

TO THE PURCHASER

The care you give your new AMCO F10 or F11 Tandem Disk Harrow will greatly determine the satisfaction and service you will obtain from it. By observing the instructions and suggestions in this manual, your AMCO Harrow will serve you well for many years.

As an Authorized AMCO Dealer, we stock Genuine AMCO Parts, which are manufactured with the same precision and skill as the original equipment. For best performance and longer life use only Genuine AMCO 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.

When you sell your harrow you should pass this manual to the new owner.

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. Remember, the right and left hand sides of the harrow are determined by standing at the rear of the harrow and facing the direction of travel.

MODEL NUMBER

SERIAL NUMBER

GENERAL SPECIFICATIONS

AXLES: 8 — 1-1/2" Square

BLADES: 22" x 3/16" Plain

SCRAPERS: Heavy Duty

HYDRAULIC CYLINDERS: 4 — 3" x 16"

HYDRAULIC HOSES: 8 — 1/4" with
Hi-Pressure Fittings

CLEVIS: Ductile Iron
Reversible with Bar and Yoke

TONGUE JACK: (1)

F10 BEARINGS: 16 — 1-1/2" Square Bore
Greaseable Ball Type—Flangette Mounted

F11 BEARINGS: 16 — 1-1/2" Square Bore
Greaseable Ball Type—Toggle Mounted

SPACING: 9"

WHEELS: Dual 15 x 8 — 6 Bolt

ACCUMULATOR: 1 — Quart

FEATHERING BLADE: 2 — 16"

CENTER TOOTH ATTACHMENT: (1)

WRENCH: Gang Bolt (1)

F10 — FLANGETTE MOUNTED GANG BEARINGS

Model	Cutting Width	No. of Blades	Transport Width	Approximate Weight Pounds
F10-5422-PBG	20'0"	54	16'0"	6194
F10-5822-PBG	21'6"	58	16'0"	6406
F10-6222-PBG	23'0"	62	16'0"	6624
With 22" Dia. x 3/16 Plain Blades				

DISK BLADE OPTIONS
22" Dia. x 3/16 Cut Out Blades

F11 — TOGGLE MOUNTED GANG BEARINGS

Model	Cutting Width	No. of Blades	Transport Width	Approximate Weight Pounds
F11-5422-PBG	20'0"	54	16'0"	6360
F11-5822-PBG	21'6"	58	16'0"	6570
F11-6222-PBG	23'6"	62	16'0"	6790
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

TABLE OF CONTENTS

To the Purchaser.....	i
General Specifications	ii
Safety Suggestions.....	iii
Table of Contents	1

PARTS LIST

Hitch	3	Front Wing Gang — F9.....	21
Main Frame	5	Rear Wing Gang — F9	23
Rockshaft	7	Front Inside Gang — F10	25
Center Tooth Attachment.....	9	Rear Inside Gang — F10.....	27
Gang Rest.....	9	Front Wing Gang — F10.....	29
Wing Lock	9	Rear Wing Gang — F10	31
Hydraulic Circuit — F9	11	Front Inside Gang — F11	33
Hydraulic Circuit — F10 & 11	13	Rear Inside Gang — F11	35
Pressure Lock Valve	13	Front Wing Gang — F11.....	37
Hydraulic Cylinder — 3 x 16 [Prince].....	14	Rear Wing Gang — F11	39
Hydraulic Cylinder — 3 x 16 [Lantex]	15	Hydraulic Cylinder [4 x 8]	40
Front Inside Gang — F9	17	Decals	41
Rear Inside Gang — F9	19		

OPERATORS MANUAL

General Torque Specifications	42
Assembly	43
Lubrication.....	48
Operating Instructions	50
Maintenance	56
Operating Tips	62
Disk Blade Failures	63



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.

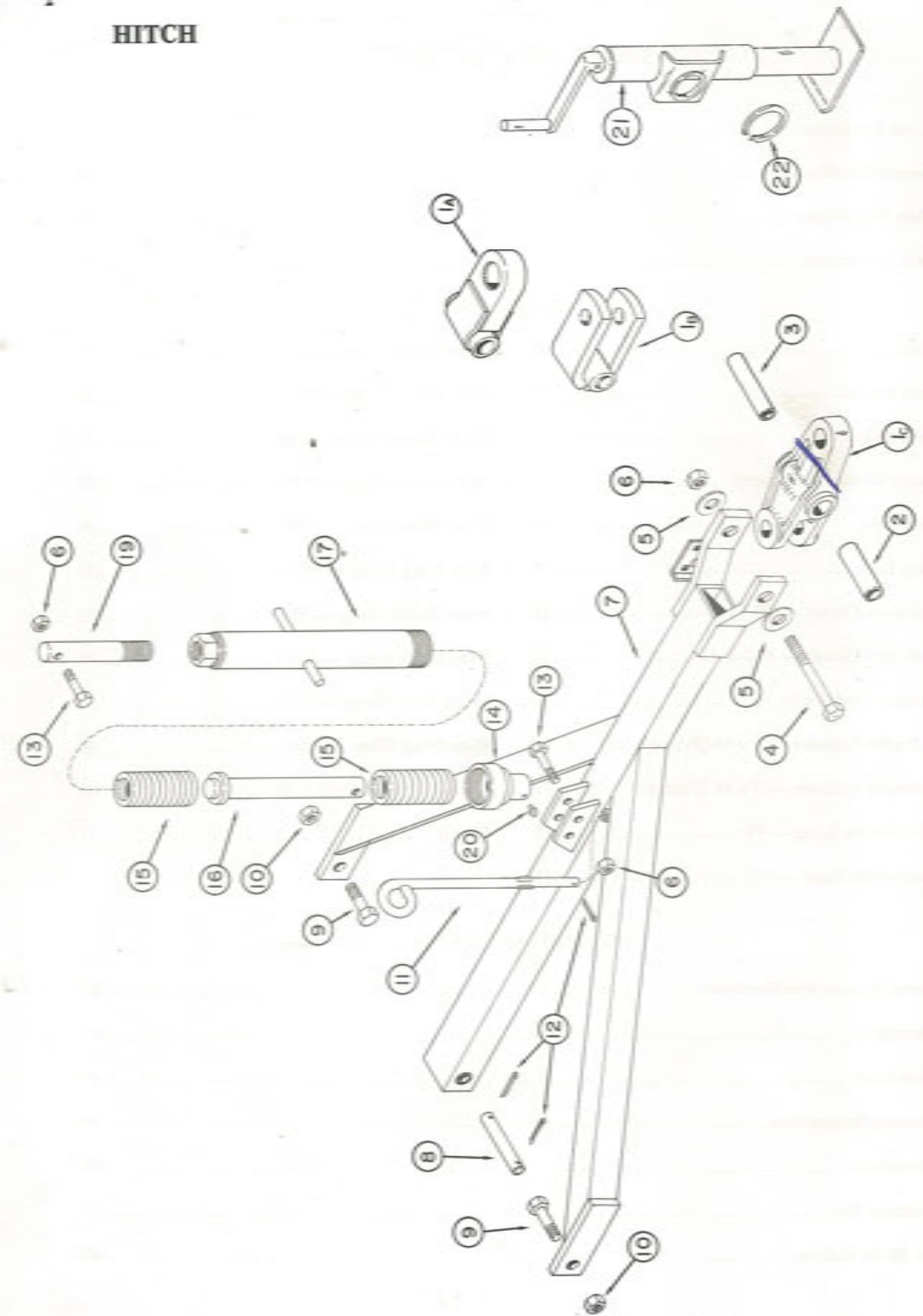
 **CAUTION** When transporting farm implements on public roads after dusk it is the responsibility of the operator to provide lighting and reflectors on the rear of the implement in accordance with your state law.

 **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.

AMCO F9, 10 & 11 SERIES DISK HARROW HITCH

Ref. No.	Part No.	Description	No. Req'd
1A	0550	Clevis — Bar Type (optional)	1
1B	0434	Clevis — Yoke Type	1
1C	16001	Clevis — Pull F10 & 11	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	0608	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	10883	Jack	1
22	10912	Ring — Snap	1

HITCH

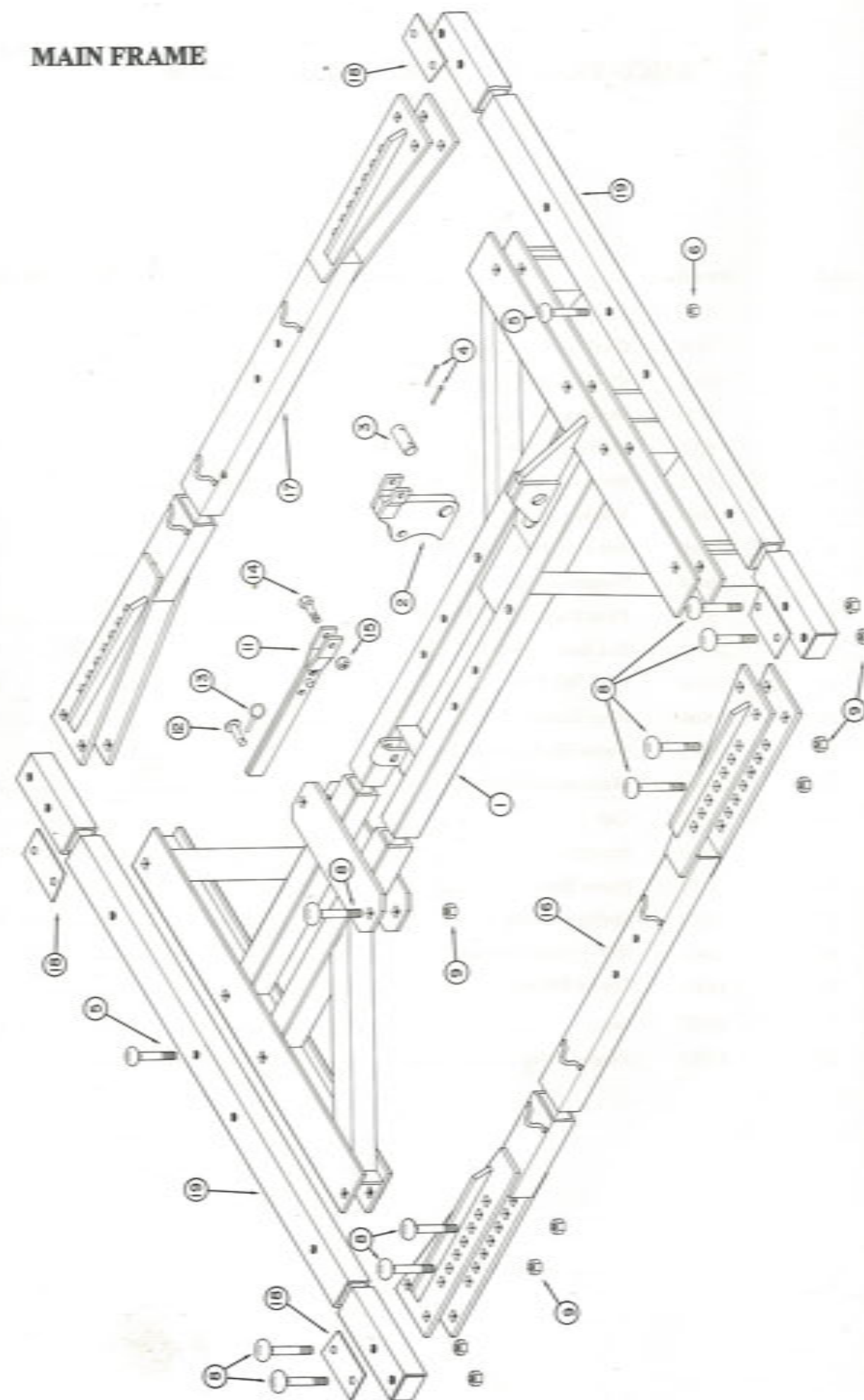


AMCO F9, 10 & 11 SERIES DISK HARROW MAIN FRAME

1481

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	1443	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 — F10 and 11	1
16	1483	Bar — Side RH — F9	1
17	0741	Bar — Side LH — F10 and 11	1
17	1484	Bar — Side LH — F9.....	1
18	5429	Shim	4
19	1481	Bar — Front or Rear.....	2

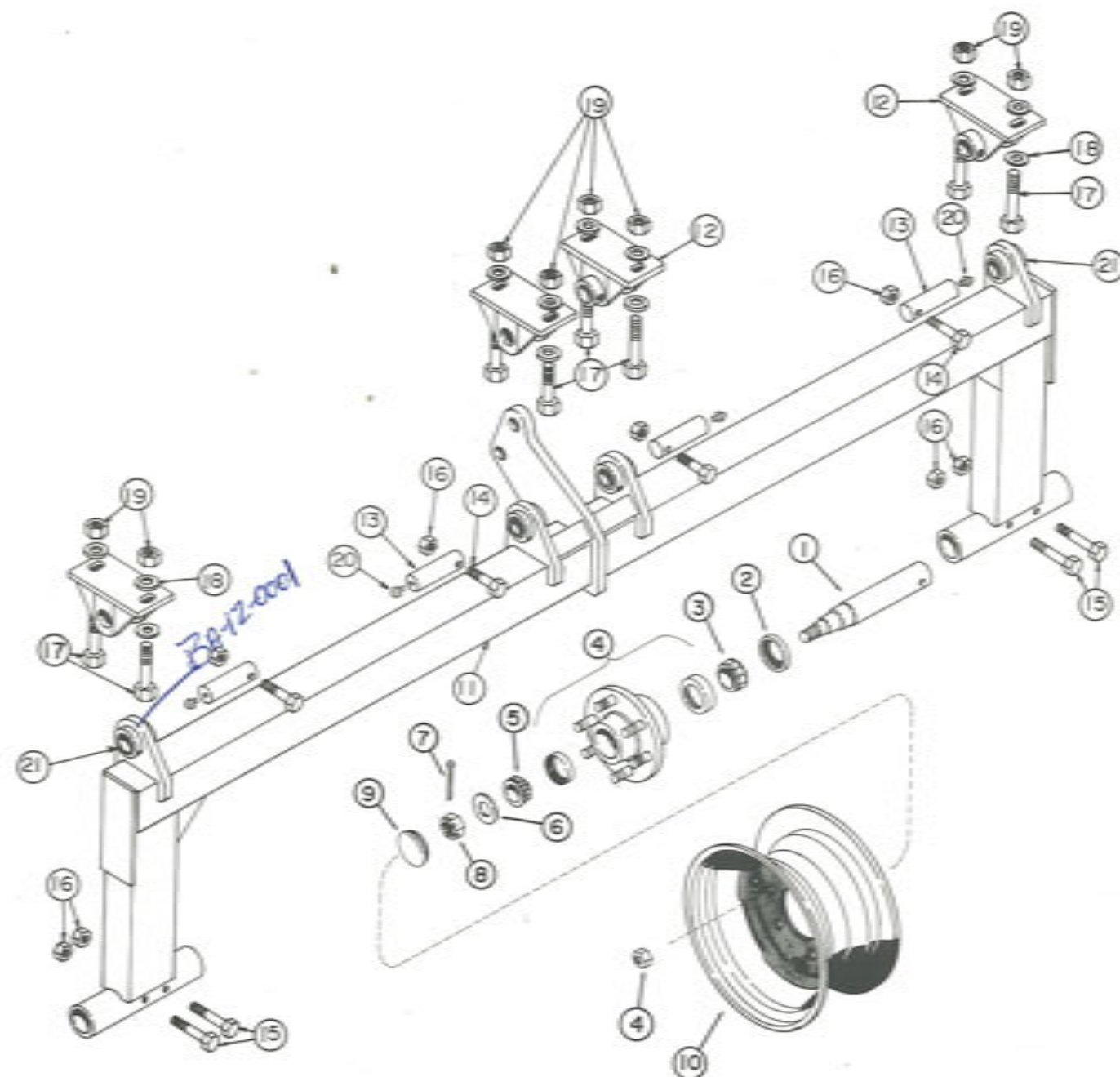
MAIN FRAME



AMCO F9, 10 & 11 SERIES DISK HARROW ROCKSHAFT

Ref. No.	Part No.	Description	No. Req'd
1	10880	Spindle 50mm (1.969") 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	0557	Rockshaft W/4 Bushings	4
12	0754	Base — Rockshaft Bearing F10 and 11	4
12	0553	Base — Rockshaft Bearing F9	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 F10 and 11	8
17	10106	Hex Bolt 5/8 x 4-1/2 NC, PL, GR5 F9	8
18	10866	Cut Washer 3/4 PL F10 and 11	16
18	10059	Cut Washer 5/8 PL F9	16
19	10300	Lock Nut 3/4 NC, PL F10 and 11	8
19	10299	Lock Nut 5/8 NC, PL F9	8
20	11081	Grease Fitting 5/16 Straight (Drive In)	4
21	9270	Bushing Bronze (Not Shown)	4
BC-05-0098		Spindle and Hub Complete (Not Shown)	

ROCKSHAFT



AMCO F9, 10 & 11 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	Time	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 F9 SERIES DISK HARROW GANG REST

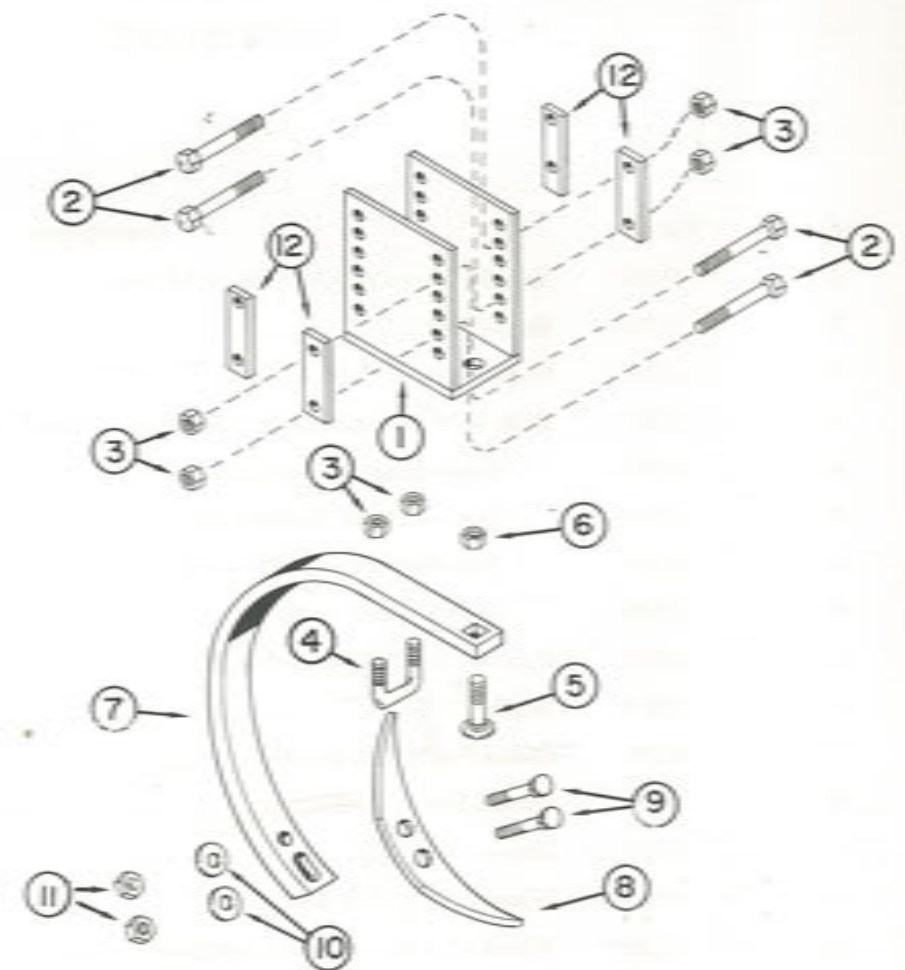
[Before Serial No. 2532: Not Required After Serial No. 2532]

Ref. No.	Part No.	Description	No. Req'd
1	0561	Rest — Gang	4
2	10073	Bolt — Carriage 5/8 x 6 NC, PL	8
3	9635	Pad — Bumper	4
4	10691	Spring	8
5	10299	Nut — Lock 5/8 NC, PL	8
6	6513	Bolt — U	4
7	10300	Nut — Lock 3/4 NC, PL	8
	10671	Bolt — Machine 3/4 x 5 NC, PL, GR5 (Not Shown)	4

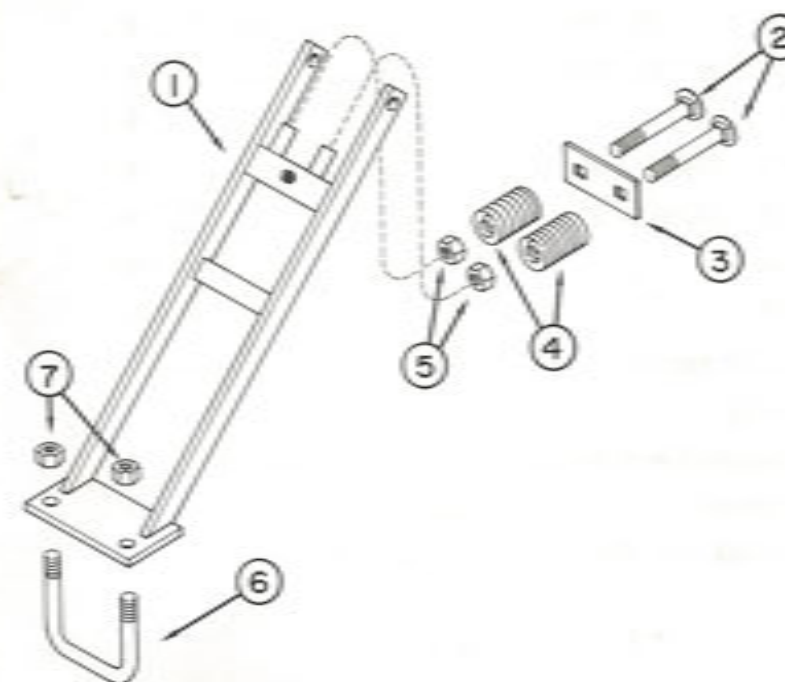
AMCO F9, 10 & 11 SERIES DISK HARROW WING LOCKS

