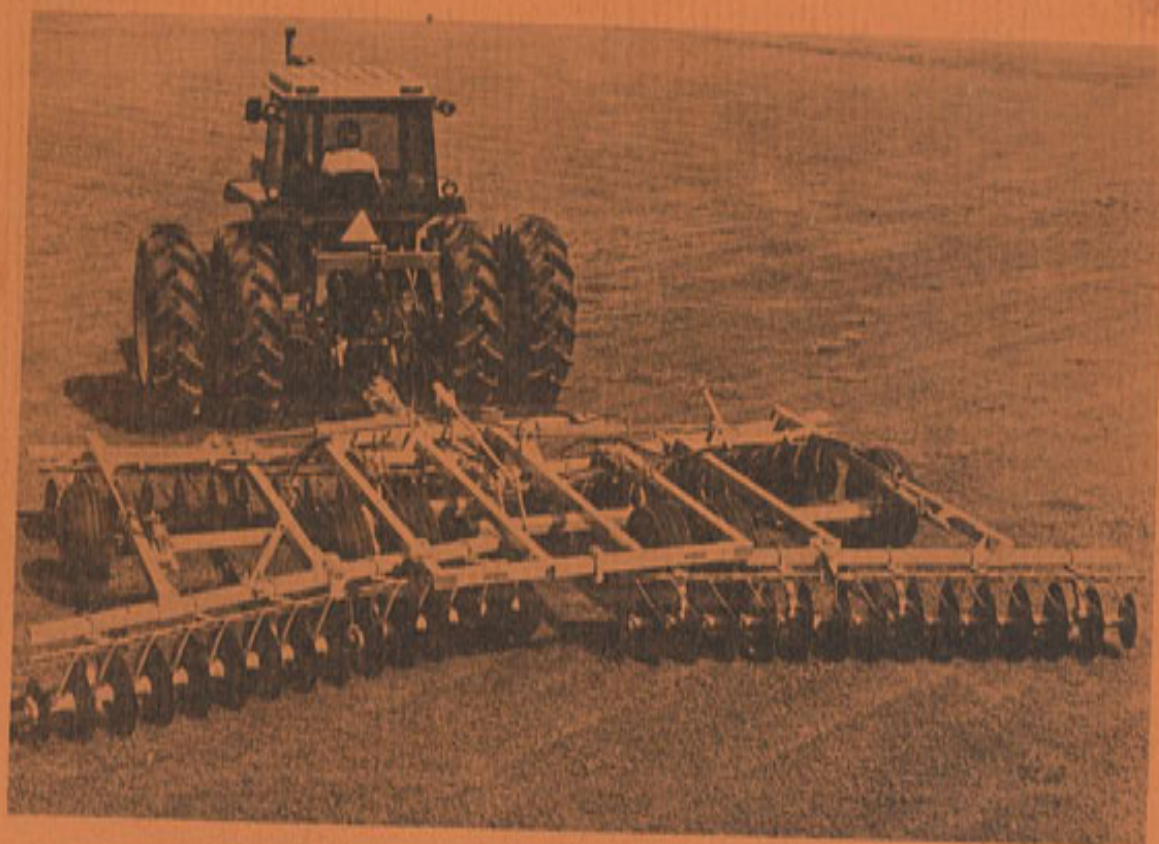




*Parts Dept  
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**30 SERIES  
DOUBLE OFFSET FLEXWING  
PARTS CATALOG  
OPERATION - MAINTENANCE - SET-UP  
INSTRUCTIONS**



**PRODUCTS**

Portable Elevator Division, Dynamics Corporation of America  
No. 1 AMCO Bldg., St. Louis, Mo. 63103





## TO THE PURCHASER

The care you give your new AMCO 30 Series 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 30 Series Harrow will serve you well for many years.

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

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

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

YOUR AUTHORIZED AMCO DEALER

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



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

To insure efficient and prompt service, please provide the model number and serial number of your AMCO Harrow in all correspondence or contacts. Remember, the right and left hand sides of the harrow are determined by standing at the rear of the harrow and facing the direction of travel.

MODEL NUMBER

SERIAL NUMBER

AMCO

17'10"-24'0"

## C30 DOUBLE OFFSET FLEXWING

### GENERAL SPECIFICATIONS

[Metrics in Parenthesis]

|                      |                                                                                                                                                                        |                   |                                                                                    |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------|
| AXLES:               | 1-1/8" square, high strength, special alloy, cold rolled steel                                                                                                         | HYDRAULIC HOSES:  | Hoses complete to front of main frame                                              |
| DISC:                | 20" x 7 ga. (4.5mm) Plain with                                                                                                                                         | BEARINGS:         | Protect-O-Shield, 2" round bore regreaseable ball type, toggle mounted over sleeve |
| BLADES:              | Diminishing gangs and two feathering blades on rear                                                                                                                    | WHEELS:           | Four 15 x 8 center section<br>Two 15 x 8 wing section                              |
| SCRAPERS:            | High carbon replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars                                    | CLEVIS:           | Reversible ductile iron                                                            |
| TONGUE:              | 90" long with tongue jack and reversible ductile iron clevis                                                                                                           | DISC SPACING:     | 7"                                                                                 |
| HYDRAULIC CYLINDERS: | Two 3-1/2" x 8" with depth control on center section<br>Two 3-1/4" x 8" on wing section<br>Two 3" x 24" for folding wings<br>Two 4" x 24" for folding wings (24' only) | ANGLE:            | Preset with 17° front gang angle and 16° rear gang angle                           |
|                      |                                                                                                                                                                        | WEIGHT:           | 90 to 99 lbs. per blade<br>313 to 344 lbs. per foot                                |
|                      |                                                                                                                                                                        | TRANSPORT WIDTH:  | 13'6"                                                                              |
|                      |                                                                                                                                                                        | TRANSPORT HEIGHT: | Under 10'0"                                                                        |

| Model    | Cutting Width  | No. of Blades | No. of Bearings | Recommended Drawbar Horsepower |          | Approximate Weight |        |
|----------|----------------|---------------|-----------------|--------------------------------|----------|--------------------|--------|
|          |                |               |                 | HP                             | [KW]     | Lbs.               | [Kg]   |
| C30-6220 | 17'10" (5.43m) | 62            | 16              | 90-110                         | (67- 82) | 6130               | (2781) |
| C30-6620 | 19' 0" (5.79m) | 66            | 16              | 90-115                         | (67- 86) | 6300               | (2858) |
| C30-7420 | 21' 4" (6.50m) | 74            | 16              | 95-125                         | (71- 93) | 6680               | (3030) |
| C30-8220 | 24' 0" (7.31m) | 82            | 20              | 100-135                        | (74-100) | 7049               | (3197) |

### OPTIONAL EQUIPMENT

|                                                              |                  |
|--------------------------------------------------------------|------------------|
| 20 x 7 ga. cutout in lieu of standard 20"                    | .....            |
| 22 x 7 ga. plain in lieu of standard 20"                     | .....            |
| 22 x 7 ga. cutout in lieu of standard 20"                    | .....            |
| Dual 15 x 8 wheels with 6 bolt hubs and spindles (for wings) | ..... BR-14-0001 |
| Set of 4 Hyd. Hoses—1/2 x 11' (from disk to tractor)         | ..... AG-20-0012 |

### RECOMMENDED TIRE SIZE

11L x 15 Tires, 6 or 8 Ply

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



AMCO

18'0"-24'0"

**D30 DOUBLE OFFSET FLEXWING****GENERAL SPECIFICATIONS**

[Metrics in Parenthesis]

|                             |                                                                                                                                                                       |                          |                                                                                   |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------|
| <b>AXLES:</b>               | 1-1/8" square, high strength, special alloy, cold rolled steel                                                                                                        | <b>HYDRAULIC HOSES:</b>  | Hoses complete to front of main frame                                             |
| <b>DISC:</b>                | 20" x 7 ga. (4.5mm) Plain with                                                                                                                                        | <b>BEARINGS:</b>         | Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve |
| <b>BLADES:</b>              | Diminishing gangs and two feathering blades on rear                                                                                                                   | <b>WHEELS:</b>           | Four 15 x 8 center section<br>Two 15 x 8 wing section                             |
| <b>SCRAPERS:</b>            | High carbon replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars                                   | <b>CLEVIS:</b>           | Reversible ductile iron                                                           |
| <b>TONGUE:</b>              | 90" long with tongue jack and reversible ductile iron clevis                                                                                                          | <b>DISC SPACING:</b>     | 9"                                                                                |
| <b>HYDRAULIC CYLINDERS:</b> | Two 3-1/2" x 8" with depth control on center section<br>Two 3-1/4" x 8" on wing section<br>Two 3 x 24" for folding wings<br>Two 4" x 24" for folding wings (24' only) | <b>ANGLE:</b>            | Preset with 17° front gang angle and 16° rear gang angle                          |
|                             |                                                                                                                                                                       | <b>WEIGHT:</b>           | 108 to 117 lbs. per blade<br>299 to 325 lbs. per foot                             |
|                             |                                                                                                                                                                       | <b>TRANSPORT WIDTH:</b>  | 13'6"                                                                             |
|                             |                                                                                                                                                                       | <b>TRANSPORT HEIGHT:</b> | Under 10'0"                                                                       |

| Model    | Cutting Width | No. of Blades | No. of Bearings | Approximate Weight |        | Recommended Drawbar Horsepower |          |
|----------|---------------|---------------|-----------------|--------------------|--------|--------------------------------|----------|
|          |               |               |                 | Lbs.               | [Kg]   | HP                             | [KW]     |
| D30-5020 | 18'0" (5.49m) | 50            | 16              | 5840               | (2649) | 100-130                        | (74-97)  |
| D30-5420 | 19'6" (5.94m) | 54            | 16              | 6010               | (2726) | 100-135                        | (74-101) |
| D30-5820 | 21'0" (6.40m) | 58            | 16              | 6270               | (2844) | 105-140                        | (78-104) |
| D30-6620 | 24'0" (7.31m) | 66            | 20              | 6673               | (3027) | 105-145                        | (78-112) |

**OPTIONAL EQUIPMENT**

|                                                              |                  |
|--------------------------------------------------------------|------------------|
| 20 x 7 ga. cutout in lieu of standard 20"                    | .....            |
| 22 x 7 ga. plain in lieu of standard 20"                     | .....            |
| 22 x 7 ga. cutout in lieu of standard 20"                    | .....            |
| Dual 15 x 8 wheels with 6 bolt hubs and spindles (for wings) | ..... BR-14-0001 |
| Set of 4 Hyd. Hoses—1/2 x 11' (from disk to tractor)         | ..... AG-20-0012 |

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

**RECOMMENDED TIRE SIZE**

11L x 15 Tires, 6 or 8 Ply

AMCO

17'10"-24'0"

**DC30 DOUBLE OFFSET FLEXWING****GENERAL SPECIFICATIONS**

[Metrics in Parenthesis]

|                             |                                                                                                                                                                        |                          |                                                                                   |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------|
| <b>AXLES:</b>               | 1-1/8" square, high strength, special alloy, cold rolled steel                                                                                                         | <b>HYDRAULIC HOSES:</b>  | Hoses complete to front of main frame                                             |
| <b>DISC:</b>                | 20" x 7 ga. (4.5mm) Plain with                                                                                                                                         | <b>BEARINGS:</b>         | Protect-O-Shield, 2" round bore regreasable ball type, toggle mounted over sleeve |
| <b>BLADES:</b>              | Diminishing gangs and two feathering blades on rear                                                                                                                    | <b>WHEELS:</b>           | Four 15 x 8 center section<br>Two 15 x 8 wing section                             |
| <b>SCRAPERS:</b>            | High carbon replaceable blades on heavy duty shanks, mounted with flange lock nuts and grade 5 bolts on high carbon angle iron bars                                    | <b>CLEVIS:</b>           | Reversible ductile iron                                                           |
| <b>TONGUE:</b>              | 90" long with tongue jack and reversible ductile iron clevis                                                                                                           | <b>DISC SPACING:</b>     | 9" front and 7" rear                                                              |
| <b>HYDRAULIC CYLINDERS:</b> | Two 3-1/2" x 8" with depth control on center section<br>Two 3-1/4" x 8" on wing section<br>Two 3" x 24" for folding wings<br>Two 4" x 24" for folding wings (24' only) | <b>ANGLE:</b>            | Preset with 17° front gang angle and 16° rear gang angle                          |
|                             |                                                                                                                                                                        | <b>WEIGHT:</b>           | 98 to 107 lbs. per blade<br>303 to 336 lbs. per foot                              |
|                             |                                                                                                                                                                        | <b>TRANSPORT WIDTH:</b>  | 13'6"                                                                             |
|                             |                                                                                                                                                                        | <b>TRANSPORT HEIGHT:</b> | Under 10'0"                                                                       |

| Model     | Cutting Width  | No. of Blades | No. of Bearings | Approximate Weight |        | Recommended Drawbar Horsepower |          |
|-----------|----------------|---------------|-----------------|--------------------|--------|--------------------------------|----------|
|           |                |               |                 | Lbs.               | [Kg]   | HP                             | [KW]     |
| DC30-5620 | 17'10" (5.43m) | 56            | 16              | 5980               | (2713) | 90-120                         | (67-89)  |
| DC30-6020 | 19' 0" (5.79m) | 60            | 16              | 6160               | (2794) | 95-125                         | (71-93)  |
| DC30-6620 | 21' 4" (6.50m) | 66            | 16              | 6470               | (2935) | 100-135                        | (74-101) |
| DC30-7420 | 24' 0" (7.31m) | 74            | 20              | 6857               | (3110) | 100-140                        | (74-104) |

**OPTIONAL EQUIPMENT**

|                                                              |                  |
|--------------------------------------------------------------|------------------|
| 20 x 7 ga. cutout in lieu of standard 20"                    | .....            |
| 22 x 7 ga. plain in lieu of standard 20"                     | .....            |
| 22 x 7 ga. cutout in lieu of standard 20"                    | .....            |
| Dual 15 x 8 wheels with 6 bolt hubs and spindles (for wings) | ..... BR-14-0001 |
| Set of 4 Hyd. Hoses—1/2 x 11' (from disk to tractor)         | ..... AG-20-0012 |

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

**RECOMMENDED TIRE SIZE**

11L x 15 Tires, 6 or 8 Ply





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** 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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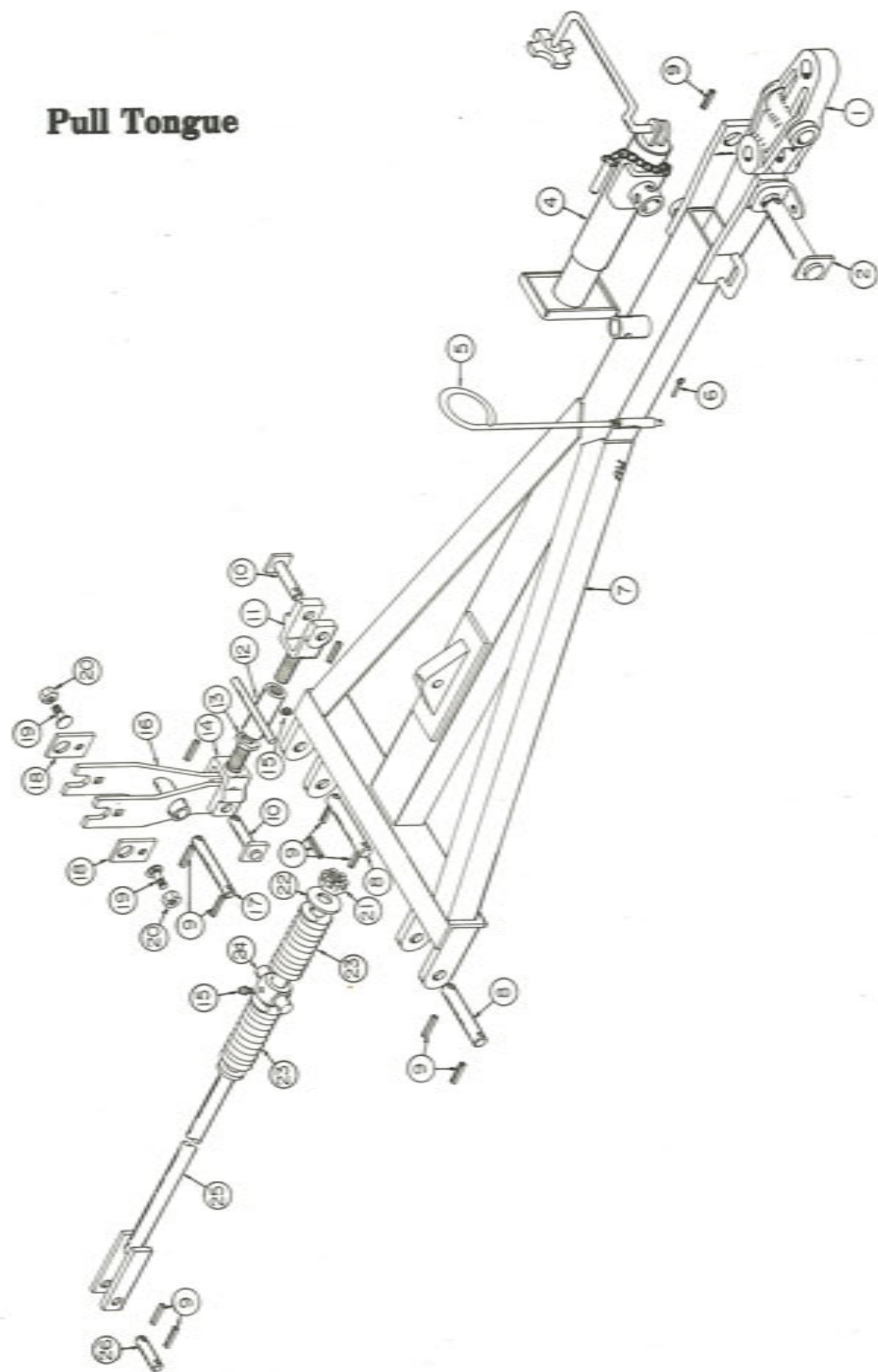
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AMCO NO. 11427

ISSUED NOV. 1981

# Pull Tongue

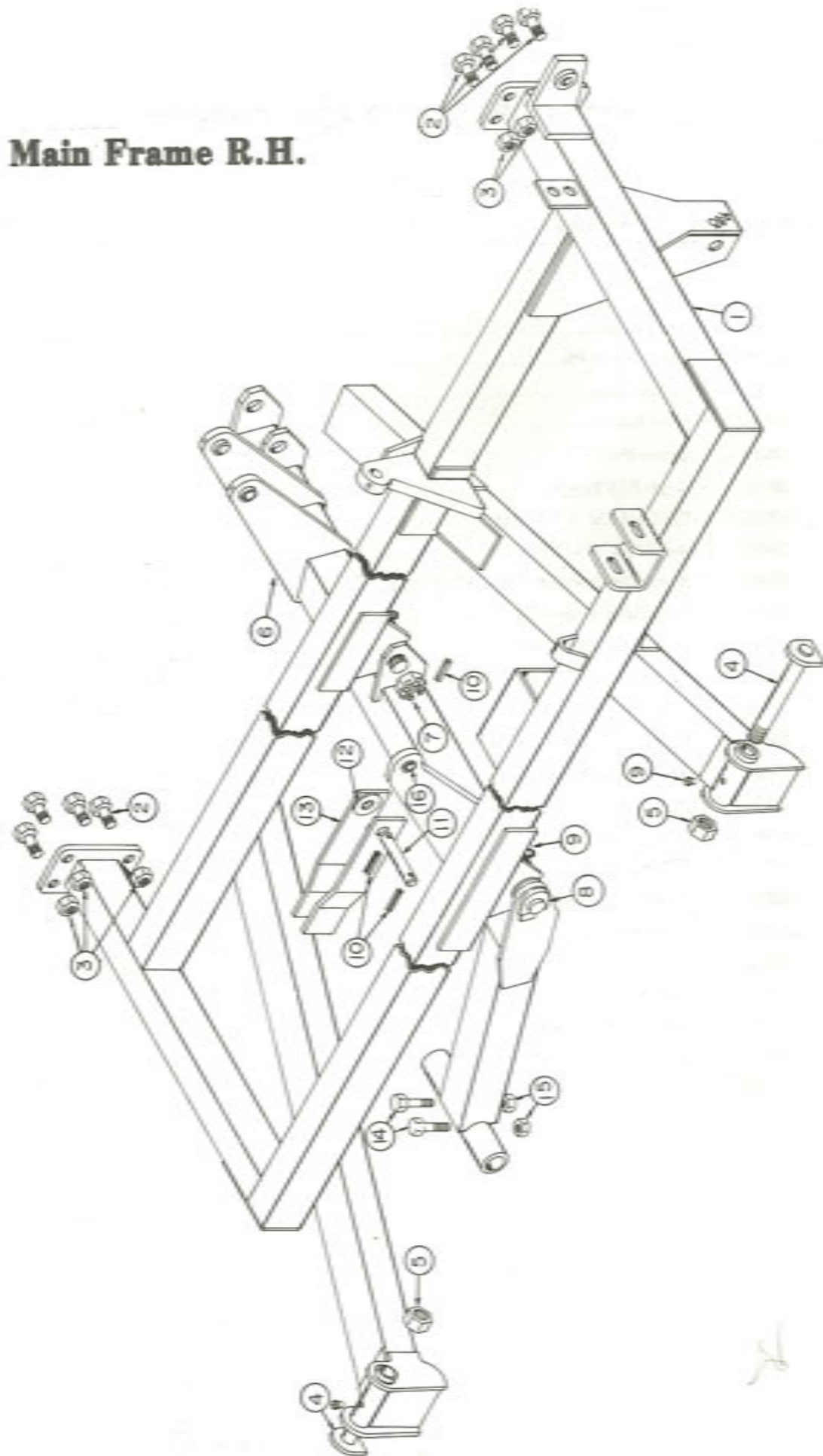


## AMCO 30 Series Pull Tongue

| Ref. No. | Part No. | Description                                  | No. Req'd |
|----------|----------|----------------------------------------------|-----------|
| 1        | 16001    | Pull Clevis .....                            | 1         |
| 2        | 20212    | Assy. Clevis Pin .....                       | 1         |
| 4        | 11261    | Tongue Jack .....                            | 1         |
| 5        | 100061   | Hose Holder .....                            | 1         |
| 6        | 10075    | Cotter Pin .....                             | 1         |
| 7        | 20213    | Assy. Pull Tongue .....                      | 1         |
| 8        | 100574   | Pin 1 1/4 Dia. 6 7/8 Long .....              | 2         |
| 9        | 10910    | Roll Pin 5/16 x 2 1/4 .....                  | 12        |
| 10       | 20094    | Assy. Retainer Pin 1" Dia. 4 3/4 Long .....  | 1         |
| 11       | 16026    | Yoke Adjusting—LH .....                      | 1         |
| 12       | 20046A   | Assy. Connector—5" Long .....                | 1         |
| 13       | 10053    | Jam Nut 1 3/8 NC, RH .....                   | 1         |
| 14       | 16025    | Yoke Adjusting—RH .....                      | 1         |
| 15       | 10606    | Grease Fitting 1/8 x 27 NPT .....            | 3         |
| 17       | 20231    | Assy. Pivot Bracket .....                    | 1         |
| 17       | 9349     | Pin 1" Dia. —8 3/8" Long .....               | 1         |
| 18       | 9628     | Clamp Trunion .....                          | 2         |
| 19       | 10135    | Carriage Screw 5/8 x 1 3/4 NC, PL, GR5 ..... | 2         |
| 20       | 10299    | Lock Nut 5/8 NC, PL .....                    | 2         |
| 21       | 11279    | Slotted Hex Nut 1 3/8 NC, PL .....           | 1         |
| 22       | 10872    | Flat Washer 1 3/8 PL .....                   | 1         |
| 23       | 10460    | Springs 3" OD 5/8 Wire—6 7/8 Long .....      | 2         |
| 24       | 9892     | Swivel—Class 30 Grey Iron .....              | 1         |
| 25       | 20230    | Assy. Leveling Rod .....                     | 1         |
| 26       | 101414   | Pin 1" Dia. 3 3/8 Long .....                 | 1         |



