

OPERATION - MAINTENANCE - SET-UP  
INSTRUCTIONS

MODEL HWTDC22 - HWTC22 - HWTDC22

WTD22 - WTC22 - WDC22

TANDEM DISK HARROW

Temporary Operating Manual

# TO THE PURCHASER:

The care you give your new AMCO Tandem Disk Harrow will greatly determine the satisfaction and service life you will obtain from it. By observing the instructions and suggestions in this manual, your harrow will serve you for many years. Please furnish this manual to new owners when the harrow is sold.

As an Authorized AMCO Dealer, we stock Genuine AMCO parts, which are manufactured with the same precision and skill as the original equipment. Use only approved replacement parts. Our factory-trained staff is kept fully informed of the most efficient methods of servicing AMCO equipment and is ready and able to assist you.

If you should require additional aid or information, contact us..

YOUR AUTHORIZED AMCO DEALER

OSHA requires that as a farm employer you meet certain safety requirements. Become familiar with and comply with those requirements. Be sure anyone who operates this equipment understands all safety related items. If this harrow is repainted, be certain new decals are ordered. Decals pertaining to personal safety must be replaced.



Look for this symbol to point out important safety precautions. It means - ATTENTION! Become alert! Your safety is involved.

To insure efficient and prompt service, please provide the model number and serial number of your AMCO Harrow in all correspondence or contacts.

## WHEEL TANDEM

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### MODEL "D22"

(Secondary Tillage)

#### STANDARD SPECIFICATIONS

(METRICS IN PARENTHESES)

<b>AXLES:</b>	1-1/8" sq., high strength, special alloy cold rolled steel	<b>BEARINGS:</b>	Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve
<b>DISCS:</b>	20" x 7 ga. (4.5m) plain with diminishing leveling blades	<b>SPACING:</b>	9 Inches
<b>SCRAPERS:</b>	High carbon, replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars	<b>WHEELS:</b>	15 x 6 with heavy duty 6 bolt hubs 2 on 12'3" - 15'0" 4 on 18'0" - 21'0"
<b>TONGUE:</b>	70" long with tongue jack and reversible clevis	<b>WEIGHT PER BLADE:</b>	12'3" to 15' ..... 92 to 100 lbs. 18'0" to 21' ..... 90 to 97 lbs.
<b>GANGS:</b>	Adjustable 14° - 19° front 11° - 18° rear	<b>WEIGHT PER FOOT:</b>	12'3" to 15' ..... 246 to 260 lbs. 18'0" to 21' ..... 240 to 260 lbs.
<b>WINGS:</b>	Spring assisted manual fold on 18'0" and larger		

MODEL NO.	Cutting Width	No. of Discs	No. of Bearings	Disc Size and Type	Approximate Drawbar HP Required h.p. (kw)	Approximate Weight lbs (kg)
RIGID MODELS						
D22-3220	12'3" (3.73m)	32	12	20" Plain	55- 75 (41-56)	3190 (1447)
D22-3620	13'6" (4.11m)	36	12	20" Plain	69.0- 80 (45-60)	3377 (1532)
D22-4020	15'0" (4.57m)	40	16	20" Plain	65- 85 (48-64)	3691 (1674)
WING MODELS						
D22-4820	18'0" (5.49m)	48	20	20" Plain	80-105 (60-78)	4674 (2120)
D22-5220	19'6" (5.94m)	52	20	20" Plain	85-110 (64-82)	4880 (2214)
D22-5620	21'0" (6.40m)	56	20	20" Plain	85-115 (64-86)	5033 (2283)
OPTIONAL EQUIPMENT						
	Shock absorber gang risers in lieu of standard fabricated gang risers, per bearing ..... (NOTE: AMCO recommends 1/4" blades for use with shock absorber gangs.)					Add 17 1/4 (8) ea.
BK-01-0002	Center tooth attachment with chisel point .....					Add 60 (27) ea.
BK-01-0003	Feathering blades with scrapers for rear gangs (2).....					Add 60 (27) ea.
BL-01-0013	Wing gang drivers (Set of 4).....					Add 75 (34) ea.
BK-14-0001	Dual 15 x 6 wheels with 6 bolt hubs.....					Add 70 (22) ea.
BD-20-0001	15 x 8 wheels in lieu of 15 x 6 wheels .....					Add 6 (2.7) ea.
BD-20-0003	4" x 8" x 1-1/2 hydraulic cylinder with stroke control .....					Add 47 (21) ea.
	20" x 7 ga. cutout blades in lieu of standard 20".....					Ded 1 (.45) ea.
	22" x 7 ga. plain blades in lieu of standard 20".....					Add 4 (1.8) ea.
	22" x 7 ga. cutout blades in lieu of standard 20".....					Add 2 1/2 (1.1) ea.
	20" x 1/4" plain blades in lieu of standard 20".....					Add 6 1/2 (2.9) ea.
	22" x 1/4" plain blades in lieu of standard 20".....					Add 11 3/4 (5.3) ea.
FA-01-0014	Safety chain 5/16" .....					Add 9 (4.1) ea.
RECOMMENDED TIRE SIZE						
9.5L x 15 Tires, 6 or 8 Ply						

AMCO PL Effective January 1, 1983

F.O. Yazoo City, Mississippi

SPECIFICATIONS AND PRICES SUBJECT TO CHANGE WITHOUT NOTICE



No. 1 AMCO Drive, Yazoo City, Mississippi 39194 / 601/746-4464  
Portable Elevator Division, Dynamics Corporation of America





## WHEEL TANDEM

## MODEL "C22"

(Secondary Tillage)

## STANDARD SPECIFICATIONS

(METRICS IN PARENTHESES)

<b>AXLES:</b>	1-1/8" sq., high strength, special alloy cold rolled steel	<b>BEARINGS:</b>	Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve
<b>DISCS:</b>	20" x 7 ga. (4.5m) plain with diminishing leveling blades	<b>SPACING:</b>	7 Inches
<b>SCRAPERS:</b>	High carbon, replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars	<b>WHEELS:</b>	15 x 6 with heavy duty 6 bolt hubs 2 on 12" 0" and 13" 2" 4 on 17" 10" - 21" 4"
<b>TONGUE:</b>	70" long with tongue jack and reversible clevis	<b>WEIGHT PER BLADE:</b>	12" 0" to 13" 2" ..... 81 to 85 lbs. 17" 10" to 21" 4" ..... 76 to 84 lbs.
<b>GANGS:</b>	Adjustable 14° - 19° front 11° - 18° rear	<b>WEIGHT PER FOOT:</b>	12" 0" to 13" 2" ..... 270 to 282 lbs. 17" 10" to 21" 4" ..... 256 to 280 lbs.
<b>WINGS:</b>	Spring assisted manual fold on 17" 10" and larger		

MODEL NO.	Cutting Width	No. of Discs	No. of Bearings	Disc Size and Type	Approximate Drawbar HP Required h.p. (kw)	Approximate Weight lbs (kg)
<b>RIGID MODELS</b>						
C22-4020	12' 0" (3.66m)	40	12	20" Plain	50- 65 (37-48)	3381 (1534)
C22-4420	13' 2" (4.01m)	44	12	20" Plain	50- 70 (27-52)	3563 (1616)
<b>WING MODELS</b>						
C22-6020	17' 10" (5.44m)	60	20	20" Plain	70- 90 (62-67)	4994 (2265)
C22-6420	19' 0" (5.79m)	64	20	20" Plain	75- 95 (56-71)	5172 (2346)
C22-6820	20' 2" (6.15m)	68	20	20" Plain	75-100 (56-75)	5291 (2400)
C22-7220	21' 4" (6.50m)	72	20	20" Plain	80-100 (60-75)	5469 (2481)
<b>OPTIONAL EQUIPMENT</b>						
	Shock absorber gang risers in lieu of standard fabricated gang risers, per bearing.....					Add 17 3/4 (8) ea.
	(NOTE: AMCO recommends 1/4" blades for use with shock absorber gangs.)					
BK-01-0002	Center tooth attachment with chisel point .....					Add 60 (27) ea.
BK-01-0003	Feathering blades with scrapers for rear gangs (2).....					Add 60 (27) ea.
BK-01-0024	Wing gang drivers (Set of 4).....					Add 70 (32) ea.
BK-14-0001	Dual 15 x 6 wheels with 6 bolt hubs.....					Add 70 (32) ea.
BD-20-0001	15 x 8 wheels in lieu of 15 x 6 wheels .....					Add 6 (2.7) ea.
BD-20-0003	4" x 8" x 1-1/2" hydraulic cylinder with stroke control.....					Add 47 (21) ea.
	20" x 7 ga. cutout blades in lieu of standard 20".....					Add 1 (.45) ea.
	22" x 7 ga. plain blades in lieu of standard 20".....					Add 4 (1.8) ea.
	22" x 7 ga. cutout blades in lieu of standard 20".....					Add 2 1/2 (1.1) ea.
	20" x 1/4" plain blades in lieu of standard 20".....					Add 6 1/2 (2.9) ea.
	22" x 1/4" plain blades in lieu of standard 20".....					Add 11 1/4 (5.3) ea.
FA-01-0014	Safety chain 5/16" .....					Add 9 (4.1) ea.
<b>RECOMMENDED TIRE SIZE</b>						
9.5L x 15 Tires, 6 or 8 Ply						

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## WHEEL TANDEM

## MODEL "DC22"

(Secondary Tillage)

## STANDARD SPECIFICATIONS

(METRICS IN PARENTHESES)

<b>AXLES:</b>	1-1/8" sq., high strength, special alloy cold rolled steel	<b>BEARINGS:</b>	Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve
<b>DISCS:</b>	20" x 7 ga. (4.5m) plain with diminishing leveling blades	<b>SPACING:</b>	9" front 7" rear
<b>SCRAPERS:</b>	High carbon, replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars	<b>WHEELS:</b>	15 x 6 with heavy duty 6 bolt hubs 2 on 12" 0" and 13" 2" 4 on 17" 10" - 21" 4"
<b>TONGUE:</b>	70" long with tongue jack and reversible clevis	<b>WEIGHT PER BLADE:</b>	12" 0" to 13" 2" ..... 87 to 91 lbs. 17" 10" to 21" 4" ..... 82 to 90 lbs.
<b>GANGS:</b>	Adjustable 14° - 19° front 11° - 18° rear	<b>WEIGHT PER FOOT:</b>	12" 0" to 13" 2" ..... 263 to 274 lbs. 17" 10" to 21" 4" ..... 271 to 285 lbs.
<b>WINGS:</b>	Spring assisted manual fold on 17" 10" and larger		

MODEL NO.	Cutting Width	No. of Discs	No. of Bearings	Disc Size and Type	Approximate Drawbar HP Required h.p. (kw)	Approximate Weight lbs (kg)
RIGID MODELS						
DC22-3620	12' 0" (3.66m)	16(fr) 20(re)	12	20" Plain	50- 70 (37-52)	3285 (1490)
DC22-4020	13' 2" (4.01m)	18(fr) 22(re)	12	20" Plain	55- 75 (41-56)	3468 (1573)
WING MODELS						
DC22-5420	17'10" (5.44m)	24(fr) 30(re)	20	20" Plain	75-100 (56-75)	4835 (2193)
DC22-6020	20'2" (6.15m)	26(fr) 34(re)	20	20" Plain	80-105 (60-78)	5084 (2306)
DC22-6420	21' 4" (6.50m)	28(fr) 36(re)	20	20" Plain	85-110 (63-82)	5252 (2382)
OPTIONAL EQUIPMENT						
	Shock absorber gang risers in lieu of standard fabricated gang risers, per bearing . . . . .					Add 17 3/4 (8) ea.
	(NOTE: AMCO recommends 1/4" blades for use with shock absorber gangs.)					
BK-01-0002	Center tooth attachment with chisel point . . . . .					Add 60 (27) ea.
BK-01-0003	Feathering blades with scrapers for rear gangs (2) . . . . .					Add 60 (27) ea.
BK-01-0025	Wing gang drivers (Set of 4) . . . . .					Add 72 (33) ea.
BK-14-0001	Dual 15 x 6 wheels with 6 bolt hubs . . . . .					Add 70 (32) ea.
BD-20-0001	15 x 8 wheels in lieu of 15 x 6 . . . . .					Add 6 (2.7) ea.
BD-20-0003	4" x 8" x 1-1/2" hydraulic cylinder with stroke control . . . . .					Add 47 (21) ea.
	20" x 7 ga. cutout blades in lieu of standard 20" . . . . .					Ded 1 (.45) ea.
	22" x 7 ga. plain blades in lieu of standard 20" . . . . .					Add 4 (1.8) ea.
	22" x 7 ga. cutout blades in lieu of standard 20" . . . . .					Add 2 1/2 (1.1) ea.
	20" x 1/4" plain blades in lieu of standard 20" . . . . .					Add 6 1/2 (2.9) ea.
	22" x 1/4" plain blades in lieu of standard 20" . . . . .					Add 11 3/4 (5.3) ea.
FA-01-0014	Safety chain 5/16" . . . . .					Add 9 (4.1) ea.
RECOMMENDED TIRE SIZE						
9.5L x 15 Tires, 6 or 8 Ply						

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## WHEEL TANDEMS

**MODEL "HD22"**  
**HYDRAULIC WING CONTROL**  
*(Secondary Tillage)*
**STANDARD SPECIFICATIONS**  
 (METRICS IN PARENTHESES)

<b>AXLES:</b>	1-1/8" sq., high strength, special alloy cold rolled steel	<b>BEARINGS:</b>	Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve
<b>DISCS:</b>	20" x 7 ga. (4.5m) plain with diminishing leveling blades	<b>SPACING:</b>	9 Inches
<b>SCRAPERS:</b>	High carbon, replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars	<b>WHEELS:</b>	Four 15 x 6 with heavy duty 6 bolt hubs
<b>TONGUE:</b>	70" long with tongue jack and reversible clevis	<b>WEIGHT PER BLADE:</b>	96 to 103 lbs.
<b>GANGS:</b>	Adjustable 14° - 19° front 11° - 18° rear	<b>WEIGHT PER FOOT:</b>	255 to 274 lbs.
		<b>WINGS:</b>	Hydraulic fold with mechanical lock for holding wings down
		<b>TRANSPORT WIDTH:</b>	14'6"

