

Amco

F 20046

Depth Control

Part # Date
Equal to or better
than -

E OF SET ELEXWING

'6"

RTS

MAI

ISTR

10-8-79

Letter

FORM -

Fit -

Re-Liability

Equal to or

better than -

on - March

20046A

Certification

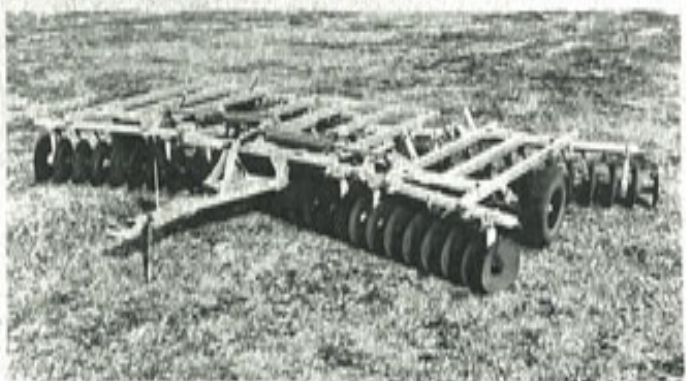
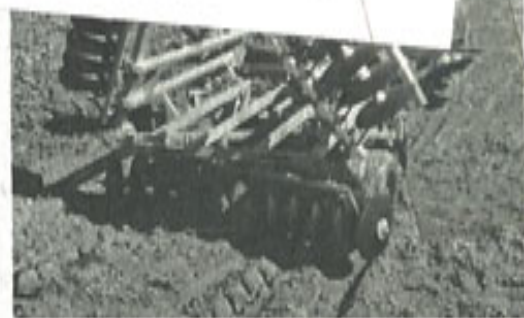
July

1982

FAX -

630-887-2101

2048-



Amco

PRODUCTS

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



TO THE PURCHASER

The care you give your new AMCO F15 Double Offset 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 F15 Harrow will serve you well for many years.

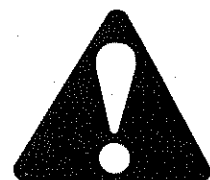
As an Authorized AMCO Dealer, we stock Genuine AMCO Parts, which are manufactured with the same precision and skill as the original equipment. For best performance and longer life use only Genuine AMCO replacement parts. Our factory trained staff is kept fully informed of the most efficient methods of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

When you sell your F15 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

AMCO

16'6" – 24'0"

F-15 DOUBLE OFFSET FLEXWING

GENERAL SPECIFICATIONS

AXLES:	1-1/2" square high carbon, cold rolled steel	BEARINGS:	Protect-O-Shield, 1-1/2" square bore regreasable ball type, toggle mounted
DISC:	22" x 3/16" Plain	WHEELS:	2-15 x 10 Center Section 2-15 x 8 Wing Sections
BLADES:	Diminishing with Two feathering blades on rear gangs	CLEVIS:	Reversible ductile iron
SCRAPERS:	High carbon replaceable blades on heavy duty shanks, mounted with grade 5 bolts on high carbon angle iron bars	WRENCH:	1 for gang bolt
TONGUE:	90" long for dual wheels with tongue jack	DISC SPACING:	9 Inches
HYDRAULIC CYLINDERS:	2-4" x 8" with depth control 2-4" x 24" for folding wings	ANGLE:	Preset at 17° — No adjustment necessary
HYDRAULIC HOSES:	Complete to front of main frame	WEIGHT:	112 - 135 lbs per blade 310 - 375 lbs per foot
		TRANSPORT WIDTH:	Under 12'0"
		TRANSPORT HEIGHT:	Under 12'6"

Model	Cutting Width	No. of Blades	No. of Bearings	Approximate Weight Pounds	Recommended Drawbar Horsepower
F15-4622	16' 6"	46	16	6075	100 - 120
F15-5022	18' 0"	50	16	6300	110 - 130
F15-5422	19' 6"	54	16	6640	115 - 140
F15-5822	21' 0"	58	16	6900	120 - 150
F15-6622	24' 0"	66	20	7520	130 - 170

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

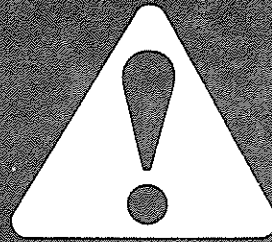
RECOMMENDED TIRE SIZE

2-11L x 15—6 or 8 Ply tires (wings)
2-12.5L x 15—8 Ply tires (center)

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 #11411
Issued 3/79



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.

TABLE OF CONTENTS

To the Purchaser	i
General Specifications	1
Safety Suggestions	2
Table of Contents	3

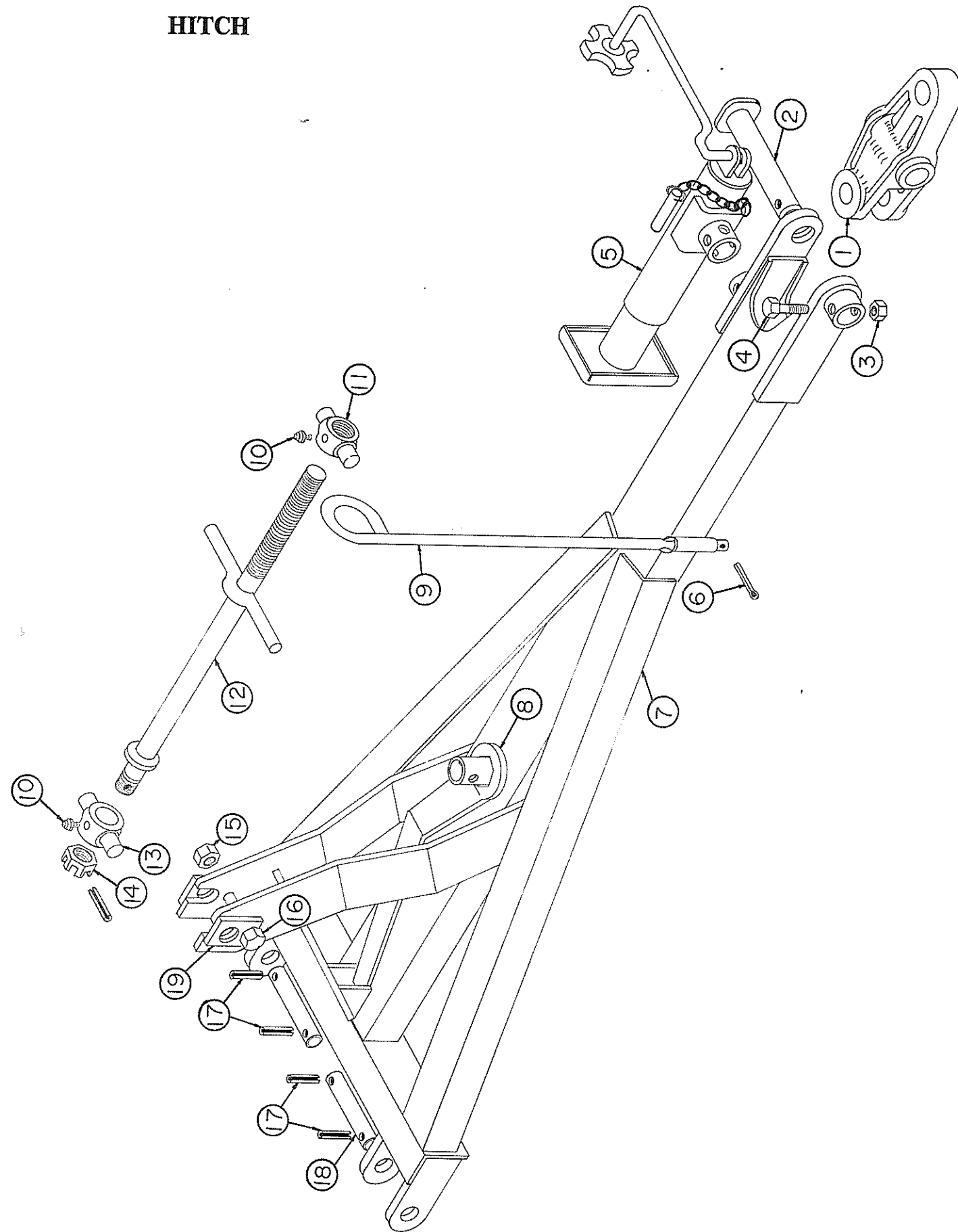
PARTS LIST

Hitch	5
Main Frame and Center Rockshafts	7
Wing Main Frame and Wing Rockshaft	9
Spindles, Wheels and Hubs	11
Hydraulic Cylinders	13
Hydraulic Circuit	15
Front Inside Gang and Gang Frame	17
Rear Inside Gang and Gang Frame	19
Front Wing Gang and Gang Frame	21
Rear Wing Gang and Gang Frame	23
Optional Shock Absorber Bearing Riser	24
Optional Heavy Duty Scrapers	25
Decals	26

OPERATORS MANUAL

Assembly Instruction	27
Lubrication	35
Storage	37
Maintenance	38
Operating Instructions	42
Operating Tips	44
Disk Blade Failures	45
General Torque Specifications	47

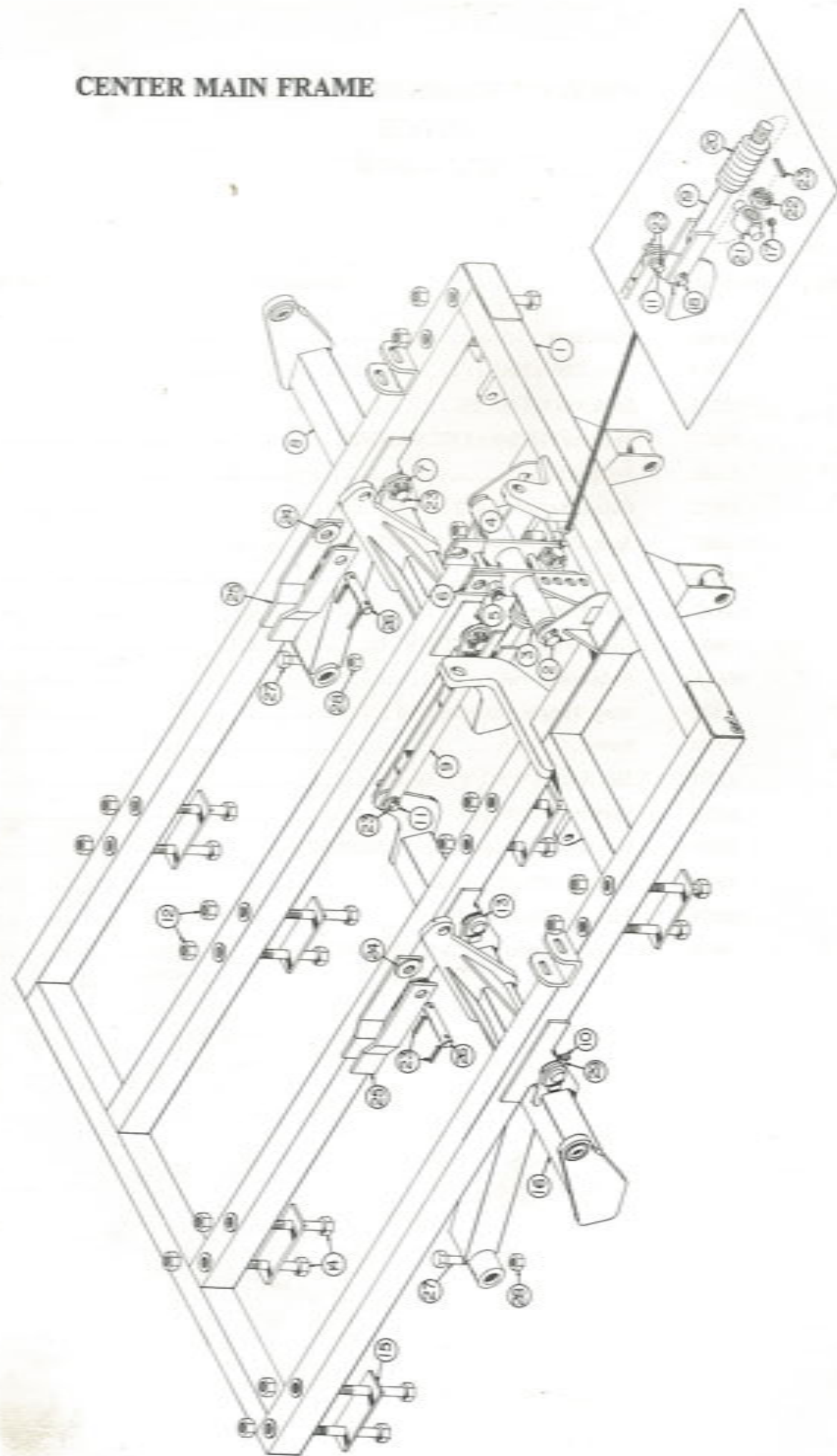
HITCH



AMCO F15 SERIES DISK HARROW
HITCH
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
1	16001	Pull Clevis	1
2	0769	Assy. Clevis Pin	1
3	10509	Lock Nut 3/8 NC, PL	1
4	10871	Machine Bolt 3/8 x 3 NC, PL, GR5	1
5	11261	Tongue Jack	1
6	10075	Cotter Pin 1/4 x 1-1/2	1
7	0831	Assy. Pull Tongue 16'6" to 24'0"	1
8	100134	Nut Wrench (Axle)	1
9	100061	Hose Holder	1
10	10606	Grease Fitting 1/8 NPT Drive In.	2
11	9919A	Stabilizer Swivel	1
12	0862	Assy. Tongue Adjusting Rod	1
13	9892	Swivel	1
14	11279	Hex Nut 1-3/8 NC, PL, Slotted	1
15	10299	Lock Nut 5/8 NC, PL	1
16	10067	Hex Head Machine Bolt 5/8 x 5-1/2 NC, PL	1
17	10910	Roll Pin 5/16 x 2-1/4	5
18	100574	Pin 1-1/4 Dia. x 6-7/8 Long	2
19	9628	Clamp Trunion 3/8 x 2-1/2 x 3-3/4 Long	2

