AMERICAN BALER
BELLEVUE, OHIO 44811
PHONE (419) 483-5790
FAX (419) 483-3815

INSTRUCTION & PARTS MANUAL

MODEL 5029H975
SN 8388
RR DONNELLEY

AMERICAN BALER COMPANY

743p.txt

ALWAYS THINK SAFETY!

Always practice safe work habits. An accident occurs when the unexpected happens. Never work with unsafe conditions present that would allow the unexpected to happen.

There is high voltage in the motor control box on this baler. Always throw the disconnect switch and **LOCK OUT POWER AND TAG OUT THIS BALER FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT** before working within the motor control box. The baler control console contains 115 volts. 115 volts can also cause serious injury under the right conditions. Always disconnect the main power source and **LOCK OUT POWER AND TAG OUT THIS BALER FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT** before working within any electrical controls.

Any machine that has moving parts can be a source of injury. The moving parts in this baler are backed by forces measurable in tons. Safety guards are placed on this machine to prevent injury. These guards should not be removed other than to perform maintenance. Before performing any maintenance, always shut off and lockout main electrical disconnect. After maintenance has been completed, the safety guards **MUST** be replaced to original positions.

This baler uses hydraulic oil in a power system designed to Industry Safety Standards. Oil is slippery and very hazardous on the floor or other working surface. Do not postpone maintenance of oil leaks which may develop. Always use a generous supply of "oil-dry" or equivalent material to cover oil leaks or oil spills when hydraulic circuit repair is required.

This baler contains numerous safety labels to advise of safe operating practices and/or proper operation. Always follow these instructions and never remove or deface the labels.

Safety in the work place depends upon you. Always follow safe work practices.

743.txt

WARNING

Modifications must not be made in any way to this baler without written approval of the American Baler Company. Unauthorized modifications could cause danger, permanent injury, or death to anyone positioned near or working on this machinery.

If you have any questions regarding the proper use of this machine, please call the Service Dept. at American Baler Company at (800) 843-7512.

THE AMERICAN BALER COMPANY
WARRANTY POLICY

All balers are warranted by American Baler to be free from defective parts or defective workmanship on parts manufactured by American Baler when used in accordance with instructions for a period of 2,080 hours of operation (a period of time that corresponds to one full year, based on eight hours of operation per day, five days per week).

In the event of a defect in parts or workmanship on parts manufactured by American Baler, American Baler will repair or replace at its discretion the defective parts or workmanship. It is the buyer's responsibility to ship defective parts to American Baler, via insured and prepaid freight service. American Baler will provide parts that are repaired or replaced under this warranty F.O.B. Bellevue, Ohio.

American Baler may provide a field service engineer to provide warranty service within the warranty period. A buyer requesting a field service engineer must make the request to American Baler directly. American Baler will determine whether a field service engineer is required and will determine the scope of service activities that are to be provided under warranty. The following activities are not warranty service:

1. Installing parts required or replaced under warranty;
2. Completing normal maintenance activities;
3. Making adjustments to the baler;
4. Providing instructions on using the baler or associated equipment; and
5. Acting as a replacement for plant maintenance personnel.

If a field service engineer is provided under warranty, the buyer will be responsible for the reasonable expenses of the field service engineer, including but not limited to travel costs to and from the buyer's location, transportation while at the buyer's location, lodging expenses and meals.

THE REMEDIES SET FORTH IN THE PARAGRAPHS ABOVE SHALL BE THE BUYER'S SOLE REMEDY FROM AMERICAN BALER PURSUANT TO THIS WARRANTY.

American Baler's warranty does not cover the following costs associated with warranty service:

1. Shipping or handling charges on parts sent from buyer to American Baler;
2. Shipping costs for the delivery of parts repaired or replaced under warranty to the customer;
3. Special handling charges to expedite the delivery of parts repaired or replaced under warranty to the customer; and
4. Labor or other costs incurred by the buyer to install parts repaired or replaced under warranty.

AMERICAN BALER PROVIDES NO WARRANTY, EXPRESS OR IMPLIES, ON PARTS NOT MANUFACTURED BY AMERICAN BALER. Instead, the warranty on parts not manufactured by American Baler is limited to the warranty that was provided by the manufacturer or supplier of the part to American Baler. All suppliers of parts not manufactured by American Baler require that defective parts be returned to them by way of American Baler. It is the buyer's responsibility to ship defective parts not manufactured by American Baler to American Baler in Bellevue, Ohio via an insured and prepaid freight service. American Baler will, in turn, forward the defective parts to their respective supplier for warranty service.

AMERICAN BALER'S EXPRESS WARRANTY, AS STATED AND LIMITED ABOVE, IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. AMERICAN BALER PROVIDES NO WARRANTIES THAT EXTEND BEYOND THE WARRANTY STATED ABOVE. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY NOR OF FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY – AMERICAN BALER WILL IN NO EVENT BE RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST SALES, INCREASED FREIGHT OR SHIPPING COSTS, INCREASED HANDLING COSTS OR LOST PRODUCTION TIME ARISING FROM THE PERFORMANCE, OR FAILURE OF PERFORMANCE, OF THE BALER.

PREVENTIVE MAINTENANCE SCHEDULE
FOR AMERICAN BALERS

GENERAL MAINTENANCE

1. Check the high pressure reached on each gauge. This should be recorded and if there is a drastic change, baler should be checked.

2. Check oil filter indicator when baler is running. Clean once a month or more often if needed.

3. Note temperature of oil in tank each day. If temperature should increase above 140 degrees, baler should be checked or cooler added.

4. Check oil level in tank daily. Oil level should be in upper half of sight glass.

5. Check baler for oil leaks daily.

6. Clean floor behind plunger and top of hydraulic tank daily.

7. Grease all grease fittings weekly.

8. Bolts, and oil fittings should be checked for tightness daily first week, thereafter once a month.

9. Keep bale length measuring device clean and in proper working order.

10. Check bale dogs daily. Keep paper from building up between bale dogs and side sheets.

11. Check motor coupling (s) weekly.

12. Gauges should be in proper working order. The gauges can be checked and calibrated by most hydraulic parts/repair shops. Remove gauges from machine during normal operation to prolong life.

13. Keep infrareds clean and properly adjusted. "Static Guard" or commercial anti-static spray will keep dust from settling on sensors.

14. Keep limit switches properly adjusted.

15. Electrical boxes should be kept clean inside and out and should be kept closed. Except for maintenance.

16. All electrical covers must be in place and tightly secured.

17. All safety covers/guards must be in place and tightly secured.

18. All Safety switches must remain functional and never tied back or defeated.

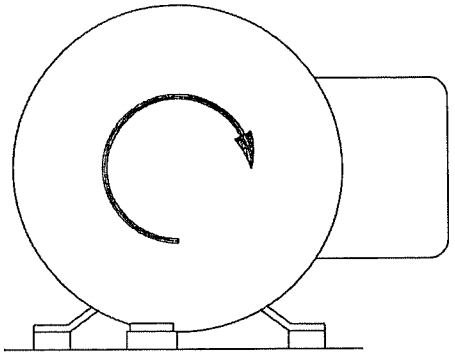
19. Oil-to-Air Heat Exchanger lose efficiency very rapidly if dust is permitted to accumulate in the radiator coils. Back blow the coils with air daily. Steam clean them if collection gets out of control. Do not use pressure above 40 PSI.

20. Oil should be checked yearly for contamination and serviceability. Test kits may be purchased from AMBACO.

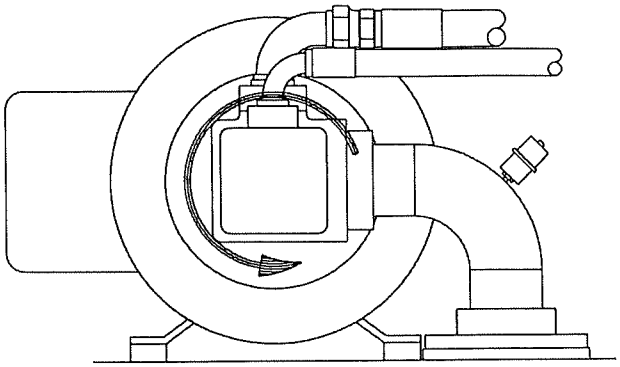
21. During startup and between extended shut down periods check for proper priming of the main pumps. To do so start up each motor individually by selecting "RH MTR" then "LH MTR" and noting that baler will operate on each motor.

A well maintained baler will give years of satisfactory operation with limited down time.

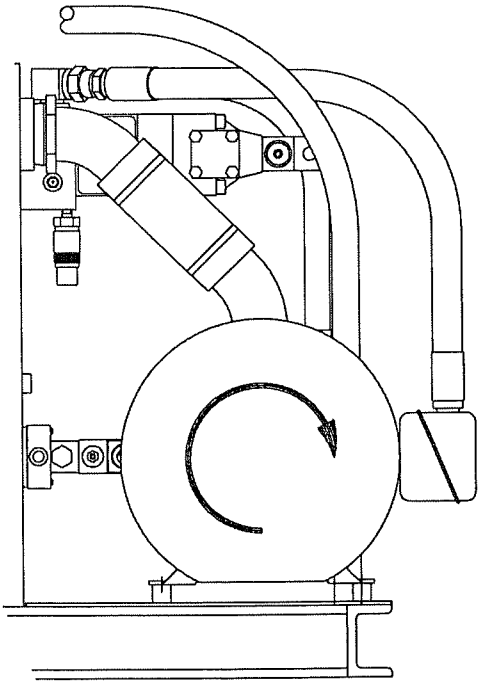
PUMP/MOTOR ROTATION



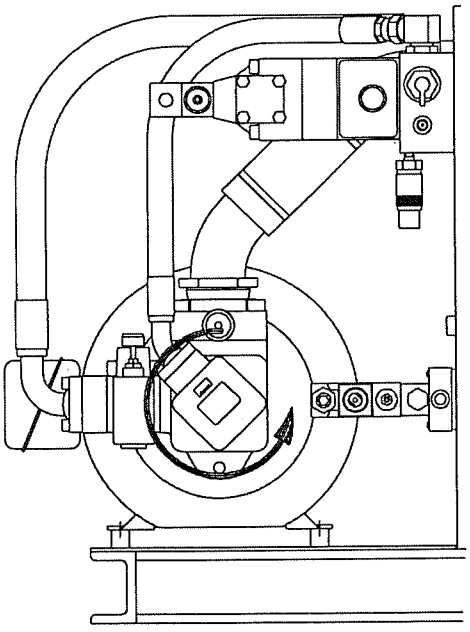
BACK OF MOTOR



PUMP END VIEW



BACK OF MOTOR



PUMP END VIEW

DO NOT RUN PUMP BACKWARDS. Check rotation by jogging main motor. Switch incoming power ahead of the baler disconnect if rotation is incorrect.

AMERICAN BALER COMPANY

for; 8043, 7242, 6042, 5042, 3029, 10007

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DATA PROC ACCT PURCH G. KREAGER: (Fore Super Assy Elect Hyd Ship)

AMERICAN BALER COMPANY

Model/Customer **5029H975 R.R. DONNELLEY**
Release Date: 1/6/03
Revision Date: 3/20/03

SN8388

QTY	PART NO	DESCRIPTION	ENG DRAWING NO
1	C-00456	75HP TEFC MOTOR C-FACE WEG#075	07518EP3E365TC
1	D-05018	WATER/OIL HEAT EXCH 1204-D6-T	
1	E-8388	ELECTRICAL GROUP SN8388	
1	H-21886	ORIFICE 1/4 NPT 3/32 DIA -A-	A
1	H-26121	ROLLING WIRE DISPENSER GR. ND	ND
1	H-32178-2	MANIFOLD ORIFICE 9/16 -A-	A
1	H-36041	SINGLE TENSION CTRL GROUP -B-	B 50-60-75 HP
1	H-36089	TIER AUXILIARY OIL GROUP -ND-	ND
1	H-36150	5029 AUTO-TIE GUARD GRP -B-	B
1	H-36167	29AT 300GAL FRAME LABEL GRP -B	B
0	H-36175	SPIN HOPPER LABEL DRAWING -B-	B
1	63984	3 FT TAIL PLATFORM GROUP -ND-	ND
1	64736	5042 & 5029H CYL HOSE ASSY -B-	B 50-60-75 HP
1	65929	WIRE GUIDE GRP -RH 5W- -ND-	ND
1	66018	PROX WIPER GRP 5029 -B-	B
1	66130	BALE LEN MEAS GROUP DC PNP -ND	ND
1	66171	CYCLE INFRARED GROUP DC -ND-	ND
1	66172	HIGH LEVEL INFRARED GROUP DC	ND
1	67215	LABEL SHEET -WARNING- ENGLISH	B ALL BALERS
1	67216	LABEL SHEET -DANGER- ENGLISH	B ALL BALERS
1	67217	LABEL SHEET -DANGER- ENGLISH	B TIER & FLUFF
1	67629	BALER ASSY 5029H-9 -D-	D WELD FRAME
1	67768	9" CYL GRP 5029H -ND-	ND 5029HAT9**
1	67974	5029 EXTENDED HOPPER GRP -ND-	ND
1	68413	TIER GROUP WM 5029 -ND-	ND
0	68418	TIER LABEL LOCATION DWG STD-B-	B
1	69322	5029 U-SLIDE PLUNGER ASSEMBLY	D
1	69501	75HP POWER UNIT GROUP -ND-	ND WATER-OIL

DATA PROC ACCT PURCH G. KREAGER: (Fore Super Assy Elect Hyd Ship)

SN8388 5029H975 R.R. DONNELLEY

RELEASED: 1/6/03
REVISED: 3/20/03

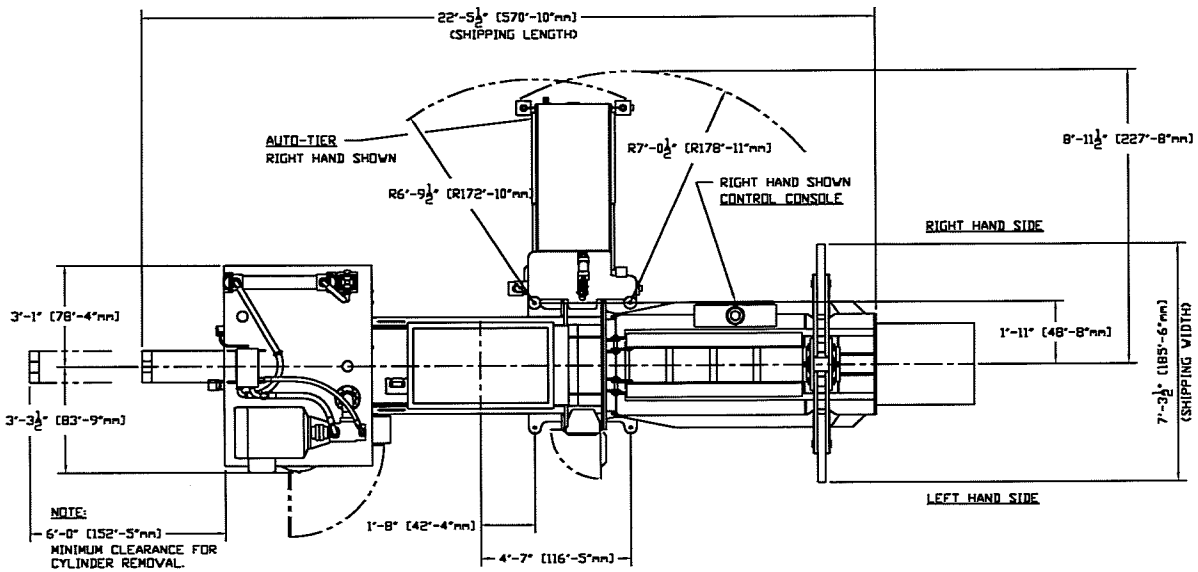
ORDER NUMBER: 300290

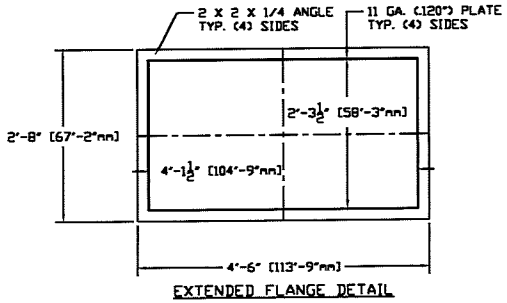
ITEMS REQUIRED:

QUANTITY	PART NUMBER	DESCRIPTION
1	SN8388	5029H975 R.R. DONNELLEY
2	Non-Inv.	BALER MANUAL
1	Non-Inv.	PRESTART-UP MANUAL
5	H-15803	LH TWISTER HOOK
5	H-15804	RH TWISTER HOOK
2	H-35679	INFRARED MOUNTING ROD
1	68500	O' RING KIT

ELECTRICAL SCHEMATIC: SS884, & SN8388
PLC PROGRAM: SN8388
T.S. PROGRAM: T-0030a
HYDRAULIC SCHEMATIC: HY-177
INSTALLATION DRAWING: YSN8388
BALER MOTORS: 75HP
VOLTS/PHASE/HERTZ: 460/3/60
KILOWATTS: 56
FULL LOAD AMPS: 104
S.C.I.C.: 50KA
TIER SIDE: RH
CONSOLE SIDE: RH
HOPPER SIDE: RH

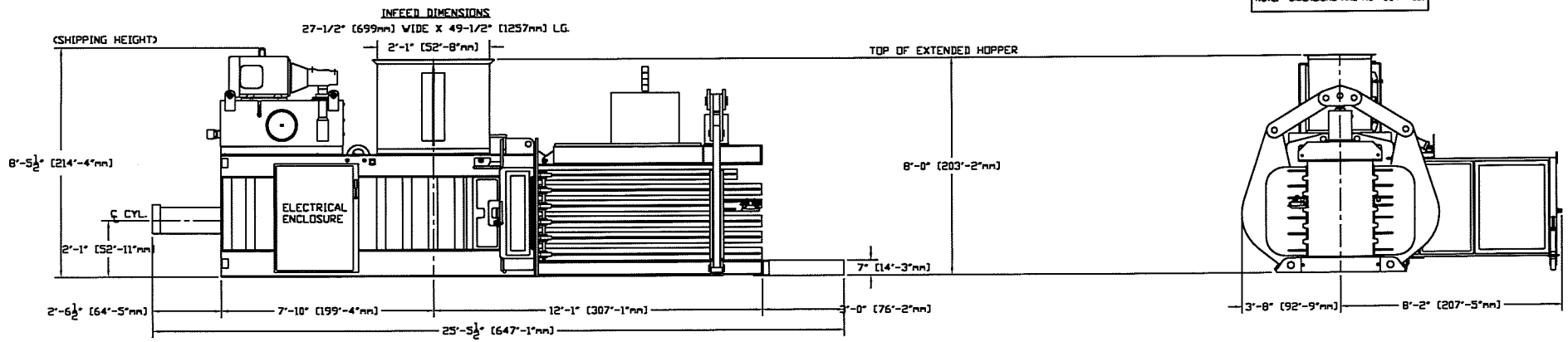
	HP	FLA	KW
Baler Motor#1:	75	82.4	55
25% of Main Motors:		20.6	
Control:		1.2	0.55
		104	56





EXTENDED FLANGE DETAIL

NOTE: DIMENSIONS ARE NOT CERTIFIED.



CUSTOMER PLEASE SPECIFY: R.R. DONNELLEY (LANCASTER, PA.)						
1. POWER SUPPLY	460	VOLT	3	PH	60	HZ
2. CONSOLE SIDE	X	RH		LH	RECOMMENDED THAT THE CONSOLE SIDE FOLLOWS THE AUTO-TIER SIDE	
3. AUTO-TIER SIDE	X	RH		LH		

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

DRAWN BY MJG | DATE 1-10-03 | SCALE NTS

INSTALLATION FOR 9" & 10" MAIN CYL

5029H-975
HORZ. AUTO-TIE
(75HP)

SHEET 1 OF 1

YSN-8388

NOTICE TO OUR CUSTOMERS

Your new baler has been manufactured in compliance with the American National Standards Institute (ANSI) Safety Requirements for Baling Equipment (ANSI Z-245.5 - 1997).

This standard outlines areas of employer (owner) responsibility and areas of employee (operator) responsibility. We urge you to purchase a copy of this standard for your safety file.

A copy of this standard can be purchased from:

American National Standards Institute
11 West 42nd Street
New York, New York 10036
Phone: (212) 642-4900
www.ansi.org

Request:

"Safety Requirements for Baling Equipment"
ANSI Z-245.5 - 1997

SAFETY PRECAUTIONS

Your American Baler has guards and safety switches to protect the operators and maintenance people. The employer and employees at the baler location must institute a regular inspection and maintenance program of the safety equipment, in order to insure everyone's safety.

Before the baler is operated:

1. The baler should be operated only by authorized personnel who have thoroughly read the baler manual, and have been instructed in the balers operation, following factory recommended procedures

2. All guards must be in place.

3. All safety limit switches must be in working order and be free from water and ice.

Weekly safety check:

1. Check all safety limit switches for mechanical operation.

2. Try to start baler with each safety switch opened, one at a time. If switches are in proper working order, baler will not start.

3. Your baler has numerous safety switches to be checked, as above. (Please note their location on your electrical drawing.)

4. All "bolt on" guards must be installed and have their bolts in place, and tightened.

If any of the guards or switches are not in place or functioning properly you must shut down the machine and make immediate repairs. The American Baler Company can provide replacement guards, if guards are lost or damaged.

Conveyor Control Considerations

If your baler is feed by means of a conveyor, there are some safety concerns that you must consider. First the conveyor manufacturer should have supplied equipment that meets the ASME B20.1 safety standard for conveyors and related equipment. Guards and safety labels must be kept in place. Maintained conveyor and baler emergency stop buttons should be placed in the proximity of the loading or working area of the conveyor that can be easily accessed by personnel. Many users place these controls near the start of the incline. Some users also include in these controls a conveyor start button. An emergency stop pull cord should be installed for the purpose of stopping the conveyor and baler. Placement is dependent upon the application. Some customers install pull cords along the entire conveyor skirt. The pull cord switch should be a maintained switch with two normally closed contacts that open when the cord is pulled. One contact wired directly into the conveyor control circuit and the other into the baler control circuit. Your schematic will show the proper wiring circuit. These switches and controls are not provided by the baler manufacturer but must be provided and installed by the conveyor manufacturer, installer or customer.

CHANGE OF BALER STATUS

Please fill out this report if your American Baler is moved to a different location, sold, destroyed or scrapped.

Baler Serial Number: _____

Effective Date : _____

Check One:

- ☐ Moved to New Location (Same Owner)
- ☐ Sold (New Location)
- ☐ Sold (Same Location)
- ☐ Scrapped (Please give name of scrap dealer below)
- ☐ Destroyed (By fire, etc.)

New Address and/or Owner:

_____

_____

_____

_____

Phone: __(_____)_____

Return to: American Baler Company
200 Hickory Street
Bellevue, Ohio
Fax : 419-483-3815
Attn: Service Department

REMOVING BALES FROM BALE CHAMBER

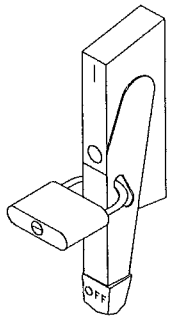
Procedure for Removing Bales for Maintenance:

1. Unload tension cylinder by turning the tension selector switch to "dump".

2. Make at least four bales with tension cylinder unloaded to make the bales in the chamber as soft as possible.

3. Turn baler off and turn main electrical disconnect off using "Lockout Procedure" below. Hand load a dense non-packing material in a straight row. Material could be: Bundled news, paper rolls about 24" in diameter, or stacked and tied corrugated boxes. DANGER, do not use wood because wood will split.

LOCKOUT PROCEDURE: TURN MAIN ELECTRICAL DISCONNECT TO "OFF" ON BALER STARTER BOX. INSERT PADLOCK DEVICE AS SHOWN. DO NOT REMOVE PADLOCK FROM MAIN ELECTRICAL PANEL UNTIL ALL MAINTENANCE PERSONEL ARE CLEAR OF BALER.



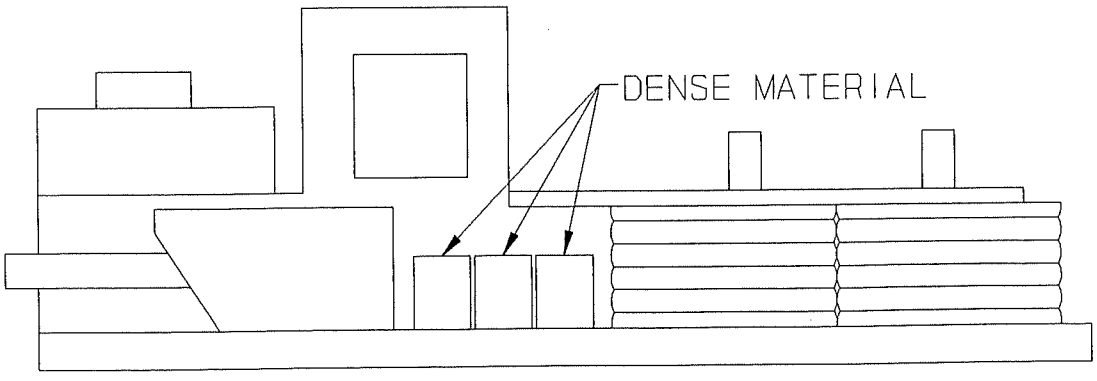
TYPICAL BALER DISCONNECT

4. Close hopper door and cycle plunger by hand control to push bale out.

5. Repeat above procedure until the last bale is out of the chamber.

6. "Lockout" baler and remove the "non-packing" material by hand.

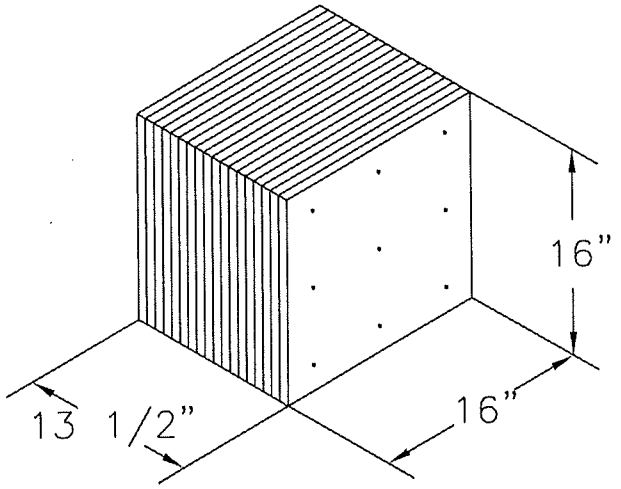
When bale chamber is to be partially emptied for maintenance, use above procedure #1 thru 4. When enough non-packing material has been loaded and cycled start the normal baler feed. After 12 inches of material is baled, cycle the auto tier and begin the baling process again. When the non-packing material reaches the end of the bale chamber, stop the baler and use "Lockout Procedure". Unload the loose material.



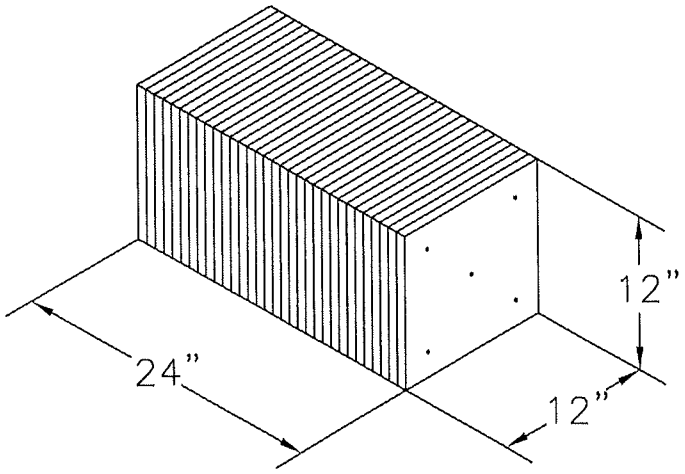
PUSHOUT BLOCKS

Pushout blocks may need to be constructed if good block type material, such as butt rolls, bundled news or magazines are unavailable for removing bales from the chamber. Several blocks need to be constructed.

For heavy duty balers construct pushout blocks from 3/4" x 4' x 8' plywood. Cut the plywood into 16" x 16" squares. Nail the squares together to form a block 13 1/2" long.



For light and medium duty balers construct pushout blocks from 3/4" x 4' x 8' plywood. Cut the plywood into 12" x 12" squares. Nail the squares together to form a block 24" long.



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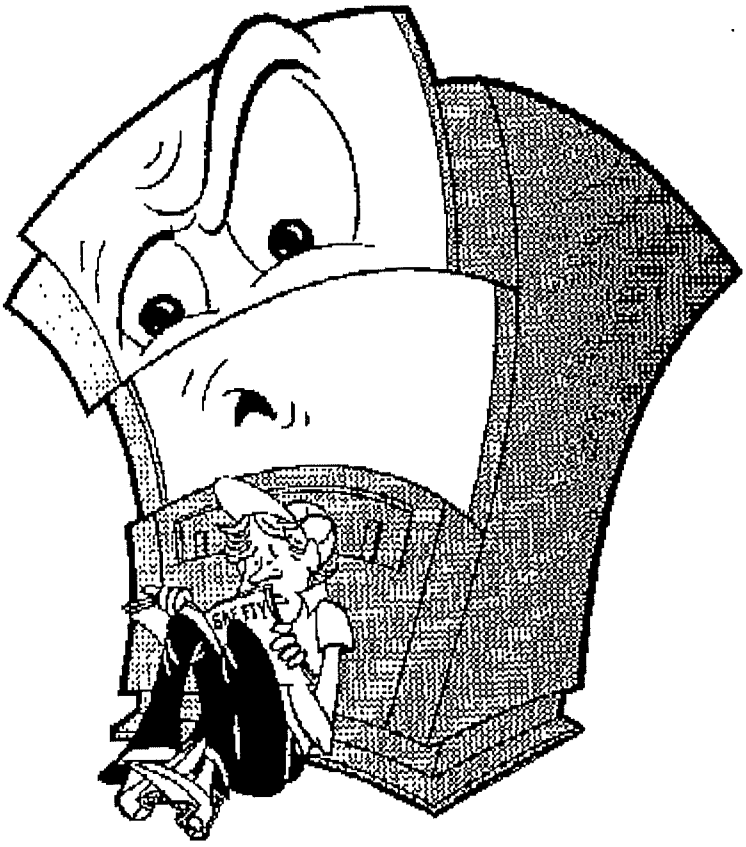
THE AMERICAN BALER COMPANY

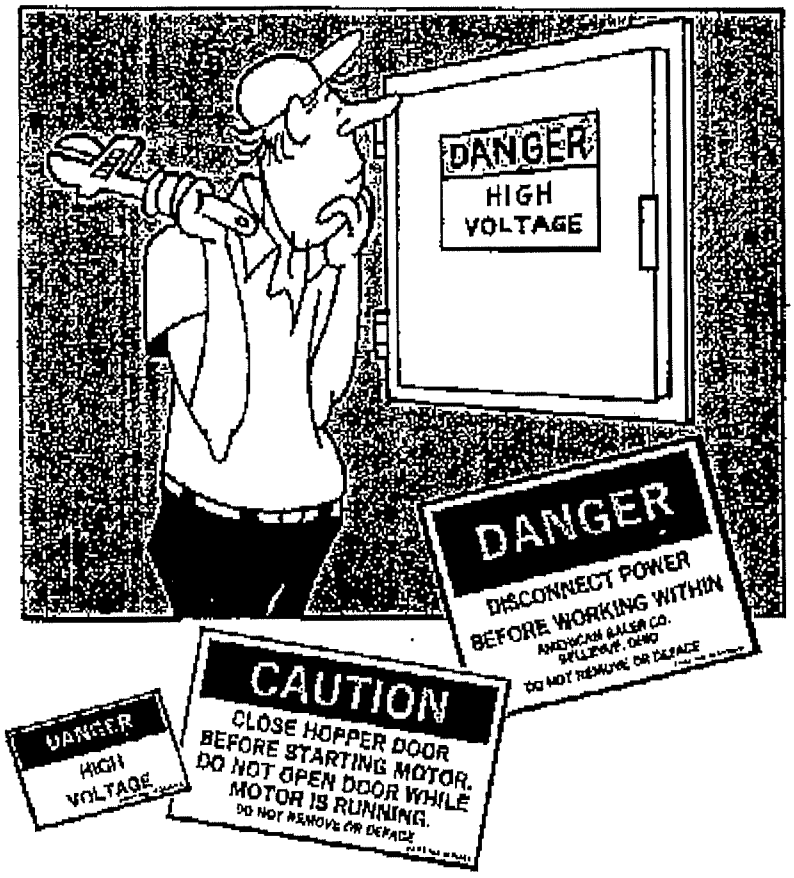
Guide to Safe Baler Operation



THIS MANUAL IS REQUIRED READING FOR ALL OWNERS, OPERATORS, AND MAINTENANCE PERSONNEL

Heed & Obey
Warning Signs

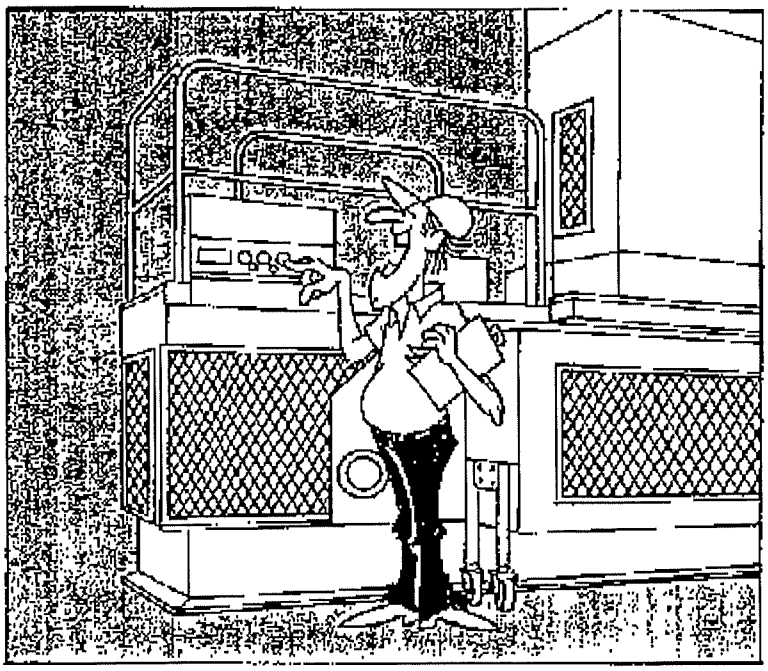
Signs such as **DANGER, CAUTION, WARNING, and ATTENTION** are on the machine for your protection. Warning signs must remain in place and be kept in readable condition. Report and replace all damaged or missing warning signs.



YOUR OPERATIONAL CARELESSNESS AND SAFETY SHORTCUTS CAN CAUSE SERIOUS INJURY OR DEATH! FOLLOW SAFETY GUIDELINES AND BE SAFETY CONSCIOUS.

Prior to Start Up

1. Wear proper safety equipment as recommended by your employer.
2. Never allow yourself or anyone involved with the baling system to be under the influence of intoxicants or narcotics while the baler is operating.
3. Walk around the baling system to check for proper equipment. Check inside the hopper.
4. Report any problems to your immediate supervisor.
5. Be positive no one is working on the baler or on adjoining equipment. Check inside the hopper.
6. If anyone is found working on or in the baler or any associated equipment, make sure power to the baler has been **DISCONNECTED AND LOCKED OUT.** If it is not, report the incident to your immediate supervisor. **NEVER ASSUME THAT YOU ARE PROTECTED BY ANOTHER EMPLOYEE'S SAFETY LOCK!**

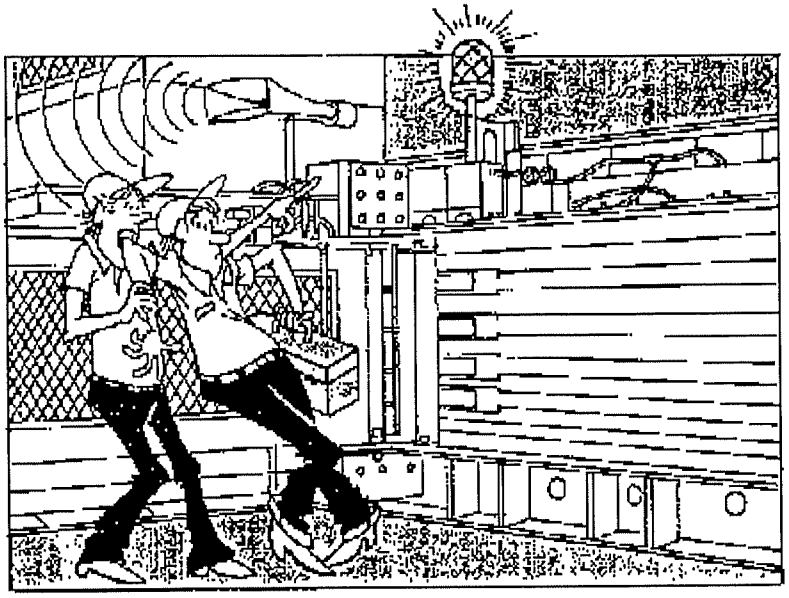


Safety Guidelines for Baler Operation

1. Only authorized personnel trained in baler operation are to operate this equipment.
2. The owner and operator are responsible for the safety of the employees and should be familiar with applicable OSHA codes and ANSI Safety Standard Z245.5.
3. Operate in accordance with the owner's manual supplied with your baler.
4. Do not set the hydraulic pressure above recommended levels. Severe baler damage and/or personal injury could result.
5. Bale only the specific material for which the baler was built (varies from baler to baler).
6. *Never* overload the hopper.
7. *Never* enter the hopper unless the power is **DISCONNECTED AND LOCKED OUT.**
8. Make sure warning horns and light are working properly. If they are not, shut down, lock out and report the malfunction. Repair it immediately.
9. If work on or in the baler or any associated equipment is required, **DISCONNECT THE POWER TO THE BALER, AND LOCK OUT. NEVER ASSUME THAT YOU ARE PROTECTED BY ANOTHER EMPLOYEE'S SAFETY LOCK!** Before restarting, repeat the "PRIOR TO START UP" procedures.
10. Anytime the baler is shut down, repeat "PRIOR TO START UP" procedures before starting for any reason.
11. Do not enter or attempt to ride on the hopper feed conveyor.
12. Do not place your head, limbs or any part of your body in a "pinch" or "scissors" point on the baler.
13. Always know where emergency help can be reached quickly.
14. NEVER ENTER A FEED CONVEYOR UNLESS THE POWER TO THE BALER AND FEED CONVEYOR ARE LOCKED OUT.
15. Never bale AREOSOL cans in the baler

Heed Warning Lights & Horns

Always observe safety warning lights and horns which indicate baler start up or wire tier operation. Keep lights and horns in good working order. Report any malfunctioning warning device to your supervisor immediately. Repair or replace the device immediately.



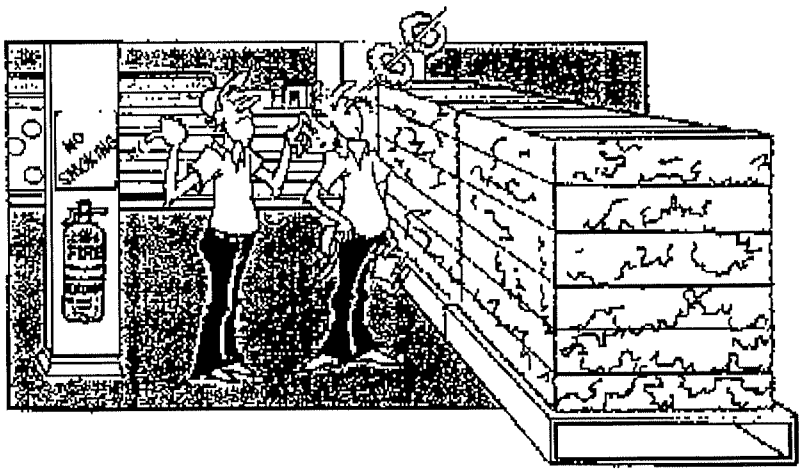
Keep Safety Guards In Place

Safety guards must be kept closed at all times. Keep the guards in good repair with periodic maintenance. **When necessary, open guards ONLY AFTER THE MACHINE POWER HAS BEEN DISCONNECTED AND LOCKED OUT. NEVER ASSUME THAT YOU ARE PROTECTED BY ANOTHER EMPLOYEE'S SAFETY LOCK!**

Check guards and hopper door limit switches for proper shut off function on a regular basis. Keep limit switches free of debris or obstructions. **DO NOT OVERRIDE OR BYPASS SAFETY SWITCHES!**

Practice Fire Prevention

1. Keep fire extinguishers accessible at all times. Use the extinguisher recommended for the material being baled. It should be safe for use on electrical fires.
2. Never smoke close to combustible material.
3. Clean the area before welding or other activities, which may make sparks. Observe the area for at least six hours after such activity.
4. Keep tank and motor areas clear of oil, dust or paper accumulations.



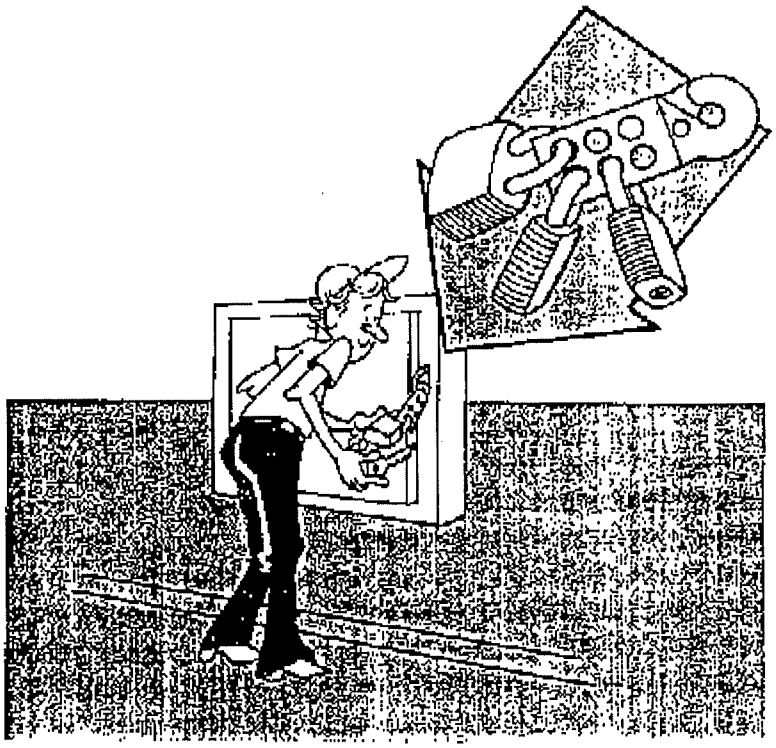
REMEMBER! ALL POSSIBLE DANGERS CANNOT BE PREDICTED. YOUR OWN SAFETY AWARENESS AND GOOD SAFETY HABITS ARE YOUR BEST PROTECTION.

Always Disconnect & Lock Out

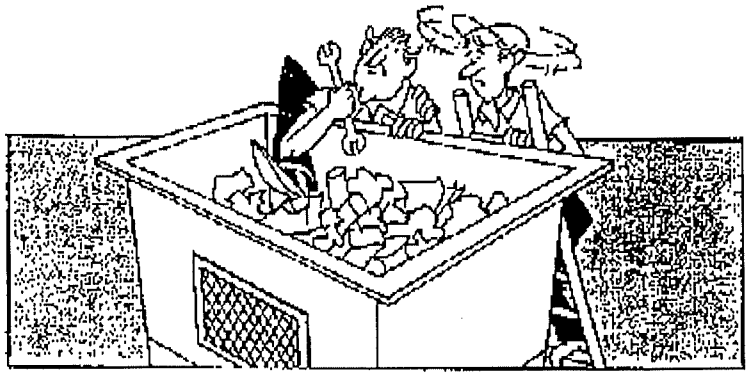
Power must always be disconnected and locked out before working within or performing maintenance on the baler or associated equipment.

