4000 SERIES BALEMASTER BALER - OPEN CHAMBER BALER
OWNER'S MANUAL

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* REFER TO THE AUTO-TY SECTION OF THIS MANUAL (WHEN PROVIDED) FOR ADDITIONAL INFORMATION RELATED TO THESE ITEMS.

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AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004

The following pages are excerpts from the American National Standard Institute Safety Requirements for balers, ANSI Code Z245.5-2004 for your information and compliance. The excerpts cover Modification (6), Installation, Operation, and Maintenance Requirements (4), Employer Responsibility (7.1) and Employee Responsibility (7.2), Lockout/Tagout (7.3) For the complete code contact:

SECRETARY - AMERICAN NATIONAL STANDARDS COMMITTEE, Z245
c/o NATIONAL SOLID WASTES MANAGEMENT ASSOCIATION
1730 RHODE ISLAND AVENUE, SUITE 1000
WASHINGTON, DC 20036

4 Installation requirements

4.1 General requirements

4.1.1 The installer of balers shall do so in accordance with the appropriate sections of this American National Standard and ANSI Z245.51, applicable codes, local ordinances and the manufacturer’s recommendations, and shall affix to such equipment the date of installation, installer's name and a statement attesting to compliance with this standard.

6 Reconstruction and modification

6.1 Reconstruction or modification of any baler (including power units and controls) shall be in accordance with requirements of ANSI Z245.51.
6.2 Reconstructed or modified balers shall be permanently identified with the name of the manufacturer or person conducting the reconstruction or modification and the date of reconstruction or modification.
6.3 Reconstructed or modified balers evaluated and determined to conform to the requirements of ANSI Z245.51 shall be identified on the baler by a statement attesting to compliance with the ANSI Z245.51 standard or shall have an approved listing mark.

7 Operational requirements

7.1 Owner/employer responsibilities for balers. The owner/employer shall provide properly maintained balers that meet all applicable regulatory safety requirements and the requirements of this standard, and shall be responsible for all of the following:

a) Ensuring that the installation of the baler conforms to local codes, ordinances, and manufacturer’s recommendations. If installing into a system, examine prevailing safety standards of associated equipment;

b) Providing to employees instruction and training in safe work methods before assigning them to operate, clean, service, maintain, modify, or repair the baler. Such instruction and training shall include procedures provided by the manufacturer. The employer will maintain records as to the names of employees and the dates of training;

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

c) Providing instructions for addressing abnormal situations (e.g., bridging of the loading chamber or feeding chute, jam of materials);

d) Assigning only trained employees to work on (which includes operating, loading, cleaning, servicing, maintaining, or repairing) the baler;

e) Monitoring the employee's operation of the baler and taking appropriate action to ensure proper use, including adherence to safe practices and the employee requirements of this standard and monitoring the employee's operation of balers and taking appropriate action to ensure proper use of equipment, including adherence to safe practice;

f) Repairing, prior to placing the baler into service, any mechanical malfunctions or breakdowns that affect the safe operations of the baler;

g) Establishing and following a program of periodic and regular inspections of all balers to ensure that all parts, component equipment, and safeguards are in safe operating condition, and adjusted, in accordance with the manufacturer's recommended procedures. This shall include keeping all malfunction reports and records of inspections and maintenance work performed;

h) Implementing a program for the maintenance of the baler which will incorporate the following elements:

1) Requirements for trained, competent maintenance employees or contractors to perform inspection and repair work;
2) Providing for the cleaning, inspection and repair of the baler in accordance with the manufacturer's recommendations, including periodic maintenance;
3) Ensuring that all required safety features are operational and functioning, and repairing, prior to placing into service, any reported malfunction or defect that affects the safe operation of the baler; and
4) Ensuring that all caution, warning and danger markings required by 5.14 are installed and legible, or are replaced if damaged, defaced or missing.

i) Utilizing the manufacturer's recommended procedures for the control of hazardous energy sources (lockout/tagout) in a program complying with Part 1910.147 of Title 29 of the Code of Federal Regulations (OSHA) (see 7.3);

j) Utilizing the manufacturer's recommended procedures for access control for permit-required confined spaces as part of the employer's program (see 7.4);

k) Protecting any person by one of the methods in 5.8.1, or by other means as effective as those means of protection.

l) For balers fed by means of a loading pit conveyor, reciprocating floor, or push pit that is flush with or below the facility floor, providing:

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

1) Protection for employees by means of:
   i) Limiting access within 6 feet (183 cm) of the edge of the pit to authorized employees;
   ii) Training authorized employees to recognize and avoid the hazards associated with the pit area;
   iii) Requiring that others whose employees use the pit area provide assurance of such training; and iv) Limiting access by unauthorized persons by installing signs, such as: "RESTRICTED AREA – AUTHORIZED EMPLOYEES ONLY"

2) Providing a device to the extent practicable, which prevents trucks or other motor vehicles that unload directly into the loading pit from rolling into the pit;

m) When balers equipped with automatic start/cycling controls are provided, allowing their use only in locations where a startup alarm is utilized or it is demonstrated that automatic starting does not result in a risk of injury to persons; NOTE: Achieving acceptably low risk of injury would include demonstrating that lockout procedures are strictly adhered to when bridging in feed chutes occurs or jammed material must be cleared from the loading chamber

n) Providing guard railings for dock ramps that meet U.S. Occupational Safety and Health Administration requirements. These shall be located around the loading chamber opening if walk-on ramps are used to deposit refuse into the loading chamber. Guard railings and toe boards shall be provided on the sides of docks and ramps;

o) Providing for an adequate work area around the baler for safe maintenance, servicing, and cleaning procedures;

p) Keeping all surrounding walking areas and floors free from obstructions, and accumulations of waste matter, grease, oil, and water (slipping and tripping hazards);

q) Maintaining records or employee reports of malfunctions;

r) Specifically inspecting safety interlocks, switches, and other protective devices to ensure that these devices are not disabled or bypassed, and not to permit the baler to be operated unless these devices are fully functional. These inspections shall be in accordance with (g);

s) Ensuring that containers supplied are capable of withstanding the maximum forces generated by the baling system;

t) Ensuring that loaders are aware of hazards and safety requirements;

u) Ensuring that only authorized employees (18 years old or older) operate, inspect, or maintain balers;

v) Ensuring that only authorized employees (16 years old or older) load, but do not operate balers; and

w) Incorporating balers into the employer's safety program (see Section 8).

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

7.2 Operator and employee responsibilities. Operators who work on and around the baler shall be responsible for the items listed below:

a) Using all applicable safety features provided on the baler;

b) Using the baler only after receiving instruction;

c) Reporting any damage to, or malfunction of, the baler by submitting a report to the employer or responsible authority when the damage or malfunction occurs;

d) Ensuring that access doors and service opening covers are in place, secure, and/or locked before operations begin;

e) Ensuring that the area of operation around container/cart lifting systems and the container will be clear of persons during all phases of the lifting operation prior to energizing the dumping system;

f) Ensuring that all persons are clear of the baler point of operation before actuating any compaction cycle controls or container/cart lifting system controls and being prepared to stop the compaction cycle or container dumping operation if necessary;

g) Ensuring that all persons are clear of the tailgate (on baler-container combinations so equipped) before the tailgate is opened or shut. The operator shall warn all persons not to cross behind or under an open tailgate;

h) Using the baler in accordance the manufacturer’s instructions, including ensuring the proper position of all locks, doors, guards, etc.;

i) Ensuring that no one disables or bypasses safety interlocks, switches, or other protective devices and that the baler is not operated unless these devices are fully functional;

j) Locking out the unit when inspecting malfunctions, jams, or other problems arising from daily operations; servicing; or performing maintenance (except maintenance testing). The affected employee shall identify the type and magnitude of the energy that the baler uses, shall understand the hazards, and know the methods to control the energy (see 7.3);

k) Coupling and securing a compatible container to a baler frame as specified by the baler and container manufacturer(s); l) Operating, inspecting, and maintaining the baler only if 18 years old or older and after being properly instructed and trained; and m) Loading, but not operating, the baler only if 16 years old or older.

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

7.3 Procedures for the control of hazardous energy sources (lockout/tagout)

7.3.1 The owner/employer shall have a hazardous energy control (lockout/tagout) procedure to follow when performing servicing and maintenance on balers where the unexpected energization or start up of equipment, or release of stored energy could cause injury to employees.

7.3.2 The owner/employer shall utilize the instructions provided by the manufacturer for the control of hazardous energy sources. The lockout/tagout procedure shall isolate and render safe all energy sources, including electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other potential energy sources (e.g., gravity, kinetic, etc.). It shall be used to ensure that the baler is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the baler or release of stored energy could cause injury.

7.3.3 The lockout/tagout procedure shall include but is not limited to the following:

a) Shutting down all power sources;

b) Removing keys or other devices that enable the baler;

c) Using a lock to secure the power supply or, if that is not feasible, installing a tag on an appropriate location, using a non-reusable fastener, or installing a similar warning device;

d) Placing operating components in such a position so as not to be subject to possible free fall and/or installation of additional blocking devices to prevent such free fall of any raised or elevated component; and

e) Relieving stored hydraulic or pneumatic pressure, after blocking devices are installed, if maintenance is to be done to the hydraulic or pneumatic system.

7.3.4 The procedure shall address the following:

a) Sequence of lockout for the baler:

1) Notify all affected employees that servicing or maintenance is required on a baler and that the baler must be shut down and locked out to perform the servicing or maintenance.

2) The authorized employee shall refer to the company procedure to identify the type and magnitude of the energy that the baler utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

3) If the baler is operating, it must be shut down by the normal stopping procedure (depress stop button, open switch, close valve, etc.).

4) De-activate the energy isolating device(s) so that baler is isolated from the energy source(s).

5) Lock out the energy isolating device(s) with assigned

individual lock(s).

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

6) Stored or residual energy must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

7) Ensure that the baler is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

Caution: Return operating control(s) to neutral or "off" position only after verifying the isolation of the equipment.

NOTE: The machine or equipment is now locked out.

b) Restoring the baler to service. When the servicing or maintenance is completed and the baler is ready to return to normal operating condition, the following steps shall be taken:

1) Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

2) Check the work area to ensure that all employees have been safely positioned or removed from the area.

3) Verify that the controls are in neutral.

4) Remove the lockout devices and reenergize the machine or equipment. NOTE: The removal of some forms of blocking may require re-energizing of the machine before safe removal.

5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

BALEMASTER

PREFACE

This Owner's Manual is to provide a fast and easy reference for installation, operation and servicing Balemaster Equipment. Safe operating and maintenance procedures, regular inspections, daily clean out of marked areas on the equipment and planned maintenance by qualified personnel are the responsibility of the user's management.

This Operator's Manual contains information on the operation and servicing of your new Balemaster Baler. Read, understand and follow the enclosed installation and operating instructions before connecting and operating your new Balemaster Baler. The equipment was electrically and hydraulically pressure tested and preset at the factory prior to shipment. It is important all users fully understand the safe operation and maintenance of this equipment. Operators having a language barrier or who are illiterate must be given sufficient training and supervision. It is important to know the Series Baler as stamped on the Series/Model Tag on the Baler in reviewing this Owner's Manual.

This Manual explains the conditions, under normal use, that the equipment may be installed, checked out and operated. It is intended to be used as a supplement to and not in place of other Safety Standards. Many local codes require installation of an Electrical Disconnect Switch in sight of the motor and be capable of being locked in "OFF" position only. Check your local codes for your installation.

The Balemaster equipment has been designed to provide an economical and reliable method of processing and compacting most forms of waste materials. The equipment is a first line production machine and it should receive regular maintenance.

All necessary maintenance and adjustments must be made promptly to avoid any complications and compounding problems. The use of jumpers or other devices to block out electrical interlocks or forcibly over-riding hydraulic components will result in damage to the unit, costly repairs, void the Warranty and could cause injury to operating and maintenance personnel and cannot be condoned.

PRECAUTIONS

P R E C A U T I O N S

BEFORE ANY MAINTENANCE IS PERFORMED ON BALEMASTER/BALEWEL EQUIPMENT, MAKE CERTAIN THAT ALL ELECTRICAL CONTROLS ARE LOCKED OUT. DO NOT OPERATE THE EQUIPMENT WHEN PANELS AND GUARDS ARE NOT IN PLACE.

A V O I D A C C I D E N T S

Most accidents, whether they occur in industry, on the farm, at home or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules and precautions. For this reason most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

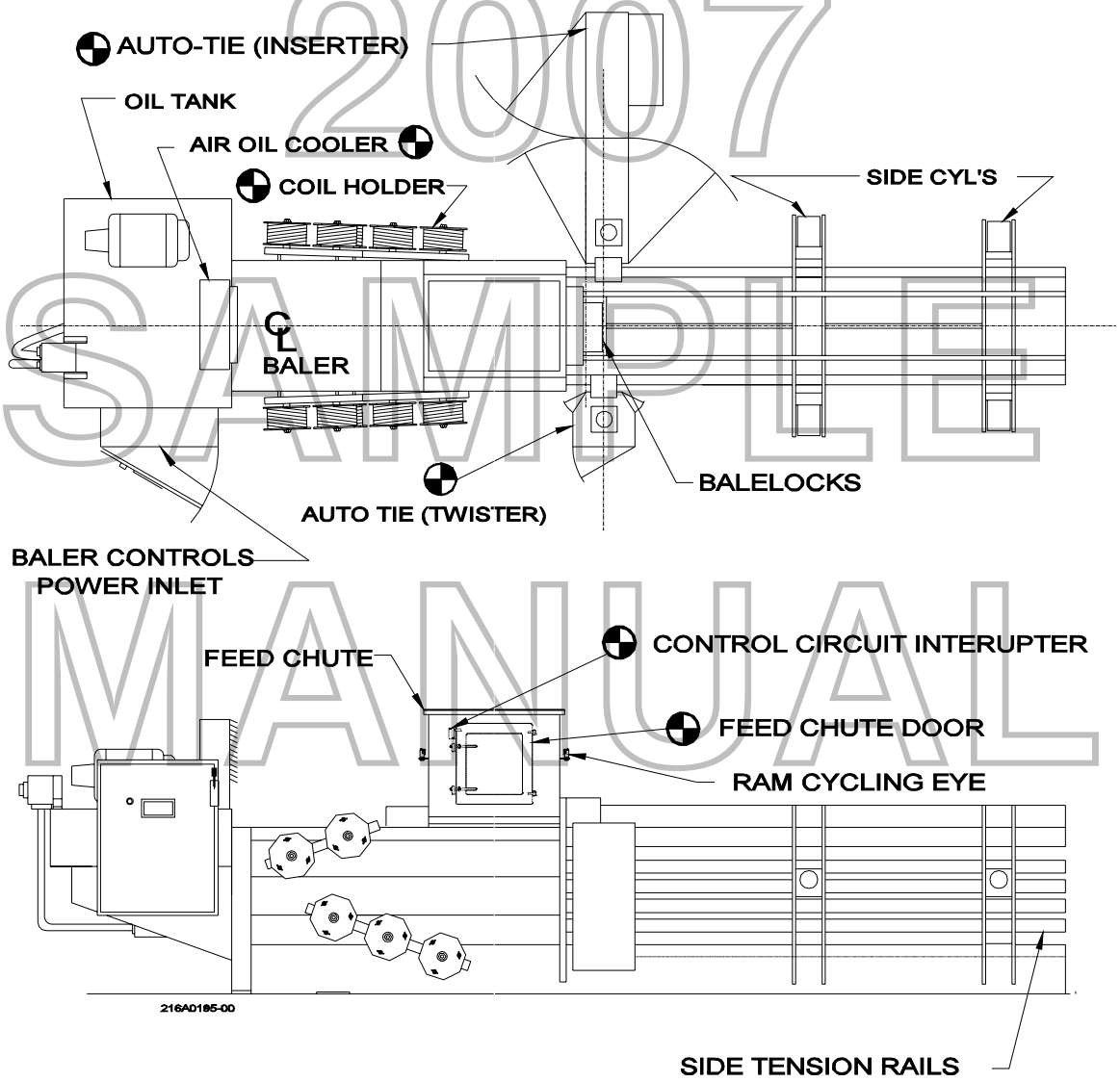
WITH ANY MACHINERY A CAREFUL AND TRAINED OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT.

DON'T REMOVE OR DEACTIVATE SAFETY DEVICES OR TAGS OFF MACHINES.

CAUTION: DON'T REMOVE TAGS OR DEACTIVATE SAFETY DEVICES!

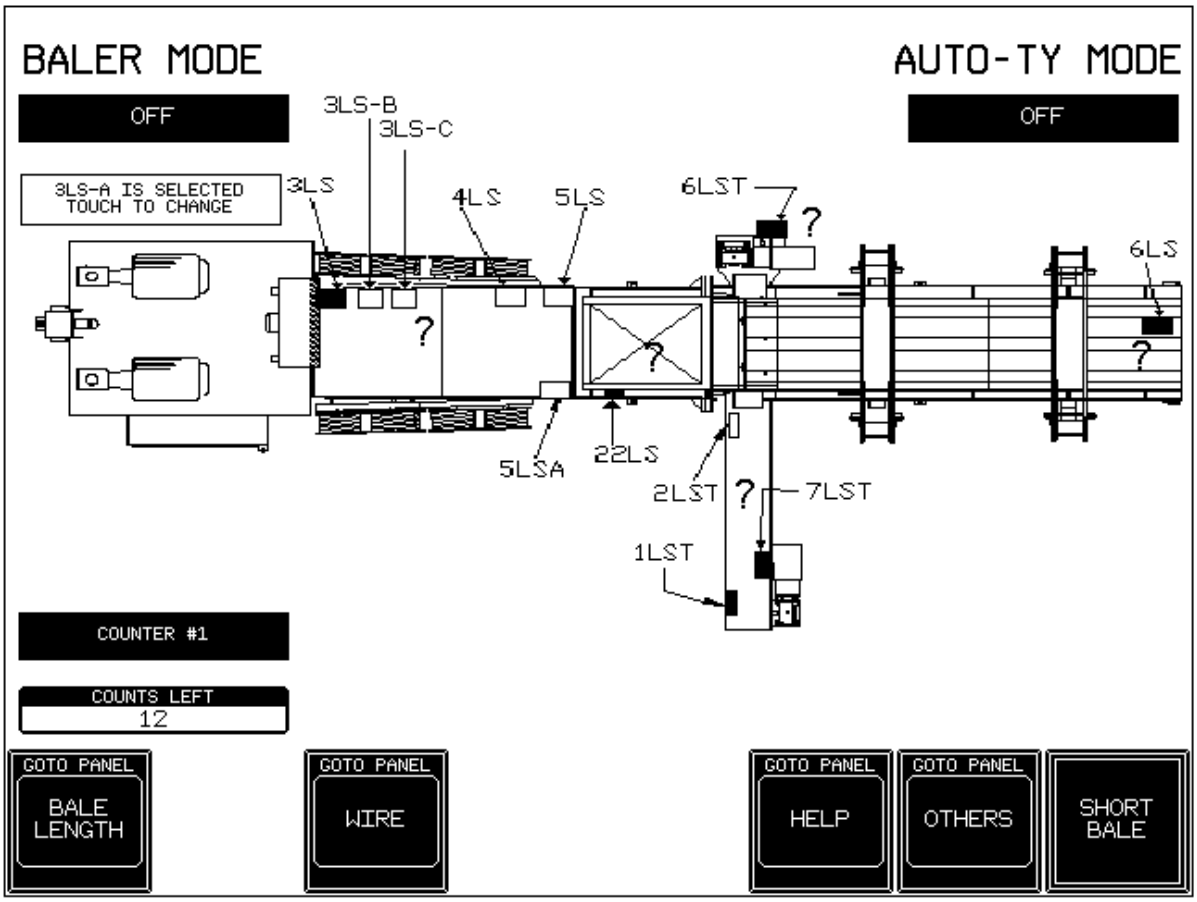
NEVER ATTEMPT TO CLEAN, OIL OR ADJUST A MACHINE WHILE IT IS IN MOTION.

GENERAL ARRANGEMENT



OPTIONAL EQUIPMENT
BALER - STANDARD
AUTO-TIE - STANDARD

BALER W/TOUCH SCREEN
MAIN SCREEN



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During normal automatic operation of the baler the main screen as shown above should be displayed. This screen will illustrate the various limit switches being activated while the baler is cycling.

Alarm messages are also located on this screen, for example if a certain limit switch is not activated when it should, there will be a message indicating to check that switch.

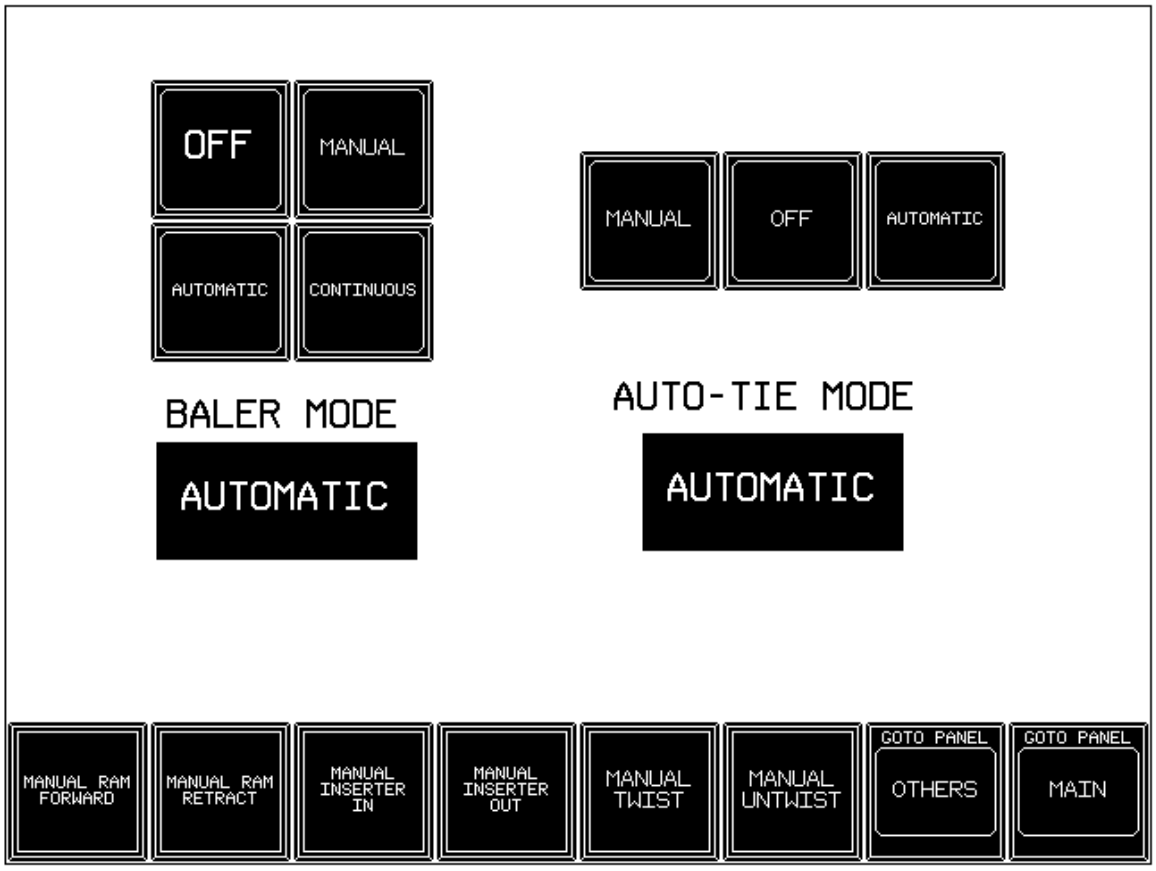
By pressing "BALE LENGTH" on the main screen the Bale Length Counter screen can be displayed which allows for changing the counter length or the counter currently being used.

Pressing "WIRE", a screen illustrating the proper threading of the baling wire.

"OTHERS" will display the screen that allows access to the Hour Meters, Bale Counters, E.S.D. adjustment, and change the number of pumps running.

The electrical components are designed to operate in a temperature range of 32°F to 104°F (0°C to 40°C), in the absence of condensation and freezing moisture.

BALER W/TOUCH SCREEN



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BALER OPERATION

"With Access Door Closed" pull Red Mushroom Button out to energize the master control relay. At this time both the baler and the Auto-Ty are off. Select the baler and Auto-Ty modes by pressing the corresponding button on the screen. When a selection is made the mode will be displayed in the box. After modes are selected press the "'MAIN" button to continue to the main screen.

The baler can be operated in Automatic, Continuous, or Manual.

AUTOMATIC OPERATION

Pull the power control switch out to start the machine. The red light will light up. Push the button on the panel marked "AUTOMATIC". If the photo eye's are blocked the motor(s) will start in a couple of seconds and the ram will cycle. After photo eyes are clear the ram will return to the back of the machine and the motor(s) will stop.

CONTINUOUS OPERATION (OPTIONAL)

Pull the power control switch out to start the machine. The red light will light up. Push the button on the panel marked "CONTINUOUS". Motor(s) will start and run continuously, if the photo eye is blocked the ram will cycle and continue to cycle until the eyes are clear. After the eyes are clear the ram will remain at the rear of the machine with motor(s) running.

BALER W/TOUCH SCREEN

MANUAL OPERATION

Pull the power control switch out to start the machine. The red light will light up. Push the button on the panel marked "MANUAL". Motor(s) will start and run continuously. Push the "MAIN" button to advance to the main screen, then press the "BALER MODE" or "AUTO-TY MODE" button to advance to the Baler & Auto-Ty Selector Screen. Press the "MANUAL RAM RETRACT" button and the ram will retract to the back of the machine.

AUTO-TY OPERATION
The AUTO-TY can be operated in Automatic, or Manual.

AUTO-TY MANUAL
Must be in the Baler & Auto-Ty Selector Screen for Manual Operation.
Set the Baler in the manual mode by pushing the "MANUAL" button. Move the ram to its full forward position by pressing and holding the "MANUAL RAM FWD" button. Limit Switches 5LS & 5LSA will be activated when the ram is in the full forward position. The Auto-Ty cannot be operated in the manual mode unless limit switches 5LS & 5LSA are activated, the Baler is in the manual mode and the Auto-Ty is in the manual mode. Set the Auto-Ty to manual by pressing "MANUAL" on the Auto-Ty Selector Switch. To advance the inserter carriage, push and hold "MANUAL INSERTER IN" button. To retract the inserter carriage, push and hold "MANUAL INSERTER OUT" button.

To activate the Twister manually the inserter must be in the fully retracted position with 1LST activated. Twister will not operate without 1LST activated. To twist, push and hold "MANUAL TWIST" button. To manually untwist, push and hold the "MANUAL UNTWIST" button. The twister motor will untwist until 6LST is activated. When the twister motor stops, the hooks will be in the stored position.

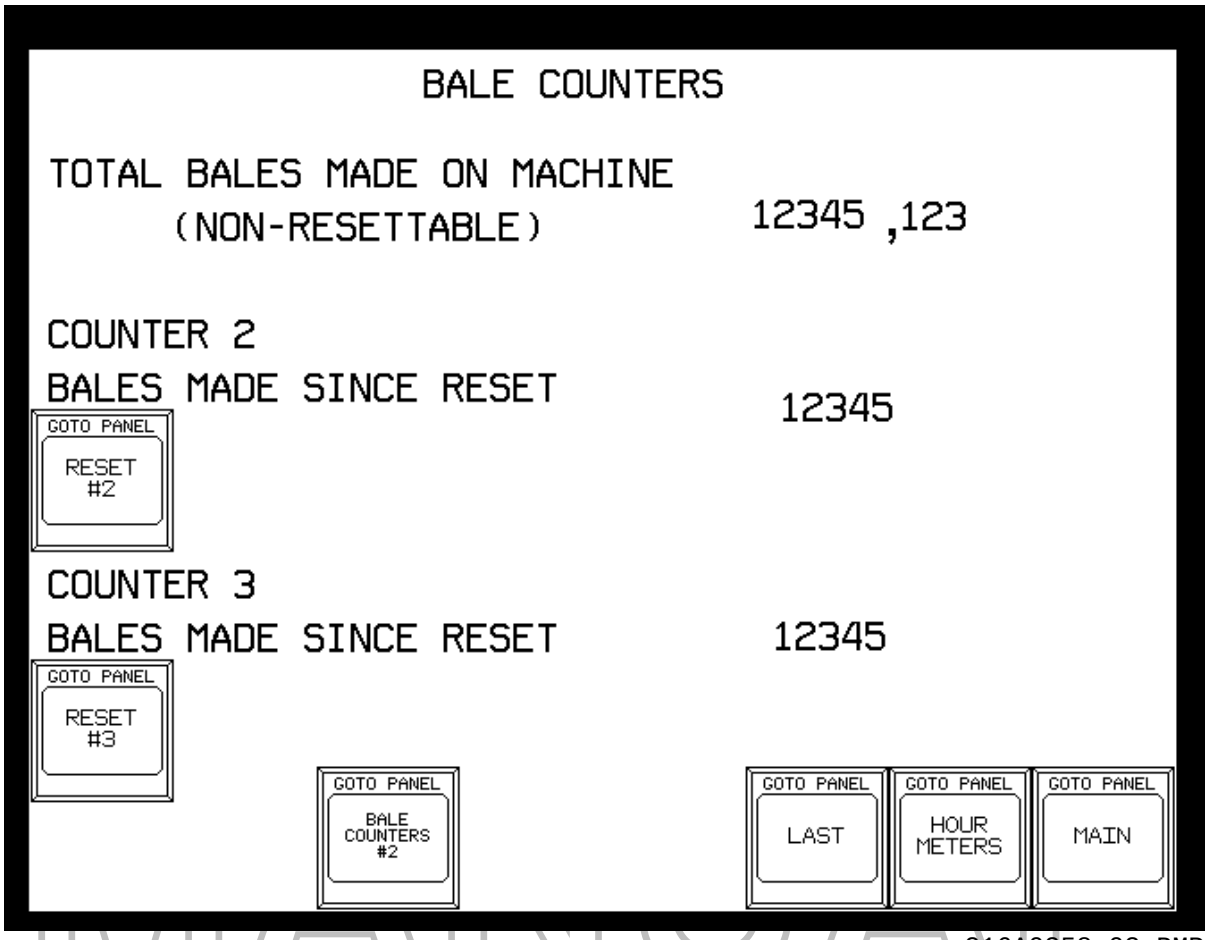
AUTO-TY AUTOMATIC
Select the automatic mode for the baler by pushing the "BALER AUTO." button. Push the "AUTO." button of the Auto-Ty Selector Switch and the baler will function automatically.

SHORT BALE
Set the baler and Auto-Ty to the automatic mode. From the Main Screen, push and hold the "SHORT BALE" button until the display panel displays the message "INSERTER ADVANCING". The baler will tie off the bale automatically.

BALE LENGTH COUNT
Three separate bale lengths can be stored and recalled at any time. In the bottom left corner of the main screen the current bale length counter and the counts left to tie-off are displayed. From the main screen push "BALE LENGTH" to advance to the Bale Length Counter Screen. The selected counter will have a "COUNTER ACTIVE" displayed above, to change the counter push the desired bale count button until the "COUNTER ACTIVE" displayed above. If a different length is needed enter the length from the number keypad and push the enter button to update the program.
Press "MAIN" to return to the main screen.

3LS SELECTION (OPTIONAL)
If the baler is equipped with the three position 3LS option any one of the three limit switches can be selected by pushing the corresponding button on the main screen. "3LS SEL.". "3LSA" is for full stroke, "3LSB" is 2/3 stroke and "3LSC" is 1/3 stroke.

BALER W/TOUCH SCREEN
BALE COUNTERS



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Three Bale Counters that record the number of bales made.

1.) Total Bales Made, Counts the bales made since the baler was started-up. (not resettable)

2.) Bales made since last reset, Counts the number of bales made since last reset. (Reset by pressing the "Reset") and entering the code 427 to access the reset screen.

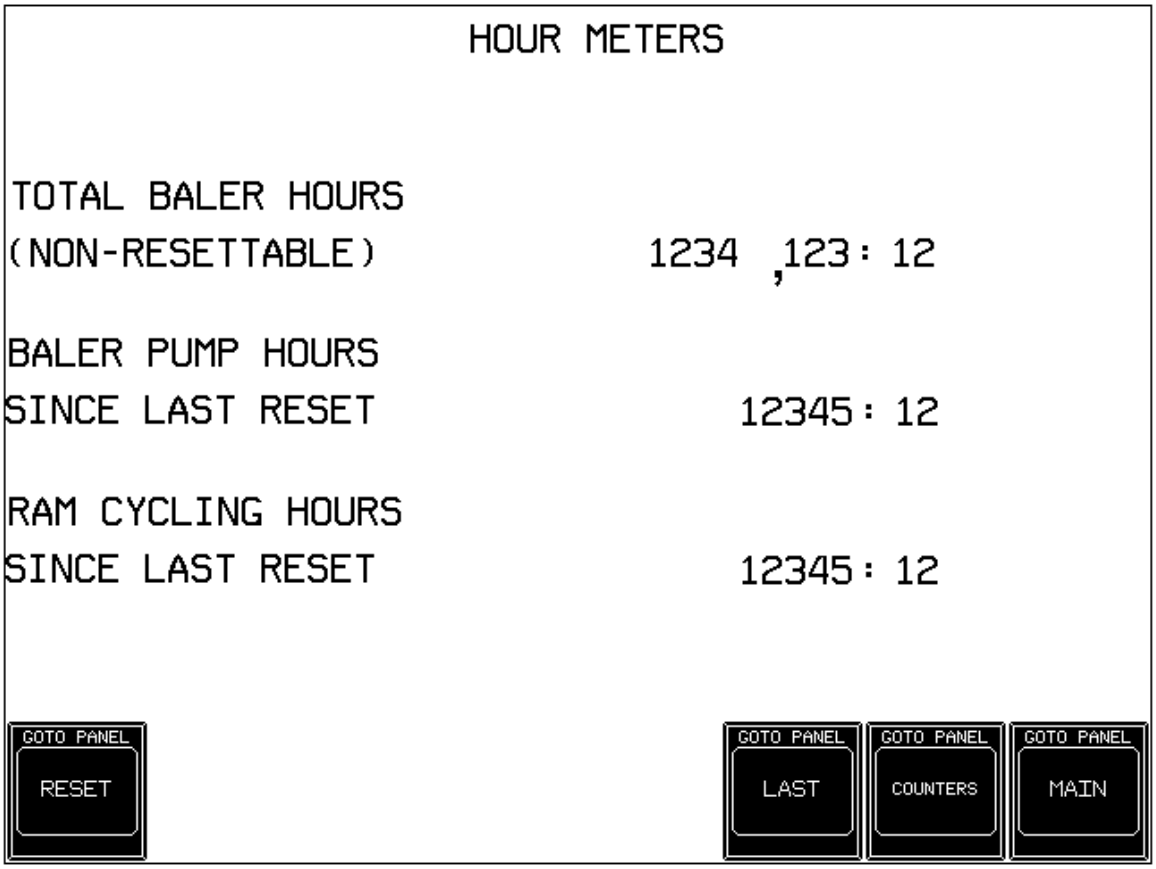
3.) Bales made since last reset, Counts the number of bales made since last reset. (Reset by pressing "Reset") and entering the code 427 to access the reset screen.
(See Page 5.12)

Counters 2 and 3 can be used for production to keep track of the bales made per shift or day.

Press “LAST” to access the bale counter screen.

Push “MAIN” to return to the main screen.

BALER W/TOUCH SCREEN
HOUR METERS



216A0358-02.BMP

Three Hour Meters

1.) Total Baler Hours, Records the hours that the Baler control power is energized, (not resettable).

2.) Baler Pump Hours, Records the hours that the baler pump is running.

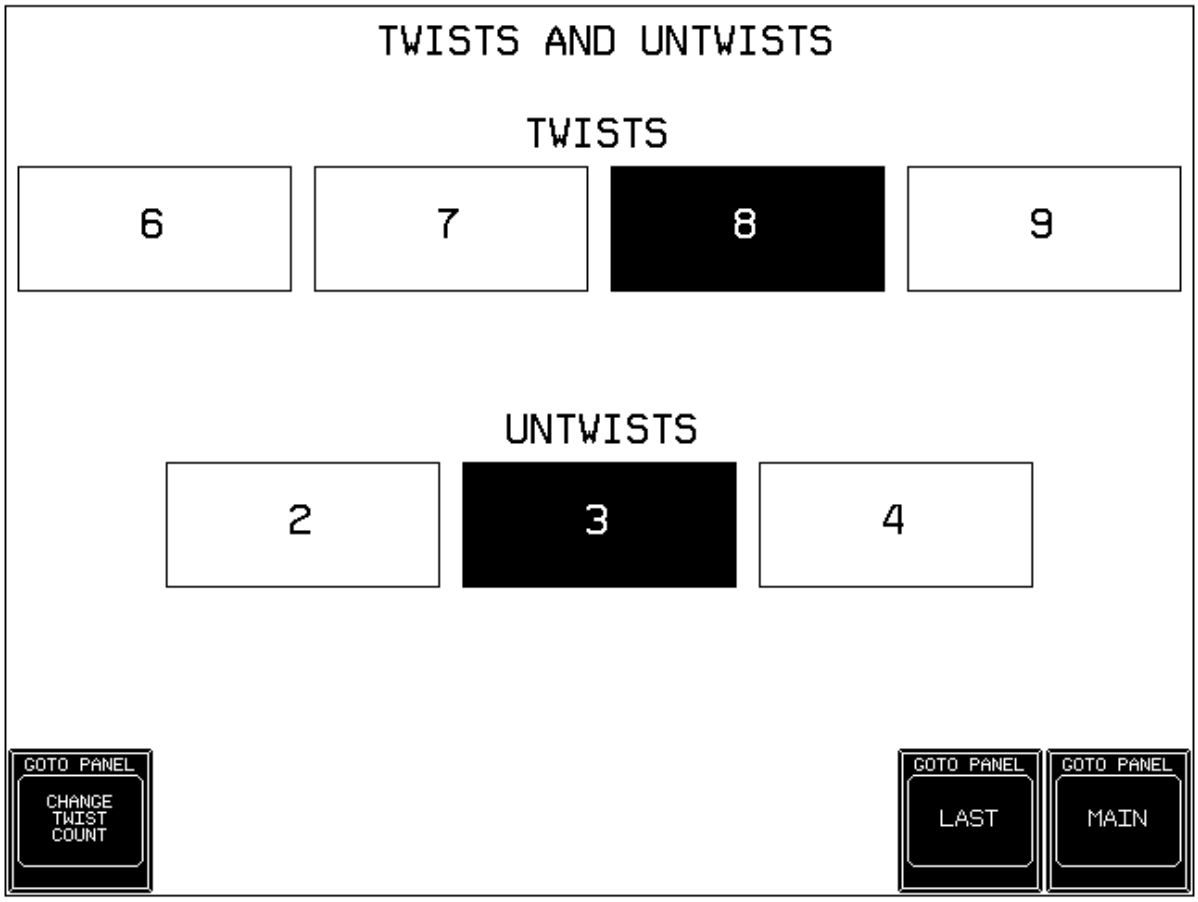
3.) Ram Cycling Hours, Records the hours that the ram is advancing or retracting.

To reset hour meters 2 & 3 press "RESET", to access the reset code screen, enter code 427 then select function to reset. (See Page 5.12)

At 2nd Hour Meter screen, press the "RESET" button corresponding to the hour meter to reset.

Push "MAIN" to return to the main screen.

BALER W/TOUCH SCREEN
TWISTS/UNTWISTS



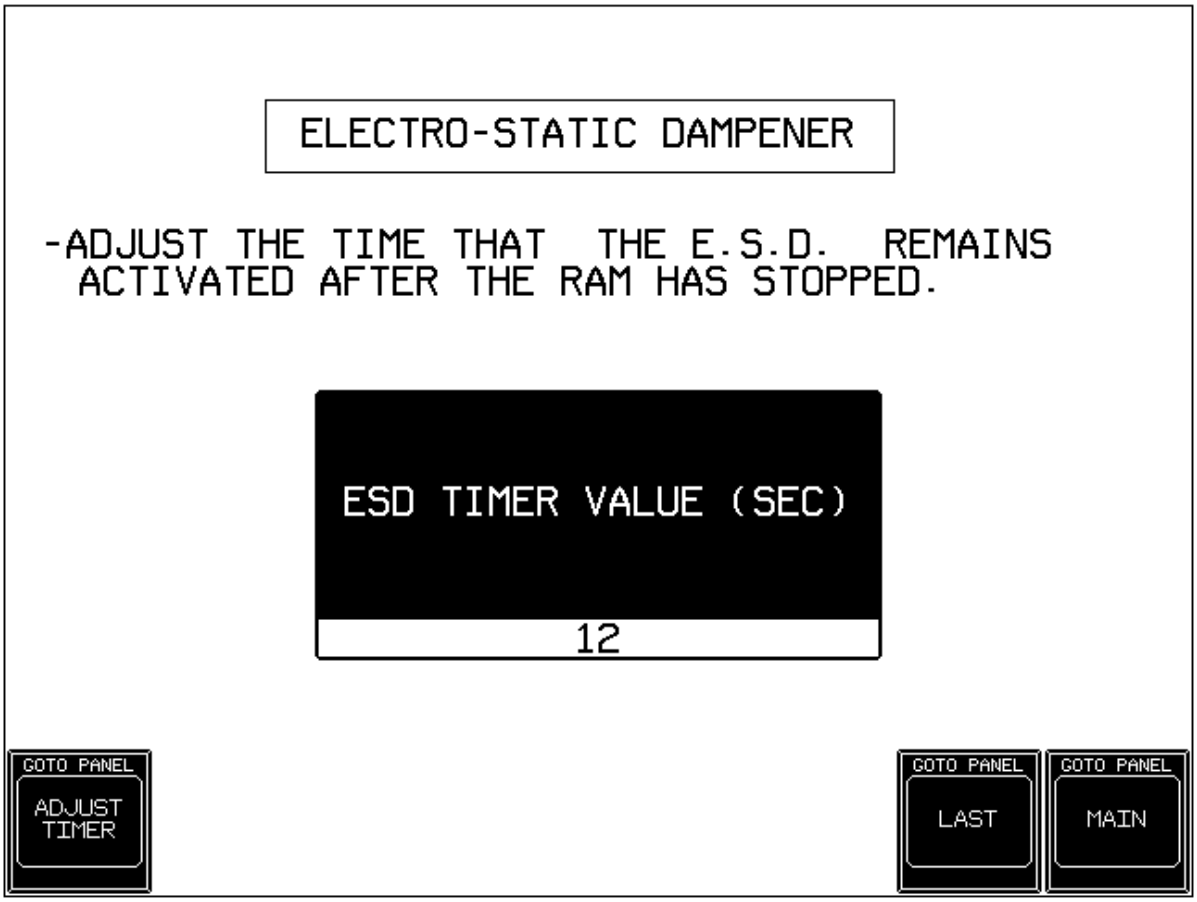
216/A0358-08

The TWISTS/UNTWIST screen displays the current number of twists and untwists that the twister makes during a tie-off. The current selection is shaded. Twists can be between 6 and 9, untwists can be between 2 and 4.

To change the number of twists or untwists, press "CHANGE TWIST COUNT", to access the reset code screen, enter 427 then go to the Twist/Untwists screen and press the desired count. (See Page 5.12)

Press "MAIN" to return to the main screen.

BALER W/TOUCH SCREEN
ELECTRO-STATIC DAMPENER
(E.S.D. OPTIONAL)



216A0358-10.BMP

The Electro-Static Dampener (E.S.D.) automatically sprays water into the feed chute during the ram cycle, reducing the electro-statically charged dust; thereby giving a cleaner operation.

The water spray also helps break-down material memory, (spring back) when baling whole material.

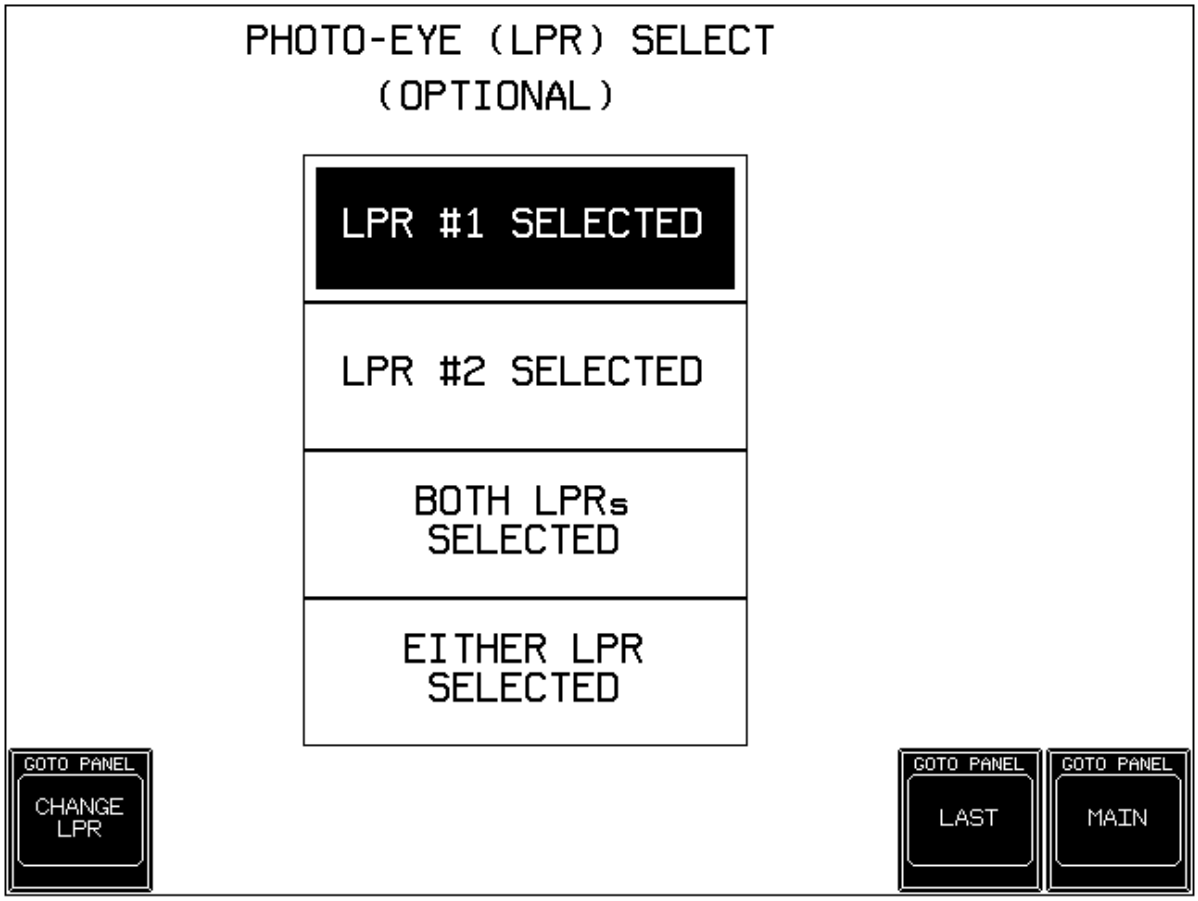
The E.S.D. operates during the ram cycle and remains energized for a preset time after the ram stops. The current E.S.D. screen displays the seconds that the water will spray after the ram stops.

To adjust this timer press "ADJUST TIMER" enter reset code 427 and select ESD. Press the button labeled "INCREASE" or "DECREASE" to change the time. (See Page 5.12)

Press "LAST" to return to the previous screen.

Press "MAIN" to return to the main screen.

BALER W/TOUCH SCREEN
TWO SETS OF BALER CYCLING EYES
(OPTIONAL)



216A00358-09.BMP

If purchased with the baler the LPR Select Screen allows for the selection of which photo-eye will control the ram cycling.

LPR OPTIONS:

1.) LPR #1 is used to cycle the baler.
2.) LPR #2 is used to cycle the baler.
3.) Both LPR's 1 and 2 must be blocked before the ram will cycle.
4.) Either LPR 1 or 2 will cause the ram to cycle.

To change LPR press "CHANGE LPR", enter code 427 then select LPR and select the LPR to be used. (See Page 5.12)

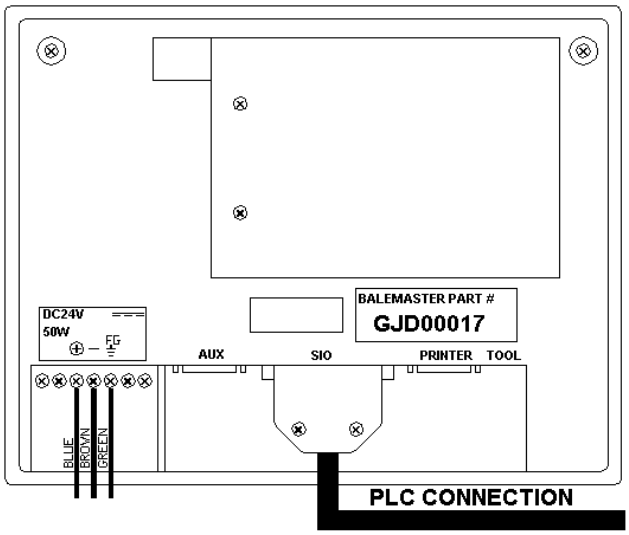
If the baler is not equipped with this option the screen will be visible but no selection can be made.

Press "LAST" to return to the previous screen.

Press "MAIN" to return to the main screen.

BALER W/TOUCH SCREEN
PLC CONNECTING CABLE

The cable shown above connects the Touch Screen to the PLC. Removal of cable could cause machine to malfunction.



