8"	9	62-1/2"	2008-1-625B
	Wing	Front Inside	8"	11	87-1/2"	2008-1-875B
		Front Outside	8"	8	53-1/2"	4850-1-535
		Rear Inside	8"	11	87-1/2"	2008-1-875B
		Rear Outside	8"	9 + EXT	79-1/2"	2008-1-795B
8200-38WQF	Center	Front	9-1/8"	9	83"	2008-1-83B
		Rear	9-1/8"	8	62-1/2"	2008-1-625B
	Wing	Front Inside	9-1/8"	9	79-1/2"	2008-1-795B
		Front Outside	9-1/8"	8	62-1/2"	2008-1-625B
		Rear Inside	9-1/8"	9	79-1/2"	2008-1-795B
		Rear Outside	9-1/8"	9 + EXT	87-1/2"	2008-1-875B

ROCK FLEX BEARING ARM ASSEMBLY



4/06
M8200-27

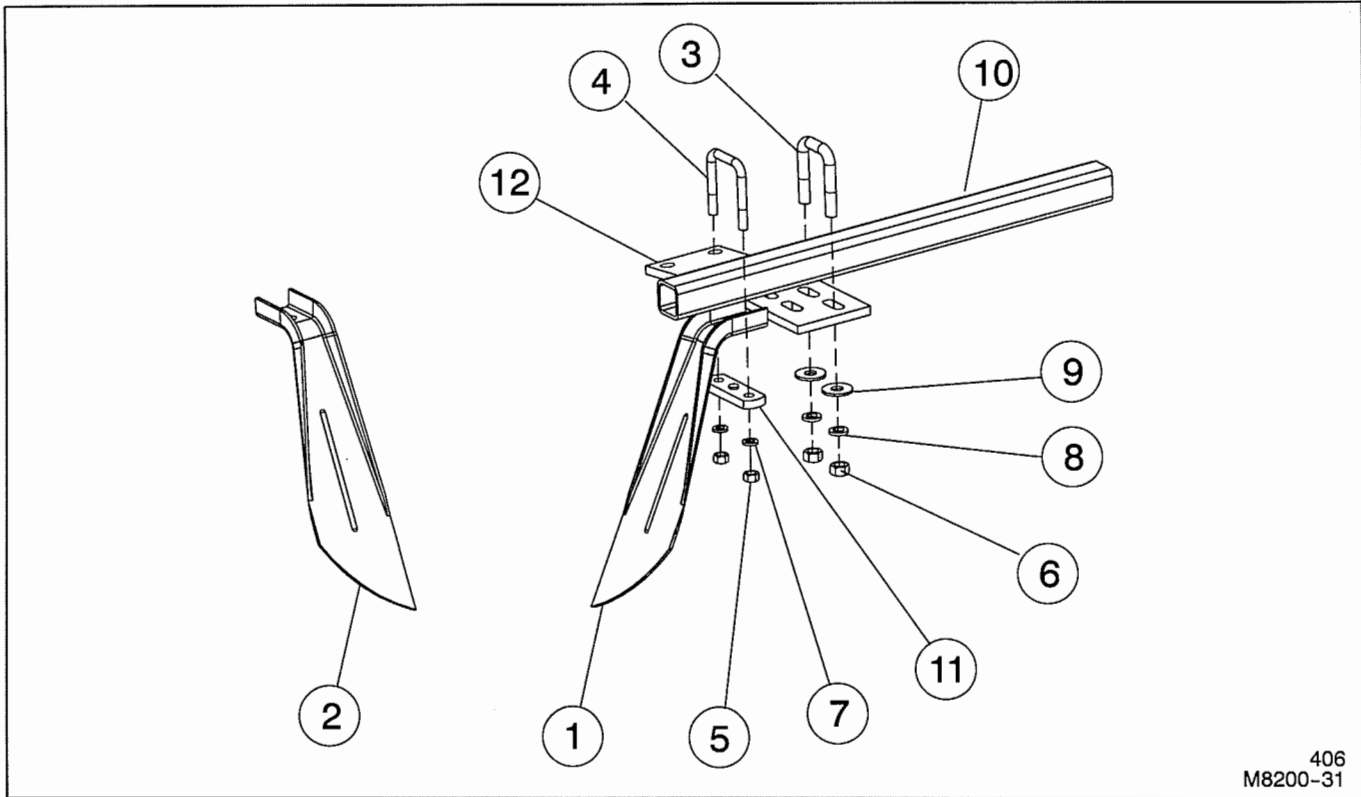
FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	31-210	Rock Flex Bearing Arm	*	16	31-212	RH Disc Harrow C-Arm	*
2	40-167	Bearing Assembly	1	17	62-139	1/2NC x 1-3/4" GD5 Carriage Bolt	2
3	45-105	Side Ring	2	18	63-108	1/2NC Nylon-Top Lock Nut	2
4	61-264	U-Bolt, .75D x 5.06W x 6.88L	2	19	64-108	1/2" STD Flat Washer	2
5	62-197	3/4NC x 3" GD5 Cap Screw	1	20	4950-185-1A	Scraper Bracket	1
6	62-213	3/4NC x 6-1/2" GD5 Cap Screw	2	21	4950-185-2A	Left Convex Scraper Blade	1
7	63-112	3/4NC Hex Nut	7	22	4950-185-3A	Left Concave Scraper Blade	1
8	64-112	3/4" STD Lock Washer	7	23	4950-186-2A	Right Convex Scraper Blade	1
9	64-113	3/4" STD Flat Washer	2	24	4950-186-3A	Right Concave Scraper Blade	1
10	65-123	1/8 x 2-5/32 Grease Zerk	1				
11	4850-10-1	Lower Bearing Housing	1				
12	4850-10-2	Upper Bearing Housing	1				
13	7404-0-27	Bolt Plate	1				
14	7404-0-6	Scraper Tube Bracket	1				
15	31-211	LH Disc Harrow C-Arm	*				

* Specify Quantity required

RIGID SCRAPERS



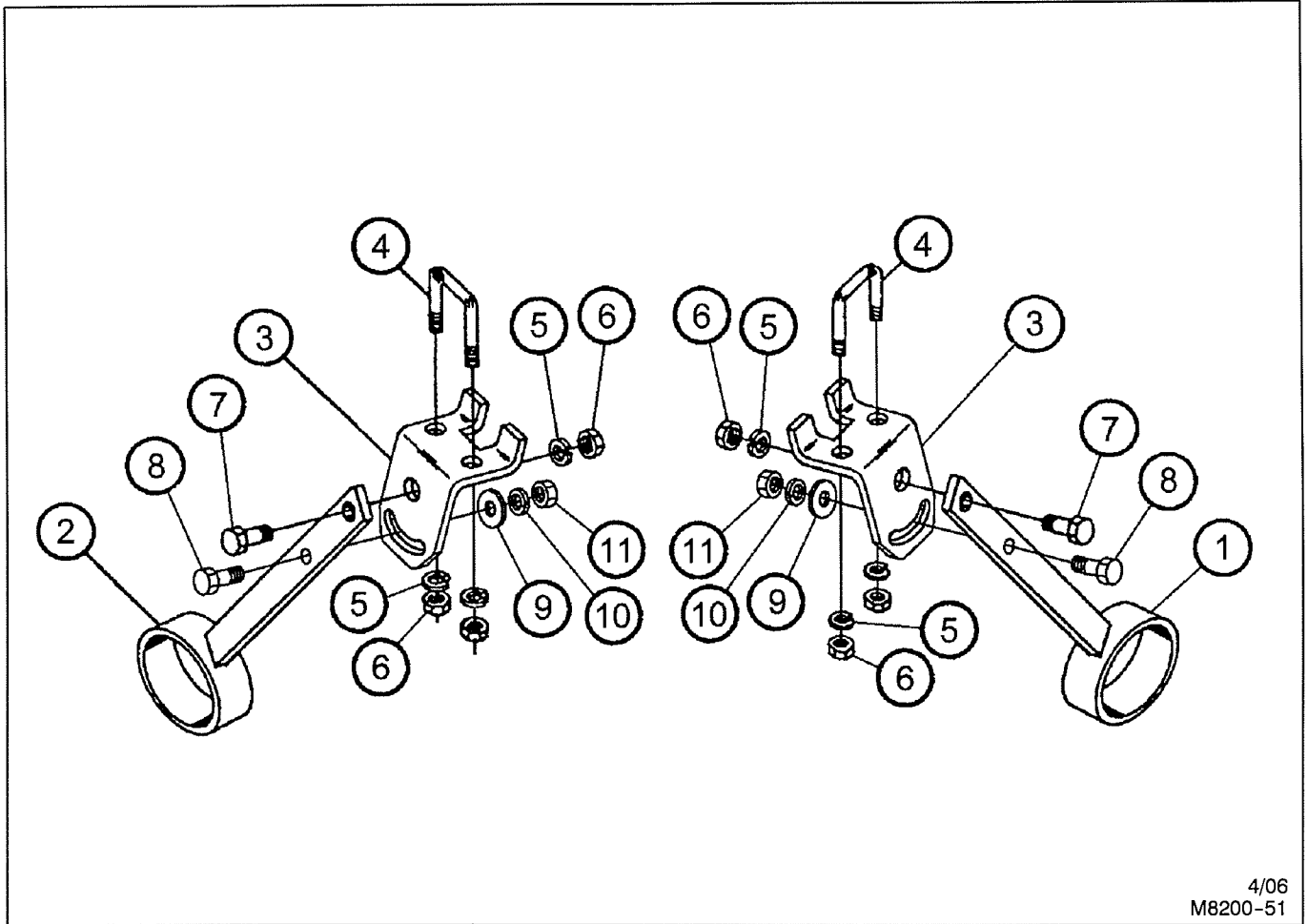
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M8200-31

FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.
1	32-120	5" RF / LR Scraper	1
2	32-121	5" LF / RR Scraper	1
3	61-119	U-Bolt, 5/8"DIA x 2-1/16"W x 3-9/16"L	1
4	61-141	U-Bolt, 1/2"DIA x 2-9/16"W x 3-5/8"L	1
5	63-106	1/2NC Hex Nut	2
6	63-109	5/8NC Hex Nut	2
7	64-107	1/2" STD Lock Washer	2
8	64-109	5/8" STD Lock Washer	2
9	64-110	5/8" STD Flat Washer	2
10	★ 2008-1-465B	Scraper Bar (46-1/2")	1
	2008-1-625B	Scraper Bar (62-1/2")	1
	2008-1-795B	Scraper Bar (79-1/2")	1
	2008-1-83B	Scraper Bar (83")	1
	2008-1-875B	Scraper Bar (87-1/2")	1
	4850-1-535	Scraper Bar (53-1/2")	1
	4850-1-705	Scraper Bar (70-1/2")	1
11	7404-0-38	Clamp	1
12	7404-0-6	Scraper Tube Bracket	1
★ See placement page for correct scraper bar at each location			

EXTENSION TRASH BAR ASSEMBLIES



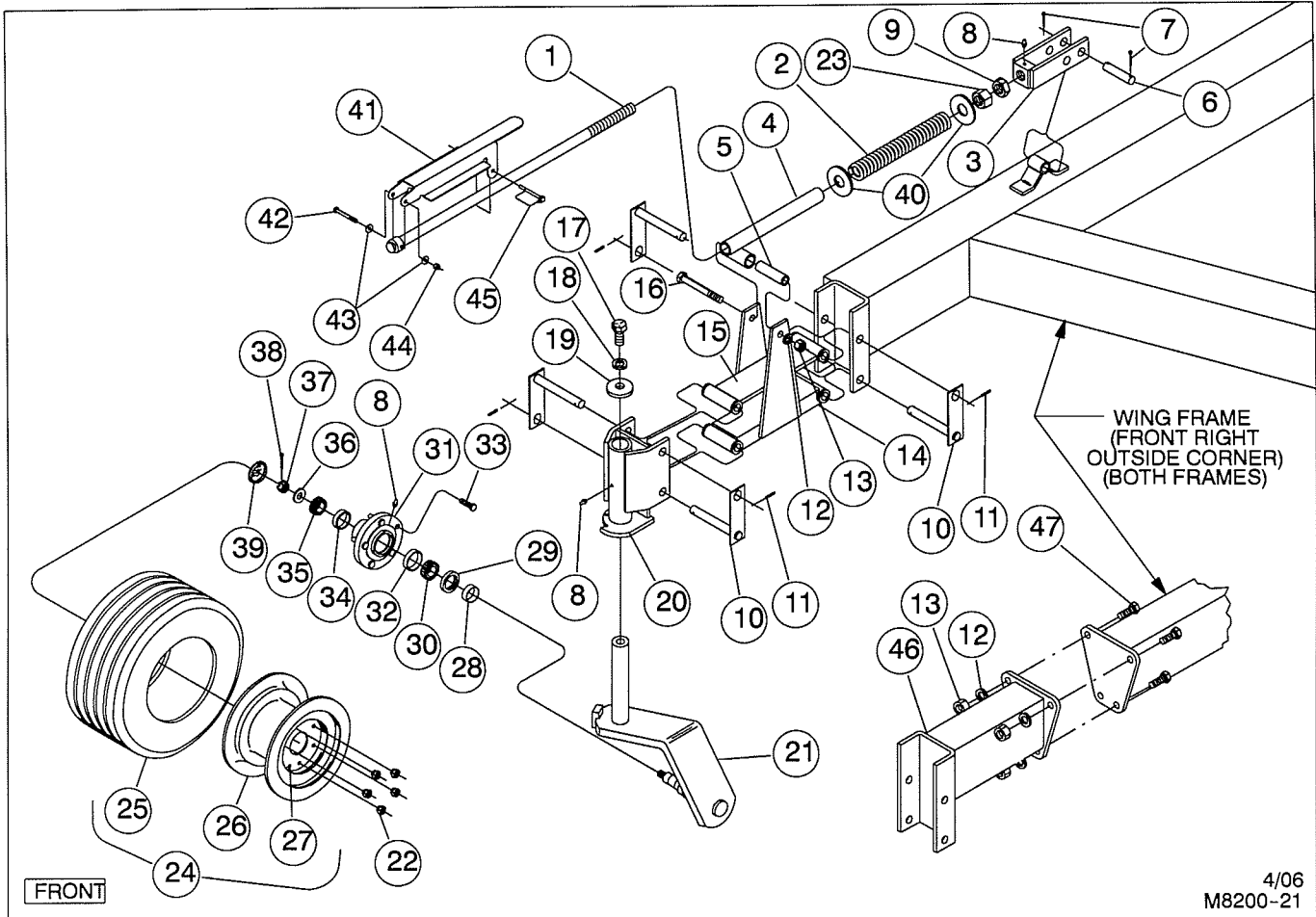
4/06
M8200-51

FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.
1	7404-44-0	Right Extension Trash Bar	1
2	7404-45-0	Left Extension Trash Bar	1
3	7404-41-1	Bracket	1
4	61-119	5/8" DIA. U-Bolt	1
5	64-109	5/8" STD. Lock Washer	3
6	63-109	5/8NC Hex Nut	3
7	62-169	5/8NC x 2"GD5 Cap Screw	1
8	62-414	1/2NC x 1-3/4" GD5 Cap Screw	1
9	64-108	1/2" STD. Flat Washer	1
10	64-107	1/2" STD. Lock Washer	1
11	63-106	1/2NC Hex Nut	1

GAUGE WHEEL ASSEMBLY -- ACCESSORY



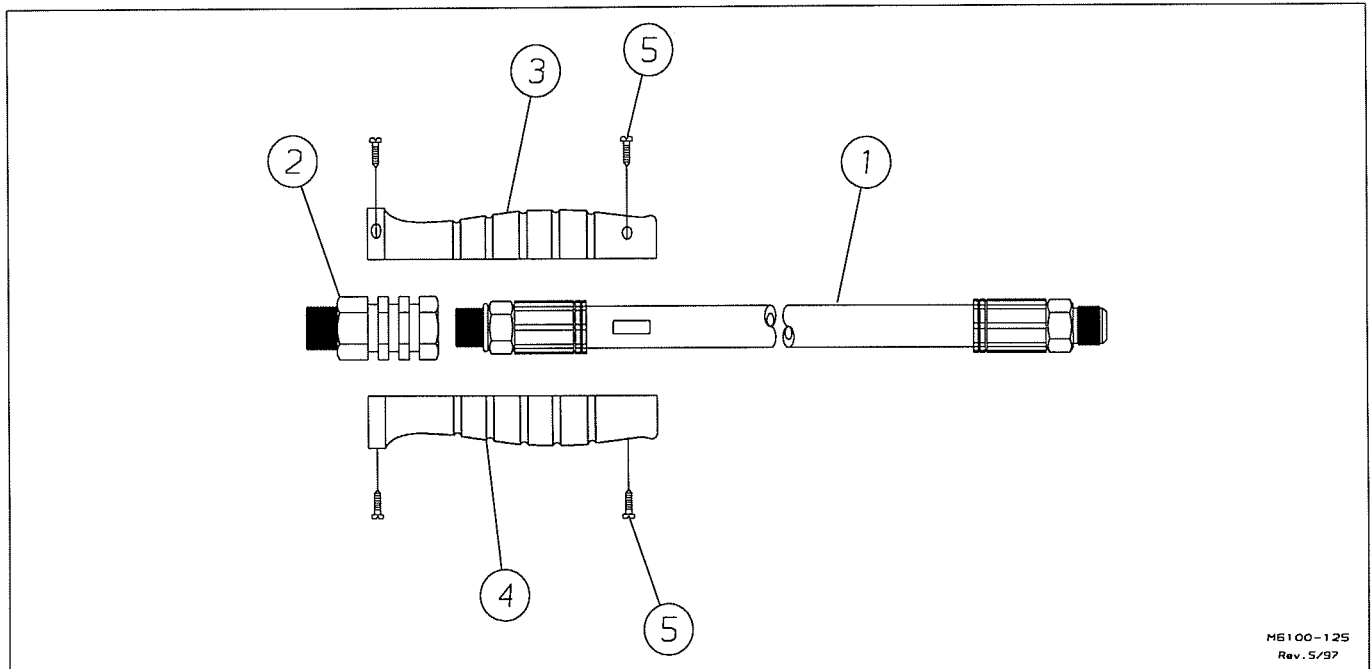
4/06
M8200-21

FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	70-223	Adjustment Screw Weldment	1	24	1000-81066-0	Wheel Assm (Includes ★Items)	1
2	5630-402-1	Spring - Painted	1	25	★ 51-121	20.5 x 8-10 Tire	1
3	5630-115-0	Link End Weldment	1	26	★ 52-109	10 x 6 Wheel	1
4	5630-116-0	Trunnion Weldment	1	27	★ 51-120	Valve Stem	1
5	5630-0-13	1-1/4" x 4-1/8" Sleeve	1	28	53-111	Wear Sleeve, 2" od x 1-7/8" id x 5/8"	1
6	4226-0-8	Clevis Pin	1	29	42-115	Seal	1
7	60-702	3/16" DIA. x 1-1/2" Cotter Pin	2	30	41-112	Cone	1
8	● 65-101	1/8" STD. Zerk	3	31	4990-114-0	Repair Hub (Includes ●Items)	1
9	63-124	1-1/4NC Hex Jam Nut	2	32	● 41-208	Cup	1
10	5630-159-0	Link Pin	4	33	● 62-498	1/2NF x 1-7/8" Wheel Bolt	5
11	60-606	1/4" DIA. x 2" Roll Pin	4	34	● 41-215	Cup	1
12	64-112	3/4" STD. Lock Washer	5	35	41-117	Cone	1
13	63-112	3/4NC Hex Nut	5	36	64-161	3/4" STD Flat Washer, Black	1
14	5630-105-0	Lower Link Weldment	1	37	63-201	3/4NF Slotted Hex Nut	1
15	5630-107-0A	Upper Link Weldment	1	38	60-725	5/32" DIA. x 1-1/2" Cotter Pin	1
16	62-210	3/4NC x 6" GD5 Cap Screw	1	39	52-305	Hub Cap	1
17	62-234	1NC x 2" Cap Screw	1	40	64-127	1-1/4" SAE Flat Washer	2
18	64-118	1" STD. Lock Washer	1	41	5630-402-2	Handle	1
19	770-101-3	Flat Washer	1	42	62-120	3/8NC x 3" GD5 Cap Screw	1
20	5630-98-0	Castor Pivot Weldment	1	43	64-104	3/8" STD Flat Washer	2
21	5630-97-0A	Castor Weldment	1	44	63-134	3/8NC Nylon-Top Lock Nut	1
22	● 63-209	1/2NF Lug Nut	5	45	60-103	P.T.O. Lock Pin	1
23	63-123	1-1/4NC Hex Nut	1	46	7404-86-0	Gauge Wheel Mount (31-34 Ft)	1
				47	62-421	3/4NC x 2" GD5 Cap Screw	4

HYDRAULIC HOSE WITH PLASTIC GRIP ASSEMBLIES



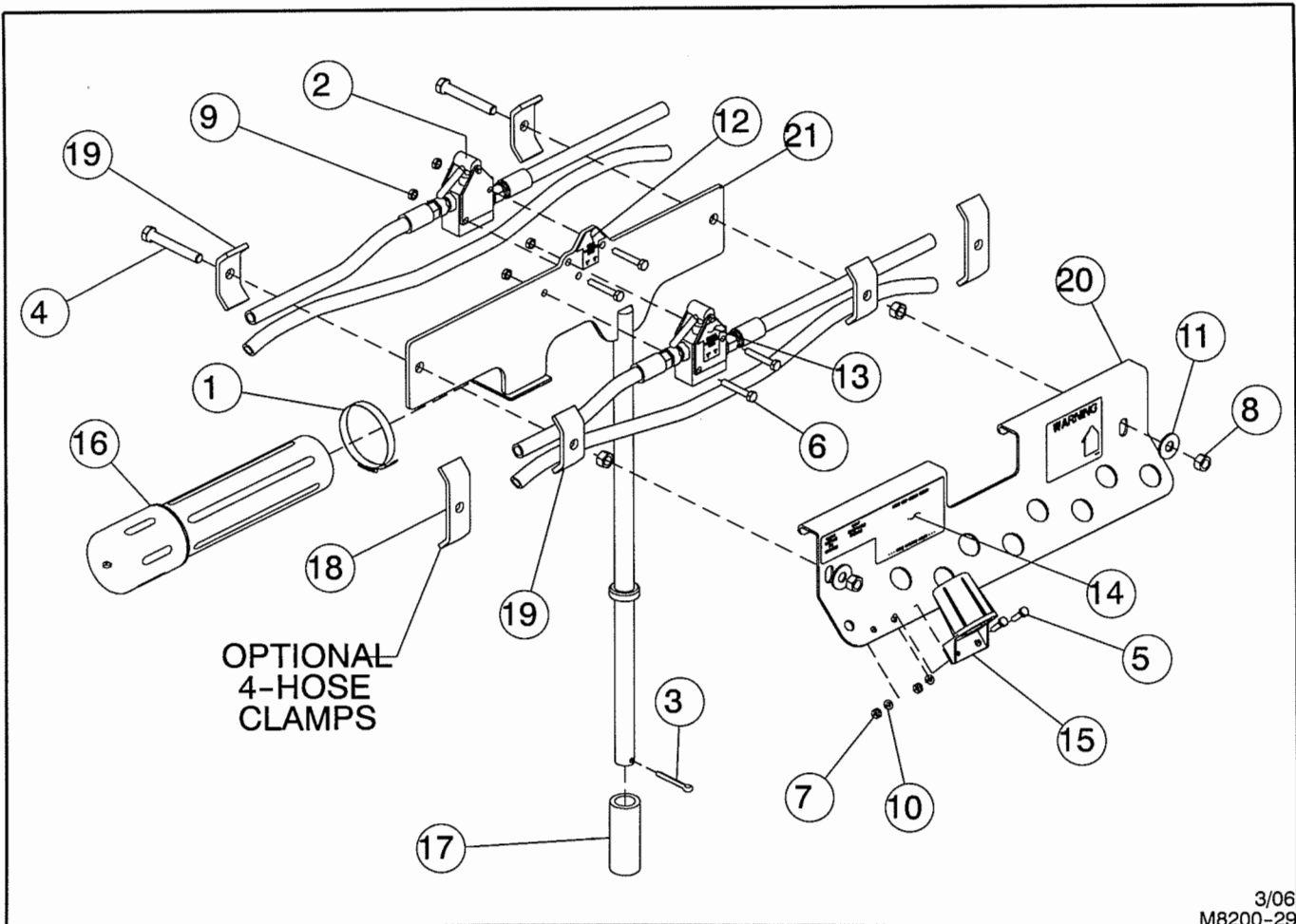
ME100-125
Rev. 5/97

FOR MODELS - ALL

3/05

Item	Part Number	Part Description	Qty.
	4881-71-0	1/2" x 95" 100R2 Hose with Black/Black Grip Assembly	1
1	24-330R	1/2" DIA. x 95" JIC/ORB 100R2 Hose	1
2	25-2295	3/4 ORB to 1/2 NPT Hydraulic Fitting	1
3	25-2291	Hose Grip Half - Black	1
4	25-2291	Hose Grip Half - Black	1
5	62-656	Screw	4
	4881-77-0	1/2" x 95" 100R2 Hose with Red/Black Grip Assembly	1
1	24-330R	1/2" DIA. x 95" JIC/ORB 100R2 Hose	1
2	25-2295	3/4 ORB to 1/2 NPT Hydraulic Fitting	1
3	25-2289	Hose Grip Half - Red	1
4	25-2291	Hose Grip Half - Black	1
5	62-656	Screw	4
	4881-70-0	3/8" x 95" 100R2 Hose with Red/Yellow Grip Assembly	1
1	24-2105R	3/8" DIA. x 95" JIC/ORB 100R2 Hose	1
2	25-2295	3/4 ORB to 1/2 NPT Hydraulic Fitting	1
3	25-2289	Hose Grip - Red	1
4	25-2290	Hose Grip - Yellow	1
5	62-656	Screw	4
	4881-76-0	3/8" x 95" 100R2 Hose with Yellow/Yellow Grip Assembly	1
1	24-2105R	3/8" DIA. x 95" JIC/ORB 100R2 Hose	1
2	25-2295	3/4" ORB to 1/2 NPT Hydraulic Fitting	1
3	25-2290	Hose Grip Half - Yellow	1
4	25-2290	Hose Grip Half - Yellow	1
5	62-656	Screw	4
	4881-72-0	3/8 x 95" 100R2 Hose with Blue/Blue Grip Assembly	1
1	24-2105R	3/8" DIA. x 95" JIC/ORB 100R2 Hose	1
2	25-2295	3/4" ORB to 1/2NPT Hydraulic Fitting	1
3	25-2509	Hose Grip Half - Blue	1
4	25-2509	Hose Grip Half - Blue	1
5	62-656	Screw	4
	4881-73-0	3/8" x 95" 100R2 Hose with Red/Blue Grip Assembly	1
1	24-2105R	3/8" DIA. x 95" JIC/ORB 100R2 Hose	1
2	25-2295	3/4 ORB to 1/2NPT Hydraulic Fitting	1
3	25-2289	Hose Grip Half - Red	1
4	25-2509	Hose Grip Half - Blue	1
5	62-656	Screw	4

