Revised Edition

case

D24 Series Double Offs
Tandem Disk Harrow
Operators Manual

Rac 9-6242

J I Case
A Tenneco Company

TENNECO

CASE MODEL D24 SERIES
TANDEM DISK HARROW

Parts Catalog No. 9-6242
OPERATORS MANUAL
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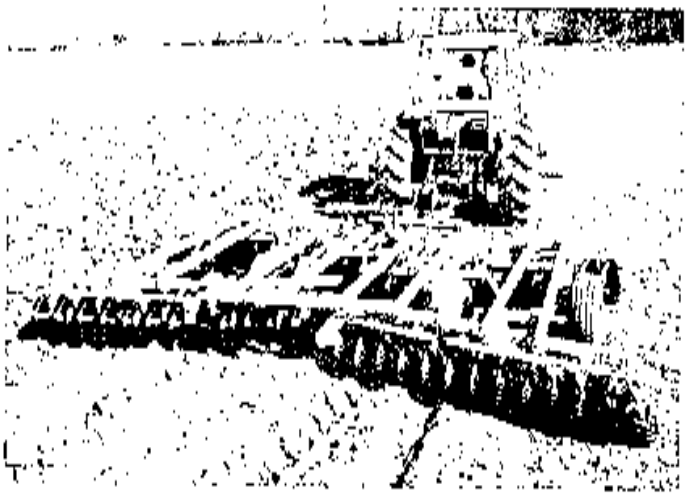

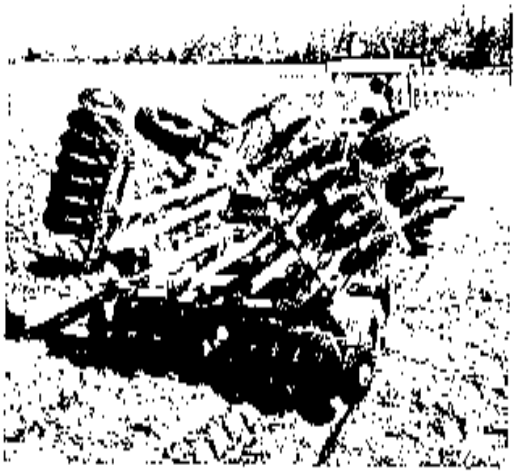

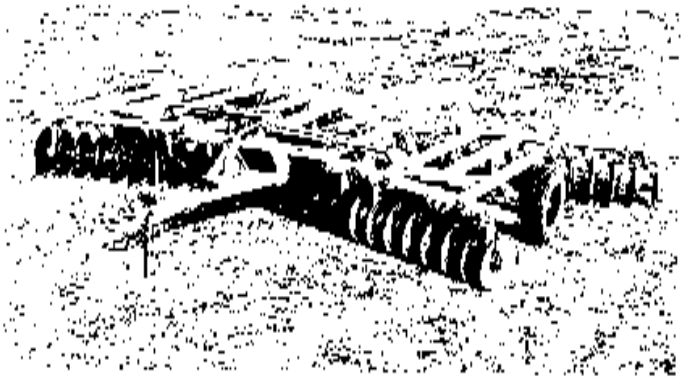

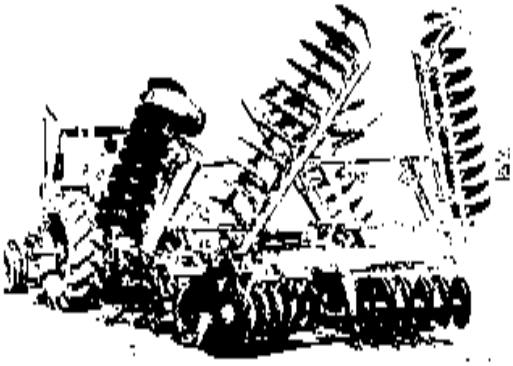

TO THE PURCHASER

The care you give your new CASE D24 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 CASE D24 Harrow will serve you well for many years.

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

When you sell your D24 Harrow you should pass this manual to the new owner.

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

YOUR AUTHORIZED CASE 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 CASE 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 _____

CASE 16'6" – 24'0"

D-24 DOUBLE OFFSET FLEXWING

GENERAL SPECIFICATIONS

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

DISC: 22" x 3/16" Plain

BLADES: Diminishing with Two feathering blades on rear gangs

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

TONGUE: 90" long for dual wheels with tongue jack

HYDRAULIC CYLINDERS:
2-4" x 8" with depth control
2-4" x 24" for folding wings

HYDRAULIC HOSES:
Complete to front of main frame

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

WHEELS: 2-15 x 10 Center Section
2-15 x 8 Wing Sections

CLEVIS: Reversible ductile iron

WRENCH: 1 for gang bolt

DISC SPACING: 9 Inches

ANGLE: Preset at 17° — No adjustment necessary

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
D24-198	16' 6"	46	16	6075	100-120
D24-216	18' 0"	50	16	6300	110-130
D24-252	21' 0"	58	16	6900	120-150
D24-288	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. Issued June 1979

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

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

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

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

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

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

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

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

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

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

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

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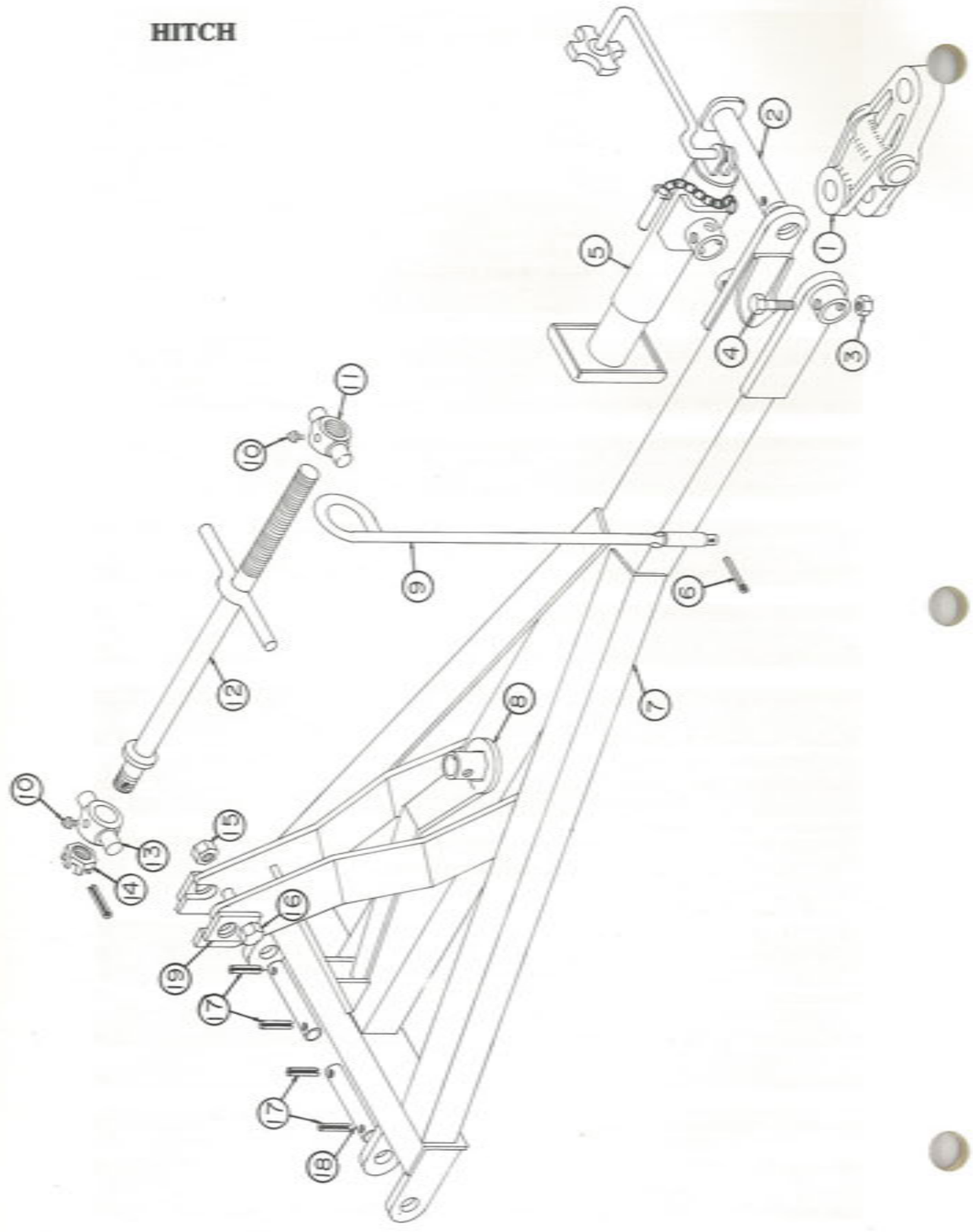
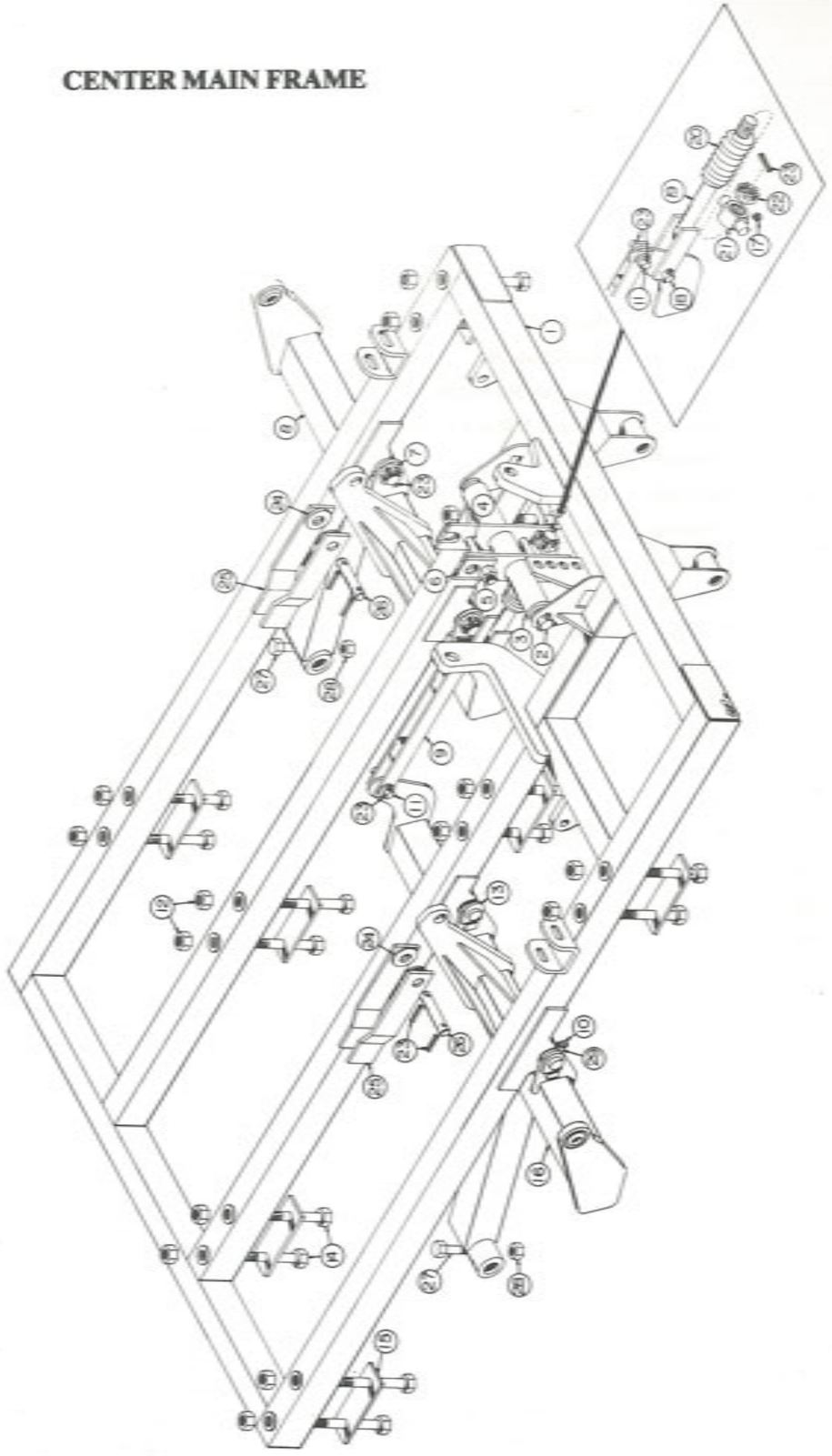
HITCH



CASE D24 SERIES DISK HARROW
HITCH
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
1	T54658	**Pull Clevis**	1
2	T55130	**Assy. Clevis Pin**	1
3	131-178	**Lock Nut** 3/8 NC, PL	1
4	113-241	**Machine Bolt** 3/8 x 3 NC, PL, GR5	1
5	T56247	**Tongue Jack**	1
6	132-349	**Cotter Pin** 1/4 x 1-1/2	1
7	T56316	**Assy. Pull Tongue** 16' 6" to 24' 0"	1
8	T54659	**Nut Wrench** (Axle)	1
9	T53995	**Hose Holder**	1
10	219-3	**Grease Fitting** - 1/8 NPT	2
11	T53870	**Stabilizer Swivel**	1
12	T56353	**Assy. Tongue Adjusting Rod**	1
13	T54556	**Swivel**	1
14	129-611	**Hex Nut** 1-3/8 NC, PL, Slotted	1
15	131-387	**Lock Nut** 5/8 NC, PL	1
16	113-643	**Hex Head Machine Bolt** 5/8 x 5-1/2 NC, PL	1
17	138-162	**Roll Pin** 5/16 x 2-1/4	5
18	T56249	**Pin** 1-1/4 Dia. x 6-7/8 Long	2
19	T52681	**Clamp Trunion** 3/8 x 2-1/2 x 3-3/4 Long	2

