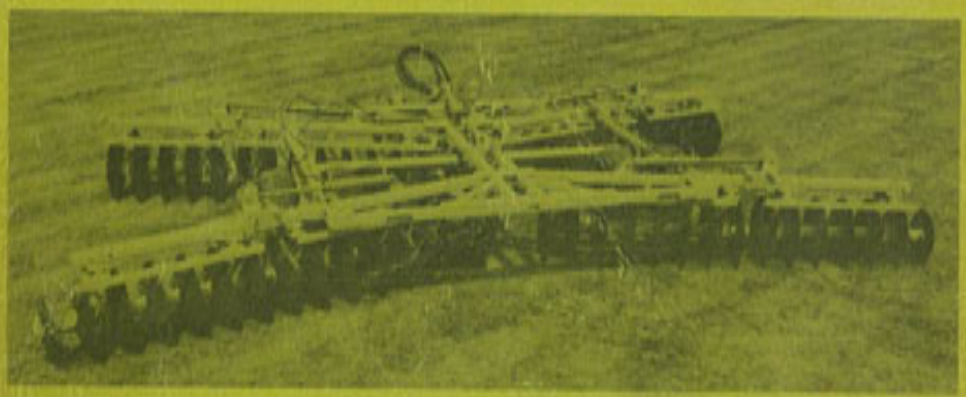
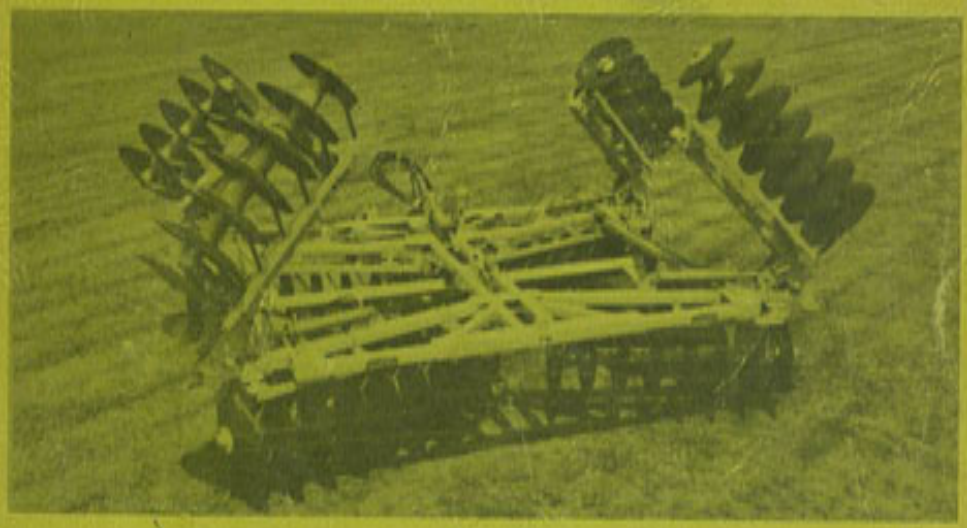
AMCO

PARTS CATALOG

OPERATION — MAINTENANCE — SET-UP INSTRUCTIONS

MODEL F12 TANDEM DISK HARROW





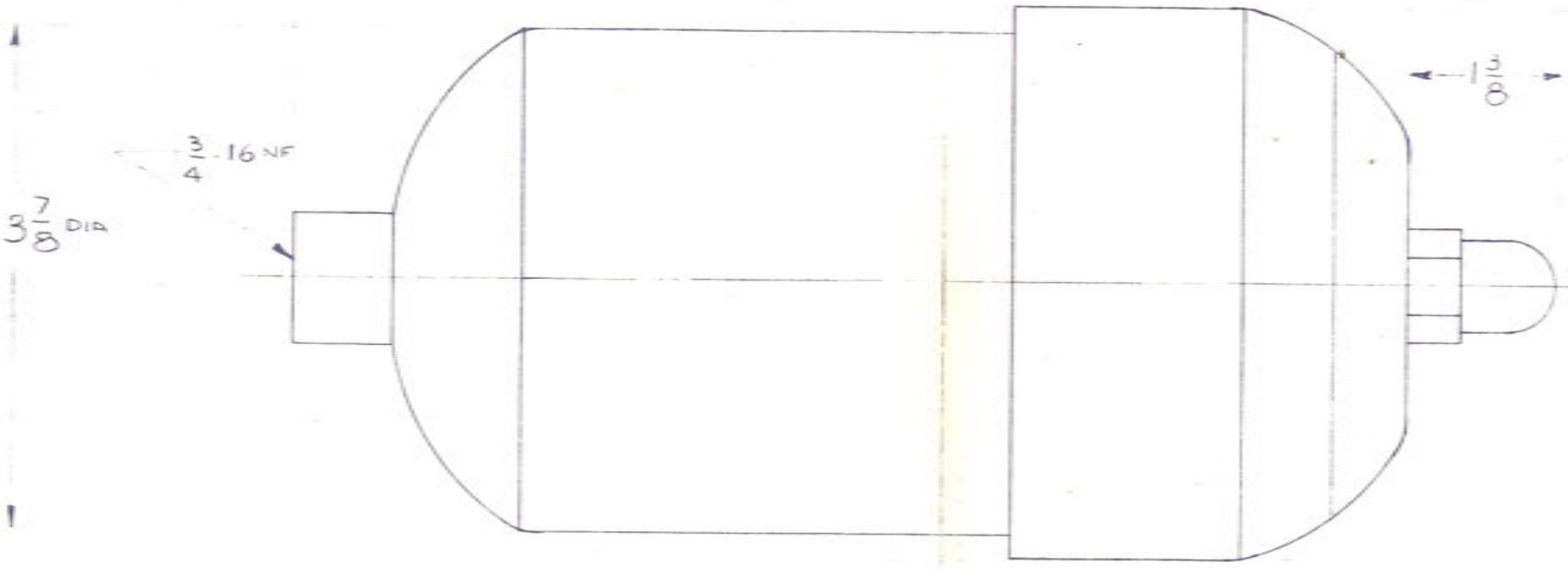
AMCO

PRODUCTS

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

10920

NOTES: THE ACCUMULATORS ARE PURCHASED WITH APPROXIMATELY 500 PSI PRE CHARGE. THEY MUST BE CHARGED TO 900 PSI PRIOR TO SHIPMENT. THE ATTACHED TAG SHOULD BE ALTERED TO SHOW CORRECT PRESSURE. THE VALVE COVER MUST BE TIGHTENED WITH A WRENCH TO SEAL VALVE. TORQUE ACORN NUT TO 40-60 FT. LBS.



DIM APPROX

GREER-OLAER PRODUCTS
DIVISION-GREER HYD INC.
LOS ANGELES, CALIF.

AG1547-200
NITROGEN PRECHARGED TO
900-1000 PSI

REV.		DWG. NO. 10920		MATERIAL	AMCO INTERNATIONAL YAZOO CITY, MISSISSIPPI, U.S.A.
REV.		DRAWN BY RW	SCALE FULL		PART NAME ACCUMULATOR 1G
REV.		DATE 1-12-73	APPV'D BY		

AMCO 12'6" – 23'0"

F-12 HYDRAULIC WING TANDEM

GENERAL SPECIFICATIONS

AXLES: 1-1/2" square high carbon, cold rolled steel

DISC: 22" x 3/16" Plain

BLADES: Diminishing with Two feathering blades on rear gangs

SCRAPERS: High carbon replaceable blades on heavy duty shanks, mounted with grade 5 bolts on 2 x 2 x 3/8 high carbon angle iron bars

TONGUE: 71 inches long. Includes tongue jack and reversible ductile iron clevis

HYDRAULIC CYLINDERS:
4 — 3" x 16" for wing,
1 — 4" x 8" with stroke control for center section

HYDRAULIC HOSE:
8 — 1/4" for wing cylinders (models with hydraulic wing fold)

BEARINGS: Protect-O-Shield, 1-1/2" square bore regreasable ball type, toggle mounted

WHEELS: 4 — 15 x 8 with heavy duty 6 bolt hubs

CLEVIS: Reversible ductile iron

WRENCH: 1 for gang bolt

DISK SPACING: 9 Inches

GANG ANGLE: Adjustable from 15° to 19° front and rear

CENTER TOOTH:
Spring steel with chisel point

WEIGHT: 110 - 129 lbs. per blade
295 - 351 lbs. per foot

TRANSPORT WIDTH:
Width of cut plus 18" on ridgid models, 14'6" on 18'6" and 20'0" models 16'0" on 20'0" and larger models.

Model	Cutting Width	No. of Blades	No. of Bearings	Approximate Weight Pounds	Recommended Drawbar Horsepower
F12-3422	12'6"	34	8	4393	70- 90
F12-3822	14'0"	38	12	4769	80-100
F12-4222	15'6"	42	12	4932	85-105
F12A-5022	18'6"	50	16	6085	95-115
F12-5422	20'0"	54	16	6295	100-120
F12-5422	20'0"	54	16	6360	100-120
F12-5822	21'6"	58	16	6570	115-140
F12-6222	23'0"	62	16	6790	130-160

With 22" Dia. x 3/16 Plain Blades

DISK BLADE OPTIONS
22" Dia. x 3/16 Cut Out
22" Dia. x 1/4 Plain
22" Dia. x 1/4 Cut Out
24" Dia. x 3/16 Plain
24" Dia. x 3/16 Cut Out
24" Dia. x 1/4 Plain
24" Dia. x 1/4 Cut Out

RECOMMENDED TIRE SIZE
4 — 9.5L x 15, 6 Ply or
4 — 11L x 15, 6 Ply

OPTIONAL EQUIPMENT
Shock Absorber Bearing Risers
Heavy Duty Scrapers and Scraper Bars
Wing gang drivers (set of 4) for wing type harrows (NOT for use with shock absorber gang risers)
15 x 10 wheels in lieu of standard 15 x 8

NOTE: Use of disk on tractors with higher than recommended Drawbar Horsepower will cause excessive maintenance cost and may void your warranty.

PRINTED IN U.S.A.

AMCO #11421
Issued June 1979

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.*

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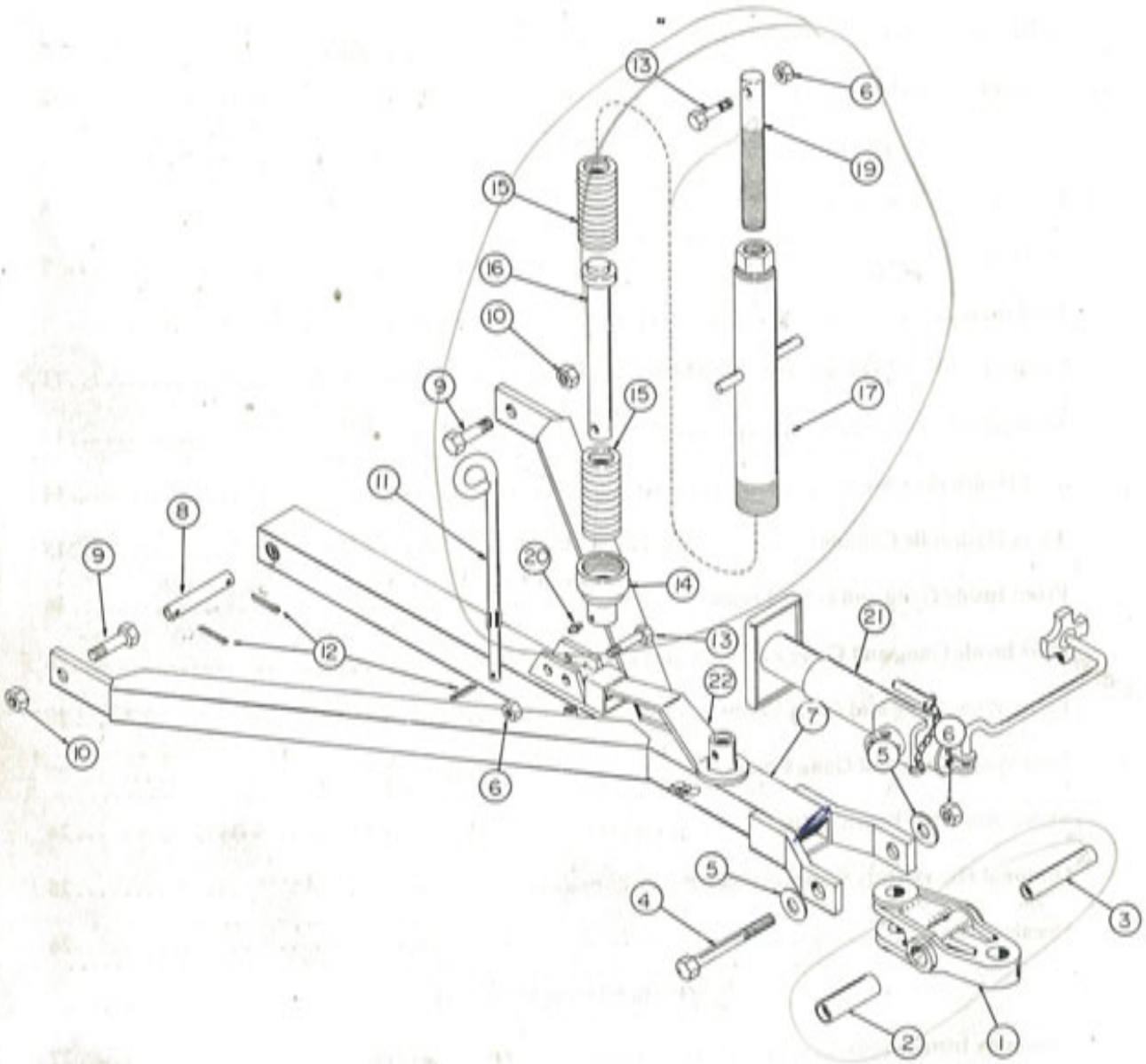
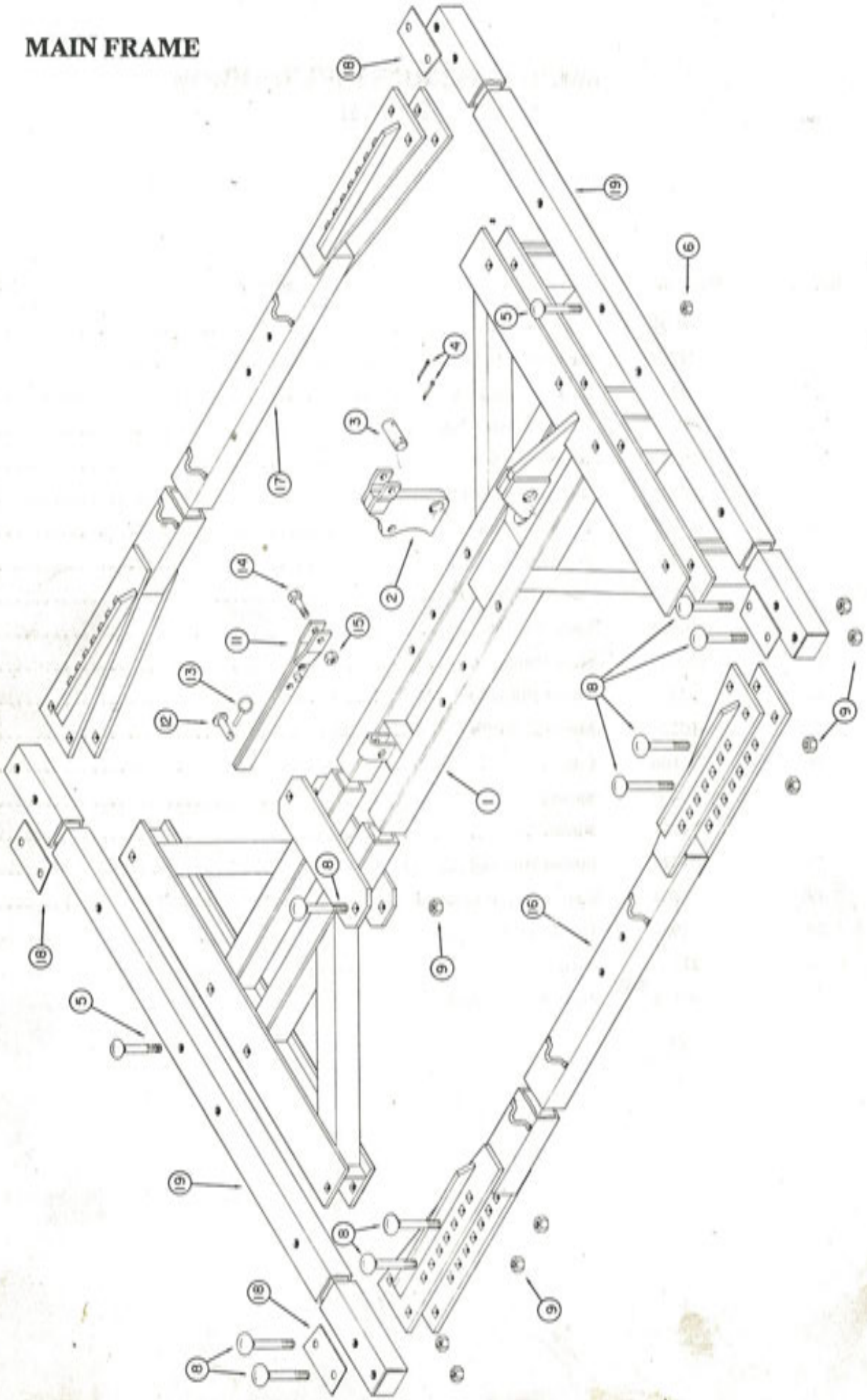
HITCH



AMCO F12 SERIES DISK HARROW
HITCH

Ref. No.	Part No.	Description	No. Req'd
1	16001	**Clevis** — Pull	1
2	9204	**Bushing** — Clevis	1
3	9205	**Bushing** — Clevis	1
4	10865	**Machine Bolt** 3/4 x 9 NC, PL	1
5	10866	**Washer** 3/4 PL	2
6	10300	**Nut** — Lock 3/4 NC, PL	3
7	0608A	**Tongue** — Pull	1
8	5396	**Pivot Pin**	1
9	10373	**Hex Bolt** 1 x 3-1/2 NC, PL	2
10	10868	**Lock Nut** 1 NC	2
11	100061	**Hose Holder**	1
12	10075	**Cotter Pin** 1/4 x 1-1/2	3
13	10320	**Machine Bolt** 3/4 x 3-1/2 NC, PL	2
14	1166	**Cap**	1
15	10460	**Spring**	2
16	1167	**Piston Rod**	1
17	1479	**Spring Housing**	1
19	5403	**Rod** — Stud Threaded	1
20	11081	**Grease Fitting**	1
21	11261	**Jack**	1
22	100134	**Gang Bolt Wrench**	1