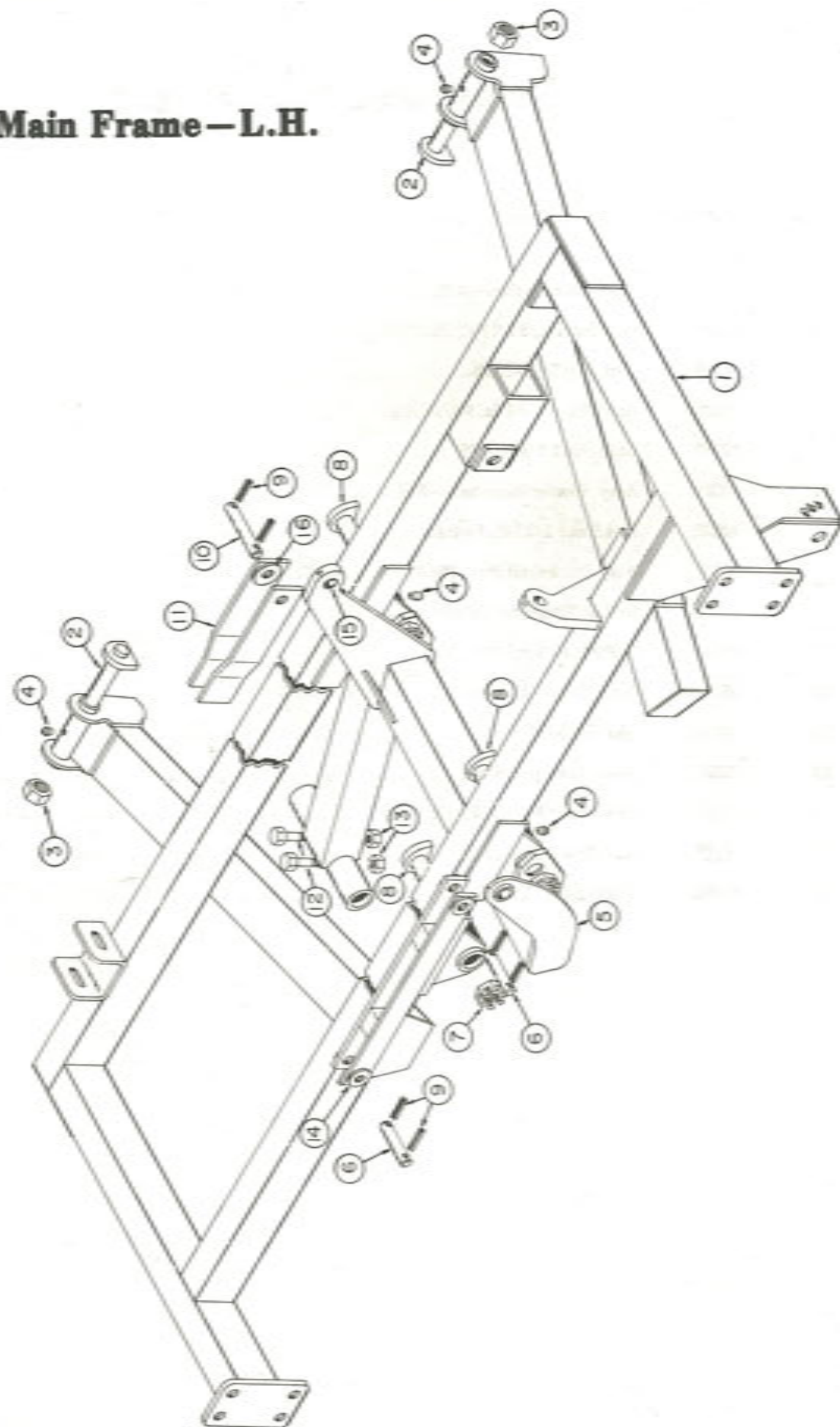
## Main Frame R.H.



## 30 Series Main Frame—R.H.

| Ref. No. | Part No. | Description                                          | No. Req'd |
|----------|----------|------------------------------------------------------|-----------|
| 1        | 20214    | Assy. Main Frame—R.H. ....                           | 1         |
| 2        | 11892    | Hex Screw 7/8 x 2 NC, PL, GB5 ....                   | 8         |
| 3        | 10396    | Lock Nut 7/8 NC, PL ....                             | 8         |
| 4        | 20132    | Assy. Pin 1 1/4 Dia. 9 3/4 Long ....                 | 2         |
| 5        | 10397    | Lock Nut 1 1/4 NC, PL ....                           | 2         |
| 6        | 20221    | Assy. Center Rockshaft—R.H. ....                     | 1         |
| 7        | 10232    | Hex Nut 1 1/2 NC, Slotted ....                       | 3         |
| 8        | 0866     | Assy. Rockshaft Pivot Pin 1 1/2 Dia. 7 5/8 Long .... | 3         |
| 9        | 11081    | Grease Fitting (not shown) ....                      | 5         |
| 10       | 10910    | Roll Pin 5/16 x 2 1/4 ....                           | 5         |
| 11       | 6554     | Pin 1" Dia. —5 Long ....                             | 1         |
| 12       | 10879    | Flat Washer 1" PL ....                               | 2         |
| 13       | 20222    | Assy. Transport Lock ....                            | 1         |
| 14       | 10871    | Hex Screw 3/8 x 3 NC, PL, GB5 ....                   | 2         |
| 15       | 10509    | Lock Nut 3/8 NC, PL ....                             | 2         |
| 16       | 11492    | Bushing 3/4" Long ....                               | 1         |

## Main Frame—L.H.

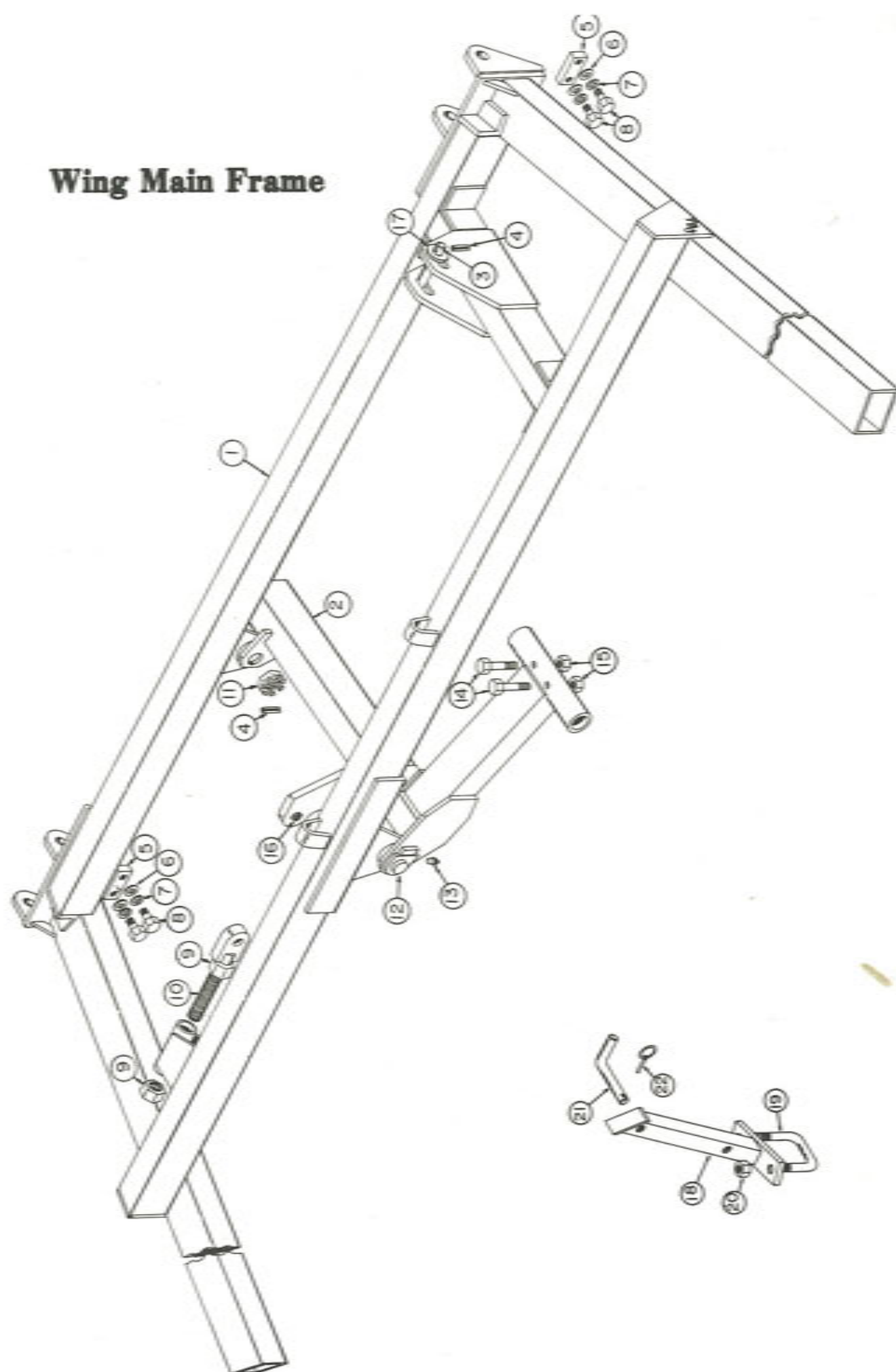


## 30 Series Main Frame—L.H.

| Ref. No. | Part No. | Description                                    | No. Req'd |
|----------|----------|------------------------------------------------|-----------|
| 1        | 20215    | Assy. Main Frame—L.H.                          | 1         |
| 2        | 20132    | Assy. Pin 1 1/4 Dia.—9 3/4 Lg.                 | 2         |
| 3        | 10397    | Lock Nut 1 1/4 NC, PL                          | 2         |
| 4        | 11081    | Grease Fitting                                 | 5         |
| 5        | 20220    | Assy. Center Rockshaft—L.H.                    | 1         |
| 6        | 7397     | Pin 1" Dia. 4 3/8 Lg.                          | 2         |
| 7        | 10232    | Hex Nut 1 1/2 NC, Slotted                      | 2         |
| 8        | 0866     | Assy. Rockshaft Pivot Pin 1 1/2 Dia. 7 5/8 Lg. | 2         |
| 9        | 10910    | Roll Pin 5/16 x 2 1/4                          | 6         |
| 10       | 6554     | Pin 1" Dia. 6 Lg.                              | 1         |
| 11       | 20222    | Assy. Transport Lock                           | 1         |
| 12       | 10871    | Hex Screw 3/8 x 3 NC, PL, GB5                  | 2         |
| 13       | 10509    | Lock Nut 3/8 NC, PL                            | 2         |
| 14       | 20067    | Assy. Rockshaft Tie Link                       | 1         |
| 15       | 11492    | Bushing 1" Lg.                                 | 1         |
| 16       | 10879    | Flat Washer 1" PL                              | 2         |



# Wing Main Frame

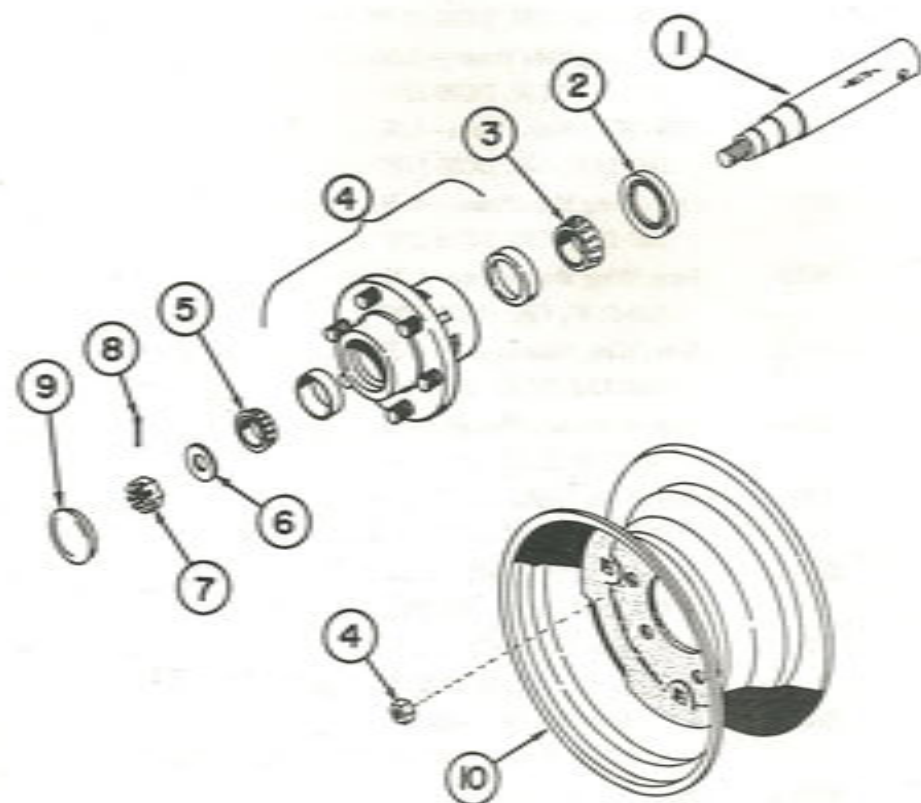


## 30 Series Wing Main Frame D30, C30, DC30

| Ref. No. | Part No. | Description                                                                   | No. Req'd |
|----------|----------|-------------------------------------------------------------------------------|-----------|
| 1        | 20223    | Assy. Wing Main Frame—R.H.<br>D30-18'0", C30, DC30-17'10"                     | 1         |
| 1        | 20224    | Assy. Wing Main Frame—L.H.<br>D30-18'0", C30, DC30-17'10"                     | 1         |
| 1        | 20225    | Assy. Wing Main Frame—R.H.<br>D30-19'6", C30, DC30-19'0"                      | 1         |
| 1        | 20226    | Assy. Wing Main Frame—L.H.<br>D30-19'6", C30, DC30-19'0"                      | 1         |
| 1        | 20227    | Assy. Wing Main Frame—R.H.<br>D30-21'0", C30, DC30-21'4"                      | 1         |
| 1        | 20228    | Assy. Wing Main Frame—L.H.<br>D30-21'0", C30, DC30-21'4"                      | 1         |
| 1        | 20262    | Assy. Wing Main Frame—R.H.<br>D30, C30, DC30 - 24'0"                          | 1         |
| 1        | 20263    | Assy. Wing Main Frame—L.H.<br>D30, C30, DC30 - 24'0"                          | 1         |
| 2        | 20216    | Assy. Wing Rockshaft—L.H.<br>D30-18'0", 19'6", C30, DC30-17'10", 19'0"        | 1         |
| 2        | 20217    | Assy. Wing Rockshaft—R.H.<br>D30-18'0", 19'6", C30, DC30-17'10", 19'0"        | 1         |
| 2        | 20218    | Assy. Wing Rockshaft—L.H.<br>D30-21'0", C30, DC30-21'4", D30, C30, DC30-24'0" | 1         |
| 2        | 20219    | Assy. Wing Rockshaft—R.H.<br>D30-21'0", C30, DC30-21'4", D30, C30, DC30-24'0" | 1         |
| 3        | 6554     | Pin 1" Dia. 5 Long                                                            | 1         |
| 4        | 10910    | Roll Pin 5/16 x 2 1/4                                                         | 4         |
| 5        | 101436   | Leveling Plate                                                                | 2         |
| 6        | 10832    | Flat Washer 1/2 PL                                                            | 4         |
| 7        | 10786    | Lock Washer 1/2 PL                                                            | 4         |
| 8        | 10785    | Hex Screw 1/2 x 1 1/2 NC, PL                                                  | 4         |
| 9        | 10149    | Hex Nut 1 1/4 NC                                                              | 2         |
| 10       | 20229    | Assy. Cylinder Mount                                                          | 1         |
| 11       | 10232    | Hex Nut 1 1/2 NC, Slotted                                                     | 2         |
| 12       | 0866     | Assy. Rockshaft Pivot Pin 1 1/2 Dia. 7 5/8 Lg.                                | 2         |
| 13       | 11081    | Grease Fitting 5/16 Straight Drive-In                                         | 2         |
| 14       | 10871    | Hex Screw 3/8 x 3 NC, PL, GR5                                                 | 2         |
| 15       | 10509    | Lock Nut 3/8 NC, PL                                                           | 2         |
| 16       | 11492    | Bushing 1" Long                                                               | 1         |
| 17       | 10879    | Flat Washer 1" PL                                                             | 6         |
| 18       | 20232    | Assy. Stand—Transport                                                         | 2         |
| 19       | 11280    | "U" Bolt 7/8 Dia.                                                             | 2         |
| 20       | 10396    | Lock Nut 7/8" NC, PL                                                          | 4         |
| 21       | 100683   | Lock Pin 3/4" Dia.                                                            | 2         |
| 22       | 10317    | Roll Pin 1/4"                                                                 | 2         |
| 23       | 100578   | Pin 1" Dia. x 5 1/2 Long                                                      | 1         |



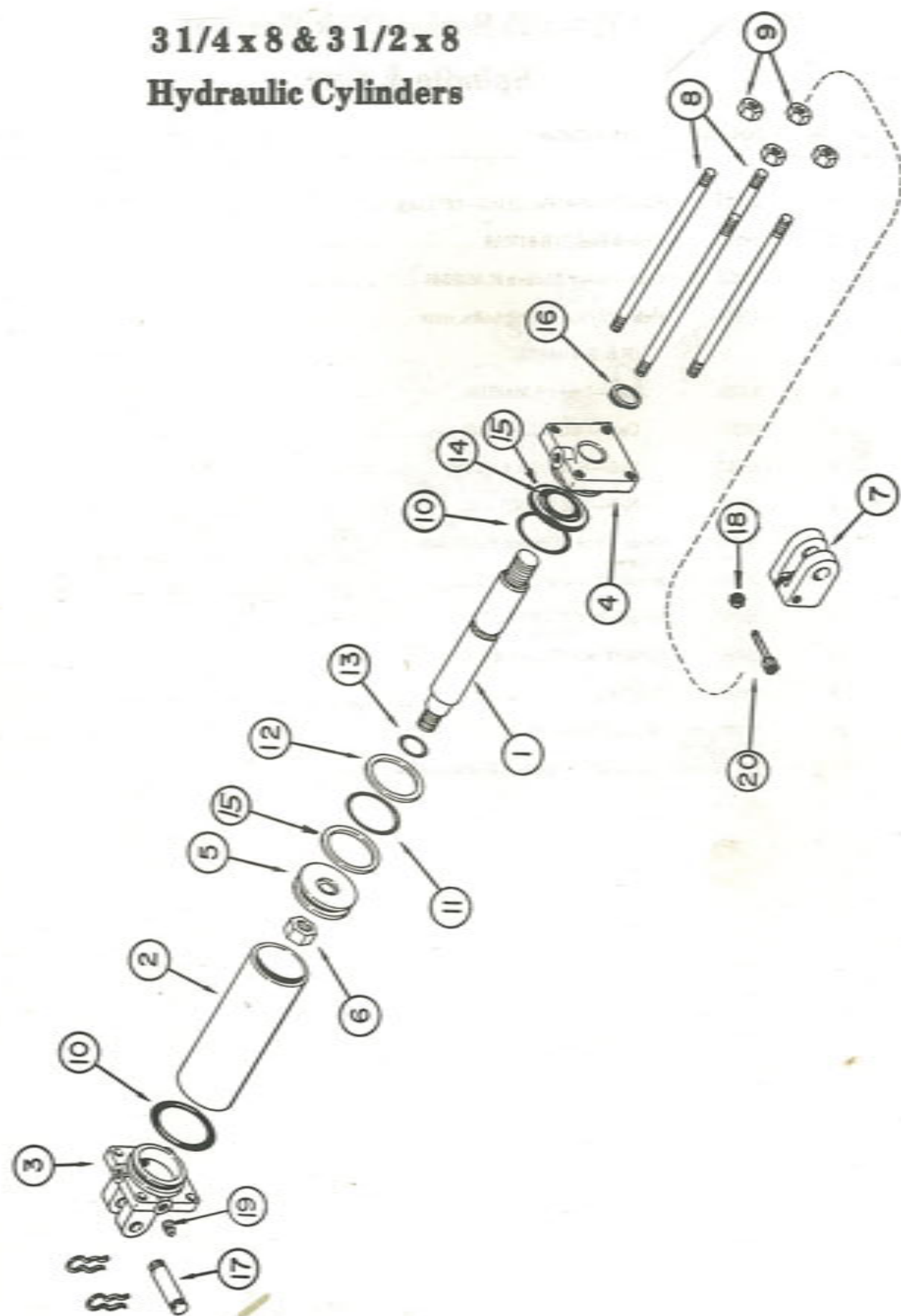
# SPINDLE & HUB



## AMCO 30 Series Disk Harrow Spindle & Hub

| Ref. No.                                     | Part No. | Description                                         | No. Req'd |
|----------------------------------------------|----------|-----------------------------------------------------|-----------|
| 1                                            | 11643    | Spindle 1 3/4 Dia. C1141—12" Long                   | 1         |
| 2                                            | 11017    | Grease Seal C/R #17618                              | 1         |
| 3                                            | 10353    | Cone—Inner Timken #LM48548                          | 1         |
| 4                                            | 11644    | Hub w/2 cups & 6 lug bolts, nuts<br>(F & H #106675) | 1         |
| 4                                            | 10352    | Cup—Inner (LM48510)                                 | 1         |
| 4                                            | 10293    | Cup—Outer (LM67010)                                 | 1         |
| 4                                            | 11657    | Hub—Bolt 1/2 x 1 1/2 NF                             | 6         |
| 4                                            | 11046    | Hub—Nut 1/2 NF                                      | 6         |
| 5                                            | 10295    | Cone—Outer Timken #LM67048                          | 1         |
| 6                                            | 10263    | Spindle Washer 7/8                                  | 1         |
| 7                                            | 10264    | Spindle Nut 7/8 NF                                  | 1         |
| 8                                            | 10291    | Cotter Pin 5/32 x 1 1/4                             | 1         |
| 9                                            | 10356    | Hub—Cap                                             | 1         |
| 10                                           | 10936    | Wheel 15 x 8—6 Hole                                 | 1         |
| BM-05-0082 Sub Bundle Spindle & Hub Complete |          |                                                     |           |

## 3 1/4 x 8 & 3 1/2 x 8 Hydraulic Cylinders



## 3 1/4 x 8 Hydraulic Cylinder

| Ref. No. | Part No. | Description                      | No. Req'd |
|----------|----------|----------------------------------|-----------|
| 1        | 11680    | Rod                              | 1         |
| 2        | 11677    | Barrell                          | 1         |
| 3        | 11678    | Base—Clevis                      | 1         |
| 4        | 11679    | Head                             | 1         |
| 5        | 11687    | Piston                           | 1         |
| 6        | 10980    | Lock Nut, self-locking           | 1         |
| 7        | 11663    | Rod Clevis                       | 1         |
| 8        | 11681    | Tie Rod                          | 4         |
| 9        | 11682    | Hex Nut, Tie Rod                 | 8         |
|          | 11689    | Kit—Seal Repair (4041-34 Lantex) |           |
| 10       | 11685*   | Gland Static Seal                | 2         |
| 11       | 11683*   | O-Ring                           | 1         |
| 12       | 11684*   | Piston Seal                      | 1         |
| 13       | 11252*   | Rod Static Seal                  | 1         |
| 14       | 11673*   | Rod Seal                         | 1         |
| 15       | 11674*   | Back-up Ring                     | 1         |
| 16       | 11675*   | Rod Wiper                        | 1         |
| 17       | 11686    | Pin Assy                         | 2         |
| 18       | 11672    | Bolt, Allen Head                 | 1         |
| 19       | 11676    | Plug                             | 1         |
| 20       | 11670    | Hex Nut, Rod Clevis              | 1         |

\*Parts purchased in Seal Kit #11689 only.