HOSE STAND



3/06
M8200-29

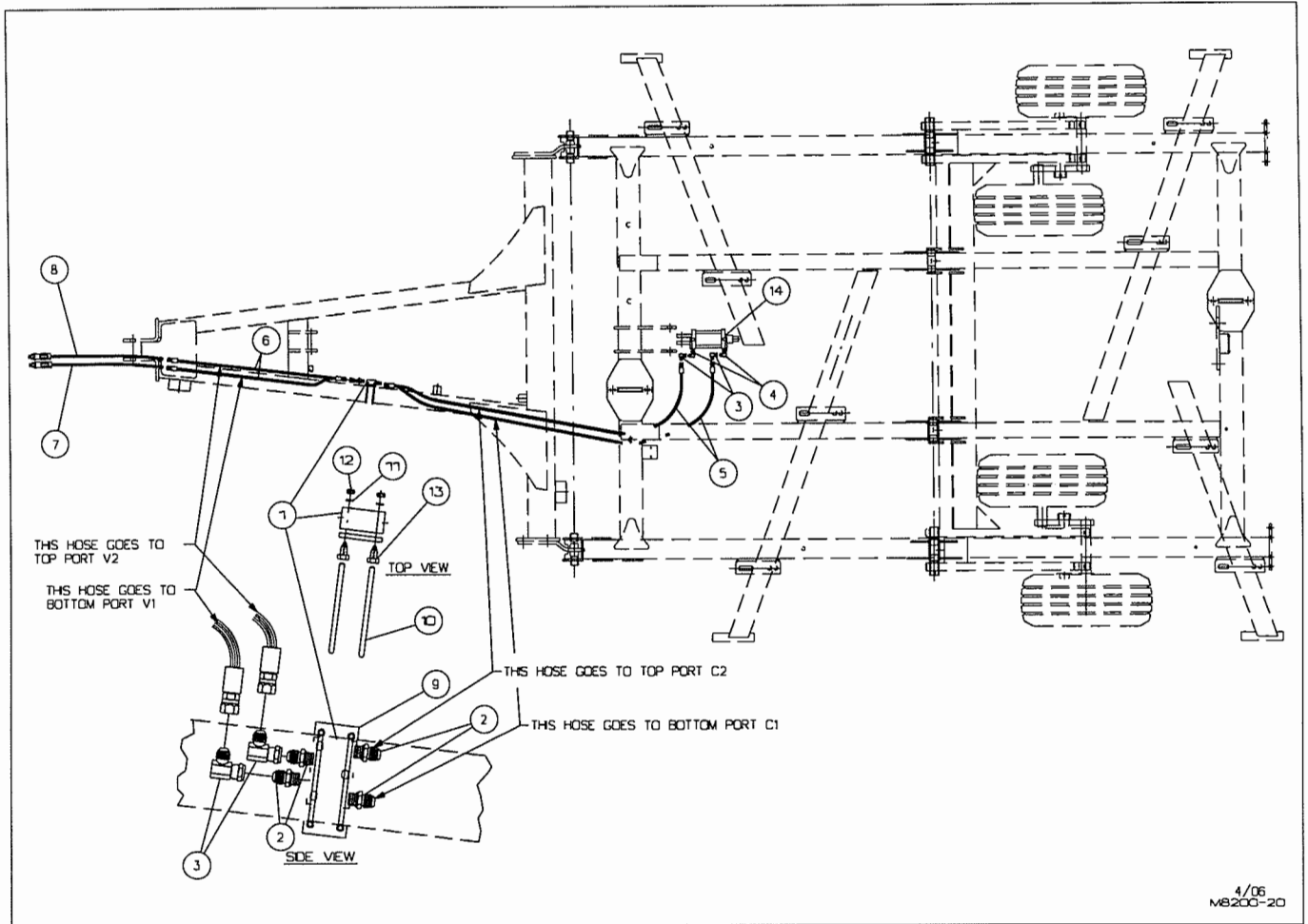
FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.
1	25-1163	Hose Clamp	1
2	25-2272	Manual Check Valve	2
3	60-708	1/4"DIA x 1-3/4" Cotter Pin	1
4	62-154	1/2NC x 3-1/2" GD5 Cap Screw	2
5	62-417	1/4NC x 1" GD5 Cap Screw	2
6	62-792	5/16NC x 2" GD5 Cap Screw	4
7	63-100	1/4NC Hex Nut	2
8	63-106	1/2NC Hex Nut	4
9	63-144	5/16NC Hex Jam Nut (included with valve)	4
10	64-100	1/4" STD Lock Washer	2
11	64-108	1/2" STD Flat Washer	2
12	74-572	Decal - Wing Transport Lock	1
13	74-574	Decal - Wheel Transport Lock	1
14	74-612	Decal - Hose Grip Color Guide	1
15	79-397	Plug Storage Receptacle	1
16	99-218	Manual Tube - Black	1
17	570-0-8	Spacer	1
18	★ 2426-170-5	4 Hose Clamp	Spec.
19	3514-0-2	2 Hose Clamp	Spec.
20	4850-0-28	Hose Cover Plate	1
21	4850-39-0	Hose Stand	1

★ USED FOR OPTIONAL HYDRAULIC LEVELING ONLY

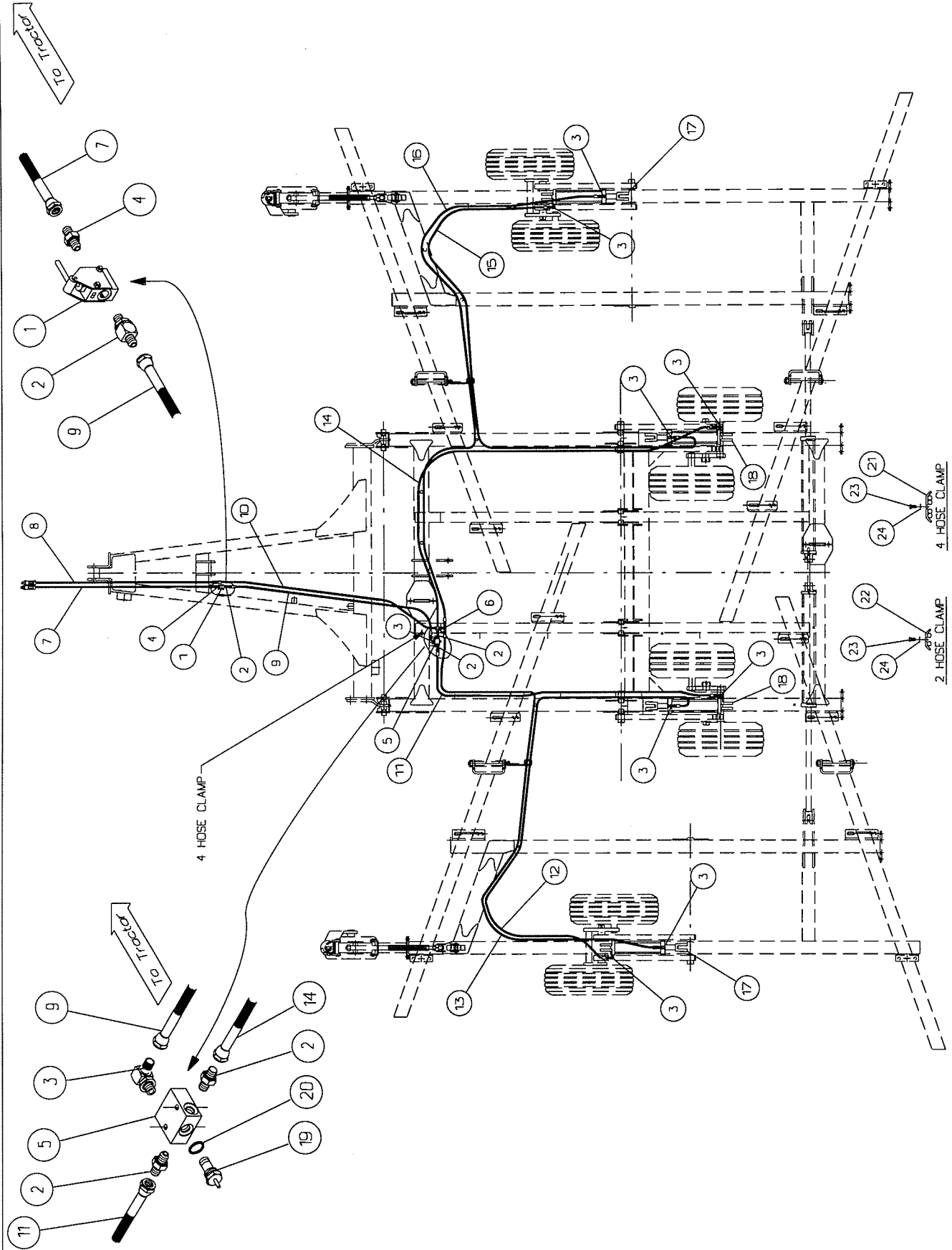
HYDRAULIC DIAGRAM -- LEVELING LINK



FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.
1	25-2278	Lock Valve	1
2	25-328	9/16(M) O-Ring x 3/4(M) JIC Fitting	4
3	25-310	90° Ell (M/F) JIC Fitting	4
4	4956-75-0	90° O-Ring JIC(M) Ell Restrictor Fitting	2
5	24-2106R	Hose Assembly 3/8 x 104	2
6	24-239R	Hose Assembly 3/8 x 46	2
7	4881-73-0	Hose & Red/Blue Grip Assembly 3/8 x 95	1
8	4881-72-0	Hose & Blue/Blue Grip Assembly 3/8 x 95	1
9	6118-0-6	Bolt Plate	1
10	61-251	U-Bolt, .25D x 5.06W x 5.00L	2
11	64-100	1/4 STD Lock Washer	4
12	63-100	1/4NC Hex Nut	4
13	62-510	Hex Thread Cutting Screw	3
14	21-180	4 x 5 Hydraulic Cylinder Assembly w/o Clevis	1

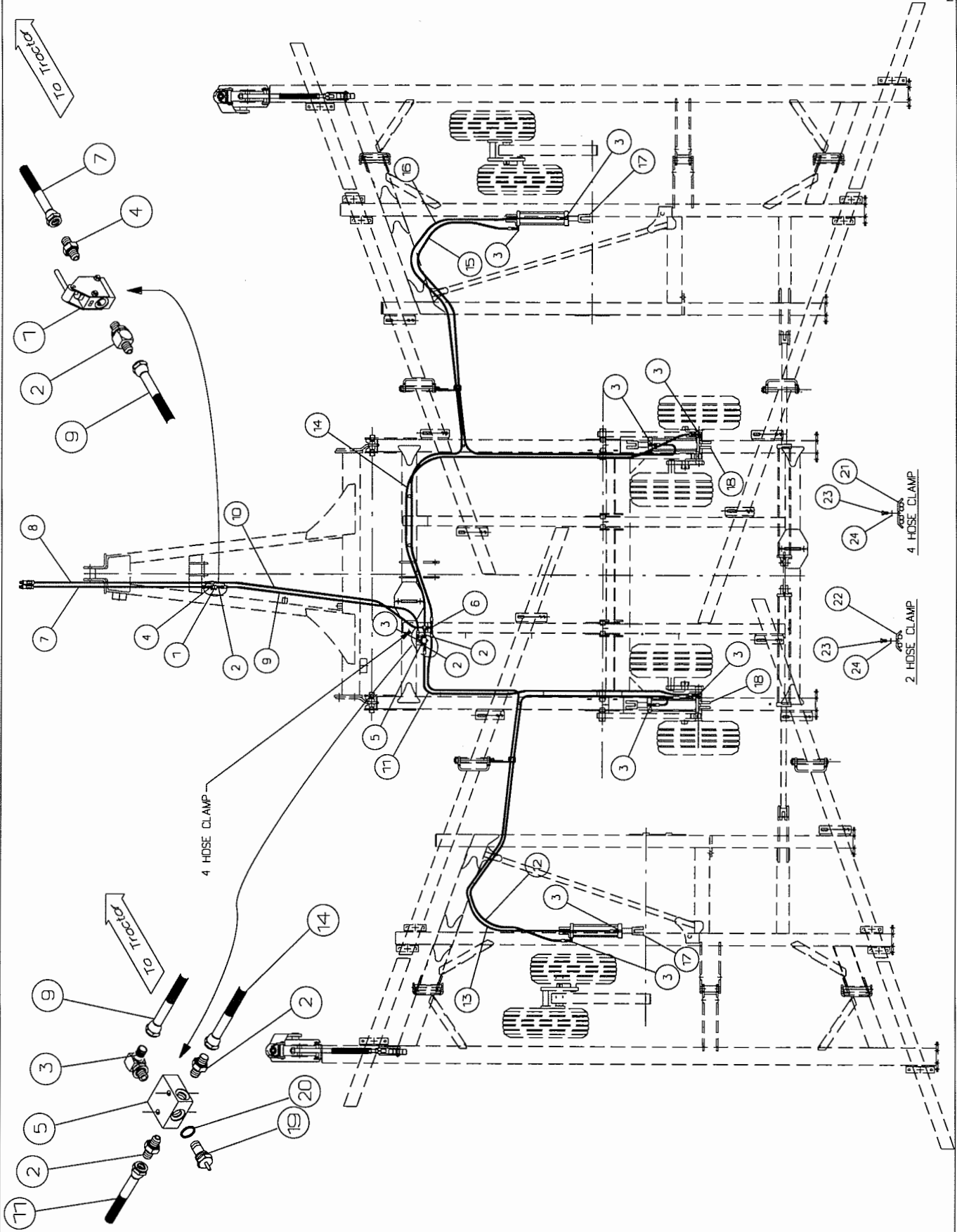


HYDRAULIC DIAGRAM -- ROCKERS

FOR MODELS - 31' - 34'

4/06

<i>Item</i>	<i>Part Number</i>	<i>Part Description</i>	<i>Qty.</i>
1	25-2272	Manual Check Valve	1
2	25-300	3/4(M) O-Ring to 3/4(M) JIC Adapter	3
3	25-301	3/4(M) O-ring to 3/4(M) JIC 90° Ell	9
4	25-314	3/4(M) O-Ring to 3/4(F) JIC	1
5	25-2535	Limit Valve	1
6	25-303	3/4(M) JIC Tee	1
7	4881-77-0	Hose & Red/Black Grip Assembly 1/2 x 95	1
8	4881-71-0	Hose & Black/Black Grip Assembly 1/2 x 95	1
9	24-339R	Hose Assembly 1/2 x 119	1
10	24-317R	Hose Assembly 1/2 x 112	1
11	24-223R	Hose Assembly 3/8 x 128	1
12	24-248R	Hose Assembly 3/8 x 214	1
13	24-263R	Hose Assembly 3/8 x 227	1
14	24-2101R	Hose Assembly 3/8 x 187	1
15	24-260R	Hose Assembly 3/8 x 243	1
16	24-2117R	Hose Assembly 3/8 x 259	1
17	21-1011	Hydraulic Cylinder 3-3/4 x 12	2
18	21-1012	Hydraulic Cylinder 4 x 12	2
19	● 25-2536	Cartridge	1
20	● 25-2476	O-Ring	1
21	2426-170-5	4-Hose Clamp	Spec.
22	3514-0-2	2-Hose Clamp	Spec.
23	62-491	3/8NF x 3/4" Cap Screw	Spec.
24	64-104	Flat Washer 3/8"	Spec.
● Item is Included in 25-2535 Valve			



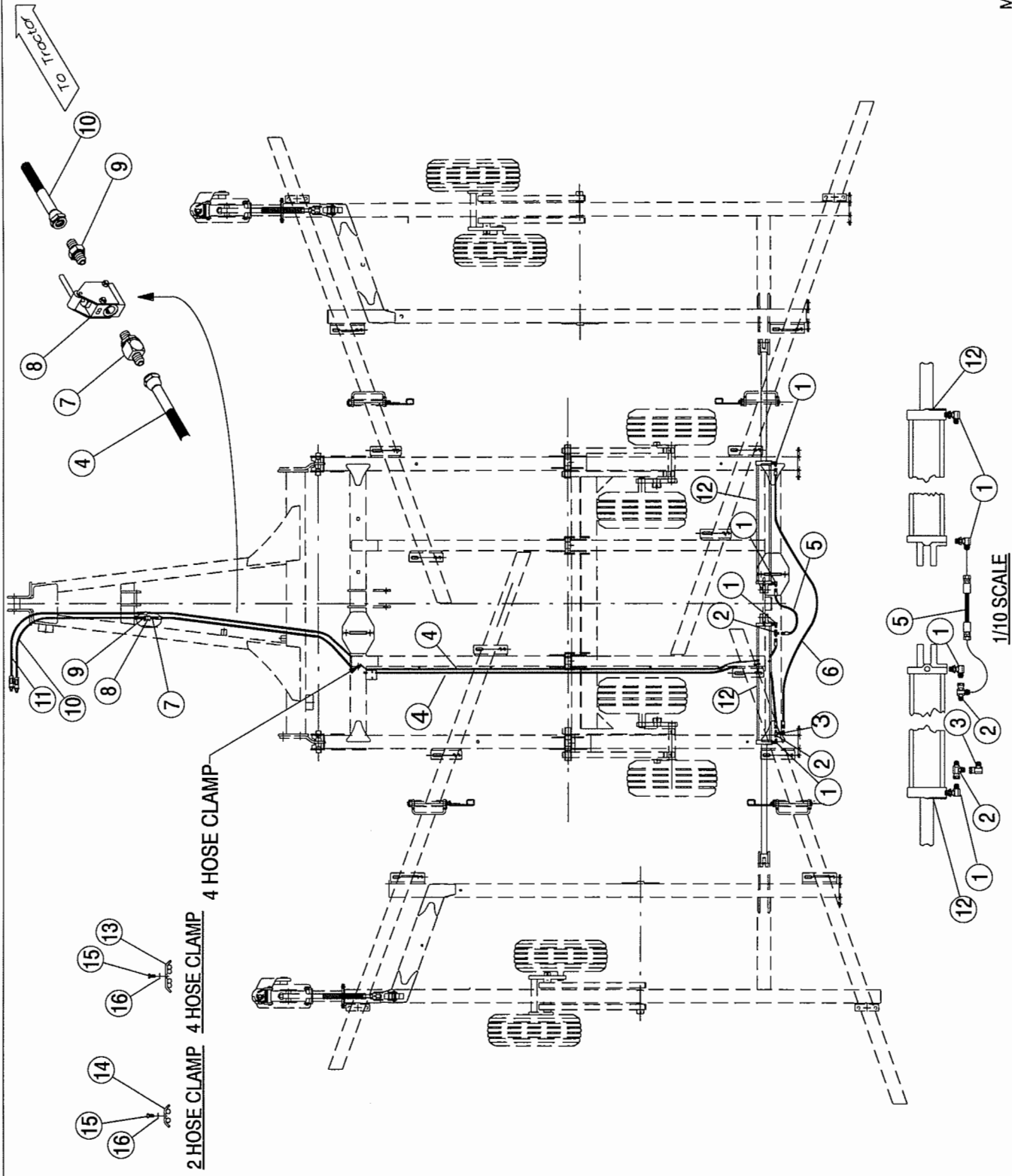
HYDRAULIC DIAGRAM -- ROCKERS

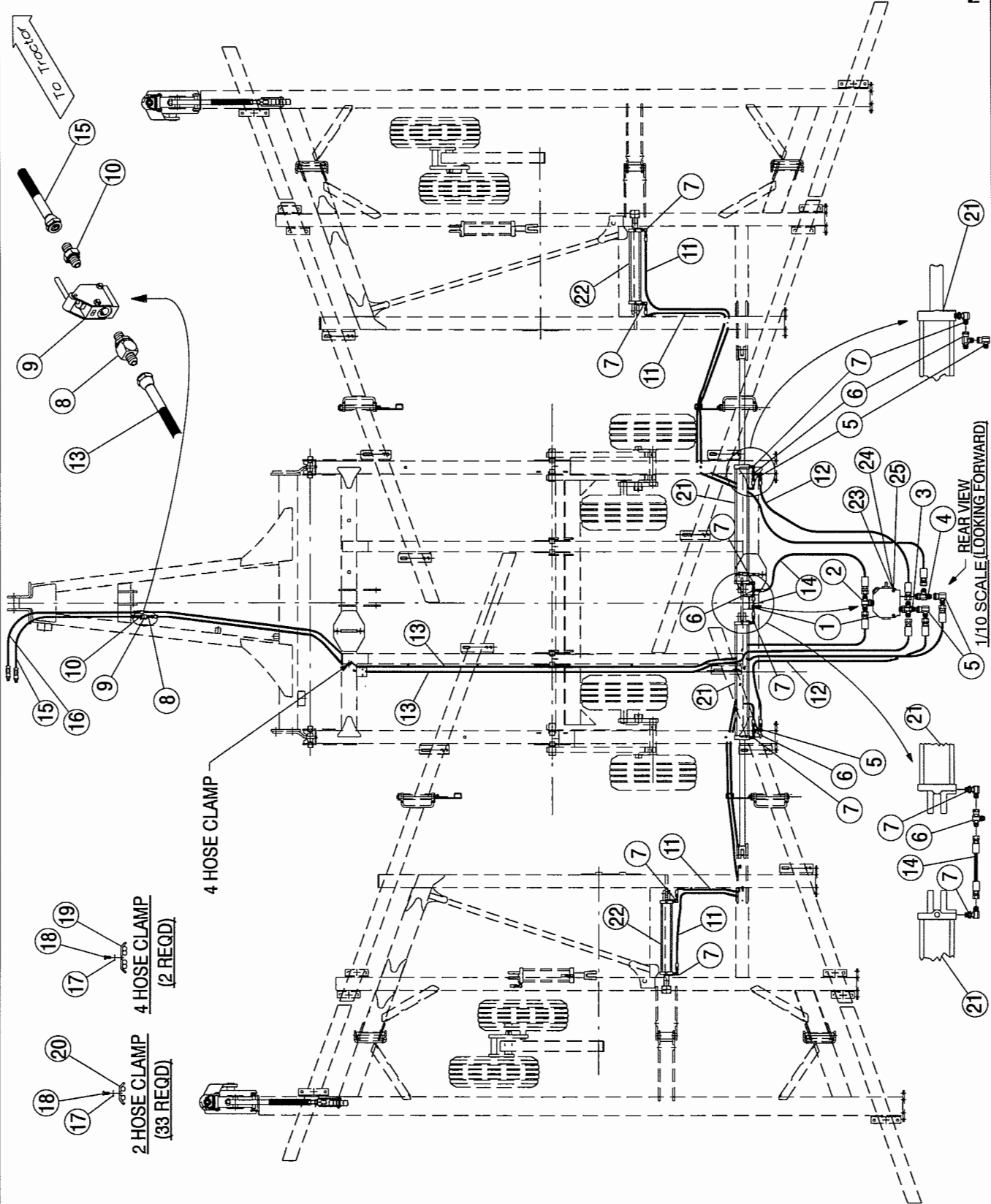
FOR QUAD-FOLD MODELS - 36' - 38'

