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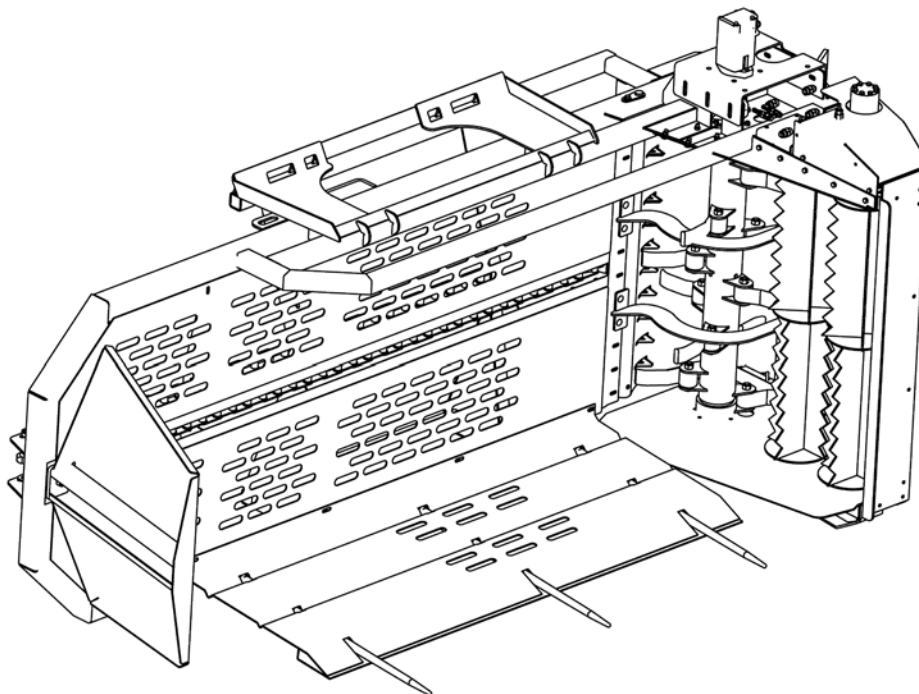
Operator's Manual

Keep this manual with the machine at all times.



Bale Processor

Boss I - 20 Series



Operator's Manual

Thank you for choosing the Tubeline Boss 1 - 20 Series Bale Processor. We know that it will give you many years of productive service. Please read and understand this manual and the machine before operation. This manual covers both 3720 and 3820 models.



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.

Serial Plate Location

The implement serial number is located underneath the flail drum motor, see *below*. This number helps us to track changes and improvements and must be mentioned when ordering parts or requesting service. For your convenience, a space has been provided inside the front cover of this manual to record the serial number, model number, purchase date, and dealer name.

Model No: Boss I 20 Series - 3720 or 3820

Serial No: _____

Date Purchased: _____

Dealer Name: _____

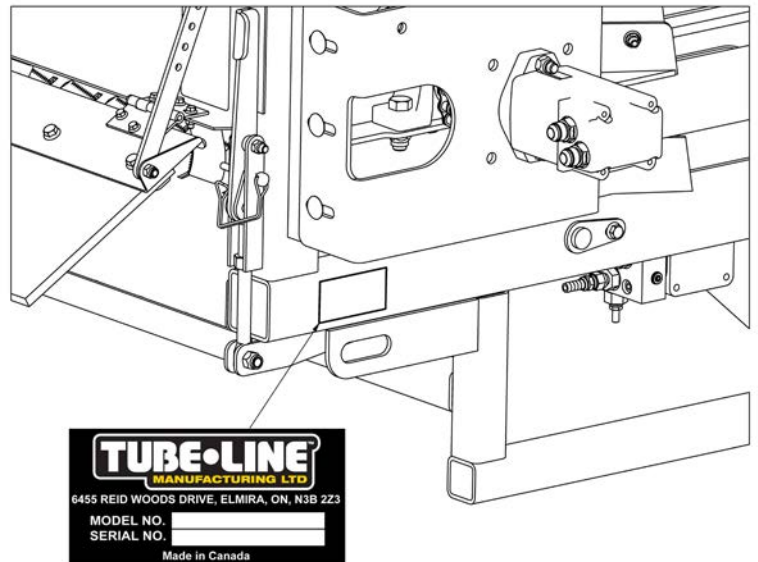


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Section 1 - Introduction

The **Boss I 20 Series** 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.

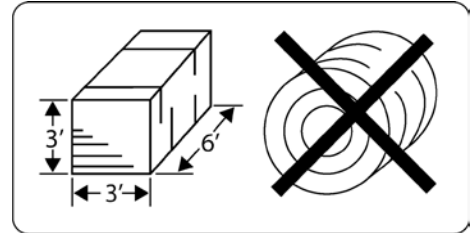
Bale Sizes

Tubeline Boss 20 series machines can load and shred all types of forage in large square bales.

Model 3720 specifications:

Maximum bale weight is 1500lbs (680 kg).

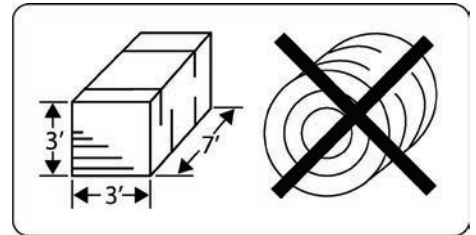
Maximum length of bales is 72" (183 cm) X 36" (91 cm) X 36" (91 cm).



Model 3820 specifications:

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 I 20 Series 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.

Power Unit Specifications

NOTE: Exceeding any of the recommended power unit specifications can damage your power unit and/or this product and WILL void all Tubeline warranties.

| Minimum | Maximum |
|--------------------|--------------------|
| 20 GPM at 2500 PSI | 40 GPM at 3000 PSI |

Section 2 - Safety

NOTICE: This safety alert symbol is found throughout this manual to call attention to instructions involving yourself and others working around the machine.

Failure to follow these instructions can result in injury or death.



This symbol means:

Attention!

Become Alert!

Your Safety is involved!

Safety Signal Words / Safety Messages

CAUTION: Indicates a potentially hazardous situation that may result in injury.

WARNING: Indicates a potentially hazardous situation that could result in serious injury or death.

DANGER: Indicates a hazardous situation that needs to be avoided. Operator needs to be aware of these dangers. High probability of serious injury or death.

NOTICE: Indicates an informative non-safety related message.

Safety Guidelines

Take the necessary precautions to avoid injury or death. These include:

- Reading and understanding this manual before operating.
- Have training and train new operators.
- Review the safety instructions with all users annually.
- Know where safety decals are and what they convey.
- **DO NOT** paint over, remove or deface any safety signs or warning decals on your equipment.
- Replace damaged and/or missing safety decals.
- **DO NOT** operate without fully installed shields.
- Reinstall any removed shields **BEFORE** operating.
- Inspect machine before operating.
- **DO NOT** operate this machine while under the influence of drugs or alcohol.
- **DO NOT** let children ride or operate this machine.

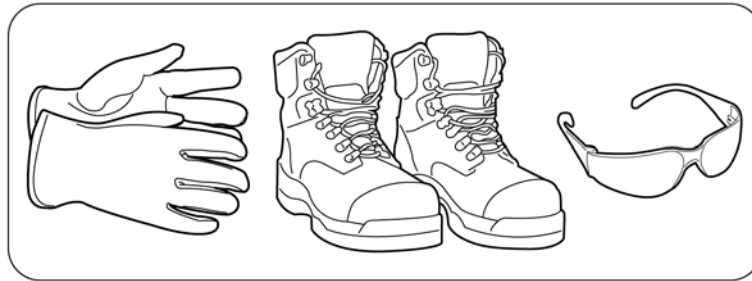
Personal Protective Equipment



WARNING: Wear work boots, gloves, and safety glasses when maintaining or repairing machine.

WARNING: Wear work boots and ear protection when operating machine.

DANGER: Secure loose clothing, hair, accessories, etc before operating or maintaining the TL50SLV.



Maintenance Safety

Know and follow good work practices when assembling, mounting, maintaining, repairing, removing and storing this product:

- Work on a level surface in a clean, dry and well lit area.
- 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 to perform the necessary function.

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.

NOTICE: 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. 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.

Transport Safety

- 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.

Hydraulic Safety

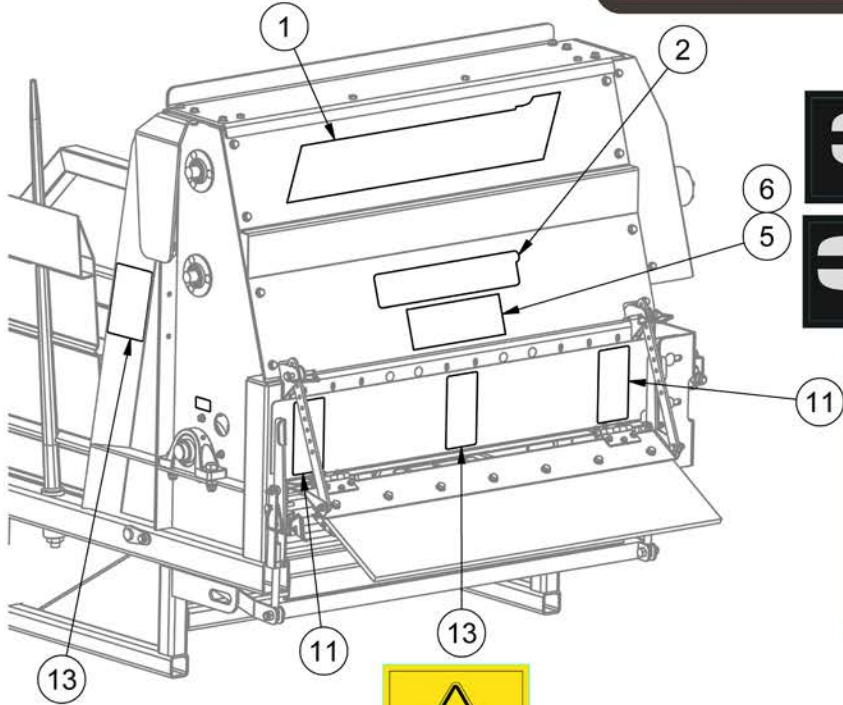
WHEN DEALING WITH HYDRAULICS DURING ANY TYPE OF ASSEMBLY, OPERATION, MAINTENANCE OR OTHER WORK ON OR NEAR THIS PRODUCT:

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 sound 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!**

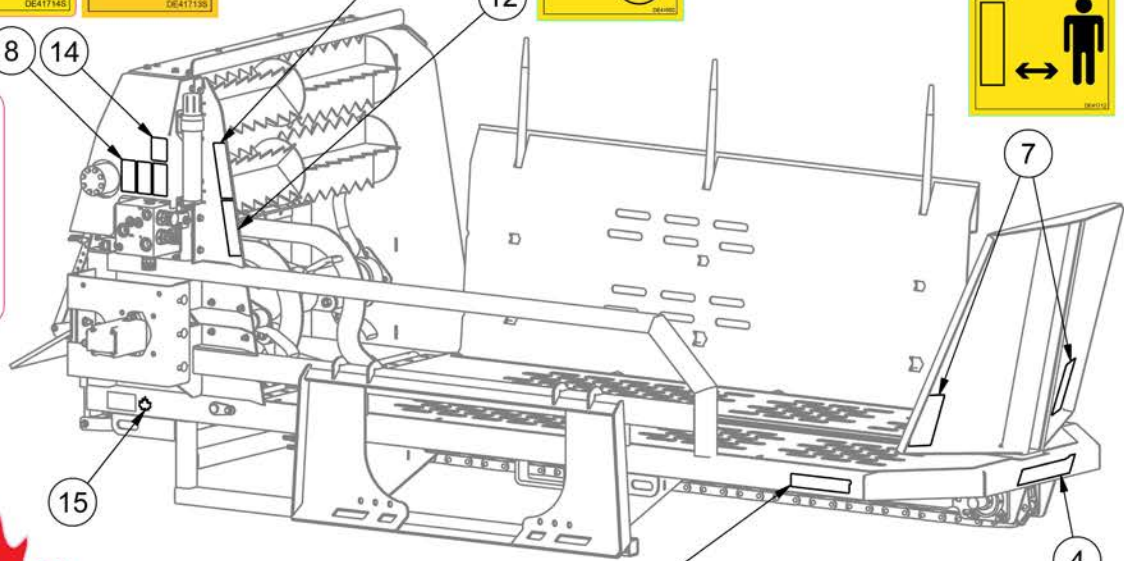
Before connecting or disconnecting hydraulic hoses, read your tractor or power unit's operator's manual for detailed instructions on connecting and disconnecting hydraulic attachments. Make certain that all parts meet the specifications for this product when installing or replacing hydraulic hoses or fittings. After connecting hydraulic lines: Slowly and carefully raise the loader and cycle the rollback / dump cylinders to check hose clearances and to check for any interference. Operate the hydraulics on this product to check hose clearances and to check for any interference. Make certain that the hoses cannot interfere with or actuate the quick-attach mechanism. Make certain that hoses will not be pinched, or get tangled, in any equipment. Do not lock the auxiliary hydraulics of your power unit in the "ON" position.

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.

Section 3 - Decal Locations



10 9 8 14



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------|--|
| 1 | 1 | DE23960 | Boss 1 Decal 32.5 x 5.5 |
| 2 | 1 | DE28146 | Tubeline Decal 4" x 16" |
| 3 | 1 | DE28705 | Tubeline Decal 2.0" x 8.3 " |
| 4 | 1 | DE28724 | Bale Processor BossI - 2.0 x 12 Decal |
| 5 | 1 | DE37511 | Boss I-3820 Model Decal |
| 6 | 1 | DE37512 | Boss I-3720 Model Decal |
| 7 | 2 | DE41712 | ISO Decal - Hand Pinch Point |
| 8 | 1 | DE41713S | ISO Decal - Hydraulic Pressure Small (50mm X 96mm) |
| 9 | 1 | DE41714S | ISO Decal - Read Operator's Manual (50mm X 96mm) |
| 10 | 1 | DE41715S | ISO Decal - Remove Key Before Repair (50mm X 96mm) |
| 11 | 2 | DE41718 | ISO Decal - Thrown Object Vertical |
| 12 | 1 | DE41902V | ISO Decal - Chain Entanglement Vertical |
| 13 | 3 | DE41913 | ISO Decal - Cutting Hazard |
| 14 | 1 | DE50043 | Boss I QR Decal |
| 15 | 1 | DECANADA | Decal Made In Canada |

Placement or Replacement of Decals

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.

- 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.

DE39484 / DE39485 - 3720 / 3820 Model Decal Kits

Item: 1 Part No: DE23960 Item: 4 Part No: DE28724



Item: 2 Part No: DE28146 Item: 3 Part No: DE28705



Item: 5 Part No: DE37511



Item: 6 Part No: DE37512



Item: 14 Part No: DE50043

DE39589 - Safety Decal Kit

Item: 7 Part No: DE41712

Keep clear of machine while operating.
Do not attempt to free material by hand.
May result in serious injury and/or death.



Item: 8 Part No: DE41713S

Do not attempt to find hydraulic leaks with hand. Consult operators manual (pg.7-1)



Item: 9 Part No: DE41714S

Read and understand Operator's Manual before operating.



Item: 10 Part No: DE41715S

Remove power unit key before servicing machine. Read operator's manual for proper repair or maintenance techniques.



Item: 11 Part No: DE41718

Thrown object hazard. Keep clear of machine while operating. Serious injury may occur.



Item: 12 Part No: DE41902V

Chain Entanglement Hazard. Keep hands clear of rotating parts while machine running. Do not operate without shielding in place.



Item: 13 Part No: DE41913

Cutting hazard. Sharp knives can cause dismemberment. Wait for moving parts to stop before attempting to repair.



Item: 15 Part No: DECANADA

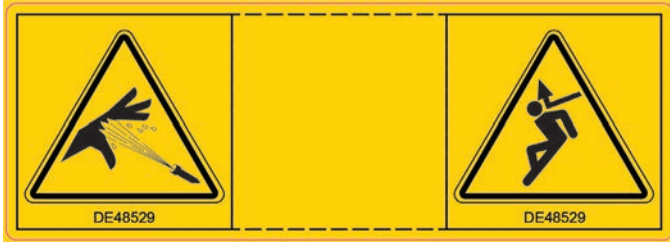
Country of Origin.



Optional Decals

Part No: DE48529

High Flow motor option requires a case drain hose.
DO NOT remove case drain hose or attempt to
operate without case drain connected to power unit.



Section 4 - Functions & Adjustments

Control Switch Functions

NOTICE: The Boss I 20 series machine can be operated without electrical controls. However this removes the ability to stop the ram and top beater independently from the flail drum.

With the handheld electrical control positioned as shown in Fig.1, the three toggle switch functions are:

- **(A)** Neutral position, the switch has no control over the hydraulic functions.
- **(B)** Left position, the switch will stop hydraulic flow to the bale ram.
- **(C)** Right position, the switch will stop hydraulic flow to both the bale ram and the top beaters.

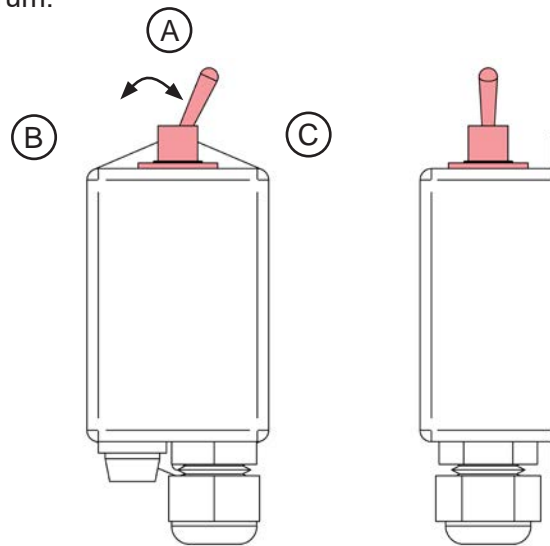


Fig.1

Control Manifold Functions - CTI

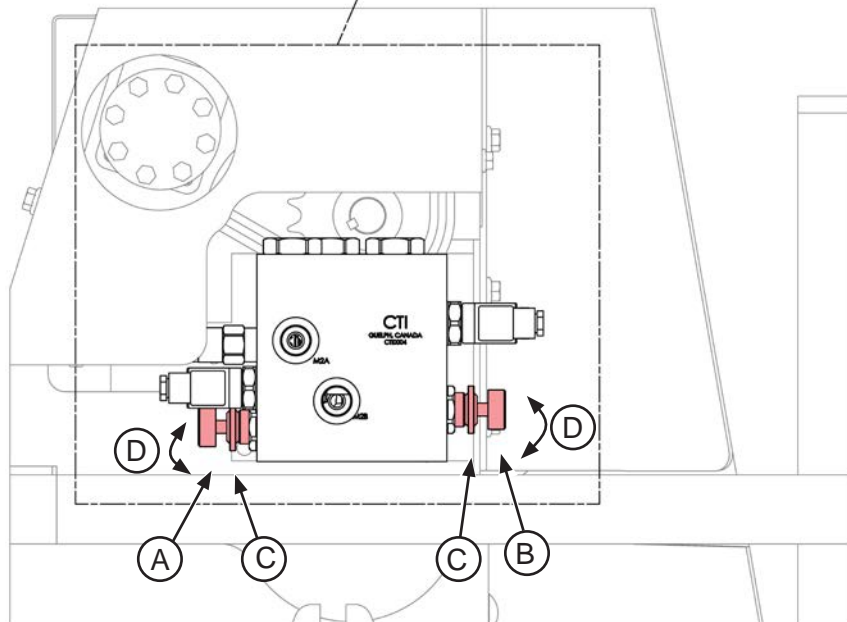
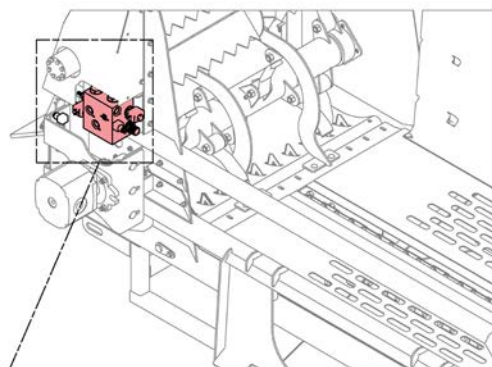
A Boss I 20 series machine equipped with a CTI manifold valve has 2 adjustable hydraulic functions.

1. Bale Feed Rate

The hand dial located on the left side **(A)** of the manifold valve controls the speed that the bale ram pushes a bale into the flail drum.

2. Secondary Bale Feed Rate

The hand dial located on the right side **(B)** of the manifold valve controls the rotation speed of the top beaters.



Adjusting CTI Manifold Dials



CAUTION: Damage to dial knobs may result if attempting to adjust while hydraulics are under pressure.

Loosen lock knob **(C)** until the adjuster knob **(D)** can rotate. Turn adjuster knob left to increase speed of function. Turn adjuster knob to right to decrease speed of function.

Adjusting Canimex High Flow Manifold Dials

There are 3 dials on the high flow Canimex manifold block. They control various functions of the machine.

NOTE: Loosen set screw on **(A)** and **(B)** dials before attempting adjustment.

1. Bale Feed Rate

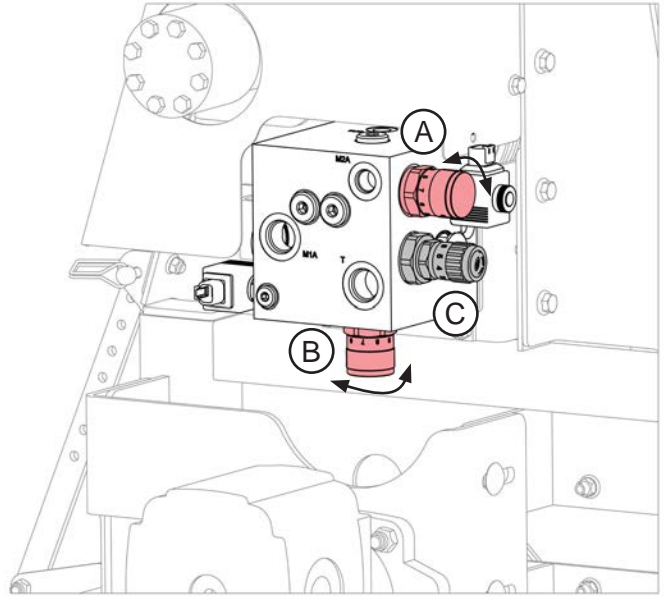
The hand dial located on the upper right side **(A)** of the manifold valve controls the speed that the bale ram pushes a bale into the flail drum.

2. Secondary Bale Feed Rate

The hand dial located on the bottom side **(B)** of the manifold valve controls the rotation speed of the top beaters.

3. Ram Retract Speed

The black hand dial located on the lower right side **(C)** of the manifold valve controls the speed that the bale ram retracts from the flail drum.