These parts are not purchased separately.

## 3 1/2 x 8 Hydraulic Cylinder

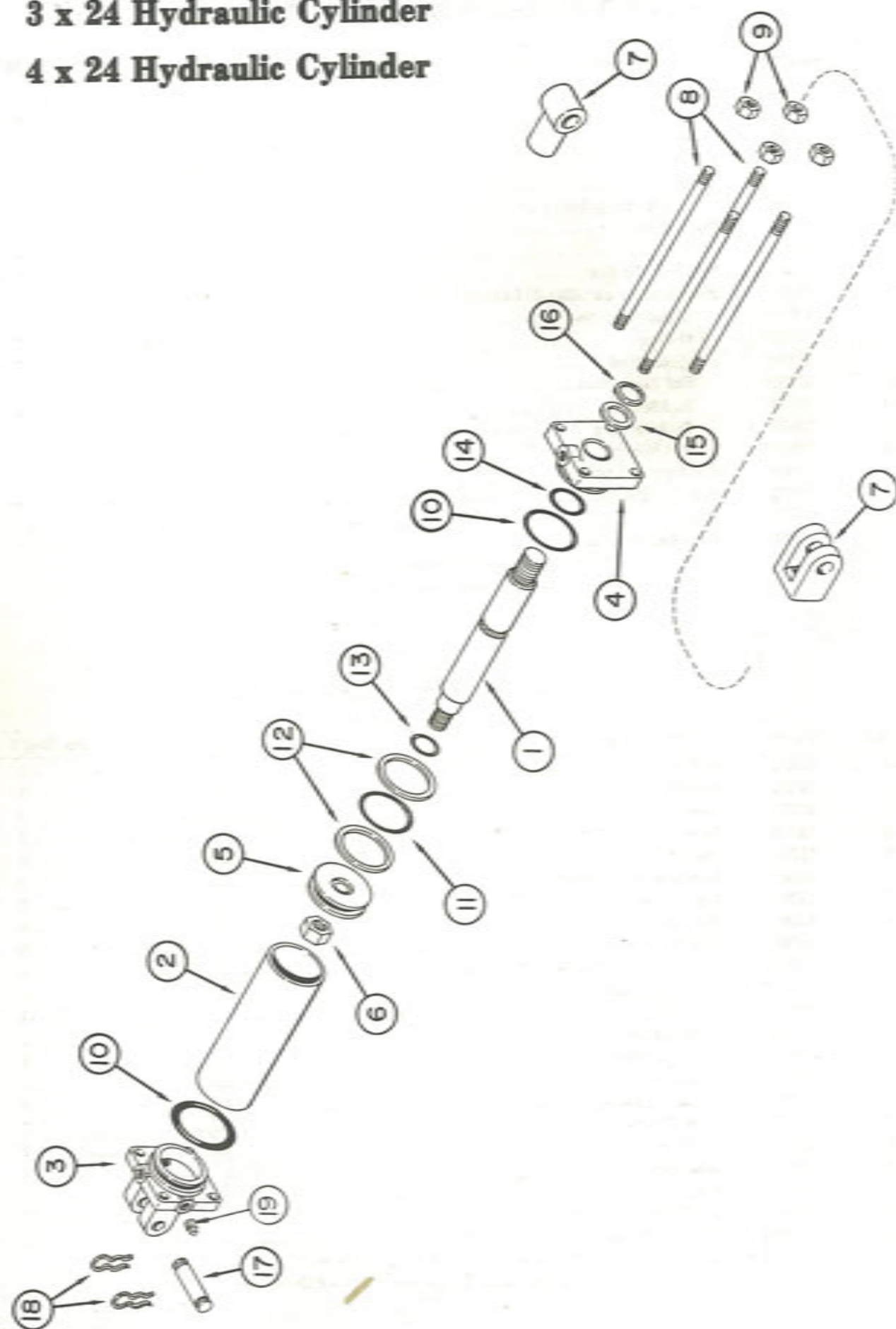
| Ref. No. | Part No. | Description                       | No. Req'd |
|----------|----------|-----------------------------------|-----------|
| 1        | 11723    | Rod                               | 1         |
| 2        | 11724    | Barrell                           | 1         |
| 3        | 11721    | Base—Clevis                       | 1         |
| 4        | 11720    | Head                              | 1         |
| 5        | 11719    | Piston                            | 1         |
| 6        | 10980    | Lock Nut, self-locking            | 1         |
| 7        | 11722    | Rod Clevis                        | 1         |
| 8        | 11681    | Tie Rod                           | 4         |
| 9        | 11682    | Hex Nut, Tie Rod                  | 8         |
|          | 11718    | Kit—Seal Repair (#4057-34 Lantex) |           |
| 10       | 11249*   | Gland Static Seal                 | 1         |
| 11       | 11254*   | O-Ring                            | 1         |
| 12       | 11255*   | Piston Seal                       | 1         |
| 13       | 11252*   | Rod Static Seal                   | 1         |
| 14       | 11727*   | Rod Seal                          | 1         |
| 15       | 11726*   | Back-up Ring                      | 2         |
| 16       | 11725*   | Rod Wiper                         | 1         |
| 17       | 11686    | Pin Assy                          | 2         |
| 18       | 11672    | Bolt, Allen Head                  | 1         |
| 19       | 11676    | Plug                              | 1         |
| 20       | 11671    | Hex Nut, Rod Clevis               | 1         |
| 21       | 11728    | Stroke Control Assy (Not shown)   | 1         |

\*Parts purchased in Seal Kit #11718 only.

These parts are not purchased separately.



# 3 x 24 Hydraulic Cylinder 4 x 24 Hydraulic Cylinder



## 3 x 24 Hydraulic Cylinder

| Ref. No. | Part No. | Description                    | No. Req'd |
|----------|----------|--------------------------------|-----------|
| 1        | 11730    | Piston Rod                     | 1         |
| 2        | 11729    | Tube                           | 1         |
| 3        | 11555    | Butt                           | 1         |
| 4        | 11556    | Gland                          | 1         |
| 5        | 11557    | Piston                         | 1         |
| 6        | 10986    | Lock Nut 3/4-16                | 1         |
| 7        | 10987    | Clevis Assy                    | 1         |
| 8        | 11731    | Tie Rod                        | 4         |
|          | 11552    | Kit—Seal Repair (Prince #9200) | 1         |
| 10       | 11559*   | O-Ring                         | 2         |
| 11       | 10990*   | O-Ring                         | 1         |
| 12       | 10991*   | Bu-Washer                      | 2         |
| 13       | 10989*   | O-Ring                         | 1         |
| 14       | 11560*   | O-Ring                         | 1         |
| 15       | 10993*   | Bu-Washer                      | 1         |
| 16       | 10994*   | Wiper                          | 1         |
| 17       | 11096    | Clevis Pin                     | 2         |
| 18       | 10957    | Hairpin Clip                   | 4         |
| 19       | 10978    | Pipe Plug                      | 1         |

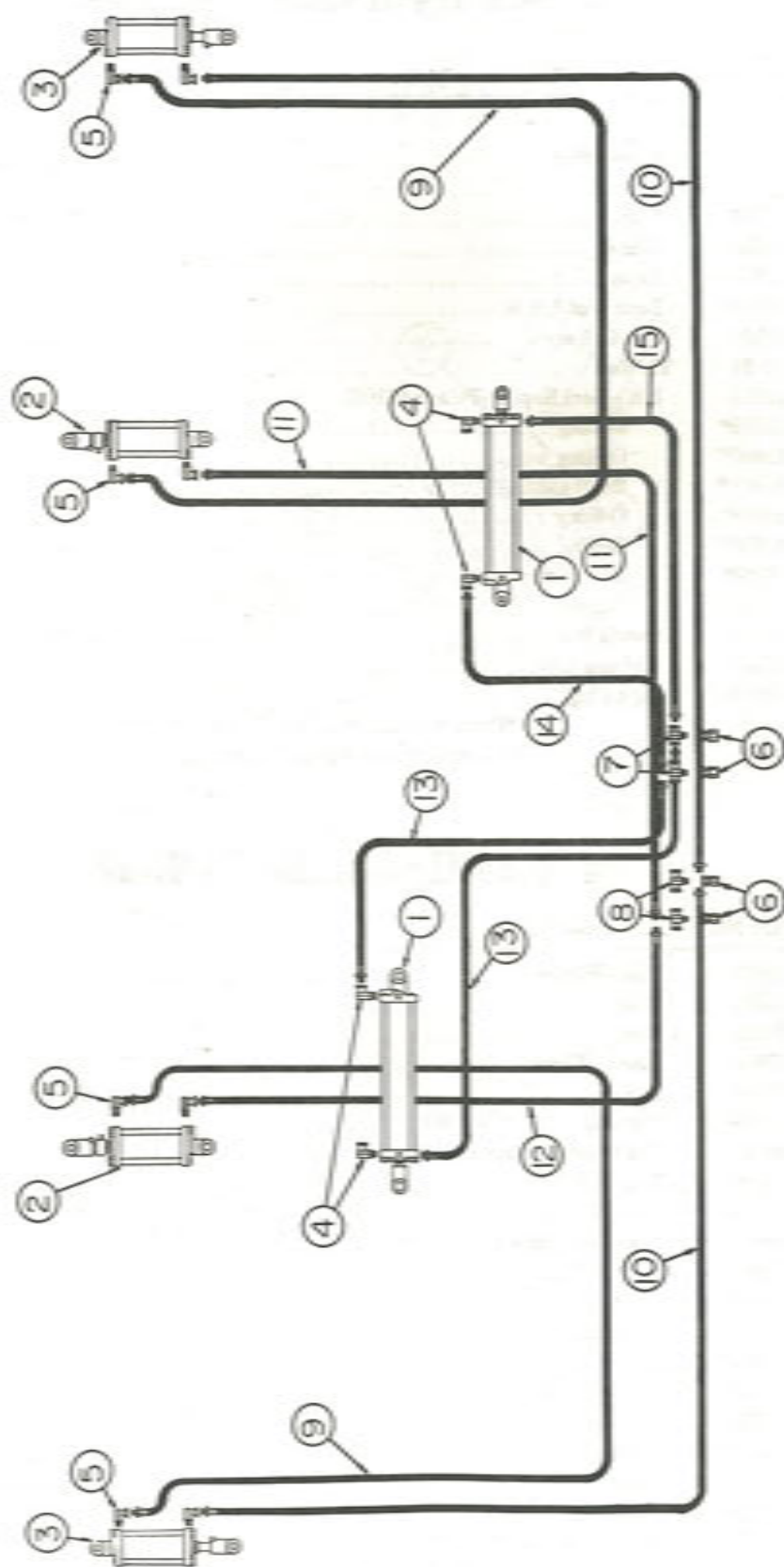
\*Parts purchased in Seal Kit #11552 only.  
These parts are not purchased separately.

## 4 X 24 Hydraulic Cylinder

| Ref. No. | Part No. | Description                      | No. Req'd |
|----------|----------|----------------------------------|-----------|
| 1        | 10960    | Rod—Piston                       | 1         |
| 2        | 10961    | Tube                             | 1         |
| 3        | 10962    | Butt                             | 1         |
| 4        | 10963    | Head—Piston                      | 1         |
| 5        | 10964    | Piston                           | 1         |
| 6        | 10979    | Nut—Lock 1 1/4"-12 NF            | 1         |
| 7        | 10942    | Tee Casting For 1 1/4" Dia. Pin  | 1         |
| 8        | 10965    | Rod—Tie                          | 4         |
| 9        | 10187    | Nut—Hex 5/8 NC, PL               | 4         |
|          | 10977    | Kit—Seal Repair (Prince #9400)   | 1         |
| 10       | 10968*   | "O" Ring                         | 2         |
| 11       | 10969*   | "O" Ring                         | 1         |
| 12       | 10960*   | Washer                           | 2         |
| 13       | 10961*   | "O" Ring                         | 1         |
| 14       | 10962*   | "O" Ring                         | 1         |
| 15       | 10963*   | Washer                           | 1         |
| 16       | 10964*   | Wiper                            | 1         |
| 17       | 10966    | Pin—Clevis 1"x4"                 | 1         |
| 18       | 10967    | Clip                             | 2         |
| 19       | 10978    | Plug—Pipe 1/2 NPT                | 1         |
| 20       | 11492    | Bushing—(used in Tee Casting #7) | 2         |

\*Seal Repair Kit Parts Available in Repair Kits Only.

# Hydraulic Circuit 18-19'6" 17'10"-19'0"

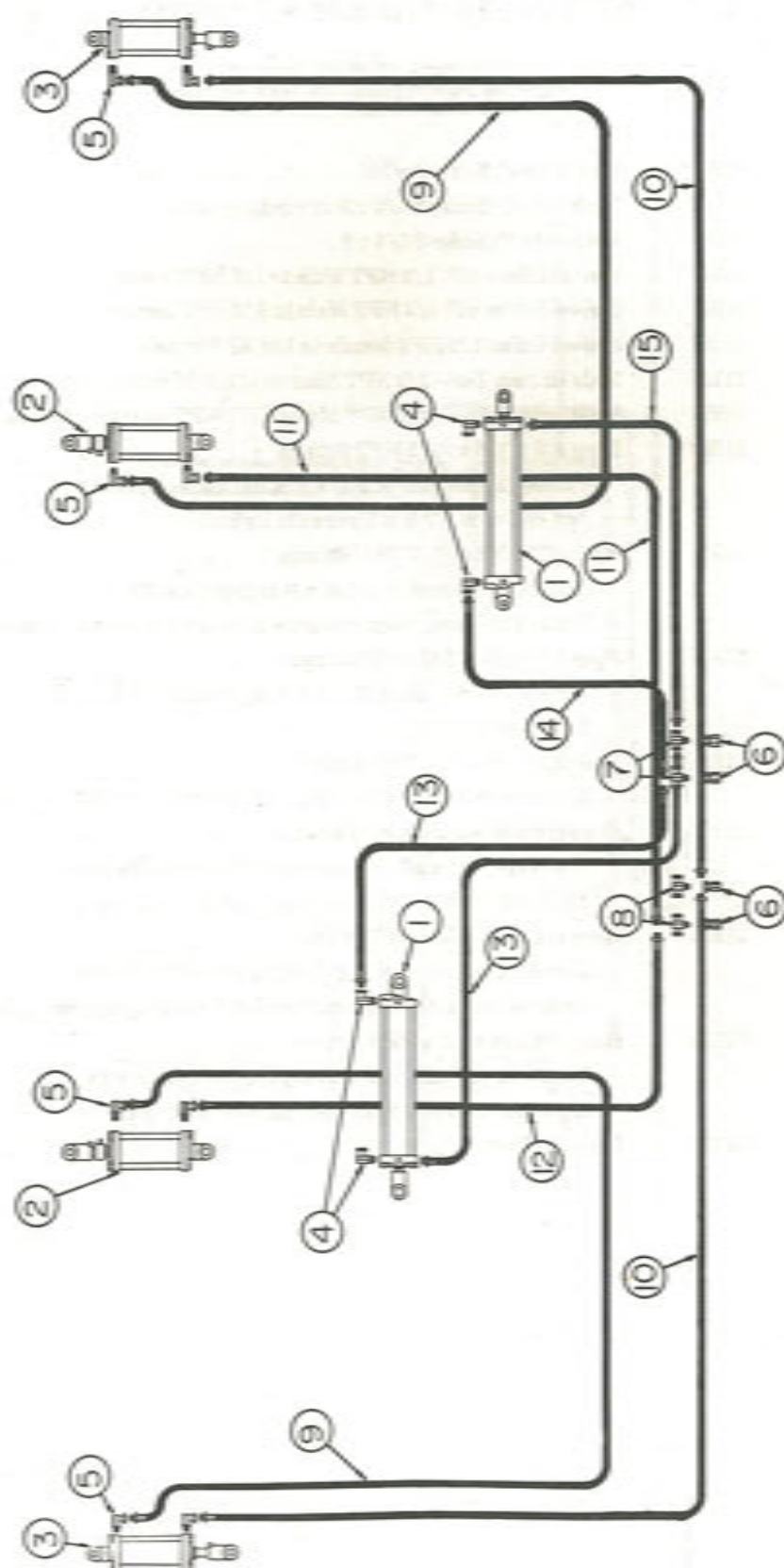


## D30 Series Hydraulic Circuit—18'-19'6" C30 Series Hydraulic Circuit—17'10"-19'0"

| Ref. No. | Part No. | Description                                                                                                      | No. Req'd |
|----------|----------|------------------------------------------------------------------------------------------------------------------|-----------|
| 1        | 11701    | Hydraulic Cylinder 3 x 24 .....                                                                                  | 2         |
| 2        | 11702    | Hydraulic Cylinder 3 1/2 x 8 w/stroke control .....                                                              | 2         |
| 3        | 11661    | Hydraulic Cylinder 3 1/4 x 8 .....                                                                               | 2         |
| 4        | 11127    | Swivel Elbow 90° 1/2 NPT Male to 1/4 NPT female .....                                                            | 4         |
| 5        | 10921    | Swivel Elbow 90° 1/2 NPT Male to 1/2 NPT female .....                                                            | 8         |
| 6        | 11157    | Swivel Union 1/2 NPT female to 1/2 NPT female .....                                                              | 4         |
| 7        | 11126    | Male Branch Tee—1/2 NPT Male to 1/4 NPT female branches .....                                                    | 2         |
| 8        | 10923    | Male Branch Tee—1/2 NPT Male to 1/2 NPT female branches .....                                                    | 2         |
| 9        | 11310    | Hose 3/8 x 156 w/1/2 NPT fittings .....                                                                          | 2         |
|          |          | Connects butt end of 3 1/4 x 8 Hydraulic Cylinder to rod end of 3 1/2 x 8 Hydraulic Cylinder.                    |           |
| 10       | 11311    | Hose 3/8 x 168 w/1/2 NPT fittings .....                                                                          | 2         |
|          |          | Connects rod end of 3 1/4 x 8 to front tee #8.                                                                   |           |
|          |          | Note: #10 Hoses from rod ends of 3 1/4 x 8 cylinders must connect to same front tee.                             |           |
| 11       | 11305    | Hose 3/8 x 66 w/1/2 NPT fittings .....                                                                           | 1         |
|          |          | Connects butt end of 3 1/2 x 8 Hydraulic Cylinder to front tee with #12.                                         |           |
| 12       | 11304    | Hose 3/8 x 60 w/1/2 NPT fittings .....                                                                           | 1         |
|          |          | Connects butt end of 3 1/2 x 8 Hydraulic Cylinder to front tee.                                                  |           |
| 13       | 11168    | Hose 1/4 x 66 with 1/4 NPT fittings .....                                                                        | 2         |
|          |          | Connects butt end and rod end of right hand 3 x 24 hydraulic cylinder to front tees. Refer to diagram.           |           |
| 14       | 11323    | Hose 1/4 x 24 w/1/4 NPT fittings .....                                                                           | 1         |
|          |          | Connects butt end of 3 x 24 Hydraulic Cylinder to front tee with #13 from butt end of 3 x 24 Hydraulic Cylinder. |           |
| 15       | 11119    | Hose 1/4 x 36 w/1/4 NPT fittings .....                                                                           | 1         |
|          |          | Connects rod end of 3 x 24 Hydraulic Cylinder to front tee with #13 from rod end of 3 x 24 cylinder.             |           |
|          | 11128    | Hose Tie (Not Shown) .....                                                                                       | 2         |



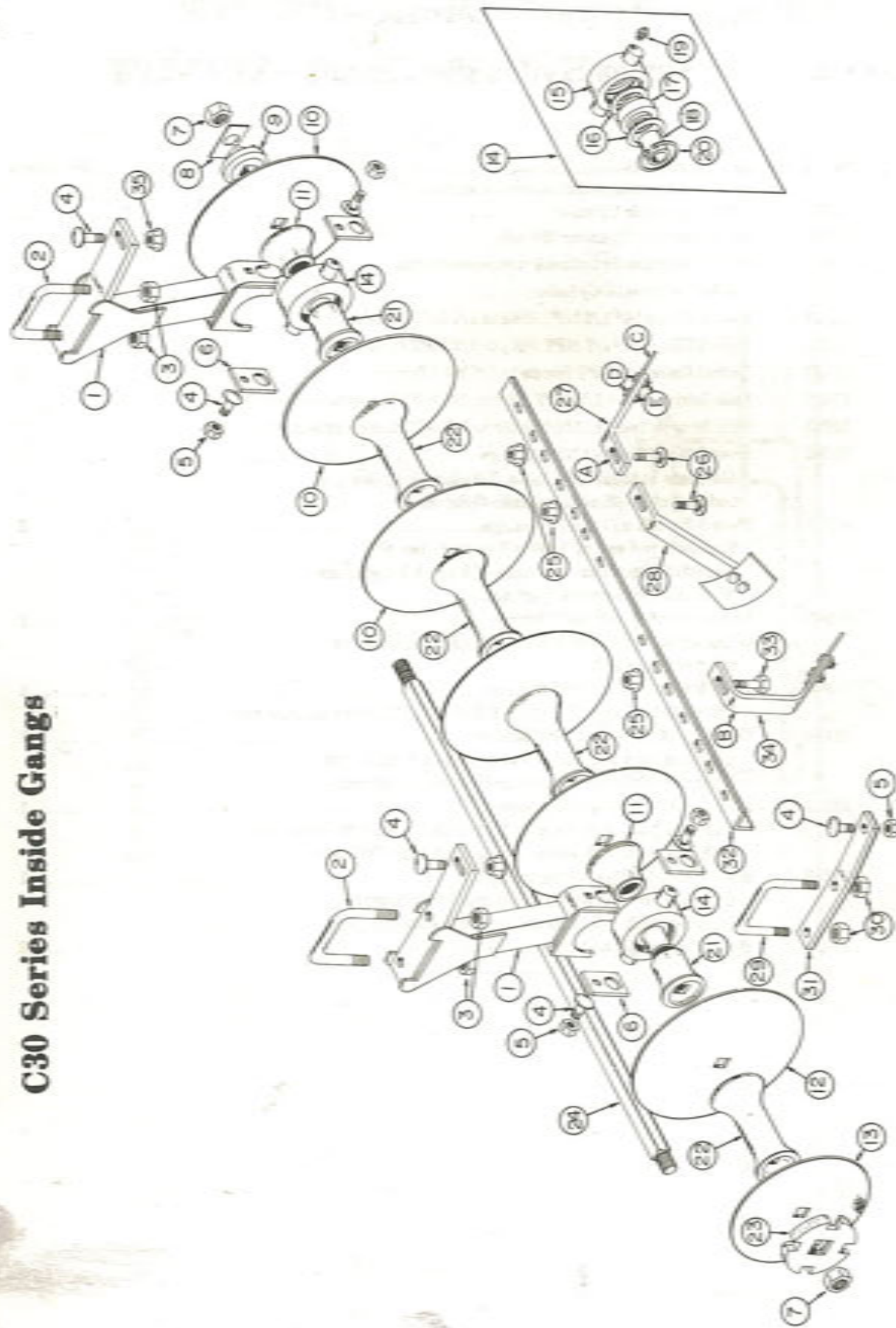
# Hydraulic Circuit 21'0"-24'0" 21'4"-24'0"



