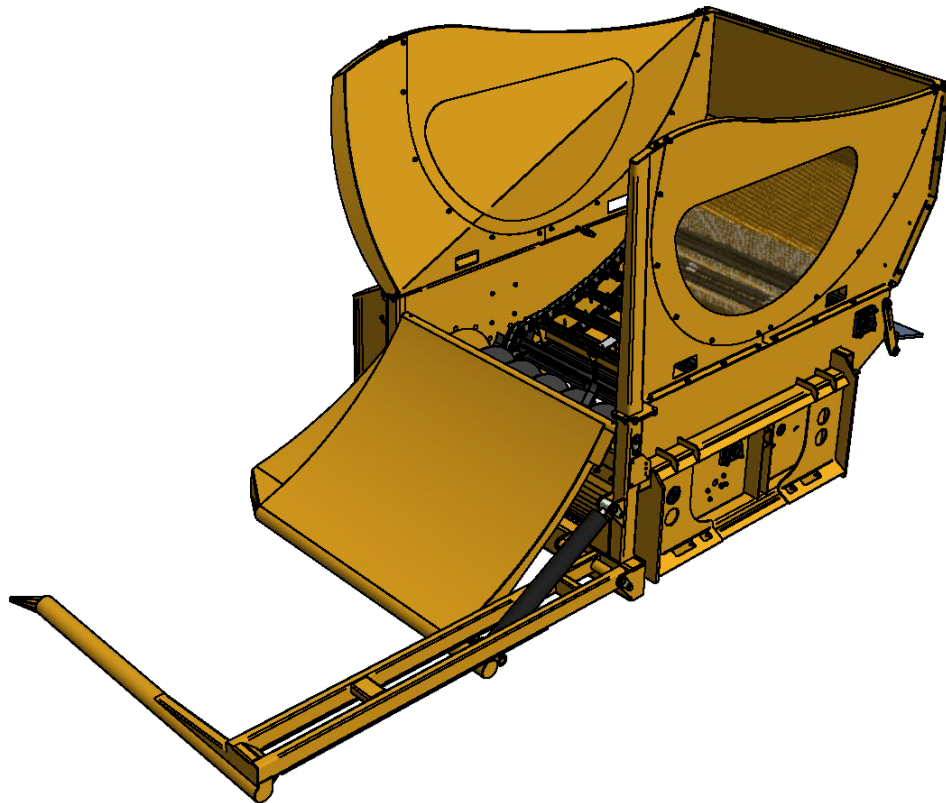


Tube-Line Bale Processor

BOSS R 4520



Operator's Manual

TUBE•LINE™
MANUFACTURING LTD

40252 (16/01/2017)

Operator's Manual

Thank you for choosing the Tubeline Boss R 4520 Bale Processor.

Our hope is that it will give you many years of productive service.

Please read and understand this manual and the machine before operation.

Warranty and Limitation of Liability

All equipment is sold subject to mutual agreement that it is warranted by the company to be free from defects of materials and workmanship. But the company shall not be liable for special, indirect or consequential, damages of any kind under this contract or otherwise. The company's liability shall be limited exclusively to replacing or repairing without charge, at its factory or elsewhere, at its discretion.

Any material, or workmanship defects which become apparent within one year from the date on which the equipment was purchased, and the company shall have no liability for damages of any kind. The buyer by the acceptance of the equipment will assume all liability for any damages, which may result from the use or misuse by his employees or others.

Warranty coverage is null and void unless Warranty Registration form has been completely filled in and is on file at Tubeline Manufacturing Ltd.

Contact Information

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Section 1 - Introduction

The **Boss R** is carefully designed and manufactured to give you many years of dependable service. You or any other person, who will be assembling, operating, maintaining or working with this product, are required to read and completely understand the information and instructions contained in this manual. If anyone does not fully understand every part of this manual, please obtain further assistance by contacting the dealer from which this product was purchased or by contacting Tube-Line at the telephone number or address listed on the previous page of this manual. Keep this manual available for reference whenever this product is being handled or used. Provide this manual to any new owners and/or operators.

Bale Sizes

The Tubeline Boss R was designed to load and shred all types of forage in large square bales.

Maximum bale weight is 1500lbs (680 kg).

Maximum length of bales is 84" (213 cm) X 36" (91 cm) X 36" (91 cm)

Uses

The Tubeline Boss R has many uses, including :

- Laying windrows in open fields.
- Filling feed bunks - fence line, circular, etc.
- Spreading forage for livestock bedding.
- Spreading mulch over perennial plants such as strawberries and mushrooms.

General Information

The purpose of this manual is to assist you in safely assembling, mounting, operating and maintaining your Boss R. Read this manual carefully to obtain valuable information and instructions that will help you achieve safe and dependable service. The illustrations and data used in this manual were current at the time of printing, but due to possible engineering and/or production changes, this product may vary slightly in detail. Tube-Line reserves the right to redesign and/or change components as necessary without notification.

Throughout this manual, references may be made to :

Power Unit	The engine-driven machine to which this product must be attached, ie; loader tractor, skidsteer, telehandler, etc.
Right, Left, Front, Rear	Directions which are determined in relation to the operator of the equipment when seated in the normal operating position.
IMPORTANT	Precautions that must be followed to prevent damage to equipment.
NOTICE	Precautions that must be followed to prevent substandard performance.

Serial Number Location

Always refer to the model and serial number when ordering parts or requesting information from your dealer. The serial number plate is located on upper left front corner of the top beater of your Tubeline Boss R machine. Refer to image on [page 3-1](#).

Section 2 - Safety Instructions

Definition of Safety Terms and Symbols

Throughout this manual, the terms **DANGER**, **WARNING** and **CAUTION** are used to indicate the degree of hazard to personnel if proper safety procedures are not followed. These words will be used in conjunction with the Safety Alert Symbol: a dark triangle containing a white exclamation mark.



The Safety Alert Symbol means:

- ATTENTION - BECOME ALERT - YOUR SAFETY IS INVOLVED

DANGER – Indicates an imminently hazardous situation, which, if not avoided, WILL result in death or serious injury.

WARNING – Indicates a potentially hazardous situation, which, if not avoided, Could result in death or serious injury.

CAUTION – Indicates a potentially hazardous situation, which, if not avoided, May result in minor or moderate injury;

OR

May also be used to alert against unsafe practices, which may result in damage to property. The safety information given in this manual does not replace any safety codes, insurance needs, federal, state and local laws.

The best safety device is a careful operator. Tube-Line and your dealer ask that **YOU** be that careful, responsible equipment operator.

Pay attention to the job at hand. No accident prevention program can be successful without the cooperation of the person who is directly responsible for the operation of the equipment.

If accidents are to be prevented, that prevention will come from equipment operators who accept their complete responsibility and anticipate the results of their actions.

The designer, the manufacturer, and the safety engineer all help create a safe product, but their combined efforts can be wiped out with a single careless act by the operator of that product.

Do not attempt to operate this equipment under the influence of drugs or alcohol.

YOU are the key to safety :

YOU are responsible for the SAFE operation and maintenance of YOUR Side Discharge Bucket.

YOU are responsible to familiarize yourself, and anyone else who will assemble, operate, maintain, or work around this product, with the safety information contained in this manual.

YOU are responsible to read ALL information contained in this manual to any operators or maintenance personnel who are not fully able to read the written English language. Whether **YOU** read the manual as written or translate it into another language, **YOU** must make certain that all operators and maintenance personnel have complete understanding of the full and exact contents of this manual.

YOU can reduce the risk of injury or death by following all safety precautions and by using good safety practices.

Safety Instructions

WORK SAFELY – A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST ACCIDENTS

WARNING SECTION

WARNING

Obey all safety instructions listed in this section and throughout this manual. Failure to obey instructions in this section could result in death or serious injury.

BEFORE ATTEMPTING ANY TYPE OF ASSEMBLY, OPERATION, MAINTENANCE OR OTHER WORK ON OR NEAR THIS PRODUCT:

READ AND COMPLETELY UNDERSTAND THIS MANUAL.

READ AND COMPLETELY UNDERSTAND THE MANUALS PROVIDED WITH YOUR POWER UNIT, LOADER AND QUICK-ATTACHMENT. Read and understand all safety signs on this product and on your power unit, loader and quick-attach. Know all your controls and know how to quickly stop all power unit movements, the processor movement, and the engine in case of emergency. Know and obey all applicable government rules, O.S.H.A regulations, local laws and other professional guidelines for your operation. Make sure that anyone who will be assembling, mounting, maintaining, repairing, removing and/or storing this product: Has been instructed in the safe operation of this product and of the power unit and the quick-attach to which this product is attached. Is physically and mentally capable of the safe operation of this type of equipment. Is not under the influence of drugs or alcohol. Is carefully supervised from a safe distance, especially if such person is inexperienced.

Wear personal protective equipment (i.e. hardhat, safety glasses, work gloves, protective shoes, respirator, ear protection, etc.) Does not wear loose fitting clothes, loose or uncovered hair or any accessories that can catch and entangle on moving parts.

Has annually reviewed all safety instructions. Know and follow good work practices when assembling, mounting, maintaining, repairing, removing and storing this product: Work on a level surface in a well lit area. Keep the area clean and dry. Use properly grounded electrical outlets and tools. Use the right tool for the job at hand. Make sure that your tools are in good condition for performing the desired function. When using tools, wear the protective equipment specified by the tool manufacturer (i.e. hardhat, safety glasses, work gloves, protective shoes, etc.).

WHEN YOUR POWER UNIT IS USED DURING ANY TYPE OF ASSEMBLY, OPERATION, MAINTENANCE OR OTHER WORK ON OR NEAR THIS PRODUCT:

Before leaving the operator's station or before beginning any type of work on this product, lower this product to the ground, apply your power unit's parking brake, stop the engine, remove the starter key, wait for all moving parts to stop and then relieve all pressure in the hydraulic lines. *Refer to your power unit's operator's manual for instructions on how to relieve hydraulic pressure in lines.*

Know your loader's safe lifting and operating capacity and the weight of this product. See the specifications in this manual for the weight of this product and refer to your power unit's and loader's operator's manuals for safe operating limits. Lift capacity may be reduced if using a quick-attach.

Never allow anyone, except the operator, to be around the power unit or this product when either is in motion. Do not start up unless others are clear of the work area. Do not allow riders on this product or the power unit. Do not stand or climb on this product when raised. Do not place any part of your body under any part of this product unless this product is securely resting on adequate blocking or on the ground.

Do not use blocking made of concrete blocks, logs, buckets, barrels or any other material that could suddenly collapse or shift positions. Do not use wood or steel blocking that shows any signs of material decay. Do not use wood blocking that is warped, twisted or tapered. Never operate controls from the ground. Operate the controls only from the operator's station. Never leave the equipment unattended with the engine running or with this product raised on the loader. Be aware of the added weight and width of this product. Reduce travel speeds accordingly, especially when traveling over rough ground. Keep this product close to the ground and under control when transporting. When transporting, be sure processor does not block view of vehicle lights or road.



WARNING

Obey all safety instructions listed in this section and throughout this manual. Failure to obey instructions in this section could result in death or serious injury.

