WIL-RICH

OPERATOR'S MANUAL

WIL-RICH 2900 IN-FURROW SEMI-MOUNTED MOLDBOARD PLOW

SERVICE & ASSEMBLY

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HUTCHINSON WIL-RICH
MANUFACTURING COMPANY
P.O.BOX 1030 WAHPETON, ND 58074
PHONE: (701) 642-2621

WARRANTY

WIL-RICH WARRANTY

The only warranty Hutchinson Wil-Rich Manufacturing Company gives and the only warranty the dealer is authorized to give is as follows:

We warrant products sold by us to be in accordance with our published specifications or those specifications agreed to by us in writing at time of sale. Our obligation and liability under this warranty is expressly limited to repairing, or replacing, at our option, within 12 months after date of retail delivery, any product not meeting the specifications. WE MAKE NO OTHER WARRANTY, EXPRESS OR IMPLIED AND MAKE NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Our obligation under this warranty shall not include any transportation charges or costs or installation or any liability for direct, indirect or consequential damage or delay. If requested by us, products or parts for which a warranty claim is made are to be returned transportation prepaid to our factory. Any improper use, operation beyond rated capacity, substitution of parts not approved by us, or any alteration or repair by others in such manner as in our judgment affects the product materially and adversely shall void this warranty. NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY.

Hutchinson Wil-Rich Manufacturing Company reserves the right to make improvement changes on any of our products without notice.

WHEN WARRANTY LIMITED OR NOT APPLICABLE: Warranty on hoses, cylinders, hubs, spindles, or other trade accessories are limited to the warranties made by the respective manufacturers of these components. Rubber tires and tubes are warranted directly by the respective tire manufacturer only and not by Hutchinson Wil-Rich Manufacturing Company.

Warranty does not apply to any machine or part which has been repaired or altered in any way so as in the company's judgment to affect its reliability, or which has been subject to misuse, negligence or accident.

A DELIVERY REPORT FORM MUST BE FILLED OUT AND RECEIVED BY HUTCHINSON WIL-RICH MANUFACTURING COMPANY TO INITIATE THE WARRANTY COVERAGE.

WARRANTY CLAIMS PROCEDURE

1. The Warranty Form must be returned to Hutchinson Wil-Rich Manufacturing Company within fifteen (15) working days from the repair date.

2. Parts returned to Hutchinson Wil-Rich Manufacturing Company without authorization will be refused. The parts must be retained at the dealership for ninety (90) days after the claim has been filed. If the Service Department would like to inspect the parts, the packing slip will be mailed to the dealer. The packing slip must be returned with the parts. The parts must be returned prepaid within thirty (30) days of receiving authorization. After the parts are inspected and warranty is verified, credit for the return freight will be issued to the dealer.

3. Parts that will be scrapped at the dealership will be inspected by Hutchinson Wil-Rich Manufacturing Company Sales Representatives, District Sales Managers or Service Representatives within the ninety (90) day retaining period.

PERSONAL SAFETY IS IMPORTANT !!

ALL PERSONNEL INVOLVED WITH THE ASSEMBLY

AND/OR OPERATION OF THIS EQUIPMENT MUST BE

INFORMED OF PROPER SAFETY PROCEDURES.

OPERATOR'S AND ASSEMBLY MANUALS PROVIDE

THE NECESSARY INFORMATION.

IF A MANUAL IS LOST FOR A PARTICULAR IMPLEMENT,

A REPLACEMENT SHOULD BE ORDERED AT ONCE.

OPERATOR'S AND ASSEMBLY MANUALS ARE AVAILABLE

AT NO CHARGE UPON REQUEST.

ADDRESS INQUIRIES TO:

HUTCHINSON WIL-RICH MANUFACTURING COMPANY

P.O. BOX 1030

WAHPETON, ND 58074

(701) 642-2621

Safety decals appear at various locations on your machine. These decals are provided for your safety and should be kept clean. Replace any decal that becomes worn, damaged, painted over, or otherwise difficult to read. Replacement decals are available through your Wil-Rich dealer.

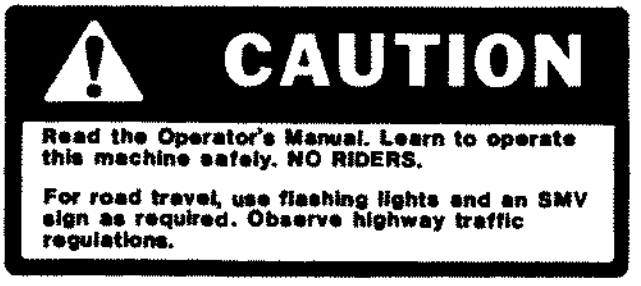
BEFORE OPERATING

Use extreme care when making adjustments.

When working under or around the machine always lower shanks to the ground.

After servicing, be sure all tools, parts, or servicing equipment is removed from the machine.

Make sure that there is no one near the machine just before operating and during operation.



DURING OPERATION

Reduce speed when cornering on field ends and when operating on or across dead furrows.

Do not attempt to remove any obstruction while the machine is in motion.

Use extreme care when operating close to ditches, fences, or on hillsides.

No one other than the operator should ride on the tractor.

Before and during operation be sure no one is on or around the implement. Serious injury can result from improper use.

Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result if medical treatment is not given immediately. Make sure all connections are tight and that hoses and lines are in good condition before applying pressure to the system. Relieve pressure before disconnecting the lines or performing other work on the hydraulic system. To find a leak under pressure use a small piece of cardboard or wood: Never use hands.

ON-HIGHWAY OPERATION

Always place the machine in the transport position.

Comply with your state and local laws governing highway safety when moving machinery on a highway.

Reduce road speed on corners.

Drive at a reasonable speed to maintain complete control of the machine at all times.

A S.M.V. emblem should be used at all times while traveling on public roads.

THIS SYMBOL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS CONCERNING YOUR PERSONAL SAFETY. BE SURE TO OBSERVE AND FOLLOW THESE INSTRUCTIONS.

TO THE OWNEF

It is the responsibility of the user: To read the Operator's Manual and comply with the safe and correct operating procedure as: Pertains to the operation of the product; and to lubricate and maintain the product according to the information outlined in the Operator's Manual.

The user is responsible for inspecting his machine, and for having parts repaired or replaced when continued use of the product would cause damage or excessive wear to the other parts.

The word NOTE is used to convey information that is out of context with the manual text; special information such as specifications, techniques, reference information, safety practices, and other information of supplementary nature.

Hutchinson Wil-Rich Manufacturing Company
Wahpeton, ND Made in U.S.A.

Serial Number:

WIL-RICH® NOBLE®

This machine may be covered by one or more of the following patents:

- PAT. U.S. - 3,606,928 3,782,481 4,451,052 4,296,695 4,054,177 4,068,723 4,121,852
- PAT. CAN. - 1974 1976 1982 1985
- OTHER PATENTS PENDING

When in need of parts, always specify the model and serial numbers, including prefix and suffix letters. Write these numbers in the spaces provided.
The in-furrow semi-mounted plow has the serial number plate located on the top side of the main frame tube, behind the second bottom assembly.

CONTENTS

MODIFICATIONS

It is the policy of Wil-Rich Operations to improve its products whenever possible and practical to do so. We reserve the right to make changes, improvements, and modifications at any time without incurring the obligation to make such changes, improvements, and modifications on any equipment sold previously.

ADJUSTING AND OPERATING

PREPARATION

Before using your Wil-Rich plow, a careful inspection should become routine. A check should be made to insure that all hardware is securely tightened and moving parts properly lubricated.

TRACTOR PREPARATION

Refer to tractor's operator's manual furnished with tractor for recommended adjustments and weight distribution.

TRACTOR TIRES

See pre-plowing adjustment procedure (page 3) for recommended tractor tire width.

TIRE INFLATION

The use of the proper air pressure is the most important factor in satisfactory performance and maintenance of implement tires. Underinflation will damage the cord body of the tire and cause a series of diagonal breaks in the fabric in the sidewall area.

If the tire buckles or wrinkles, the air pressure should be increased to the point where the sidewalls remain smooth while operating.

NOTE: DO NOT OVERINFLATE TIRES.

WHEEL BOLTS

It is recommended that all wheel bolts be checked for tightness before using and again after one day of use. Paint or rust can work out causing the wheel to become loose. Check periodically to be sure the wheel bolts are tight.

BEARING ASSEMBLIES

Bearing assemblies should be checked periodically for looseness. A loose bearing will cause costly damage after a short period of time.

ATTACHING TO TRACTOR

By using a combination of the hitch pin, spacer and bushing the Wil-Rich semi-mounted plows will hitch to tractors with Category II or III Quick Hitch or 3-Point. (See Fig. 1)

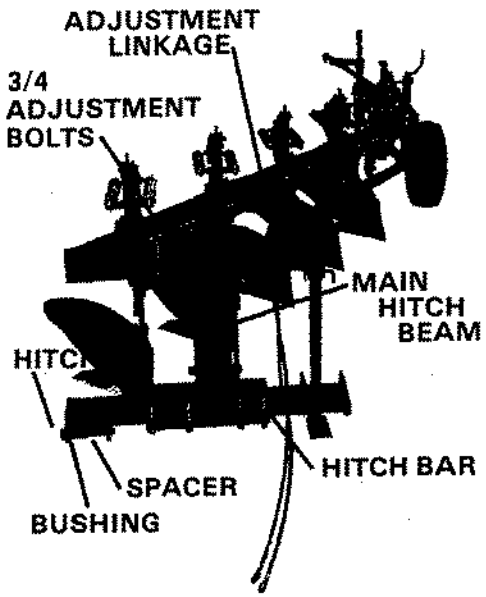


FIG. 1 PI-75356

When the upper link of the tractor is not used, secure in the storage position and be sure it will not interfere with the operation of the lower links. Refer to the tractor manual for details.

NOTE: THE TRACTOR LINK ARMS MUST BE LOCKED TO PREVENT SWAYING.

TRANSPORTING

A SMV slow moving vehicle bracket is provided on the rear portion of tailsection. The SMV emblem should be used at all times while on public roads.

Drive at a reasonable speed to maintain complete control of the machine at all times.

Comply with your state and local laws governing highway safety and with any regulations which cover moving machinery on the highway in your area.

REMOVING PROTECTIVE COATING FROM BOTTOMS

Plow bottoms are polished and coated to prevent rusting before leaving the factory. Good work cannot be accomplished until this coating is removed.

The black, protective coating on the bottoms will quickly wear away in most soils; however, for soils which scour with difficulty, it is advisable to remove the coating before attempting to plow. For this purpose, use a paint remover and wipe or scrape off.

NOTE: DO NOT PERMIT SMOKING OR AN OPEN FLAME WHERE COMBUSTIBLE FUELS ARE BEING USED TO REMOVE THE PROTECTIVE COATING. KEEP THE WORK AREA WELL VENTILATED.