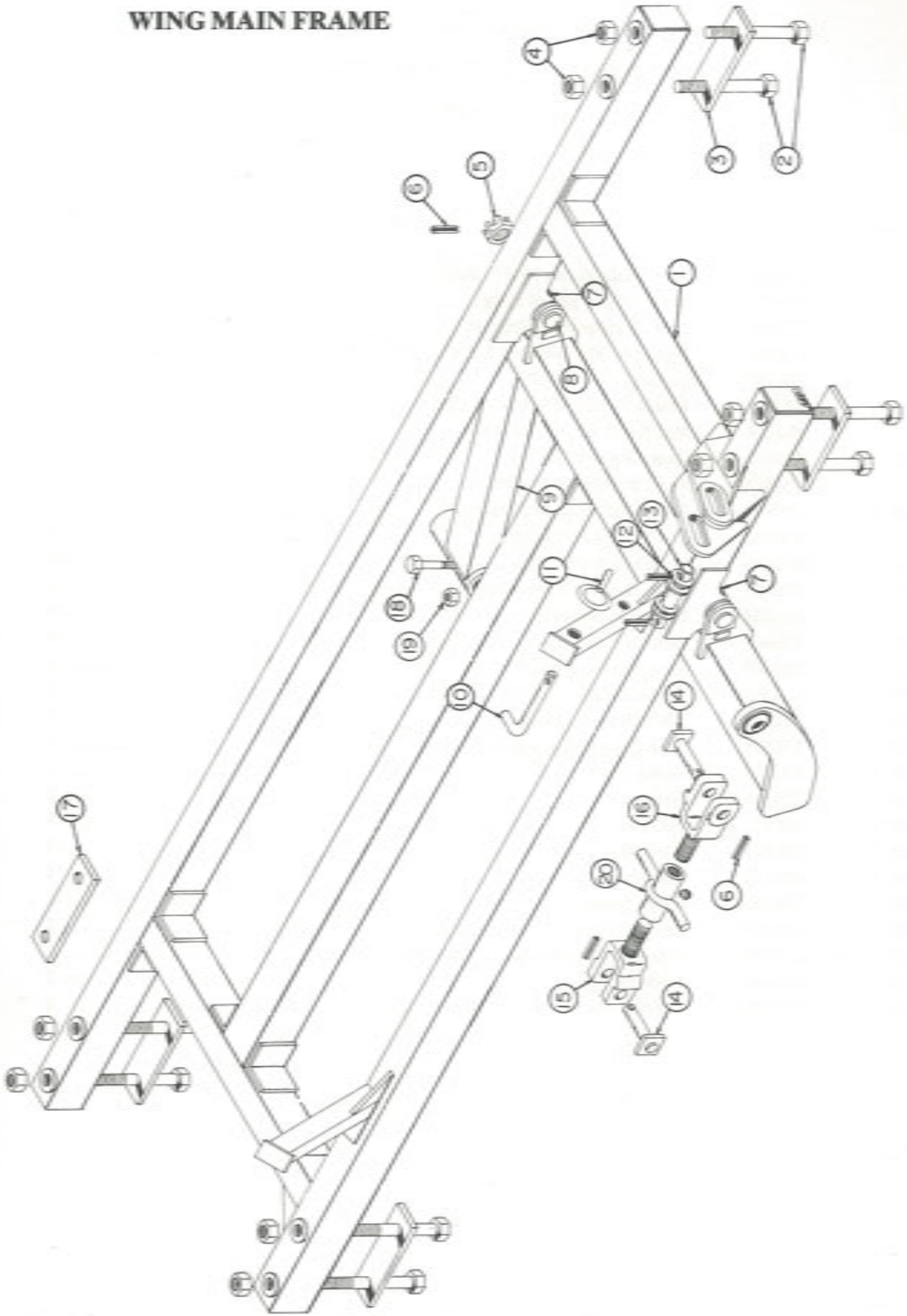
CENTER MAIN FRAME



CASE D24 SERIES DISK HARROW
MAIN FRAME & CENTER ROCKSHAFTS
16'6" — 24'0"

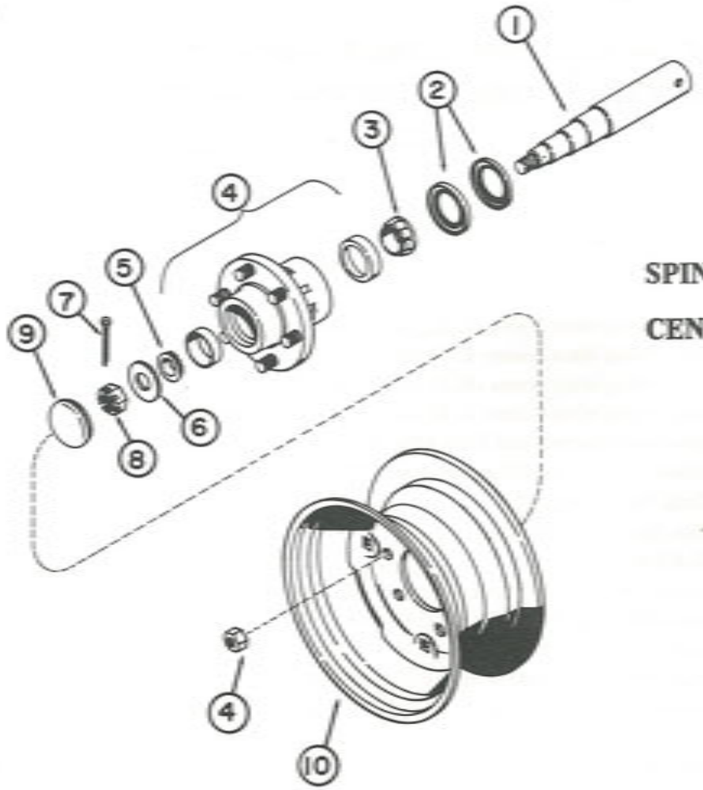
Ref. No.	Part No.	Description	No. Req'd
1	T56300	**Assy. Main Frame** 16'6" - 24'0"	1
2	T56305	**Pin** 1" Dia. x 22-1/4 Long	1
3	T56304	**Assy. Tongue Pivot Bracket**	1
4	113-650	**Hex Head Machine Bolt** 5/8 x 6-1/2 NC, PL, GR5	2
5	131-387	**Lock Nut** 5/8 NC, PL	2
6	T52681	**Clamp Trunion** 3/8 x 2-1/2 x 3-3/4	4
7	25-1224	**Hex Nut** 1-1/2 NC, Slotted	4
8	T56650	**Assy. Rockshaft, L. H.**	1
9	T56652	**Assy. Rockshaft Tie Link**	1
10	219-15	**Grease Fitting** 5/16 Straight	4
11	T56242	**Pin** 1 Dia. x 4-3/8 Long	2
12	131-1140	**Lock Nut** 7/8 NC, PL	16
13	T56240	**Assy. Rockshaft Pivot Pin** 1-1/2 Dia. x 6-5/8	4
14	113-828	**Hex Head Machine Bolt** 7/8 x 9 NC, PL	16
15	T53695	**Strap** 5/8 x 3 x 9 Long	8
16	T56649	**Assy. Rockshaft R. H.**	1
17	219-3	**Grease Fitting** 1/8 NPT	1
18	T56340	**Pin** 1 Dia. x 3-7/8 Long	1
19	T56651	**Assy. Tongue Control Rod** - Short	1
20	T51576	**Spring** 3" O.D. x 5/8 Wire x 6-7/8 Long	1
21	T54556	**Swivel**	1
22	129-611	**Hex Nut** 1-3/8 NC, PL, Slotted	1
23	138-162	**Roll Pin** 5/16 x 2-1/4	17
24	195-113	**Cut Washer** 1-1/4 PL	4
25	T56333	**Assy. Transport Lock**	2
26	T56332	**Pin** 1-1/4 Dia. x 5-3/8 Long	2
27	113-431	**Hex Head Machine Bolt** 1/2 x 4 NC, PL, GR5	2
28	131-165	**Lock Nut** 1/2 NC, PL	2
29	T51708	**Bushing** 1-3/4 O.D. x 1-1/2 I.D. x 2	8

WING MAIN FRAME

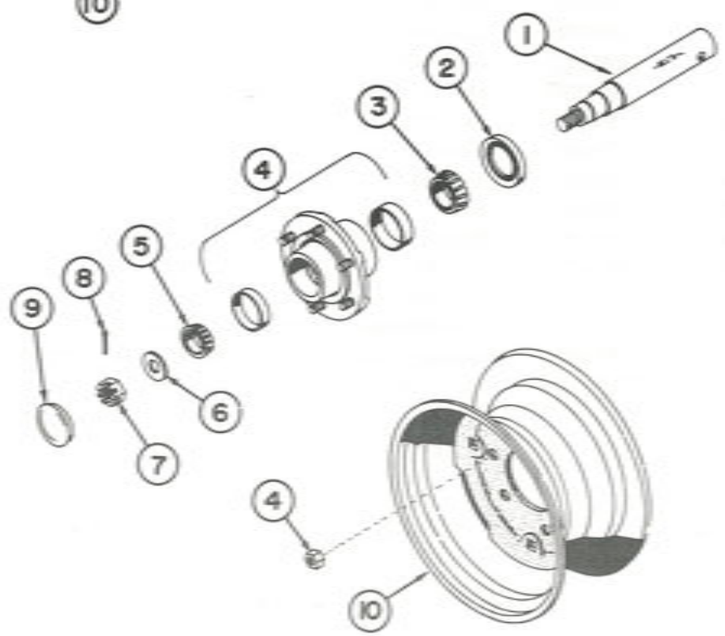


CASE D24 SERIES DISK HARROW
WING MAIN FRAME & WING ROCKSHAFT
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
1	T56309	**Assy. Wing Main Frame** - R. H. (16'6" & 18'0")	1
1	T56310	**Assy. Wing Main Frame** - L. H. (16'6" & 18'0")	1
1	T56689	**Assy. Wing Main Frame** - R. H. (21'0" & 24'0")	1
1	T56690	**Assy. Wing Main Frame** - L. H. (21'0" & 24'0") (SHOWN)	1
2	113-828	**Hex Head Machine Bolt** 7/8 x 9 NC, PL	8
3	T53695	**Strap** 5/8 x 3-9 Long (3 on 16'6" & 18'0")	4
4	131-1140	**Lock Nut** 7/8 NC, PL	8
5	25-1224	**Hex Nut** 1-1/2 NC Slotted	2
6	138-162	**Roll Pin** 5/16 x 2-1/4	6
7	219-15	**Grease Fitting** 5/16 Straight Drive-In	2
8	T56240	**Assy. Rockshaft Pivot Pin** 1-1/2 Dia. x 6-5/8	2
9	T56656	**Assy. Wing Rockshaft** R. H. (16'6" - 18'0")	1
9	T56657	**Assy. Wing Rockshaft** L. H. (16'6" - 18'0")	1
9	T56658	**Assy. Wing Rockshaft** R. H. (21'0" - 24'0")	1
9	T56659	**Assy. Wing Rockshaft** L. H. (21'0" - 24'0") (SHOWN)	1
10	T56308	**Lock Pin** 3/4 Dia. 9-1/2 Long	1
11	A30338	**Klik Pin** 1/4"	1
12	195-113	**Cut Washer** 1-1/4 PL	4
13	T56313	**Pin** 1-1/4 Dia. x 6-3/8 Long	1
14	T56982	**Assy. Pin** 1 Dia. x 4-1/8 Long	2
15	T56980	**Yoke Adjusting** - R. H.	1
16	T56981	**Yoke Adjusting** - L. H.	1
17	T56312	**Strap** 3/4 x 3-9 1/8 Long (16'6" & 18'0" only)	1
18	113-203	**Hex Head Machine Bolt** 3/8 x 3-1/2 NC, PL, GR5	1
19	131-178	**Lock Nut** 3/8 NC, PL	1
20	T56655	**Assy. Connector**	1
21	219-3	**Grease Fitting** 1/8 NPT (NOT SHOWN)	1
	T51708	**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