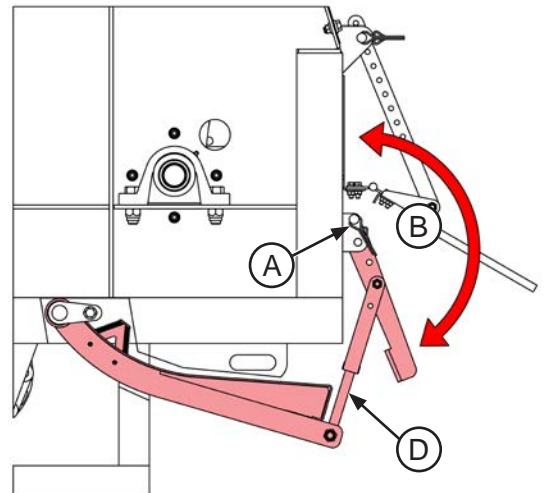
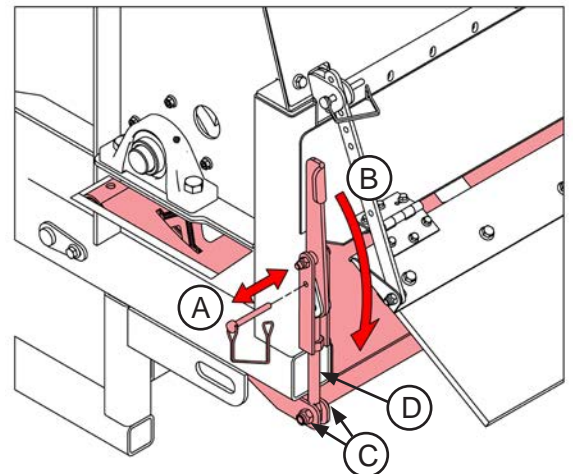


NOTE: This dial is factory preset and should **NOT** be adjusted.

Flail Floor Adjustment

The floor beneath the flail drum can be lowered to allow longer strand material to be fed out of the machine.

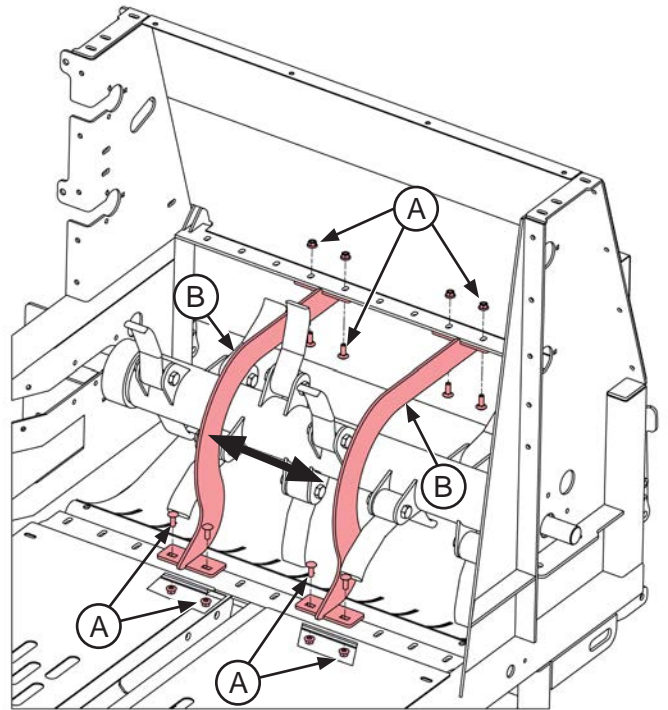
1. Pull lock pins **(A)** from upper pivot linkages (both sides).
2. Pull pivot linkage handles **(B)** down to lower floor (both sides).
3. Refasten lock pins through frame lugs to avoid losing them.
4. Further adjustment can be made by unfastening nuts and bolts **(C)** of lower pivot point which allows the eyebolts **(D)** to turn.
5. Turn the eyebolts to adjust the amount the flail floor lowers.
6. Refasten the nut and bolt through the eyebolt and flail floor (both sides).



Flail Drum Guards Adjustment

Flail drum guards are a great way to restrict the amount of material that is feed through the flail drum. However longer materials may be restricted too much and become entangled in the guards. Follow these instructions to remove or change the spacing of the flail drum guards.

1. Remove nuts and bolts (**A**) from top and bottom of gaurds.
2. Slide, or remove, guards (**B**) to desired locations.
3. Refasten nuts and bolts of top and bottom of guards.



Removing Cutting Knives

Removing the knives offers less resistance and faster processing when shorter material is being fed through the Boss I.



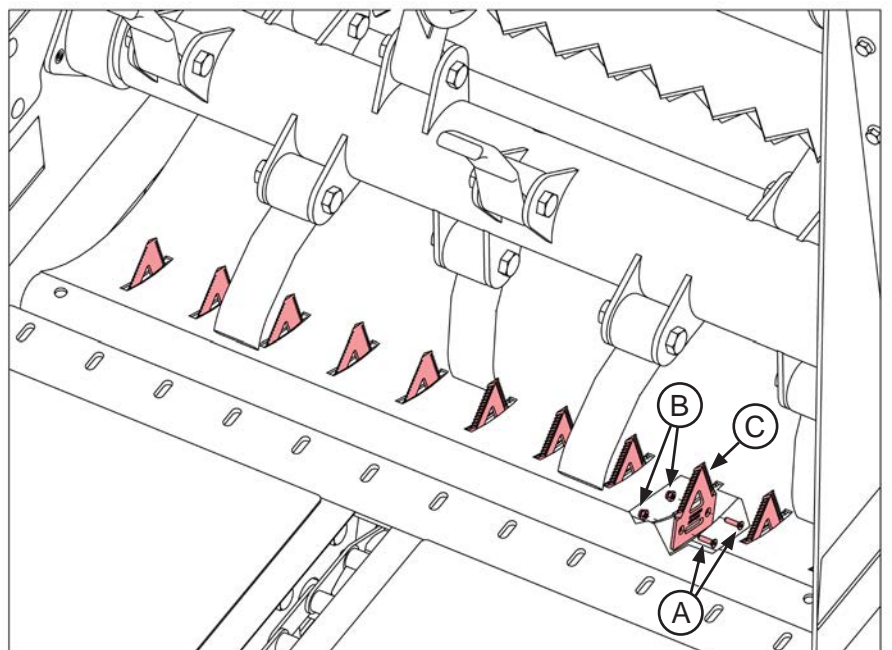
DANGER: Only remove knives when machine is disconnected from power unit. Wear work gloves to avoid cutting hands on serrated edges.

To remove knives follow these instructions:

WARNING: You may want to clamp the knife blade(s) to the frame to avoid accidental injury when fasteners are removed.

1. Remove countersunk bolts (**A**) and lock nuts (**B**).
2. Remove knife blade (**C**) and wrap sharp edges with a rag or other thick material.
3. Repeat the process to remove as many knives as desired.

Store knives and hardware in a labelled container for future use.



Section 5 - 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 and twine from bales before processing.

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.

- 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.
- Drive slowly through gates and doors.
- Know your loader's safe operating weight limit and the weight of your loader attachment.

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

Processor Hydraulic Connection



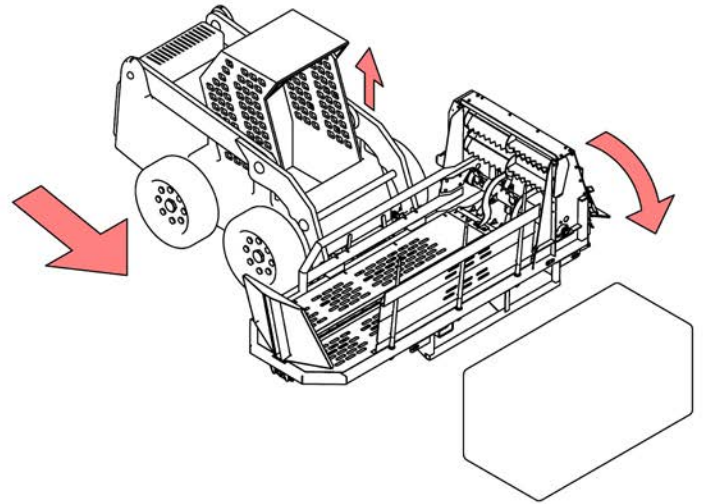
WARNING: Read and understand [Section 2 - Safety](#) before beginning any hydraulic connection.

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.

Carefully raise the loading arm and cycle the power unit tilt cylinders to check hose clearances and to check any interference.

Loading Bales

- Load one bale at a time. If bales are frozen, put frozen side down to the table for better operation.
- Center the bale on the forks before loading on to the table. Slide forks lightly on the ground when loading bales. Store bales on level ground and on a clean surface free from rocks and other foreign objects.
- When bale is loaded, return machine to its upright position.
- Remove bale strings.
- Adjust discharge deflector to spread forage at desired width.

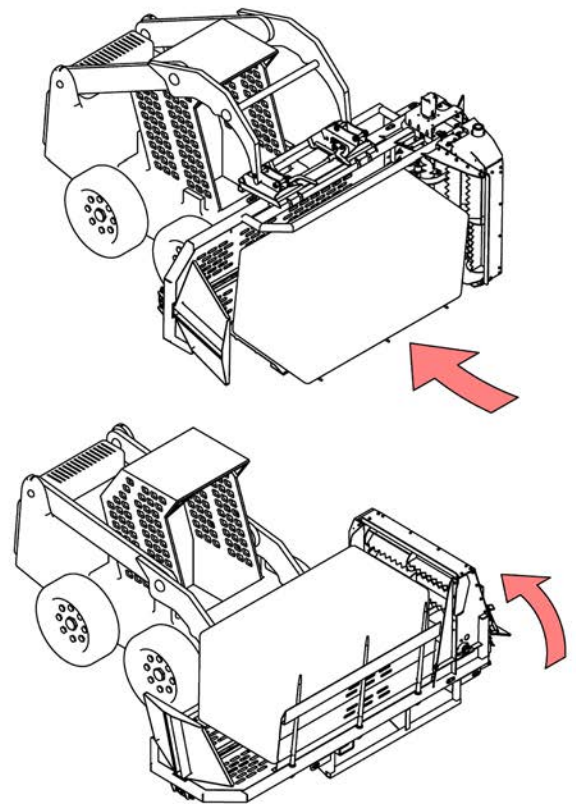


Spreading

NOTE: Operating power unit at maximum RPM. allows the processor to do a better job of chopping forage.

- Raise the machine to the desired height.
- Engage power unit's hydraulic controls to start turning the flail motor and top beaters.
- Use hydraulic controls to start the ram towards the bale.
- Push the bale against the flail drum, adjusting hydraulics for desired material outflow and operating time.
- 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.

NOTE: Twine build-up should be kept to a minimum to reduce fire hazard and keep the machine in balance.



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 3-1](#).

After Every 10 Hours of Operation

Grease all roller bearings ([refer to diagram on page 9-1](#)).

Inspect and tighten Allen screws on bearing.

Repairs

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

Order safety decals for replacement parts that have a safety decal on the original part.

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.



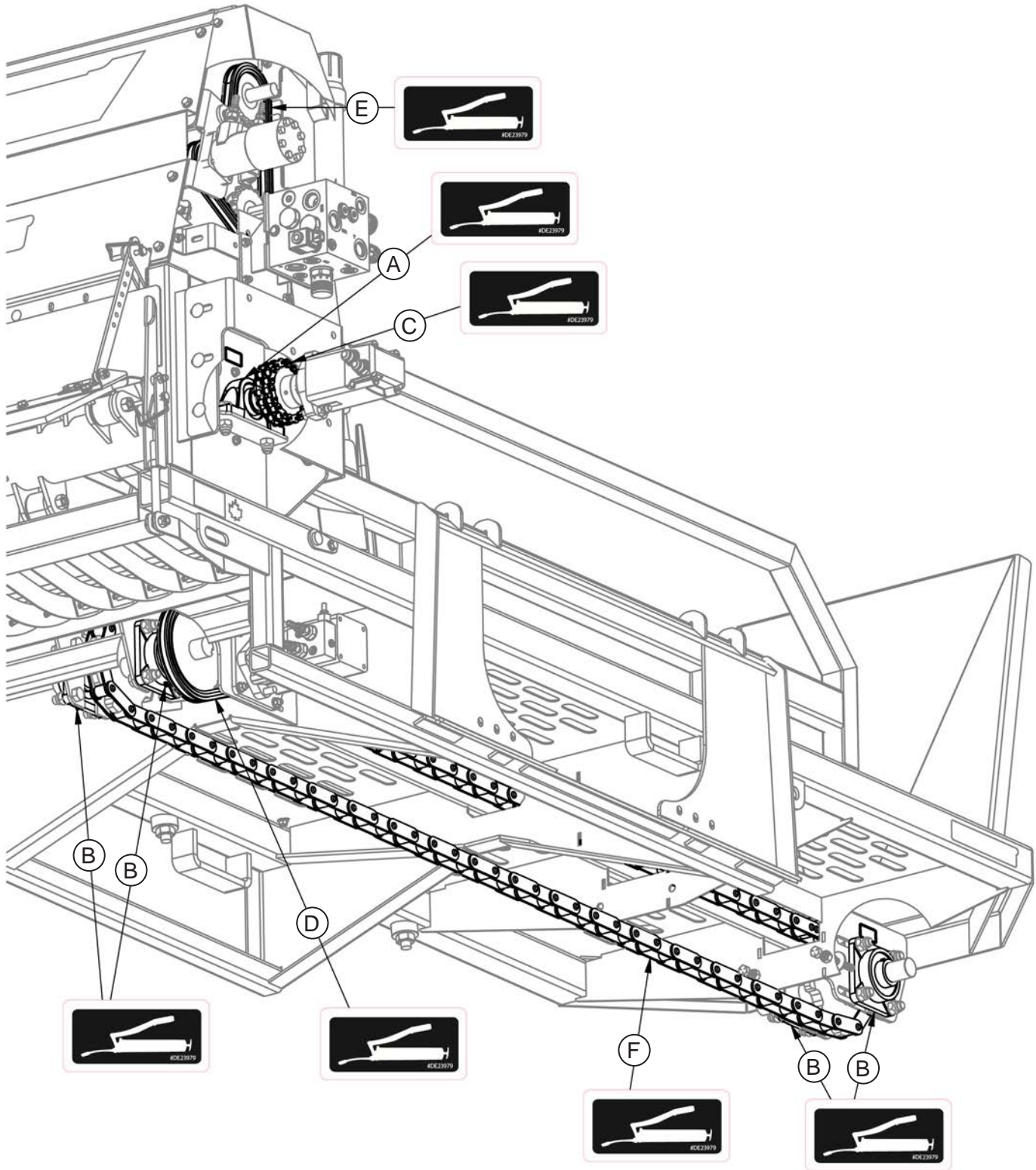
WARNING

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.

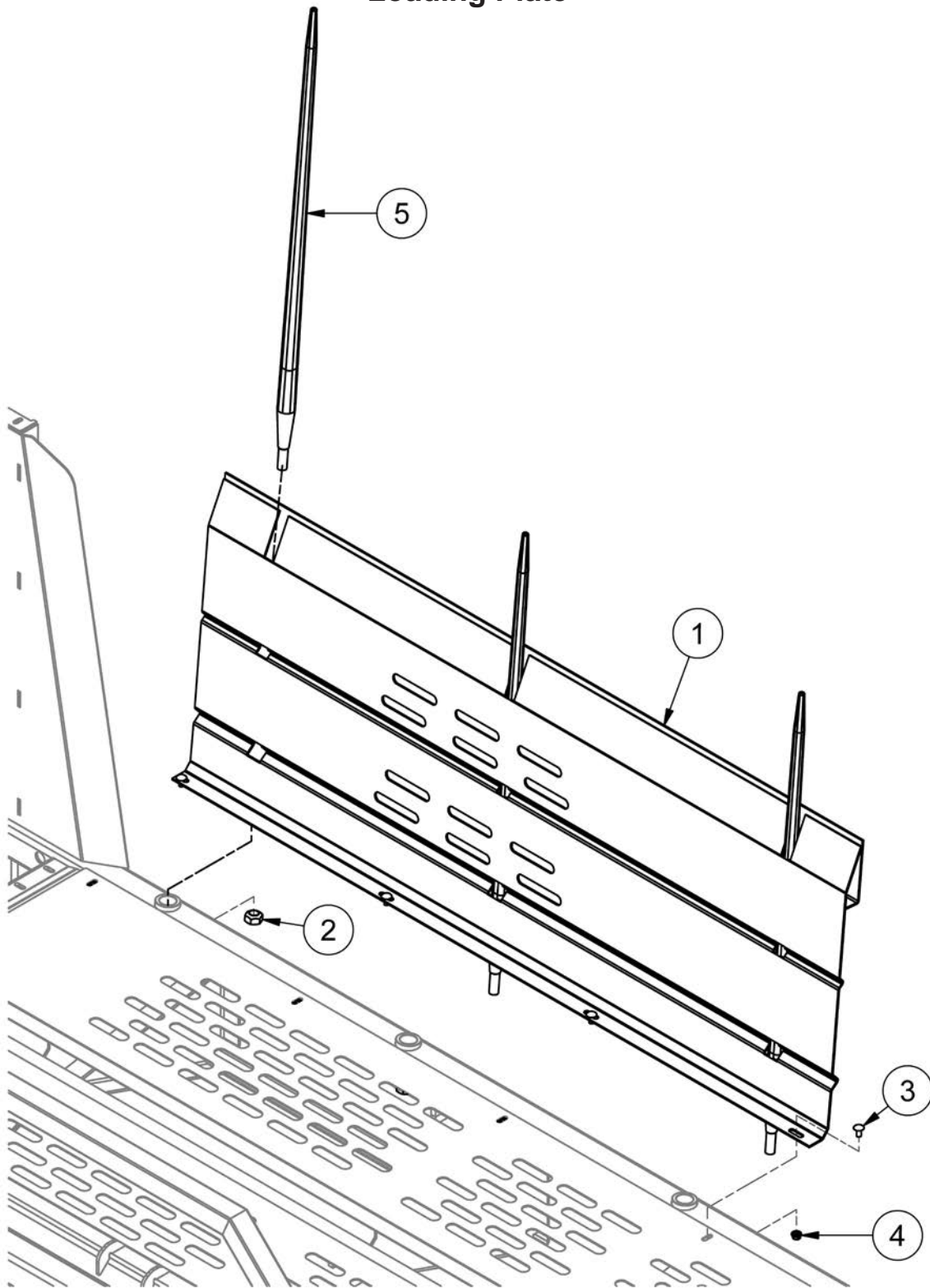
Grease Points



| ITEM | QTY | AREA | TIMELINE | TYPE |
|------|-----|-----------------------------------|----------|------------------------------|
| A | 2 | Flail Shaft Pillow Block Bearings | Weekly | No.2 Extreme Pressure Grease |
| B | 4 | Bed Chain Flange Bearings | Monthly | |
| C | 1 | Flail Motor Chain Coupler | Weekly | No.2 White Grease (Aerosol) |
| D | 1 | Bed Sprocket Roller Chain | Monthly | |
| E | 1 | Top Beater Roller Chain | Monthly | |
| F | 1 | Bed Chain | Annually | |

