MARATHON®

COMPACTION & RECYCLING SOLUTIONS

OPERATION, MAINTENANCE, AND INSTALLATION MANUAL

TIEger® Series Auto-Tie Balers

NS - Narrow Shear
WS - Wide Shear
EWS - Extra Wide Shear

OMI Manual No. 0067-TIEger-0918

Environmental Solutions Group

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1 - OPERATION

Introduction

Congratulations on choosing a TIEger® Auto-Tie Baler!

This product is designed to give you reliable service and superior performance for years to come. The purpose of this manual is to provide the owner and/or operator(s) with the necessary information to properly and safely install, operate, and maintain the TIEger® auto-tie baler.

The manual is not intended as a primary training source, but as a reference guide for authorized, trained personnel. Each person involved in the operation, maintenance and installation of the baler should read and thoroughly understand the instructions in this manual and follow all warnings.

Meeting standards is imperative to us.

All of our balers meet or exceed standards set by the American National Standards Institute (ANSI). The employer involved in the operation, maintenance, and installation of the baler should read and understand the most current version of the following applicable standards:

- ANSI Standard No. Z245.5, Safety Requirements For Baling Equipment www.ansi.org
- OSHA 29 CFR, Part 1910.147, The control of hazardous energy (lock-out & tag-out) www.osha.gov

Safety comes first

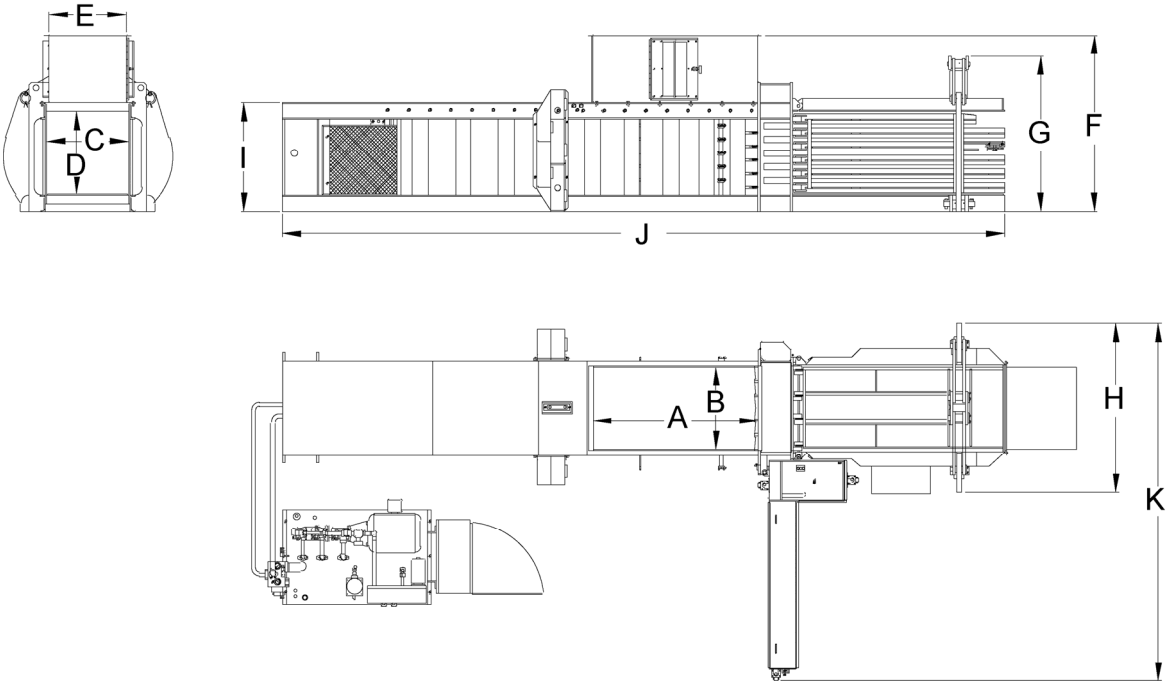
We strive to maintain the highest level of safety in our facilities and want you to do the same. ALL SERVICE OR REPAIR PROCEDURES DESCRIBED IN THIS MANUAL SHOULD BE PERFORMED BY AUTHORIZED, FULLY TRAINED PERSONNEL ONLY. Any service or repairs that go beyond the scope of this manual should be performed by factory authorized personnel only.

Got Questions? We've got answers.

If after reading this manual should you need further assistance with the operation, maintenance, or installation of this baler, please feel free to contact your distributor or the Service Department directly by phone at **1-800-633-8974**. You will need to provide the following information:

- Baler Serial Number (located on serial plate)
- Installation Date
- Electrical Schematic Number (the electrical schematic for this baler may be found in the panel box.

Specifications



	Model #s	NS 240 -50	WS 150/240 -60	WS 150/240 -72	WS 240/310 -84	EWS 150/240 -60	EWS 190/240 -72	EWS 240-84
A	**Charge Chamber Length**	55	65	77	89	65	77	89
B	**Charge Chamber Width**	30	42	42	42	48	48	48
C	**Bale Width**	30	42	42	42	48	48	48
D	**Bale Height**	42	42	42	42	42	42	42
E	**Feed Hopper Width**	28	39	39	39	45	45	45
F	**Feed Hopper Height**	90	90	90	90	90	90	90
G	**Tensioner Height (max.)**	89 3/8	89 3/8	89 3/8	89 3/8	89 3/8	89 3/8	89 3/8

Specifications (Continued)

H	**Tensioner Width (max.)**	72 1/4	85 1/2	85 1/2	85 1/2	90 1/4	90 1/4	90 1/4
I	**Body Height**	52	55	55	55	55	55	55
J	**Body Length**	336	356	380	404	356	380	404
K	**Overall Width**	162	186	186	186	199	199	199

Note: All units shown in inches.

Pre-Operation Instructions

Warning: Do not operate baler until operating instructions are thoroughly understood. Wear safety glasses and gloves when operating this equipment.

Stay clear of all internal baler parts and all moving external baler parts when in operation. Failure to do so could result in serious personal injury or death!

Never enter any part of baler unless the disconnect switch has been turned off, padlocked, and all stored energy sources have been removed. See Lock-Out & Tag-Out Instructions in Maintenance section of this manual. Before starting baler, be sure no one is inside. Be certain that everyone is clear of all operation points and pinch point areas before starting.

This baler is controlled by photocells and will start automatically when photocells detect ANY OBJECTS in the charge box.

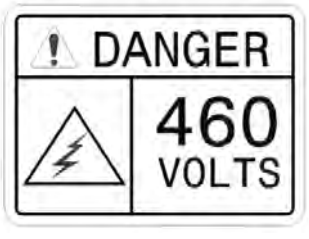
The compression ram in this baler travels at a very fast speed. Stand clear of the baler when in operation.

Employers should allow only authorized and thoroughly trained personnel to operate this baler.

This baler is equipped with a key operated locking system. Keys should be in possession of only authorized personnel. Federal regulation prohibits operation by persons under 18 years of age. Turn off and remove the key after use.

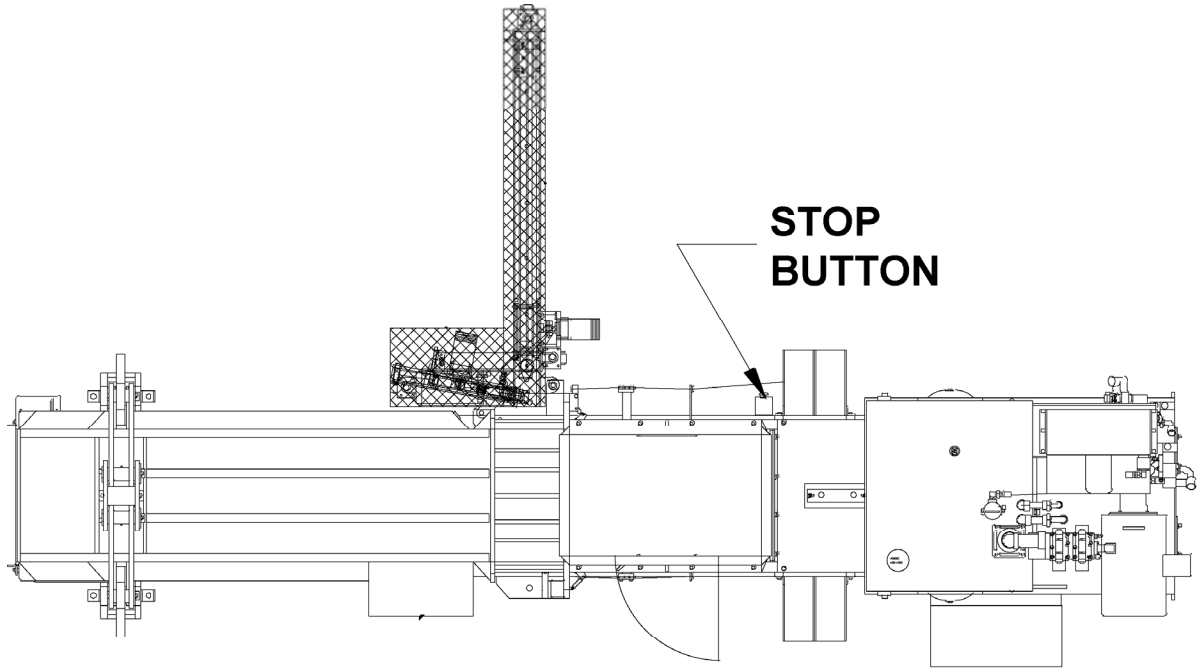
The baler hydraulic system operates at high pressures and at high temperatures. If you suspect a leak, **Do Not Check With Your Hands** and avoid contact with piping, hoses, and cylinders.

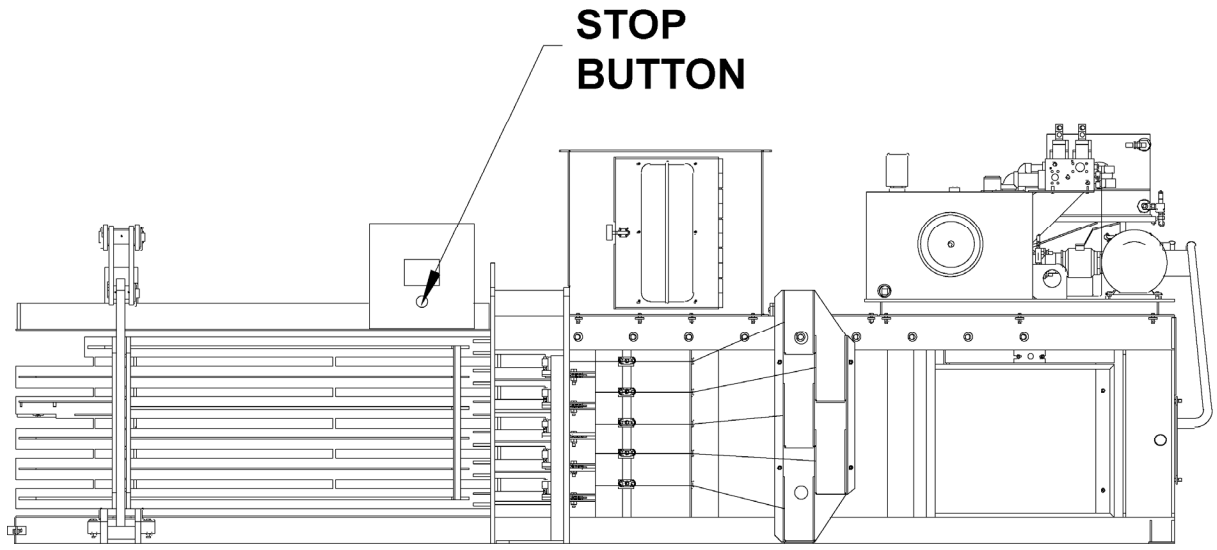
ONLY AUTHORIZED PERSONNEL SHOULD BE ALLOWED INSIDE PANEL BOX. The panel box contains high voltage components. **See Lock-Out & Tag-Out Instructions in Maintenance section.**



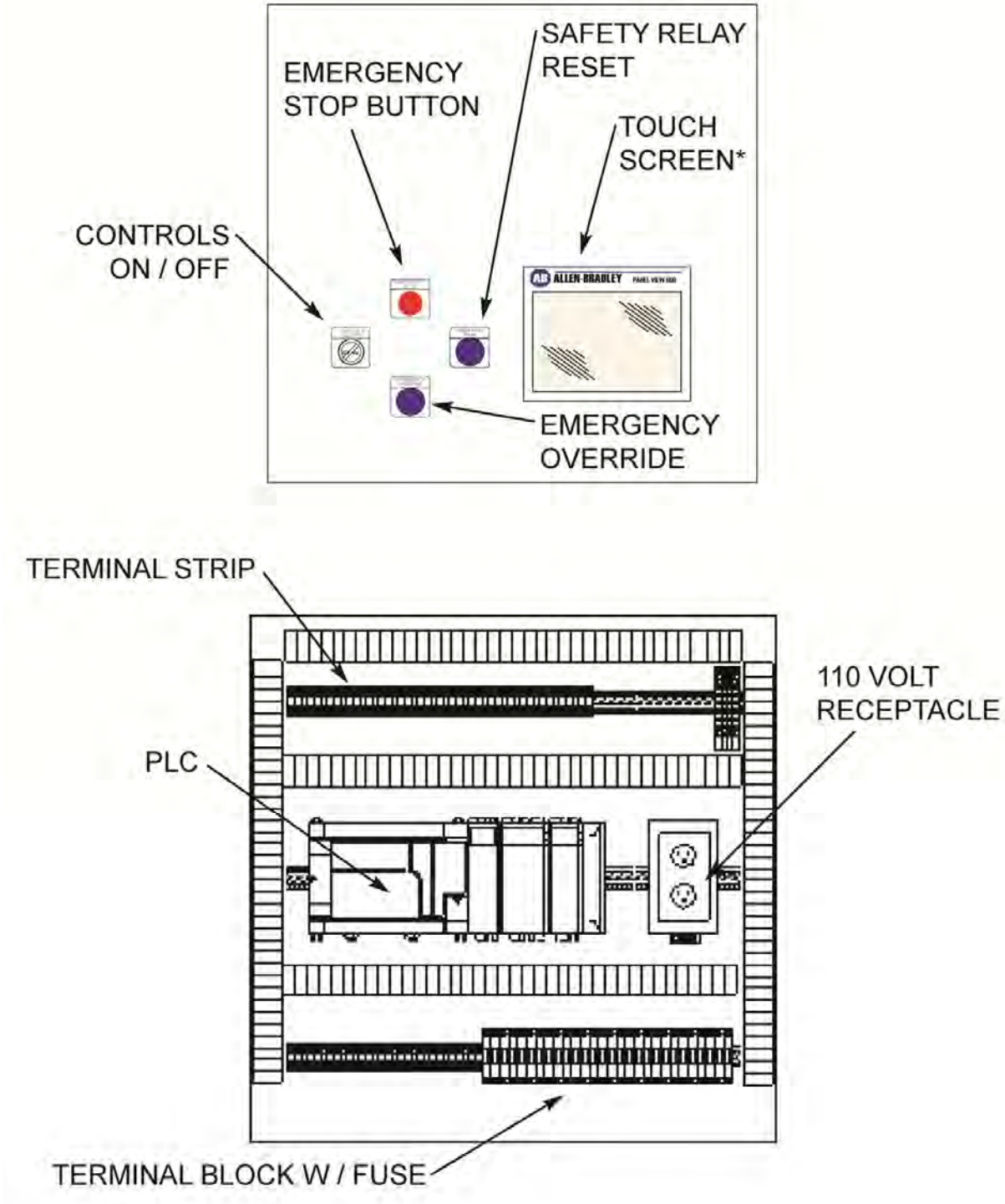
Emergency Stop Locations

In case of emergency, push any one of two red mushroom-head stop buttons on baler. See diagram below for locations. Make sure all personnel operating baler know where all stop buttons are located. Make sure area around each stop button is clean and free of any debris or operator hazards. Check operation of each stop button as outlined in the MAINTENANCE section of this manual. All equipment in the processing stream of baler should have emergency stop buttons located for easy operator access. These stop buttons should be connected so as to shut down all power to baler when depressed.





Typical Control Panel and Panel Box



*Touch Screen Instructions begin on **page 1-11.**

Standard Operation - Baler Start Up

IN CASE OF EMERGENCY:

Push large red button to STOP!

Prior to start-up of baler each day, check items found in DAILY list of **Periodic Maintenance** section of this manual, **page 2-4**.

Note: The TIEger® Auto-Tie Baler features an ANSI Z245.5 - 5.10 compliant start-up alarm that is both audible and visible during the activation of the baler motor(s).

Standard operation includes baler start up for Manual and Automatic Operation.

Baler Start Up

1) Check work area and make sure that all personnel are clear of baler.

2) Turn electrical disconnect to "ON" position.

3) Insert CONTROL key and rotate switch to "ON" position.

4) Make sure all "EMERGENCY STOP BUTTONS" are pulled out.

5) Touch "SAFETY RELAY RESET" button.

(Allow for a brief delay for control processor to initialize).

6) Touch "ACK ALL" (acknowledge all) and "RESET" on touch screen to clear alarm screen. Screen will change to main menu.

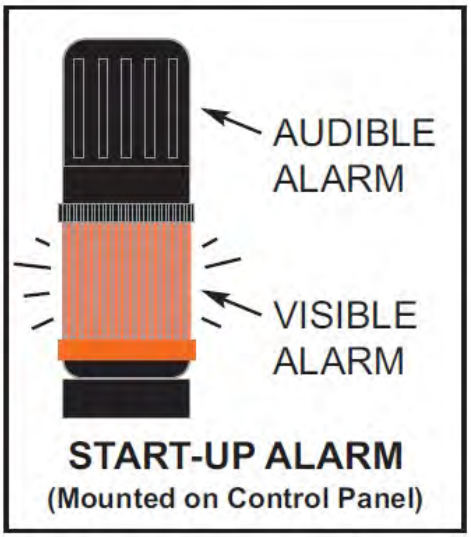
7) Touch and hold "MOTOR START" button for 20 seconds.

   a) Both an audible and visual start-up alarm will energize for 5 seconds.

   b) After 5 seconds, the audible alarm will cease and the visual alarm will continue for an additional 15 seconds.

   c) The main motor(s) will start after the 20-second delay and operator should remove finger from "Motor Start" button.

This completes BALER START UP sequence.



Touch Screen Instructions Begin On **Page 1-11**

Standard Automatic Operation

Automatic Operation Mode

1) Start baler per Start-Up procedure.

2) Touch "MANUAL MODE" button and screen will advance to "MANUAL MODE-SCREEN".

3) Touch "RAM REVERSE" button until ram is fully retracted.

4) Touch "MAIN MENU" button.

5) Touch "AUTO MODE" button and screen will advance to “AUTO MODE-SCREEN”. Touch "AUTO MODE" button and baler will Automatically cycle when designated photocell is blocked by incoming product.

6) Touch CONVEYOR "AUTO" button, if you want baler to control flow of material. You may control flow of material manually by touching CONVEYOR "ON - OFF" button as required. (**OPTIONAL CONTROLS**)

7) Touch "MANUAL MODE", "MAIN MENU", or "CYCLE STOP" button will end AUTO MODE. To resume AUTO MODE, you will have to begin at step 1 of this procedure.

Manual Operation Mode

1) Start baler per Start-Up procedure.

2) Touch "MANUAL MODE" button and screen will advance to "MANUAL MODE SCREEN".

3) Touch "RAM REVERSE" or “RAM FORWARD” button for manual ram operation.

Touch Screen Instructions Begin On **Page 1-11**

Procedure for Manually Tying Bale

Notice: Baler must be in operation and in "MANUAL MODE" and on the "MANUAL MENU" to perform this function.

1) Press "TIE CYCLE" button.

2) Press and hold "RAM EXTEND" until "RAM EXTENDED" illuminates and "RAM AT TIE POSITION" illuminates.

3) Press the go to "MANUAL TIE" button.

4) Press and hold "NEEDLES IN" until the needles are fully extended.

5) Press and hold "NEEDLES OUT" until the needles are fully retracted.

6) Press and hold "TWISTER IN" until the twister head is fully extended.

7) Press and hold "TWIST" until all rotation stops.

8) Press "TWISTER CUT POSITION".

9) Press and hold "TWISTER OUT" until the twister head is fully retracted, this will cut the wires.

10) Press "TWIST" once and this will return spin heads back to home position.

11) Press "TWISTER IN". Then press "TWISTER OUT" until twister head is fully retracted to ensure no wires are in the spin heads.

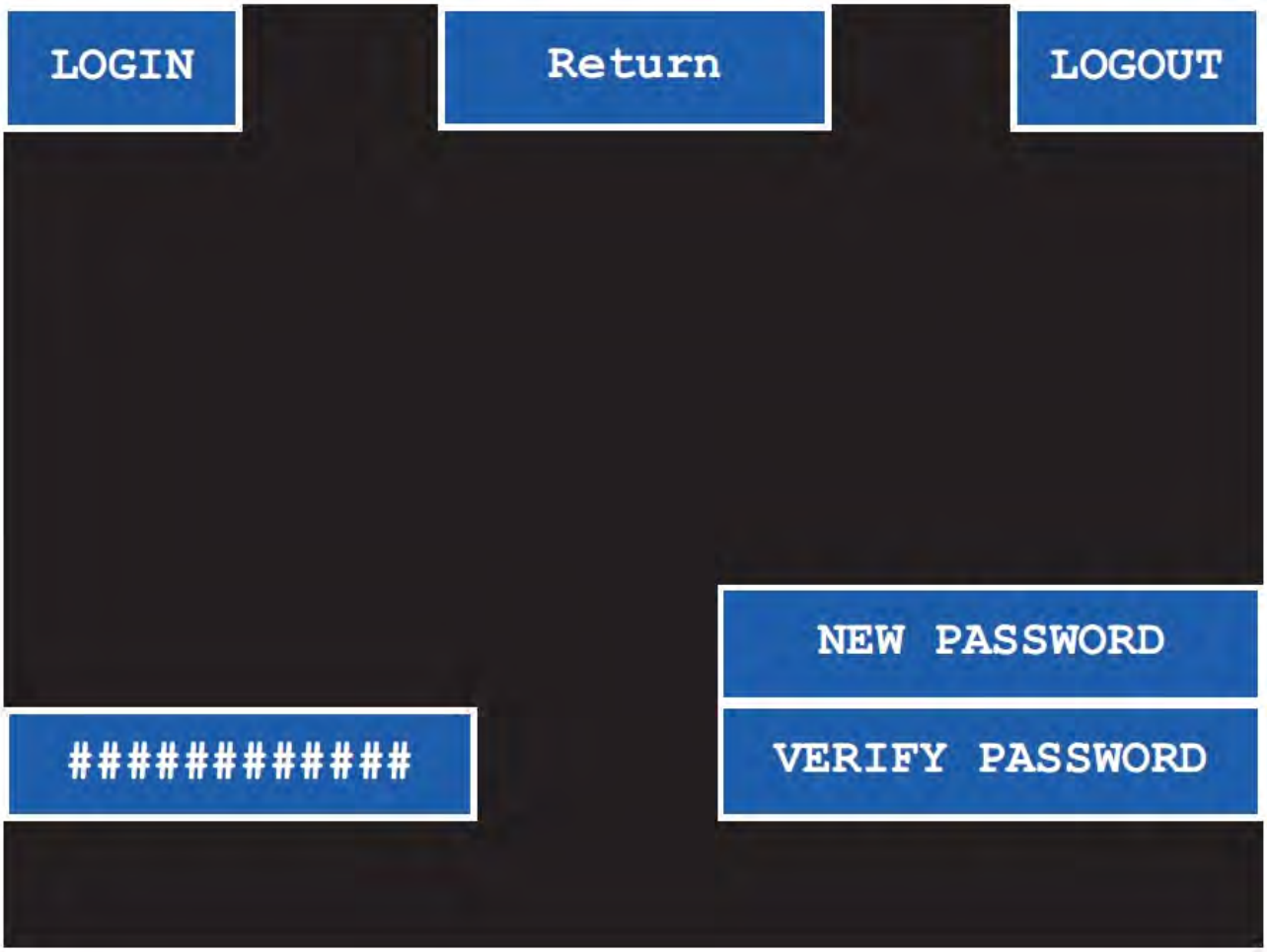
12) Press "Manual Ram" to go back to manual menu.

13) Press and hold "Ram Retract" until "Ram Retracted" illuminates.

14) Press "MAIN MENU" .

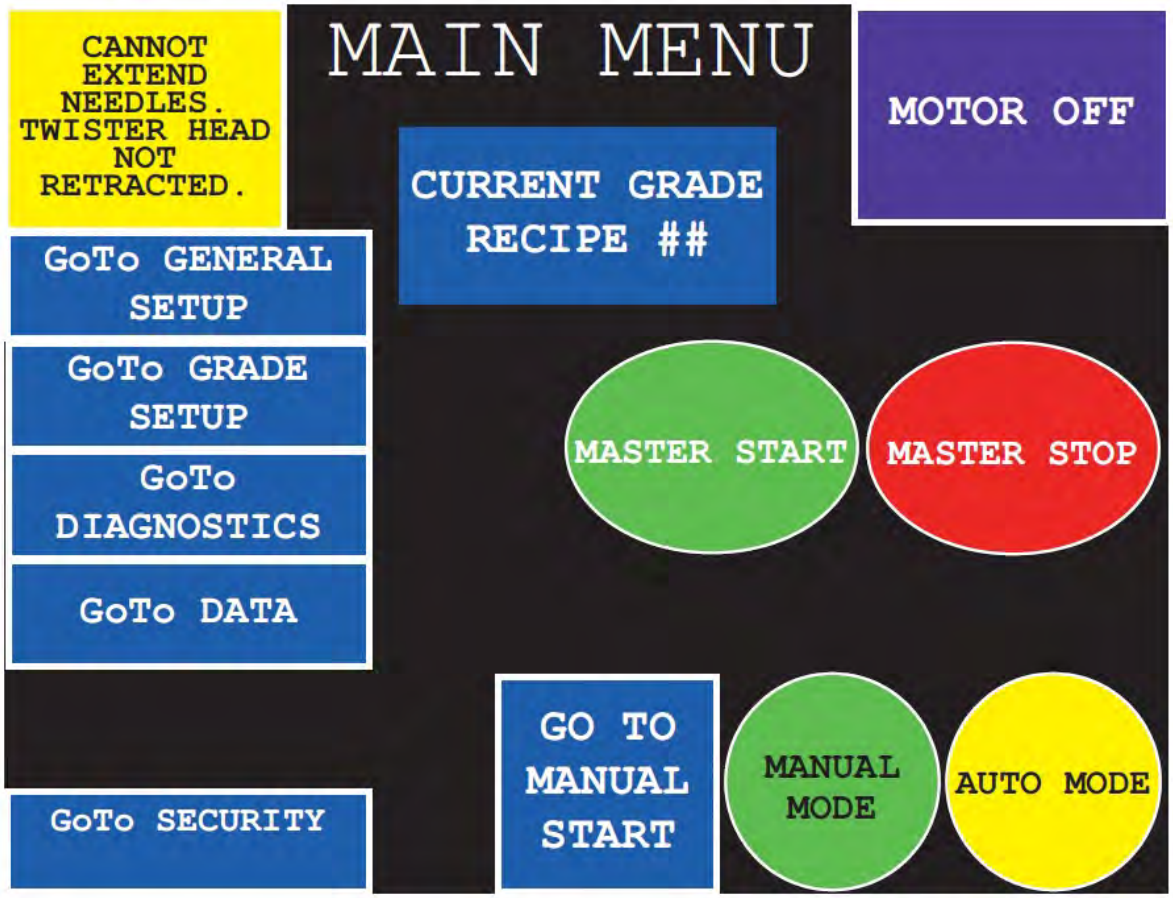
15) Press " AUTO MENU".

Security Screen



LOGIN	Press this box after entering the password to login to the interface.
############	Press to select either “operator” or “supervisor” as usernames. Once selected, a numeric keypad is displayed for you to type in your password. Default passwords are “1234” for operators and “8710” for supervisors. These may be changed by selecting “new password”.
Return	Pressing this button returns you to the main menu.
LOGOUT	Press when operator or supervisor is ready to logout of the interface.
NEW PASSWORD	Allows operator or supervisor to choose a new password.
VERIFY PASSWORD	Re-enter new password to verify and save.

Main Menu Screen - 1

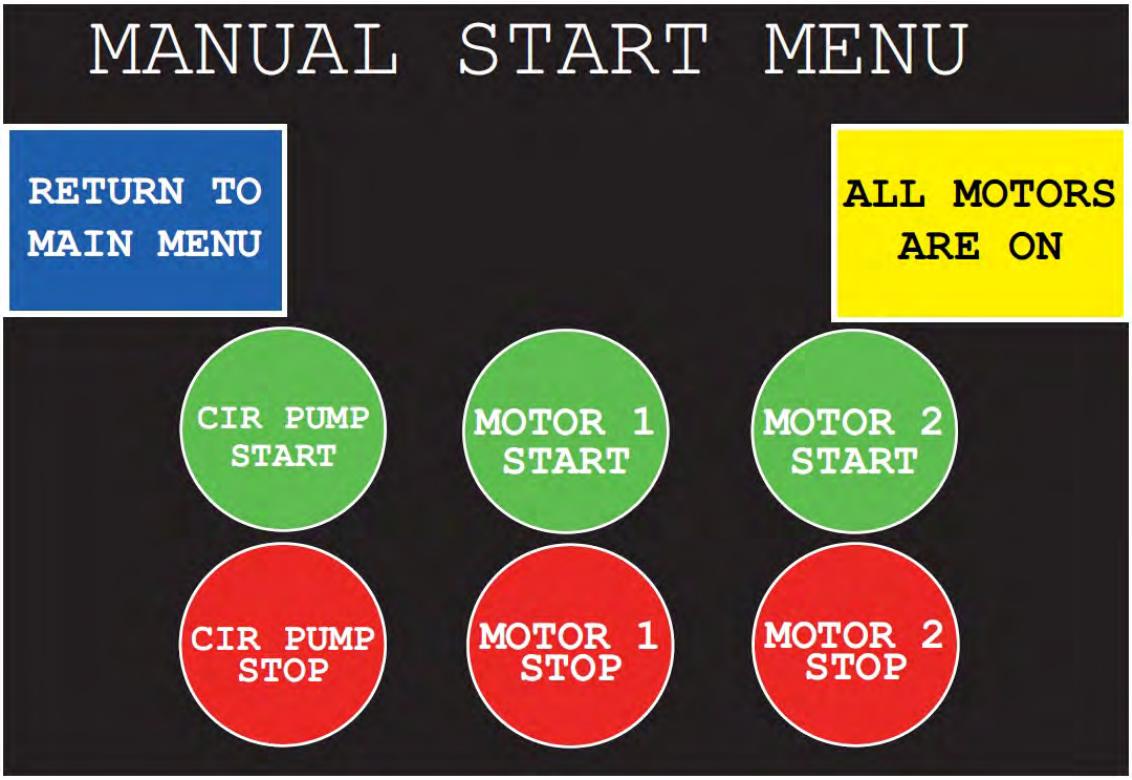


MAIN MENU	Menu name.
CANNOT EXTEND NEEDLES. TWISTER HEAD NOT RETRACTED.	Yellow info/error window explains interruption of process.
GoTo GENERAL SETUP	Login as “supervisor” to access general setup. See **Page 1-24**.
MOTOR OFF	Blue info window indicating status of motors.
MASTER START	Have to press and hold for 20 seconds to start motors. See countdown in blue info window.
MASTER STOP	Press to stop all motors in operation.

Main Menu Screen - 1 (Continued)

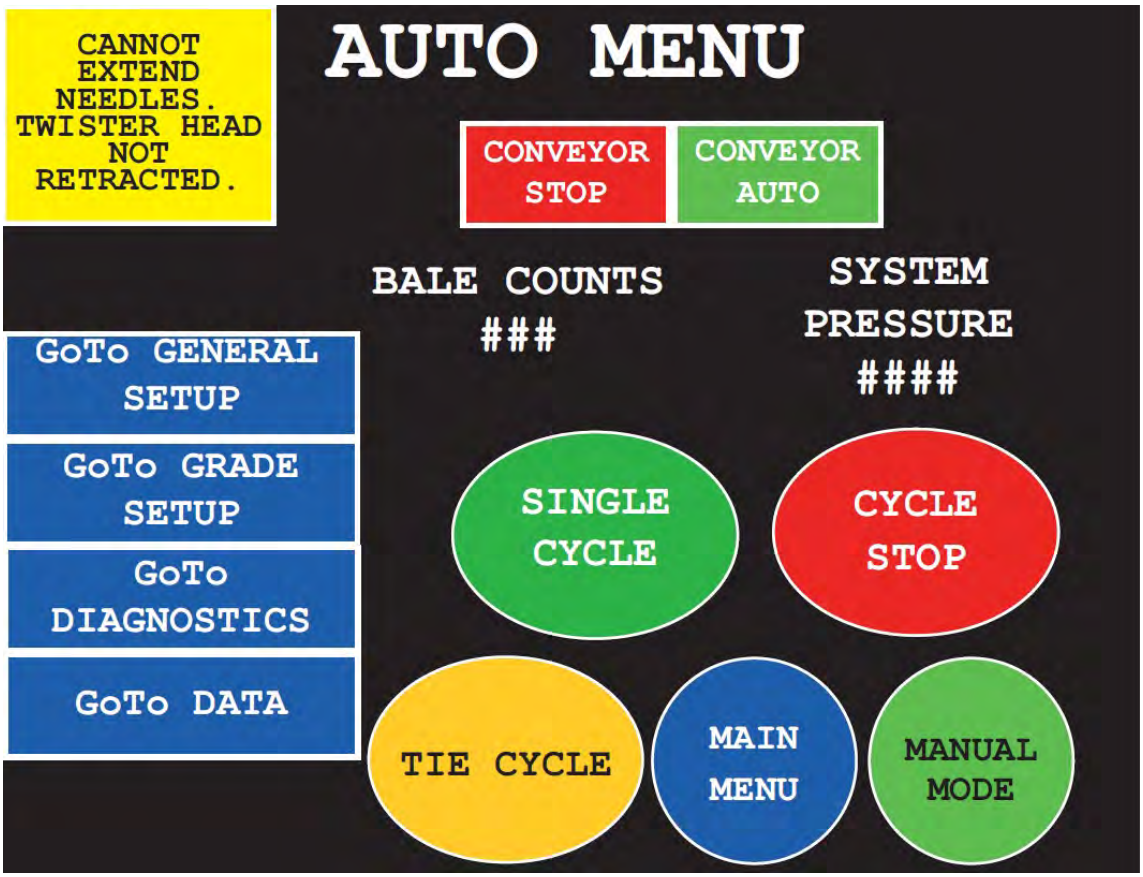
GoTo GRADE SETUP	Press button to go to grade setup. See **Page 1-28**.
GoTo DIAGNOSTICS	Press button to go to diagnostics. See **Page 1-36**.
GoTo DATA	Press button to go to the data screen. See **Page 1-42**.
GoTo SECURITY	Back to security/login screen.
GO TO MANUAL START	Takes you to the manual start screen where you can manually start the motor(s).
MANUAL MODE	Takes you to the manual menu screen. See **Page 1-17**.
AUTO MODE	Starts auto mode.

Manual Motor Start Screen



RETURN TO MAIN MENU	Pressing this button takes you to the main menu screen.
ALL MOTORS ARE ON	Indicator screen that displays the status of the motor(s).
CIR PUMP START / CIR PUMP STOP	Pressing these buttons starts and stops the circulating pump.
MOTOR 1 START / MOTOR 1 STOP	Pressing these buttons starts and stops motor #1.
MOTOR 2 START / MOTOR 2 STOP	Pressing these buttons starts and stops motor #2.

Auto Menu Screen

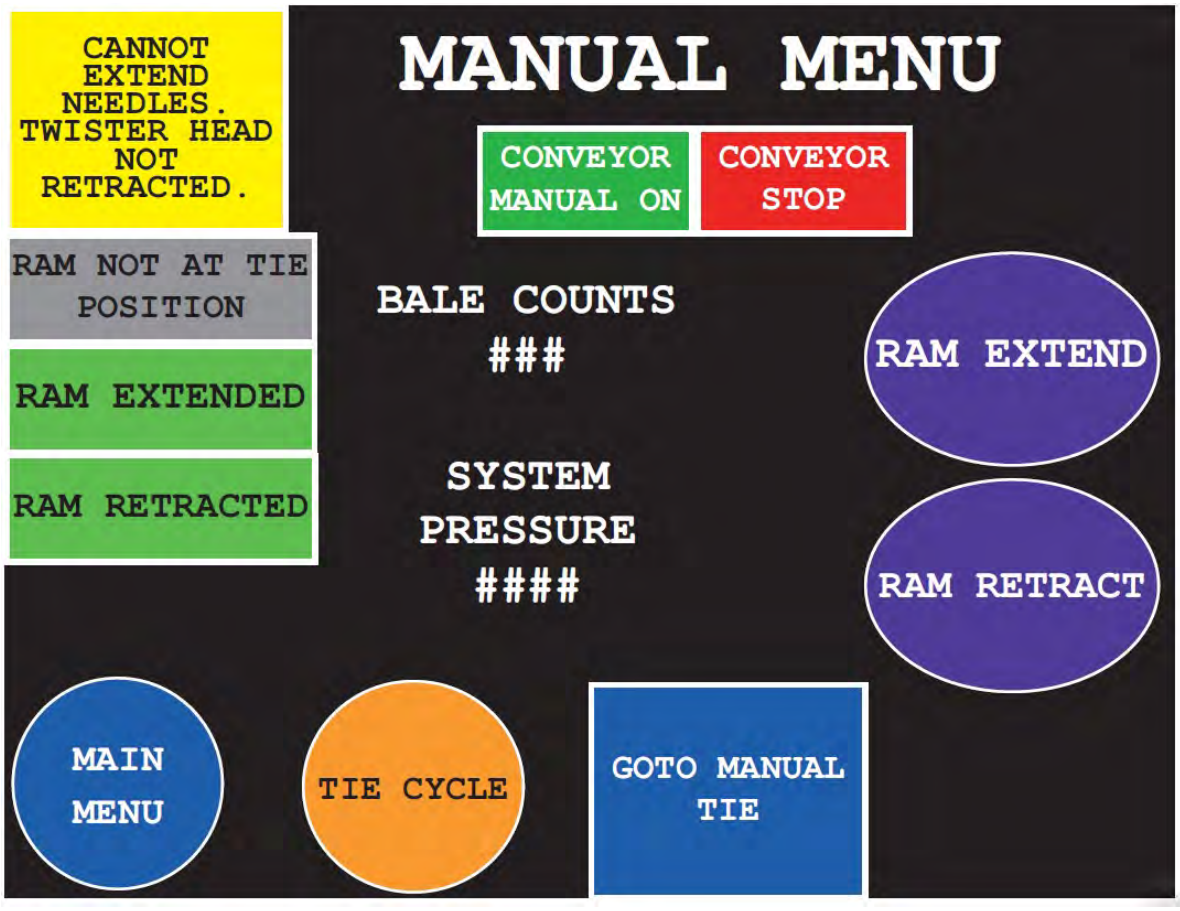


GoTo GENERAL SETUP	Login as “supervisor” to access general setup. See **Page 1-24**.
GoTo GRADE SETUP	Press button to go to grade setup. See **Page 1-28**.
GoTo DIAGNOSTICS	Press button to go to diagnostics. See **Page 1-36**.
GoTo DATA	Press button to go to the data screen. See **Page 1-42**.
CONVEYOR STOP	Press to stop the conveyor.
CONVEYOR AUTO	Press to start conveyor. Conveyor is defaulted to stop once upper photocell is blocked.
SINGLE CYCLE	Press to cycle the main ram once.

Auto Menu Screen (Continued)

	Press button to stop the cycle.
	Acts as a manual tie override. Pressing this button takes the ram to the tie position.
	Press button to go to the main menu screen.
	Press button to switch to the manual menu screen.

Manual Menu Screen - 1



RAM NOT AT TIE POSITION | RAM EXTENDED | RAM RETRACTED

Indicators displaying the position of the ram. The box illuminates green when ram is at that position.

MAIN MENU

Press button to go to the main menu screen.

TIE CYCLE

Acts as a manual tie override. Pressing this button takes the ram to the tie position.

CONVEYOR MANUAL ON | CONVEYOR STOP

Press these buttons to manually start or stop the conveyor.

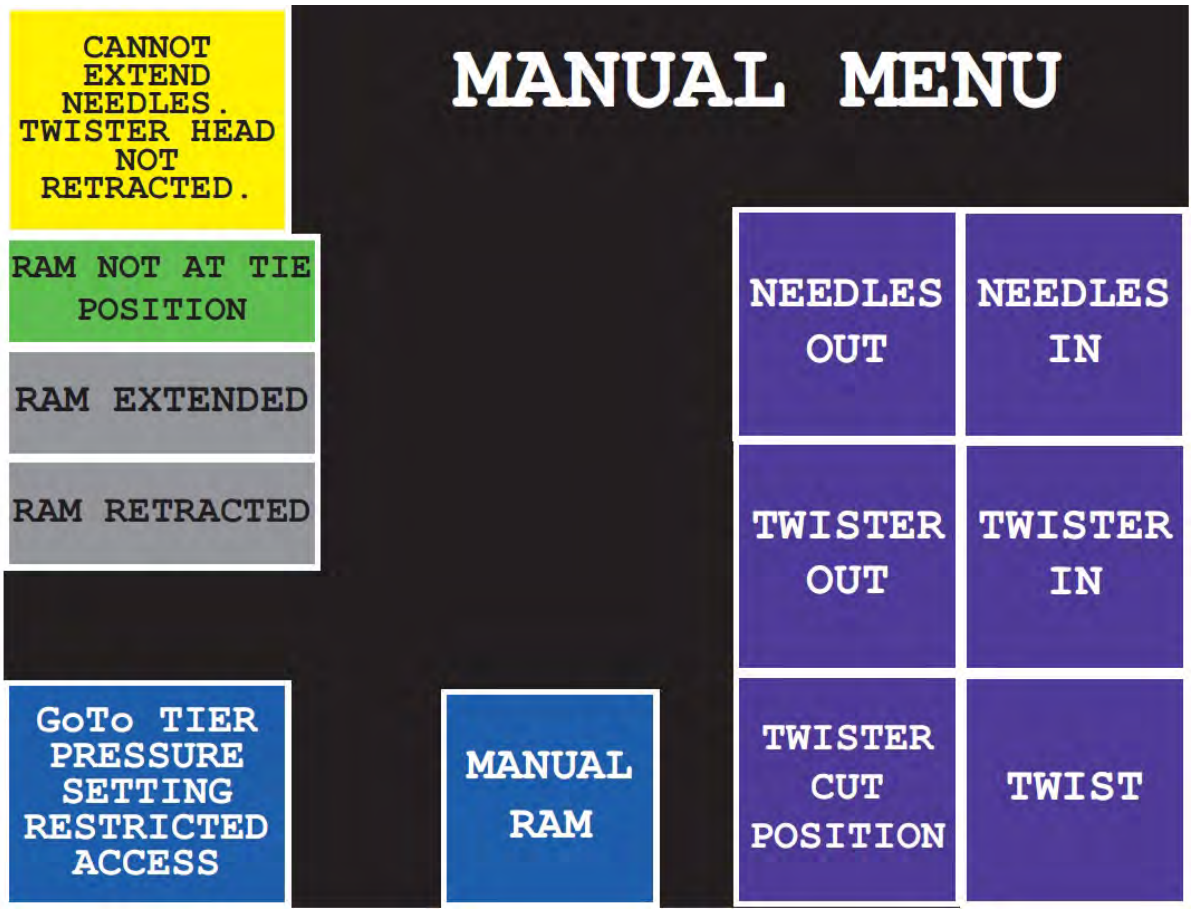
RAM EXTEND | RAM RETRACT

Press these buttons to manually extend or retract the main ram.

GOTO MANUAL TIE

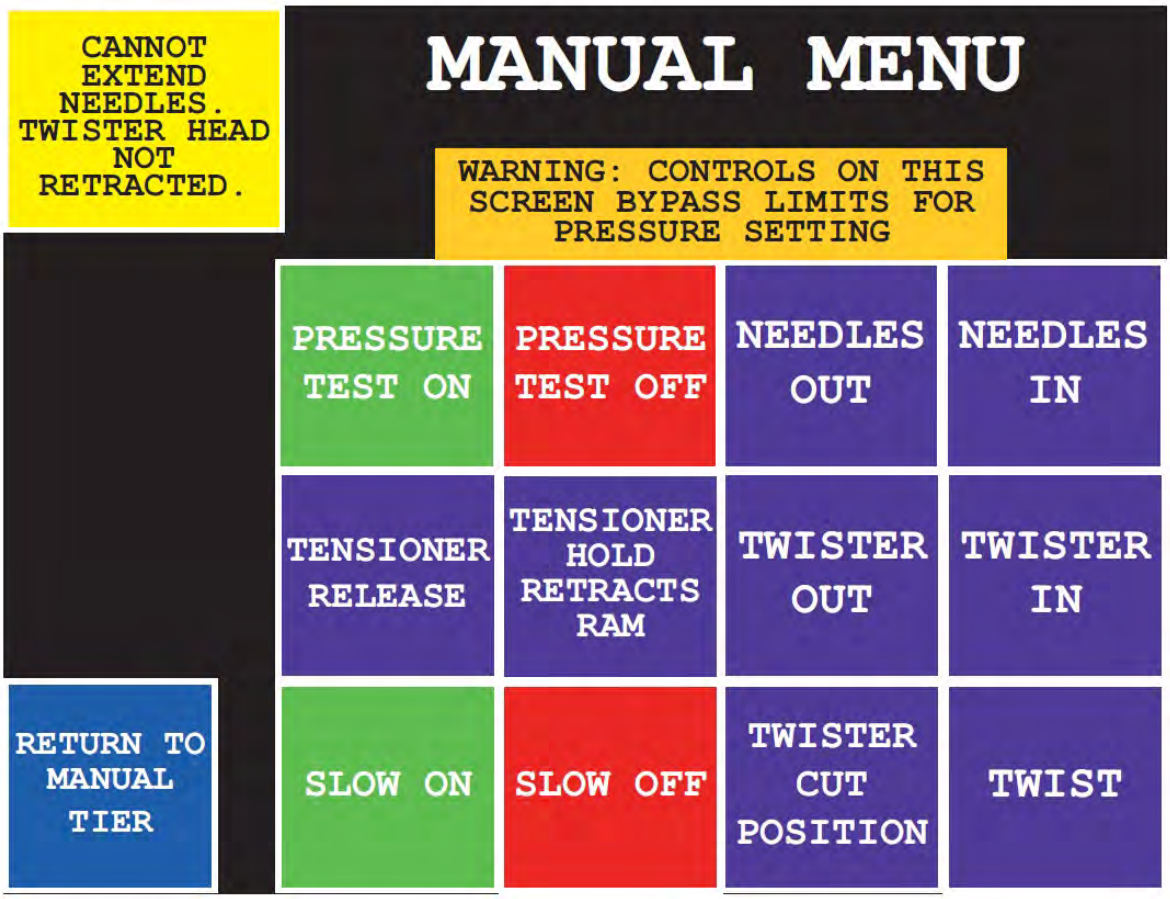
Pressing this button takes you to manual menu screen 2, where you can manually control the tying process.

Manual Menu Screen - 2



GoTo TIER PRESSURE SETTING RESTRICTED ACCESS	Must be logged in as “supervisor” to access. Takes you to the manual menu screen 3.
MANUAL RAM	Takes you back to manual menu screen 1.
NEEDLES IN / NEEDLES OUT	“Needles in” extends the inserter needles and “needles out” retracts the inserter needles.
TWISTER OUT / TWISTER IN	“Twister in” extends the twister head and “twister out” retracts the twister head.
TWISTER CUT POSITION	Pressing this button rotates the wire twisters into the cut position to cut the bale wires.
TWIST	Pressing this button manually twists the bale wires together a preset number of times.

Manual Menu Screen - 3

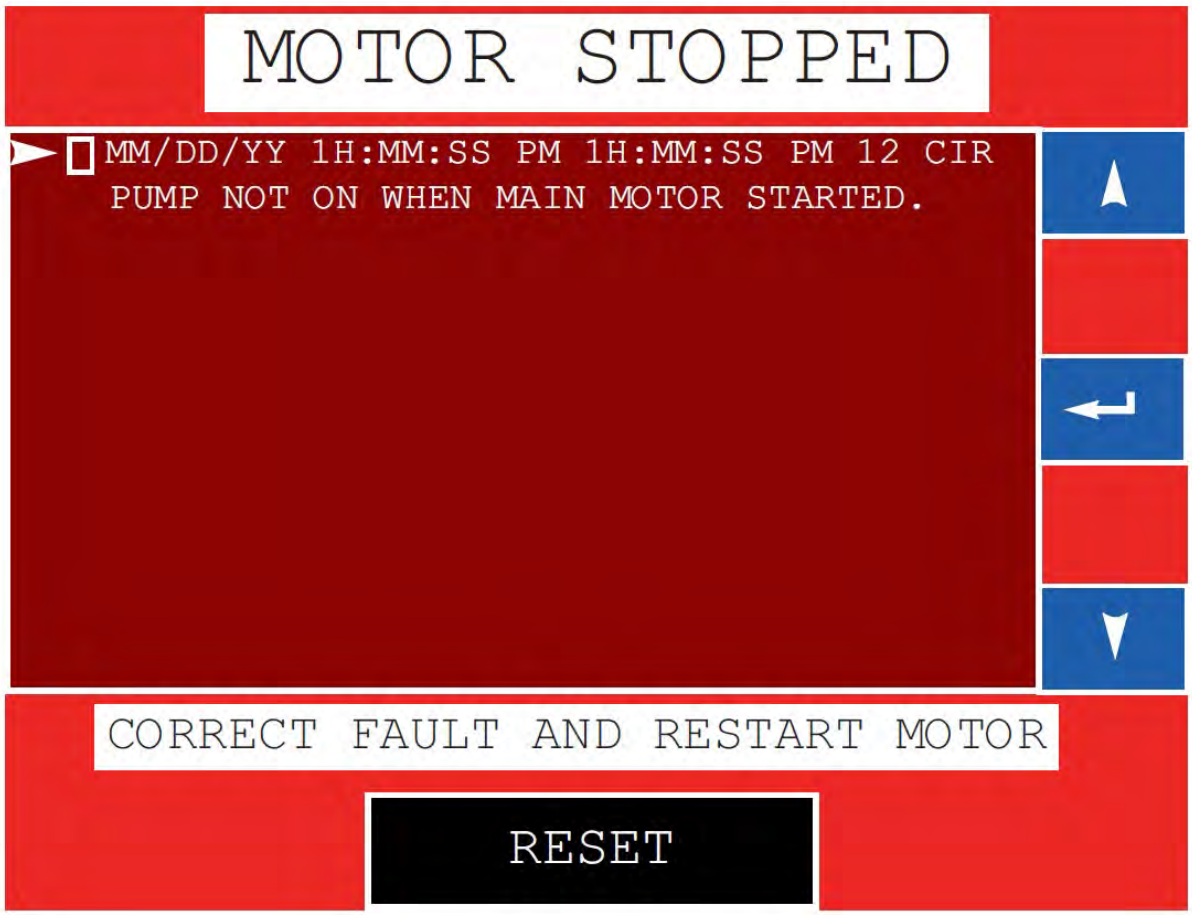


RETURN TO MANUAL TIER	Takes you back to manual menu screen 2.
PRESSURE TEST ON / PRESSURE TEST OFF	“Pressure test on” allows you to bypass limits for the pressure setting in order to set release.
TENSIONER RELEASE	Releases pressure on the tensioner to allow for bale ejection and expansion.
TENSIONER HOLD RETRACTS RAM	Retracts the ram while the tensioner maintains pressure.
SLOW ON / SLOW OFF	Slows the operations of the baler when on.
WARNING: CONTROLS ON THIS SCREEN BYPASS LIMITS FOR PRESSURE SETTING	Indicator screen.
NEEDLES OUT / NEEDLES IN	“Needles in” extends the inserter needles and “needles out” retracts the inserter needles.