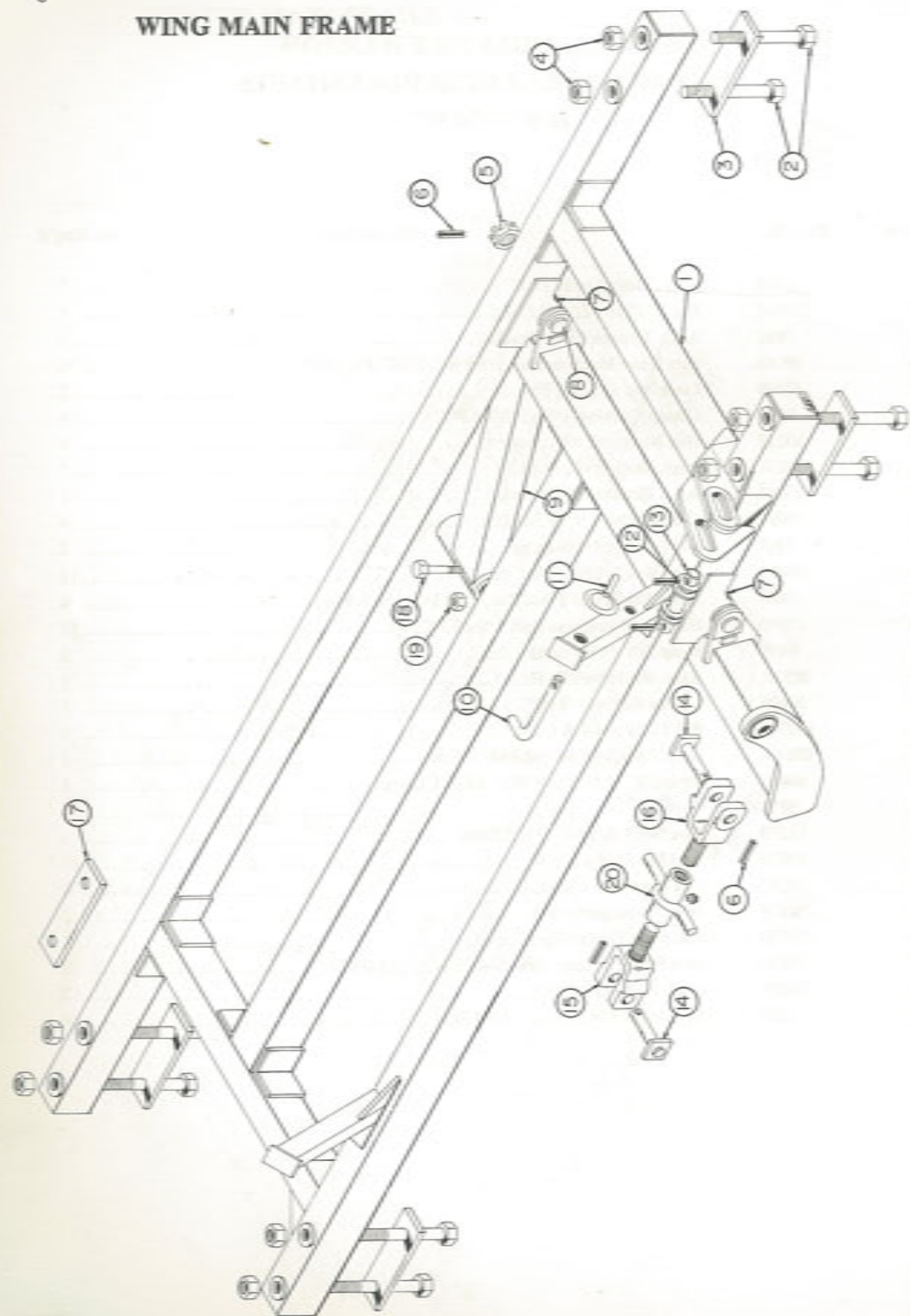
CENTER MAIN FRAME



AMCO F15 SERIES DISK HARROW
MAIN FRAME & CENTER ROCKSHAFTS
16'6" - 24'0"

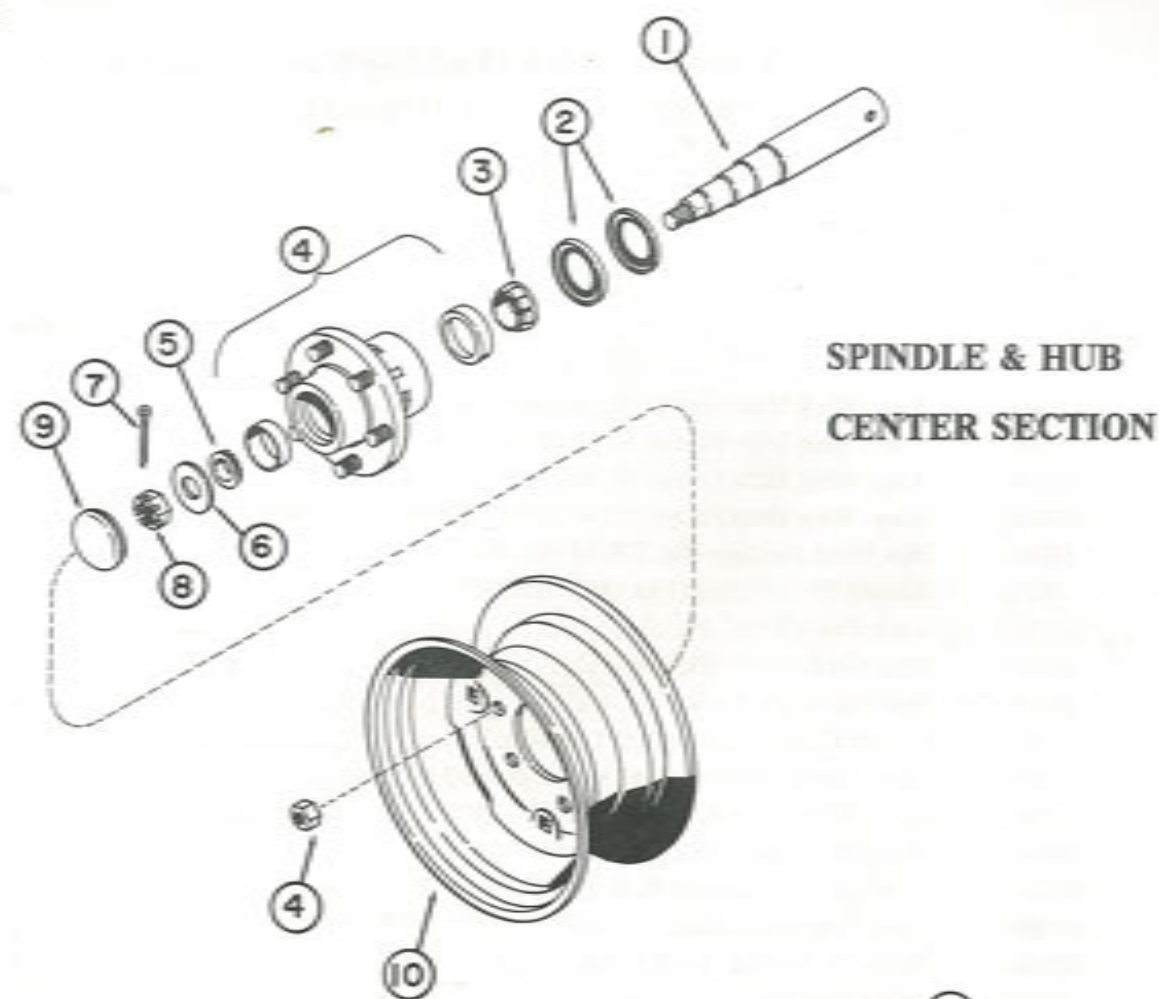
Ref. No.	Part No.	Description	No. Req'd
1	0838	Assy. Main Frame 16'6" - 24'0"	1
2	100568	Pin 1" Dia. x 22-1/4 Long	1
3	0842	Assy. Tongue Pivot Bracket	1
4	10043	Hex Head Machine Bolt 5/8 x 6-1/2 NC, PL, GR5	2
5	10299	Lock Nut 5/8 NC, PL	2
6	9628	Clamp Trunion 3/8 x 2-1/2 x 3-3/4	4
7	10232	Hex Nut 1-1/2 NC, Slotted	4
8	0852A	Assy. Rockshaft, L. H.	1
9	20067	Assy. Rockshaft Tie Link	1
10	11081	Grease Fitting 5/16 Straight	4
11	7397	Pin 1 Dia. x 4-3/8 Long	2
12	10396	Lock Nut 7/8 NC, PL	16
13	0866	Assy. Rockshaft Pivot Pin 1-1/2 Dia. x 6-5/8	4
14	10945	Hex Head Machine Bolt 7/8 x 9 NC, PL	16
15	9856	Strap 5/8 x 3 x 9 Long	8
16	0851A	Assy. Rockshaft R. H.	1
17	10606	Grease Fitting 1/8 NPT	1
18	100567	Pin 1 Dia. x 3-7/8 Long	1
19	0861A	Assy. Tongue Control Rod - Short	1
20	10460	Spring 3" O.D. x 5/8 Wire x 6-7/8 Long	1
21	9892	Swivel	1
22	11279	Hex Nut 1-3/8 NC, PL, Slotted	1
23	10910	Roll Pin 5/16 x 2-1/4	17
24	10077	Cut Washer 1-1/4 PL	4
25	0873	Assy. Transport Lock	2
26	100570	Pin 1-1/4 Dia. x 5-3/8 Long	2
27	10834	Hex Head Machine Bolt 1/2 x 4 NC, PL, GR5	2
28	10395	Lock Nut 1/2 NC, PL	2
29	9270	Bushing 1-3/4 O.D. x 1-1/2 I.D. x 2	8

WING MAIN FRAME



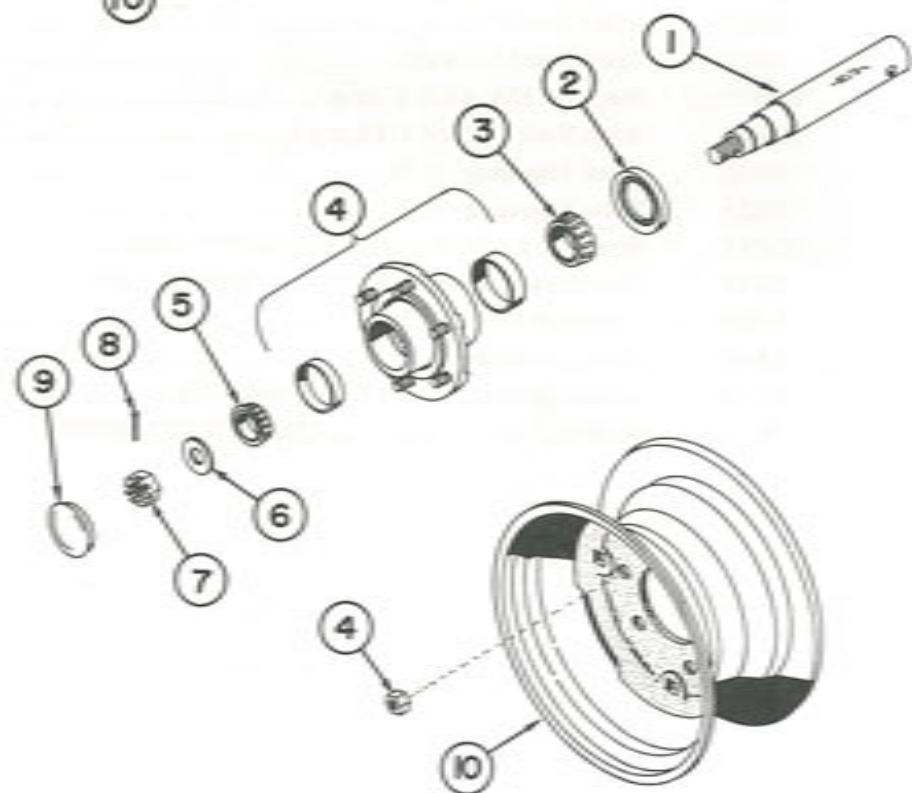
AMCO F15 SERIES DISK HARROW
WING MAIN FRAME & WING ROCKSHAFT
16'6" - 24'0"

Ref. No.	Part No.	Description	No. Req'd
1	0843	Assy. Wing Main Frame - R. H. (16'6" & 18'0")	1
1	0844	Assy. Wing Main Frame - L. H. (16'6" & 18'0")	1
1	0845A	Assy. Wing Main Frame - R. H. (21'0" & 24'0")	1
1	0846A	Assy. Wing Main Frame - L. H. (21'0" & 24'0") (SHOWN)	1
2	10945	Hex Head Machine Bolt 7/8 x 9 NC, PL	8
3	9856	Strap 5/8 x 3-9 Long (3 on 16'6" & 18'0")	4
4	10396	Lock Nut 7/8 NC, PL	8
5	10232	Hex Nut 1-1/2 NC Slotted	2
6	10910	Roll Pin 5/16 x 2-1/4	6
7	11081	Grease Fitting 5/16 Straight Drive-In	2
8	0866	Assy. Rockshaft Pivot Pin 1-1/2 Dia. x 6-5/8	2
9	0855A	Assy. Wing Rockshaft R. H. (16'6" - 18'0")	1
9	0856A	Assy. Wing Rockshaft L. H. (16'6" - 18'0")	1
9	0857A	Assy. Wing Rockshaft R. H. (21'0" - 24'0")	1
9	0858A	Assy. Wing Rockshaft L. H. (21'0" - 24'0") (SHOWN)	1
10	100683	Lock Pin 3/4 Dia. 9-1/2 Long	1
11	10317	Clip Pin 1/4"	1
12	10077	Cut Washer 1-1/4 PL	4
13	100573	Pin 1-1/4 Dia. x 6-3/8 Long	1
14	20094	Assy. Pin 1 Dia. x 4-1/8 Long	2
15	16025	Yoke Adjusting - R. H.	1
16	16026	Yoke Adjusting - L. H.	1
17	100583	Strap 3/4 x 3-9 1/8 Long (16'6" & 18'0" only)	1
18	10773	Hex Head Machine Bolt 3/8 x 3-1/2 NC, PL, GR5	1
19	10509	Lock Nut 3/8 NC, PL	1
20	20046	Assy. Connector	1
21	10606	Grease Fitting 1/8 NPT (NOT SHOWN)	1
	9270	Bushing 1-3/4 O.D. x 1-1/2 I.D. x 2 (NOT SHOWN)	4



**SPINDLE & HUB
CENTER SECTION**

**SPINDLE & HUB
WING SECTION**



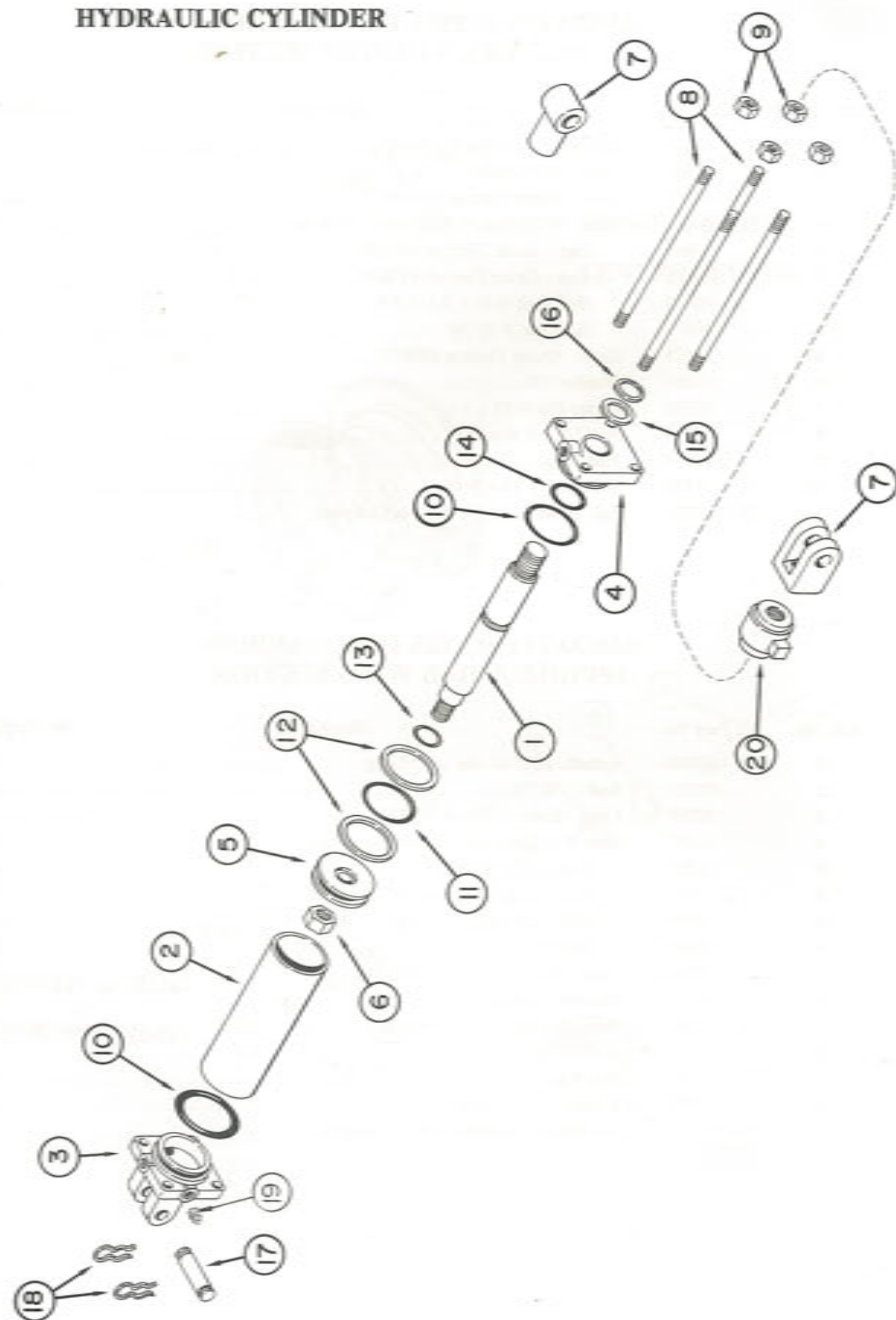
**AMCO F15 SERIES DISK HARROW
SPINDLE & HUB CENTER SECTION**

Ref. No.	Part No.	Description	No. Req'd
1	10922	Spindle 2-7/32 Dia. x 14-1/2 Long	2
2	10467	Seal (C/R 521430)	4
3	10469	Cone - Inner Timken #25590	2
4	10463-1	Hub - W/2 Cups, 6 Hub bolts and Nuts	2
4	10468	Cup - Inner Timken #25520	2
4	10472	Cup - Outer Timken #25821	2
4	10470	Hub Bolt 9/16 x 2-1/4 NF	12
4	10471	Hub Nut 9/16 NF	12
5	10473	Cone - Outer Timken #25877	2
6	10263	Washer 7/8	2
7	10291	Cotter Pin 5/32 x 1-1/4	2
8	10264	Nut 7/8 NF slotted	2
9	10474	Hub Cap	2
10	11236	Wheel 15 x 10-6 Bolt	2
	JA-05-0024	Sub Bundle Spindle & Hub Complete	

