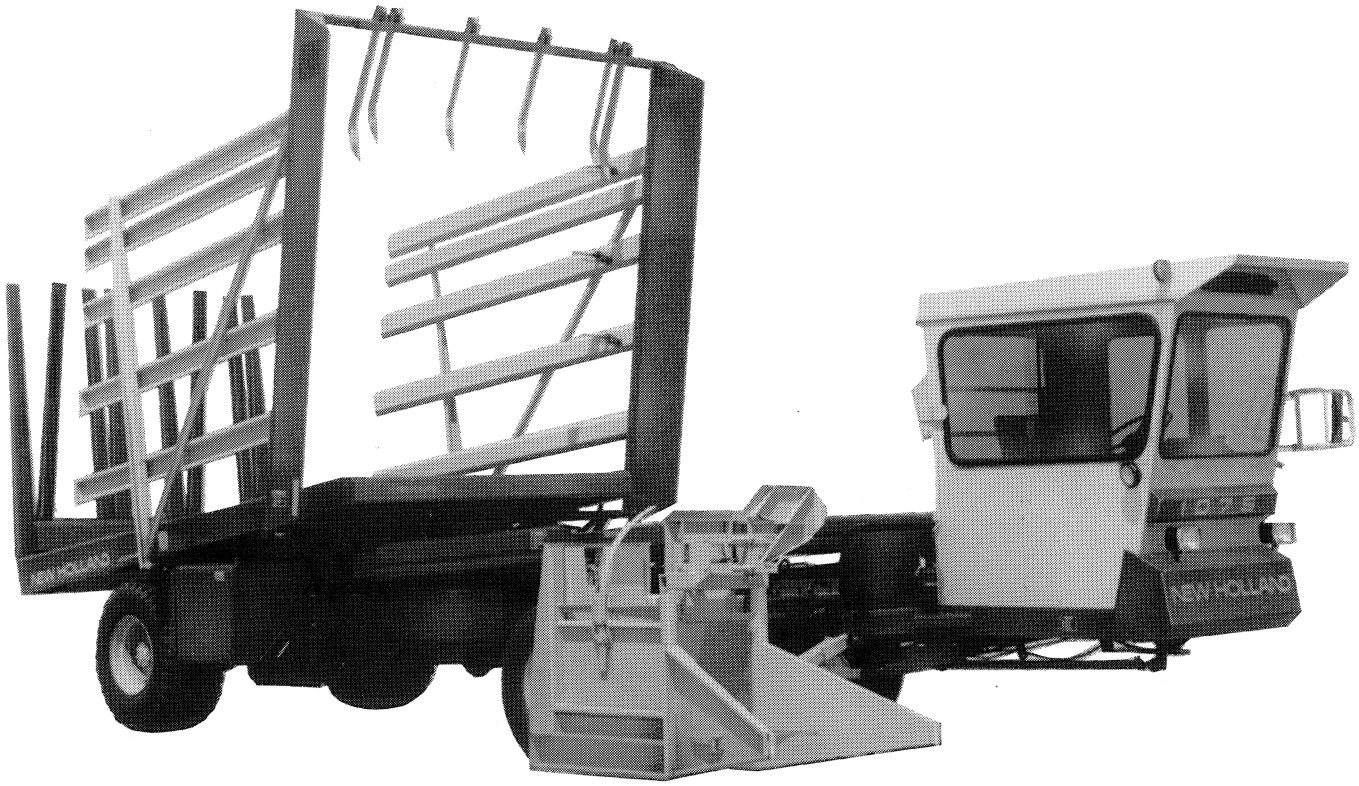
SERVICE MANUAL

Stackcruiser® Bale Wagon 1075

Electronic Control System

Issue 7-88
(Replaces All Previous Issues)



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CONTENTS

SAFETY PRECAUTIONS

1. DO NOT CLEAN, LUBRICATE, OR MAKE ANY ADJUSTMENTS ON THE BALE WAGON WHILE IT IS IN MOTION.
2. DO NOT ENGAGE THE CLUTCH UNTIL YOU ARE CERTAIN THAT EVERYONE IS CLEAR OF THE MACHINE AND HAVE MADE SURE THAT NO TOOLS ARE LYING ON THE MACHINE.
3. DO NOT WORK AROUND THE BALE WAGON IN LOOSE CLOTHING THAT MIGHT CATCH IN ANY OF THE MOVING PARTS.
4. DO NOT FILL THE FUEL TANK WHILE THE ENGINE IS RUNNING.
5. DO NOT LEAVE THE OPERATOR'S PLATFORM WHILE THE BALE WAGON IS IN OPERATION.
6. DO NOT ATTEMPT TO SERVICE THE BALE WAGON WHILE THE HYDRAULIC SYSTEM IS ENGAGED OR WHILE THE ENGINE IS RUNNING.
7. DO NOT MAKE ANY ADJUSTMENTS OR REACH UNDER ANY OF THE TABLES WHILE THEY ARE LOADED EVEN THOUGH THE HYDRAULIC SYSTEM IS DISENGAGED.
8. DO NOT EXCEED 30 MPH (48 KM/HR) WHEN THE WAGON IS LOADED.

INTRODUCTION

ELECTRONIC SYSTEM OPERATION

The Model 1075 automatic bale wagon utilizes a solid-state electronic control system which controls the functions of the first table, second table, the tie spikes, and a short bale compensator. The electronic control system also allows an operator to select five different block stack configurations.

Ten solid-state sensors are used on the Model 1075 to track bale and table movements. These sensors tell the electronics what the machine is doing at any given time.

Within the control box are two different voltage levels - 5 volts used for the sensors and all logical operations within the box; 12 volts required to drive the solenoid coils.

SENSOR DESCRIPTION

The sensors are completely sealed in a threaded aluminum bushing and are operated by the south pole of a magnet. The sensors (switches) used on the machine are semiconductor switches based on the "HALL" effect. The "HALL" effect is an increase in voltage within the sensor when it is subjected to a magnetic field which causes it to switch on or off.

SENSOR LOCATION AND FUNCTIONS

1. Left side sensor - located under the far left of the first table on the cab back. Reverses the cross conveyor. Also delivers the first table on the center bale of the tie tiers and stops the cross conveyor.
2. Right side sensor - located on the right side of the first table, behind the cross conveyor chain under the first table. Delivers the first table if the left side sensor has been tripped and stops the cross conveyor.
3. First table limit sensor - located under the front of the second table below the first table pivot point on the left side of the main frame. Resets the first table delivery, advances the first table count, and starts the cross conveyor forward.
4. Spikes down sensor - one of two sensors under the left front of the second table bracketed to the second table front rest. Spikes down resets the down drive to allow the system to operate properly, also shows "spikes down" on the display panel.
5. Spikes up sensor - one of two sensors under the left front of the second table bracketed to the second table front rest. Spikes up resets the up drive to allow the system to operate properly, also shows "spikes up" on the display.
6. Second table down sensor - one of three sensors under the left front of the load rack on the second table support. The second table down sensor prevents first table delivery when the second table is off its rest.
7. 50° limit sensor - one of three sensors located under the left front of the load rack on the second table support. The 50° limit sensor resets the second table up command on tie tier operations and starts opening and closing the rolling rack solenoid dump valve on complete second table deliveries.
8. Second table limit sensor - one of three sensors located under the left front of the load rack on the second table support. Upper limit resets the second table at completion of delivery, advances the tier counter one count, and turns off the rolling rack dump valve.
9. Load rack down sensor - behind the load rack support on the left side. This sensor indicates that the load rack is in position to accept second table delivery, resets the counter (display) to zero after stacking and, when the load is raised slightly, counting is prevented.
10. Bale loader down sensor - located on the right side of the main frame behind the rear bale loader pivot. It indicates that the bale loader is down ready to pick up bales and, if the bale loader is raised, first table delivery and cross conveyor reverse are prevented.

