

OPERATOR'S MANUAL

GRINDER MIXER

GX1117



HSMFG0409

5HPOMGX1

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WARRANTY:

Warranty coverage is provided by John Deere according to the terms of the Agricultural/Commercial & Consumer Equipment Warranty Statement. Carefully read the warranty statement on the back of your original purchase order for details on coverage and limitations of this warranty.

NOTES

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

FRONTIER DEALER PRE-DELIVERY CHECK LIST

After the Grinder Mixer has been completely set-up, check to be certain it is in correct running 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 mill and the mill cover closes and latches tightly .
- Wheels are properly mounted.
- Tires are inflated to 80 PSI (563 kpa s).
- 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 so equipped) tractor and attach the PTO. Connect the scale (If so equipped) Plug transport light cord into tractor. 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 equipped) operates properly
- Implement and all components are functioning properly .

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

**FRONTIER
DEALER PRE-DELIVERY CHECK LIST (Continued)**

Swinging Intake Auger (SIA) (If so Equipped)

- Guards, shields and attaching hardware are in place and properly secured.
- SIA lifing, locking and supporting mechanisms function correctly . Counter balance spring and brake are properly adjusted. See Adjustment 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.

_____	Serial Number
(Dealer's Name)	Model 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 Grinder Mixer 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 recommended loads for different types of materials.
- Explain to customer that regular lubrication is required for proper operation and long life of machine. Show customer the lubrication section of Operators Manual.
- Give the customer Operators Manual and make sure he reads and understands all operating
- and service instructions.

Record Serial Number on page 23 of this Manual.

Date Delivered _____ Dealer's Name _____

Signature of Original Buyer _____ By _____

(Remove Dealer File Copy/At Perforation)

FRONTIER MODEL GX1117 GRINDER MIXER

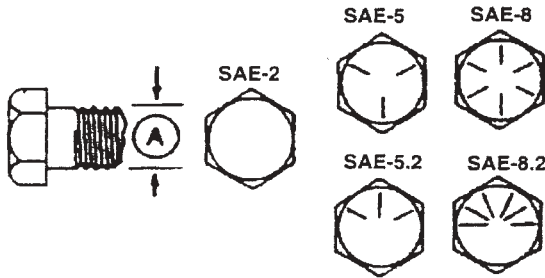
Your Frontier Grinder Mixer has been manufactured of the finest quality materials and components. The performance you get from your machine is largely dependent upon how well you read and understand this manual and apply this knowledge. There is a right and a wrong way to do everything. Please do not assume that you know how to operate and maintain your spreader before reading this manual carefully. Keep this manual available for ready reference.

SPECIFICATIONS

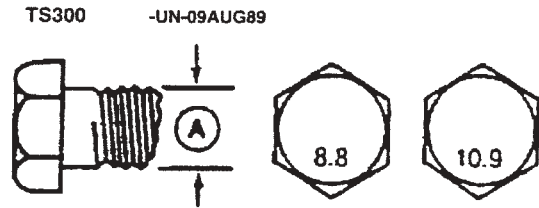
	GM1117
Mixing Tank Capacity - (Bushel).....	135
Mixing Tank Capacity - (Cubic Ft.).....	170
Mixing Tank Diameter.....	72"
Mixing Auger Diameter.....	14" w/30" Base
Mixing Tank Ladder.....	Standard - Front Mount Over Mill
Mixing Tank Windows.....	2 Full Length & 1 Port Hole Style
Overall Height.....	10' 7"
Overall Width.....	7' 9" w/o Auger Feeder
Overall Width.....	8' 8" w/Auger Feeder
Overall Length.....	15' 8"
Ground Clearance.....	11-1/2"
Supplement Hopper.....	23"W x 18"L - 35" Above Ground
Feeder.....	Gravity Hopper or Feed Auger
P.T.O. Drive.....	540 or 1000 RPM
H.P. Requirement.....	45 RPM up to 1 1/2 HP - 1000 RPM up to 145 HP
Tires.....	12.5I x 15 - 20 Ply
Jack.....	Standard
Weight w/o Auger Feeder.....	3,200 lbs.
Weight w/Auger Feeder.....	3,600 lbs.
<u>Auger Feeder</u>	
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
<u>Mill</u>	
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 Sq. In.
Throat Magnets.....	2 - 4" x 18"
Speed.....	2700 RPM
<u>Discharge Conveyor</u>	
Unloading Auger Tube Diameter.....	8"
Unloading Auger Length.....	12'
Unloading Auger Rotation.....	300°
Unloading Auger Reach Standard.....	19' @ 53°
<u>Hydraulic Drive System</u>	
Pump Pressure.....	3,200 PSI
Oil Flow.....	10-1/2 GPM
Hydraulic Reservoir.....	Cyclonic Reservoir
Oil Filter.....	10 Micron

*Determine right and left side of grinder mixer by viewing it from the rear. If instructions or parts lists call for hardened bolts see page 6 to identify.

CAP SCREW TORQUE VALUES



Inch Cap Screw Head Markings



Metric Cap Screw Head Markings

INCH 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)

METRIC CAP SCREW TORQUE VALUES

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.



**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 or the towing source.

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.



OBSERVE MAXIMUM TRANSPORT SPEED

The maximum transport speed for this implement is 32 km/h (20 mph).

Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement's maximum transport speed.

Exceeding the implements maximum transport speed can result in:

- Loss of control of the tractor/implement combination
- Reduced or no ability to stop during braking
- Implement tire failure
- Damage to the implement structure or its components



Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

Do not attempt transport if the fully loaded implement weighs more than 1.5 times the weight of the tractor .

TRACTORS

This operators manual uses the term “Tractor” when identifying the power or the towing 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 UNLOADING MECHANISM 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.
Never allow riders in or on the machine.

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

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

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

STAY CLEAR of discharge auger when in operation.

Keep hands, feet and clothing away from all moving parts when 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.

Frontier always takes the operator and his safety into consideration and guards exposed moving parts for his 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

! WARNING



DO NOT REMOVE SHIELDS

MOVING PARTS INSIDE

1494K

! WARNING



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

1494J

! 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

! 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

3350C

! DANGER



MAXIMUM OPERATING SPEED 540 RPM

OVERSPEED CAN CAUSE SEVERE INJURY OR DEATH

DO NOT OPERATE WITH-

- 1800 RPM TRACTOR PTO
- TRACTOR PTO ADAPTER

! WARNING

DO NOT STEP UP ON MACHINE WHILE IN OPERATION

8390T

! DANGER



MAINTAIN SAFE CLEARANCE FROM ELECTRICAL 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 OPERATE THIS EQUIPMENT IF THIS DECAL IS EXPOSED. REPLACE SAFETY SHIELDS.

1494A

⚠ WARNING

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

32597A

⚠ 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

⚠ CAUTION

To Avoid Serious Injury:

- Read Operator's Manual before operating, servicing or repairing equipment. Follow all safety rules and instructions. (Manuals are available from your selling dealer.)
- Never allow riders.
- Keep bystanders away from equipment during operation.
- Operate from tractor seat only.
- Keep all shields in place and in good condition.
- Lower equipment to ground, stop engine, remove key and set brake before dismantling tractor.
- Never allow children or untrained persons to operate equipment.

FRONT

⚠ WARNING

STAY CLEAR OF DISCHARGE AUGER

82907A

⚠ 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.

82907B

⚠ WARNING

STAY CLEAR OF AUGER EXTENSION HINGE AREA

82907B

⚠ DANGER



NO STEP-STAY CLEAR

9194A


⚠ 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

82907C



⚠ DANGER

KEEP OUT
DO NOT ENTER
TANK. KEEP COVER CLOSED.
FAILURE TO HEED THIS
WARNING MAY RESULT IN
PERSONAL INJURY OR DEATH


82967F



⚠ WARNING

AVOID SERIOUS INJURY
FROM CUTTING BY OR
ENTANGLEMENT WITH
ROTATING AUGER.
NEVER REMOVE PANEL
WITH MACHINE RUNNING.

81269



⚠ WARNING

STAY CLEAR
KEEP HANDS OUT
OF SUPPLEMENT
HOPPER

82967G



⚠ WARNING

STAY CLEAR
ROTATING
PARTS INSIDE

82967D



⚠ 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


82967H



⚠ DANGER

**NEVER
ALLOW
RIDERS
ON THIS
MACHINE**

82967L



⚠ WARNING

Do not exceed this implement's maximum transport speed of 32 km/h (20 mph). Exceeding this speed may result in loss of control during transport or braking and serious injury or death.

Transport only with a properly ballasted tractor and a properly attached safety tow chain. Do not transport with a motor vehicle. Reduce speed and use additional caution when on inclines, towing under adverse surface conditions, and turning.

PREPARING FOR OPERATION

TRACTOR CONNECTIONS

PTO

Fasten the G rinder-Mixer to the tractor draw bar 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 GX1117 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 rpms until the grinder-mixer is running at the rated PTO speed. Begin the grinding process.

SET-UP & ASSEMBLY

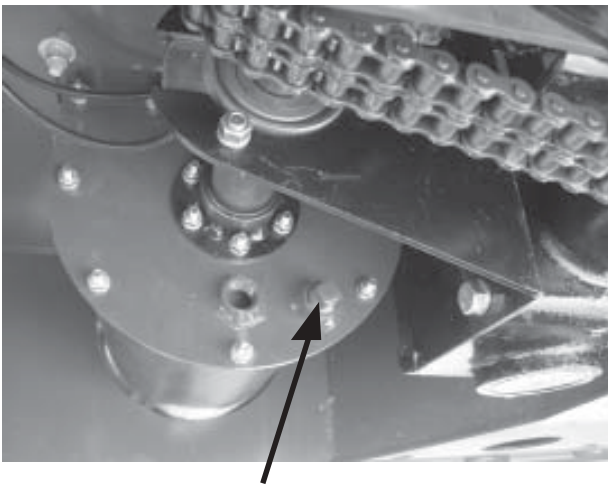
WHEELS & TIRES

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).

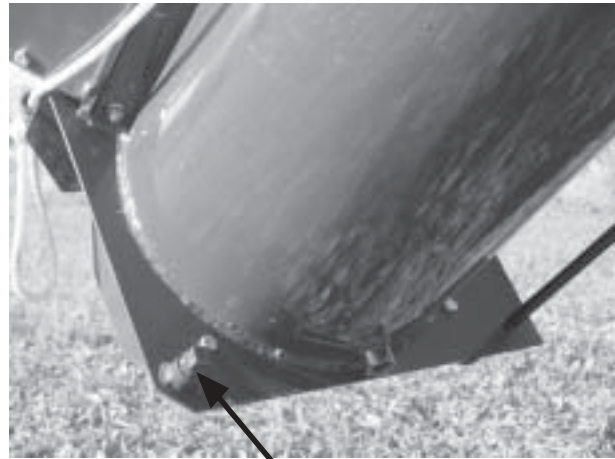
DRAIN PLUGS & DRAIN COVER

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 GX1117 is ready for delivery, install the drain plug in the back plate of the transfer auger. If the mixer is equipped with a Swinging Inake 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

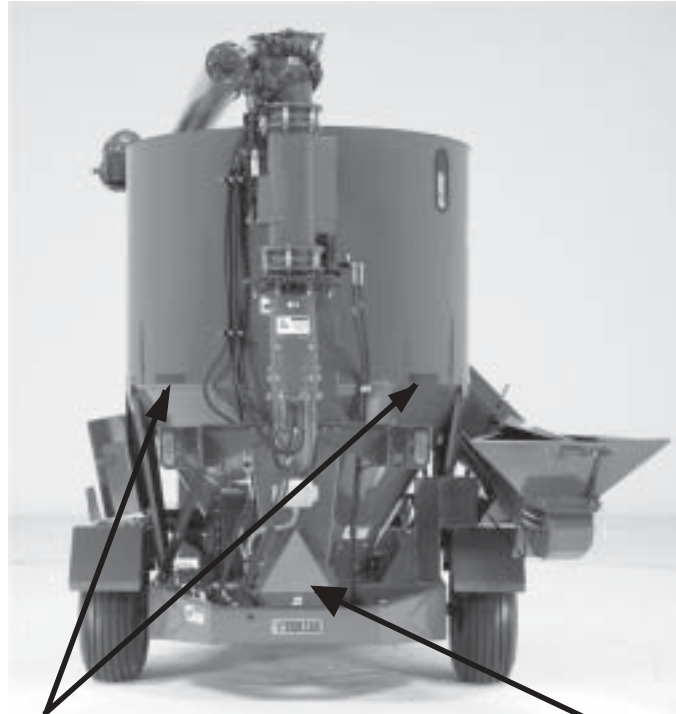
IMPORTANT: If the GX1117 is stored outside, the water drain holes must be left unplugged. Before the mixer is going to be operated, re-install the plugs. After a rain, check the mill, mixing tank, and augers for water accumulation before operating the mixer. As necessary, drain the water before using the mixer.

NOTE: After water has been drained from the mixer, it is advisable to run the GX1117 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 sign, bracket and red reflector strips they are located on the rear of the mixer. Make sure they are kept clean from dust and debris.

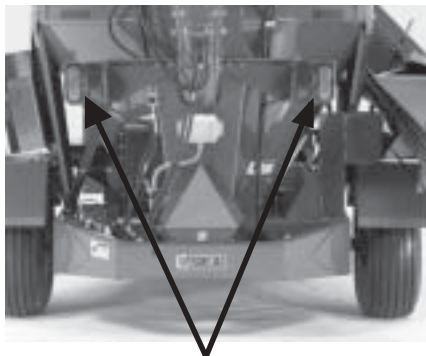


Red Reflectors

SMV Sign

TRANSPORT LIGHTING

Transport warning lights and tractor light power cord are standard equipment on the GX1 117 Grinder Mixer. Make sure they are plugged in to the tractor at all times. Make sure lights are kept clean and visible for safe operation.

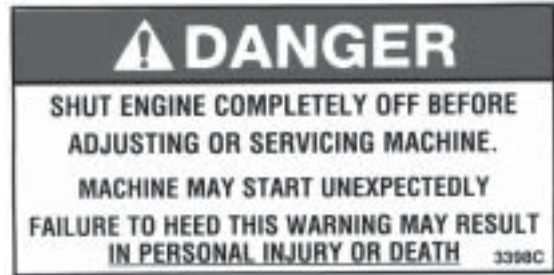


Transport Warning Lights

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 GX1117 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 15 hp (28 to 86 kW) 540 RPM tractor or by a 50 to 145 hp (38 to 109 kW) 1000 RPM tractor.



Bushel Sight Gauge

540/1000 RPM PTO DRIVE

The Frontier GX1 117 grinder-mixer features a 540 drive as standard equipment for use with tractors up to 15hp (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.

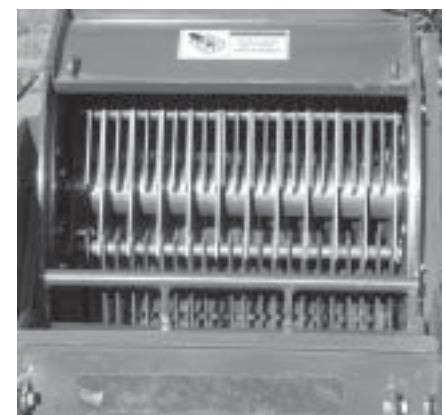


Clutch Handle

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 GX1117 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

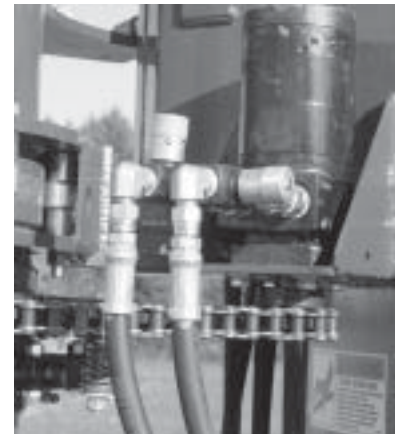
Ground feed from the mixing tank is discharged by an auger system consisting of three hydraulically motor driven augers that are connected in series so that all augers are synchronized as well as started and stopped together. If any motor malfunctions, the movement of material through the augers will 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

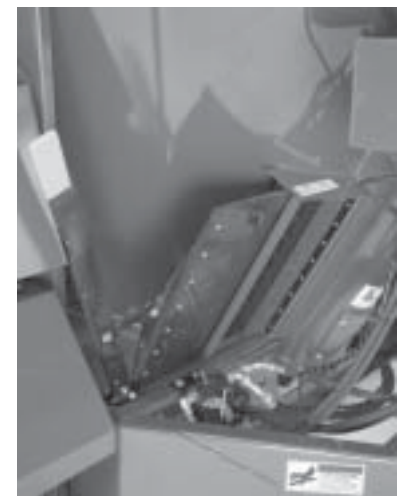
An adjustable needle valve is provided on each hose of the discharge auger rotation to control the speed of auger swing to provide smooth rotation. Needle valves are located at the rear of the machine by the hydraulic rotation motor. See the Adjustment Chapter of the manual for adjustment details.



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

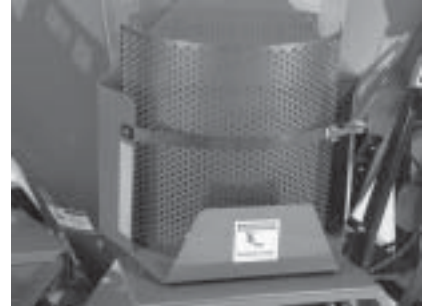
Uniformity of grinding is a factor of mill speed, condition of the hammers, and sharpness of the screen. The efficiency of the mill will also decrease if the holes of the screen are badly worn. If grinding fineness is deteriorating, the screen should be rotated to place the sharp holes edges against the direction of the cylinder rotation or the screen should be replaced. The GX1117 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.

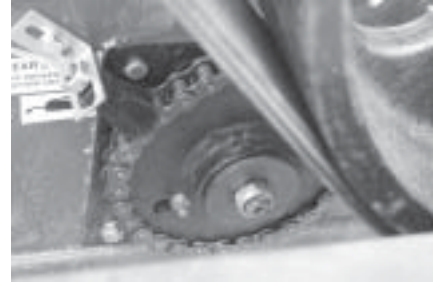


OPERATION (cont.)

OVERLOAD PROTECTION

Main Drive

The GX1117 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.)

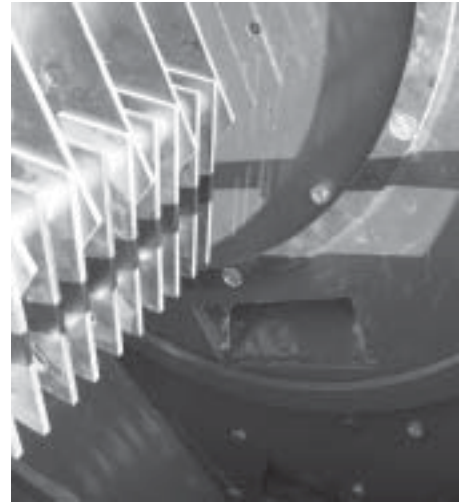
BLOWER INLET & OUTLET

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:

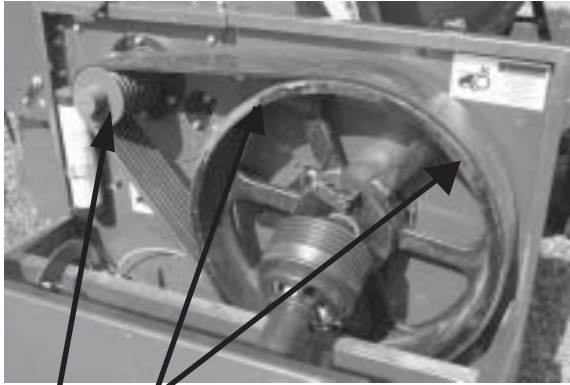
1. Open the mill screen cover and clean material out of the mill/cylinder and transfer auger area.
2. Check the auger/transmission shear bolt to determine if it has sheared. Rotate the mill drive sheave by hand to turn the sprocket, shaft and transfer auger. If the shaft does not turn, follow the shear 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

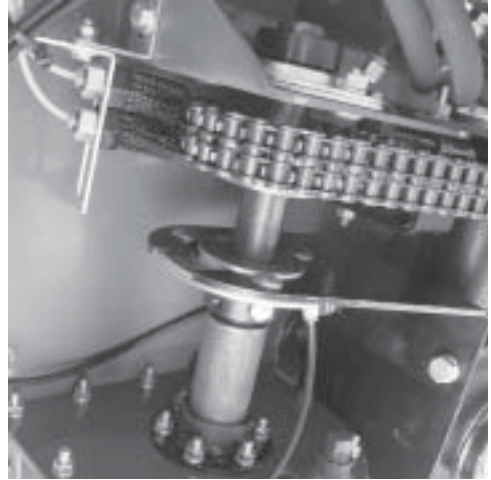
The transfer auger/transmission shaft is driven by a sprocket which is connected by the front drive chain to a sprocket on the main drive shaft. The front chain tension is self-adjusted by a spring-loaded idler and does not require adjustment. The chain should be inspected periodically for signs of wear.