Manual Menu Screen - 3 (Continued)

TWISTER OUT TWISTER IN	"Twister in" extends the twister head and "twister out" retracts the twister head.
TWISTER CUT POSITION	Pressing this button rotates the wire twisters into the cut position to cut the bale wires.
TWIST	Pressing this button manually twists the bale wires together a preset number of times.

Fault Screen - 10



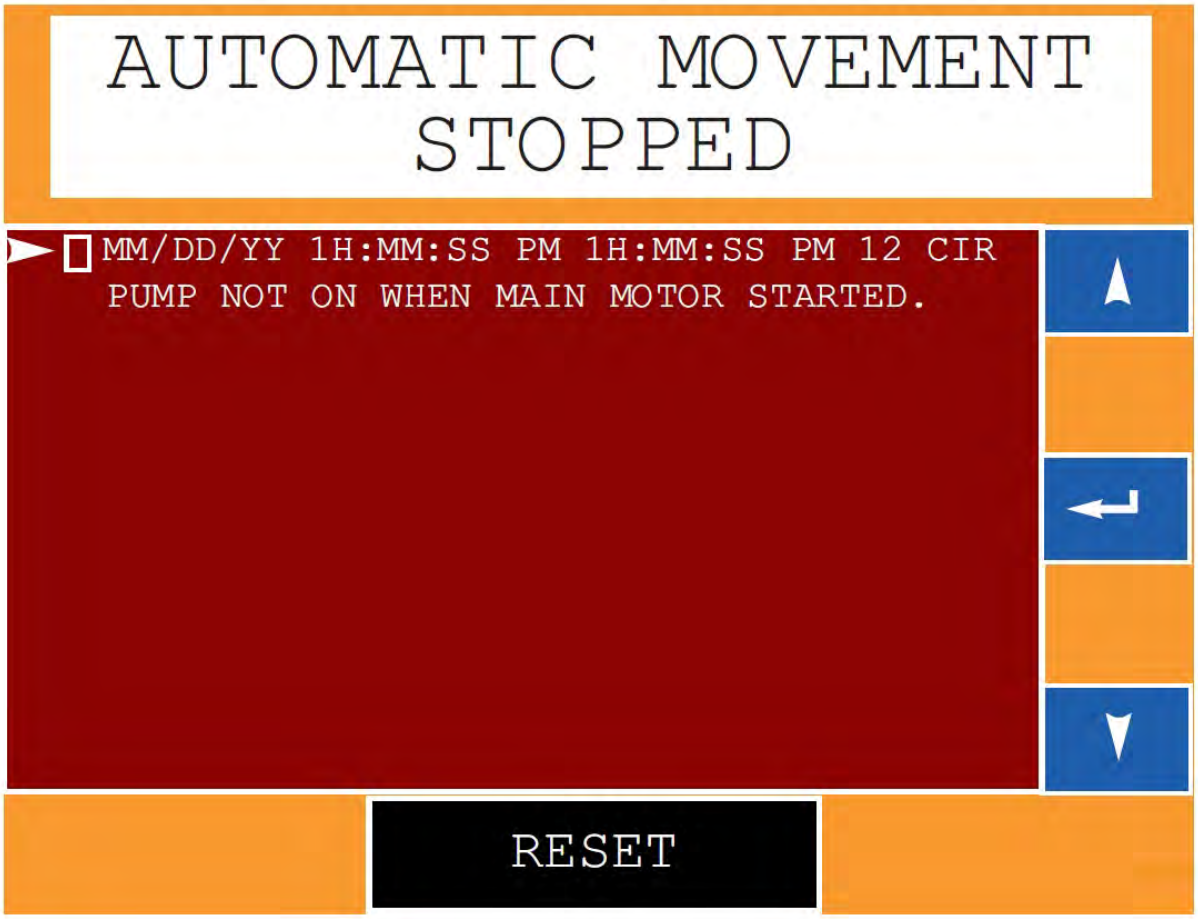
This is a fault screen indicating that the machine has encountered a problem and operation cannot continue until the fault is corrected. Scroll through the faults with the arrows.

The date and time of the fault are recorded here as well.

Pressing the “reset” button will clear all listed faults.

Refer to the fault list on **Page 1-23** for a complete listing of possible faults.

Major Fault Screen - 11



This screen indicates a fault condition exists. Automatic movement of the baler was stopped because it was not able to complete a function. For example the ram could not reach the extend position proximity switch, due to too much material in the charge box.

Press "ack all" (acknowledge all) on the alarm banner, press reset on the fault list screen place the machine in manual and correct the problem area. Then return all parts of the baler to their start position and return the baler to automatic.

Fault List

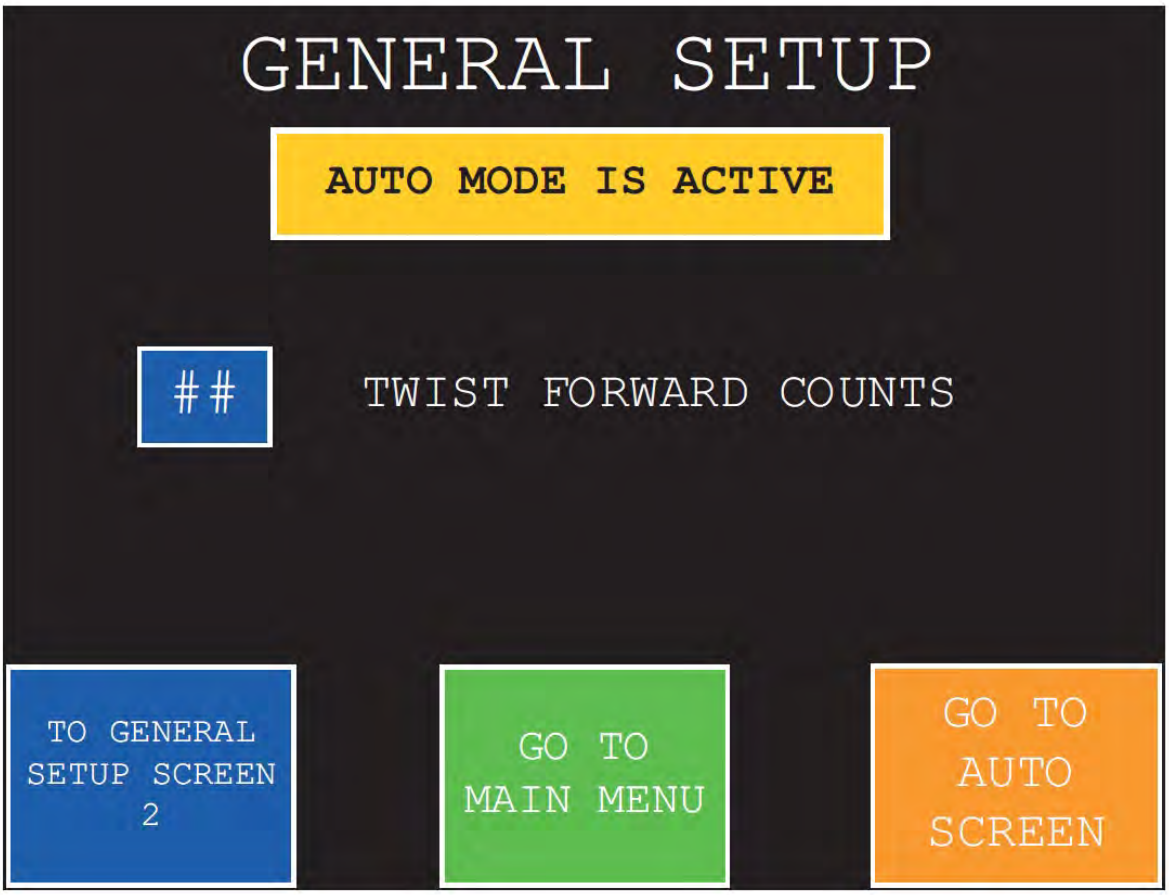
The following faults will stop the baler motor. The fault must be cleared and motor restarted to continue operation.

- An e-stop is pressed or interlocked cover or door is open.
- Suction valve is closed.
- Main motor overload tripped.
- Oil cooler overload tripped.
- Low oil level.
- High oil temperature.
- Check fan motor starter, output fuse and auxiliary contact.
- Check main motor starter, output fuse and auxiliary contact.

The following faults will stop automatic movement of the baler ram or tie system. The fault must be cleared and all parts of the baler returned to their starting position before automatic operation can continue.

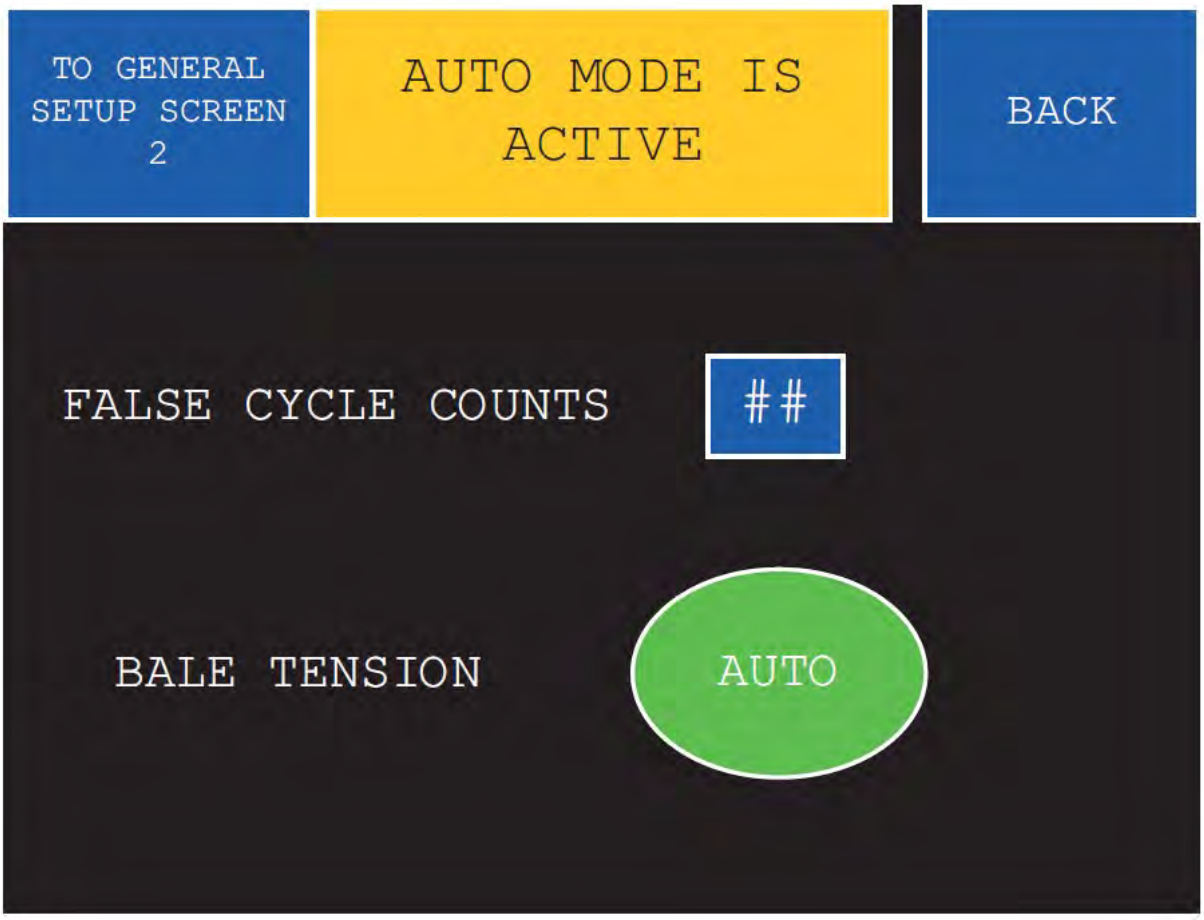
- Twister could not find home position.
- Ram can not retract. Needles not retracted.
- Twister cannot extend. Needles not retracted.
- Needles cannot extend. Twister not retracted.
- Needles cannot extend. Ram not at the tie position.
- False cycle. Too many cycles without change in photo eye.
- Wire did not cut.
- Ram jammed. Ram could not reach extend proximity switch.
- Check photo eyes. Upper eye is blocked lower eye is clear.
- Ram could not retract or rear proximity switch failure.
- Extend proximity switch failure.
- Bale length proximity counter failure. No change in counter.
- Needles could not extend or needles extended limit switch failure.
- Needles could not retract or needles retract limit switch failure.
- Twister head could not reach home position proximity switch.
- Tie system out of position.
- Unloading valve failure.

General Setup Screen - 1



AUTO MODE IS ACTIVE	Indicator screen.
## TWIST FORWARD COUNTS	Pressing the number box displays a numeric keypad for you to select the number of times the bale wires are twisted together.
TO GENERAL SETUP SCREEN 2	Press this button to go to the next general setup screen.
GO TO MAIN MENU	Press button to go to the main menu screen.
GO TO AUTO SCREEN	Press button to go to the auto menu screen.

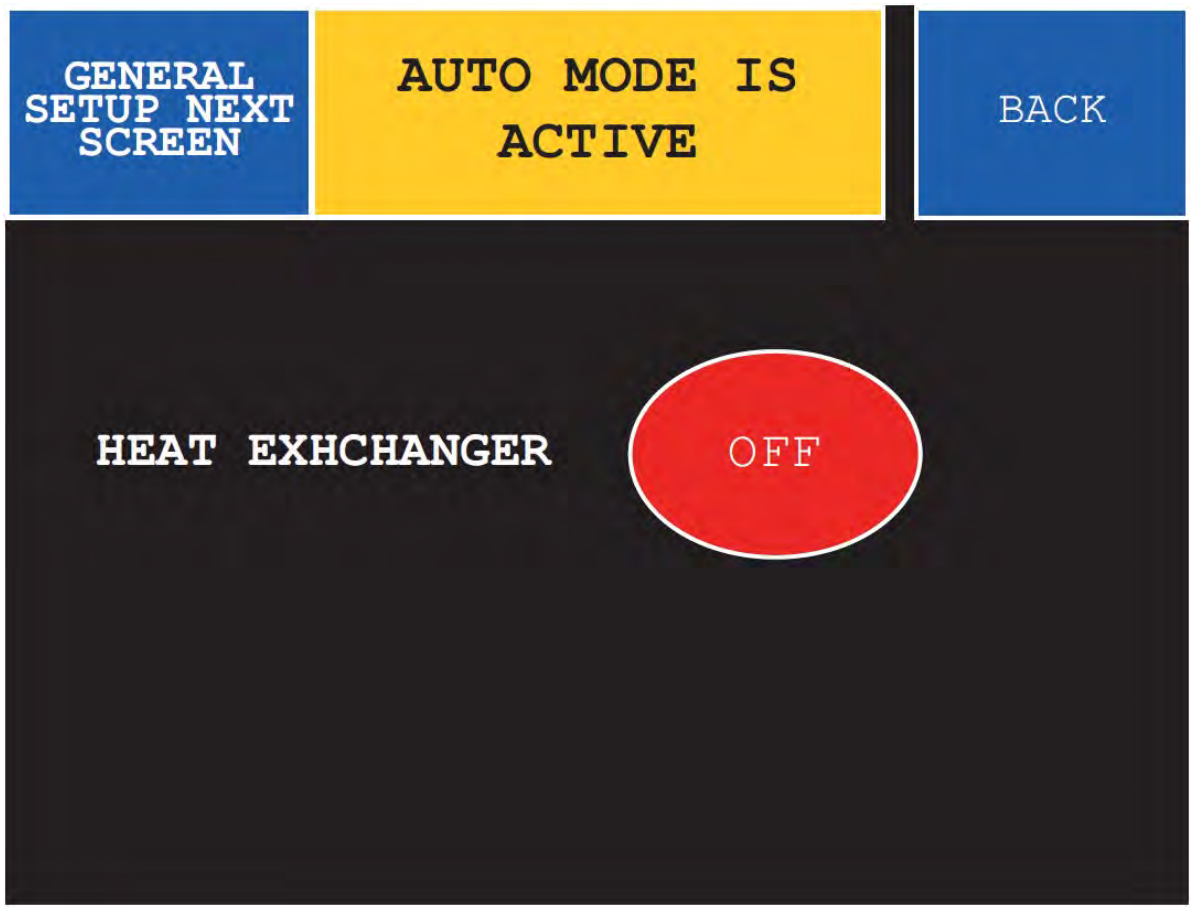
General Setup Screen - 2



FALSE CYCLE COUNTS ## Pressing the number box will display a numeric keypad for you to select the number of counts the baler will cycle with the upper photocell blocked. Gives fault.

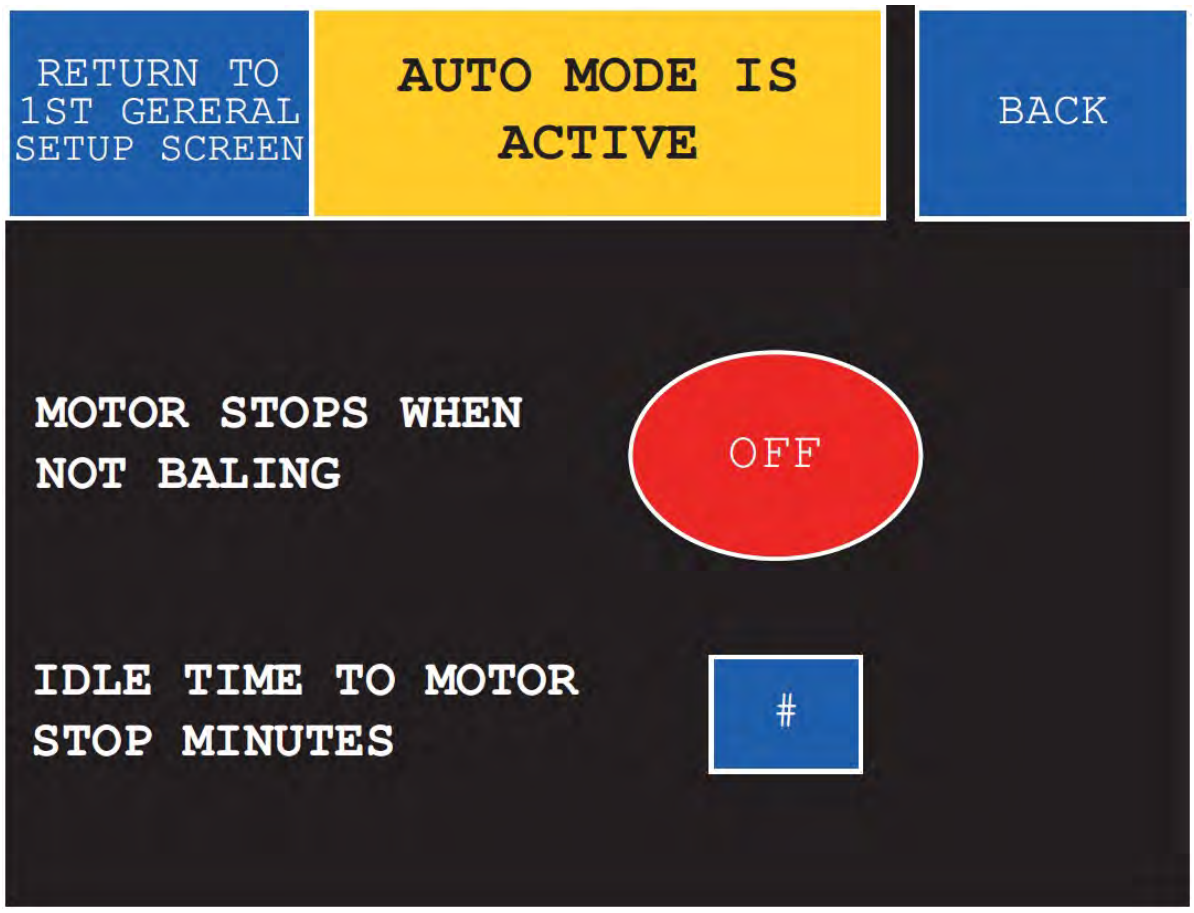
BALE TENSION AUTO Bale tension can be set for “auto” (always recommended) or set to be “off”.

General Setup Screen - 3



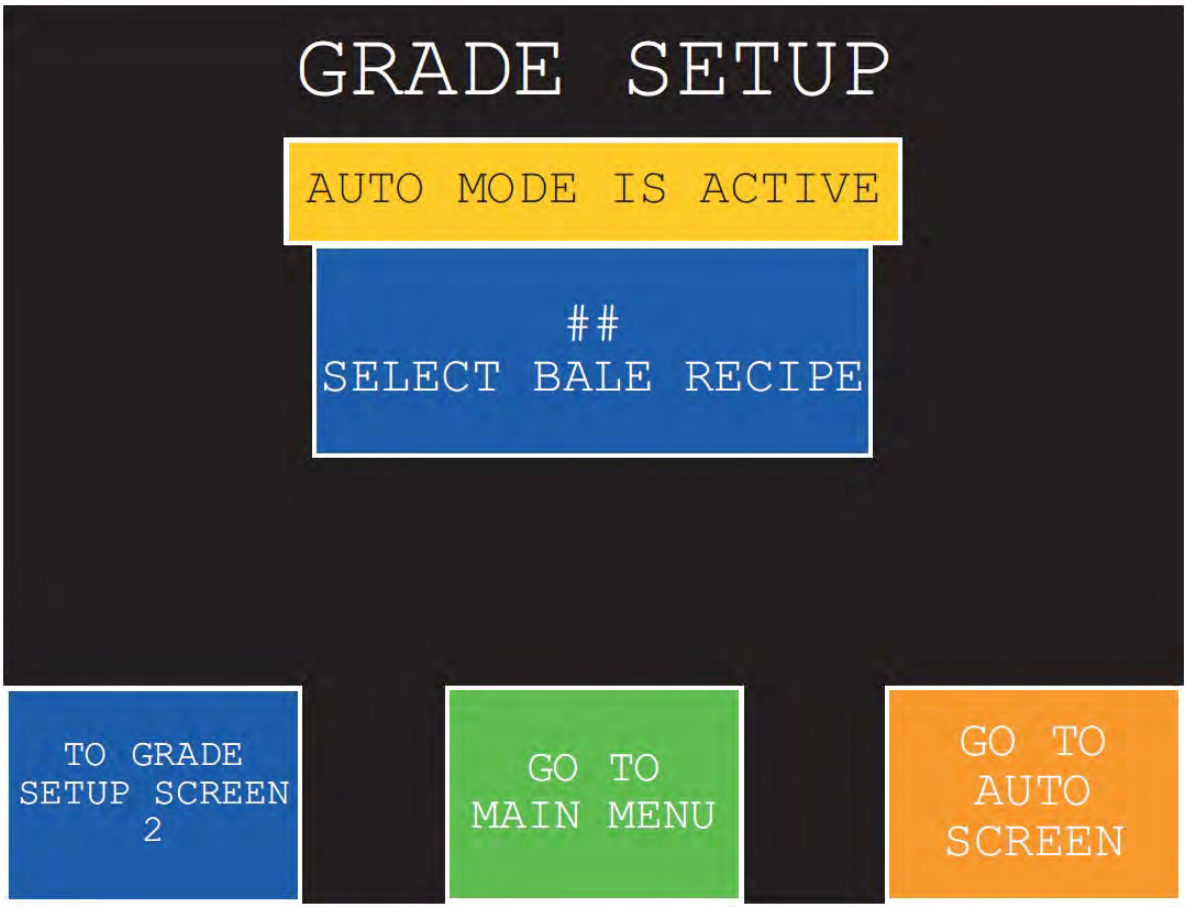
Pressing this button switches the heat exchanger (oil cooler) to the “auto” mode. It is recommended to keep this on “auto” during operation.

General Setup Screen - 4



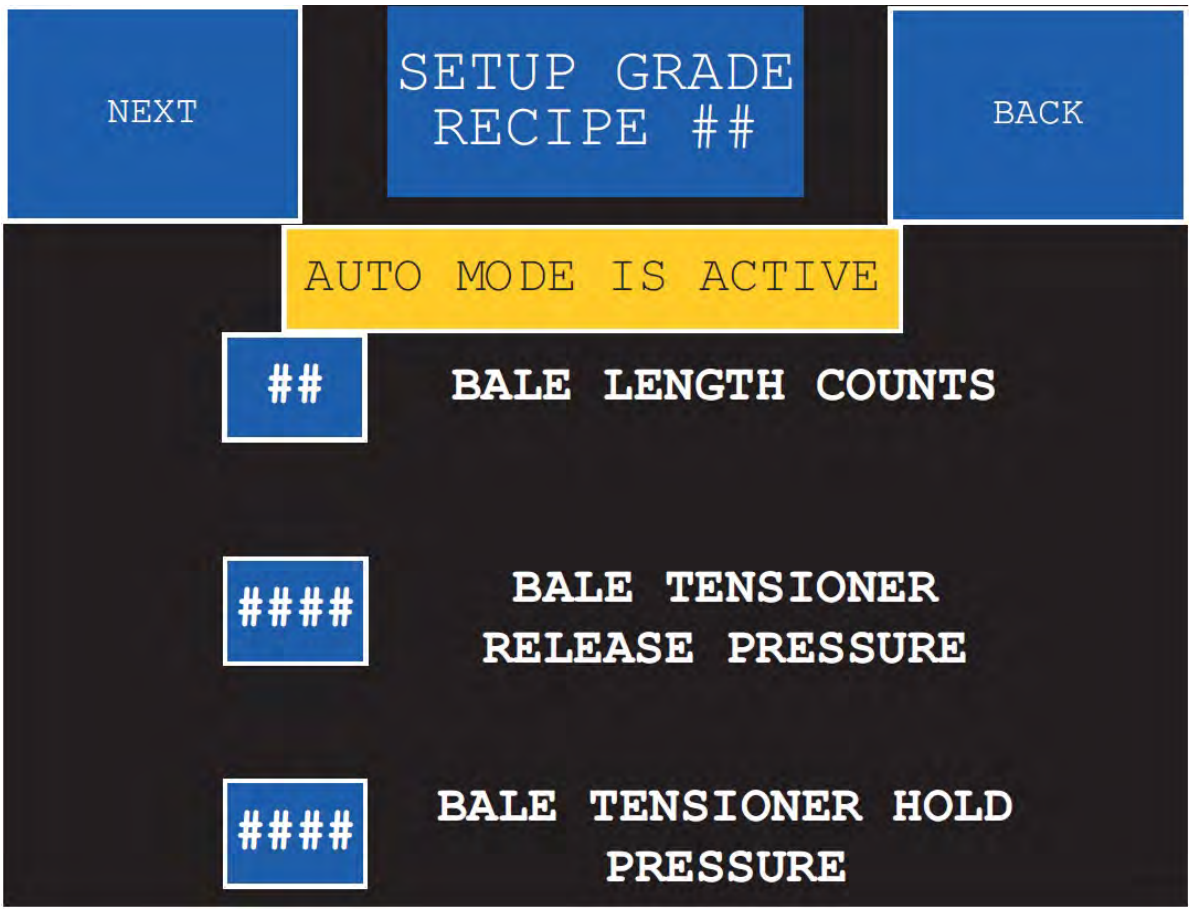
MOTOR STOPS WHEN NOT BALING	OFF	Pressing this button switches to the “on” setting, which programs the baler to stop after a set length of idle time.
IDLE TIME TO MOTOR STOP MINUTES	#	Pressing this button displays a numeric keypad which allows you to choose the length of idle time (in minutes) before the motor(s) automatically shut down.

Grade Setup Screen - 1



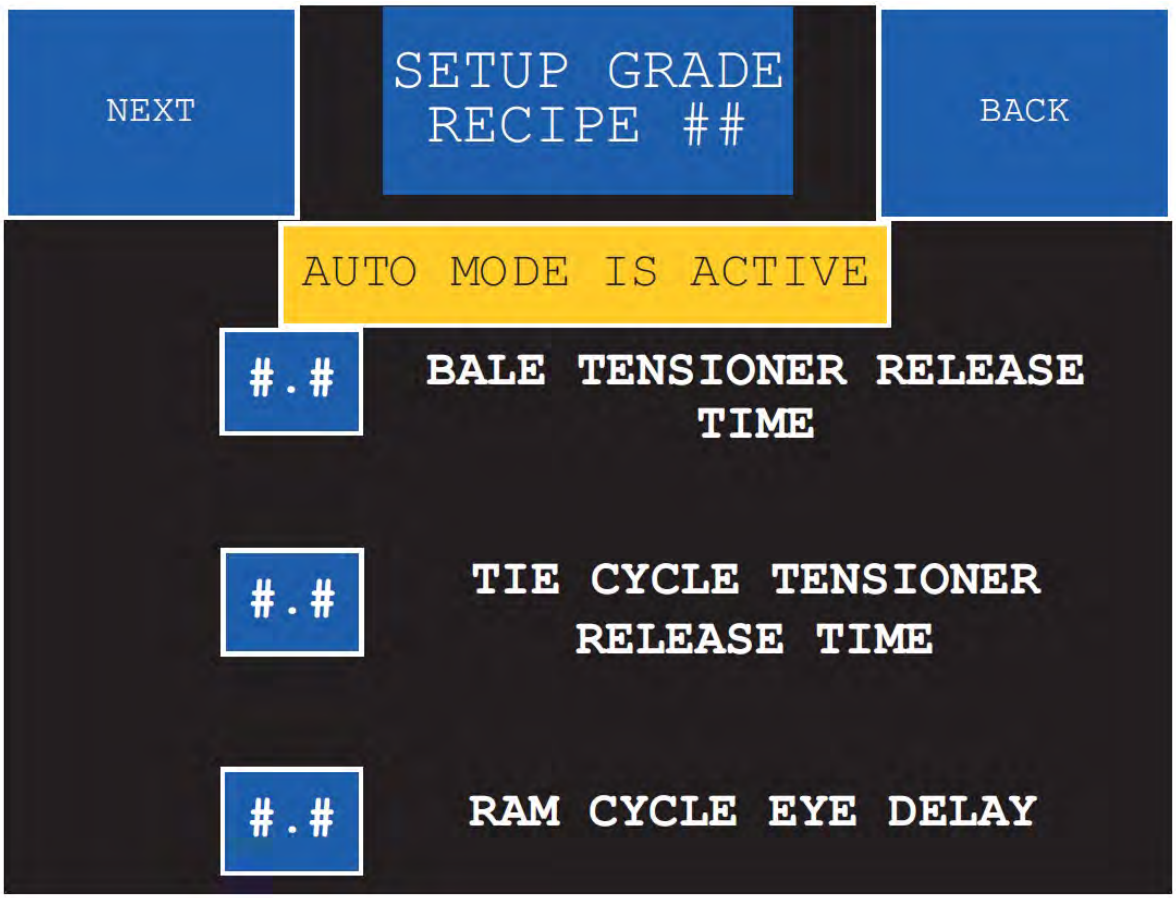
## SELECT BALE RECIPE	You must login as the operator to change bale recipe.
TO GRADE SETUP SCREEN 2	Your must login as a supervisor to go to the next grade setup screen.
GO TO MAIN MENU	Press button to go to the main menu screen.
GO TO AUTO SCREEN	Press button to go to the auto menu screen.

Grade Setup Screen - 2



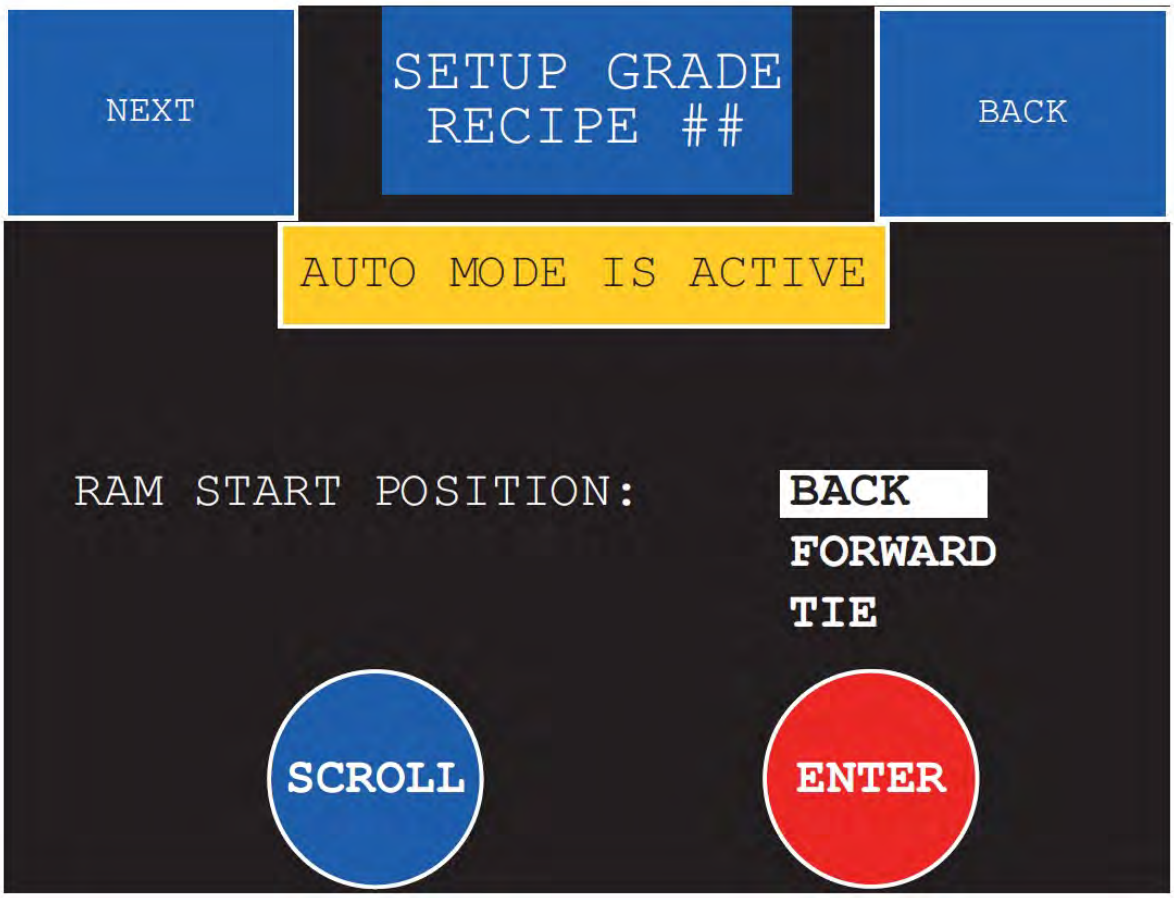
##	BALE LENGTH COUNTS	Displays the number of counts by the wheel counter.
####	BALE TENSIONER RELEASE PRESSURE	This is the set pressure at which point the tensioner releases the pressure on the bale.
####	BALE TENSIONER HOLD PRESSURE	This is the set pressure at which point the tensioner stops tensioning and holds until the set release pressure is reached.

Grade Setup Screen - 3



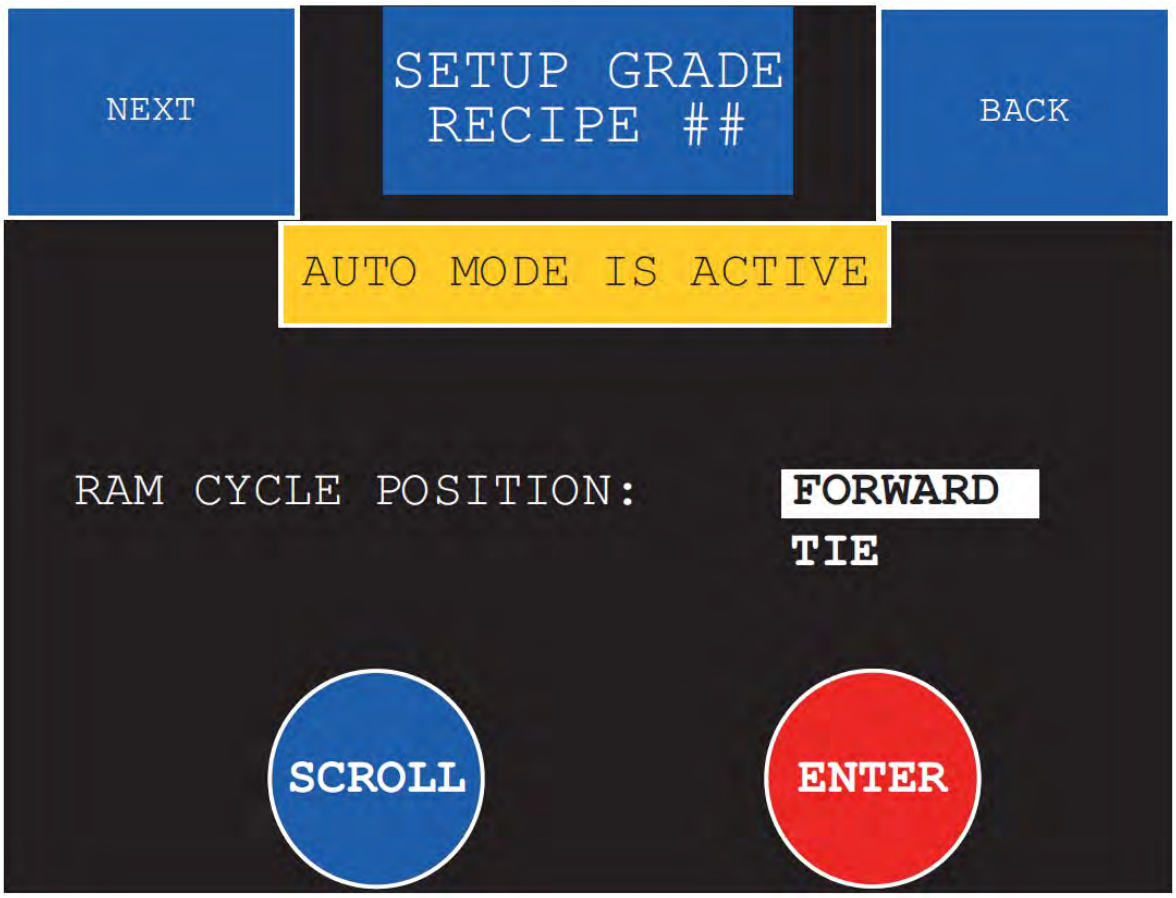
#.#	BALE TENSIONER RELEASE TIME	Pressing the number box displays a numeric keypad that allows you to choose the amount of time (to one-tenth of a second) the bale tensioner releases pressure to allow for bale ejection and expansion.
#.#	TIE CYCLE TENSIONER RELEASE TIME	Time (to one-tenth of a second) additional to the bale tensioner release time which pressure is released to allow for the bale to be tied.
#.#	RAM CYCLE EYE DELAY	Time that the photocell is to be blocked before the ram activates. Can be set within one-tenth of a second.

Grade Setup Screen - 4



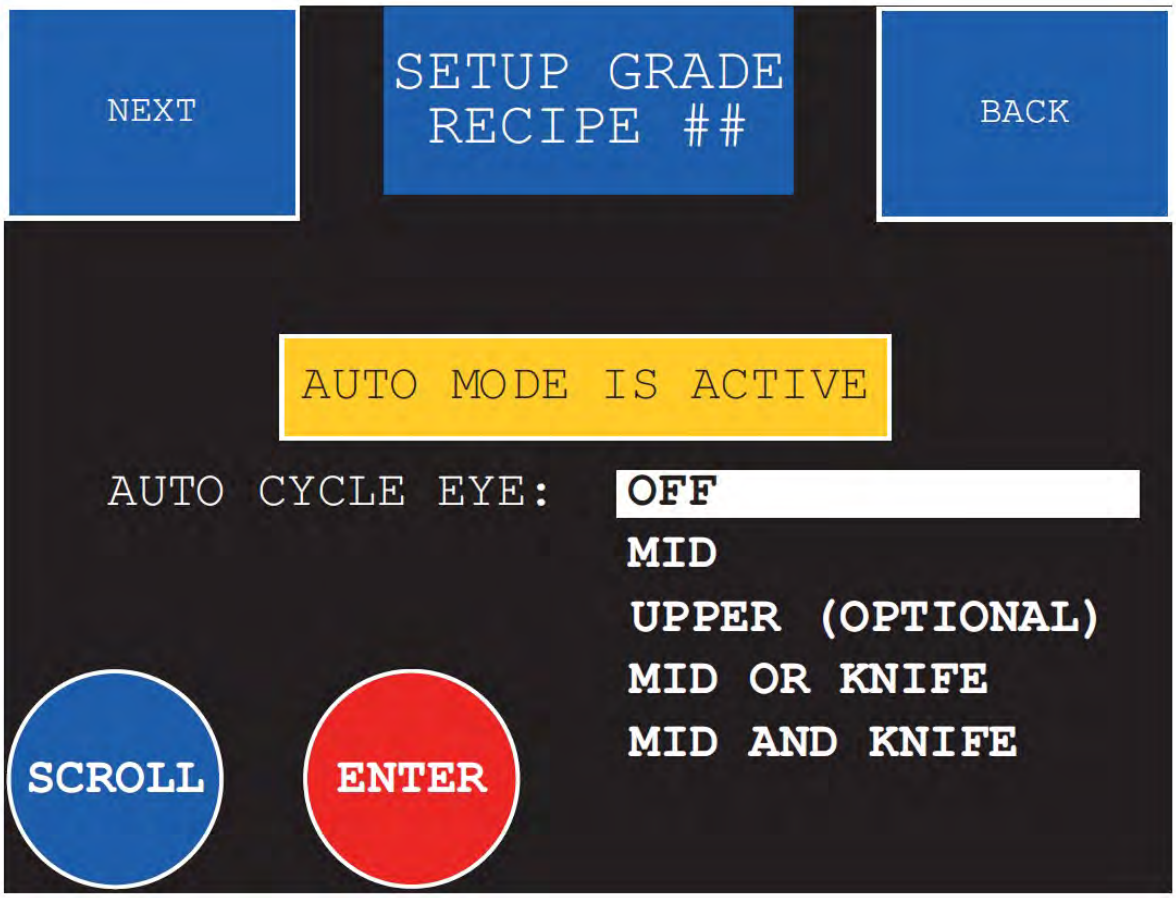
RAM START POSITION:	Push “Scroll” to select ‘Back’, ‘Forward’, or ‘tie’ for the starting position of the ram. Press enter once the selected position is highlighted.

Grade Setup Screen - 5



RAM CYCLE POSITION:	Push “Scroll” to select ‘Forward’, or ‘tie’ for the position to which the ram extends. Press enter once the selected position is highlighted.

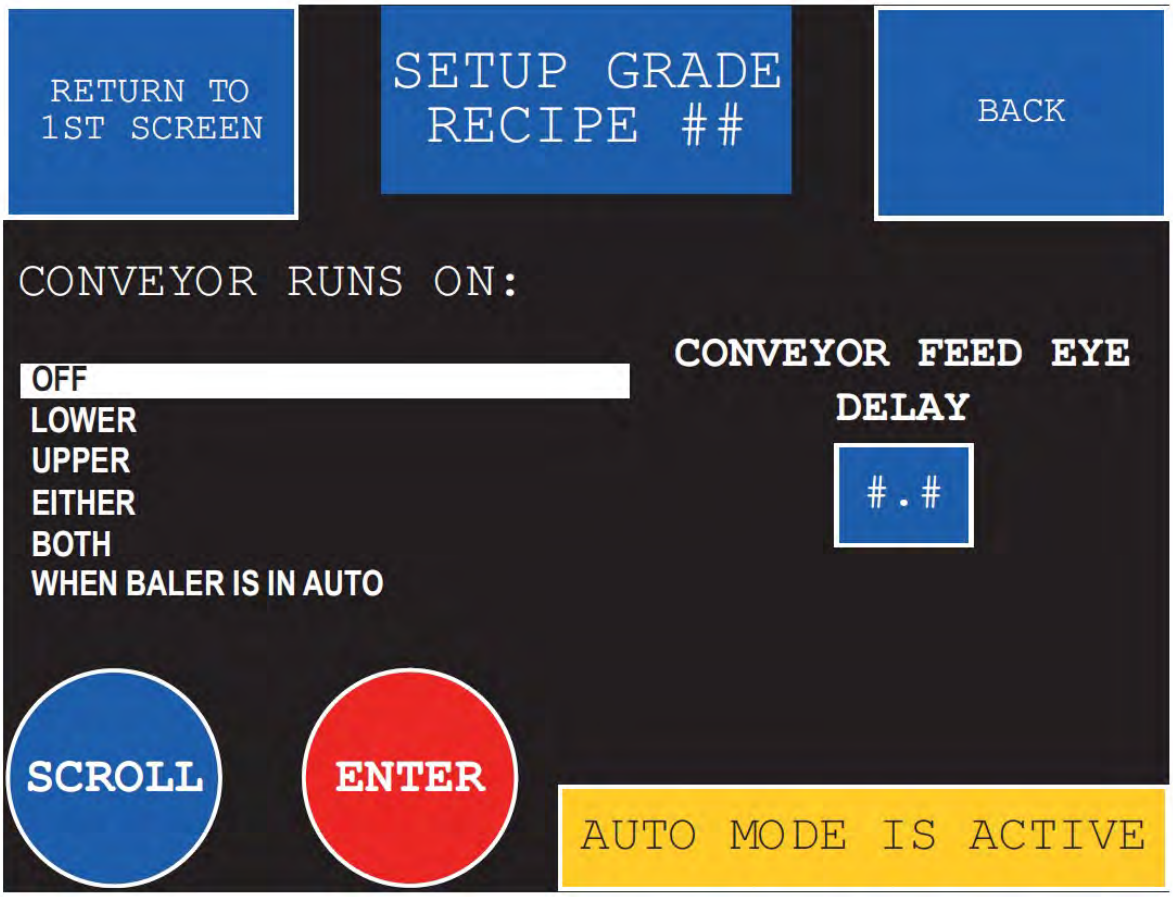
Grade Setup Screen - 6



Use “Scroll” to select the photocell that activates the main ram to begin auto-cycling. Press “enter” once the selected photocell is highlighted. This setting would be changed according to baling material size. For example, when baling larger material, such as corrugated cardboard, you would select the upper photocell. When baling smaller material, such as office paper, you would select either one or both of the lower photocells, depending on material density.

Note: Not all auto-tie baler models contain all of the photocell options shown above.

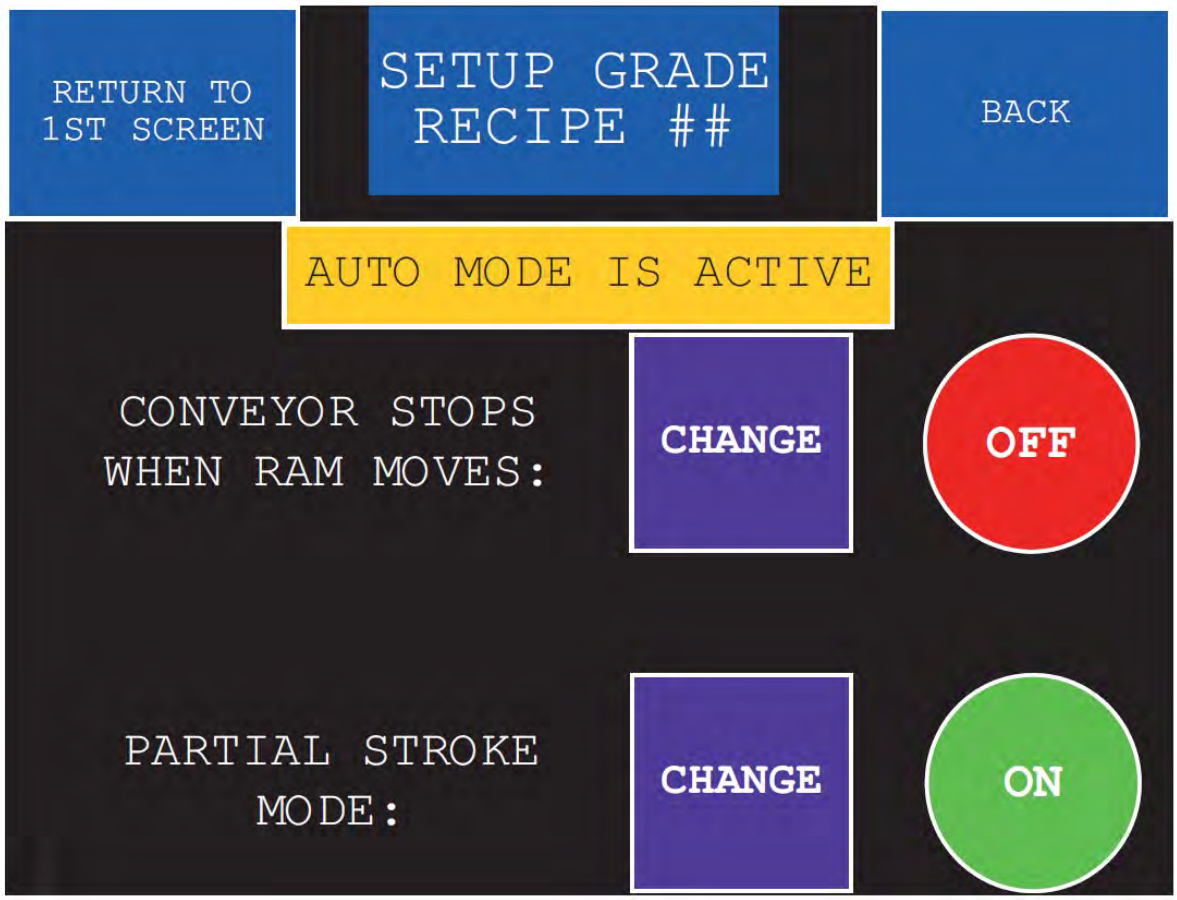
Grade Setup Screen - 7



Push the blue scroll button to select which photocell stops the conveyor for the duration of the ram cycle. Press enter once selected photocell is highlighted.