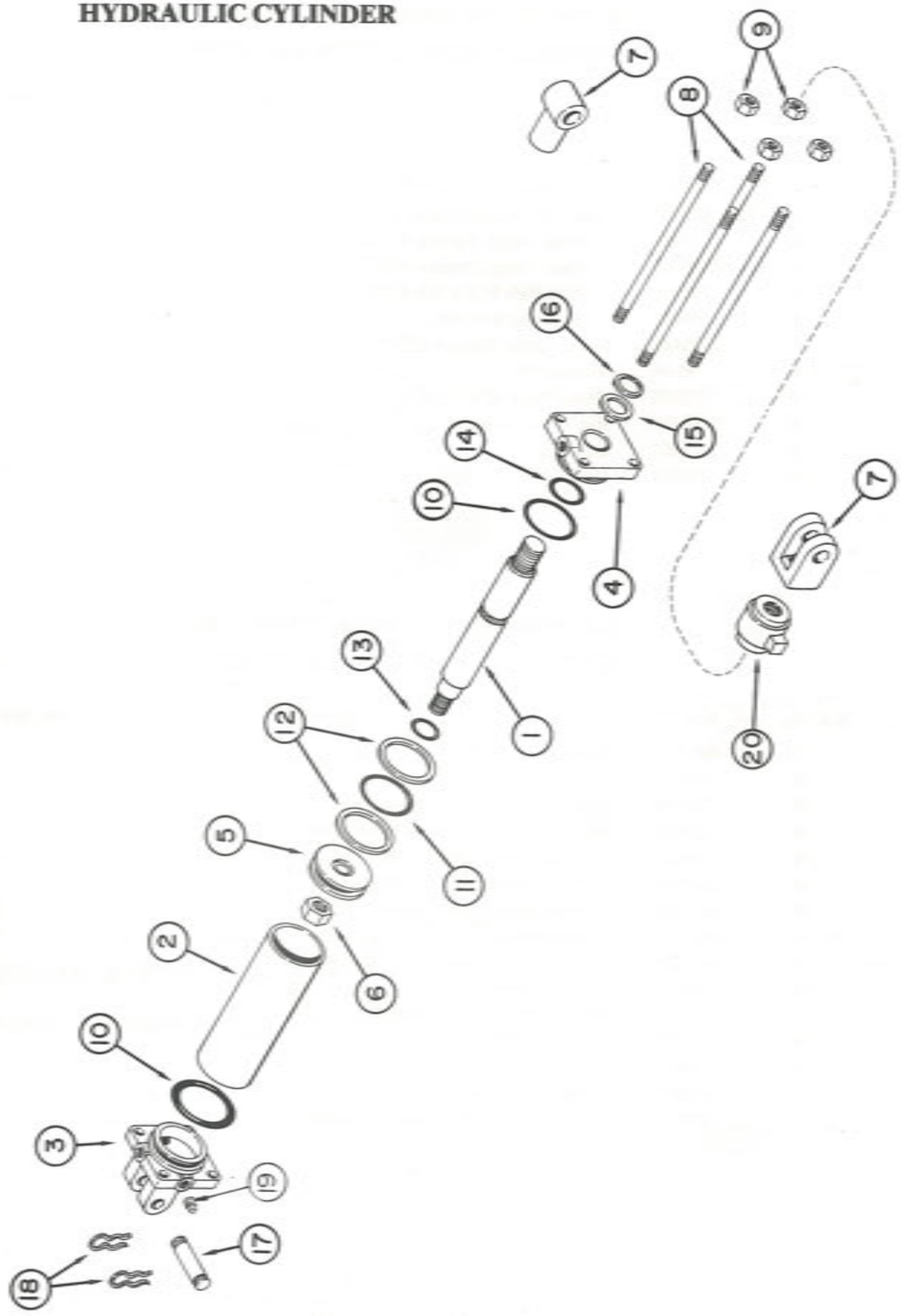
CASE D24 SERIES DISK HARROW
SPINDLE & HUB CENTER SECTION

Ref. No.	Part No.	Description	No. Req'd
1	T52724	**Spindle** 2-7/32 Dia. x 14-1/2 Long	2
2	F37383	**Seal** (C/R 521430)	4
3	T33023	**Cone** - Inner Timken #25590	2
4	T52908	**Hub** - W/2 Cups, 6 Hub bolts and Nuts	2
4	A29062	**Cup** - Inner Timken #25520	2
4	A30580	**Cup** - Outer Timken #25821	2
4	T52907	**Hub Bolt** 9/16 x 2-1/4 NF	12
4	G49041	**Hub Nut** 9/16 NF	12
5	A29465	**Cone** - Outer Timken #25877	2
6	95-14	**Washer** 7/8	2
7	132-71	**Cotter Pin** 5/32 x 1-1/4	2
8	25-1314	**Nut** 7/8 NF slotted	2
9	D25067	**Hub Cap**	2
10	T39714	**Wheel** 15 x 10-6 Bolt	2

CASE D24 SERIES DISK HARROW
SPINDLE & HUB WING SECTION

Ref. No.	Part No.	Description	No. Req'd
1	T52707	**Spindle** 1-31/32 Dia. x 13 Long	2
2	T30028	**Seal** (C/R 22870)	2
3	T20079	**Cone** - Inner (Timken 342A)	2
4	T55906	**Hub** W/2 Cups 6 Hub Bolts and Nuts	2
4	40421	**Cup** - Inner (Timken 332)	2
4	A29977	**Cup** - Outer (Timken 14276)	2
4	E16592	**Hub Bolt** 1/2 x 1-7/8 NF	12
4	F23214	**Hub Nut** 1/2 NF	12
5	A29976	**Cone** - Outer (Timken 14137A)	2
6	95-14	**Washer** - Spindle 7/8	2
7	25-1314	**Nut** - Spindle 7/8 NF Slotted	2
8	132-71	**Cotter Pin** 5/32 x 1-1/4	2
9	T30029	**Hub Cap**	2
10	T52673	**Wheel** 15 x 8-6 Bolt	2
	A57879	**Wheel** 15 x 8-6 Bolt (Used for Repairs)	

HYDRAULIC CYLINDER

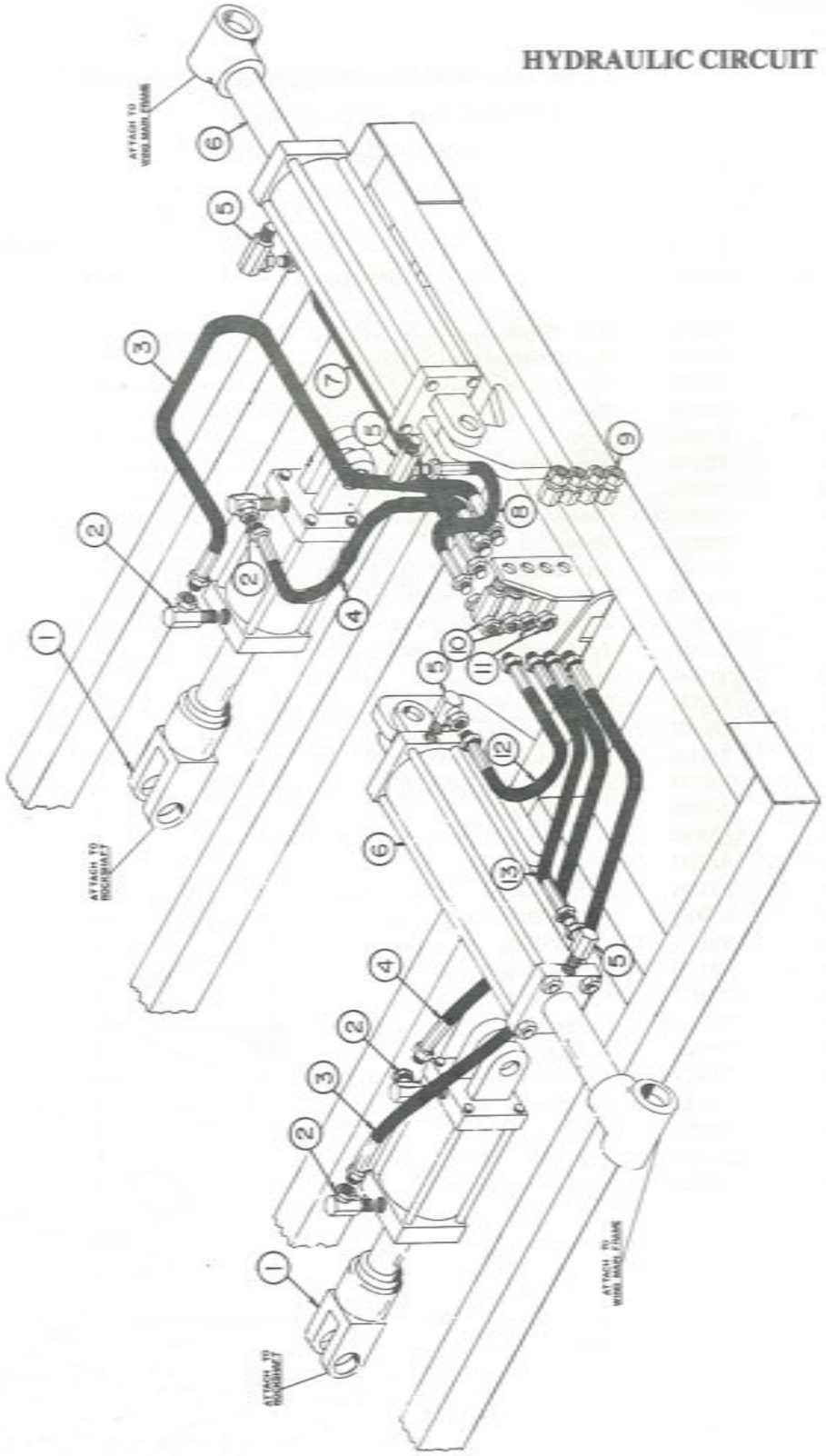


CASE D24 SERIES DISK HARROW
HYDRAULIC CYLINDERS
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd 4 x 8	No. Req'd 4 x 24
1	T52936	**Rod** - Piston	1	—
1	T52918	**Rod** - Piston	—	1
2	T52937	**Tube**	1	—
2	T52919	**Tube**	—	1
3	T52920	**Butt**	1	1
4	T52938	**Head** - Piston	1	—
4	T52921	**Head** - Piston	—	1
5	T52939	**Piston**	1	—
5	T52922	**Piston**	—	1
6	131-1147	**Nut** - Lock 1" - 14 NF	1	—
6	131-1148	**Nut** - Lock 1-1/4" - 12 NF	—	1
7	T55891	**Clevis** for 1-1/4 Dia. Pin	1	—
7	T52923	**Tee Casting** for 1-1/4 Dia. Pin	—	1
8	T52941	**Rod** - Tie	4	—
8	T52924	**Rod** - Tie	—	4
9	129-107	**Nut** - Hex 5/8	4	4
	T63124	**Kit** - Seal Repair (prince #8600)	1	—
	T63123	**Kit** - Seal Repair (prince #9400)	—	1
10	T52928	**"O" Ring**	2	2
11	A30895	**"O" Ring**	1	1
12	A23535	**Washer**	2	2
13	R15365	**"O" Ring**	1	—
13	A59066	**"O" Ring**	—	1
14	T13224	**"O" Ring**	1	—
14	A31183	**"O" Ring**	—	1
15	H745687	**Washer**	1	—
15	T52933	**Washer**	—	1
16	T52945	**Wiper**	1	—
16	T52934	**Wiper**	—	1
17	T52925	**Pin** - Clevis 1" x 4"	1	1
18	T52926	**Clip**	2	2
19	221-1844	**Plug** - Pipe 1/2 NPT	1	1
20	T52728	**Control** - Stroke	1	—

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

HYDRAULIC CIRCUIT

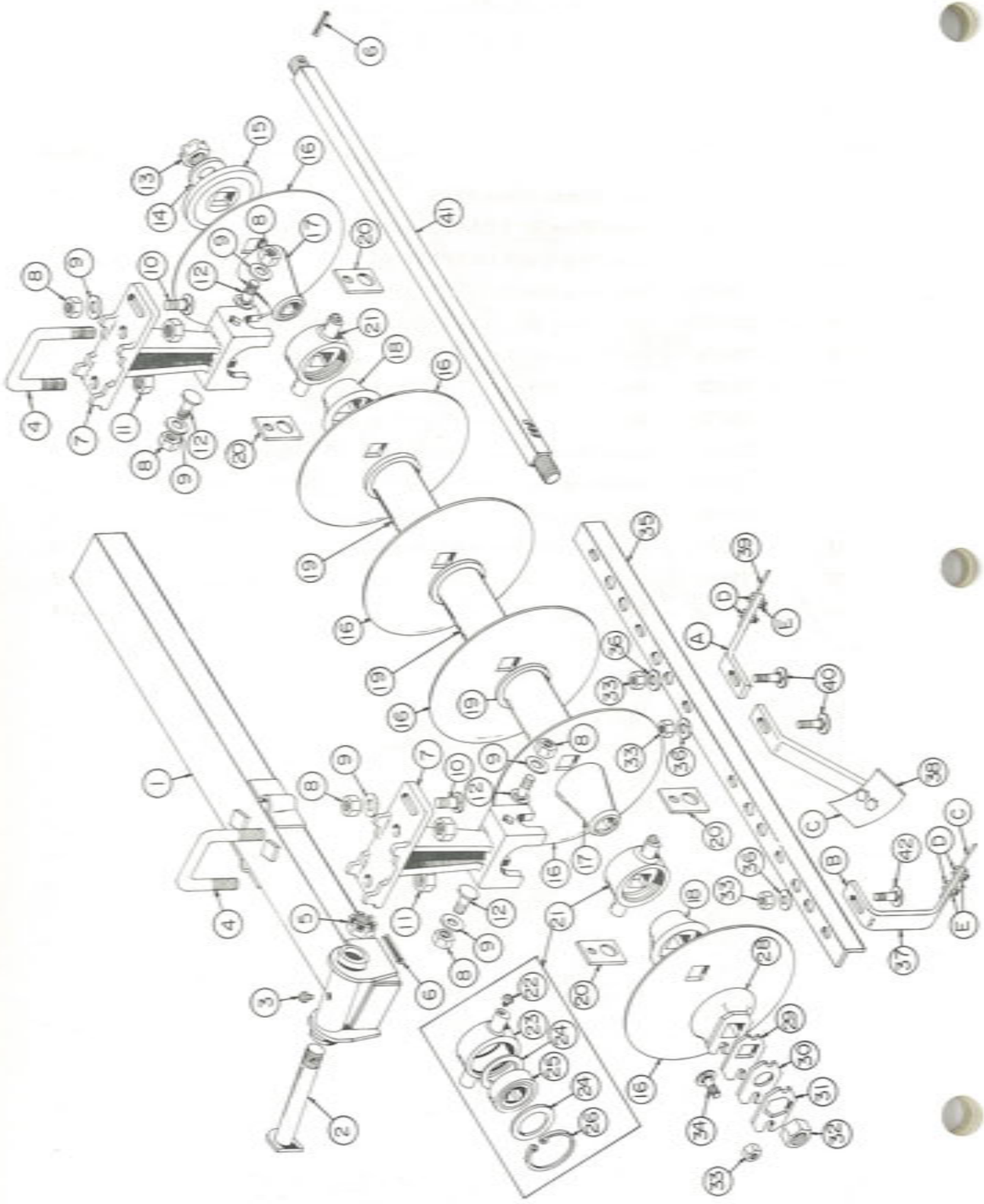


CASE D24 SERIES DISK HARROW
HYDRAULIC CIRCUIT
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
* 1	T56272	**4 x 8 Cylinder** (Prince #8608)	2
2	218-927	**Swivel Elbow** 90° 1/2 NPT Male to 1/2 NPT Female	4
3	T56324	**Hose** 3/8 x 42 with 1/2 NPT fittings	2
4	T56323	**Hose** 3/8 x 30 with 1/2 NPT fittings	2
5	218-922	**Swivel Elbow** 90° 1/2 NPT Male to 1/4 Female	4
* 6	T52674	**4 x 24 Cylinder** (Prince #9424)	2
7	T56328	**Hose** 1/4 x 42 with 1/4 NPT Fittings	1
8	T56325	**Hose** 1/4 x 15 with 1/4 NPT Fittings	1
9	218-911	**Swivel Union** 1/2 NPT Female to 1/2 NPT Female	4
10	T55104	**Male Branch tee** - special 1/2 NPT Male to 1/4 NPT Female	2
11	218-953	**Male Branch tee** - special 1/2 NPT Male to 1/2 NPT Female	2
12	T56326	**Hose** 1/4 x 24 with 1/4 NPT Fittings	1
13	T55145	**Hose** 1/4 x 36 with 1/4 NPT Fittings	1
14	B17426	**Pipe Sealant** — Not Illustrated	1