4/06

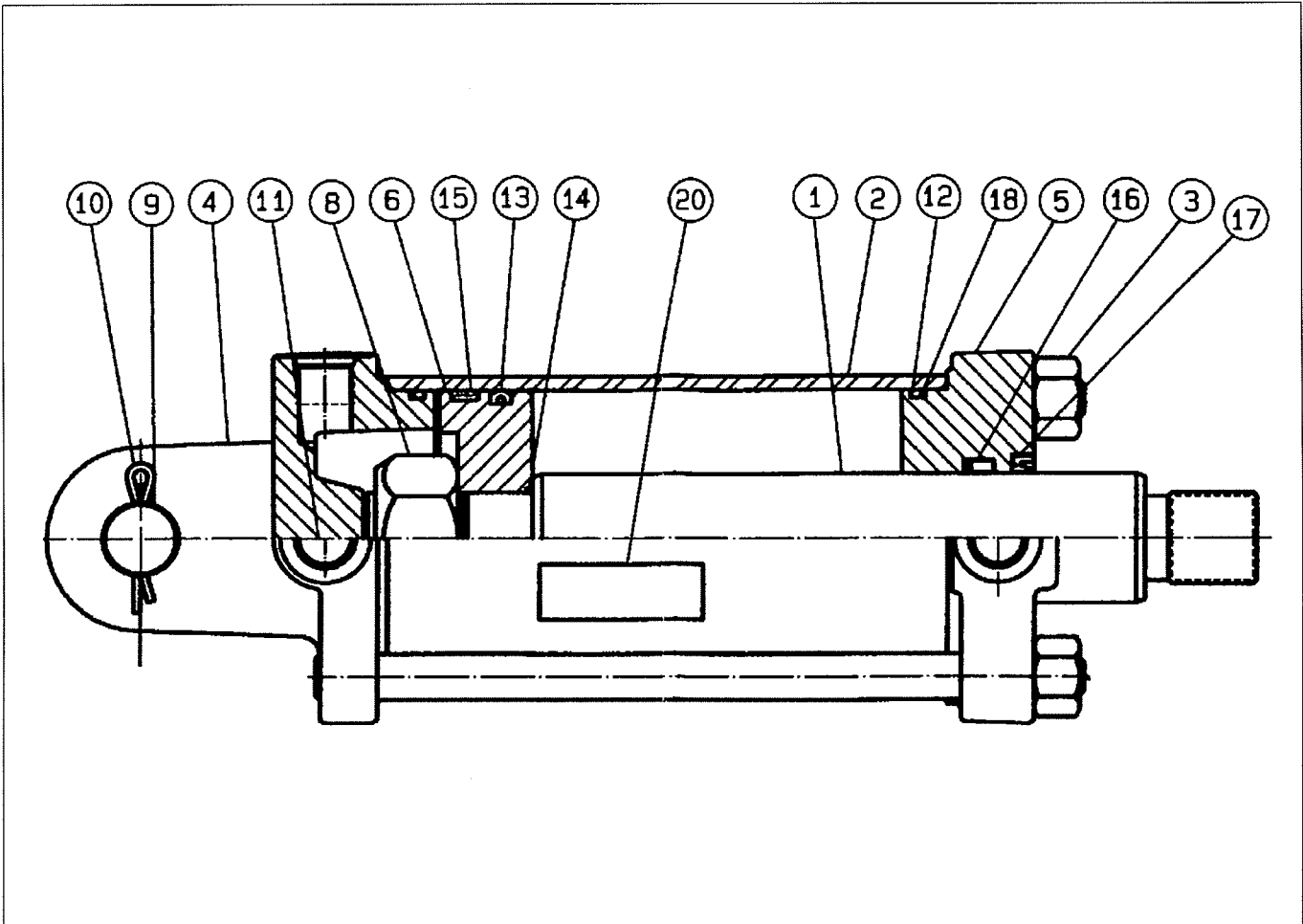
<i>Item</i>	<i>Part Number</i>	<i>Part Description</i>	<i>Qty.</i>
1	25-2272	Manual Check Valve	1
2	25-300	3/4(M) O-Ring to 3/4(M) JIC Adapter	3
3	25-301	3/4(M) O-Ring to 3/4(M) JIC 90° Ell	9
4	25-314	3/4(M) O-Ring / 3/4(F) JIC	1
5	25-2535	Limit Valve	1
6	25-303	3/4(M) JIC Tee	1
7	4881-77-0	Hose & Red/Black Grip Assembly 1/2 x 95	1
8	4881-71-0	Hose & Black/Black Grip Assembly 1/2 x 95	1
9	24-339R	Hose Assembly 1/2 x 119	1
10	24-317R	Hose Assembly 1/2 x 112	1
11	24-223R	Hose Assembly 3/8 x 128	1
12	24-277R	Hose Assembly 3/8 x 204	1
13	24-252R	Hose Assembly 3/8 x 219	1
14	24-2101R	Hose Assembly 3/8 x 187	1
15	24-262R	Hose Assembly 3/8 x 233	1
16	24-2139R	Hose Assembly 3/8 x 249	1
17	21-1011	Hydraulic Cylinder 3-3/4 x 12	2
18	21-1012	Hydraulic Cylinder 4 x 12	2
19	● 25-2536	Cartridge Assembly	1
20	● 25-2476	O-Ring	1
21	2426-170-5	4-Hose Clamp	Spec.
22	3514-0-2	2-Hose Clamp	Spec.
23	62-491	3/8NF x 3/4" Cap Screw	Spec.
24	64-104	3/8" STD Flat Washer	Spec.

● This Item is Included in 25-2535 Valve





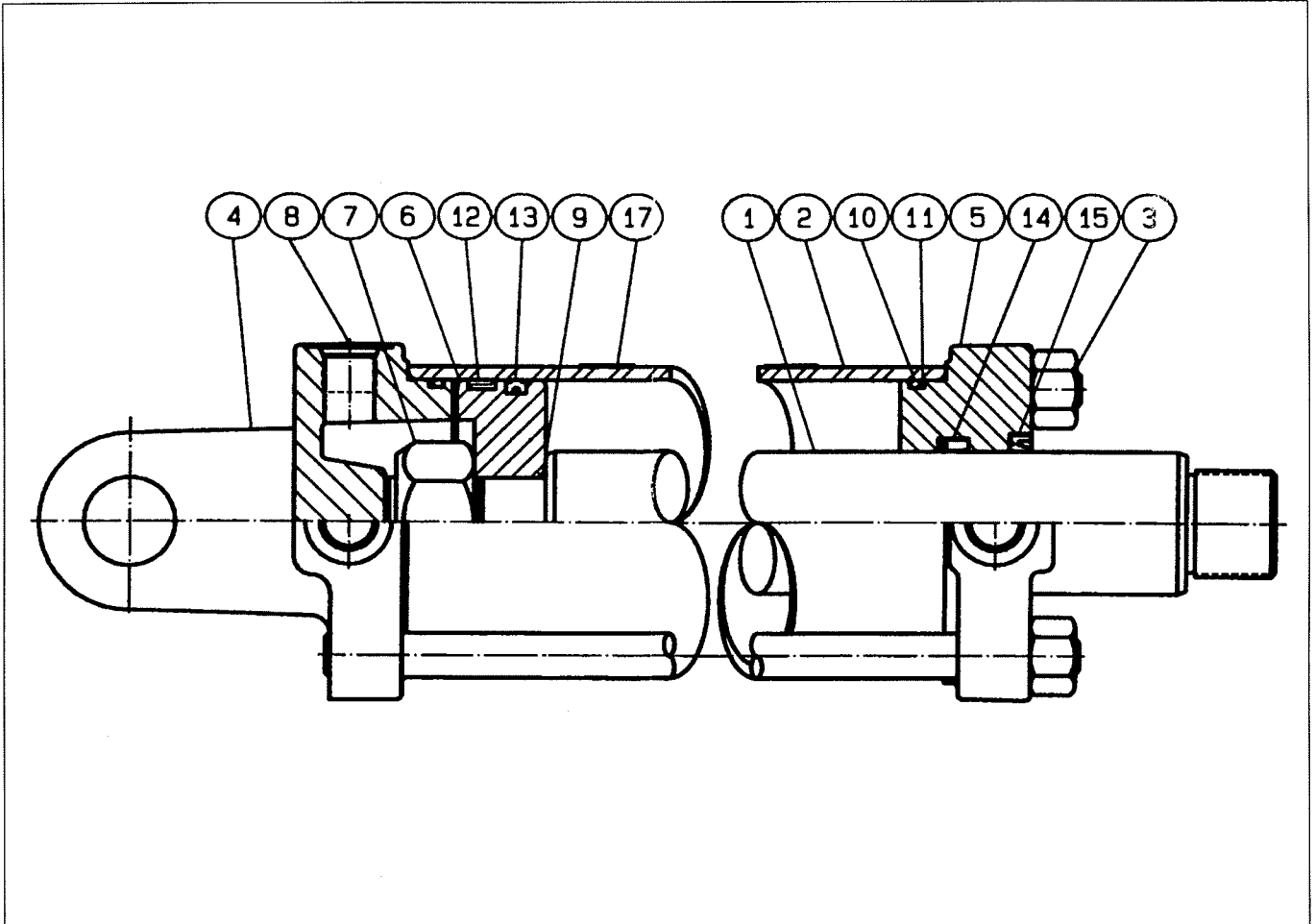
PRINCE HYDRAULIC CYLINDER



21-180 4" X 5" PRINCE HYDRAULIC CYLINDER ASSEMBLY (No Clevis) 10/00
Retracted - 17" Stroke - 5" Extended - 22" Rod Diameter - 1-3/4"

Item	Part Number	Part Description	Qty.
1	21-899	Piston Rod	1
2	21-903	Tube	1
3	21-905	Tie Rod Assembly	4
4	21-337	Butt	1
5	21-878	Gland	1
6	21-879	Piston	1
7			
8	21-286	Lock Nut	1
9	21-908	Clevis Pin	1
10		3/16" DIA. x 1-3/4" Cotter Pin	2
11	21-404	Port Plug	3
12	★	O-Ring	2
13	★	Crown Seal	1
14	★	O-Ring	1
15	★	Bearing Ring	1
16	★	U-Cup	1
17	★	Wiper	1
18	★	Back-Up Washer	2
19			
20	74-113	Cylinder Warning Decal	1
	● 21-857	Seal Kit (★ Items Included in Kit)	
	●	Not Included in Cylinder Assembly	

PRINCE HYDRAULIC CYLINDER

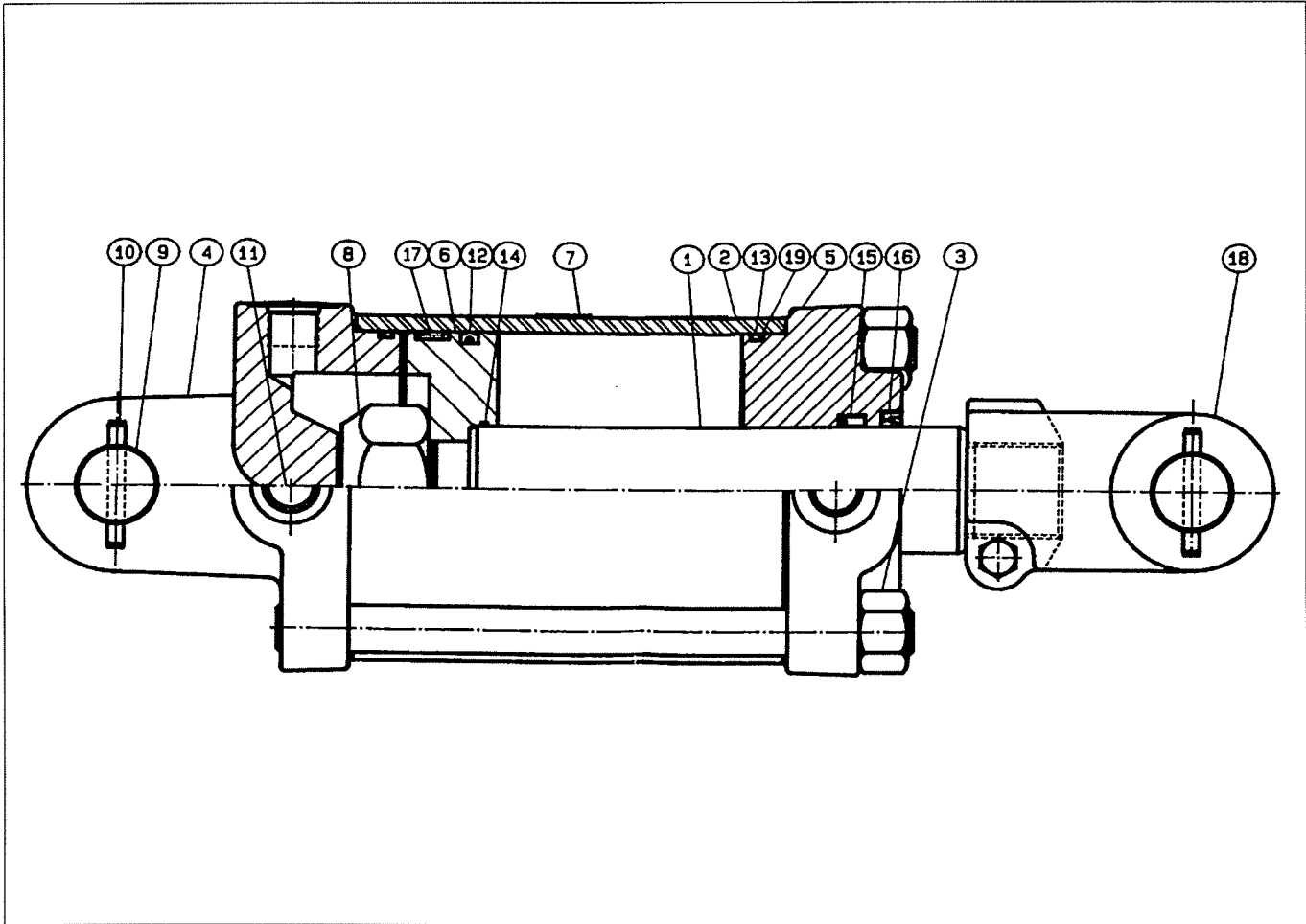


21-174 4" X 24" PRINCE HYDRAULIC CYLINDER ASSEMBLY (No Clevis)
Stroke - 24" Rod Diameter - 2"

12/00

Item	Part Number	Part Description	Qty.
1	21-896	Piston Rod	1
2	21-222	Tube	1
3	21-2046	Tie Rod Assembly	4
4	21-738	Butt	1
5	21-898	Gland	1
6	21-879	Piston	1
7	21-286	Lock Nut	1
8	21-404	Port Plug	3
9	★	O-Ring	1
10	★	O-Ring	2
11	★	Back-Up Washer	2
12	★	Bearing Ring	1
13	★	Crown Seal	1
14	★	U-Cup	1
15	★	Wiper	1
16			
17	74-113	Cylinder Warning Decal	1
	● 21-895	Seal Kit (★ Items Included in Kit)	
	● Not Included in Cylinder Assembly		

PRINCE HYDRAULIC CYLINDER



21-169 5" X 40" PRINCE HYDRAULIC CYLINDER ASSEMBLY

11/99

Retracted - 52-3/4"

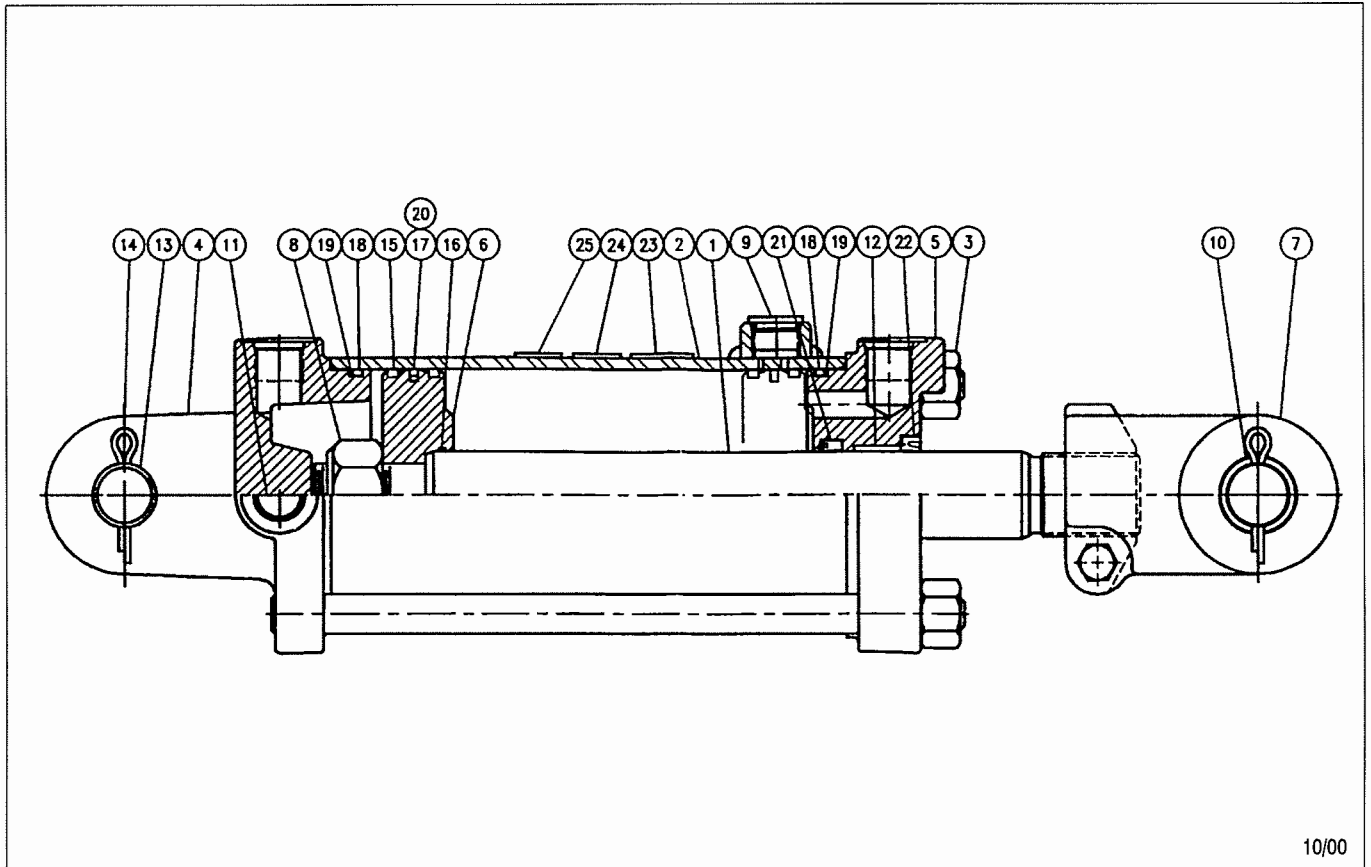
Stroke - 40"

Extended - 92-3/4"

Rod Diameter - 2"

Item	Part Number	Part Description	Qty.
1	21-866	Piston Rod	1
2	21-277	Tube	1
3	21-867	Tie Rod Assembly	4
4	21-868	Butt	1
5	21-869	Gland	1
6	21-870	Piston	1
7	74-113	Cylinder Warning Decal	1
8	21-871	Lock Nut	1
9	21-872	Clevis Pin	2
10		1/4" DIA. x 2" Roll Pin	4
11	21-404	#8 SAE Plug (not shown)	1
12	★	Crown Seal	2
13	★	O-Ring	2
14	★	O-Ring	1
15	★	U-Cup	1
16	★	Wiper	1
17	★	Bearing Ring	1
18	21-685	Clevis Assembly	1
19	★	Back-Up Washer	2
	● 21-858	Seal Kit (★ Items Included in Kit)	
	●	Not Included in Cylinder Assembly	

PRINCE HYDRAULIC CYLINDER

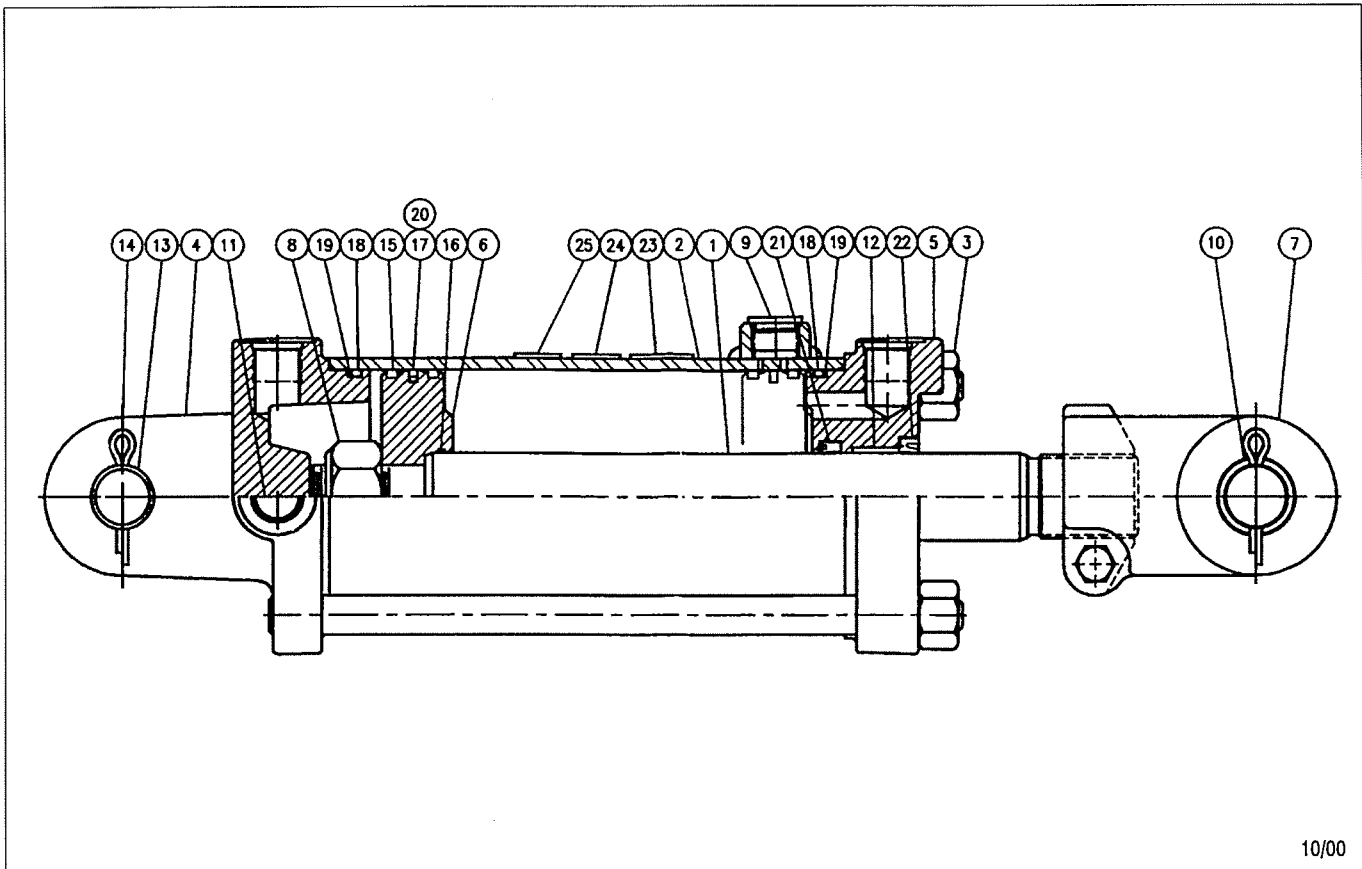


10/00

21-1011 3-3/4" X 12" PRINCE HYDRAULIC CYLINDER ASSEMBLY (Series) 4/04
Retracted - 24-1/4" Extended - 36-1/4" Stroke - 12" Rod Diameter - 1-3/8"