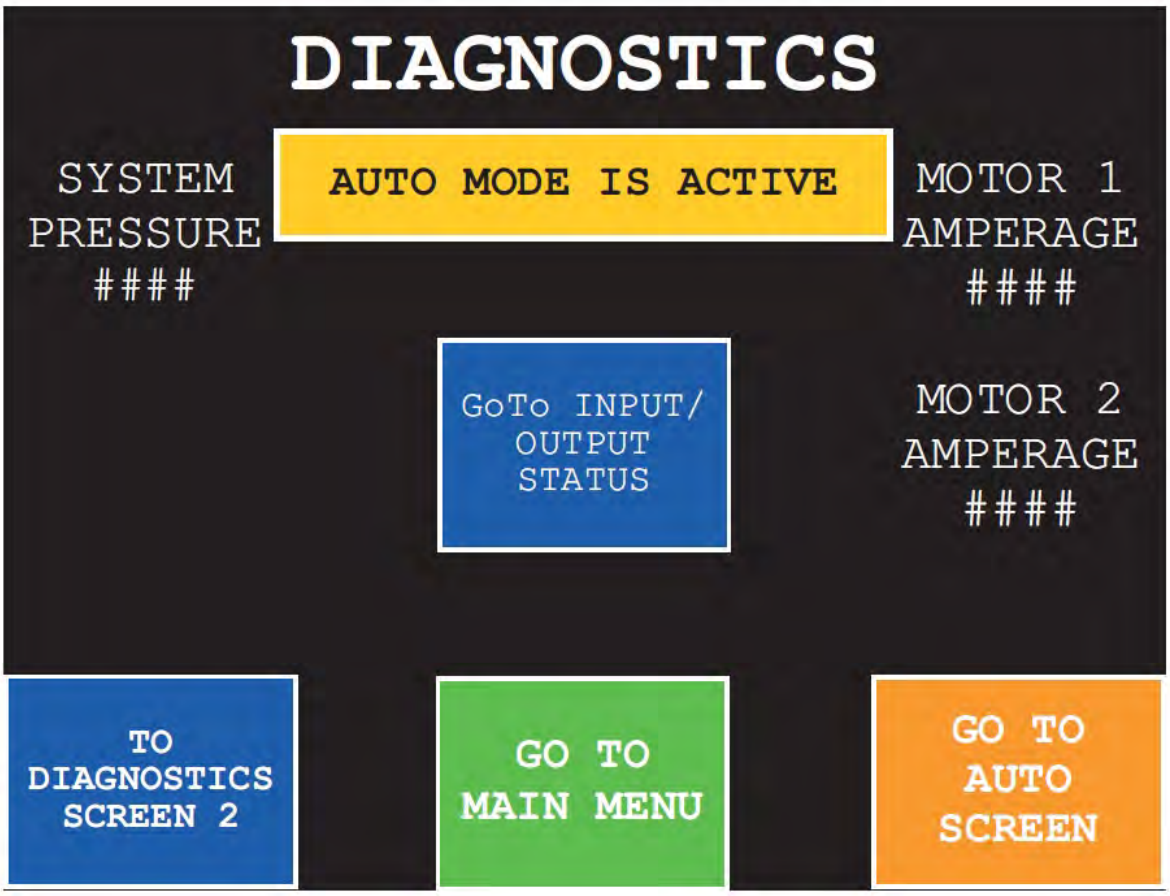
Pressing this button displays a numeric keypad to select the length of time, in seconds, the photocell is blocked before the conveyor stops.

Grade Setup Screen - 8



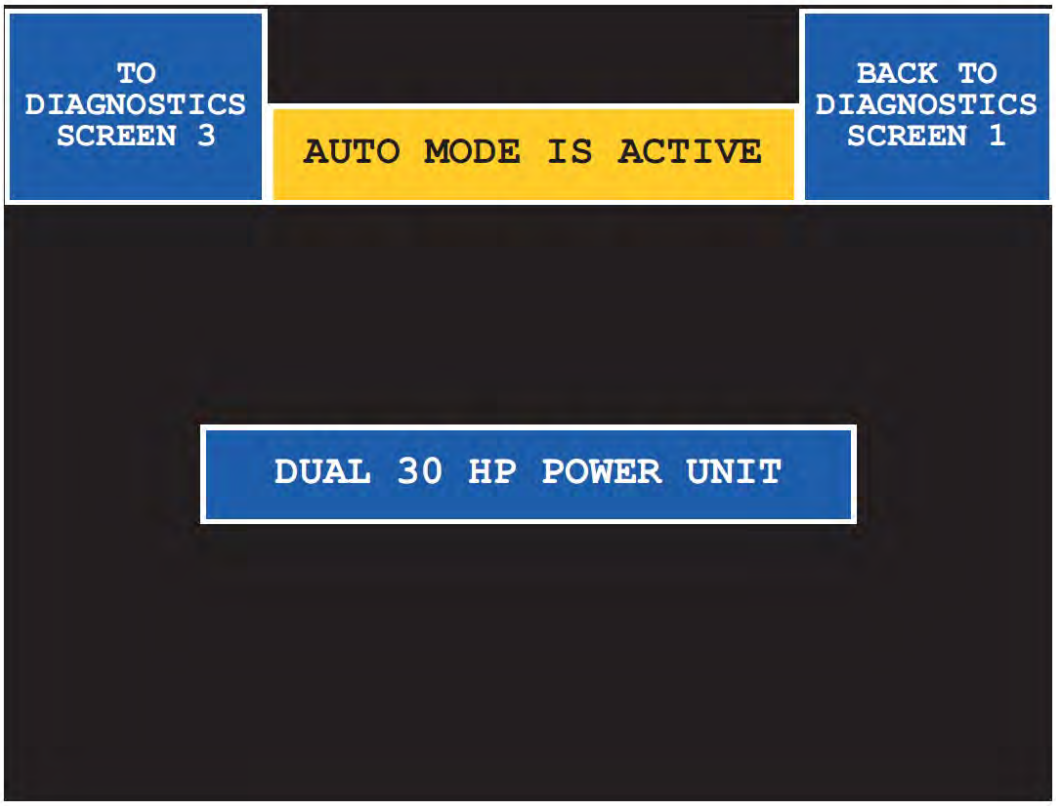
CONVEYOR STOPS WHEN RAM MOVES:	CHANGE	This setting controls the conveyor when the ram is in motion. Press 'change' to choose this function to be 'Off' or 'on'.
PARTIAL STROKE MODE:	CHANGE	This option is only available on shear model auto-ties and when "On" allows the baler to calculate whether or not a partial ram cycle is needed to create an average. Consistent bale length.

Diagnostics Menu - 1

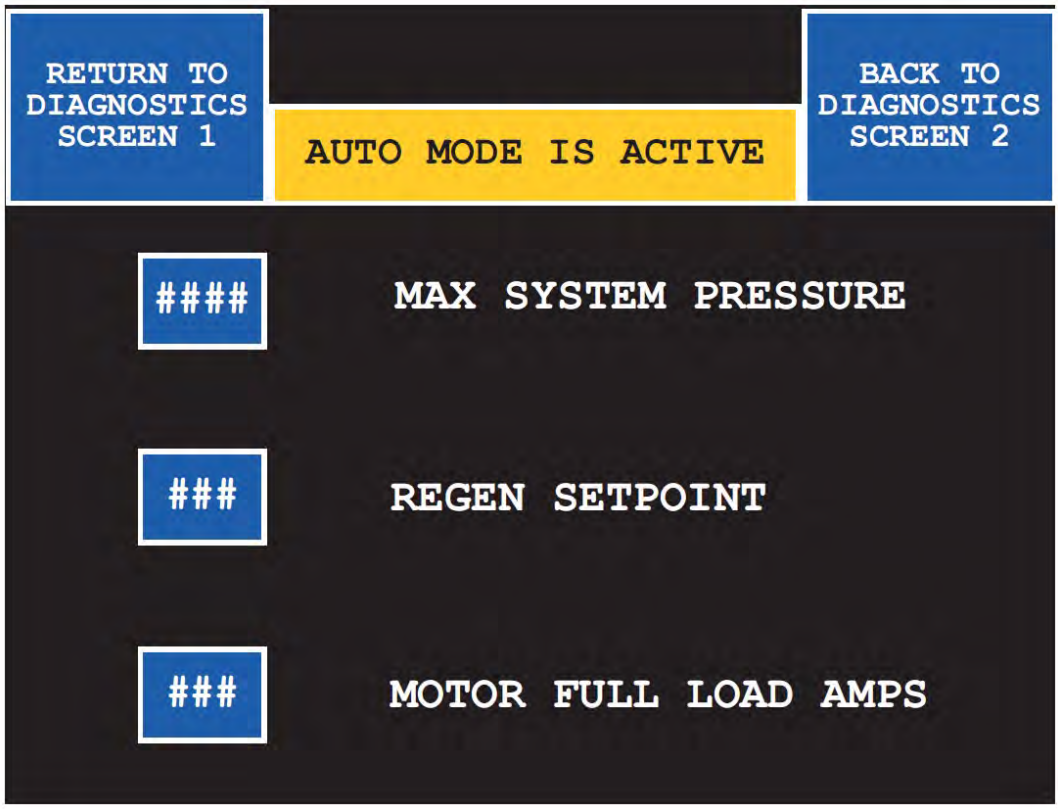


Note: The diagnostics menu and subsequent screens may only be accessible by Marathon personnel. in the event that you need to access this, please call our service department at 1-800-633-8974 and proper instructions will be given accordingly.

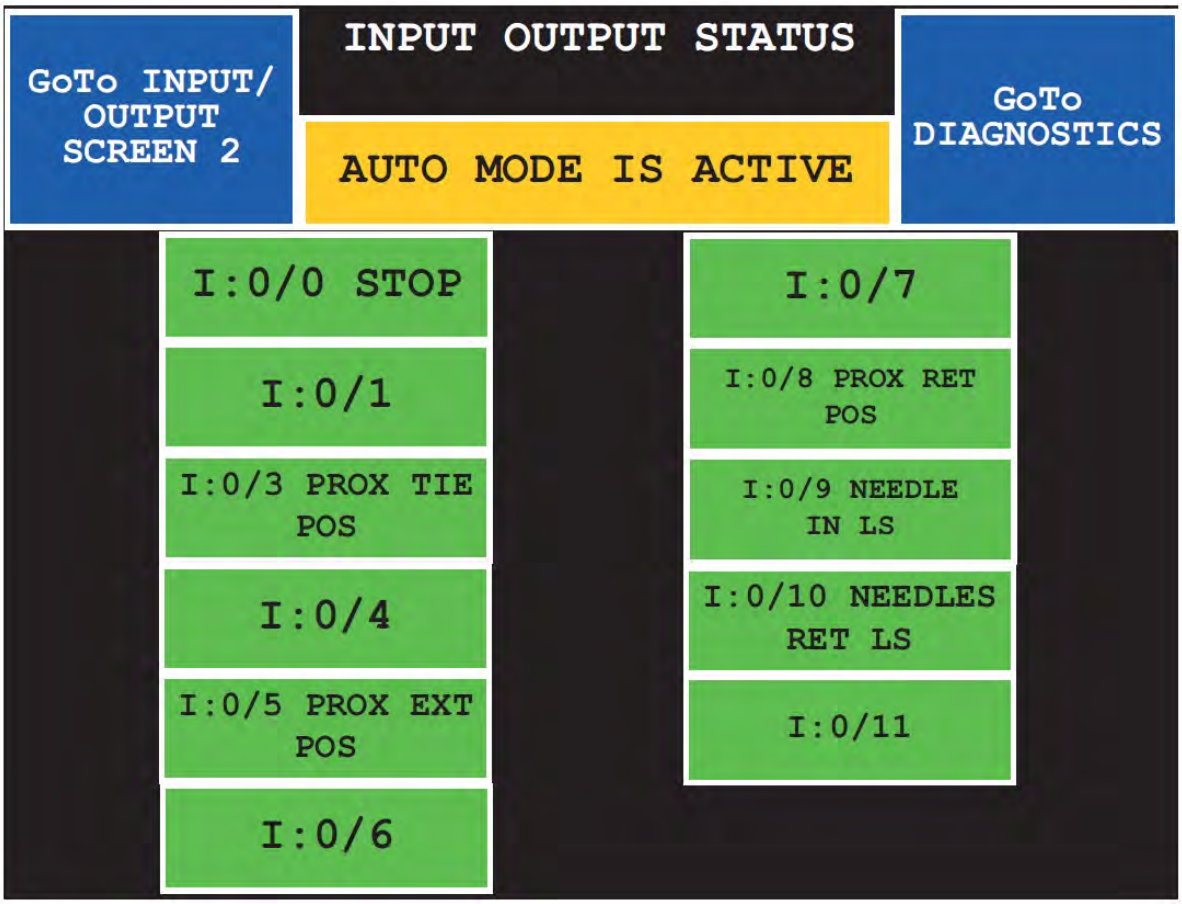
Diagnostics Menu - 2



Diagnostics Menu - 3

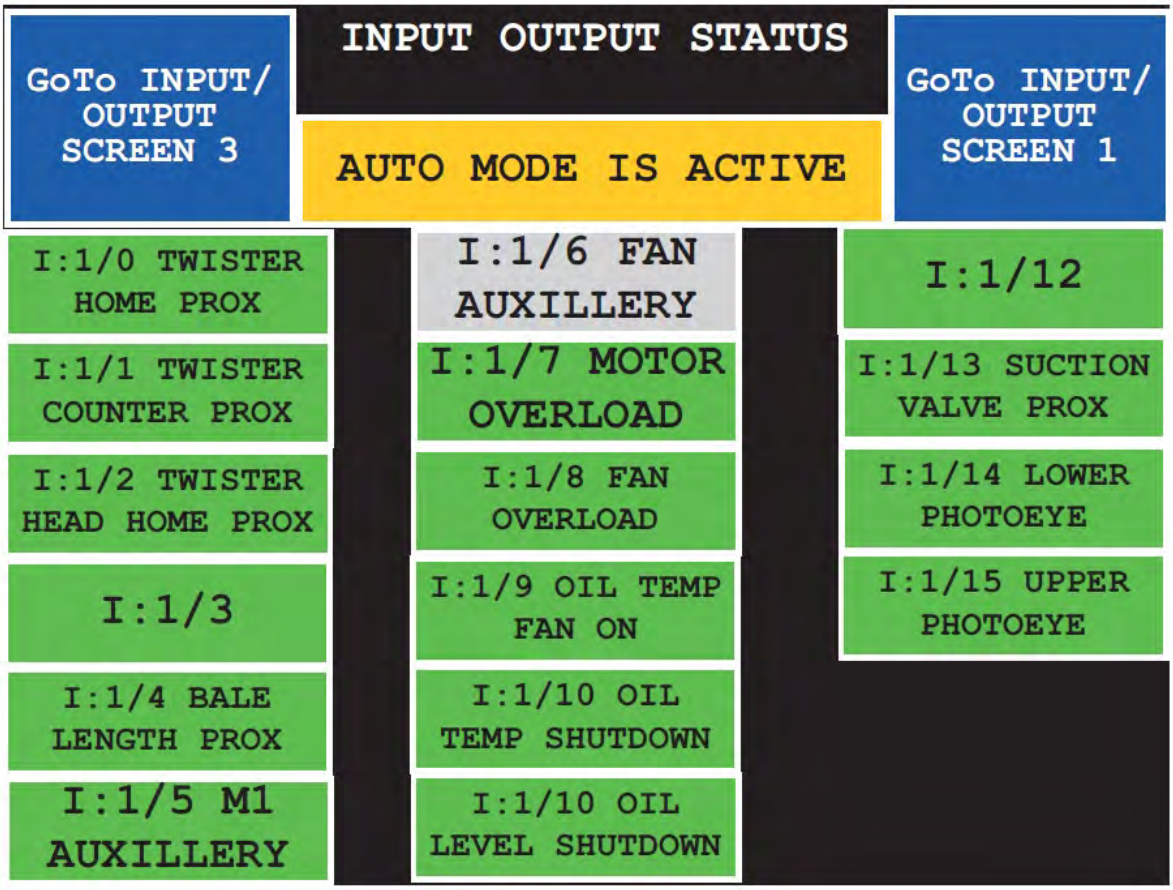


Input / Output Status Screen - 1



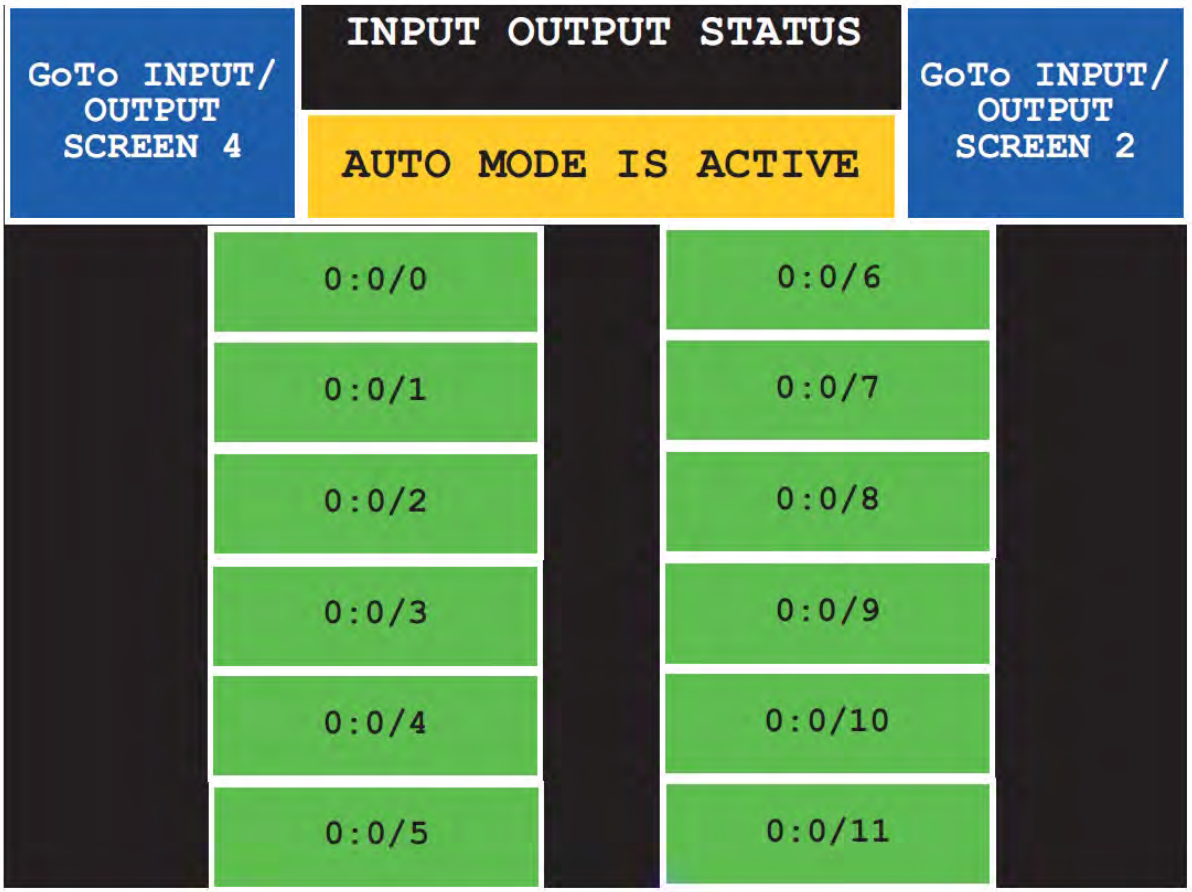
The input/output screens coincide with the plc and electrical schematic to show which components have power to them by illuminating green. If no power to specific input/output, then box remains gray.

Input / Output Status Screen - 2



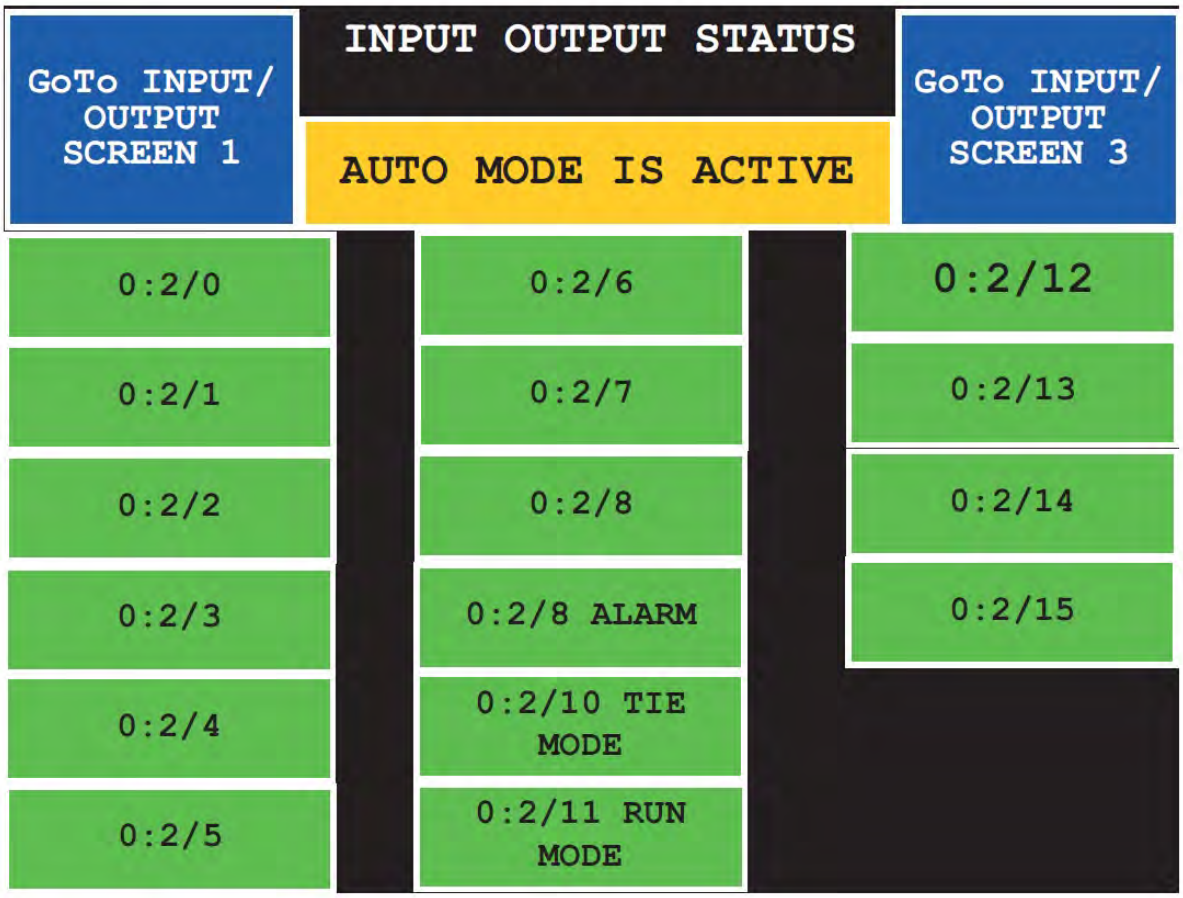
The input/output screens coincide with the plc and electrical schematic to show which components have power to them by illuminating green. If no power to specific input/output, then box remains gray.

Input / Output Status Screen - 3



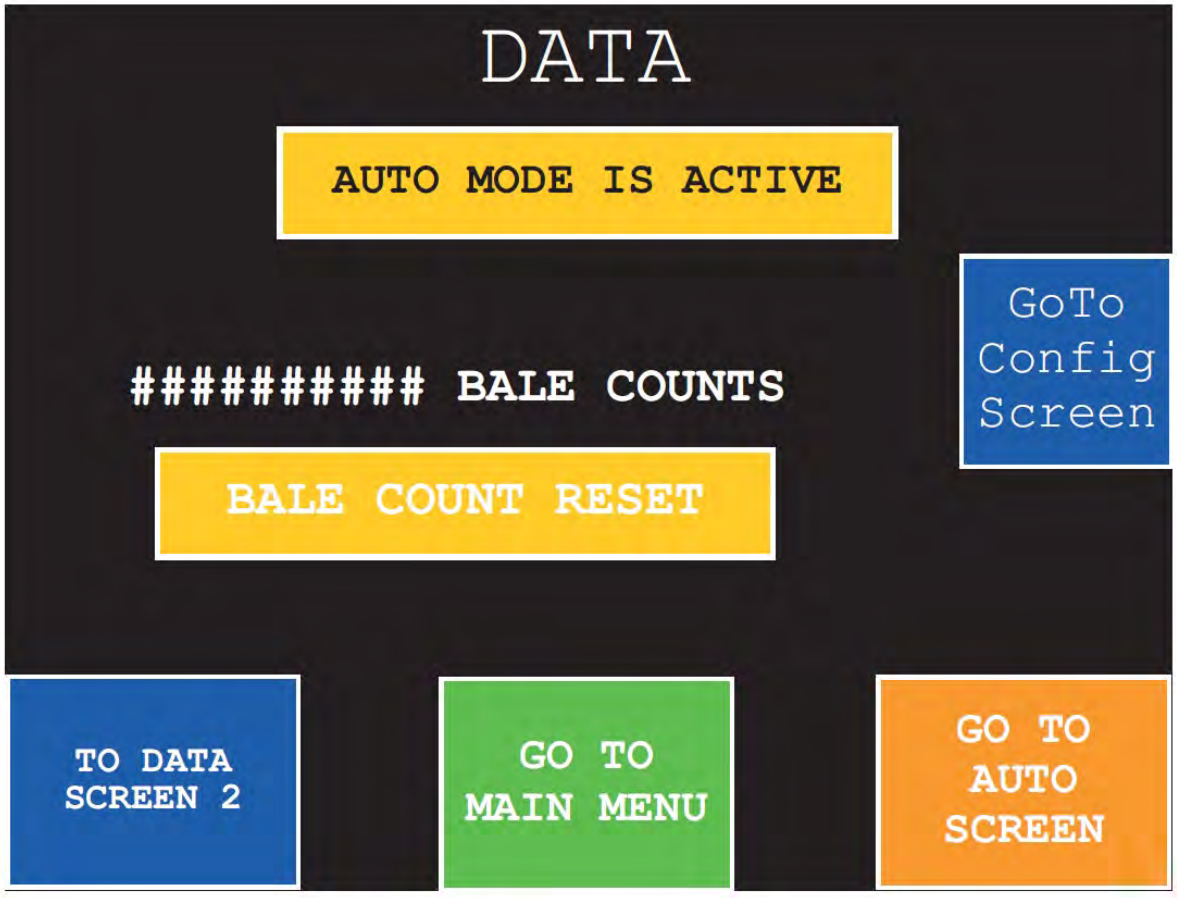
The input/output screens coincide with the plc and electrical schematic to show which components have power to them by illuminating green. If no power to specific input/output, then box remains gray.

Input / Output Status Screen - 4



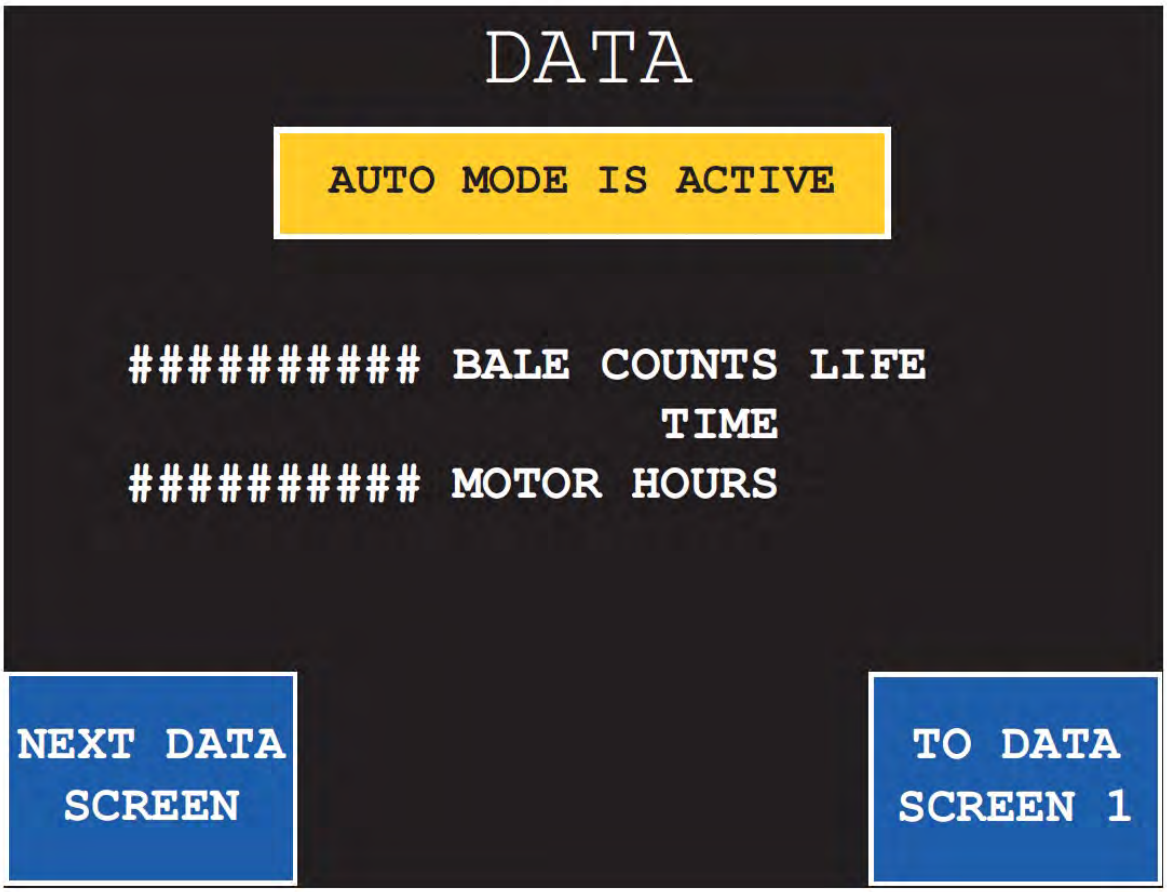
The input/output screens coincide with the plc and electrical schematic to show which components have power to them by illuminating green. If no power to specific input/output, then box remains gray.

Data Screen - 1



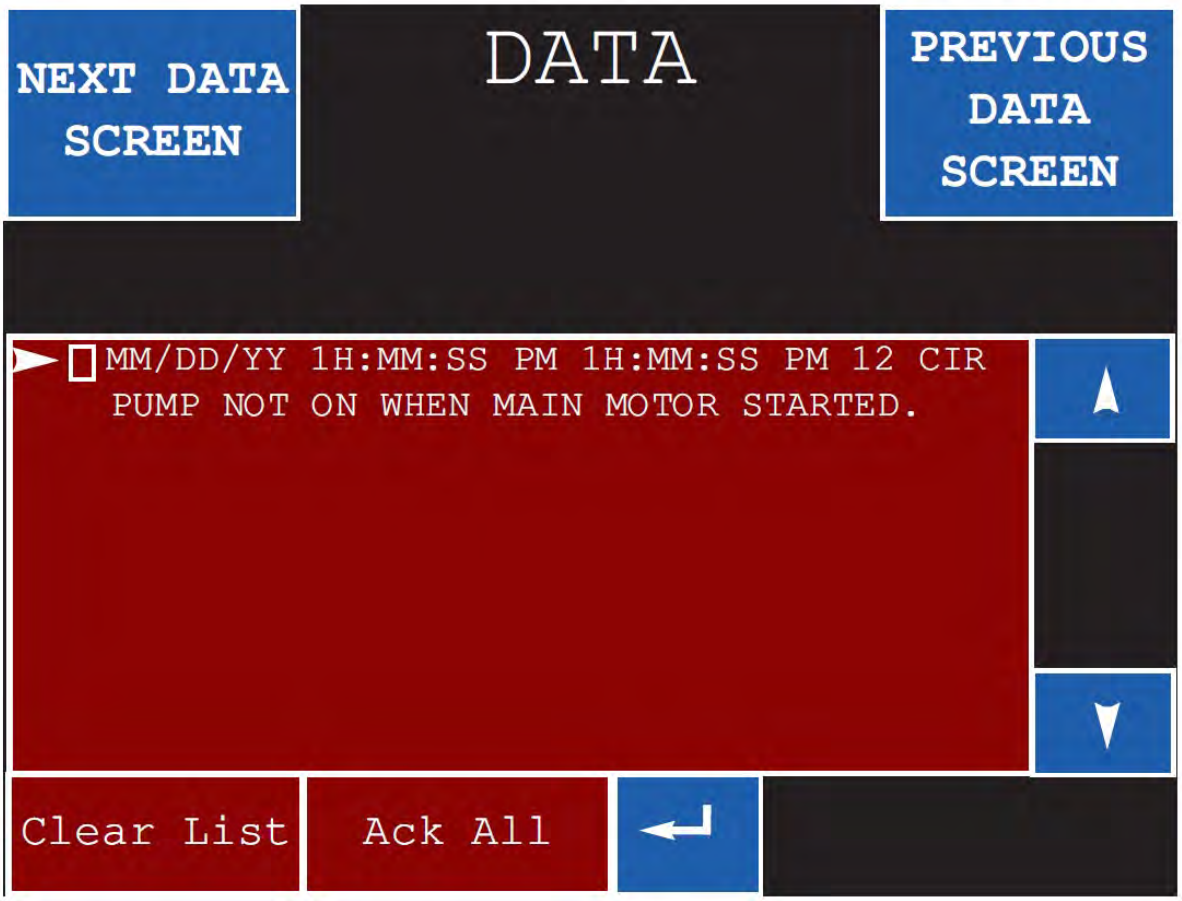
########## BALE COUNTS	Indicates number of bales made since last reset.
BALE COUNT RESET	Press to reset the bale counter.
TO DATA SCREEN 2	Takes you to the next data screen.
GO TO MAIN MENU	Takes you to the main menu.
GoTo Config Screen	Pressing this button takes you to the configuration screen, which should only be used to change the time and date for date stamping and fault analysis. Other functions in this mode are to be used by trained personnel only.
GO TO AUTO SCREEN	Takes you to the auto menu.

Data Screen - 2



########## BALE COUNTS LIFE TIME ########## MOTOR HOURS	Indicates number of total bales made during life of baler and total number of hours the motor(s) have been in operation.

Data Screen - 3



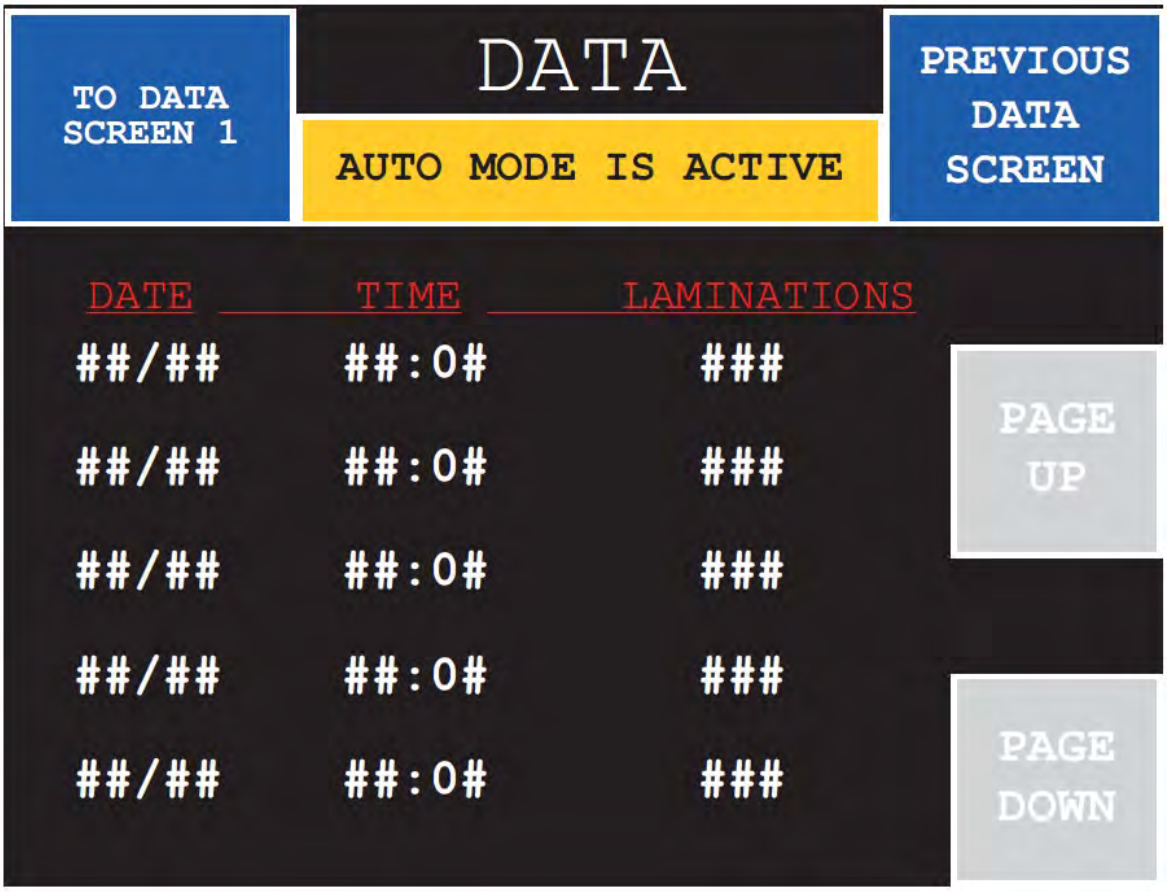
This is a data screen listing the last 10 faults the baler has encountered. Scroll through the faults with the arrows.

The date and time of the fault are recorded here as well.

Pressing the “clear list” button will clear all listed faults.

Refer to the fault list on **Page 1-19** for a complete listing of possible faults.

Data Screen - 4



PAGE UP

This screen (and subsequent screens) stores the statistics for the last 50 bales made. Scroll through using page up and page down.

PAGE DOWN

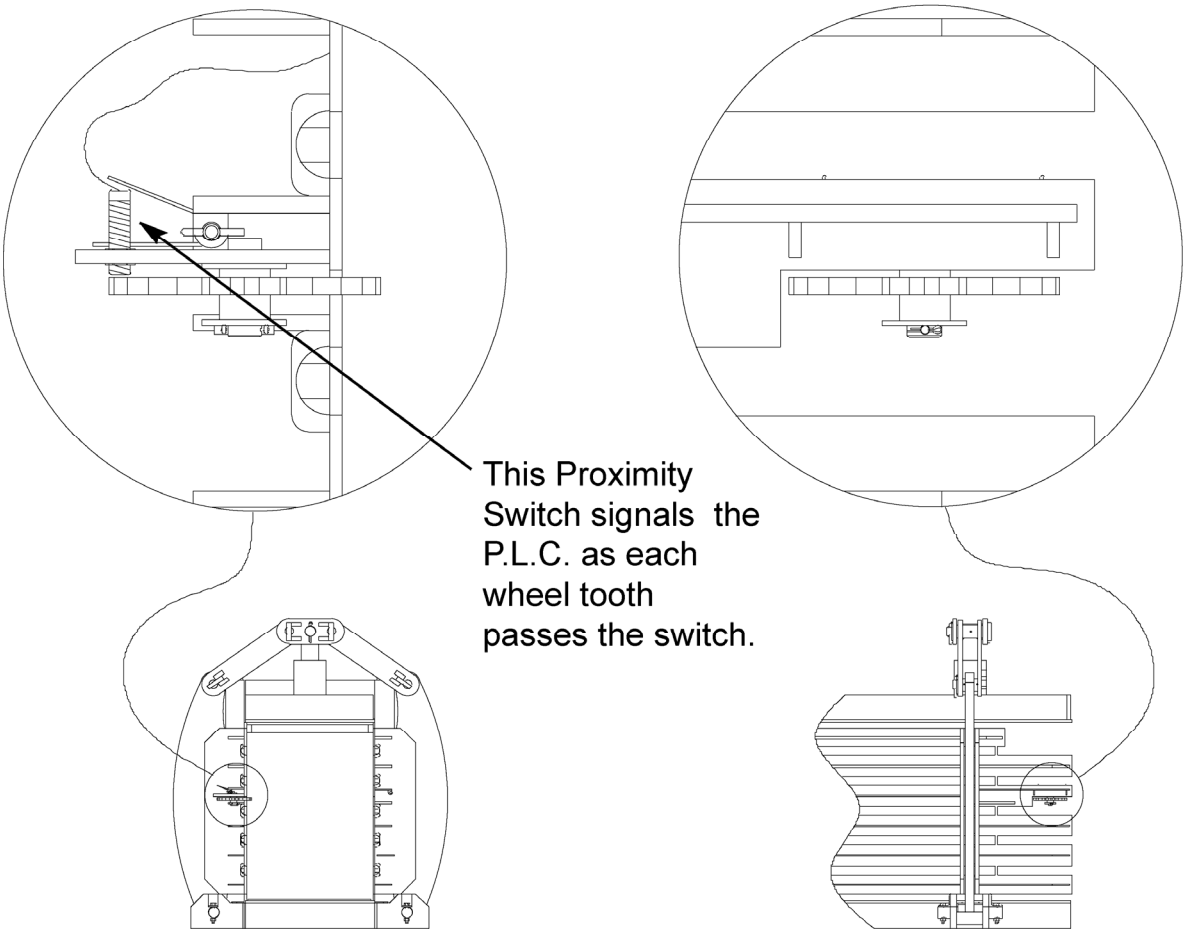
Bale Length Counter

Setting Bale Length Counter

Bale length counter is set in Grade Setup **Page Number 1-28**.

End View of Bale Length Counter Wheel

Side View of Bale Length Counter Wheel



Bale Plug Instructions

To begin baling process, it is necessary to build a plug or barrier in the extrusion chamber, to form a compaction wall. The following method describes bale plug process.

1) Insert 2" x 2" boards through tie slots. (see drawing below)

2) Manually tie wire* to post. (see drawing)

2a) Twist and tie wire behind post. (see drawing)

3) Perform machine startup per instructions.

4) Press "MANUAL TIE" cycle to tie wires.

5) Remove scrap wire tied to post.

6) Load feed chamber with material to create first bale.

7) Press "START CYCLE" button. The ram will move forward and compact material and return to its retract position.

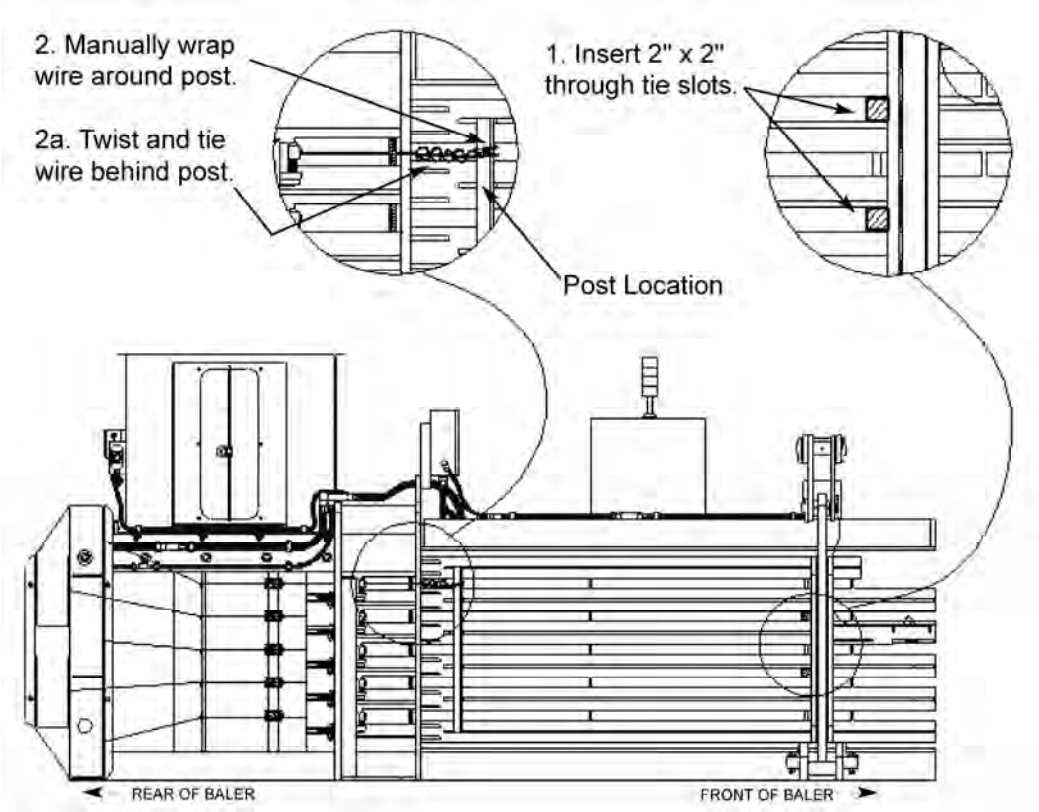
8) Continue to cycle ram until 2 x 2's break.

9) Press tie cycle to tie off bale.

10) Remove 2 x 2's.

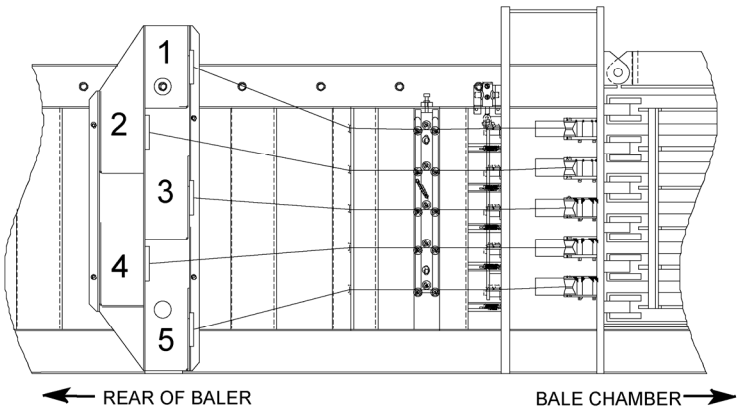
11) Start normal baling processing.

*See **Pages 1-50 & 1-51** for wire box installation instructions and diagrams

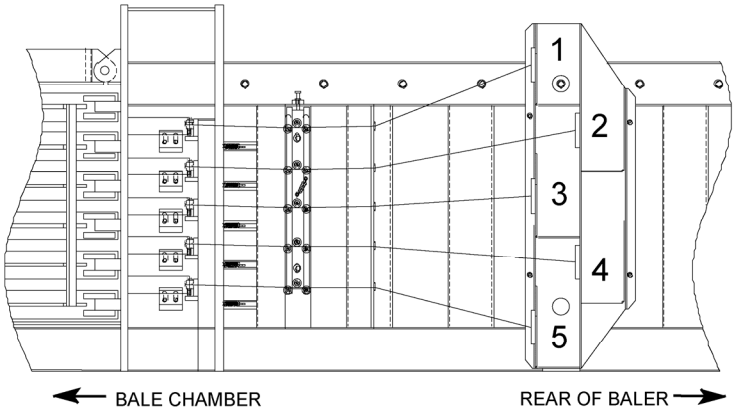


Wire Box Loading

TYPICAL WIRE BOX INSTALLATION



WIRE TIER SIDE VIEW

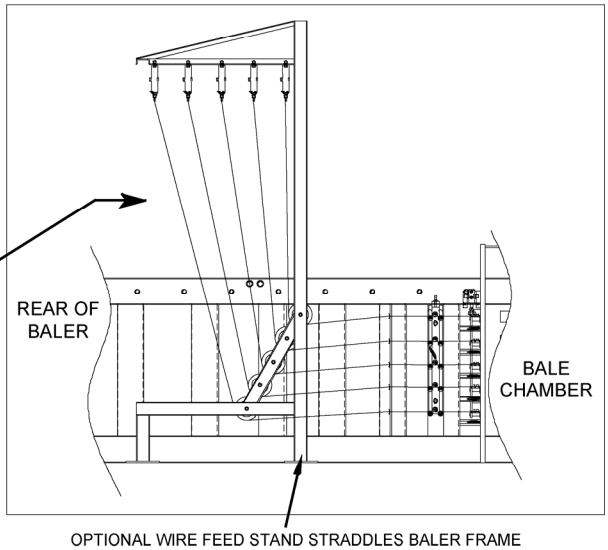


OPPOSITE VIEW

LOAD INDIVIDUAL WIRE BOXES IN EACH COMPARTMENT (LABELED #'s 1 - 5 IN DIAGRAM) ON EACH SIDE OF THE BALER

OPTIONAL WIRE INSTALLATION

OPTIONAL 1000# COIL STUMP FEED SYSTEM -
WIRE FEEDS INTO BALER IN SIMILAR MANNER



General Overview of the Auto-Tie Cycle

During tie cycle, the **Inserter Needles** travel across the width of the baler and capture the wires on the side opposite the tier. The needles then retract, capture the wires on the tier side and position the wires to be twisted, then cut.

The hydraulic **Wire-Feeding Arms** on the tier side of the baler lift the wires as the **Inserter Needles** travel across the baler and lower the wires as the needles retract. This ensures that the wire on the tier side is captured upon return of the needles.

The **Spring Feeder Arms** on the side opposite the wire-tier must be manually adjusted if the **Inserter Needles** miss the wires on that side. The instructions below and on the following pages describe wire-routing for each side, along with **Wire-Tensioner** adjustment and **Spring-Feeder** adjustment.

Prior to routing wires in the auto-tie baler, the compaction ram must be moved to the tie position using the baler controls.

Wire Routing And Installation

(See **Page 1-48**)

The wires must be properly routed on each side of the baler from the five installed wire boxes (or optional stump feed system). First cut the tape binding the wire spool together inside the box. Then pull the wire through the **wire nozzles**, **wire tensioner**, and **wire feeder arms** (shown on **Page 1-52**).

Adjusting the Wire-Tensioner

(See Diagrams On **Page 1-50**)

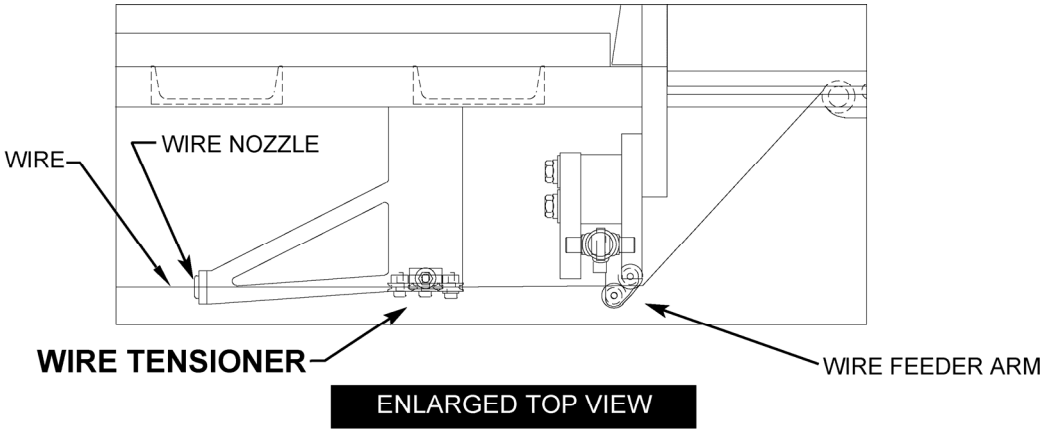
The **Wire-Tensioner** can be adjusted to put more or less tension in the wire by loosening the **Jam Nut** and turning the **Adjustment Bolt**. The bolt can be tightened for more tension in the wire and loosened for less tension.