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	

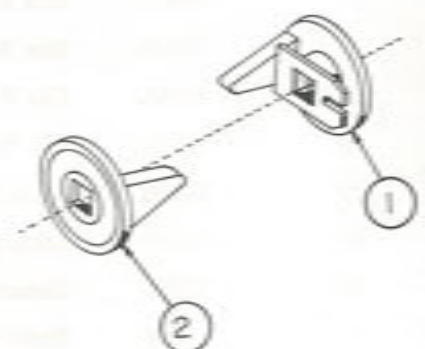
CENTER TOOTH ATTACHMENT



GANG REST

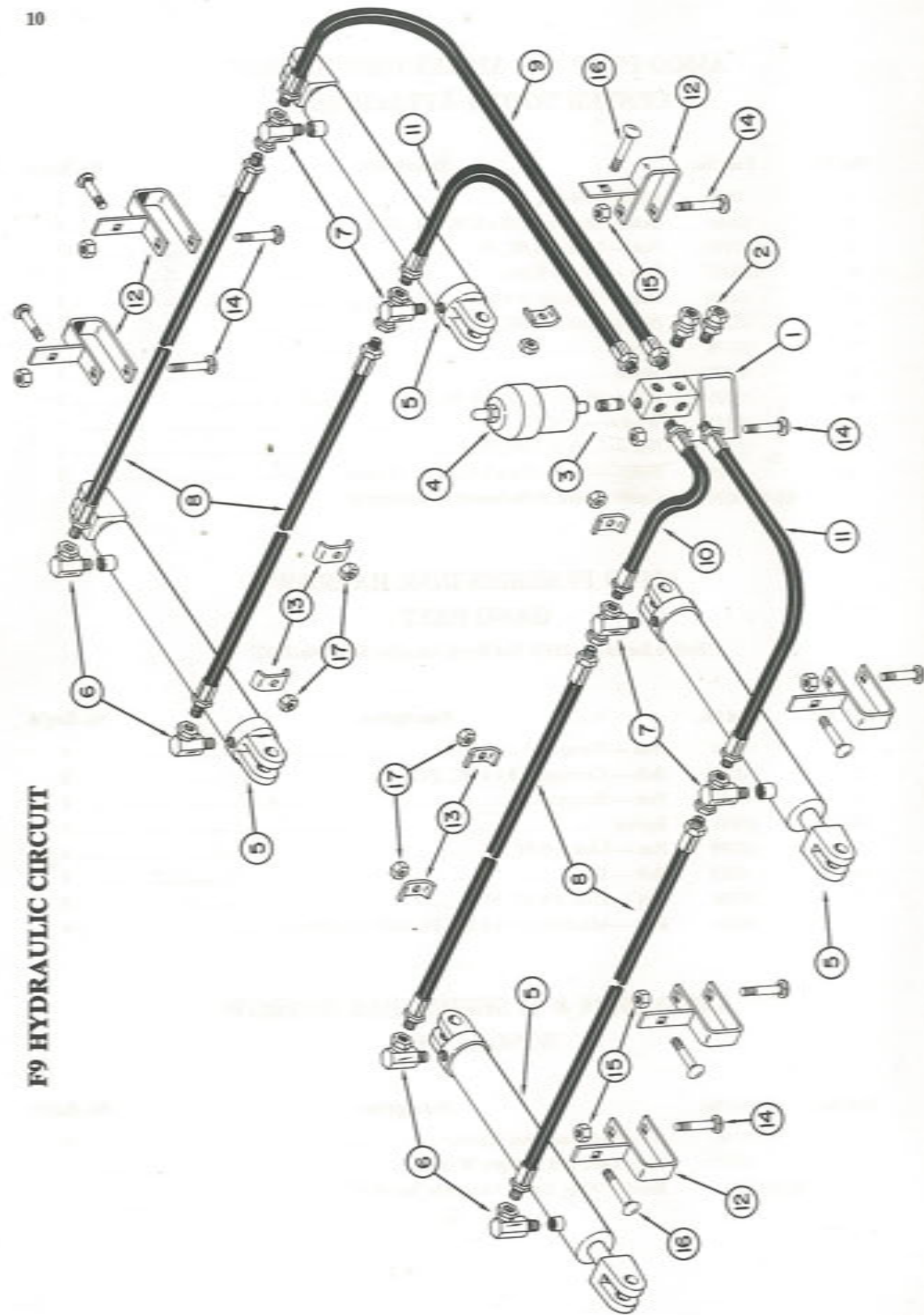


WING LOCK



AMCO F9 SERIES DISK HARROW HYDRAULIC CIRCUIT

Ref. No.	Part No.	Description	No. Req'd
1	0567	Manifold	1
2	10932	Restrictor	2
3	11097	Nipple — Adapter	1
4	10920	Accumulator	1
5	10916	Cylinder — Hydraulic 3 x 16	4
6	10921	Elbow — 90° Swivel 1/2 NPT	4
7	10923	Tee — Male Branch 1/2 NPT	4
8	10925	Hose — 3/8 x 96"	4
9	10924	Hose — 3/8 x 70"	1
10	10917	Hose — 3/8 x 33"	1
11	10918	Hose — 3/8 x 52"	2
12	0568	Support — Hose	6
13	7369	Clamp — Hose	6
14	10647	Bolt — Carriage 1/2 x 4 NC, PL	7
15	10395	Nut — Lock 1/2 NC, PL	7
16	10499	Bolt — Carriage 3/8 x 1-3/4 NC, PL	6
17	10509	Nut — Bolt 3/8 NC, PL	6
	10940	Tape — Teflon (Not Shown)	1



F9 HYDRAULIC CIRCUIT

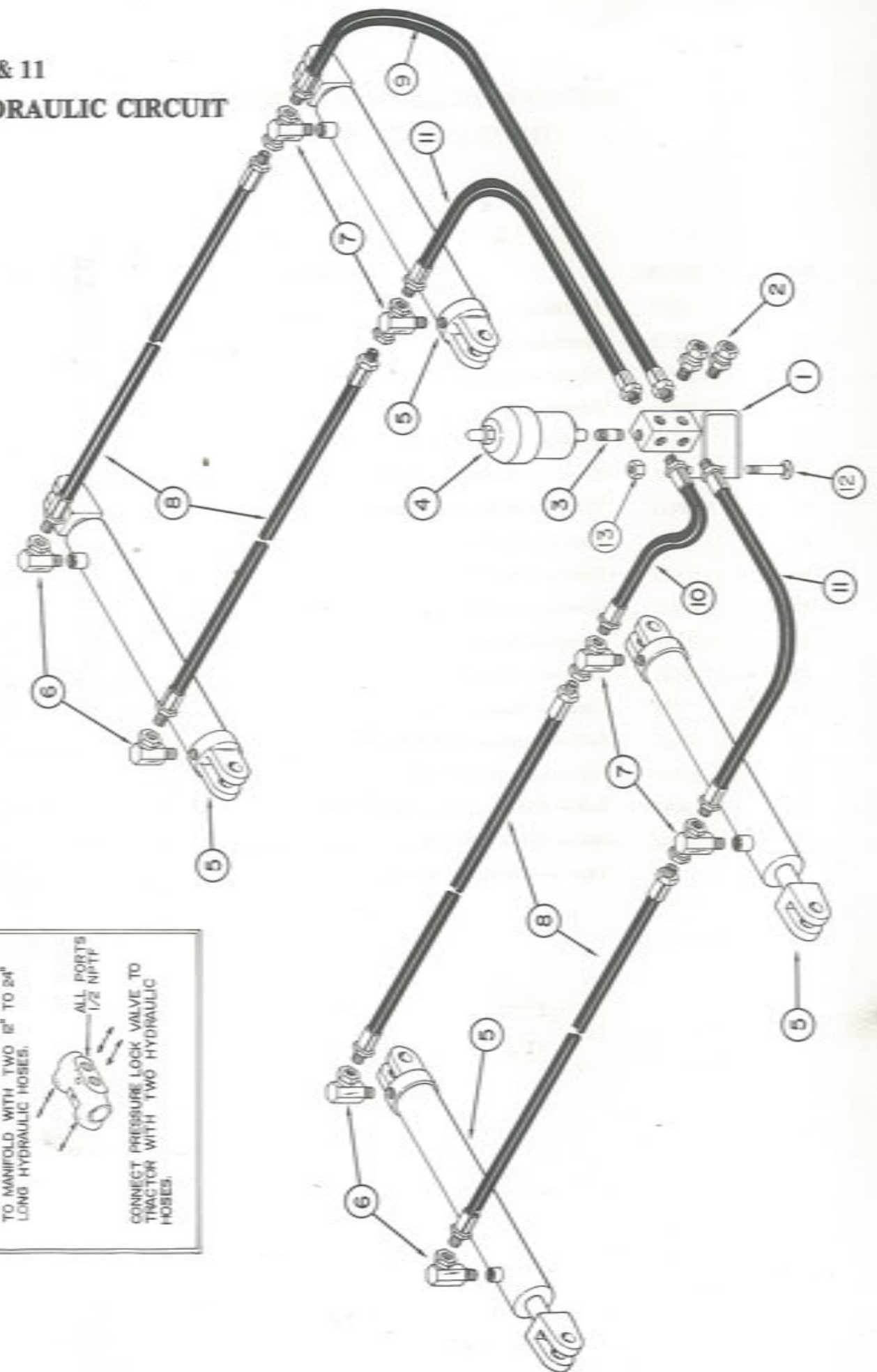
AMCO F10 & 11 SERIES DISK HARROW HYDRAULIC CIRCUIT

Ref. No.	Part No.	Description	No. Req'd
1	0764	Assy Manifold	1
2	10932	Restrictor	2
3	11097	Nipple — Adapter	1
4	10920	Accumulator	1
5	10916	Cylinder 3 x 16	4
6	11127	Elbow — 90° Swivel 1/2 NPTF to 1/4 NPTF	4
7	11126	Tee — Male Branch 1/2 NPTF to 1/4 NPTF	4
8	11123	Hose 1/4 x 96	4
9	11121	Hose 1/4 x 72	1
10	11119	Hose 1/4 x 36	1
11	11120	Hose 1/4 x 54	2
12	10647	Carriage Bolt 1/2 x 4 — NC, PL	1
13	10395	Lock Nut 1/2 NC, PL	1
	10940	Tape — Teflon (Not Shown)	1

AMCO F9, 10 & 11 SERIES DISK HARROW PRESSURE LOCK VALVE [Optional]

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

F10 & 11 HYDRAULIC CIRCUIT



—OPTIONAL PRESSURE LOCK VALVE—
CONNECT PRESSURE LOCK VALVE
TO MANIFOLD WITH TWO 12" TO 24"
LONG HYDRAULIC HOSES.

ALL PORTS
1/2 NPTF

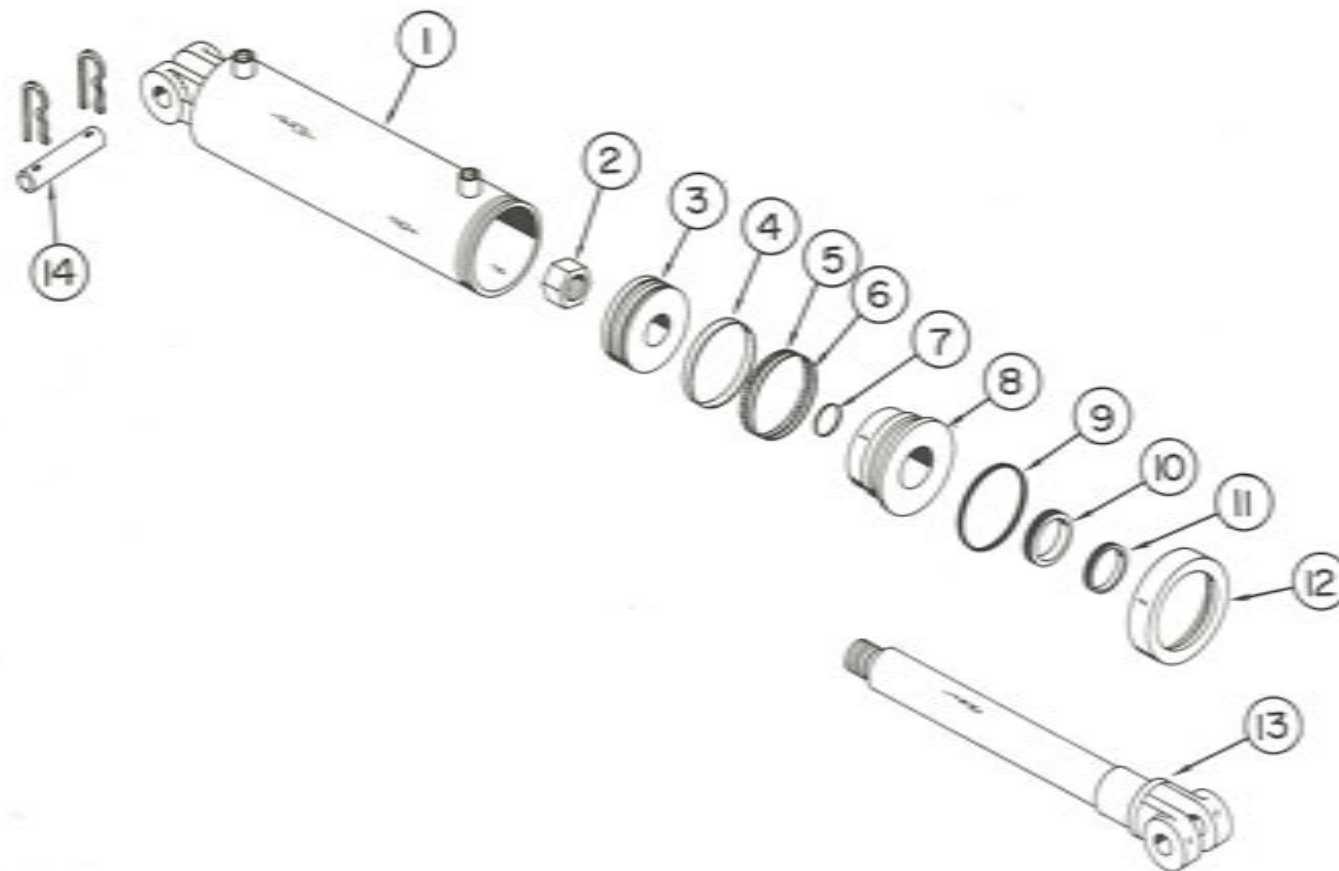
CONNECT PRESSURE LOCK VALVE TO
TRACTOR WITH TWO HYDRAULIC
HOSES.

AMCO F10 & 11 SERIES DISK HARROW 3 x 16 HYDRAULIC CYLINDER [Lantex BL Series]

USED ON F10 HARROWS SERIAL NO. 153 AND UP
USED ON F11 HARROWS SERIAL NO. 5209 AND UP

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

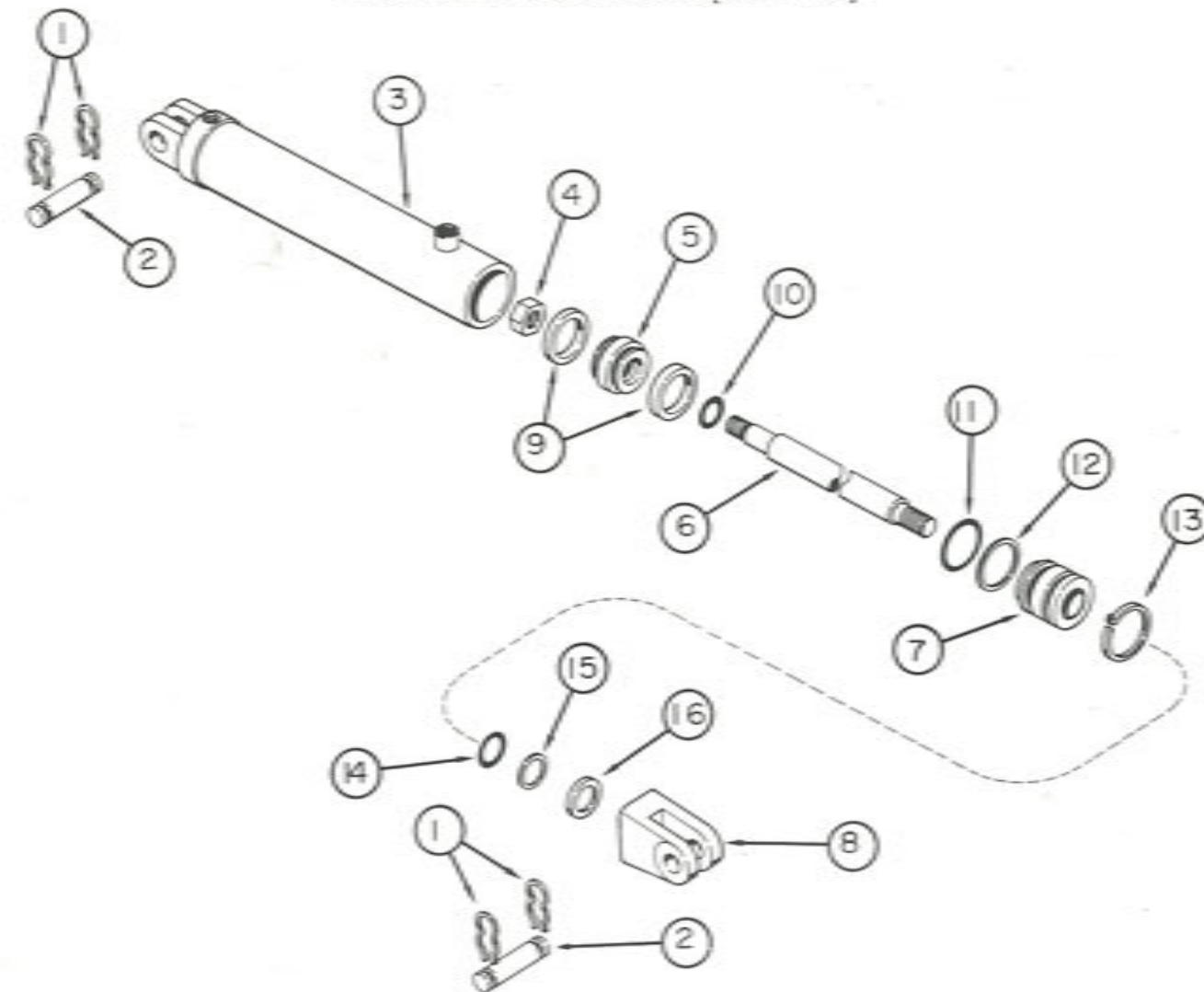


+ FL2- AMCO F9, 10 & 11 SERIES DISK HARROW 3 x 16 HYDRAULIC CYLINDER [Prince #P-1046]

USED ON F10 HARROWS BEFORE SERIAL NO. 153
USED ON F11 HARROWS BEFORE SERIAL NO. 5209

Ref. No.	Part No.	Description	No. Req'd
	10916	Cylinder Complete (Prince #P-1046)	4
1	10957	Clip — Hair Pin	2
2	11096	Pin — Clevis 1 Dia. x 3-1/2 Long	1
3	10983	Butt & Tube	1
4	10986	Nut — Lock 3/4 - 16 NF	1
5	10985	Piston	1
6	10982	Rod — Piston	1
7	10984	Gland	1
8	10987	Clevis	1
	10996	Kit — Seal Repair (Prince #PMCK-P1046)	1
9	10988	Cup — "U"	2
10	10989	Ring — "O"	1
11	10990	Ring — "O"	1
12	10991	Washer — Back Up	1
13	10995	Ring — Retainer	1
14	10992	Ring — "O"	1
15	10993	Washer — Back Up	1
16	10994	Wiper	1