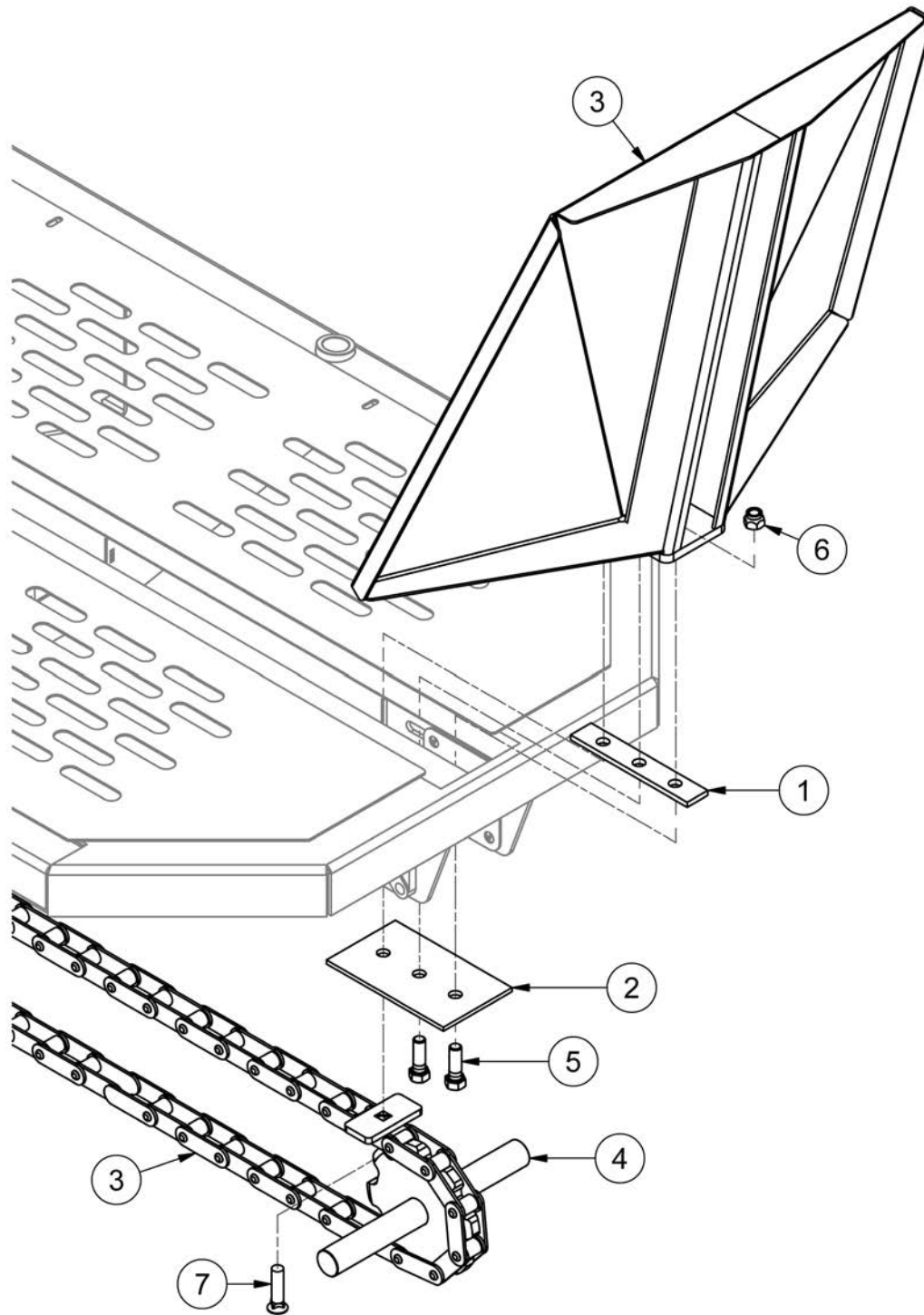
Section 7 - Part Breakdowns & Lists

Loading Plate



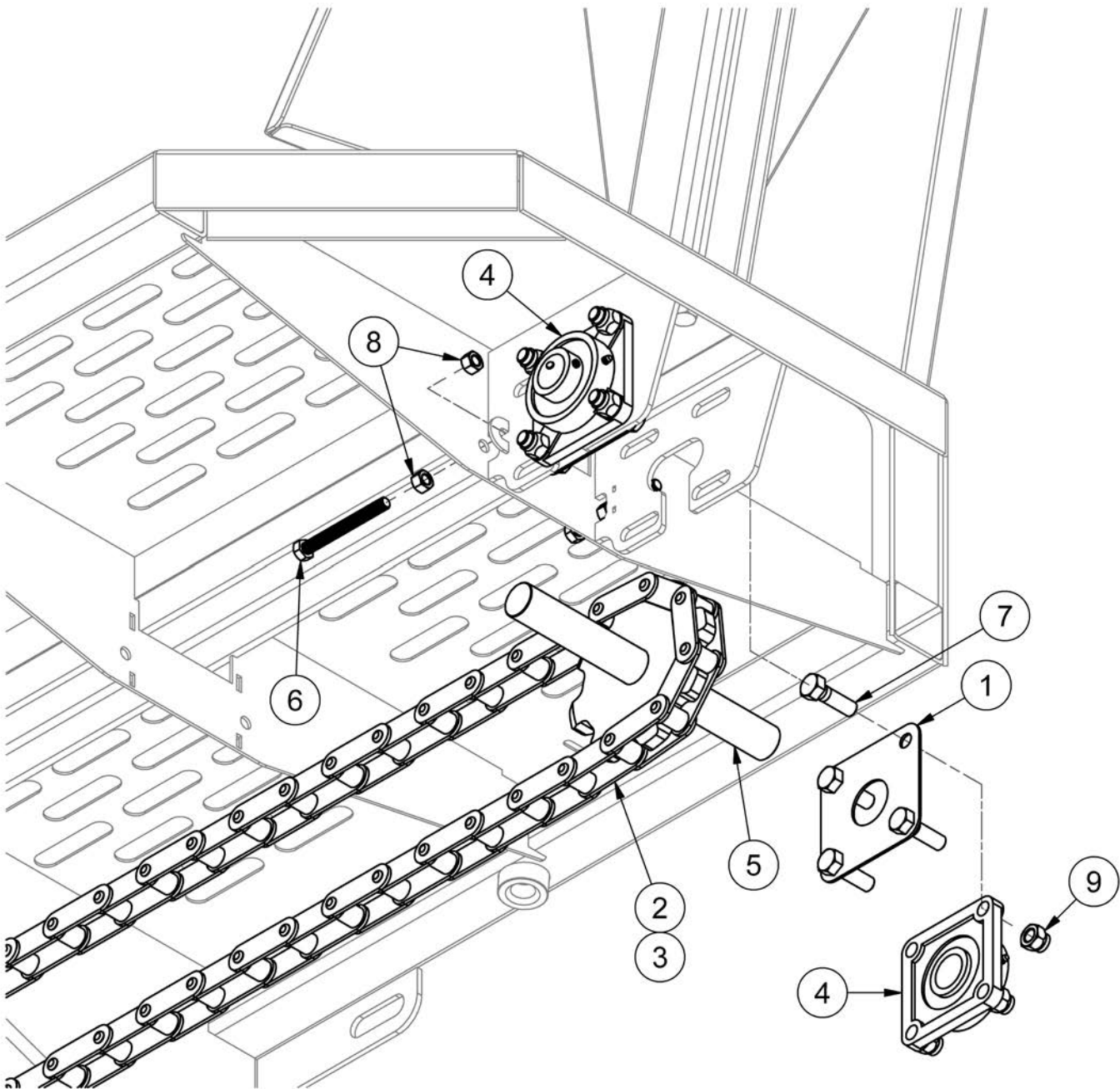
| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|------------------|---|
| 1 | 1 | 25783 | Loading Plate |
| 2 | 3 | 39510 | Conus 1 Nut |
| 3 | 4 | CB3/8-16X0.75CZ5 | Carriage Bolt - 3/8-16 x 3/4" Grade 5 Zinc |
| 4 | 4 | HNS3/8-16CZ | 3/8"-16" Zinc Finish Hardened Serrated Flange Nut |
| 5 | 3 | TL5X2-301-144 | 43" Tine |

Ram



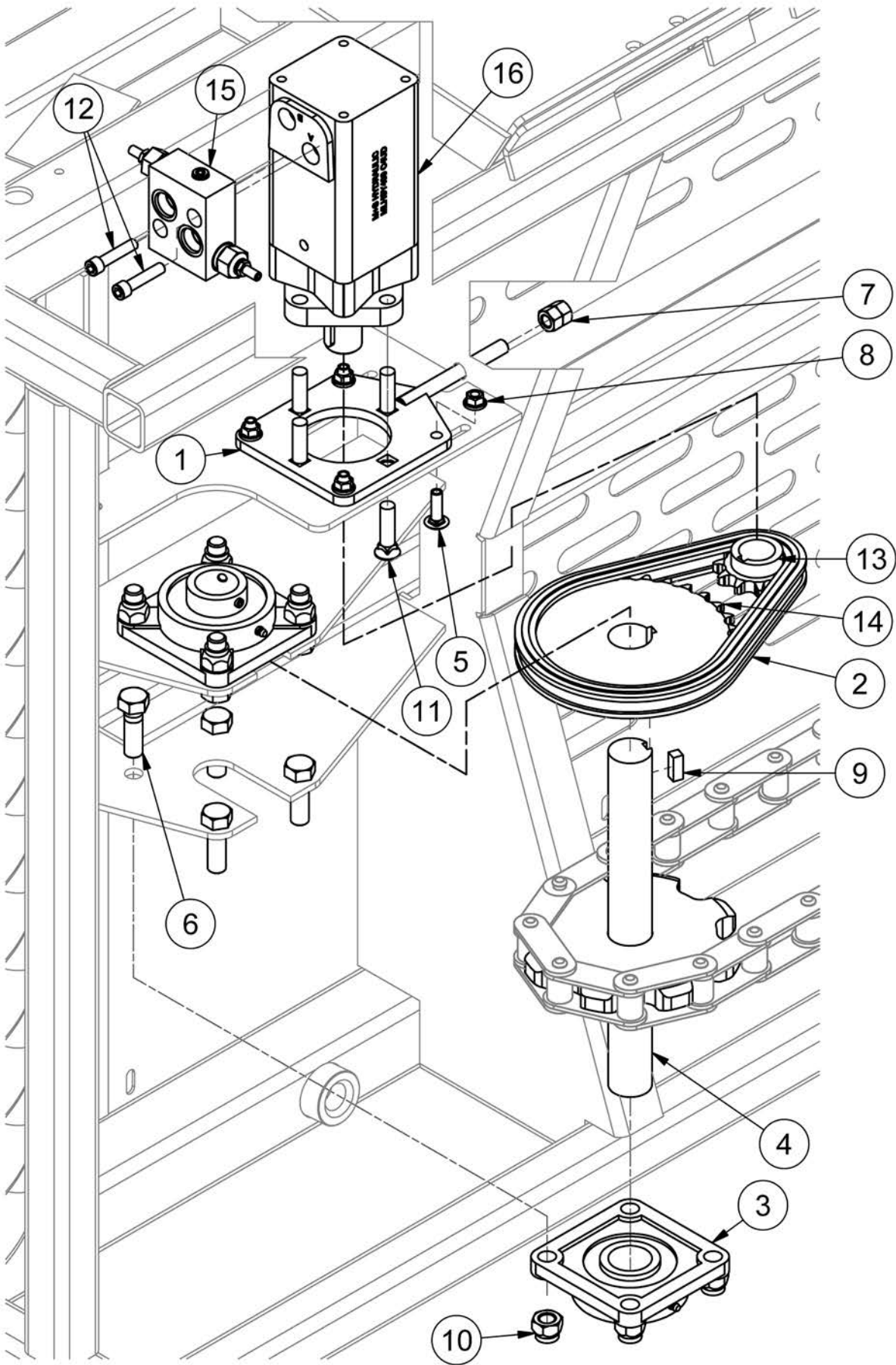
| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|---------------|---|-------------------------------|
| 1 | 1 | 36350 | Ram Guide | |
| 2 | 1 | B1 123 | Bottom Ram Slider Plate | |
| 3 | 1 | B1 150 | Ram | |
| 4 | 1 | BS200138A | Idler | |
| 5 | 2 | HB5/8-11X2Z5 | Hex Bolt 5/8-11x2 Grade 5 Zinc Plated Hex Cap Screw | |
| 6 | 3 | LN5/8-11NCZ5 | LN 5/8-11 Zinc Plated Nylon Insert Lock Nut | |
| 7 | 1 | PB 5/8-11X2.5 | Plow Bolts - 5/8-11 x 2 1/2 Flat Head Gr.5 | Old Style: HB 5/8-11X2.5Z5 |

Rear Idler



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-----------------------|---|
| 1 | 2 | 36353 | Bearing Plate |
| 2 | 1 | 39992 | 3720 Bed Chain - (81X Chain) |
| 3 | 1 | 39993 | 3820 Bed Chain - (81X Chain) |
| 4 | 2 | BEA UCF208-24-1.5 | 1 1/2" 4 Bolt Flange Bearing |
| 5 | 1 | BS200138A | Idler |
| 6 | 2 | HB1/2-13 X 4-1/2 TCZ5 | 1/2-13 x 4-1/2 UNC Fully Threaded Hex Bolt |
| 7 | 8 | HB5/8-11X2Z5 | Hex Bolt 5/8-11x2 Grade 5 Zinc Plated Hex Cap Screw |
| 8 | 4 | HN1/2-13CZ5 | Hex Nut 1/2"-13 Grade 5 Zinc Plated Finished |
| 9 | 8 | LN5/8-11NCZ5 | LN 5/8-11 Zinc Plated Nylon Insert Lock Nut |

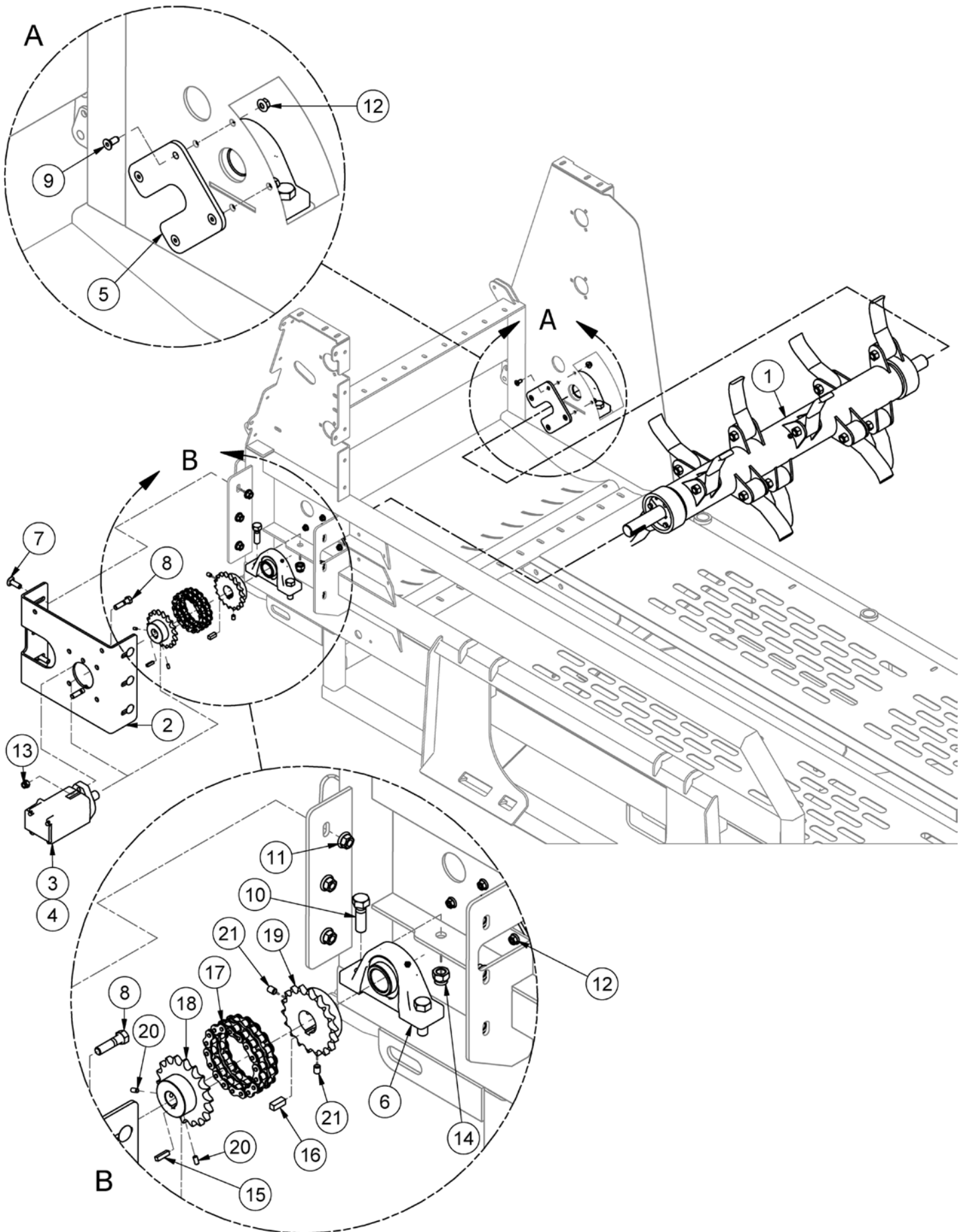
Front Chain Drive



Front Chain Drive

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------------|---|
| 1 | 1 | 36695 | Ram Motor Plate |
| 2 | 1 | 39997 | Chain - #60 x 39 Links (+ Connector Link) |
| 3 | 2 | BEA UCF208-24-1.5 | Flange Bearing |
| 4 | 1 | BS200141A | Bed Chain Sprocket Weldment |
| 5 | 4 | CB3/8-16X1.25CZ5 | Carriage Bolt - 3/8-16 x 1 1/4" Grade 5 Zinc |
| 6 | 2 | HB5/8-11X2Z5 | Hex Bolt 5/8-11x2 Grade 5 Zinc Plated Hex Cap Screw |
| 7 | 2 | HN1/2-13CZ5 | Hex Nut 1/2"-13 Grade 5 Zinc Plated Finished |
| 8 | 8 | HNS3/8-16CZ | 3/8"-16" Zinc Finish Hardened Serrated Flange Nut |
| 9 | 1 | KS39999 | Keystock - .375 X .375 X 1.25 |
| 10 | 4 | LN5/8-11NCZ5 | LN 5/8-11 Zinc Plated Nylon Insert Lock Nut |
| 11 | 4 | PB 1/2-13X2 | Plow Bolts - 1/2-13 x 2 Flat Head Gr.5 |
| 12 | 2 | SHCS3/8-16X1.75 | Hex Bolt - 3/8-16 x 1 3/4 Socket Head Cap Screw |
| 13 | 1 | SPR60B111.25 | Sprocket - 11 Tooth, 1.25" Bore w/ .313" Keyway |
| 14 | 1 | SPR60B30F-IH | Sprocket - 30 Tooth, 1.5" Bore w/ .375" Keyway |
| 15 | 1 | VAL KPDS100/A/3 | Relief Valve |
| 16 | 1 | VAL MLHSY400 | Hydraulic Motor |

Flail Drum Assembly

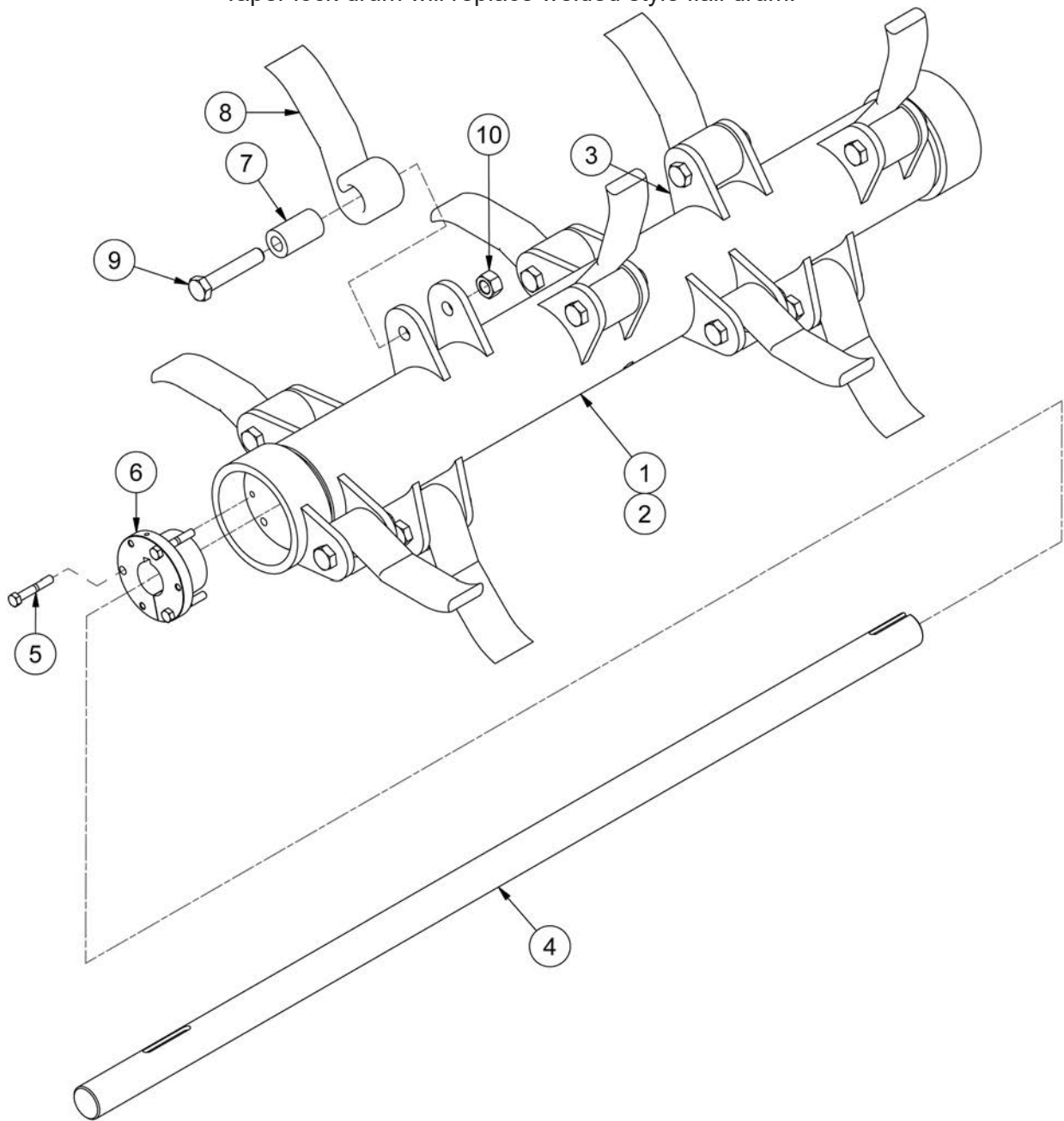


Flail Drum Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|-----------------------|---|-------------------|
| 1 | 1 | 39678 | Flail Drum | Brkdwn Pg.7-10 |
| 2 | 1 | 36395 | Motor Mount | |
| 3 | 1 | VAL 1002 | Hydraulic Motor | |
| 4 | 1 | SK 61258 | Seal Kit for Eaton Hydraulic Motor 104-1002-006 | |
| 5 | 2 | 36376 | Flail Spacer | |
| 6 | 2 | BEA P208-108DI | 1.5" Pillow Block Bearing | |
| 7 | 6 | CB 1/2-13 X1.5 Z5 | Carriage Bolt - 1/2-13 x 1 1/2" Grade 5 Zinc | |
| 8 | 2 | HB 1/2-13X2 Z5 | Hex Bolt 1/2-13x2 Grade 5 Zinc Plated Hex Cap Screw | |
| 9 | 8 | HB 5/16-18X0.75 FHSCS | Hex Bolt - 5/16"-18 x 3/4" Flat Socket Cap Screw | |
| 10 | 4 | HB 5/8-11X2 Z5 | Hex Bolt 5/8-11x2 Grade 5 Zinc Plated Hex Cap Screw | |
| 11 | 6 | HNC1/2 | Serrated Hex Nut | |
| 12 | 8 | HNC5/16 | Serrated Hex Nut | |
| 13 | 2 | LN 1/2 N | LN 1/2-13 Zinc Plated Nylon Insert Lock Nut | |
| 14 | 4 | LN 5/8 N | LN 5/8-11 Zinc Plated Nylon Insert Lock Nut | |
| 15 | 1 | KS40254 | Keystock .250 X 1.000 | |
| 16 | 1 | KS39999 | Keystock .375 X 1.000 | |
| 17 | 1 | SPR6018CC | #60 Chain Coupler (c/w Connector Link) | |
| 18 | 1 | SPR60B18 | 18 Tooth, 1" Bore Chain Coupler Sprocket | |
| 19 | 1 | SPR60B18-1.5 | 18 Tooth, 1.5" Bore Chain Coupler Sprocket | |
| 20 | 2 | SS 14X12 | Allan Head Set Screw, 1/4-20 x 1/2 | |
| 21 | 2 | SS 38X12 | Allan Head Set Screw, 3/8-16 x 1/2 | |

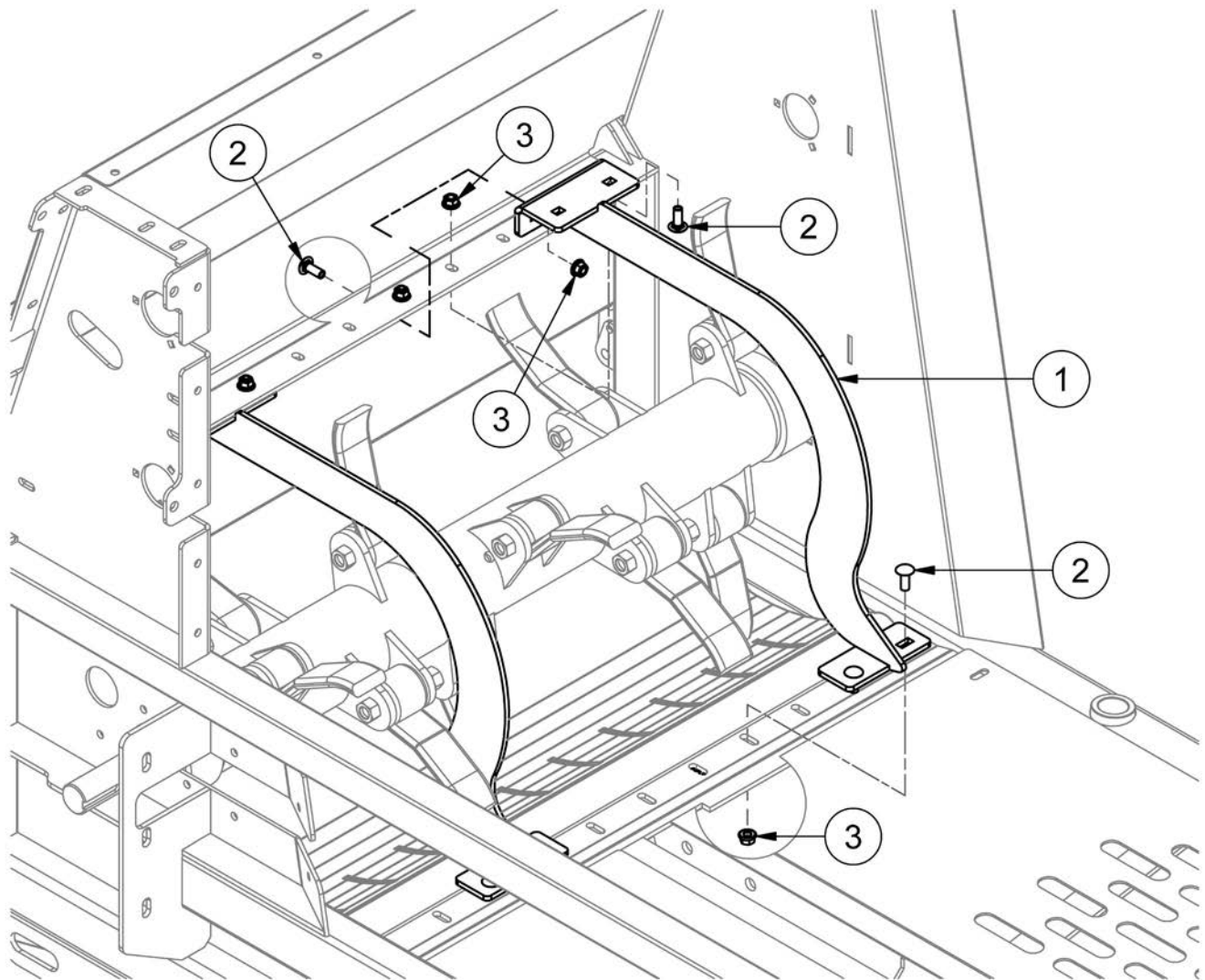
Flail Drum (Taper Lock Hub) Breakdown

*Taper lock drum will replace welded style flail drum.