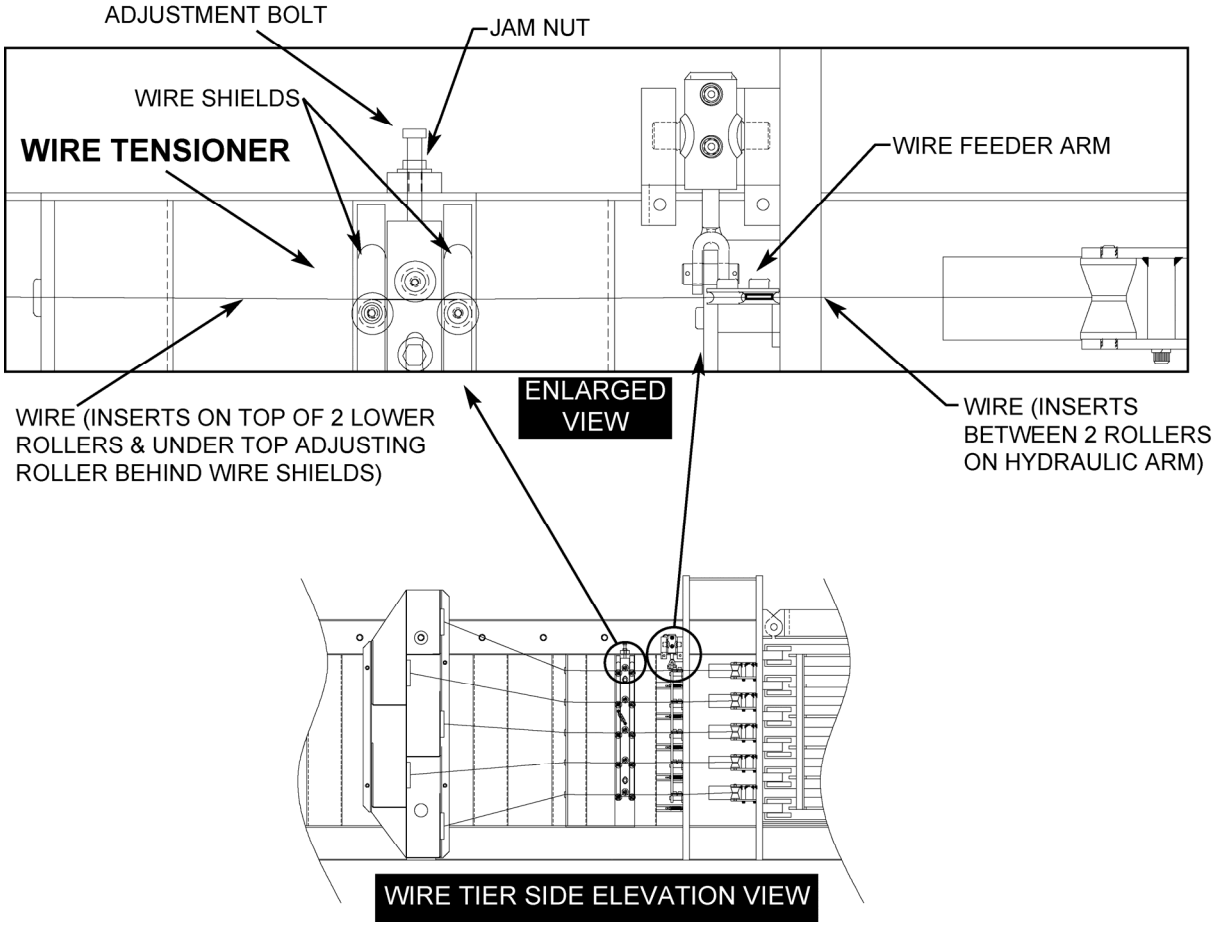
To load the wire in the **Wire-Tensioner**, first loosen the **Jam Nut**, then turn the **Adjustment Bolt** counterclockwise to raise the center bank of rollers to allow just enough room to insert the wire. Insert the wire behind the **Wire Shields**, on top of the 2 lower rollers and under the top adjusting roller.

Turn the adjustment bolt clockwise to lower the center bank of rollers until all rollers contact the wire and then turn one more complete turn. Tighten the **Jam Nut**.

Note: The correct wire tension depends on the wire gauge, the tensile strength of the wire, the amount of oil on the wire, if any, and other factors. more or less tension may be required as bale density increases. If there is too much slack in the wire, the tensioner needs to be tightened. If the wire isn't being pulled from one side or if the wire breaks, the tensioner needs to be loosened.

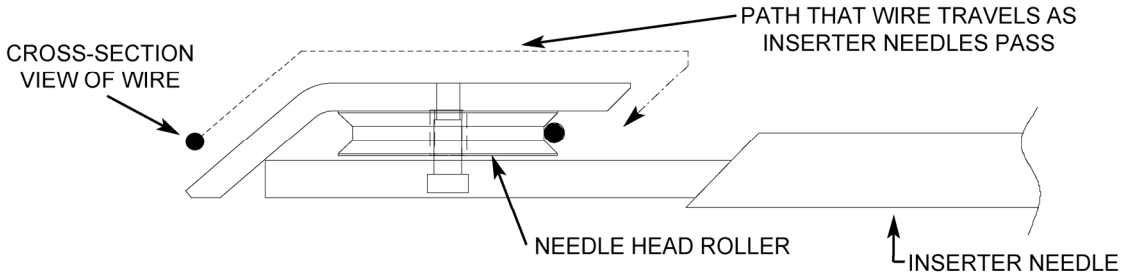
Wire Installation and Adjustment - Wire-Tier Side





Wire Installation and Adjustment - Opposite Wire-Tier Side

As the **Inserter Needles** traverse to the opposite side of the baler, the wires must travel up and over the **Needle Heads** and drop down into the gap behind. When the needles retract, the wire is forced against the **Needle Head Roller** and brought back to the tier side of the baler.

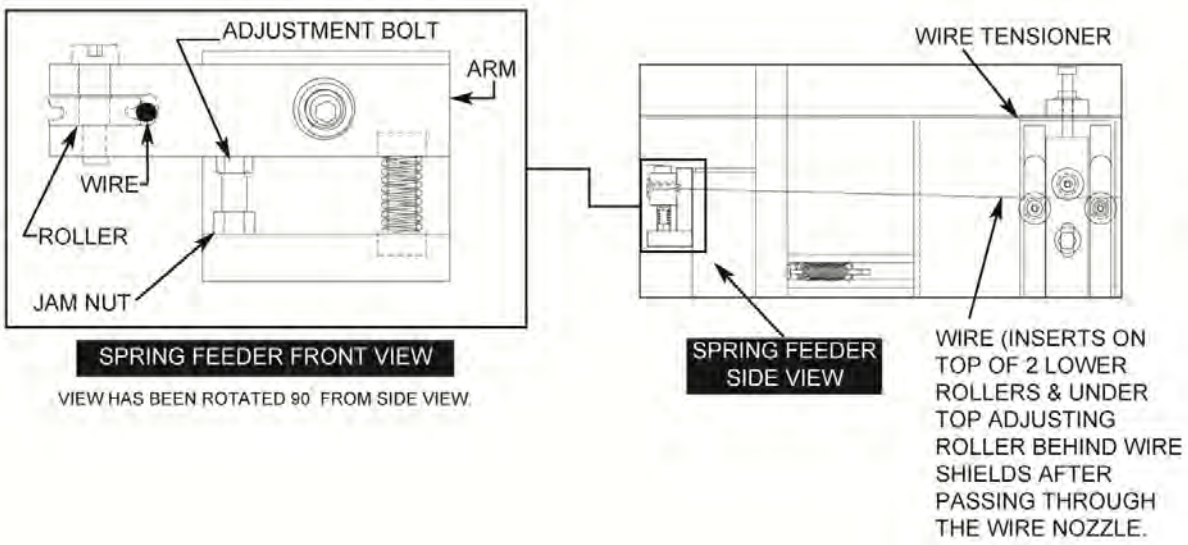


Needle Head - Side View

Spring Feeder Adjustment - Opposite Wire-Tier Side

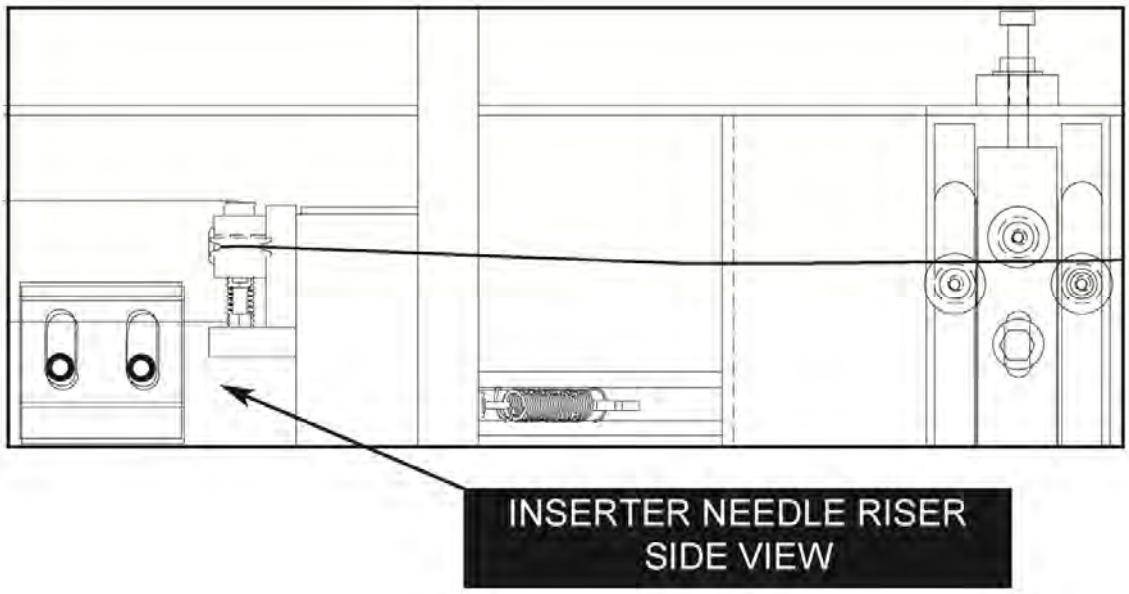
Note: Spring feeder arm positions have been factory set and should ensure correct position for needles to capture wire. however, in the event that the needle heads do not capture the wire, the spring feeders can be adjusted to raise or lower the roller arms for correct alignment.

The **Spring Feeders** are located on the side of the baler opposite the wire tier and hold the bale tie wire at the correct height for the **Inserter Needles** to pass underneath the wire. If the wire is too low, the needles will pass over the wire and will not capture it. The **Arms** need to be raised by first loosening the **Jam Nut**, then turning the **Adjustment Bolt** counterclockwise. The **Jam Nut** must be retightened once the **Arms** are in the correct position. If the wire is too high, it will not be forced into the gap behind the needle head and the needles will not capture it. In this case, the arms need to be lowered by turning the **Adjustment Bolt** clockwise.



Inserter Needle Risers

The **Inserter Needle Risers** serve as ramps to raise the needles as they pass through the width of the baler to the side opposite the wire tier. To ensure that the needles are in the correct position to capture the wire, the risers can be adjusted by loosening the two bolts, moving the chamfered wear pads up or down, and then retightening the bolts.



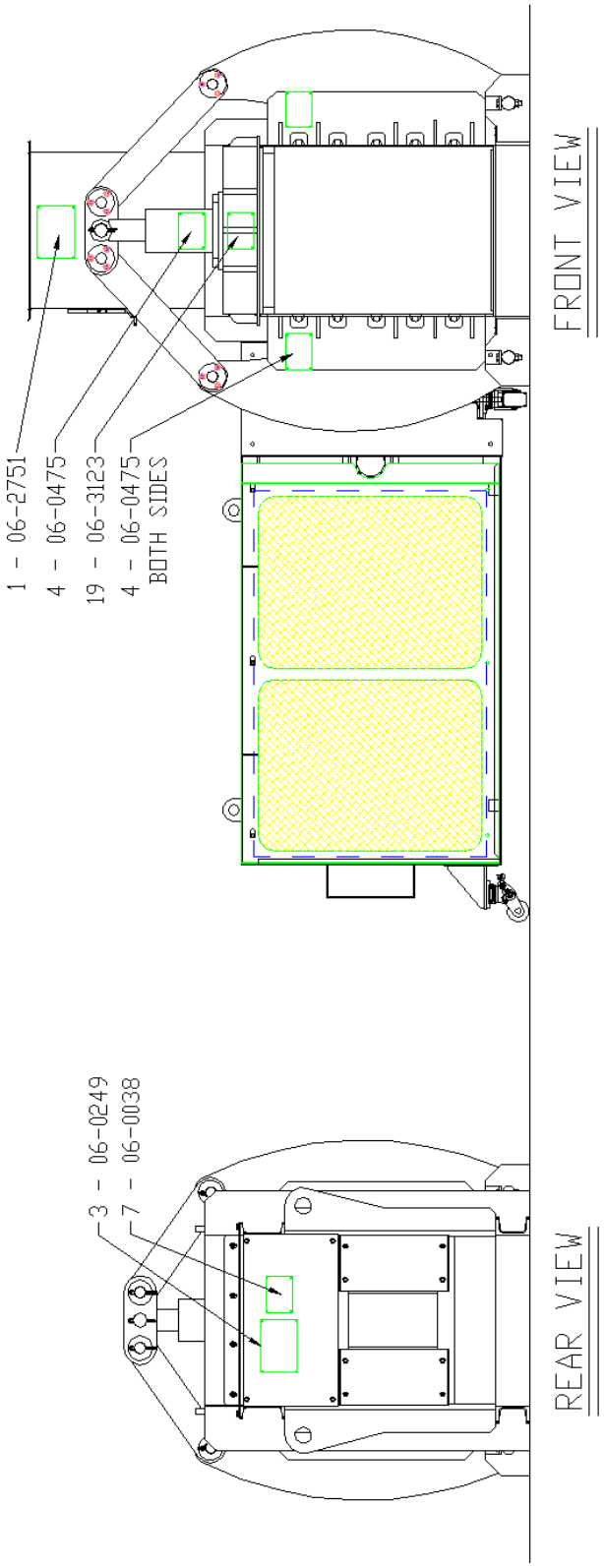
Wire Installation - Initial Wire Connection

Once all of the wires have been inserted through the wire nozzle, wire tensioner, and the roller arms on both sides of the baler (hydraulic feeder arms on the tier side and spring feeder arms on the opposite side), the wire must be fed across the baler from the side opposite the wire tier to the tier side. Both wires must be twisted together with wire pliers at least 10 times to ensure a good wire knot.

The baler is now ready to begin or resume baling.

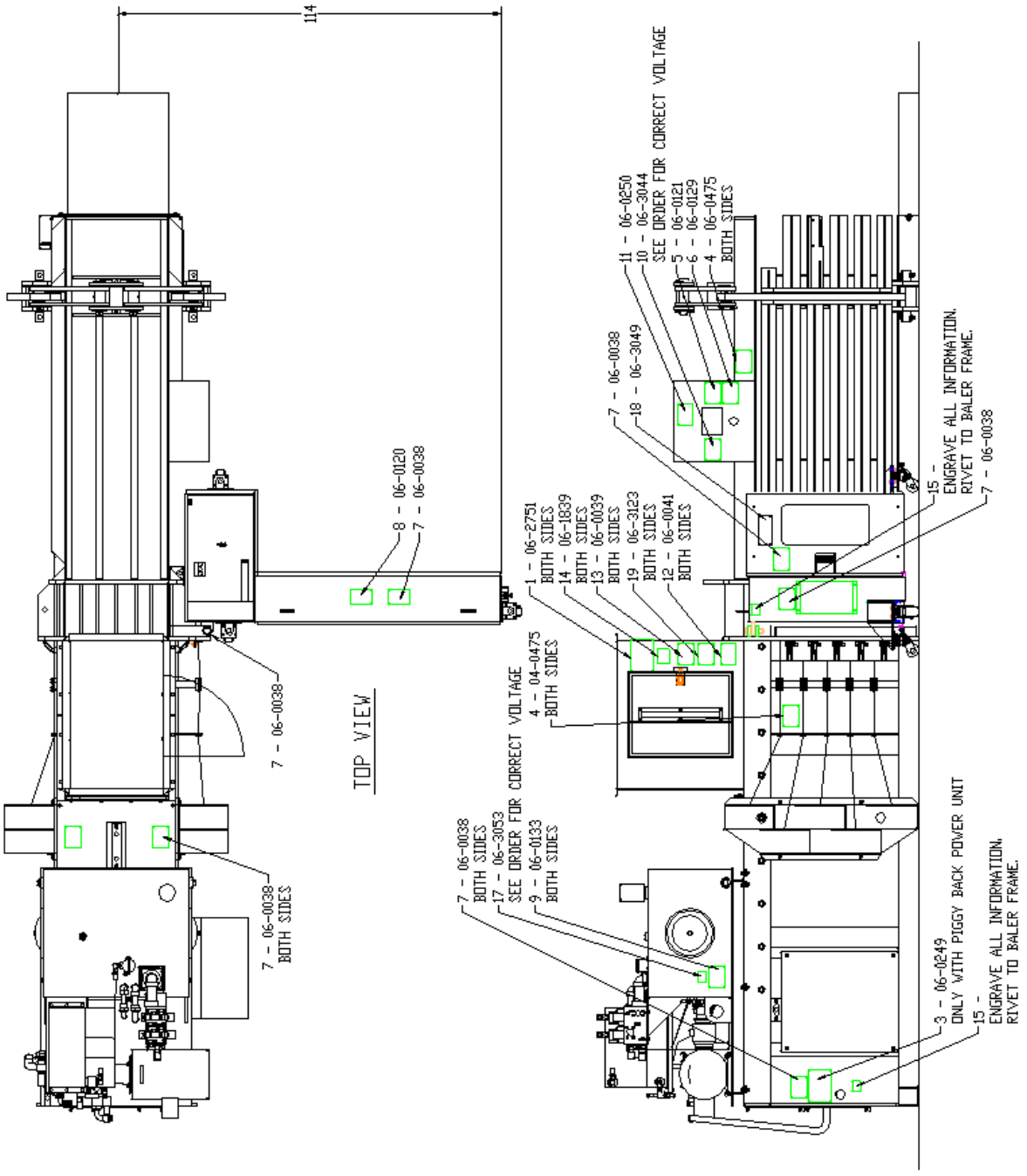
Decal Diagram

Refer to Chart on Page 1-55 for Decal Descriptions



Decal Diagram (Continued)

Refer to Chart on Page 1-55 for Decal Descriptions



Decal Description

Warning decal requirements when your baler leaves the factory, several warning decals are installed for everyone's protection. These labels are subject to wear and abuse due to the nature of baling operation. All decals must be maintained. Replacement decals may be purchased through your distributor or by going to www.parts1stop.com.

Images of Decals can be found on **Page 1-56**

Part#	Ref#	Description
06-2751	1	Marathon Compaction & Recycling Solutions 6"X10"
06-0249	3	Danger Hazardous Voltage
06-0475	4	Caution Stay Clear While in Operation
06-0121	5	Notice Federal Regulation Prohibits/Under 18
06-0129	6	Periodic maintenance....for service
06-0038	7	Warning do not remove access...
06-0120	8	Danger Disconnect & Lock Power
06-0133	9	Danger stay off...do not climb
06-3044	10	Danger Volts _____
06-0250	11	Lock out point danger lock out...
06-0041	12	Warning this Machine Starts Automatically
06-0039	13	Danger do not Enter
06-1839	14	American Flag
06-0097	15	Serial Number Plate Non UL
06-3053	17	Danger Volts _____ (2"X4")
06-3049	18	TIEger Wire Tier
06-3123	19	Confined Space
06-2684	20	208 (Voltage)
06-2686	21	230 (Voltage)
06-2690	22	460 (Voltage)

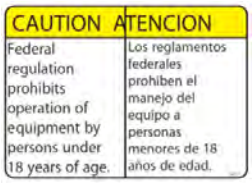
Decal Images

06-2751

06-0249

06-0475

06-0121



06-0129

06-0038

06-0120

06-0133

06-3044

06-0250

06-0041

06-0039

06-1839

06-0097

06-3053

06-3049

06-3123

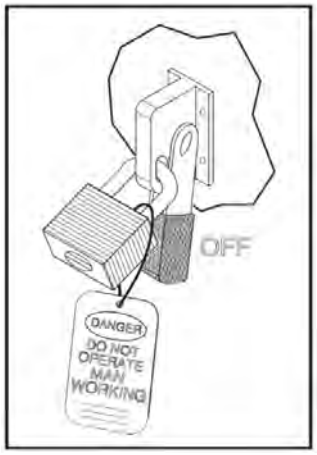
06-2684

06-2686

06-2690

2 - MAINTENANCE

Lock-Out & Tag-Out Instructions



Before entering any part of the baler, be sure that all sources of energy have been shut off, all potential hazards have been eliminated, and baler is locked-out and tagged-out in accordance with OSHA and ANSI requirements.

If ram is pressing against a load, move ram rearward before shutting baler down. Specific lock-out and tag-out instructions may vary from company to company (i.e. multiple locks may be required, or other machinery may need to be locked-out and tagged-out). The following instructions are provided as minimum guidelines.

Instructions

1) **Move main disconnect lever to OFF position.**

2) **Padlock disconnect lever with a keyed padlock and take key with you.**

3) **Along with padlock, place an appropriate, highly visible, warning tag on disconnect lever**. Tag should provide a warning such as: " Danger: Do not operate equipment. Person working on equipment. Warning: Do not energize without permission of _____."

4) **After locking and tagging baler, try to start and operate baler (as outlined in Operating Instructions) to make sure lock-out and tag-out is effective. If lock-out and tag-out is effective, remove key from key switch and take with you.**

Electrical: The panel box contains high voltage components. Only authorized service personnel should be allowed inside box. Authorized service personnel should be allowed inside box only after baler has been locked-out and tagged-out.

Hydraulic: Stored hydraulic energy must be removed from baler hydraulic circuit for complete lock-out and tag-out. Make sure that all personnel are clear of compaction and ejection areas. To remove pressure from system, make sure the ram is not pressing against a load. Manually depress poppet valve pin located in center of each poppet valve on main manifold and hold pin for a couple of seconds. See power unit layouts in this section of manual for poppet and manifold location.

MARATHON EQUIPMENT'S
SERVICE CALL CENTER

During Normal Business Hours Please Call:

1-800-633-8974

SERVICE DEPARTMENT

Normal Business Hours:

Monday - Thursday	Friday	Saturday
7:00am - 5:30pm	7:00am - 4:30pm	7:00am -12:00pm

Central Standard Time

Please have the following ready when calling:

- **Baler Serial Number**
- **Installation Date**
- **Electrical Schematic Number**

Periodic Maintenance

Danger: Only authorized and trained personnel should perform following procedures. Lock-out and Tag-out baler per instructions on **Page 2-2** as specified.

After Start-Up

1) Replace return line filter after the start-up technician has completed the initial startup of the machine.

Daily (Operator)

1) Open wire twister cabinet and check for material build-up in bottom of cabinet. Clean out any material found in twister or its enclosure.

2) Check for material build-up behind the compaction ram.

3) Check for material build-up under bale length counter cover.

4) Check oil level and temperature in hydraulic reservoir. Maintain oil level above 3/4 full in sight gauge. Temperature should be below 160° F.

5) Check all remote emergency stop locations. Make sure each emergency stop button is not obstructed, damaged, or depressed.

6) Make sure operator area and access door are free from hazards that could cause a slip, trip, or fall.

7) Make sure that there is an adequate supply of wire on all wire reels.

8) Inspect for hydraulic system leak.

Weekly (Operator)

1) Check all limit switches to ensure free movement.

2) Clean photocell heads and reflectors.

3) Check function of all emergency stop buttons and interlock switches.

4) Check return line filter indicator located on top of power unit. See power unit drawings located later in this section. If indicator is in red portion of scale, discontinue use of baler and call for service.

Monthly (Service Personnel)

1) Check all hoses for chaffing, rubbing, or other deterioration and damage.

2) Inspect breather cap on hydraulic reservoir. Clean or replace as necessary.

3) Check cylinder pins and make sure they are secure.

4) Check hold-down bar clearance above ram. Clearance should be 1/32” or less. Adjust as necessary. See procedure later in this section of the manual.

Periodic Maintenance (Continued)

5) After the first 160 hours of operation, return line filter needs to be replaced. After this replacement, return line filter maintenance/replacement will be extended to every 600-1000 hours of operation.

6) Inspect baler floor plate and liners for excessive wear.

7) Lubricate access door hinges and extrusion chamber hinges.

8) Apply a thin covering of lubricant to all tier gears and inserter chain. Recommended lubricants are:

   - CRC Dry Moly Lubricant (high solids molybydenum disulfide), 16 ounce spray can. Available from Grainger #2F138.
   - Slip Plate Graphite Dry Film Lubricant, 16 ounce spray can. Available from Grainger #2F138.

Semi-Annually (Service Personnel)

1) Send oil sample out for evaluation.

2) Check baler structure for any signs of problems (i.e., cracked welds, bending, etc.).

3) Inspect cylinder rod of compression ram cylinders for nicks and abrasions. Check main cylinder rod seals for damage. Inspect clyinder pins for movement or missing cotter pins.

Annually (2000 Hours of Operation)

1) Send oil sample out for evaluation. If contaminated, replace hydraulic fluid of the entire system. The hydraulic tank should be cleaned inside with a nonflammable solvent and thoroughly dried before replacing oil.

2) Lubricate electric motor bearings as recommended by manufacturer.

Annually

1) Change hydraulic fluid in entire system. If existing oil is reused, it should be tested by a laboratory to ensure it meets necessary specifications. Additives can be added to bring oil back to standards. Before returning oil to tank, it should be filtered through a minimum 6 micron filter. Hydraulic tank should be cleaned inside with a nonflammable solvent and thoroughly dried before replacing oil.

2) Lubricate electric motor bearings as recommended by manufacturer.

3) Filter maintenance:

   a) Hydraulic suction filters should be cleaned at yearly intervals.

   b) Filters may be removed from unit by disconnecting union on the suction side of pump (circulating pump for oil cooler), or by removing four bolts that retain suction flange to main pump, and lifting the filter from reservoir.

Periodic Maintenance (Continued)

c) Care should be exercised in cleaning filter to ensure that element is not torn. Clean filter with a soft brush and standard industrial solvent.

d) Replace filter after cleaning. Tighten union, or bolts, securely. Pump noise and a “crackle” sound is most often caused by air entering the pump suction line. Tightening suction fittings will usually eliminate problem.

Recommended Oils

1) Union-UNAX-46, UNAX-AW46
2) Gulf-Harmony 47, Harmony 48-AW
3) Exxon-Teresstic 46, NUTO 46
4) Texaco-Rando 46
5) Chevron-AW 46
6) Shell-Turbo 46, Tellus 46
7) Citgo-Pacemaker 46, Tellus-AW46
8) Conoco-Super Hydraulic Oil 46
9) Quaker State-Dextron II (ATF) Automatic Transmission Fluid
10) Amoco-Rycon MV
11) Cold Weather Fluid

TIEger Auto-Tie Baler

Service

10 HOUR MAINTENANCE SCHEDULE			
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TIEger Auto-Tie Baler

Service

50 HOUR MAINTENANCE SCHEDULE			
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TIEger Auto-Tie Baler

Service

200 HOUR MAINTENANCE SCHEDULE			
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TIEger Auto-Tie Baler

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500 HOUR MAINTENANCE SCHEDULE			
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TIEger Auto-Tie Baler

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TIEger Auto-Tie Baler

Service

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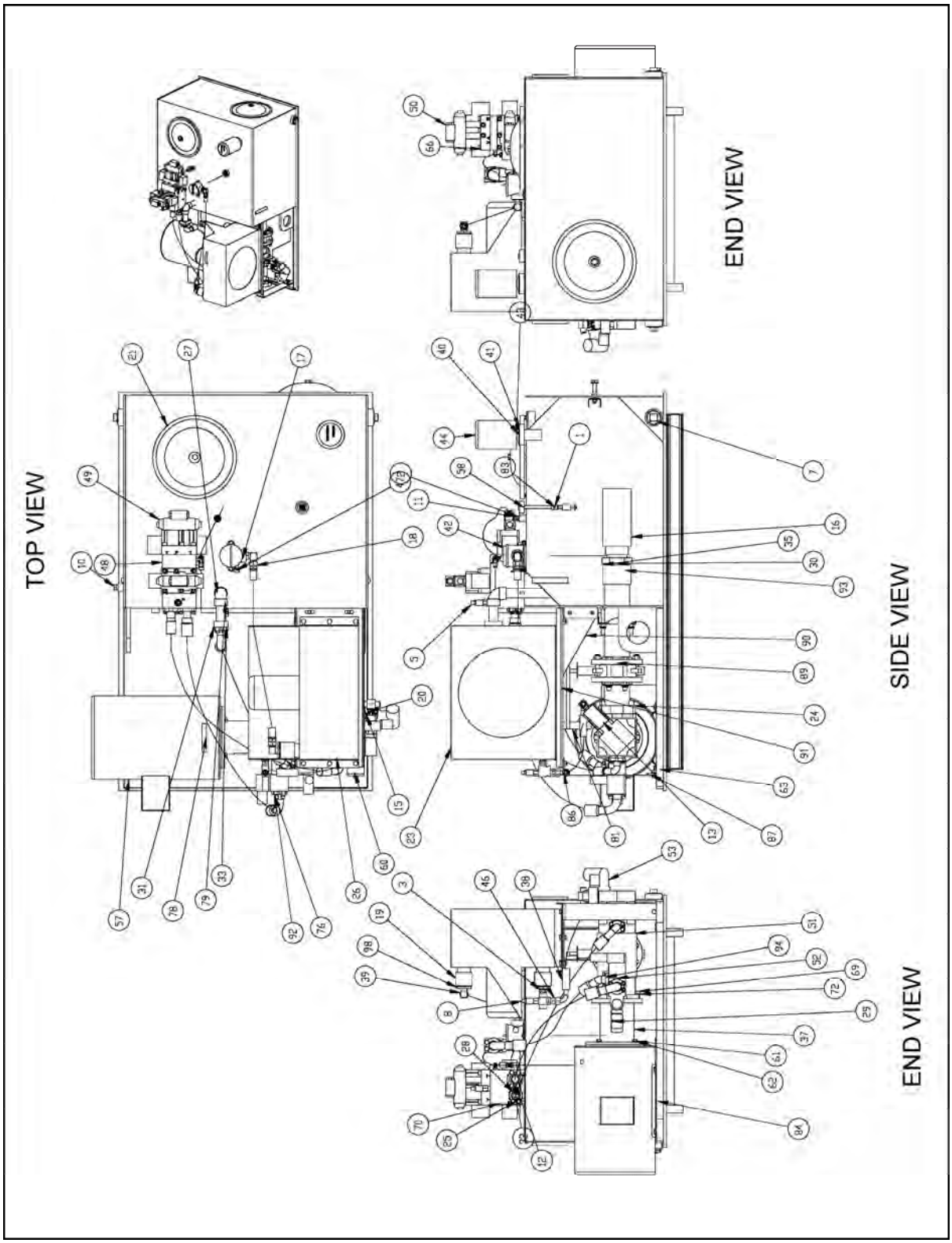
Power Unit Drawing 30 HP



Power Unit Reference Numbers 30 HP

Part #	Ref. #	Description	Qty.
02-0021	1	COUPLING 1/4 NPT	1
02-0040	2	ADAPTER 3/8 NPTF X 1/2 NPTM	1
02-0048	3	NIPPLE 3/4 NPT	2
02-0132	4	ADAPTER 1/2 NPTF X 3/4 NPTM	1
02-0214	5	VALVE RELIEF 20 GPM CART PILOT	1
02-0215	6	GAUGE SIGHT LEVEL 5 INCH	2
02-0254	7	PLUG 2 NPT SQ HD	2
02-0300	8	VALVE RELIEF 20 GPM CART PILOT	1
02-0310	9	TEE 3/4 NPTF	1
02-0316	10	PLUG 3/4 NPT	1
02-0332	11	HOSE END 3/8 WB X 3/8 NPTM	1
02-0565	12	FLANGE C61 1 1/4 SPLIT	4
02-0606	13	TUBING END 3/8 X 6 ORM 90	2
02-0612	14	CLAMP TUBE 3/8 WELD	2
02-0634	15	FLANGE C61 1 #12 O-RING	1
02-0668	16	FILTER SUCTION 3 NPTF 100 GPMSEC-100-3	1
02-0697	17	ELL 12 ORM X 12 JICM	1
02-0698	18	HOSE END 3/4 WB X 12 JICF	2
02-0805	19	COUPLING 2 SCH 40	2
02-0822	20	TEE 12 JICM X 12 ORM BRANCH	1
02-0823	21	CLEAN OUT COVER 14	2
02-0824	22	CLEAN OUT COVER MNTG BRKT REMOVABLE	2
02-0863	23	OIL COOLER AOCH-20	1
02-0872	24	FLANGE C61 4 WELD 500 PSI	1
02-0878	25	FLANGE C61 1 SPLIT W/BOLTS	2
02-0879	26	HOSE END 1 WB X 1 F61 SPT 90	1
02-0883	27	ELL 1 1/4 WELDF 90 SCH 160	1
02-0908	28	HOSE END 1 WB X 1 F61 SPT	1
02-0932	29	HUB COUPLING 1 1/4-5/16 X 1 7/8-1/2	1
02-1028	30	NIPPLE 3 NPT SCH 40	1
02-1062	31	FLANGE C61 1 1/4 WELD COMP W61-20-20	1
02-1088	32	HOSE END 1 1/4 WB X 1 1/4 F61SPT 3000	1
02-1098	33	HOSE END 1 1/4 WB X 1 1/4 F6190 5000	2
02-2258	34	CLAMP FOR 1 1/2 ID HOSE BARB FITTING	1
02-3427	35	COUPLING 4 SCH 40 FEMALE NPT THREAD	1
02-3780	36	HOSE END 3/8 2WB X 6 JICF SWV	1

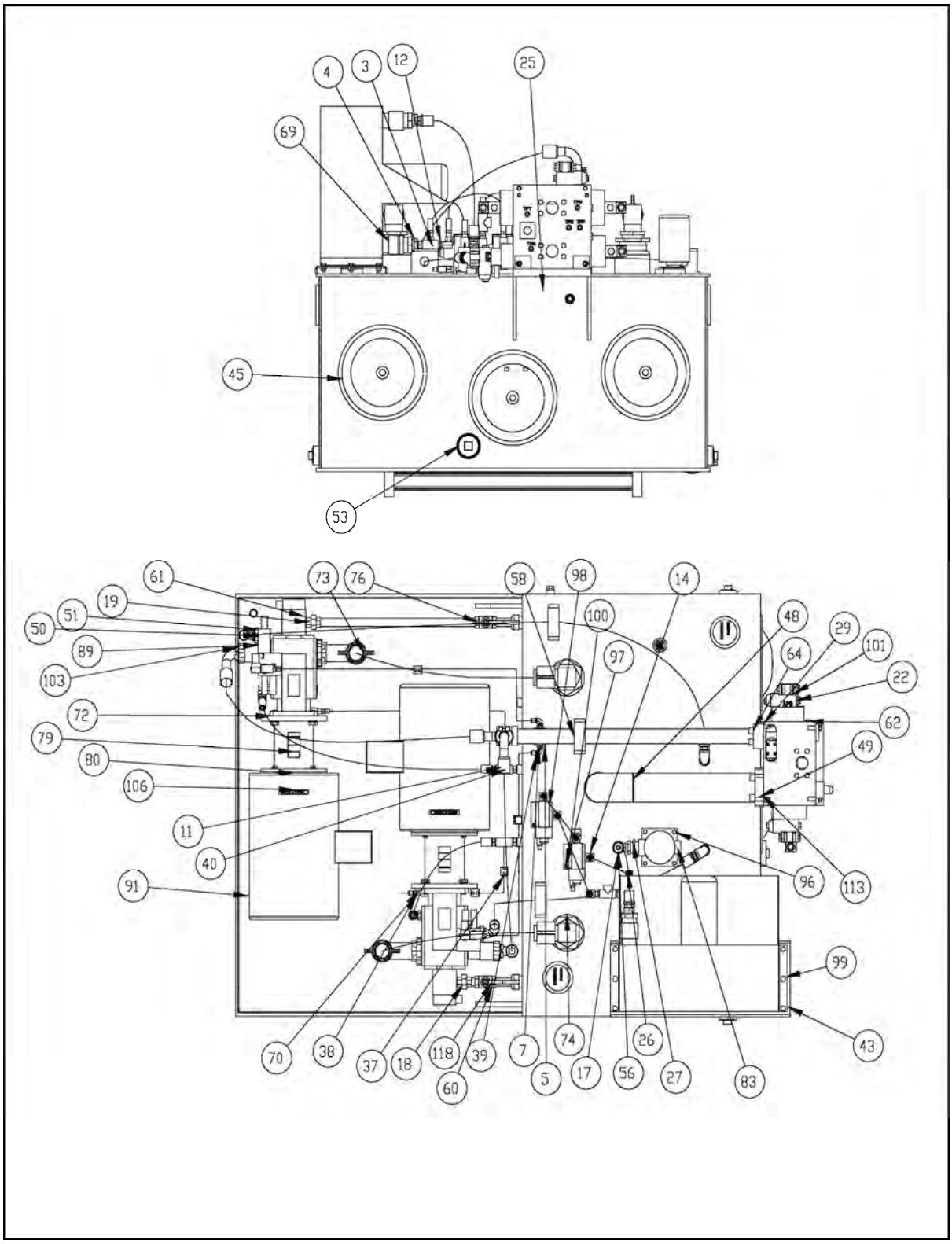
Power Unit Reference Numbers 30 HP (Continued)

Part #	Ref. #	Description	Qty.
02-4043	37	ADAPTER PUMP/MTR SAE C 2B X 286TC X 7.88	1
02-4154	38	HOSE END 3/4 WB X 12JICF 90 DAYCO#HY12-12FJ	2
02-4155	39	ELL 3/4 NPTM X 12 JICM 90 KRJOHNSON 2501-12-	1
02-4253	40	FILTER BREATHER BAYONET FLANGE 2 INCH	1
02-4254	41	FILTER BREATHER BASKET 2 INCH	1
02-4324	42	FILTER RETURN 12 ORM 6 MICRONTANK TOP VICKER	1
02-4328	43	FILTER BREATHER BAYONET ADAPTER F/ 02-3229	1
02-4330	44	FILTER BREATHER SPIN ON VICKERS V0211B1R03	1
02-4331	45	CAP 2 NPT SCH 40	1
02-4340	46	ADAPTER 1/2 NPTM X 12 JICM	1
02-4343	47	FILTER INDICATOR GAUGE 1/8 NPTM COLOR CODED	1
02-4404	48	MANIFOLD DUAL D08 REGEN 75 GPM	1
02-4405	49	VALVE 4-WAY 08 T 3-POS EXT P&D HI-FLOW	1
02-4406	50	VALVE 4-WAY 08 A TO T 3-POS EXT P & D HI-FLO	1
02-4407	51	PUMP VANE 53 18 12 VICKERS VMQ	1
02-4409	52	UNLOADING VALVE 1 1/4 W/ SOLENOID VENT	1
02-4410	53	VALVE CHECK 1 1/4 CODE 61 FLANGE 75 PSI CRAC	1
02-4411	54	ELL 6 ORM X 6 JICM	1
02-4426	55	VALVE BUTTERFLY 4 WAFFER SUCTION	1
02-4427	56	FLANGE ANSI 4 NPTF	2
03-1179	57	MOTOR 3O HP 1760 208-230/460V286TC TEFC SP	1
03-3689	58	SWITCH LEVEL PLUG ADAPTER 1 1/4	1
05-0015	59	NUT 3/8-16 UNC HEX SELF-LOCKING	4
05-0052	60	WASHER 1/2 FLAT	1
05-0061	61	BOLT 1/2-13 X 1 1/4 HEX HD GR2	8
05-0064	62	WASHER 1/2 LOCK	4
05-0075	63	NUT 1/2-13 HEX SELF-LOCKING	11
05-0105	64	NUT 5/16-18 HEX SELF-LOCKING	2
05-0148	65	BOLT 1/2-13 X 1	7
05-0199	66	BOLT 1/2-13 X 2 1/2 ALLEN HD	12
05-0236	67	BOLT, HEX, 3/4-10UNC X 5 1/2	4
05-0263	68	NUT 3/4-10 HEX LOCKING	4
05-0338	69	BOLT 5/8 X 1 1/2 GR 2 HHCS ZINC	2
05-0521	70	WASHER 1/2 LOCK GRADE 8 HI-COLLAR80-0123	12
05-0549	71	BOLT5/16-18 X 1 1/4 GRD 5 HEXHD	6
05-0561	72	WASHER 5/8 LOCK	2

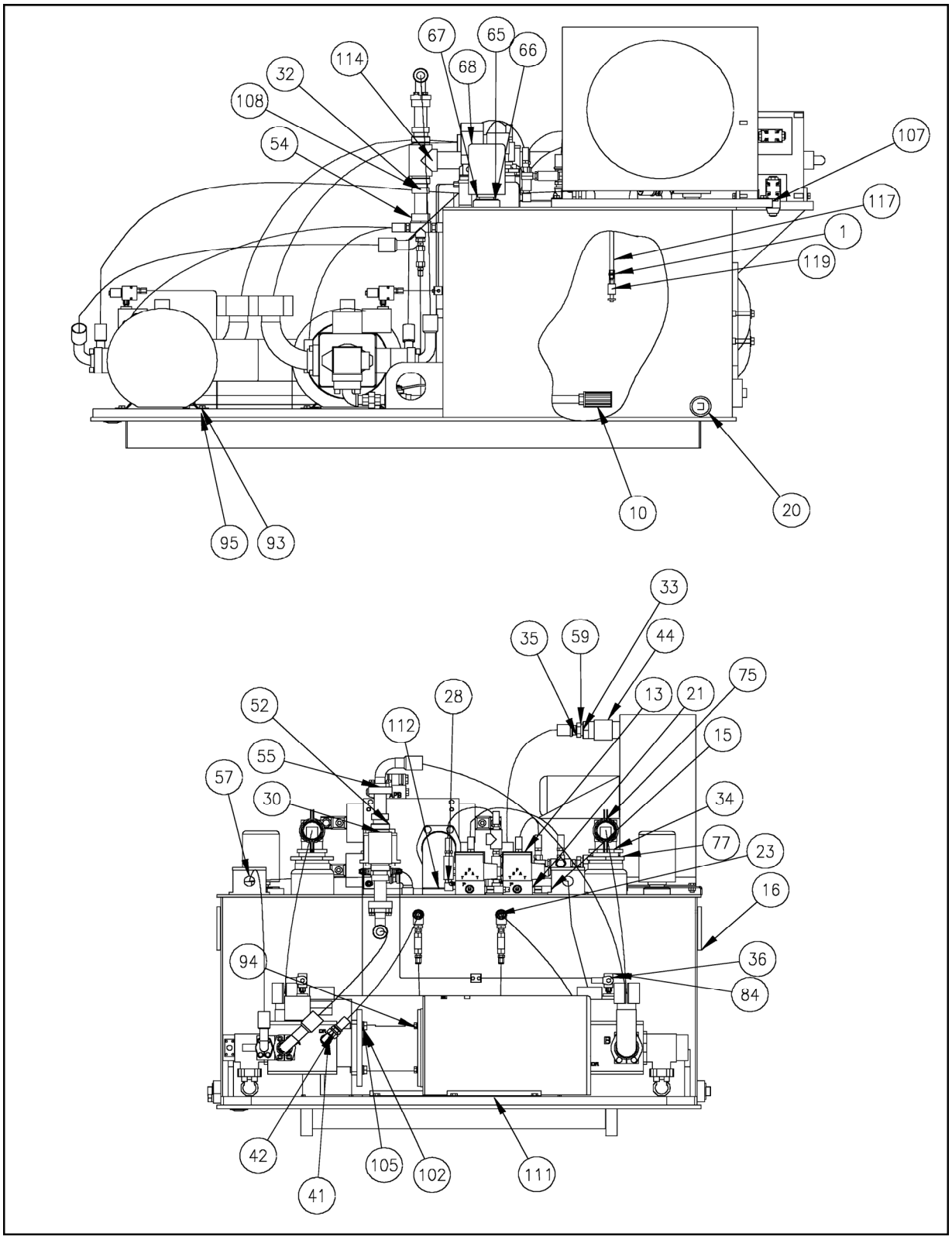
Power Unit Reference Numbers 30 HP (Continued)

Part #	Ref. #	Description	Qty.
05-2301	73	NUT 5/8-11 NC SLN	4
05-3644	74	BOLT 7/16-14 X 7 1/2 SOCKET HD GRADE 8	4
05-2001	75	WASHER, LOCK, 5/16"	4
06-0011	76	DECAL MOTOR ROTATION 3/4 X 4	1
23-5425	77	1 1/4 X SCH80 X 4 PIPE SQ CUT	1
26-9656	78	1/2 X SCH40 X 23 PIPE	1
27-5256	79	7GA X 1-1/4 X 5	1
28-1367	80	1 1/4 X SCH40 X 23 PIPE	1
28-1562	81	1/4 X SCH80 X 6 PIPE	1
28-1869	82	7GA X 13 X 14-3/4	1
28-6058	83	2 1/2 X SCH40 X 24 PIPE	1
28-6693	84	7GA X 3 X 20	1
28-6694	85	1/4 PL X 3 X 3	1
28-8762	86	4 X SCH40 X 6 PIPE	1
28-8763	87	4 X SCH40 X 15 PIPE	1
28-8953	88	7GA X 6-3/4 X 12 (1=2)	1
28-8963	89	7GA X 14 X 28-1/4	1
99-0676	90	WASHER 7/16 HI-COLLAR LOCKING	4
99-6723	91	ADAPTER 4 NPTM X 3 NPTF	1
99-6929	92	HOSE END 1 1/4 WB X 1 1/4 F61SPT 45	1
99-7009	93	SWITCH OIL LEVEL & TEMP NC UPTL008180F	1
99-7152	94	COUPLING 4 DRESSER 4 BOLT X 5LONG	1
99-7235	95	BOLT 5/8-11 X 4 1/2 NOT PLATED	4
99-7783	96	ADAPTER 3/4 NPTF X 2 NPTM SCH80	2
02-0880	97	HOSE 1 WB 4000PSI	4
02-0335	98	HOSE 1 1/4 WIRE BRAID 5000	6
02-0333	99	HOSE 3/8 WIRE BRAID (TWO) 2500 PSI	2
02-3725	100	TUBING 3/8 OD .083 WAL	8
02-0327	101	HOSE 3/4 2WB 3100 PSI	5
02-1091	102	HOSE 1 1/2 WB 5000PSI	1

Power Unit Drawing 2 X 30 HP Motors



Power Unit Drawing 2 X 30 HP Motors (Continued)



Power Unit Reference Numbers 2 X 30 HP

Part #	Ref. #	Description	Qty.
02-0021	1	COUPLING 1/4 NPT	1
02-0025	2	NIPPLE 3/8 NPT	2
02-0029	3	ELL 1/2 NPTM X 1/2 NPTF SWV 90	2
02-0030	4	ADAPTER 3/4 NPTF X 1 1/4 NPTM	1
02-0035	5	TEE 1/2 NPTF	2
02-0036	6	NIPPLE 1/2 NPT	2
02-0040	7	ADAPTER 3/8 NPTF X 1/2 NPTM	2
02-0044	8	ELL 3/4 NPTM X 3/4 NPTF 90	3
02-0048	9	NIPPLE 3/4 NPT	4
02-0050	10	FILTER SUCTION 1 13 GPM 100 MESH	2
02-0124	11	ADAPTER 3/8 NPTF X 3/4 NPTM	2
02-0132	12	ADAPTER 1/2 NPTF X 3/4 NPTM	2
02-0157	13	VALVE 4-WAY 05 O 2-POS	2
02-0204	14	CHECK VALVE 1/2 NPTF	4
02-0214	15	VALVE RELIEF 20 GPM CART PILOT	2
02-0215	16	GAUGE SIGHT LEVEL 5 INCH	2
02-0238	17	ELL 1 NPTM X 1 NPTF SCH 40	5
02-0239	18	UNION 1 NPT	2
02-0240	19	NIPPLE 1 NPT CLOSE	3
02-0254	20	PLUG 2 NPT SQ HD	2
02-0264	21	SUBPLATE WITH RELIEF CAVITY	2
02-0297	22	VALVE 4-WAY 03 C 2-POS	5
02-0310	23	TEE 3/4 NPTF	4
02-0316	24	PLUG 3/4 NPT	1
02-0326	25	HOSE END 3/4 WB X 3/4 NPTM	2
02-0329	26	HOSE END 1/2 WB X 1/2 NPTM	6
02-0339	27	ADAPTER 1 1/4 NPTF X 1 1/2 NPTM	1
02-0555	28	ELL 1/2 NPTM X 1/2 NPTM	4
02-0558	29	FLANGE C62 2 WELD	1
02-0560	30	TEE 2 WELDF SCH 160	1
02-0565	31	FLANGE C61 1 1/4 SPLIT	2
02-0571	32	ADAPTER 1 1/4 WELDF X 1 1/2 WELDM SCH160	2
02-0578	33	ADAPTER 1 1/4 NPTF X 2 NPTM	2
02-0591	34	ADAPTER 2 1/2 FM X 3 NPTM	2
02-0603	35	ADAPTER 1 NPTF X 1 1/4 NPTM	2
02-0607	36	TUBING END 3/8 X 6 ORM	2

Power Unit Reference Numbers 2 X 30 HP (Continued)