Every employee who works on or with the baler should have his own lock and key. **NEVER ASSUME THAT YOU ARE PROTECTED BY ANOTHER EMPLOYEE'S SAFETY LOCK!**

Use a safety lockout to allow more than one employee to work on the baling system – while not permitting any one person to unlock the system.

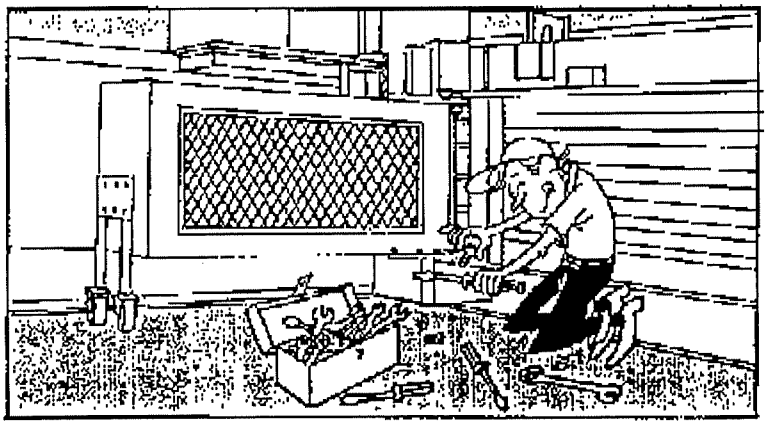


Never Enter the Hopper Without First Disconnecting and Locking Out Power.



NEVER ASSUME THAT YOU ARE PROTECTED BY ANOTHER EMPLOYEE'S SAFETY LOCK!

Never Work on the Wire Tier Without First Disconnecting and Locking Out Power.



NEVER ASSUME THAT YOU ARE PROTECTED BY ANOTHER EMPLOYEE'S SAFETY LOCK!

Keep a Clean Machine

GOOD HOUSEKEEPING MAKES A SAFE WORKPLACE

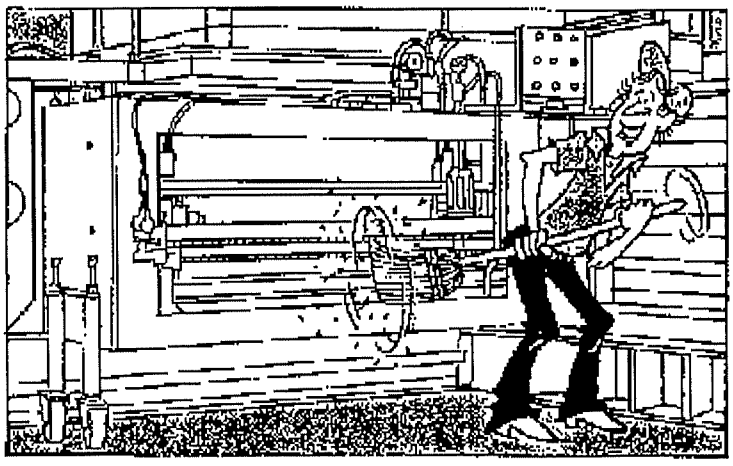
1. Keep handrails and steps clean of grease and debris.

2. Clean motor area daily.

3. On balers so equipped, blow dust from the air to oil heat exchanger several times a day, especially under severe operating conditions. Do not use more than 40 PSI for the air supply.

4. Clean out the back of the ram daily. Make sure you first **DISCONNECT AND LOCK OUT THE POWER. NEVER ASSUME THAT YOU ARE PROTECTED BY ANOTHER EMPLOYEE'S SAFETY LOCK!**

5. Clean retainer dog box areas and tiers after each work shift, or as needed.



Baler Safety Features

Hopper doors that will not allow the machine to run when they are opened.

Bale chamber doors, which stop the baling operation when they are opened.

Wire tier guards that stop machine operation if accidentally opened.

Warning light and horn to indicate baler start up.

Warning light and horn to indicate wire tier operation.

Machine fully guards dangerous moving parts.

Emergency baler stops which stop entire baling operation located on console and wire tiers.

Recessed start button.

Time delay on baler start to allow for warning (requires start button to be pressed the second time). Two ram balers only.

Main power disconnect equipped for a locking device on every machine.

Full manual option modes.

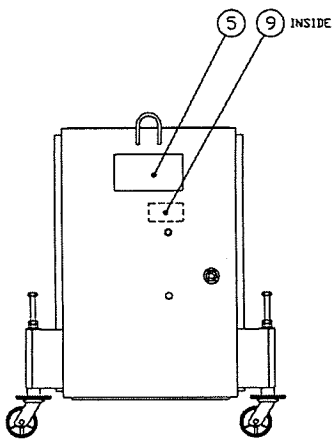
Full set of warning and safety decals placed in strategic areas.

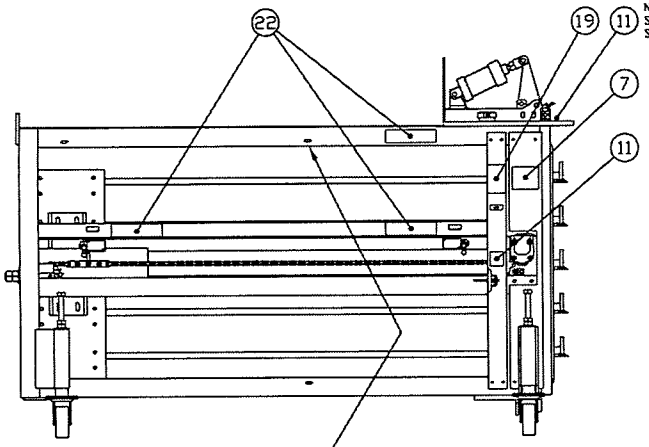
Control Console situated so major baler operations can be observed.

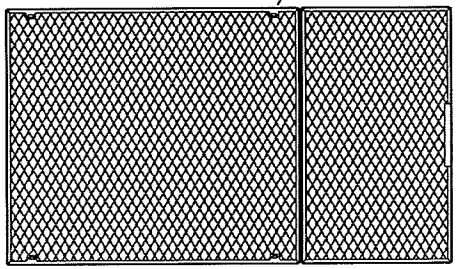
Control Console equipped with on / off key switch for additional safety. Key should be turned to off and removed before performing any maintenance, cleaning, or clearing of baler and any associated equipment.

REMEMBER! ALL POSSIBLE DANGERS CANNOT BE PREDICTED. YOUR OWN SAFETY AWARENESS AND GOOD SAFETY HABITS ARE YOUR BEST PROTECTION.

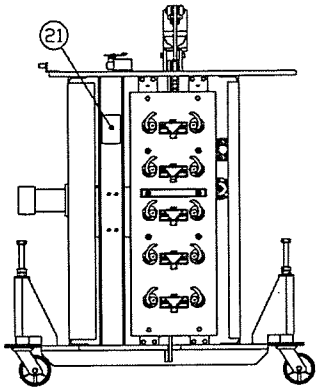
ABC 1547 10-10

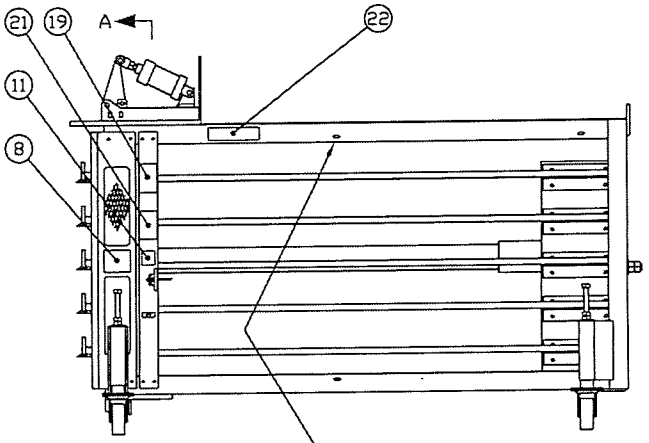


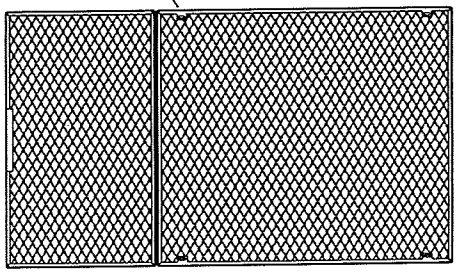




SCREEN GUARD





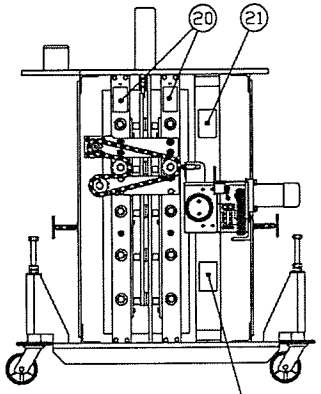


SCREEN GUARD

SAFETY LABEL APPLICATION INSTRUCTIONS:

1. DETERMINE THE PROPER POSITION OF THE LABEL. KEEP LABEL FREE FROM OBSTRUCTIONS.
2. WIPE SURFACE SO IT IS FREE OF ANY DIRT, OIL OR GRIME.
3. IF SURFACE TEMPERATURE IS BELOW 70° HEAT SURFACE WITH HEAT GUN.
4. THE BACKING PAPER ON THE BACK OF THE LABEL IS SPLIT. PEEL OFF HALF OF THE BACKING PAPER.
5. POSITION AND STICK THAT PART OF THE LABEL TO THE SURFACE, BEING CAREFUL THAT THERE ARE NO FOLDS OR WRINKLES IN THE LABEL.
6. PEEL OFF THE REMAINING BACKING PAPER AND PRESS LABEL TO THE SURFACE, AGAIN BEING CAREFUL THAT THERE ARE NO WRINKLES.
7. RUB THE ENTIRE SURFACE OF THE LABEL TO INSURE IT IS PROPERLY STUCK TO THE SURFACE. IF AIR BUBBLES ARE TRAPPED UNDER THE LABEL, PUNCTURE THE AIR BUBBLE SO THE AIR CAN ESCAPE.
8. AFTER ABOVE STEPS ARE COMPLETED APPLY HEAT TO APPLIED LABEL WITH HEAT GUN.

ENLARGED VIEW OF JUNCTION BOX



SECTION A-A

NOTE:

USE Y-04282 REFERENCE DWG SHEETS FOR SAFETY LABEL IDENTIFICATION.

22	4	H-32228-B	DANGER-MOVING PARTS (DBL)
21	4	H-32227-B	DANGER-ROTATING HOOKS
20	2	H-32226-B	DANGER-MOVING PARTS (GEAR)
19	2	H-32225-B	WARNING-MOVING PARTS (GEAR)
11	3	H-32233-B	WARNING-SAFETY SWITCH
9	1	H-32229-B	DANGER-FINGER CRUSH
8	1	H-32222-B	DANGER-MOVING PARTS
7	1	H-32221-B	WARNING-MOVING PARTS
5	1	H-32232-B	WARNING-START AT ANYTIME
4	1	H-32235-B	DANGER-HAZARDOUS VOLTAGE

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

AMSCO

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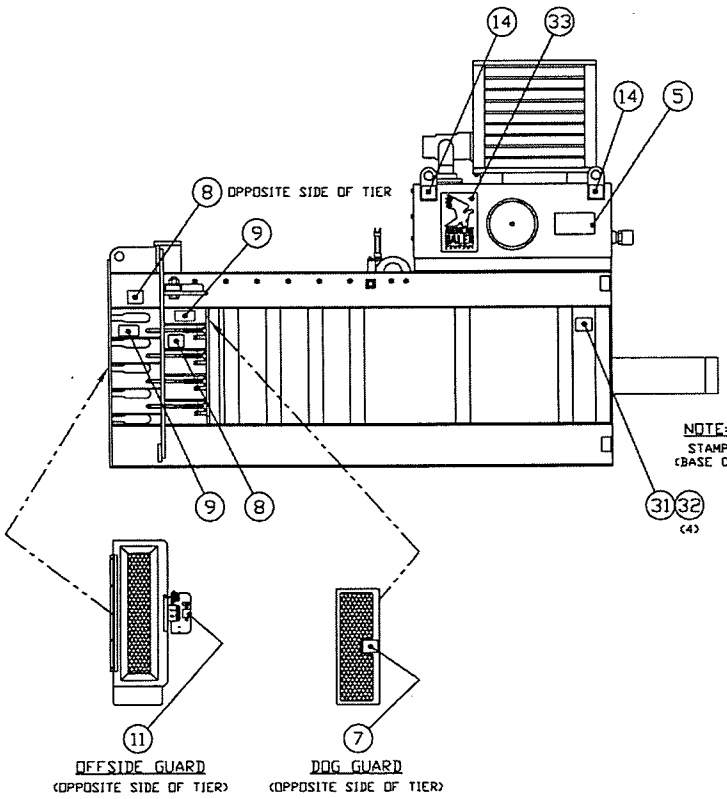
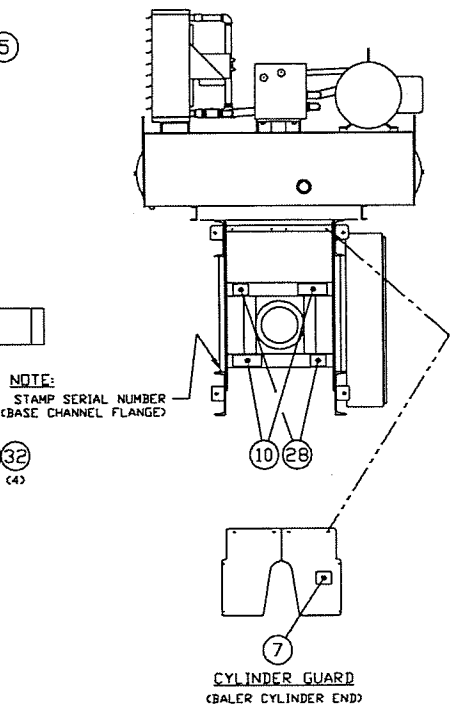
AMERICAN BALER COMPANY

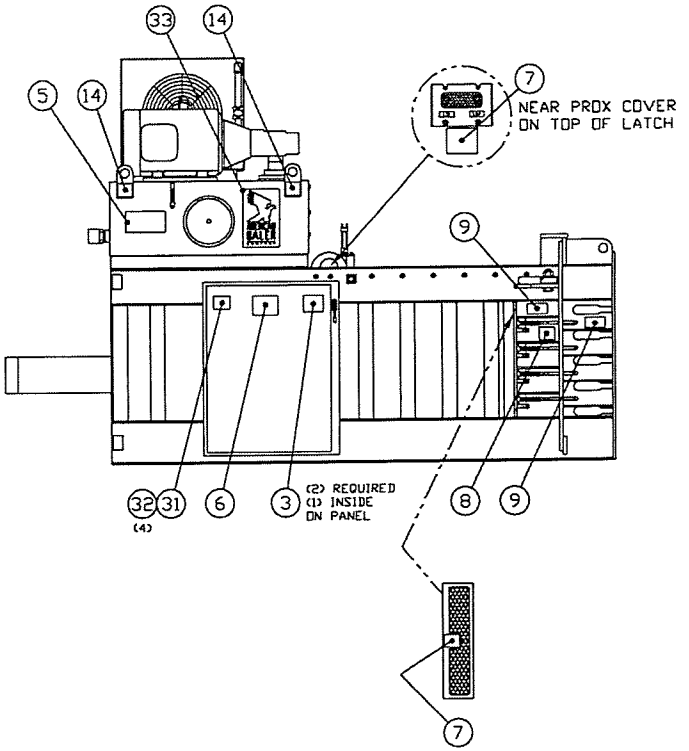
TIER LABEL LOCATION DWG (STD)

SHEET 1 OF 1

68418







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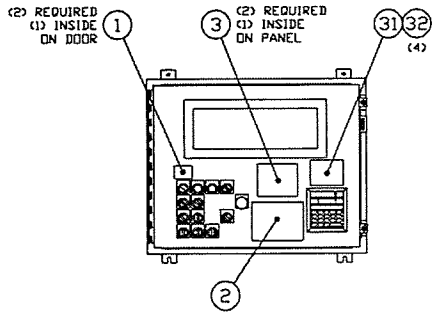


ENLARGED VIEW CONTROL CONSOLE

NOTE:
USE Y-04282 REFERENCE DWG SHEETS FOR SAFETY LABEL IDENTIFICATION.

A	33	2	H-32149-A	AMERICAN LOGO
	32	12	H-24405-A	STEEL DRIVE SCREW
	31	3	H-04350-A	AMERICAN SERIAL NO. PLATE
	28	2	H-32279-B	DANGER-CONFINED SPACE
	14	4	H-31298-A	WARNING-LIFTING POWER UNIT
	11	1	H-32233-B	WARNING-SAFETY SWITCH
	10	2	H-32223-B	DANGER-CRUSH AREA
	9	4	H-32229-B	DANGER-FINGER CRUSH
	8	3	H-32222-B	DANGER-MOVING PARTS
	7	4	H-32221-B	WARNING-MOVING PARTS
	6	1	H-24400-B	NOTICE-WARRANTIES ARE VOID
	5	2	H-32232-B	WARNING-START AT ANYTIME
	3	4	H-32231-B	DANGER-HAZARDOUS VOLTAGE
	2	1	H-32230-B	WARNING-PROPERLY TRAINED
A	1	2	H-32466-A	DANGER-TURN KEY TO OFF
	NEW	QTY	PART NO.	MATERIAL/DESCRIPTION

NCN	MAH	02-24-98	A	ITEM #1 H-32466 WAS H-35716 ITEM #33 H-32149 WAS ITEM #38 92707
ECN NO.	BY	DATE	NO.	REVISION

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

AMRACO

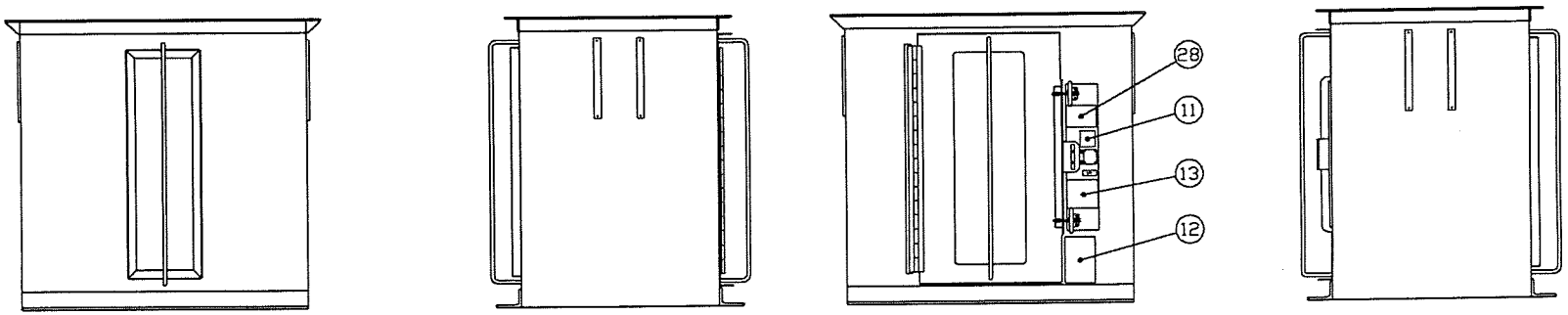
DRAWN BY MAH DATE 03-10-95 SCALE

MODEL 5029AT FRAME

TITLE 5029AT 300 GAL FRAME LABEL GROUP

SHEET 1 OF 1 REV A

DWG NO H-36167



ACCESS DOOR SIDE

SAFETY LABEL APPLICATION INSTRUCTIONS:

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NOTE:

USE Y-04282 REFERENCE DWG SHEETS FOR SAFETY LABEL IDENTIFICATION.

28	1	H-32279-B	DANGER-CONFINED SPACE
13	1	H-32219-B	WARNING-HOPPER DOOR
12	1	H-32220-B	DANGER-KNIFE AREA
11	1	H-32233-B	WARNING-SAFETY SWITCH

NCN	MH	07-12-97	A	PICTORIAL CHG OF HOPPER

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

AMRACO

DRAWN MAH 03-10-95

USED ON 3029, PAC SERIES

HOPPER LABEL GROUP

SHT 1 REV A

H-36175

OPERATING INSTRUCTIONS: PACAT

I) When maintenance is to be performed or personnel are to be in the baler
   A) Stop the baler
   B) Turn BALER key switch to OFF and remove key
   C) Then: **LOCK OUT POWER AND TAG OUT MAIN POWER SOURCE FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT.**

II) **Stopping the baler**
   A) At the control console
      1) Push the STOP button
         (a) Will illuminate red
      2) Turn BALER key switch to OFF
   B) Turn off disconnect at motor control center
   C) Shut off baler at end of day or shift or when machine will be unattended for an extended period of time

III) For **emergency stopping the baler**
   A) Push the red mushroom head EMERGENCY STOP button
      1) At the control console
      - Or -
      2) At the tier
      - Or -
      3) At the offside
      - Or -
      4) At a customer supplied location

IV) **Starting the baler**
   A) Check around and inside the baler to make sure all personnel are clear
   B) Make sure all guards are in place
      1) Tier offside guard in position at LS8
      2) Tier guard in position at LS9
      3) Tier guard in position at LS10
   C) Make sure hopper door is closed at LS6
   D) Turn on disconnect at motor control center
   E) At control console
      1) Turn BALER key switch to ON
      2) Press START button
         (a) Will illuminate green
      3) Amber warning horn and light go on and off to signal baler startup
      5) Motor starts

V. **Normal Operation**
   A) On the HAND/HOME screen press the AUTO MODE Button

How do I?

1. How do I Manually Advance the Plunger?

With the baler in HAND MODE touch the PLUNGER ADV button on the HAND OPERATION SCREEN. The plunger will advance provided the tier is in position at LS-5, the needles are on LS-22, the plunger has not contacted LS-1, and on latch style balers (50 to 75 HP) the LS-31 latch Up switch is made.

2. How do I Manually Retract the Plunger?
With the baler in HAND MODE touch the PLUNGER RET button on the HAND OPERATION SCREEN. The plunger will retract provided the tier is in position at LS-5, the needles are on LS-22, the plunger has not contacted LS-2, and on latch style balers (50 to 75 HP) the LS-31 latch Up switch is made.

3. How do I put the baler into a manual tie cycle?
With the baler in HAND MODE touch the TIE CYCLE button and then within one (1) second touch the PLUNGER ADV button on the HAND OPERATION SCREEN. The plunger will advance to the tie position (LS-4) provided LS-1 is made.
When the plunger contacts LS-4 the PLC turns on the auxiliary supply valve supplying oil to the tier. The blue tier light flashes indicating the baler is in the tie cycle, and an audible warning is sounded.

4. How do I manually advance the needles into the baler?
With the baler in a tie cycle (step 3) touch the NEEDLES IN button on the HAND OPERATION SCREEN. The needles will advance provided that LS-23 Twister Count & Safety switch is made, and the needles are not fully in on LS-21.

5. How do I manually retract the needles into the baler?
With the baler in a tie cycle (step 3) touch the NEEDLES OUT button on the HAND OPERATION SCREEN. The needles will retract provided that LS-23 Twister Count & Safety switch is made, and the needles are not fully out on LS-22.

6. How do I manually activate twist forward?
With the baler in a tie cycle (step 3) touch the TWIST FORWARD button on the HAND OPERATION SCREEN. The twisters will rotate forward provided that the needles are on LS-22, and the Twist Forward Preset is not reached.

6. How do I manually activate twist reverse?
With the baler in a tie cycle (step 3) touch the TWIST REVERSE button on the HAND OPERATION SCREEN. The twisters will rotate in reverse provided that the needles are on LS-22, and the Twist Reverse Preset is not reached.

7. On a latch style baler what how do I get the latch up or down?
NEEDLE IN lowers the Latch, and TWIST REVERSE lifts the latch.

CAUTION

After maintenance has been performed on the tier we recommend that the tier be reset by running through TWIST REVERSE. TWIST REVERSE will reset the tier and prepare the system for the next tie.

Do not at any time run machine above factory pressure Settings. Refer to hydraulic schematic for correct settings.

Maximum oil temperature is 140 degrees Fahrenheit.

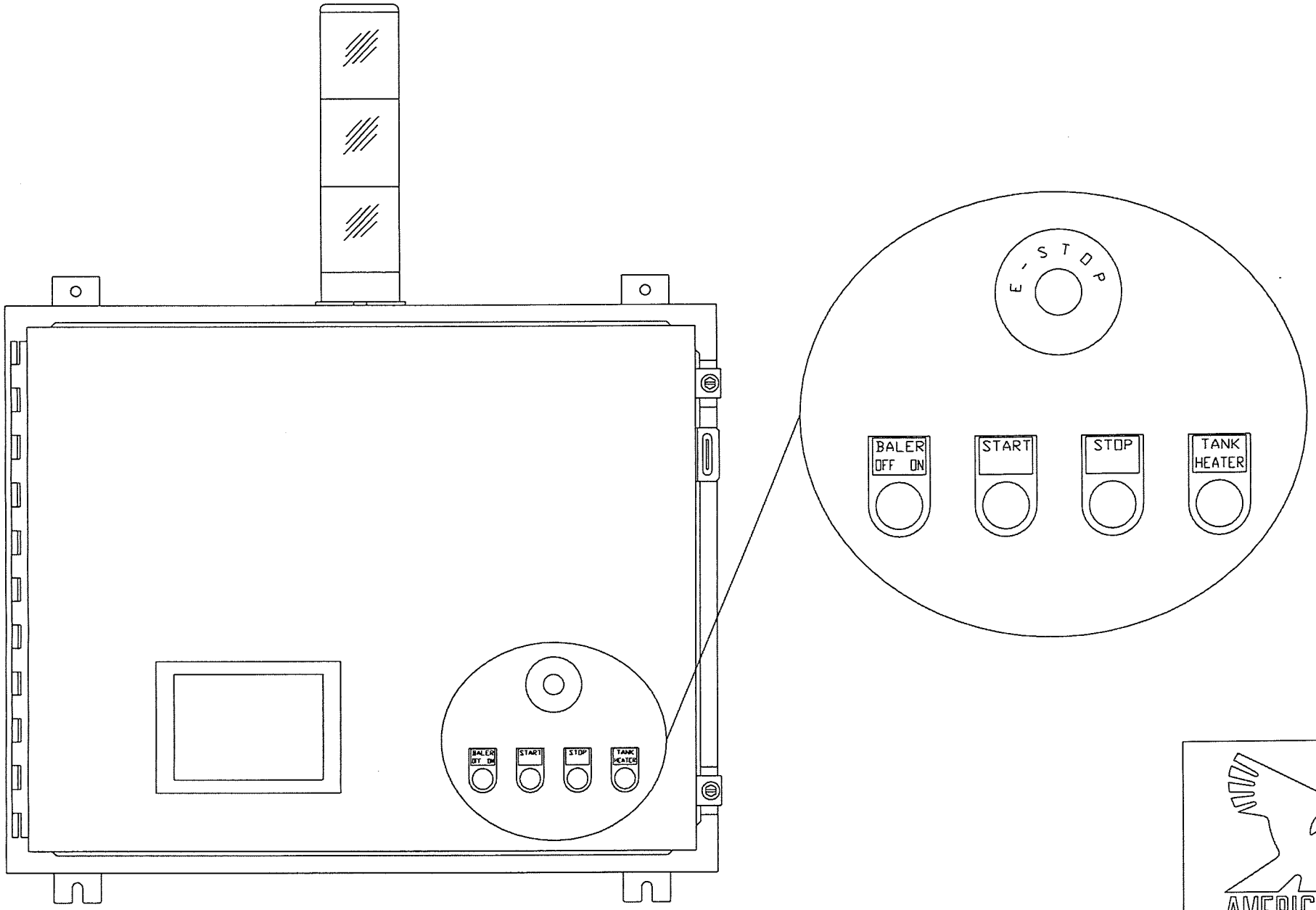
SEQUENCE OF OPERATION

Normal Sequence of Operation

1. The material fills the hopper until the material blocks the infrared sensor. The blocked sensor signals the computer to advance the plunger.
2. The plunger advances compacting the material and continues to advance until the plunger actuates LS-1 Limit Switch (Or LS-4 if selected). LS-1 informs the computer that the plunger has reached the full advanced position and it is OK to retract the plunger.
3. The plunger returns to LS-2, or the PARTIAL STROKE position if selected, and the process repeats.

Normal Tie Cycle Operation

1. When the Bale Length equals the Auto Tie Length the baler goes into a tie cycle.
2. The blue tie light turns on and an audible warning is sounded.
3. The plunger advances bypassing LS-1 and continues on until LS-4 is made.
4. LS-4 signals the PLC that the plunger is in position, and the auxiliary valve is turned on providing hydraulic pressure to the tying unit.
5. The needle in signal, drops the latch on latch style balers, and sends the needles into the baler. The needles continue to move in until LS-21 is contacted.
6. LS-21 informs the PLC that the needles are full in and it is OK to retract the needles. As the needles retract to LS-22, the offside and near side wires are caught in the needle head, and pulled into the cutter pocket.
7. LS-22 is the signal to begin twisting the wires forward. As the twisters rotates forward, the wires are caught in the twister hooks, and the cut cylinder extends to cut the wires.
8. After the wires are cut the twisters continue to rotate until the twist forward count equals the twist forward preset. When the preset is reached the PLC begins twist reverse.
9. At the initiation of twist reverse the plunger latch lifts on latch type baler, the cut cylinder retracts, and the hooks reposition themselves to the safe 12:00 position. Once the twist reverse preset is reached the baler cancels the tie cycle and the normal baling process resumes.



AMERICAN BALER COMPANY

4029 TOUCH SCREEN PUSHBUTTON LAYOUT | 1452.DWG

MANUAL PAGES FOR THE USE OF CTC-PARKER 6" TOUCH SCREEN (A.K.A. PATHFINDER)

*PASSWORD INFORMATION INCLUDED.
SUPERVISORS PLEASE READ

OVERVIEW

When using the touch screen, you will notice that different color buttons have similar functions. There are also interface tools which may be used on several different screens.

BLUE NAVIGATION BUTTONS:

When pressed, these buttons change the current screen to the one indicated on the button. This will remain the same throughout every screen.

GREY OUTLINED BUTTONS:

These buttons control the primary functions of the baler such as *PLUNGER ADVANCE* and *PLUNGER RETRACT.*

BLUE CONTROL BUTTONS:

These buttons are associated with input lists and display tools. They may be used to set a value, send a value, or to scroll through a list.

INPUT AREA:

These are list tools that have several different parameters or settings. Using the up and down arrow keys will scroll from setting to setting. Pressing the EDIT button will bring up a *Numeric Key Pad* that works similar to a calculator. This is where values can be edited. After an edit is made, two buttons must be pressed; SAVE and SEND. These buttons "save" the new setting to the touch screen and "send" the value to the PLC. **If these buttons are not pressed, the information on the screen may not match that of the PLC and unexpected operations could occur.**

PASSWORD SETUP FOR TOUCH SCREENS

The change user button on the main screen will pop up a numeric input pad. The following passwords are valid.

PASSWORD	LEVEL
0	OPERATOR LEVEL
SN	SUPERVISOR

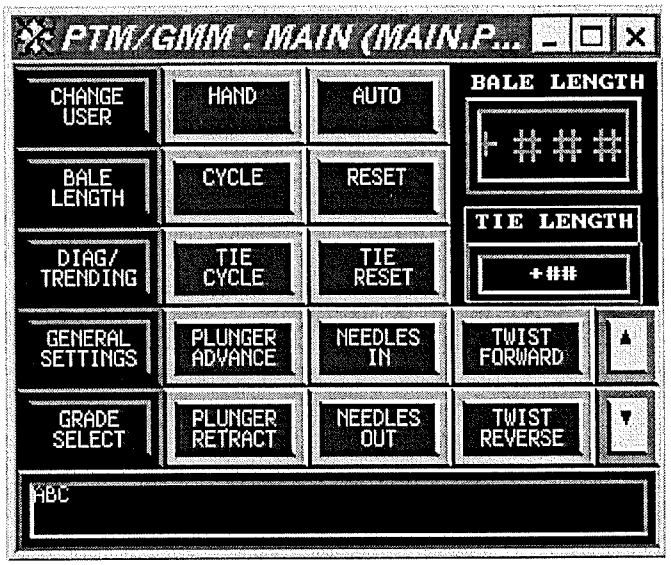
The default level on screen boot up is OPERATOR level. This is the most restrictive level. The operator is allowed to change grades, but not edit them.

The SUPERVISOR level (first 4 digits of nameplate serial number) gives full access to grades and settable bale count. It also allows the bale length to be changed to any value. The last 4 digits of the serial number are a date code and not used in the password.

If the nameplate on the control console of a baler says SN:8131200. The SUPERVISOR password for that baler would be 8131.

HOME SCREEN

The HOME SCREEN is the default when the touch screen is first booted. It is here that the main functions of the baler are accessed.



CHANGE USER:

This button changes the user level of the screen. See PASSWORD SETUP for a more detailed description of user levels. A *numeric entry keypad* will pop up. Enter the desired password and press enter.

CYCLE:

When in AUTO mode, this will cause the baler to cycle from LS2 to LS1 and then back to LS2.

RESET:

This button resets all baler faults and warning conditions once they have been satisfied or corrected. The need for RESET is usually denoted by a message on the screen accompanied by the amber warning light and warning horn.

TIE CYCLE:

If in a*uto mode*, pressing this button will cause the baler to automatically tie off it's bale even if it was not at it's tie length. If the baler is in *hand mode*, pressing this button and then pressing PLUNGER ADVANCE within two seconds, will cause the baler to enter a manual tie cycle. This means that all of the functions of tying off the baler must be done manually with buttons on the screen. The blue warning light should be on during any tie cycle

TIE RESET:

This button will cancel a baler tie cycle. The blue tie cycle warning light will turn off.

HAND MODE:

This button will put the baler into *hand mode* or manual operation. Several buttons may become visible or invisible depending on which mode you are in. If an optional HAND/AUTO panel switch is installed, this button will be overridden and simply act as an indicator.

AUTO MODE:

This button will put the baler into *auto mode* or automatic operation. Most of the baler cycle/tie functions will be controlled by the PLC. Several buttons may become visible or invisible depending on which mode you are in. If an optional HAND/AUTO panel switch is installed, this button will be overridden and simply act as an indicator.

PLUNGER RETRACT/ADVANCE:

These two buttons available in *hand mode* will move the main plunger forward toward the extrusion end or backwards toward the power unit.

NEEDLES IN/OUT:

During a manual tie cycle, these buttons will move the needles into or out of the baler assuming that the plunger is at LS4, auxiliary pressure is active, and (on some balers) the plunger latch - LS31 is down.

TWIST FORWARD/REVERSE:

During a manual tie cycle, these buttons move the twister hooks forward and reverse in order to tie off the bale.

BALE LENGTH DISPLAY:

This is the length of the current bale. Below 75% of tie length, the numbers will remain green. Between 75% and 89%, the numbers will turn yellow. At 90% and above, the numbers will turn red.

TIE LENGTH DISPLAY:

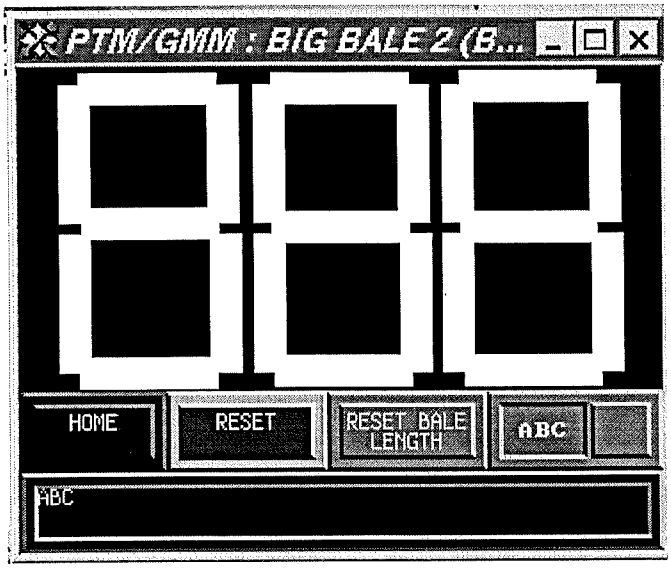
This is the length in inches that the baler will tie off it's bale. By pressing the display, it can be changed at any time. The tie length displayed here is the current tie length. Changing it on this screen will NOT change the grade setup where it is also located, but will overwrite the current value in the PLC.

BALER MESSAGES:

This is where process messages and warnings are displayed. Arrow keys allow you to scroll through current messages if the number exceeds the display limit.

BALE LENGTH DISPLAY

This screen is to show the bale length in a larger scale so as to be seen from a distance. This may be useful for balers that run automatically with little supervision.



The RESET button is a duplicate from the HOME SCREEN. This allows an operator to reset faults or warnings. A truncated BALER MESSAGES display is here as well.

RESET BALE LENGTH:

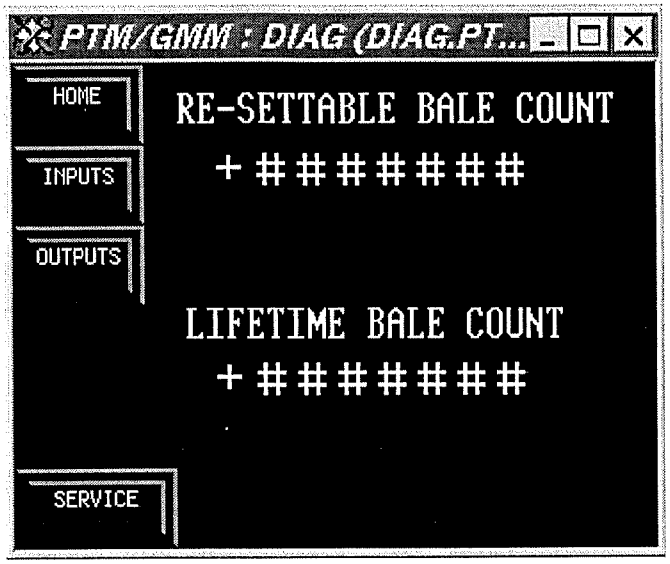
Pressing this button resets the current bale length to 0.

CHANGE UNITS:

This pull down menu will allow the units to be changed to one of the following: Inches, Centimeters, and Percent of tie length. When this button is pressed, a pull down menu will pop up. Select the desired display units by pressing the word and then ACCEPT or CANCEL.

DIAGNOSTICS & TRENDING

This screen is for keeping track of baler functions over time. It allows you to have accurate production information for calculating efficiency.



RE-SETTABLE BALE COUNT:

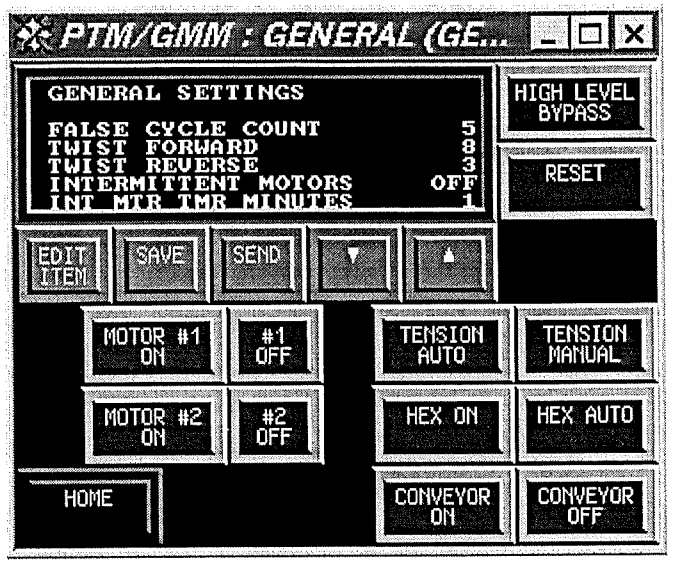
This display shows how many bales have been made in the baler. If the current password level is SUPERVISOR, this may be reset.

LIFETIME BALE COUNT:

This bale counter is for over the life of the baler. It is factory re-settable only.

GENERAL SETTINGS

This screen allows the baler operator to turn machine functions on and off. These functions, such as motors on or off, are independent of the options for each grade.



TENSION AUTO/MANUAL:

These two buttons tell the baler whether to control the tension cylinder automatically (via a pressure switch), or to constantly dump pressure.

HIGH LEVEL BYPASS:

Pressing this button during a *high level* condition will jog the conveyor and energize the High Level Relay as long as the button remains activated.

CONVEYOR CONTROLS:

The CONVEYOR ON and CONVEYOR OFF buttons control whether the conveyor is on or off. Several conveyor control options may be accessed on the **GRADE SELECT** screen

MOTOR CONTROL:

Turns the main motor(s) on and off. The motor(s) may only be turned on in *hand mode*. If the baler motors were running when the baler is shut off, they will start up again on the next power up.

HEAT EXCHANGER CONTROL:

The heat exchanger(s) may be set to run continuously (ON) or be controlled by an electric temperature switch (AUTO).

MACHINE FAULT RESET:

This is a duplicate of the RESET button on the HOME SCREEN.

FALSE CYCLE COUNT:

This is the amount of times the baler will continuously cycle before it faults. This function is useful in the event of material bridging across the cycle eye(s).

GENERAL SETTINGS:

The parameters may be selected with the arrow keys. Pressing the EDIT ITEM button will allow them to be changed. After changing an item, make sure to press the SAVE SETTINGS and SEND VALUES buttons.

TWIST FORWARD:

The number of times the twister hooks will twist the wire during a tie cycle.

TWIST REVERSE:

The number of times the twister hooks reverse. This removes the wire from the hooks after a bale is tied off.

INTERMITTENT MOTORS:

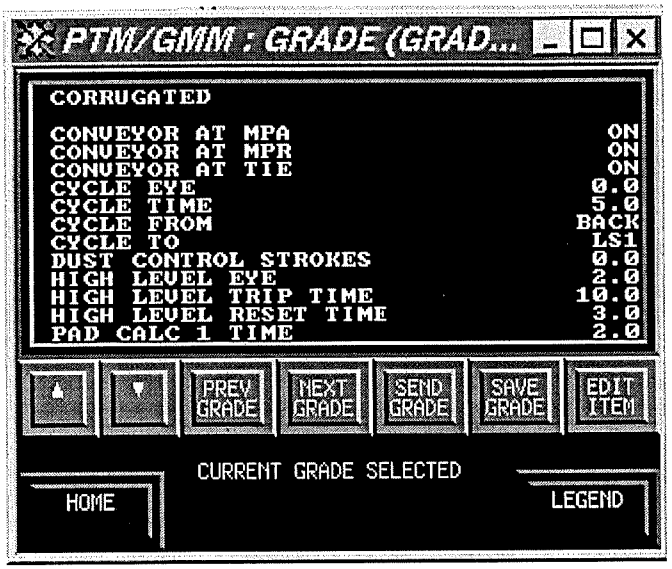
When turned on, this function will shut off the main motor(s) in the event that the baler is idle for more than the time set by INTERMITTENT MOTOR MINUTES. This saves on motor wear and excess power consumption. The motors will only go to "sleep" 4 times per hour. Use this function for balers that are cycled few times per hour or have long periods between baling.

INTERMITTENT MOTOR MINUTES:

This is the time that you set for your motors to go intermittent (see above) This can be set from 1 to 60 minutes.

GRADE SELECT

This screen allows the user to select the current grade that the machine is baling. There are 20 grades and 18 settings per grade. The CURRENT GRADE SELECTED display will tell the user what grade has been selected and sent to the PLC. The GRADE SETUP WINDOW and the CURRENT GRADE SELECTED may not always be the same. Make sure to have the desired grade in the GRADE SETUP WINDOW before editing.