216A0358-17.BMP

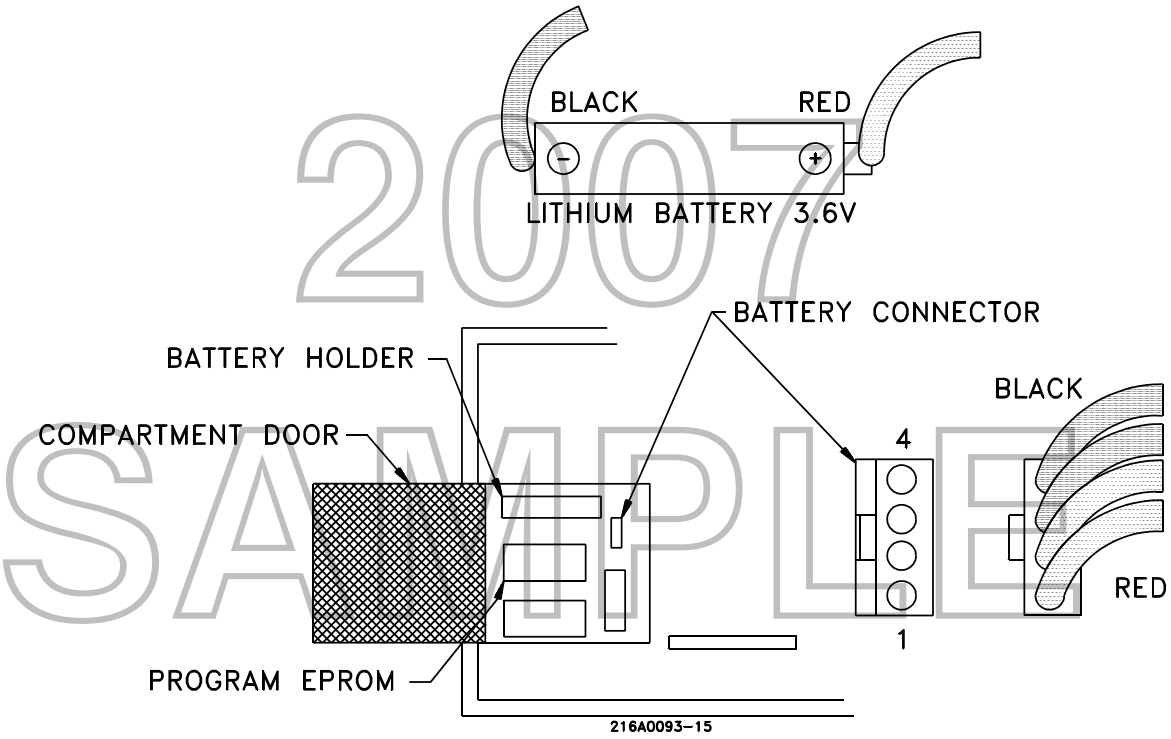
CLEANING TOUCH PANEL SCREEN

Use a mild detergent to remove finger prints and foreign material. Do not use paint thinner, ammonia, ester oil compounds, or acid compounds on the screen.

SCREEN CONTRAST

From the main screen on the touch screen.
Select **OTHERS**.
Select **SET-UP**.
Press **ENTER THE SET-UP PASSWORD**.
Press **7734 OK.**
Press **NEXT**.
Press **CONTRAST**.
Press **DISPLAY** Icon. (two times quickly)
Press **CONTRAST** Tab.
Adjust the slider bar to the best visual display of screen.(Left or Right)
Press **OK**. (Top Right Corner)
Press the **X** to close the window.
Press **BACK-UP** to save the changes made. (Bottom Left of Screen)
A message will indicate that the save has been completed successfully.
Press **OK**.
Press **DONE**.

BALER W/TOUCH SCREEN
TOUCH SCREEN BATTERY REPLACEMENT



TO REPLACE THE BATTERY
Slide battery compartment cover to the left and pull out on the left end. Slide and remove.

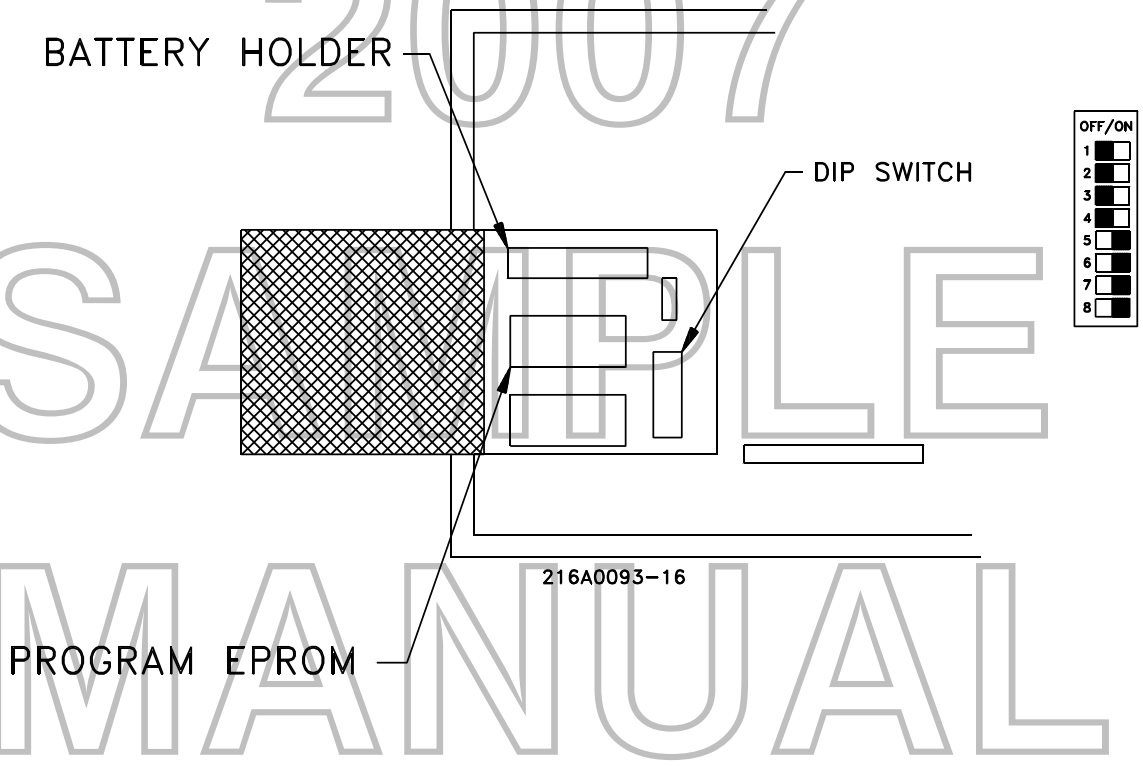
With the TOUCH SCREEN POWERED-UP, pull the battery connector out of it's socket. Remove the battery from the battery holder.

CAUTION:

BATTERY REPLACEMENT MUST BE PREFORMED WITH THE TOUCH SCREEN POWERED-UP. FAILURE TO FOLLOW INSTRUCTIONS COULD RESULT IN LOSS OF PROGRAM.

Connect the new battery to the connector as shown above. Make sure the guide notch on the female connector matches up with the slot on the male connector. Snap the battery into the holder and replace the cover.

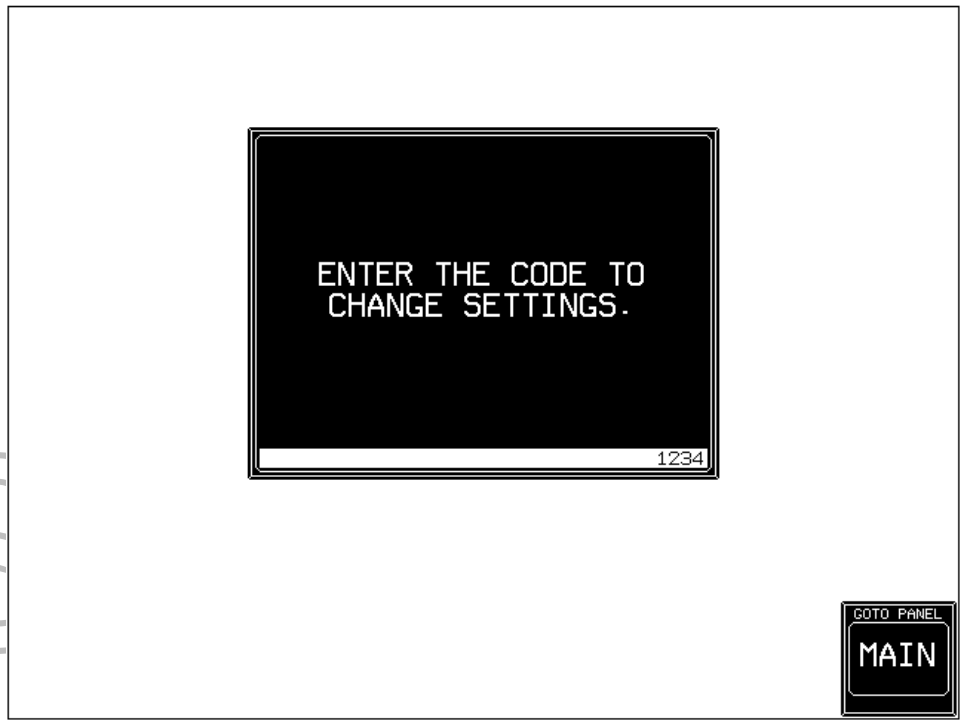
BALER W/TOUCH SCREEN
DIP SWITCH SETTINGS



The diagram above shows the dip switch settings. Changing these settings could cause the machine to malfunction.

The PROGRAM EPROM contains the Touch Screen Program. Removal of the Program Eprom will result in memory loss and machine will not function.

BALER W/TOUCH SCREEN
ITEM CHANGE CODE



216A0358-29.BMP

To change the baler settings, the code "427" must be entered, this prevents accidental changes to the bale length, twists/untwists, and other important information.

First press the box in the middle of the screen until it becomes shaded, then enter the code 427 and press the "ENTER" button.

If by entering the code the screen does not advance to the change setting screen:

1.) Enter 0 first then re-enter the code 427.
2.) The box in the middle of the screen must be shaded for the code to be accepted.

After entering the code the “SELECT ITEM TO CHANGE” Screen will come up. At this screen, make the selection of the item that is to be changed. (See figure above)

Make changes.

Press “MAIN” to return to the main screen.

BALER W/TOUCH SCREEN
SCREEN SAVER

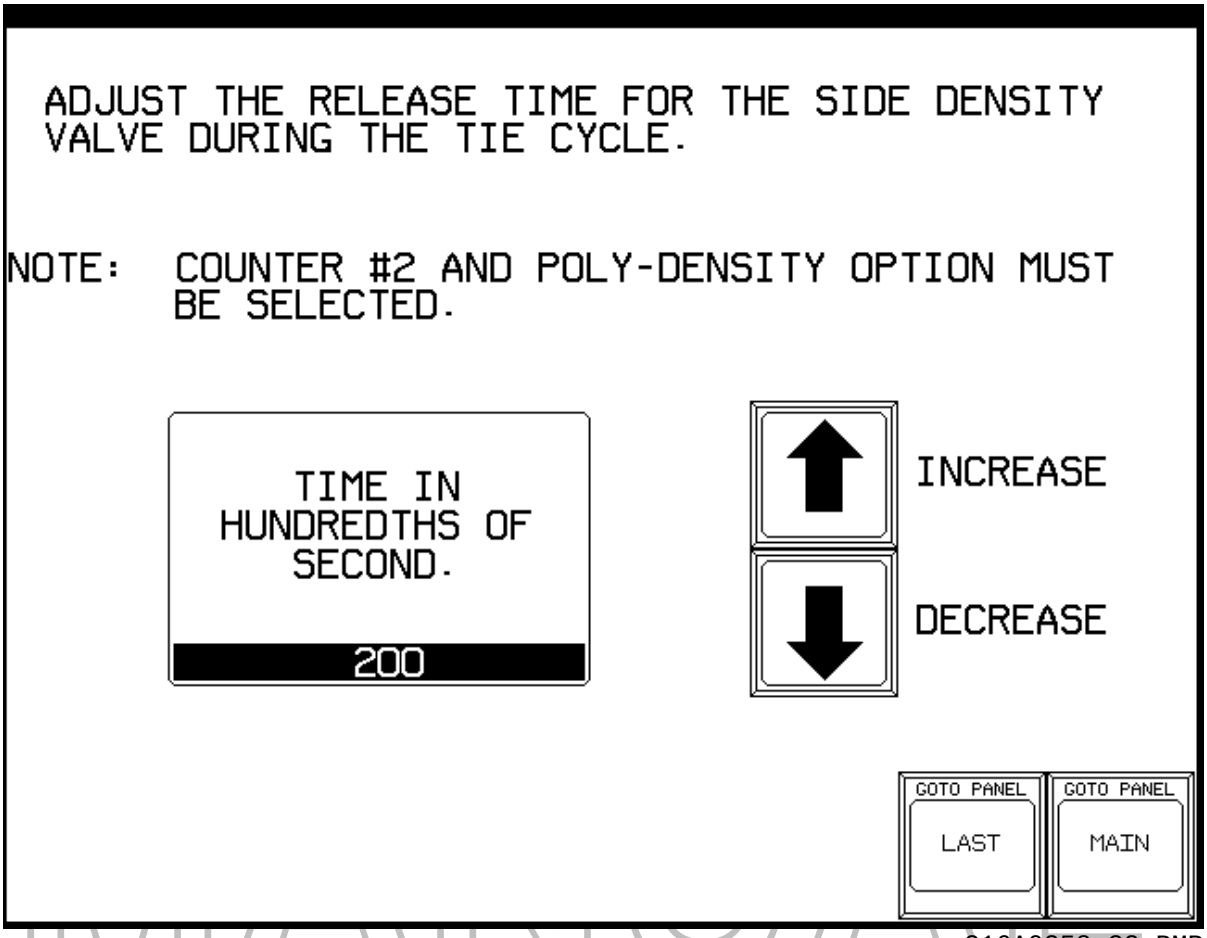
The Touch Screen is equipped with a screen saver to prolong the life of the LCD back light. This screen saver allows the back light to shut off after a predetermined time of non-activity on the screen.

The baler will continue to function even when the screen is dark, if the control power is energized and the proper baler and Auto-Ty modes are selected.

Touching the screen will turn the back light on.

The time for the screen saver is preset at 5 minutes.

BALER W/TOUCH SCREEN
POLY-DENSITY SCREEN
(OPTIONAL)



216A0358-32.BMP

This screen is used to adjust the time duration that the poly-density valve releases the side density pressure. The poly-density option should be used for baling "slick" type materials. The time can be adjusted by pressing the increase or decrease keys.

When counter #2 is selected, the poly-density valve will open and release the side density pressure for the displayed time value before the inserter needles begin to advance for the Auto-Ty. It allows for the expansion of the bale and prevents bale wire breakage.

When finished making adjustments, press the "main" “MAIN” key to continue.

TOUCH SCREEN SPECIFICATIONS

10.5 MONOCHROME LCD

Voltage	20.4 - 27.6 VDC
Power Consumption	50 Watts Max.
Power Failure Immunity	20 ms Max.
Withstand Voltage	1500 VAC (20 ma Max., 1 min)
Insulation	10 M Ω @ 500 VDC
Noise Immunity	1200 V(p-p) 1 us pulse
Ratings	Suitable for IP65F, NEMA # 250, Type 4/13
Operating Temperature	0° to 45°C
Storage Temperature	-10° to 60°C
Operating Humidity	30 to 85% RH non-condensing
Storage Humidity	5 to 85% RH non-condensing
Vibration	10 to 25 Hz 2G on each of X, Y, Z 30 min.
Dimensions	9.57"H x 12.48"W x 3.05"D 317mmW, 243mmH, 85mmD
Weight	6.6 lbs. (3kg) + option module
Cooling	Natural Convection
Installation	Front Mount
Display Type	LCD Monochrome
Pixel Resolution	640 X 480 W
Colors	White/Black + Flash
Viewing Area	8.48" W x 6.32" H, 10.5" diag. (212mm x 158mm)
Touch Panel Type	Resistive
Touch Panel Resolution	32 W X 24 H
Printer Port	Yes

BALEMASTER SERIES

INSTALLATION INSTRUCTIONS

NOTE: INSTALLATION IS TO BE MADE BY QUALIFIED PERSONNEL AND IS THE RESPONSIBILITY OF THE USER MANAGEMENT.

1. Carefully move the baler into desired location and remove skids. Level the baler using floor of baler chamber as reference. Do not leave gaps at anchor points (always shim or grout). Anchor the baler to the floor through holes provided in anchor pads.

2. Place the slide plate section (if furnished) in front of the baler. See Slide Plate Instructions for installation.

3. Check the level of the hydraulic oil by use of the dipstick. If it is low or not visible on the dipstick, add premium grade of non-foaming oil (See Page 19.4). It is better to slightly overfill than under-fill (Refer to Preventive Maintenance - Hydraulic Oil Change).

   If the baler is to be operated or left standing for a period of time in other than normal temperature conditions (70°F), normal oil supplied may not be suitable. Check with your local hydraulic oil supplier for unusual temperature conditions.

   The electrical components are designed to operate in a temperature range of 32°F to 104°F (0°C to 40°C), in the absence of condensation and freezing moisture.

4. Connect your 3 Phase Electrical Power to the Power Control Cabinet and ground the baler frame per Local or National Electrical Codes. NOTE: ALL ELECTRICAL DISCONNECT SWITCHES SHOULD BE INSTALLED IN SIGHT OF ALL MOTOR CONTROLS OR SHOULD BE CAPABLE OF BEING LOCKED IN "OFF" POSITION ONLY. A tag on the electrical control box indicated the voltage, phase and frequency. Your machine is prewired in accordance with the purchase order.

   WARNING: THE PROGRAMMABLE LOGIC CONTROLLER AND THE BALER ENCLOSURE MUST BE PROPERLY GROUNDED. ALL APPLICABLE CODES AND ORDINANCES MUST BE OBSERVED WHEN WIRING THE BALER.

   DO NOT START UNIT.

5. Check pump rotation per initial check sheet.

INSTALLATION INSTRUCTIONS

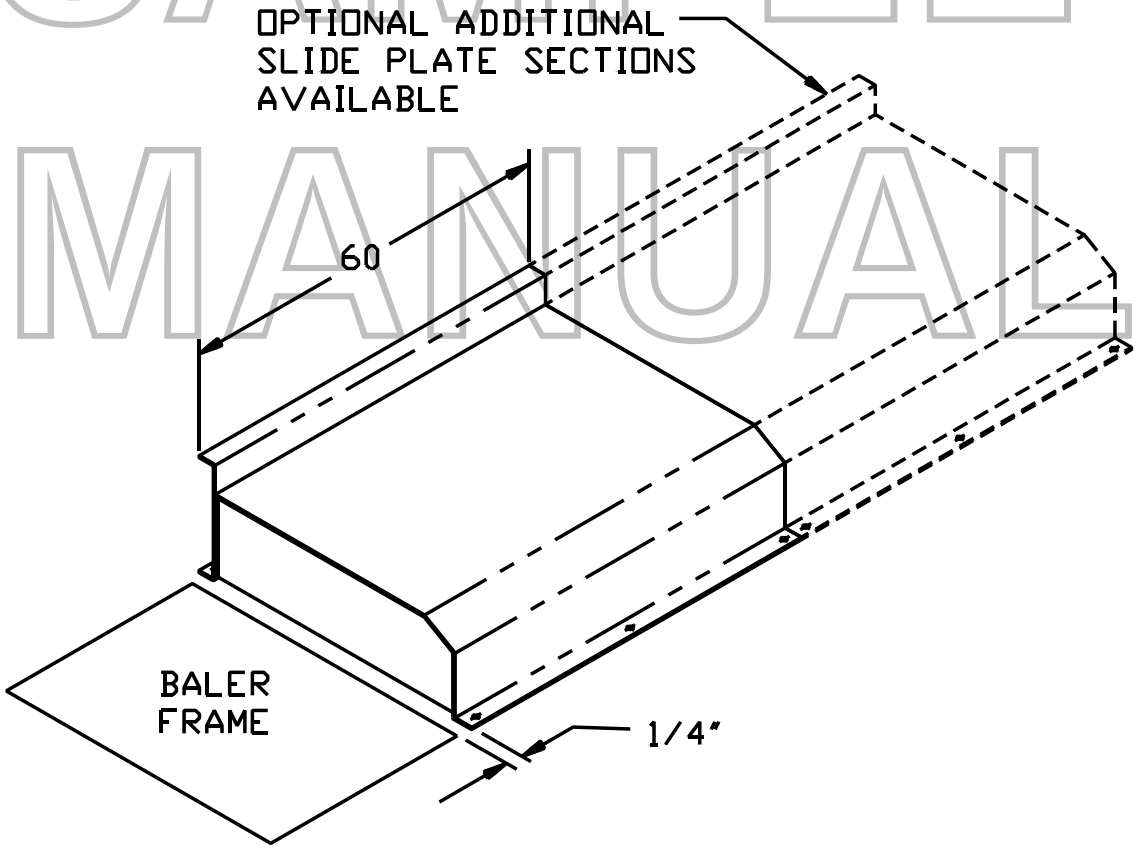
BALEMASTER SERIES - BALE SLIDE PLATE

1. The Balemaster Series Balers are supplied, as an option, with a five foot Bale Slide Plate.

2. For all models, locate the slide plate 1 ½" forward of the baler frame.

3. Level the conveyor as necessary, making sure the slide plate is below bale chamber floor line.

4. Anchor slide plate to floor using all mounting holes provided.



INITIAL CHECK-OUT
BALER W/TOUCH SCREEN

NOTE: INSTALLATION IS TO BE MADE BY QUALIFIED PERSONNEL AND IS THE RESPONSIBILITY OF THE USER MANAGEMENT.

1. Check completion of installation instructions.

2. On the Operator's Control Cabinet Door, check to see that:

   A. Electrical Power Switch (Red Mushroom Button) is pushed in.

3. Throw the disconnect switch handle, located on the Power Control Cabinet, to "ON". Yellow L.E.D. indicator should illuminate on the source and receiver photo switches. The Red and Green L.E.D.'s should illuminate if the source and receiver are aligned and there is electrical power to the Power Control Cabinet.

4. Pull Electrical Power Switch (Red Mushroom Button) out to "START". This energized the 115 Volt Control Circuit causing the power switch light to illuminate. If pilot light does not illuminate check:

   A. Electrical power hook-up.
   B. 115 Volt Transformer Fuse located on Electrical Control Panel.
   C. Faulty lamp in Electrical Power Switch.

   NOTE: TO REMOVE BULB, UNSCREW RED MUSHROOM BUTTON SECTION.

5. "With Access Door Closed", pull Red Mushroom Button out to energize the master control relay. Check the pump rotation by pressing the "BALER MANUAL" Button and note the direction of rotation. The pump shaft normally rotates clockwise when looking at the shaft end. The direction of rotation should correspond to the arrow on the pump. If it does not, reverse leads "T1" & "T3" at incoming side of disconnect and repeat test.

CAUTION:

OPERATING THE MOTOR FOR MORE THAN A FEW SECONDS IN "REVERSE DIRECTION" COULD CAUSE DAMAGE TO THE HYDRAULIC PUMP.

6. Test the Door Interrupting Limit Switch by opening access door. This should stop the pump. If it does not, adjust switch arm and retest. Pump should operate only when access door is closed and it's switch activated.

7. Electric Eye light source and receiver alignment, per alignment procedure instructions.

INITIAL CHECK-OUT CONTINUED
BALER W/TOUCH SCREEN

8. At the control cabinet, select the "BALER MANUAL" button, press the "DONE" button to advance to the main screen, then press the Baler Mode button to advance to the Baler & Auto-Ty Selector Screen. Press the "MANUAL RAM FWD." button (F1) and hold until the ram moves forward about twelve (12) inches. If ram does not move forward recheck pump rotation and the hydraulic oil level. Select the Automatic mode by pushing the "BALER AUTO." button, and the ram will automatically return to the rear position and stop. Select "BALER MANUAL", press the "MANUAL RAM FWD." button and hold until the ram advances to it's full stroke. Press the red "STOP" button and observe the position of the ram in the chamber, the wire tie slots in the ram face should be fully exposed. Pull the "START" button, press the "BALER MANUAL" button and press the "MANUAL RAM RETRACT" button, and hold until the ram returns to the rear position and stops.

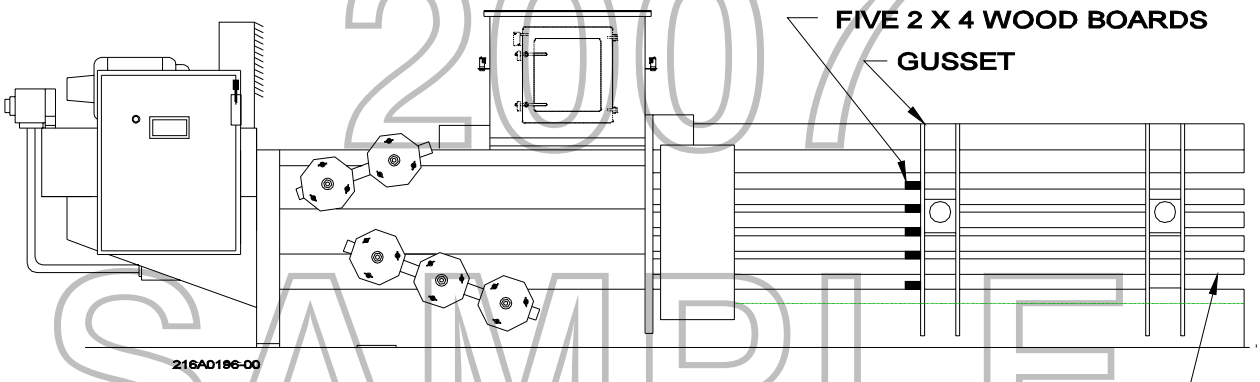
9. With "BALER AUTO" selected block the electric photo eye light beam using a heavy piece of nontransparent paper or cardboard. After a delay of about five seconds the motor(s) will start and the baler will continue to cycle as long as the light source is blocked. Remove the paper blocking the light source, the ram will finish its cycle, return to the back position and the motor(s) will turn off.

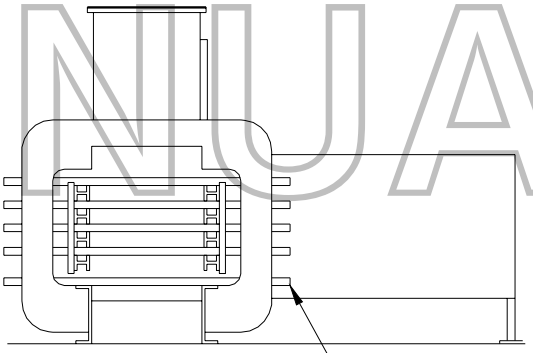
AUTOMATIC BALE LENGTH CONTROL

10. Replace the paper block on the electric photo eye. Select the off mode for the AUTO-TY by pressing the "OFF" button. While the ram is cycling, rotate the bale length counter, located on the top of the frame near the bale exit. Rotate the wheel in the direction it would normally move as the bale passed beneath it. Continue rotating the wheel until the ram moves to the full forward position. At this point the machine is ready to make a tie.

If all of the above operations function properly, go to Page 7.00 of the Auto-Ty section of the manual and begin the Initial Check-Out. If there are any discrepancies in the above operations, refer to the TROUBLE SHOOTING CHART section of the manual (Page 20.00).

INITIAL START-UP





INITIAL START-UP
BALER W/TOUCH SCREEN

AFTER COMPLETING THE INSTALLATION & CHECK-OUT
THE BALER IS READY FOR START-UP

CAUTION:

**DO NOT ACTIVATE SIDE DENSITY SYSTEM AT THIS TIME;
SIDE DENSITY SHUT OFF, ITEM #25 ON THE HYDRAULIC
SCHEMATIC, SHOULD BE CLOSED TO PREVENT EQUIPMENT DAMAGE.**

1. Place five 2" X 4" soft wood boards across I-Beam side rails of bale chamber against the ram side of vertical post. End of boards should have minimum grip of 1".

2. Fold a heavy piece of paper or corrugated board to the cross-section dimensions of the bale chamber and set upright against (ram side) the 2" X 4" boards.

3. Energize 115 volt control circuit by pulling out the Red Mushroom Start Button. Proceed to the Bale & Auto-Ty Selector Screen, Push Baler "MANUAL" button. Press "MANUAL RAM FWD." until the ram stops in the fully forward position.

4. Feed material into feed chute. Let material build up at least 40" in the feed chute when forming the first bale. Turn the baler to automatic.

CAUTION:

**HAVE ALL PERSONNEL STAY CLEAR OF FRONT OF MACHINE AT THIS TIME.
AS THE MATERIAL COMPRESSES THE 2" X 4" WOOD BOARDS WILL BREAK.**

5. Continue to bale until material "packs" against 2" X 4" boards. Select the manual mode by pushing the "BALER MANUAL" button. Press the "MANUAL RAM FWD." button and advance the ram manually until wire-tie slots on the ram are fully exposed. Push the red stop button to turn the baler off.

6. Tie off bale. Check that the ram slots are exposed. Turn the baler and the Auto-Ty to "MANUAL" Press "MANUAL INSERTER IN" and hold until the needles stop. Turn baler power off. Check to see that the needles stopped with the center of the notch, on the needle, lining up with the twister hooks. If the needles are not lined-up 2LST will have to be adjusted. Once 2LST is adjusted and the needles are in the proper position the tie can be completed. Turn the control power on and select "BALER AUTO" and AUTO-TY "AUTO", the hooks will begin to twist.

INITIAL START-UP (CONTINUED)
BALER W/TOUCH SCREEN

7. After the tie is complete set the auto-ty to "MANUAL" and continue feeding material in the feed chute. When the first bale reaches the end of the baler, activate the density system by opening SHUT OFF VALVE #25 on the hydraulic circuit. Adjust Valve #18 for the desired density.

8. When second bale has been made to the desired length, (72" maximum), put the baler in manual by pushing the "BALER MANUAL" button. Manually advance the ram by pushing and holding the "MANUAL RAM FWD." button until the ram slots are exposed. Tie off the bale as described in Steps 5 & 6. Read instructions for bale length control before proceeding to the next step.

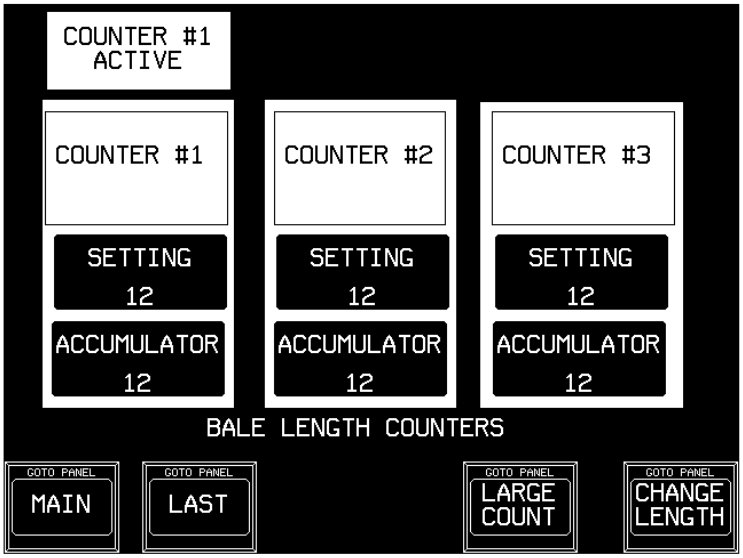
CAUTION:

HAVE ALL PERSONNEL STAY CLEAR OF FRONT OF MACHINE AT THIS TIME; AS THE MATERIAL COMPRESSES, THE 2" X 4" WOOD BOARDS WILL BREAK.

9. Turn baler back to automatic and continue to bale. The third bale should have the density to advance the Bale Length Counter Ratchet Wheel as the bale advances in the baling chamber.

10. When the third bale has been made to desired length, the bale length counter has counted out, the ram will automatically stop in forward position with wire-tie slots exposed the Auto-Ty will tie off the bale.

BALE LENGTH COUNT SELECTION
BALER W/TOUCH SCREEN



The bale length control automatically measures the length of the bale as it is being formed. A sprocket, mounted near the front of the baler frame, trips a limit switch (6LS) as the bale advances from the baling chamber. This is electrically sensed and entered into the programmable logic controller (PLC).

In the bottom left corner of the main screen the current bale length counter and the counts left to tie-off are displayed.

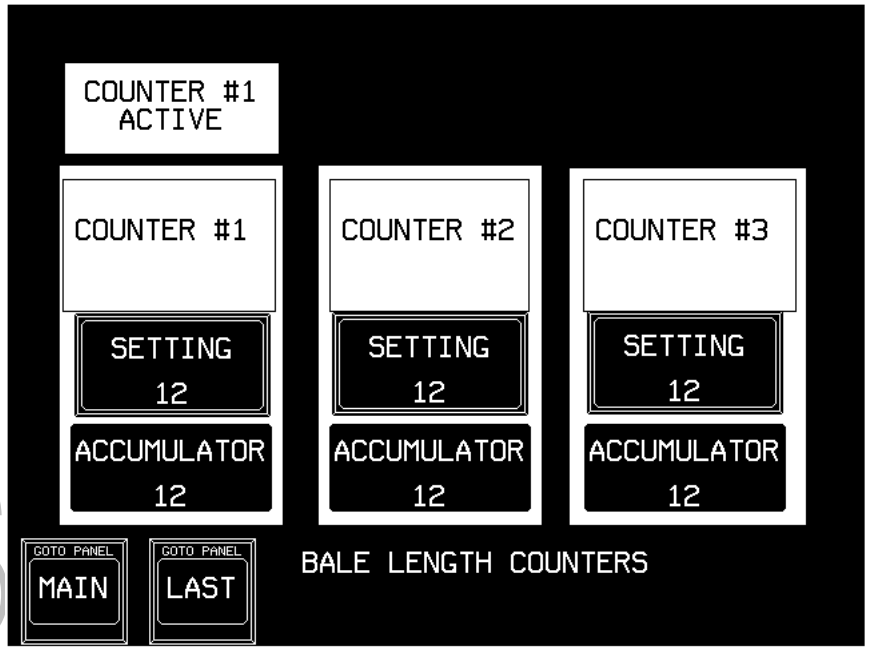
BALE COUNT

Three separate bale lengths can be stored and recalled at any time. From the main screen push "BALE LENGTH"/"CHANGE LENGTH" to advance to the Bale Length Counter Screen (shown above). The selected counter will have "COUNTER#_ ACTIVE" above, to change the counter push the desired bale count button until "COUNTER#_ACTIVE" is displayed above.

If a different length is needed press "CHANGE LENGTH" enter the reset code 427, See Page 5.12, then select Bale Length Counters. Go to Page 8.04.

Press "MAIN" to return to the main screen.

BALER W/TOUCH SCREEN
BALE LENGTH COUNT ADJUSTMENT



BALE COUNT

See Page 8.03 for procedure to access Bale Length Adjustment Screen.

If a different length is needed, enter the length from the number keypad and push the enter button to update the program.

Press "MAIN" to return to the main screen.

Numbers entered for bale length count are relative numbers and do not represent the bale length in actual inches. A count of 44 entered into the program may result in a actual bale length of 48 inches. A count of 66 entered into the program may result in a actual bale length of 72 inches. These values will vary with material being baled, baling pressure, condition of the material (wet or dry) and the amount of expansion after the bale is out of the chamber. Normally a bale will expand approximately 1 inch for every 12 inches of bale length. Some experimentation will be required to get the exact length required.

OPERATING INSTRUCTIONS
BALER W/TOUCH SCREEN

CAUTION:

READ THIS ENTIRE MANUAL BEFORE OPERATING THIS EQUIPMENT

AUTO-TY OFF:

When the Auto-Ty is in the off position, the baler will operate normally until the bale length is reached. The baler will not continue to cycle until a tie has been made and the bale length counter automatically resets.

AUTO-TY AUTOMATIC: INITIAL CONDITIONS & SEQUENCE OF OPERATIONS.

1. Select the automatic mode for the baler as described in the Baler Owner's Manual. (See Page 7.01.)
2. Set the Auto-Ty to automatic by pressing the "AUTO" button of the Auto-Ty Selector Switch.
3. Baler & Auto-Ty operation will function automatically.

AUTO-TY MANUAL: INITIAL CONDITIONS & SEQUENCE OF OPERATIONS.

To run the baler and Auto-Ty in manual the Baler & Auto-Ty screen must be displayed.

1. Set the baler in the manual mode by pressing the "BALER MANUAL" button. Press the "MANUAL RAM FWD" button and hold until the ram is all the way forward and limit switches 4LS, 5LS and 5LSA are activated.
2. Set the Auto-Ty to manual by pressing the "MANUAL" button of the Auto-Ty Selector Switch.
3. To advance the inserter carriage, press the "MANUAL INSERTER IN" button.
4. To retract the inserter carriage, press the "MANUAL INSERTER OUT" button.
5. To twist press the "MANUAL TWIST" button.

NOTE: The carriage must be fully retracted activating 1LST.

SHORT BALE: INITIAL CONDITIONS & SEQUENCE OF OPERATION.

1. Set the baler to the automatic mode by pressing the "BALER AUTO." button.
2. Set the Auto-Ty to automatic by pressing the "AUTO." button.
3. From the Main Screen press and hold the "SHORT BALE" button.

NOTE: ANOTHER TIE CANNOT BE MADE UNTIL THE RAM HAS BEEN FULLY RETRACTED ACTIVATING 3LS.

HELPFUL HINTS FOR FORMING BETTER BALES

For best results make sure the ram returns to its fully retracted position after each stroke. It should stay at this position until the photo-electric eye has been blocked.

Under normal conditions, the ram chamber and feed chute should be full of material at this time. Should the photo-electric eye be blocked by dust, foreign material or improper filling of the chute (such as material falling all on one side), a false signal will be given and the machine will cycle. After continuous operation under this condition, the bales coming out may have a very loose look, be lower than average in weight, curved bales or even fall apart.

Below is a list of items to check if you are experiencing these conditions:

1. Make sure the lenses of the photo-electric receiver and feed chute glass are free of dust.

2. Make sure the electro-static dampener (if furnished) is operating. this will help keep the dust down.

3. Check the time on the photo-eye. It should be 6 to 8 seconds (See Photo-Eye Alignment Procedure for adjusting instructions).

4. Make sure the material you are baling has been properly prepared. This will help to insure a proper charge in the chamber, giving a uniform bale.

5. Make sure material is falling evenly in the feed chute. Curved bales are usually a result of uneven loading in the feed chute.

It has been our experience that if the ram does not move forward far enough to trap the material with the Balelock, the material may spring back and prevent forming a proper charge. Never bale wax board or poly type coated material without the wax option. They will cause the side rails to become slippery and a loss of baling pressure will occur.

BALEMASTER TECHNICAL OPERATING DESCRIPTION
BALER W/TOUCH SCREEN

LIMIT SWITCHES & SOLENOID VALVES DESIGNATION & FUNCTION

SYMBOL	DESCRIPTION
3LS	Baling Ram Retracted
4LS	Baling Ram (Auto-Stroke)
6LS	Bale Length Control
Sol A	Advance Baling Ram
Sol B	Retract Baling Ram
LPR	Lower Photo Electric Relay (Cycling Eye)

The baler can be operated in Automatic, Continuous, or Manual.

AUTOMATIC OPERATION: INITIAL CONDITIONS & SEQUENCE OF OPERATIONS

1. Pull the power control switch out to start the machine. The yellow L.E.D. lights will light up indicating the 110 Volt control circuit is energized.

2. Push the button on the panel marked "BALER AUTO". If the photo eye's are blocked the motor(s) will start and the ram will cycle. After photo eyes are clear the ram will return to the back of the machine and the motor(s) will stop.

3. As material builds in the feed chute to the level of the electric photo eye, the light beam will be blocked and after a brief time delay Solenoid "A" will be energized and the baler ram will advance forward. Solenoid "A" will remain energized until the ram completes it's stroke activating Limit Switch "4LS".

4. When limit switch is activated, Solenoid "B" is activated retracting the baling ram. Solenoid "B" will remain energized until the baling ram completes it's stroke actuating limit switch "3LS", which de-energizes the pump(s) and cooler motors.

5. As material builds up in the feed chute to level of "LPR" unit cycling eye, the blocking of light beam will cause the "LPR" time delay to expire energizing Solenoid "A", advancing the baling ram in the forward stroke. Solenoid "A" will remain energized until ram completes stroke, actuating Limit Switch "4LS".

6. When Limit Switch "4LS" is actuated, Solenoid "B" is energized retracting baling ram. Solenoid "B" will remain energized until ram completes stroke actuating Limit Switch "3LS" which de-energizes the pump and cooler motors.

TECHNICAL OPERATING DESCRIPTION CONTINUED
BALER W/TOUCH SCREEN

AUTOMATIC: INITIAL CONDITIONS & SEQUENCE OF OPERATIONS

7. The baling cycle as described in Steps 5 and 6 continues until the Selected Bale Length Control Counter has reached its present count. The counter responds to impulses from Limit Switch "6LS" which is actuated by the moving ratchet wheel due to forward motion of material in the baling chamber.

8. When the preset count on counter has been reached, the baling ram will then move full forward and stop, exposing ram face tie slots.

   Go to Auto-Ty Section in Manual

NOTE - MODELS 50 H.P. AND LARGER:
IF BALER STARTS MORE THAN 4 TIMES PER HOUR, RUN BALER IN "CONTINUOUS". STARTING MORE THAN 4 TIMES PER HOUR WILL SHORTEN THE LIFE OF BOTH THE STARTER AND MOTOR.

CONTINUOUS: (OPTIONAL) INITIAL CONDITIONS & SEQUENCE OF OPERATION

STEPS 1, 2 and 3 same as in "Automatic" sequence.

4. Press the "CONT" button on the Baler & Auto-Ty Selector Screen. If baling ram is in its retracted position and actuating Limit Switch "3LS", the pump and cooler motors will start. If baling ram is not in its retracted position and off "3LS", the pump and cooler motors will start, retracting the baling ram until "3LS" is actuated, and pump and cooler motors will continue to run.

STEP 5 same as in "Automatic" sequence.

6. When Limit Switch "4LS" is actuated, Solenoid "B" is energized retracting baling ram. Solenoid "B" will remain energized until ram completes stroke actuating Limit Switch "3LS". The hydraulic pump and cooler motors will continue to run at "IDLE".

STEPS 7 and 8 are the same as in "Automatic" sequence.

TECHNICAL OPERATING DESCRIPTION CONTINUED
BALER W/TOUCH SCREEN

MANUAL: INITIAL CONDITIONS & SEQUENCE OF OPERATION

1. Pull the start-stop switch out to energize the control power. The red light will illuminate indicating the 115 Volt Control Circuit is energized.

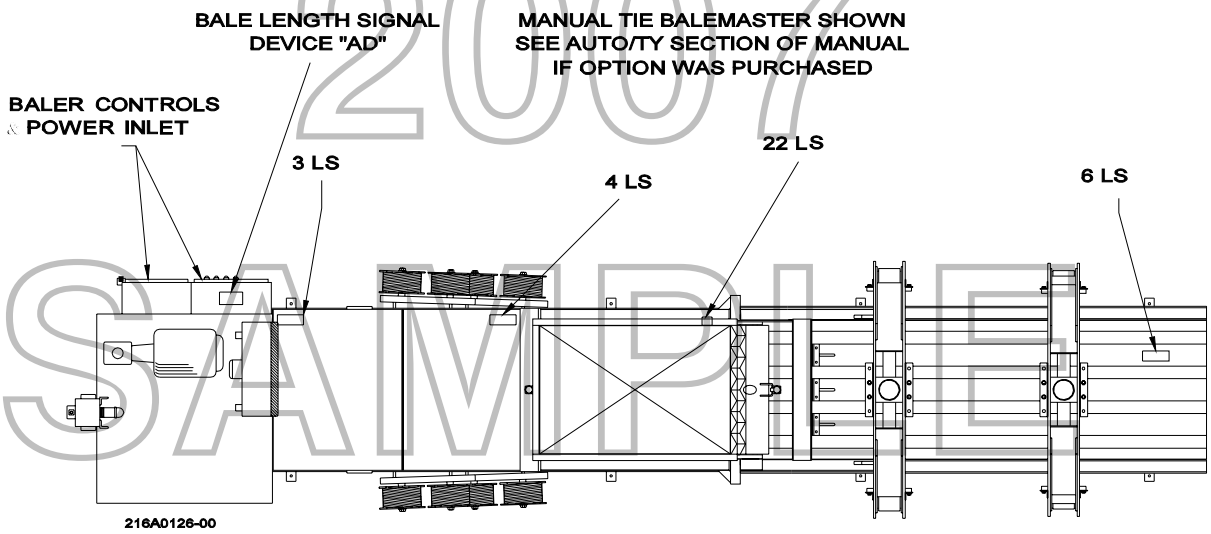
   To run the baler in manual the Baler & Auto-Ty Selector Screen must be displayed.

2. Turn the baler to manual by pressing the Baler "MANUAL" button. The button will be shaded and the hydraulic pump motor and cooler motor will start.

3. MANUAL ADVANCE BALING RAM: Pressing the "MANUAL RAM FORWARD" button will energize Solenoid "A", advancing the baling ram. Solenoid "A" will remain energized until either the push button is released or the Ram reaches 5LS and 5LSA.

4. MANUAL RETRACT BALING RAM: Pressing the "MANUAL RAM RETRACT" button will energize Solenoid "B", retracting the baling ram. Solenoid "B" will remain energized until either the push button is released or the Ram reaches 3LS.

LIMIT SWITCH LOCATIONS



BALEMASTER

LIMIT SWITCHES - DESCRIPTION/ADJUSTMENTS

Refer to Limit Switch Arrangement Diagram on Page 13.00.

DESCRIPTION: REAR LIMIT SWITCH "3LS"

The Limit Switch is located toward the rear of the ram chamber.

FUNCTION: With the ram in the retracted position and limit switch actuated, the baling cycle is ready for operation when material builds up in the feed chute causing the "LPR" light beam to be blocked. After a time delay, Solenoid "A" is energized causing the 4-way valve to shift, making the ram go forward.

NOTE: UNDER THIS CONDITION, THE PUMP MOTOR WILL NOT RUN WHEN BALER UNIT IS IN THE AUTOMATIC MODE. IT WILL RUN CONTINUOUS WHEN BALER UNIT IS IN THE CONTINUOUS MODE.

ADJUSTMENT: Position of limit switch arm should be such that when the ram is fully retracted, it will be actuated. If improperly adjusted, the ram cannot actuate the limit switch and the ram will not advance when going through the baling cycle.

NOTE: RAM SHOULD STOP 1/4" TO 1/8" BEFORE "DEADHEAD" OF CYLINDER. DO NOT STOP AT DEADHEAD OF THE CYLINDER ON RETURN STROKE OR DAMAGE MAY OCCUR TO CYLINDER.

DESCRIPTION: LIMIT SWITCH "4LS"

This Limit Switch is located forward in the ram chamber.

FUNCTION: When limit switch is actuated as the ram moves forward, it energizes Solenoid "B", causing the 4-way valve to shift, making the ram reverse after the forward stroke.

ADJUSTMENT: Position of limit switch arm determines length of ram stroke when stroke is done automatically. If the limit switch arm is properly adjusted, the length of the stroke positions the material fully in front of the balelocks, preventing the materials from expanding back into the feed chute chamber when ram returns to the retracted position. The normal reversing position is when the ram face is 1/4" past the side sheets.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

LIMIT SWITCHES - DESCRIPTION/ADJUSTMENTS

DESCRIPTION: LIMIT SWITCH "6LS"

This limit switch is located under cover of the bale length control mechanical mechanism mounted on top of the bale chamber.

FUNCTION: This limit switch, each time actuated by the moving ratchet wheel, sends an electrical impulse signal to the counter, causing the counter to count down.

ADJUSTMENT: If this limit switch is properly adjusted, the contacts will "make & break" on each actuation of the ratchet wheel cam.

DESCRIPTION: LIMIT SWITCH "22LS" (OPTIONAL)

This limit switch is located above the feed chute door.

FUNCTION: This limit switch is a safety device and is designed in such a way that when the feed chute door is open the pump motor will not run; thus shutting down the operational sequence of the baler.

ADJUSTMENT: If the limit switch is properly adjusted, opening the door would shut down the pump motor. The baler must be restarted at the control panel after the door is closed.

NOTE: TO ADJUST LIMIT SWITCH ARM, LOOSEN SET SCREW TO FREE ARM SO THAT MOVEMENT PERMITS THE LIMIT SWITCH TO BE PROPERLY ADJUSTED. AFTER PROPER ADJUSTMENT, TIGHTEN SET SCREW.