**AMCO F15 SERIES DISK HARROW
SPINDLE & HUB WING SECTION**

Ref. No.	Part No.	Description	No. Req'd
1	10680	Spindle 1-31/32 Dia. x 13 Long	2
2	10256	Seal (C/R 22870)	2
3	10258	Cone - Inner (Timken 342A)	2
4	11297	Hub W/2 Cups 6 Hub Bolts and Nuts	2
4	10257	Cup - Inner (Timken 332)	2
4	10261	Cup - Outer (Timken 14276)	2
4	11299	Hub Bolt 1/2 x 1-7/8 NF	12
4	11046	Hub Nut 1/2 NF	12
5	10262	Cone - Outer (Timken 14137A)	2
6	10263	Washer - Spindle 7/8	2
7	10264	Nut - Spindle 7/8 NF Slotted	2
8	10291	Cotter Pin 5/32 x 1-1/4	2
9	10242	Hub Cap	2
10	10936	Wheel 15 x 8-6 Bolt	2
	BC-05-0098	Sub Bundle Spindle & Hub Complete	

HYDRAULIC CYLINDER



AMCO F15 SERIES DISK HARROW

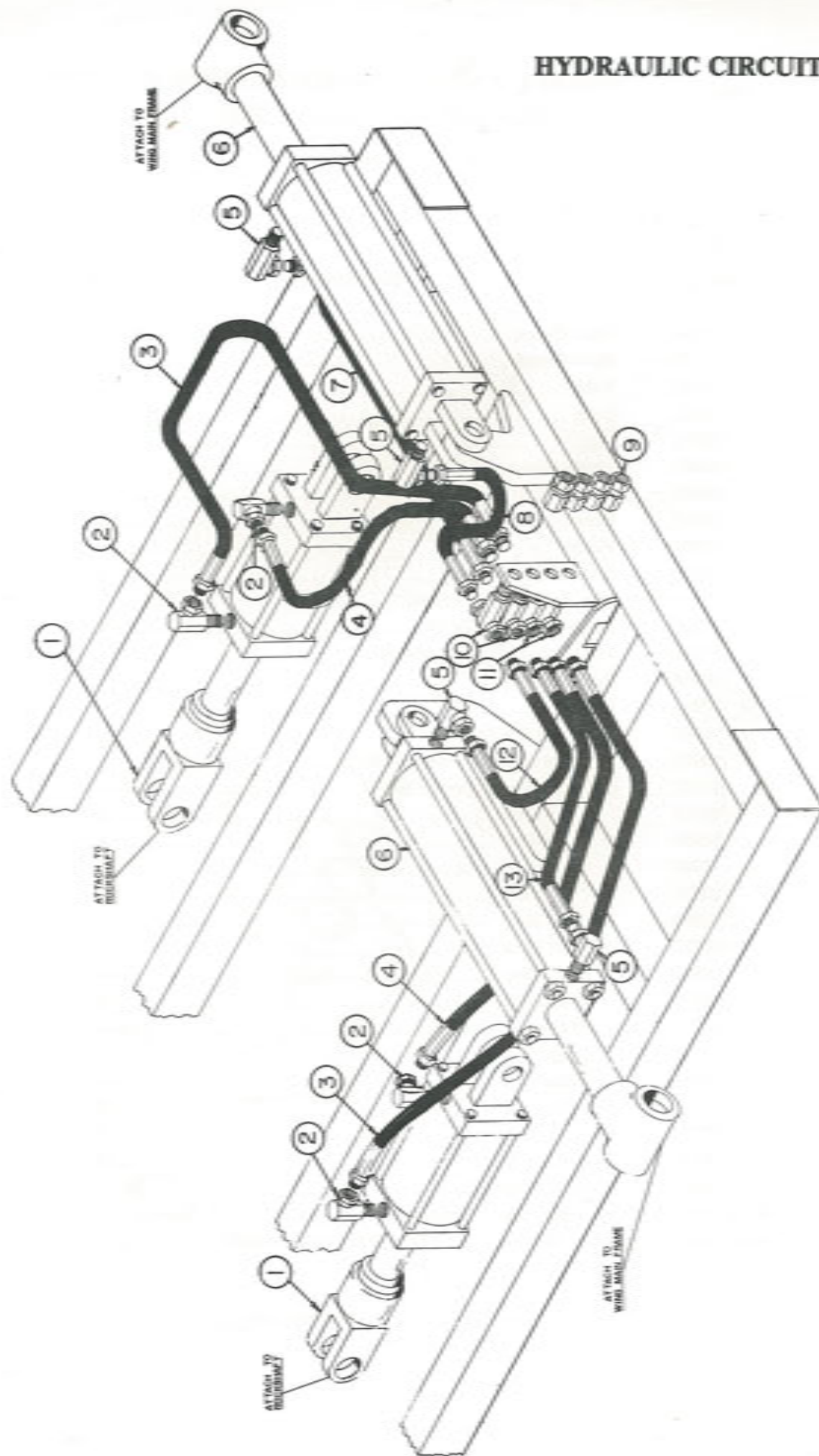
HYDRAULIC CYLINDERS

16'6"—24'0"

Ref. No.	Part No.	Description	No. Req'd	
			4 x 8	4 x 24
1	10965	Rod - Piston	1	—
1	10950	Rod - Piston	—	1
2	10966	Tube	1	—
2	10951	Tube	—	1
3	10952	Butt	1	1
4	10967	Head - Piston	1	—
4	10953	Head - Piston	—	1
5	10968	Piston	1	—
5	10954	Piston	—	1
6	10980	Nut - Lock 1" - 14 NF	1	—
6	10979	Nut - Lock 1-1/4" - 12 NF	—	1
7	11296	Clevis for 1-1/4 Dia. Pin.	1	—
7	10942	Tee Casting for 1-1/4 Dia. Pin.	—	1
8	10970	Rod - Tie	4	—
8	10955	Rod - Tie	—	4
9	10187	Nut - Hex 5/8 NC, PL	4	4
	10976	Kit - Seal Repair (prince #8600)	1	—
	10977	Kit - Seal Repair (prince #9400)	—	1
10	10958	"O" Ring	2	2
11	10959	"O" Ring	1	1
12	10960	Washer	2	2
13	10971	"O" Ring	1	—
13	10961	"O" Ring	—	1
14	10972	"O" Ring	1	—
14	10962	"O" Ring	—	1
15	10973	Washer	1	—
15	10963	Washer	—	1
16	10974	Wiper	1	—
16	10964	Wiper	—	1
17	10956	Pin - Clevis 1" x 4"	1	1
18	10957	Clip	2	2
19	10978	Plug - Pipe 1/2 NPT	1	1
20	10937	Control - Stroke	1	—
	BC-20-0001	4 x 8 Cylinder Complete (prince #8608)		
	BD-20-0002	Bundle 4 x 24 Cylinder Complete (prince #9424)		

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

HYDRAULIC CIRCUIT

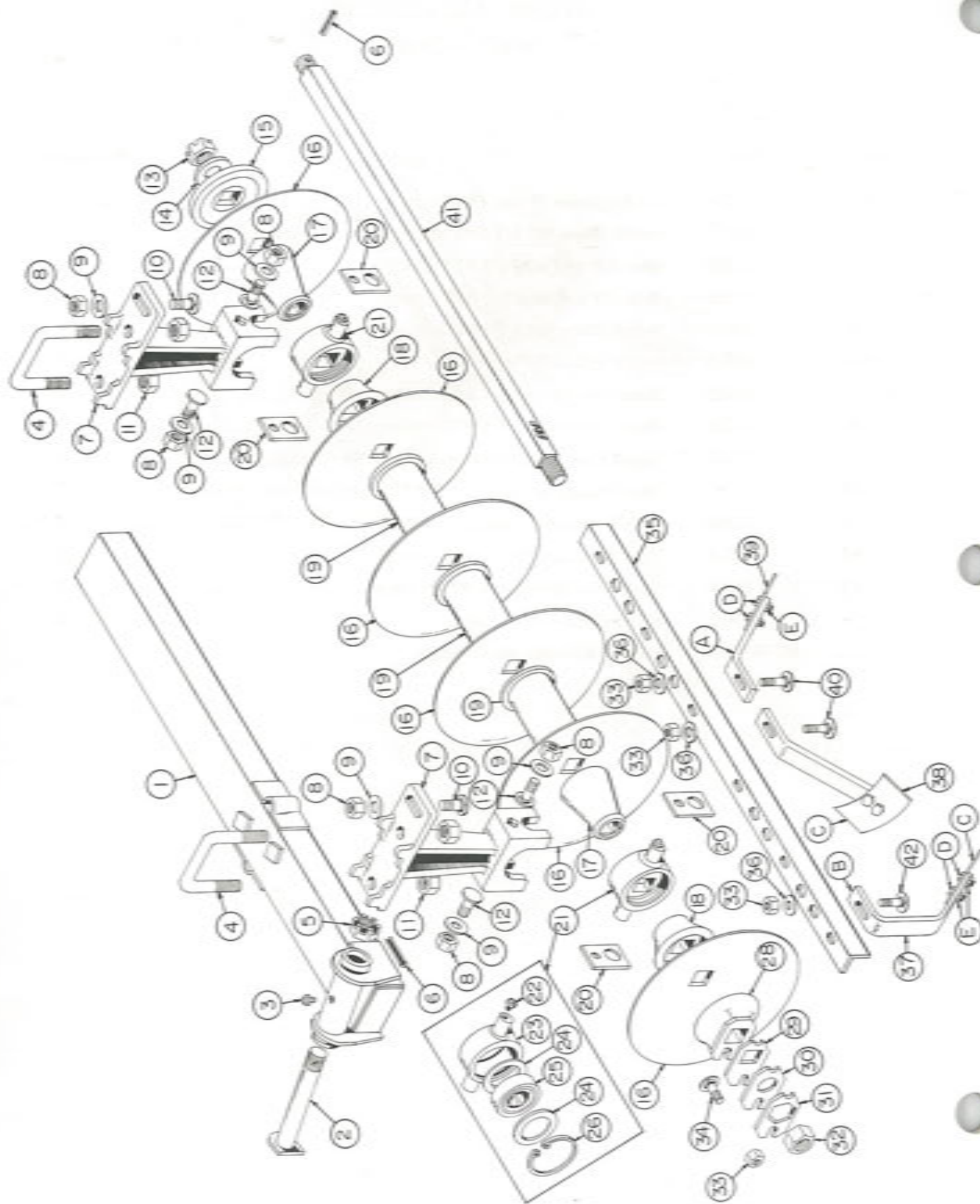


AMCO F15 SERIES DISK HARROW
HYDRAULIC CIRCUIT
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
* 1	11257	4 x 8 Cylinder (Prince #8608).....	2
2	10921	Swivel Elbow 90° 1/2 NPT Male to 1/2 NPT Female	4
3	11302	Hose 3/8 x 42 with 1/2 NPT fittings	2
4	11301	Hose 3/8 x 30 with 1/2 NPT fittings	2
5	11127	Swivel Elbow 90° 1/2 NPT Male to 1/4 Female	4
* 6	10933	4 x 24 Cylinder (Prince #9424).....	2
7	11165	Hose 1/4 x 42 with 1/4 NPT Fittings	1
8	11321	Hose 1/4 x 15 with 1/4 NPT Fittings	1
9	11157	Swivel Union 1/2 NPT Female to 1/2 NPT Female	4
10	11156	Male Branch tee - special 1/2 NPT Male to 1/4 NPT Female	2
11	11260	Male Branch tee - special 1/2 NPT Male to 1/2 NPT Female	2
12	11323	Hose 1/4 x 24 with 1/4 NPT Fittings	1
13	11119	Hose 1/4 x 36 with 1/4 NPT Fittings	1
14	11462	Pipe Sealant — 6 cc Tube	1
BC-01-0014		Bundle Hydraulic Kit Complete	

