

H&S

GM 170



WARNING

READ AND UNDERSTAND THIS MANUAL
BEFORE OPERATING THIS EQUIPMENT

**UNSAFE OPERATION OR MAINTENANCE OF THIS EQUIPMENT CAN RESULT IN
SERIOUS INJURY OR DEATH**

OPERATOR'S MANUAL AND PARTS LIST

Revision #3
Starting Serial # 110203

HSMFG312011

Manufactured By
H&S MANUFACTURING CO., INC.

P.O. BOX 768 (715) 387-3414 FAX (715) 384-5463
MARSHFIELD, WISCONSIN 54449

H&S GM 170
OPERATOR'S & PARTS MANUAL
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WARRANTY

H & S WARRANTY

H & S Manufacturing Co., Inc. ("H & S") warrants this product to be free from defect in material and workmanship. Except as noted below, this warranty term is twelve (12) months from the date of delivery of the product to the original purchaser by an authorized H & S dealer. Under this warranty, H & S will repair or replace, at its option, any covered part which is found to be defective in material or workmanship during the applicable warranty term. In no case will the covered repair cost of a part or parts exceed the replacement cost of that part. Warranty service must be performed by H & S or a dealer authorized by H & S to sell and/or service the product involved, which will use only new or remanufactured parts or components furnished by H & S. This warranty includes approved parts and labor to fix the product but does not include, and the purchaser is responsible for, any service call and/or transportation of the product to and from the dealer's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service work not directly related to any defect covered under this warranty. This warranty includes only those components of the product manufactured by H & S. Warranty for any component not manufactured by H & S including, but not limited to, engines, batteries, tires, rims, hydraulic motors, pumps, etc. are covered by the warranty, if any, provided separately by their respective manufacturers.

This warranty in all its parts, is extended solely to the original purchaser of the product, is terminated upon any subsequent transfer or sale from or by the original purchaser and extends no third party benefits or rights whatsoever.

The warranty term for any product used in any commercial, custom, for hire or rental application, is limited to six (6) months from the date of delivery of the product to the original purchaser by an authorized H & S dealer.

Polybonded (polyethylene and plywood) panels utilized in H & S Manure Spreaders are warranted, to the original purchaser, to not wear through and the polyethylene overlay to not tear free of the plywood for the functional life of the spreader. This specific warranty on polybonded panels includes only replacement of any defective panel part without any allowance for labor beyond the terms of the general warranty (12 or 6 months), and is further limited to manure spreaders used to spread normal agricultural manure.

This warranty does not include: (1) Any product that has been altered or modified in ways not approved by H & S; (2) Depreciation or damage caused by normal wear, misuse, improper or insufficient maintenance, improper operation, accident or failure to follow the product Operator's Manual recommendations and product decal recommendations; (3) Normal maintenance parts and service; (4) Repairs made with parts other than those available from H & S or performed by anyone other than H & S or a dealer authorized by H & S to sell and/or service the product involved.

To secure warranty service the purchaser must report the product defect to a dealer authorized by H & S to sell and/or service the product involved within the applicable warranty term together with evidence of the warranty start date and make the product available to that dealer within a reasonable period of time.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. H & S and the companies affiliated with it makes no warranties, representations, or promises, express or implied, as to the performance or freedom from defect of its products other than those set forth above and NO IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS OR FITNESS FOR A PARTICULAR PURPOSE IS MADE. IN NO EVENT WILL THE DEALER, H&S OR ANY COMPANY AFFILIATED WITH H&S BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. The ONLY REMEDY the purchaser has in connection with the breach of performance of any warranty on H & S products are those set forth above.

The selling dealer has no authority to make any representation or promise on behalf of H & S, or to modify the terms or limitations of this warranty in any way.

2/04

FILL OUT AND MAIL IMMEDIATELY TO MAKE WARRANTY EFFECTIVE



WARRANTY REGISTRATION

Date of Purchase _____

Purchaser _____ Address _____

City _____ State _____ Zip _____

Product _____ Model# _____ Serial# _____

Dealer _____ Address _____

City _____ State _____ Zip _____

Signature of Original Buyer

IMPORTANT!

Tear on dotted line, provide the information requested on the card. The H&S Warranty is valid **“only”** after this card is received and recorded at H&S Mfg. Co. Mail at once. No postage is required in the U.S.A.

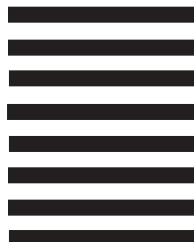


NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL Permit No.195 Marshfield, WI 54449

POSTAGE WILL BE PAID BY ADDRESSEE

H&S Manufacturing Co., Inc.
PO Box 768
Marshfield, WI 54449-9963



H&S DEALER PRE-DELIVERY CHECK LIST

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

After the 170 Grinder-Mixer has been completely set-up, check to be certain it is in correct operating order before delivering to the customer. The following is a list of points to inspect. Check off each item as you have made the proper adjustments and found the item operating satisfactorily.

- Grinder-Mixer was not damaged in shipment. Check for dents and loose or missing parts. Report damage immediately to H&S Manufacturing Co., Inc.
- All bolts and fasteners are tight.
- Mixer has been correctly assembled according to instructions in this manual. Wheel nuts and all other fasteners are tightly secured.
- All grease fittings have been lubricated. The transmission and cyclonic reservoir are filled to proper levels. See Lubrication Chapter of this manual for details.
- Hydraulic pump, motors, hoses and fittings are properly attached.
- Guards and shields are secure.
- Screens fit properly into the mill and the mill cover closes and latches tightly.
- Wheels are properly mounted.
- Tires are inflated to 80 PSI (563 kpa).
- Belts are properly adjusted.
- Rear Drive Chain tension is properly adjusted. See Adjustment Chapter of this manual.
- Discharge auger door operates smoothly.
- Decals are in place and legible.
- Lights and wiring functioning properly if applicable.

Connect the Mixer onto a proper horsepower 540 RPM or 1000 RPM (if applicable) tractor and attach the PTO. Connect the scale and lights if applicable. Run the Grinder-Mixer and make sure all components operate properly.

- PTO guard turns freely.
- Hydraulic system does not leak under pressure.
- Electronic Scale (if provided) operates properly.
- Implement and all components are functioning properly.

(Remove Dealer File Copy At Perforation)

H&S DEALER PRE-DELIVERY CHECK LIST(CONT.)

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

SWINGING INTAKE AUGER (SIA)(if applicable)

- Guards, shields, and attaching hardware are in place and properly secured.
- SIA lifting, locking and supporting mechanisms function correctly. Counter-balance spring and brake are properly adjusted. See Adjustments Chapter of this manual.
- Transport lock mechanism engages and disengages correctly. Safety locking clip is attached to the transport bracket.
- Hydraulic motor and speed control levers operate properly during operation.
- Decals are in place and legible.

	Model Number

(Dealer's Name)	_____
	Serial Number

(Signature of Pre-Delivery Inspector)	_____
	(Inspection Date)

DEALER DELIVERY CHECK LIST

This check list that follows is an important reminder of valuable information that should be passed on to the customer at the time this machine is delivered.

Check off each item as you explain it to the customer.

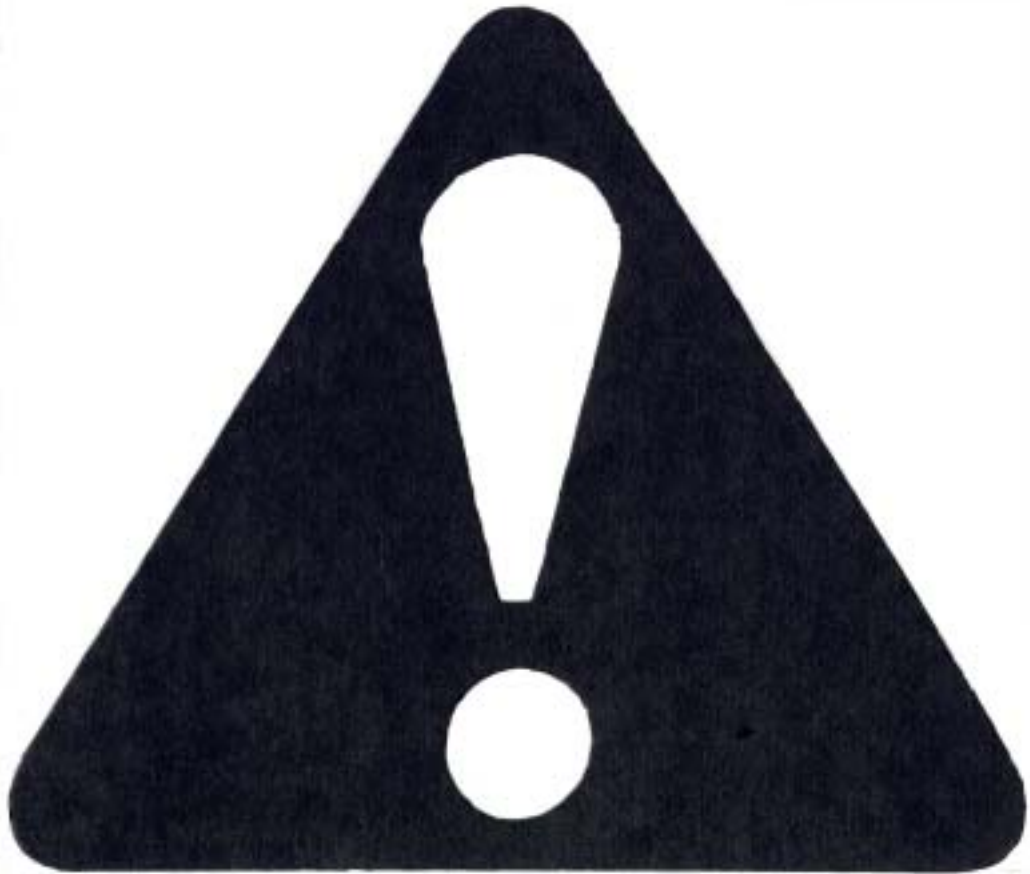
This delivery check list, when properly filled out and signed assures the customer that the Pre-delivery service was satisfactorily performed.

- Explain to the customer that the pre-delivery inspection was made.
- Explain to the customer all the safety precautions they must exercise when operating this unit.
- Explain to customer that regular lubrication is required for proper operation and long life of machine. Show customer the Lubrication Chapter of the Operator's Manual.
- Explain to customer that drain plugs must be installed before operating of grinder- mixer.
- Give the customer Operator's Manual and make sure they read and understand all operating and service instructions.
- Record model and serial number on this page and page 50 of this Manual.
- Have customer sign a completed "Warranty Registration," and mail it promptly.

Date Delivered _____	Dealer's Name _____
_____	By _____
Signature of Original Buyer	

Note: Warranty is not valid until warranty card is completed and returned to H & S Mfg. Co., Inc.

SAFETY INFORMATION



**BE
ALERT!**

**YOUR SAFETY
IS INVOLVED.**

THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL. REMEMBER: THE CAREFUL OPERATOR IS THE BEST OPERATOR. MOST ACCIDENTS ARE CAUSED BY HUMAN ERROR. CERTAIN PRECAUTIONS MUST BE OBSERVED TO PREVENT THE POSSIBILITY OF INJURY OR DAMAGE.

TRACTORS

This operator's manual uses the term "Tractor" when identifying the power source.

H & S MANUFACTURING CO. INC.

SAFETY INFORMATION

RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



UNDERSTAND SIGNAL WORDS

A signal word- DANGER, WARNING, or CAUTION - is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs.



FOLLOW SAFETY INSTRUCTIONS


Carefully read all safety messages in this manual, and all safety signs on your machine. Follow all recommended precautions and safe operating procedures.


Keep signs in good condition. Immediately replace any missing or damaged signs.


SAFETY INFORMATION

PULL TO STOP 126-2177

SHEAR BOLTS
REMOVE BROKEN SHEAR
BOLT BEFORE REPLACING
112-11176

 DANGER
SHUT ENGINE COMPLETELY OFF BEFORE
ADJUSTING OR SERVICING MACHINE.
MACHINE MAY START UNEXPECTEDLY
FAILURE TO HEED THIS WARNING MAY RESULT
IN PERSONAL INJURY OR DEATH 3398C


1494A

 WARNING
DO NOT OPERATE
THIS EQUIPMENT
IF THIS DECAL IS
EXPOSED.
REPLACE SAFETY
SHIELDS.

 DANGER



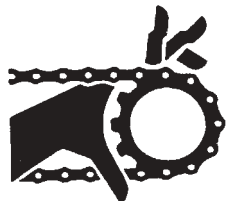
ROTATING DRIVELINE
CONTACT CAN CAUSE DEATH
KEEP AWAY!

DO NOT OPERATE WITHOUT-


- ALL DRIVELINE, TRACTOR
AND EQUIPMENT SHIELDS
IN PLACE.
- DRIVELINES SECURELY
ATTACHED AT BOTH ENDS.
- DRIVELINE SHIELDS THAT
TURN FREELY ON DRIVELINE.


1494L

 WARNING



DO NOT CLEAN
OR WORK ON THIS
MACHINE WITHOUT
FIRST DISENGAGING
POWER AND
SHUTTING OFF
TRACTOR ENGINE.
1494J

 DANGER



MAINTAIN SAFE CLEARANCE
FROM ELECTRIC POWER LINES
AND AVOID CONTACT WITH ANY
ELECTRICALLY CHARGED
CONDUCTOR.
CONTACT WITH ELECTRIC
POWER SOURCES CAN RESULT
IN ELECTRICAL SHOCK OR
ELECTROCUTION.
FAILURE TO HEED THIS
WARNING MAY RESULT IN
SERIOUS INJURY OR DEATH.
1494P

 WARNING



DO NOT
REMOVE
SHIELDS
MOVING
PARTS
INSIDE
1494K

SAFETY INFORMATION

⚠ WARNING

DO NOT OPERATE THIS EQUIPMENT IF THIS DECAL IS EXPOSED. REPLACE SAFETY SHIELDS.

32597A

⚠ WARNING



CRUSHING HAZARD

TO PREVENT SERIOUS INJURY OR DEATH:

KEEP HANDS AND BODY OUT OF HITCH AREA WHEN ATTACHING TOWING VEHICLE.

KEEP BODY CLEAR OF CRUSH POINT BETWEEN TOWING VEHICLE AND LOAD.

KEEP FEET AND LEGS CLEAR FROM UNDER TONGUE AREA IN CASE OF POSSIBLE JACK FAILURE.

82602

⚠ WARNING

HELP AVOID INJURY

- READ & UNDERSTAND THE OPERATORS MANUAL PROVIDED WITH THIS MACHINE. IF MISPLACED CALL H & S MANUFACTURING AT 715-387-3414 WITH MODEL AND SERIAL NUMBER.
- UNDERSTAND ALL SAFETY WARNINGS AND FUNCTION OF CONTROLS.
- KEEP SAFETY DEVICES IN PLACE AND WORKING.
- KEEP YOURSELF AND OTHERS WELL CLEAR OF MOVING PARTS.
- DISCONNECT ALL POWER BEFORE SERVICING OR CLEANING THIS MACHINE.
- DO NOT EXCEED 25 MPH

72203A

⚠ WARNING!



KEEP CHILDREN AWAY AT ALL TIMES!

2495



⚠ WARNING

DO NOT GO NEAR LEAKS

- High pressure oil easily punctures skin causing serious injury, gangrene or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.
- Do not use finger or skin to check for leaks.
- Lower load or relieve hydraulic pressure before loosening fittings.

11599



⚠ WARNING

STAY CLEAR OF DISCHARGE AUGER

82987A

SAFETY INFORMATION

 82907B	⚠ WARNING
	STAY CLEAR OF AUGER EXTENSION HINGE AREA

⚠ DANGER
 82907H
STAY CLEAR KEEP HANDS AND FEET AWAY FROM AUGER AT ALL TIMES FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH

 82907C	⚠ DANGER
	STAY CLEAR KEEP HANDS AND FEET AWAY FROM AUGER AT ALL TIMES FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH

 82907D	⚠ WARNING
	STAY CLEAR ROTATING PARTS INSIDE

⚠ DANGER

NEVER ALLOW RIDERS ON THIS MACHINE 82907L

 82907E	⚠ WARNING
	STAY CLEAR ROTATING AUGER BEHIND THIS PANEL

SAFETY INFORMATION



TRACTORS:

This operators manual uses the term “Tractor” when identifying the the power source.



WARNING

TO PREVENT SERIOUS INJURY OR DEATH

BEFORE YOU ATTEMPT TO OPERATE THIS EQUIPMENT, READ AND STUDY THE FOLLOWING INFORMATION. IN ADDITION, MAKE SURE THAT EVERY INDIVIDUAL WHO OPERATES OR WORKS WITH THIS EQUIPMENT, WHETHER FAMILY MEMBER OR EMPLOYEE, IS FAMILIAR WITH THESE SAFETY PRECAUTIONS.

KNOW HOW TO STOP MACHINE BEFORE STARTING IT.

If the machine becomes clogged or for servicing, Stop the tractor engine, remove ignition key and allow all mechanisms to stop. Before cleaning or working on the machine, detach the PTO shaft, and completely disengage the tractor hydraulics.

DO NOT attempt to perform maintenance or repair with tractor running, PTO and hydraulic hoses connected to the tractor.

DO NOT step up on machine at any time while in operation.

DO NOT allow minors to operate or be near the machine.

DO NOT ALLOW PERSONNEL OTHER THAN THE QUALIFIED OPERATOR NEAR THE MACHINE.

STAY CLEAR of discharge auger when in operation.

Keep hands, feet, and clothing away from all moving parts when the Grinder-Mixer is in operation.

Loose or floppy clothing should not be worn by the operator.

Be sure the machine is clear of people, tools, and other objects before engaging PTO.

Do not step over PTO shaft: Stay clear of PTO at all times.

NEVER start the Grinder-Mixer until all guards and safety shields are secured in place.

Never operate Grinder-Mixer with a PTO speed greater than the recommended PTO RPM.

STAY CLEAR of hydraulic lines, they may be under extreme pressure or heat.

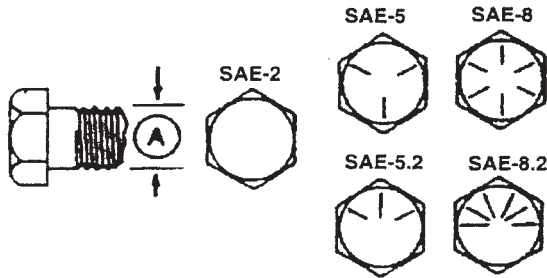
NEVER open or plug the water drain holes with the Mixer running.

H&S Mfg. Co. always takes the operator and their safety into consideration and guards exposed moving parts for their protection. However, some areas cannot be guarded or shielded in order to assure proper operation. In addition, the operators manual and decals on the machine itself warn you of further danger and should be read and observed closely.

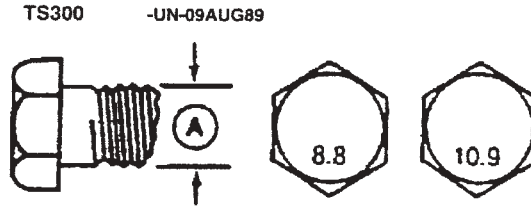
Study The Above Safety Rules

ATTENTION - BE ALERT - YOUR SAFETY IS INVOLVED

CAP SCREW TORQUE VALUES



Inch Cap Screw Head Markings



Metric Cap Screw Head Markings

INCH CAP SCREW TORQUE VALUES

METRIC CAP SCREW TORQUE VALUES

Bolt Diameter (A)	Wrench Size	Cap Screw Grade					
		SAE 2		SAE 5		SAE 8	
		N-m	lb.-ft	N-m	lb.-ft	N-m	lb.-ft
1/4"	7/16"	7	(5)	11	(8)	16	(12)
5/16"	1/2"	14	(10)	23	(17)	33	(24)
3/8"	9/16"	24	(18)	41	(30)	54	(40)
7/16"	5/8"	41	(30)	68	(50)	95	(70)
1/2"	3/4"	61	(45)	102	(75)	142	(105)
9/16"	13/16"	88	(65)	142	(105)	203	(150)
5/8"	15/16"	122	(90)	197	(145)	278	(205)
3/4"	1-1/8"	217	(160)	353	(260)	495	(365)
7/8"	1-5/16"	224	(165)	563	(415)	800	(590)
1"	1-1/2"	332	(245)	848	(625)	1193	(880)
1-1/4"	1-7/8"	665	(490)	1492	(1100)	2393	(1765)

Bolt Diameter (A)	Wrench Size	Markings on Cap Screw Heads			
		8.8		10.9	
		N-m	lb.-ft	N-m	lb.-ft
5 mm	8 mm	6	(4.5)	9	(6.5)
6 mm	10 mm	10	(7.5)	15	(11)
8 mm	13 mm	25	(18)	35	(26)
10 mm	16 mm	50	(37)	75	(55)
12 mm	18 mm	85	(63)	130	(97)
16 mm	24 mm	215	(159)	315	(232)
20 mm	30 mm	435	(321)	620	(457)
24 mm	36 mm	750	(553)	1070	(789)
30 mm	46 mm	1495	(1103)	2130	(1571)



CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

DO NOT use these values if a different torque value tightening procedure is listed for a specific application. Torque values listed are for general use only. Check tightness of cap screws 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 fastener threads are clean and 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 amount shown in chart. Tighten toothed or serrated-type lock nuts to full torque value.

PREPARING FOR OPERATION

TRACTOR CONNECTIONS

PTO

Fasten the Grinder-Mixer to the tractor drawbar with a hitch pin with safety locking device, and attach the Grinder-Mixer PTO to the tractor PTO shaft locking it into position.

1. Maintain a straight alignment between the grinder-mixer and the tractor.
2. Maintain a 15-1/2" distance between the lock on the tractor PTO and hole on grinder-mixer hitch for a 540 RPM machine.
3. Maintain a 17" distance between the lock on the tractor PTO and hole on grinder-mixer hitch for a 1000 RPM machine.
4. Maintain a distance of 6"- 12" between the top of the tractor drawbar and the center of the tractor PTO. An 8" distance is standard.



Hydraulics

The GM 170 requires a 4 hose hook-up; 2 hoses for the discharge auger lift, and 2 hoses for the discharge auger rotation.

PREPARING MIXER

- * Properly lubricate the grinder-mixer, checking the transmission and cyclonic reservoir oil levels, and filling if necessary before operating the grinder-mixer.
- * All drain plugs must be properly installed and secured.
- * Follow the procedures outlined in the Operation Chapter of this manual for installing the mill screen.
- * The tank lid and the discharge auger door must be closed and the cyclone cover must be open.
- * Start the tractor, engage the PTO at idle speed and increase the rpm's until the grinder-mixer is running at the rated PTO speed. Begin the grinding process.

SET-UP & ASSEMBLY

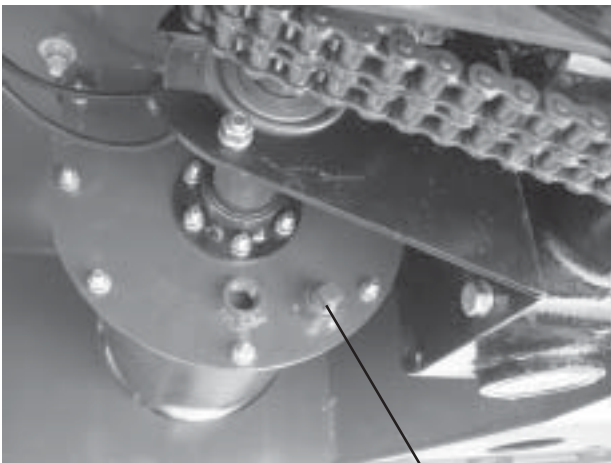
WHEELS & TIRES

The Grinder-Mixer is shipped without the rims and tires installed on the axle hubs. Install the rims and tires, and torque the wheel nuts to 90 ft-lb (124 N-m). Inflate the 12.5L x 15 - 20 ply tires to 80 PSI (563 kpa).

DRAIN PLUGS & DRAIN COVER

When the Grinder-Mixer is delivered, the drain plug on the back plate of the transfer auger will be in the storage position. See the diagram below for the storage position. When the GM 170 is ready for delivery, install the drain plug in the back plate of the transfer auger. If the mixer is equipped with a Swinging Intake Auger (SIA), the drain plug will also be in the storage position. Upon delivery, also install the drain plug in the drain hole in the bottom of the SIA attachment.

IMPORTANT: Never open or plug the water drain holes with the mixer running.



Transfer Auger Drain Plug In Storage Position.



SIA Drain Plug In Storage Position.

STORAGE

IMPORTANT: If the GM 170 is stored outside, the water drain holes must be left unplugged. Before the mixer is going to be operated, re-install the plugs. After a rain, check the mill, mixing tank, and augers for water accumulation before operating the mixer. As necessary, drain the water before using the mixer.

NOTE: After water has been drained from the mixer, it is advisable to run the GM 170 while empty for a period of time in an attempt to dry the mixer before grinding to eliminate any sticking of material and possible plugging.

TRANSPORTING

SMV BRACKET & REFLECTORS

The grinder-mixer is equipped with a SMV bracket. Red reflector strips are located on the rear of the tank and on the SIA (if applicable).



TRANSPORT LIGHTING

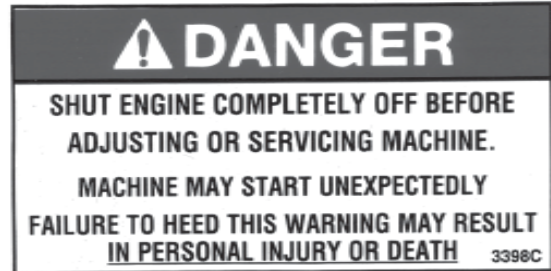
An optional highway transport lighting kit is available.



OPERATION

EMERGENCY SHUTDOWN

In an emergency or in case a foreign object enters the mill inlet, stop mixer operation immediately by disengaging the tractor PTO.



GENERAL INFORMATION

Check entire unit carefully before first operation. Tighten bolts and set screws that might have come loose in shipping. Lubricate as explained in the Lubrication Chapter in this manual.

NOTE: *These procedures must be done before grinding;*

- 1.) *Grinder mill door is closed.*
- 2.) *The collector cover is open,*
- 2.) *The tank lid is closed,*
- 3.) *The unloading auger shut-off door is closed.*

Operate the mixer on level ground for uniformity of mix. Maintain a straight-line alignment between the tractor and mixer to prolong the life of the drive line components.

Maintain the tractor rated PTO speed which produces a mill cylinder speed of 2700 RPM, to obtain the most efficient grind. Do not exceed a cylinder speed of 3000 RPM. Before grinding, the unloading auger shut-off door must be closed.

Add supplements after a small amount of feed has been ground, then dry granular materials.

NOTE: *Do not grind feed with high moisture content. This may cause plugging. Abnormally damp crops will not feed or mix well.*

Grinding should be stopped when the feed in the windows begins to drop.

IMPORTANT: *Overfilling the mixing tank will place unnecessary stress on the drive line components. Keep the tank lid closed and properly latched so that if the tank is accidentally overfilled, the lid can pop open and release the feed inside the tank.*

The two full-length windows on the tank are calibrated with numbers representing bushels of ground feed.

NOTE: *Optional models of electronic scales are available for accurate weight measurements and rations.*

Stop the tractor and disengage the mill/blower drive sheave pin after grinding. Start the tractor and allow the mixer to continue running for several minutes to thoroughly mix the ground feed. Allow the mixer to continue running during transport, disengaging the PTO on corners or turns.

IMPORTANT: *When transporting the mixer and mixing, disengage the tractor PTO before turning corners to prevent damage to the PTO driveline.*

OPERATION (cont.)

CAPACITY

The GM 170 mixing tank capacity is 170 cubic feet or 135 bushels by volume. The tank will hold approximately 6000 to 7000 lbs of ground feed consisting of average weight corn, small grain and/or concentrates. More or less weight (per tank) is possible, depending upon whether the material that is being ground is lighter or heavier than average. Grinding capacity of the mill will vary due to the type of material being ground, the moisture content of the material, the size screen used, and the horsepower of the tractor used to operate the mixer.

The mixer is designated for operation by a 50 to 115 hp (28 to 86 kW) 540 RPM tractor or by a 50 to 145 hp (38 to 109 kW) 1000 RPM tractor.



540/1000 RPM PTO DRIVE

The H&S GM 170 grinder-mixer features a 540 drive as standard equipment for use with tractors up to 115hp (86kW).

An optional 1000 RPM drive is available for use with tractors up to 145hp (109 kW).



