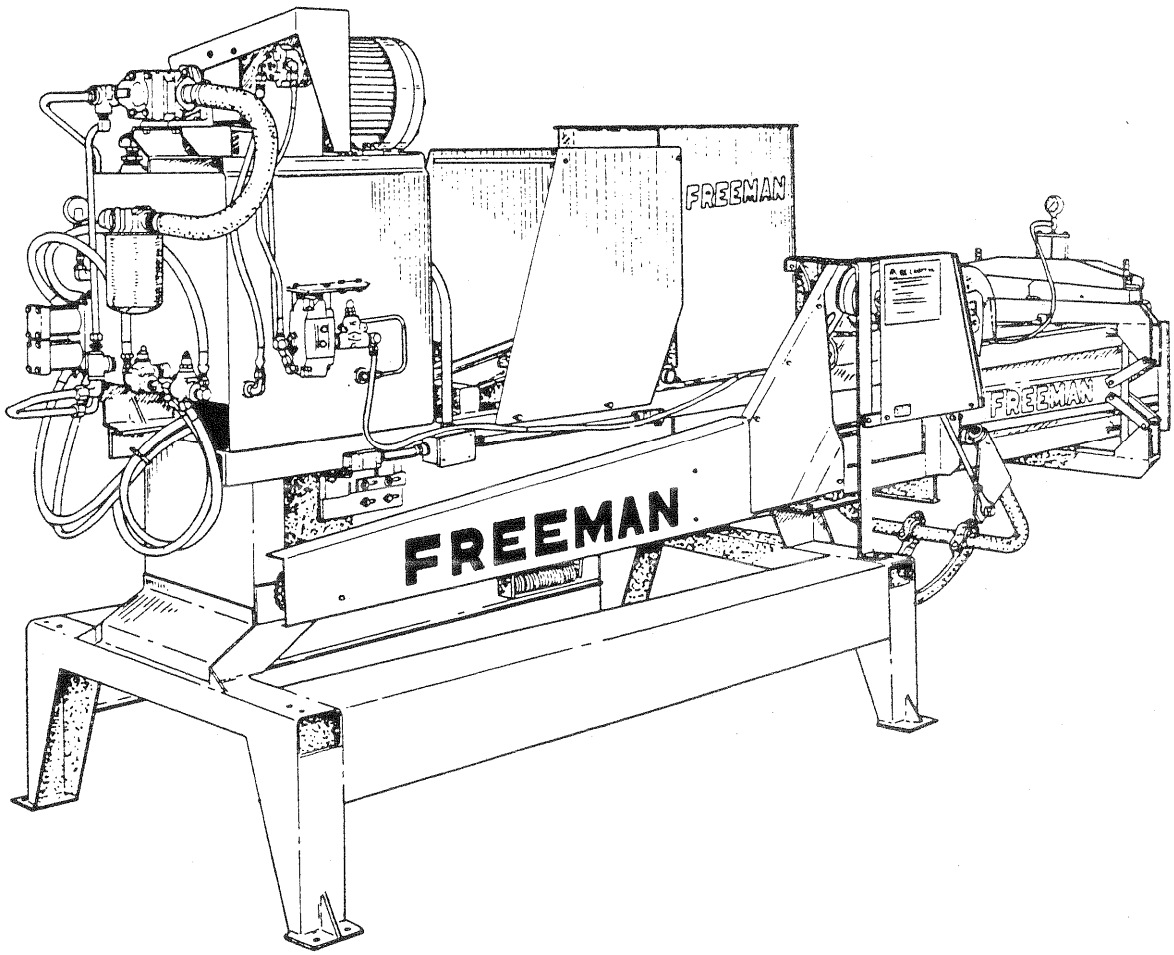
FREEMAN

CM 1418
HORIZONTAL HYDRAULIC
AUTOMATIC TIE BALER

OPERATOR'S MANUAL



manufactured and distributed by

J. A. FREEMAN & SON, INC.

PORTLAND, OREGON

PB 0141877

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BALER IDENTIFICATION

Each Freeman Baler is identified by means of a baler model number and baler serial number. As a further identification, all power units are provided with a serial number.

To ensure prompt, efficient service when ordering parts or requesting repairs from your authorized Freeman dealer, record the serial numbers in the spaces provided.

BALER SERIAL NUMBER _____

Front of Baler on upper frame.

WIRE KNOTTER SERIAL NUMBER _____

Right side of twister and shuttle bar frame.

POWER UNIT SERIAL NUMBER _____

10 or 15 HP Electric Motor-
Left side, near connection box.

NOTE: The motor and pump end is considered the front of the baler. The sides are described as left-hand side and right-hand side as viewed from behind while facing the baling chamber from the rear.

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SAFETY PRECAUTIONS

"THE BEST SAFETY DEVICE IS A CAREFUL OPERATOR"

Do not clean, lubricate, or make any adjustments on the equipment while it is in operation.

Do not start the equipment until you are certain everyone is clear of the machine and have ensured there are no tools on the unit.

Do not work around equipment in loose clothing.

Do not attempt to service any equipment while the motor is running.

Inspection Covers and Safety Shields should only be removed by authorized service persons.

After servicing do not place the equipment back into operation until all Safety Shields and Devices have been replaced. Operation without Safety Shields and Devices can place the operator into a hazardous situation.

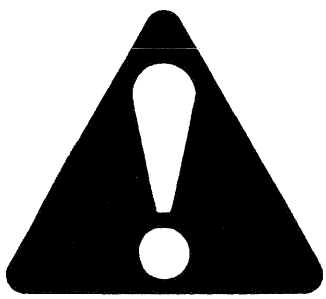
Do not open or work on the In-Feed System until the flow of material has been stopped and the Baler Motor has been turned off.

Do not make any adjustments or reach under any load bearing surfaces while they are loaded.

Do not attempt to correct a tangle or malfunction in the Baling Wire while the machine is operating.

CAUTION: ⚠ IN THIS MANUAL THE SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES. WHEN YOU SEE THE SYMBOL, BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY AND CAREFULLY READ THE MESSAGE WHICH FOLLOWS.

INSTRUCT ALL OPERATORS ON SAFETY PRECAUTIONS.



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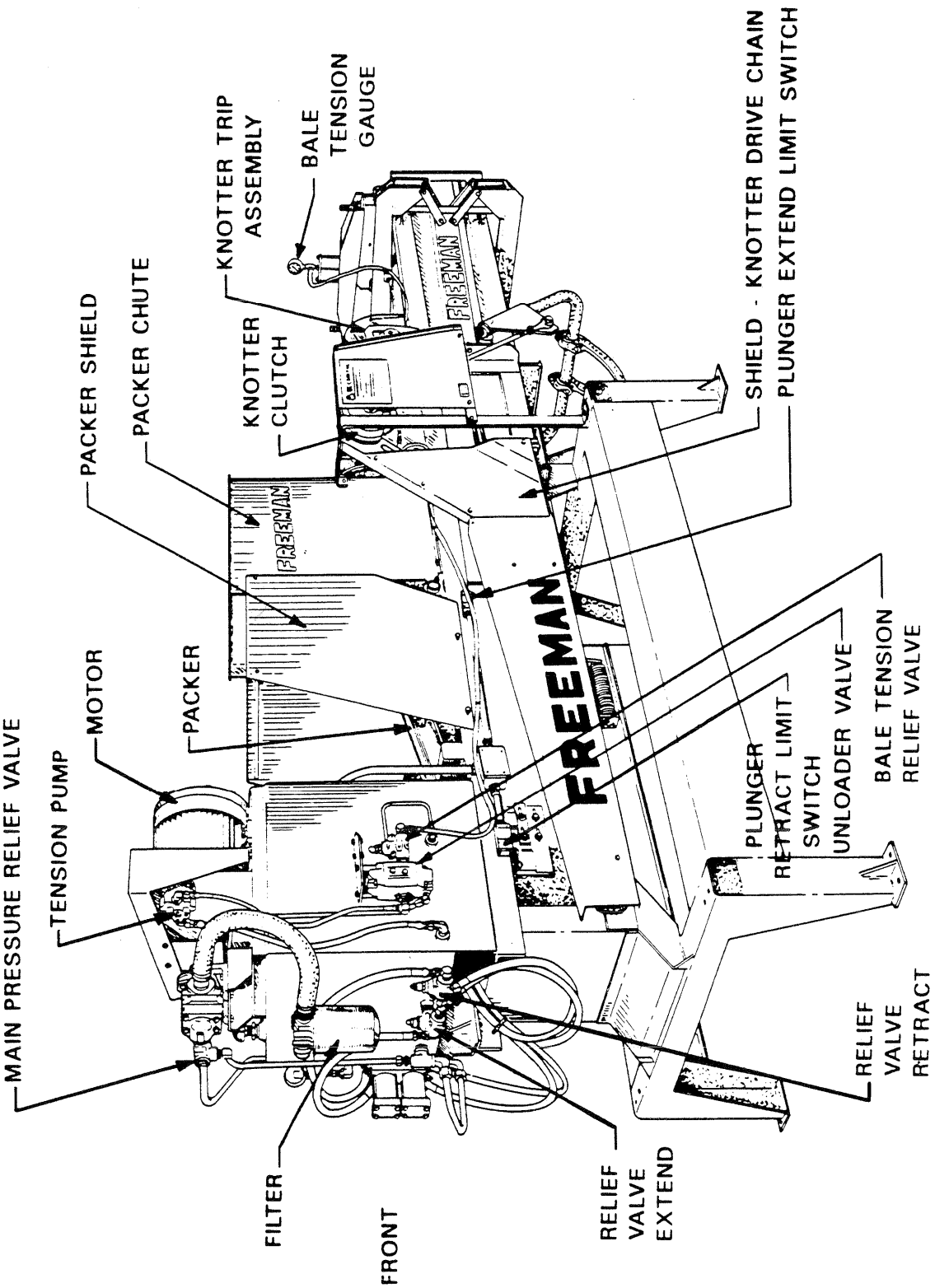
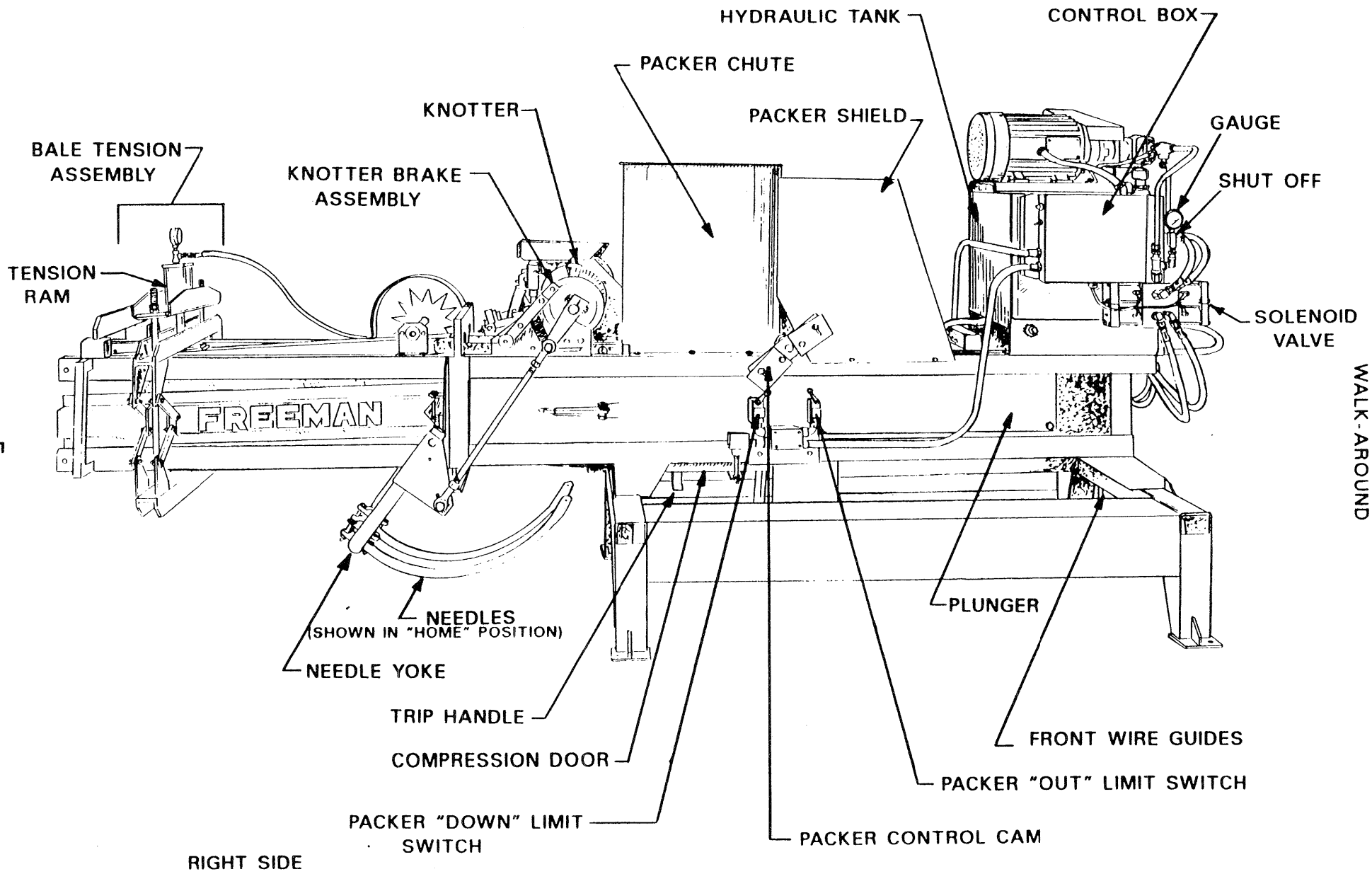

MAIN PRESSURE RELIEF VALVE
TENSION PUMP
MOTOR
PACKER
PACKER SHIELD
PACKER CHUTE
KNOTTER TRIP ASSEMBLY
KNOTTER CLUTCH
BALE TENSION GAUGE
SHIELD - KNOTTER DRIVE CHAIN
PLUNGER EXTEND LIMIT SWITCH
PLUNGER RETRACT LIMIT SWITCH
UNLOADER VALVE
BALE TENSION RELIEF VALVE
RELIEF VALVE RETRACT
RELIEF VALVE EXTEND
FILTER
FRONT
LEFT SIDE
FREEMAN


HYDRAULIC TANK
CONTROL BOX
PACKER CHUTE
KNOTTER
PACKER SHIELD
GAUGE
BALE TENSION ASSEMBLY
KNOTTER BRAKE ASSEMBLY
SHUT OFF
TENSION RAM
SOLENOID VALVE
FREEMAN
NEEDLES
(SHOWN IN "HOME" POSITION)
PLUNGER
NEEDLE YOKE
TRIP HANDLE
FRONT WIRE GUIDES
COMPRESSION DOOR
PACKER "OUT" LIMIT SWITCH
PACKER "DOWN" LIMIT SWITCH
PACKER CONTROL CAM
RIGHT SIDE

INSTALLATION

If the CM 1418 baler is set up out of doors a shelter should be constructed to protect the baler and materials from inclimate weather conditions.