MODEL NO.	Cutting Width	No. of Discs	No. of Bearings	Disc Size and Type	Approximate Drawbar HP Required h.p. (kw)	Approximate Weight lbs (kg)
RIGID MODELS						
HD22-4820	18'0" (5.49m)	48	20	20" Plain	85-110 (63-82)	4939 (2240)
HD22-5220	19'6" (5.94m)	52	20	20" Plain	85-115 (63-86)	5139 (2331)
HD22-5620	21'0" (6.40m)	56	20	20" Plain	90-120 (67-89)	5364 (2433)
OPTIONAL EQUIPMENT						
	Shock absorber gang risers in lieu of standard fabricated gang risers, per bearing .....					Add 17 3/4 (8) ea.
	(NOTE: AMCO recommends 1/4" blades for use with shock absorber gangs.)					
BK-01-0002	Center tooth attachment with chisel point .....					Add 60 (27) ea.
BK-01-0003	Feathering blades for rear gangs (2) .....					Add 60 (27) ea.
BK-01-0028	Wing gang drivers (Set of 4) .....					Add 42 (19) ea.
BD-20-0003	4" x 8" x 1-1/2" hydraulic cylinder with stroke control .....					Add 47 (21) ea.
BD-20-0001	15 x 8 wheels in lieu of standard 15 x 6 wheels .....					Add 6 (2.7) ea.
	20" x 7 ga. cutout blades in lieu of standard 20" .....					Ded 1 (.45) ea.
	22" x 7 ga. plain blades in lieu of standard 20" .....					Add 4 (1.8) ea.
	22" x 7 ga. cutout blades in lieu of standard 20" .....					Add 2 1/2 (1.1) ea.
	20" x 1/4" plain blades in lieu of standard 20" .....					Add 6 1/2 (2.9) ea.
	22" x 1/4" plain blades in lieu of standard 20" .....					Add 11 3/4 (5.3) ea.
FA-01-0014	Safety chain 5/16" .....					Add 9 (4.1) ea.
RECOMMENDED TIRE SIZE						
9.5L x 15 Tires, 6 or 8 Ply						

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## WHEEL TANDEMS

**MODEL "HC22"**  
**HYDRAULIC WING CONTROL**  
*(Secondary Tillage)*
**STANDARD SPECIFICATIONS**  
 (METRICS IN PARENTHESES)

<b>AXLES:</b>	1-1/8" sq., high strength, special alloy cold rolled steel	<b>BEARINGS:</b>	Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve
<b>DISCS:</b>	20" x 7 ga. (4.5m) plain with diminishing leveling blades	<b>SPACING:</b>	7 Inches
<b>SCRAPERS:</b>	High carbon, replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars	<b>WHEELS:</b>	Four 15 x 6 with heavy duty 6 bolt hubs
<b>TONGUE:</b>	70" long with tongue jack and reversible clevis	<b>WEIGHT PER BLADE:</b>	80 to 88 lbs.
<b>GANGS:</b>	Adjustable 14° - 19° front 11° - 18° rear	<b>WEIGHT PER FOOT:</b>	271 to 295 lbs.
		<b>WINGS:</b>	Hydraulic fold with mechanical lock for holding wings down
		<b>TRANSPORT WIDTH:</b>	14'6"

MODEL NO.	Cutting Width	No. of Discs	No. of Bearings	Disc Size and Type	Approximate Drawbar HP Required h.p. (k.w.)	Approximate Weight lbs (kg)
HC22-6020	17'10" (5.44m)	60	20	20" Plain	75- 95 (56-71)	5266 (2389)
HC22-6420	19' 0" (5.79m)	64	20	20" Plain	80-100 (60-75)	5410 (2454)
HC22-6820	20' 2" (6.15m)	68	20	20" Plain	80-105 (60-78)	5549 (2517)
HC22-7220	21' 4" (6.50m)	72	20	20" Plain	85-110 (63-82)	5771 (2618)
<b>OPTIONAL EQUIPMENT</b>						
	Shock absorber gang risers in lieu of standard fabricated gang risers, per bearing . . . . .					Add 17¼(8) ea.
	(NOTE: AMCO recommends 1/4" blades for use with shock absorber gangs.)					
BK-01-0002	Center tooth attachment with chisel point . . . . .					Add 60 (27) ea.
BK-01-0003	Feathering blades for rear gangs (2) . . . . .					Add 60 (27) ea.
BK-01-0027	Wing gang drivers (Set of 4) . . . . .					Add 38 (17) ea.
BD-20-0003	4" x 8" x 1-1/2" hydraulic cylinder with stroke control. . . . .					Add 47 (21) ea.
BD-20-0001	15 x 8 wheels in lieu of standard 15 x 6 wheels . . . . .					Add 6 (2.7) ea.
	20" x 7 ga. cutout blades in lieu of standard 20" . . . . .					Ded 1 (.45) ea.
	22" x 7 ga. plain blades in lieu of standard 20" . . . . .					Add 4 (1.8) ea.
	22" x 7 ga. cutout blades in lieu of standard 20" . . . . .					Add 2½(1.1)ea.
	20" x 1/4" plain blades in lieu of standard 20" . . . . .					Add 6½(2.9) ea.
	22" x 1/4" plain blades in lieu of standard 20" . . . . .					Add 11¾(5.3)ea.
FA-01-0014	Safety chain 5/16" . . . . .					Add 9 (4.1) ea.
<b>RECOMMENDED TIRE SIZE</b> 9.5L x 15 Tires, 6 or 8 Ply						

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## WHEEL TANDEMS

**MODEL "HDC22"**  
**HYDRAULIC WING CONTROL**  
*(Secondary Tillage)*
**STANDARD SPECIFICATIONS**  
 (METRICS IN PARENTHESES)

<b>AXLES:</b>	1-1/8" sq., high strength, special alloy cold rolled steel	<b>BEARINGS:</b>	Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve
<b>DISCS:</b>	20" x 7 ga. (4.5m) plain with diminishing leveling blades	<b>SPACING:</b>	9" front 7" rear
<b>SCRAPERS:</b>	High carbon, replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars	<b>WHEELS:</b>	Four 15 x 6 with heavy duty 6 bolt hubs
<b>TONGUE:</b>	70" long with tongue jack and reversible clevis	<b>WEIGHT PER BLADE:</b>	86 to 94 lbs.
<b>GANGS:</b>	Adjustable 14° - 19° front 11° - 18° rear	<b>WEIGHT PER FOOT:</b>	261 to 286 lbs.
		<b>WINGS:</b>	Hydraulic fold with mechanical lock for holding wings down
		<b>TRANSPORT WIDTH:</b>	14'6"

MODEL NO.	Cutting Width	No. of Discs	No. to Bearings	Disc Size and Type	Approximate Drawbar HP Required h.p. (kw)	Approximate Weight lbs (kg)
HDC22-5420	17' 10" (5.44m)	24(fr) 30(re)	20	20" Plain	80-105 (60-78)	5098 (2312)
HDC22-6020	20' 2" (6.15m)	26(fr) 34(re)	20	20" Plain	85-110 (64-82)	5345 (2424)
HDC22-6420	21' 4" (6.50m)	28(fr) 36(re)	20	20" Plain	85-115 (64-86)	5567 (2525)
<b>OPTIONAL EQUIPMENT</b>						
	Shock absorber gang risers in lieu of standard fabricated gang risers, per bearing .....					Add 17 3/4 (8) ea
	(NOTE: AMCO recommends 1/4" blades for use with shock absorber gangs.)					
BK-01-0002	Center tooth attachment with chisel point .....					Add 60 (27) ea
BK-01-0003	Feathering blades for rear gangs (2) .....					Add 60 (27) ea
BK-01-0029	Wing gang drivers (Set of 4) .....					Add 40 (18) ea
BD-20-0003	4" x 8" x 1-1/2" hydraulic cylinder with stroke control. ....					Add 47 (21) ea
BD-20-0001	15 x 8 wheels in lieu of standard 15 x 6 wheels .....					Add 6 (2.7) ea
	20" x 7 ga. cutout blades in lieu of standard 20" .....					Ded 1 (.45) ea
	22" x 7 ga. plain blades in lieu of standard 20" .....					Add 4 (1.8) ea
	22" x 7 ga. cutout blades in lieu of standard 20" .....					Add 2 1/2 (1.1) ea
	20" x 1/4" plain blades in lieu of standard 20" .....					Add 6 1/2 (2.9) ea
	22" x 1/4" plain blades in lieu of standard 20" .....					Add 11 3/4 (5.3) ea
FA-01-0014	Safety chain 5/16" .....					Add 9 (4.1) ea
<b>RECOMMENDED TIRE SIZE</b> 9.5L x 15 Tires, 6 or 8 Ply						

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THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY.



**CAUTION:** Never stand between tractor and disk harrow when hitching unless all controls are in neutral and the brakes are locked.



**CAUTION:** Park or block the disk harrow so it will not roll when disconnected from the tractor drawbar.



**CAUTION:** When working on disk harrows, care should be exercised in handling or tightening bolts near disk blades to avoid injury.



**CAUTION:** Always secure for transport by using the lock pin and wing lock pins.



**CAUTION:** Never clean, adjust or lubricate a disk harrow that is in motion.



**CAUTION:** Stay out from underneath wing gangs when folding or unfolding.



**CAUTION:** When transporting machinery over public roads, comply with your local and state laws regarding length, width and lighting.



**CAUTION:** When trailing the harrow over public roads, the SMV Emblem must be used for protection of tractor and motor vehicle operators.










**CAUTION:** When transporting farm implements on public roads after dusk it is the responsibility of the operator to provide lighting and reflectors on the rear of the implement in accordance with your state law.



**CAUTION:** All hydraulically or mechanically elevated operating components must be blocked to prevent accidental lowering or must be lowered to the ground when making adjustments or when the equipment is idle.



GENERAL TORQUE SPECIFICATION TABLE (Revised 2-74)									
USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN									
Note: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly-disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.									
SAE Grade No.		2		5		8 *			
Bolt head identification marks as per grade NOTE: Manufacturing Marks Will Vary				  		  			
Bolt Size		Torque Foot Pounds		Torque Foot Pounds		Torque Foot Pounds			
Inches	Millimeters	Min	Max	Min	Max	Min	Max		
1/4	6.35	5	6	9	11	12	15		
5/16	7.94	10	12	17	20.5	24	29		
3/8	9.53	20	23	35	42	45	54		
7/16	11.11	30	35	54	64	70	84		
1/2	12.70	45	52	80	96	110	132		
9/16	14.29	65	75	110	132	160	192		
5/8	15.88	85	105	150	180	220	264		
3/4	19.05	150	185	270	324	380	456		
7/8	22.23	160	200	400	480	600	720		
1	25.40	250	300	580	696	900	1080		
1-1/8	25.58			800	880	1280	1440		
1-1/4	31.75			1120	1240	1820	2000		
1-3/8	34.93			1460	1680	2380	2720		
1-1/2	38.10			1940	2200	3160	3560		

\* Thick nuts must be used with Grade 8 bolts

\* Thick nuts must be used with Grade 8 bolts

ALL BOLTS SHOULD BE TIGHTENED TO THE RECOMMENDED TORQUES SHOWN IN THE "GENERAL TORQUE SPECIFICATION TABLE"

## ASSEMBLY INSTRUCTIONS

The harrow is shipped from the factory with maximum pre-assembly in the following bundles:

- A. Main Frame, Pull Tongue and Rockshaft
- B. 2 or 4; 15 x 6-6 Bolt wheels
- C. 4-2 1/2 x 16 Hydraulic Cylinders (HMTD22 and HMTD22 only)
- D. Scrapers and Bolts
- E. Hydraulic Kit (HMTD22 and HMTD22 only)
- F. Front Gang - RH
- G. Front Gang - LH
- H. Rear Gang - RH
- I. Rear Gang - LH
- J. Tongue Jack

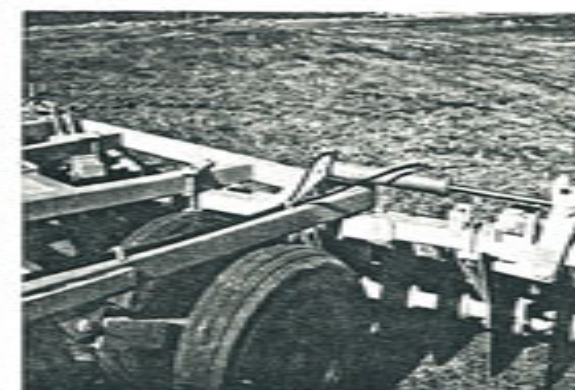
- Place all bundles where they will be convenient. Arrange loose parts so they may be readily seen when needed. To insure good alignment of the units and parts, always insert all bolts leaving the nuts loose. Tighten the nuts evenly to prevent misalignment, distortion, or binding. Be sure all bolts are tight, all cotter pins properly spread and all pins properly inserted.

- Select clean level area for assembly. Place main frame on sturdy stands at least 30" high. Place on front and rear to clear gang frames.



**CAUTION** Use sturdy stands to prevent frame from falling.

- Remove the pull tongue from main frame bundle. Swing rockshaft down into position and lock in place with transport strap.
- Mount 9.5L x 15 high flotation tires on the wheels. Bolt the wheels to the hubs. Tighten bolts evenly to assure proper alignment of wheels. Consult tire manufacturer for proper tire inflation pressure.



- Attach pull tongue in upper or lower holes on main frame to match tractor drawbar height. Attach hose support.
- Attach front cylinder mount and stabilizer assembly.
- Attach front gangs to main frame with attached straps. Bolt heads must be on top. Center gangs on main frame.
- Attach rear gangs to main frame with attached straps. Center gangs on main frame.

## OPTIONAL EQUIPMENT

9. Attach the butt end of the four 2½ x 16 hydraulic cylinders to the mount on inside gangs. Attach hydraulic hoses as shown in the diagram on page 14. (Hydraulic models) Attach hydraulic hoses to tractor and charge the hydraulic system. Extend and retract cylinders at least three times to get all air out of system. Install rod end of cylinder to wing cylinder mounts.
10. Attach scrapers to scraper bars. Scrapers should be 1/16" to 1/8" from blade. Rotate gangs to assure that scrapers are properly adjusted.
11. Install wing stands on wing gang frames. Adjust tension in springs so wings will fold easily. (Spring assist models).
12. Attach lift cylinder and hydraulic hoses (optional equipment)
13. Attach tongue jack.
14. Attach the center tooth to the center bar of the main frame. Use the lower set of holes for harrows with 20" blades and the upper set of holes for harrows with 22" blades.
15. Attach the feathering blades to the rear gangs.
16. Install wing gang drivers.
17. Check and retighten all bolts after initial field use.

## LUBRICATION

### GANG BEARINGS

Careful and regular attention to lubrication will greatly increase the life of the harrow. For economical and efficient operation, the proper lubrication of the gang bearings, rockshaft retainer pins and wheel bearings is essential.

Be sure the pressure fittings are free of dirt or paint before using the pressure gun. Replace any damaged or missing fittings. Use a good grade of No. 2 gun grease (Lithium Base).

The AMCO 22 Series Harrow gangs are equipped with regreasable Protect -O-Shield ball bearings. The grease fitting is located on the rear of each bearing housing. During operation they should be greased daily with a good grade of lithium soap base grease. Apply grease until old or dirty grease is purged from the bearings. All bearings should be greased at the beginning and end of each disking season. To protect the seals from the elements, raise the harrow on its wheels and slowly spin the gangs so the grease wraps around the seals.