Part #	Ref. #	Description	Qty.
02-0612	37	CLAMP TUBE 3/8 WELD	6
02-0616	38	ADAPTER 1/4 NPTF X 4 ORM	2
02-0629	39	TUBING END 3/8 X 3/8 NPTM 90	2
02-0687	40	TUBING END 3/8 X 3/8 NPTM 90	2
02-0697	41	ELL 12 ORM X 12 JICM	2
02-0698	42	HOSE END 3/4 WB X 12 JICF	2
02-0804	43	OIL COOLER AOCH-25-3 208-230/460 60HZ	1
02-0805	44	COUPLING 2 SCH 40	2
02-0823	45	CLEAN OUT COVER 14	3
02-0824	46	CLEAN OUT COVER MNTG BRKT REMOVABLE	3
02-0859	47	VALVE CHECK 3/8 NPTF AIR BLEED	2
02-0871	48	ELL 4 WELD 90 SCH 40	1
02-0872	49	FLANGE C61 4 WELD 500 PSI	1
02-0878	50	FLANGE C61 1 SPLIT W/BOLTS	2
02-0879	51	HOSE END 1 WB X 1 F61 SPT 90	2
02-0881	52	ADAPTER 1 1/2 WELDF X 2 WELDM	2
02-0904	53	PLUG 3 NPT SQ HD	1
02-1062	54	FLANGE C61 1 1/4 WELD COMP W61-20-20	2
02-1098	55	HOSE END 1 1/4 WB X 1 1/4 F6190 5000	2
02-2255	56	ADAPTER 1 NPTM X 1 NPTF SWV	1
02-2330	57	CLAMP HOSE 1 WB W/RUBBER INS.	2
02-3064	58	CLAMP PIPE 2 STAUFF WELD	1
02-3076	59	HOSE END 1 WB X 1 NPTM	4
02-3107	60	VALVE BALL 1 NPTF W/ HANDLE	2
02-3540	61	FLANGE C61 1 1/2 X 1 NPT W/BOLTS	2
02-3560	62	MANIFOLD ASSEMBLY F/TR-12 100A TR-10 100 (RE	1
02-3884	63	O-RING 1/8 X 1.5 ID F/ 1 1/4 FLANGE	2
02-4079	64	BOLT KIT F/ 2 CODE 62 FLANGE	1
02-4253	65	FILTER BREATHER BAYONET FLANGE 2 INCH	2
02-4254	66	FILTER BREATHER BASKET 2 INCH	2
02-4328	67	FILTER BREATHER BAYONET ADAPTER F/ 02-3229	2
02-4330	68	FILTER BREATHER SPIN ON VICKERS V0211B1R03	2
02-4331	69	CAP 2 NPT SCH 40	1
02-4417	70	TUBING END 3/8 X 1/4 NPTM	2
02-4472	71	ADAPTER 4 ORF X 6 ORM K&R6410-6-4	4
02-4582	72	PUMP 69 GPM PISTON HP LIMITEDW/ 12 VANE KAWA	2

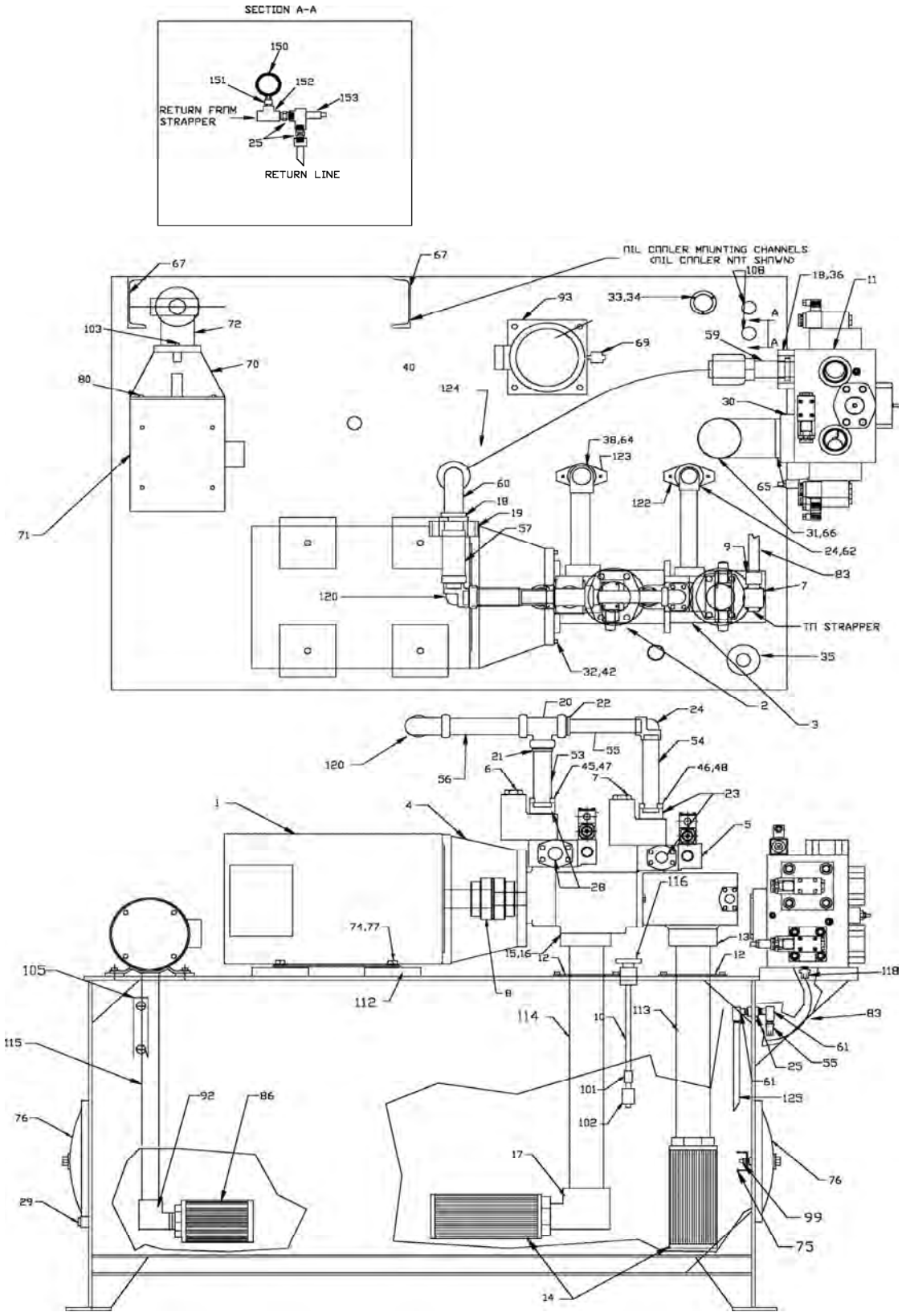
Power Unit Reference Numbers 2 X 30 HP (Continued)

Part #	Ref. #	Description	Qty.
02-4584	73	HOSE END 2 1/2 BARB X 2 1/2 F61 90	2
02-4585	74	ADAPTER 4 NPTF X 5 NPTF SCH 40	2
02-4586	75	HOSE END 2 1/2 BEADED X 2 1/2NPTM 90	2
02-4587	76	1 X SCH40 X 27 PIPE	1
02-4588	77	FILTER SUCTION 3 100 GPM 100 MESH TANK MOUNT	2
02-4589	78	5 X SCH40 X 25 PIPE	2
02-4590	79	HUB COUPLING 1 3/4-7/16 X 1 7/8-1/2 M500U IN	2
02-4591	80	ADAPTER PUMP/MTR SAE D4 X 286TC 8 1/2	2
02-4593	81	VALVE CHECK FLG MTD 1 1/4 C62BODY INSERTA IC	2
02-4594	82	VALVE CHECK INSERT USE W/02-4593 INSERTA ICS	2
02-4595	83	FILTER RETURN LINE 1 1/2 NPTF6 MICRON TANK M	1
02-4596	84	VALVE 2-WAY 4 ORF PORTS NO 120 VAC	2
02-4597	85	NIPPLE 4 ORM ADJUSTABLE	2
02-4604	86	HOSE END 1 1/4 WB X 1 1/4 F6290	2
02-4606	87	CLAMP HOSE FOR 2.5 ID 3.0625 OD SUCTION HOSE	4
02-4607	88	FLANGE C62 1 1/4 SPLIT	4
02-4608	89	VALVE RELIEF 1 1/4 C62 80 GPM	2
02-4609	90	FLANGE C61 2 1/2 SPLIT W/ BOLT KIT	2
03-1179	91	MOTOR 3O HP 1760 208-230/460V286TC TEFC SP	2
03-3689	92	SWITCH LEVEL PLUG ADAPTER 1 1/4	1
05-0061	93	BOLT 1/2-13 X 1 1/4 HEX HD GR2	20
05-0064	94	WASHER 1/2 LOCK	12
05-0075	95	NUT 1/2-13 HEX SELF-LOCKING	14
05-0096	96	BOLT3/8-16 X 1 HEX HD	4
05-0105	97	NUT 5/16-18 HEX SELF-LOCKING	4
05-0145	98	BOLT 1/4-20 X 1 1/2 ALLEN HD	8
05-0148	99	BOLT 1/2-13 X 1	6
05-0154	100	BOLT 5/16-18 X 2 1/4 ALLEN HD	4
05-0212	101	BOLT 10/24 X 1 1/4 ALLEN HD	20
05-0226	102	WASHER 3/4 LOCK	8
05-0521	103	WASHER 1/2 LOCK GRADE 8 HI-COLLAR80-0123	8
05-2276	104	BOLT 1/2-13 X 6 1/2 ALLEN HEAD	8
05-2557	105	BOLT 3/4-10 X 1 3/4 HX HD GD 5	8
06-0011	106	DECAL MOTOR ROTATION 3/4 X 4	2
09-4837	107	7GA X 13-1/2 X 30-1/8	1
09-5847	108	1 1/4 X SCH160 X 4 PIPE SQ CUT	2

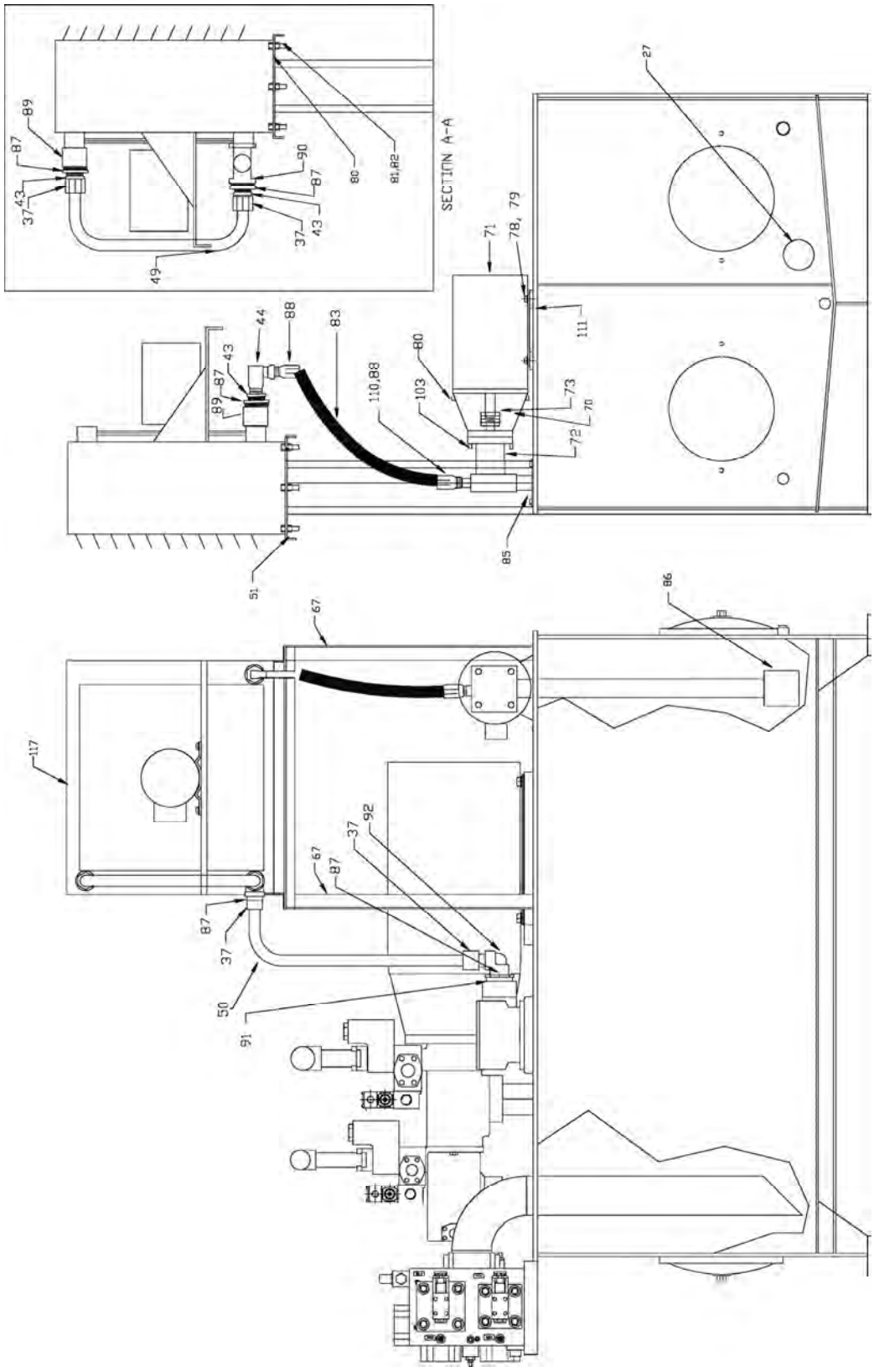
Power Unit Reference Numbers 2 X 30 HP (Continued)

Part #	Ref. #	Description	Qty.
14-2239	109	1/2 X 2 BAR X 2-11/16	4
28-1366	110	1 X SCH40 X 23 PIPE	2
28-1869	111	7GA X 13 X 14-3/4	2
29-5510	112	4 X SCH40 X 29 PIPE	1
29-5526	113	4 X SCH40 X 21-1/2 PIPE SQ CUT	1
29-6008	114	2 X SCH160 X 40-3/4 PIPE SQ CUT	1
29-6066	115	1/2 X SCH40 X 24 PIPE	3
29-6067	116	3/4 X SCH40 X 25 PIPE	3
29-6090	117	1/4 X SCH80 X 10 PIPE	1
29-6554	118	1 X SCH40 X 24 PIPE	2
99-7009	119	SWITCH OIL LEVEL & TEMP NC UPTL008180F	1
02-4605	120	HOSE 2 1/2 SUCTION	7
02-0880	121	HOSE 1 WB 4000PSI	14
02-0327	122	HOSE 3/4 2WB 3100 PSI	6
02-0335	123	HOSE 1 1/4 WIRE BRAID 5000	8
02-0608	124	TUBING 3/8 OD .049 WALL	22
02-0330	125	HOSE 1/2 WB 3500PSI	3

Power Unit Drawing 50 HP



Power Unit Drawing 50 HP (Continued)



Power Unit Reference Numbers 50 HP

Part #	Ref#	Description
02-0281	1	COUPLING 1/4 F 3/8 F
03-0675	1	MOTOR 50 HP TEFC 230/460 326TC 1760 RPM 60 HZ
03-0437	2	SWITCH OIL LEVEL & TEMPERATURE
02-0812	2	PUMP 90GPM VANE F/TR-9
05-0096	3	BOLT3/8-16 X 1 HEX HD
02-0813	3	PUMP 35/12GPM VANE F/TR-9
02-0810	4	ADAPTER PUMP/MOTOR C2 X 324TCX 8 7/8
02-0215	5	GAUGE SIGHT LEVEL 5 INCH
02-0815	5	VALVE RELIEF 1 1/4 F61 DUAL SOL VENT
02-0814	6	VALVE UNLOADING 1 1/2 F61 F/TR-9
02-0822	7	TEE 12 JICM X 12 ORM BRANCH
02-0816	7	VALVE CHECK 1 1/4 F61 F/TR-9
02-0811	8	HUB COUPLING 1 1/2-3/8 X 2 1/8-1/2 50HP
02-2329	8	HUB COUPLING 1 1/2-3/8 X2 3/8-5/8 W/INS
09-4835	8	3/4" SCH 40 PIPE X 30
02-0698	9	HOSE END 3/4 WB X 12 JICF
09-4836	9	1" SCH 40 PIPE X 30
02-0047	10	ADAPTER 3/4 NPTM X 3/4 NPTF SWV
09-1203	10	3/8 X SCH40 X 6 PIPE
02-3560	11	MANIFOLD ASSEMBLY F/TR-12 100A TR-10 100 RE
09-1239	11	1/2 X 2 BAR X 2
02-0621	12	FLANGE SUCTION 3 PIPE
09-4865	12	1 X 3 X 3 BAR
02-0669	13	FLANGE C61 3 NPT
02-0670	13	3 X SCH40 X 24 PIPE
02-0668	14	FILTER SUCTION 3 NPTF 100 GPMSEC-100-3
02-0899	14	NIPPLE 3 SCH 40 X 29 1/2 THD 1 END
02-0886	15	FLANGE C61 3 1/2 X 3 WELD
09-4855	15	1 1/4 SCH 40 PIPE X 31
02-0887	16	FLANGE BOLT KIT 3 1/2 CODE 61
02-0897	16	ADAPTER 1/2 NPTF X 1 NPTM
02-0671	17	ELL 3 NPTM X 3NPTF 90 SCH 40
02-0804	17	OIL COOLER AOCH-25-3 208-230/460 60HZ
02-0636	18	HOSE END 3/4 WB X 12 ORM
02-0875	18	FLANGE C61 2 WELD W/ORING ANDBOLTS
02-1071	19	FLANGE C62 2 WELD COMP

Power Unit Reference Numbers 50 HP (Continued)

Part #	Ref#	Description
02-0560	20	TEE 2 WELDF SCH 160
02-0876	20	ELL 2 WELDF 90 SCH 160
02-0881	21	ADAPTER 1 1/2 WELDF X 2 WELDM
02-1044	22	FLANGE RETURN 1 1/4
02-0882	23	FLANGE C61 1 1/4 WELD
02-1043	23	FLANGE RETURN LINE 1 1/2
02-0883	24	ELL 1 1/4 WELDF 90 SCH 160
02-0912	24	HOSE 2 HYDRAULIC 5000PSI
02-0036	25	NIPPLE 1/2 NPT
02-0897	26	ADAPTER 1/2 NPTF X 1 NPTM
02-0904	27	PLUG 3 NPT SQ HD
02-0873	28	FLANGE C61 1 1/2 WELD
02-0316	29	PLUG 3/4 NPT
02-0872	30	FLANGE C61 4 WELD 500 PSI
02-0871	31	ELL 4 WELD 90 SCH 40
05-0176	32	BOLT 3/4-10 X 1 1/4
02-0856	33	BREATHER WELD RISER F/02-0647
02-0647	34	BREATHER 2 IN HOLE W/STRAINER
02-0885	35	BREATHER 10 MICRON 300 GPM 3/4 NPT
02-0888	36	BOLT KIT F/4 CODE 61 FLANGE BK510
02-0896	37	TUBING END 1 1/4 X 1 1/4 NPTM
02-0890	38	ELL 1 1/2 WELDF 90 SCH 160
05-0226	42	WASHER 3/4 LOCK
02-0030	43	ADAPTER 3/4 NPTF X 1 1/4 NPTM
02-0054	44	ELL 3/4 NPTM X 3/4 NPTF SWV 90 W/ 1/4 HOLE
05-0535	45	STUD 1/2-13 X 9 1/4 GRADE 8
05-0536	46	STUD 7/16-14 X 8 1/2 ALL THREAD STUD
05-0537	47	NUT 1/2-13 NC SELF LOCKING GRD 8
05-0538	48	NUT 7/16-14 SELF-LOCKING GR 8
02-0894	49	TUBING 1 1/4 OD W/(2) 90D BEND @19 3/8
02-3026	50	TUBING 1 1/4 OD .120 WALL 90 DEG W/3 3/4"KIC
09-4837	51	7 GA X 13 1/2 X 30 1/8
09-5898	53	1 1/2 SCH 160 PIPE X 6 1/2 STR CUT
09-5899	54	1 1/4 SCH 80 X 8 3/4 STR CUT
02-0326	55	HOSE END 3/4 WB X 3/4 NPTM
09-5900	55	1 1/4 SCH 80 PIPE X 7 1/4 STRCUT

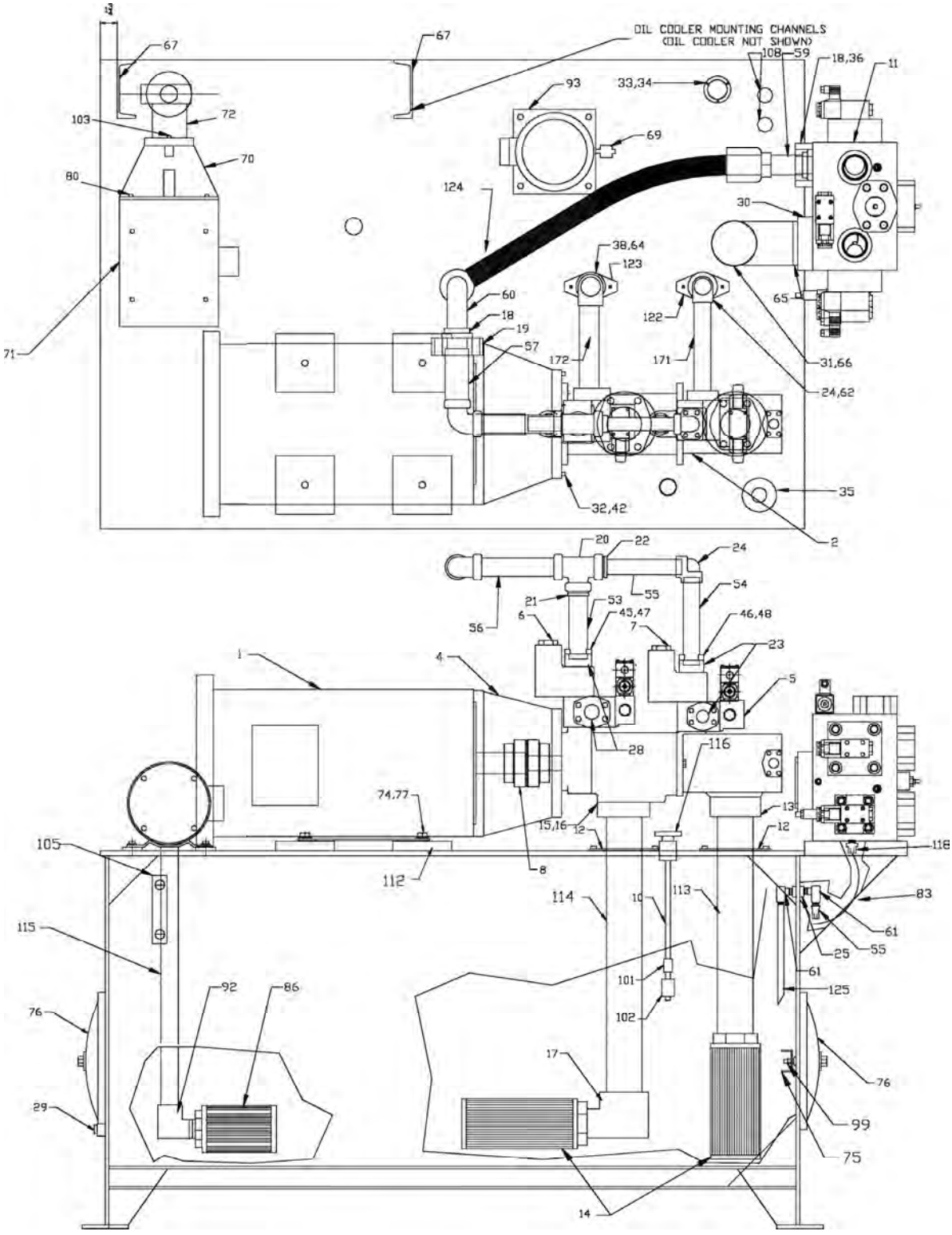
Power Unit Reference Numbers 50 HP (Continued)

Part #	Ref#	Description
09-5901	56	2 SCH 160 PIPE X 8 STR CUT
09-5902	57	2 SCH 160 PIPE X 6 STR CUT
02-1072	59	HOSE END 2 WB X 2 F62 SF
02-0044	60	ELL 3/4 NPTM X 3/4 NPTF 90
02-2088	60	CLAMP DUAL 3/4 PIPE HC-16-2
09-5904	61	1 1/4 SCH 80 PIPE X 10 STR CUT
09-4848	62	1 1/4" SCH 40 PIPE X 45 1/2
09-5905	63	1 1/2 SCH 160 PIPE X 9 1/2 STR
09-4850	64	1 1/2" SCH 40 PIPE X 44 3/4
09-4851	65	4" SCH 40 PIPE X 2 SQ CUT
09-4852	66	4" SCH 40 PIPE X 31
09-4853	67	6"C @ 8.2 X 28 SQ CUT
09-4854	68	1/2 X 2 BAR X 19 1/2
03-0772	69	SWITCH PRES F/FAIREY ARLON FL
02-0307	70	ADAPTER PUMP/MTR SAE A2 X 215TC 5 1/4
03-1265	71	MOTOR 3HP 208/230/460 RIGID BASE TEFC
02-0259	72	PUMP GEAR 18.5 GPM
02-0276	73	HUB COUPLING 7/8-1/4 X 1 1/8-1/4 G350
05-0243	74	WASHER LOCK 5/8 GRADE 8
02-0824	75	CLEAN OUT COVER MNTG BRKT REMOVABLE
02-0823	76	CLEAN OUT COVER 14
05-0338	77	BOLT 5/8 X 1 1/2 GR 2 HHCS ZINC
05-0155	78	BOLT 3/8-16 X 3/4 HEX HD
05-0159	79	WASHER 3/8 LOCK
05-0062	80	BOLT 1/2-13 X 1 1/2 HEX
05-0018	81	NUT 1/2-13NC HEX SELF-LOCKING
05-0052	82	WASHER 1/2 FLAT
02-0327	83	HOSE 3/4 2WB 3100 PSI
05-0539	84	BOLT 5/8-11 X 1 1/2 SOCKET CAP SCREW
02-0260	85	FLANGE SUCTION 1 1/4 PIPE
02-0051	86	SUCTION STRAINER 1 1/4
02-0639	87	ADAPTER 1 1/4 NPTF X 2 NPTM SCH 80
02-0046	88	HOSE END 3/4 TP X 3/4 NPTM
02-0805	89	COUPLING 2 SCH 40
05-0160	90	TEE 2IN NPTF SCH 40
02-0638	91	FLANGE C61 2 NPT

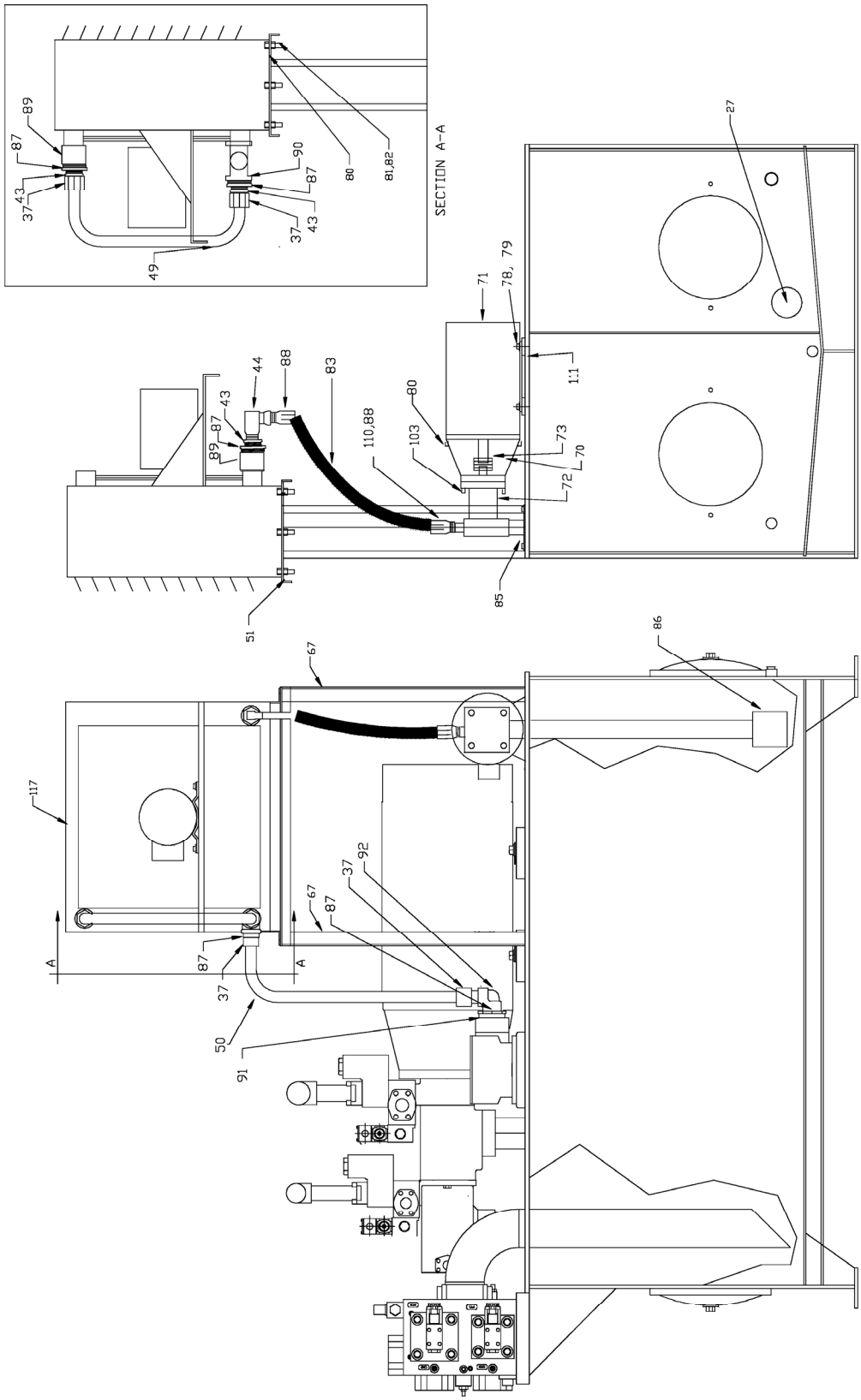
Power Unit Reference Numbers 50 HP (Continued)

Part #	Ref#	Description
02-0261	92	ELL 1 1/4 NPTM X 1 1/4 NPTF SCH 40
02-1056	93	FILTER RETURN LINE 10 MICRON ABSOLUTE
02-0878	96	FLANGE C61 1 SPLIT W/BOLTS
05-0015	99	NUT 3/8-16 UNC HEX SELF-LOCKING
02-0700	150	GAUGE PRESSURE 1/4 NPTM 0-5000 W/ORIFICE
02-0256	151	ADAPTER 1/4 NPTF X 1/2 NPTM
02-0035	152	TEE 1/2 NPTF
02-0300	153	VALVE RELIEF 20 GPM CART PILOT OP

Power Unit Drawing 75 HP (1 of 2)



Power Unit Drawing 75 HP (2 of 2)



Power Unit Reference Numbers 75 HP

Part #	Ref. #	Description	Qty.
02-0297		VALVE 4-WAY 03 C 2-POS	5
03-0245		SWITCH OIL TEMP CUT OFF ADJ.RANGE 1/2	1
03-0883		CONDULET 1/2 LB	1
05-0225		SCREW 5/16-18 X 3/4 ST TYPE 23	4
05-2258		BOLT 5MM X 30MM GRADE 12.9SHCS PLN	20
03-0147		CONDULET 1/2 GASKET	1
03-0146		CONDULET 1/2 COVER	1
02-0281	1	COUPLING 1/4 F 3/8 F	1
03-0880	1	MOTOR 75HP 230/460 3PH 1760 TEFC 365TC	1
02-2327	2	PUMP 150GPM VANE 3 SECTION	1
03-0437	2	SWITCH OIL LEVEL & TEMPERATURE	1
05-0096	3	BOLT3/8-16 X 1 HEX HD	2
02-2328	4	ADAPTER PUMP/MTR SAE C2 X 324T X 10 F/75HP	1
02-0215	5	GAUGE SIGHT LEVEL 5 INCH	2
02-0815	5	VALVE RELIEF 1 1/4 F61 DUAL SOL VENT	1
02-0814	6	VALVE UNLOADING 1 1/2 F61 F/TR-9	1
02-0816	7	VALVE CHECK 1 1/4 F61 F/TR-9	1
02-2329	8	HUB COUPLING 1 1/2-3/8 X2 3/8-5/8 W/INS	1
09-4835	8	3/4" SCH 40 PIPE X 30	2
02-0047	10	ADAPTER 3/4 NPTM X 3/4 NPTF SWV	1
09-1203	10	3/8 X SCH40 X 6 PIPE	1
09-1239	11	1/2 X 2 BAR X 2	4
02-3560	11	MANIFOLD ASSEMBLY F/TR-12 100A TR-10 100 (RE	1
02-0621	12	FLANGE SUCTION 3 PIPE	2
09-4865	12	1 X 3 X 3 BAR	4
02-0669	13	FLANGE C61 3 NPT	1
02-0670	13	3 X SCH40 X 24 PIPE	1
02-0668	14	FILTER SUCTION 3 NPTF 100 GPMSEC-100-3	2
02-0899	14	NIPPLE 3 SCH 40 X 29 1/2 THD 1 END	1
02-0886	15	FLANGE C61 3 1/2 X 3 WELD	1
09-4855	15	1 1/4 SCH 40 PIPE X 31	1
02-0887	16	FLANGE BOLT KIT 3 1/2 CODE 61	1
02-0897	16	ADAPTER 1/2 NPTF X 1 NPTM	1
02-0671	17	ELL 3 NPTM X 3NPTF 90 SCH 40	1
02-0804	17	OIL COOLER AOCH-25-3 208-230/460 60HZ	1
02-0636	18	HOSE END 3/4 WB X 12 ORM	1

Power Unit Reference Numbers 75 HP (Continued)

Part #	Ref. #	Description	Qty.
02-0875	18	FLANGE C61 2 WELD W/ORING AND BOLTS	1
02-1071	19	FLANGE C62 2 WELD COMP	1
02-0560	20	TEE 2 WELDF SCH 160	1
02-0881	21	ADAPTER 1 1/2 WELDF X 2 WELDM	1
02-1044	22	FLANGE RETURN 1 1/4	1
02-0882	23	FLANGE C61 1 1/4 WELD	2
02-1043	23	FLANGE RETURN LINE 1 1/2	1
02-0883	24	ELL 1 1/4 WELDF 90 SCH 160	2
02-0912	24	HOSE 2 HYDRAULIC 5000PSI	4
02-0021	1	COUPLING 1/4 NPT	1
02-0040	2	ADAPTER 3/8 NPTF X 1/2 NPTM	1
02-0048	3	NIPPLE 3/4 NPT	2
02-0132	4	ADAPTER 1/2 NPTF X 3/4 NPTM	1
02-0214	5	VALVE RELIEF 20 GPM CART PILOT	1
02-0215	6	GAUGE SIGHT LEVEL 5 INCH	2
02-0254	7	PLUG 2 NPT SQ HD	2
02-0300	8	VALVE RELIEF 20 GPM CART PILOT	1
02-0310	9	TEE 3/4 NPTF	1
02-0316	10	PLUG 3/4 NPT	1
02-0332	11	HOSE END 3/8 WB X 3/8 NPTM	1
02-0565	12	FLANGE C61 1 1/4 SPLIT	4
02-0606	13	TUBING END 3/8 X 6 ORM 90	2
02-0612	14	CLAMP TUBE 3/8 WELD	2
02-0634	15	FLANGE C61 1 #12 O-RING	1
02-0668	16	FILTER SUCTION 3 NPTF 100 GPMSEC-100-3	1
02-0697	17	ELL 12 ORM X 12 JICM	1
02-0698	18	HOSE END 3/4 WB X 12 JICF	2
02-0805	19	COUPLING 2 SCH 40	2
02-0822	20	TEE 12 JICM X 12 ORM BRANCH	1
02-0823	21	CLEAN OUT COVER 14	2
02-0824	22	CLEAN OUT COVER MNTG BRKT REMOVABLE	2
02-0863	23	OIL COOLER AOCH-20	1
02-0872	24	FLANGE C61 4 WELD 500 PSI	1
02-0878	25	FLANGE C61 1 SPLIT W/BOLTS	2
02-0879	26	HOSE END 1 WB X 1 F61 SPT 90	1
02-0883	27	ELL 1 1/4 WELDF 90 SCH 160	1

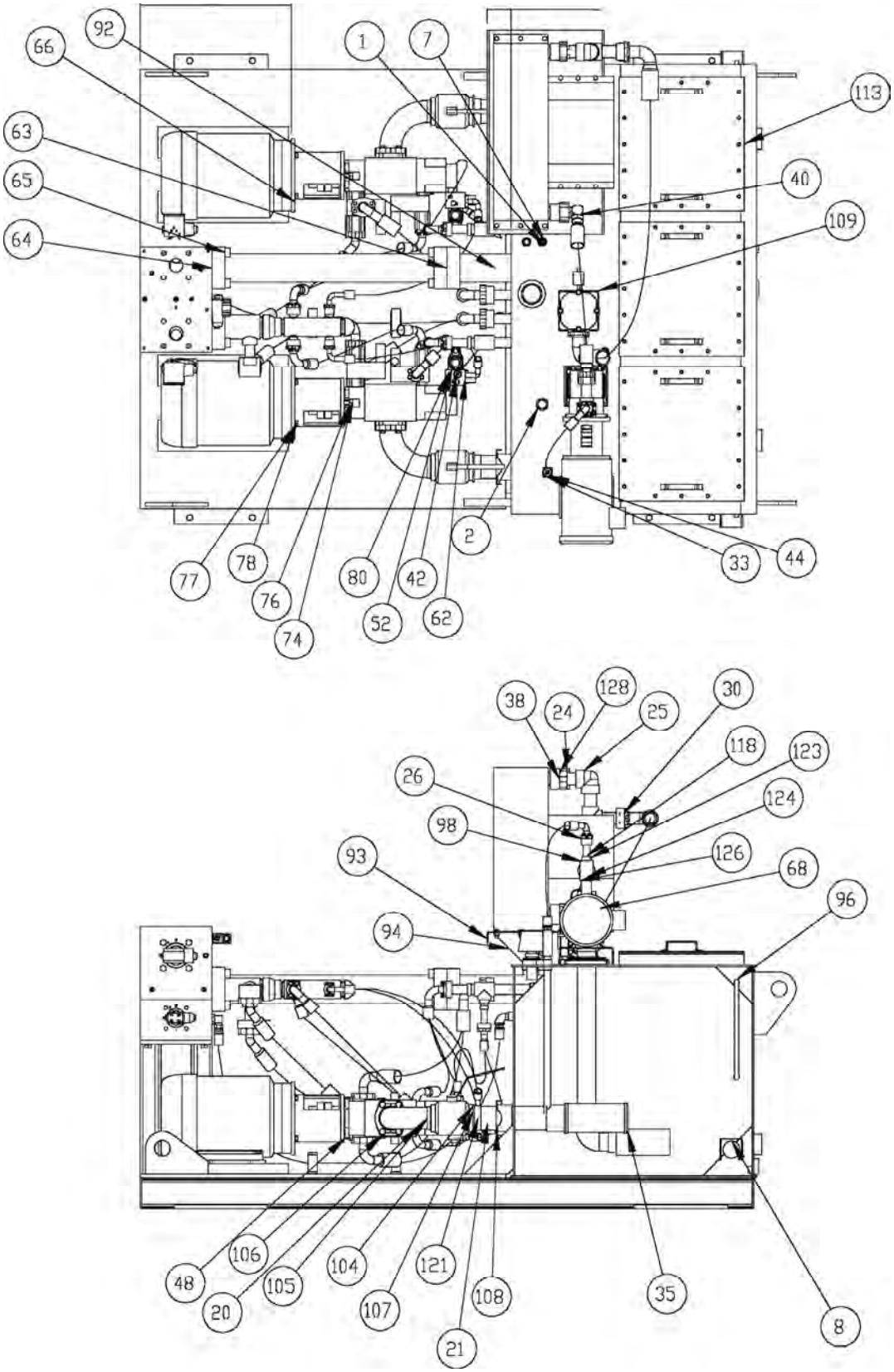
Power Unit Reference Numbers 75 HP (Continued)

Part #	Ref. #	Description	Qty.
02-0908	28	HOSE END 1 WB X 1 F61 SPT	1
02-0932	29	HUB COUPLING 1 1/4-5/16 X 1 7/8-1/2	1
02-1028	30	NIPPLE 3 NPT SCH 40	1
02-1062	31	FLANGE C61 1 1/4 WELD COMP W61-20-20	1
02-1088	32	HOSE END 1 1/4 WB X 1 1/4 F61SPT 3000	1
02-1098	33	HOSE END 1 1/4 WB X 1 1/4 F6190 5000	2
02-2258	34	CLAMP FOR 1 1/2 ID HOSE BARB FITTING	1
02-3427	35	COUPLING 4 SCH 40 FEMALE NPT THREAD	1
02-3780	36	HOSE END 3/8 2WB X 6 JICF SWV	1
02-4043	37	ADAPTER PUMP/MTR SAE C 2B X 286TC X 7.88	1
02-4154	38	HOSE END 3/4 WB X 12JICF 90 DAYCO#HY12-12FJ	2
02-4155	39	ELL 3/4 NPTM X 12 JICM 90 KRJOHNSON 2501-12-	1
02-4253	40	FILTER BREATHER BAYONET FLANGE 2 INCH	1
02-4254	41	FILTER BREATHER BASKET 2 INCH	1
02-4324	42	FILTER RETURN 12 ORM 6 MICRONTANK TOP VICKER	1
02-4328	43	FILTER BREATHER BAYONET ADAPTER F/ 02-3229	1
02-4330	44	FILTER BREATHER SPIN ON VICKERS V0211B1R03	1
02-4331	45	CAP 2 NPT SCH 40	1
02-4340	46	ADAPTER 1/2 NPTM X 12 JICM	1
02-4343	47	FILTER INDICATOR GAUGE 1/8 NPTM COLOR CODED	1
02-0276	73	HUB COUPLING 7/8-1/4 X 1 1/8-1/4 G350	1
05-0243	74	WASHER LOCK 5/8 GRADE 8	6
02-0824	75	CLEAN OUT COVER MNTG BRKT REMOVABLE	4
02-0823	76	CLEAN OUT COVER 14	4
05-0338	77	BOLT 5/8 X 1 1/2 GR 2 HHCS ZINC	4
05-0155	78	BOLT 3/8-16 X 3/4 HEX HD	4
05-0159	79	WASHER 3/8 LOCK	4
05-0062	80	BOLT 1/2-13 X 1 1/2 HEX	10
05-0018	81	NUT 1/2-13NC HEX SELF-LOCKING	6
05-0052	82	WASHER 1/2 FLAT	6
02-0327	83	HOSE 3/4 2WB 3100 PSI	5
05-0539	84	BOLT 5/8-11 X 1 1/2 SOCKET CAP SCREW	2
02-0260	85	FLANGE SUCTION 1 1/4 PIPE	1
02-0051	86	SUCTION STRAINER 1 1/4	1
02-0639	87	ADAPTER 1 1/4 NPTF X 2 NPTM SCH 80	5
02-0805	89	COUPLING 2 SCH 40	2

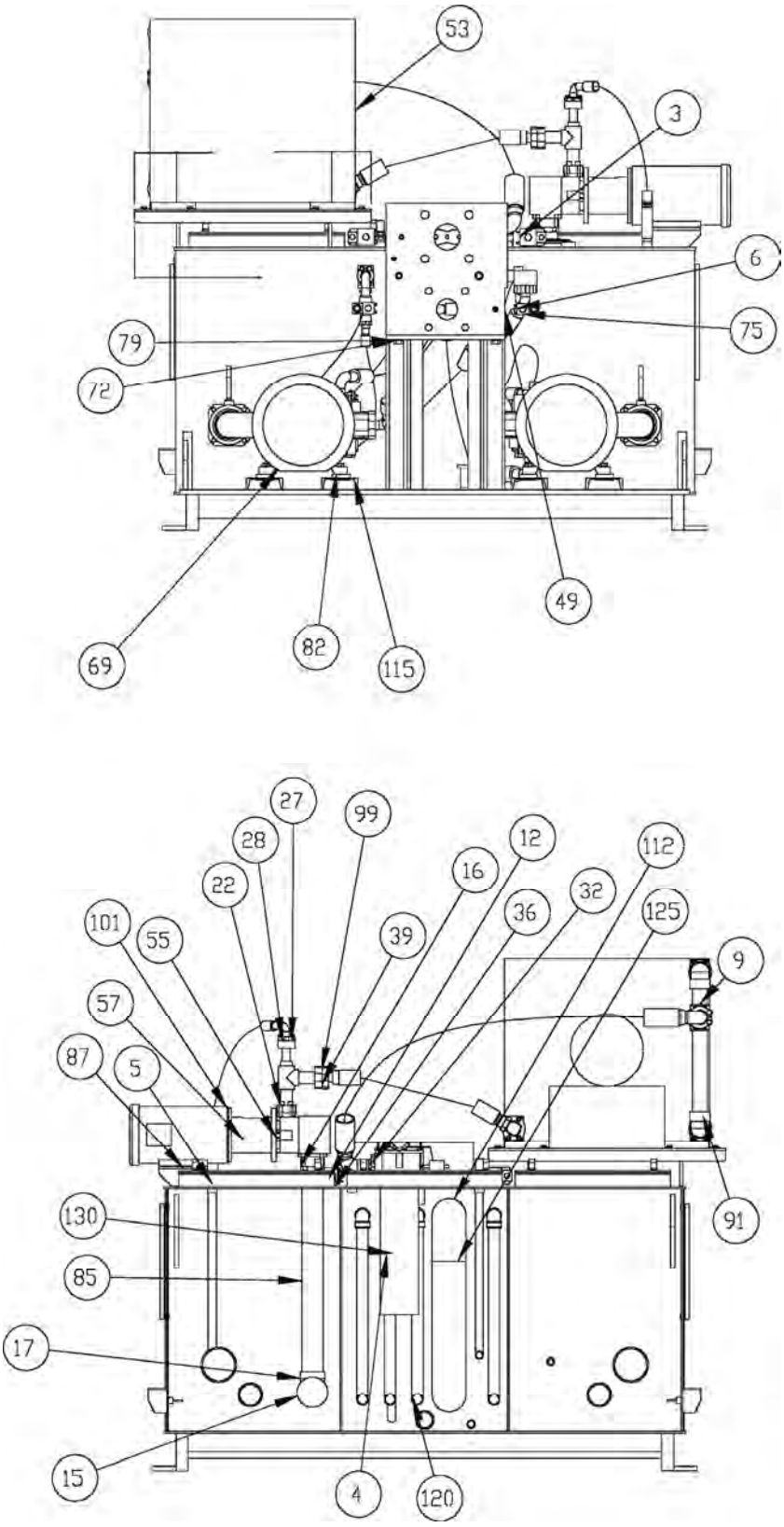
Power Unit Reference Numbers 75 HP (Continued)

Part #	Ref. #	Description	Qty.
05-0160	90	TEE 2IN NPTF SCH 40	1
02-0638	91	FLANGE C61 2 NPT	1
02-0261	92	ELL 1 1/4 NPTM X 1 1/4 NPTF SCH 40	2
02-1056	93	FILTER RETURN LINE 10 MICRON ABSOLUTE	1
05-0015	99	NUT 3/8-16 UNC HEX SELF-LOCKING	12

Power Unit Drawing 2 X 50 HP (1 of 2)



Power Unit Drawing 2 X 50 HP (2 of 2)



Power Unit Reference Numbers 2 X 50 HP

Part #	Ref #	Description
02-0060	1	ADAPTER 3/4 NPTF X 1 NPTM
02-0122	2	COUPLING 1 1/4 NPT HALF SCHDULE 20
02-0157	3	VALVE 4-WAY 05 O 2-POS
02-0238	4	ELL 1 NPTM X 1 NPTF SCH 40
02-0240	5	NIPPLE 1 NPT CLOSE
02-0297	6	VALVE 4-WAY 03 C 2-POS
02-0326	7	HOSE END 3/4 WB X 3/4 NPTM
02-0384	8	GAUGE TEMP 3
02-0560	9	TEE 2 WELDF SCH 160
02-0565	10	FLANGE C61 1 1/4 SPLIT
02-0571	11	ADAPTER 1 1/4 WELDF X 1 1/2 WELD SCHEDULE 160
02-0621	12	FLANGE SUCTION 3 PIPE
02-0656	13	ELL 24 ORM X 24 JICM 90
02-0657	14	FLANGE C61 32-24 ORING
02-0668	15	FILTER SUCTION 3 NPTF 100 GPMSEC-100-3
02-0669	16	FLANGE C61 3 NPT
02-0671	17	ELL 3 NPTM X 3NPTF 90 SCH 40
02-0697	18	ELL 12 ORM X 12 JICM
02-0811	19	HUB COUPLING 1 1/2-3/8 X 2 1/8-1/2 50HP
02-0816	20	VALVE CHECK 1 1/4 F61 F/TR-9
02-0869	21	PLUG 2 C61 SPLIT FLANGE
02-0873	22	FLANGE C61 1 1/2 WELD
02-0874	23	HOSE END 1 WB X 1 JICF
02-0875	24	FLANGE C61 2 WELD W/ORING ANDBOLTS
02-0876	25	ELL 2 WELDF 90 SCH 160
02-0877	26	FLANGE C61 1 WELD COMP
02-0878	27	FLANGE C61 1 SPLIT W/BOLTS
02-0879	28	HOSE END 1 WB X 1 F61 SPT 90
02-0898	29	ELL 16 ORM X 16 JICM 90
02-0901	30	FLANGE C61 2 SPLIT
02-0902	31	FLANGE C61 3/4 WELD COMP
02-0913	32	HOSE END 2 WB X 2 F61 90 SF
02-0970	33	VALVE CHECK 1 NPTF 65PSI CRACKING PRESSURE
02-1045	34	FLANGE C61 2 WELD COMP
02-1053	35	FILTER SUCTION 4 200GPM
02-1055	36	FLANGE SUCTION RISER 4
02-1062	37	FLANGE C61 1 1/4 WELD COMP W61-20-20

Power Unit Reference Numbers 2 X 50 HP (Continued)

Part #	Ref #	Description
02-1070	38	FLANGE C61 2 NPT COMP
02-1089	39	HOSE END 1 1/2 WB X 1 1/2 F61SPT 3000
02-1090	40	HOSE END 1 1/2 WB X 24 JICF
02-1098	41	HOSE END 1 1/4 WB X 1 1/4 F6190 5000
02-2145	42	ADAPTER 12 ORM X 12 JICM KR JOHNSON 640
02-2330	43	CLAMP HOSE 1 WB W/RUBBER INS.
02-3076	44	HOSE END 1 WB X 1 NPTM
02-4253	45	FILTER BREATHER BAYONET FLANGE 2 INCH
02-4254	46	FILTER BREATHER BASKET 2 INCH
02-4328	47	FILTER BREATHER BAYONET ADAPTER F/ 02-32
02-4483	48	PUMP 12 36 90 VANE VICKERS VMQ
02-4485	49	MANIFOLD 250 to 350 GPM REXROTH W/RELIEF
02-4486	50	VALVE RELIEF 1 1/4 F61 SOL VENT DIN CONN
02-4487	51	VALVE CHECK 1 1/2 F62
02-4490	52	VALVE 4-WAY 05 O 3-POS HI-FLOW SS VICKER
02-4496	53	OIL COOLER AOVH-35
02-4497	54	MANIFOLD RELIEF AND DIVERTER FOR TR12-10
02-4503	55	PUMP VANE 75 GPM SAE C 2 BOLTVICKERS
02-4507	56	VALVE RELIEF 1 1/2 C62 FLG MTD W/ SOL VE
02-4508	57	HUB COUBLING 1 1/4 -5/16 X 1 3/8-5/16
02-4510	58	FLANGE SADDLE 3/4 C61 X 3 WELD COMP
02-4524	59	FILTER BREATHER 1.5 UN STR THRD 2 MICRON
02-4525	60	HOSE END 3/4 WB X 12 JICF F/CE12 HOSE
02-4526	61	HOSE END 3/4 WB X C61 F/ CE12HOSE 4000 P
02-4527	62	HOSE END 3/4 WB X C61 90 ELL F/ 12CE HOS
02-4548	63	FLANGE SQ3000 5 COMP WELD
02-4549	64	FLANGE SQ3000 5 WELD
02-4550	65	BOLT KIT F/ 5 SQ3000 FLANGE
02-4551	66	ADAPTER PUMP/MTR SAE C2 X 324T X 9 3/4 F
02-4632	67	FLANGE C62 1 1/2 WELD COMP 90
03-0345	68	MOTOR 10 HP 1750 215TC TEFC
03-0675	69	MOTOR 50 HP TEFC 230/460 326TC 1760 RPM
05-0018	70	NUT 1/2-13NC HEX SELF-LOCKING
05-0061	71	BOLT 1/2-13 X 1 1/4 HEX HD GR2
05-0111	72	WASHER 7/8 LOCK
05-0145	73	BOLT 1/4-20 X 1 1/2 ALLEN HD
05-0176	74	BOLT 3/4-10 X 1 1/4

Power Unit Reference Numbers 2 X 50 HP (Continued)

Part #	Ref #	Description
05-0226	76	WASHER 3/4 LOCK
05-0243	77	WASHER LOCK 5/8 GRADE 8
05-0338	78	BOLT 5/8 X 1 1/2 GR 2 HHCS ZINC
05-2480	79	BOLT 7/8-9 X 2 3/4 HEX HEAD CAP SCREW GRADE 5
05-3192	80	BOLT 3/8-16 X 3 1/2 HX SOC CAP SCR GRADE 8
05-4069	81	WASHER 3/8 LOCK, HIGH COLLAR
09-4865	82	1 X 3 X 3 BAR
12-1820	83	3/4 X SCH40 X 3 PIPE SQ CUT
29-2573	84	4 XXS PIPE X 8
29-2602	85	3 X SCH40 X 35 PIPE SQ CUT
29-2698	86	5 SCH 40 PIPE X 22 STR CUT
29-2781	87	7GA X 8 X 16
29-2782	88	5 SCH 40 PIPE X 42 1/8 STR CUT
29-2787	89	3/4 PL X 13-3/4 X 19-1/2
29-2788	90	L 4 X 4 X 1/2 X 24-3/4 SQ CUT
29-2798	91	2 SCH 160 X 14 3/4 STR CUT
29-2920	92	2 SCH 160 PIPE X 6
29-7919	93	7GA X 26 X 39-1/16
29-7920	94	1/2 PL X 6 X 20
29-7956	95	3 XXS PIPE X 11 1/2
99-0566	96	GAUGE SIGHT 18 OLG-18
99-0853	97	FLANGE C62 1 1/2 SPLIT
99-5952	98	FLANGE C61 1 1/2 WELD COMPANION
99-6091	99	FLANGE C61 1 1/2 SPLIT #FL-24SF
99-6249	100	ADAPTER 3/4 WELDF X 1 WELDM SCH 80
99-7105	101	ADAPTER PUMP/MTR SAE C 2B X 256TC X 7.5
99-7109	102	FLANGE SQ6000 4 WELD
99-7111	103	BOLT KIT F/ 4 SQ6000 FLANGE
99-7144	104	VALVE BALL 4 ORM 300PSI
99-7145	105	ELL 64 ORM X F61 SPL 90
99-7146	106	FLANGE C61 4 SPLIT W/ BOLT KIT
99-7147	107	ADAPTER 4 ORM X WELD
99-7152	108	COUPLING 4 DRESSER 4 BOLT X 5LONG
99-7166	109	FILTER RETURN 120 GPM 10 MICRON ABSLT
99-7168	110	CAP 3 WELD XXS
99-7170	111	ADAPTER 4 WELDM X 3 WELDM XXS
99-7171	112	ELL 5 WELDM SCH 40

Power Unit Reference Numbers 2 X 50 HP (Continued)

Part #	Ref #	Description
99-7179	113	1/4 NEOPRENE X 24 X 25 5/8 CLEAN OUT CVR
99-7181	114	FLANGE SADDLE 1 1/4 C61 X 3 WELD COMP
99-7213	115	C6 X 8.2 X 25 SQ CUT
99-7218	116	ELL 1 1/2 NPTF 90 SCH 40
99-7219	117	FLANGE C62 1 1/2 WELD COMP
99-7223	118	ADAPTER 1 WELDF X 1 1/2 WELDMSCH 40
99-7224	119	1 1/2 X SCH40 X 8 PIPE
99-7225	120	1 1/2 X SCH40 X 30 PIPE
99-7232	121	PIPE 4 SCH 40 X 14 THREAD ONEEND
99-7239	122	1 1/4 X SCH40 X 4 PIPE SQ CUT
99-7240	123	1 X SCH40 X 3 PIPE SQ CUT
99-7241	124	1 1/2 SCH 40 PIPE X 4 STR CUT
99-7249	125	5 SCH 40 PIPE X 25
99-7257	126	TEE 1 1/2 WELDF SCH 40
99-7299	127	SOCKOLET 1 1/2 X 3-5 6000 PSI
99-7312	128	2 SCH 160 X 4 STR CUT
99-7331	129	1 1/2 SCH 160 PIPE X 4 STR CUT
99-7339	130	1 X SCH40 X 28 PIPE
99-7342	131	HOSE END 1 1/2 X 1 1/2 F62 90
99-7640	132	HOSE END 1 1/2 WB X 1 1/2 F62SF 45
99-8218	133	FLANGE C61 X 3/4 SPLIT
02-1091	134	HOSE 1 1/2 WB 5000PSI
02-0335	135	HOSE 1 1/4 WIRE BRAID 5000
02-0912	136	HOSE 2 HYDRAULIC 5000PSI
02-3493	137	HOSE 3/4 4WB 4000 PSI DAYCO#12CE
02-0880	138	HOSE 1 WB 4000PSI

Procedure - Shear Bar & Ram Guide Adjustment

Danger: Only authorized and trained personnel should perform following procedures. **Lock-out and tag-out baler per instructions on page 2-2 as directed in following procedure.**

If the gap between the body shear bar and the ram shear bar becomes greater than 1/8" or the gap between the ram guides and the ram becomes greater than 1/32", adjustment of the machine is required.