It is the owner's responsibility to supply electrical power to the baler. This electrical hookup should be done by a licensed electrician to meet national and local electrical codes.

NOTE: USE CARE WHEN MOVING THE BALER WITH ANY EQUIPMENT, WHICH MAY DAMAGE COMPONENTS.

The motor end is considered the front of the baler. The sides are described as leftside and rightside as viewed from behind while facing the baling chamber from the rear.

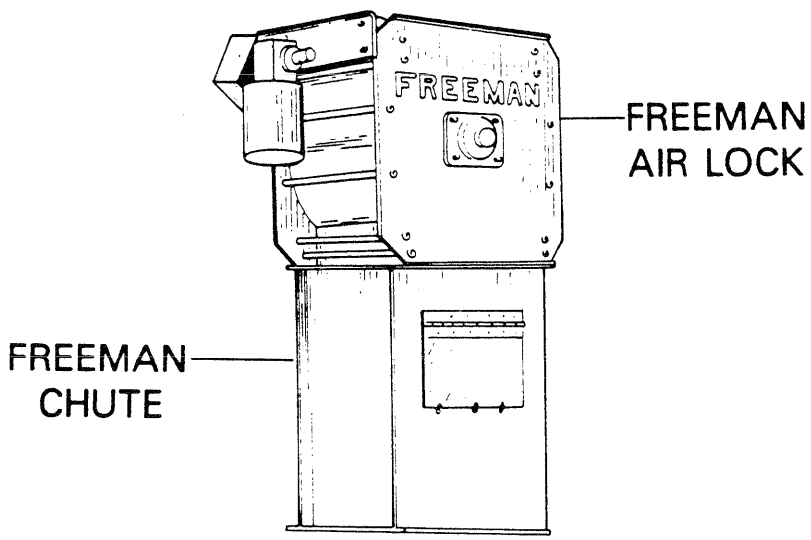
Before proceeding with the installation, be sure the baler is located in the desired position. It is a must that sufficient area is permitted for baler service and maintenance.

The baler may be mounted on any surface that is firm and level enough to provide uniform support for all four feet. Balers usually require anchoring to prevent movement.

A platform must be constructed and attached rearward from, and level with the bottom of the bale chamber for a distance at least equal to the length of one bale. (48 inches is a common bale length). The chute is necessary to provide support for the bales being extruded from the baler if satisfactory bales are to be produced. The bales will be adequately supported if an optional Freeman Bale Diverter is used.

A Chute (Freeman Chute is available) which extends approximately three feet above the packer should be used to mate with material inlet if maximum baler capacity is to be achieved. The chute should have straight sides, a large access door, and preferably, windows. Air movement within this feed chute must be prevented as pressure or vacuum can seriously degrade or prevent baler operation.

Direct attachment of a cyclone or a forced air conveyor system to the baler is unsatisfactory as proper air balance is difficult to achieve and nearly impossible to maintain as operating conditions change. The application of a Freeman Air Lock satisfies the feed chute requirements and allows attachment to the cyclone.



INITIAL START-UP

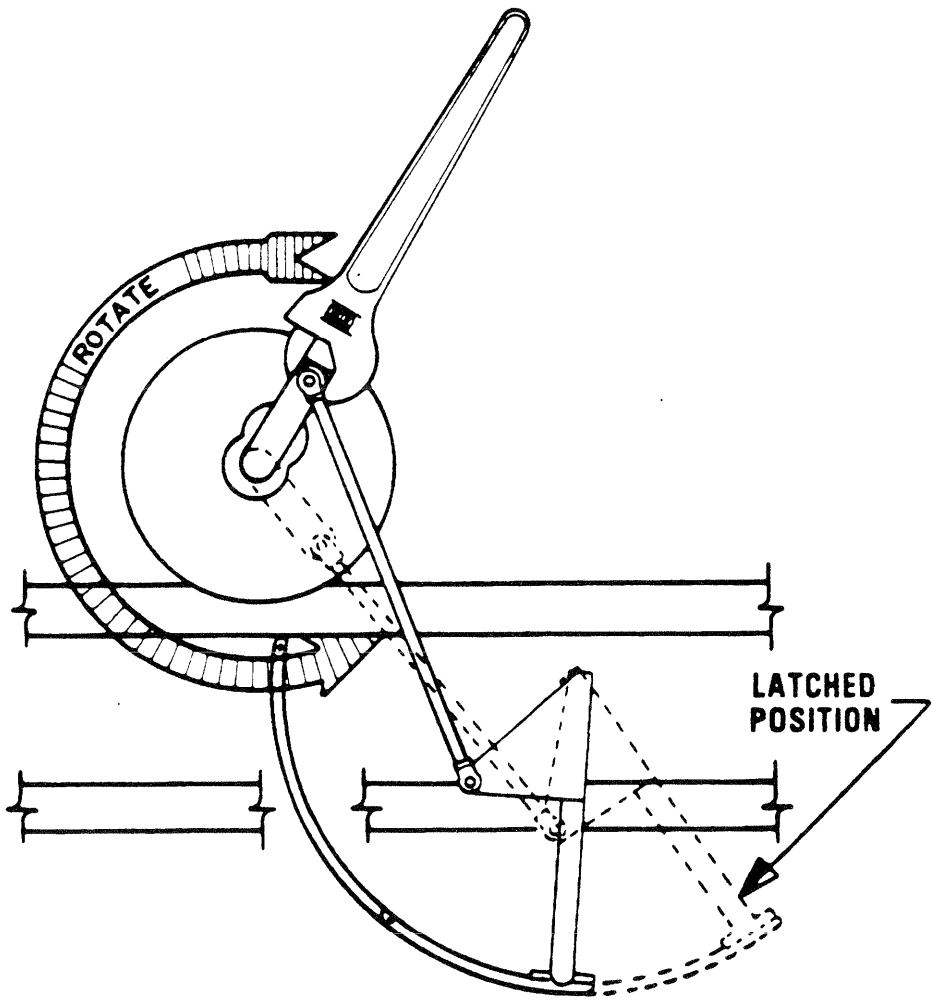
NOTE: BALER IS SHIPPED WITHOUT OIL IN THE HYDRAULIC TANK. BE SURE BALER IS CLEAR OF ALL SHIPPING MATERIALS.

At the factory, baler shipping preparation includes rotating the knotter mechanism to position the needles inside the bale chamber. Before attempting to start the baler, ensure that the needles are out of the bale chamber.

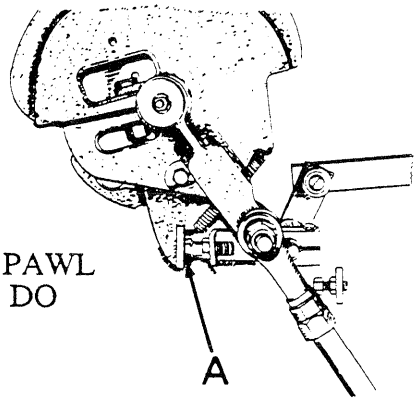
This is accomplished by rotating the knotter until the needles return to their retracted position.

AVOID EQUIPMENT DAMAGE

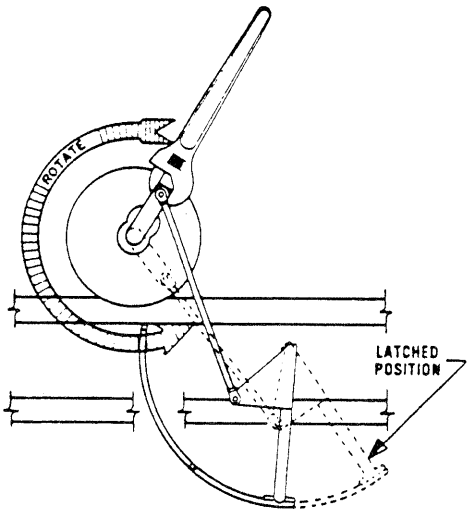
BEFORE STARTING BALER, ENSURE THAT THE NEEDLES ARE OUT OF THE BALE CHAMBER AND ARE LATCHED IN THE RETRACTED POSITION.

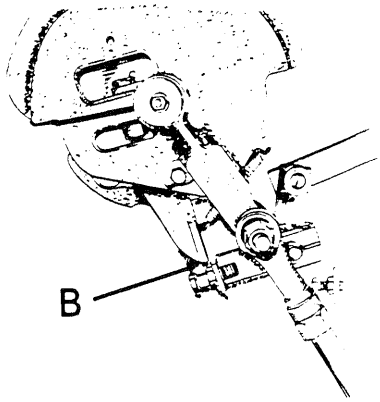


NOTE: **The knotter assembly can be freely rotated. When the needles have reached their retracted position, the cam follower on the saddle level will snap into the notch on the brake disc.**



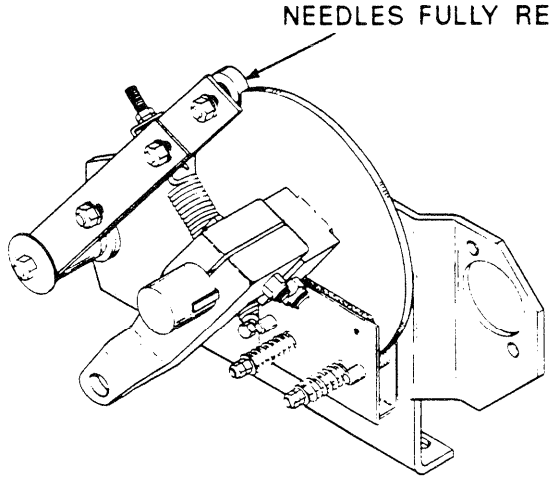
REF. A SHOWS THE CLUTCH PAWL IN THE LATCHED POSITION. DO NOT ATTEMPT TO ROTATE.





REF. B SHOWS THE CLUTCH PAWL IN THE UNLATCHED POSITION. UNIT MUST BE ROTATED AS SHOWN AT LEFT.

CAM FOLLOWER IN NOTCH
NEEDLES FULLY RETRACTED



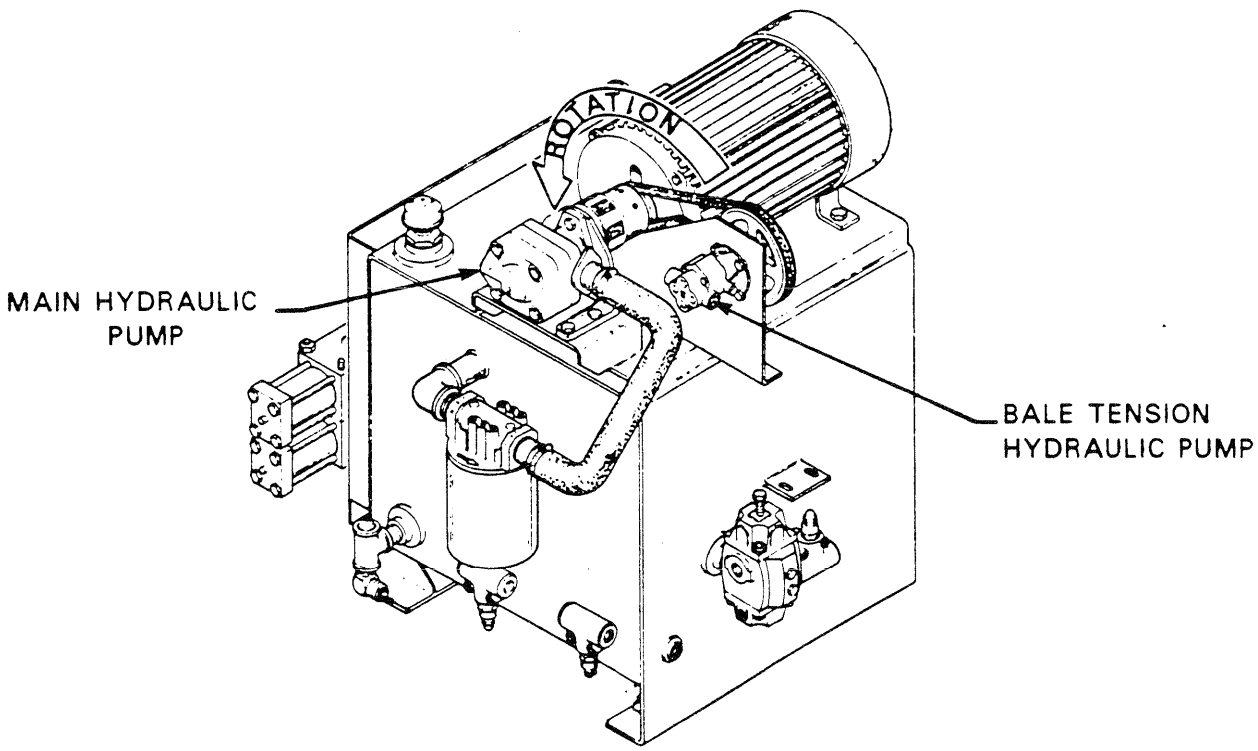
NOTE: **BALER IS SHIPPED WITHOUT OIL IN THE HYDRAULIC TANK. BE SURE BALER IS CLEAR OF ALL SHIPPING MATERIALS.**

When checking motor rotation, follow this procedure or serious hydraulic pump damage may occur. Be sure the hydraulic tank is filled with oil to within approximately 3" from the inside top of the tank. turn the baler operating switch (the small toggle switch mounted on the rear of the control box) downward to "off".