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 1/4" (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 1/2" (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 GX1117 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 GX1117 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)

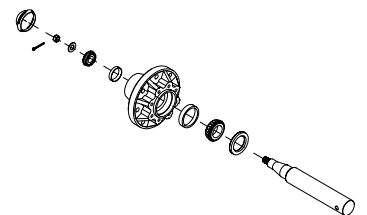
Grease Each Time a Bolt is Sheared or at least Once a Year

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.



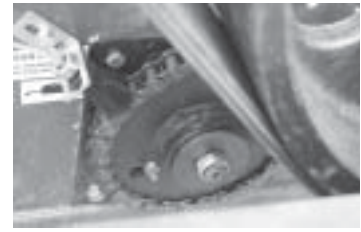
LUBRICATION (cont.)



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)



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



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)



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



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

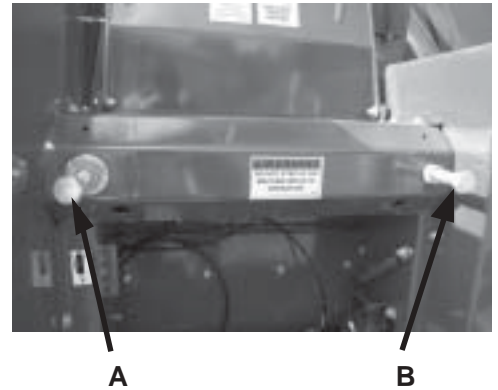
The oil filter should be replaced once a year or every 75 hours of operation, whichever comes first. The oil should be drained and replaced every two years or every 150 hours of operation, whichever comes first. Keep oil filled to proper level.

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.



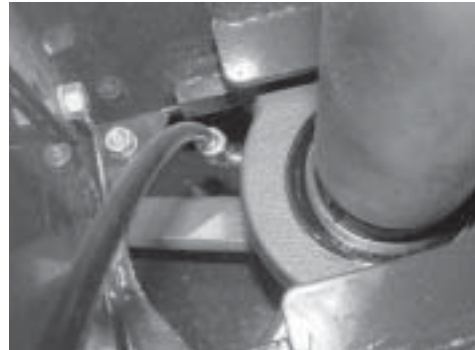
IMPORTANT: *The mill/blower drive belt will deteriorate more rapidly if improper tension is applied. Uneven sheave alignment will result in uneven belt stretch. Improper mill/blower belt tension will produce excessive pressure on the mill/blower bearings and cause premature bearing failure.*

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.

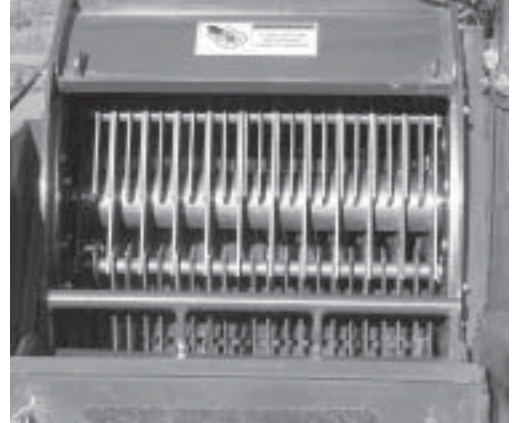


SERVICE

MILL HAMMER ROTATION OR REPLACEMENT

To maintain maximum grinding efficiency, the mill hammers should be rotated before wear radius measures $\frac{1}{4}$ " (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 $\frac{1}{4}$ " (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 $\frac{3}{16}$ x 1- $\frac{1}{4}$ " 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 GX1117 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 Frontier 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.

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.*

TIRES & WHEELS

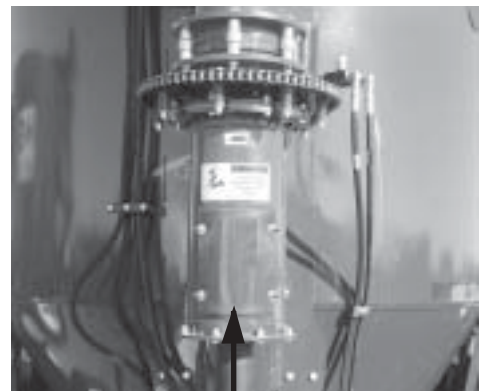
Check the Tire pressure after every 50 hours of operation. Tires should be inflated to 80 PSI (563kpa). Wheel lugs torque should also be checked after every 50 hours of operation and tightened to 90 ft-lb (124 Nm) torque.



NOTE: *Check the transmission oil level periodically.*



Lower Unloading Auger Cleanout



Vertical Unloading Auger Cleanout

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 GX1117.



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.



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.



Pivoting Mounting Bracket

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 9.2GPM 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.	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.
	Not enough oil flow to hydraulic pump.	Change oil filter, replace oil with new oil and fill to proper level.
	Hydraulic pump defective.	Replace hydraulic pump.
	Hydraulic motor defective.	Repair or replace hydraulic motor.
	SIA relief valve pressure set too low.	Check pressure to valve, if pressure is low adjust to factory setting or replace if will not adjust.
	SIA auger partially plugged.	Remove plugging material.
	SIA pressure relief valve doesn't function properly.	Check pressure to valve, if it will not adjust to the factory setting, replace the valve.

DECAL PLACEMENT

Your Frontier GX1117 was manufactured with operator safety in mind. Located on GX1117 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.

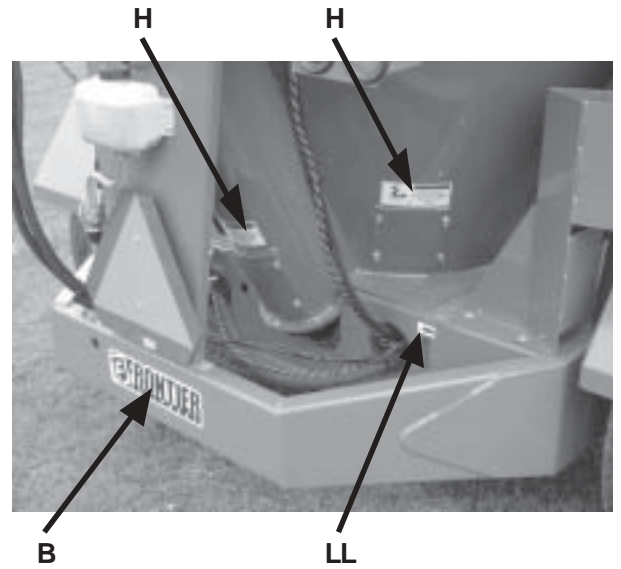
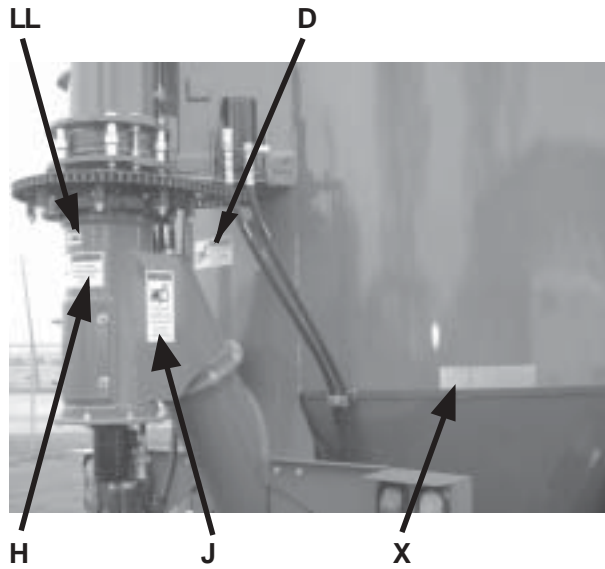
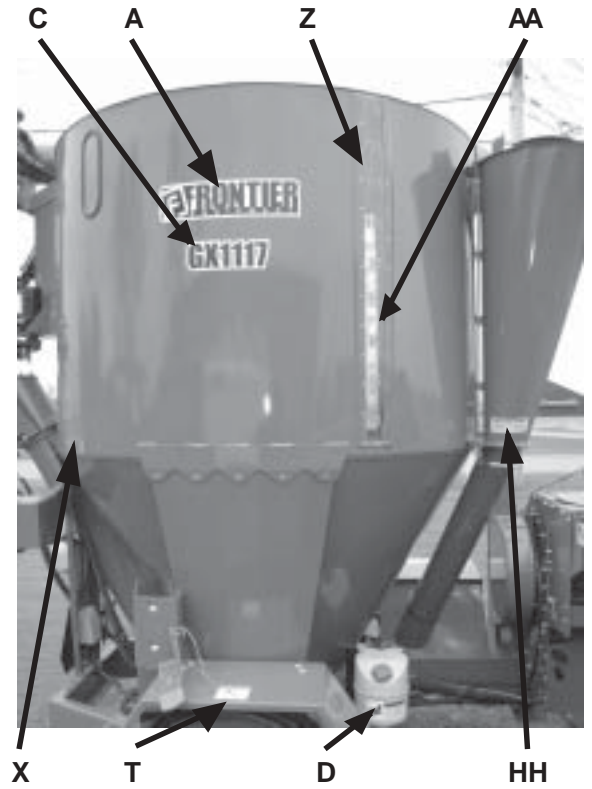
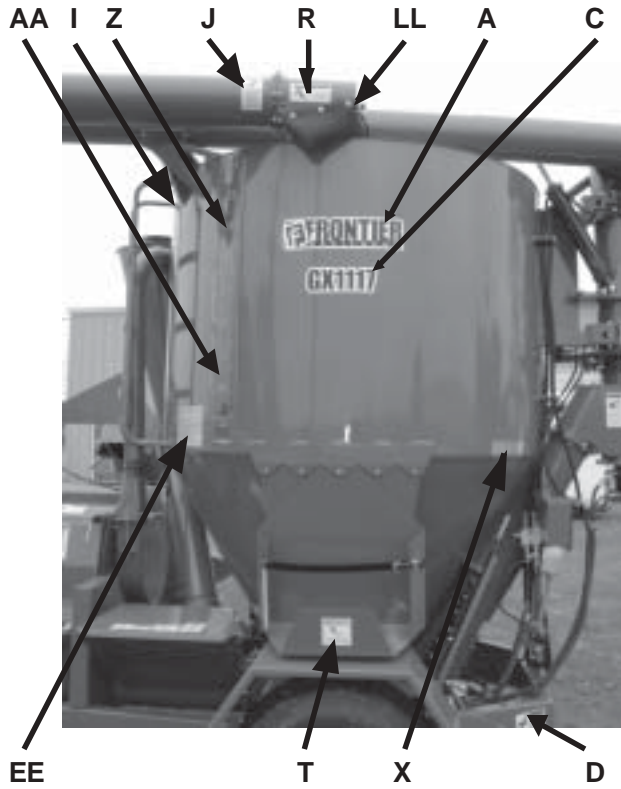


DO NOT REMOVE ANY OF THESE DECALS. IF DECALS ARE LOST, DAMAGED, OR IF YOUR GRINDER-MIXER IS REPAINTED, REPLACE DECALS. REMEMBER: DECALS ARE FOR YOUR PROTECTION AND SAFETY.

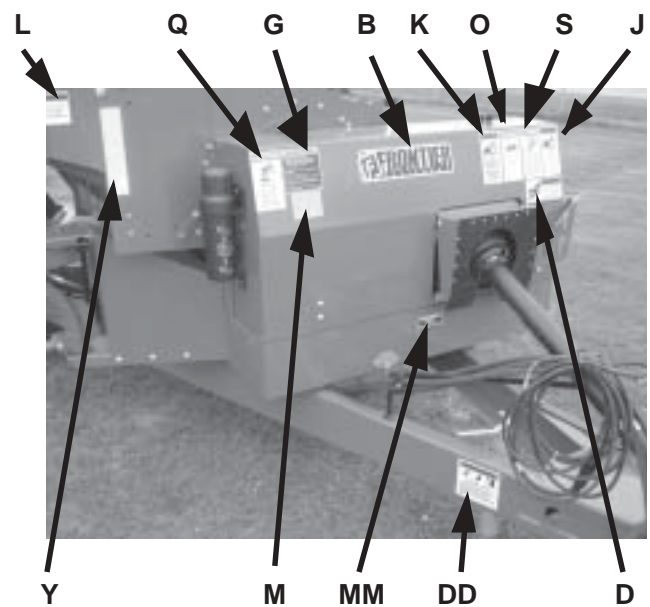
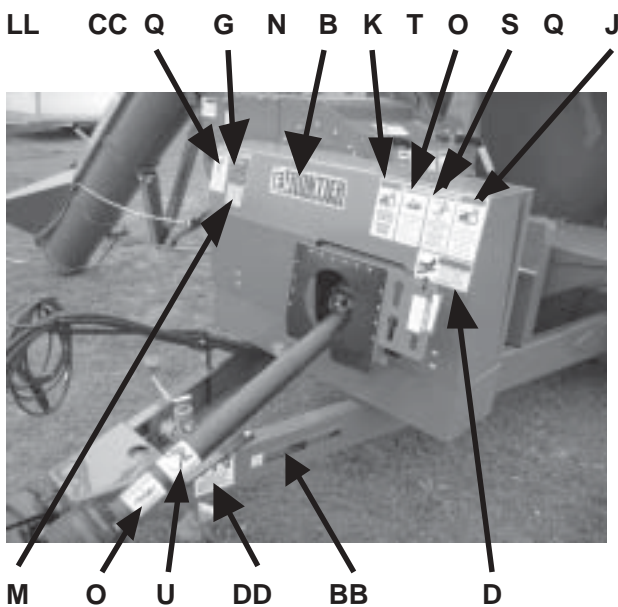
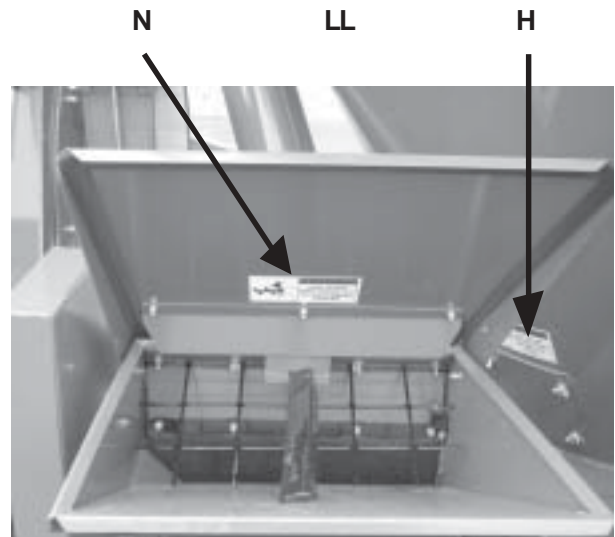
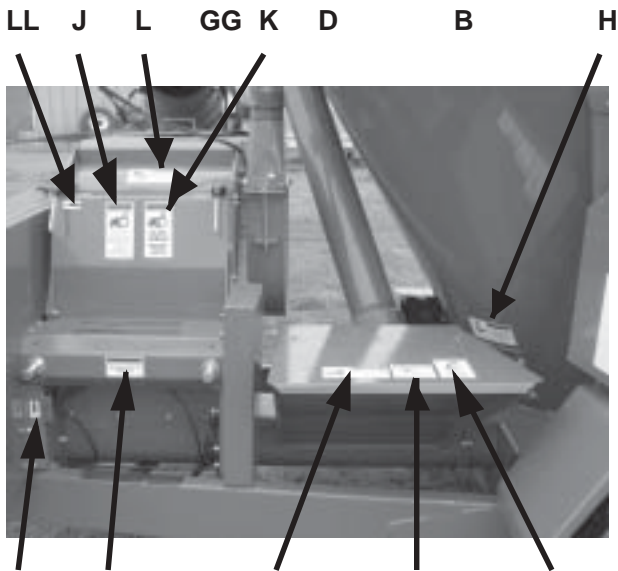
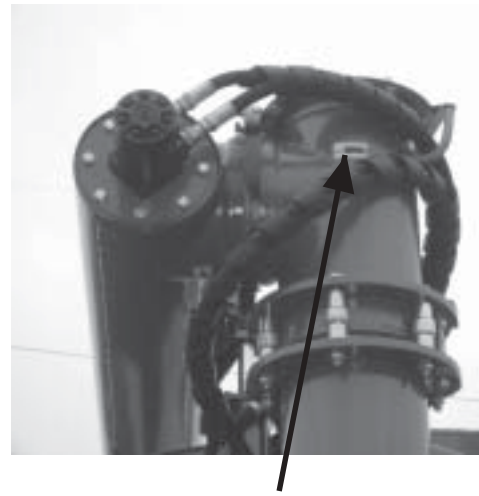
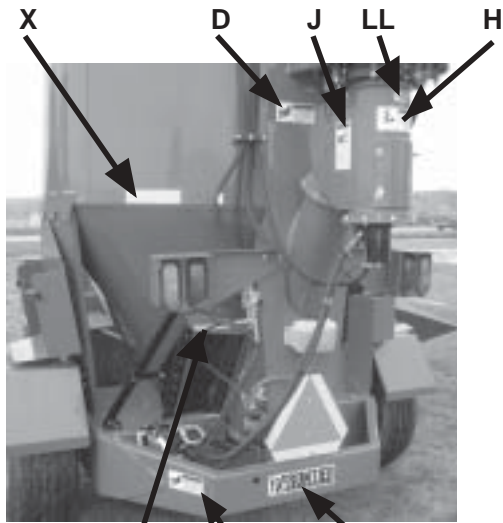
Listed below are the decals on your GX117 Grinder-Mixer. These decals may be ordered individually by part number, or by ordering as a complete set.