* Not Included in Hydraulic Kit

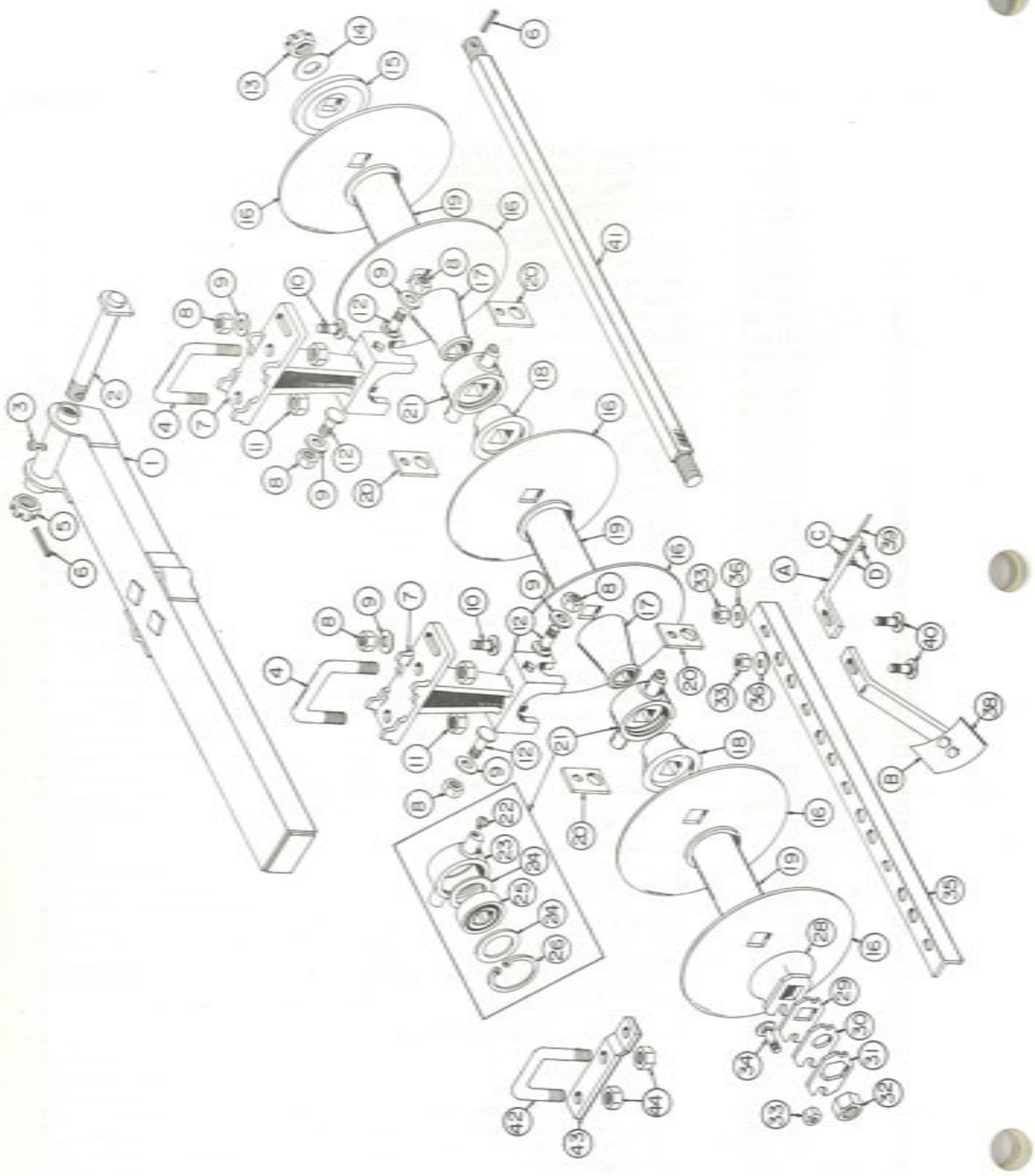
FRONT INSIDE GANG & FRAME



CASE D24 SERIES DISK HARROW
FRONT INSIDE GANG & FRAME
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
1	T56279	**Assy. Gang Frame** - Left Front, Right Rear (SHOWN)	1
1	T56280	**Assy. Gang Frame** - Right Front, Left Rear	1
2	T56297	**Assy. Wing Pivot Pin** 1-1/2" Dia. x 10-1/4" long	2
3	219-15	**Grease Fitting** 5/16" Drive In	1
4	T56254	**"U" Bolt** 7/8" Dia.	2
5	25-1224	**Hex Nut** 1-1/2" NC, Slotted	1
6	138-162	**Roll Pin** 5/16" x 2-1/4"	2
7	T57199	**Bearing Riser**	2
8	131-387	**Lock Nut** 5/8" NC, PL	6
9	195-108	**Cut Washer** 5/8" PL	6
10	111-617	**Carriage Bolt** 5/8" x 1-3/4" NC, PL	2
11	131-1140	**Lock Nut** 7/8" NC, PL	4
12	111-618	**Carriage Bolt** 5/8" x 2" NC, PL, GR5	4
13	25-1324	**Nut Gang Bolt** 1-1/2" NF, Slotted	1
14	195-114	**Cut Washer** 1-3/8" PL	1
15	T51600	**Bumper Washer**	1
16	T55907	**Blade** 22" x 3/16" Plain	6
16	T55908	**Blade** 22" x 3/16" C. O.	6
16	T55915	**Blade** 22" x 1/4" Plain	6
16	T55917	**Blade** 22" x 1/4" C. O.	6
16	T55912	**Blade** 24" x 1/4" C. O.	6
16	T55911	**Blade** 24" x 1/4" Plain	6
16	T51693	**Blade** 24" x 3/16" Plain	6
16	T51694	**Blade** 24" x 3/16" C.O.	6
17	T56270	**End Bell** - Small (Before Serial No. 1631303)	2
17	T56687	**End Bell** - Small (After Serial No. 1631302)	2
18	T56271	**End Bell** - Large	2
19	T51655	**Spacer Spool**	3
20	T52681	**Clamp Trunion** 3/8 x 2-1/4" x 3-3/4 Long	4
21	T63252	**Sub. Assy. Housing & Bearing** (Before Serial No. 1631303)	2
21	T63287	**Sub. Assy. Housing & Bearing** (After Serial No. 1631302)	2
22	219-3	**Grease Fitting** 1/8" NPT Straight	1
23	NSS	**Housing** - Bearing	2
24	T55591	**Washer** 100mm	2
25	T51653	**Bearing** GW211PP3 (Before Serial No. 1631303)	1
25	T56688	**Bearing** GW211PP17 (After Serial No. 1631302)	1
26	T51654	**Snap Ring**	1
28	T54657	**End Gang Washer**	1
29	T54647	**Spacer Plate**	1
30	T54646	**Bearing Plate**	1
31	T55051	**Lock Plate**	1
32	25-1124	**Nut Gang Bolt** 1-1/2 NF	1
33	131-165	**Lock Nut** 1/2" NC, PL	7
34	111-539	**Carriage Bolt** 1/2" x 2" NC, PL	1
35	T53190	**Scraper Bar** 2" x 2" x 3/8" - 51-11/16"	1
36	195-106	**Cut Washer** 1/2" PL	6
37	T56298	**Assy. Scraper** - Special R.H.	1
37	T56299	**Assy. Scraper** - Special L.H. (Shown)	1
38	T55088	**Assy. Scraper** - L.H.	5
A	T55103	**Scraper Shank**	1
B	T56098	**Scraper Shank** - Special	1
C	T55102	**Scraper Blade** 3/16" x 6" x 4"	1
D	113-410	**Hex Head Machine Bolt** 1/2 x 1-1/2 NC, PL	2
E	131-165	**Lock Nut** 1/2 NC, PL	2
39	T55087	**Assy. Scraper** - R.H.	5
40	111-524	**Carriage Bolt** 1/2 x 1-1/2 NC, PL, GR5	4
41	T51599	**Gang Bolt** 1-1/2" Square x 52-1/8	1
42	113-422	**Machine Bolt** 1/2 x 2-1/2 NC, PL, GR5	1

REAR INSIDE GANG & FRAME



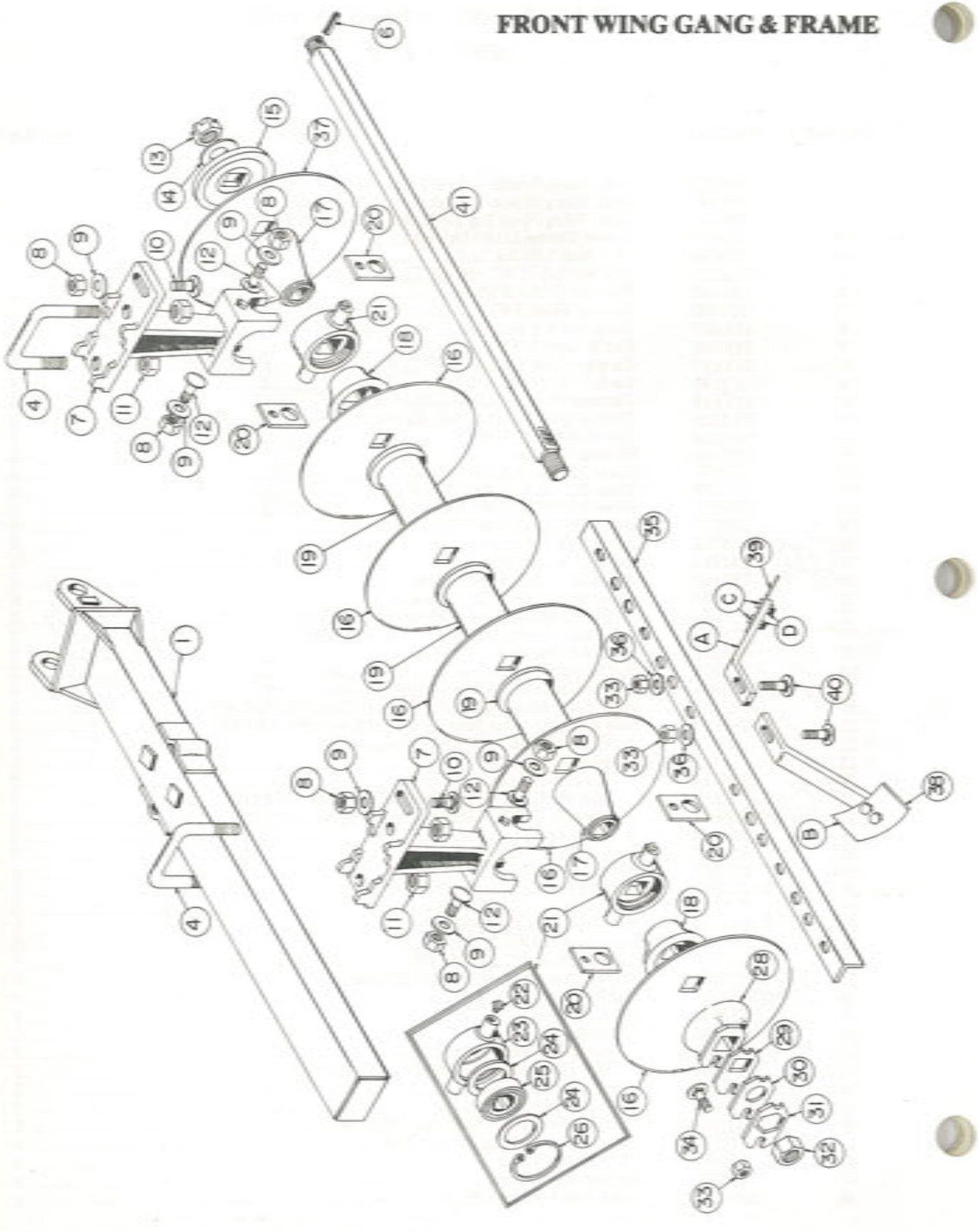
CASE D24 SERIES DISK HARROW

REAR INSIDE GANG & FRAME

16'6" — 24'0"

Ref. No.	Part No.	Description	No. Req'd
1	T56279	**Assy. Gang Frame** — Left Front, Right Rear (Shown)	1
1	T56280	**Assy. Gang Frame** — Right Front, Left Rear	1
2	T56297	**Assy. Wing Pivot Pin** 1-1/2 Dia. x 11-1/8 Long	1
3	219-15	**Grease Fitting** 5/16" Drive In	1
4	T56254	**"U" Bolt** 7/8 Dia.	2
5	25-1224	**Hex Nut** 1-1/2 NC, slotted	1
6	138-162	**Roll Pin** 5/16 x 2-1/4	2
7	T57199	**Bearing Riser** (PP)	2
8	131-387	**Lock Nut** 5/8 NC, PL	7
9	195-108	**Cut Washer** 5/8 PL	7
10	111-617	**Carriage Bolt** 5/8 x 1-3/4 NC, PL	3
11	131-1140	**Lock Nut** 7/8 NC, PLT	4
12	111-618	**Carriage Bolt** 5/8 x 2 NC, PL, GR5	4
13	25-1324	**Nut Gang Bolt** 1-1/2 - NF, Slotted	1
14	195-114	**Cut Washer** 1-3/8 PL	1
15	T51600	**Bumper Washer**	1
16	T55907	**Blade** 22" Plain 3/16" Thick	6
16	T55908	**Blade** 22" C. O. 3/16" Thick	6
16	T55915	**Blade** 22" Plain 1/4" Thick	6
16	T55917	**Blade** 22" C. O. 1/4" Thick	6
16	T55912	**Blade** 24 x 1/4 C. O.	6
16	T55911	**Blade** 24 x 1/4 Plain	6
16	T51693	**Blade** 24" Plain 3/16" Thick	6
16	T51694	**Blade** 24" C. O. 3/16" Thick	6
17	T56270	**End Bell** - Small (Before Serial No. 1631303)	2
17	T56687	**End Bell** - Small (After Serial No. 1631302)	2
18	T56271	**End Bell** - Large	2
19	T51655	**Spacer Spool**	3
20	T52681	**Clamp Trunion** 3/8 x 2-1/2 x 3-3/4 long	4
21	T63252	**Sub. Assy. Housing Bearing** (Before Serial No. 1631303)	2
21	T63287	**Sub-Assy. Housing Bearing** (After Serial No. 1631302)	2
22	219-3	**Grease Fitting** 1/8 NPT Straight	1
23	NSS	**Housing Bearing**	1
24	T55591	**Washer** 100mm	2
25	T51653	**Bearing** GW 211PP3 (Before Serial No. 1631303)	1
25	T56688	**Bearing** GW211PP17 (After Serial No. 1631302)	1
26	T51654	**Snap Ring**	1
28	T54657	**End Gang Washer**	1
29	T54647	**Spacer Plate**	1
30	T54646	**Bearing Plate**	1
31	T55051	**Lock Plate**	1
32	25-1124	**Nut Gang Bolt** 1-1/2 NF	1
33	131-165	**Lock Nut** 1/2 NC, PL	6
34	111-539	**Carriage Bolt** 1/2 x 2 NC, PL	1
35	T53189	**Scraper Bar** 2 x 2 x 3/8 - 42-1/2 Long	1
36	195-106	**Cut Washer** 1/2 PLT	5
38	T55088	**Assy. Scraper** L.H.	5
A	T55103	**Scraper Shank**	1
B	T55102	**Scraper Blade** 3/16 x 6 x 4	1
C	113-410	**Hex Head Machine Bolt** 1/2 x 1-1/2 NC, PL	2
D	131-165	**Lock Nut** 1/2 NC, PL	2
39	T55087	**Assy. Scraper** R.H.	5
40	111-524	**Carriage Bolt** 1/2 x 1-1/2 NC, PL, GR5	5
41	T51599	**Gang Bolt** 1-1/2 Square x 52-1/8	1
42	T56686	**"U" Bolt** 3/4 Dia.	1
43	T56252	**Scraper Bar Mount**	1
44	131-1131	**Lock Nut** 3/4" NC, PLT	2