Only jog the motor to determine rotation by turning the main power on and then off. Do not let the motor run ! ! The proper direction of rotation is counterclockwise while facing the shaft end of the motor. When proper rotation has been achieved, continue jogging the motor until both the main hydraulic pump and the bale tension hydraulic pump have been primed. The larger, directly driven main hydraulic pump may be considered primed when its audible tones change from a rasping sound to a uniform pitch. If audible tones are insufficient to determine a primed condition of the hydraulic pump, continue jogging until reasonably certain priming has occurred. Then check by turning on the baler operating switch and operate the hydraulic pump for a few seconds. Observe the packer and plunger. If either move, priming has been completed. The small, belt-driven bale tension hydraulic pump may be considered primed when movement can be detected from the bale tension control cylinder assembly mounted on the rear of the baler, or when there is a change in the pressure on the bale tension gauge mounted on the cylinder. Re-priming should be unnecessary unless the hydraulic pump loses its charge of oil. This may occur if the filter is changed, oil lines attached to the hydraulic pumps are broken or removed, or oil level in the tank becomes too low.

Use one of the following types of oil:

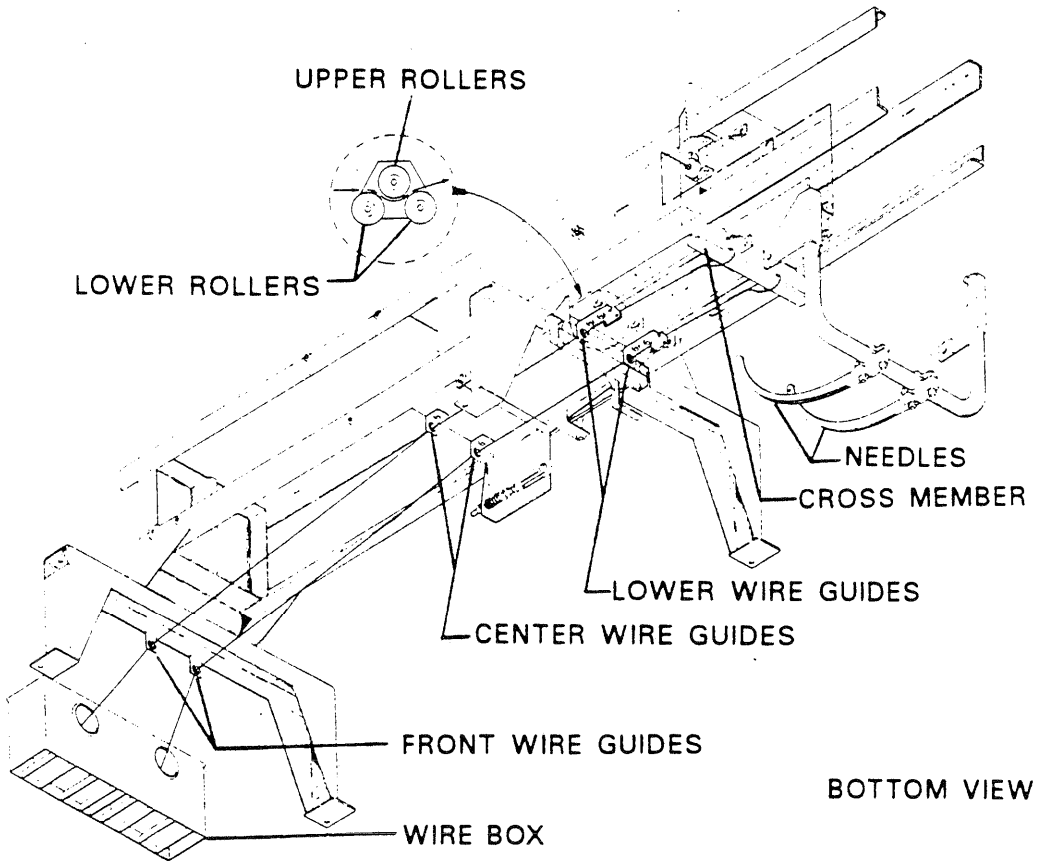
Anti-wear Hydraulic oil, 150-215 SSU @ 100 F
Automatic transmission oil
10-40 SAE engine oil



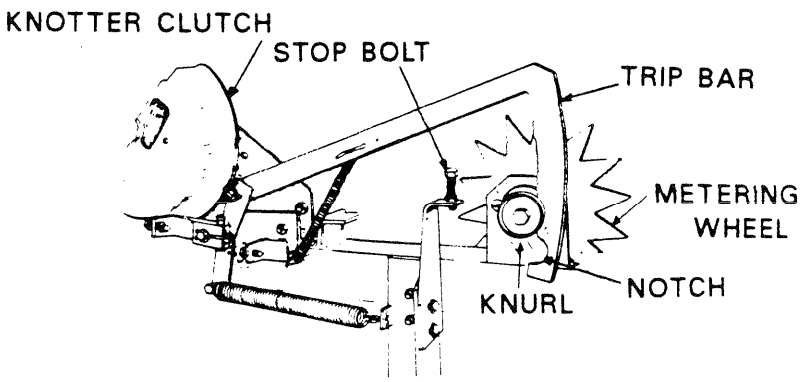
THREADING THE BALE WIRE

Place the wire box on the floor directly in front of the baler with the flared holes facing rear-ward. Place the wire rolls in the wire box with the start end wire projecting from the flared holes. Remove the excess finish end wire from the unflared side of the wire box and bend the wire sharply over the edge of the holes to prevent it from tangling with the wire coils inside the wire box. Cut the binding tapes that secure the wire coils inside the boxes then draw the start end wire from the flared side of the wire box and pass rear-ward through the front wire guides beneath the front of the baler. Continue pulling the wire rear-ward, passing it through the center wire guides, then lower wire guides. The wire is then fed through, above the lower rollers and below the upper rollers in the wire guides. Then, draw the wire rear-ward and attach to the cross member mounted just to the rear of the wire guide rollers.

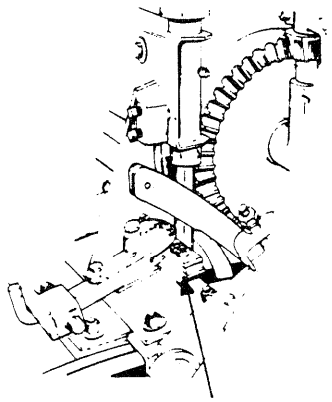
When attaching this wire, be sure it is in line with the path the needles will follow as they carry the wire upward through the bale chamber to the knotter. Repeat this process for each needle.



The knotter may now be tripped by manually lifting the trip bar until the notch in its lower end drops over the knurl on the end of the metering wheel shaft.



With the baler running, depress the trip door lever extending from beneath the right side of the baler, directly below the feed chute. Hold this lever down until the plunger starts to move rearward. After the plunger completes its rear-ward compression stroke, it should reverse and move forward, at which time the needles will move upward through the bale chamber, carrying the wire with them and placing it in the wire grippers of the knotter.



The needles will now move downward and return to the home position. The baler should now be ready for operation.

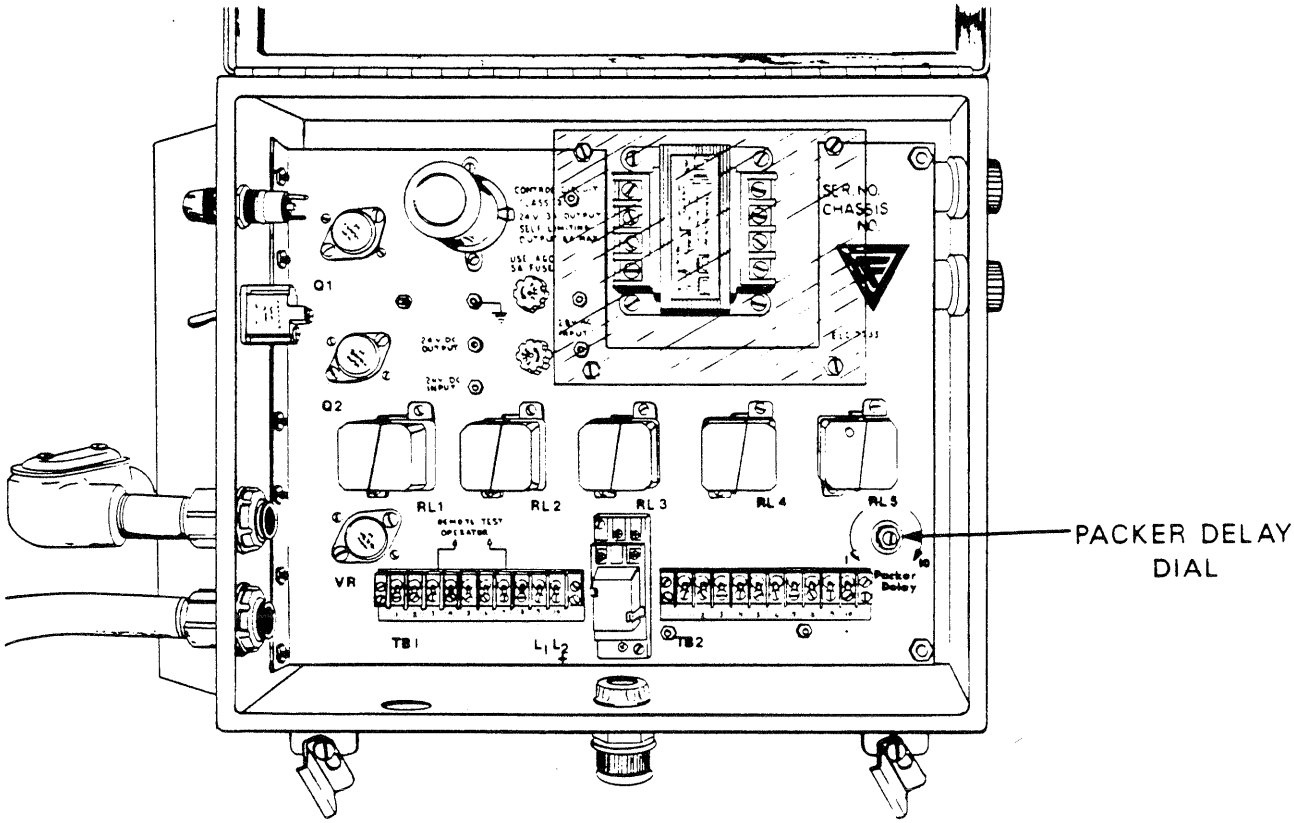
BALING

The baling process may be executed by operating the baler continuously and feeding the material to be baled into the feed chute at a rate not to exceed the maximum capacity of the baler. The maximum capacity is exceeded when the mass of material in the feed chute accumulated during a plunger stroke, is sufficient to lodge between the tip of the packer and the rear side of the feed chute, as the packer moves downward on its first stroke following the completion of a plunger operating cycle. If the baler is stalled due to overfeeding, it may be put back into service by depressing the trip door lever while manually operating the (rear) packer down limit switch. This procedure initiates the plunger operating cycle. When the plunger completes the cycle, the packer will move out of the feed chute allowing the overfed material to fall into the void created by plunger operation. The procedure may have to be repeated if the clogged condition is severe. On some occasions the plunger may stall midway during this clearing cycle. If this occurs, switch the baler operating switch to "off" and then back to "on". This will cause the plunger to move out of the chamber and then the packer to move out of the feedchute, restoring the baler to the proper operating condition for continuing the unclogging operation, or to resume normal baling operation when unclogging is complete. If the clogged condition still occurs it may be necessary to stop the feeding process until the baler has been cleared below the feed chute. In the event that the plunger cannot mechanically clear the bale chamber it may be necessary to clear it manually. This is done by activating the plunger, which is achieved by depressing the trip door lever. When the plunger moves in and stalls turn the baler operating switch to the off position, this will release the tension on the rear of the chamber allowing the manual removal of material being baled.

CAUTION: ⚠ ALWAYS TURN BALER MOTOR OFF WHEN MANUALLY REMOVING MATERIAL FROM BALE CHAMBER.

PACKER DELAY

The packer can be delayed to remain out of the feed chute for varying lengths of time from 1 to 10 seconds on a standard baler. If the delay is not appropriate for the required needs, it can be adjusted by opening the control box and adjusting the dial in the lower right corner of the box. Turn the dial clockwise to increase and counterclockwise to decrease the delay. If the 10 second delay is not long enough there is an optional feature available to lengthen the delay to a maximum of 2 minutes.



PACKER DELAY
SHUT DOWN PROCEDURE

If the baler is shut down overnight or weekends, it is necessary first, to stop material flow from the point of production. Then allow time for the material to clear from the packer chute. When the packer chute has cleared, depress the trip door lever to cycle the plunger. At this time the SHUT DOWN PROCEDURE is completed and the power to the baler may be turned off. For extended periods of time duplicate the above process and then clear the bale chamber of all material. This will prevent moisture buildup in materials left in the chamber that could cause a stalled plunger.

CAUTION: ⚠ INSURE THE BALER IS OFF BEFORE CLEARING CHAMBER.

Upon completion of the clearing process, normal baling may be resumed. As baling progresses, the hydraulic gauges should be observed periodically.