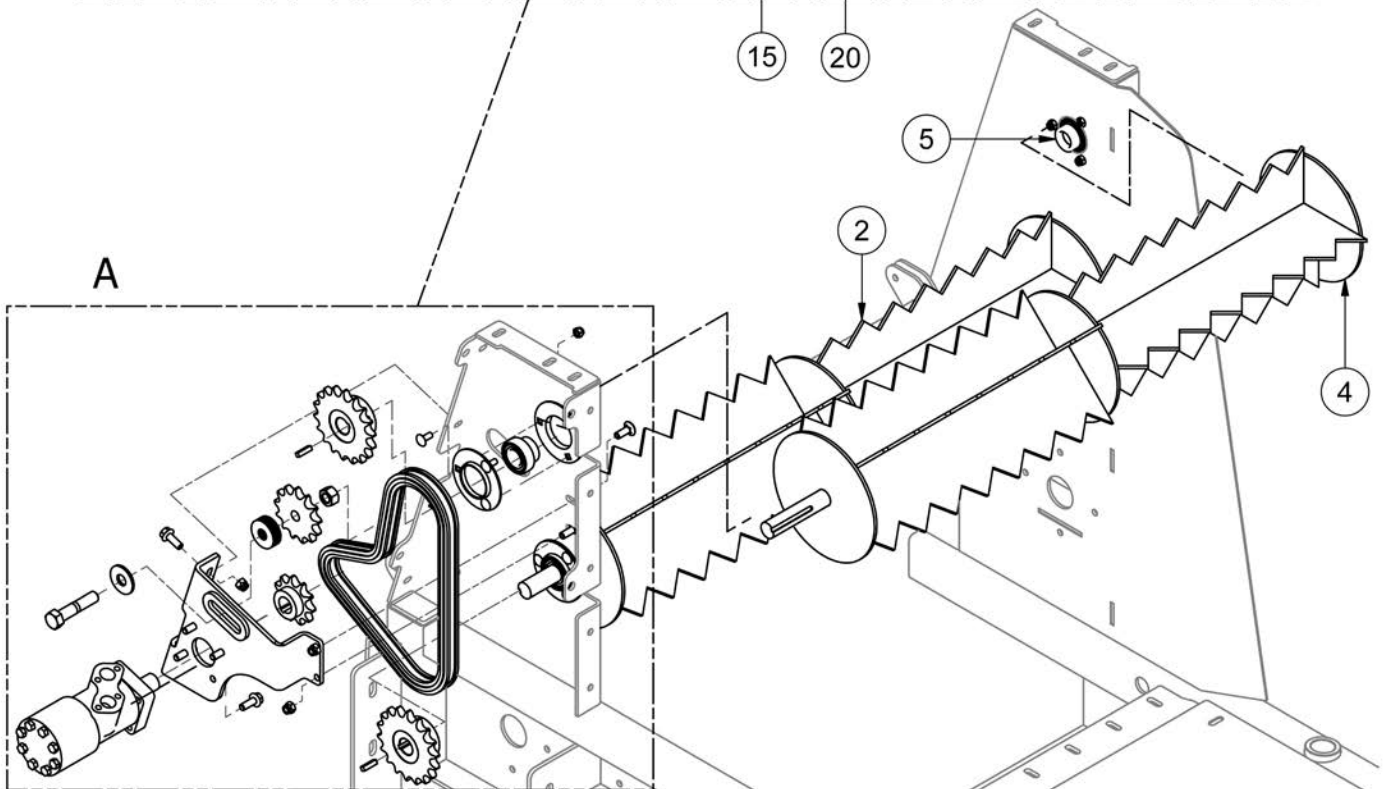
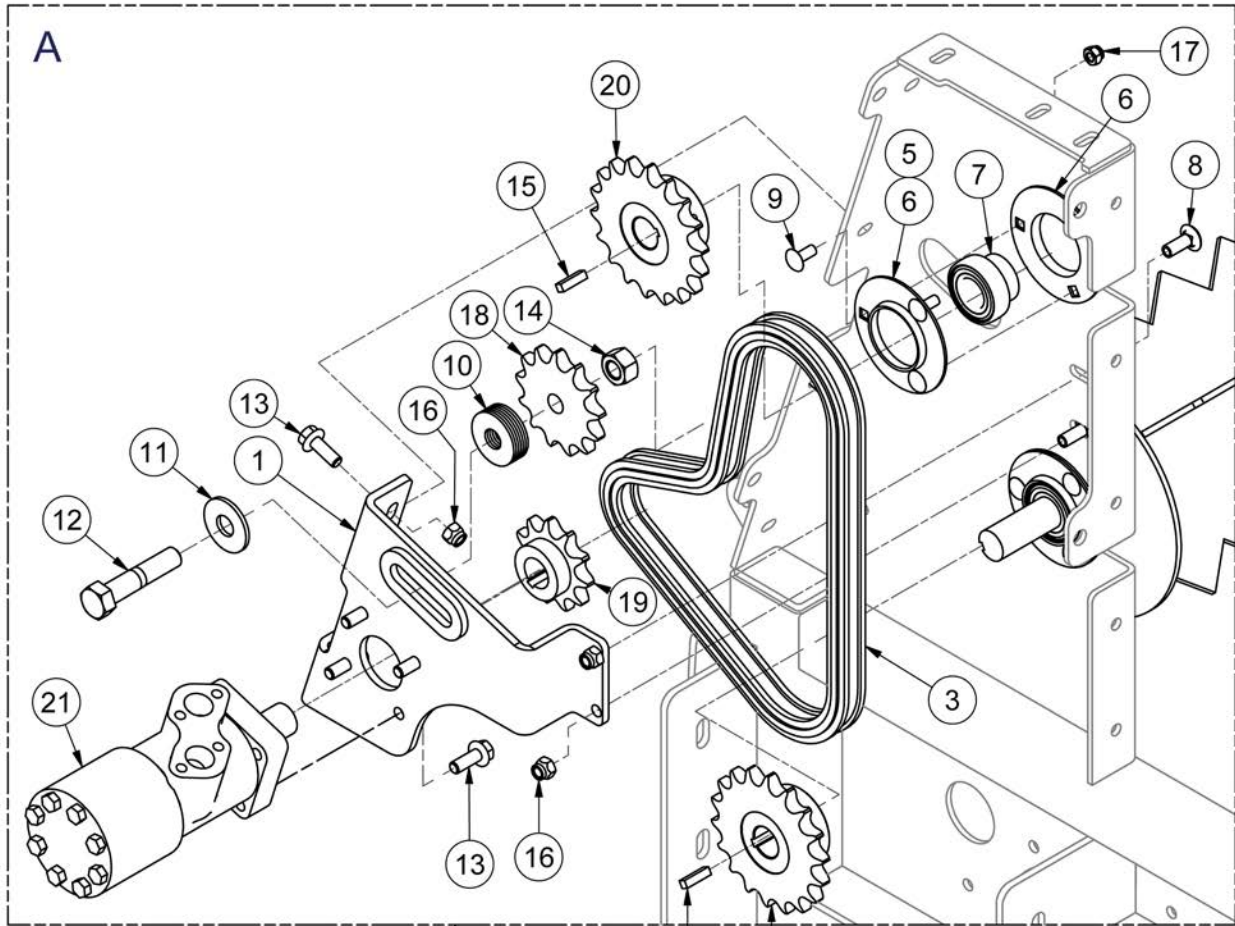
| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|-----------------|--|----------------|
| 1 | 1 | 39678 | Boss I 20 Series Complete Taper Lock Drum Assembly | Inc. All Items |
| 2 | 1 | 39677 | Flail Drum | Inc. Items 3-6 |
| 3 | 24 | 30070 | Flail Mount Lug | |
| 4 | 1 | 39921 | 1.5" Flail Drum Shaft | |
| 5 | 6 | HB 5/16-18X2 Z5 | Hex Bolt 5/16-18x2 Grade 5 Zinc Plated Hex Cap Screw | |
| 6 | 2 | BS BUSK-1.5 | SK Taper Lock Bush 1 1/2 | |
| 7 | 12 | BS200059 | Flail Bushing | |
| 8 | 12 | BS200060A-1 | Hammers, Heavy - 7/16 Material | |
| 9 | 12 | HB5/8-18X3.25Z8 | Hex Bolt 5/8-18x3 1/4 Grade 8 Zinc Hex Cap Screw | |
| 10 | 12 | LN5/8-18CFZ2 | Center Lock Nut 5/8"-18 Grade A Zinc Plated | |

Flail Drum Guards



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|---------------|---|
| 1 | 2 | 36306 | Flail Rib |
| 2 | 12 | CB3/8-16X1CZ5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc |
| 3 | 12 | HNS3/8-16CZ | 3/8"-16" Zinc Finish Hardened Serrated Flange Nut |

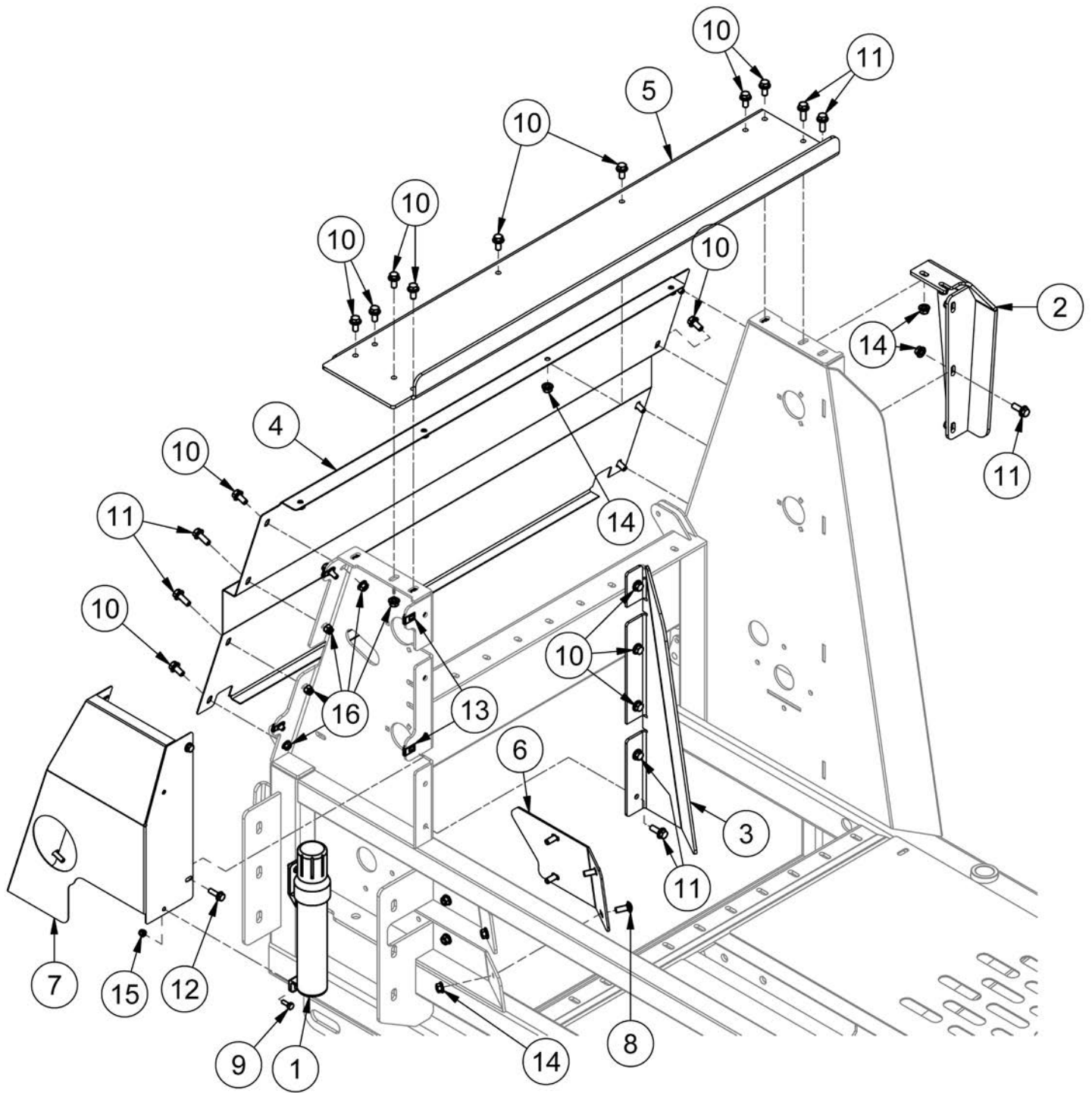
Top Beaters



Top Beaters

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------------|---|
| 1 | 1 | 36312 | Hyd. Motor Mount |
| 2 | 1 | 36972 | Top Beater |
| 3 | 1 | 40256 | Chain - #60, 49 Links (+ Connector Link) |
| 4 | 1 | B1 084 | Top Beater |
| 5 | 4 | BEA 42852 | BEA SA205-16+BEA PF205 |
| 6 | 2 | BEA PF205 | PF205 Bearing Flange |
| 7 | 1 | BEA SA205-16 | 1" Bearing Insert |
| 8 | 2 | CB3/8-16X1CZ5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc |
| 9 | 6 | CB5/16-18X0.75CZ5 | Carriage Bolt - 5/16-18 x 3/4" Grade 5 Zinc |
| 10 | 6 | FW 5/8 | Flatwasher - 5/8" Zinc Plated USS |
| 11 | 1 | FW 5/8 HD | Flatwasher - Hardened |
| 12 | 1 | HB 5/8-11X3 Z5 | Hex Bolt 5/8-11x3 Grade 5 Zinc Plated Hex Cap Screw |
| 13 | 6 | HBC3/8X1 | Hex Bolt Cerrated 3/8-16 x 1 Zinc Flange Bolt |
| 14 | 1 | HN5/8-11CZ5 | Hex Nut 5/8"-11 Grade 5 Zinc Plated Finished |
| 15 | 2 | KS40254 | Keystock - .25 x .25 x 1.5 |
| 16 | 16 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |
| 17 | 6 | LN5/16-18NCZ5 | LN 5/16-18 Zinc Plated Nylon Insert Lock Nut |
| 18 | 1 | SPR60A13-.625 | Idler Sprocket - #60, 13 Tooth, 5/8 Bore |
| 19 | 1 | SPR60B11-1.0 | Sprocket - #60, 11 Tooth |
| 20 | 3 | SPR60B18 | Sprocket - #60, 18 Tooth |
| 21 | 1 | VAL 1008 | Hydraulic Motor |

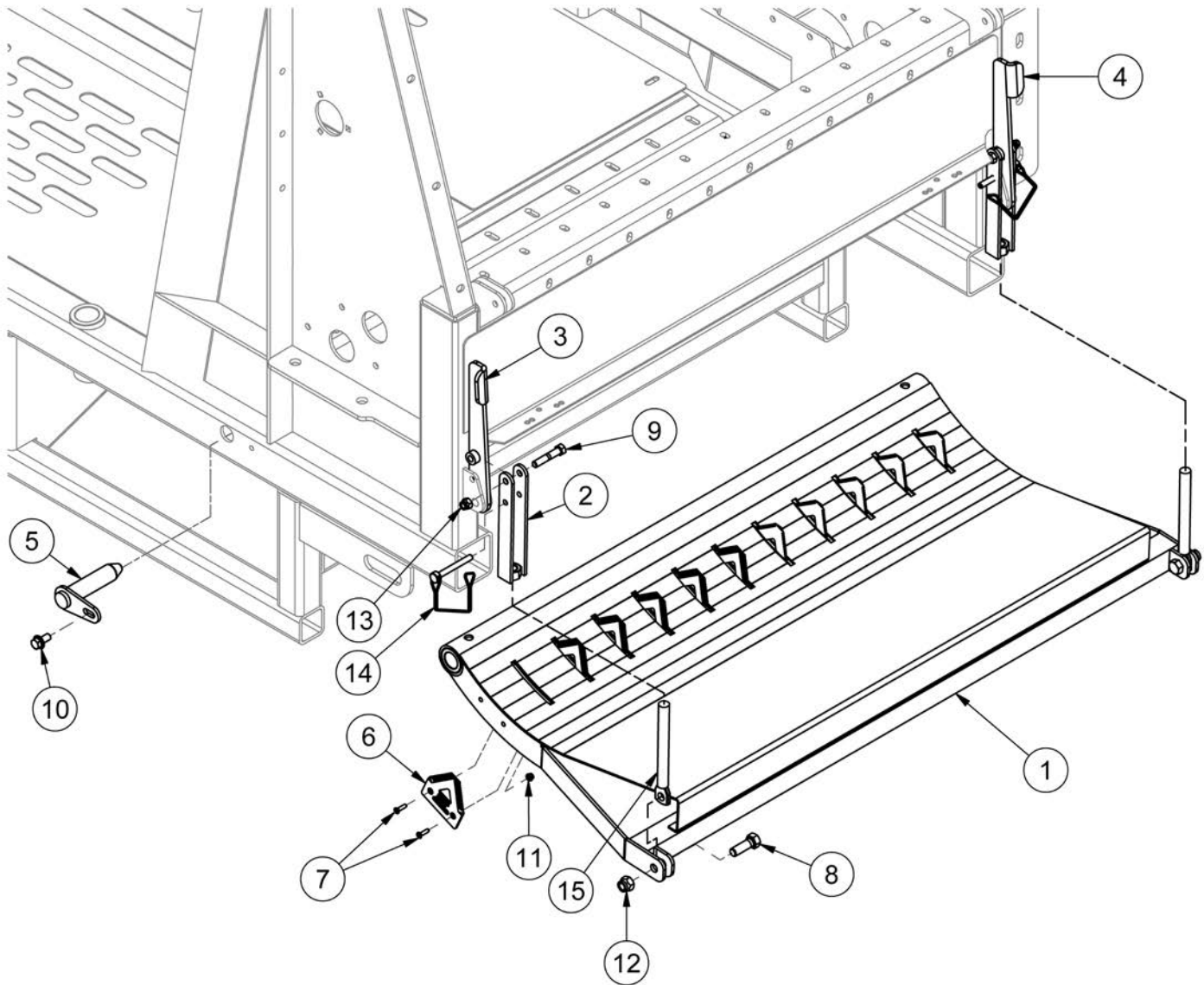
Front Shields



Front Shields

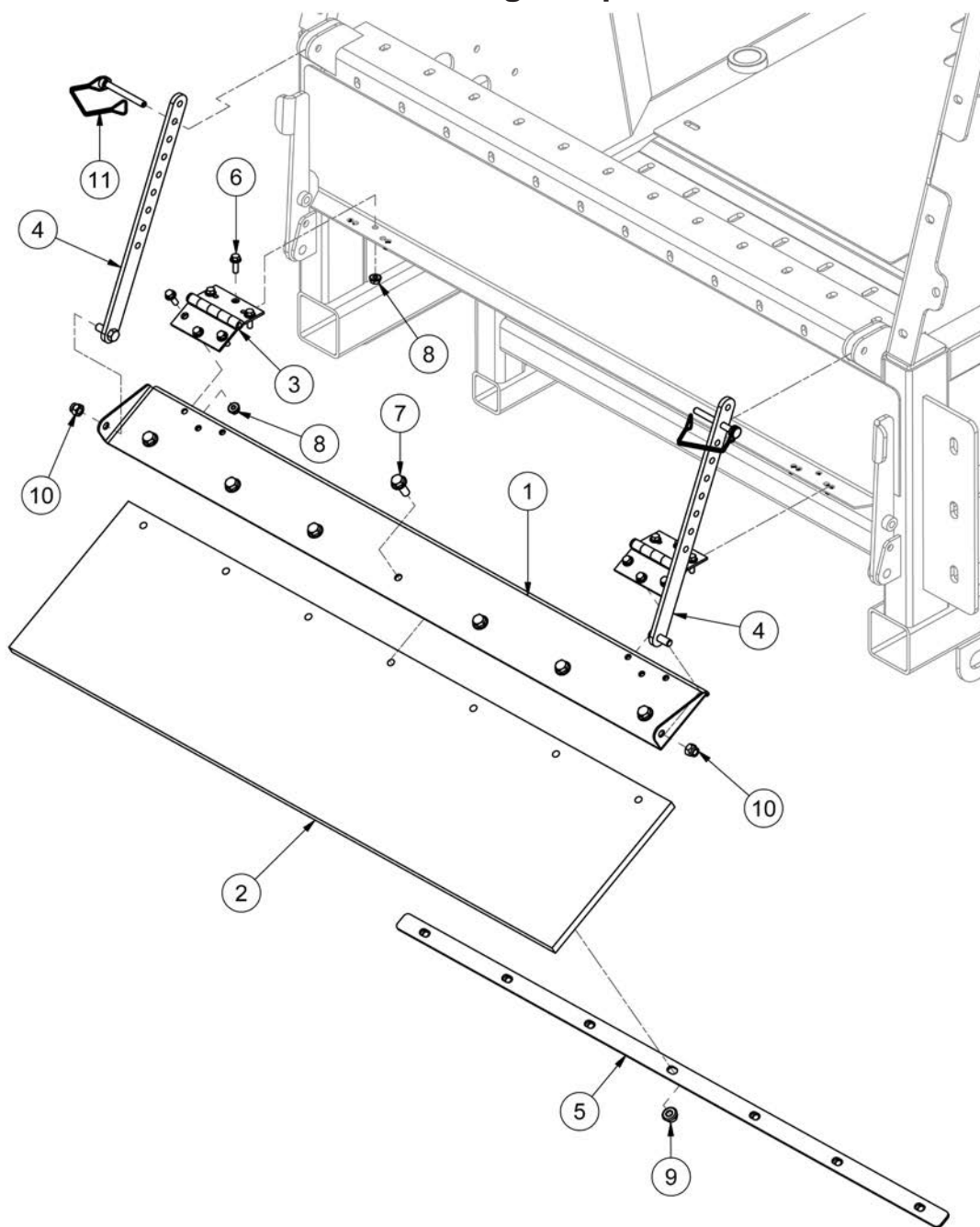
| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-----------------|---|
| 1 | 1 | 32854 | Small Operators Manual Holder |
| 2 | 1 | 36311 | Skid Shoe |
| 3 | 1 | 36375 | Bolt-On Flail Sideplate |
| 4 | 1 | 36379 | Left Beater Shield |
| 5 | 1 | 36380 | Top Beater Shield |
| 6 | 1 | 36384 | Lower Rear Housing Cover |
| 7 | 1 | 36920 | Side Shield |
| 8 | 4 | CB3/8-16X1CZ5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc |
| 9 | 2 | HB1/4-20X0.75Z5 | Hex Bolt 1/4-20x3/4 Grade 5 Zinc Plated Hex Cap Screw |
| 10 | 17 | HBC3/8X0.75 | Hex Bolt Cerrated 3/8-16 x 3/4 Zinc Flange Bolt |
| 11 | 9 | HBC3/8X1 | Hex Bolt Cerrated 3/8-16 x 1 Zinc Flange Bolt |
| 12 | 4 | HBC5/16X1 | Hex Bolt Cerrated 5/16-18 x 1 Zinc Flange Bolt |
| 13 | 4 | HNP 5/16 | Panel Nut - 5/16" U-Type Spring |
| 14 | 20 | HNS3/8-16CZ | 3/8"-16" Zinc Finish Hardened Serrated Flange Nut |
| 15 | 2 | LN1/4-20NCZ5 | LN 1/4-20 Zinc Plated Nylon Insert Lock Nut |
| 16 | 5 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |