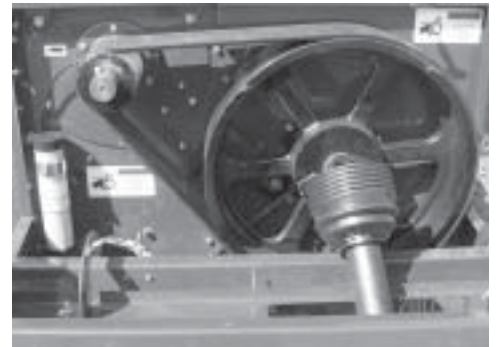
MILL & BLOWER

Drive Sheave

The mill/blower can be engaged or disengaged by the positioning of a pin on the sheave.

To disengage the mill/blower, grasp the pin handle, pull it forward and rotate it onto the L-shaped bracket.

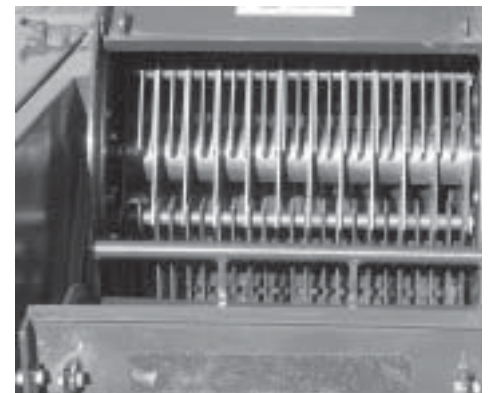
IMPORTANT: When starting the Grinder-Mixer, engage the tractor PTO at a slow idle speed. Advance the throttle of the tractor to the rated PTO speed.



Mill & Blower Operation

Material enters the cylinder chamber through the mill inlet and is drawn into the cylinder by a vacuum below the cylinder. The vacuum below the cylinder is obtained by the physical location of the blower Inlet below the cylinder.

The 21" cylinder is composed of sixty-six swinging hammers which are equally divided among three rows around the cylinder. As the cylinder rotates at the recommended speed of 2700 RPM, the hammers grind the material and force it through the screen. Once through the screen, the ground material drops down to the transfer auger and is conveyed to the mixing tank. Light-weight chaff or dust is drawn into the blower inlet and forced by the blower up into the collector where it is refined and separated. Heavy particles are directed back down into the transfer auger and conveyed to the mixing tank.



OPERATION (cont.)

SELF-CONTAINED HYDRAULIC SYSTEM

Hydraulic System

The mixer has a self-contained hydraulic system featuring hydraulic motor operated discharge augers and an optional hydraulic motor operated swinging intake auger attachment. The self-contained hydraulic system is composed of a pump, flow control with pressure relief, cyclonic reservoir and oil filter.



Note: When operating at cold temperatures, allow the hydraulic oil in the self-contained system to warm up at tractor idle speed with the PTO running prior to grinding.



Pressure Relief Valves

Pressure relief valves on the variable speed controls for the Swinging Intake Auger (SIA) if applicable, and discharge auger system provide overload protection for the hydraulic system. The relief valves will permit pressure build-up to a factory set value of 3200 PSI. The self-contained hydraulic system operating pressure range is normally 500 to 2000 PSI. If the SIA is stopped by a malfunction or overloading, the pressure will build up to the factory set cut-off pressure and the relief valve will open allowing oil to flow directly through the flow control and continue to the flow control for unloading augers which will continue to function. If one of the hydraulic motors of the unloading auger system is stopped by a malfunction of the component it is driving, the pressure will build-up to the factory set cut-off pressure and the relief valve will automatically stop flow throughout the entire hydraulic system. After the problem is corrected, the relief valve will automatically reset and restore oil flow to the system.



Hydraulic Pump/Motor Drive

The GM 170 has a double sheave on the end of the main drive shaft which is connected by a double banded belt to the hydraulic pump. The pump is belt driven directly off the main drive shaft which is coupled by the telescoping drive to the tractor PTO shaft. Overload protection for the hydraulic pump is provided by a self-adjusting spring tightener.

IMPORTANT: Stop mixer operation if drive belt slipping is detected.



OPERATION (cont.)

Discharge Auger System

Ground feed from the mixing tank is discharged by an auger system consisting of three hydraulically motor driven augers that are connected in series so that all augers are synchronized as well as started and stopped together. If any motor malfunctions, the movement of material through the augers will stop immediately. The discharge auger unloads material to any point within a 300 degree radius. The length of the unloading auger is approximately 12 feet, without any extensions. By adding a 3' or 6' folding extensions, the length can be increased. A transport cradle is provided for holding the unloading auger in position during transport.



Shown with 6' folding extension

Needle Valves

An adjustable needle valve is provided on each hose of the discharge auger rotation to control the speed of auger swing to provide smooth rotation. Needle valves are located at the rear of the machine by the hydraulic rotation motor. See the Adjustment Chapter of the manual for adjustment details.



Discharge Auger Door & Variable Speed Valve

A variable speed valve with a pressure relief controls the hydraulic motors which operate at a single constant speed determined by the speed of the tractor PTO, or at a variable speed determined by the valve. A discharge auger shut-off door is provided to regulate the amount of feed passing into the discharge auger.

NOTE: Always activate the hydraulic variable speed control valve to engage the discharge augers before opening the discharge auger shut-off door. When the mixing tank has been unloaded, close the discharge auger shut-off door then shut-off the hydraulic variable speed control valve .



OPERATION (cont.)

HYDRAULIC OPERATED ATTACHMENTS

Swinging Intake Auger (SIA)

An optional hydraulic drive Swinging Intake Auger (SIA) attachment conveys material into the mill. The intake auger can be swung in and locked against the mixer tank support brace for transporting, or swung out and locked at any point. Operating height of the infeed hopper can be raised or lowered and held in position using the rope mechanism. The attachment is spring counterbalanced to help with lifting. The right portion of the infeed hopper folds in to reduce overall width for transporting.



SIA Variable Speed Control Valve

Speed control handles are provided for regulation of the speed of conveyor auger rotation. Movement of any one of the three mechanically interconnected handles enables stopping and starting auger rotation as well as regulating the feeding rate of material being fed into the mill hopper. Two other convenience features on the SIA are an enclosed wind and grain shield, which is located over the discharge end of the SIA trough, and a water drain plug which is located in the bottom of the trough infeed hopper.



GRAVITY FEEDER

The standard equipment gravity feeder is a stationary hopper with no moving or running parts. Material to be ground is dumped into the hopper and slides directly into the mill inlet. A combination steel/rubber splash plate prevents the material which is being fed from being kicked out by the mill cylinder.



MAGNETS

Two heavy-duty 4" x 18" magnets located in the gravity feed hopper remove any metal that may accidentally mix with the material entering the mill.



OPERATION (cont.)

SCREENS

Uniformity of grinding is a factor of mill speed, condition of the hammers, and sharpness of the screen. The efficiency of the mill will also decrease if the holes of the screen are badly worn. If grinding fineness is deteriorating, the screen should be rotated to place the sharp holes edges against the direction of the cylinder rotation or the screen should be replaced. The GM 170 can be fitted with numerous screens that are available with various size holes to accommodate different material and grinding requirements. A screen storage rack is provided on the left side of the mixer.



NOTE: *If a screen is correctly installed, it should fit tight against the mill throat plate and butt tightly against the mill frame hood sheet when the mill screen cover is closed and securely latched.*

The listing below are only suggested hole size recommendations for different materials;

Fine Grind	Small Grains; 1/8", 3/16"
Medium Grind	Small Grains; 3/16", 1/4", 5/16"
Coarse Grind	Small Grains; 3/8", 1/2", 5/8"
Fine Grind	Shelled Corn; 1/8", 3/16", 1/4", 5/16"
Medium Grind	Shelled Corn; 3/8", 1/2", 5/8"
Coarse Grind	Shelled Corn; 3/4", 1"
Fine Grind	Ear Corn; 1/4", 5/16", 3/8"
Medium Grind	Ear Corn; 1/2", 5/8"
Coarse Grind	Ear Corn; 3/4", 1", 1-1/4', 1-1/2"

SUPPLEMENT HOPPER

The cover on the supplement hopper is spring-loaded to hold it in either the open or closed position. A bag guard is provided to prevent containers from being accidentally drawn into the transfer auger. A flip-over bag breaker allows easy opening of supplement bags.

NOTE: *Liquids, such as molasses, should not be poured into the grinder-mixer.*



TANK LID

The lid on top of the mixing tank features spring-loaded latches which enables it to be forced open by overflowing material should the tank accidentally become filled beyond capacity. The tank lid will open, allowing the ground feed to spill-out to prevent damage to the mixing auger and drive components.

IMPORTANT: *Stop mixer operation if the tank lid is forced open. Before restarting to grind or mix, the tank lid must be closed and the latches properly adjusted.*



OPERATION (cont.)

OVERLOAD PROTECTION

Main Drive

The GM 170 is furnished with a 5/16 x 1" Grade 5 shear bolt protecting the transfer auger drive shaft, transmission and mixing auger. When the shear bolt fails, the transfer auger and mixing auger will stop turning. Check the rear chain tightener for proper tension if this bolt shears.



Transfer Auger

The 1/4" x 1-1/4" Grade 5 transfer auger shear bolt is accessible only through the mill cover. This shear bolt protects the auger flighting. The transfer auger will stop rotating even though the auger/transmission drive shaft will continue to rotate if this shear bolt fails.



IMPORTANT: Stop mixer operation when either shear bolt fails.

UNPLUGGING

IMPORTANT: When plugging is detected, stop mixer operation.

Mill, Mill Drive and Mixing Tank

Overfeeding of the mill and/or the mill inlet can result in plugging, thus slipping of the miller/blower drive belt, shearing of either the auger/transmission shear bolt, or the transfer auger shear bolt. Abnormal crop conditions would include crops with high moisture content or crops that are too light or bulky which would not feed properly.

Overfeeding

If plugging develops from overfeeding, the tractor will choke down and even stall. To remove the plugging proceed as follows:

1. Shut the tractor off, remove key, disengage the PTO, detach the PTO and hydraulic hoses from the tractor.
2. Shut off the feeder attachment.(If applicable)
3. Open the mill screen cover, remove the screen and allow the material to fall down into the transfer auger or remove material if the transfer auger is overloaded, close mill cover.
4. Disengage the mill/blower drive sheave pin.
5. Start the tractor and engage the PTO at slow speed to convey the material into the Tank.
6. Shut the tractor off and disengage the PTO.
7. Open the mill screen cover, replace the mill screen, close mill cover, engage the mill/blower drive sheave pin, and restart the tractor and PTO.
8. Bring the mill up to proper running speed and restart the feeder attachment(if applicable). If the condition of the crop remains the same, reduce the feeding speed to avoid overfeeding.

OPERATION (cont.)

BLOWER INLET & OUTLET

NOTE: *The collector cover must always be open while grinding.*

Plugging in the blower inlet or outlet can be seen by the abnormal amount of dust particles in the air around the top of the collector, and/or the visible presence of dust in the mill throat area and/or a reduced air discharge at the top of the collector. If plugging is detected, proceed as follows:

Blower Inlet

1. Stop the tractor engine, remove ignition key, allow all mechanisms to stop and disengage PTO.
2. Open the mill screen cover and remove the screen.
3. Inspect the blower inlet opening and remove any build-up.



Collector

4. If there is no air coming out the top of the collector, the plugging is in the discharge side (blower outlet). Remove and clean out the tube connected to the blower outlet. Climb the ladder and check the inside of the collector. If the cyclone is plugged, remove the pipe below the cyclone and dislodge the plugging material.
5. After the plugging has been removed, replace the screen, close and latch the mill screen cover and attempt to resume grinding.



OPERATION (cont.)

MILL/BLOWER DRIVE BELT SLIPPAGE

Overload protection for the mill and blower components is provided by an 8 “A” section drive belt, which connects the mill/blower driven sheave to the drive sheave. The mill and blower will gradually slow down without much reduction in tractor PTO speed if plugging develops from mill/blower drive belt slippage, and stop turning the mill/blower drive shaft if plugging or breakdown occurs in the mill or blower areas. Follow steps 1 through 5 from the previous page to remove the plugging. After the plugging has been removed, shut the tractor off, disengage the PTO, and adjust the drive belt tension to the proper tension(see [Adjustment](#) Chapter). Re-start the tractor and PTO, bring the mill cylinder up to proper operating speed and resume grinding.

IMPORTANT: Stop mixer operation if drive belt slipping is detected.



SHEAR BOLTS

Blockage in the mixer may cause the tractor to stall. Shut down the tractor and mixer, disconnect the PTO, and proceed as follows:

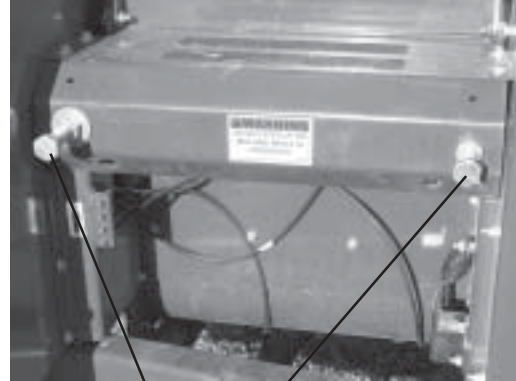
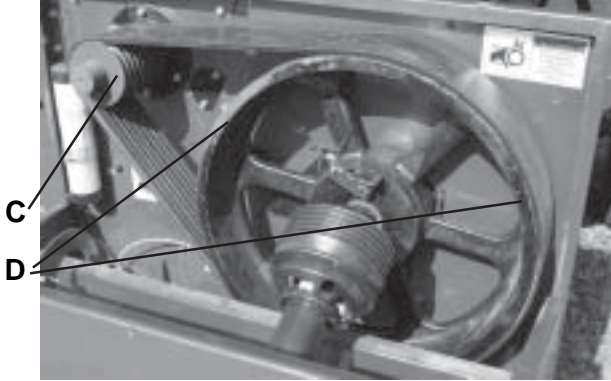
1. Open the mill screen cover and clean material out of the mill/cylinder and transfer auger area.
2. Check the auger/transmission shear bolt to determine if it has sheared. Rotate the mill drive sheave by hand to turn the sprocket, shaft and transfer auger. If the shaft does not turn, follow the shear bolt replacement procedures according to the [Service](#) Chapter in this manual.
3. If the transfer auger does not turn, the transfer auger shear bolt has failed. Refer to the [Service](#) Chapter in this manual for shear bolt replacement information.
4. After the shear bolts have been replaced, attempt to rotate the entire assembly. If rotation, in either direction, is not possible, proceed to step 5. If the sprockets and transfer auger turn but the mixing auger does not turn, proceed to step 6.
5. Check for a broken chain, drive sprocket or driven sprocket or for sheared keys which hold the sprockets. Replace any damaged parts.
6. If the items in step 5 are not at fault, remove the transmission drive chain and attempt to rotate the transmission input shaft. If the input shaft turns freely, internal transmission component failure is probable. Remove the transmission and take it to your nearest dealer for repair.

After the cause of the plugging has been corrected, restore all components, guards and shields before resuming operation according to the [Service](#) Chapter in this manual.

ADJUSTMENTS

MILL/BLOWER DRIVE

The combination mill/blower driven sheave is connected from the main drive sheave by an 8" "A" section banded drive belt. Adjusting bolts are provided to align the drive sheave with the driven sheave as well as to adjust the drive belt tension.



Sheave Alignment

To align the combination mill/blower driven sheave with the drive sheave, proceed as follows:

1. Loosen both of the bolt/nut (A & B) assemblies on the main drive shaft.
2. Place a straightedge across the faces of both sheaves (C & D) to check alignment.
3. Adjust the nut on the left bolt assembly (A) and the bolt on the right side assembly (B) to bring the drive sheave into alignment with the driven sheave.
4. After proper alignment is obtained, check and adjust drive belt tension.

Belt Tension

To adjust mill/blower drive belt tension, proceed as follows:

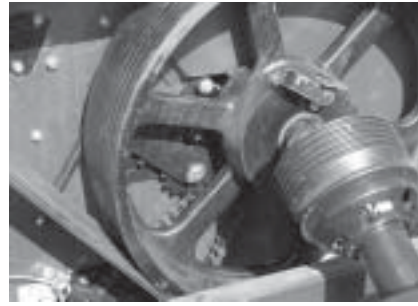
1. Check the drive belt tension initially by measuring the amount of belt deflection at the midway point between the sheaves while applying 60 lbs. of force at the midway point.
2. Adjust the nut on the left bolt assembly (A) clockwise to decrease deflection (increase tension) and adjust the right side bolt assembly (B) an equal number of turns counterclockwise to keep drive sheave in alignment with driven sheave. Adjust both sides until the deflection measures 3/8" (10 mm).
3. After proper tension is obtained, check for correct sheave alignment, retighten the lock nut on the right side bolt.

NOTE: A new drive belt should be adjusted for an initial tension of 3/8" (10 mm) deflection with an applied pressure of 80 lb. (360 N). Refer to the Service chapter of this manual for new belt installation procedures.

ADJUSTMENTS (cont.)

FRONT DRIVE CHAIN

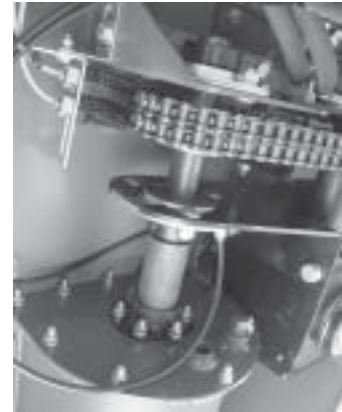
The transfer auger/transmission shaft is driven by a sprocket which is connected by the front drive chain to a sprocket on the main drive shaft. The front chain tension is self-adjusted by a spring-loaded idler and does not require adjustment. The chain should be inspected periodically for signs of wear.



TRANSMISSION DRIVE (REAR) DRIVE CHAIN

The transmission input sprocket is linked by the rear drive chain to a sprocket on the end of the transfer auger drive shaft. Chain tension can be adjusted by appropriate positioning of an idler sprocket which is attached to an adjustable bracket. Access to the idler and bracket is obtained from under the machine. Chain tension should be adjusted and maintained at a ¼" (6 mm) deflection on the strand of chain opposite the idler sprocket.

NOTE: *Rear chain tension should be checked periodically and properly adjusted to prevent wear and excessive noise.*



SWINGING INTAKE AUGER ATTACHMENT

SIA Brake Tension

A brake lever adjusts the hold and horizontal position of the swinging intake auger attachment. The brake mechanism consists of a cam-type lever-activated mechanism which is connected to a band around the attachment pivot. An adjustment bolt on the opposite end of the lever, can be turned in to tighten, or out to loosen the band around the pivot. The bolt should be adjusted so when the brake lever is at a right angle to the pivot, there is no binding or restriction when the auger is swung. When the brake lever is straight out, there should be tight clamping around the pivot and the auger is firmly held in place.



SIA Counterbalance Spring Tension

The Swinging Intake Auger (SIA) attachment is spring counterbalanced to facilitate lifting the attachment. There are multiple holes in the spring attachment bracket to select the appropriate SIA lift tension. The spring should provide enough tension to conveniently raise the SIA and still allow the SIA to remain stationary when the intake hopper end is lowered to the ground.

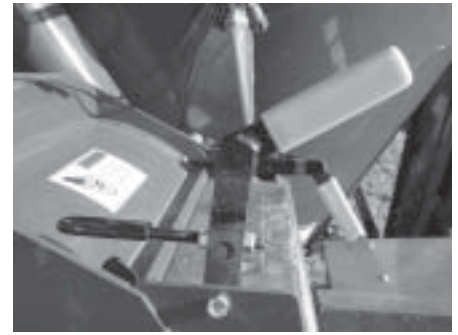


ADJUSTMENTS (cont.)

MILL SCREEN COVER LATCHES

Over-center handle latches are used to secure the mill cover tightly closed while the mill is being operated.

Lock nuts on the bolts of the latches are used to adjust latching tension. This tension should be adjusted and maintained so that some force has to be applied on the handles to lock and unlock them. Both latch mechanisms should be adjusted equally.



NEEDLE VALVES

An adjustable needle valve is provided on each hose of the discharge auger rotation to control the speed of auger swing to provide smooth rotation. Needle valves are located at the rear of the machine by the hydraulic rotation motor. Unlock the set screw on the valve - adjust each valve by dialing it left or right to decrease or increase auger rotation speed. After the speed has been set, lock the set screw down.



TANK LID

The tank lid on top of the mixing tank is designed to be self-unlatching in the event that the mixing tank accidentally becomes overfilled. The latching mechanism should be properly adjusted by the latch nut to maintain proper tension on the lid to keep it closed and weather-tight, but still allow it to be forced open from the inside of the tank by overflowing material. If the latch handle can be pulled straight up approximately ½" (12 mm), completely compressing the spring, tension is correct.

IMPORTANT: *The latch springs should never be completely compressed when the handle is all the way down or the lid will not open during over filling.*



12' DISCHARGE AUGER

Transport Cradle

The unloading auger must always be moved to and set into the transport cradle before the mixer is transported. If the auger does not set in the cradle, adjust the stop bolt on the vertical rotating auger at the rear of the machine.



3' & 6' Discharge Auger Extensions

The 3' and 6' discharge auger extensions fold back and lock into position with a safety lock pin. If the main pin does not line up with the hole on the bracket of the standard 12' auger, loosen the bolts and adjust the bracket.



LUBRICATION

GENERAL INFORMATION

IMPORTANT: *The GM 170 must be properly lubricated, the transmission and cyclonic oil reservoir must be filled to the proper oil levels before it can be operated.*

IMPORTANT: *Catch and dispose of fluid per local waste disposal regulations whenever service is performed on hydraulic components (valves, cylinders, hoses, etc.) or transmission.*

TRANSMISSION OIL LEVEL

NOTE: *Check the fluid level in the mixer transmission periodically by removing the plug located on the transmission. Requirements: 1-1/2 U.S. Pints (0.7 liters) of SAE #140 Gear Lube.*

Check the transmission occasionally for oil drips and dust accumulation around the seals. Oil drips or dust accumulation indicate that seals are leaking.

Water is present in the oil if the oil is tan in color and foams excessively. Drain and replace the lubricant immediately.

NOTE: *Fill the transmission gearbox to the bottom of the inspection plug hole - Do not overfill!*

OILING

The GM170 utilizes an automatic oiling system to lubricate the #60 main drive chain and the double #50 transmission drive chain. Any time that the discharge auger is raised, a specified amount of oil is sent to the brushes on each of the chains. The oiler is adjustable to set the amount that is being discharged. The rotating chain on the discharge auger should be lubricated every 5 hours using a good grade of lubricant. Spray the entire chain on the center of the rollers.

CYCLONIC OIL RESERVOIR

Check the cyclonic oil reservoir daily. Oil level should be between Max/Min level marks. Fill as needed using Exxon Nuto H46 or Equivalent.

LUBRICATION (cont.)

GREASING

NOTE: Grease all fittings at the intervals of operation listed, before and after storing the unit, and as otherwise listed. Use a good grade of Lithium-base grease.

Wipe dirt from the fittings before greasing to prevent the dirt from being forced into the bearing or pivot. Grease should come out around the shaft on sleeve type bearings. To minimize dirt build-up, avoid excessive greasing.

GREASE FITTING LOCATIONS

Grease Every 10 hours (or Daily)

1. Telescoping PTO Drive (3 zerks)
2. Front & Rear Mill Bearings - (2 zerks - remote in Grease Bank under main shaft shield)
3. Main Shaft Slider Bearings - (2 zerks - remote in Grease Bank under main shaft shield)
4. Transfer Auger Front Bearing(1 zerk - under mill cover on front of auger)
5. Transfer Auger Rear Bearings(2 zerks - remote on rear of frame)
6. Transmission Output Shaft Collar(1 zerk - remote on rear of frame)
7. Transmission Input Shaft Bearing(1 zerk - remote on rear of frame)
8. Top of Mixing Auger(1 zerk - under top of tank cover)
9. Unloading Auger Rotating Pivot/Collar(4 zerks - 2 on the top of the collar & 2 on the bottom of the collar)
10. Unloading Auger Vertical Pivot/Collar(4 zerks - 2 on each side of the pivot)
11. Unloading Augers(2 zerks - 1 on the top of vertical section auger & 1 at the end of the auger discharge spout)
12. Flywheel (1 zerk - under front main cover)

Attachments - As Applicable

13. SIA Upper Pivot Bearing(1 zerk)
14. SIA Lower Pivot Bearing(1 zerk)

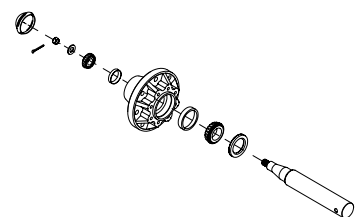
Grease Each Time a Bolt is Sheared or at least Once a Year

15. Auger/Transmission (Main) Shear Device(1 zerk - under front main cover)

WHEEL BEARING LUBRICATION, CLEAN & RE-PACK INSTRUCTIONS

Grease wheel bearings as needed depending on amount of travel.

Annually disassemble and clean parts in a solvent. Pack bearings with a high grade grease. Reassemble, and tighten nut until a slight drag is felt when wheel is turned. Back nut off and insert cotter pin into first hole that you see as you back the nut off, bend cotter pin over and re-install cap.



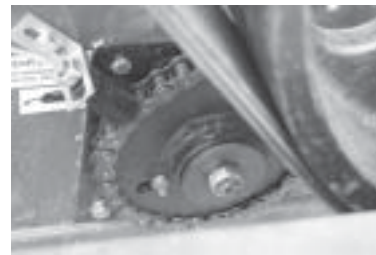
LUBRICATION (cont.)



Telescoping PTO Drive (3 zerks)



Flywheel (1 zerk)



Auger/Transmission Main Shear Bolt(1 zerk)



*Front & Rear Mill Bearings
(2 zerks - remote in Grease Bank under main shaft shield)
*Main Shaft Slider Bearings
(2 zerks - remote in Grease Bank under main shaft shield)



Transfer Auger Front Bearing
(under mill cover, 1 zerk on front bearing)



Transfer Auger Rear Bearings(2 remote zerks on rear of frame)
Transmission Output Shaft Collar(1 remote zerk on rear of frame)
Transmission Input Shaft Bearing(1 remote zerk on rear of frame)



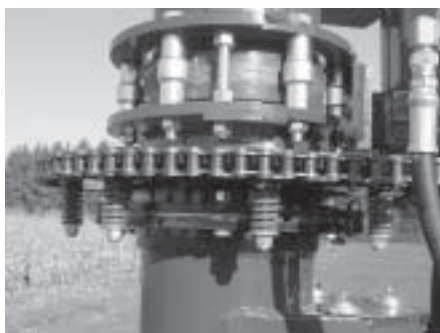
Top of Mixing Auger
(1 zerk - under top of tank cover)



Unloading Auger(1 zerk on the top of vertical section auger and 4 zerks on vertical auger pivot.)



SIA Upper Pivot Bearing
(1 zerk)
SIA Lower Pivot Bearing
(1 zerk)



Unloading Auger Pivot/Collar
(4 zerks - 2 on the top of the collar & 2 on the bottom of the collar)



Unloading Auger-(1 zerk at the end of the auger discharge spout)



Oil level should be between Max/Min level marks

SERVICE

HYDRAULIC SYSTEM

Hydraulic Pump Sheave Alignment

The hydraulic pump drive and driven sheaves must be maintained in correct alignment and be tightly secured at all times.

Hydraulic Pump Belt Tension

Overload protection for the hydraulic pump is provided by a self-adjusting spring tightener that requires no adjustment. The idler pulley must be properly positioned to keep the belt aligned with the sheaves.

Cyclonic Hydraulic Reservoir

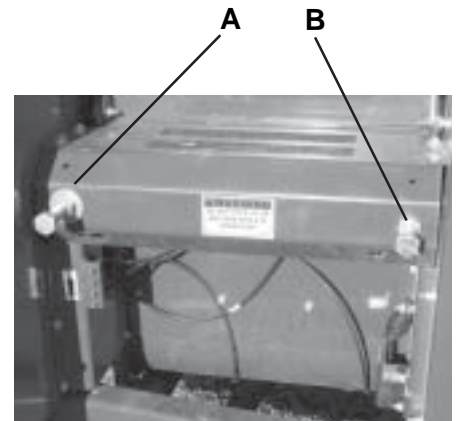
The oil filter should be replaced once a year or every 75 hours of operation, whichever comes first. The oil should be drained and replaced every two years or every 150 hours of operation, whichever comes first. Keep oil filled to proper level.

MILL/BLOWER DRIVE

Belt Replacement

To replace the mill/blower drive belt, perform the following steps:

1. Disengage PTO, shut-off tractor and remove key.
2. Release front drive chain tension.
3. Loosen both of the bolt/nut (A & B) assemblies on the main drive shaft.
4. After tension is released, remove the old belt and replace with a new belt.
5. Adjust the new belt tension per the Adjustment Chapter of this manual. After tension is properly adjusted, re-connect the front drive chain idler bracket spring.