NOTE: THE SHUT-OFF VALVE FOR THE PLUNGER PRESSURE/ PACKER PRESSURE GAUGE ON THE FRONT OF THE BALER SHOULD BE KEPT TURNED OFF EXCEPT WHILE READING THE GAUGE, OR IT WILL BE DAMAGED BY PRESSURE SURGES.

HYDRAULIC GAUGE READING
AND BALE TENSION

All of the hydraulic pressures discussed should be observed while the oil is at normal operating temperature. If the oil is cold, somewhat higher pressures will usually be observed. Normal oil temperature should be obtained after one hour of continuous operation. As the packer is in motion the pressure readings on the plunger pressure/packer pressure gauge should be below 500 psi typically, 200 psi when the packer is moving downward, and 300 psi when the packer is moving outward. If the packer is stalled for any reason the pressure should not exceed 600 psi. As the plunger moves rear-ward the pressure on the plunger pressure/packer pressure gauge will be typically 200 pounds until material compression actually begins, then a sharp rise in pressure will be observed. Then, the pressure should normalize at approximately 1200 psi for a fraction of a second just preceeding reversal of the plunger. As the plunger moves out of the chamber, the pressure will typically be 300 psi. The Bale Tension Gauge located on the bale tension control cylinder will typically read 1300 psi. This pressure is suitable for nearly all materials and conditions. Changing this pressure will not alter bale density provided that a dip in the Bale Tension gauge reading can be observed during the final portion of the plunger compression stroke. Special conditions may produce sound reasons for altering the 1300 psi bale tension control pressure setting, as follows: The Hydraulic Bale Tension control pressure should be increased if a dip of at least 300 psi is not observed during the final stage of the compression stroke.

NOTE: A pressure dip may not be observed during baler start-up, restarting, or any factors which could change bale density. The absence of a dip at this time is not a basis for readjustment of bale tension control pressure.

BALE TENSION

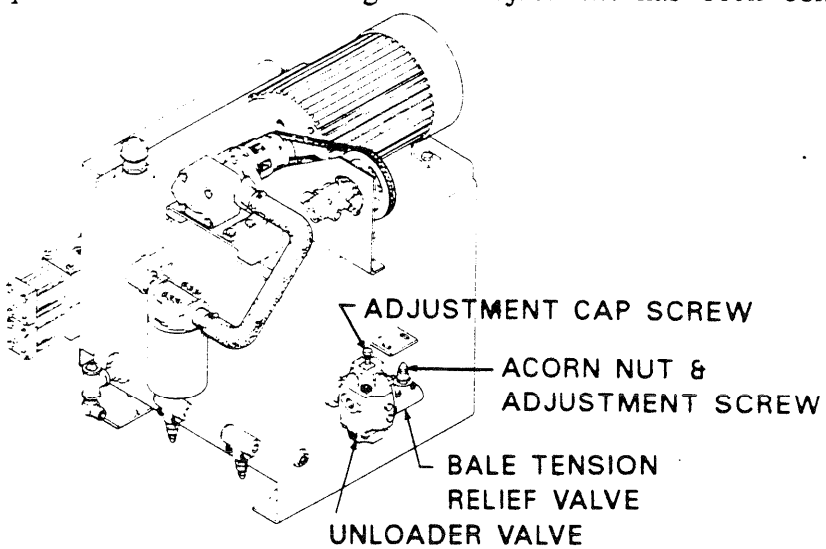
Bale tightness is controlled by the bale tension relief valve and the unloader valve.

If excessive tension rail pressure damages or distorts the bale and the pressure dip exceeds 300 psi, then the hydraulic bale tension control needs to be reduced, but should NOT BE REDUCED to below 800 psi. The hydraulic tension control pressure is adjusted at the bale tension relief valve which is the rear valve mounted on the left side of the hydraulic tank. The adjustment is made by removing the acorn nut, loosening the jam nut, and turning the slotted screw clockwise to increase the pressure and counter clockwise to decrease the pressure. After adjustment, re-tighten the jam nut and replace the acorn nut.

NOTE: **When bale density or tightness is to be checked and the baler has been stored with an empty bale chamber, wait until the fourth bale is produced before making any judgements concerning baler adjustments that effect bale tightness, unless it is obvious that the bales being produced are too tight. If the bale tightness adjustments are made during the baling process, the results will not become apparent until the third bale following the adjustment has cleared the bale chamber.**

The unloader valve is the forward valve mounted on the left side of the hydraulic tank. The function of this valve is to reduce the bale tension relief pressure sufficiently to allow the bale to be extruded from the bale chamber when the pressure on the plunger cylinder reaches the point required to produce adequate force for compressing the bale to the desired tightness. This reduction occurs only during the final portion of the plunger compression stroke as the bale is being extruded.

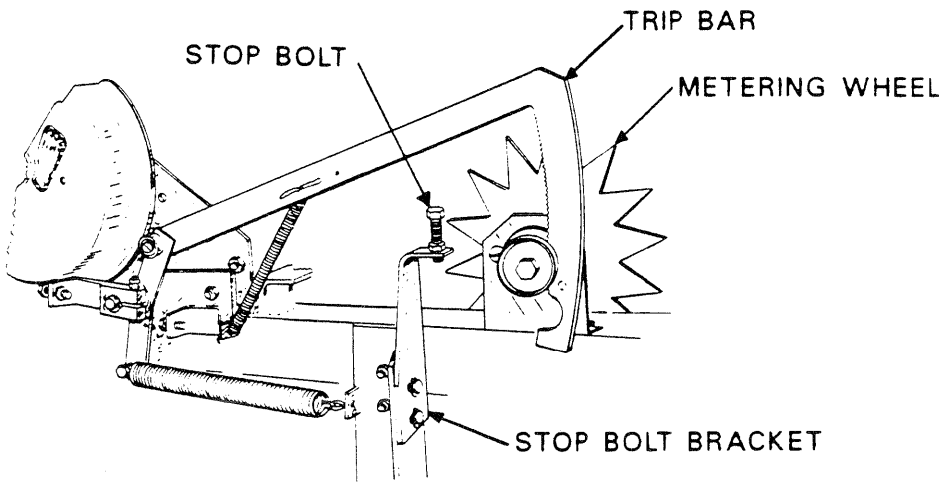
If the wires are broken at the knot or if the wire on top of the bale being formed breaks prior to the knotting process, bale tightness is too great and may be corrected by screwing the 3/8" cap screw found in the top of the unloader valve counter clockwise. If the bales being produced are too soft, light, or loose, they may be tightened by screwing the cap screw clockwise. If greater tightness is desired, it may sometimes be achieved by using a different grade of wire, such as galvanized baling wire. If the cap screw is adjusted, be sure that it is locked into position with the jam nut. If bale tightness is increased, extreme care should be exercised to prevent turning the adjustment cap screw in far enough to disable the valve. If this should happen, regulation of the bale tension control pressure cannot be accomplished. If the baler is allowed to operate in this condition, the plunger will stall before it reaches completion of the compression stroke, thus preventing the baler from operation until the bale tightness adjustment has been corrected.



BALE LENGTH ADJUSTMENT

When the baling process is normalized, the length of the bales should be measured in order to determine if bale length adjustment is necessary to provide the desired bale length. From a practical standpoint, the bales produces should be 36" or 46" long. The 36" length is preferred, as it produces a more stable bale and cross stacks evenly for storage. The 46" length bale is sometimes preferred when stacks are to be made 8' wide. The length adjustment is made with the trip bar stop bolt located on the left side of the baling chamber just behind the knotter clutch. In order to shorten the bales, the stop bolt is screwed upward. If inadequate adjustment is obtainable with the stop bolt, the stop bolt bracket may be repositioned in the alternate holes provided for its mounting.

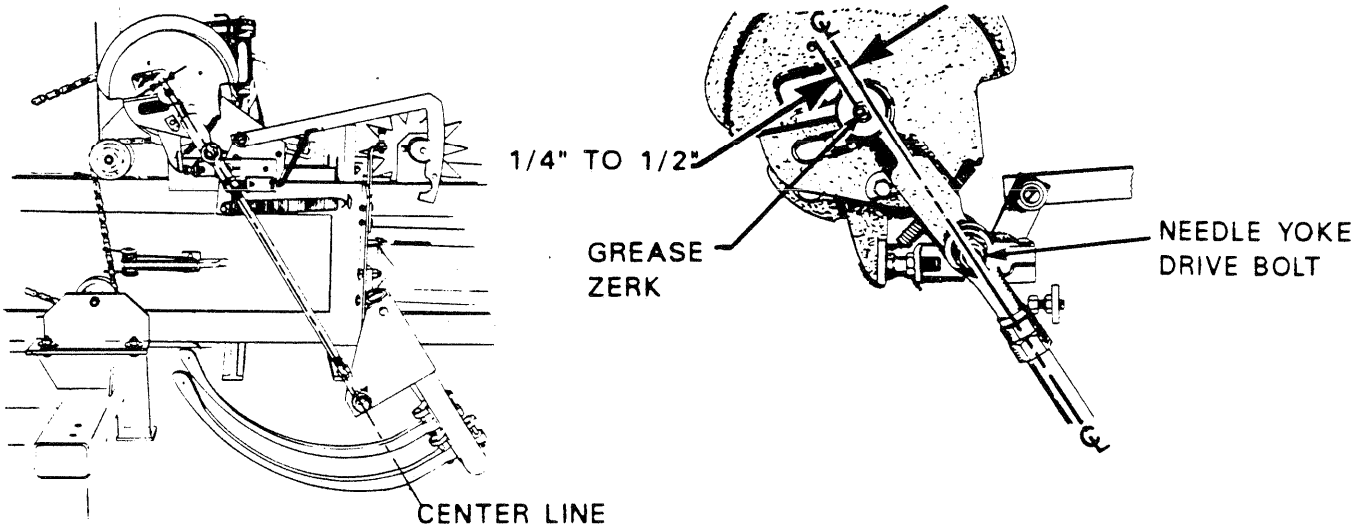
CAUTION: ⚠ ALWAYS TURN BALER MOTOR OFF WHEN INSPECTING, ADJUSTING, OR SERVICING THE BALER.



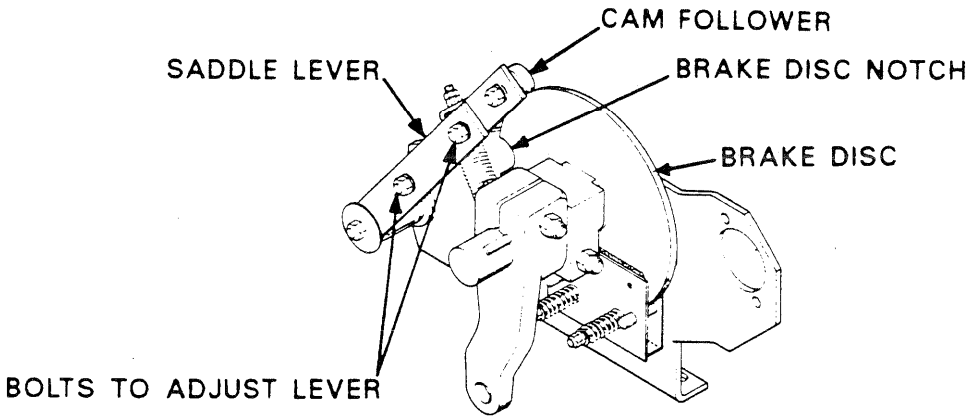
KNOTTER TRIP AND CLUTCH ADJUSTMENT

CAUTION: ⚠ ALWAYS TURN BALER MOTOR OFF WHEN INSPECTING, ADJUSTING, OR SERVICING THE BALER.

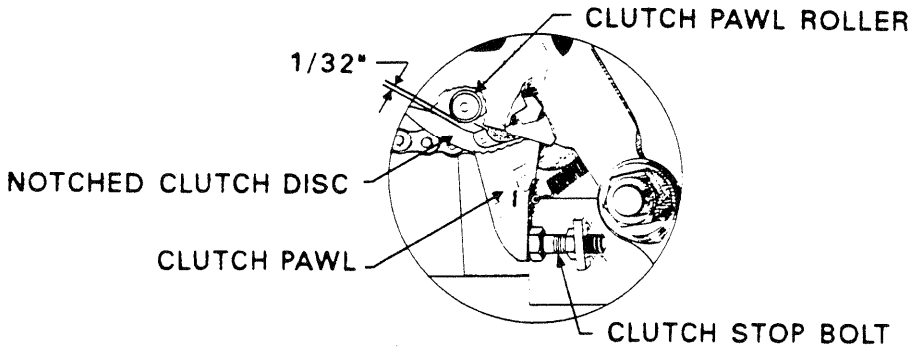
With needles in the home position, set the needle yoke drive bolt 1/4" to 1/2" past the center line between the knotter clutch grease zerk and the lower needle yoke drive bolt.



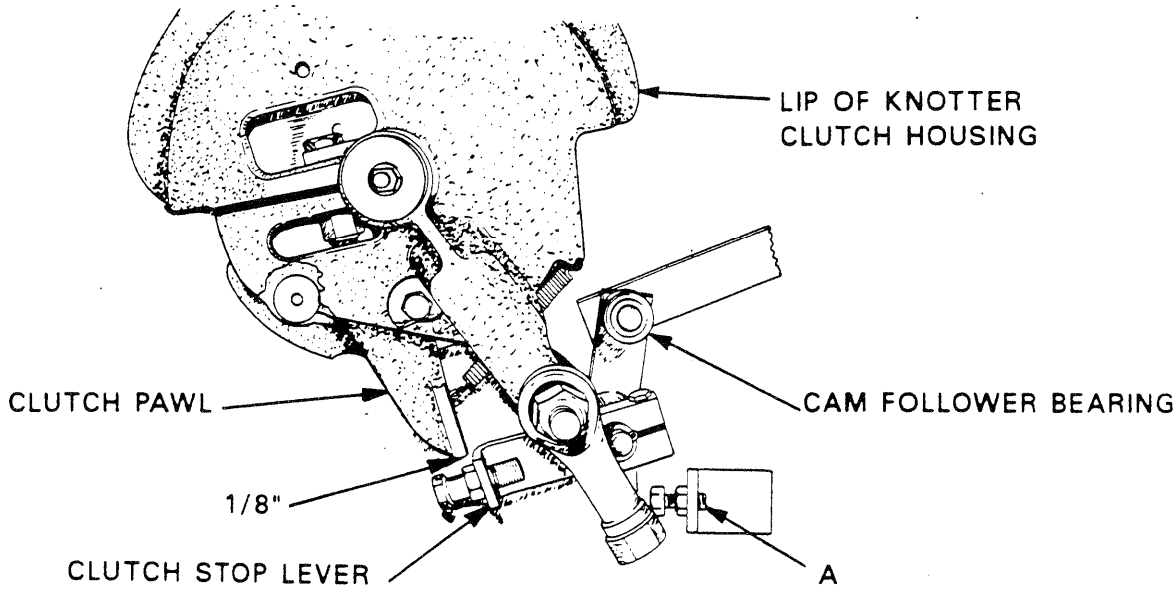
To obtain this setting adjust the saddle lever. Loosen the bolts to lengthen or shorten the lever (as needed) until the cam follower seats in the brake disc knotch. Then retighten the bolts.