Section 3 - Safety Sign Locations

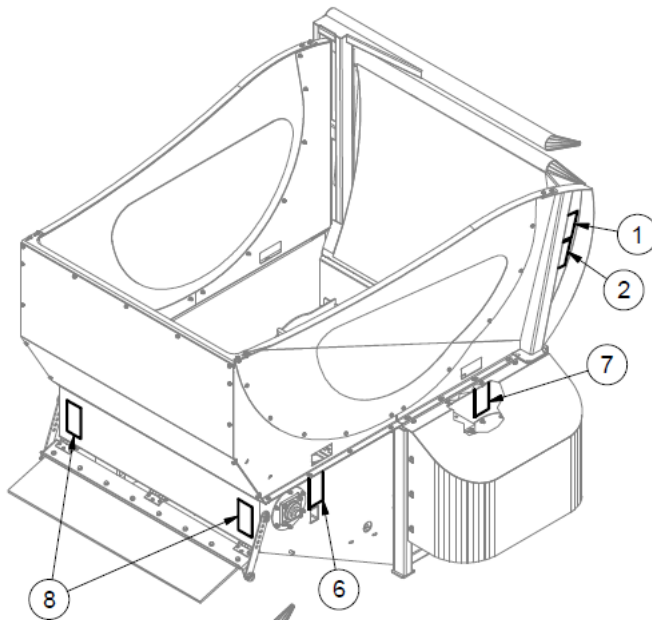
Placement or Replacement of Safety Signs

Clean the area of application with non-flammable solvent, then, wash the same area with soap and water. Allow the surface to fully dry. Remove the backing from the safety sign, exposing the adhesive surface. Apply the safety sign to the position shown in the diagram above and smooth out any bubbles.

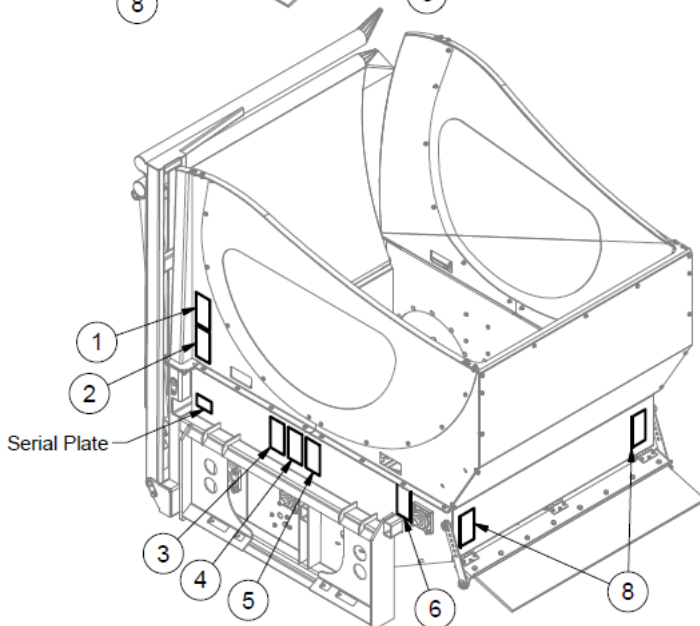
Instructions

Keep all safety signs clean and legible.

- Replace all missing, illegible or damaged safety signs.
- Replacement parts for parts with safety signs attached must also have safety signs attached.
- Safety signs are available free of charge from your dealer or from Tube-Line.



ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	DE41711	Angled Crush Hazard
2	2	DE41712	Hand Pinch Point
3	1	DE41713	High Pressure Fluid
4	1	DE41714	Read Operator's Manual
5	1	DE41715	Remove Key Before Repair
6	2	DE41716	Shaft Entanglement
7	1	DE41717	Sprocket Entanglement
8	2	DE41718	Thrown Object



Item : 1

Part # : DE41711

Crush hazard from bale loading arm.
Stand clear while arm raised.



Item : 2

Part # : DE41712

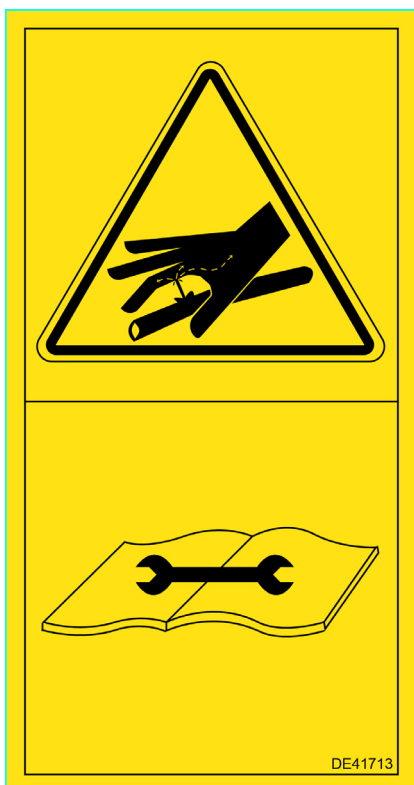
Pinch point hazard from bale loading arm. Stand clear while arm in motion.



Item : 3

Part # : DE41713

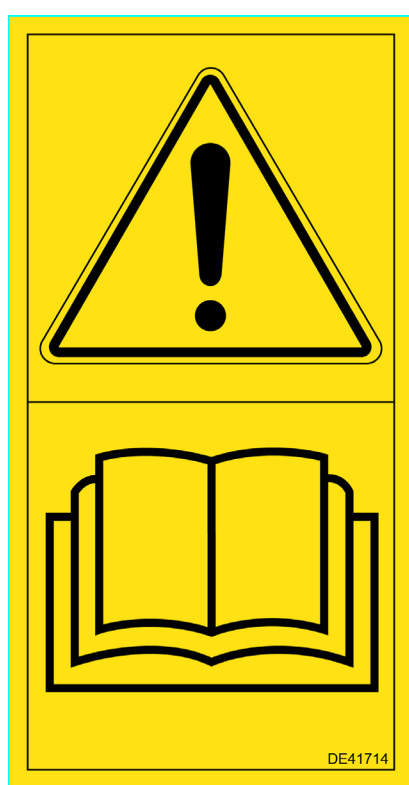
High pressure fluid hazard. Refer to
Maintenance notes on [pg.5-3](#).



Item : 4

Part # : DE41714

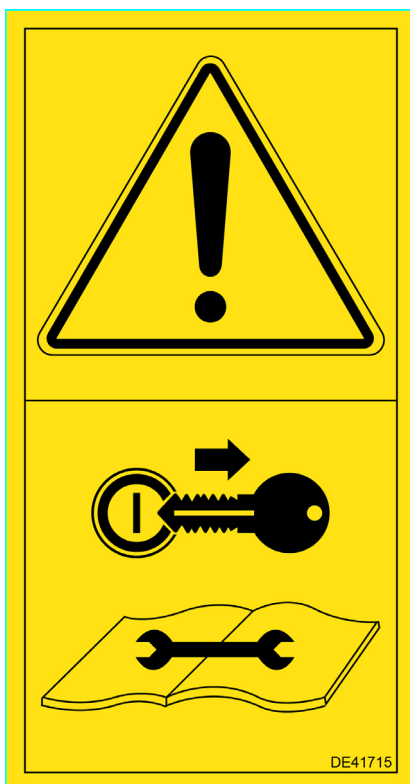
Read and understand manual
before operating this machine.



Item : 5

Part # : DE41715

Remove key from power unit before attempting repairs on this machine.



Item : 6

Part # : DE41716

Keep hands away from rotating shaft end.



Item : 7

Part # : DE41717

Never reach into rotating sprocket area.



Item : 8

Part # : DE41718

Thrown object hazard.
Stand clear of feed path.



Section 4 - Power Unit Specifications

IMPORTANT

Exceeding any of the recommended power unit specifications CAN result in damage to your power unit and/or this product and **WILL** void all Tubeline warranties.

Minimum	Maximum (Recommended)
20 GPM at 3000 PSI	25-35 GPM at 3000 PSI

Section 5 - Processor Operation



SAFETY FIRST

Read and understand the safety instructions (pages 3-6 of this manual) **BEFORE** beginning any processor operation.

DANGER

Failure to obey the following procedure will result in death or serious injury. Avoid contacting overhead wires.

WARNING

Failure to obey the following procedures could result in death or serious injury.

Never lift this product: above the operator's eye level OR
to a height where visibility is obstructed,
whichever is lower.

Use caution when raising loaded processor. Objects could fall from processor toward bystanders or operator.

Remove all foreign objects from bales.

Processor Installation Instructions

Refer to the operator's manuals of your power unit, your loader and your quick-attach for special or detailed mounting instructions. This product should fit onto the quick-attach or loader arms of your power unit the same as the original products that were designed by your loader / quick-attach manufacturer. If this product does not fit properly, contact Tube-Line before operating. Never place your finger into the mounting plate or 3-point hitch or loader holes. A slight movement of the power unit or this product could cause serious injury.

Make certain that all safety signs are in place and legible. Refer to the safety sign page in this manual for the placement of safety signs for this product. Inspect driveline shield for free rotation. Replace all damaged or excessively worn parts and hardware only with genuine Tube-Line parts or with properly rated fasteners, hydraulic hoses or fittings. Make certain that all locking pins, latches and connection devices are properly installed and secured. Make certain that all shields are in place and secure. Remove all foreign objects from processor.

- Never use processor on a power unit that is not equipped with a cab or ROPS, and operator restraints (seat belts or equivalent devices).
- Place this product on a firm, level surface that is large enough to safely accommodate this product, your power unit and all workers involved in the mounting process. Be sure all connection points are properly secured.
- Refer to the operator's manual(s) for your power unit, loader and quick-attach and follow the mounting instructions contained therein.
- Carefully raise the loader arms and cycle the tilt cylinders to check clearances and to verify that all mounting procedures have been successfully completed.
- Make sure bales are free from foreign objects.
- Drive slowly through gates and doors.
- Know your power unit's safe operating weight limit and the weight of your loader attachment.

NOTICE

Refer to your power unit's operator's manual for safe operating limit and use of counterweights.

Pre-Operation

Run machine through cycle without bale in chamber to confirm all functions are in good working order.

Loading Bales

When using the loading arm to load a bale into the Boss R 4520, keep loading implement at idle and a low oil flow rate.

- Lower loading arm completely to ground.

Drive forward into bale using the loading arm as a fork. **DO NOT SPEAR BALE. DO NOT PUSH BALES WITH LOADING ARM.**

- With bale completely on loading arm forks, raise the loading arm to a position (usually around half way) where the bale is being cradled by the inner loading arm. The bale should be partially overhanging the bale chamber.

Note: Bale chamber width is only slightly wider than the bale.

Use the bucket angle to ensure the bale is against the backside of the chamber, **FORCING MISALIGNED BALE INTO CHAMBER MAY DAMAGE MACHINE.**

- Cut strings or netwrap from bale when it is partially into bale chamber. This will ensure loose material falls into bale chamber. Strings or netwrap can be pulled off from the top of bale.
- Fully raise loading arm to push entire bale into bale chamber.

DANGER! NEVER LOAD BALES WHILE FLAIL DRUM ROTATING.

Shredding

For best results keep the bale turning while shredding, misaligned bale will cause uneven feed.

- Start flail drum to full RPM with bed chain stopped.
- Raise the machine off the ground to desired height.
- Slowly increase the bed chain speed in the direction of the flail drum.
- As bale is being fed through the flail drum, adjust the bed chain speed with the control panel and the flail drum speed.
- Adjust discharge deflector to spread forage at desired width.

Post Operation

- Always lower the processor to the ground; set the parking brake; stop the engine; remove ignition key and wait for all moving parts to stop before leaving the operator's seat.
- Twine build-up should be kept to a minimum to reduce fire hazard and keep the machine in balance.