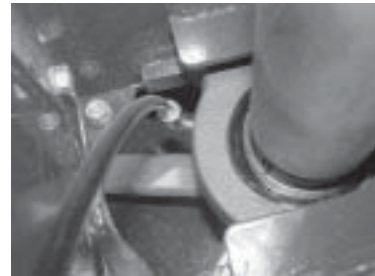
IMPORTANT: *The mill/blower drive belt will deteriorate more rapidly if improper tension is applied. Uneven sheave alignment will result in uneven belt stretch. Improper mill/blower belt tension will produce excessive pressure on the mill/blower bearings and cause premature bearing failure.*

SERVICE

MAIN DRIVE SHAFT BEARINGS

Main drive shaft bearings are greased by 2 of the remote zerks in grease bank under the step by the mill cover. For bearing replacement, follow steps 1-5 from the previous [Belt Replacement](#) section in this chapter. Then:

1. Disengage PTO, shut-off tractor and remove key.
2. Remove the hydraulic pump belt shield.
3. Release the spring tension on the hydraulic pump drive belt.
4. Remove the hydraulic drive pulley on the end of the main shaft.
5. Remove the drive chain to the transfer shaft.
6. Remove the PTO.
7. Remove the flywheel and flywheel clutch.
8. Remove the back left flywheel shield.
9. Remove remote grease lines from bearing blocks.
10. Remove main driveshaft cover with shaft and bearings.
11. Remove shaft and bearings from cover.
12. Loosen set screws and remove bearings.
13. Install new bearings and tighten set screws.
14. Re-install components in reverse order.
15. The bolt securing the PTO to the shaft should be tightened to seat the bearings. Then back the bolt out and tighten to 6-10 inch lbs. of torque. Secure the bolt with wire to PTO yoke.



ENGAGING PIN

The pin used to engage and disengage the mill/blower drive sheave should be checked periodically for excessive wear or improper seating. Excessive wear on the pin or the hole in the hub that the pin engages, could result in the pin accidentally disengaging in the middle of mill and blower operation. Both components should be replaced if worn.

IMPORTANT: Do not start the PTO until the pin is positively engaged. Using the PTO to engage the pin will cause premature pin failure.

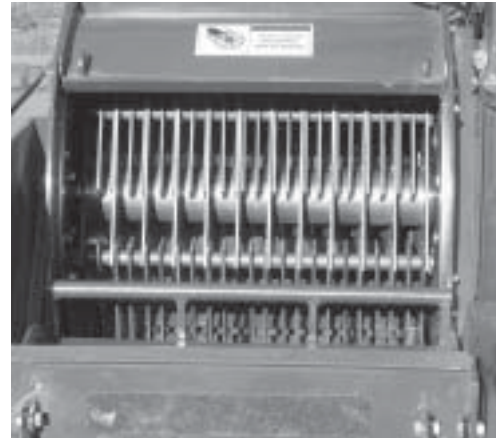


SERVICE

MILL HAMMER ROTATION OR REPLACEMENT

To maintain maximum grinding efficiency, the mill hammers should be rotated before wear radius measures ¼" (6 mm). Mill hammers are designed to be conveniently removed and rotated through 4 positions, before they require replacement. The hammers should be replaced when all four corners are worn to ¼" (6 mm) radius.

The mill cylinder contains 3 rows with 22 hammers in each row. To remove a row of hammers, rotate the cylinder to the position where the row of hammers to be removed lines up with the access hole in the left side of the mill housing. With the access hole cover removed, pull the cotter pins out of the ends of the hammer rod and pull the rod out through the access hole.



NOTE: Use a catch pan or install a small screen below the rod for the hammers and spacers to drop into as the rod is being pulled out.

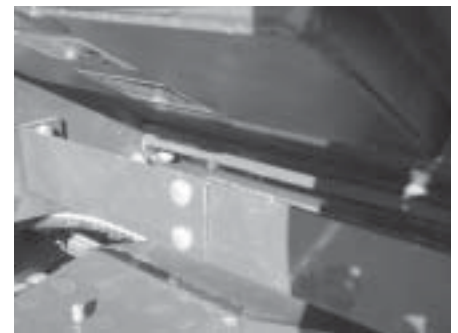
IMPORTANT: Hammers and spacers must be replaced in proper sequence with respect to the appropriate row on the cylinder. When the hammers are rotated they should always be rotated in the same direction to maintain a balanced cylinder. All 3 rows of hammers should be rotated at the same time or replaced at the same time.

After the hammer rod is replaced and all of the hammers and spacers have been replaced, secure the rods in place with a new 3/16 x 1-1/4" cotter pins. Spread the points and bend them around the rod. Replace the access hole cover.

MILL THROAT PLATE

The mill throat plate must be properly adjusted to hold the screen in place when the mill screen cover is closed and latched. Adjust the throat plate position with the 2 bolts on each side of the mill housing. To adjust the throat plate;

1. Disengage PTO, shut-off tractor and remove key.
2. Open the mill screen cover and install a screen into the screen support.
3. Loosen, but do not remove the 4 adjustment bolts and position the throat plate toward the bottoms of their mounting slots, then partially tighten the bolts.
4. Close the mill screen cover while forcing the screen against the throat plate.
5. Before latching the cover, tightly secure the 4 adjustment bolts to lock the throat plate position.



NOTE: The throat plate position should be adjusted regularly to maintain proper mill/screen operation and cover latching, and to prevent material from dropping out the bottom of the mill.

SERVICE

MIXING AUGER & TUBE

The mixing auger should be centered inside the tube at all times. Adjustment bolts are provided on the 4 supports which hold the tube for aligning and centering it around the auger. Access to the adjustment bolts and removing the mixing auger is gained through the tank lid opening in the top of the tank. The auger can be removed as follows:

1. Disengage the PTO, shut-off tractor and remove key.
2. Open the tank lid, loosen the bearing set collar and remove the bearing from the auger shaft.
3. Remove the top bearing bracket from the tank cover.
4. Remove the 2 paddles from the auger.
5. Remove the 4 supports from the tube.
6. Remove the tube and then the auger through the tank lid.



To replace the mixing auger or install a new auger, reverse the procedure of removal. After all components are replaced, the tube must be correctly centered around the auger and tightly secured.

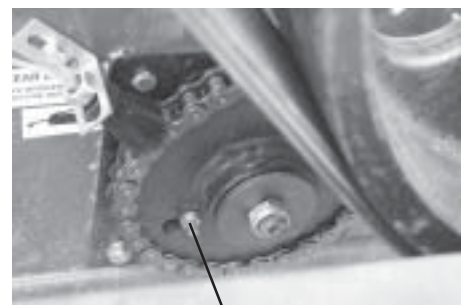
SHEAR BOLTS

Main Shear Bolt

The main shear bolt located on the driven sprocket on the front end of the transmission drive shaft, protects the drive shaft, transmission and mixing auger. If the shear bolt fails, the transfer auger and mixing auger will also stop rotating. In case of an overload, the head of the bolt will shear off and stop shaft rotation. To replace the main shear bolt, proceed as follows:

IMPORTANT: Use only a 5/16 x 1" grade 5 shear bolt.

1. Disengage the PTO, shut-off tractor and remove key.
2. With the shifter pin engaged, rotate the mill/blower sheave by hand to align the keyhole in the sprocket with the slot in the shear flange. After proper alignment is obtained, disengage the shifter pin.
3. Turn the lock nut on the shear bolt flush and insert the bolt head through the keyhole and into the slot. Move the bolt down into the narrower portion of the keyhole.
4. Tighten the lock nut to fix the bolt position.
5. Grease the fitting on the sprocket to prevent the mechanism from seizing.



Main Shear Bolt

IMPORTANT: Remove the cause of the shear bolt failure before resuming operation. Grease the fitting on the sprocket any time a bolt is sheared.

SERVICE

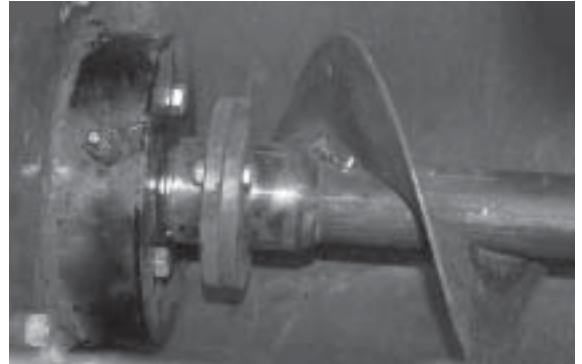
Transfer Auger Shear Device

The transfer auger shear bolts are accessible only through the mill cover. This shear bolt protects the transfer auger flighting. If the shear bolts fail, the transfer auger will stop rotating even though the mixing auger and transmission drive shaft will continue to rotate.

NOTE: *Two 1/4" x 1-1/4" Grade 5 shear bolts are used on the shear hub.*

To replace the shear bolts, proceed as follows:

1. Disengage the PTO, shut-off tractor and remove key.
2. For access to the shear bolt, open mill cover door and remove the material in the bottom of the transfer auger.
3. Remove any shear bolt parts remaining in the shear hub.
4. Line up the shear bolt holes by manually rotating the flywheel.
5. Replace both shear bolts using the *1/4" x 1-1/4" Grade 5* shear bolts stored on the inside of the front cover.
6. After the cause of the shear bolt failure is corrected and the bolts have been replaced, place the mill/blower engaging pin in the engaged position and rotate the flywheel by hand checking the intake auger for rotation before attempting to resume grinding.
7. Close the mill cover door and resume operation.



IMPORTANT: *When restarting the grinder mixer, place the tractor throttle at idle before engaging the PTO.*

SERVICE

TRANSMISSION

The GM 170 transmission can be removed from the mixer for taking it to the dealer for internal component service.

Note: Internal component repairs and replacement should only be attempted by (or under the direction of) an authorized H&S Manufacturing Dealer.

To remove the transmission from the mixer;

1. Disengage the PTO, shut-off tractor and remove key.
2. Release the drive chain tension and uncouple the chain.
3. Remove the remote grease fitting from the input auger bearing.
4. Remove the bolts securing the gearbox shaft brace.
5. Remove the cap screws that secure the transmission to frame.
6. Repair transmission.
7. Replace the transmission in reverse order of removal.
8. Adjust drive chain tension following details in the Adjustments Chapter.



NOTE: Check the transmission oil level periodically.

UNLOADING AUGER

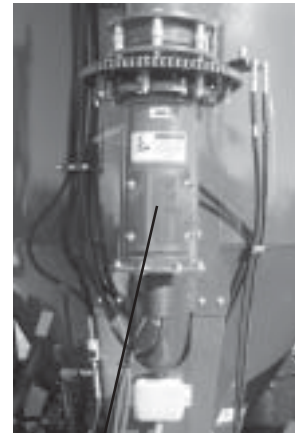
If the Unloading Auger System becomes plugged, proceed as follows:

1. Disengage the PTO, shut-off tractor and remove key.
2. Shut the unload auger door and turn off the variable speed control valve.
3. Remove the cleanout covers on the lower and vertical unloading augers and remove as much material as possible.
4. Replace the lower and vertical unloading auger cleanout covers
5. Hydraulically lower the main discharge auger to the lowest position.
6. Re-start the tractor, engage the PTO, and slowly engage the variable speed control valve to clear the remaining material from the discharge augers.

NOTE: If the plugging is due to an improperly attached extension, check and correct before attempting to resume unloading.



Lower Unloading Auger Cleanout



Vertical Unloading Auger Cleanout

TIRES & WHEELS

Check the Tire pressure after every 50 hours of operation. Tires should be inflated to 80 PSI (563kpa). Wheel lugs torque should also be checked after every 50 hours of operation and tightened to 90 ft-lb (124 Nm) torque.

OPTIONAL FEATURES & ACCESSORIES

ELECTRONIC SCALES & COMPONENTS

Model: Digi-Star EZ 2000

An optional factory installed Digi-Star EZ 2000 scale is available for accurate weight measurement. The 3-point Weighbar System features 3 modes, Net, Tare and Gross.



Model: Digi-Star EZ 3200 w/External Horn

An optional factory installed Digi-Star EZ 3200 scale is available with all the features of the EZ 2000, plus an external horn, and has the capability for entering rations.

SWINGING INTAKE AUGER (SIA)

An optional Swinging Intake Auger (SIA) with a variable speed control is available for the GM 170.



FENDER SET

A fender set is available and consists of 2 fenders, 4 fender support angles and attaching hardware. Installation instructions are packaged with the kit of parts.



TRANSPORT LIGHTING

An optional highway transport lighting kit is available.



SCREENS

12 sizes of screens are available. Sizes include:
1/8", 3/16", 1/4", 5/16", 3/8", 1/2", 5/8", 3/4", 1", 1-1/4", 1-1/2", & 2".



OPTIONAL FEATURES & ACCESSORIES

UNLOADING AUGER EXTENSIONS

3' Folding Auger Extension

The 3' folding discharge auger extension kit consists of a 3' length of auger which is attached on a pivoting mounting bracket to the end of the 12' unloading auger.

NOTE: The 3' folding auger extension must be folded back and locked in position for transport.



6' Folding Auger Extension

The 6' folding discharge auger extension kit consists of a 6' length of auger which is attached on a pivoting mounting bracket to the end of the 12' unloading auger.

NOTE: The 6' folding auger extension must be folded back and locked in position for transport.



TROUBLESHOOTING

NOTE: *This Troubleshooting Chapter presents problems, causes and suggested remedies beyond the extent of loose, worn or missing parts and it was developed with the understanding that the machine is in otherwise good operating condition.*

MILL & MIXER DRIVE

PROBLEM	CAUSE	REMEDY
PTO Shaft vibrates excessively.	Improper tractor hook-up	Adjust hook-up.
	Tractor being operated at an angle.	Align tractor straight-away with Grinder-Mixer.
	PTO shaft bent.	Replace PTO shaft.
	PTO shaft bearings worn.	Replace bearings
Mill/Blower doesn't turn.	Mill Engaging Pin not engaged or improperly engaged.	Engage Pin.
	Mill/Blower drive belt slipping.	Adjust belt tension.
Mixing Auger doesn't turn.	Transmission shear bolt sheared.	Replace bolt and correct cause of bolt failure.
	Front drive chain disconnected.	Repair or replace chain.
	Transmission rear drive chain disconnected.	Repair or replace chain.
	Sprocket key sheared.	Replace key.
	Transmission gear key sheared.	Replace key.
	Broken shaft.	Replace shaft.
Transfer Auger doesn't turn.	Transfer auger shear bolt sheared.	Replace bolt and correct cause of bolt failure.
	Front drive chain is broken or disconnected.	Repair or replace chain.

TROUBLESHOOTING

MILL

PROBLEM	CAUSE	REMEDY
Decreased or low capacity	<p>Mill not operating at the recommended RPM speed.</p> <p>Mill loses speed as material enters it.</p> <p>Screen worn.</p> <p>Blower inlet plugged.</p>	<p>Adjust tractor throttle to proper RPM speed.</p> <p>Adjust Mill/Blower sheave alignment and/or drive belt tension.</p> <p>Rotate or replace screen.</p> <p>Unplug.</p>
Excess vibration.	<p>Uneven flow of grain into the mill.</p> <p>Excess RPM.</p> <p>Mill bearings worn or defective.</p> <p>Flywheel bearings worn or improperly adjusted.</p> <p>Hammers missing or broken.</p> <p>Blower unbalanced.</p>	<p>Transfer grain into the mill as smoothly as possible.</p> <p>Operate at 540 RPM.</p> <p>Replace bearings.</p> <p>Replace and/or properly adjust bearings.</p> <p>Replace hammers.</p> <p>Remove, balance & replace.</p>
Excessive dust.	<p>Blower inlet plugged.</p> <p>Collector covered.</p>	<p>Check & unplug.</p> <p>Uncover collector while operating.</p>
Material not ground to desired size.	<p>Incorrect screen being used.</p> <p>Mill speed too high or low.</p>	<p>Change screen diameter to correct size.</p> <p>Adjust to correct RPM speed.</p>
Material will not flow through mill hopper.	<p>Mixer is sloped towards the feeding side.</p> <p>Material too damp.</p> <p>Material too light or bulky.</p>	<p>Reposition mixer on level ground.</p> <p>Adjust slope of intake hopper.</p> <p>Adjust slope of intake hopper.</p>

UNLOADING

PROBLEM	CAUSE	REMEDY
Tank won't unload or stops unloading.	Bridging in tank.	Shut-off mixer and tractor, break up bridging by probing through the access doors.
Tank unloads too slow.	Discharge slide is not open all the way.	Open slide up more.

TROUBLESHOOTING

HYDRAULICS

Note: In troubleshooting a self-contained hydraulic system, it is necessary to isolate the pump from the hydraulic motors to determine which unit is malfunctioning. A worn pump or motor will both give the same system indication. Run a pressure and flow check on the pump first to make sure that it is performing within the operating specifications, then check the motor for the correct specifications. Oil flow must be checked at the rated PTO speed. Flow should be 9.2 GPM at 1000 PSI.

PROBLEM	CAUSE	REMEDY
Discharge augers do not turn.	Variable speed flow control valve in off position. Pump defective. Hydraulic motor defective. Hydraulic pressure too low. Foreign object lodged in auger.	Turn variable speed flow control valve on. Replace pump. Replace or repair hydraulic motor. Check for restriction in hydraulic lines. Remove foreign object.
Difficult to engage or disengage variable speed control valve.	Variable speed control valve defective.	Replace variable speed control valve.
Pump will not turn.	Belt out of grooves. Belt does not have proper tension. Pump defective. Return line blocked or restricted.	Realign sheaves and adjust belt tension. Replace idler tension spring or properly position idler. Check oil flow and replace pump if necessary. Remove blockage and replace oil and filter if dirty.
Pump squeals during start up.	Oil too heavy/cold. Oil level in reservoir too low.	Allow oil to warm up or switch to a recommended lighter oil. Add oil to bring between min/max indicator levels.
Augers operating slow.	Improper oil flow. Plugged oil filter. Hydraulic pump defective. Variable speed control valve not open all the way. Hydraulic motor defective. Oil too thin. Not enough oil flow to hydraulic pump.	Check pump output pressure as applicable. Replace filter. Replace hydraulic pump. Open variable speed control valve more. Repair or replace hydraulic motor. Replace with heavier oil. Change oil filter, replace oil with new oil and fill to proper level.

TROUBLESHOOTING

HYDRAULICS

PROBLEM	CAUSE	REMEDY
Tank unloads slow.	<p>Insufficient oil flow to motors.</p> <p>Plugged oil filter.</p> <p>Hydraulic pump defective.</p> <p>Variable speed control valve not open all the way.</p> <p>Hydraulic motor defective.</p> <p>Oil too thin.</p> <p>Not enough oil flow to hydraulic pump.</p> <p>Loose connection to the motor.</p>	<p>Increase tractor RPM speed.</p> <p>Replace filter.</p> <p>Replace hydraulic pump.</p> <p>Open variable speed control valve more.</p> <p>Repair or replace hydraulic motor.</p> <p>Replace with heavier oil.</p> <p>Change oil filter, replace oil with new oil and fill to proper level.</p> <p>Check and tighten connection.</p>
None of the motors operate.	<p>Pump not being driven.</p> <p>Hydraulic pump defective.</p> <p>Discharge auger variable speed control valve relief pressure set too low.</p>	<p>Check sheaves and belt for malfunction.</p> <p>Replace hydraulic pump.</p> <p>Check pressure to valve, if pressure is low adjust to factory setting or replace if it will not adjust.</p>
Discharge auger variable speed control valve will not engage or disengage.	<p>Variable speed control valve defective.</p>	<p>Replace variable speed control valve.</p>
Swinging Intake Auger (SIA) attachment will not operate.	<p>SIA variable speed control in the off position.</p> <p>SIA variable speed control valve relief pressure set too low.</p>	<p>Check mechanical linkage controls and open valve.</p> <p>Check pressure to valve, if pressure is low adjust to factory setting or replace if will not adjust.</p>
Auger in SIA turns in the wrong direction.	<p>Motor connections crossed.</p>	<p>Switch hose connections to change direction of motor rotation.</p>

TROUBLESHOOTING

HYDRAULICS

PROBLEM	CAUSE	REMEDY
SIA turns too slow.	Excessive or wet grain. Not enough oil flow to hydraulic pump. Hydraulic pump defective. Hydraulic motor defective. SIA relief valve pressure set too low. SIA auger partially plugged. SIA pressure relief valve doesn't function properly.	The higher the moisture content and weight of the material that is being conveyed, the more power it takes. Adjust the variable speed control valve to allow more oil to the hydraulic motor. Change oil filter, replace oil with new oil and fill to proper level. Replace hydraulic pump. Repair or replace hydraulic motor. Check pressure to valve, if pressure is low adjust to factory setting or replace if will not adjust. Remove plugging material. Check pressure to valve, if it will not adjust to the factory setting, replace the valve.

DECAL PLACEMENT

Your H&S 170 Grinder-Mixer was manufactured with operator safety in mind. Located on GM 170 are various decals to aid in operation, and to warn of danger or caution areas. Pay close attention to all the decals on your Grinder-Mixer.

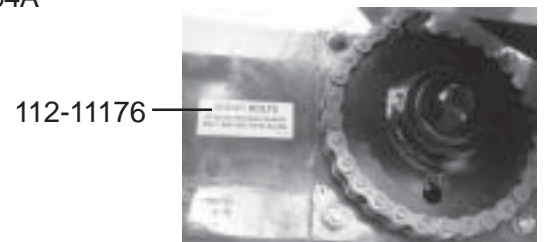
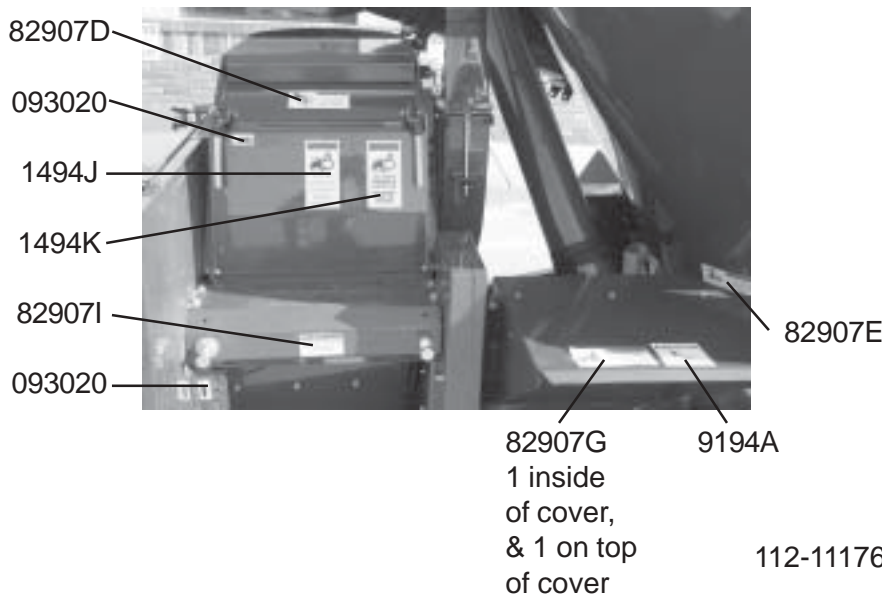
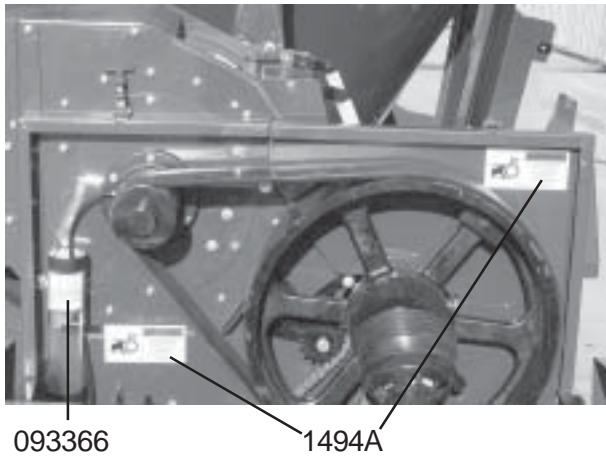
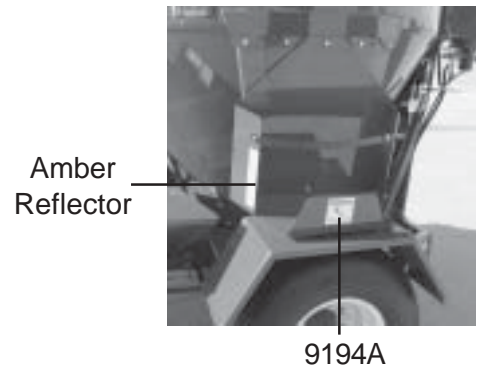
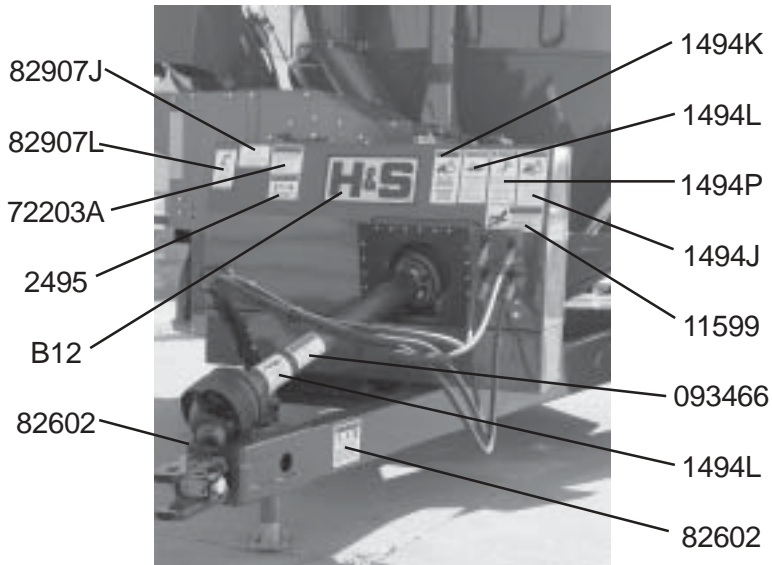


DO NOT REMOVE ANY OF THESE DECALS. IF DECALS ARE LOST, DAMAGED, OR IF YOUR GRINDER-MIXER IS REPAINTED, REPLACE DECALS. REMEMBER: DECALS ARE FOR YOUR PROTECTION AND SAFETY.