ITEM	PART NO.	DESCRIPTION	QTY.
A.	5HPFRONTIER19	Frontier Decal	2
B.	5HPFRONTIER13	Frontier Decal	2
C.	5HP1117GX	Frontier Model Decal	2
D.	5HP11599	WARNING - Do Not Go Near Leaks	4
E.	5HP1494A	WARNING - Do Not Operate	2
F.	5HP32597A	WARNING - Do Not Operate	1
G.	5HPFRON1	CAUTION - Avoid Serious Injury	1
H.	5HP81209	WARNING - Stay Clear Rotating Auger	4
I.	5HP82907F	DANGER - Keep Out Do Not Enter Tank	1
J.	5HP1494J	WARNING - Do Not Clean or Work	4
K.	5HP1494K	WARNING - Do Not Remove Shields	2
L.	5HP82907D	WARNING - Stay Clear Rotating Parts Inside	4
M.	5HPHS404	Patent Numbers	1
N.	5HP82907G	WARNING - Stay Clear Keep Hands Out	2
O.	5HP1494L	DANGER - Rotating Driveline	2
P.	5HP82907H	DANGER - Keep Hands and Feet Away	1
Q.	5HP82907L	DANGER - Never Allow Riders	2
R.	5HP82907A	WARNING - Stay Clear of Discharge Auger	2
S.	5HP1494P	DANGER - Maintain Safe Clearance From Power Lines	3
T.	5HP9194A	DANGER - No Step Stay Clear	3
U.	5HP093466	WARNING - Operate Only With 540 PTO (540 PTO Only)	1
V.	5HP82907C	WARNING - Keep Hands and Feet Out	4
W.	5HP82907B	WARNING - Stay Clear of Auger Extension Hinge Area (With Optional Extension Only)	1
X.	5HP2X9RED	Red Reflector	2
Y.	5HP2X9AMBER	Amber Reflector	2
Z.	5HPGMA	95 - 135 Bushel Decal	2
AA.	5HPGMB	55 - 85 Bushel Decal	2
BB.	5HP92606	WARNING - Do Not Exceed Transport Speed	1
CC.	5HP82907I	WARNING - Do Not Step Up On Machine	1
DD.	5HP82602	WARNING - Crushing Hazard	2
EE.	5HP100107	Operating Instructions	1
FF.	5HP1202177	Pull to Stop	1
GG.	5HP82907M	Discharge Auger Door - Open/Close	1
HH.	5HP82907K	Cyclone Cover - Open/Close	1
II.	5HP11211176	Shear Bolts	1
JJ.	5HP5696D	Disengage	1
KK.	5HP5696E	Engage	1
LL.	5HP093020	Grease Zerk Decal	7
MM.		Serial Number	1

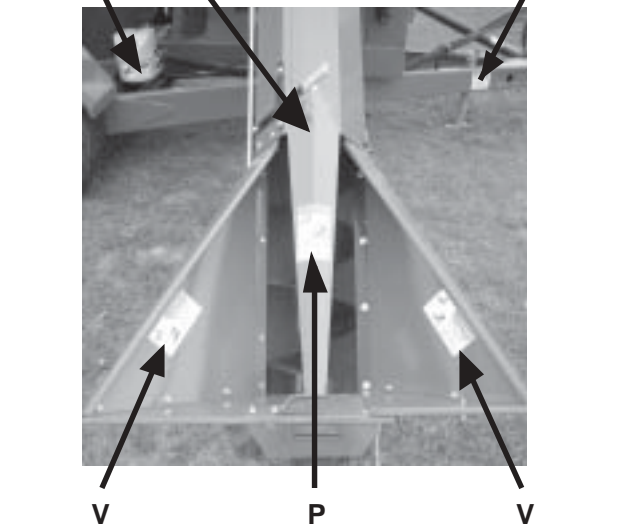
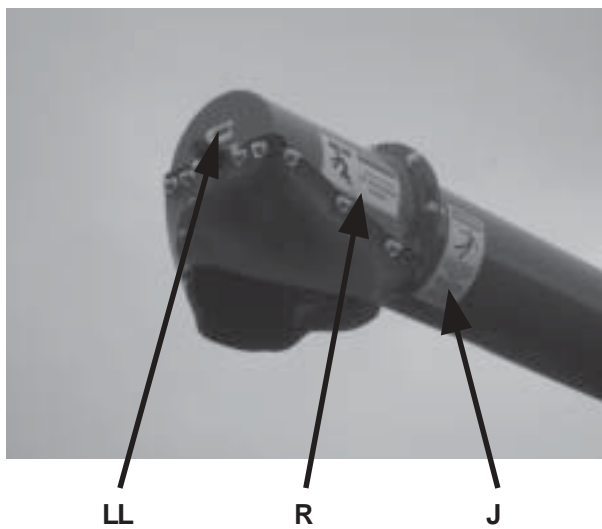
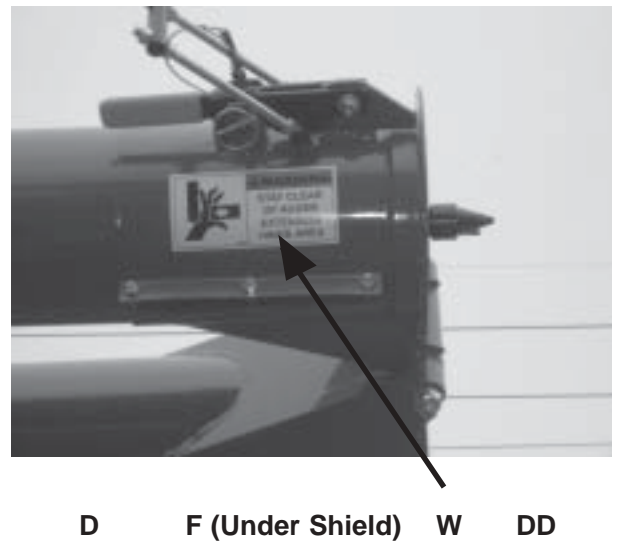
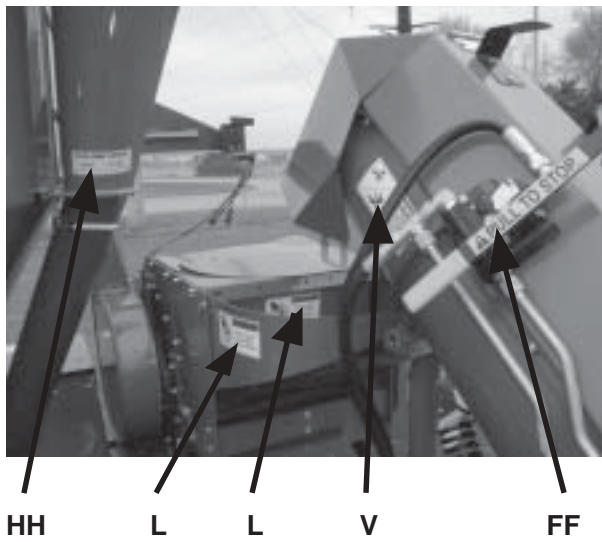
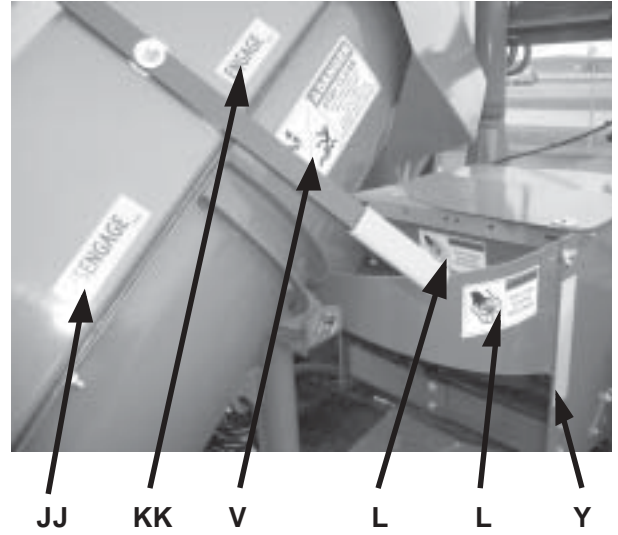
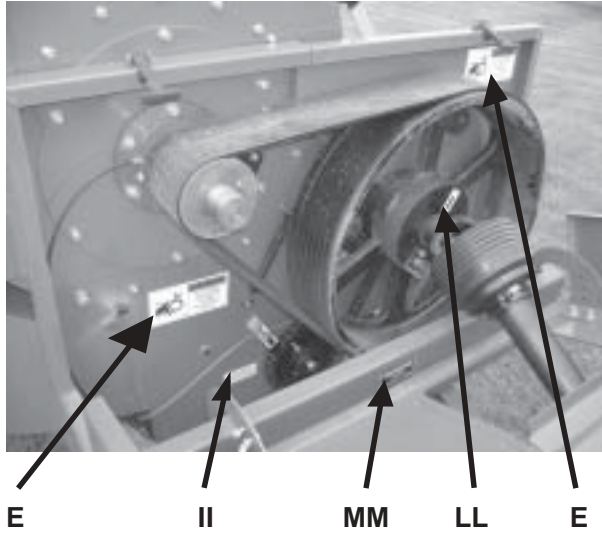
DECAL PLACEMENT



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)



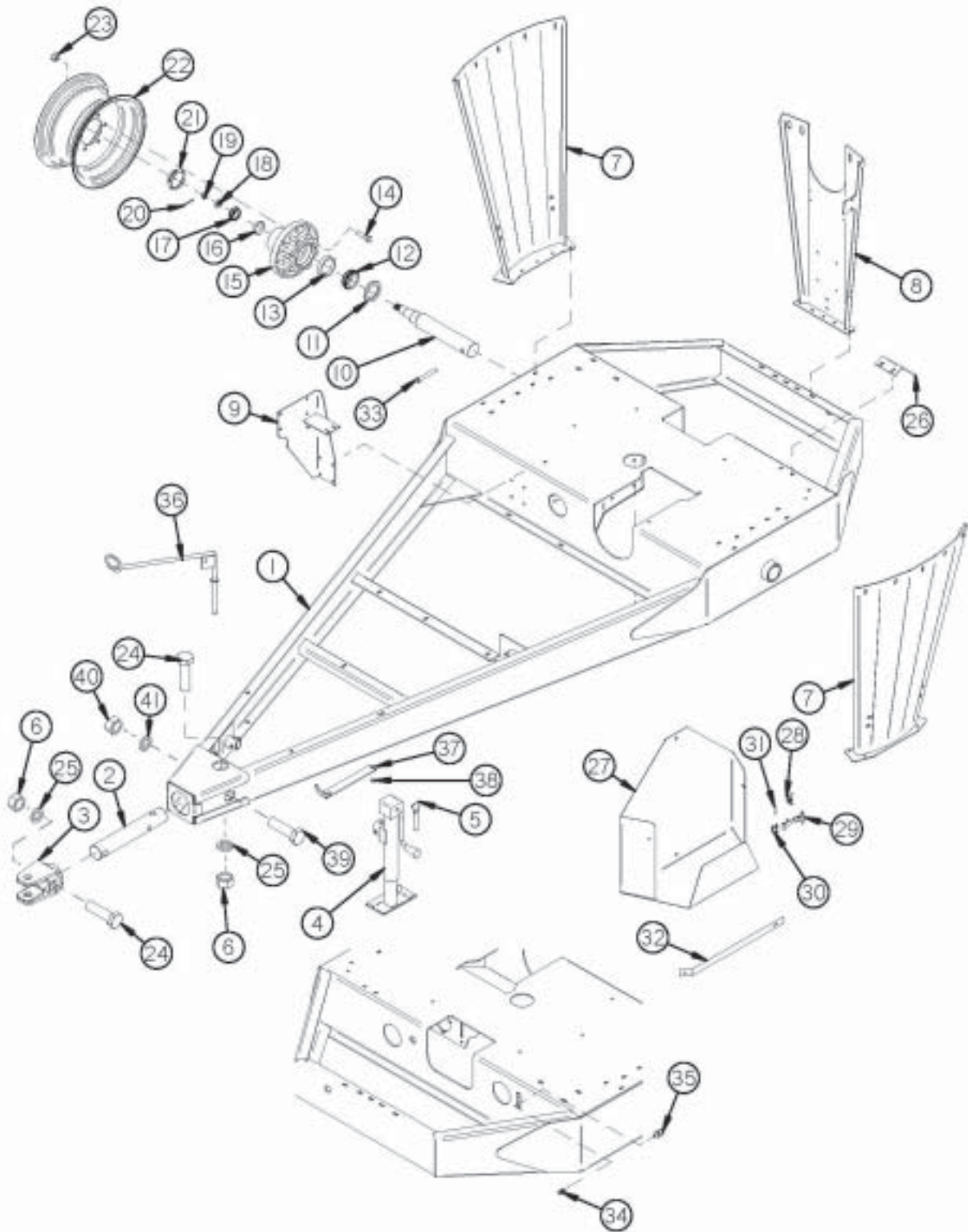
PLEASE RECORD NUMBERS FOR YOUR UNIT FOR QUICK REFERENCE

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.

FIGURE 1



**FIGURE 1
FRONTIER MODEL GX1117
FRAME**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM72	Frame
2.	5HPGM73	Hitch Shaft
3.	5HPGM74	Hitch
4.	5HPGM396	Jack
5.	5HP12N13	Jack Pin & Chain
6.	5HPt151	1" Nut
7.	5HPGM76	Tank Side Support
8.	5HPGM77	Tank Back Support
*	5HPF97	SMV Bracket
9.	5HPGM78	Oil Tank Bracket
10.	5HPGM79	Spindle
11.	5HPB90	Seal
12.	5HPB91	Inner Bearing
13.	5HPB91A	Inner Race
14.	5HP26G5A	Stud 5/8" - 18
15.	5HP26G4A	Hub (821)
16.	5HPB94A	Outer Race
17.	5HPB94	Outer Bearing
18.	5HPB4	Washer
19.	5HPB3	Nut
20.	5HPB31	Cotter Pin
21.	5HPB2	Hub Cap
22.	5HPRG73	Wheel (W-51350)
*	5HPGM394	Tire (12.5L x 15 20Ply)
23.	5HP26G6A	Lug Nut 5/8" - 18
24.	5HPGM80	1" x 5" Bolt GR. 5
25.	5HPDWM171	1" Lock Washer
26.	5HPGM397	Flow Control Bracket
27.	5HPGM398	Screen Holder
28.	5HPX193	Latch Keeper
29.	5HPX192	Rubber Latch
30.	5HPX194	Latch Mounting Bracket
31.	5HPX195	Latch Pin
32.	5HPGM399	Screen Holder Strap
33.	5HPB10	1/2" x 4" Bolt GR. 5
34.	5HPG89	Grease Zerk (#1641)
35.	5HPGM424	1/4" - 28 Grease Line Adapter
36.	5HPGM440	Grinder Hose Holder
37.	5HP42N2	PTO Holder
38.	5HP42N3	Spring (MB1000-035)
39.	5HPGM183	3/4" x 4-1/2" Bolt GR. 5
40.	5HPGM417	3/4" - 10 Nut
41.	5HPRG199	3/4" Lock Washer

NOTE: * (MEANS NOT SHOWN)

FIGURE 2

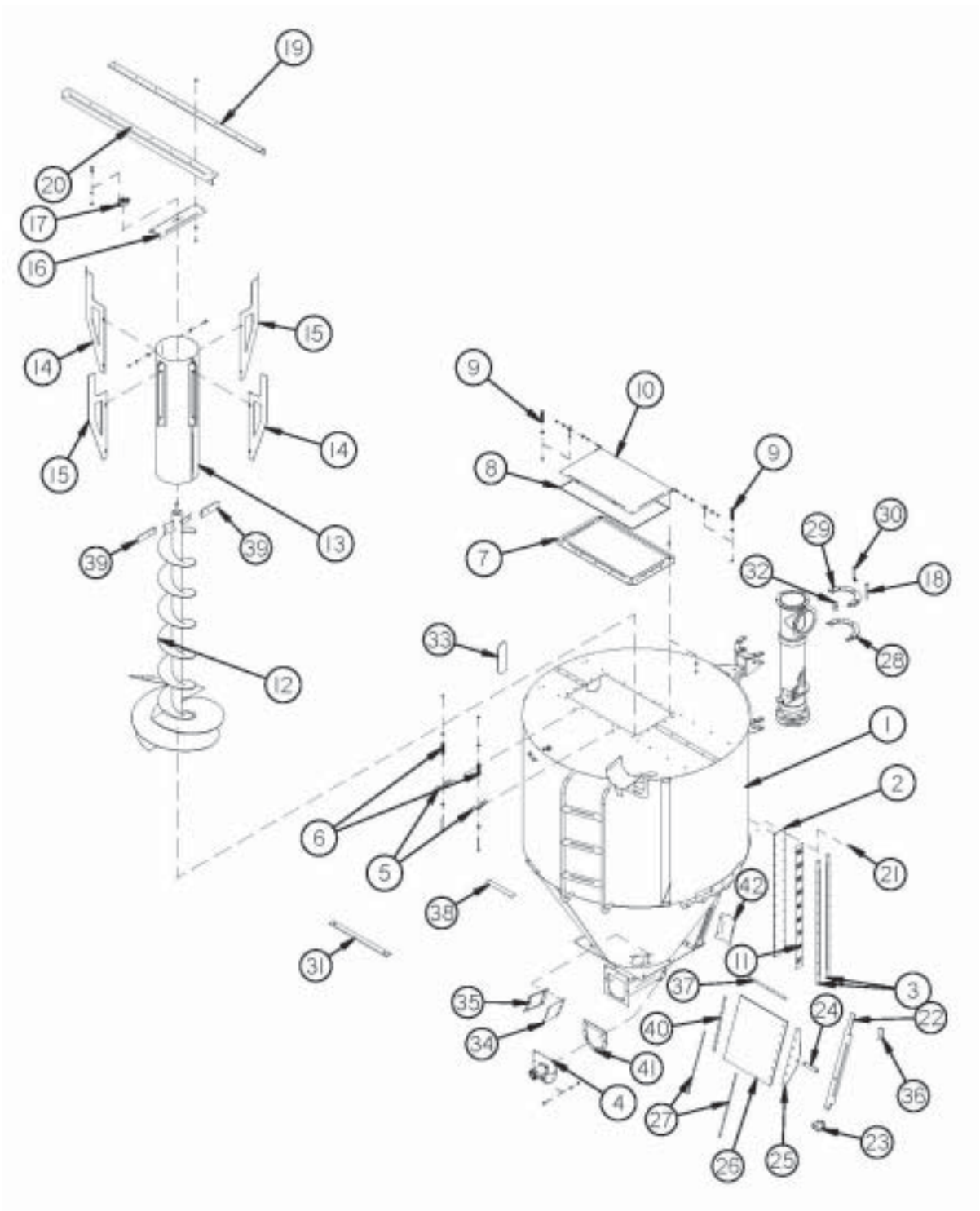
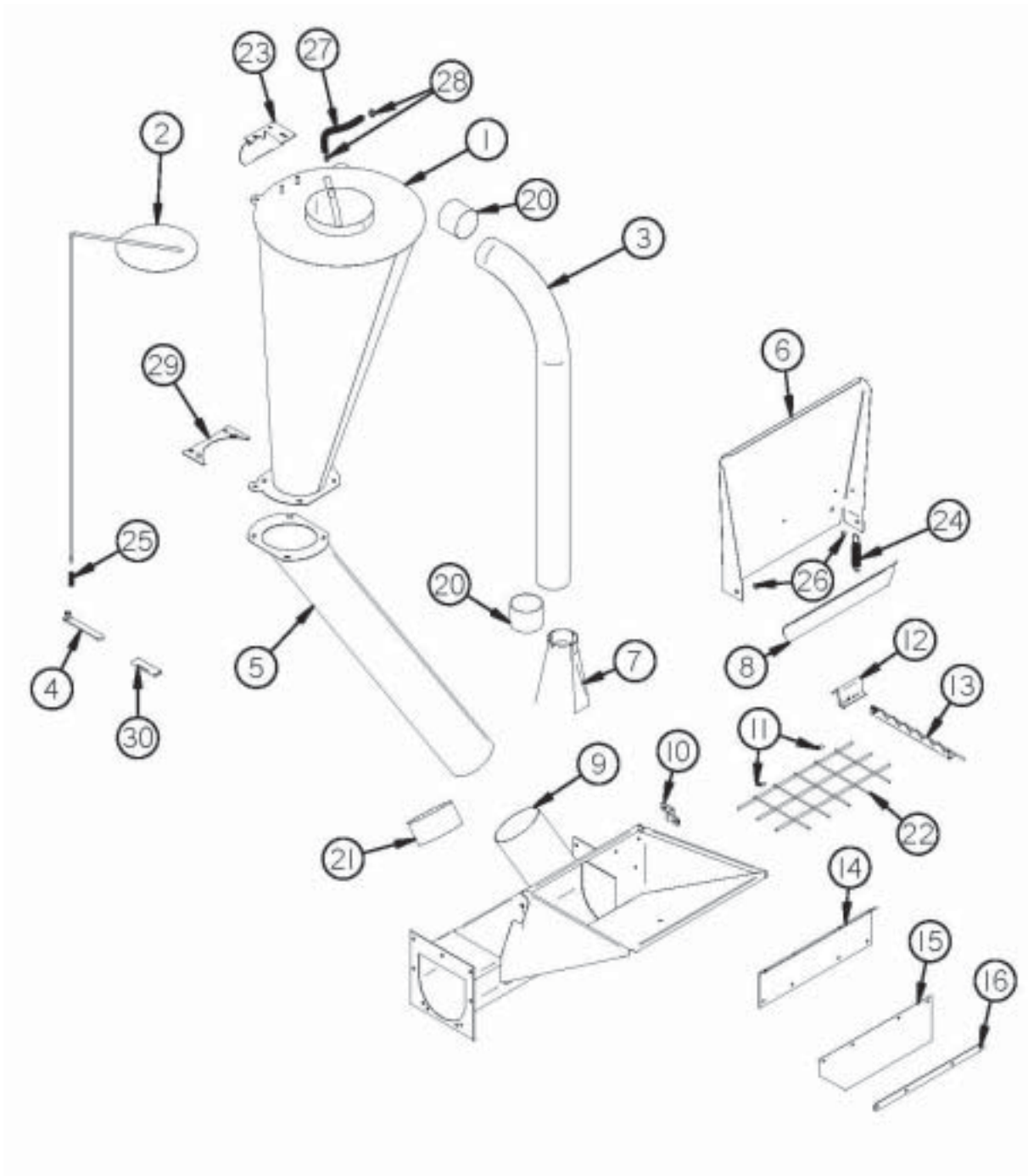