SCOURING

If the plow bottoms do not scour immediately, it is because the soil is rather sticky and you will have to wait until the bottoms have taken a land polish. This may require a few rounds or in very sticky soil, a few days. To obtain this land polish, it is recommended that you run the plow rather shallow and fast. It is also advisable to set the coulters far to the outside of the landside and not too deep. Sometimes it is necessary to remove the coulters entirely to obtain the maximum pressure on the plow bottom.

If the plow is not to be used for a long period of time, scrape off the dirt, clean, and protect the polished surface of the bottoms with a liberal coating of moldboard bottom paint protector. These paints are a rust preventative; they apply easily and are easily scoured when the plow is again used. Heavy grease may be used to protect the bottoms for short periods of time.

DISCONNECTING PLOW FROM TRACTOR

Before lowering the plow for detaching, be sure to swing the support leg down and secure with pin. (See Page 10)

⚠ CAUTION

LOWER PLOW TO GROUND BEFORE UNHITCHING TRACTOR

HITCH ADJUSTMENT

For best operation of an in-furrow plow, the PULL POINT of the tractor must be properly attached to the CENTER OF LOAD of the plow. As shown in the drawing (Fig. 2), the LINE OF DRAFT starts at the tractor PULL POINT and extends to the CENTER OF LOAD of the plow. The PULL POINT of most two wheel drive tractors is located on the tractor center line just ahead of the rear axle. (Refer to your tractor operators manual for the exact location).

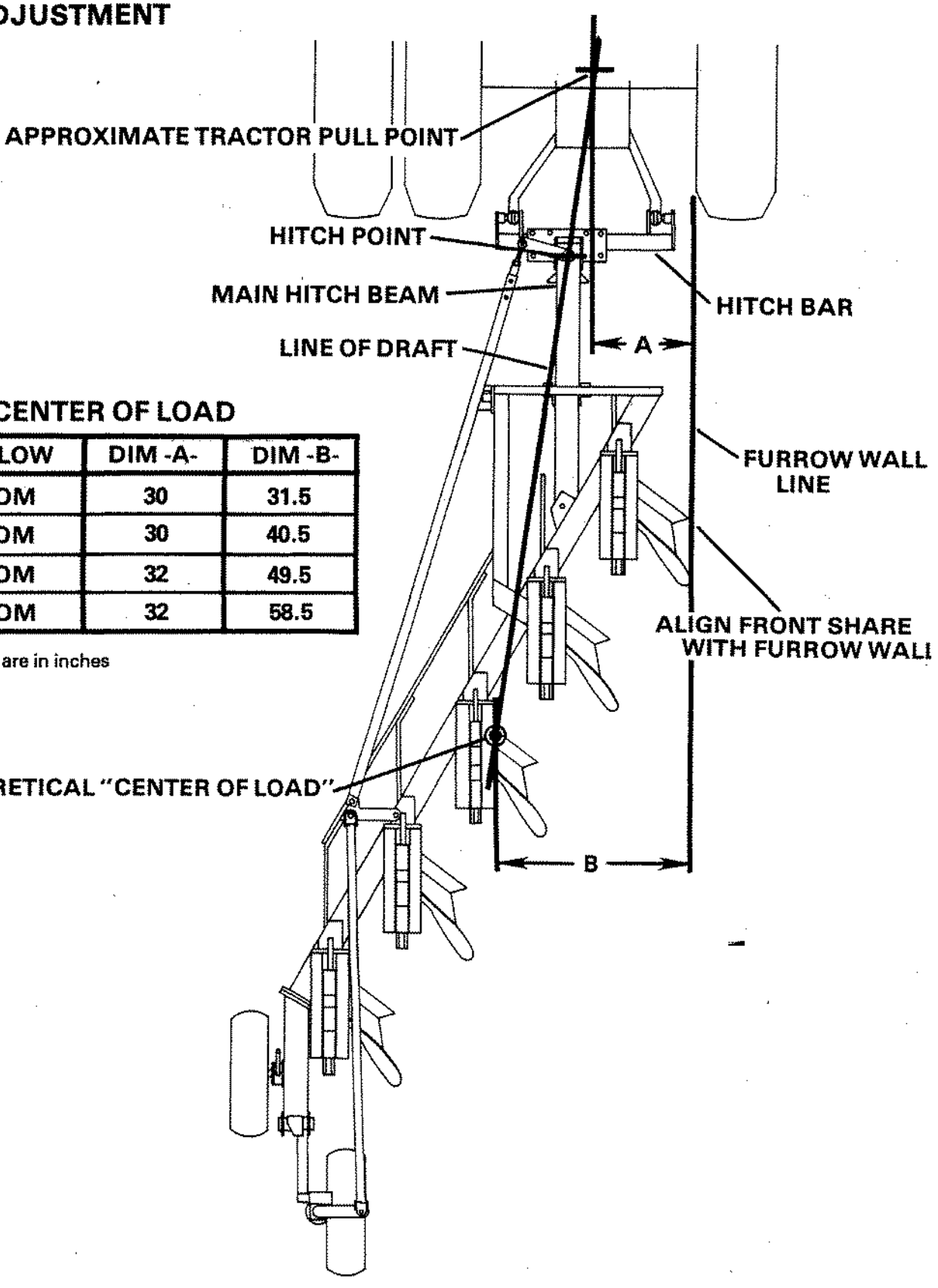
The CENTER OF LOAD is a theoretical point on the front edge of the moldboard share. It is measured from the edge of the furrow wall to the front edge of the appropriate bottom. These points have been predetermined, see center of load table (See Fig. 2).

PRE-PLOWING HITCH ADJUSTMENT PROCEDURE

1. Draw a straight line on the floor or ground to represent the furrow. (See Fig. 2)
2. Set tractor on line as shown, with noted wheel measurement.
3. Set front plow share on furrow line as shown with all standards pointing straight forward.
4. Draw a line or pull a string to represent the line of draft as shown.
5. Loosen the bolts which hold the main hitch beam and hitch bar in place. Move the main hitch to center the hitch point over the line of draft and retighten the mounting bolts.

These are the initial adjustments which can be made before entering the field and apply primarily to the in-furrow model plow.

HITCH ADJUSTMENT



CENTER OF LOAD

SIZE OF PLOW	DIM -A-	DIM -B-
3 BOTTOM	30	31.5
4 BOTTOM	30	40.5
5 BOTTOM	32	49.5
6 BOTTOM	32	58.5

dimensions are in inches

FIG. 2

TAILWHEEL

The tailwheel serves to carry the rear end of the plow when transporting and to take part of the thrust of the landside against the furrow wall. Be sure the tire is inflated to the recommended air pressure before making adjustments.

By adjusting the screw stop cylinder on the tailwheel more weight can be carried by the tailwheel to further stabilize the rear of the plow

A channel lock should always be used when transporting.

GUAGE WHEEL

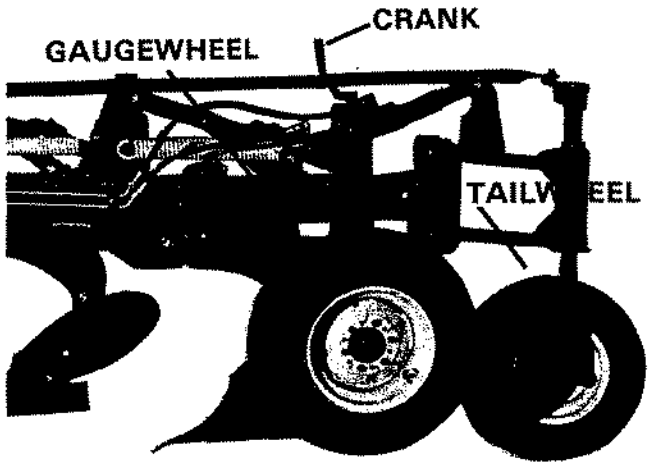


FIG. 4

To set the gauge wheel to desired plowing depth turn gauge wheel crank as required. (See Fig. 4) When plow is in operation the gauge wheel should be supporting most of the rear end weight of the plow.

STRIKING OUT

IN-FURROW

See tractors operators manual for proper adjustment of the 3-point link arms. Adjustment is necessary to obtain the desired depth on the front bottom.

NOTE: TO PREVENT INSTABILITY, WHICH IS POSSIBLE IN SHARP TURNS, LIMIT STOPS HAVE BEEN BUILT INTO THE FRONT HITCH.

HITCH ROTATION MUST BE STOPPED AT FRONT HITCH OR AN EXCESSIVE LOAD WILL BE PLACED ON THE LINKAGE ARMS.

DO NOT USE TRACTOR BRAKES WHILE MAKING TURNS.

LEVELING PLOW

FRONT-TO-REAR

Before the plow can be properly leveled the strike out round must be made. Set the desired depth of the rear bottom with the gauge wheel on plow.

The front bottom depth of the in-furrow plow is set by the tractor link arms and three point hydraulics.

SIDE-TO-SIDE

To level the in-furrow plow side to side adjust the lift arms on your tractor until the front 2 x 6 beam is horizontal with the ground.

Setting the land corner lower than the furrow corner will give quicker penetration of the shares if needed.

DRAFT ADJUSTMENT

Once the striking out round has been completed; bottoms are properly scoured; coulters evenly set; and the plow has been properly leveled front to rear and latterally, as described previously, the final draft adjustments can be made. If pre-plowing adjustment procedures have been followed the front bottom should be cutting the corre width. Normal soil forces, which can vary widely from fie to field and within the same field, tend to rotate a plow clockwise (looking down from above). If a plow is overcutting it is necessary to move the hitch point toward the furrow by loosening the mounting bolts and moving the main hitch beam toward the furrow. A corresponding change in the location of the hitch bar is needed to maintain the correct cut of the front bottom. It may be necessary to change the initial wheel tread settings to insure the correct cut of the front bottom and the proper placement of the load on the tractor. If the plow is undercutting the hitch point is moved away from the furrow with the corresponding changes made in the opposite direction. These principals apply to both the in-furrow and the on-land model plows with the only difference being in the adjustment of the hitch pole.

The draft of the plow is greatly effected by the soil conditions, speed of plowing, depth of plowing, coulter settings, etc. which can effect the hitch location. There are no more specific instructions that can be given other than to move the hitch point away from the furrow when the plow is undercutting and toward the furrow when the plow is overcutting. On an in-furrow plow this may require a revised tractor wheel setting or the addition of ballast to the front or rear of the tractor. All draft adjustment- are effected also by the vertical leveling of the plow a. those also should be considered.

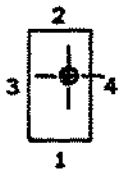
AUTOMATIC RESET STANDARD

The trip shank assembly is designed to give total protection against rocks and other obstacles which are encountered while in operation.

The amount of force required to trip or fold the linkage is determined by the stop block setting.