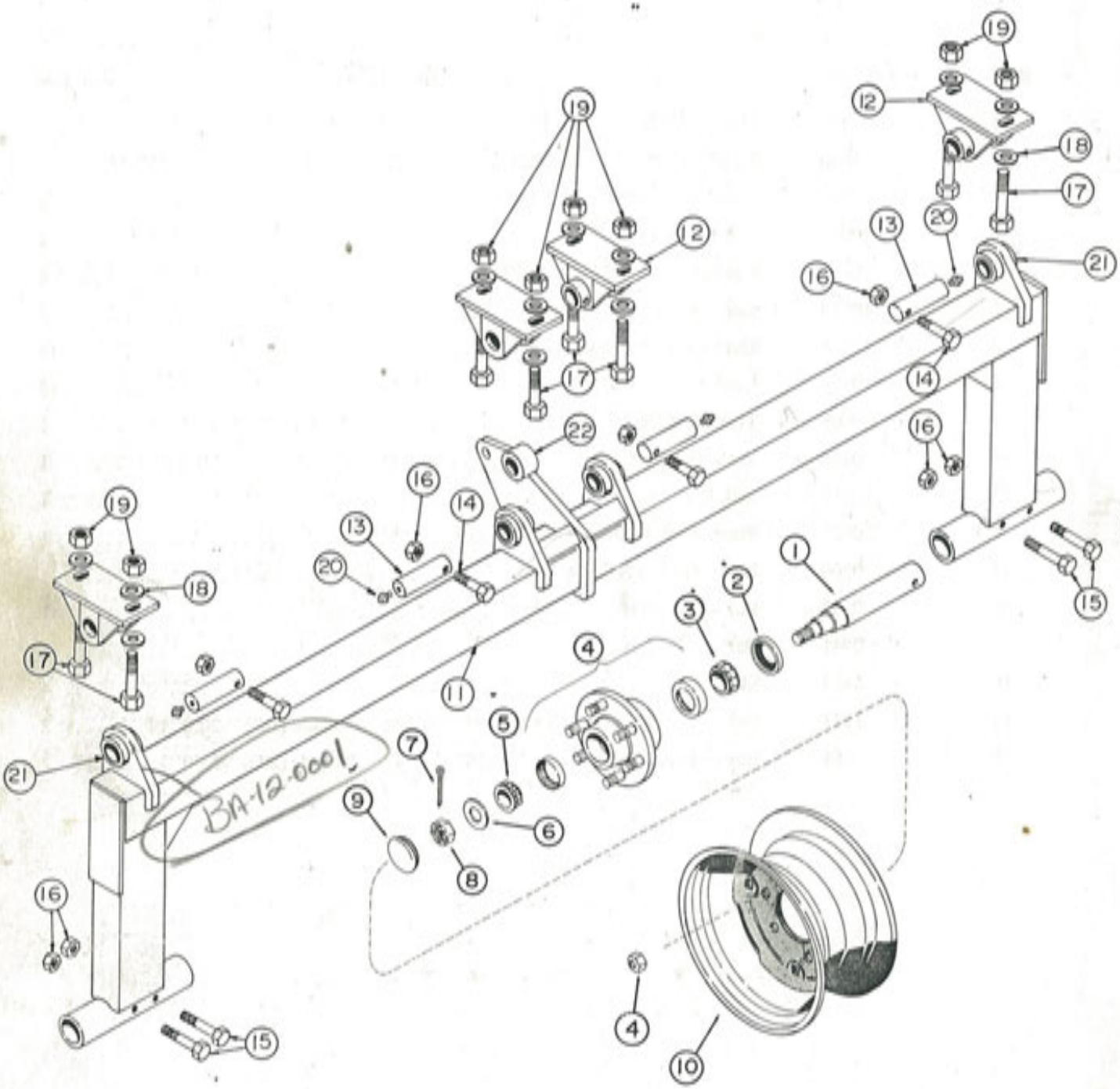
MAIN FRAME



AMCO F12 SERIES DISK HARROW
MAIN FRAME

Ref. No.	Part No.	Description	No. Req'd
1	0745	**Frame** — Main	1
2	1460	**Hydraulic Cylinder Bracket**	1
3	6388	**Pivot Pin** 1-1/2 Dia. x 3-1/2 Long	1
4	10087	**Cotter Pin** 1/4 x 2	2
5	10130	**Carriage Bolt** 5/8 x 5 NC, PL	8
6	10299	**Lock Nut** 5/8 NC, PL	8
8	10370	**Carriage Bolt** 7/8 x 5-1/2 NC, PL	18
9	10396	**Lock Nut** 7/8 NC, PL	18
11	1443A	**Transport Bar**	1
12	0388	**Transport Pin**	1
13	10317	**Klik Pin** 1/4	1
14	10727	**Machine Bolt** 3/4 x 3 NC, PL, GR5	1
15	10300	**Lock Nut** 3/4 NC, PL	1
16	0742	**Bar** — Side RH	1
17	0741	**Bar** — Side LH	1
18	5429	**Shim**	4
19	1171	**Bar** — Front or Rear - 3 x 4 x **104"** for 34 to 54 blade (12'6"-20'0")	2
19	1481	**Bar** — Front or Rear - 3 x 4 x **124"** for 54 to 62 blade (20'0"-23'0")	2

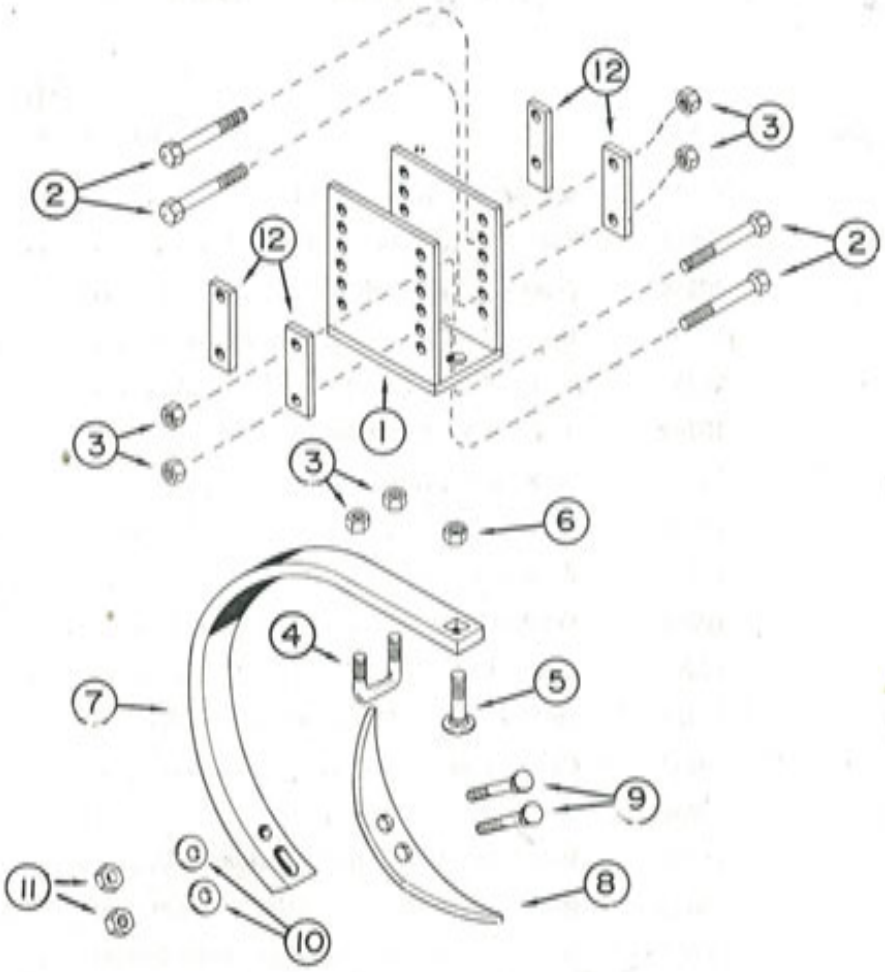
ROCKSHAFT



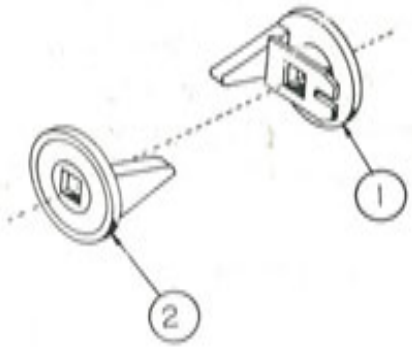
AMCO F12 SERIES DISK HARROW
ROCKSHAFT

Ref. No.	Part No.	Description	No. Req'd
1	10880	**Spindle** 50mm Dia. x 13 Long	4
2	10256	**Seal** (C/R#22870)	4
3	10258	**Cone** — Inner Timken 342A	4
4	11297	**Hub** — W/2 Cups & 6 Hub Bolts and Nuts	4
4	10257	**Cup** — Inner Timken 332	4
4	10261	**Cup** — Outer Timken 14276	4
4	11299	**Hub Bolt** 1/2 x 1-7/8 — NF	24
4	11046	**Hub Nut** 1/2 — NF	24
5	10262	**Cone** — Outer Timken 14137A	4
6	10263	**Washer** 7/8	4
7	10291	**Cotter Pin** 5/32 x 1-1/4	4
8	10264	**Slotted Nut** 7/8 NF	4
9	10242	**Cap** — Hub	4
10	10936	**Wheel** 15 x 8 — 6 Bolt	4
10	11236	**Wheel** 15 x 10 — 6 Bolt (Optional)	4
11	20076	**Rockshaft** W/Bushings (104" main frame)	1
11	20037	**Rockshaft** W/Bushings (124" main frame)	1
12	0754	**Base** — Rockshaft Bearing	4
13	9209	**Pin** — Retainer 1-1/2 Dia. x 5-1/4 Long	4
14	10765	**Machine Bolt** 3/8 x 2-1/2 NC, PL, GR5	4
15	10773	**Machine Bolt** 3/8 x 3-1/2 NC, PL, GR5	4
16	10509	**Lock Nut** 3/8 NC, PL	8
17	10671	**Hex Bolt** 3/4 x 5 NC, PL, GR5	8
18	10866	**Cut Washer** 3/4 PL	16
19	10300	**Lock Nut** 3/4 NC, PL	10
20	11081	**Grease Fitting** 5/16 Straight (Drive In)	4
21	9270	**Bushing Bronze** (Not Shown) 1-3/4 O.D. x 1-1/2 I.D. x 2 Long	4
22	11501	**Bushing** 1-1/2 O.D. x 1-1/4 I.D. x 1-1/2 Long	
	BC-05-0098	**Spindle and Hub Complete**	

CENTER TOOTH ATTACHMENT



WING LOCK



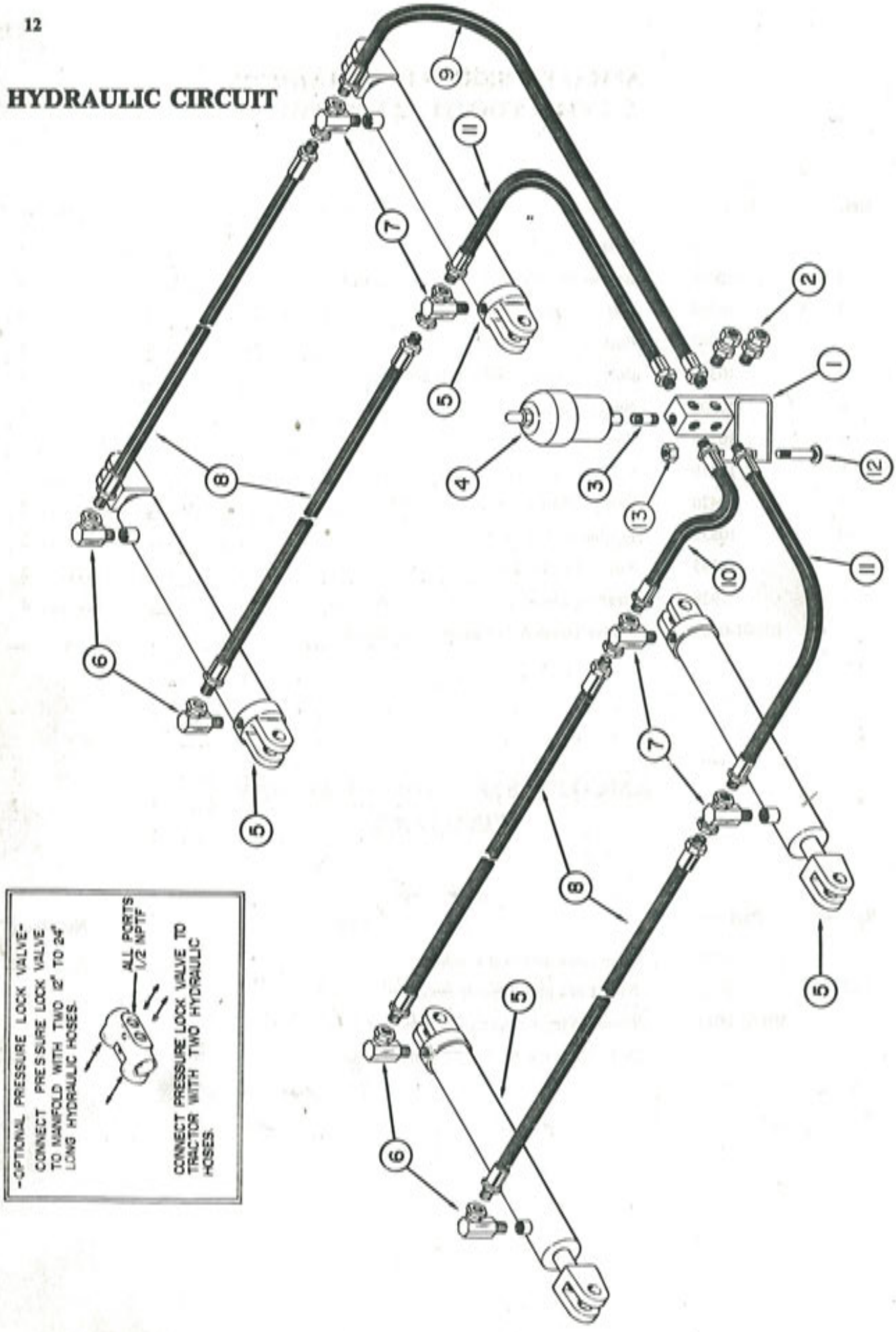
AMCO F12 SERIES DISK HARROW
CENTER TOOTH ATTACHMENT

Ref. No.	Part No.	Description	No. Req'd
1	0729	**Buster** — Balk	1
2	10666	**Bolt** — Machine 5/8 x 5 NC, PL, GR5	8
3	10299	**Nut** — Lock 5/8 NC, PL	10
4	100087	**Bolt** — "U" 5/8 Dia.	1
5	10389	**Bolt** — Carriage 3/4 x 2-1/2 NC, PL	1
6	10300	**Nut** — Lock 3/4 NC, PL	1
7	10378	**Tine**	1
8	10379	**Spike**	1
9	10420	**Bolt** — Plow 1/2 x 2-1/4 NC, PL	2
10	10832	**Washer** — 1/2 PL	2
11	10395	**Nut** — Lock 1/2 NC, PL	2
12	7928	**Strap** — Clamp 1/2 x 1-1/2 x 5-1/4 Long	4
	BB-01-0009	**Center Tooth Attachment** — Complete	

AMCO F12 SERIES DISK HARROW
WING LOCK

Ref. No.	Part No.	Description	No. Req'd
1	0796	**Wing Lock and End Washer**	4
2	0797	**Wing Lock and Bumper Washer**	4
	BB-01-0013	**Bundle Wing Locks** Complete Set of 4 (**NOT** for use with shock absorber bearing risers)	

HYDRAULIC CIRCUIT



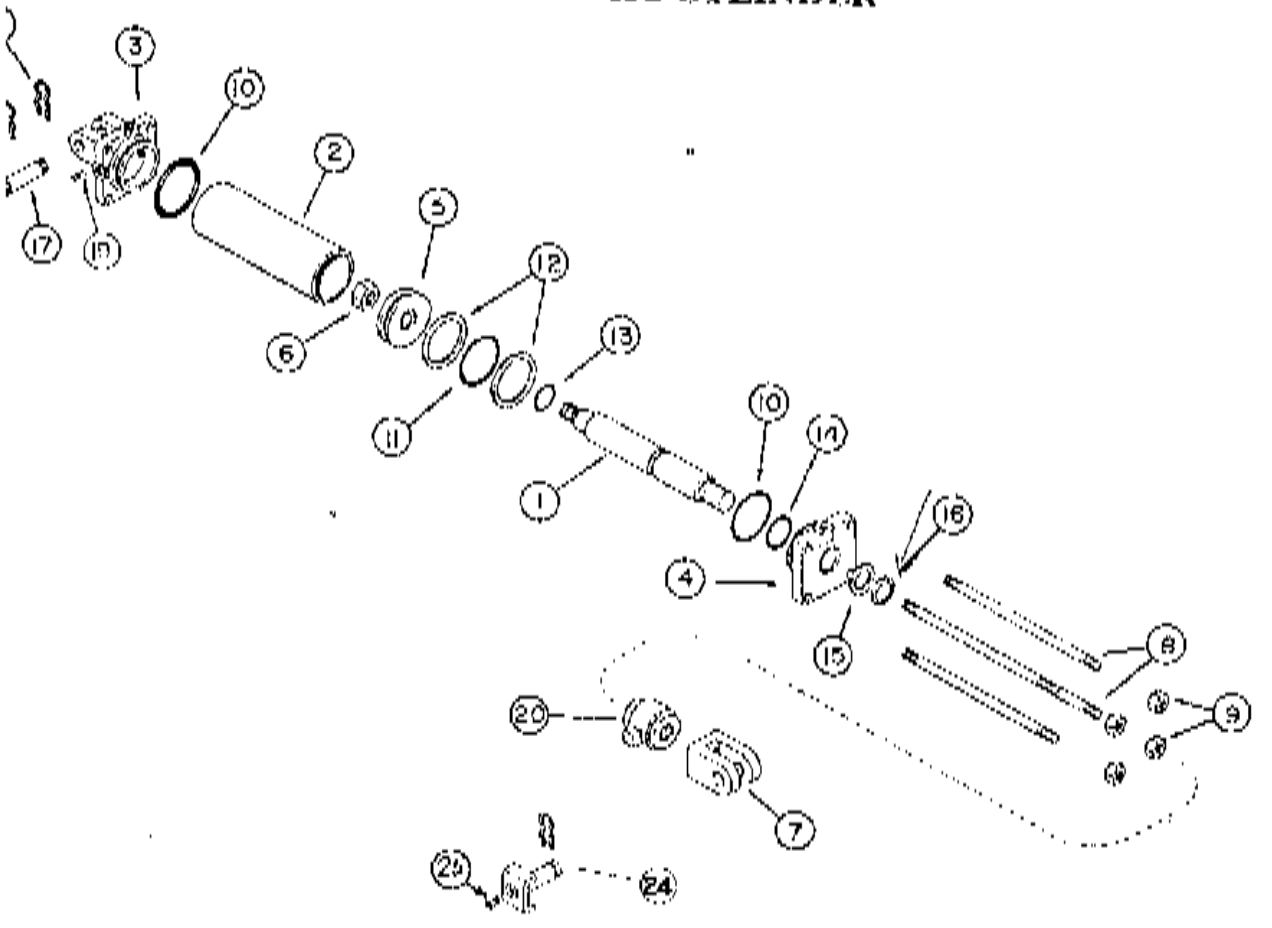
AMCO F12 SERIES DISK HARROW
HYDRAULIC CIRCUIT

Ref. No.	Part No.	Description	No. Req'd 104'' 50-54 Blade	No. Req'd 124'' 50-54-62 Blade
1	0764	**Assy. Manifold**	1	1
2	10932	**Restrictor**	2	2
3	11097	**Nipple** — Adapter	1	1
4	10920	**Accumulator**	1	1
5	11377	**Cylinder** 3 x 16	4	4
6	11127	**Elbow** — 90° Swivel 1/2 NPTF to 1/4 NPTF	4	4
7	11126	**Tee** — Male Branch 1/2	4	4
8	11123	**Hose** 1/4 x 96''	1	1
9	11168	**Hose** 1/4 x 66''	1	—
9	11121	**Hose** 1/4 x 72''	—	1
10	11174	**Hose** 1/4 x 30''	1	—
10	11119	**Hose** 1/4 x 36''	—	1
11	11166	**Hose** 1/4 x 48''	2	—
11	11120	**Hose** 1/4 x 54''	—	2
12	10647	**Carriage Bolt** 1/2 x 4 NC, PL	1	1
13	10395	**Lock Nut** 1/2 NC, PL	1	1
	11462	**Pipe Sealant** — 6cc Tube (with teflon)	1	1