FIGURE 2
FRONTIER MODEL GX1117
TANK

ITEM	PART NO.	DESCRIPTION
1.	5HPGM301	Tank
2.	5HPGM302	Window
3.	5HPGM303	Window Frame
4.	5HPGM304	Motor Mount
5.	5HPGM305	Lid Latch
6.	5HPGM225	Latch Spring (A262)
7.	5HPGM307	Lid Frame
8.	5HPGM308	Lid Gasket
9.	5HPGM309	Spring (A162 Spring)
10.	5HPGM310	Lid
11.	5HPGMA	Decal (Bushel Upper Half)
*	5HPGMB	Decal (Bushel Lower Half)
12.	5HPGM311	Mixing Auger
13.	5HPGM312	Mixing Auger Tube
14.	5HPGM313	Mixing Tube Support B
15.	5HPGM314	Mixing Tube Support
16.	5HPGM315	Mixing Auger Top Support
17.	5HPT40	Bearing
18.	5HPGM463	1/2" x 5" Bolt GR. 5 Full Thread
19.	5HPGM317	Tank Top Frame Channel Back
20.	5HPGM318	Tank Top Frame Channel Front
21.	5HPGM234	3/16" x .700" (0155997)
22.	5HPGM334	Door Handle
23.	5HPGM335	Door Stop
24.	5HPGM336	Door Linkage
25.	5HPGM337	Door Edge
26.	5HPGM338	Door
27.	5HPGM339	Door Seal Strap
*	5HPGM348	Rubber Door Seal Front (Left)
*	5HPGM349	Bubber Door Seal Back (Right)
28.	5HPGM340	Split Ring Bottom
29.	5HPGM341	Split Ring Top
30.	5HPGM342	Step Bolt
31.	5HPGM442	Poly Strip
32.	5HPGM345	Roller
33.	5HPGM346	Top Sight Window
*	5HPGM347	Window Gasket
34.	5HPGM356	Clean Out Door
35.	5HPGM357	Clean Out Gasket
36.	5HPS403	Handle Grip
37.	5HPGM391	Inside Door Seal Strap
*	5HPGM392	Inside Door Seal
38.	5HPGM435	Safety T read
39.	5HPGM437	Paddle Mixer
40.	5HPGM438	Door Seal Strap
*	5HPGM439	Rubber Door Seal
41.	5HPGM320	Auger Bottom Cap Spacer
42.	5HPGM488	Auger Clean Out Door
*	5HPGM509	Felt Gasket

NOTE: * (MEANS NOT SHOWN)

FIGURE 3

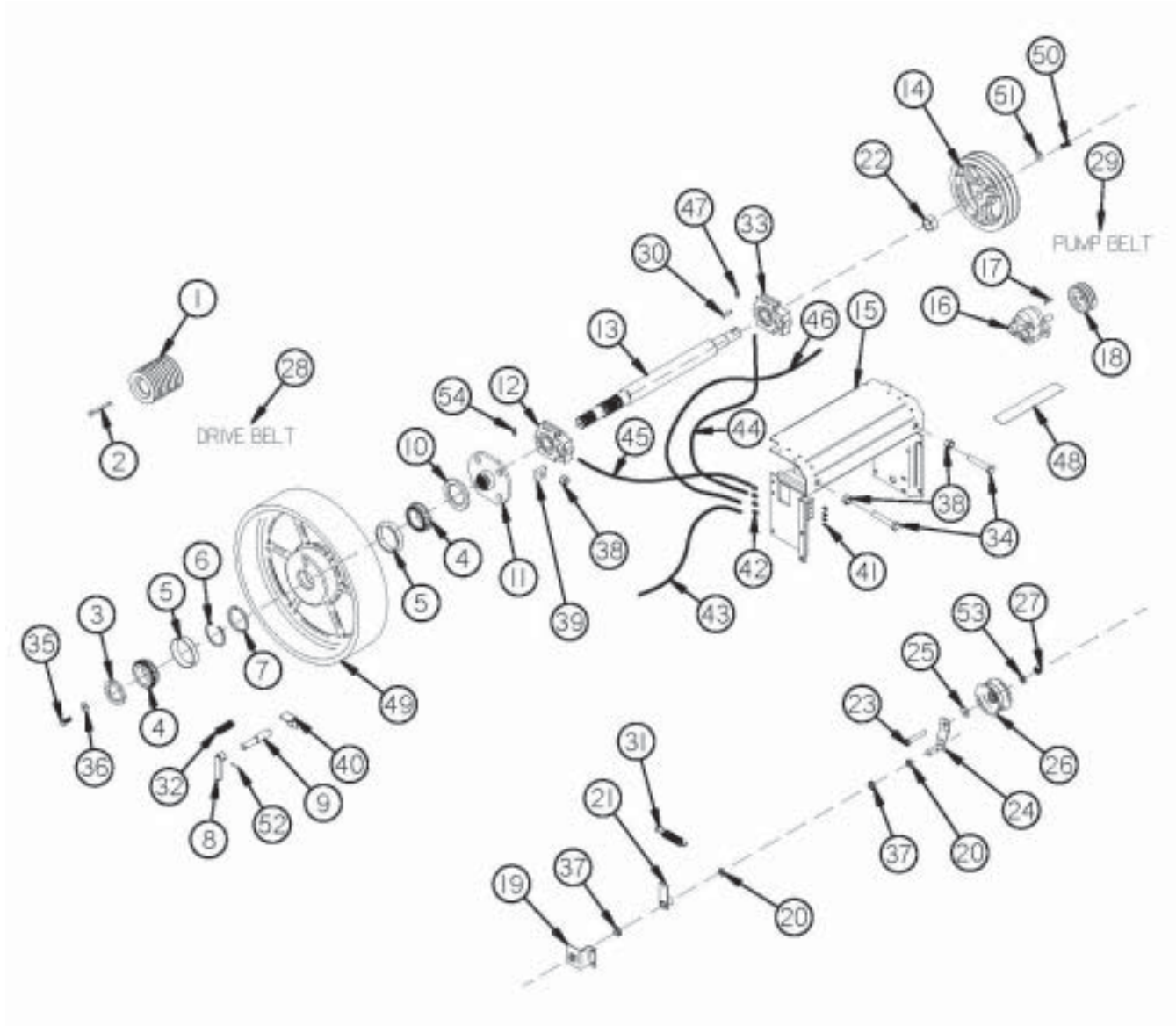


**FIGURE 3
FRONTIER MODEL GX1117
CONCENTRATE HOPPER & COLLECTOR**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM81	Dust Collector
2.	5HPGM82	Dust Collector Cover
3.	5HPGM83	Blower Pipe
4.	5HPGM84	Cover Handle
5.	5HPGM85	Dust Collector Pipe
6.	5HPGM86	Cover Hopper
*	5HPGM420	Cover Seal
7.	5HPGM87	Blower Transition Chute
8.	5HPGM88	Stop Cover
9.	5HPGM89	Supplement Hopper
10.	5HPGM90	Retainer Guard
11.	5HPGM91	Hose Clamp
12.	5HPGM92	Support Breaker
13.	5HPGM93	Breaker Bar
14.	5HPGM94	Dust Shield
15.	5HPGM95	Dust Flap
16.	5HPGM96	Dust Flap Retainer
20.	5HPGM100	Blower Pipe Seal
21.	5HPGM101	Dust Collector Seal
22.	5HPGM360	Hopper Grate
23.	5HPGM368	Adjustable Mount Plate
24.	5HPK103	Spring (SP10)
25.	5HP17G128	Spring
26.	5HPGM443	Supplement Hopper Door Pivot
27.	5HPGM452	3/4" x 14" Hose
28.	5HPGM453	1" Hose Clamp
29.	5HPGM460	Adjustable Support Bottom
30.	5HPGM370	Handle Grip

NOTE: * (MEANS NOT SHOWN)

FIGURE 4

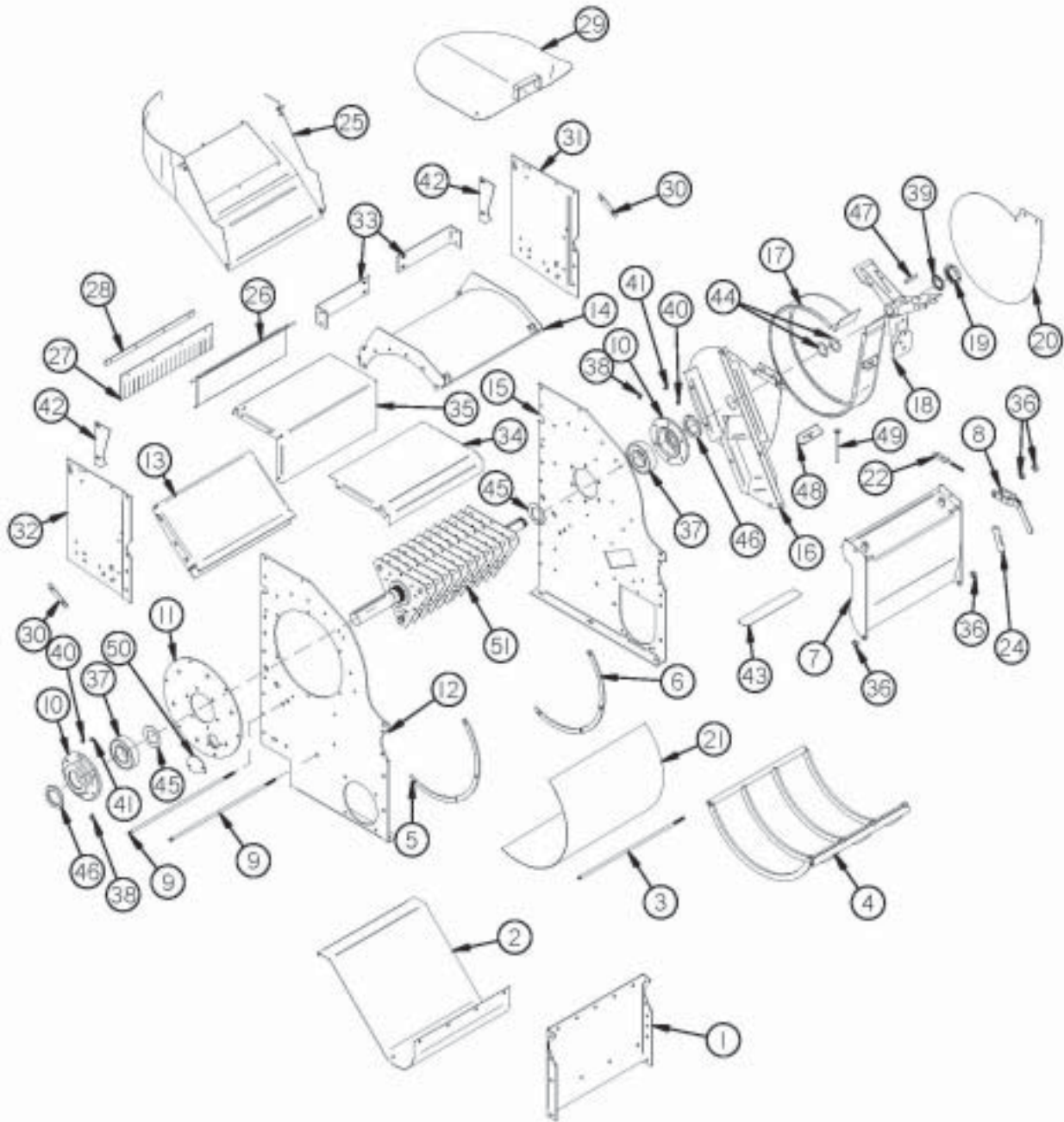


**FIGURE 4
FRONTIER MODEL GX1117
DRIVE LINE**

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	5HPGM102	Mill Sheave 540 RPM	*	5HPGM130	V-Belt (8/A96) 1000 RPM 98"
*	5HPGM103	Mill Sheave 1000 RPM	29.	5HPGM131	V-Belt (2/A62) 540 RPM 64"
2.	5HPGM104	3/8" Taper Key	*	5HPGM132	V-Belt (2/A52) 1000 RPM 54"
3.	5HPGM105	Seal (22338)	30.	5HPG12	5/16" x 1" Key
4.	5HPGM106	Outer Bearing (LM501349)	31.	5HPGM410	Spring (B11108) 540 RPM
5.	5HPGM107	Race (LM501310)	*	5HPGM454	Spring (U10063) 1000 RPM
6.	5HPGM108	Snap Ring	32.	5HPGM411	Spring (13E29)
7.	5HPGM109	Spacer	33.	5HPGM413	Bearing (UCT208-24-11/16)
8.	5HPGM110	Clutch Handle	34.	5HPGM306	3/4" x 5" Bolt GR.5 Full Thread
9.	5HPGM111	Clutch Pin	35.	5HPGM414	1/2"-20 x 1-1/4" Bolt GR.5
10.	5HPGM112	Seal (22430)			w/Hole
11.	5HPGM113	Flywheel Clutch	36.	5HPGM415	Input Yoke Washer
12.	5HPGM114	Bearing (UCT-210-31 1 1/16)	37.	5HPGM416	Idler Pivot Bushing
13.	5HPGM115	Main Drive Shaft	38.	5HPGM417	3/4"-10 Nut
14.	5HPGM508	Pump Drive Sheave (540 RPM)	39.	5HPGM445	Slider Bearing Nut
*	5HPGM117	Pump Drive Sheave (1000 RPM)	40.	5HPGM423	Flywheel Clutch Bracket
15	5HPGM118	Drive Shaft Carrier	41.	5HPG89	Grease Zerk (#1641)
16.	5HPGM14	Pump	42.	5HPGM424	1/4"-28 Grease Line Adapter
17.	5HPGM275	3/16" Key (Sq. Key Round Ends)	43.	5HPGM425	Grease Line 70"
18.	5HPGM120	Pump Sheave	44.	5HPGM426	Grease Line 25"
19.	5HPGM121	Idler Shaft Support	45.	5HPGM427	Grease Line 20"
20.	5HPGM122	Spacer	46.	5HPGM428	Grease Line 85"
21.	5HPGM123	Arm	47.	5HPGM429	1/4"-28 90° Adapter
22.	5HPGM444	Sheave Spacer	48.	5HPGM435	Safety Tread
23.	5HPBFR438	5/8" x 2" Bolt GR. 5	49.	5HPGM41	Flywheel
24.	5HPGM125	Idler Arm	50.	5HPGM456	1/2"-20 x 1-1/4" Bolt GR.5
25.	5HPRG8	5/8" Flat Washer	51.	5HPGM124	540 Sheave Washer
26.	5HPGM127	Idler Pulley	52.	5HPGM40	1/4" x 1-1/4" Expansion Pin
27.	5HPGM128	5/8" - 11 Nut	53.	5HPT69	5/8" Lock Washer
28.	5HPGM129	V-Belt (8/A91) 540 RPM 93"	54.	5HPGM419	1/8" Grease Line Adapter

NOTE: * (MEANS NOT SHOWN)

FIGURE 5

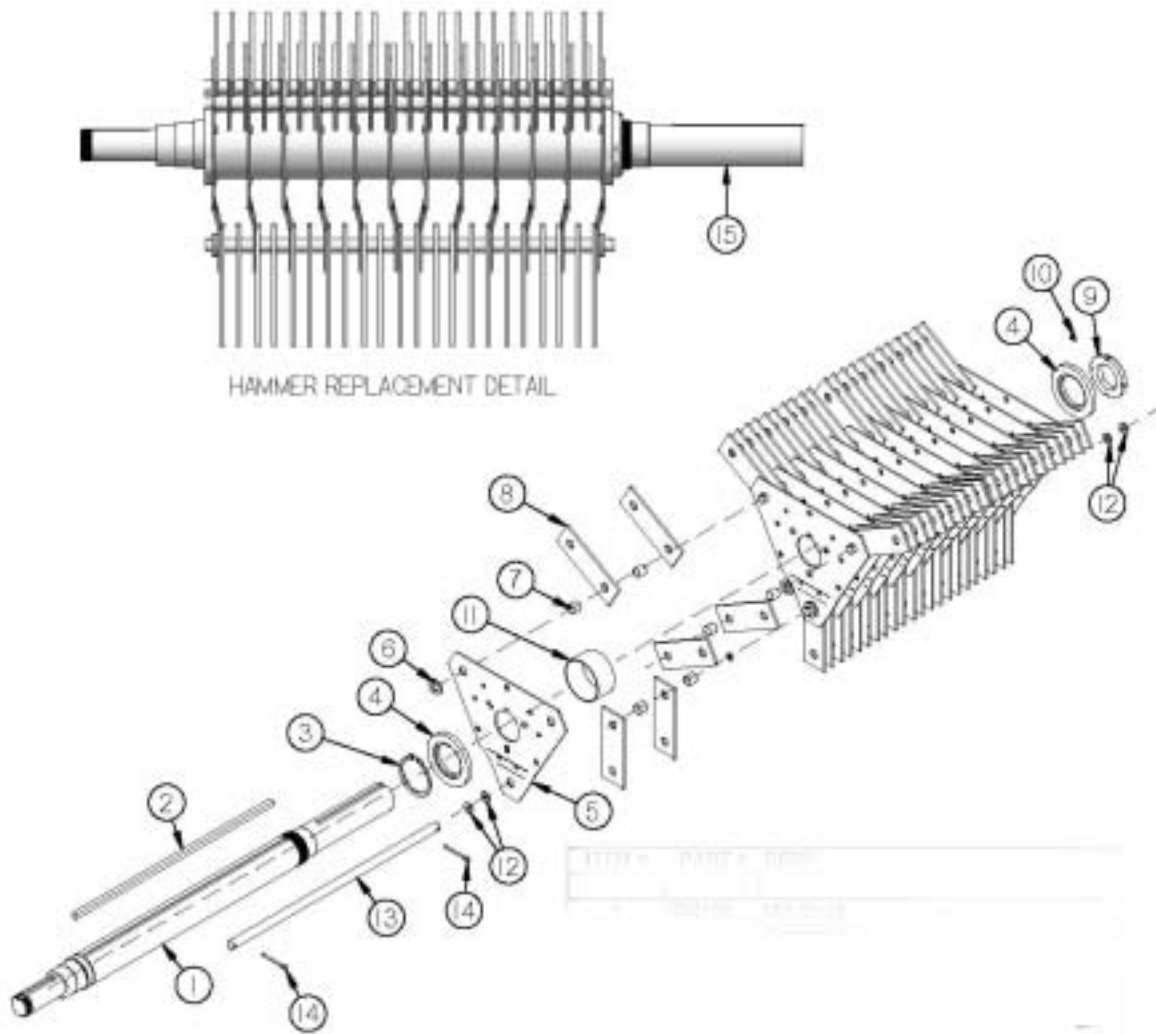


**FIGURE 5
FRONTIER MODEL GX1117
MILL**

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	5HPGM133	Grinder Side Panel	*	5HPGM165	Hammer Mill Screen 2"
2.	5HPGM134	Mill Bottom Panel	22.	5HPGM166	Door Hook
3.	5HPGM135	Mill Long 1/2" x 22.500"	24.	5HPGM370	Handle Grip
4.	5HPGM136	Screen Support	25.	5HPGM351	Infeed Chute For Infeed Conveyor
5.	5HPGM137	Screen Guide Front			
6.	5HPGM138	Screen Guide Back	*	5HPGM352	Chute Magnet
7.	5HPGM139	Grinder Door	26.	5HPGM353	Infeed Flap
8.	5HPGM140	Door Latch	27.	5HPGM354	Infeed Flap Rubber
9.	5HPGM141	3/8" x 22.375 Rod	28.	5HPGM355	Infeed Flap Rubber S trap
10.	5HPGM142	Bearing Housing	29.	5HPGM358	Infeed Chute Cover
11.	5HPGM143	Cylinder Cover	30.	5HPGM362	Hopper Adjustment
12.	5HPGM144	Mill Front Panel	31.	5HPGM363	Grinder Throat Left
13.	5HPGM145	Throat Plate	32.	5HPGM364	Grinder Throat Right
14.	5HPGM146	Grinder Top	33.	5HPGM365	Chute Brace
15.	5HPGM147	Mill Back Panel	34.	5HPGM366	Chute Mid Shield
16.	5HPGM148	Front Blower Panel	35.	5HPGM367	Chute Top Shield
17.	5HPGM149	Blower Band	36.	5HPGM180	Pivot Spacer
18.	5HPGM150	Blower Fan	37.	5HPGM421	Bearing (J211WDN)
19.	5HPGM151	Nut (N-08)	38.	5HPGM419	1/8" Grease Line Adapter
20.	5HPGM152	BlowerBack Panel	39.	5HPGM431	Locking Washer
21.	5HPGM154	Hammer Mill Screen 1/8"	40.	5HPGM432	3/8"-16 Set Screw w/Point
*	5HPGM155	Hammer Mill Screen 3/16"	41.	5HPS355	3/8"-16 Jam Nut
*	5HPGM156	Hammer Mill Screen 1/4"	42.	5HPGM433	Chute Stop
*	5HPGM157	Hammer Mill Screen 5/16"	43.	5HPGM435	Safety Tread
*	5HPGM158	Hammer Mill Screen 3/8"	44.	5HPGM448	Fan Spacer
*	5HPGM159	Hammer Mill Screen 1/2"	45.	5HPGM449	Bearing Spacer
*	5HPGM160	Hammer Mill Screen 5/8"	46.	5HPGM450	Seal (2608)
*	5HPGM161	Hammer Mill Screen 3/4"	47.	5HPGM462	3/8" x 2-1/2" Key
*	5HPGM162	Hammer Mill Screen 1"	48.	5HPGM316	Blower Band Angle
*	5HPGM163	Hammer Mill Screen 1-1/4"	49.	5HPGM323	3/8" x 8-1/2" Bolt GR.5
*	5HPGM164	Hammer Mill Screen 1-1/2"	50.	5HPGM457	Service Port Cover
			51.	5HPGM451	Complete Mill Cylinder