* Not Included in Hydraulic Kit

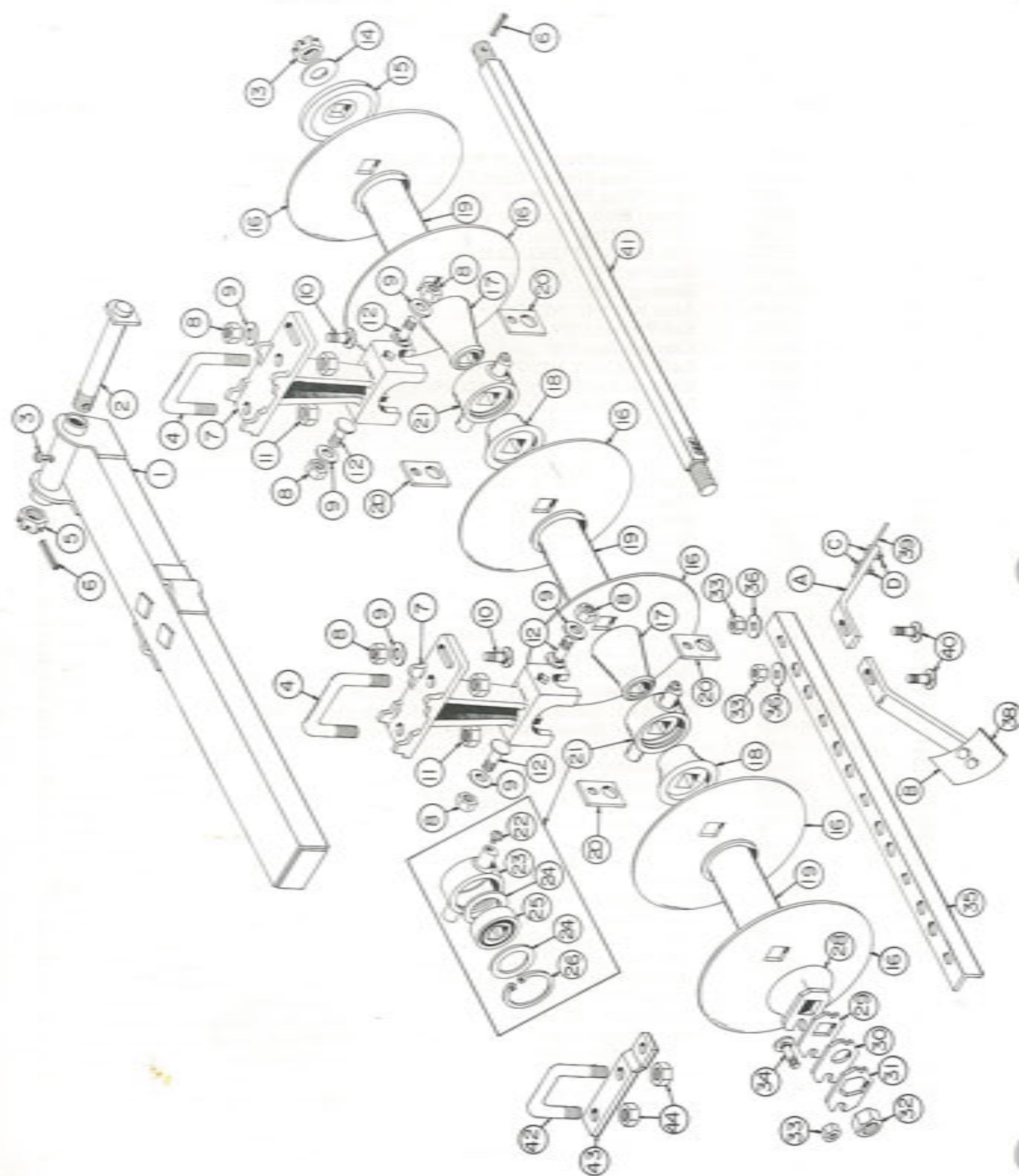
FRONT INSIDE GANG & FRAME



AMCO F15 SERIES DISK HARROW
FRONT INSIDE GANG & FRAME
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
1	0877A	Assy. Gang Frame - Left Front, Right Rear (SHOWN).....	1
1	0878A	Assy. Gang Frame - Right Front, Left Rear	1
2	0827	Assy. Wing Pivot Pin 1-1/2" Dia. x 10-1/4" long	2
3	11081	Grease Fitting 5/16" Drive In	1
4	11280	"U" Bolt 7/8" Dia.	2
5	10232	Hex Nut 1-1/2" NC, Slotted	1
6	10910	Roll Pin 5/16" x 2-1/4"	2
7	16012A	Bearing Riser	2
8	10299	Lock Nut 5/8" NC, PL	6
9	10059	Cut Washer 5/8" PL	6
10	10135	Carriage Bolt 5/8" x 1-3/4" NC, PL	2
11	10396	Lock Nut 7/8" NC, PL	4
12	10665	Carriage Bolt 5/8" x 2" NC, PL, GR5	4
13	10226	Nut Gang Bolt 1-1/2" NF, Slotted	1
14	10872	Cut Washer 1-3/8" PL	1
15	2404	Bumper Washer	1
16	9480	Blade 22" x 3/16" Plain	6
16	9484	Blade 22" x 3/16" C. O.	6
16	3276	Blade 22" x 1/4" Plain	6
16	3275	Blade 22" x 1/4" C. O.	6
16	11571	Blade 24" x 1/4" C. O.	6
16	11572	Blade 24" x 1/4" Plain	6
16	3253	Blade 24" x 3/16" Plain	6
16	2455	Blade 24" x 3/16" C.O.	6
17	17009	End Bell - Small (Before Serial No. 749)	2
17	17014	End Bell - Small (After Serial No. 750)	2
18	17010	End Bell - Large	2
19	0522	Spacer Spool	3
20	9628	Clamp Trunion 3/8 x 2-1/4" x 3-3/4" Long	4
21	FB-09-0013	Sub. Assy. Housing & Bearing (Before Serial No. 749)	2
21	FB-09-0015	Sub. Assy. Housing & Bearing (After Serial No. 750)	2
22	10606	Grease Fitting 1/8" NPT Straight	1
23	16003	Housing - Bearing	2
24	100104	Washer 100mm	2
25	G11071	Bearing GW211PP3 (Before Serial No. 749)	1
25	11503	Bearing GW211PP17 (After Serial No. 750)	1
26	11064	Snap Ring	1
28	1222A	End Gang Washer	1
29	100099	Spacer Plate	A.R.
30	100098	Bearing Plate	1
31	5622A	Lock Plate	1
32	10489	Nut Gang Bolt 1-1/2 NF	1
33	10395	Lock Nut 1/2" NC, PL	7
34	10710	Carriage Bolt 1/2" x 2" NC, PL	1
35	9548	Scraper Bar 2" x 2" x 3/8" - 51-11/16"	1
36	10832	Cut Washer 1/2" PL	6
37	0824	Assy. Scraper - Special R.H.	1
37	0825	Assy. Scraper - Special L.H. (Shown)	1
38	0789	Assy. Scraper - L.H.	5
A	100271	Scraper Shank	1
B	100368	Scraper Shank - Special	1
C	100270	Scraper Blade 3/16" x 6" x 4"	1
D	10785	Hex Head Machine Bolt 1/2 x 1-1/2 NC, PL	2
E	10395	Lock Nut 1/2 NC, PL	2
39	0788	Assy. Scraper - R.H.	5
40	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	4
41	9442	Gang Bolt 1-1/2" Square x 52-1/8	1
42	10097	Machine Bolt 1/2 x 2-1/2 NC, PL, GR5	1

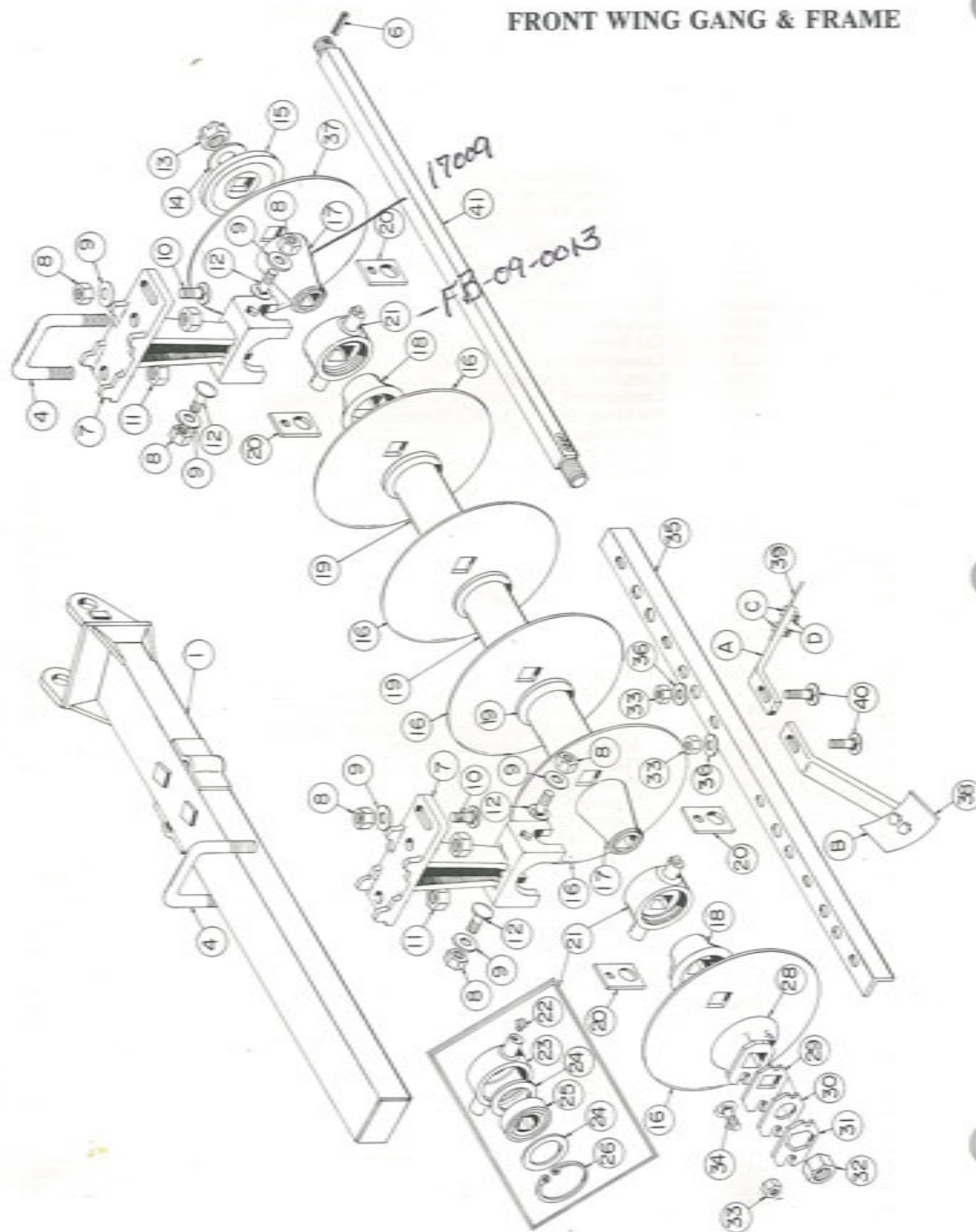
REAR INSIDE GANG & FRAME



AMCO F15 SERIES DISK HARROW REAR INSIDE GANG & FRAME 16'6"–24'0"

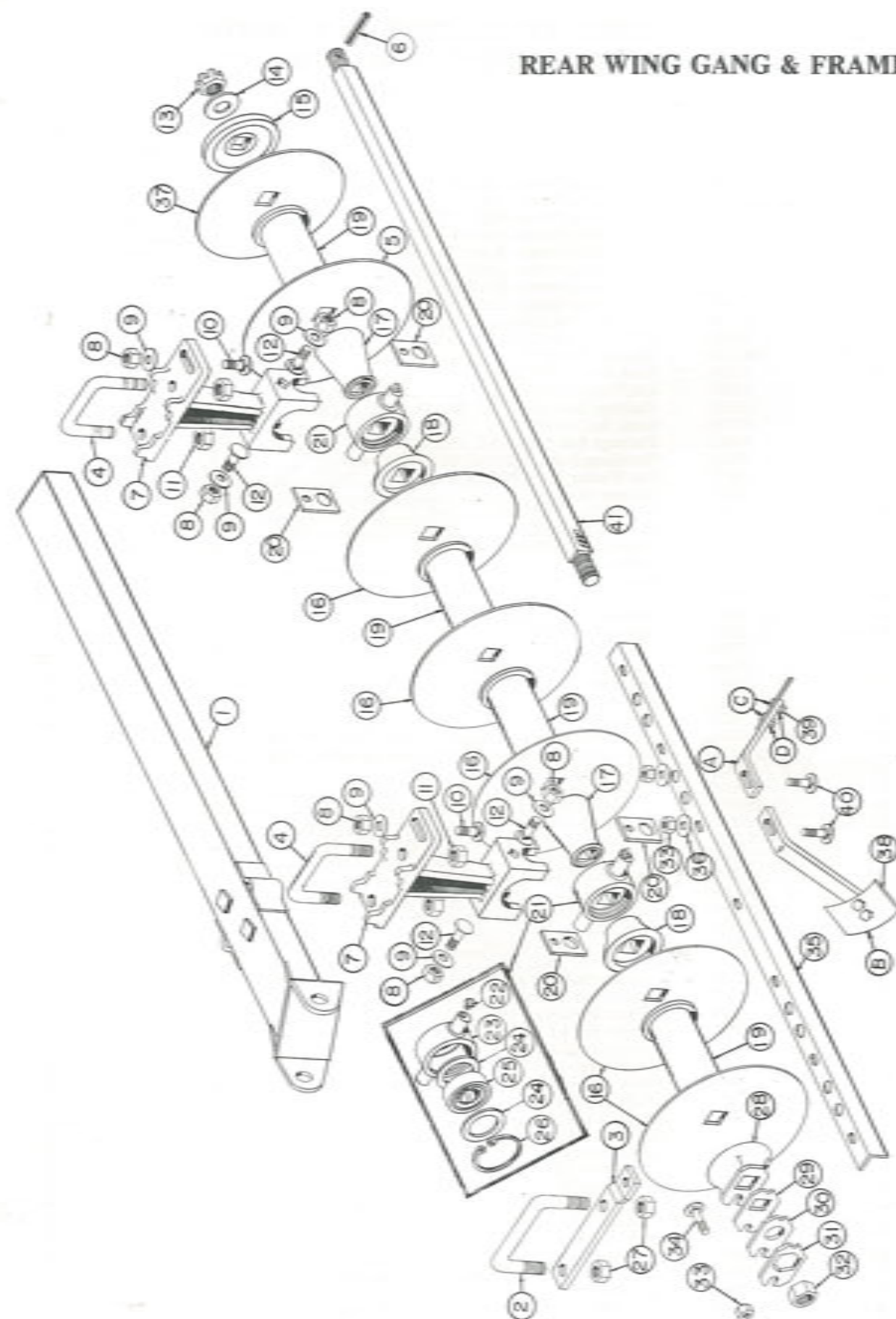
Ref. No.	Part No.	Description	No. Req'd
1	0877A	Assy. Gang Frame — Left Front, Right Rear (Shown)	1
1	0878A	Assy. Gang Frame — Right Front, Left Rear	1
2	0827	Assy. Wing Pivot Pin 1-1/2 Dia. x 11-1/8 Long	1
3	11081	Grease Fitting 5/16" Drive In	1
4	11280	"U" Bolt 7/8 Dia.	2
5	10232	Hex Nut 1-1/2 NC, slotted	1
6	10910	Roll Pin 5/16 x 2-1/4	2
7	16012A	Bearing Riser (PP)	2
8	10299	Lock Nut 5/8 NC, PL	7
9	10059	Cut Washer 5/8 PL	7
10	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	3
11	10396	Lock Nut 7/8 NC, PLT	4
12	10665	Carriage Bolt 5/8 x 2 NC, PL, GR5	4
13	10226	Nut Gang Bolt 1-1/2 - NF, Slotted	1
14	10872	Cut Washer 1-3/8 PL	1
15	2404	Bumper Washer	1
16	9480	Blade 22" Plain 3/16" Thick	6
16	9484	Blade 22" C. O. 3/16" Thick	6
16	3276	Blade 22" Plain 1/4" Thick	6
16	3275	Blade 22" C. O. 1/4" Thick	6
16	11571	Blade 24 x 1/4 C. O.	6
16	11572	Blade 24 x 1/4 Plain	6
16	3253	Blade 24" Plain 3/16" Thick	6
16	2455	Blade 24" C. O. 3/16" Thick	6
17	17009	End Bell - Small (Before Serial No. 749)	2
17	17014	End Bell - Small (After Serial No. 750)	2
18	17010	End Bell - Large	2
19	0522	Spacer Spool	3
20	9628	Clamp Trunion 3/8 x 2-1/2 x 3-3/4 long	4
21	FB-09-0013	Sub. Assy. Housing Bearing (Before Serial No. 749)	2
21	FB-09-0015	Sub. Assy. Housing Bearing (After Serial No. 750)	2
22	10606	Grease Fitting 1/8 NPT Straight	1
23	16003	Housing Bearing	1
24	100104	Washer 100mm	2
25	G11071	Bearing GW 211PP3 (Before Serial No. 749)	1
25	11503	Bearing GW211PP17 (After Serial No. 750)	1
26	11064	Snap Ring	1
28	1222A	End Gang Washer	1
29	100099	Spacer Plate	A.R.
30	100098	Bearing Plate	1
31	5622A	Lock Plate	1
32	10489	Nut Gang Bolt 1-1/2 NF	1
33	10395	Lock Nut 1/2 NC, PL	6
34	10710	Carriage Bolt 1/2 x 2 NC, PL	1
35	9475	Scraper Bar 2 x 2 x 3/8 - 42-1/2 Long	1
36	10832	Cut Washer 1/2 PLT	5
38	0789	Assy. Scraper L.H.	5
A	100271	Scraper Shank	1
B	100270	Scraper Blade 3/16 x 6 x 4	1
C	10785	Hex Head Machine Bolt 1/2 x 1-1/2 NC, PL	2
D	10395	Lock Nut 1/2 NC, PL	2
39	0788	Assy. Scraper R.H.	5
40	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	5
41	9442	Gang Bolt 1-1/2 Square x 52-1/8	1
42	6513	"U" Bolt 3/4 Dia.	1
43	100365	Scraper Bar Mount	1
44	10300	Lock Nut 3/4" NC, PLT	2