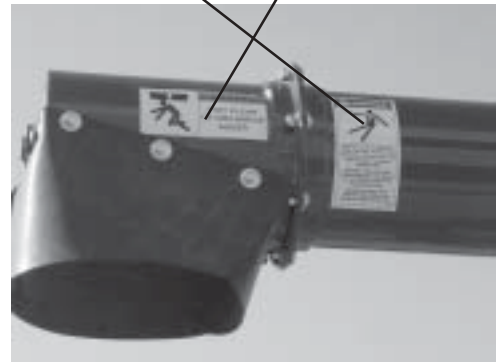
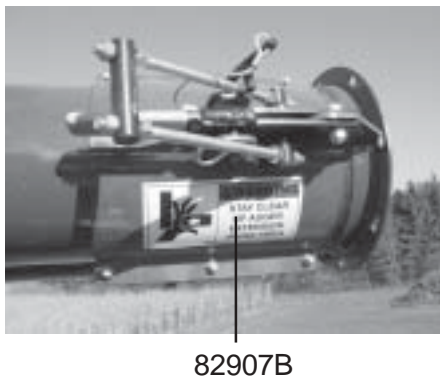
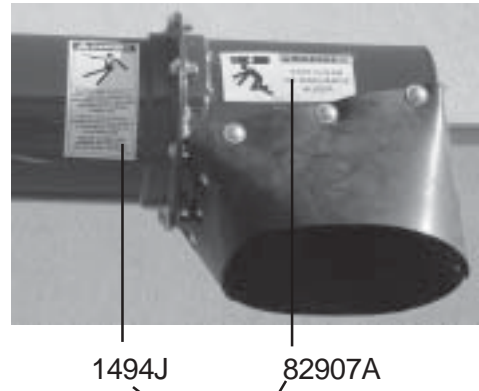
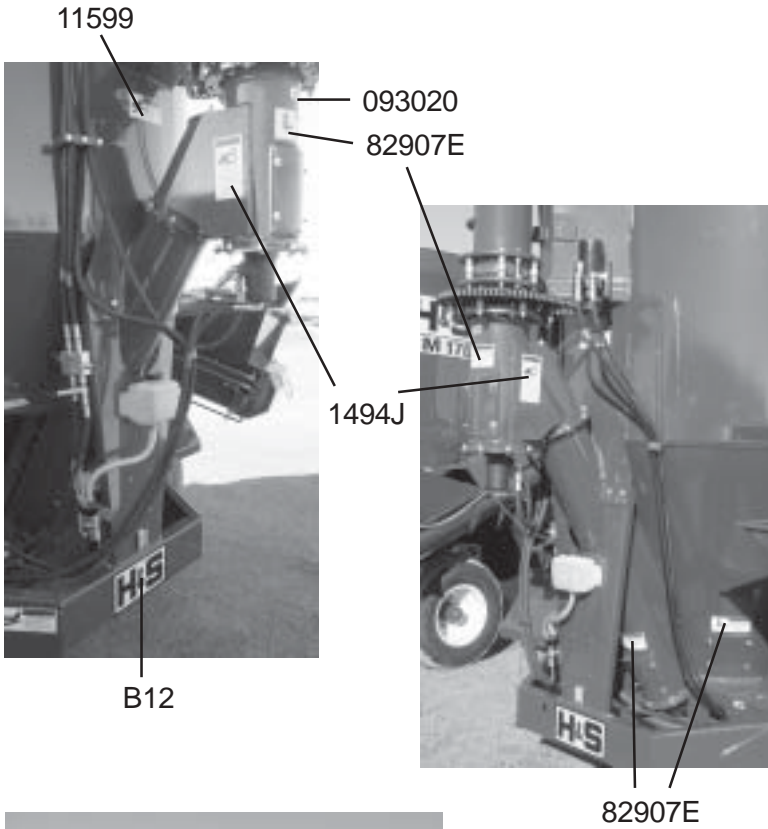
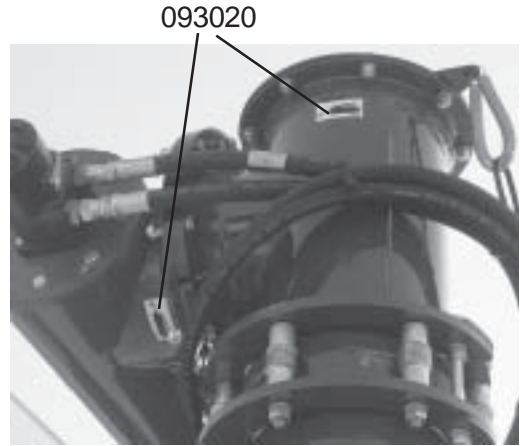
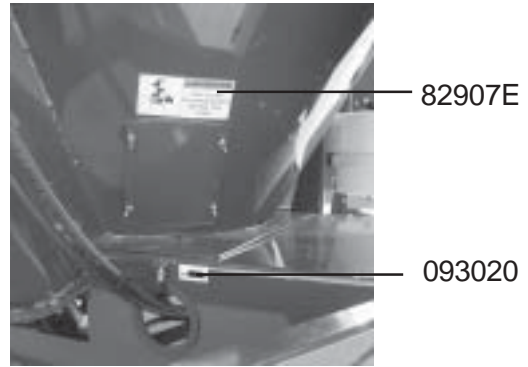
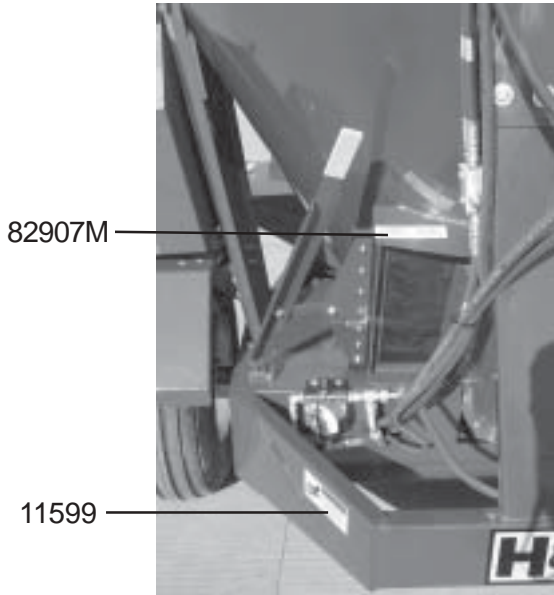
Listed below are the decals on your 170 Grinder-Mixer. These decals may be ordered individually by part number, or by ordering as a complete set.

<u>Part Number</u>	<u>Description</u>
112-11176	Shear Bolts - Remove broken shear bolt before replacing
120-2177	Pull to Stop
1494A	Do not operate this equipment if this decal is exposed. Replace safety shields
1494J	Do not clean or work on this machine without first disengaging power
1494K	Do not remove shields - moving parts inside
1494L	Rotating driveline
093466	Operate only with 540 RPM PTO
1494P	Maintain safe clearance from electrical power lines
2595	Keep children away at all times
9194A	No step - stay clear
11599	Do not go near leaks
32597A	Do not operate this equipment if this decal is exposed. Replace safety shields
72203A	Help avoid injury - Read and understand the operators manual
82407	H&S GM 170
82602	Crushing Hazard
82907A	Stay clear of discharge auger
82907B	Stay clear of auger extension hinge area
82907C	Stay clear - Keep hands and feet away from auger at all times
82907D	Stay clear - Rotating parts inside
82907E	Stay clear - Rotating auger behind this panel
82907F	Keep out - Do not enter tank - Keep cover closed
82907G	Stay clear - Keep hands out of supplement hopper
82907H	Stay clear - Keep hands and feet away from auger at all times
82907I	Do not step up on machine while in operation
82907J	Operator's manual is located behind this shield
093366	Keep Operator's Manual Here
82907K	Cyclone cover - Open/Close
82907L	Never allow riders on this machine
82907M	Discharge auger door - Open/Close
093020	Grease zerk decal
B12	H&S decal
GM-A	95 -135 bushel decal
GM-B	55 - 85 bushel decal
5696D	Disengage
5696E	Engage
ZX21	Red paint - Gallon
ZX22	Red paint - Quart
ZX23	Red paint - Pint
ZX79	Red paint - Spray Can
	Red Reflector
	Amber Reflector

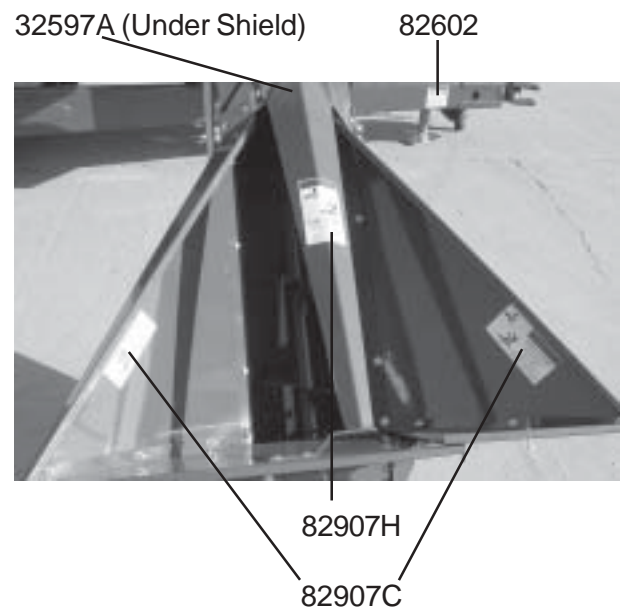
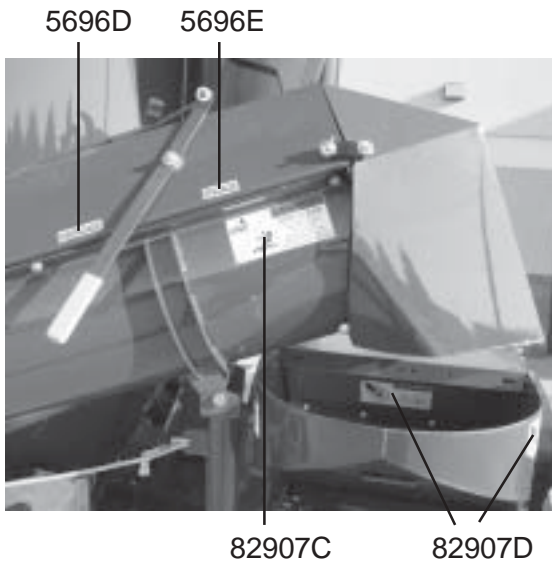
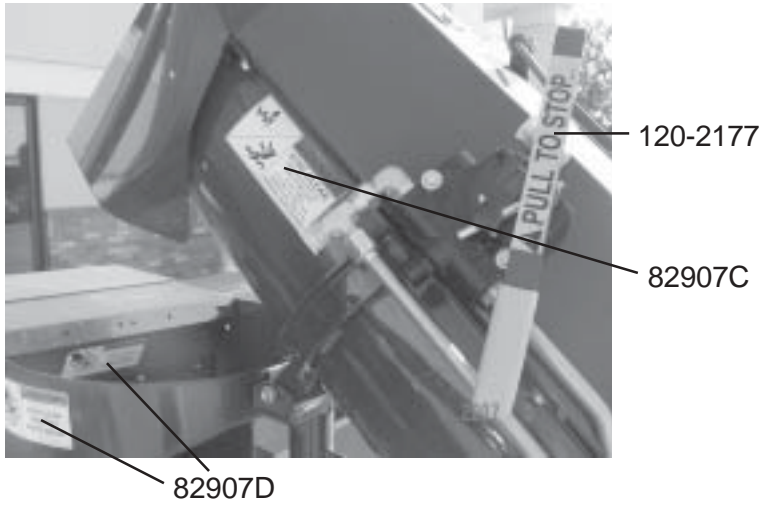
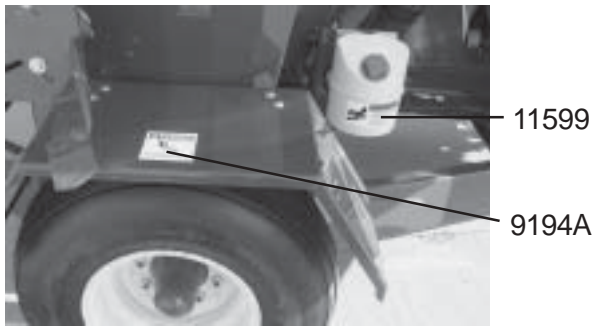
DECAL PLACEMENT



DECAL PLACEMENT



DECAL PLACEMENT



INSTRUCTIONS FOR ORDERING PARTS

All service parts should be ordered through your authorized H & S dealer. They will be able to give you faster service if you will provide them with the following

1. Model & Serial number is located on the main frame.
2. All reference to left or right apply to the machine as viewed from the rear.
3. Parts should not be ordered from illustration only. Please order by complete part number.
4. If your dealer has to order parts - give shipping instructions:

VIA truck - large pieces (please specify local truck lines)

VIA United Parcel Service (include full address)

H&S MFG. CO. INC.	
MARSHFIELD, WIS.	
MOD. NO.	<input type="text"/>
SER. NO.	<input type="text"/>
DESCR.	<input type="text"/>

PLEASE RECORD NUMBERS FOR YOUR UNIT FOR QUICK REFERENCE

ABOUT IMPROVEMENTS

H&S IS CONTINUALLY STRIVING TO IMPROVE IT'S PRODUCTS

We must therefore, reserve the right to make improvements or changes whenever it becomes practical to do so without incurring any obligation to make changes or additions to the equipment previously sold.

SERVICE & PARTS NOTES

Lined area for service and parts notes.

FIGURE 1

FRAME

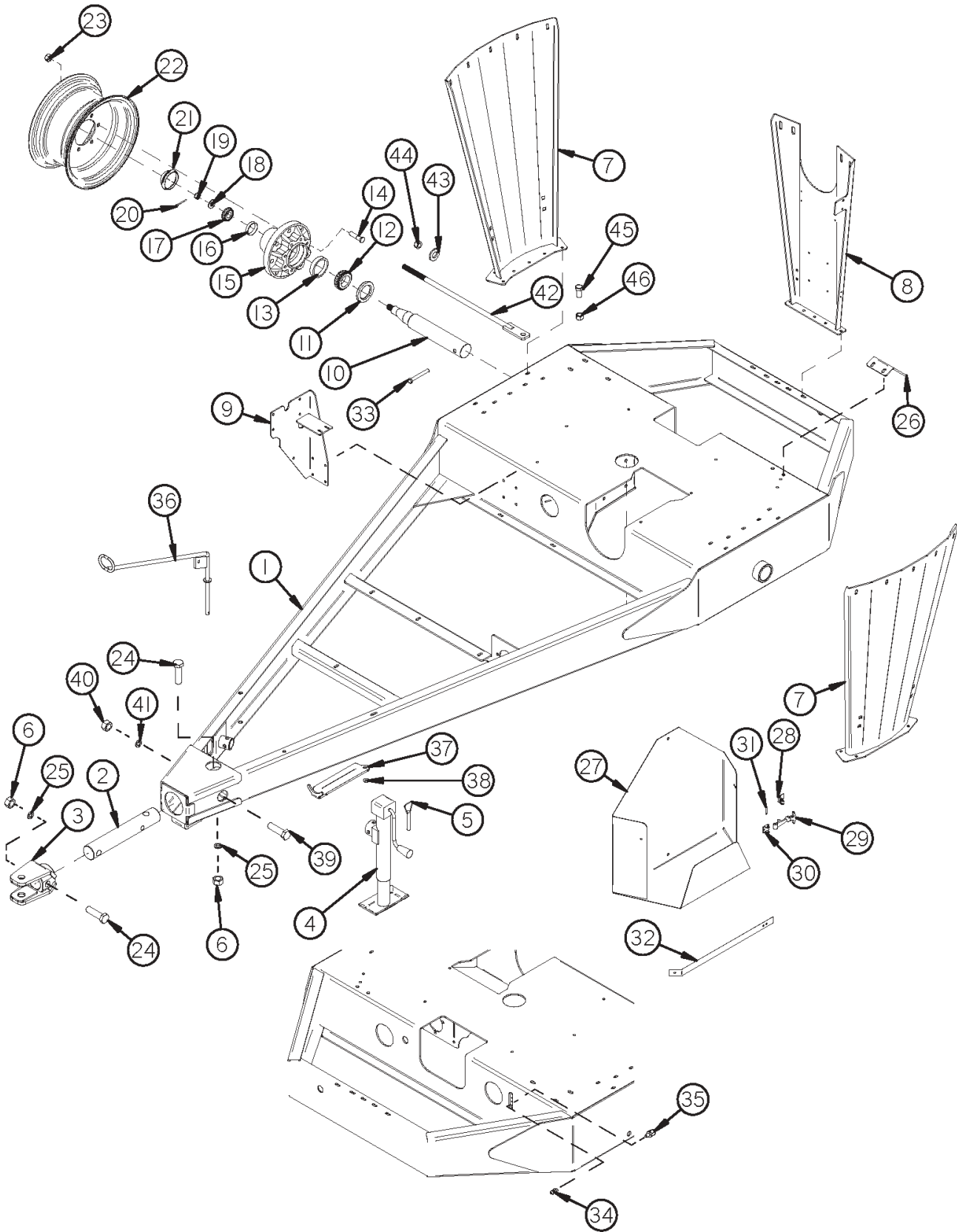


FIGURE 1

FRAME

<u>ITEM #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM72	FRAME
2	GM73	HITCH SHAFT
3	GM74	HITCH
4	GM396	JACK
5	12N13	JACK PIN & CHAIN
6	YNHX32010	HEX NUT, 1"-8 PLATED
7	GM76	TANK SIDE SUPPORT
8	GM77	TANK BACK SUPPORT
*	F97	SMV BRACKET
9	GM78	OIL TANK BRACKET
10	GM79	SPINDLE
11	B90	SEAL
12	B91	INNER BEARING
13	B91A	INNER RACE
14	26G5A	STUD 5/8"-18
15	26G4A	HUB (821)
16	B94A	OUTER RACE
17	B94	OUTER BEARING
18	B4	WASHER
19	YNSL28005	HEX NUT, SLOTTED, 7/8"-14
20	YPCT05020	COTTER PIN, 5/32" X 1-3/4"
21	B2	HUB CAP
22	RG73	WHEEL (W-51350)
*	GM394	TIRE (12.5L x 15 20 Ply)
23	26G6A	LUG NUT 5/8"-18
24	YBHH32020	BOLT, 1"-8 X 5" GR. 5
25	YWLO32005	WASHER, LOCK, 1"
26	GM397	FLOW CONTROL BRACKET
27	GM398	SCREEN HOLDER
28	X193	LATCH KEEPER
29	X192	RUBBER LATCH
30	X194	LATCH MOUNTING BRACKET
31	X195	LATCH PIN
32	GM399	SCREEN HOLDER STRAP
33	YBHH16130	BOLT, 1/2" X 4" GR. 5
34	G89	GREASE ZERK (#1641)
35	GM424	1/4"-28 GREASE LINE ADAPTER
36	GM440	GRINDER HOSE HOLDER
37	42N2	PTO HOLDER
38	42N3	SPRING (MB1000-035)
39	YBHH24075	BOLT, 3/4" X 4-1/2" GR. 5
40	YNHX24005	HEX NUT, 3/4"-10 PLATED
41	YWLO24005	WASHER, LOCK, 3/4"
42	GM518	ROD
43	33SV95	WASHER
44	YNNY24005	HEX NUT, NYLON LOCKNUT, 3/4"
45	YBHH24001	3/4"-10 x 1" GR. 5 BOLT
46	YNLC24005	3/4"-10 LOCK NUT

* Means Not Shown

FIGURE 2

TANK

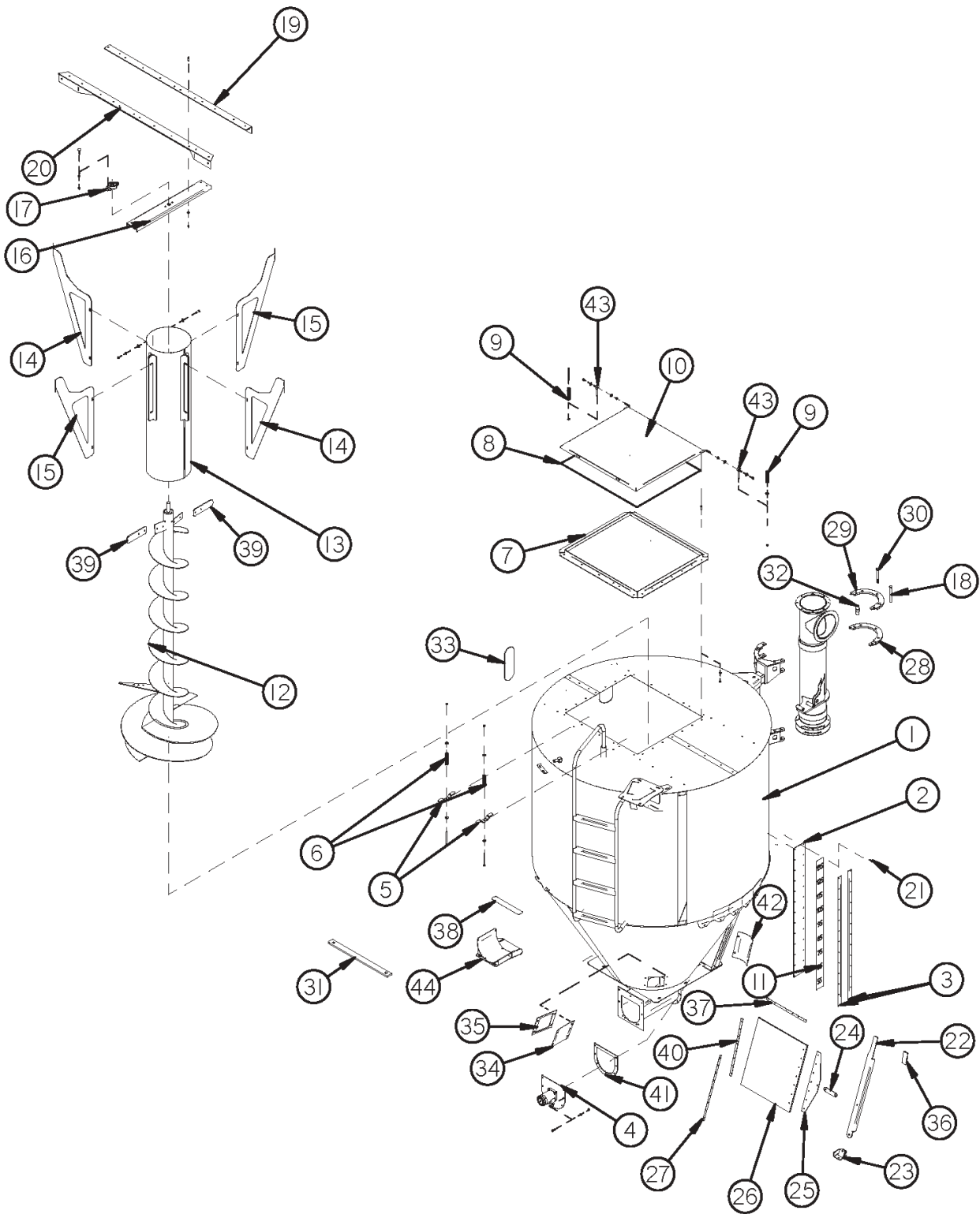


FIGURE 2

TANK

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM301	TANK
2	GM302	WINDOW
3	GM303	WINDOW FRAME
4	GM304	MOTOR MOUNT
5	GM305	LID LATCH
6	GM225	LATCH SPRING (A262)
7	GM560	LARGE LID FRAME
8	GM571	LID GASKET LARGE
9	GM309	SPRING (A162)
10	GM559	LARGE TANK LID
11	GM-A & GM-B	DECAL (BUSHEL SCALE - UPPER AND LOWER)
12	GM311	MIXING AUGER
13	GM312	MIXING AUGER TUBE
14	GM565	MIXING TUBE SUPPORT B (WIDE)
15	GM564	MIXING TUBE SUPPORT A (WIDE)
16	GM563	MIXING AUGER TOP SUPPORT (WIDE)
17	T40	BEARING
18	YBHH16156	BOLT, 1/2" x 5" GR. 5 FULL THREAD
19	GM562	TANK TOP SUPPORT SHORT
20	GM561	TANK TOP WELDED BRACE
21	GM234	POP RIVET 3/16" X .700" (0155997)
22	GM334	DOOR HANDLE
23	GM335	DOOR STOP
24	GM336	DOOR LINKAGE
25	GM337	DOOR EDGE
26	GM338	DOOR
27	GM339	DOOR SEAL STRAP
*	GM348	RUBBER DOOR SEAL FRONT (LEFT)
*	GM349	RUBBER DOOR SEAL BACK (RIGHT)
28	GM340	SPLIT RING BOTTOM
29	GM341	SPLIT RING TOP
30	GM342	STEP BOLT
31	GM442	POLY STRIP
32	GM345	ROLLER
33	GM346	TOP SIGHT WINDOW
*	GM347	WINDOW GASKET
34	GM356	CLEANOUT DOOR
35	GM357	CLEANOUT GASKET
36	S403	HANDLE GRIP
37	GM391	INSIDE DOOR SEAL STRAP
*	GM392	INSIDE DOOR SEAL
38	GM435	SAFETY TREAD
39	GM437	PADDLE MIXER
40	GM438	DOOR SEAL STRAP
*	GM439	RUBBER DOOR SEAL
41	GM320	AUGER BOTTOM CAP SPACER
42	GM488**	AUGER CLEANOUT COVER
*	GM357**	FELT GASKET
43	YBTE10025	TURNUED EYE BOLT, 5/16" X 2-3/4"
44	GM527	AUGER ADJUSTABLE CRADLE

* Means Not Shown

** Means Used on Serial #800111 and Higher

FIGURE 3

CONCENTRATE HOPPER & COLLECTOR

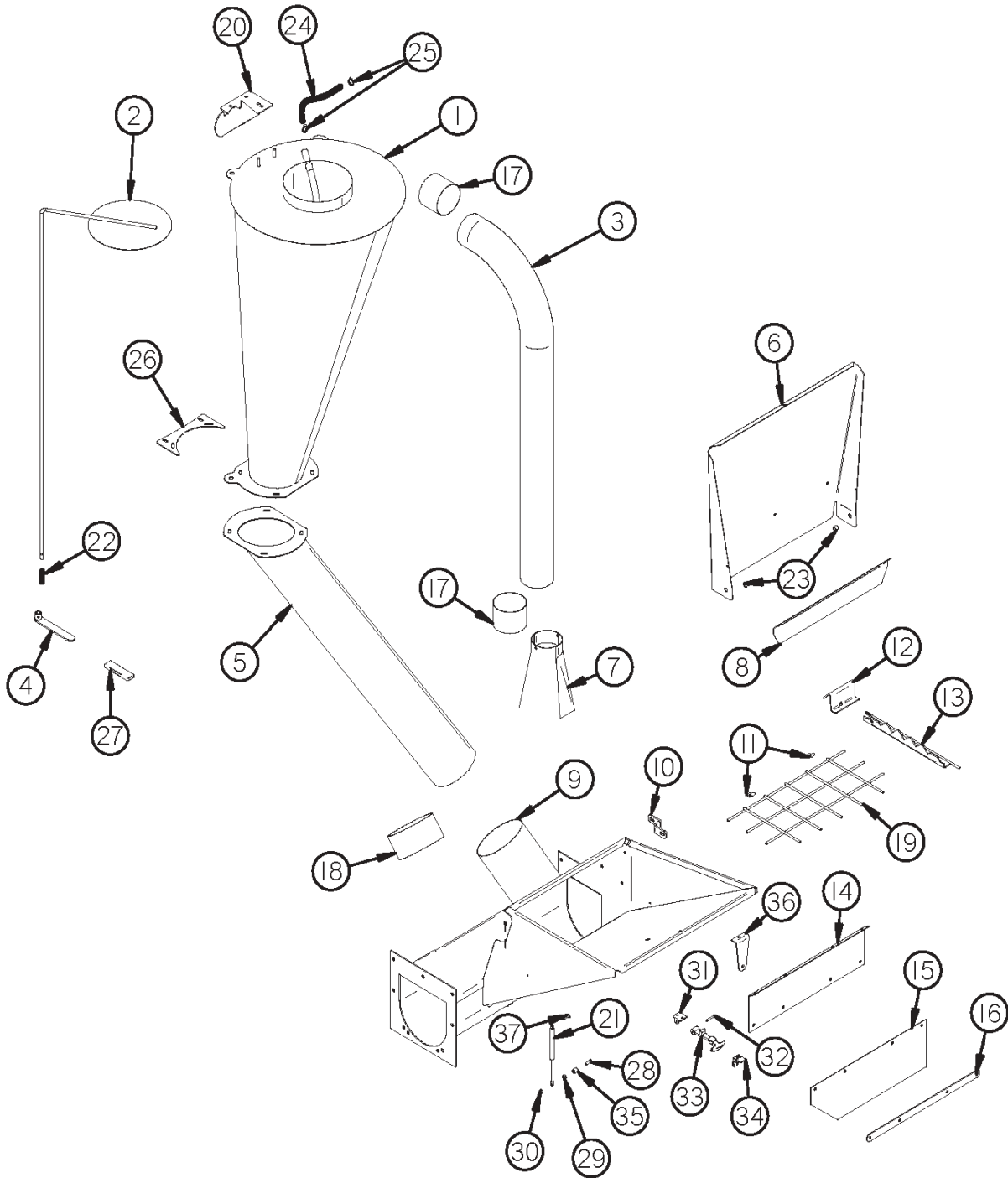


FIGURE 3

CONCENTRATE HOPPER & COLLECTOR

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM81	DUST COLLECTOR
2	GM82	DUST COLLECTOR TOP
3	GM83	BLOWER PIPE
4	GM84	COVER HANDLE
5	GM85	DUST COLLECTOR PIPE
6	GM86	COVER HOPPPER
*	GM420	COVER SEAL
7	GM87	BLOWER TRANSITION CHUTE
8	GM88	STOP COVER
9	GM89	SUPPLEMENT HOPPPER
10	GM90	RETAINER GUARD
11	GM91	HOSE CLAMP
12	GM92	SUPPORT BREAKER
13	GM93	BREAKER BAR
14	GM94	DUST SHIELD
15	GM95	DUST FLAP
16	GM96	DUST FLAP RETAINER
17	GM100	BLOWER PIPE SEAL
18	GM101	DUST COLLECTOR SEAL
19	GM360	HOPPER GRATE
20	GM368	ADJUSTABLE MOUNT PLATE
21	SD190	GAS STRUT
22	17G128	SPRING
23	GM443	SUPPLEMENT HOPPER DOOR PIVOT
24	GM452	3/4" X 14" HOSE
25	GM453	1" HOSE CLAMP
26	GM460	ADJUSTABLE SUPPORT BOTTOM
27	GM370	HANDLE GRIP
28	YBHH62010	Bolt 8-32 x 1-1/4"
29	YNHX62005	Nut 8-32
30	YNNY62005	Nylock Nut 8-32
31	X194	LATCH MOUNTING BRACKET
32	X195	LATCH PIN
33	X192	RUBBER LATCH
34	X193	LATCH CATCH BRACKET
35	GM525	SPACER (RIGHT SIDE BOTTOM ONLY)
36	GM526	LATCH BRACKET
37	YBHH62005	Bolt 8-32 x 3/4"