NOTE: * (MEANS NOT SHOWN)

FIGURE 6



**FIGURE 6
FRONTIER MODEL GX1117
MILL CYLINDER**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM168	Mill Shaft
2.	5HPGM169	3/8" x19-3/8" Cylinder Key
3.	5HPGM465	Retaining Ring (EN237)
4.	5HPGM171	Retainer Plate
5.	5HPGM172	Cylinder Plate (12 Pcs.)
6.	5HPGM173	Spacer
7.	5HPGM174	Hammer Spacer
8.	5HPGM175	Hammer (66 Pcs.)
9.	5HPGM176	Cylinder Shaft Nut (N-12)
10.	5HPGM277	1/4"-20 x .375 Set Screw
11.	5HPGM177	Spacer Plate
12.	5HPGM430	Balance Washer (4 Pcs.)
13.	5HPGM44	Hammer Shaft
14.	5PHSB53	3/16" x 1-1/4" Cotter Pin
15.	5HPGM451	Complete Cylinder

FIGURE 7

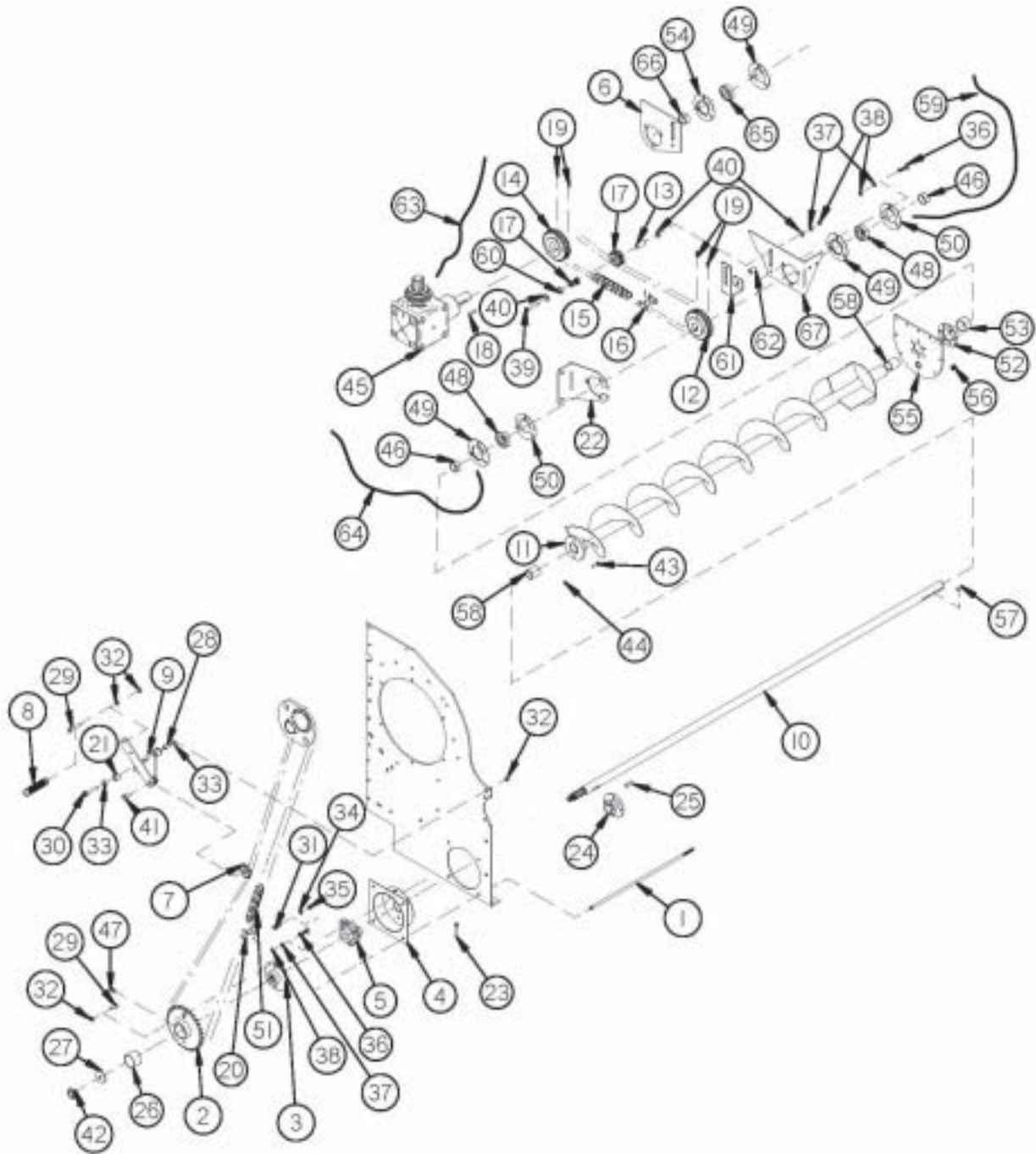
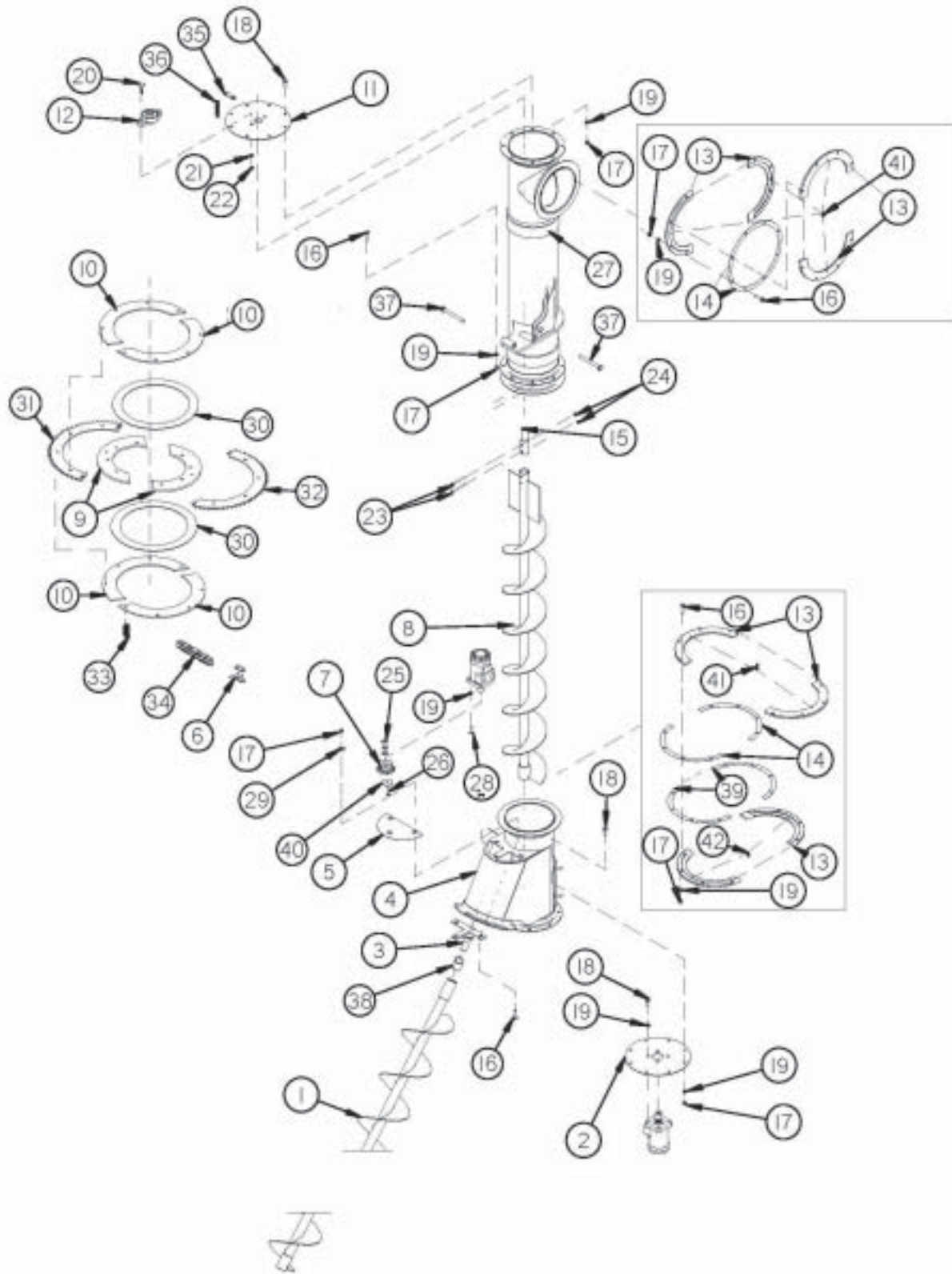


FIGURE 7
FRONTIER MODEL GX1117
CONVEYOR DRIVE

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	5HPGM141	3/8" X 22.375" Rod	33.	5HPGM300	Flat Washer
2.	5HPGM247	Sprocket 30T 540 RPM	34.	5HPRGB39	5/16" Lock Washer
*	5HPGM248	Sprocket 54T 1000 RPM	35.	5HPT116	5/16" Nut
3.	5HPGM249	Shear Flange	36.	5HPBFR247	3/8" x 1" Carriage Bolt
4.	5HPGM479	Bearing Bracket A	37.	5HPB68	3/8" Lock Washer
5.	5HPGM491	Bearing (SBRFB 201 20-G)	38.	5HPK60	3/8" Nut
6.	5HPGM480	Gearbox Shaft Brace	39.	5HPCHM7	3/8" x 3-1/2" Bolt
7.	5HPGM251	Idler Sprocket (60A15)	40.	5HPX67	3/8" Flat Washer
*	5HPGM246	Bearing (203 RR2 Fafnir)	41.	5HP50N183	5/8" x 1-1/4" Bolt
8.	5HPGM252	Idler Spring (077055)	42.	5HPBFR104	3/4" Nylock Nut (Thin)
9.	5HPGM253	Idler Bracket	43.	5HPGM493	1/4" x 1-1/4" Bolt GR.5
10.	5HPGM254	Trans. Drive Shaft	44.	5HPLW140	1/4" Nut
11.	5HPGM255	Intake Conveyor Auger	45.	5HPGM273	Gearbox (A11)
12.	5HPGM469	Sprocket 23T (Double)	46.	5HPWM27	Lock Collar
13.	5HPGM292	Idler Spacer	47.	5HPG89	Grease Zerk
14.	5HPGM470	Sprocket 26T (Double)	48.	5HPWM29	Bearing (SA207-20G)
15.	5HPGM471	#50 Double Chain 54 Pitches	49.	5HPF143	Flange (Greaseable)
16.	5HPD118	#50 Double Conn. Link	*	5HPGM424	1/4"-28 Grease Line Adapter
17.	5HPGM473	Idler Sprocket 8T	50.	5HPF145	Flange
*	5HPWM125	Bearing Sprocket (SKF 6000-2RSJEM)	51.	5HPGM361	#60 Chain 66 Pitches (540 RPM)
18.	5HPGM492	5/16" x 1-1/4" Sq. Key Rd. Ends	*	5HPGM343	#60 Chain 80 Pitches (1000 RPM)
19.	5HPS435	5/16" x 3/8" Set Screw	52.	5HPGM393	Auger Seal
20.	5HPD39	#60 Connector Link	53.	5HPS50	Bushing (A-2001 x 1-1/8")
21.	5HPGM296	Idler Pivot Bushing (3/4"OD x .635"ID x 3/4")	54.	5HPGM494	Relube Bearing Flange
22.	5HPGM481	Gearbox Bearing Plate	55.	5HPGM441	Auger Transition Cap
23.	5HP45N57	1/4"NPT x 2-5/8" Grease Zerk	56.	5HPGM202	1/2" Pipe Plug
24.	5HPGM485	Shaft Shear Hub	57.	5HPGM511	5/16" x 1-3/4" Square Key
25.	5HPWM121	5/16" x 1" Square Key	58.	5HPRG132	Bushing (1.265IDx1-1/2"ODx2")
26.	5HPGM297	Bushing (2.015IDx2-1/4"ODx1.312)	59.	5HPGM36	Grease Line 30"
27.	5HPGM298	Trans. Auger Sprocket Washer	60.	5HPGM472	Retaining Ring (N5000-102)
28.	5HPGM299	Tensioner Pivot	61.	5HPGM474	Tightener Support
29.	5HPRGB38	5/16" x 1" Bolt GR.5	62.	5HPGM475	Tightener Support S pacer
30.	5HP12V126	5/16" x 2" Bolt	63.	5HPGM507	Grease Line 60"
31.	5HP12V66	5/16" x 3/4" Bolt GR.5	64.	5HPGM506	Grease Line 51"
32.	5HPD81	5/16" Lock Nut	65.	5HPF144	Bearing (FH207-22)
			66.	5HPF146	Lock Collar
			67.	5HPGM510	Mount Plate

NOTE: * (MEANS NOT SHOWN)

FIGURE 8

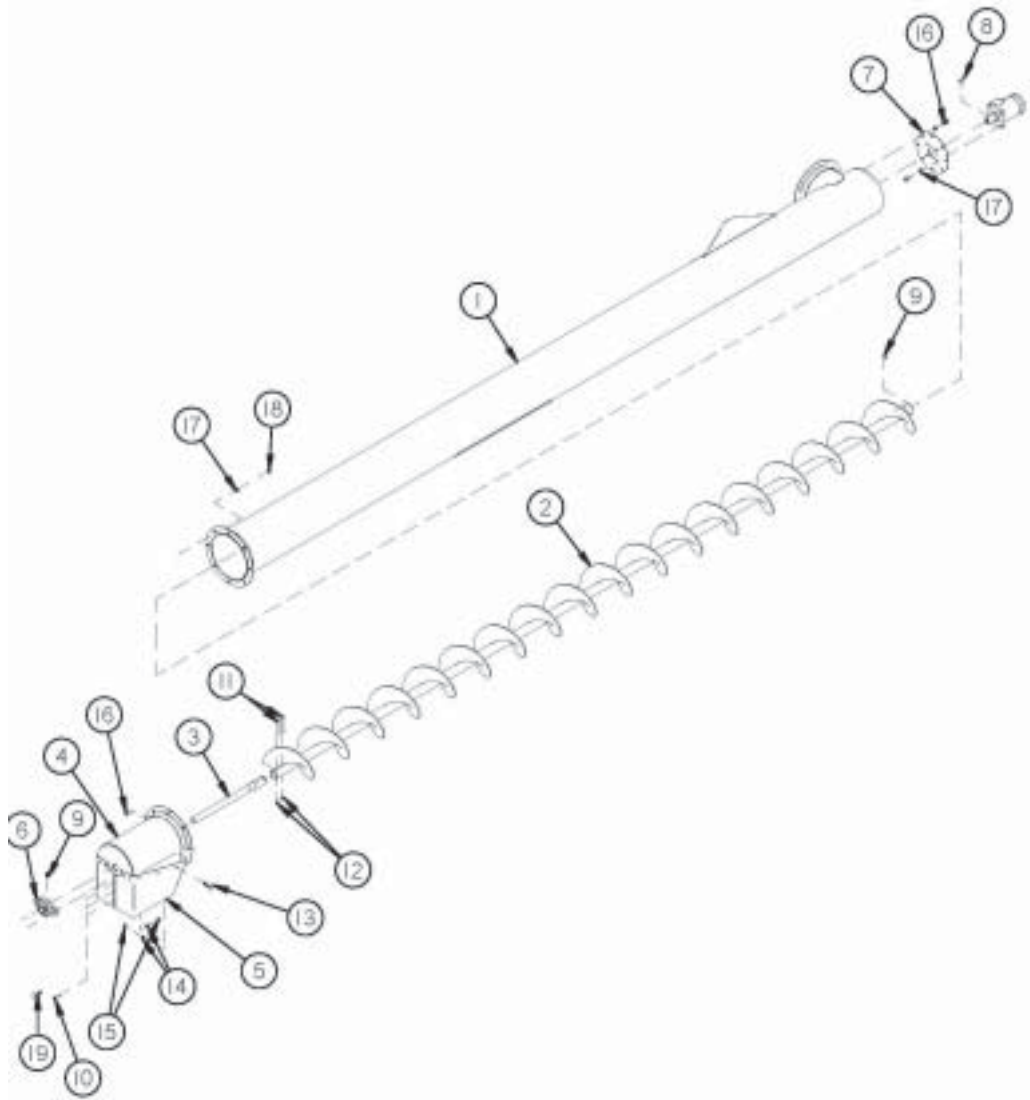


**FIGURE 8
FRONTIER MODEL GX1117
UNLOADING AUGER**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM220	Tank Unloading Auger
2.	5HPGM221	Auger Drive Cap
3.	5HPGM222	Auger Shaft
4.	5HPGM223	Auger Tube
*	5HPGM488	Auger Clean Out Cover
*	5HPGM509	Felt Gasket
5.	5HPGM224	Over Flow Cover
6.	5HPD39	#60 Connector Link
7.	5HPGM226	Sprocket 60-B11
8.	5HPGM227	Vertical Auger
9.	5HPGM228	Clutch Plate
10.	5HPGM229	Clutch Face
11.	5HPGM230	End Cap
12.	5HPT40	Bearing
13.	5HPGM231	Collar
14.	5HPGM232	Collar Shim
15.	5HPGM233	Vertical Auger Shaft
16.	5HPLW134	3/8" x 1-1/2" Bolt GR.5
17.	5HPK60	3/8" Nut
18.	5HP80N57	3/8" x 3/4" Bolt
19.	5HPB68	3/8" Lock Washer
20.	5HPGM179	5/16" x 1" Carriage Bolt
21.	5HPRGB39	5/16" Lock Washer
22.	5HPT116	5/16" Nut
23.	5HPGM235	1/4" x 2-1/4" Bolt
24.	5HPD65	1/4" Lock Nut
25.	5HPT16	1/4" Flat Washer
26.	5HP26N223	1/4" x 1-1/4" Bolt
27.	5HPGM236	Pivot Tube
28.	5HPX111	3/8" x 1" Bolt
29.	5HPX67	3/8" Flat Washer
30.	5HPGM237	Clutch
31.	5HPGM238	Turn Sprocket B
32.	5HPGM239	Turn Sprocket A
33.	5HPWM210	Clutch Spring (Red)
34.	5HPGM409	#60 Chain 81 Pitches
35.	5HPGM436	Hose Holder
36.	5HP23N187	Spring
37.	5HP9S16	1/2" x 4-1/2" Bolt Full Thread
38.	5HPRG11	Bushing (1.010"ID x 1-1/4"OD x 2")
39.	5HPGM459	Collar Shim
40.	5HPGM461	Pinon Stop
41.	5HPRG51	1/4"-28 90° Grease Zerk (1911)
42.	5HPG89	1/4"-28 Grease Zerk (1641)

NOTE: * (MEANS NOT SHOWN)