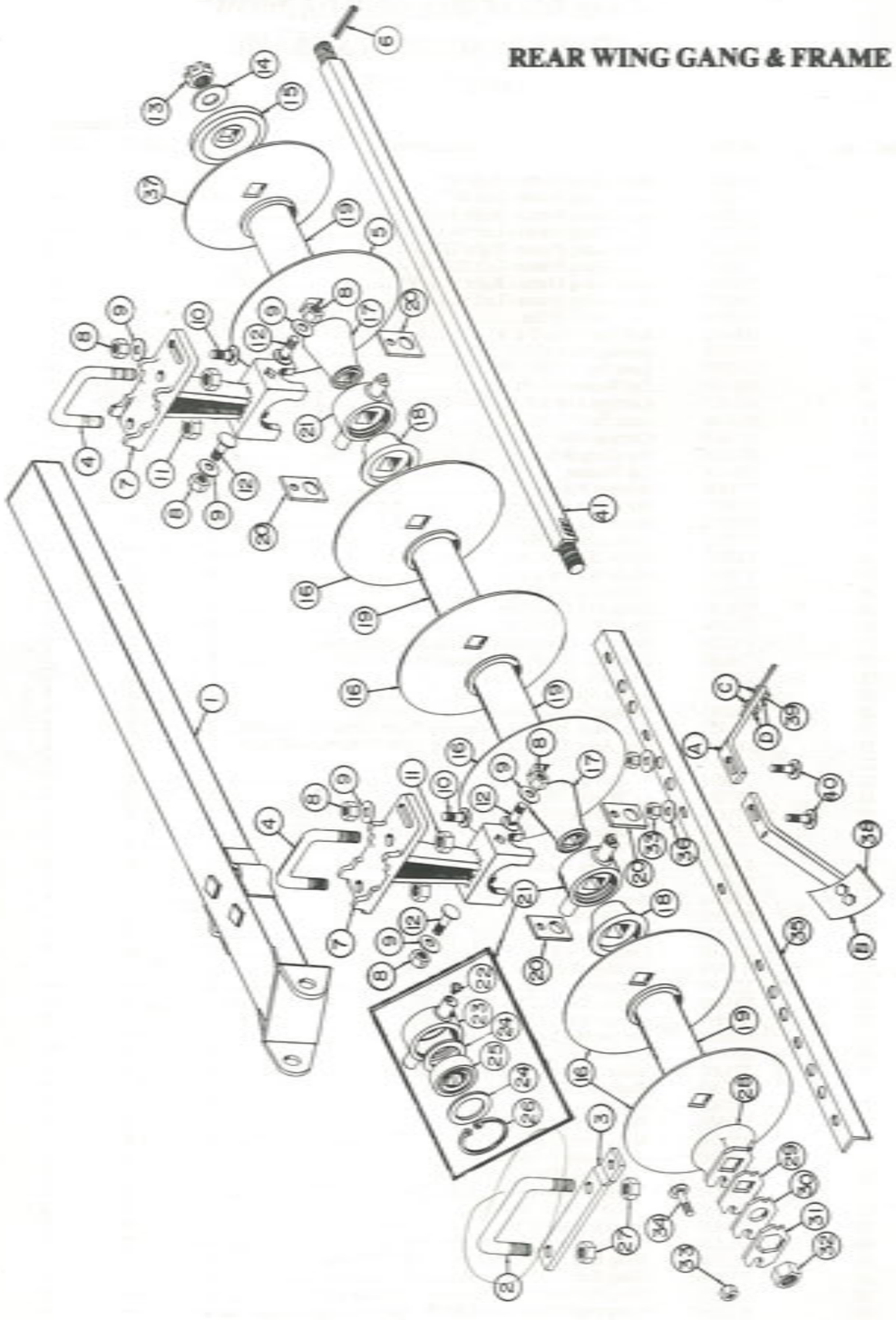
FRONT WING GANG & FRAME



CASE D24 SERIES DISK HARROW
FRONT WING GANG & FRAME
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Required 16'6"	18'0"	21'0"	24'0"
1	T56281	**Assy. Gang Frame** - Right 45"	1	—	—	—
1	T56282	**Assy. Gang Frame** - Left 45"	1	—	—	—
1	T56284	**Assy. Gang Frame** - Right 54-1/4"	—	1	—	—
1	T56283	**Assy. Gang Frame** - Left 54-1/4"	—	1	—	—
1	T56287	**Assy. Gang Frame** - Right 72-3/4	—	—	1	—
1	T56288	**Assy. Gang Frame** - Left 72-3/4	—	—	1	—
1	T56291	**Assy. Gang Frame** - Right 91-1/4"	—	—	—	1
1	T56292	**Assy. Gang Frame** - Left 91-1/4"	—	—	—	1
4	T56254	**"U" Bolt** 7/8 Dia.	2	2	2	3
6	138-162	**Roll Pin** 5/16 x 2-1/4	1	1	1	1
7	T57199	**Bearing Riser** (PP)	2	2	2	3
8	131-387	**Lock Nut** 5/8 NC, PL	6	6	6	9
9	195-108	**Cut Washer** 5/8 PL	6	6	6	9
10	111-617	**Carriage Bolt** 5/8 x 1-3/4 NC, PL	2	2	2	3
11	131-1140	**Lock Nut** 7/8 NC, PL	4	4	4	6
12	111-618	**Carriage Bolt** 5/8 x 2 NC, PL, GR5	4	4	4	6
13	25-1324	**Nut Gang Bolt** 1-1/2" NF Slotted	1	1	1	1
14	195-114	**Cut Washer** 1-3/8 PLT	1	1	1	1
15	T51600	**Bumper Washer**	1	1	1	1
16	T55907	**Blade** 22 x 3/16 Plain	4	5	7	9
16	T55908	**Blade** 22 x 3/16 C.O.	4	5	7	9
16	T55915	**Blade** 22 x 1/4 Plain	4	5	7	9
16	T55917	**Blade** 22 x 1/4 C.O.	4	5	7	9
16	T55912	**Blade** 24 x 1/4 C.O.	4	5	7	9
16	T55911	**Blade** 24 x 1/4 Plain	4	5	7	9
16	T51693	**Blade** 24 x 3/16 Plain	4	5	7	9
16	T51694	**Blade** 24 x 3/16 C.O.	4	5	7	9
17	T56270	**End Bell** - Small (Before Serial No. 1631303)	2	2	2	3
17	T56687	**End Bell** - Small (After Serial No. 1631302)	2	2	2	3
18	T56271	**End Bell** - Large	2	2	2	3
19	T51655	**Spacer Spool**	2	3	5	6
20	T52681	**Clamp Trunion** 3/8 x 2-1/2 x 3-3/4 Long	4	4	4	6
21	T63252	**Sub. Assy. Housing & Bearing** (Before Serial No. 1631303)	2	2	2	2
21	T63287	**Sub. Assy. Housing & Bearing** (After Serial No. 1631302)	—	—	2	2
22	219-3	**Grease Fitting** 1/8 NP Straight	1	1	1	1
23	NSS	**Housing** - Bearing	1	1	1	1
24	T55591	**Washer** 100mm	2	2	2	2
25	T51653	**Bearing** GW211PP3 (Before Serial No. 1631303)	1	1	1	1
25	T56688	**Bearing** GW211PP17 (After Serial No. 1631302)	1	1	1	1
26	T51654	**Snap Ring**	1	1	1	1
28	T54657	**End Gang Washer**	1	1	1	1
29	T54647	**Spacer Plate**	1	1	1	1
30	T54646	**Bearing Plate**	1	1	1	1
31	T55051	**Lock Plate**	1	1	1	1
32	25-1124	**Nut Gang Bolt** 1-1/2 NF	1	1	1	1
33	131-165	**Lock Nut** 1/2 NC, PL	5	6	8	10
34	111-539	**Carriage Bolt** 1/2 x 2 NC, PL, GR5	1	1	1	1
35	T53189	**Scraper Bar** 2 x 2 x 3/8 42-1/2	1	—	—	—
35	T53190	**Scraper Bar** 2 x 2 x 3/8 51-11/16	—	1	—	—
35	T53837	**Scraper Bar** 2 x 2 x 3/8 70-1/16	—	—	1	—
35	T56267	**Scraper Bar** 2 x 2 x 3/8 88-7/16	—	—	—	1
36	195-106	**Cut Washer** 1/2 PLT	4	5	7	9
37	T51603	**Blade** 20 x 3/16 Plain	1	1	1	1
37	T51695	**Blade** 20 x 3/16 C.O.	1	1	1	1
37	T55907	**Blade** 22 x 3/16 Plain	1	1	1	1
37	T55908	**Blade** 22 x 3/16 C.O.	1	1	1	1
38	T55088	**Assy. Scraper L.H.**	4	5	7	9
A	T55103	**Scraper Shank**	1	1	1	1
B	T55102	**Scraper Blade** 3/16 x 6 x 4	1	1	1	1
C	113-410	**Hex Head Machine Bolt** 1/2 x 1-1/2 NC, PL	2	2	2	2
D	131-165	**Lock Nut** 1/2 NC, PL	2	2	2	2
39	T55087	**Assy. Scraper R.H.**	4	5	7	9
40	111-524	**Carriage Bolt** 1/2 x 1-1/2 NC, PL, GR5	4	5	7	9
41	T51598	**Gang Bolt** 1-1/2" Sq. 5 Blade - 42-7/8 Long	1	—	—	—
41	T51599	**Gang Bolt** 1-1/2" Sq. 6 Blade - 52-1/8 Long	—	1	—	—
41	T51625	**Gang Bolt** 1-1/2" Sq. 8 Blade - 70-5/8 Long	—	—	1	—
41	T51639	**Gang Bolt** 1-1/2" Sq. 10 Blade - 89-1/8 Long	—	—	—	1

REAR WING GANG & FRAME



CASE D24 SERIES DISK HARROW

REAR WING GANG & FRAME

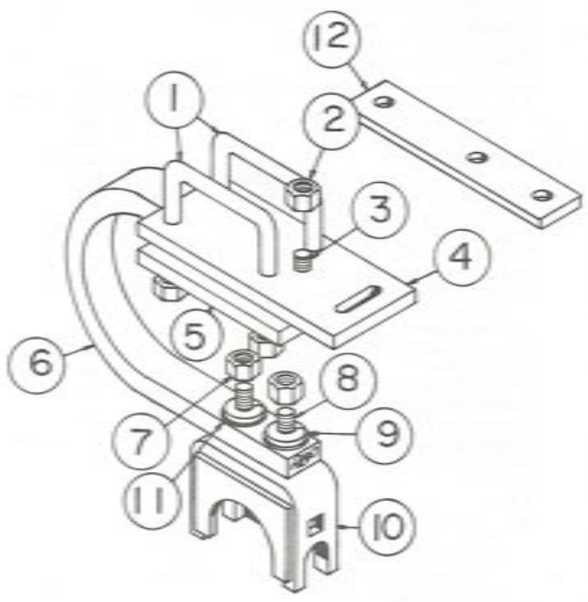
16'6" — 24'0"