Item	Part Number	Part Description	Qty.
1	21-2137	Piston Rod	1
2	21-2136	Tube Assembly	1
3	21-2111	Tie Rod Assembly	4
4	21-348	Butt	1
5	21-803	Gland	1
6	21-804	Piston	1
7	21-2066	Clevis Assembly	1
8	63-119	Lock Nut	1
9	21-702	Port Plug	1
10	21-404	Port Plug	3
11	21-807	Bushing	1
12	21-260	Clevis Pin	2
13		3/16"DIA. x 1-3/4" Cotter Pin	4
14	★	Bearing Ring	2
15	★	O-Ring	1
16	★	O-Ring	1
17	★	O-Ring	2
18	★	Back-Up Washer	2
19	★	Teflon Seal	1
20	★	U-Cup	1
21	★	Wiper	1
22	21-443	Series Caution Decal	1
23	74-555	Seal Kit Decal	1
24	74-113	Cylinder WARNING Decal	1
	21-808	Seal Kit (★ Items Included in Kit)	

PRINCE HYDRAULIC CYLINDER

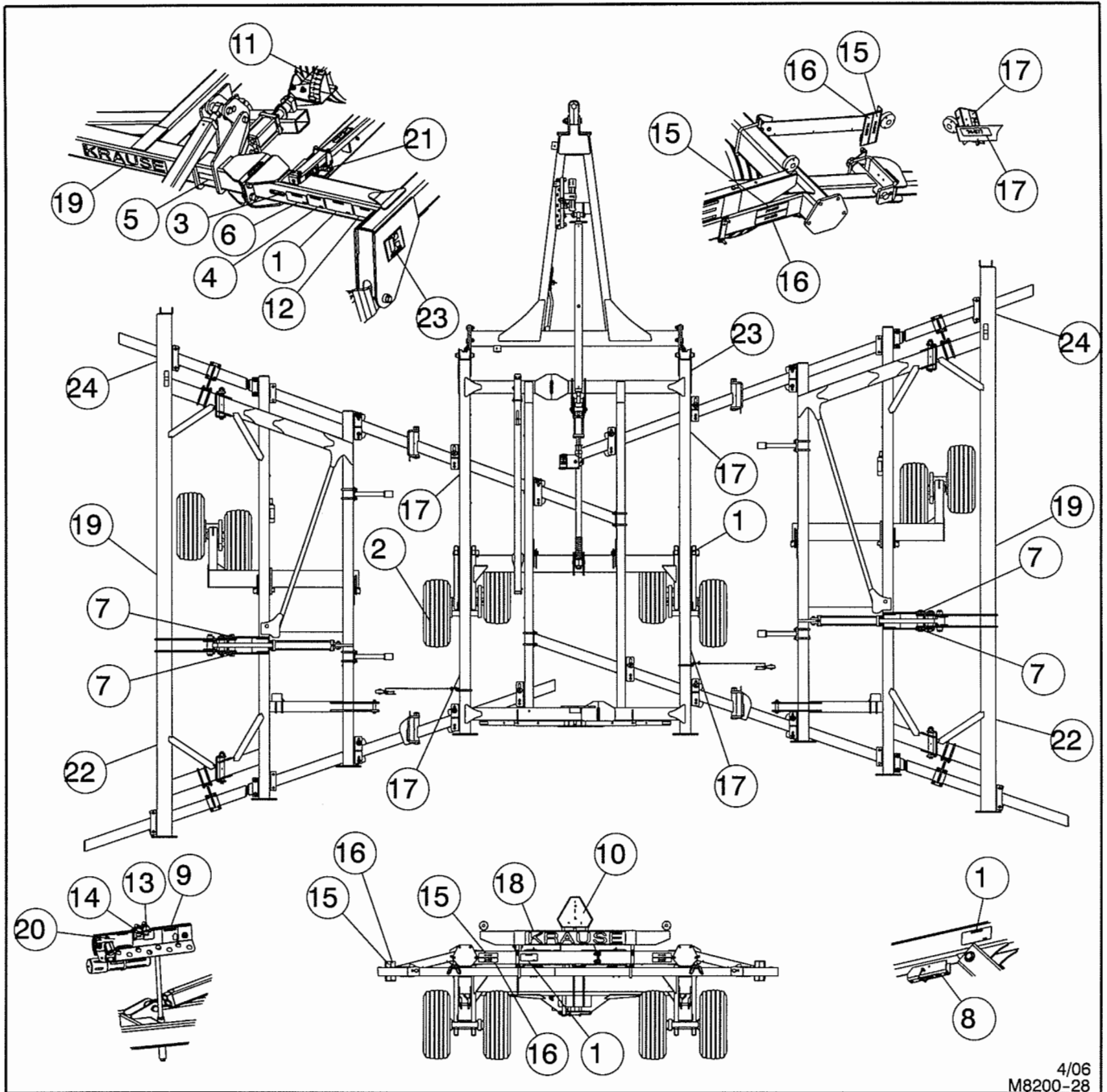


10/00

21-1012 4" X 12" PRINCE HYDRAULIC CYLINDER ASSEMBLY (Series) 4/04
Retracted - 24-1/4" Extended - 36-1/4" Stroke - 12" Rod Diameter - 1-3/8"

Item	Part Number	Part Description	Qty.
1	21-2137	Piston Rod	1
2	21-2138	Tube Assembly	1
3	21-2111	Tie Rod Assembly	4
4	21-337	Butt	1
5	21-810	Gland	1
6	21-811	Piston	1
7	21-2126	Clevis Assembly	1
8	63-119	Lock Nut	1
9	21-702	Port Plug	1
10	21-2127	Bushing	2
11	21-404	Port Plug	3
12	21-807	Bushing	1
13	21-376	Clevis Pin	2
14		3/16"DIA. x 1-3/4" Cotter Pin	4
15	★	Bearing Ring	2
16	★	O-Ring	1
17	★	O-Ring	1
18	★	O-Ring	2
19	★	Back-Up Washer	2
20	★	Teflon Seal	1
21	★	U-Cup	1
22	★	Wiper	1
23	21-443	Series Caution Decal	1
24	74-556	Seal Kit Decal	1
25	74-113	Cylinder WARNING Decal	1
	21-2059	Seal Kit (★ Items Included in Kit)	

DECALS & REFLECTORS

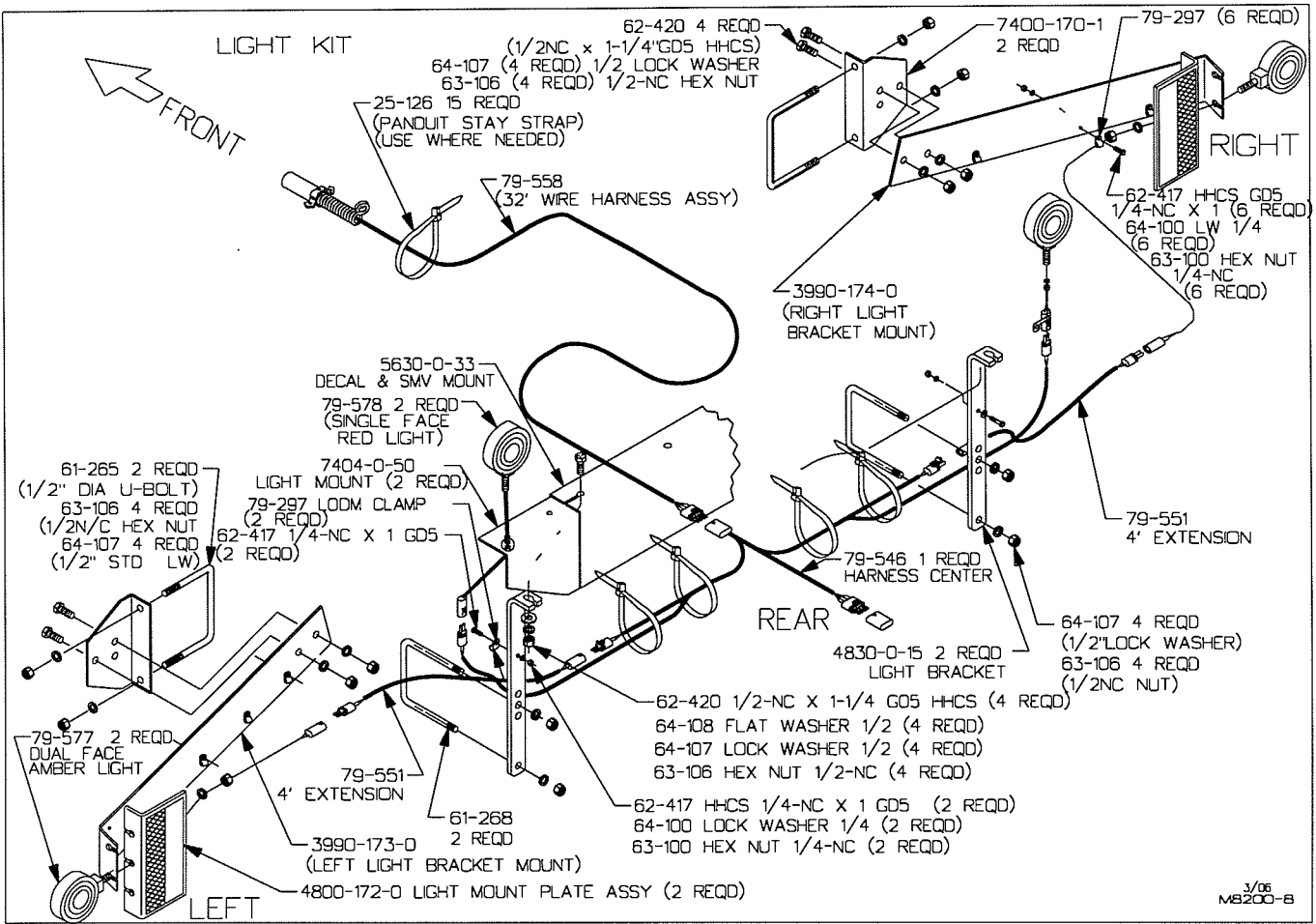


4/06
M8200-28

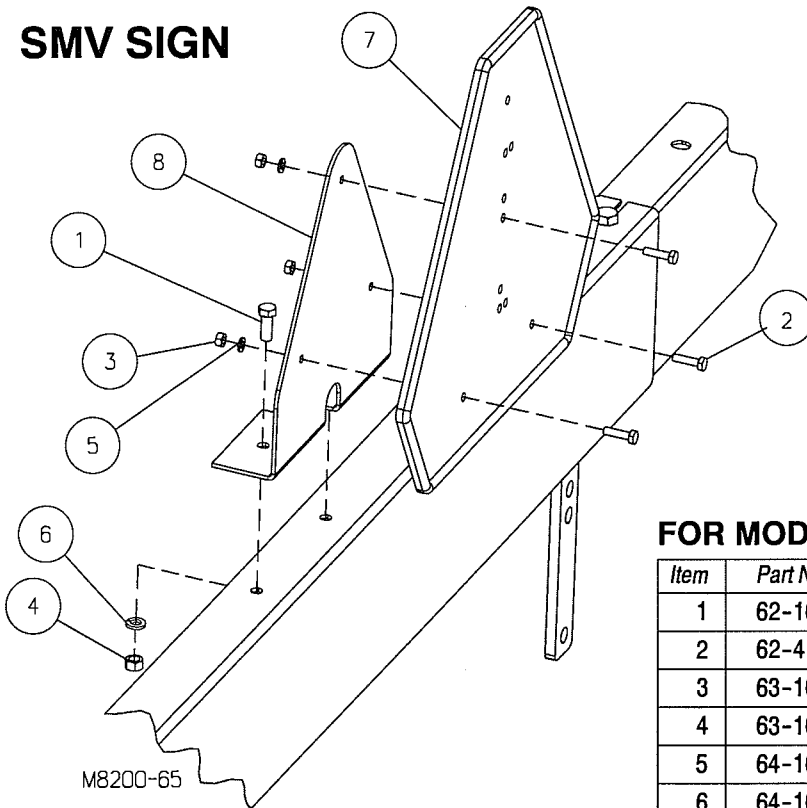
FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.	Item	Part Number	Part Description	Qty.
1	74-102	Decal-Danger Stand Clear of Wings	4	13	74-572	Decal-Wing Transport Lock	1
2	74-109	Decal-Warning Check Wheel Bolts	8	14	74-574	Decal-Wheel Transport Lock	1
3	74-115	Decal-Name Plate	1	15	74-575	Decal-Red Reflector Tape	4
4	74-121	Decal- Width/Height	1	16	74-576	Decal-Fluorescent Orange Tape	4
5	74-128	Decal-Patent	1	17	74-577	Decal-Yellow Reflector Tape	8
6	74-276	Decal-High Pressure Decal	1	18	74-602	Decal-Krause, Large	1
7	74-348	Decal-Warning Pinch Point	4	19	74-604	Decal-Krause, Small	3
8	74-387	Decal-Warning Cylinder Lock	2	20	74-612	Decal-Hose Grip Color Guide	1
9	74-465	Decal-Hydraulic	1	21	74-621	Decal-Depth	1
10	74-487	SMV Back Board	1	22	74-623	Decal-8200	2
11	74-530A	Decal-Depth Gauge	1	23	74-625	Decal-"K" Trademark	2
12	74-570	Decal-Warning Read Owner's Manual	1	24	74-626	Decal-Quad Fold	2



SMV SIGN



SMV SIGN

FOR MODELS - ALL

4/06

Item	Part Number	Part Description	Qty.
1	62-108	3/8NC x 1" GD5 Cap Screw	2
2	62-417	1/4NC x 1" GD5 Cap Screw	3
3	63-100	1/4NC Hex Nut	3
4	63-102	3/8NC Hex Nut	2
5	64-100	1/4" STD Lock Washer	3
6	64-103	3/8" STD Lock Washer	2
7	74-487	SMV Sign	1
8	5630-0-34	SMV Bracket	1

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 vales listed are for general use only. Check tightness of fasteners periodically.

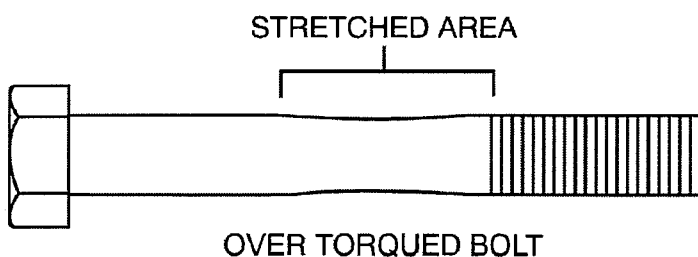
Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

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.

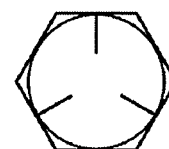
Tighten plastic insert or crimped steel-type lock nuts to approximately 110 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

*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.***

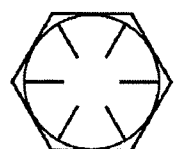
BOLT SIZE	WRENCH SIZE	BLACK OR PLATED BOLTS		
		GRADE 2	GRADE 5	GRADE 8
3/8"	9/16"	20	33	45
7/16"	5/8"	32	52	70
1/2"	3/4"	50	80	105
5/8"	15/16"	100	150	210
3/4"	1-1/8"	160	260	375
7/8"	1-5/16"	175	415	600
1"	1-1/2"	250	625	880
1-1/8"	1-11/16"	375	850	1400
1-1/4"	1-7/8"	530	1100	1765
1-1/2"	2-1/4"	930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



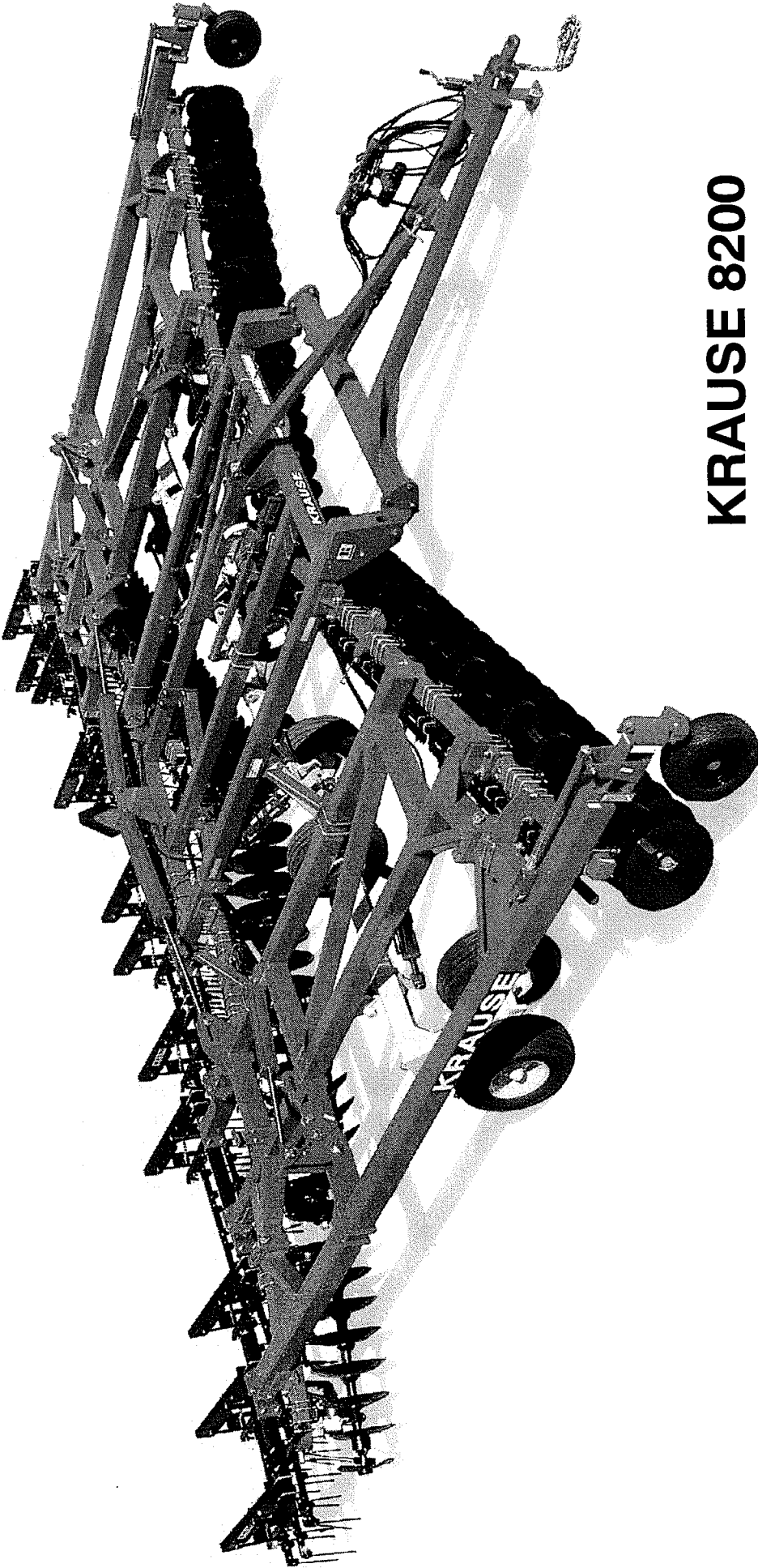
SAE
GRADE 2



SAE
GRADE 5



SAE
GRADE 8



KRAUSE 8200

ASSEMBLY INSTRUCTIONS

STUDY THE NAMES AND LOCATIONS OF THE PARTS AND FAMILIARIZE YOURSELF WITH THE FLEX WING DISC 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

Select an area for the assembly that will be large enough to accommodate the completed flex wing disc. 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 entitled "Proper Bolt Use" for the recommended torque values of different size bolts.

PART LOCATIONS

FRONT - The front of the frame can be determined by the location of the name plate that has been attached to the front frame member.

RIGHT and **LEFT** sides can be established by standing behind the frame looking toward the front, or the direction of travel.

TOP - To be sure that the frame is right side up, position the frame with the wing lift hydraulic cylinder lugs on top.



Warning: Always attach chains securely. If a chain would break, the recoil action could cause the loose end to whip in any direction and injure any person nearby. The proof load rating of chain must equal or exceed 5 times the weight being lifted.

THE HEAVIEST COMPONENT TO BE LIFTED INTO PLACE IS APPROXIMATELY 3,000 LBS.

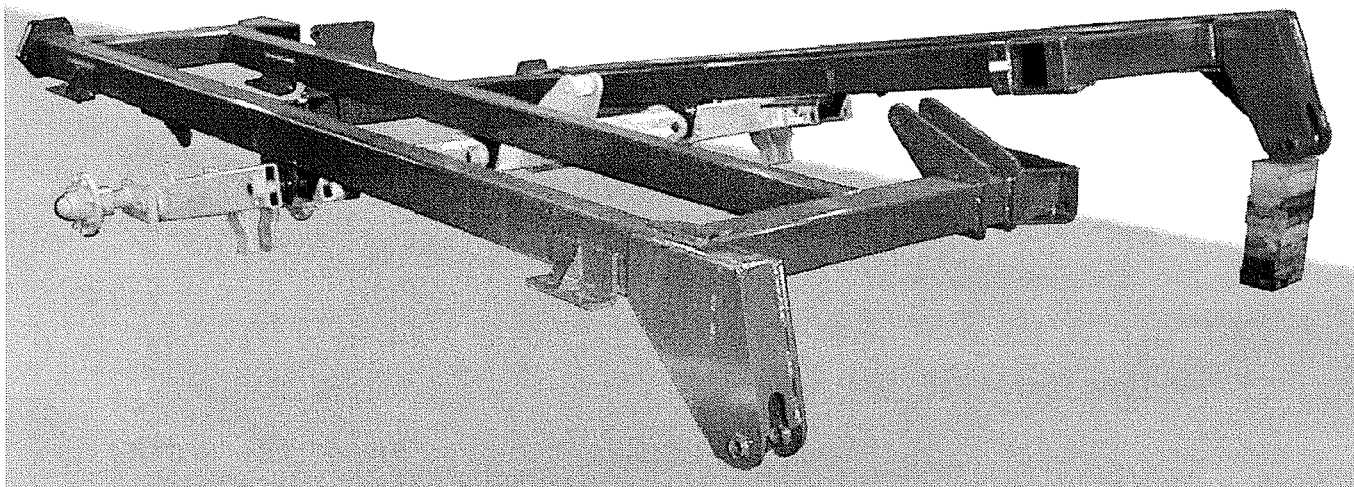
MODEL NUMBER

Know the model number of the disc being assembled. Use the model number whenever referring to the assembly, parts pages or the placement drawings. The number is stamped on the NAME PLATE which is located on the front frame member of the flex wing tandem disc.