## D30 Series Hydraulic Circuit – 21'0"-24'0" C30 & DC 30 Series Hydraulic Circuit – 21'4"-24'0"

| Ref. No. | Part No. | Description                                                                                                                                                                    | No. Req'd |
|----------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1        | 11701    | 3 x 24 Hydraulic Cylinder                                                                                                                                                      | 2         |
| 1        | 10933    | 4x24 Hydraulic Cylinder (24' only)                                                                                                                                             | 2         |
| 2        | 11702    | 3 1/2 x 8 Hydraulic Cylinder w/stroke control                                                                                                                                  | 2         |
| 3        | 11661    | 3 1/4 x 8 Hydraulic Cylinder                                                                                                                                                   | 2         |
| 4        | 11127    | Swivel Elbow 90° 1/2 NPT Male to 1/4 NPT female                                                                                                                                | 4         |
| 5        | 10921    | Swivel Elbow 90° 1/2 NPT Male to 1/2 NPT female                                                                                                                                | 8         |
| 6        | 11157    | Swivel Union 1/2 NPT female to 1/2 NPT female                                                                                                                                  | 4         |
| 7        | 11126    | Male Branch Tee—1/2 NPT Male to 1/4 NPT female branches                                                                                                                        | 2         |
| 8        | 10923    | Male Branch Tee—1/2 NPT Male to 1/2 NPT female branches                                                                                                                        | 2         |
| 9        | 11312    | Hose 3/8 x 180 w/1/2 NPT fittings<br>Connects butt end of 3 1/4 x 8 Hydraulic Cylinder to<br>rod end of 3 1/2 x 8 Hydraulic Cylinder.                                          | 2         |
| 10       | 11313    | Hose 3/8 x 192 w/1/2 NPT fittings<br>Connects rod end of 3 1/4 x 8 to front tee #8.<br>Note: #10 hoses from rod ends of 3 1/4 x 8 Cylinders<br>Must connect to same front tee. | 2         |
| 11       | 11305    | Hose 3/8 x 66 w/1/2 NPT fittings<br>Connects butt end of 3 1/2 x 8 Hydraulic Cylinder to<br>front tee with #12.                                                                | 1         |
| 12       | 11304    | Hose 3/8 x 60 w/1/2 NPT fittings<br>Connects butt end of 3 1/2 x 8 Hydraulic Cylinder to front tee.                                                                            | 1         |
| 13       | 11168    | Hose 1/4 x 66 with 1/4 NPT fittings<br>Connects butt end and rod end of right hand 3 x 24<br>Hydraulic Cylinder to front tees. Refer to diagram.                               | 2         |
| 14       | 11323    | Hose 1/4 x 24 w/1/4 NPT fittings<br>Connects butt end of 3 x 24 Hydraulic Cylinder to front tee<br>with #13 from butt end of 3 x 24 Hydraulic Cylinder.                        | 1         |
| 15       | 11119    | Hose 1/4 x 36 w/1/4 NPT fittings<br>Connects rod end of 3 x 24 Hydraulic Cylinder to<br>front tee with #13 from rod end of 3 x 24 cylinder.                                    | 1         |
|          | 11128    | Hose Tie (Not Shown)                                                                                                                                                           | 2         |

## C30 Series Inside Gangs

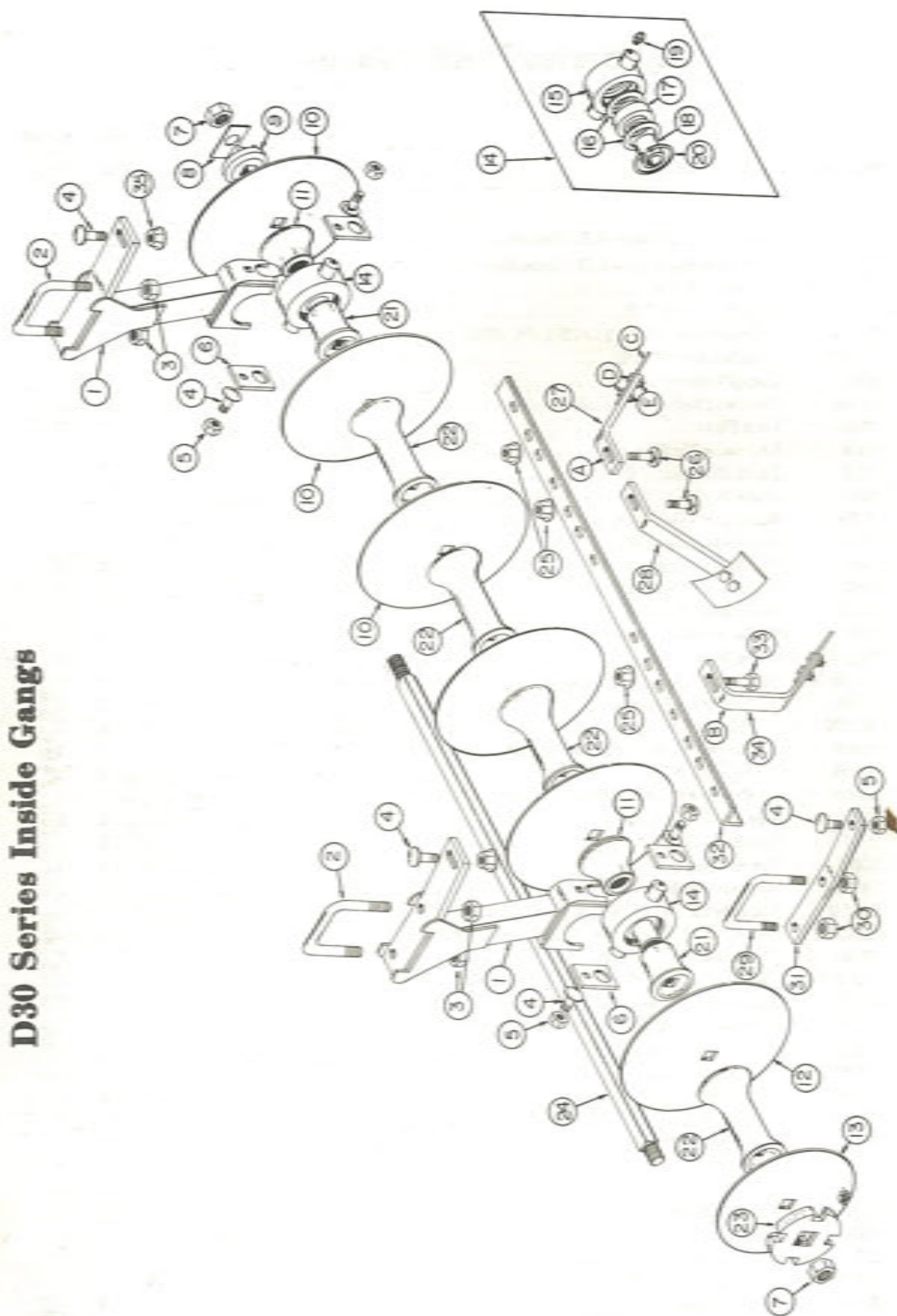


## C30 Series Inside Gangs

| Ref. No. | Part No.   | Description                               | No. Required |      |
|----------|------------|-------------------------------------------|--------------|------|
|          |            |                                           | Front        | Rear |
| 1        | 20233      | Assy. Bearing Riser—R.H. (Shown)          | 2            | 2    |
| 1        | 20234      | Assy. Bearing Riser—L.H. (Opposite)       | 2            | 2    |
| 2        | 11280      | "U" Bolt 7/8 Dia.                         | 2            | 2    |
| 3        | 10396      | Lock Nut 7/8 NC, PL                       | 4            | 4    |
| 4        | 10135      | Carriage Screw 5/8 x 1 3/4 NC, PL, GR5    | 7            | 7    |
| 5        | 10299      | Lock Nut 5/8 NC, PL                       | 5            | 5    |
| 6        | 9628       | Clamp Trunion                             | 4            | 4    |
| 7        | 11035      | Nut Gang Bolt 1 1/8 NC, Heavy             | 2            | 2    |
| 8        | 2116       | Lock Plate                                | 1            | 1    |
| 9        | 2030       | End Gang Washer                           | 1            | 1    |
| 10       | 3254       | Blade 20 x 7 Ga. C.O.                     | 9            | 7    |
| 10       | 3262       | Blade 20 x 7 Ga. Plain                    | 9            | 7    |
| 10       | 3269       | Blade 22 x 7 Ga. Plain                    | 9            | 7    |
| 10       | 3271       | Blade 22 x 7 Ga. C.O.                     | 9            | 7    |
| 11       | 17017      | End Bell—Large                            | 2            | 2    |
| 13       | 3196       | Blade 18 x 10 Ga. C.O.                    | -            | 1    |
| 13       | 3254       | Blade 20 x 7 Ga. C.O.                     | -            | 1    |
| 13       | 3268       | Blade 18 x 9 Ga. Plain                    | -            | 1    |
| 13       | 3262       | Blade 20 x 7 Ga. Plain                    | -            | 1    |
| 14       | FB-09-0019 | Sub Assy. (Bearing & Housing)             | 2            | 2    |
| 15       | 16090      | Housing—Bearing                           | 1            | 1    |
| 16       | 101407     | Washer—90mm                               | 2            | 2    |
| 17       | 11698      | Bearing 90mm Fafnir GW210PP-10            | 1            | 1    |
| 20       | 11005      | Retainer Ring                             | 1            | 1    |
| 19       | 10606      | Grease Fitting 1/8 NPT Straight           | 1            | 1    |
| 18       | 8824       | Sleeve—Insert                             | 2            | 2    |
| 21       | 9797       | End Bell—Small                            | 2            | 2    |
| 22       | 9830       | Spacer Spool                              | 6            | 5    |
| 23       | 3412A      | Bumper Washer                             | 1            | 1    |
| 24       | 100249     | Gang Bolt 1 1/8" Sq. 4140 CRS 55 3/4 Long | -            | 1    |
| 24       | 100250     | Gang Bolt 1 1/8" Sq. 4140 CRS 62 3/4 Long | 1            | -    |
| 25       | 11646      | Flange Lock Nut 1/2 NC, PL                | 8            | 7    |
| 26       | 10870      | Carriage Screw 1/2 x 1 1/2 NC, PL, GR5    | 7            | 7    |
| 27       | 0788       | Assy. Scraper—R.H.                        | 8            | 7    |
| A        | 100271     | Scraper Shank                             | 1            | 1    |
| B        | 100292     | Scraper Shank—Special                     | 1            | -    |
| C        | 100270     | Scraper Blade                             | 1            | 1    |
| D        | 10785      | Hex Screw 1/2 x 1 1/2 NC, PL              | 2            | 2    |
| E        | 10395      | Lock Nut 1/2 NC, PL                       | 2            | 2    |
| 28       | 0789       | Assy. Scraper—L.H.                        | 8            | 7    |
| 29       | 6513       | "U" Bolt 3/4 Dia.                         | 1            | 1    |
| 30       | 10300      | Lock Nut 3/4 NC, PL                       | 2            | 2    |
| 31       | 101514     | Scraper Bar Support                       | 1            | 1    |
| 32       | 9930       | Scraper Bar 2 x 2 x 3/8 L 47 Long         | -            | 1    |
| 32       | 9960       | Scraper Bar 2 x 2 x 3/8 L 61 1/2 Long     | 1            | -    |
| 33       | 10710      | Carriage Screw 1/2 x 2 NC, PL, GR5        | 1            | -    |
| 34       | 0836       | Assy. Scraper—Special R.H.                | 1            | -    |
| 34       | 0837       | Assy. Scraper—Special L.H.                | -            | 1    |
| 35       | 11647      | Flange Lock Nut 5/8 NC, PL                | 2            | 2    |



## D30 Series Inside Gangs

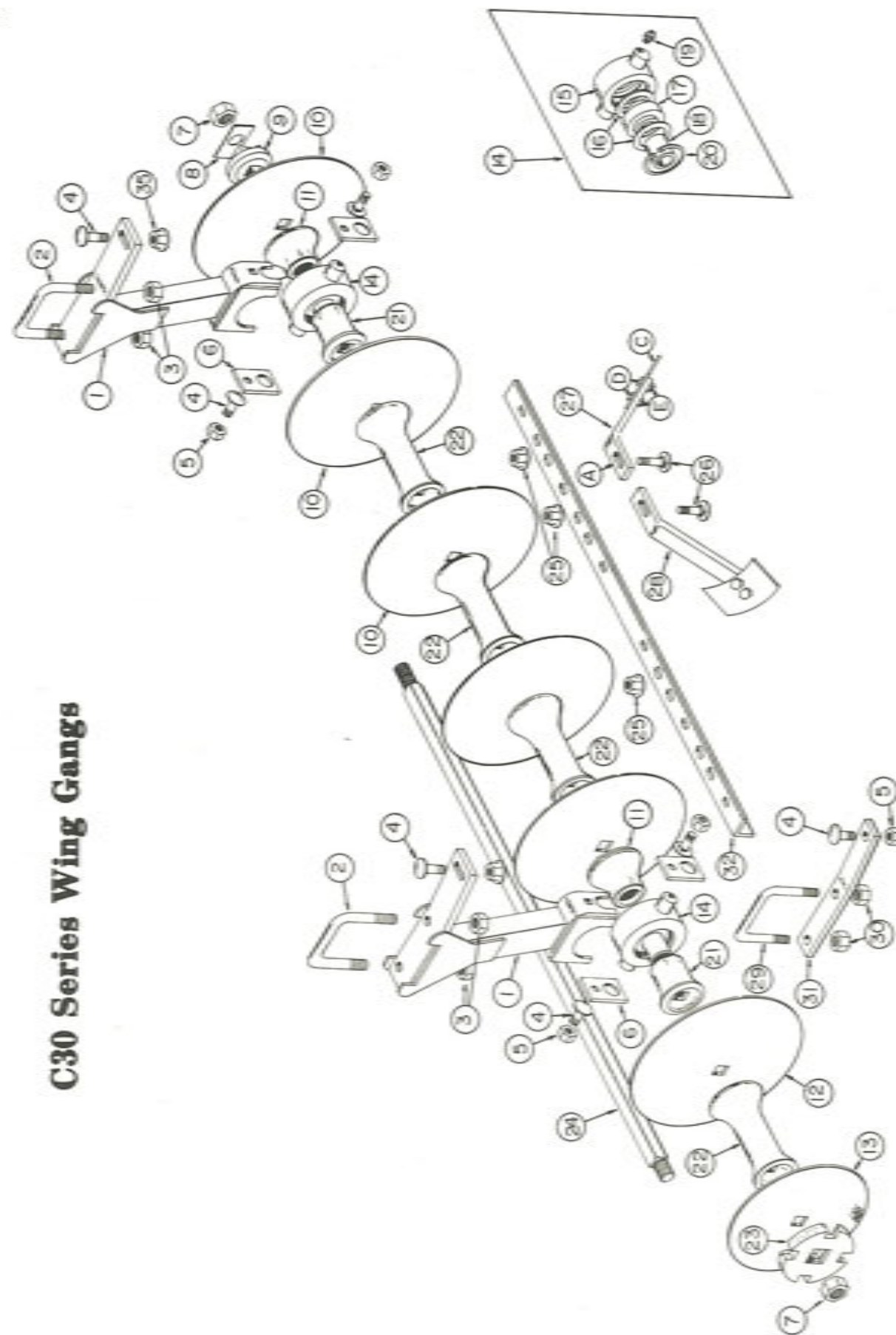


## D30 Series Inside Gangs

| Ref. No. | Part No.   | Description                              | No. Required       |             |
|----------|------------|------------------------------------------|--------------------|-------------|
|          |            |                                          | D30, DC30<br>Front | D30<br>Rear |
| 1        | 20233      | Assy. Bearing Riser—R.H. (Shown)         | 2                  | 2           |
| 1        | 20234      | Assy. Bearing Riser—L.H. (Opposite)      | 2                  | 2           |
| 2        | 11280      | "U" Bolt 7/8 Dia.                        | 2                  | 2           |
| 3        | 10396      | Lock Nut 7/8 NC, PL                      | 4                  | 4           |
| 4        | 10135      | Carriage Screw 5/8 x 1 3/4 NC, PL, GR5   | 7                  | 7           |
| 5        | 10299      | Lock Nut 5/8                             | 5                  | 5           |
| 6        | 9628       | Clamp Trunion                            | 4                  | 4           |
| 7        | 11035      | Nut Gang Bolt                            | 2                  | 2           |
| 8        | 2116       | Lock Plate                               | 1                  | 1           |
| 9        | 2030       | End Gang Washer                          | 1                  | 1           |
| 10       | 3254       | Blade 20 x 7 Ga. C.O.                    | 7                  | 5           |
| 10       | 3262       | Blade 20 x 7 Ga. Plain                   | 7                  | 5           |
| 10       | 3269       | Blade 22 x 7 Ga. Plain                   | 7                  | 5           |
| 10       | 3271       | Blade 22 x 7 Ga. C.O.                    | 7                  | 5           |
| 11       | 17018      | End Bell—Large                           | 2                  | 2           |
| 13       | 3196       | Blade 18 x 10 Ga. C.O.                   | -                  | 1           |
| 13       | 3268       | Blade 18 x 9 Ga. Plain                   | -                  | 1           |
| 13       | 3262       | Blade 20 x 7 Ga. Plain                   | -                  | 1           |
| 13       | 3254       | Blade 20 x 7 Ga. C.O.                    | -                  | 1           |
| 14       | FB-09-0019 | Sub Assy. (Bearing & Housing)            | 2                  | 2           |
| 15       | 16030      | Housing Bearing                          | 1                  | 1           |
| 16       | 101407     | Washer—90mm                              | 2                  | 2           |
| 17       | 11698      | Bearing—90mm                             | 1                  | 1           |
| 20       | 11005      | Retainer Ring                            | 1                  | 1           |
| 19       | 10606      | Grease Fitting 1/8 NPT Straight          | 1                  | 1           |
| 18       | 8824       | Sleeve—Insert (Not in Sub Assy. Bundle)  | 1                  | 1           |
| 21       | 8761       | End Bell—Small                           | 2                  | 2           |
| 22       | 6165       | Spacer Spool                             | 4                  | 3           |
| 23       | 3412A      | Bumper Washer                            | 1                  | 1           |
| 24       | 100242     | Gang Bolt 1 1/8 Sq. 4140 CRS-50 7/8 Long | -                  | 1           |
| 24       | 100243     | Gang Bolt 1 1/8 Sq. 4140 CRS-50 7/8 Long | 1                  | -           |
| 25       | 11646      | Flange Lock Nut 1/2 NC, PL               | 6                  | 5           |
| 26       | 10870      | Carriage Screw 1/2 x 1 1/2 NC, PL, GR5   | 5                  | 5           |
| 27       | 0788       | Assy. Scraper—R.H.                       | 6                  | 5           |
| A        | 100271     | Scraper Shank                            | 1                  | 1           |
| B        | 100368     | Scraper Shank—Special                    | 1                  | -           |
| C        | 100270     | Scraper Blade                            | 1                  | 1           |
| D        | 10785      | Hex Head Machine Bolt 1/2 x 1 1/2 NC, PL | 2                  | 2           |
| E        | 10396      | Lock Nut 1/2 NC, PL                      | 2                  | 2           |
| 28       | 0789       | Assy. Scraper—L.H.                       | 6                  | 5           |
| 29       | 6513       | "U" Bolts 3/4 Dia.                       | 1                  | 1           |
| 30       | 10300      | Lock Nut 3/4 NC, PL                      | 2                  | 2           |
| 31       | 101514     | Scraper Bar Support                      | 1                  | 1           |
| 32       | 9548       | Scraper Bar 2 x 2 x 3/8 L 51 11/16 Long  | -                  | 1           |
| 32       | 9549       | Scraper Bar 2 x 2 x 3/8 L 60 7/8 Long    | 1                  | -           |
| 33       | 10710      | Carriage Screw 1/2 x 2 NC, PL, GR5       | 1                  | -           |
| 34       | 0825       | Assy. Scraper—L.H. (Shown) (Special)     | 1                  | -           |
| 34       | 0824       | Assy. Scraper—R.H. (Special)             | 1                  | -           |
| 35       | 11647      | Flange Lock Nut 5/8 NC, PL               | 2                  | 2           |