GRADE SETUP WINDOW:

In order to change a grade, use the PREV GRADE and NEXT GRADE buttons to select the desired grade. By using the up and down arrows, the user can select which grade setting to edit. Once the desired setting is highlighted, press EDIT ITEM to enter changes. The screen does not automatically send or save the changes. The SAVE CHANGES TO SCREEN and SEND GRADE TO PLC buttons must be pressed. If these are not pressed and the operator changes screens, the values in the PLC may not match up with the display. An asterisk will appear next to changes that have not been saved.

GRADE SETTINGS:

The following settings may be customized for every grade available. Factory presets are only a guideline and it should not be assumed that your baler will run correctly using them. You should always take the time to customize the settings for your individual process. The names of the grades have been selected to cover a wide range of materials. If the material you are baling does not appear as a grade, that does not mean it can not be baled. Contact the American Baler Company if you have any questions on baling a material.

CONVEYOR MPA:

When this function is set to OFF, the conveyor(s) will turn off while the main plunger advances toward LS1.

CONVEYOR MPR:

When this function is set to OFF, the conveyor(s) will turn off while the main plunger retracts towards LS2.

CONVEYOR TIE CYCLE:

When this function is set to OFF, the conveyor(s) will turn off during tie cycles.

CYCLE EYE:

This number (0-5) will tell the baler which of the 3 levels of inputs to cycle the baler from. A legend is located to the left of the screen. The PLC can logically AND/OR the cycle eye inputs. If your baler only has one set of eyes (emitter and receiver) then choose a FRONT OR BACK selection.

CYCLE TIME:

This is the amount of time in seconds that the cycle eye(s) must be blocked in order to cycle the baler when is it in *auto mode.*

CYCLE FROM:

Selecting BACK is the typical operation. This tells the baler to cycle the ram from the back of the baler (LS2) to the forward (LS1) position and then back to LS2. If FRONT is selected, the ram will sit forward at LS1 when idle. It will then cycle to LS2 and back to LS1.

CYCLE TO:

This option tells the ram to cycle either to LS1 or to the tie position LS4 which is farther forward.

DUST CONTROL:

When turned on and immediately after a tie cycle, this function will keep the ram forward at LS1 for the number of cycles equal to DUST CONTROL STROKES.

DUST CONTROL STROKES:

This is the number of cycles the ram will sit forward at LS1 during DUST CONTROL.

HIGH LEVEL EYE:

This tells the baler which level of eyes controls the high level function. The **LEGEND** screen gives the settings for this selection. When the high level eye is blocked, the conveyor(s) will stop and the high level relay will drop out.

HIGH LEVEL TRIP TIME:

The amount of time in seconds that the high level eye must be blocked before the conveyor(s) and high-level relay drop out.

HIGH LEVEL RESET TIME:

This is the time in seconds that the high level function will reset after the eyes are unblocked. This needs to be set high enough to avoid *chattering* of the conveyor starters and high-level relay.

PAD CALCULATOR:

When turned on, the PLC will calculate the amount of a *pad* that is needed to complete a bale as close to the tie length as possible.

PAD CALC 1 TIME:

For the PAD CALCULATOR function, this is the time in seconds that the ram will retract when the difference between TIE LENGTH and BALE LENGTH is less then 75% and greater than 50% of the average pad taken per stroke.

PAD CALC 2 TIME:

For the PAD CALCULATOR function, this is the time in seconds that the ram will retract when the difference between TIE LENGTH and BALE LENGTH is less then 50% of the average pad taken per stroke

WATER MIST:

This function activates an optional water misting system. This is run off of the cycle eye and is used to control static electricity in the material which may cause it to stick to the hopper or window causing a false cycle condition.

WATER MIST ON TIME:

The time in seconds that the water mist will spray after being triggered.

TIE LENGTH:

This is the length in inches that the baler will tie off it's bale. The tie length displayed here is not necessarily the current tie length. It may be overwritten on the HOME SCREEN. See the **HOME SCREEN** section for more information.

EXPANSION TIME also known as. PLASTIC MODE:

Needles advance to LS21 and remain there until specified time (Grade parameter: Expansion Time) expires While this time is elapsing the tension cylinder is releasing (dumping) tension at the extrusion chamber, When time has elapsed the needles return to LS22 (home) and tension is repressurized.
This reduces broken wires caused by expanding bales.
Settings: OFF is zero, ON is above zero in seconds.

TENSION RECOVERY TIME

The time before repressurizing tension cylinder after system pressure falls below tension dump setting.

GRADE #:

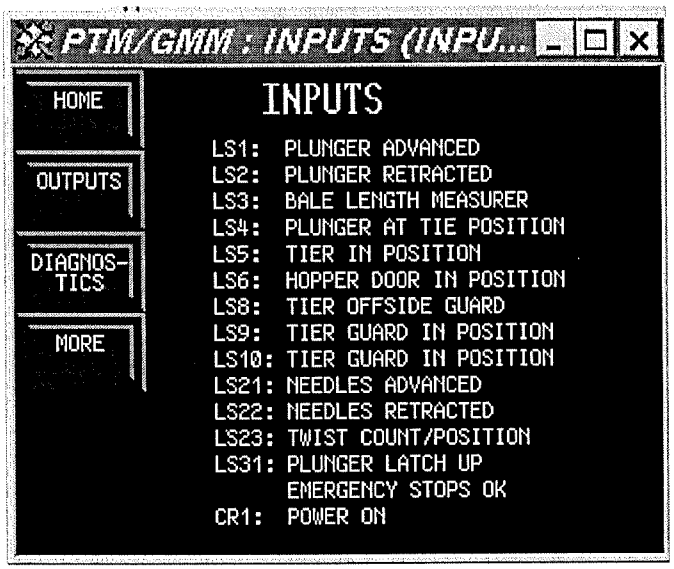
At the end of each grade is a grade #. This cannot be edited and is used by the touch screen to keep track of which grade has been sent to the PLC.

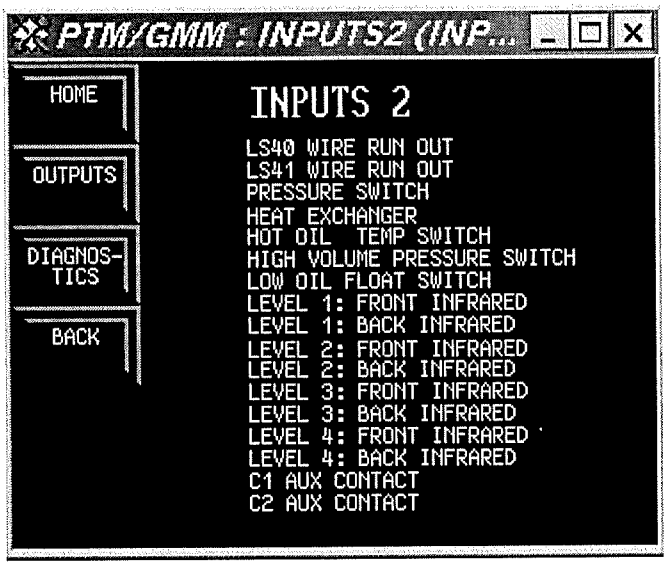
LEGEND

Due to the constraints of the software used to program the CTC touch screen, the parameters in the GRADE SETUP WINDOW must be either a numeric entry or an on/off function. Therefore the CYCLE EYE and HIGH LEVEL EYE entries have a numeric value. The legend for those entries are on this screen. Some machines may have two sets of eyes on any given level. Therefore one may choose to cycle from one set independently (OR condition), or they may wish to cycle when both sets are blocked (AND condition).

INPUTS

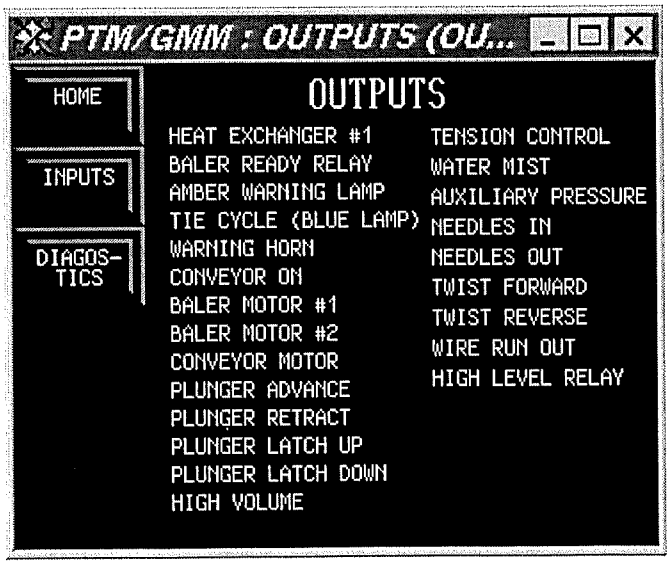
This screen shows a overview of the PLC inputs. It tells the operator what inputs are on or high. If the word is white, it means it is off. If it is green, the input is on or active. This can be used to tell if all of your limit switches are working correctly or if an infrared eye is not blocked, etc. The MORE button will give you a second page of inputs.





OUTPUTS

This screen is similar to the INPUTS page. It is a diagnostic tool that tells you what PLC outputs are active. I.e. If your heat exchanger output is shown as on and you can physically see that the heat exchanger is not on, you may have a problem.

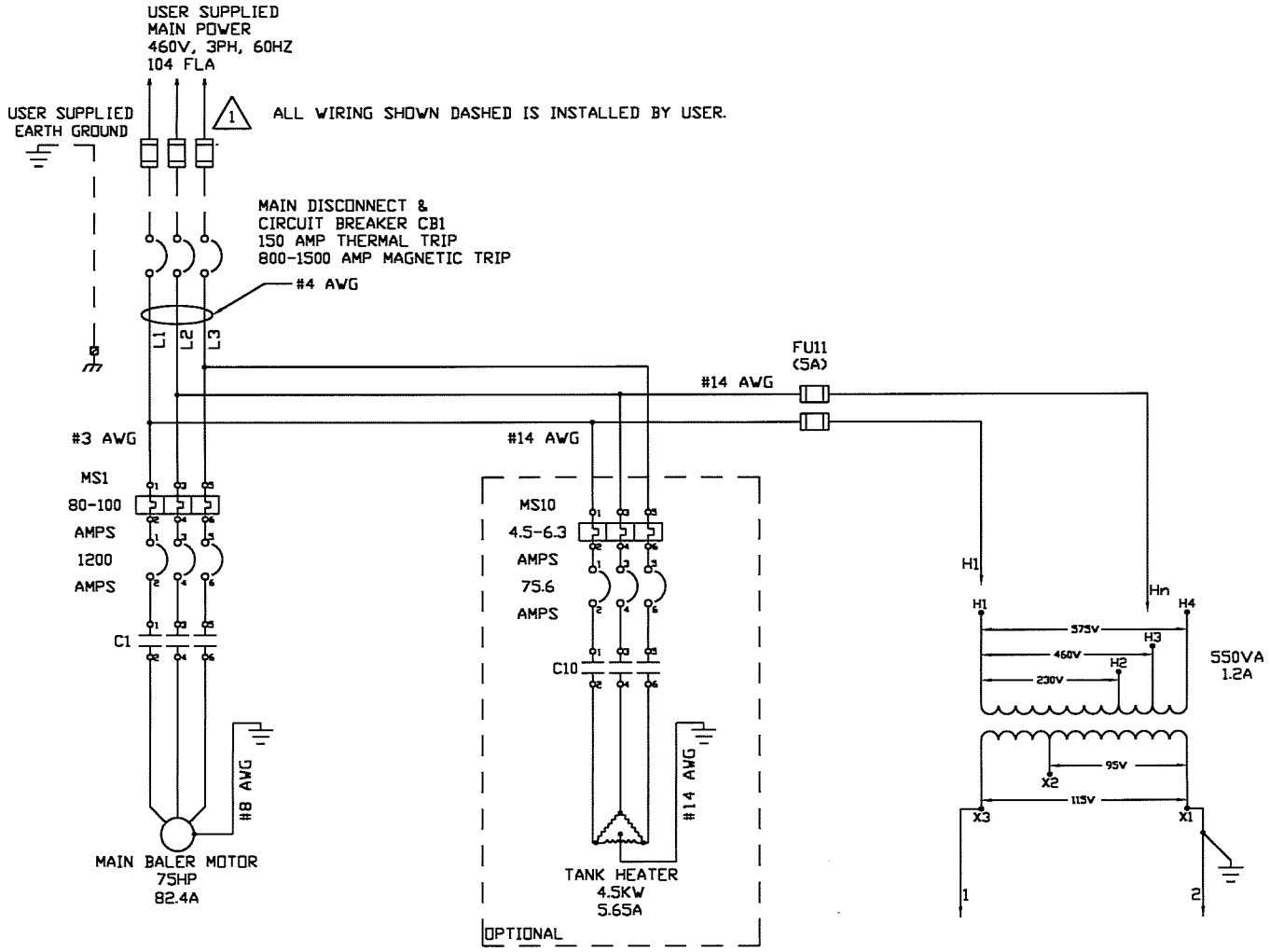


GLOSSARY OF TERMS

ADVANCE:	Movement of the plunger towards LS1.
AUTO MODE:	Otherwise known as automatic mode. In this mode, the baler will cycle and tie without any commands from the operator.
BACK:	The back of the baler is considered the end with the power pack and hydraulic tank.
BALE COUNT:	The number of bales that have been made in the baler from a given point in time (lifetime or settable counters).
BALE LENGTH:	The current length in inches of the bale being made.
CHARGE:	The material that falls into the hopper that will be compressed by the ram.
CHATTERING:	This is when a contactor or relay turns on and off in a very rapid fashion. This may occur when a HIGH LEVEL TRIP TIME and HIGH LEVEL RESET TIME are set to close to each other. Excessive CHATTERING will cause damage to the contactor or relay.
CYCLE:	This is the baler function when the plunger moves from LS2 to LS1 and back to LS2 in order to move material into the extrusion chamber. This may be done in *auto mode* or *hand mode.*
EXTRUSION END:	This is the mouth of the baler where the bale is released.
EYE:	A general term for the infrared photo eye's located at various points on the hopper. Each photo eye has an emitter and a receiver. There are 4 levels at which an eye can be placed. There may also be front or back sets of eyes on the same level (A or B).
FRONT:	The front of the baler is considered where the bale is released or the extrusion end.
GRADE:	Type of material being baled. Each grade has different properties than can customized in the touch screen.
GRADE SETTINGS:	Options and settings for each GRADE being baled.

HAND MODE:	Otherwise known as manual mode. In this mode, the user must perform all of the functions of the baler through the touch screen.
HIGH LEVEL:	This function can be set to work on any of the 4 levels of photo eyes. When the material gets to a certain point, this function stops the conveyor and drops the high level relay (if installed).
LIFETIME BALE COUNT:	The overall amount of bales the machine has produced. This number is reset at the factory before the baler is sent out. Customers may not reset this value.
MPA:	Acronym for Main Plunger Advance . This is when the plunger moves toward the front of the baler.
MPR:	Acronym for Main Plunger Retract. This is when the plunger moves toward the back of the baler.
NUMERIC ENTRY KEYPAD:	When a numeric setting is changed through the touch screen, a keypad display similar to a calculator will pop up on the screen. Enter the desired value and press enter or cancel without changes.
OPERATOR LEVEL:	This default level is the most restrictive in terms of what the operator can do through the touch screen.
PAD:	This is a charge after it has been compressed by the ram. Many pads make up one bale.
PASSWORD:	The number entered after touching the CHANGE USER button on the HOME screen. This allows various levels of access depending on the password.
PLC:	Acronym for Programmable Logic Controller. This is the "brain" of the baler. Located in the control console, the PLC controls all functions of the baler through various inputs and outputs.
PLATEN:	Another name for the RAM or PLUNGER
PLUNGER:	Sometimes referred to as a "platen", this is the large ram that pushes material from the hopper into the extrusion end of the baler.

RAM:	Another name for the PLUNGER or PLATEN.
SETTABLE BALE COUNT:	In SUPERVISOR LEVEL, this is settable to anything between 0 and 32,767. This can be used to keep track of bales made from any point desired by the user.
SUPERVISOR LEVEL:	This password level allows the user to make changes to GRADE SETTINGS, change the SETTABLE BALE COUNT, and change the BALE LENGTH display.
TENSION:	The pressure that the tension cylinder exerts on the extrusion end so as to restrict movement of the bale. After a tie cycle, this pressure releases allowing the bale to slide out of the baler.
TIE CYCLE:	During a TIE CYCLE the ram moves forward to LS4 and the tier ties the bale off. This can be done automatically in *auto mode* or manually in *hand mode.*
TIE LENGTH:	This is the preset value in inches (set through touch screen) at which point the baler will enter a *tie cycle.* This will happen when the TIE LENGTH is equal to or greater than BALE LENGTH.



ECN NO.	BY	DATE	NO.	REVISION

AMERICAN BALER COMPANY

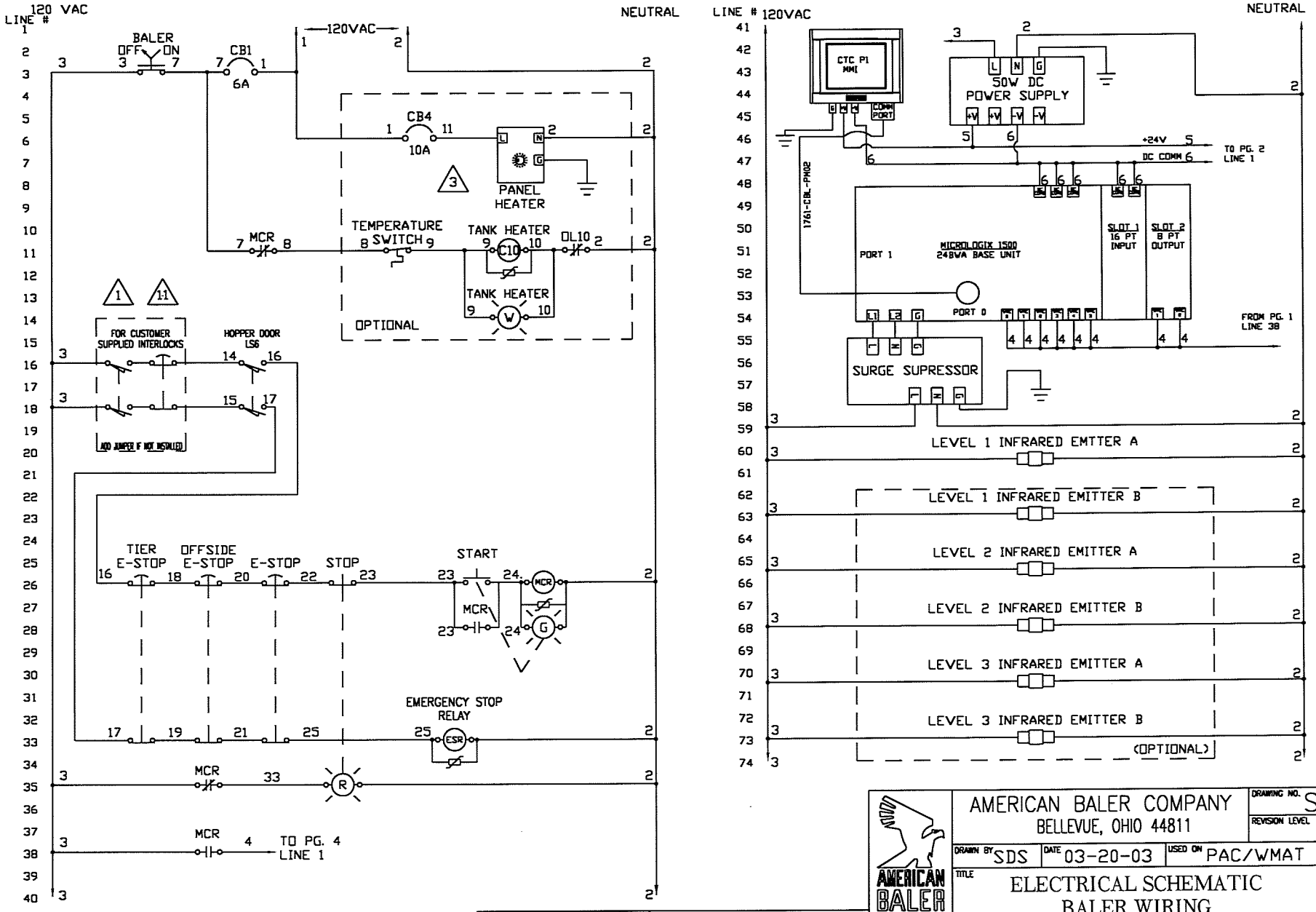
AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

DRAWING NO. SS-884
REVISION LEVEL

DRAWN BY SDS | DATE 01-02-03 | USED ON AT 75HP

TITLE
ELECTRICAL SCHEMATIC
BALER WIRING

SHEET 1
SHEETS IN SET 1



ECN NO.	BY	DATE	NO.	REVISION

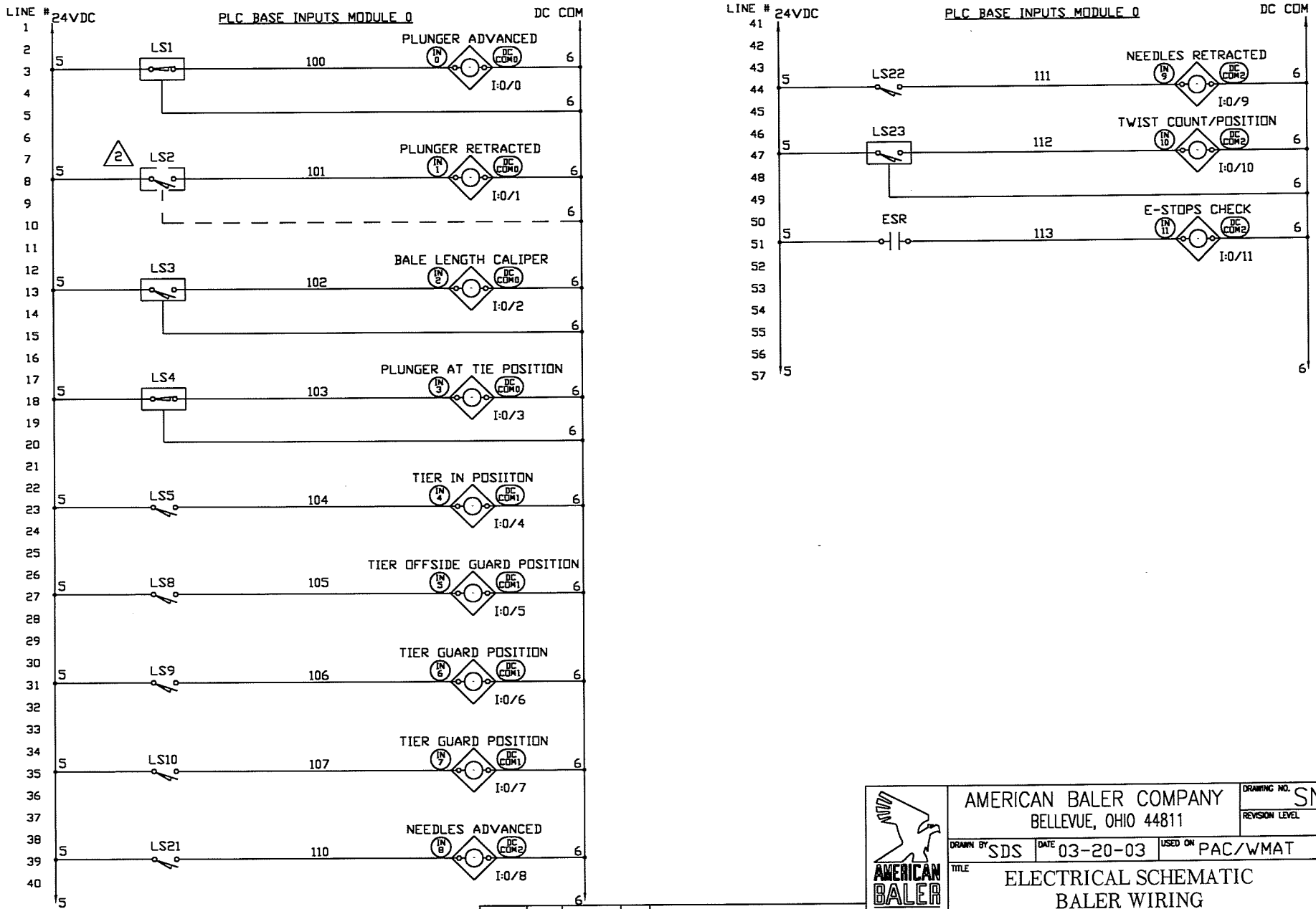
AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

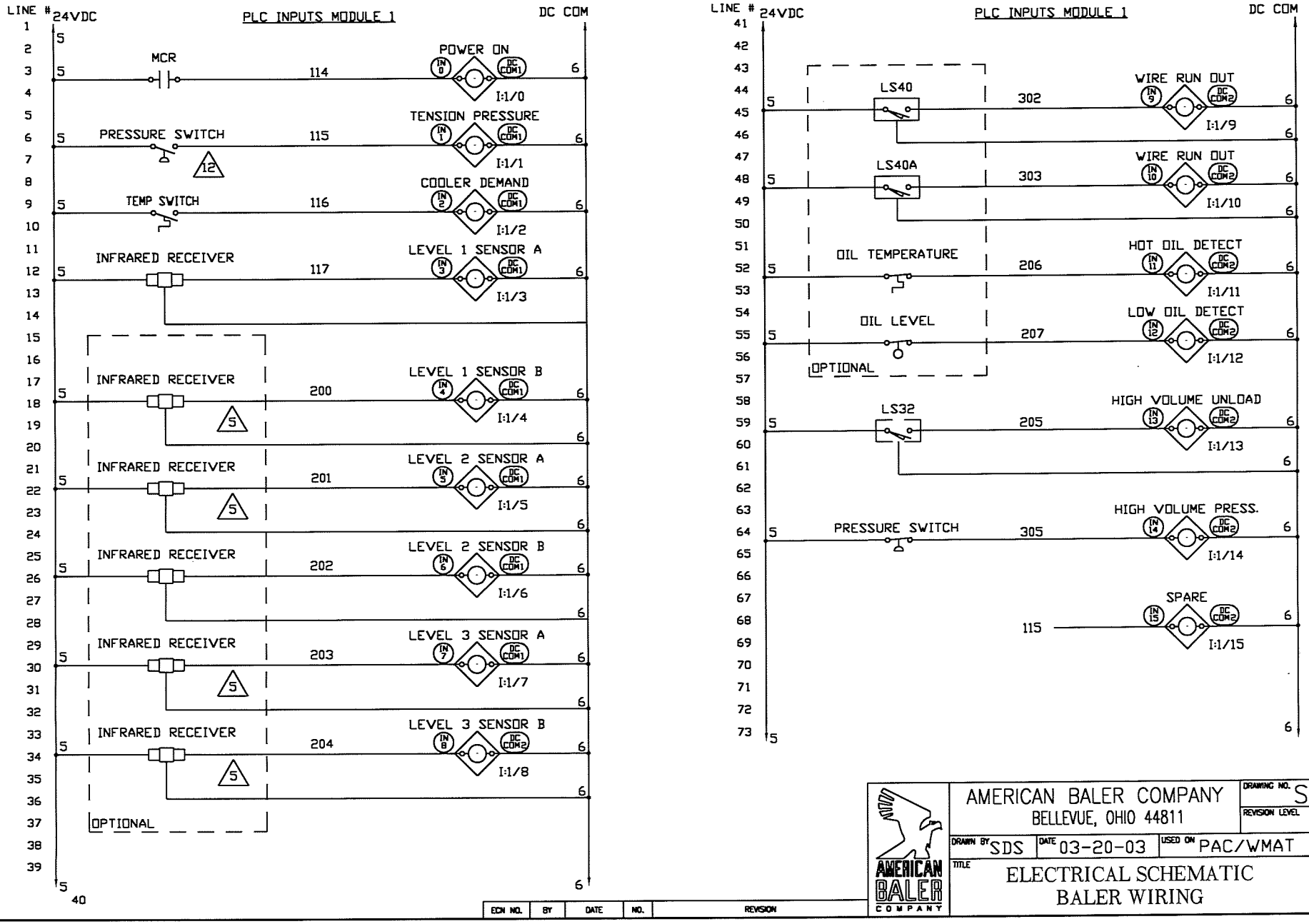
DRAWING NO. SN8388
REVISION LEVEL

DRAWN BY SDS | DATE 03-20-03 | USED ON PAC/WMAT

TITLE
ELECTRICAL SCHEMATIC
BALER WIRING

SHEET 1
SHEETS IN SET 6


LINE #
24VDC
PLC BASE INPUTS MODULE 0
DC COM
PLUNGER ADVANCED
LS1
100
I:0/0
PLUNGER RETRACTED
LS2
101
I:0/1
BALE LENGTH CALIPER
LS3
102
I:0/2
PLUNGER AT TIE POSITION
LS4
103
I:0/3
TIER IN POSIITON
LS5
104
I:0/4
TIER OFFSIDE GUARD POSITION
LS8
105
I:0/5
TIER GUARD POSITION
LS9
106
I:0/6
TIER GUARD POSITION
LS10
107
I:0/7
NEEDLES ADVANCED
LS21
110
I:0/8
NEEDLES RETRACTED
LS22
111
I:0/9
TWIST COUNT/POSITION
LS23
112
I:0/10
E-STOPS CHECK
ESR
113
I:0/11
ECN NO.
BY
DATE
NO.
REVISION
AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811
DRAWING NO. SN8388
REVISION LEVEL
DRAWN BY SDS
DATE 03-20-03
USED ON PAC/WMAT
TITLE
ELECTRICAL SCHEMATIC
BALER WIRING
SHEET 2
SHEETS IN SET 6



ECN NO.	BY	DATE	NO.	REVISION

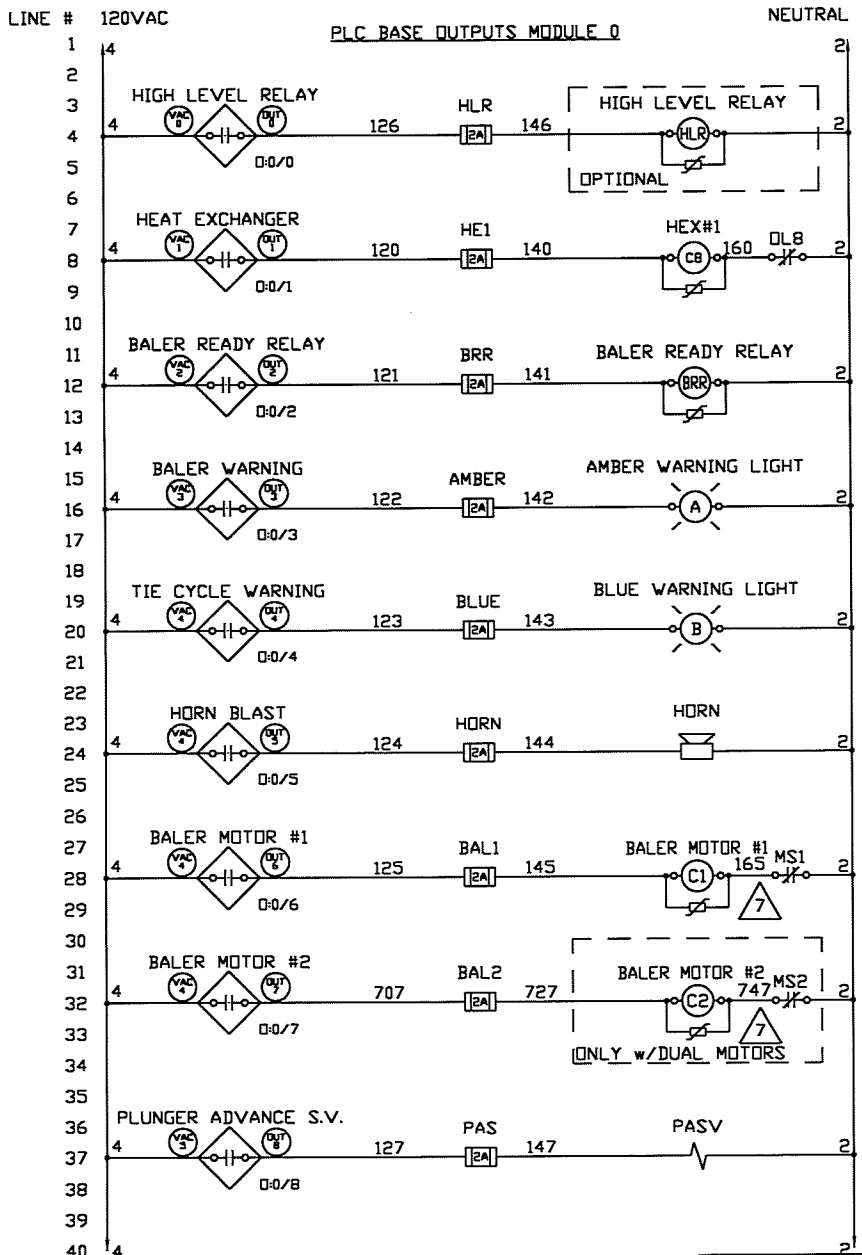
AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

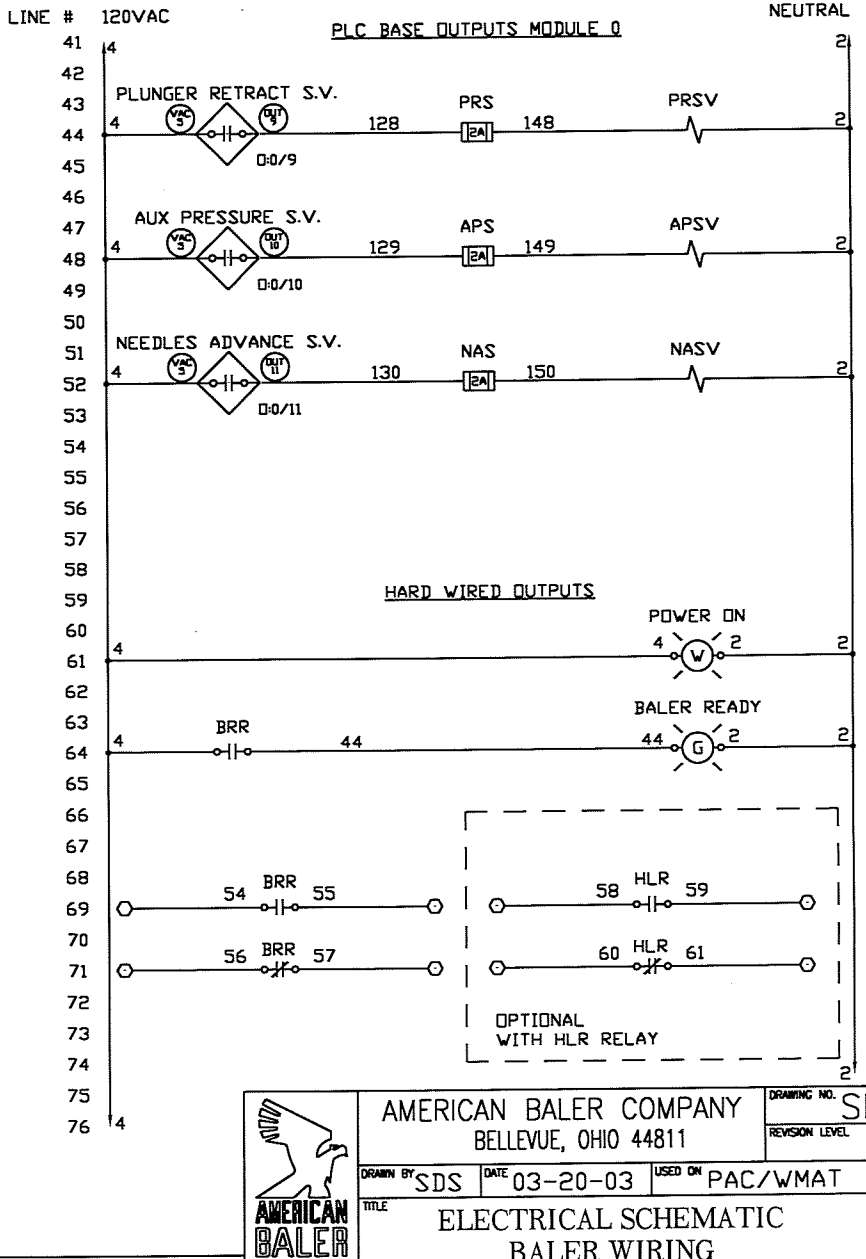
DRAWING NO. SN8388
REVISION LEVEL

DRAWN BY SDS | DATE 03-20-03 | USED ON PAC/WMAT

TITLE
ELECTRICAL SCHEMATIC
BALER WIRING

SHEET 3
SHEETS IN SET 6





ECN NO.	BY	DATE	NO.	REVISION

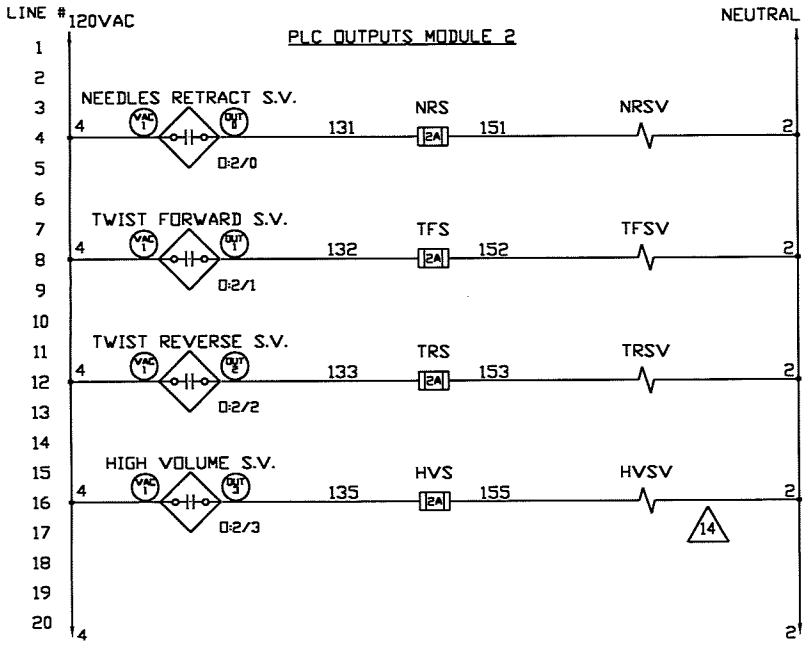
AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

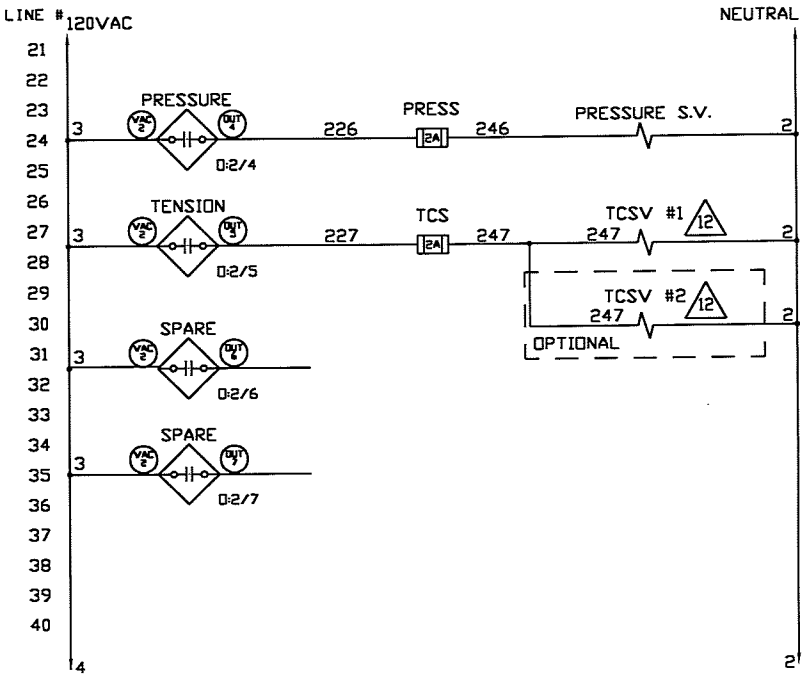
DRAWING NO. SN8388
REVISION LEVEL

DRAWN BY SDS | DATE 03-20-03 | USED ON PAC/WMAT

TITLE
ELECTRICAL SCHEMATIC
BALER WIRING

SHEET 4
SHEETS IN SET 6





ECN NO.	BY	DATE	NO.	REVISION

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

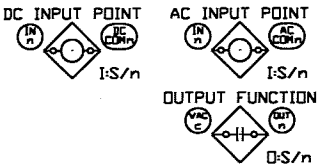
DRAWING NO. SN8388
REVISION LEVEL

DRAWN BY SDS | DATE 03-20-03 | USED ON PAC/WMAT

TITLE
ELECTRICAL SCHEMATIC
BALER WIRING

SHEET 5
SHEETS IN SET 6

NOTES



PROGRAMMABLE LOGIC CONTROLLER INPUT: S = RACK SLOT NUMBER, n = INPUT POINT TERMINAL NUMBER.
m = INPUT BANK (BASE UNIT) SIGNAL COMMON.

PROGRAMMABLE LOGIC CONTROLLER OUTPUT: S = RACK SLOT NUMBER, n = OUTPUT POINT TERMINAL NUMBER.
c = OUTPUT BANK SOURCE COMMON.

1. ALL WIRING SHOWN IN DASHED LINES IS INSTALLED BY END USER.
2. MAY BE PROXIMITY OR LIMIT SWITCH DEPENDING ON MACHINE TYPE.
3. OPTION MAY REQUIRE UPCHARGE FOR LARGER CONTROL TRANSFORMER.
4. IF BALER MOTOR BRANCH CIRCUIT HAS A CIRCUIT BREAKER USE LABEL CB3 / CB4 FOR BAL1 / BAL2 RESPECTIVELY.
IF BALER MOTOR BRANCH CIRCUIT HAS A MANUAL STARTER USE LABEL MS1 / MS2 FOR BAL1 / BAL2 RESPECTIVELY.
5. JAM LEVEL FUNCTION IS ACTIVATED BY INFRARED SENSOR(S) AT FLUFFER ELEVATION (LEVEL 4). ALL OTHER FUNCTIONS ARE ACTIVATED BY SENSOR(S) AT ELEVATION SELECTED THROUGH MMI. FUNCTIONS MAY REQUIRE BLOCKAGE OF SUBORDINATE INFRARED SENSORS BELOW SELECTED LEVEL. SEE OPERATIONS MANUAL FOR DETAILED INSTRUCTIONS.
6. IF DUAL BALER MOTOR OPTION IS PRESENT AND COMBINED HORSEPOWER EXCEEDS 50HP A PLUNGER LATCH SYSTEM MAY BE NECESSARY. THIS WOULD INCLUDE AN LS31 LIMIT SWITCH, PLUNGER LATCH UP AND PLUNGER LATCH DOWN SOLENOIDS.
7. IF SOFT START OR REDUCED VOLTAGE OPTION IS PURCHASED SEE AUXILIARY DRAWING FOR CONTROL CIRCUITS.
8. DEDICATED CONVEYOR PLC OUTPUTS STANDARD. CONVEYOR CONTROL RELAYS AND OR CONVEYOR MOTOR STARTERS ARE CUSTOMER OPTIONS.
9. IF BALER HAS FLUFFER MOTOR(S) USE NORMALLY CLOSED CONTACTS FROM MOTOR PROTECTIVE RELAY.
10. IF BALER HAS FLUFFER MOTOR(S) USE NORMALLY OPEN CONTACTS FROM OVER CURRENT RELAY.
11. FOR DEDICATED DEVICE INTERLOCKS ONLY. USE DEDICATED INTERLOCKS IN THE SAFETY AND CONTROL CIRCUITS FOR BALER AND CONVEYOR CONTROL RESPECTIVELY.
12. TENSION SYSTEM IS MACHINE SPECIFIC. TENSION PRESSURE O/P ENERGIZES WHEN PRESSURE SWITCH IS MADE AND IS TIMED ON WHEN SWITCH OPENS. TENSION DUMP O/P ENERGIZES WHEN PRESSURE WHEN PRESSURE SWITCH IS MADE AND IS TIMED OFF WHEN SWITCH OPENS. SEE MANUAL FOR DETAILED INSTRUCTIONS.
13. PLC POWER SUPPLY HAS DUAL VOLTAGE TAPS. BE SURE THE JUMPER SELECTION MATCHES THE ACTUAL INPUT VOLTAGE.
14. NOT ON ALL MACHINES, SEE HYDRAULIC SCHEMATIC FOR MACHINE SPECIFICS.