1) Using the Manual mode, move the ram forward until the shear bar on the ram is directly below the shear bar on the machine**. LOCK-OUT AND TAG-OUT THE BALER PER THE INSTRUCTIONS ON PAGE 2-2.**

2) Measure the gap between the shear bars. Record this dimension.

3) Loosen the ram guide adjusting bolts (bolted through the main channels).

4) Push the guides down until they contact the ram.

5) Retighten the ram guide adjusting bolts while holding the guides on top of the ram.

6) Remove the Lock-out and Tag-out provisions. Using the Manual mode, retract the ram to its full retract position and **Lock-out and Tag-out the baler per the instructions on page 2-2.**

7) Shim the upper shear bar (on the baler body) as required to bring the gap to a measurement of 1/16".

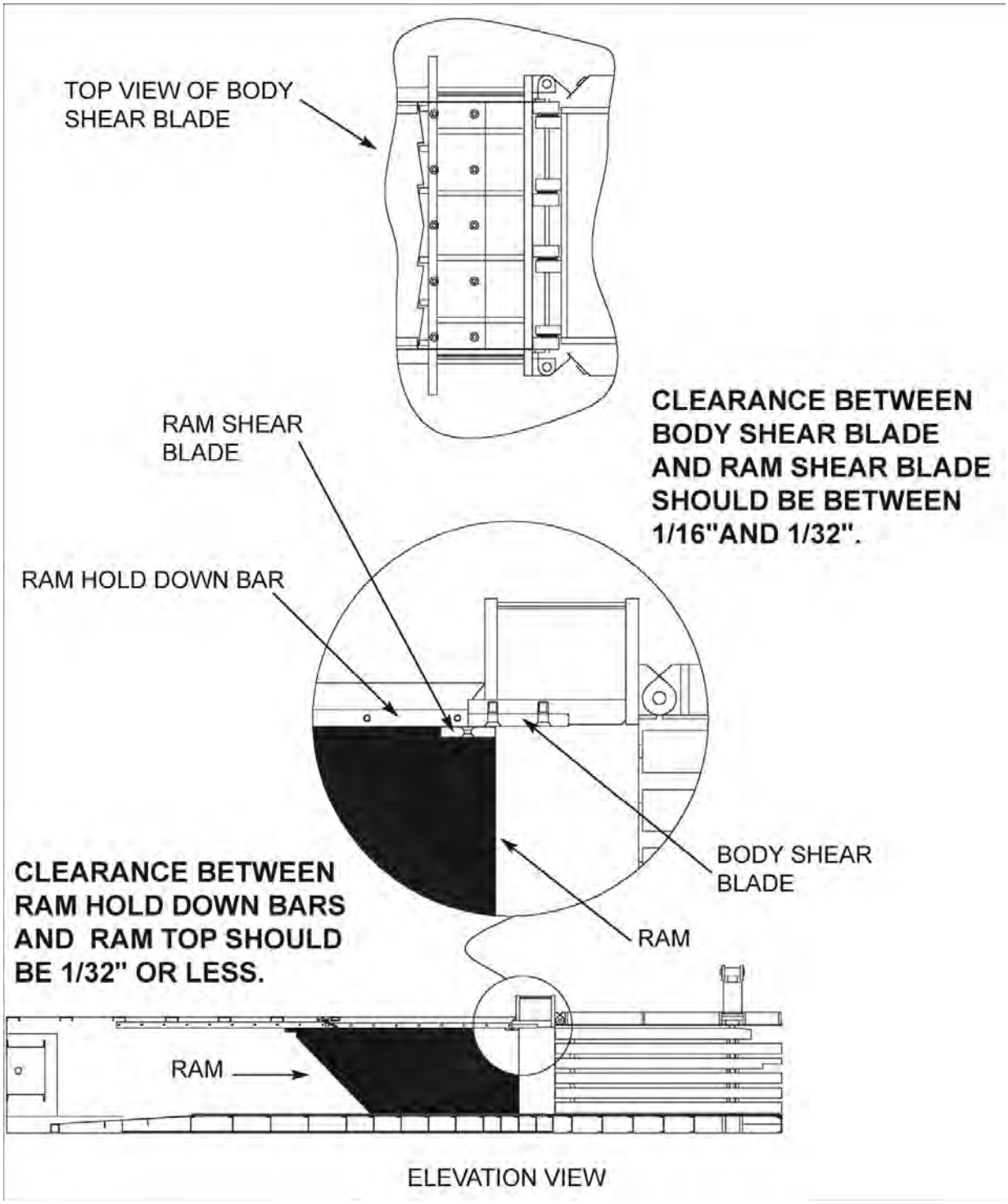
   Note: Anytime the shear bar gap is adjusted, the ram guide(hold-down) -to - ram top gap must be checked. If this gap is greater than 1/32", adjustment is required. Failure to do so may result in serious damage to the baler.

8) Remove the Lock-out and Tag-out provisions. Using the Manual mode, extend the ram forward to the shear bar on the body and stop. **Lock-out and Tag-out the baler.** Verify that the shear bars will not collide. The gap between the shear bars should be 1/16" or less. Make sure that the gap between the ram guides and the ram top is 1/32" or less.

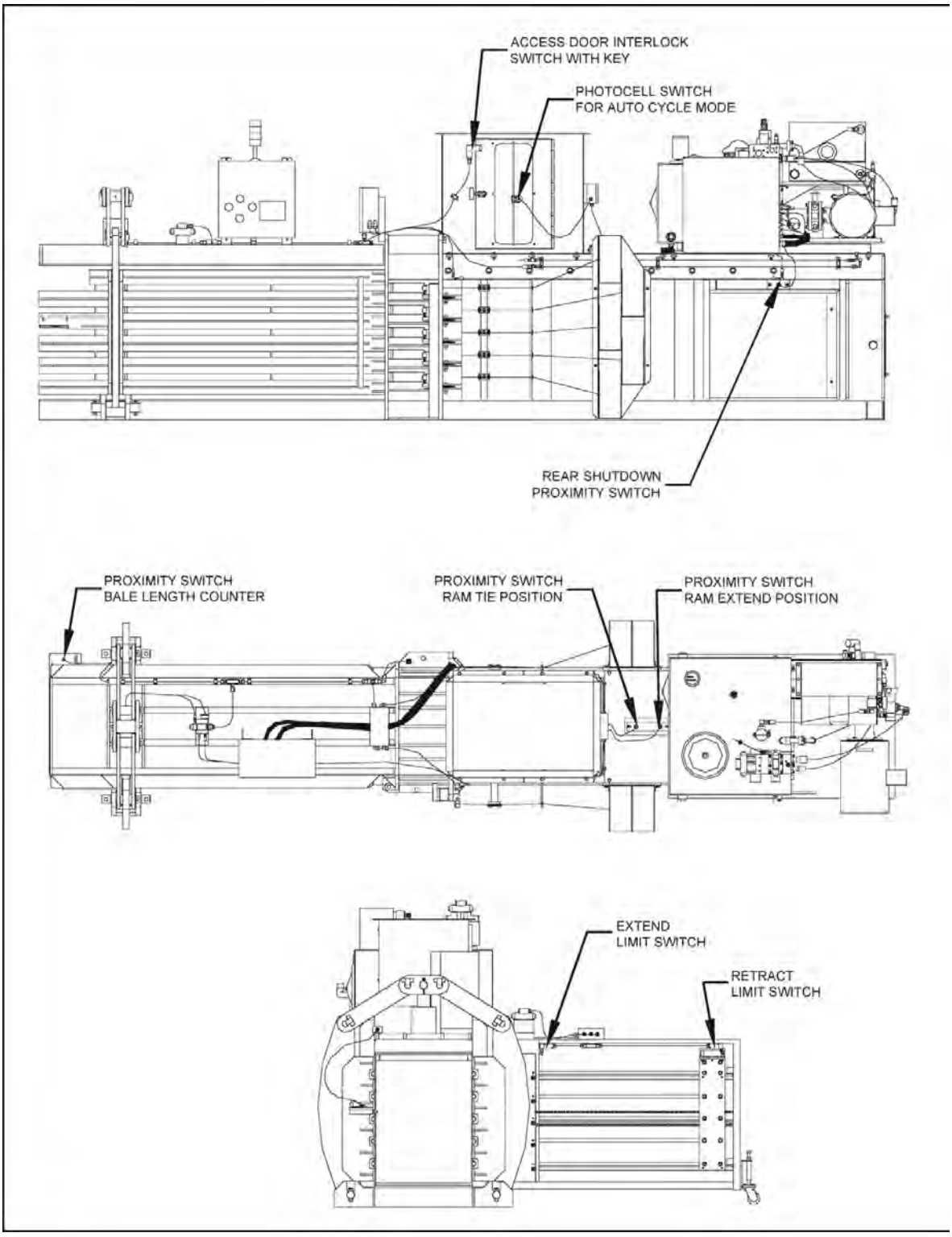
9) Shear and guide adjustment is complete.

See the diagram on the next page when using this procedure.

Shear Bar & Ram Guide Adjustment Diagram



Switch Location Diagram



Switch Description

1) PROXIMITY SWITCH, BALE COUNTER - Mounted adjacent to bale length counter wheel. This proximity switch sends a signal to P.L.C. input that controls bale length. Each pulse represents approximately 1" inch.

2) INTERLOCK SWITCH WITH KEY - Mounted next to hopper access door. This switch is used as a safety measure to prevent the machine from running if and when the hopper door is opened.

3) TIE POSITION AND RAM EXTENDED PROXIMITY SWITCH - These switches supply information to the P.L.C. when the ram is in the TIE POSITION or EXTENDED position.

4) REAR PROXIMITY SWITCH- Mounted at rear of baler. When this switch is actuated, ram stops its rearward movement and will stop or start forward, depending on control conditions.

5) TWISTER COUNTER PROXIMITY SWITCH- This switch is mounted directly over twister hydraulic motor drive gear and senses and counts rotations of motor by means of an actuator pad welded onto the gear. The L.E.D. indicator on the switch should be illuminated when t wister gear slots are open. This switch sends pulses or counts to the processor and controls tie operation. When twister stops in proper position, L.E.D. will be lit, otherwise machine will fault to prevent damage to twister/tier mechanism.

6) TIER FORWARD AND REAR LIMIT SWITCHES - These switches control travel of tier inserter.

7) BALE LENGTH COUNTER PROXIMITY- This proximity switch signals the P.L.C. one count when each gear tooth passes the switch.

8) PHOTO CELL SWITCH FOR AUTOCYCLE MODE - This proximity switch will start or continue to operate baler if the photo cell detects material in the feed hopper. (The baler must be in "AUTO CYCLE MODE" for this switch to function).

Electrical Schematic

Refer to the electrical and hydraulic schematics shipped with your open end auto-tie baler or contact Marathon Equipment Company at 1-800-633-8974 and ask to speak with the Field Service Department.

Please have model and serial number available when you call.

Electric Charts

MOTOR SIZE	VAC	TOTAL FULL LOAD AMP	DUAL ELEMENT FUSE MAX. SIZE	CIRCUIT BREAKER MAX. SIZE
20 HP MAIN MOTOR	208	59	100	125
	230	54	90	125
	460	27	45	60
	575	22	35	50
30 HP MAIN MOTOR	208	88	150	200
	230	82	150	200
	460	40	70	100
	575	32	60	80
50 HP MAIN MOTOR 2 HPCOOLER PUMP 1 HP FAN COOLER	208	143	250	350
	230	130	225	350
	460	65	100	150
	575	52	90	125
2 x 30 HP MAIN MOTOR 1 HP FAN COOLER	208	180.6	225	300
	230	164.2	200	250
	460	82.1	110	125
	575	65.7	80	110
75 HP MAIN MOTOR 3 HP COOLER PUMP 1 HP FAN COOLER	208	225	350	500
	230	205	350	450
	460	102	175	250
	575	82	125	200

Electric Charts (Continued)

MOTOR SIZE	VAC	TOTAL FULL LOAD AMP	DUAL ELEMENT FUSE MAX. SIZE	CIRCUIT BREAKER MAX. SIZE
100 HP MAIN MOTOR & 2 HP COOLER PUMP & 1 HP FAN COOLER	208	284	450	600
	230	258	400	600
	460	129	200	300
	575	103	175	250
2 x 50 HP MAIN MOTOR & 10 HP COOLER PUMP & 3 HP FAN COOLER	208	329.2	400	500
	230	301.4	350	450
	460	167.6	200	250
	575	122.8	150	200

Spare Parts List

Part #	Qty.	Description
02-0214	1	VALVE RELIEF 20 GPM CART PILOT OP
02-0700	1	GAUGE PRESSURE 1/4 NPTM 0-5000 W/ORIFICE
02-4330	1	FILTER BREATHER SPIN ON VICKERS V0211B1R03
02-4414	1	FILTER ELEMENT 6 MICRON F/ 02-4324 VICKERS
02-4512	1	COIL F/VICKERS VALVE D03 DIN CONNECTION 115AC
03-0010	1	LIMIT SWITCH ARM WITH ROLLER
03-0012	1	LIMIT SWITCH 5 DEGREE PRE-TRAVEL
03-0433	1	TRANSDUCER 0-4000 PSI 1-11 VDC
03-0476	1	FUSE 3 AMP DUAL 1 1/4 BUSS
03-0735	3	FUSE 2 AMP AGC STYLE
03-0798	1	FUSE 1 AMP AGC STYLE 250 VOLT
03-1179	1	MOTOR 30 HP 1760 RPM 208/230/460 VOLT
03-4152	1	RELAY SAFETY MONITORING 3 OUTPUT
03-4216	1	PHOTO CELL HARSH DUTY RECEIVER 24VDC SM30PRL
99-8222	1	PHOTO CELL HARSH DUTY EMITTER SMA30PEL
03-4229	1	SWITCH INTERLOCK OMRON D4BS-3AFS
03-4189	1	SWITCH PROXIMITY 12MM 10-30VDC SOURCING
03-4252	1	SWITCH PROXIMITY 30MM NO 6-48VDCSourcing 28MM RANGE
03-4264	1	TRANSDUCER CURRENT 0-10VDC 100,150,200A
03-4313	1	SWITCH PROXIMITY 18MM 10-30VDC SOURCING 8MM RANGE
03-4364	1	LIMIT SWITCH 2 NO 2 NC MAKE IN BOTH DIRECTIONS
03-4392	1	SWITCH PROXIMITY 30MM NC 6-48VDCSourcing 28MM RG
03-0935	2	KEY
80-0060	2	WIRE FEED TENSION ROLLER
05-4368	2	WIRE FEED GUIDE CERAMIC
05-4468	2	WIRE FEED GUIDE CERAMIC .200 ID
05-3656	5	BALE WIRE 11 GA 100 POUND BOX BLACK ANNEALED NON-OIL
28-8621	1	ROLLER, WIRE INSERTER NEEDLE
28-8362	1	TWISTER HEAD
06-2789	2	WIRE CUTTER
05-4420	2	BOLT FOR WIRE CUTTER 10-32 X 3/4
03-5266	3	SWITCH PROXIMITY

Troubleshooting

This section is designed to assist in the diagnostics and resolution of common system faults. It is neither expressed nor implied that this list is comprehensive in nature. Effective troubleshooting involves a thorough understanding of the machine, all components, and system processes, including electrical, mechanical, and hydraulic operations. Only factory authorized and trained personnel should be allowed to perform maintenance on this machine.

If the following troubleshooting methods fail to correct the problem, then contact the service department at 1-800-633-8974.

Warning: Do not perform any inspection, maintenance, adjustment, or repair without first locking-out and tagging-out the compactor per the instructions on page 2-2.

Troubleshooting methodology should go as follows:

1) Identify the problem.

2) Identify the faulty operation.

3) Compile a list of components involved in the operation.

4) Identify the power source for each component.

5) Through deduction, identify the problematic component.

6) Test each applicable component.

Troubleshooting – Power Unit

Only thoroughly trained and experienced service personnel should perform troubleshooting and maintenance to this baler. DO NOT ENTER BALER FOR ANY REASON UNTIL BALER HAS BEEN LOCKED-OUT AND TAGGED-OUT PER LOCKOUT AND TAG-OUT INSTRUCTIONS ON **PAGE 2-2**.

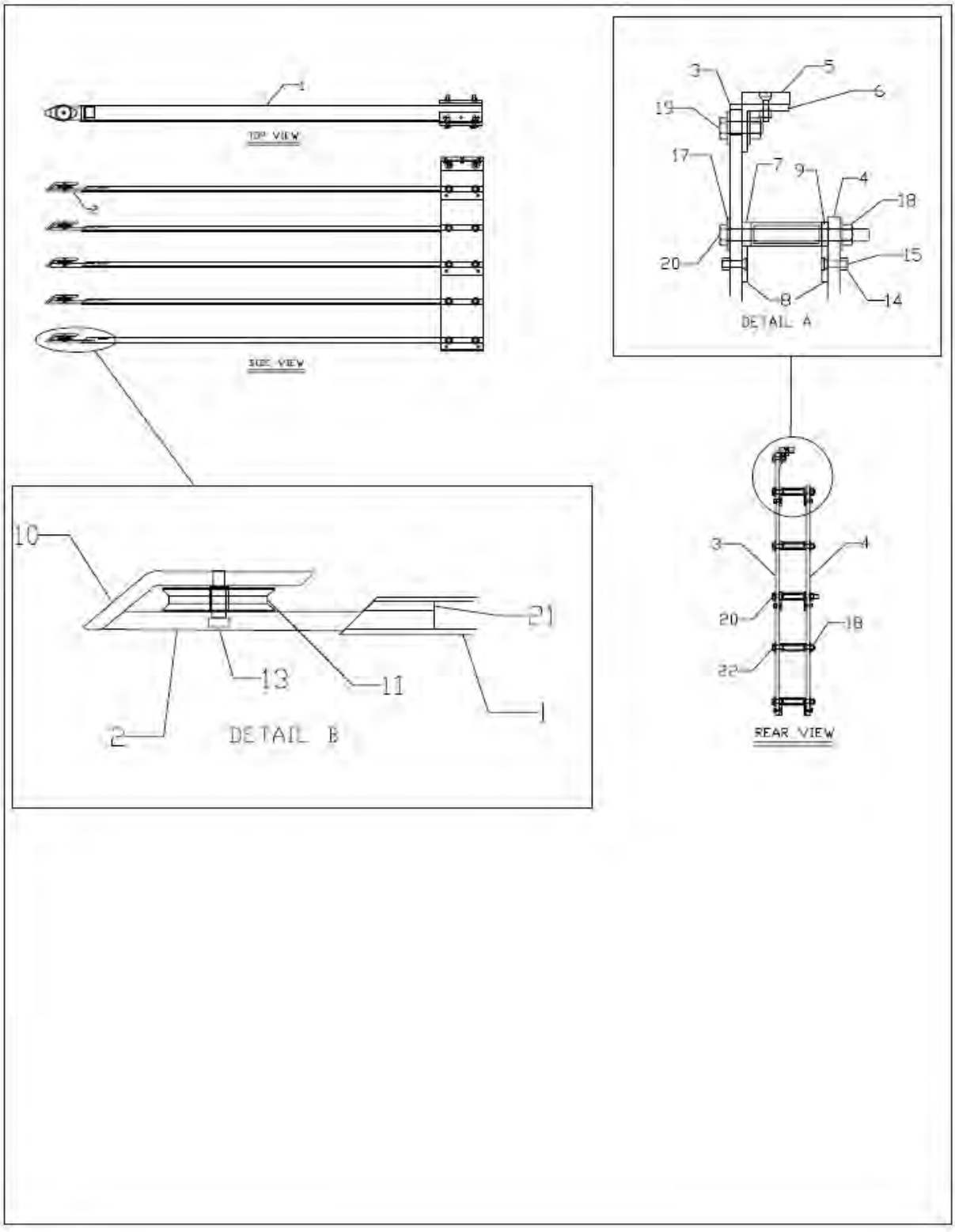
Problem	Possible Cause	Solution
MAIN MOTOR WILL NOT START/ RUN	1) No incoming power. 2) No control circuit power. 3) Safety interlock switch. 4) Emergency stop button depressed. 5) Motor overload tripped. 6) Electrical system malfunction. 7) Programmable controller fault.	1) Check main disconnect switch. 2) Check primary and secondary fuses in motor control panel. 3) Check for open hopper door. 4) Check E-Stop buttons. 5) Reset overload on motor starter. Check current load (AMPS). 6) Check electrical system. 7) Check fault lights on P.C. Make sure PLC is in RUN mode.
PUMP NOISE	1) Oil level low. 2) Air leakage in suction line. 3) Worn pump.	1) Check oil level in tank. Add if necessary. 2) Check suction line for leaks. Check pump shaft seal. 3) Repair or replace hydraulic pump.
MAXIMUM HYDRAULIC PRESSURE NOT OBTAINABLE	1) Pressure relief set too low. 2) Cylinder bypass. 3) Worn pump. 4) Check valve on unloading valve. 5) Machine not shifting out of regen.	1) Check relief valve pressure setting. 2) Check for internal cylinder leak. 3) Repair or replace hydraulic pump. 4) Repair or replace. 5) Cylinder rod relief set too low. Pressure switch or transducer malfunction.
COMPRESSION RAM WILL NOT MOVE FORWARD	1) Photocell malfunction.	1) Replace photocell.

Problem	Possible Cause	Solution
COMPRESSION RAM WILL NOT RETRACT (AUTO/MANUAL)	1) Foreign material jamming ram. 2) Compression cylinder rod puppet malfunction. 3) Compression cylinder rod end pressure puppet not opening. 4) Compression cylinder rod relief pressure set too low	1) Check for foreign material wedging between ram and shear bar. 2) Check solenoid valve. Check for plugged orifice. 3) Check solenoid valve. Make sure valve spool is shifting. 4) Reset pressure to correct setting.
COOLER/FILTER PUMP WILL NOT START/RUN	1) Motor overload tripped. 2) Cooler/filter pump fuses. 3) Electrical circuit malfunction.	1) Reset overload on motor starter. Check current load (AMPS). 2) Replace blown fuses. 3) Perform electrical system check.
INSERTER NEEDLES NOT CAPTURING WIRE.	1) Wire is too low to pass over the needle head. 2) Wire is too high to be captured against the needle head roller.	1) Adjust the Spring Feeder by loosening the Jam Nut, then loosening the Adjustment Bolt to raise the Spring Feeder to the proper height. Retighten Jam Nut. (see **Page 1-53**) 2) Adjust the Spring Feeder by loosening the Jam Nut, then tightening the Adjustment Bolt to lower the Spring Feeder. Retighten the Jam Nut. (see **page 1-53**)

Problem	Possible Cause	Solution
BALE WIRE BREAKING OR NOT BEING PULLED ACROSS THE BALER.	1) Too much tension on the wire.	1) Adjust the Wire-Tensioner by loosening the Jam Nut, then loosening the Adjustment Bolt to raise the center roller of the Wire Tensioner. Retighten Jam Nut.(see **Page 1-51**)
BALE WIRE IS SLACK AND/OR BALE DENSITY IS COMPROMISED.	1) Not enough tension on the wire.	1) Adjust the Wire-Tensioner by loosening the Jam Nut, then tightening the Adjustment Bolt to lower the center roller of the Wire- Tensioner. Retighten Jam Nut. (see **Page 1-51**)

Note: In all events, Check output fuses.

Inserter Needle Assembly



See parts list on next page.

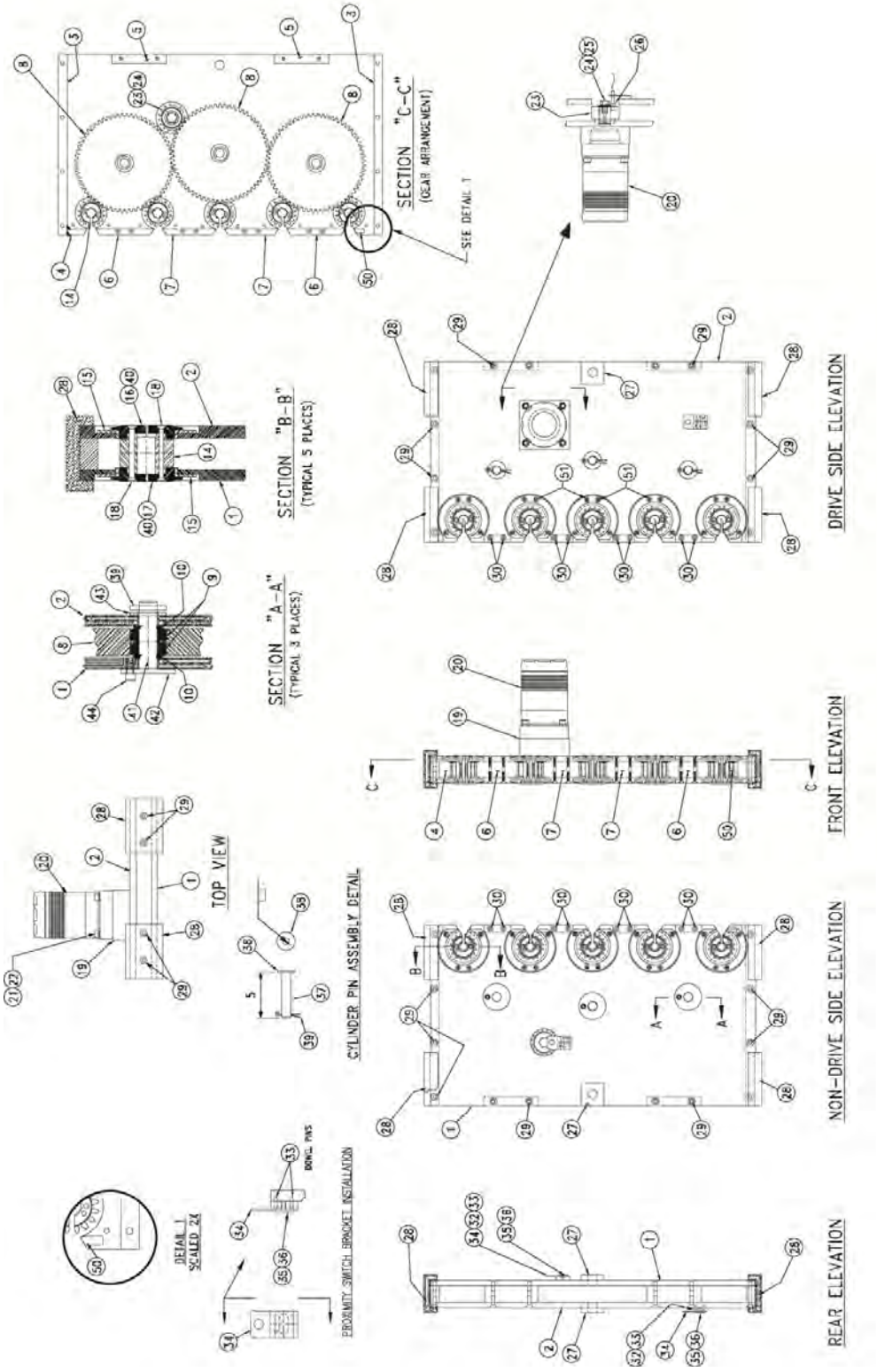
Inserter Needle Assembly - Parts List

Part Number	Ref #	Description	Quantity
*	1	*SEE CHART ON BOTTOM OF PAGE	5
288613	2	1/2 PL X 2 5/8 X 8 1/4	5
288614	3	1/2 X 8 X 36 BAR	1
288615	4	1/2 X 8 X 31 1/4 BAR	1
288617	5	UHMW 1/2 X 2 X 8	1
286008	6	L2 X 2 X 1/4 X 8	1
288616	7	3/8 X 1 X 8 BAR	5
288618	8	UHMW 1/4 X 1 1/2 X 8	10
288619	9	1/4 X 1 X 8 BAR	5
303763	10	3/8 PL X 3 X 6 3/8	5
288621	11	NEEDLE ROLLER 3 DIA X 3/4 WITH	5
800186	13	BOLT SHOULDER 3/8 X 3/4	5
50025	14	NUT 1/4-20NC HEX SELF-LOCKING	15
53222	15	BOLT 1/4 -20 X 1 FSHCS GR 5	12
50052	17	WASHER 1/2 FLAT	24
50018	18	NUT 1/2-13 HEX SELF-LOCKING	12
50319	19	BOLT 1/2- 13 X 1 3/4 HHCS GR 8	2
54358	20	BOLT 1/2- 13 X 6 HHCS GRD 8 (M	2
288622	21	1/4 X 2 X 1 7/8 BAR	5
52193	22	BOLT 1/2- 1 3 X 5 1/2 HHCS GR	8

***The lengths of the inserter needles vary by baler model. Refer to the chart below when ordering replacements.**

Baler Model	Part Number	Description
30" PC Baler	294432	3 X 1 X .120 X 75 3/4 TUBING
30" NS	294432	3 X 1 X .120 X 75 3/4 TUBING
42" WS	294503	3 X 1 X 1/8 X 88 1/4 TUBING
48" EWS	299414	3 X 1 X 94 5/16 TUBING

Twister Head Assembly



See parts list on next page.

Twister Head Assembly - Parts List

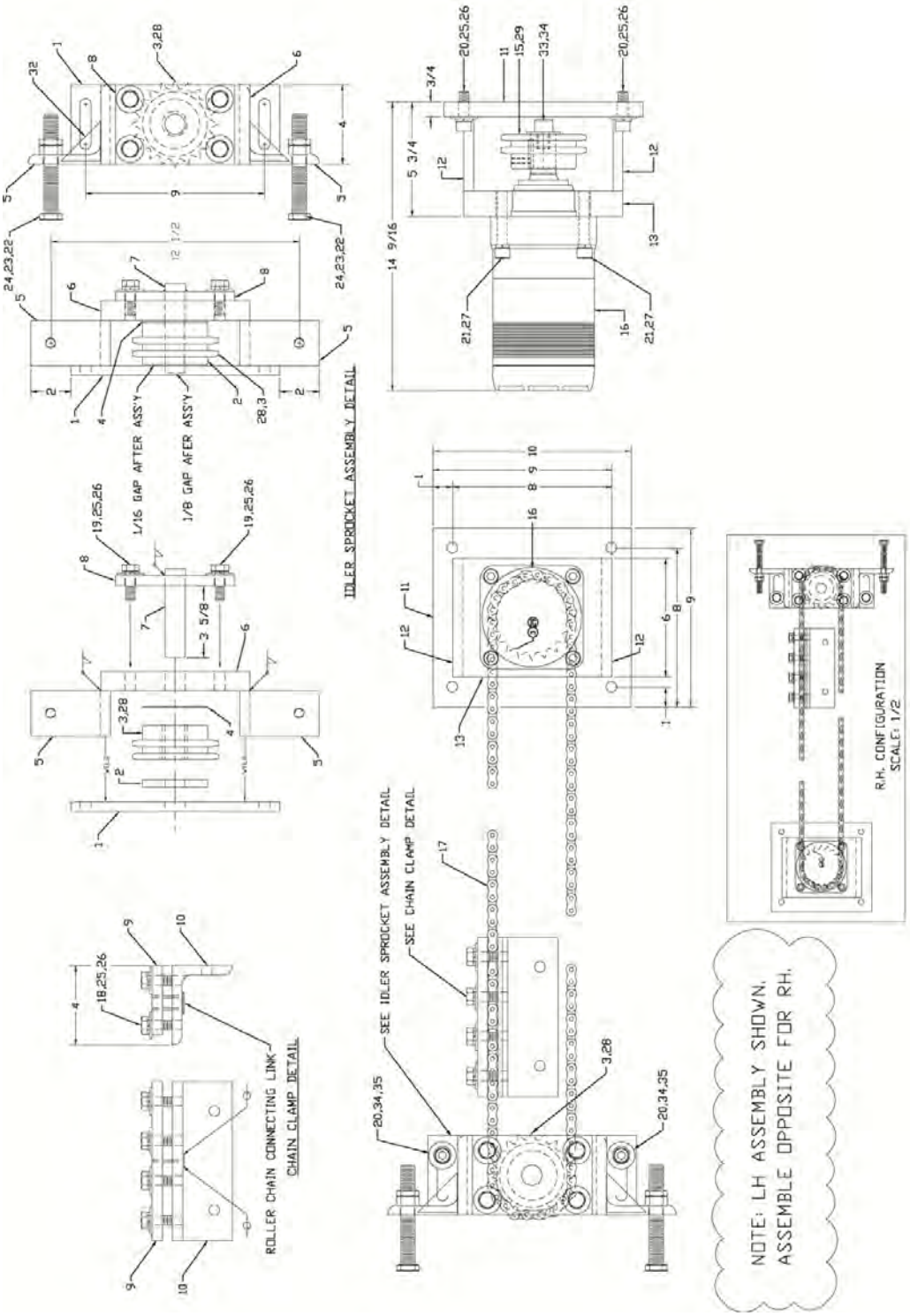
Part #	Ref. #	Description	Quantity
29-6729	1	5/8 PL X 20 X 36	1
29-6730	2	5/8 PL X 20 X 36	1
30-8748	3	1 X 2 X 20 BAR	2
29-0627	4	3/4 X 2 X 2 1/4 BAR	1
29-7166	5	1 X 2 X 6 BAR	2
29-0629	6	3/4 X 2 X 6 1/2 BAR	2
29-0630	7	3/4 X 2 X 6 BAR	2
05-4350	8	GEAR SPUR 64T 14.5PD 6DP 1 1/2	3
05-4422	9	BEARING:NICE 7516 DLTN FOR 5 T	6
05-4363	10	WASHER THRUST IGLIDE THERMOPLA	6
05-4416	14	GEAR SPUR 16T 2.666PD 6DP 1 1/	5
05-4360	15	BUSHING 660 BRONZE 5 1/2 OD(	10
28-8362	16	TWISTER HEAD, CUT SIDE	5
29-0206	17	TWISTER HEAD, GUIDE SIDE	5
05-4417	18	BOLT 1/4 -28 X 1 FSHCS	20
29-7155	19	2 PL X 5 1/2 X 5 1/2	1
02-4618	20	MOTOR HYDRAULIC PARKER TG0785U	1
05-0339	21	BOLT 1/2- 13 X 3 SHCS GR 5	4
05-0521	22	WASHER 1/2 LOCK GRADE 8 HI-COL	4
05-4544	23	GEAR SPUR 16T 2.666PD 1 1/2 FA	1
05-4559	24	BOLT 5/8-18 X 3/4 SHCS	1
05-4558	26	REST BUTTON 1/2 X 1/2 MMC# 851	1
29-6181	27	5/8 PL X 2 1/2 X 2 1/2	4
06-2904	28	UHMW 1 1/2 X 4 3/16 X 6	4
05-0276	29	BOLT 3/8-16 X 1 1/4 FSHCS	32
05-3222	30	BOLT 1/4 -20 X 1 FSHCS GR 5	16
29-0713	32	3/8 X 1 1/2 X 1 1/2 BAR	2
05-4367	33	DOWEL PIN 3/16 X 1/2	4
29-0714	34	11 GA HI TEN X 1 1/2 X 2 5/8	2
05-3665	35	BOLT 1/4- 20 X 1/2 SHCS	4
29-0715	36	11 GA HI TEN X 1 X 1 1/2 BAR	3
29-6789	37	1 CR X 5 ROD	2
05-0293	38	WASHER 5/8 FLAT	1
05-3538	39	COTTER PIN 3/16 X 2	4
05-4365	40	DOWEL PIN 1/4 X 5/8	20
29-0711	41	1 G&P X 4 ROD	3

Twister Head Assembly - Parts List (Continued)

Part #	Ref. #	Description	Quantity
29-0712	42	1/4 PL X 3 O.D. X 1 I.D.	3
05-0069	43	WASHER FLAT 1 CAD PLT	3
05-2307	44	BOLT 3/8-16 X 1 SHCS	3
30-8747	50	1/2 X 2 X 1 1/4 BAR	1
05-4366	51	BOLT 1/4 -28 X 1/2 FSHCS	40

Drive Assembly For Twister Head

See parts list on next page.

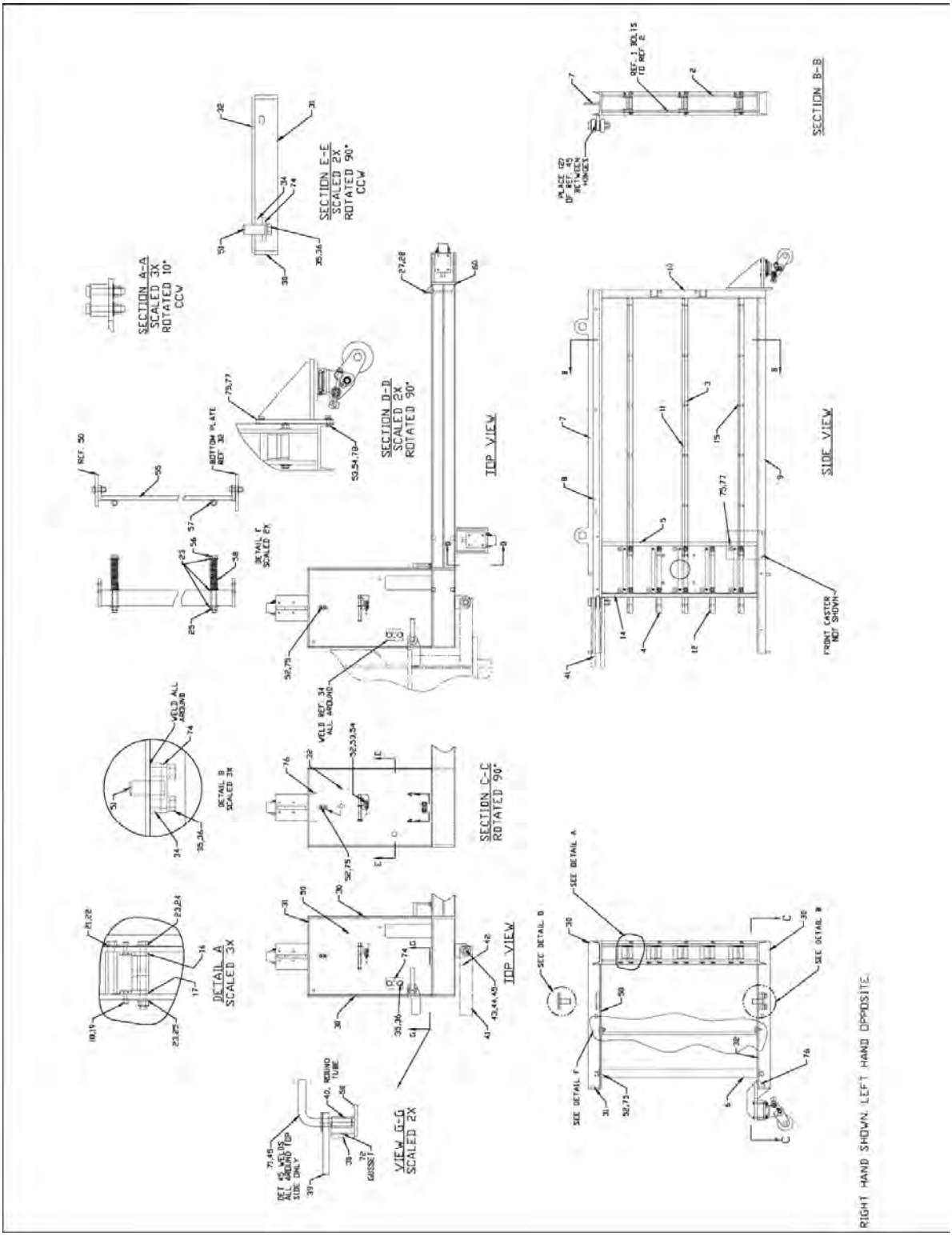


Drive Assembly For Twister Head - Parts List

Part Number	Ref #	Description	Quantity
800065		BEARING 2 OD X 1 ID PRESS FIT	2
801674		LINK CONNECTING FULL F/ 50-2 C	1
800139	1	1/2 X 4 X 10 1/2 BAR	1
800156	2	UHMW 3 1/4 X 3/8 ROD	1
54549	3	SPROCKET D50BS20HX1 1/4 5/16 K	1
800180	4	UHMW 3 1/4 X 1/16 ROD	1
290023	5	L4 X 4 X 1/2 X 2 1/4	2
800131	6	1 X 4 X 7 1/2 BAR	1
800153	7	1 X 4 1/2 CR ROD SQ CUT	1
800140	8	1/2 X 4 X 6 BAR	1
800142	9	1/2 X 3 1/2 X 8 BAR	1
290390	10	L4 X 3 X 1/2 X 8	1
289020	11	3/4 PL X 9 X 10	1
800141	12	1/2 PL X 3 3/4 X 6	2
297339	13	1 3/8 PL X 6 X 8	1
199219	15	SPROCKET TENSIONER COST MACH F	1
24618	16	MOTOR HYDRAULIC PARKER TG0785U	1
800116	17	CHAIN ROLLER RIVETED	18
50319	18	BOLT 1/2- 13 X 1 3/4 HHCS GR 8	10
52008	19	BOLT 1/2- 13 X 1 1/2 HHCS GRD	4
52452	20	BOLT 1/2- 13 X 1 1/2 HHCS GR 8	4
50339	21	BOLT 1/2- 13 X 3 SHCS GR 5	4
54372	22	BOLT 3/4-10 X 5 HHCS FULL THRE	2
52556	23	NUT 3/4-10 HEX JAM GR5	2
52433	24	NUT 3/4-10 HEX GR 5	2
50052	25	WASHER 1/2 FLAT	16
50064	26	WASHER 1/2 LOCK	16
50521	27	WASHER 1/2 LOCK GRADE 8 HI-COL	4
53668	29	SCREW 1/4-20 X 3/4 SET	1
223475	32	1/4 PL X 2 X 2 (1=2)	2
54559	33	BOLT 5/8-18 X 3/4 SHCS	1
52404	34	NUT 1/2-13 HEX GRADE 5	2
54242	35	WASHER 1/2 BEVEL (MCMASTER#915	2

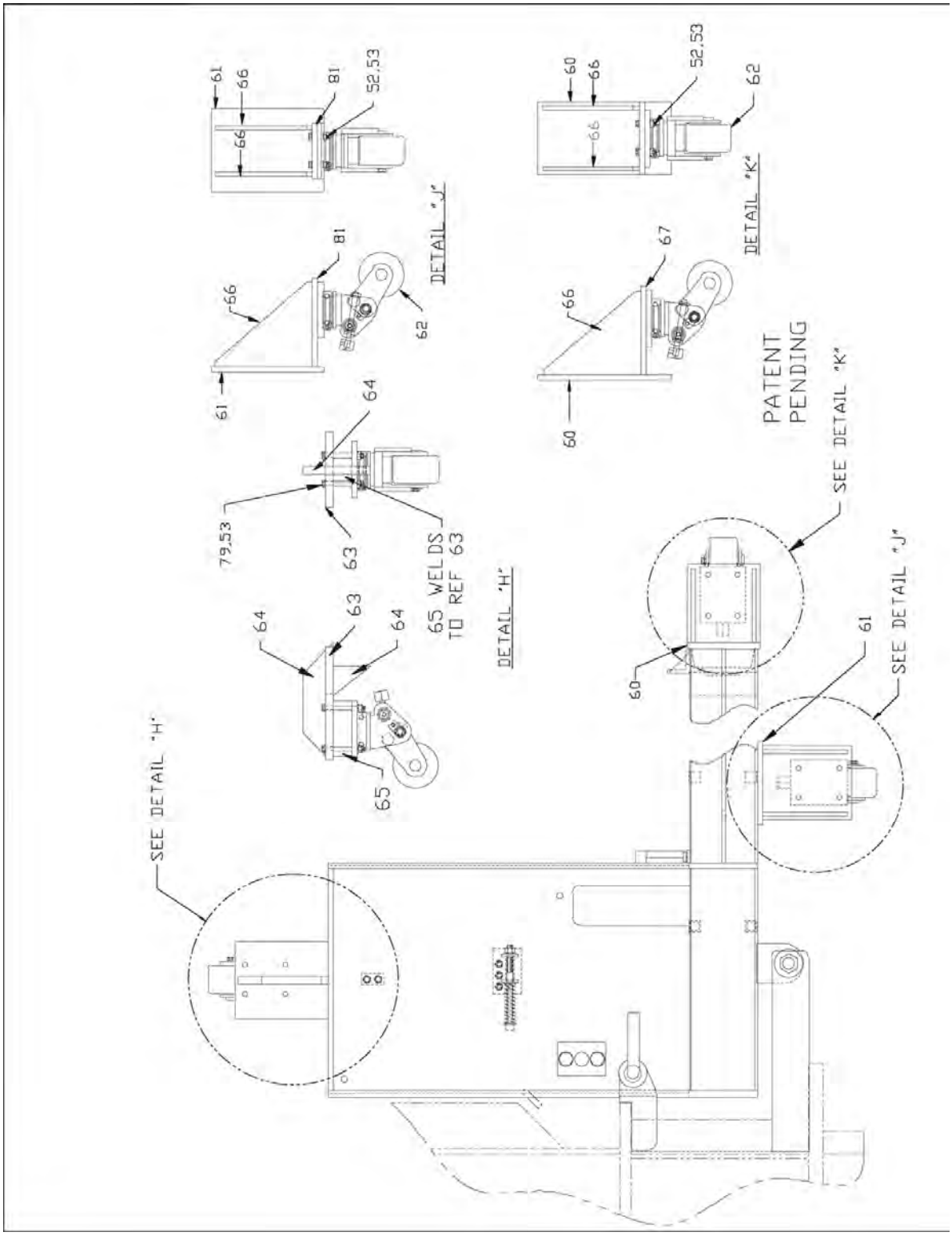
Inserter Frame Assembly - 30” Wide Models (1 Of 2)

See parts list on page 2-56.