* Means Not Shown

FIGURE 4

DRIVE LINE

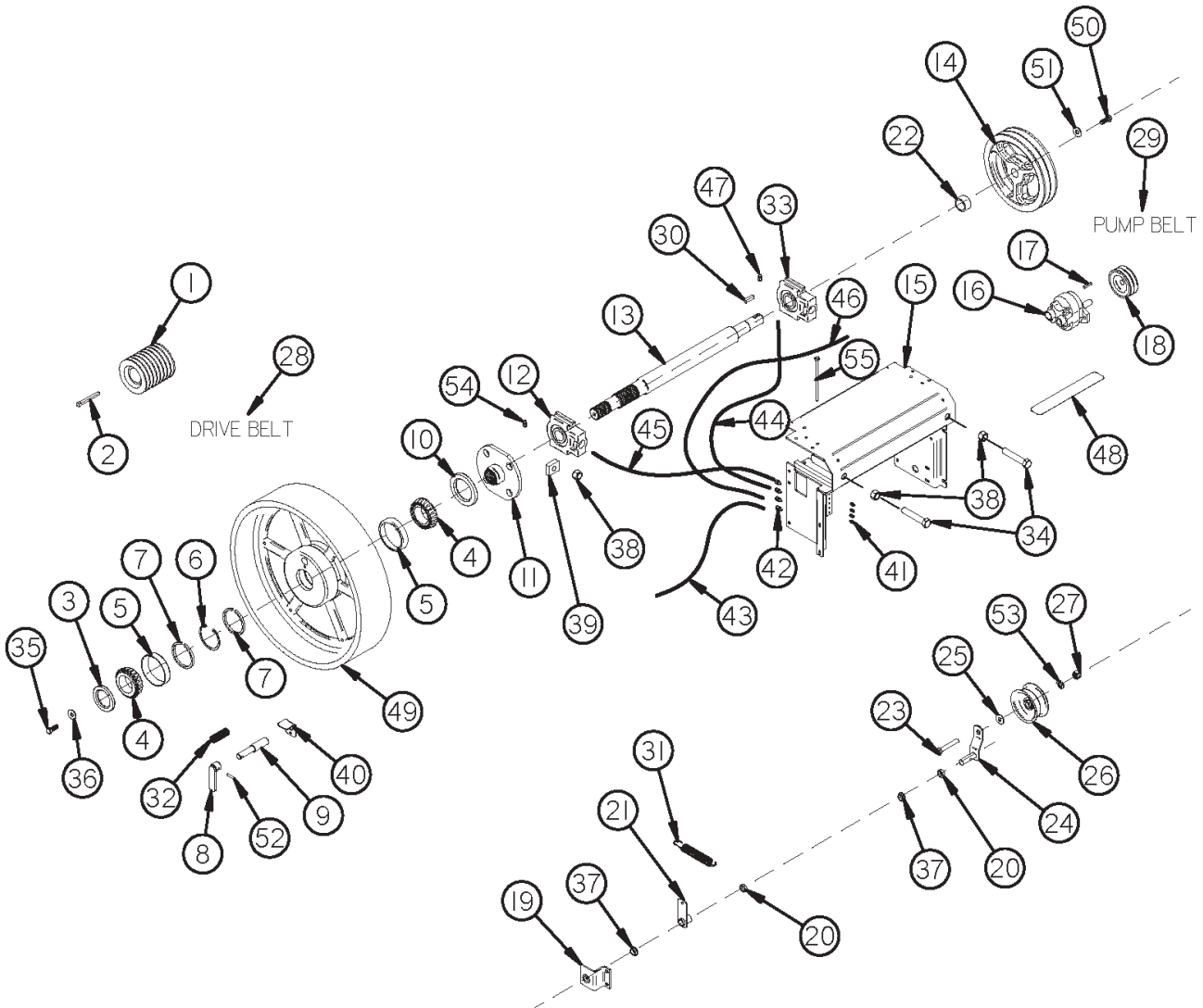


FIGURE 4

DRIVE LINE

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM102	MILL SHEAVE 540 RPM
*	GM103	MILL SHEAVE 1000 RPM
2	GM104	KEY 3/8" TAPER
3	GM105	SEAL (22338)
4	GM106	OUTER BEARING (LM501349)
5	GM107	RACE (LM501310)
6	GM108	SNAP RING
7	GM109	SPACER (2)
8	GM110	CLUTCH HANDLE
9	GM111	CLUTCH PIN
10	GM112	SEAL (22430)
11	GM113	FLYWHEEL CLUTCH
12	GM114	BEARING (UCT-210-31 11/16)
13	GM115	MAIN DRIVE SHAFT
14	GM508	PUMP DRIVE SHEAVE (540 RPM) 2AK124
*	GM117	PUMP DRIVE SHEAVE (1000 RPM) 2AK74
15	GM532	DRIVE SHAFT CARRIER
16	GM14	PUMP
17	GM275	KEY 3/16" X 1" (SQUARE KEY ROUND ENDS)
18	GM120	PUMP SHEAVE
19	GM121	IDLER SHAFT SUPPORT
20	GM122	SPACER
21	GM123	ARM
22	GM444	SHEAVE SPACER (540 & 1000 RPM)
23	YBHH20025	BOLT, 5/8" X 2" GR. 5
24	GM125	IDLER ARM
25	YWFL20005	WASHER, FLAT, 5/8" USS
26	GM127	IDLER PULLEY
27	YNHX20005	HEX NUT, 5/8"-11 PLATED
28	GM129	V BELT (8/A91) (540 RPM) 93"
*	GM130	V BELT (8/A96) (1000 RPM) 98"

* Means Not Shown

FIGURE 4

DRIVE LINE

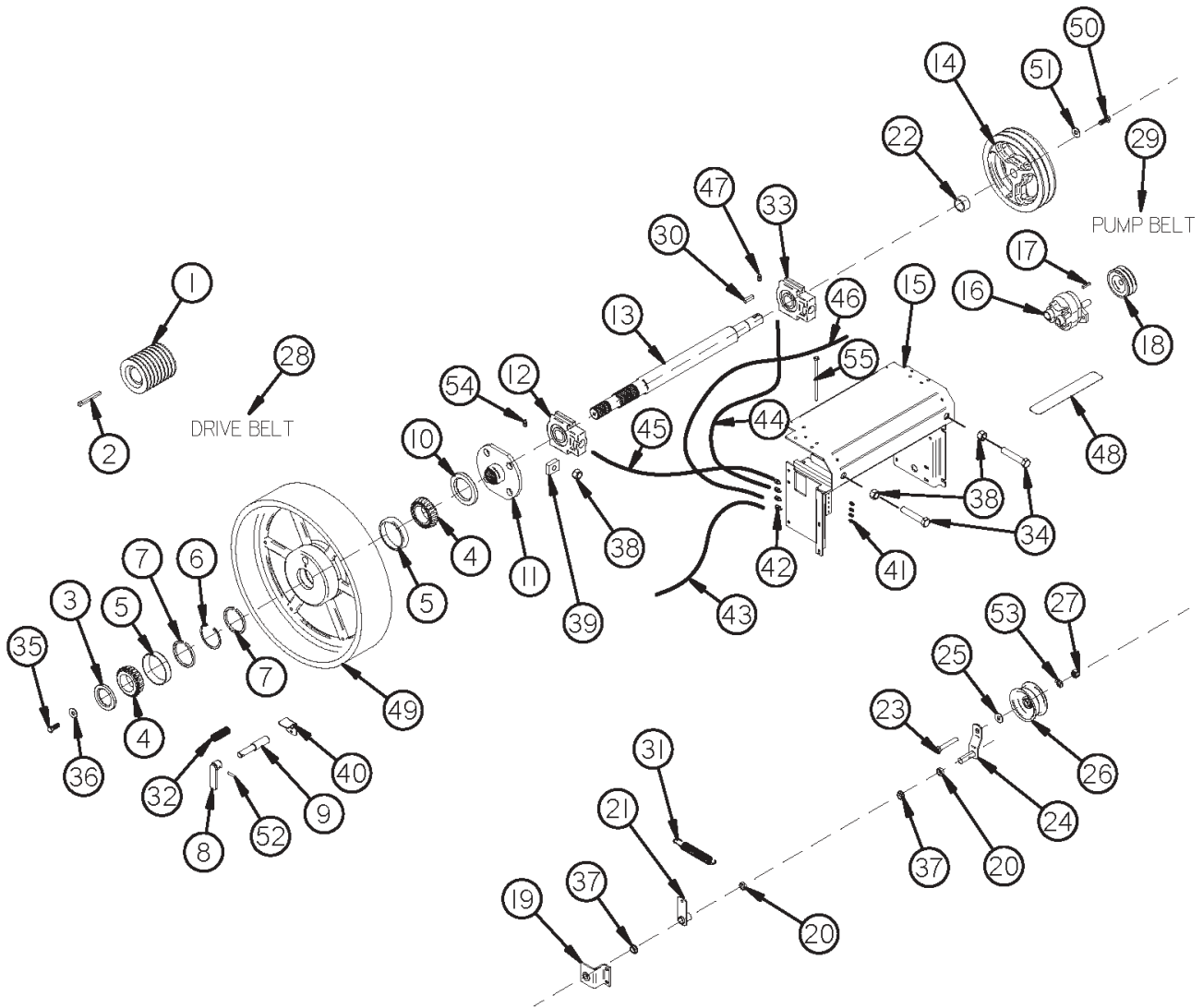


FIGURE 4

DRIVE LINE

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
29	GM131	V BELT (2/A62) (540 RPM) 64"
*	GM132	V BELT (2/A52) (1000 RPM) 54"
30	G12	KEY 5/16" X 1" (540 & 1000 RPM)
31	GM410	SPRING (B11108) 540 RPM
*	GM454	SPRING (U10063) 1000 RPM
32	GM411	SPRING (13E29)
33	GM413	BEARING (UCT208-24-11/16)
34	YBHH24101	BOLT, HEX HEAD, 3/4" X 7" GR. 5 FULL THREAD
35	GM414	1/2"-20 x 1-1/4" GR. 5 Bolt W/HOLE
36	GM415	INPUT YOKE WASHER
37	GM416	IDLER PIVOT BUSHING
38	YNHX24005	HEX NUT, 3/4"-10 PLATED
39	GM445	SLIDER BEARING NUT
40	GM423	FLYWHEEL CLUTCH BRACKET
41	G89	GREASE ZERK (#1641)
42	GM424	1/4"-28 GREASE LINE ADAPTER
43	GM425	GREASE LINE 70"
44	GM426	GREASE LINE 25"
45	GM427	GREASE LINE 20"
46	GM428	GREASE LINE 85"
47	GM429	1/4"-28 90° ADAPTER
48	GM435	SAFETY TREAD
49	GM41	FLYWHEEL
50	YBHH16045	BOLT, 1/2" X 1-1/4" GR. 5
51	GM124	540 SHEAVE WASHER
52	YPEX08010	EXPANSION PIN, 1/4" X 1-1/4"
53	YWLO20005	WASHER, LOCK, 5/8"
54	GM419	1/8" GREASE LINE ADAPTER
55	YBHH12240	BOLT, 3/8" X 6-1/2" GR. 5

NOTE: * MEANS NOT SHOWN

FIGURE 5

MILL

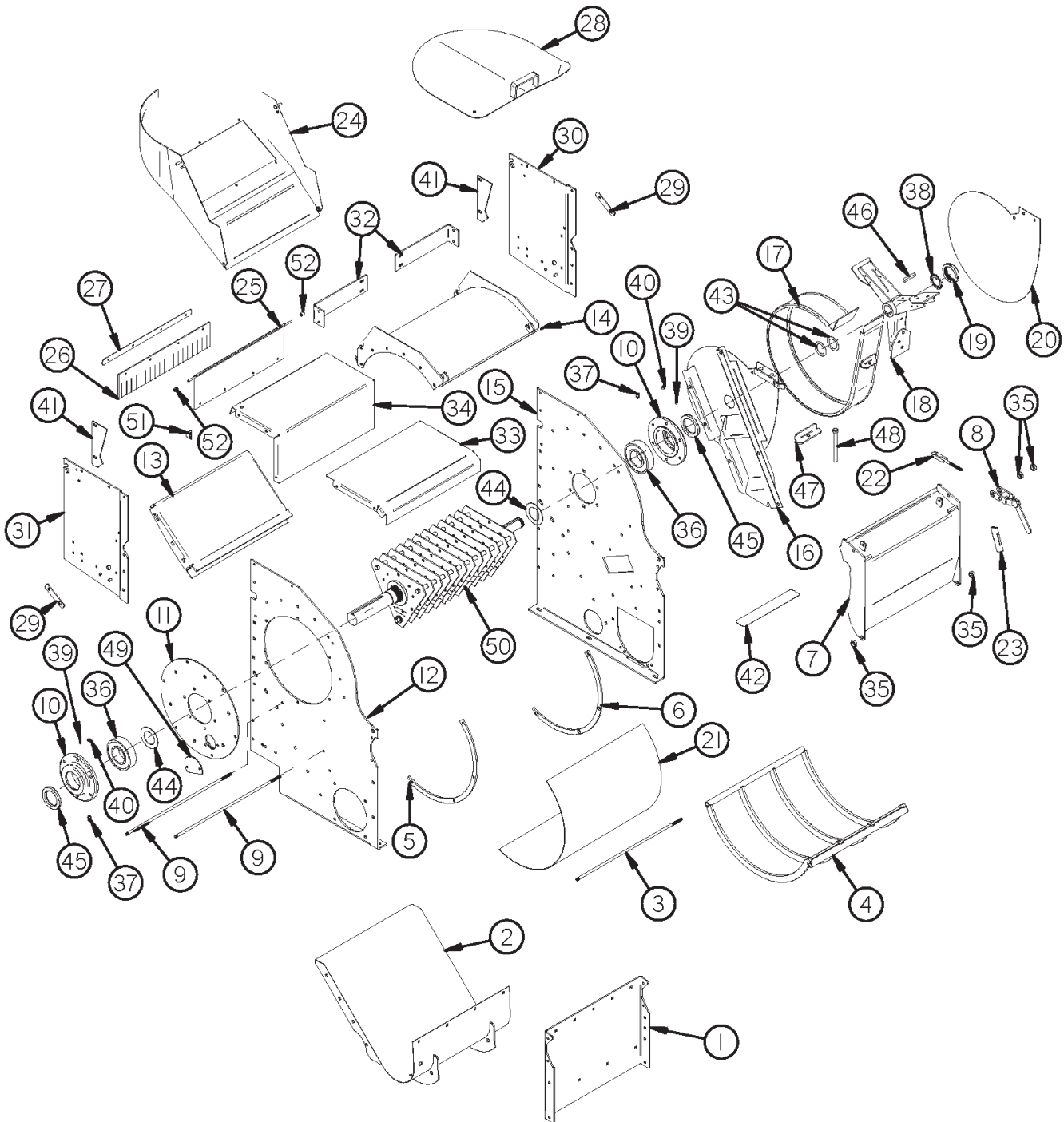


FIGURE 5

MILL

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM133	GRINDER SIDE PANEL
2	GM533	MILL BOTTOM PANEL
3	GM135	MILL LONG BOLT 1/2" X 22.500"
4	GM136	SCREEN SUPPORT
5	GM137	SCREEN GUIDE FRONT
6	GM138	SCREEN GUIDE BACK
7	GM139	GRINDER DOOR
8	GM140	DOOR LATCH
9	GM141	ROD 3/8" X 22.375"
10	GM142	BEARING HOUSING
11	GM143	CYLINDER COVER
12	GM534	MILL FRONT PANEL
13	GM145	THROAT PLATE
14	GM146	GRINDER TOP
15	GM535	MILL BACK PANEL
16	GM148	FRONT BLOWER PANEL
17	GM149	BLOWER BAND
18	GM150	BLOWER FAN
19	GM151	NUT (N-08)
20	GM152	BLOWER BACK PANEL
21	GM154	HAMMER MILL SCREEN 1/8"
*	GM155	HAMMER MILL SCREEN 3/16"
*	GM156	HAMMER MILL SCREEN 1/4"
*	GM157	HAMMER MILL SCREEN 5/16"
*	GM158	HAMMER MILL SCREEN 3/8"
*	GM159	HAMMER MILL SCREEN 1/2"
*	GM160	HAMMER MILL SCREEN 5/8"
*	GM161	HAMMER MILL SCREEN 3/4"
*	GM162	HAMMER MILL SCREEN 1"
*	GM163	HAMMER MILL SCREEN 1-1/4"
*	GM164	HAMMER MILL SCREEN 1-1/2"
*	GM165	HAMMER MILL SCREEN 2"
22	GM166	DOOR HOOK

NOTE: * MEANS NOT SHOWN

FIGURE 5

MILL

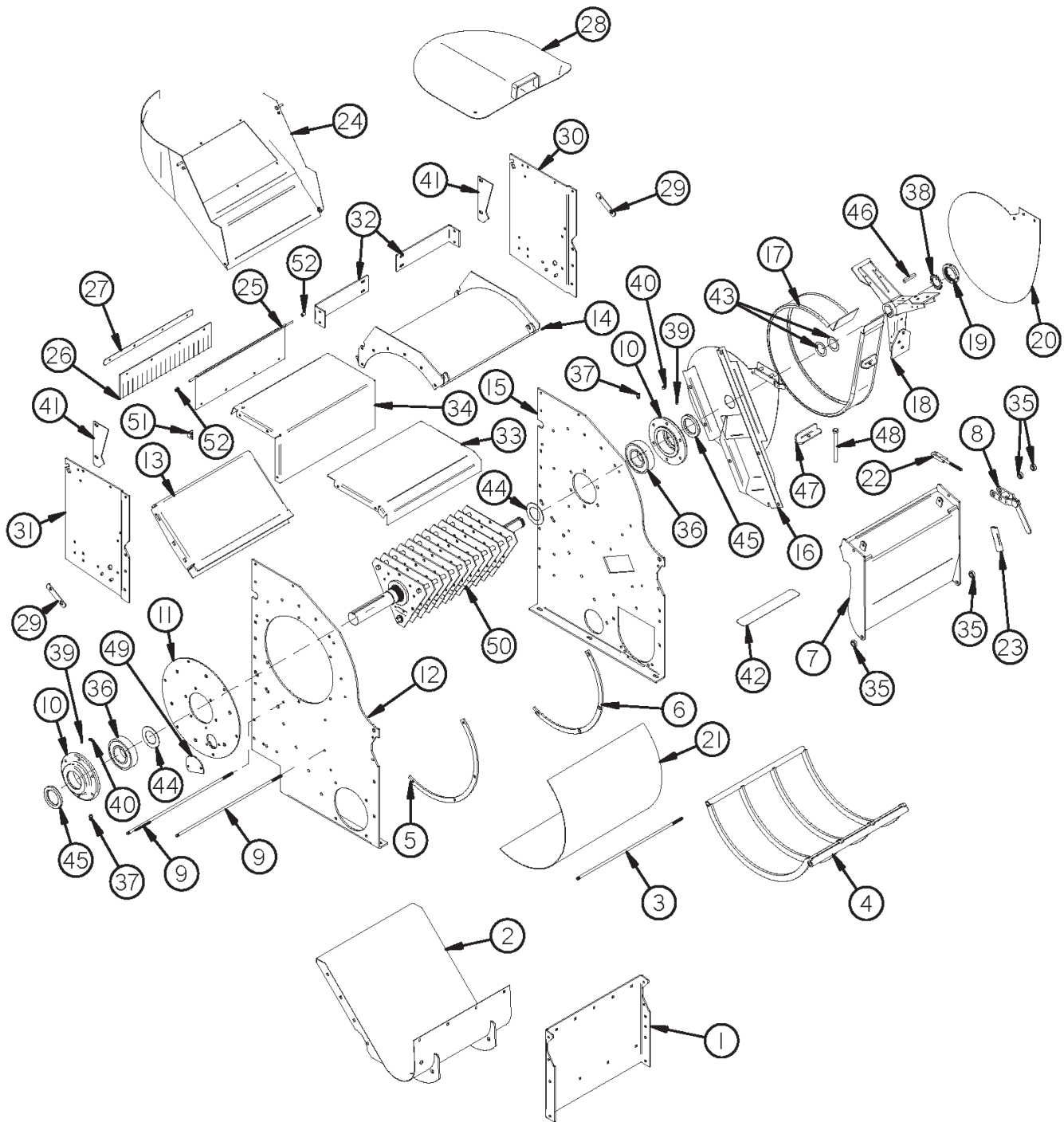


FIGURE 5

MILL

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
23	GM370	HANDLE GRIP
24	GM351	INFEED CHUTE FOR INFEED CONVEYOR
*	GM352	CHUTE MAGNET
25	GM353	INFEED FLAP
26	GM354	INFEED FLAP RUBBER
27	GM355	INFEED FLAP RUBBER STRAP
28	GM358	INFEED CHUTE COVER FOR ITEM # 25
29	GM362	HOPPER ADJUSTMENT
30	GM363	GRINDER THROAT LEFT
31	GM364	GRINDER THROAT RIGHT
32	GM365	CHUTE BRACE
33	GM366	CHUTE MID SHIELD
34	GM367	CHUTE TOP SHIELD
35	GM180	PIVOT SPACER
36	GM421	BEARING (J211WDN)
37	GM419	1/8" GREASE LINE ADAPTER (244054)
38	GM431	LOCKING WASHER (WH-08)
39	YSKP12005	SET SCREW, 3/8"-16 X 1" W/KNURLED POINT
40	YNJM12005	HEX NUT, JAM, 3/8"-16
41	GM433	CHUTE STOP
42	GM435	SAFETY TREAD
43	GM448	FAN SPACER
44	GM449	BEARING SPACER
45	GM450	SEAL (2608)
46	GM462	3/8" X 2-1/2" KEY
47	GM316	BLOWER BAND ANGLE
48	GM323	3/8" x 8-1/2" GR 5 Bolt
49	GM457	SERVICE PORT COVER
50	GM451	COMPLETE MILL CYLINDER
51	D58	ANGLE
53	GM525	CHUTE FLAP SPACER

NOTE: * MEANS NOT SHOWN

FIGURE 6
MILL CYLINDER

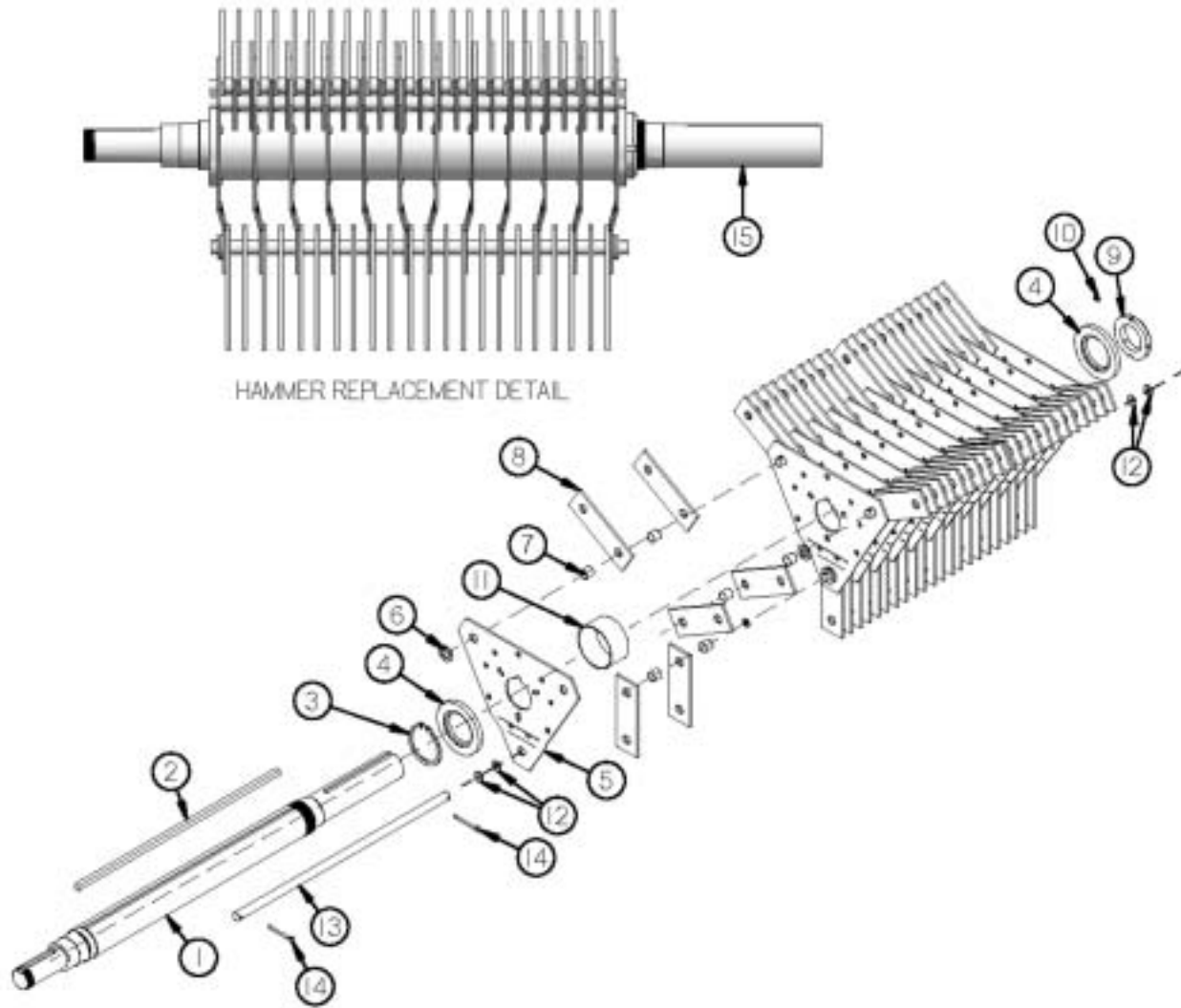


FIGURE 6

MILL CYLINDER

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM168	MILL SHAFT
2	GM169	CYLINDER KEY 3/8" X 19-3/8"
3	GM465	RETAINING RING (EN237)
4	GM171	RETAINER PLATE
5	GM172	CYLINDER PLATE (12 Pcs.)
6	GM173	SPACER
7	GM174	HAMMER SPACER
8	GM175	HAMMER (66 PIECES)
9	GM176	CYLINDER SHAFT NUT (N-12)
10	YSKP08015	SET SCREW, SOCKET, KNURLED CUP PT, 1/4"-20 X 3/8"
11	GM177	SPACET PLATE
12	GM430	BALANCE WASHER (4 Pcs.)
13	GM44	HAMMER SHAFT
14	YPCT06010	COTTER PIN, 3/16" X 1-1/4"
15	GM451	COMPLETE MILL CYLINDER

