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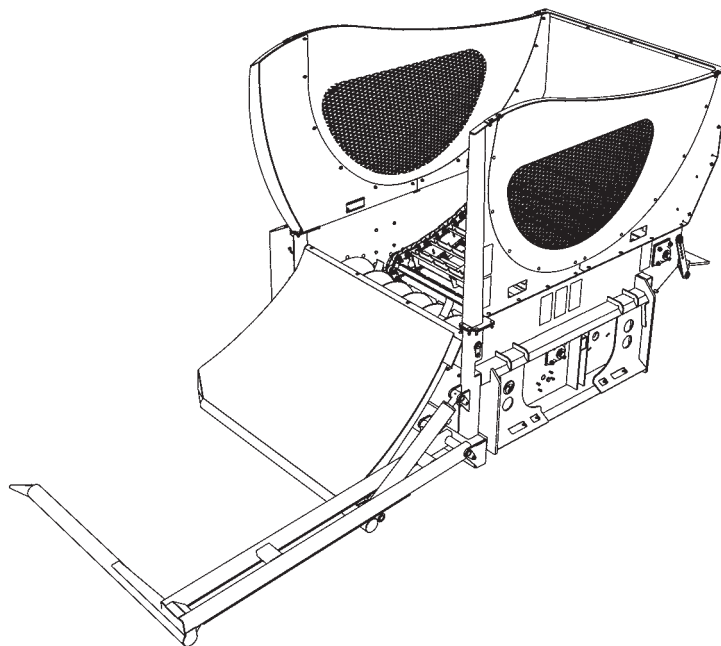
Parts Manual

Keep this manual with the machine at all times.



Bale Processor Boss R

4520



Do not attempt to operate this machine without thoroughly reviewing this manual for safe and proper operation.

Parts Manual

Thank you for choosing the Tubeline Boss R 4520 Bale Processor. We know that it will give you many years of productive service. This manual is to be used for identifying required replacement parts.

NOTE: Parts illustrations may vary slightly from actual machine.

Parts Manual Usage

This parts manual is used to order replacement parts by means of part breakdowns and their corresponding part lists. Each page contains a different range of integrated parts. Each illustration visually represents machine components. The part lists contain information needed to order replacement parts. Part lists include the following columns:

ITEM - Number matching parts breakdown balloons.

QTY - Quantity of components included in this breakdown, not entire machine.

PART NUMBER - The number to be used when placing an order.

DESCRIPTION - Term used to confirm its matching part number.

NOTE - Column may be added to part lists when a serial break or additional information is required.

Remember to always have your machine model and serial number on hand when ordering parts.

Part Orders

Part orders are taken by your local Tubeline dealer and fulfilled through a regional distributor. For quick service please record your dealer name and contact information in the *Serial Number* section.

Manuals

Parts manuals are printed and shipped with machines as they leave the manufacturer. Your machine may include parts or features not yet included in the initially shipped manual. The latest manual version can be found at www.tubeline.ca/support.php. Tubeline reserves the right to update and change manuals as seen fit. Dealers are informed of any pressing changes/ modifications. They can help you with any questions regarding replacement parts.

Serial Plate Location

Model No: _____ Boss R 4520

Serial No: _____

Date Purchased: _____

Dealer Name: _____

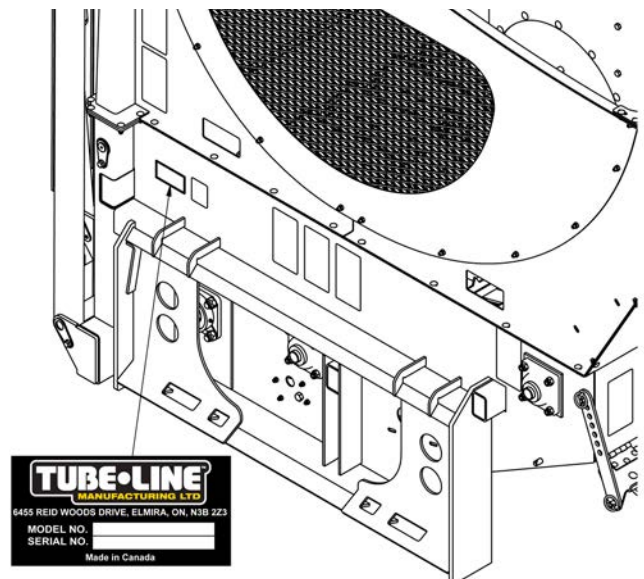
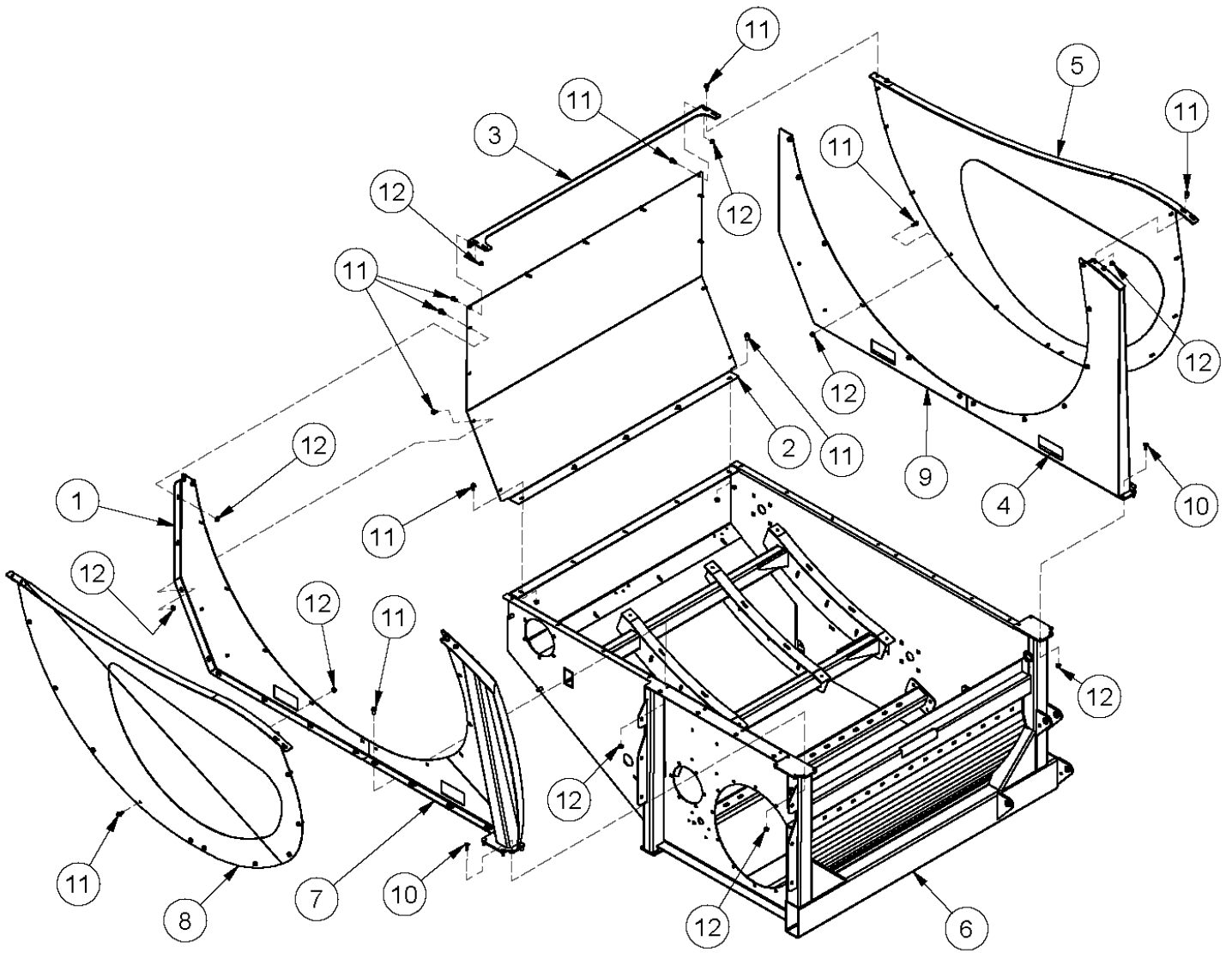


Table of Contents

| | |
|--|------------|
| Parts Manual | I |
| Parts Manual Usage | I |
| Part Orders | I |
| Manuals | I |
| Serial Plate Location | I |
| Section 1 - Part Breakdowns & Lists | 1-1 |
| Frame | 1-2 |
| Bed Chain | 1-4 |
| Bed Chain Sliders | 1-6 |
| Loading Arm | 1-8 |
| Deflector | 1-10 |
| Bed Dropout | 1-12 |
| Flail Drum | 1-14 |
| Flail Drum Assembly | 1-16 |
| Flail Drum Guards | 1-18 |
| Front Cover | 1-20 |
| Manifold Block | 1-22 |
| Hydraulic Schematic | 1-24 |
| Electrical Schematic | 1-26 |
| Section 2 - Torque Value Charts | 2-1 |
| Imperial Torque Values | 2-1 |
| Metric Torque Values | 2-2 |