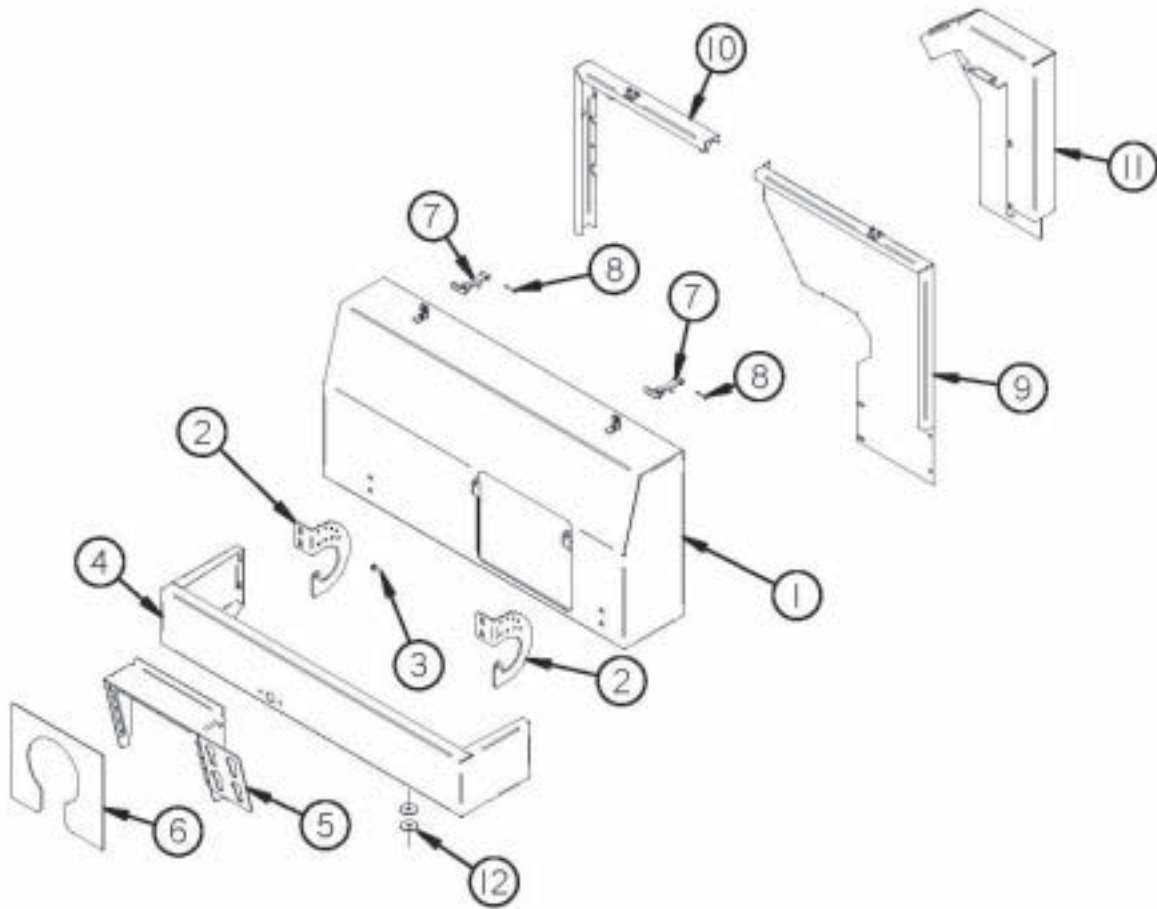
FIGURE 9



**FIGURE 9
FRONTIER MODEL GX1117
12' UNLOADING AUGER**

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	5HPGM240	12' Auger Tube	11.	5HPGM235	1/4" x 2-1/4" Bolt
2.	5HPGM241	12' Auger	12.	5HPD65	1/4" Lock Nut
3.	5HPGM242	Auger Bearing Shaft	13.	5HP50N116	5/16" x 3/4" Carriage Bolt
4.	5HPGM243	Spout	14.	5HPRGB39	5/16" Lock Washer
5.	5HPGM244	Spout Rubber	15.	5HPT116	5/16" Nut
6.	5HPT40	Bearing	16.	5HPX111	3/8" x 1" Bolt
7.	5HPGM245	End Cap	17.	5HPB68	3/8" Lock Washer
8.	5HP5B10	1/4" Woodruff Key	18.	5HPK60	3/8" Nut
9.	5HPBFR22	1/4" Set Screw	19.	5HPGM179	5/16" x 1" Carriage Bolt
10.	5HPGM234	3/16" Rivet			

FIGURE 10

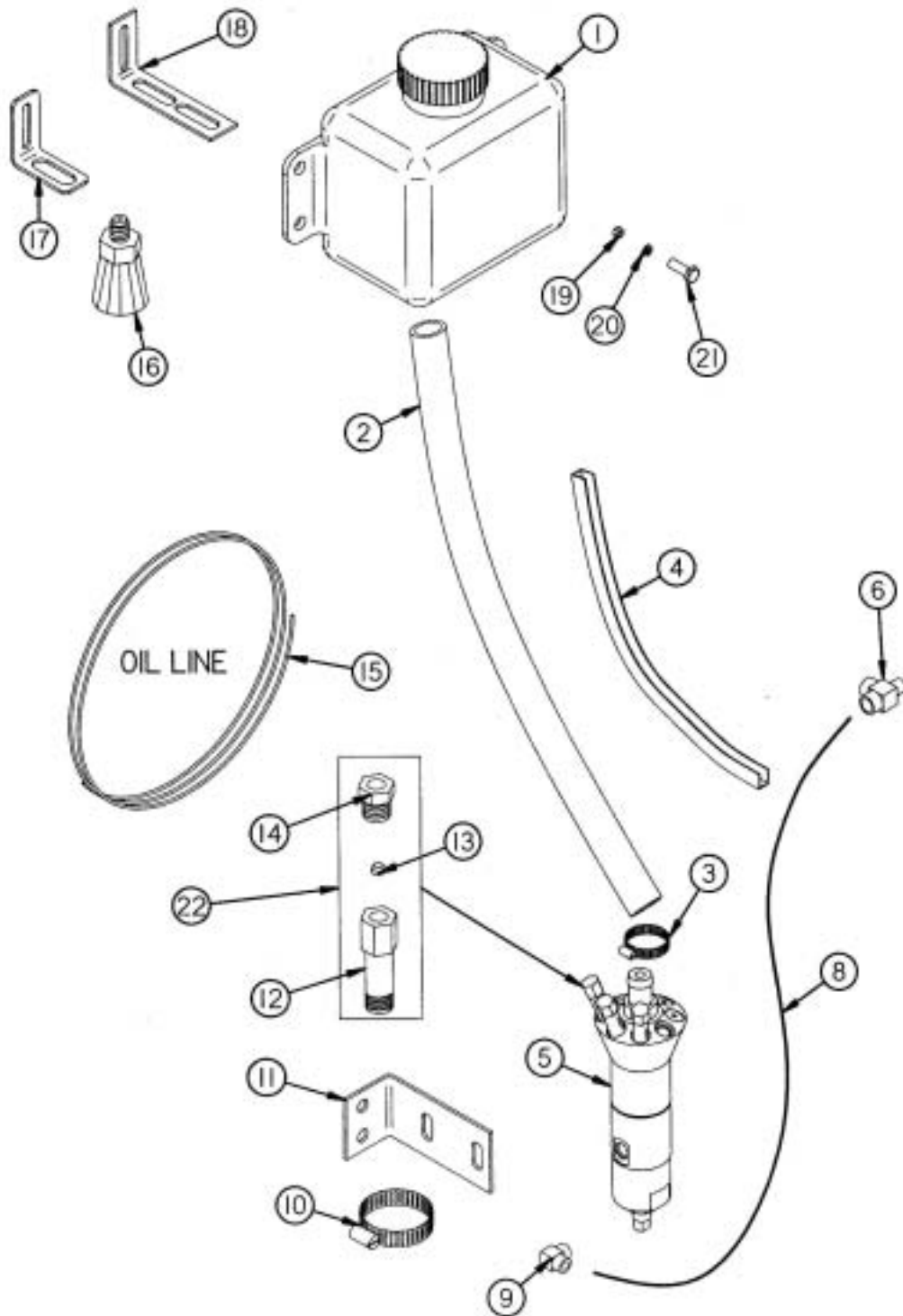


**FIGURE 10
FRONTIER MODEL GX1117
SHIELDS**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM321	Front Shield
2.	5HPGM322	Shield Hinge
3.	5HPRGB38	5/16" x 1" Bolt GR.5
*	5HPD110	1/4" x 1" Bolt GR.5
4.	5HPGM324	Fly Wheel Shield Lower
5.	5HPGM325	PTO Guard
6.	5HPGM326	Poly PTO Guard
7.	5HPX192	Rubber Latch
8.	5HPX195	Latch Pin
9.	5HPGM327	Fly Wheel Shield Back Left
10.	5HPGM328	Top Seal
11.	5HPGM329	Hydraulic Pump Shield
12.	5HPS304	Washer

NOTE: * (MEANS NOT SHOWN)

FIGURE 11



**FIGURE 11
FRONTIER MODEL GX1117
OILER**

ITEM	PART NO.	DESCRIPTION
1.	5HPHGV63	Reservoir
2.	5HPHGV66	Filler Hose
3.	5HPHGV75	1" Hose Clamp
4.	5HPHGV77	Edging 12"
5.	5HPHGV82	Pump (Complete)
6.	5HP23N116	3/8" Street Tee
8.	5HPGM501	Hydraulic Hose (1/4" x29-3/4")
9.	5HPHGV65	JIC Elbow w/O-Ring
10.	5HPHGV74	2" Hose Clamp
11.	5HPHGV68	Pump Mount Bracket
12.	5HPHGV86	Standoff
13.	5HPHGV87	Ferrule
14.	5HPHGV85	Sleeve Nut
15.	5HPGM504	Oiler Tube (2 Pcs. 5/16"OD x 48") Back
*	5HPGM505	Oiler Tube (1 Pc. 5/16" x 156") Front
16.	5HPHGV67	Brush
17.	5HPGM490	Brush Bracket Short (Front)
18.	5HPHGV69	Brush Bracket Long (Back)
19.	5HPLW140	1/4"-20 Nut
20.	5HPK84	1/4" Lock Washer
21.	5HPD110	1/4" x 1" Bolt
22.	5HPHGV84	Manifold Assembly (Complete)
*	5HPGM512	Oiler Kit (Complete)

NOTE: * (MEANS NOT SHOWN)

FIGURE 12

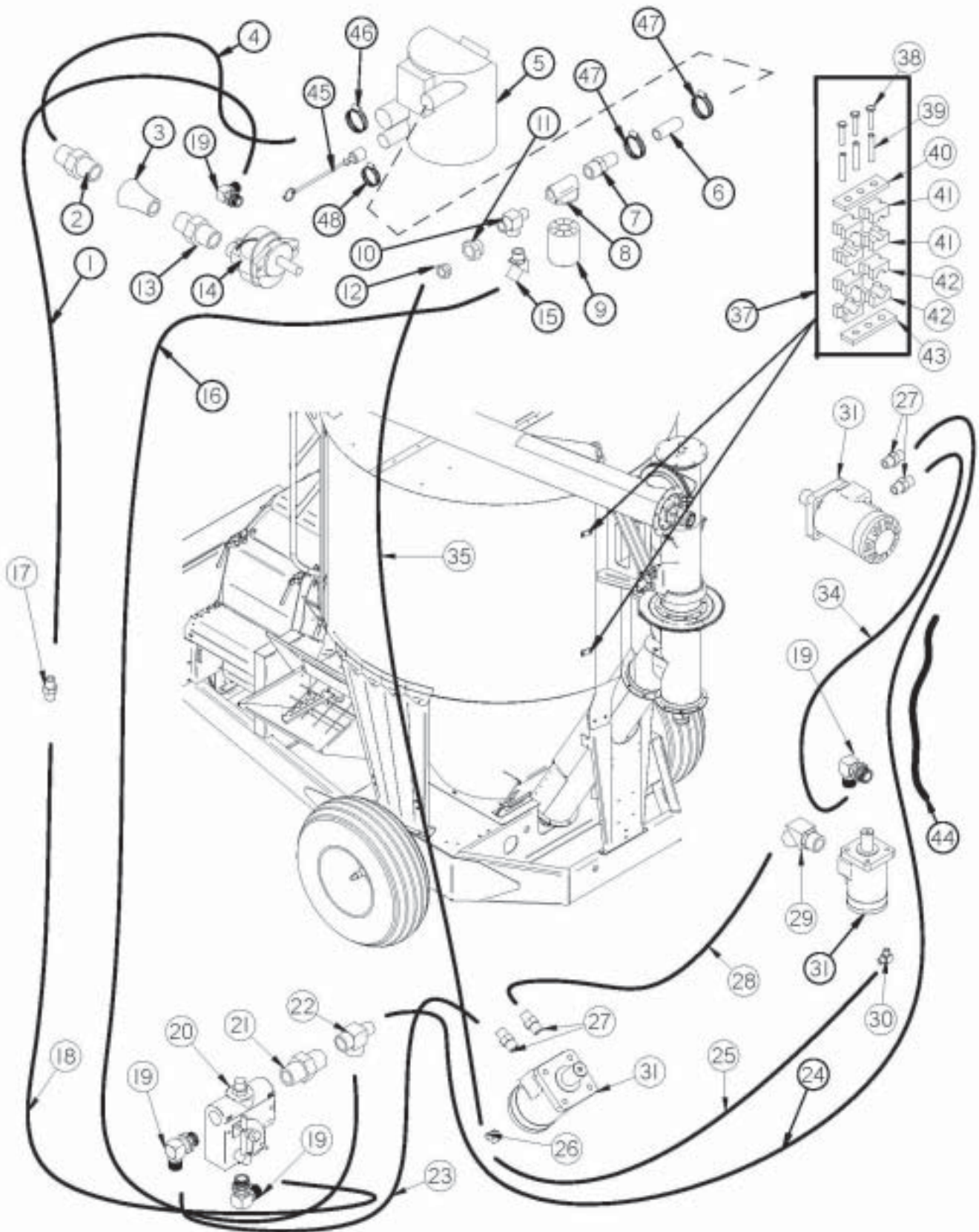
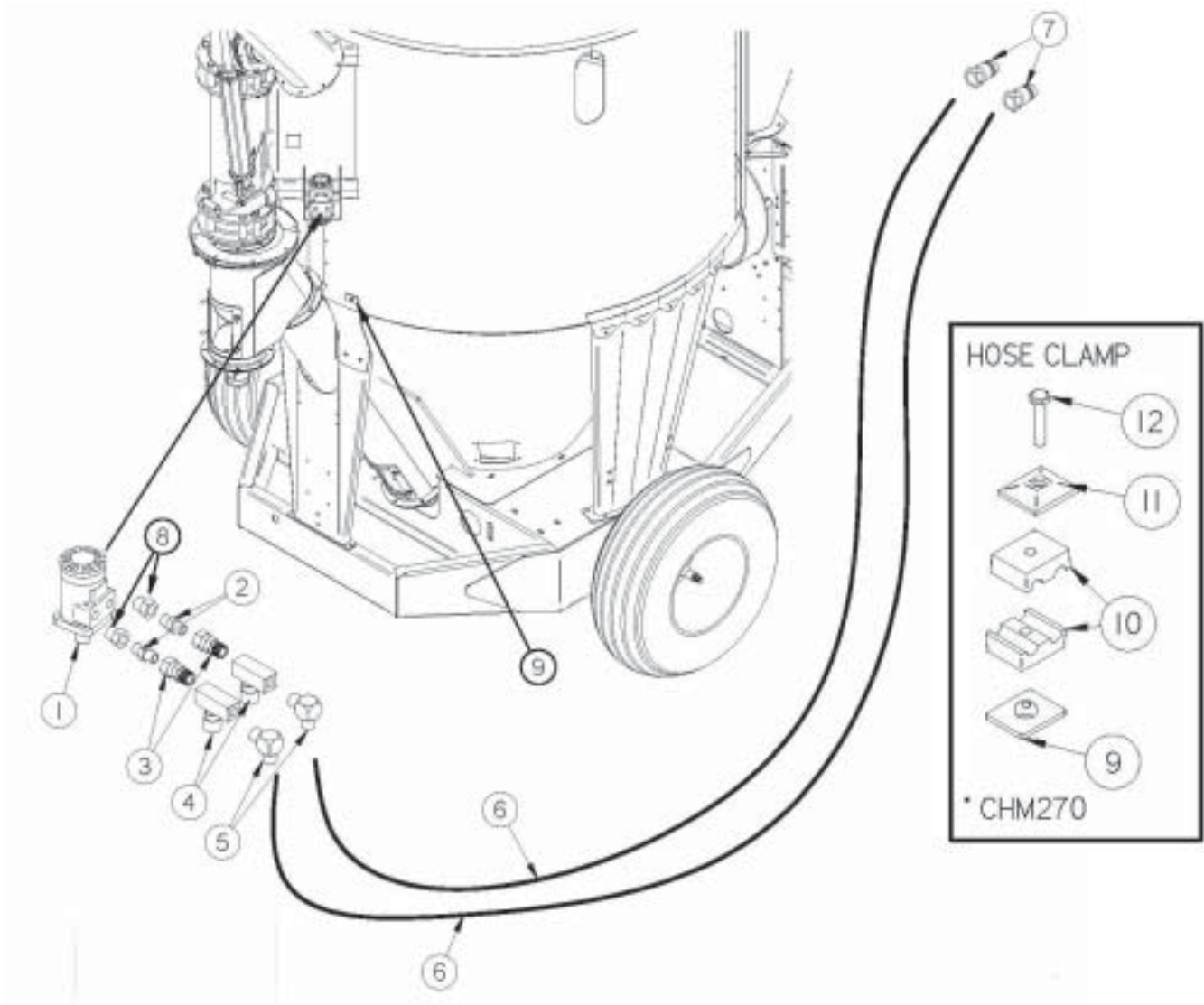


FIGURE 12
FRONTIER MODEL GX1117
AUGER HYDRAULIC CIRCUIT

ITEM	PART NO.	DESCRIPTION
1.	5HPGM1	1/2" x 32" Hose
2.	5HPGM2	Adapter (24FTX-S)
3.	5HPGM3	Pipe Reducer (1-1/2" NPT to 3/4")
4.	5HPGM4	1-1/2" x 64" Suction Hose
5.	5HPGM5	Reservoir
6.	5HPGM6	3/4" x 3" Hose
7.	5HPGM7	3/4" Hose Barb
8.	5HPLW288	Filter Head
9.	5HPLW289	Filter Element
10.	5HPGM10	3/4" Street Tee (3/4 MRO)
11.	5HPGM11	Reducer (3/4" x 1/4" PTR)
12.	5HPGM12	Adapter (4-4FTX)
13.	5HPGM13	Adapter (12-3/4 F50F-S_
14.	5HPGM14	Pump
15.	5HPGM15	45° Elbow (12VTX)
16.	5HPGM16	3/4" x 76" Hose
17.	5HPGM17	Union (8 HTX)
18.	5HPGM18	1/2" x 75" Hose
19.	5HPGM19	Elbow (8-10 C50X)
20.	5HPGM20	Flow Control
21.	5HPGM21	Adapter (12-10 F50X-S)
22.	5HPGM22	Tee (12R6X)
23.	5HPGM23	1/2" x 30" Hose
24.	5HPGM24	1/2" x 160" Hose
25.	5HPGM25	1/4" x 80" Hose
26.	5HPGM26	Tee (4R50X-S)
27.	5HPGM27	Adapter (8-10 F50X)
28.	5HPGM28	1/2" x 79" Hose
29.	5HPGM29	45° Elbow (8-10 V50X)
30.	5HPGM30	Elbow (4C50X-S)
31.	5HPGM464	Motor (101-2180-009)
34.	5HPGM34	1/2" x 116" Hose
35.	5HPGM35	1/4" x 51" Hose
37.	5HPGM8	Hose Clamp 3/8" x 1/2" (Complete)
38.	5HPGM62	Bolt
39.	5HPGM63	Tube
40.	5HPGM64	Top Plate
41.	5HPGM65	3/8" Insert
42.	5HPGM66	1/2" Insert
43.	5HPGM67	Weld Plate
44.	5HPGM32	Spiral Warp 1-1/4" x 2" (HG125)
45.	5HPGM37	Port Cap (TFH-38)
46.	5HPGM38	1-1/2" Hose Clamp
47.	5HPDWM123	1" Hose Clamp
48.	5HPGM453	1" Hose Clamp