Processor Hydraulic Connection

SAFETY FIRST!! READ AND UNDERSTAND THE SAFETY INSTRUCTIONS ([Section 2](#)) BEFORE BEGINNING ANY HYDRAULIC CONNECTION.

Disconnect the hydraulic hose quick couplers from one another and attach the quick couplers to your power unit as per the instructions in your power unit's operator's manual.

WHEN DEALING WITH HYDRAULICS DURING ANY TYPE OF ASSEMBLY, OPERATION, MAINTENANCE OR OTHER WORK ON OR NEAR THIS PRODUCT:

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Wear safety glasses, protective clothing and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS.**

If any fluid penetrates the skin, **SEEK IMMEDIATE MEDICAL ATTENTION.**

Refer to your power unit's operator's manual and this manual for procedures and intervals, then inspect and maintain the entire hydraulic system to insure that the fluid remains clean, that all devices function properly and that there are no fluid leaks.

Carefully raise the loader arm and cycle the tilt cylinders to check hose clearances and to check any interference.

Adjustments and Repairs

DO NOT MODIFY YOUR SHREDDER WITHOUT CONSENT OF MANUFACTURER.

When making repairs, use only genuine Tubeline parts or, for fasteners, hydraulic hoses or hydraulic fittings, use only properly rated parts.

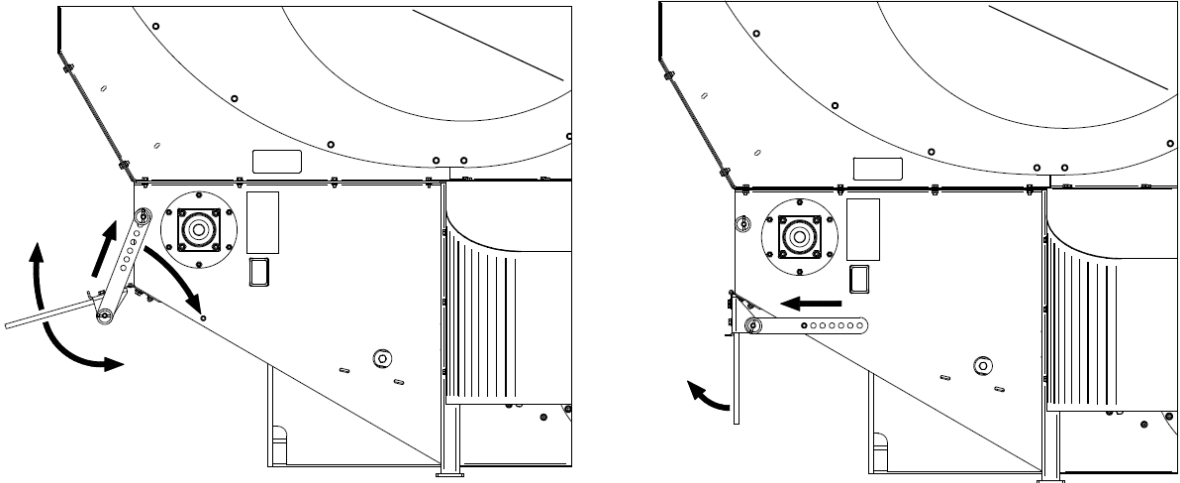
Replacement parts, for parts with safety signs attached, must also have safety sign attached.

Think SAFETY!

Work SAFELY!

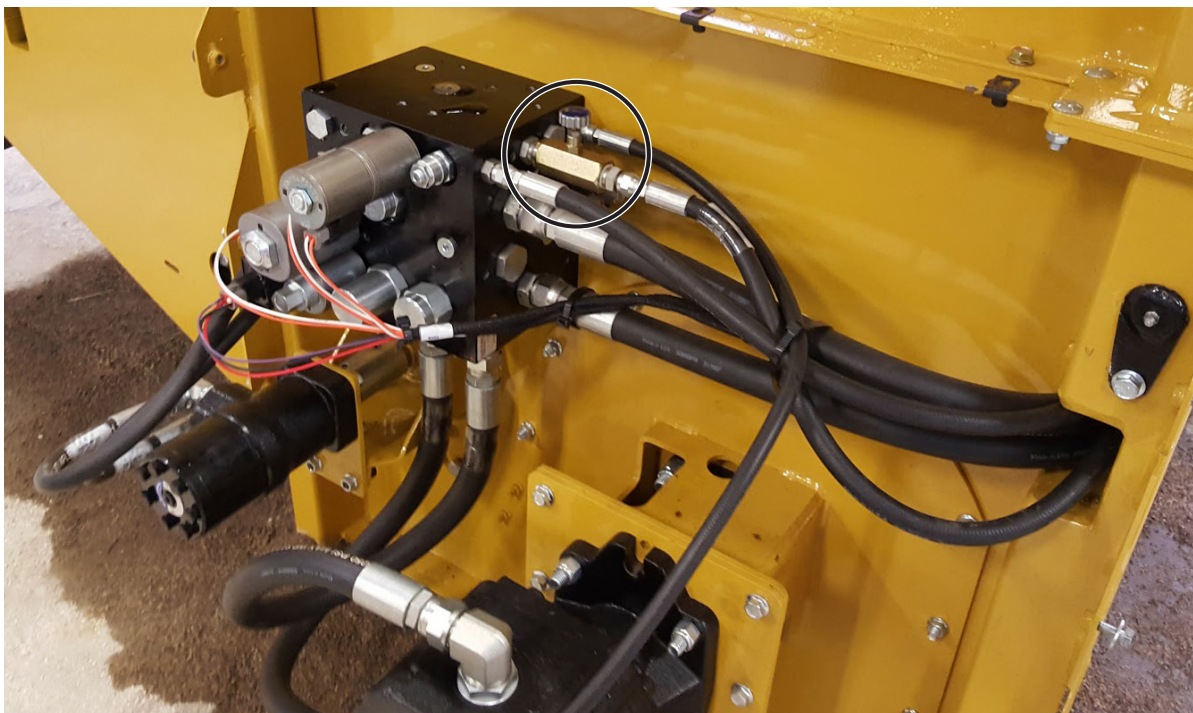
Deflector Adjustment

How material is directed can be adjusted by unpinning linkage arms and moving them to a different hole or moving arms to different peg. As shown as below.



Needle Valve Adjustment

Needle valve (encircled below) can be tightened or loosened to restrict or allow more hydraulic oil to flow to the bale arm. Front cover (Item 1 on [pg. 10-20](#)) must be removed before this adjustment can be made. **REINSTALL SHEILD BEFORE OPERATING.**



Section 6 - Processor Maintenance

Regular maintenance is the key to long equipment life and safe operation. It is very important that these maintenance functions be performed as described below.



**SAFETY FIRST!! READ AND UNDERSTAND THE SAFETY INSTRUCTIONS ([Section 2](#))
BEFORE BEGINNING ANY PROCESSOR MAINTENANCE OPERATION**

IMPORTANT

The flail tube on this machine is a fully balanced assembly. If for any reason the flails must be removed, they must be returned to the same position they were taken from. If this is not done a balance problem will result in causing machine vibration. Number flails and inserts and their positions before you do any work.

Before First Use

Inspect the attachment for shipping damage. If damage does exist, do not operate until the damaged parts have been replaced or repaired.

Before Each Use

Check for loose or badly worn parts.

Conveyor chain should be adjusted to allow chain slack 1" (2.54 cm) to 1½" (3.8 cm).

Make sure that all hydraulic fittings are tightened and that there are no leaks in any fittings or hoses.

Inspect rotor and all rotating parts for twine or wire build-up.

Check for cylinder wear and broken flails and flail bracket wear. Replace with new "Boss" flails to keep machine in balance.

Make sure that all safety signs are in place, are clean and are legible. Refer to Safety Sign Section ([page 2-1](#)).

After Every 10 Hours of Operation

Grease all roller bearings ([refer to diagram on page 8-1](#)).

Inspect and tighten Allen screws on bearing.

Section 7 - Processor Service



SAFETY FIRST!! READ AND UNDERSTAND THE SAFETY INSTRUCTIONS ([Section 2](#)) BEFORE BEGINNING ANY PROCESSOR SERVICE.



WARNING

Hydraulic fluid under pressure can penetrate skin, resulting in serious injury or death.
Always relieve hydraulic pressure before disconnecting lines.

Shut off engine, set parking brake and relieve hydraulic pressure before connecting or disconnecting hydraulic lines. Refer to your power unit's manual for instruction on how to relieve hydraulic pressure in lines.

Before applying pressure to the system, be sure that all connections are tight and be sure there are no damaged hoses, lines or fittings.

Wear safety glasses and use metal or wood when searching for leaks. Do not use your hands.



WARNING

Before servicing the loader, remove the attachment and make certain the lift arms are lowered to their lowest position or that the arms are supported by the mechanical lock up devices (if the machine is so equipped).

Steam-clean the power unit before any installation is made to the hydraulic system.

Remove any attachment from the power unit and position on a level surface.

Section 8 - Grease Points



Specifications

Flange Bearings (6): Once a Week

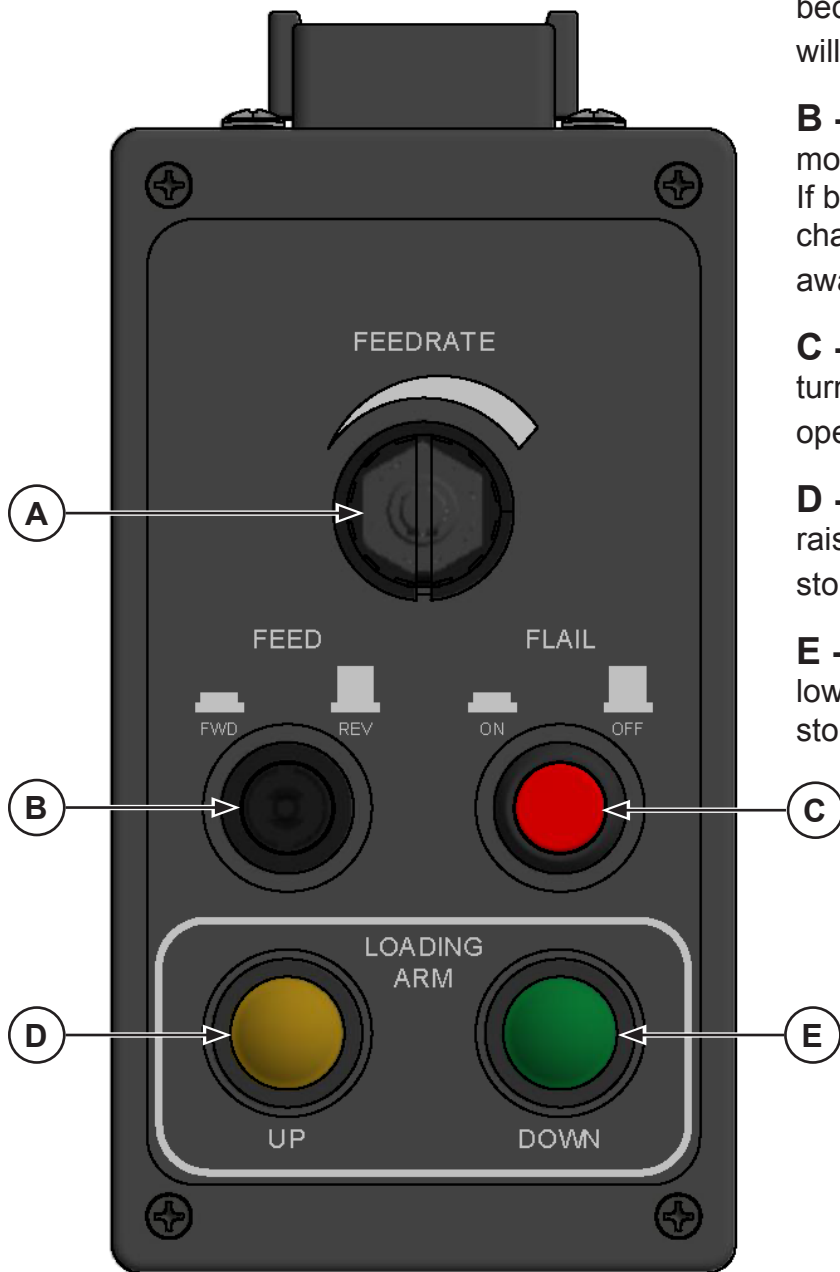
Bale Arm Cylinder Bushings: Once a Week

Sprockets: Once a Week

Pins: Once a Month



Section 9 - Control Functions



A - Twist knob turns clockwise to speed up bed chain, whereas turning counter-clockwise will slow down and/or stop the bed chain.