Discharge Chute



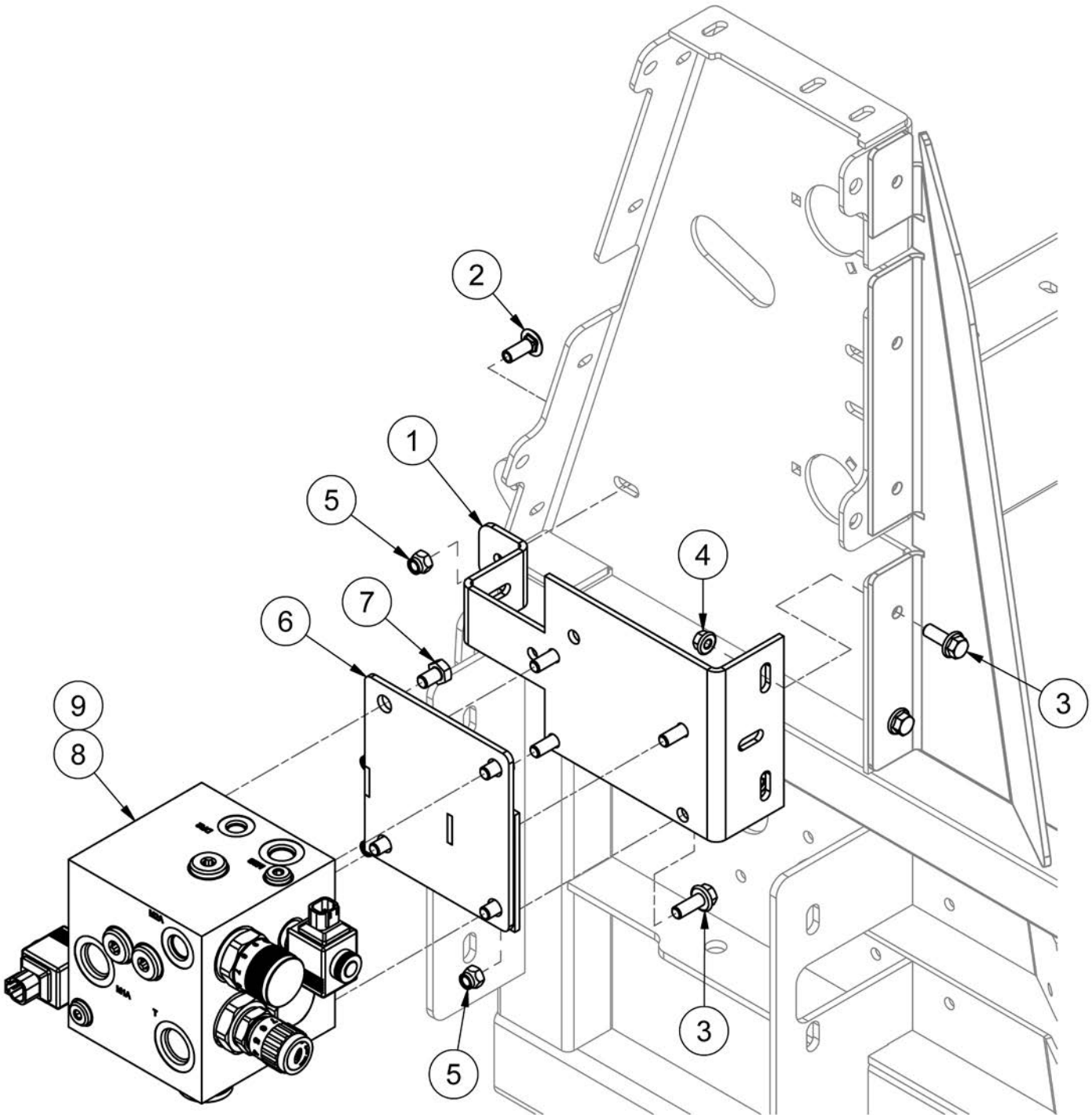
| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|------------------|---|
| 1 | 1 | 36304 | Folding Flail |
| 2 | 2 | 36305 | Link |
| 3 | 1 | 36307 | Clamp Handle |
| 4 | 1 | 36307M | Clamp Handle |
| 5 | 2 | 36930 | Retaining Pin |
| 6 | 11 | 37508 | Knife |
| 7 | 22 | FHSCS#10-24X0.75 | Hex Bolt - 3/16"-24 x 3/4" Flat Socket Cap Screw |
| 8 | 2 | HB1/2-13X1.5Z5 | Hex Bolt 1/2-13x1 1/2 Grade 5 Zinc Plated Hex Cap Screw |
| 9 | 2 | HB3/8-16X2Z5 | Hex Bolt 3/8-16x2 Grade 5 Zinc Plated Hex Cap Screw |
| 10 | 2 | HBC3/8X0.75 | Hex Bolt Cerrated 3/8-16 x 3/4 Zinc Flange Bolt |
| 11 | 22 | LN#10-24NCZ5 | LN 10-24 Zinc Plated Nylon Insert Lock Nut |
| 12 | 2 | LN1/2-13NCZ5 | LN 1/2-13 Zinc Plated Nylon Insert Lock Nut |
| 13 | 2 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |
| 14 | 2 | LP B1997 | Lock Pin |
| 15 | 2 | PP00051 | Flat Eye Bolt 5/8 x 7.0 |

Discharge Flap



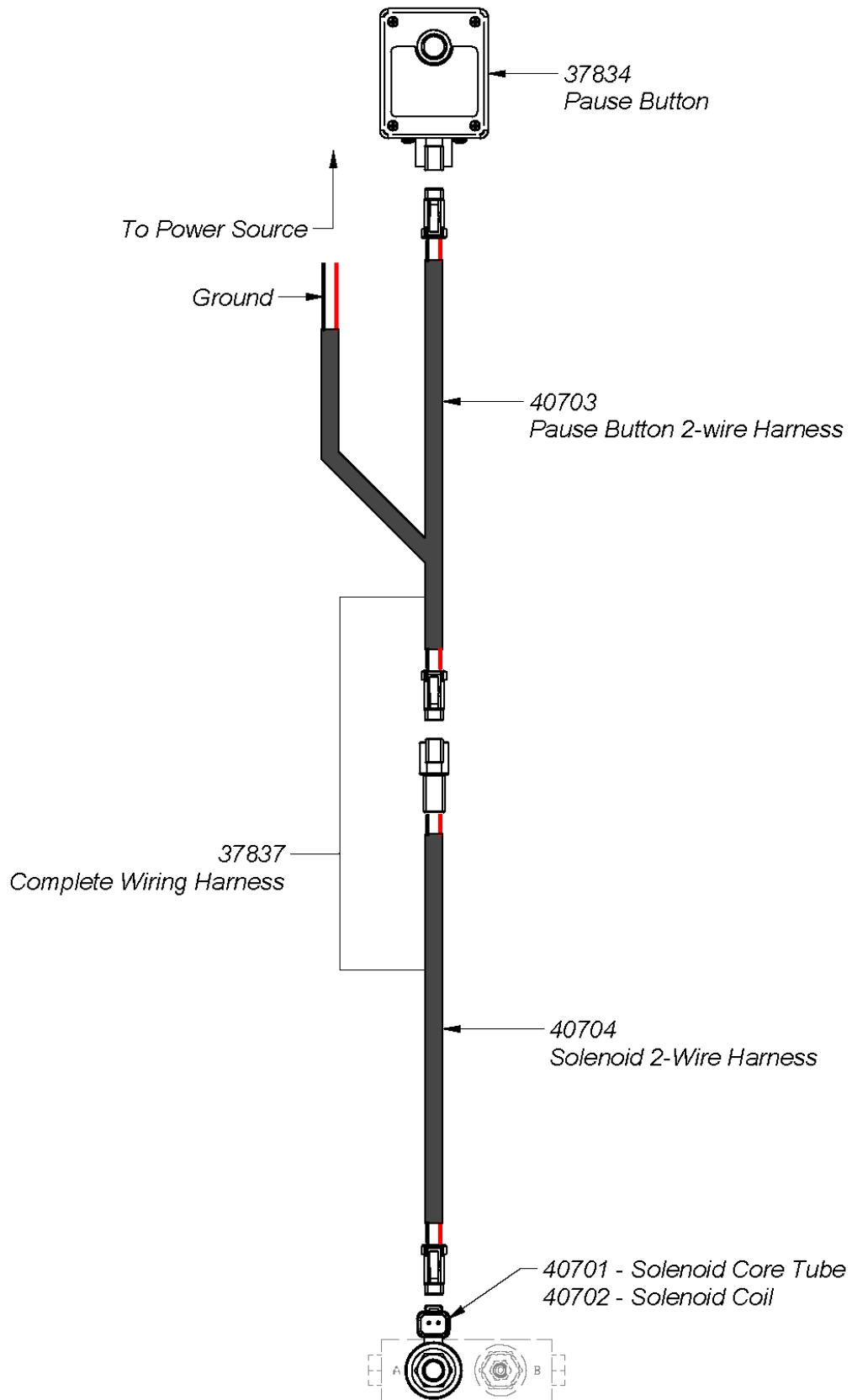
| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|--------------|---|
| 1 | 1 | 36318 | Deflector |
| 2 | 1 | 36932 | Rubber Deflector |
| 3 | 2 | HIN 3.5X3.5 | Hinge |
| 4 | 2 | 36938 | Shield Adjuster |
| 5 | 1 | 37843 | Rubber Deflector Bolt Plate |
| 6 | 12 | HBC1/4X0.75 | Hex Bolt Cerrated 1/4-20 x 3/4 Zinc Flange Bolt |
| 7 | 7 | HBC3/8X1 | Hex Bolt Cerrated 3/8-16 x 1 Zinc Flange Bolt |
| 8 | 12 | HNS1/4-20CZ | 1/4"-20" Zinc Finish Hardened Serrated Flange Nut |
| 9 | 7 | HNS3/8-16CZ | 3/8"-16" Zinc Finish Hardened Serrated Flange Nut |
| 10 | 2 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |
| 11 | 2 | LP B1997 | Lock Pin |

Manifold Block



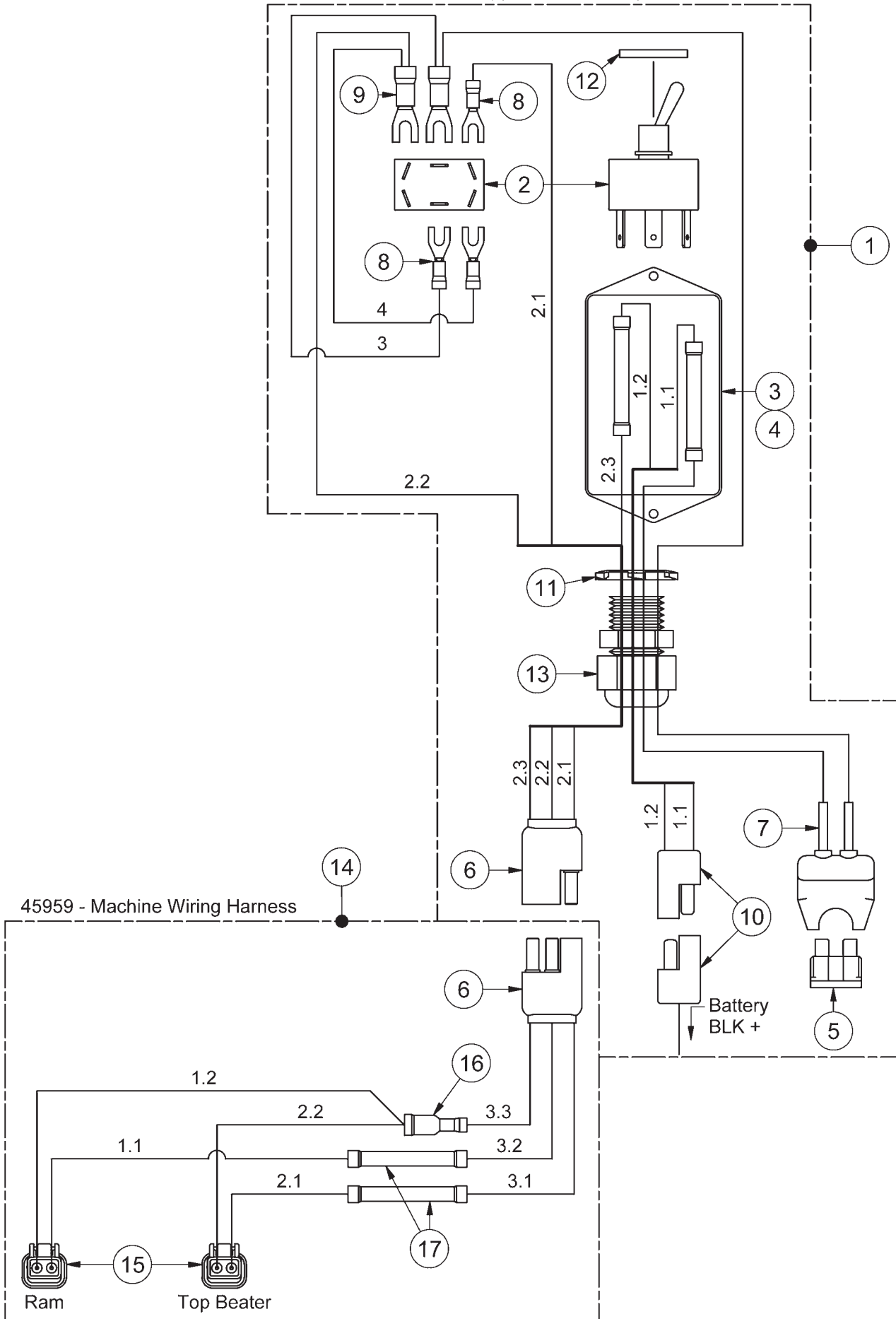
| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|---------------|--|-----------------------|
| 1 | 1 | 36392 | Valve Mount | |
| 2 | 1 | CB3/8-16X1CZ5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc | |
| 3 | 6 | HBC3/8X1 | Hex Bolt Cerrated 3/8-16 x 1 Zinc Flange Bolt | |
| 4 | 2 | HNS5/16-18CZ | 5/16"-18" Zinc Finish Hardened Serrated Flange Nut | |
| 5 | 1 | LN3/8-16NCZ5 | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut | |
| 6 | 1 | 43066 | Canimex Manifold Bracket | Canimex Manifold Only |
| 7 | 4 | M10X16X1.5 | Metric Bolt | Canimex Manifold Only |
| 8 | 1 | 42179 | Canimex Manifold | Brkdwn on Pg.7-30 |
| 9 | 1 | 28036 | CTI Manifold | Brkdwn on Pg.7-30 |

Wiring - FPS Pause Button



45958 - Canimax Manifold Wiring

BS B1 107 - Toggle Switch Wiring Harness



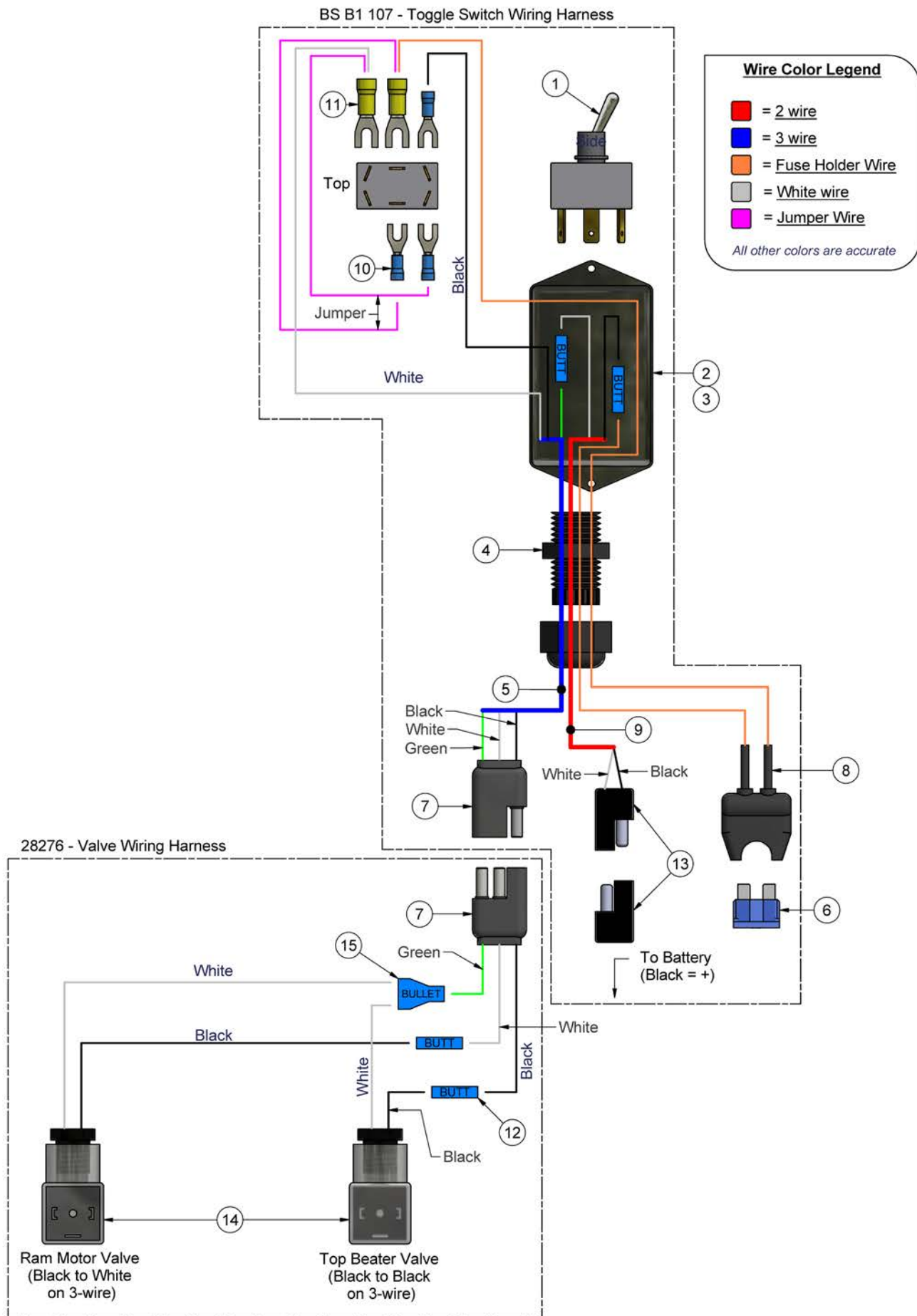
45958 - Canimex Manifold Wiring

| BS B1 107 - Toggle Switch Wiring | | | |
|----------------------------------|------------|---------|--------|
| WIRE NO. | WIRE COLOR | WIRE GA | LENGTH |
| 1.1 | BLK | 14 Ga | 12" |
| 1.2 | WHT | 14 Ga | 12" |
| 2.1 | BLK | 16 Ga | 204" |
| 2.2 | WHT | 16 Ga | 204" |
| 2.3 | GRN | 16 Ga | 204" |
| 3 | BLK | 16 Ga | 3" |
| 4 | WHT | 16 Ga | 3" |

| 45959 - Machine Wiring | | | |
|------------------------|------------|---------|--------|
| WIRE NO. | WIRE COLOR | WIRE GA | LENGTH |
| 1.1 | BLK | 14 Ga | 12" |
| 1.2 | WHT | 14 Ga | 12" |
| 2.1 | BLK | 14 Ga | 12" |
| 2.2 | WHT | 14 Ga | 12" |
| 3.1 | BLK | 16 Ga | 108" |
| 3.2 | WHT | 16 Ga | 108" |
| 3.3 | GRN | 16 Ga | 108" |

| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|---------------|---|---------------------|
| 1 | 1 | 39887 | Boss I Toggle Switch Wiring Harness | Inc. Items 1-13 |
| 2 | 1 | 26203 | Toggle Switch for Boss I (Double Pole) | |
| 3 | 1 | BS C-0203-N | Textured Case Cover | |
| 4 | 1 | BS TF-2315TX | Top Foot Enclosure with Textured Finish | |
| 5 | 1 | TL550-100-079 | 15 Amp Glass Fuse | |
| 6 | 2 | TL82-1033 | Flat 3 Wire Connector | Inc Male & Female |
| 7 | 1 | TL82-2164 | Fuse Holder | |
| 8 | 3 | TL83-2387 | Female Quick Disconnect, 16-14 | |
| 9 | 2 | TL83-2587 | Female Insulated Spade (Yellow) | |
| 10 | 1 | TL82-1034 | 2 Pole Flat Connector | Inc Male & Female |
| 11 | 1 | TLGLN050 | Pipe Locknut 1/2 | |
| 12 | 1 | FWMM12 | Flatwasher - M12 Black DIN6916 Struct. | |
| 13 | 1 | TL180-150 | 1/2 NPT 6-12mm Gland Connector | |
| 14 | 1 | 45959 | Boss I Valve Wiring Harness | Inc. Items 10,16,17 |
| 15 | 2 | DT06-2S | Deutsch Connector - Male 2 Pin | |
| 16 | 1 | TL83-2400 | Female Bullet Connector, 16-14 | |
| 17 | 4 | TL83-2380 | Blue Butt Connectors (16-14) | |