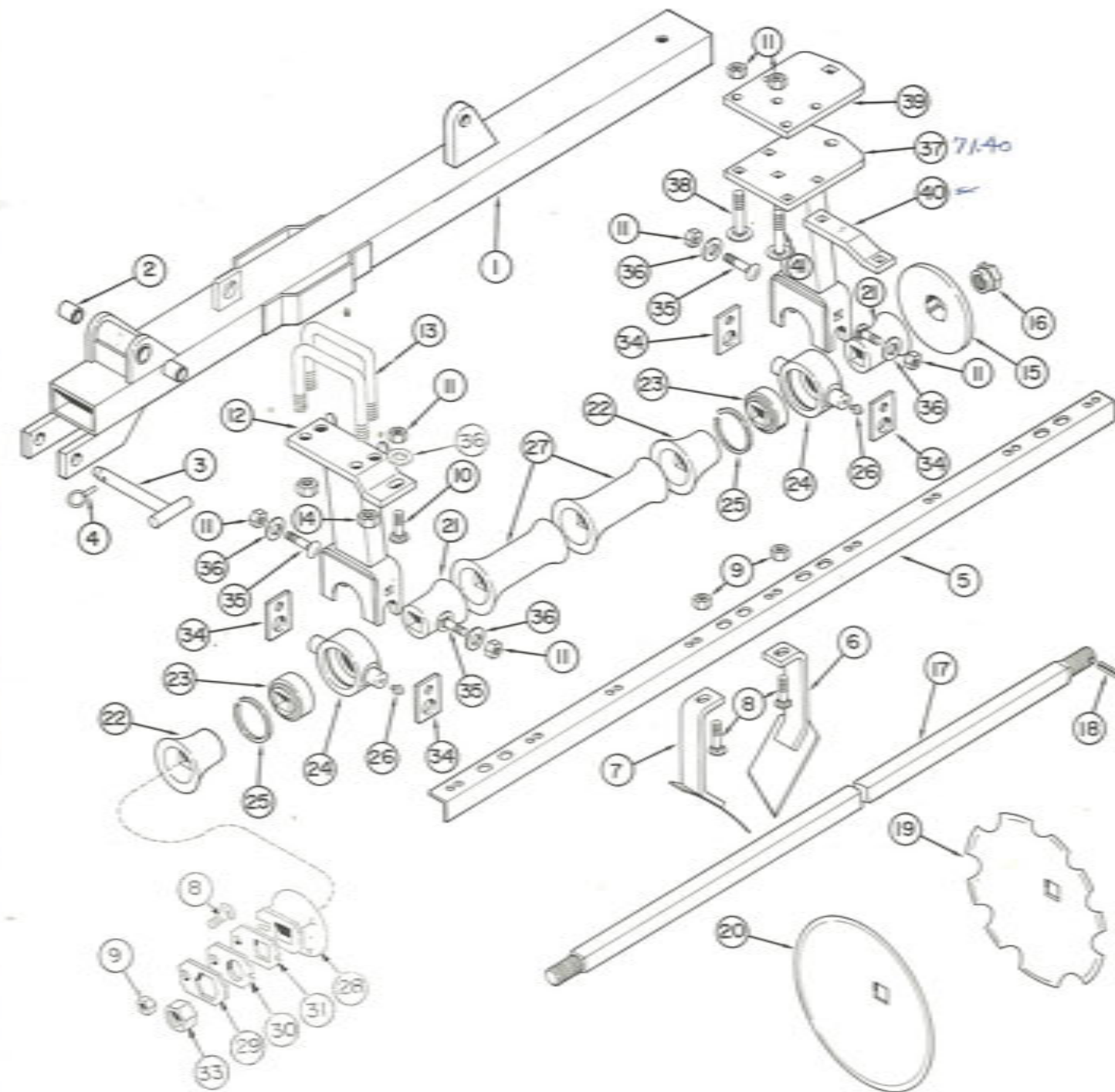
Note: Item 9-16 Sold in Seal Repair Kit Only



AMCO F9 SERIES DISK HARROW FRONT INSIDE GANG

Ref. No.	Part No.	Description	No. Req'd
1	0562	Frame — Gang Front	1
2	9637	Bushing — Fallon <i>Replaced by 11501</i>	2
3	0618	Pin — Pivot	1
4	10317	Pin — Klik	1
5	9551	Bar — Scraper 79 1/4	1
6	0533	Scraper — FRH, RLH	9
7	0534	Scraper — FLH, RRH	9
8	10870	Bolt — Carriage 1/2 x 1-1/2 NC, PL, GR5	10
9	10395	Nut — Lock 1/2 NC PL	10
10	10135	Bolt — 5/8 x 1-3/4 NC, PL	3
11	10299	Nut — Lock 5/8 NC, PL	14
12	0551	Riser — Bearing FRH, RLH	2
12	0560	Riser — Bearing FLH, RRH	2
13	6513	Bolt — "U"	4
14	10300	Nut — Lock 3/4 NC, PL	8
15	9578	Washer — Bumper	1
16	9577	Nut — Gang Bolt Special	1
17	9445	Bolt — Gang 9 Blade 79-7/8	1
18	10910	Pin — Roll 5/16 x 2-1/4	1
19	11573	Blade — 24 Dia x 3/16 CO	9
19	3275	Blade — 22 Dia x 1/4 CO	9
19	9484	Blade — 22 Dia x 3/16 CO	9
20	11574	Blade — 24 Dia x 3/16 Plain	9
20	3276	Blade — 22 Dia x 1/4 Plain	9
20	9480	Blade — 22 Dia x 3/16 Plain	9
21	9350	Bell — End Small	3
22	9351	Bell — End Large	3
	FB-09-0001	Bearing and Housing (Fully Assembled)	3
23	G11071	Bearing — (Fafnir GW211PP3)	1
24	G2668	Housing	1
25	11064	Ring — Snap	1
26	10606	Fitting — Grease 1/8 NPT Straight	1
27	9272	Spool — Spacer	5
28	1222A	Washer — End Gang	1
29	5622A	Plate — Lock	1
30	100098	Bearing Plate	1
31	100099	Spacer Plate	As Required
33	10489	Nut — Gang Bolt 1-1/2 NF	1
34	9628	Clamp — Trunion	6
35	10665	Bolt — Carriage 5/8 x 2 NC, PL, GR5	6
36	10059	Washer — 5/8 PL	9
37	0558	Riser — Bearing Inside Front	1
38	10130	Bolt — Carriage 5/8 x 5 NC, PL	4
39	5638	Plate — Pivot Upper	1
40	9474	Mount — Scraper Bar — Special	1
41	10073	Bolt — Carriage 5/8 x 6 NC, PL	1
	8970	Spacer — 3/8 Thick x 6 Dia. (Not Shown)	As Required
	10396	Nut — Lock 7/8 NC, PL (Not Shown)	1
	10370	Bolt — Carriage 7/8 x 5-1/2 — NC, PL (Not Shown)	1

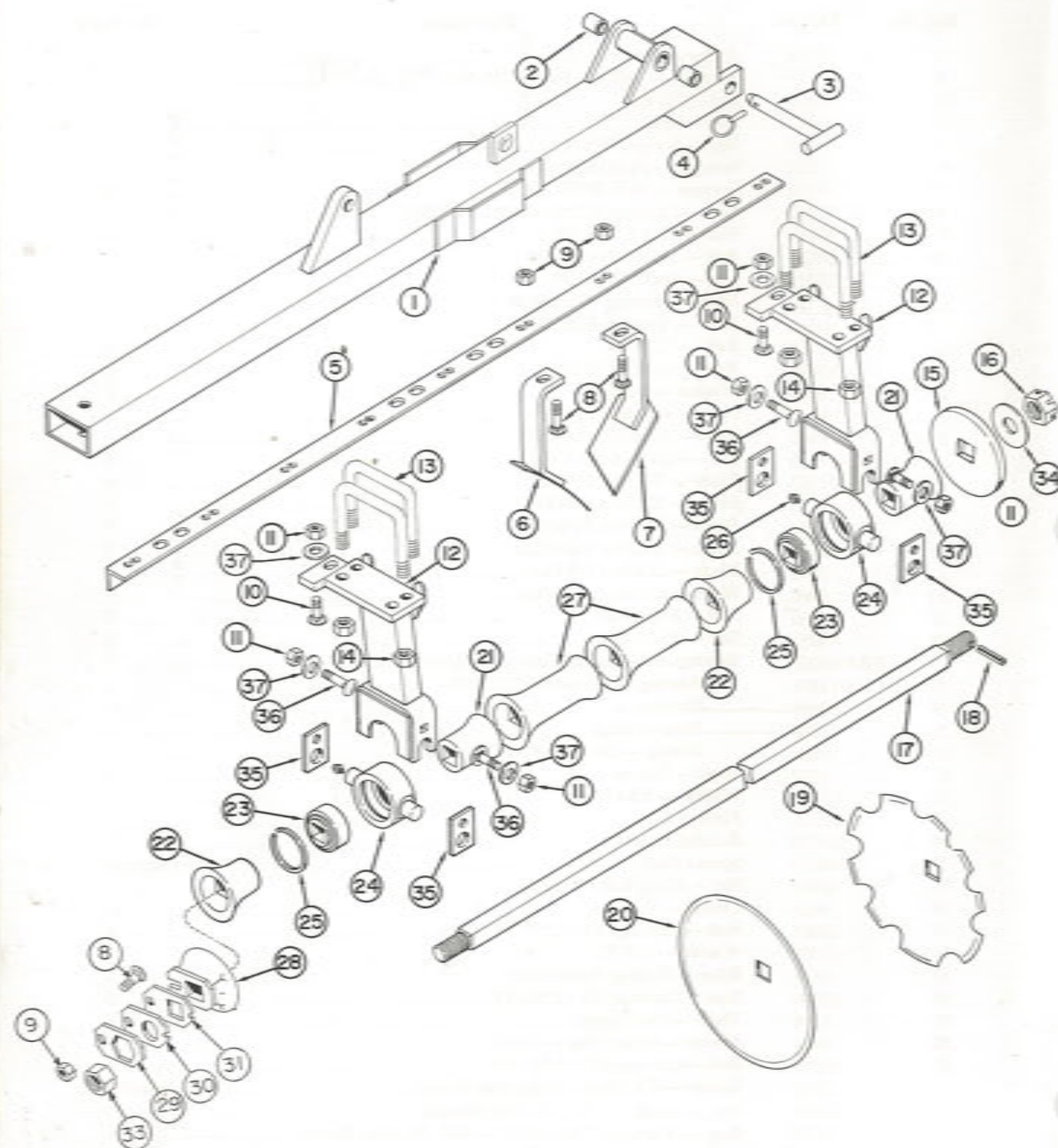
FRONT INSIDE GANG — F9



AMCO F9 SERIES DISK HARROW REAR INSIDE GANG

Ref. No.	Part No.	Description	No. Req'd
1	0563	Frame — Gang Rear	1
2	9637	Bushing — Fallon	2
3	0618	Pin — Pivot	1
4	10317	Pin — Klik	1
5	9651	Bar — Scraper 79-1/4	1
6	0533	Scraper — FRH, RLH	9
7	0534	Scraper — FLH, RRH	9
8	10870	Bolt — Carriage 1/2 x 1-1/2 NC, PL, GR5	10
9	10395	Nut — Lock 1/2 NC, PL	10
10	10135	Bolt — 5/8 x 1-3/4 NC, PL	3
11	10299	Nut — Lock 5/8 NC, PL	9
12	0559	Riser — Bearing FRH, RLH	3
12	0560	Riser — Bearing FLH, RRH	3
13	6513	Bolt — "U"	6
14	10300	Nut — Lock 3/4 NC, PL	12
15	2404	Washer — Bumper	1
16	10226	Nut — Gang Bolt 1-1/2 NF Slotted	1
17	9445	Bolt — Gang 9 Blade 79-7/8	1
18	10910	Pin — Roll 5/16 x 2-1/4	1
19	11573	Blade — 24 Dia x 3/16 CO	9
19	3275	Blade — 22 Dia x 1/4 CO	9
19	9484	Blade — 22 Dia x 3/16 CO	9
20	11574	Blade — 24 Dia x 3/16 Plain	9
20	3276	Blade — 22 Dia x 1/4 Plain	9
20	9480	Blade — 22 Dia x 3/16 Plain	9
21	9350	Bell — End Small	3
22	9351	Bell — End Large	3
	FB-09-0001	Bearing and Housing (Fully Assembled)	3
23	G11071	Bearing — (Fafnir GW211PP3)	1
24	G2668	Housing	1
25	11064	Ring — Snap	1
26	10606	Fitting — Grease 1/8 NPT Straight	1
27	9272	Spool — Spacer	5
28	1222A	Washer — End Gang	1
29	5622A	Plate — Lock	1
30	100098	Bearing Plate	1
31	100099	Spacer Plate	As Required
33	10489	Nut — Gang Bolt 1-1/2 NF	1
34	10872	Washer — 1-3/8 PL	1
35	9628	Clamp — Trunion	6
36	10665	Bolt — Carriage 5/8 x 2 NC, PL, GR5	6
37	10059	Washer — 5/8 PL	9
	8970	Spacer — 3/8 Thick x 6 Dia (Not Shown)	As Required

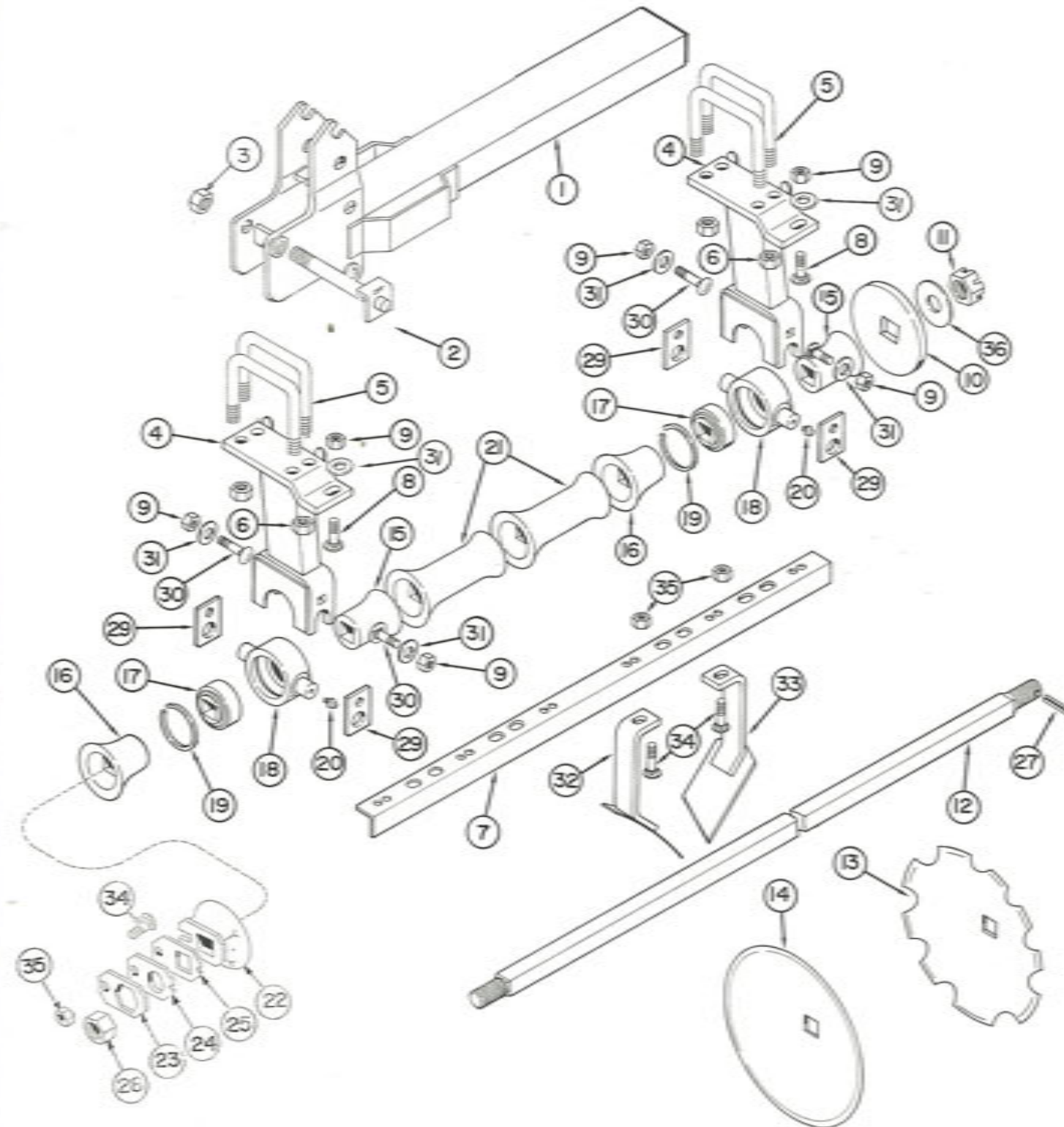
REAR INSIDE GANG — F9



AMCO F9 SERIES DISK HARROW FRONT WING GANG

Ref. No.	Part No.	Description	54 Blade	No. Required 58 Blade	62 Blade
1	0565A	Frame — Wing Gang 4 Blade	1	—	—
1	0564A	Frame — Wing Gang 5 Blade	—	1	—
1	0566A	Frame — Wing Gang 6 Blade	—	—	1
2	0727	Pin — Pivot	1	1	1
3	10397	Nut — Lock 1-1/4 NC, PL	1	1	1
4	0560	Riser — Bearing FLH, RRH	2	2	2
4	0559	Riser — Bearing FRH, RLH	2	2	2
5	6513	Bolt — "U"	4	4	4
6	10300	Nut — Lock 3/4 NC, PL	8	8	8
7	9476	Bar — Scraper 33-5/16	1	—	—
7	9475	Bar — Scraper 42-1/2	—	1	—
7	9548	Bar — Scraper 51-11/16	—	—	1
8	10135	Bolt — Carriage 5/8 x 1-3/4 NC, PL	2	2	2
9	10299	Nut — Lock 5/8 NC, PL	6	6	6
10	2404	Washer — Bumper	1	1	1
11	10226	Nut — Gang Bolt 1-1/2 NF Slotted	1	1	1
12	9440	Bolt — Gang 4 Blade 33-5/8	1	—	—
12	9441	Bolt — Gang 5 Blade 42-7/8	—	1	—
12	9442	Bolt — Gang 6 Blade 52-1/8	—	—	1
13	11573	Blade — 24 x 3/16 CO	3	4	5
13	3275	Blade — 22 x 1/4 CO	3	4	5
13	9484	Blade — 22 x 3/16 CO	3	4	5
13	9487	Blade — 20 x 3/16 CO	1	1	1
14	11574	Blade — 24 x 3/16 Plain	3	4	5
14	3276	Blade — 22 x 1/4 Plain	3	4	5
14	9480	Blade — 22 x 3/16 Plain	3	4	5
14	9481	Blade — 20 x 3/16 Plain	1	1	1
15	9350	Bell — End Small	2	2	2
16	9351	Bell — End Large	2	2	2
	FB-09-0001	Bearing and Housing (Fully Assembled)	2	2	2
17	G11071	Bearing — (Fafnir GW211PP3)	1	1	1
18	G2668	Housing — Bearing	1	1	1
19	11064	Ring — Snap	1	1	1
20	10606	Grease Fitting 1/8 NPT Straight	1	1	1
21	9272	Spool — Spacer	1	2	3
22	1222A	Washer — End Gang	1	1	1
23	5622A	Plate — Lock	1	1	1
24	100098	Bearing Plate	1	1	1
25	100099	Spacer Plate	1	As Required	1
27	10910	Pin — Roll 5/16 x 2-1/4	1	1	1
28	10489	Nut — Gang Bolt 1-1/2 NF	1	1	1
29	9628	Clamp — Trunion	4	4	4
30	10665	Bolt — Carriage 5/8 x 2 NC, PL, GR5	4	4	4
31	10059	Washer — 5/8 PL	6	6	6
32	0533	Scraper — FRH, RLH	4	5	6
33	0534	Scraper — FLH, RRH	4	5	6
34	10870	Bolt — Carriage 1/2 x 1-1/2 NC, PL, GR5	5	6	7
35	10395	Nut — Lock 1/2 NC, PL	5	6	7
36	10872	Washer 1-3/8 PL	1	1	1
	8970	Spacer — 3/8 Thick x 6 Dia (Not Shown)	—	As Required	—