CAUTION:

DO NOT OPERATE THE BALER IF THIS LIMIT SWITCH IS OPERATING IMPROPERLY.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

OPERATION OF (OPTIONAL) THREE POSITION RAM RETRACTED SWITCH W/TOUCH SCREEN

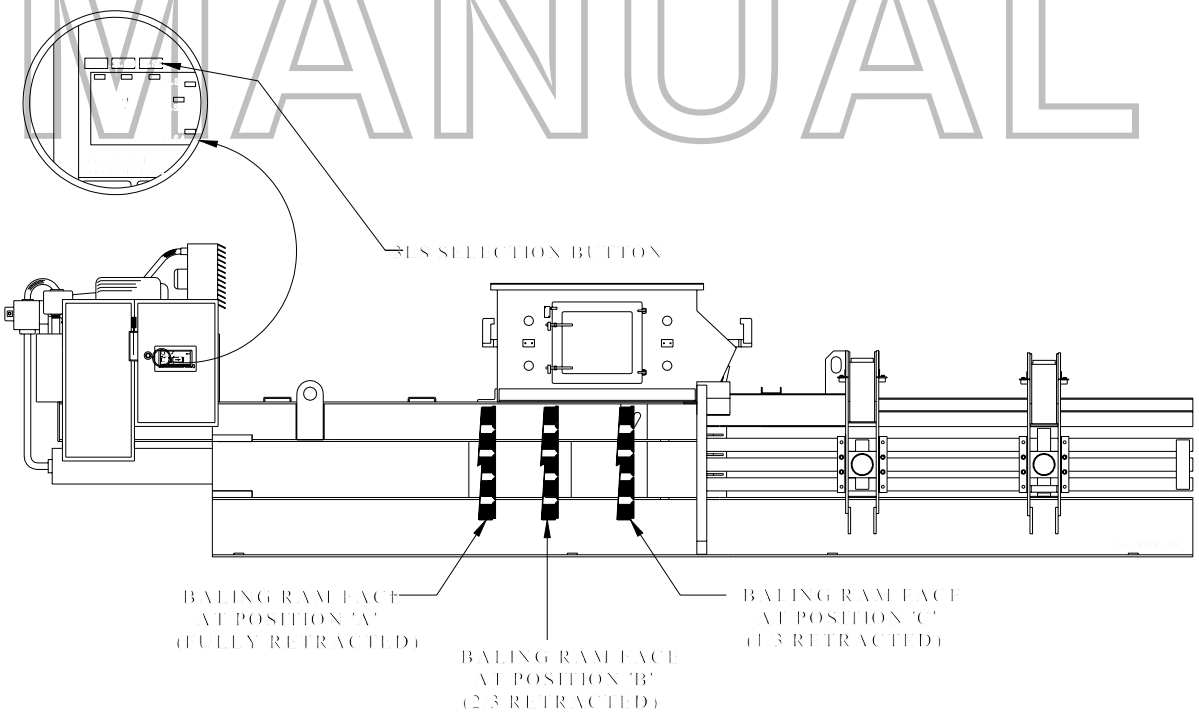
This switch enables the ram to retract to three positions in the chamber; fully retracted, 2/3 retracted, 1/3 retracted. By selecting one of these positions a proper charge will be entered into the chamber to form a better bale. The position selected for the ram to retract to is directly related to the type of material being processed. To change the ram retracted position, simply push the corresponding button on the screen. The following is a list of the three positions and possible applications: *

POSITION A - Fully Retracted
(Baling Low Density Material, Fluffy Material, Whole Corrugated Boxes, Etc.) *

POSITION B - 2/3 Retracted
(Baling Moderate Density Material, Loose Paper, Trim Stock, Etc.) *

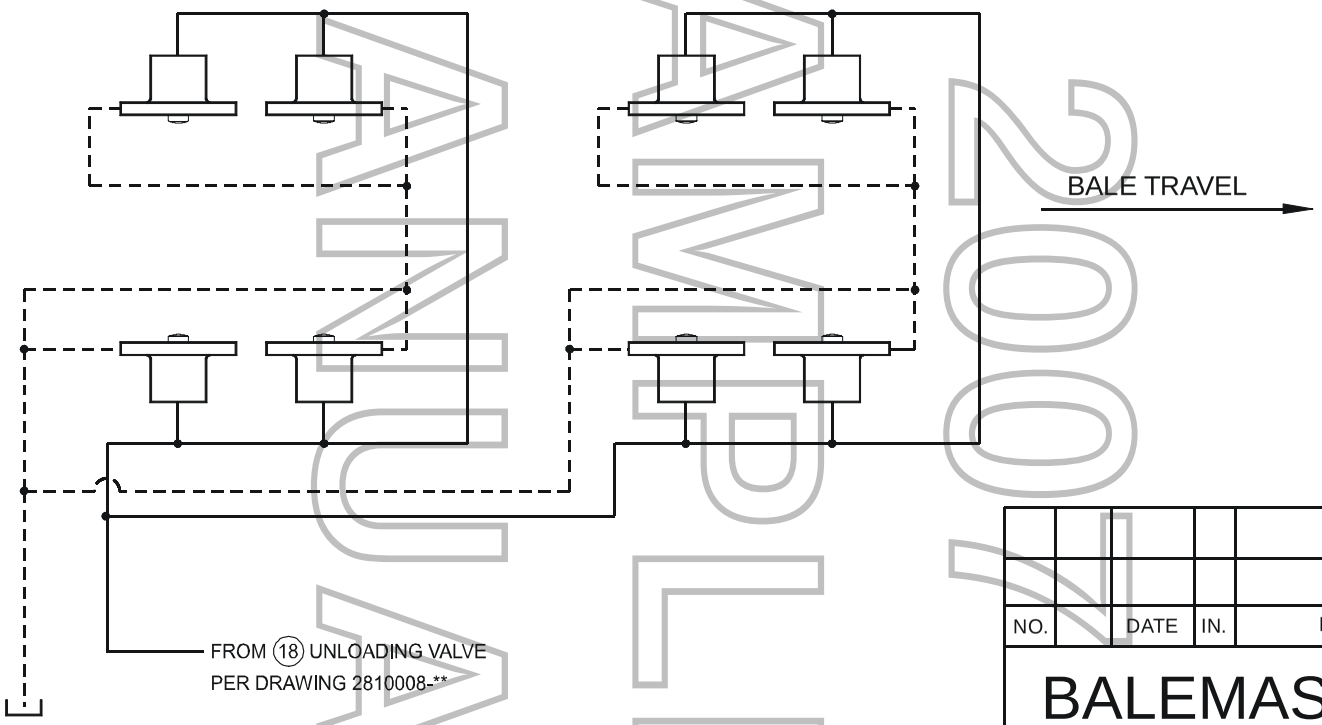
POSITION C - 1/3 Retracted
(Baling High Density Material, Flattened Cans, Newspaper, Etc.) *

* The limit switches are adjustable on most units to fine tune for optimum material processing and may vary with different material applications.



ELECTRICAL SCHEMATIC

The full-sized electrical schematic for this manual can be found in the back of the manual in the clear plastic envelope.



NO.		DATE	IN.	REMARKS

BALEMASTER®
DIV. OF EAST CHICAGO MACHINE TOOL CORP.
CROWN POINT, INDIANA

8 - SIDE CYLINDER ARRANGEMENT

TOLERANCES - UNLESS OTHERWISE SPECIFIED:

FRACTIONAL	+/- 1/64	
DECIMAL	0.000	+/- 0.005
DECIMAL	0.00	+/- 0.01

THIRD ANGLE PROJECTION

DO NOT SCALE WORK TO DIMENSIONS

SCALE: NONE

B/M REQ'D: YES / NO

DR. LLN | CH. | APP.

DATE: 03-06-96

281A0054-08

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HYDRAULIC SCHEMATIC

The full-sized hydraulic schematic for this manual can be found in the back of the manual in the clear plastic envelope.

BALEMASTER

AUTOMATIC BALE DENSITY CONTROL

DESCRIPTION/ADJUSTMENT FOR 3000 PSI

NOTE: Refer to the Hydraulic Schematic.

The Hydraulic Side Rail System should be set to a pressure that allows the main baling cylinder to operate between 1800 to 2250 PSI. Certain materials may require higher baling pressure; however, this pressure should not exceed 3000PSI. When the main cylinder pressure reaches this pressure, the control valve (Item 18) will shift and allow the oil from the side cylinders to escape to the tank. At the same time the main baling cylinder can continue to extrude the bale. The control valve (Item 18) will reset and again operate on the next stroke.

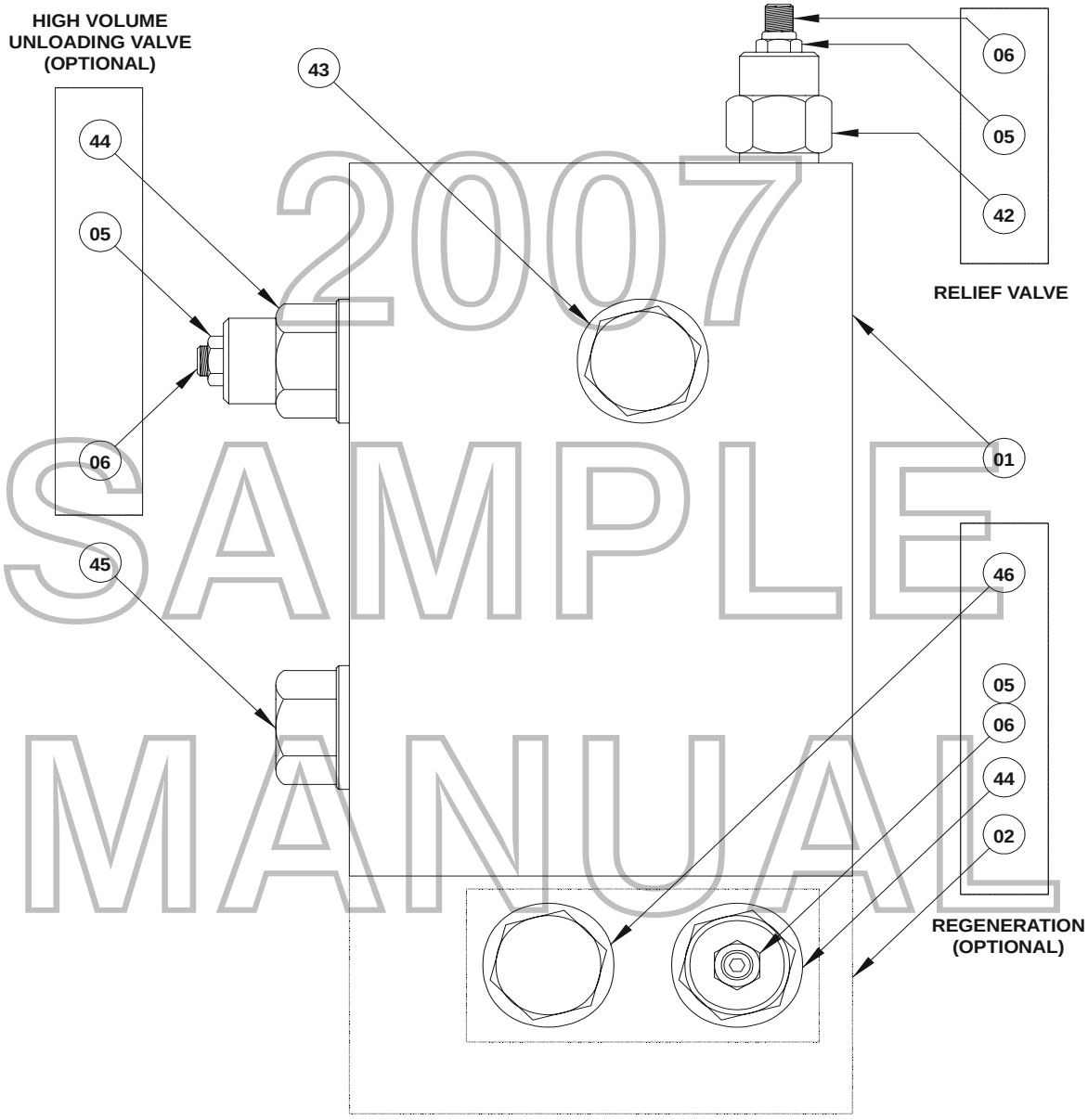
To increase the baling pressure, the pressure upon the side cylinders must be increased. This is done by turning the adjustment screw clockwise on control valve #18. If baling pressure becomes too high, this screw will have to be backed out. Do **NOT** read side pressure gauge. This gauge is used to observe needle movement only. When needle stays at zero the density valve 18 must be cleaned or adjusted.

Side density shut-off Item 25 should be closed to prevent equipment damage when the chamber is empty. When making the first bale, do not activate the side density system until material has reached as far as the side cylinders.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

20/25/30 H.P. HYDRAULIC MANIFOLD ASSEMBLY



ITEM	DESCRIPTION	PART NO.
01	HYDRAULIC MANIFOLD ASSEMBLY	
02	HYDRAULIC MANIFOLD ASSEMBLY WITH REGENERATION	
42	SYSTEM RELIEF VALVE ASSEMBLY	HCA00217
44	HIGH VOLUME UNLOADING VALVE ASSEMBLY (OPT.)	HCA00225
44	PLUG (SINGLE PRESS. PUMP)	HCA00222
05	JAM NUT	
06	VALVE STEM	
43	CHECK VALVE ASSEMBLY	HCA00218
45	CHECK VALVE ASS'Y (PILOT TO OPEN)	HCA00220
46	REGEN. CHECK VALVE ASS'Y (PILOT TO CLOSE, OPT.)	HCA00221
44	REGENERATION VALVE ASSEMBLY (OPT)	HCA00225

216A0040-00

HYDRAULIC VALVE DESCRIPTION

AND
PRESSURE SETTING PROCEDURES
75 HP MANIFOLD AND BELOW W/3000
WITH REGEN

HYDRAULIC MANIFOLD ASSEMBLY

REGENERATION : Pressure Setting 700 to 900 PSI

Regeneration is used to decrease cycle time by increasing cylinder speed without additional pump flow. It is achieved by taking oil discharged from the rod end of the cylinder and routing it to the cap end to join the pump oil and increase cylinder speed.

ADJUSTABLE UNLOADING VALVE: Pressure Setting 1100 to 1400 PSI

This valve limits high volume pressure by directing high volume pump flow to tank when the pressure reaches valve setting and thus prevents overloading of the electrical motor.

ADJUSTABLE RELIEF VALVE: Pressure Setting 3000 PSI Maximum

This valve limits system pressure by directing pump flow to tank when system pressure reaches valve setting and thus prevents overloading of the system.

PRESSURE SETTING PROCEDURES

The pressure has been preset at the factory. The following procedure is to fine tune the baler to the application.

NOTE: THE FOLLOWING IS A TECHNICAL PROCEDURE AND MUST BE PERFORMED BY EXPERIENCED MAINTENANCE PERSONNEL.

1. **Balers with Auto-Tier**

   Shut off baler, move disconnect switch on control cabinet to OFF position. The setting of pressure for the relief and unloading valves will be done using an "AMPERE PROBE" that can handle double the full load ampere of the pump motor, as read on motor nameplate. Place probe around one of the leads going to the motor in the starter control cabinet.

2. Loosen the adjustment stem jam nuts on the relief and unloading valves. Remove the ram chamber cover.

3. Start the baler by pulling the control power switch out. Press the buttons on the panel marked "BALER AUTOMATIC" and "TIER AUTOMATIC".

**HYDRAULIC VALVE DESCRIPTION
AND PRESSURE SETTING PROCEDURES
75 HP MANIFOLD AND BELOW W/3000
WITH REGEN**

HYDRAULIC MANIFOLD ASSEMBLY

4. Allow the machine to cycle in the normal manner. Note the speed of the ram and the pressure gauge. When the ram begins to move forward, it will be moving at the highest speed of its stroke. Pressure (observed on gauge 17) will rise rapidly to approximately 700 PSI. Pressure will drop briefly and then begin to rise again. This is the regeneration circuit dropping out. The pressure will continue to rise to approximately 1200/1400 PSI and again drop briefly. This is the high volume flow of the pump being diverted to tank. Pressure will continue to rise until the unloading pressure of 1850 is reached.

5. Begin adjustment with the unloading valve. Observe the ampere probe at the time the machine diverts the high volume flow to tank. Adjust the unloading valve until the ampere reading is 1.4 times the full load rating on the motor tag. Under normal conditions this load will only be imposed for a fraction of a second. The unloading valve is now set.

6. Observe and record the cycle time. The cycle time is measured from the ram leaving the 3LS limit switch to the return to 3LS. Adjust the regeneration valve by turning the in or out until the lowest cycle time is reached without exceeding the 1.4 times the full load rating on the motor tag.

7. Move the disconnect switch to ON position and place baler in manual mode.

8. Back off the relief valve by turning the valve stem counter-clockwise.

9. Push the manual plunger on the 4-way valve advancing and <u>keeping</u> the ram in its deadhead position.

10. Push the 4-way valve plunger. Turn the relief valve stem clockwise until the pressure read on Gauge 13 is 3000 PSI. Tighten relief valve jam-nut.

CAUTION:

DO NOT EXCEED 3000 PSI.

11. Release the 4-way valve plunger. Shut baler off and move disconnect to OFF position. Remove ampere probe and close control cabinet door and replace ram chamber cover.

THE UNLOADING, REGENERATION, AND RELIEF PRESSURES ARE NOW SET.

HYDRAULIC VALVE DESCRIPTION

HYDRAULIC SCHEMATIC

ITEM NUMBER 18

Pilot Operated Adjustable Control Valve - Automatic Bale Density Control Pages 15.00 and 16.00.

This valve regulates the baling hydraulic pressure (normally 1800 to 2250 PSI) as indicated on high pressure gauge, Item 13. Adjustment for this valve is described under Automatic Bale Density Control.

If density cylinder pressure as indicated on the low pressure gauge, Item 17, rises during ram stroke then drops to zero between ram strokes, the control valve is by-passing. Clean and repair or replace valve. If Gauge 17 reads zero at all times, clean Valve 18.

ITEM NUMBER 20

In-Line Check Valve (Furnished W/Air-Oil Cooler) Page 15.00

This valve allows for by-passing excess hydraulic oil to tank from the drain line feeding the Air-Oil Cooler, preventing pressure build-up in the cooler. The valve may be located in the reservoir directly below the manifold or in a drain line leading into the tank.

ITEM NUMBER 21

In-Line Check Valve Page 15.00

This valve seals hydraulic oil in the Automatic Bale Density Control Circuit. There is no adjustment for this valve.

ITEM NUMBER 22

This valve controls hydraulic oil flow into the Automatic Bale Density Control Circuit.

If density cylinder pressure cannot be increased as explained under Automatic Bale Density Control, the valve may be blocked. Clean and repair or replace valve.

HYDRAULIC VALVE DESCRIPTION

HYDRAULIC SCHEMATIC

ITEM NUMBER 23

Permanent Magnets

Magnets are located inside reservoir near oil suction line. When the reservoir is drained for cleaning, these magnets should be removed, cleaned and reinstalled.

ITEM NUMBER 25

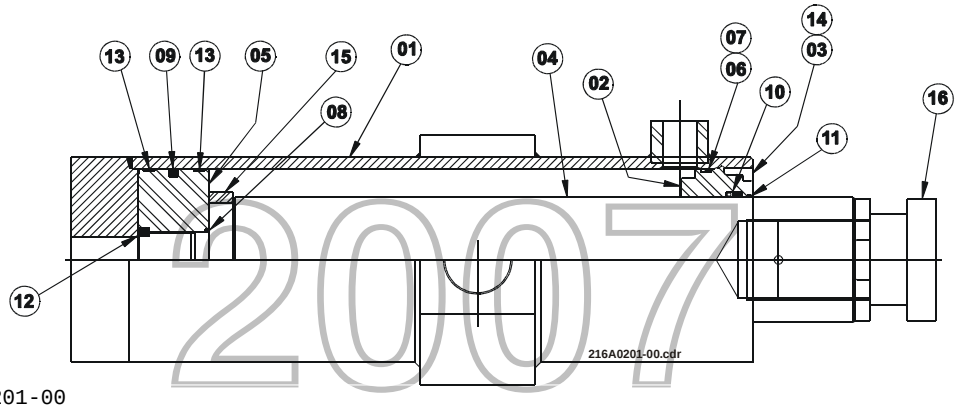
Adjustable Needle Valve (Density Control Circuit Shut-Off) Page 15.00

This valve when closed shuts off oil flow to the density control system. In normal operation, the valve should be fully open.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

HYDRAULIC CYLINDER PARTS



216A0201-00

ITEM	DESCRIPTION	REQ.
1	BODY WELDMENT	1
2	HEAD	1
3	HEAD NUT	1
4	PISTON ROD	1
5	PISTON	1
6	BODY SEAL	1
7	BODY SEAL B.U.	1
8	ROD SEAL	1
9	PISTON PACKING	1
10	ROD PACKING	1
11	ROD WIPER	1
12	GRUB SCREW	2
13	PISTON WEAR BANDS	2
14	HEAD LOCK NUT	1
15	STOP TUBE	1
16	ROD END	1

PART NUMBER: **287A0102-00**

BORE: 8"

ROD DIAMETER: 5 ½"

WORKING STROKE: 49 ½"

MAX. OPERATING PRESSURE: 3000 PSI

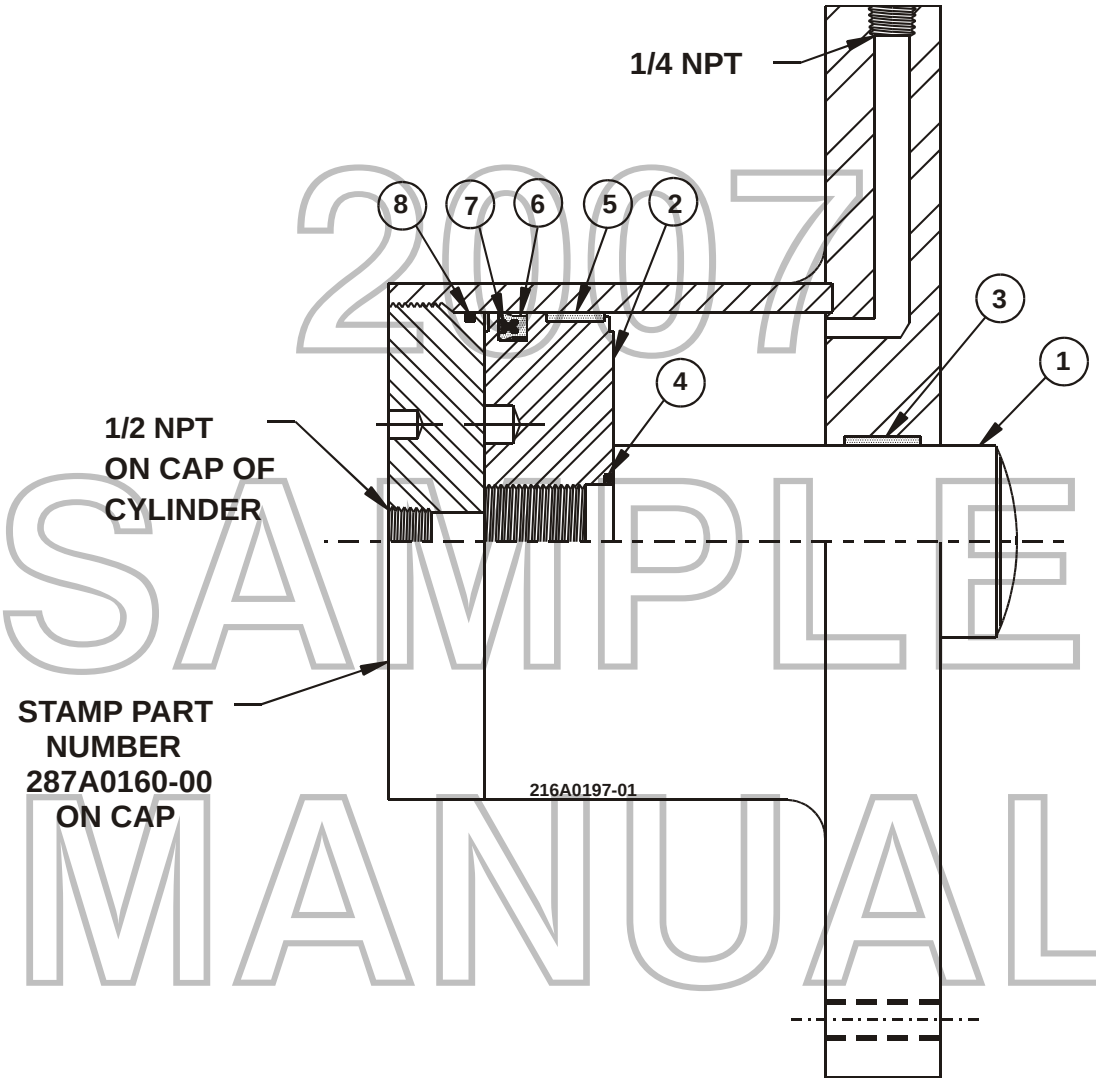
PORTS: 2" SAE 4 BOLT

SEAL KIT PART NUMBERS:

ROD SEALS: HAC102

PISTON SEALS: HAC202

HYDRAULIC DENSITY CYLINDER



ITEM #	DESCRIPTION	PART NUMBER	QTY.
	COMPLETE CYLINDER	287AO160-00	1
1	PISTON ROD		1
2	PISTON		1
3	ROD WEAR STRIP		2
4	PISTON ROD SEAL		1
5	WEAR STRIP		1
6	PISTON SEAL		1
7	PISTON SEAL EXPANDER		1
8	END CAP SEAL		1

* ITEMS #3 THRU #8 AVAILABLE AS SEAL KIT: HAM00601

PREVENTIVE MAINTENANCE

NOTE: THE FOLLOWING SCHEDULE IS BASED UPON OPERATING ONE EIGHT (8) HOUR SHIFT FIVE (5) DAYS A WEEK. LONGER OPERATING TIMES WILL CHANGE SCHEDULE.

CAUTION:

NEVER PERFORM MAINTENANCE ON BALER UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT. DO NOT REMOVE, PAINT OVER OR DEFACE WARNING INSTRUCTIONS OR IDENTIFICATION LABELS.

1. HYDRAULICS

A. Hydraulic Oil Level: Height of oil can be read on dipstick located on top side of reservoir (See Page 19.03 for Oil Level).

B. Oil Change: On a new machine, the oil in the hydraulic system should be thoroughly pumped out after 500 hours of initial running time (See Oil Change Schedule) and the tank cleaned using clean dry rags or equivalent. Inside the tank are two (2) magnets located under the oil suction line. If they are covered with residue and cannot be seen, feel around in the tank until found. Remove, clean and reinstall magnets under oil suction line after tank is thoroughly cleaned. After reinstalling magnets, refill reservoir at filler breather with clean premium grade hydraulic oil to proper level.

Under normal conditions, 500 hours of operation, the oil should be changed and the reservoir cleaned every 2000 hours of operation thereafter.

NOTE: SEE PAGE 19.04 FOR OIL/TEMPERATURE AND CAPACITY CHART.

C. Air-Oil Cooler: From outside of oil cooler reverse blow with compressed air through cores every 100 operating hours or more often if necessary.

D. Oil Leak Check: Inspect for oil drips on all tube and pipe fittings and tighten when necessary in accordance with approved hydraulic fitting practices.

NOTE: IT IS IMPORTANT THAT THE PROPER SIZE WRENCH BE USED SO AS NOT TO DAMAGE THE HYDRAULIC FITTINGS. OVER TORQUING IS JUST AS BAD AS UNDER TORQUING.

PREVENTIVE MAINTENANCE CONTINUED

2. MECHANICAL

A. Ram Wiper: Inspect ram wiper to be sure that it rides on ram top plate. This should be done on a weekly basis. The wiper assembly is secured to the wiper support bracket which is located at the rear of the feed chute. If ram wiper requires adjustment, use the following instructions:

1. Determine the wear on the wiper by visual observation. If worn or cracked, replace.

2. Remove the fasteners that holds the support bracket in place.

3. With support bracket removed from the ram chamber, loosen the fasteners.

4. After new wiper has been put in place, reinstall the fasteners.

5. Replace the support bracket and tighten the fasteners which mounts the assembly to the ram chamber.

B. Ram Chamber: On the bottom in the rear of the ram chamber area, is an opening with a tag that states "Clean Out Daily". If material is allowed to build up in the chamber because of failure to clean chamber daily, it will shorten cylinder life or cause other serious damage to the equipment.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

C. Ram Liners: Inspect the four (4) replaceable liners mounted on ram every 500 hours. Liners should just rub side plates and have no more than 1/8" clearance under baling ram gib bars.

D. Balelock: Balelocks should be cleaned daily of material that builds up in the balelock frame during operations. The balelock assembly is located on top of bale chamber in front of feed chute. If material is allowed to accumulate in the balelocks, it would effect its primary function to prevent the bale from expanding back into the feed chute chamber and could destroy the springs.

PREVENTIVE MAINTENANCE CONTINUED

E. Clean Plexiglas Lens: Assure cleanliness of all plexiglas on feed chute. Do not wipe with abrasive materials as it will scratch surface and reduce light transmission.

3. ELECTRICAL

A. Motor: Reverse blow with compressed air every 500 hours, blowing from the coupling end.

Motor - except totally enclosed: Lubricate motor bearings every 2000 hours using Sinclair Oil Company - Durolube #22 or equivalent NLGI #2 consistency grease free from any chemical or mechanical impurities.

B. Electrical Control Cabinet: Keep control cabinet door secured for personnel safety and cabinet cleanliness.

C. Control Circuit Interrupter: Check to make sure control circuit interrupter switch on load door of feed chute is, in fact, stopping motor when door is not closed. If faulty, do not operate baler until adjusted or repaired.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

PREVENTIVE MAINTENANCE

HYDRAULIC OIL CHANGE SCHEDULE

RECOMMENDED BALER OIL CHANGE SCHEDULE

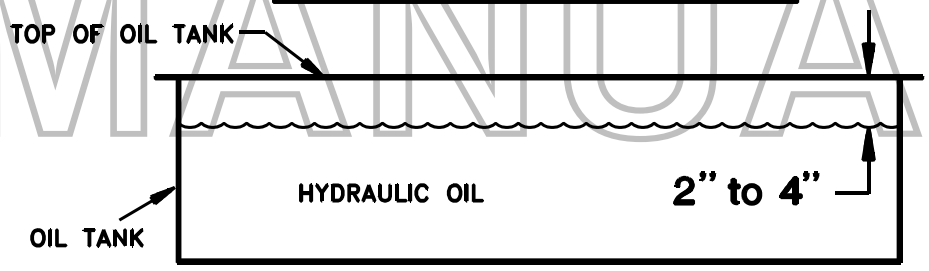
AFTER THE START-UP OF YOUR BALER CHANGE THE HYDRAULIC OIL AFTER 500 OPERATING HOURS, AND EVERY 2000 HOURS THEREAFTER.

500 HOURS = 1 SHIFT OPERATION (5 DAYS) = CHANGE OIL AFTER 3 MONTHS
500 HOURS = 2 SHIFT OPERATION (5 DAYS) = CHANGE OIL AFTER 6 WEEKS
500 HOURS = 3 SHIFT OPERATION (5 DAYS) = CHANGE OIL AFTER 4 WEEKS

2000 HOURS = 1 SHIFT OPERATION (5 DAYS) = CHANGE OIL AFTER 1 YEAR
2000 HOURS = 2 SHIFT OPERATION (5 DAYS) = CHANGE OIL AFTER 6 MONTHS
2000 HOURS = 3 SHIFT OPERATION (5 DAYS) = CHANGE OIL AFTER 4 MONTHS

NOTE: THE ABOVE IS BASED ON A 40 HOUR SHIFT, AND 52 WEEK YEAR. 6 OR 7 DAY OPERATION WILL REDUCE THE ABOVE OIL CHANGE INTERVALS. EXTERNAL FILTRATION DOWN TO 3 MICRON AND/OR SPECTROANALYSIS OF THE OIL MAY EXTEND THE ABOVE INTERVALS. FAILURE TO CHANGE OIL AT PROPER INTERVALS WILL VOID WARRANTY. SEE MANUAL FOR ADDITIONAL INFORMATION.

HYDRAULIC OIL LEVEL



FILL HYDRAULIC OIL BETWEEN 2" AND 4" FROM TOP OF OIL TANK WITH THE *BALING RAM IN A FULLY RETRACTED POSITION.*
CHECK MANUAL FOR MORE INFORMATION.

111A0079-00

NOTE: SEE FOLLOWING PAGE FOR HYDRAULIC OIL SPECIFICATIONS.

PREVENTIVE MAINTENANCE CONTINUED

BALEMASTER SERIES BALER HYDRAULIC OIL/AMBIENT TEMPERATURE & CAPACITY CHART				
AMBIENT TEMPERATURE				
60°F TO 90°F	PREMIUM GRADE HYDRAULIC OIL-220/250 SSU* AT 100° F			
BELOW 60° F OR ABOVE 90° F	CONSULT YOUR LOCAL HYDRAULIC DEALER			
Horsepower	20/25/30	50/60/75	100/150	225
Operating Capacity Range (Gallons)	116-132	244-269	336-380	482-544

* Capacity Range corresponds to an oil level between 2" and 4" from the top of the tank. Always measure oil level with ram in the retracted position.

* SSU REFERS TO **SAYBOLT SECOND UNIVERSAL**, AND IS THE ONLY DROP TEST USED TO DETERMINE THE **VISCOSITY RATING** OF A GIVEN OIL AT A SPECIFIED TEMPERATURE.

OIL LEVEL/TEMPERATURE INDICATOR - (OPTIONAL)

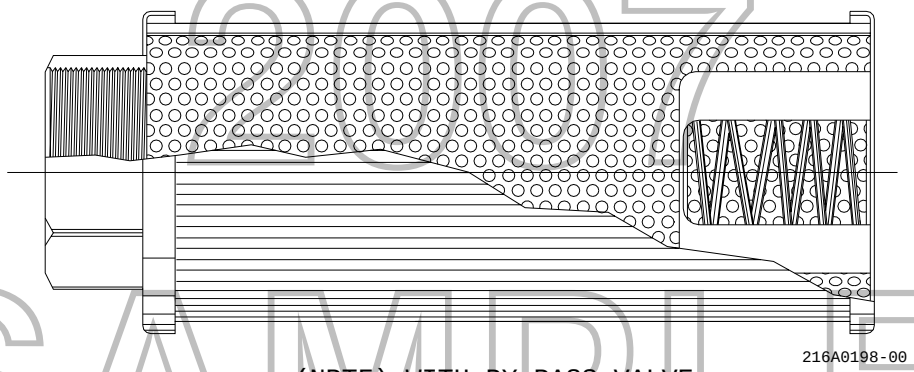
The Oil Level/Temperature Switch will stop the baler if the oil temperature exceeds 150° F or if the tank level drops to approximately half the tank depth.

NOTE: SOME HYDRAULIC OIL WILL REMAIN IN SYSTEM WHEN EMPTIED. THIS WILL NOT AFFECT RECOMMENDED QUANTITIES REQUIRED.

PREVENTIVE MAINTENANCE

OIL FILTERS SHOULD BE CLEANED EVERY 30 DAYS.

PART #HHA00020



(NPTF) WITH BY-PASS VALVE

HOW TO CLEAN:

Remove filter element from suction line. Swish element in any non-caustic clean solvent for a short period of time.

CAUTION:

DO NOT LEAVE ELEMENT IN SOLVENT.

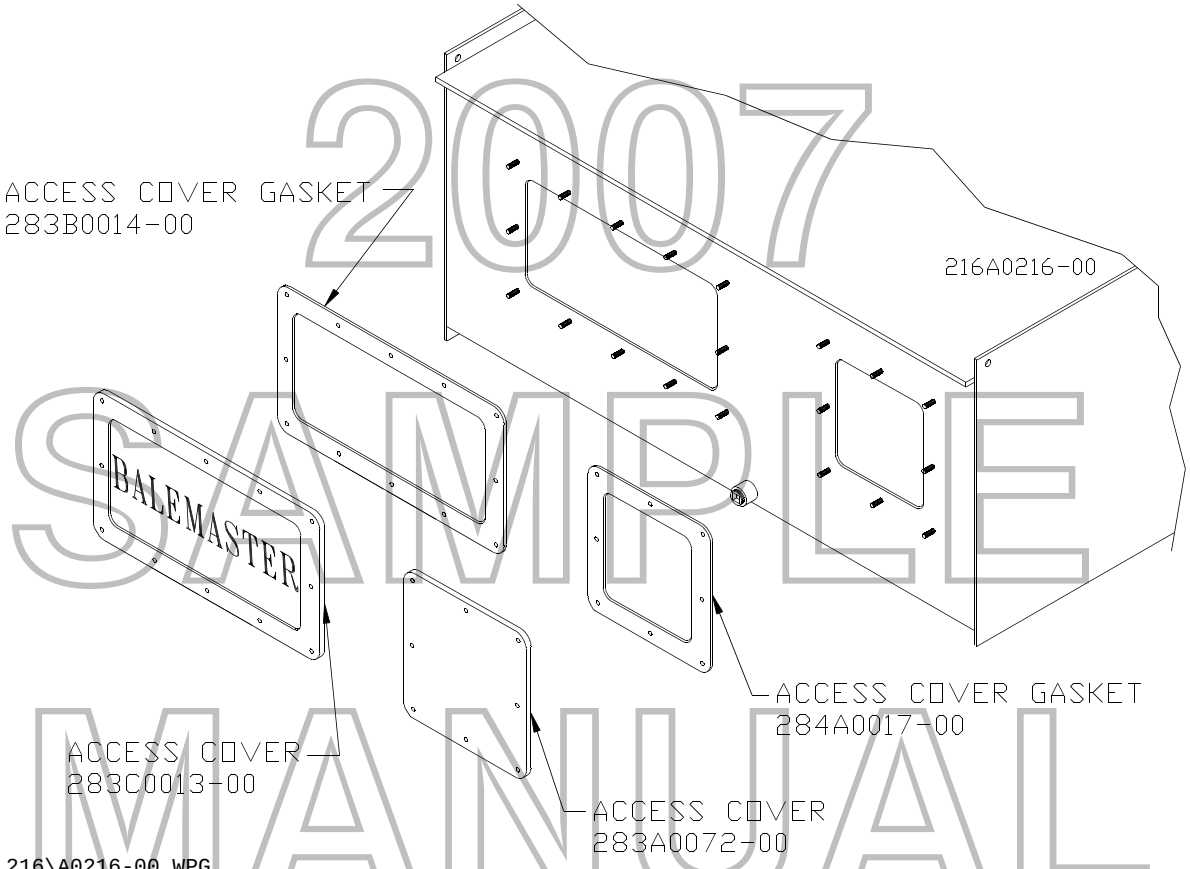
A stiff fiber brush may be used, if necessary, to remove impacted deposits between wire cloth serrations. Shake off excess solvent. If compressed air is available, blow dry from inside out.

CAUTION:

STOP BALER BEFORE REMOVING FILTERS.

PREVENTIVE MAINTENANCE

REPLACING ACCESS COVER GASKETS



216\A0216-00.WPG

NOTE: **When replacing Access Cover Gasket, be sure to seal with Dow Corning #732RTV Silicone Multi-Purpose Sealant on both sides (cork gaskets only). Foam rubber gaskets do not require sealant.**

NOTE: **Access Cover 283A0072-00 only used on 75 HP and higher.**

NOTE: **Tighten all nuts evenly. DO NOT OVER TIGHTEN.**

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

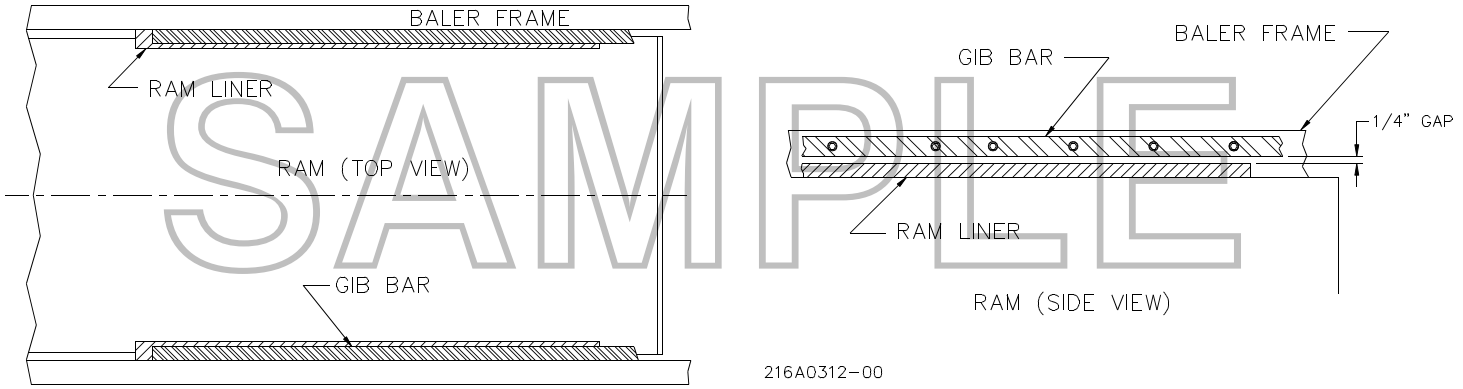
RAM MAINTENANCE

One of the most important observations to be made is to recognize excessive movement of the ram during its baling cycle, indicating the need to check/replace the ram liners and/or ram rollers. Timely replacement of these wear items will reduce the possibility of damage or premature wear to the ram, the main baling cylinder, and the baler frame itself. This is routine maintenance that cannot be neglected.

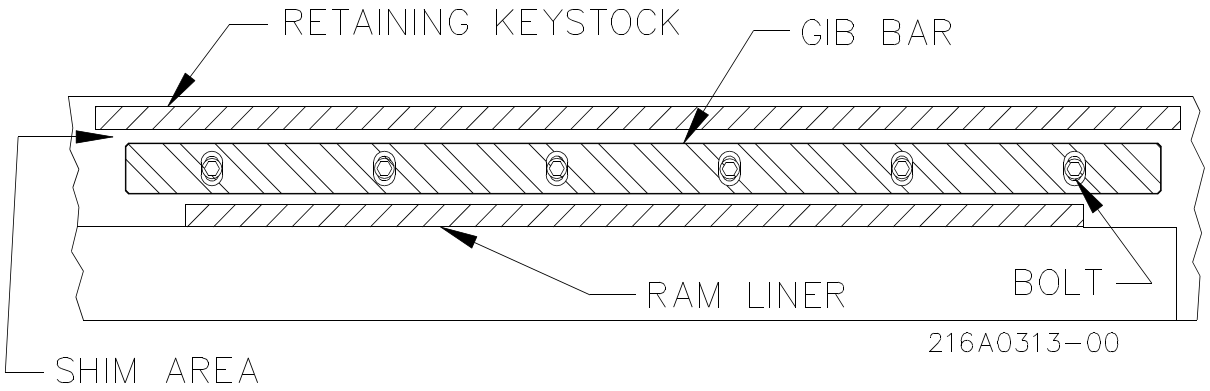
Some of the items to check are:

TOP LINERS/GIB BAR GAP

The gap between the gib bar and liner should never exceed 1/4". If the gap is not within specifications after the liners are replaced, it may indicate the gib bars also need replacement. The reason for the excessive gap must be determined and corrected.



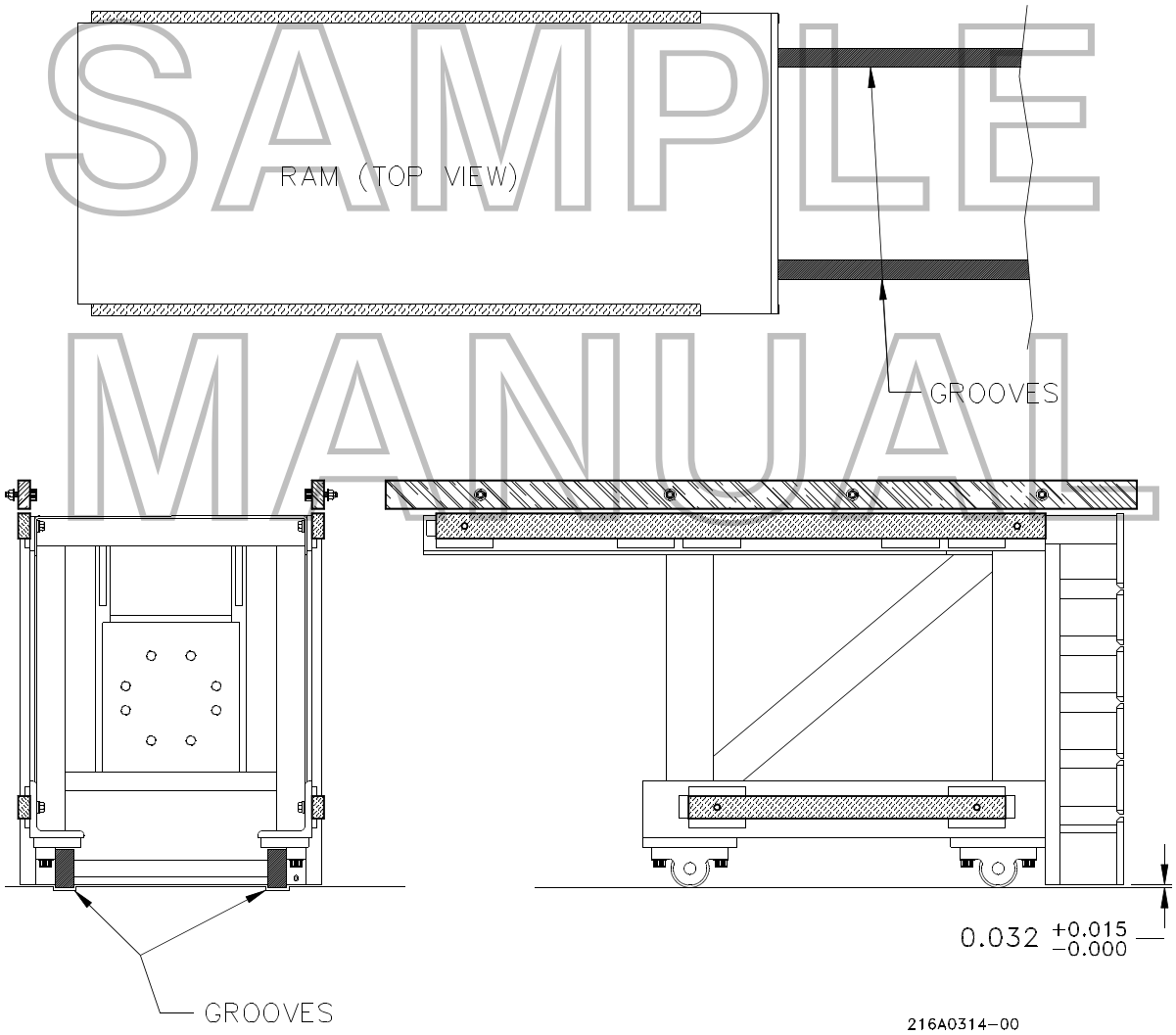
NOTE: Some shear bar equipped balers have adjustable gib bars that can be moved downward to eliminate the gap caused by wear. However, when the gib bars have reached their limit of adjustment, and the gap becomes excessive, the liner/gib bars will have to be replaced. When the gib bars are moved downward, a shim must be installed so they cannot move up during baling.



RAM MAINTENANCE CONTINUED
(FOR RAMS WITH ROLLERS ONLY)

GROOVES IN THE BALER FLOOR

Check the baler floor for any unusual wear, especially where the liners and rollers travel. For balers with roller equipped rams, grooves in the floor indicate one or more of the rollers is not rolling. The rollers must be checked and replaced as necessary before the grooves become deep enough to cause wear on the lower edge of the ram face as it is dragged along the baler floor. If the grooves become too deep they will have to be welded and ground smooth, a very time consuming, expensive process. The lower edge of the ram face may have to be welded and re-machined to maintain the proper clearance (1/32") between the floor and bottom of the ram face. Excessive clearance between the floor and the ram face will allow material to pass under the ram and could cause the rollers or liners to ride on the accumulated material and jam the liners into the gib bars, thus stalling the ram.



RAM MAINTENANCE CONTINUED

MAIN BALING CYLINDER

Check for leaks at the cylinder rod bushing. Excessive movement of the ram causes side loading on the cylinder rod bushing, which will cause wear on the bushing and result in the seals leaking. Also, side loads can be exerted on the cylinder piston and may lead to internal wear and premature failure of the cylinder. Our latest baler designs, with the trunnion mounted cylinder, reduce the side forces in the cylinder and extends the seal life.

RAM WIPER

Check to make sure the ram wiper is in contact with the top of the ram. If not, adjust as necessary. One design mounts the wiper vertically and is adjusted downward to be in contact with the top of the ram. The other design mounts the wiper at a 45 ° angle to the top of the ram, and therefore rides on the top of the ram. This second design allows the ram wiper to stay in contact with the top of the ram has vertical movement during the baling stroke. Check to make sure the lip is long enough to maintain contact with the ram. The ram wiper helps keep dust and material out of the back part of the ram chamber, thereby slowing down the accumulation of material behind the ram. Excessive accumulation of material behind the ram can cause "reverse baling" between the ram and rear bulkhead preventing the ram from reaching limit switch 3LS, its fully retracted position.

INFEED SYSTEM

For conveyor feed baler systems, a carefully planned discharge system at the feed chute area can eliminate some of the wear problems associated with liner and floor wear. By adding a screen at the last few feet of the conveyor, debris can be eliminated from falling on top of or on other areas of the baler thus allowing material to fall only in the feed chute where it should be.

SIDE SWIPERS

On newer model machines, UHMW side swipers are installed on the face of the ram to prevent material from passing behind the ram. These wipers should be inspected for damage and replaced if worn to the point where they are not contacting the side walls of the baling chamber.

RAM SLOTS

Ram slots should be inspected by running the ram to Autoty position (5LS & 5LSA). It should be possible to clean out the slots using compressed air or a rod **AFTER LOCKING OUT THE MACHINE**. It may also be necessary to clean out the slot from the front of the ram. This is done in the feed chute with the ram retracted and the machine **LOCKED OUT**.

SHEAR BAR SPACING

For balers with shear bars, the gap between the top of the ram and the shear bar should be no greater than 1/16" - 3/16". Larger gaps or rounded shear points may cause the ram to stall during shear. The bottom ram liner can be replaced to minimize gap. The shear blade can be welded up and sharpened to increase shearing effectiveness. If the gap is not maintained, severe wedging may cause frame damage.

RAM MAINTENANCE CONTINUED

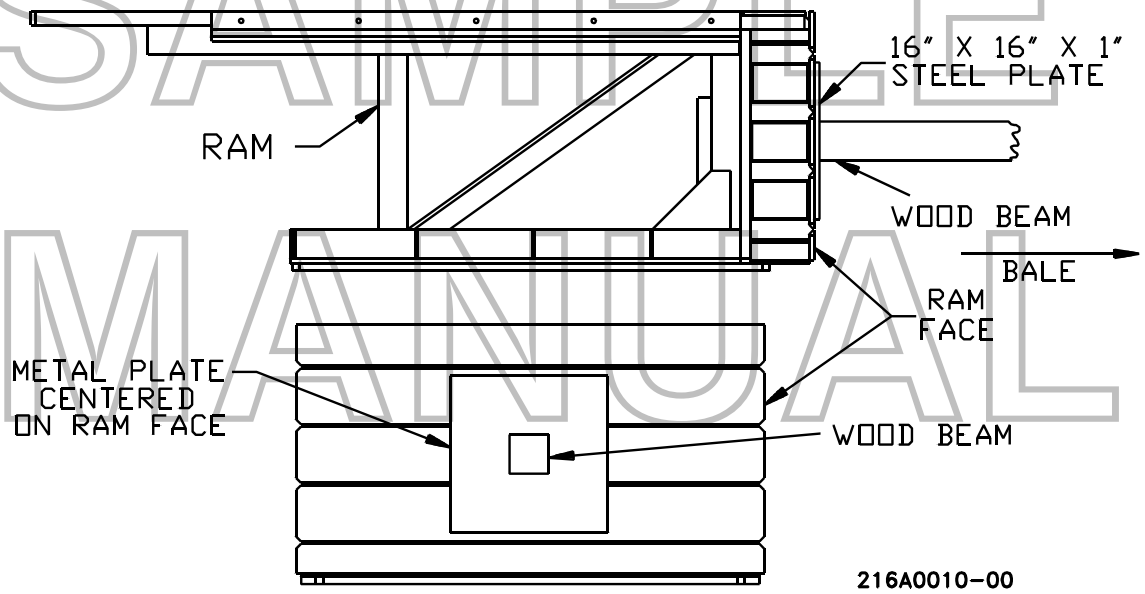
RAM REMOVAL

When the decision is made to change the ram liners, the ram must be removed first. There are two basic methods of removing the ram:

If the feed system to the baler can be removed along with the feed chute to a reasonable height, the ram can be taken out from the top of the baler. This eliminates the need to empty the machine of bales.

If the ram cannot be taken out from the top of the machine, the ram must be removed from the front of the machine, emptying the machine of bales first.