FRONT WING GANG & FRAME


 AMCO F15 SERIES DISK HARROW
 FRONT WING GANG & FRAME
 16'6" — 24'0"

Ref. No.	Part No.	Description	16'6"	No. Required		
				18'0"	21'0"	24'0"
1	0883	Assy. Gang Frame - Right 45"	1	—	—	—
1	0884	Assy. Gang Frame - Left 45"	1	—	—	—
1	0885	Assy. Gang Frame - Right 54-1/4"	—	1	—	—
1	0886	Assy. Gang Frame - Left 54-1/4"	—	1	—	—
1	0889	Assy. Gang Frame - Right 72-3/4"	—	—	1	—
1	0890	Assy. Gang Frame - Left 72-3/4"	—	—	1	—
1	0893	Assy. Gang Frame - Right 91-1/4"	—	—	—	1
1	0894	Assy. Gang Frame - Left 91-1/4"	—	—	—	1
4	11280	"U" Bolt 7/8 Dia.	2	2	2	3
6	10910	Roll Pin 5/16 x 2-1/4	1	1	1	1
7	16012A	Bearing Riser (PP)	2	2	2	3
8	10299	Lock Nut 5/8 NC, PL	6	6	6	6
9	10059	Cut Washer 5/8 PL	6	6	6	6
10	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	2	2	2	3
11	10396	Lock Nut 7/8 NC, PL	4	4	4	6
12	10665	Carriage Bolt 5/8 x 2 NC, PL, GR5	4	4	4	6
13	10226	Nut Gang Bolt 1-1/2" NF Slotted	1	1	1	1
14	10872	Cut Washer 1-3/8 PLT	1	1	1	1
15	2404	Bumper Washer	1	1	1	1
16	9480	Blade 22 x 3/16 Plain	4	5	7	9
16	9484	Blade 22 x 3/16 C.O.	4	5	7	9
16	3276	Blade 22 x 1/4 Plain	4	5	7	9
16	3275	Blade 22 x 1/4 C.O.	4	5	7	9
16	11571	Blade 24 x 1/4 C.O.	4	5	7	9
16	11572	Blade 24 x 1/4 Plain	4	5	7	9
16	3253	Blade 24 x 3/16 Plain	4	5	7	9
16	2455	Blade 24 x 3/16 C.O.	4	5	7	9
17	17009	End Bell - Small (Before Serial No. 749)	2	2	2	3
17	17014	End Bell - Small (After Serial No. 750)	2	2	2	3
18	17010	End Bell - Large	2	2	2	3
19	0522	Spacer Spool	2	3	5	6
20	9628	Clamp Trunion 3/8 x 2-1/2 x 3-3/4 Long	4	4	4	6
21	FB-09-0013	Sub. Assy. Housing & Bearing (Before Serial No. 749)	2	2	2	2
21	FB-09-0015	Sub. Assy. Housing & Bearing (After Serial No. 750)	—	—	2	2
22	10606	Grease Fitting 1/8 NP Straight	1	1	1	1
23	16003	Housing - Bearing	1	1	1	1
24	100104	Washer 100mm	2	2	2	2
25	G11071	Bearing GW211PP3 (Before Serial No. 749)	1	1	1	1
25	11503	Bearing GW211PP17 (After Serial No. 750)	1	1	1	1
26	11064	Snap Ring	1	1	1	1
28	1222A	End Gang Washer	1	1	1	1
29	100099	Spacer Plate	1	1	1	1
30	100098	Bearing Plate	1	1	1	1
31	5622A	Lock Plate	1	1	1	1
32	10489	Nut Gang Bolt 1-1/2 NF	1	1	1	1
33	10395	Lock Nut 1/2 NC, PL	5	6	8	10
34	10710	Carriage Bolt 1/2 x 2 NC, PL, GR5	1	1	1	1
35	9475	Scraper Bar 2 x 2 x 3/8 42-1/2	1	—	—	—
35	9548	Scraper Bar 2 x 2 x 3/8 51-11/16	—	1	—	—
35	9550	Scraper Bar 2 x 2 x 3/8 70-1/16	—	—	1	—
35	100367	Scraper Bar 2 x 2 x 3/8 88-7/16	—	—	—	1
36	10832	Cut Washer 1/2 PLT	4	5	7	9
37	9481	Blade 20 x 3/16 Plain	1	1	1	1
37	9487	Blade 20 x 3/16 C.O.	1	1	1	1
37	9480	Blade 22 x 3/16 Plain	1	1	1	1
37	9484	Blade 22 x 3/16 C.O.	1	1	1	1
38	0789	Assy. Scraper L.H.	4	5	7	9
A	100271	Scraper Shank	1	1	1	1
B	100270	Scraper Blade 3/16 x 6 x 4	1	1	1	1
C	10785	Hex Head Machine Bolt 1/2 x 1-1/2 NC, PL	2	2	2	2
D	10395	Lock Nut 1/2 NC, PL	2	2	2	2
39	0788	Assy. Scraper R.H.	4	5	7	9
40	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	4	5	7	9
41	9441	Gang Bolt 1-1/2" Sq. 5 Blade - 42-7/8 Long	1	—	—	—
41	9442	Gang Bolt 1-1/2" Sq. 6 Blade - 52-1/8 Long	—	1	—	—
41	9444	Gang Bolt 1-1/2" Sq. 8 Blade - 70-5/8 Long	—	—	1	—
41	9446	Gang Bolt 1-1/2" Sq. 10 Blade - 89-1/8 Long	—	—	—	1

REAR WING GANG & FRAME



AMCO F15 SERIES DISK HARROW REAR WING GANG & FRAME 16'6" — 24'0"

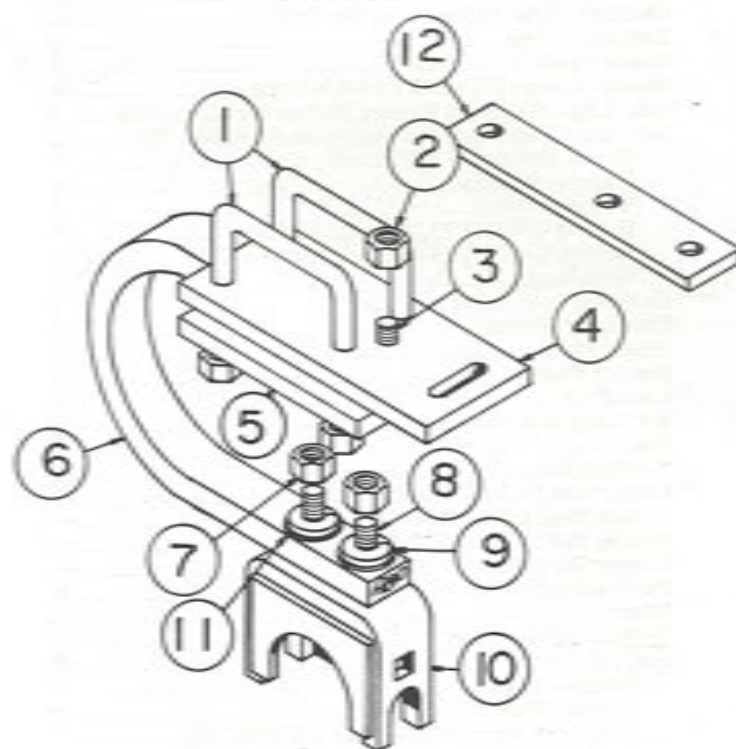
Ref. No.	Part No.	Description	16'6"	No. Required		
				18'0"	21'0"	24'0"
1	0885	Assy. Gang Frame R.H. - 54-1/4"	1	—	—	—
1	0886	Assy. Gang Frame L.H. - 54-1/4"	1	—	—	—
1	0887	Assy. Gang Frame R.H. - 63-1/2"	—	1	—	—
1	0888	Assy. Gang Frame L.H. - 63-1/2"	—	1	—	—
1	0891	Assy. Gang Frame R.H. - 82"	—	—	1	—
1	0892	Assy. Gang Frame L.H. - 82"	—	—	1	—
1	0895	Assy. Gang Frame R.H. - 100-1/2"	—	—	—	1
1	0896	Assy. Gang Frame L.H. - 100-1/2"	—	—	—	1
2	6513	"U" Bolt 3/4 Dia.	1	1	1	1
3	100365	Scraper Bar Support	1	1	1	1
4	11280	"U" Bolt 7/8 Dia.	2	2	2	2
5	9481	Blade 20 x 3/16 Plain	1	1	1	1
5	9487	Blade 20 x 3/16 C.O.	1	1	1	1
5	9480	Blade 22 x 3/16 Plain	1	1	1	1
5	9484	Blade 22 x 3/16 C.O.	1	1	1	1
6	10910	Roll Pin 5/16 x 2-1/4	1	1	1	1
7	16012A	Bearing Riser (PP)	2	2	2	3
8	10299	Lock Nut 5/8 NC, PL	7	7	7	10
9	10059	Cut Washer 5/8 PL	7	7	7	10
10	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL	3	3	3	4
11	10396	Lock Nut 7/8 NC, PLT	4	4	4	6
12	10665	Carriage Bolt 5/8 x 2 NC, PL, GR5	4	4	4	6
13	10226	Nut Gang Bolt 1-1/2 NF, Slotted	1	1	1	1
14	10872	Cut Washer 1-3/8 PL	1	1	1	1
15	2404	Bumper Washer	1	1	1	1
16	9480	Blade 22 x 3/16 Plain	4	5	7	9
16	9484	Blade 22 x 3/16 C.O.	4	5	7	9
16	3276	Blade 22 x 1/4 Plain	4	5	7	9
16	3275	Blade 22 x 1/4 C.O.	4	5	7	9
16	11571	Blade 24 x 1/4 C.O.	4	5	7	9
16	11572	Blade 24 x 1/4 Plain	4	5	7	9
16	3253	Blade 24 x 3/16 Plain	4	5	7	9
16	2455	Blade 24 x 3/16 C.O.	4	5	7	9
17	17009	End Bell - Small (Before Serial No. 749)	2	2	2	3
17	17014	End Bell - Small (After Serial No. 750)	2	2	2	3
18	17010	End Bell - Large	2	2	2	3
19	0522	Spacer Spool	3	4	6	7
20	9628	Clamp Trunion 3/8 x 2-1/2 x 3-3/4 Long	4	4	4	6
21	FB-09-0013	Sub. Assy. Housing & Bearing (Before Serial No. 749)	2	2	2	3
21	FB-09-0015	Sub. Assy. Housing & Bearing (After Serial No. 750)	2	2	2	3
22	10606	Grease Fitting 1/8 NP Straight	1	1	1	1
23	16003	Housing Bearing	1	1	1	1
24	100104	Washer 100mm	2	2	2	2
25	G11071	Bearing GW211PP3 (Before Serial No. 749)	1	1	1	1
25	11503	Bearing GW211PP17 (After Serial No. 750)	1	1	1	1
26	11064	Snap Ring	1	1	1	1
27	10300	Lock Nut 3/4" NC, PL	2	2	2	2
28	1222A	End Gang Washer	1	1	1	1
29	100099	Spacer Plate	1	1	1	1
30	100098	Bearing Plate	1	1	1	1
31	5622A	Lock Plate	1	1	1	1
32	10489	Nut Gang Bolt 1-1/2 NF	1	1	1	1
33	10395	Lock Nut 1/2 NC, PL	7	8	1	12
34	10710	Carriage Bolt	1	1	1	1
35	9548	Scraper Bar 2 x 2 x 3/8 51-11/16	1	—	—	—
35	9549	Scraper Bar 2 x 2 x 3/8 60-7/8	—	1	—	—
35	9551	Scraper Bar 2 x 2 x 3/8 79-1/4	—	—	1	—
35	100534	Scraper Bar 2 x 2 x 3/8 97-5/8	—	—	—	1
36	10832	Cut Washer 1/2 PL	6	7	9	11
37	3055	Blade 16 x 9 Plain	1	1	1	1
37	9482	Blade 18 x 8 Ga. Plain	1	1	1	1
38	0789	Assy. Scraper L. H.	6	7	9	11
A	100271	Scraper Shank	6	7	9	11
B	100270	Scraper Blade 3/16 x 6 x 4	6	7	9	11
C	10785	Hex Head Machine Bolt 1/2 x 1-1/2 NC, PL	1	—	—	—
D	10395	Lock Nut 1/2 NC, PL	—	1	—	—
39	0788	Assy. Scraper R. H.	—	—	1	—
40	10870	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	—	—	—	1
41	9442	Gang Bolt 1-1/2" Sq. 6 Blade - 52-1/8 Long	1	1	1	1
41	9443	Gang Bolt 1-1/2" Sq. 7 Blade - 61-3/8 Long	1	1	1	1
41	9445	Gang Bolt 1-1/2" Sq. 9 Blade - 79-7/8 Long	2	2	2	2
41	9447	Gang Bolt 1-1/2" Sq. 11 Blade - 98-3/8 Long	2	2	2	2

AMCO F15 SERIES DISK HARROW

OPTIONAL SHOCK ABSORBER BEARING RISER

Ref. No.	Part No.	Description	No. Req'd
1	11467	"U" Bolt 3/4 Dia.	2
2	10300	Lock Nut 3/4 NC, PL	5
3	10320	Machine Bolt 3/4 x 3-1/2 NC, PL, GR5	1
4	100801	Top Plate 1/2 x 5 - 12" Long	1
5	100802	Bottom Plate 5/8 x 5 - 8-3/4" Long	1
6	11521	Shock Absorber Shank 1-1/4 x 2	1
7	10585	Hex Nut 3/4 NF	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 PL	2
12	100846	Scraper Bar Support 1/2 x 2-1/2 - 12 Long	1

NOTE: Parts 1 - 11 are required to replace Bearing Riser 16012 on a Shock Absorber Harrow. Part 12 used to replace 100365 on a Shock Absorber Harrow.