FRONT WING GANG — F9

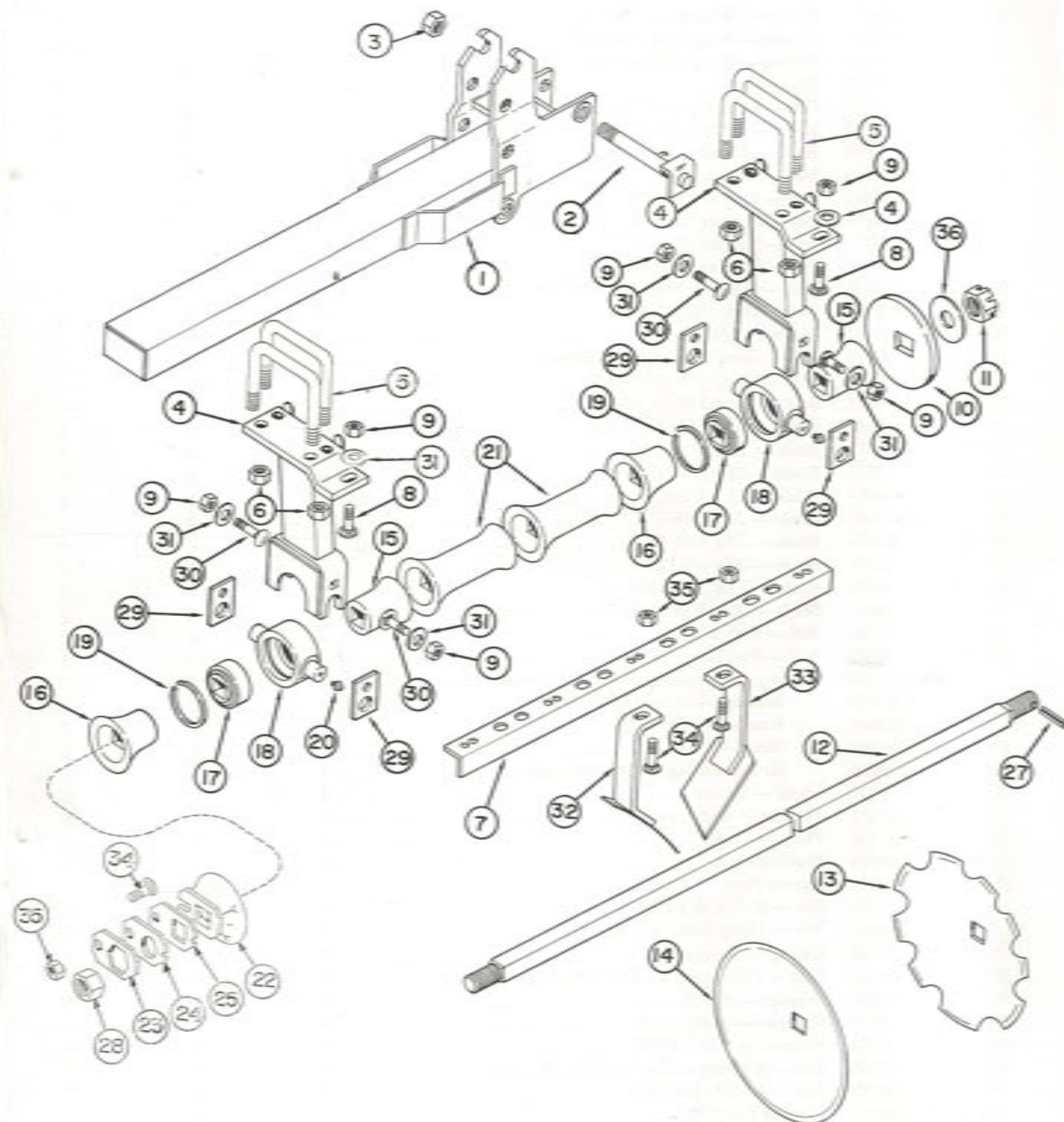


AMCO F9 SERIES DISK HARROW

REAR WING GANG

Ref. No.	Part No.	Description	54 Blade	No. Required 58 Blade	62 Blade
1	0565A	Frame — Wing Gang 4 Blade	1	—	—
1	0564A	Frame — Wing Gang 5 Blade	—	1	—
1	0566A	Frame — Wing Gang 6 Blade	—	—	1
2	0727	Pin — Pivot	1	1	1
3	10397	Nut — Lock 1-1/4 NC, PL	1	1	1
4	0560	Riser — Bearing FLH, RRH	2	2	2
4	0559	Riser — Bearing FRH, RLH	2	2	2
5	6513	Bolt — "U"	4	4	4
6	10300	Nut — Lock 3/4 NC, PL	8	8	8
7	9475	Bar — Scraper 42-1/2	1	—	—
7	9548	Bar — Scraper 51-11/16	—	1	—
7	9549	Bar — Scraper 60-7/8	—	—	1
8	10135	Bolt — Carriage 5/8 x 1-3/4 NC, PL	2	2	2
9	10299	Nut — Lock 5/8 NC, PL	6	6	6
10	2404	Washer — Bumper	1	1	1
11	10296	Nut — Gang Bolt 1-1/2 NF Slotted	1	1	1
12	9441	Bolt — Gang 5 Blade 42-7/8	1	—	—
12	9442	Bolt — Gang 6 Blade 52-1/8	—	1	—
12	9443	Bolt — Gang 7 Blade 61-3/8	—	—	1
13	11573	Blade — 24 x 3/16 CO	3	4	5
13	3275	Blade — 22 x 1/4 CO	3	4	5
13	9484	Blade — 22 x 3/16 CO	3	4	5
13	9487	Blade — 20 x 3/16 CO	1	1	1
14	11574	Blade — 24 x 3/16 Plain	3	4	5
14	3276	Blade — 22 x 1/4 Plain	3	4	5
14	9480	Blade — 22 x 3/16 Plain	3	4	5
14	9481	Blade — 20 x 3/16 Plain	1	1	1
14	3055	Blade — 16" 11 GA. Plain	1	1	1
15	9350	Bell — End Small	2	2	2
16	9351	Bell — End Large	2	2	2
	FB-09-0001	Bearing and Housing (Fully Assembled)	2	2	2
17	G11071	Bearing — (Fafnir GW211PP3)	1	1	1
18	G2668	Housing — Bearing	1	1	1
19	11064	Ring — Snap	1	1	1
20	10606	Fitting — Grease 1/8 NPT Straight	1	1	1
21	9272	Spool — Spacer	2	3	4
22	1222A	Washer — End Gang	1	1	1
23	5622A	Plate — Lock	1	1	1
24	100098	Bearing Plate	1	1	1
25	100099	Spacer Plate	1	As Required	1
27	10910	Pin — Roll 5/16 x 2-1/4	1	1	1
28	10489	Nut — Gang Bolt 1-1/2 NF	1	1	1
29	9628	Clamp — Trunion	4	4	4
30	10665	Bolt — Carriage 5/8 x 2 NC, PL, GR5	4	4	4
31	10059	Washer — 5/8 PL	6	6	6
32	0533	Scraper — FRH, RLH	5	6	7
33	0534	Scraper — FLH, RRH	5	6	7
34	10870	Bolt — Carriage 1/2 x 1-1/2 NC, PL, GR5	6	7	8
35	10395	Nut — Lock 1/2 NC, PL	6	7	8
36	10872	Washer — 1-3/8 PL	1	1	1
	8970	Spacer — 3/8 Thick x 6 Dia. (Not Shown)	—	As Required	—

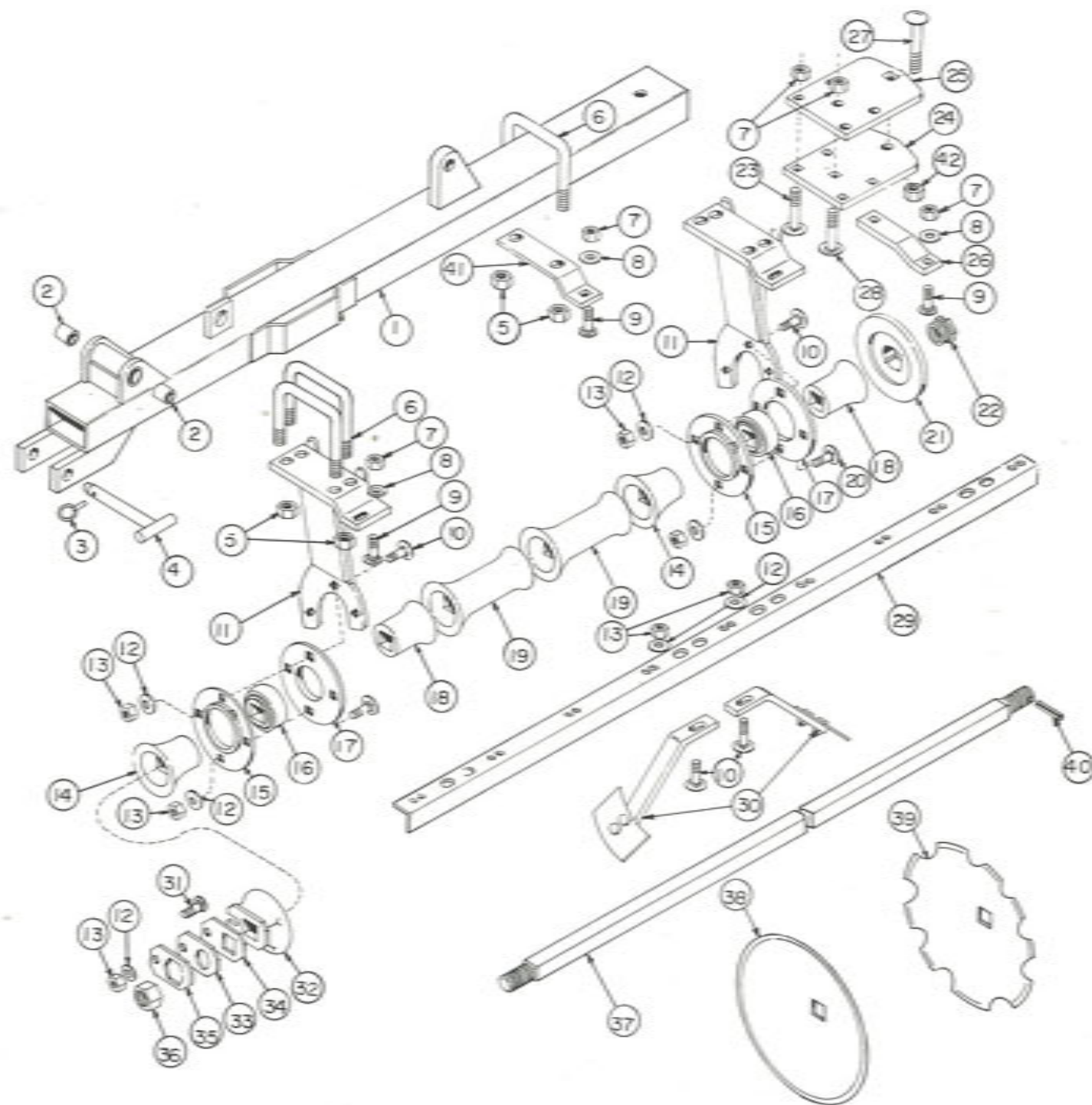
REAR WING GANG — F9



AMCO F10 SERIES DISK HARROW
FRONT INSIDE GANG

Ref. No.	Part No.	Description	No. Req'd
1	0562	Assy Gang Frame	1
2	9637	Bushing (Fafnir) 1-1/2 x 1-1/4 ID 1-1/2 LG	2
3	10317	Klik Pin	1
4	0618	Assy Pivot Pin	1
5	10300	Lock Nut 3/4 NC, PL	10
6	6513	"U" Bolt 3/4 Dia	5
7	10299	Lock Nut 5/8 NC, PL	9
8	10059	Cut Washer 5/8 PL	4
9	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	4
10	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	17
11	0758	Assy. Bearing Riser FRH, RLH	2
11	0759	Assy. Bearing Riser FLH, RRH	2
12	10832	Cut Washer 1/2 PL	21
13	10395	Lock Nut 1/2 NC, PL	21
14	9351	End Bell — Large	2
15	10904	Flangette G100 MSA2	2
16	10906	Bearing GW 211PPB3	2
17	10905	Flangette G100 MSB2	2
18	9350	End Bell — Small	2
19	9272	Spacer Spool	6
20	10860	Carriage Bolt 1/2 x 1 NC, PL	2
21	9578A	Bumper Washer	1
22	9577A	Nut Gang Bolt	1
23	10130	Carriage Bolt 5/8 x 5 NC, PL	4
24	5636	Pivot Plate Lower 5/8 x 7-1/8 x 10	1
25	5638	Pivot Plate Upper 5/8 x 7-1/8 x 10	1
26	9474	Scraper Bar Support	1
27	10370	Carriage Bolt 7/8 x 5-1/2 NC, PL	1
28	10073	Carriage Bolt 5/8 x 6 NC, PL	1
29	9923	Scraper Bar — RH — 72-1/8 Long	1
29	9924	Scraper Bar — LH — 72-1/8 Long	1
30	0788	Scraper — RH	8
	100270	Scraper Blade 3/16 x 4 x 6	1
	100271	Scraper Leg 1/2 x 1-1/2	1
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2
	10395	Lock Nut 1/2 NC, PL	2
30	0789	Scraper — LH	8
	100270	Scraper Blade 3/16 x 4 x 6	1
	100271	Scraper Leg 1/2 x 1-1/2	1
	10785	Hex Bolt 1/2 x 1-1/2 — NC, PL	2
	10395	Lock Nut 1/2 NC, PL	2
31	10710	Carriage Bolt 1/2 x 2 NC, PL	1
32	1222A	End Gang Washer	1
33	100098	Bearing Plate	1
34	100099	Spacer Plate	As Required
35	5622A	Lock Plate	1
36	10489	Nut Gang Bolt 1-1/2 NF, CH	1
37	9445	Gang Bolt 1-1/2 SQ. x 79-7/8 Long	1
38	9480	Blade 22 x 3/16 Plain	9
39	9484	Blade 22 x 3/16 CO	9
40	10910	Roll Pin 5/16 x 2-1/4	1
41	100170	Scraper Bar Mount 5/8 x 2 x 12 Long	1
42	10396	Lock Nut 7/8 NC, PL	1

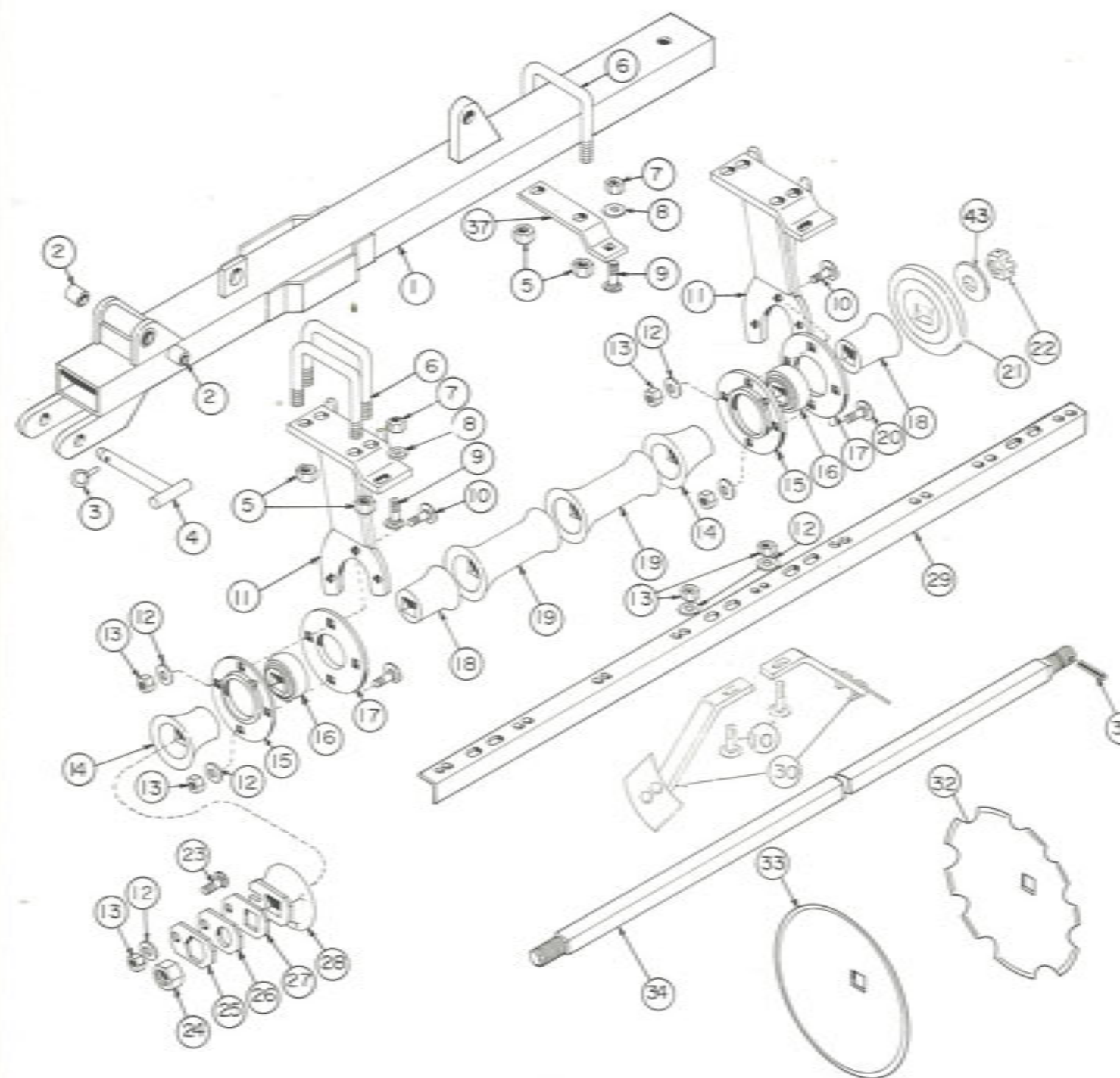
FRONT INSIDE GANG — F10



AMCO F10 SERIES DISK HARROW REAR INSIDE GANG

Ref. No.	Part No.	Description	No. Req'd
1	0762	Assy Gang Frame — Rear	1
2	9637	Bushing (Fafcon) 1-1/2 OD x 1-1/4 ID 1-1/2 L	2
3	10317	Klik Pin	1
4	0618	Assy. Pivot Pin	1
5	10300	Lock Nut 3/4 NC, PL	10
6	6513	"U" Bolt 3/4 Dia	5
7	10299	Lock Nut 5/8 NC, PL	3
8	10059	Cut Washer 5/8 PL	3
9	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	3
10	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	17
11	0758	Assy Bearing Riser FRH, RLH	2
11	0759	Assy Bearing Riser FLH, RRH	2
12	10832	Cut Washer 1/2 PL	21
13	10395	Lock Nut 1/2 NC, PL	21
14	9351	End Bell — Large	2
15	10904	Flangette G100 MSA2	2
16	10906	Bearing GW 211PPP3	2
17	10905	Flangette G100MSB2	2
18	9350	End Bell — Small	2
19	9272	Spacer Spool	5
20	10860	Carriage Bolt 1/2 x 1 NC, PL	2
21	2404	Bumper Washer	1
22	10226	Nut Gang Bolt 1-1/2 NF Slotted	1
23	10710	Carriage Bolt 1/2 x 2 NC, PL	1
24	10489	Nut Gang Bolt 1-1/2 NF, CH	1
25	5622A	Lock Plate	1
26	100098	Bearing Plate	1
27	100099	Spacer Plate	As Required
28	1222A	End Gang Washer	1
29	9921	Scraper Bar RH 62-15/16 Long	1
29	9922	Scraper Bar LH 62-15/16 Long	1
30	0788	Scraper — RH	7
	100270	Scraper Blade 3/16 x 4 x 6	1
	100271	Scraper Leg 1/2 x 1-1/2	1
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2
	10395	Lock Nut 1/2 NC, PL	2
30	0789	Scraper — LH	7
	100270	Scraper Blade 3/16 x 4 x 6	1
	100271	Scraper Leg 1/2 x 1-1/2	1
	10785	Hex Bolt 1/2 x 1-1/2 — NC, PL	2
	10395	Lock Nut 1/2 NC, PL	2
31	10910	Roll Pin 5/16 x 2-1/4	1
32	9484	Blade 22 x 3/16 CO	8
33	9480	Blade 22 x 3/16 Plain	8
34	9444	Gang Bolt 1-1/2 SQ. 70-5/8 Long	1
37	100170	Scraper Bar Mount 5/8 x 2 x 12 Long	1
43	10872	Washer 1-3/8	1