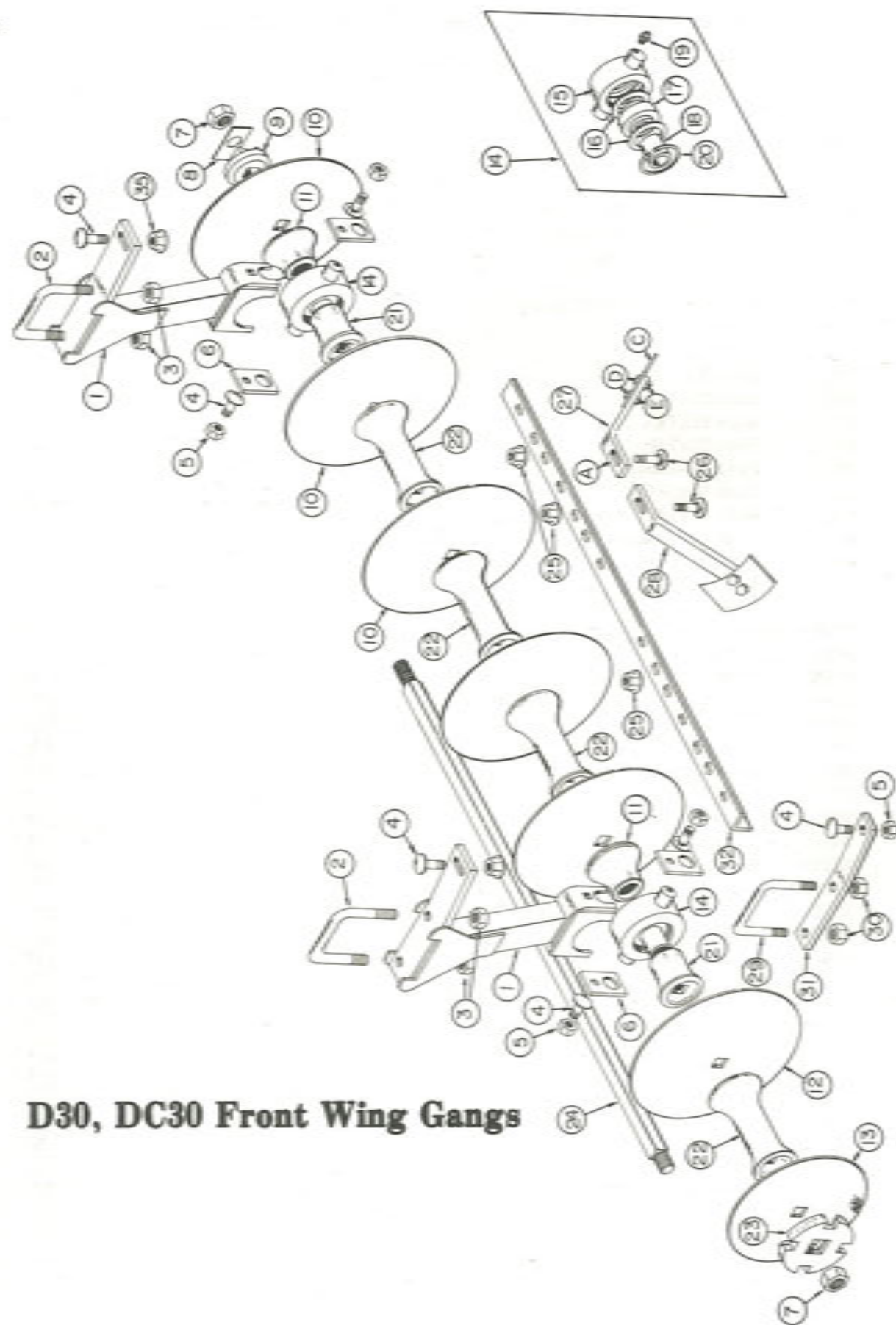
## C30 Series Wing Gangs



## C30 Series Front Wing Gangs

| Ref. No. | Part No.   | Description                            | No. Req'd |       |       |       |
|----------|------------|----------------------------------------|-----------|-------|-------|-------|
|          |            |                                        | 17'10"    | 19'0" | 21'4" | 24'0" |
| 1        | 20233      | Assy. Bearing Riser—R.H.               | 2         | 2     | 2     | 3     |
| 1        | 20234      | Assy. Bearing Riser—L.H.               | 2         | 2     | 2     | 3     |
| 2        | 11280      | "U" Bolt 7/8 Dia.                      | 2         | 2     | 2     | 3     |
| 3        | 10396      | Lock Nut 7/8 NC, PL                    | 4         | 4     | 4     | 6     |
| 4        | 10135      | Carriage Screw 5/8 x 1 3/4             | 7         | 7     | 7     | 10    |
| 5        | 10299      | Lock Nut 5/8 NC, PL                    | 5         | 5     | 5     | 7     |
| 6        | 9638       | Clamp Trunion                          | 4         | 4     | 4     | 6     |
| 7        | 11035      | Nut Gang Bolt 1 1/8 NC, Heavy          | 2         | 2     | 2     | 2     |
| 8        | 2116       | Lock Plate                             | 1         | 1     | 1     | 1     |
| 9        | 2030       | End Gang Washer                        | 1         | 1     | 1     | 1     |
| 10       | 3254       | Blade 20 x 7 Ga. C.O.                  | 5         | 6     | 8     | 10    |
| 10       | 3262       | Blade 20 x 7 Ga. Plain                 | 5         | 6     | 8     | 10    |
| 10       | 3269       | Blade 22 x 7 Ga. Plain                 | 5         | 6     | 8     | 10    |
| 10       | 3271       | Blade 22 x 7 Ga. C.O.                  | 5         | 6     | 8     | 10    |
| 11       | 17017      | End Bell—Large                         | 2         | 2     | 2     | 3     |
| 13       | 3196       | Blade 18 x 10 Ga. C.O.                 | 1         | 1     | 1     | 1     |
| 13       | 3268       | Blade 18 x 9 Ga. Plain                 | 1         | 1     | 1     | 1     |
| 13       | 3262       | Blade 20 x 7 Ga. Plain                 | 1         | 1     | 1     | 1     |
| 13       | 3254       | Blade 20 x 7 Ga. C.O.                  | 1         | 1     | 1     | 1     |
| 14       | FB-09-0019 | Sub. Assy. (Bearing & Housing)         | 2         | 2     | 2     | 3     |
| 15       | 16030      | Housing—Bearing                        | 1         | 1     | 1     | 1     |
| 16       | 101407     | Washer—90mm                            | 2         | 2     | 2     | 2     |
| 17       | 11698      | Bearing—90mm Fafnir GW210PP-10         | 1         | 1     | 1     | 1     |
| 20       | 11005      | Retainer Ring                          | 1         | 1     | 1     | 1     |
| 19       | 10606      | Grease Fitting 1/8 NPT Straight        | 1         | 1     | 1     | 1     |
| 18       | 8824       | Sleeve—Insert                          | 2         | 2     | 2     | 3     |
| 21       | 9797       | End Bell—Small                         | 2         | 2     | 2     | 3     |
| 22       | 9830       | Spacer Spool                           | 3         | 4     | 6     | 7     |
| 23       | 3412A      | Bumper Washer                          | 1         | 1     | 1     | 1     |
| 24       | 101406     | Gang Bolt 1 1/8 Sq. 4140 CRS 41 1/4    | 1         | -     | -     | -     |
| 24       | 100248     | Gang Bolt 1 1/8 Sq. 4140 CRS 48 1/2    | -         | 1     | -     | -     |
| 24       | 100250     | Gang Bolt 1 1/8 Sq. 4140 CRS 62 3/4    | -         | -     | 1     | -     |
| 24       | 100252     | Gang Bolt 1 1/8 Sq. 4140 CRS 77 3/8    | -         | -     | -     | 1     |
| 25       | 11646      | Flange Lock Nut 1/2 NC, PL             | 5         | 6     | 8     | 10    |
| 26       | 10870      | Carriage Screw 1/2 x 1 1/2 NC, PL, GR5 | 5         | 6     | 8     | 10    |
| 27       | 0788       | Assy. Scraper R.H.                     | 5         | 6     | 8     | 10    |
| A        | 100271     | Scraper—Shank                          | 1         | 1     | 1     | 1     |
| C        | 100270     | Scraper Blade                          | 1         | 1     | 1     | 1     |
| D        | 10785      | Hex Screw 1/2 x 1 1/2 NC, PL           | 2         | 2     | 2     | 2     |
| E        | 10395      | Lock Nut 1/2 NC, PL                    | 2         | 2     | 2     | 2     |
| 28       | 0789       | Assy. Scraper—L.H.                     | 5         | 6     | 8     | 10    |
| 29       | 6513       | "U" Bolt—3/4 Dia.                      | 1         | 1     | 1     | -     |
| 30       | 10300      | Lock Nut 3/4 NC, PL                    | 2         | 2     | 2     | -     |
| 31       | 101514     | Scraper Bar Support                    | 1         | 1     | 1     | -     |
| 32       | 9929       | Scraper Bar 2 x 2 x 3/8 L - 39 3/4     | 1         | -     | -     | -     |
| 32       | 9930       | Scraper Bar 2 x 2 x 3/8 L - 47 Long    | -         | 1     | -     | -     |
| 32       | 9960       | Scraper Bar 2 x 2 x 3/8 L - 61 1/2     | -         | -     | 1     | -     |
| 32       | 9962       | Scraper Bar 2 x 2 x 3/8 L - 76 Long    | -         | -     | -     | 1     |
| 35       | 11647      | Flange Lock Nut 5/8 NC, PL             | 2         | 2     | 2     | 3     |





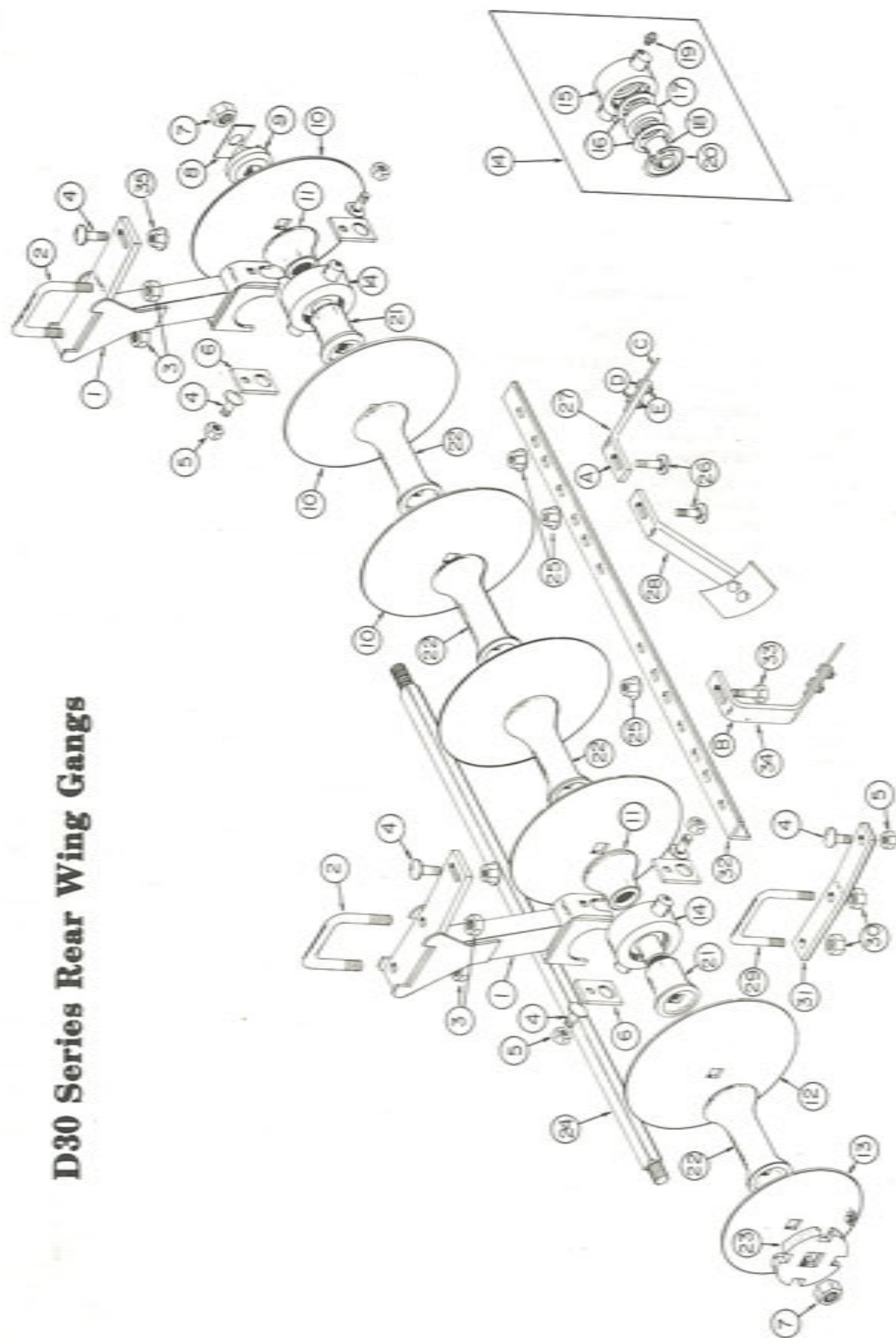
D30, DC30 Front Wing Gangs

## D30, DC 30 Front Wing Gangs

| Ref. No. | Part No.   | Description                            | No. Req'd |       |      |      |
|----------|------------|----------------------------------------|-----------|-------|------|------|
|          |            |                                        | 18'V      | 19'6" | 21'V | 24'V |
| 1        | 30233      | Assy. Bearing Riser—R.H.               | 2         | 2     | 2    | 3    |
| 1        | 30234      | Assy. Bearing Riser—L.H.               | 2         | 2     | 2    | 3    |
| 2        | 11280      | "U" Bolt 7/8" Dia.                     | 2         | 2     | 2    | 3    |
| 3        | 10396      | Lock Nut 7/8" NC, PL                   | 4         | 4     | 4    | 6    |
| 4        | 10135      | Carriage Screw 5/8 x 1 3/4 NC, PL, GR5 | 7         | 7     | 7    | 10   |
| 5        | 10299      | Lock Nut 5/8" NC, PL                   | 5         | 5     | 5    | 7    |
| 6        | 9628       | Clamp Trunion                          | 4         | 4     | 4    | 6    |
| 7        | 11035      | Nut Gang Bolt 1 1/8 NC, Heavy          | 2         | 2     | 2    | 2    |
| 8        | 2116       | Lock Plate                             | 1         | 1     | 1    | 1    |
| 9        | 2030       | End Gang Washer                        | 1         | 1     | 1    | 1    |
| 10       | 3254       | Blade 20 x 7 Ga. C.O.                  | 4         | 5     | 6    | 8    |
| 10       | 3262       | Blade 20 x 7 Ga. Plain                 | 4         | 5     | 6    | 8    |
| 10       | 3269       | Blade 22 x 7 Ga. Plain                 | 4         | 5     | 6    | 8    |
| 10       | 3271       | Blade 22 x 7 Ga. C.O.                  | 4         | 5     | 6    | 8    |
| 11       | 17018      | End Bell—Large                         | 2         | 2     | 2    | 3    |
| 13       | 3196       | Blade 18 x 10 Ga. C.O.                 | 1         | 1     | 1    | 1    |
| 13       | 3268       | Blade 18 x 9 Ga. Plain                 | 1         | 1     | 1    | 1    |
| 13       | 3262       | Blade 20 x 7 Ga. Plain                 | 1         | 1     | 1    | 1    |
| 13       | 3254       | Blade 20 x 7 Ga. C.O.                  | 1         | 1     | 1    | 1    |
| 14       | FB-09-0019 | Sub. Assy. (Bearing & Housing)         | 2         | 2     | 2    | 3    |
| 15       | 16030      | Housing—Bearing                        | 1         | 1     | 1    | 1    |
| 16       | 101407     | Washer—90mm                            | 2         | 2     | 2    | 2    |
| 17       | 11698      | Bearing—90mm Fairair GW210PP-10        | 1         | 1     | 1    | 1    |
| 20       | 11005      | Retainer Ring                          | 1         | 1     | 1    | 1    |
| 19       | 10606      | Grease Fitting 1/8 NPT Straight        | 1         | 1     | 1    | 1    |
| 18       | 8824       | Sleeve—Insert                          | 2         | 2     | 2    | 3    |
| 21       | 8761       | End Bell—Small                         | 2         | 2     | 2    | 3    |
| 22       | 6165       | Spacer Spool                           | 2         | 3     | 4    | 5    |
| 23       | 3412A      | Bumper Washer                          | 1         | 1     | 1    | 1    |
| 24       | 101406     | Gang Bolt 1 1/8 Sq. 4140 CRS-41 1/4    | 1         | -     | -    | -    |
| 24       | 100242     | Gang Bolt 1 1/8 Sq. 4140 CRS-50 7/8    | -         | 1     | -    | -    |
| 24       | 100243     | Gang Bolt 1 1/8 Sq. 4140 CRS-59 7/8    | -         | -     | 1    | -    |
| 24       | 100245     | Gang Bolt 1 1/8 Sq. 4140 CRS-78 1/4    | -         | -     | -    | 1    |
| 25       | 11646      | Flange Lock Nut 1/2 NC, PL             | 4         | 5     | 6    | 8    |
| 26       | 10870      | Carriage Screw 1/2 x 1 1/2 NC PL, GR5  | 4         | 5     | 6    | 8    |
| 27       | 0788       | Assy. Scraper—R.H.                     | 4         | 5     | 6    | 8    |
| A        | 100271     | Scraper Shank                          | 1         | 1     | 1    | 1    |
| C        | 100270     | Scraper Blade                          | 1         | 1     | 1    | 1    |
| D        | 10785      | Hex Bolt 1/2 x 1 1/2 NC, PL            | 2         | 2     | 2    | 2    |
| E        | 10395      | Lock Nut 1/2 NC, PL                    | 2         | 2     | 2    | 2    |
| 28       | 0789       | Assy. Scraper—L.H.                     | 4         | 5     | 6    | 8    |
| 29       | 6513       | "U" Bolts 3/4 Dia.                     | 1         | 1     | 1    | -    |
| 30       | 10300      | Lock Nut 3/4 NC, PL                    | 2         | 2     | 2    | -    |
| 31       | 101514     | Scraper Bar Support                    | 1         | 1     | 1    | -    |
| 32       | 9475       | Scraper Bar 2 x 2 x 3/8 L-- 42 1/2     | 1         | -     | -    | -    |
| 32       | 9548       | Scraper Bar 2 x 2 x 3/8 L-- 51 11/16   | -         | 1     | -    | -    |
| 32       | 9549       | Scraper Bar 2 x 2 x 3/8 L-- 60 7/8     | -         | -     | 1    | -    |
| 32       | 9551       | Scraper Bar 2 x 2 x 3/8 L-- 79 1/4     | -         | -     | -    | 1    |
| 35       | 11647      | Flange Lock Nut 5/8 NC, PL             | 2         | 2     | 2    | 3    |



## D30 Series Rear Wing Gangs



## D30 Series Rear Wing Gangs

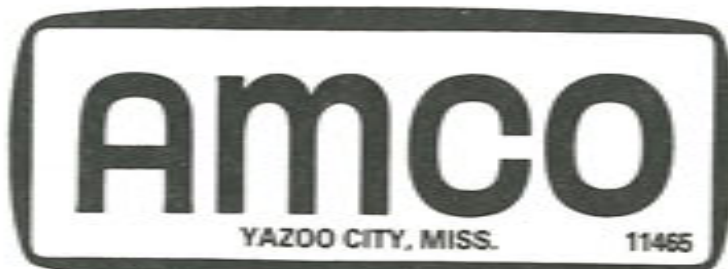
| Ref. No. | Part No.   | Description                            | No. Req'd |       |      |      |
|----------|------------|----------------------------------------|-----------|-------|------|------|
|          |            |                                        | 15'V      | 15'6" | 21'V | 24'V |
| 1        | 20233      | Assy. Bearing Riser—R.H.               | 2         | 2     | 2    | 3    |
| 1        | 20234      | Assy. Bearing Riser—L.H.               | 2         | 2     | 2    | 3    |
| 2        | 11280      | "U" Bolt 7/8" Dia.                     | 2         | 2     | 2    | 3    |
| 3        | 10396      | Lock Nut 7/8" NC, PL                   | 4         | 4     | 4    | 6    |
| 4        | 10135      | Carriage Screw 5/8 x 1 3/4 NC, PL, GR5 | 7         | 7     | 7    | 10   |
| 5        | 10299      | Lock Nut 5/8 NC, PL                    | 5         | 5     | 5    | 7    |
| 6        | 9628       | Clamp Trunion                          | 4         | 4     | 4    | 6    |
| 7        | 11035      | Nut Gang Bolt 1 1/8 NC, Heavy          | 2         | 2     | 2    | 2    |
| 8        | 2116       | Lock Plate                             | 1         | 1     | 1    | 1    |
| 9        | 2030       | End Gang Washer                        | 1         | 1     | 1    | 1    |
| 10       | 3254       | Blade 20 x 7 Ga. C.O.                  | 5         | 6     | 7    | 9    |
| 10       | 3262       | Blade 20 x 7 Ga. Plain                 | 5         | 6     | 7    | 9    |
| 10       | 3269       | Blade 22 x 7 Ga. Plain                 | 5         | 6     | 7    | 9    |
| 10       | 3271       | Blade 22 x 7 Ga. C.O.                  | 5         | 6     | 7    | 9    |
| 11       | 17008      | End Roll—Large                         | 2         | 2     | 2    | 3    |
| 12       | 3196       | Blade 18 x 10 Ga. C.O.                 | 1         | 1     | 1    | 1    |
| 12       | 3268       | Blade 18 x 9 Ga. Plain                 | 1         | 1     | 1    | 1    |
| 12       | 3262       | Blade 20 x 7 Ga. Plain                 | 1         | 1     | 1    | 1    |
| 12       | 3254       | Blade 20 x 7 Ga. C.O.                  | 1         | 1     | 1    | 1    |
| 13       | 11585      | Blade 14 x 10 Ga. Plain                | 1         | 1     | 1    | 1    |
| 13       | 3267       | Blade 16 x 10 Ga. Plain                | 1         | 1     | 1    | 1    |
| 14       | FB-09-0019 | Sub. Assy. (Bearing & Housing)         | 2         | 2     | 2    | 3    |
| 15       | 16030      | Housing—Bearing                        | 1         | 1     | 1    | 1    |
| 16       | 101407     | Washer—90mm                            | 2         | 2     | 2    | 2    |
| 17       | 11698      | Bearing—90mm Fairair GW210PP-10        | 1         | 1     | 1    | 1    |
| 20       | 11005      | Retainer Ring                          | 1         | 1     | 1    | 1    |
| 19       | 10606      | Grease Fitting 1/8 NPT Straight        | 1         | 1     | 1    | 1    |
| 18       | 8824       | Sleeve—Insert                          | 2         | 2     | 2    | 3    |
| 21       | 8761       | End Roll—Small                         | 2         | 2     | 2    | 3    |
| 22       | 6165       | Spacer Spool                           | 4         | 5     | 6    | 7    |
| 23       | 3412A      | Bumper Washer                          | 1         | 1     | 1    | 1    |
| 24       | 100243     | Gang Bolt 1 1/8 Sq. 4140 CRS - 59 7/8  | 1         | -     | -    | -    |
| 24       | 100244     | Gang Bolt 1 1/8 Sq. 4140 CRS - 69 1/16 | -         | 1     | -    | -    |
| 24       | 100245     | Gang Bolt 1 1/8 Sq. 4140 CRS - 78 1/4  | -         | -     | 1    | -    |
| 24       | 101604     | Gang Bolt 1 1/8 Sq. 4140 CRS - 96 3/8  | -         | -     | -    | 1    |
| 25       | 11646      | Flange Lock Nut 1/2 NC, PL             | 6         | 7     | 8    | 10   |
| 26       | 10870      | Carriage Screw 1/2 x 1 1/2 NC, PL, GR5 | 5         | 6     | 7    | 9    |
| 27       | 0788       | Assy. Scraper—R.H.                     | 6         | 7     | 8    | 10   |
| A        | 100271     | Scraper Shank                          | 1         | 1     | 1    | 1    |
| B        | 100368     | Scraper Shank                          | 1         | 1     | 1    | 1    |
| C        | 100270     | Scraper Blade                          | 1         | 1     | 1    | 1    |
| D        | 10785      | Hex Bolt 1/2 x 1 1/2 NC, PL            | 2         | 2     | 2    | 2    |
| E        | 10395      | Lock Nut 1/2 NC, PL                    | 2         | 2     | 2    | 2    |
| 28       | 0789       | Assy. Scraper—L.H.                     | 6         | 7     | 8    | 10   |
| 29       | 6513       | "U" Bolt 3/4 Dia.                      | 1         | 1     | 1    | -    |
| 30       | 10300      | Lock Nut 3/4 NC, PL                    | 2         | 2     | 2    | -    |
| 31       | 101514     | Scraper Bar Support                    | 1         | 1     | 1    | -    |
| 32       | 9548       | Scraper Bar 2 x 2 x 3/8 L - 51 11/16   | 1         | -     | -    | -    |
| 32       | 9549       | Scraper Bar 2 x 2 x 3/8 L - 60 7/8     | -         | 1     | -    | -    |
| 32       | 9550       | Scraper Bar 2 x 2 x 3/8 L - 70 1/16    | -         | -     | 1    | -    |
| 32       | 100367     | Scraper Bar 2 x 2 x 3/8 L - 88 7/16    | -         | -     | -    | 1    |
| 33       | 10710      | Carriage Screw 1/2 x 2 NC, PL, GR5     | 1         | 1     | 1    | 1    |
| 34       | 0824       | Assy. Scraper—Special R.H.             | 1         | 1     | 1    | 1    |
| 34       | 0825       | Assy. Scraper—Special L.H.             | 1         | 1     | 1    | 1    |
| 35       | 11647      | Flange Lock Nut 5/8 NC, PL             | 2         | 2     | 2    | 3    |



## 30 Series Decals

| Ref. No. | Part No. | Description                        | No. Required |
|----------|----------|------------------------------------|--------------|
| 1        | 11465    | Decal—AMCO—Large .....             | 3            |
| 1        | 11466    | Decal—AMCO—Small .....             | 2            |
| 2        | 11645    | Decal—Warning .....                | 1            |
| 3        | 10997    | Decal—Maintenance .....            | 1            |
|          | 11548    | Decal—"FEMA" .....                 | 1            |
|          | 11117    | Reflector Tape—Red (Rear) .....    | 2            |
|          | 11118    | Reflector Tape—Amber (Front) ..... | 2            |

①



②

**STAY CLEAR OF RAISED WINGS**  
SERIOUS INJURY CAN RESULT  
IF RAISED WINGS DROP DUE  
TO HYDRAULIC FAILURE, AIR  
IN CYLINDERS OR ACCIDENTAL  
MOVEMENT OF CONTROLS.  
OPERATE CYLINDERS SEVERAL  
TIMES TO REMOVE AIR.