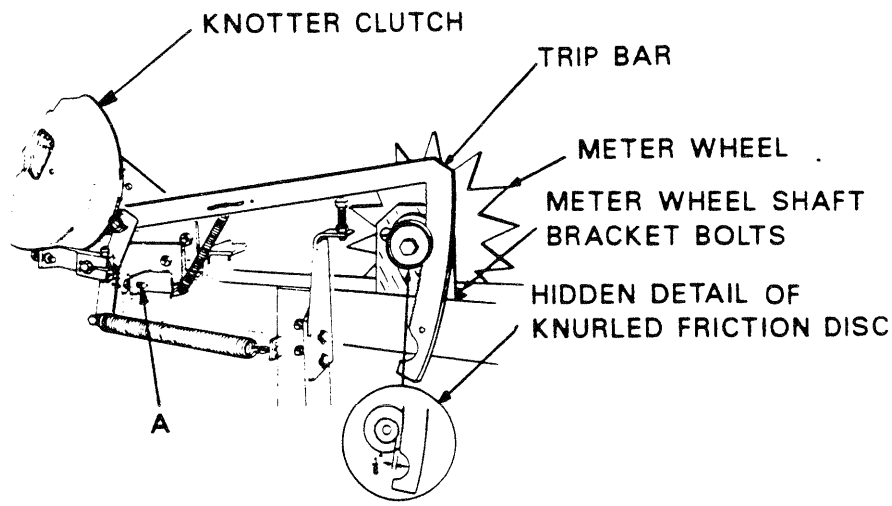
Proceed to knotter clutch pawl adjustment. When the face of the clutch pawl and the head of the clutch stop bolt are making contact there should be 1/32 clearance between the clutch pawl roller and the notched clutch disc. This adjustment is made by adjusting the clutch stop bolt as needed.



The Meter trip bar should then be lifted to trip the knotter. The clutch pawl is then free to pass over the clutch stop lever. There should be 1/8" clearance between the clutch pawl as it passes over the clutch stop lever. The adjustment is made by adjusting stop bolt "A"

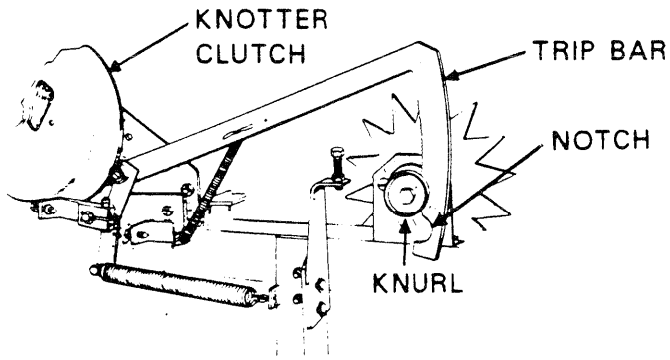


Rotate the knotter counter clockwise until the cam follower bearing makes full contact with the lip of the knotter clutch housing as shown, and completely resets the meter trip bar. When the meter trip bar is completely reset there should be 1/8" between the meter trip bar and the knurled friction disc. The adjustment is made by loosening the bolts that secure the meter wheel shaft brackets to the frame and sliding the meter wheel shaft until the proper adjustment is achieved. Insure that the shaft remains perpendicular to the frame. Then retighten the bolts.

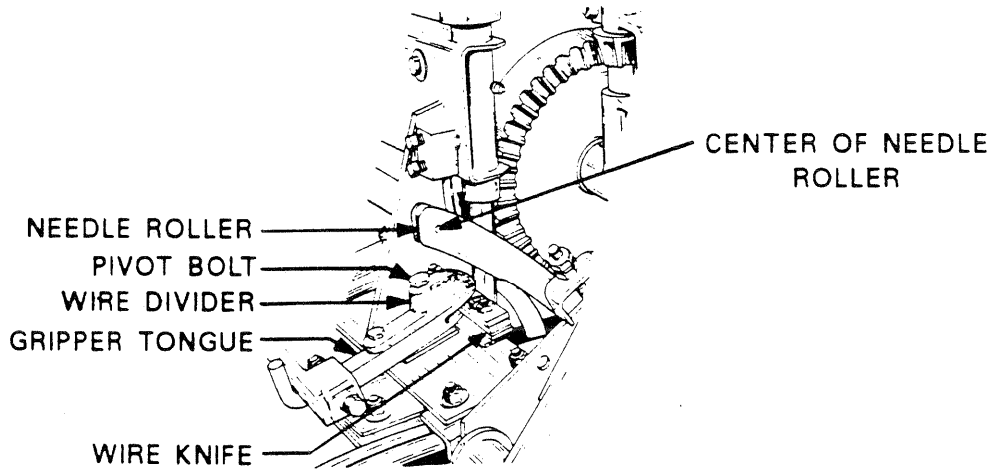


NEEDLE ADJUSTMENT

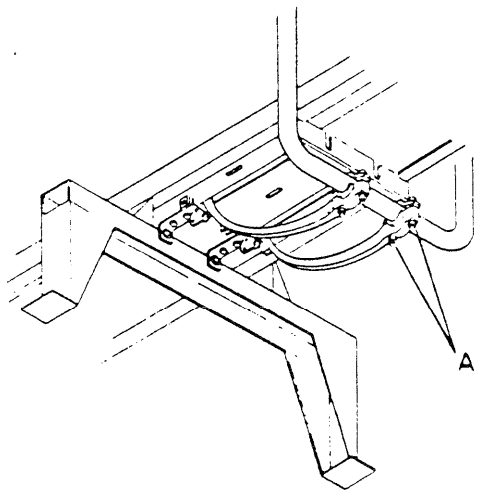
Trip the knotter clutch by lifting the meter trip bar so that the knurled friction disc on the end of the meter wheel shaft falls into the knotch on the meter trip bar.



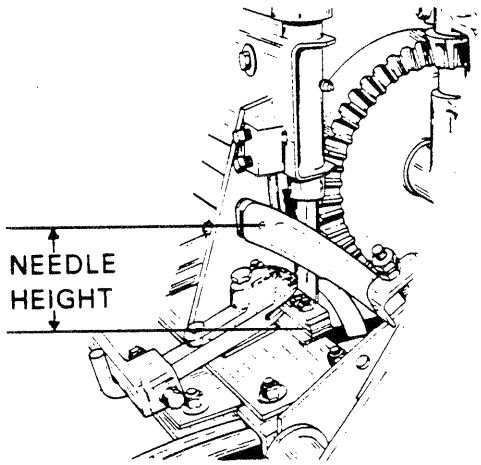
Swing the needles through the bale chamber, by rotating the knotter clutch. When the tips of the needles are over the wire divider, the roller in the tip of the needle should clear by 1/8" and be in line with the center of the pivot bolt of the gripper tongue.



Adjust the needles to obtain this 1/8" as follows: To increase the clearance loosen the front and tighten the rear needle anchor bolts "A". To decrease the clearance reverse the procedure

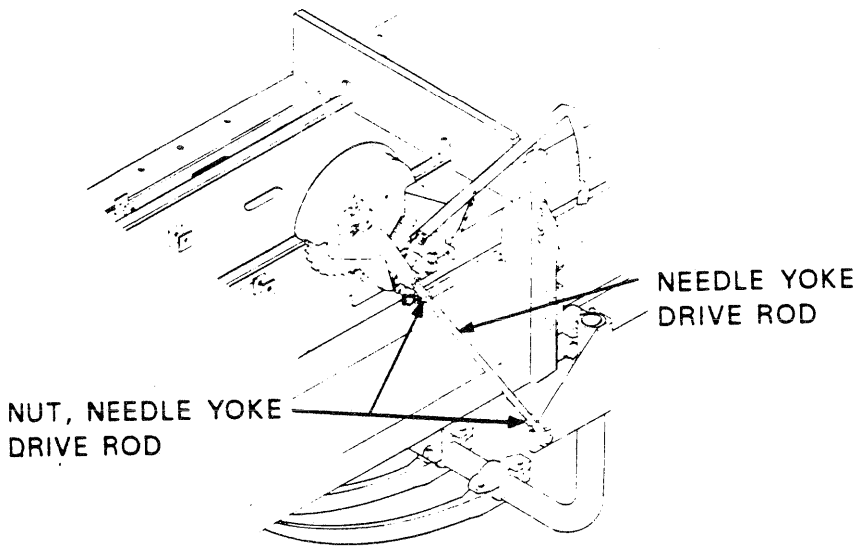


Run the needles to top dead center. The distance from the top of the wire knife to the center of the needle roller should be 4 1/2".



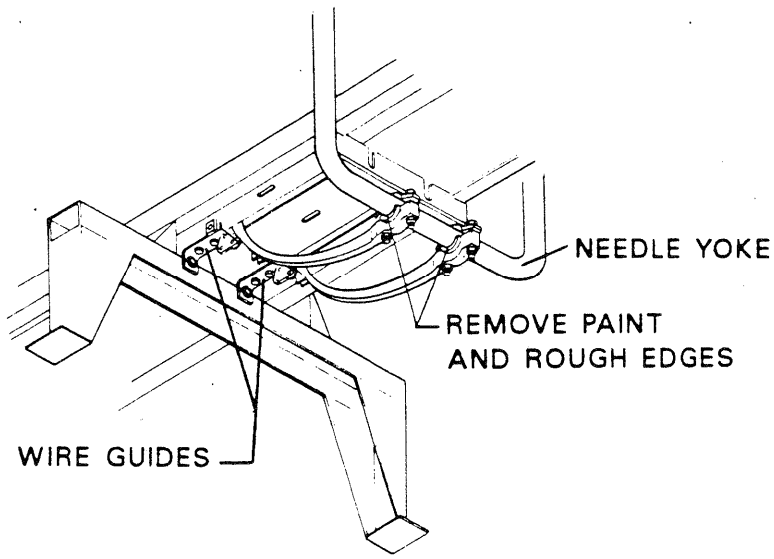
NOTE: **When an adjustment is made to the needles, recheck each adjustment in the sequence presented.**

To change the needle height, loosen the nuts on the needle yoke drive rods on each side and turn the rods for adjustment. For adjustment to be accurate both needle yoke drive rods must be adjusted for equal load on each rod at top dead center.



CAUTION: ⚠ **ALWAYS TURN BALER MOTOR OFF WHEN INSPECTING, ADJUSTING, OR SERVICING THE BALER.**

When the needles are on the down stroke, align the lower wire guides to the needle roller and as close to the needle as possible. Always adjust the needles to the knotter, then align the lower guides to the needle. When installing new needles, always remove paint and rough edges from the area that fits against the needle yoke and be sure the needles do not come in contact with any part of the baler as they move up and down through the bale chamber.



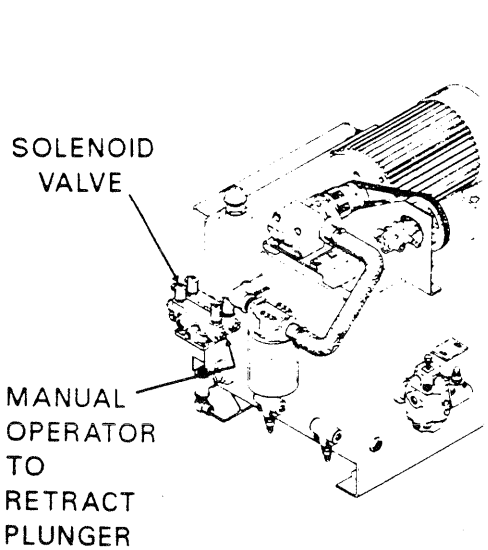
CAUTION: ⚠ **ALWAYS TURN BALER MOTOR OFF WHEN INSPECTING, ADJUSTING, OR SERVICING THE BALER.**

NEEDLE TIMING ADJUSTMENT

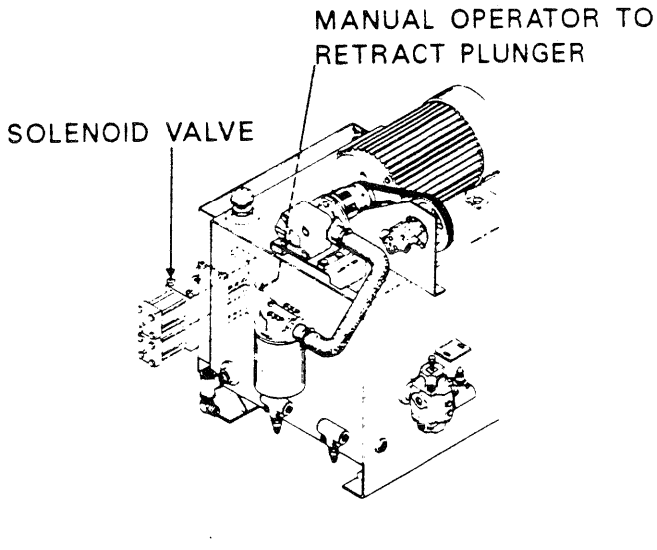
NOTE: **Before timing needles, knotter clutch adjustment, and wire needle adjustment procedures must be performed.**

Knotter clutch adjustments should be checked before performing this procedure. The plunger must be all the way forward in the chamber to time the needles. To insure that the plunger is forward, turn "control circuit" switch to "off" and press the manual operating button on the plunger solenoid valve.