ECN NO.	BY	DATE	NO.	REVISION

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

DRAWING NO. SN8388
REVISION LEVEL

DRAWN BY SDS | DATE 03-20-03 | USED ON PAC/WMAT

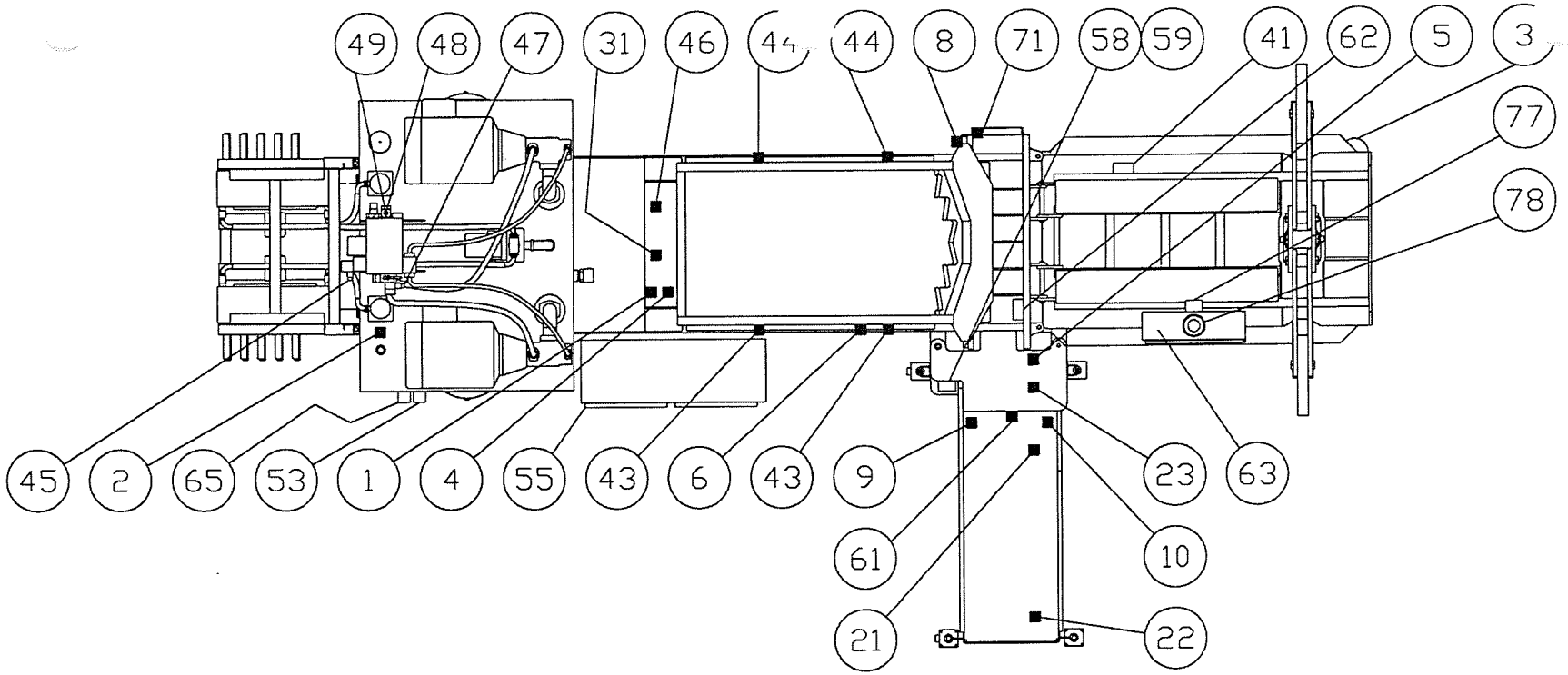
TITLE
ELECTRICAL SCHEMATIC
BALER WIRING

SHEET 6
SHEETS IN SET 6

TITLE

8043 COMPONENT LAYOUT

1442



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	LS1 PLUNGER ADVANCED	45	HIGH VOLUME SOLENOID
2	LS2 PLUNGER RETRACTED (INSIDE FRAME)	46	PLUNGER LATCH SOLENOIDS
3	LS3 BALE LENGTH MEASURER	47	AUXILIARY PRESSURE SOLENOID
4	LS4 PLUNGER AT TIE POSITION	48	PLUNGER RETRACT SOLENOID
5	LS5 TIER IN POSITION	49	PLUNGER ADVANCE SOLENOID
6	LS6 HOPPER DOOR IN POSITION	53	TENSION DUMP PRESSURE SWITCH
8	LS8 TIER OFFSIDE GUARD IN POSITION	55	MOTOR CONTROL CENTER
9	LS9 TIER GUARD DOOR IN POSITION (INSIDE)	58	NEEDLE SOLENOIDS
10	LS10 TIER GUARD DOOR IN POSITION (INSIDE)	59	TWIST SOLENOIDS
21	LS21 TIER NEEDLES ADVANCED (INSIDE)	61	TIER EMERGENCY STOP STATION
22	LS22 TIER NEEDLES RETRACTED (INSIDE)	62	TIER ELECTRICAL JUNCTION BOX
23	LS23 TWIST COUNT / TWIST POSITION (INSIDE)	63	CONTROL CONSOLE
31	LS31 PLUNGER LATCH IN POSITION (UP)	65	HIGH VOLUME DUMP PRESSURE SWITCH
41	TENSION DUMP SOLENOID	71	OFFSIDE EMERGENCY STOP STATION
43	INFRARED RECIEVER	77	WARNING HORN
44	INFRARED EMITTER	78	STACK LIGHTS

HYDRAULICS

MAINTENANCE

1. The hydraulic power units furnished with American Balers include an ample oil supply tank. Keeping the air volume above the oil to a minimum holds condensation within the tank to a minimum.

2. Oil supply should be a good grade of industrial hydraulic oil, nonfoaming, non-detergent, and with rating of 150 to 200 SSU at 100 degree F. An antiwear component is recommended as a step in the right direction to obtain maximum life from the hydraulic equipment. (See SERVICE PARTS section for oil spec.)

3. In any such hydraulic system such as this, it is reasonable to expect a certain amount of "built-in dirt". This is contamination particles that are left in the system from manufacture of the components. All American Balers are filled with oil at the factory and operated for many cycles. The tank is then drained and cleaned.

4. The above procedure is intended to minimize the "built-in dirt" passed on to the customer, but it is strongly recommended that filter elements be replaced after the first 40 hours of operation. Replace filter elements every six to twelve months should be adequate thereafter or when the filter pressure indicator shows in or near the red. Operators should be trained to check the filter indicators daily.

5. Air-To-Oil Heat Exchangers are furnished as standard. Clean dirt and paper from the heat exchanger daily. Operating temperatures from 100 degrees to 120 degrees F. are excellent. If oil temperatures consistently range above 140 degrees, modification should be considered.

6. The oil tank should be kept free of any appreciable accumulation of dust and frequent repainting should be avoided to maintain best heat radiation characteristics.

7. The hydraulic power package consists of a Manifold Block on which is mounted a solenoid operated 4-way valve directing pilot oil to four pilot actuated check valve, which in turn, control the flow of oil to the hydraulic cylinder. These check valves are labeled "A", "B", "C", and "D" on the hydraulic circuit diagram, and corresponding letters are stamped onto the face of the manifold block to identify them on the machine.

8. This hydraulic package directs the flow of oil from the pumps to the plunger cylinder in effective power saving sequence. Operating pressure on the power stroke builds from zero to 500- 900 p.s.i. depending on model, with oil flow from both pumps and the oil from the rod end of the cylinder being directed to the piston end of the cylinder. At this pressure setting, the high volume section of the double pump is unloaded to the tank by the high volume unloading valve, thereby relieving power requirement on the electric motor.

9. Pressure continues to rise as resistance increases at plunger, and power requirement of the motor climbs again as the product of volume and pressure rise. The second unloading valve is set to actuate as amperage of the motor again approaches peak allowable values. The second unloading valve appearing as the cap of check valve "A", when open, turns the oil from the rod end of the cylinder to tank instead of joining the pump flow into the piston end of the cylinder. At this point, a second drop in power requirement is experienced until now the oil pressure and volume produced by the pump was working against an effective area equal to the area of the cylinder rod. From the time the second unloading valve opens, the pressure is applied to the full area of the piston. In this third and final stage of the power stroke, the volume of the small pump works against full piston area to full relief valve pressure setting (if required) to complete the stroke.

10. The venting valve is so arranged to block the vent ports from the relief valve and the high volume unloading valve when the plunger of the baler is working. Thus, on the advance stroke, the high volume unloading valve will unload according to the adjustment set on the unloading valve; the relief valve will go to the full setting on the relief valve. On the retract stroke, the main relief valve will vent at setting of the relief valve within the venting valve. This relief is set low (1200-1500psi depending on model) to limit the system pressure to that required to perform the retract stroke. The purpose of this being to reduce pressures applied to the rod packing of the main cylinder.

11. When the baler is in neutral ("Hand" with neither advance nor retract button depressed) there is no pressure at either end of the vent valve spool to move it from the neutral position. In this condition, both high volume unloading valve and the relief valve are vented to tank so there settings become virtually zero pressure, permitting both pump volumes to flow freely to tank.

12. To set pressure available for retract stroke, have an assistant retract the baler while in "hand" let it continue to pump against the blind end in retracted position. Watch system pressure gauge and set pressure with adjustment screw on the venting valve.

13. With limit switches reset for automatic cycling, feed material to the machine and with tong ammeter watch the amperage pull of the motor as the platen advances into the load. The amperage will peak and drop when the unloading valve opens, then climb again in the final press. Amperage at the first peak should not exceed a value of 1.1 times the rating value given on the nameplate of the motor. If the amperage fails to fall off, back off the adjustment screw at the high volume unloading valve (or high volume pressure switch on some models) and adjust accordingly. If it is impossible to arrive at a setting where the valve will perform consistently, the valve spool may be sticking, and the valve should be removed from the manifold block, disassembled on a clean bench, washed thoroughly, and examined for evidence of galling on moving parts.

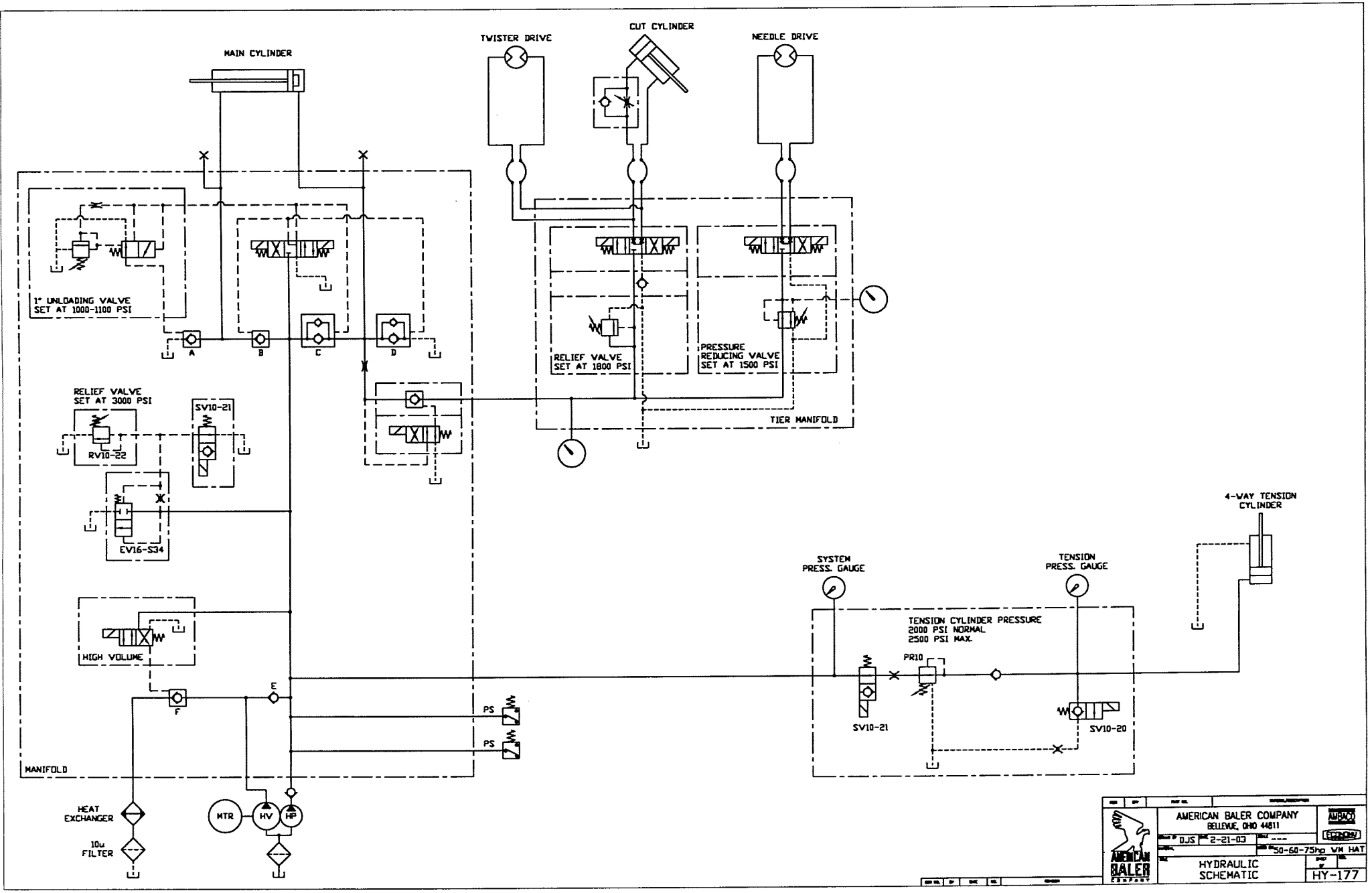
14. The differential unloading valve can best be set by watching the main system pressure gauge while the baler is working. As the plunger advances against material, the gauge hand should show a slight drop or irregularity in its climb when this valve operates. This should occur at 1000-1100 p.s.i. on the gauge, and will be accompanied by noticeable slowing of the plunger advance speed. The adjustment is under acorn nut on the cap of check valve "A".

15. To set the relief valve place the baler in "Hand" jog the platen to the normal forward position. Place the baler in the tie cycle mode using the "Tie Cycle" switch and jog platen to the full forward position.

16. Set tension release or "dump" pressure switch during normal baling operations. Watch both system and tension cylinder gauges during a normal loaded forward stroke. The tension cylinder pressure gauge will drop towards zero at the instant the tension pressure switch activates. Note the pressure on the system gauge when the tension cylinder pressure drops towards zero. This is your tension release pressure setting.

17. The pressure reducing valve is to be used to set the pressure on the tension cylinder which, in turn, regulates the restriction at the throat of the discharge end of the baler. This is easily checked and set during a tie cycle by monitoring the tension cylinder pressure gauge.

18. Pressure checks should be made frequently to assure maximum bale density is being obtained. Different materials or just a change in moisture content of a given material will change the tension requirement at the discharge end.


MAIN CYLINDER
TWISTER DRIVE
CUT CYLINDER
NEEDLE DRIVE
1" UNLOADING VALVE
SET AT 1000-1100 PSI
A
B
C
D
RELIEF VALVE
SET AT 1800 PSI
PRESSURE
REDUCING VALVE
SET AT 1500 PSI
TIER MANIFOLD
RELIEF VALVE
SET AT 3000 PSI
RV10-22
SV10-21
EV16-S34
HIGH VOLUME
E
F
PS
PS
MANIFOLD
HEAT
EXCHANGER
10u
FILTER
MTR
HV
HP
SYSTEM
PRESS. GAUGE
TENSION
PRESS. GAUGE
4-WAY TENSION
CYLINDER
TENSION CYLINDER PRESSURE
2000 PSI NORMAL
2500 PSI MAX.
PR10
SV10-21
SV10-20
AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811
DJS
2-21-03
50-60-75Hp WM HAT
HYDRAULIC
SCHEMATIC
HY-177

Mobil Lubrication Service Guide

Hydraulic Systems

Hydraulic systems operate the moving parts of many kinds of industrial machines by applying the force of a fluid under pressure. Figure 1 shows a basic hydraulic system. It consists of a fluid reservoir, a motor-driven pump, control valves, a piston and cylinder to do the work, and piping to connect these units.

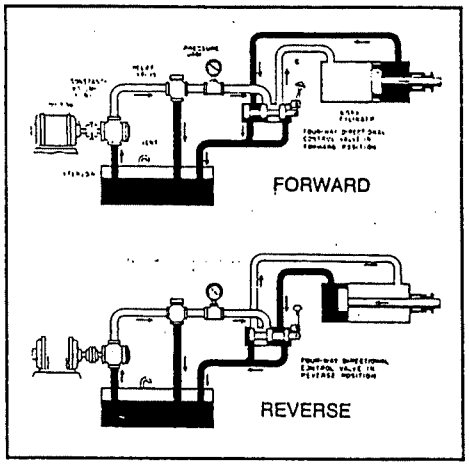


Fig. 1 Basic Hydraulic System

Power Unit

The power unit is the heart of a hydraulic system. The typical unit shown in Figure 2 includes a reservoir, pump, electric motor, relief valve, suction screen, and associated piping. A properly designed reservoir has these features:

- — Raised from the floor, with a drain plug at the low point of the dished bottom
- — Fill connection with a fine screen and a tight cover
- — Flush-type oil level gage
- — Large clean-out doors at each end
- — Drain and suction connections separated by a baffle
- — Breather vent, fitted with an air filter
- — Flange-type seals on piping clearance holes

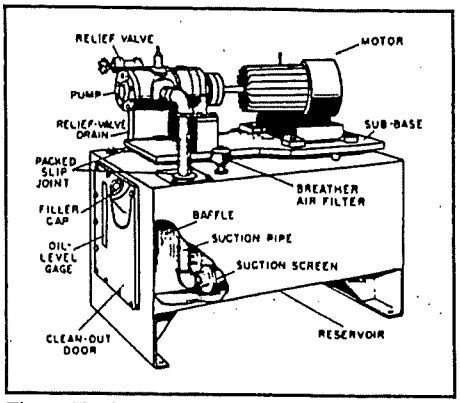


Fig. 2 Typical Hydraulic Power Unit

The power unit may be equipped with a filter, oil cooler, unloading valve, pressure gage, thermometer, and motor-starting controls.

Hydraulic Pumps

The most common hydraulic pumps are gear, vane, and piston. Constant-volume pumps, such as positive displacement gear or vane pumps, are used for pressures up to about 2,000 psi (136 bar). Variable-volume pumps, such as vane, radial piston, or axial piston pumps, typically provide pressures up to 5,000 psi (340 bar). Variable-volume pumps, like the vane pump shown in Figure 3, are infinitely adjustable for volume. The pressure chamber ring may be shifted from the eccentric position (as shown) where the discharge volume is maximum, to the concentric position where the discharge volume is zero. Variable-volume pumps also may be designed for reversible operation.

Hydraulic Cylinders

Pistons and cylinders convert hydraulic energy into linear mechanical motion. Cylinders usually are made of steel tubing which is bored to close tolerances and honed to a fine finish. Piston rings or rubber or

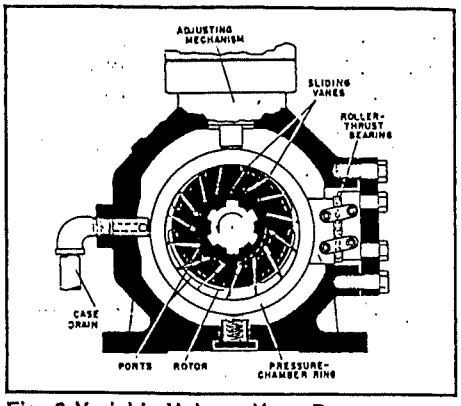


Fig. 3 Variable Volume Vane Pump

leather cups maintain a seal between the piston and cylinder bore. Piston rods often are hard chrome-plated steel, ground and polished to minimize wear of the packing gland which seals the rod. A wiper ring cleans the rod because the rod packing is very susceptible to damage from abrasive material. A protective boot or shield may be used on the rod to keep it clean. Figure 4 is a diagram of a typical double-acting cylinder.

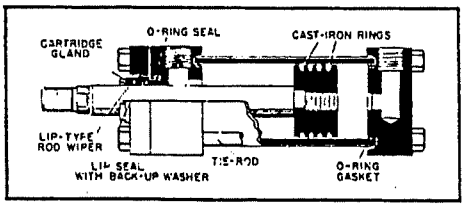


Fig. 4 Double-Acting Cylinder

Rotary Motors

Rotary fluid motors are used instead of hydraulic cylinders to convert hydraulic energy to rotary motion. Gear and vane motors are constant-volume types. Radial and axial position motors are usually constant-volume, but are available as variable-volume. In general, fluid motors resemble pumps of the same kind, but differ in certain details that affect efficiency.

Hydraulic Transmissions

A hydraulic transmission consists of an electric-motor-driven pump, rotary motor, oil reservoir, valves, and piping. The most common arrangement combines a variable-volume pump with a constant-volume motor, but the pump or motor, or both, may be variable-volume units. Hydraulic transmissions also are called adjustable-speed drives or hydrostatic drives. They provide precise control over a wide range of operating speeds. Engine-driven hydrostatic drives are used widely in mobile construction and farm equipment.

Hydraulic Fluids

Hydraulic fluids are the life blood of the hydraulic system. The hydraulic fluid transmits pressure and energy, seals close-clearance parts against leakage, minimizes wear and friction, removes heat, flushes away dirt and wear particles, and protects surfaces against rusting. Petroleum oils normally are used in hydraulic systems, but if a fire hazard exists, a suitable fire-resistant fluid should be used.

Petroleum Oils

Viscosity is the most important characteristic of petroleum oils used in hydraulic systems. Selecting the correct viscosity is essential to prevent wear, to seal internal parts of the system, and to minimize internal fluid friction. Hydraulic systems normally use oil with a viscosity range of 32 to 64 cSt at 40°C (150 to 335 SUS at 104°F) and a viscosity index (VI) of at least 85. Most builders require that the viscosity at startup temperature should not exceed 1515 cSt (7,000 SUS) to ensure flow to the pump. Some builders, however, limit the startup viscosity to 866 cSt (4,000 SUS).

In addition to correct viscosity and VI, the hydraulic oil should have good antiwear properties, high oxidation resistance, good water separating ability, good antirust properties, and good resistance to foaming.

Soluble Oil Emulsions

Water serves as a hydraulic fluid in some very large, noncritical hydraulic systems. Large forging and extrusion presses with vertical in-line pumps or special axial piston pumps, for example, operate at 2,000 to 3,000 psi (136 to 204 bar). Because water has little ability to lubricate, seal, or prevent rust, it can be mixed with one to five percent of soluble oil to form an oil-in-water emulsion for these systems. Operating temperatures, however, must be kept below 60°C (140°F) to prevent the water from evaporating

High-Water-Content Fluids — Commonly known as HWCF or 95/5 fluids, they contain two to five percent of soluble chemicals which impart some lubricity, rust protection, and wear protection for valves, packing glands, and cylinders. They work very well at pressures as high as 10,000 psi (680 bar) in reciprocating plunger pumps, or in axial piston pumps at pressures in the range of 1,000 psi (68 bar). Because their antiwear protection is limited, they are used in vane pumps up to 1000 psi (68 bar), and they are not recommended for systems with gear pumps. Again, operating temperatures must be limited to avoid excessive loss of water by evaporation. Concentration is best determined by a simple titration method which the supplier of the fluid can provide.

Fire-Resistant Fluids

Where there is a possibility that the hydraulic fluid may come in contact with a source of ignition, use fire-resistant fluids. They include synthetics, or water-containing fluids, such as water-glycol mixtures, water-in-oil (invert) emulsions, or high-water-content (95/5) emulsions.

Synthetic Fluids — Such fluids are either a straight phosphate ester or phosphate-ester-based. They have very high flash points and their viscosity is comparable to petroleum-based hydraulic fluids. Synthetic fluids have very low VIs. Pumps may have to be derated to use these fluids, and special seals and paints are required. Special engineering consideration is necessary when converting a system from petroleum-based oil to a synthetic FR fluid.

Water-Glycol Fluids — Water content of about 40 to 50 percent provides the fire resistance in glycol-based fluids. Their viscosities are comparable to petroleum-based hydraulic fluids. Operating temperatures must be kept below 60°C (140°F) to prevent water evaporation because the ratio of water to glycol controls the viscosity of the fluid. Cork seals and some paints may be affected by water-glycol fluids, and pumps may have to be derated to achieve reasonable service life with these fluids.

Water-in-Oil Emulsions — These emulsions contain about 40 percent water to provide the fire resistance. Because the oil surrounds finely divided water droplets which are uniformly dispersed in the mixture, these emulsions are commonly called "invert emulsions". This special emulsion should not be confused with conventional oil-in-water emulsions which contain about 95 percent water. Both are off-white in color.

Although the initial viscosity of water-in-oil emulsions is higher than the normal recommendation for petroleum-based oils, these fluids tend to shear down in service to approximaely the same viscosity as petroleum-based hydraulic fluids.

Pumps must be specially selected to operate with invert emulsions. Keep the operating temperature below 60°C (140°F) to prevent water evaporation which will cause a loss of viscosity. A laboratory test to break the emulsion will determine how much water should be added to increase the viscosity to the normal level.

Hydraulic Fluid Maintenance

Three maintenance objectives are essential to gaining the optimum service life of hydraulic fluids:

Keep Oil Temperatures Low — Heat develops in the fluid as it is forced through the pumps, motor tubing, and relief valves. Maintain the temperature betwee 49-65°C (120-149°F) in a conventional hydraulic system. Some variable-volume pump systems and hydraulic transmissions may operate up to 120°C (248°F). Keep systems which

operate on a water-based fluid below 60°C (140°F) to prevent the water from evaporating.

Excessive temperatures will oxidize the oil and lead to varnish and sludge deposits in the system. These deposits plug valves and suction screens. Use only premium hydraulic fluids in systems subject to high operating temperatures.

To allow heat to radiate from the system, keep the outside of the reservoir clean and the surrounding area clear of obstructions. Make sure the oil cooler is functioning properly and keep air-cooled radiators free of dirt and debris. Keep the reservoir filled to the proper level to allow enough fluid residence time for the heat to dissipate.

Oil degradation is critical in numerically controlled (NC) machine tools with electro-hydraulic servo valves. Because of space constraints, these systems typically are designed with small reservoirs and short rest times for the hydraulic oil. Operating at pressures up to 3,500 psi (240 bar), bulk oil temperatures exceed 50°C (122°F) in many machines. With minimal residence time and high system pressures, entrained air bubbles can cause extreme localized heating of the hydraulic fluid. This results in nitrogen fixation that, when combined with oil oxidation, can form deposits which will plug oil filters and cause servo valves to stick.

Conventional laboratory analysis cannot determine such contamination. The hydraulic oil in these critical machines should be monitored by the Mobil NC Hydraulic Program. This program uses special tests developed by Mobil to determine the rate of contamination and to predict oil service life.

Keep Systems Clean — Even new systems may be contaminated and should be cleaned before use. Prevent contaminants such as dirt, water, cutting fluids, and metal particles from entering the system around the reservoir cover, openings for suction and drain lines, through breather and fill openings, past piston rod packing, and through leaks in pump suction lines.

A visual inspection of the hydraulic fluid may reveal the type and degree of contamination. Take a sample of the fluid and allow it to settle overnight in a clean glass container. Inspect the sample for color, appearance, and odor. If there is no evidence of water, corrosion, or excessive accumulation of deposits or sludge, and the fluid has the color and odor of new fluid, laboratory analysis is not necessary.

Water-in-oil emulsions have a milky color; water-glycol fluids are hazy. A slight "burned oil" odor is common in conventional hydraulic systems using petroleum oils. However, a burned oil odor in an NC machine oil sample may be cause for concern. If water, soluble oil, or specific contaminants cannot be identified, take a sample for laboratory analysis.

If inspection shows that the fluid is in poor condition but the machine is operating properly, shut the unit down and drain it immediately. Clean the reservoir manually, change filters, and refill the system with new fluid.

If the machine is not operating satisfactorily and inspection reveals deposits, circulate a small amount of a special petroleum solvent cleaner with the fluid to loosen and remove the deposits. Drain the fluid while it is hot, clean the reservoir and suction screen, change the filters, and refill the system with new fluid.

Keep the Fluid Clean — Keeping hydraulic fluids clean begins with good storage and handling procedures. To prevent contamination before use, store new fluid in a protected area and dispense it in clean, dedicated containers. Clean the fill cap before removing it to add hydraulic fluid. On critical NC machines, use quick-disconnect hoses and filter all oil added to the reservoir through a 5-micron filter.

Filtration

Full-flow filters designed into the system keep the fluid clean in service. Full-flow filters have a bypass valve which allows the flow of unfiltered fluid to keep the machine in operation. Some filters have indicators or pressure gages to warn of reduced flow or a blocked filter.

Figure 5 shows a suction-line full-flow filter with a device which tells when the element needs changing or cleaning. Figure 6 shows a surface-type full-flow filter with a replaceable pleated paper element. Inspect fluid filters frequently and change or clean them before they become blocked or are bypassed.

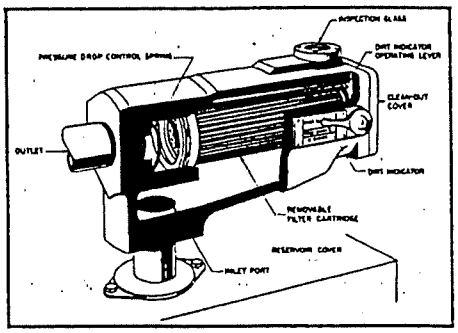


Fig. 5 Suction-Line Filter with Indicator

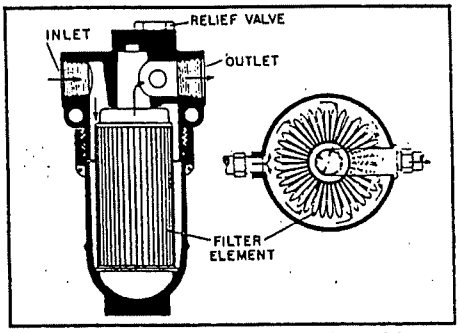


Fig. 6 Full-Flow Filter with Replaceable Element

Fire-resistant hydraulic fluids require a high standard of filtration to maintain system reliability.

Portable Filters — Portable filters supplement permanently installed system filters. Figure 7 shows a typical portable filter with a motor-driven pump which circulates fluid from the reservoir, through a fine filter, and back into the reservoir. The suction and return hoses should be connected to opposite ends of the reservoir with quick-disconnect fittings. Clean all fittings as the filter is connected to the system. Operate a portable filter for at least 24 hours on each system to ensure that the full oil charge is filtered effectively.

Portable filters are used when transferring new fluid from drums to the system. They are essential when adding new fluid to NC machines.

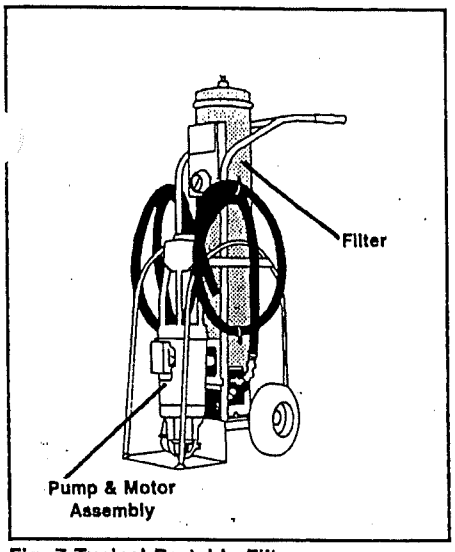


Fig. 7 Typical Portable Filter

Batch Filtration — The entire charge of fluid may be removed from large or heavily contaminated systems, reclaimed as a batch through filters or centrifuges, and reused. The disadvantage of this procedure is that the machine must be taken out of service to remove the fluid charge.

Leakage Control

Hydraulic fluid leakage is a common problem in industrial hydraulic systems. Improperly prepared joints in pipe or tubing, vibration, or worn packing or seals can cause leakage. Excessive fluid temperature will harden and crack seals and cause hoses to deteriorate.

Table 1 shows the amount of oil lost at various rates of leakage.

Table 1 Loss from Oil Leaks

Leakage	Loss in One Day, Gallons	Loss in One Year, Gallons
One drop* in 10 seconds	0.112	40.3
One drop* in 5 seconds	0.225	81.0
One drop* per second	1.125	405.0
Three drops* per second	3.75	1,350.0
Steam breaks into drops	24.00	8,640.0

*Drops approx. $^{11}/_{64}$ in. diameter

Mobil developed the Hydraulic Fluid Index (HFI) to compare total plant hydraulic fluid usage with the total capacity of all plant hydraulic systems. The average HFI of a representative sample of plants in various industries is 4.0. Ideally, an effective leakage control program can help a plant achieve and HFI of 1.0 or less.

Foaming

Air entrained in the fluid causes foaming, which may be the result of: low fluid level which allows the pump to draw in air; air leaks in the suction line piping or suction side pump seals; low fluid temperature, or fluid too viscous to maintain suction at the pump; or fluid too viscous to release entrained air bubbles. Oxidation and contamination increase the fluid's tendency to foam.

Cavitation

Entrained air is a major cause of destructive pump cavitation. The intense pressures and temperatures created by the collapse of the bubbles erode metal parts of pumps and valves, resulting in excessive wear. Pump or valve cavitation may cause irregular operation or "spongy" response of the system.

A vacuum gage on the inlet side of the pump to check suction pressure can detect cavitation. In addition, cavitation is apparent by a high-pitched whine or scream in the pump. And, the pump may sound as if there are marbles trapped in the housing.

Fluid Changeout Recommendations

These are the proper steps to follow when changing the hydraulic fluid in a system:

1. Drain system while fluid is hot to keep contaminants from settling out;
2. Empty fluid from cylinders, accumulators, and lines that might not drain properly;
3. Mop, siphon, or pump out oil left in the reservoir;
4. Wipe reservoir clean with lint-free cloths; remove rust and loose paint;
5. Replace or clean filter elements and strainers; clean filter housings;
6. Refill the system with the recommended new fluid; vent high points;
7. Check system for proper operation.

Oiler's Recommended Duties

An oiler responsible for hydraulic systems should perform these checks and inspections:

1. Check fluid level in reservoir daily; add recommended fluid (filtered if necessary), as needed; wipe around filler cap before removing; check fine mesh screen in filler cap and clean, as needed; replace screen if damaged;
2. Check filter indicators or gages daily; replace or clean filters as needed, but shut machine down and relieve system pressure before changing filters;
3. Use portable filter, when scheduled, to clean fluid;
4. Inspect reservoir breather filter at least once a week; clean or replace if dirty;
5. Visually inspect all parts of the hydraulic system at least once a week for leaks or frayed hoses; report leaks immediately;
6. Inspect fluid periodically for color, odor, foaming, and cleanliness; report any change; obtain fluid sample for analysis, if needed;
7. If plant has a fluid sample analysis program, change hydraulic fluid according to results of the analysis; if there is no analysis program, change hydraulic fluid at least once a year, or sooner if contaminted; follow above-recommended changeout procedures;
8. Refill the system with the recommended fluid; change filters; check for proper operation.

Safety Precautions

Hydraulic systems operate under very high pressures. Shut the machine down and relieve system pressure before opening any part of the system that is under pressure. Do not allow spray from any high-pressure leak to contact any part of the body, as serious injury may result. Pumps, valves, and motors may become very hot; be careful of burns. Keep hands and clothing away from moving parts of the system.

Mobil Oil Corporation
TECHNICAL PUBLICATIONS
3225 GALLOWS ROAD, FAIRFAX, VIRGINIA 22037-0001

Hydraulic Fluid And Temperature Recommendations For Industrial Machinery

Unit Type	Viscosity	Anti-wear Characteristicts
Inline Piston (Pumps & Motors)	• Viscosity Grades: 32-68 cSt (150-315 SUS) @ 40°C. (104°F) Running: 13-54 cSt (70-250 SUS) At Start Up: 220 cSt (1000 SUS) Max.	Antiwear type hydraulic oils such as: automotive crankcase oils having API letter designations "SE", "SF", "SG", or "SH" per SAE J183
Angle Piston Vane (Except MHT) Gear (Pumps & Motors)	• Viscosity Grades: 32-68 cSt (150-315 SUS) @ 40°C. (104°F) Running: 13-54 cSt (70-250 SUS) At Start Up: 860 cSt (4000 SUS) Max.	
◆ MHT (High Torque/ Low Speed Vane Motors	• Viscosity Grades: 32-68 cSt (150-315 SUS) @ 40°C. (104°F) Running: 13-54 cSt (70-250 SUS) At Start Up: 110 cSt (500 SUS) Max.	

cSt: Centistokes

SUS:Saybolt Universal Seconds

◆ Adhere to the oil recommendations for MHT units rather than the pumps involved.

• Viscosity Grades are the standard viscosity grades listed in ASTM D-2422 titled "Viscosity System for Industrial Fluid Lubricants", but any intermediate viscosity is acceptable.

Selection Of Viscosity Grades

Use the following tabulation to determine the temperature extremes between which the viscosity grades can be used to remain within Vickers start-up and running viscosity range recommendations.

The SAE 10W grades fall between the 32 cSt (150 SUS) and 46 cSt (215 SUS) grades and the SAE 20-20W approximates the 68 cSt (315 SUS) grade.

Viscosity Grade 40°C (104°F)	Start Up 860 cSt (4000 SUS)	Start Up 220 cSt (1000 SUS)	Start Up 110 cSt (500 SUS)	Running 54 cSt (250 SUS) Max.	Running 13 cSt (70 SUS) Min.
32 cSt (150 SUS)	-12°C (11°F)	6°C (42°F)	14°C (58°F)	27°C (80°F)	62°C (143°F)
46 cSt (215 SUS)	-6°C (22°F)	12°C (54°F)	22°C (72°F)	34°C (94°F)	71°C (159°F)
68 cSt (315 SUS)	0°C (32°F)	19°C (66°F)	29°C (84°F)	42°C (108°F)	81°C (177°F)

General Data

Oil in hydraulic systems performs the dual function of lubrication and transmission of power. It constitutes a vital factor in a hydraulic system, and careful selection should be made with the assistance of a reputable supplier. Proper selection of oil assures satisfactory life and operation of the system components with particular emphasis on hydraulic pumps and motors. Generally, oil selected for use with pumps and motors are acceptable for use with valves. Critical servo valves may need special consideration.

Some of the factors especially important in the selection of oil for use in an industrial hydraulic system are:

1. The oil must contain the necessary additives to ensure high antiwear characteristics. Not all hydraulic oils contain these in sufficient amounts.
2. The oil must have proper viscosity to maintain adequate sealing and lubricating quality at the expected operating temperature of the hydraulic system.
3. The oil must have rust and oxidation inhibitors for satisfactory system operation.

Two specific types of oil meet the requirements of modern industrial hydraulic systems:

1. Antiwear type industrial hydraulic oils. A new generation of industrial hydraulic oils containing adequate quantities of antiwear compound is recommended by Vickers for general hydraulic service.

Hydraulic Fluid And Temperature Recommendations For Industrial Machinery

These oils are generally developed and evaluated on the basis of pump wear tests such as the Vickers 35VQ25A and ASTM D-2882. These oils offer superior protection against pump and motor wear and the advantage of long service life. In addition, they provide good demulsibility as well as protection against rust.

2. Automotive type crankcase oils having API letter designation "SE", "SF", "SG", "SH", per SAE J183.

   The above classes of oils in the 10W and 20-20W SAE viscosity ranges are for severe hydraulic service where there is little or no water present. The only adverse effect is that the "detergent" additive tends to hold water in a tight emulsion and prevents separation of water, even on long time standing.

   Automotive type crankcase oils generally exhibit poorer shear stability which could result in some loss of viscosity during their service life. More shear stable multiple viscosity industrial grade hydraulic fluids will provide improved viscosity control.

Over the years, Vickers hydraulic oil recommendations have been based on oils that: (1) provide adequate wear protection, (2) have proper viscosity, and (3) are sufficiently stable to withstand the chemical, thermal and mechanical stresses of severe hydraulic service. There are automotive crankcase oils that are outside of the API SE, SF, SG and SH classes that meet the above basis of recommendation.

With these oils, it is highly desirable to have acceptable data from pump wear tests (35VQ25A and ASTM-D-2882). In exceptional cases where the requirements of speed, pressure, temperature and ambient conditions exceed the recommendations for industrial machinery, please refer to the oil recommendations. These fluids must also pass the Vickers 35VQ25 pump test.

Viscosity

Viscosity is the measure of the fluid's resistance to flow. The selection of a hydraulic oil of specific viscosity range must be based on the needs of the system, limitations of critical components, or proper performance of specific types of units. Vickers recommends that certain maximum and minimum viscosity ranges of the oil at start-up and during running be maintained. (See chart) Very high viscosities at start-up temperatures can cause noise and cavitational damage to pumps. Continuous operation at moderately high viscosities will tend to hold air in suspension in the oil as well as generate higher operating temperatures. This can cause noise and early failure of pumps, motors and erosion of valves. Low viscosities result in decreased system efficiency and impairment of dynamic lubrication which causes wear.

Choose the proper oil viscosity for your particular system so that over the entire temperature range encountered, the start-up viscosity and the running viscosity range shown in the chart is met. This is important, and assurance should be obtained from your oil supplier that the viscosity of the oil being used will not be less than the minimum recommended at maximum oil temperature encountered.

A number of antiwear hydraulic oils containing polymeric thickeners (V.I. improvers) are available and are used for low temperature application. The temporary and permanent viscosity loss of some of these oils at operating temperature may adversely affect the life and performance of components. Be certain you know the extent of loss of viscosity (shear stability) of polymer containing oils under hydraulic service before using them so that you do not operate below the recommended minimum viscosity. The selection of an oil with good shear stability, is recommended for low temperature applications.

Temperature

To obtain optimum service life from both the oil and the hydraulic system, operate between 49°C (120°F) and 54°C (130°F). The maximum oil temperature normally recommended is 66°C (150°F).

MHT motors are permitted to operate at higher temperatures, but this is permissible by meeting special application requirements. For this service, oils should have antiwear characteristics required to pass pump test on page 20. Pumps can be approved to operate MHT motors at these higher temperatures. Contact your Vickers representative for recommendations.

Cleanliness

Thorough precautions should always be observed to ensure that the hydraulic system is clean.

1. Clean (flush) entire system to remove paint, metal chips, welding shot, lint, etc.
2. Filter each change of oil to prevent introduction of contaminant into the system.
3. Provide continuous oil filtration to remove sludge and products of wear and corrosion generated during the life of the system.
4. Provide continuous protection of system from entry of airborne contamination by proper filtration of air through breathers.
5. During usage, proper oil filling of reservoir and servicing of filters, breathers, reservoirs, etc. cannot be over emphasized.