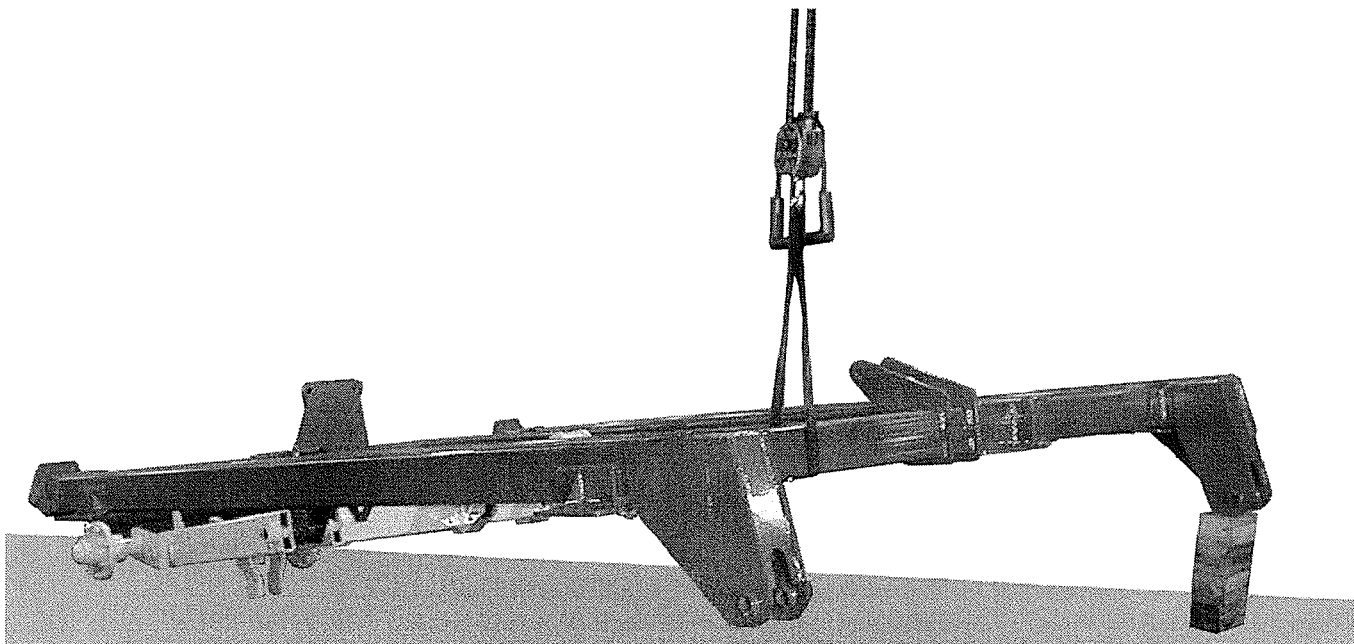
I. CENTER ROCKER & MAIN FRAMES

1. Place the CENTER ROCKER on the ground as shown below.



M8200-66

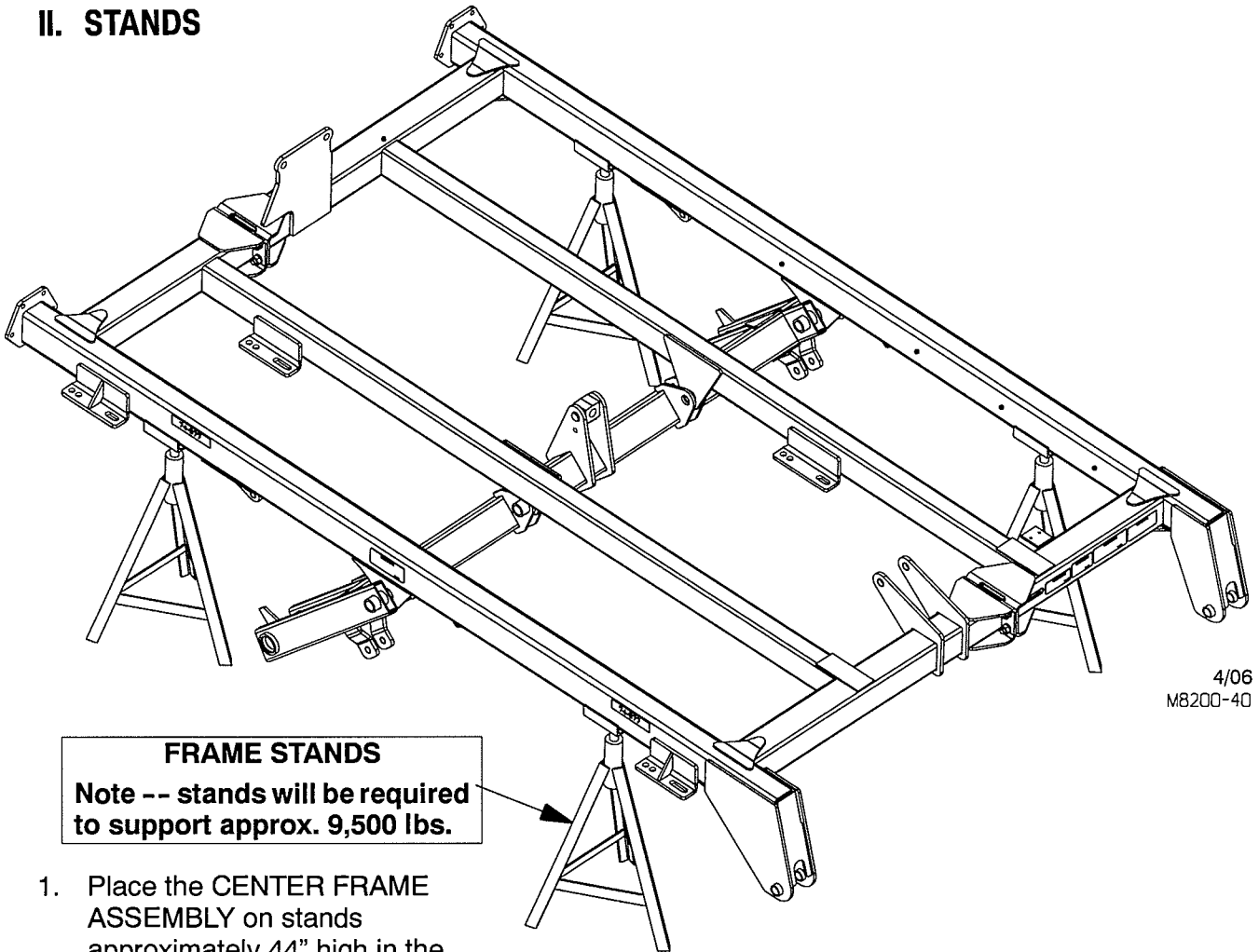
2. Pin the left half of the center frame to the rocker using (1) 7404-0-51 (1-3/4" DIA x 12-1/4") PIN, (1) 4987-0-3 (1-3/4 x 5-1/2) PIN, (2) 1/2 x 3-1/2 bolts and lock nuts.
3. Block up the front of the frame.



M8200-66

4. As in #2 above pin the right half of the center frame to the rocker.
5. Pivot the right frame half on the rocker until the halves align.
6. Fasten together and tighten bolts using (8) 1 x 2-1/2" Bolts, Lock Washers and Hex Nuts.

II. STANDS



4/06
M8200-40

FRAME STANDS

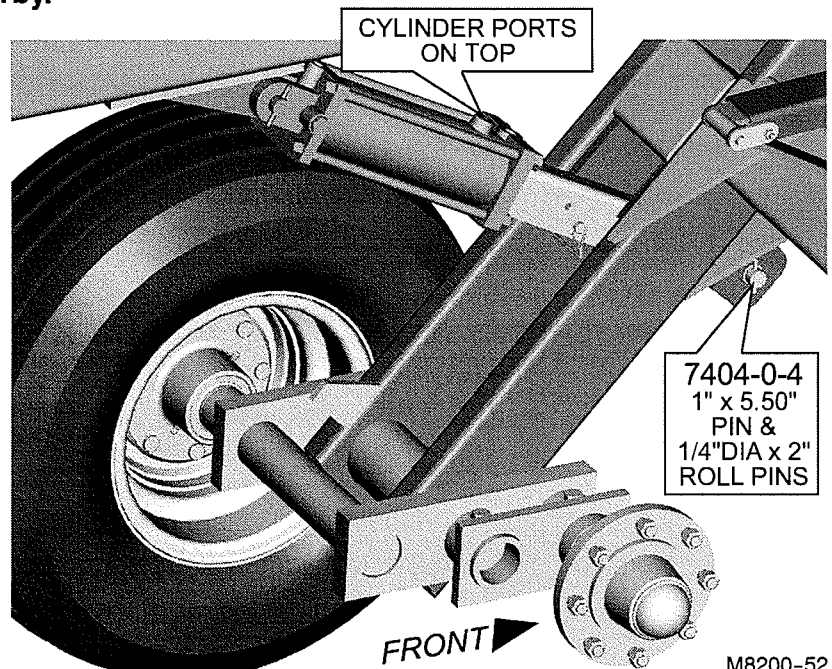
Note -- stands will be required to support approx. 9,500 lbs.

1. Place the CENTER FRAME ASSEMBLY on stands approximately 44" high in the center of the assembly area, facing a direction that will permit future hitching to a tractor.
NOTE: The stands will be required to support the assembly that will weigh approximately 9,500 lbs. before the tool will be self-supporting.

⚠ Caution: Always attach cables and chains securely. The sudden release of a cable or chain under tension can cause injury to persons standing nearby.

III. CENTER CYLINDERS

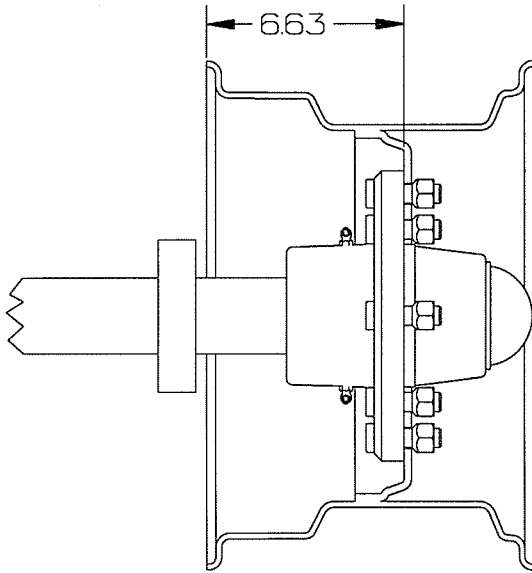
1. Assemble TWO 21-1012 4" x 12" CYLINDERS to the center frame lugs and center rocker lugs as shown in the following illustration with the hydraulic ports on top.
2. Assemble the maintenance locks onto the extended cylinder rods and retain them with P.T.O. Pins. Both maintenance locks must be used.



M8200-52

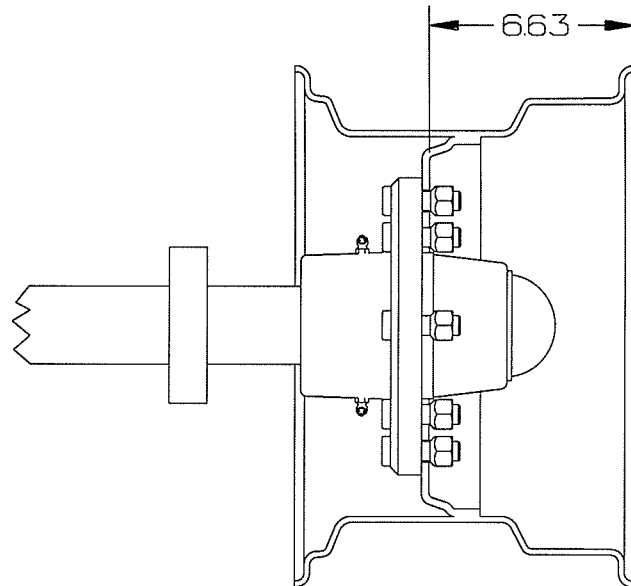
IV. CENTER ROCKER ASSEMBLY

1. Remove the nuts from the hubs on the rocker shaft and attach the 12.5 x 15 FI 8-bolt wheel assemblies to the hubs through the countersunk bolt holes as shown in the drawing below.
2. 36-38' QUAD-FOLD MODELS:
 - a) Slide the 8-bolt HUB and SPINDLE ASSEMBLY into the WALKING BEAM and secure it with a 5/8 x 4-1/2" bolt and lock nut.
 - b) The wheel assembly on this hub only will be reversed with the offset to the outside of the hub.



WHEEL OFFSET

**INFLATE 12.5L X 15 FI
TIRES TO 90 P.S.I.**



AT ALL LOCATIONS EXCEPT
FOR INSIDE TIRES ON THE
36' & 38' CENTER FRAME
POSITION OFFSET TO INSIDE
AS SHOWN

IMPORTANT

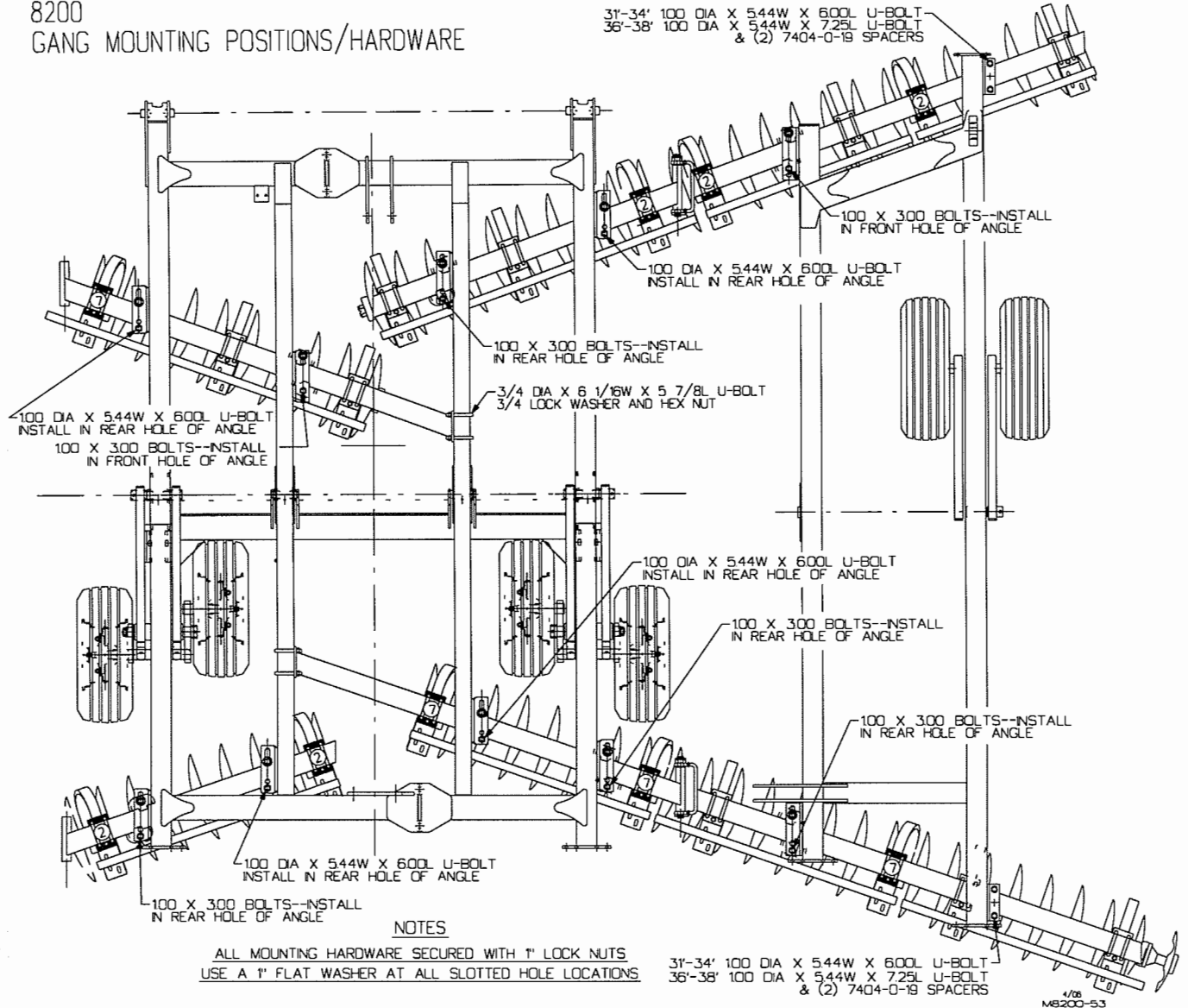
**TORQUE ALL
WHEEL NUTS
TO 145 FT. LBS.**

THE INSIDE TIRES ON THE
36' & 38' CENTER FRAME
NEED TO BE POSITIONED
WITH THE OFFSET TO THE
OUTSIDE AS SHOWN HERE

M8200-41

V. CENTER GANG ATTACHMENT

8200
GANG MOUNTING POSITIONS/HARDWARE



1. Refer to the Placement pages in the back of this manual to help select the correct location for each disc gang.
 - a) The center gangs have hinge tubes
 - b) Left and right can be identified by hinge tube alignment
 - c) The front left and the right rear gangs are longer with a bolt plate on one end.
2. Roll each disc gang assembly under the frame at their specific locations.

⚠ Warning: Due to their sharpness and weight, serious injury can be inflicted by blades and gangs if not handled safely. Watch for unsafe conditions. Keep your co-workers safety in mind.

3. Note in the illustration the mounting hole locations and hardware for the gangs. Attach the gangs to the frame.
4. **DO NOT TIGHTEN THE GANG HARDWARE UNTIL THE WING FRAMES HAVE BEEN ASSEMBLED.**

VI. TONGUE ASSEMBLY

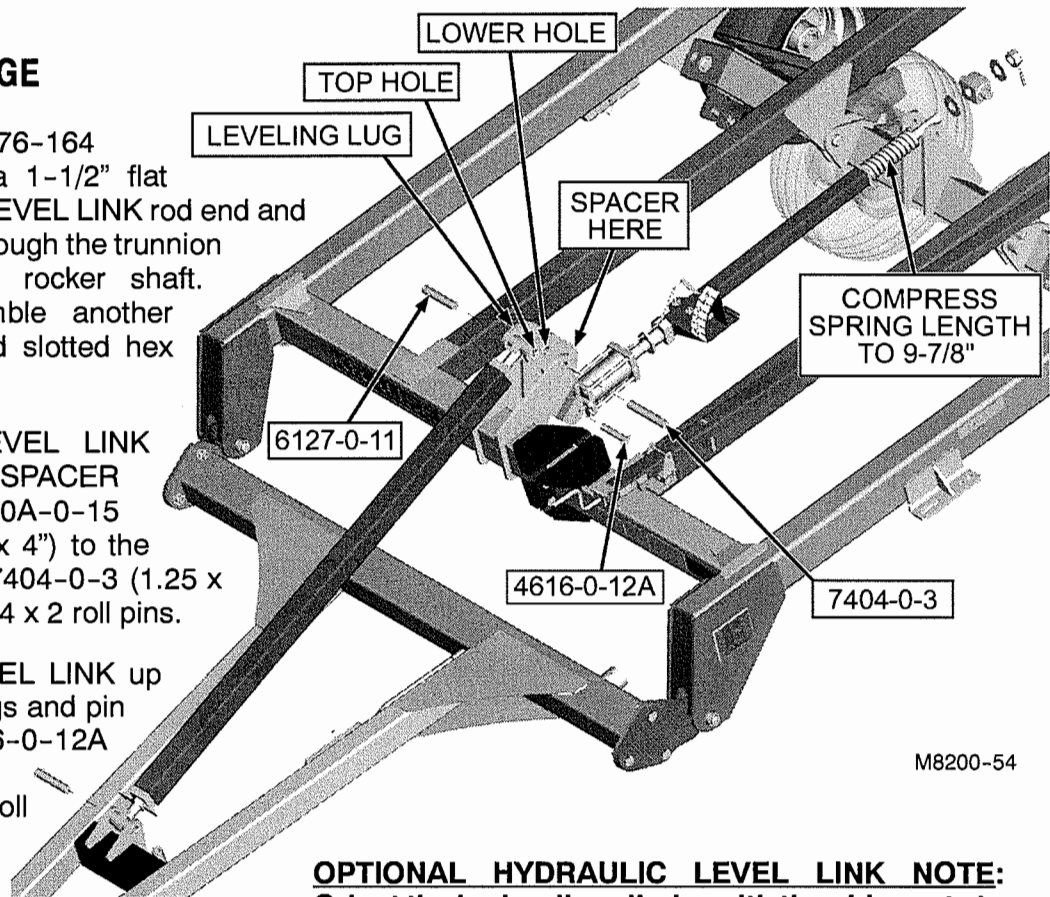
REFER TO PARTS SECTION PAGE P4 FOR TONGUE ASSEMBLY

1. Position the tongue in front of the frame with the turnbuckle lug on the top side.
2. Pin the PIVOT PLATE WELDMENTS to the frame with 3991-0-6 (1.50 x 9.00) pin and 60-615 (3/8 x 2) roll pins. The offset in the plates should be to the inside.
3. Raise the rear of the TONGUE and bolt to the PIVOT PLATE WELDMENTS with (6) 1NC x 3" Bolts, Lock Washers and Hex Nuts..
4. Raise the front of the tongue and assemble the TONGUE JACK.
5. Assemble the HITCH and SAFETY CHAIN.

SEE PARTS SECTION PAGE P5 TO ATTACH HITCH AND SAFETY CHAIN TO OPTIONAL GUARDIAN HITCH.

VII. LEVEL LINKAGE

1. Assemble the 76-164 SPRING and a 1-1/2" flat washer to the LEVEL LINK rod end and slide the rod through the trunnion on the center rocker shaft. Loosely assemble another flat washer and slotted hex nut to the rod.
2. Attach the LEVEL LINK LUGS and SPACER BUSHING 960A-0-15 (2"od x 1.31id x 4") to the frame using a 7404-0-3 (1.25 x 8.00) pin and 1/4 x 2 roll pins.
3. Swing the LEVEL LINK up between the lugs and pin with a 4616-0-12A (1.00 x 5.44) pin and 1/4 x 2 roll pins.



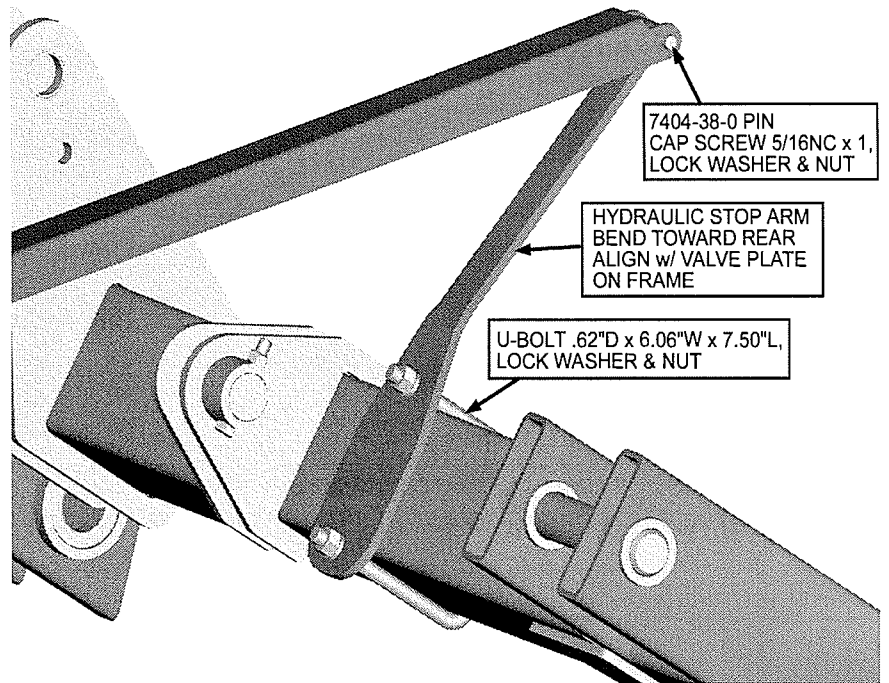
OPTIONAL HYDRAULIC LEVEL LINK NOTE:
Orient the hydraulic cylinder with the side ports to the left and the gauge in the upright position.