B - A black button that, when pushed in, will move the bed chain forward when in use. If black button is in raised position, the bed chain will reverse when engaged (move bale away from flail motor).

C - A red button that allows the flail drum to turn when pressed, or stops flail drum from operating if button is in raised position.

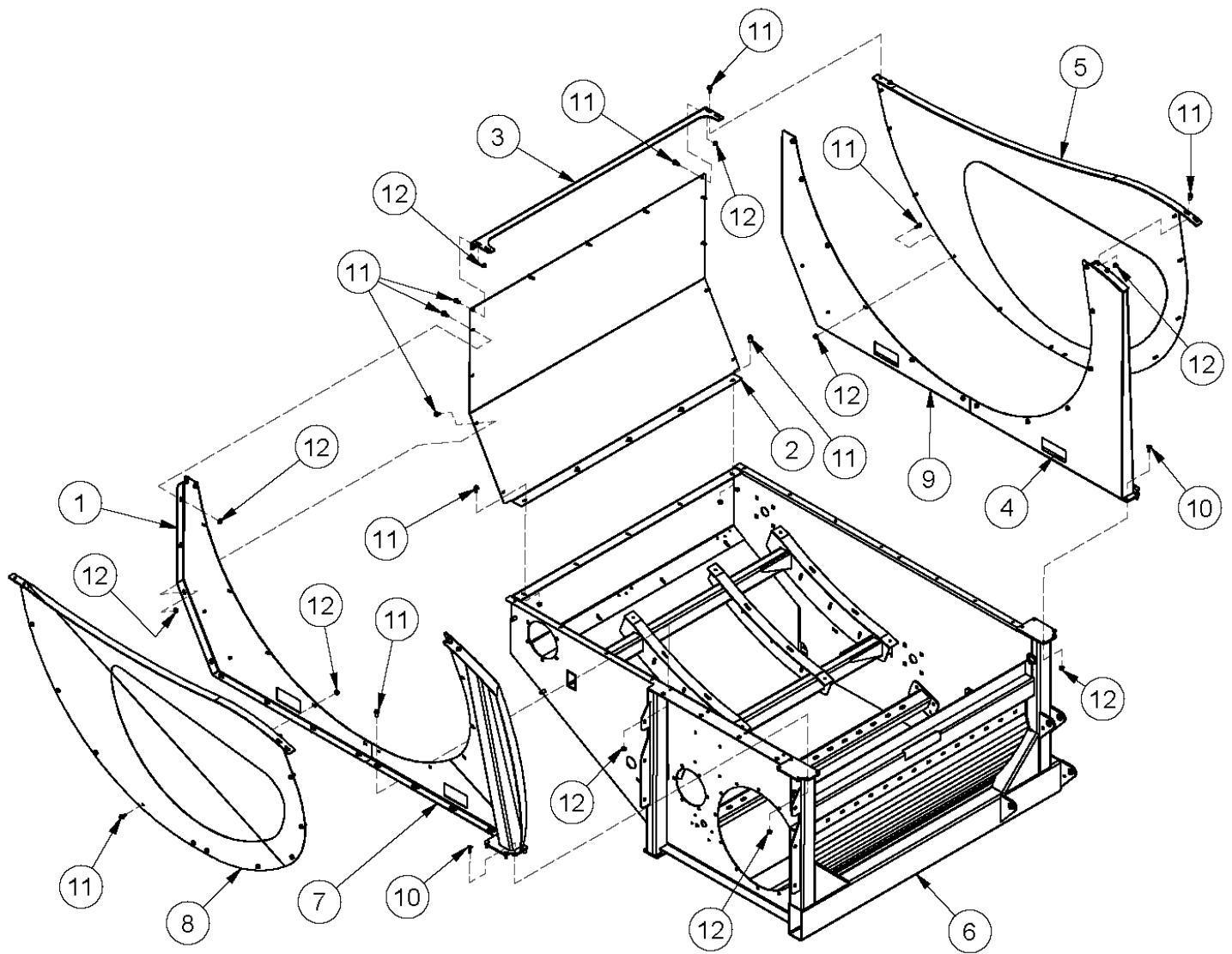
D - A yellow push button that must be held to raise the loading arm. Releasing button will stop the upward motion of the loading arm.

E - A green push button that must be held to lower the loading arm. Releasing button will stop the lowering of the loading arm.

Section 10 - Part Breakdowns & Lists

Actual parts may vary slightly from illustrations.