Ref. No.	Part No.	Description	No. Required 16'6"	18'0"	21'0"	24'0"
1	T56284	Assy. Gang Frame R.H. - 54-1/4"	1	—	—	—
1	T56283	Assy. Gang Frame L.H. - 54-1/4"	1	—	—	—
1	T56286	Assy. Gang Frame R.H. - 63-1/2"	—	1	—	—
1	T56285	Assy. Gang Frame L.H. - 63-1/2"	—	1	—	—
1	T56290	Assy. Gang Frame R.H. - 82"	—	—	1	—
1	T56289	Assy. Gang Frame L.H. - 82"	—	—	1	—
1	T56294	Assy. Gang Frame R.H. - 100-1/2"	—	—	—	1
1	T56293	Assy. Gang Frame L.H. - 100-1/2"	—	—	—	1
2	T56686	"U" Bolt 3/4 Dia.	1	1	1	1
3	T56252	Scraper Bar Support	1	1	1	1
4	T56254	"U" Bolt 7/8 Dia.	2	2	2	3
5	T51603	Blade 20 x 3/16 Plain	1	1	1	1
5	T51695	Blade 20 x 3/16 C.O.	1	1	1	1
5	T55907	Blade 22 x 3/16 Plain	1	1	1	1
5	T55908	Blade 22 x 3/16 C.O.	1	1	1	1
6	138-162	Roll Pin 5/16 x 2-1/4	1	1	1	1
7	T57199	Bearing Riser (PP)	2	2	2	3
8	131-387	Lock Nut 5/8 NC, PL	7	7	7	10
9	195-108	Cut Washer 5/8 PL	7	7	7	10
10	111-617	Carriage Bolt 5/8 x 1-3/4 NC, PL	3	3	3	4
11	131-1140	Lock Nut 7/8 NC, PLT	4	4	4	6
12	111-618	Carriage Bolt 5/8 x 2 NC, PL, GR5	4	4	4	6
13	25-1324	Nut Gang Bolt 1-1/2 NF, Slotted	1	1	1	1
14	195-114	Cut Washer 1-3/8 PL	1	1	1	1
15	T51600	Bumper Washer	1	1	1	1
16	T55907	Blade 22 x 3/16 Plain	4	5	7	9
16	T55908	Blade 22 x 3/16 C.O.	4	5	7	9
16	T55915	Blade 22 x 1/4 Plain	4	5	7	9
16	T55917	Blade 22 x 1/4 C.O.	4	5	7	9
16	T55912	Blade 24 x 1/4 C.O.	4	5	7	9
16	T55911	Blade 24 x 1/4 Plain	4	5	7	9
16	T51693	Blade 24 x 3/16 Plain	4	5	7	9
16	T51694	Blade 24 x 3/16 C.O.	4	5	7	9
17	T56270	End Bell - Small (Before Serial No. 1631303)	2	2	2	3
17	T56687	End Bell - Small (After Serial No. 1631302)	2	2	2	3
18	T56271	End Bell - Large	2	2	2	3
19	T51655	Spacer Spool	3	4	6	7
20	T52681	Clamp Trunion 3/8 x 2-1/2 x 3-3/4 Long	4	4	4	6
21	T63252	Sub. Assy. Housing & Bearing (Before Serial No. 1631303)	2	2	2	3
21	T63287	Sub. Assy. Housing & Bearing (After Serial No. 1631302)	2	2	2	3
22	219-3	Grease Fitting 1/8 NP Straight	1	1	1	1
23	NSS	Housing Bearing	1	1	1	1
24	T55591	Washer 100mm	2	2	2	2
25	T51653	Bearing GW211PP3 (Before Serial No. 1631303)	1	1	1	1
25	T56688	Bearing GW211PP17 (After Serial No. 1631302)	1	1	1	1
26	T51654	Snap Ring	1	1	1	1
27	131-1131	Lock Nut 3/4" NC, PL	2	2	2	2
28	T54657	End Gang Washer	1	1	1	1
29	T54647	Spacer Plate	1	1	1	1
30	T54646	Bearing Plate	1	1	1	1
31	T55051	Lock Plate	1	1	1	1
32	25-1124	Nut Gang Bolt 1-1/2 NF	1	1	1	1
33	131-165	Lock Nut 1/2 NC, PL	7	8	10	12
34	111-539	Carriage Bolt	1	1	1	1
35	T53190	Scraper Bar 2 x 2 x 3/8 51-11/16	1	—	—	—
35	T53193	Scraper Bar 2 x 2 x 3/8 60-7/8	—	1	—	—
35	T53187	Scraper Bar 2 x 2 x 3/8 79-1/4	—	—	1	—
35	T56329	Scraper Bar 2 x 2 x 3/8 97-5/8	—	—	—	1
36	195-106	Cut Washer 1/2 PL	6	7	9	11
37	T55916	Blade 16 x 9 Plain	1	1	1	1
37	T51604	Blade 18 x 8 Ga. Plain	1	1	1	1
38	T55088	Assy. Scraper L. H.	6	7	9	11
A	T55103	Scraper Shank	1	1	1	1
B	T55102	Scraper Blade 3/16 x 6 x 4	1	1	1	1
C	113-410	Hex Head Machine Bolt 1/2 x 1-1/2 NC, PL	2	2	2	2
D	131-165	Lock Nut 1/2 NC, PL	2	2	2	2
39	T55087	Assy. Scraper R. H.	6	7	9	11
40	111-524	Carriage Bolt 1/2 x 1-1/2 NC, PL, GR5	6	7	9	11
41	T51599	Gang Bolt 1-1/2" Sq. 6 Blade - 52-1/8 Long	1	—	—	—
41	T51621	Gang Bolt 1-1/2" Sq. 7 Blade - 61-3/8 Long	—	1	—	—
41	T51638	Gang Bolt 1-1/2" Sq. 9 Blade - 79-7/8 Long	—	—	1	—
41	T51643	Gang Bolt 1-1/2" Sq. 11 Blade - 98-3/8 Long	—	—	—	1

CASE D24 SERIES DISK HARROW
OPTIONAL SHOCK-SORB BEARING RISER

Ref. No.	Part No.	Description	No. Req'd
1	T56502	**"U" Bolt** 3/4 Dia.	2
2	131-1131	**Lock Nut** 3/4 NC, PL	5
3	113-717	**Machine Bolt** 3/4 x 3-1/2 NC, PL, GR5	1
4	T56503	**Top Plate** 1/2 x 5 - 12" Long	1
5	T56504	**Bottom Plate** 5/8 x 5 - 8-3/4" Long	1
6	T56428	**Shock-sorb Shank** 1-1/4 x 2	1
7	25-1712	**Hex Nut** 3/4 NF	2
8	111-709	**Carriage Bolt** 3/4 x 3 NF, GR5	2
9	192-27	**Lock Washer** 3/4 PL	2
10	T56429	**Assy. Trunnion Mount**	1
11	195-109	**Cut Washer** 3/4 PL	2
12	T56505	**Scraper Bar Support** 1/2 x 2-1/2 - 12 Long	1

NOTE: Parts 1 - 11 are required to replace Bearing Riser T57199 on a Shock-sorb Harrow. Part 12 used to replace T56252 on a Shock-sorb Harrow.

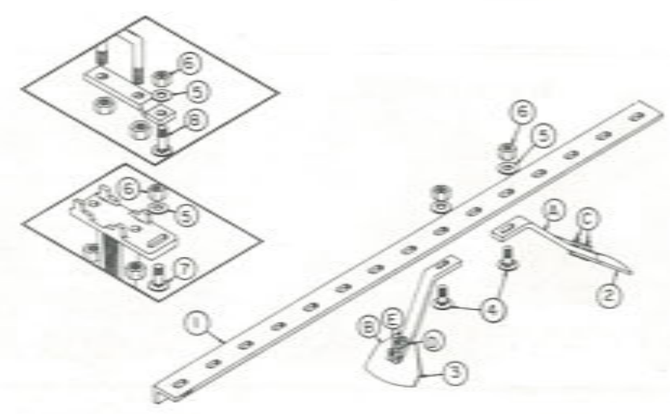


OPTIONAL SHOCK-SORB BEARING RISER

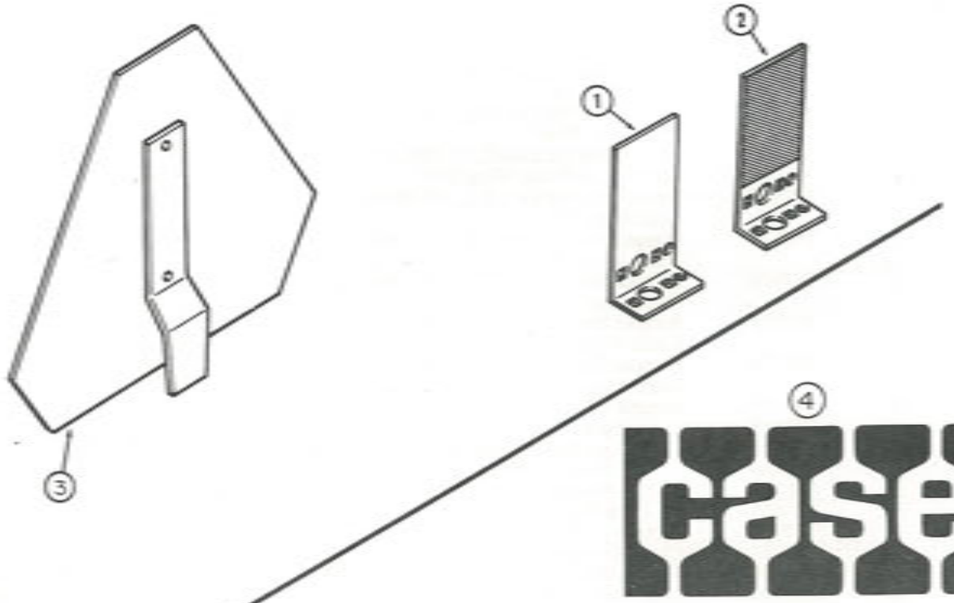
CASE D24 SERIES DISK HARROW
OPTIONAL HEAVY DUTY SCRAPERS

Ref. No.	Part No.	Description	No. Required 16'6"	18'0"	21'0"	24'0"
1	T57167	**Scraper Bar** 3 x 2 x 1/2 ∠ - 36-5/8 Long Front Wing 16'6"	2	—	—	—
1	T57168	**Scraper Bar** 3 x 2 x 1/2 ∠ - 41-1/4 Long Rear Inside	2	2	2	2
1	T57169	**Scraper Bar** 3 x 2 x 1/2 ∠ - 45-7/8 Long Front Wing 18'	—	2	—	—
1	T57170	**Scraper Bar** 3 x 2 x 1/2 ∠ - 50-1/2 Long Rear Wing 16'6"	2	—	—	—
1	T57171	**Scraper Bar** 3 x 2 x 1/2 ∠ - 55-1/8 Long Front Inside Front Wing 19'6"	2	2	2	2
1	T57172	**Scraper Bar** 3 x 2 x 1/2 ∠ - 59-3/4 Long Rear Wing 18'	—	2	—	—
1	T57173	**Scraper Bar** 3 x 2 x 1/2 ∠ - 64-3/8 Long Front Wing 21'	—	—	2	—
1	T57174	**Scraper Bar** 3 x 2 x 1/2 ∠ - 78-1/4 Long Rear Wing 21'	—	—	2	—
1	T57175	**Scraper Bar** 3 x 2 x 1/2 ∠ - 82-7/8 Long Front Wing 24'	—	—	—	2
1	T57176	**Scraper Bar** 3 x 2 x 1/2 ∠ - 96-3/4 Long Rear Wing 24'	—	—	—	2
2	T57177	**Scraper** - RH	21	23	27	31
A	T57178	**Scraper Shank** .360 x 2	1	1	1	1
B	T57179	**Scraper Blade** 3/16 x 6-1/2	1	1	1	1
C	113-410	**Hex Head Screw** 1/2 x 1-1/2 NC, PL	2	2	2	2
D	195-106	**Cut Washer** 1/2 PL	2	2	2	2
E	131-165	**Lock Nut** 1/2 NC, PL	2	2	2	2
3	T57180	**Scraper** - LH	21	23	27	31
4	111-617	**Carriage Bolt** 5/8 x 1-3/4 NC, PL, GR5	40	44	52	60
5	195-108	**Cut Washer** 5/8 PL	42	46	54	62
6	131-387	**Lock Nut** 5/8 NC, PL	42	46	54	62
7	111-618	**Carriage Bolt** 5/8 x 2 NC, PL, GR5 (Mounts Scraper Bar to Bearing Riser)	18	18	22	22
8	111-619	**Carriage Bolt** 5/8 x 2-1/2 NC, PL (Mounts Scraper & Scraper Bar to Rear Center Support)	2	2	2	2

OPTIONAL HEAVY DUTY SCRAPERS



REFLECTORS — SMV EMBLEM



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case

5

WARNING

RAISED WINGS CAN CONTACT ELECTRIC UTILITY LINES AND OVERHEAD OBSTRUCTIONS. SEVERE SHOCK, INJURY, OR DEATH CAN RESULT. DRIVE CAREFULLY. MEASURE OVERALL TRANSPORT HEIGHT AND ASSURE CLEARANCE.

DECALS

6

MAINTENANCE INSTRUCTIONS

1. Keep all bolts tight.
   A. Visually inspect all bolts daily.
   B. Check after first 50 hours or one week's operation.
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 two weeks 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.

CASE D24 SERIES DISK HARROW
REFLECTORS — SMV EMBLEM

Ref. No.	Part No.	Description	No. Req'd
1	T62687	**Reflector** - Red and Amber	1
2	T60873	**Reflector** - Red	1
3	A59450	**Emblem** - SMV	1

CASE D24 SERIES DISK HARROW
DECALS

Ref. No.	Part No.	Description	No. Req'd
4	321-2575	**Decal** - Case	2
5	321-3890	**Decal** - Warning	1
6	321-3883	**Decal** - Maintenance	1
7	321-4795	**Decal** - Model	1
8	321-5687	**Decal** - Warning (Not Shown)	1

7

D24

GENERAL TORQUE SPECIFICATION TABLE

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

GENERAL TORQUE SPECIFICATION TABLE

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN

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

SAE Grade No.		2		5		8 *	
Bolt head identification marks as per grade NOTE: Manufacturing Marks Will Vary							
Bolt Size		Torque Foot Pounds		Torque Foot Pounds		Torque Foot Pounds	
Inches	Millimeters	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.35	5	6	9	11	12	15
5/16	7.94	10	12	17	20.5	24	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

assembly instructions

CASE D24 HARROW
16'6" — 24'0"

The CASE D24 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.*

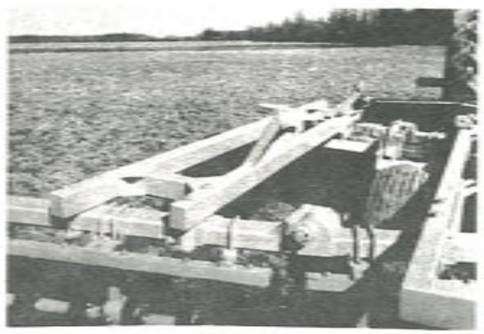
Step 6.
Attach the two rear wing gang frames to the inside rear gang frames. Use the 1-1/2" diameter wing pivot pins. Tighten the nuts snug but not tight.

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.