4. Tighten the slotted hex nut on rod end of level link until spring is compressed to 9-7/8" in length. Secure with a 60-617 (3/8 x 2-1/2" roll pin)
5. Assemble the TURNBUCKLE ASSEMBLY to the TONGUE and LEVELING LINK LUGS in the TOP HOLE using 6127-0-11 (1.25 x 6.75) pins and 1/4 x 2" roll pins.

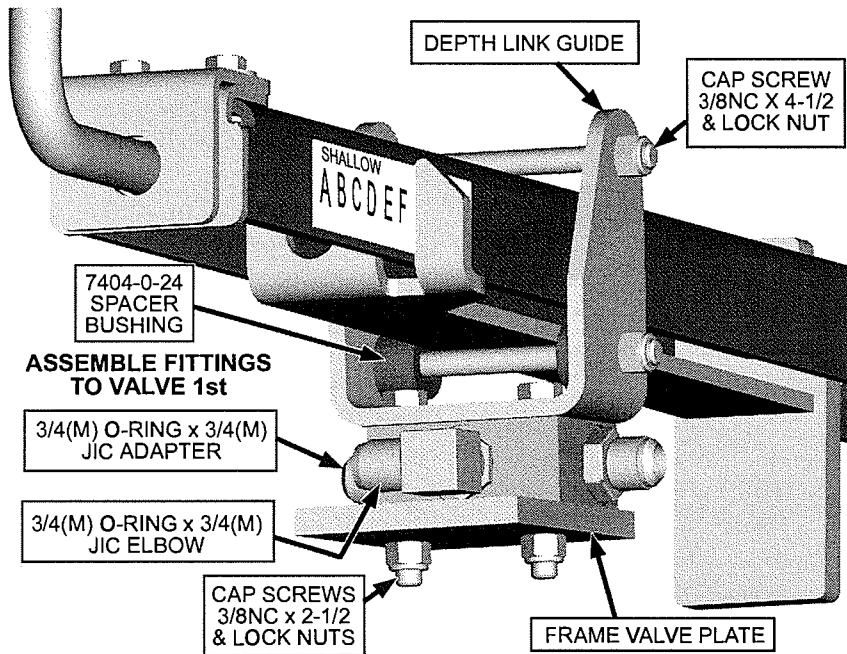
NOTE: If unit is to get attachments, assemble turnbuckle to lower hole in leveling link lugs.

VIII. DEPTH CONTROL LINK

1. Loosely assemble the HYDRAULIC STOP ARM to the center rocker cross tube in line with the valve plate on the front frame member. Place the arm on the side opposite the wheel arm with the bend to the rear of the unit.
2. Assemble (1) 3/4(M)O-Ring x 3/4(M)JIC Elbow and (2) 3/4(M)O-Ring x 3/4(M)JIC Adapter fittings to the DEPTH CONTROL VALVE.



M8200-55



M8200-56

3. Assemble the DEPTH CONTROL VALVE and DEPTH LINK GUIDE to the valve plate on the front frame member as shown.
4. Assemble the DEPTH CONTROL LINK and SPACER BUSHINGS to the HYDRAULIC STOP ARM and DEPTH LINK GUIDE.
 - a) Turn lock nuts on 3/8NC x 4-1/2" bolts down against DEPTH LINK GUIDE snug, but not tight.
5. Finish aligning the HYDRAULIC STOP ARM and tighten hardware.

IX. REMOVE STANDS

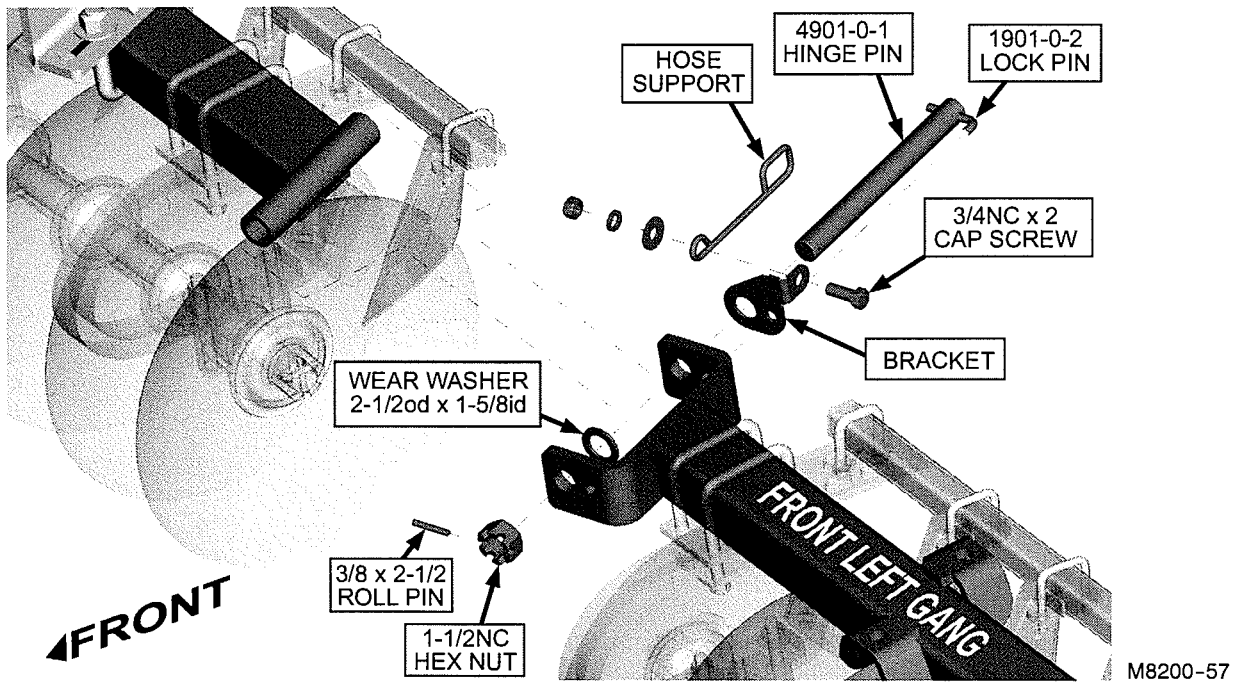
1. The center section assembly (approximate weight up to 9,500 lbs) is now ready to be free standing. Remove the stands. The assembly will be supported by the tires and jack.

⚠ Caution: Always attach cables and chains securely. The sudden release of a cable or chain under tension can cause injury to persons standing nearby.

X. WING GANG ASSEMBLY

1. Attach the wing gang assemblies to the center frame hinge tubes.
 - a) The rear wing gang assemblies are longer than the front gang beams.
 - b) Assemble all HINGE PINS with the threaded end toward the front of the disc away from the scraper tubes.

2. A HOSE CARRIER BRACKET is assembled to the hinge pin on the front gangs of the 31-34' models and at all four hinges of the 36' & 38' Quad-Fold models. The proper orientation of the bracket is to match the bracket holes to the gang clevis holes with the bent tab up. The bracket is assembled on the rear of the front gangs and the front of the rear gangs.



NOTE: Make sure that the WEAR WASHER (2-1/2od x 1-5/8id) is on the FRONT side of the hinge tube.

3. Support the outer end of the wing gangs with frame stands.

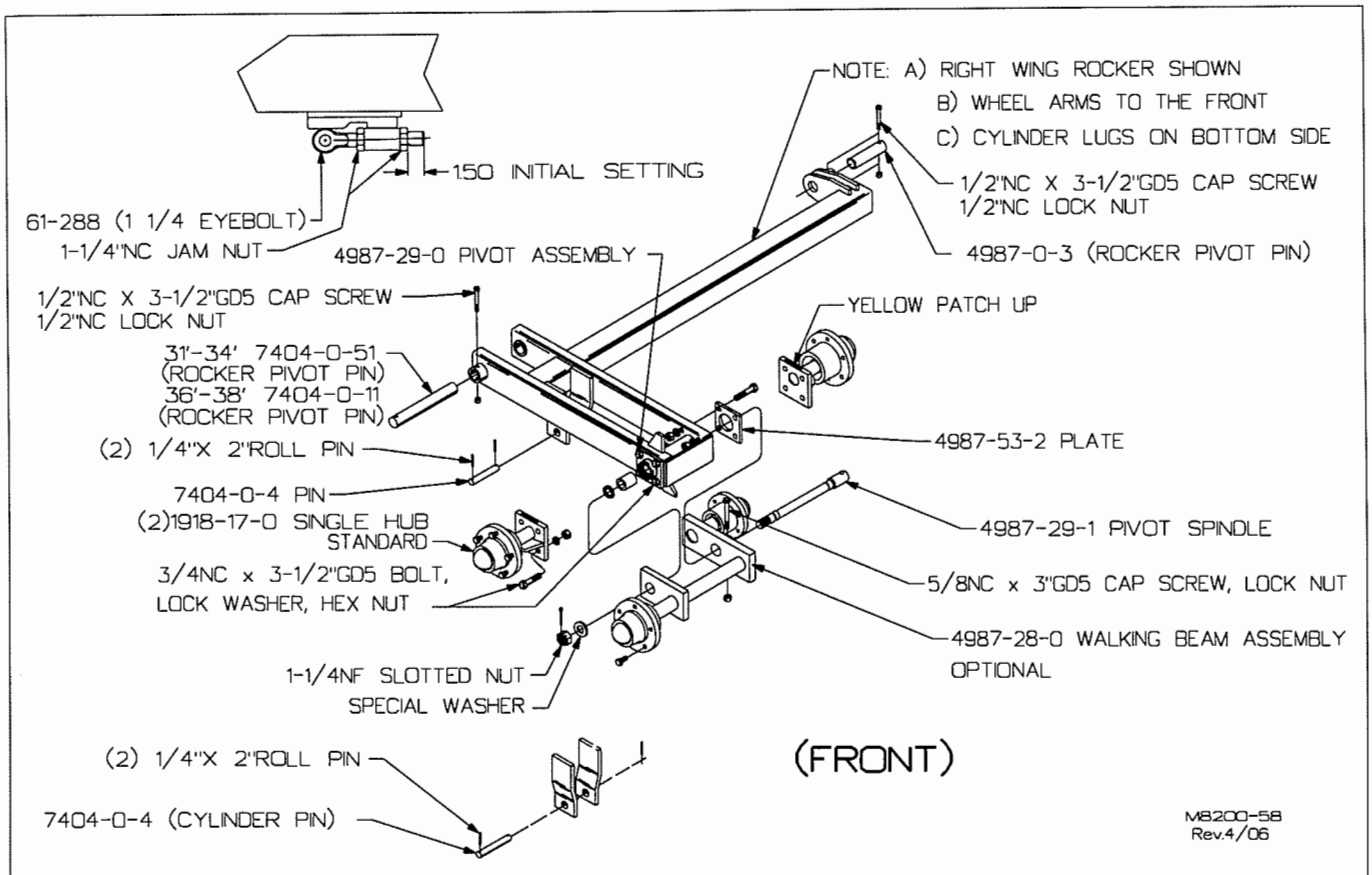
XI. WING FRAME ASSEMBLY

1. Lower the WING FRAMES on top of the wing gangs.
36-38' Quad-Fold units NOTE: Leave OUTER WING FRAME folded. The fold cylinder has been charged with hydraulic fluid and the wing will be unfolded after the plumbing has been installed.
2. Align the mounting holes to the gang anchors and loosely fasten with the hardware shown.
Refer to illustration M8200-53 shown on page A7 for proper placement.
36-38' Quad-Fold units NOTE: Four SPACER PLATES (7404-0-19) are required between the outer mounting angles and the gang beams. Stack two spacers under each angle that is not over the bearing arm.
3. After all mounting hardware has been installed, tighten all gang mounting hardware starting at the center section and moving outward to the wings.

XII. WING ROCKER ASSEMBLY

Refer to illustration M8200-58 at the top of page A11.

1. Lay the wing rockers underneath the wing frames. The wheel arms should be towards the front and the cylinder lugs should be down.
2. **31-34' units:** Pin the outer end of the wing rocker to the frame with a 7404-0-51 (1.75 x 12.25") PIVOT PIN.
36-38' Quad-Fold: Pin the outer end of the wing rocker to the frame with a 7404-0-11 (1.75 x 10.06") PIVOT PIN.
3. Fasten the inside end of the wing rocker to the frame with a 4987-0-3 (1.75 x 5.50") PIVOT PIN.
4. Secure the pins to the rocker with 1/2NC x 3-1/2" bolt and lock nuts.
5. Fasten the wing rocker adjustment EYEBOLT to the wing frame with (2) 1.25 Hex Jam Nuts. For initial setting, there should be 1.50" of thread showing.
6. Assemble a 21-1011 (3.75" x 12" Series Cylinder) to each wing rocker with the ports to the top using a 7404-0-4 (1.0 x 5.5") PIN in the rod end. Secure PIN with 1/4" DIA. x 2" roll pins.



31' - 34' Units ONLY:

7. Standard Dual Wheels

- a) Attach the dual wheel hub assembly to the wheel arms using 3/4"NC x 3-1/2" GD5 Bolts, Lock Washers and Hex Nuts. Be sure that the yellow patch on the spindle plate is positioned on the top.

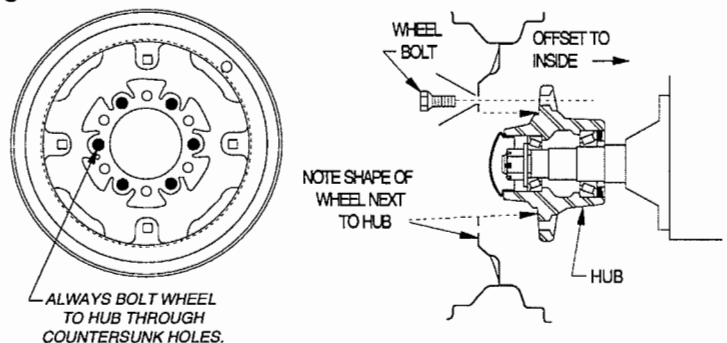
8. Optional Walking Beams

- a) Remove the zerk from the WALKING BEAM PIVOT assembly (4987-29-0), and slide it into the hole in the wing wheel arms. Position the zerk hole so that it points toward the long rocker cross beam.
- b) Slide the RETAINER PLATE (4987-53-2) over the pivot and secure both ends with 3/4"NC x 3-1/2" GD5 Bolts, Lock Washers and Hex Nuts.
- c) Remove the CENTER SPINDLE (4987-29-1) from the PIVOT ASSEMBLY and position the WALKING BEAM weldment (4987-28-0) with the cross spindle to the bottom of the wheel arms between the rotation stops and reinsert the CENTER SPINDLE.
- d) Torque the CENTER SPINDLE NUT to 25-30 ft.-lbs.
- e) Reinstall zerk and fill pivot tube with grease.

XIII. WING TIRES

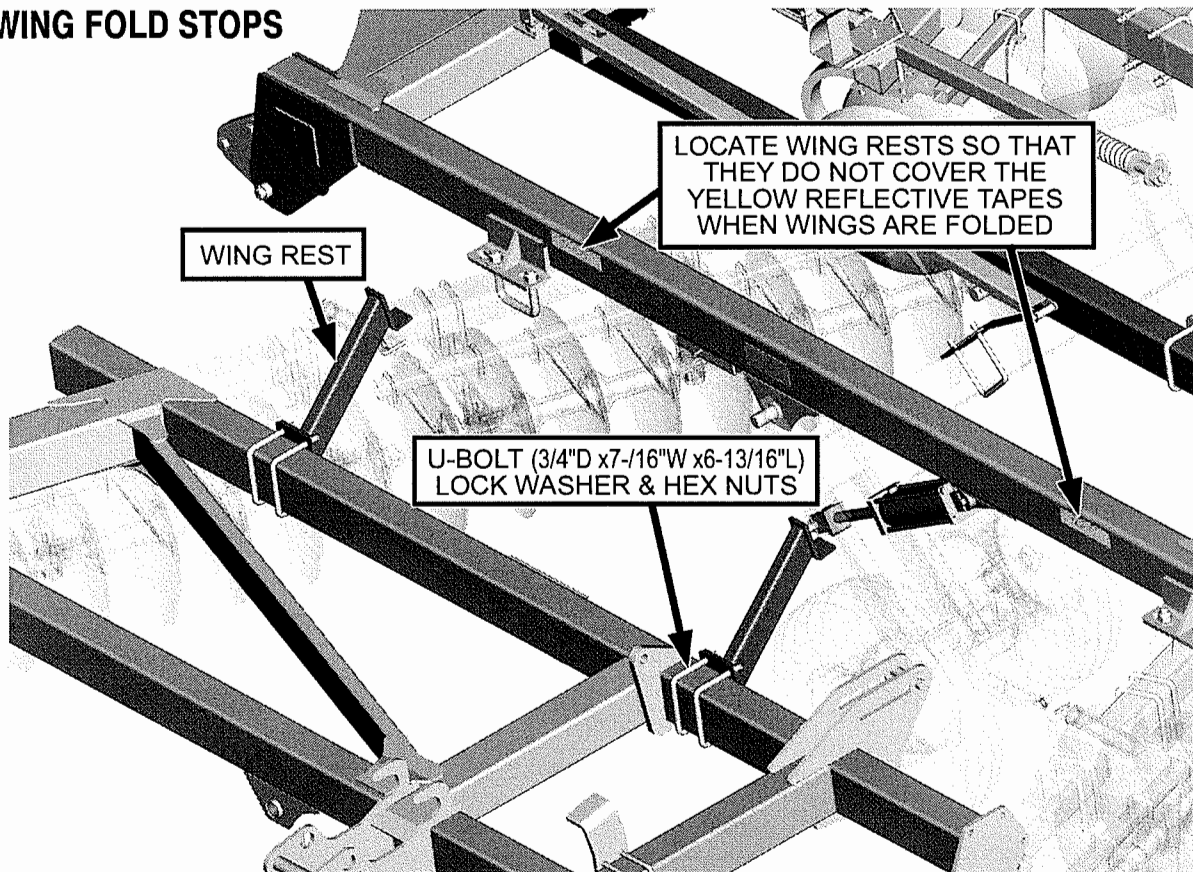
1. Mount 10.00 x 15 6-Bolt wheel assemblies to hubs as illustrated.
2. Torque wheel nuts to 120 ft. lbs.

IMPORTANT: CHECK THE HUBS FOR EXCESSIVE END PLAY. IF NECESSARY ADJUST WHEEL HUB AT THIS TIME IN THE ASSEMBLY.



DO NOT ALLOW DIRT AND DUST TO ENTER THE HUBS. DIRT IN THE HUBS MAY RESULT IN BEARING FAILURE DURING OPERATION.

XIV. WING FOLD STOPS



1. Attach (2) WING RESTS to the inside front to rear frame member on each wing with 3/4" DIA x 7-1/16"W x 6-13/16"L U-Bolts, Lock Washers and Hex Nuts.

XV. HYDRAULIC ASSEMBLY

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

1. Refer to the parts section Hydraulic Diagrams pages P29 through P37 and the following for the correct assembly of hoses, fittings, and hose clamps.

NOTE: No tape or sealant is necessary on O-Ring / 37° Flare Fittings.

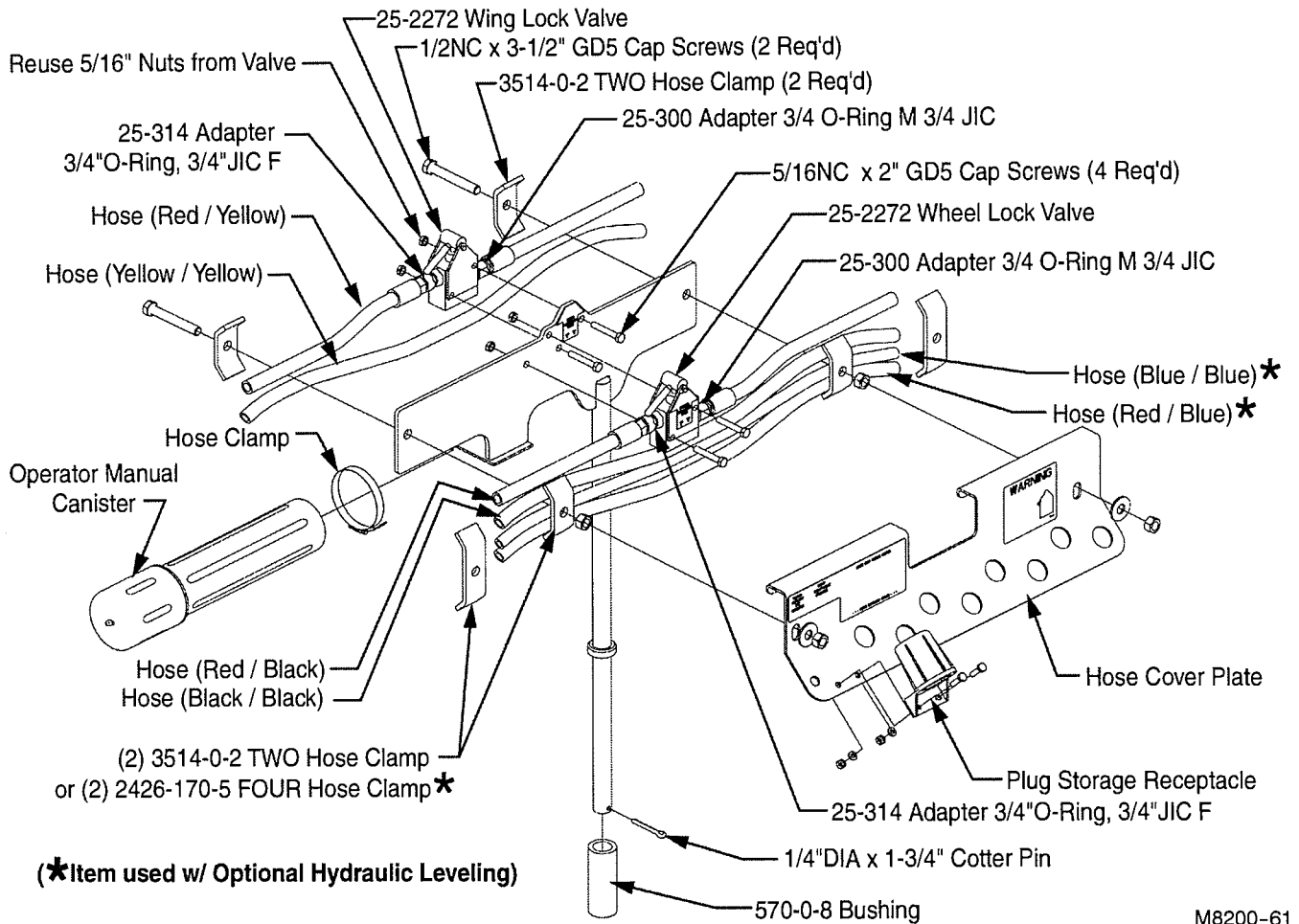
NOTE Rocker Lift Cylinders: Use the side port on the base ends of all rocker lift cylinders. Use the top port on all rod ends.

NOTE 36'-38' Quad-Fold Outside Fold Cylinders: The outside wing fold cylinders come from the factory charged with hydraulic fluid.