Sound Level

Noise can be an indication of system problems. Fluid selection and the condition of that fluid in service will affect the noise levels of your systems.

Some of the major factors affecting the fluid conditions that cause the loudest noises in a hydraulic system are:

1. Very high viscosities at start-up temperatures can cause pump noises due to cavitation.
2. Running with moderately high viscosity fluid will impede the release of entrained air. The fluid will not be completely purged of such air in the time it remains in the reservoir before recycling through the system.

3. Aerated fluid can be caused by ingestion of air through the pipe joints of inlet lines, high velocity discharge lines, cylinder rod packings, or by fluid discharging above the fluid level in the reservoir. Air in the fluid will cause abnormal noise and wear in your system.

4. Contamination fluids can cause excessive wear of internal pump parts which may result in increased sound levels.

5. Systems using water based fluids are susceptible to noise created by vaporization of the fluid if excessive vacuums and temperatures are encountered.

Fire Resistant Fluids

Hydraulic systems using fire resistant fluids require special engineering considerations. For applications using fire resistant fluids, consult Vickers Guide to Alternative Fluids, Bulletin 579, for the specific component being used or contact your local Vickers representative for assistance.

Proper design, operation and maintenance of fluid power systems is of paramount importance to obtain the optimum performance of fire resistant fluids such as synthetics, water glycol and water-in-oil emulsion types.

Additionally, you should consult your fluid supplier for specific fluid maintenance and application data on their fluid.

Water Based Fluids

General Data

To assure an effective emulsion or solution, the water should not have excessive hardness or have an acid nature, and it should be distilled or deionized with less than 300 parts per million hardness.

Hard water containing excessive mineral content, such as calcium and iron, may cause deposits in the hydraulic system or result in additive separation or emulsion breaking.

Proper maintenance of water containing fluids requires periodic testing for pH, oil and water concentrations. The pH should be maintained at 8.0-9.5 in accordance with the supplier's recommendation. If the pH number exceeds these limits, discard the fluid. Always use a premixed fluid to replenish the system. The recommended storage or operating temperature range of water containing fluids is 4°C (39°F) to 49°C (120°F), unless otherwise specified by the fluid supplier.

Types Of Water Based Fluids

Invert Emulsions

Invert emulsions are inverted water-in-oil emulsions consisting of a continuous oil phase surrounding finely divided water droplets that are uniformly dispersed throughout the mixture.

Water-Glycol Fluids

Water-glycol fire-resistant fluids are typically water and diethylene glycol mixtures. They have approximately 40% water content.

Oil-In-Water Fluids

Oil-in-water fluids are emulsions of oil and water. When preparing these mixtures, the soluble oil should always be added to the water while maintaining good fluid agitation. The water should never be added to the soluble oil. Do not mix soluble oil brands.

Filters

Many Vickers standard indicating type inlet filters and return line filters are approved with water-based fluid types.

A reduction of predicted life of hydraulic components should be expected when using water-based fluid types.

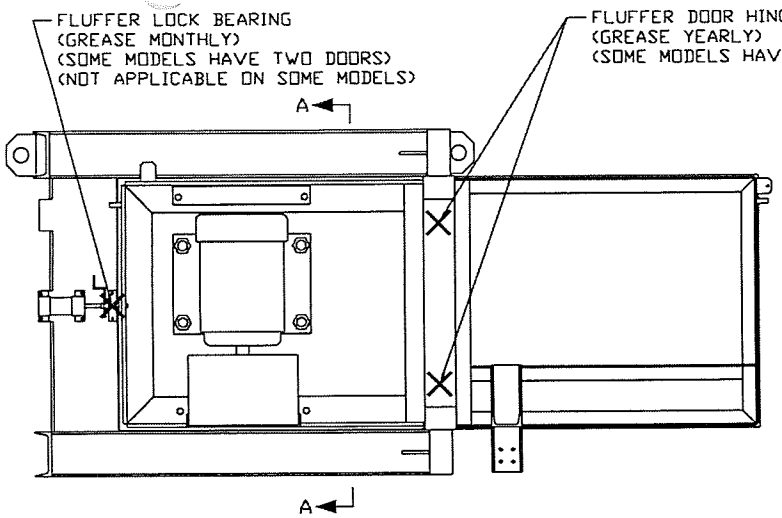
Synthetic Fluid Type

Phosphate Ester

Phosphate ester type fluids are manufactured from chemically produced esters. These types of fluids require fluorocarbon seals. Consult your fluid supplier for the types of seals which are compatible.

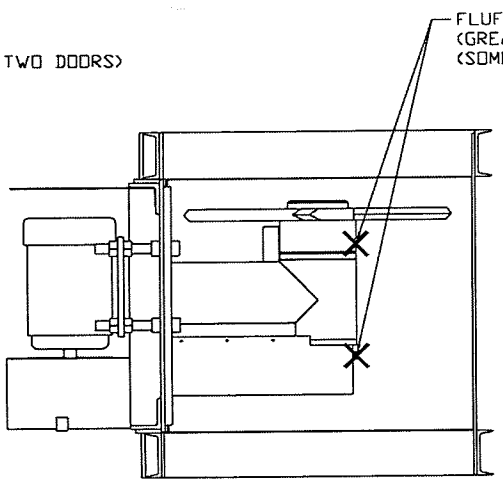
Environmental Hydraulic Oil

If you have equipment that operates in environmentally sensitive areas, you may consider use of more environmentally aware fluids. These fluids perform well in our hydraulic systems but may require extra caution in order not to exceed their performance capabilities.

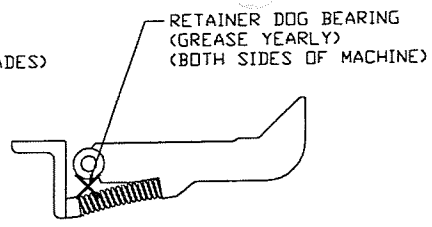


FLUFFER GREASE FITTING LOCATIONS

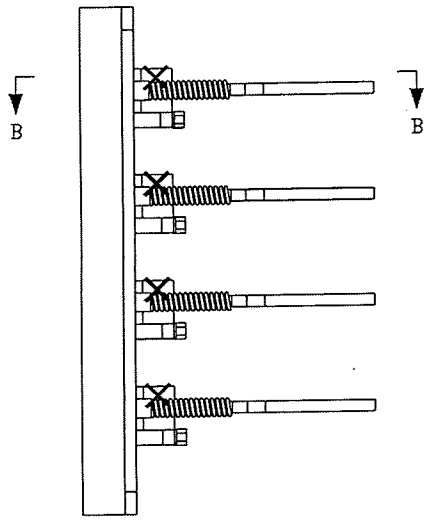
(BALERS WITH FLUFFERS ONLY)



FLUFFER SECT. A-A

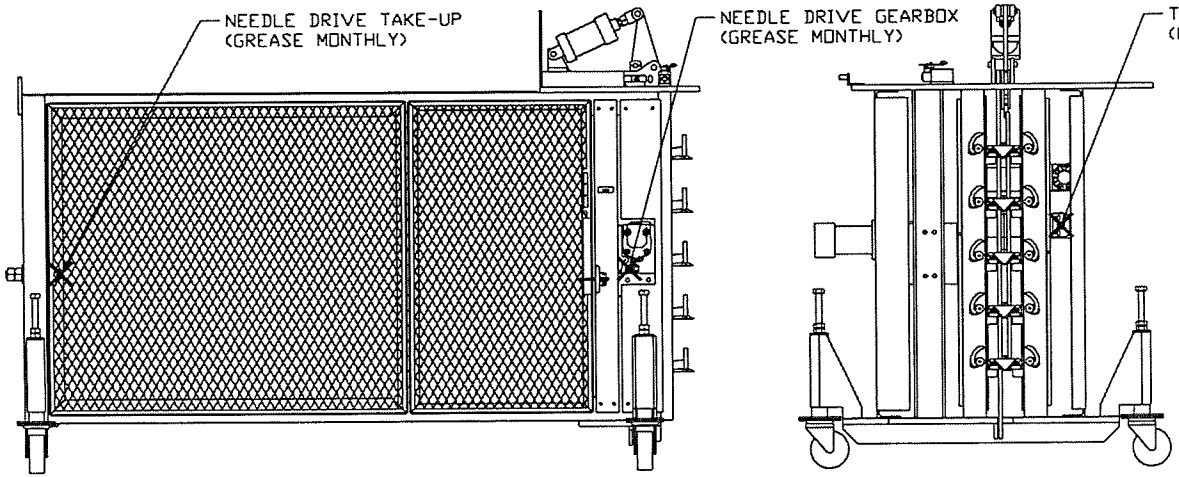


RETAINER DOG SECT. B-B



ENLARGED VIEW RETAINER DOG BOX

(LARGE MODEL BALERS ONLY)



AUTO-TIER GREASE FITTING LOCATIONS

(BALERS WITH AUTO-TIER ONLY)

ELECTRIC MOTORS

INCLUDING: MAIN MOTOR(S) & FLUFFER MOTOR(S)

GREASE MOTOR BEARINGS (ONE EACH END) ONE PUMP OF GREASE EVERY YEAR BASED ON (8) HOURS PER DAY USAGE.

EXP: IF MOTOR IS RUN (24) HOURS PER DAY GREASE EVERY (4) MONTHS.

DO NOT OVER GREASE

DJS	9-23-96	A	FLUFFER WAS GREASE MONTHLY

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

DRAWN BY MAH | DATE 02-15-95 | SCALE | HOLD ON

TITLE: RECOMMENDED LUBRICATION

SHEET 1 OF 1 | REV A

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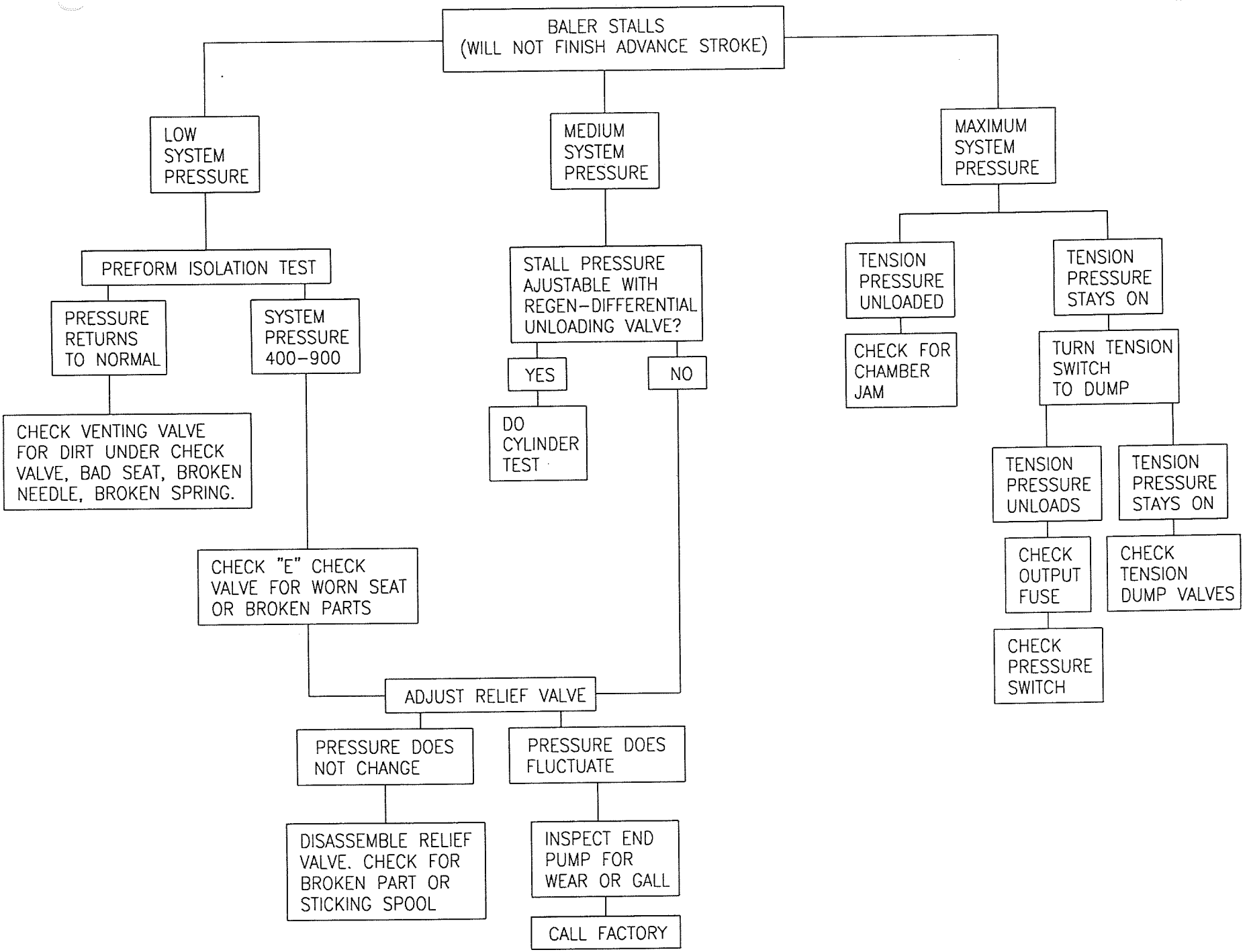


(REV 1-14-94) 760.dwg

TROUBLESHOOTING INSTRUCTIONS
PACAT (ELECTRICAL)
PATHFINDER

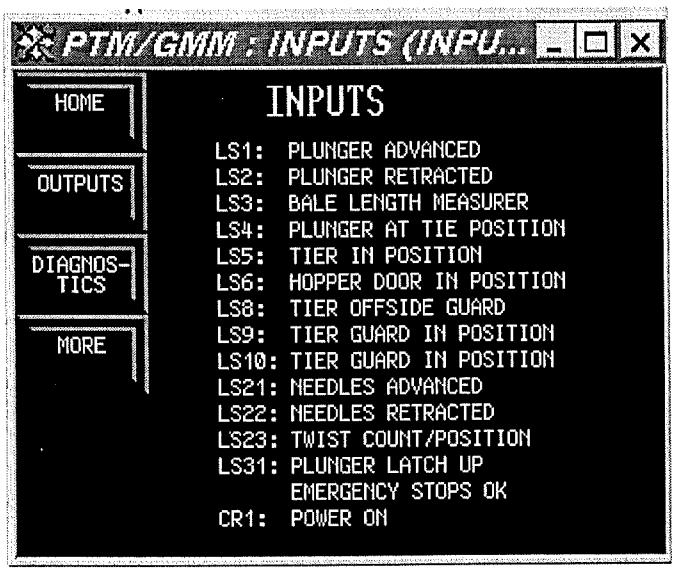
I) When maintenance is to be performed or personnel are to be in the baler:
A) Stop the baler
B) Turn BALER key switch to OFF and remove key
Then: **LOCK OUT POWER AND TAG OUT MAIN POWER SOURCE FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT.**

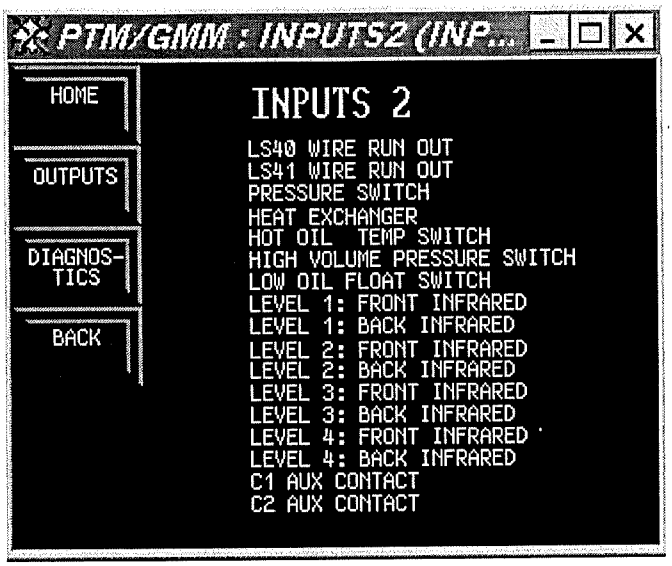
TROUBLE	PROBABLE CAUSE	POSSIBLE REMEDY
1. Baler motor will not Start	1A. Baler not on	Start Baler
	1B. Hopper door or customer access open	Close hopper door or customer access
	1C. Output fuse to starter is blown.	Replace output fuse located in PLC box
	1D. Starter overloads tripped	Check and reset overloads
	1E. Motor Failed	Repair or replace motor
2. Plunger will not advance in HAND MODE	2A. Not in manual mode	Touch HAND on any screen to enter HAND MODE
	2B. Safety guard is open or tier is not in position.	On the INPUTS screen check that inputs for LS-5, LS-8, LS-9, LS-10, LS-22, and on latch style balers LS-31 are made. Correct as required.
	2C. Plunger is at LS-1	Not a problem
	2D. On the OUTPUTS screen check the PLUNGER ADV output. If the output is on the output fuse to fourway valve may be blown.	Replace output fuse located in PLC box
	2E. If the PLUNGER ADV output is ON, and the output fuse is good, the fourway valve may be defective.	Repair or replace the fourway valve.
	2F. Problem may be due to a malfunction of the hydraulic system.	Repair as required
3. Plunger will not retract in HAND MODE	3A. Not in manual mode	Touch HAND on any screen to enter HAND MODE

	3B. Safety guard is open or tier is not in position.	On the INPUTS screen check that inputs for LS-5, LS-8, LS-9, LS-10, LS-22, and on latch style balers LS-31 are made. Correct as required.
	3C. Plunger is at LS-2	Not a problem
	3D. On the OUTPUTS screen check the PLUNGER RET output. If the output is on the output fuse to fourway valve may be blown.	Replace output fuse located in PLC box
	3E. If the PLUNGER RET output is ON, and the output fuse is good, the fourway valve may be defective.	Repair or replace the fourway valve.
	3F. Problem may be due to a malfunction of the hydraulic system.	Repair as required
4. Baler will not go into a TIE CYCLE	4A. LS-4 not Made	See the TIER TROUBLESHOOTING guide in the auto-tie section of the baler manual.
5. No Pressure to the tying unit	5A. Not in tie cycle	No malfunction or put baler in tie cycle,
	5B. LS-4 not made	See the TIER TROUBLESHOOTING guide in the auto-tie section of the baler manual.
	5C. Safety guard is open or tier is not in position.	On the INPUTS screen check that inputs for LS-5, LS-8, LS-9, LS-10, LS-22, and on latch style balers LS-31 are made. Correct as required.
	5D. On the OUTPUTS screen check the AUXILARY output. If the output is on the output fuse to supply valve may be blown.	Replace output fuse located in PLC box
	5E. Problem may be due to a malfunction of the hydraulic system.	Repair as required

INPUTS

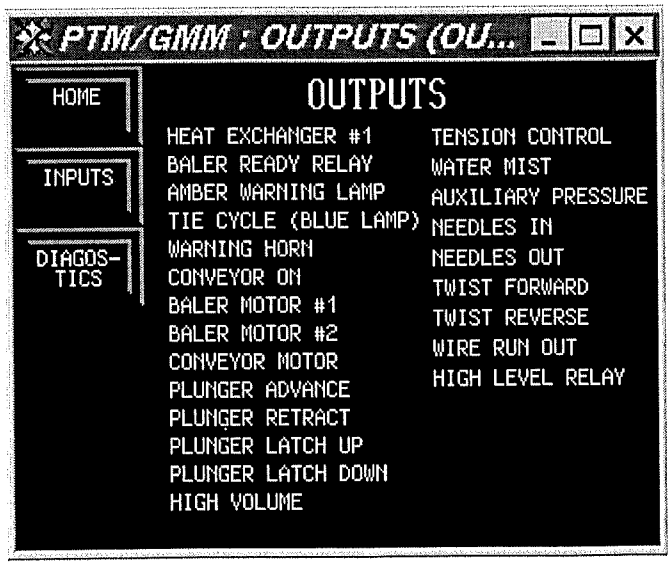
This screen shows a overview of the PLC inputs. It tells the operator what inputs are on or high. If the word is white, it means it is off. If it is green, the input is on or active. This can be used to tell if all of your limit switches are working correctly or if an infrared eye is not blocked, etc. The MORE button will give you a second page of inputs.



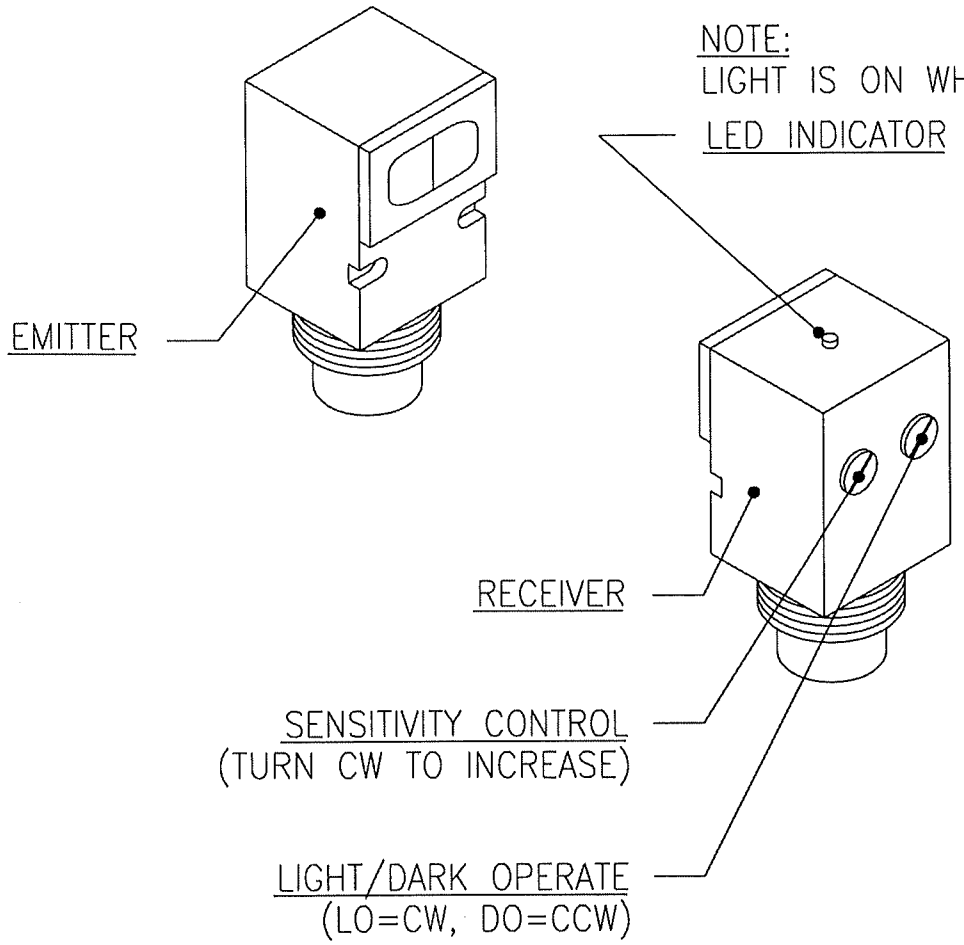


OUTPUTS

This screen is similar to the INPUTS page. It is a diagnostic tool that tells you what PLC outputs are active. I.e. If your heat exchanger output is shown as on and you can physically see that the heat exchanger is not on, you may have a problem.



INFRARED SENSORS



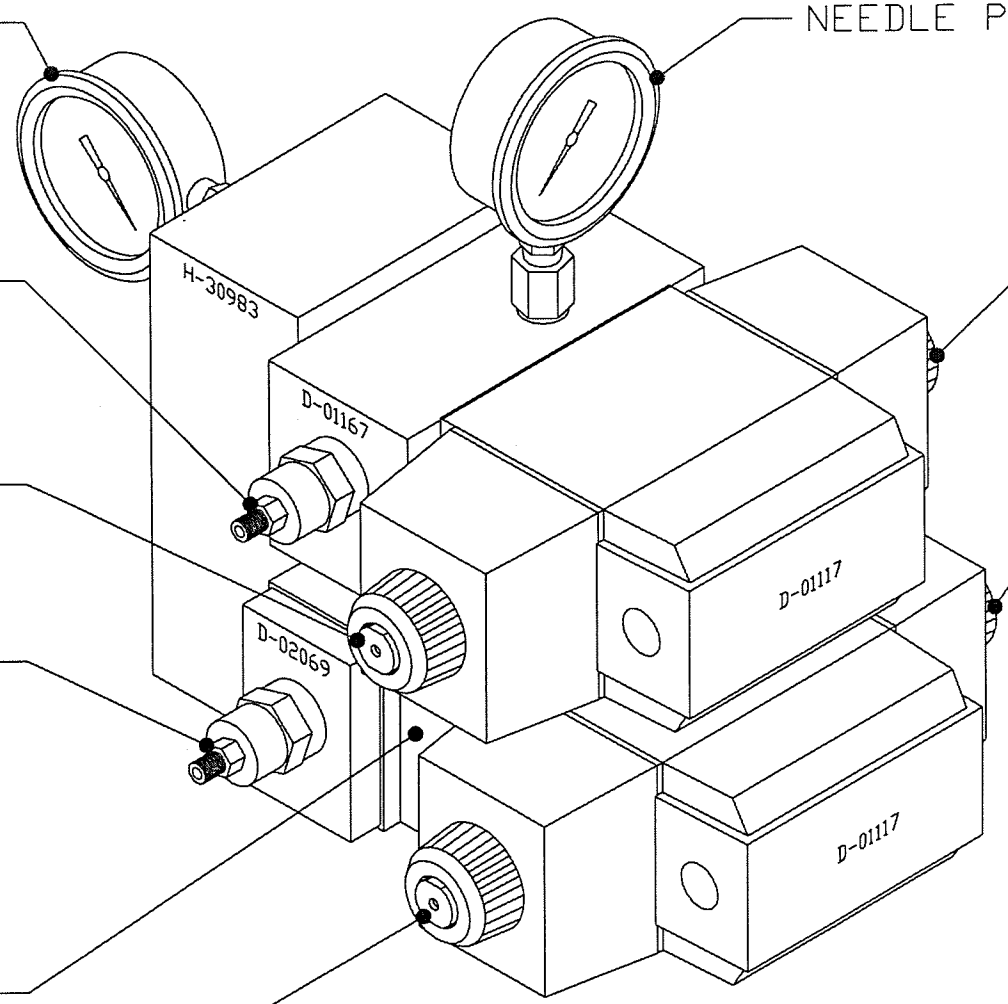
INFRARED REPLACEMENT

A. TURN OFF POWER TO BALER
B. UNSCREW QUICK DISCONNECT
C. UNMOUNT BAD INFRARED SENSOR
D. ADJUST SETTINGS FOR NEW RECEIVER
   1. REMOVE SCREWS FOR POT ACCESS
   2. SET SENSITIVITY POT TO MAX. (FULLY CLOCKWISE)
   3. SET LIGHT/DARK POT TO DARK OPERATE (FULLY COUNTER-CLOCKWISE)
E. MOUNT NEW SENSORS
F. SCREW-IN QUICK-DISCONNECT

INFRARED ALIGNMENT

A. SHOOT THE INFRARED THROUGH ITS HOLE
B. MOVE RECEIVER UNTIL RED INDICATOR LIGHT ON THE RECEIVER IS NOT LIT

770.DWG



TIER PRESSURE
(CUT & TWIST)

NEEDLE PRESSURE

NEEDLE PRESSURE
ADJUSTMENT
SET @ 1500 PSI

NEEDLES OUT
SOLENOID

NEEDLES IN
SOLENOID

TWIST FORWARD
SOLENOID
(CUT)

TIER PRESSURE
ADJUSTMENT
SET @ 1800 PSI

CHECK VALVE
(D-02136)

TWIST REVERSE
SOLENOID
(OPEN CUTTER)

(WM SERIES)
(8043)
(4430)
(10*67)
(12*67)
(13*67)

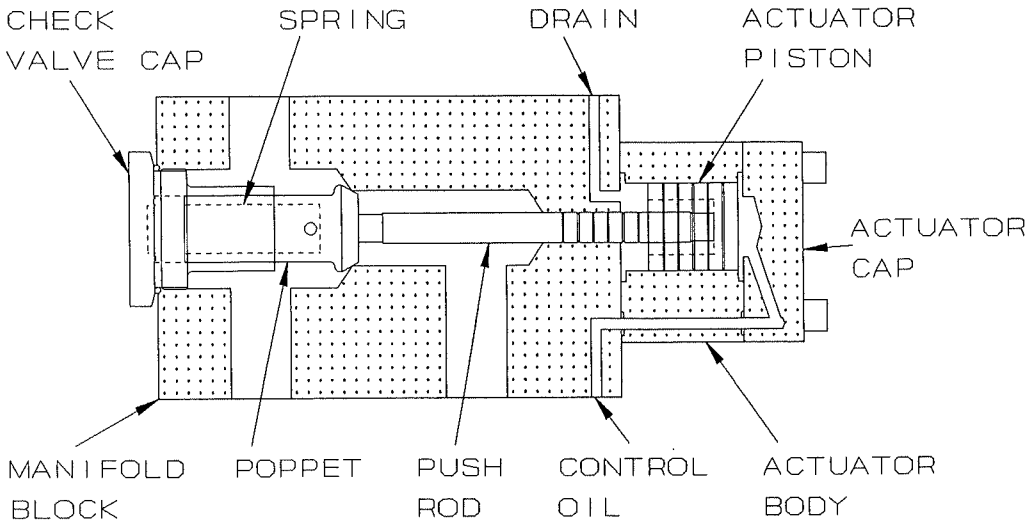
AMERICAN BALER COMPANY

TITLE

TIER MANIFOLD SETTINGS

1101.DWG

THE PILOT OPERATED CHECK VALVE



The above arrangement is typical of the check valves "B", "C", and "D" in the hydraulic circuit diagram. Note that oil can "free flow" from right to left simply by deflecting the check valve spring. However, from left to right the flow is stopped until control oil is directed to the actuator piston to drive the poppet off its seal.

Check valves "A" and "F" are the same arrangement except that the differential and high-volume unloading valves are substituted for the actuator cap. In these cases the control oil must reach the pressure setting of the respective valve before it is directed to the actuator piston.

To check for freeness of the mechanism, remove the actuator cap, actuate the piston with your thumb and see that is returns. (Some pistons have helper spring under them. This spring must be removed for this check).

It is seen that if the push rod is too long, the check valve will be held open, allowing oil to pass the check valve in the closed position. This condition can result in time with deeper seating of the check valve and can considerably effect overall efficiency of the baler. To check for this condition hold the actuator body firmly against the block. If the push rod holds the piston flush with the open face of the actuator body or beyond, remove the rod and grind the length so the piston is approximately 1/16" below the surface with the check valve closed as shown.

HIGH VOLUME UNLOADING VALVE
2" CHECK VALVE ("F" CHECK VALVE)

The high volume pump gives the plunger speed during low pressure movement of the plunger.

The unloading of the large pump cartridge is monitored by a pressure switch mounted on the end of the hydraulic tank. The pressure switch is set at 900 PSI. During advance and retract of the main plunger, a 115 volt signal is sent to the unloading 4 way valve. As the pressure rises to 900 PSI, the pressure switches sends a signal to the computer to unload the high volume pump so that the motor is not overloaded.

The normal at rest condition of the unloading valve is zero voltage.

If the high volume valve fails to unload during plunger cycle the motor will draw high amps or stop turning.

If the high volume valve does not engage the pump, the plunger speed will be cut in half.

Trouble shooting:

Check the input from the pressure switch.

Check the output to the 4 way valve.

Check the over-ride pin on the 4 way, must be spring loaded and smooth acting.

Contact the factory for further instructions.

TESTING THE MASTER CYLINDER

Bad cylinder wear, piston wear, piston rings worn or sticking in piston grooves, or any combination of these will result in oil passing the piston and returning to tank when working pressures above the setting of the differential unloading valve are reached in the advanced stroke.

The net result, if severe, is a full "stall" condition in the last 8 to 12 inches of advance travel of the platen in this portion of the stroke. If pressure is adjustable with the differential unloading valve, this is a strong indication of failure at the piston. Quite frequently, you can hear oil passing the piston.

To make a positive test of the cylinder for this type of malfunction, the procedure is as follows:

1. If a leak is determined, an estimate of the rate should be determined before calling the factory for recommendations. This only requires a reasonable measure of the gallons coming from the hose in a given time.

Note: The hole at the manifold where the rod hose is removed may be left open through this test, personnel and equipment should be kept clear of the open port. Any appreciable flow from this hole will indicate a leak of check valve "B". Do not under any circumstances use the "retract" function with the rod hose removed.

If the hydraulic tank is above the manifold block, consult the factory for further instructions.

1. Baler in hand control.
2. Fill the baler feed chamber with material.
3. Decrease the main relief valve setting at zero.
4. Advance the main plunger into the material. Increase the relief valve setting to 700 p.s.i. while holding the advance control button.
5. Turn the motor "off". Remove the main cylinder return hose at the manifold. Loosen the bottom hose fitting to allow the hose to swivel down into a clean 5 gallon bucket. Retighten the bottom hose fitting.
6. Turn the baler "on". The operator pushes the "advance" button and watches the main pressure gauge. 700 p.s.i. should be present for the length of the test. A second person watches the hose and the main plunger.

7. A good cylinder will produce one gush of oil into the bucket. The plunger will move about 2". A defective cylinder will produce one gush of oil, then continue to flow oil greater than a drizzle. Hold the "advance" button for 10 seconds.

THE DIFFERENTIAL UNLOADING VALVE
(1" Unloading Valve)

This valve senses the pressure in the system and controls the utilization of oil being discharged from the rod end of the main cylinder during the advance.

Examination of the circuit drawing shows that with check valve "A" closed, the rod end oil flows through Check Valve "B" to join the pump oil contributing to the speed of the cylinder advance. As the platen meets the work load, system pressure rises, and at the setting of the Differential Unloading Valve the spool shifts and control oil is directed to open Check Valve "A", thus pressure gauge will give an indication of the operation of this valve. Pressure will climb on advance into load to the valve setting, drop to about one-half, and climb again as the platen continues into the load.

If the spool of the Differential Unloading Valve fails to shift or if the setting is high, the full range of pressure may be available, but only half the available force is applied to the work. Until the Check Valve "A" opens, pressure is equal on both sides of the piston.

If the spool of the Differential Unloading Valve fails to reset (it is spring returned), Check Valve "A" will open immediately at start of the advance stroke. Speed of the advance stroke of the platen will be reduced to about one-half. Check for freeness of the spool and for dirt in the center hole of the spool.

If Check Valve "A" sticks in the open position, the "retract" of the cylinder will be very weak, hesitant, or not available at all as the pump delivery has the election of going direct to tank. Check for freeness of the actuator piston and of the push rod.

THE HIGH VOLUME UNLOADING CIRCUIT
(Pressure Switch / 4-way Style)

The unloading valve is unloaded and the high volume oil is returned to the tank when the baler is in neutral. During an advance or retract stroke the High Volume output on the controller is enabled and the valve shifts allowing high volume oil to flow into the cylinder. The high volume pressure switch senses the pressure in the system and unshifts the high volume 4-way valve to permit the oil from the high volume pump to flow to tank. Thus, at this pressure, no power is required to drive the high volume pump and full power of the motor is available to drive the low volume (high pressure) pump in the higher pressure ranges.

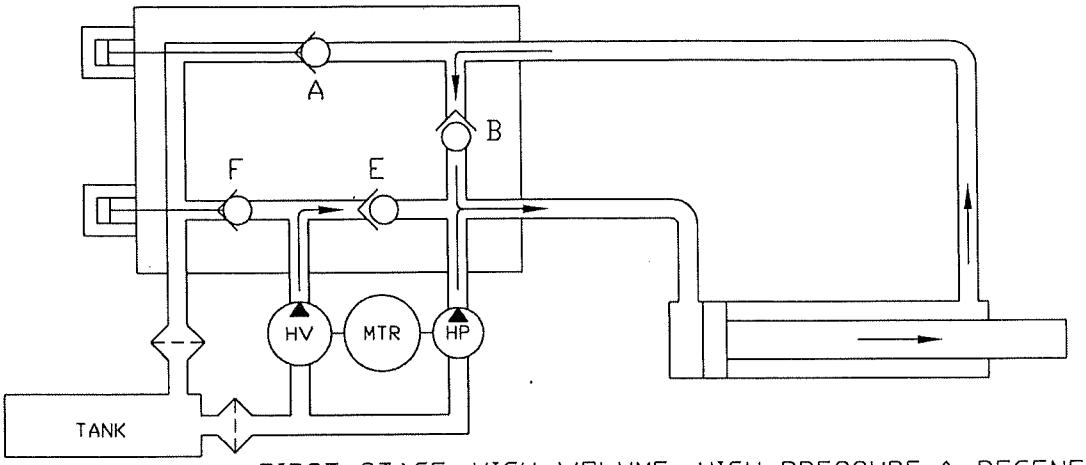
Proper setting of the valve can best be determined with an ammeter on one of the motor leads. Observe the ammeter closely as the plunger advances into the load. It should rise to approximately the rated amperages specified on the motor nameplate, then abruptly drop with the shift of the valve. There will also be a marked decrease in the advance speed of the plunger at this point, as flow of oil to the cylinder is reduced by considerably more than half.

The valve can be set by pressure if an ammeter is unavailable. The setting will be in the pressure range of 500 to 900 psi. Refer to the manifold settings page of this manual for the proper setting. The pressure drop should not be confused with that which will also appear at approximately 1000 psi with the shift of the regenerative Differential Unloading Valve.

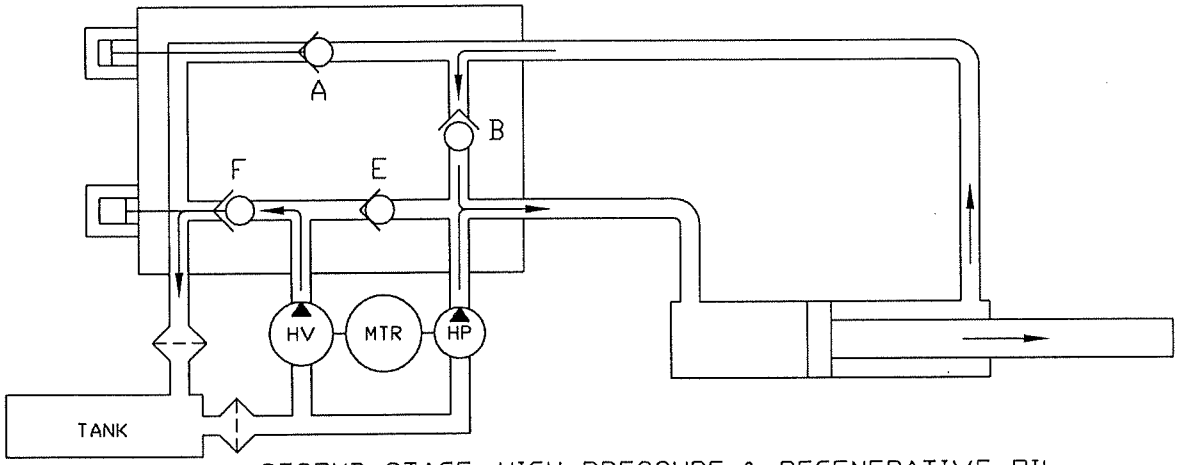
If the High Volume Unloading Pressure Switch is set too high or fails to unshift, the first evidence to appear will be in overloading of the motor, which can trip the heaters or burn the fuses. Check for a faulty pressure switch. Check for a sticking or broken 4-way valve. Check for freeness of the actuator piston and push rod.

If the unloading valve fails to shift, the plunger travel will be very slow, less than half of normal speed. Check the output fuse at the controller. Check the 4-way for a faulty coil and freeness of the spool. Check for freeness of the actuator piston and push rod.

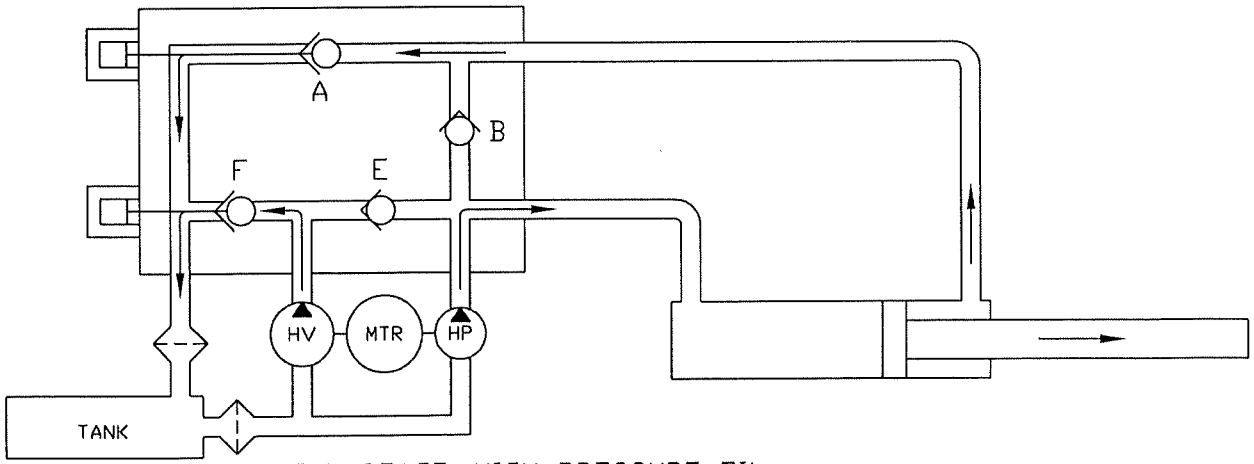
HYDRAULIC INSTRUCTION SHEET



FIRST STAGE: HIGH VOLUME, HIGH PRESSURE & REGENERATIVE OIL
MOVE THE CYLINDER FORWARD



SECOND STAGE: HIGH PRESSURE & REGENERATIVE OIL
MOVE THE CYLINDER FORWARD



THIRD STAGE: HIGH PRESSURE OIL
MOVES THE CYLINDER FORWARD

730.DWG

SERVICE ASSISTANCE

The American Baler Company Product Field Service personnel are Factory-Trained Specialists. Their workmanship and the new replacement parts used in the repair carry the same warranty as a factory repaired unit.

The Field service Personnel are available to provide technical support for your baling operations. They will work with your maintenance personnel either over the phone or in your plant as a working supervisor to correct any problems with your baling equipment.

Under no circumstances will The American Baler Company honor charges made by the customer for labor by his personnel unless specifically authorized by an officer of The American Baler Company. To quickly obtain this service, call the Factory Service Department or write the below address for more information on world-wide service. Charges for domestic service beyond our normal warranty are made in accordance with the schedule given below.

SCHEDULE OF FIELD SERVICE CHARGES

1. All travel will be billed at $ 35.00 per hour

2. SERVICE CHARGES AT CUSTOMER'S PLANT:

   a. Weekdays .....$70.00 per hour

   NOTE: A day constitutes up to 8 working hours, any time after 8 hours is billed at $105.00 per hour

   b. Saturdays .....$105.00 per hour

   c. Sundays or Holidays,including travel time.$140.00 per hour.

3. EXPENSE CHARGES:

   For actual travel and living expenses incurred by our employee from the time he leaves his home base to time of his return to that base.

3. MINIMUM SERVICE CHARGE AT CUSTOMER'S PLANT.....$280.00
   for 0-4 hours including travel time

4. PURCHASE ORDER:

   All requests for field service must be confirmed by a purchase order.