The stop block maintains the linkage arms distance from center, shown as dimension (A), (See Fig. 6)

The stop block may be loosened and turned to any one of four positions. Decreasing distance (A) will increase the force required to trip the linkage arms.



1st POSITION — EASY TRIP
2nd POSITION — MEDIUM TRIP
3rd POSITION — HARD TRIP
4th POSITION — HARDEST TRIP

To change stop block use the following procedure:

1. Remove both reset springs.
2. Raise bottom several inches and block securely.
3. Loosen stop block bolt, turn block to desired position.
4. Reassemble.

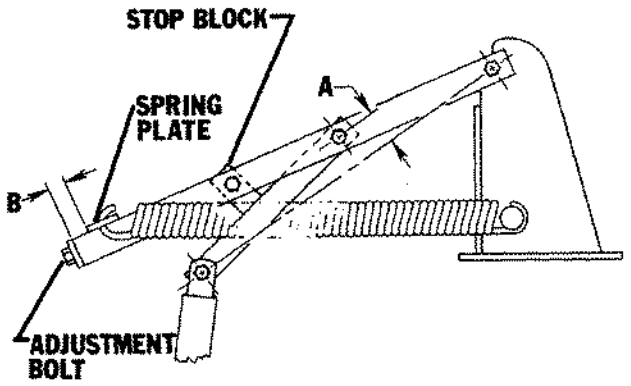


FIG. 6

The spring tension may be adjusted with the adjustme bolt. Tightening the springs increases the for necessary to trip the linkage arms, it also increas reset force and resists "floating" or vertical rise of t bottom.

SUGGESTED SETTING

In **average rock conditions** it is recommended the st block be placed in the 2nd position and the springs t adjusted to a distance, at (B), of 3/4.

In **extremely heavy rock** conditions it is recommende the stop block be placed in the 1st position and th springs be adjusted to a distance, at (B), of 1-1/4.

For **heavier draft conditions** it is recommended the sto block be placed in the 3rd position and the springs b adjusted to a distance, at (B), of 1/2.

Only for extremely heavy soil conditions and relativel rock free fields it is recommended the stop block b placed in the 4th position and the springs adjusted at (B for the highest reset power and heaviest draf resistance as required.

For added reset pressure, reverse spring plate.

NOTE: DO NOT SET THE TRIP TIGHTER THAN NEEDEI TO RESIST NORMAL PLOWING LOAD. THIS WILL IN CREASE SHOCK LOAD, CAUSING EXTRA WEAR ON SHARES, BOLTS, AND ETC.

The trip shank stop bolt (See Fig. 7) can be adjusted a limited amount to help vertical alignment of the bottoms. Do not extend the bolt over 1/2".

Stop bolts will tend to work out during use so keep locknut tight and check all stop bolts occasionally.

Trip shank pivot bolts (See Fig. 7) are adjustable tc eliminate side play in the shank assemblies. Remove cotter pins and tighten until the side play is reduced, but still loose enough to allow the shank to move freely.

It is recommended the bottoms be checked for side play and these nuts adjusted after the first few days of field use.

Stop bolts tend to work out during use so keep locknut tight and check all bolts regularly.

NOTE: USE CAUTION WHEN PLOWING IN FIELDS WITH LARGE ROCKS, WHICH PROTRUDE SIX INCHES OR MORE ABOVE THE SURFACE.

NOTE: DO NOT OVER TIGHTEN PIVOT BOLT SINCE THIS MAY CAUSE A BOTTOM TO HANGUP WHEN TRIPPED.

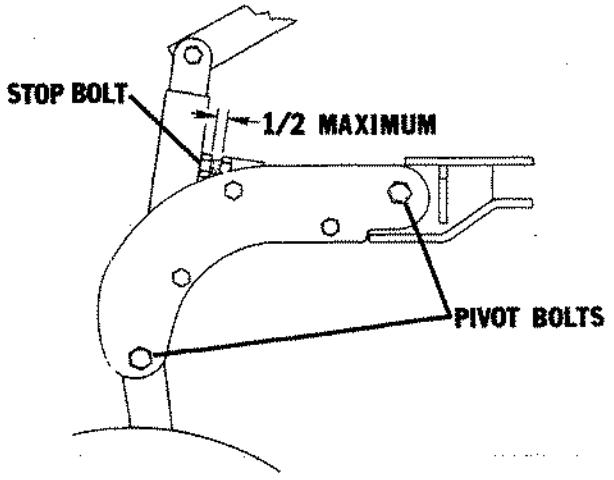


FIG. 7

PI-75360

NOTE: THE SPRINGS AND BARS WHIP AT A VERY FAST RATE FORWARD, MAKING IT DANGEROUS TO RIDE ANYWHERE ON THE PLOW FRAME.

THE TRIP ASSEMBLIES OPERATE VERY RAPIDLY AND ARE POTENTIALLY DANGEROUS TO BE NEAR AT ANY TIME WHILE PLOWING.

SHOULD DIRT OR TRASH CAUSE A UNIT TO HANGUP, STAY CLEAR OF THE AREA NEAR THE UNIT. TO REMOVE THE OBSTRUCTION, USE A LONG POLE OR HOOK.

SHEAR BOLT STANDARD

The shear bolt trip assembly is designed to protect the bottom assembly and plow from damage when plowing in light rock conditions. When an obstruction is encountered while plowing, the shear bolt (A) will absorb the shock load through shear and allow the bottom to rise above the obstruction before damage is done.

To reset the bottom assembly, raise the plow out of the ground far enough to allow the trip assembly to swing down into plowing position. Replace the shear bolt with a special Wil-Rich replacement shear bolt (A-5243) and tighten to approximately 50 foot pounds torque (See Fig. 8).

Because this trip assembly is designed for use in area's of light rocks and the shock cushioning effect of the spring reset is not present, it is important you check all bolts and nuts on the shear bolt trip assemblies often enough to insure they are kept tight.

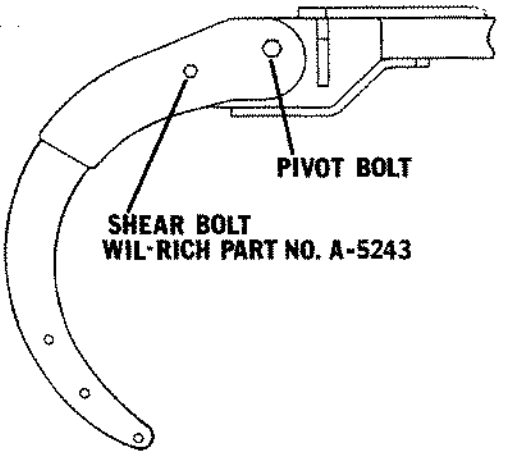


FIG. 8

PI-75361

NOTE: A STANDARD 5/8 X 3-1/2 GRADE 2 BOLT MAY BE SUBSTITUTED FOR THE WIL-RICH SHEAR BOLT.

MOLDBOARD PLOW BOTTOMS

NOTE: NEVER ALLOW THE SHARE, SHIN OR LAND-SIDE TO WEAR UNTIL THE FROG IS EXPOSED. WHEN PLOWING IN ABRASIVE OR ROCKY SOIL CHECK THE CONDITION OF THESE PARTS FREQUENTLY. PLOWING WITH WORN SHARES CAN RESULT IN A HARD RUNNING PLOW AND INCREASE FUEL COSTS.

COULTER ADJUSTMENT

Coulters help cut the furrow slices vertically and also cut through the surface trash and aid in producing a clean furrow wall. Compression spring coulters are recommended for use with automatic reset standards and stony soil. The coulters are adjusted both vertically and side to side by slightly loosening the coulter shank clamp and adjusting the shank to the desired position. For normal conditions the coulter should be set to run approximately ½ to ¾ of an inch to the left of the moldboard shin. In lighter crumbly ground a wider setting may be necessary in order to obtain a clean furrow wall. In sod or firmer soil the coulters may sometimes be set narrower. (See Fig. 9)

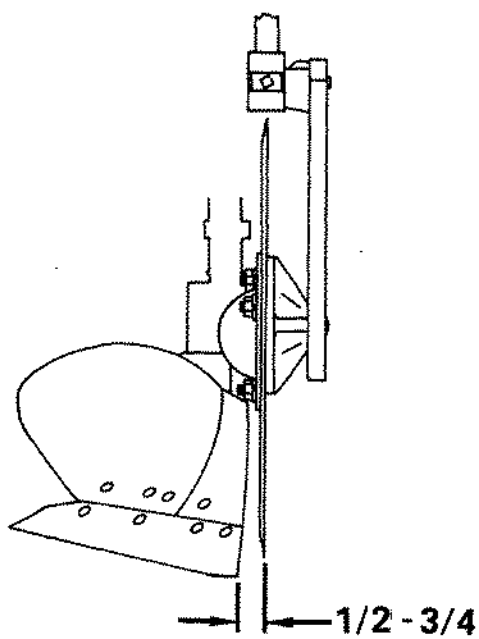
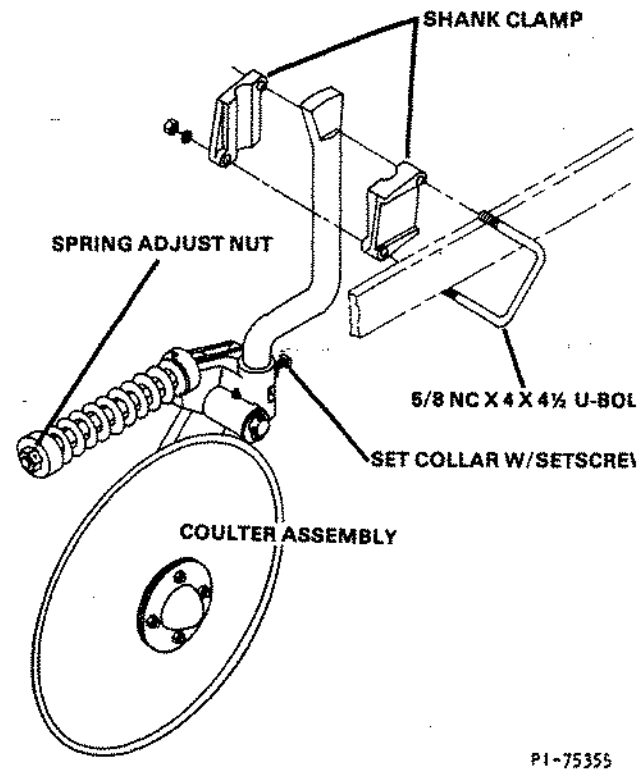


FIG. 9 P1-75369

A set collar is provided in the coulter yoke to prevent the coulter from swinging completely around. The collar should be adjusted to allow the coulter to swing approximately the same distance from side to side.

Once the rear coulter has been properly set to obtain a clean furrow wall, all other coulters should be set the same. For normal conditions coulters should cut one half the depth of plowing.