UNDER NO CIRCUMSTANCE when removing the bales from an autoty machine, should a push bar be used directly against the ram face. A buttress should be used when attempting to eject the bales prior to ram removal. Depending on the material, a buttress is sometimes needed on the face of the bale to prevent embedding the push bar into the bale.



It is advisable to measure the face of the ram and to then measure the entire bale chamber in comparison. Balemaster balers are built to close tolerances and sometimes during the manufacturing process the gussets area contracts due to the welding at that area. If an area is slightly smaller that the face of the ram, it is recommended that the chamber at that point be ground wide enough to facilitate ram removal. The Balemaster strength and integrity will not be compromised by the grinding of material between the side cylinder gusset area.

RAM MAINTENANCE CONTINUED

RAM LINER REPLACEMENT

Ram liners are made of either ryertex, bronze, or steel, and can be found on the top, side, or bottom of the ram depending on the model of the baler.

1. Remove the ram from the baler.
2. Remove the old ram liners.

NOTE: Some older model balers had the screws that attach the ram liner to the ram installed with loctite products. To remove these screws, heat may have to be applied. Loctite must be used with the new screws also to prevent then from vibrating loose and causing damage to the liners and baler walls. Newer rams have the liners installed with through bolts and locknuts or through bolts and threaded brass inserts in the liners. If locknuts are used, make sure to use locknuts and not lock-washers and nuts.

NOTE: If any shims were removed they should be marked as to their location and saved. This will save time when re-installing the ram liners. Any shim that is added to the ram assembly must be secured to the ram either by welding/brazing or held in place by a mechanical fastener.

3. Place the new ram liners into the pocket on the ram.

NOTE: Ryertex ram liners may have to be ground down on the ends to correctly fit into the pocket. After fitting the liner into the pocket, make sure the bolt holes are aligned.

4. Make sure the liners fit snugly into the pocket.

5. Make sure new bolts and threaded brass inserts are used. Do not substitute another bolt of different length, size, or shoulder size. Bolt or ram liner failure might consequently occur. If you had the old style ram liners held on by bolts and lock-washers, you should have received or should replace with our new style liners consisting of only two holes and fasteners per liner. A threaded brass insert is placed into the hole on the liner which allows the bolt to self-thread from the inside of the ram. This allows changing of the top ram liners without removing the ram from the machine in most cases.

MAINTENANCE SCHEDULE

Initial oil change * see note	500 hrs
After initial oil change, every * see note	2000 hrs
Inspect ram liners	500 hrs
Inspect ram rollers (if equipped)	500 hrs
Inspect gib bars	4000 hrs
Inspect wire rollers	500 hrs
Clean out: Bale Lock Chamber Ram Chamber Twister Inserter	 8 hrs 8 hrs 8 hrs 8 hrs
Clean up around the machine	8 hrs
Clean out ram slots	8 hrs
At initial start up, tighten all nuts and bolts, hose clamps and hose connections.	8 hrs
- After initial start up, check every	40 hrs
At initial start up, tighten all electrical connections	40 hrs
- After initial start up, check every	2000 hrs
Emergency Stop Buttons: These switches should be tested periodically to assure they will stop machine motion when needed.	

In more severe or caustic environments reduce the time by 50% or more.

* For large oil tanks: remove the oil and clean the tank. Analyze the filter, and return the oil to tank.

BALEMASTER

TROUBLE SHOOTING CHART

CAUTION:

UNDER NO CIRCUMSTANCES ATTEMPT TO ANALYZE OR CORRECT ELECTRICAL FAILURES ON THE EQUIPMENT UNLESS YOU ARE A FULLY QUALIFIED ELECTRICIAN. LACK OF KNOWLEDGE AND PROPER ELECTRICAL PRACTICES COULD CAUSE SERIOUS INJURY OR DEATH TO PERSONNEL.

TROUBLE: MOTOR WILL NOT START

A. Routine Observations:

1. Check power control cabinet to see if the disconnect switch handle is to "ON" position.

2. Has electrical power control switch (Red Mushroom Button) on the operators control cabinet been pulled out to "START" and baler selector switch turned to either manual, automatic, or continuous mode.

   NOTE: IN AUTOMATIC MODE, HYDRAULIC PUMP MOTOR WILL NOT RUN UNTIL TIMER ON "LPR" UNIT EXPIRES AFTER CYCLING EYE IS BLOCKED.

3. Is Feed Chute Door closed, actuating Limit Switch "22LS".

   If the above observation did not solve the problem, then electrical power failure to the equipment is likely.

B. Incoming Power Source Check:

1. Test for a blown control transformer fuse on secondary side, located in the power control cabinet.

2. Check motor starter overload heaters to see if they are tripped. If so, push all reset buttons in.

3. Test for blown fuses that protects the primary side of control transformer and motor starter.

4. Check motor starter control coil.

   If the above fails to pinpoint the problem after initial checkout, proceed as follows:

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

At the motor leads T1 T2 and T3 in the power control cabinet, take voltage readings across T1 and T2, T2 and T3, and T1 and T3. The readings at any of these points should correspond to the line voltages. For example: If the line voltage is 480 volts, then readings across T1 and T2, T2 and T3, T1 and T3 should read 480 volts.

If the condition above does not agree, then the failure to get power to the motor could be caused by the incoming power source to the equipment.

TROUBLE: RAM WILL NOT ADVANCE

A. Proper Oil Level:

Check proper level of hydraulic oil on the dipstick (See Preventive Maintenance Oil Change Schedule). If the oil is low, inspect for oil drips on all tube and pipe fittings and tighten where necessary in accordance with approved hydraulic fitting practices. If any hosing sections have excessive oil leaks due to damage or wear, they should be replaced. When hydraulic leaks are repaired, add proper premium grade non-foaming hydraulic oil to the proper oil level.

B. Dirty Oil Filter:

The oil filter systems traps dirt and foreign particles, keeping these impurities from contaminating the hydraulic oil. When the filter is not maintained regularly as described in the Preventive Maintenance section of this manual, these deposits build up, eventually blocking the oil flow. Remove filter element and clean thoroughly.

C. Is Ram Limit Switch "3LS" Properly Operating:

Two conditions can affect the above situation:

1. Material can build up behind the ram over a period of time. Failure to clean out daily will cause material to pack tightly in the chamber. It eventually prevents the ram from retracting into its fully stored position, thus preventing actuation of "3LS". To correct this problem, turn baler selector switch to "Manual" and manually run ram forward by depressing the "Man-Ram-Forward" push-button until ram is completely forward. Turn selector switch to "OFF", shutdown equipment and be sure it is electrically locked out. When ram chamber is cleaned of material and all personnel clear of baler unit, start up the equipment and turn selector switch to the automatic mode. This will cause the ram to return to normal stored position.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: RAM WILL NOT ADVANCE (CONTINUED)

C. Is Ram Limit Switch "3LS" Properly Operating: (Continued)

2. If ram is in its fully retracted position, but not actuating "3LS" Limit Switch Arm causing limit switch to be inoperative, check limit switch cam alignment. If adjustment is necessary, loosen fasteners holding cam and reset until limit switch arm is actuated. Tighten fasteners.

   NOTE: MUST BE ADJUSTED SO CYLINDER STOPS 1/8" TO 1/4" "BEFORE DEADHEAD.

TROUBLE: HYDRAULIC PUMP NOT FUNCTIONING PROPERLY

The double pump consists of two separate pumping devices contained in one housing. The double pump has an inlet port and two outlet ports to provide fluid flow for two separate circuits. Separate circuits require separate pressure controls to limit maximum pressure in each circuit. The relief valve on high pressure side of pump is set at 2250 PSI; the unloading valve on low pressure side of pump is set at 700 to 900 PSI. To check pump for defect, proceed as follows:

1. Refer to Pages 17.00, 17.01 & 17.02 for procedures.

2. If any of the above pressure readings are low, then efficiency of pump to produce the maximum flow rates has failed and pump should be rebuilt or replaced.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)
WITH TOUCH SCREEN

TROUBLE: RAM RECIPROCATES CONTINUOUSLY

The normal cycling procedure is due primarily to the control function of the "LPR" unit; ie, when the receiver is blocked from the source, the internal relay is de-energized, which close N/C contacts and opening N/O contacts. The closed contacts, energize the ram advance circuits after the time delay expires, causing the ram to go forward. (Done by the PLC) If the ram continuously goes back and forth, it shows that the ram advance circuits are not being de-energized because the N/C contacts remained closed due to the "LPR" relay not being energized when the source beam again penetrates the receiver or the light beam is still interrupted due to accumulated dirt or dust on the feed chute windows. To correct the situation described above, proceed as follows:

1. Clean the feed chute windows inside and outside of dirt and dust.
2. Check to see that the "LPR" units are aligned properly.
3. Check to see that the yellow (power on) lights are on both for the source and receiver units. If not, check for proper incoming voltage.
4. If unit is not operative, it could be bad and should be replaced.

TROUBLE: LONG DELAY BEFORE RAM ADVANCES

Three (3) conditions can affect a long delay:

1. Time delay for the "LPR" unit could be set too long. Refer to “LPR" control diagram. With a piece of heavy non-transparent paper, block the photo-eye and observe that the green light (output energized) should go off.

   The time delay setting is normally 6 to 8 seconds before the ram cycles. If the time delay is longer than the normal setting, go to the operator interface. At the main screen, press (F7) others to go to the information screen. Then press (F5) LPR's to go to the select screen. Press (F1) change LPR to proceed to the next screen. Press the box, then enter the code number, and press "E" to enter. At the select screen press LPR's. Press (F2) to adjust the LPR time delay. Adjust the time delay to the desired setting, then press (F10) to return to the main screen.

   NOTE: DO NOT DECREASE BEYOND THE NORMAL SETTING. TIME DELAY SHOULD BE SUCH AS TO PERMIT A FULL CHARGE IN THE BALING CHAMBER.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS & ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: LONG DELAY BEFORE RAM ADVANCES

2. Spool in 4-way valve could be dirty.
When dirt from hydraulic oil accumulates around the spool over a period of time, it tends to cause the sliding action to become sluggish. When this happens, the time it takes the spool to shift will be greatly increased, thus causing a delay before a ram advances. To correct this problem, proceed as follows: Shut down the equipment. Remove the four (4) socket head screws holding the cap end to 4-way directional valve body. Remove cap end, spring, spring seat, and spool away from the body. Clean the spool in mild detergent solution or solvent. Replace spool, spring seat, spring and cap end with proper seal. Secure to valve body by tightening the four (4) socket head screws. (Be sure to insert as removed as reverse insertion will not operate.)

3. Choke valve adjustments improper (if supplied).
The choke valve, mounted on 4-way valve, has two (2) adjustment screws. These adjustments regulate the speed of spool shifting in the forward and reverse directions. The adjustment on the "A" port side determines the speed the spool will shift when moving from forward start. Adjustment on the "B" port side determines the speed the spool will shift when moving from reverse start.

TROUBLE: RAM ADVANCES ONLY PART WAY

1. If baling chamber resistance too high:
The side density cylinders on the hydraulic side rail system is set at a pressure that allows the main baling cylinder to operate at approximately 1850 to 2200 PSI to extrude the bale. When this pressure is too high, the density cylinder force against side rails tends to oppose the force of the main baling ram pushing the bale out. The unloading valve (Item 18) that regulates the baling density pressure is set to high. Turn the adjustment knob counter-clockwise to reduce pressure.

2. If pressure read on pressure gauge #13 is low:
The relief valve (Item 9) limits system pressure by directing pump flow to tank when pressure reaches the setting of the valve, thus preventing overloading of the system. If the valve is set too low, it reduces system pressure because the pressure increase in the system is limited by setting of adjustment knob on valve, thus unloading the pump flow to tank before system can exceed its maximum pressure. To adjust Relief Valve (Item 9), refer to Page 17.01 of this Manual.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: RAM ADVANCES ONLY PART WAY (CONTINUED)

3. Is pump delivering required output pressure to system?

   To check pump operation, refer to Page 20.02, "Hydraulic Pump Not Functioning Properly".

4. Is main hydraulic baling cylinder losing hydraulic pressure on forward stroke?

   Refer to Page 21.00 in this manual for "Hydraulic Cylinder Check".

   If the cylinder check indicates oil being pumped out of rod end of cylinder, then piston cups and rod seals should be replaced.

5. Check oil level - May be low and pump is sucking in air. Normally sounds like "marbles" in pump.

TROUBLE: RAM SPEED REDUCED IN GENERAL

1. Inspect for leaks in the hydraulic system and low oil level in reservoir. Refer to "Ram Will Not Advance" Section, Page 20.01 in this manual.

2. If oil filter is dirty, it reduces the quality of oil to the pump, thus decreasing the efficiency of the pump to deliver maximum flow rate to the system. Pressure drop in the main ram cylinder will then tend to push the ram at slower than normal speed. Remove filter element and clean thoroughly. Refer to Page 19.05.

3. Is ram speed slow and baling pressure low?

   Refer to "Ram Advances Only Part Way" - Paragraph #4 on this page.

4. Pump Performance:

The ability of the main cylinder to move the bale depends upon the pressure applied to it. The speed at which the ram advances the bale depends on the flow rate of the pump. If the pump flow rate is reduced due to wear of internal parts, reduction in the flow rate to the cylinder will result in pressure drop in main cylinder. To check pump, see "Hydraulic Pump Not Functioning Properly", Page 20.02.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: RAM SPEED REDUCED IN GENERAL (CONTINUED)

5. Condition where air is in hydraulic oil:
   Air is soluble in oil. At atmospheric temperature and pressure, a volume of air dissolves in oil. As pressure increases, the amount of dissolved air increases. While this in itself is not serious, the reciprocal effect, air coming out of the oil when the oil is subjected to low pressure at the pump inlet (suction side of pump), causes cavitation, ie, formation of partial vacuum in the oil by the swift internal moving parts of the pump. Air bubbles throughout the oil are caused by air leaking into the system from various sources. Main leakage source are loose fittings, loose or worn seals on components, and low oil level in the reservoir. Inspect and repair all air leaks in system. Observe especially air leaks on suction side of pump.

TROUBLE: RAM WILL NOT RETURN

1. If ram is seized in baling chamber, try to free ram by turning selector switch to "OFF" and back to automatic several times. If ram cannot be freed, inspect balelock chamber for excessive paper build-up. If balelock chamber is not cleaned daily, paper eventually accumulates until material packs tightly in chamber and under ram top surface, thus jamming the ram. Material will have to be broke free and balelocks cleaned out.

   NOTE: IT MIGHT BECOME NECESSARY TO REMOVE BALELOCKS TO CLEAN OUT MATERIAL.

2. Check Solenoid "B" coil on 4-way valve to see if electrically operative.

   If pilot valve spool is dirty, the sliding action becomes extremely sluggish, preventing it from shifting. Remove and clean with mild detergent solution or solvent. The pilot valve is located on 4-way valve.

3. Observe in ram chamber to see if rod and ram are disconnected. If hydraulic rod is broken, replace rod, rod bushings and seals. Refer to Page 22.00 for Balemaster Service.

TROUBLE: LOSS OF NORMAL BALING PRESSURE

1. If baling chamber resistance is too low:

   The unloading valve (Item 18) regulates the baling pressure which is normally adjusted between 1800 to 2250 PSI on Gauge #13, depending upon material being baled.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: LOSS OF NORMAL BALING PRESSURE (CONTINUED)

1. Continue reading - If Gauge #17 shows pressure drop while ram is idle or drops to zero pressure while ram is stopped, then valve (Item 18) should be adjusted to a higher setting by turning the adjustment knob clockwise to increase pressure. If adjustment cannot be made, the valve usually requires cleaning.

2. Unloading Valve (Item 18) sticking:

   Disassemble valve and clean or replace.

3. Flow Control Valve (Item 22) blocked:

   Remove and clean if possible or replace.

4. Side Density Cylinders leaking:

   Replace Piston Cup Seals and Rod Seals.

5. Ram advances before a full charge of material has fallen into baling chamber:

   Refer to "Long Delay Before Ram Advances" Section, Page 20.03.

6. Low pressure reading on Gauge #13:

   If Gauge #13 is faulty, it would give a false reading, preventing proper setting or normal baling pressure. Replace defective gauge.

TROUBLE: RAM CREEP DURING TIE OFF

Minimum ram creep is normal. If ram creeps back excessively during tie off, check high pressure reading on high pressure Gauge #13. If pressure indicated on Gauge #13 drops during tie off, then:

1. Hydraulic system should be checked for leaks. If leaks are present, all tube and pipe fittings should be tightened.

2. Check main hydraulic cylinder for internal bypassing. If bypassing is present, piston cups and rod seals should be replaced. Refer to "Hydraulic Cylinder Check".

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: RAM CREEP DURING TIE OFF (CONTINUED)

3. If hydraulic cylinder is not bypassing during check out of cylinder, then the 4-way valve may be leaking due to contamination or wear. Replace with new 4-way valve if this is the case.

TROUBLE: BALE UNDER LENGTH

1. If bale length counter control is set too low, the bale length would result in shorter bales than desired. Refer to "Adjustments Bale Length Control" under "Initial Start-Up".

2. A sprocket mounted in the bale frame trips Limit Switch "6LS" as the bale advances in the baling chamber. The housing containing this sprocket must be kept clean and free of debris to allow the sprocket to rotate. After extrusion, the bale will expand approximately 1" per 12" of bale length. The exact amount of expansion will depend on the material being baled and may require a change in the counter setting.

3. Refer to Pages 30.02 & 30.03 for replacement of counter program. Make sure the mode selector switch is set to operate before returning the counter control to its housing.

TROUBLE: BALE OVER LENGTH

1. If the bale length counter control is set too high, the bale length would result in longer bales than desires. Refer to "Adjustments Bale Length Control" under "Initial Start-up".

2. Check proper alignment of bale length limit switch "6LS". The side roller plunger should move in and out (making and breaking of contacts) on each increment of rotation of the ratchet wheel. Refer to "Description/Limit Switch 6LS" under "Limit Switches Description Adjustment."

3. Check limit switch 6LS to see if electrically operative.

4. Observe any irregularities (voids) in top of bale or banana shaped bales.

   If you have the condition above, check the counter ratchet wheel for rotation as the ram advances the bale. If you observe a hit and miss situation (ie, ratchet wheel rotates when in contact with material, no rotation when ratchet wheel is not in contact with material due to voids in the bale), then two possible problems could exist:

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: BALE OVER LENGTH (CONTINUED)

4. Continued.....

A. Check balelock operation: Is balelock preventing the bale from returning into the feed chute chamber when ram retracts?

B. Check cycling time delay on "LPR" unit: If time is too short, the ram will advance before a full charge of material has fallen into the baling chamber. Refer to "Long Delay Before Ram Advances", Page 20.03, under" Trouble Shooting Chart" in the manual.

TROUBLE: PUMP FAILURE

1. Excessive Pump Noise:

A. Air bubbles in hydraulic oil are caused by air leaking into the system from various sources. Refer to "Condition Where Air is in Hydraulic Oil", Pages 20.05 and 20.06, under "Ram Speed Reduced in General".

B. Check Oil Level In Reservoir: Low oil level can result in the pump sucking air, creating air bubbles in the hydraulic oil and cause pump to cavitate. Fill reservoir to proper oil level. Refer to Maintenance Section, Page 19.00 in this manual.

C. Dirty Oil Due To Dirty Oil Filer: The oil filter has a safety by-pass design. When filter traps dirt, it accumulates over a period of time and the filtered passage will eventually plug up. When the oil can no longer pass through the filtered passage, it will by-pass directly to the pump. This allows the unfiltered oil to be pumped in the system. Dirt from the contaminated oil settles on the internal pump parts causing abrasion problems which will wear out or damage the pump before its time. Remove filter element and clean thoroughly. Refer to Page 19.05.

D. Improper Grade Of Oil: Refer to "Preventive Maintenance", pages in this manual.

E. Excessive Heat: Clean air-oil cooler and be certain cooler fan is electrically operative.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TROUBLE SHOOTING CHART (CONTINUED)

TROUBLE: PUMP FAILURE (CONTINUED)

F. Excessive Pressure: Refer to "Hydraulic Pump Not Functioning Properly", Page 20.02.

G. Motor - Pump Coupling Misalignment: Coupling halves on pump and motor shaft must be aligned within .003 inch.

TROUBLE: PREMATURE HYDRAULIC CYLINDER FAILURE

1. Material packed in ram chamber: Ram chamber and roller ways should be cleaned daily so ram is free to reciprocate, avoiding unnecessary opposition to cylinder operation.

   NOTE: INSPECT RAM WIPER. ADJUST WIPER IF REQUIRED. REFER TO "PREVENTIVE MAINTENANCE" SECTION OF THIS MANUAL.

2. Dirty Oil Due To Dirty Oil Filter: The filter elements are of the safety by-pass design. If filter is plugged, oil will by-pass directly to the system to prevent pump from cavitating. This allows unfiltered oil to be pumped to hydraulic cylinder and accumulated dirt from contaminated oil will cause abrasion problems which will wear the piston cups and cylinder wall. Remove filter element and clean. Refer to Page 19.05.

3. Baling At Too High A Pressure: Never operate baler above specified hydraulic pressures. For proper operating pressure, refer to "Hydraulic Valves - Description/Adjustments" Section of this manual for "Adjustment Of Relief Valve", Page 17.01, and Unloading Valve (Item 9).

4. Excessive Heat: Clean air-oil cooler and be certain cooler fan is electrically operative.

5. Worn Ram Liners: Replace worn ram liners. Refer to "Preventive Maintenance" Section of this manual.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

TORQUE WRENCH CHART

BOLT DIA.	THREAD PITCH	GRADE 0-2	GRADE 5	GRADE 6	GRADE 7	GRADE 8
1/4	20 28	5.5 6.0	9.7 11.0	11.0 12.0	11.5 13.0	13.0 15.0
5/16	18 24	10.0 11.4	18.0 20.0	20.0 23.0	21.0 24.0	24.0 27.5
3/8	16 24	21.7 24.5	39.0 44.0	43.0 49.0	45.0 51.0	52.0 59.0
7/16	14 20	32.4 38.4	58.0 69.0	65.0 77.0	67.0 80.0	78.0 92.0
½	13 20	43.5 54.6	87.0 103.0	97.0 115.0	102.0 121.0	116.0 138.0
9/16	12 18	57.5 68.0	111.0 131.0	123.0 146.0	129.0 153.0	147.0 175.0
5/8	11 18	86.0 102.0	173.0 200.0	192.0 224.0	201.0 235.0	230.0 269.0
3/4	10 16	152.0 182.0	290.0 345.0	324.0 384.0	336.0 403.0	389.0 461.0
7/8	9 14	222.0 261.0	500.0 585.0	555.0 653.0	583.0 685.0	666.0 784.0
1	8 14	307.0 370.0	690.0 830.0	769.0 925.0	807.0 967.0	923.0 1111.0
1-1/4	7 12	384.0 462.5	862.5 1037.5	961.0 1156.0	1009.0 1209.0	1154.0 1389.0
1-1/2	6 12	460.5 555.0	1035.0 1245.0	1153.5 1387.5	1210.5 1450.5	1384.5 1666.5
1-3/4	5 12	537.0 647.2	1207.5 1452.5	1346.0 1619.0	1412.0 1692.0	1615.0 1944.0
2	4.5	614.0	1380.0	1538.0	1614.0	1846.0

VALUES ARE FOR CLEAN THREADS, LIGHTLY OILED.

EXCEPTIONS:

1. Ryertex:
   a. Bearing, same as Grade 2.
   b. Threaded, ½ the value of Grade 2.
2. Brass: ½ the value of Grade 2.
3. Grade 8 & Soc Hd Bolts W/Gr. 5 Nuts; use values of Gr. 5.
4. Bolt In Slotted Holes; use ½ value of Grade 2.
5. Hogger Tie Rod Bolts.
6. Code 61/62 Split flanges: see next page for table.

Recommended Bolt Torque For Split Flanges

Flange Size	Bolt Dimensions	Torque Range (ft-lb)
3/4"	3/8-16 X 1-1/4" lg	21 - 30
1"	3/8-16 X 1-1/4" lg	27 - 35
1-1/4"	7/16-14 X 1-1/2" lg	35 - 46
1-1/2"	1/2-13 X 1-1/2" lg	46 - 58
2"	1/2-13 X 1-1/2" lg	54 - 67
2-1/2"	1/2-13 X 1-1/2" lg	79 - 92

Note: Bolts must be Grade 5 or better. Grade 8 is preferred.

HYDRAULIC CYLINDER CHECK

This page is to assist maintenance personnel in determining a cylinder failure without removing the cylinder from the machine.

The following test will give a confirming answer should a cylinder failure be in question.

1. Remove the furthest forward limit switch (either 4LS or 5LS).
2. With the controls in "MAN" mode, push the "MAN-RAM" button and hold it until the baling ram comes to a stop.
3. Turn the control power off.
4. Remove the hydraulic hose from the rod end.
5. Turn the control power on and with the baler in "MAN" mode, hold the "MAN-RAM" button depressed.

NOTE: IF OIL IS LEAKING OUT OF THE ROD END OF THE CYLINDER, THE CYLINDER PISTON CUP SEALS HAVE FAILED OR THE INTERIOR CYLINDER WALLS ARE SCORED AND THE CYLINDER MUST BE REBUILT OR REPLACED.

CAUTION:

SOME HYDRAULIC FLUIDS ARE FLAMMABLE. CARE SHOULD BE TAKEN TO AVOID SPILLAGE.

BALING CYLINDER REMOVAL AND INSTALLATION

NOTE: MAINTENANCE IS THE RESPONSIBILITY OF THE USER MANAGEMENT AND IS TO BE PERFORMED BY QUALIFIED PERSONNEL.

CYLINDER REMOVAL

WARNING: DO NOT DISCONNECT THE MAIN HYDRAULIC CYLINDER HOSES WITH THE BALING RAM IN CONTACT WITH THE BALED MATERIAL. THE BALED MATERIAL IS UNDER COMPRESSION AND MAY MOVE THE RAM BACKWARDS IF THE HYDRAULIC HOSES ARE DISCONNECTED. ALWAYS MOVE THE RAM TO THE RETRACTED POSITION, OR A INTERMEDIATE POSITION WHERE IT IS NOT IN CONTACT WITH THE BALED MATERIAL.

1. Position the ram at least half way forward in the chamber permitting sufficient room for personnel access to the cylinder/ram attachment.

2. Lock out electrical power.

CAUTION:

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

3. Remove ram chamber cover.

4. Support the cylinder to prevent it from dropping when the cylinder adaptor is removed.

5. Disconnect the hoses. Mark the hoses so they can be hooked up correctly upon installation. Incorrect attachment will cause ram to operate in reverse. Install plugs in threaded port or covers on SAE Flanges. This prevents the cylinder rod from moving unexpectedly during handling.

6. Remove the bolts from the cylinder adaptor at the rear of the ram. THE TRUNNION BLOCKS MUST BE UNBOLTED FROM THE FRAME AND THEN REMOVED FROM THE CYLINDER. NOTE LOCATION OF ANY SHIMS AND SAVE TO USE FOR INSTALLATION.

7. Remove the cylinder from the baler.

8. If the cylinder is to be stored or shipped, retract the rod back into the cylinder and install plugs or covers in the cylinder ports.

IMPORTANT: THE RECEIVING DEPARTMENT WILL NOT ACCEPT CYLINDERS WITHOUT PLUG OR COVERS ON THE PORTS.

BALING CYLINDER REMOVAL & INSTALLATION

NOTE: KEEP ALL HYDRAULIC PARTS CLEAN. DIRT AND CONTAMINATES SHORTEN THE LIFE OF HYDRAULIC COMPONENTS.

CYLINDER INSTALLATION

1. Place cylinder in baler.

   NOTE: PROTECT THE CYLINDER ROD FROM DAMAGE.

2. Attach cylinder to baler frame.

3. Extend the cylinder and check alignment. See figure on next page. The cylinder should be supported, but not attached to the ram. Measure the distance from the rod to side sheets. This should be done at the cylinder body and the cylinder end (extended). Also measure from the cylinder body to the side sheet at the trunnion mount. All of these measurements should be within 1/16" of being centered (a maximum difference of 1/8" between the two measurements). Alignment can be adjusted by using shims behind the trunnion blocks.

4. Extend cylinder rod to ram, and attach.

5. Install hoses.

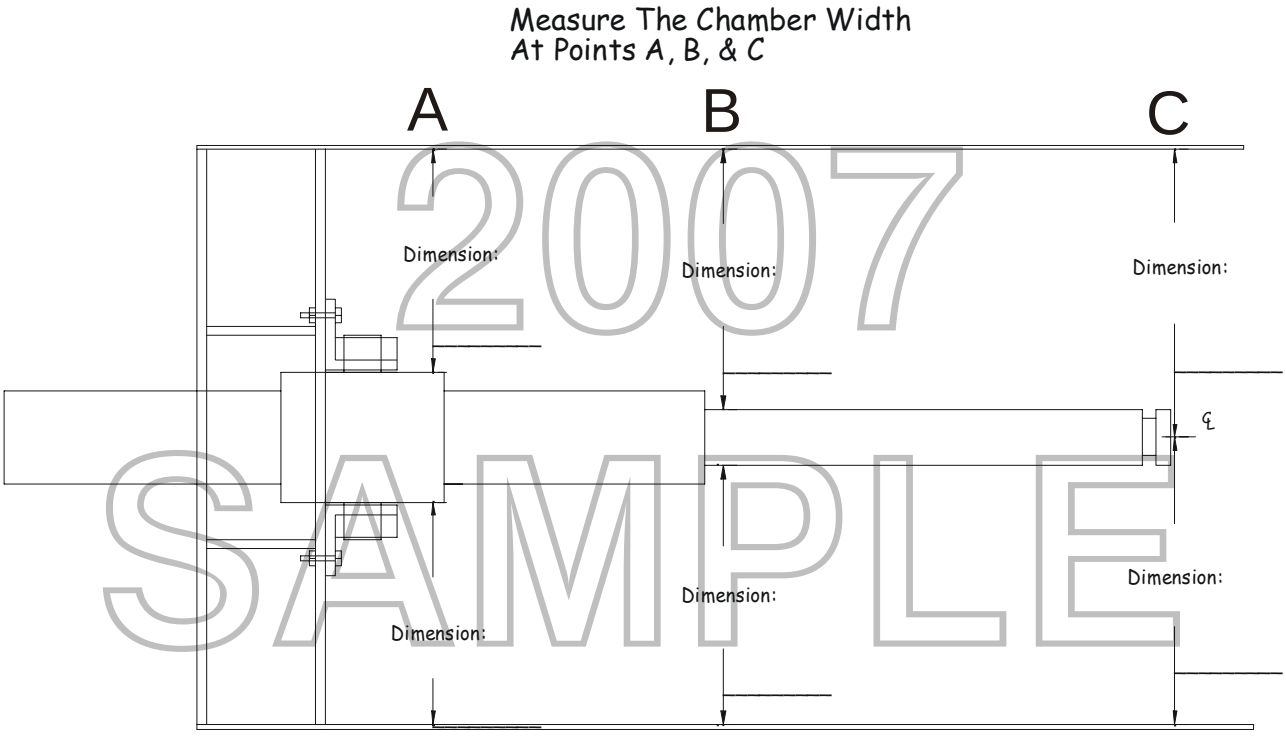
6. Turn on electrical power.

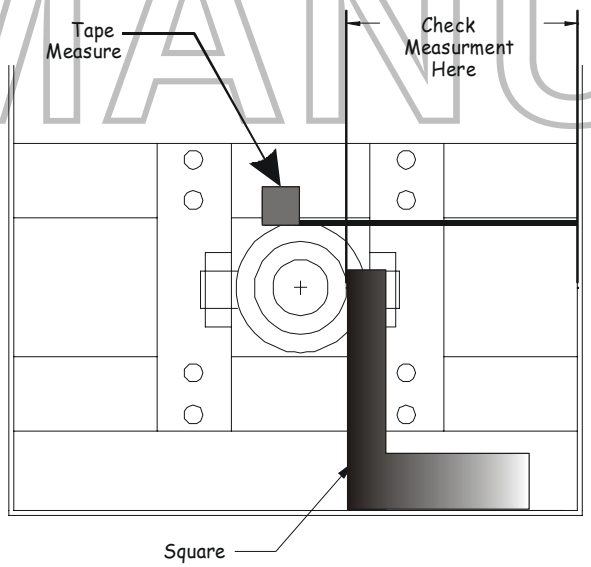
7. Start baler. Check for hydraulic leaks and ram direction.

8. Check limit switch for proper location. See Pages 13.00, 13.01 and 13.02 for limit switch description, location and adjustment.

9. Reinstall ram chamber cover.

CYLINDER ALIGNMENT





Using a tape measure; Measure from the side wall to the inside of the square (Where the square touches the cylinder rod, Measure both sides and record these measurements.
Check the measurements with the square on the collar next to the trunion, and on the cylinder rod next to the cylinder tube as illustrated above. Then check the measurement with the rod fully extended from each side wall to the center point on the hockey puck.

PARTS ORDERING INFORMATION

BALEMASTER/BALEWEL EQUIPMENT

SERVICES AVAILABLE:

We will be pleased to quote the following:

1. Replacement Parts and Spare Parts.
2. Bale Tie Wire.
3. Factory Field Service Supervision.

PARTS ORDERING

Your order **MUST** include the following:

1. Serial Number and Model Number as tagged on the machine.
2. Part Number -- refer to Parts List in this Manual.

CONTACT

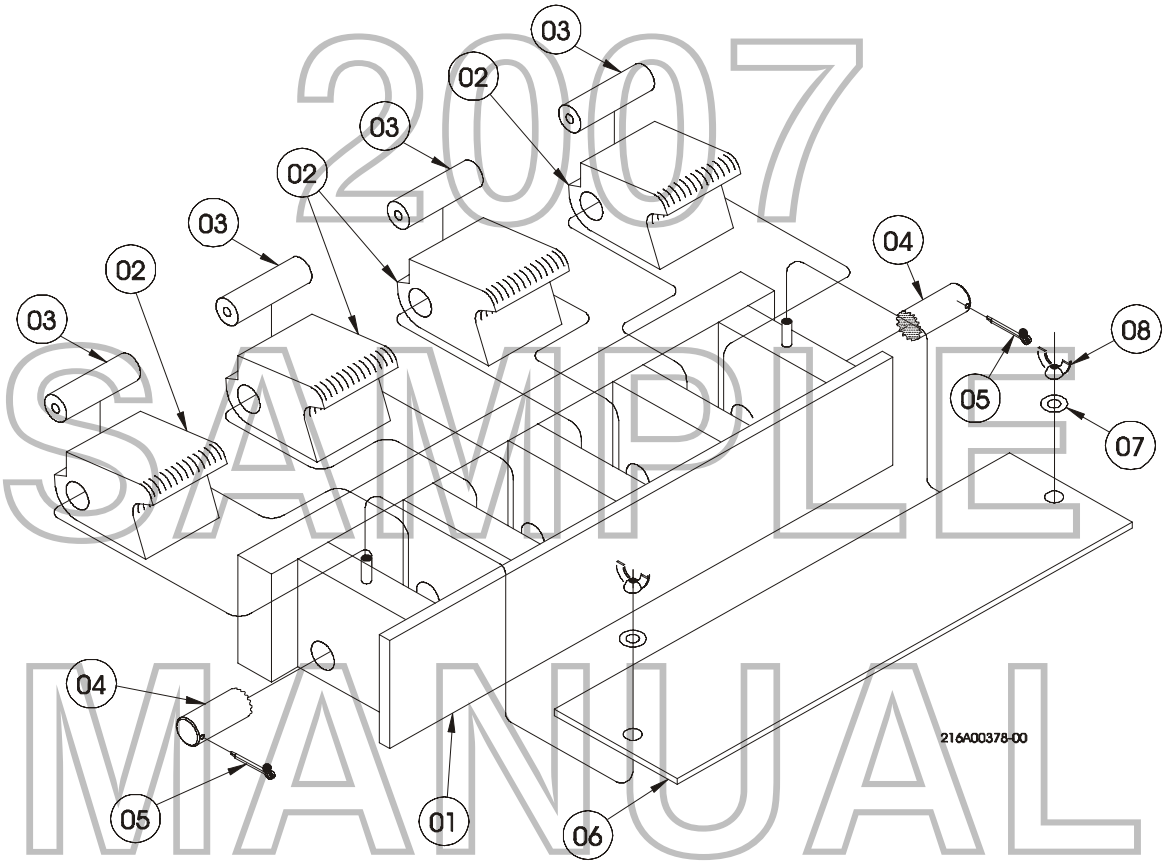
THE SERVICE DESK
BALEMASTER DIVISION
EAST CHICAGO MACHINE TOOL CORPORATION
980 CROWN COURT
CROWN POINT, INDIANA 46307

OR CALL

(219)663-4525

3. All Warranty Claimed Returned Parts must have a Return Authorization Number given during contact with our Service Desk. Ship to the attention of: Customer Service Department. **NO** Collect Shipments will be accepted. See Warranty.

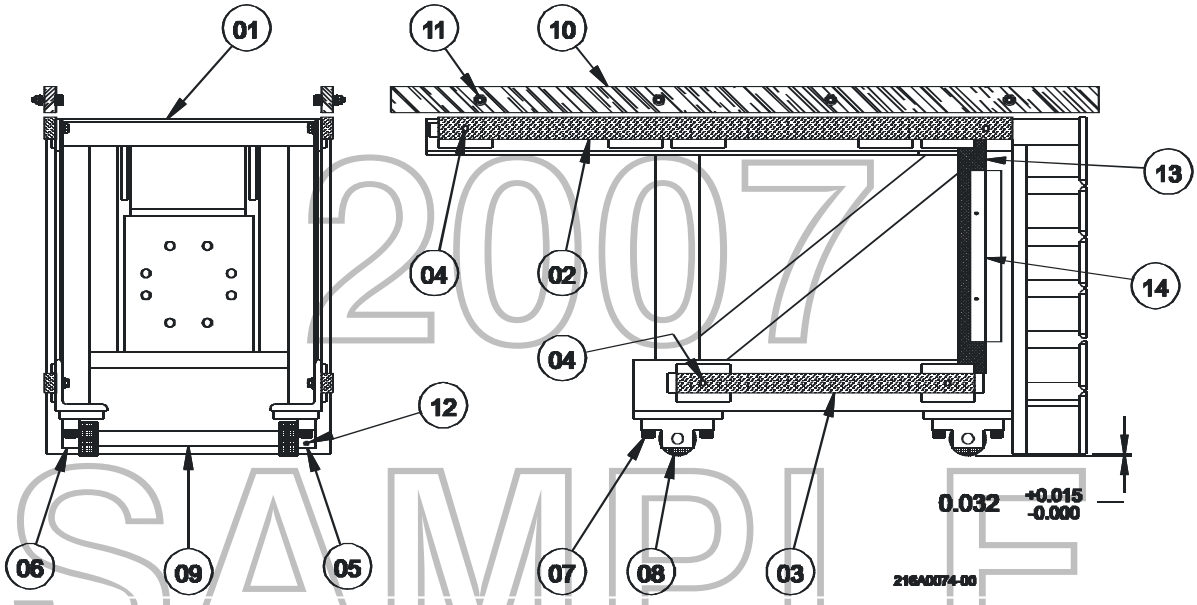
SPARE PARTS - BALELOCK ASSEMBLY



ITEM #	DESCRIPTION	PART NUMBER	QTY.
1	BALELOCK FRAME	PART OF MAIN FRAME	1
*2	BALELOCK	225B0061-00	4
*3	SPRING	225A0062-00	4
*4	BALELOCK PIN	225B0011-02	1
5	COTTER PIN	APC00016	2
6	BALELOCK COVER	225B0071-00	1
7	FLAT WASHER	AHA00004	2
8	WING NUT	AZA00012	2

* THESE SPARE PARTS ARE RECOMMENDED FOR YOU OWN INVENTORY TO COVER EMERGENCY REPAIRS.

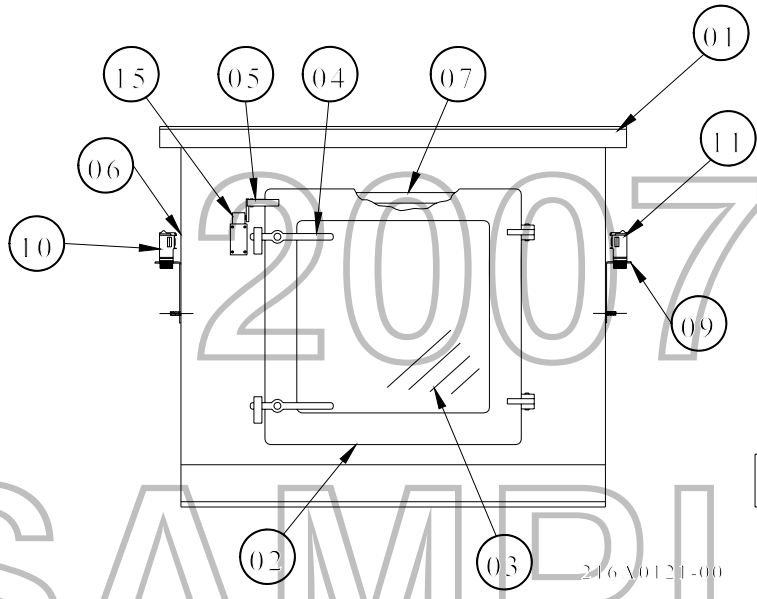
SPARE PARTS - RAM - AUTOTY
PART NUMBERS: BR065-05, BR067-04



ITEM#	DESCRIPTION	PART NUMBER	QTY.
01	4000 AUTOTY RAM	223C0150-00	1
	EXTENSION (OVERSIZE)	223A0154-00	1
02	TOP SIDE LINER (Ryertex)	223A0522-00	2
02	TOP SIDE LINER (Moly Infused)	223A0522-04	2
03	BOTTOM SIDE LINER	223A0525-00	2
03	BOTTOM SIDE LINER (Moly Infused)	223A0525-04	2
04	3/8-16 HEX HD CAP SCR	AAA00036	8
	3/8 LOCK WASHER	AHB00006	8
	3/8 FLAT WASHER	AHA00006	8
	3/8 BRASS INSERT	AGG00001	8
05	ROLLER SHAFT BLOCK	228B0004-00	2
06	ROLLER SHAFT BLOCK	228B0005-00	2
07	3/4-10 SOC HD CAP SCR	AAB00111	8
08	RAM ROLLER	CEA00002	4
09	RAM ROLLER SHAFT	228B0014-06	2
10	GIB BAR (RIGHT HAND)	222A0007-90	1
	GIB BAR (LEFT HAND)	222A0007-91	1
11	½-13 SOC HD CAP SCR	AAB00083	12
	½-13 HEX HD CAP SCR	AAA00072	4
	½-13 LOCK NUT	AGB00005	16
12	CUP POINT SET SCREW	ADB00057	2
13	# SIDE SWIPER	223B0816-00	2
14	# SIDE SWIPER BACK-UP BAR	223B0818-00	2
	* RAM GROOVE COVER	223B0206-00	5
	* COVER BACKUP BAR	223B0206-02	5

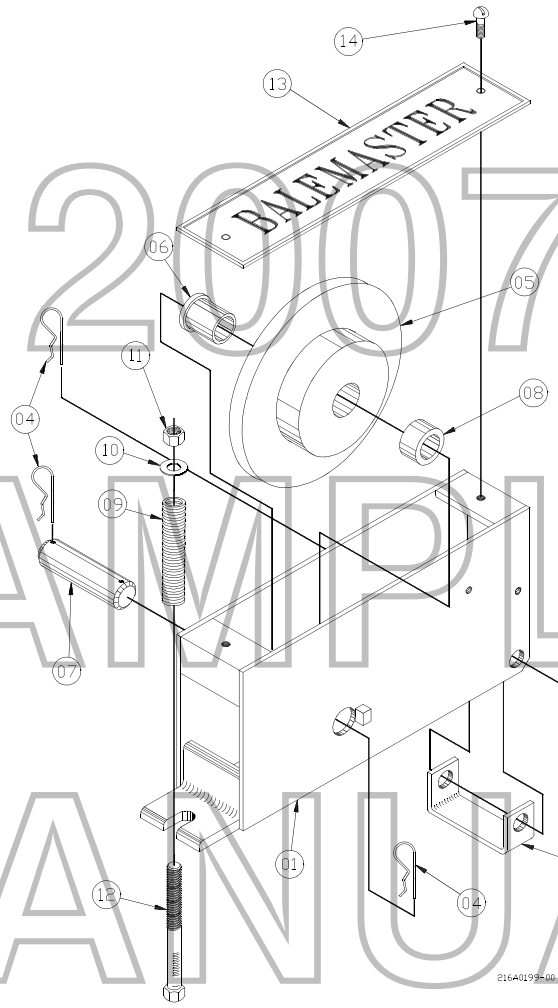
* TO BE USED WITH R.1 OPTION ONLY
# TO BE USED WITH R.3 OPTION ONLY

SPARE PARTS - FEED CHUTE W/DOOR



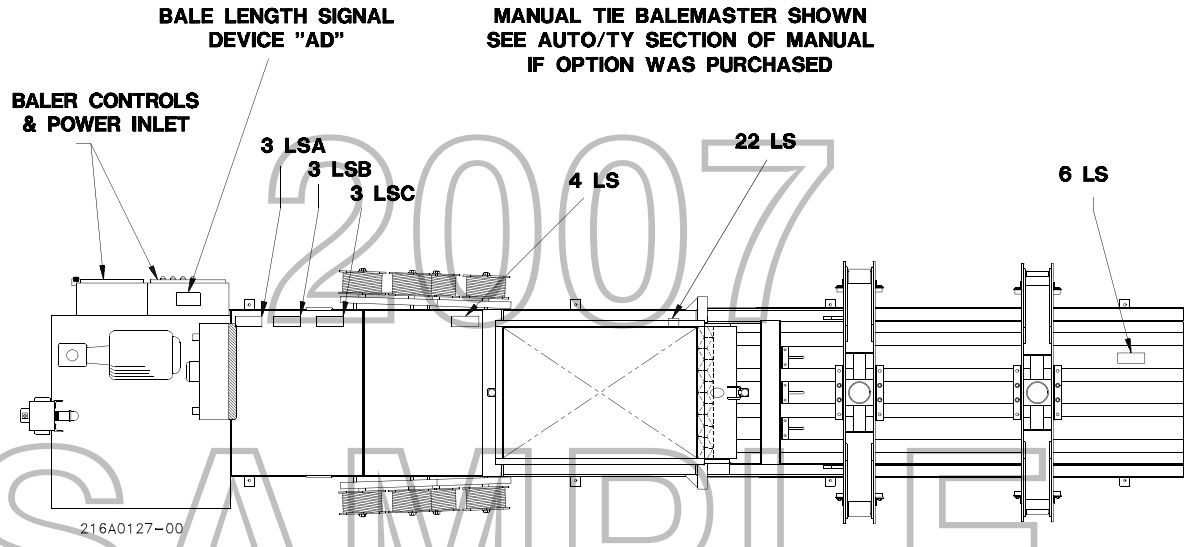
ITEM #	DESCRIPTION	PART NUMBER	QTY.
1	FEED CHUTE W/DOOR-26"	224C0099-00	1
	FEED CHUTE W/DOOR-32"	224C0101-00	1
	FEED CHUTE W/DOOR-40"	224C0103-00	1
	FLARED FEED CHUTE W/DOOR-40"	224C0179-00	1
	REINFORCED FEED CHUTE - 40"	224C0271-00	1
2	DOOR	224C0005-00	1
3	WINDOW	224B0006-00	1
4	HANDLE	224B0007-00	2
5	LIMIT SWITCH ACTUATOR	226A0013-00	1
6	PHOTO-CELL WINDOW	EJA00006	4
7	DOOR GASKET	EAB00012	1
8	RAM INSPECTION COVER-26"	212A0022-00	1
NOT	RAM INSPECTION COVER-32"	212A0022-00	1
SHOWN	RAM INSPECTION COVER-40"	212A0023-00	1
9	PHOTO-CELL BRACKET	113A0023-00	2
10	LIGHT SOURCE	GTE00030	1
11	RECEIVER PHOTOSWITCH CONTROL	GTE00020	1
12	RAM WIPER SUPPORT-26"	223B0919-00	1
	RAM WIPER SUPPORT-32"	223B0916-00	1
	RAM WIPER SUPPORT-40"	223B0916-00	1
13	RAM WIPER BACK-UP BAR	223B0804-06	1
14	RAM WIPER	223B0804-04	1
15	LIMIT SWITCH-22LS	GXA00031	1
	LIMIT SWITCH ARM	GXA00026	1

SPARE PARTS - BALE LENGTH CONTROL



ITEM #	DESCRIPTION	PART NUMBER	QTY.
1	BALE LENGTH FRAME	226B0043-00	1
2	PIVOT BRACKET	226A0044-00	1
3	PIVOT PIN	226B0007-00	1
4	HAIR PIN COTTER	APC00025	4
5	SPROCKET	112A0004-00	1
6	BRONZE BUSHING	CKA00003	1
7	SPROCKET PIN	226A0045-00	1
8	SPACER	226A0067-00	1
9	COIL SPRING	ZKA00006	1
10	½" FLAT WASHER	AHA00007	1
11	½-13 HEX NUT	AGC00015	1
12	½-13 X 5 HEX HD CAP SCR	AAA00078	1
13	NAME PLATE (COVER)	111A0015-00	1
14	1/4-20 X 3/4 RD HD MACH SCR	AFB00038	2