Section 1 - Part Breakdowns & Lists

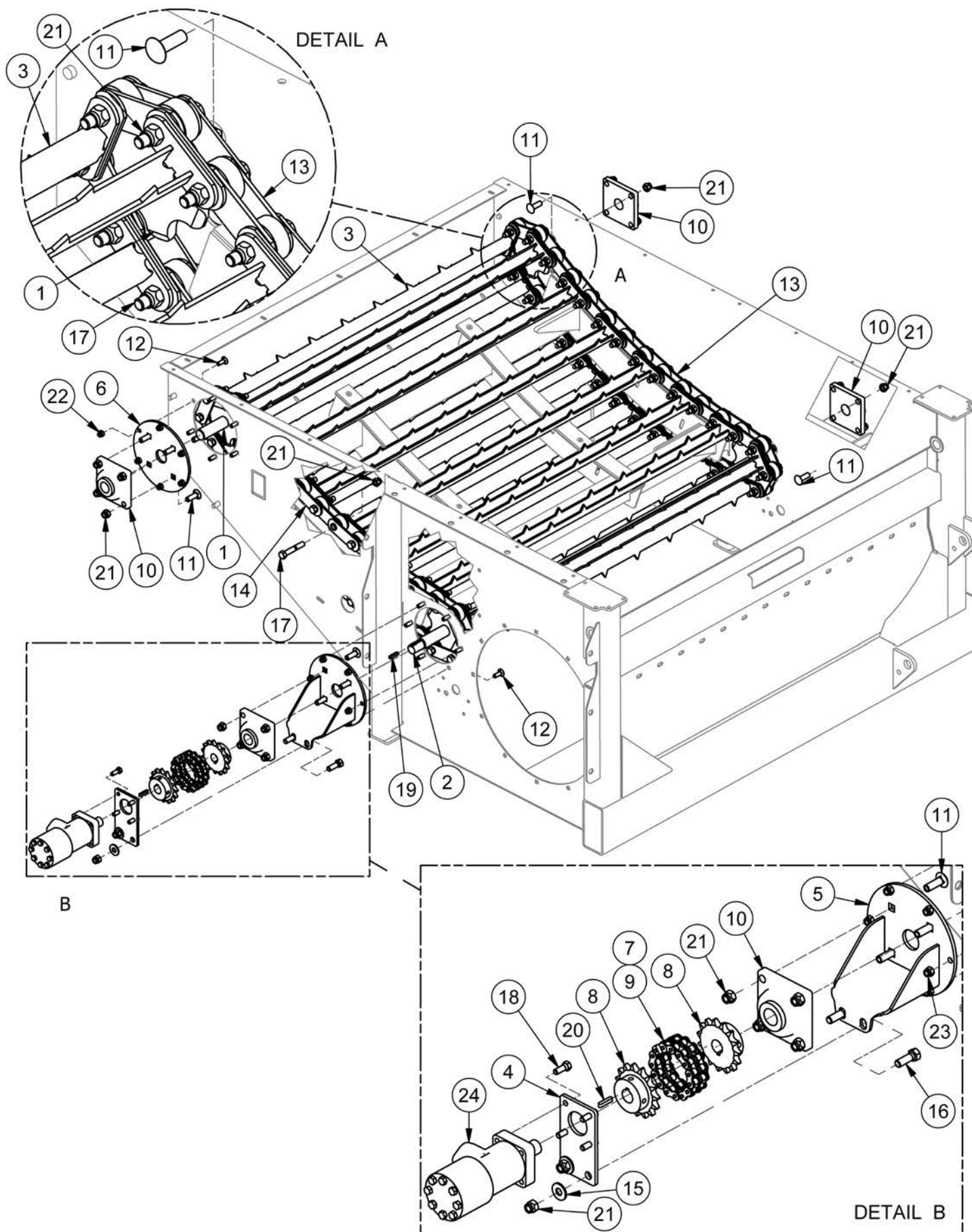
Frame



Frame

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------------|--|
| 1 | 1 | 37438 | Front Side Panel |
| 2 | 1 | 37461 | Right Panel |
| 3 | 1 | 37463 | Right Top Cross Member |
| 4 | 1 | 37491 | Rear Corner Post |
| 5 | 1 | 37494 | Rear Side Shield |
| 6 | 1 | 37499 | Main Frame |
| 7 | 1 | 40239 | Front Angled Corner Post |
| 8 | 1 | 41524 | Front Side Shield |
| 9 | 1 | 41586 | Rear Side Panel |
| 10 | 10 | CB 5/16-18X1.0 Z5 | Carriage Bolt - 5/16-18 x 1" Zinc Plated Grade 5 |
| 11 | 59 | HBC516X34 | Hex Bolt Cerrated |
| 12 | 69 | HNC516 | Hex Nut Cerrated |

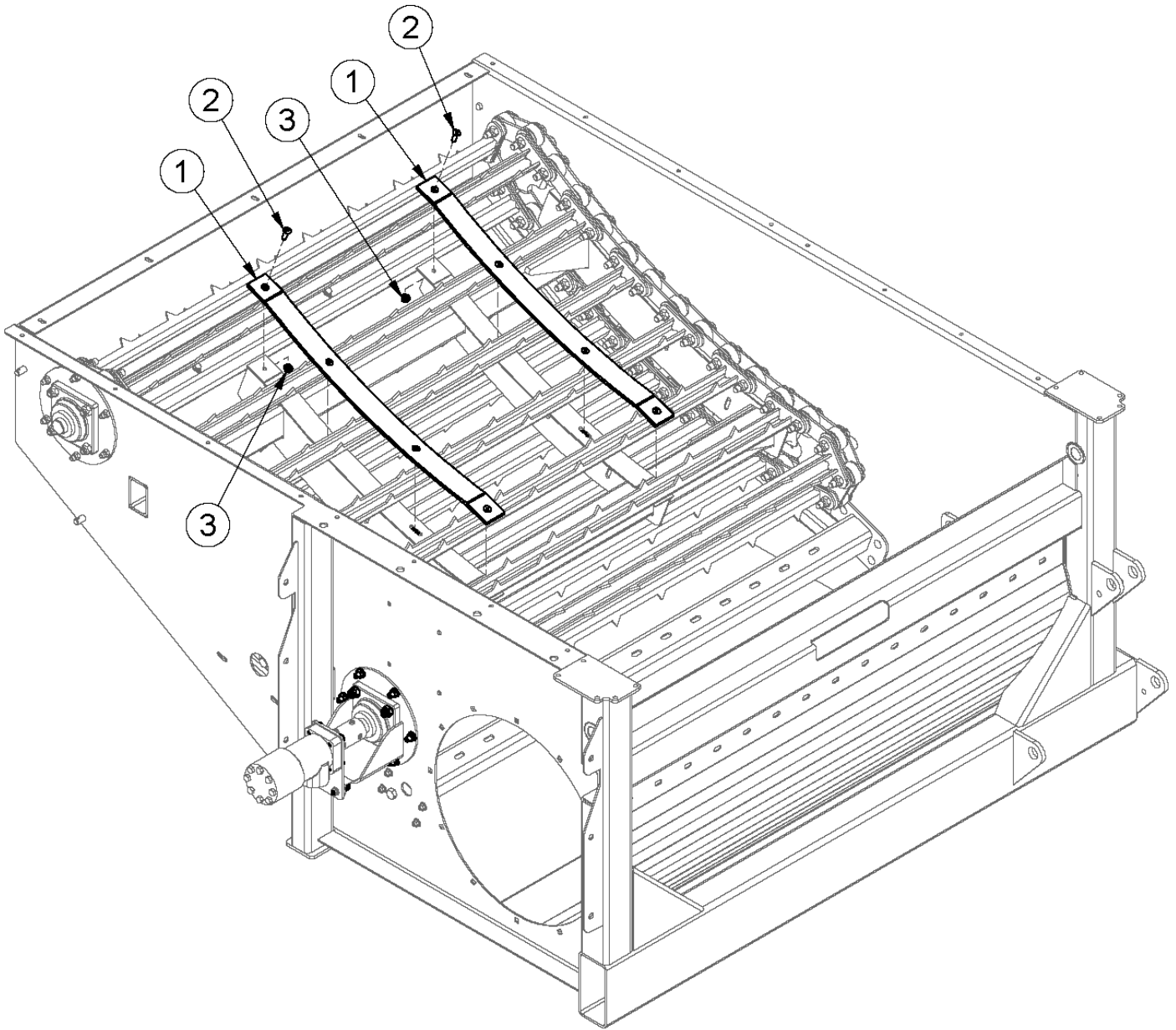
Bed Chain



Bed Chain

| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|----------|-----------------|--|---------------|
| 1 | 1 | 36101 | Bed Idler Shaft | |
| 2 | 1 | 36102 | Bed Drive Shaft | |
| 3 | 15 | 36103 | Slat Boss R | |
| 4 | 1 | 37486 | Moter MT. | |
| 5 | 1 | 37488 | Apron Motor Mount | |
| 6 | 1 | 39610 | Bearing Mount | |
| 7 | 1 | 50213 | Apron Chain Coupler | Inc Items 8,9 |
| 8 | 2 | SPR60B15-1 | Sprocket 60B15 1.0 Bore Idler 1/4 Keyway- 2 Set Screws | |
| 9 | 1 | SPR6015CC | Coupling Chain For SPR6015 | |
| 10 | 4 | BEA UCF207-20 | Flange Block, UCF207-20 National 4-Bolt, 1.25 ID | |
| 11 | 16 | CB1/2-13X1.5CZ5 | Carriage Bolt - 1/2-13 x 1 1/2" Grade 5 Zinc | |
| 12 | 12 | CB3/8-16X1CZ5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc | |
| 13 | 9ft/side | CHAIN ZC60 | Chain ZC60-76.2-ZP | |
| 14 | 2 | CHAIN ZC60-CON | Chain ZC60-76.2-ZP Connector | |
| 15 | 2 | FW 1/2 | Flatwasher - 1/2" Zinc Plated USS | |
| 16 | 2 | HB1/2-13X1.5Z5 | Hex Bolt 1/2-13x1 1/2 Gr 5 Zinc Plated Hex Cap Screw | |
| 17 | 60 | HB1/2-13X3Z5 | Hex Bolt 1/2-13x3 Grade 5 Zinc Plated Hex Cap Screw | |
| 18 | 4 | HB3/8-16X1Z5 | Hex Bolt 3/8-16x1 Grade 5 Zinc Plated Hex Cap Screw | |
| 19 | 1 | KS41536 | Keystock .25 x 1.25 | |
| 20 | 1 | KS41589 | 1/4 Keystock | |
| 21 | 78 | LN1/2-13NCZ5 | LN 1/2-13 Zinc Plated Nylon Insert Lock Nut | |
| 22 | 6 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut | |
| 23 | 6 | LN3/8-24NFZ5 | Center Locknuts (3/8-24) 2-Way Fine Thread | |
| 24 | 1 | VAL 1008 | Motor, Hydraulic - (BS208107A) | |