Inserter Frame Assembly - 30” Wide Models (2 Of 2)

See parts list on page 2-56.



Inserter Frame Assembly Parts List - 30” Wide Models

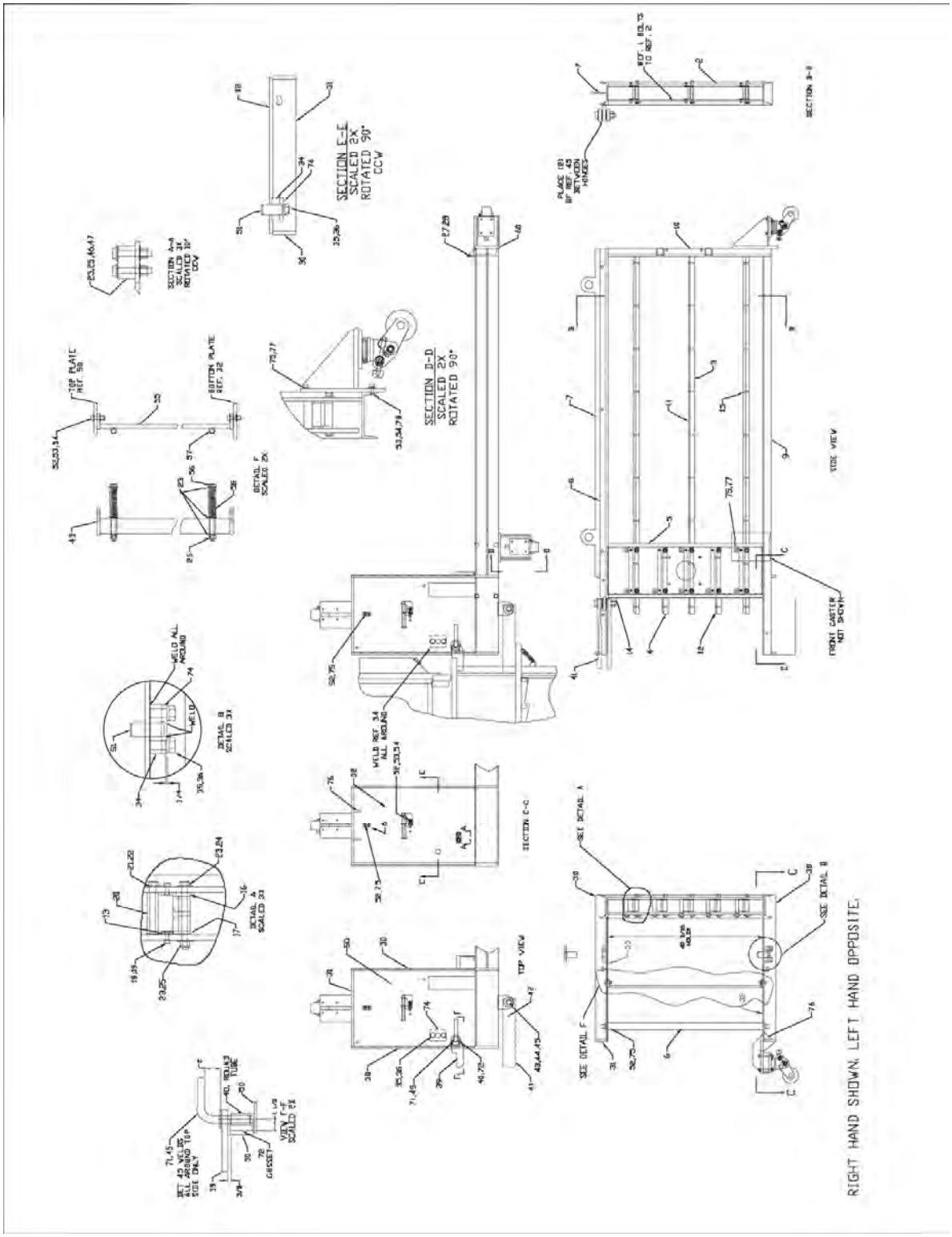
Part #	Ref #	Description	Quantity
288767	1	1/2 PL X 12 X 39 3/4	1
288766	2	1/2 PL X 12 X 40 3/16	1
294424	3	1 X 3 X 81 1/4 CR BAR	3
288775	4	1 X 3 X 17 1/4 CR BAR	2
291538	5	1 X 1 X 40 3/16 BAR	2
290428	6	1 X 2 X 40 1/2 BAR	1
294425	7	3/8 PL X 6 3/8 X 73 1/8	1
309053	8	C6 X 13 X 93 3/4	1
309054	9	C6 X 13 X 9 19/16	1
288785	10	C6 X 13 X 42 5/16	1
294489	11	UHMW 1/2 X 3 X 80 3/4	3
288816	12	UHMW 1/2 X 3 X 17	2
288817	13	UHMW 1/4 X 1 X 12	10
288818	14	1 X 1 X .12 X 40 3/16 TUBING S	2
50276	15	BOLT 3/8-16 X 1 1/4 FSHCS	23
286238	16	5/16 X 1 1/4 X 12 BAR	5
286239	17	1/4 X 1 1/2 X 12 BAR	5
53222	18	BOLT 1/4 -20 X 1 FSHCS GR 5	20
50025	19	NUT 1/4-20NC HEX SELF-LOCKING	20
288823	20	1 X 1 X 3 9/16 CR BAR	8
50317	21	BOLT 1/2-13 X 1 1/2 HHCS GR 8	8
50064	22	WASHER 1/2 LOCK	8
50052	23	WASHER 1/2 FLAT	30
52193	24	BOLT 1/2- 1 3 X 5 1/2 HHCS GR	10
50018	25	NUT 1/2-13 HEX SELF-LOCKING	24
286230	27	L2 X 2 X 1/4 X 1 1/2 SQ CUT	2
271794	28	1/4 PL X 1 7/8 X 1 7/8 (1=2)	4
291543	30	1/2 PL X 3 X 38	4
297506	31	1/2 PL X 3 X 19 1/2	2
311787	32	3/8 PL X 20 1/16 X 32	1
290447	34	1 X 3 X 4 1/4 BAR	2
53163	35	BOLT 3/4-10 X 1 1/2 HHCS GR 8	4
50226	36	WASHER 3/4 LOCK	4
297434	39	3/4 PL X 3 1/4 X 7 15/16	1
294496	40	1 1/2 OD X .234 X 3 CDSM SQ CU	1
309042	41	1 PL X 3 1/4 X 17 15/16	2

Inserter Frame Assembly Parts List - 30” Wide Models (Continued)

Part #	Ref #	Description	Quantity
288849	42	3/4 PL X 3 1/2 X 4 1/8	1
50546	43	BOLT 1-8 X 5 HHCS GR8	1
50533	44	NUT 1-8 HEX SELF-LOCKING	1
50069	45	WASHER FLAT 1 CAD PLT	5
288863	46	1 1/4 X 1 1/2 X 2 3/4 BAR	1
50501	47	BOLT 1/2- 13 X 3 1/2 SQHCS	2
294429	49	3/8 PL X 2 X 3 5/8	2
311788	50	3/8 PL X 20 1/16 X 32	1
290435	51	1 1/4 X 3 CR ROD	2
52476	52	BOLT 3/8-16 X 1 1/2 HHCS GR 5	16
50015	53	NUT 3/8-16 HEX SELF LOCKING	16
50016	54	WASHER 3/8 FLAT	14
290436	55	1/2 X 2 X 39 3/8 BAR SQ CUT	1
54529	56	BOLT 1/2-13 X 7 ALLEN HEAD (MC	2
226878	57	3/4 OD X .125 X 2 CDSM SQ CUT	2
54530	58	SPRING COMPRESSION .938 OD-.14	2
310730	60	1/2 PL X 6 1/2 X 11 3/4 SQ CUT	1
309040	61	1/2 PL X 7 3/8 X 9 3/4	1
62926	62	CASTER SWIVEL ADJ HEIGHT 850#	3
316271	63	3/4 PL X 6 3/4 X 10	1
316272	64	3/4 PL X 6 X 10	1
316273	65	2 PL X 1 5/8 X 5 SQ CUT	1
310732	66	3/8 PL X 6 9/16 X 7 7/16	4
297405	67	1/2 PL X 6 5/8 X 7 13/16	1
294431	71	1 X 11 ROD	1
294497	72	1/4 X 1 1/2 X 3 BAR SQ CUT	2
290438	74	1/2 X 3 X 4 1/4 BAR	2
50159	75	WASHER 3/8 LOCK	7
290439	76	1/2 PL X 1 13/16 X 1 13/16 GUS	2
53737	77	BOLT 3/8-16 X 1 1/4 HHCS GR 8	2
52850	78	BOLT 3/8-16 X 1 1/2 FSHCS	2
53192	79	BOLT 3/8-16 X 3 1/2 SHCS GR 88	4
310731	81	1/2 PL X 5 X 7 13/16	1

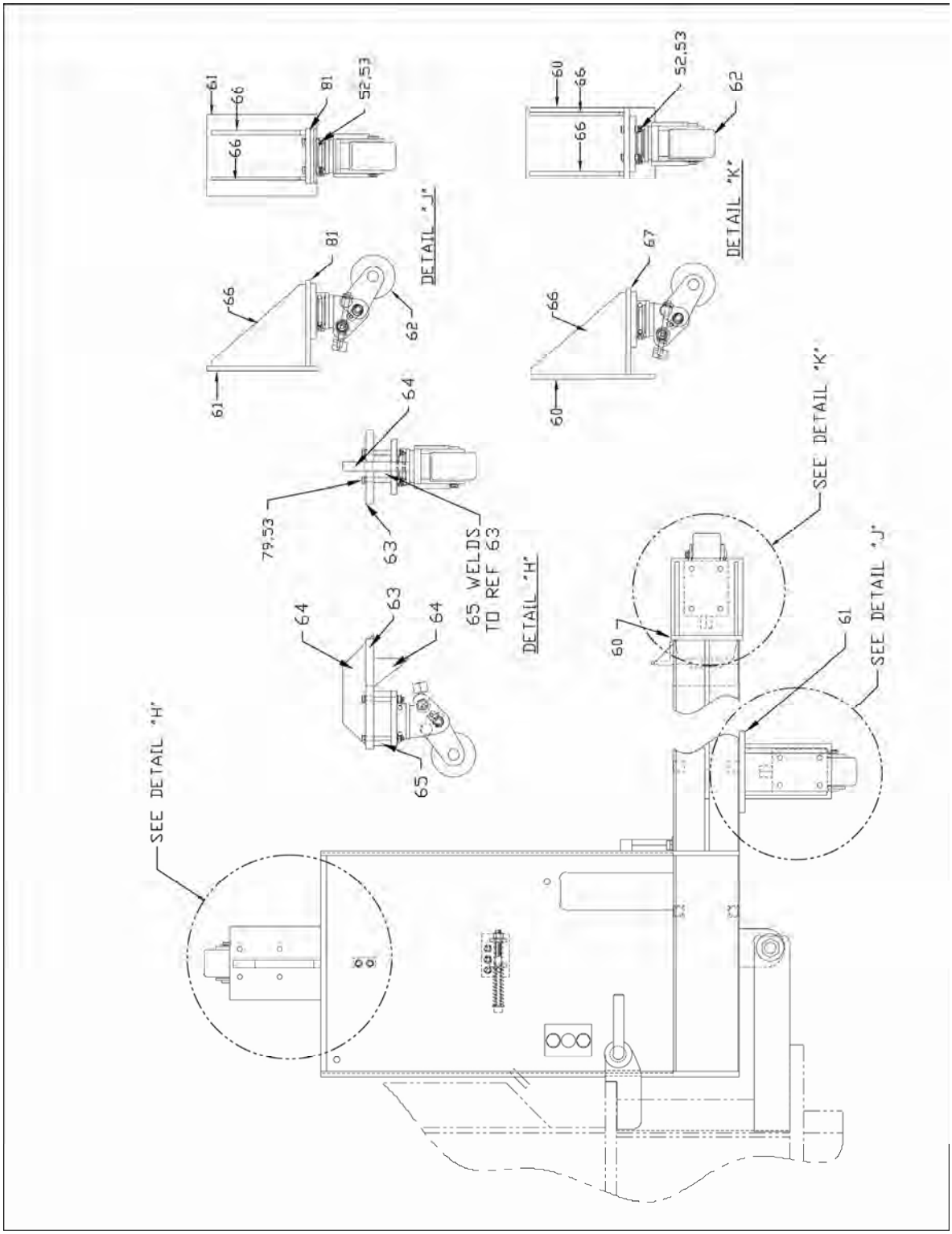
Inserter Frame Assembly - 42” Wide Models (1 Of 2)

See parts list on page 2-60.



Inserter Frame Assembly - 42” Wide Models (2 Of 2)

See parts list on page 2-60.



Inserter Frame Assembly Parts List - 42” Wide Models

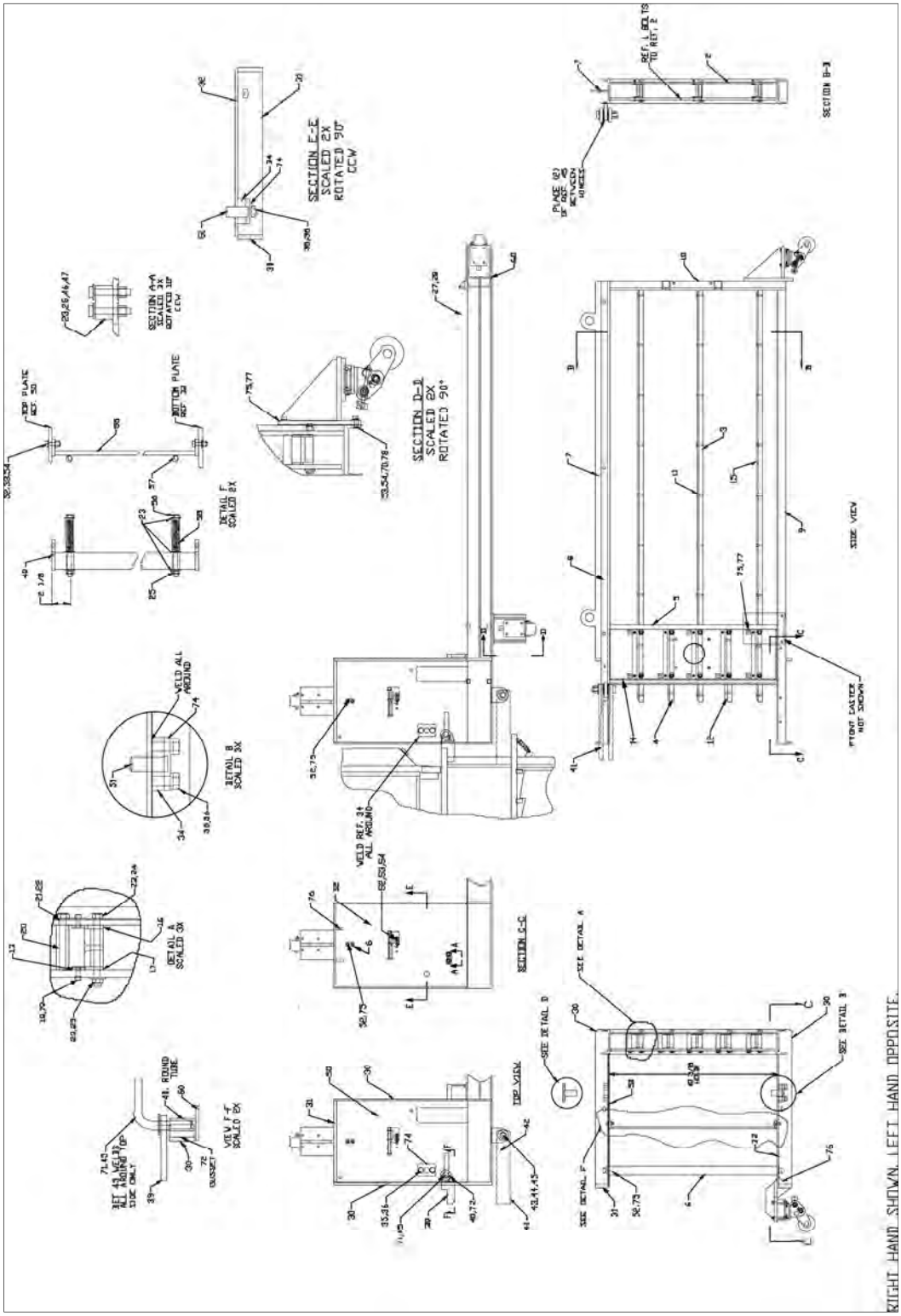
Part #	Ref #	Description	Quantity
288767	1	1/2 PL X 12 X 39 3/4	1
288766	2	1/2 PL X 12 X 40 3/16	1
294493	3	1 X 3 X 92 11/16 CR BAR	3
288775	4	1 X 3 X 17 1/4 CR BAR	2
291538	5	1 X 1 X 40 3/16 BAR	2
290428	6	1 X 2 X 40 1/2 BAR	1
294494	7	3/8 PL X 6 3/8 X 84 9/16	1
309097	8	C6 X 13 X 105 3/16	1
309098	9	C6 X 13 X 103	1
288785	10	C6 X 13 X 42 5/16	1
294495	11	UHMW 1/2 X 3 X 92 1/4	3
288816	12	UHMW 1/2 X 3 X 17	2
288817	13	UHMW 1/4 X 1 X 12	10
288818	14	1 X 1 X .12 X 40 3/16 TUBING S	2
50276	15	BOLT 3/8-16 X 1 1/4 FSHCS	31
286238	16	5/16 X 1 1/4 X 12 BAR	5
286239	17	1/4 X 1 1/2 X 12 BAR	5
53222	18	BOLT 1/4 -20 X 1 FSHCS GR 5	20
50025	19	NUT 1/4-20NC HEX SELF-LOCKING	20
288823	20	1 X 1 X 3 9/16 CR BAR	8
50317	21	BOLT 1/2-13 X 1 1/2 HHCS GR 8	8
50064	22	WASHER 1/2 LOCK	8
50052	23	WASHER 1/2 FLAT	30
52193	24	BOLT 1/2- 1 3 X 5 1/2 HHCS GR	10
50018	25	NUT 1/2-13 HEX SELF-LOCKING	24
286230	27	L2 X 2 X 1/4 X 1 1/2 SQ CUT	2
271794	28	1/4 PL X 1 7/8 X 1 7/8 (1=2)	4
291543	30	1/2 PL X 3 X 38	4
297506	31	1/2 PL X 3 X 19 1/2	2
311787	32	3/8 PL X 20 1/16 X 32	1
290447	34	1 X 3 X 4 1/4 BAR	2
53163	35	BOLT 3/4-10 X 1 1/2 HHCS GR 8	4
50226	36	WASHER 3/4 LOCK	4
292921	39	3/4 PL X 3 1/4 X 7 15/16	1
294496	40	1 1/2 OD X .234 X 3 CDSM SQ CU	1
309042	41	1 PL X 3 1/4 X 17 15/16	2

Inserter Frame Assembly Parts List - 42” Wide Models (Continued)

Part #	Ref #	Description	Quantity
288849	42	3/4 PL X 3 1/2 X 4 1/8	1
50546	43	BOLT 1-8 X 5 HHCS GR8	1
50533	44	NUT 1-8 HEX SELF-LOCKING	1
50069	45	WASHER FLAT 1 CAD PLT	5
288863	46	1 1/4 X 1 1/2 X 2 3/4 BAR	1
50275	47	BOLT 1/2 -13 X 3 HHCS GR 5	2
294429	49	3/8 PL X 2 X 3 5/8	2
311788	50	3/8 PL X 20 1/16 X 32	1
290435	51	1 1/4 X 3 CR ROD	2
52476	52	BOLT 3/8-16 X 1 1/2 HHCS GR 5	16
50015	53	NUT 3/8-16 HEX SELF LOCKING	16
50016	54	WASHER 3/8 FLAT	10
290436	55	1/2 X 2 X 39 3/8 BAR SQ CUT	1
54529	56	BOLT 1/2-13 X 7 ALLEN HEAD (MC	2
226878	57	3/4 OD X .125 X 2 CDSM SQ CUT	2
54530	58	SPRING COMPRESSION .938 OD-.14	2
310730	60	1/2 PL X 6 1/2 X 11 3/4 SQ CUT	1
309040	61	1/2 PL X 7 3/8 X 9 3/4	1
62926	62	CASTER SWIVEL ADJ HEIGHT 850#	3
316271	63	3/4 PL X 6 3/4 X 10	1
316272	64	3/4 PL X 6 X 10	1
316273	65	2 PL X 1 5/8 X 5 SQ CUT	1
310732	66	3/8 PL X 6 9/16 X 7 7/16	4
297405	67	1/2 PL X 6 5/8 X 7 13/16	1
294431	71	1 X 11 ROD	1
294497	72	1/4 X 1 1/2 X 3 BAR SQ CUT	2
290438	74	1/2 X 3 X 4 1/4 BAR	2
50159	75	WASHER 3/8 LOCK	7
230992	76	1/2 PL X 2 X 2 (1=2)	2
53737	77	BOLT 3/8-16 X 1 1/4 HHCS GR8	2
52850	78	BOLT 3/8-16 X 1 1/2 FSHCS	2
53192	79	BOLT 3/8-16 X 3 1/2 SHCS GR88	4
310731	81	1/2 PL X 5 X 7 13/16	1

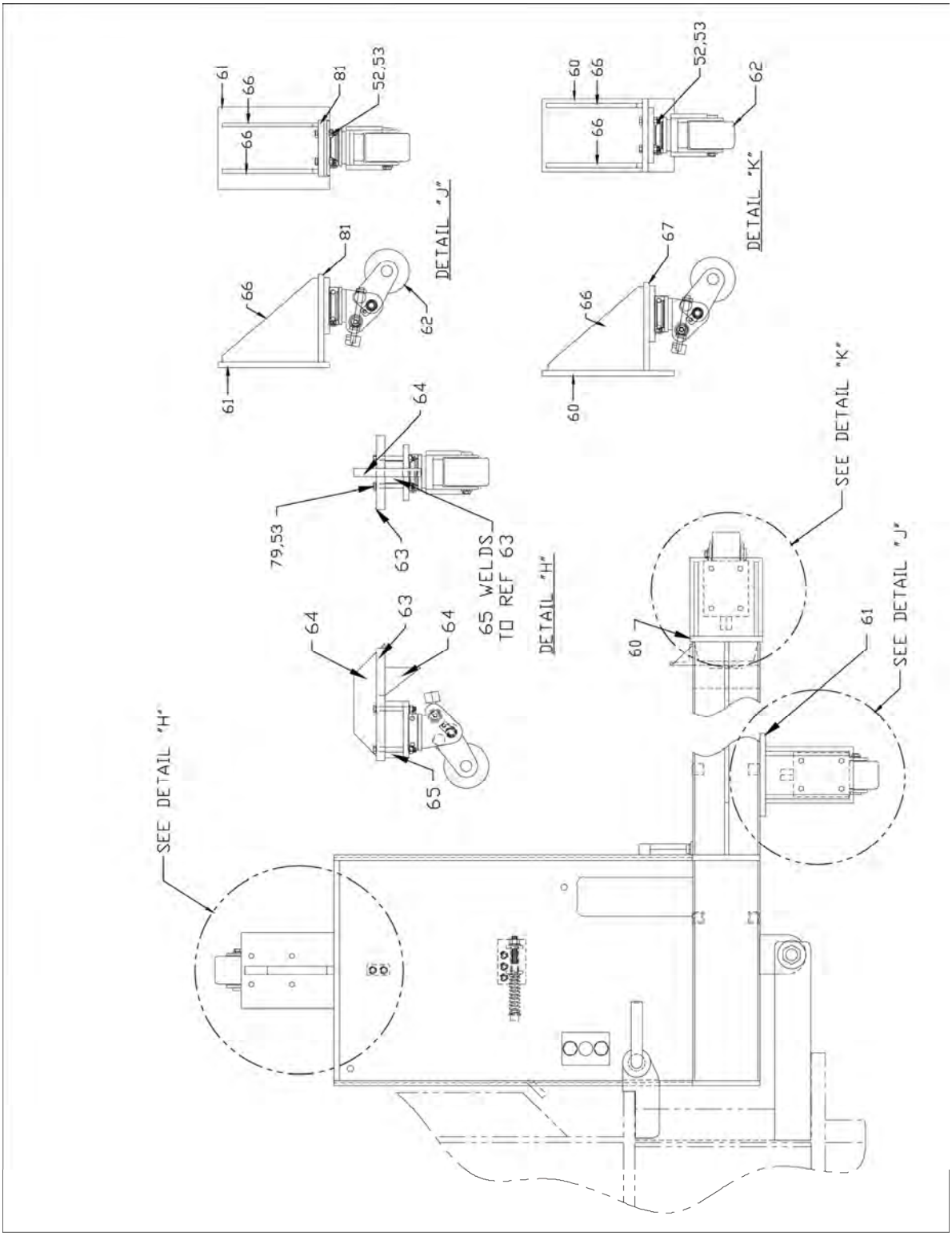
Inserter Frame Assembly - 48” Wide Models (1 Of 2)

See parts list on page 2-64.



Inserter Frame Assembly - 48” Wide Models (2 Of 2)

See parts list on page 2-64.



Inserter Frame Assembly Parts List - 48” Wide Models

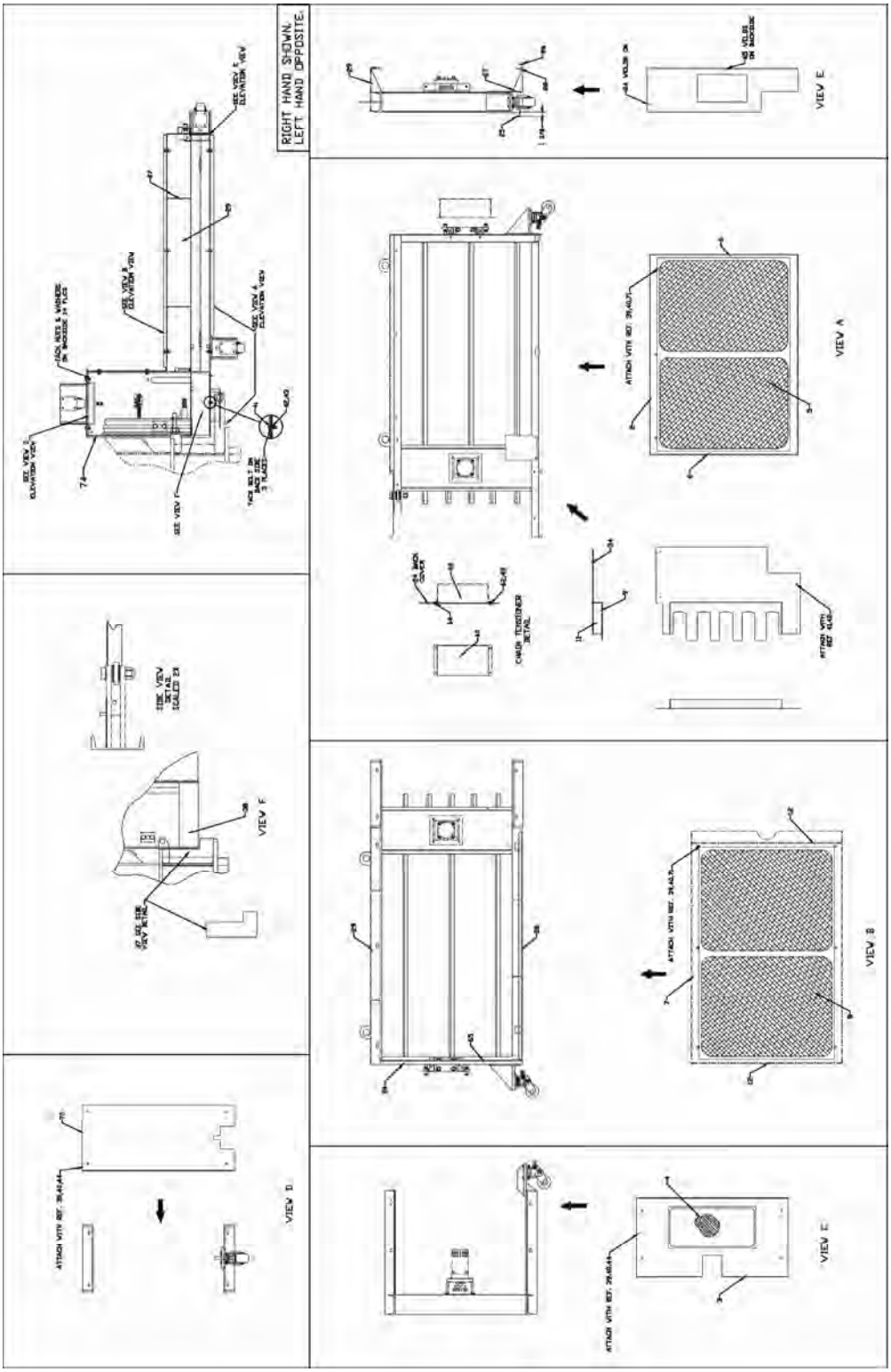
Part #	Ref #	Description	Quantity
288767	1	1/2 PL X 12 X 39 3/4	1
288766	2	1/2 PL X 12 X 40 3/16	1
299395	3	1 X 3 X 98 3/4 CR BAR	3
288775	4	1 X 3 X 17 1/4 CR BAR	2
291538	5	1 X 1 X 40 3/16 BAR	2
290428	6	1 X 2 X 40 1/2 BAR	1
299396	7	3/8 PL X 6 3/8 X 90 5/8	1
309099	8	C6 X 13 X 111 1/4	1
309100	9	C6 X 13 X 109 1/16	1
288785	10	C6 X 13 X 42 5/16	1
62969	11	UHMW 1/2 X 3 X 98 5/16	3
288816	12	UHMW 1/2 X 3 X 17	2
288817	13	UHMW 1/4 X 1 X 12	10
288818	14	1 X 1 X .12 X 40 3/16 TUBING S	2
50276	15	BOLT 3/8-16 X 1 1/4 FSHCS	31
286238	16	5/16 X 1 1/4 X 12 BAR	5
286239	17	1/4 X 1 1/2 X 12 BAR	5
53222	18	BOLT 1/4 -20 X 1 FSHCS GR 5	20
50025	19	NUT 1/4-20NC HEX SELF-LOCKING	20
288823	20	1 X 1 X 3 9/16 CR BAR	8
50317	21	BOLT 1/2-13 X 1 1/2 HHCS GR 8	8
50064	22	WASHER 1/2 LOCK	8
50052	23	WASHER 1/2 FLAT	30
52193	24	BOLT 1/2- 1 3 X 5 1/2 HHCS GR	10
50018	25	NUT 1/2-13 HEX SELF-LOCKING	14
286230	27	L2 X 2 X 1/4 X 1 1/2 SQ CUT	2
271794	28	1/4 PL X 1 7/8 X 1 7/8 (1=2)	4
291543	30	1/2 PL X 3 X 38	4
297506	31	1/2 PL X 3 X 19 1/2	2
311787	32	3/8 PL X 20 1/16 X 32	1
290447	34	1 X 3 X 4 1/4 BAR	2
53163	35	BOLT 3/4-10 X 1 1/2 HHCS GR 8	4
50226	36	WASHER 3/4 LOCK	4
292921	39	3/4 PL X 3 1/4 X 7 15/16	1
294496	40	1 1/2 OD X .234 X 3 CDSM SQ CU	1
309042	41	1 PL X 3 1/4 X 17 15/16	2

Inserter Frame Assembly Parts List - 48" Wide Models (Continued)

Part #	Ref #	Description	Quantity
288849	42	3/4 PL X 3 1/2 X 4 1/8	1
50546	43	BOLT 1-8 X 5 HHCS GR8	1
50533	44	NUT 1-8 HEX SELF-LOCKING	1
50069	45	WASHER FLAT 1 CAD PLT	5
288863	46	1 1/4 X 1 1/2 X 2 3/4 BAR	1
50275	47	BOLT 1/2 -13 X 3 HHCS GR 5	2
294429	49	3/8 PL X 2 X 3 5/8	2
311788	50	3/8 PL X 20 1/16 X 32	1
290435	51	1 1/4 X 3 CR ROD	2
52476	52	BOLT 3/8-16 X 1 1/2 HHCS GR5	20
50015	53	NUT 3/8-16 HEX SELF LOCKING	16
50016	54	WASHER 3/8 FLAT	10
290436	55	1/2 X 2 X 39 3/8 BAR SQ CUT	1
54529	56	BOLT 1/2-13 X 7 ALLEN HEAD (MC	2
226878	57	3/4 OD X .125 X 2 CDSM SQ CUT	2
54530	58	SPRING COMPRESSION .938 OD-.14	2
310730	60	1/2 PL X 6 1/2 X 11 3/4 SQ CUT	1
309040	61	1/2 PL X 7 3/8 X 9 3/4	1
62926	62	CASTER SWIVEL ADJ HEIGHT 850#	3
316271	63	3/4 PL X 6 3/4 X 10	1
316272	64	3/4 PL X 6 X 10	1
316273	65	2 PL X 1 5/8 X 5 SQ CUT	1
310732	66	3/8 PL X 6 9/16 X 7 7/16	4
297405	67	1/2 PL X 6 5/8 X 7 13/16	2
50159	70	WASHER 3/8 LOCK	1
294431	71	1 X 11 ROD	1
294497	72	1/4 X 1 1/2 X 3 BAR SQ CUT	2
290438	74	1/2 X 3 X 4 1/4 BAR	2
50159	75	WASHER 3/8 LOCK	5
230992	76	1/2 PL X 2 X 2 (1=2)	2
53737	77	BOLT 3/8-16 X 1 1/4 HHCS GR8	2
52850	78	BOLT 3/8-16 X 1 1/2 FSHCS	2
53192	79	BOLT 3/8-16 X 3 1/2 SHCS GR88	4
310731	81	1/2 PL X 5 X 7 13/16	1

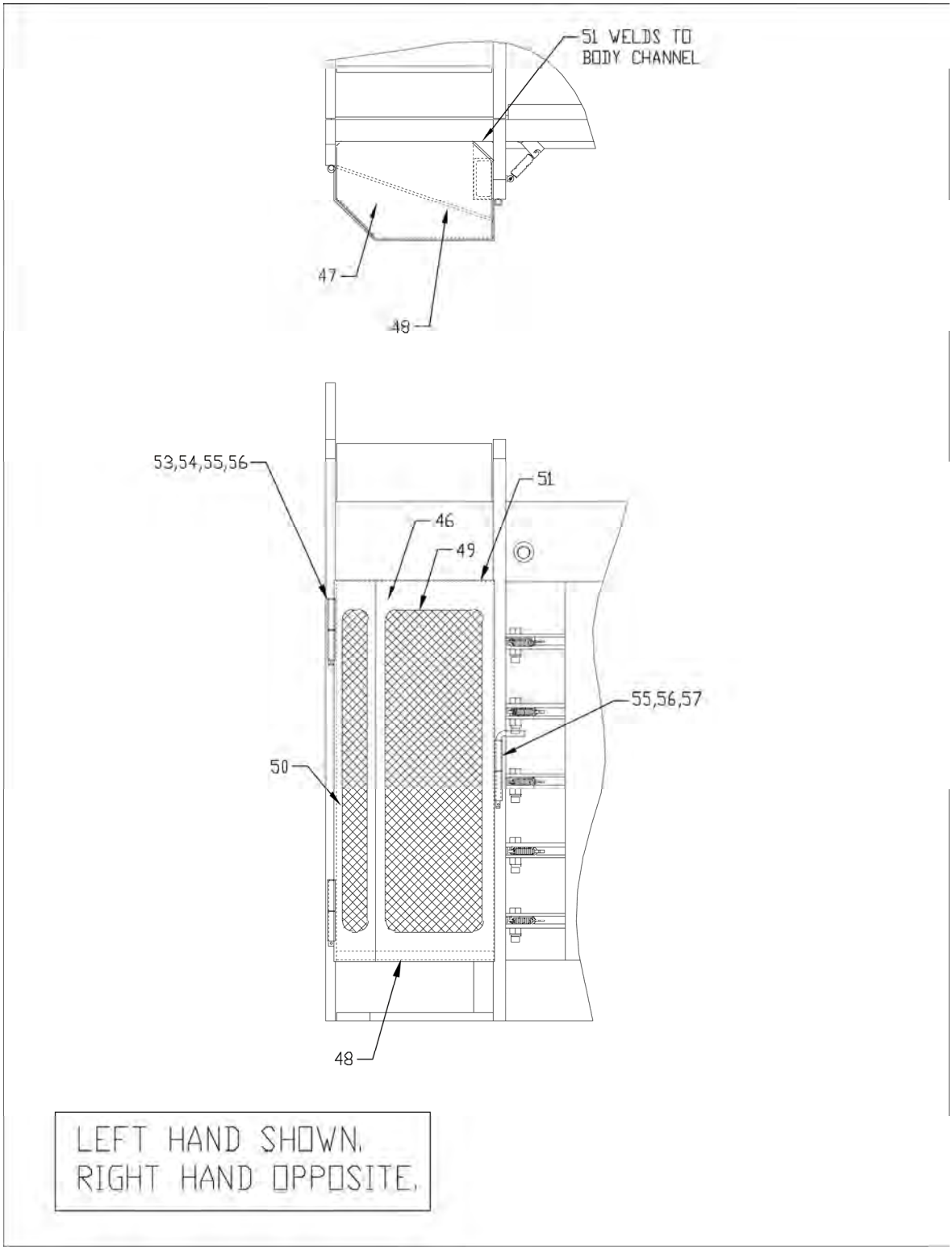
Inserter/Twister Covers - 30” Wide Models (1 of 2)

See parts list on page 2-68.



Inserter/Twister Covers - 30” Wide Models (2 of 2)

See parts list on page 2-68.



Inserter/Twister Covers Parts List - 30” Wide Models

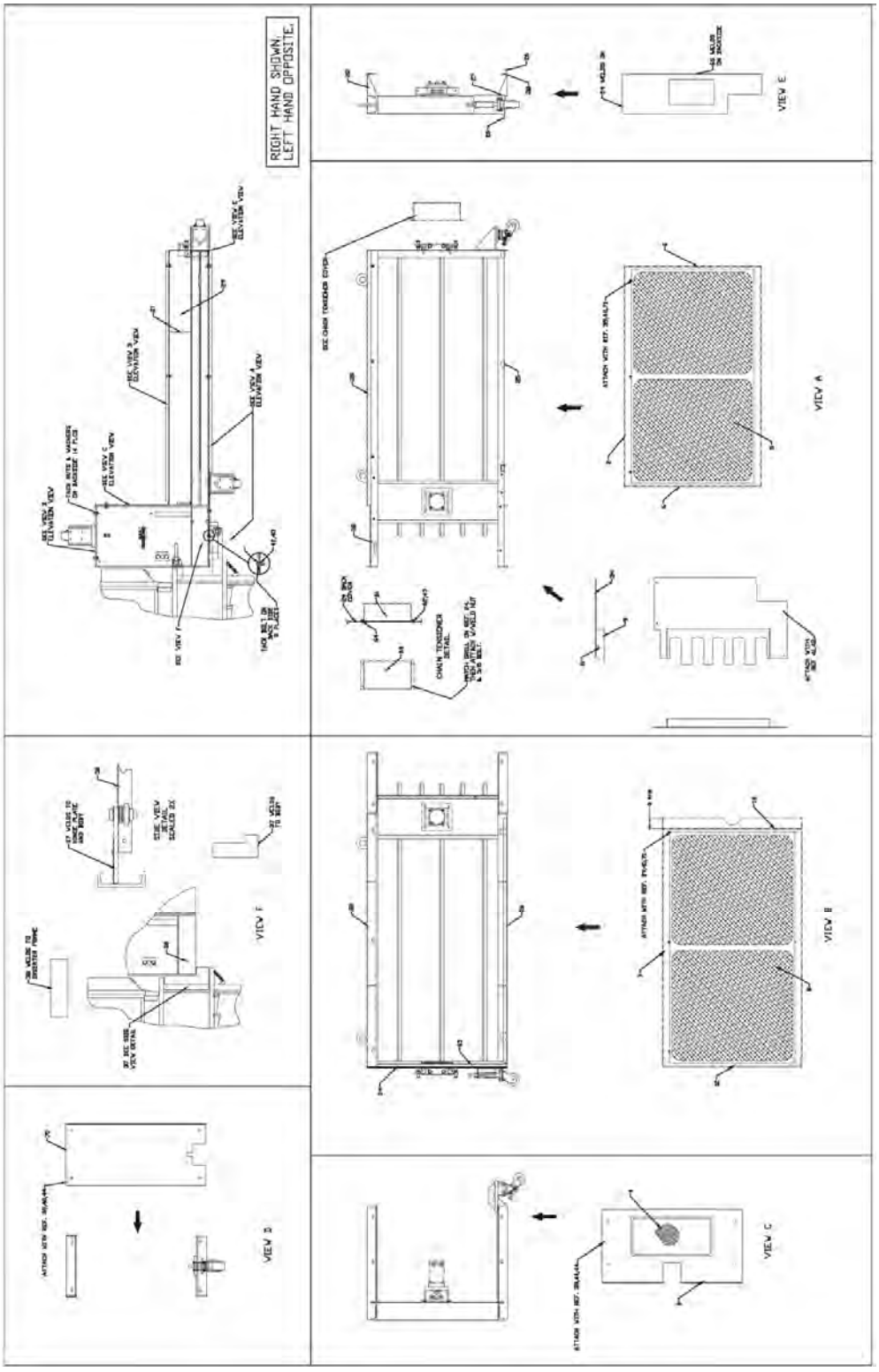
Part Number	Ref #	Description	Quantity
308941	2	11 GA HI TEN X 47 7/16 X 62 1/	1
297496	3	11 GA HI TEN X 26 1/4 X 52	1
294522	4	1/2-#13 EXP MTL X 13 X 28	1
308944	5	1/2-#13 FLT EXP MTL X 40 15/16	1
295023	6	1/4 X 1 X 45 3/8 BAR SQ CUT	4
295024	7	11 GA HI TEN X 48 1/4 X 71 15/	1
295025	8	1/2-#13 EXP MTL X 41 3/4 X 65	1
308942	9	11 GA HI TEN X 14 5/8 X 34 1/2	1
308943	11	11 GA HI TEN X 2 3/4 X 9 7/8	2
141284	12	1/4 X 1 X 46 1/4 BAR SQ CUT	2
294523	24	11 GA HI TEN X 13 3/8 X 46 5/8	1
291622	25	1/4 X 2 X 3 5/8 BAR	3
294524	26	11 GA HI TEN X 12 1/2 X 73 1/8	1
294525	27	11 GA HI TEN X 3 1/16 X 6 7/8	4
241012	28	1/4 X 2 X 2 BAR SQ CUT	2
294526	29	7 GA X 16 7/8 X 73 1/8	1
308940	34	11 GA HI TEN X 26 7/8 X 44 1/2	1
290565	37	11 GA HI TEN X 7 7/8 X 15 9/16	1
291627	38	11 GA HI TEN X 5 3/4 X 19 7/16	1
52008	39	BOLT 1/2- 13 X 1 1/2 HHCS GRD	14
52404	40	NUT 1/2-13 HEX GRADE 5	14
52850	41	BOLT 3/8-16 X 1 1/2 FSHCS	4
52016	42	NUT 3/8-16 HEX	4
50159	43	WASHER 3/8 LOCK	4
50052	44	WASHER 1/2 FLAT	11
289811	46	11 GA HI TEN X 24 9/16 X 38 1/	1
291477	47	11 GA HI TEN X 9 5/8 X 15 5/8	1
233913	48	1/4 X 1 X 16 1/2 BAR SQ CUT	1
289814	49	1/2-#13 FLT EXP MTL X 10 3/4 X	1
289815	50	1/2-#13 FLT EXP MTL X 4 5/8 X	1
291478	51	11 GA HI TEN X 1 7/8 X 1 7/8	1
289818	53	11 GA HI TEN X 3/4 DIA	2
289819	54	1/2 X 6 9/16 CR ROD	2
288020	55	3/4 OD X .125 X 3 CDSM SQ CUT	6
50565	56	PIN COTTER 1/8 X 3/4	3
289820	57	7/16 X 10 3/16 HR ROD	1

Inserter/Twister Covers Parts List - 30” Wide Models (Continued)

Part Number	Ref #	Description	Quantity
291303	60	11 GA HI TEN X 9 1/2 X 28 7/8	1
291304	61	11 GA HI TEN X 5 11/16 X 15 7/	2
50155	62	BOLT 3/8-16 X 3/4 HHCS	4
50030	64	NUT 3/8-16 NC WELD	4
278718	65	1/4 X 1 X 43 1/2 BAR SQ CUT	1
310596	70	11 GA HI TEN X 22 5/16 X 46 15	1
054242	71	WASHER 1/2 BEVEL (MCMASTER#915	3

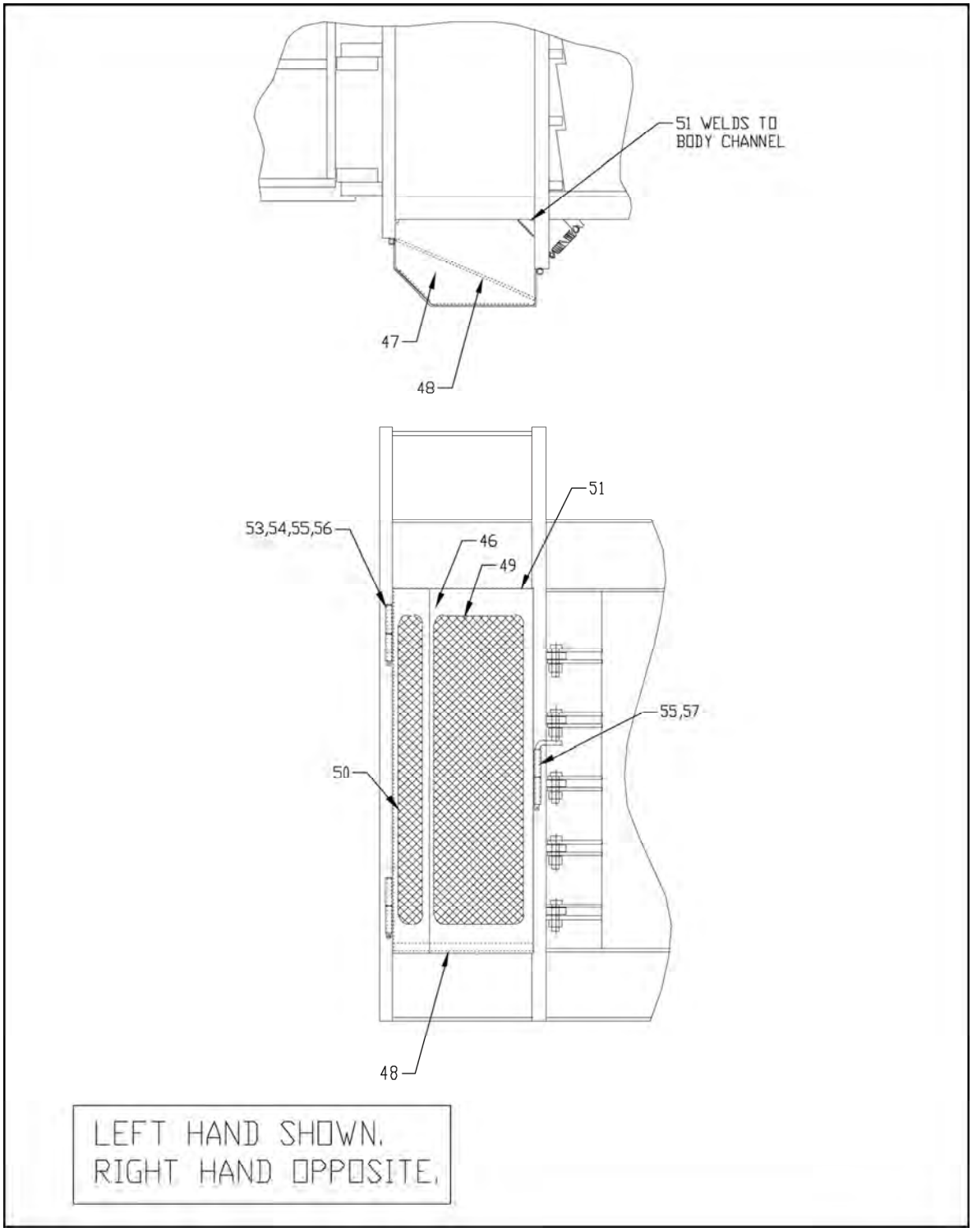
Inserter/Twister Covers - 42” Wide Models (1 of 2)

See parts list on page 2-72.



Inserter/Twister Covers - 42” Wide Models (2 of 2)

See parts list on page 2-72.