## WHEEL BEARINGS

Wheel bearings should be repacked with grease and adjusted annually. Under extreme conditions, they should be serviced more frequently. Check occasionally for excessive end play.

To disassemble the hub, remove the dust cap by prying around it. Remove the cotter pin, slotted nut and flat washer. Carefully remove the hub and bearings from the spindle. Inspect all parts for wear and replace if necessary, Figure 2.

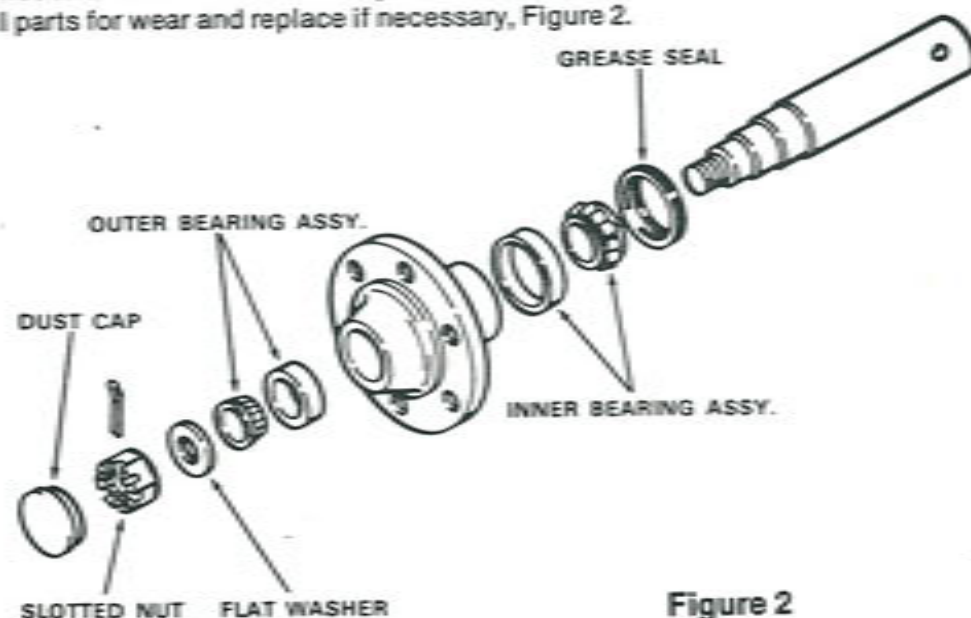


Figure 2

Use the following procedure when repairing or servicing wheel hubs:

1. Clean all parts that are to be re-used.
2. Carefully inspect the metal case on the grease seal. Discard seal if case is bent or damaged. Check seal lips for cuts, tears or excessive wear. Seal must fit snugly on extended inner race of bearing.
3. Carefully inspect both sets of bearings cones. Bearing bore and rollers must be smooth and free of nicks and scratches. Replace cones if damaged.
4. Inspect hub to make sure that hub bolt holes have a full thread. Bearing cups must be smooth and free of surface blemishes. Cups must be removed from the hub and replaced if damaged. Cups should be fully pressed into the hub and rest squarely against the shoulder inside the hub. Hub cap and grease seal should fit snugly inside the hub. Severely damaged hubs should be replaced.
5. Threads on spindle must be in good condition. Bearing cone seats must be smooth and free of blemishes. Bearing cones must fit squarely on spindle.
6. Flat washer, slotted nut, cotter pin and hub cap must be in good condition. Replace if worn or damaged.

To reassemble the hub, repack each bearing cone with grease and fill the hub cavity  $\frac{1}{3}$  full of grease. Place inner bearing assembly in hub, press grease seal into hub and carefully re-install the hub on the spindle. Install the outer bearing assembly into the hub, and replace the flat washer and slotted nut. Tighten the slotted nut, to seat the bearings, until the hub binds when rotated.

Back the slotted nut off to the nearest slot. Rotate the hub five or six revolutions in each direction to seat all parts. Re-tighten the slotted nut while rotating the hub. When the hub binds, back the slotted nut off to the nearest slot and secure with a cotter pin. Install dust cap and re-mount wheel on hub.

## ROCKSHAFT RETAINER PINS

The four rockshaft retainer pins, Figure 3, should be greased every week or 50 hours of operation. These retainer pins should also be greased at the start of each season, and at the end of each season. The retainer pins ride in bronze bushings that should be replaced when worn.

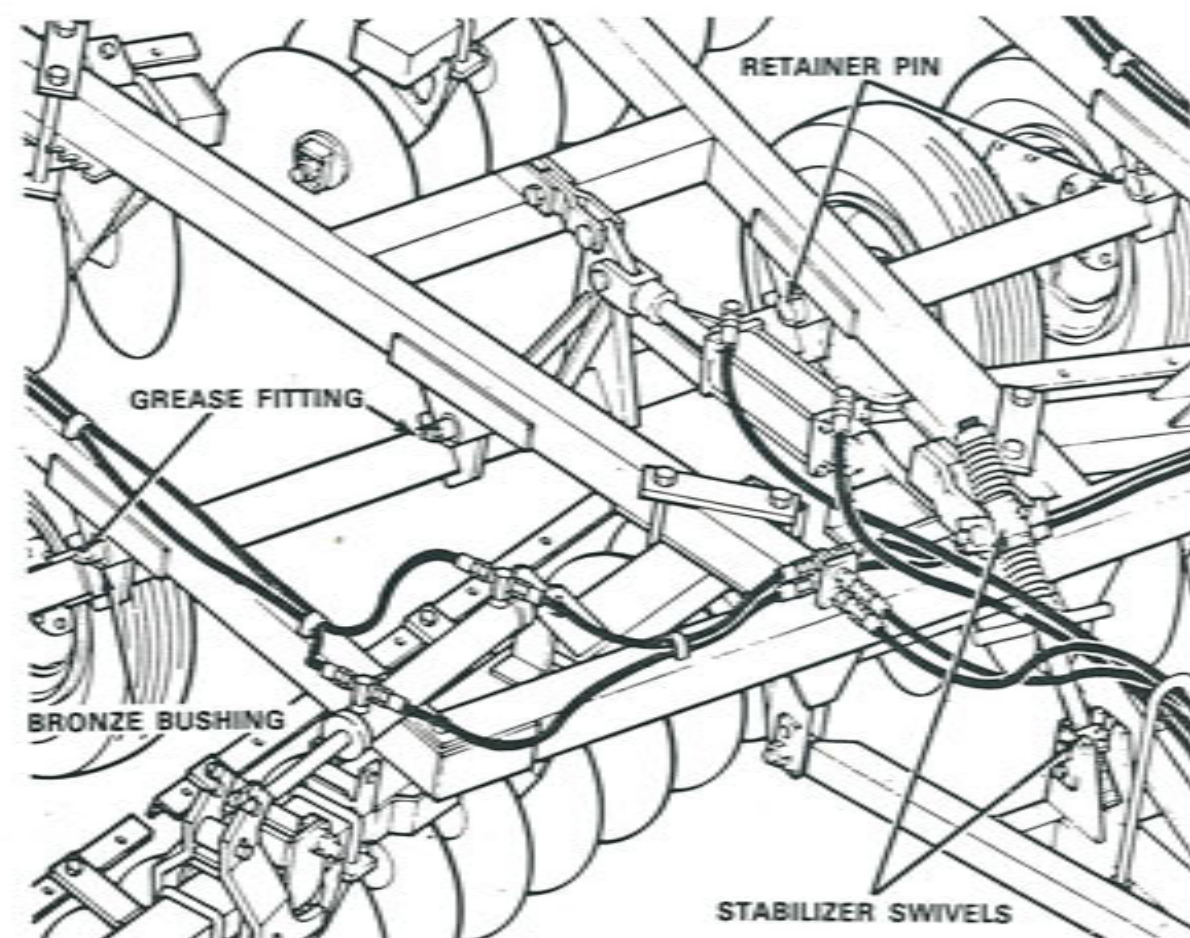


Figure 3

The stabilizer swivels, Figure 3, should be greased every week or 50 hours of operation. The stabilizer swivels should also be greased at the start of each season, and at the end of each season. The threads on the stabilizer rod should be cleaned and oiled occasionally for smooth operation.



## ADJUSTMENT FOR LEVEL DISKING

It is recommended the tractor be operated at a speed best suited for soil conditions. High-speed disking will sometimes result in excessive lateral movement of the soil. This may leave an uneven surface behind the disk harrow known as "Ridging" and "Furrowing".

When disking in a cover crop or where the land is to be reworked, an uneven surface is not objectionable. If the land is to be bare through the winter, furrows and ridges will reduce soil washing, and will help catch and hold moisture, resulting in more water being absorbed by the soil.

## CENTER RIDGE

If a ridge of soil is left behind the center of the harrow, decrease the weight on the rear gangs by shortening the stabilizer rod, decrease the angle of the rear gangs, or move the gangs farther apart, or do a combination of all three.

## CENTER FURROW

If a furrow is left behind the center of the harrow, increase the weight on the rear gangs by lengthening the stabilizer rod, or move the gangs closer together, or do a combination of all three.

## OUTER RIDGES OR FURROWS

If ridges or furrows are left behind at the outer ends of the harrow, change the weight on the rear gangs by adjusting the length of the stabilizer rod, or change the front gang cutting angle.

## FEATHERING BLADES

The use of feathering blades with smaller disks will move the excess soil back which is thrown out by the front gangs at high speed. By using the feathering blades, the outside furrows are partially filled giving a more uniform job of disking.

## GROUND SPEED AND ADJUSTMENTS

Where it is necessary to have a level job of disking, the following factors must be taken into consideration: (1) Tractor Speed, (2) Hitch Adjustment, (3) Disk Gang Angle Adjustment, and (4) Gang Lateral Adjustment.

## TRACTOR SPEED

Speeds above 5 MPH may result in forming of ridges and furrows. Lateral adjustment of the rear gangs, and use of rear gang feathering blades helps to overcome this problem.

Disk as deep as necessary to do a thorough job, but do not try to disk to an excessive depth. In most conditions the AMCO harrow has sufficient weight for good penetration. In other conditions you have a little more weight than you really need. For these conditions, your harrow should be equipped with flotation tires. 9.5L x 15 or 11L x 15 tires will be adequate for most conditions. You also need a good heavy duty 4 x 8 Hydraulic Cylinder with stroke control. This will allow you to control cutting depth.

Never allow soil to "bulldoze" ahead of or flow over the spacer spools. Cutting depth should be controlled to avoid this situation. Maintaining proper cutting depth will have the following advantages:

1. Increase gang bearing life.
2. Reduce strain on harrow frame and related parts.
3. Reduce load on tractor engine and drive train.
4. Lower fuel consumption due to less load on tractor engine.
5. Reduce wheel slippage and rear tractor tire wear due to lower load.
6. Increase tractor travel speeds due to less rear wheel slippage.

By properly controlling cutting depth, gang bearing life will be increased with more acres covered per day at a lower cost.



## HITCH ADJUSTMENT

The frame of the harrow should be level front to rear when the harrow is in operation so the front and rear disk gangs will penetrate the soil uniformly. Shorten or lengthen the stabilizer rod to level the frame.

Attach pull tongue in upper or lower holes, Figure 4, provided on main frame, so that frame is near level when attached to tractor drawbar.

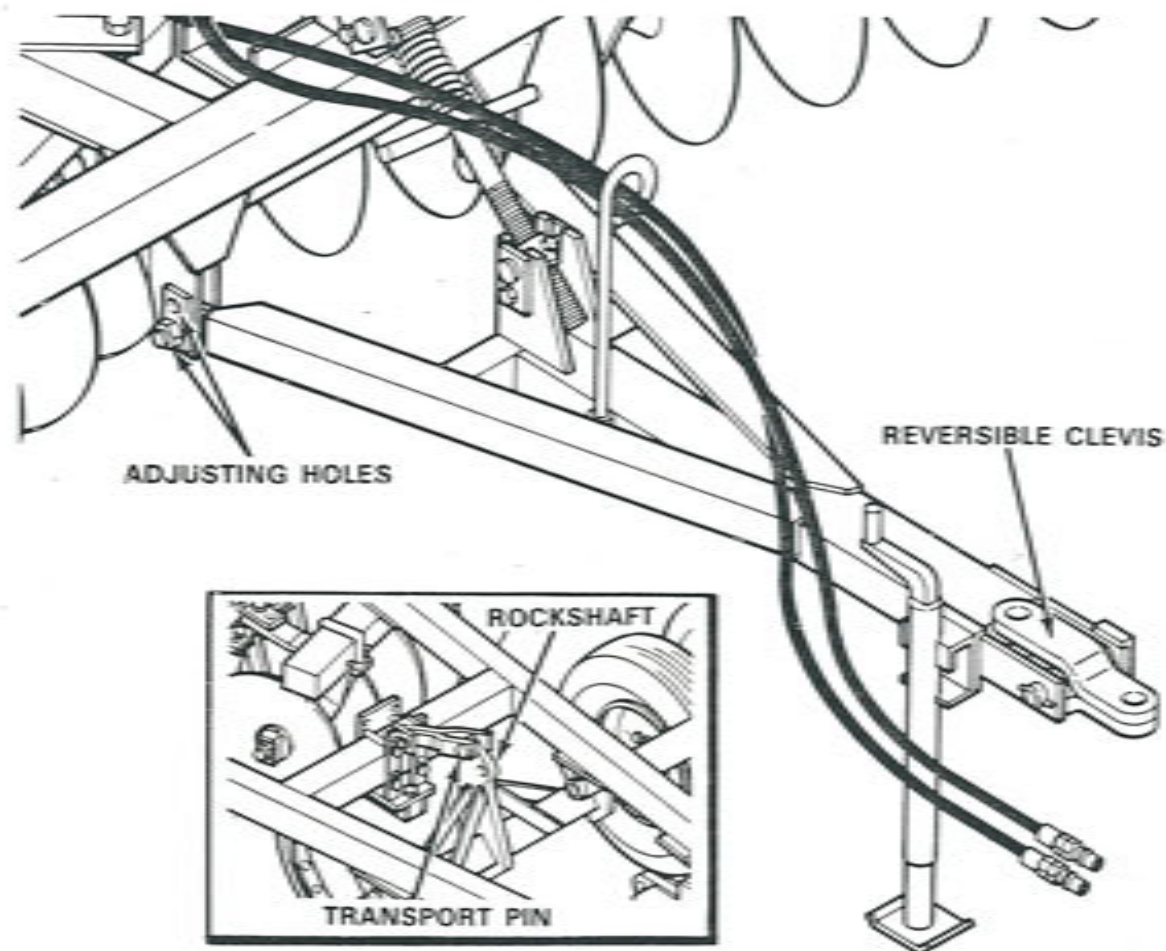


Figure 4

Attach the harrow to the tractor drawbar with the reversible clevis and lower the gangs. **IMPORTANT:** Be sure to remove the transport pin from transport position and insert it in rockshaft before lowering gangs.