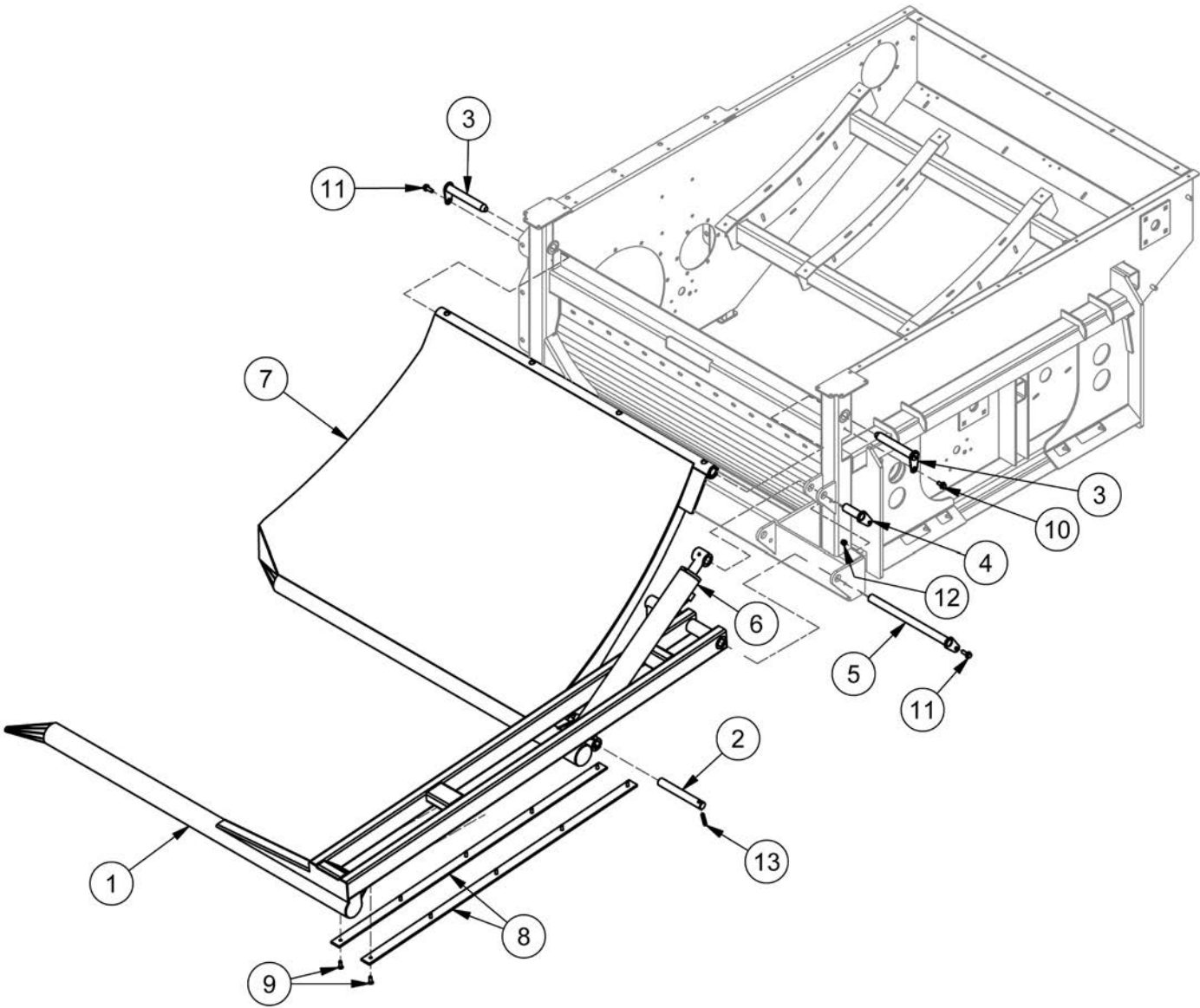
Bed Chain Sliders



Bed Chain Sliders

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|----------------------|--|
| 1 | 2 | 41541 | Bed Sliders |
| 2 | 8 | HB 5/16-18X1.0 FHSCS | Hex Bolt - 5/16-18 x 1" Zinc Plated Flat Head Socket Cap Screw |
| 3 | 8 | HNC516 | Hex Nut Cerrated |

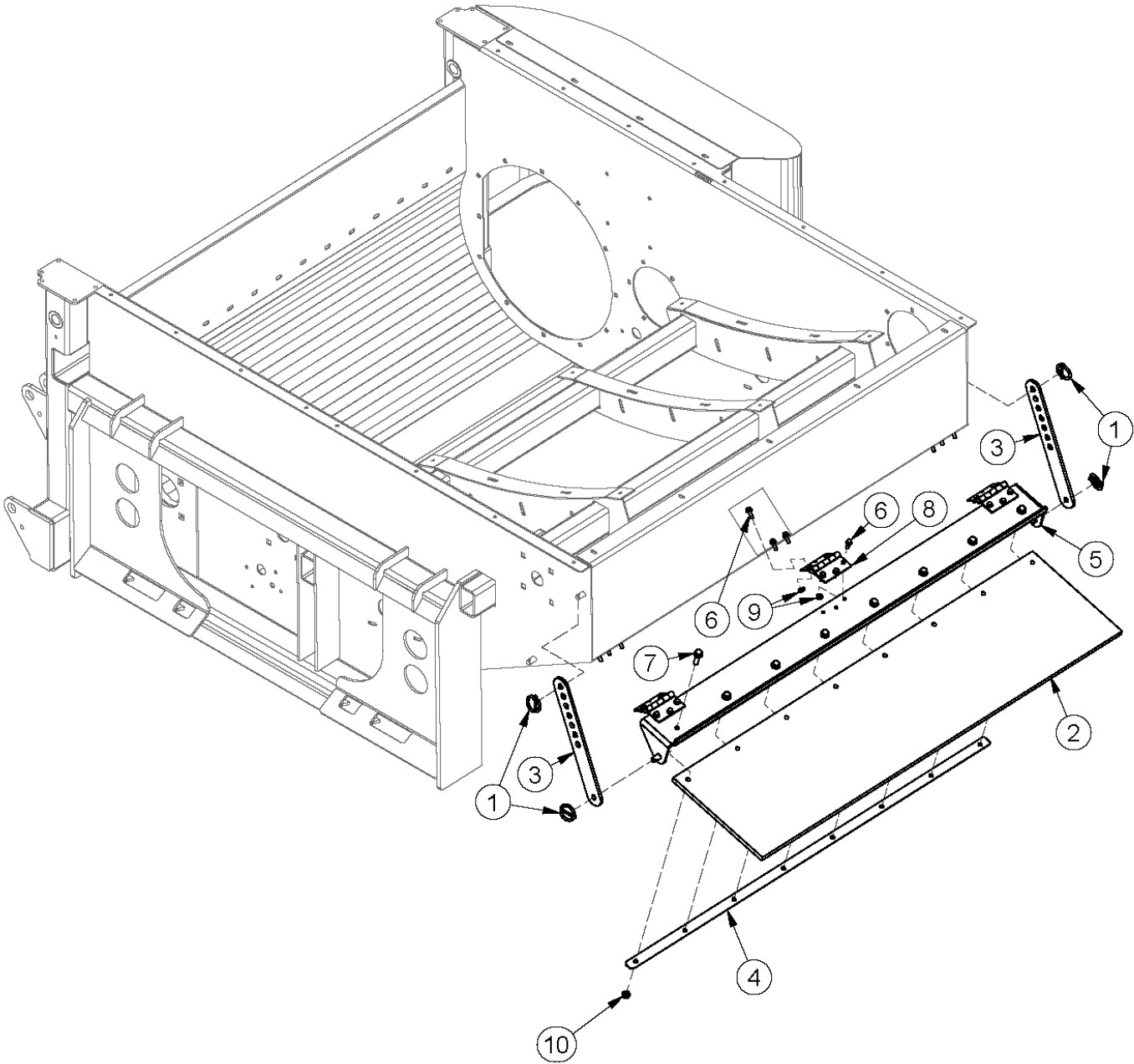
Loading Arm



Loading Arm

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|----------------|---|
| 1 | 1 | 37422 | Outside Loading Arm |
| 2 | 1 | 37474 | Loading Arm Pin |
| 3 | 2 | 37489 | Loading Cradle Pin |
| 4 | 1 | 37497 | Cylinder Pin |
| 5 | 1 | 37498 | Loading Arm Pin |
| 6 | 1 | 39628 | 2-1/2" Bore x 20" Stroke |
| 7 | 1 | 40989 | Inside Loading Arm |
| 8 | 2 | 41540 | Loading Arm Slide |
| 9 | 10 | FHSCS5/16-18X1 | Hex Bolt - 5/16"-18 x 1" Flat Socket Cap Screw |
| 10 | 1 | HBC3/8X0.75 | Hex Bolt Cerrated 3/8-16 x 3/4 Zinc Flange Bolt |
| 11 | 2 | HBC3/8X1 | Hex Bolt Cerrated 3/8-16 x 1 Zinc Flange Bolt |
| 12 | 1 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |
| 13 | 1 | RP 3/8 x 2 | Pin - Roll Pin 3/8 x 2 |