AMCO F12 SERIES DISK HARROW
PRESSURE LOCK VALVE (OPTIONAL)

Ref. No.	Part No.	Description	No. Req'd
1	11109	**Pressure Lock Valve**	1

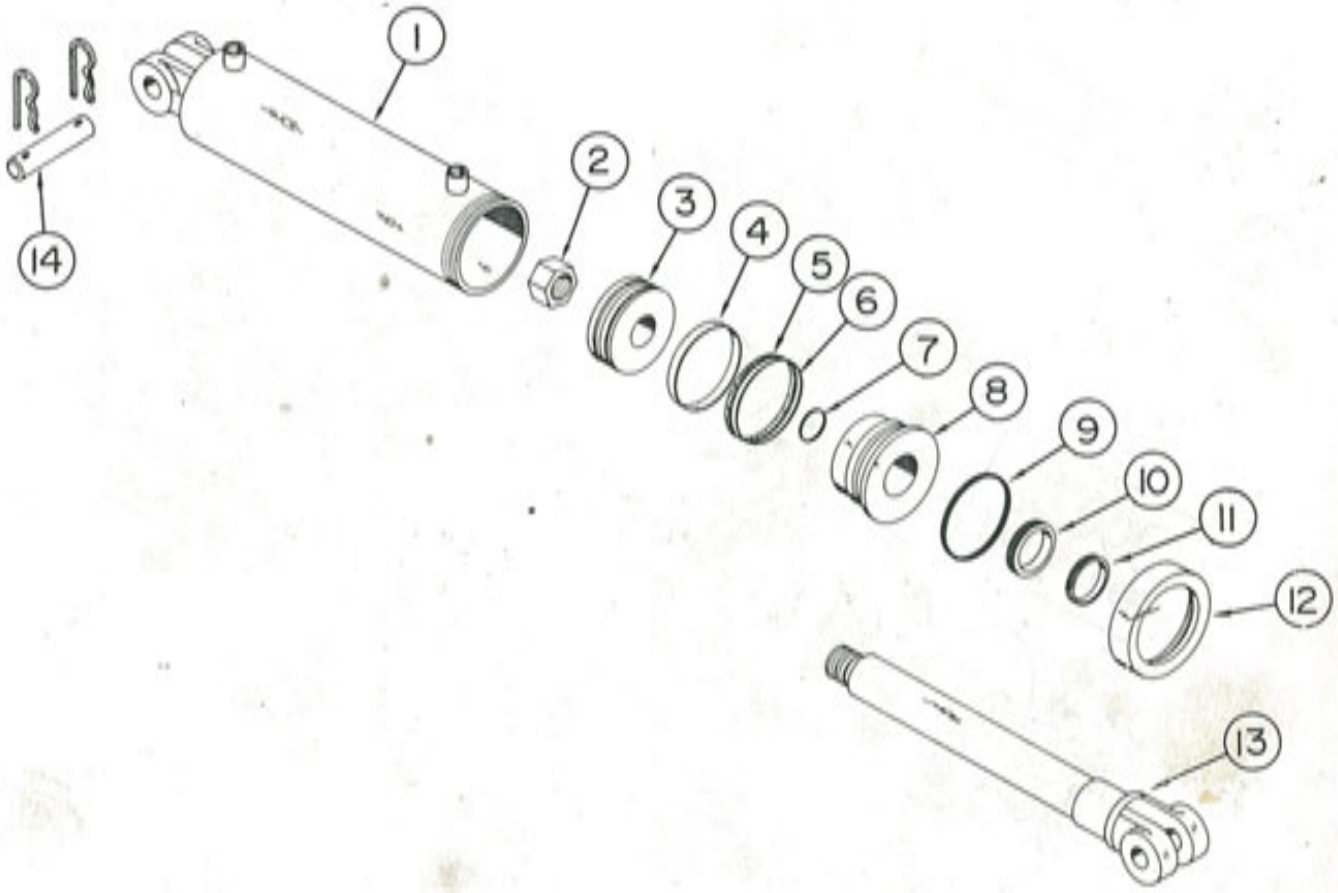
AMCO F12 SERIES DISK HARROW
4 x 8 HYDRAULIC CYLINDER



No.	Part No.	Description	No. Req'd
	10965	**Rod** - Piston	1
	10966	**Tube**	1
	10952	**Butt**	1
	10967	**Head** - Piston	1
	10968	**Piston**	1
	10980	**Nut** - Lock 1" - 14 NF	1
	11502	**Clevis** for 1-1/4 Dia. Pin	1
	10970	**Rod** — Tie	1
	10139	**Nut** — Hex 5/8 NC, PL	4
	10956	**Pin** — Clevis 1" x 4"	4
	11541	**Clip**	1
	10978	**Plug** - Pipe 1/2 NPT	3
	10937	**Control** — Stroke	1
	20053	**Pin** — 1-1/4 Dia. (with lube fitting)	1
	10606	**Fitting** - Grease	1
	10976	**Kit** - Seal Repair (prince #8600)	1
	10958	"O" Ring	1
	10959	"O" Ring	2
	10960	Washer	1
	10971	"O" Ring	2
	10972	"O" Ring	1
	10973	Washer	1
	10974	Wiper	1
BB	20-0004	**4 x 8 Cylinder Complete** (prince #S-971)	1

NOTE: Seal Repair Kit Parts Available in Repair Kits only
(Ref. No. 10-16)

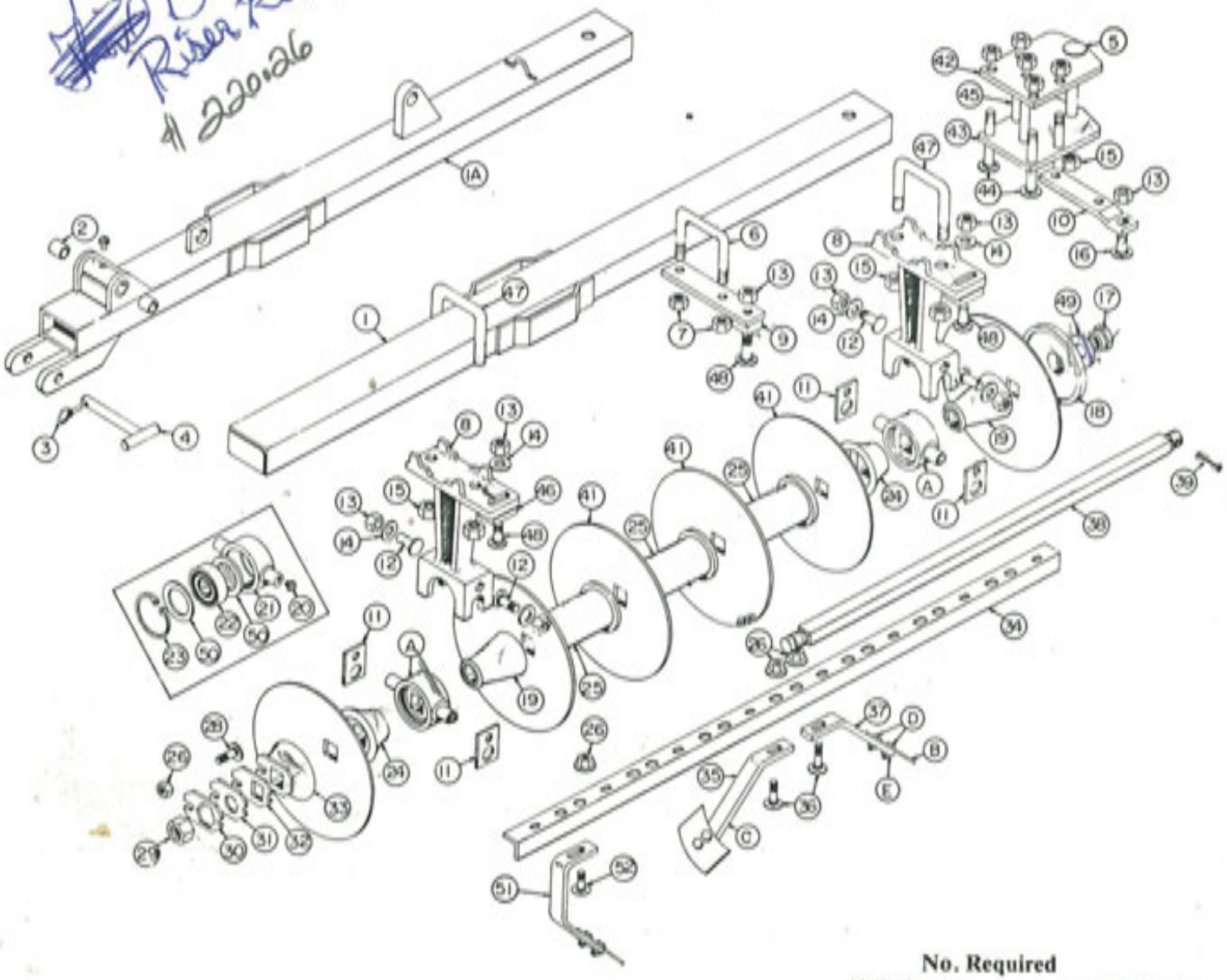
AMCO F12 SERIES DISK HARROW
3 x 16 HYDRAULIC CYLINDER (Lantex BL Series)



Ref. No.	Part No.	Description	No. Req'd
	11377	**Cylinder Complete** (Lantex #3752-BL)	1
1	11386	**Barrel Assy**	1
2	10980	**Lock Nut** — Self Locking 1" - 14NF	1
3	11384	**Piston**	1
4	*11390	**Wear Ring**	1
5	*11388	**Piston Seal**	1
6	*11389	**"O" Ring**	1
7	*11252	**Rod Static Seal**	1
8	11382	**Gland**	1
9	*11387	**Gland Static Seal**	1
10	*11250	**Rod Seal**	1
11	*11251	**Rod Wiper**	1
12	11383	**Collar**	1
13	11385	**Rod Assy**	1
14	11396	**Pin Assy.** w/2 Hair Pin Clips 1" Dia. x 4" Long	1
	11391	**Seal Repair Kit**	
		Note: Item 4, 5, 6, 7, 9, 10 and 11 sold in Seal Repair Kit Only	

FA-01-0019 Bag Set up Riser Kit. # 220.26

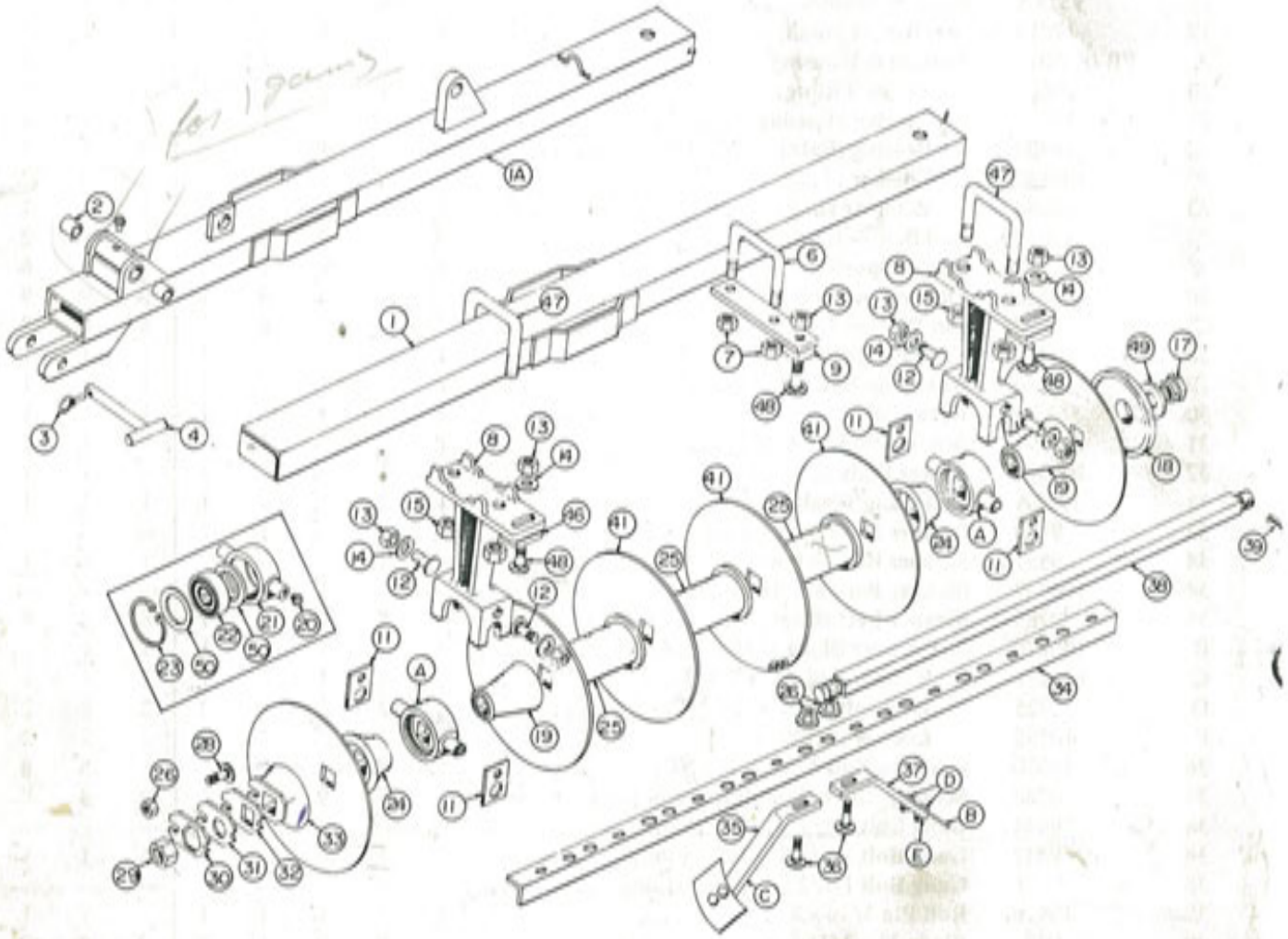
AMCO F12 SERIES DISK HARROW
FRONT INSIDE GANG



Ref. No.	Part No.	Description	No. Required 104" Frame 34	38	42	50	54	124" Frame 54	58	62
1	20082	Assy. Gang Frame — 63" long	1	—	—	—	—	—	—	—
1	20083	Assy. Gang Frame — 72" long	—	1	—	—	—	—	—	—
1	20084	Assy. Gang Frame — 81" long	—	—	1	—	—	—	—	—
1A	20088	Assy. Gang Frame — 68-1/8" long	—	—	—	1	1	—	—	—
1A	0562X	Assy. Gang Frame — 77-3/8" long	—	—	—	—	—	1	1	1
2	11501	Bushing 1-1/2 O.D. x 1-1/4 I.D. x 1-1/2 long	—	—	—	2	2	2	2	2
3	10317	Klik Pin	—	—	—	1	1	1	1	1
4	0618	Assy. Pivot Pin — 1" Dia. x 8-1/4" long	—	—	—	1	1	1	1	1
5	10370	Carriage Bolt 7/8 x 5-1/2 NC, PL	1	1	1	1	1	1	1	1
6	6513	"U" Bolt 3/4 Dia.	1	—	1	1	1	1	1	1
7	10300	Lock Nut 3/4 NC, PL	2	—	2	2	2	2	2	2
8	16012A	Bearing Riser	2	3	3	2	2	2	2	2
9	20062	Scraper Bar Support	1	—	1	1	1	1	1	1
10	100365	Scraper Bar Mount 5/8 x 2 x 11-1/16	1	1	1	1	1	1	1	1
11	9628	Clamp Trunion 3/8 x 2-1/2 x 3-3/4	4	6	6	4	4	4	4	4
12	10665	Carriage Bolt 5/8 x 2 NC, PL, GR5	4	6	6	4	4	4	4	4
13	10299	Lock Nut 5/8 NC, PL	13	15	16	13	13	13	13	13

Ref. No.	Part No.	Description	No. Required 104" Frame 34	38	42	50	54	124" Frame 54	58	62
14	10059	**Cut Washer** 5/8 PL	7	9	10	7	7	7	7	7
15	10396	**Lock Nut** 7/8 NC, PL	5	7	7	5	5	5	5	5
16	10135	**Carriage Bolt** 5/8 x 1-3/4 NC, PL, GR5	1	1	1	1	1	1	1	1
17	9577A	**Nut Gang Bolt**	1	1	1	1	1	1	1	1
18	9578A	**Bumper Washer**	1	1	1	1	1	1	1	1
19	17014	**End Bell** — Small	2	3	3	2	2	2	2	2
A	FB-09-0015	**Bearing & Housing**	2	3	3	2	2	2	2	2
20	10606	**Grease Fitting**	1	1	1	1	1	1	1	1
21	16003	**Bearing Housing**	1	1	1	1	1	1	1	1
22	11503	**Bearing** (Fafnir GW211PP-17)	1	1	1	1	1	1	1	1
50	100104	**Washer**	2	2	2	2	2	2	2	2
23	11064	**Retainer Ring**	1	1	1	1	1	1	1	1
24	17010	**End Bell** — Large	2	3	3	2	2	2	2	2
25	0522	**Spacer Spool**	5	5	6	5	5	6	6	6
26	11646	**Flange Lock Nut** 1/2 NC, PL	8	9	10	9	9	9	9	9
27	10832	**Cut Washer** 1/2 PL	7	8	9	8	8	8	8	8
28	10710	**Carriage Bolt** 1/2 x 2 NC, PL	1	1	1	1	1	1	1	1
29	10489	**Nut Gang Bolt** 1-1/2 — NF	1	1	1	1	1	1	1	1
30	5622A	**Lock Plate**	1	1	1	1	1	1	1	1
31	100098	**Bearing Plate**	1	1	1	1	1	1	1	1
32	100099	**Spacer Plate**	1	1	1	1	1	1	1	1
33	1222A	**End Gang Washer**	1	1	1	1	1	1	1	1
34	9550	**Scraper Bar** 70-1/16 long	1	—	—	1	1	—	—	—
34	9551	**Scraper Bar** 79-1/4 long	—	1	—	—	—	1	1	1
34	100367	**Scraper Bar** 88-7/16 long	—	—	1	—	—	—	—	—
35	0789	**Scraper Left Hand**	7	8	9	7	7	8	8	8
B	100270	**Scraper Blade** 3/16 x 4 x 6	1	1	1	1	1	1	1	1
C	100271	**Scraper Leg** 1/2 x 1-1/2	1	1	1	1	1	1	1	1
D	10785	**Hex Bolt** 1/2 x 1-1/2 NC, PL	2	2	2	2	2	2	2	2
E	10395	**Lock Nut** 1/2 NC, PL	2	2	2	2	2	2	2	2
36	10870	**Carriage Bolt** 1/2 x 1-1/2 NC, PL, GR5	7	8	9	7	7	8	8	8
37	0788	**Scraper Right Hand** (same components as 0789)	7	8	9	7	7	8	8	8
38	9444	**Gang Bolt** 1-1/2 Sq. 70-5/8 long	1	—	—	1	1	—	—	—
38	9445	**Gang Bolt** 1-1/2 Sq. 79-7/8 long	—	1	—	—	—	1	1	1
38	9446	**Gang Bolt** 1-1/2 Sq. 89-1/8 Long	—	—	1	—	—	—	—	—
39	10910	**Roll Pin** 5/16 x 2-1/4	1	1	1	1	1	1	1	1
40	9484	**Blade** 22 x 3/16 C.O.	7	8	9	8	8	9	9	9
40	2455	**Blade** 24 x 3/16 C.O.	7	8	9	8	8	9	9	9
40	3275	**Blade** 22 x 1/4 C.O.	7	8	9	8	8	9	9	9
40	3250	**Blade** 24 x 1/4 C.O.	7	8	9	8	8	9	9	9
40	9487	**Blade** 20 x 3/16 C.O.	1	1	1	1	1	—	—	—
41	9480	**Blade** 22 x 3/16 Plain	7	8	9	8	8	9	9	9
41	3253	**Blade** 24 x 3/16 Plain	7	8	9	8	8	9	9	9
41	3276	**Blade** 22 x 1/4 Plain	7	8	9	8	8	9	9	9
41	3255	**Blade** 24 x 1/4 Plain	7	8	9	8	8	9	9	9
41	9481	**Blade** 20 x 3/16 Plain	1	1	1	1	1	—	—	—
41	3278	**Blade** 10 x 11 Ga. Plain (Back-up)	1	1	1	—	—	—	—	—
42	5638	**Pivot Plate** (upper)	1	1	1	1	1	1	1	1
43	5636	**Pivot Plate** (lower)	1	1	1	1	1	1	1	1
44	10130	**Carriage Bolt** 5/8 x 5 NC, PL	3	3	3	3	3	3	3	3
45	10073	**Carriage Bolt** 5/8 x 6 NC, PL	2	2	2	2	2	2	2	2
46	100974	**Shim** 3/4 x 2 x 3	2	3	3	2	2	2	2	2
47	11280	**"U" Bolt** 7/8 Dia.	2	3	3	2	2	2	2	2
48	11115	**Carriage Bolt** 5/8 x 2-3/4 NC, PL, GR5	3	3	4	3	3	3	3	3
49	10872	**Cut Washer** 1-3/8 PL	1	1	1	1	1	1	1	1
51	0824	**Assy. Scraper** — Special RH	—	—	—	1	1	1	1	1
51	0825	**Assy. Scraper** — Special LH	—	—	—	1	1	1	1	1
52	10097	**Machine Bolt** 1/2 x 2-1/2 NC, PL, GR5	—	—	—	1	1	1	1	1