FIGURE 7

CONVEYOR DRIVE

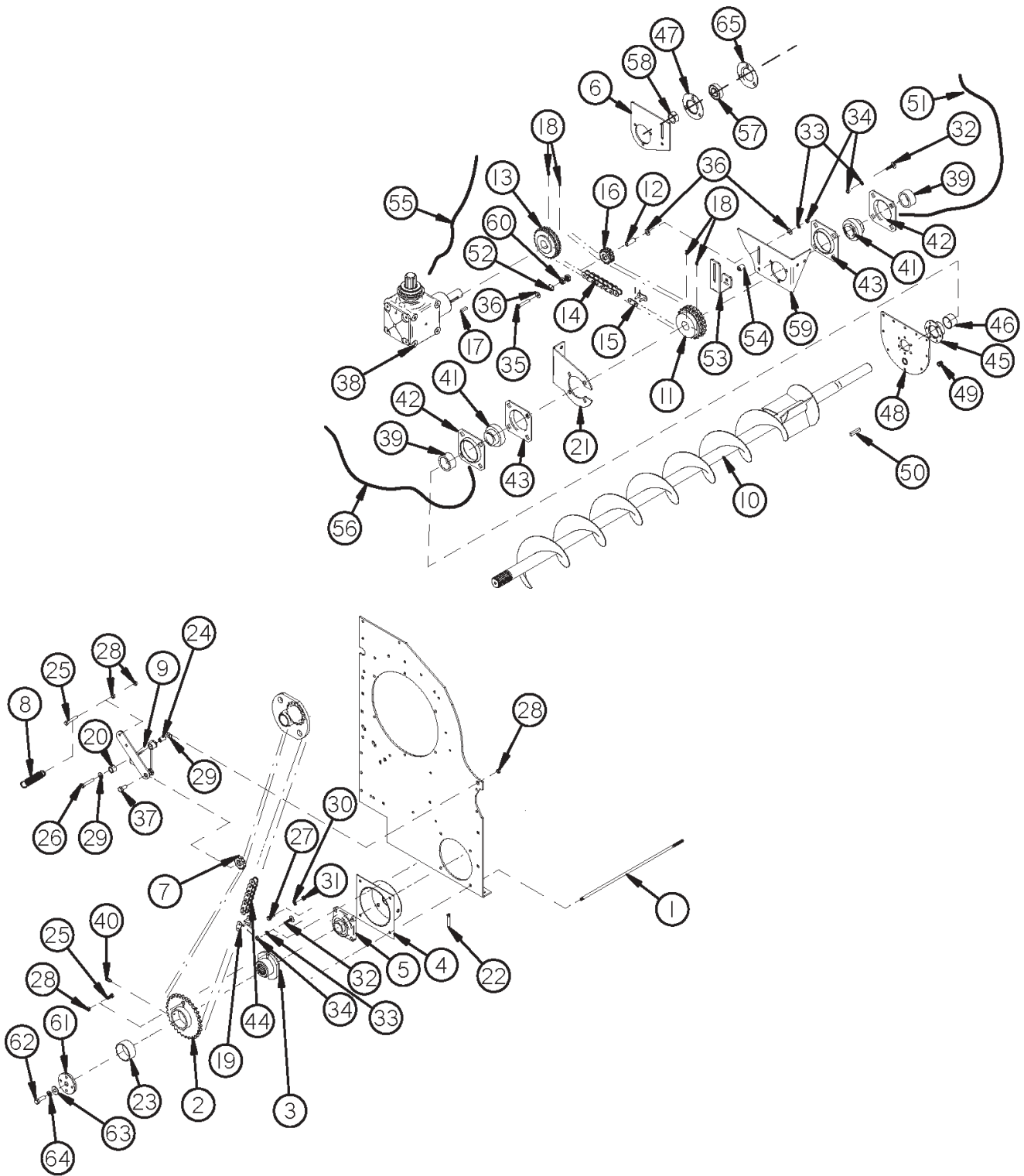


FIGURE 7

CONVEYOR DRIVE

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM141	ROD 3/8" X 22.375"
2	GM536	SPROCKET 30T (540 RPM)
*	GM537	SPROCKET 54T (1000 RPM)
3	GM538	SHEAR FLANGE
4	GM539	BEARING BRACKET FOUR BOLT
5	GM566	BEARING (BH85F6 X 1-3/4")
6	GM480	GEARBOX SHAFT BRACE
7	GM251	IDLER SPROCKET (60A15)
*	GM246	BEARING (203 RR2 USA Fafnir)
8	GM252	IDLER SPRING (077055)
9	GM253	IDLER BRACKET
10	GM540	SOLID TRANSFER AUGER
11	GM567	23T OVERRUNNING CLUTCH
12	GM292	IDLER SPACER
13	GM470	SPROCKET 26T (DOUBLE)
14	GM471	#50 DOUBLE CHAIN X 54 PITCH
15	D118	#50 DOUBLE CONNECTOR LINK
16	GM473	IDLER SPROCKET 8 TOOTH
17	GM492	5/16" X 1-1/4" SQUARE KEY W/ ROUND ENDS
18	YSKP10010	SET SCREW, SOCKET, KNURLED CUP PT, 5/16" - 18 X 3/8"
19	D39	CONNECTOR LINK #60
20	GM296	IDLER PIVOT BUSHING (3/4" OD X .635" ID X 3/4")
21	GM541	GEARBOX BEARING PLATE LARGE
22	45N57	1/4" NPT X 2-5/8" GREASE ZERK (58754)
23	GM542	SHEAR BUSHING LARGE BORE
24	GM299	TENSIONER PIVOT
25	YBHH10010	BOLT, 5/16" X 1" GR. 5
26	YBHH10070	BOLT, 5/16" X 2" GR. 5
27	YBHH10105	BOLT, 5/16" X 3/4" GR. 5
28	YNTL10005	HEX NUT, TOP LOCK, 5/16"-18
29	YWFL10005	WASHER, FLAT, 5/16" USS
30	YWLO10005	WASHER, LOCK, 5/16"
31	YNHX10005	HEX NUT, 5/16"
32	YBCR12010	CARR. BOLT, 3/8" X 1" GR. 5

NOTE: * MEANS NOT SHOWN

FIGURE 7

CONVEYOR DRIVE

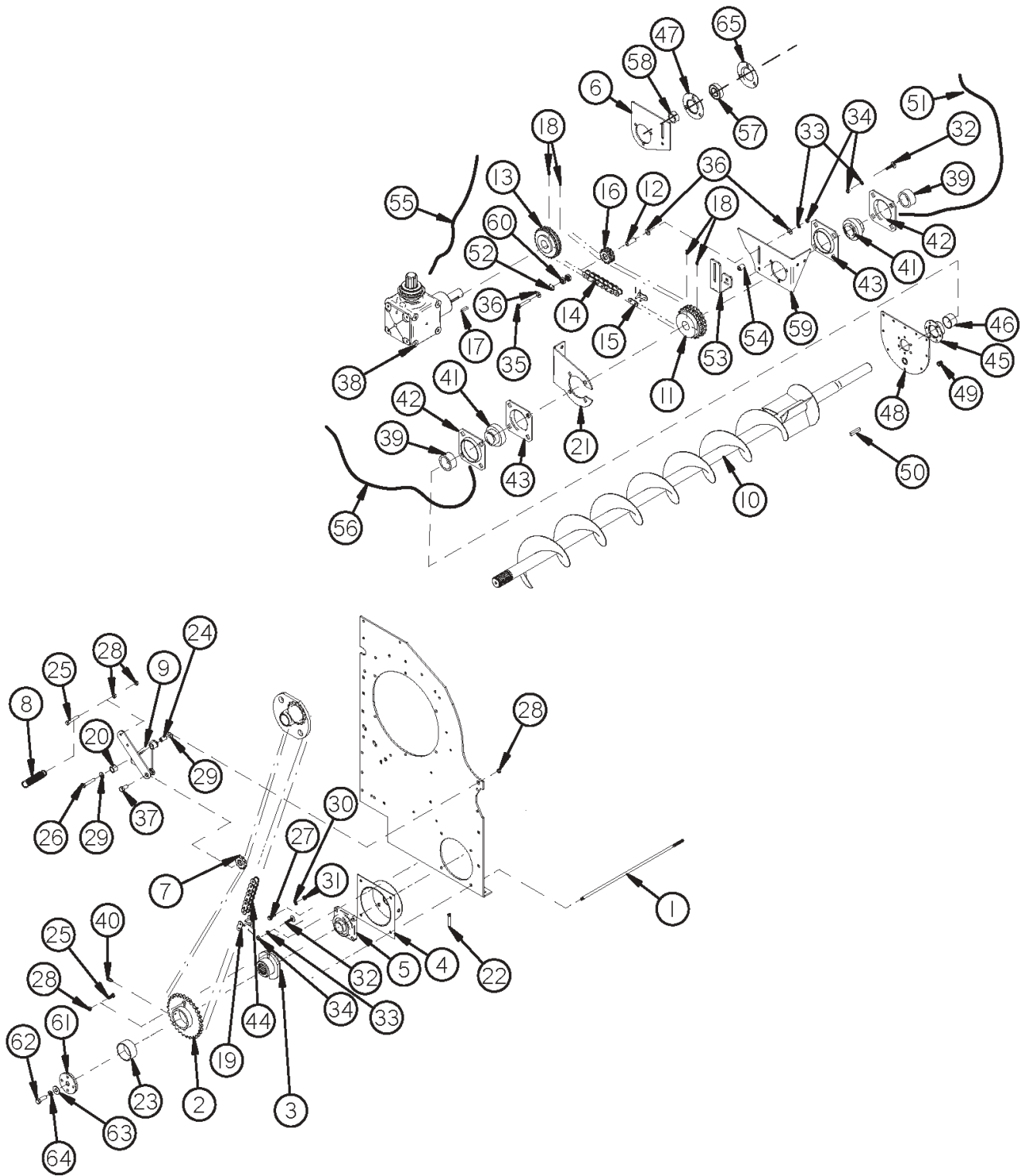


FIGURE 7

CONVEYOR DRIVE

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
33	YWLO12005	WASHER, LOCK, 3/8"
34	YNHX12005	HEX NUT, 3/8"-16
35	YBHH12145	BOLT, 3/8" X 3-1/2" GR. 5
36	YWFL12005	WASHER, FLAT, 3/8" USS
37	YBHH20015	BOLT, 5/8" X 1-1/4" GR. 5
38	GM489	GEARBOX (A11)
39	GM561	1-3/4" LOCK COLLAR
40	G89	GREASE ZERK
41	GM568	BEARING (FH209-28G)
42	GM569	FLANGE (GREASABLE)
*	GM424	1/4"-28 GREASE LINE ADAPTER
43	GM570	FLANGE
44	GM361	#60 CHAIN X 66 PITCHES (540 RPM)
*	GM343	#60 CHAIN X 80 PITCHES (1000 RPM)
45	GM393	AUGER SEAL
46	S50	BUSHING (A-2001 x 1-1/8")
47	GM494	RELUBE BEARING FLANGE
48	GM441	AUGER TRANSITION CAP
49	GM202	1/2" PLUG (5406-8P)
50	D27	KEY 3/8" X 1-3/4" SQUARE
51	GM36	GREASE LINE 30"
52	GM472	RETAINING RING (N5000-102)
53	GM474	TIGHTENER SUPPORT
54	GM475	TIGHTENER SUPPORT SPACER
55	GM507	GREASE LINE 60"
56	GM506	GREASE LINE 51"
57	F144	BEARING (FH207-22)
58	F146	LOCK COLLAR
59	GM510	MOUNT PLATE
60	WM125	BEARING SPROCKET (SKF 6000-2RSJEM)
61	GM543	SPLINED WASHER COMPLETE
62	YBHH16030	BOLT, 1/2" X 1-1/2" GR. 5
63	YWFL16005	WASHER, FLAT, 1/2" USS
64	YWLO16005	WASHER, LOCK, 1/2"
65	F143	FLANGE (GREASABLE)
*	GM544	MOUNT PLATE ADAPTER

NOTE: * MEANS NOT SHOWN

FIGURE 8

UNLOADING AUGER

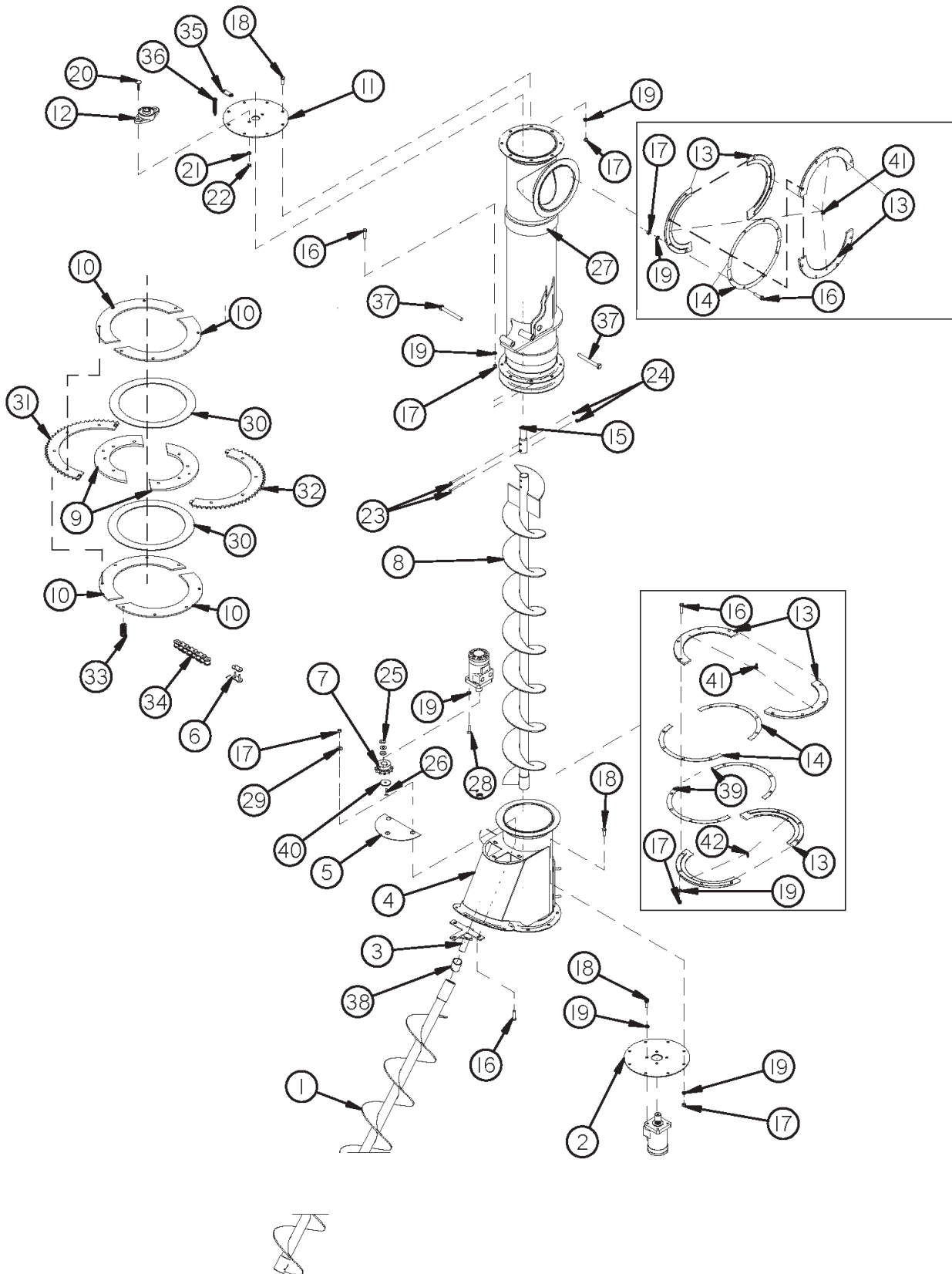


FIGURE 8

UNLOADING AUGER

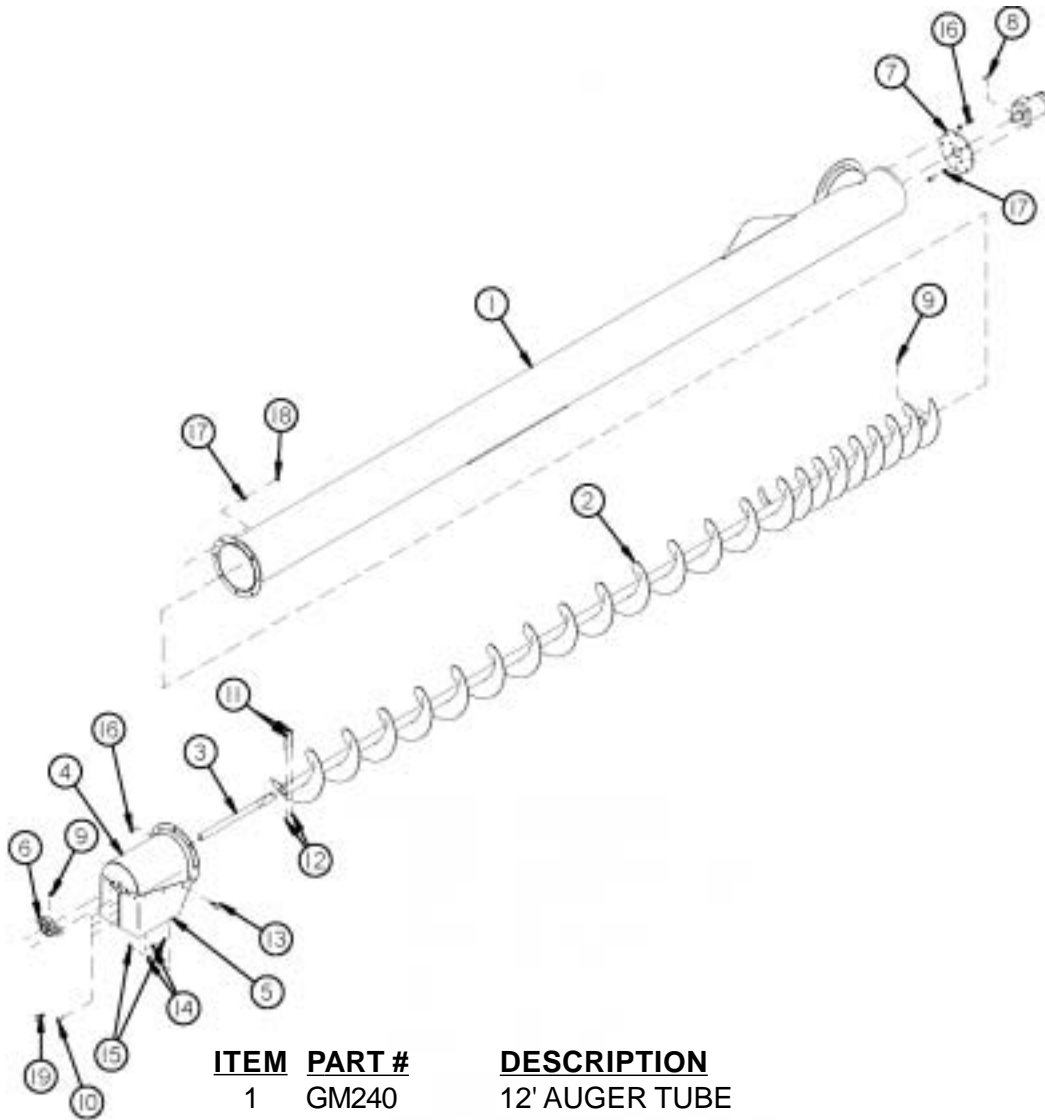
<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM220	TANK UNLOADING AUGER
2	GM221	AUGER DRIVE CAP
3	GM222	AUGER SHAFT
4	GM223	AUGER TUBE
*	GM488**	AUGER CLEANOUT COVER
*	GM357**	FELT GASKET
5	GM224	OVERFLOW COVER
6	D39	#60 CONNECTOR LINK
7	GM226	SPROCKET 60-B11
8	GM523	VERTICAL AUGER
9	GM228	CLUTCH PLATE
10	GM229	CLUTCH FACE
11	GM230	END CAP
12	T40	BEARING
13	GM231	COLLAR
14	GM232	COLLAR SHIM
15	GM233	VERTICAL AUGER SHAFT
16	YBHH12025	BOLT, 3/8" X 1-1/2" GR. 5
17	YNHX12005	HEX NUT, 3/8"-16
18	YBHH12135	BOLT, 3/8" X 3/4" GR. 5
19	YWLO12005	WASHER, LOCK, 3/8"
20	YBCR10010	CARR. BOLT, 5/16" X 1" GR. 5
21	YWLO10005	WASHER, LOCK, 5/16"
22	YNHX10005	HEX NUT, 5/16"
23	YBHH08060	BOLT, 1/4" X 2-1/4" GR. 5
24	YNTL08005	HEX NUT, TOP LOCK, 1/4"-20
25	YWFL08005	WASHER, FLAT, 1/4" USS
26	YBHH08035	BOLT, 1/4" X 1-1/4" GR. 5
27	GM236	PIVOT TUBE
28	YBHH12010	BOLT, 3/8" X 1" GR. 5
29	YWFL12005	WASHER, FLAT, 3/8" USS
30	GM237	CLUTCH
31	GM238	TURN SPROCKET B
32	GM239	TURN SPROCKET A
33	WM210	CLUTCH SPRING (RED)
34	GM409	#60 CHAIN x 81 PITCHES
35	GM436	HOSE HOLDER
36	23N187	SPRING
37	YBHH16135	BOLT, 1/2" X 4-1/2" GR. 2 FULL THREAD
38	RG11	BUSHING (1.010" ID x 1-1/4" x 2")
39	GM459	COLLAR SHIM
40	GM461	PINION STOP
41	RG51	1/4"-28 90° GREASE ZERK (1911)
42	G89	1/4"-28 GREASE ZERK (1641)

NOTE: * MEANS NOT SHOWN

** MEANS USED ON SERIAL #800110 AND HIGHER

FIGURE 9

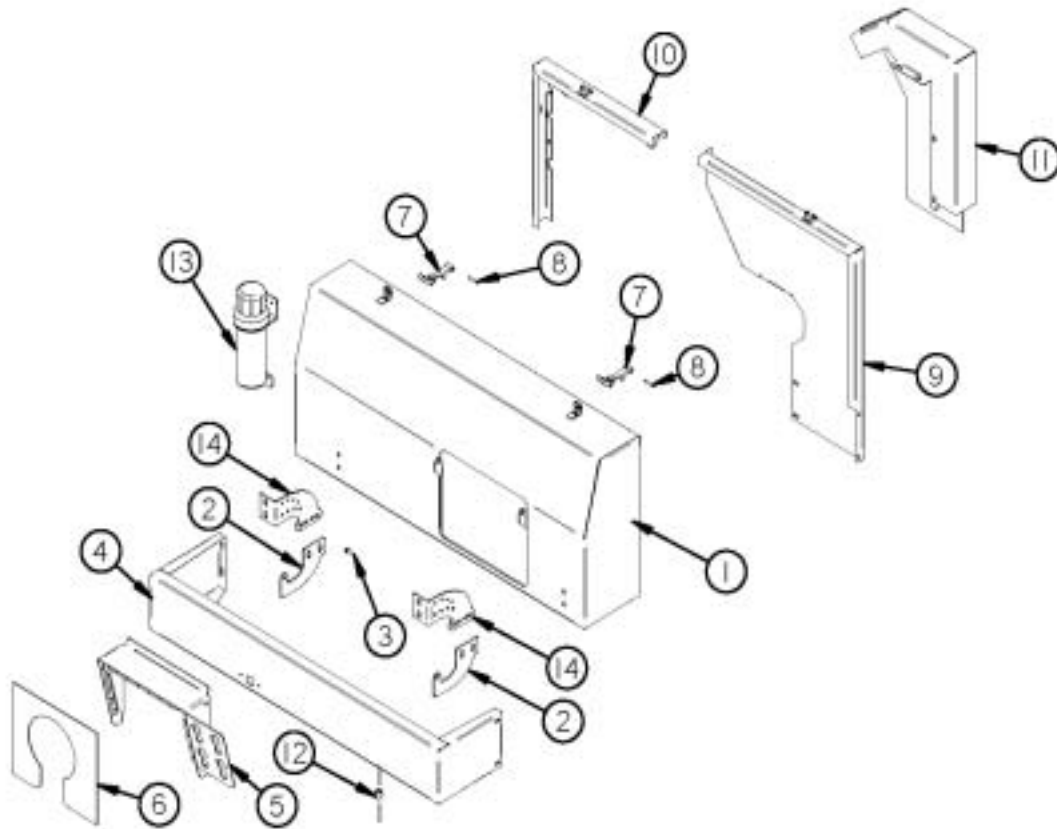
12' UNLOADING AUGER



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM240	12' AUGER TUBE
2	GM524	12' AUGER
3	GM242	AUGER BEARING SHAFT
4	GM243	SPOUT
5	GM244	SPOUT RUBBER
6	T40	BEARING
7	GM245	END CAP
8	5B10	1/4" WOODRUFF KEY
9	YSKP08010	SET SCREW, SOCKET, KNURLED CUP PT, 1/4"-20 X 1/2"
10	GM234	3/16" RIVET
11	YBHH08060	BOLT, 1/4" X 2-1/4" GR. 5
12	YNTL08005	HEX NUT, TOP LOCK, 1/4"-20
13	YBCR10030	CARR. BOLT, 5/16" X 3/4" GR. 5
14	YWLO10005	WASHER, LOCK, 5/16"
15	YNHX10005	HEX NUT, 5/16"
16	YBHH12010	BOLT, 3/8" X 1" GR. 5
17	YWLO12005	WASHER, LOCK, 3/8"
18	YNHX12005	HEX NUT, 3/8"-16
19	YBCR10010	CARR. BOLT, 5/16" X 1" GR. 5

FIGURE 10

SHIELDS



ITEM	PART #	DESCRIPTION
1	GM545	FRONT SHIELD
2	GM529	SHIELD FRONT HINGE BOTTOM
3	YBHH10010	BOLT, 5/16" X 1" GR. 5
*	YBHH08010	BOLT, 1/4" X 1" GR. 5
4	GM546	FLYWHEEL SHIELD LOWER
5	GM325	PTO GUARD
6	GM326	POLY PTO GUARD
7	X192	RUBBER LATCH
8	X195	LATCH PIN
9	GM547	FLYWHEEL SHIELD BACK LEFT
10	GM328	TOP SEAL
11	GM548	HYDRAULIC PUMP SHIELD
12	GM519	SHIELD SPACER
13	S522	MANUAL HOLDER
14	GM528	SHIELD FRONT HINGE TOP

NOTE: * MEANS NOT SHOWN

FIGURE 11

OILER

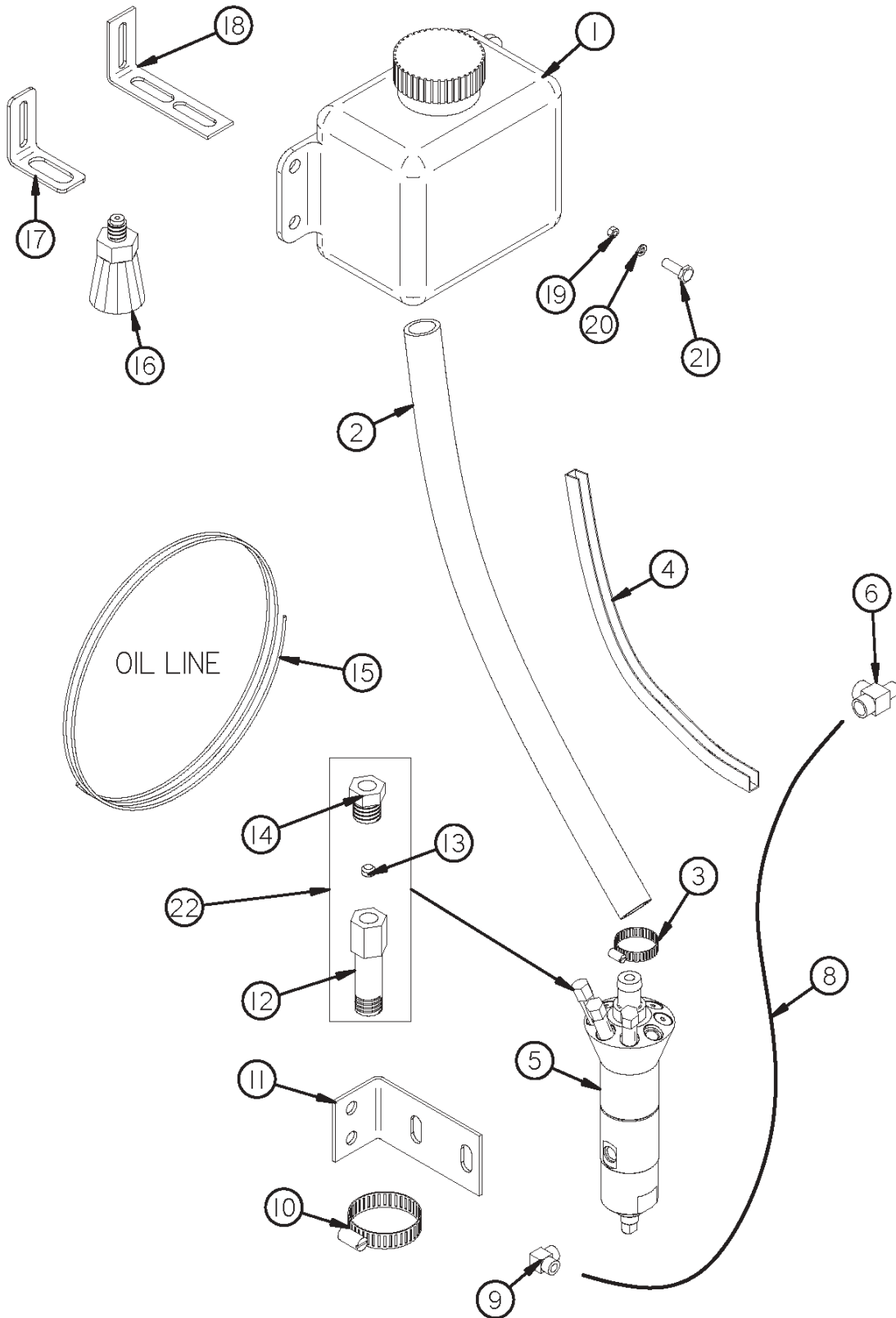


FIGURE 11

OILER

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	HGV63	RESERVOIR
2	HGV66	FILLER HOSE
3	HGV75	1" HOSE CLAMP
4	HGV77	EDGING 12"
5	HGV82	PUMP (COMPLETE)
6	23N116	3/8" STREET TEE (CHAMFER ON MALE END)
8	GM501	HYDRAULIC HOSE (1/4" x 29-3/4")
9	HGV65	O-RING/JIC ELBOW
10	HGV74	2" HOSE CLAMP
11	HGV68	PUMP MOUNT BRACKET
12	HGV86	STANDOFF
13	HGV87	FERRULE
14	HGV85	SLEEVE NUT
15	GM504	OILER TUBE (2 PCS. 5/16" OD X 48") BACK
*	GM505	OILER TUBE (1 PCS. 5/16" OD X 156") FRONT
16	HGV67	BRUSH
17	GM490	BRUSH BRACKET SHORT (FRONT)
18	HGV69	BRUSH BRACKET LONG (BACK)
19	YNHX08005	HEX NUT, 1/4"-20
20	YWLO08005	WASHER, LOCK, 1/4"
21	YBHH08010	BOLT, 1/4" X 1" GR. 5
22	HGV84	MANIFOLD ASSEMBLY (COMPLETE)
*	GM512	OILER KIT (COMPLETE)