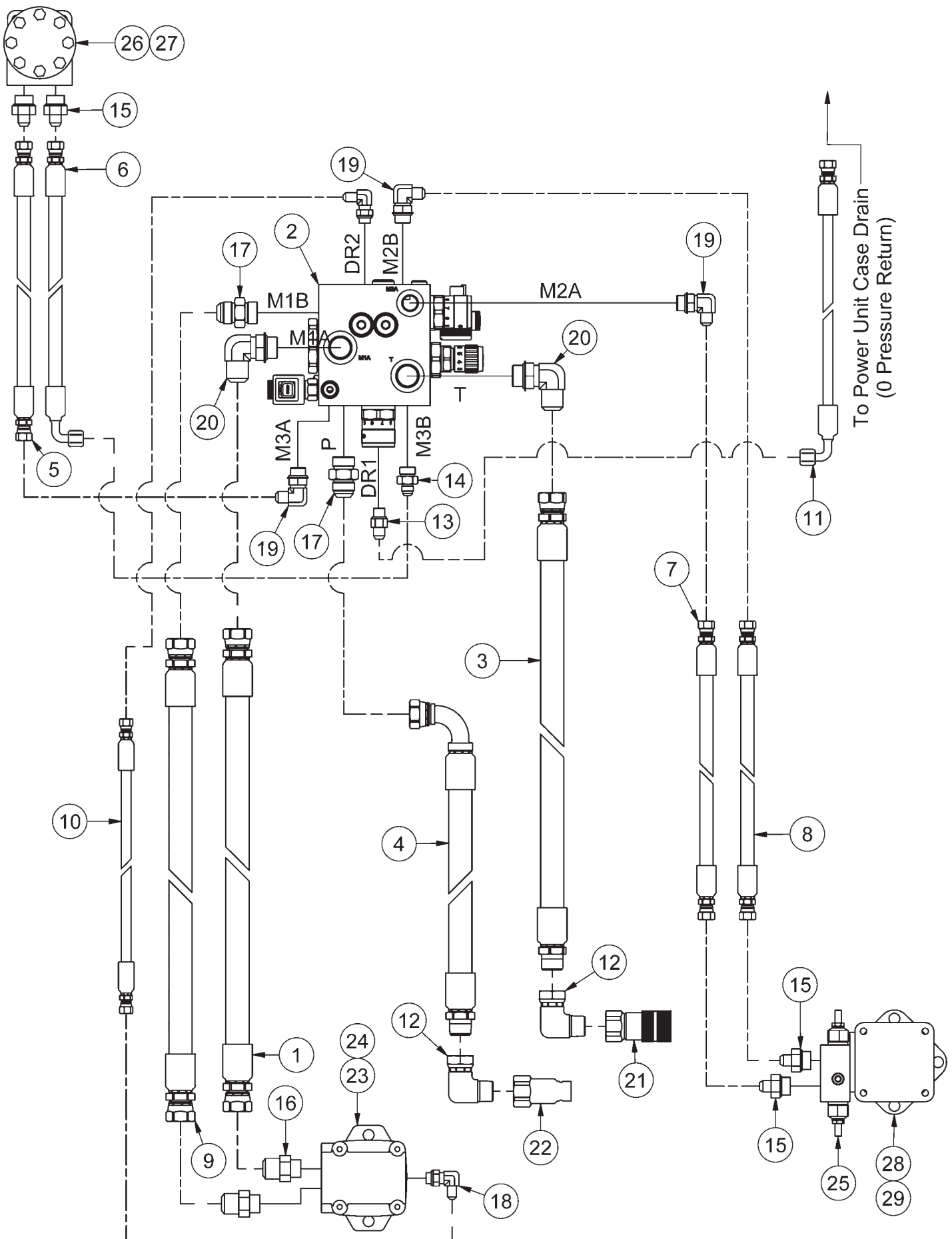
45960 - CTI Manifold Wiring



45960 - CTI Manifold Wiring

| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|---------------|--|-------------------|
| | 1 | BS B1 107 | Boss I Toggle Switch Wiring Harness | Inc Items 1-13 |
| 1 | 1 | 26203 | Toggle Switch for Boss I (Double Pole) | |
| 2 | 1 | BS C-0203-N | Textured Case Cover | |
| 3 | 1 | BS TF-2315TX | Top Foot Enclosure with Textured Finish | |
| 4 | 1 | TL180-150 | 1/2 NPT 6-12mm Gland Connector | |
| 5 | 1 | TL270101-250 | 10.5 3 Wire 16 Ga. Cab Tire | |
| 6 | 1 | TL550-100-079 | 15 Amp Glass Fuse | |
| 7 | 2 | TL82-1033 | Flat 3 Wire Connector | Inc Male & Female |
| 8 | 1 | TL82-2164 | Fuse Holder | |
| 9 | 1 | TL82-5503 | Wire - 2 Wire Cable | |
| 10 | 3 | TL83-2387 | Female Quick Disconnect, 16-14 | |
| 11 | 2 | TL83-2587 | Female Insulated Spade (Yellow) | |
| 12 | 4 | EL23662 | Electrical Connector PVC Butt Connector BL | |
| 13 | 1 | TL82-1034 | 2 Pole Flat Connector | Inc Male & Female |
| | 1 | 28276 | Boss I Valve Wiring Harness | Inc Items 7,14,15 |
| 14 | 2 | 28534 | Tandem Valve DIN Connector | |
| 15 | 1 | TL83-2400 | Female Bullet Connector, 16-14 | |

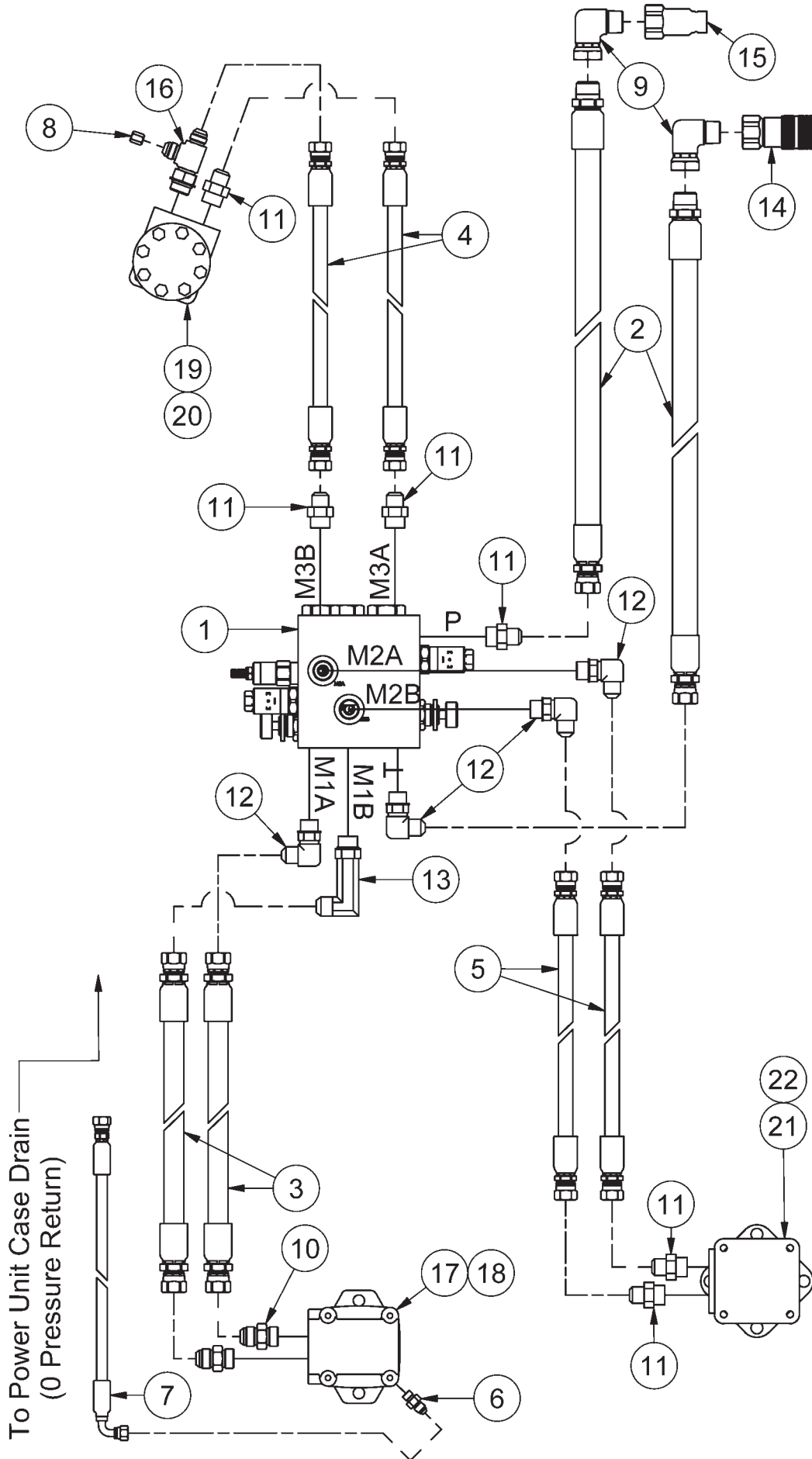
Hydraulic Layout - Canimex



Hydraulic Layout - Canimex

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-----------------|---|
| 1 | 1 | 23896 | Hose - HH24 - 12AT1(12FJ,12FJ) HCL 24" |
| 2 | 1 | 42179 | Boss I Canimex Manifold Block |
| 3 | 1 | 43107 | Hose - HH72 - 12AT1(12MP,12FJXH)HCL 72" |
| 4 | 1 | 43108 | Hose - HH76 - 12AT1(12MP,12FJXH90S)HCL 76" |
| 5 | 1 | 43221 | Hose - HH15 - 6AT1(6FJX,6FJX) HCL 15" |
| 6 | 1 | 43222 | Hose - HH15 - 6AT1(6FJX,6FJX90L) HCL 15" |
| 7 | 1 | 43223 | Hose - HH53 - 6AT1(6FJX,6FJX) HCL 53" |
| 8 | 1 | 43224 | Hose - HH57 - 6AT1(6FJX,6FJX) HCL 57" |
| 9 | 1 | 43225 | Hose - HH30 - 12AT1(12FJX,12FJX) HCL 30" |
| 10 | 1 | 43226 | Hose - HH31 - 4AT1(4FJX,4FJX) HCL 31" |
| 11 | 1 | 47645 | Hose - HH91 - 4AT1(6FJX,6FJX90S) HCL 91" |
| 12 | 2 | HF 1501-12-12 | Hydraulic Fitting 90 Degree Male to Female |
| 13 | 1 | HF 6400-6-6 | Hydraulic Fitting - Male JIC - Male ORB |
| 14 | 1 | HF 6400-6-8 | Hyd Fitting -Male JIC - Male ORB |
| 15 | 4 | HF 6400-6-10 | Hydraulic Fitting - Male JIC - Male ORB |
| 16 | 2 | HF 6400-12-10 | Straight 3/4 MJIC - 7/8 O-Ring |
| 17 | 2 | HF 6400-12-12 | Hydraulic Fitting-O-Ring JIC Adapter, Male JIC 3/4" Male BSPP |
| 18 | 2 | HF 6801-4-6 | Hydraulic Fitting - Male JIC - Male Orb 90° |
| 19 | 3 | HF 6801-6-8 NWO | Adapter |
| 20 | 2 | HF 6801-12-12 | Forged Fitting - 3/4" JIC X 3/4" SAE 90° Elbow |
| 21 | 1 | HF QCFF-1 | Quickcoupler 3/4" Flat Face Pipe - Female |
| 22 | 1 | HF QCFF-2 | Quickcoupler 3/4" Flat Face Pipe - Male |
| 23 | 1 | VAL 1002 | 104-1002 Beater Motor |
| 24 | 1 | SK 61258 | Seal Kit for Eaton Hydraulic Motor 104-1002-006 |
| 25 | 1 | VAL KPDS100/A/3 | Relief Valve |
| 26 | 1 | VAL MLHPQ400C4C | M+S Hydraulic Motor |
| 27 | 1 | SKMLHPQUDE | Seal Kit for 200 & 400 Series Motors |
| 28 | 1 | VAL MLHSY400 | Complete Motor - MLHSY400C4UD |
| 29 | 1 | SKMLHSY-U/D | Seal Kit for M+S Motors |

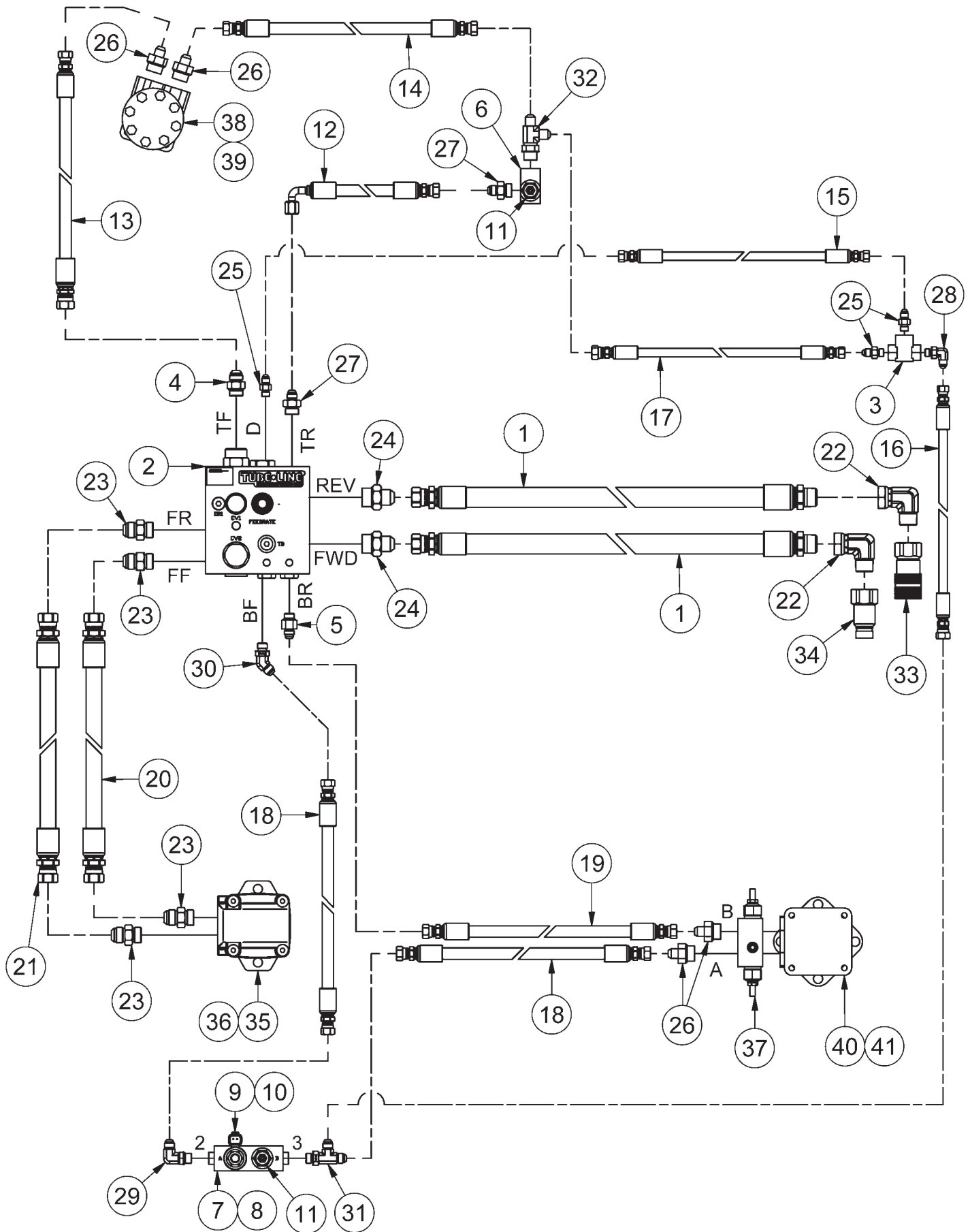
Hydraulic Layout - CTI



Hydraulic Layout - CTI

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|----------------|--|
| 1 | 1 | 28036 | Manifold Block |
| 2 | 2 | 28143 | Hose - HH72 - 12AT1(12MP,10FJXH)HCL 72" |
| 3 | 2 | 39834 | Hose - HH26 - 10AT1(10FJXH,10FJXH) HCL 26" |
| 4 | 2 | 39835 | Hose - HH18 - 6AT1(8FJXH,8FJXH) HCL 18" |
| 5 | 2 | 39837 | Hose - HH42 - 6AT1(8FJXH,8FJXH) HCL 42" |
| 6 | 1 | 43702 | Check Valve 1/4 O-ring to Jic |
| 7 | 1 | 47644 | Hose - HH110 - 4AT1(6FJX,4FJX90S) HCL 110" |
| 8 | 1 | HF 0304C-06 | JIC #6 Cap |
| 9 | 2 | HF 1501-12-12 | Hydraulic Elbow Fitting |
| 10 | 2 | HF 6400-10-10 | Hydraulic Fitting |
| 11 | 6 | HF 6400-8-10 | Hydraulic Adaptor Fitting |
| 12 | 4 | HF 6801-8-10 | Hydraulic Elbow Fitting |
| 13 | 1 | HF 6801L-10-10 | Hydraulic Elbow Fitting (Long) |
| 14 | 1 | HF QCFF-1 | Female Quick Coupler |
| 15 | 1 | HF QCFF-2 | Male Quick Coupler |
| 16 | 1 | HF6804-8-10-8 | Hyd. Fitting 1/2-MJIC-5/8-MORB-1/2-MJIC |
| 17 | 1 | VAL 1002 | Flail Motor |
| 18 | 1 | SK 61258 | Seal Kit for Eaton Hydraulic Motor |
| 19 | 1 | VAL 1008 | Top Beater Motor |
| 20 | 1 | SKMLHPQUDE | Seal Kit for 200 & 400 Series Motors |
| 21 | 1 | VAL MLHSY400 | Bed Chain Drive Motor |
| 22 | 1 | SKMLHSY-U/D | Seal Kit for M+S Motors (MLHSY400C4UD) |