## HITCH ADJUSTMENT (CONT'D)

Turn the stabilizer rod, Figure 5, until the frame is positioned for the desired working depth of all gangs. The cushion springs, Figure 5, allow the hitch to flex in relation to the main frame.

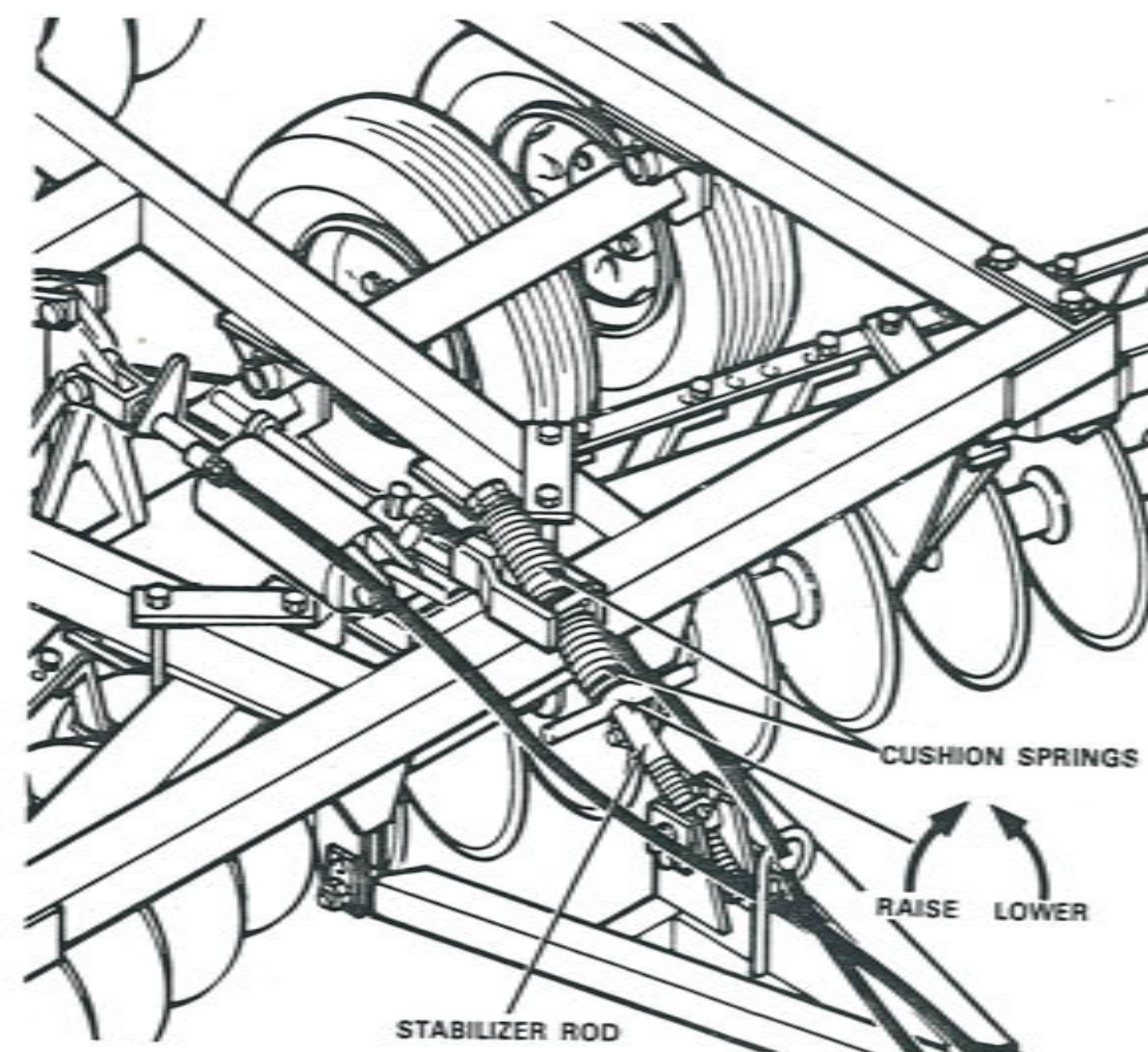


Figure 5

Extend the length of the stabilizer rod to increase penetration of the rear gangs. Reduce the length of the stabilizer rod to increase penetration of the front gangs.



## DISK ANGLE ADJUSTMENT

### FRONT GANG

The front gang angle may be varied between  $14^{\circ}$  and  $19^{\circ}$ , and the rear gang angle may be varied between  $11^{\circ}$  and  $18\frac{1}{2}^{\circ}$ . The greater the angle of the gang, the deeper the blades will penetrate the soil. The draft increases as the angle increases. For maximum disk life and operating economy, the gangs should be set at the smallest angle which will do satisfactory disking.

To adjust the front and rear gang angle, remove the bolts securing the angle set brackets and move the gang to the desired degree of cut. Refer to Figures 6 and 7. Be sure to retighten the angle set bracket bolts to 200 foot pounds torque.

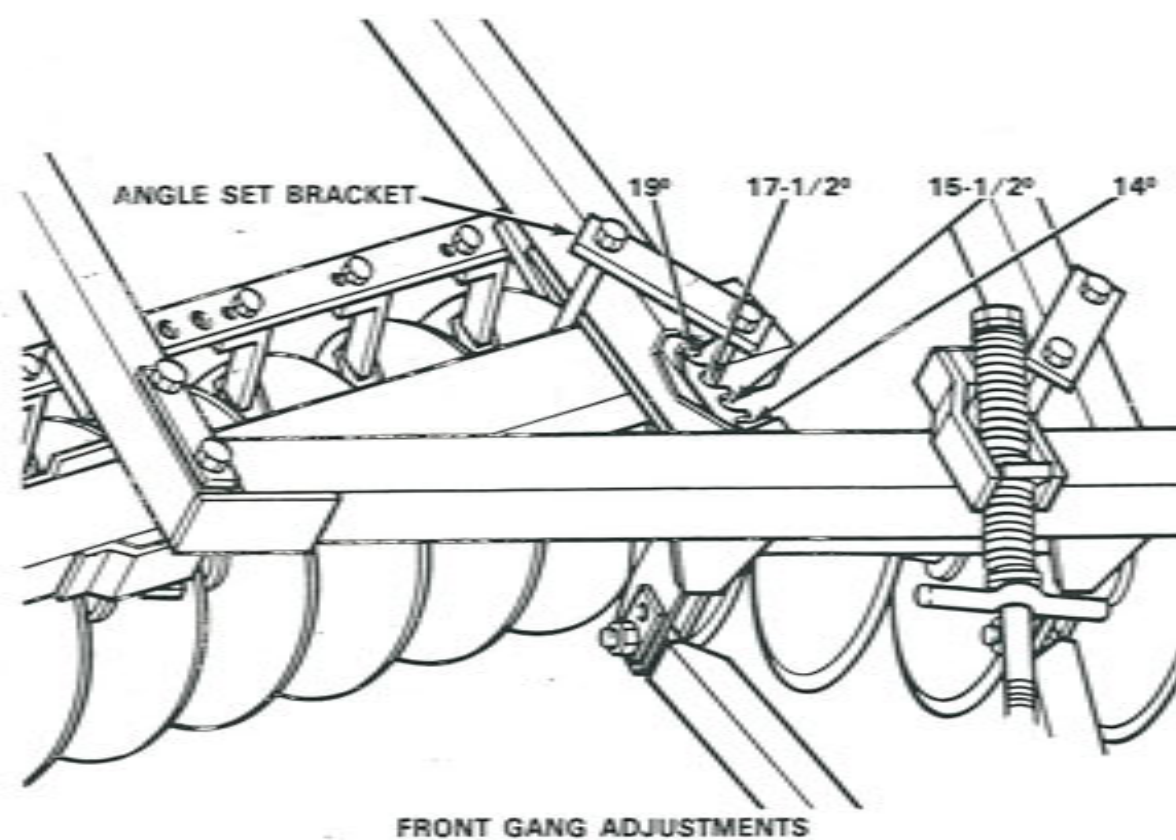


Figure 6

## DISK ANGLE ADJUSTMENT (CONT'D)

### REAR GANG

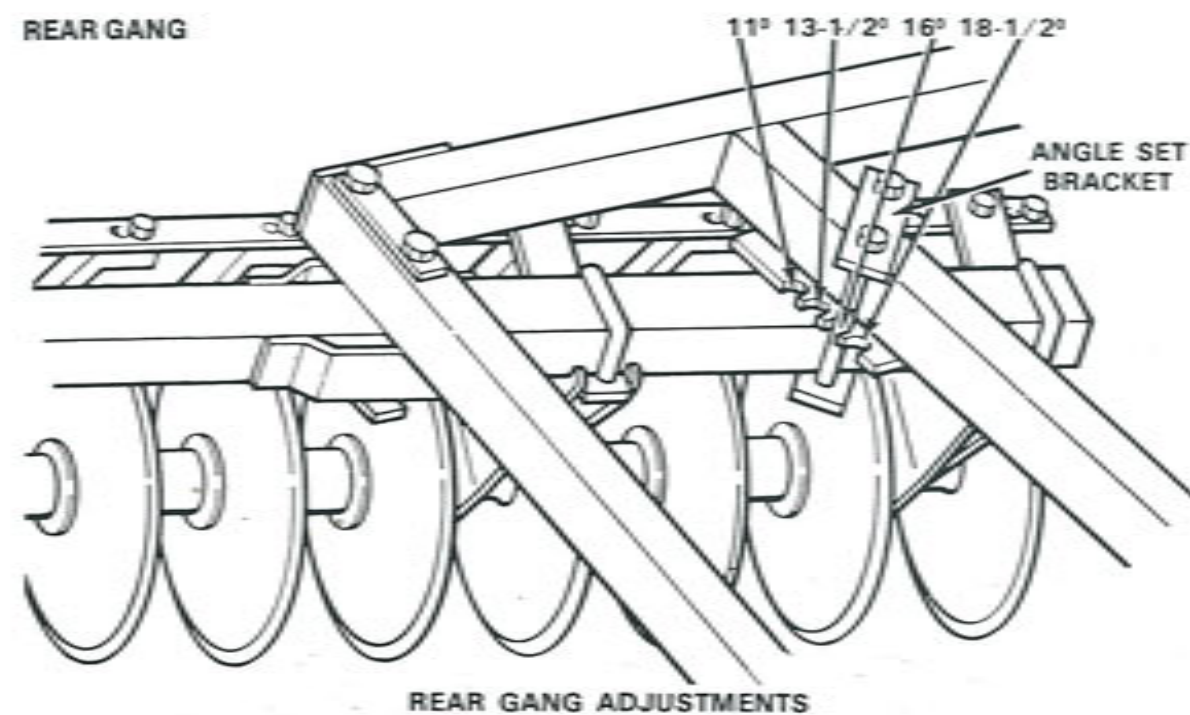


Figure 7

### ADJUSTMENT SUMMARY

To fill a furrow, set the front gangs at minimum angle, set the rear gangs at maximum angle and increase the weight on the rear gangs. To cut down a ridge, set the front gangs at maximum angle, set the rear gangs at minimum angle and decrease the weight on the rear gangs.



**WARNING** Lower or block elevated components before servicing or when leaving the machine. Elevated components can fall and cause serious injury.



## GANG LATERAL ADJUSTMENT

### GENERAL

The front and rear gangs are adjustable laterally to compensate for soil conditions and tractor speed. As an initial setting, it is recommended that the front gangs be adjusted so that bumper washers are centered on harrow frame and clear each other by  $3/8$  to  $1/2$  inch; (1 to  $1\frac{1}{4}$ " with shock risers) and the rear gangs are approximately 28 inches apart, measured from front edge of disk blades.

### RIDGING

Make adjustments as needed after the harrow is placed in operation. When a ridge of soil is left behind the center of the harrow, the rear gangs should be set out. Weight on the rear gangs can be decreased by shortening the stabilizer rod.

### FURROWING

When a furrow is formed behind the center of the harrow, the rear gangs should be set in. Weight on the rear gangs should also be increased by lengthening the stabilizer rod.

### ADJUSTMENT

To adjust the front and rear gangs laterally, loosen the two bolts securing the gang to the corner of the main frame, and the two bolts in the angle set brackets, Figure 8.

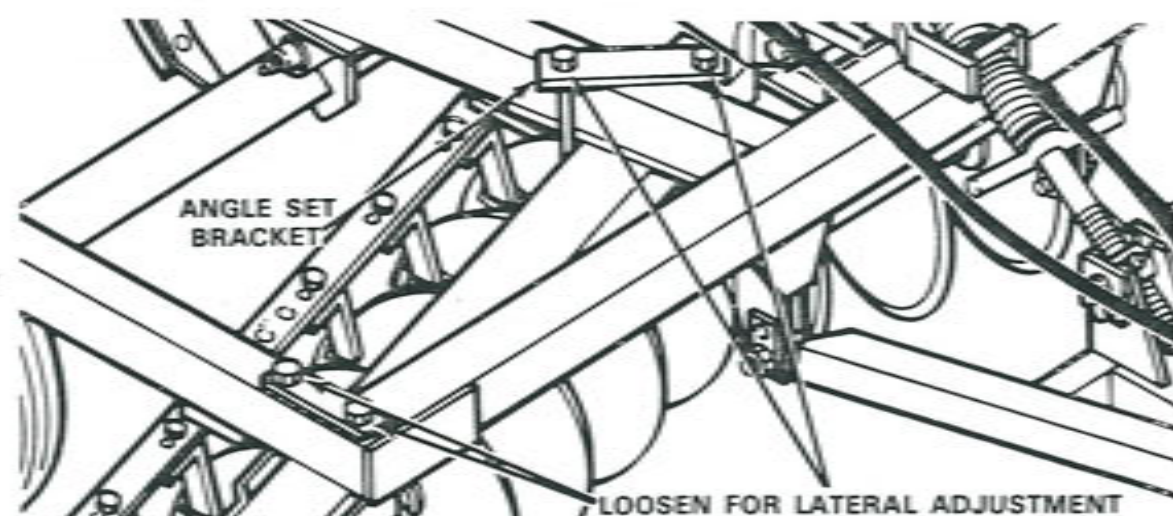


Figure 8

Slide the gangs either toward the center or toward the outside of the harrow until the desired position has been obtained. Be sure to retighten the bolts to 200 foot pounds torque.

It is recommended that the rear gangs be set in at low tractor speeds (below 5 MPH) and set out at high tractor speeds (5 to 6 MPH).

A center tooth attachment is available to till the band of soil not moved by the front gangs.

## WING GANGS (SPRING ASSIST)

The wing gangs are equipped with adjustable springs to assist in folding the wings for transport, and unfolding into working position.