NOTE: **If the baler is powered by a 10 hp motor the solenoid valves are mounted on the right side of the hydraulic tank. The manual operating button to bring the plunger forward is located on the rear end of the lower valve. If the baler is powered by a 15 hp motor the solenoid valves are mounted on the front of the hydraulic tank. The manual operating button to bring the plunger forward is located on the right side of the front valve.**



15 H.P.

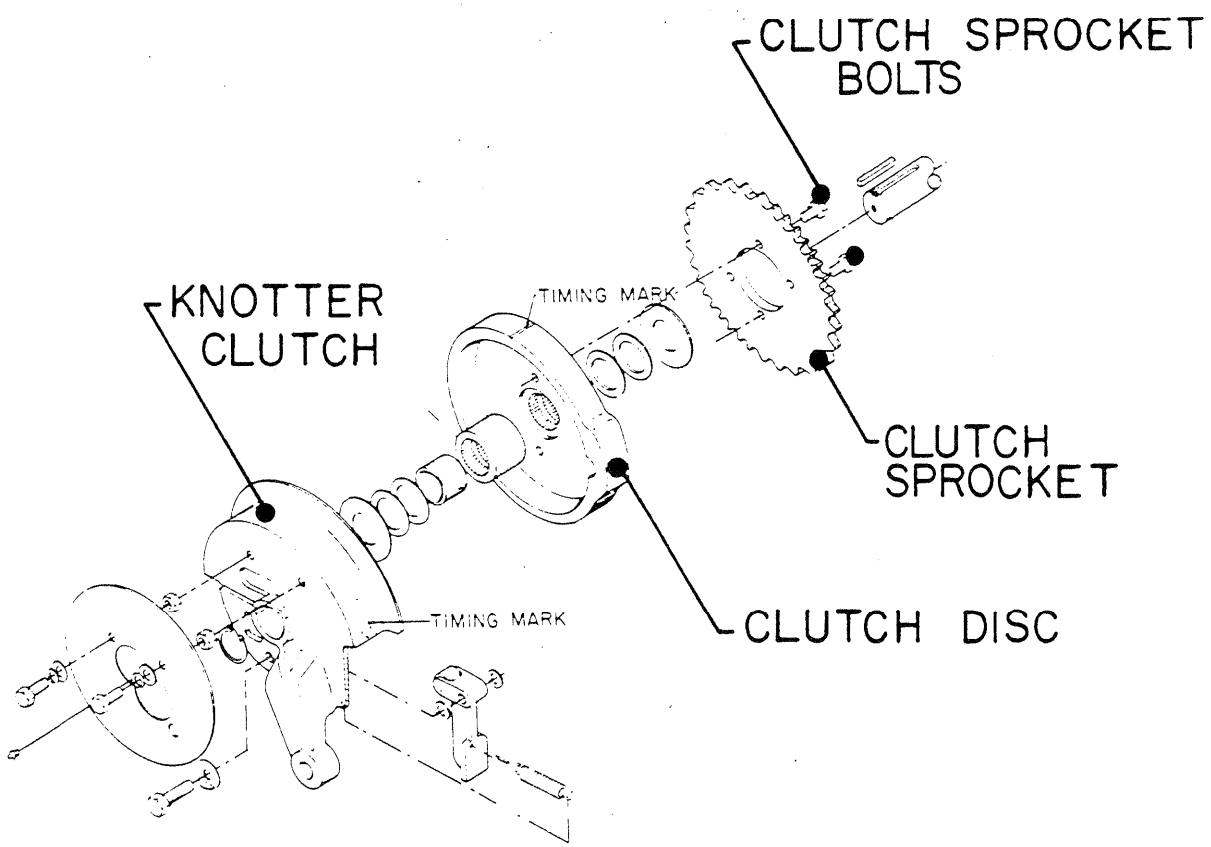


10 H.P.

After the plunger is brought forward, check the alignment of the knotter clutch and clutch disc timing marks. See p.14 of green colored parts book for location of timing marks. If timing marks cannot be located, follow procedure on page 23.

CAUTION: ⚠ **ALWAYS TURN BALER MOTOR OFF WHEN INSPECTING, ADJUSTING, OR SERVICING THE BALER.**

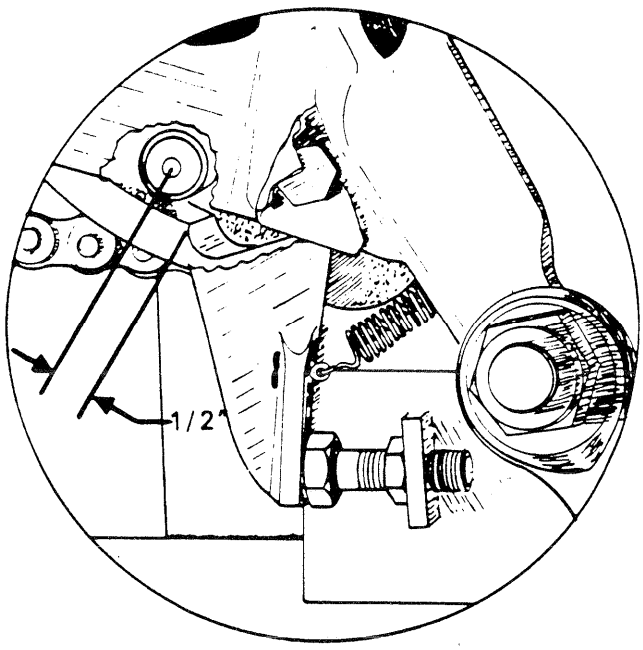
If the timing marks are not lined up loosen the knotter chain idler tension and remove the knotter drive chain from the clutch sprocket. Align the timing marks, replace the chain and tighten the knotter chain idler tension. The clutch sprocket will require turning if timing marks are misaligned an amount equal to 1/2 of a chain link. To turn the clutch sprocket, loosen knotter chain idler tension and remove chain. Then remove clutch sprocket bolts and turn clutch sprocket to the other set of holes and tighten. Return chain and check timing.



NEEDLE TIMING WHEN TIMING MARKS CANNOT BE LOCATED

NOTE: **Before timing needles, knotter clutch adjustment, and wire needle adjustment procedures must be performed.**

With baler motor running and with "control circuit" switch "off" , push the manual operator pin on the end of the solenoid valve to fully retract the plunger. This position is slightly more retracted than that obtained when the plunger is stopped by its limit switch. Turn motor off. Ensure that the saddle lever roller is seated in the notch in the brake disc. Measure the distance between the center of the clutch pawl roller and the edge of the notch in the notched clutch disc as shown below. If this distance is not 1/2", remove the knotter drive chain from the knotter clutch sprocket, rotate the sprocket to obtain the 1/2" and replace the chain. If the required adjustment is less than one full chain link, the knotter clutch sprocket must be removed and remounted in its alternate mounting holes. This gives one-half chain link adjustment.

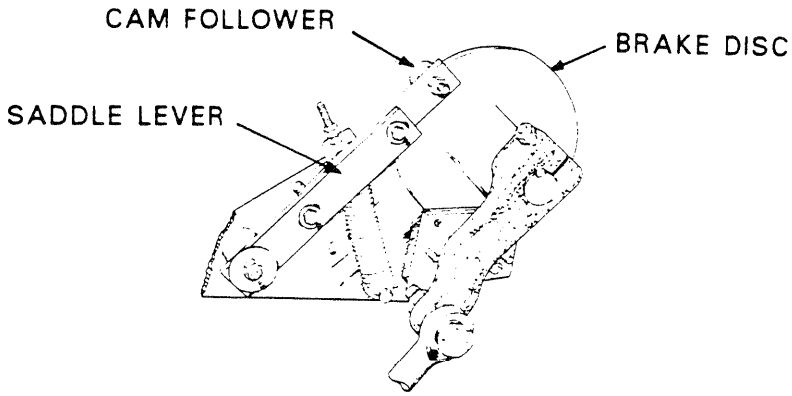


KNOTTER ADJUSTMENTS

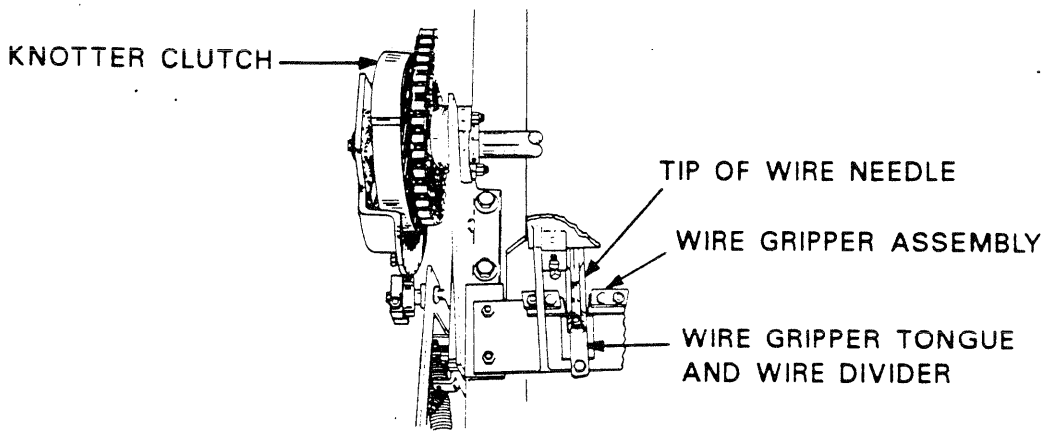
Preliminary Checks: Often apparent wire knotter problems may be found by checking parts and items not directly associated with the wire knotter. Before making any adjustments, check the wire for a tangle in the wire box or the wire guides and rollers. Then inspect the wire guides, rollers, wire gripper, wire gripper tongue, twister shaft, bushings, and twister hooks. If any of these parts show excessive wear, replace them. Inspect the wire knives and replace if they are nicked. Check to insure that the wire is threaded properly and the needles are adjusted correctly. Many apparent wire knotter problems are caused by one or more of the above listed problems, check all of them before proceeding. THIS IS A MUST!

CAUTION: ⚠ ALWAYS TURN BALER MOTOR OFF BEFORE INSPECTING, ADJUSTING OR SERVICING THE BALER.

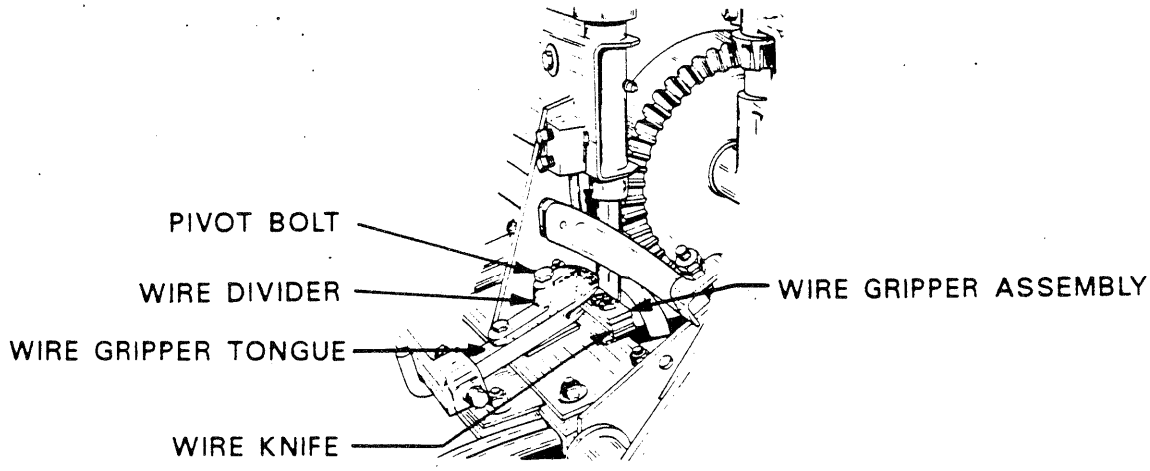
Wire gripper adjustment: Wire grippers must be adjusted to apply enough pressure to insure that the wire does not pull loose during the baler's compression stroke. Be sure the cam follower on the saddle lever is resting in the hard notch of the brake disc before making this adjustment.



Insert a 0.115" gauge (available Freeman part F7392) between the wire gripper tongue and shuttle bar adjusting screw. Then adjust the shuttle bar adjusting screw to force the wire gripper tongue over so that is just comes in contact with the wire gripper assembly. Adjust both sides of each gripper tongue the same way.

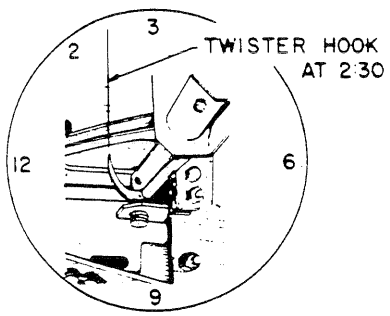


If the wire grippers or the wire knives need to be replaced use the Freeman gauge block (available Freeman part F7511) to obtain the proper adjustment between the wire grippers and wire knives. The wire gripper tongue must be removed to make this adjustment.