REAR INSIDE GANG — F10

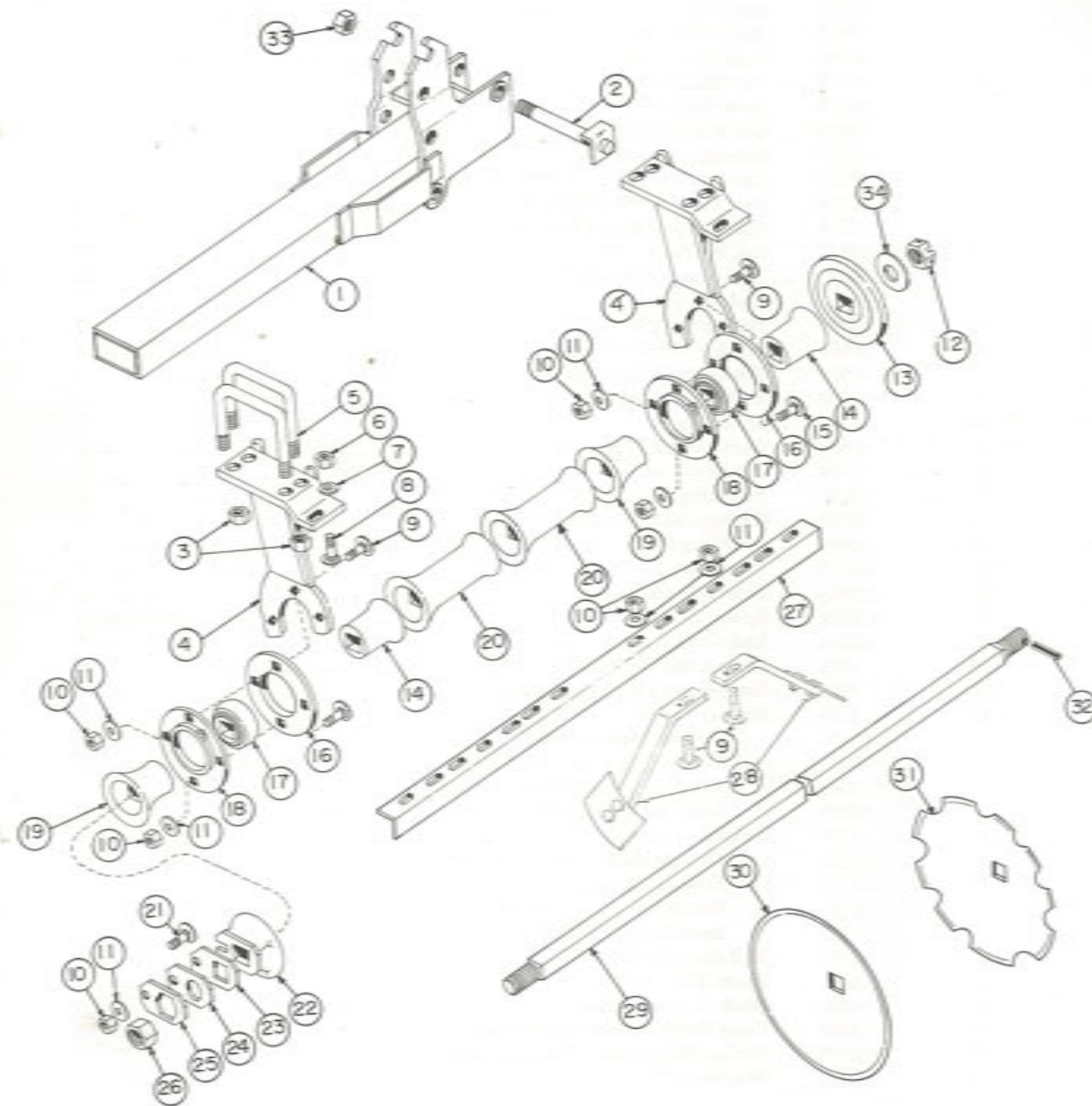


AMCO F10 SERIES DISK HARROW

FRONT WING GANG

Ref. No.	Part No.	Description	54 Blade	No. Required 58 Blade	62 Blade
1	0565A	Frame — Wing Gang 4 Blade	1	—	—
1	0564A	Frame — Wing Gang 5 Blade	—	1	—
1	0566A	Frame — Wing Gang 6 Blade	—	—	1
2	0727	Assy Pivot Pin	1	1	1
3	10300	Lock Nut 3/4 NC, PL	8	8	8
4	0758	Assy Bearing Riser FRH, RLH	2	2	2
4	0759	Assy Bearing Riser FLH, RRH	2	2	2
5	6513	"U" Bolt 3/4 Dia	4	4	4
6	10299	Lock Nut 5/8 NC, PL	2	2	2
7	10059	Cut Washer 5/8 PL	2	2	2
8	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	2	2	2
9	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	10	10	10
10	10395	Lock Nut 1/2 NC, PL	11	11	11
11	10832	Cut Washer 1/2 PL	11	11	11
12	10226	Nut Gang Bolt 1-1/2 NF Slotted	1	1	1
13	2404	Bumper Washer	1	1	1
14	9350	End Bell Small	2	2	2
15	10860	Carriage Bolt 1/2 x 1 NC, PL	2	2	2
16	10905	Flangette G100MSB2	2	2	2
17	10906	Bearing GW211PPB3	2	2	2
18	10904	Flangette G100MSA2	2	2	2
19	9351	End Bell — Large	2	2	2
20	9272	Spacer Spool	1	2	2
21	10710	Carriage Bolt 1/2 x 2 NC, PL	1	1	1
22	1222A	End Gang Washer	1	1	1
23	100098	Bearing Plate	1	1	1
24	100099	Spacer Plate	—	As Required	—
25	5622A	Lock Plate	1	1	1
26	10489	Nut Gang Bolt 1-1/2 NF	1	1	1
27	9476	Scraper Bar 33-5/16	1	—	—
27	9475	Scraper Bar 42-1/2	—	1	—
27	9548	Scraper Bar 51-11/16	—	—	1
28	0789	Scraper LH	4	5	6
	100270	Scraper Blade 3/16 x 4 x 6	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 — NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	2	—	—
28	0788	Scraper RH	4	5	6
	100270	Scraper Blade 3/16 x 4 x 6	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	2	—	—
29	9440	Gang Bolt 4 Blade 1-1/2 SQ. 33-5/8 Long	1	1	1
29	9441	Gang Bolt 5 Blade 1-1/2 SQ. 42-7/8 Long	—	1	—
29	9442	Gang Bolt 6 Blade 1-1/2 SQ. 52-1/8 Long	—	—	1
30	9480	Blade 22 x 3/16 Plain	3	4	5
30	9481	Blade 20 x 3/16 Plain	1	1	1
31	9484	Blade 22 x 3/16 CO	3	4	5
31	9487	Blade 20 x 3/16 CO	1	1	1
32	10910	Roll Pin 5/16 x 21/4	1	1	1
33	10397	Lock Nut 1-1/4 NC, PL	1	1	1
34	10872	Cut Washer 1-3/8 PLT	1	1	1

FRONT WING GANG — F10



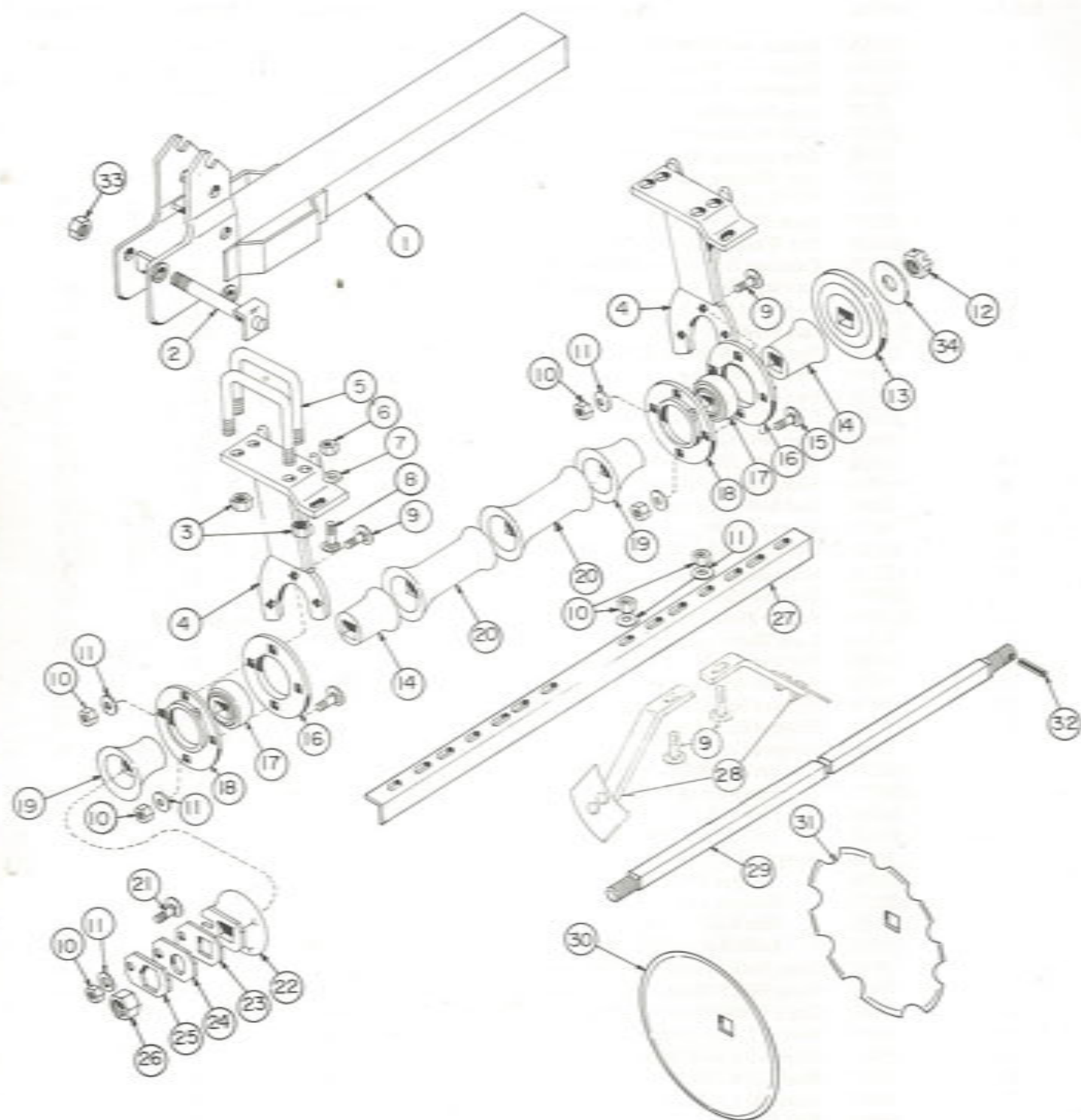
AMCO F10 SERIES DISK HARROW REAR WING GANG

31

Ref. No.	Part No.	Description	54 Blade	No. Required 58 Blade	62 Blade
1	0564A	Frame — Wing Gang 5 Blade	1	—	—
1	0566A	Frame — Wing Gang 6 Blade	—	1	—
1	0763	Frame — Wing Gang 7 Blade	—	—	1
2	0727	Assy Pivot Pin	1	1	1
3	10300	Lock Nut 3/4 NC, PL	8	8	10
4	0758	Assy Bearing Riser FRH, RLH	2	2	2
4	0759	Assy Bearing Riser FLH, RRH	2	2	2
5	6513	"U" Bolt 3/4 Dia	4	4	5
6	10299	Lock Nut 5/8 NC, PL	2	2	3
7	10059	Cut Washer 5/8 PLT	2	2	3
8	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	2	2	3
9	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL GR5	12	13	14
10	10395	Lock Nut 1/2 NC, PL	13	14	15
11	10832	Cut Washer 1/2 PL	13	14	15
12	10226	Nut Gang Bolt 1-1/2 NF Slotted	1	1	1
13	2404	Bumper Washer	1	1	1
14	9350	End Bell Small	2	2	2
15	10860	Carriage Bolt 1/2 x 1 NC, PL	2	2	2
16	10905	Flangette G100MSB2	2	2	2
17	10906	Bearing GW211PPB3	2	2	2
18	10904	Flangette G100MSA2	2	2	2
19	9351	End Bell Large	2	2	2
20	0222	Spacer Spool Sub 0522	3	4	5
21	10710	Carriage Bolt 1/2 x 2 NC, PL	1	1	1
22	1222A	End Gang Washer	1	1	1
23	100098	Bearing Plate	1	1	1
24	100099	Spacer Plate	—	As Required	—
25	5622A	Lock Plate	1	1	1
26	10489	Nut Gang Bolt 1/2 NF	1	1	1
27	9548	Scraper Bar 51-11/16	1	—	—
27	9549	Scraper Bar 60-7/8	—	1	—
27	9550	Scraper Bar 70-1/16	—	—	1
28	0788	Scraper — RH	6	7	8
	100270	Scraper Blade 3/16 x 4 x 6	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	1	—	—
28	0789	Scraper — LH	6	7	8
	100270	Scraper Blade 3/16 x 4 x 6	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	2	—	—
29	9442	Gang Bolt 6 Blade 1-1/2 SQ. 52-1/8 Long	1	—	—
29	9443	Gang Bolt 7 Blade 1-1/2 SQ. 61 3/8 Long	—	1	—
29	9444	Gang Bolt 8 Blade 1-1/2 SQ. 70-5/8 Long	—	—	1
30	9480	Blade 22 x 3/16 Plain	4	5	6
30	9481	Blade 20 x 3/16 Plain	1	1	1
30	3055	Blade 16 x 11 GA. Plain	1	1	1
31	9484	Blade 22 x 3/16 CO	4	5	6
31	9487	Blade 20 x 3/16 CO	1	1	1
32	10910	Roll Pin 5/16 x 2-1/4	1	1	1
33	10397	Lock Nut 1-1/4 NC, PL	1	1	1
34	10872	Cut Washer 1-3/8 PLT	1	1	1

30

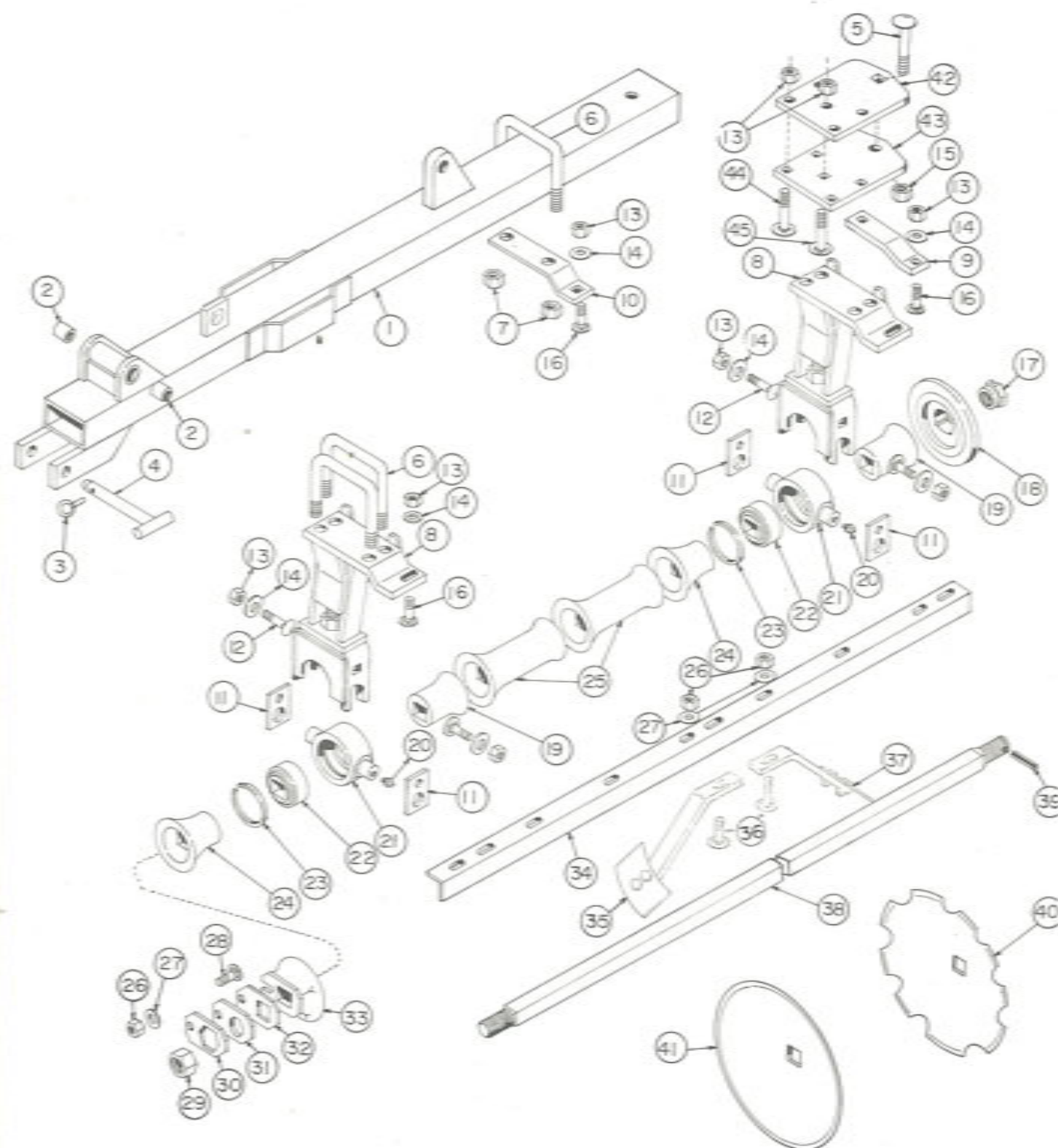
REAR WING GANG — F10



AMCO F11 SERIES DISK HARROW FRONT INSIDE GANG

Ref. No.	Part No.	Description	No. Req'd
1	0562	Assy Gang Frame Front.....	1
2	9637	Bushing (Fafnir) 1-1/2 OD x 1-1/4 ID — 1-1/2 Long.....	2
3	10317	Klik Pin.....	1
4	0618	Assy Pivot Pin.....	1
5	10370	Carriage Bolt 7/8 x 5-1/2 NC, PL.....	1
6	6513	"U" Bolt 3/4 Dia.....	5
7	10300	Lock Nut 3/4 NC, PL.....	10
8	0753	Assy Bearing Riser FLH, RRH.....	2
8	0752	Assy Bearing Riser FRH, RLH.....	2
9	9474	Scraper Bar Support.....	1
10	100170	Scraper Bar Support 5/8 x 2 HRMS — 12 Long.....	1
11	9628	Clamp Trunion 3/8 x 2-1/2 HRMS 3-3/4 Long.....	4
12	10665	Carriage Bolt 5/8 x 2 NC, PLT, GR5.....	4
13	10299	Lock Nut 5/8 NC, PLT.....	13
14	10059	Cut Washer 5/8 PLT.....	8
15	10396	Lock Nut 7/8 NC, PL.....	1
16	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL.....	4
17	9577A	Nut Gang Bolt.....	1
18	9578A	Bumper Washer.....	1
19	9350	End Bell — Small.....	2
	FB-09-0013	Bearing and Housing (Fully Assembled).....	2
20	10606	Grease Fitting.....	1
21	16003	Bearing Housing.....	1
22	G11071	Bearing (Fafnir GW211PP3).....	1
	100104	Washer 100 mm (Not Shown).....	2
	11064	Retainer Ring.....	1
23		End Bell — Large.....	2
24	9351	Spacer Spool.....	6
25	9272	Lock Nut 1/2 NC, PL.....	8
26	10395	Cut Washer 1/2 PL.....	8
27	10832	Carriage Bolt 1/2 x 2 NC, PL.....	1
28	10710	Lock Nut 1-1/4 NC, PL.....	1
29	10397	Lock Plate.....	1
30	5622A	Bearing Plate.....	1
31	100098	Spacer Plate.....	As Required
32	100099	End Gang Washer.....	1
33	1222A	Scraper Bar RH 72-1/8 Long.....	1
34	9923	Scraper Bar LH 72-1/8 Long.....	1
34	9924	Scraper LH.....	8
35	0789	Scraper Blade 3/16 x 4 x 6.....	1
	100270	Scraper Leg 1/2 x 1-1/2.....	1
	100271	Hex Bolt 1/2 x 1-1/2 NC, PL.....	2
	10785	Lock Nut 1/2 NC, PL.....	2
	10395	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5.....	7
36	10870	Scraper RH.....	8
37	0788	Scraper Blade 3/16 x 4 x 6.....	1
	100270	Scraper Leg 1/2 x 1-1/2.....	1
	100271	Hex Bolt 1/2 x 1-1/2 NC, PL.....	2
	10785	Lock Nut 1/2 NC, PL.....	2
	10395	Gang Bolt 1-1/2 SQ. 79-7/8 Long.....	1
38	9445	Roll Pin 5/16 x 2-1/4.....	1
39	10910	Blade 22 x 3/16 CO.....	8
40	9484	Blade 24 x 3/16 CO.....	8
40	11573	Blade 22 x 1/4 CO.....	8
40	3275	Blade 22 x 3/16 Plain.....	8
41	9480	Blade 24 x 3/16 Plain.....	8
41	11574	Blade 22 x 1/4 Plain.....	8
41	3276	Pivot Plate Upper 5/8 7-1/8 x 10.....	1
42	5638	Pivot Plate Lower 5/8 7-1/8 x 10.....	1
43	5636	Carriage Bolt 5/8 x 5 NC, PL.....	4
44	10130	Carriage Bolt 5/8 x 6 NC, PL.....	1
45	10073		