EFFECTIVE NOVEMBER 1997
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

THE AMERICAN BALER COMPANY
P.O. BOX 29
BELLEVUE, OHIO 44811
(419) 483-5790

HYDRAULIC OIL SPECIFICATIONS

1. The oils listed below meet the requirements of Denison's severe duty axial pump and vane pump Specification HF-0. They also meet the equivalent Vickers Specification I-286-S,

2. Consult American Baler Company Engineering Department if another oil type other than listed below is requested.

3. American Baler Company recommends Texaco Rando HD-46 or Mobil DTE-25 for warm weather and indoor heated building applications.

4. American Baler Company recommends Texaco Rando HD-32 or Mobil DTE-24 for cold weather and unheated indoor applications.

5. Oil interchangeability list:

	Cold Weather	Warm Weather
Texaco	Rando HD-32	Rando HD-46
Arco	Duro AW-32	Duro AW-46
Exxon	Nuto H32	Ntuo H46
Gulf	Harmony AW-32	Harmony AW-46
Mobil	DTE-24	DTE-25
Shell	Tellus 32	Tellus 46
Sun	Sunvis 832	Sunvis 846
Castrol	Tribol 943/32-AW	Tribol 943/46-AW

ADDITION OF NEW OIL

New hydraulic oil is less than clean. There are cases where hydraulic oil has been tested directly from a new drum having 50 times the ISO recommended level of contaminates. The largest contaminates usually being ferrous-oxide (rust). These contaminates could give the hydraulic system problems with venting valves, unloading valves, relief valves and 4-way valves. The oil should be filtered with a 10 micron filter or better as it is added to the reservoir. Then the baler filters need to be run for two to three hours before operation of the baler. In the case of the 8043's, 75hp Economy's, 12,000's and the NSB's the centrifugal pump needs to be run two to three hours before starting the main motors. Balers without centrifugal pumps need to have their baler pump run for two to three hours before cycling the baler.

COLD WEATHER BALER OPERATION

1. Reservoir oil temperature must be maintained at a minimum of 50 degrees Fahrenheit during idle hours.

2. Use a cold weather grade of hydraulic fluid. (Refer to "Hydraulic Oil Specifications" in your manual.)

3. At initial start up dry cycle baler several times to warm up the cylinder seals.

4. While in the hand mode, place the baler in a tie cycle and run the plunger latch down by pulsing the "NEEDLES IN" switch. This will flow hydraulic oil to the tier allowing the tier manifold, valves and lines to warm up. Allow oil to flow for several minutes or until warm.

5. Bale lengths may need to be shortened due to cold weather affects on wire elongation and malleability properties.

6. When temperature is below 0 degrees Fahrenheit, we recommend that system pressure be reduced by 15 percent. The tension dump pressure switch may also need to be lowered.

7. We do not recommend the operating of the baler at temperatures below minus 20 degrees Fahrenheit.

AMERICAN BALER COMPANY

Hydraulic Contamination Control

Why contamination control?

It is estimated that 70 percent of all hydraulic component failures are due to poor hydraulic fluid condition. So by practicing good contamination control the hydraulic components on your baler will last longer saving you time & money.

What is contamination?

A contaminant is any foreign material that has a harmful effect on the fluid's performance in a system. The contaminant could be in the form of a solid, gas, or liquid.

Can I determine the condition of the oil by visual observation?

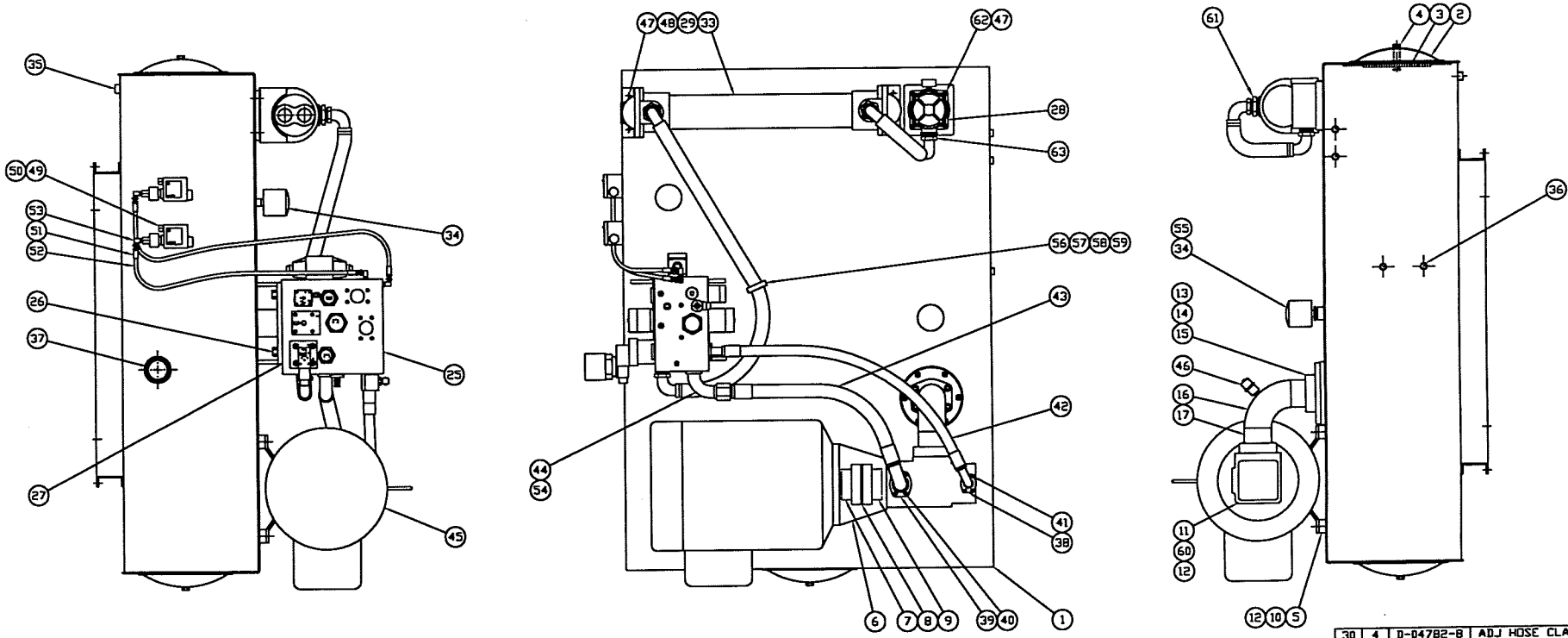
No not really. A grain of table salt is about 100 microns, and a human hair is about 74 microns, and the human eye can see down to about 40 microns. Most of the harmful contaminants in hydraulic fluid are below 40 microns.

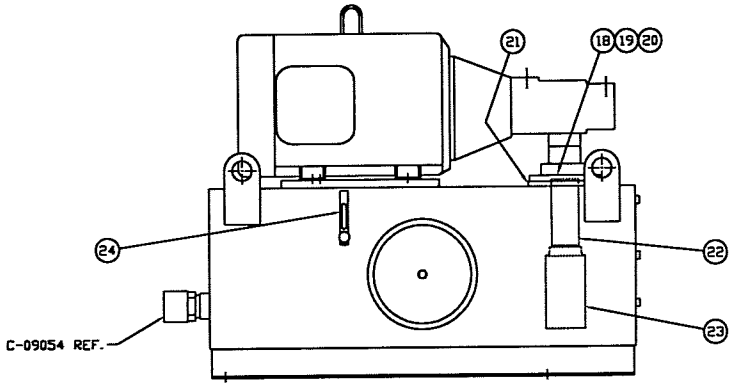
So how do I check for contamination?

We at American Baler recommend that the oil in your balers hydraulic tank be tested on a regular basis. The D-09243 Oil Sample Kit may be purchased from us. You will take a sample of your oil, and send it to the lab specified in the kit. They will return the results back to you along with their recommendations.

How often should I have my oil checked?

1 Shift Operation	Quarterly
2 Shift Operation	Every Other Month
3 Shift Operation	Monthly

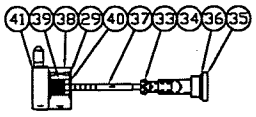




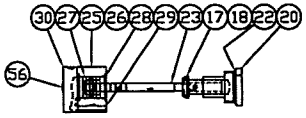
300 GALLON TANK - WATER TO OIL

63	1	D-08790	#24 SAE TO 1 1/2 HOSE 90° FTG
62	4	678-0-1-0-6-0	3/8-16 HEX NUT
61	2	668-0-1-0-32-12	2" x 1 1/2" RED BUSH
60	2	613-0-1-0-10-12	5/8-11 x 1 1/2 HHCS
59	2	675-0-1-0-5-0	5/16 LOCK WASHER
58	2	613-0-1-0-5-28	5/16-18 x 3 1/2 HHCS
57	1	H-25612-A	CLAMP MOUNT
56	1	D-08446-A	1 1/2" HOSE CLAMP
55	1	668-0-1-0-20-6	1 1/4 x 3/4 RED BUSHING
54	2	222-02-225	O RING 1 7/8 x 2 1/8 x 1/8
53	2	D-08280-A	HOSE ADAPTER
52	8FT	D-08276-A	3/16 IN. I.D. HOSE
51	4	D-08278-A	3/16 HOSE COUPLING
50	4	626-0-1-0-4-6	1/4-20 X 3/4 SHCS
49	2	C-04361-A	PRESSURE SWITCH 3000 PSI
48	4	613-0-1-0-6-6	3/8-16 x 3/4 HHCS
47	8	675-0-1-0-6-0	3/8 LOCK WASHER
46	1	D-09226-A	VACUUM INDICATOR
45	1	C-00367	MTR 7SHP 1800RPM 230/460
44	1	D-08596-A	1 1/2" HOSE ADAPTOR
43	1	D-08650-A	1 1/2" HOSE ASSY
42	1	D-08649-A	1" HOSE ASSY
41	8	626-0-1-0-6-10	3/8-16 X 1 1/4 SHCS
40	8	626-0-1-0-8-12	1/2-13 X 1 1/2 SHCS
39	4	D-08114-A	1 1/2" FLANGE HALF
38	4	D-08112-A	1" FLANGE HALF
37	1	669-0-1-0-40-0	2 1/2" SQ HD PIPE PLUG
36	2	669-0-1-0-8-0	1/2" SQ HD PIPE PLUG
35	1	669-0-1-0-12-0	3/4" SQ HD PIPE PLUG
34	2	D-09231	BREATHER
33	1	D-05018	HEAT EXCH (REF)
32	3	D-08421-A	1 1/2 90D (FORMRITE FTG)
31	10	023-VP210-24-0	1 1/2 I.D. RETURN HOSE
30	4	D-04782-B	ADJ HOSE CLAMP
29	2	H-04860-A	HEAT EXCH MOUNTING PAD
28	1	D-09224-A	RETURN FILTER
27	1	H-03975-A	GASKET
26	4	613-0-1-0-12-12	3/4-10 X 1 1/2 HHCS
25	1	H-37482-B	MANIFOLD ASSY
24	1	D-09196-A	GAUGE OIL LEVEL-TEMP
23	1	D-09242-A	SUMP FILTER SR-9
22	1	64443-A	TANK PIPE
21	1	64444-B	GASKET
20	6	675-0-1-0-8-0	1/2 LOCK WASHER
19	6	613-0-1-0-8-12	1/2-13 X 1 1/2 HHCS
18	1	64442-B	TANK FLANGE
17	.5	826-1-28-40-0	3 1/2 SCH 40 PIPE
16	1	731-9-1-0-56-0	3 1/2 PIPE WELD ELBOW
15	2	222-02-241	3 7/8 X 4 1/8 X 1/8 O'RING
14	8	626-0-1-0-10-16	5/8-11 X 2 SHCS
13	2	D-08270-A	3 1/2 WELD FTG
12	6	675-0-1-0-10-0	5/8 LOCK WASHER
11	1	D-00162-A	T6EC-62-28-1R03 PUMP
10	4	613-0-1-0-10-10	5/8-11 X 1 1/4 HHCS
9	1	D-04661-A	1 1/2 D X 3/8 K COUPLING
8	1	D-04604-A	DRIVE LUG
7	1	D-04667-A	2 3/8 D X 5/8 K COUPLING
6	1	D-04859-A	PUMP ADAPTOR
5	2	64441-A	MOTOR MOUNT
4	2	613-0-1-0-10-28	5/8-11 X 3 1/2 HHCS
3	2	H-08732-A	REINF. PLATE
2	2	H-08733-A	COVER PLATE
1	1	64639-D	TANK WELDMENT

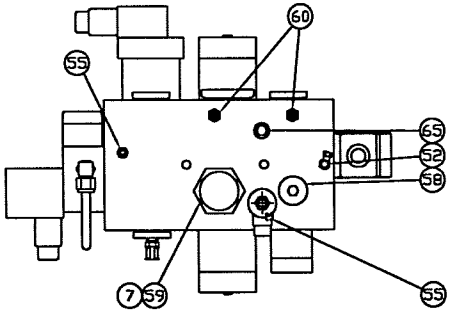
DRN	D.J.S.	THE AMERICAN BALER COMPANY	
DATE	2-21-03	FORMRITE BELLEVUE, OHIO 44811	ABACO
SCALE	1=8	SIZE 75HP TANK ASSY	DWG NO. 69500
MATERIAL	WATER-OIL		REV -

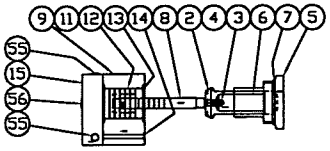


CHECK VALVE A

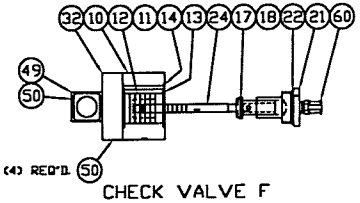


CHECK VALVE B

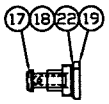




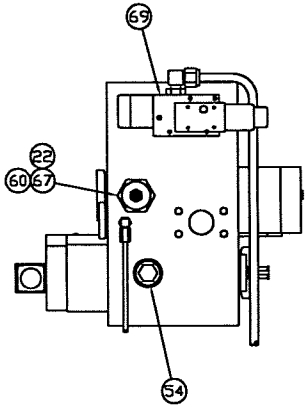
CHECK VALVE C & D



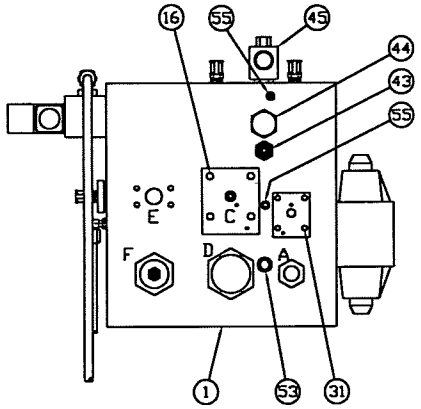
CHECK VALVE F

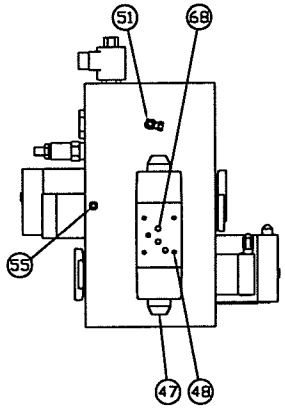


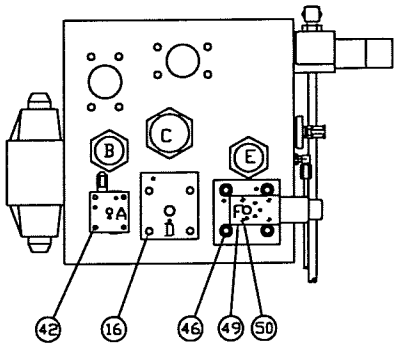
CHECK VALVE E

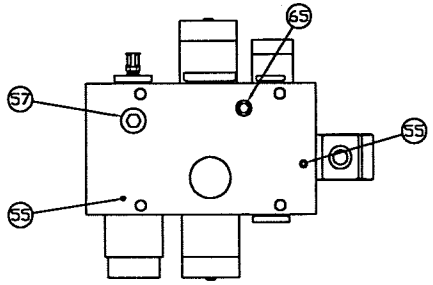


1 1/4 NPT ORIFICE BELOW









FOR MANUAL USE

70	1	H-03975	GASKET
69	1	H-17839-ND	AUTO TIE SUPPLY VALVE
68	4	222-01-014	"O" RING 1/2 X 5/8 X 1/16
67	1	H-31561-A	#24 SAE TO 1/4 PIPE
66			
65	2	004-R771-12-0	#12 PLUG
64			
63			
62			
61			
60	4	D-09204	GAUGE NIPPLE 1/4 NPT
59	1	H-21602-A	#32 SAE PLUG
58	1	004-R771-24-0	#24 PLUG
57	1	004-R771-20-0	#20 PLUG
56	3	004-R771-6-0	#6 PLUG
55	15	004-R771-4-0	#4 PLUG
54	1	669-24-1-0-24-0	1 1/2 SOC HD PIPE PLUG
53	1	669-24-1-0-12-0	3/4" SOC HD PIPE PLUG
52	1	D-08279	#16MORB x 1/4FNPT SW 90° FTG
51	1	004-SWR2000-4-4	#4MORB x 1/4FNPT SW 90° FTG
50	4	626-17-1-0-0-10	#10-24 x 1 1/4 SHCS
49	1	D-01081	4-WAY DIR VALVE
48	4	626-0-1-0-4-12	1/4-20 X 1 1/2 SHCS
47	1	D-01063-A	4 WAY VALVE
46	4	626-0-1-0-8-32	1/2-13 X 4 SHCS
45	1	D-06004	CART. 2-WAY VALVE N.O.
44	1	D-06007	CART. VALVE EV16-S34
43	1	D-06006	CART. RELIEF RV10-22
42	4	626-0-1-0-5-22	5/16-18 X 2 3/4 SHCS
41	1	H-08357-A	1" UNLOADING VAL ASSY
40	2	222-02-216	"O" RING 1 1/8 X 1 3/8 X 1/8
39	1	H-02967-A	PISTON
38	1	H-03282-B	ACTUATOR BODY
37	1	H-03964-A	ACTUATOR ROD
36	1	H-01855	#16 SAE "O" RING
35	1	H-04503-A	1" CHK VAL CAP
34	1	H-01827-A	1" CHK VAL SPRING
33	1	H-01825-A	1" CHK VAL POPPET
32	1	H-32243-C	2" ELECT UNLOADER CAP
31	4	626-0-1-0-6-24	3/8-16 X 3 SHCS
30	1	H-03834-B	CHECK ACTUATOR CAP
29	6	222-01-010	"O" RING 1/4 X 3/8 X 1/16
28	2	222-02-220	"O" RING 1 3/8 X 1 5/8 X 1/8
27	1	H-03761-A	CHECK ACTUATOR PISTON
26	1	H-03762-A	SPRING
25	1	H-03283-B	1 1/2" ACTUATOR BODY
24	1	H-04520-A	ACTUATOR ROD
23	1	H-03963-A	ACTUATOR ROD
22	4	H-01857	#24 SAE "O" RING
21	1	H-04513-A	1 1/2" CHK VAL CAP
20	1	H-04497-A	1 1/2" CHK VAL CAP
19	1	H-01823-A	1 1/2" CHK VAL CAP
18	3	H-01824-A	1 1/2" CHK VAL SPRING
17	3	H-01822-A	1 1/2" CHK VAL POPPET
16	8	626-0-1-0-8-36	1/2-13 X 4 1/2 SHCS
15	2	H-03757-B	CHECK ACTUATOR CAP
14	8	222-01-012	"O" RING 3/8 X 1/2 X 1/16
13	6	222-02-226	"O" RING 2 X 2 1/4 X 1/8
12	3	H-03437-A	CHK ACT PISTON
11	3	H-03439-A	SPRING
10	1	H-32007-B	2" UNLOADING ACT BODY
9	2	H-03435-B	ACTUATOR BODY
8	2	H-03962-A	ACTUATOR ROD
7	3	222-02-228	"O" RING 2 1/4 X 2 1/2 X 1/8
6	2	H-01821-A	2" CHK VAL SPRING
5	2	H-01820-A	2" CHK VAL CAP
4	2	H-03737-A	WASHER - SPRING SUPPORT
3	2	H-03679-A	DECOMPRESSION POPPET
2	2	H-03736-A	2" DECOMP POPPET
1	1	H-33017-D	MANIFOLD BLOCK

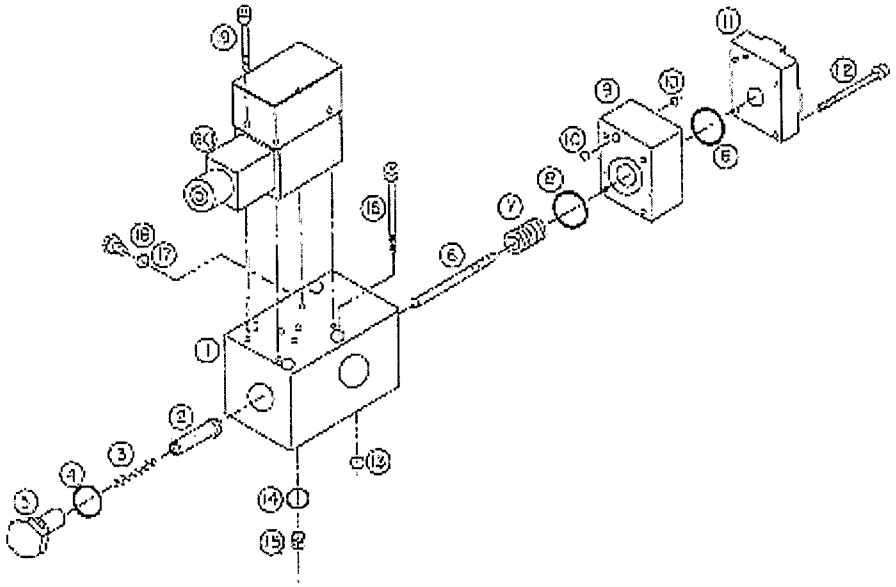
AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

DJS 2-20-03 1=4

MANIFOLD BLOCK ASSEMBLY

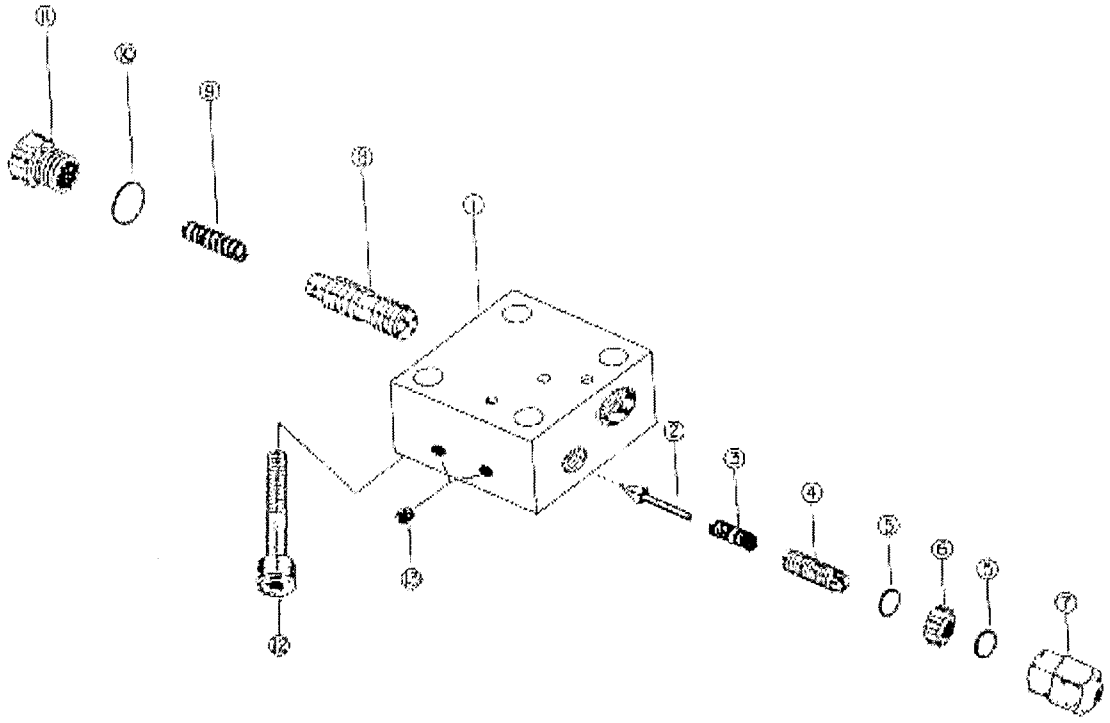
H-37482

AUTO TIE SUPPLY VALVE



ITEM	QTY.	Part NO.	DESCRIPTION
1	1	H-13699	Valve Body
2	1	H-01828	Poppet
3	1	H-01830	Spring
4	1	H-01853	O Ring
5	1	H-01829	Cap
6	1	H-13698	Rod
7	1	H-02966	Piston
8	2	222-02-214	O Ring
9	1	H-02964	Body
10	2	222-02-010	O Ring
11	1	H-13732	Cap
12	4	626-0-1-0-4-18	¼-20 X 2 1/4 SHCS
13	1	222-01-013	O Ring
14	1	222-01-116	O Ring
15	1	H-14569	Pipe Plug Orifice
16	4	626-0-1-0-4-20	¼-20 X 2 ½ SHCS
17	1	H-01848	O Ring
18	1	004-R77-4-0	O Ring Plug
19	4	626-18-1-0-0-14	#10-32 X 1 ¾ SHCS
20	1	D-01081	4-Way Valve

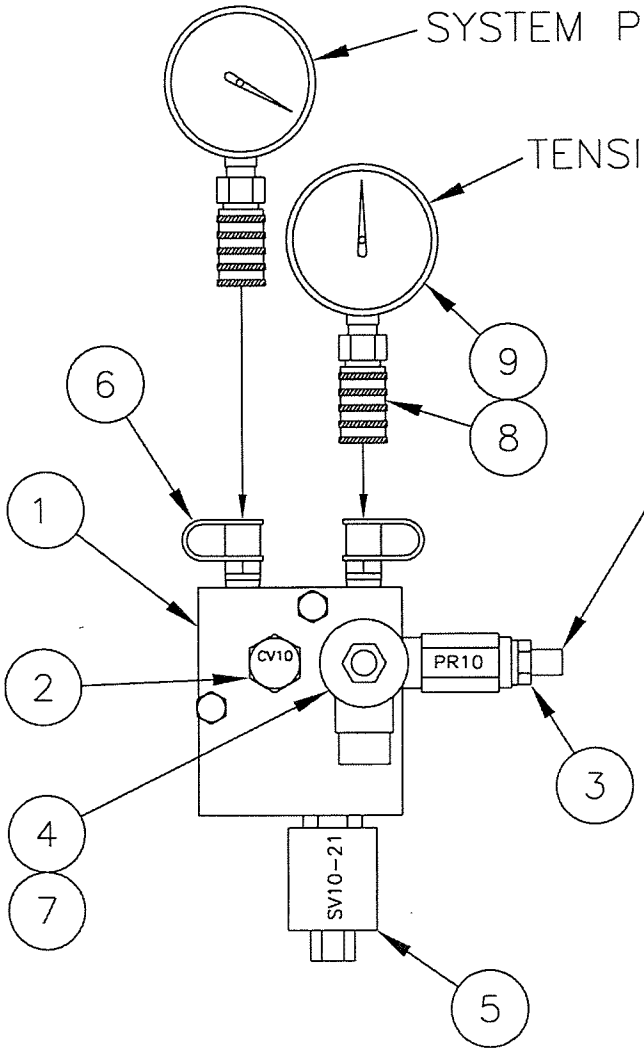
H-8357
1" UNLOADING VALVE ASSEMBLY



ITEM	QTY.	Part NO.	DESCRIPTION
1	1	H-04495	Unloading Valve Body
2*	1	H-03431	Needle
3*	1	H-03063	Spring
4	1	H-03292	Adjusting Screw
5*	2	222-01-012	O Ring
6	1	H-01070	Hex Jam Nut (Special)
7	1	H-01071	Acorn Nut (Special)
8	1	H-03291	Spool
9*	1	H-03062	Spring
10*	2	H-01850	O Ring
11	2	004-R771-4-0	O Ring Plug
12	4	626-0-1-0-5-22	5/16-18 X 2 ¾ SHCS
13	2	669-24-1-0-1-0	1/16 NPT Pipe Plug
*	1	H-08942	Repair Kit

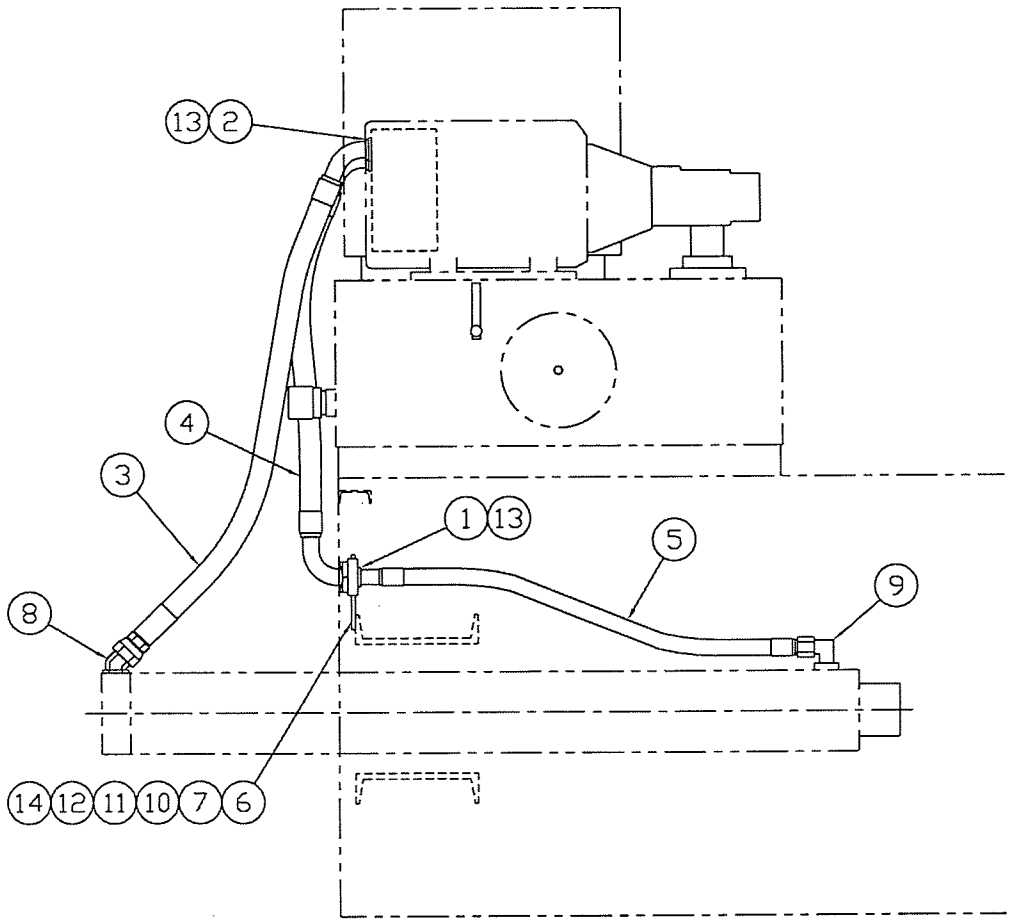
* = Included in Repair Kit

TENSION CONTROL MANIFOLD



ITEM	QTY	PART NO.	MATERIAL/DESCRIPTION
9	2	D-09066	PRESSURE GAUGE - 3000PSI
8	2	D-09202	QUICK DISCONNECT
7	1	D-06005-2	ORIFICE DISK .1094"
6	2	D-09204	GAUGE NIPPLE
5	1	D-06004	CARTRIDGE 2-WAY VALVE N.O.
4	1	D-06003	CARTRIDGE 2-WAY VALVE N.C.
3	1	D-06002	CARTRIDGE PRESS RED VALVE
2	1	D-06000	CARTRIDGE CHECK VALVE
1	1	H-32216	TENSION CONTROL MANIFOLD

TENSION CONTROL | 936.DWG



	ITEM	QTY	PART NO.	MATERIAL/DESCRIPTION
Ⓐ	14	2	694-0-1-0-8-0	1/2 BEVELED WASER
	13	16	626-0-1-0-8-12	1/2-13 x 1 1/2 SHCS
Ⓐ	12	2	613-0-1-0-8-18	1/2-13 X 2 1/4 HHCS
	11	2	678-0-1-0-8-0	1/2-13 HEX NUT
	10	2	675-0-1-0-8-0	1/2 LOCK WASHER
	9	1	020-2062-24-24	FTG #24SAE-#24JIC 90°
	8	1	031-V5BX-32-0	FTG #32SAE-#32JIC 45°
	7	1	H-25663-B	APAPTOR PLATE
	6	1	H-04594-A	BRACKET
	5	1	D-08655	1 1/2" HOSE ASSY R.E
	4	1	D-08654	2" HOSE ASSY MFLD-R.E.
	3	1	D-08653	2" HOSE ASSY B.E.
	2	6	D-08124	2" SPLIT FLANGE HALF
	1	2	D-08114	1 1/2" SPLIT FLG HALF

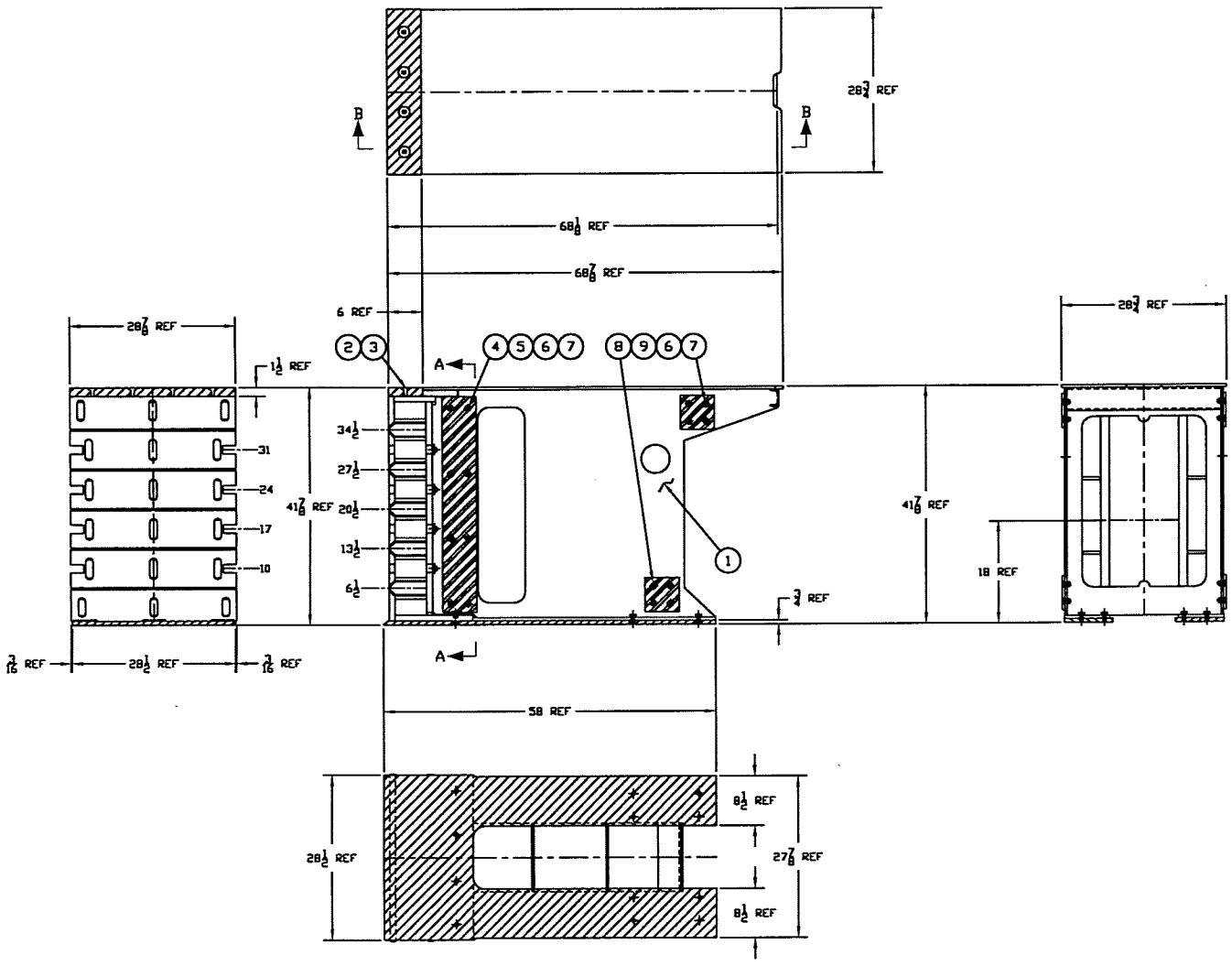
ECN NO.	BY	DATE	NO.	REVISION
NCN	MH	4-8-92	A	ADDED ITEM 14: ITEM 12 WAS 2"LG.

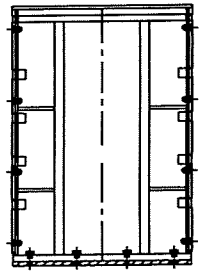
DRAWN BY: DJS
DATE: 2-17-92
SCALE:
MATERIAL:
USED ON: 5042 5029

THE AMERICAN BALER COMPANY
ECONOMY BELLEVUE, OHIO 44811 AMBACO

TITLE: 5042&29 75HP CYL HOSE ASSY

SHEET OF: 64736
REV.: A





SECT. A-A

9	4	68711-16	PAD WEAR SHIM (16 GA.)
8	4	63061-A	WEAR PAD (1/2 UHMW)
7	32	679-8-1-0-8-8	1/2-13 LOCK WASHER
6	32	645-8-1-0-8-12	1/2-13 x 1-1/2 LG FSHCS
5	2	68710-16	FRONT WEAR SHIM (16 GA.)
4	2	63060-A	WEAR STRIP
3	4	645-8-1-0-16-32	1"-8 x 4 LG FSHCS
2	1	63936-A	PLUNGER KNIFE
1	1	69321-D	5029 U-SLIDE PLUNGER WELD.

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

TOLERANCES UNLESS SPECIFIED
FRACTIONAL ±1/16
ANGLES ±1°

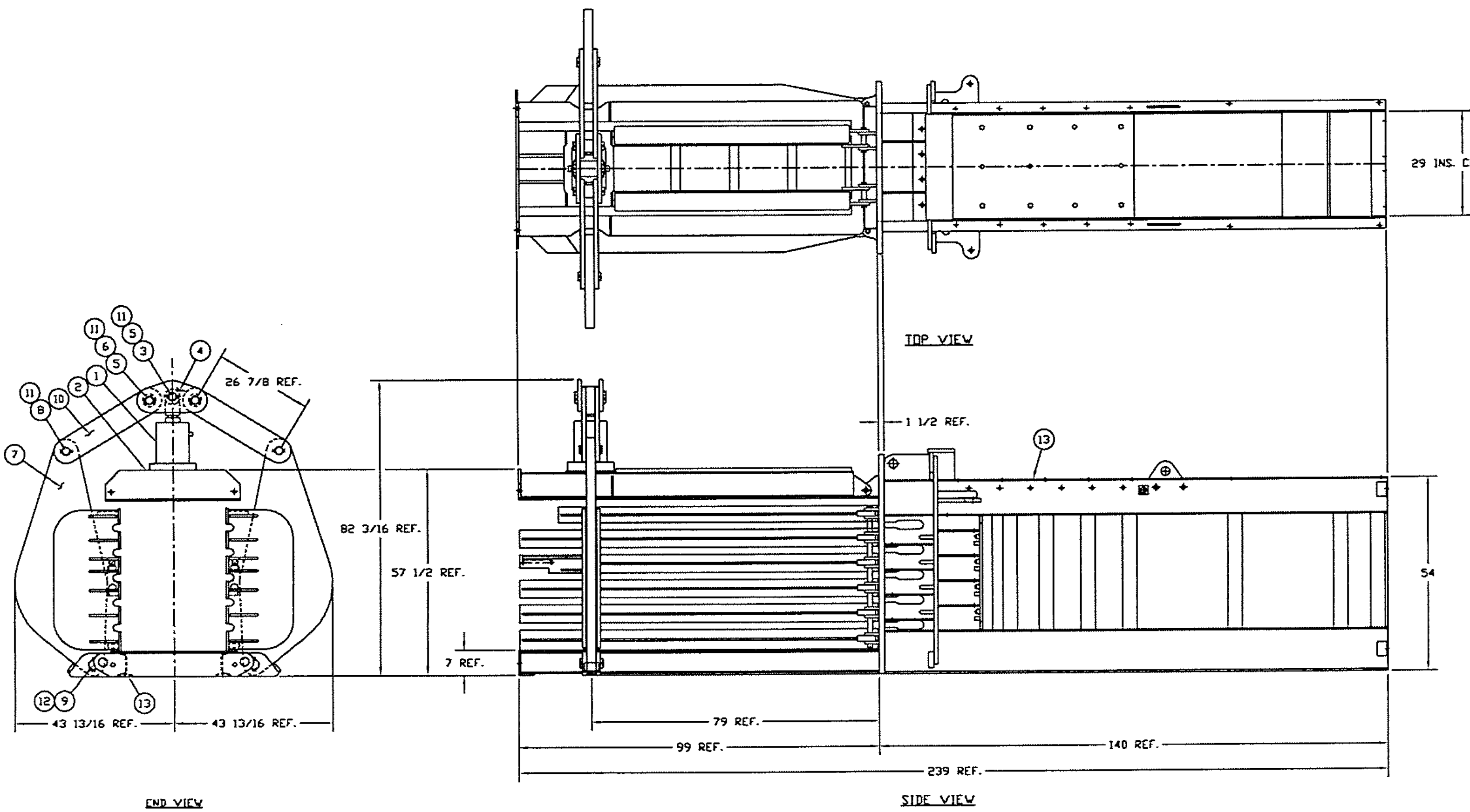
DRAWN BY MJG | DATE 12-5-02 | SCALE 1=10

MATERIAL 5029 U-SLIDE

TITLE
5029 U-SLIDE
PLUNGER ASSEMBLY

SHEET 1 OF 1

DWG. NO. 69322



38	2	64489-A	CONSOLE MOUNTING PLATE
37	4	H-22046-A	MOUNTING PLATE
36	2	678-1-1-0-22-0	1 3/8-12 HEX NUT FINE THREAD
35	2	678-0-1-0-24-0	1 1/2-6 HEX NUT
34	4	678-0-1-0-16-0	1-8 HEX NUT
33	12	678-0-1-0-12-0	3/4-10 HEX NUT
32	2	675-0-1-0-24-0	1 1/2 LOCK WASHER
31	2	675-0-1-0-22-0	1 3/8 LOCK WASHER
30	4	675-0-1-0-16-0	1 LOCK WASHER
29	12	675-0-1-0-12-0	3/4 LOCK WASHER
28	16	675-0-1-0-10-0	5/8 LOCK WASHER
27	8	661-0-1-0-2-0	1/8 NPT X 45 DEG GREASE FITTING
26	8	64976-A	RETAINER DOG SHAFT
25	4	645-0-1-0-16-32	1-8 X 4 FSHCS
24	12	645-0-1-0-12-24	3/4-10 X 3 FSHCS
23	1	63980-C	SHEAR BAR
22	2	63122-A	SHIM
21	4	63121-A	SHIM
20	2	63068-B	PLUNGER GUIDE BAR
19	16	626-0-1-0-10-14	5/8-11 X 1 3/4 SHCS
18	2	613-0-1-0-24-40	1 1/2-6 X 5 HHCS GRADE 5
17	2	H-31125-A	3-1/2 DIA. CAM FOLLOWER
16	8	H-25669-A	RETAINER BLOCK
15	8	H-07067-A	RETAINER DOG ASSEMBLY
14	8	H-00187-A	SPRING
13	1	67628-D	5029H-9 BALER WELDMENT
12	4	670-0-1-0-8-28	1/2 X 3-1/2 LG. COTTER PIN
11	10	670-0-1-0-6-24	3/8 X 3" LG. COTTER PIN
10	4	67066-A	TENSION LINK
9	2	67032-A	PIN (2-3/4" DIA. X 6-3/8 LG.)
8	2	67031-A	PIN (2-1/4 DIA. X 5-7/8" LG.)
7	2	67030-B	TENSION ARM
6	2	67029-A	SPACER TUBE
5	3	67028-A	PIN (2-1/4 DIA. X 8-1/2 LG.)
4	2	67027-B	YOKE
3	1	67025-A	TRUNNION WELDMENT
2	4	H-10038-A	STOP BLOCK
1	1	D-04721-A	CYLINDER (8"B X 5"S)

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

AMBACO ECONOMY

D2 08-18-97 1=16 5029H-9

BALER FRAME ASSEMBLY
(WELDED BALER FRAME)

1 of 1 67629

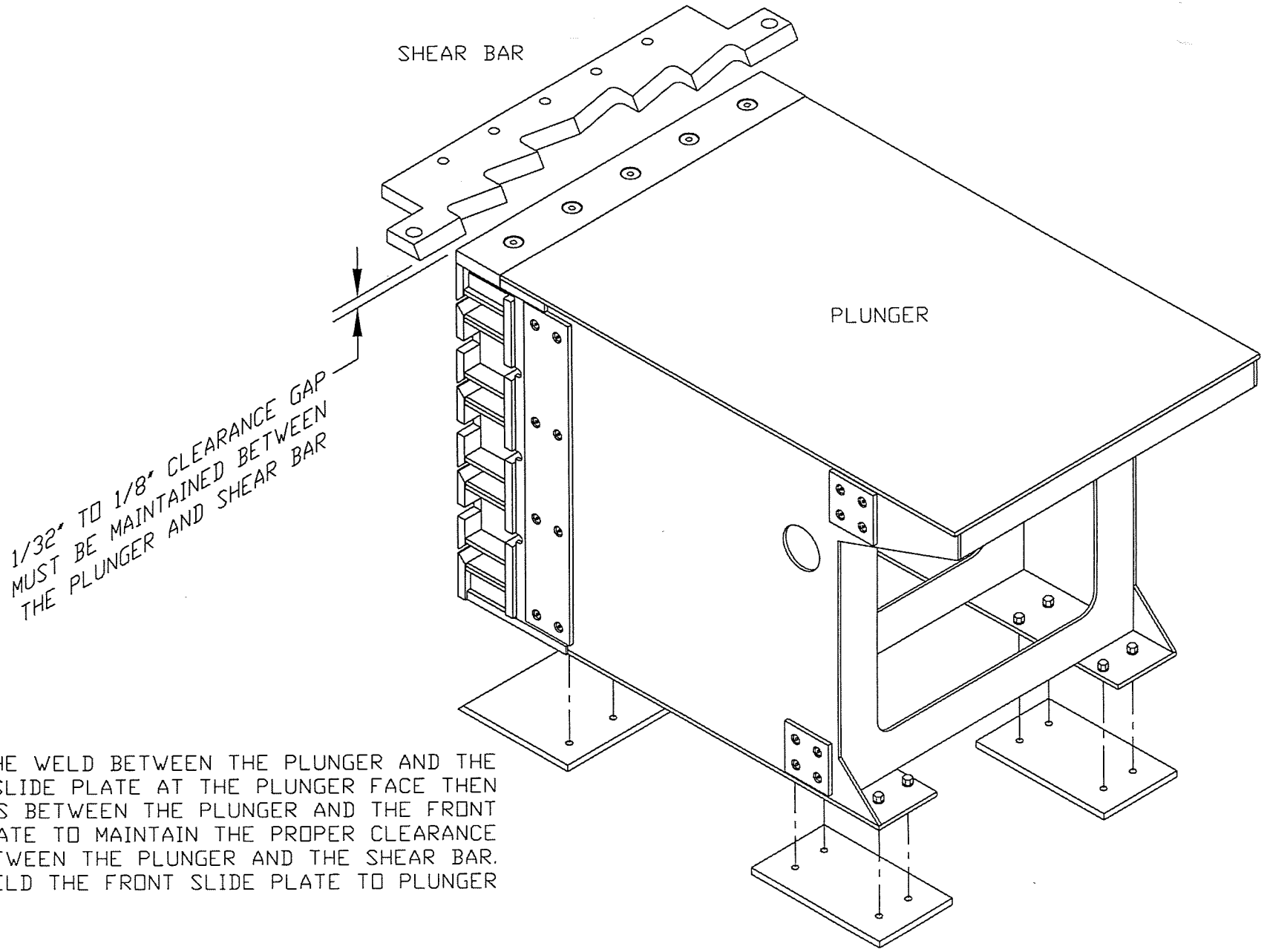
AMERICAN BALER COMPANY

LIMIT SWITCHES

Keep limit switches free of debris. Adjust arms as required and keep tight. Always keep limit switch mounting screws tight. Keep limit switches free of water or ice. Under **NO circumstances** should a safety limit switch be over-ridden.