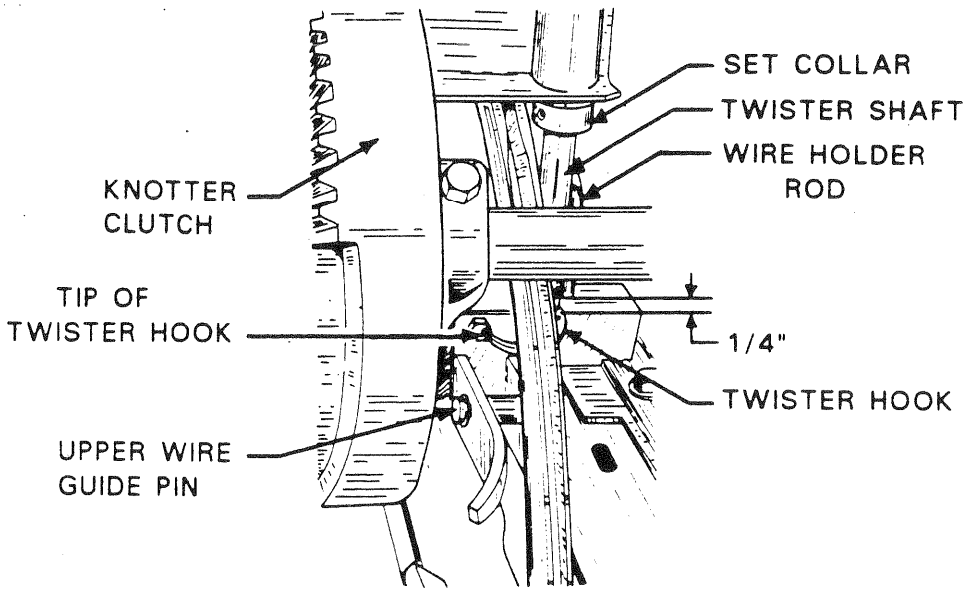
NOTE: **Insure that the pivot bolt jam nut is removed before attempting to remove the pivot bolt. When retightening the pivot bolt, tighten the bolt so that the gripper tongue cannot pivot and then back the pivot bolt off so the gripper tongue can be pivoted by hand. replace the pivot bolt jam nut (insure that it is a jam nut) and tighten. Recheck the gripper tongue for pivotability.**

Wire cut timing: Lift meter trip bar and turn the knotter clutch until needles are top dead center. Consider the front of the baler as 12:00 o'clock and rear as 6:00 o'clock. Place a length of baling wire between the wire gripper tongue and the wire knife. Rotate the knotter until the wire is cut. The tip of the twister hook should be between 2:00 and 3:00 o'clock when the wire is cut.



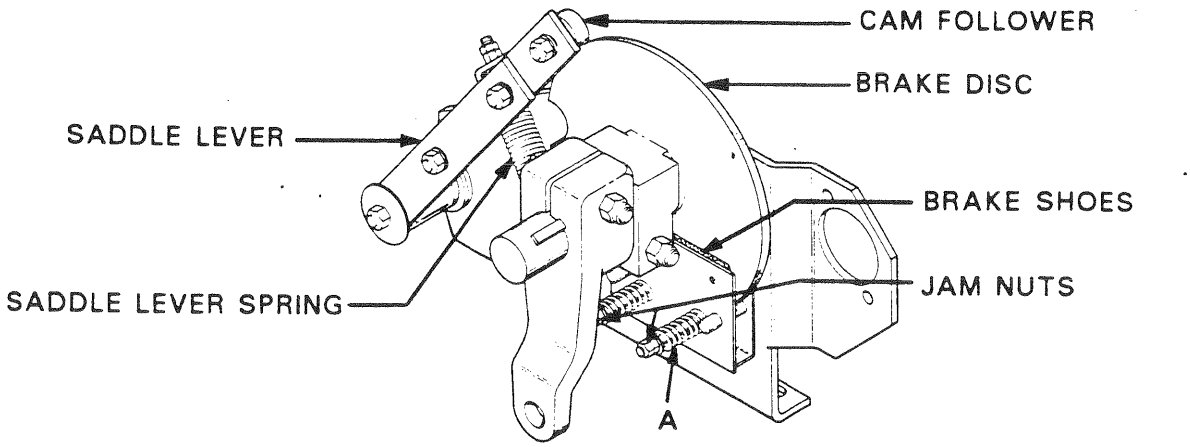
The adjustment is made by advancing or retarding the twister sprocket to the twister drive chain, or by loosening the two allen set screws on the twister sprocket, allowing the twister shaft to be turned within the twister sprocket to the appropriate setting. After the cut timing is adjusted, the twister hook should be between 5:00 and 7:00 o'clock when in the resting position.

Twister hook and wire holder rod adjustment: Set the tip of the twister hook 3 3/4" above the top of the bale chamber by loosening the two allen set screws in the set collar and the two in the twister sprocket. Then slide the twister shaft up or down within the set collar and twister sprocket to achieve the appropriate setting. After this setting is made adjust the wire holder rod to clear the twister hook by 1/4" and just touch the twister shaft with no pressure.



KNOTTER BRAKE ADJUSTMENTS

The knotter brake should be set to insure knotter turns evenly throughout the bale tying process. Adjust the brake shoe tension springs so springs can just be rotated between fingers. Replace brake shoes if they are excessively worn.
Adjust the brake shoe tension springs "A" so that the outer jam nuts are flush with the end of the clamp bolts.

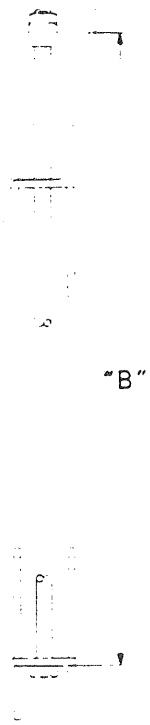


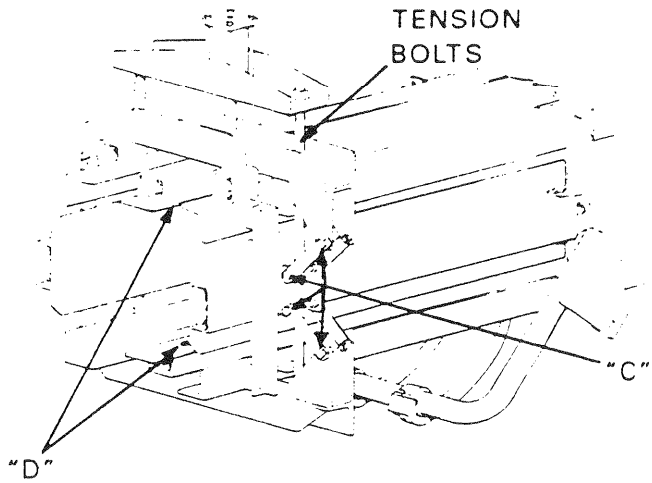
The saddle lever spring is adjusted correctly when the saddle lever cam follower is seated in the notch of the brake disc and the saddle spring is extended 3/4".

CAUTION: ⚠ ALWAYS TURN BALER MOTOR OFF BEFORE INSPECTING, ADJUSTING, OR SERVICING THE BALER.

BALE CHAMBER

The measurement is taken between "B." The correct measurement is 23 1/4 inches.





Chamber size 14" x 18"

Tension Bolt Measurement 23 1/4 inches

The tension bolt should never be changed from the measurement given in the chart. Adjusting the tension bolts has NO effect on the shape of the bale. DO NOT ADJUST TENSION BOLTS.

The bolts in "C," must remain loose to allow free movement of lever action on the side rails. The bolts in "D" must be free to allow floating action of the bottom and top rails

RELIEF VALVE SETTINGS

FOR: 3" DIA. PLUNGER CYL.
3" DIA. PACKER CYL.

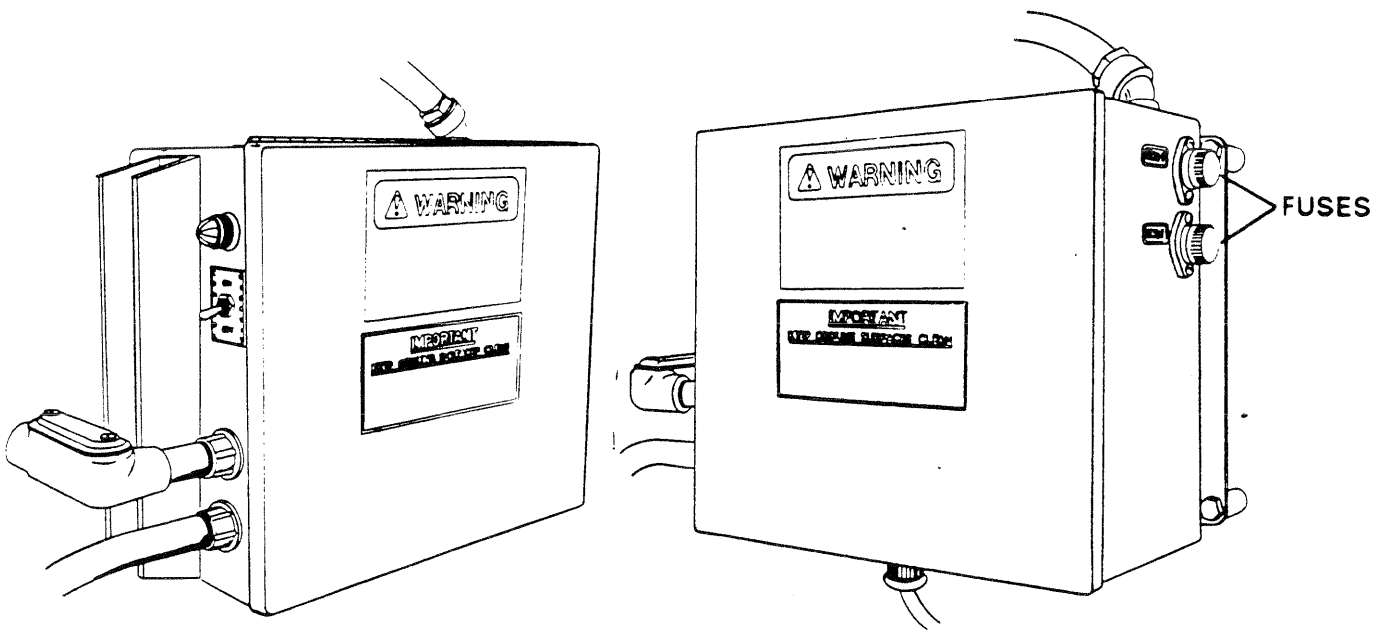
MAIN: 2500 PSI
PACKER DN: 600 PSI
PACKER UP: 600 PSI
TENSION CONTROL: 1200-1400 PSI

SET TENSION CONTROL
UNLOADER VALVE TO
UNLOAD AT 1200 PSI
ON PLUNGER CYLINDER

ELECTRICAL SPECIFICATIONS

CAUTION: ⚠ ELECTRICAL HOOKUP SHOULD BE DONE BY A LICENSED ELECTRICIAN TO MEET LOCAL ELECTRICAL CODES.

Power for the motor must be supplied through an external motor branch circuit disconnect and magnetic starter incorporating a motor over load disconnect device. The motor branch circuit disconnect should be provided with over-current preventing devices near the maximum allowed by National Electric Code Table 430-152. Motor overload disconnects should be set for the full load current rating of the motor. The supply conductors should be correctly sized to prevent the motor from stalling due to momentary overloads during baler operation. The following may be used as a guide for minimum proper conductor size for short wire runs when using motors supplied as standard on Freeman Mote or CM-1418 Balers. Special Motors Require individual Attention when selecting conductor sizes. The 10 horsepower motor operating at 230 volts is rated for 26 amps full load and requires #8 copper wire. The 10 horsepower motor operating at 460 volts is rated at 13 amps full load and requires #12 wire. The 15 horsepower motor operating at 230 volts is rated at 40 amps full load and requires #6 copper wire. The 15 horsepower motor operating at 460 volts is rated at 20 amps full load and requires #10 wire. Connect the motor leads for the voltage to be applied. Connect the two wires coming from the control transformer within the control box to two of the motor supply leads. Connect the control transformer to operate on the voltage to be applied. Install the proper fuses in the control transformer primary leads as follows. For balers with 110V AC control panels, use FNM or FNQ 1/4 when connected to 230V. Use FNQ 1/8 when connected to 460 volts. For balers with 24V DC panels use FNM or FNQ 1 for 230 volts and FNQ 1/2 for 460 volts.



SIZE AND WEIGHT
SPECIFICATIONS FOR CM-1418 BALER

Baler Size

Height Overall	74" (1873 mm).
Height to Hopper	64" (1619 mm)
Length	158" (4001 mm).
In-Feed Hopper	15" by 18 1/2" (381 mm by 470 mm).
Weight	Approximately 2800 lbs (1273 kg).

Bale size

Width	18" (457 mm)
Height	14" (356 mm)
Length	Adjustable 12" to 60" (at approx. 12" intervals) (305 mm to 1524 mm).
Weight	Adjustable 20 to 200 lbs (27 to 91 kg) dependent upon material being baled.

Baling Capacity	0 to over 50 Bales per hour.
Baler Ram Force	Appriximately 17,600 lbs (8,000 kg).
Motor Size	Standard - 10 or 15 hp
Baling Wire Size	Standard - 14 to 14 1/2 gauge.
Floor Space Required	Length and width of Baler, plus space for maintenance access and extrusion support for completed bales.

Optional Equipment

- Air Lock Equipment.
- Automatic Hydraulic Bale Diverters.
- In-Feed Chutes.
- Other Bale Handling Equipment to meet other individual needs.