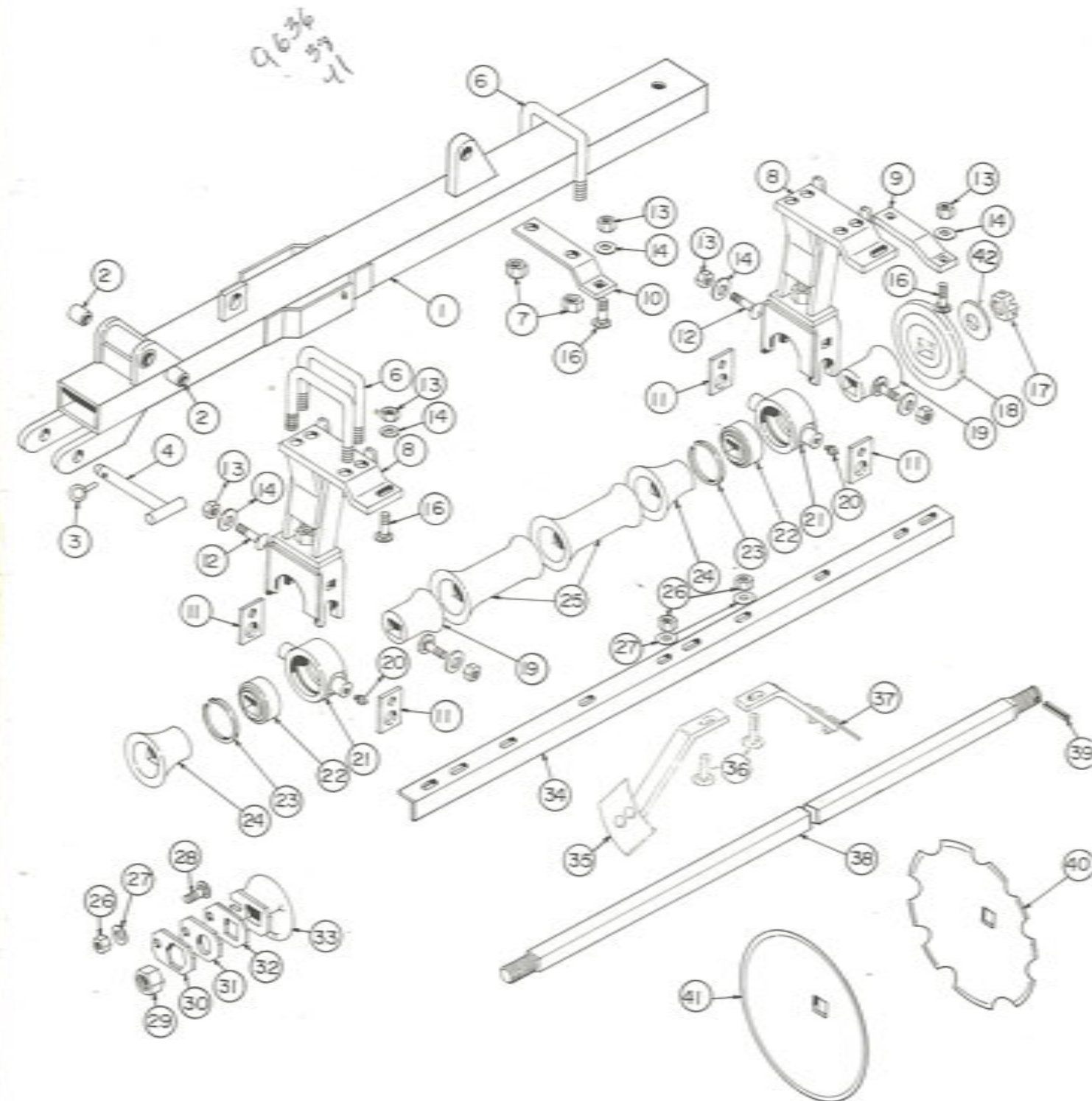
FRONT INSIDE GANG — F11



AMCO F11 SERIES DISK HARROW REAR INSIDE GANG

Ref. No.	Part No.	Description	No. Req'd
1	0762	Assy Gang Frame — Rear	1
2	9637	Bushing [Fallon] 1-1/2 OD x 1-1/4 ID — 1-1/2 Long	2
3	10317	Klik Pin	1
4	0618	Assy Pivot Pin	1
6	6513	"U" Bolt 3/4 Dia	5
7	10300	Lock Nut 3/4 NC, PL	10
8	0753	Assy Bearing Riser FLH, RRH	2
8	0752	Assy Bearing Riser FRH, RLH	2
9	9474	Scraper Bar Support	1
10	100170	Scraper Bar Support 5/8 x 2 HRMS - 12 Long	1
11	9628	Clamp Trunion 3/8 x 2-1/2 HRMS 3-3/4 Long	4
12	10665	Carriage Bolt 5/8 x 2 NC, PLT, GR5	4
13	10299	Lock Nut 5/8 NC, PLT	7
14	10059	Cut Washer 5/8 PLT	7
16	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	3
17	10226	Nut Gang Bolt 1-1/2 NF Slotted	1
18	2404	Bumper Washer	1
19	9350	End Bell — Small	2
	FB-09-0013	Bearing and Housing (Fully Assembled)	2
20	10606	Grease Fitting	1
21	16003	Bearing Housing	1
22	G11071	Bearing (Fafnir GW211PP3)	1
	100104	Washer 100mm (Not Shown)	2
	11064	Retainer Ring	1
24	9351	End Bell — Large	2
25	9272	Spacer Spool	5
26	10395	Lock Nut 1/2 NC, PL	8
27	10832	Cut Washer 1/2 PL	8
28	10710	Carriage Bolt 1/2 x 2 NC, PL	1
29	10397	Lock Nut 1-1/4 NC, PL	1
30	5622A	Lock Plate	1
31	100098	Bearing Plate	1
32	100099	Spacer Plate	As Required
33	1222A	End Gang Washer	1
34	9921	Scraper Bar RH 62-15/16	1
34	9922	Scraper Bar LH 62-15/16	1
35	0789	Scraper LH	1
	100270	Scraper Blade 3/16 x 4 x 6	1
	100271	Scraper Leg 1/2 x 1-1/2	1
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2
	10395	Lock Nut 1/2 NC, PL	2
36	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	7
37	0788	Scraper RH	7
	100270	Scraper Blade 3/16 x 4 x 6	1
	100271	Scraper Leg 1/2 x 1-1/2	1
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2
	10395	Lock Nut 1/2 NC, PL	2
38	9444	Gang Bolt 1-1/2 SQ 70-5/8 Long	1
39	10910	Roll Pin 5/16 x 2-1/4	1
40	9484	Blade 22 x 3/16 CO	8
40	11573	Blade 24 x 3/16 CO	8
40	3275	Blade 22 x 1/4 CO	8
41	9480	Blade 22 x 3/16 Plain	8
41	11574	Blade 24 x 3/16 Plain	8
41	3276	Blade 22 x 1/4 Plain	8
42	10872	Washer 1-3/8 PL	1

REAR INSIDE GANG — F11

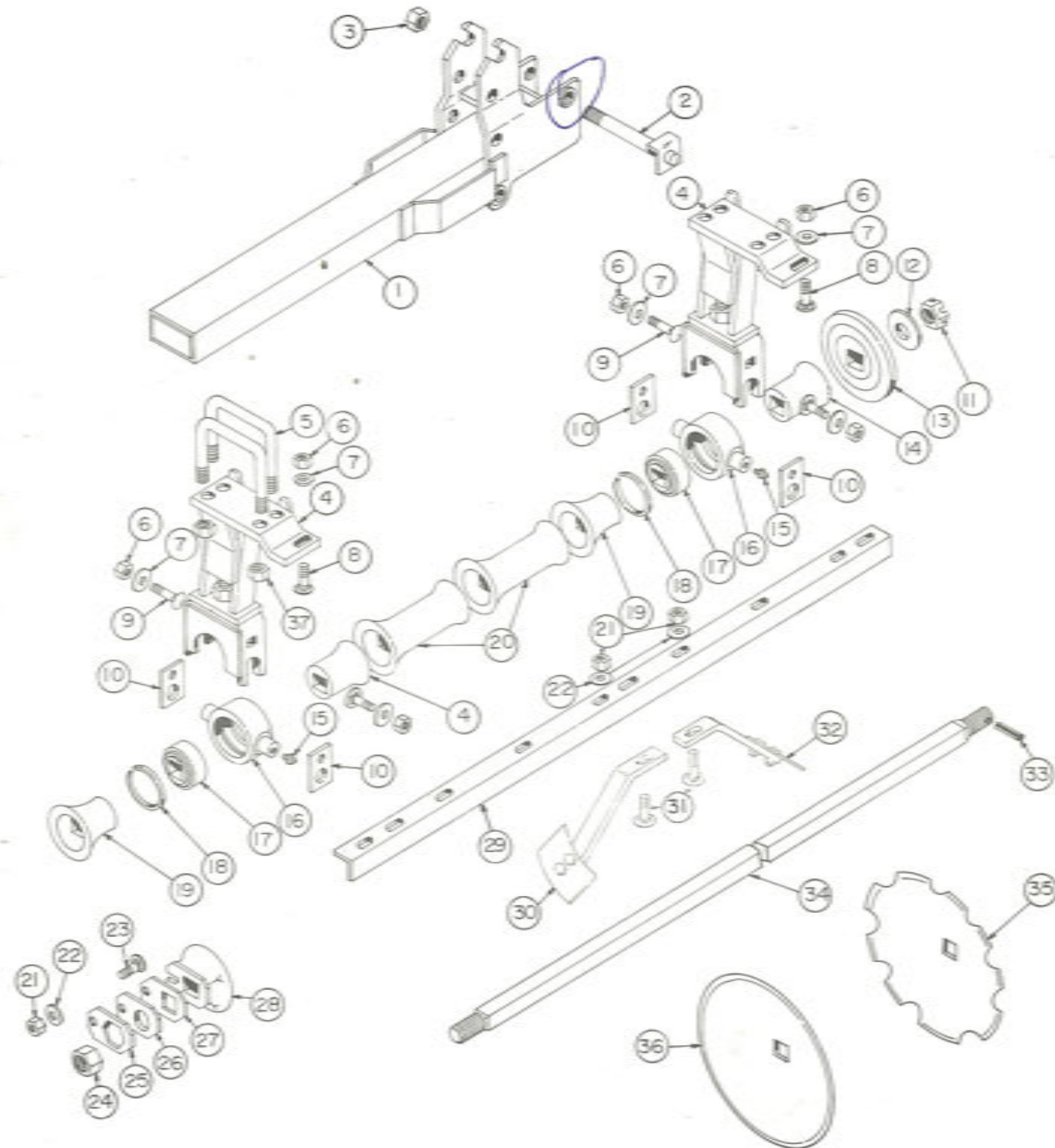


AMCO F11 SERIES DISK HARROW

FRONT WING GANG

Ref. No.	Part No.	Description	54 Blade	No. Required 58 Blade	62 Blade
1	0565A	Frame — Wing Gang 5 Blade	1	—	—
1	0564A	Frame — Wing Gang 6 Blade	—	1	—
1	0566A	Frame — Wing Gang 7 Blade	—	—	1
2	0727	Assy Pivot Pin	1	1	1
3	10397	Lock Nut 1-1/4 NC, PL	1	1	1
4	0752	Assy Bearing Riser FRH, RLH	2	2	2
4	0753	Assy Bearing Riser FLH, RRH	2	2	2
5	6513	"U" Bolt 3/4 Dia	4	4	4
6	10299	Lock Nut 5/8 NC, PLT	6	6	6
7	10059	Cut Washer 5/8 PLT	6	6	6
8	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	2	2	2
9	10665	Carriage Bolt 5/8 x 2 NC, PLT, GR5	4	4	4
10	9628	Clamp Trunion 3/8 x 2-1/2 HRMS 3-3/4 Long	4	4	4
11	10226	Nut Gang Bolt 1-1/2 NF Slotted	1	1	1
12	10872	Cut Washer 1-3/8 PLT	1	1	1
13	2404	Bumper Washer	1	1	1
14	9350	End Bell — Small	2	2	2
	FB-09-0013	Bearing and Housing (Fully Assembled)	2	2	2
15	10606	Fitting — Grease 1/8 NPT Straight	1	—	—
16	16003	Housing — Bearing	1	—	—
17	G11071	Bearing — (Fafnir GW211PP3)	1	—	—
	100104	Washer 100 mm (Not Shown)	2	—	—
18	11064	Ring — Snap	1	—	—
19	9351	End Bell — Large	2	2	2
20	9272	Spacer Spool	1	2	2
21	10395	Lock Nut 1/2 NC, PL	5	6	5
22	10832	Cut Washer 1/2 PL	6	7	8
23	10710	Carriage Bolt 1/2 x 2 NC, PL	1	1	1
24	10397	Lock Nut 1-1/4 NC, PL	1	1	1
25	5622A	Lock Plate	1	1	1
26	100098	Bearing Plate	1	1	1
27	100099	Spacer Plate	1	1	1
28	1222A	End Gang Washer	1	As Required	1
29	9476	Scraper Bar 33-5/16	1	1	1
29	9475	Scraper Bar 42-1/2	—	1	—
29	9548	Scraper Bar 51-11/16	—	—	1
30	0789	Scraper LH	4	5	6
	100270	Scraper Blade 3/16 x 4 x 6	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	2	—	—
31	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	4	5	6
32	0788	Scraper RH	4	5	6
	100270	Scraper Blade 3/16 x 4 x 6	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	2	—	—
33	10910	Roll Pin 5/16 x 2-1/4	1	1	1
34	9440	Gang Bolt 1-1/2 SQ. 33-5/8 Long	1	1	—
34	9441	Gang Bolt 1-1/2 SQ. 42-7/8 Long	—	1	—
34	9442	Gang Bolt 1-1/2 SQ. 52-1/8 Long	—	—	1
35	9484	Blade 22 x 3/16 CO	3	4	5
35	11573	Blade 24 x 3/16 CO	3	4	5
35	3275	Blade 22 x 1/4 CO	3	4	5
35	9481	Blade 20 x 3/16 Plain	1	1	1
36	11574	Blade 24 x 3/16 Plain	3	4	5
36	9480	Blade 22 x 3/16 Plain	3	4	5
36	3276	Blade 22 x 1/4 Plain	3	4	5
36	9487	Blade 20 x 3/16 CO	1	1	1
37	10300	Lock Nut 3/4 NC, PL	8	8	8

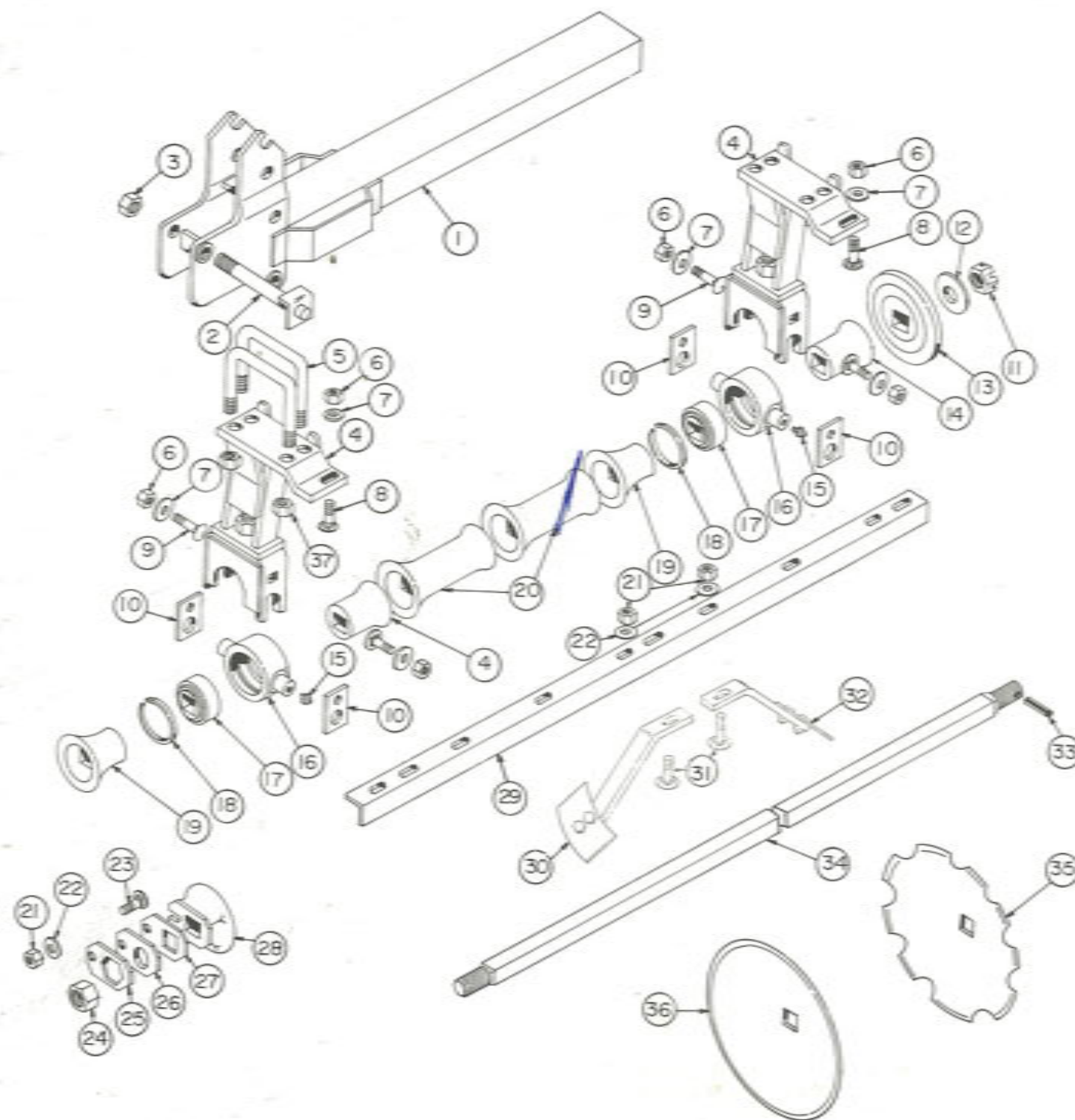
FRONT WING GANG — F11



AMCO F11 SERIES DISK HARROW REAR WING GANG

Ref. No.	Part No.	Description	54 Blade	No. Required 58 Blade	62 Blade
1	0564A	Frame — Wing Gang 5 Blade	1	—	—
1	0565A	Frame — Wing Gang 6 Blade	—	1	—
1	0763	Frame — Wing Gang 7 Blade	—	—	1
2	0727	Assy Pivot Pin	1	1	1
3	10397	Lock Nut 1-1/4 NC, PL	1	1	1
4	0752	Assy Bearing Riser FLH, RRH	2	2	2
4	0753	Assy Bearing Riser FRH, RLH	2	2	2
5	6513	"U" Bolt 3/4 Dia	4	4	5
6	10299	Lock Nut 5/8 NC, PLT	6	6	7
7	10059	Cut Washer 5/8 PLT	6	6	7
8	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	2	2	3
9	10665	Carriage Bolt 5/8 x 2 NC, PLT, GR5	4	4	4
10	9628	Clamp Trunion 3/8 x 2-1/2 HRMS 3-3/4 Long	4	4	4
11	10226	Nut Gang Bolt 1-1/2 NF Slotted	1	1	1
12	10872	Cut Washer 1-3/8 PLT	1	1	1
13	2404	Bumper Washer	1	1	1
14	9350	End Bell — Small	2	2	2
	FB-09-0013	Bearing and Housing (Fully Assembled)	2	2	2
15	10606	Grease Fitting	1	—	—
16	16003	Bearing Housing	1	—	—
17	G11071	Bearing — (Fafnir GW211PP3)	1	—	—
	100104	Washer 100mm (Not Shown)	2	—	—
	11064	Retainer Ring	1	—	—
18	9351	End Bell — Large	2	2	2
19	9272	Spacer Spool	3	4	5
21	10395	Lock Nut 1/2 NC, PL	7	8	9
22	10832	Cut Washer 1/2 PL	7	8	9
23	10710	Carriage Bolt 1/2 x 2 NC, PL	1	1	1
24	10397	Lock Nut 1-1/4 NC, PL	1	1	1
25	5622A	Lock Plate	1	1	1
26	100098	Bearing Plate	1	1	1
27	100099	Spacer Plate	1	As Required	1
28	1222A	End Gang Washer	1	1	1
29	9548	Scraper Bar 51-11/16	1	1	1
29	9549	Scraper Bar 60-7/8	—	1	1
29	9550	Scraper Bar 70-1/16	—	1	1
30	0789	Scraper LH	6	7	8
	100270	Scraper Blade 3/16 x 4 x 6	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	2	—	—
31	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	6	7	8
32	0788	Scraper RH	6	7	8
	100270	Scraper RH	1	—	—
	100271	Scraper Leg 1/2 x 1-1/2	1	—	—
	10785	Hex Bolt 1/2 x 1-1/2 NC, PL	2	—	—
	10395	Lock Nut 1/2 NC, PL	2	—	—
33	10910	Roll Pin 5/16 x 2-1/4	1	1	1
34	9442	Gang Bolt 6 Blade 1-1/2 SQ. 52-1/8 Long	1	1	1
34	9443	Gang Bolt 7 Blade 1-1/2 SQ. 61-3/8 Long	—	1	1
34	9444	Gang Bolt 8 Blade 1-1/2 SQ. 70-5/8 Long	—	1	1
35	9484	Blade 22 x 3/16 CO	4	5	6
35	11573	Blade 24 x 3/16 CO	4	5	6
35	3275	Blade 22 x 1/4 CO	4	5	6
35	9487	Blade 20 x 3/16 CO	4	5	6
36	9480	Blade 22 x 3/16 Plain	4	5	6
36	11574	Blade 24 x 3/16 Plain	4	5	6
36	3276	Blade 22 x 1/4 Plain	4	5	6
36	9481	Blade 20 x 3/16 Plain	1	1	1
36	3055	Blade 16 x 11 GA Plain	1	1	1
37	10300	Lock Nut 3/4 NC, PL	8	8	10

REAR WING GANG — F11



DECALS

①

AMCO

10948

②

! WARNING

LOWER OR BLOCK ELEVATED COMPONENTS
BEFORE SERVICING OR WHEN LEAVING THE
MACHINE.

ELEVATED COMPONENTS CAN FALL AND
CAUSE SERIOUS INJURY.

11233

③

MAINTENANCE INSTRUCTIONS

1. Keep all bolts tight.
 - A. Visually inspect all bolts daily.
 - B. Check after first 50 hours or one week's operations.
2. Keep wheel bearings properly adjusted.
 - A. Clean and repack each season or every 300 hours.
 - B. Replace all worn or damaged parts when repairing.
3. Do not run with loose disk blades. Keep gang bolts tight! Tighten after first day's operation.
4. Keep scrapers properly adjusted 1/16" - 1/8" from blades.
5. Grease gang bearings 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, clean lithium base grease, Shell Alvania No. 3 or equal. Rotate gangs while greasing for best results.