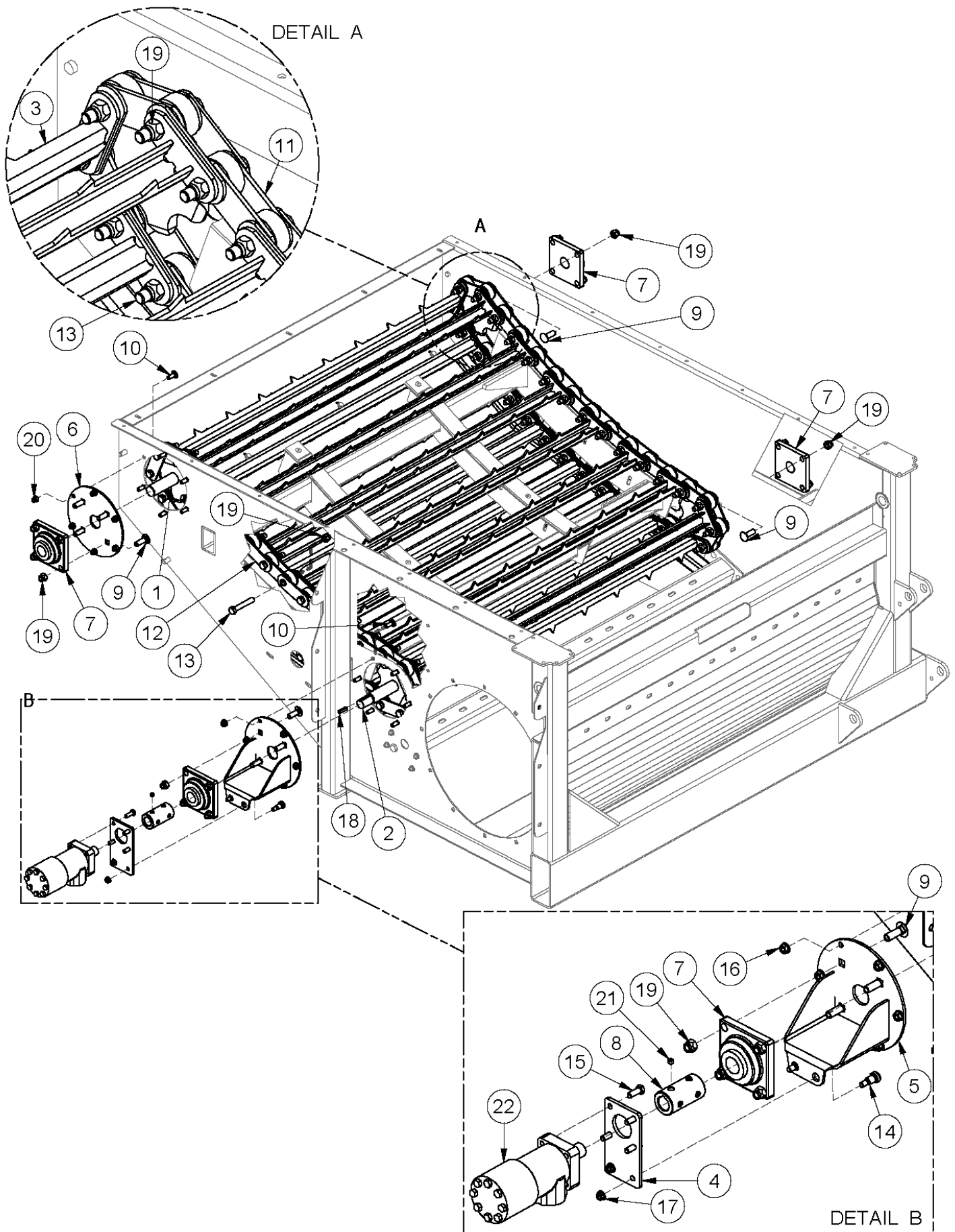
Frame



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

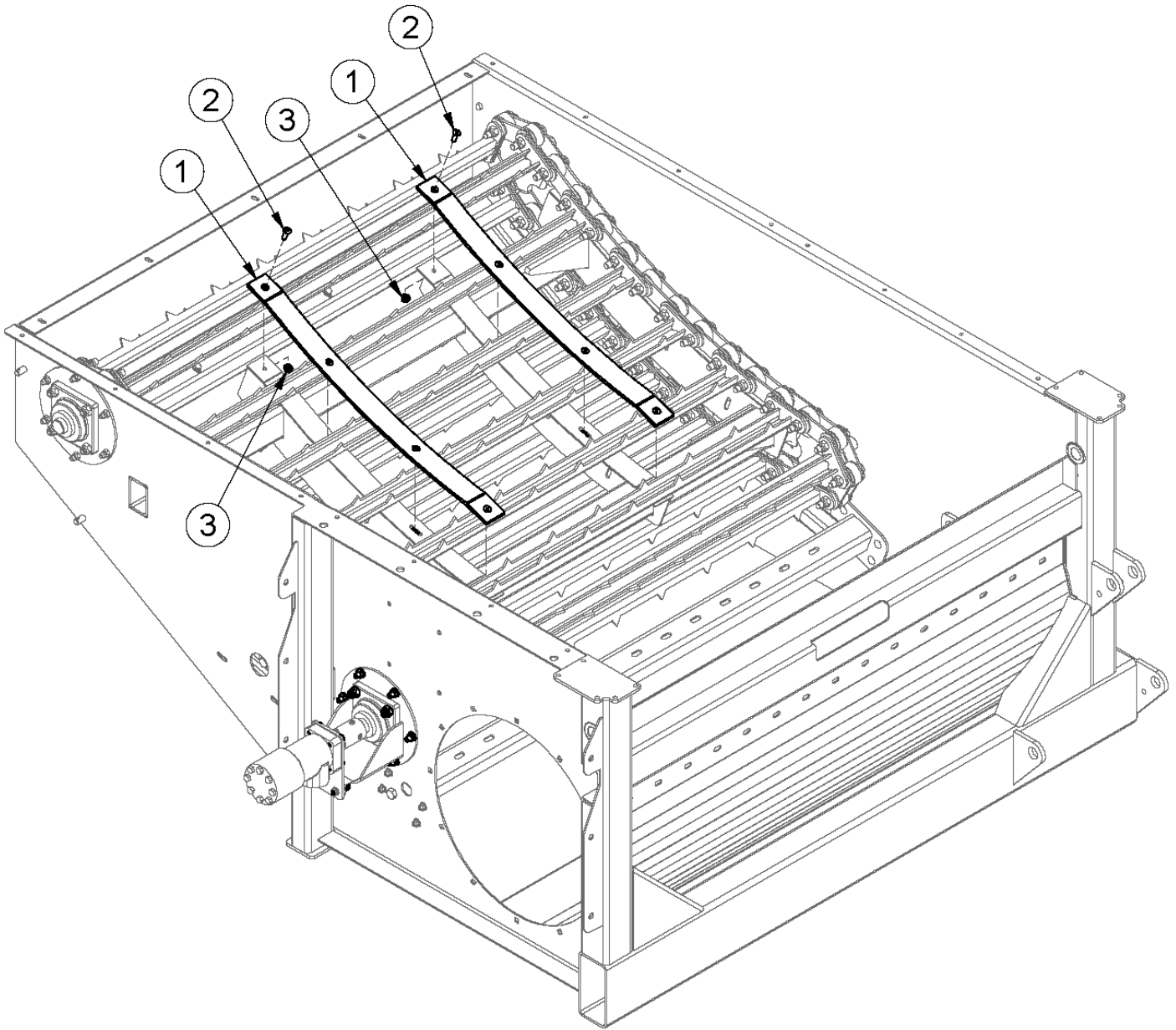
Bed Chain



Bed Chain

ITEM	QTY	PART NUMBER	DESCRIPTION
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	4	BEA UCF207-20	Flange Block, UCF207-20 National 4-Bolt, 1.25 ID
8	1	BS CMP200099	Top Motor Coupler
9	16	CB 1/2-13X1.1/2 Z5	Carriage Bolt - 1/2-13 x 1-1/2" Grade 5 Zinc
10	38	CB 3/8-16X1.0 Z5	Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc
11	9ft/side	CHAIN ZC60	Chain ZC60-76.2-ZP
12	2	CHAIN ZC60-CON	Chain ZC60-76.2-ZP Connector
13	62	HB 1/2-13X3.0 Z5	Hex Bolt 1/2-13 x 3" Grade 5 Zinc Plated Hex Cap Screw NC
14	2	HB 3/8 x 5/8 SS	Shoulder Bolt
15	8	HB 3/8-16X1.0 Z5	Hex Bolt 3/8-16 x 1" Grade 5 Zinc Plated Hex Cap Screw NC
16	53	HNC38	Hex Nut Cerrated
17	104	HNC516	Hex Nut Cerrated
18	1	KS41536	Keystock .25 x 1.25
19	78	LN 1/2 N	Locknuts - 1/2-13 Zinc Plated Nylon Insert Lock Nut
20	6	LN 3/8 N	Locknuts - 3/8-16 Zinc Plated Nylon Insert Lock Nut
21	4	SS 38-24X38	3/8"-24 x 3/8" Black Oxide Alloy Steel Knurled Point Socket Set Screw
22	1	VAL 1008	Motor, Hydraulic - (BS208107A)

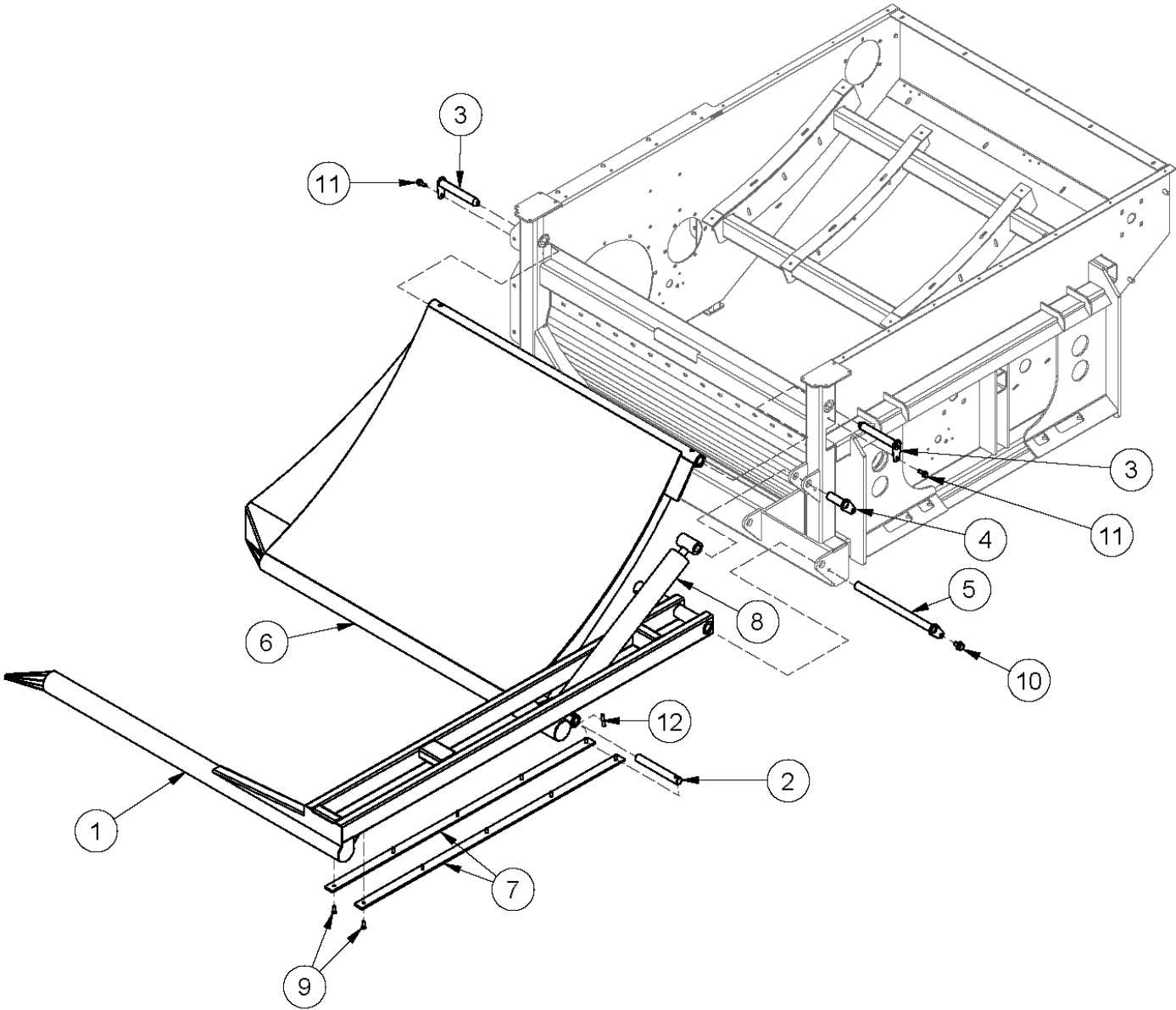
Bed Chain Sliders



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

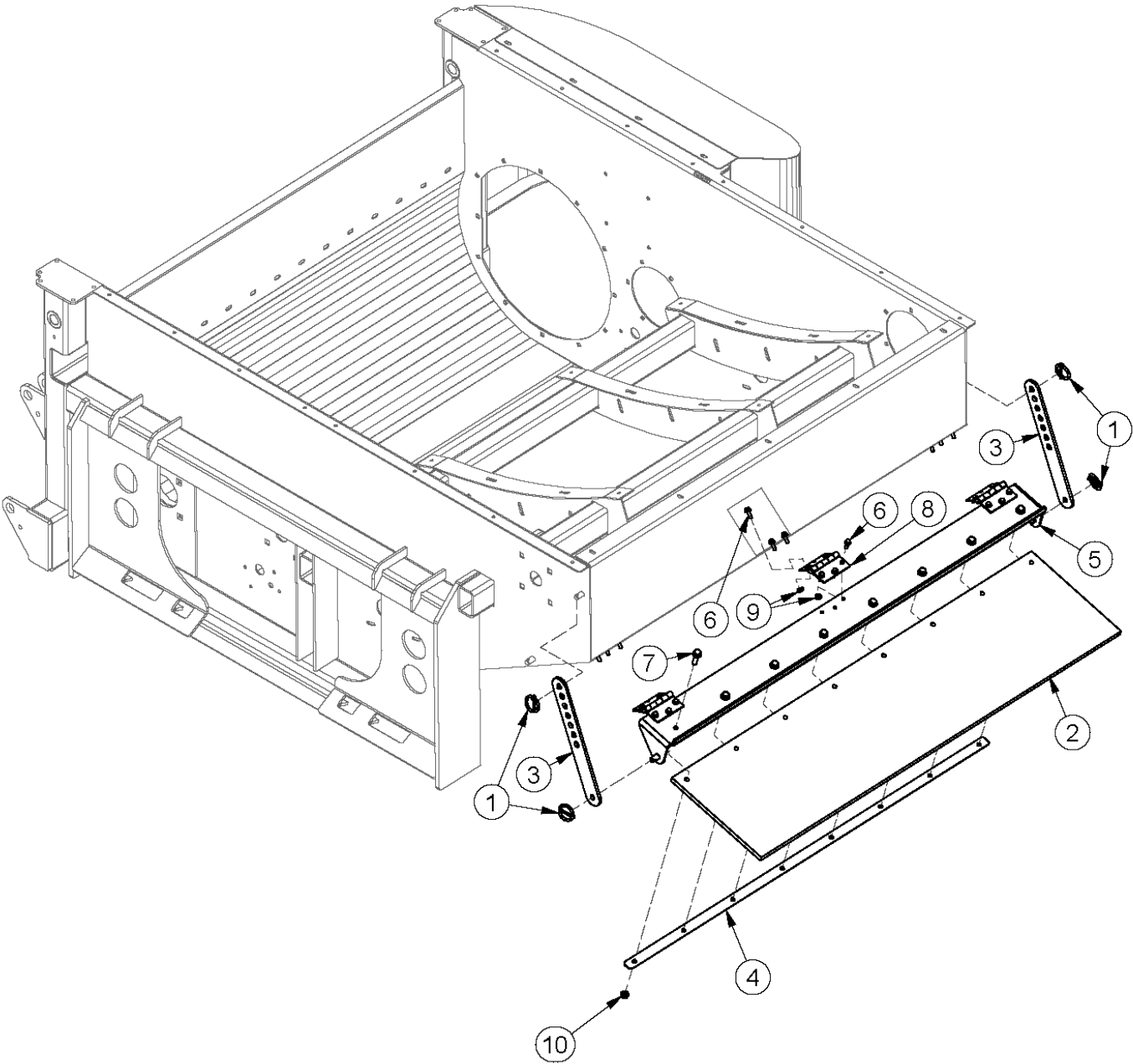
Loading Arm



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	40989	Inside Loading Arm
7	2	41540	Loading Arm Slide
8	1	CYL39628	Hydraulic Cylinder
9	20	HB 5/16-18X1.0 FHSCS	Hex Bolt - 5/16-18 x 1" Zinc Plated Flat Head Socket Cap Screw
10	1	HBC12X34	Hex Bolt Cerrated Gr. 5 NC
11	15	HBC38X1	Hex Bolt Cerrated
12	1	RP 3/8X 2.0	Pin - Roll Pin 3/8 x 2.0