SHEAR ADJUSTMENT

The clearance between the shear and plunger should not exceed 1/8". If excessive clearance is found, adjust as follows: Jog plunger forward to the leading edge of the shear knife. **LOCK OUT POWER AND TAG OUT MAIN POWER SOURCE FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT.** Turn key switch to "OFF" position on operator's control panel and remove key. Replace key after maintenance completion. Measure bottom wear plate thickness in an area near front of plunger. If bottom wear plate measures 5/16" or less, replace slide plate. From inside the plunger loosen the plunger slide bolts. Jack plunger up with hydraulic jack. Do not jack on cylinder rod. Jack until plunger is snug against shear. Add shims between plunger frame and slide plate at bolt centers and ends. Retighten bolts to 200 to 350 ft/lbs. Power up baler and hand jog plunger checking for proper clearance.
(See shear adjustment and plunger assembly drawings.)



BREAK THE WELD BETWEEN THE PLUNGER AND THE FRONT SLIDE PLATE AT THE PLUNGER FACE THEN ADD SHIMS BETWEEN THE PLUNGER AND THE FRONT SLIDE PLATE TO MAINTAIN THE PROPER CLEARANCE BETWEEN THE PLUNGER AND THE SHEAR BAR. THEN RE-WELD THE FRONT SLIDE PLATE TO PLUNGER

ADD SHIMS BETWEEN THE PLUNGER AND (2) BACK SLIDE PLATES. IF REQUIRED.

PLUNGER TO SHEAR BAR ADJUSTMENT

REPLACES Y-3769

1338.DWG

PREVENTIVE MAINTENANCE SCHEDULE
FOR AMERICAN BALER AUTO TIER

WARNING: Do not put hands in or around twister hook area with baler running! **LOCK OUT POWER AND TAG OUT THIS BALER FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT.**

GENERAL MAINTENANCE

1. Insure wire feed is smooth and unrestricted from wire dispensers or stump stand daily.

2. Wire should be threaded into wire guides correctly each time new wire is installed or broken wire rethreaded.

3. Keep all chains clean and lubricated. Cleaning can easily be done daily with air without removing guards. Periodically lubricate with a light coat of light oil or a dry spray lubricant. The dry spray lubricant containing a mixture of Molybdenum Disulfate and Graphite is recommended for dusty and dirty applications. Dow Corning 321 and Keystone Lubricants, Safeguard Spray Lubricant Moly 23 are two possible sources.

4. The double twister drive chain should be taut.

5. Needle carriage chain should have a slight droop. Chain should be adjusted if droop is more than 3/8" at the center. Do not over lubricate chain. Should be checked weekly.

6. All twister hooks should be aligned with points up. Ensure hooks are not broken or missing. Check daily.

7. Check wire guides (5 each side of baler) weekly. These should pivot up and down and rollers should turn freely.

8. Needle heads should be checked weekly for loose bolts and stuck rollers.

9. TURN POWER OFF! Feel each pair of cutter blades to ensure tightness weekly.

10. Check set screws once a month (or more often if needed). This must be done with power off.

11. Once each month check to see that limit switch arms are tight and properly positioned.

12. Bolts should be checked for tightness daily first week, thereafter once a month.

13. Once a month (or as needed) check timing (cutter cylinder speed vs twister shaft speed. Correct timing is 5/8 to 1 revolution on the twister to one extension of the cut cylinder. Using two people, one to operate controls (#1 man) and one to watch twister shaft (#2 man).

CAUTION: LATE TIMING MAY BEND OR BREAK TWISTER SHAFTS.

PROCEDURE:

Step 1. #1 man brings baler into tie cycle on "Hand". Holds "Advance" switch, watches cut cylinder, and activates "Twist Forward" switch. When cut is complete, he quickly releases "Twist Forward" switch.

Step 2. #2 man notes revolutions made by twister shaft.

Step 3. #1 man returns cutter cylinder and twister fingers back to normal position by activating "Twist Reverse".

NOTE: Needles are not sent across for this test.

If the speed relationship between the cutter cylinder and the twister shafts is not correct, then adjust flow control on twist forward to achieve 1 revolution per second on twisters. #1 man holds "Advance" switch and activates twist forward. #2 man counts revolutions on twisters and adjusts flow control. After achieving 1 revolution per second, #1 man activates "Twist Reverse" to reposition cutter cylinder and twisters. Steps 1, 2, and 3 are repeated. By adjusting flow control to cutter cylinder #2 man can set proper timing. When the above is completed, #1 man should activate "Twist Reverse" until the cutter cylinder is in normal position, then jog "Twist Reverse" button until LS-23 light turns on. Return main plunger to full retract position.

14. Check limit switch housing and covers for tightness each month.

15. Ensure that tier position limit switch is operating properly each month by removing pin in turnbuckle and swing tier off of limit switch. Plunger should not advance. Reposition tier.

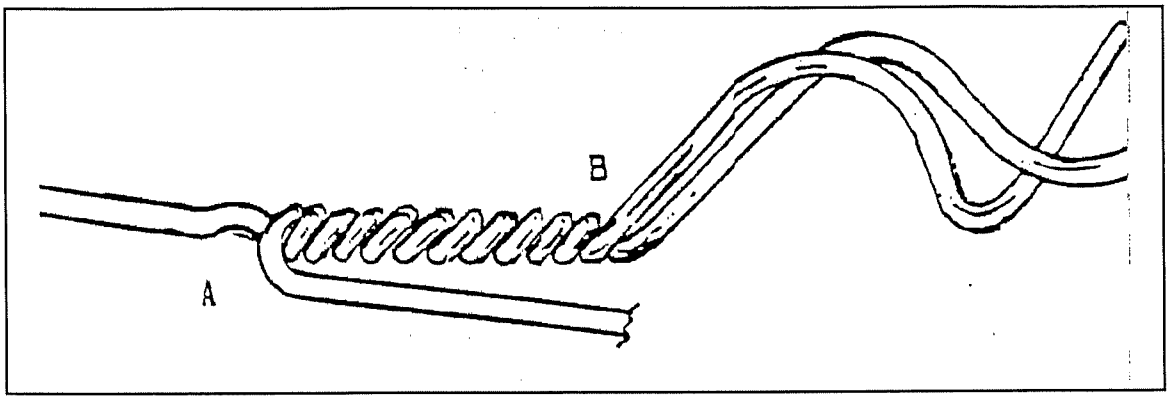
16. Check needle alignment daily be opening door on opposite side of tier and after running needles through plunger slots. The needles should be in center of slots.

NOTE: ALL GUARDS MUST BE IN PLACE AND SECURED TIGHTLY!

Cleanliness is a must on the tier unit to enable tier to work at it's full capability. Tier should be blown out with compressed air at least once each shift or more if needed to prolong the life of the components.

KNOT PROBLEMS
AMBACO AUTO-TIE

Considerable work hardening of the wire occurs with the twisting operation. The more twists that are put into the knot the tighter the twists more molecular disturbance generation of heat, and consequently a higher brittality of the material in the worked areas.



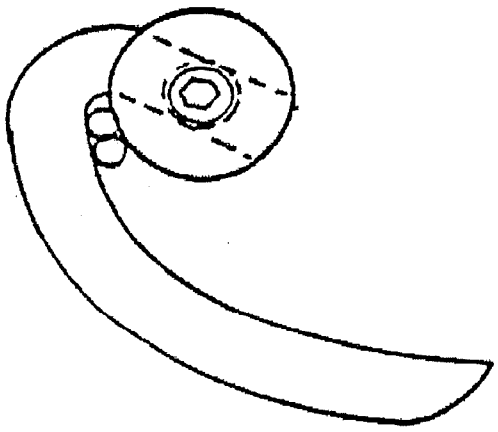
Point "A" is subjected to severe working and is also subjected to the full tension of the strap once the bale is released from the chamber. Failure at "A" should be reduced by reducing number of twists forward. For normal baling of corrugated, news or mixed paper, wire should have approximately 70,000 tensile strength and most important elongation characteristics of 20 to 22%.

At point "B" the working of the wire in making the knot is even more severe in that the twist starts at this point and works down to the base of the know. Failure here can also be caused by too many twists forward or poor wire elongation characteristics. Two "twists reverse" is normally adequate to free the wire to pull off the twister shafts. Check this first if failure at "B" is overly frequent.

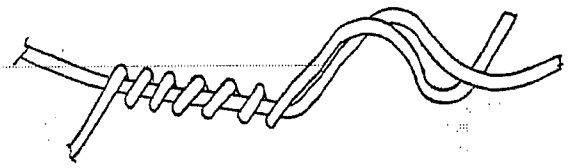
The twister hooks must grasp the wires before they are cut, and wires should be free of any loading that would tend to pull them away at the instant that cutting occurs. Watch the twister hooks closely, and see that they do hit the wires and stop or hesitate as the cut is made. If not open, the "twist forward" flow control or reduce cut cylinder speed to obtain proper sequence.

If tail wires are uneven or short at the corner of the bale being tied, may be an indication that the bale is creeping as it is being tied. The "tension lock" valve prevents the tension cylinder from relaxing in the tie cycle to hold the bale firm. Watch the tension cylinder to see that it is functioning properly.

If tails are uneven at the knot coming from the wire coils, look for excessive resistance upstream in the wire feed system.

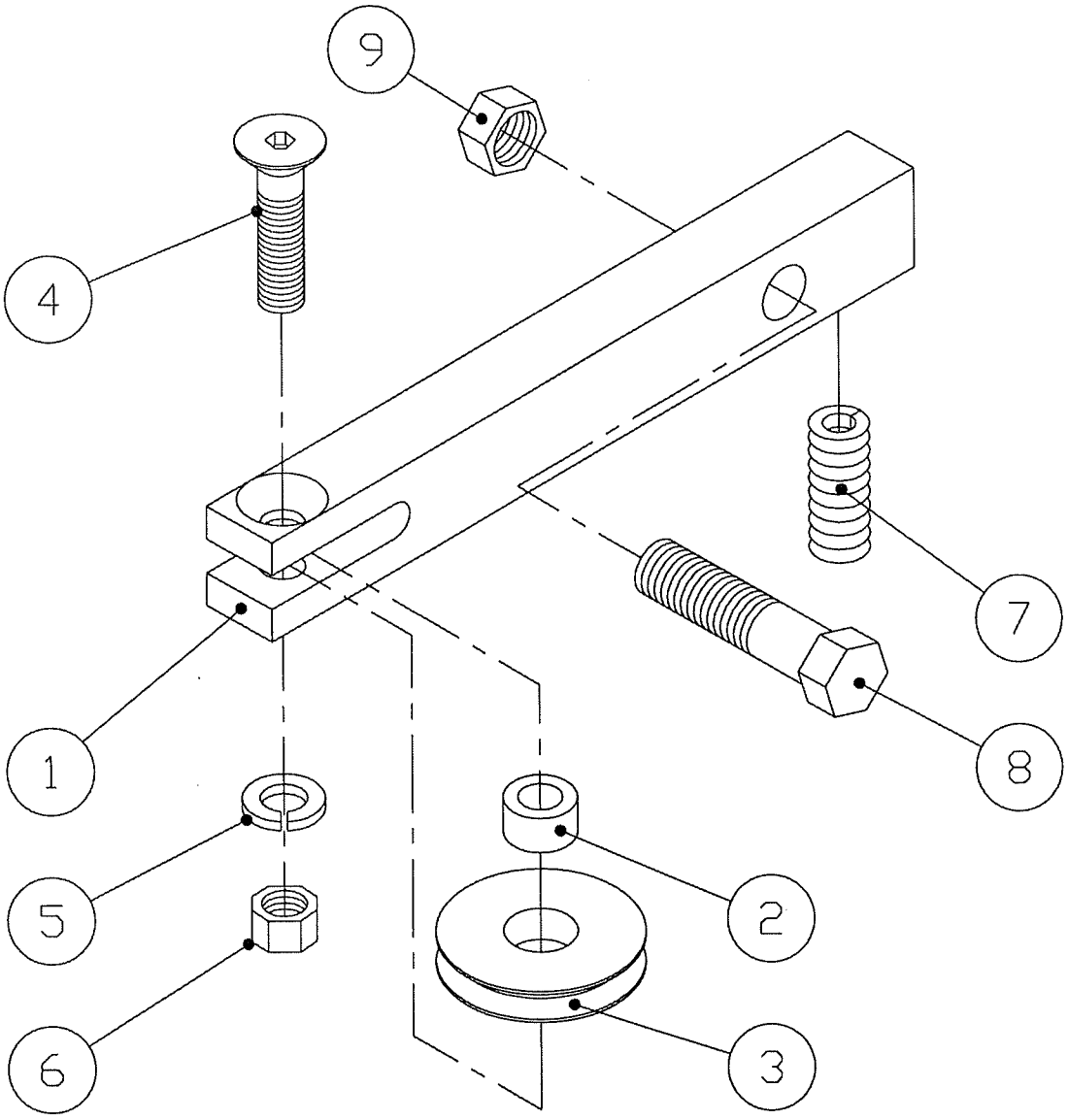


Wires are to be crowded into the elbow of the twister hook and against the twister shaft as shown here. Uneven tails may be an indication of hooks that have loosened in the shaft or are badly worn.



If one wire in the twist is relatively straight with the second wire wrapped around it, this will occur at the knot coming from the wire feed, there is too much tension in the straight wire or not enough in the wrapped wire. Check for proper threading of the wires and relative resistance in upstream wire feeds. Be sure that no rollers have been lost from the wire guides, and be sure that the rollers are free to turn. A considerable difference in wire hardness of the two coils may be contributing, if you've changed wire suppliers, try to match wire on both sides of the baler feeding a given wire station.

WIRE GUIDE ASSEMBLY

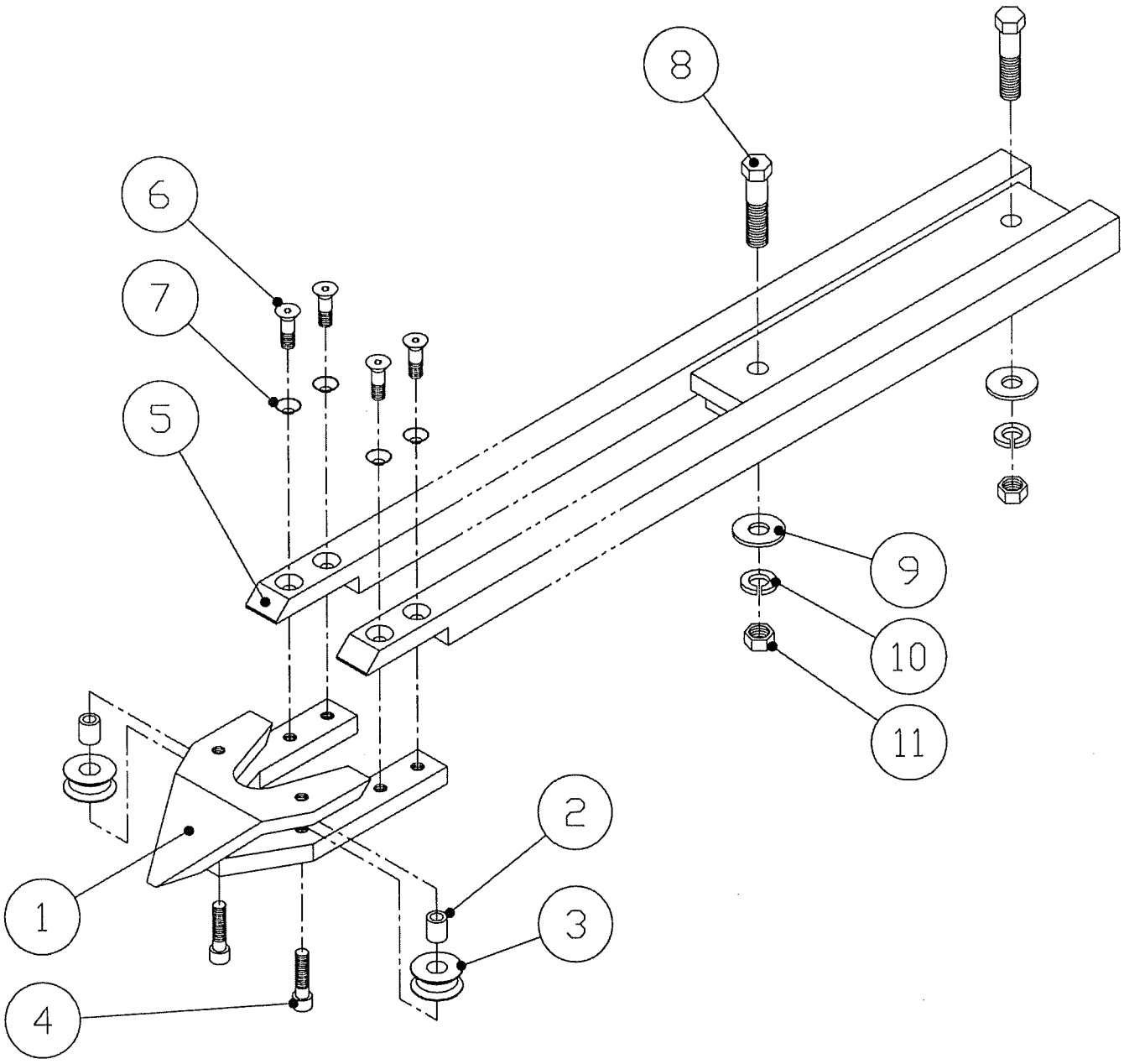


RETAINER BAR ASSEMBLY
(H-37276)

ITEM	DESCRIPTION	PART NUMBER
1	RETAINER BAR	H-32442
2	BUSHING	H-15624
3	ROLLER	H-15625
4	3/8-16 X 1-1/2 LG. F.S.H.C.S.	645-0-1-0-6-12
5	3/8 LOCK WASHER	675-0-1-0-6-0
6	3/8-16 HEX HUT	678-0-1-0-6-0
7	SPRING	H-15274
8	1/2-13 X 2 LG. H.H.C.S.	613-0-1-0-8-16
9	1/2-13 HEX NUT	678-0-1-0-8-0

1091.DWG

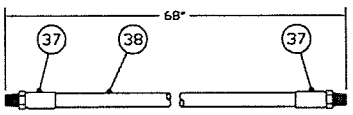
NEEDLE ASSEMBLY



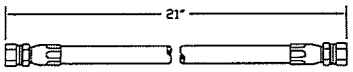
NEEDLE HEAD ASSEMBLY
(H-08832)

ITEM	DESCRIPTION	PART NUMBER
1	NEEDLE HEAD WELDMENT	H-27164
2	BUSHING	H-15350
3	ROLLER	H-15349
4	5/16-18 X 1-1/4 LG. S.H.C.S.	626-0-1-0-5-10
5	NEEDLE WELDMENT	H-37013
6	5/16-18 X 1 F.S.H.C.S.	645-0-1-0-5-8
7	5/16 C'SUNK LOCK WASHER	682-12-1-0-5-0
8	1/2-13 X 2 LG. H.H.C.S.	613-0-1-0-8-16
9	1/2 FLAT WASHER	674-0-1-0-8-0
10	1/2 LOCK WASHER	675-0-1-0-8-0
11	1/2-13 HEX NUT	678-0-1-0-8-0

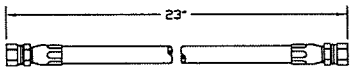
732.DWG



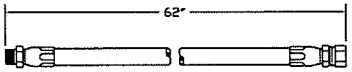
3/16 I.D. HOSE ASSEMBLY
(CASE DRAIN LINE)



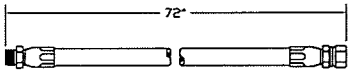
(29) D-08220 HOSE (3/8)
(USED ON CUT CYLINDER R.E.)



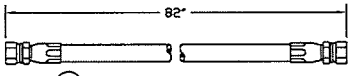
(28) D-08221 HOSE (3/8)
(USED ON CUT CYLINDER B.E.)



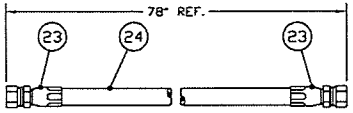
(27) D-08688 HOSE (3/8)
(USED ON NEEDLE MOTOR)



(26) D-08687 HOSE (3/8)
(USED ON NEEDLE MOTOR)



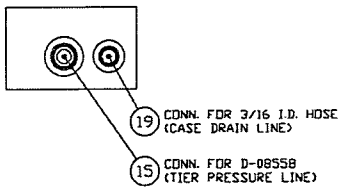
(25) D-08558 HOSE (1/2)
(TIER PRESSURE LINE)

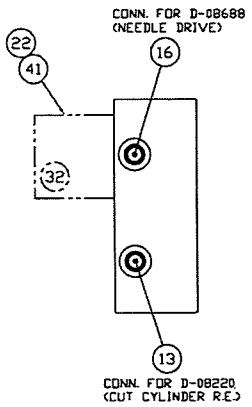


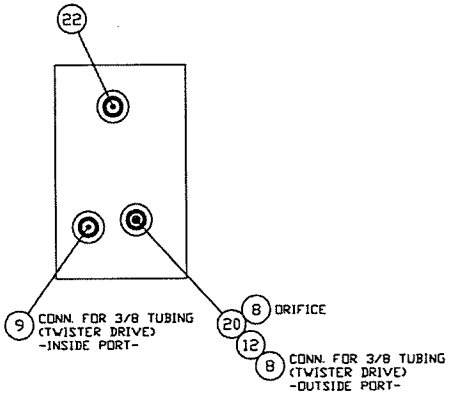
3/4 HOSE ASSEMBLY
(TIER DRAIN LINE)

REF: REPLACES H-37211-B

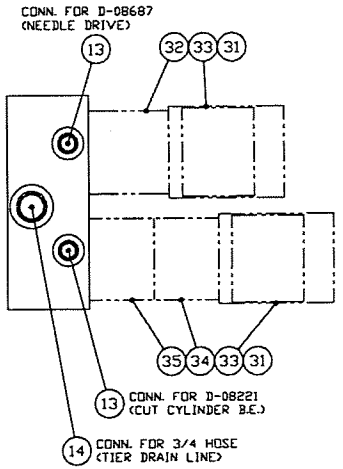
MANIFOLD MTG. HARDWARE
(4) (3) REQ'D.
(5) (3) REQ'D.

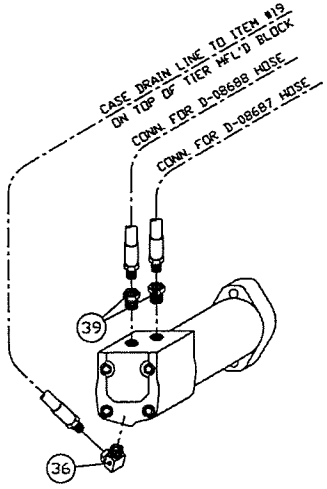




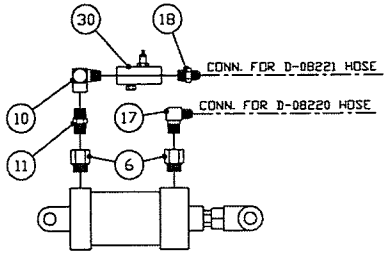


(21) TIER MANIFOLD BLOCK
(68398-B 2-1/2 X 4 X 6-1/2 CRS)

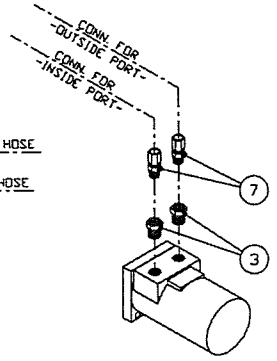




NEEDLE DRIVE FITTINGS
(D-00180 HYDRAULIC MOTOR)



CUT CYLINDER
(D-04704 HYDRAULIC CYLINDER)



TWISTER DRIVE FITTINGS
(D-00084 HYDRAULIC MOTOR)

41	1	004-R1100-4-4	FLODAR #4 MSAE TO 1/4 FNPT ADAPTER
40			
39	2	031-FSOG5-10-6	PARKER #10 MSAE X #6 SAE-RED.
38	55ft	D-08276-A	3/16 IN I.D. HOSE (SYNFLEX)
37	2	D-08278-A	HOSE ADAPTER 1/4 MNPT STR.
36	1	004-SMR2000-4-4	#4 MSAE X 1/4 FNPT SV 90° EL
35	1	D-02069-A	RELIEF VALVE
34	1	D-02136-A	D02 MODULAR CHECK VALVE
33	2	D-01117-A	4-WAY VALVE
32	1	D-01167-A	PRESSURE REDUCING VALVE
31	2	D-02156-A	BOLT KIT 1/4-20 (CUT TO LENGTH)
30	1	D-05000-A	FLOW CONTRDL VALVE (3/8)
29	1	D-08220-A	3/8 HOSE ASSY. - 21" LG.
28	1	D-08221-A	3/8 HOSE ASSY. - 23" LG.
27	1	D-08688-A	3/8 HOSE ASSY. - 62" LG.
26	1	D-08687-A	3/8 HOSE ASSY. -72" LG.
25	1	D-08558-A	1/2 HOSE ASSY. - 82" LG.
24	6.5ft	020-2651-12-0	AERO 3/4" HOSE (1500 WP)
23	2	020-4411-12-0	AERO #12 FJIC STR. HOSE FTG.
22	2	D-09066-A	PRESSURE GUAGE (3,000)
21	1	68398-B	TIER MANI. BLOCK (W/O D-5000)
20	1	004-R1100-6-0	FLODAR #6 MSAE TO 1/4 FNPT ADAPTER
19	1	D-08279-A	ADAPTER #6 MSAE X 1/4 FNPT SV 90° EL
18	1	020-2021-6-6	AERO 3/8 MNPT X #6 MJIC STR.
17	1	020-2024-6-6	AERO 3/8 MNPT X #6 MJIC 90°EL
16	1	020-202702-6-6	AERO #6 MSAE X #6 MJIC STR.
15	1	020-202702-8-8	AERO #8 MSAE X #8 MJIC STR.
14	1	020-2062-10-12	AERO #10 MSAE X #12 MJIC 90°EL
13	3	020-2062-6-6	AERO #6 MSAE X #6 MJIC 90°EL
12	1	020-2083-4-4	AERO 1/4 NPT NIPPLE W/HEX
11	1	020-2083-6-6	AERO 3/8 NPT NIPPLE W/HEX
10	1	020-2069-6-6	AERO 3/8 MNPT X 3/8 FNPT 90°EL
9	1	031-C5BU-6-0	PARKER 3/8 TUBE X #6 MSAE 90°EL
8	1	031-DBU-6-0	PARKER 3/8 TUBE X 1/4 FNPT 90°EL
7	2	031-FBU-6-6	PARKER 3/8 TUBE X 3/8 MNPT STR.
6	2	031-FSOG-10-3/8	PARKER #10 MSAE X 3/8 FNPT STR.
5	3	613-0-1-0-6-8	3/8-16 X 1" LG. H.H.C.S.
4	3	675-0-1-0-6-0	3/8 LOCK WASHER
3	2	668-2-1-0-8-3	1/2 MNPT TO 3/8 FNPT REDUCER (HP)
2	1	65314-46	1/16 NPT PLUG / (.081) ORIFICE
1	3 Ft	824-1-6-49-0	3/8 O.D. X .049 WALL HYD. TUBING
ITEM	QTY	PART NO.	MATERIAL/DESCRIPTION

965	DJS	5-3-99	A	ADDED ORIFICE TO #21
DWG NO.	BY	DATE	ECN NO.	REVISION

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

AMRACO

DRAWN BY MAH DATE 02-23-99 SCALE --

MATERIAL

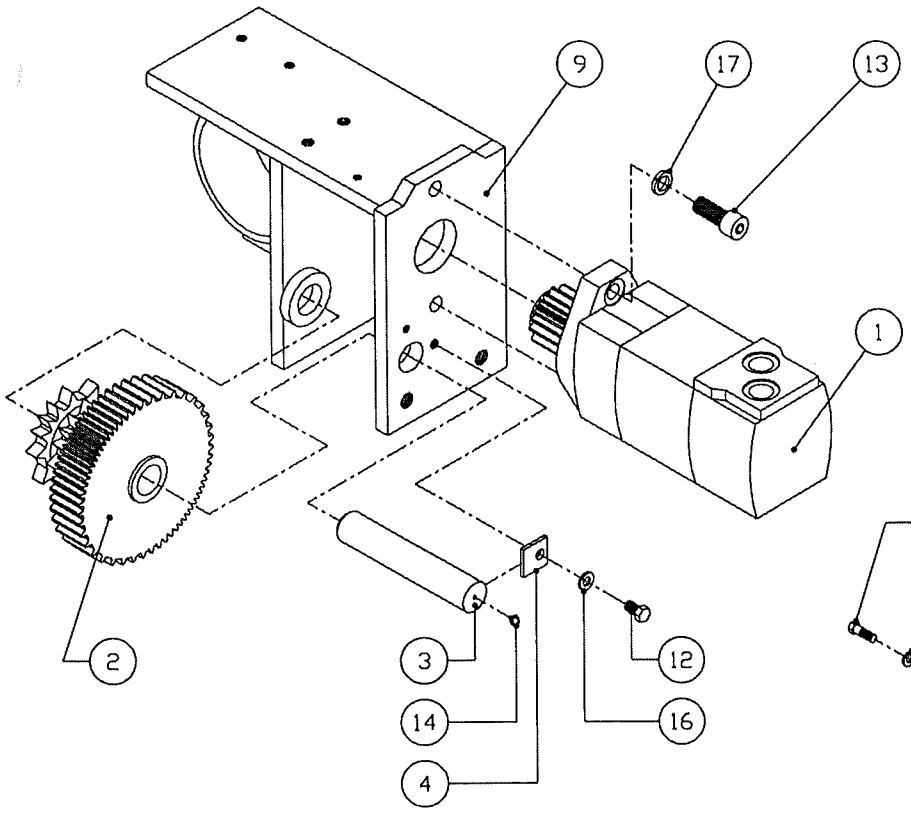
MFG BY TIER W/O D-5000

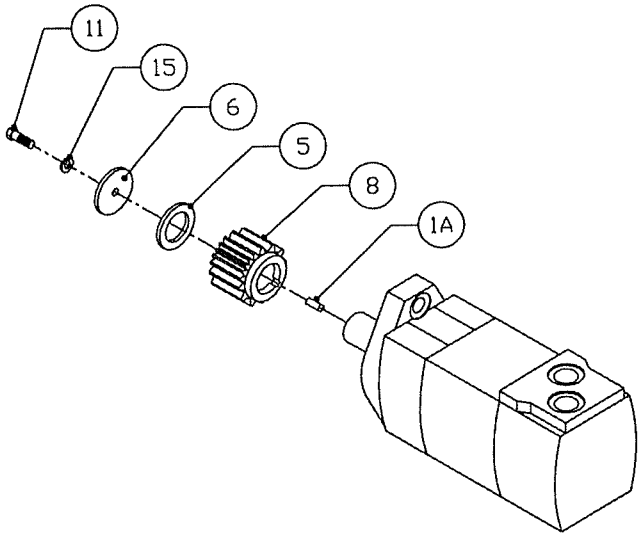
TITLE
TIER VALVE ASSEMBLY (STD.)

SHT 1 OF 1 REV A

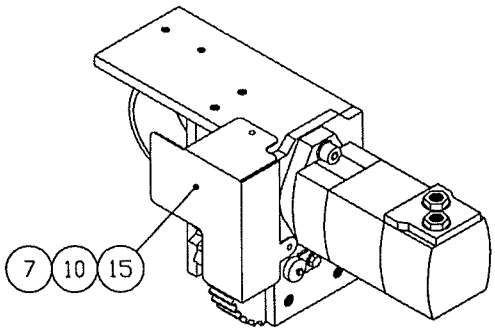
68400

GEAR BOX ASSEMBLY





D-00180 MOTOR/GEAR ASSEMBLY



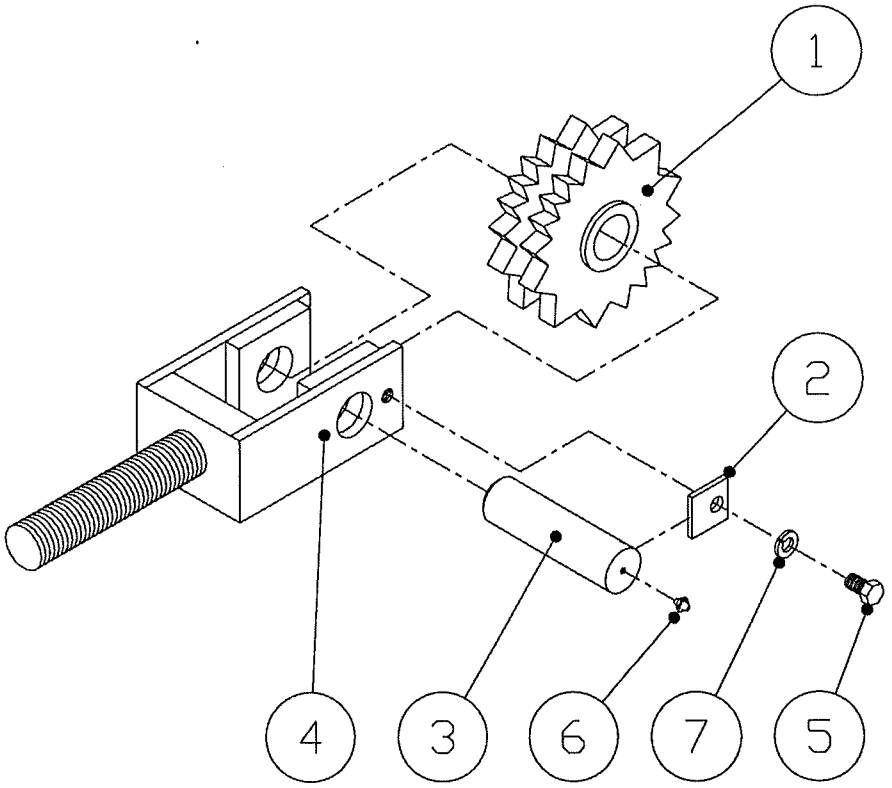
ASSEMBLED VIEW

GEAR BOX ASSEMBLY
(H-37210)

ITEM	DESCRIPTION	PART NUMBER
1	HYDRAULIC MOTOR	D-00180
1A	#15 WOODRUFF KEY	671-0-1-0-15-0
2	SPROCKET/GEAR ASSEMBLY	H-08728
3	SHAFT	H-15464
4	LOCK CLIP	H-15465
5	THRUST WASHER (BRONZE)	H-15781
6	WASHER (SPECIAL)	H-15782
7	DUST COVER	H-32371
8	GEAR (18 TOOTH 10DP)	H-15967
9	GEAR BOX WELDMENT	H-37209
10	1/4-20 X 1/2 LG. H.H.C.S.	613-0-1-0-4-4
11	1/4-20 X 3/4 LG. H.H.C.S.	613-0-1-0-4-6
12	5/16-18 X 1/2 LG. H.H.C.S.	613-0-1-0-5-4
13	1/2-13 X 1 1/4 LG. S.H.C.S.	626-0-1-0-8-10
14	1/8 GREASE FITTING	660-0-1-0-2-0
15	1/4 LOCK WASHER	675-0-1-0-4-0
16	5/16 LOCK WASHER	675-0-1-0-5-0
17	1/2 LOCK WASHER	675-0-1-0-8-0

1066.DWG REV. A (04-17-95)

TAKE-UP ASSEMBLY

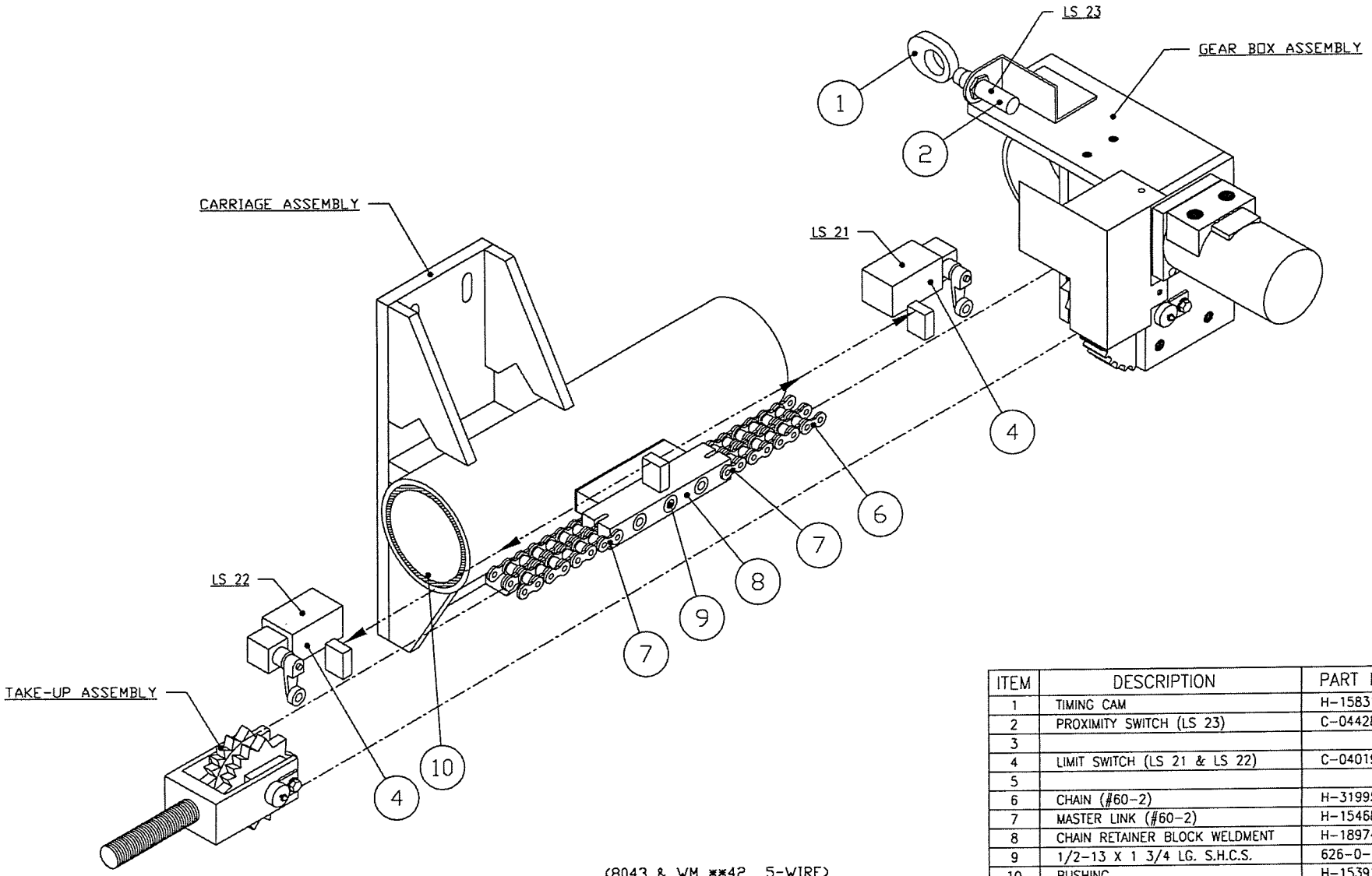


TAKE-UP ASSEMBLY
H-09097

ITEM	DESCRIPTION	PART NUMBER
1	SPROCKET ASSEMBLY	H-08695
2	LOCK CLIP	H-15465
3	SHAFT	H-15492
4	CLEVIS WELDMENT	H-27153
5	5/16-18 X 1/2 LG. H.H.C.S.	613-0-1-0-5-4
6	1/8 GREASE FITTING	660-0-1-0-2-0
7	5/16 LOCK WASHER	675-0-1-0-5-0