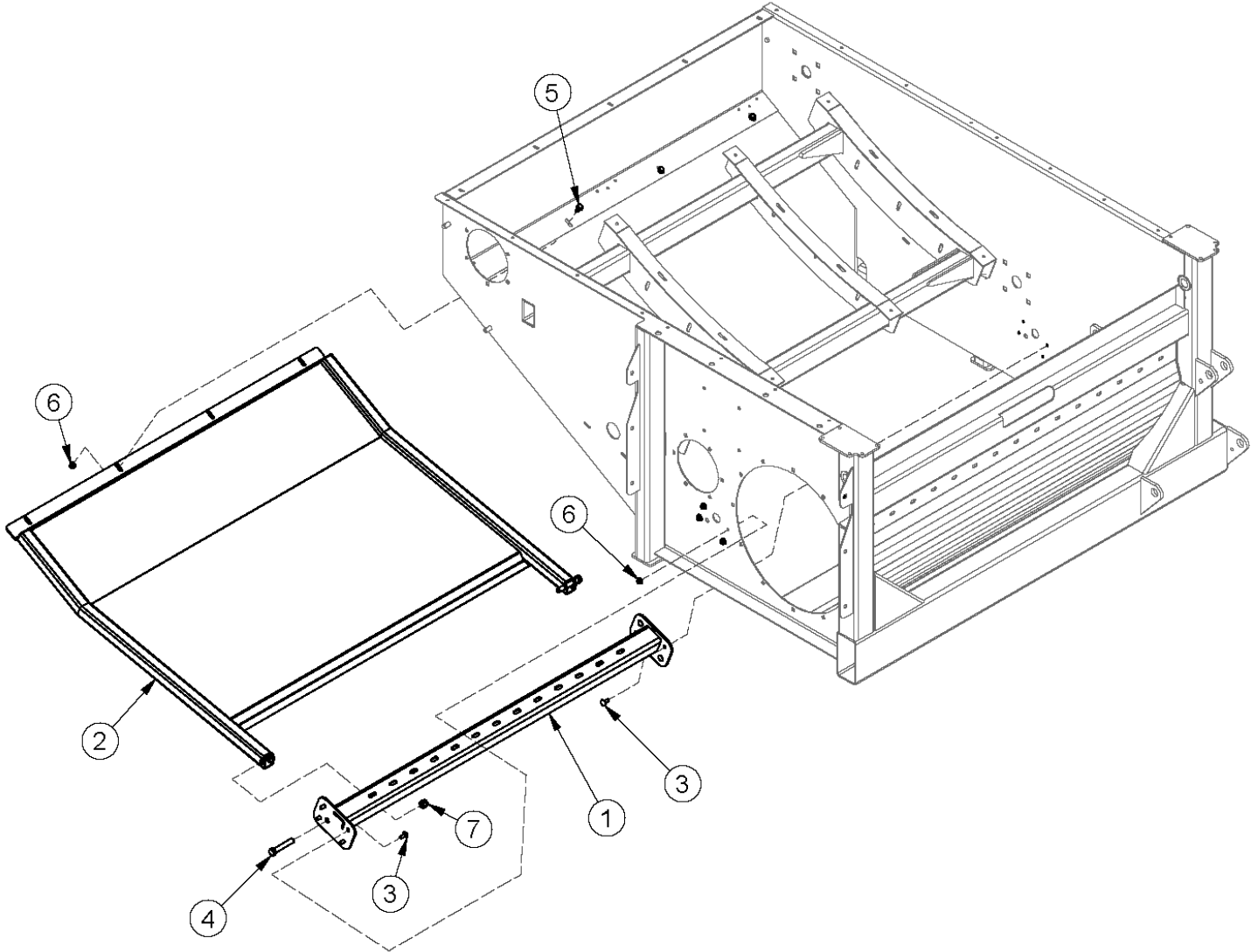
Deflector



Deflector

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|---------------|---|
| 1 | 4 | 25680 | Lynch Pin 3/16 x 1.5 |
| 2 | 1 | 39354 | Rubber Deflector |
| 3 | 2 | 39356 | Deflector Link |
| 4 | 1 | 39358 | Deflector Strip |
| 5 | 1 | 40237 | Deflector |
| 6 | 18 | HBC14X34 | Hex Bolt - 1/4-20 x 3/4 Grade 8.2 Zinc Flange Bolt SAE |
| 7 | 8 | HBC38X114 | Hex Bolt Cerrated - 3/8-16 x 1-1/4 Case Hardened Zinc Flange Bolt |
| 8 | 3 | HIN 3.5 X 3.5 | Hinge - 3 1/2 x 3 1/2 Butt Hinge - Plain Weldable |
| 9 | 18 | HNC14 | Hex Nut Cerrated |
| 10 | 8 | HNC38 | Hex Nut Cerrated |

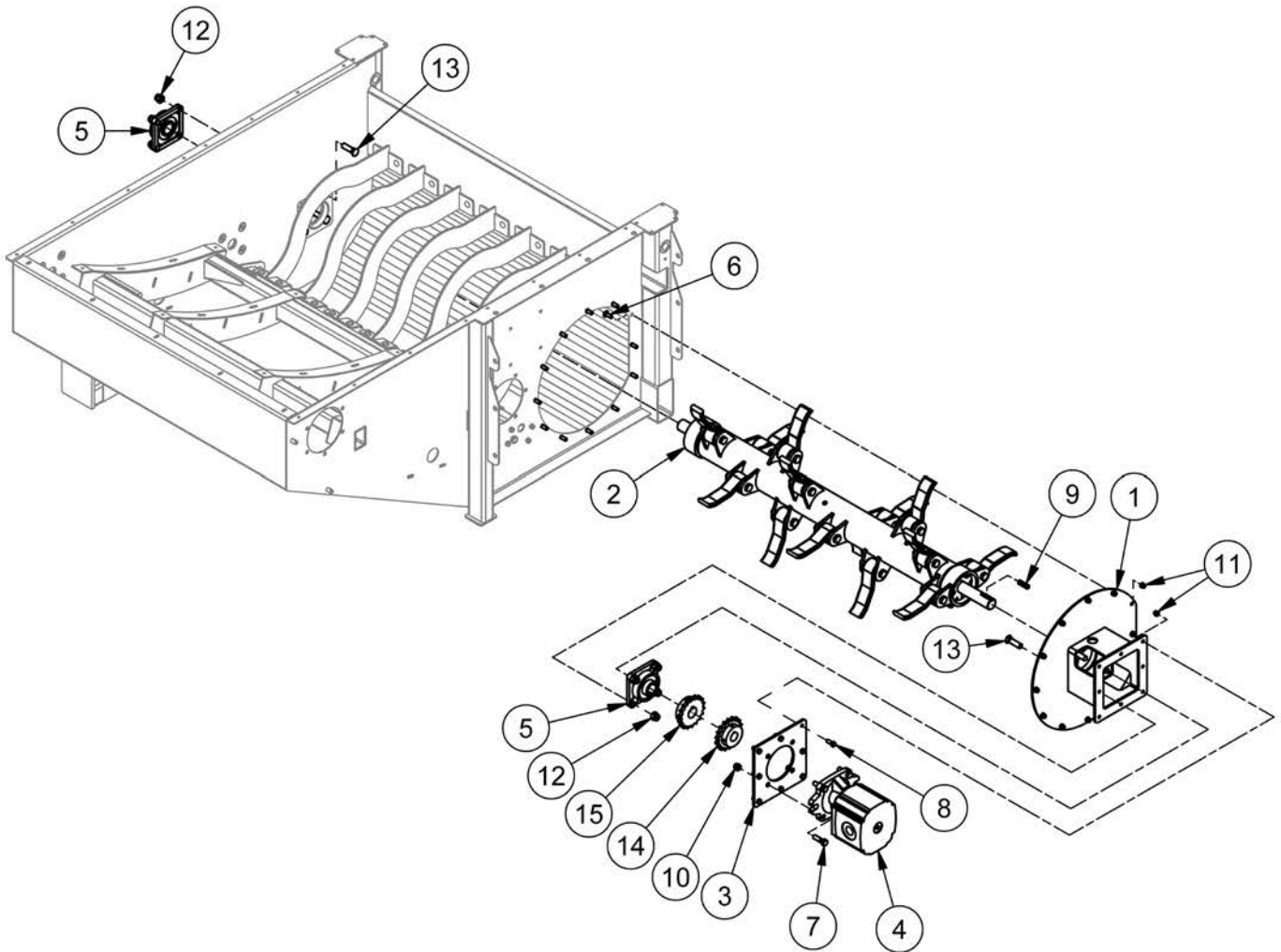
Bed Dropout



Bed Dropout

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|--------------------|---|
| 1 | 1 | 36111 | Bottem MT. for Retainer Bars |
| 2 | 1 | 39629 | Bottom Pan |
| 3 | 8 | CB 5/16-18X 3/4 Z5 | Carriage Bolt - 5/16-18 x 3/4" Zinc Plated Grade 5 |
| 4 | 2 | HB 1/2-13X3.0 Z5 | Hex Bolt 1/2-13 x 3" Grade 5 Zinc Plated Hex Cap Screw NC |
| 5 | 4 | HBC516X34 | Hex Bolt Cerrated |
| 6 | 8 | HNC516 | Hex Nut Cerrated |
| 7 | 8 | LN 1/2 N | Locknuts - 1/2-13 Zinc Plated Nylon Insert Lock Nut |