Coulter trip pressure can be increased by tightening the spring adjustment nut. (See Fig. 10).



P1-75355

FIG. 10

NOTE: Care should be taken in the mounting of the coulter on the front bottom on units which have a front furrow wheel. Locate the coulter so that the center of the coulter blade is no more than eight inches in front of the point of the share. Also, the set collar should be adjusted so that the coulter cannot swing past the front of the share into the plowed ground more than one and one half inches. These restrictions are to insure that the front furrow wheel tire is not cut by the front coulter.

SETTING UP

Remove all wires and arrange the parts conveniently.

Wherever the terms "left" and "right" are used, it should be understood to mean from a position behind and facing the machine.

Lubricate all bearing and moving parts as you proceed and see that they work freely.

Bolts must be used in the holes in which they are found, or in the parts to which they are attached, unless otherwise shown.

When tightening bolts, they should be torqued to the proper number of foot-pounds as indicated in the table unless otherwise specified.

On new machines, all nuts and bolts should be rechecked after a few hours of operation.

GRADE 8

GRADE 5

GRADE 2

TORQUE IN FOOT POUNDS

BOLT DIA		3/8	1/2	5/8	3/4	7/8	1
HEX HEAD		9/16	3/4	15/16	1-1/8	1-5/16	1-1/2
UNC	2	18	45	89	160	252	320
	GRADE 5	30	68	140	240	360	544
	GRADE 8	40	100	196	340	528	792
UNF	2	21	51	102	178	272	368
	5	32	70	168	264	392	572
	8	48	112	216	368	792	840

PI - 75623

When replacing a bolt, use only a bolt of the same grade or higher.

Bolts with no markings are grade 2.

Grade 5 bolts furnished with the machine are identified by three radial lines on the head.

Grade 8 bolts furnished with the machine are identified by six radial lines on the head.

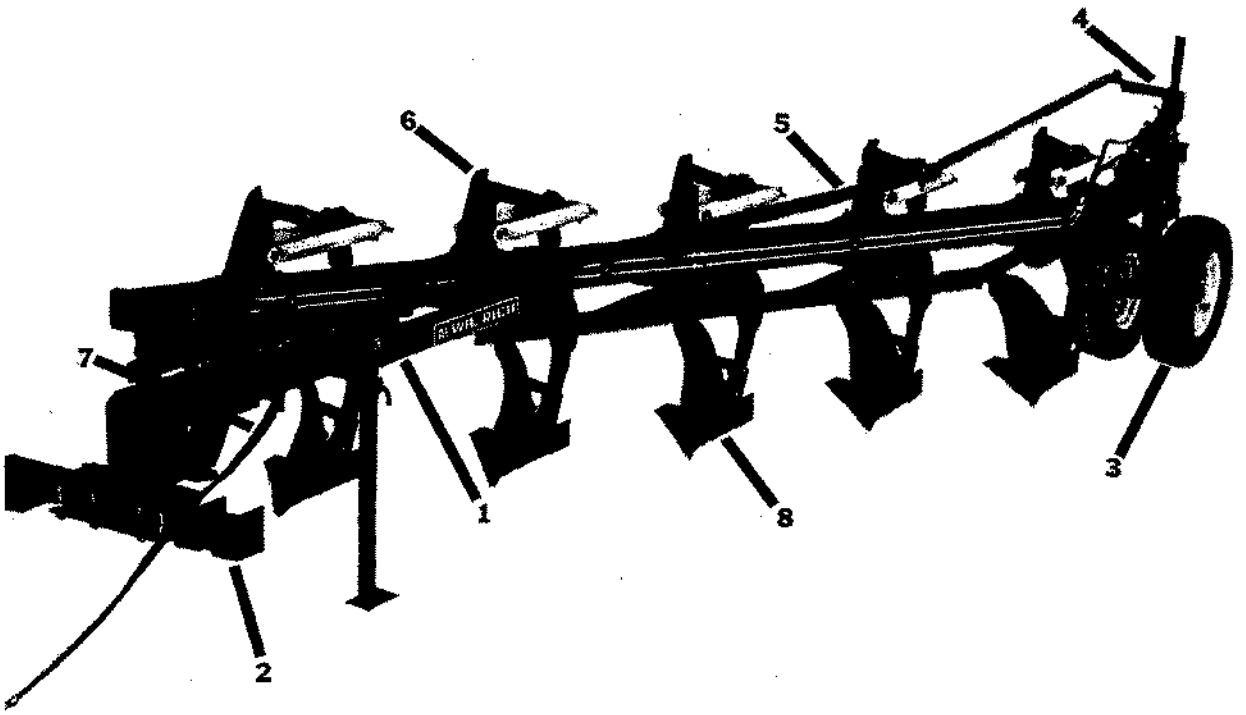
All U-bolts are grade 5.

NOTE: ALWAYS WEAR SAFETY GLASSES OR GOGGLES AND BE CAREFUL WHEN CUTTING WIRES AND STEEL BANDS AS THEY ARE UNDER TENSION AND WILL SPRING BACK WHEN CUT.

NOTE: CHECK YOUR TRACTOR'S HYDRAULIC FLUID LEVEL AFTER CYCLING HYDRAULICS AND FILLING NEW CYLINDERS AND LINES. REFILL IF NECESSARY.

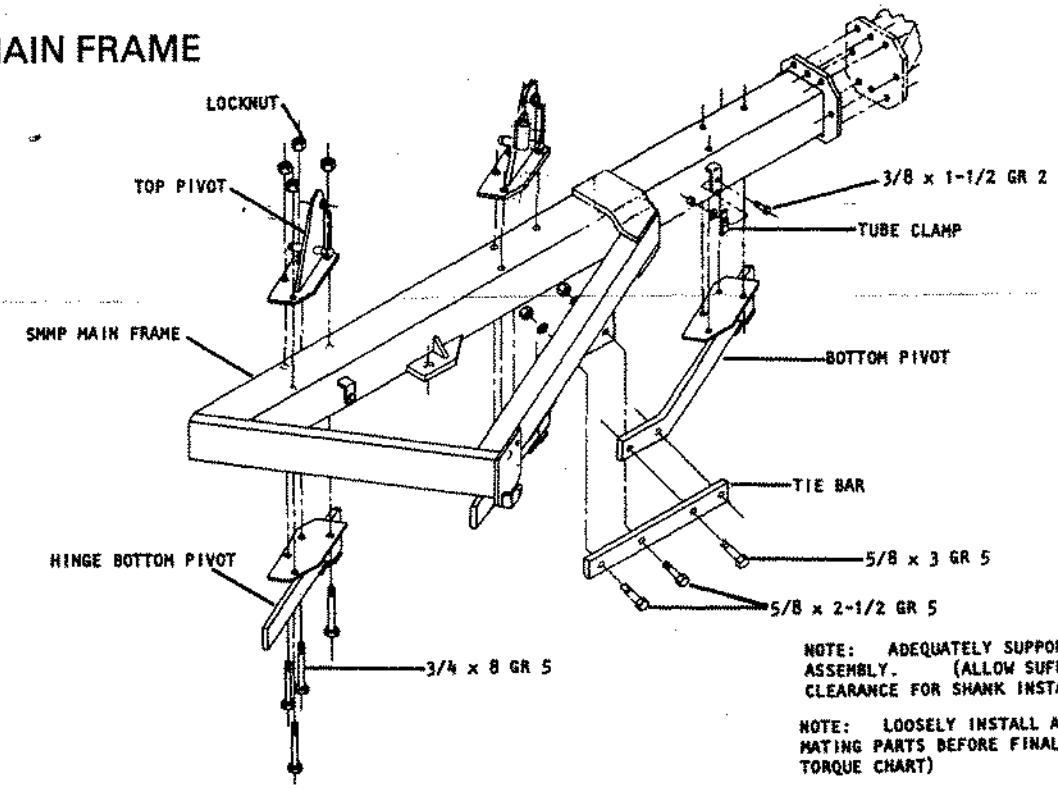
GENERAL SEQUENCE OF ASSEMBLY

IN-FURROW STYLE PLOW



PI-77609

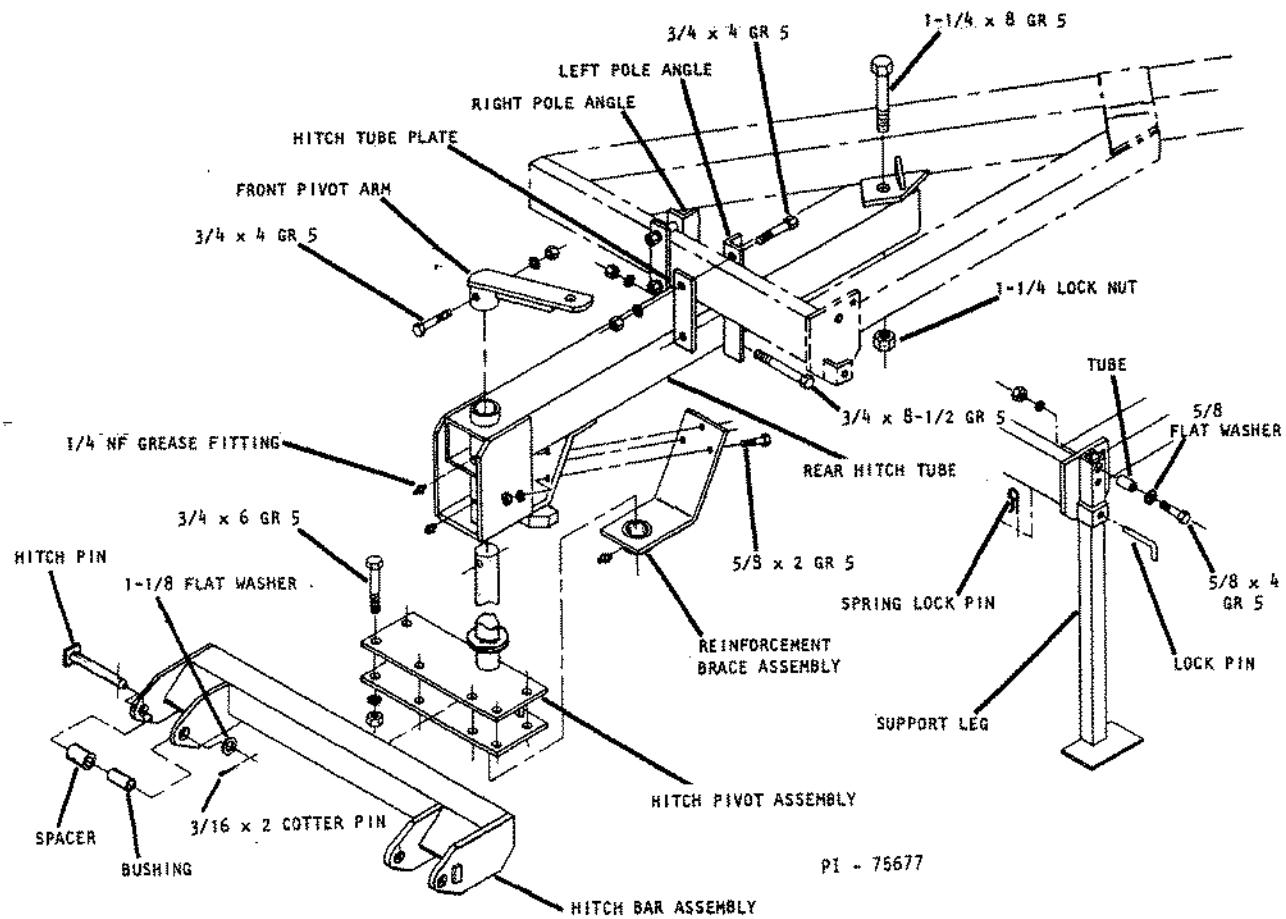
1. MAIN FRAME



NOTE: ADEQUATELY SUPPORT FRAME DURING ASSEMBLY. (ALLOW SUFFICIENT GROUND CLEARANCE FOR SHANK INSTALLATION).