### ⚠ WARNING

LOWER OR LOCK IN TRANSPORT POSITION  
RAISED MACHINERY CAN FALL AND CAUSE  
INJURY. ALWAYS LOWER OR LOCK IN  
TRANSPORT POSITION BEFORE SERVICING  
OR LEAVING THE MACHINE.

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

③

### MAINTENANCE INSTRUCTIONS

- KEEP ALL BOLTS TIGHT.  
A. VISUALLY INSPECT ALL BOLTS DAILY.  
B. CHECK AFTER FIRST 50 HOURS OR ONE WEEK'S OPERATION.
- KEEP WHEEL BEARINGS PROPERLY ADJUSTED.  
A. CLEAN & REPACK EACH SEASON OR EVERY 300 HRS.  
B. REPLACE ALL WORN OR DAMAGED PARTS WHEN REPAIRING.
- DO NOT RUN WITH LOOSE DISK BLADES. KEEP GANG BOLTS TIGHT! TIGHTEN AFTER FIRST DAY'S OPERATION.
- KEEP SCRAPERS PROPERLY ADJUSTED 1/16" - 1/8" FROM BLADES.
- 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.

10997

## assembly instructions

AMCO 30 Series Harrows are shipped from the factory in bundles for assembly.

- Bundle Pull Tongue
- Two Bundle Main Frames (with rockshafts)
- Six 15 x 8 Six Bolt Wheels (optional eight)
- Bundle Risers and Cylinders (with tongue jack)
- Bundle Wing Main Frame—Right Hand (with Rockshaft)
- Bundle Wing Main Frame—Left Hand (with Rockshaft)
- Bundle Hydraulic Kit with Operators Manual
- Bundle Scraper Bars
- Bundle Scrapers and Bolts
- Bundle Front Gangs
- Bundle Rear Gangs

### 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 strapped-on parts from main frame.

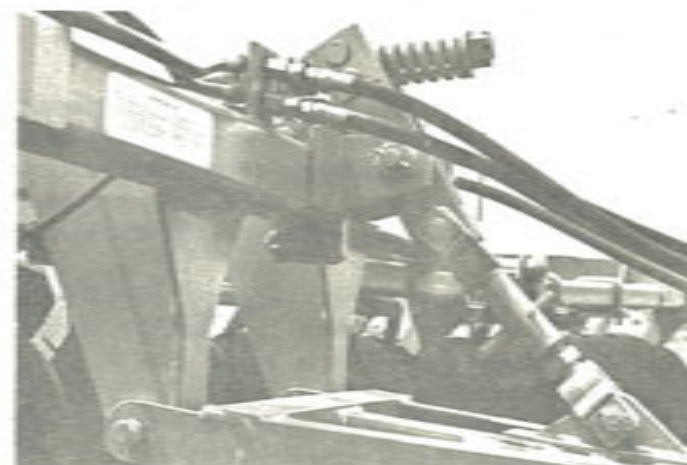
Note: The right and left hand sides of the harrow are determined by standing at the rear of the harrow and facing the direction of travel.

### STEP 2

Connect the right hand and left hand halves of the center main frame together with eight 7/8" x 2" hex bolts.

**IMPORTANT:** Do not tighten 7/8 x 2 bolts until rockshaft assembly is complete.

Align holes carefully and insert 1 1/2" x 6 5/8" pivot pin to connect rockshaft to left hand inner frame rail. Avoid damage to the two bronze bushings inside the rockshaft mount housing. After the rockshaft is attached, tighten the 7/8 x 2 bolts on the main frame. Place the center main frame "right side up" on sturdy stands at least 32" high. Connect rockshaft tie link between the two center rockshafts, inserting the rear 1" x 4 3/8" pin first. Attach pull tongue and associated linkages. Tighten bolts and make sure all 5/16 x 2 1/4 roll pins are installed.

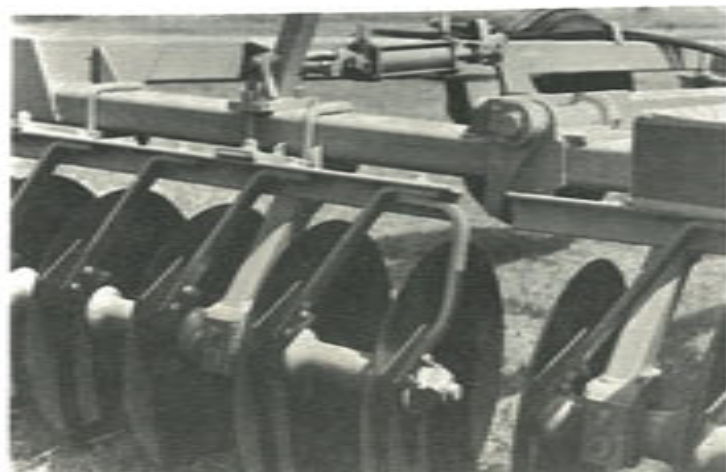


Note: Refer to the General Torque Specification Table on page 62 to determine proper torque for screws.

### STEP 3 (Refer to figure 1 & Table 1 on page 40-41)

Loosely attach bearing risers with 7/8" U bolts and scraper bar supports with 3/4" U bolts to gang frames on the center main frame. Starting with dimension A and going through F for the appropriate harrow model, locate bearing risers and scraper bar supports, measuring to the center of the U bolts. Place right hand bearing risers on the front right hand and the rear left hand gang frames. Place left hand bearing risers on the front left hand and the rear right hand gang frames. Tighten only the four inner most bearing risers snugly in place. Leave supports and other risers loose enough for shifting easily by hand later.





**STEP 4** (Refer to the appropriate model diagram in figure 2 on pages 42-44 for gang and scraper placement.) Position the four inside gangs for attachment. Note position of smaller "step down" blades toward the harrow center on rear gangs. Raise gangs to connect gang bearing trunions to bearing riser mounts.

**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.

Attach each trunion to the riser with two 2 1/2 x 3 3/4 fastening plates and 5/8 x 1 3/4 carriage screws. Shift outside bearing risers as required to make sure all toggles on the trunions are centered inside the mounting slots on the risers with no preload. Tighten U bolts evenly on all risers.

**VERY IMPORTANT:** Make sure each bearing riser top plate is clamped flush to the underside of its gang frame and is square with the gang frame before moving to another gang. Rotate each gang slowly and make sure toggles do not bind against the mounting slots. Loosen U bolts, align risers and retighten as required. Failure to properly align trunions and risers will cause premature failure of gang bearings and will void bearing warranty!

**STEP 5** (Refer to appropriate figure on pages 42-44 for scraper bar placement.) With the vertical leg downward and to the front, attach each of the four scraper bars to the inside gangs using 5/8 x 1 3/4 carriage screws. Finger tighten nuts to screws at this time. Allow bars to overhang at the ends sufficiently to attach scrapers as shown in Fig. 2. Attach special scrapers for the front outside blades on the inside gangs as shown in Fig. Using a 1/2 x 2 carriage screw, attach a special scraper and a regular scraper to the same slot on the front scraper bars.



Attach all other left hand and right hand scrapers for the inside gangs. Adjust scrapers to run 1/16" to 1/8" from the disk blades. Tighten all bolts!

#### STEP 6

Mount four 11L x 15 eight or six ply tires on the four 15 x 8 wheels for the center main frame. Inflate eight ply tires to 32 PSI or six ply tires to 24 PSI. Mount wheels on center rockshafts. Tighten hub bolts tight.

#### STEP 7

Attach the right hand and left hand wing main frames using four 1 1/4 x 10 5/8 bolts and 1 1/4 lock nuts.

**IMPORTANT:** Mount the wings so that the frame cross member is toward the front. Wing rockshafts should operate in the opposite direction of center rockshafts when wings are properly attached.

#### STEP 8

Attach one wing support stand to the front right hand wing gang frame and one to the rear left hand wing gang frame. See figure 1 for proper location.



**STEP 9** (Refer to figure 1 and table 1 for wing bearing riser and scraper bar support location.) Starting with dimension G and going through L for the appropriate harrow model, follow the same procedure on the wings as was used in Step 3 for the center section.

#### STEP 10 (Refer to appropriate figure for gang and scraper placement on the wings.)

Follow the same procedure on the wings as was used in Steps 4 & 5 for the inside gangs. Note proper location of gangs with step-down blades and feathering blades. Again pay particular attention to proper alignment of bearings as discussed in Step 4. Special scrapers are located at the rear wing gangs.

#### STEP 11

Mount two (or four with optional dual wheels) 11L x 15 eight or six ply tires on the 15 x 8 wheels for the wings. Inflate as in Step 6. Mount wheels on wing rockshafts and tighten lug bolts snug.

#### STEP 12 (See the hydraulic circuit drawing on page 46)

Install the two 3 1/2 x 8 hydraulic cylinders on the center main frame and the two center rockshafts. The rod end should be attached to the rockshaft. Two flat washers should be installed between the transport lock and the cylinder clevis. Make sure stroke collars on the two cylinders are the same at all times to prevent damage to the harrow.

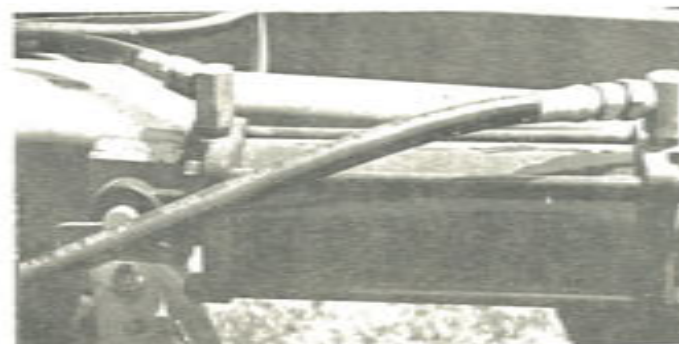
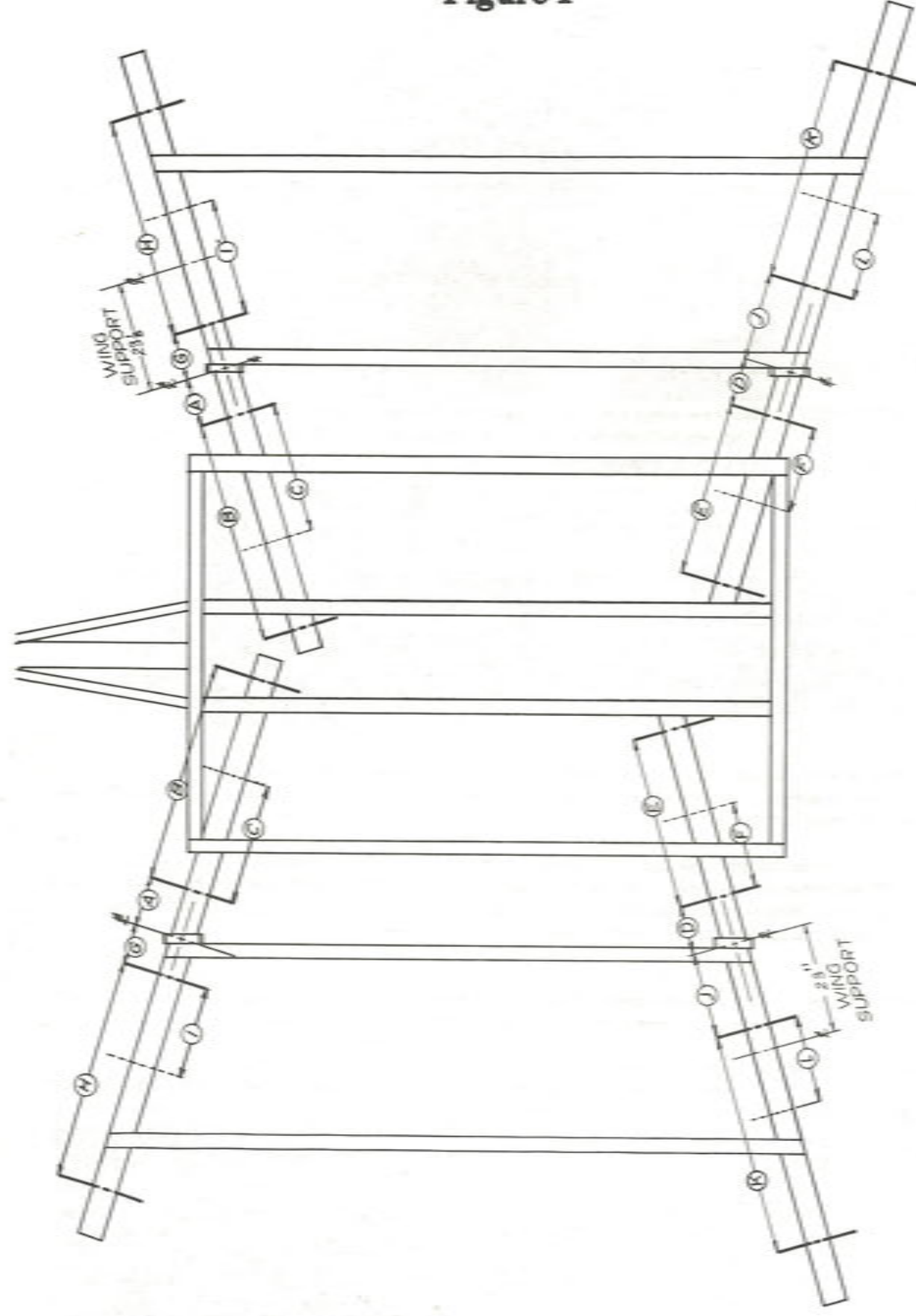




Figure 1



—— BEARING RISER U-BOLT  
 ..... SCRAPER BAR SUPPORT U-BOLT

TABLE 1

|                         | A      | B        | C       | D      | E      | F      | G     | H                       | I       | J       | K                         | L        |
|-------------------------|--------|----------|---------|--------|--------|--------|-------|-------------------------|---------|---------|---------------------------|----------|
| D30 50 Blade<br>18'0"   | 10 3/4 | 45 15/16 | 28 1/16 | 11     | 36 3/4 | 17 7/8 | 7 5/8 | 27 9/16                 | 8 11/16 | 7 3/8   | 36 3/4                    | 28 1/16* |
| D30 54 Blade<br>19'0"   | 10 3/4 | 45 15/16 | 28 1/16 | 11     | 36 3/4 | 17 7/8 | 7 5/8 | 36 3/4                  | 8 11/16 | 7 3/8   | 45 15/16                  | 28 1/16  |
| D30 58 Blade<br>21'0"   | 10 3/4 | 45 15/16 | 28 1/16 | 11     | 36 3/4 | 17 7/8 | 7 5/8 | 45 15/16                | 27 1/16 | 16 9/16 | 45 15/16                  | 18 7/8   |
| D30 66 Blade<br>24'0"   | 10 3/4 | 45 15/16 | 28 1/16 | 11     | 36 3/4 | 17 7/8 | 7 5/8 | 27 9/16**<br>64 5/16*** |         | 16 9/16 | 36 3/4**<br>64 5/16***    |          |
| C30 62 Blade<br>17'10"  | 6 5/8  | 50 5/16  | 22 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 3/4 | 28 3/4                  | 6 3/4   | 11 1/16 | 35 15/16                  | 7 3/4    |
| C30 66 Blade<br>19'0"   | 6 5/8  | 50 5/16  | 22 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 3/4 | 35 15/16                | 6 3/4   | 11 1/16 | 43 1/8                    | 29 1/2*  |
| C30 74 Blade<br>21'4"   | 6 5/8  | 50 5/16  | 22 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 3/4 | 50 5/16                 | 28 1/2  | 18 1/4  | 50 3/8                    | 15       |
| C30 82 Blade<br>24'0"   | 6 5/8  | 50 5/16  | 22 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 3/4 | 28 3/4**<br>64 11/16*** |         | 18 1/4  | 35 15/16**<br>64 11/16*** |          |
| DC30 56 Blade<br>17'10" | 10 3/4 | 45 15/16 | 28 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 5/8 | 27 9/16                 | 8 11/16 | 11 1/16 | 35 15/16                  | 7 3/4    |
| DC30 60 Blade<br>19'0"  | 10 3/4 | 45 15/16 | 28 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 5/8 | 36 3/4                  | 8 11/16 | 11 1/16 | 43 1/8                    | 29 1/2*  |
| DC30 66 Blade<br>21'4"  | 10 3/4 | 45 15/16 | 28 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 5/8 | 45 15/16                | 27 1/16 | 18 1/4  | 50 3/8                    | 15       |
| DC30 74 Blade<br>24'0"  | 10 3/4 | 45 15/16 | 28 1/16 | 10 1/2 | 28 3/4 | 13 7/8 | 7 5/8 | 27 9/16**<br>64 5/16*** |         | 18 1/4  | 35 15/16**<br>64 11/16*** |          |

\*Rear wing scraper bar supports located outside of frame rail on this model.

\*\*Measure from Inside Bearing Riser to Middle Bearing Riser.

FIGURE 2

LEGEND:

SD - STEP DOWN  
 SS - SPECIAL SCRAPER  
 FB - FEATHERING BLADE

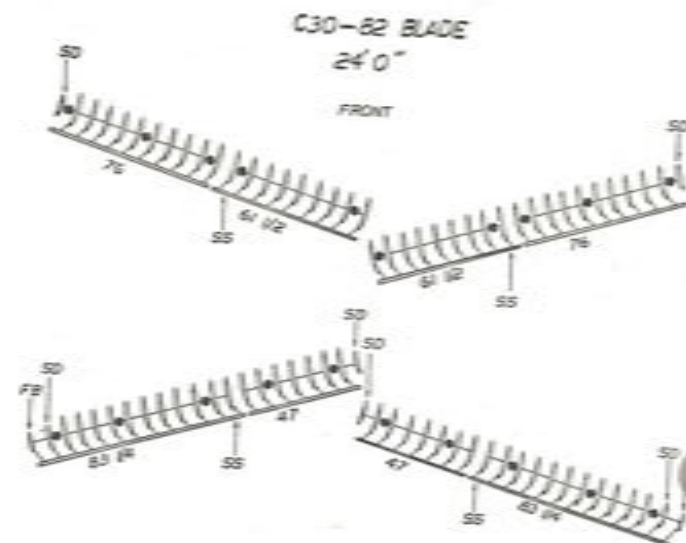
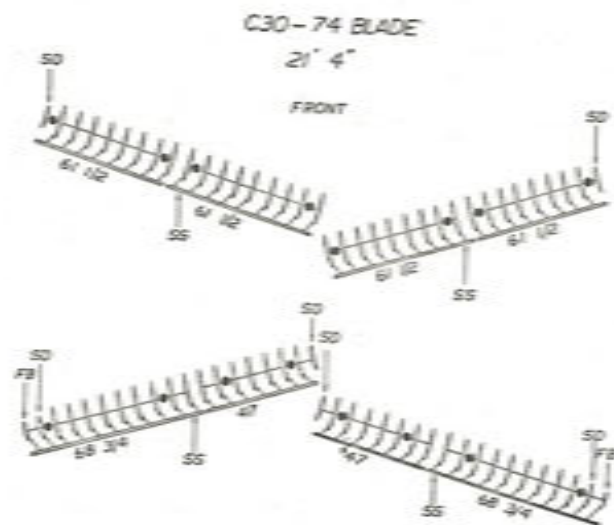
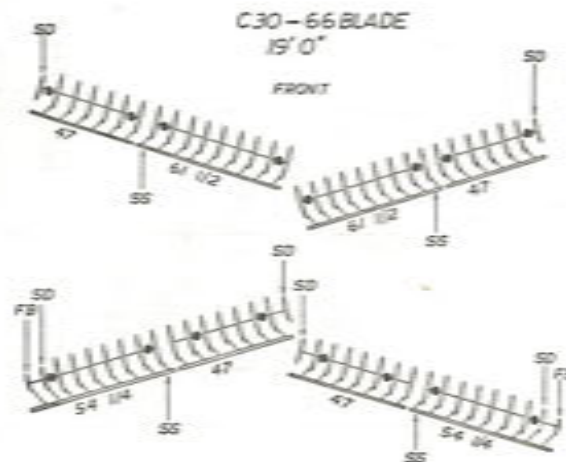
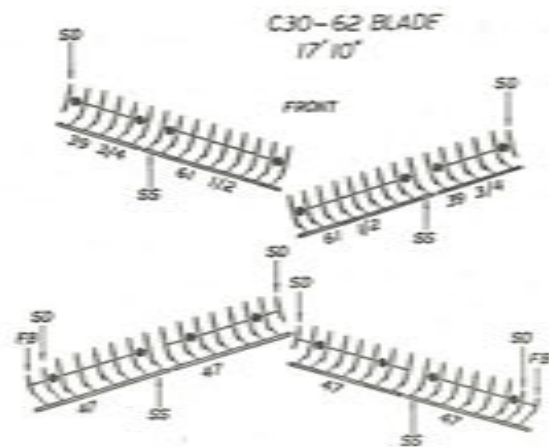


FIGURE 3

LEGEND:

SD - STEP DOWN  
 SS - SPECIAL SCRAPER  
 FB - FEATHERING BLADE

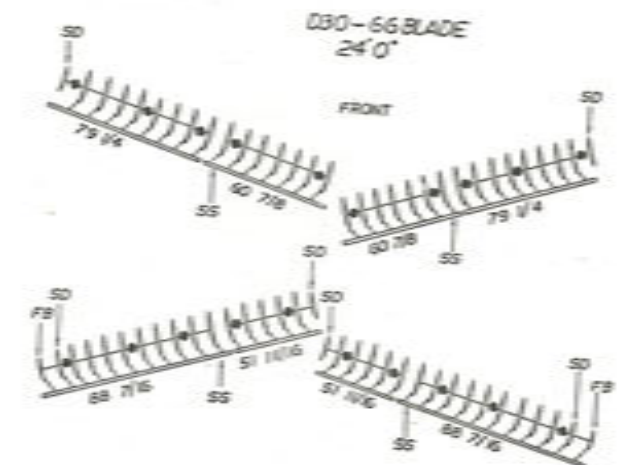
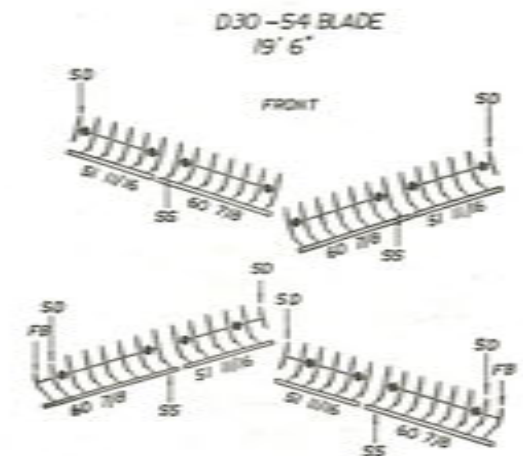
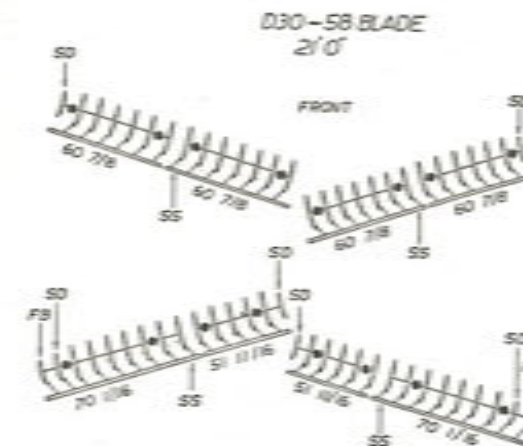
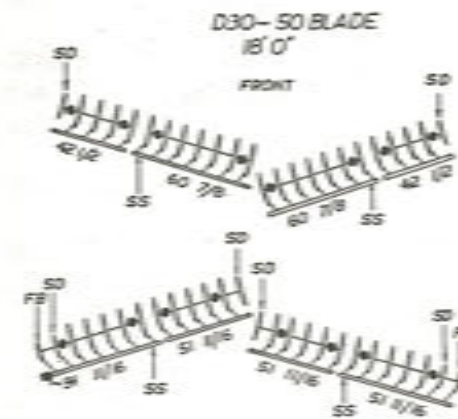
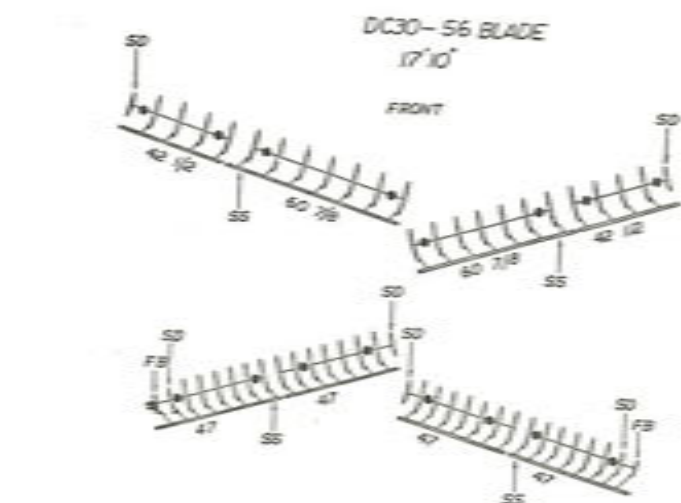


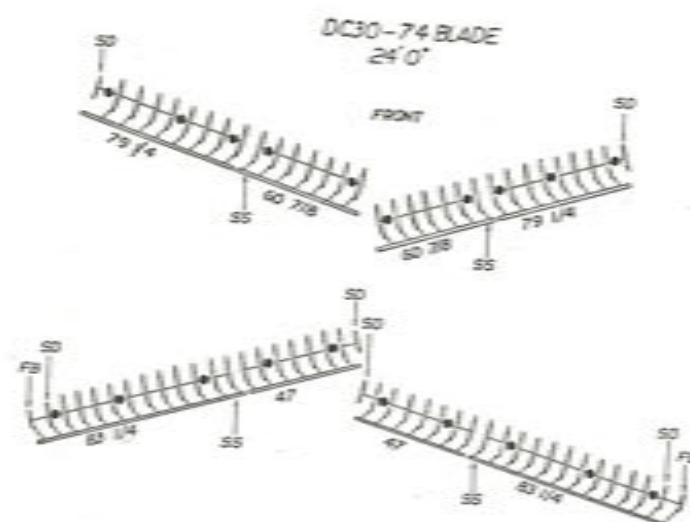
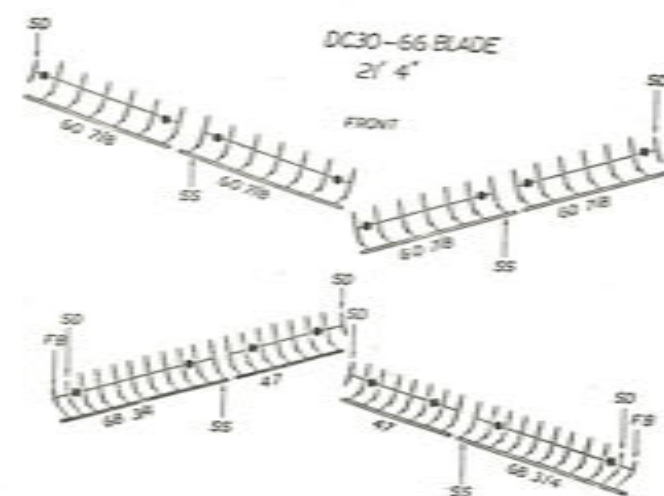
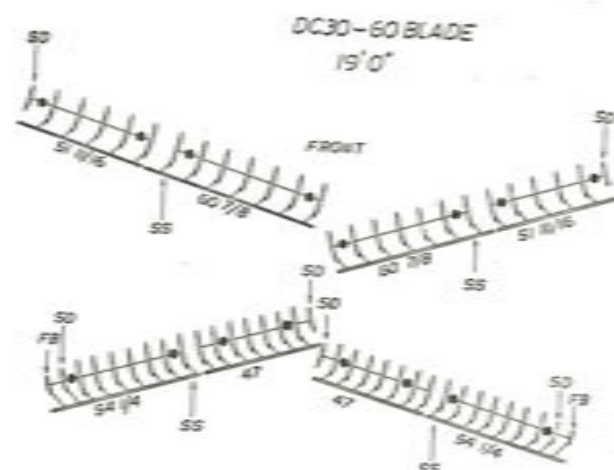


FIGURE 4



## LEGEND:

- SD - STEP DOWN  
SS - SPECIAL SCRAPER  
FB - FEATHERING BLADE



## STEP 13

Install 3 1/4" x 8" hydraulic cylinders on the wings with the rod end attached to the rockshaft. Check the adjustable cylinder mounts on outside rails of the wing main frames. The distance from the front edge of the round tube weldment to the center of the mounting hole should be 4" for both wings. Adjust as required. Also make sure a metal plug is installed tightly in the extra port hole.

## STEP 14

Manually extend the two 3 x 24 or 4 x 24 cylinders and install on the center main frame with two ports on top. Make sure a metal plug is installed in the extra port and tightened snugly.

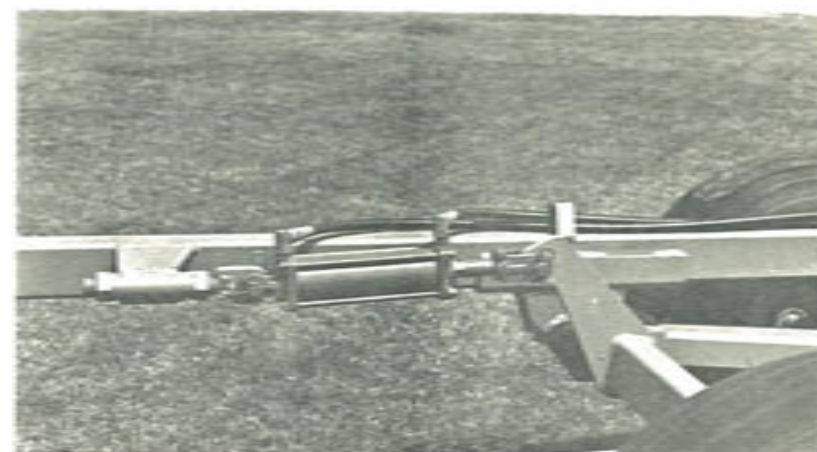
NOTE: All cylinders should be installed with the ports up.

## STEP 14

Install hydraulic fittings as follows:

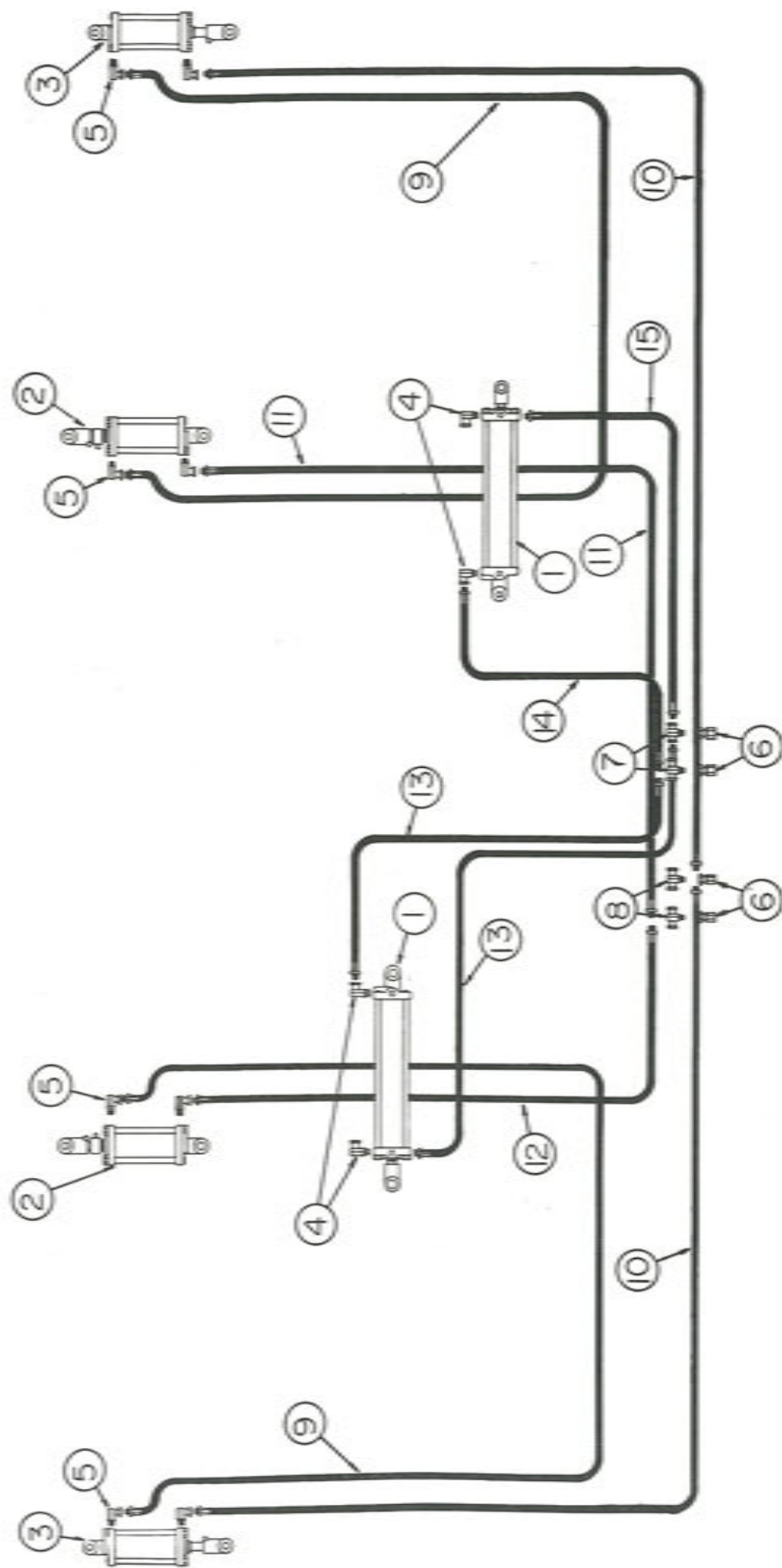
Note: Remember the right and left hand sides of the plow are determined by standing at the rear of the plow and facing the direction of travel.

- A. Install eight #10921 1/2" Male to 1/2" Female swivel elbows into the ports on the 3 1/2 x 8 and 3 1/4 x 8 cylinders. Turn fittings as shown in pictures. 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 3 x 24 cylinders. Turn fittings as shown in pictures. 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 hoses that go to the tractor. The two #10923 1/2" Male to 1/2" Female tees should be installed in the two right hand holes. The two #11126 1/2" Male to 1/4" Female tees should be installed in the two left hand holes. Use the sealant as described above.
- D. Connect cylinders with hoses as follows:
  - (1) #11168 (Ref. No. 13 in diagram) 1/4 x 66 hose connects butt end and rod end of right hand 3 x 24 hydraulic cylinder to left hand tees. One to each tee on the mount bracket.
  - (2) #11323 (Ref. No. 14) 1/4 x 24 hose connects butt end of left hand 3 x 24 hydraulic cylinder to left tee with #13 from butt end of right hand 3 x 24 cylinder. Butt ends must connect to the same front tee.
  - (3) #11119 (Ref. No. 15) 1/4 x 36 hose connects rod end of left hand 3 x 24 cylinder to left tee with #13 from rod end of right hand 3 x 24 cylinder. Rod ends must connect to the same front tee.
  - (4) #11310 3/8 x 156 or #11312 3/8 x 180 (Ref. No. 9) connects butt ends of 3 1/4 x 8 hydraulic cylinders to rod ends of 3 1/2 x 8 hydraulic cylinders. These hoses must be routed from the cylinders toward the front of the harrow, across the wing main frame and back down using all hose mounts along the way. (See picture) If not routed properly hose damage could result while operating the harrow.



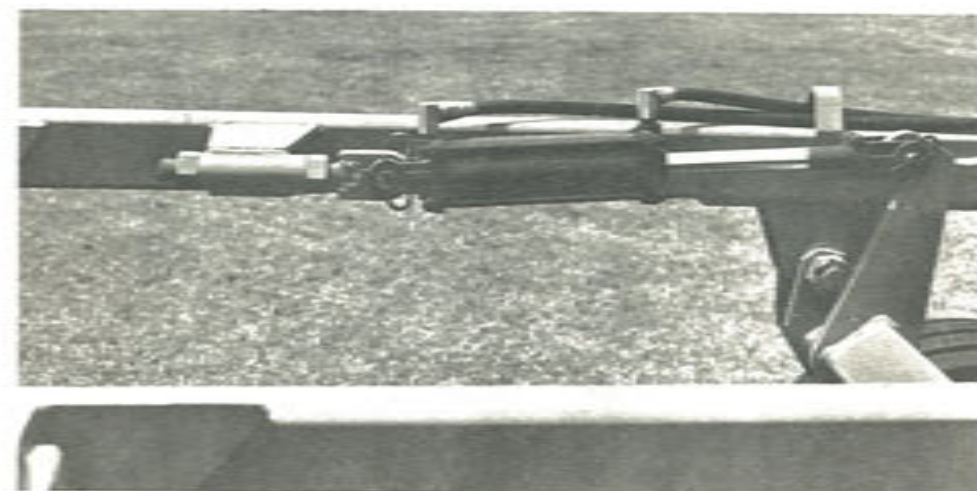


## Hydraulic Hose Diagram



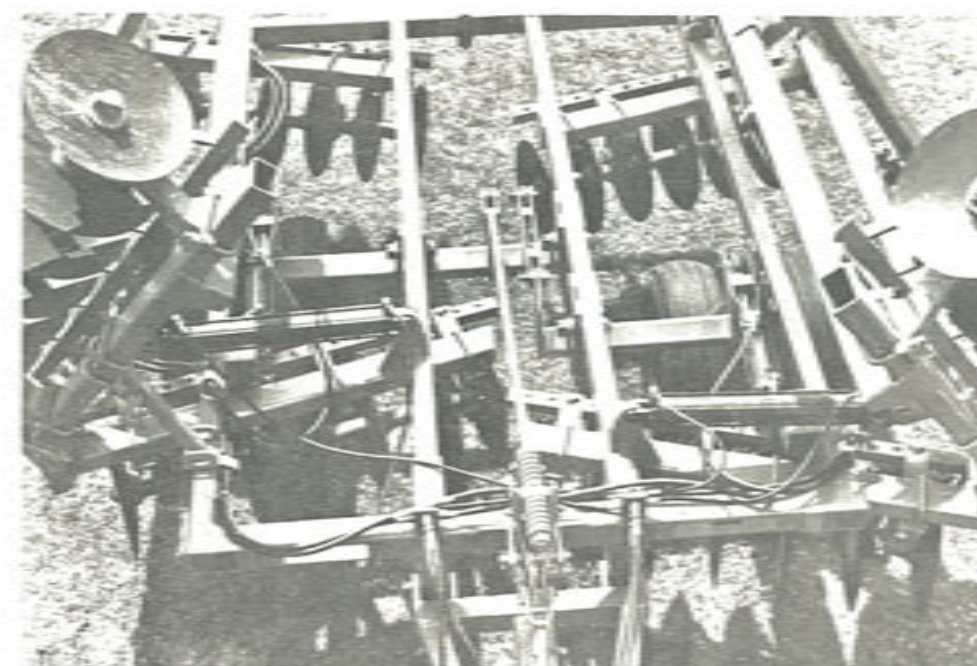
- (5) #11311 3/8 x 168 or #11313 3/8 x 192 (Ref. No. 10) connects rod ends of 3 1/4 x 8 cylinders to front right hand tee. These two hoses must connect to the same front tee.
- (6) #11304 (Ref. No. 12) 3/8 x 60 connects butt end of right hand 3 1/2" x 8" cylinder to front tee.
- (7) #11305 (Ref. No. 11) 3/8 x 66 connects butt end of left hand 3 1/2" x 8" cylinder to front tee with hose #11304 in previous step.

Use small amount of pipe sealant on each hydraulic fluid fitting to eliminate fluid seeps. Tighten fittings. The hydraulic installation is now complete. Be sure all hoses have been properly routed and are not hanging over the frame to hamper operation.



### STEP 16

Attach four 1/2" x 11' or 3/8" x 11' 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.

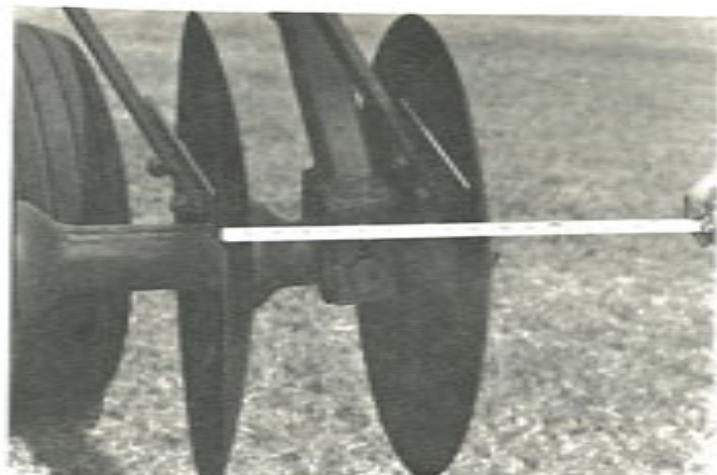




## STEP 17

## 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".
- B. Check the inside rear gangs, for normal conditions they should be 26" to 30" apart at the front tips of the blades, measuring square with the frame. Local conditions may require a different setting based on previous experience or a test run in the field. Shift gangs as required to obtain the proper spacing.
- C. Check the blade spacing between the center gangs and wing gangs. For 9" spacing blades should be 9" to 9 1/2" apart from blade edge to blade edge, and on 7" spacing, 7" to 7 1/2". The harrow must be on a level area when checking this spacing. Shift wing gangs as required to obtain proper spacing.



**IMPORTANT:** Follow directions in Step C on blade spacing between center gangs and wing gangs to prevent axle nuts and gang parts from damage when wings flex downward in the field.

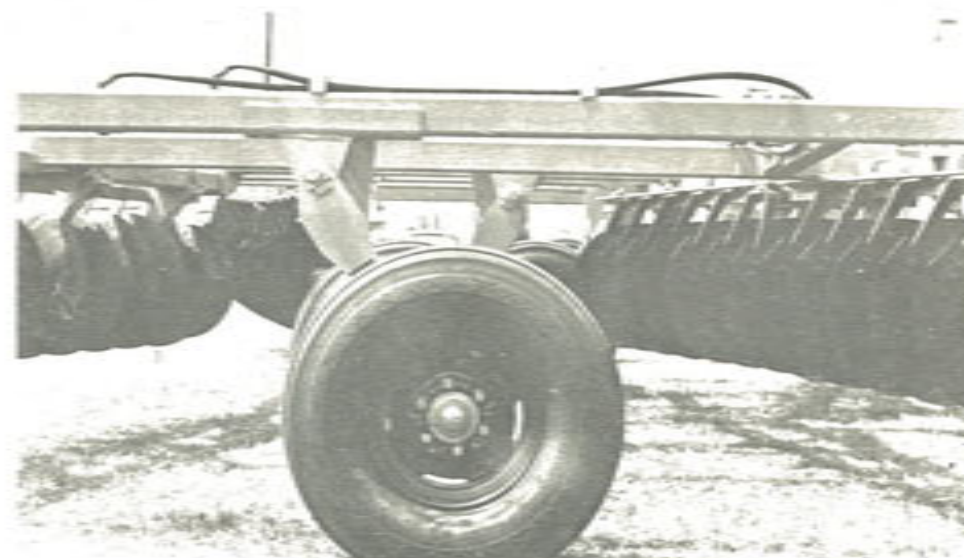
- D. Check scraper adjustment. Scrapers should be adjusted to run 1/16" to 1/8" from disk blades.
- E. Raise and lower harrow 4 or 5 times with 3 1/2" x 8" and 3 1/4" x 8" cylinders to be sure that hoses are properly routed, to fill cylinders with fluid and to purge air from the system. Hold down tractor valve for 3 minutes with harrow in raised position to get lift cylinders in phase. Check transport locks to see if they function properly.



**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.

- F. 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.

- G. Fully extend the 3 1/2" x 8" and 3 1/4" x 8" cylinders and raise the harrow for transport. Adjust the tongue turnbuckle to level the harrow for transport.
- H. Check all hydraulic hoses and fittings for leaks. Repair as required.



- I. 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 nine 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 four wing pivot pins at the wing hinges. Again, it will take several strokes to initially fill the cavity.
  - (3) Grease the fittings on the tongue turnbuckle until grease appears.
  - (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 daily 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.

- J. Check all bolts for proper torque.