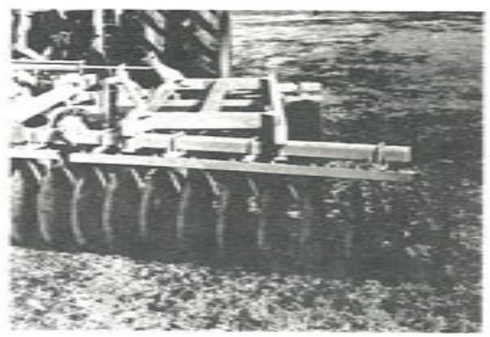
Step 8.
Clamp the wing main frames to the wing gang frames using the 7/8 x 9 bolts and 5/8 x 3 straps. Note that the outside rear straps on the 16'6" and 18'0" harrows are slightly longer than the other 5/8 x 3 straps.

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.*

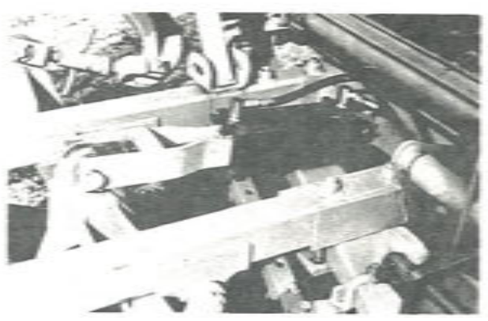


16'6" AND 18'0"
WING MAIN FRAME



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

TURNBUCKLES



HYDRAULIC CYLINDER MOUNTING

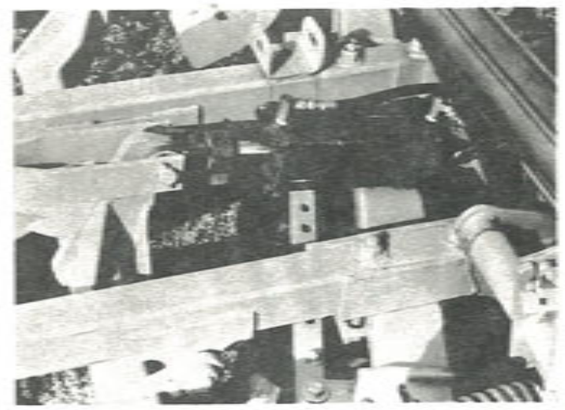
Step 9.
Install the turnbuckle sub. assemblies between the center rockshafts and the wing rockshafts. Adjust turnbuckles to 15" length before installation. Tighten the 1-3/8-NC jam nut.

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.

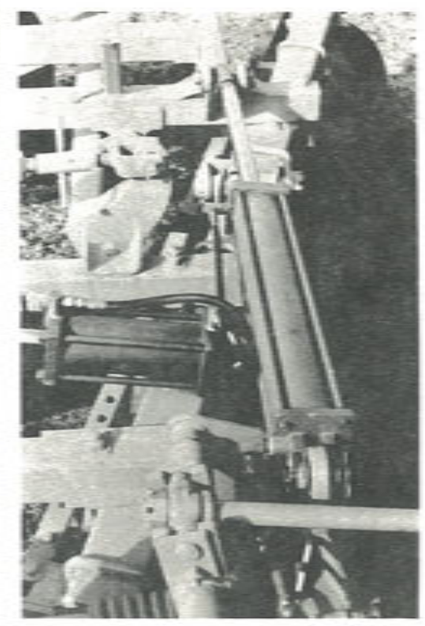
Step 11.
Install the two 4" x 8" hydraulic cylinders on the center main frame and the two center rockshafts. The rod end should be attached to the rockshaft. The two 1-1/4" cut washers should be installed between the transport lock and cylinder clevis.

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!

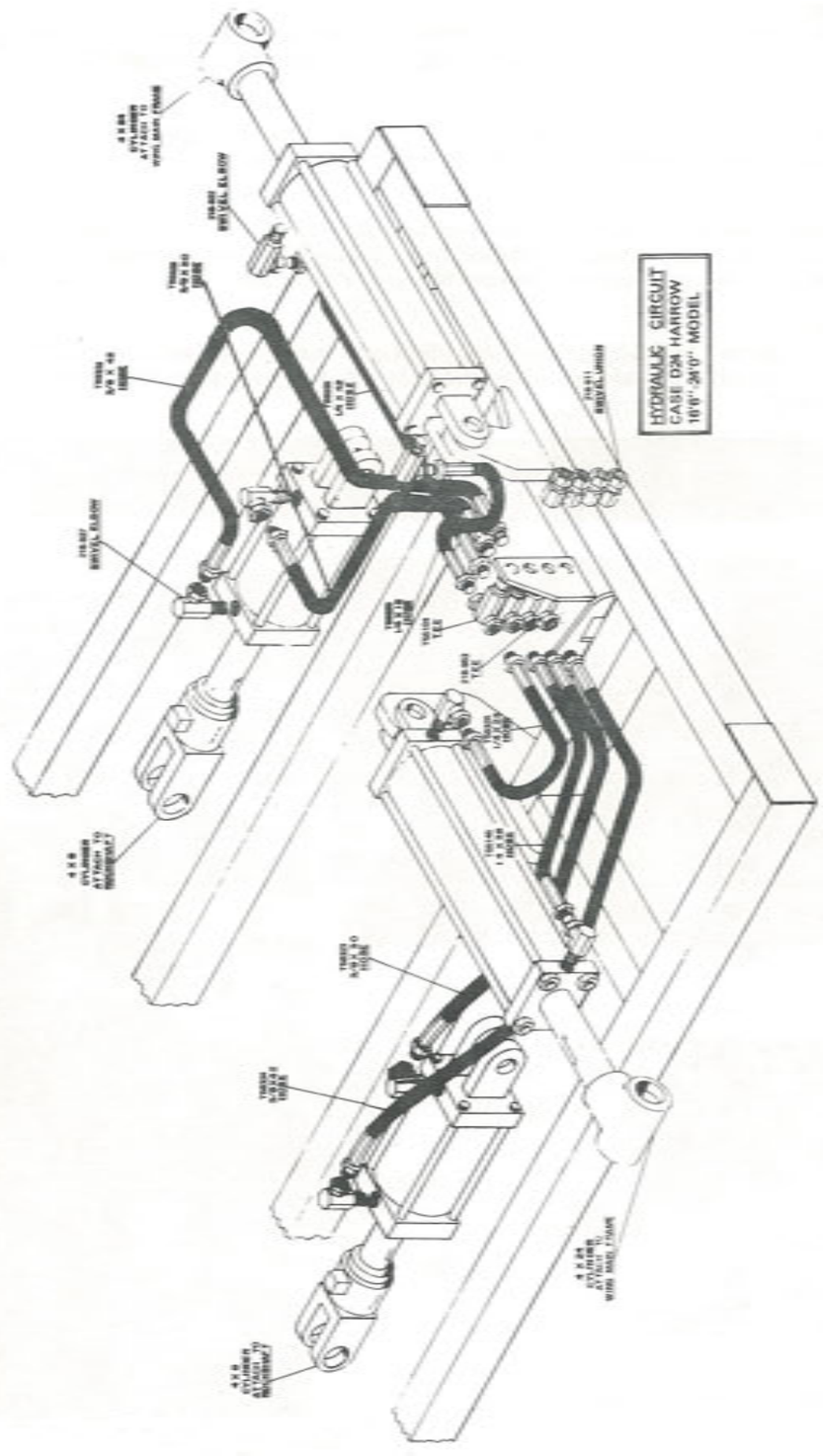
Step 13.
Extend the two 4" x 24" cylinders and attach to the wing main frames. Note how the four 1-1/4" washers are located. Secure with the 1-1/4" pins and the 5/16" x 2-1/4" roll pins.



4 X 8 CYLINDER
INSTALLATION



4 X 24 CYLINDER
INSTALLATION



Step 14.
Install hydraulic fittings as follows:

A. Install four **218-927** 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!

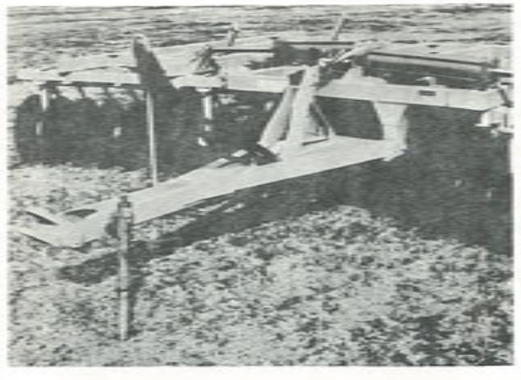
B. Install four **218-922** 1/2" Male to 1/4" Female swivel elbows into ports on 4" x 24" cylinders. Turn fittings as shown in drawing. Tighten fittings!

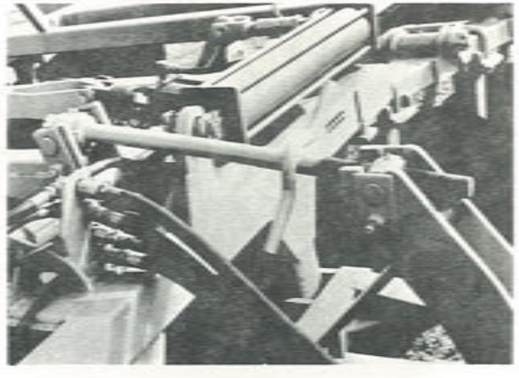
C. The four **218-911** 1/2" Female to 1/2" Female swivel unions are used to secure the four tees to the mounting bracket. The swivel on the union should be turned to the front to simplify attachment of the four 1/2" x 10' hoses that go to the tractor. The two **T55104** 1/2" Male to 1/2" Female tees should be installed in the two bottom holes. The two **218-953** 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 **T56324** 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 **T56323** 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) **T55145** 1/4" x 36" hose goes from rod end of right hand 4" x 24" cylinder to the second tee from the top.
   (4) **T56328** -1/4" x 42" hose goes from rod end of left hand 4" x 24" cylinder to the second tee from the top.
   (5) **T56326** 1/4" x 24" hose goes from butt of right hand 4" x 24" cylinder to top tee.
   (6) **T56325** 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.



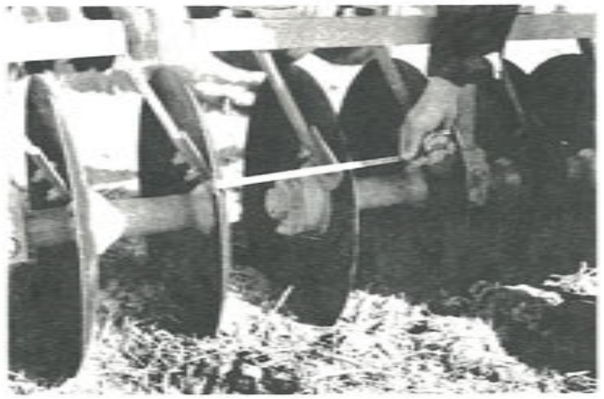


Step 16.
Attach four 1/2" x 10" or 3/8" x 10" SAE 100R2 or SAE 100R8 Double Braid Hydraulic hoses to the swivel adaptors on the main frame. Attach quick couplers. (Hoses and couplers are available as optional equipment.) Attach harrow and hoses to tractor.

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.



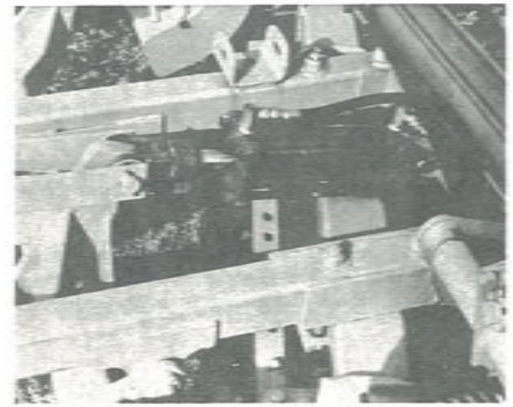
C. Check the spacing between the blades on the center gangs and wing gangs. This spacing should be 9-1/4" to 9-3/4". The harrow must be on a level area when checking this spacing. Shift wing gangs as required to obtain this spacing.

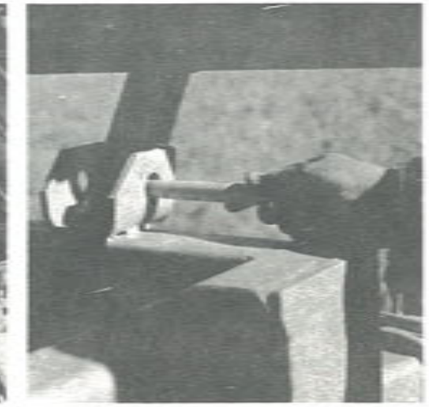
D. Check scraper adjustment. Scrapers should be adjusted to run 1/16" to 1/8" from disk blades.

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.

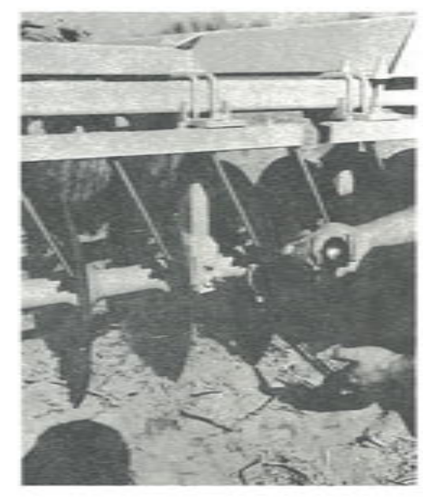
H. Fully extend the 4" x 8" cylinders and raise the harrow for transport. Adjust the tongue adjusting rod to level the harrow for transport.

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

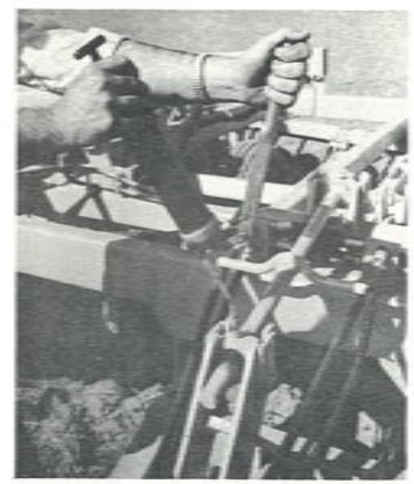
Careful and regular attention to lubrication will greatly increase the life of the harrow. For economical and efficient operation, the proper lubrication of frame fittings, gang bearings, and wheel bearings is essential.