**CAUTION** Stay out from underneath wing gangs when folding or unfolding.

Models WTD22-4820, WTC22-6020, WTC22-6420 and WTD22-5420 use a 22" spring. Models WTD22-5220, WTD22-5620, WTC22-6820, WTC22-7220, WTD22-6020 and WTD22-6420 use a  $24\frac{1}{2}$ " spring. Note: 22" spring attaches in lower hole of spring anchor,  $24\frac{1}{2}$ " spring attaches in upper hole of spring anchor.

The springs are adjusted by shortening or lengthening the adjusting bolt shown in Figure 9.

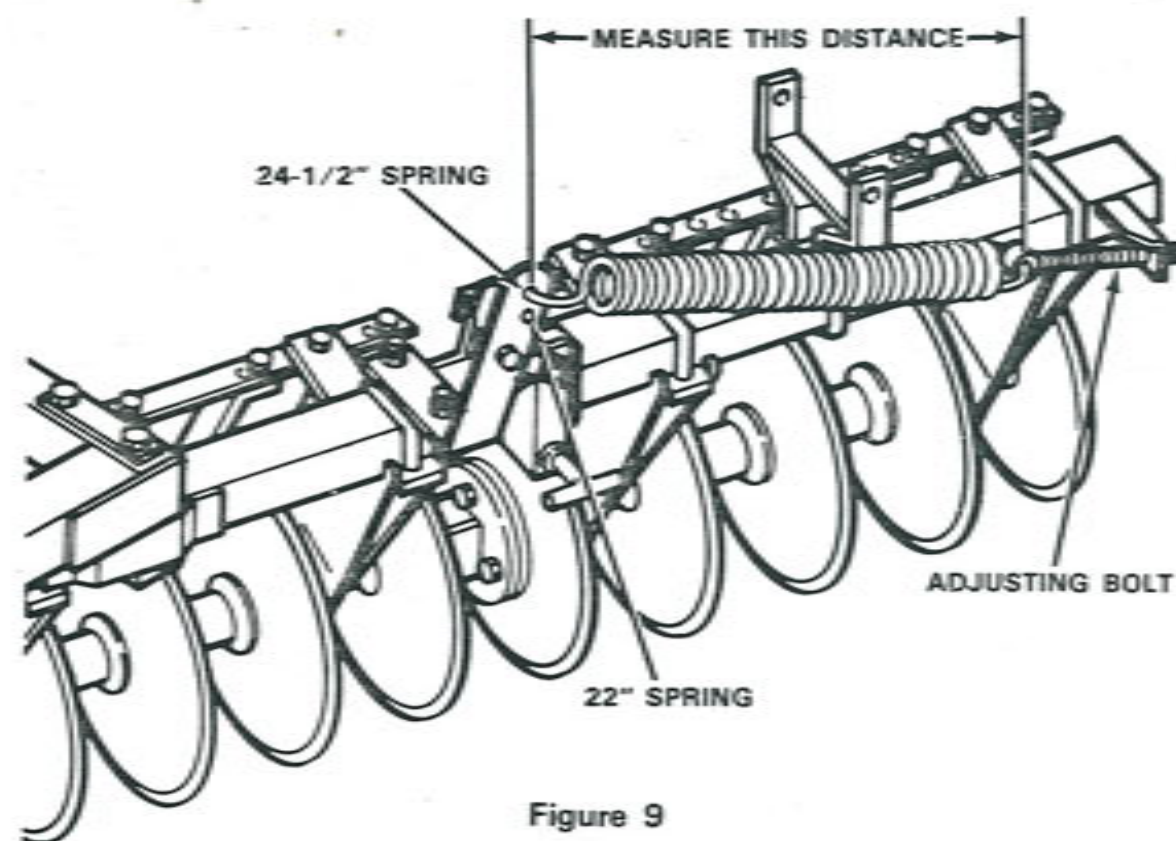


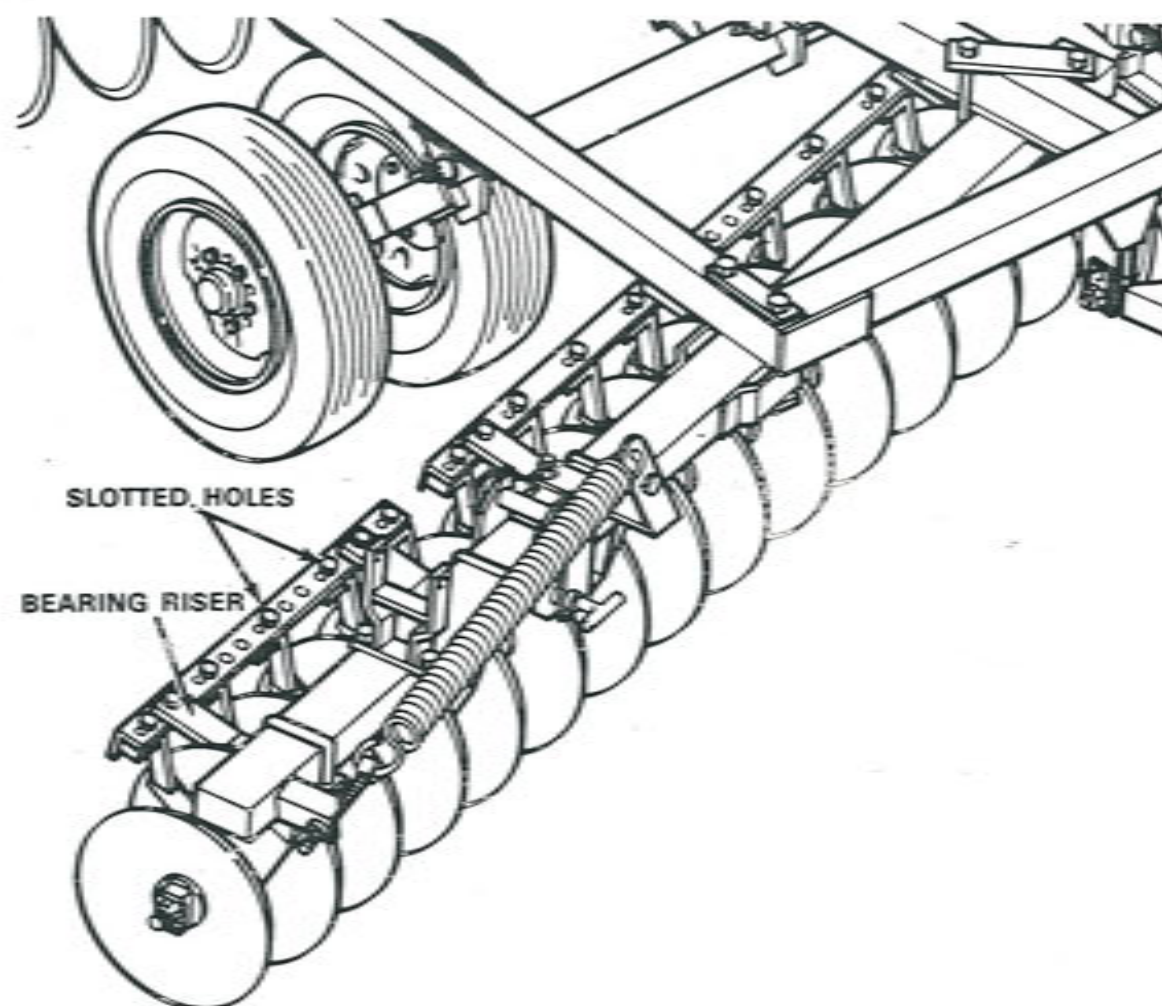
Figure 9

Adjust tension of wing lift assist springs so that wing gang can be folded with about forty to fifty pounds lifting force. Adjust spring length, (measured from center to center of hook ends) as follows: 22" spring approximately 34" long, and  $24\frac{1}{2}$ " spring approximately 41- $\frac{1}{2}$ " long. See Figure 9.



## SCRAPER ADJUSTMENT

Scrapers should be adjusted to run approximately 1/16 to 1/8 inch from the disk blades. Each scraper may be adjusted in the slotted scraper bar, or the entire scraper bar assembly may be moved laterally in the slotted holes provided in the bearing risers, as shown in Figure 10.



## HYDRAULIC LIFT CYLINDER INSTALLATION

Attach rod end of cylinder in forward hole of rockshaft lift arm and other end to cylinder mount on main frame, as shown in Figure 11.

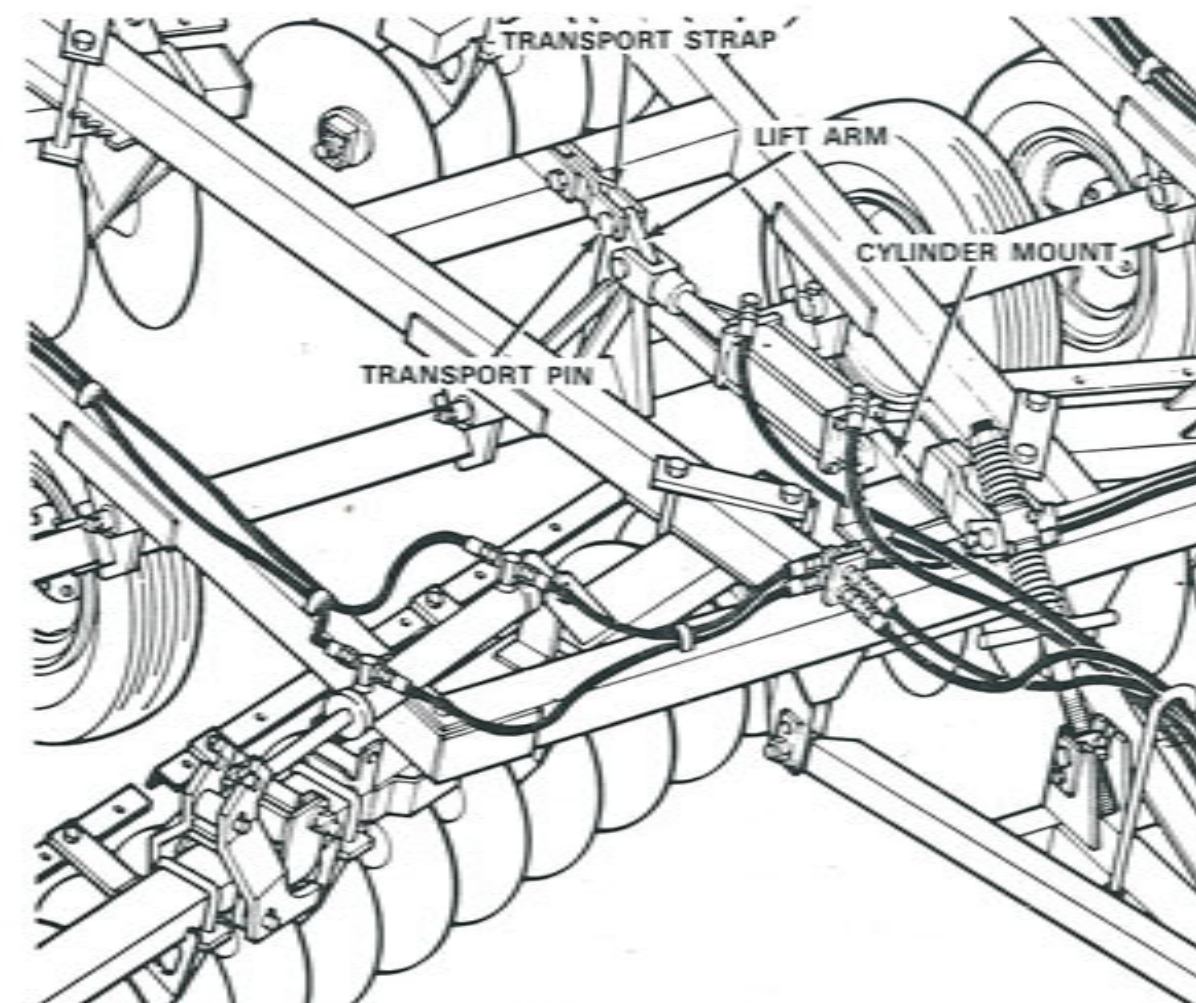


Figure 11

Use the hydraulic lift cylinder to control depth of cut for herbicide incorporation or to conserve fuel.

A heavy duty 4 x 8 ASAE standard hydraulic cylinder, with depth stop, is recommended for raising and lowering the disk harrow.

Heavy duty ASAE standard hydraulic cylinders are available at your local AMCO Dealer.



**CAUTION:** Before attaching cylinder to disk, stroke cylinder to full length several times to allow oil to fill cylinder and hoses. Otherwise cylinder may drop load when first used.



## TRANSPORT SAFETY LOCK



**CAUTION** Always secure for transport by using the transport lock pin and wing hold pins.

Prior to transport, raise harrow and lock in transport position by securing transport strap to rockshaft lift arm with transport pin, as shown in Figure 12, to keep disk blades clear of road surface when transporting. Secure transport pin with klik pin.