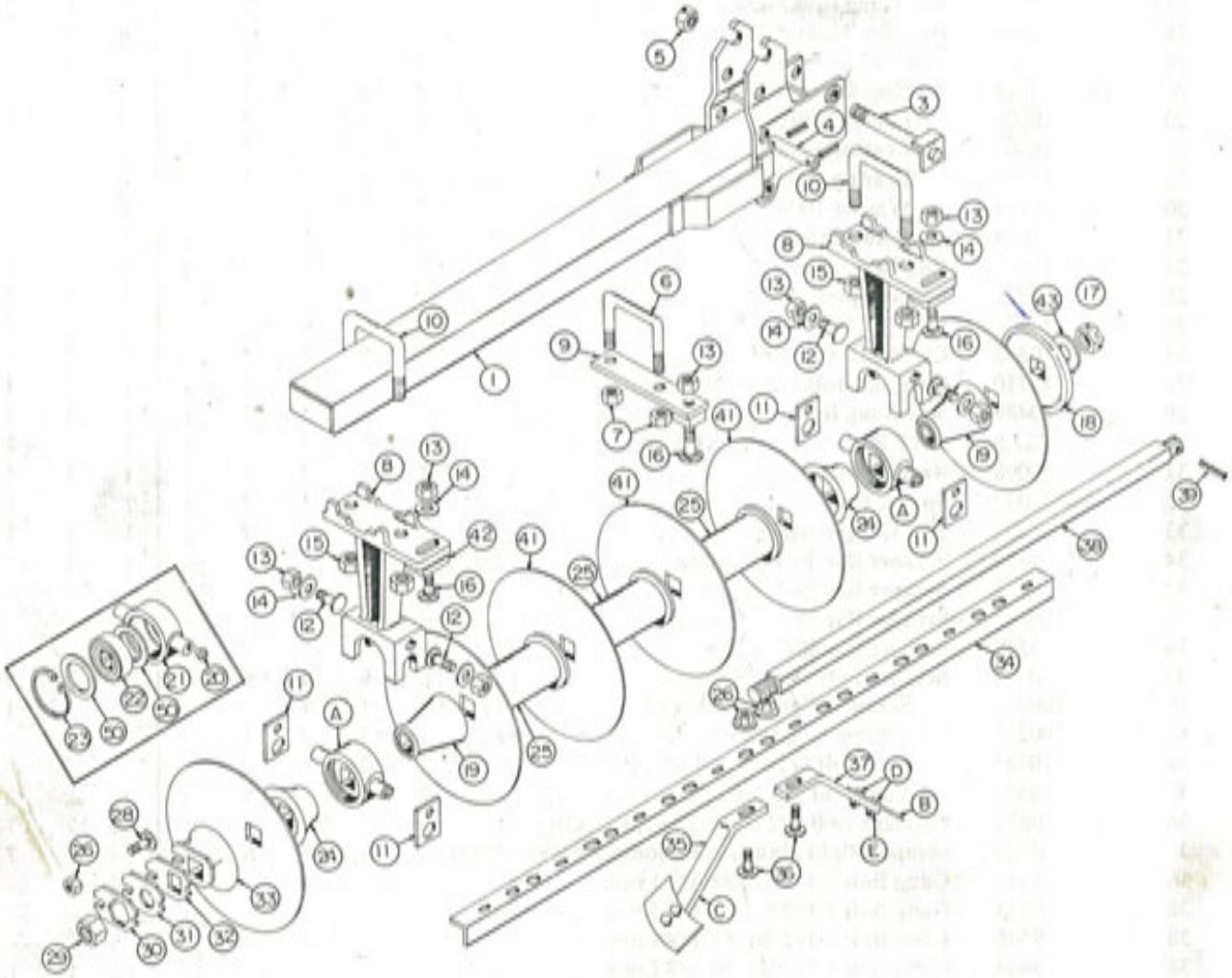
AMCO F12 SERIES DISK HARROW
REAR INSIDE GANG



Ref. No.	Part No.	Description	No. Required 104" Frame 34	38	42	50	54	124" Frame 54	58	62
1	20085	Assy. Gang Frame — 74" Long	1	—	—	—	—	—	—	—
1	20086	Assy. Gang Frame — 83" Long	—	1	—	—	—	—	—	—
1	20087	Assy. Gang Frame — 92" Long	—	—	1	—	—	—	—	—
1	20089	Assy. Gang Frame — 69-1/8" Long	—	—	—	1	1	—	—	—
1	0762	Assy. Gang Frame — 78-3/8" Long	—	—	—	—	—	1	1	
2	11501	Bushing 1-1/2 O.D. x 1-1/4 I.D. x 1-1/2 Long	—	—	—	2	2	2	2	
6	6513	"U" Bolt 3/4 Dia.	1	1	1	1	1	1	1	1
7	10300	Lock Nut 3/4 NC, PL	2	2	2	2	2	2	2	2
8	16012A	Bearing Riser	2	3	3	2	2	2	2	2
9	20062	Scraper Bar Support	1	1	1	1	1	1	1	1

Ref. No.	Part No.	Description	No. Required 104" Frame 34	38	42	50	54	124" Frame 54	58	62
11	9628	**Clamp Trunion** 3/8 x 2-1/2 x 3-3/4	4	6	6	4	4	4	4	4
12	10665	**Carriage Bolt** 5/8 x 2 NC, PL, GR5	4	6	6	4	4	4	4	4
13	10299	**Lock Nut** 5/8 NC, PL	7	9	10	7	7	7	7	7
14	10059	**Cut Washer** 5/8 PL	6	8	9	6	6	6	6	6
15	10396	**Lock Nut** 7/8 NC, PL	4	6	6	4	4	4	4	4
17	10226	**Nut Gang Bolt** 1-1/2 — NF Slotted	1	1	1	1	1	1	1	1
18	2404	**Bumper Washer**	1	1	1	1	1	1	1	1
19	17014	**End Bell** — Small	2	3	3	2	2	2	2	2
A	FB-09-0015	**Bearing & Housing**	2	3	3	2	2	2	2	2
20	10606	**Grease Fitting**	1	1	1	1	1	1	1	1
21	16003	**Bearing Housing**	1	1	1	1	1	1	1	1
22	11503	**Bearing** (Fafnir GW211PP-17)	1	1	1	1	1	1	1	1
50	100104	**Washer** 100mm	2	2	2	2	2	2	2	2
23	11064	**Retainer Ring**	1	1	1	1	1	1	1	1
24	17010	**End Bell** — Large	2	3	3	2	2	2	2	2
25	0522	**Spacer Spool**	6	6	7	4	4	5	5	5
26	11646	**Flange Lock Nut** 1/2 NC, PL	7	8	9	5	5	6	6	6
27	10832	**Cut Washer** 1/2 PL	8	9	10	6	6	7	7	7
28	10710	**Carriage Bolt** 1/2 x 2 NC, PL	1	1	1	1	1	1	1	1
29	10489	**Nut Gang Bolt** 1-1/2 — NF	1	1	1	1	1	1	1	1
30	5622A	**Lock Plate**	1	1	1	1	1	1	1	1
31	100098	**Bearing Plate**	1	1	1	1	1	1	1	1
32	100099	**Spacer Plate**	1	1	1	1	1	1	1	1
33	1222A	**End Gang Washer**	1	1	1	1	1	1	1	1
34	9550	**Scraper Bar** 70-1/16 Long	1	—	—	—	—	1	1	1
34	9551	**Scraper Bar** 79-1/4 Long	—	1	—	—	—	—	—	—
34	100367	**Scraper Bar** 88-7/16 Long	—	—	1	—	—	—	—	—
34	9549	**Scraper Bar** 60-7/8 Long	—	—	—	1	1	—	—	—
35	0789	**Scraper Left Hand**	8	9	10	6	6	7	7	7
B	100270	**Scraper Blade** 3/16 x 4 x 6	1	1	1	1	1	1	1	1
C	100271	**Scraper Leg** 1/2 x 1-1/2	1	1	1	1	1	1	1	1
D	10785	**Hex Bolt** 1/2 x 1-1/2 NC, PL	2	2	2	2	2	2	2	2
E	10395	**Lock Nut** 1/2 NC, PL	2	2	2	2	2	2	2	2
36	10870	**Carriage Bolt** 1/2 x 1-1/2 NC, PL, GR5	8	9	10	6	6	7	7	7
37	0788	**Scraper Right Hand** (same components as 0789)	8	9	10	6	6	7	7	7
38	9447	**Gang Bolt** 1-1/2 Sq. 98-3/8 Long	—	—	1	—	—	—	—	—
38	9445	**Gang Bolt** 1-1/2 Sq. 79-7/8 Long	1	—	—	—	—	—	—	—
38	9446	**Gang Bolt** 1-1/2 Sq. 89-1/8 Long	—	1	—	—	—	—	—	—
38	9444	**Gang Bolt** 1-1/2 Sq. 70-5/8 Long	—	—	—	—	—	1	1	1
38	9443	**Gang Bolt** 1-1/2 Sq. 61-3/8 Long	—	—	—	1	1	—	—	—
39	10910	**Roll Pin** 5/16 x 2-1/4	1	1	1	1	1	1	1	1
40	9484	**Blade** 22 x 3/16 C.O.	7	8	9	7	7	8	8	8
40	2455	**Blade** 24 x 3/16 C.O.	7	8	9	7	7	8	8	8
40	3275	**Blade** 22 x 1/4 C.O.	7	8	9	7	7	8	8	8
40	3250	**Blade** 24 x 1/4 C.O.	7	8	9	7	7	8	8	8
40	9487	**Blade** 20 x 3/16 C.O.	1	1	1	—	—	—	—	—
41	9480	**Blade** 22 x 3/16 Plain	7	8	9	7	7	8	8	8
41	3253	**Blade** 24 x 3/16 Plain	7	8	9	7	7	8	8	8
41	3276	**Blade** 22 x 1/4 Plain	7	8	9	7	7	8	8	8
41	3255	**Blade** 24 x 1/4 Plain	7	8	9	7	7	8	8	8
41	3055	**Blade** 16 x 9 Ga. Plain	1	1	1	—	—	—	—	—
41	9482	**Blade** 18 x 8 Ga. Plain	1	1	1	—	—	—	—	—
41	9481	**Blade** 20 x 3/16 Plain	1	1	1	—	—	—	—	—
46	100974	**Shim** 3/4 x 2 x 3	2	3	3	2	2	2	2	2
47	11280	**"U" Bolt** 7/8 Dia.	2	3	3	2	2	2	2	2
48	11115	**Carriage Bolt** 5/8 x 2-3/4 NC, PL, GR5	3	4	4	3	3	3	3	3
49	10872	**Cut Washer** 1-3/8 PL	1	1	1	1	1	1	1	1

AMCO F12 SERIES DISK HARROW
FRONT WING GANG



Ref. No.	Part No.	Description	No. Required 104'' Frame 50	104'' Frame 54	124'' Frame 54	124'' Frame 58	124'' Frame 62
1	0565A	Assy. Wing Gang Frame — 32-1/2'' Long	1	—	1	—	—
1	0564A	Assy. Wing Gang Frame — 40'' Long	—	1	—	1	—
1	0566A	Assy. Wing Gang Frame — 49'' Long	—	—	—	—	1
3	0727	Assy. Pivot Pin 1-1/4 Dia. x 8-3/8 Long	1	1	1	1	1
4	6554	Hitch Pin 1'' Dia. 5'' Long	1	1	1	1	1
5	10397	Lock Nut 1-1/4 NC, PL	1	1	1	1	1

Ref. No.	Part No.	Description	No. Required 104" Frame 50	54	124" Frame 54	58	62
6	6513	**"U" Bolt** 3/4 Dia.	—	—	—	—	1
7	10300	**Lock Nut** 3/4 NC, PL	—	—	—	—	2
8	16012A	**Bearing Riser**	2	2	2	2	2
9	20062	**Scraper Bar Support**	—	—	—	—	1
10	11280	**"U" Bolt** 7/8" Dia.	2	2	2	2	2
11	9628	**Clamp Trunion** 3/8 x 2-1/2 x 3-3/4	4	4	4	4	4
12	10665	**Carriage Bolt** 5/8 x 2 — NC, PL, GR5	4	4	4	4	4
13	10299	**Lock Nut** 5/8 NC, PL	4	4	4	4	4
14	10059	**Cut Washer** 5/8 PL	4	4	4	4	4
15	10396	**Lock Nut** 7/8 NC, PL	4	4	4	4	4
16	11115	**Carriage Bolt** 5/8 x 2-3/4 NC, PL, GR5	2	2	2	2	2
17	10226	**Nut Gang Bolt** 1-1/2 NF Slotted	1	1	1	1	1
18	2404	**Bumper Washer**	1	1	1	1	1
19	17014	**End Bell** — Small	2	2	2	2	2
A	FB-09-0015	**Bearing & Housing**	2	2	2	2	2
20	10606	**Grease Fitting**	1	1	1	1	1
21	16003	**Bearing Housing**	1	1	1	1	1
22	11503	**Bearing** (Fafnir GW11PP-17)	1	1	1	1	1
50	100104	**Washer** 100mm	2	2	2	2	2
23	11064	**Retainer Ring**	1	1	1	1	1
24	17010	**End Bell** — Large	2	2	2	2	2
25	0522	**Spacer Spool**	1	2	1	2	3
26	11646	**Flange Lock Nut** 1/2 NC, PL	4	4	4	4	4
27	10832	**Cut Washer** 1/2 PL	4	4	4	4	4
28	10710	**Carriage Bolt** 1/2 x 2 NC, PL	1	1	1	1	1
29	10489	**Nut Gang Bolt** — 1-1/2 NF	1	1	1	1	1
30	5622A	**Lock Plate**	1	1	1	1	1
31	100098	**Bearing Plate**	1	1	1	1	1
32	100099	**Spacer Plate**	1	1	1	1	1
33	1222A	**End Gang Washer**	1	1	1	1	1
34	9576	**Scraper Bar** — 33-5/16 Long	1	—	1	—	—
34	9475	**Scraper Bar** — 42-1/2 Long	—	1	—	1	—
34	9548	**Scraper Bar** — 51-11/16 Long	—	—	—	—	1
35	0789	**Scraper** L.H.	3	4	3	4	5
B	100270	**Scraper Blade** 3/16 x 4 x 6	1	1	1	1	1
C	100271	**Scraper Leg** 1/2 x 1-1/2	1	1	1	1	1
D	10785	**Hex Bolt** 1/2 x 1-1/2 NC, PL	2	2	2	2	2
E	10395	**Lock Nut** 1/2 NC, PL	2	2	2	2	2
36	10870	**Carriage Bolt** 1/2 x 1-1/2 NC, PL, GR5	3	4	3	4	5
37	0788	**Scraper** R.H. (same components as 0789)	3	4	3	4	5
38	9440	**Gang Bolt** — 1-1/2 Sq. 33-5/8 Long	1	—	1	—	—
38	9441	**Gang Bolt** — 1-1/2 Sq. 42-7/8 Long	—	1	—	1	—
38	9442	**Gang Bolt** — 1-1/2 Sq. 52-1/8 Long	—	—	—	—	1
39	10910	**Roll Pin** 5/16 x 2-1/4	3	3	3	3	3
40	9484	**Blade** 22 x 3/16 C.O.	4	5	4	5	6
40	2455	**Blade** 24 x 3/16 C.O.	4	5	4	5	6
40	3275	**Blade** 22 x 1/4 C.O.	4	5	4	5	6
40	3250	**Blade** 24 x 1/4 C.O.	4	5	4	5	6
40	9487	**Blade** 20 x 3/16 C.O.	4	5	4	5	6
41	9480	**Blade** 22 x 3/16 Plain	4	5	4	5	6
41	3253	**Blade** 24 x 3/16 Plain	4	5	4	5	6
41	3276	**Blade** 22 x 1/4 Plain	4	5	4	5	6
41	3255	**Blade** 24 x 1/4 Plain	4	5	4	5	6
41	9481	**Blade** 20 x 3/16 Plain	1	1	1	1	1
41	3278	**Blade** 10 x 11 Ga. Plain (Back-Up)	1	1	1	1	1
42	100974	**Shim** 3/4 x 2 x 3	2	2	2	2	2
43	10872	**Cut Washer** 1-3/8 PL	1	1	1	1	1