FIGURE 13

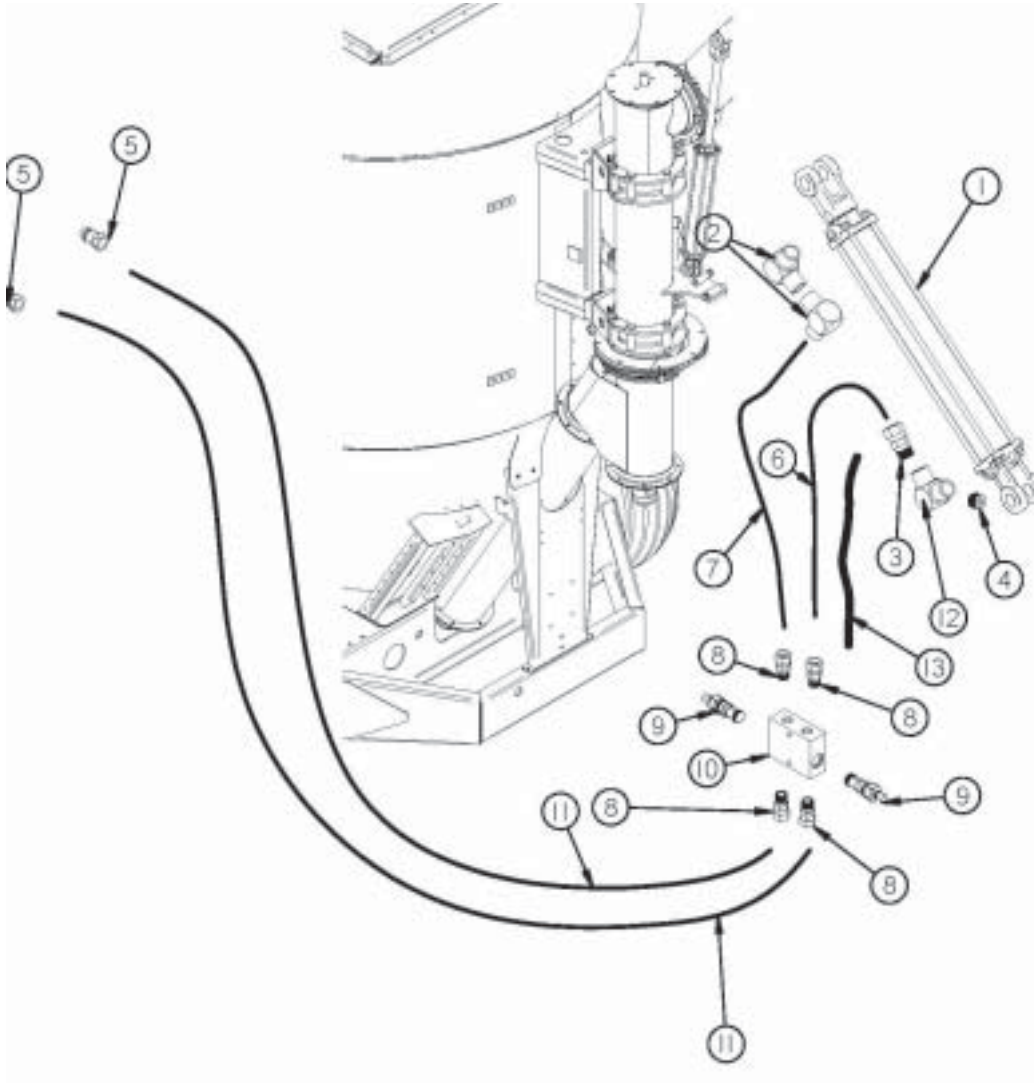


**FIGURE 13
FRONTIER MODEL GX1117
AUGER HYDRAULIC SWING CIRCUIT**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM412	Motor (Parker TB0390FP100AAAB)
2.	5HP16SV351	3/8" Nipple Nut (5404-6-6)
3.	5HPDWM233	3/8" Male Union Adapter
4.	5HPCHM265	Needle Valve (F600S)
5.	5HPGM42	Elbow (6-6 CTX)
6.	5HPGM43	3/8" x 264" Hose
7.	5HPDWM205	1/2" Male Coupler
8.	5HPJB82	Bushing 1/2" to 3/8" (5406-8-6)
9.	5HPCHM279	Weld Plate
10.	5HPCHM278	Clamp Halves 3/8" Hose
11.	5HPCHM277	Cover Plate
12.	5HPCHM276	Hex Bolt
*	5HPCHM270	Complete 3/8" Double Hose Clamp

NOTE: * (MEANS NOT SHOWN)

FIGURE 14



**FIGURE 14
FRONTIER MODEL GX1117
AUGER HYDRAULIC LIFT CIRCUIT**

ITEM	PART NO.	DESCRIPTION
1.	5HP10WR11A	2-1/2" x 16" Cylinder (645886)
2.	5HP23N234	3/8" Elbow
3.	5HPDWM233	3/8" Male Union Adapter
4.	5HPGM455	Restrictor (.032)
5.	5HPDWM205	1/2" Male Coupler
6.	5HPGM45	3/8" x 130" Hose
7.	5HPGM46	3/8" x 125" Hose
8.	5HPGM47	Adapter (0507-6-6)
9.	5HPGM48	Relief Cartridge
10.	5HPGM49	Relief Valve Body
*	5HPGM50	Relief Valve Complete
11.	5HPGM51	3/8" x 24" Hose
12.	5HPGM446	3/8" Street Elbow w/Restrictor
13.	5HPGM32	Spiral Wrap 1-1/4" x 2" (HG125)

NOTE: * (MEANS NOT SHOWN)

**FIGURE 15
FRONTIER MODEL GX1117
GEAR BOX**

ITEM	PART NO.	DESCRIPTION
1.	5HPG50	Gearbox Housing
2.	5HPG68	Cap
3.	5HPG52	Bevel Gear
4.	5HPG53	Bearing Cone (14139A)
5.	5HPG54	Bearing Race (14276)
6.	5HPG55	Snap Ring
7.	5HPG64	Seal (F465)
8.	5HPG62	3/8" x 1-3/8" Key (Hardened)
9.	5HPGM495	Input Shaft
10.	5HPG58	1-3/8"-18 Stake Nut
11.	5HPGM484	Cover
12.	5HPG56	Capscrew
13.	5HPG65	Plug 3/8" NPT
14.	5HPG67	Vent 1/8" NPT
15.	5HPGM496	Bearing Cone (14117A)
16.	5HPGM486	1-3/8"-18 Stake Nut Long
17.	5HPGM497	Fitting(o-Ring 18"-27 NPT)
18.	5HPGM498	Seal (19739)
19.	5HPGM482	Gearbox Seal Extension
20.	5HPGM487	Bushing (2-1/4"OD x 2"ID x 1.765)
21.	5HPGM499	Seal (19786)
22.	5HPRG24	Thrust Washer (2"ID x 3"OD x 1/8")
23.	5HPGM500	Output Shaft
24.	5HPGM483	Gearbox Output Bushing
25.	5HPG66	Gasket
*	5HPGM273	Complete Machine Gearbox

NOTE: * (MEANS NOT SHOWN)

FIGURE 16

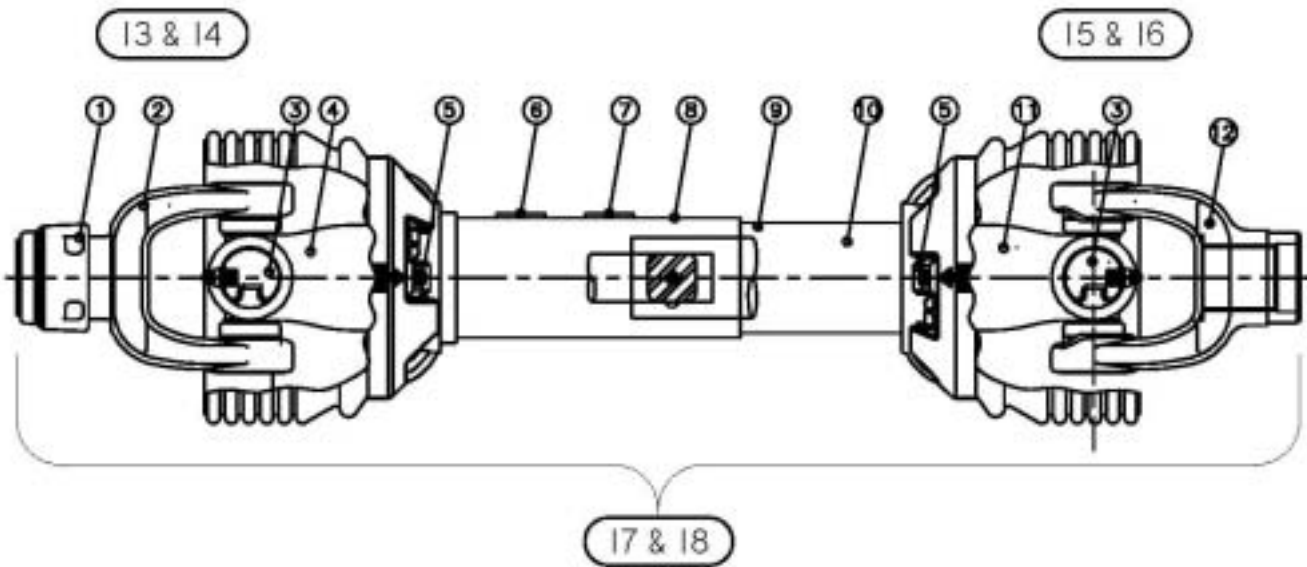
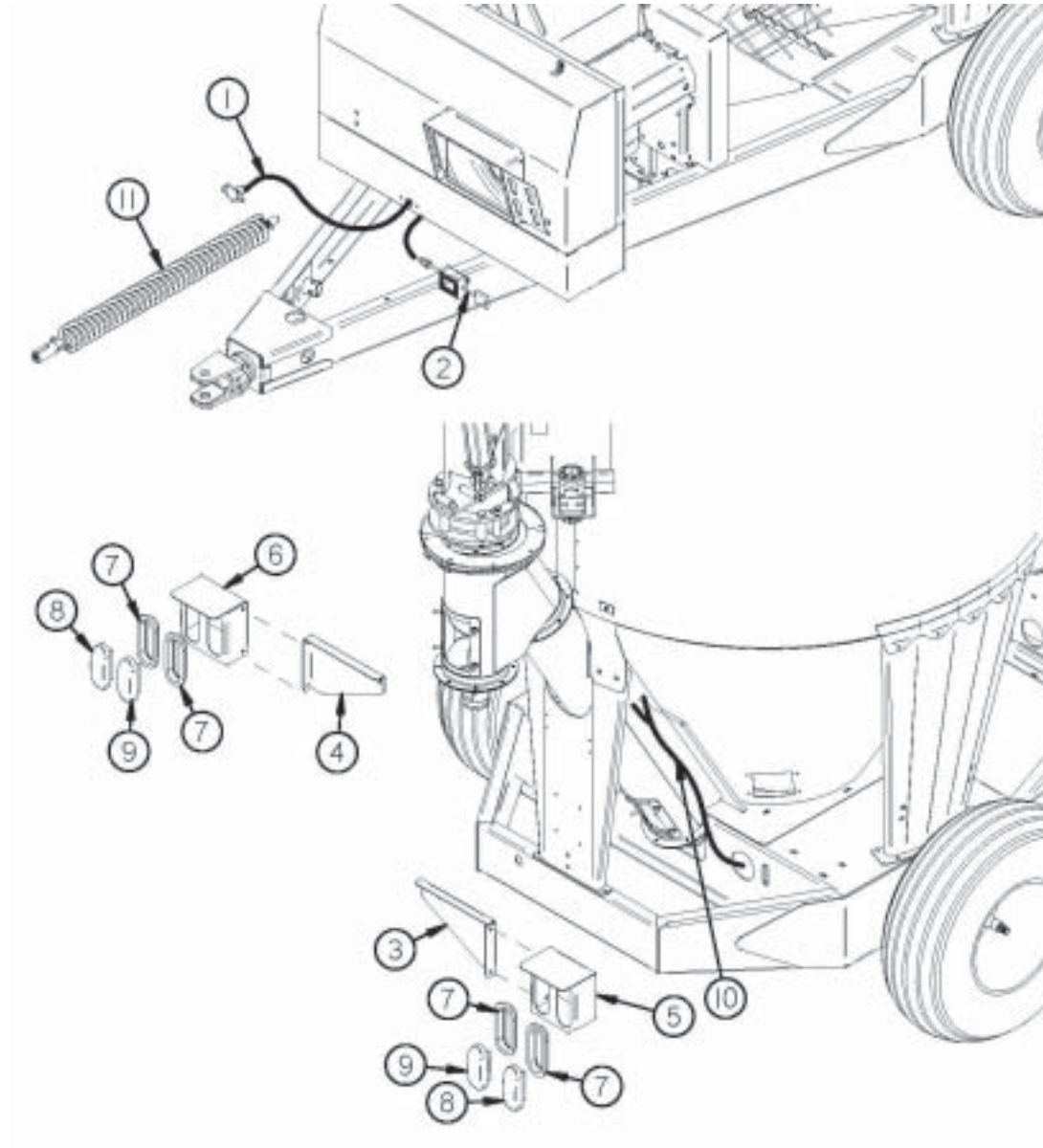


FIGURE 16
FRONTIER MODEL GX1117
PTO

ITEM	540 RPM PART NO.	1000 RPM PART NO.	DESCRIPTION
1.	5HP16SV274	"	Safety Slide Lock Repair Kit
2.	5HPGM374	5HPGM375	Safety Slide Lock Yoke Assembly
3.	5HPGM376	"	55R Cross & Bearing Kit
4.	5HPGM377	"	Yoke & Shaft
5.	5HPGM378	"	Nylon Repair Kit (Not Shown)
6.	5HP16SV283	"	Safety Sign
7.	5HPGM379	5HPGM380	Safety Sign
8.	5HPGM381	5HPGM476	Outer Guard
9.	5HPGM382	"	Inner Guard
10.	5HP16SV286	"	Safety Sign (Not Shown)
11.	5HPGM383	"	Yoke, Tube & Slip Sleeve
12.	5HPGM384	"	Yoke
13.	5HPGM385	5HPGM477	Joint & Shaft Half Assembly w/Guard
14.	5HPGM386	5HPGM478	Joint & Shaft Half Assembly
15.	5HPGM387	"	Joint & Tube Assembly w/Guard
16.	5HPGM388	"	Joint & Tube Assembly
17.	5HPGM389	-	Complete PTO 540 RPM
18.	-	5HPGM390	Complete PTO 1000 RPM

FIGURE 17



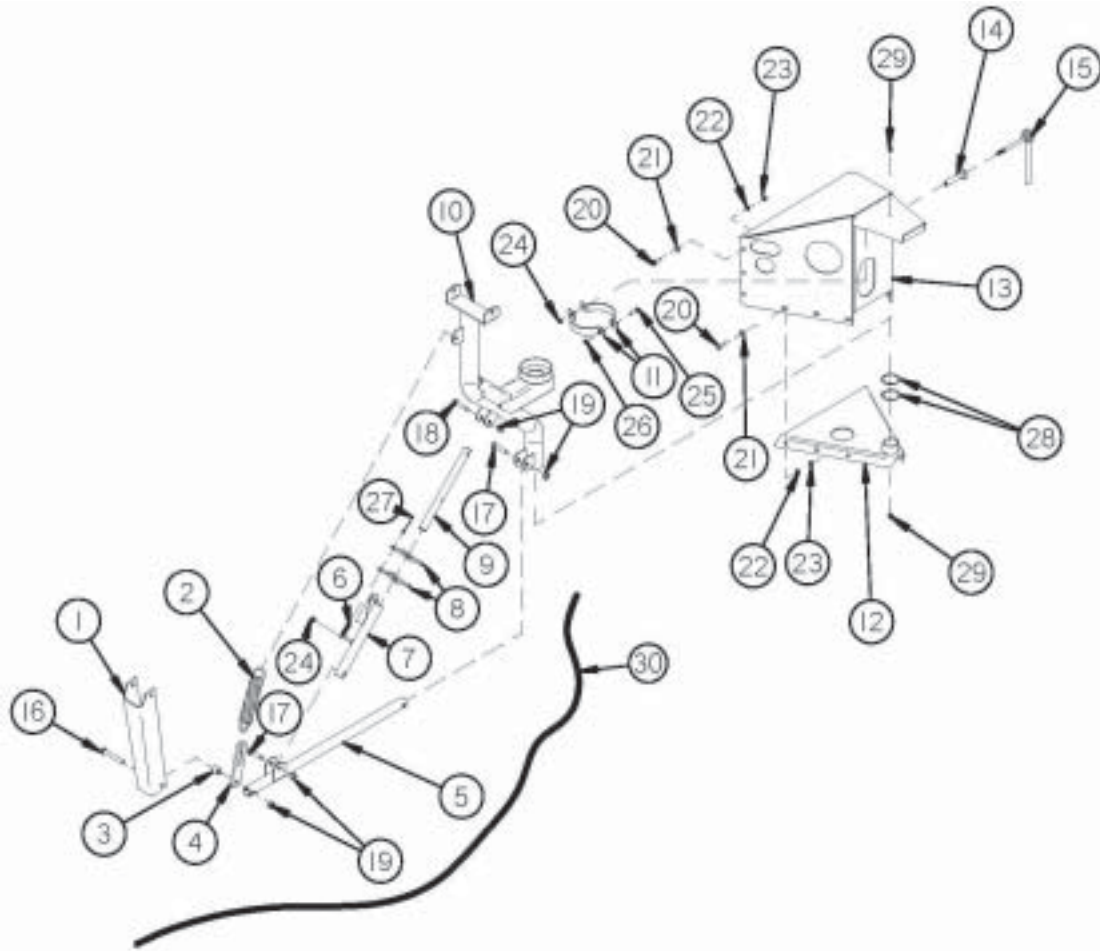
**FIGURE 17
FRONTIER MODEL GX1117
LIGHTS**

ITEM	PART NO.	DESCRIPTION
1.	5HP56N154	Flasher Module Loom
2.	5HPS441	Flasher Module
3.	5HPGM330	Light Bracket Right
4.	5HPGM331	Light Bracket Left
5.	5HP55N62	Light Housing Right
6.	5HP55N61	Light Housing Left
7.	5HPS308	Rubber Grommet
8.	5HPS309	Amber Hazard Light
9.	5HPS310	Red Hazard Light
10.	5HPGM502	Light Harness
11.	5HPTLPC	Tractor Cord

FIGURE 18
FRONTIER MODEL GX1117
OPTIONAL INFEED CONVEYOR

ITEM	PART NO.	DESCRIPTION
1.	5HPGM178	Shield
2.	5HPT116	5/16" Nut
3.	5HPRGB39	5/16" Lock Washer
4.	5HPGM179	5/16" x 1" Bolt
5.	5HPBFR22	1/4"-20 x 1/2" Set Screw
6.	5HP5B10	1/4" Key
7.	5HPGM180	Spacer
8.	5HPGM181	Motor Mount
9.	5HPGM182	Handle Latch
10.	5HPX43	1/8" x 1" Cotter Pin
11.	5HPK68	1/2" Flat Washer
12.	5HP17G128	Spring
13.	5HPG110	3/8" x 3/4" Bolt
14.	5HPB68	3/8" Lock Washer
15.	5HPX67	3/8" Flat Washer
16.	5HPK60	3/8" Nut
17.	5HPGM184	Auger
18.	5HPGM185	Auger Trough
19.	5HPGM202	1/2" Plug (5406-8P)
20.	5HPGM186	Trough End Right
21.	5HPGM187	Side Trough
22.	5HPGM188	Trough Latch
23.	5HPGM189	Trough End
24.	5HPGM190	Trough Side Left
25.	5HPGM191	Auger Guard
26.	5HPGM192	Support Pivot
27.	5HPGM193	Conveyor Cover
28.	5HPGM194	Handle Guide
29.	5HPGM195	Handle
30.	5HPGM196	Flow Control Rod
31.	5HPGM197	Flow Control Handle
32.	5HPGM198	Trough Extension Stop
33.	5HPGM199	Cover Holder
34.	5HPGM200	Trough Extension
35.	5HPGM201	Scraper
36.	5HPGM54	Transport Post
37.	5HPGM75	Transport Support
38.	5HPGM208	Latch Spring (17H387)
39.	5HPGM370	Handle Grip
40.	5HPGM371	Control Handle
41.	5HPGM372	Cover Stop Right
42.	5HPGM373	Cover Stop Left
43.	5HPPB190	Lynch Pin
44.	5HPS122	Lanyard
45.	5HPGM126	Hinge
46.	5HPGM458	Pivot Pin
47.	5HPBFR224	1/2" x 4-1/2" Bolt GR.5