SPARE PARTS - ELECTRICAL - LIMIT SWITCHES

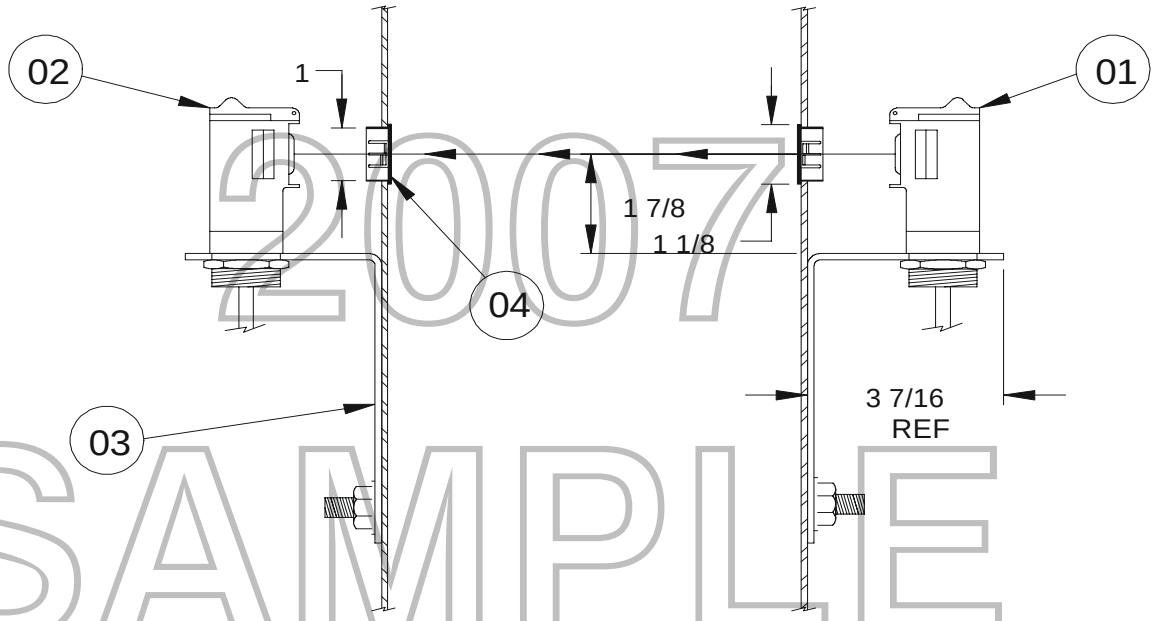


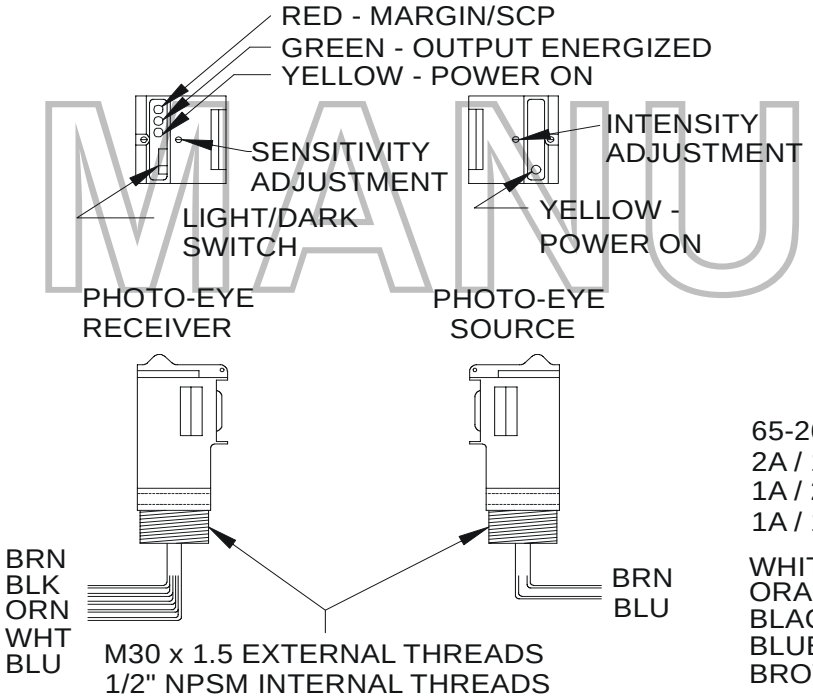
BALER LIMIT SWITCHES	PART NUMBER
22LS	GXA00031
LIMIT SWITCH ARM	GXA00026
6LS	GXA00031
LIMIT SWITCH ARM	GXA00026
5LS** - 5LSA**	GXA00031
LIMIT SWITCH ARM	GXA00026
4LS	GXA00031
LIMIT SWITCH ARM	GXA00030
3LSA - 3LSB** - 3LSC**	GXA00032
LIMIT SWITCH ARM	GXA00026
* BALE LENGTH COUNTER	GSA00008
* LPR-RECEIVER	SEE PAGE 27.02
* LPR LIGHT SOURCE	SEE PAGE 27.02

* THESE PARTS ARE RECOMMENDED FOR YOUR OWN STOCK TO COVER EMERGENCY REPAIRS

** OPTIONAL SWITCHES - DEPENDING UPON FEATURES SELECTED

LOWER PHOTO RELAY (LPR)





65-264 VDC / 60-264 VAC, 4VA
2A / 132 VAC
1A / 264 VAC
1A / 150 VDC

WHITE : NORMALLY CLOSED
ORANGE: COMMON
BLACK: NORMALLY OPEN
BLUE: ~ / - (TYPICALLY 120 VAC)
BROWN: ~ / + (TYPICALLY 120 VAC)

216A0124-01

SPARE PARTS - LOWER PHOTO RELAY (LPR)

ITEM #	DESCRIPTION	PART NUMBER	QTY.
01	LIGHT SOURCE	GTE00030	1
02	RECEIVER	GTE00020	1
03	MOUNTING BRACKET	113A0035-00	2
04	PHOTO-CELL WINDOW	EJA00006	2

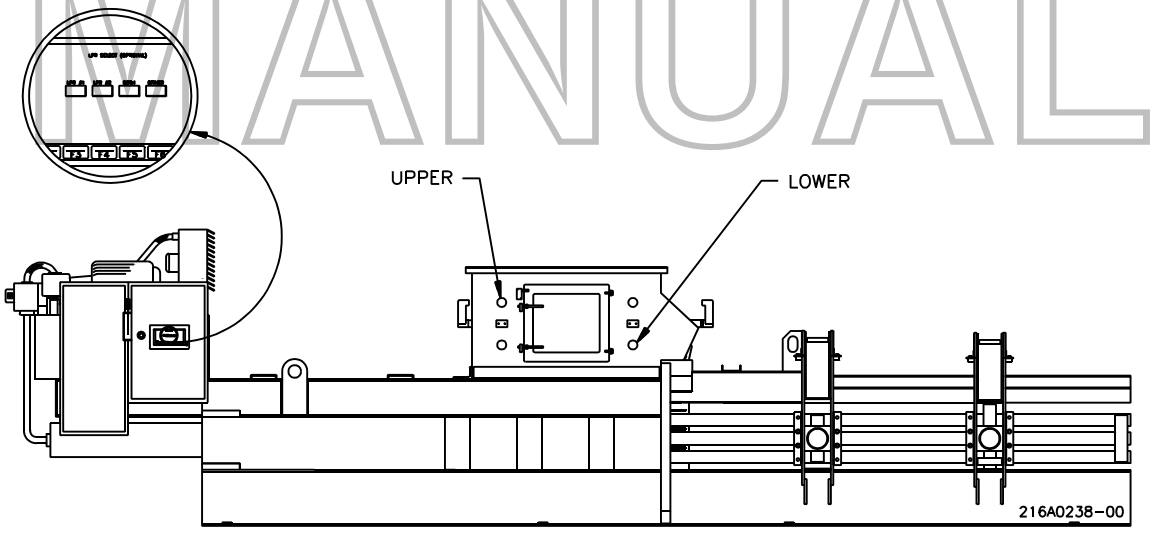
OPERATION OF (OPTIONAL) PHOTO EYE SELECTOR SCREEN

This switch is used to select which set of photo eyes will be used; either a lower set or an upper set can be selected by pushing the button on the touch screen. The photo eyes that should be used are directly related to the type of material being processed. The lower photo eyes will cause the baler to cycle sooner with less material in the feed chute. The upper photo eyes will cause the baler to cycle later with more material in the chamber. It is important to set the photo eyes at the proper level depending upon the material being processed or possible damage could occur. The following is a list of the positions and possible applications: *

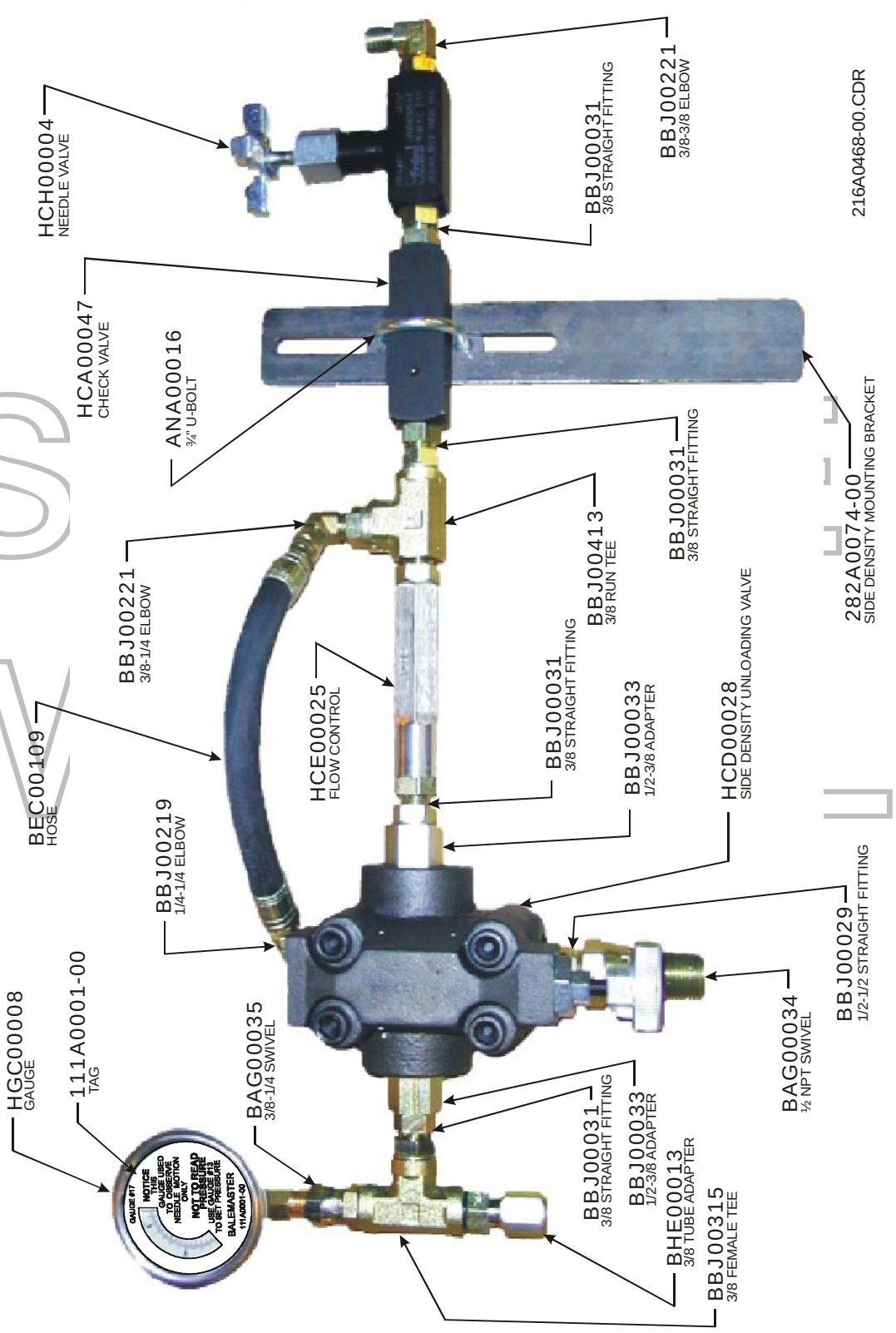
UPPER - This set of eyes is used for baling low density material, fluffy material, whole corrugated boxes, etc. *

LOWER - This set of eyes is used for baling high density material, flattened cans, newspaper, etc. *

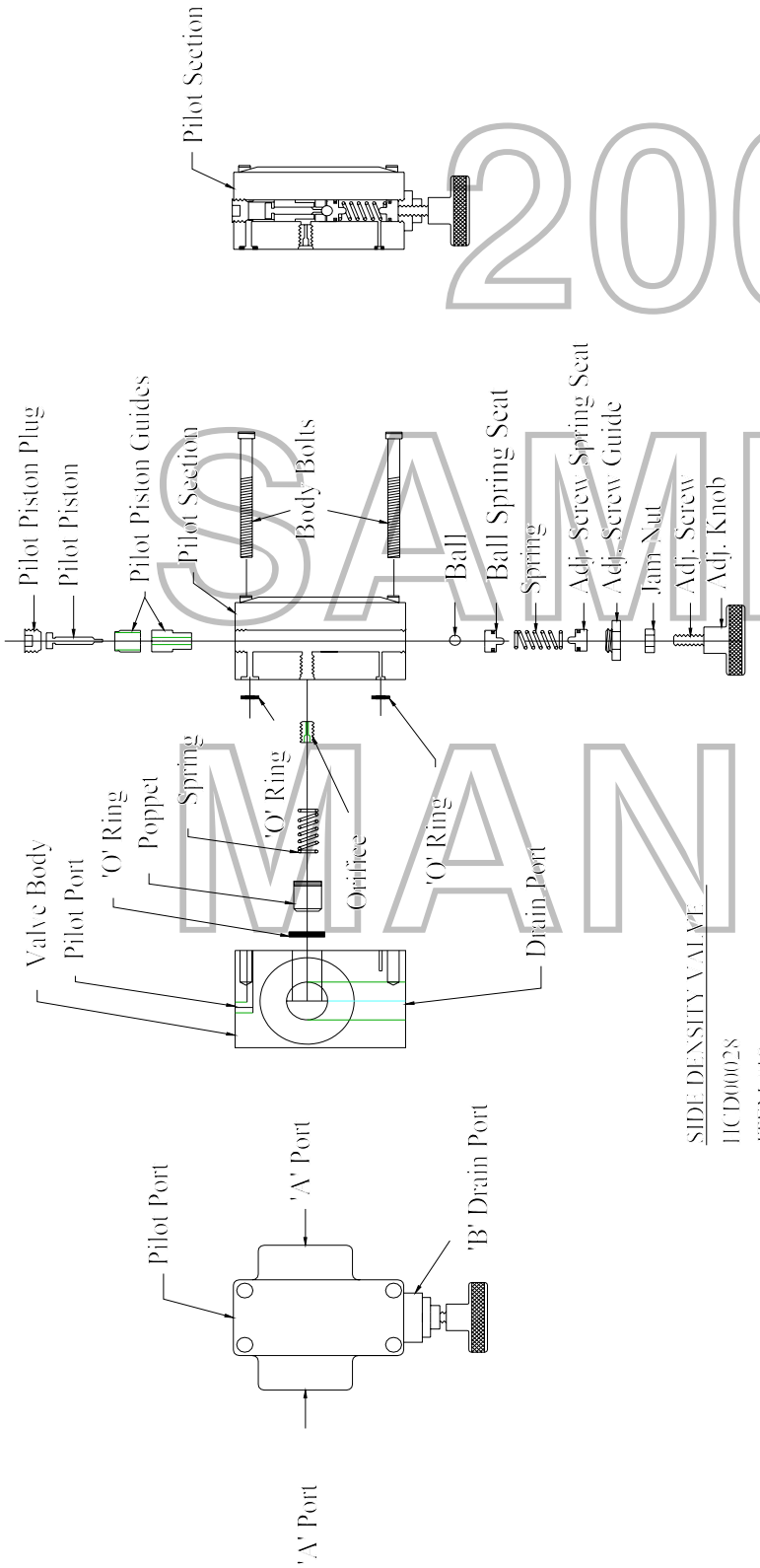
*Other locations might give best results depending on product being baled and may vary with different material applications.



SIDE DENSITY CONTROL ASSEMBLY - PARTS LIST #BP001-04



PROCEDURE TO CLEAN DENSITY VALVE



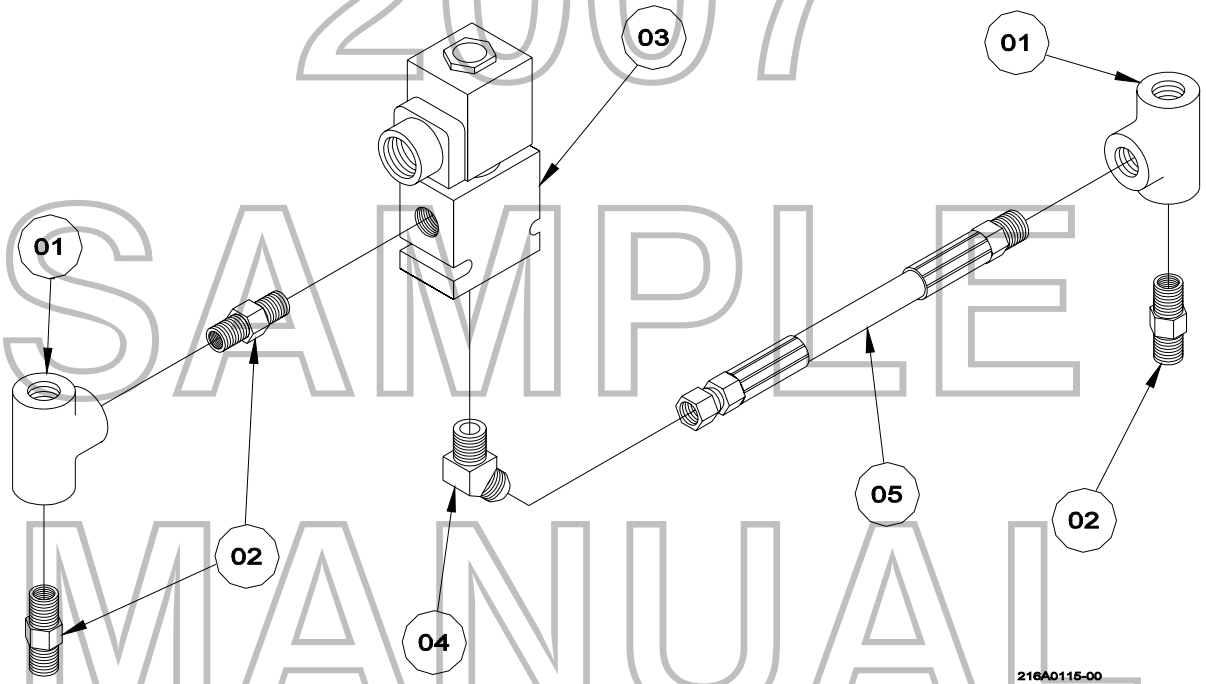
SIDE DENSITY VALVE
HCD00028
ITEM 18

PROCEDURE TO CLEAN SIDE DENSITY VALVE

Shut baler off and LOCK-OUT disconnect switch.
Shut off 1/4 inch shut-off valve on side density sub-assembly. Item #25 on the hydraulic schematic
Turn Adj. Knob on side density valve counter clock-wise to release any side pressure in the system.
Loosen & take out the (4) body bolts holding the pilot section to the valve body.
Pull out the spring and poppet from the valve body. the poppet may be stuck.
Wipe off poppet with a clean rag and reinsert into the body, making sure that it moves freely.
Replace the spring and pilot section being careful not to crush the (3) 'O' rings.
Tighten the (4) body bolts and readjust the side pressure to achieve 1800 psi locking pressure.

CAUTION: NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

SPARE PARTS - POLY-DENSITY CIRCUIT
(OPTIONAL)



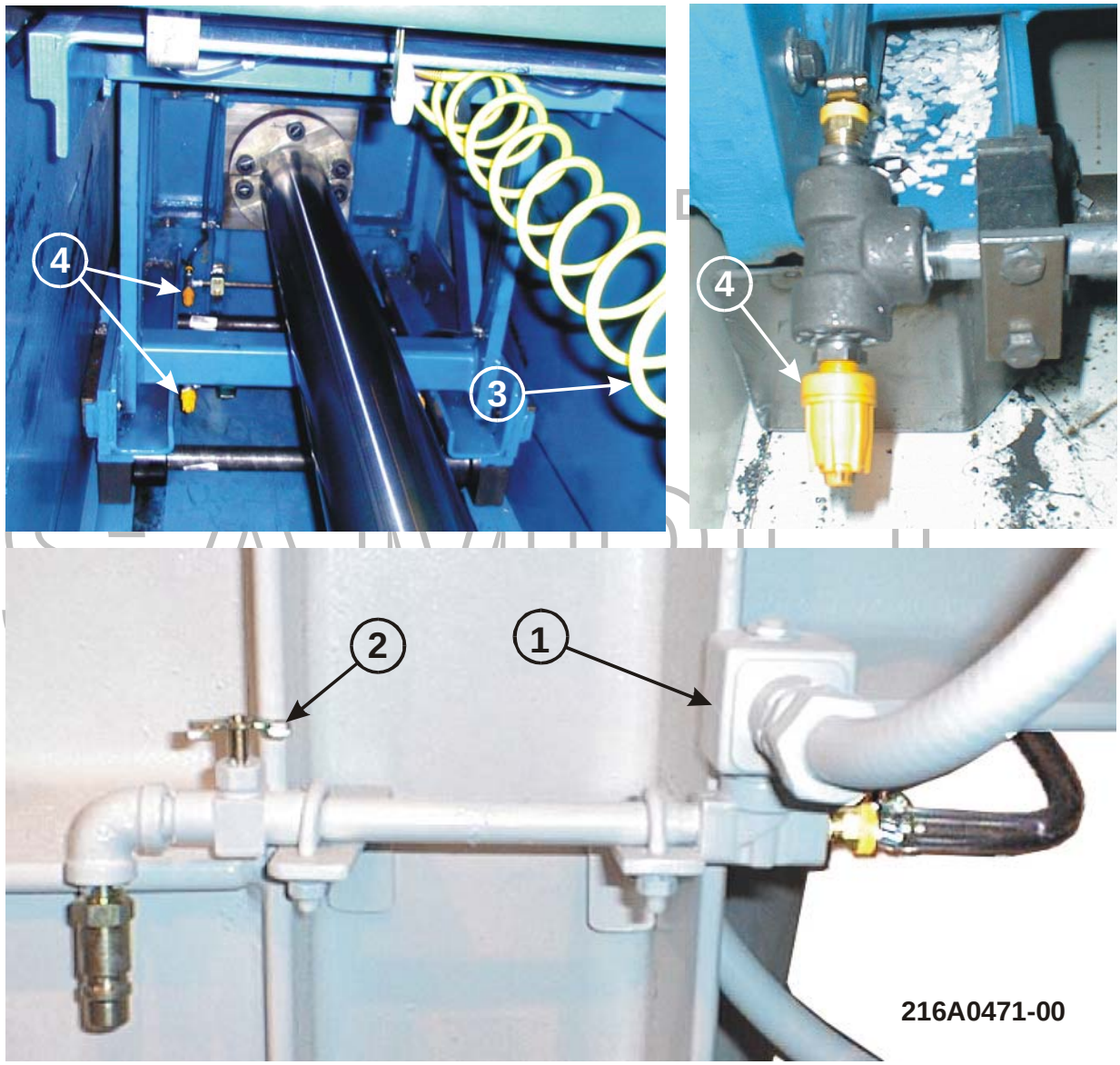
ITEM #	DESCRIPTION	PART NUMBER
01	1/4 TEE	BAC00004
02	1/4 NIPPLE HEX	BAE00024
03	SOLENOID VALVE, 2 WAY	HCK00004
04	1/4 MALE ELBOW, 45	BBE00203
05	1/4 HYDRAULIC HOSE	BEB00131

HYDRAULIC SPARE PARTS

SEQ#	PSCN	PMDESC	PSQTYP	PSPN
10.01	287A0112-00	CYL 6" BORE 4" ROD X 49-1/2" W	1.0000	BC055-05
20.01	223B0320-00	ADAPTER,RAM 6" CYLINDER	1.0000	BC055-05
20.02	HCA00217	CART RELIEF VALVE S	1.0000	BI255-05
20.03	HCA00218	CART CHECK VALVE SUN	1.0000	BI255-05
20.04	HCA00225	UNLOAD/REGEN CTR BALANCE VALVE	2.0000	BI255-05
20.05	HCA00220	CART P.O. CHECK VALVE, OPEN S	1.0000	BI255-05
20.06	HCA00221	CART P.C. CHECK VALVE, CLOSE S	1.0000	BI255-05
20.11	HCA00217C	COVER, CART RELIEF VALVE	1.0000	BI255-05
50.01	BEJ55E6E114	HOSE, HP, 1-1/4 X 114, 1-1/4 9	1.0000	BI255-05
50.02	BEF00005	1-1/4" FLANGE KIT #20	1.0000	BI255-05
50.03	BEF00006	1 1/2" FLANGE KIT #24	1.0000	BI255-05
60.01	BEJ55E6Q060	HOSE, HP, 1-1/4 X 60, 1-1/4 90	1.0000	BI255-05
60.02	BEF00005	1-1/4" FLANGE KIT #20	1.0000	BI255-05
60.03	BEF00006	1 1/2" FLANGE KIT #24	1.0000	BI255-05
10.01	GOA00001	RELAY,OVERLOAD,MOTOR,SIN.POLE	1.0000	BJ035-08
20.01	HDA00026	COOLER,AIR-OIL, 1PH 115V,OKC5S	1.0000	BJ035-08
30.01	BEA55C5B032	HYD HOSE, LP, 1-1/4 X 32, ST.	1.0000	BJ035-08
30.02	BEF00005	1-1/4" FLANGE KIT #20	1.0000	BJ035-08
40.06	HCA00051	VALVE,CHECK,IN-LINE,1 1/4"	1.0000	BJ035-08
50.03	BLA00005	1-1/4" I.D. LOW PRESSURE RUBBE	2.0000	BJ035-08
10.01	HGC00008	GAUGE,PRESSURE,5000 PSI ENF	1.0000	BP001-04
10.03	HCD00028	SIDE DENSITY VALVE 1/2" DENNI	1.0000	BP001-04
10.04	HCA00047	3/8 SAE,IN LINE 5# CHECK VALVE	1.0000	BP001-04
10.05	HCE00025	FLOW CONTROL,3/8" SAE, 1-GPM L	1.0000	BP001-04
10.06	HCH00004	VALVE,NEEDLE,3/8" SAE, STAUFF	1.0000	BP001-04
30.04	BEC00109	HOSE,HP,1/4" X 9", 1/4 FEM JIC	1.0000	BP001-04
40.05	BHE00013	3/8" SAE - TUBE CONNECTOR, STR	1.0000	BP001-04
20.05	HMA00002	HYDRAULIC OIL	15.0000	BP029-09
30.07	284B0005-00	OIL TANK COVER GASKET 10"X10"	1.0000	BP029-09
30.08	284A0021-02	GASKET,11"X14" PUMP SUCTION CO	1.0000	BP029-09
40.01	283B0116-00	ACCESS COVER,HYDRAULIC TANK	1.0000	BP029-09
40.02	283B0014-00	ACCESS COV.GASKET FOAM RUBBER	1.0000	BP029-09
50.02	HHA00002	BREATHER/DIPSTICK/FILTER S	1.0000	BP029-09
50.03	ZTA00017	MAGNET 1.75 ID X 3.937 OD X .7	1.0000	BP029-09
60.03	HCC00038	4 WAY VALVE 3/4" VI	1.0000	BP029-09
70.01	HKB00004	FLANGE,MOTOR/PUMP, 30 HP	1.0000	BP029-09
70.02	DBA00056	COUPLING,MTR/PMP,1-1/4 X 1-7/8	1.0000	BP029-09
70.03	HBA00045	PUMP,30 HP, DUAL VANE NORTHMA	1.0000	BP029-09
80.05	HHA00020	FILTER,HYD.200MESH/3 PSI BYPAS	1.0000	BP029-09
110.01	BEJ45E4G038	HYD HOSE, HP, 1 X 38, 1-1/4 90	1.0000	BP029-09
110.02	BEF00005	1-1/4" FLANGE KIT #20	1.0000	BP029-09
110.03	BEF00004	FLANGE KIT, FOR 1" FLG TYPE HO	1.0000	BP029-09
120.01	BEJ34E3H040	HYD HOSE, HP, 3/4 X 40, 1" 90	1.0000	BP029-09
120.02	BEF00004	FLANGE KIT, FOR 1" FLG TYPE HO	1.0000	BP029-09
120.03	BEF00003	FLANGE KIT, FOR 3/4" FLG TYPE	1.0000	BP029-09
170.03	BBE00303	ELBOW,MALE,90,1/4 - 1/4" 3000P	1.0000	BP029-09
180.03	HGC00008	GAUGE,PRESSURE,5000 PSI ENF	1.0000	BP029-09
20.01	287A0160-00	TENSION CYLINDER, 6 X 2-1/2 X	4.0000	BW057-03
30.20	BHE00008	3/8" TUBE UNION, STRAIGHT	2.0000	BW057-03
30.30	BHE00003	3/8" TUBE UNION TEE	2.0000	BW057-03
30.40	BHE00006	3/8" TEE, SAE - TUBE - TUBE	2.0000	BW057-03
30.50	BHE00005	3/8" ADAPTER, 90 DEG, 3/8 SAE	2.0000	BW057-03
30.70	BHE00004	3/8" TUBE UNION 90 DEG ELBOW	1.0000	BW057-03
30.80	BHE00009	QM20 TUBE CLAMP, NEOPRENE INSU	13.0000	BW057-03
30.90	BHE00002	3/8" TUBE BULKHEAD UNION, 6 WB	1.0000	BW057-03

SPARE PARTS

RAM CHAMBER AIR SWEEP (OPTIONAL)



ITEM	PART #	DESCRIPTION
1	HCK00003	SOLENOID VALVE
2	HCH00003	NEEDLE VALVE
3	BLA00003	COILED AIR HOSE
4	BFA00016	AIR NOZZLE

NOZZLE CAPACITY (PER NOZZLE)

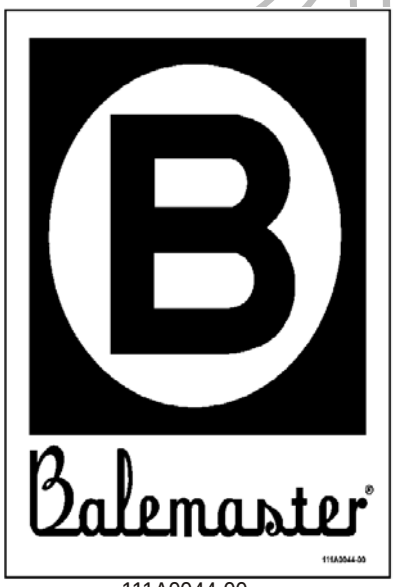
12.4 SCFM @ 30 PSI
21.0 SCFM @ 60 PSI
29.4 SCFM @ 90 PSI

SPARE TAGS

NOTE: TO ORDER NEW TAGS, USE THE PART NUMBER BY EACH TAG.
CAUTION: DON'T REMOVE OR DEACTIVATE SAFETY DEVICES OR TAGS!

111A0011-00

111A0006-00



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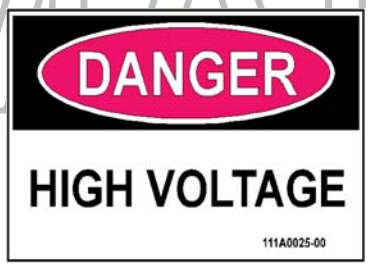


111A0025-00

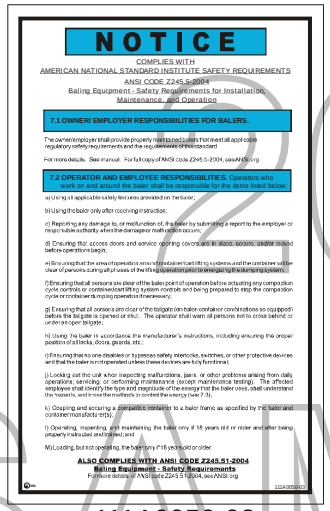
111A0012-00

111A0026-00

111A0049-00

SPARE TAGS

NOTE: TO ORDER NEW TAGS, USE THE PART NUMBER BY EACH TAG.
CAUTION: DON'T REMOVE TAGS OR DEACTIVATE SAFETY DEVICES!

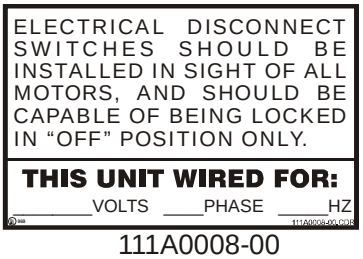


111A0050-03

111A0136-01

111A0207-00

111A0138-00



111A0008-00

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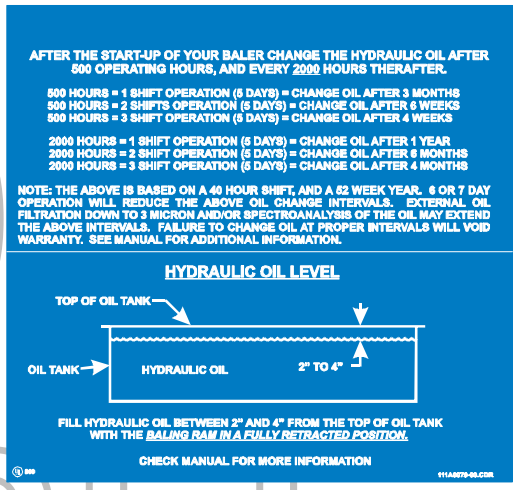
SPARE TAGS

NOTE: TO ORDER NEW TAGS, USE THE PART NUMBER BY EACH TAG.
CAUTION: DON'T REMOVE TAGS OR DEACTIVATE SAFETY DEVICES!

111A0024-00



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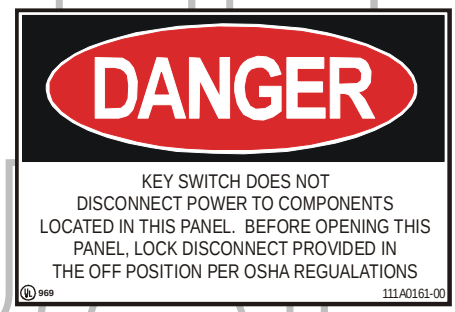

111A0161-00

111A0195-01

111A0205-00

COMMENT FORM

Please use this form only to identify publication errors or to request changes in publications. Direct any requests to purchase additional manuals or have technical questions answered about existing equipment to the Service Department. You may use this form to communicate your comments about this publication, it's organization, or subject matter with the understanding that Balemaster, a Division of East Chicago Machine Tool Corporation, may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

☐ If your comment does not need a reply (for example, pointing out a typing error), check this box and do not include your name and address below. If your comment is applicable, we will include it in the next revision of the manual.

☐ If you would like a reply, check this box. Please be sure to print your name and address below.

PAGE NO.	COMMENT

COMPANY OR ORGANIZATION

ADDRESS

CITY, STATE & ZIP CODE

TELEPHONE NUMBER W/AREA CODE

Please Mail Form To:
BALEMASTER
DIVISION OF EAST CHICAGO MACHINE TOOL CORPORATION
980 CROWN COURT
CROWN POINT, INDIANA 46307
ATTN: SERVICE DEPARTMENT

Balemaster®
DIVISION OF EAST CHICAGO MACHINE TOOL CORP.
980 CROWN COURT, CROWN POINT, INDIANA 46307
219/663-4525 Fax 219/663-4591

TERMS AND CONDITIONS OF SALE

The following terms and conditions of sale become a part of the proposal and any subsequent sale of equipment manufactured by the East Chicago Machine Tool Corporation. its Divisions or Subsidiary, hereafter referred to as "we," "us," "our," etc., whether the equipment be purchased or leased directly from us or our Agent, Representative or Dealer, or from a Leasing Company. "Buyer" as used herein includes not only the purchaser but also the original user and original owner of the equipment.

PRICES

1. Prices are firm for a period of 60 days from date of proposal provided that the first available shipment will be accepted by Buyer.

2. Prices are f.o.b. point of manufacture. Shipments will be made freight collect only.

3. Prices are in U.S. currency and do not include any excise, sales, use or property taxes. export or import duties or other taxes of any taxing authority. Prices are subject to increase equal in amount to any tax we may be required to collect or pay on the sale or use of the equipment. Such amount will be payable when invoiced.

TERMS OF PAYMENT

1. Unless otherwise specified by us, the following payment schedule applies to all accepted orders, based on the total dollar amount of the order

To $50,000:
Twenty five percent payable at time of placement of order;
Sixty five percent payable five (5) calendar days prior to shipment;
Ten percent payable thirty (30) calendar days following date of shipment.

$50,001 and up
Twenty five percent payable at time of placement of order followed by equal monthly progress payments, so scheduled, that ninety percent has been paid five (5) calendar days prior to scheduled shipment and final ten percent payable thirty (30) calendar days following date of shipment.

2. Accounts not paid within 30 days of invoice date will bear a service charge of one and one-half percent (1½%) per month on the unpaid balance due.

ACCEPTANCE

1. All orders are subject to acceptance in Crown Point, Indiana in writing by our marketing manager or one of our corporate officers. Typographical and clerical errors in quotations and acknowledgments are subject to correction. Equipment manufacture will not be scheduled prior to receipt of down payment.

2. For credit verification, w**e** may require a financial statement or other financial information from the Buyer. At our option prior to shipment of the equipment, we may require the utilization of a financing statement and security agreement or irrevocable Letter of Credit. Title to equipment shall pass to Buyer only upon payment in full, of the balance due on the order.

3. Any contract for the sale of equipment by us shall be treated as made and as performed in the State of Indiana.

CHANGES IN DESIGN

1. As we constantly strive to improve our products, specifications are necessarily subject to change without notice. We are not obligated to apply any change or improvement on equipment previously manufactured.

2. Changes in design or construction of equipment made at the request of the Buyer after its order has been accepted. or, in the case of custom equipment orders after the approval of certified drawings, will be made at the expense of the Buyer under terms to be mutually agreed.

CANCELLATION

1. Accepted orders cannot be canceled or assigned without prior written agreement by our marketing manager or one of our corporate officers and payment of a charge of not less than 10%of the purchase price to cover lost time and handling expenses in the case of cancellation.

SHIPMENT

1. We reserve the right to select the transportation carrier which has equipment to meet the requirements of our shipping facility.

2. We are not responsible for shipping delays beyond our reasonable control. It is understood that we are free of any and all liability and penalty for delayed shipments caused by transportation delays, inability to obtain necessary components and materials for fabrication and assembly, acts of Buyer, labor disturbances, wars, riots, fires, accidents. explosions, floods, epidemics, quarantine, adverse weather, Governmental acts or regulations, or acts of God.

3. Should the Buyer be unable or unwilling to accept shipment of the equipment when notified that the equipment is ready for shipment, the terms of payment of the order shall then be in effect as if shipment had been made. Any expense or cost to us incidental to the delayed shipment will be payable by the Buyer when invoiced.

RISK OF LOSS AND DAMAGES

W**e** assume no responsibility for loss or damage to the equipment incurred after we load the equipment on the transportation carrier. The risk of loss or damage shall thereafter be borne by the Buyer regardless of whether title has passed to Buyer upon shipment. Claims for such loss or damage must be filed by the Buyer with the transportation carrier or other responsible party.

SERVICE

1. Before the equipment is placed in operation, start-up and training service by one of our field service engineers is available and recommended.

During this start-up, final equipment adjustments are made and the Buyer and his operating and maintenance personnel are instructed. This service is charged at prevailing rates. Service work cannot be scheduled unless payments are current in accordance with the contract.

2. Two Owner's Manuals covering Installation, Operating and Maintenance Instructions and Spare and Replacement Parts Lists are furnished with the equipment purchased. Additional manuals may be purchased at the prevailing nominal charge.

TITLE AND LIEN RIGHTS

We Shall retain title to all equipment until purchase price has been paid in full. Also, the Buyer agrees to execute any documents requested which are necessary for attachment and protection of our security interest. We shall have all rights of secured creditor under the Uniform Commercial Code.

GENERAL

1. Electrical components used on the equipment meet ANSI and National Electrical Code requirements and are UL approved. Hydraulic system components used on the equipment comply with National Fluid Power Association and JIC Standards.

The equipment is constructed in compliance with the intent of the Occupational Safety and Health Act of 1970 (OSHA), and in particular with Title 29, Chapter XVII, Part 1910, of the Occupational Safety and Health Standards adopted Oct. 18, 1972.

2. Additional costs as the result of special hydraulic, electrical or pneumatic components or other special arrangements required by local standards or codes will be the responsibility of the Buyer.

3. The equipment is skidded as is normal to the transportation carrier. Loading, skidding, crating, export boxing, packing or painting of a special type or nature can be provided at an extra charge.

4. In the event that litigation is brought against the Buyer alleging that the equipment of our manufacture, which is the subject of this proposal, infringes any U.S. or Canadian patent issued as of the date of acceptance of the order, we agree to defend such litigation at our expense provided the Buyer notifies us within seven (7) days after receiving notice of the alleged infringement and provided we are given complete control of the defense of such litigation with the right to settle such litigation or to make changes in the equipment for the purpose of avoiding the alleged infringement.

5. These terms and conditions supersede and take precedence over all the provisions of the Buyer's purchase order or any similar document of the Buyer in conflict with these terms and conditions of sale.

6. These terms and conditions of sale, our written warranty, our published current literature and specifications and our acceptance of the Buyer's order define our entire obligation with respect to any sale of our equipment.

7. All information in the proposal is confidential, prepared solely for the Buyer's consideration to purchase our equipment. Transmissions of all or any part of the proposal information to others or use by the Buyer for other purposes is unauthorized without our written consent.

WARRANTY

1. We warrant the equipment to the Buyer against defective materials or workmanship under normal use and service during a five day week starting from date of shipment on a prorated basis as follows: Up to 8 hours per day operation -12 calendar months; 8 hours to 16 hours per day operation -6 calendar months; 16 hours per day operation and up -4 calendar months. A warranty of less than (1) one year commences the first day the equipment is operated in excess of eight hours. This warranty will not be honored unless payments are current in accordance with the contract.

Should the equipment or any part of the equipment prove defective in materials or workmanship within the warranty period, we will repair or replace the defective equipment or part, free of charge, f.o.b. our plant, provided the defective equipment or part is delivered to us at our plant or other location at our direction. However, no replacement parts will be furnished under this warranty or otherwise, unless payments are current in accordance with the contract. Such action by us does not extend the warranty period. The Buyer shall assume the cost of removal and installation of replacement parts.

This warranty is contingent upon our being promptly notified of the defects and the Buyer establishing to our satisfaction that the defective equipment or part of the equipment has been properly installed, maintained in accordance with the Owners' manual supplied, and operated within the limits of rated and normal usage.

2. This warranty has no application to electric motors on the equipment or to normal replacement of service parts such as operating oil, paint, conveyor belts and drive belts, light sources and fuses and other parts which may have service life inherently shorter in duration than the warranty period. Customer specified components will carry the component manufacturers warranty only. Electric motor warranty claims should be directed to the local motor manufacturer service center.

3. This warranty has no application to wear or damage resulting from accident, alteration, misuse, abuse, neglect, non-action, improper removal or reinstallation or handling of new or defective parts, lack of preventive maintenance, sabotage, tampering, fire, explosion or any other causes not directly attributable to defective workmanship or material of the equipment or any part of the equipment. Under no circumstances shall we have any liability under this warranty for loss of use or for any other losses or damages sustained by the Buyer.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS, AND EXPRESSES OUR ENTIRE OBLIGATION AND LIABILITY WITH RESPECT TO SAID EQUIPMENT. WE NEITHER ASSUME, NOR AUTHORIZE ANYONE TO ASSUME FOR US, ANY OTHER OBLIGATION OR LIABILITY WITH RESPECT TO THE EQUIPMENT OR ANY PART OF THE EQUIPMENT. WE EXPRESSLY DISCLAIM ALL LIABILITY FOR DAMAGES OF EVERY NATURE AND DESCRIPTION, IF ANY, SUSTAINED BY THE BUYER FROM DELAYS IN THE SHIPMENT AND DELIVERY OF EQUIPMENT, REPLACEMENT EQUIPMENT OR ANY REPLACEMENT PART, OR FROM DEFECTS IN, OR FAILURES OR MALFUNCTIONS OF, THE EQUIPMENT OR ANY PART THEREOF.

AUTOMATIC WIRE TIE - 5-WIRE

OWNER'S MANUAL

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AUTOMATIC WIRE TIE - 5-WIRE

OWNER'S MANUAL CONTINUED
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AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004

The following pages are excerpts from the American National Standard Institute Safety Requirements for balers, ANSI Code Z245.5-2004 for your information and compliance. The excerpts cover Modification (6), Installation, Operation, and Maintenance Requirements (4), Employer Responsibility (7.1) and Employee Responsibility (7.2), Lockout/Tagout (7.3) For the complete code contact:

SECRETARY - AMERICAN NATIONAL STANDARDS COMMITTEE, Z245
c/o NATIONAL SOLID WASTES MANAGEMENT ASSOCIATION
1730 RHODE ISLAND AVENUE, SUITE 1000
WASHINGTON, DC 20036

4 Installation requirements

4.1 General requirements

4.1.1 The installer of balers shall do so in accordance with the appropriate sections of this American National Standard and ANSI Z245.51, applicable codes, local ordinances and the manufacturer’s recommendations, and shall affix to such equipment the date of installation, installer's name and a statement attesting to compliance with this standard.

6 Reconstruction and modification

6.1 Reconstruction or modification of any baler (including power units and controls) shall be in accordance with requirements of ANSI Z245.51.
6.2 Reconstructed or modified balers shall be permanently identified with the name of the manufacturer or person conducting the reconstruction or modification and the date of reconstruction or modification.
6.3 Reconstructed or modified balers evaluated and determined to conform to the requirements of ANSI Z245.51 shall be identified on the baler by a statement attesting to compliance with the ANSI Z245.51 standard or shall have an approved listing mark.

7 Operational requirements

7.1 Owner/employer responsibilities for balers. The owner/employer shall provide properly maintained balers that meet all applicable regulatory safety requirements and the requirements of this standard, and shall be responsible for all of the following:

a) Ensuring that the installation of the baler conforms to local codes, ordinances, and manufacturer’s recommendations. If installing into a system, examine prevailing safety standards of associated equipment;

b) Providing to employees instruction and training in safe work methods before assigning them to operate, clean, service, maintain, modify, or repair the baler. Such instruction and training shall include procedures provided by the manufacturer. The employer will maintain records as to the names of employees and the dates of training;

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

c) Providing instructions for addressing abnormal situations (e.g., bridging of the loading chamber or feeding chute, jam of materials);

d) Assigning only trained employees to work on (which includes operating, loading, cleaning, servicing, maintaining, or repairing) the baler;

e) Monitoring the employee's operation of the baler and taking appropriate action to ensure proper use, including adherence to safe practices and the employee requirements of this standard and monitoring the employee's operation of balers and taking appropriate action to ensure proper use of equipment, including adherence to safe practice;

f) Repairing, prior to placing the baler into service, any mechanical malfunctions or breakdowns that affect the safe operations of the baler;

g) Establishing and following a program of periodic and regular inspections of all balers to ensure that all parts, component equipment, and safeguards are in safe operating condition, and adjusted, in accordance with the manufacturer's recommended procedures. This shall include keeping all malfunction reports and records of inspections and maintenance work performed;

h) Implementing a program for the maintenance of the baler which will incorporate the following elements:

1) Requirements for trained, competent maintenance employees or contractors to perform inspection and repair work;
2) Providing for the cleaning, inspection and repair of the baler in accordance with the manufacturer's recommendations, including periodic maintenance;
3) Ensuring that all required safety features are operational and functioning, and repairing, prior to placing into service, any reported malfunction or defect that affects the safe operation of the baler; and
4) Ensuring that all caution, warning and danger markings required by 5.14 are installed and legible, or are replaced if damaged, defaced or missing.

i) Utilizing the manufacturer's recommended procedures for the control of hazardous energy sources (lockout/tagout) in a program complying with Part 1910.147 of Title 29 of the Code of Federal Regulations (OSHA) (see 7.3);

j) Utilizing the manufacturer's recommended procedures for access control for permit-required confined spaces as part of the employer's program (see 7.4);

k) Protecting any person by one of the methods in 5.8.1, or by other means as effective as those means of protection.

l) For balers fed by means of a loading pit conveyor, reciprocating floor, or push pit that is flush with or below the facility floor, providing:

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

1) Protection for employees by means of:
   i) Limiting access within 6 feet (183 cm) of the edge of the pit to authorized employees;
   ii) Training authorized employees to recognize and avoid the hazards associated with the pit area;
   iii) Requiring that others whose employees use the pit area provide assurance of such training; and iv) Limiting access by unauthorized persons by installing signs, such as: "RESTRICTED AREA – AUTHORIZED EMPLOYEES ONLY"

2) Providing a device to the extent practicable, which prevents trucks or other motor vehicles that unload directly into the loading pit from rolling into the pit;

m) When balers equipped with automatic start/cycling controls are provided, allowing their use only in locations where a startup alarm is utilized or it is demonstrated that automatic starting does not result in a risk of injury to persons; NOTE: Achieving acceptably low risk of injury would include demonstrating that lockout procedures are strictly adhered to when bridging in feed chutes occurs or jammed material must be cleared from the loading chamber

n) Providing guard railings for dock ramps that meet U.S. Occupational Safety and Health Administration requirements. These shall be located around the loading chamber opening if walk-on ramps are used to deposit refuse into the loading chamber. Guard railings and toe boards shall be provided on the sides of docks and ramps;
o) Providing for an adequate work area around the baler for safe maintenance, servicing, and cleaning procedures;

p) Keeping all surrounding walking areas and floors free from obstructions, and accumulations of waste matter, grease, oil, and water (slipping and tripping hazards);

q) Maintaining records or employee reports of malfunctions;

r) Specifically inspecting safety interlocks, switches, and other protective devices to ensure that these devices are not disabled or bypassed, and not to permit the baler to be operated unless these devices are fully functional. These inspections shall be in accordance with (g);

s) Ensuring that containers supplied are capable of withstanding the maximum forces generated by the baling system;

t) Ensuring that loaders are aware of hazards and safety requirements;

u) Ensuring that only authorized employees (18 years old or older) operate, inspect, or maintain balers;

v) Ensuring that only authorized employees (16 years old or older) load, but do not operate balers; and

w) Incorporating balers into the employer's safety program (see Section 8).

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

7.2 Operator and employee responsibilities. Operators who work on and around the baler shall be responsible for the items listed below:

a) Using all applicable safety features provided on the baler;

b) Using the baler only after receiving instruction;

c) Reporting any damage to, or malfunction of, the baler by submitting a report to the employer or responsible authority when the damage or malfunction occurs;

d) Ensuring that access doors and service opening covers are in place, secure, and/or locked before operations begin;

e) Ensuring that the area of operation around container/cart lifting systems and the container will be clear of persons during all phases of the lifting operation prior to energizing the dumping system;

f) Ensuring that all persons are clear of the baler point of operation before actuating any compaction cycle controls or container/cart lifting system controls and being prepared to stop the compaction cycle or container dumping operation if necessary;

g) Ensuring that all persons are clear of the tailgate (on baler-container combinations so equipped) before the tailgate is opened or shut. The operator shall warn all persons not to cross behind or under an open tailgate;

h) Using the baler in accordance the manufacturer’s instructions, including ensuring the proper position of all locks, doors, guards, etc.;

i) Ensuring that no one disables or bypasses safety interlocks, switches, or other protective devices and that the baler is not operated unless these devices are fully functional;

j) Locking out the unit when inspecting malfunctions, jams, or other problems arising from daily operations; servicing; or performing maintenance (except maintenance testing). The affected employee shall identify the type and magnitude of the energy that the baler uses, shall understand the hazards, and know the methods to control the energy (see 7.3);

k) Coupling and securing a compatible container to a baler frame as specified by the baler and container manufacturer(s); l) Operating, inspecting, and maintaining the baler only if 18 years old or older and after being properly instructed and trained; and m) Loading, but not operating, the baler only if 16 years old or older.