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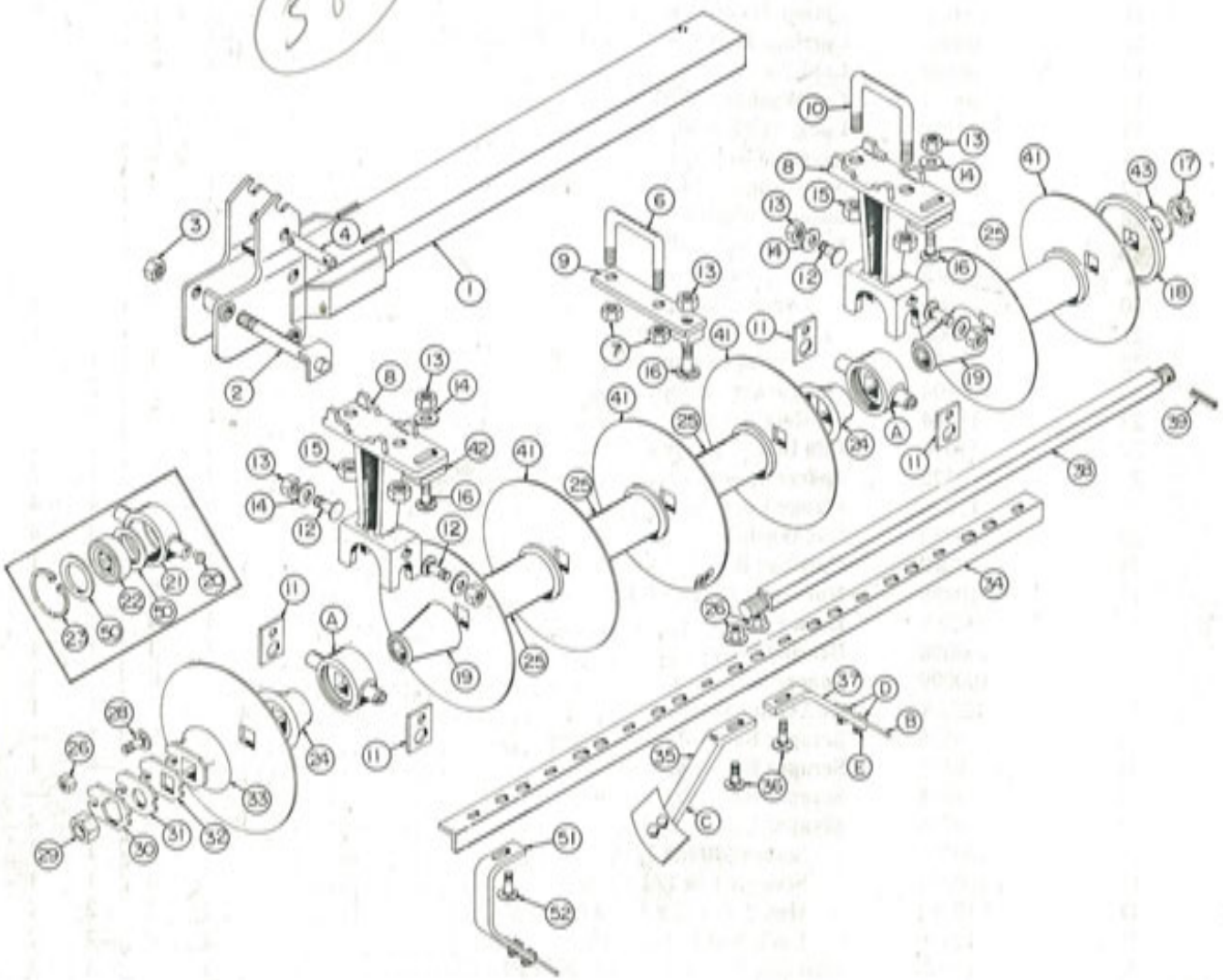
AMCO F12 SERIES DISK HARROW
REAR WING GANG

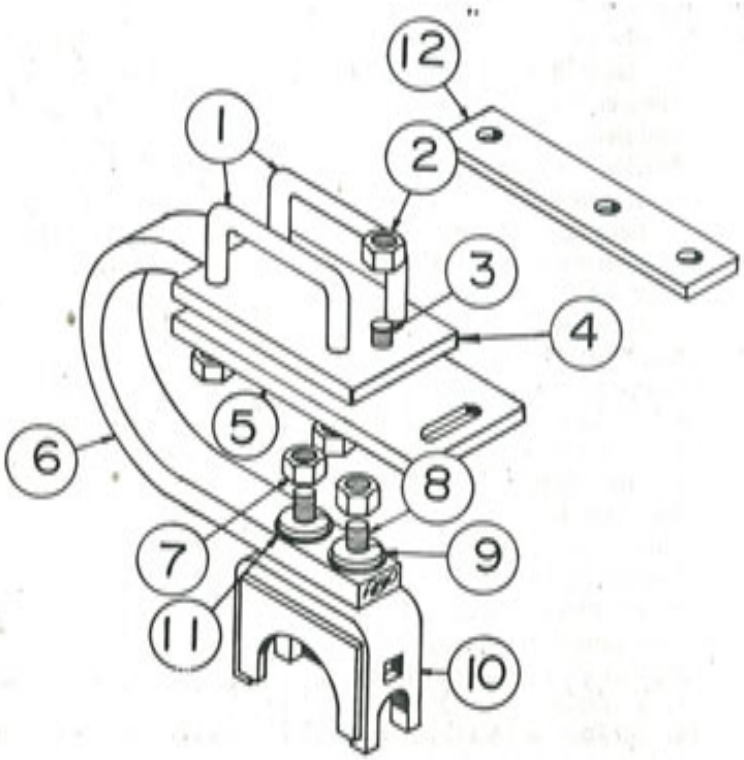
58-1/4



Ref. No.	Part No.	Description	No. Required 104'' Frame 50	104'' Frame 54	124'' Frame 54	124'' Frame 58	124'' Frame 62
1	0763	**Assy. Wing Gang Frame** — 58-1/4'' Long	—	—	—	—	1
1	0564A	**Assy. Wing Gang Frame** — 40'' Long	1	—	1	—	—
1	0566A	**Assy. Wing Gang Frame** — 49'' Long	—	1	—	1	—
3	0727	**Assy. Pivot Pin** 1-1/4 Dia. x 8-3/8 Long	1	1	1	1	1
4	6554	**Hitch Pin** 1'' Dia. 5'' Long	1	1	1	1	1
5	10397	**Lock Nut** 1-1/4 NC, PL	1	1	1	1	1
6	6513	**''U'' Bolt** 3/4 Dia.	—	—	—	—	1
7	10300	**Lock Nut** 3/4 NC, PL	—	—	—	—	2
8	16012A	**Bearing Riser**	2	2	2	2	2
9	20062	**Scraper Bar Support**	—	—	—	—	1

Ref. No.	Part No.	Description	No. Required 104" Frame 50	104" Frame 54	124" Frame 54	124" Frame 58	124" Frame 62
10	11280	**"U" Bolt** 7/8" Dia.	2	2	2	2	2
11	9628	**Clamp Trunion** 3/8 x 2-1/2 x 3-3/4	4	4	4	4	4
12	10665	**Carriage Bolt** 5/8 x 2 — NC, PL, GR5	4	4	4	4	4
13	10299	**Lock Nut** 5/8 NC, PL	6	6	6	6	6
14	10059	**Cut Washer** 5/8 PL.	6	6	6	6	6
15	10396	**Lock Nut** 7/8 NC, PL	4	4	4	4	4
16	11115	**Carriage Bolt** 5/8 x 2-3/4 NC, PL, GR5	2	2	2	2	2
17	10226	**Nut Gang Bolt** 1-1/2 NF Slotted	1	1	1	1	1
18	2404	**Bumper Washer**	1	1	1	1	1
19	17014	**End Bell** — Small	2	2	2	2	2
A	FB-09-0015	**Bearing & Housing**	2	2	2	2	2
20	10606	**Grease Fitting**	1	1	1	1	1
21	16003	**Bearing Housing**	1	1	1	1	1
22	11503	**Bearing** (fafnir GW11PP-17)	1	1	1	1	1
50	100104	**Washer** 100mm	2	2	2	2	2
23	11064	**Retainer Ring**	2	2	2	2	2
24	17010	**End Bell** — Large	2	2	2	2	2
25	0522	**Spacer Spool**	3	4	3	4	5
26	11646	**Flange Lock Nut** 1/2 NC, PL	6	7	6	7	8
27	[illegible]	**Cut Washer** 1/2 PL.	6	7	6	7	8
28	10710	**Carriage Bolt** 1/2 x 2 NC, PL	1	1	1	1	1
29	10489	**Nut Gang Bolt**	1	1	1	1	1
30	5622A	**Lock Plate**	1	1	1	1	1
31	100098	**Bearing Plate**	1	1	1	1	1
32	100099	**Spacer Plate**	1	1	1	1	1
33	1222A	**End Gang Washer**	1	1	1	1	1
34	9549	**Scraper Bar** — 60-7/8" Long	—	—	—	—	1
34	9475	**Scraper Bar** — 42-1/2" Long	1	—	1	—	—
34	9548	**Scraper Bar** — 51-11/16" Long	—	1	—	1	—
35	0789	**Scraper** L.H.	5	6	5	6	7
B	100270	**Scraper Blade** 3/16 x 4 x 6	1	1	1	1	1
C	100271	**Scraper Leg** 1/2 x 1-1/2	1	1	1	1	1
D	10785	**Hex Bolt** 1/2 x 1-1/2 NC, PL	2	2	2	2	2
E	10395	**Lock Nut** 1/2 NC, PL	2	2	2	2	2
36	10870	**Carriage Bolt** 1/2 x 1-1/2 NC, PL, GR5	4	5	4	5	6
37	0788	**Scraper** R.H. (same components as 0789)	5	6	5	6	7
38	9444	**Gang Bolt** — 1-1/2 Sq. 70-5/8" Long	—	—	—	—	1
38	9442	**Gang Bolt** — 1-1/2 Sq. 52-1/8" Long	1	—	1	—	—
38	9443	**Gang Bolt** — 1-1/2" Sq. 61-3/8" Long	—	1	—	1	—
39	10910	**Roll Pin** 5/16 x 2-1/4	3	3	3	3	3
40	9484	**Blade** 22 x 3/16 C.O.	4	5	4	5	6
40	2455	**Blade** 24 x 3/16 C.O.	4	5	4	5	6
40	3275	**Blade** 22 x 1/4 C.O.	4	5	4	5	6
40	3250	**Blade** 24 x 1/4 C.O.	4	5	4	5	6
40	9487	**Blade** 20 x 3/16 C.O.	1	1	1	1	1
41	9480	**Blade** 22 x 3/16 Plain	4	5	4	5	6
41	3253	**Blade** 24 x 3/16 Plain	4	5	4	5	6
41	3276	**Blade** 22 x 1/4 Plain	4	5	4	5	6
41	3255	**Blade** 24 x 1/4 Plain	4	5	4	5	6
41	9481	**Blade** 20 x 3/16 Plain	1	1	1	1	1
41	3055	**Blade** 16 x 9 Ga. Plain	1	1	1	1	1
41	9482	**Blade** 18 x 8 Ga. Plain	1	1	1	1	1
42	100974	**Shim** 3/4 x 2 x 3	2	2	2	2	2
43	10872	**Cut Washer** 1-3/8 PL	1	1	1	1	1
51	0825	**Assy. Scraper** — Special R.H.	1	1	1	1	1
51	0824	**Assy. Scraper** — Special L.H.	1	1	1	1	1
52	10097	**Machine Bolt** 1/2 x 2-1/2 NC, PL, GR5	1	1	1	1	1

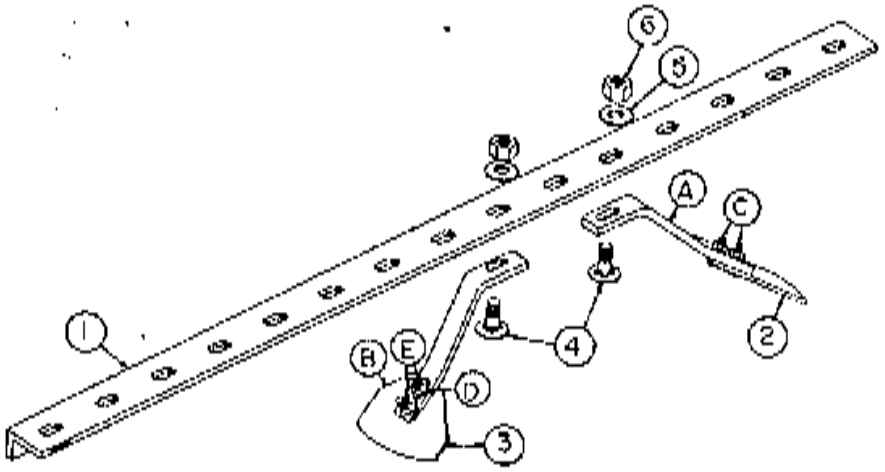
AMCO F12 SERIES DISK HARROW
SHOCK ABSORBER BEARING RISER



Ref. No.	Part No.	Description	No. Req'd
1	11467	**"U" Bolt** 3/4 Dia. — 18-1/4" Long	2
2	10300	**Lock Nut** 3/4 NC, PL	5
3	10320	**Machine Bolt** 3/4 x 3-1/2 NC, PL, GR5	1
5	100801	**Plate** 1-1/2 x 5 — 12" Long	1
4	100802	**Plate** 1/2 x 5 — 8-3/4" Long	1
6	11521	**Shock Absorber Shank** (pp)	1
7	10585	**Hex Nut** 3/4 NF, CH	2
8	10579	**Carriage Bolt** 3/4 x 3 NF, GR5	2
9	10061	**Lock Washer** 3/4	2
10	0944	**Assy. Trunnion Mount**	1
11	10866	**Cut Washer** 3/4 PLT	2
12	20061	**Scraper Bar Support**	1

NOTE: Parts 1 - 11 are required to replace Bearing Riser 16012 on a Shock Absorber Harrow. Part 12 used to replace 20062 on a Shock Absorber Harrow.

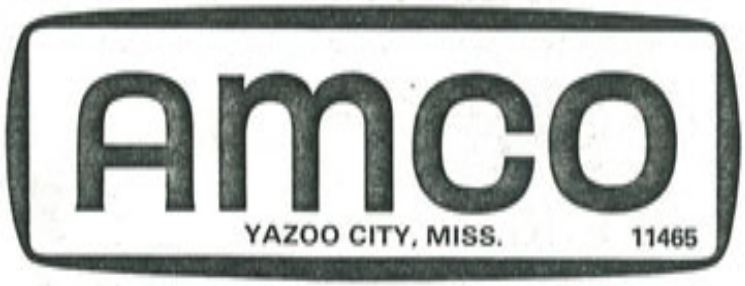
AMCO F12 SERIES DISK HARROW
OPTIONAL HEAVY DUTY SCRAPERS



Ref. No.	Part No.	Description	No. Required Blades 34	38	42	50	54	124" Frame 54	58	62
1	101071	Scraper Bar 3 x 2 x 1/2 ∠ - 36-5/8" Long	—	—	—	—	2	—	2	—
1	101090	Scraper Bar 3 x 2 x 1/2 ∠ - 27-3/8" Long	—	—	—	2	—	2	—	—
1	101073	Scraper Bar 3 x 2 x 1/2 ∠ - 45-7/8" Long	—	—	—	—	—	—	—	2
1	101074	Scraper Bar 3 x 2 x 1/2 ∠ - 50-1/2" Long	—	—	—	2	—	2	—	—
1	101075	Scraper Bar 3 x 2 x 1/2 ∠ - 55-1/8" Long	—	—	—	2	2	—	—	—
1	101076	Scraper Bar 3 x 2 x 1/2 ∠ - 59-3/4" Long	2	—	—	—	2	—	2	—
1	101077	Scraper Bar 3 x 2 x 1/2 ∠ - 64-3/8" Long	—	—	—	—	—	2	2	2
1	101078	Scraper Bar 3 x 2 x 1/2 ∠ - 69" Long	2	2	—	2	2	—	—	2
1	101080	Scraper Bar 3 x 2 x 1/2 ∠ - 78-1/4" Long	—	2	2	—	—	2	2	2
1	101082	Scraper Bar 3 x 2 x 1/2 ∠ - 87-1/2" Long	—	—	2	—	—	—	—	—
2	20068	Scraper — R.H.	15	17	19	23	25	25	27	29
A	101049	Scraper Shank .360 x 2	1	1	1	1	1	1	1	1
B	101019	Scraper Blade 3/16 x 6-1/2	1	1	1	1	1	1	1	1
C	10785	Hex Head Screw 1/2 x 1-1/2 NC, PL	2	2	2	2	2	2	2	2
D	10395	Cut Washer 1/2 PL	2	2	2	2	2	2	2	2
E	10295	Lock Nut 1/2 NC, PL	2	2	2	2	2	2	2	2
3	20069	Scraper - LH	15	17	19	23	25	25	27	29
4	10135	Carriage Bolt 5/8 x 1 3/4 NC, PL, GR5	30	34	38	46	50	50	54	58
5	10059	Cut Washer 5/8 PL	30	34	38	46	50	50	54	58
6	10299	Lock Nut 5/8 NC, PL	30	34	38	46	50	50	54	58

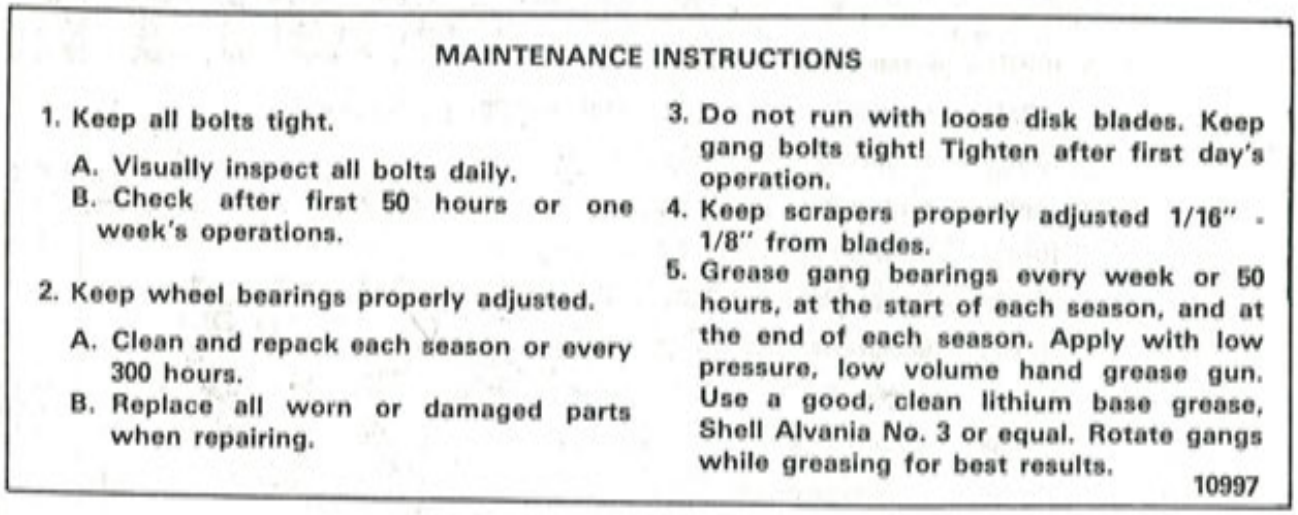
DECALS

(1)



(2)

(3)



AMCO F12 SERIES DISK HARROW
DECALS

Ref. No.	Part No.	Description	No. Req'd
1	11465	Decal — AMCO	2
2	11233	Decal — Warning	1
3	10997	Decal — Maintenance	1

assembly instructions

AMCO F12 SERIES

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

A. Main Frame and Side Bars
B. Pull Tongue
C. Rockshaft
D. Cross Bars
E. 4 — 15 x 8 — 6 Bolt Wheels
F. 4 — 3 x 16 Hydraulic Cylinders
G. 1 — 4 x 8 Hydraulic Cylinder
H. Accumulator
I. Box of Hydraulic Components
J. Center Tooth Attachment
K. Front Gang R.H.
L. Front Gang — L.H.
M. Rear Gang — R.H.
N. Rear Gang — L.H.