NOTE: LOOSELY INSTALL ALL BOLTS CONNECTING MATING PARTS BEFORE FINAL TIGHTENING. (SEE TORQUE CHART)

PI-75343



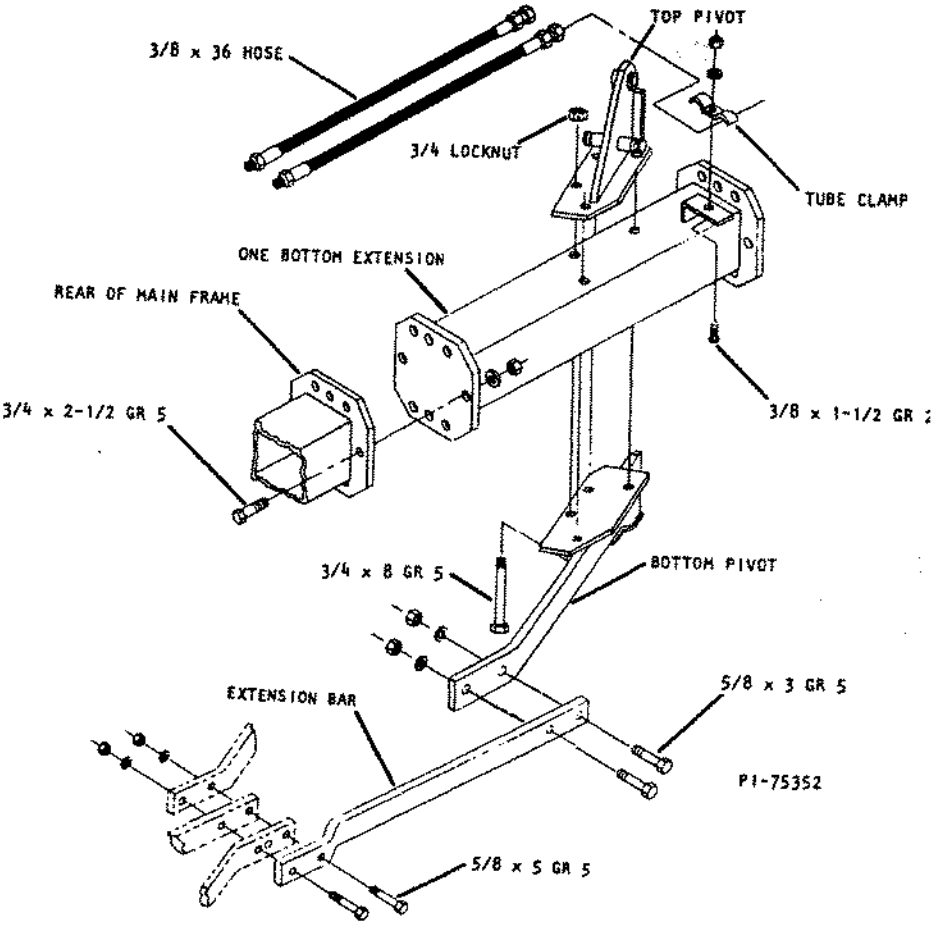
PI - 75677

2. HITCH

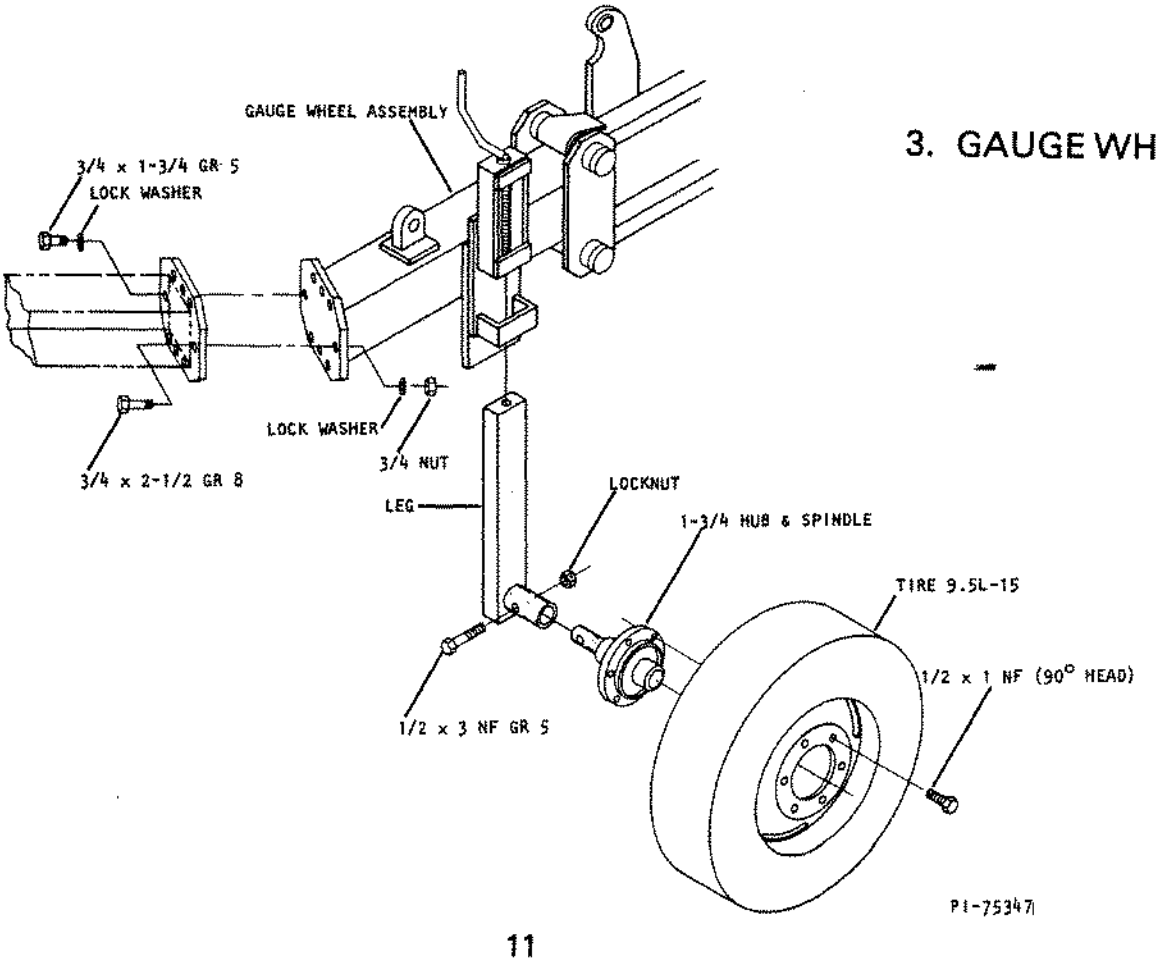
EXTENSIONS (IF REQUIRED ASSEMBLE AT THIS TIME)

1 BOTTOM EXTENSION

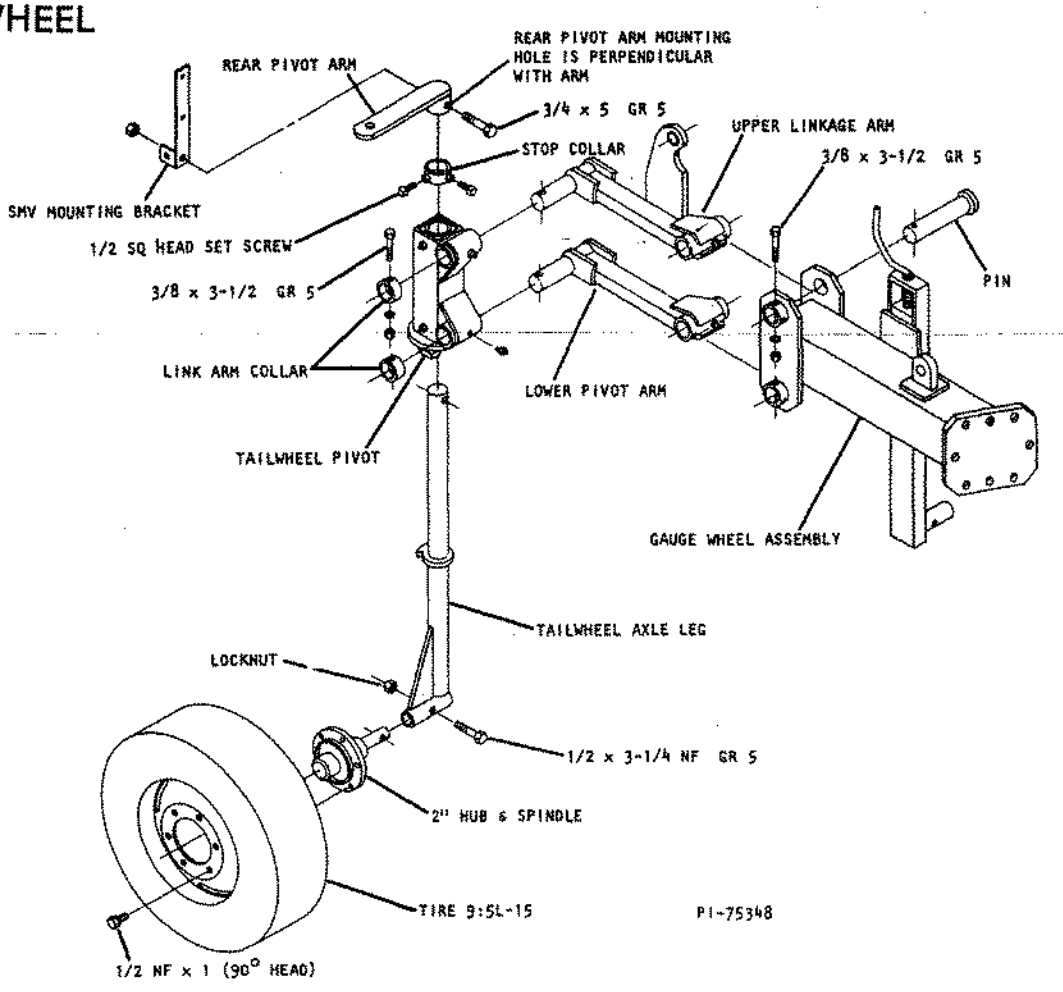
NOTE: TO ASSURE PROPER ALIGNMENT OF BOTTOM(S) WHEN MOUNTING AN EXTENSION, THERE SHOULD BE A SLIGHT CLOCKWISE TWISTING LOAD PLACED ON THE MAIN FRAME TO EXTENSION JOINT BEFORE TIGHTENING BOLTS. THIS CAN BE ACCOMPLISHED BY HANGING THE TAILWHEEL SECTION ON THE END OF THE EXTENSION AND ALLOWING THE WEIGHT OF THE TAILWHEEL TO APPLY A CLOCKWISE (AS VIEWED FROM THE REAR) TWISTING LOAD TO THE FRONT JOINT OF THE EXTENSION.