10997

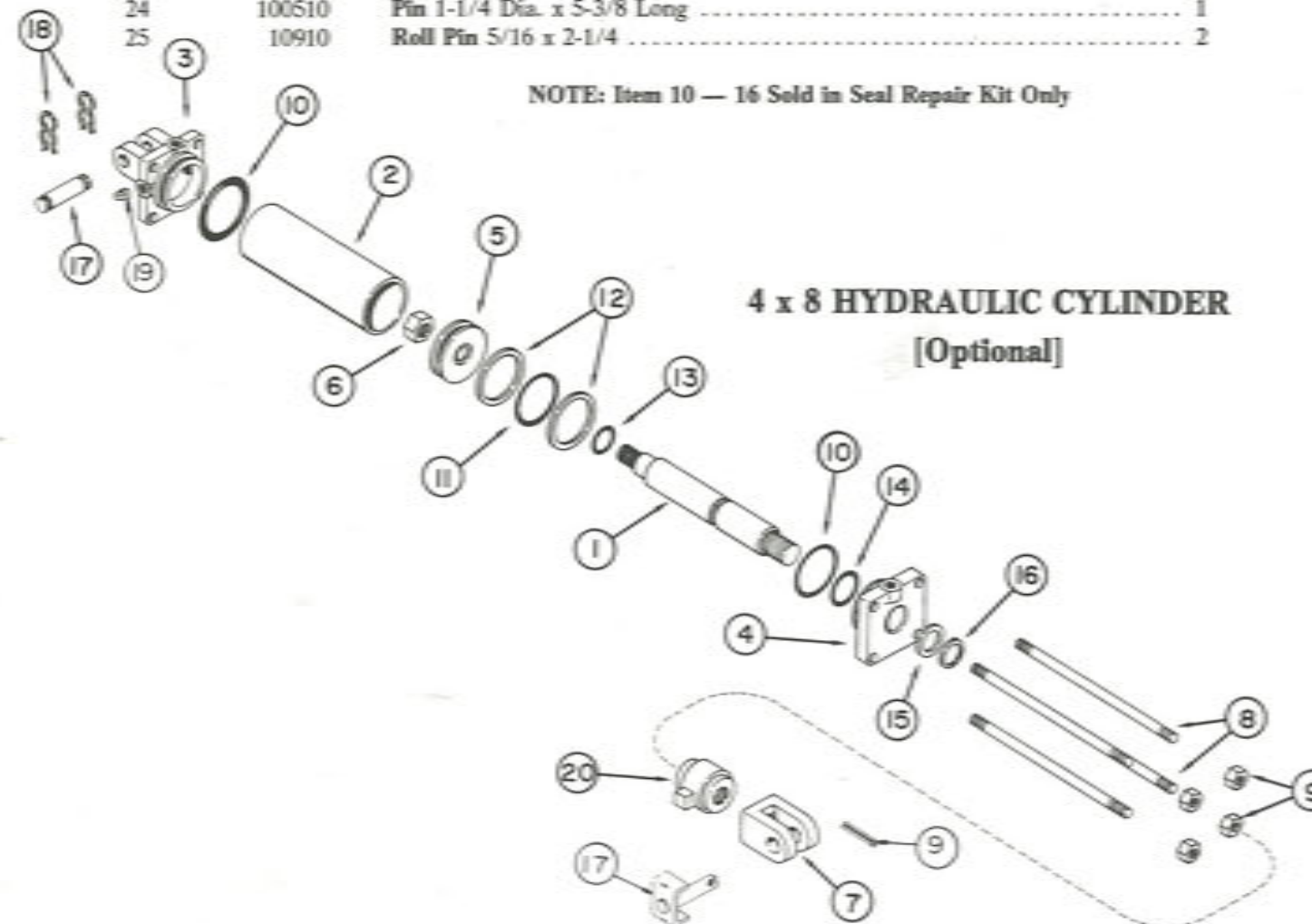
 AMCO F9, 10 & 11 SERIES DISK HARROW
DECALS

Ref. No.	Part No.	Description	No. Req'd
1	10948	Decal — AMCO	2
2	11233	Decal — Warning	2
3	10997	Decal — Maintenance	1

 AMCO F9, 10 & 11 SERIES DISK HARROW
4 x 8 HYDRAULIC CYLINDER [Prince #8608] [Optional]

Ref. No.	Part No.	Description	No. Req'd
	BD-20-0003	Cylinder Complete (Prince #8608) 1" Dia. Rod Clevis Pin	1
	BC-20-0004	Cylinder Complete (Prince #8608) 1-1/4" Dia. Rod Clevis Pin	1
1	10965	Rod — Piston Assembly	1
2	10966	Tube	1
3	10952	Butt	1
4	10967	Head Piston	1
5	10968	Piston	1
6	10980	Lock Nut 1-14 NF	1
7	10969	Clevis Assembly 1" Dia. Pin	1
7	11296	Clevis Assembly 1-1/4" Dia. Pin	1
8	10970	Rod Tie	4
9	10139	Nut 5/8 — NC, PL	4
	10976	Kit Seal Repair (Prince #8600)	1
10	10958	"O" Ring	2
11	10959	"O" Ring	1
12	10960	Washer — Back Up	2
13	10971	"O" Ring	1
14	10972	"O" Ring	1
15	10973	Washer — Back Up	1
16	10974	Wiper	1
17	10956	Pin Clevis 1" x 4"	2
18	10957	Clip Hair Pin	4
19	10978	Plug — Pipe 1/2 NPT	4
20	10937	Stroke Control	1
24	100510	Pin 1-1/4 Dia. x 5-3/8 Long	1
25	10910	Roll Pin 5/16 x 2-1/4	2

NOTE: Item 10 — 16 Sold in Seal Repair Kit Only



assembly instructions

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

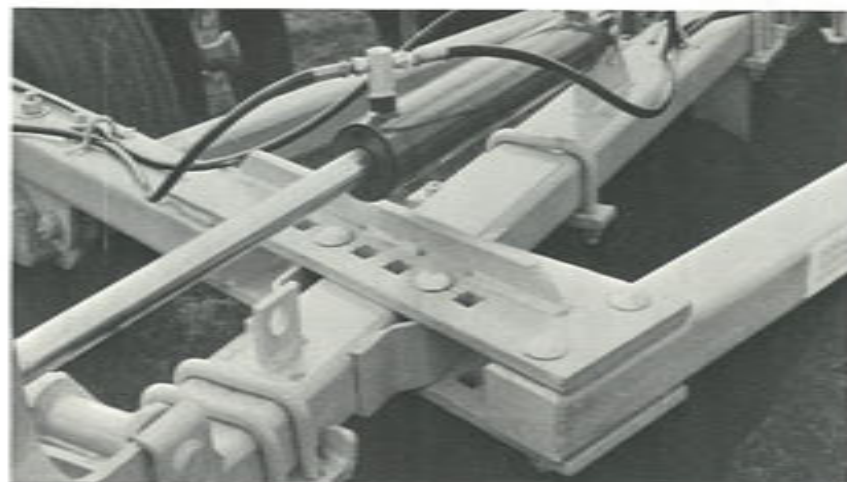
- A. Main Frame and Side Bars
- B. Pull Tongue
- C. Rockshaft
- D. Cross Bars
- E. 4 — 15 x 8-6 Hole Wheels
- F. 4 — 3 x 16 Hydraulic Cylinders
- G. Accumulator
- H. Box of Hydraulic Components
- I. Center Tooth Attachment
- J. Front Gang — R.H.
- K. Front Gang — L.H.
- L. Rear Gang — R.H.
- M. Rear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

- 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.

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



- 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 align frame. Tighten bolts snug but not tight.

GENERAL TORQUE SPECIFICATION TABLE

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN

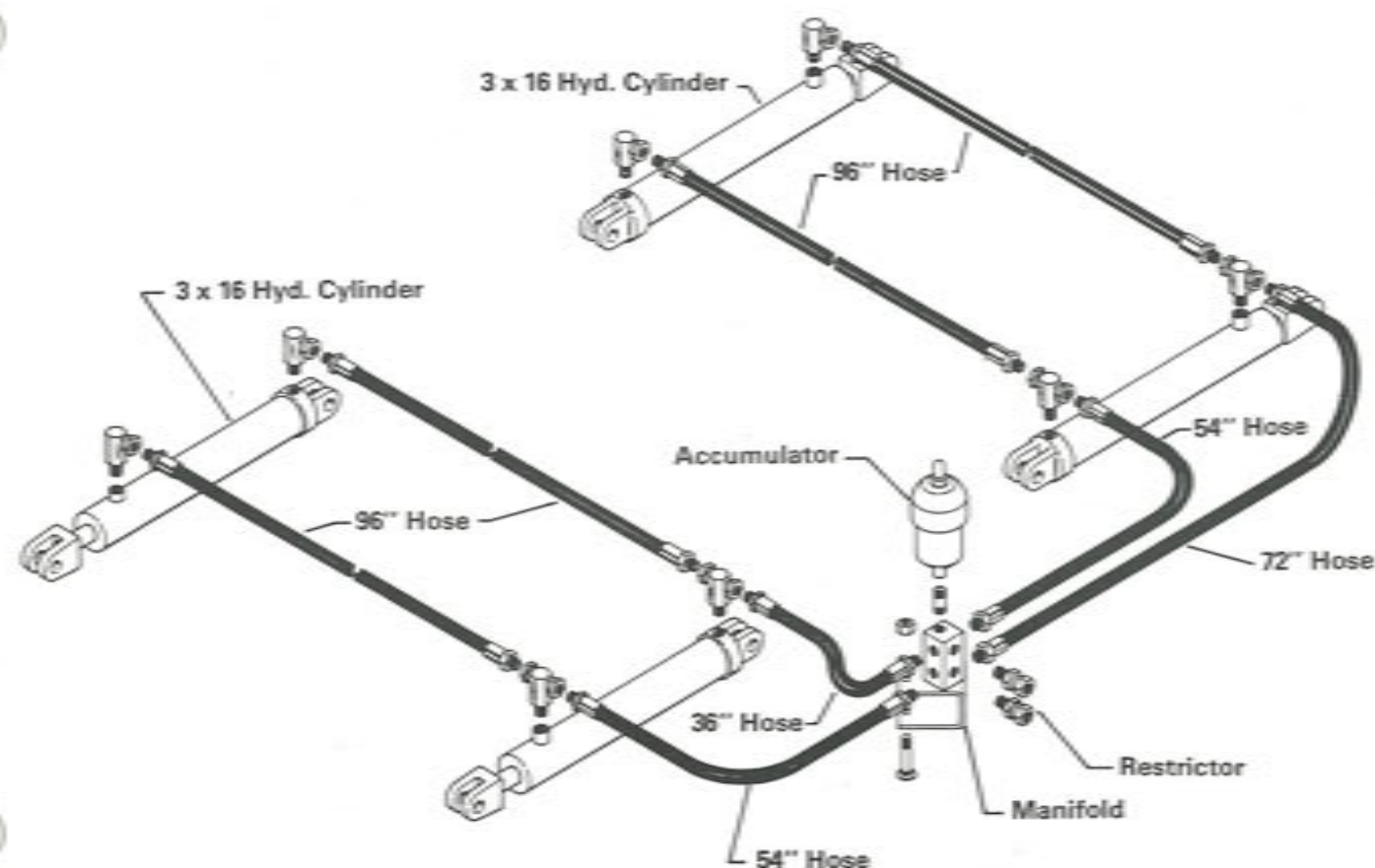
Note: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly-disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.

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 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	95 105	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

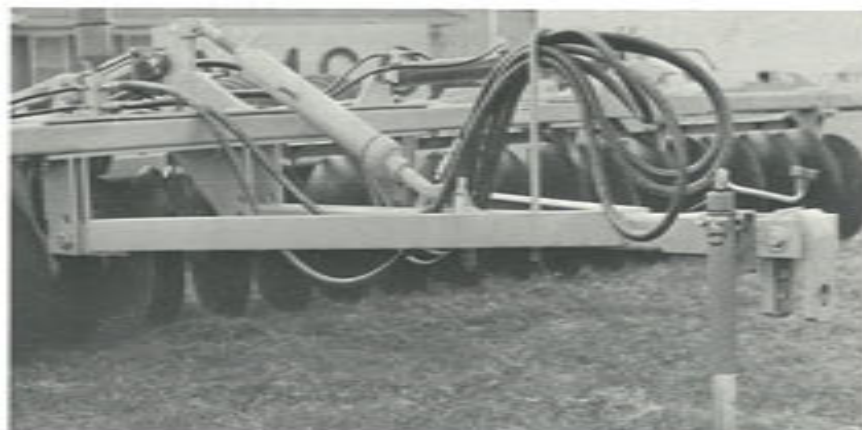
* Thick nuts must be used with Grade 8 bolts

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

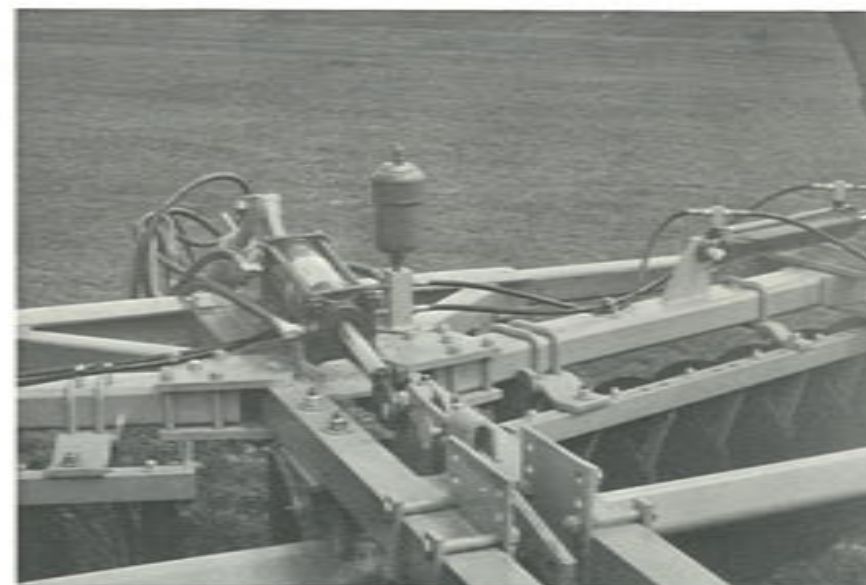
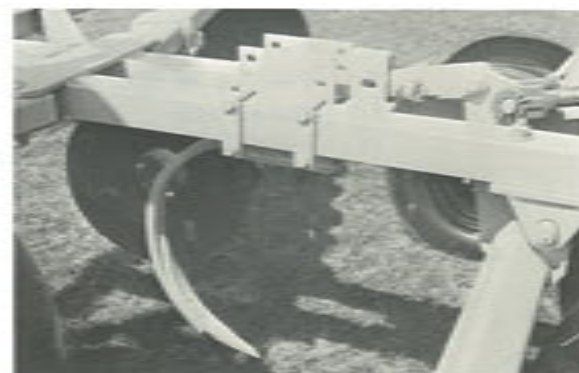
HYDRAULIC CIRCUIT DIAGRAM



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.



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 tire 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 telfon tape to wrap all fittings and prevent hydraulic fluid leaks. One and one half to two wraps of telfon tape should be used. Tape should be at least 1/16" from end of fittings.



13. Install accumulator on top of manifold. Check accumulator for 800-1000 p.s.i. nitrogen pre-charge. 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)

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 with 4 or 5 shots of grease to purge any condensation that has accumulated during shipment and storage.

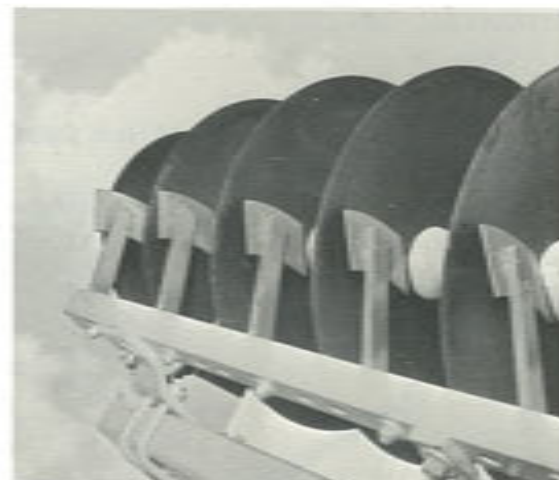
G. If the harrow is in storage for four to six months, the entire harrow should again be lubricated before placing in service. It should also be greased every 50 hours while in use, at the end of each season and at the start of each season.

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.

21. 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.

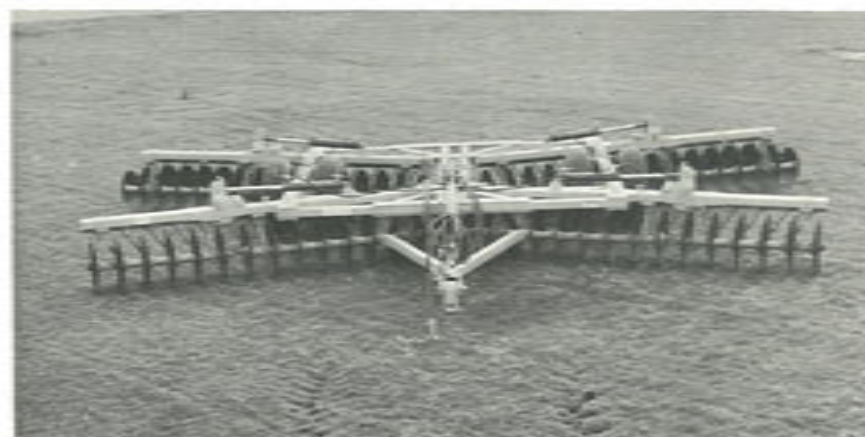
22. All bolts, including wheel hubs should be checked often the first 50 hours of field operation.



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

[NOTE: Hoses and couplings not provided with harrow]

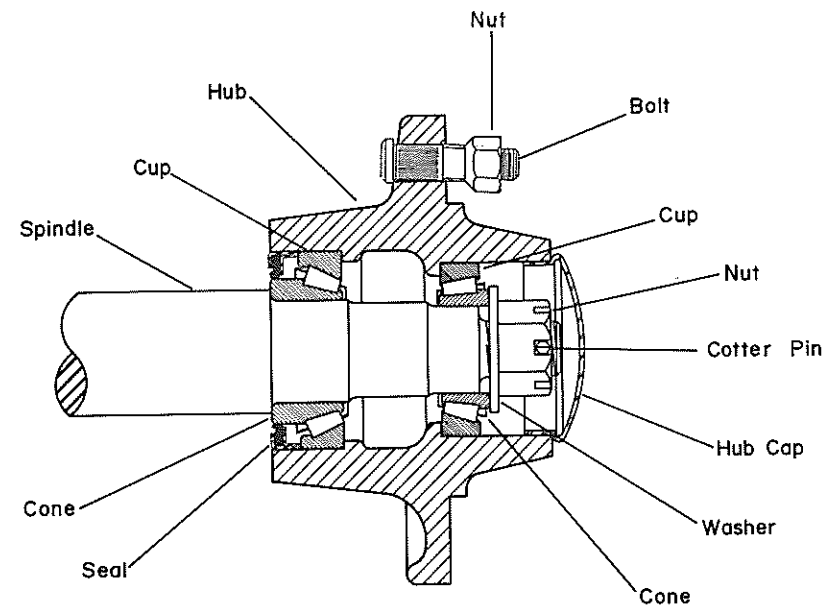


20. Final Grooming and check points.

21. All bolts, including wheel bolts, should be checked after initial field use.

- A. Check inside front gangs. The bumper washers should clear by $3/8$ to $1/2$ inch. 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.

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.

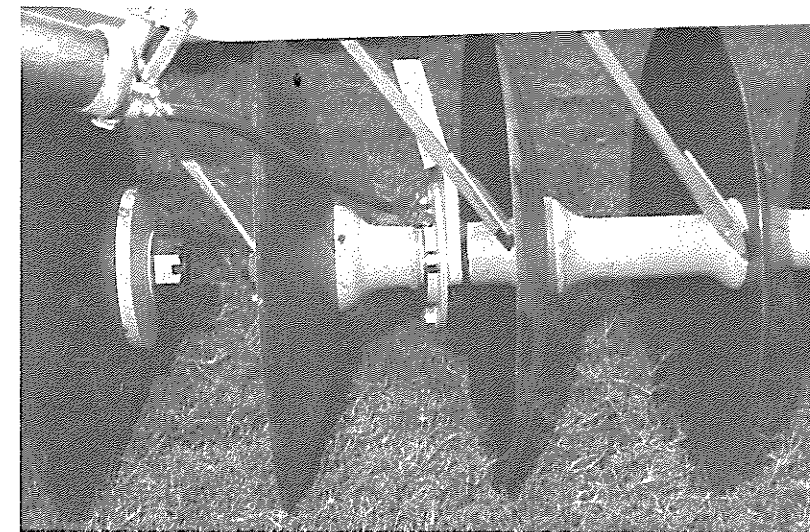
The stabilizer should be greased every week or fifty (50) hours of operation. The stabilizer should also be greased at the start of each season, and at the end of each season. The threads on the stabilizer rod should be oiled occasionally for smooth operation.