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

7.3 Procedures for the control of hazardous energy sources (lockout/tagout)

7.3.1 The owner/employer shall have a hazardous energy control (lockout/tagout) procedure to follow when performing servicing and maintenance on balers where the unexpected energization or start up of equipment, or release of stored energy could cause injury to employees.

7.3.2 The owner/employer shall utilize the instructions provided by the manufacturer for the control of hazardous energy sources. The lockout/tagout procedure shall isolate and render safe all energy sources, including electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other potential energy sources (e.g., gravity, kinetic, etc.). It shall be used to ensure that the baler is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the baler or release of stored energy could cause injury.

7.3.3 The lockout/tagout procedure shall include but is not limited to the following:

a) Shutting down all power sources;

b) Removing keys or other devices that enable the baler;

c) Using a lock to secure the power supply or, if that is not feasible, installing a tag on an appropriate location, using a non-reusable fastener, or installing a similar warning device;

d) Placing operating components in such a position so as not to be subject to possible free fall and/or installation of additional blocking devices to prevent such free fall of any raised or elevated component; and

e) Relieving stored hydraulic or pneumatic pressure, after blocking devices are installed, if maintenance is to be done to the hydraulic or pneumatic system.

7.3.4 The procedure shall address the following:

a) Sequence of lockout for the baler:

1) Notify all affected employees that servicing or maintenance is required on a baler and that the baler must be shut down and locked out to perform the servicing or maintenance.

2) The authorized employee shall refer to the company procedure to identify the type and magnitude of the energy that the baler utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

3) If the baler is operating, it must be shut down by the normal stopping procedure (depress stop button, open switch, close valve, etc.).

4) De-activate the energy isolating device(s) so that baler is isolated from the energy source(s).

AMERICAN NATIONAL STANDARD INSTITUTE SAFETY REQUIREMENTS
ANSI CODE Z245.5-2004 CONTINUED

5) Lock out the energy isolating device(s) with assigned individual lock(s).

6) Stored or residual energy must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

7) Ensure that the baler is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

Caution: Return operating control(s) to neutral or "off" position only after verifying the isolation of the equipment.

NOTE: The machine or equipment is now locked out.

b) Restoring the baler to service. When the servicing or maintenance is completed and the baler is ready to return to normal operating condition, the following steps shall be taken:

1) Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

2) Check the work area to ensure that all employees have been safely positioned or removed from the area.

3) Verify that the controls are in neutral.

4) Remove the lockout devices and reenergize the machine or equipment. NOTE: The removal of some forms of blocking may require re-energizing of the machine before safe removal.

5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

BALEMASTER

PREFACE

This Owner's Manual is to provide a fast and easy reference for installation, operation and servicing Balemaster equipment. Safe operating and maintenance procedures, regular inspections, daily clean out of marked areas on the equipment and planned maintenance by qualified personnel are the responsibility of the user's management.

This Operator's Manual contains information on the operation and servicing of your new Balemaster equipment. **Read, understand and follow the enclosed installation and operating instructions** before connecting and operating your new Balemaster equipment. The equipment was electrically and hydraulically pressure tested and preset at the factory prior to shipment. It is important all users **fully understand the safe operation and maintenance of this equipment.** Operators having a language barrier or who are illiterate must be given sufficient training and supervision. It is important to know the Series Number as stamped on the Series/Model Tag on the equipment in reviewing this Owner's Manual.

This Manual explains the conditions, under normal use, that the equipment may be installed, checked out and operated. It is intended to be used as a supplement to and not in place of other Safety Standards. **Many local codes require installation of an Electrical Disconnect Switch in sight of the motor and be capable of being locked in "OFF" position only. Check your local codes for your installation.**

The Balemaster equipment has been designed to provide an economical and reliable method of processing and compacting most forms of waste materials. The equipment is a first line production machine and it should receive regular maintenance.

All necessary maintenance and adjustments must be made promptly to avoid any complications and compounding problems. The use of jumpers or other devices to block out electrical interlocks or forcibly over-riding hydraulic components will result in damage to the unit, costly repairs, void the Warranty and could cause injury to operating and maintenance personnel and cannot be condoned.

PRECAUTIONS

P R E C A U T I O N S

BEFORE ANY MAINTENANCE IS PERFORMED ON BALEMASTER/BALEWEL EQUIPMENT, MAKE CERTAIN THAT ALL ELECTRICAL CONTROLS ARE **LOCKED OUT.** DO NOT OPERATE THE EQUIPMENT WHEN PANELS AND GUARDS ARE NOT IN PLACE.

A V O I D A C C I D E N T S

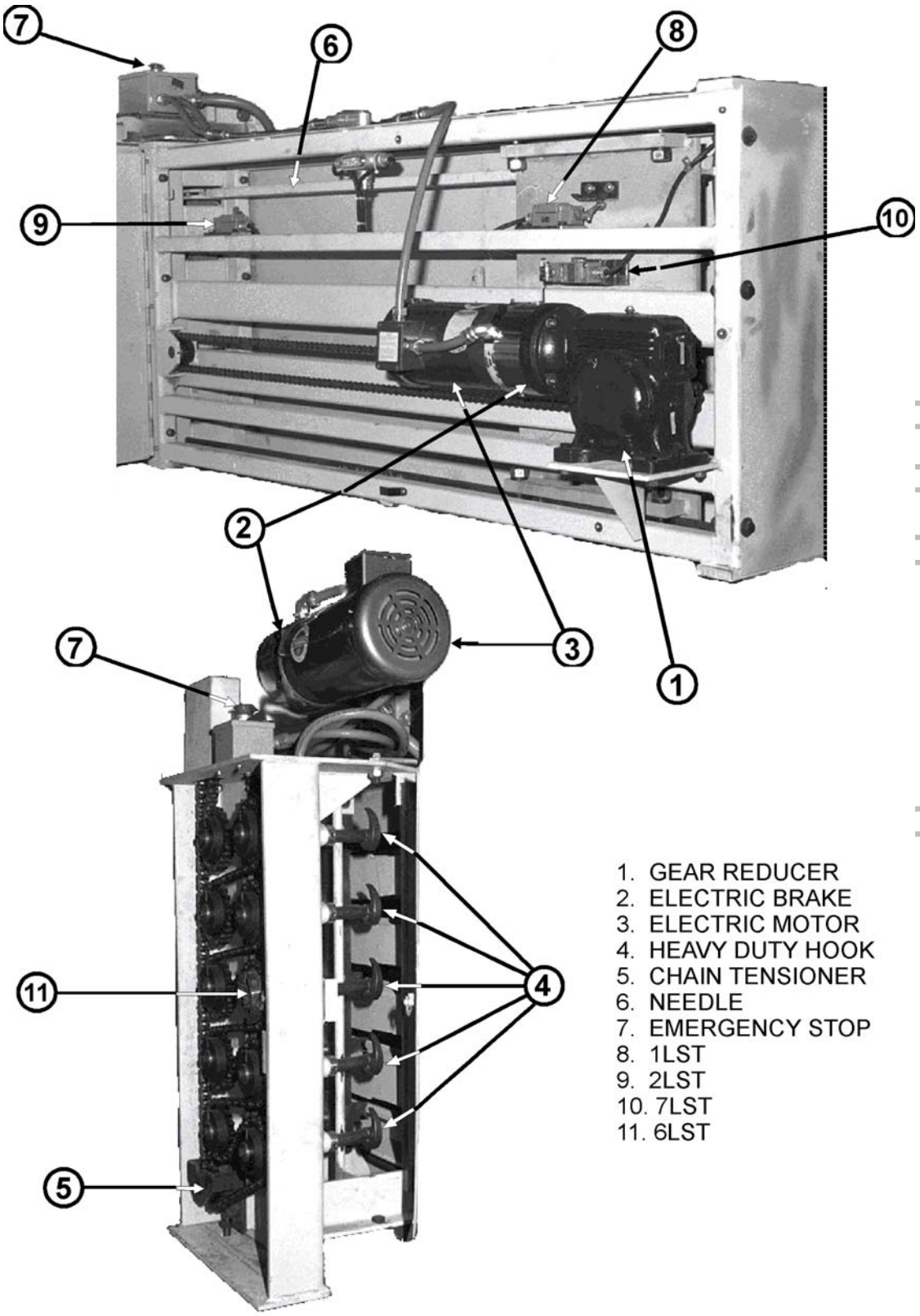
Most accidents, whether they occur in industry, on the farm, at home or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules and precautions. For this reason most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

WITH ANY MACHINERY A CAREFUL AND TRAINED OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT.

CAUTION: DON'T REMOVE TAGS OR DEACTIVATE SAFETY DEVICES!

NEVER ATTEMPT TO CLEAN, OIL OR ADJUST A MACHINE WHILE IT IS IN MOTION.

BALER STARTUP
GENERAL ARRANGEMENT - TWISTER & INSERTER

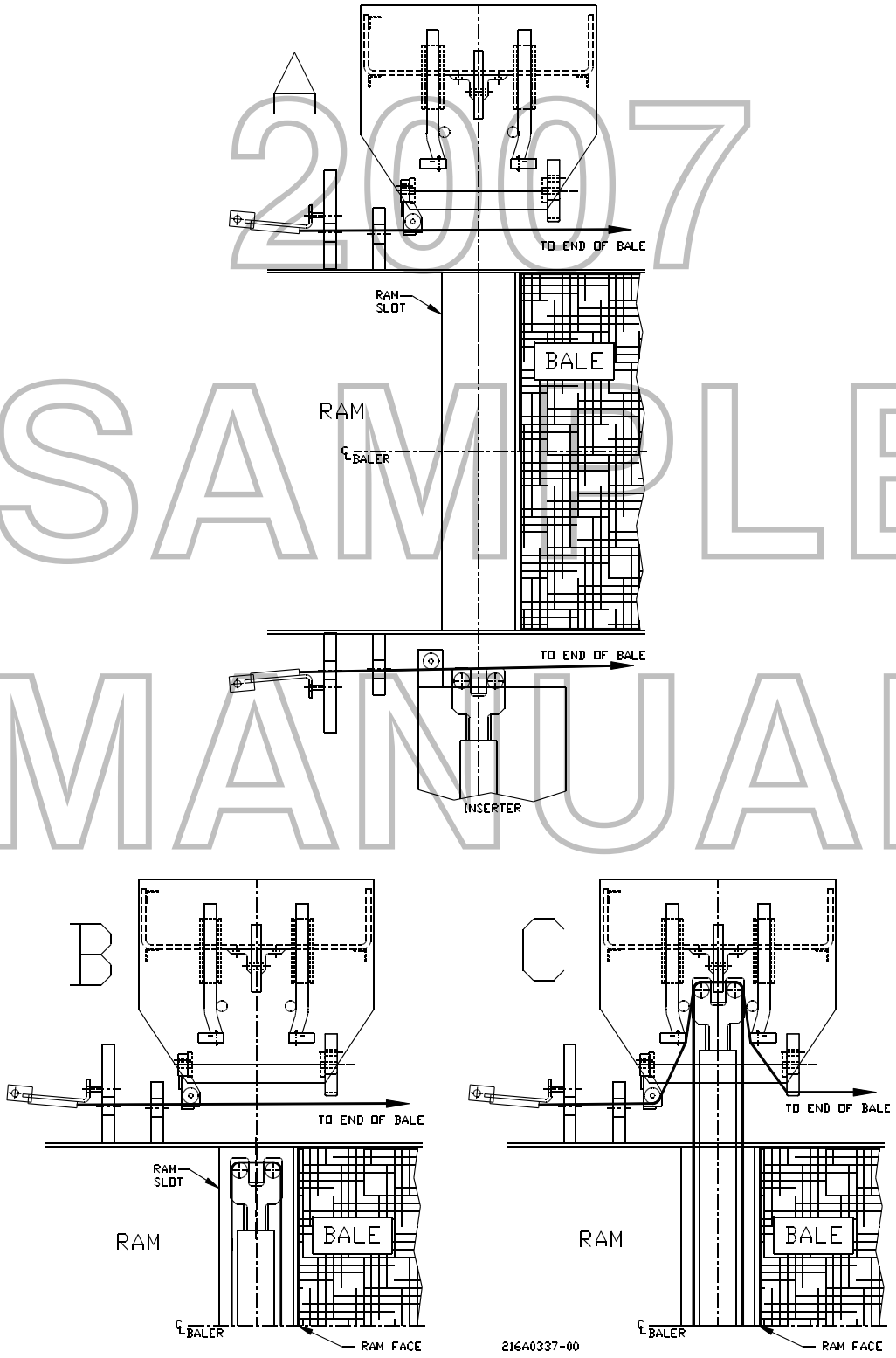


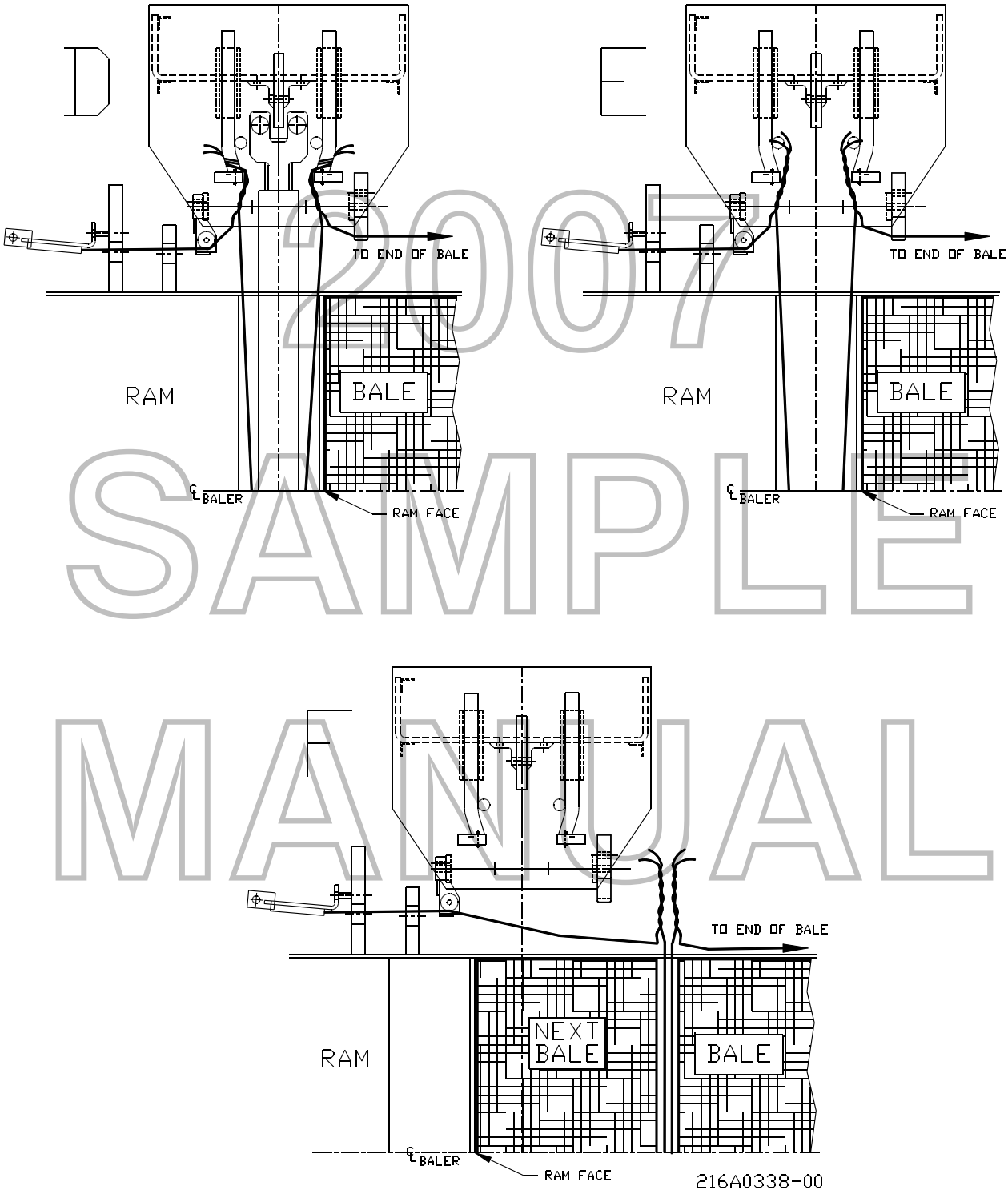
1. GEAR REDUCER
2. ELECTRIC BRAKE
3. ELECTRIC MOTOR
4. HEAVY DUTY HOOK
5. CHAIN TENSIONER
6. NEEDLE
7. EMERGENCY STOP
8. 1LST
9. 2LST
10. 7LST
11. 6LST

AUTOTY CYCLE

The following illustrations show the sequence of a normal tie cycle:

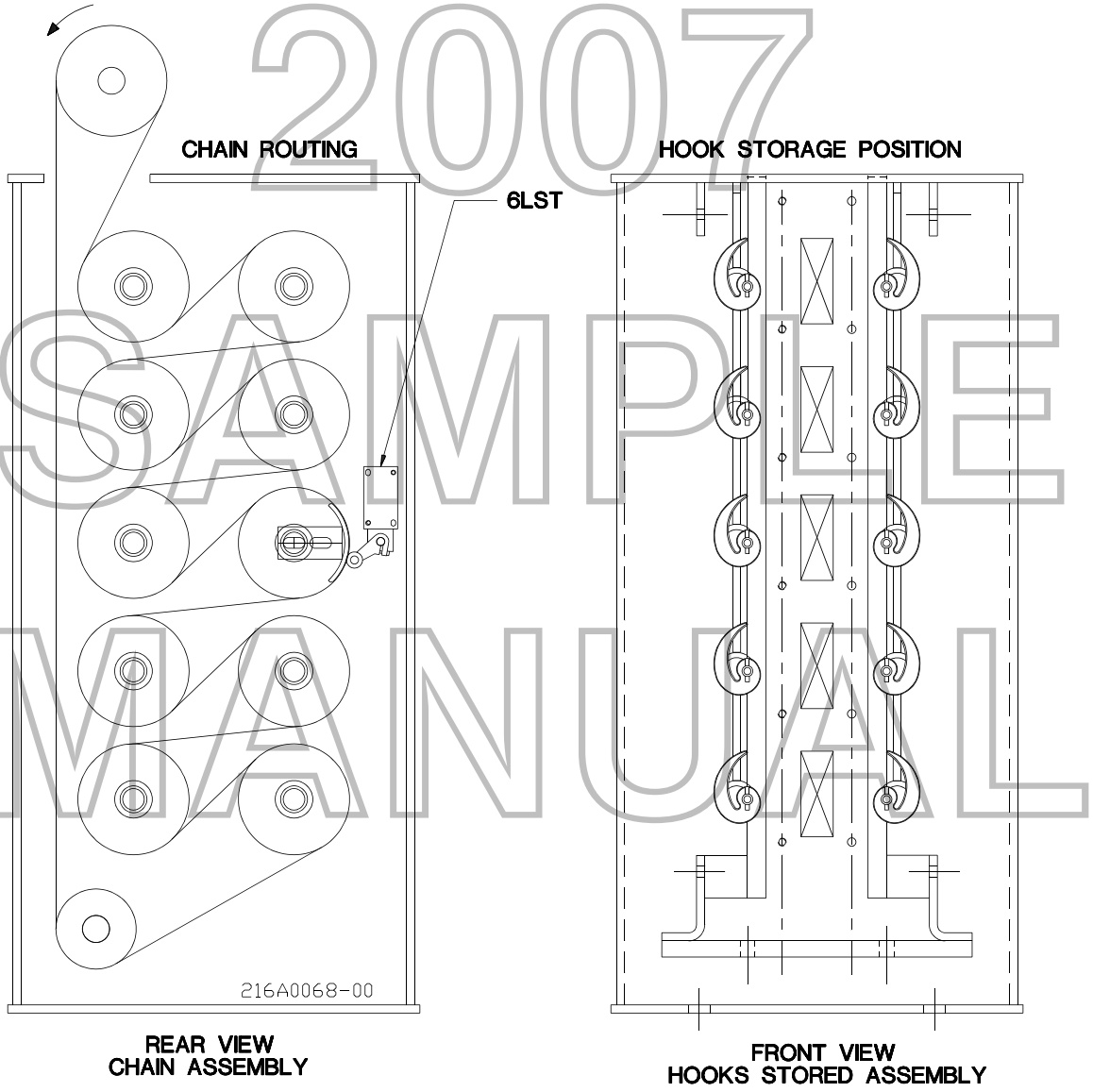
AUTOTY CYCLE





GENERAL ARRANGEMENT

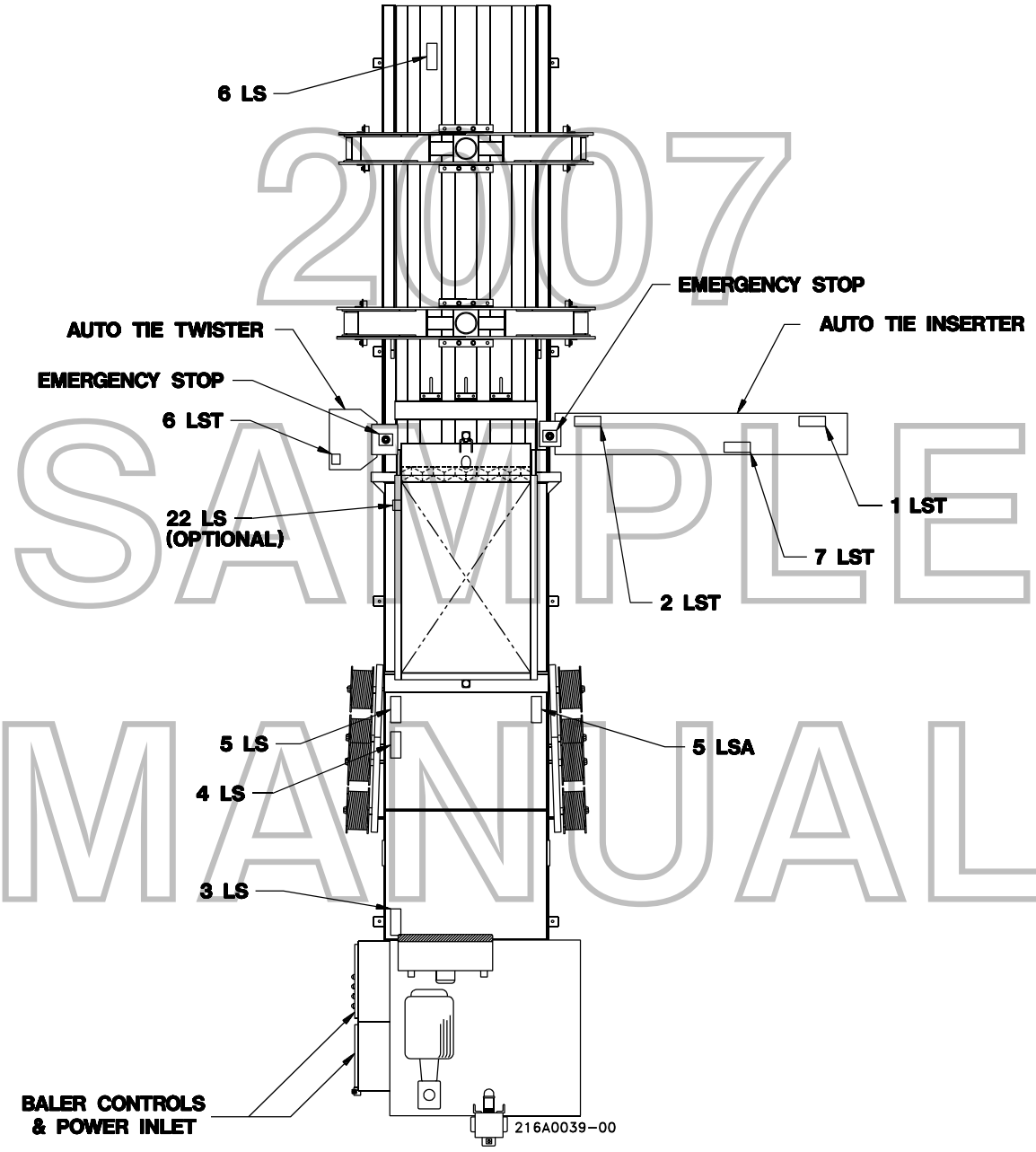
CHAIN ASSEMBLY & HOOKS STORED ASSEMBLY



REAR VIEW
CHAIN ASSEMBLY

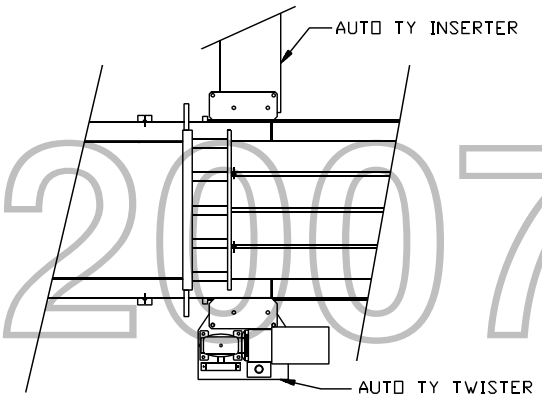
FRONT VIEW
HOOKS STORED ASSEMBLY

TYPICAL LIMIT SWITCH LOCATIONS

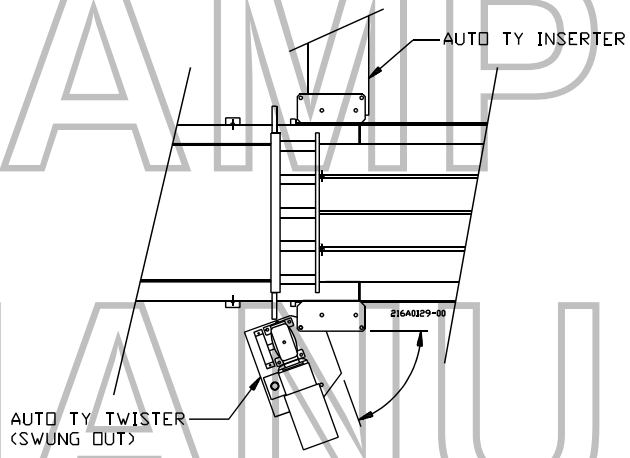


NOTE: ALL LIMIT SWITCHES ON PLC CONTROLLED BALEMASTERS ARE GXA00031.

ROTATING TWISTER LAYOUT (PLAN VIEW)
LEFT HAND AUTOTY CONFIGURATION



TWISTER POSITION



ROTATED TWISTER POSITION

After removing two of the inline mounting bolts, the twister mechanism will pivot out for maintenance and general clean-out purposes.

CAUTION: NEVER WORK ON TWISTER UNTIL ALL MOTORS AND ROTATING HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

AUTO-TY

INSTALLATION INSTRUCTIONS

NOTE: INSTALLATION IS TO BE MADE BY QUALIFIED PERSONNEL AND IS THE RESPONSIBILITY OF THE USER'S MANAGEMENT.

After the Baler has been leveled, installed and bolted down, the Balemaster Auto-Ty Inserter Assembly may be mounted.

The Twister Assembly is factory mounted and ready for operation.

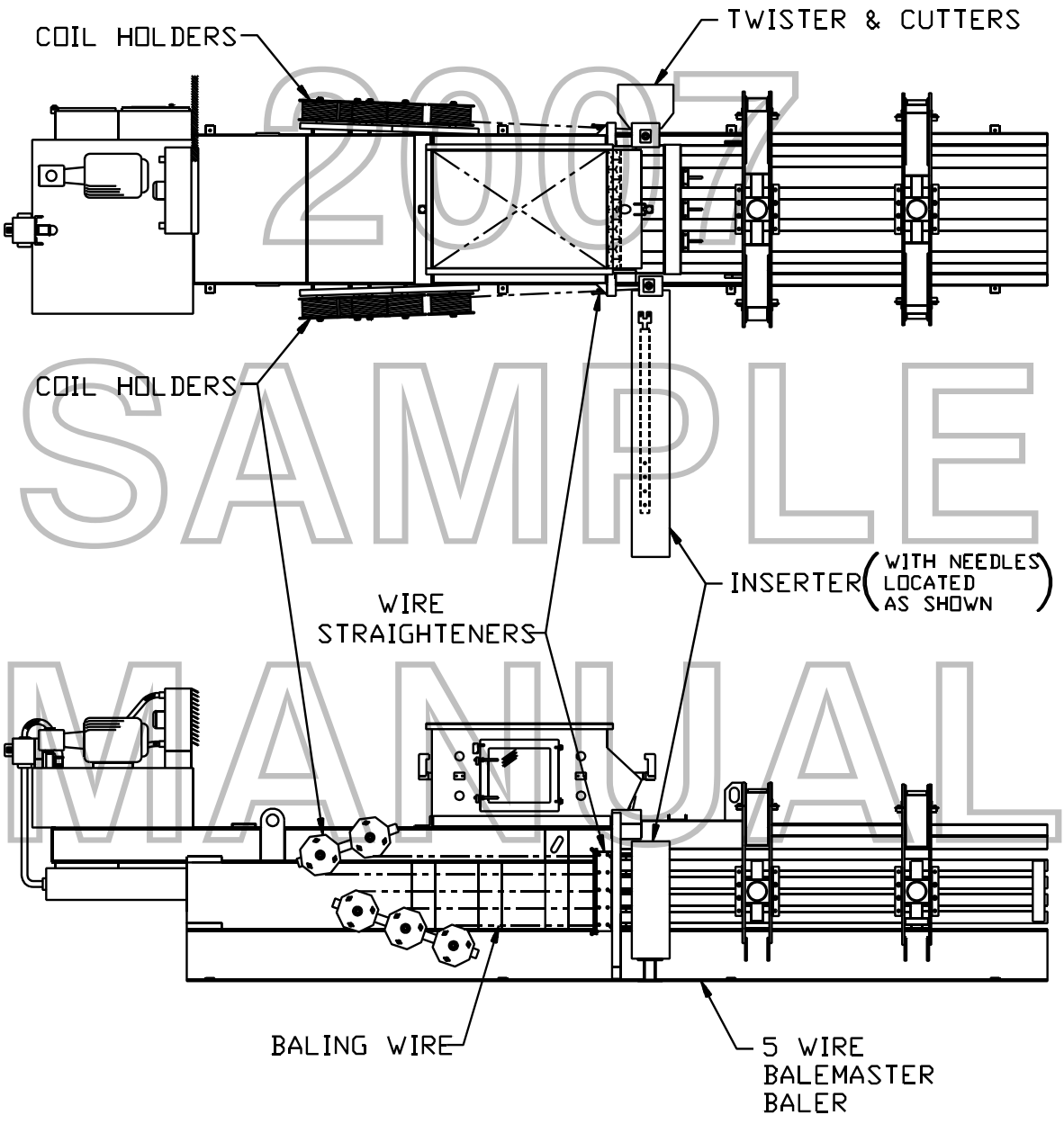
For shipping purposes, the Inserter Assembly is shipped separately. It is easily installed and made ready for operation when the following steps are taken:

1. Remove all crating and skids.
2. Mount the inserter between the brackets provided on the baler and attach the inserter support.
3. Do not lag inserter to the floor until a qualified technician has checked alignment.
4. Disengage brake as shown on Page 10.01. With the baling ram fully advanced (see Baler Manual), insert the needles manually by turning the motor drive adaptor. The motor drive adaptor is attached to the motor shaft inside the rear cover. It can be reached with an allen wrench without removing the rear motor cover. Check needle vertical and lateral alignment at twister side. Adjust inserter frame as required. Tighten hold-down bolts. Retract needles.
5. Locate and secure wire coil holders (optional) as per Page 6.01.
6. Make inserter electrical connections in accordance with electrical circuit diagram.
7. After completion of above, reinstall **ALL** guards.

CAUTION

DO NOT OPERATE WITHOUT ALL GUARDS IN PLACE.

AUTO-TY
INSTALLATION INSTRUCTIONS
STANDARD RIGHT HAND CONFIGURATION SHOWN



AUTO-TY
INITIAL CHECK-OUT
WITH TOUCH SCREEN

CAUTION

READ THIS ENTIRE MANUAL BEFORE OPERATING THIS EQUIPMENT.

1. With the inserter in the retracted position, disengage brake as shown on Page 10.01. Advance the needles by turning the motor drive adaptor counterclockwise to 1" maximum. This will move the limit switch bracket off of 1LST. The motor drive adaptor is attached to the motor shaft inside the rear cover and can be reached with an allen wrench without removing the rear motor cover. With the baler selector switch in MANUAL, attempt to move the baling ram forward by pressing the "MANUAL RAM FWD" button. The ram should NOT MOVE. If it does, there is a fault in the wiring hookup that must be corrected before any further operation is resumed. Attempt this action with the baler in all three (3) modes; MANUAL, AUTOMATIC AND CONTINUOUS.

2. Retract the needles by turning the motor drive adaptor clockwise until the limit switch bracket is again on 1LST and activated. Be sure brake is disengaged.

3. With the baler in "MANUAL", move the baling ram forward to some mid-stroke position by pressing the "MANUAL RAM FWD" button. (Do not activate full forward limit switches 5LS and 5LSA.)

4. With the Auto-Ty in MANUAL, attempt to advance the carriage by pressing the "MANUAL INSERTER IN" button. The carriage should NOT ADVANCE. If it does, there is a fault in the wiring hookup that must be corrected before any further operation is resumed.

5. Remove all twister hooks, see Page 5.01.

6. With the Auto-Ty in MANUAL, advance the ram full forward by pressing the "MANUAL RAM FWD" button, actuating 5LS and 5LSA.

7. Set the Auto-Ty to MANUAL by pressing the "MANUAL" button of the Auto-Ty selector switch.

8. Disengage brake on twister side. See Page 10.01. Move twister in counterclockwise direction until limit switch 6LST is off limit switch bracket by turning the motor drive adaptor. Motor drive adaptor location same as described in Step 1.

9. Press the "MANUAL INSERTER IN" button. The carriage should NOT ADVANCE. If it does, there is a fault in the wiring hookup that must be corrected before any further operation is resumed.

10. Move twister in clockwise direction until limit switch 6LST is activated on limit switch bracket by turning the motor drive adaptor. Be sure brake is disengaged.

AUTO-TY

INITIAL CHECK-OUT CONTINUED
WITH TOUCH SCREEN

11. Push the "MANUAL INSERTER IN" button in and hold it until the carriage is fully advanced.

12. Repeat Step 8.

13. Push the "MANUAL INSERTER OUT" button. It should NOT RETRACT. If it does, there is a fault in the wiring hookup that must be corrected before any further operation is resumed.

14. Repeat Step 10.

15. Set the Baler & Auto-Ty to AUTOMATIC by pressing the "AUTO" button on both the Baler & Auto-Ty selector switches. The twister will turn eight (8) or nine (9) revolutions twisting, then the twister will untwist for three (3) revolutions, the inserter needles will retract.

16. With the "CYCLING EYE" blocked (use a piece of cardboard or other material in front of the receiver), the ram will reciprocate. Move the bale length counter wheel in the direction the material would move until the counter has "counted out". Refer to Baler Manual.

17. The ram will advance to the fully advanced position, the needles will insert, the twister will twist, the twister will untwist, the needles will then retract, the counter will reset and the baling ram will retract if the eye is still blocked and continue to operate until the cycling eye is clear. Remove the material blocking the "CYCLING EYE".

18. Reinstall the twister hooks per diagram on Page 5.01.

19. Repeat Steps 6, 7 and 11.

    NOTE: OBSERVE THE ALIGNMENT OF THE TWISTER HOOKS IN RELATION TO THE CLEARANCE SLOTS IN THE INSERTER NEEDLES. A MINIMUM OF 1/4" CLEARANCE ON ALL SIDES IS REQUIRED.

20. Repeat Step 15.

AUTO-TY

INITIAL START-UP

CAUTION

READ THIS ENTIRE MANUAL BEFORE OPERATING THIS EQUIPMENT

1. After the 2" X 4" boards have been inserted (See Baler Manual), the wires from the coils must be inserted through their proper slots and manually twisted together with the wire directly opposite on the other side, laying the wires on top of the boards.

CAUTION

HAVE ALL PERSONNEL STAY CLEAR OF FRONT OF MACHINE AT THIS TIME. AS THE MATERIAL COMPRESSES, THE 2" x 4" WOOD BOARDS WILL BREAK.

2. Follow all other Start-Up procedures as described in the Baler Manual.

3. The first bale may be made intentionally short and tied off in Manual Mode as described in the Baler Manual. This would be a plug and would be your Initial Start-Up.

CAUTION

Initial bales and any bales with missing ties should not be stacked due to tipping hazzard. Re-bale all non-uniform bales, bales with low density, or bales with missing ties.

AUTO-TY

TECHNICAL OPERATING DESCRIPTION
WITH TOUCH SCREEN

CAUTION

READ THIS ENTIRE MANUAL BEFORE OPERATING THIS EQUIPMENT.

AUTO-TY OFF:

When the Auto-Ty is in the off position, the baler will operate normally until the bale length is reached. The baler will not continue to cycle until a tie has been made and the bale length counter automatically resets.

AUTO-TY AUTOMATIC: INITIAL CONDITIONS & SEQUENCE OF OPERATIONS.

1. Select the automatic mode for the baler as described in the Baler Owner's Manual. (See Page 7.01)
2. Set the Auto-Ty to automatic by pushing the "AUTO" button of the Auto-Ty Selector Switch.
3. Baler & Auto-Ty operation will function automatically.

AUTO-TY MANUAL: INITIAL CONDITIONS & SEQUENCE OF OPERATIONS.

To run the Baler & Auto-Ty in MANUAL the Baler and Auto-Ty Screen must be displayed.

1. Set the baler in the manual mode by pressing the "BALER MANUAL" button. Press the "MANUAL RAM FORWARD" button and hold until the ram is all the way forward and limit switches 4LS, 5LS and 5LSA are activated.
2. Set the Auto-Ty to manual by pressing the "MANUAL" button on the Auto-Ty Selector Switch.
3. To advance the inserter carriage, press the "MANUAL INSERTER IN" button.
4. To retract the inserter carriage, press the "MANUAL INSERTER OUT" button.
5. To twist press the "MANUAL TWIST" button.

NOTE: THE CARRIAGE MUST BE FULLY RETRACTED ACTIVATING 1LST.

SHORT BALE: INITIAL CONDITIONS & SEQUENCE OF OPERATIONS.

1. Set the baler to the automatic mode by pressing the "BALER AUTO" button.
2. Set the Auto-Ty to automatic by pressing the "AUTO" button.
3. From the Main Screen press and hold the "SHORT BALE" button.

NOTE: ANOTHER TIE CANNOT BE MADE UNTIL THE RAM HAS BEEN FULLY RETRACTED, ACTIVATING 3LS.

AUTO-TY

TECHNICAL OPERATING DESCRIPTION CONTINUED
WITH TOUCH SCREEN

LIMIT SWITCHES & SOLENOID VALVES DESIGNATION & FUNCTION

SYMBOL	DESCRIPTION
3LS	BALING RAM RETRACTED
4LS	BALING RAM ADVANCED
5LS & 5LSA	BALING RAM FULLY ADVANCED
6LS	BALE LENGTH CONTROL
1LST	CARRIAGE RETRACTED
2LST	CARRIAGE ADVANCED
6LST	TWIST COUNTING
7LST	CHAIN SLACK
SOLENOID A	ADVANCE BALING RAM
SOLENOID B	RETRACT BALING RAM

AUTOMATIC OPERATIONS:

1. Set the Baler to automatic by pressing the "BALER AUTO" button.
2. Set the Auto-Ty to automatic by pressing the "AUTO" button on the Auto-Ty Selector Switch.
3. Refer to Baler Manual for baling operation in the Automatic Mode.
4. When the preset count has been reached, the baling ram continues forward beyond limit switch "4LS" until limit switches "5LS" & "5LSA" are activated. The bale will then be tied automatically.
5. The carriage needles advance forward until limit switch "2LST" is activated.
6. The twister will twist eight (8) revolutions, cut and twist in reverse three (3) revolutions.
7. The bale length control counter will automatically reset.
8. The carriage needles will retract until limit switch "1LST" is activated.
9. After an automatic tie the baling ram will remain in the forward position, when the photo electric eye is blocked Solenoid "B" will be energized.
10. The baling ram will retract until limit switch "3LS" is activated.

AUTO-TY

TECHNICAL OPERATING DESCRIPTION CONTINUED
WITH TOUCH SCREEN

MANUAL OPERATION:

The Baler and Auto-Ty can only be activated manually when the Baler and Auto-Ty Selector Screen is displayed.

1. The carriage can be advanced or retracted by pressing the "MANUAL INSERTER IN" button, with the baler in the manual mode, the Auto-Ty in the manual mode and the baler ram fully advanced activating 5LS and 5LSA.

2. Manual twisting is done by pressing the "MANUAL TWIST" button. This can only be done when the carriage is fully retracted activating 1LST. To untwist, press the "MANUAL UNTWIST" button. This can only be done when the carriage is fully advanced or fully retracted.

3. The cutters are mechanically connected to the twister shaft and should be fully opened when the twister hooks are in their stored position.

MANUAL RAM FORWARD PUSH BUTTON:

The "MANUAL RAM FORWARD" button, when depressed, will directly energize Solenoid "A", advancing the baling ram forward. This operation can only be done when the baler is in the manual mode and the carriage needles are fully retracted activating "1LST".

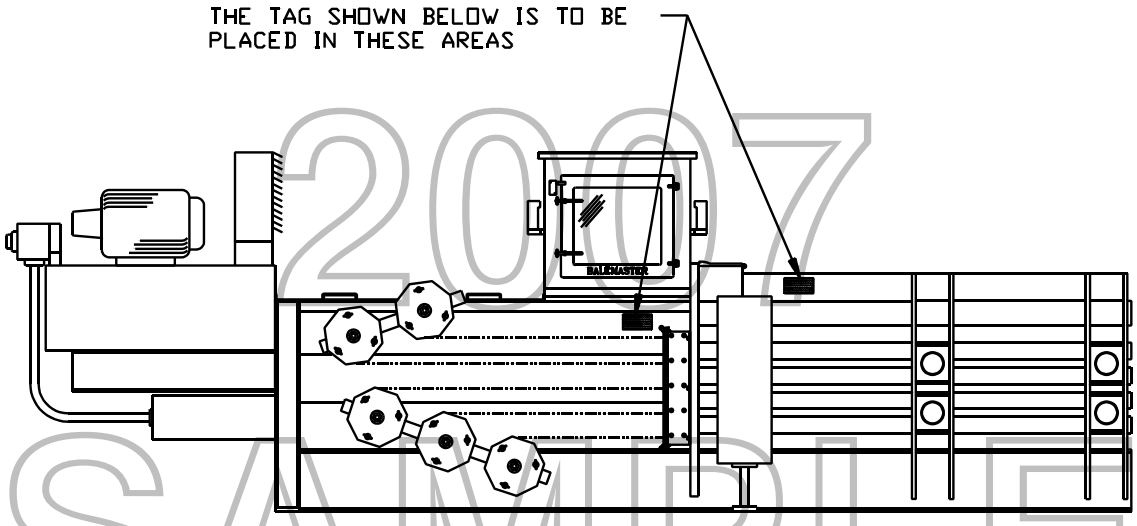
EMERGENCY MANUAL RAM FORWARD PUSH BUTTON:

If the baler is shut down during tie off, the ram may creep off of 5LS and 5LSA over time. In this condition, the ram cannot be moved because the inserter is not in the home position (1LST) and the inserter cannot be moved because the ram is not in the tie off position (5LS and 5LSA). If this conditions exists, press the EMERGENCY RAM FORWARD PUSH BUTTON (located on the inside of the control panel door) at the same time the MANUAL RAM FORWARD BUTTON. This will activate Solenoid "A" to advance the ram, activating 5LS and 5LSA. This can only be done when the Baler Selector Switch is turned to MANUAL.

NOTE: THE EMERGENCY MANUAL RAM FORWARD BUTTON IS LOCATED INSIDE THE CONTROL CABINET AND IS ONLY TO BE USED BY QUALIFIED MAINTENANCE PERSONNEL.IT IS IMPORTANT TO VISUALLY CHECK THE LOCATION OF THE INSERTER NEEDLES TO AVOID DAMAGE TO THEM WHEN ADVANCING THE BALING RAM.

AUTO-TY

OPERATING INSTRUCTIONS/WIRE SPLICING



CAUTION

BALER MUST BE SHUT OFF BY **LOCKING** BALER DISCONNECT SWITCH IN THE **OFF POSITION** WHEN PERFORMING ANY OF THE FOLLOWING:

WHEN	threading, splicing, or aligning tie wires through Twister or Inserter mechanism.
WHEN	tying or re-tying loose or broken wires.
WHEN	removing broken or excess wire form the Auto Ty mechanism or baling ram slots.
WHEN	performing other operator or maintenance functions in or around the Baler or Auto Ty mechanism.
NOTE:	Tie wires should be spliced together downstream of the Twister or Inserter mechanism. See the Baler manual provided with the baler.

111A0057-00

PATTY CAKE OPTION
(OPTIONAL)

Some materials and/or feed situations may require this option. Non-woven materials and ribbon-fed steel trim, are applications that can greatly benefit from this option. Most materials that are stringy with long continuous, tough fibers will tend to "link" bales together. This requires additional bale handling to cut or separate bales as they are extruded. Depending on the material, this can be very time consuming and labor intensive. To minimize this difficulty, use the "Patty-Cake" option. When this option is selected the ram will make 3 more consecutive full strokes (between 3LS and 5LS) before tying off. These extra strokes will minimize the amount of material that bridges between two bales, reducing or removing the need to manually separate bales.

MOTOR BRAKE

PART NUMBER:

DAB00007 230/460 VOLT

DAB00008 208/415 VOLT

DAB00009 575 VOLT

DAB00010 380 50 HZ

60 SERIES DOUBLE C FACE BRAKE
ENCLOSED HOUSING

INSTALLATION (See exploded view, Page 10.03)

1) Mount hub (22) over key on shaft 1/4" from the motor mounting face. Part number on hub to face away from motor. Use 3/16" square key furnished. Key must extend to, and be flush with, end of motor shaft. Tighten both setscrews in hub with 8-10 lbs. ft. torque.

2) Remove adapter housing (7). You may have to remove wrap cover (9) and tap lightly with a soft mallet in the openings in the side of the adapter housing. Place brake assembly onto the motor C face, engaging hub splines into brake disc splines. The release should be located at the top.

3) Screw in four 3/8-16 threaded rods (28) or (32) through bracket (1) into motor C face (approx. 9/16" engagement or 9 turns). Bring coil lead wires out of conduit hole before installing adapter housing. Align adapter housing (7) with four threaded rods. NOTE: Arrow head on adapter housing should be in line with the manual release nob (15). Slide adapter housing onto threaded rods, turning output shaft (8) so that the key-way in the brake shaft lines up with the key in the motor shaft. Make sure adapter housing seats against the bracket (1). Tap adapter housing in place lightly. If excessive force is required, the key may have to be filed.

4) Install key into the brake shaft extension. Slide gear reducer onto threaded rods, aligning key in the brake shaft with the key-way in gear reducer. Fasten with lock-washers (29) and nuts (30).

NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

MOTOR BRAKE
(Continued)

MANUAL RELEASE (See exploded view)

The brake is equipped with a manual release. Turn the release knob (15) clockwise to stop position to release the brake. The brake will remain released until the release knob is turned counterclockwise (approx. 65 deg.) or until the brake coil is energized, automatically resetting the brake.

TORQUE ADJUSTMENT (See exploded view, Page, 10.03)

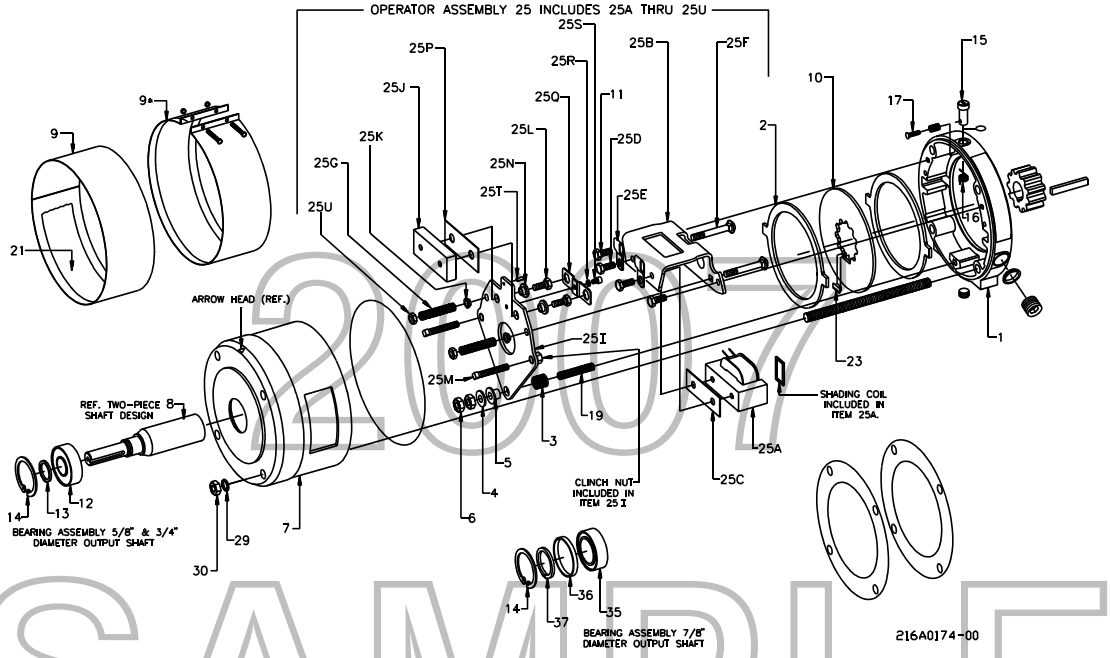
The magnetic disc brake is factory set for a rated static torque. The brake can be adjusted to reduce torque which increases stopping time. Do not attempt to adjust brake for a higher torque, as this will cause premature coil burnout.