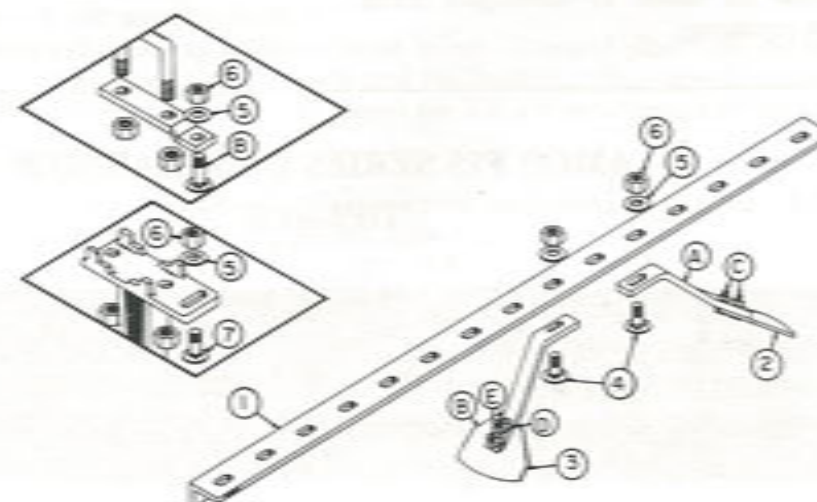
OPTIONAL SHOCK ABSORBER BEARING RISER

AMCO F15 SERIES DISK HARROW

OPTIONAL HEAVY DUTY SCRAPERS

Ref. No.	Part No.	Description	No. Required				
			16'6"	18'0"	19'6"	21'0"	24'0"
1	101071	Scraper Bar 3 x 2 x 1/2 L - 36-5/8 Long Front Wing 16'6"	2	—	—	—	—
1	101072	Scraper Bar 3 x 2 x 1/2 L - 41-1/4 Long Rear Inside	2	2	2	2	2
1	101073	Scraper Bar 3 x 2 x 1/2 L - 45-7/8 Long Front Wing 18'	—	2	—	—	—
1	101074	Scraper Bar 3 x 2 x 1/2 L - 50-1/2 Long Rear Wing 16'6"	2	—	—	—	—
1	101075	Scraper Bar 3 x 2 x 1/2 L - 55-1/8 Long Front Inside Front Wing 19'6"	2	2	4	2	2
1	101076	Scraper Bar 3 x 2 x 1/2 L - 59-3/4 Long Rear Wing 18'	—	2	—	—	—
1	101077	Scraper Bar 3 x 2 x 1/2 L - 64-3/8 Long Front Wing 21'	—	—	—	2	—
1	101078	Scraper Bar 3 x 2 x 1/2 L - 69 Long Rear Wing 19'6"	—	—	2	—	—
1	101080	Scraper Bar 3 x 2 x 1/2 L - 78-1/4 Long Rear Wing 21'	—	—	—	2	—
1	101081	Scraper Bar 3 x 2 x 1/2 L - 82-7/8 Long Front Wing 24'	—	—	—	—	2
1	101084	Scraper Bar 3 x 2 x 1/2 L - 96-3/4 Long Rear Wing 24'	—	—	—	—	2
2	20068	Scraper - RH.	21	23	25	27	31
A	101049	Scraper Shank .360 x 2	1	1	1	1	1
B	101019	Scraper Blade 3/16 x 6-1/2	1	1	1	1	1
C	10785	Hex Head Screw 1/2 x 1-1/2 NC, PL	2	2	2	2	2
D	10832	Cut Washer 1/2 PL	2	2	2	2	2
E	10395	Lock Nut 1/2 NC, PL	2	2	2	2	2
3	20069	Scraper - LH.	21	23	25	27	31
4	10135	Carriage Bolt 5/8 x 1-3/4 NC, PL, GR5	40	44	48	52	60
5	10059	Cut Washer 5/8 PL	42	46	50	54	62
6	10299	Lock Nut 5/8 NC, PL	42	46	50	54	62
7	10665	Carriage Bolt 5/8 x 2 NC, PL, GR5 (Mounts Scraper Bar to Bearing Riser)	18	18	20	22	22
8	10722	Carriage Bolt 5/8 x 2-1/2 NC, PL (Mounts Scraper & Scraper Bar to Rear Center Support)	2	2	2	2	2

OPTIONAL HEAVY DUTY SCRAPERS



DECALS

①



②



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 F15 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 F15 HARROW
16'6" — 24'0"

The AMCO F15 Harrow is shipped from the factory with maximum pre-assembly. The following bundles are required for a complete harrow:

- A. Bundle Pull Tongue (with tongue jack)
- B. Bundle Main Frame (with rockshafts)
- C. Two 15 x 8 Six Bolt Wheels
- D. Two 15 x 10 Six Bolt Wheels
- E. Two 4 x 8 Hydraulic Cylinders with Transport lock
- F. Two 4 x 24 Hydraulic Cylinders
- G. Bundle Wing Main Frame — Right Hand (with Rockshaft)
- H. Bundle Wing Main Frame — Left Hand (with Rockshaft)
- I. Bundle Hydraulic Kit with Operators Manual
- J. Bundle Front Right Hand Inside Gang and Gang Frame
- K. Bundle Front Left Hand Inside Gang and Gang Frame
- L. Bundle Rear Right Hand Inside Gang and Gang Frame
- M. Bundle Rear Left Hand Inside Gang and Gang Frame
- N. Bundle Front Right Hand Wing Gang and Gang Frame
- O. Bundle Front Left Hand Wing Gang and Gang Frame
- P. Bundle Rear Right Hand Wing Gang and Gang Frame
- Q. Bundle Rear Left Hand Wing Gang and Gang Frame

Step 1.

Select a clear level area to assemble the harrow. Place all parts and bundles where they will be readily accessible during assembly. Remove rockshafts and other parts from main frame.

Step 2.

Place the center main frame "right side up" on sturdy stands at least 33" high. Install rockshafts and related linkages. Tighten bolts and install all 5/16 x 2-1/4 roll pins.



CAUTION Use sturdy stands to prevent frame from falling.

Step 3.

Attach the two inside front gangs and gang frames to the center main frame. Clamp in place with the 7/8 x 9 Bolts and 5/8 x 3 straps. These gangs have six blades and two bearings. The gangs should be located to throw soil away from the center of the harrow. Leave the 7/8 x 9 bolts snug but not tight.

Step 4.

Attach the two inside rear gangs to the center main frame. Clamp in place with the 7/8 x 9 bolts and 5/8 x 3 straps. These gangs have six blades and two bearings. The gangs should be located to throw soil toward the center of the harrow. Leave the 7/8 x 9 bolts snug but not tight.

Step 5.

Attach the two front wing gang frames to the inside front gang frames. Use the 1-1/2" diameter wing pivot pins. Tighten the nuts snug but not tight.

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.

Step 6.

Attach the two rear wing gang frames to the inside rear gang frames. Use the 1-1/2" diameter wing pivot pins. Tighten the nuts snug but not tight.

Step 7.

Mount two 12.5L x 15 eight ply tires on the two 15 x 10 wheels. Inflate to 40-50 PSI. Mount wheels on center rockshafts. Tighten hub bolts tight. Remove all stands from underneath the main frame.

Step 8.

Clamp the wing main frames to the wing gang frames using the 7/8 x 9 bolts and 5/8 x 3 straps. Note that the outside rear straps on the 16'6" and 18'0" harrows are slightly longer than the other 5/8 x 3 straps.

Shift gangs as required to align all holes. **Thoroughly tighten all thirty-two 7/8 x 9 clamp bolts.** Tighten four 1-1/2" diameter wing pivot pins. Secure the four wing pivot pins with 5/16 x 2-1/4 Roll Pins.



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



16'6" AND 18'0"
WING MAIN FRAME



21'0" AND 24'0"
WING MAIN FRAME



TURNBUCKLES



HYDRAULIC CYLINDER MOUNTING

Step 9.

Install the turnbuckle sub. assemblies between the center rockshafts and the wing rockshafts. Adjust turnbuckles to 15" length before installation. Tighten the 1-3/8-NC jam nut.

Step 10.

Mount two 11L x 15 six or eight ply tires on the two 15 x 8 wheels. Inflate to 40-50 PSI. Mount wheels on wing rockshafts. Tighten hub bolts tight.

Step 11.

Install the two 4" x 8" hydraulic cylinders on the center main frame and the two center rockshafts. The rod end should be attached to the rockshaft. The two 1-1/4" cut washers should be installed between the transport lock and cylinder clevis.

Step 12.

Install the two 4" x 24" hydraulic cylinders. Turn ports to rear on left hand cylinder. Turn ports to front on right hand cylinder. Check plug on bottom of butt casting on each cylinder. It must be tight!

Step 13.

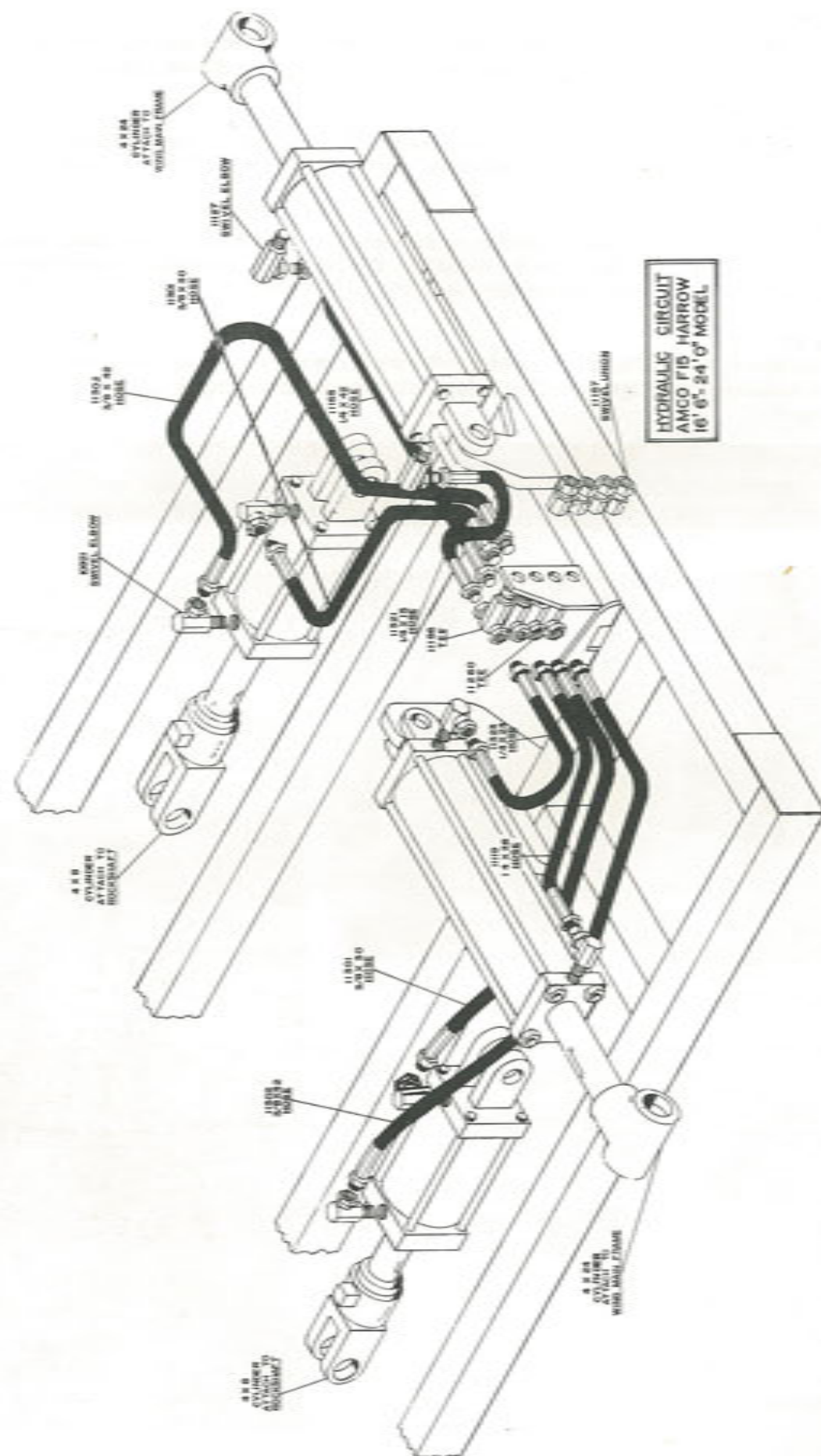
Extend the two 4" x 24" cylinders and attach to the wing main frames. Note how the four 1-1/4" washers are located. Secure with the 1-1/4" pins and the 5/16" x 2-1/4" roll pins.



4 X 8 CYLINDER
INSTALLATION



4 X 24 CYLINDER
INSTALLATION

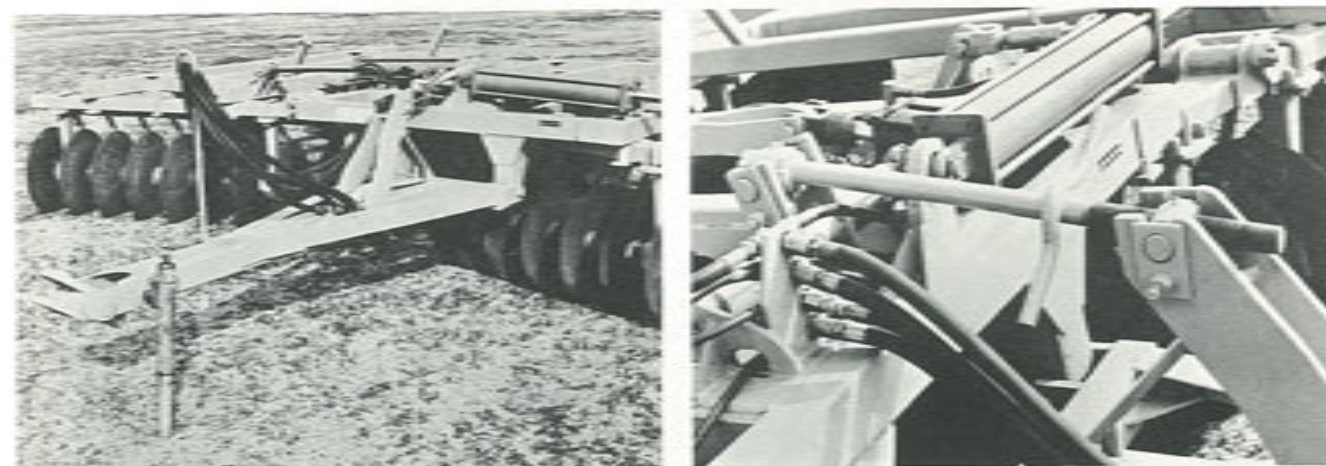
**Step 14.**

Install hydraulic fittings as follows:

- A. Install four #10921 1/2" Male to 1/2" Female swivel elbows into the ports on the 4" x 8" cylinders. Turn fittings as shown in drawing. Use small amount of pipe sealant on each fitting to eliminate fluid seeps. Tighten fittings!
- B. Install four #11127 1/2" Male to 1/4" Female swivel elbows into ports on 4" x 24" cylinders. Turn fittings as shown in drawing. Tighten fittings!
- C. The four #11157 1/2" Female to 1/2" Female swivel unions are used to secure the four tees to the mounting bracket. The swivel on the union should be turned to the front to simplify attachment of the four 1/2" x 10' hoses that go to the tractor. The two #11260 1/2" Male to 1/2" Female tees should be installed in the two bottom holes. The two #11156 1/2" Male to 1/4" Female tees should be installed in the two top holes. Use the sealant as described above.
- D. Connect cylinders with hoses as follows:
 - (1) Two #11302 3/8" x 42" hoses go to the rod ends of the 4" x 8" cylinders. Connect to the bottom tee on the mount bracket.
 - (2) Two #11301 3/8" x 30" hoses go to the butt ends of the 4" x 8" cylinders. Connect to the second tee from the bottom.
 - (3) #11119 1/4" x 36" hose goes from rod end of right hand 4" x 24" cylinder to the second tee from the top.
 - (4) #11165 1/4" x 42" hose goes from rod end of left hand 4" x 24" cylinder to the second tee from the top.
 - (5) #11323 1/4" x 24" hose goes from butt of right hand 4" x 24" cylinder to top tee.
 - (6) #11321 1/4" x 15" hose goes from butt of left hand 4" x 24" cylinder to top tee.
 Use small amount of pipe sealant on each hydraulic fluid fitting to eliminate fluid seeps. Tighten fittings!