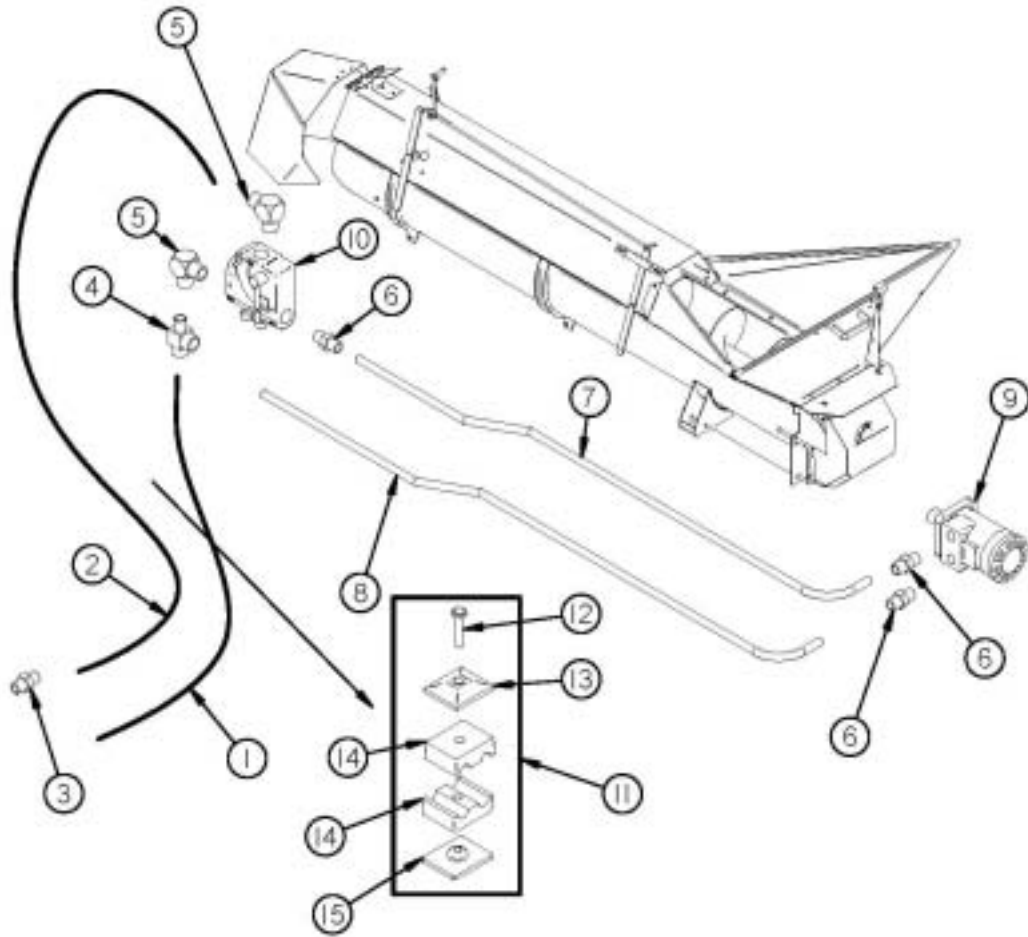
FIGURE 19



**FIGURE 19
FRONTIER MODEL GX1117
OPTIONAL INFEED CONVEYOR PIVOT**

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	5HPGM203	Support	16.	5HPLW131	1/2" x 3-1/2" Bolt
2.	5HPGM204	Spring (40174)	17.	5HPBFR119	1/2" x 2-1/4" Bolt
3.	5HPGM205	Spacer	18.	5HPF52	1/2" x 2" Bolt
4.	5HPGM206	Spring Adjustment	19.	5HPR11	1/2" Lock Nut
5.	5HPGM207	Pivot Linkage	20.	5HPX111	3/8" x 1" Bolt
6.	5HPGM208	Spring (17H387)	21.	5HPX67	3/8" Flat Washer
7.	5HPGM209	Locking Tube	22.	5HPB68	3/8" Lock Washer
8.	5HPGM210	Locking Lever	23.	5HPK60	3/8" Nut
9.	5HPGM211	Locking Shaft	24.	5HPK93	3/8" Lock Nut
10.	5HPGM212	Pivot Main Support	25.	5HPGM218	5/16" x 1-1/4" Bolt
11.	5HPGM213	Brake Band	26.	5HPD81	5/16" Lock Washer
12.	5HPGM214	Bottom Support	27.	5PHSB55	3/16" x 1" Cotter Pin
13.	5HPGM215	Top Support	28.	5HPGM219	Pivot Spacer
14.	5HPGM216	Lever Guide	29.	5HPRG51	Grease Fitting 90°
15.	5HPGM217	Brake Lever	30.	5HPGM434	Trip Rope

FIGURE 20



**FIGURE 20
FRONTIER MODEL GX1117
OPTIONAL INFEEED CONVEYOR HYDRAULIC CIRCUIT**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM52	1/2" x 81-1/4" Hose
2.	5HPGM53	1/2" x 97-1/2" Hose
3.	5HPGM17	Adapter (8 HTX)
4.	5HPGM55	Tee (10 R6X)
5.	5HPGM56	Elbow (10 C50X)
6.	5HPGM57	Adapter (10 F50X)
7.	5HPGM58	Pressure Tube
8.	5HPGM59	Return Tube
9.	5HPGM61	Motor (101-1013-009)
10.	5HPGM20	Flow Control
11.	5HPGM9	Hose Clamp 1/2" Double Complete
12.	5HPGM68	Bolt
13.	5HPGM69	Top Plate
14.	5HPGM70	1/2" Insert
15.	5HPGM71	Weld Plate

FIGURE 21

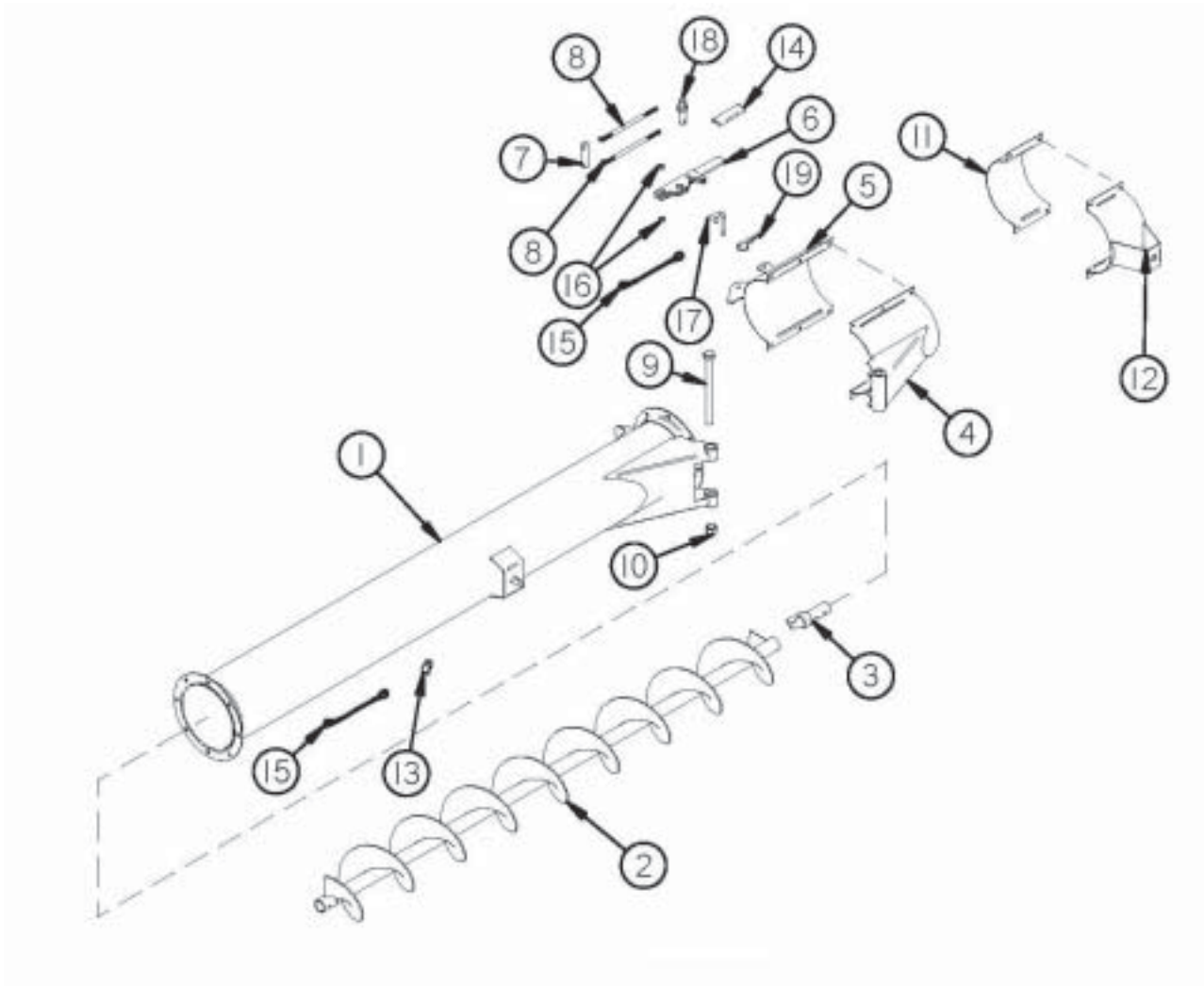
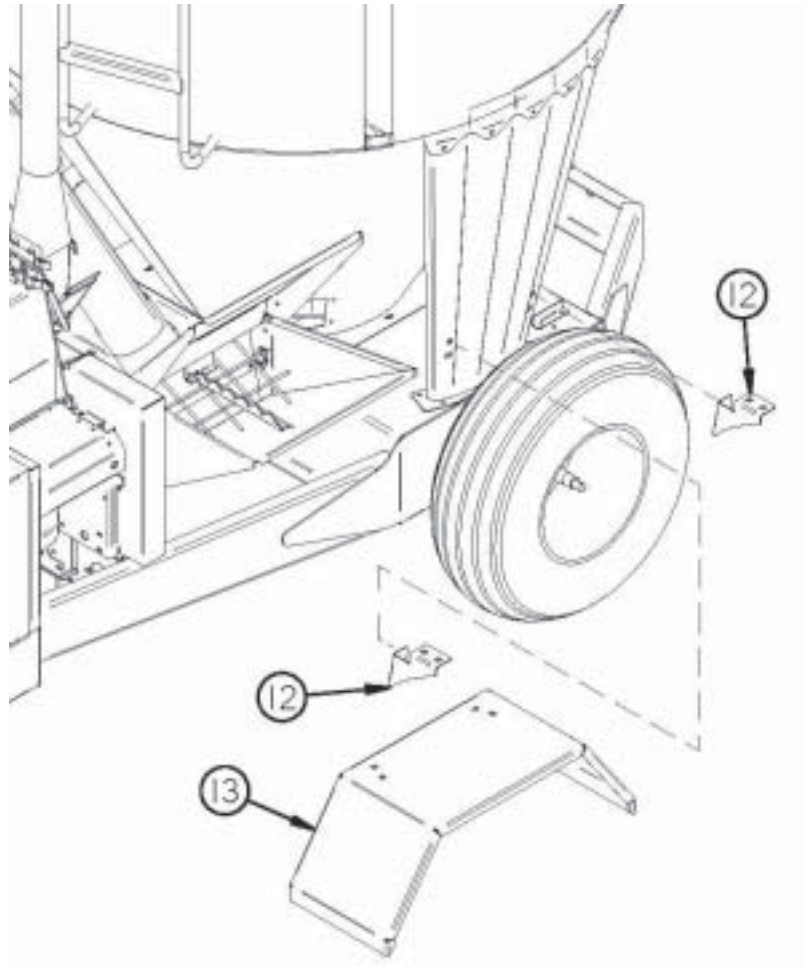


FIGURE 21
FRONTIER MODLE GX1117
OPTIONAL 3' & 6' UNLOADING AUGER EXTENSION

ITEM	PART NO.	DESCRIPTION
1.	5HPGM278	6' Extension
*	5HPGM279	3' Extension
2.	5HPGM280	6' Auger
*	5HPGM281	3' Auger
3.	5HPGM282	Auger Connect Shaft
4.	5HPGM283	Pivot Clamp
5.	5HPGM284	Latch Clamp
6.	5HPGM285	Latch Handle
7.	5HPGM286	Latch Pivot Shaft
8.	5HPGM287	Latch Rod
9.	5HPGM288	3/4" x 9" Bolt GR.5
10.	5HPHE7	3/4"-10 Lock Nut
11.	5HPGM289	Transport Lock Clamp
12.	5HPGM290	Transport Lock Latch
13.	5HPPB190	Lynch Pin
14.	5HPGM370	Handle Grip
15.	5HPS122	Lanyard
16.	5HPGM180	Pivot Spacer
17.	5HPGM39	Latch Pin
18.	5HPGM369	Latch Pivot Pin
19.	5HPES7	Hair Pin

NOTE: * (MEANS NOT SHOWN)

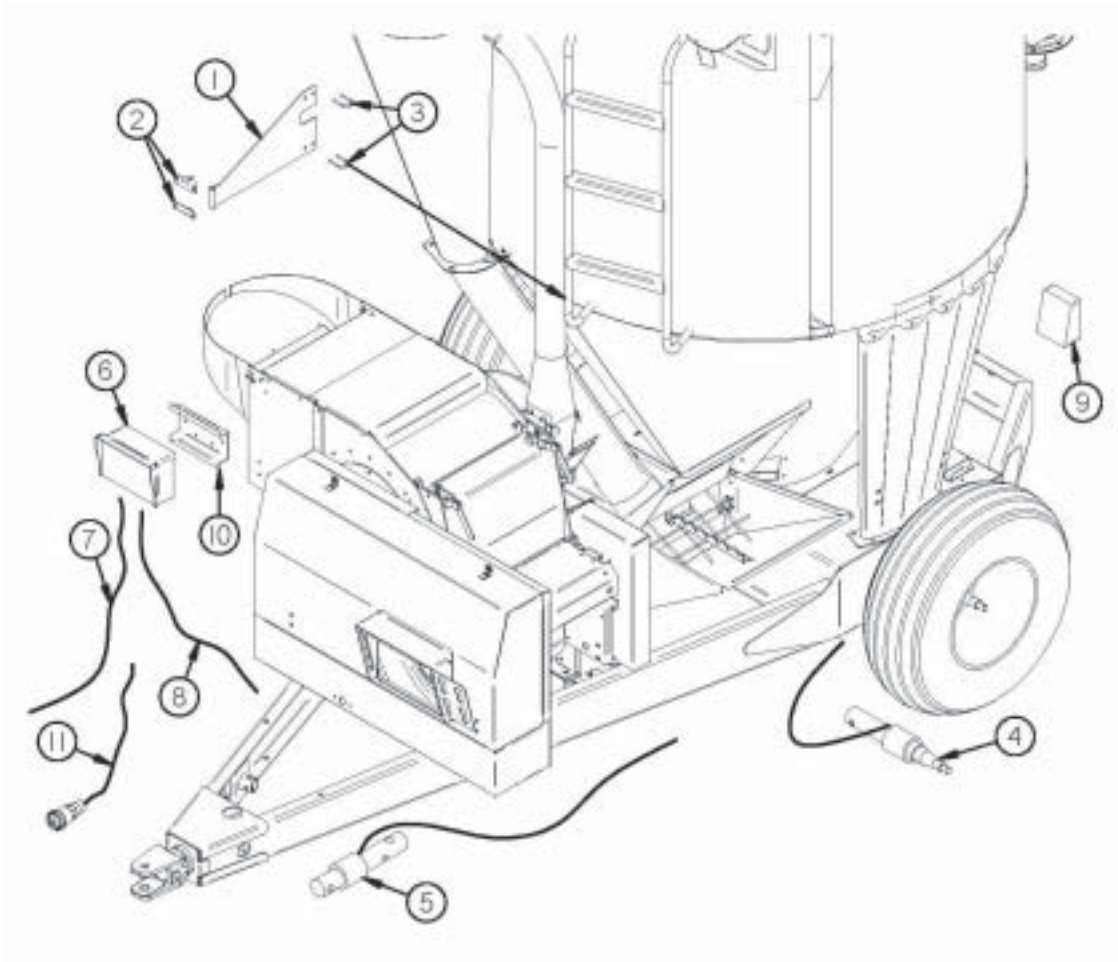
FIGURE 22



**FIGURE 22
FRONTIER MODEL GX1117
OPTIONAL FENDERS**

ITEM	PART NO.	DESCRIPTION
12.	5HPGM332	Fender Support
13.	5HPGM333	Fender (Fits Either Side)

FIGURE 23



**FIGURE 23
FRONTIER MODEL GX1117
OPTIONAL SCALE**

ITEM	PART NO.	DESCRIPTION
1.	5HPGM400	Control Box Arm
2.	5HPGM401	Control Box Mount
3.	5HPGM119	5/16" x 2" U-Bolt
4.	5HPGM402	Spindle Load Cell (146772)
5.	5HPGM403	Hitch Load Cell (143480)
6.	5HPGM404	Scale Display EZ2000 (400590)
*	5HPGM466	Scale Display EZ3200 (400844)
*	5HPGM467	Horn Junction Box (405101)
*	5HPGM468	Horn Alarm Pack w/Bracket (145398)
7.	5HPGM405	Power Cord
8.	5HPGM406	Junction Box Cord
9.	5HPGM407	Junction Box (404465)
10.	5HPGM408	Scale hanger Bracket (840459)
11.	5HP16SV269	Tractor Power Cord

**FIGURE 24
FRONTIER MODEL GX1117
DECALS**

ITEM	PART NO.	DESCRIPTION	QTY.
1.	5HPFRONTIER19	Frontier Decal	2
*	5HPFRONTIER13	Frontier Decal	2
2.	5HP1117GX	Frontier Model Decal	2
3.	5HP11599	WARNING - Do Not Go Near Leaks	4
4.	5HP1494A	WARNING - Do Not Operate	2
5.	5HP32597A	WARNING - Do Not Operate	1
6.	5HPFRON1	CAUTION -Avoid Serious Injury	1
7.	5HP81209	WARNING - Stay Clear Rotating Auger	4
8.	5HP82907F	DANGER - Keep Out Do Not EnterTank	1
9.	5HP1494J	WARNING - Do Not Clean or Work	4
10.	5HP1494K	WARNING - Do Not Remove Shields	2
11.	5HP82907D	WARNING - Stay Clear Rotating Parts Inside	4
12.	5HPHS404	Patent Numbers	1
13.	5HP82907G	WARNING - Stay Clear Keep Hands Out	2
14.	5HP1494L	DANGER - Rotating Driveline	2
15.	5HP82907H	DANGER - Keep Hands and FeetAway	1
16.	5HP82907L	DANGER - NeverAllow Riders	2
17.	5HP82907A	WARNING - Stay Clear of DischargeAuger	2
18.	5HP1494P	DANGER - Maintain Safe Clearance From Power Lines	3
19.	5HP9194A	DANGER - No Step Stay Clear	3
20.	5HP093466	WARNING - Operate Only With 540 PTO (540 PTO Only)	1
21.	5HP82907C	WARNING - Keep Hands and Feet Out	4
22.	5HP82907B	WARNING - Stay Clear ofAuger Extension HingeArea (With Optional Extension Only)	1
23.	5HP2X9RED	Red Reflector	2
24.	5HP2X9AMBER	Amber Reflector	2
25.	5HPGMA	95 - 135 Bushel Decal	2
26.	5HPGMB	55 - 85 Bushel Decal	2
27.	5HP92606	WARNING - Do Not ExceedTransport Speed	1
28.	5HP82907I	WARNING - Do Not Sep Up On Machine	1
29.	5HP82602	WARNING - Crushing Hazard	2
30.	5HP100107	Operating Instructions	1
31.	5HP1202177	Pull to Stop	1
32.	5HP82907M	Discharge Auger Door - Open/Close	1
33.	5HP82907K	Cyclone Cover - Open/Close	1
34.	5HP11211176	Shear Bolts	1
35.	5HP5696D	Disengage	1
36.	5HP5696E	Engage	1
37.	5HP093020	Grease Zerk Decal	6

NOTE: * (MEANS NOT SHOWN)