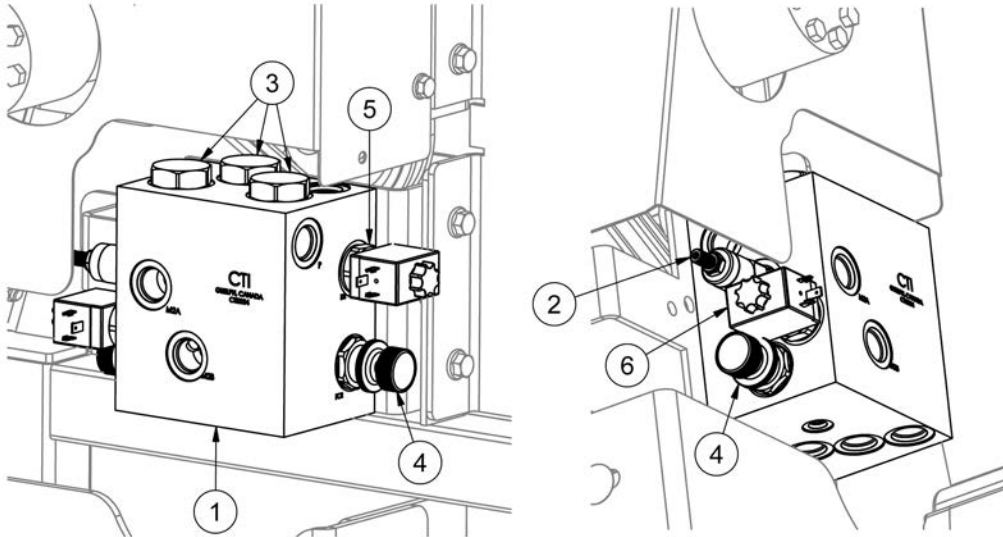
Hydraulic Layout - FPS



Hydraulic Layout - FPS

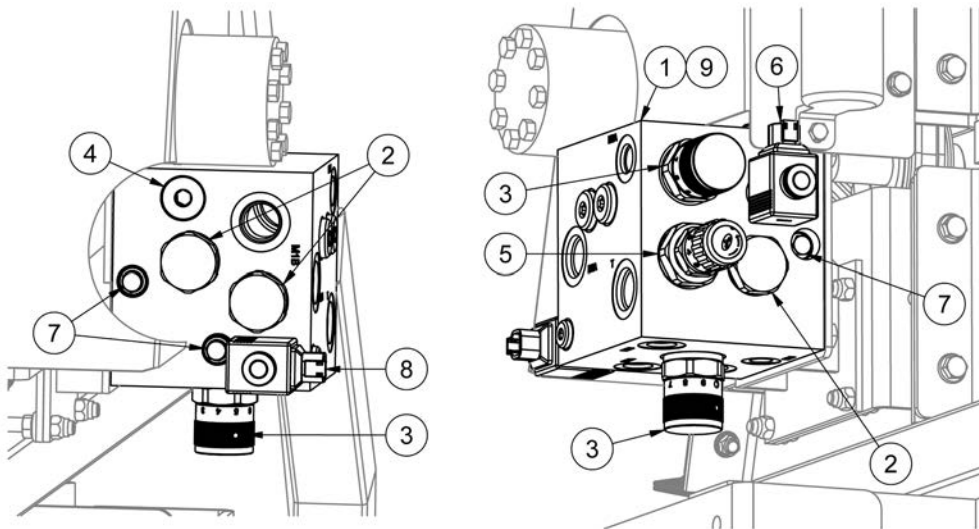
| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|-----------------|---|-----------------|
| 1 | 2 | 28143 | Hose - HH72 - 12AT1(12MP,10FJXH)HCL 72" | |
| 2 | 1 | 40613 | Manifold Block | |
| 3 | 1 | 40614 | Shuttle Valve | |
| 4 | 1 | 40615 | 1/2" Check Valve Fitting | |
| 5 | 1 | 40616 | 3/8" Check Valve Fitting | |
| 6 | 1 | 40617 | Manual Flow Control (c/w dial) | Inc. Item 11 |
| 7 | 1 | 40618 | Complete Electric Pause - Manual Flow Control FPS | Items 8,9,10,11 |
| 8 | 1 | 40700 | Valve Body (c/w plugs & dial) | |
| 9 | 1 | 40701 | Solenoid Core Tube | |
| 10 | 1 | 40702 | Solenoid Coil | |
| 11 | 2 | 42431 | Adjustable Flow Control Cartridge | |
| 12 | 1 | 60001 | HH14.5" - 6AT1(6FJ,6FJ90°)HCL 14.5" | |
| 13 | 1 | 60002 | HH20.5 - 6AT1(8FJXH,6FJXH) HCL 20.5" | |
| 14 | 1 | 60003 | HH14.5" - 6AT1(6FJX,6FJX)HCL 14.5" | |
| 15 | 1 | 60004 | HH14.5" - 4AT1(4FJX,4FJX)HCL 14.5" | |
| 16 | 1 | 60005 | HH23.5" - 4AT1(4FJX,6FJX)HCL 23.5" | |
| 17 | 1 | 60006 | HH18.5" - 4AT1(4FJX,6FJX)HCL 18.5" | |
| 18 | 2 | 60007 | HH20.5" - 6AT1(6FJX,6FJX)HCL 20.5" | |
| 19 | 1 | 60008 | HH38.5" - 6AT1(6FJX,6FJX)HCL 38.5" | |
| 20 | 1 | 60010 | Hose - HH25 - 10AT1(10FJXH,10FJXH) HCL 25" | |
| 21 | 1 | 60011 | Hose - HH27" - 10AT1(10FJXH,10FJXH) HCL 27" | |
| 22 | 2 | HF 1501-12-12 | Hydraulic Elbow Fitting | |
| 23 | 4 | HF 6400-10-10 | Hydraulic Fitting | |
| 24 | 2 | HF 6400-10-12 | Hydraulic Fitting | |
| 25 | 3 | HF 6400-4-4 | Hydraulic Fitting | |
| 26 | 4 | HF 6400-6-10 | Hydraulic Fitting | |
| 27 | 2 | HF 6400-6-8 | Hydraulic Fitting | |
| 28 | 1 | HF 6801-4-4 | Hydraulic Elbow Fitting | |
| 29 | 1 | HF 6801-6-6 | Hydraulic Elbow Fitting | |
| 30 | 1 | HF 6802-6-6 | Hydraulic 45° Elbow Fitting | |
| 31 | 1 | HF 6804-6-6-6 | Hydraulic Tee Fitting | |
| 32 | 1 | HF 6804-6-8-6 | Hydraulic Tee Fitting | |
| 33 | 1 | HF QCFF-1 | 3/4" Female Quick Coupler | |
| 34 | 1 | HF QCFF-2 | 3/4" Male Quick Coupler | |
| 35 | 1 | VAL 1002 | Hydraulic Motor - (Flail Drum) | |
| 36 | 1 | SK 61258 | Seal Kit | |
| 37 | 1 | VAL KPDS100/A/3 | Relief Valve | |
| 38 | 1 | VAL MLHPQ400C4C | Hydraulic Motor - (Top Beater) | |
| 39 | 1 | SKMLHPQUDE | Seal Kit | |
| 40 | 1 | VAL MLHSY400 | Hydraulic Motor - (Chain Drive) | |
| 41 | 1 | SKMLHSY-U/D | Seal Kit | |

CTI Manifold Breakdown - 28036



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------|------------------------------|
| 1 | 1 | 28036 | Manifold Block |
| 2 | 1 | 45951 | Bi-directional Relief Valve |
| 3 | 3 | 39932 | Check Valve for CTI Manifold |
| 4 | 1 | 43650 | Hand Knob for Flow Control |
| 5 | 2 | 35790 | Solenoid Operated Valve N/C |
| 6 | 2 | 35792 | 12 Volt Coil |

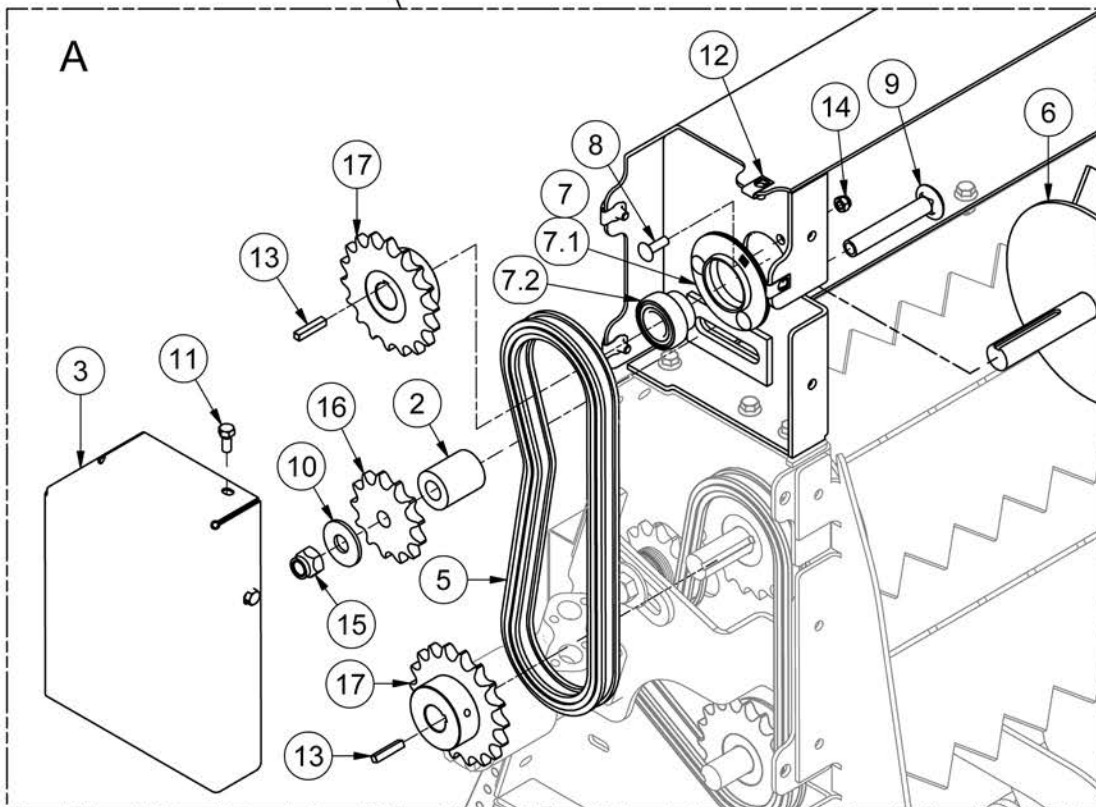
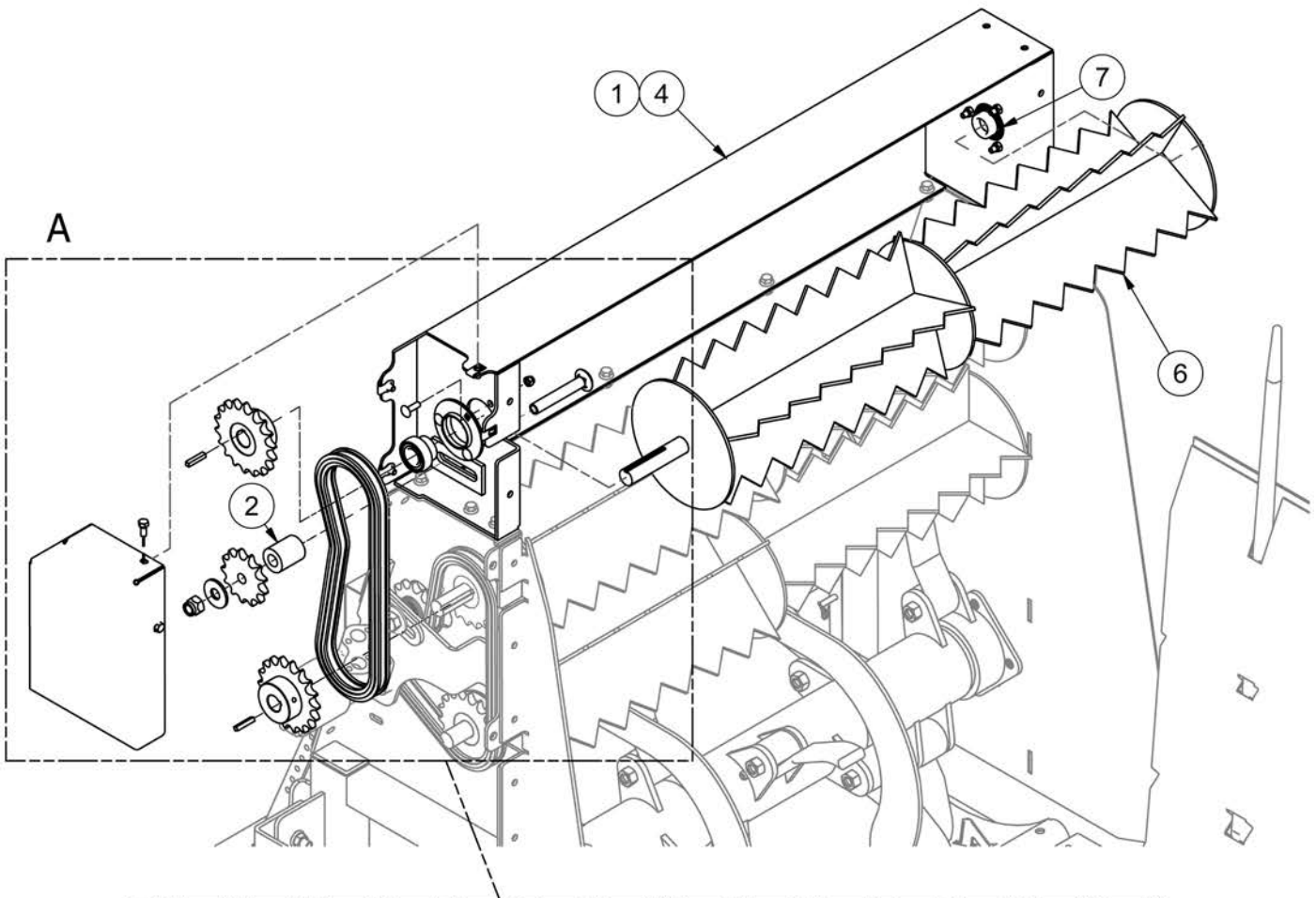
Canimex Manifold Breakdown - 42179



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------|--|
| 1 | 1 | 42179 | Boss I Canimex Manifold Block Assembly |
| 2 | 3 | 48179 | VR 100 Valve |
| 3 | 2 | 48180 | PP16A/BM0B(5 GPM-19Imp) |
| 4 | 1 | 48181 | VR 34 Valve |
| 5 | 1 | 48182 | NB16A/AM08 |
| 6 | 1 | 48183 | EW08M/20NB |
| 7 | 3 | 48184 | Valve C/SDS100-DPC130-CL/DPX100 |
| 8 | 1 | 48185 | EC08M/20NB |
| 9 | 1 | 50058 | Manifold Block Only |

Section 8 - Options

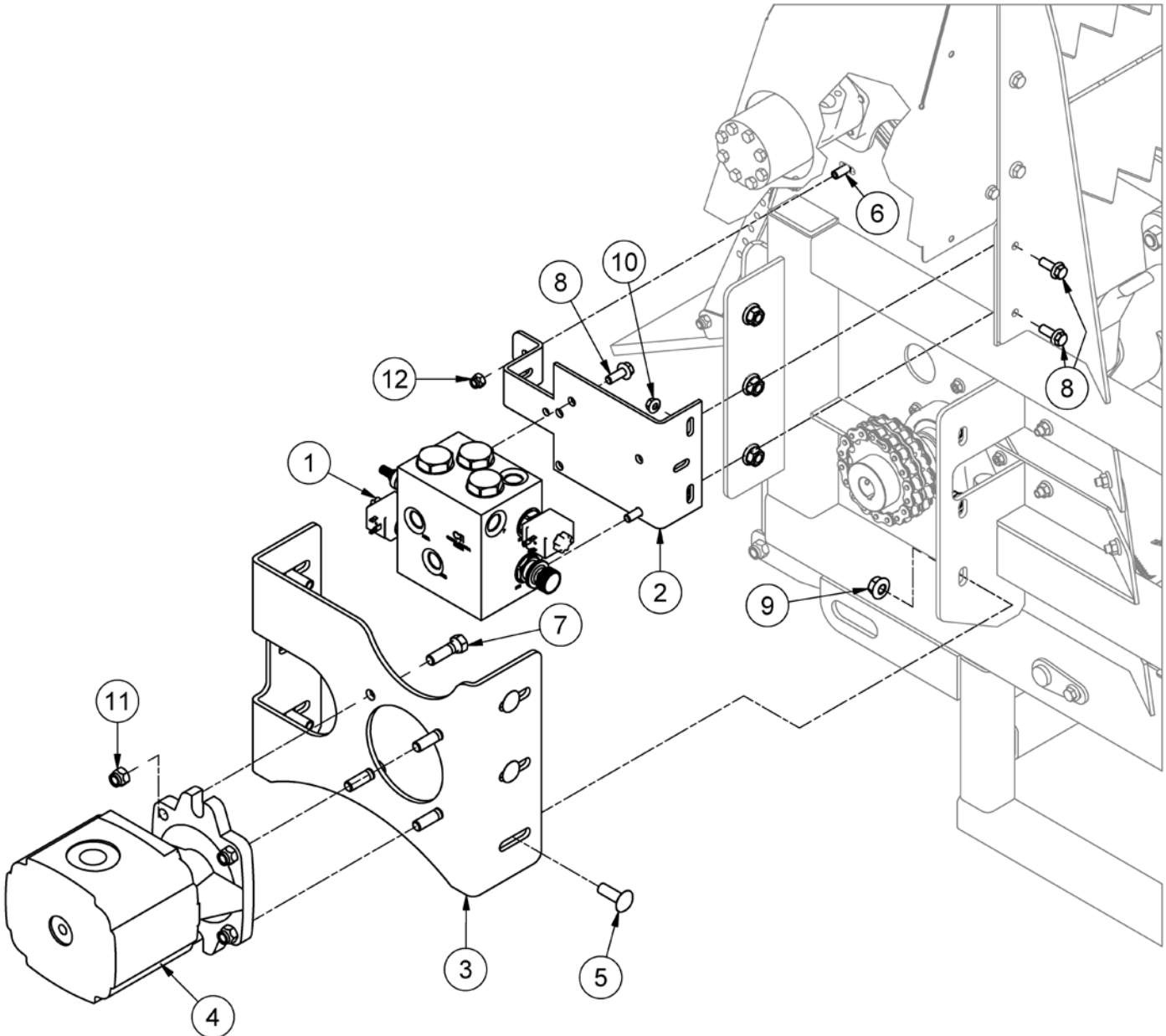
36916 - Third Beater Kit



36916 - Third Beater Kit

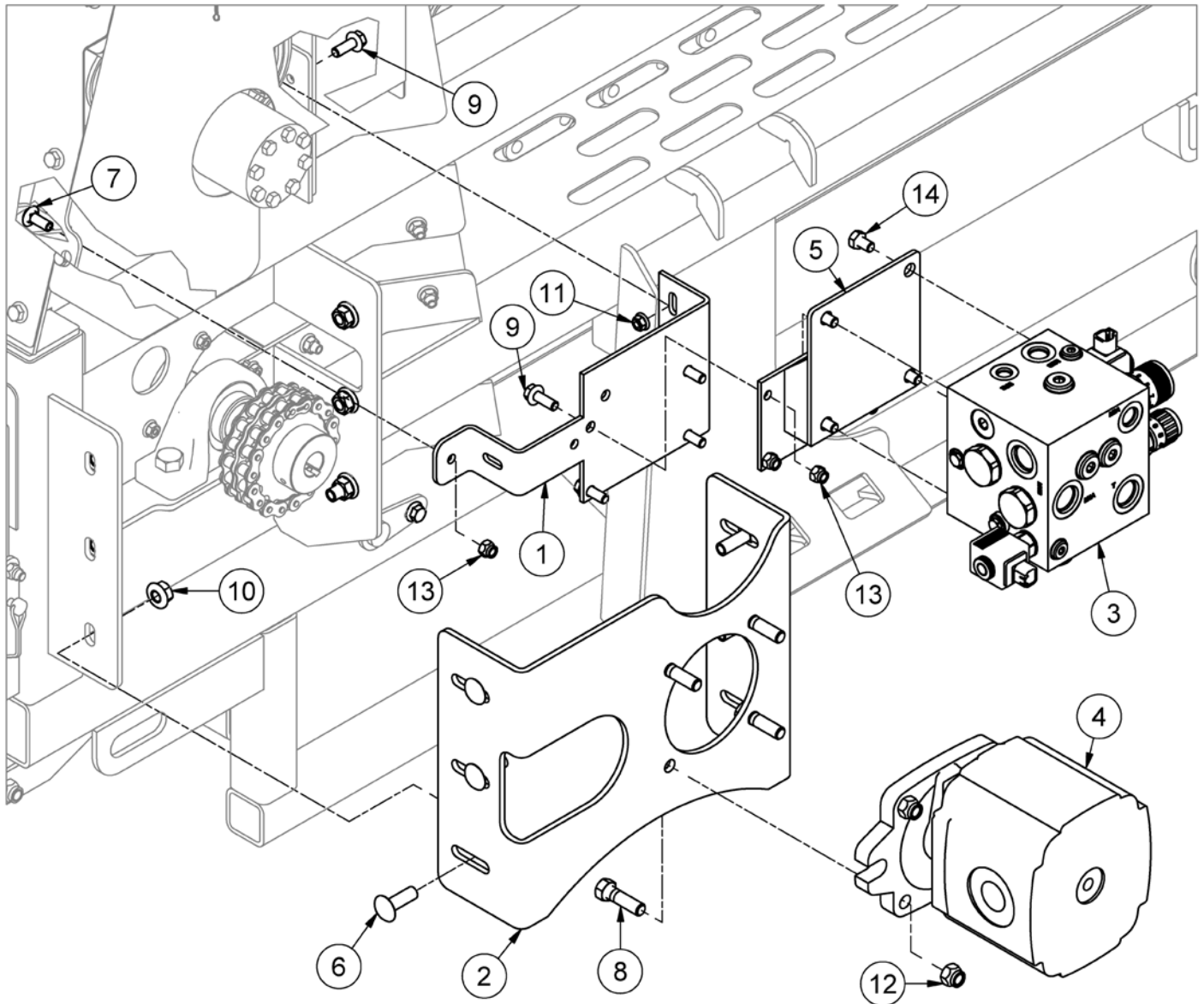
| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|------------------|---|----------------|
| 1 | 1 | 36916 | 3rd Beater Kit | Inc. all Items |
| 2 | 1 | 36915 | Idler Sprocket Spacer | |
| 3 | 1 | 36921 | 3rd Beater Chain Guard | |
| 4 | 1 | 36934 | 3rd Beater Frame | |
| 5 | 1 | 40255 | Chain - #60, 49 Links | |
| 6 | 1 | B1 084 | Top Beater | |
| 7 | 2 | BEA 42852 | BEA SA205-16 + BEA PF205 | |
| 7.1 | 2 | BEA PF205 | Flange (3 Hole) - PF205 NTL | Qty for 1 |
| 7.2 | 1 | BEA SA205-16 | Bearing, Insert 1" - SB205-16 NTL | Qty for 1 |
| 8 | 6 | CB5/16-18X1CZ5 | Carriage Bolt - 5/16-18 x 1" Grade 5 Zinc | |
| 9 | 1 | CB5/8-11X4CZ5 | Carriage Bolt - 5/8-11 x 4" Grade 5 Zinc | |
| 10 | 1 | FW 5/8 | Flatwasher - 5/8" Zinc Plated USS | |
| 11 | 4 | HB5/16-18X0.75Z5 | Hex Bolt 5/16-18x3/4 Gr.5 Zinc Plated Hex Cap Screw | |
| 12 | 4 | HNP 5/16 | Panel Nut - .375 U-Type Spring | |
| 13 | 2 | KS40258 | Keystock - .25 x .25 x 1 | |
| 14 | 6 | LN5/16-18NCZ5 | LN 5/16-18 Zinc Plated Nylon Insert Lock Nut | |
| 15 | 1 | LN5/8-11NCZ5 | LN 5/8-11 Zinc Plated Nylon Insert Lock Nut | |
| 16 | 1 | SPR60A13-.625 | Sprocket - #60, 13 Tooth, .625 Bearing | |
| 17 | 2 | SPR60B18 | Sprocket - #60, 18 Tooth, 1" Bore | |