NOTE: * MEANS NOT SHOWN

FIGURE 12 AUGER CIRCUIT

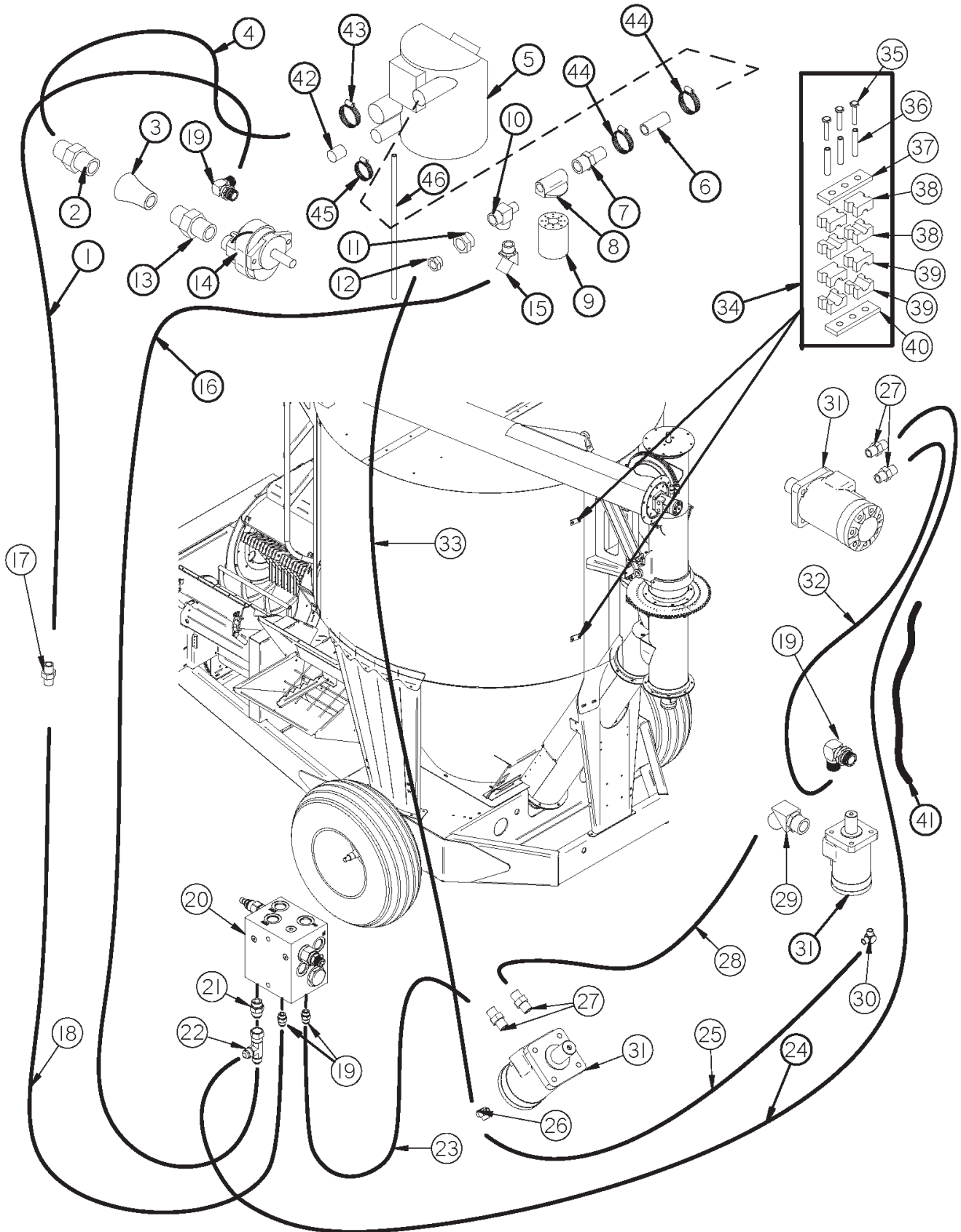


FIGURE 12

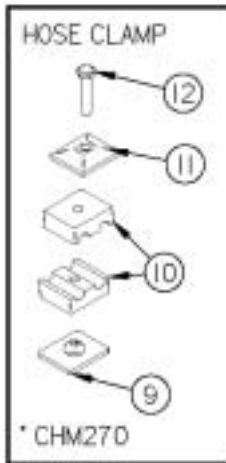
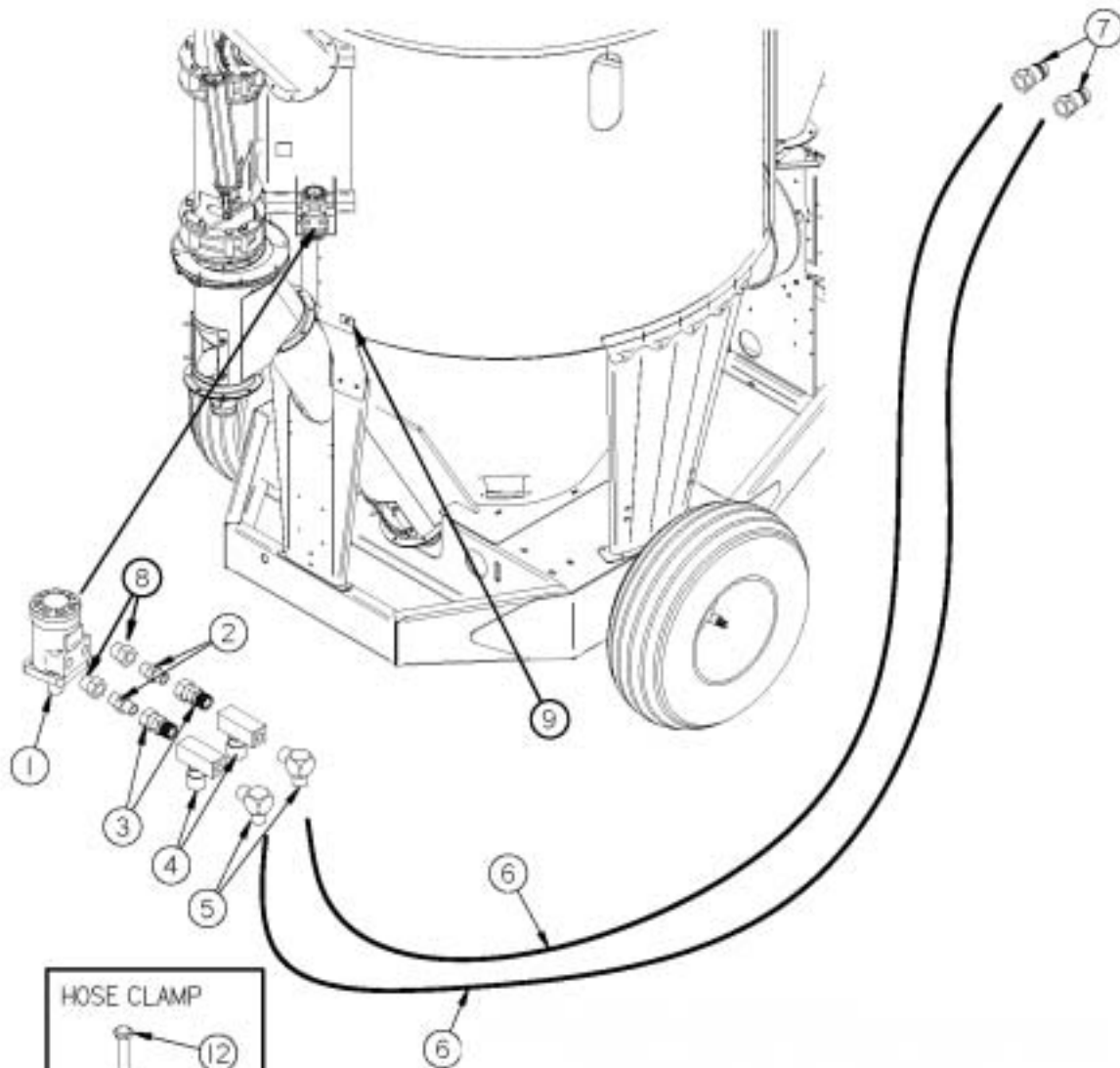
AUGER CIRCUIT

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM1	1/2" X 32" HOSE
2	GM2	ADAPTER (24FTX-S)
3	GM3	PIPE REDUCER (1-1/2" NPT TO 3/4")
4	GM4	1-1/2" X 64" SUCTION HOSE
5	GM5	RESERVOIR
6	GM6	1" X 3" HOSE
7	GM7	3/4" TO 1" HOSE BARB
8	LW288	FILTER HEAD
9	LW289	FILTER ELEMENT
10	GM10	3/4" STREET TEE (3/4 MRO)
11	GM11	REDUCER (3/4 X 1/4 PTR)
12	GM12	ADAPTER (4-4 FTX)
13	GM13	ADAPTER (12-3/4 F50F-S)
14	GM14	PUMP
15	GM15	45° ELBOW (12VTX)
16	GM549	HYDRAULIC HOSE 3/4" X 102" 106HY-12-12 X 106HY-12-12
17	GM17	UNION (8 HTX)
18	GM550	HYDRAULIC HOSE 1/2" X 111" 106HY-8-8 X 103HY-8-8
19	GM551	STRAIGHT THREAD CONNECTOR (8 F50X-S)
20	GM552	ON/OFF VALVE COMPLETE (FROM PRICE: PN# PEAA6182-01)
*	GM553	ON/OFF VALVE BODY (PEC PN# PEAA6181-01)
*	GM48	RELIEF CARTRIDGE - AUGER LIFT (SUN PN# RPEC-LAN)
*	GM554	RELIEF CARTRIDGE - MOTOR CIRCUIT (SUN PN# RPEC-LWN @3200 PSI)
*	GM555	ON/OFF CARTRIDGE (VICKERS PN# MPV1-10)
21	GM556	STRAIGHT THREAD CONNECTOR (12-8 F50X-S)
22	GM22	TEE (12R6X)
23	GM557	HYDRAULIC HOSE 1/2" X 52" 106HY-8-8 X 139HY-8-8
24	GM24	1/2" X 160" HOSE
25	GM25	1/4" X 80" HOSE
26	GM26	TEE (4R50X-S)
27	GM27	ADAPTER (8-10 F50X)
28	GM28	1/2" X 79" HOSE
29	GM29	45° ELBOW (8-10 V50X)
30	GM30	ELBOW (4C50X-S)
31	GM464	MOTOR (101-2180-009)
32	GM34	1/2" X 116" HOSE
33	GM35	1/4" X 51" HOSE
34	GM8	HOSE CLAMP 3/8" X 1/2" (COMPLETE)
35	GM62	BOLT
36	GM63	TUBE
37	GM64	TOP PLATE
38	GM65	3/8" INSERT
39	GM66	1/2" INSERT
40	GM67	WELD PLATE
41	GM32	SPIRAL WRAP (HG125) 1-1/4" x 2'
42	GM37	PORT CAP (NEW STYLE FROM VALUE ADDED)
43	GM38	1-1/2" HOSE CLAMP
44	DWM123	1" HOSE CLAMP
45	GM453	15/16" SPRING CLAMP
46	GM509	BREATHING TUBE

NOTE: * MEANS NOT SHOWN

FIGURE 13

AUGER SWING CIRCUIT

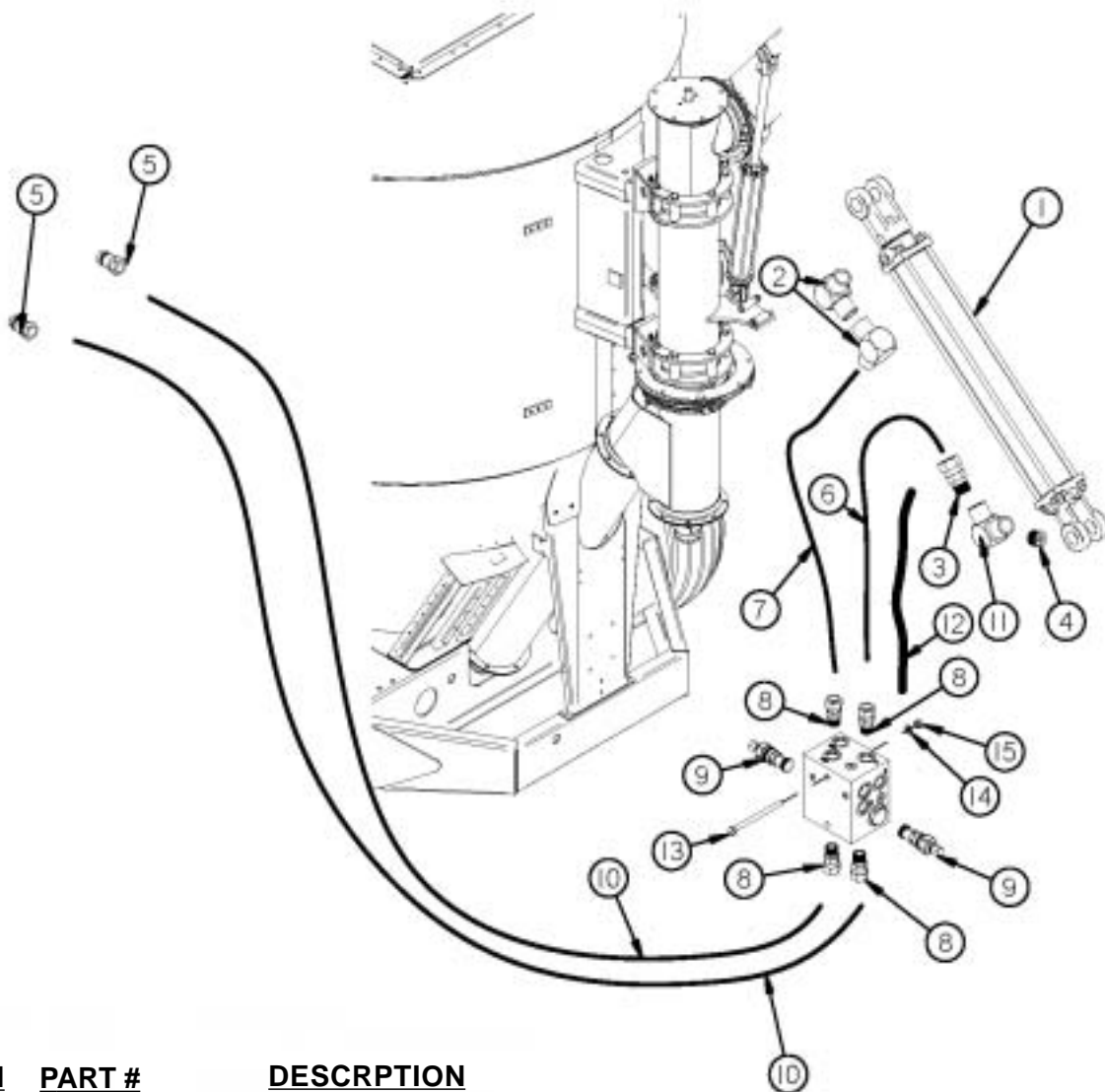


ITEM	PART #	DESCRIPTION
1	GM412	MOTOR (PARKER) TB0390FP100AAAB
2	16SV351	3/8" NIPPLE NUT (5404-6-6)
3	DWM233	3/8" MALE UNION ADAPTER
4	CHM265	NEEDLE VALVE (F600S)
5	GM42	ELBOW (6-6 CTX)
6	GM43	3/8" X 264" HOSE
7	DWM205	1/2" MALE COUPLER
8	JB82	BUSHING 1/2" TO 3/8" (5406-8-6)
9	CHM279	WELD PLATE
10	CHM278	CLAMP HALVES 3/8" HOSE
11	CHM277	COVER PLATE
12	CHM276	HEX BOLT
*	CHM270	COMPLETE 3/8" HOSE CLAMP (DOUBLE)

NOTE: * MEANS NOT SHOWN

FIGURE 14

AUGER LIFT CIRCUIT



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	10WR11A	2-1/2" X 16" CYLINDER (645886)
2	23N234	3/8" ELBOW
3	DWM233	3/8" MALE UNION ADAPTER
4	GM455	RESTRICTOR (.032)
5	DWM205	1/2" MALE COUPLER
6	GM45	3/8" X 130" HOSE
7	GM46	3/8" X 125" HOSE
8	GM47	ADAPTER (0507-6-6)
9	GM48	RELIEF CARTRIDGE
10	GM51	3/8" X 240" HOSE
11	GM446	3/8" STREET ELBOW W/ RESTRICTOR
12	GM32	SPIRAL WRAP (HG125) 1-1/4" x 2'
13	YBHH10130	BOLT, 5/16" X 5" GR. 5
14	YWLO10005	WASHER, LOCK, 5/16"
15	YNHX10005	HEX NUT, 5/16"

FIGURE 15
GEARBOX (All)

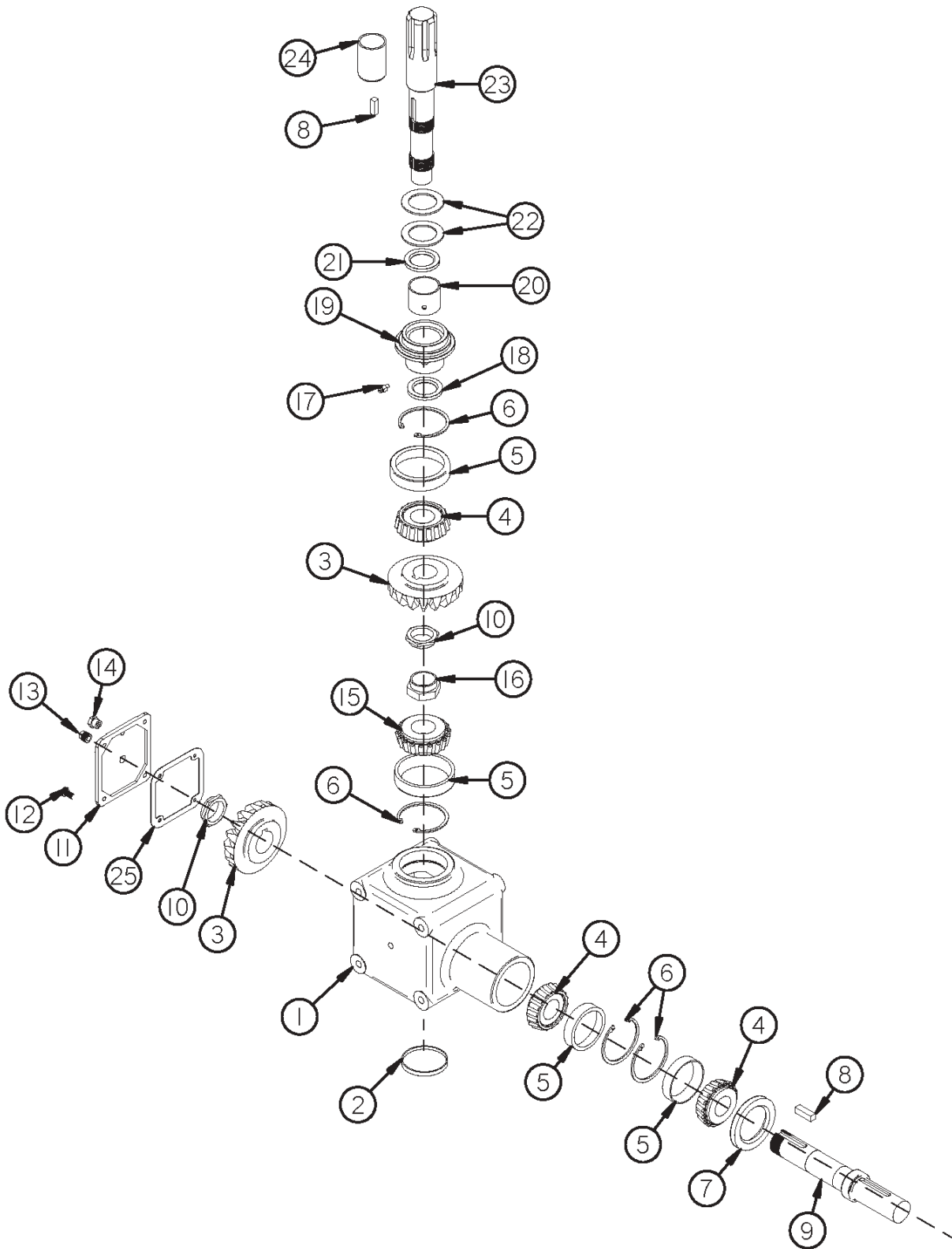


FIGURE 15

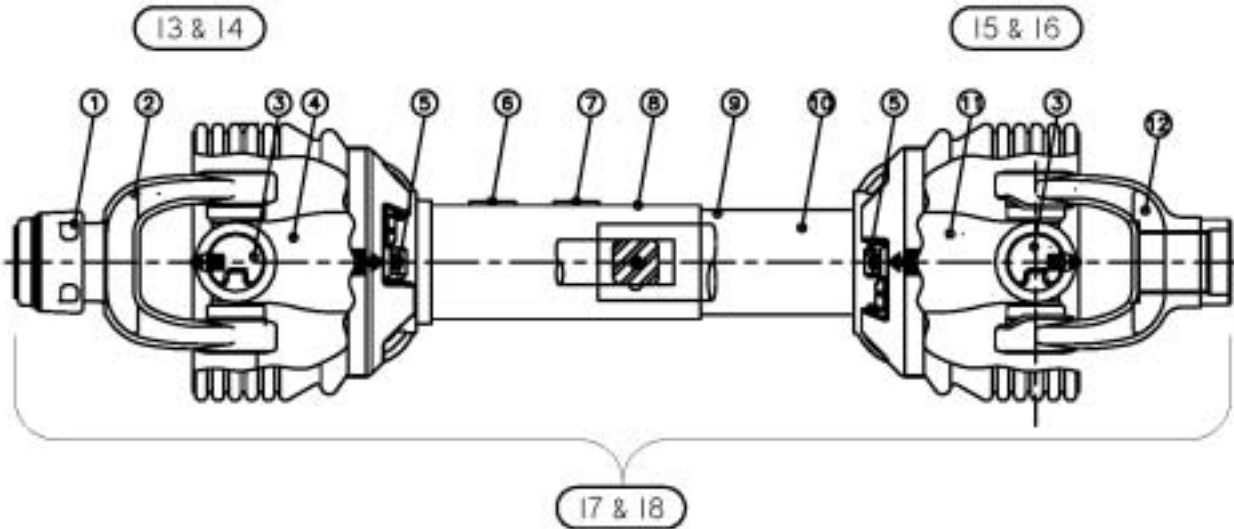
GEARBOX (AII)

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	G50	HOUSING
2	G68	CAP
3	G52	BEVEL GEAR
4	G53	BEARING CONE (14137A)
5	G54	BEARING RACE (14276)
6	G55	SNAP RING
7	G64	SEAL (F465)
8	23N139	KEY 3/8" x 1-3/8" (HARDENED)
9	GM495	INPUT SHAFT
10	G58	STAKE NUT (1-3/8"-18)
11	GM484	COVER
12	G56	CAPSCREW
13	G65	PLUG 3/8" NPT
14	G67	VENT 1/8" NPT
15	GM496	BEARING CONE (14117A)
16	GM486	STAKE NUT LONG (1-3/8"-18)
17	GM497	FITTING (O-Ring 1/8"-27 NPT)
18	GM498	SEAL (19745)
19	GM482	GEARBOX SEAL EXTENSION
20	GM487	BUSHING (2-1/4" OD x 2" ID x 1.765)
21	GM499	SEAL (19786)
22	RG24	THRUST WASHER (2" ID x 3" OD x 1/8")
23	GM500	OUTPUT SHAFT
24	GM483	GEARBOX OUTPUT BUSHING
25	G66	GASKET
*	GM489	COMPLETE MACHINE GEARBOX

NOTE: * MEANS NOT SHOWN

FIGURE 16

PTO

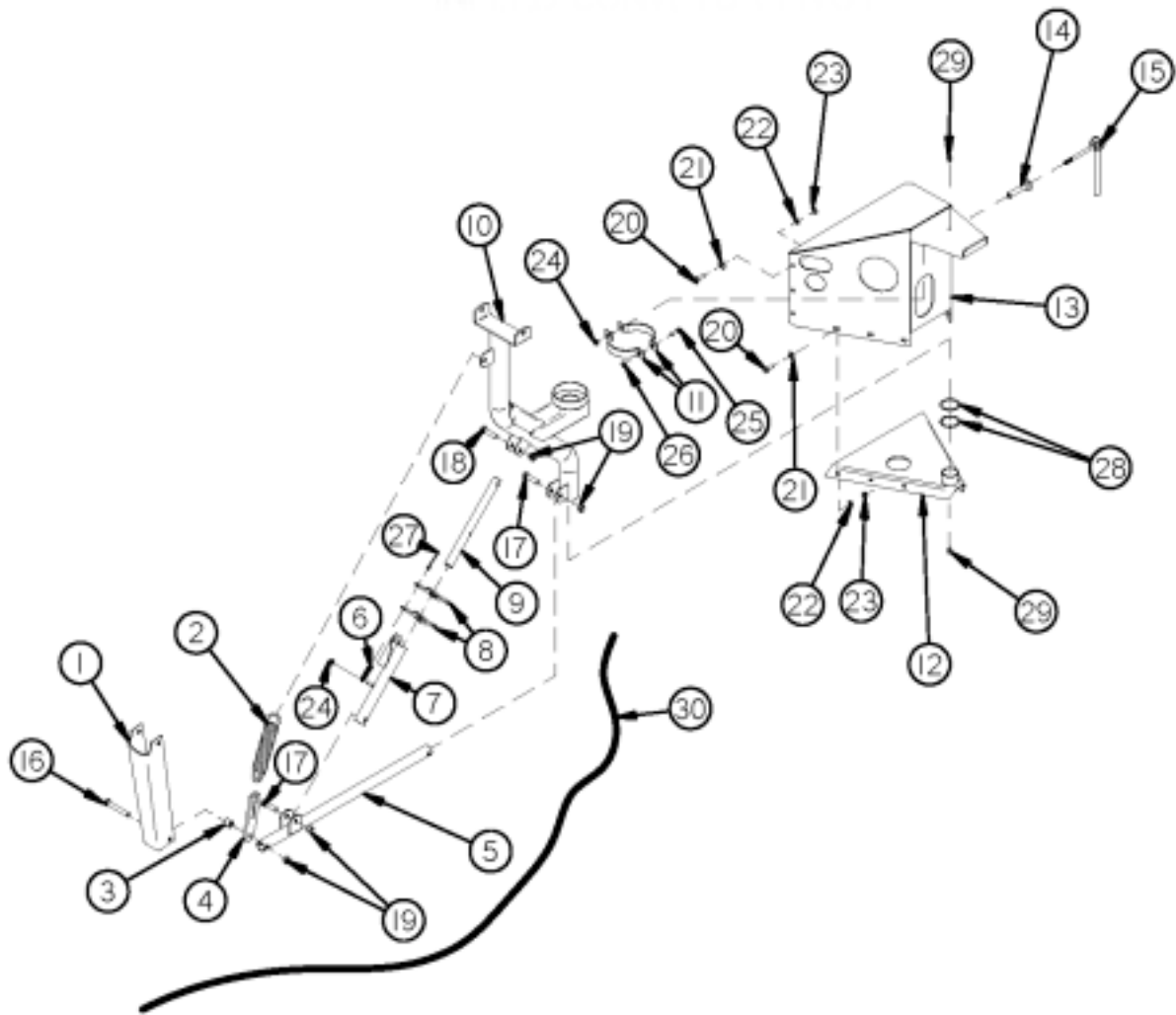


ITEM	540 RPM	1000 RPM 1-3/8"	DESCRIPTION
1	16SV274	"	SAFETY SLIDE LOCK REPAIR KIT 540 RPM
2	GM374	GM375	SAFETY SLIDE LOCK YOKE ASSEMBLY 540 RPM
3	GM376	"	55R CROSS & BEARING KIT
4	GM377	"	YOKE & SHAFT
5	GM378	"	NYLON REPAIR KIT (NOT SHOWN)
6	16SV283	"	SAFETY SIGN
7	GM379	GM380	SAFETY SIGN
8	GM381	GM476	OUTER GUARD
9	GM382	"	INNER GUARD
10	16SV286	"	SAFETY SIGN (NOT SHOWN)
11	GM383	"	YOKE, TUBE & SLIP SLEEVE
12	GM384	"	YOKE
13	GM385	GM477	JOINT & SHAFT HALF ASSEMBLY W/ GUARD
14	GM386	GM478	JOINT & SHAFT HALF ASSEMBLY
15	GM387	"	JOINT & TUBE HALF ASSEMBLY W/ GUARD
16	GM388	"	JOINT & TUBE HALF ASSEMBLY
17	GM389	---	COMPLETE PTO 540 RPM (262-23944)
18	---	GM390	COMPLETE PTO 1000 RPM 1-3/8" (262-23956)