2. HOSE STAND ASSEMBLY

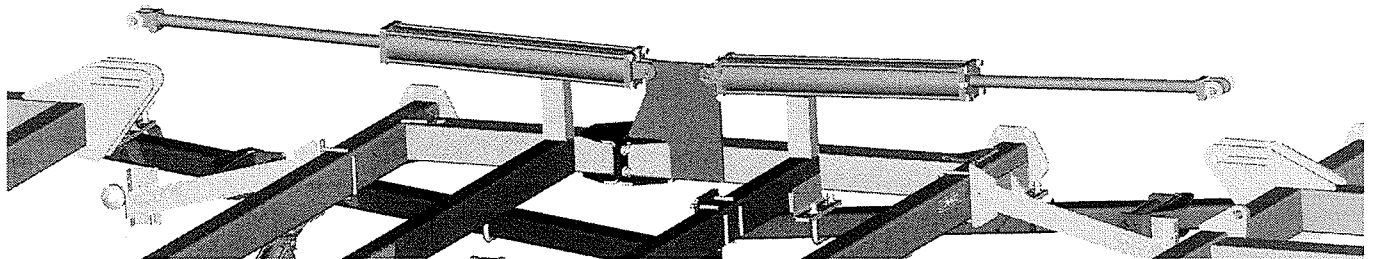
Refer to illustration M8200-61 at the top of page A13

- a) Assemble the Wheel Lock Valve to the left forward position of the hose stand with the "A" port toward the tractor as shown.
- b) Assemble the Wing Lock Valve to right rear position of the hose stand with the "A" port toward the tractor.
- c) Attach the hoses & fittings to the valves as shown.
- d) Optional Hydraulic Leveling -- Use (2) plastic stay straps around the stand plate to temporarily hold the remaining hoses in position. Adjust the trail hose (with blue grip) lengths to match the hose with red/black grip.
- e) Assemble hose clamps and tighten bolts enough to hold hoses in position before removing stay straps.



M8200-61

3. Pin the base end of the (2) 21-169 (5" x 40") WING LIFT CYLINDERS to the center frame lug and block up the rod ends to clear the wing lugs. (See figure M8200-60 below)



M8200-60

IMPORTANT: A 90° RESTRICTOR SHOULD BE ASSEMBLED INTO BOTH ROD END AND BASE END PORTS OF EACH WING LIFT CYLINDER. THE RESTRICTOR CAN BE IDENTIFIED BY A TAG ATTACHED TO IT. PROPER LOCATION OF THESE FITTINGS IS IMPORTANT TO PREVENT THE IMPLEMENT WINGS FROM FREE-FALLING IF A HYDRAULIC FAILURE SHOULD OCCUR.

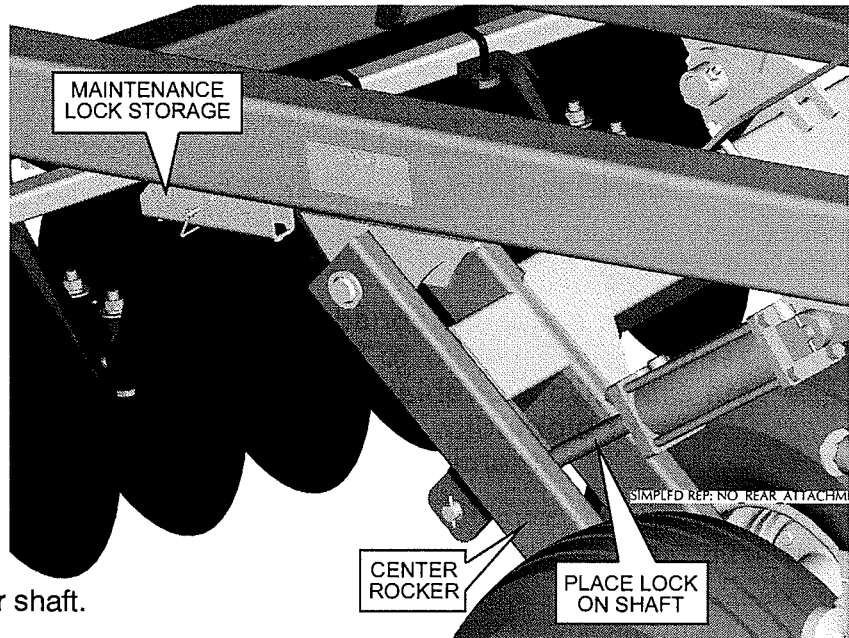
DO NOT PIN THE ROD END OF THE WING FOLD CYLINDERS UNTIL ALL HYDRAULIC ASSEMBLY IS COMPLETE AND THE SYSTEM HAS BEEN PURGED OF AIR AND FILLED WITH OIL.

4. CHARGING THE CYLINDERS:

⚠ Caution: 36'-38' Quad Fold -- Remove all bands and loose parts from outside wing frames. Stand clear of outside wing frames when charging the fold system. Outside fold cylinders are charged with oil from the factory and will unfold the wings when charging the inside fold cylinders.

- a) After all hose and fittings are assembled, check the blocks under the wing cylinders. Make sure that they are raised high enough to clear any attaching lugs. (See photo M8200-60 on page A13)
- b) Attach hydraulic hoses to the tractor. Check the tractor hydraulic reservoir and make sure it is full of the tractor manufacturer's recommended oil.
- c) If you are sure all connections are tight and leakproof, begin filling the system by extending and retracting the cylinders.

- d) The rocker shaft cylinders have rephasing grooves that will allow the oil to pass by the piston when the disc is fully raised. Open the road lock valve and raise the unit. Hold the tractor lever in the raised position to fill each rocker shaft cylinder. When the cylinders are fully extended, remove the maintenance locks on the master cylinders and place them in the storage position under the frame in front of the center rocker shaft.



- e) Cycle the hydraulic cylinders until all air is purged from the system. When cycling the rocker shaft cylinders, hold the lever for 30 to 45 seconds in the fully raised position to rephase the cylinders.
- f) Continue the cycles until the cylinders respond with immediate solid actuation.

⚠ 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.



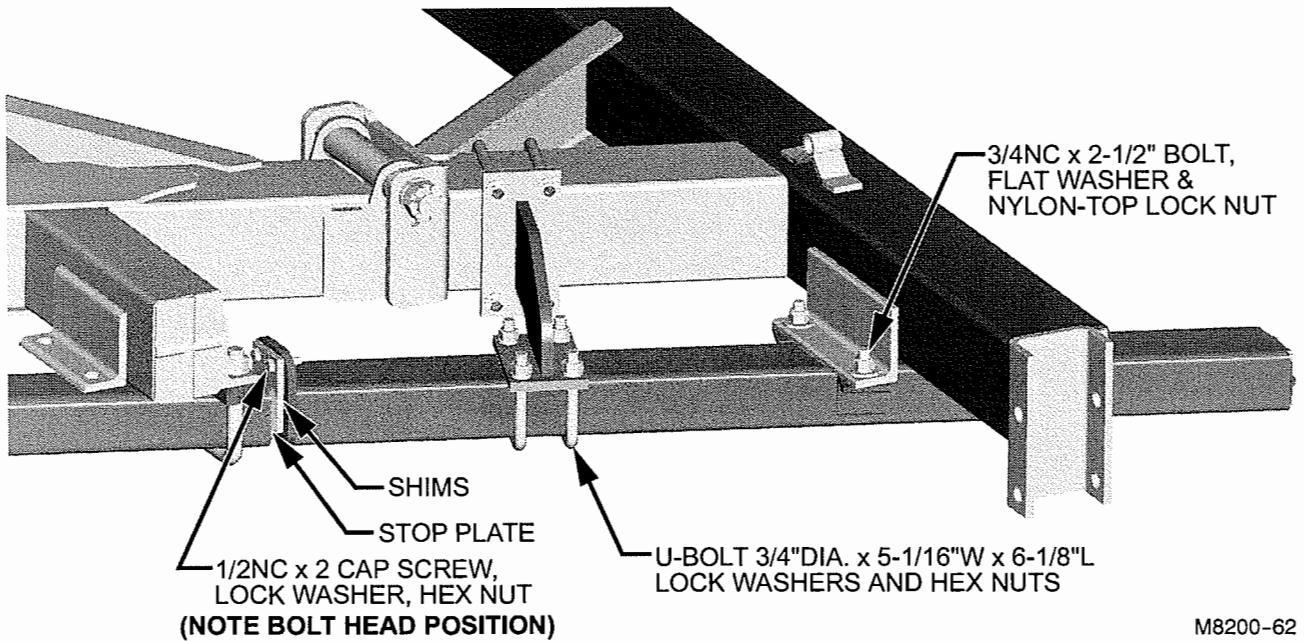
Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

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.

- g) After the wing cylinders are full, extend them to maximum length and remove the wood blocks.
IMPORTANT: AFTER PURGING THE HYDRAULIC SYSTEM OF AIR, PIN THE ROD ENDS OF THE 5 X 40 WING LIFT CLINGERS WITH (2) 6327-0-2 1-1/4" DIA X 6-1/4" PINS. SECURE EACH PIN WITH (2) 1-1/4" STD FLAT WASHERS, AND (2) 1/4" DIA X 2" ROLL PINS.

⚠ Caution: Before proceeding further with assembly of this unit close the hydraulic lock valves and reinstall the maintenance locks on the center section cylinders.

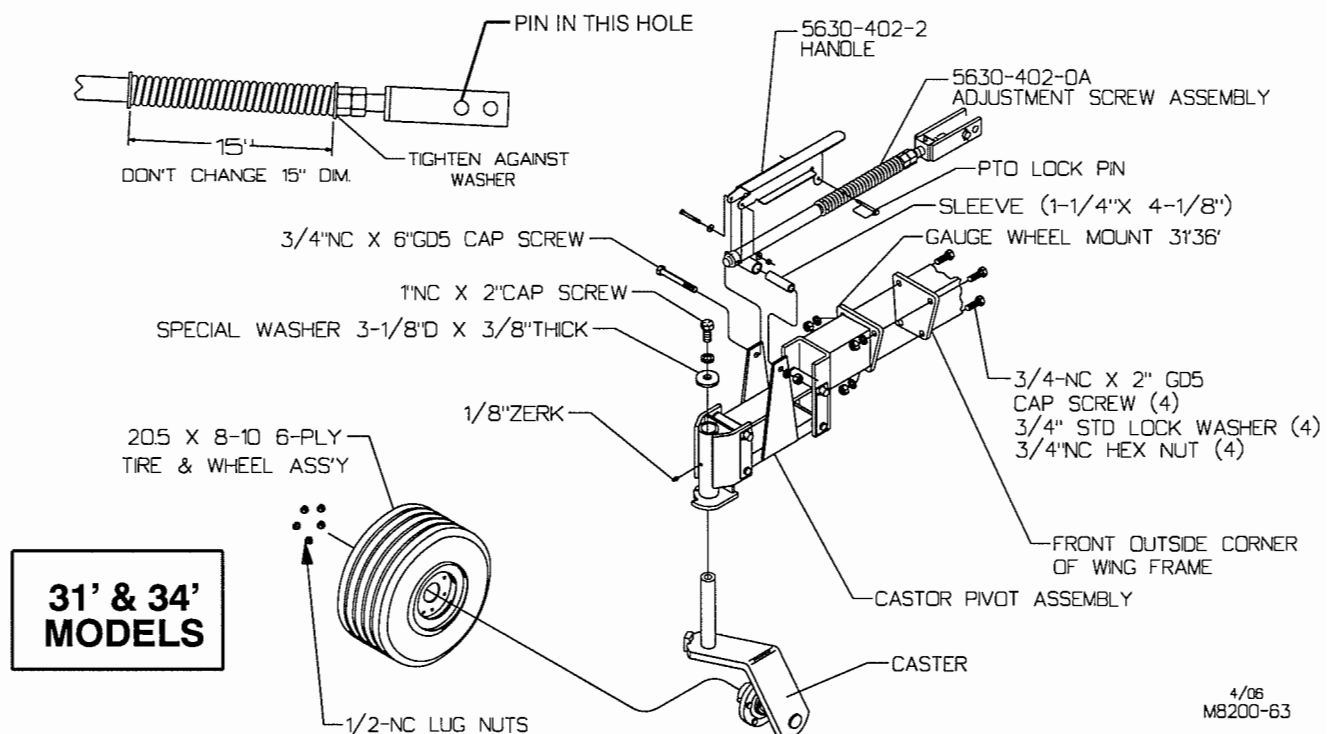
XVI. OUTSIDE GANGS 36' - 38' QUAD-FOLD

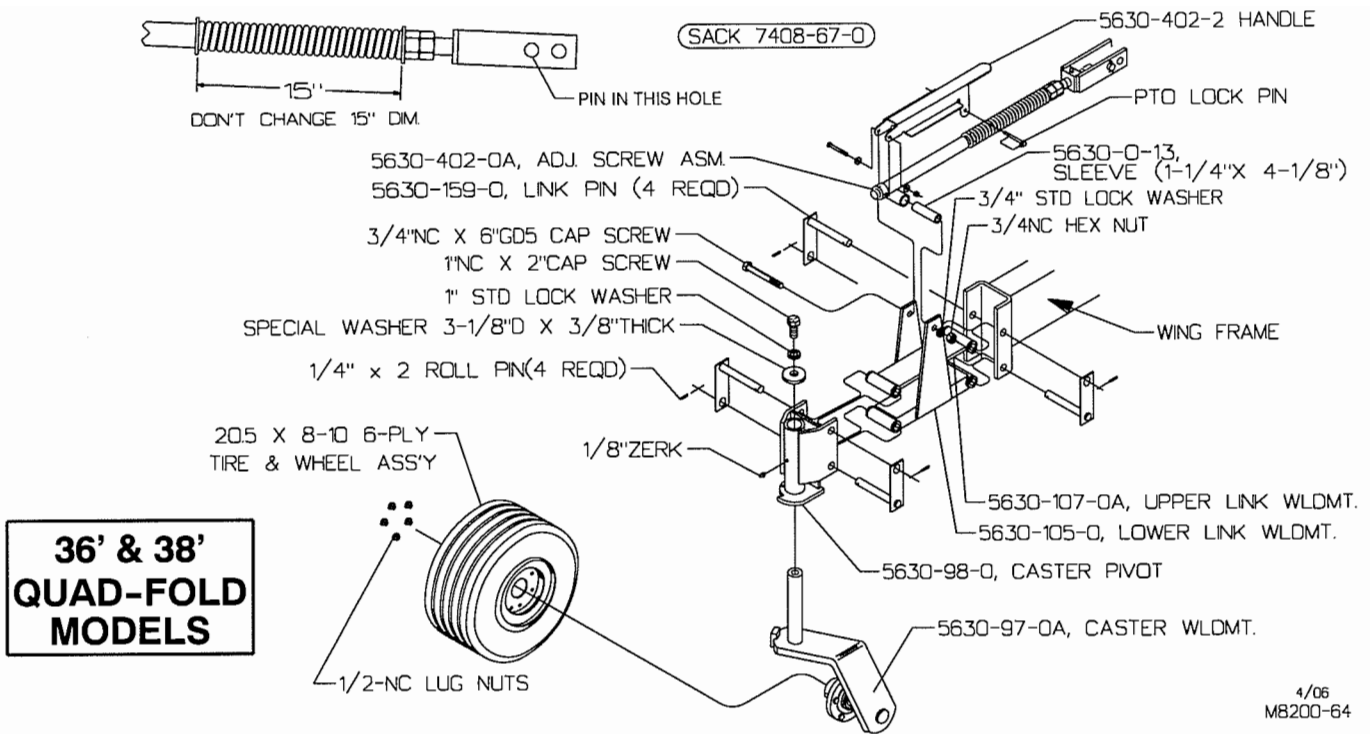


1. The outside wings should be in the unfolded position. Place the outside disc gangs under the frame.
2. Raise the gang to the frame and fasten with (2) 3/4NC x 2-1/2" Bolts with Flat Washers and Nylon-Top Lock Nuts, and (2) 3/4" DIA. x 5-1/16"W x 6-1/8"L length U-Bolts, Lock Washers and Hex Nuts.
3. The outer wing gang down stops against the inner gang and should be level with the inner wing gang when locked down. To level the outer gangs with the inner gangs, add or remove SHIMS (7404-0-26) from behind STOP PLATE (7404-0-25) between the gangs. Fasten with 1/2NC x 2" Cap Screw, Lock Washer and Hex Nut.

NOTE: Insert the cap screw with the bolt head to the inside.

XVII. GAUGE WHEELS





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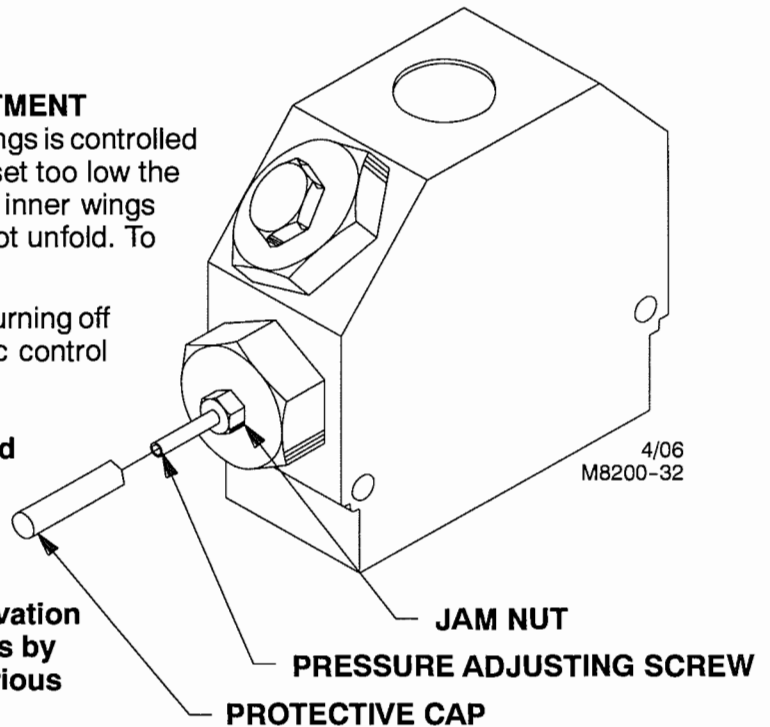
XVIII. SEQUENCE VALVE

QUAD FOLD SEQUENCE VALVE ADJUSTMENT

The timing of the unfolding of the outer wings is controlled by a sequence valve. If the pressure is set too low the outer wings will try to unfold before the inner wings and if set too high the outer wings will not unfold. To adjust the valve:

1. Relieve the fold system pressure by turning off the tractor and moving the hydraulic control lever back and forth.

Warning: Have all personnel stand clear of wings when relieving hydraulic pressure, folding and unfolding the wings. A hydraulic failure or activation of the hydraulic controls by someone can cause serious injury or death.



2. Remove the protective cap to the pressure adjusting screw and loosen the jam nut.
3. Using an allen wrench, screw the adjusting screw in (clockwise) to increase the pressure and stop the outer wing from unfolding.
4. Fold the inner wings out (the outer wings will not unfold) and unscrew (counterclockwise) the adjusting screw until the outer wings start to unfold.
5. Cycle the wings to assure the proper sequencing.
6. When the desired setting is reached, tighten the jam nut and replace the protective cap.

XIX. ZERKS

1. Install grease zerks to following locations:
 - a) Add (4) 1/8NPT x 45 at gang hinge tubes
 - b) Add (2) 1/8NPT STD Zerks at gauge wheel castor pivot
 - c) Add (2) 1/8NPT STD Zerks at gauge wheel adjustment screw clevis

XX. LIGHT KIT (Bolt sack 66-1183)

Always comply with state and local laws pertaining to lighting.

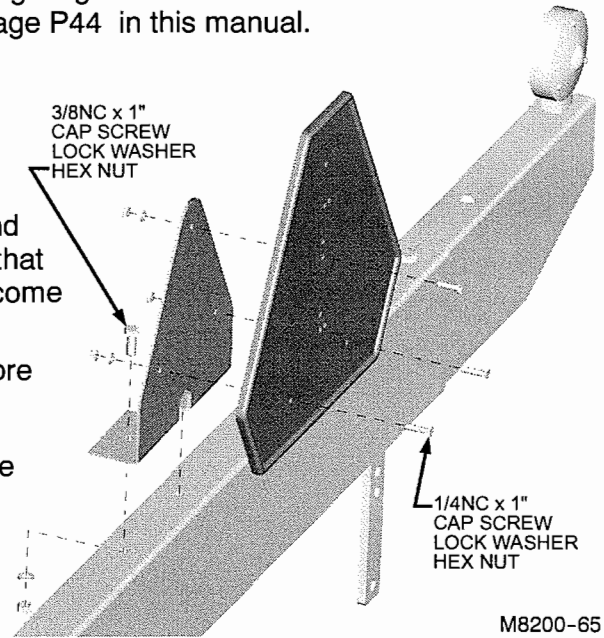
1. Install the LIGHT KIT as shown in illustration on page P44 in this manual.

XXI. DECALS

It is very important that all decals be placed on the implement as shown in the parts drawing on page P43 in this manual. These decals, reflectors, safety, and operating messages are just as important as the parts that have been assembled. If decals or reflectors should become faded or damaged be sure to replace them.

NOTE: Wipe frame members clean before applying decals for better adhesion.

1. Assemble the SMV BRACKET (5630-0-34) to the top of the DECAL and SMV MOUNT as shown.



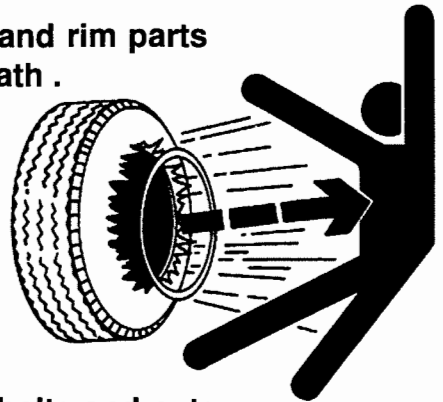
M8200-65

XXII. FINAL CHECK

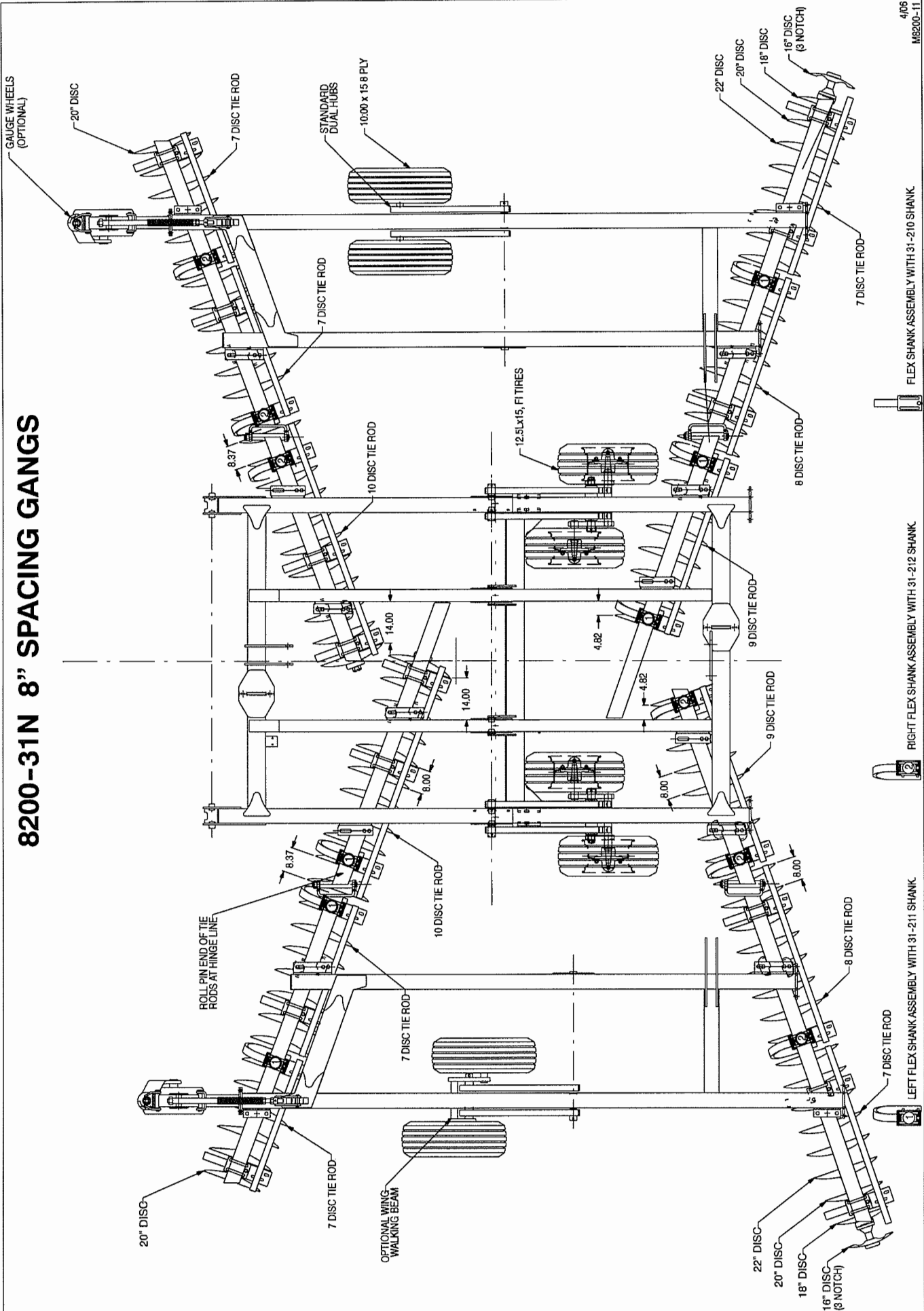
1. Check the hydraulic system for leaks.
2. Lubricate all grease points.
3. Fully extend depth control cylinders. Close transport lock valve.
4. Lower tongue jack.
5. Check tire pressure and wheel bolt torque.
6. Perform final inspection. See Dealer Predelivery Check Sheet (follows Warranty page at the front of this manual.)