OPERATION SEQUENCES

1. Cross conveyor/first table. In the cross conveyor/first table group, there are four set/reset functions, two in the first table section and two in the cross conveyor. The cross conveyor and first table are covered together because they are interrelated and operate almost totally independent of the control box memory.

The action of the cross conveyor is as follows: The cross conveyor is initially running forward. The first bale on the table clears the cross conveyor chain and then the second bale pushes the first bale into the left side trip. The magnet comes in contact with the sensor. The left side sensor signal turns off the cross conveyor forward function and starts the cross conveyor reverse function.

The cross conveyor pulls the second bale back toward the bale loader until it contacts the right side sensor. The right side sensor signal stops the cross conveyor reverse function and, when both the left and right side sensor have been activated, the first table is ready for delivery.

The cross conveyor "off" condition is the only condition for delivery of the first table. When both the "CCF" and "CCR" are off, the control box senses this condition and gives a signal for a flat or edge first table delivery, depending on which is called for by the stack pattern. When the first table has completed its delivery and has activated the limit sensor, the sensor resets both first table functions (edge and flat). In addition, the limit sensor starts the cross conveyor in the forward direction for the next set of bales by resetting the cross conveyor reverse and setting the cross conveyor forward.

For a center bale delivery, the sequence is changed slightly by the control box memory. When the center bale trip is positioned by the raised spikes, the left side sensor stops the cross conveyor and the single bale is delivered. The first table dump valve is operated through and/or functions from the edge or flat signal.

2. Second table. When the proper number of first table deliveries has been counted by the counters for the tier being made, the control box signals for a second table delivery. The memory resets the second table down function and sets the second table up function. The second table then raises up until engaging the second table limit sensor. The limit sensor resets the second table up function and sets the second table down function, and then the second table lowers for the next tier.
3. Rolling rack dump system. The rolling rack dump system allows the second table to push the roll rack back with the least resistance as possible. The rolling rack will move only when the second table is raising and has passed the 50° limit sensor. The dump valve will remain pulsed open until the second table reaches the limit sensor. The limit sensor resets the rolling rack function, closing the dump valve.
4. Spikes. The spikes sequence is similar to the second table. The control box memory calls for spikes up after the first normal first table delivery of a tie tier. The signal sets the spikes up function which causes the spikes to rise. The spikes rise until the spikes up limit sensor is reached. The limit sensor signal resets the up function, allowing the spikes to remain raised. The signaling for spikes down comes from the memory causing an identical sequence with the spikes down limit sensor.

MACHINE INTERLOCKS

There are no machine interlocks on the electronic functions of the Model 1075 when the controls are operated manually. The first table, second table, and tie spikes will operate manually with no regard for position of the other machine components. It is up to the operator to make sure the first table is not actuated manually while the bale loader is raised.

In contrast, several interlocks are present on the machine when it is operating automatically. These interlocks are:

1. Cross conveyor reverse and first table cannot operate automatically until the bale loader is down.
2. First table will not deliver bales to the second table unless the second table is down.
3. First table will not put more bales on the second table than it can handle if it is already full.
4. Both the first and second table cycle counters will not advance when the load rack is up off the load rack support.

TEST EQUIPMENT

A versatile multi-range volt-ohmmeter is required to accurately check the electronic system. The multi-tester must be capable of measuring DC voltages and resistance with accuracy and ease.

For most accurate readings, use a digital volt-ohmmeter.

LINKAGE AND SENSOR ADJUSTMENTS

The following adjustments will have to be made or verified to determine if the bale wagon is adjusted properly for efficient bale handling.

FIRST TABLE

1. The first table trip arm should be adjusted so it will trip the first table linkage and actuate the electronic system when two average length bales are centered on the first table. Make an estimated setting and then deliver two bales to the second table. Determine if the bales are centered when delivered onto the second table. If they are not centered, adjust the first table trip linkage. See Figure 1.

   If the bales are too far to the left side of the machine, remove the hairpin cotter which retains link, A, in place and shorten link, A, by moving the link and the first table trip toward the right side of the machine. When the link has been relocated, place the hairpin cotter in the retaining hole to retain the adjustment. This adjustment will cause bales to deliver farther to the right side of the machine.

   If the bales are too far to the right side of the second table, lengthen link, A, in the manner detailed previously.

   See Figure 1. It may be necessary to adjust the spacing between the activating magnet and the electronic sensor to insure proper operation of the first table trip. To make this adjustment, release the first table delay latch and pull the first table trip away from the machine. This will cause link, C, to rotate in a clockwise direction and the stop block on the link will contact the rear vertical surface of the member on which link, C, is pivoted. Measure the clearance between the magnet and the sensor. If the clearance is in excess of 1/16" (1.6 mm), loosen the mounting nuts on the sensor and relocate the sensor to maintain a maximum clearance between the magnet and the sensor face of 1/16" (1.6 mm).

   Be sure that the magnet is centered on the sensor face. The sensor is mounted in a horizontally slotted hole to allow adjustment, if necessary. To insure reliable performance, the magnet must be fully within the circle described by the sensor face.

   IMPORTANT: When making this adjustment, be sure that the sensor does not come in direct contact with the magnet. The stop block on link, C, should contact the main cross member at the rear of the cab to stop the travel of the link. As long as there is a measurable clearance between the face of the magnet and the face of the sensor, the adjustment has been properly made, but the maximum clearance of 1/16" (1.6 mm) must always be maintained.