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.

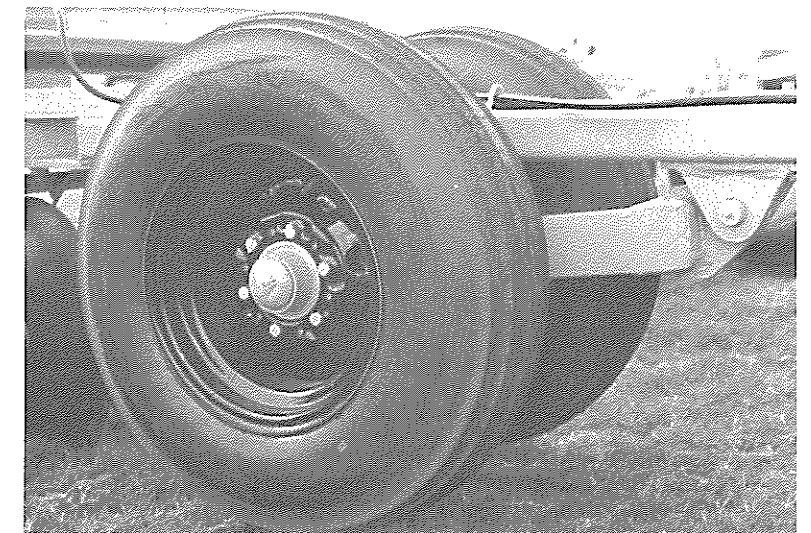
The gangs are equipped with ball bearings, which are greased at the factory. They should be greased every week or fifty (50) hours of operation. These bearings must also be greased at the start of each season, and at the end of each season.



IMPORTANT

Apply grease with low pressure, low volume hand grease gun. Use care to prevent damage to bearing seals.

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.

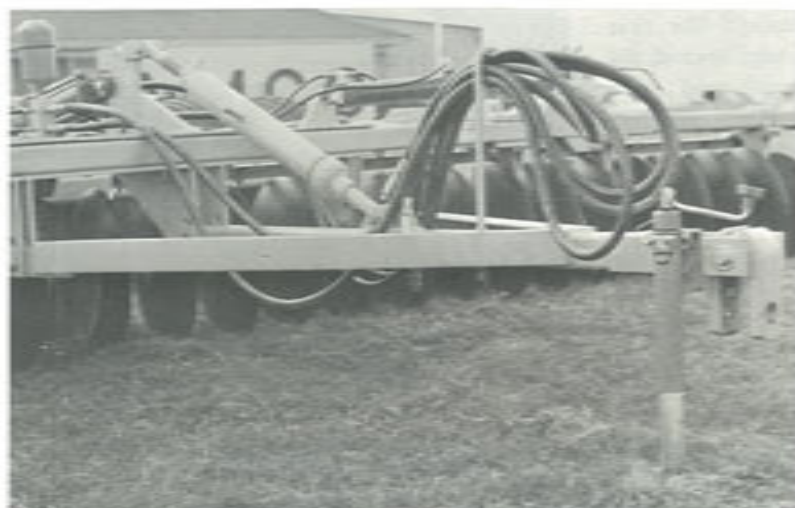


Wheel bearings should be repacked with grease and adjusted annually. Under extreme conditions, they should be serviced more frequently. Check occasionally for excessive end play. Adjust as required to eliminate excessive end play.

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.

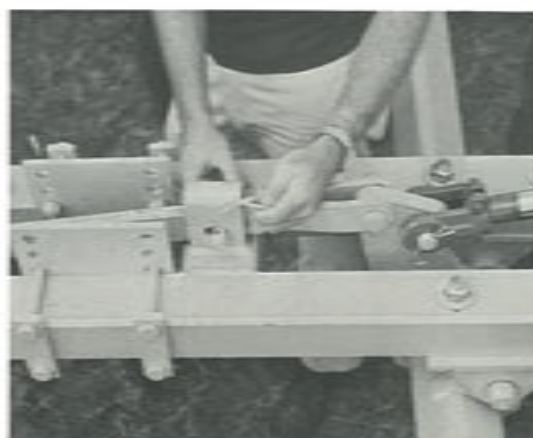


Attach the harrow to the tractor drawbar with the reversible clevis and lower the gangs.

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.

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. For these conditions, your harrow should be equipped with flotation tires. 11L x 15 tires will be adequate for most conditions. You also need a good heavy duty 4 x 8 hydraulic cylinder with depth 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. 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, shorten the stabilizer to reduce weight on rear gangs, or do a combination of both.

CENTER FURROW

If a furrow is left behind the center of the harrow, increase the angle of the rear gangs, lengthen the stabilizer to add weight on rear gangs, or do a combination of both.

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

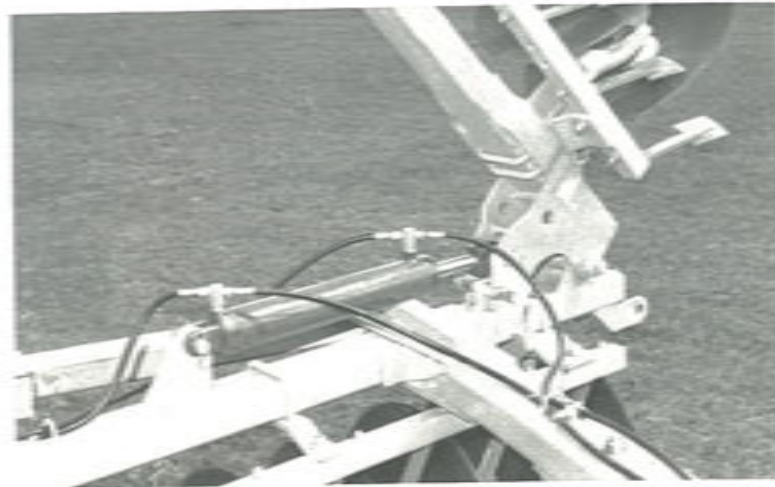
Where it is necessary to have a level job of disking, the following factors must be taken into consideration: (1) Tractor Speed, (2) Hitch Adjustment, and, (3) Disk Gang Angle Adjustment.

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.

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.

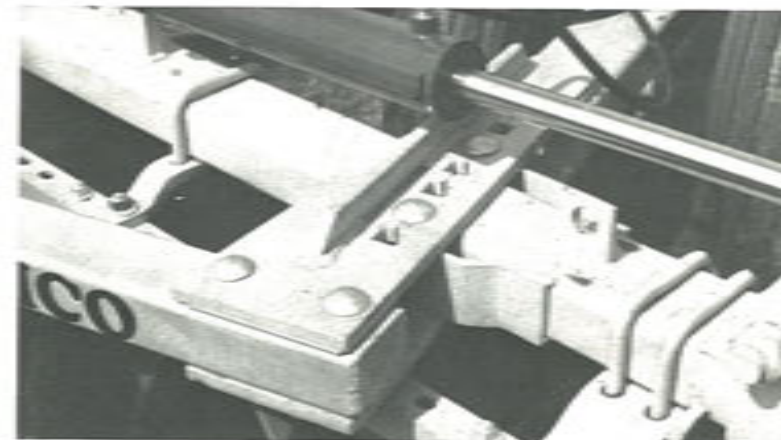
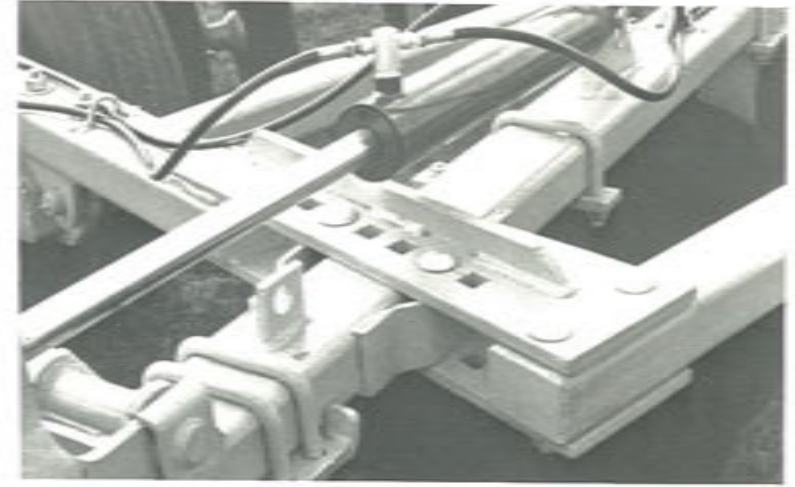
The wings can be lowered by removing the wing transport pin and actuating the four 3 x 16 hydraulic cylinders.



The harrow can be operated as a rigid, non-flexing 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.

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.

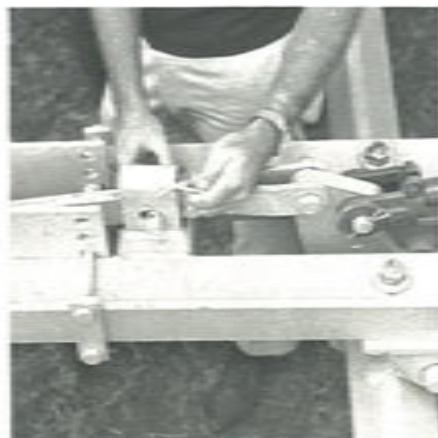
It is recommended that the rear gangs be set in at low tractor speeds (below 5 MPH) and set out at high tractor speeds (5 to 6 MPH).

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

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 rigid 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.

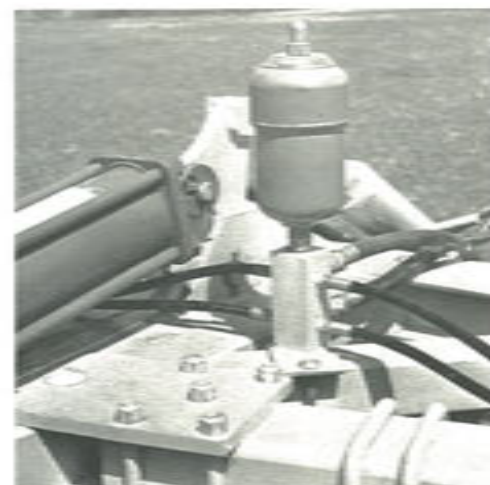
WARNING LAMP

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 law.

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

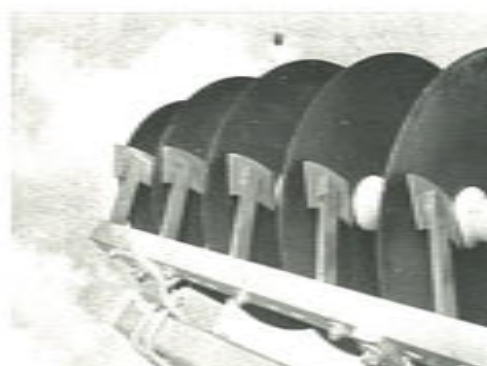
Should the wings encounter uneven terrain or an obstruction, the wing cylinder will retract and the excess fluid will be forced into the accumulator. After passing over the obstruction the hydraulic fluid will be forced back into the hydraulic cylinder thus lowering the wings.

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

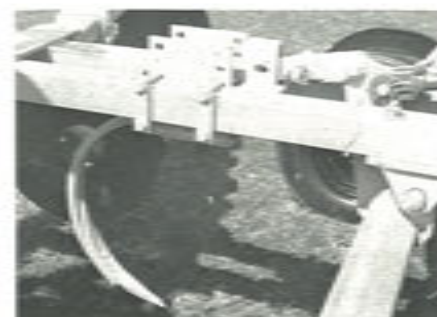
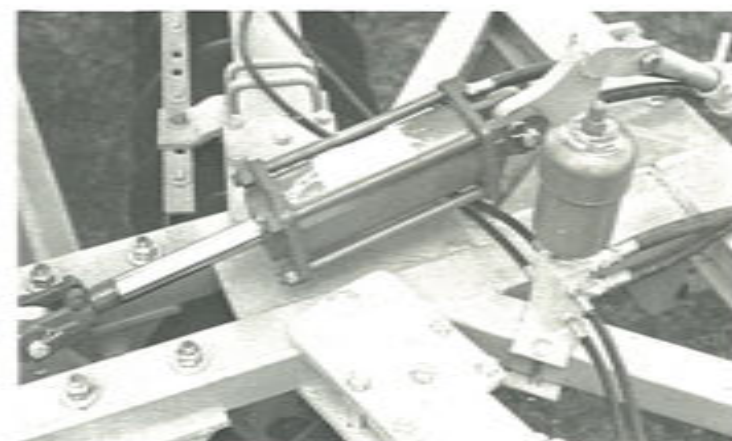
Scrapers should be adjusted to run approximately 1/16 to 1/8 inch from the disk blades. Each scraper may be adjusted in the slotted hole on the scraper bar, or the entire scraper bar may be moved laterally in the slotted holes provided in the bearing risers, as shown in the picture at left.



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 an 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.

- 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 dust cap and mount wheel on hub.

3. GANG REPAIR — F10 HARROWS WITH FLANGETTE MOUNTED BEARINGS

- 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 bolts that secure the gang to the bearing riser.
- C. 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.
- D. Remove the gang bolt nut and end washer.
- E. Remove the blades, spacer spools and bearings being careful not to damage the threads on the gang bolt.
- F. Tear the entire gang down and clean all parts. Check disk axle for straightness. Bowed, bent or worn axles must be replaced.
- G. Check spacer spools for damage caused by running disk with loose gangs or hitting underground obstructions. Replace spools if they are damaged.
- H. 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.
- I. 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.
- J. Check disk blades and replace as required. Check around the blade center hole for wear and cracks.
- K. To replace bearing, remove all flangette bolts, clean flangettes, check flangettes for wear. Check flangettes on new bearing. They must be tight enough to hold bearing snug. Discard flangettes if not in good condition.
- L. After **cleaning**, checking and replacing all damaged parts, the gang should be assembled. Be sure the grease fittings in the flangettes face up and to the rear. 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.
- M. After the gang is assembled it should be attached to the harrow. The bearing risers should be **carefully** spaced to match the flangettes. Poorly spacing 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.
- N. 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.

maintenance

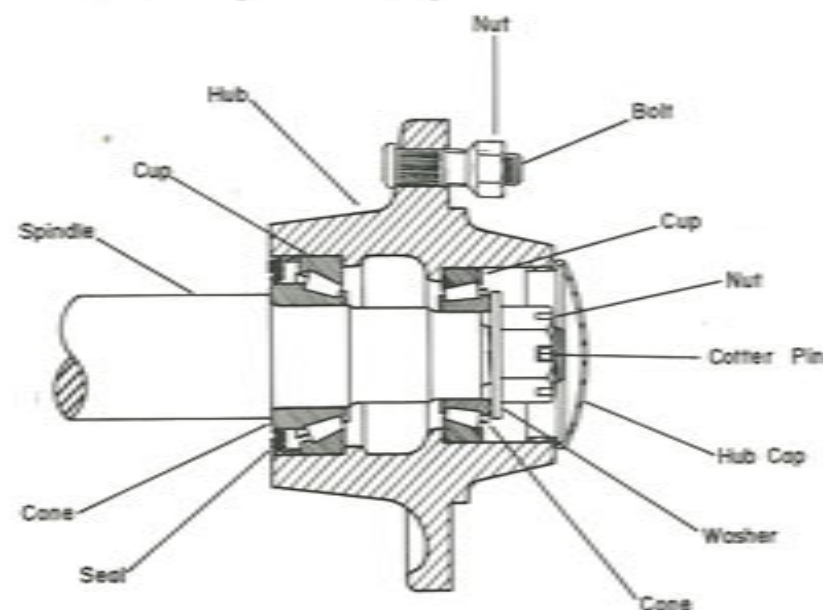
1. KEEP ALL BOLTS TIGHT

- 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 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.

- 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.

- O. 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.

4. GANG REPAIR — F11 HARROWS WITH TRUNION MOUNTED BEARINGS

- 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 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.

- 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 45 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 roll of teflon tape is included in each hydraulic kit. Use 1 1/2 to 2 wraps of tape on the threads of each fitting to eliminate 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 PSI 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.)

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

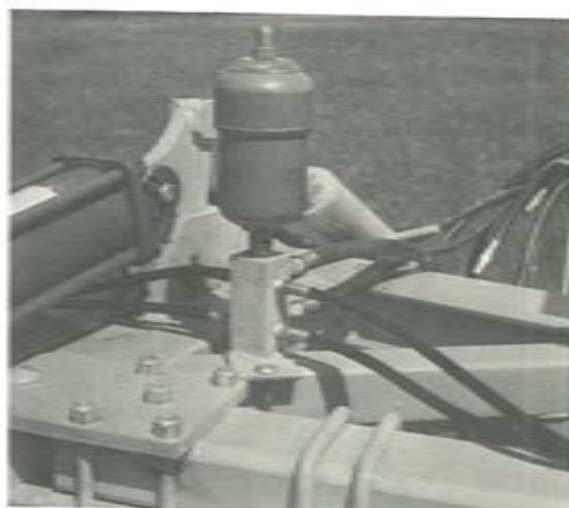
Have dealer check accumulator each season to maintain proper charge. Use DRY NITROGEN to maintain 800-1000 pounds per square inch nitrogen pressure. Check nitrogen pressure with pressure removed from the hydraulic system. Charging kit is required to check nitrogen pressure and to add nitrogen.

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.

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 gang cutting angle and 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.

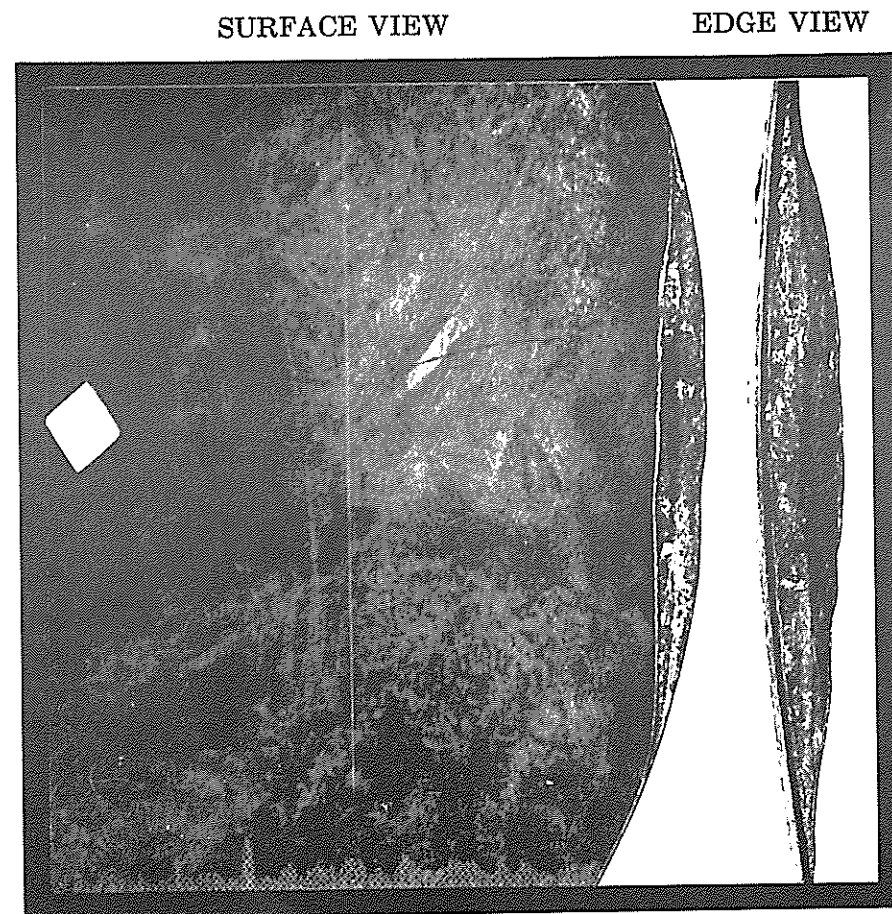
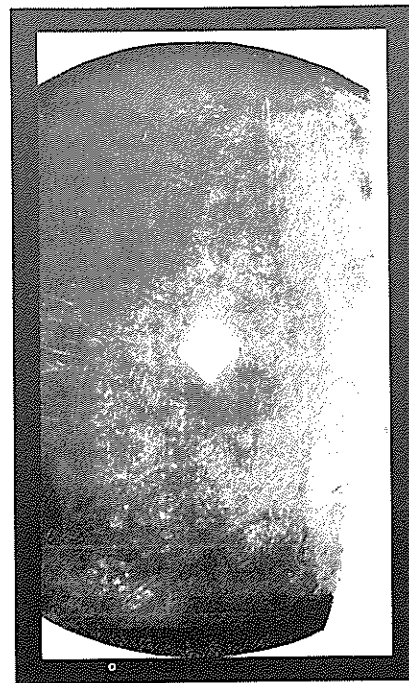


FIGURE 2 — Straight directional break caused by defective steel. Eligible for warranty consideration.



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 gland on rod end of cylinder. Use a spanner wrench to ROTATE GLAND AND REMOVE SQUARE RETAINER RING THROUGH SLOT IN end of cylinder barrel. NOTE: Use Spanner to remove collar on lantex cylinders.
- 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.