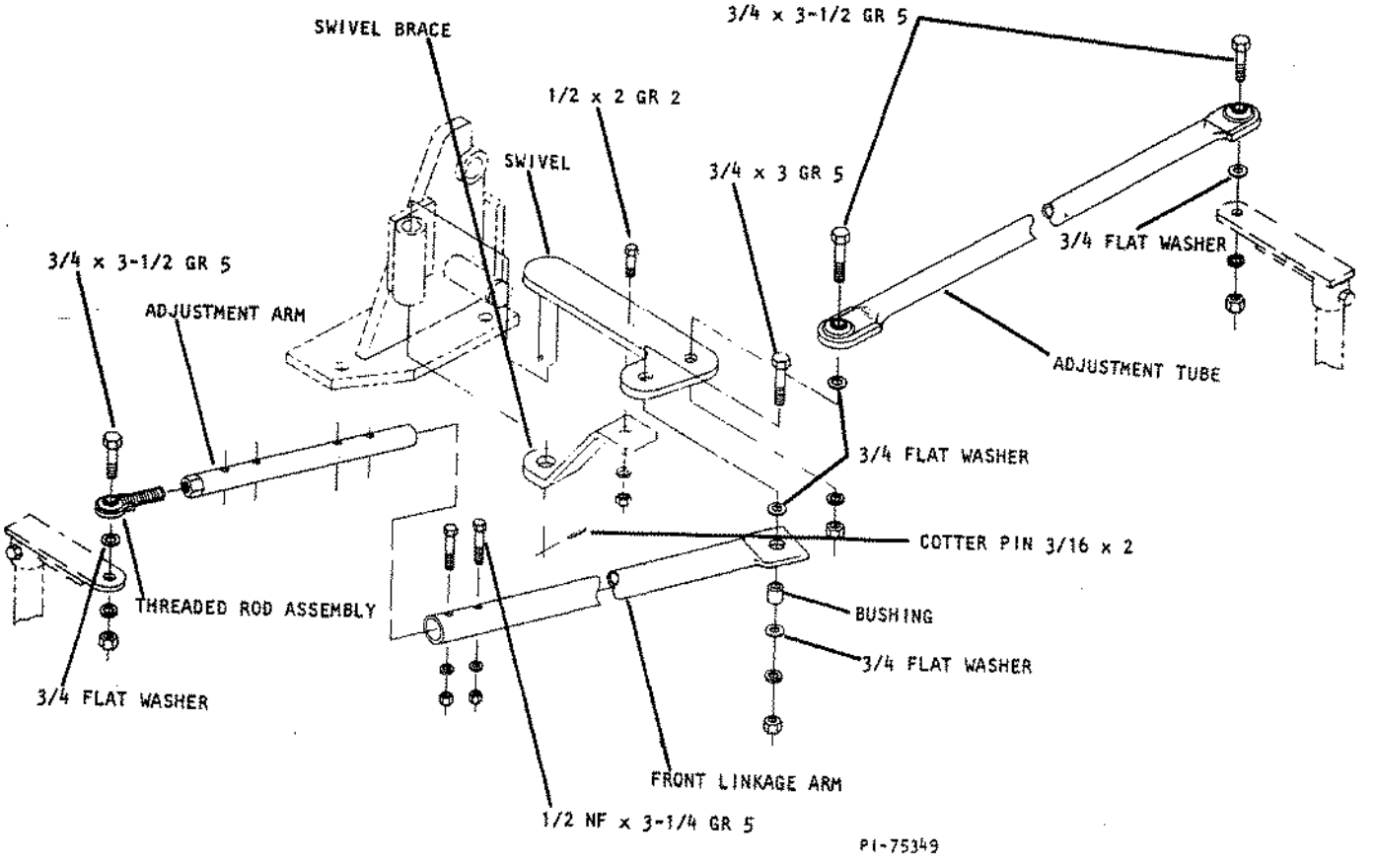
3. GAUGE WHEEL



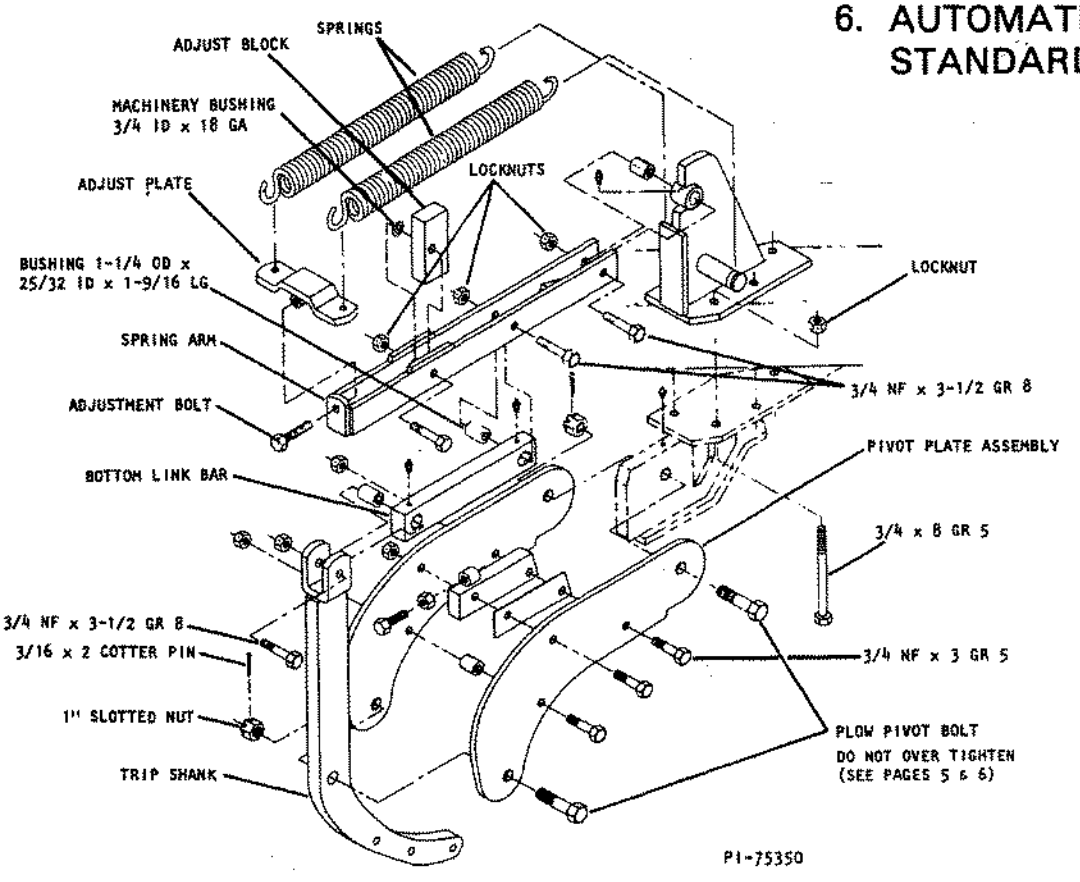
4. TAIL WHEEL



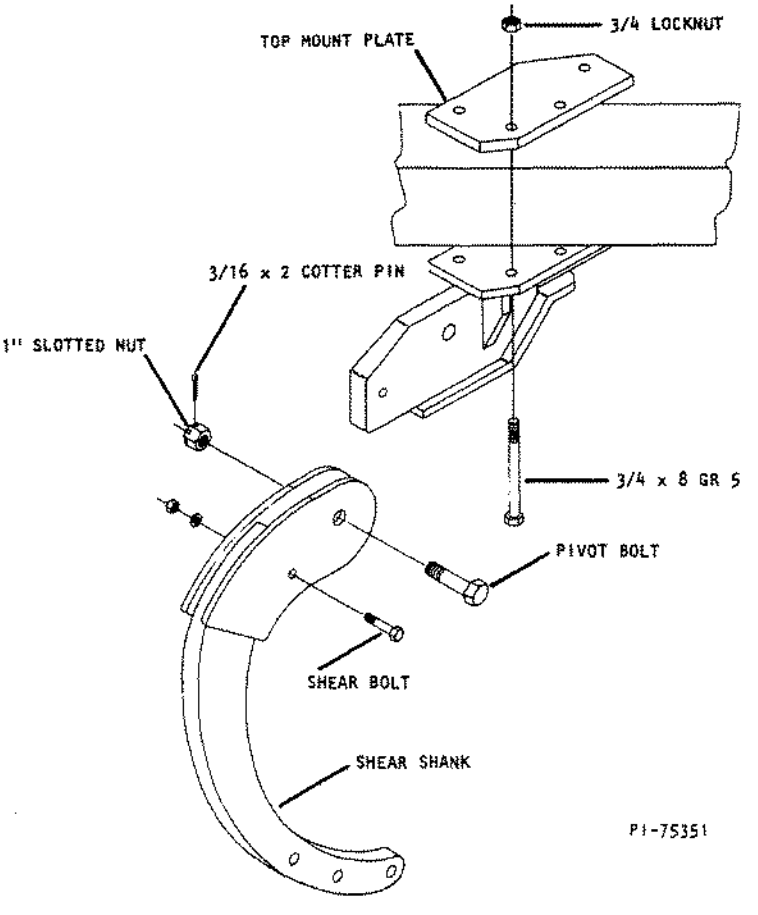
5. STEERING LINGAGES



6. AUTOMATIC RESET STANDARD



6. SHEAR BOLT STANDARD



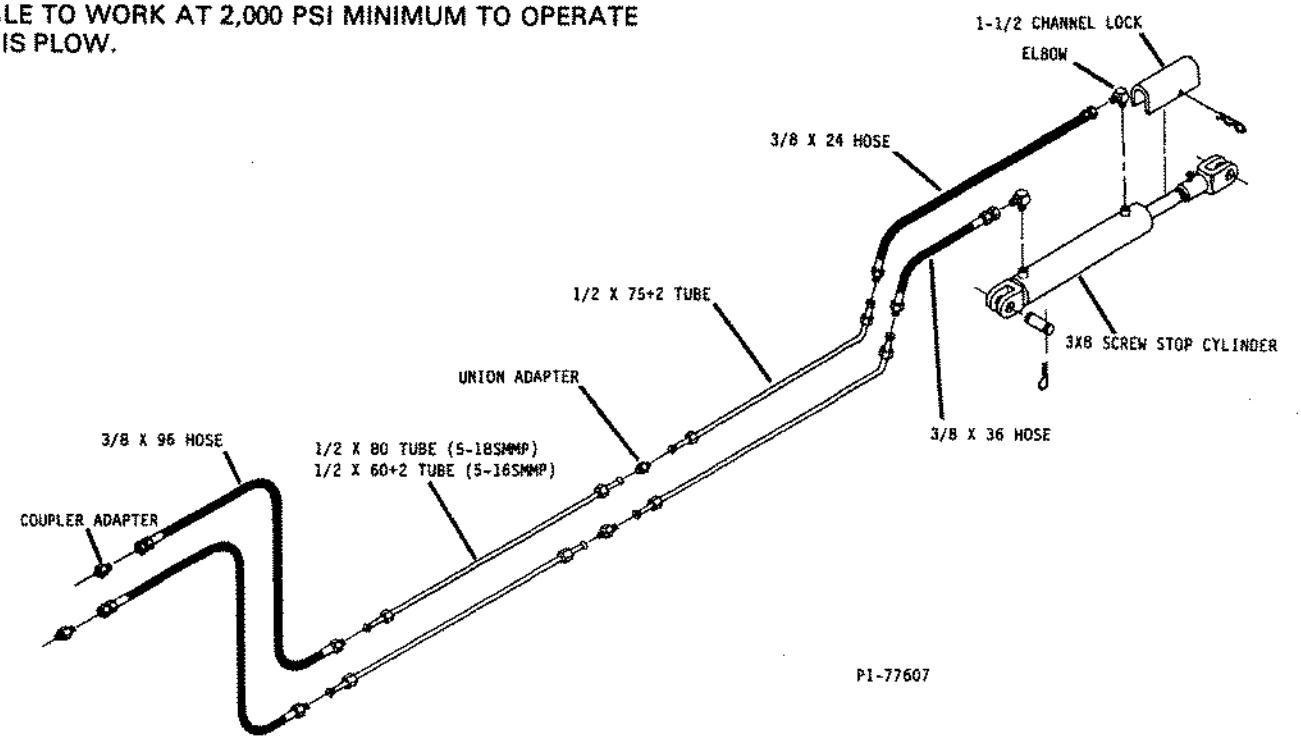
7. HYDRAULICS

NOTE: HYDRAULIC FLUID ESCAPING UNDER PRESSURE CAN HAVE ENOUGH FORCE TO PENETRATE THE SKIN. INFECTION OR REACTION CAN RESULT IF MEDICAL TREATMENT IS NOT GIVEN IMMEDIATELY. MAKE SURE ALL CONNECTIONS ARE TIGHT AND THAT HOSES AND LINES ARE IN GOOD CONDITION BEFORE APPLYING PRESSURE TO THE SYSTEM. RELIEVE ALL PRESSURE BEFORE DISCONNECTING THE LINES OR PERFORMING OTHER WORK ON THE HYDRAULIC SYSTEM. TO FIND A LEAK UNDER PRESSURE USE A SMALL PIECE OF CARDBOARD OR WOOD. NEVER USE HANDS.

NOTE: THE TRACTOR HYDRAULIC SYSTEM MUST BE ABLE TO WORK AT 2,000 PSI MINIMUM TO OPERATE THIS PLOW.

Hydraulic pipe compound should be used to prevent leakage on all pipe thread connections (cylinder ports).

Torque all 37° flare end fittings and hoses 20 to 40 pounds. Do not over tighten; flares do the sealing, not thread deformation.



8. BOTTOMS AND COULTERS

GENERAL PURPOSE I BOTTOM WITH OPTIONAL TRASHBOARD

General purpose bottom assemblies should be loosely bolted with the two lower mounting bolts. Then bolt the moldboard brace to the moldboard using the outer hole in the brace. If the brace does not fit properly with the standard, remount the brace to the moldboard using the inner hole on the brace (as shown) and shim the space between the brace and standard with 5/8 flat washers. Torque standard bolts to 200 ft/lbs.