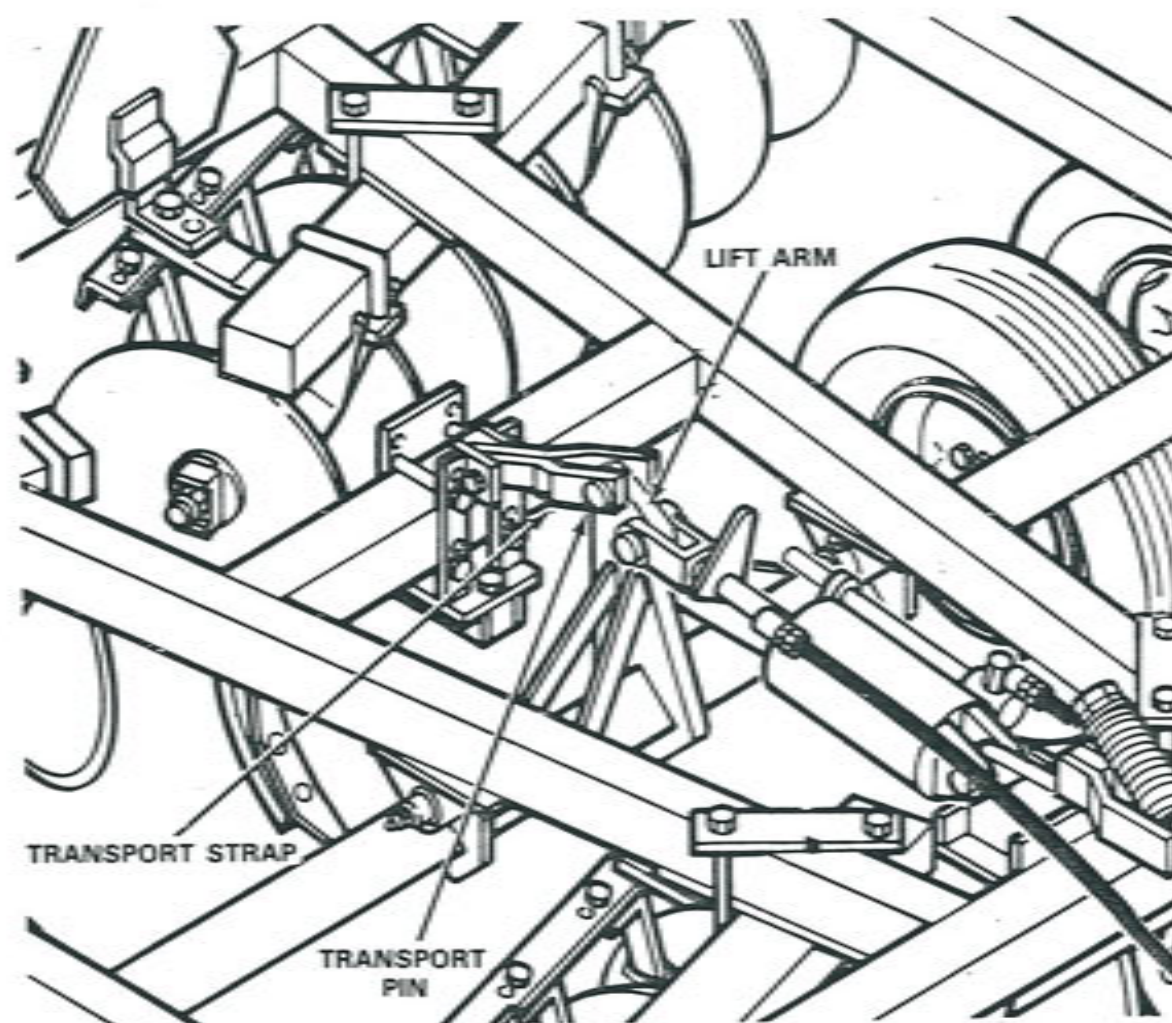


Figure 12

## TRANSPORT SAFETY LOCK (CONT'D) (SPRING ASSIST WING GANGS)

If the harrow is equipped with spring assist wing gangs, remove the wing hold pins, Figure 13.

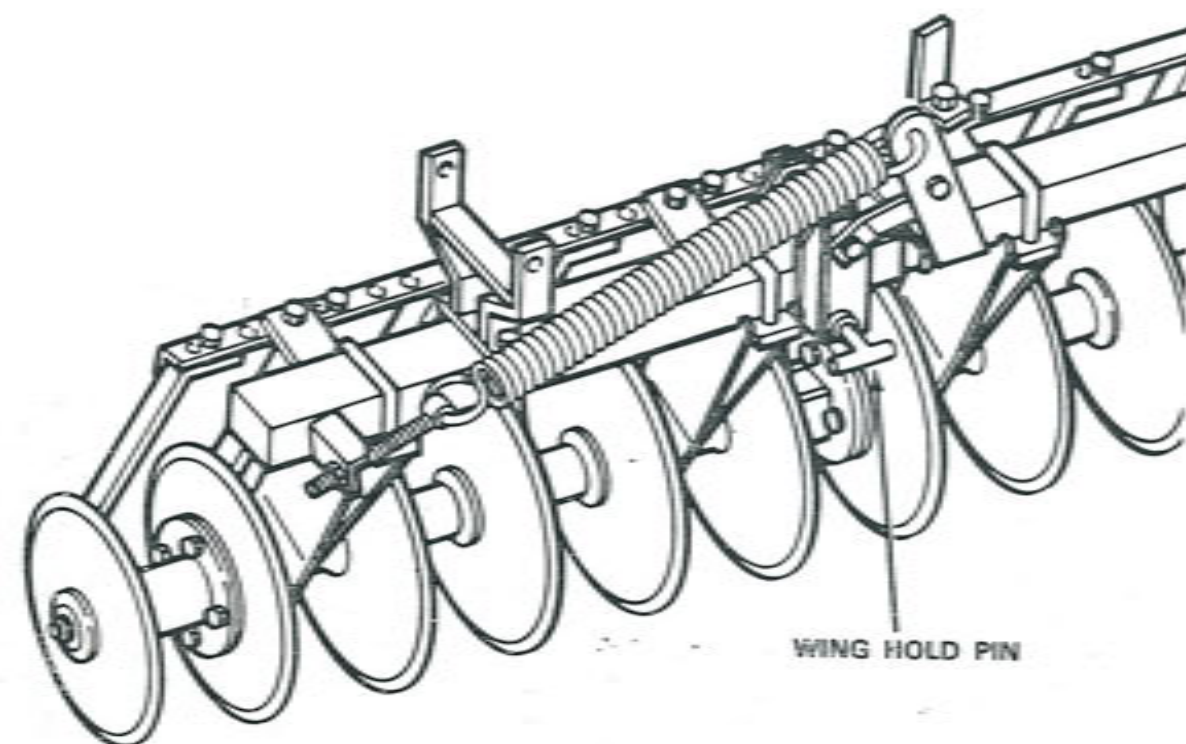


Figure 13



**CAUTION** Stay out from underneath wing gangs when folding or unfolding.



## TRANSPORT SAFETY LOCK (CONT'D)

Fold the wings and lock in position, in the gang rest brackets, with the wing hold pins as shown in Figure 14. Secure the wing hold pins with the klik pins.

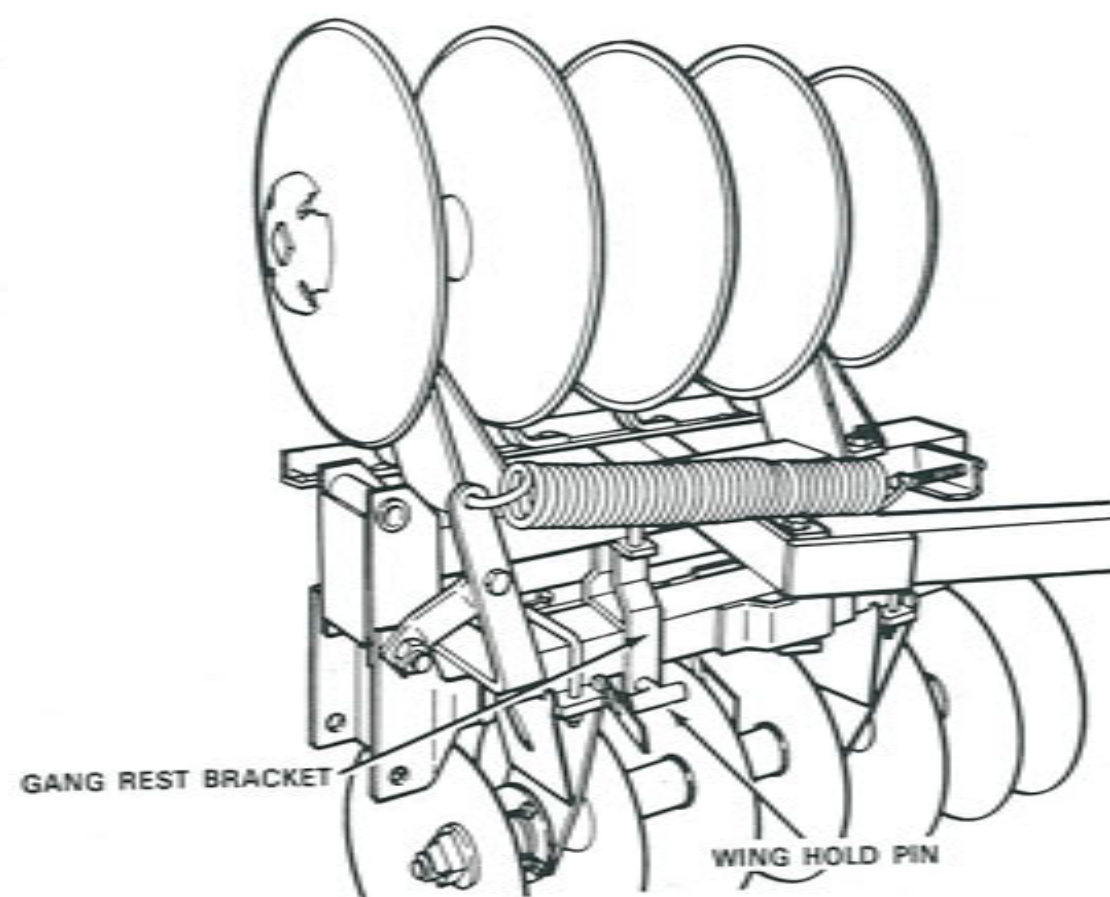


Figure 14

**CAUTION** When transporting machinery over public roads, comply with your local and state laws regarding length, width and lighting.

## TRANSPORT SAFETY LOCK (CONT'D) (HYDRAULIC WING GANGS)

If the harrow is equipped with hydraulic wing gangs, fold the wings by retracting the wing lift cylinders. Remove the wing hold pins from storage position and lock wings in position as shown in Figure 15. Secure the wing hold pins with the klik pins.

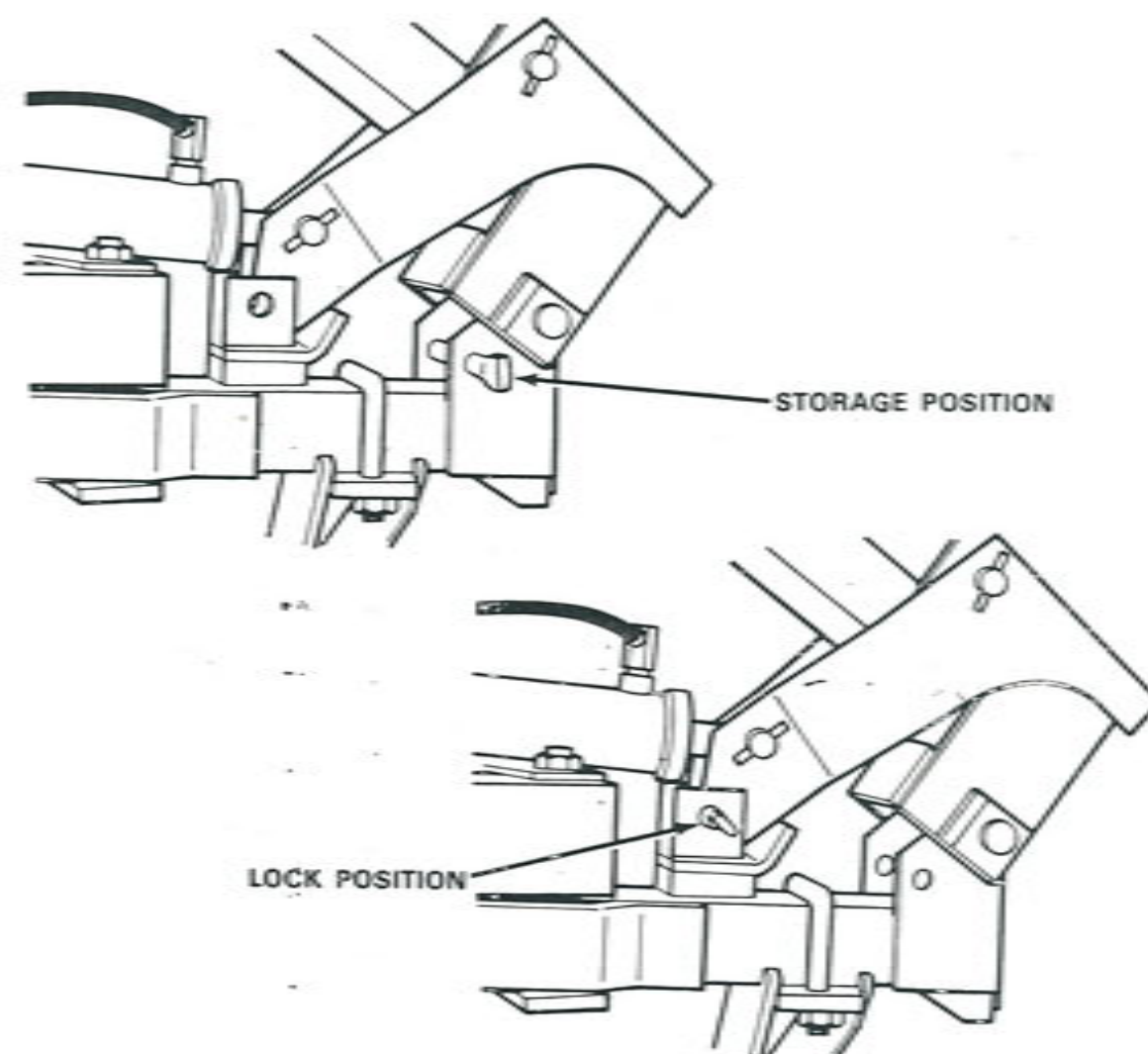


Figure 15

**CAUTION** Stand clear when disk wings are being raised or lowered. Do not work or stand under disk wings unless wing lock pins are installed. Accidental operation of hydraulic lever or failure of any hydraulic component could cause wing to drop, causing serious injury or damage.

When lowering the hydraulic type wings into the working position, keep pressure applied for 5 to 10 seconds after the cylinders are extended to assure that the wing latches are fully latched.



## STORAGE

Proper storage will add to the life of your disk harrow, and assure its being in good condition for the next season. The following procedure is recommended.

Clean off all foreign matter, and thoroughly lubricate the harrow.

Repaint the harrow where the original paint has worn off.

Coat the disk blades and hydraulic cylinder rods with a good rust preventative. If equipped with hydraulic wings, fold wings if possible.

Tighten loose bolts and replace any damaged or missing parts.

Store in a dry place, with the gangs resting on boards to remove weight from the tires.

Carefully rotate each gang and check for worn or damaged blades, bent gang shafts, worn scrapers, damaged bearings and other parts which may need replacing.

Whenever disk blades or bearings are replaced, the gang shaft nuts must be torqued to 800 foot pounds.

## MAINTENANCE

1. Keep all bolts tight.
  - A. Check before placing in service.
  - B. Visually inspect all bolts daily.
  - C. Check after first 50 hours or one week's operation.
  - D. Check each season.
2. Keep wheel bearings properly adjusted.
  - A. Check often.
  - B. Clean and repack each season or every 300 hours.
  - C. Replace worn or damaged parts.
  - D. In dis-assembling and re-assembling the wheel hub assemblies, care must be taken to not damage the grease seal lips. In re-assembly, to seat the bearings, carefully tighten the hex nut until the hub drags. Rotate hub to help seat the bearings cups and cones. Re-tighten the hex nut until the hub drags, then back off the hex nut to the nearest slot and secure with cotter pin.
3. Do not run with loose disk blades. Keep gang bolts tight! Tighten gang bolts to 800 ft-lbs of torque.
4. Keep scrapers properly adjusted 1/16" — 1/8" from blades.
5. Grease gang bearings and rockshaft retainer pins every week or 50 hours, at the start of each season, and at the end of each season. Apply with low pressure, low volume hand grease gun. Use a good No. 2 gun grease (Lithium Base). Rotate gangs while greasing for best results.