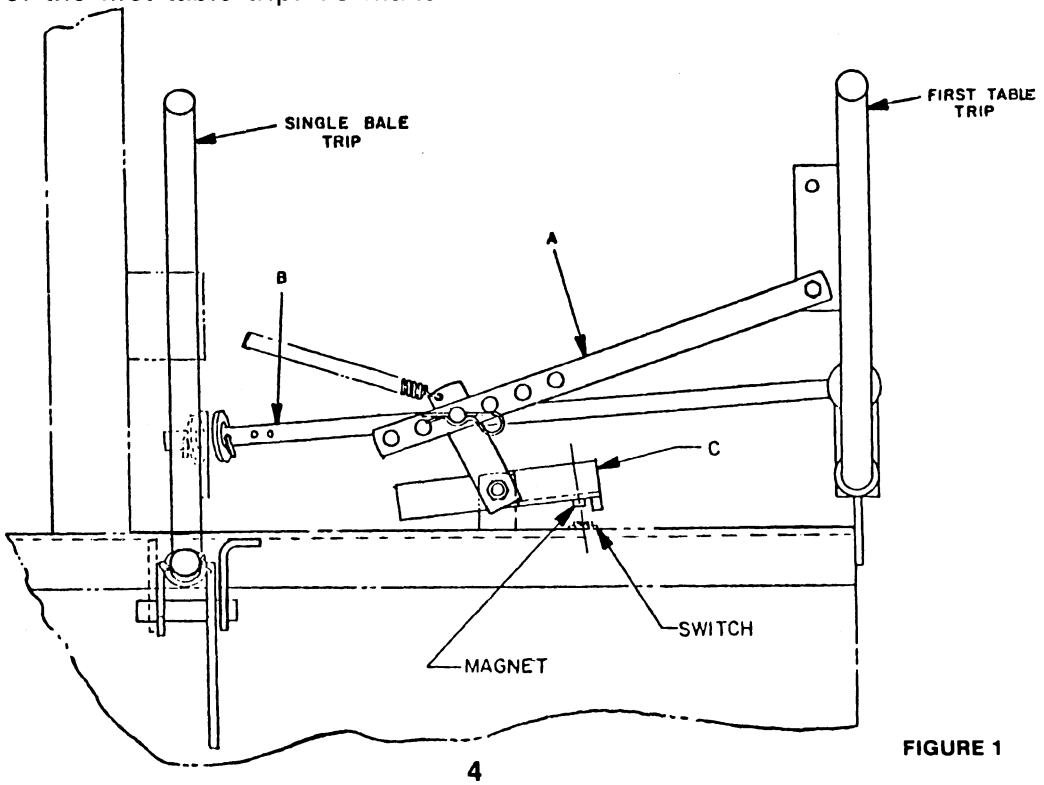


FIGURE 1

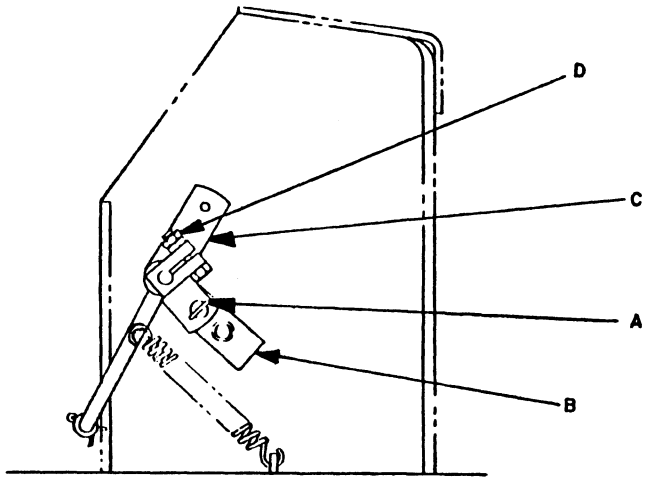


FIGURE 2

2. The first table should be adjusted to return when the first table reaches an angle of approximately 92° to the second table. Refer to Figure 2. The actuating magnet for the return system is mounted on link, C; the electronic sensor is mounted on link, B. As the first table delivers, it rotates link, C, in a clockwise direction. When the desired delivery point for the first table has been reached, the magnet on link, C, should be centered on the electronic sensor on link, B.

   The maximum clearance between the magnet and the electronic sensor should be no more than 1/16" (1.6 mm). If the delivery angle of the first table must be changed, loosen wing screw, A, and move link, B, in the direction desired. Moving link, B, clockwise will increase the delivery of the first table; moving link, B, counterclockwise will reduce the delivery of the first table. A limited amount of adjustment is built into link, B. If a greater range of adjustment is required, loosen the clamping hardware, D, and rotate the complete assembly consisting of the wing screw assembly, link, B, and the clamp block. This assembly rotates about the same shaft on which link, C, pivots. However, it must be firmly clamped in position when the desired location is reached. Maintain a minimum amount of end play between the sensor mounting assembly and link, C, when relocating this portion of the linkage. There should be no more clearance than that necessary to allow link, C, to rotate freely upon its shaft.

   Excessive end play between the sensor mounting assembly and clamp block and link, C, will allow an excessive variation in the spacing between the actuating magnet and the sensor itself. This can result in nonoperation of the system, if the clearance is too large. Or, the sensor and magnet can be damaged if they are moved too close together so they are not able to freely pass by each other.

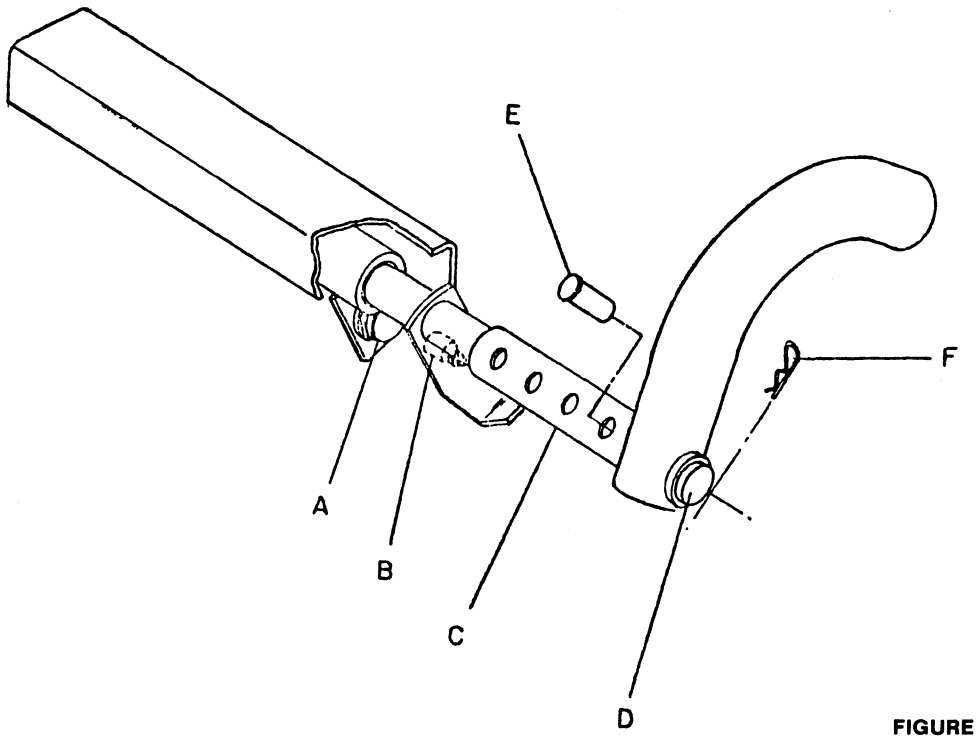


FIGURE 3

RIGHT SIDE SENSOR

1. This linkage performs the function of evening the right side of the stack as it is formed on the bale wagon. The linkage which actuates the right side switch may be adjusted to reposition the right side bales as desired.

   Refer to Figure 3. Moving trip arm, C, toward the bale loader will place the right side bales farther away from the center line. Conversely, moving trip arm, C, toward the center line of the machine will move the right side bales nearer the center line of the machine. Adjust the location of this trip by pulling hairpin cotter, F, out of clevis pin, E. Then slide arm, C, on rod, D, to align the holes for the clevis pin and at the same time place arm, C, in the desired location.

   IMPORTANT: Be sure trip arm, C, will clear the first table when it cycles.

2. This linkage also incorporates a magnetically actuated electronic sensor system. To insure proper function, maintain a clearance of 1/16" (1.6 mm) or less between the magnet and magnetically actuated sensor on this linkage. Also, the body of the magnet must be within the confines of the circumference of the magnetically actuated sensor.

   Both of the adjustments required on the switching mechanism are made by loosening the nuts which lock electronic sensor, A, in position. The sensor is mounted in an enlarged slot and it is possible to locate the sensor correctly by moving it within this large slot. After locating the sensor properly in relation to the magnet, be sure to securely lock the sensor in place with the attaching nuts.

   While making adjustments to this sensor linkage, be sure that the slider rod, D, is to the maximum limits of its travel toward the left side of the machine. Also, be sure the trip arm, C, has fully rotated counterclockwise to the limits of its travel.

   NOTE: When adjusting this linkage, be sure that the magnet is within 1/16" (1.6 mm) of the face of the electronic sensor. Also make sure the magnet does not make direct physical contact with the face of the sensor as this can result in damage to either one or both of the components.