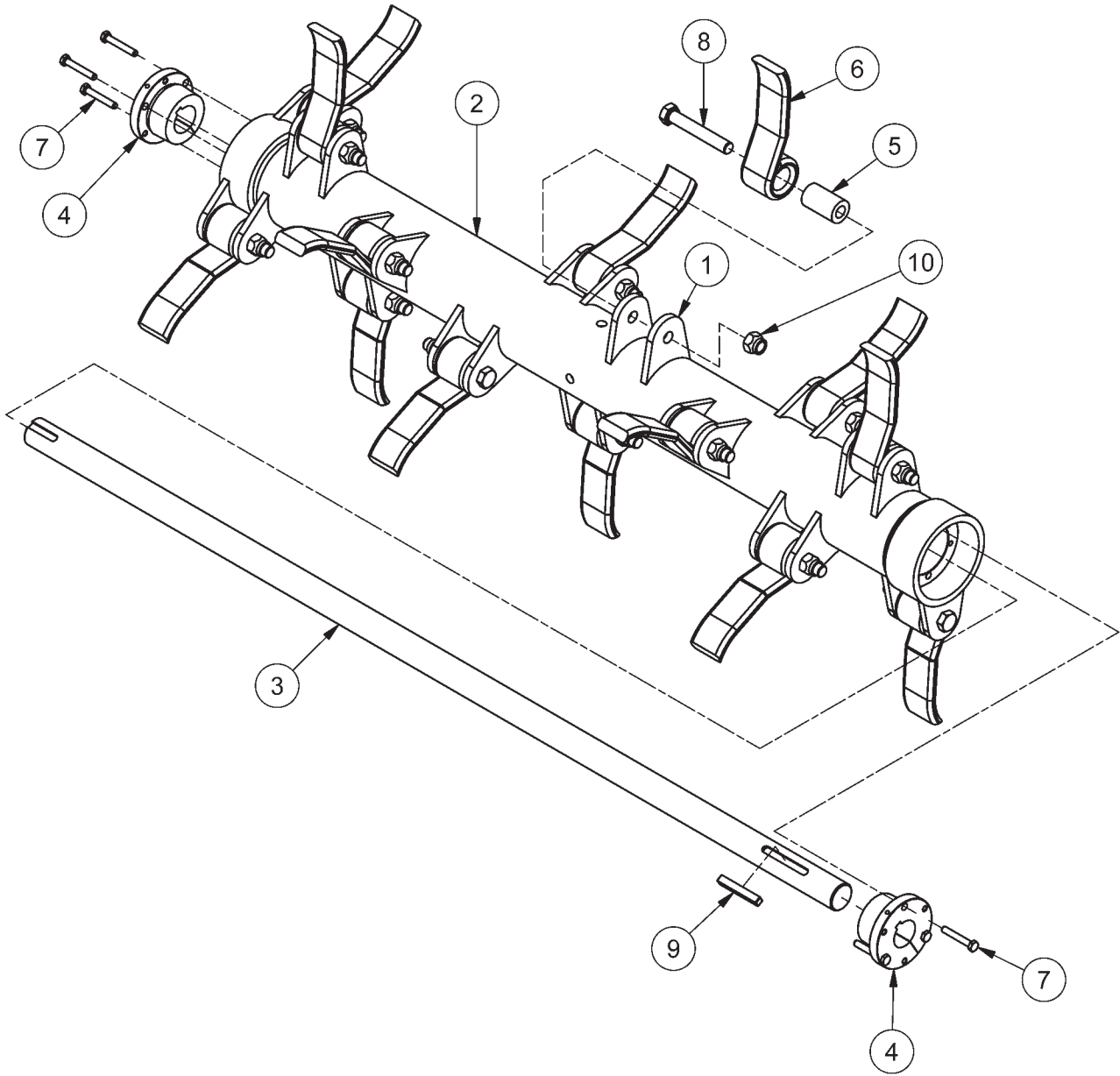
Flail Drum



Flail Drum

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-----------------|---|
| 1 | 1 | 37496 | Flail Housing Mount |
| 2 | 1 | 39603 | Flail Drum Assembly |
| 3 | 1 | 39611 | Cassapa Moter Mount |
| 4 | 1 | 40580 | Beater Motor |
| 5 | 2 | BEA UCF208-24R3 | Bearing -Triple Seal- Ductile Iron |
| 6 | 12 | CB3/8-16X1CZ5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc |
| 7 | 4 | HB1/2-13X1.75Z5 | Hex Bolt 1/2-13x1 3/4 Grade 5 Zinc Plated Hex Cap Screw |
| 8 | 8 | HB3/8-16X1Z5 | Hex Bolt 3/8-16x1 Grade 5 Zinc Plated Hex Cap Screw |
| 9 | 1 | KS41537 | Keystock 3/8 X 3/8 |
| 10 | 6 | LN1/2-13NCZ5 | LN 1/2-13 Zinc Plated Nylon Insert Lock Nut |
| 11 | 20 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |
| 12 | 8 | LN5/8-11NCZ5 | LN 5/8-11 Zinc Plated Nylon Insert Lock Nut |
| 13 | 8 | PB 5/8-11X2.25 | Plow Bolts - 5/8-11 x 2 1/4 Flat Head Gr.5 |
| 14 | 1 | SPR60B18-1.25 | 60B18 Sprocket w/1.25 Bore 5/16 kwy |
| 15 | 1 | SPR60B18-1.5 | 60B18 Sprocket w/1.5 Bore 3/8 kwy |