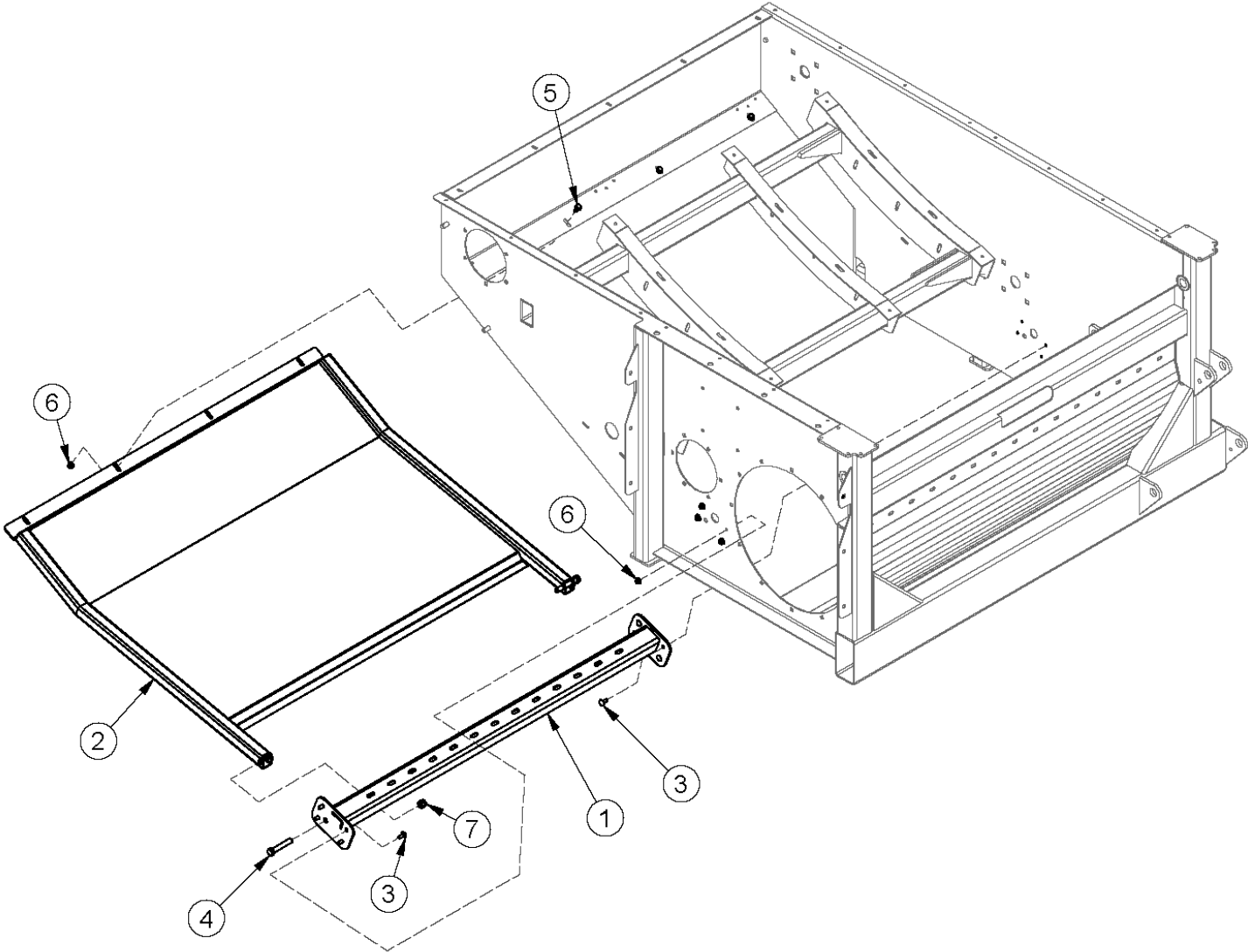
Deflector



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

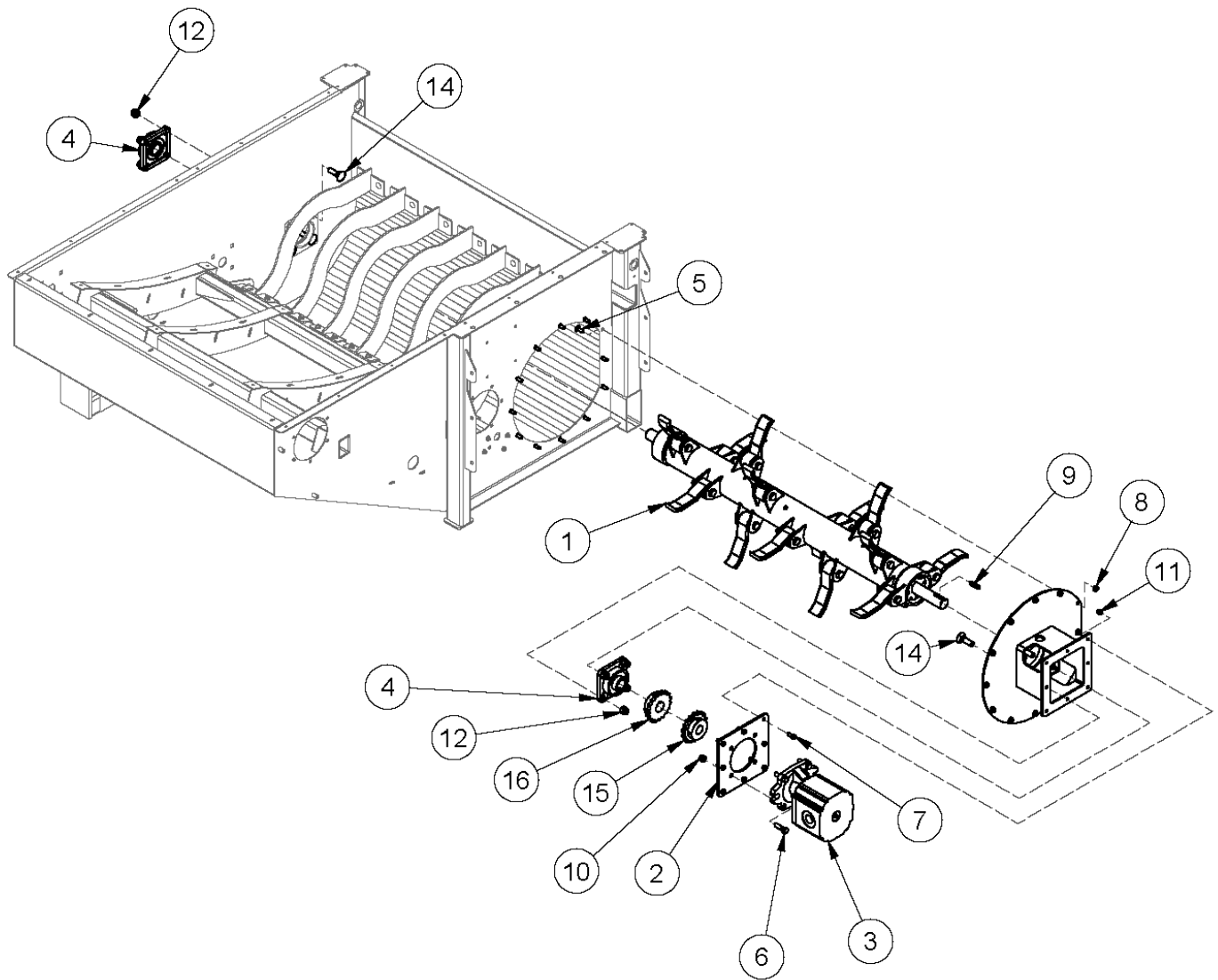
Bed Dropout



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

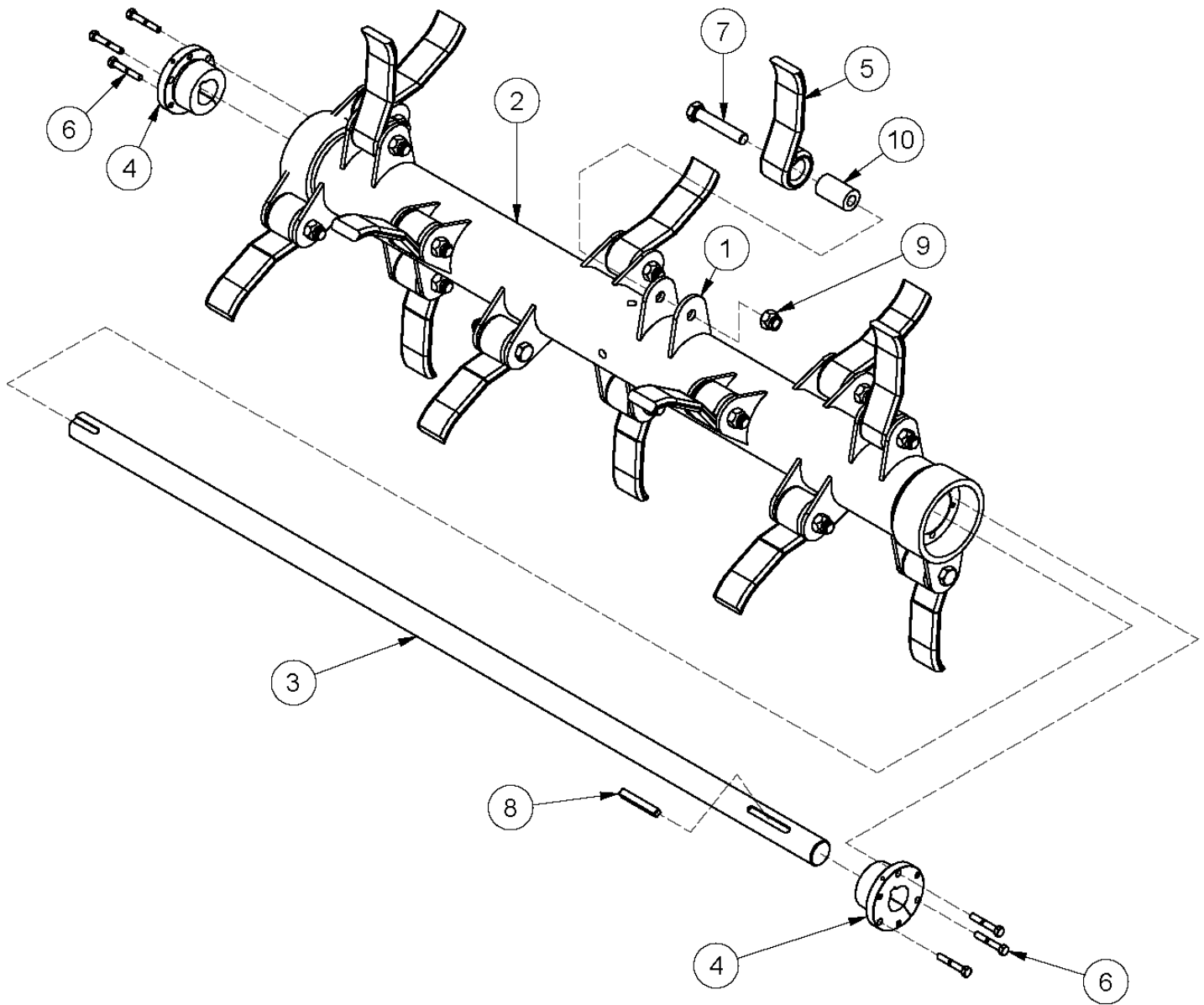
Flail Drum



Flail Drum

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	39603	Flail Drum Assembly
2	1	39611	Cassapa Moter Mount
3	1	40580	Beater Motor
4	2	BEA UCF208-24R3	Bearing -Triple Seal- Ductile Iron
5	12	CB 3/8-16X1.0 Z5	Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc
6	4	HB 1/2-13X1.3/4 Z5	Hex Bolt Plated - 1/2"-13 x 1-3/4" Zinc Finish SAE J429 Gr. 5 NC
7	8	HB 3/8-16X1.0 Z5	Hex Bolt 3/8-16 x 1" Grade 5 Zinc Plated Hex Cap Screw NC
8	12	HNC38	Hex Nut Cerrated
9	1	KS41537	Keystock 3/8 X 3/8
10	4	LN 1/2 N	Locknuts - 1/2-13 Zinc Plated Nylon Insert Lock Nut
11	12	LN 3/8 N	Locknuts - 3/8-16 Zinc Plated Nylon Insert Lock Nut
12	8	LN 5/8 N	Locknut - 5/8-11 Zinc Plated Nylon Insert Lock Nut
14	8	PB 5/8X2.1/4	Plow Bolts Gr.5
15	1	SPR60B18-1.25	60B18 Sprocket w/1.25 Bore 5/16 kwy
16	1	SPR60B18-1.5	60B18 Sprocket w/1.5 Bore 3/8 kwy