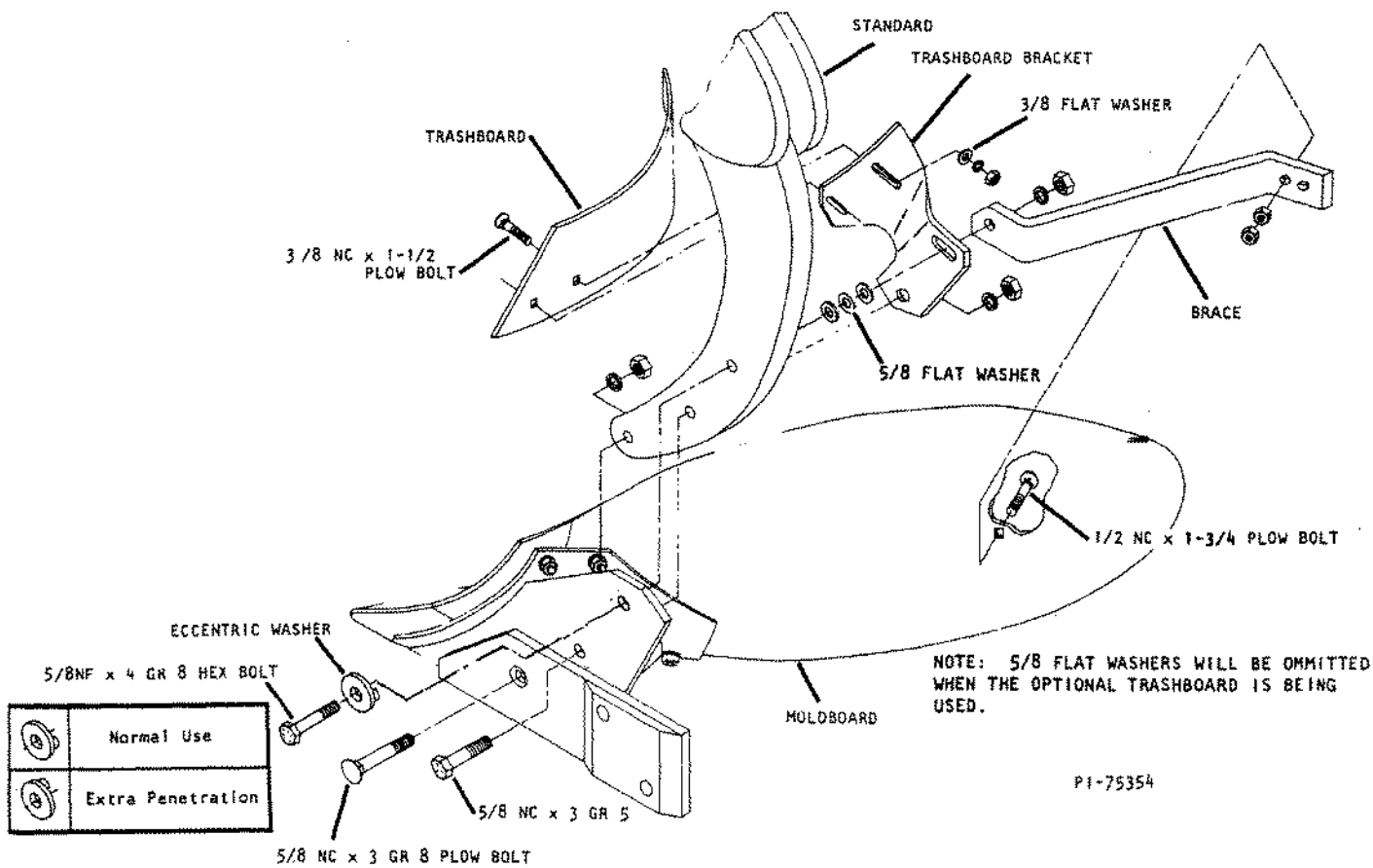
NOTE: THE BRACE MUST BE CAREFULLY SHIMMED WITH THE PROPER NUMBER OF WASHERS. THERE SHOULD BE NO PUSHING OR PULLING ON THE MOLDBOARD WHEN THE BOLTS ARE TIGHTENED.

When mounting the brace with a trashboard bracket, mount to the inner hole on the brace and if necessary shim any space between the trashboard bracket and brace with 5/8 flat washers. Torque standard bolts to 200 ft/lbs.

The adjustable pitch feature is provided on all general purpose plow bottoms to aid penetration with worn shares, and thus prolong share life. This feature also provides more suck when additional penetration is required.

Caution must be used to insure the proper use of this feature. When new shares are in use the bottom should be set in the normal position.

Never allow the shin, share or landside to wear until the frog is exposed. These parts should be checked periodically (more often when plowing in abrasive soil) and adjusted or replaced if worn. Plowing with worn, bent or broken shares is economically poor, and it can result in a hard running plow and/or increased fuel costs.



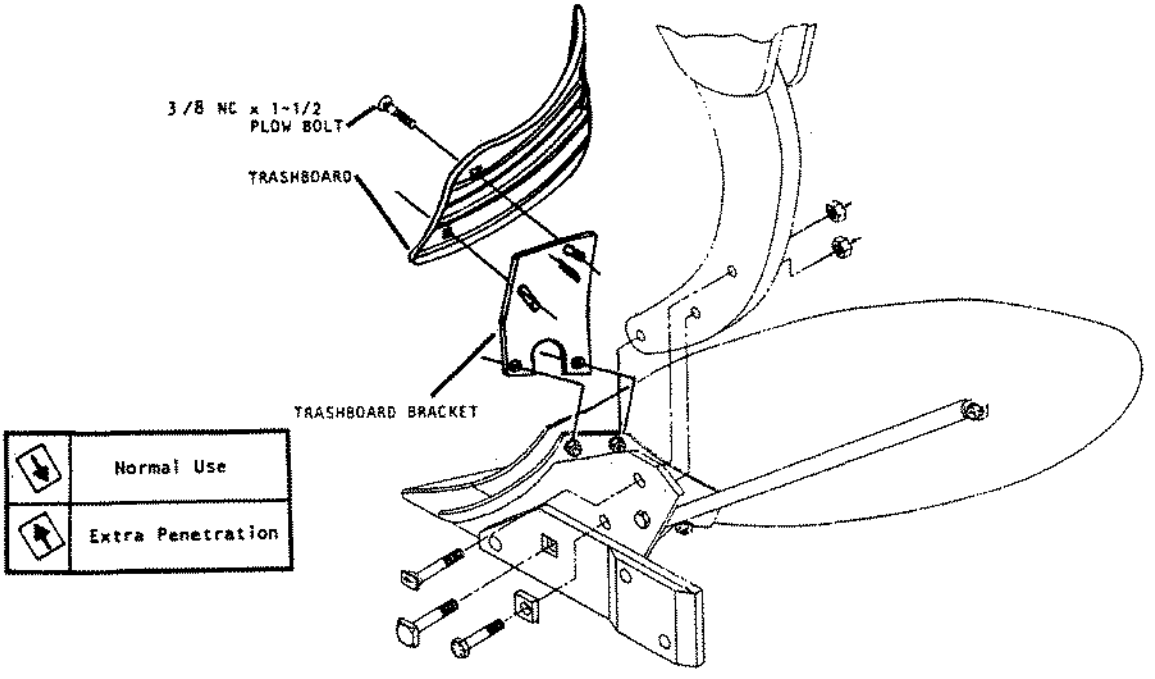
GENERAL PURPOSE II BOTTOM WITH OPTIONAL TRASHBOARD (PLASTIC TRASHBOARD SHOWN)

Torque standard bolts to 200 ft/lbs.