Inserter/Twister Covers Parts List - 42” Wide Models

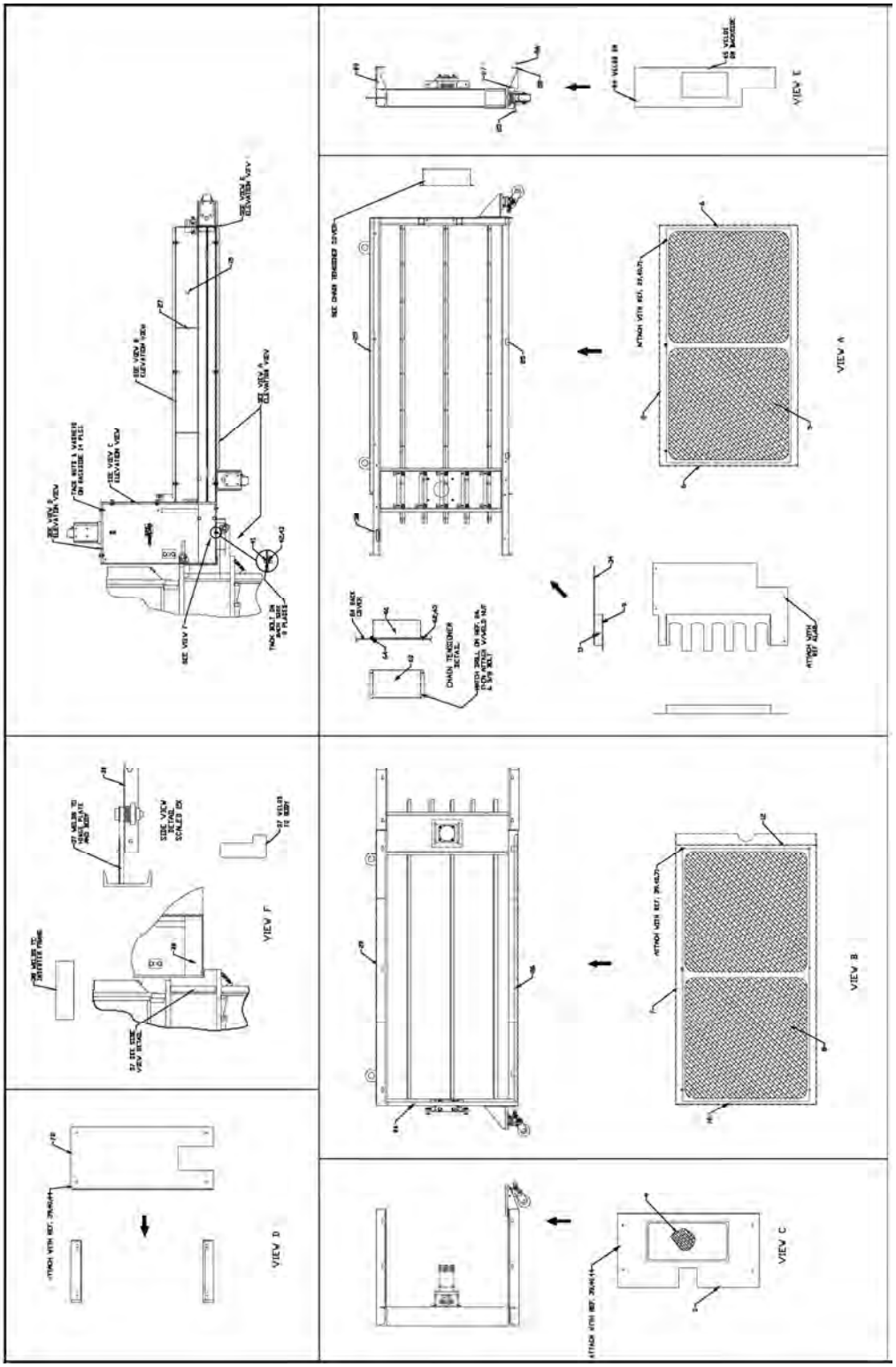
Part #	Ref #	Description	Quantity
309084	2	11 GA HI TEN X 47 7/16 X 73 5/	1
297496	3	11 GA HI TEN X 26 1/4 X 52	1
294522	4	1/2-#13 EXP MTL X 13 X 28	1
309085	5	1/2-#13 EXP MTL X 40 15/16 X 7	1
295023	6	1/4 X 1 X 45 3/8 BAR SQ CUT	4
295441	7	11 GA HI TEN X 48 1/4 X 83 3/8	1
295442	8	1/2-#13 EXP MTL X 41 3/4 X 77	1
308942	9	11 GA HI TEN X 14 5/8 X 34 1/2	1
308943	11	11 GA HI TEN X 2 3/4 X 9 7/8	2
141284	12	1/4 X 1 X 46 1/4 BAR SQ CUT	2
294523	24	11 GA HI TEN X 13 3/8 X 46 5/8	1
291622	25	1/4 X 2 X 3 5/8 BAR	3
295443	26	11 GA HI TEN X 12 1/2 X 84 9/1	1
294525	27	11 GA HI TEN X 3 1/16 X 6 7/8	4
241012	28	1/4 X 2 X 2 BAR SQ CUT	2
295444	29	7 GA X 16 7/8 X 84 9/16	1
308940	34	11 GA HI TEN X 26 7/8 X 44 1/2	1
292035	37	11 GA HI TEN X 7 1/2 X 15 1/16	1
291627	38	11 GA HI TEN X 5 3/4 X 19 7/16	1
52008	39	BOLT 1/2- 13 X 1 1/2 HHCS GRD	14
52404	40	NUT 1/2-13 HEX GRADE 5	14
52850	41	BOLT 3/8-16 X 1 1/2 FSHCS	4
52016	42	NUT 3/8-16 HEX	4
50159	43	WASHER 3/8 LOCK	4
50052	44	WASHER 1/2 FLAT	14
291942	46	11 GA HI TEN X 24 1/8 X 39 15/	1
291944	47	11 GA HI TEN X 9 5/16 X 15 1/8	1
233913	48	1/4 X 1 X 16 1/2 BAR SQ CUT	1
291945	49	1/2-#13 FLT EXP MTL X 10 1/4 X	1
291947	50	1/2-#13 FLT EXP MTL X 4 5/8 X	1
291478	51	11 GA HI TEN X 1 7/8 X 1 7/8	1
289818	53	11 GA HI TEN X 3/4 DIA	2
289819	54	1/2 X 6 9/16 CR ROD	2
288020	55	3/4 OD X .125 X 3 CDSM SQ CUT	6
50565	56	PIN COTTER 1/8 X 3/4	2
289820	57	7/16 X 10 3/16 HR ROD	1

Inserter/Twister Covers Parts List - 42” Wide Models (Continued

Part #	Ref #	Description	Quantity
291303	60	11 GA HI TEN X 9 1/2 X 28 7/8	1
291304	61	11 GA HI TEN X 5 11/16 X 15 7/	2
50155	62	BOLT 3/8-16 X 3/4 HHCS	4
50030	64	NUT 3/8-16 NC WELD	4
278718	65	1/4 X 1 X 43 1/2 BAR SQ CUT	1
310596	70	11 GA HI TEN X 22 5/16 X 46 15	1
054242	71	WASHER 1/2 BEVEL (MCMASTER#915	3

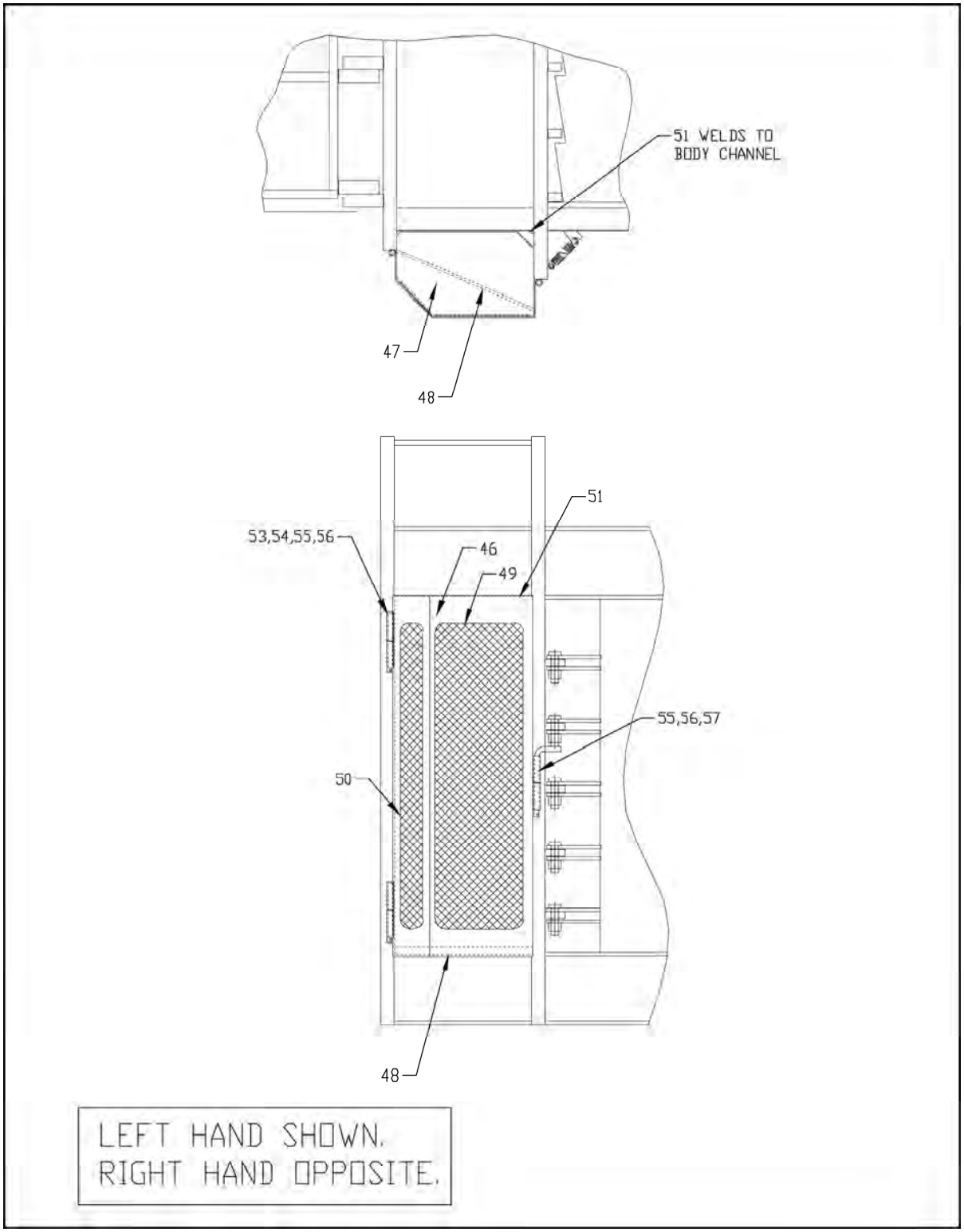
Inserter/Twister Covers - 48” Wide Models (1 of 2)

See parts list on page 2-76.



Inserter/Twister Covers - 48” Wide Models (2 of 2)

See parts list on page 2-76.



Inserter/Twister Covers Parts List - 48” Wide Models

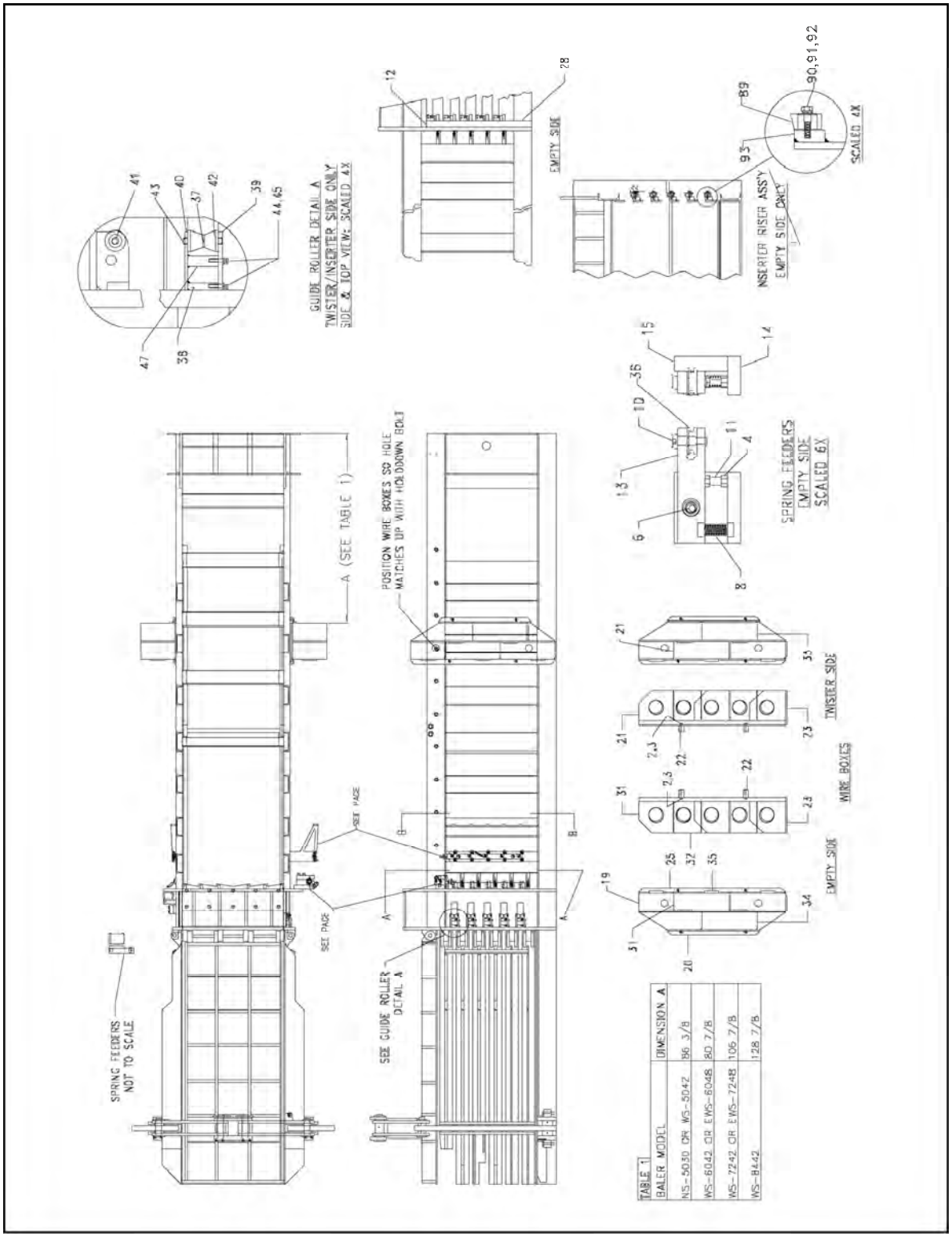
Part #	Ref #	Description	Quantity
309086	2	11 GA HI TEN X 47 7/16 X 79 3/	1
297496	3	11 GA HI TEN X 26 1/4 X 52	1
294522	4	1/2-#13 EXP MTL X 13 X 28	1
309087	5	1/2-#13 EXP MTL X 40 15/16 X	1
295023	6	1/4 X 1 X 45 3/8 BAR SQ CUT	4
299447	7	11 GA HI TEN X 48 1/4 X 89 1/2	1
299448	8	1/2-#13 EXP MTL X 41 3/4 X 83	1
308942	9	11 GA HI TEN X 14 5/8 X 34 1/2	1
308943	11	11 GA HI TEN X 2 3/4 X 9 7/8	2
141284	12	1/4 X 1 X 46 1/4 BAR SQ CUT	2
294523	24	11 GA HI TEN X 13 3/8 X 46 5/8	1
291622	25	1/4 X 2 X 3 5/8 BAR	3
299449	26	11 GA HI TEN X 12 1/2 X 88 3/	1
294525	27	11 GA HI TEN X 3 1/16 X 6 7/8	4
241012	28	1/4 X 2 X 2 BAR SQ CUT	2
299450	29	7 GA X 16 7/8 X 90 5/8	1
308940	34	11 GA HI TEN X 26 7/8 X 44 1/2	1
292035	37	11 GA HI TEN X 7 1/2 X 15 1/16	1
291627	38	11 GA HI TEN X 5 3/4 X 19 7/16	1
52008	39	BOLT 1/2- 13 X 1 1/2 HHCS GRD	14
52404	40	NUT 1/2-13 HEX GRADE 5	14
52850	41	BOLT 3/8-16 X 1 1/2 FSHCS	4
52016	42	NUT 3/8-16 HEX	4
50159	43	WASHER 3/8 LOCK	4
50052	44	WASHER 1/2 FLAT	17
291942	46	11 GA HI TEN X 24 1/8 X 39 15/	1
291944	47	11 GA HI TEN X 9 5/16 X 15 1/8	1
233913	48	1/4 X 1 X 16 1/2 BAR SQ CUT	1
291945	49	1/2-#13 FLT EXP MTL X 10 1/4 X	1
291947	50	1/2-#13 FLT EXP MTL X 4 5/8 X	1
291478	51	11 GA HI TEN X 1 7/8 X 1 7/8	1
289818	53	11 GA HI TEN X 3/4 DIA	2
289819	54	1/2 X 6 9/16 CR ROD	2
288020	55	3/4 OD X .125 X 3 CDSM SQ CUT	6
50565	56	PIN COTTER 1/8 X 3/4	2
289820	57	7/16 X 10 3/16 HR ROD	1

Inserter/Twister Covers Parts List - 48” Wide Models (Continued)

Part #	Ref #	Description	Quantity
291303	60	11 GA HI TEN X 9 1/2 X 28 7/8	1
291304	61	11 GA HI TEN X 5 11/16 X 15 7/	2
50155	62	BOLT 3/8-16 X 3/4 HHCS	4
500300	64	NUT 3/8-16 NC WELD	4
278718	65	1/4 X 1 X 43 1/2 BAR SQ CUT	1
310596	70	11 GA HI TEN X 22 5/16 X 46 15	1
54242	71	WASHER 1/2 BEVEL (MCMASTER#915	2

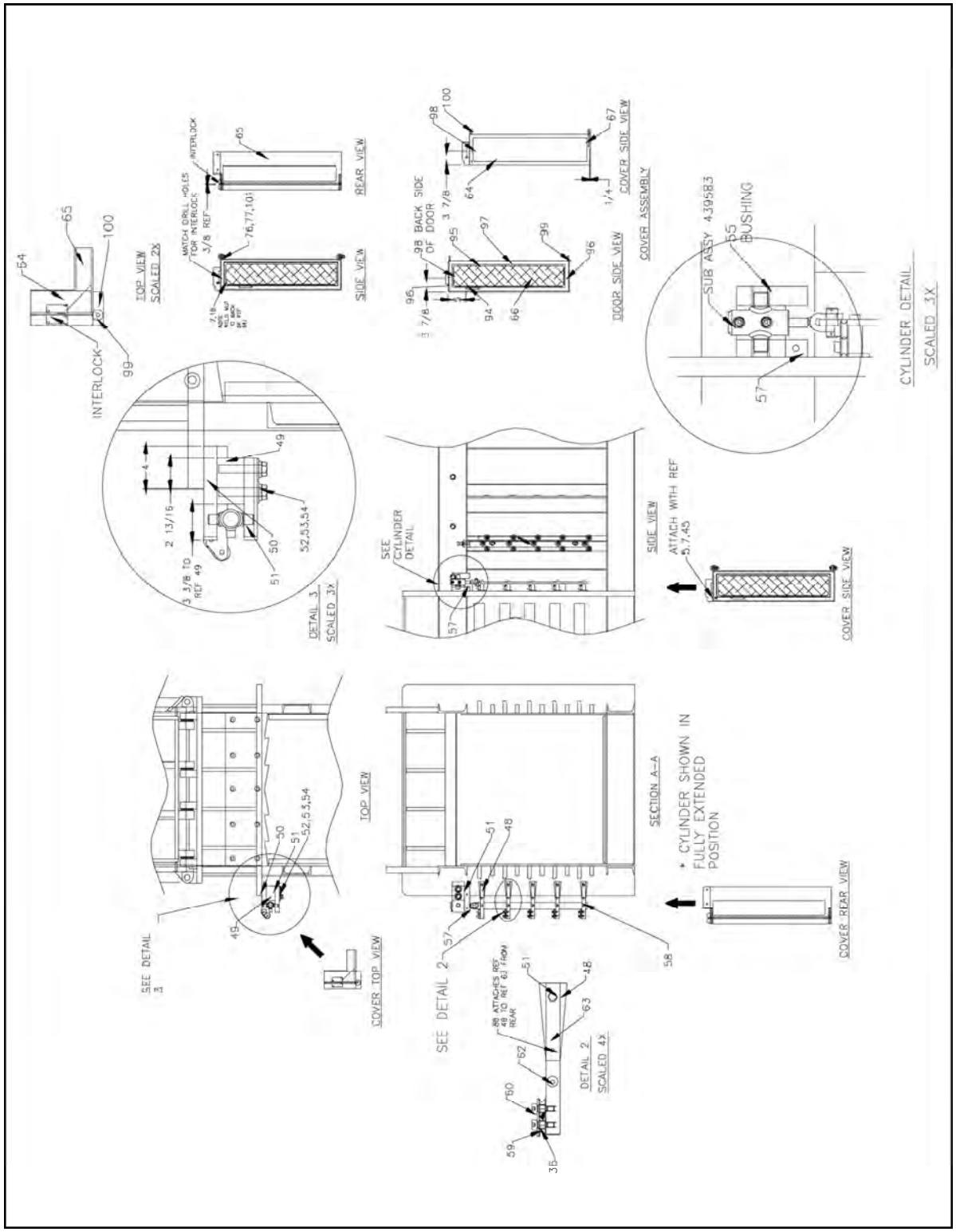
Wire Feed Components

See parts list on page 2-81.



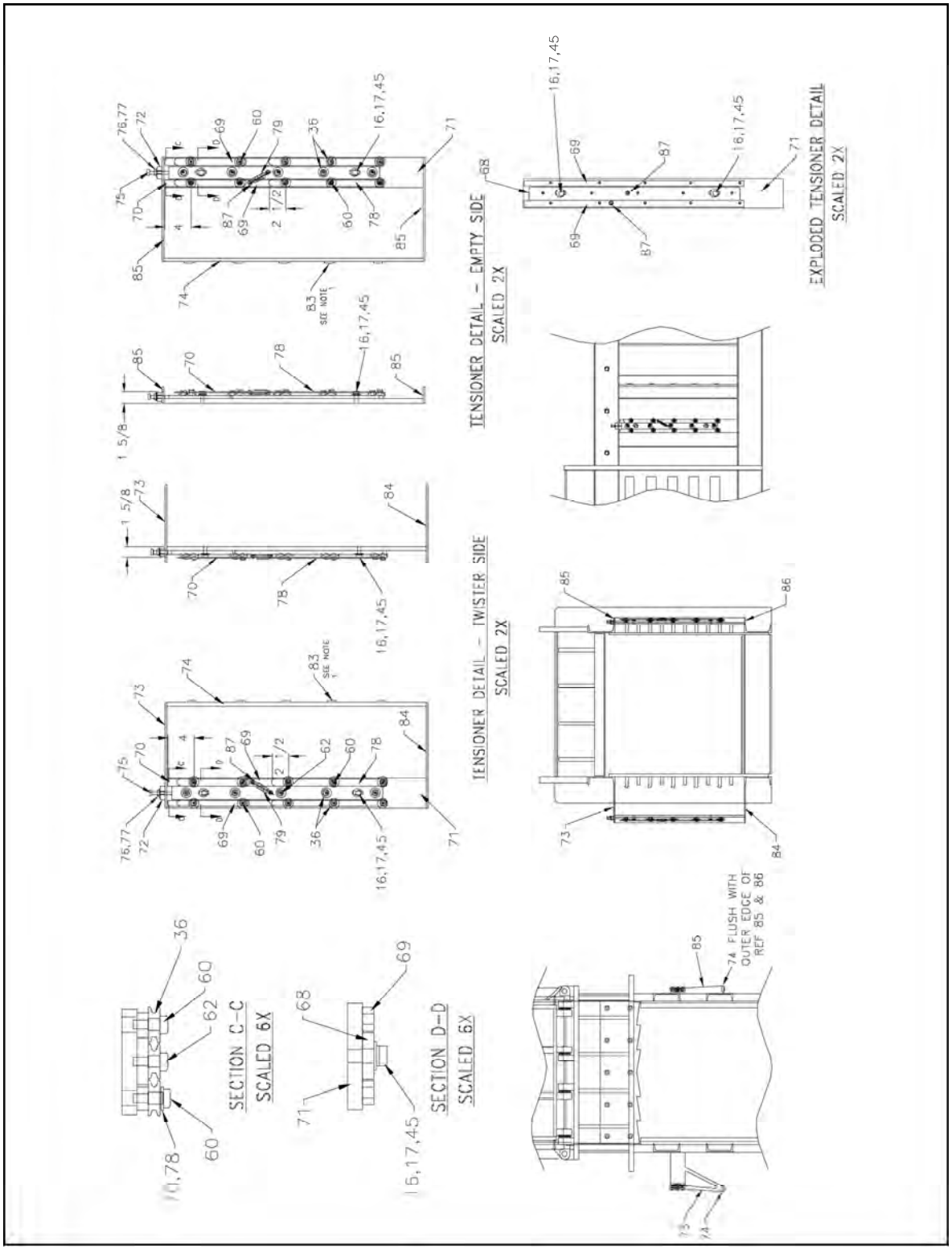
Hydraulic Wire Guides - Twister Side

See parts list on page 2-81.



Wire Tensioner Components

See parts list on page 2-81.



Wire Feed, Guides, & Tensioner - Parts List

Part Number	Ref #	Description	Quantity
439583		CYL WIRE FEED ARMS	1
50064	2	WASHER 1/2 LOCK	8
50082	3	BOLT 1/2-13 X 2 HHCS	8
54677	4	NUT 3/8-16 UNC HEX SERR FLNG	5
52231	5	BOLT 3/8-16 X 1 HHCS GR5	4
54766	6	BOLT SHOULDER 1/2-13 X 5/8 X 1	5
52016	7	NUT 3/8-16 HEX	4
54332	8	SPRING .08 WIRE X 3/4 OD X 2	5
54392	10	BOLT SHOULDER 1/2 X 1 W/3/8-16	5
54393	11	BOLT 3/8-16 X 1 3/4 FULL THR	5
264902	12	11 GA HI TEN X 2 3/4 X 3 3/4 S	1
308972	13	1 1/2 X 1 1/4 X 6 1/2 BAR	5
285325	14	3/4 PL X 2 1/8 X 4	5
285326	15	3/4 X 4 X 3 BAR	5
52476	16	BOLT 3/8-16 X 1 1/2 HHCS GR 5	5
50016	17	WASHER 3/8 FLAT	4
298458	19	1/4 PL X 15 3/4 X 61 1/2	2
292367	20	L2 X 2 X 1/4 X 39 1/16	2
298454	21	7 GA X 14 1/2 X 22 1/4	3
292368	22	2 X 2 X 2 7/8 BAR	8
286966	23	1/2 PL X 6 5/8 X 14 1/2 SQ C	2
292369	25	L2 X 2 X 1/4 X 61 1/2	2
292371	28	4 X 3 X 1/4 X 44 3/4 TUBING SQ	1
298455	31	7 GA X 14 1/2 X 22 1/4	3
292374	32	7 GA X 14 1/2 X 61 1/2	2
298456	33	7 GA X 14 1/2 X 22 1/4	2
298457	34	7 GA X 14 1/2 X 22 1/4	2
290022	35	6 OD X 5.5 ID X 1	10
800060	36	SHEAVE 1 1/2 X 7/16 X 1/2 MC#3	45
63364	37	PIN SPRING 1/8 DIA X 1 1/4 MC#	5
300033	38	3/4 X 2 X 2 15/16 BAR	5
294487	39	3/8 PL X 3 1/8 X 5 3/4	5
294488	40	3/8 PL X 3 1/8 X 5 3/4	5
54464	41	BUSHING BRONZE 5/8 OD X 1/2	10
294181	42	2 X 2 15/16 1045 CR ROD	5
315456	43	7/16 X 3 15/16 CR ROD	5

Wire Feed, Guides, & Tensioner - Parts List (Continued)

Part Number	Ref #	Description	Quantity
54134	44	BOLT 3/8-16 X 1 1/4 SHCS	10
50159	45	WASHER 3/8 LOCK	18
54468	46	CERAMIC INSERT .200 ID F/AUTO	5
300034	47	1 X 2 15/16 CR ROD	5
63177	48	NYLATRON GSM 1/4 X 2 X 5 1/2	5
308915	49	2 1/2 PL X 3 1/2 X 4 1/4	1
308916	50	1 1/4 PL X 3 1/2 X 8 13/16	1
313413	51	1 1/4 PL X 5 X 7 5/8	1
050049	52	WASHER 3/4 FLAT	2
050226	53	WASHER 3/4 LOCK	2
054863	54	BOLT 3/4-10 X 4 HHCS GR 8 FULL	2
054782	55	BUSHING BRONZE 1 ID X 1 1/4 OD	2
308983	57	1/4 PL X 1 1/4 X 1 1/2	1
304312	58	1/2 PL X 2 X 32	1
303726	59	11 GA X 1 1/2 X 3	5
054326	60	BOLT SHOULDER 1/2x5/8 SOC	20
054704	61	BOLT SHOULDER 1/2 X 2 1/4 MC#	5
054706	62	BOLT SHOULDER 1/2 X 1/2 MC#912	15
304311	63	1 PL X 2 X 10 5/8	5
313414	64	7 GA X 8 9/16 X 38 13/16	1
313415	65	7 GA X 8 15/16 X 38 1/4	1
313206	66	1/2-#13 EXP MTL X 6 1/2 31 3/4	1
221966	67	7 GA X 3 X 3 (1=2)	1
309139	68	1/2 X 2 X 31 3/4 BAR	2
309140	69	1/2 X 1 X 32 15/16 BAR	4
306520	70	11 GA X 1 X 10 7/8	4
309141	71	5/8 PL X 4 1/2 X 39 1/8	2
306522	72	3/4 PL X 1 1/4 X 2	2
309142	73	1/4 PL X 11 3/4 X 16 1/16	1
309147	74	1/2 X 2 X 39 1/8 BAR	2
054737	75	BOLT 1/2-13 X 3 HHCS FULL THRD	2
050052	76	WASHER 1/2 FLAT	6
050327	77	NUT 1/2-13 HEX SELF-LOCKING	4
306525	78	11 GA X 1 X 17 1/4	4
054736	79	SPRING, EXTENSION, 3/4 OD X .0	2
054368	83	CERAMIC INSERT F/AUTO TIE	10

Wire Feed, Guides, & Tensioner - Parts List (Continued)

Part Number	Ref #	Description	Quantity
309145	84	1/4 PL X 11 13/16 X 16 1/16	1
306528	85	1/4 PL X 2 3/8 X 16 1/16	1
309150	86	1/4 PL X 2 3/8 X 16 1/16	1
054144	87	WELD-ON PAD EYE	4
054679	88	BOLT 1/4-20 X 1 1/2 FSHCS	5
062970	89	NYLATRON GSM 1 1/2 X 3 X 4	5
050547	90	BOLT 5/8-11 X 2 3/4 HHCS GR 8	10
050293	91	WASHER 5/8 FLAT	10
050561	92	WASHER 5/8 LOCK	10
299399	93	1 1/4 X 3 X 4 BAR	5
313294	94	3/8 X 9 CR ROD	1
313199	95	11 GA HI TEN X 8 3/4 X 34	1
313200	96	1/4 X 1 1/2 X 8 3/4 BAR SQ CUT	2
313201	97	1/4 X 1 1/2 X 33 1/2 BAR SQ CU	2
313202	98	11 GA HI TEN X 1 X 1 SQ CUT	1
313203	99	1/4 PL X 1 1/2 X 2 1/4	2
313204	100	1/4 PL X 1 1/2 X 4	4
050319	101	BOLT 1/2- 13 X 1 3/4 HHCS GR 8	2

3 - INSTALLATION

Installation - General Requirements

Caution:

Review this manual before beginning installation. Study job site and installation requirements carefully to be certain all necessary safeguards and/or safety devices are provided to protect all personnel and equipment during installation and as a completed system. Special attention is directed to the extract from American National Standards Institute Z245.5.

Operating instructions in Section one of this manual are not intended as a substitute for training and experience in proper use and safety procedures in operating this equipment.

This baler is designed for indoor use ONLY.

Marathon does not assume responsibility for installation procedures of this equipment. Conformance to applicable local, state, and federal laws concerning installation rests with customer.

This section of manual covers assembly and installation of your Auto-Tie baler. The following pages cover general installation, electrical installation and start-up instructions.

Concrete Pad or Floor

The pad or floor should be a minimum 3000 psi concrete, steel reinforced, 6” thick. It is recommended that pad or floor be flush with surrounding area.

Working clearance for the panel box must comply with state and local building codes. Allow enough space in front of bale exit for bale handling vehicle. Also, allow enough space for installation and safe operation of auto-tie mechanism.

Anchoring

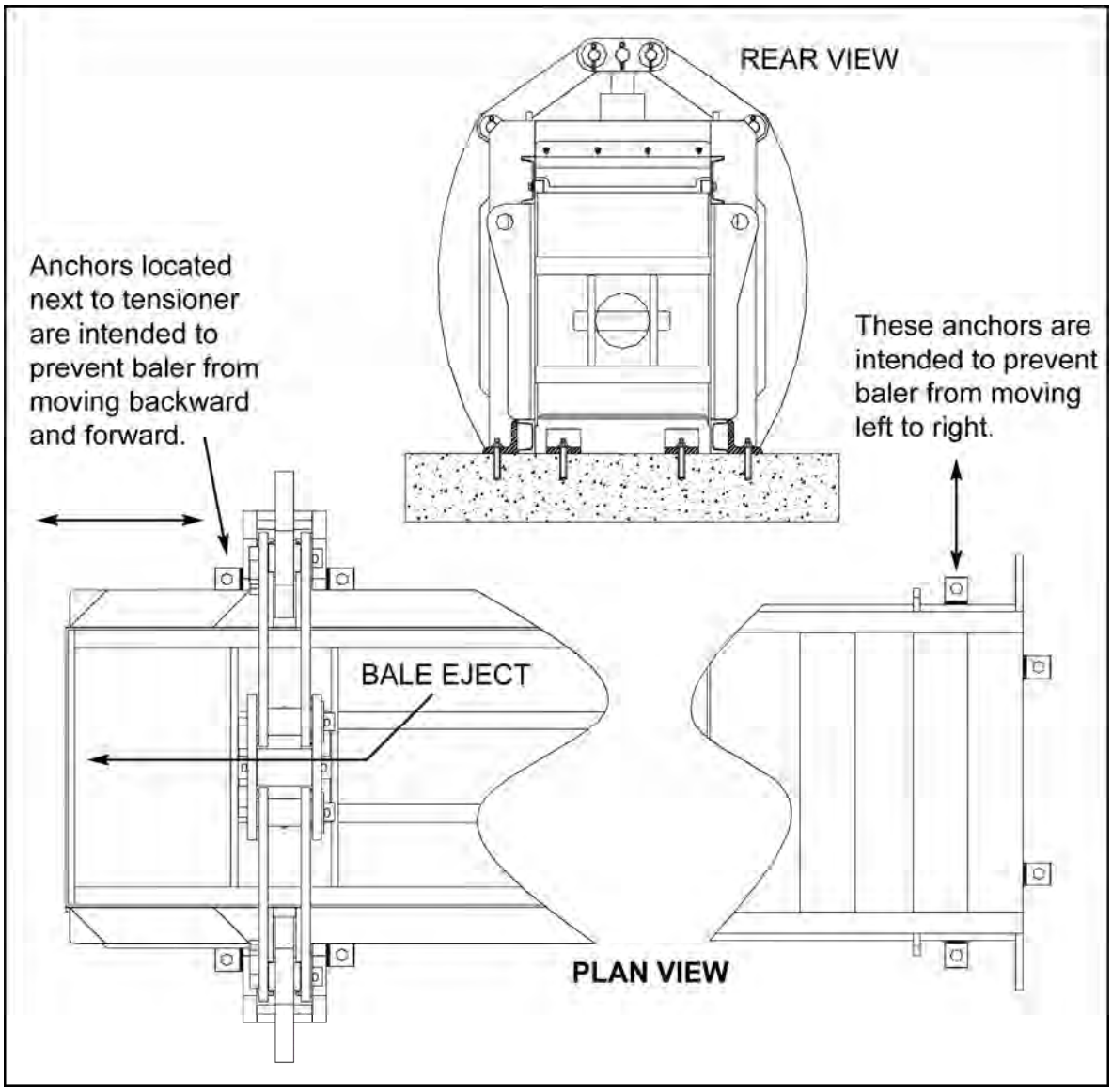
Anchor baler to pad using anchor plates on each side of baler base and (8) 1” diameter anchor bolts, 5 3/4” long, Red Head type recommended. After connecting all hydraulic lines, anchor power unit (if remote power unit) to pad using (6) 3/4” anchor bolts, 5 3/4” long.

Anchor bolts and are not provided by Marathon Equipment Company.

Decals

Installation of baler is not complete until an inspection of warning decals has been made. All warning decals must be in place prior to operating baler. Decals should be clearly visible, legible, securely applied and in proper location. For decal description and location, see Section One of this manual. Call your distributor or Marathon Equipment Company if any of warning decals are missing or become damaged and need replacing.

Installation - General Requirements (Continued)



1) Position baler in the desired location.

2) With a pencil, mark the location of anchor holes.

3) Remove anchor to view markings.

4) With a masonry bit, drill into the marked area.

5) Insert the concrete wedge bolts into drilled holes and tap with a hammer until set.

6) Set anchor in place add washers and nut to each anchor and tighten with wrench.

Note: Welding anchors to body is not recommended.

Electrical Installation

The panel box contains high voltage components. Only authorized service personnel should be allowed inside. See Lock-Out & Tag-Out Instructions in maintenance section.

Warning: Before making any electrical connection, be sure the disconnect switch has been locked-out and tagged-out per Lock-Out & Tag-Out Instructions on page 2-2.

Danger: All equipment should be grounded per National Electric Code.

Grounding Instructions:

This appliance must be connected to a grounded, metal, permanent wiring system; or an equipment grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the appliance.

If there is any doubt whether the equipment is properly grounded, a qualified electrician should be consulted.

1) Use FUSE AND CIRCUIT BREAKER chart and WIRE SIZE chart in MAINTENANCE section of this manual for reference during electrical installation.

2) Before connecting power to baler, check incoming line voltage with a voltmeter. Also, check voltage wiring in baler panel box. If baler is not wired for correct voltage, make necessary changes before proceeding.

3) A lockable disconnect switch is provided on baler control panel and is sized in accordance to baler. Three phase power should be connected to top of this switch. Be careful not to let incoming wires touch each other. A properly sized equipment ground should be connected to enclosure ground lug.

Start-Up Instructions

Caution: Make sure all persons and installation materials are clear of charge box area.

1) After electrical connections are complete, check motor rotation by doing the following:

   a) Turn disconnect switch to "ON" position.

   b) Insert Control key switch and turn to "ON" position.

   c) Touch "POWER ON" button.

   d) Touch "MOTOR START"button for 20 seconds until motor starts then touch "MOTOR STOP button.

   e) Check motor rotation by watching the hub coupling through slot in pump-to-motor adapter. A rotation decal on power unit shows correct rotation. In the event this decal is missing, look at hub coupling from the motor end. Rotation should be clockwise.

   f) Reversing any two incoming power lines will change motor/pump rotation.

   Caution: If pump rotates backward, stop immediately!

   Pump can be damaged if operated in reverse even for short periods of time.

2) With ram in full retract position, check to be sure oil reservoir is filled to 3/4 level on sight gauge (refer to maintenance chart for hydraulic oil recommendations). The hydraulic system pressure has been factory set.

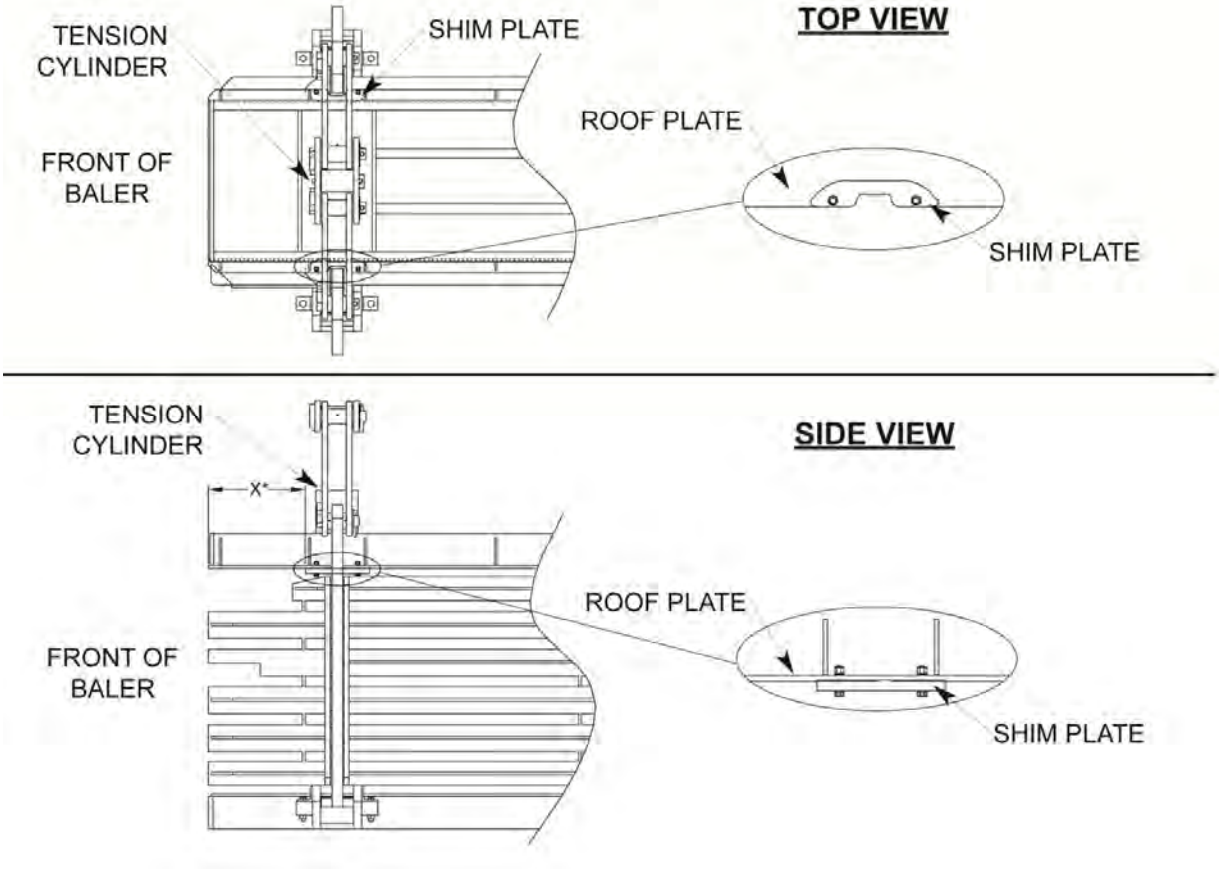
3) This open end baler is equipped with photocells, a key type interlock on hopper door and a limit switch on the swing away tier assembly, and two limit switches on the Inserter. These items have been factory adjusted. Check proper function of each of these prior to operation start-up. See procedures in Section two of this manual.

4) **Make sure that operators are thoroughly trained in proper use of this equipment.**

Roof Shims

When the baler leaves the factory, a set of shims are bolted to each side of the roof. These shims increase the tension applied by the sides to ensure good bale density. They may be needed in some baling applications of magazines, shredded paper, office paper, clothing or similar items that might cause the bale to slip as it is ejected from the baler. If the bale seems to be hanging up and not moving freely, the shims should be removed.

To remove the two roof shims, it is recommended to first retract the tension cylinder so there is no pressure on the roof or the sides of the baler. Lock-out and tag-out the baler per the procedure on **page 2-2**. The shims are located 18" (PC models) or 17 9/16" (shear models) from the front of the baler, directly under the tension cylinder and side compression plates (as shown in the diagram below). Remove the bolts, nuts, and washers securing each shim plate. The shims may be re-installed when necessary.



*The distance of X = 18" on PC balers and 17 9/16" on Shear model balers.

Twister Head Clock Adjustment - Left Hand Assembly

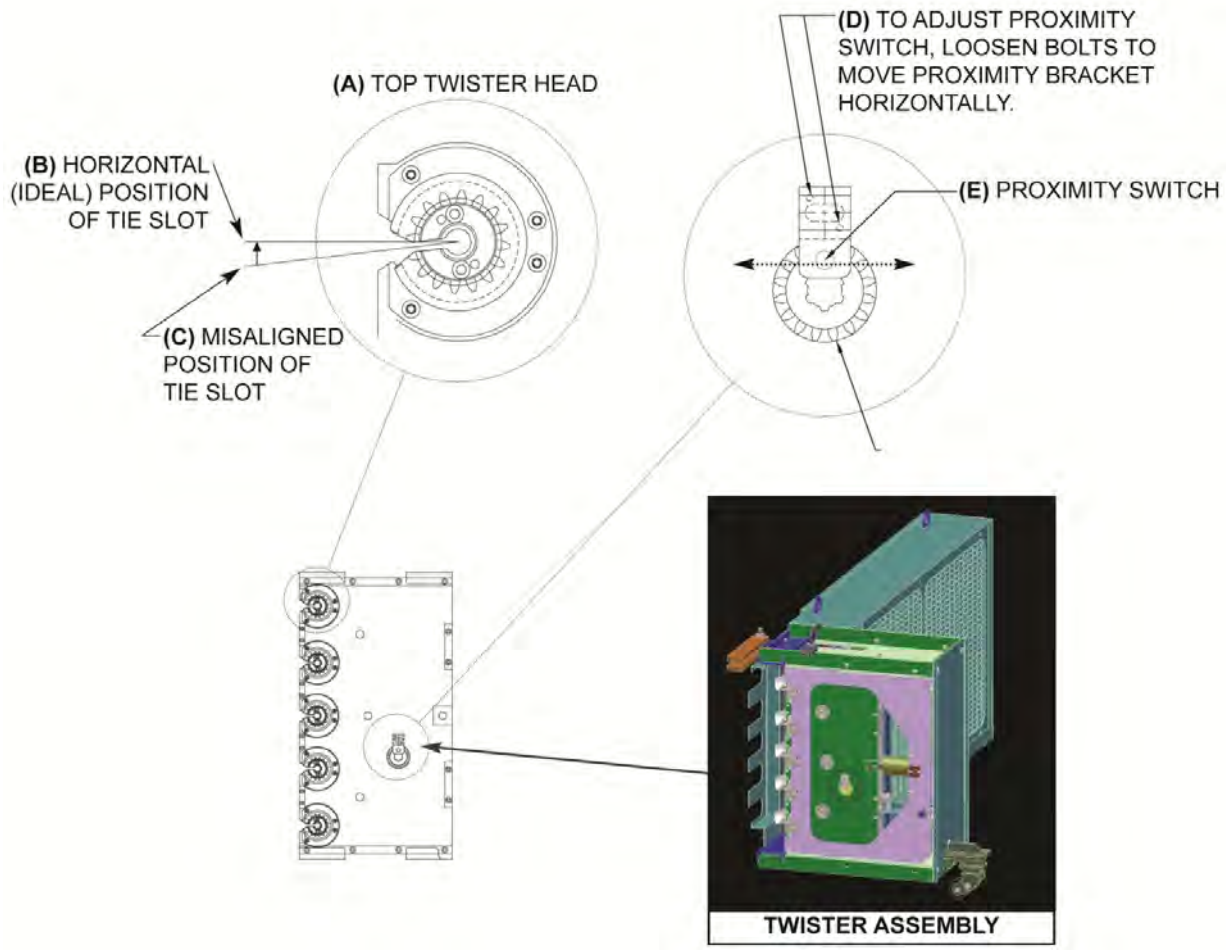
Note: The procedure below is for TIEger Auto-Tie balers with a left hand twister assembly only. The procedure for balers with right hand twister assemblies can be found on the next page. To assess the misalignment of the twister heads, look at the top twister head **(A)**. The condition shown in the diagram below indicates that the top twister head is misaligned, indicated by the downward position of the tie slot **(C)**, which needs to be adjusted to the horizontal position **(B)**, as shown.

Adjustment procedure:

1) Loosen the 2 bolts (see diagram below) on the proximity bracket **(D)**.

2) Adjust proximity switch **(E)** to the left to adjust the twister head upward or to the right to adjust the twister head downward (the amount of adjustment should be done in increments of 1/16" or less at a time).

3) Once the twister head slot reaches the horizontal position **(B)**, then retighten the 2 bolts that secure the proximity bracket **(D)**.



Twister Head Clock Adjustment – Right Hand Assembly

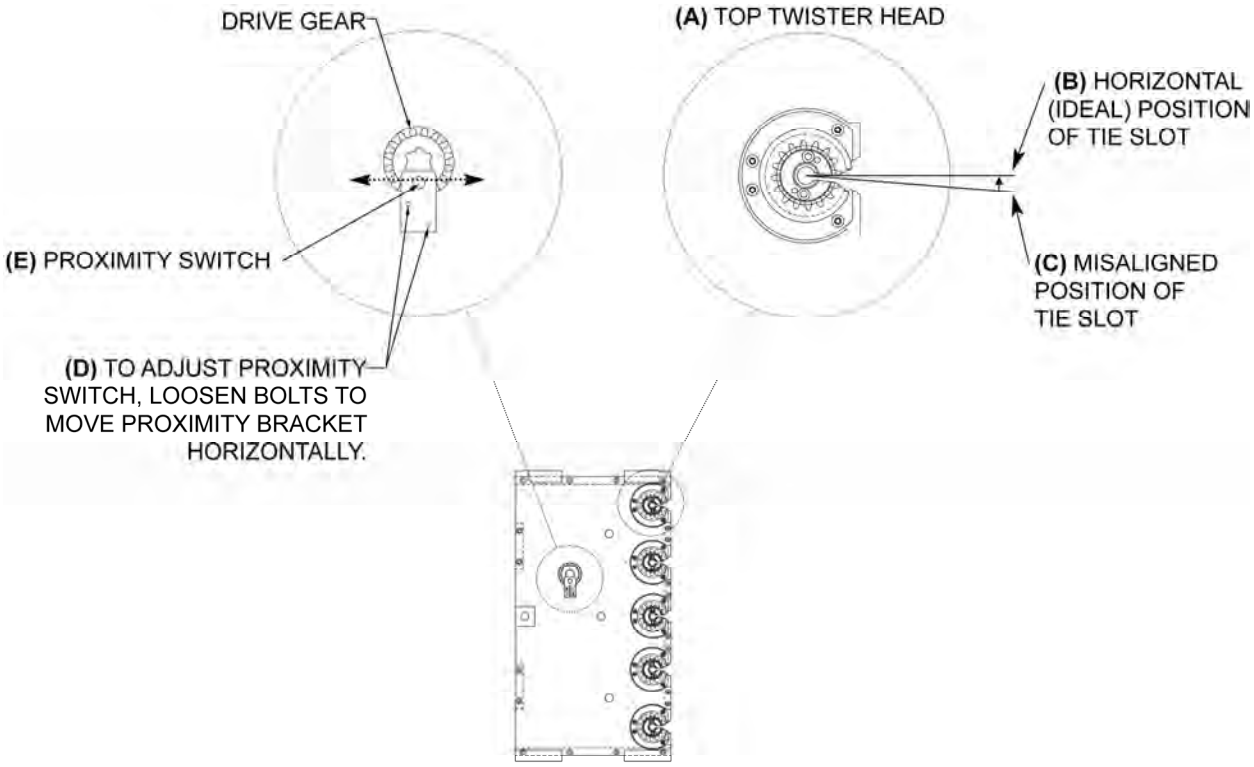
Note: The procedure below is for TIEger Auto-Tie balers with a right hand twister assembly only. The procedure for balers with left hand twister assemblies can be found on the previous page. To assess the misalignment of the twister heads, look at the top twister head **(A)**. The condition shown in the diagram below indicates that the top twister head is misaligned, indicated by the downward position of the tie slot **(C)**, which needs to be adjusted to the horizontal position **(B)**, as shown.

Adjustment Procedure:

1) Loosen the 2 bolts (see diagram below) on the proximity bracket **(D)**.

2) Adjust proximity switch **(E)** to the left to adjust the twister head upward or to the right to adjust the twister head downward (the amount of adjustment should be done in increments of 1/16" or less at a time).

3) Once the twister head slot reaches the horizontal position **(B)**, then retighten the 2 bolts that secure the proximity bracket **(D)**.



TWISTER ASSEMBLY