High Flow Kit (CTI) - SN 18B1001 to 20B1051



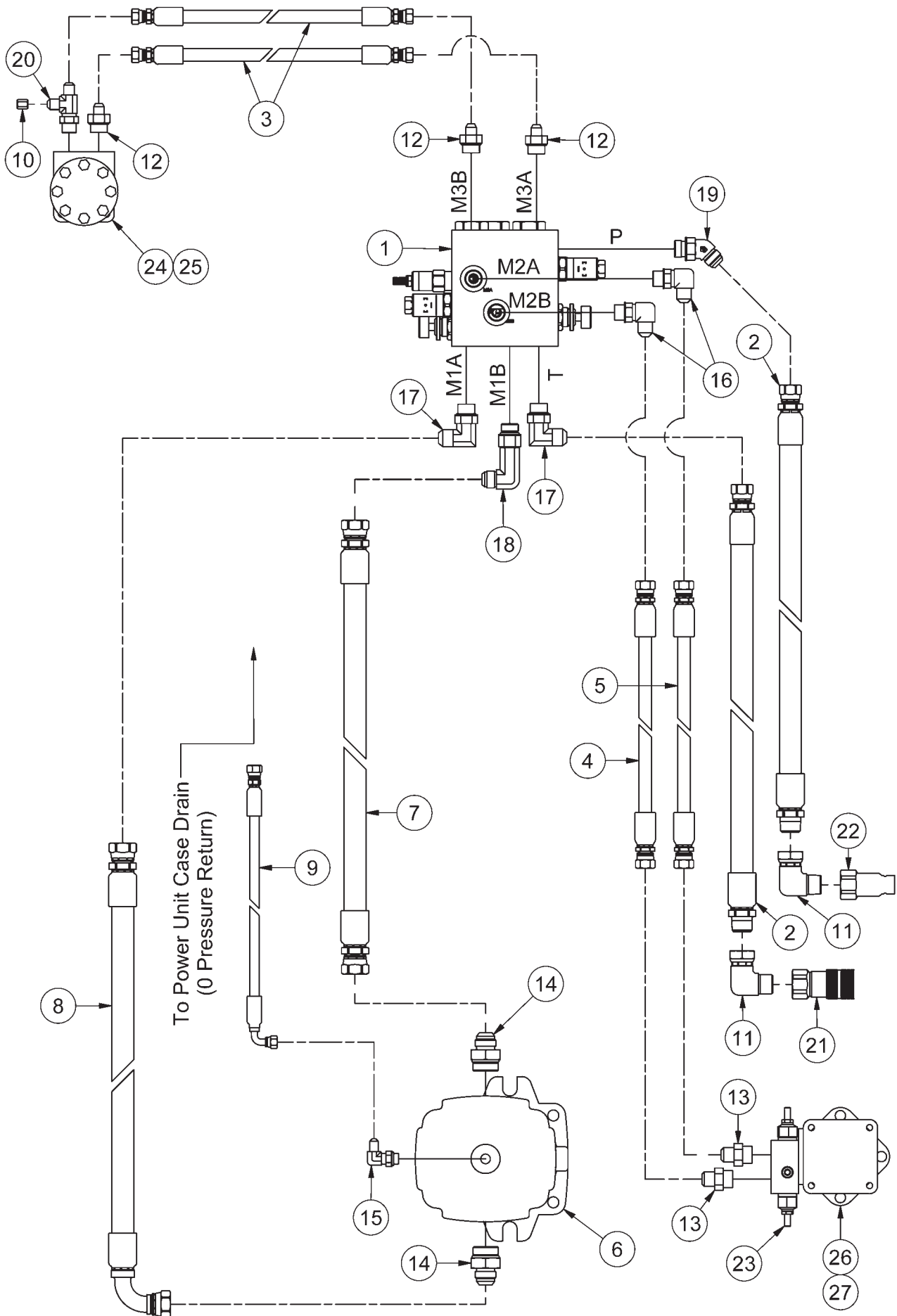
| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------------|---|
| 1 | 1 | 28036 | Manifold Block |
| 2 | 1 | 36392 | Valve Mount |
| 3 | 1 | 36399 | Hydraulic Motor Mount |
| 4 | 1 | 42272 | High Flow Hydraulic Motor |
| 5 | 6 | CB 1/2-13 X1.5 Z5 | Carriage Bolt - 1/2-13 x 1 1/2" Grade 5 Zinc |
| 6 | 1 | CB 3/8-16 X1 Z5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc |
| 7 | 4 | HB 1/2-13X1.75 Z5 | Hex Bolt 1/2-13x1 3/4 Grade 5 Zinc Plated Hex Cap Screw |
| 8 | 2 | HBC3/8X1 | Hex Bolt Cerrated 3/8-16 x 1 Zinc Flange Bolt |
| 9 | 6 | HNC1/2 | Serrated Hex Nut |
| 10 | 2 | HNC5/16 | Serrated Hex Nut |
| 11 | 4 | LN 1/2 N | LN 1/2-13 Zinc Plated Nylon Insert Lock Nut |
| 12 | 1 | LN 3/8 N | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |

High Flow Kit - Canimex - SN 21B1001 to Current



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-------------------|---|
| 1 | 1 | 36392 | Valve Mount |
| 2 | 1 | 36399 | Hydraulic Motor Mount |
| 3 | 1 | 42179 | Boss I Canimex Manifold |
| 4 | 1 | 42272 | High Flow Hydraulic Motor |
| 5 | 1 | 43066 | Canimex Manifold Bracket |
| 6 | 6 | CB 1/2-13 X1.5 Z5 | Carriage Bolt - 1/2-13 x 1 1/2" Grade 5 Zinc |
| 7 | 1 | CB 3/8-16 X1 Z5 | Carriage Bolt - 3/8-16 x 1" Grade 5 Zinc |
| 8 | 4 | HB 1/2-13X1.75 Z5 | Hex Bolt 1/2-13x1 3/4 Grade 5 Zinc Plated Hex Cap Screw |
| 9 | 6 | HBC3/8X1 | Hex Bolt Cerrated 3/8-16 x 1 Zinc Flange Bolt |
| 10 | 6 | HNC1/2 | Serrated Hex Nut |
| 11 | 2 | HNC3/8 | Serrated Hex Nut |
| 12 | 6 | LN 1/2 N | LN 1/2-13 Zinc Plated Nylon Insert Lock Nut |
| 13 | 5 | LN 3/8 N | LN 3/8-16 Zinc Plated Nylon Insert Lock Nut |
| 14 | 4 | M10X16X1.5 | Metric Bolt |

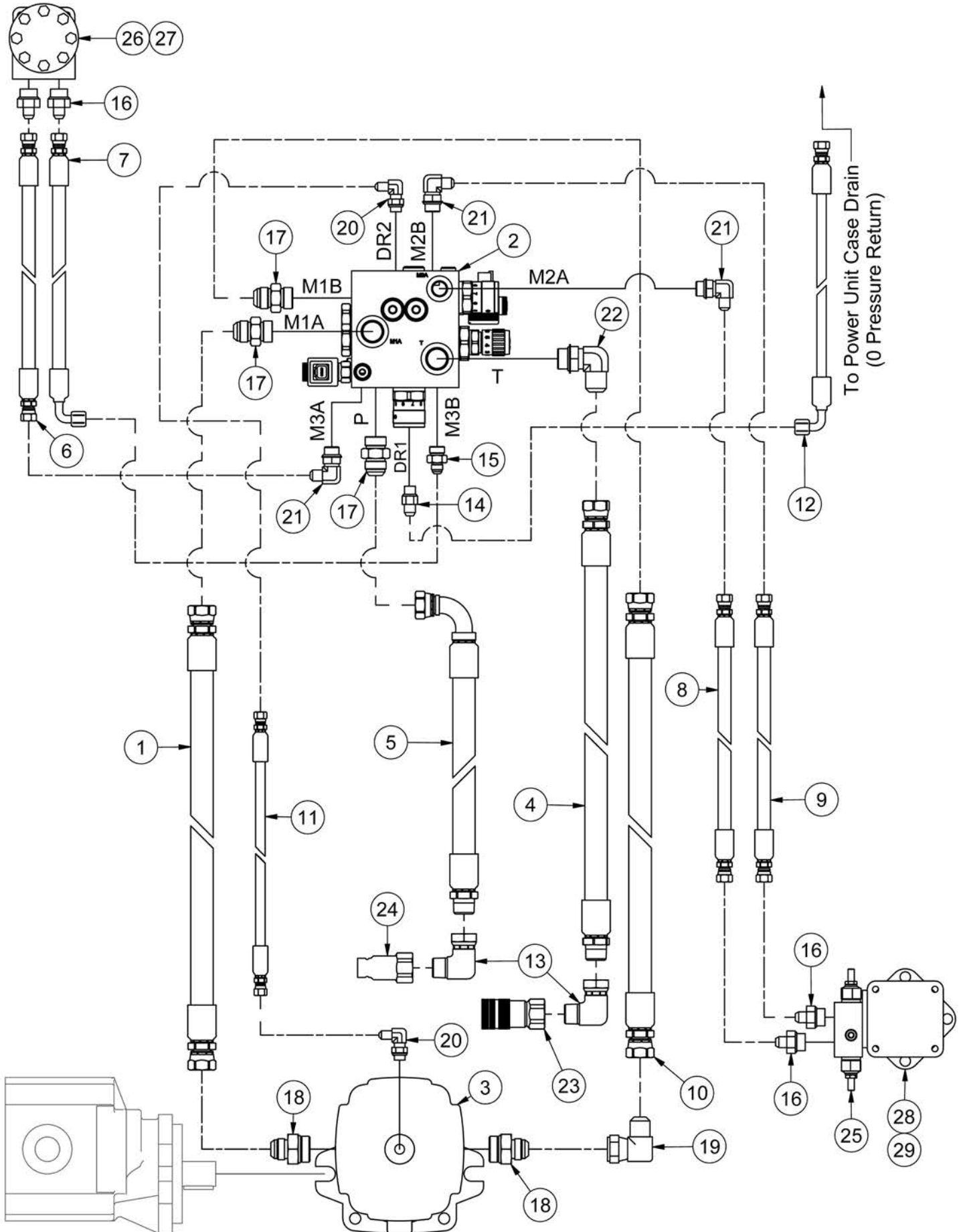
High Flow Layout (CTI) - SN 18B1001 to 20B1051



High Flow Layout (CTI) - SN 18B1001 to 20B1051

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|------------------|--|
| 1 | 1 | 28036 | Manifold Block |
| 2 | 2 | 28143 | Hose - HH72 - 12AT1(12MP,10FJXH)HCL 72" |
| 3 | 2 | 39835 | Hose - HH18 - 6AT1(8FJXH,8FJXH) HCL 18" |
| 4 | 1 | 39836 | Hose - HH40 - 6AT1(8FJXH,8FJXH) HCL 40" |
| 5 | 1 | 39837 | Hose - HH42 - 6AT1(8FJXH,8FJXH) HCL 42" |
| 6 | 1 | 42272 | High Flow Hydraulic Motor |
| 7 | 1 | 45395 | Hose - HH26 - 12AT1(10FJXH,12FJXH) HCL 26" |
| 8 | 1 | 45396 | Hose - HH26 - 12AT1(10FJXH,12FJX90L) HCL 26" |
| 9 | 1 | 47644 | Hose - HH110 - 4AT1(6FJX,4FJX90S) HCL 110" |
| 10 | 1 | HF 0304C-06 | JIC #6 Cap |
| 11 | 2 | HF 1501-12-12 | Hydraulic Fitting 90 Degree Male to Female |
| 12 | 3 | HF 6400-6-10 | Hydraulic Fitting - Male JIC - Male ORB |
| 13 | 2 | HF 6400-8-10 | Hyd Fitting - Male JIC - Male ORB |
| 14 | 2 | HF 6400-12-16 | Hydraulic Adapter JIC to O-Ring |
| 15 | 1 | HF 6801-4-6 | Hydraulic Fitting - Male JIC - Male Orb 90 Degree |
| 16 | 2 | HF 6801-8-10 | Hyd. Fitting - 1/2" JIC - 5/8" 90° Elbow |
| 17 | 2 | HF 6801-10-10 | Forged Fitting - 5/8" JIC X 5/8" SAE 90 Degree Elbow |
| 18 | 1 | HF 6801-10-10-LL | Forged Fitting - 5/8" JIC X 5/8" SAE 90 Degree Elbow |
| 19 | 1 | HF 6802-10-10 | Forged Fitting - 5/8" JIC X 5/8" SAE 45 Degree Elbow |
| 20 | 1 | HF 6804-6-8-6 | Hydraulic Fitting - Male JIC - Male ORB Tee |
| 21 | 1 | HF QCFF-1 | Quickcoupler 3/4" Flat Face Pipe - Female |
| 22 | 1 | HF QCFF-2 | Quickcoupler 3/4" Flat Face Pipe - Male |
| 23 | 1 | VAL KPDS100/A/3 | Relief Valve |
| 24 | 1 | VAL MLHPQ400C4C | M+S Hydraulic Motor |
| 25 | 1 | SKMLHPQUDE | Seal Kit for 200 & 400 Series Motors |
| 26 | 1 | VAL MLHSY400 | Complete Motor - MLHSY400C4UD |
| 27 | 1 | SKMLHSY-U/D | Seal Kit for M+S Motors |

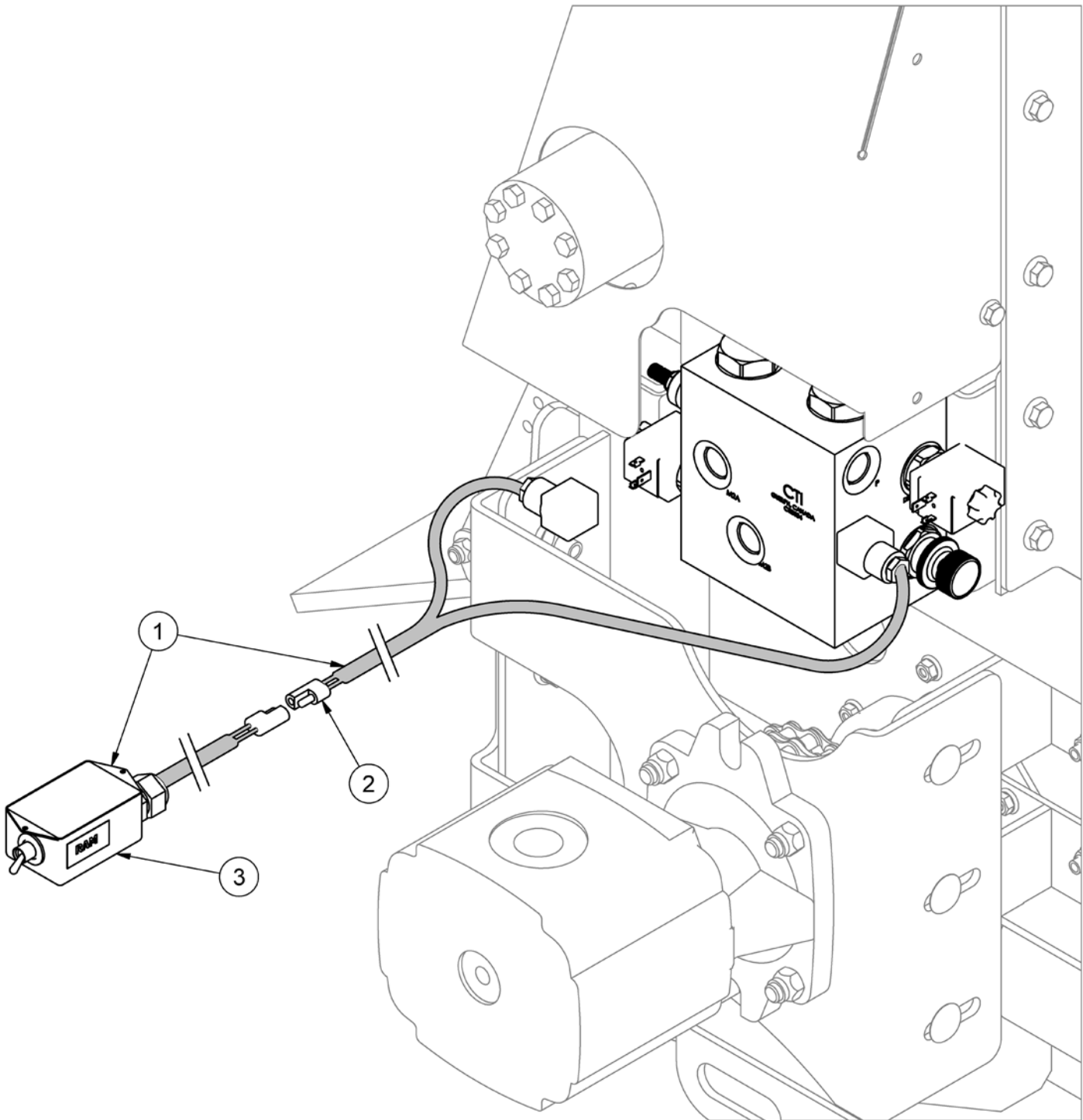
High Flow Layout (Canimex) - SN 21B1001 to Current



High Flow Layout (Canimex) - SN 21B1001 to Current

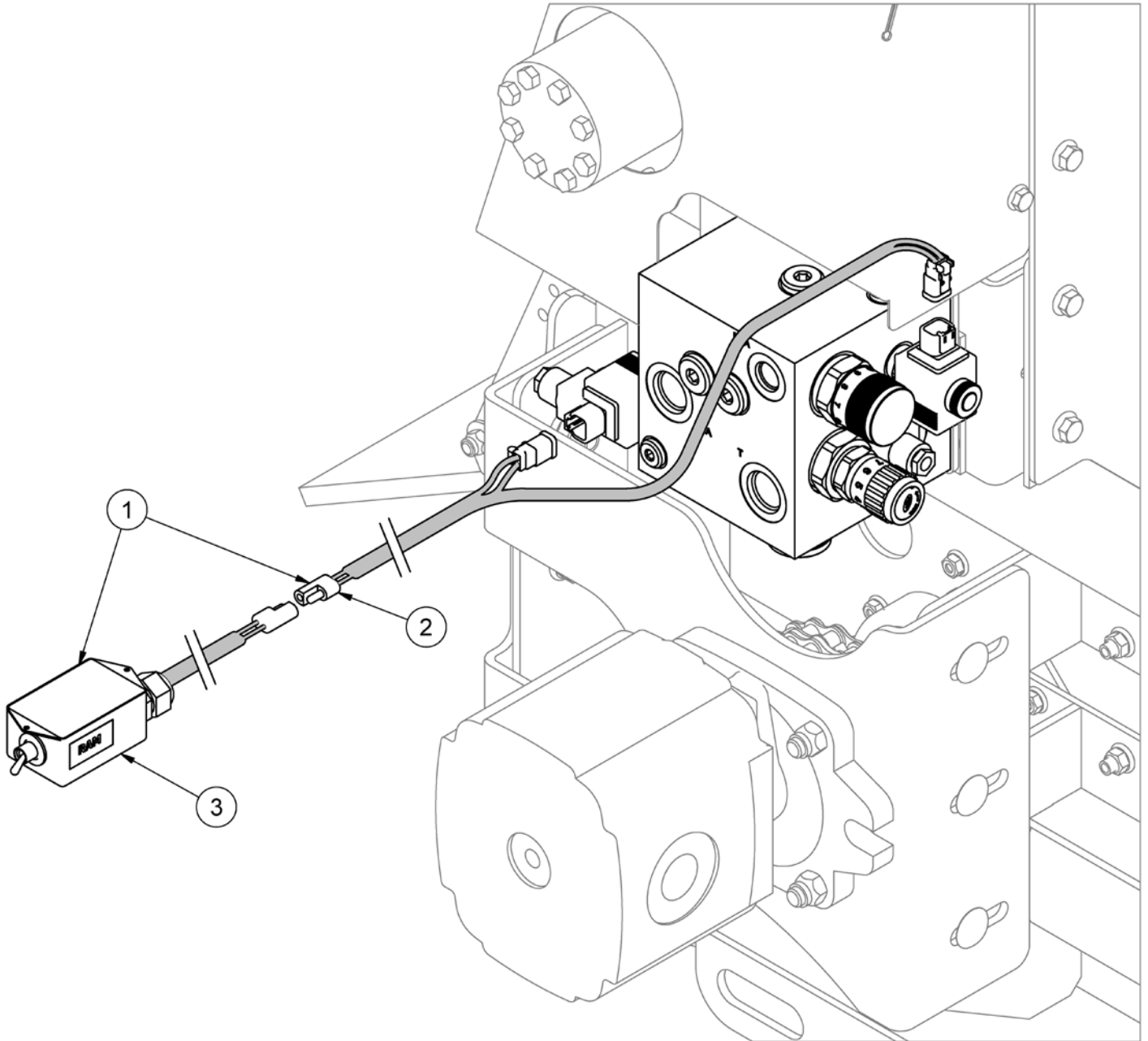
| ITEM | QTY | PART NUMBER | DESCRIPTION |
|------|-----|-----------------|---|
| 1 | 1 | 23896 | Hose - HH24 - 12AT1(12FJ,12FJ) HCL 24" |
| 2 | 1 | 42179 | Boss I Canimex Manifold Block |
| 3 | 1 | 42272 | High Flow Hydraulic Motor |
| 4 | 1 | 43107 | Hose - HH72 - 12AT1(12MP,12FJXH)HCL 72" |
| 5 | 1 | 43108 | Hose - HH76 - 12AT1(12MP,12FJXH90S)HCL 76" |
| 6 | 1 | 43221 | Hose - HH15 - 6AT1(6FJX,6FJX) HCL 15" |
| 7 | 1 | 43222 | Hose - HH15 - 6AT1(6FJX,6FJX90L) HCL 15" |
| 8 | 1 | 43223 | Hose - HH53 - 6AT1(6FJX,6FJX) HCL 53" |
| 9 | 1 | 43224 | Hose - HH57 - 6AT1(6FJX,6FJX) HCL 57" |
| 10 | 1 | 43225 | Hose - HH30 - 12AT1(12FJX,12FJX) HCL 30" |
| 11 | 1 | 43226 | Hose - HH31 - 4AT1(4FJX,4FJX) HCL 31" |
| 12 | 1 | 47645 | Hose - HH91 - 4AT1(6FJX,6FJX90S) HCL 91" |
| 13 | 2 | HF 1501-12-12 | Hydraulic Fitting 90 Degree Male to Female |
| 14 | 1 | HF 6400-6-6 | Hydraulic Fitting - Male JIC - Male ORB |
| 15 | 1 | HF 6400-6-8 | Hyd Fitting -Male JIC - Male ORB |
| 16 | 4 | HF 6400-6-10 | Hydraulic Fitting - Male JIC - Male ORB |
| 17 | 3 | HF 6400-12-12 | Hydraulic Fitting-O-Ring JIC Adapter, Male JIC 3/4" Male BSPP |
| 18 | 2 | HF 6400-12-16 | Hydraulic Adapter JIC to O-Ring |
| 19 | 1 | HF 6500-12-12 | Hydraulic Elbow Fitting - 3/4" FJXH MJIC |
| 20 | 2 | HF 6801-4-6 | Hydraulic Fitting - Male JIC - Male Orb 90° |
| 21 | 3 | HF 6801-6-8 NWO | Adapter |
| 22 | 1 | HF 6801-12-12 | Forged Fitting - 3/4" JIC X 3/4" SAE 90° Elbow |
| 23 | 1 | HF QCFF-1 | Quickcoupler 3/4" Flat Face Pipe - Female |
| 24 | 1 | HF QCFF-2 | Quickcoupler 3/4" Flat Face Pipe - Male |
| 25 | 1 | VAL KPDS100/A/3 | Relief Valve |
| 26 | 1 | VAL MLHPQ400C4C | M+S Hydraulic Motor |
| 27 | 1 | SKMLHPQUDE | Seal Kit for 200 & 400 Series Motors |
| 28 | 1 | VAL MLHSY400 | Complete Motor - MLHSY400C4UD |
| 29 | 1 | SKMLHSY-U/D | Seal Kit for M+S Motors |

High Flow Electrical Harness - CTI











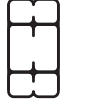

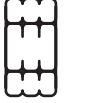
| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|-------------|--|-----------------|
| 1 | 1 | 45960 | Boss I CTI Electrical Harness - Complete | Incl. Items 2,3 |
| 2 | 1 | 28276 | Boss I CTI Valve Wiring Harness | |
| 3 | 1 | BS B1 107 | Boss I Toggle Switch Wiring Harness | |

High Flow Electrical Harness - Canimex



| ITEM | QTY | PART NUMBER | DESCRIPTION | NOTE |
|------|-----|-------------|--------------------------------------|-----------------|
| 1 | 1 | 45958 | Boss I HF Canimex Harness - Complete | Incl. Items 2,3 |
| 2 | 1 | 45959 | Boss I HF Canimex Harness | |
| 3 | 1 | BS B1 107 | Boss I Toggle Switch Wiring Harness | |

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.

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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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