Step 15.

Install pull tongue. Install tongue adjusting rod sub assembly.

**Step 16.**

Attach four 1/2" x 10" or 3/8" x 10" SAE 100R2 or SAE 100R8 Double Braid Hydraulic hoses to the swivel adaptors on the main frame. Attach quick couplers. (Hoses and couplers are available as optional equipment.) Attach harrow and hoses to tractor.

Step 17.

Final Grooming and Check Points.

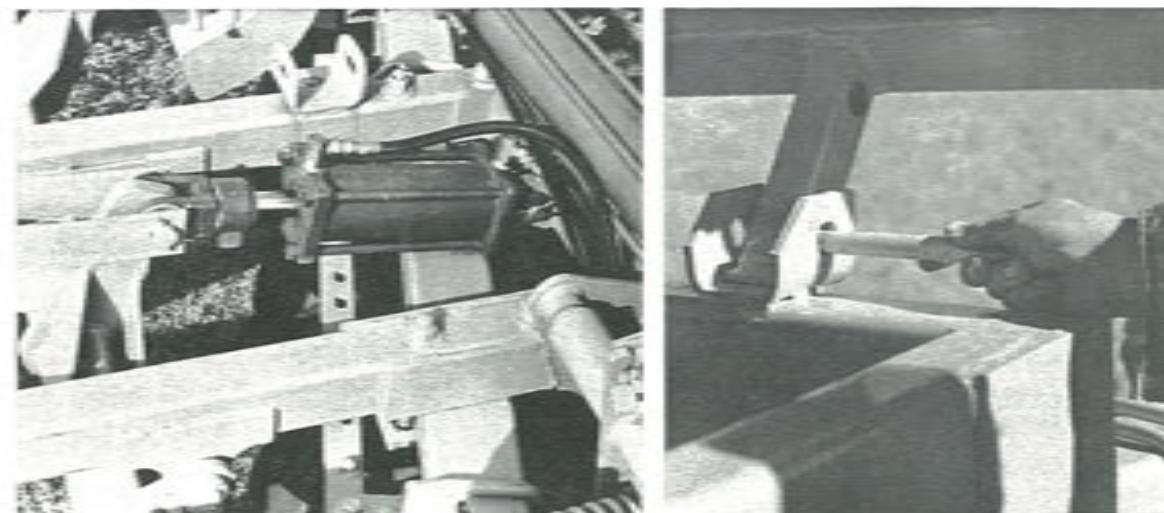
- A. Check inside front gangs. They should overlap in center about 1-1/2" to 2-1/2". (Front tips of inside blades should be 3/4" to 1-1/4" over center line of harrow.) This can be adjusted by shifting the gangs on the gang frames. It is important that center blades clear by at least 2-1/2".
- B. Check the inside rear gangs. They should be 26" to 30" apart. (The front tips of the inside blades should be 13" to 15" from the harrow centerline.) Shift gangs as required to obtain this spacing.



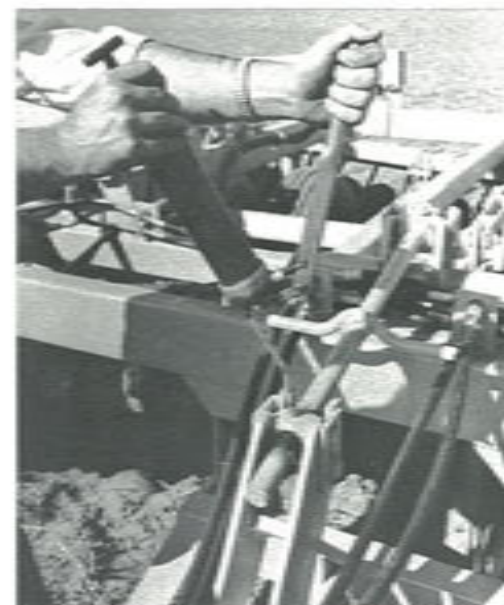
- C. Check the spacing between the blades on the center gangs and wing gangs. This spacing should be 9-1/4" to 9-3/4". The harrow must be on a level area when checking this spacing. Shift wing gangs as required to obtain this spacing.
- D. Check scraper adjustment. Scrapers should be adjusted to run 1/16" to 1/8" from disk blades.
- E. Raise and lower harrow 4 or 5 times with 4" x 8" cylinders to be sure that hoses are properly routed. Check transport locks to see if they function properly.
- F. Check adjustment of turn buckles between center and wing rockshafts. Both 4" x 8" cylinders must be fully retracted. Extend or retract turnbuckles for equal ground clearance under all four tires. Extending the turnbuckles will raise the wing gauge wheels. Retracting the turnbuckles will lower the wing gauge wheels. The turnbuckles should never be extended to over 16" in length. They should never be retracted to under 14" in length. The 1-3/8-NC jam nut should be tightened.



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



- G. Fold and unfold the wings 4 or 5 times. Check hose routing to be certain hoses and fittings will not be damaged in normal operation. Check wings to be sure they fold properly. Make sure the transport lock pins are stored in the holes on the wing main frames. The pins should easily slip into the holes to lock the wings in transport position.
- H. Fully extend the 4" x 8" cylinders and raise the harrow for transport. Adjust the tongue adjusting rod to level the harrow for transport.
- I. Check all hydraulic hoses and fittings for leaks. Repair as required.
- J. Raise harrow for transport as described above. Use a good grade of **clean** Lithium soap base chassis grease to grease 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 eight rockshaft pivot pins until grease appears at the ends of the pivot journals. It will take several strokes to initially fill the pivot journals.
 - (2) Grease the two turnbuckles between the center rockshafts and wing rockshafts. Fill the cavity until grease appears around the threads. Again, it will take several strokes to initially fill the cavity. Grease the four wing pivot pins.



- (3) Grease the two fittings on the tongue adjusting rod and the one fitting on the tongue control rod. This fitting is located under the front center of the harrow main frame. It is immediately in front of the compression spring on the tongue control rod. Remove tape from tongue adjusting rod.
- (4) Grease the gang bearings with 4 or 5 shots of grease to purge any condensation that has accumulated during shipment and storage.

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.

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.

- L. Check all bolts for proper torque.

Step 18.

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 improvements.

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

NOTES:

lubrication

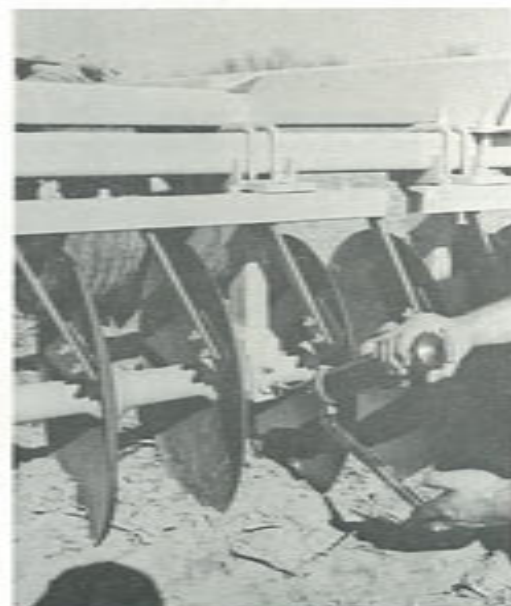
Careful and regular attention to lubrication will greatly increase the life of the harrow. For economical and efficient operation, the proper lubrication of frame fittings, gang bearings, and wheel bearings is essential.

Be sure fittings are free of dirt before greasing. If a fitting is lost or damaged, replace it immediately. Lubricate all parts thoroughly with a good grade No. 2 gun grease (Lithium Base).

Miscellaneous working parts not provided with lubrication fittings should be oiled occasionally with a good grade of lubrication oil.

ROCKSHAFT PIVOT PINS: A high carbon steel pin with a grease fitting joins each rockshaft to the main frame in two places. These 8 pins should be greased every 50 hours of operation. They should also be greased at the beginning and end of the disking season. A good grade of Lithium soap base grease is recommended.

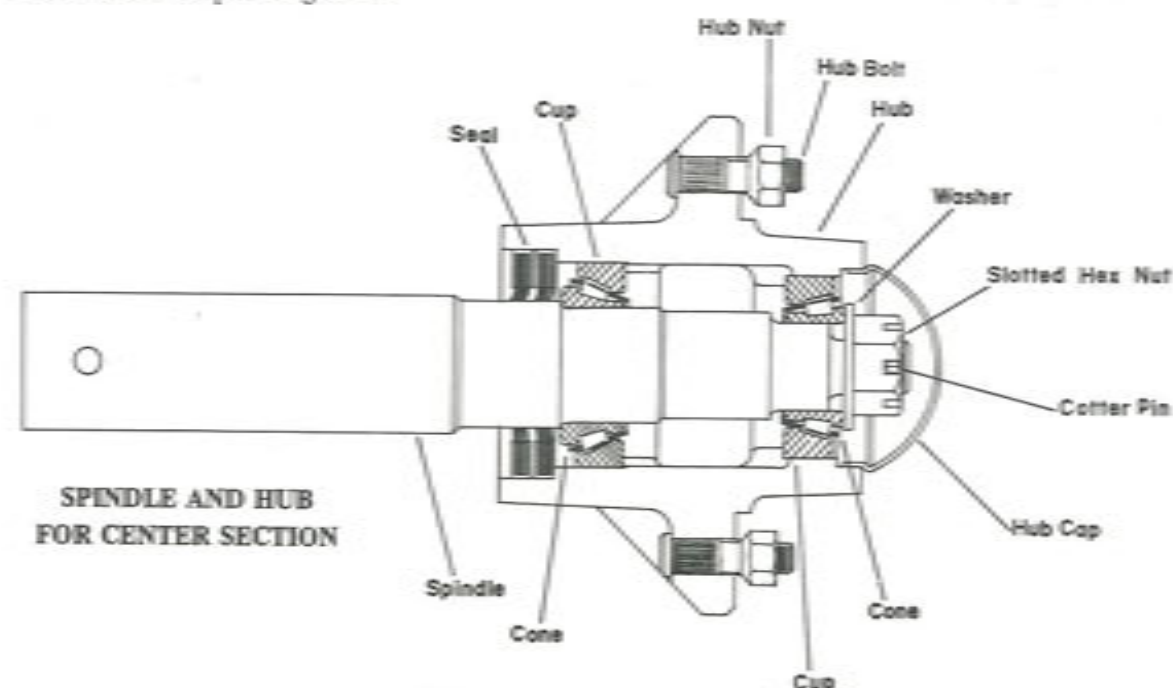
TONGUE ADJUSTING ROD AND TONGUE CONTROL ROD: The two swivels on the tongue adjusting rod and the fitting on the tongue control rod should be greased every 50 hours of operation. Also, at the beginning and end of each disking season. The threads on the rod should be cleaned and oiled occasionally for smooth operation.



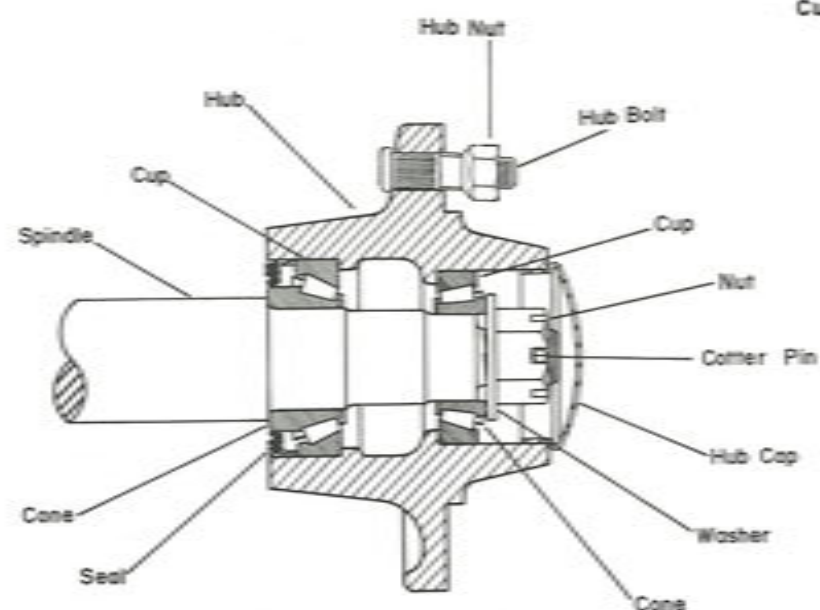
GANG BEARINGS: The AMCO F15 Harrow Gangs are equipped with regreasable Protect-O-Shield ball bearings. The grease fitting is located on the rear of each bearing housing. They should be greased every 50 hours of operation with a good grade of lithium soap base chassis grease. All bearings should be greased at the beginning and end of each disking season. To protect the seals from the elements, raise the harrow on its wheels and slowly spin the gangs so the grease wraps around the seals.

More frequent greasing is recommended when working in very sandy or wet conditions.

WHEEL HUB BEARINGS: The wheel hubs are equipped with tapered roller bearings. These hubs are packed with grease and adjusted at the factory. They should be repacked and the spindle nut properly adjusted each disking season or every 300 hours of operation. Use a good grade of clean lithium soap base grease.



SPINDLE AND HUB
FOR CENTER SECTION



SPINDLE AND HUB
FOR WING SECTION

WING PIVOT PINS: The hydraulically folded wings pivot on four 1-1/2" diameter high carbon steel pins. These pivot pins should be greased each week or every 50 hours of operation.



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.

ROCKSHAFT TURNBUCKLES: The center rockshafts and wing rockshafts are connected with turnbuckles. The threads should be periodically cleaned and lubricated to assure smooth operation. They should also be greased each week or every 50 hours of operation.

storage

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

Clean off all foreign matter, and thoroughly lubricate the harrow.
(See LUBRICATION INSTRUCTIONS)

Tighten loose bolts and replace any damaged or missing parts.

Repaint the harrow where the original paint has worn off.

Coat the disk blades and hydraulic cylinder rod with a good rust preventative.

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

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

Whenever disk blades or bearings are replaced, the gang shaft nuts must be torqued to 1200 foot pounds.



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.