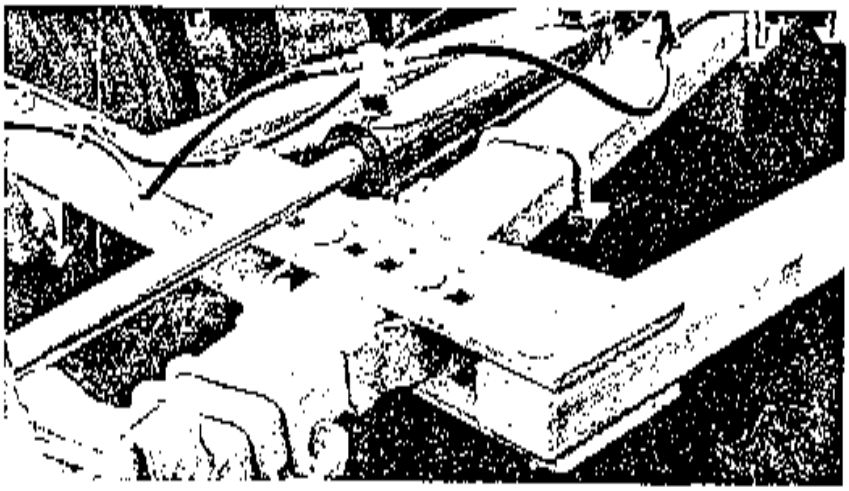
1. Place all bundles where they will be convenient. Arrange loose parts so they may be readily seen when needed. To insure good alignment of the units and parts, always insert all bolts leaving the nuts loose. Tighten the nuts evenly to prevent misalignment, distortion, or binding. Be sure all bolts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

2. 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.

3. Attach four gang frames to main frame. Use four 7/8 x 5-1/2 carriage bolts.

4. Shift front gang frames to front and rear gang frames to rear. Install both side bars and shift the gang frames into position. Secure with eight 7/8 x 5-1/2 carriage bolts. Tighten bolts snugly but not tight.



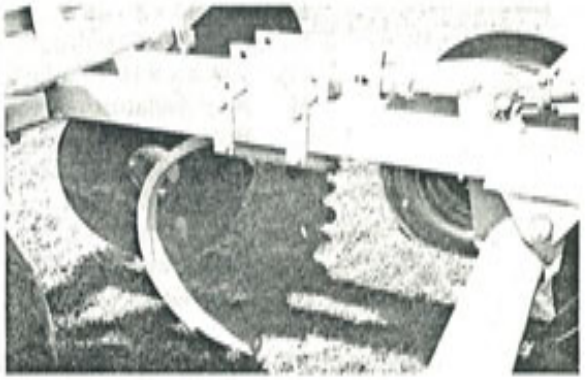
5. Install front and rear cross bars. Insert eight 5/8 x 5 carriage bolts to attach cross bars to main frame. Attach cross bars to side rails with eight 7/8 x 5-1/2 carriage bolts. Use pry bars and drift pins to square and aline frame. Tighten bolts snug but not tight.

6. Move rockshaft into position under center of main frame. Bolt to main frame — snugly — but not tight! Use eight 3/4 x 5 bolts and 16 cut washers. The eight 3/4 x 5 bolts must be installed with the nuts on top of the main frame. A cut washer should be used under the head and under the nut on each bolt.

7. Mount four 9.5L x 15 or 11L x 15 high flotation tires and tubes on the four 15 x 8 wheels. Consult the manufacturer for proper tire inflation pressure.

8. Remove hub bolts. Bolt wheels to hub, tighten bolts evenly to assure proper alignment of wheels.

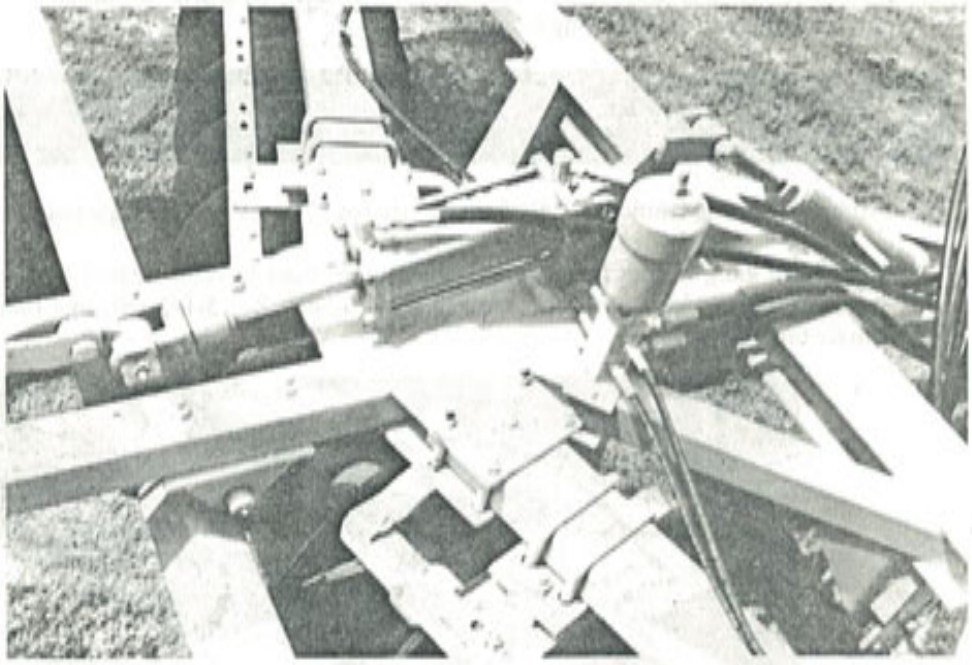
9. Attach center tooth to main frame approximately 10 inches behind rockshaft. Bottom tip of spike should be even with bottom of disk blades.



10. Attach four 3 x 16 hydraulic cylinders to mounting holes on gang frames. Cylinder rods should be attached to the wings.

11. Attach hydraulic manifold to main frame. Remove plugs from holes.

12. Route hydraulic hoses through hose supports and connect all fittings and hoses. Use pipe sealant to coat all fittings and prevent hydraulic fluid leaks.

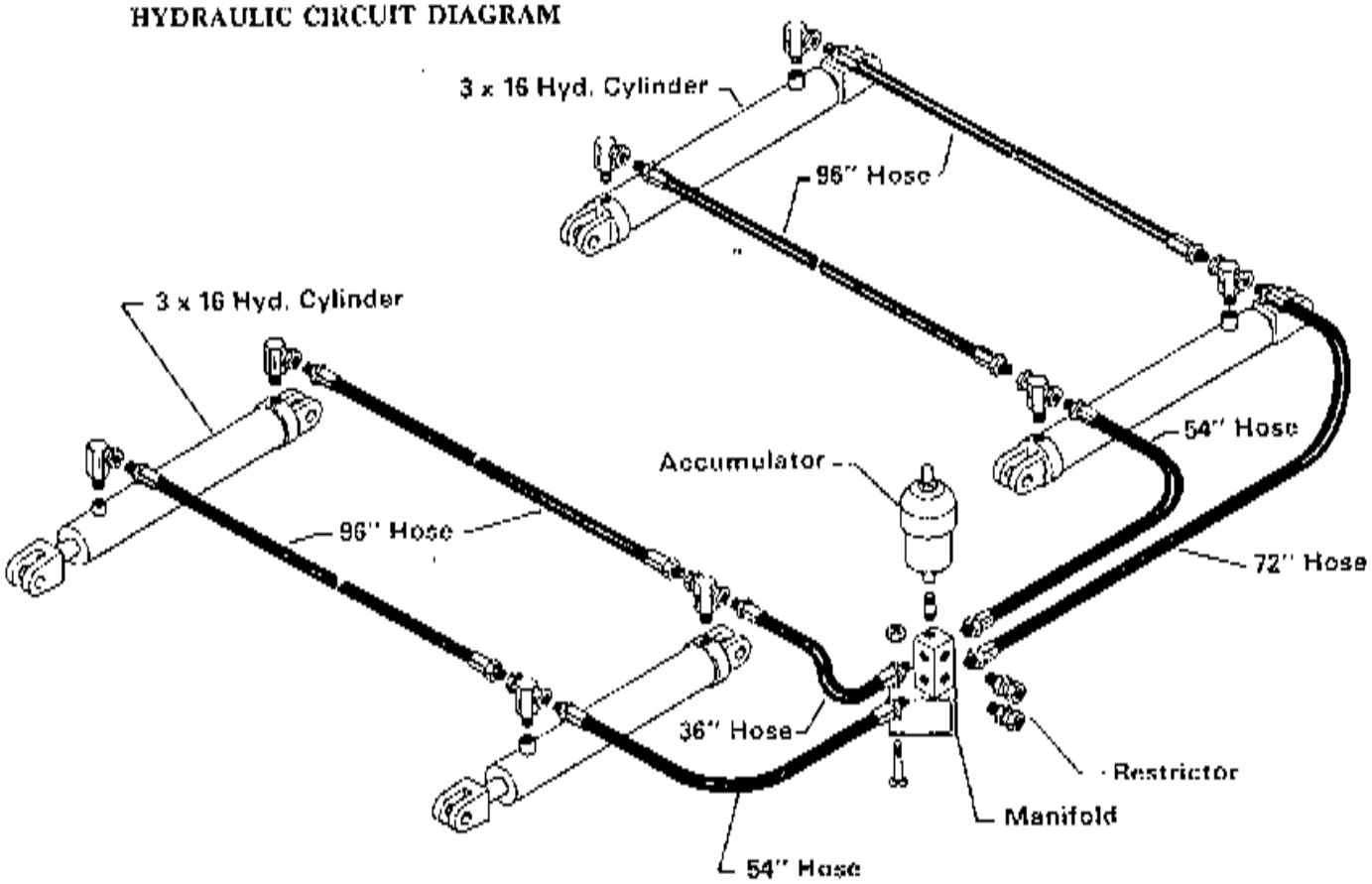


13. Install accumulator on top of manifold. Check accumulator for 800-1000 p.s.i. nitrogen precharge. Add nitrogen if necessary.

CAUTION. Be sure hydraulic hoses are routed properly to assure proper performance and prevent damage to hoses when folding wings or actuating the rockshaft.

(Hydraulic Circuit Diagram on Next Page)

HYDRAULIC CIRCUIT DIAGRAM

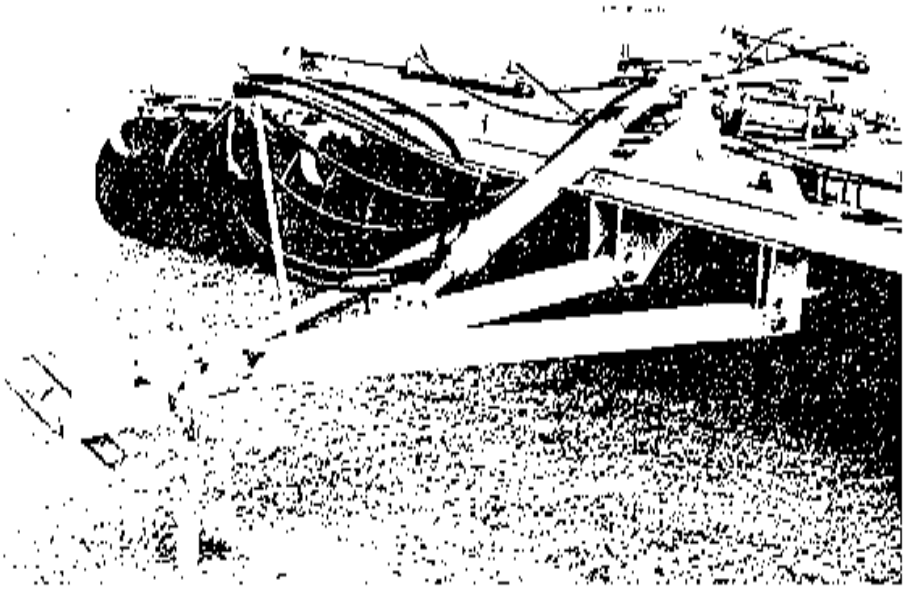


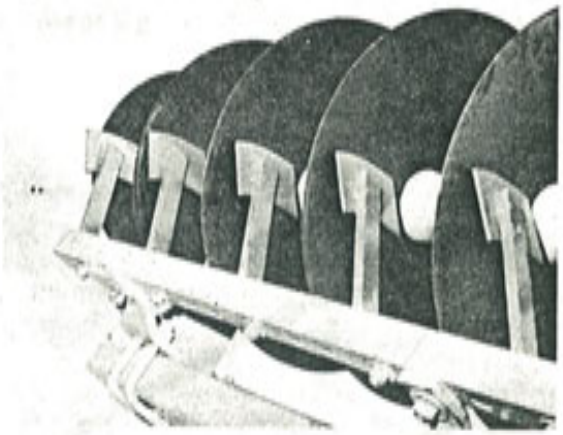
14. Attach hitch tongue using lower holes in main frame. Tighten bolts. Adjust later if necessary to match tractor drawbar.

15. Attach stabilizer to hitch control bracket.

16. Attach hose holder to hitch tongue.

17. Attach hitch jack to hitch tongue.



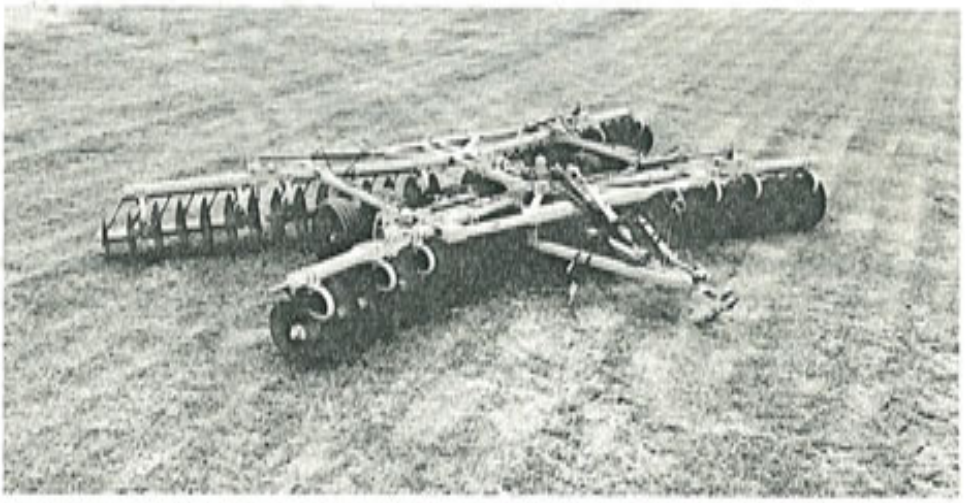


18. Check each scraper for proper adjustment. Place scrapers 1/16" - 1/8" from blades. Rotate gangs to check for scrapers rubbing on blades.

19. Install 4 x 8 hydraulic cylinder.

20. Attach four (4) hoses (approximately 12') and breakaway couplings from tractor to hydraulic manifold on harrow.

(NOTE: Hoses and couplings not provided with harrow)



21. Final Grooming and check points.

A. Check inside front gangs. The bumper washers should clear by 3/8" to 1/2". The blade spacing between the center gangs and wing gangs should be 9-1/4" to 9-3/4". The gangs should be shifted as required to obtain these spacings.

B. Check inside rear gangs. The front tips of the inside rear blades should be 32" — 36" apart. The blade spacing between the center gangs and wing gangs should be 9-1/4" to 9-3/4". The gangs should be shifted as required to obtain these spacings.

C. Check scraper adjustment. Scrapers should be adjusted to run 1/16" to 1/8" from disk blades.

D. Tighten all bolts to proper torque.

E. Raise and lower harrow 4 or 5 times with the heavy duty 4" x 8" hydraulic cylinder. Check transport lock to be sure it functions properly. Fold wings 4 or 5 times to see if hydraulic hoses are properly routed and the wings function properly. Check to see if the wing transport lock pins function properly.

F. Raise harrow for transport as described above. Use a good grade of clean Lithium soap base chassis grease to lubricate the entire harrow. This is very important if the harrow will be kept in inventory for several weeks before being placed in service. Grease the harrow as follows:

(1) Grease the four rockshaft pivot pins until grease appears at the ends of the pivot journals.
(2) Grease the fitting on the stabilizer barrel.
(3) Grease the gang bearings to purge any condensation that has accumulated during shipment and storage.
(4) Grease the four wing pivot pins.
(5) Grease the hydraulic cylinder mount pin.

G. If the harrow is in storage for four to six months, the entire harrow should again be lubricated before placing in service. It should also be greased every 50 hours while in use, at the end of each season and at the start of each season.

H. Check decals to be certain they are in place and in good condition. Touch up paint as required before delivery. Place Operators Manual in the heavy plastic shipping bag. Tape bag to main frame so the Operators Manual will be delivered to your customer along with the harrow.

22. Review all steps of the assembly process to be certain the harrow is properly assembled. Check all bolts to be sure they are properly torqued. Visually inspect the harrow for any missing, damaged, or defective parts. Repaint any areas that need improvement.

Remember, a little extra attention to details at this time can prevent problems after the harrow is placed in service.

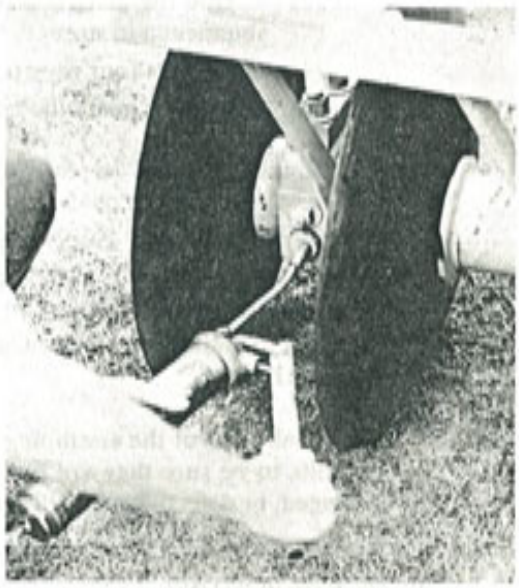
23. All bolts, including wheel hubs should be checked often the first 50 hours of field operation.

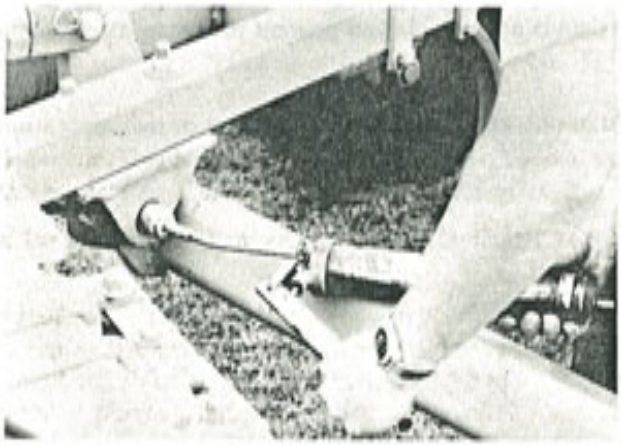
lubrication

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, wheel bearings and stabilizer 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 grease (Lithium Base). Never use greases which contain metallic additives. Always make sure that grease is clean and not contaminated with dirt or other foreign matter.

The gangs are equipped with ball bearings, which are greased at the factory. They should be greased every week or fifty (50) hours of operation. These bearings must also be greased at the start of each season, and at the end of each season.