⚠ 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.



8200-31N 8" SPACING GANGS



FLEX SHANK ASSEMBLY WITH 31-210 SHANK

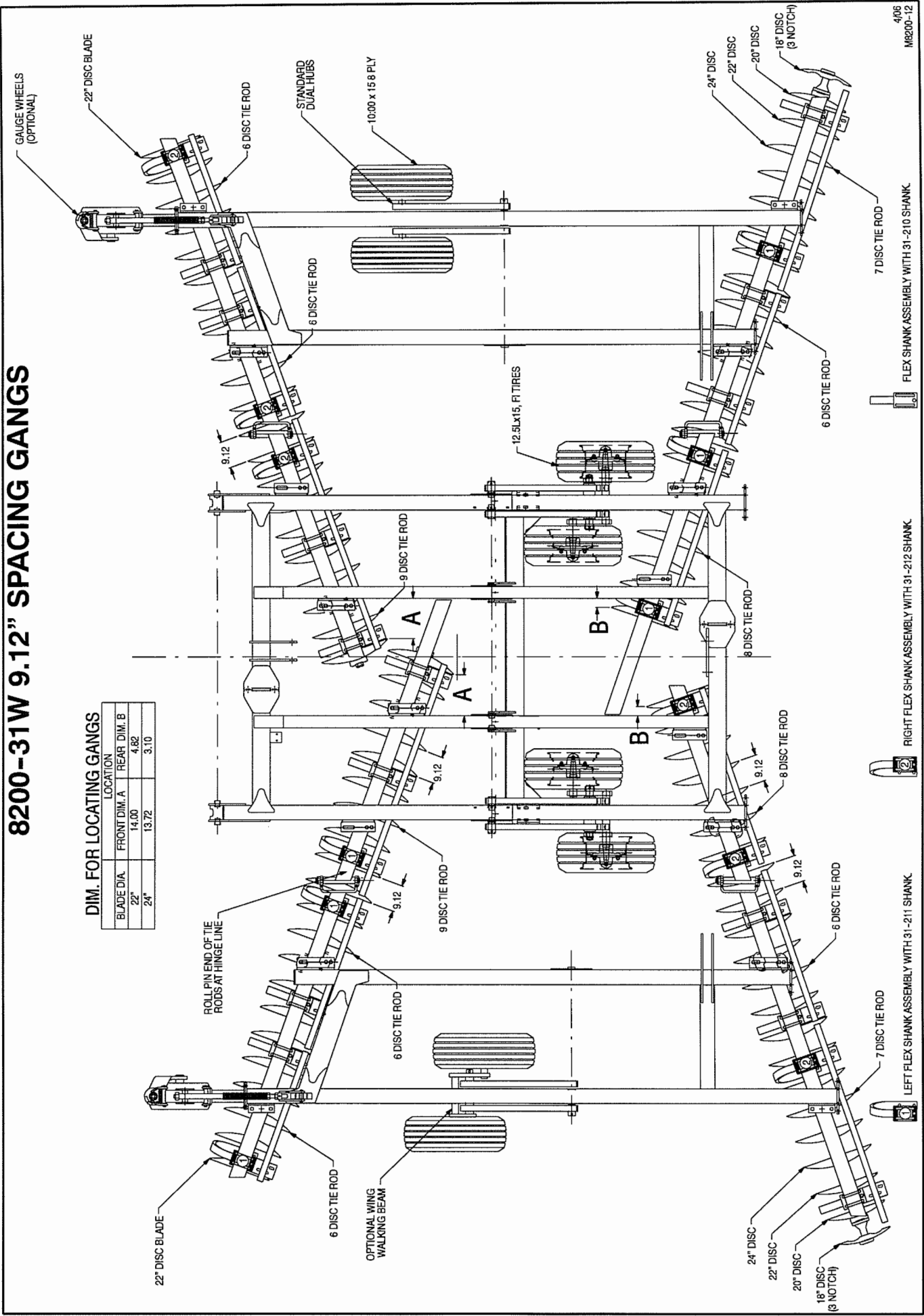
RIGHT FLEX SHANK ASSEMBLY WITH 31-212 SHANK

LEFT FLEX SHANK ASSEMBLY WITH 31-211 SHANK

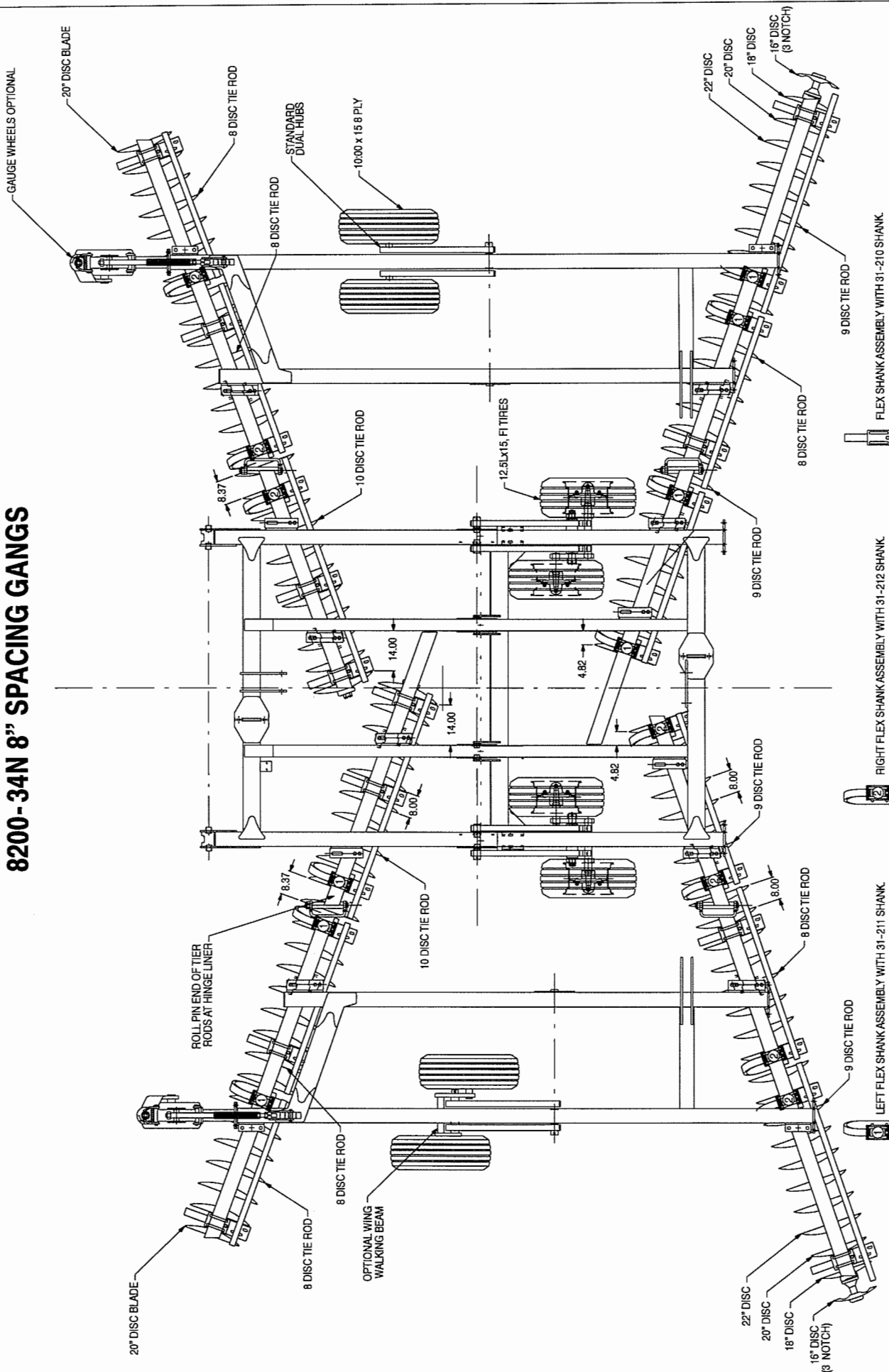
8200-31W 9.12" SPACING GANGS

DIM. FOR LOCATING GANGS

BLADE DIA.	LOCATION	
	FRONT DIM. A	REAR DIM. B
22"	14.00	4.82
24"	13.72	3.10



8200-34N 8" SPACING GANGS

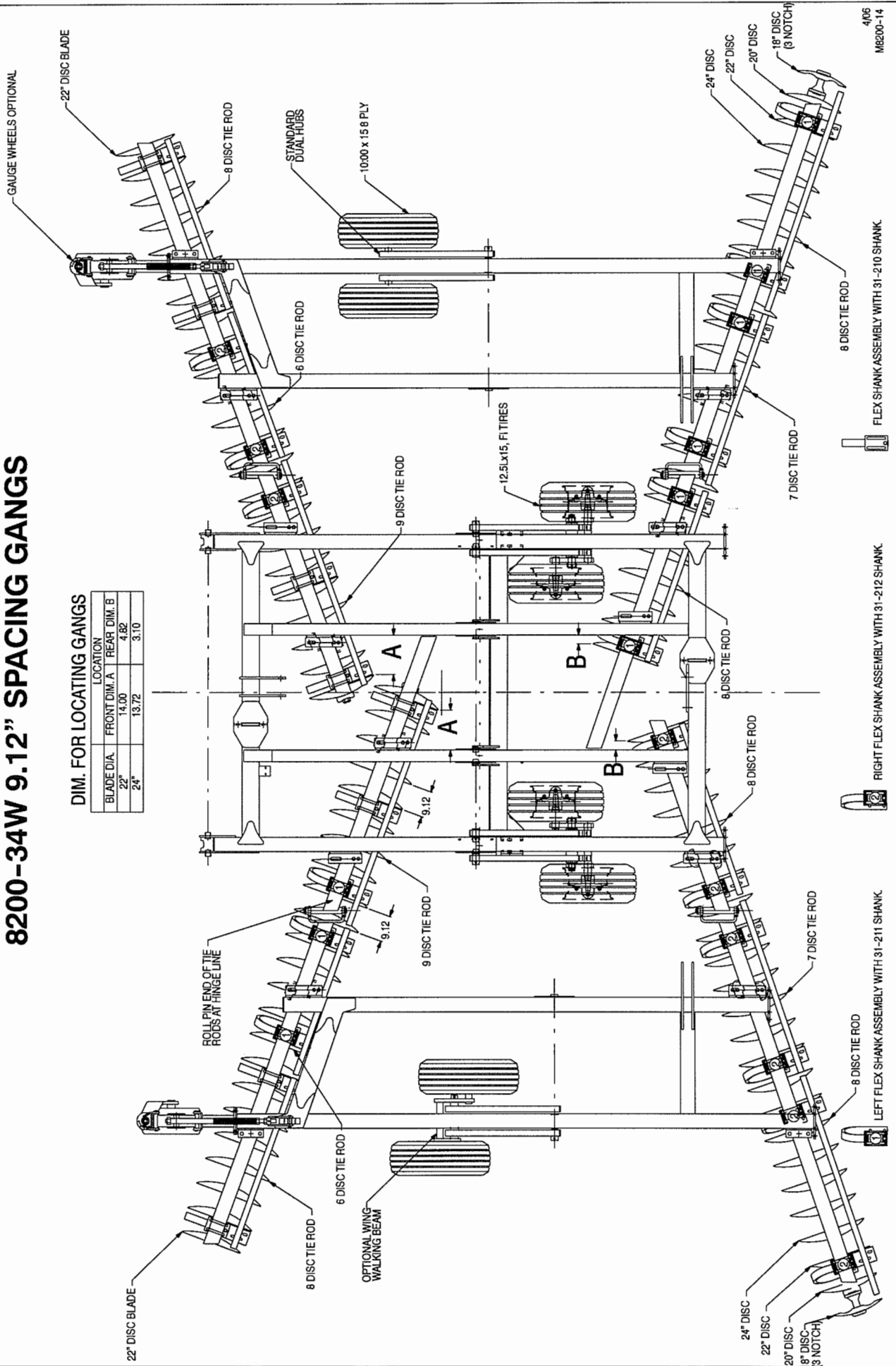


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8200-34W 9.12" SPACING GANGS

DIM. FOR LOCATING GANGS

BLADE DIA.	LOCATION	
	FRONT DIM. A	REAR DIM. B
22"	14.00	4.82
24"	13.72	3.10



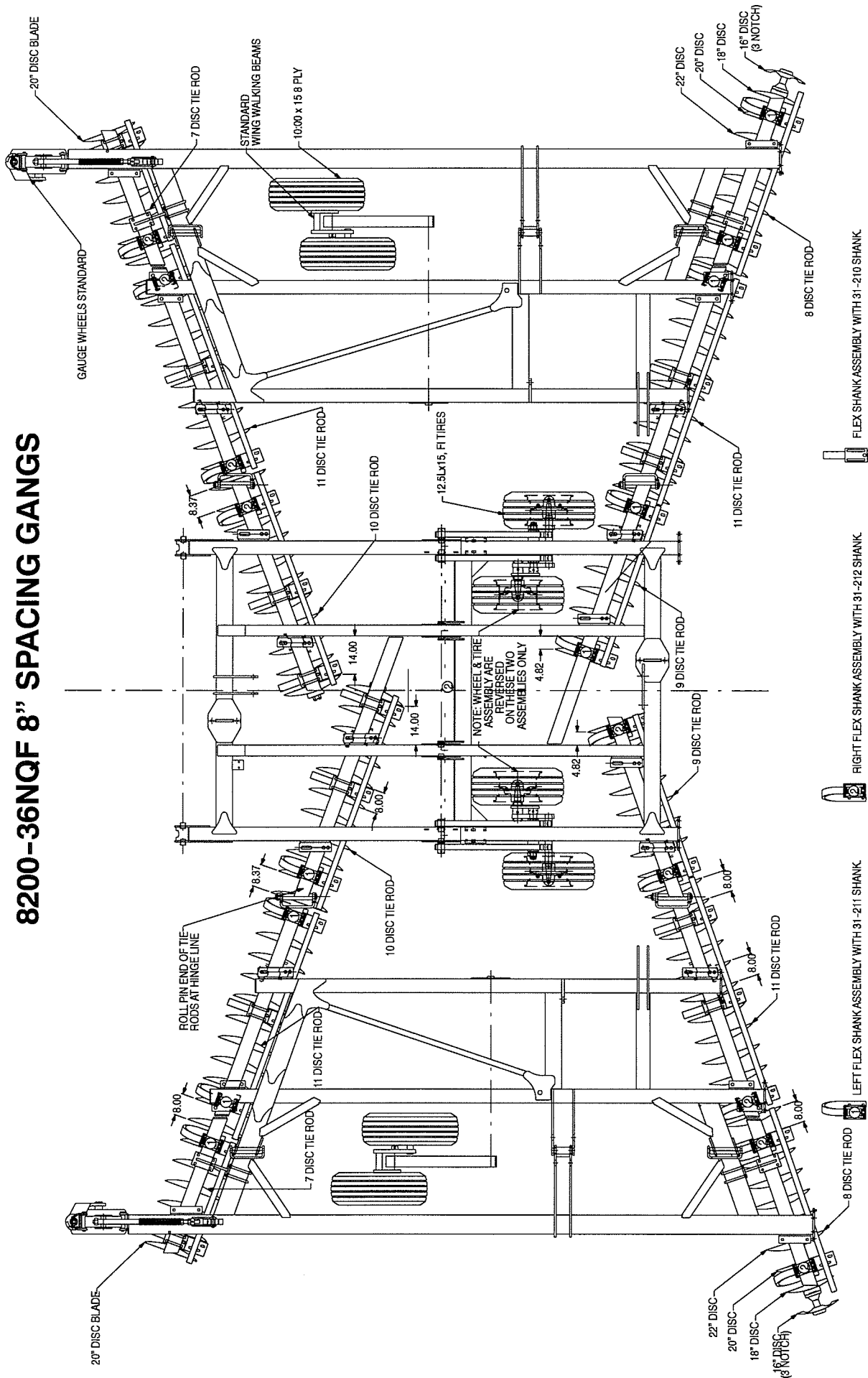
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8 DISC TIE ROD
FLEX SHANK ASSEMBLY WITH 31-210 SHANK

8 DISC TIE ROD
RIGHT FLEX SHANK ASSEMBLY WITH 31-212 SHANK

8 DISC TIE ROD
LEFT FLEX SHANK ASSEMBLY WITH 31-211 SHANK

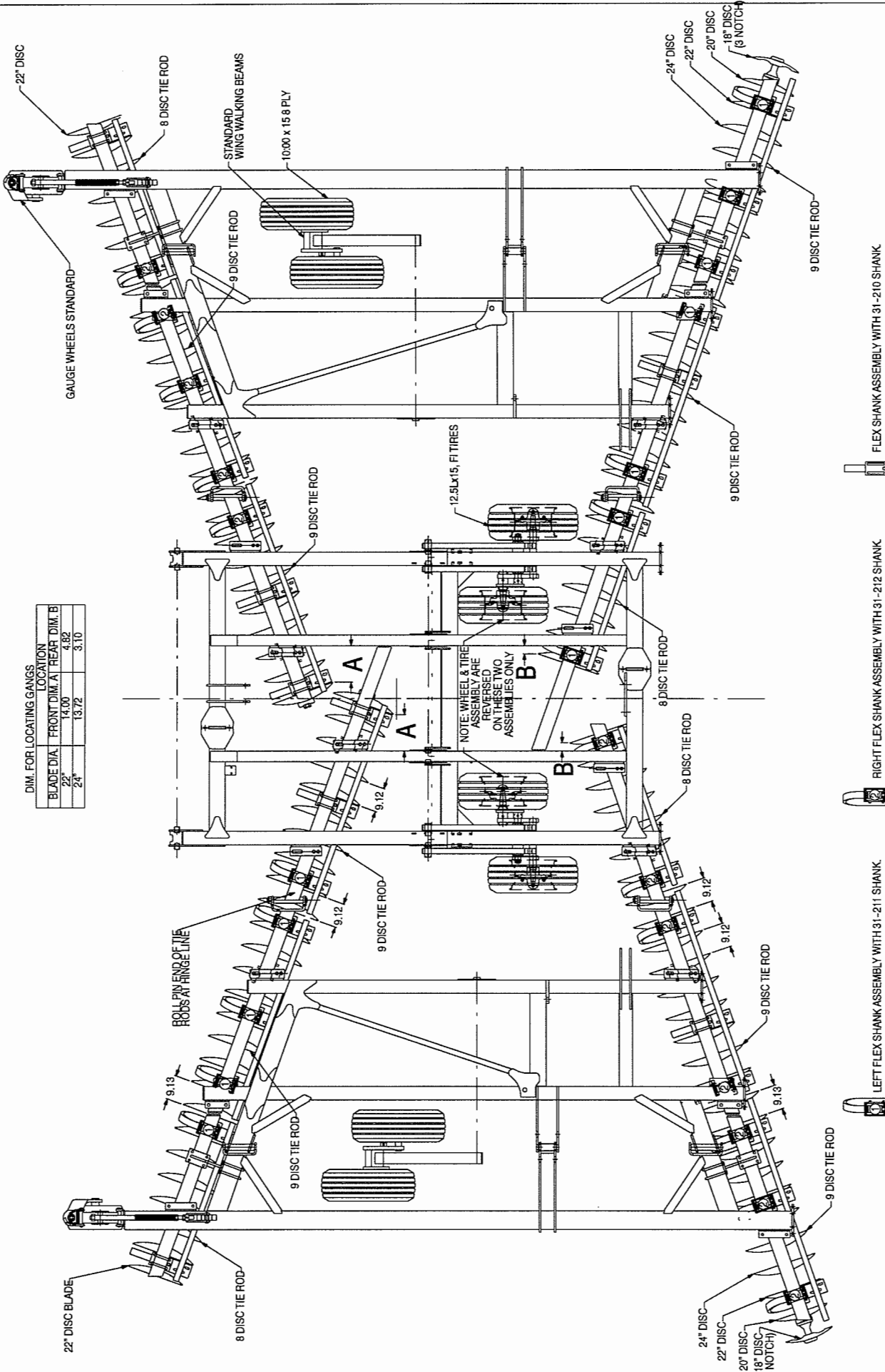
8200-36NQF 8" SPACING GANGS



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8200-38WQF 9.12" SPACING GANGS

DIM. FOR LOCATING GANGS		LOCATION
BLADE DIA.	FRONT DIM. A	REAR DIM. B
22"	14.00"	4.82"
24"	13.72"	3.10"



NOTE: WHEEL & TIRE ASSEMBLY ARE REVERSED ON THESE TWO ASSEMBLIES ONLY

LEFT FLEX SHANK ASSEMBLY WITH 31-211 SHANK.

RIGHT FLEX SHANK ASSEMBLY WITH 31-212 SHANK.

FLEX SHANK ASSEMBLY WITH 31-210 SHANK.

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SAFETY FIRST

Be observant and safety minded. Recognize and correct or avoid hazardous conditions before an accident can happen. Most accidents can be prevented by practicing simple fundamental safety rules.

1. Read and understand the implement and tractor owner's manuals before operating.
2. Be sure safety decals and reflectors are clean and in place.
3. Do not climb or walk on gangs or frames or tires.
4. Never position yourself under any portion of implement unless the transport lock is engaged or entire unit is lowered to the ground.
5. Stop engine before leaving the operator's position to adjust, lubricate, clean or unclog the machine.
6. Do not stand between the implement and tractor unless the tractor brakes are locked and engine is shut off.
7. Do not stand on or straddle a tongue when unhitching.
8. Always store a winged implement with the wings down.
9. Never remove locking pins until hydraulic cylinders and lines are full of oil and free of air. See Operating Instructions for proper method of removing air.
10. Never use machinery until all safety devices are in place.
11. Release all hydraulic pressure before shutdown periods.
12. Comply with Federal, State and local laws.
13. Use a Slow-Moving-Vehicle (SMV) emblem when transporting.
14. Always use a safety chain of tensile strength equal to the gross weight of the implement and attachments when roading.
15. Towing vehicle weight must exceed weight of towed implement.
16. Check wheel bolts before and during transport.
17. Always use wing locks and road locks to hold raised positions.
18. Never permit riders on implement.
19. Do not road an implement over 15 miles per hour on the best surface conditions. Reduce speed when going up or down hills and when approaching ditches.
20. Keep small children away from farm equipment.
21. Never modify an implement without permission from the Krause Engineering Department.
22. Always use authorized Krause parts.

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