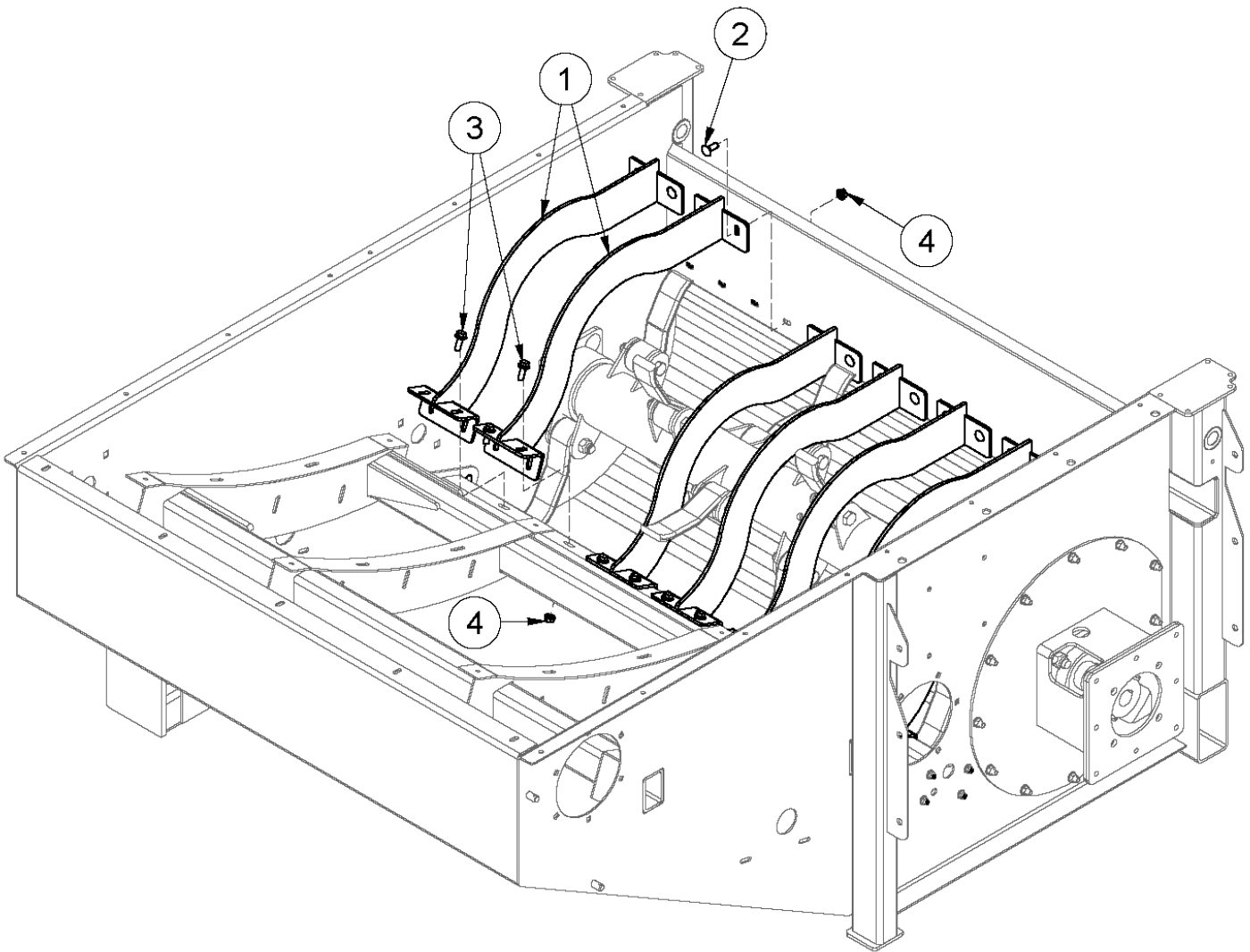
Flail Drum Assembly



Flail Drum Assembly

ITEM	QTY	PART NUMBER	DESCRIPTION
1	32	30070	Flail Mount Lug
2	1	39601	Flail Drum
3	1	39604	Drum Shaft
4	2	BS BUSK-1.5	SK Taper Lock Bush 1 1/2
5	16	CMP200113	Flail
6	6	HB 5/16-18X2.0 Z5	Hex Bolt - 5/16-18 x 2" Grade 5 Zinc Plated Hex Cap Screw NC
7	16	HB 5/8-18X3.1/2 YZ8	5/8"-18 x 3 1/2" Grade 8 Yellow Zinc Hex Cap Screw
8	1	KS41594	Keystock .375 x .375 x 2.75
9	16	LN 5/8 N	Locknut - 5/8-11 Zinc Plated Nylon Insert Lock Nut
10	16	SAW200059	Flail Bushing