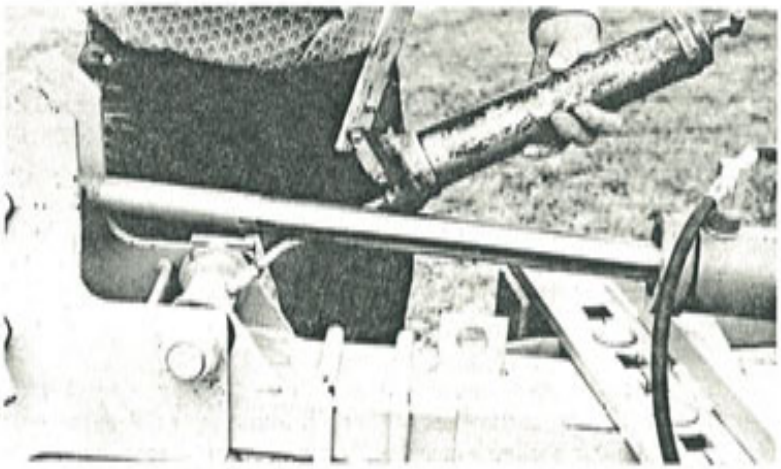




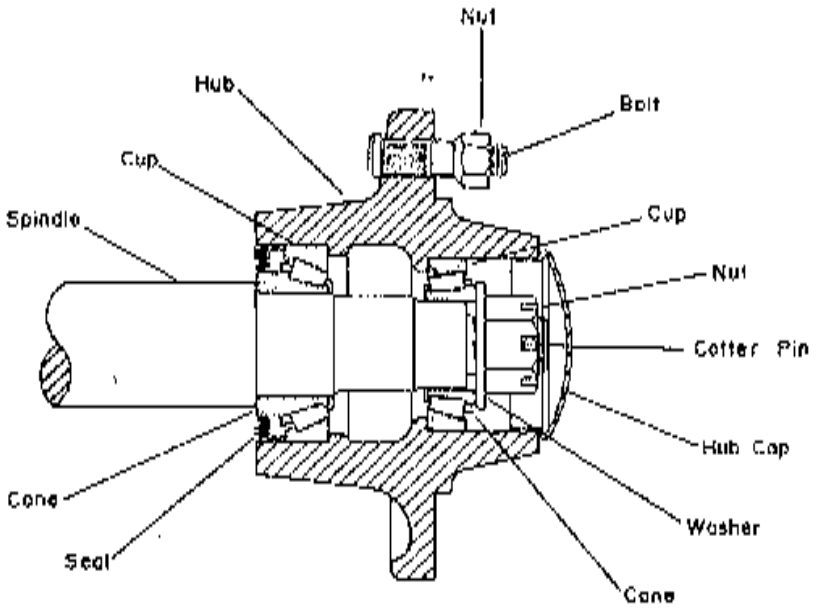
Grease rockshaft retainer pins each week or every fifty (50) hours of operation. These retainer pins should also be greased at the start of each season and at the end of each season. Bushings should be checked each season and replaced when worn.

Grease cylinder mount pin and wing pivot pins each week or every 50 hours of operation.

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. Adjust as required to eliminate excessive end play.



To disassemble the hub, remove the wheel, then 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. Thoroughly clean and carefully inspect all parts for wear. All parts that appear to be worn or damaged must be replaced.



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 bearing 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 bolts 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 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.

The stabilizer should be greased every week or fifty (50) hours of operation. The stabilizer 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 oiled occasionally for smooth operation.

operating instructions

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. In these conditions you should use the 11L x 15 tires and the hydraulic cylinder 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. Increased gang bearing life.
2. Reduced strain on harrow frame and related parts.
3. Reduced load on tractor engine and drive train.
4. Lower fuel consumption due to less load on tractor engine.
5. Reduced wheel slippage and rear tractor tire wear due to lower load.
6. Increased travel speeds due to less wheel slippage.

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

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".

CENTER RIDGE

If a ridge of soil is left behind the center of the harrow, decrease the angle of the rear gangs. Increase the angle of the front gangs. Shorten the stablizer to reduce weight on rear gangs, or do a combination of all three.

CENTER FURROW

If a furrow is left behind the center of the harrow, increase the angle of the rear gangs. Decrease the angle of the front gangs. Lengthen the stabilizer to add weight on rear gangs, or do a combination of all three.

FEATHERING BLADES

The use of feathering blades 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. Feathering blades are standard equipment and designed into the harrow.

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, and, (3) Disk Gang Angle Adjustment.

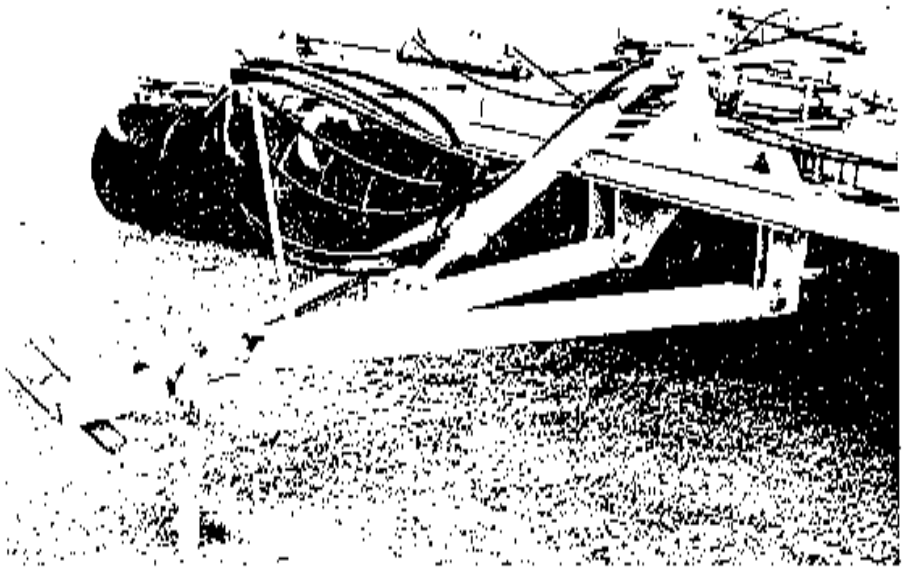
TRACTOR SPEED

Speeds above six (6) MPH may result in forming ridges and furrows. Front and rear gang angle adjustment and leveling the harrow from front to rear helps overcome this problem.

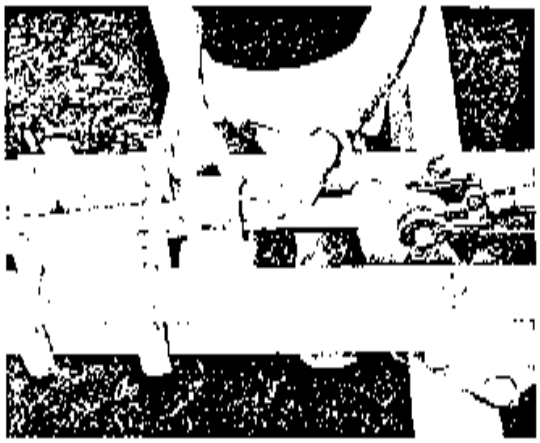
HITCH ADJUSTMENT

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.

To adjust the pull tongue for proper tractor drawbar height, attach pull tongue in upper or lower holes.



Attach the harrow to the tractor drawbar with reversible clevis and lower the gangs.



IMPORTANT

Be sure to remove the transport pin from transport position and insert it in the transport bar before lowering gangs.

With the harrow in the ground, turn the stabilizer until the frame is positioned for the desired working depth of all gangs. The cushion springs allow the hitch to flex in relation to the main frame.

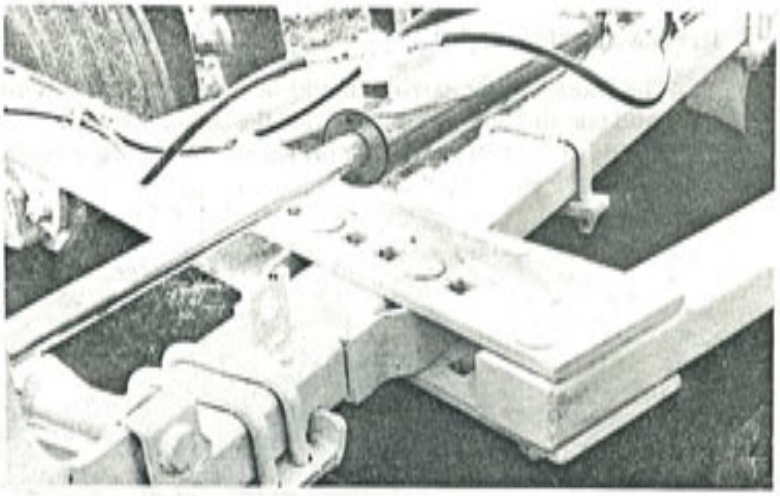
Extending the stabilizer raises the front gangs thus adding weight to the rear gangs. Retracting the stabilizer lowers the front gangs thus adding weight for additional penetration. Adjust the stabilizer to keep the harrow frame level while disking.

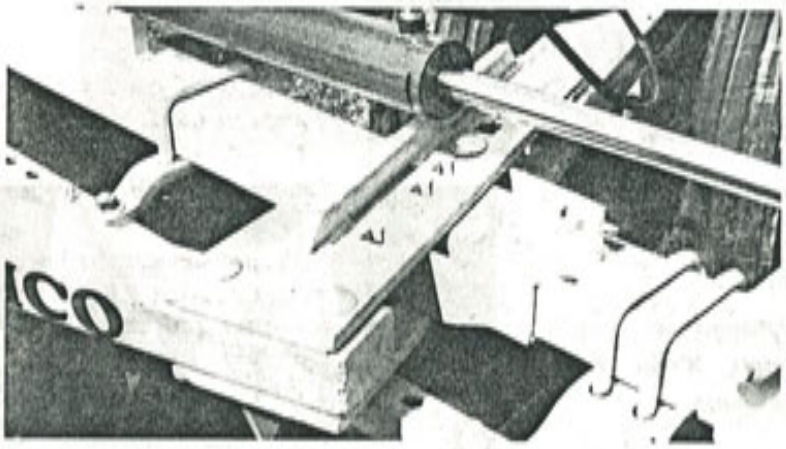
DISK ANGLE ADJUSTMENT

The front and rear gang angle may be varied between 15° and 19°. 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.

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.

All four gangs can be independently adjusted from 15° to 19°. Moving the front gangs forward and the rear gangs rearward increases the gang angle. Gang angle can be reduced by moving the front gangs toward the rear and the rear gangs toward the front. Set front and rear gangs in center position initially, then adjust as necessary. Adjust both front gangs evenly. Adjust both rear gangs evenly.





To adjust gang angle remove the two bolts that secure the gang frame. Slide gang frame to desired position and replace both bolts.

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

GANG LATERAL ADJUSTMENT

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 clear each other by 3/8 to 1/2 inch; and the rear gangs are approximately 34 inches apart, measured from front edge of disk blades.

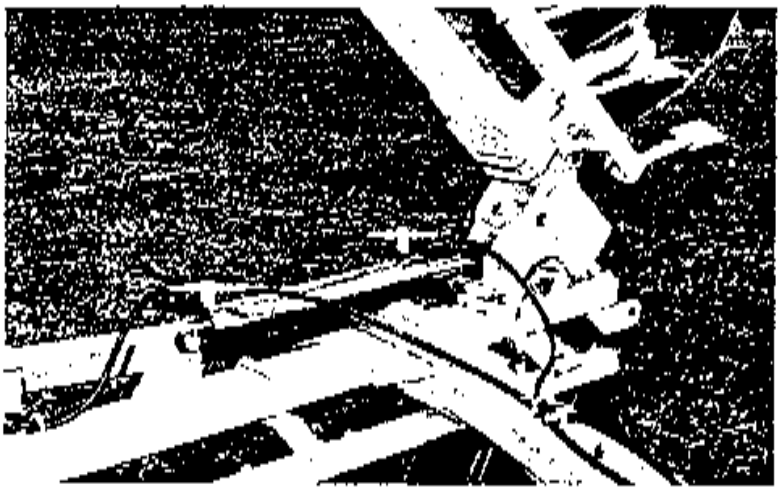
Make adjustments as needed after the harrow is placed in operation. When a ridge of soil is left behind the center of the harrow, the rear gangs should be set out. When a furrow is formed behind the center of the harrow, the rear gangs should be set in. Slide the gangs either toward the center or toward the outside of the harrow until the desired position has been obtained. Be sure to retighten the bolts to 160-175 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 supplied to till the band of soil not moved by the front gangs.

WING GANGS

Each gang is equipped with a 3 x 16 hydraulic cylinder to fold the wings for transport and lower the wings into the working position. The harrow can be operated with the wings folded for additional penetration.



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

The wing gangs should be pinned in the folded position for transport or when operating the harrow with the wings folded.

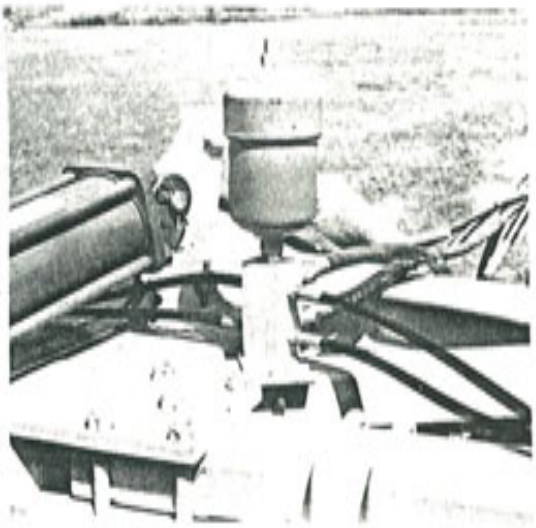
The wings can be lowered by removing the wing transport pin and actuating the four 3 x 16 hydraulic cylinders.

The harrow can be operated as a rigid, nonflexing harrow by installing the wing transport pin in the gang lock holes.

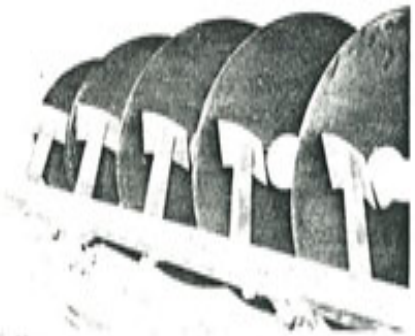
The wings can be secured in the lowered position with the accumulator and hydraulic pressure. The accumulator comes filled with 60 cubic inches of nitrogen at a pressure of 900 pounds per square inch. After lowering the wings the tractor hydraulic control lever should be held in the lowering position for 10 to 15 seconds. This allows hydraulic fluid to enter the accumulator. The accumulator then contains about 30 cubic inches of nitrogen and 30 cubic inches of hydraulic fluid at 1800 to 2000 pounds pressure.

Should the wings encounter uneven terrain or an obstruction, the wing cylinder will retract and the excess fluid will be forced into the accumulator. After passing over the obstruction the hydraulic fluid will be forced back into the hydraulic cylinder thus lowering the wings.

The accumulator will also replace any hydraulic fluid that seeps past the hydraulic cylinder pistons or tractor hydraulic control valves. As fluid leaves the accumulator the nitrogen expands and the pressure slowly decreases. The accumulator should be replenished with fluid every 15 to 20 minutes of operation or when the wings start floating up too easily. Move the tractor hydraulic control lever to the lowering position and hold for 15 to 20 seconds. This will replenish the hydraulic fluid in the accumulator.



SCRAPERS

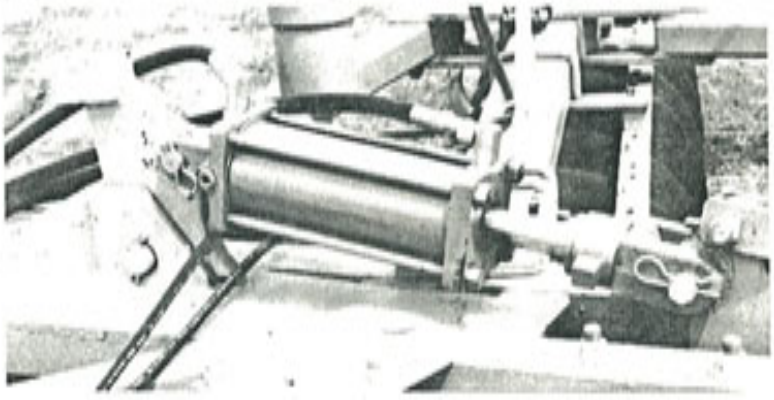


Scrapers should be adjusted to run approximately 1/16 to 1/8 inch from the disk blades. Each scraper may be adjusted in the slotted hole on the scraper bar, or the entire scraper bar may be moved laterally in the slotted holes provided in the bearing risers, as shown in the picture at left.

HYDRAULIC CYLINDER

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

A heavy duty ASAE 4 x 8 inch stroke hydraulic cylinder, with depth stop, is recommended for raising and lowering the disk harrow. On larger harrows with 24'' blades on ASAE 5 x 8 inch stroke hydraulic cylinder may be required. This will allow use of the harrow on tractors which do not have 2000 p.s.i. hydraulic systems. Optional ASAE standard 8'' stroke hydraulic cylinders are available at your local AMCO Dealer.



CENTER TOOTH ATTACHMENT

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

Bolt the clamp to the center bars of the main frame, behind the transport strap. Adjusting holes are provided in the clamp for desired depth of spike tooth.

TRANSPORT

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

Prior to transport the wings must be folded. Remove wing transport pin prior to folding if wings are pinned down in the ridgid position. The wing transport pin should be used to lock the wings in the folded position for transport. The entire harrow should be raised and the transport lock pin installed prior to transporting the harrow.

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

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 lubricate the harrow.

Repaint the harrow where the original paint has worn off.

Coat the disk blades and stabilizer rod with a rust preventative.

Tighten loose bolts and replace any damaged or missing parts.

All hydraulic cylinder rods should be fully retracted or coated with a rust preventative to prevent rusting in storage.

WARNING REFLECTORS [OPTIONAL]

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

SMV EMBLEM [OPTIONAL]

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 harrow 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 laws.

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

maintenance

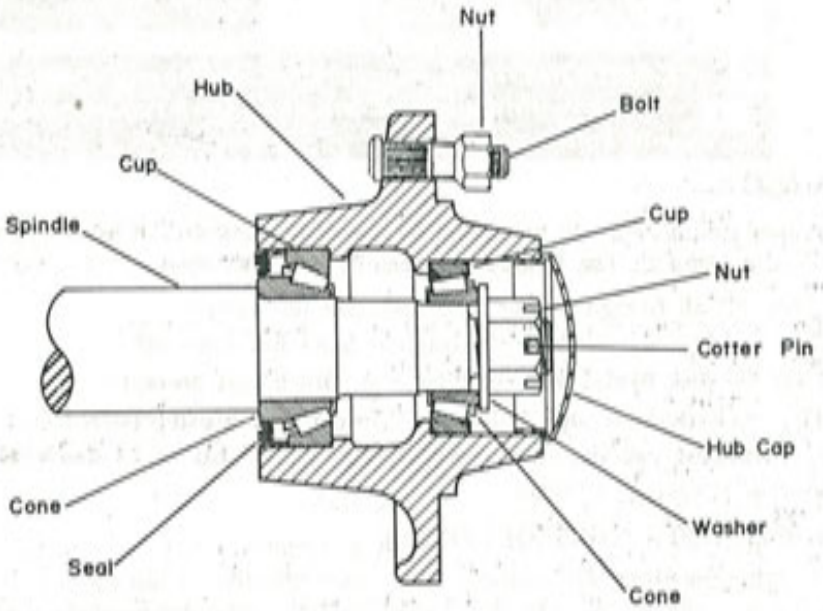
1. KEEP ALL BOLTS TIGHT

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. WHEEL HUB REPAIR

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. Adjust as required to eliminate excessive end play.