NOTE: " MEANS SAME AS PREVIOUS MODEL
 --- MEANS NOT USED ON THIS MODEL

FIGURE 17

INFEEED CONVEYOR PIVOT



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM203	SUPPORT	16	YBHH16115	BOLT, 1/2" X 3-1/2" GR. 5
2	GM204	SPRING (40174)	17	YBHH16095	BOLT, 1/2" X 2-1/4" GR. 5
3	GM205	SPACER	18	YBHH16065	BOLT, 1/2" X 2" GR. 5
4	GM206	SPRING ADJUSTMENT	19	YNTL16005	HEX NUT, TOP LOCK, 1/2"-13
5	GM207	PIVOT LINKAGE	20	YBHH12010	BOLT, 3/8" X 1" GR. 5
6	GM208	SPRING (17H387)	21	YWFL12005	WASHER, FLAT, 3/8" USS
7	GM209	LOCKING TUBE	22	YWLO12005	WASHER, LOCK, 3/8"
8	GM210	LOCKING LEVER	23	YNHX12005	HEX NUT, 3/8"-16
9	GM211	LOCKING SHAFT	24	YNTL12005	HEX NUT, TOP LOCK, 3/8"-16
10	GM212	PIVOT MAIN SUPPORT	25	YBHH10045	BOLT, 5/16" X 1-1/4" GR. 5
11	GM213	BRAKE BAND	26	YNTL10005	HEX NUT, TOP LOCK, 5/16"-18
12	GM214	BOTTOM SUPPORT	27	YPCT06002	COTTER PIN, 3/16" X 1"
13	GM215	TOP SUPPORT	28	GM219	PIVOT SPACER
14	GM216	LEVER GUIDE	29	RG51	GREASE FITTING 90°
15	GM217	BRAKE LEVER	30	GM434	TRIP ROPE

FIGURE 18

INFEEED CONVEYOR

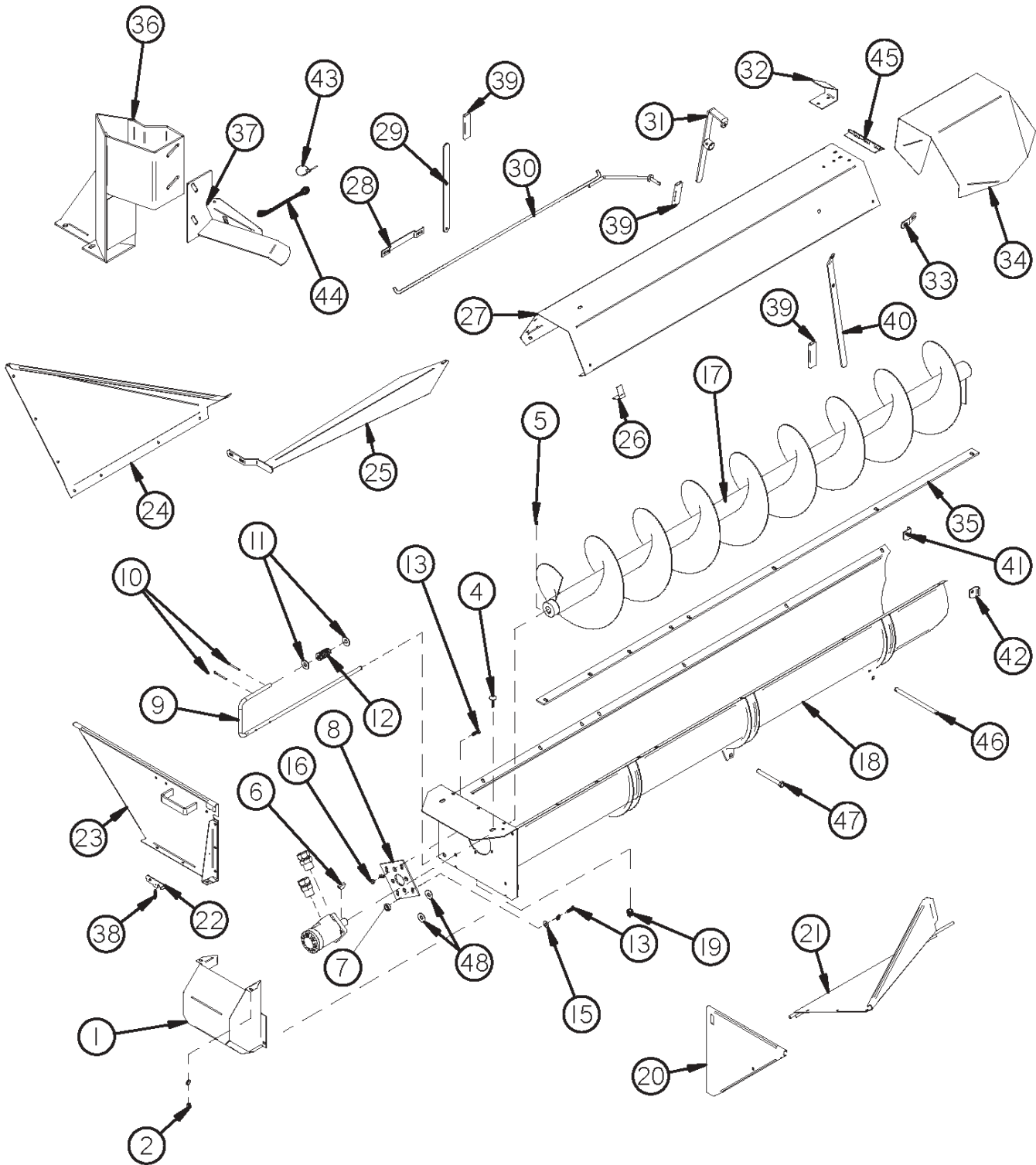


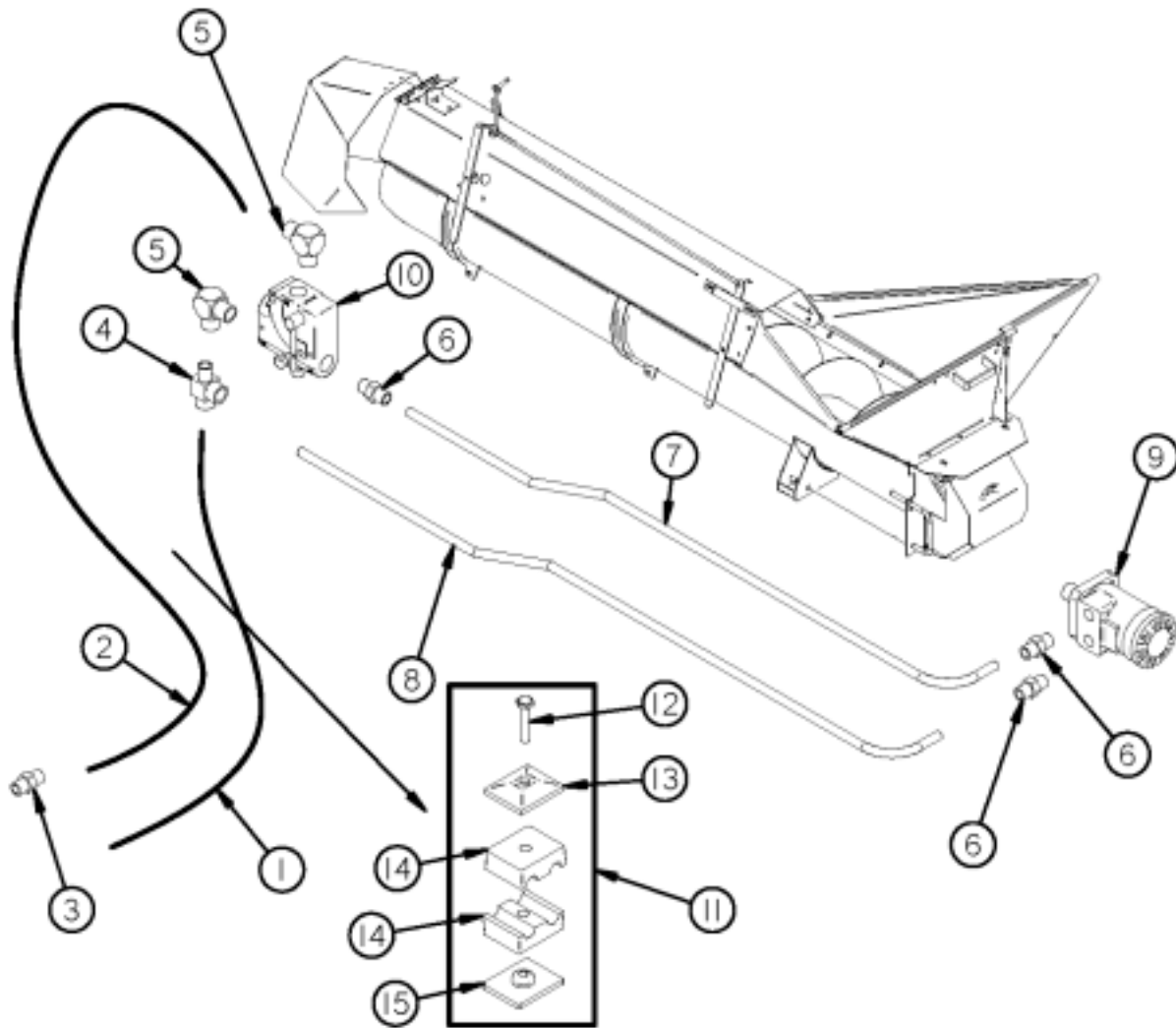
FIGURE 18

INFEED CONVEYOR

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM178	SHIELD
2	YNHX10005	HEX NUT, 5/16"
3	YWLO10005	WASHER, LOCK, 5/16"
4	YBCR10010	CARR. BOLT, 5/16" X 1" GR. 5
5	YSKP08010	SET SCREW, SOCKET, KNURLED CUP PT, 1/4"-20 X 1/2"
6	5B10	1/4" KEY
7	GM180	SPACER
8	GM181	MOTOR MOUNT
9	GM182	HANDLE LATCH
10	YPCT04005	COTTER PIN, 1/8" X 1"
11	YWFL16005	WASHER, FLAT, 1/2" USS
12	17G128	SPRING
13	YBHH12130	BOLT, 3/8" X 3/4" GR. 2
14	YWLO12005	WASHER, LOCK, 3/8"
15	YWFL12005	WASHER, FLAT, 3/8" USS
16	YNHX12005	HEX NUT, 3/8"-16
17	GM184	AUGER
18	GM185	TROUGH
19	GM202	1/2" PLUG (5406-8P)
20	GM186	TROUGH END RIGHT
21	GM187	SIDE TROUGH
22	GM188	TROUGH LATCH
23	GM189	TROUGH END
24	GM190	TROUGH SIDE LEFT
25	GM191	AUGER GUARD
26	GM192	SUPPORT PIVOT
27	GM193	CONVEYOR COVER
28	GM194	HANDLE GUIDE
29	GM195	HANDLE
30	GM196	FLOW CONTROL ROD
31	GM197	FLOW CONTROL HANDLE
32	GM198	TROUGH EXTENSION STOP
33	GM199	COVER HOLDER
34	GM200	TROUGH EXTENSION
35	GM201	SCRAPER
36	GM54	TRANSPORT POST
37	GM75	TRANSPORT SUPPORT
38	GM208	LATCH SPRING (17H387)
39	GM370	HANDLE GRIP
40	GM371	CONTROL HANDLE
41	GM372	COVER STOP RIGHT
42	GM373	COVER STOP LEFT
43	PB190	LYNCH PIN
44	S122	LANYARD
45	GM126	HINGE
46	GM458	PIVOT PIN
47	YBHH16140	BOLT, 1/2" X 4-1/2" GR. 5
48	S304	WASHER

FIGURE 19

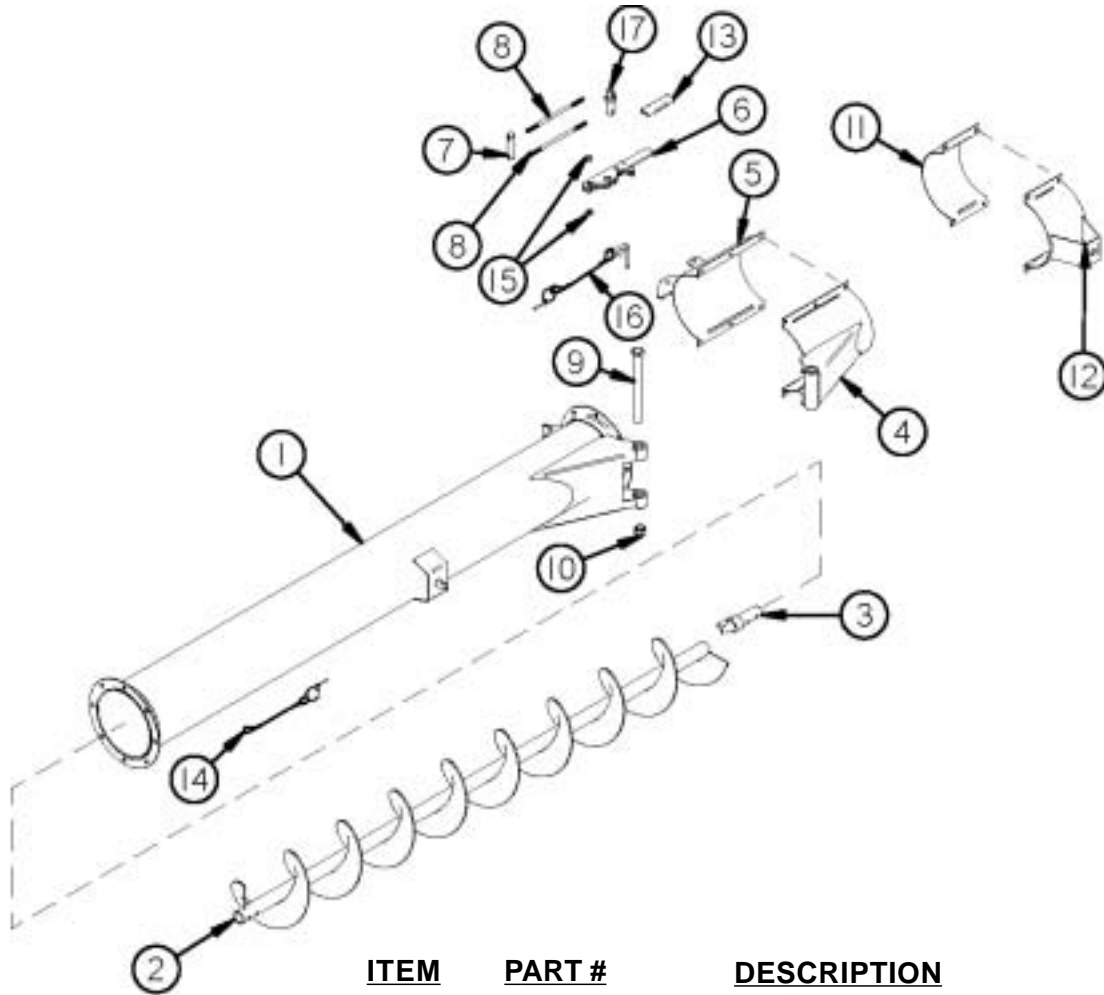
INFEEED AUGER CIRCUIT



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM52	1/2" X 81-1/4" HOSE
2	GM53	1/2" X 97-1/2" HOSE
3	GM17	ADAPTER (8 HTX)
4	GM55	TEE (10 R6X)
5	GM56	ELBOW (10 C50X)
6	GM57	ADAPTER (10 F50X)
7	GM58	PRESSURE TUBE
8	GM59	RETURN TUBE
9	GM61	MOTOR (101-1013-009)
10	GM20	FLOW CONTROL
11	GM9	HOSE CLAMP 1/2" TWIN (COMPLETE)
12	GM68	BOLT
13	GM69	TOP PLATE
14	GM70	1/2" INSERT
15	GM71	WELD PLATE

FIGURE 20

3' & 6' AUGER EXTENSION



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM278	6' EXTENSION
*	GM279	3' EXTENSION
2	GM280	6' AUGER
*	GM281	3' AUGER
3	GM282	AUGER CONNECT SHAFT
4	GM283	PIVOT CLAMP
5	GM284	LATCH CLAMP
6	GM285	LATCH HANDLE
7	GM286	LATCH PIVOT SHAFT
8	GM287	LATCH ROD
9	YBHH24120	BOLT, 3/4" X 9" GR. 5
10	YNL24005	HEX NUT, TOP LOCK, 3/4"-10
11	GM289	TRANSPORT LOCK CLAMP
12	GM290	TRANSPORT LOCK LATCH
13	GM370	HANDLE GRIP
14	S122	CLIP PIN W/ LANYARD
15	GM180	PIVOT SPACER
16	GM573	LATCH PIN W/ CLIP PIN & LANYARD
17	GM369	LATCH PIVOT PIN

NOTE: * MEANS NOT SHOWN

FIGURE 21

OPTIONAL LIGHTS & FENDERS

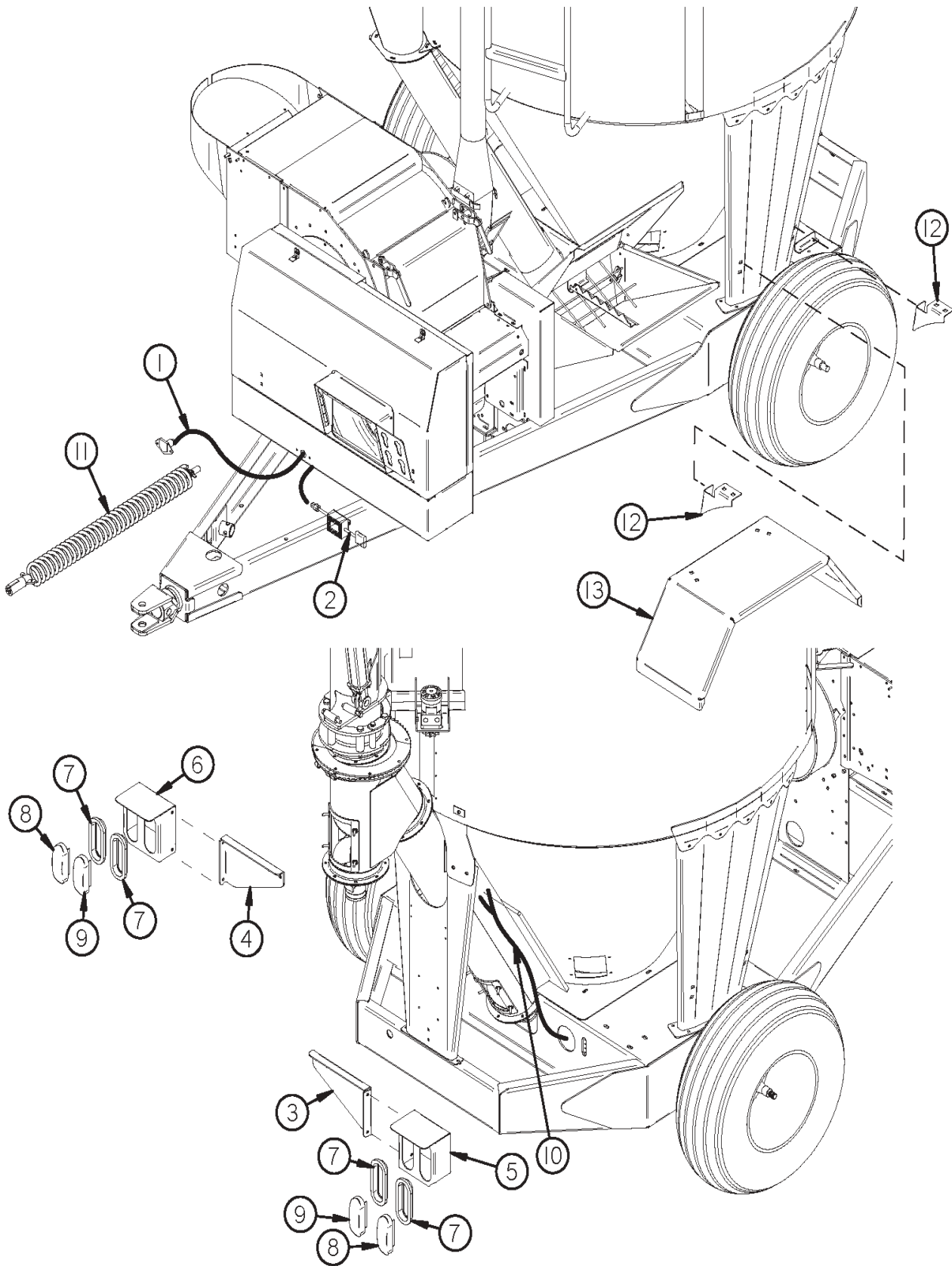


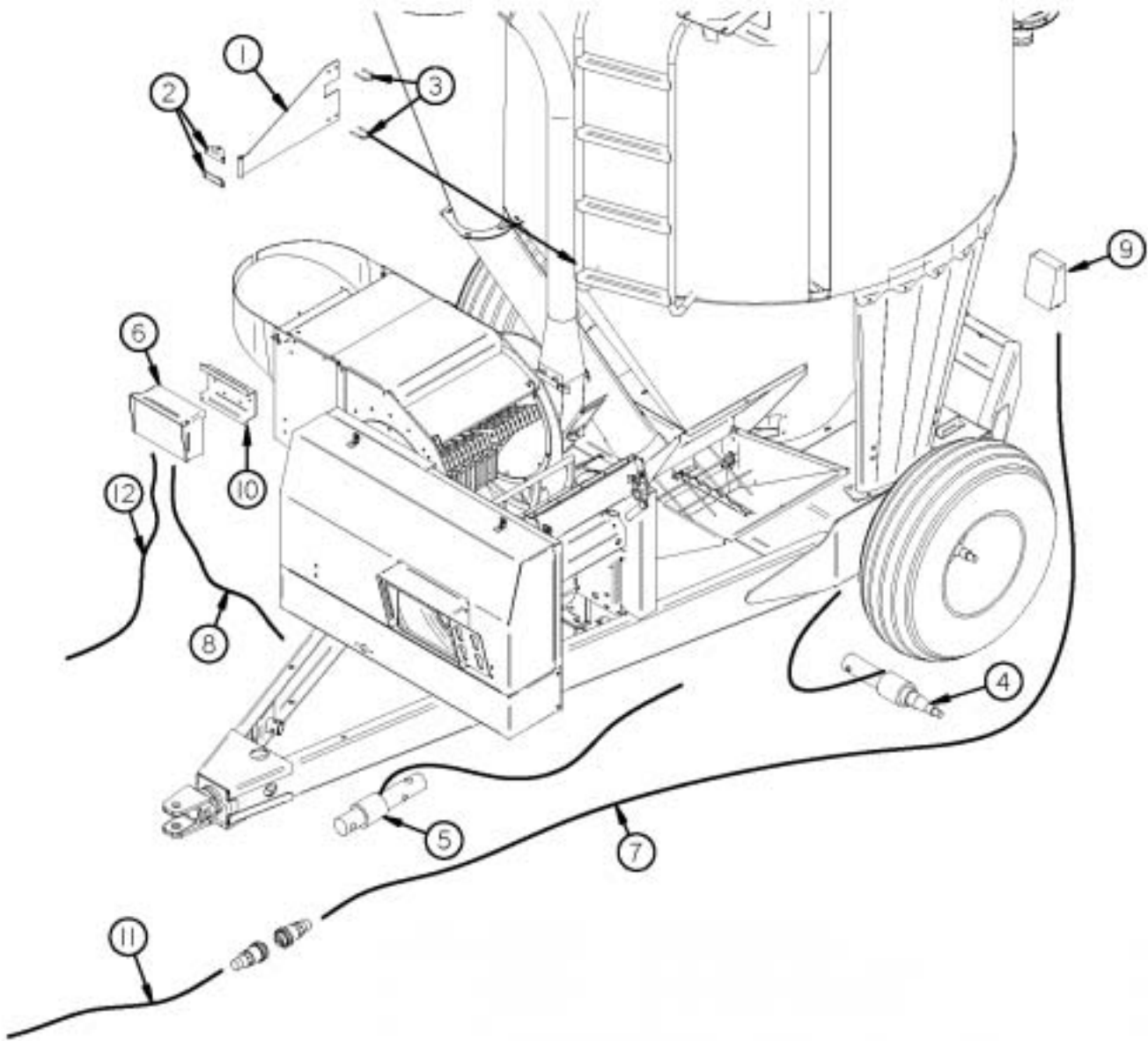
FIGURE 21

OPTIONAL LIGHTS & FENDERS

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	56N154	FLASHER MODULE LOOM
2	S441	FLASHER MODULE
3	GM330	LIGHT BRACKET RIGHT
4	GM331	LIGHT BRACKET LEFT
5	55N62	LIGHT HOUSING RIGHT
6	55N61	LIGHT HOUSING LEFT
7	S308	RUBBER GROMMET
8	S309	AMBER HAZARD LIGHT
9	S310	RED HAZARD LIGHT
10	GM502	LIGHT HARNESS
11	S317	OPTIONAL TRACTOR CORD
12	GM332	FENDERS SUPPORT
13	GM333	FENDER (FITS EITHER SIDE)

FIGURE 22

OPTIONAL SCALE



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	GM400	CONTROL BOX ARM
2	GM401	CONTROL BOX MOUNT
3	YBPU10005	PIPE U BOLT, 5/16" X 1-1/2"
4	GM402	SPINDLE LOAD CELL (146772)
5	GM403	HITCH LOAD CELL (143480)
6	GM404	SCALE DISPLAY (400590)
7	GM405	POWER CORD
8	GM406	JUNCTION BOX CORE
9	GM407	JUNCTION BOX (404465)
10	GM408	SCALE HANGER BRACKET (840459)
11	16SV269	TRACTOR POWER CORD
12	GM558	JUNCTION BOX CORD

H&S GM 170 SPECIFICATIONS

Tank Capacity –Bushel	135
Tank Capacity – Cubic Ft.	170
Tank Diameter	72”
Diameter of Mixing Auger	14” Diameter w/30” Base
Ladder	Standard -Front Mount Over Mill
Tank Windows	2 Full Length & 1 Port Hole Style
Overall Height	10’ 7”
Overall Width	7’ 9” w/o Auger Feeder
Overall Width	8’ 8” w/Auger Feeder
Overall Length	15’ 8”
Ground Clearance	11½”
Supplement Hopper	23”W x 18”L - 35” Above Ground
Feeder	Gravity Hopper or Feed Auger
PTO Drive	540 or 1000 RPM
H.P. Requirement	540 RPM up to 115 HP - 1000 RPM up to 145 HP
Tires	12.5L-15 - 20 Ply
Jack	Standard
Weight w/Auger Feeder	3,600#

Auger Feeder

Auger Feeder Length	84”
Auger Feeder Auger Diameter	12”
Infeed Hopper	42” w/Fold-In-Flare - Adjustable as low as 20”
Drive	Direct Drive Independent Hydraulic Motor

Mill

Hammermill Width	21”
Cylinder Diameter	20”
Grinder Drive	8 - “A” Section Banded V-Belt
Grinder Hammers	66–4 Way Reversible Steel Alloy
Grinder Screen Area	600 Square Inches
Throat Magnets	2 - 4” x 18”
Speed	2700 RPM

Discharge Conveyor

Unloading Auger Tube Diameter	8”
Unloading Auger Length	12’
Unloading Auger Rotation	300 Degrees
Unloading Auger Reach Standard	19’ @ 53 Degrees

Drive System - Self-Contained - Includes Pulley-Driven Pump, Reservoir & Pressure Relief Valve

Pump Pressure	3,200 PSI Maximum
Oil Flow	10.5 G.P.M.
Hydraulic Reservoir	Cyclonic Reservoir
Oil Filter	10 Micron

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

H&S MFG. CO.

products approved

for the

FEMA

SEAL OF QUALITY