**CAUTION! Use care to prevent damage to seals.**
6. Approximately three (3) gallons of hydraulic fluid is required to fill the harrow hydraulic system.

**CAUTION! Check the tractor hydraulic fluid level after all cylinder rams have been extended. Add fluid as necessary.**
7. Disk Blade, Bearing and Spool Replacement.
  - A. With the harrow in its "down" or working position, loosen the gang bolt nut. It is helpful to clean the threads of all bolts with a wire brush and apply penetrating oil before removing the nuts.

- B. Remove the nuts that secure the gang to the bearing riser.
- C. Remove the trunion clamps.
- D. Raise the harrow on its wheels. The entire gang can then be rolled away from the harrow. In most cases time can be saved by removing the scraper bars and scrapers.
- E. Remove the gang bolt nut and end washer.
- F. Remove the blades, spacer spools and bearings being careful not to damage the threads on the gang bolt.
- G. Tear the entire gang down and clean all parts. Check disk axle for straightness. Bowed, bent or worn axles must be replaced.
- H. Check spacer spools for damage caused by running disk with loose gangs or hitting underground obstructions. Replace spools if they are damaged.
- I. Carefully check all end bells. The large end must contact the disk blade around the entire circumference of the end bell. The small end must be smooth and perpendicular to the axle. The end bells must be replaced if they are cracked or worn on the surface adjacent to the bearing.
- J. Check all disk blades for cracks, wear and other damage. Replace worn or damaged disk blades. Check sleeves for wear or other damage. Replace worn or damaged sleeves.
- K. Check all the bearings on the gang. Running a harrow for one hour or more after a bearing failure will seriously damage other bearings on the gang. This damaged bearing will then fail within a few hours after the failed bearing has been replaced. Continued operation with this failed bearing will damage the new bearing thus it will fail after a few hours use. In most cases it will be best to replace all bearings on a gang when it is torn down for repairs. A triple lip sealed bearing should always be used for bearing replacement. Also, a re-greasable type bearing should always be used.
- L. To replace a bearing, The snap ring must be removed. The old bearing should then be pressed out of the housing. Clean and wash out old grease and carefully check the housing. Replace the housing if it is damaged. Check the Protect-O-Shield washers. Replace if they show wear near the inner race of the bearing or show other damage. Do not use the harrow without the washers being installed. Press the new bearing straight into the housing. Always press against the outer race of the bearing. Never press against the seal or inner race of the bearing. The small grease hole must align with the grease groove in the bearing housing. Rotate the bearing in the housing after it is pressed in to be sure it turns freely. Install the snap ring in the housing.
- M. After cleaning, checking and replacing all damaged parts, the gang should be assembled. Be sure the grease fittings in the bearing housing face to the rear. Be sure the snap ring in the bearing housing is turned toward the convex (back) side of the disk blades. The 1 1/8" square gang bolt nut should be torqued to 800 FT/LBS. The axle nut should be locked in place with the lock strap.
- N. After the gang is assembled it should be attached to the harrow. The bearing risers should be carefully spaced to match the bearing housings. Poorly spaced bearing risers will overload the bearings and cause premature failure. The gang should be rotated 4 or 5 complete revolutions to be sure that all parts are aligned and the gang turns freely.



- O. During operation the bearings should be greased daily with a good grade of clean, lithium soap base grease. Refer to Lubrication Section on Gang Bearings for proper lubrication procedure.
- P. It is essential that gang bolts be kept tight to prevent axle bending, blade breakage, spacer spool breakage and damage to other gang parts. Gang parts tend to wear on a bevel when the harrow is operated with a loose gang bolt. This reduces the area of contact between mating gang parts. Therefore, it is often difficult to keep a gang bolt tight if it has been operated in a loose condition. After such a gang bolt has been properly torqued it should be retorqued after about 30 minutes of operation, again after 4 or 5 hours of operation and again after 8 to 10 hours of use. This will assure that proper gang bolt tension is maintained while the mating components are reseating. If the gang bolt will not stay tight, the gang should be completely disassembled and all parts carefully inspected. All damaged parts should be replaced before reassembling the gang.

#### 8. Hydraulic Cylinder Repair:

- A. Remove hoses and fittings from cylinder.
- B. Remove cylinder from harrow and clean outside of cylinder.
- C. Disassemble cylinder by rotating cap on rod end of cylinder. Use a spanner wrench to remove cap.
- D. Pull cylinder rod to slip rod, gland and piston out of barrel.
- E. Remove nut on end of rod then slip piston and gland off rod. Use care to avoid damaging rod while removing nut.
- F. Carefully clean and inspect all parts for wear or damage. Small nicks, scratches or blemishes on rod and inside of barrel should be smoothed with fine steel wool or emory cloth.
- G. Remove all "O" rings, seals and "U" cups from piston and gland. Carefully replace all seals with new parts.
- H. Assemble cylinder using care to prevent damage to "O" rings, seals and "U" cups.
- I. Replace cylinder on harrow and attach hoses.

Check cylinder for leaks by applying pressure to butt end of cylinder before attaching hose to rod end of cylinder. Oil will flow from port on rod end of cylinder if piston seals are not sealing properly. Attach hose to rod end of cylinder and apply pressure to check for gland or rod seal leaks.

**CAUTION:** Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues causing serious injury. Use a piece of wood or cardboard when looking for leaks - never use the hands or other parts of the body.



Relieve hydraulic pressure before disconnecting circuits. When reassembling, make absolutely certain that all connections are tight.

If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious infection or reaction may occur if medical attention is not given at once.



**CAUTION:** Never clean, adjust or lubricate a disk that is in motion. Disk blades could cause severe injury.

## DUAL WHEEL ATTACHMENT

A dual wheel attachment is available for harrows with single wheels. This attachment consists of two spindles with hubs. Insert the spindle and hub into the rockshaft and secure with the 3/8 x 3 1/2" bolt and locknut as shown in Figure 16.

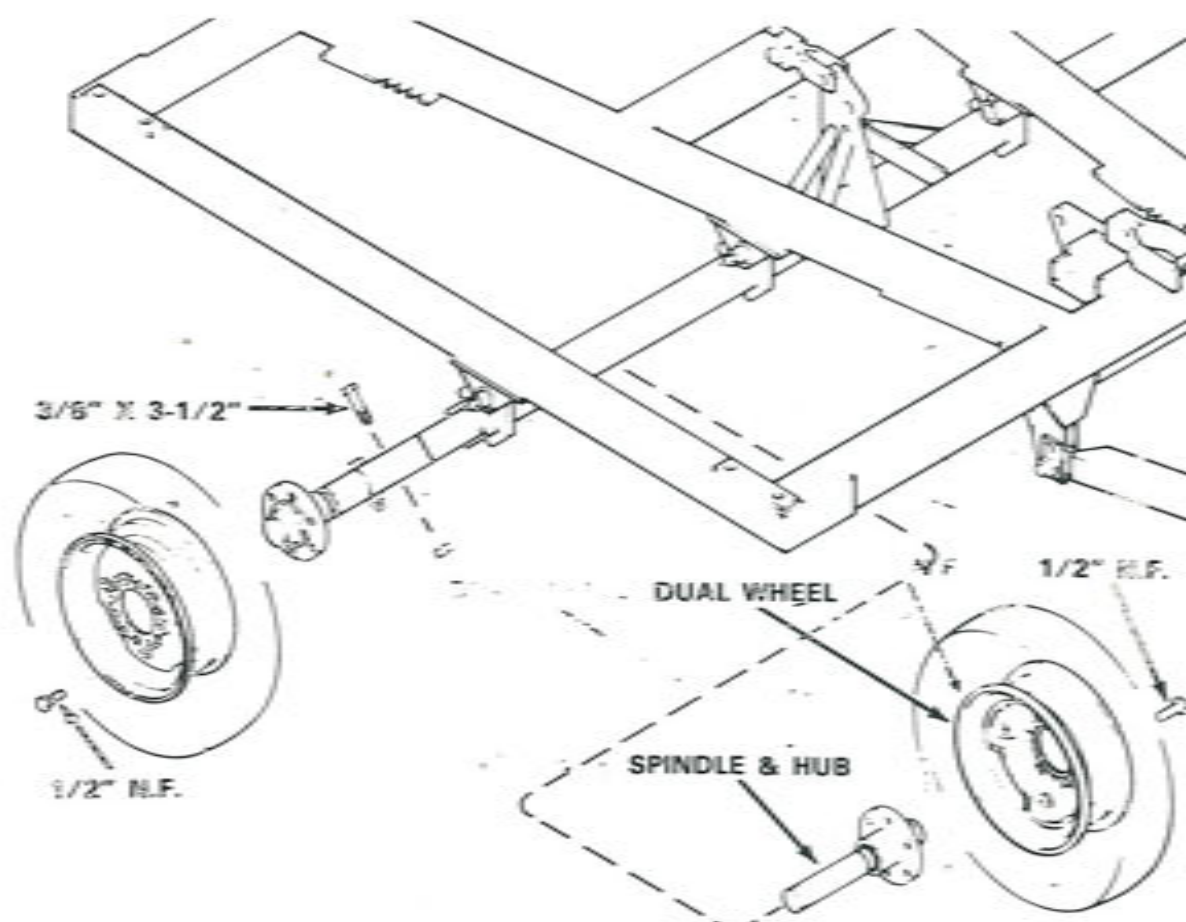


Figure 16

Bolt the wheels to the hubs, and tighten wheel bolts evenly to assure proper alignment of wheels.

**NOTE:** Be sure to use the same size tires on all four wheels so that main frame remains level.



## CENTER TOOTH ATTACHMENT

A center tooth attachment is available to till the band of soil not moved by the front gangs.

Bolt the clamp to the center bar of the main frame, straddling the transport strap, with the four  $\frac{5}{8}$ " x 6" carriage bolts and locknuts. When harrow is equipped with 20" blades, use the lower set of mounting holes. When harrow is equipped with 22" blades, use the upper set of mounting holes. Adjusting holes are provided in the clamp for desired depth of spike tooth. Refer to Figure 17.

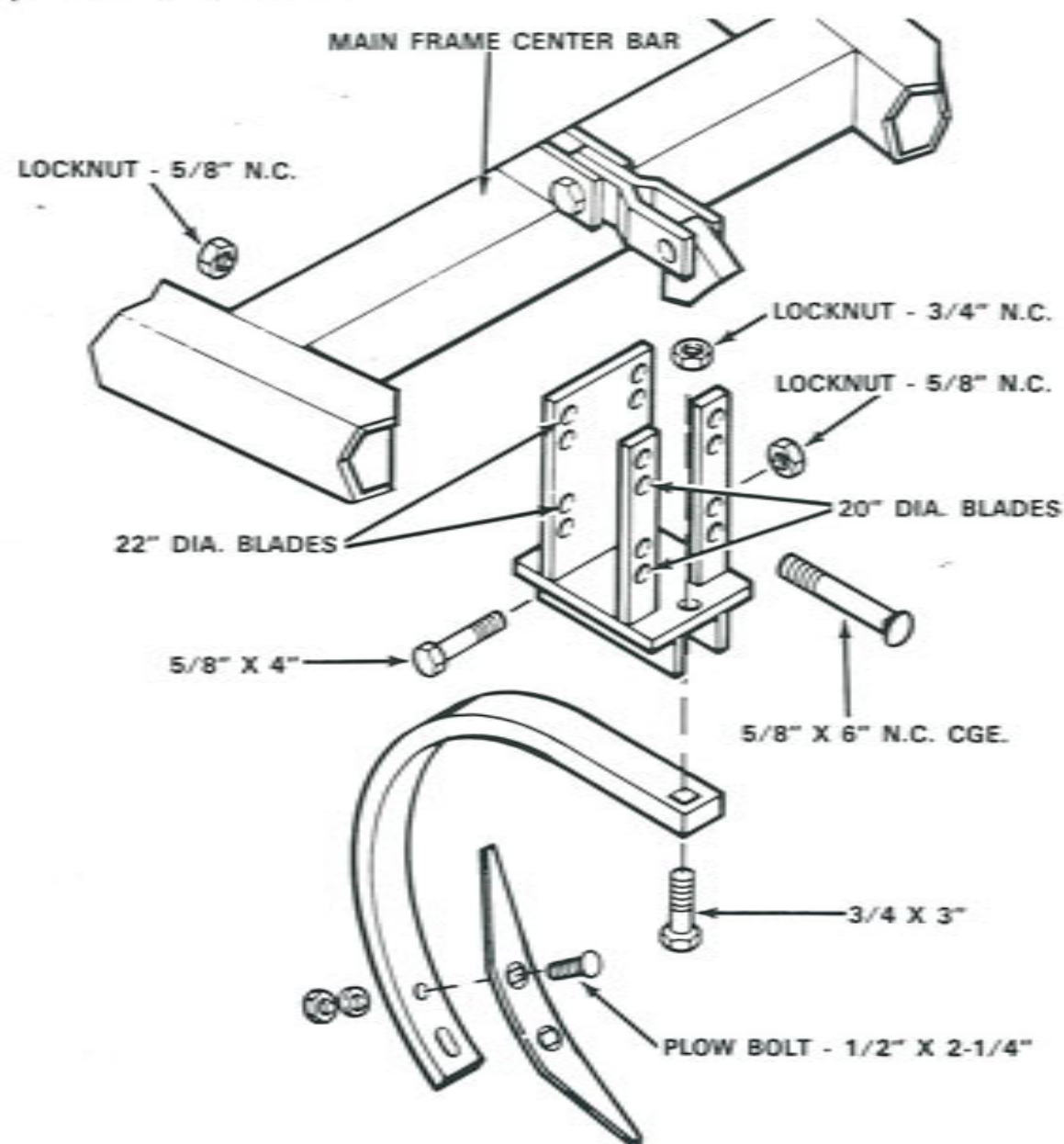


Figure 17

## FEATHERING BLADES

Feathering blades with scrapers are available for the rear gangs to fill and level the furrow left by the front gang outer disk blades.

Secure the blade spacer to the outer bumper washer with the four  $\frac{1}{2}$ " x 2" bolts and locknuts, as shown in Figure 18. Bolt the scraper to end of scraper bar with the  $\frac{1}{2}$ " x 1- $\frac{1}{2}$ " bolt and locknut, maintaining a distance of  $\frac{1}{16}$  to  $\frac{1}{8}$  of an inch from disk blade.