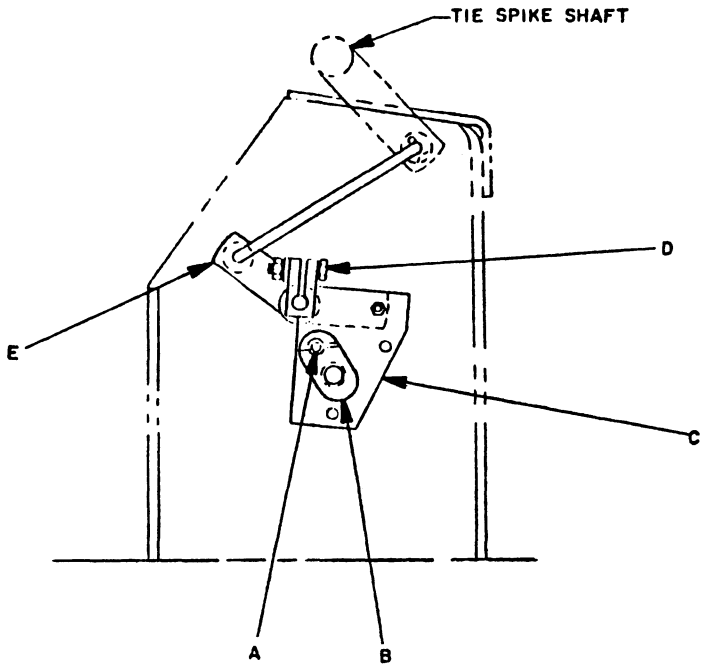


FIGURE 4

TIE SYSTEM

1. The tie spikes should be set in a position so they will penetrate the rail bale approximately 6"-8" (152 mm-203 mm) from the outer end. There are two positions provided for location of the spike. To relocate the spike to the desired position, remove the hairpin cotter which retains the spike pivot pin and remove the spike pivot pin which retains the spike on the actuator shaft arm. Rotate the spike 180° which will cause its final location to be different than when it was removed. Then return the pivot pin to its position through the actuating arm and through the tie spike and reinstall the hairpin cotter.
2. The tie spikes must be either fully up or fully down for the electronic control system to operate properly. Therefore, adjust the linkage, Figure 4, so that when the spikes are fully up the magnet mounted on link, E, is centered on the face of the electronic sensor which is mounted in plate, B. Also, when the spikes are fully retracted, the magnet on link, E, should be centered on the face of the upper electronic sensor which is mounted on plate, C.

   If the down sensor which is mounted in plate, C, must be repositioned, loosen the clamping hardware, D, and rotate plate, C, until the electronic sensor is centered on the actuating magnet in link, E. Use caution when making this adjustment to maintain an absolute minimum amount of allowable end play for rotating link, E. End play is controlled by moving plate, C, in and out on the pivot shaft for link, E. There should be just sufficient end play for link, E, to rotate freely.

   After this adjustment is made, tighten the clamping hardware, D. If the tie spike down sensor had to be relocated as detailed previously, it will probably be necessary to relocate the position of the tie spike up sensor on this linkage. This is done by loosening wing screw, A, and rotating plate, B, which contains the electronic sensor, until the actuating magnet on link, E, is centered on the face of the electronic sensor mounted on link, B. This adjustment must be made with the spikes in the fully up position.

   The tie spikes must be fully up or fully down with the actuating magnet centered on the appropriate electronic sensor within 1/16" (1.6 mm), for the electronic control system to function properly. **This adjustment is critical for proper operation.**

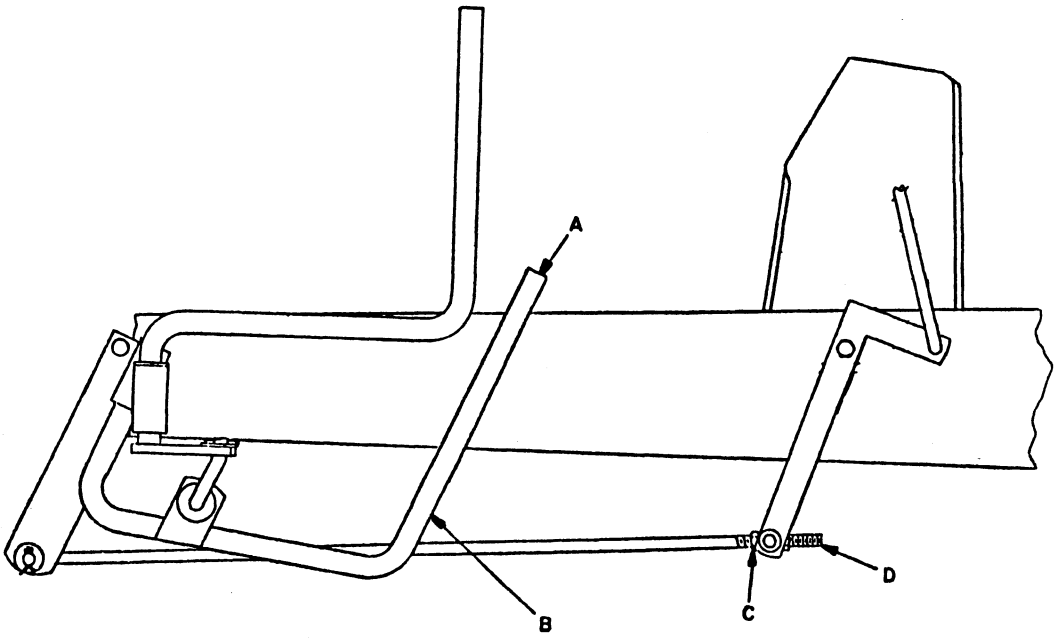


FIGURE 5

3. Under most conditions, it will not be necessary to adjust the location of the single bale trip to change placement of the center bale in a tie tier. However, in some conditions it may be desirable to relocate the center bale. See Figure 1.

   The single bale trip arm can be set in several different positions on rod, B. The trip arm is retained in position on rod, B, by two hairpin cotters and two large flat washers. If the center bale in a tie tier is being delivered too far to the right of the machine, move the single bale trip arm toward the left of the machine. This will reposition the two hairpin cotters, the arm itself, and the flat washers which are placed on either side of the arm.

   The slotted link on the bottom of the single bale trip arm must always have rod, B, passing through it and have hairpin cotters and washers retaining it in position on the rod.

   The height of the single bale trip may have to be adjusted to provide clearance for bales moving across the first table when the linkage system is not activated. Locate the intermediate trip arm in the deactivated position, so it is located approximately ½" (13 mm) below the top of the first table channels. Refer to Figure 5.

   Loosen nuts, C, on rod, D, to raise or lower the trip as required. To raise the trip arm, A, move both nuts on rod, D, toward the front of the machine. To lower trip arm, A, move both nuts on rod, D, toward the rear of the machine. Be sure to tighten the nuts on rod, D, against both sides of the pivot block after the correct adjustment is obtained. This adjustment must be made with the tie spikes in a fully retracted position.

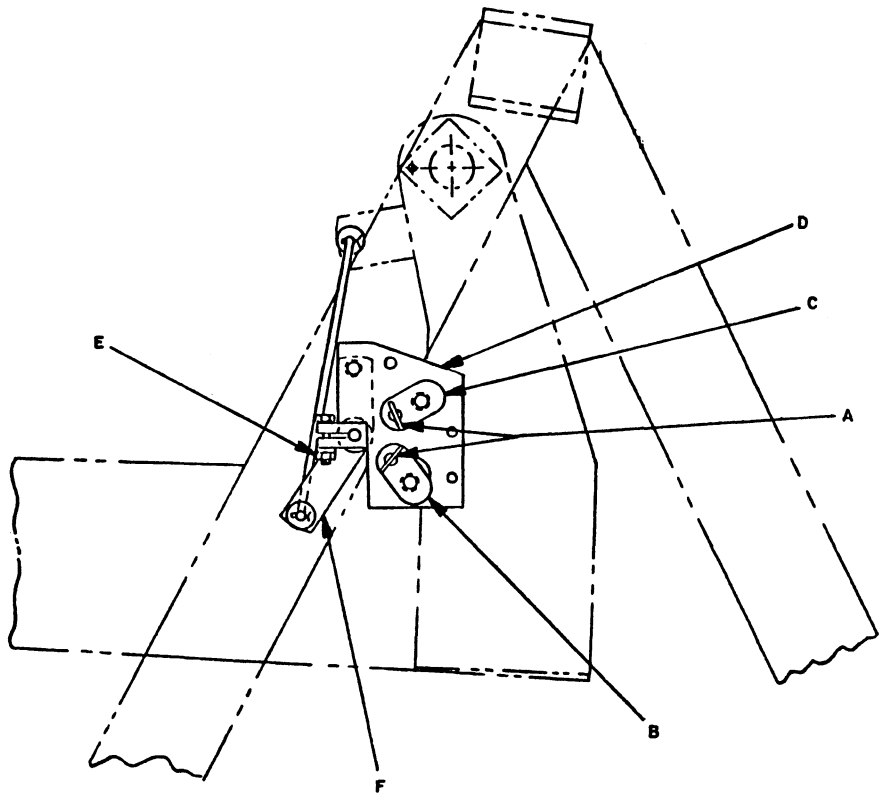


FIGURE 6

SECOND TABLE

1. The first adjustment to be made on the second table is the second table down sensor. With the second table fully down, the magnet located on link, E, should be centered on the electronic sensor which is mounted in the uppermost part of plate, D. This position is shown in Figure 6. If the sensor must be relocated so it is centered on the actuating magnet, loosen the clamping hardware, E, and rotate plate, D, until the electronic sensor mounted in plate, D, is centered on the actuating magnet mounted on link, F. Retighten the clamping hardware, E. When relocating this portion of the linkage, maintain a very minimum amount of end play between the sensor mounting assembly and link, F. There should be no more clearance than that necessary to allow link, F, to rotate freely upon its shaft.