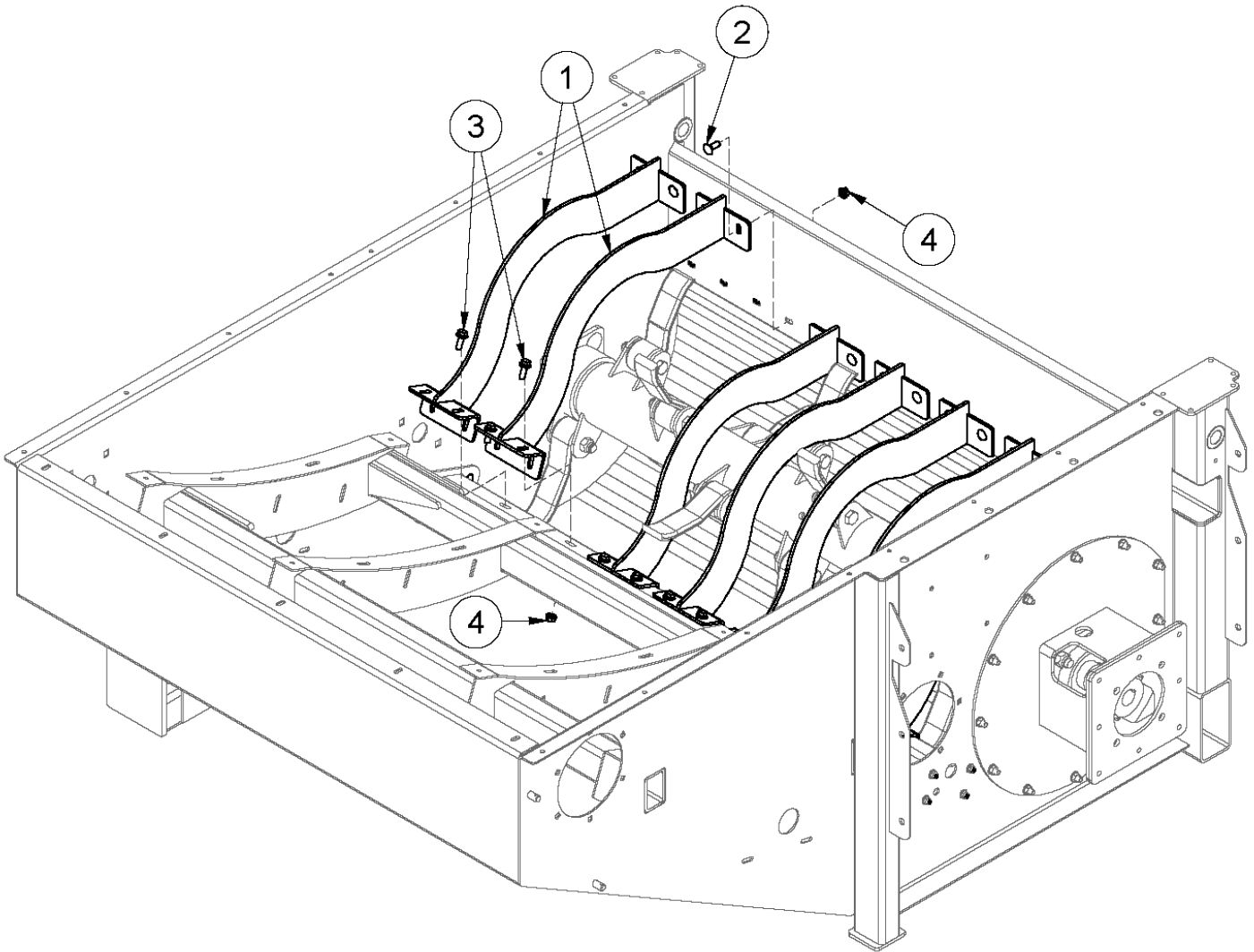
Flail Drum Assembly



Flail Drum Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------------|--|
| 1 | 32 | 30070 | Flail Mount Lug |
| 2 | 1 | 39601 | Flail Drum Weldment |
| 3 | 1 | 39604 | Drum Shaft |
| 4 | 2 | BS BUSK-1.5 | SK Taper Lock Bush 1 1/2 |
| 5 | 16 | BS SAW200059 | Flail Bushing |
| 6 | 16 | BS200060A-1 | Hammers, Heavy for Boss Shredder - 7/16 Material |
| 7 | 6 | HB5/16-18X2.0TCZ8 | Hex Bolt 5/16-18X2 Hex Tap Bolt Ful Thrd Gr8 Zinc Yellow |
| 8 | 16 | HB5/8-18X4YZ8 | Hex Bolt 5/8-18x4 Grade 8 Zinc Hex Cap Screw |
| 9 | 1 | KS41594 | Keystock .375 x .375 x 2.75 |
| 10 | 16 | LN5/8-18NFZ2 | Locknut - 5/8-18 Zinc Plated Nylon Insert Lock Nut |

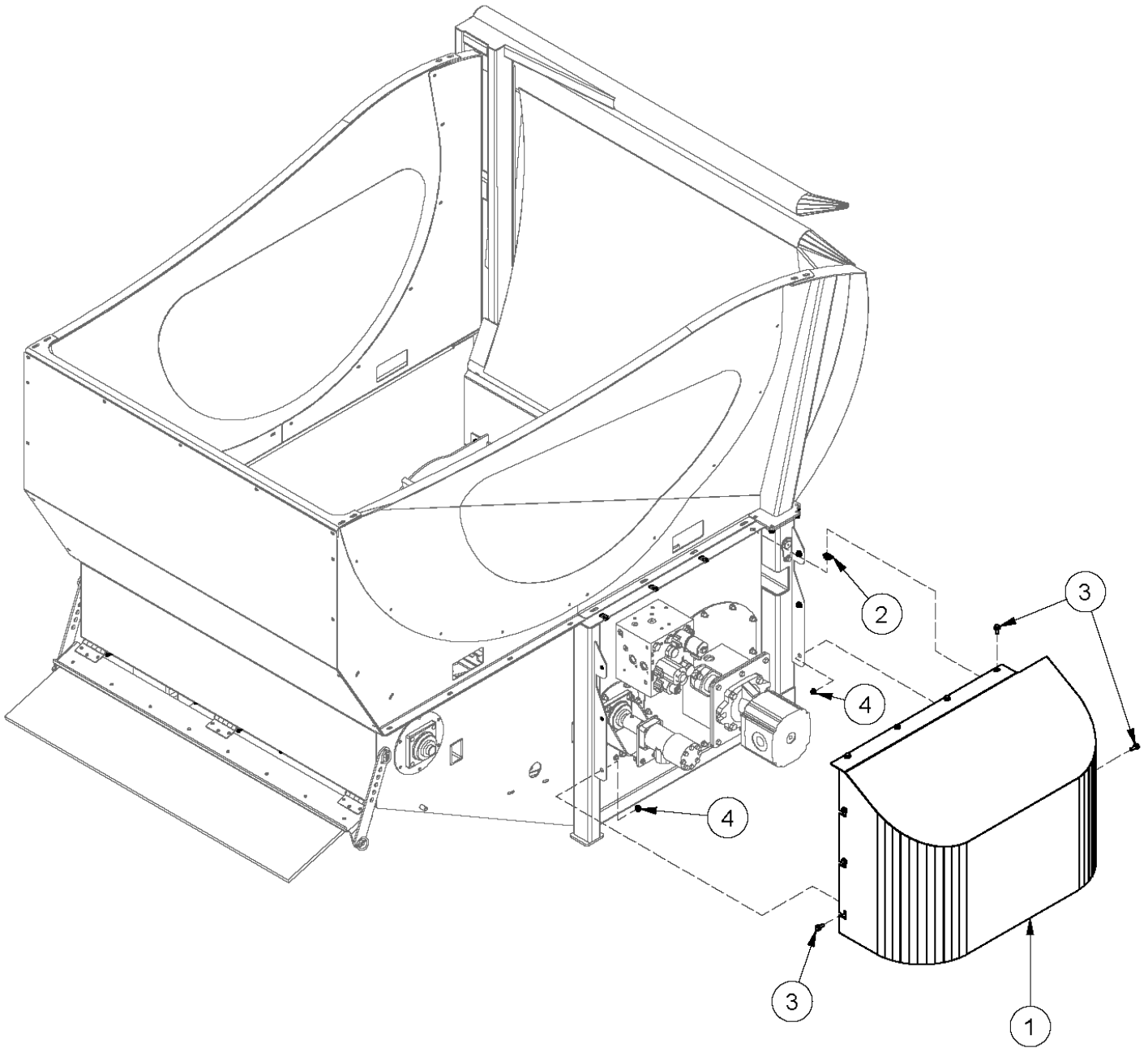
Flail Drum Guards



Flail Drum Guards

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|-------------|------------|--------------------|--|
| 1 | 7 | 36106 | Restrictor Bars |
| 2 | 38 | CB 3/8-16X1.0 Z5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc |
| 3 | 15 | HBC38X1 | Hex Bolt Cerrated |
| 4 | 53 | HNC38 | Hex Nut Cerrated |

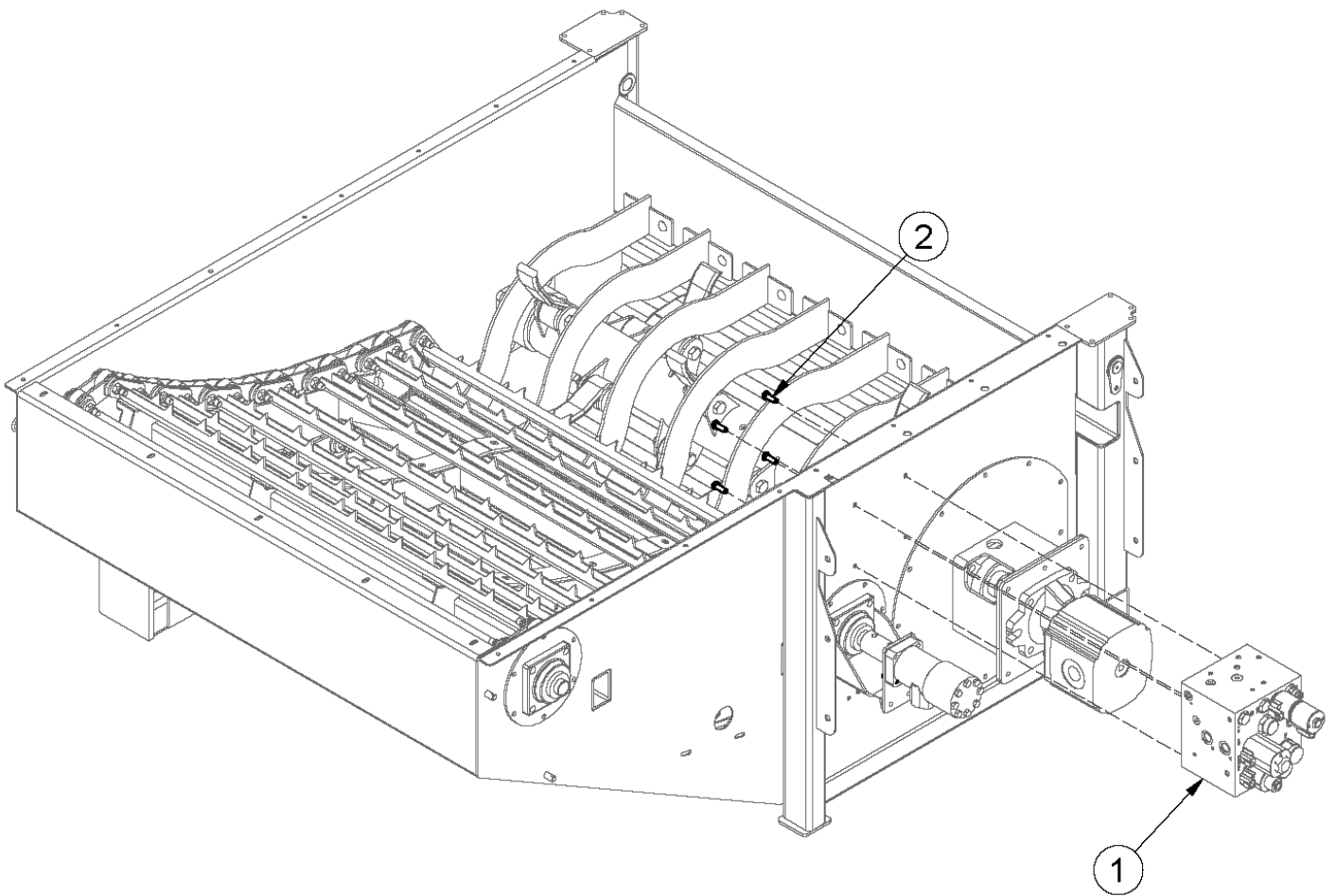
Front Cover



Front Cover

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|-------------|------------|--------------------|---------------------------------|
| 1 | 1 | 37495 | Front Cover |
| 2 | 4 | HNP 5/16 | Panel Nut - 5/16" U-Type Spring |
| 3 | 10 | HBC516X34 | Hex Bolt Cerrated |
| 4 | 4 | HNC516 | Hex Nut Cerrated |