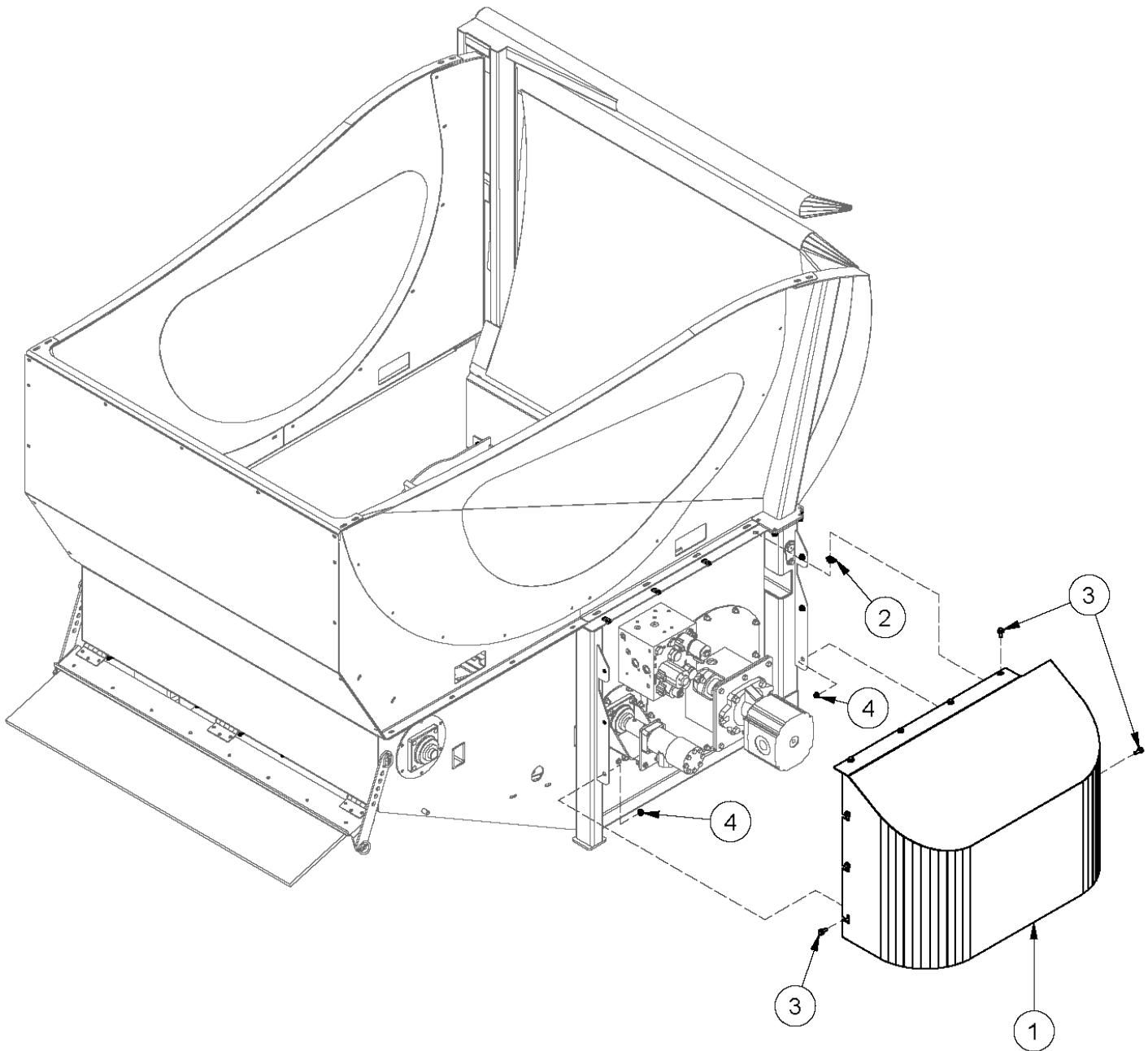
Flail Drum Guards



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

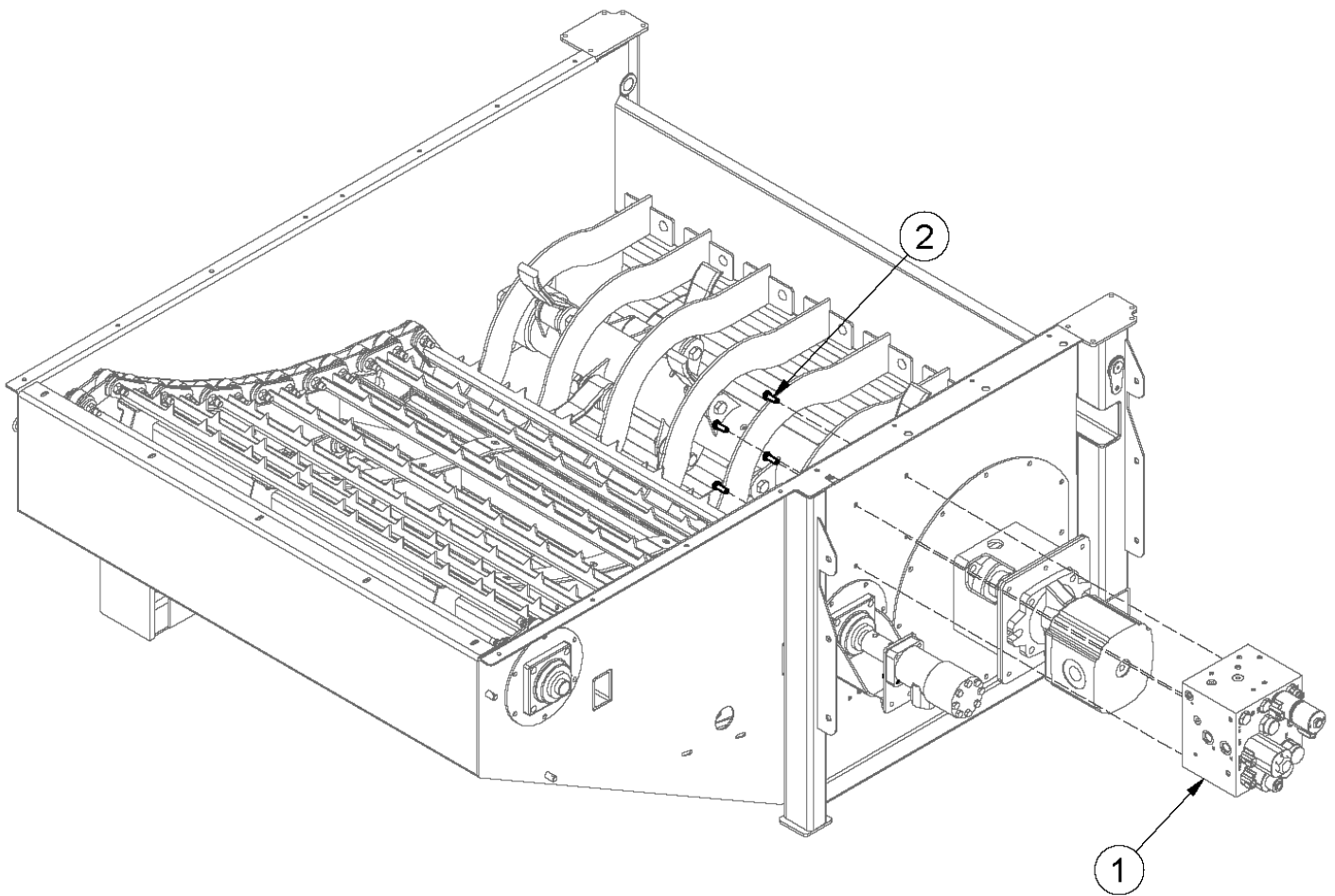
Front Cover



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

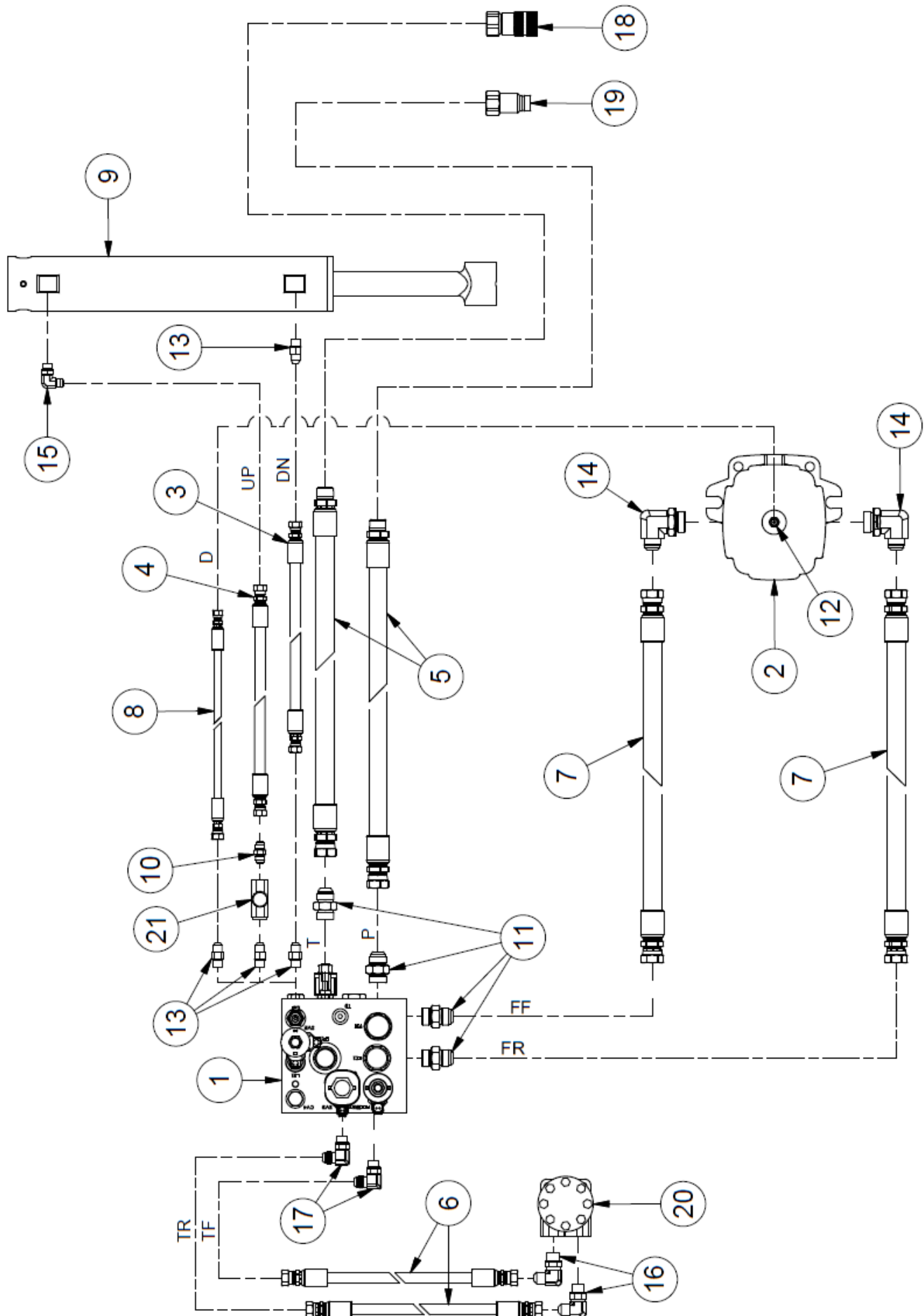
Manifold Block



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

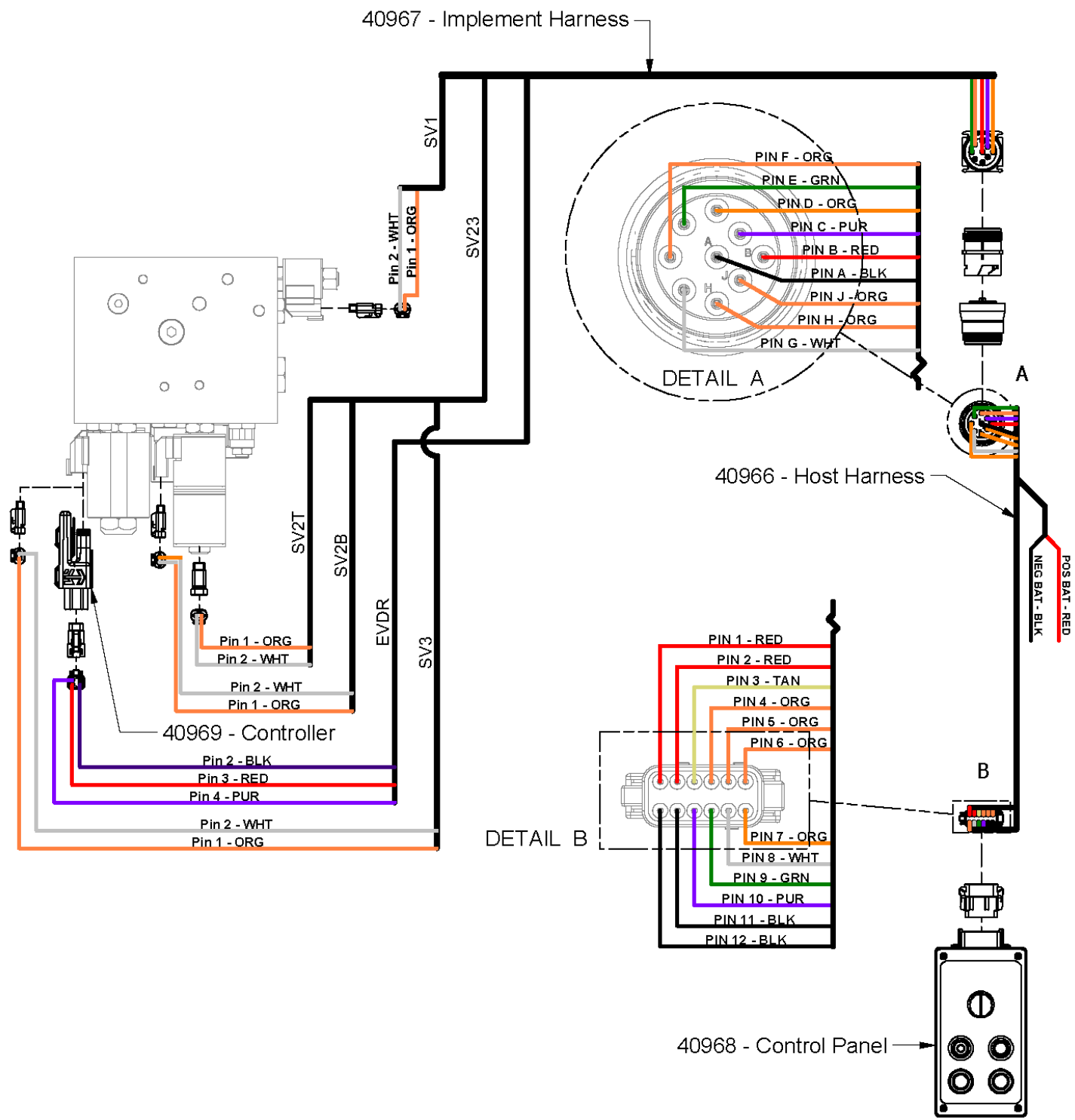
Hydraulic Schematic



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	CYL39628	Hydraulic Cylinder
10	1	HF 2403-6-6	FJIC- MJIC Reducer
11	4	HF 6400-12-12	Hyd. Fitting O-Ring to JIC Adapter, Male JIC to 3/4" Male BSPP
12	1	HF 6400-4-4	Hyd Fitting - Male JIC - Male ORB
13	4	HF 6400-6-6	Hyd Fitting
14	2	HF 6801-12-16	Forged Fitting - JIC x SAE 90 Deg. Elbow
15	1	HF 6801-6-6	Hyd. Fitting 90 Deg.0-Ring to JIC
16	2	HF 6801-8-10	Hyd. Fitting -1/2" JIC - 5/8" 90 Degree Elbow
17	2	HF 6801-8-8	Hyd. Fitting- 1/2" JIC- 1/2" SAE 90 Deg Elbow
18	1	HF QCFF-1	Quickcoupler 3/4" Flat Face Pipe -Female
19	1	HF QCFF-2	Quickcoupler 3/4" Flat Face Pipe -Male
20	1	VAL 1008	Motor, Hydraulic - (BS208107A)
21	1	VAL FT-03-2090	Flow Control Valve

Electrical Schematic














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Section 11 - Torque Value Charts

Imperial Torque Values

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES

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

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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.

^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.

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.

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Metric Torque Values

METRIC BOLT AND CAP SCREW TORQUE VALUES

Property Class and Head Markings	4.8   	8.8    	10.9  	12.9    
Property Class and Nut Markings	5   	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.

^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.

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.

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