Excessive end play between the sensor mounting assembly and clamp block and link, F, will allow an excessive variation in the spacing between the sensor actuating magnet and the sensor itself. This can result in nonoperation of the system if the clearance is too large. Also, the sensor and magnet can be damaged if they are moved too close together so as not to be able to freely pass by each other. Adjust the clearance between the electronic sensor face and the magnet face by screwing the electronic sensor in or out of plate, D, to obtain a 1/16" (1.6 mm) maximum clearance. The magnetic sensor must then be locked in place by retightening the locknut which locks it into place, D. Refer to Figure 6.

Plate, B, controls the delivery of the second table to the load rack. If adjustment is needed, relocate plate, B, which mounts another electronic sensor. Loosen wing screw, A, and rotate plate, B, to the proper location for the desired delivery of the second table. Moving link, B, in the clockwise direction increases the amount of delivery of the second table; moving plate, B, in the counterclockwise direction reduces the delivery of the second table. When the proper adjustment is obtained, securely tighten wing screw, A.

2. The location of plate, C, which also contains an electronic sensor, determines the angle at which the table delivers when making a center rail or double rail tie (when a portion of a tier must be moved to the rear of the table). Varying bale conditions determine the angle at which the second table must travel to deliver bales to the rear of the second table in a center rail or double rail tie.

   This adjustment must be made under field conditions. Loosen wing screw, A, that secures plate, C, in position. Rotate plate, C, to obtain the proper delivery angle for the particular bale condition. Moving plate, C, in a clockise direction increases the angle through which the second table travels. Rotating plate, C, in a counterclockwise direction reduces the angle through which the second table travels. When the proper adjustment is obtained, securely tighten wing screw, A.

3. After the previous adjustments are made, be sure that the maximum clearance between the actuator magnet and the electronic sensors on the second table sensor actuating linkage never exceeds 1/16" (1.6 mm). Be sure end play between link, F, and plate, D, does not allow side shift of plate, F, to cause the actuating magnet to contact any of the electronic sensors.

4. The second table side rails must be adjusted to allow the bales to fit between the rails without restriction when they are being pushed back onto the second table by the next delivery of bales from the first table. The bales must also be free to slide to the rear of the second table during the tie sequence.

   This adjustment must be a compromise between good bale retention on the second table while still allowing bales to slide freely to the rear of the second table.

   Adjust the side rails by loosening the jam nuts and setscrews on each of the side rail mounting tubes. Then move the side rails in or out as required to accept the two bales which are being pushed between the side rails. When an adjustment is made on the second table side rails, be sure that the rails will pass between the front stabilizer uprights when the second table delivers to the load rack. Failure to observe this caution will result in damage to the stabilizer uprights and/or the second table side rails.

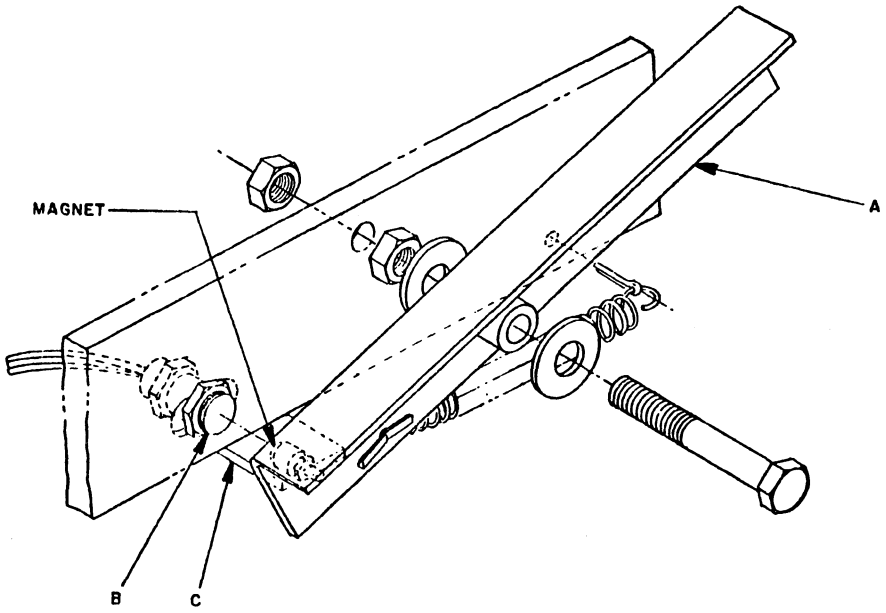


FIGURE 7

LOAD RACK DOWN SENSOR

Refer to Figure 7. When the load rack is raised for stacking, it allows the actuating magnet which is mounted on link, A, to actuate electronic sensor, B, which is mounted on the load rack cradle. This function completely clears the electronic control system and prepares the machine to start a new load with all counts and functions at zero.

The sensor actuating linkage must be adjusted so that the sensor actuating magnet is no more than 1/16" (1.6 mm) from the electronic sensor on the load rack cradle and the magnet is approximately centered on the sensor. If it is necessary to correct this adjustment, the load rack must be fully raised. The load rack cylinders should be fully extended and the rolling rack should be fully to the rear of the load rack.

The electronic sensor, B, may be moved by loosening the two locknuts which retain it in place. Move the sensor in the slot. If this does not provide enough adjustment to place the magnet in approximately the center of the actuating sensor, bend tab, C, which acts as a stop for link, A, to locate the magnet in the proper relation to the electronic sensor.

The clearance between the sensor and magnet must not exceed 1/16" (1.6 mm), but it must still provide clearance so the magnet will clear the sensor when running through its normal rotational cycle.

CONTROLLER AND SENSOR QUICK CHECK

This section contains a step-by-step procedure to help locate and define any problems that might be present. The bale wagon must be positioned as follows: engine running with hydraulics on, bale loader down, rolling rack forward, and the load rack raised.

1. Try to advance the first and second table counts. You should not be able to advance the counts; if you can, there is a load rack sensor problem.
2. Manually raise the second table. As the second table passes the 50° sensor, the rolling rack should pulsate down. Once the second table reaches the upper limit sensor, the rolling rack should stop moving.
3. Return the load rack to its rest and set the stack selector knob to "E" stack. Advance the first table count to "5," the second table count to "0," and depress the load reset button. After the load reset button is pressed, the second table should deliver to the upper limit and then return. Also, the second table count will advance to "1" and the first table count will be reset to "0" as the second table contacts the upper limit sensor.
4. Advance the second table count to "2," the first table count to "1," and depress the load reset button. The tie spikes should go up when the load reset button is pressed and the spikes "up" indicator on the display will come on, the spikes "down" indicator will go off.