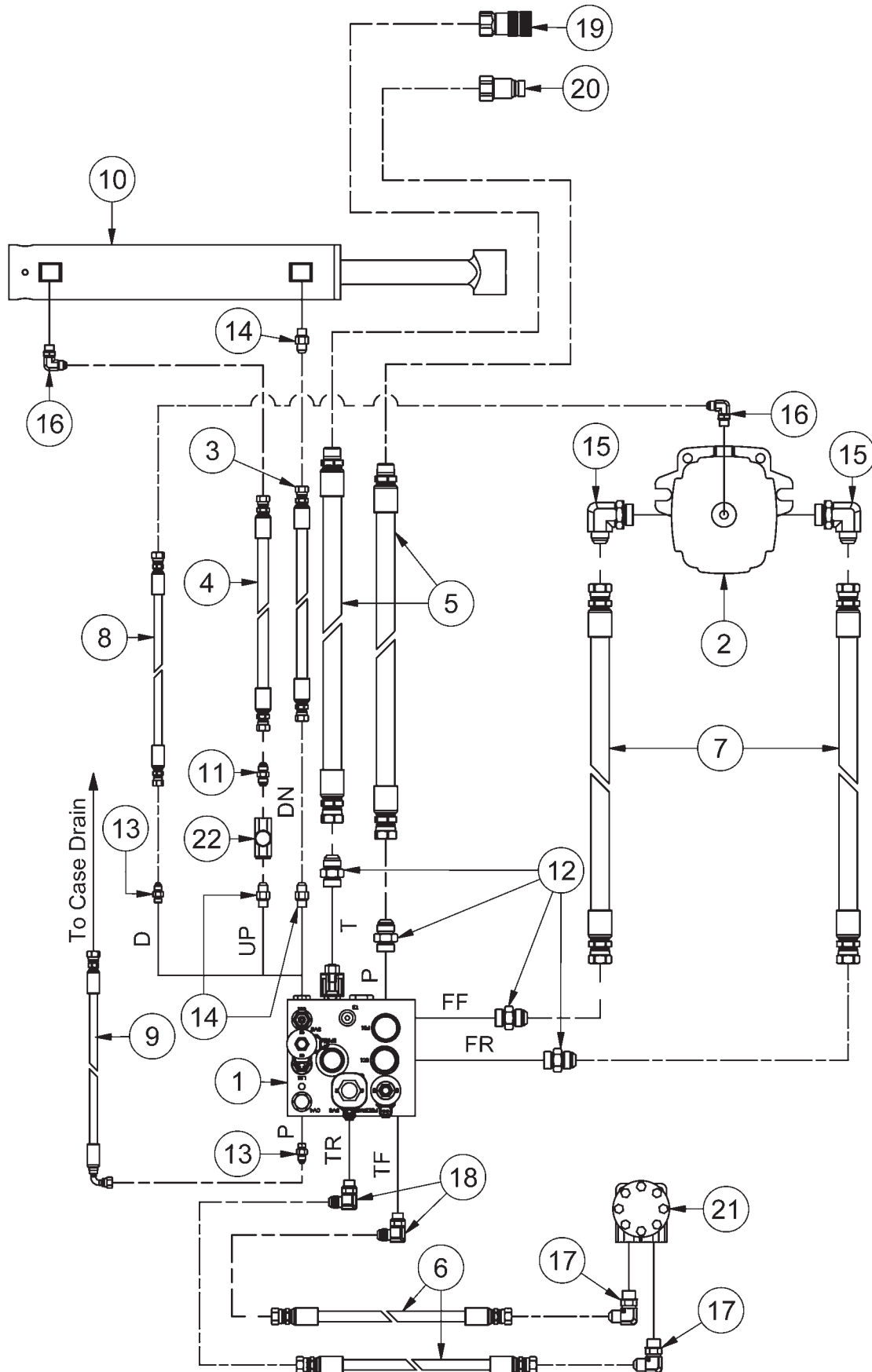
Manifold Block



Manifold Block

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|-------------|------------|--------------------|---|
| 1 | 1 | 37835 | Manifold |
| 2 | 4 | HB 3/8-16X1.0 Z5 | Hex Bolt 3/8-16 x 1" Grade 5 Zinc Plated Hex Cap Screw NC |