735.DWG

NEEDLE DRIVE & LIMIT SWITCH ASSEMBLY



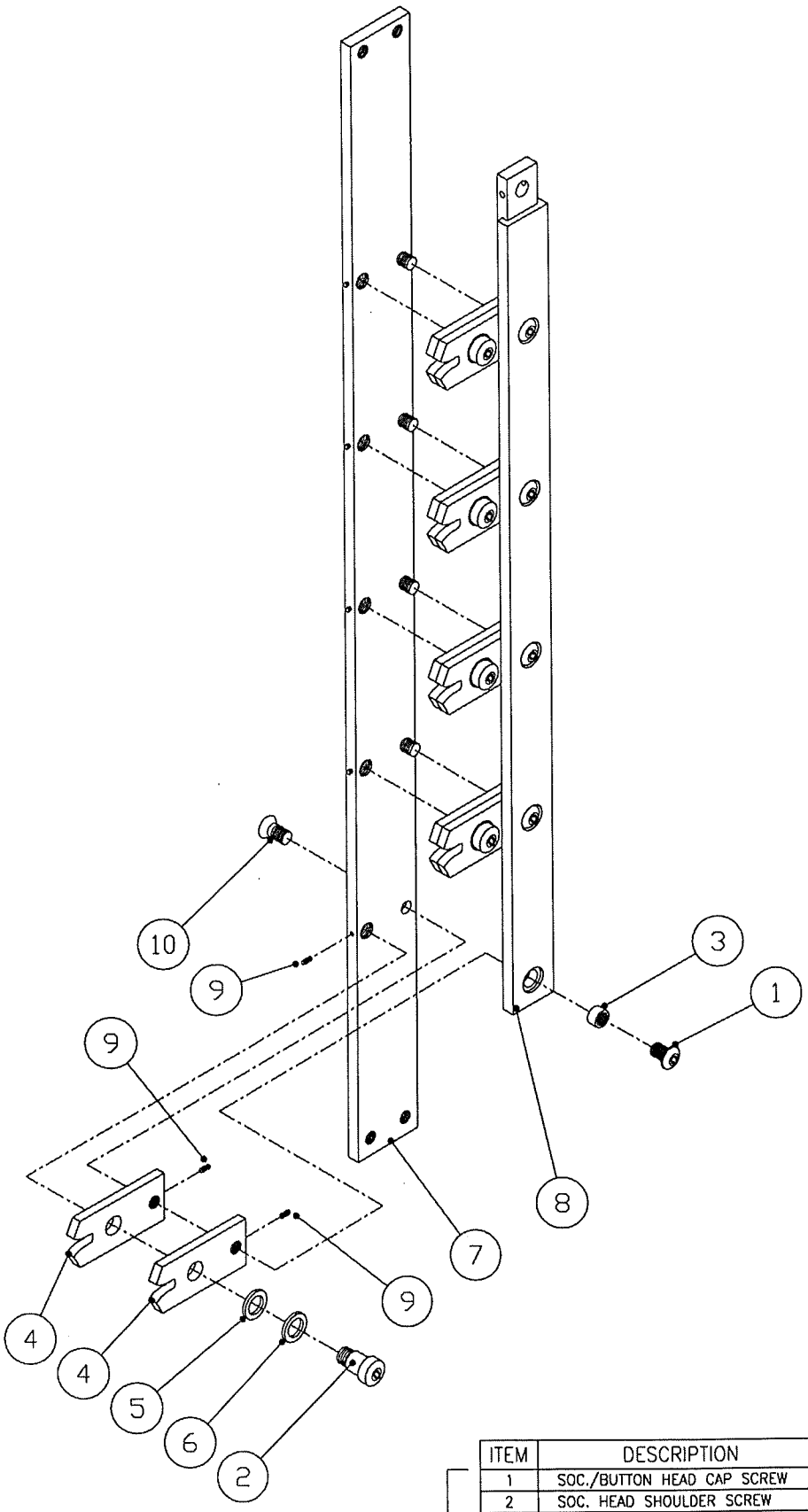
ITEM	DESCRIPTION	PART NUMBER
1	TIMING CAM	H-15831
2	PROXIMITY SWITCH (LS 23)	C-04428
3		
4	LIMIT SWITCH (LS 21 & LS 22)	C-04019
5		
6	CHAIN (#60-2)	H-31995
7	MASTER LINK (#60-2)	H-15468
8	CHAIN RETAINER BLOCK WELDMENT	H-18974
9	1/2-13 X 1 3/4 LG. S.H.C.S.	626-0-1-0-8-14
10	BUSHING	H-15391

1030.DWG

(8043 & WM **42 5-WIRE)

737.DWG

CUTTER BAR ASSEMBLY



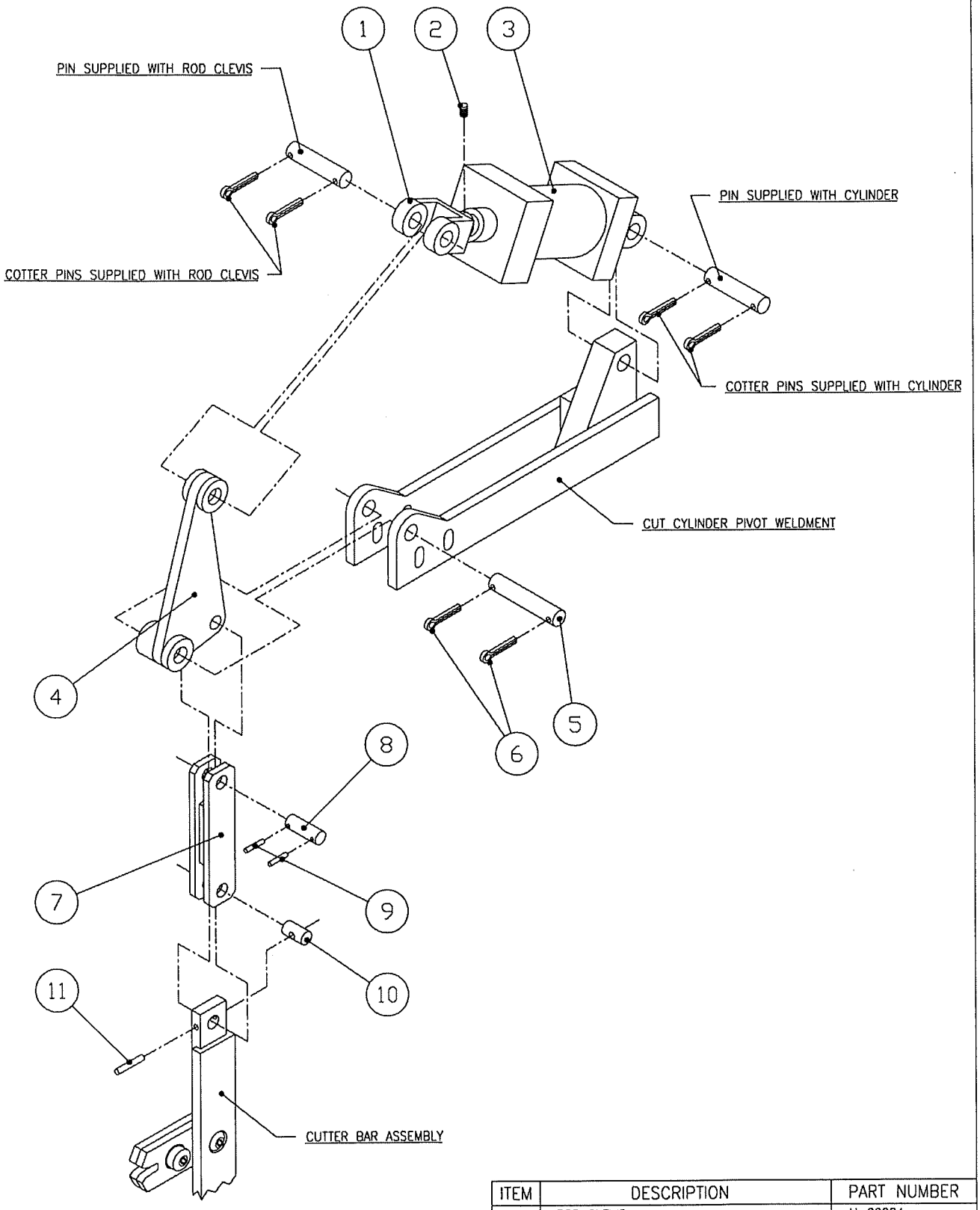
CUTTER BAR ASSEMBLY
H-37002

ITEM	DESCRIPTION	PART NUMBER
1	SOC./BUTTON HEAD CAP SCREW	H-15825
2	SOC. HEAD SHOULDER SCREW	H-15826
3	PIVOT BUSHING	H-15827
4	CUTTER BLADE	H-15828
5	SHIM (.005 THICK)	H-15837
6	SHIM (.010 THICK)	H-15838
7	SUPPORT BAR	H-31962
8	CUTTER BAR WELDMENT	H-37003
9	#10-32 X 3/8 LG. S.S. SET SCREW	644-18-5-0-0-3
10	1/2-20 X 7/8" LG. F.S.H.C.S.	645-1-1-0-8-7

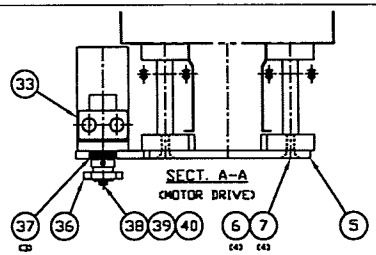
737.DWG (8043 & WM 5WIRE) REVISED 2-9-96

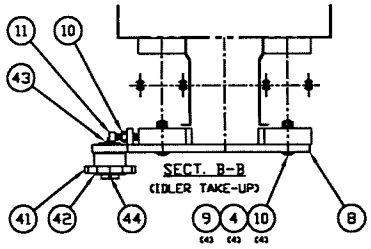
738.DWG

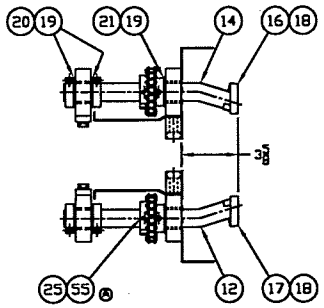
CUT CYLINDER ASSEMBLY

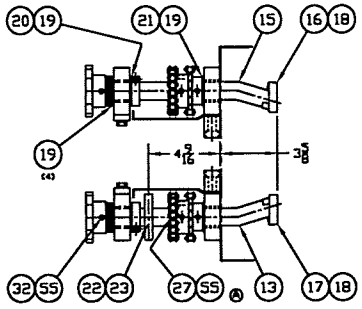


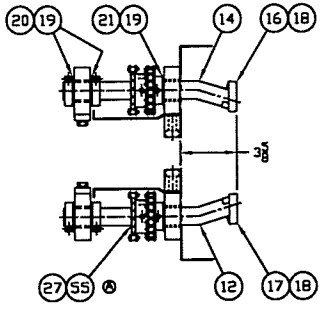
ITEM	DESCRIPTION	PART NUMBER
1	ROD CLEVIS	H-22284
2	5/16-18 X 1/2 LG. SET SCREW	644-0-1-0-5-4
3	HYDRAULIC CYLINDER	D-04704
4	PIVOT PLATE WELDMENT	H-08952
5	PIVOT PIN	H-15425
6	1/4 X 1-1/2 LG. COTTER PIN	670-0-1-0-4-12
7	LINKAGE	H-27206
8	CLEVIS PIN	H-15460
9	3/16 X 1" LG. ROLL PIN	631-0-1-0-3-8
10	CLEVIS PIN	H-15461
11	1/4 X 1-1/2 LG. ROLL PIN	631-0-1-0-4-12

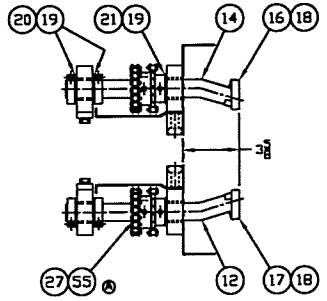


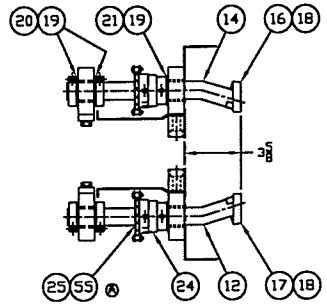


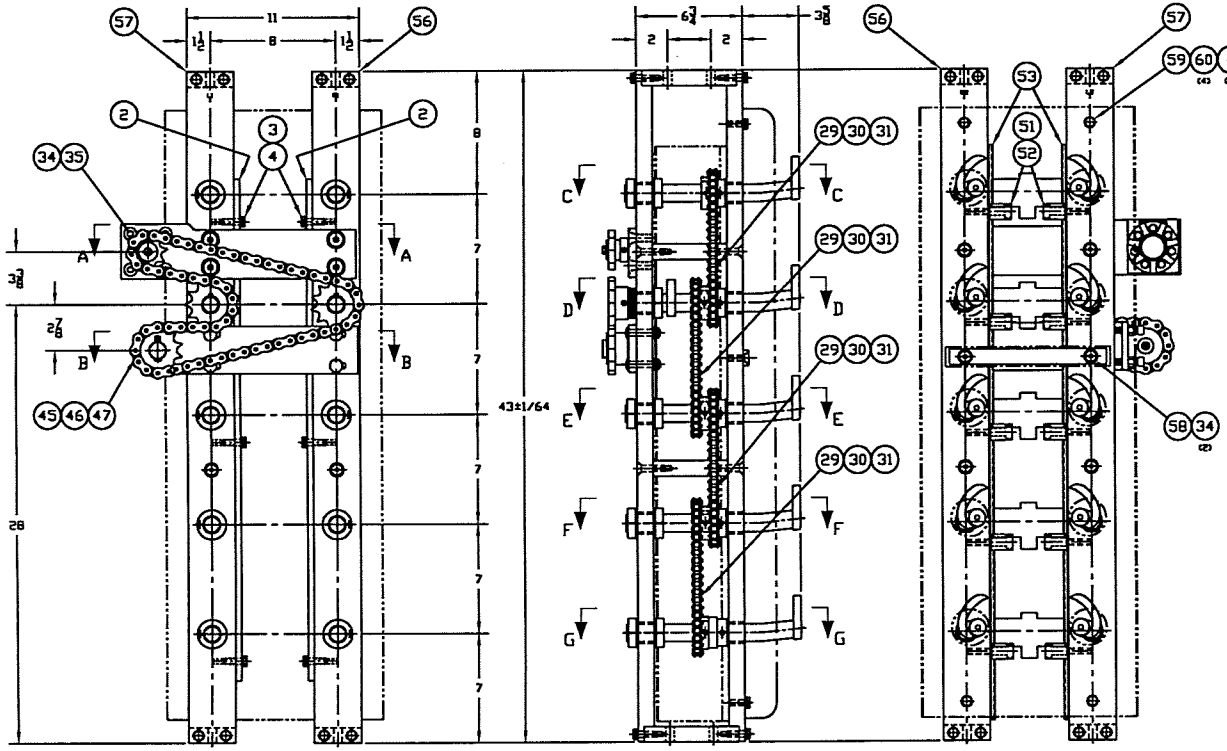












60	4	613-0-1-0-6-4	3/8-16 X 1/2 LG HHCS
59	1	68377-C	TIER FACE DUST GUARD (SV)
58	1	68376-A	TWISTER BANK BAR
57	1	68375-B	TWISTER BANK LH ASSEMBLY
56	1	68374-B	TWISTER BANK RH ASSEMBLY
55	12	68133-A	SQUARE KEY (1/4 x 1-3/8 LG)
54	----	------	------
53	2	68363-C	DUST GUARD
52	10	621-8-0-8-8-8	1/2 X 1 SHOULDER BOLT
51	10	H-15606-A	ROLLER
50	----	------	------
49	----	------	------
48	----	------	------
47	1	68359-A	#60 OFFSET LINK
46	1	68358-A	#60 MASTER LINK
45	1	68357-A	#60 TWISTER CHAIN (63 P)
44	1	670-0-1-0-3-10	3/16 X 1-1/4 COTTER PIN
43	1	660-0-1-0-2-0	1/8 GREASE FITTING
42	1	674-8-1-8-16-0	1" FLAT WASHER (A325)
41	1	68362-A	#60 IDLER ASSEMBLY
40	1	675-0-1-0-4-0	1/4 LOCK WASHER
39	1	613-0-1-0-4-6	1/4-20 X 3/4 LG HHCS
38	1	68134-A	WASHER (SPECIAL)
37	3	H-15781-A	THRUST WASHER
36	1	68360-A	SPROCKET (60B9)
35	4	682-12-1-8-6-0	3/8 C'SUNK EXT LOCK WASHER
34	6	645-0-1-0-6-8	3/8-16 X 1" LG FSHCS
33	1	D-00084-A	CHARLYN HYD. MOTOR
32	2	68325-A	TWISTER SPROCKET (60B12)
31	8	H-15438-A	OFFSET LINK (#40 CHAIN)
30	8	H-15437-A	MASTER LINK (#40 CHAIN)
29	8	H-31956-A	#40 ROLLER CHAIN
28			
27	6	H-30684-A	SPROCKET (DS40A17HD
26			
25	4	H-30683-A	SPROCKET (40B17HD
24	2	H-35959-A	SPACER
23	2	644-35-1-0-5-5	5/16-18 X 5/16 SH SET SCREW
22	1	68382-A	LS23 TIMING CAM
21	10	H-15810-A	SHAFT COLLAR
20	18	H-15815-A	LOCK COLLAR
19	36	H-15814-A	THRUST WASHER
18	10	644-0-1-0-6-3	3/8-16 X 3/8 SH SET SCREW
17	5	H-15803-B	TWISTER HOOK (LH)
16	5	H-15804-B	TWISTER HOOK (RH)
15	1	H-15808-C	TWISTER SHAFT (LH)
14	4	H-15806-C	TWISTER SHAFT (LH)
13	1	H-15807-C	TWISTER SHAFT (RH)
12	4	H-15805-C	TWISTER SHAFT (RH)
11	2	626-8-1-8-6-12	3/8-16 X 1-1/2 LG SHCS
10	6	678-0-1-0-6-0	3/8-16 HEX NUT
9	4	619-0-1-0-6-16	3/8-16 X 2 LG CARRIAGE BOLT
8	1	68130-B	#60 IDLER TAKE-UP WELDMENT
7	4	682-12-1-8-8-0	1/2 C'SUNK EXT LOCK WASHER
6	4	645-0-1-0-8-12	1/2-13 X 1-1/2 LG FSHCS
5	1	H-30494-B	MOTOR MOUNT
4	14	675-0-1-0-6-0	3/8 LOCK WASHER
3	6	613-0-1-0-6-8	3/8-16 X 1" LG HHCS
2	2	H-31955-A	BRASS WEAR BAR
1	----	------	------

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811

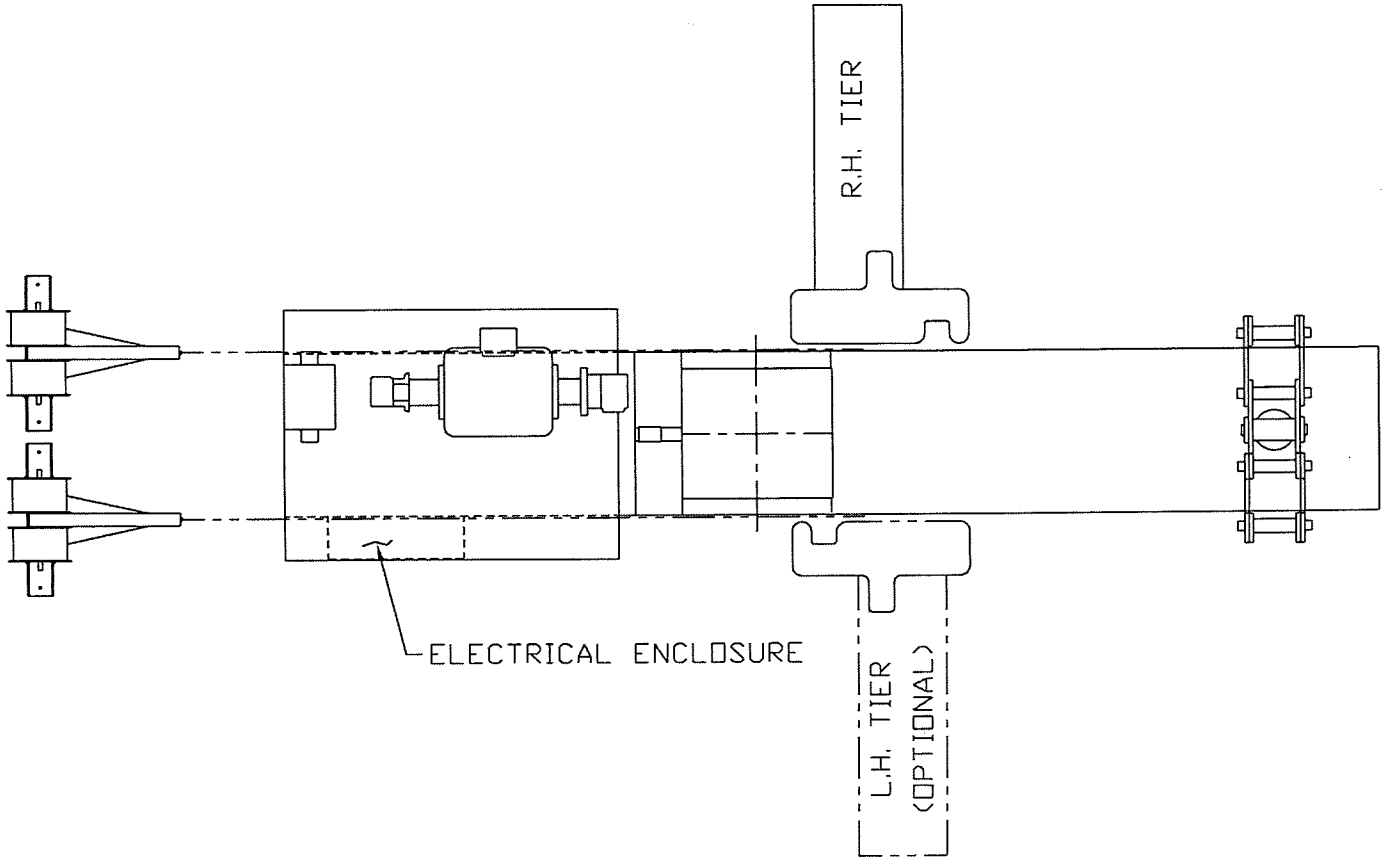
MAH 02-15-99 1=4

BOLTED FRAME

#60 TWISTER
FRAME ASSEMBLY

1 of 1 A

68378



NOTE:

PLACE WIRE STAND APPROXIMATELY AS SHOWN FOR WIRE TO HAVE A STRAIGHT PATH TO TYING STATION AND AVOID DRAGGING ON OTHER BALER COMPONENTS.
NOTE: WIRE PASSES BEHIND ELECTRICAL ENCLOSURE.

ITEM	QTY	PART NO.	MATERIAL/DESCRIPTION

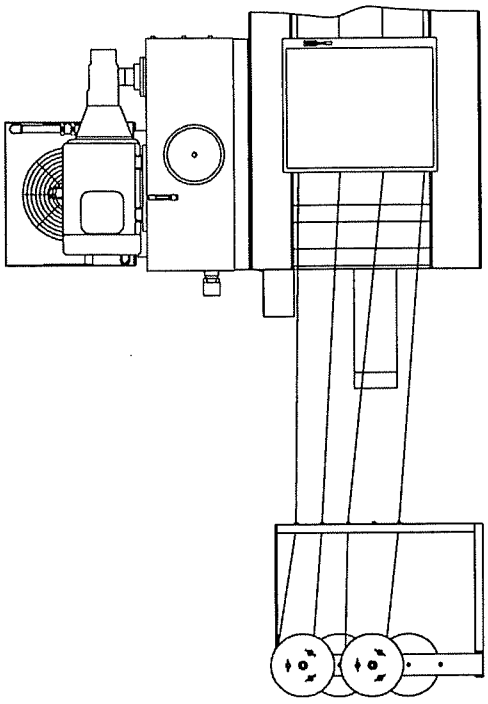
DRAWN BY	MAH
DATE	3-1-91
SCALE	
MATERIAL	
USED ON	

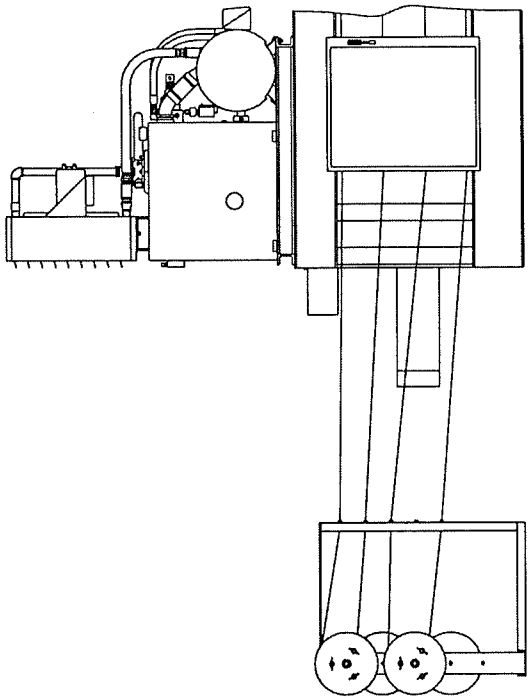
THE AMERICAN BALER COMPANY
ECONOMY BELLEVUE, OHIO 44811 AMBACO

TITLE
100 LB WIRE DISP. LAYOUT

SHEET OF
REV.
Y-4046

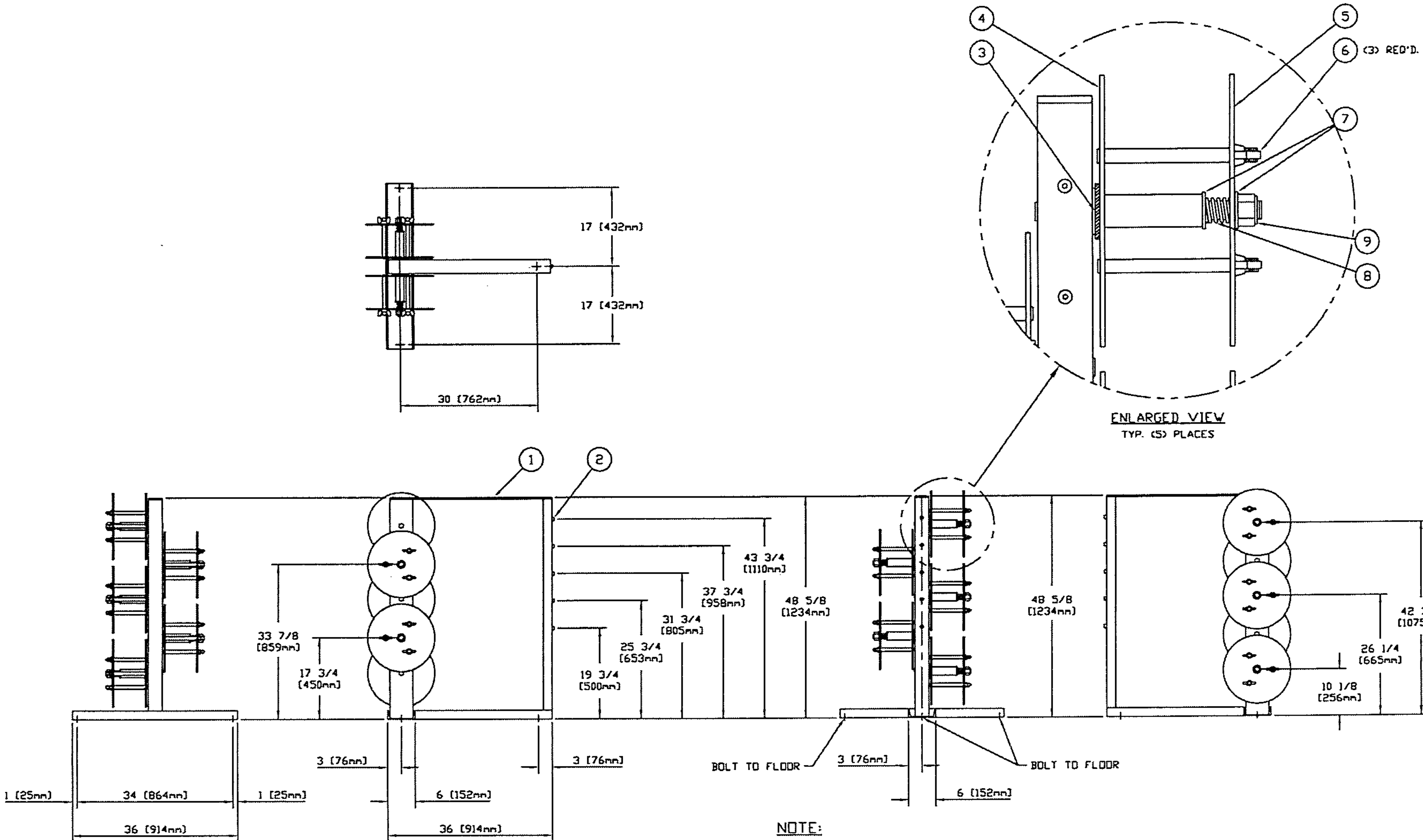
ECN NO.	BY	DATE	NO.	REVISION





AMERICAN BALER COMPANY

100# WIRE DISPENSER	847.DWG



NOTE:
OWNER MUST SECURELY ANCHOR BOTTOM OF DISPENSER TO THE FLOOR (3 PLACES) WITH 1/2 DIA. BOLTS AT MINIMUM (NOT FURNISHED)

	ITEM	QTY	PART NO.	DESCRIPTION
	9	5	679-4-1-0-16-0	1"-8 ESNA FIBER LOCK NUT
	8	5	H-32194-A	SPRING
	7	10	674-26-1-0-16-0	1" STD. SAE FLAT WASHER
	6	15	681-0-1-0-12-0	3/4-10 WING NUT
A	5	5	H-21778-B	PULL DOWN PLATE
A	4	5	H-08827-B	BACK PLATE WELDMENT
	3	5	H-21777-A	FRICTION DISC
	2	5	H-14527-A	WIRE GUIDE
A	1	1	H-08826-C	WIRE DISPENSER WELDMENT

AMERICAN BALER COMPANY
BELLEVUE, OHIO 44811
AMBACO
ECONOMY
MAH 9-2-92 NONE
(5) WIRE BALER
100 LB WIRE DISPENSER ASSEMBLY
A
H-27837

665	D?	12-21-92	A	ITEMS 1, 4, & 5

TIER TROUBLESHOOTING INDEX

NOTICE: LOCK OUT POWER AND TAG OUT MAIN POWER SOURCE FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT.

NOTICE: LOCK OUT POWER AND TAG OUT MAIN POWER SOURCE FOLLOWING O.S.H.A. PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ON THIS BALER OR ANY ASSOCIATED EQUIPMENT.

TIER TROUBLESHOOTING

I. LS-4 Not made
   A. Platen stalls and fails to contact LS-4.
      1. Release tension by turning tension dump switch to "DUMP" so the bale can slide forward and contact LS-4. Then reset to "AUTO".
      2. Check the main system pressure for correct reading.
      3. Tier not in position.
      4. See BALER STALLS in main troubleshooting section.
   B. LS-4 Switch defective.
      1. Repair, replace or adjust switch.
   C. Tier in POSITION safety switch is open.
      1. Insure switch is made.

II. LS-23 Light is not illuminated.
   A. LS-23 switch defective or out of adjustment indicating twister hooks out of position.
      1. Adjust or repair LS-23.
   B. Tie cycle interrupted before twister hooks returned to 12:00 position.
      1. Put baler in tie cycle with the selector switch in the "HAND" position.
      2. Bump twist reverse switch until LS-23 light goes on and the twister hooks are at the 12:00 position.
      3. Cancel the TIE CYCLE.
      4. Resume baling and monitor.
   C. Cam drifting causing LS-23 to actuate.
      1. Check spool in four way valve for wear and bypassing oil.

III. No hydraulic pressure to tier.
   A. LS-4 not illuminated.
      1. See LS-4 NOT MADE.
   B. Fuse is blown.
      1. Replace fuse.
      2. Monitor power at valve.
   C. Tier supply solenoid valve on power unit manifold is defective.
      1. Override valve.
      2. If pressure returns to the tier, repair or replace the valve.
   D. Not in tie cycle.
      1. No defect - Tier only receives pressure in the tie cycle.
   E. Plunger latch not down (<u>LATCH NOT ON ALL BALER MODELS</u>)
      1. Fuse is blown- replace fuse
      2. Latch limit switch defective or misadjusted
      3. Mechanical interference
      4. Defective latch coil
      5. Defective latch 4-way valve

IV Baler enters tie cycle, platen advances but does not complete tie cycle.

A. Platen fails to advance forward enough to contact LS-4.
   1. See LS-4 NOT MADE.

B. LS-4 contacted, but no hydraulic pressure tier.
   1. See NO HYDRAULIC PRESSURE TO TIER.

C. Hydraulic pressure to the tier is low.
   1. Adjust pressure relief valve to 1500 p.s.i., or sufficient pressure to retract the needles.

D. LS-23 out of adjustment.
   1. See LS-23 LIGHT NOT ILLUMINATED.

E. Needles are stalled.
   1. See NEEDLES FAIL TO GO IN OR COME OUT.

V. Needles fail to go in or come out.

A. LS-4 not made.
   1. See LS-23 NOT MADE.

B. LS-23 not made.

C. Fuse blown.
   1. Replace fuse and determine cause.

D. Coil on needle 4 way valve defective.
   1. Replace coil.

E. 4 way valve not shifting.
   1. Repair or replace 4 way valve.

F. No or low hydraulic pressure to tier.
   1. See NO HYDRAULIC PRESSURE TO TIER.

G. Needle drive gear box defective.
   1. Inspect gear box for defect and repair.

H. Hydraulic motor defective.
   1. Repair or replace motor.

I. Needle drive chain broke.
   1. Repair or replace chain.

J. Needles are being restricted in needle slot of plunger.
   1. Clear needle slots of restriction.

K. Wires have excessive drag and tier has insufficient pressure to move needles.
   1. Insure tier has at least 800 p.s.i.
   2. Eliminate cause of excessive drag.

L. Check flow control to needle drive may be closed or defective.
   1. Adjust or replace flow control.

VI. Needles go in but fail to come out.

A. LS-21 not made.
   1. Adjust LS-21.

B. Excessive wire drag or low pressure.
   1. See NEEDLES FAIL TO GO IN OR COME OUT.

VII. Twister hooks not turning.
- A. Loss of pressure to tier.
  1. See NO HYDRAULIC PRESSURE TO TIER.
- B. Flow control valve turned off or defective.
  1. Adjust or replace flow control.
- C. Hydraulic motor defective.
  1. Rebuild or replace motor.
- D. Fuse blown.
  1. Replace fuse.
- E. Drive chain broken.
  1. Repair chain.
- F. LS-22 not made.
  1. Needles must be fully retracted and LS-22 contacted.
- G. Wires not cut, causing twisters to stall.
  1. Tier out of sequence, cutter bar closed.
  2. Repair cutter bar.
  3. Linkage pin fell out.
  4. Linkage worn out, blades don't cross.

VIII. Missing wire tie.
- A. Wire guides out of adjustment causing one or both wires not to be picked up by needle.
  1. Adjust wire guides.
- B. Wire guide will not move up or down freely. This will cause a bend in the wire, and the needle will fail to pick up the wire.
  1. Insure wire guides move up and down freely.
- C. Wire broken, improperly threaded, or spool is empty.
  1. Insure wire is properly threaded through both sides of tier.
- D. Too much tension on one or both wires.
  1. Check wire feed system for excessive drag.
  2. Check wire guide rollers for wear or not turning.
  3. Check needle rollers for worn, loose or frozen rollers.
  4. Check for improperly threaded wires.
  5. On 100 pound feed systems check for brake adjusted to tight on dispenser.
- E. Burr or gouge on needle head, or needle head roller mount screw(s) too long and sticking above needle head.
  1. Insure needle head is smooth and free of gouges, burrs or any defect which could snag the wire.
- F. Needle head mounting screw(s) not fully seated and snagging wire.
  1. Insure all mounting screws are fully seated.
- G. Needles out of alignment.
  1. Realign needles with plunger slots and recheck wire guide adjustments.

H. Burr, gouge, or material snagging wire in plunger slots causing wire to snag.
   1. Insure plunger slots are free of any defect.
I. Needles not pulling wires all the way into cutting bar.
   1. Adjust LS-22 for approximately one quarter inch space between needle head and cutter blade.
J. Cutter blades are loose, broken, worn, or defective causing an incomplete wire cut.
   1. Check cutting surfaces.
   2. Check security of blades.
   3. Observe correct operation.
   4. Check tier timing.
K. Incorrect tier timing.
   1. Insure twisters are rotating at one revolution per second.
   2. (12 GAUGE) Insure cutter timing is correct. One and one quarter revolutions of the twister shaft to one full extension of the cut cylinder. (10 GAUGE) Insure cutter timing is correct. Five eights revolution of the twister shaft to one full extension of the cut cylinder.
L. Twister hook(s) broken, loose, worn or not turning.
   1. Check twister hooks for any defects.
M. Twister hook not picking up both wires or one wire pulling out of twister hook.
   1. Needle head rollers worn.
   2. Too much wire tension.
   3. Incorrect timing.
   4. Twister hook defective.
   5. Twister hook not fully installed in shaft.
N. Twister hook(s) not fully installed into twister shaft.
   1. Remove twister hook and grind end as necessary to obtain a good fit into twister shaft.
O. Twister hook not turning.
   1. See TWISTER HOOKS NOT TURNING.
P. Wire caught in feed system causing excessive drag or wire breakage.
   1. Check spools, wire guides, and rollers for problems.
Q. Needle roller missing.
   1. Replace needle head roller.
R. Tier bolts loose.
   1. Insure all bolts on tier are tight.

IX. Wires pull out of twister hooks.
  A. Excessive wire drag.
    1. Inspect wire feed system for cause of excessive drag.
  B. Twister hook(s) not fully installed into twister.
    1. Remove twister hook and grind end as necessary.
  C. Twister hooks worn.
    1. Repair twister hook by grinding grabbing surface or replace.
  D. Twister hook(s) not turning.
    1. See TWISTER HOOKS NOT TURNING.

X. Wires are being over twisted.
  A. Wire is too hard.
    1. Set twister forward count lower.
  B. Twist forward set up for too many twist forward.
    1. Set twist forward for fewer counts.
  C. LS-23 switch out of adjustment. (Might not count every rotation).
    1. Readjust LS-23 or repair as required.

XI. Twister hooks breaking.
  A. Locking collar loose or missing allowing twister shaft to move forward and allowing twister hook to contact wire guide.
    1. Adjust or repair as required.
  B. Insufficient clearance between needle head and twister hook.
    1. Adjust needle head so there is only one quarter inch space between the cutter bar and needle head.
    2. Insure twister hook shaft is properly positioned.
  C. Wrong shafts or wire guides installed.
    1. Install correct shafts or guides.
  D. Twister hook(s) hitting wire guide.
    1. Grind wire guide as necessary to clear twister hook.
  E. Carriage being pulled off LS-22.
    1. Increase cutter speed.
    2. Adjust LS-22 to clear before twisters break.

XII. Wires not cutting and are twisting around twister hook shafts.
  A. Wire not going into cutter bar.
    1. SEE MISSING WIRE TIES.
  B. Cutting blade(s) loose, broken or defective.
    1. Remove cutter bar assembly and tighten and repair as necessary.
  C. Needle roller missing.
    1. Replace roller.

XIII. Wire(s) not being picked up.
    A. See MISSED WIRE TIE.

XIV. Wire(s) coming off guide rollers on wire feed system.
    A. Poor alignment between rollers and guides.
        1. Realign guide rollers or install guides to hold the wires in position.

XV. Wire(s) breaking at base of knot.
    A. Wire bring over twisted.
        1. See OVER TWISTING WIRE.
    B. Wire too hard.
        1. Have wire checked. Call American Baler.
        2. Use softer wire.
        3. See WIRE TOO HARD.

XVI. One or both tails are breaking off.
    A. Loose or worn blades on cutters may be causing an incomplete cut.
        1. Remove cutter bar and tighten or repair as necessary.
    B. Timing incorrect.
        1. See INCORRECT TIER TIMING.

XVII. Uneven tails on tied knots.
    A. Tier timing is poor.
        1. Adjust tier timing.
    B. Excessive wire drag.
        1. Eliminate drag, especially on off tier side.
    C. One hard and one soft wire mated together.
        1. Mate soft wire with soft wire.

XVIII. Wire loop at base of knot.
    A. Insufficient tension on tier side wire feed system.
        1. Increase tension on tier side of feed system.

XIX. Tier making good ties, but wire(s) breaking before bale leaves chamber.
    A. Wire is being pinched, snagged or cut.
        1. Eliminate source of conflict.

XX. Wire is too hard.
    A. Cause wire to break at base of knot or wire breaks after bale leaves chamber.
        1. Use fewer twist forward.
        2. Use shorter bales.
        3. Make lighter (less dense) bales.
        4. Use a softer wire.

XXI. Wire is too soft.
- A. Causes wire to untie as bale leaves chamber.
  1. Use harder wire.
  2. Try using more twist forward.
- B. Baler density and/or length is so great wires cannot hold the bale together.
  1. Lower bale density by reducing push pressure.
  2. Make shorter bales.
  3. Use lower gauge wire. Call American Baler first.

XXII. Tier making good knots, but wires breaking or pulling apart after bale leaves chamber.
- A. Wires too soft or hard.
  1. See WIRE TOO HARD.
  2. See WIRE TOO SOFT.
- B. Wires are being over twisted.
  1. See OVER TWISTING WIRE.
- C. Bale density or length too great.
  1. Make less dense bales.
  2. Use shorter bale length.
  3. Change wire gauge. Call American Baler first.
- D. Bale not being supported as it leaves the bale chamber.
  1. An unsupported bale increases the strain on the upper wire. Support the bale.
- E. Wires being nicked or cut.
  1. Inspect entire feed system to determine what is damaging wire.

XXIII. One twister hook out of adjustment.
- A. Individual twister hook chain is broken, worn, or loose.
  1. Return twister hook to 12:00 position and repair or install new chain.

XXIV. Both banks of twister hooks out of position.
- A. Either LS-23 cam slipped or maintenance reassembled out of sync.
  1. Readjust LS-23 cam or remove main drive chain, realign twisters, reconnect chain.
     a. Note: Twister shaft keyways should be up when twisters are up.

XXV. Needle drive chain is breaking.

A. Too much hydraulic pressure on needles.
   1. Lower pressure to the lowest pressure tier will still operate.

B. Restriction in needle slot is causing needles to hang up.
   1. Inspect needle slots for defect.

C. Needle drive flow control not properly adjusted.
   1. Adjust flow control while needles are retracting. Restrict flow until needle retract speed is reduced 10% to 15% of full flow.

D. Shock absorber not working.
   1. Adjust or replace shock absorber.