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

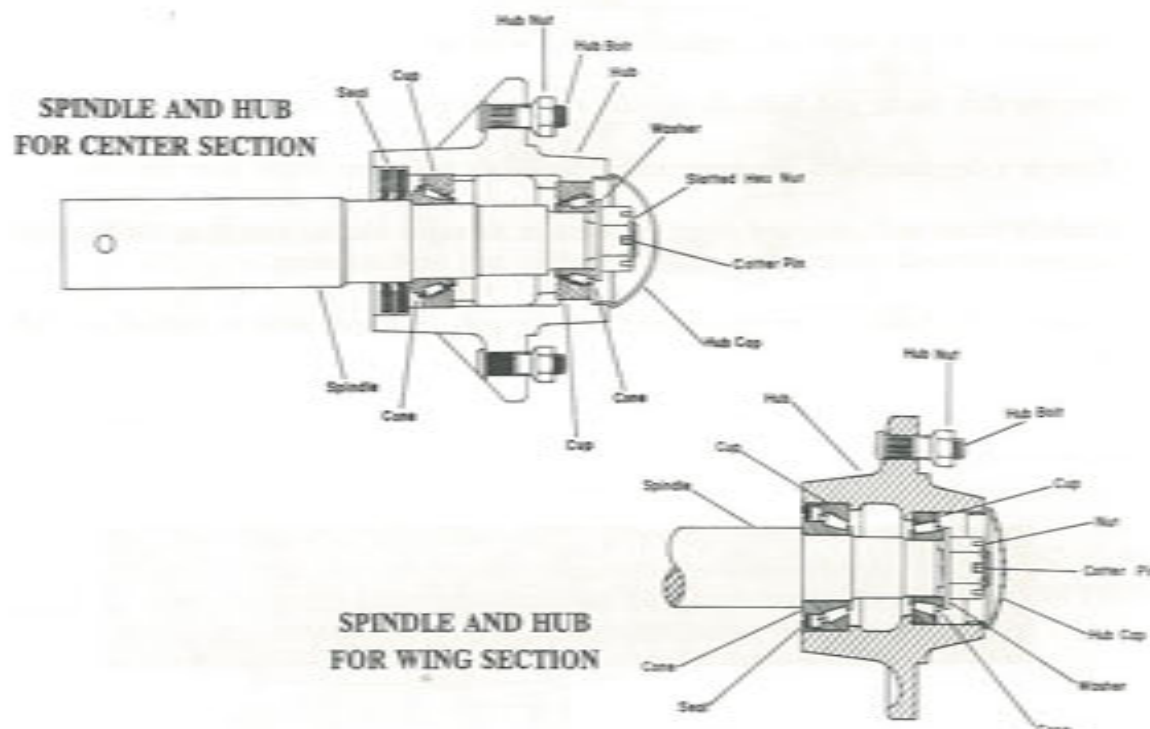
Relieve hydraulic pressure before disconnecting circuits. When reassembling, make absolutely certain that all connections are tight.

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

maintenance

WHEEL BEARING 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.

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



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. The hubs on the wing depth gauges use the inner bearing race as the sealing surface. Make sure the seal fits snugly on this surface. The seal must be replaced if excessively worn. The hubs on the center section have two seals that seal on the spindle. Check the seals and the spindle for good sealing surfaces. Particular attention must be paid to cleaning the spindle prior to reassembly. Use emory cloth to smooth the grease seal seats and provide a smooth sealing surface.
3. Carefully inspect both sets of bearings cones. Bearing bore and rollers must be smooth and free of nicks and scratches. Replace cones if damaged.
4. Inspect hub to make sure that hub 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.
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. Spindle washer, slotted nut, cotter pin and hub cap must be in good condition. Replace if worn or damaged.
7. 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 the hub and carefully re-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, to seat the bearings, until the hub binds when rotated. Check seal lips to be certain they are turned out to exclude contamination.

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.

GANG REPAIR:



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

1. 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.
2. Remove the nuts that secure the gang to the bearing riser.
3. Remove the trunion clamps.
4. 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.
5. Remove the gang bolt nut and end washer.
6. Remove the blades, spacer spools and bearings being careful not to damage the threads on the gang bolt.
7. Tear the entire gang down and clean all parts. Check disk axle for straightness. Bowed, bent or worn axles must be replaced.
8. Check spacer spools for damage caused by running disk with loose gangs or hitting underground obstructions. Replace spools if they are damaged.
9. 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.
10. Check all disk blades for cracks, wear and other damage. Replace worn or damaged disk blades.
11. Check all the bearings on the gang. Running a harrow for one hour or more after a bearing failure will seriously damage other bearings on the gang. This damaged bearing will then fail within a few hours after the failed bearing has been replaced. Continued operation with this failed bearing will damage the new bearing thus it will fail after a few hours use. In most cases it will be best to replace all bearings on a gang when it is torn down for repairs. A triple lip sealed bearing should always be used for bearing replacement. Also, a regreasable type bearing should always be used.

12. To replace a bearing, the snap ring must be removed. The old bearing should then be pressed out of the housing. Clean and wash out old grease and carefully check the housing. Replace the housing if it is damaged. Check the Protect-O-Shield washers. 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 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. **NEVER** press against the seal or inner race of the bearing. Check location of the grease hole in the outer race of the bearing. This hole must align with the grease groove in the bearing housing. Rotate the bearing in the housing after it is pressed in to be sure it turns freely. Install the snap ring in the housing.
13. After cleaning, checking and replacing all damaged parts, the gang should be assembled. Be sure the grease fittings in the bearing housing face to the rear. Be sure the snap ring in the bearing housing is turned toward the convex (back) side of the disk blades. The 1-1/2" square gang bolt nut should be torqued to 1200 FT/LBS. The axle nut should be locked in place with the lock strap.
14. After the gang is assembled it should be attached to the harrow. The bearing risers should be carefully spaced to match the bearing housings. Poorly spaced bearing risers will overload the bearings and cause premature failure. The gang should be rotated 4 or 5 complete revolutions to be sure that all parts are aligned and the gang turns freely.
15. 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.
16. It is essential that gang bolts be kept tight to prevent axle bending, blade breakage, spacer spool breakage and damage to other gang parts. Gang parts tend to wear on a bevel when the harrow is operated with a loose gang bolt. This reduces the area of contact between mating gang parts. Therefore, it is often difficult to keep a gang bolt tight if it has been operated in a loose condition. After such a gang bolt has been properly torqued it should be retorqued after about 30 minutes of operation, again after 4 or 5 hours of operation and again after 8 to 10 hours of use. This will assure that proper gang bolt tension is maintained while the mating components are reseating. If the gang bolt will not stay tight, the gang should be completely disassembled and all parts carefully inspected. All damaged parts should be replaced before reassembling the gang.



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.

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 1/16" to 1/8" 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.

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.

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 removing the rods and nut from end of cylinder rod. Slip piston and gland off cylinder rod.
- D. 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.
- E. Remove all O' Rings from piston and gland. Replace all seals with new parts.
- F. Assemble cylinder using care to prevent damage to O' Rings and Seals.
- G. Replace cylinder on harrow and attach hoses. Check cylinder for leaks.

GENERAL:

Keeps all bolts tight. Check all bolts after 50 hours operation and each season thereafter. Visually inspect all bolts daily. Do not run with loose gang bolts. Keep the gang bolts torqued to 1200 FT/LBS.

operating instructions

TRANSPORTING THE DISK: Extreme caution is required when transporting any machinery on roads or highways. Remember you are responsible for compliance with State and Local laws regarding lighting, reflectors, and SMV emblems as well as length and width.



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



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



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

Before transporting the disk check your tires for proper inflation. Be sure that hub bolts and nuts are tight. Wheel bearings should be checked for proper adjustment and lubrication prior to roading the disk over long distances.

The F15 is equipped with transport pins for each wing. These pins should be inserted through the bracket on the main frame and stand on the wing frames.



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

Each of the 4" x 8" hydraulic cylinders used for lifting the F15 is equipped with a transport latch. When the harrow is on its wheels in the transport position, these latches may be folded over the cylinder rods preventing the cylinders retracting. These latches should always be used when the harrow is transported.

The drawbar pin should be in good condition and strong enough to secure the disk to the tractor. Secure the drawbar pin to keep it in place. The drawbar should be secured to prevent swinging.

FIELD ADJUSTMENTS: By using the tongue adjusting rod, level the harrow from front to rear. This rod compensates for different drawbar heights and soil conditions. It is used to adjust the disk for proper soil penetration and leveling. After a few minutes of operation any minor adjustments needed on the tongue adjusting rod will be apparent. Use the stroke control devices on the 4" x 8" hydraulic cylinders to regulate cutting depth. These stroke controls should be adjusted evenly. Disk as deep as necessary to do a satisfactory job, but, trying to disk excessively deep exerts undue strain on the tractor, wastes fuel, puts strain on the disk frame and shortens the bearing life. Never let soil "Bulldoze" over or in front of the spacer spools.

With the center section disking at the proper depth and running level the wings can be adjusted to give uniform penetration and leveling across the entire harrow width. If the wings are cutting deeper than the center section, shorten the turnbuckles that connect the wing rockshafts to the center rockshafts. If more penetration is desired on the wings, lengthen the turnbuckles. The turnbuckle length should be approximately 15 inches. The turnbuckles should always be between 14" and 16" in length.

TIPS FOR LEVEL DISKING: Five factors must be considered when level disking is required. They are (1) depth of cut (2) tractor speed (3) tongue adjusting rod length (4) lateral gang adjustment and (5) soil conditions. Improper adjustments and tractor speeds above 6 MPH contributes to ridging and furrowing.

When a center ridge is left behind the disk you should shorten the tongue adjusting rod to put less weight on the rear gangs, adjust the inside rear gang outward slightly, or reduce tractor speed. Perhaps, a combination of all three adjustments will be required.

A center furrow may be corrected by lengthening the tongue adjusting rod to put more weight on the rear gangs. The inside rear gangs may be shifted inward slightly if necessary.

Outer ridges or furrows are usually the opposite action of ridges or furrows in the center. Therefore, most can be corrected by adjusting the tongue adjusting rod. In some cases it may be necessary to adjust the turnbuckle between the main frame and wing frame to prevent the wing tips from digging in and throwing up a ridge.

SUMMARY: The F15 has three adjustments that can be used to "set" the disk for proper operation. They are: (1) stroke control on the lift cylinders (2) turnbuckles to control wing cutting depth and (3) tongue adjusting rod to level the disk front to rear. These are the only components that will normally need to be adjusted to match field conditions. In extremely loose soil (dry powder), it may be necessary to shift the rear gangs laterally to get good level disking.



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

If the harrow is not leveling properly, after making these adjustments, you should go back to the assembly section and carefully check the entire harrow for proper assembly.

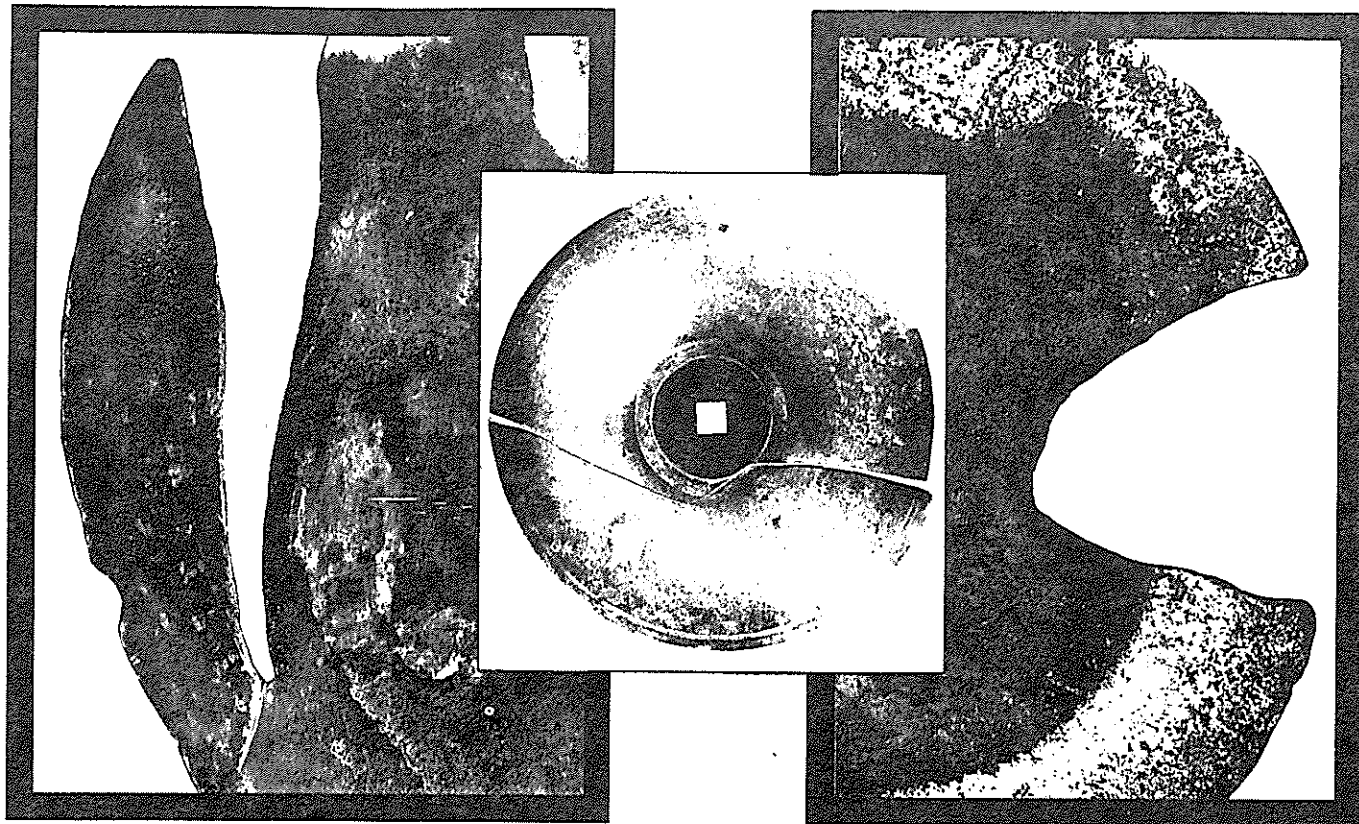


FIGURE 3, 4, 5 — Irregular breaks caused by contact against rocks or stumps. Not covered by warranty.

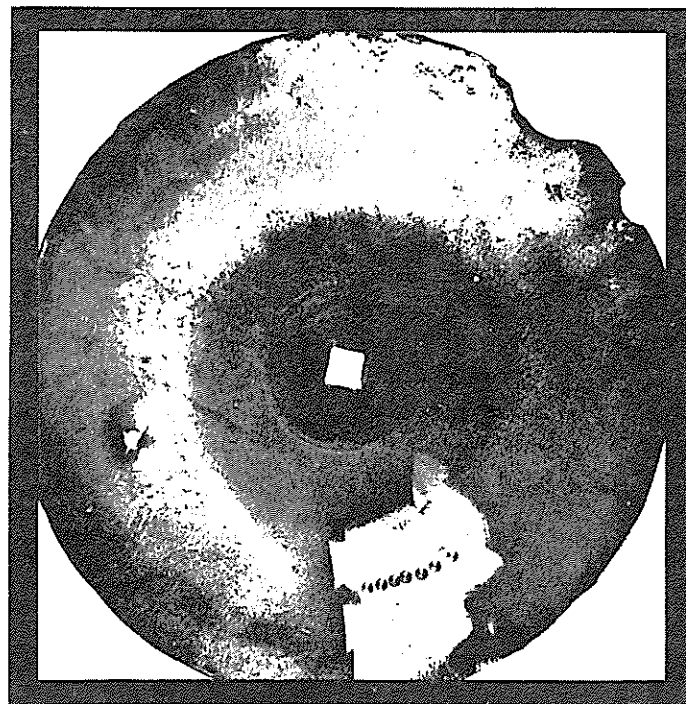


FIGURE 6 — Chipped or dented edges resulting from use in areas containing rocks or stumps. Not covered by warranty.



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.

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		Torque		Torque			
		Foot Pounds		Foot Pounds		Foot Pounds			
Inches	Millimeters	Min.	Max.	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