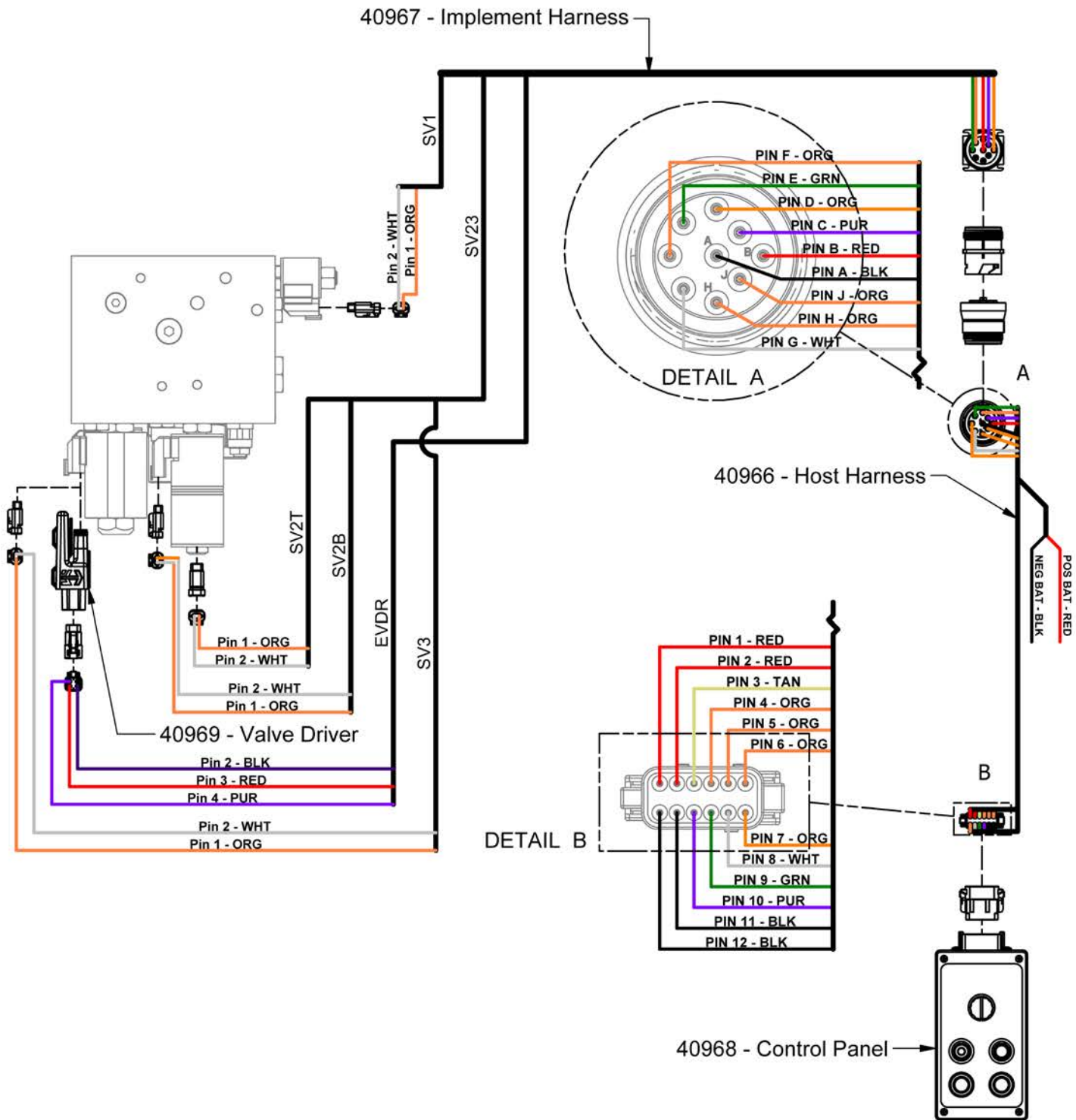
Hydraulic Schematic



Hydraulic Schematic

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|----------------|--|
| 1 | 1 | 37835 | Manifold |
| 2 | 1 | 40580 | Beater Motor |
| 3 | 1 | 41426 | HH112 - 6AT1(6FJIC,6FJIC) HCL112" |
| 4 | 1 | 41427 | HH130- 6AT1(6FJIC,6FJIC) HCL130" |
| 5 | 2 | 41428 | HH156 - 12AT1(12FJXH,12MP) HCL 156" |
| 6 | 2 | 41429 | HH19- 6AT1(8FJIC,8FJIC) HCL19" |
| 7 | 2 | 41430 | HH29 - 12AT1(12FJXH,12FJXH) HCL 29" |
| 8 | 1 | 41431 | HH29 - 4AT1(4FJX,6FJX) HCL 29" |
| 9 | 1 | 50056 | Hose - HH174 - 4AT1(6FJX,4FJX90S) HCL 174" |
| 10 | 1 | CYL39628 | Hydraulic Cylinder |
| 11 | 1 | HF 2403-6-6 | FJIC- MJIC Reducer |
| 12 | 4 | HF 6400-12-12 | Hyd. Fitting O-Ring to JIC Adapter, Male JIC to 3/4" Male BSPP |
| 13 | 2 | HF 6400-4-4 | Hyd Fitting - Male JIC - Male ORB |
| 14 | 3 | HF 6400-6-6 | Hyd Fitting |
| 15 | 2 | HF 6801-12-16 | Forged Fitting - JIC x SAE 90 Deg. Elbow |
| 16 | 2 | HF 6801-6-6 | Hyd. Fitting 90 Deg.0-Ring to JIC |
| 17 | 2 | HF 6801-8-10 | Hyd. Fitting -1/2" JIC - 5/8" 90 Degree Elbow |
| 18 | 2 | HF 6801-8-8 | Hyd. Fitting- 1/2" JIC- 1/2" SAE 90 Deg Elbow |
| 19 | 1 | HF QCFF-1 | Quickcoupler 3/4" Flat Face Pipe -Female |
| 20 | 1 | HF QCFF-2 | Quickcoupler 3/4" Flat Face Pipe -Male |
| 21 | 1 | VAL 1008 | Motor, Hydraulic - (BS208107A) |
| 22 | 1 | VAL FT-03-2090 | Flow Control Valve |



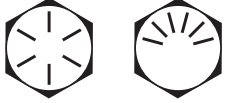



Electrical Schematic



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Section 2 - Torque Value Charts

Imperial Torque Values

| | | | | |
|-----------------------------|---------|--|---|---|
| SAE Grade and Head Markings | NO MARK | 1 or 2 ^b  | 5 5.1 5.2  | 8 8.2  |
| SAE Grade and Nut Markings | NO MARK | 2  | 5  | 8  |

| Size | Grade 1 | | | | Grade 2 ^b | | | | Grade 5, 5.1, or 5.2 | | | | Grade 8 or 8.2 | | | |
|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|
| | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | |
| | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft |
| 1/4 | 3.7 | 2.8 | 4.7 | 3.5 | 6 | 4.5 | 7.5 | 5.5 | 9.5 | 7 | 12 | 9 | 13.5 | 10 | 17 | 12.5 |
| 5/16 | 7.7 | 5.5 | 10 | 7 | 12 | 9 | 15 | 11 | 20 | 15 | 25 | 18 | 28 | 21 | 35 | 26 |
| 3/8 | 14 | 10 | 17 | 13 | 22 | 16 | 27 | 20 | 35 | 26 | 44 | 33 | 50 | 36 | 63 | 46 |
| 7/16 | 22 | 16 | 28 | 20 | 35 | 26 | 44 | 32 | 55 | 41 | 70 | 52 | 80 | 58 | 100 | 75 |
| 1/2 | 33 | 25 | 42 | 31 | 53 | 39 | 67 | 50 | 85 | 63 | 110 | 80 | 120 | 90 | 150 | 115 |
| 9/16 | 48 | 36 | 60 | 45 | 75 | 56 | 95 | 70 | 125 | 90 | 155 | 115 | 175 | 130 | 225 | 160 |
| 5/8 | 67 | 50 | 85 | 62 | 105 | 78 | 135 | 100 | 170 | 125 | 215 | 160 | 240 | 175 | 300 | 225 |
| 3/4 | 120 | 87 | 150 | 110 | 190 | 140 | 240 | 175 | 300 | 225 | 375 | 280 | 425 | 310 | 550 | 400 |
| 7/8 | 190 | 140 | 240 | 175 | 190 | 140 | 240 | 175 | 490 | 360 | 625 | 450 | 700 | 500 | 875 | 650 |
| 1 | 290 | 210 | 360 | 270 | 290 | 210 | 360 | 270 | 725 | 540 | 925 | 675 | 1050 | 750 | 1300 | 975 |
| 1-1/8 | 400 | 300 | 510 | 375 | 400 | 300 | 510 | 375 | 900 | 675 | 1150 | 850 | 1450 | 1075 | 1850 | 1350 |
| 1-1/4 | 570 | 425 | 725 | 530 | 570 | 425 | 725 | 530 | 1300 | 950 | 1650 | 1200 | 2050 | 1500 | 2600 | 1950 |
| 1-3/8 | 750 | 550 | 950 | 700 | 750 | 550 | 950 | 700 | 1700 | 1250 | 2150 | 1550 | 2700 | 2000 | 3400 | 2550 |
| 1-1/2 | 1000 | 725 | 1250 | 925 | 990 | 725 | 1250 | 930 | 2250 | 1650 | 2850 | 2100 | 3600 | 2650 | 4550 | 3350 |

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

^b Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

Metric Torque Values

| | | | | | | | | | | |
|----------------------------------|-----|--|-----|--|-----|--|------|--|------|--|
| Property Class and Head Markings | 4.8 | | 8.8 | | 9.8 | | 10.9 | | 12.9 | |
| | | | | | | | | | | |
| Property Class and Nut Markings | 5 | | 10 | | 10 | | 10 | | 12 | |
| | | | | | | | | | | |

| Size | Class 4.8 | | | | Class 8.8 or 9.8 | | | | Class 10.9 | | | | Class 12.9 | | | |
|------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|
| | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | |
| | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft |
| M6 | 4.8 | 3.5 | 6 | 4.5 | 9 | 6.5 | 11 | 8.5 | 13 | 9.5 | 17 | 12 | 15 | 11.5 | 19 | 14.5 |
| M8 | 12 | 8.5 | 15 | 11 | 22 | 16 | 28 | 20 | 32 | 24 | 40 | 30 | 37 | 28 | 47 | 35 |
| M10 | 23 | 17 | 29 | 21 | 43 | 32 | 55 | 40 | 63 | 47 | 80 | 60 | 75 | 55 | 95 | 70 |
| M12 | 40 | 29 | 50 | 37 | 75 | 55 | 95 | 70 | 110 | 80 | 140 | 105 | 130 | 95 | 165 | 120 |
| M14 | 63 | 47 | 80 | 60 | 120 | 88 | 150 | 110 | 175 | 130 | 225 | 165 | 205 | 150 | 260 | 190 |
| M16 | 100 | 73 | 125 | 92 | 190 | 140 | 240 | 175 | 275 | 200 | 350 | 255 | 320 | 240 | 400 | 300 |
| M18 | 135 | 100 | 175 | 125 | 260 | 195 | 330 | 250 | 375 | 275 | 475 | 350 | 440 | 325 | 560 | 410 |
| M20 | 190 | 140 | 240 | 180 | 375 | 275 | 475 | 350 | 530 | 400 | 675 | 500 | 625 | 460 | 800 | 580 |
| M22 | 260 | 190 | 330 | 250 | 510 | 375 | 650 | 475 | 725 | 540 | 925 | 675 | 850 | 625 | 1075 | 800 |
| M24 | 330 | 250 | 425 | 310 | 650 | 475 | 825 | 600 | 925 | 675 | 1150 | 850 | 1075 | 800 | 1350 | 1000 |
| M27 | 490 | 360 | 625 | 450 | 950 | 700 | 1200 | 875 | 1350 | 1000 | 1700 | 1250 | 1600 | 1150 | 2000 | 1500 |
| M30 | 675 | 490 | 850 | 625 | 1300 | 950 | 1650 | 1200 | 1850 | 1350 | 2300 | 1700 | 2150 | 1600 | 2700 | 2000 |
| M33 | 900 | 675 | 1150 | 850 | 1750 | 1300 | 2200 | 1650 | 2500 | 1850 | 3150 | 2350 | 2900 | 2150 | 3700 | 2750 |
| M36 | 1150 | 850 | 1450 | 1075 | 2250 | 1650 | 2850 | 2100 | 3200 | 2350 | 4050 | 3000 | 3750 | 2750 | 4750 | 3500 |

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

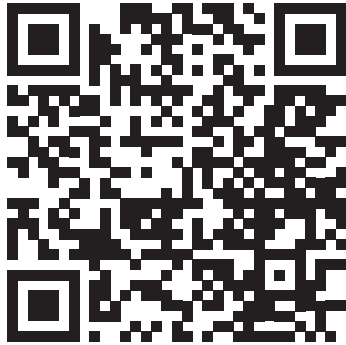
Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

Index

| | |
|----------------------------------|------|
| Bed Chain | .1-4 |
| Bed Chain Sliders | .1-6 |
| Bed Dropout | 1-12 |
| Deflector | 1-10 |
| Electrical Schematic | 1-26 |
| Flail Drum | 1-14 |
| Flail Drum Assembly | 1-16 |
| Flail Drum Guards | 1-18 |
| Frame | .1-2 |
| Front Cover | 1-20 |
| Hydraulic Schematic | 1-24 |
| Imperial Torque Values | .2-1 |
| Loading Arm | .1-8 |
| Manifold Block. | 1-22 |
| Manuals | . |
| Metric Torque Values. | .2-2 |
| Part Orders | . |
| Parts Manual Usage | . |
| Serial Plate Location. | . |



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Proposition 65 Warning

Battery posts, terminals, and similar parts may contain lead which are known to the State of California to cause cancer and reproductive harm. Wear gloves and wash hands after handling.

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