   NOTE: The spikes "up" indicator will come on as the spikes start to rise and both "up" and "down" indicators (messages) will remain on until the spikes reach the up position, at which time the "down" indicator will go off. This can be confirmed by operating the spikes in the manual mode and stopping the spikes at midposition.
5. Advance the first table count to "3" (second table still at "2") and depress the load set button. The spikes will come down, the second table will deliver to the 50° limit sensor and return, but the second table count should not advance.
6. Raise the load rack approximately 1' and return to rest. This should reset the table counts to zero. Raise the bale loader about 1' off the down position and then manually operate the left side trip. The cross conveyor should stop, but reversing the cross conveyor is prevented by raising the bale loader (magnet will be on the sensor).
7. Lower the bale loader. The cross conveyor will reverse as the loader comes to the down position.
8. In the manual mode, raise the second table off the down position approximately 1' and hold it there. Manually operate the right side trip. The cross conveyor will stop, and the first table delivery will be prevented by the second table being off the down sensor.
9. Manually lower the second table to the down position. As the second table contacts the down sensor, the first table will deliver to the limit sensor and return. Also, the first table count will advance to "1" at the limit sensor point.
10. With the second table locked in the manual mode, advance the first table count to "5" (stack selector in "E" pattern) and depress the load reset button. In sequence, manually operate the left side trip (cross conveyor reverses) and then the right side trip (cross conveyor stops). First table delivery is prevented as the second table is full, but has not delivered.
11. Place the second table in automatic mode. The second table delivers to the 90° limit sensor and returns. The second table count advances to "1" and the first table resets to "0" at the 90° limit, and the first table delivers as the second table reaches the down position. The first table count advances to "1" at the limit position and starts the cross conveyor running forward.

TROUBLESHOOTING AND FLOW CHARTS

This section contains a step-by-step procedure to aid in diagnosing common functional problems that may occur with the electronic control system.

A large percentage of all problems involving the electronic control system is due to poorly adjusted and maintained sensors. These sensors, their actuating magnets, and all associated linkage must be kept in good operating condition. The electronic control system should operate trouble free as long as the information it receives from its sensors is correct.

Use the flow charts to isolate the cause of a function difficulty in terms of its origin, either in the control box itself or out on the machine. While all sensors, linkages, wiring and solenoid valves are field serviceable, the control box itself is not. This manual does not contain detailed information on problems inside the control box.

CAUTION: WHEN TROUBLESHOOTING THE BALE WAGON, EXTREME CARE MUST BE TAKEN. MANY CHECKS WILL REQUIRE ACTIVATING SENSORS WHILE THE HYDRAULIC POWER IS ON. ON A MALFUNCTIONING MACHINE, ONE MUST BE ALERT FOR ABNORMAL MACHINE REACTIONS AT ALL TIMES.

Problems with the control system may be separated into two categories: Intermittent or random failures and steady state or hard failures.

Hard failures are consistent, repeatable problems which are readily diagnosed and corrected by following the flow charts to pinpoint and replace the defective component.

Random or intermittent problems are difficult to determine and locate. The majority of random failures is a result of problems external to the control package.

Many of these problems can be corrected without changing the controller. Changing the controller may temporarily cure the problem, but the same problem will probably recur. All other possibilities must be thoroughly exhausted prior to box replacement. Most random failures are caused by:

1. Loose or corroded terminal connections at the control box.
2. Electronic wiring harness damaged or in poor condition.
3. Electrical noise.
4. Dirty manual/auto switches in the controller.

The best way to help prevent random failures is to:

1. Advise the customer/operators to keep the cab door and windows closed when not in use.
2. Maintain sensor connections protection.
3. Periodically inspect and protect harness wear spots.

The frequency of random and intermittent failures depends on the following factors:

1. Vibration
2. Temperature
3. Humidity or water spray

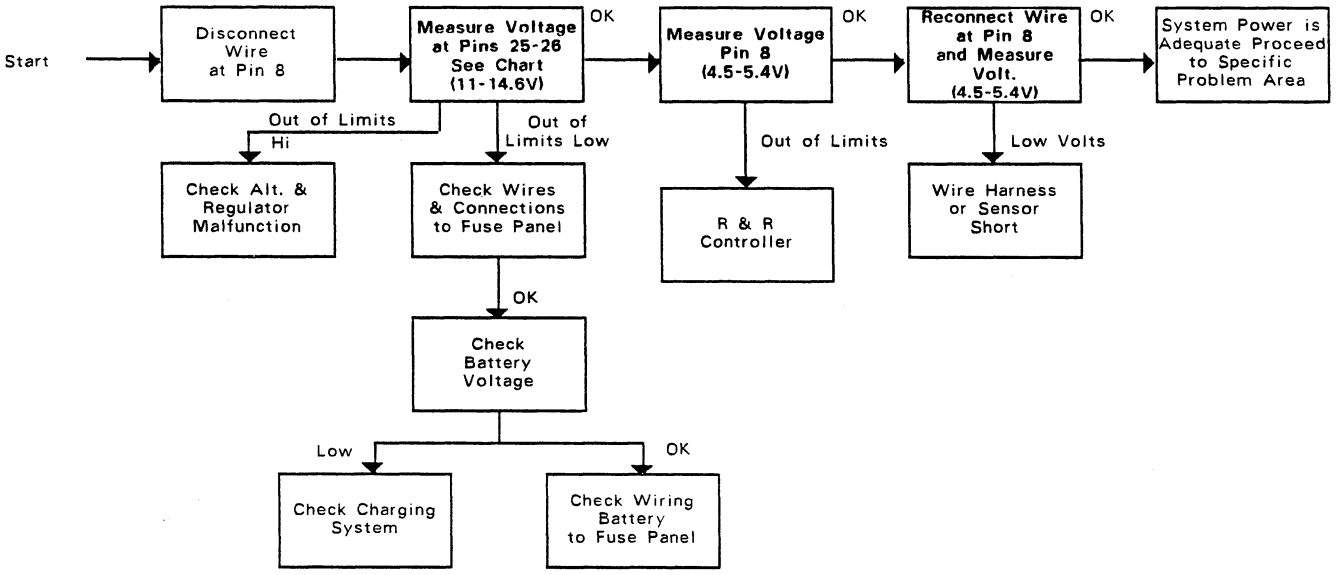


FIGURE 8

POWER CHECK (Figure 8)

Controller Pin Number	Voltage Values Acceptable Voltage Range
8	4.5 to 5.4
25	11.0 to 14.6 (1-amp fuse)
26	11.0 to 14.6 (15-amp fuse)

Measure all voltages with the ground lead at pin number 2 of the controller.

Control box removal sequence:

1. Remove the 1-amp and 15-amp fuse or disconnect the positive battery cable(s).
2. Remove the single screw at the top center of the control box face plate.
3. Lift the controller straight up and out of the console.
4. Place the control box on the operator seat.
5. Replace the fuses or reconnect the battery(s) positive cable.

CROSS CONVEYOR CHECK (PERFORM POWER CHECK FIRST)