The adjustable pitch feature is provided on all general purpose plow bottoms to aid penetration with worn shares, and thus prolong share life. This feature also provides more suck when additional penetration is required.

Caution must be used to insure the proper use of this feature. When new shares are in use the bottom should be set in the normal position.

Never allow the shin, share or landside to wear until the frog is exposed. These parts should be checked periodically (more often when plowing in abrasive soil) and adjusted or replaced if worn. Plowing with worn, bent or broken shares is economically poor, and it can result in a hard running plow and/or increased fuel costs.

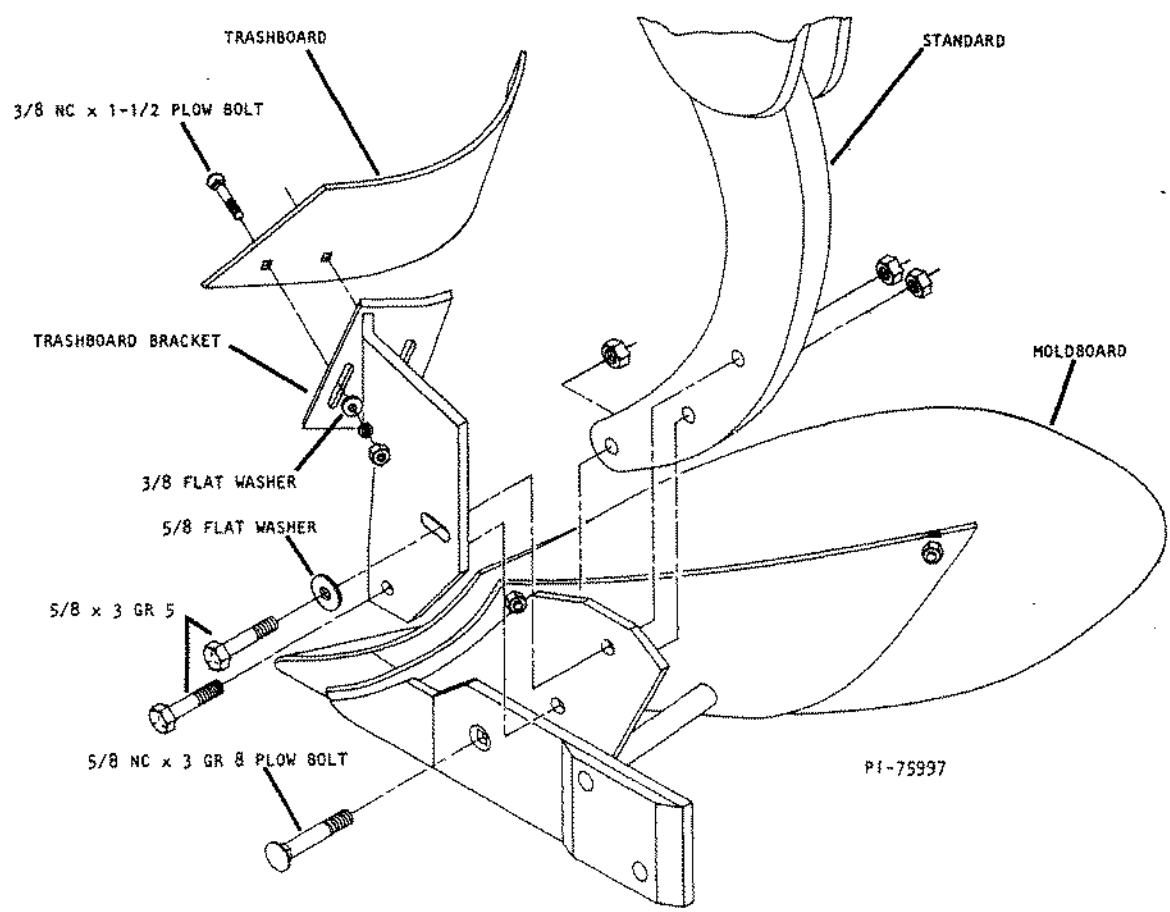


DEEP TILLAGE BOTTOM WITH OPTIONAL TRASHBOARD

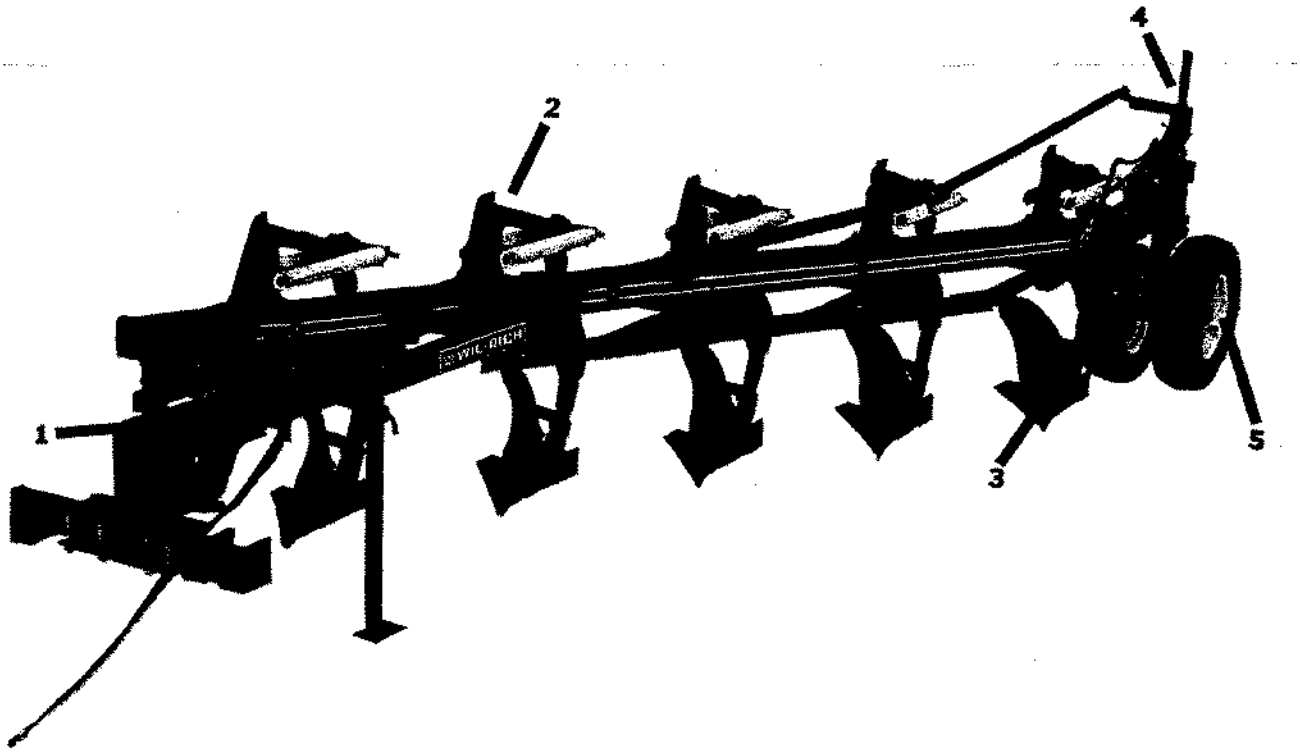
Bolt the deep tillage and high speed bottoms to the standards and torque to 200 ft/lbs.

COULTERS

Refer to coulter operation and adjusting for coulter mounting.



LUBRICATION



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Grease fittings are provided at all points indicated in the lubrication chart. All parts provided with grease fittings should be lubricated with SAE multi-purpose type grease.

If any grease fittings are missing, replace them immediately. Clean the fittings thoroughly before using grease gun.

Listed below are the lubrication procedures that should be carried out.

1. Hitch Pivot ..... Daily or Every 8 Hrs.
2. Automatic Reset Standard (Four Fittings) ..... Daily or Every 8 Hrs.
3. Coulters (One Fitting Compression Coulters Only) ..... Daily or Every 8 Hrs.
4. Tailwheel (Six Fittings) ..... Daily or Every 8 Hrs.
5. Wheel Bearings (All Wheels and Coulters) ..... Once a season disassemble, clean and repack with good quality wheel bearing grease.

TROUBLESHOOTING

PROBLEM	CORRECTIONS	PAGE
SLOW GROUND ENTRY		
Entire Plow Penetrates Slowly	-Adjust Link Arms to Lower Share Points	4
	-Deep Suck Shares	7
	-Adjust Coulters	7
	-Worn Shares (Replace)	—
RIDGING		
Ridging	-Level Frame	4
	-Check Coulter Width Settings	7
	-Poor Soil Conditions and Soil Compaction from Tires	—
PLOW RUNNING CROOKED		
Plow Pulls into Unplowed Ground	-Move Hitch Point Closer to Furrow	2
	-Lower Link Arms	4
	-Check Frame Level	4
	-Worn Wear Pads (Replace)	—
Plow Pulls into Plowed Ground	-Move Hitch Point Away from Furrow	2
	-Check Frame Level	4
FURROW WALL	—	
Ragged Furrow Wall	-Adjust Coulter for Proper Cut	7

TROUBLESHOOTING

PROBLEM	CORRECTIONS	PAGE
UNEVEN SHARE WEAR		
Excessive Heel Wear	-Adjust Link Arms to Operate on Share Points	4
Excessive Point Wear	-Adjust Link Arms to Operate on Heels	4
TRIP ASSEMBLIES		
Floats too Easily	-Increase Spring Pressure	5
Excessive Tripping	-Change Stop Block Setting	5
Will not Reset	-Check Shares	—
	-Slow Down	—