1) To adjust, remove cover (9) to expose torque locknuts (25U), which are above torque springs (25G).

2) To increase stopping time and reduce torque, turn two locknuts (25U) counterclockwise, increasing spring length. Each full turn reduces torque 7% to 10%.

NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

MOTOR BRAKE



EXPLODED VIEW

WARNING

BRAKE PERFORMANCE AND FEATURES MUST BE CAREFULLY MATCHED TO THE REQUIREMENTS OF THE APPLICATION.

Consideration must be given to torque requirements, especially where an overhauling condition exists, as well as thermal capacity, ambient temperature, atmospheric explosion hazards, type of enclosure and any other unusual conditions.

Improper selection and installation of a brake and/or lack of maintenance may cause brake failure which could result in damage to property and/or injury to personnel.

If injury to personnel could be caused by brake failure, additional means must be provided to insure safety of personnel.

Do not operate manual release or energize brake coil before installation in order to preserve pre-alignment of rotating discs for ease of installation.

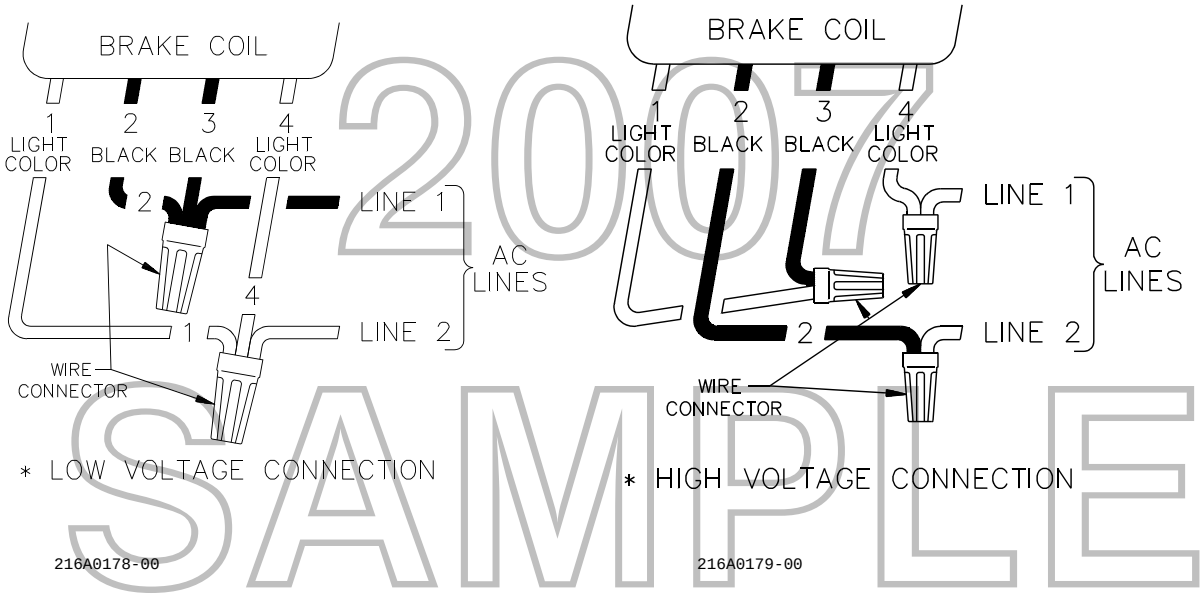
NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

MOTOR BRAKE WIRING

Connect coil leads as indicated and replace cover.

CONNECTION OF COIL LEADS

DUAL VOLTAGE COIL



Connect leads 2 and 4 to any two line leads (single or three phase) of same voltage and frequency as brake.

SINGLE VOLTAGE COIL

Connect brake coil leads to any two line leads (single or three phase) of same voltage and frequency as brake.

NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

MOTOR BRAKE

MAINTENANCE AND SERVICE

WEAR ADJUSTMENT (See Figure 1 Below & Exploded View, Page 10.03)

Before air gap "A" reaches .100", adjustment is required. Any delay in adjusting the magnetic air gap will result in eventual loss of torque.

1. To adjust, remove cover (9) to expose adjusting screws for magnetic air gap "A."
2. Measure air gap "A" using 3/8" to ½" wide feeler gauge as shown in Figure 1.
3. Turn two square head screws (25M) until air gap "A" measures 0.050/0.055". Air gap should be the same on both sides.

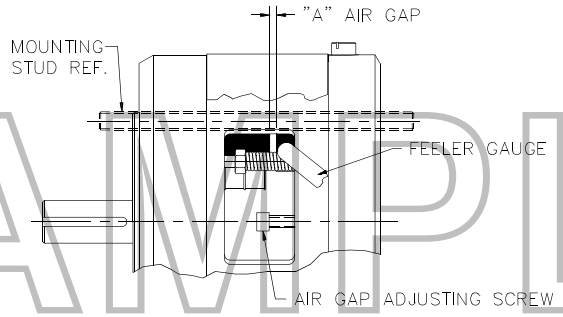


Figure 1. 216A0177-00

FRICTION DISC REPLACEMENT (See Exploded View, page 10.03)

When total wear on a rotating friction disc reaches 1/16" (3/16" Thick New), replace disc.

1. Disconnect power.
2. Remove any equipment mounted on the brake C face, such as a gear reducer, by removing nuts (30) and lock-washers (29).
3. For two piece shaft design, remove adapter housing (7) which includes shaft (8).
4. Remove operator assembly (25) by removing screws (11) and pivot stud (19). Item 19 has a hex socket in end of stud for removal.

NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

FRICTION DISC REPLACEMENT (Continued)

5. Remove worn rotating discs (10) and stationary discs (2). Replace worn discs and install new discs in the same order. Install stabilizer clip (23), if furnished, on rotating discs prior to installation.

6. To replace operator assembly, turn two screws (25M) counterclockwise five turns. Place operator assembly onto brake bracket (1) and install two screws (11). Replace compression spring (3), bushing (5), washer (6), and pivot stud (19) which has the two nuts (6) in place. Tighten firmly.

7. Readjust magnetic air gap "A" as described under "Wear Adjustment."

8. Check manual release operation before completing installation.

9. Reassemble.

MAGNET ASSEMBLY REPLACEMENT

1. Disconnect power supply.

2. Remove adapter assembly as described in "Friction Disc Replacement."

3. Remove two cap screws (25D), wire clamps (25E), magnet assembly and shock mount (25C).

4. Replace shock mount and magnet, feeding coil wires through hole in back of bracket (25B). Tighten mounting screws with 55 to 60 in.lbs. torque.

5. Set air gap "A" as described under "Wear Adjustment."

6. Energize coil. Coil should be quiet. If not, adjust pivot stud.

7. Reassemble.

NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

MOTOR BRAKE

TROUBLE SHOOTING

BRAKE DOES NOT RELEASE

1. Check for failure of power supply to brake.
2. Check brake visually for broken or damaged parts.
3. Check for broken lead wire or bad electrical connection.
4. Check for correct voltage. Voltage must correspond to that listed on brake nameplate. If voltage is more than 10% below figure stamped on nameplate, magnet will not pull in, causing coil or burn out within minutes. If voltage is more than 10% above, coil will overheat and burn out.
5. Check for burned out coil (coil may be charred or burned).

BRAKE DOES NOT STOP

1. Check that manual release is in normal reset position.
2. Check brake visually for broken or damaged parts.
3. Check disc wear (See "Wear Adjustment").
4. Check for broken friction disc.
5. Make certain hub has not shifted position on shaft and that all rotating discs are fully engaged on hub.

BRAKE CHATTERS OR HUMS

1. Clean magnet faces. If dirty:
   Insert a clean sheet of paper between magnet faces and energize brake. Move paper around between faces to dislodge dirt. Finally, remove paper.
2. Check that magnet faces are parallel in closed position:
   If not parallel along length of magnet, check bushings under torque springs for binding or excessive wear. If not parallel along width of magnet, adjust pivot nut (Item 6) on post to obtain minimum magnet hum. Check magnet gap "A" and adjust if necessary (See "Wear Adjustment"). Operate manual release (15) and adjust if necessary. ("Manual release adjustment.")

MANUAL RELEASE ADJUSTMENT

1. Set air gap "A" as described in "Wear Adjustment"
2. If brake does not release, turn adjusting screw (17) counterclockwise 1/4 turn and try again.
3. If the release nob (15) does not return to its normal position automatically, turn screw (17) clockwise 1/4 turn and try again.

NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

PREVENTIVE MAINTENANCE

CAUTION

NEVER PERFORM MAINTENANCE ON BALER UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT. DO NOT REMOVE, PAINT OVER OR DEFACE WARNING INSTRUCTIONS OR IDENTIFICATION LABELS.

The Balemaster Auto-Ty is a very reliable and durable component requiring very little maintenance. If the below items are checked on a regular basis, it will give you excellent, long lasting service.

DAILY

1. Check gear reducer for leaks. Correct as necessary.
2. Check the inserter tracks for contaminants and clean as necessary.
3. Check inserter and twister chains for proper tension.
4. Check wire cutter blades for damaged edges.
5. Check that all guards are in place. Do not operate without guards in proper position.

MONTHLY:

1. Check the gear reducers for proper oil level. Use 90 weight high pressure gear lube that is compatible with brass.
2. Check inserter and twister chains for proper tension. Do not over lubricate.
3. Check the level, square the alignment of the inserter needles with the twister hooks. Adjust as necessary.
4. Check the twister hook screws for tightness. Tighten as required.
5. Check disc brake for wear and adjust as required.
6. Check wire cutters for damaged edges and actuator blocks for excessive wear. Blocks should be changed when total wear exceeds 1/8".

Emergency Stop Buttons: These switches should be tested periodically to assure they will stop machine motion when needed.

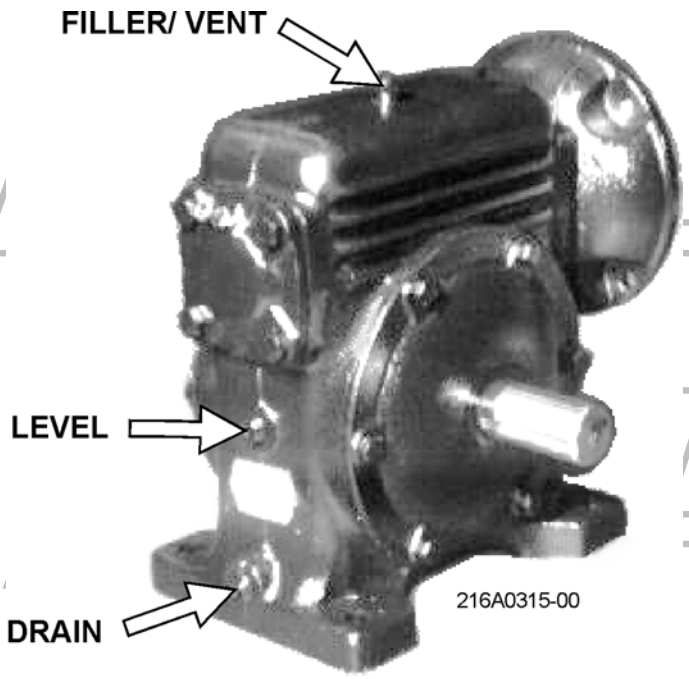
CAUTION

AFTER PERFORMING THE ABOVE, REPLACE ALL GUARDS.

PREVENTIVE MAINTENANCE-LUBRICATION OF WORM GEAR REDUCERS

PREVENTIVE MAINTENANCE
GEAR REDUCER

For normal operating conditions where surrounding temperatures are within the limits of 40° to 120°F, we recommend the use of 80W90 gear lubricant or similar oil of equal viscosity and composition. Check level monthly. Drain and refill if oil shows signs of breaking down or is contaminated.



TROUBLE SHOOTING CHART

PROBLEM	CAUSE	CORRECTION
CARRIAGE WILL NOT ADVANCE OR RETRACT	SELECTOR SWITCH IN "OFF POSITION"	TURN SWITCHES TO PROPER POSITIONS
	NO WIRE	FILL WIRE HOLDERS ACTIVATING LIMIT SWITCH 33LST AND 34LST (OPT.)
	BALING RAM NOT FULL FORWARD	CHECK POSITION OF RAM AND LIMIT SWITCHES 5LS AND 5LSA
	6LST NOT ACTIVATED	SEE PAGE 5.02 FOR POSITION
	BRAKE NOT RELEASED	SEE PAGE 10.01
	MOTOR HEATERS "TRIPPED"	PUSH RESET BUTTONS. DETERMINE CAUSE
	MOTOR FUSES "BLOWN"	DETERMINE AND CORRECT PROBLEM. REPLACE FUSES
	BROKEN CHAIN, KEY OR SPROCKET	REPAIR AS NECESSARY "7LST" DE-ACTIVATED
	NEEDLES OUT OF ALIGNMENT	REALIGN INSERTER OR NEEDLES

CAUTION

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

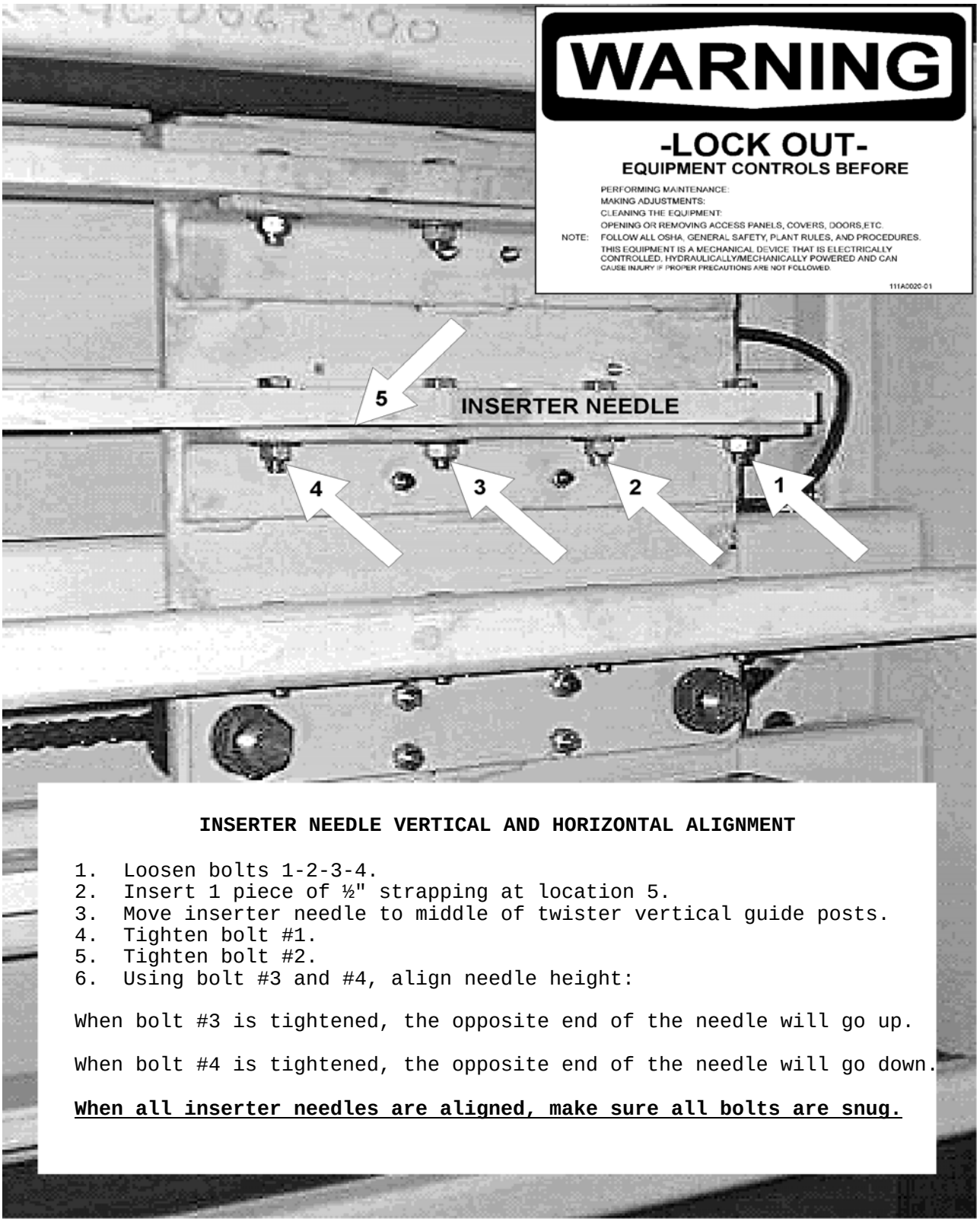
TROUBLE SHOOTING CHART

PROBLEM	CAUSE	CORRECTION
TWISTER DOES NOT OPERATE	AUTO-TY IN "OFF" POSITION	TURN SWITCHES TO PROPER POSITIONS
	BRAKE NOT RELEASED	SEE PAGE 10.01
	1LST OR 2LST NOT ACTIVATED	CHECK CARRIAGE POSITION AND LIMIT SWITCHES
	MOTOR HEATERS "TRIPPED"	DETERMINE CAUSE AND PUSH RESET BUTTONS
	MOTOR FUSES "BLOWN"	SEE PAGE 10.01
	MOTOR HEATERS "TRIPPED"	PUSH RESET BUTTONS. DETERMINE CAUSE
	MOTOR FUSES "BLOWN"	DETERMINE AND CORRECT PROBLEM. REPLACE FUSES
	BROKEN CHAIN, KEY, OR SPROCKET	REPAIR AS NECESSARY "7LST" DE-ACTIVATED
	NEEDLES OUT OF ALIGNMENT	REALIGN INSERTER OR NEEDLES

CAUTION

NEVER WORK ON UNIT UNTIL ALL MOTORS AND ROTATING EQUIPMENT HAS STOPPED AND IS ELECTRICALLY LOCKED OUT.

NEEDLE ALIGNMENT



INSERTER NEEDLE VERTICAL AND HORIZONTAL ALIGNMENT

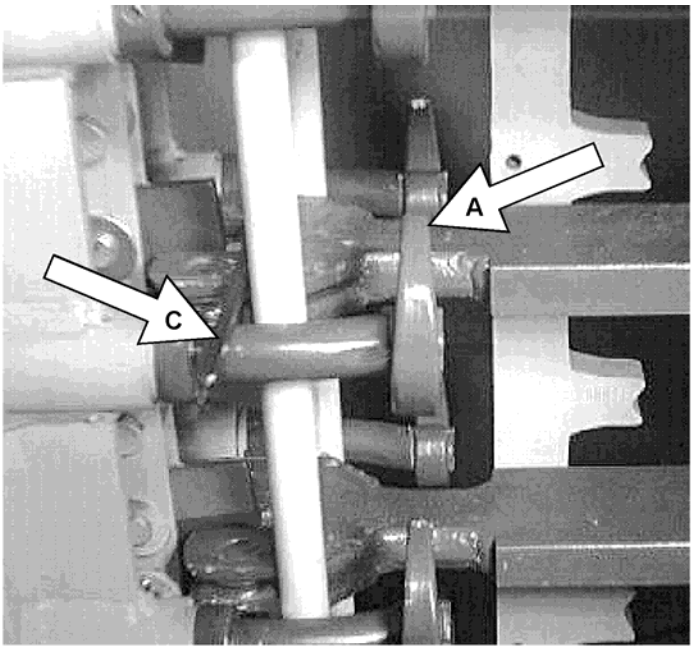
1. Loosen bolts 1-2-3-4.
2. Insert 1 piece of ½" strapping at location 5.
3. Move inserter needle to middle of twister vertical guide posts.
4. Tighten bolt #1.
5. Tighten bolt #2.
6. Using bolt #3 and #4, align needle height:

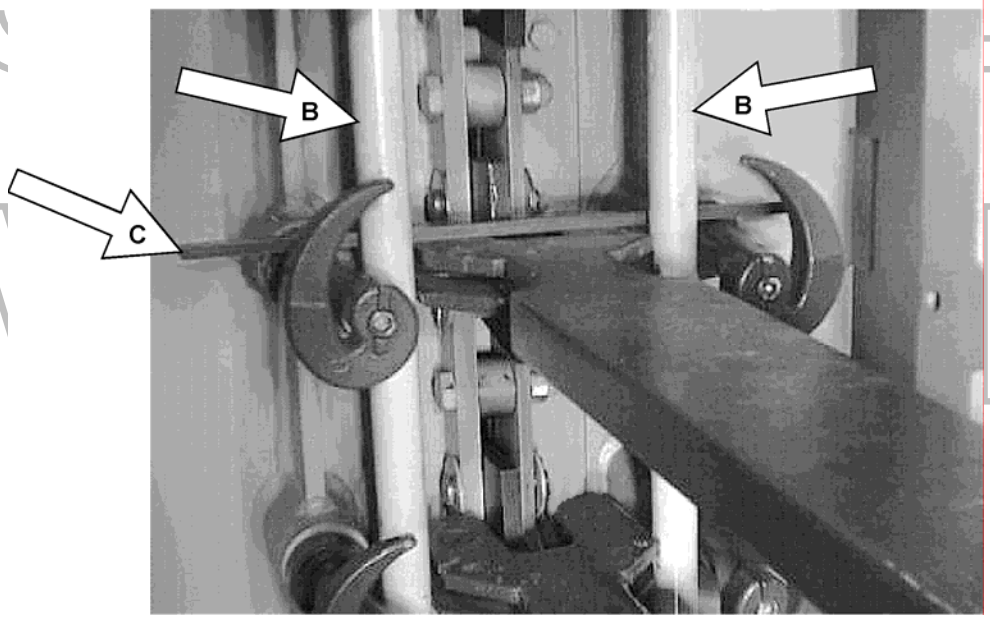
When bolt #3 is tightened, the opposite end of the needle will go up.

When bolt #4 is tightened, the opposite end of the needle will go down.

When all inserter needles are aligned, make sure all bolts are snug.

NEEDLE ALIGNMENT





A) Set 2LST so that the depth of the needles leaves the hooks approximately in the center of the neck on the needle.

B) Align the needle to the center of the vertical posts.

C) With a piece straight edge between the tops of the twister shafts, align the top of the needle to the bottom of the straight edge. This aligns the centerline of the needle to the centerline of the shafts and the center of the ram slot.

TORQUE WRENCH CHART

BOLT DIA.	THREAD PITCH	GRADE 0-2	GRADE 5	GRADE 6	GRADE 7	GRADE 8
1/4	20	5.5	9.7	11.0	11.5	13.0
	28	6.0	11.0	12.0	13.0	15.0
5/16	18	10.0	18.0	20.0	21.0	24.0
	24	11.4	20.0	23.0	24.0	27.5
3/8	16	21.7	39.0	43.0	45.0	52.0
	24	24.5	44.0	49.0	51.0	59.0
7/16	14	32.4	58.0	65.0	67.0	78.0
	20	38.4	69.0	77.0	80.0	92.0
½	13	43.5	87.0	97.0	102.0	116.0
	20	54.6	103.0	115.0	121.0	138.0
9/16	12	57.5	111.0	123.0	129.0	147.0
	18	68.0	131.0	146.0	153.0	175.0
5/8	11	86.0	173.0	192.0	201.0	230.0
	18	102.0	200.0	224.0	235.0	269.0
3/4	10	152.0	290.0	324.0	336.0	389.0
	16	182.0	345.0	384.0	403.0	461.0
7/8	9	222.0	500.0	555.0	583.0	666.0
	14	261.0	585.0	653.0	685.0	784.0
1	8	307.0	690.0	769.0	807.0	923.0
	14	370.0	830.0	925.0	967.0	1111.0
1-1/4	7	384.0	862.5	961.0	1009.0	1154.0
	12	462.5	1037.5	1156.0	1209.0	1389.0
1-1/2	6	460.5	1035.0	1153.5	1210.5	1384.5
	12	555.0	1245.0	1387.5	1450.5	1666.5
1-3/4	5	537.0	1207.5	1346.0	1412.0	1615.0
	12	647.2	1452.5	1619.0	1692.0	1944.0
2	4.5	614.0	1380.0	1538.0	1614.0	1846.0

VALUES ARE FOR CLEAN THREADS, LIGHTLY OILED.

EXCEPTIONS:

1. Ryertex:
    a. Bearing, same as Grade 2.
    b. Threaded, ½ the value of Grade 2.
2. Brass: ½ the value of Grade 2.
3. Grade 8 & Soc Hd Bolts W/Gr. 5 Nuts; use values of Gr. 5.
4. Bolt In Slotted Holes; use ½ value of Grade 2.
5. Hogger Tie Rod Bolts.

AUTO-TY

PARTS ORDERING INFORMATION

BALEMASTER/BALEWEL EQUIPMENT

SERVICES AVAILABLE:

We will be pleased to quote the following:

1. Replacement Parts & Spare Parts.
2. Bale Tie Wire.
3. Factory Field Service Supervision.

PARTS ORDERING:

Your order **MUST** include the following:

1. Serial Number & Model Number as tagged on the machine.
2. Part Number -- refer to Parts List in this Manual.

CONTACT

THE SERVICE DESK
BALEMASTER DIVISION
EAST CHICAGO MACHINE TOOL CORPORATION
980 CROWN COURT
CROWN POINT, INDIANA 46307-2732

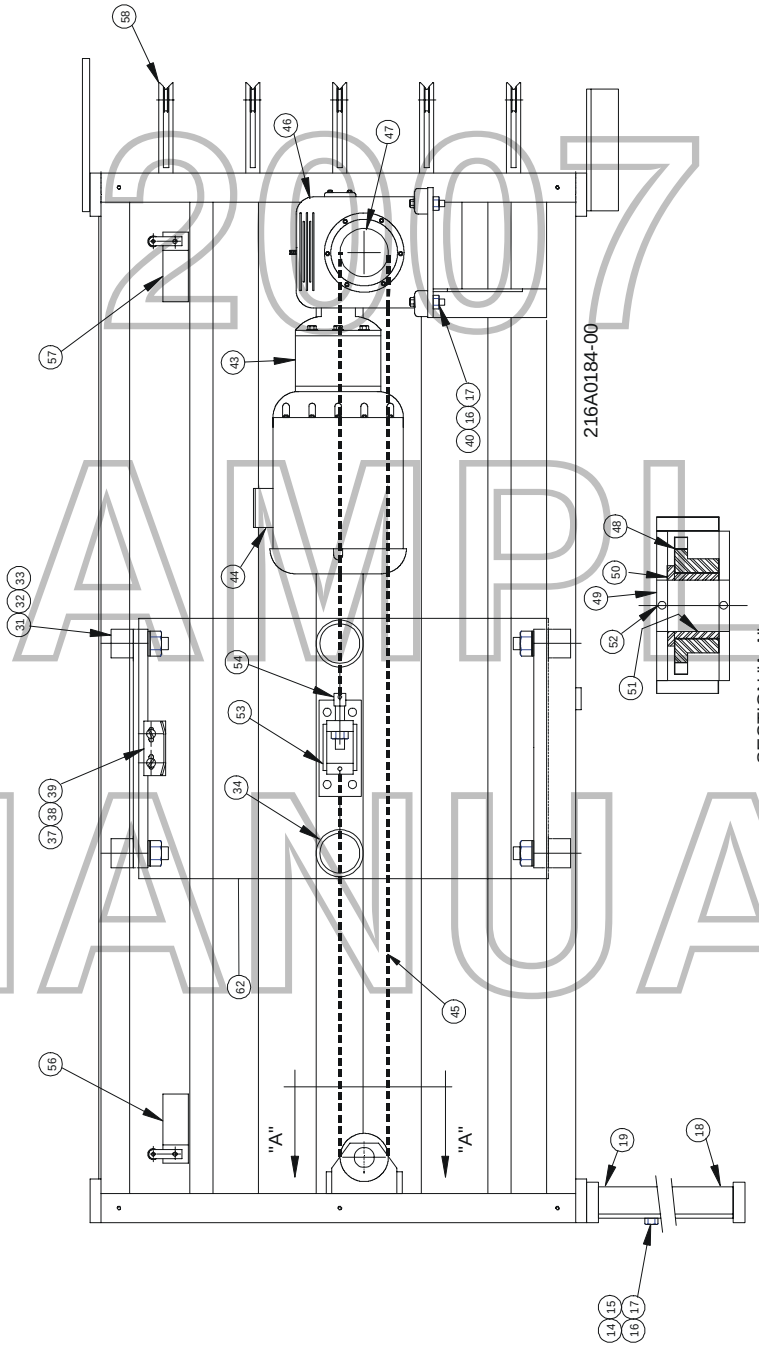
OR CALL

(219)663-4525
FAX: (219)663-4591

3. All Warranty Claimed Returned Parts must have a Return Authorization Number given during contact with our Service Desk. Ship to the attention of: CUSTOMER SERVICE DEPARTMENT. NO Collect Shipments will be accepted. See Warranty.

AUTO-TY
INSERTER ASSEMBLY

AUTO-TY
INSERTER ASSEMBLY CONTINUED



AUTO-TY

SPARE PARTS - INSERTER
COMMON PARTS FOR ALL INSERTER MODELS
5 - WIRE

ITEM #	DESCRIPTION	PART NUMBER	QTY.
1	INSERTER FRAME	SEE NON COMMON PARTS	
5	HEX HEAD CAP SCREW	AAA00071	3
6	LOCK WASHER	AHB00008	3
7	HEX NUT	AGC00015	3
8	HEX HEAD CAP SCREW	AAA00073	3
9	LOCK WASHER	AHB00008	3
10	HEX NUT	AGC00015	3
11	HEX HEAD CAP SCREW	AAA00090	2
12	FLAT WASHER	AHA00008	2
13	FLEX LOCK NUT	AGB00006	2
14	HEX HEAD CAP SCREW	AAA00064	2
15	FLAT WASHER	AHA00007	2
16	LOCK WASHER	AHB00008	2
17	HEX NUT	AGC00015	2
18	INSERTER SUPPORT (BOTTOM)	241A0022-00	1
20	HEX HEAD CAP SCREW	AAA00030	10
21	LOCK WASHER	AHB00006	10
22	INSERTER WEAR BLOCK	241A0111-00	5
23	INSERTER FRONT PLATE	241B0107-00	1
24	NEEDLE	SEE NON COMMON PARTS	
25	FLAT HD SOC CAP SCREW	ACB00028	10
26	ROLLER	241A0018-02	10
27	BUSHING	241A0030-02	10
28	HEX HEAD CAP SCREW	AAA00069	20
29	FLAT WASHER	AHA00007	20
30	FLEX LOCK NUT	AGB00005	20
31	2" CAM FOLLOWER	CEA00005	4
32	LOCK WASHER	AHB00011	4
33	HEX NUT	AGC00021	4
34	3 1/4 CAM FOLLOWER	CEA00006	2
35	LOCK WASHER	AHB00014	2
36	HEX NUT	AGC00026	2
37	PAN HEAD SCREW	AFB00041	2
38	LOCK WASHER	AHB00004	2
39	LIMIT SWITCH ACTUATOR	241A0021-00	1

AUTO-TY
SPARE PARTS - INSERTER
COMMON PARTS FOR ALL INSERTER MODELS CONTINUED
5 - WIRE

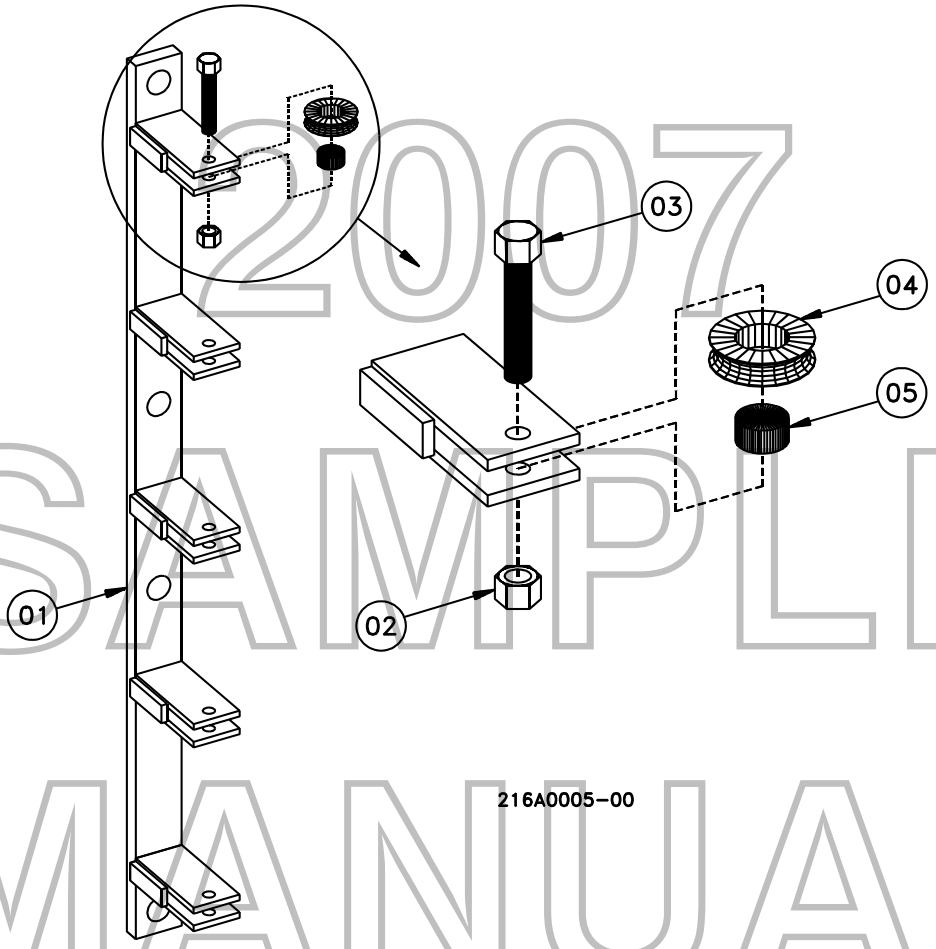
ITEM #	DESCRIPTION	PART NUMBER	QTY.
40	HEX HD CAP SCR	AAA00067	4
43	BRAKE ASSEMBLY	SEE ELECTRICAL	1
44	MOTOR	SEE ELECTRICAL	1
45	CONNECTING LINK	DCB00011	1
46	GEAR REDUCER	DAA00003	1
46A	R-OPTION	DAA00023	1
47	GEAR REDUCER SPROCKET	112A0001-00	1
48	IDLER SPROCKET	112A0001-03	1
49	PIN	242A0112-00	1
50	SPROCKET SPACER	241A0020-00	1
51	BEARING	CKA00010	1
52	SET SCREWS	ADB00018	1
53	PULL BRACKET	241B0025-00	1
54	CHAIN STUD	241A0015-00	1
56	1LST LIMIT SWITCH	GXA00031	1
57	2LST LIMIT SWITCH	GXA00031	1
58	INSERTER WIRE GUIDE	241B0046-00	1
62	CARRIAGE PLATE	241C0028-00	1

NON-COMMON PARTS PER BALER MODEL NUMBER

ITEM #	DESCRIPTION	BB, B400 4000, 4400 5400	4200	4500 5700 5200	QTY.
1	FRAME	241D0062-40	241D0062-42	241D0062-45	1
41	CARRIAGE TRACK (TOP & BOTTOM)	241A0055-01	241A0055-03	241A0055-05	2
18	NEEDLE	241B0007-10	241B0007-06	241B0007-08	5
45	ROLLER CHAIN	DCB00182	DCB00204	DCB00228	1
19	INSERTER SUPPORT EXTENSION	241A0008-00	241A0008-09	241A0008-03	1

AUTO-TY

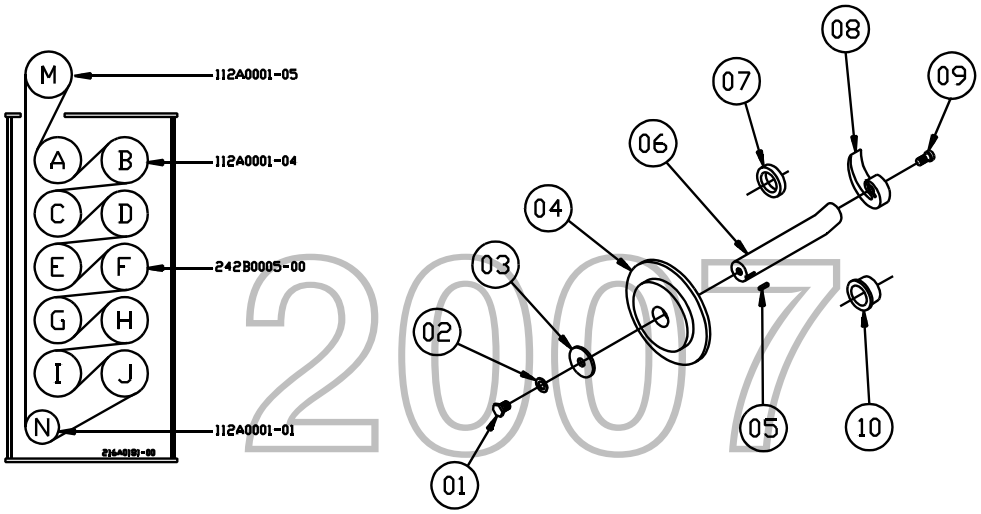
SPARE PARTS - INSERTER WIRE GUIDE



ITEM #	DESCRIPTION	PART NUMBER	QTY.
01	INSERTER WIRE GUIDE	241B0046-00	1
02	5/16-18 FLEX LOCK NUT	AGB00004	5
03	5/16-18 X 1 1/4 HEX HD CAP SCR	AAA00019	5
04	ROLLER	241A0018-02	5
05	BUSHING	241A0030-02	5

AUTO-TY

SPARE PARTS - TWISTER MECHANISM



TWISTER ASSEMBLIES 1,2,3,4,5,7,8,9,10

ITEM #	DESCRIPTION	PART NUMBER	QTY.
1	HEX HD CAP SCR	AAA00032	9
2	LOCK WASHER	AHB00006	9
3	RETAINER	242A0011-00	9
4	SPROCKET	112A0001-04	9
5	KEYSTOCK	ATF00001	-
6	TWISTER HOOK SHAFT	242B0004-00	10
7	COLLAR, SET	DEA00003	10
8	*TWISTER HOOK	242B0006-00	10
9	SOC HD CAP SCR	AAB00046	10
10	BUSHING	CKA00003	20
	CHAIN W/CON. LINK	DCB00293	1

TWISTER ASSEMBLY F - SAME AS ABOVE EXCEPT:

4	ECCENTRIC SPROCKET (DRIVES CUTTER MECH.)	242B0005-00	1
	LIMIT SWITCH ACTUATOR	242A0013-00	1

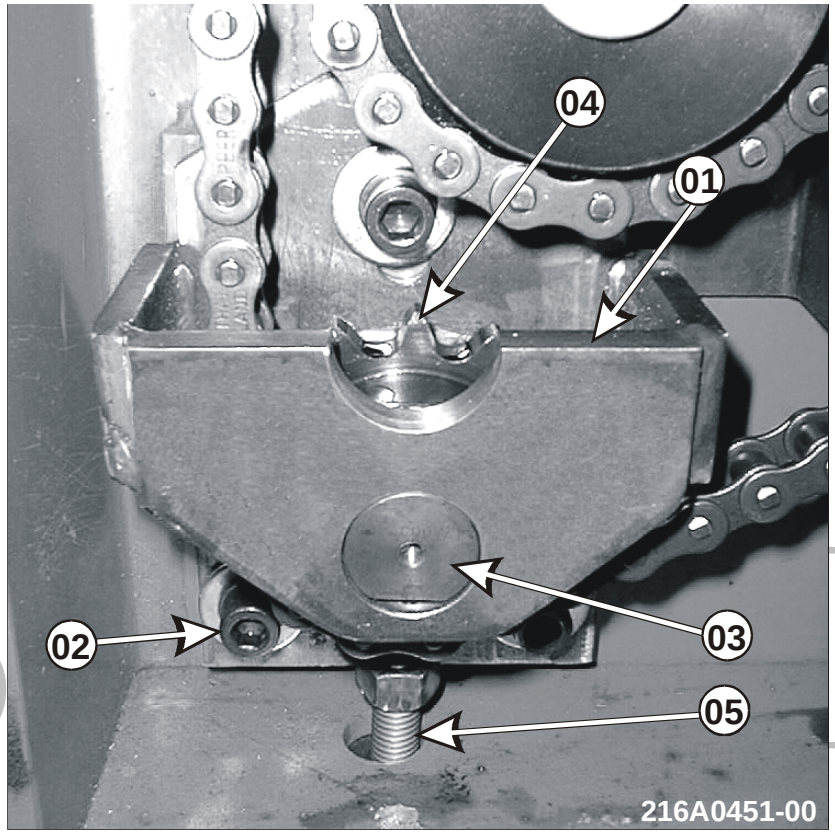
TWISTER ASSEMBLY M - ON GEAR REDUCER

SPROCKET	1120001-05	1
KEYSTOCK	ATF00001	-
GEAR REDUCER	DAA00023	1
COMPLETE BRAKE	DAB00001	
MOTOR	SEE ELECTRICAL	
GUARD	242A0009-00	1
SCREWS	AFB00036	2

CAUTION

DO NOT GRIND OR WELD ON TWISTER HOOKS.
BROKEN HOOKS ARE TO BE REPLACED WITH NEW HOOKS ONLY.

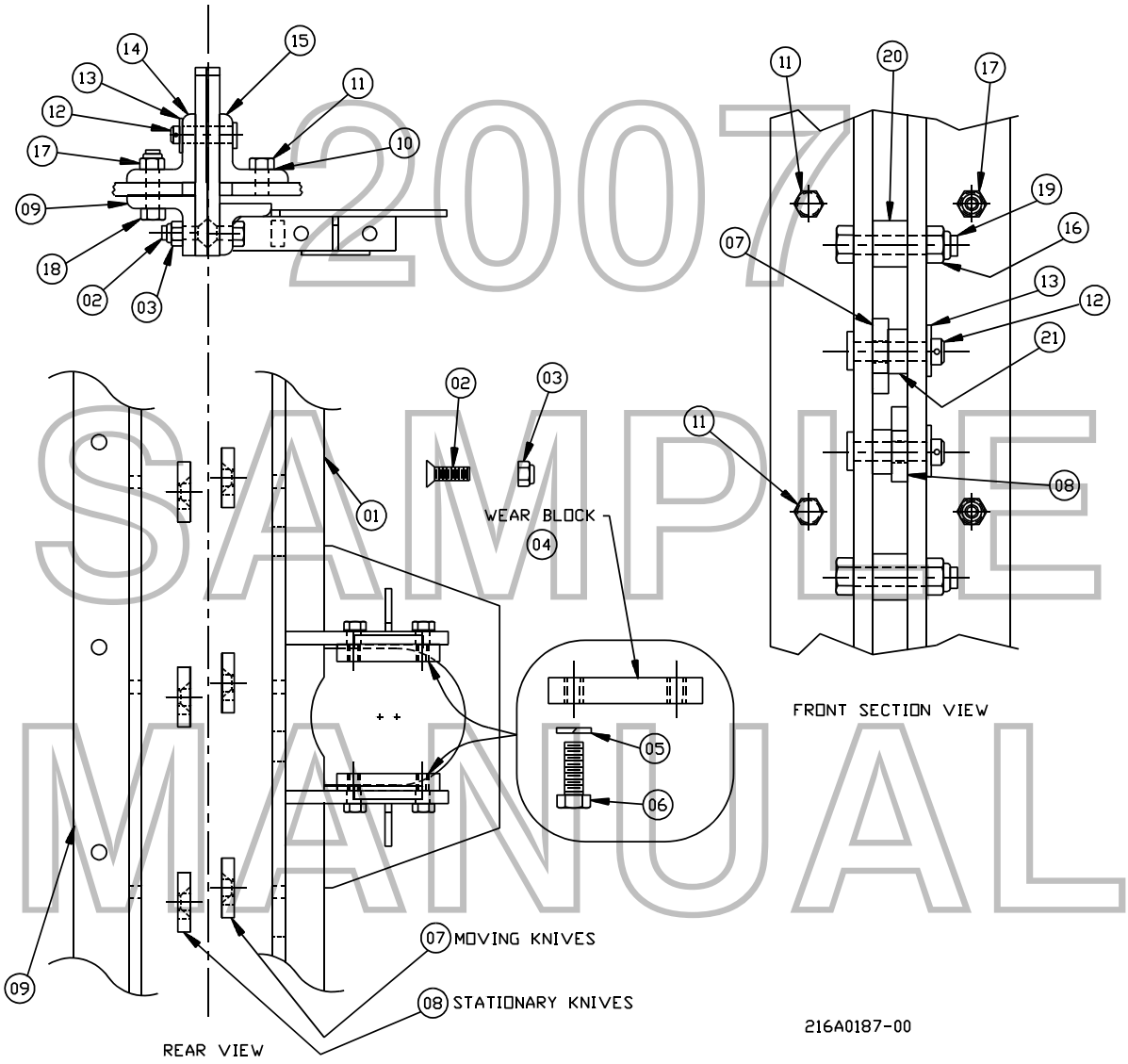
AUTO-TY
CHAIN TENSIONER
TWISTER ASSEMBLY "N" - CHAIN TENSIONER ASSEMBLY



ITEM	DESCRIPTION	PART NUMBER	QTY.
01	TAKE-UP BRACKET	242C0020-00	1
02	BOLTS	AAB00077	3
	FLAT WASHER	AHA00007	3
	LOCK WASHER	AHB00008	3
03	PIN, DRIVEN SPROCKET	241A0112-00	1
	SET SOCKET SCREW	ADB00018	1
04	SPROCKET	112A0001-01	1
	ROLLER BEARING	CHA00006	1
*04	SPROCKET	112A0001-03	1
	DU BUSHING	CKA00010	1
05	SQUARE HD SET SCREW	ADA00033	1
	HEAVY HEX NUT	AGC00017	1
	FLAT WASHER	AHA00008	1

* PARTS FOR SELF-LUBRICATING BUSHING OPTION

TWISTER CUTTER



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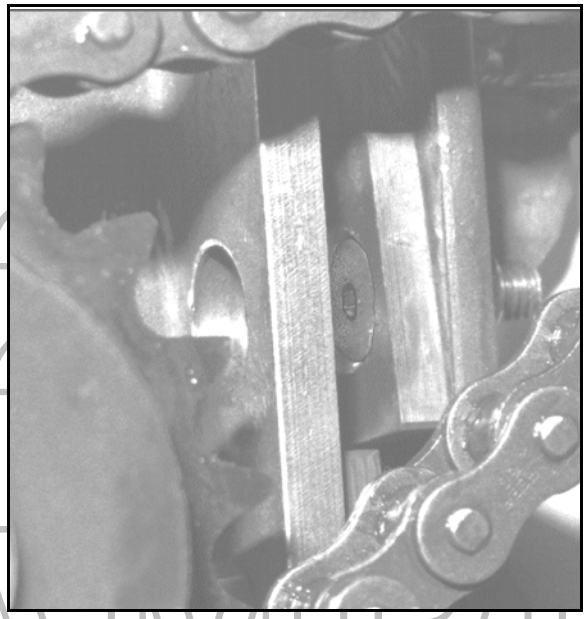
AUTO-TY

TWISTER CUTTER



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In order to replace cutter knives or cutter knife bolts, the following steps must be taken:

1) Align holes in cutter knife frame to cutter knife bolt heads by moving the drive bar. This can be done by releasing the brake and manually turning the motor with a 3/8 Allen wrench.

2) Replace knife/bolt.

3) Tighten movable cutter knife bolt using 7/32 Allen wrench (Drive bar is threaded). When bolt is snug, back the bolt out 1/4 turn.

4) Tighten lock nut using 3/8 wrench making sure bolt stays in the backed out position.

FAILURE TO FOLLOW THIS PROCEDURE WILL RESULT IN FAILURE OF CUTTER KNIFE BOLT

NEVER PERFORM MAINTENANCE ON BRAKE UNTIL MOTOR AND ROTATING COMPONENTS HAVE STOPPED AND ARE ELECTRICALLY LOCKED OUT.