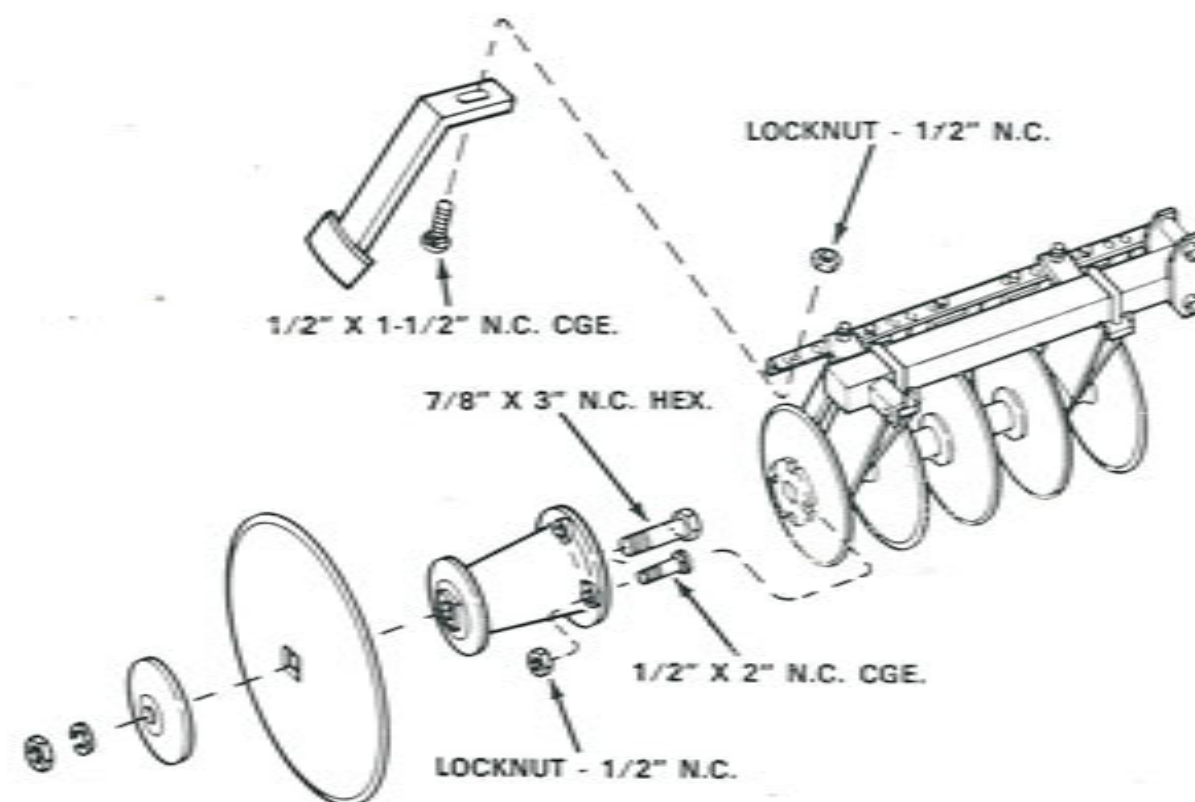


Figure 18



## WING GANG DRIVERS (SPRING ASSIST WINGS)

Wing gang drivers are available for all four gangs, to provide positive rotation of wing gangs.

Refer to Figure 19, and bolt the male lock to the outer bumper washer on the main gang with the four  $\frac{1}{2}$ " x 2" bolts, flatwashers and locknuts. Tighten bolts evenly to assure proper gang lock alignment.

Remove the wing gang bolt nut and install the female lock and strap, securing with the wing gang bolt nut. **NOTE:** Be sure to torque wing gang bolt to 800 foot pounds.

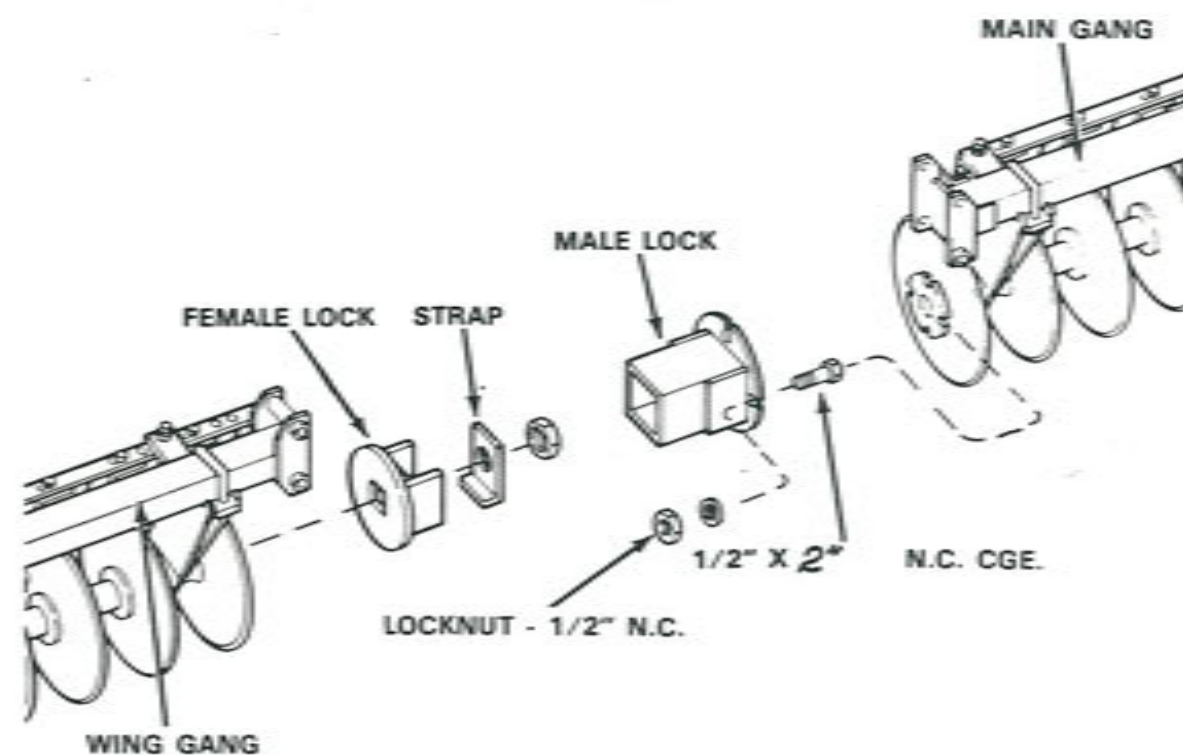


Figure 19

## WING GANG DRIVERS (HYDRAULIC WINGS)

Wing gang drivers are available for all four gangs, to provide positive rotation of wing gangs.

Refer to Figure 20, and bolt the lock and end washer to the bumper washer on each gang with the (4)  $\frac{1}{2}$ " x 2" bolts, flatwashers and locknuts. Tighten bolts evenly to assure proper gang lock alignment.

Remove the gang bolt nut from other gangs and install the lock and strap securing with the gang bolt nut. **NOTE:** Be sure to torque gang bolt nut to 800 foot pounds.

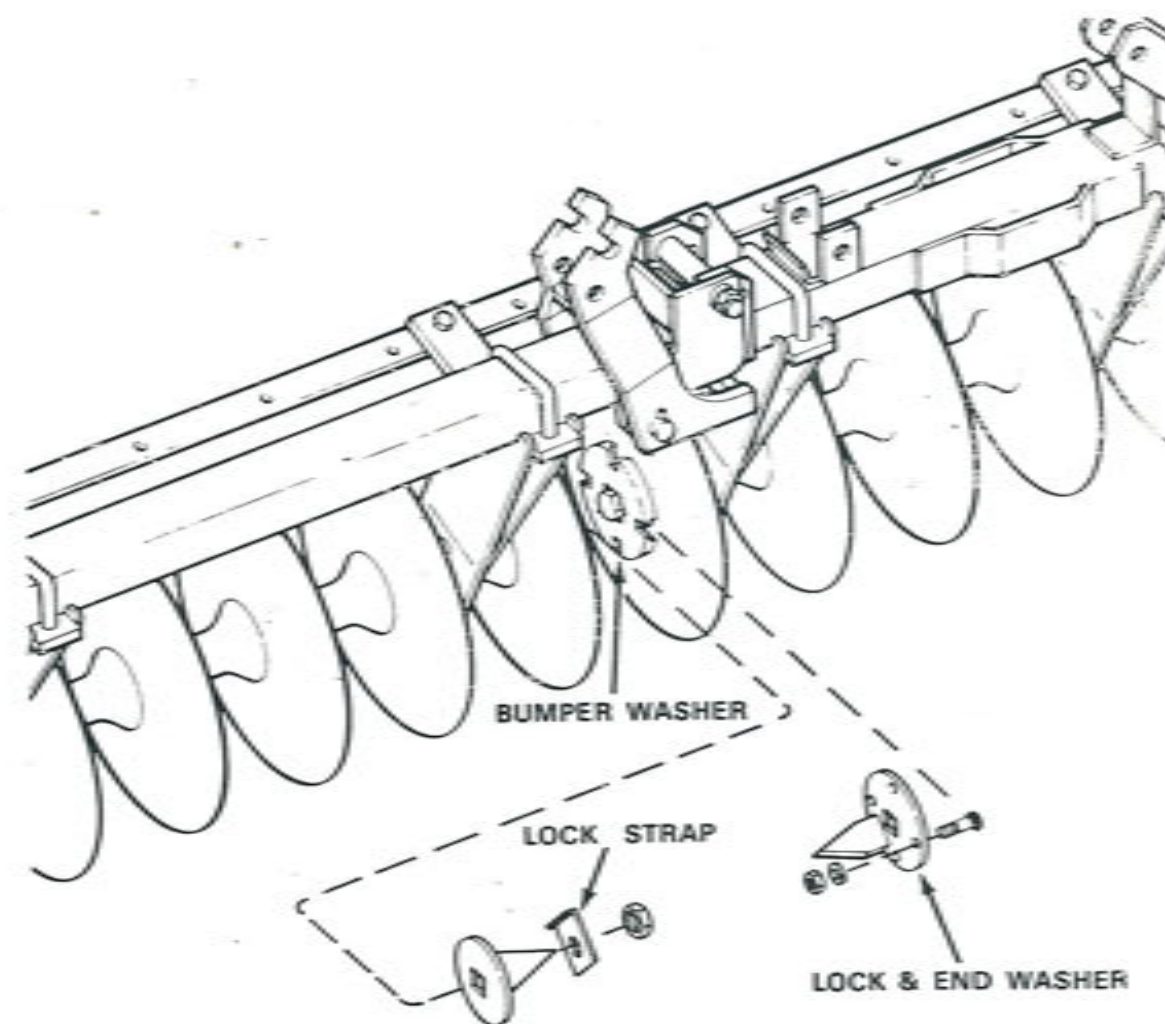
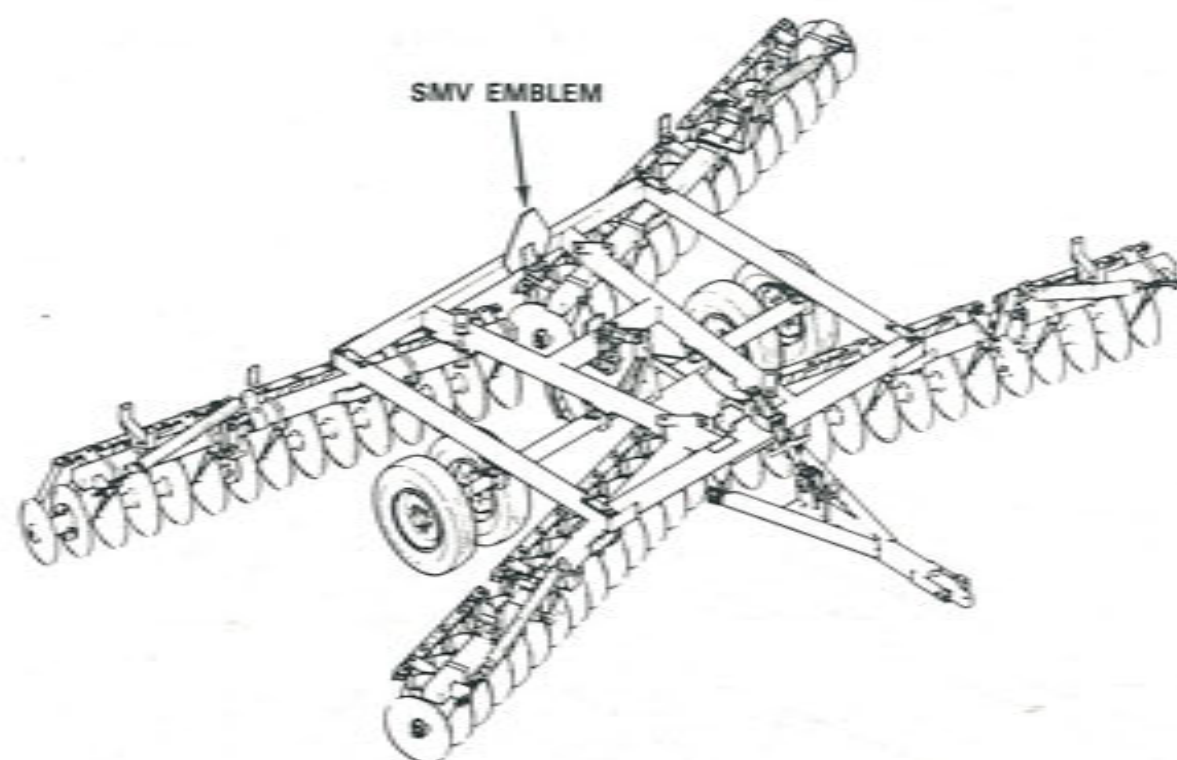


Figure 20



## SMV EMBLEM

The SMV (Slow Moving Vehicle) Emblem is a recommended attachment that should be added to your harrow. The SMV Emblem can be purchased from your Authorized AMCO Dealer. Check your state and local laws regarding the placement and use of the SMV Emblem.



**CAUTION** When trailing the disk over public roads, the SMV Emblem must be used, for protection of tractor and motor vehicle operators.

## WARNING LAMP

**CAUTION** When transporting farm implements on public roads after dusk, it is the responsibility of the operator to provide lighting and reflectors on the rear of the implement in accordance with your state law.

A warning lamp to be mounted on the extreme left hand rear of the disk harrow is available at your local AMCO Dealer.

## EXTRA EQUIPMENT

### WARNING REFLECTORS

Attach the reflector with both red and amber reflective surfaces as near as possible to the extreme left rear part of the harrow. Mount the reflector so the red reflective surface is visible from the rear and the amber surface visible from the front.

Attach the other reflector as near as possible to the extreme right rear part of the harrow with the red reflective surface visible from the rear.

**CAUTION** When transporting farm implements on public roads after dusk, it is the responsibility of the operator to provide lighting and reflectors on the rear of the implement in accordance with your state law.

**CAUTION** When transporting machinery over public roads, comply with your local and state laws regarding length, width and lighting.

**CAUTION** Be sure the area is clear of any personnel before safely driving tractor with disk attached.