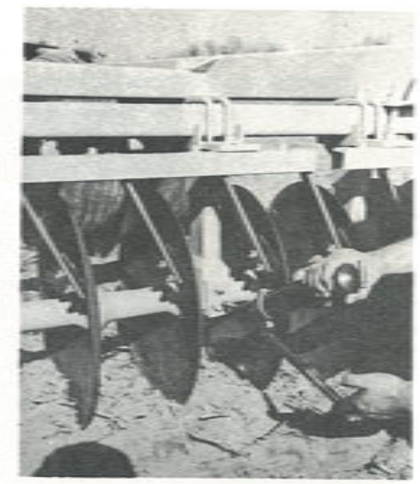
Be sure fittings are free of dirt before greasing. If a fitting is lost or damaged, replace it immediately. Lubricate all parts throughly with a good grade No. 2 gun grease (Lithium Base).

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 Lithum 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.

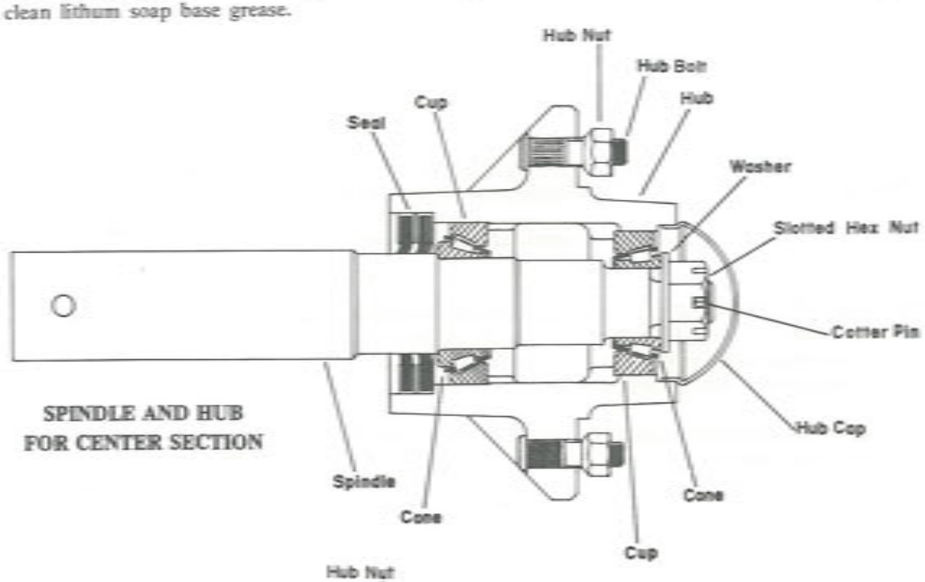




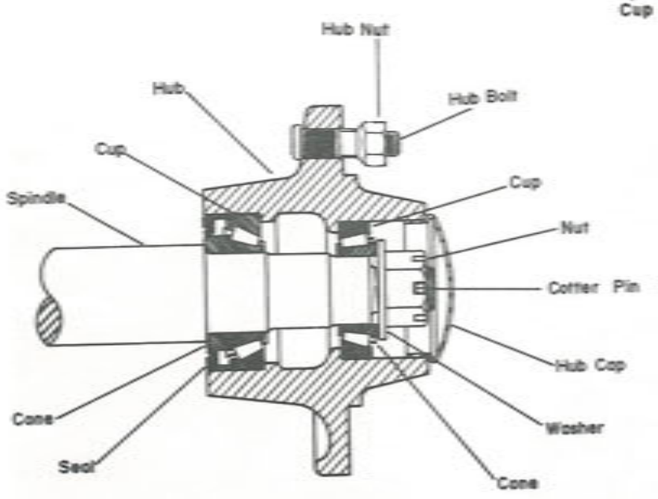
GANG BEARINGS: The CASE D24 Harrow Gangs are equipped with regreasable Protect-O-Shield ball bearings. The grease fitting is located on the rear of each bearing housing. They should be greased every 50 hours of operation with a good grade of lithum soap base chassis grease. All bearings should be greased 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 lithum 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.*

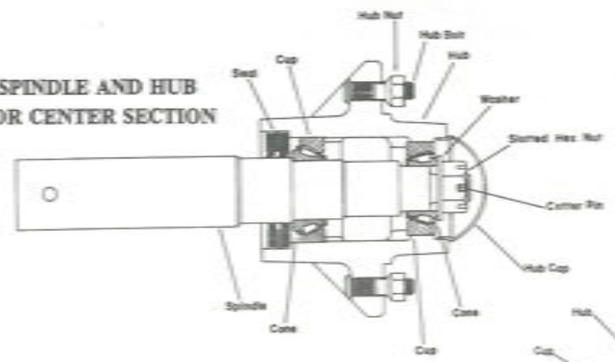
> ⚠ CAUTION *Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues causing serious injury. Use a piece of wood or cardboard when looking for leaks – never use the hands or other parts of the body.*
>
> *Relieve hydraulic pressure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

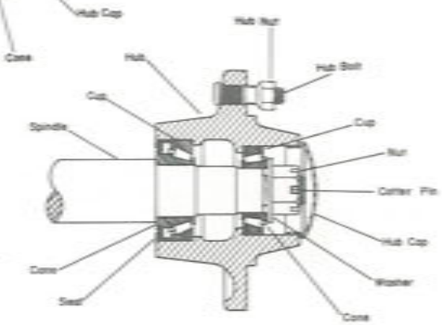
WHEEL BEARING REPAIR: Wheel bearings should be repacked with grease and adjusted annually. Under extreme conditions, they should be serviced more frequently. Check occasionally for excessive end play.

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.

SPINDLE AND HUB
FOR CENTER SECTION



SPINDLE AND HUB
FOR WING SECTION



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.

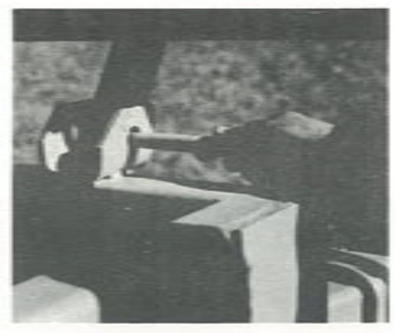
⚠ CAUTION *When transporting farm implements on public roads after dusk, it is the responsibility of the operator to provide lighting and reflectors on the rear of the implement in accordance with your state law.*

⚠ 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 D24 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 D24 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. Disc 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 D24 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.

operating tips

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, 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 CASE 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.
10. Do not operate disk with wings folded. Operating disk with wings folded will cause excessive blade breakage, bent axles and undue strain on related parts.

MOST OFTEN ENCOUNTERED DISK BLADE FAILURES

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

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

SURFACE VIEW EDGE VIEW

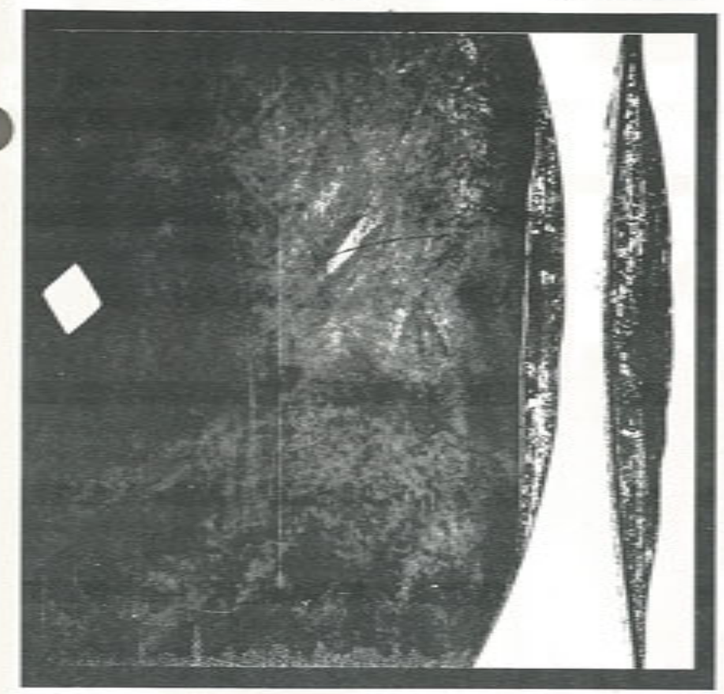
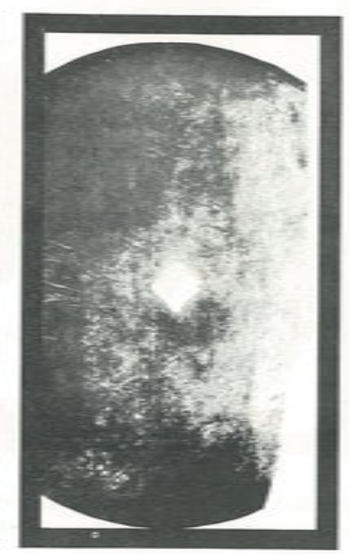
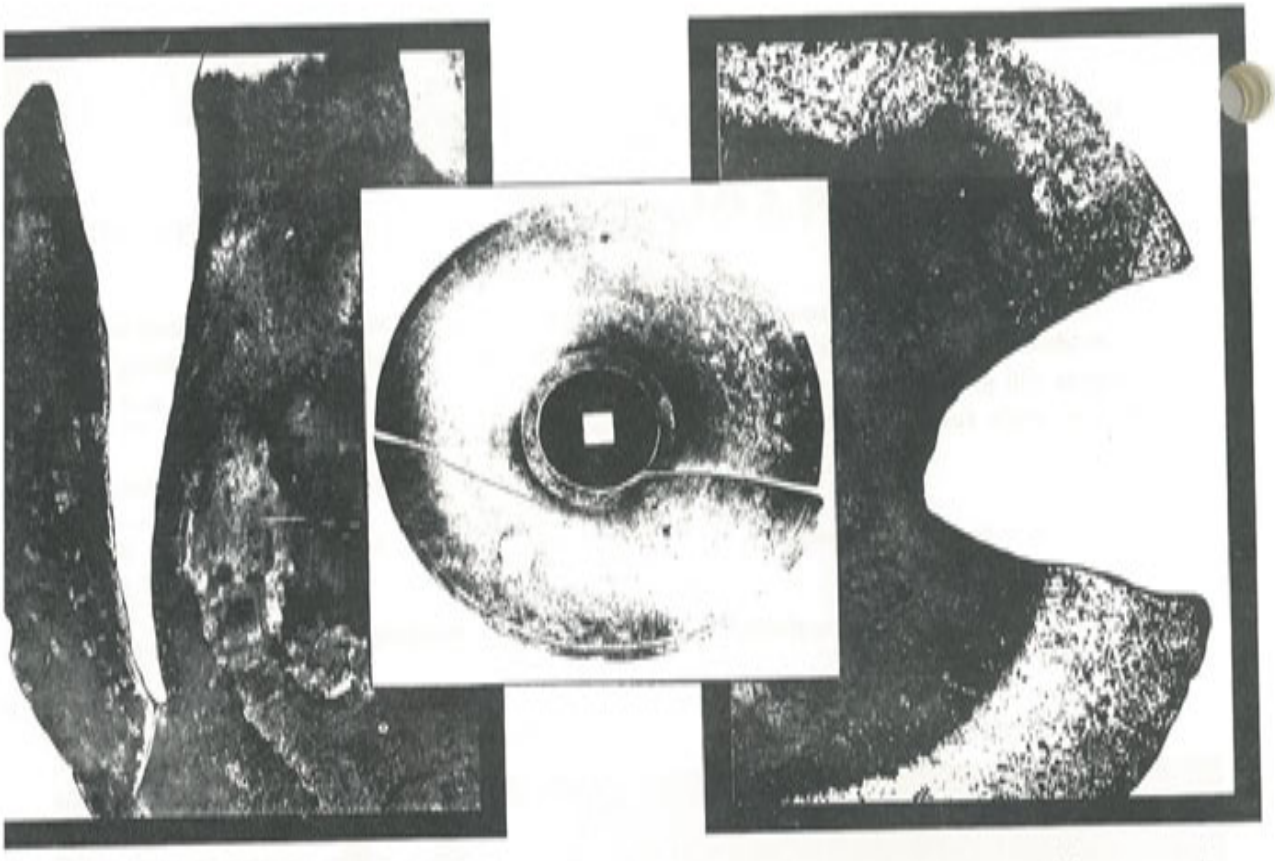
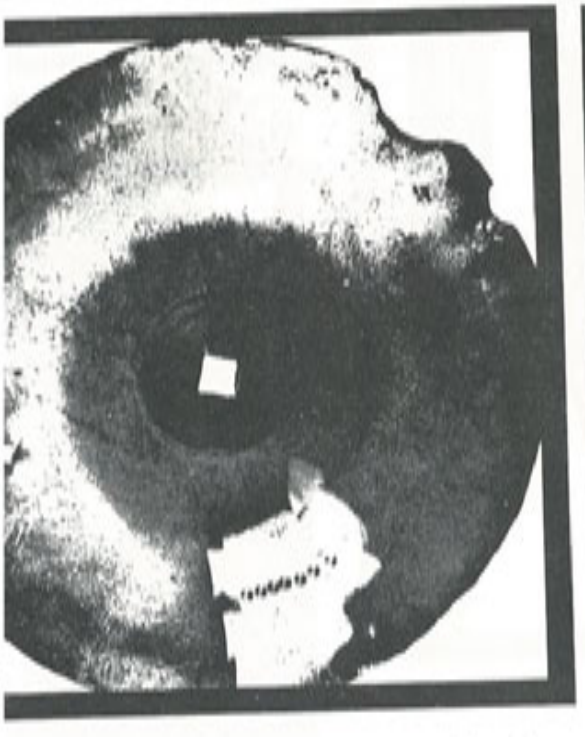


FIGURE 2 — Straight directional break caused by defective steel. Eligible for warranty consideration.





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



6 — Chipped or dented edges resulting from eas containing rocks or stumps. Not covered by

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.