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



Use the following procedure when repairing or servicing wheel hubs:

A. Clean all parts that are to be re-used.

B. 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.

C. Carefully inspect both sets of bearing cones. Bearing bore and rollers must be smooth and free of nicks and scratches. Replace cones if damaged.

D. Inspect hub to make sure that hub bolts have a good thread. Bearing cups must be smooth and free of surface blemishes. Cups must be removed from the hub and 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.

E. 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.

F. Spindle washer, slotted nut, cotter pin and hub cap must be in good condition. Replace if worn or damaged.

G. To reassemble the hub, repack each bearing cone with grease and fill the hub cavity 1/3 full of grease. Place inner bearing in hub, press grease seal into hub and carefully install the hub on the spindle. Install the outer bearing assembly into the hub, and replace the spindle washer and slotted nut. Tighten the slotted nut until the hub binds when rotated.

H. 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 the dust cap and mount wheel on hub.

CAUTION: When working on disk harrows care should be exercised in handling or tightening bolts near disk blades to avoid injury. All hydraulically or mechanically elevated components must be blocked or lowered to prevent accidents when servicing the harrow.

4. GANG REPAIR

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 trunnion 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 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 end bells must be replaced if they are cracked or worn on the surface adjacent to the bearing.

J. 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. These damaged bearings 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 regreasable bearing should always be used for bearing replacement.

K. Check disk blades and replace as required. Check around the blade center hole for breaks and cracks. Check the edges for wear and cracks.

L. To replace a bearing, the snap ring must be removed. The old bearing and "Protect-O-Shield Washers" 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. They should fit snug in the bearing housing requiring a few light taps with a hammer to remove or install them. If they are loose, bent or show signs of wear, near the inner race of the bearing, they should be replaced. 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. Check the location of the grease holes in the bearing. These holes 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 housings 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 1-1/2" square gang bolt nut should be torqued to 1200 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 housing. 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. Replace the scraper bar and scrapers.

O. The bearings should be greased each week or every 50 hours of use with a good grade of clean, lithium soap base grease. Use of dirty grease or a grease with metallic additives will reduce bearing life.

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 gangs.

CAUTION: When working on disk harrows care should be exercised in handling or tightening bolts near disk blades to avoid injury. All hydraulically or mechanically elevated components must be blocked or lowered to prevent accidents when servicing the harrow.

5. SCRAPER REPAIR

Bent scraper bars or shanks should be replaced or straightened if possible. The blades can be replaced when they wear to the extent they are not performing properly. Keep the blades adjusted from 1/8" to 1/4" from the disk blades. The scrapers can be adjusted by loosening the mount bolt and sliding the scraper to the proper position then tightening the mount bolt. Additional adjustment can be obtained by loosening the scraper bar mount bolts and shifting the entire scraper bar. Do not allow the scraper blades to run on the spacer spools as immediate damage to the spool will occur.

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6. ROCKSHAFT PIVOT PIN REPAIR

The rockshafts are equipped with replaceable, regreasable, bronze bushings. If properly lubricated they should last for several seasons. The bushings should be checked each disking season for excessive pivot pin or bushing wear. Worn bushings and pivot pins should be replaced. Failure to replace worn or damaged parts will damage other parts.

7. PROPER STORAGE

Proper storage will add life to your disk harrow. To prepare for storage:

A. Clean and lubricate the machine.

B. Inspect and note excessively worn or broken parts so that repair or replacement can be made promptly.

C. Repaint where necessary and protect all unpainted surfaces with rust-preventative grease or oil.

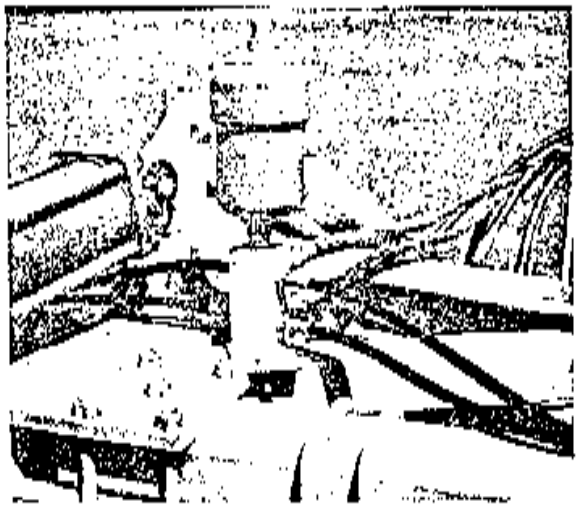
D. Tighten loose bolts.

E. All hydraulic cylinder rods should be fully retracted or coated with a rust-preventative to prevent rusting.

8. ACCUMULATOR CARE

Have dealer check accumulator each season to maintain proper charge. Use DRY NITROGEN to maintain 800-1000 pounds per square inch nitrogen pressure. Check nitrogen pressure with pressure removed from the hydraulic system. Charging kit is required to check nitrogen pressure and to add nitrogen.
Accumulator can be damaged by operation without nitrogen precharge.

9. CHARGING THE ACCUMULATOR



Hydraulic pressure in the disk harrow wing lift system must be removed before recharging or checking the nitrogen pressure in the accumulator. Refer to picture at right.

A. Remove the valve guard and valve cap on the charging side of the accumulator.

B. Retract shaft in the recharge adapter by turning the handle counter-clockwise until it stops rotating.

C. Attach gauge assembly and adapter to accumulator valve stem.

D. Attach gland nut of recharge hose assembly to nitrogen bottle and tighten.

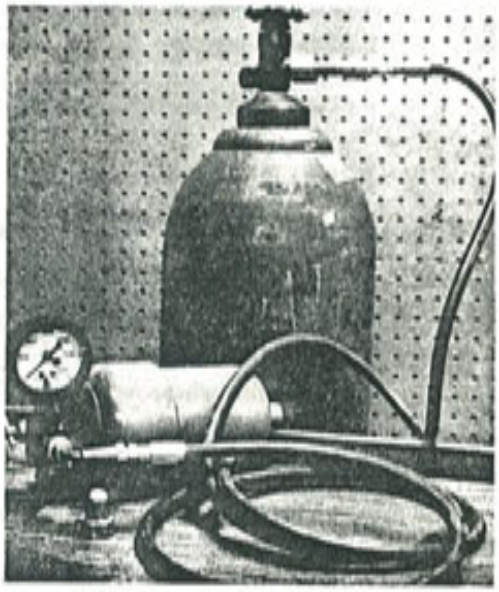
E. Attach other end of recharge hose to gauge assembly and hand tighten to prevent gas leakage. Turn handle clockwise on adapter to depress nitrogen valve core.

F. Open valve slowly on the nitrogen bottle to precharge the accumulator to 900 p.s.i. Close nitrogen bottle valve occasionally to allow needle on pressure gauge to give an accurate reading. Bleeder valve under pressure gauge should be used to let out excess pressure.

CAUTION! *Nitrogen bottle valve must be turned slowly and carefully to prevent damage to the charging assembly.*

G. To remove the gauge assembly, retract the shaft in the adapter by turning handle counter-clockwise. Open bleeder valve to remove pressure in gauge assembly and hose. Remove adapter from accumulator and check for leaks. Replace valve cap and guard and tighten finger tight, then tighten 1/2 turn with wrench to seal charging valve. Then replace acorn nut on top of accumulator.

H. The accumulator can be removed and taken to the dealer for recharging. Refer to picture at right.



10. HYDRAULIC CIRCUIT TESTING

A. Hydraulic Circuit assembly: Refer to page 29 of the operators manual for proper assembly of the hydraulic circuit. The circuit must be assembled as shown to assure proper operation.

B. Leaking Hoses or Hydraulic Fittings: A tube of pipe sealer is included in each hydraulic kit. Use a small amount on the threads of each fitting to eleminate fitting leakage. Fittings that continue to leak after tightening should be replaced.

C. Proper System Function:

(1.) If all wings will not raise and lower properly check the hydraulic circuit for proper assembly.

(2.) If wings will not stay in raised position, or creep up during operation, the circuit components should be checked as follows:

(a.) Accumulator: Remove cover and check for accumulator charge. Slightly depress the filler valve core. A slight hiss of escaping nitrogen denotes a charged accumulator. (Be careful to prevent excessive loss of nitrogen.) Replace the cover IF THE ACCUMULATOR IS PROPERLY CHARGED. Tighten the small cover finger tight then use a wrench to tighten 1/4 to 1/2 turns to assure proper sealing. Then install the acorn nut. Uncharged accumulators should be recharged or replaced.

(b.) Cylinder piston leakage: Remove hoses and fittings from the rod end of the four cylinders. Apply 1,800 to 2,000 p.s.i. pressure to the hydraulic circuit for 30 to 60 seconds. Oil will escape from the open port on the rod end of defective cylinders. These cylinders can be repaired with a Cylinder Repair Kit.

(c.) Tractor Hydraulic System: If problems continue after checking the hoses, fittings, accumulator and cylinders the tractor hydraulic system should be checked. The tractor must maintain at least 1,600 p.s.i. hydraulic pressure to properly operate the folding wings. Also, seepage past the tractor's hydraulic valves will allow wings to creep up during operation.
This problem can be corrected by installing a "PRESSURE LOCK VALVE" between the tractor and the manifold on the harrow. This valve will block fluid seepage from the harrows hydraulic circuit. (AMCO part number 11109.)

11. HYDRAULIC CYLINDER REPAIR

A. Remove hoses and fittings from cylinder.

B. Remove cylinder from harrow and clean outside of cylinder.

C. Dis-assemble cylinder by rotating cap on rod end of cylinder. Use spanner 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.

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. Replace parts that cannot be repaired.

G. Remove all O' Rings and "U" cups from piston and gland. Replace all seals with new parts.

H. Assemble cylinder using care to prevent damage to O' Rings and "U" cups.

I. Replace cylinder on harrow and attach hoses. Check cylinder for leaks as described on previous page.

OPERATING TIPS FOR LONG LIFE AND SATISFACTORY PERFORMANCE

1. Match the harrow with the proper size tractor. Too much horsepower and speed will result in excessive maintenance cost.
2. Lubricate with clean grease at the recommended intervals.
3. Use good quality tires, hoses, and hydraulic cylinders.
4. Use the tongue adjusting rod, gang angle adjustment, proper cutting depth, and travel speed to get level disking and smooth fields.
5. Wash corrosive materials such as fertilizer and herbicides from the disk when it is not in use.
6. Insist on genuine AMCO replacement parts. Items such as bearings and blades look alike but are not as reliable as original equipment.
7. Never allow unsafe conditions or operating practices. Your safety is of prime importance.
8. Raise the disk harrow on its transport wheels when turning. Failure to do so will result in broken blades, bent axles, and excessive strain on the tongue and main frame.
9. Reduce operating speed in areas containing stumps or rocks to reduce blade breakage.

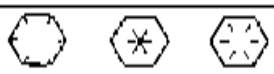
GENERAL TORQUE SPECIFICATION TABLE

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

GENERAL TORQUE SPECIFICATION TABLE

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	28
3/8	9.53	20	23	35	42	45	54
7/16	11.11	30	35	50	64	70	84
1/2	12.70	45	52	80	95	110	132
9/16	14.29	65	75	110	132	160	192
5/8	15.88	90	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

MOST OFTEN ENCOUNTERED DISK BLADE FAILURES

Most disk blade failures can be prevented by selecting the correct blade size and thickness for individual conditions when buying a disk. Reduction of speed in areas containing rocks and stumps will greatly lengthen the blade life. Keeping gang bolts properly torqued and raising the harrow while turning will also reduce disk blade breakage.

FIGURE 1 — Laminated Disc—defective steel. Eligible for warranty consideration.

SURFACE VIEW EDGE VIEW

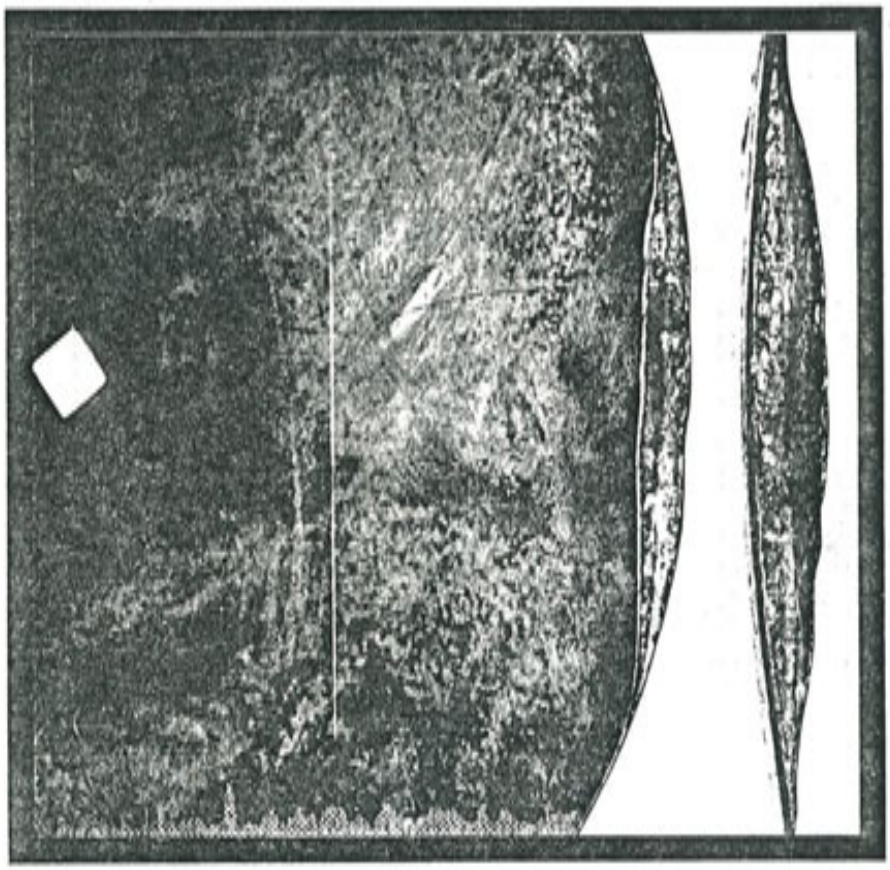
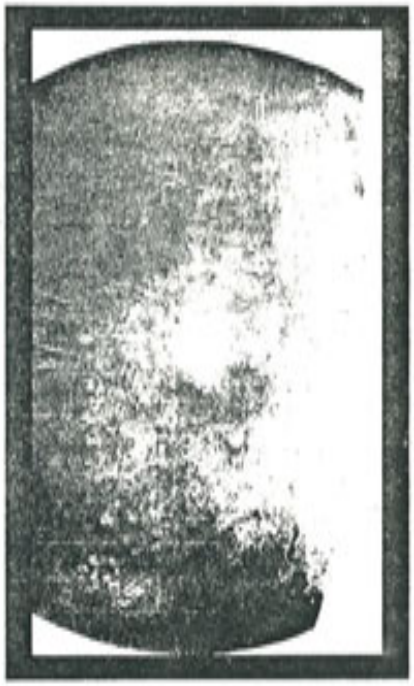


FIGURE 2 — Straight directional break caused by defective steel. Eligible for warranty consideration.



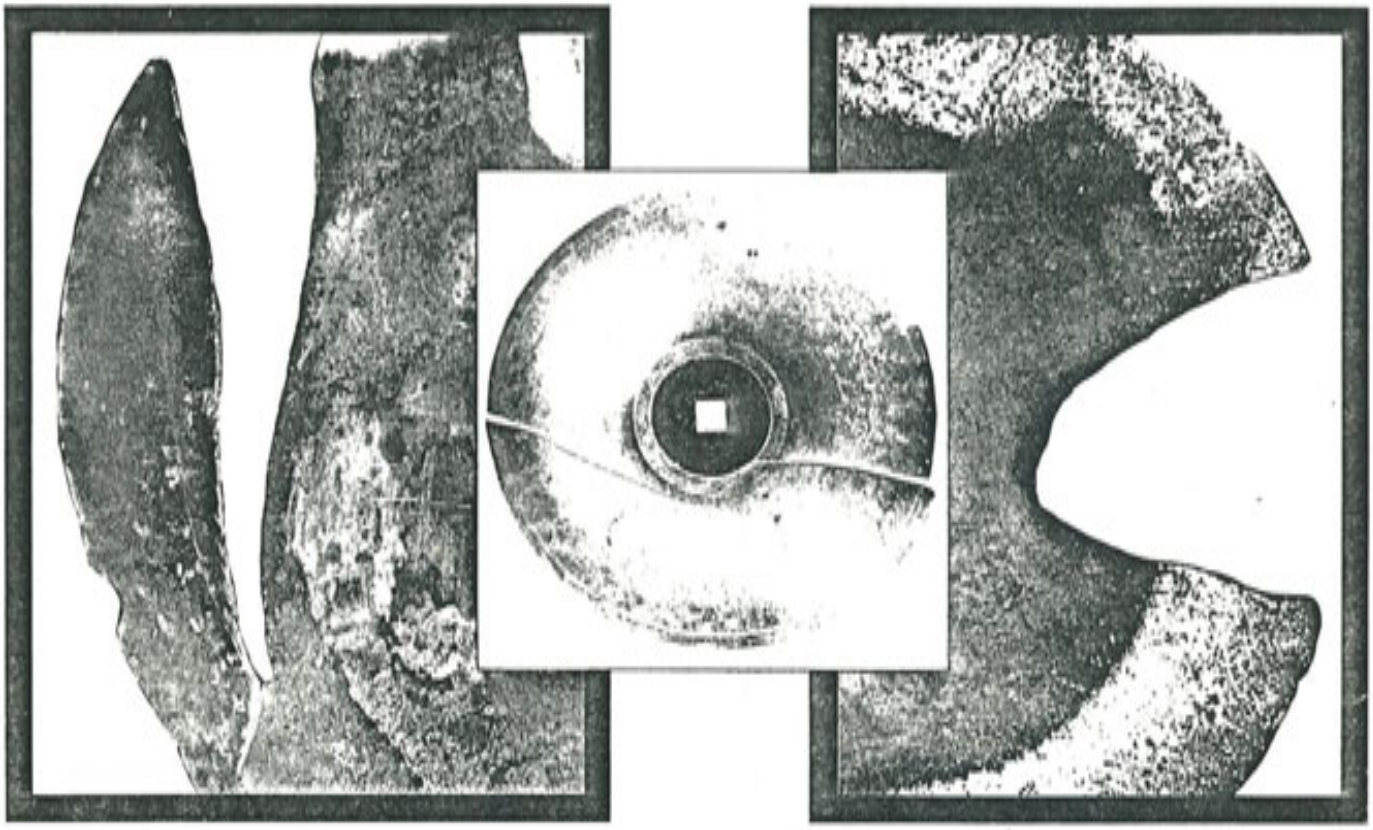


FIGURE 3, 4, 5 — Irregular breaks caused by contact against rocks or stumps. Not covered by warranty.

FIGURE 6 — Chipped or dented edges resulting from use in areas containing rocks or stumps. Not covered by warranty.

FIGURE 7 — Center broken out—Experience has shown that this is usually caused by loose bolts, excessive flexing, or by contact with rocks and stumps. Not covered by warranty.