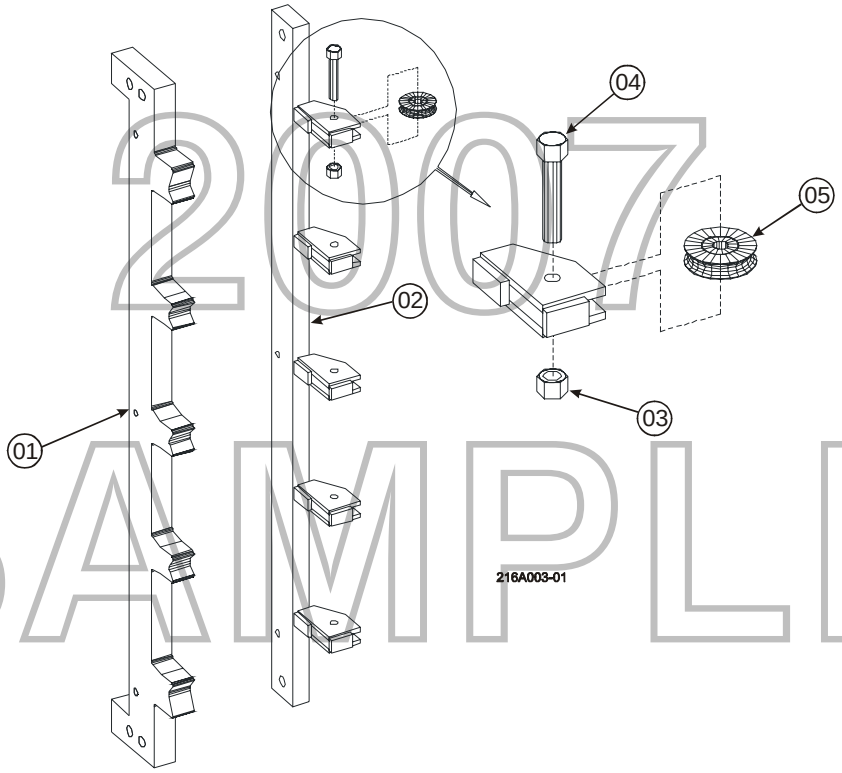
AUTO-TY

SPARE PARTS - TWISTER CUTTER
5 - WIRE

ITEM #	DESCRIPTION	PART NUMBER	QTY.
1	DRIVE BAR	242C00021-00	1
2	FLAT SOC HD HEX CAP SCR	ACB00038	10
3	FLEX LOCK NUT (TIGHTEN STATIONARY KNIFE SECURELY) (SNUG UP MOVING KNIFE .001 TO .002 CLEARANCE)	AGB00002	10
4	MD NYLON WEAR BLOCK	223A0509-04	2
5	LOCK WASHER	AHB00006	4
6	HEX HD CAP SCR	AAA00031	4
7	CUTTER KNIFE	242B0019-00	5
8	CUTTER KNIFE	242B0019-00	5
9	REAR KNIFE SUPPORT	242B0002-00	1
10	LOCK WASHER	AHB00006	6
11	HEX HD CAP SCR	AAA00031	6
12	CLEVIS PIN	APA00006	5
13	FLAT WASHER	AHA00007	5
14	FRONT KNIFE SUPPORT	242B0003-91	1
15	FRONT KNIFE SUPPORT	242B0003-90	1
16	1/2" FLEX NUT	AGB00005	6
17	FLEX LOCK NUT	AGB00002	6
18	HEX HD CAP SCR	AAA00035	5
19	HEX HD CAP SCR	AAA00068	6
20	CUTTER KNIFE SPACER	242A0010-01	6
21	CUTTER KNIFE SPACER	242A0010-00	10

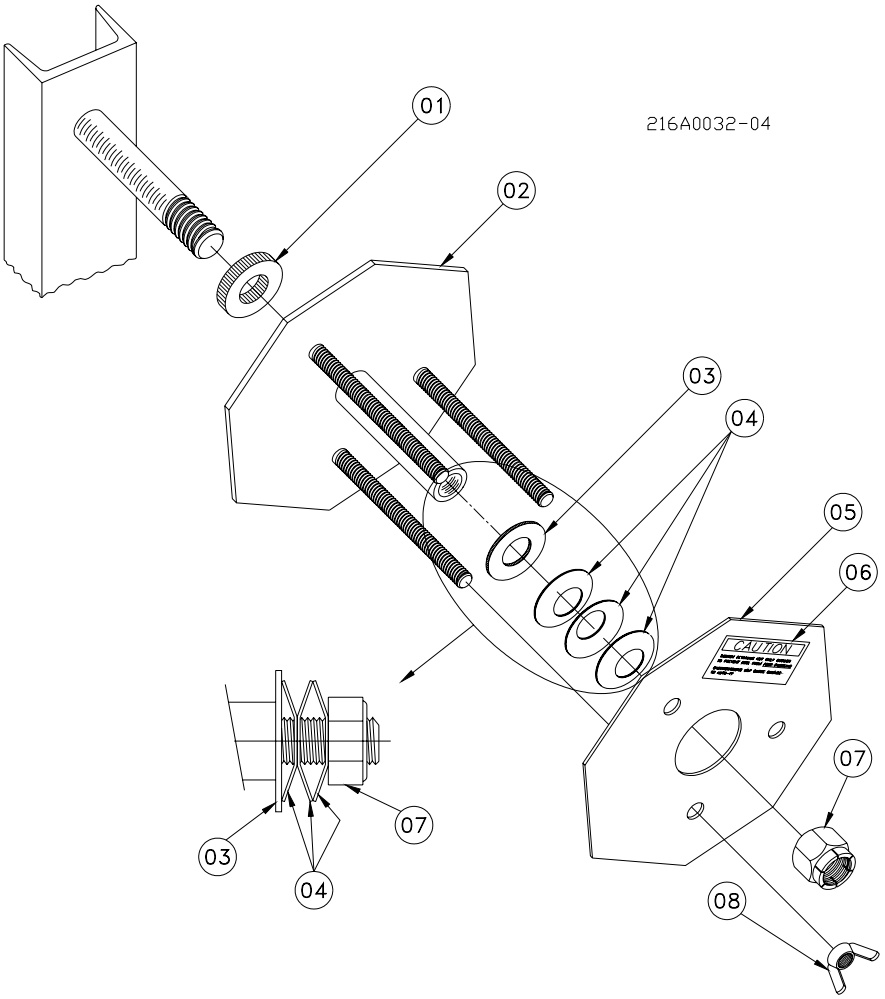
AUTO-TY

SPARE PARTS - TWISTER WIRE GUIDE



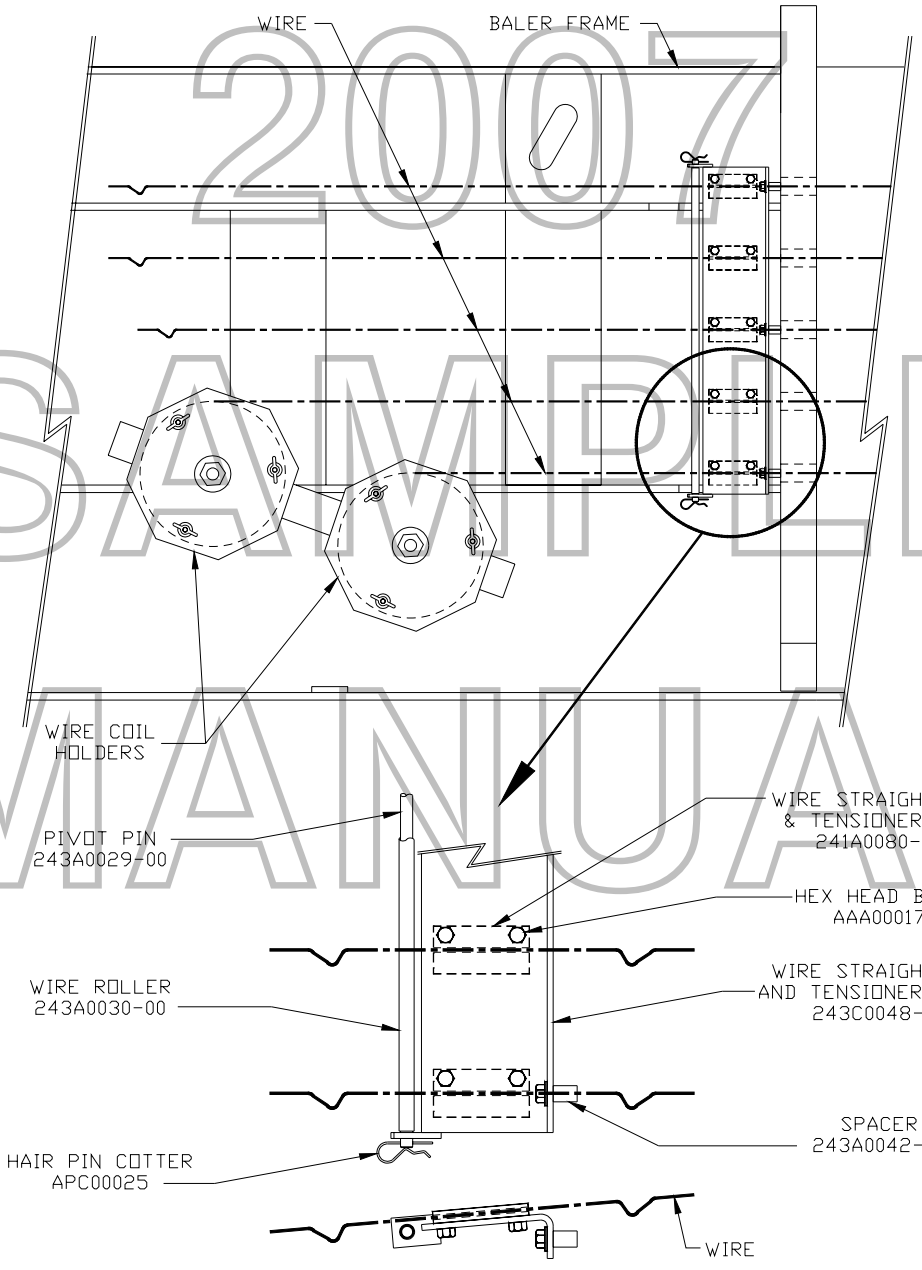
ITEM #	DESCRIPTION	PART NUMBER	QTY.
01	T.W. GUIDE OUTPUT SIDE	242B0001-00	1
02	T.W. GUIDE INPUT SIDE	242C0036-00	1
03	5/16-18 FLEX LOCK NUT	AGB00004	5
04	5/16-18 X 1 1/4 HEX HD CAP SCR	AAA00019	5
05	ROLLER	CHA00011	5

AUTO-TY
SPARE PARTS - WIRE COIL HOLDER

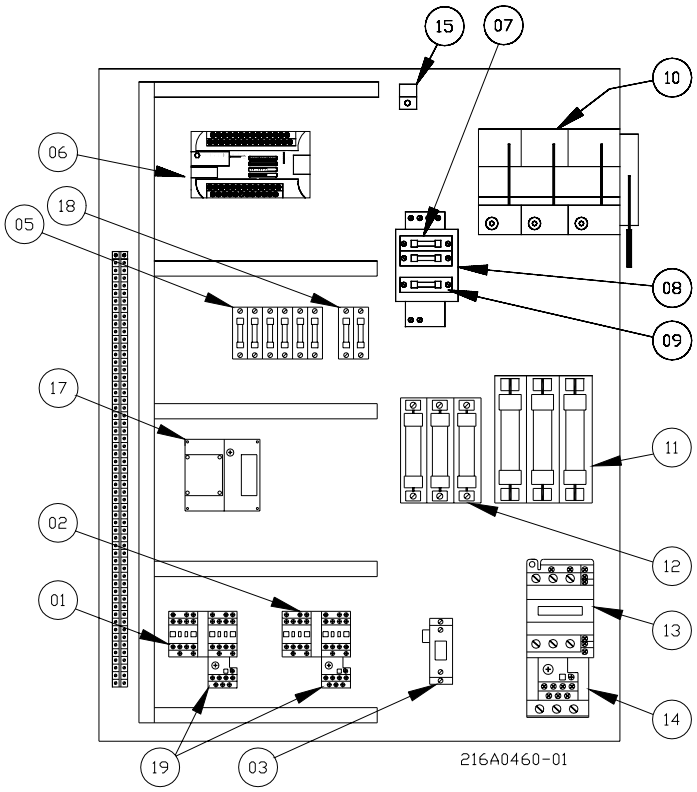


ITEM #	DESCRIPTION	PART	QTY.
1	INNER SPACER	242A0034-04	1
2	WIRE COIL REEL	242B0032-00	1
3	FLAT WASHER	AHA00011	1
4	BELLEVILLE DISC SPRING	ZKA00023	3
5	WIRE COIL RETAINER PLATE	242A0031-00	1
6	CAUTION TAG	111A0040-00	1
7	1-8 FLEX LOCK NUT	AGB00014	1
8	5/8-11 WING NUT	AZA00011	3

WIRE STRAIGHTENER & TENSIONER ASSEMBLY



TYPICAL CONTROL PANEL ALLEN-BRADLEY MICROLOGIX 1200 W/TOUCH SCREEN (1 PUMP) IEC ELECTRICAL



ITEM	DESCRIPTION	PART NUMBER	QTY
01	REV. CONTACTOR TWISTER	GNH00001	1
02	REV. CONTACTOR INSERTER	GNH00001	1
03	OIL COOLER OVERLOAD	PER HP/VOLT	1
05	PLC OUTPUT FUSES	GMH00002	6
06	A.B. MICROLOGIX 1200	GJA00115	1
07	PRIMARY TRANSFORMER FUSES	PER HP/VOLT	2
08	TRANSFORMER	PER HP/VOLT	1
09	SECONDARY TRANSFORMER FUSE	PER HP/VOLT	1
10	DISCONNECT	PER HP/VOLT	1
11	PUMP FUSES	PER HP/VOLT	3
12	INSERTER/TWISTER FUSES	GMA00031	3
13	PUMP CONTACTOR	PER HP/VOLT	1
14	PUMP CONTACTOR OVERLOAD	PER HP/VOLT	1
15	GROUND LUG	GDA00002	1
17	24 VDC POWER SUPPLY	GQB00010	1
18	POWER SUPPLY FUSES	GMH00001	2
19	INSERTER/TWISTER CONTACTOR OVERLOAD	GOC00006	2

WARNING: The Programmable Logic Controller (PLC Item 6), and the baler enclosure must be properly grounded. All applicable codes and ordinances must be observed when wiring the baler.

DON'T GET CAUGHT IN THE TRICK BAG.

IF YOUR BALEMASTER BALER IS EQUIPPED WITH A PROGRAMABLE LOGIC CONTROL(PLC), MAKE IT A REGULAR PART OF YOUR MAINTENANCE ROUTINE TO BACK UP THE MEMORY. VALUABLE INFORMATION IS STORED IN THE PROCESSOR'S MEMORY SUCH AS THE NUMBER OF HOURS RUN, HOURS ON THE PUMPS AND NUMBER OF BALES MADE. IN ADDITION TO THIS THERE ARE SET UP CODES THAT CUSTOM FIT YOUR MACHINE TO ITS APPLICATION. IF YOU DO NOT ALREADY OWN THE SOFTWARE FOR YOUR PLC, CONTACT YOUR LOCAL PLC DEALER AND MAKE A BACK UP OF YOUR PROGRAM. THE PROGRAM CAN BE LOST BY POWER SURGES, RADIO FREQUENCY INTERFERENCE OR HUMAN ERROR. DON'T LET A MINOR PROBLEM SHUT DOWN PRODUCTION FOR DAYS. BACK UP NOW!

Troubleshooting Your System

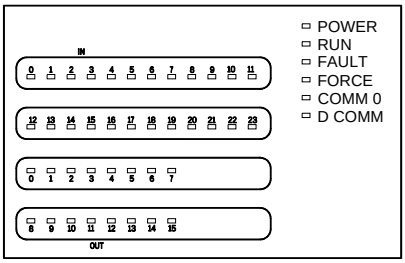
This chapter describes how to troubleshoot your controller. Topics include:

- understanding the controller LED status
- controller error recovery model
- analog expansion I/O diagnostics and troubleshooting
- calling Rockwell Automation for assistance

Understanding the Controller LED Status

The controller status LEDs provide a mechanism to determine the current status of the controller if a programming device is not present or available.

Table C.1 Controller LED Indicators



LED	COLOR	INDICATES
POWER	off	No input power, error condition
	green	Power on
RUN	off	Not executing the user program
	green	Executing the user program in run mode
	green flashing	Memory module transfer occurring
FAULT	off	No fault detected
	red flashing	Application fault detected
	red	Controller hardware faulted
FORCE	off	No forces installed
	amber	Forces installed
COMM O	off	Not transmitting via RS-232 port
	green	Transmitting via RS-232 port
DCOMM	off	Configured communications
	green	Default communications
INPUTS	off	Input is not energized
	amber	Input is energized (logic status)
OUTPUTS	off	Output is not energized
	amber	Output is energized (logic status)

Normal Operation

The POWER and RUN LEDs are on. If a force condition is active, the FORCE LED turns on and remains on until all forces are removed.

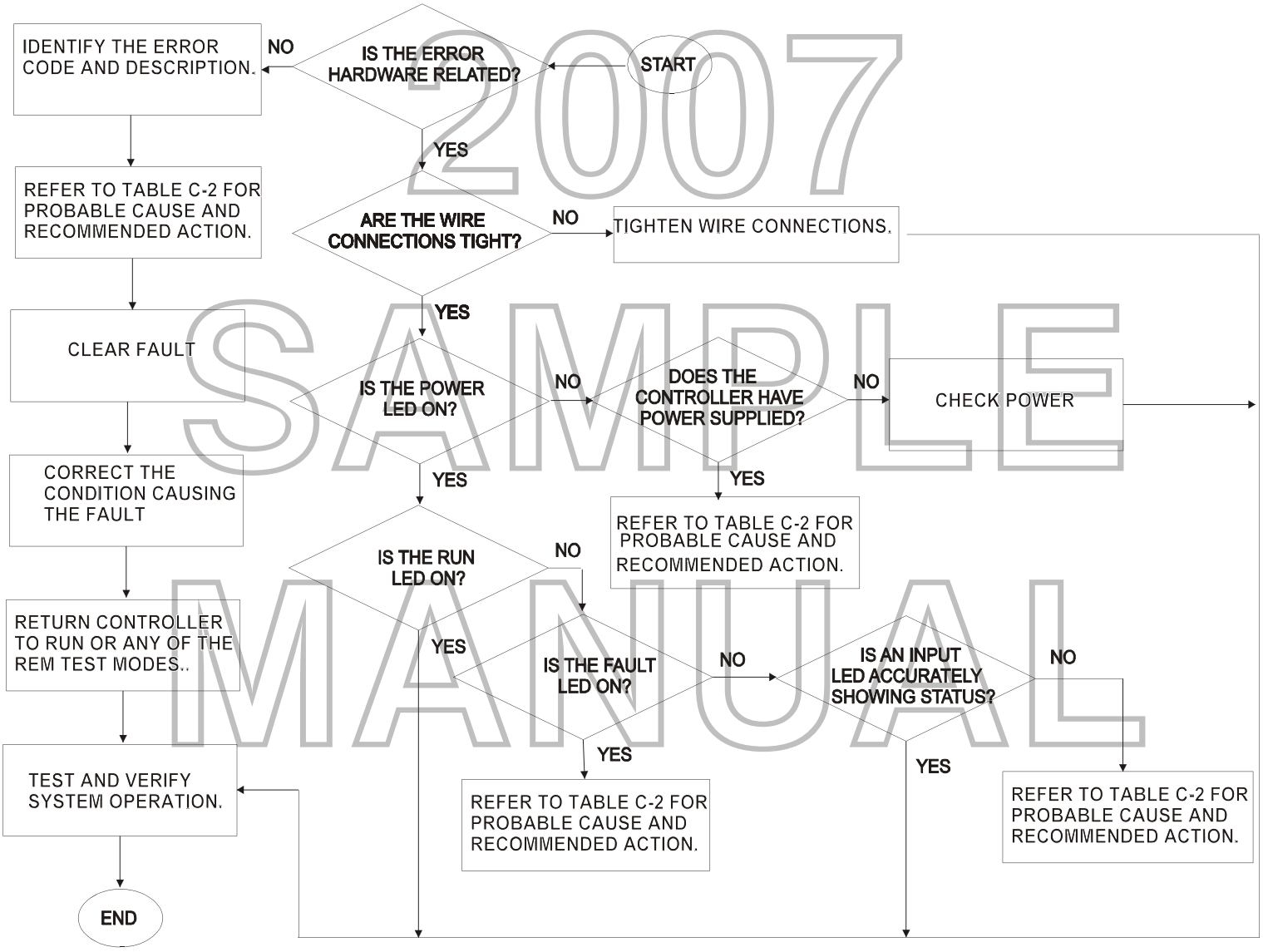
Error Conditions

If an error exists within the controller, the controller LEDs operate as described in the following table:

If the LEDS indicate	The Following Error Exists	Probable Cause	Recommended Action
All LEDs off	No input power or power supply error	No line Power	Verify proper line voltage and connections to the controller
		Power Supply Overloaded	This problem can occur intermittently if power supply is overloaded when output loading and temperature varies
Power and FAULT LEDs on solid	Hardware faulted	Processor Hardware Error	Cycle power. Contact your local Allen-Bradley representative if the error persists
		Loose Wiring	Verify connections to the controller
Power LED on and FAULT LED flashing	Application fault	Hardware/Software Major Fault Detected	For error codes and Status File information, see *MicroLogix 1200 and 1500 Programmable Controllers Instruction Set Reference Manual*, Publication 1762-RM001A-US-P

Controller Error Recovery Model

Use the following error recovery model to help you diagnose software and hardware problems in the micro controller. The model provides common questions you might ask to help troubleshoot your system. Refer to the recommended pages within the model for further help.



Analog Expansion I/O Diagnostics and Troubleshooting

Module Operation and Channel Operation

The module performs operations at two levels:

- module level
- channel level

Module level operations include functions such as power-up, configuration, and communication with the controller.

Internal diagnostics are performed at both levels of operation. Both module hardware and channel configuration error conditions are reported to the controller. Channel over range or under range conditions are reported in the module's input data table. Module hardware errors are reported in the controller's I/O status file. Refer to the *MicroLogix 1200 ans 1500 Programmable Controllers Instruction Set Reference Manual*, Publication 1762-RM001A-US-P for more information.

When a fault condition is detected, the analog outputs are reset to zero.

Power Up Diagnostics

At module power up, a series of internal diagnostic tests are performed.

Table C.2 Module Status LED State Table

If Module Status LED is	Indicated Condition	Corrective Action
On	Proper Operation	No action required.
Off	Module Fault	Cycle power. If condition persists, replace the module. Call your local distributor or Allen-Bradley for assistance

Critical and Non-Critical Errors

Non-critical module errors are recoverable. Channel errors (over range or under range errors) are non-critical. Non-critical error conditions are indicated in the module input data table. Non-critical configuration errors are indicated by the extended error code. See Table C.5.

Critical module errors are conditions that prevent normal or recoverable operation of the system. When these types of errors occur, the system leaves the run mode of operation. Critical module errors are indicated in Table C.5.

Module Error Definition Table

Analog module errors are expressed in two fields as four digit Hex format with the most significant digit as "don't care" and irrelevant. The two fields are "Module Error" and "Extended Error Information." The structure of the module error data is shown below.

Table C.3 Module Error Table

"Don't Care" Bits				**Module Error**			**Extended Error Information**								
15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hex Digit 4				**Hex Digit 3**			**Hex Digit 2**					**Hex Digit 1**			

Module Error Field

The purpose of the module error field is to classify module errors into three distinct groups, as described in the table below. The type of error determines what kind of information exists in the extended error information field. These types of module errors are typically reported in the controller's I/O status file. Refer to the *MicroLogix 1200 and 1500 Programmable Controllers Instruction Set Reference Manual*, Publication 1762-RM001A-US-P for more information.

Table C.4 Module Error Types

Error Type	**Module Error Field Value Bits 11 through 09 (Binary)**	**Description**
No Errors	000	No error is present. The extended error field holds no additional information
Hardware Errors	001	General and specific hardware error codes are specified in the extended error information field
Configuration Errors	010	Module-specific error codes are indicated in the extended error field. These error codes correspond to options that you can change directly. For example, the input range or input filter selection.

Extended Error Information Field

Check the extended error information field when a non-zero value is present in the module error field. See Table C.5.

NOTE If no errors are present in the module error field, the extended error information field is set to zero.

Hardware Errors

General or module specific hardware errors are indicated by module error code 2. See Table C.5.

Configuration Errors

If you set the fields in the configuration file to invalid or unsupported values, the module ignores the invalid configuration, generates a non-critical error, and keeps operating with the previous configuration.

Table C.5 lists the configuration error codes defined for the module.

Table C.5 Extended Error Codes

Error Type	Hex Equivalent [1]	Module Error Code	Extended Error Information Code	Error Description
		Binary	Binary	
No Error	X000	000	0 0000 0000	No error
General Common Hardware Error	X200	001	0 0000 0000	General hardware error; no additional information
	X201	001	0 0000 0001	Power up reset state
Hardware Specific Error	X210	001	0 0001 0000	Reserved
Configuration Error	X400	010	0 0000 0000	General configuration error; no additional information
	X401	010	0 0000 0001	Invalid input data format selected (channel 0)
	X402	010	0 0000 0010	Invalid input data format selected (channel l)
	X403	010	0 0000 0010	Invalid output data format selected (channel 0)
	X404	010	0 0000 0100	Invalid output data format selected (channel l)

[1]X represents “Don’t Care.”

Calling Rockwell Automation for Assistance

If you need to contact Rockwell Automation or local distributor for assistance, it is helpful to obtain the following (prior to calling):

- controller type, series letter, revision letter, and firmware (FRN) number of the controller
- controller LED status
- controller error codes (*Refer to MicroLogix 1200 and 1500 Programmable Controllers Instruction Set Reference Manual*, Publication 1762-RM001A-US-P for error code information).

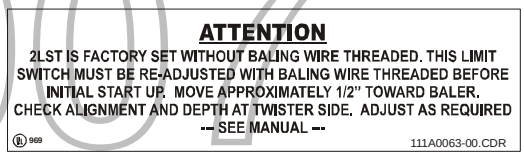
AUTO-TY SPARE TAGS

NOTE: TO ORDER NEW TAGS, USE THE PART NUMBER BY EACH TAG.

CAUTION: DON'T REMOVE TAGS OR DEACTIVATE SAFETY DEVICES OFF MACHINE.

111A0040-00

111A0011-00



111A0063-00

111A0136-01

111A0057-00

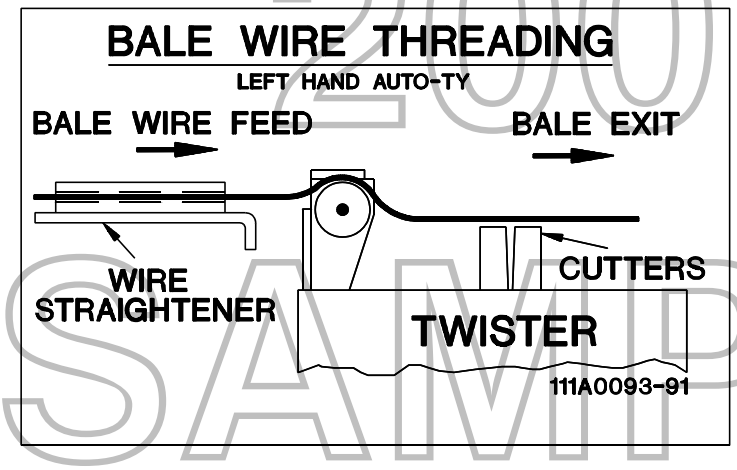
111A0044-00

111A0010-00

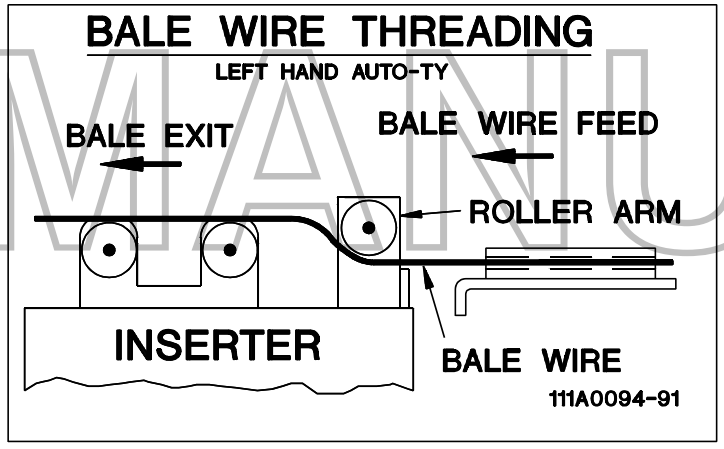
111A0024-00

AUTO-TY SPARE TAGS
LEFT HAND AUTO-TY

NOTE: TO ORDER NEW TAGS, USE THE PART NUMBER BY EACH TAG.



PART# 111A0093-91



PART# 111A0094-91

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980 CROWN COURT, CROWN POINT, INDIANA 46307
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TERMS AND CONDITIONS OF SALE

The following terms and conditions of sale become a part of the proposal and any subsequent sale of equipment manufactured by the East Chicago Machine Tool Corporation. its Divisions or Subsidiary, hereafter referred to as "we," "us," "our," etc., whether the equipment be purchased or leased directly from us or our Agent, Representative or Dealer, or from a Leasing Company. "Buyer" as used herein includes not only the purchaser but also the original user and original owner of the equipment.

PRICES

1. Prices are firm for a period of 60 days from date of proposal provided that the first available shipment will be accepted by Buyer.

2. Prices are f.o.b. point of manufacture. Shipments will be made freight collect only.

3. Prices are in U.S. currency and do not include any excise, sales, use or property taxes. export or import duties or other taxes of any taxing authority. Prices are subject to increase equal in amount to any tax we may be required to collect or pay on the sale or use of the equipment. Such amount will be payable when invoiced.

TERMS OF PAYMENT

1. Unless otherwise specified by us, the following payment schedule applies to all accepted orders, based on the total dollar amount of the order

To $50,000:
Twenty five percent payable at time of placement of order;
Sixty five percent payable five (5) calendar days prior to shipment;
Ten percent payable thirty (30) calendar days following date of shipment.

$50,001 and up
Twenty five percent payable at time of placement of order followed by equal monthly progress payments, so scheduled, that ninety percent has been paid five (5) calendar days prior to scheduled shipment and final ten percent payable thirty (30) calendar days following date of shipment.

2. Accounts not paid within 30 days of invoice date will bear a service charge of one and one-half percent (1½%) per month on the unpaid balance due.

ACCEPTANCE

1. All orders are subject to acceptance in Crown Point, Indiana in writing by our marketing manager or one of our corporate officers. Typographical and clerical errors in quotations and acknowledgments are subject to correction. Equipment manufacture will not be scheduled prior to receipt of down payment.

2. For credit verification, w**e** may require a financial statement or other financial information from the Buyer. At our option prior to shipment of the equipment, we may require the utilization of a financing statement and security agreement or irrevocable Letter of Credit. Title to equipment shall pass to Buyer only upon payment in full, of the balance due on the order.

3. Any contract for the sale of equipment by us shall be treated as made and as performed in the State of Indiana.

CHANGES IN DESIGN

1. As we constantly strive to improve our products, specifications are necessarily subject to change without notice. We are not obligated to apply any change or improvement on equipment previously manufactured.

2. Changes in design or construction of equipment made at the request of the Buyer after its order has been accepted. or, in the case of custom equipment orders after the approval of certified drawings, will be made at the expense of the Buyer under terms to be mutually agreed.

CANCELLATION

1. Accepted orders cannot be canceled or assigned without prior written agreement by our marketing manager or one of our corporate officers and payment of a charge of not less than 10%of the purchase price to cover lost time and handling expenses in the case of cancellation.

SHIPMENT

1. We reserve the right to select the transportation carrier which has equipment to meet the requirements of our shipping facility.

2. We are not responsible for shipping delays beyond our reasonable control. It is understood that we are free of any and all liability and penalty for delayed shipments caused by transportation delays, inability to obtain necessary components and materials for fabrication and assembly, acts of Buyer, labor disturbances, wars, riots, fires, accidents. explosions, floods, epidemics, quarantine, adverse weather, Governmental acts or regulations, or acts of God.

3. Should the Buyer be unable or unwilling to accept shipment of the equipment when notified that the equipment is ready for shipment, the terms of payment of the order shall then be in effect as if shipment had been made. Any expense or cost to us incidental to the delayed shipment will be payable by the Buyer when invoiced.

RISK OF LOSS AND DAMAGES

W**e** assume no responsibility for loss or damage to the equipment incurred after we load the equipment on the transportation carrier. The risk of loss or damage shall thereafter be borne by the Buyer regardless of whether title has passed to Buyer upon shipment. Claims for such loss or damage must be filed by the Buyer with the transportation carrier or other responsible party.

SERVICE

1. Before the equipment is placed in operation, start-up and training service by one of our field service engineers is available and recommended.

During this start-up, final equipment adjustments are made and the Buyer and his operating and maintenance personnel are instructed. This service is charged at prevailing rates. Service work cannot be scheduled unless payments are current in accordance with the contract.

2. Two Owner's Manuals covering Installation, Operating and Maintenance Instructions and Spare and Replacement Parts Lists are furnished with the equipment purchased. Additional manuals may be purchased at the prevailing nominal charge.

TITLE AND LIEN RIGHTS

We Shall retain title to all equipment until purchase price has been paid in full. Also, the Buyer agrees to execute any documents requested which are necessary for attachment and protection of our security interest. We shall have all rights of secured creditor under the Uniform Commercial Code.

GENERAL

1. Electrical components used on the equipment meet ANSI and National Electrical Code requirements and are UL approved. Hydraulic system components used on the equipment comply with National Fluid Power Association and JIC Standards.

The equipment is constructed in compliance with the intent of the Occupational Safety and Health Act of 1970 (OSHA), and in particular with Title 29, Chapter XVII, Part 1910, of the Occupational Safety and Health Standards adopted Oct. 18, 1972.

2. Additional costs as the result of special hydraulic, electrical or pneumatic components or other special arrangements required by local standards or codes will be the responsibility of the Buyer.

3. The equipment is skidded as is normal to the transportation carrier. Loading, skidding, crating, export boxing, packing or painting of a special type or nature can be provided at an extra charge.

4. In the event that litigation is brought against the Buyer alleging that the equipment of our manufacture, which is the subject of this proposal, infringes any U.S. or Canadian patent issued as of the date of acceptance of the order, we agree to defend such litigation at our expense provided the Buyer notifies us within seven (7) days after receiving notice of the alleged infringement and provided we are given complete control of the defense of such litigation with the right to settle such litigation or to make changes in the equipment for the purpose of avoiding the alleged infringement.

5. These terms and conditions supersede and take precedence over all the provisions of the Buyer's purchase order or any similar document of the Buyer in conflict with these terms and conditions of sale.

6. These terms and conditions of sale, our written warranty, our published current literature and specifications and our acceptance of the Buyer's order define our entire obligation with respect to any sale of our equipment.

7. All information in the proposal is confidential, prepared solely for the Buyer's consideration to purchase our equipment. Transmissions of all or any part of the proposal information to others or use by the Buyer for other purposes is unauthorized without our written consent.

WARRANTY

1. We warrant the equipment to the Buyer against defective materials or workmanship under normal use and service during a five day week starting from date of shipment on a prorated basis as follows: Up to 8 hours per day operation -12 calendar months; 8 hours to 16 hours per day operation -6 calendar months; 16 hours per day operation and up -4 calendar months. A warranty of less than (1) one year commences the first day the equipment is operated in excess of eight hours. This warranty will not be honored unless payments are current in accordance with the contract.

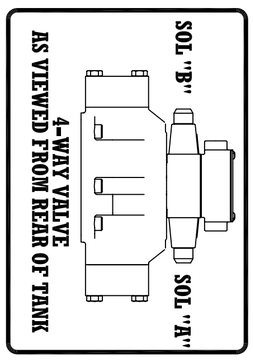
Should the equipment or any part of the equipment prove defective in materials or workmanship within the warranty period, we will repair or replace the defective equipment or part, free of charge, f.o.b. our plant, provided the defective equipment or part is delivered to us at our plant or other location at our direction. However, no replacement parts will be furnished under this warranty or otherwise, unless payments are current in accordance with the contract. Such action by us does not extend the warranty period. The Buyer shall assume the cost of removal and installation of replacement parts.

This warranty is contingent upon our being promptly notified of the defects and the Buyer establishing to our satisfaction that the defective equipment or part of the equipment has been properly installed, maintained in accordance with the Owners' manual supplied, and operated within the limits of rated and normal usage.

2. This warranty has no application to electric motors on the equipment or to normal replacement of service parts such as operating oil, paint, conveyor belts and drive belts, light sources and fuses and other parts which may have service life inherently shorter in duration than the warranty period. Customer specified components will carry the component manufacturers warranty only. Electric motor warranty claims should be directed to the local motor manufacturer service center.

3. This warranty has no application to wear or damage resulting from accident, alteration, misuse, abuse, neglect, non-action, improper removal or reinstallation or handling of new or defective parts, lack of preventive maintenance, sabotage, tampering, fire, explosion or any other causes not directly attributable to defective workmanship or material of the equipment or any part of the equipment. Under no circumstances shall we have any liability under this warranty for loss of use or for any other losses or damages sustained by the Buyer.
THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS, AND EXPRESSES OUR ENTIRE OBLIGATION AND LIABILITY WITH RESPECT TO SAID EQUIPMENT. WE NEITHER ASSUME, NOR AUTHORIZE ANYONE TO ASSUME FOR US, ANY OTHER OBLIGATION OR LIABILITY WITH RESPECT TO THE EQUIPMENT OR ANY PART OF THE EQUIPMENT. WE EXPRESSLY DISCLAIM ALL LIABILITY FOR DAMAGES OF EVERY NATURE AND DESCRIPTION, IF ANY, SUSTAINED BY THE BUYER FROM DELAYS IN THE SHIPMENT AND DELIVERY OF EQUIPMENT, REPLACEMENT EQUIPMENT OR ANY REPLACEMENT PART, OR FROM DEFECTS IN, OR FAILURES OR MALFUNCTIONS OF, THE EQUIPMENT OR ANY PART THEREOF.

FIRST USED ON MO 05117



DEVICES NOT LOCATED IN PANEL:
- LIMIT SWITCHES
- MOTORS
- EMERGENCY STOP SWITCHES
- PHOTO-EYES
- SOLENOIDS
- MOTOR BRAKES
- OIL LEVEL/TEMPERATURE SENSOR

NOTES:
* TOUCH SCREEN IS 24 VOLTS DC
1-DISCONNECT "OFF", PULL/BUTTON "IN"
2-FEED CHUTE DOOR CLOSED
3-INSERTER & RAM RETRACTED

DEVICE	WIRE RUN-OUT	+24VDC SCREEN
OPTIONAL	"K" OPTION (3) 3LS	X
	3Ø COOLERS	
1	1Ø COOLERS	
1	MOTORS	

TOLERANCES - UNLESS OTHERWISE SPECIFIED:
FRACTIONAL +/- 1/64
DECIMAL 0.000 +/- 0.005
DECIMAL 0.00 +/- 0.01

THIRD ANGLE PROJECTION

BALEMASTER®
DIV. OF EAST CHICAGO MACHINE TOOL CORP.
CROWN POINT, INDIANA

BALER w/AB Micrologix 1200
w/TOUCH SCREEN (<75HP)

DO NOT SCALE WORK TO DIMENSIONS

SCALE: 1=1.5

B/M REQ'D: YES / NO

DR. DCS 02/16/05

CH.

APP.

291D0575-01

NO.	DATE	IN.	REMARKS
C	07-20 2005	RS	ADDED SOLENOID LOCATION
B	05-11 2005	RS	ADDED GROUND SYMBOL TO EACH MOTOR

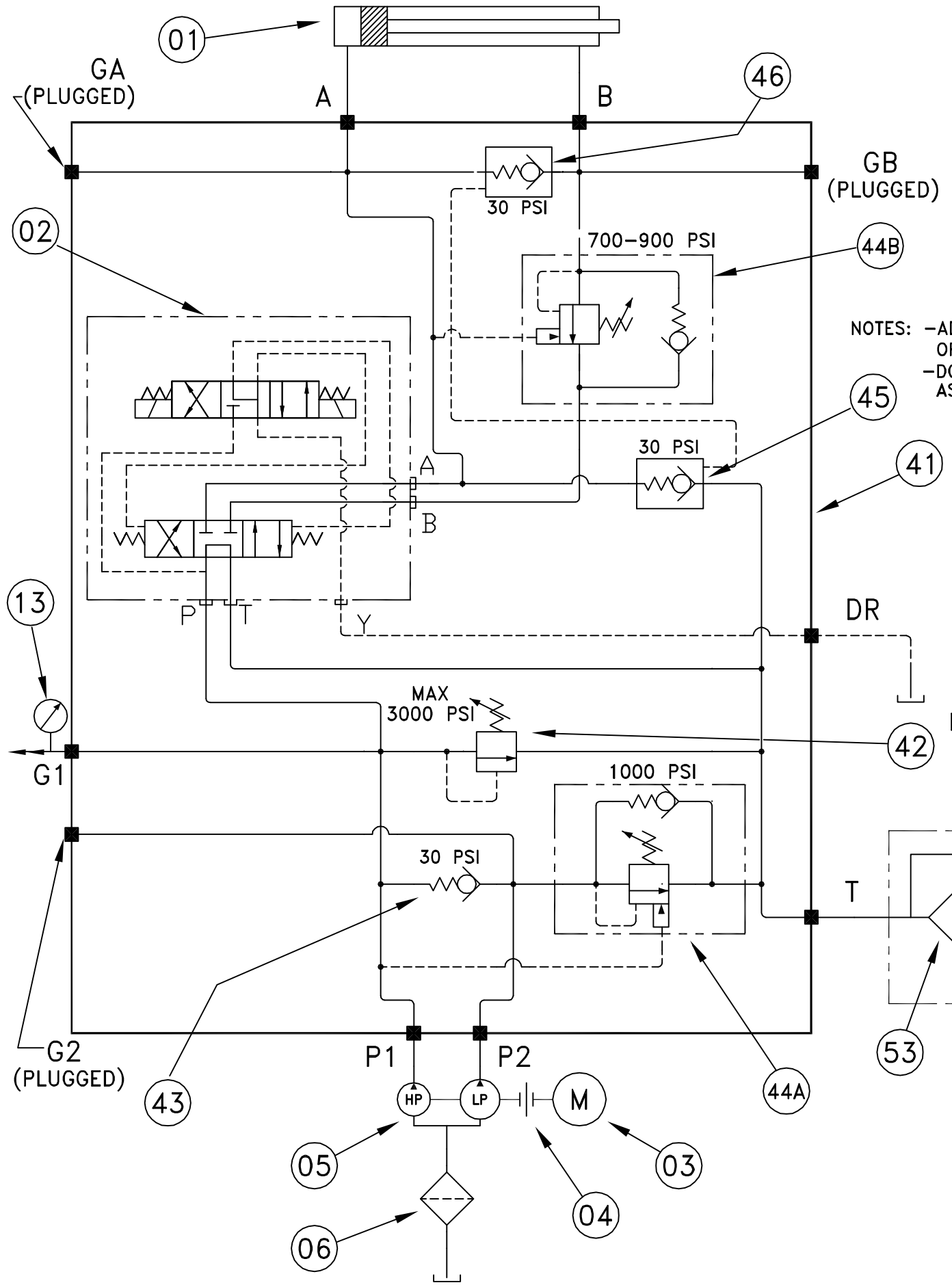
L1 1L1 BFU BM BOL BALER PUMP MOTOR
L2 1L2
L3 1L3
I/T FU INSERTER REV FWD IOL T51 T52 T53 INSERTER MOTOR
INSERTER BRAKE COIL
TWISTER REV FWD TOL T61 T62 T63 TWISTER MOTOR
TWISTER BRAKE COIL
CPT FU PRIMARY
KEY SWITCH OFF ON
8 8A CPT FU 115 VAC SECONDARY WHITE 2
EMER. STOP LOCATED AT CONTROL PANEL 3A 3B
EMER. STOP LOCATED AT FEED CHUTE 3C
FEED CHUTE DOOR 22LS 3 4A 4
AUTO-TY EMER. STOP 5A 5
EMER. STOP 27A 27
LPR SOURCE BRN BLU 2
RECEIVER ORN WHT BLK 25 TO LINE 28
PSFU 52 1 +24VDC POWER SUPPLY 2 4 TSFU 53 BLUE 54 COMM BROWN
GND OPERATOR INTERFACE +24VDC NEUT
27 TO LINE 30
A.B. MICROLOGIX 1200 1762-L40AWA
COM 0 IN 0 IN 1 IN 2 COM 1 IN 3 IN 4 IN 5 IN 6 IN 7 COM 2 IN 8 IN 9 IN 10 IN 11 IN 12 IN 13 IN 14 IN 15 IN 16 IN 17 IN 18 IN 19 IN 20 IN 21 IN 22 IN 23
3LSA RAM FULLY RETRACTED RED 11
3LSB RAM RETRACT-B (OPTIONAL) RED 12
3LSC RAM RETRACT-C (OPTIONAL) RED 13
4LS RAM FORWARD RED 14
5LS RAM FULL FORWARD RED 15
5LSA RAM FULL FORWARD RED 16
6LS BALE LENGTH RED 17
1LST INSERTER OUT RED 18
2LST INSERTER IN RED 19
6LST HOOKS STORED RED 20
7LST CHAIN SLACK RED 21
EMER. RAM FWD. RED 22
OIL LEVEL SWITCH (OPTIONAL) ADD JUMPER WHEN NOT USED RED 23
OIL TEMPERATURE SWITCH (OPTIONAL) ADD JUMPER WHEN NOT USED RED 24
LPR-1 RED 25 TO LINE 7
LPR-2 RED 26 (OPTIONAL)
E-STOP INPUT RED 27 TO LINE 6
34LSTA 34LSTB WIRE RUN-OUT RED 28
RED 61 RED 62 RED 63 RED 64 RED 65 RED 66
VAC-L1 GND VAC NEUT VAC DC 0 OUT 0 VAC DC 1 OUT 1 VAC DC 2 OUT 2 VAC DC 3 OUT 4 OUT 5 OUT 6 OUT 7 VAC DC 4 OUT 8 OUT 9 OUT 10 OUT 11 VAC DC 5 OUT 12 OUT 13 OUT 14 OUT 15
OCFU 9A BM 9 OCOL 10 OC OIL COOLER MOTOR
BM BOL OCOL PUMP MOTOR
SOL A SOL A RAM FW'D
SOL B SOL B RAM REV
REV FWD INSERT OL INSERTER IN
FWD REV INSERTER OUT
REV FWD TWIST OL TWIST
FWD REV UNTWIST
ESD ELECTROSTATIC DAMPENER (ESD) (OPTIONAL)
NOTE: CUSTOMER OUTPUT TO STOP INFEED BELT DURING TIE-OFF CAUTION: CONNECT TO 110 VAC CONTROL CIRCUIT ONLY
CONVEYOR STOP FOR TIE-OFF
WIRE RUN-OUT/ START-UP ALARM LIGHT AND HORN (FLASHING)
BALER MALFUNCTION
POLY-DENSITY POLY-DENSITY SOLENOID (OPTIONAL)
BALER ON SIGNAL (FLASHING)
RESERVED RESERVED RESERVED

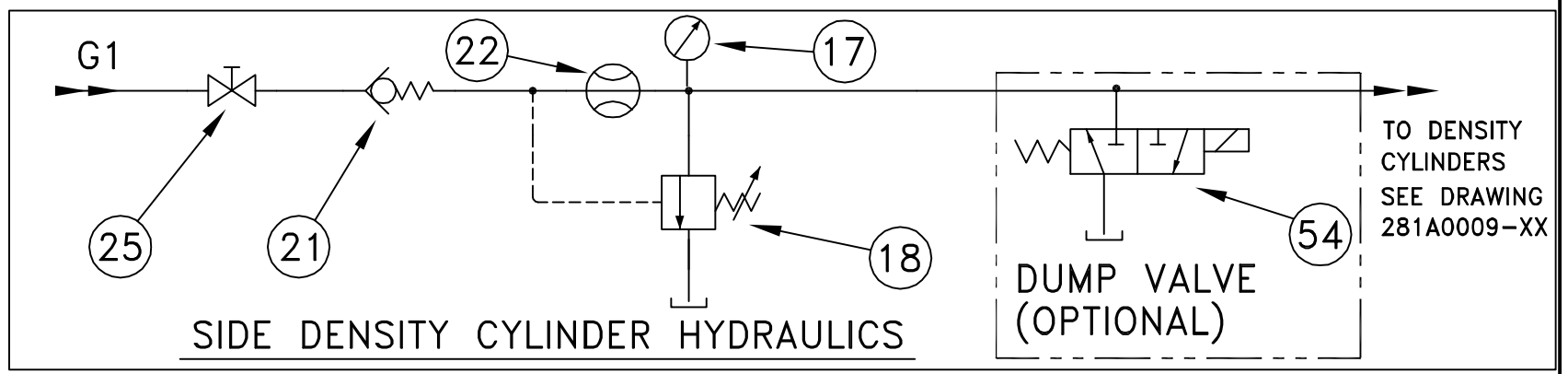
LAST NUMBER USED 66

ITEM	QTY.	DESCRIPTION
01	1	MAIN BALING CYLINDER
02	1	PILOTED FOUR-WAY VALVE
03	1	ELECTRIC BALER MOTOR
04	1	MOTOR COUPLING
05	1	HYDRAULIC PUMP
06	1	HYDRAULIC OIL FILTER
07	1	OPTIONAL AIR/OIL COOLER
13	1	MAIN PRESSURE GAUGE
17	1	DENSITY PRESSURE GAUGE
18	1	DENSITY UNLOADING VALVE
20	1	65 PSI CHECK VALVE

ITEM	QTY.	DESCRIPTION
21	1	CHECK VALVE
22	1	FLOW CONTROL
25	1	SHUT OFF VALVE
41	1	MANIFOLD ASSEMBLY
42	1	SYSTEM RELIEF VALVE
43	1	30 PSI CARTRIDGE CHECK VALVE
44A	1	UNLOADING VALVE
44B	1	REGENERATION VALVE
45	1	30 PSI PILOT TO OPEN CHECK VALVE
46	1	30 PSI PILOT TO CLOSE CHECK VALVE
53	1	OIL FILTER
54	1	SIDE DENSITY DUMP VALVE

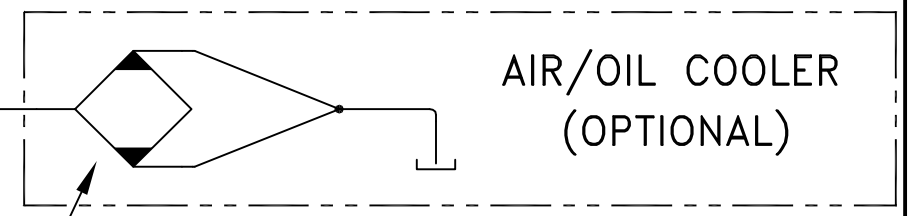
NOTES: -ADJUST VALVE (ITEM 18) TO ATTAIN SYSTEM OPERATING PRESSURE OF 1800/2250 PSI AS SHOWN ON GAUGE (ITEM 13).
-DO NOT EXCEED MAXIMUM PRESSURE OF 2500 PSI AS READ ON GAUGE (ITEM 13) AS PERSONAL INJURY OR EQUIPMENT DAMAGE MAY OCCUR.





NOTE: DO NOT READ BALING OR MAX PRESSURE FROM ITEM 17 GAUGE.

MAX PRESSURE 3000 PSI



USED ON BALEMASTER BALERS WITH:
-20,25 OR 30 H.P. MOTOR (C)
-TWO PRESSURE PUMP
-ALUMINUM HYDRAULIC MANIFOLD
-WITH REGENERATION
-WITH OR WITHOUT COOLER

NO.		DATE	IN.	REMARKS
F		11-10 2006	LN	CHANGED PRESSURES
E		07-09 2003	VT	REPLOT

BALEMASTER®
DIV. OF EAST CHICAGO MACHINE TOOL CORP.
CROWN POINT, INDIANA

TOLERANCES - UNLESS OTHERWISE SPECIFIED:
FRACTIONAL +/- 1/64
DECIMAL 0.000 +/- 0.005
DECIMAL 0.00 +/- 0.01

THIRD ANGLE PROJECTION

HYDRAULIC SCHEMATIC 20/25/30 HP W/REGEN

DO NOT SCALE WORK TO DIMENSIONS | SCALE: 1=1

B/M REQ'D: YES / NO

DR. GOLINSKI | CH. | APP.

DATE: 07-22-92

281B0038-00

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