TROUBLE SHOOTING

CAUTION: ⚠ **INSURE BALER MOTOR IS OFF BEFORE ADJUSTING OR SERVICING THE BALER.**

Problem	Possible Cause	Remedy
Needle does not carry wire to gripper.	1. No wire in wire box. 2. Lower wire guides not in line with needle rollers. 3. Wire tangled in box causing wire to break. 4. Wire tangled in wire guides or rollers causing wire to break. 5. Broken needle.	1. Fill wire box. 2. Adjust guides rollers. 3. Check wire in wire box. 4. Check guides and rollers for excessive wear and freedom of movement. 5. Replace & adjust needle
Needle breakage.	1. Obstruction in needle slots in the chamber. 2. Needles out of time.	1. Clean out slots. 2. Adjust needle timing.
Uneven bale length.	1. Meter wheel shaft assembly not adjusted properly. 2. Clearance between clutch pawl and stop is not properly adjusted. 3. Broken clutch pawl spring 4. Uneven feeding.	1. Adjust shaft assembly according to knotter trip and clutch adjustments section. 2. Adjust knotter trip and clutch. 3. Replace clutch pawl spring. 4. Check in-feed system.
Wire wraps and breaks off on twister shaft.	1. Needles are out of alignment with knotter.	1. Adjust needles.
Short length of wire breaks off and wraps on twister shaft.	1. Twister hooks are advanced too far.	1. Retard twister hook to be at 2 to 3 o'clock when wire is cut.
No twist on bottom wire.	1. Twister hooks are too low. 2. Needles are out of alignment with the knotter.	1. Adjust tip of twister hooks to 3 3/4" above the bale chamber. 2. Adjust needles.
No twist on top wire	1. Wire grippers and gripper tongue need to be adjusted. 2. Needles are out of alignment with the knotter. 3. The twister hooks are not advanced far enough when wire is cut.	1. Adjust wire grippers to wire knife and wire gripper tongue. 2. Adjust needles. 3. Advance twister hooks one sprocket tooth.
Wire breaks at the bottom of twist.	1. Twister hooks are too low. 2. Wire holder rod is too close to twister shaft. 3. Bales are too tight. 4. Upper wire guide pin is worn excessively.	1. Adjust tip of twister hooks to 3 3/4" above the bale chamber. 2. Adjust wire holder rod to just touch the twister shaft with no pressure. 3. Reduce pressure at sequence valve. 4. Replace upper wire guide pin.

TROUBLE SHOOTING
WIRE KNOTTERS ONLY

CAUTION: ⚠ **INSURE BALER MOTOR IS OFF BEFORE ADJUSTING OR SERVICING THE BALER.**

Problem	Possible Cause	Remedy
Needle doesn't carry wire to gripper.	a. Wire tangled in can. b. Wire tangles through guides and needle heads. c. Wire guides on bottom of bale chamber not aligned with needle rollers. d. Worn guide rollers.	a. Check wire in can. b. Check wire through guides and needles, making sure it runs freely. c. See wire needle adjustment. d. Replace worn guides.
Wire wraps and breaks off on twister shaft	a. Needles are out of alignment with knotter.	a. See wire needle adjustment.
Short length of wire breaks off and wraps on twister shaft.	a. Hooks are advanced too far. b. Wire pulls too hard through bale.	a. Adjust hook to cut at 2 to 3 o'clock. b. Check bale density. Feed fork adjustment may be necessary.
No twist on bottom wire	a. Twister hooks too low. b. Needles out of alignment.	a. Adjust twister hooks. b. See wire needle adjustment.
No twist on top wire	a. Grippers need adjustment. b. Tension control not working properly. c. Needle out of line.	a. Check gripper adjustment b. See tension control. c. See wire needle adjustment.
Wire breaks at bottom of the twist.	a. Twister hooks too low. b. Too much tension between wire holder rod and twister shaft. c. Too much tension on hay.	a. See hook adjustment. b. See twister hook and wire holder adjustment. c. Reduce tension control pressure.

LUBRICATION SERVICE CHART

Lubrication Points	No. of fittings	Recommended	Frequency
Electric Motor	1	Rust Inhibiting Polyurea Base grease	2000 hours
Packer (a) Cylinder Rod End (b) Packer Bearings	 2 2	 Gun Grease Gun Grease	 48 hours 48 hours
Air Lock. Bearings one each side	2	Gun Grease	240 hours
Knotter on Knotter Body	6	Gun Grease	48 hours
Knotter clutch	1	Gun Grease	48 hours
Needle Yoke Drive Rod one each side	4	Gun Grease	48 hours
Chain Idler Sprocket	1	Gun Grease	48 hours

CAUTION: ⚠ **KEEP ALL MOVING PARTS CLEAR OF MATERIALS AT ALL TIMES.**

⚠ **ALWAYS SHUT OFF BALER WHEN INSPECTING, ADJUSTING, LUBRICATING, OR SERVICING.**

CM-1418 BALER
MACHINE FUNCTIONS AS INDICATED BY SCHEMATIC DRAWING

Mode of Operation as Shown by Schematic

1. Power off
2. Plunger forward (near motor end of Baler)
3. Packer midway in travel
4. Trip door up (normal)
5. Needle yoke retracted

Solenoid Functions

1. Solenoid #1 - Moves packer downward
2. Solenoid #2 - Moves packer upward
3 Solenoid #3 - #1 & #2 - De-energized - packer stops
4. Solenoid #4 - Retracts plunger
6. Solenoids #3 & #4 - De-energized - plunger stops

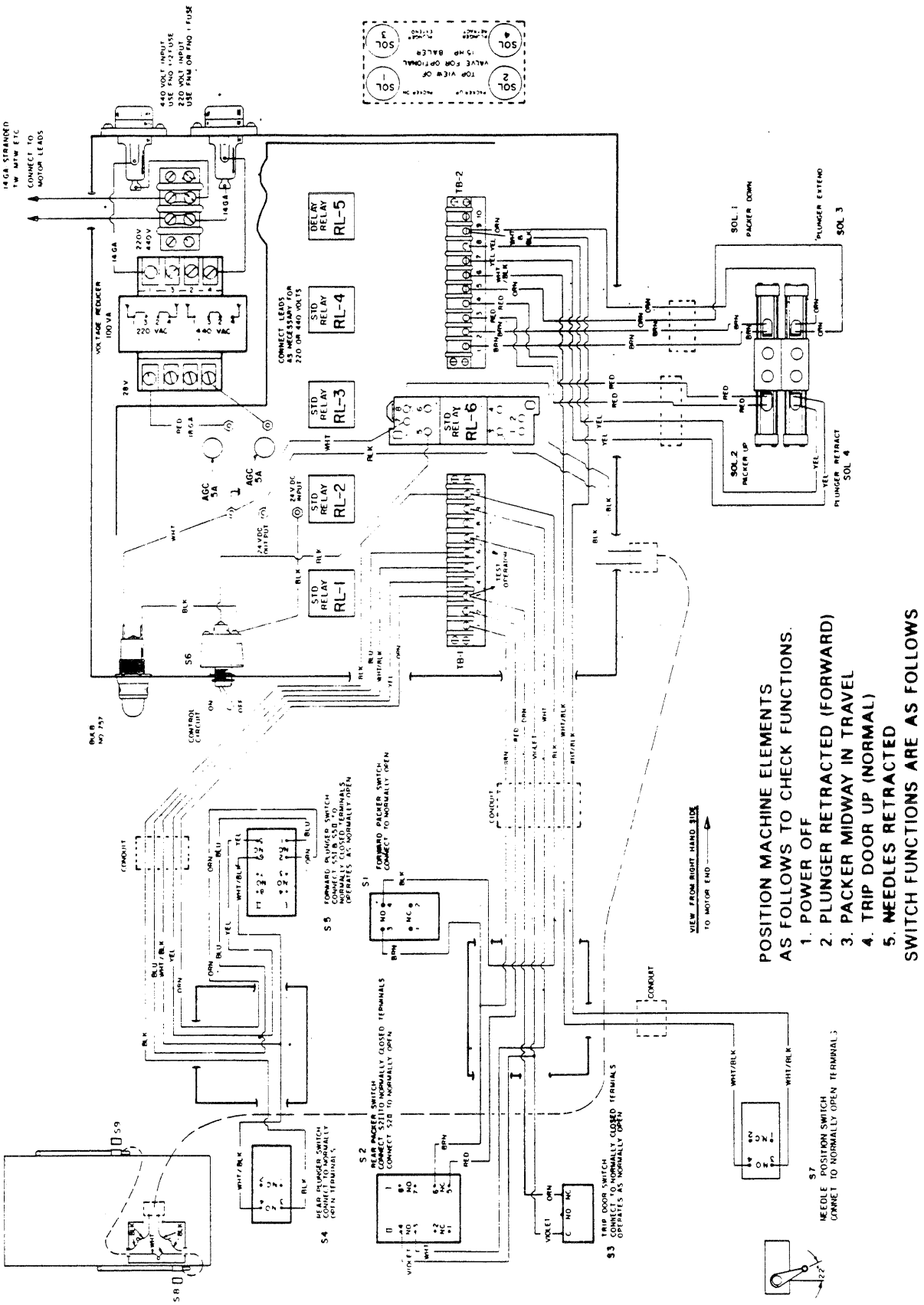
Switch Functions

1. S1 -Closes momentarily as packer reaches UP position and reverses packer travel.
2. S2-II -Opens momentarily as packer reaches DOWN position and reverse packer travel.
3. S2-I -Closes momentarily as packer reaches DOWN position and allows RL3 to be energized by S3.
4. S3 -Closes momentarily as trip door is depressed and energizes RL 3 if S2-I is closed causing packer to stop and plunger to operate.
5. S4 -Closes as plunger reaches rear extended position causing plunger to reverse direction.
6. S5-II -Closes as plunger moves from forward retracted position allowing plunger to continue operation for its complete cycle.
7. S5-I -Opens as plunger returns to forward retracted position to de-energize RL 3 and reinstate packer operation.
8. S6 -Manual power supply switch for control circuit--when OFF, maching operations stop.
9. S7 -Closed by needle yoke in retracted position. Prevents plunger advance if needles are inside bale chamber.

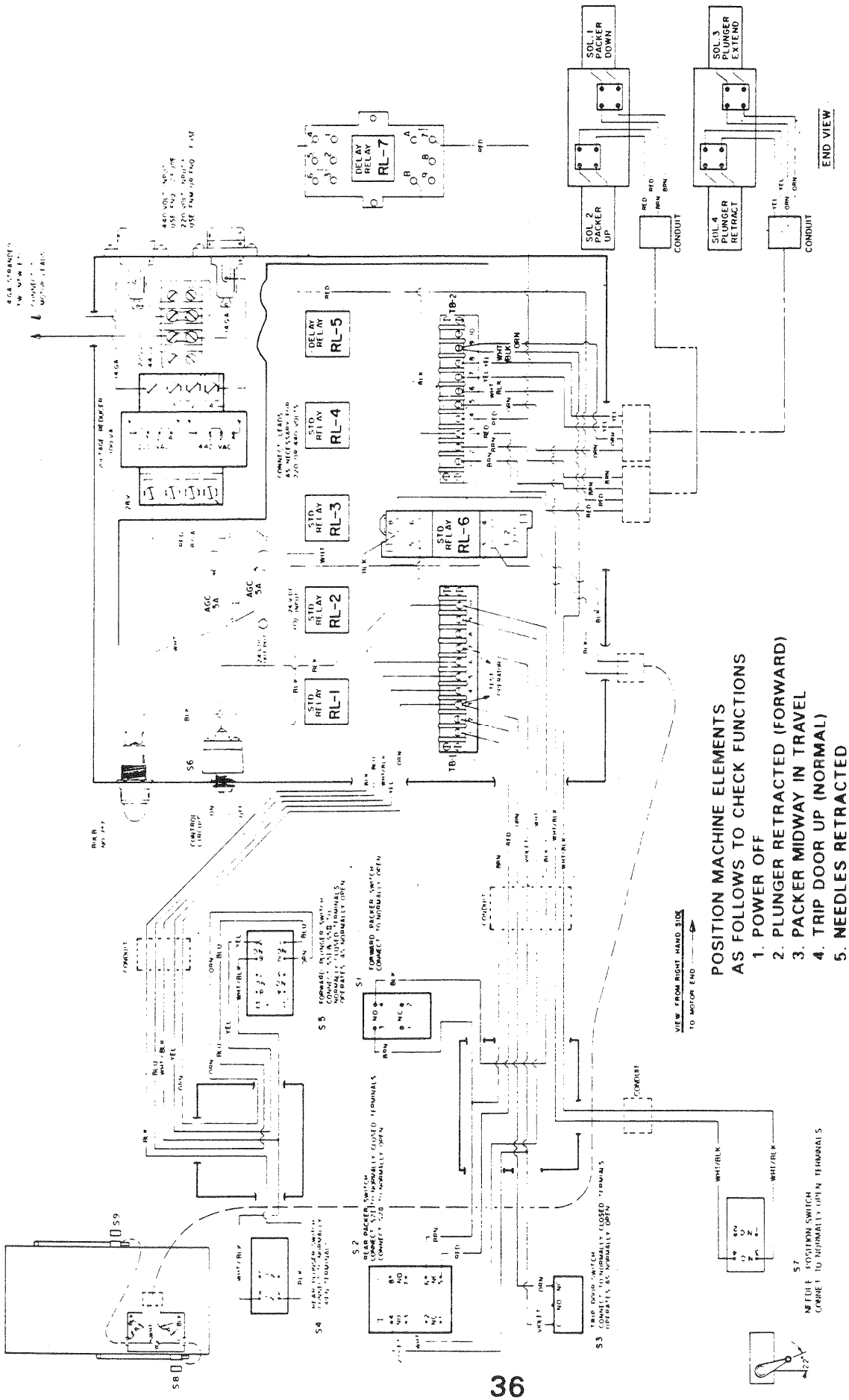
Relay Functions

1. RL1 -Controls packer travel
   a. Normal; packer moves upward.
   b. Energized; packer moves downward.
2. RL2 -Controls plunger
   a. Normal; plunger moves rearward (extends)
   b. Energized; plunger moves forward (retracts)
3. RL3 -Selects modes of operation by preventing plunger from operating if packer is not down and prevents packer form operating if plunger is not forward.
4. RL4 -Returns Baler tonormal operation if operating cycles are altered by power interruption.
5. RL5 -Provides variable time delay in initiation of packer downstroke.

WIRING DIAGRAM 24 VOLT SYSTEM



WIRING DIAGRAM 24 VOLT SYSTEM
15 HP W/REXROTH VALVES ON MANIFOLD



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