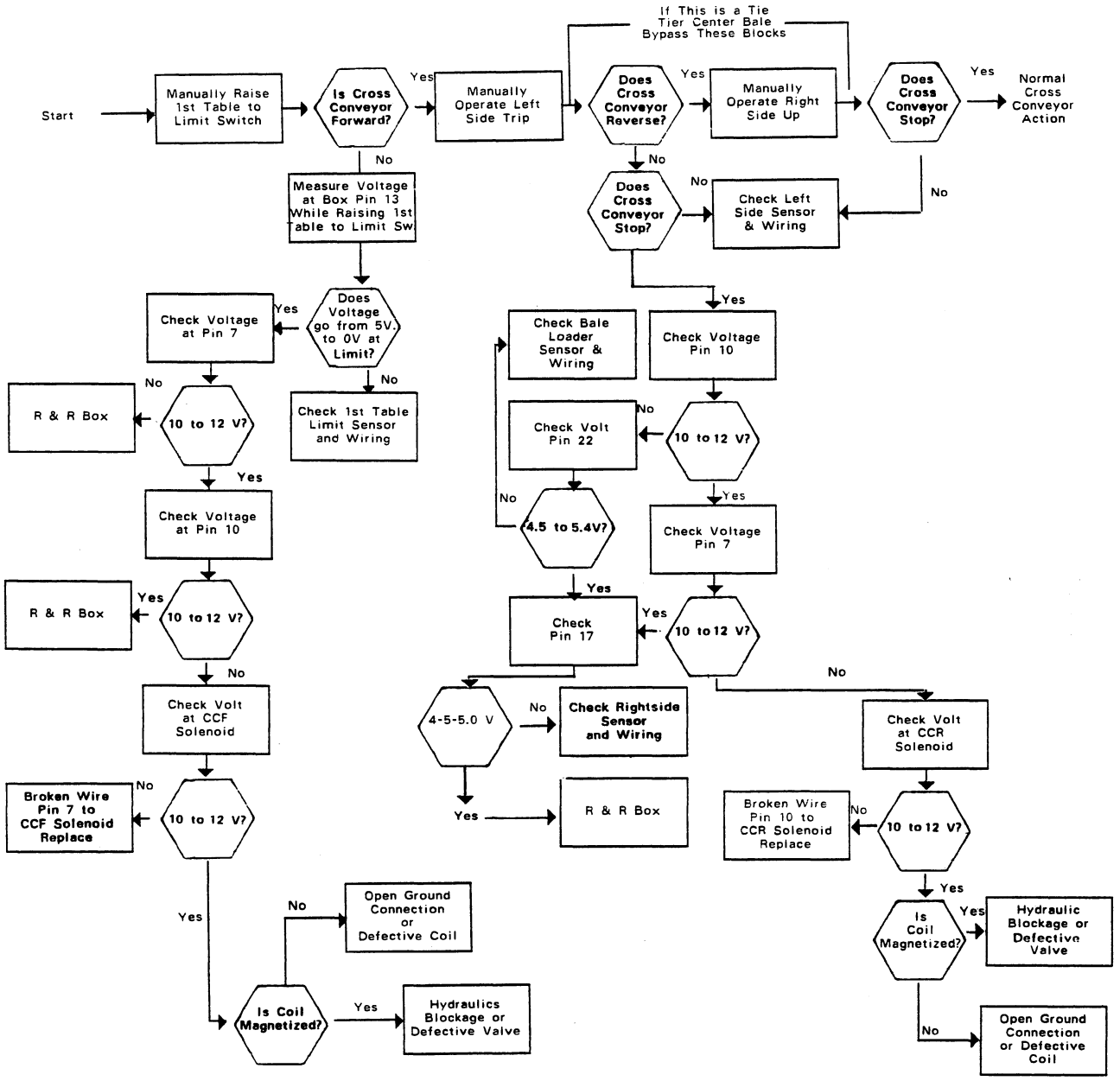


FIGURE 9

CROSS CONVEYOR CHECK (Figure 9)

Sequence - Two bale delivery

1. Hydraulics on - cross conveyor running forward.
2. After activation of left side sensor by two bales on first table, cross conveyor reverses.
3. After activation of right side sensors by second bale returning, cross conveyor stops, then first table delivers.

NOTE: Cross conveyor will not reverse if bale loader is raised.

Sequence - single bale delivery **(NOTE: Spikes are up, raising center bale trip)**

1. Hydraulics on - cross conveyor running forward.
2. After activation of left side sensor through center bale trip linked to left side trip, cross conveyor stops, and first table delivers.

FIRST TABLE

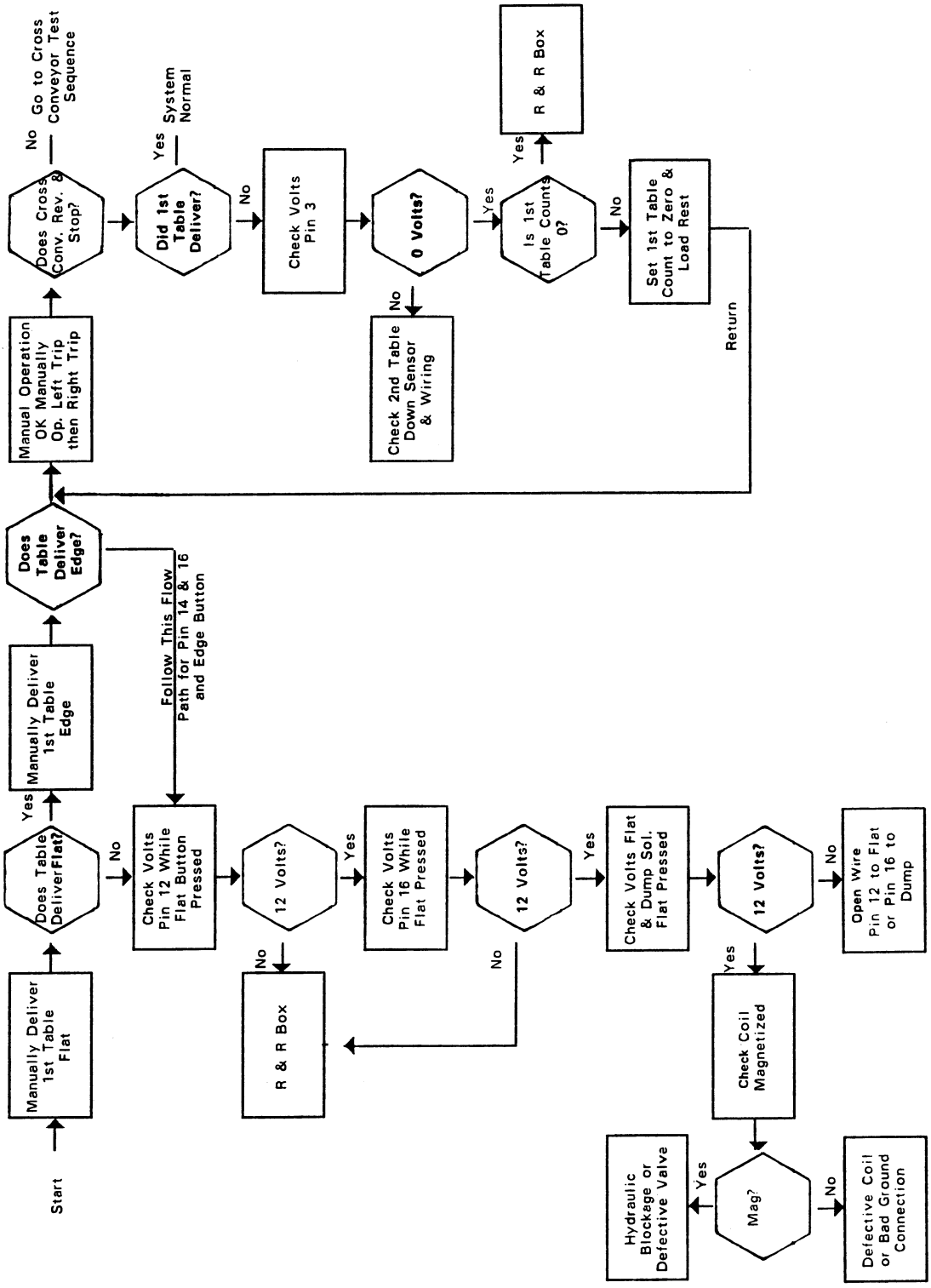


FIGURE 10

FIRST TABLE (Figure 10)

Sequence:

1. Activation of the first table delivery is developed from inside the controller whenever the cross conveyor is stopped (see cross conveyor section).
2. When delivery is called for, the table will deliver either edge or flat depending on the stack pattern selected and the first and second table counts. Voltage is applied to the edge or flat valve and the first table dump valve.
3. The first table function is turned off by the first table limit sensor and the cross conveyor function is reset in forward.