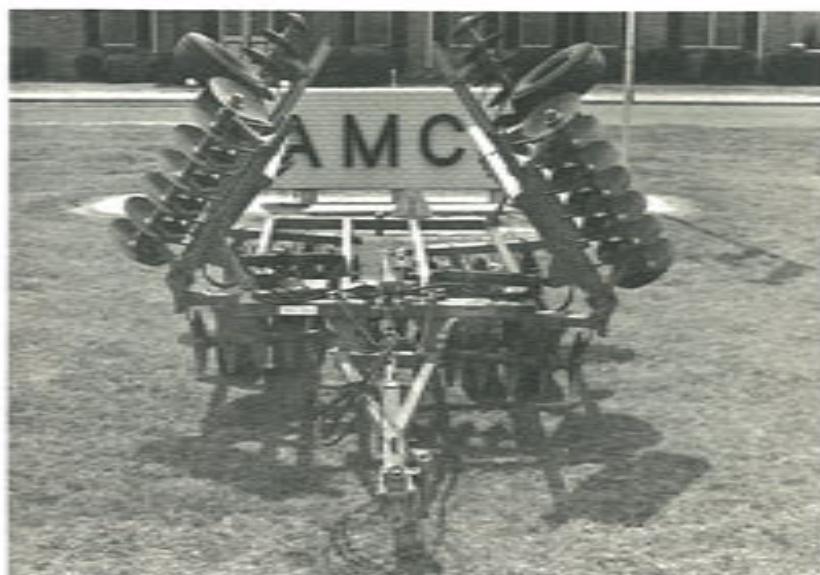


**CAUTION** Always secure for transport by using the lock pin and wing lock pins.

#### 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.

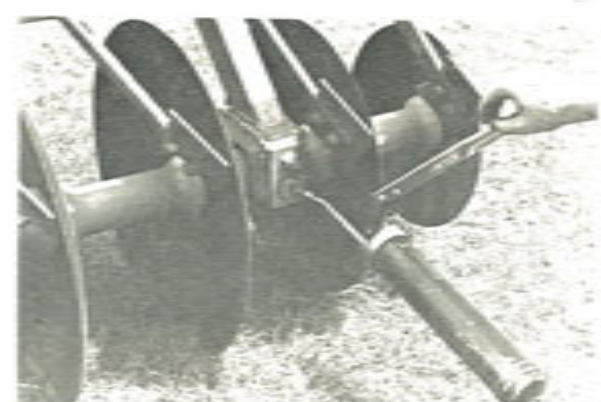
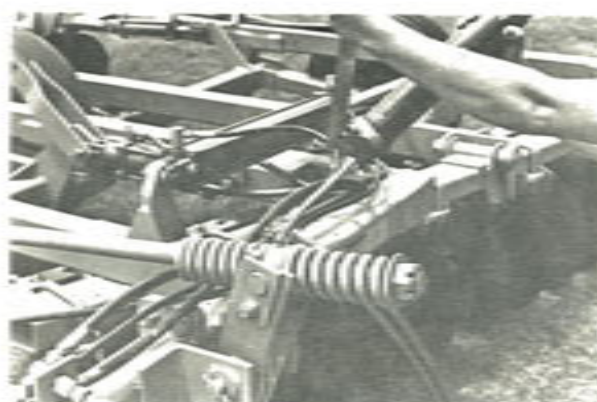
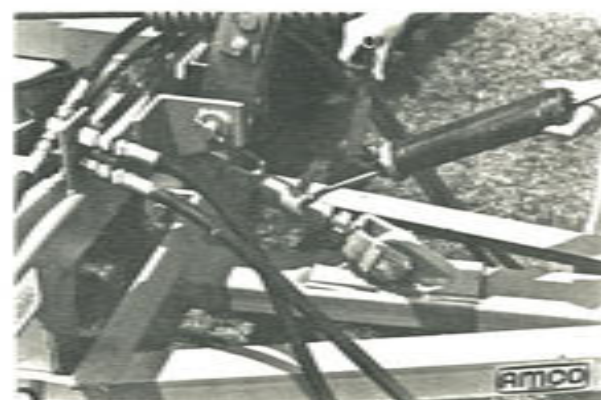


## lubrication

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.



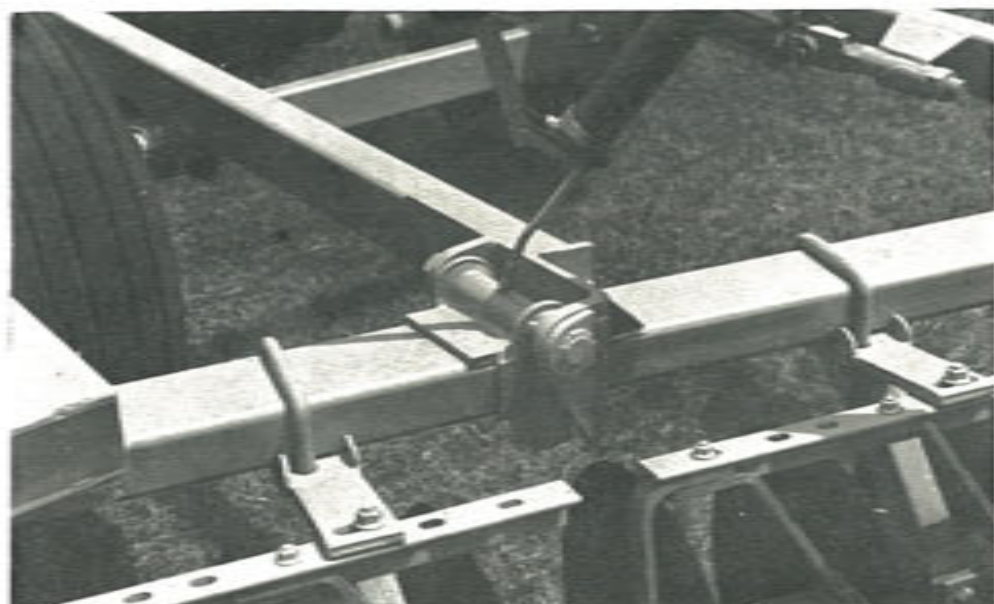
**ROCKSHAFT PIVOT PINS:** High carbon steel pins with a grease fitting in each, join each rockshaft to the main frame. These nine pins should be greased every 50 hours of operation. They should also be greased at the beginning and end of the disking season. A good grade of Lithium soap base grease is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

**TONGUE TURNBUCKLE AND LEVELING ROD:** The tongue turnbuckle and the swivel on the leveling rod should be greased every 50 hours of operation and at the beginning and end of each disking season.

**GANG BEARINGS:** The AMCO 30 Series Harrow gangs are equipped with regreaseable Protect-O-Shield ball bearings. The grease fitting is located on the rear of each bearing housing. During operation they should be greased daily with a good grade of Lithium soap base grease. Apply grease until old or dirty grease is purged from the bearings. All bearings should be greased at the beginning and end of each disking season. To protect the seals from the elements, raise the harrow on its wheels and slowly spin the gangs so the grease wraps around the seals.



**WHEEL 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 disk season or every 300 hours of operation. Use a good grade of clean lithium soap base grease.



**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.



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

## 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 1000 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.

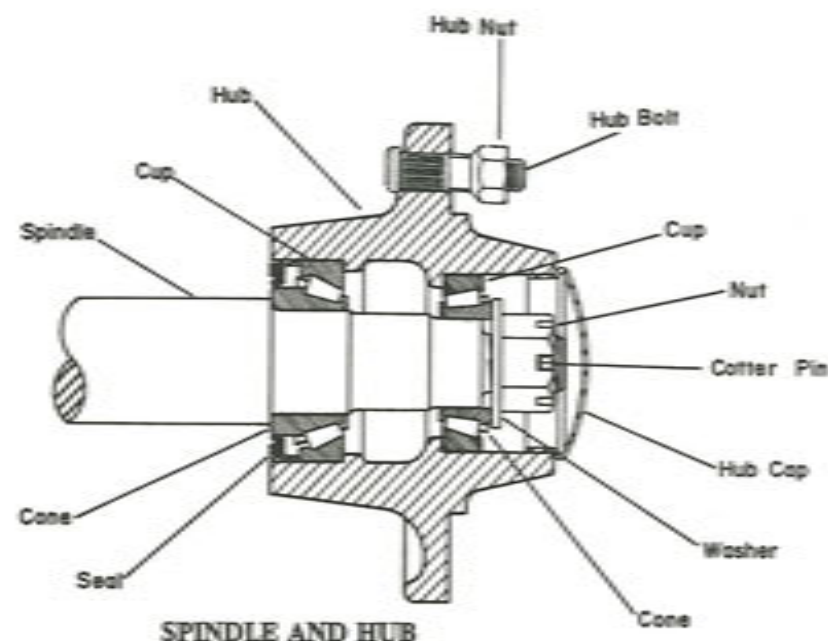
If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious infection or reaction may occur if medical attention is not given at once.



## 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 and excessive wear. The hubs use the inner bearing race (cone) as the sealing surface. Make sure the seal fits snugly on this surface. The seal must be replaced if excessively worn.
3. Carefully inspect both sets of bearing cones. Bearing bore and rollers must be smooth and free of nicks and scratches. Replace cones if damaged.
4. Inspect hub to make sure that hub bolts have a 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. Check sleeves for wear or other damage. Replace worn or damaged sleeves.
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. Replace if they show wear near the inner race of the bearing or show other damage. Do Not use the harrow without the washers being installed. Press the new bearing straight into the housing. Always press against the outer race of the bearing. NEVER press against the seal or inner race of the bearing. The small grease hole must align with the grease groove in the bearing housing. Rotate the bearing in the housing after it is pressed in to be sure it turns freely. Install the snap ring in the housing.
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 1000 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. During operation the bearings should be greased daily with a good grade of clean, lithium soap base grease. Refer to Lubrication Section on Gang Bearings on page 51 for proper lubrication procedure.
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 retesting. 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, regreassable, 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.

**CHECKING FOR HYDRAULIC CYLINDER LEAKS:** Check 3"x24" or 4"x24" wing fold cylinders for piston seal leaks by applying hydraulic pressure to rod end of cylinder with hose disconnected on butt end of cylinder. Before checking for leaks cylinder should be completely full of oil and fully retracted. Oil will flow from port on butt end of cylinder if piston seals are not sealing properly. Look for gland or rod seal leaks around the rod.

To check for piston seal leaks on 3 1/4" x 8" rephasing cylinders, attach a "doughnut" or similar collar at least 1 1/2" long to the piston rod and proceed as described above. If oil flows from butt end port, piston seals are not sealing properly.

To check for piston seal leaks on 3 1/2" x 8" rephasing cylinders, adjust the standard stroke control collar out at least 1 1/2" and follow the same procedure.

To check 3 1/4" x 8" and 3 1/2" x 8" rephasing hydraulic cylinders for proper phasing attach hydraulic hose to butt end, disconnect hose from rod end. Before checking, cylinder rod should be fully extended. Apply hydraulic pressure to the butt end of the cylinder. Oil will flow from the rod end port if cylinder is phasing properly.

#### **HYDRAULIC CYLINDER REPAIR: Tie Rod Type Cylinders.**

1. Remove hoses and fittings from cylinder.
2. Remove cylinder from harrow and clean outside of cylinder.
3. Dis-assemble cylinder by removing the rods and nut from end of cylinder rod. Slip piston and gland off cylinder rod.
4. Carefully clean and inspect all parts for wear or damage. Bent parts, nick, scratches or blemishes on rod and inside barrel will cause internal leaks and should be smoothed with fine steel wool or emory cloth. Replace parts that cannot be repaired. Wear marks on one side of the rod or barrel is a sign of side load on the cylinder. Check cylinder mounts and make necessary repairs to prevent misalignment or binding.
5. Remove all "O" Rings from piston and gland. Replace all seals with new parts.
6. Assemble cylinder using care to prevent damage to "O" Rings and Seals.
7. Replace cylinder on harrow and attach hoses.



## 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.



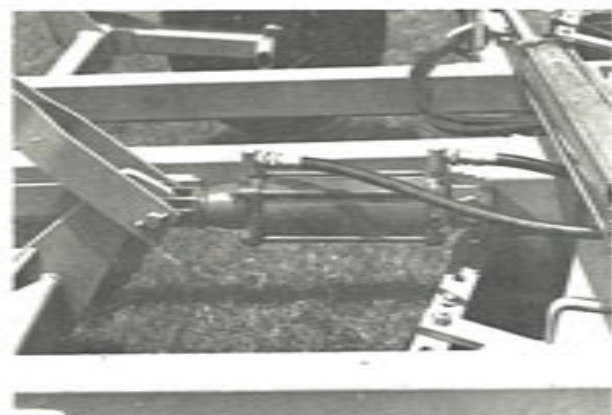
**CAUTION** When transporting machinery over public roads, comply with your local and state laws regarding length, width and lighting.



**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 30 Series Harrow 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 two 3 1/2" x 8" hydraulic cylinders used on the center main frame for lifting the harrow are 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 from 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.

A transport safety chain must be attached between the disk harrow pull tongue and the tractor to prevent separation in case of accidental loss or failure of the drawbar pin. The chain must be of adequate strength, be attached securely at each end and pass through auxiliary loops located within 6" of the drawbar pin. Mounting brackets are standard equipment on the pull tongue. An AMCO chain which meets ASAE standards for towed implements can be purchased as optional equipment from your authorized AMCO dealer.



**TIPS FOR LEVEL DISKING:** Your 30 Series disk harrow has been preadjusted at the dealership to suit most conditions. However, further adjustments as described below may be necessary for individual conditions.

If a **CENTER RIDGE** forms behind the harrow, first shorten the tongue turnbuckle to reduce weight on the rear gangs. If further adjustment is needed, shift the rear gangs outward. (NOTE: in some conditions it may be best to shift the rear gangs inward to "starve" the two inside rear blades for soil.)

If a **CENTER FURROW** forms, first lengthen the tongue turnbuckle to put more weight on the rear gangs. Shift rear gangs inward if required, but not so far as to starve the two inside blades for soil. Increased speed will throw soil further and eliminate a center furrow at the rear.

If an **OUTSIDE RIDGE** forms due to the front outside blades digging too deeply, lengthen the tongue turnbuckle or adjust wing wheels downward to correct. If an **OUTSIDE FURROW** forms from the rear outside blades digging too deeply, shorten the turnbuckle or adjust the wing wheels downward. Uneven conditions at the outside usually accompany uneven conditions at the center; therefore, correct problems at the center of the harrow first.

**IMPORTANT:** Operate harrow with wheels on the ground for proper leveling and depth gauging.



When cutting deep, when in hard ground or when disking heavy dry soils, leveling plates are provided at all four wing hinges to prevent wings from cutting deeper than the center section. Simply fold wings into transport position, secure with transport pins for safety, remove leveling plates from the outside of the hinges and bolt them between the hinge plates to insure level disking from side to side.



When using leveling plates, make sure all four plates are used simultaneously or frame damage may result. Adjustment of wing gauge wheels with turnbuckles should handle any wing leveling needs when shallow disking, and leveling plates should not be used.

The 30 Series harrows are designed to perform properly at speeds from 5 to 8 miles per hour. However, damage may result from operating in rocks or chunks at the higher speeds and void the warranty.



**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.



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

#### HYDRAULIC TROUBLE SHOOTING:

If a new harrow fails to raise level across the entire width, several hydraulic functions should be checked. Check the assembly instructions for proper hose routing. The hoses from the rod end of the center section lift cylinders must go to the butt end of the wing lift cylinders. Hold the hydraulic control lever fully open in the raising position for three minutes to rephase wheel cylinders with hydraulic fluid. Raise and lower the disk several times to remove all air from the system. It may be necessary to rephase the cylinders occasionally during the disking season. The cylinders can get out of phase if oil leaks out of the system or back through the valves on the tractor. The disk should be raised to maximum height while turning to keep the cylinders properly phased. Remember to check the tractor hydraulic system oil level after all cylinders have been filled with hydraulic fluid. The cylinders hold two gallons of hydraulic fluid. Check tractor hydraulic valve for leaks by switching outlets. If problems persist, raise the harrow and disconnect hoses from the tractor. If harrow does not leak down, cylinders are okay.

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.

#### GENERAL:

Keep 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 1000 FTLBS.

## operating tips

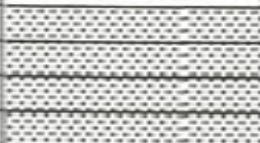
#### OPERATING TIPS FOR LONG LIFE AND SATISFACTORY PERFORMANCE

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



## 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                       |             |                                                                                     |      |                                                                                                                                                                                                                                                        |      |                                                                                                                                                                                                                                                             |      |
| SAE Grade No.                                                                      |             | 2                                                                                   |      | 5                                                                                                                                                                                                                                                      |      | 8 *                                                                                                                                                                                                                                                         |      |
| Bolt head identification marks as per grade<br>NOTE: Manufacturing Marks Will Vary |             |    |      |    |      |    |      |
| Bolt Size                                                                          |             | Torque<br>Foot Pounds                                                               |      | Torque<br>Foot Pounds                                                                                                                                                                                                                                  |      | Torque<br>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                                                                                                                                                                                                           |      |                                                                                                                                                                                                                                                             |      |

\* Thick nuts must be used with Grade 8 bolts

## MOST OFTEN ENCOUNTERED DISK BLADE FAILURES

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

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

SURFACE VIEW

EDGE VIEW

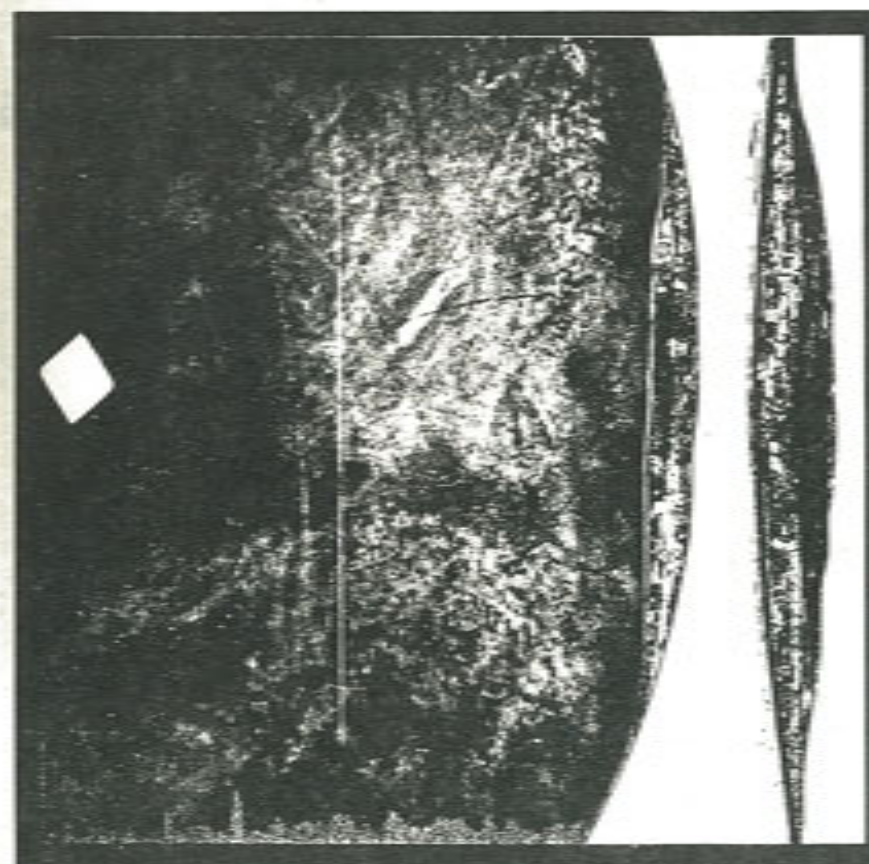


FIGURE 2 — Straight directional break caused by defective steel. Eligible for warranty consideration.





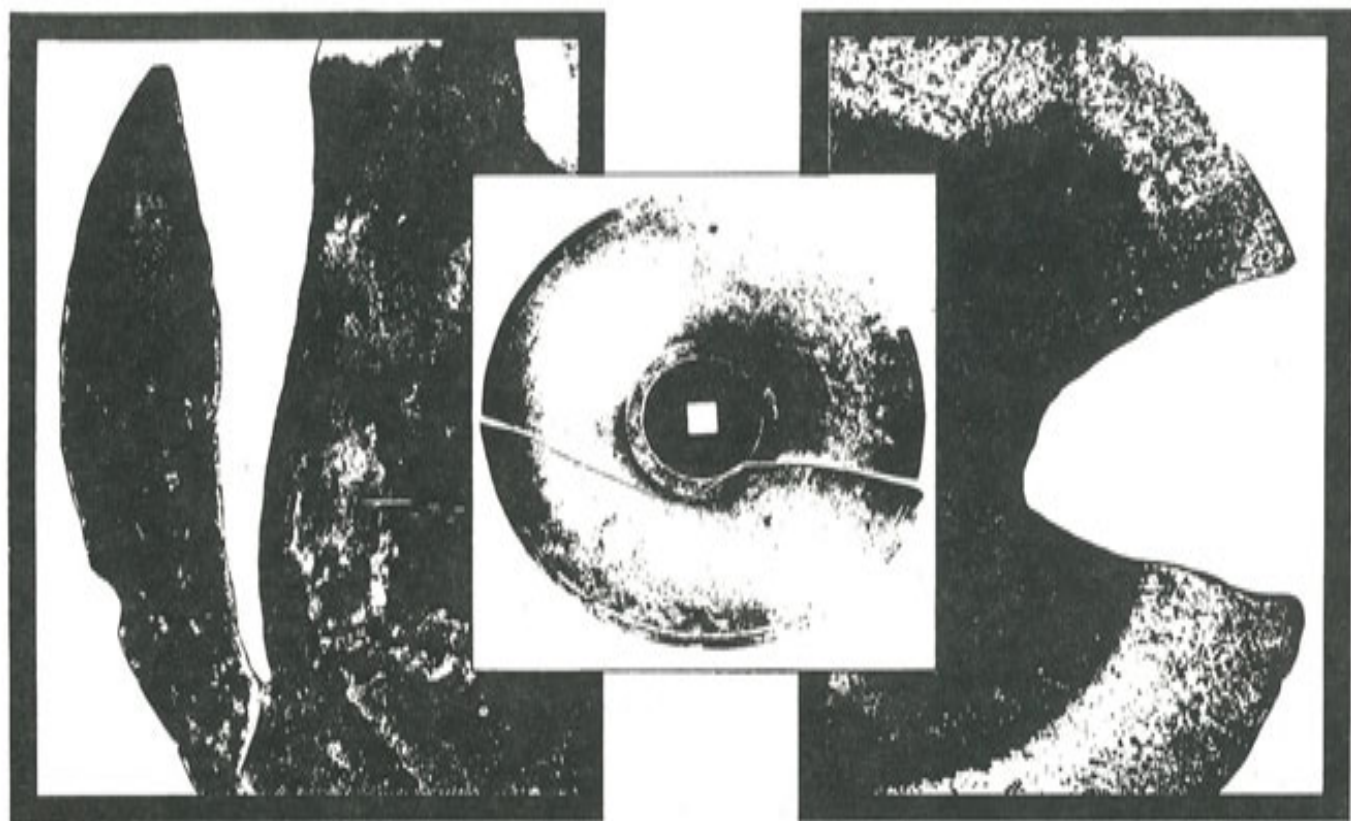


FIGURE 3, 4, 5 — Irregular breaks caused by contact against rocks or stumps. Not covered by warranty.



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



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