IMPORTANT: The first table will not deliver if:

1. The bale loader is up, or:
2. The second table is up, or:
3. The second table is full but not raised.

SPIKES

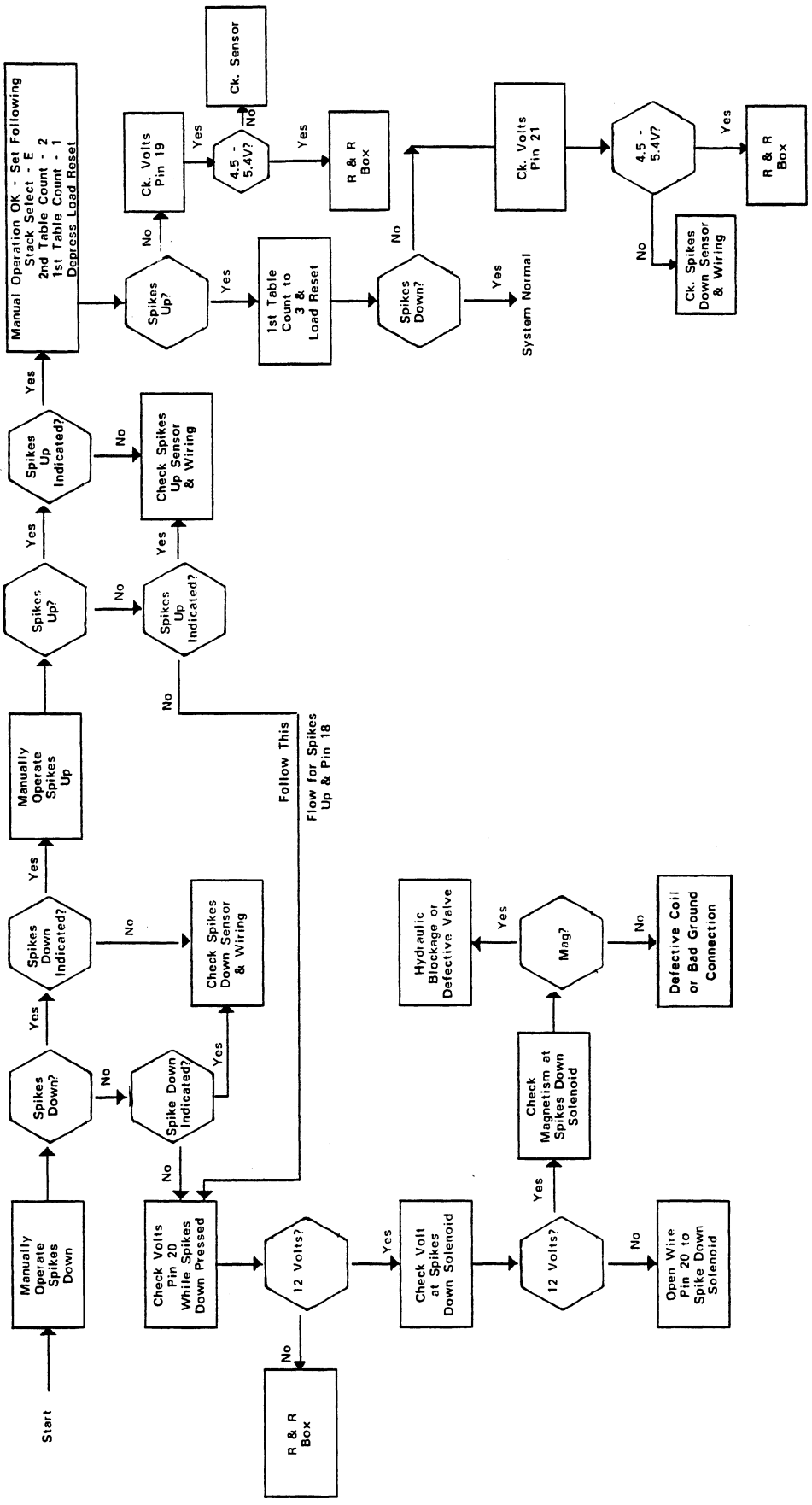


FIGURE 11

SPIKES (Figure 11)

Sequence:

1. The spikes "up" and "down" signals are generated within the controller and are dependent only on the first and second table count and the stack pattern selected.
2. When automatically activated, the spikes drive is turned off when the corresponding limit sensor is reached.

   NOTE: If the spikes drive is not turned off by the limit sensor in the automatic mode, the hydraulic system will go into bypass when the physical travel limit is reached. All other functions will not operate until the spikes bypass is cleared.

   The display indicates when the spikes are at the limit sensor positions (up or down).

SECOND TABLE

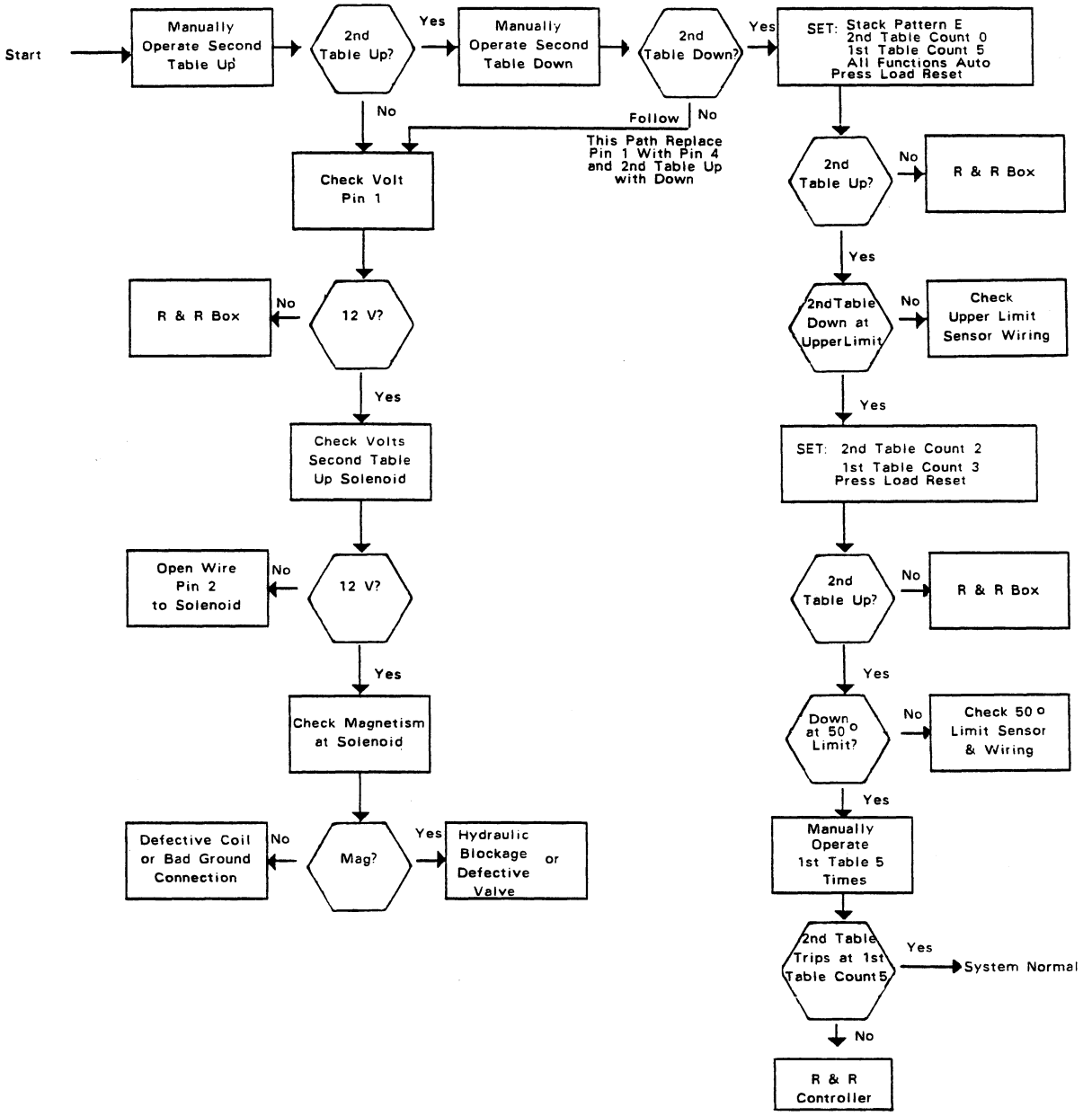
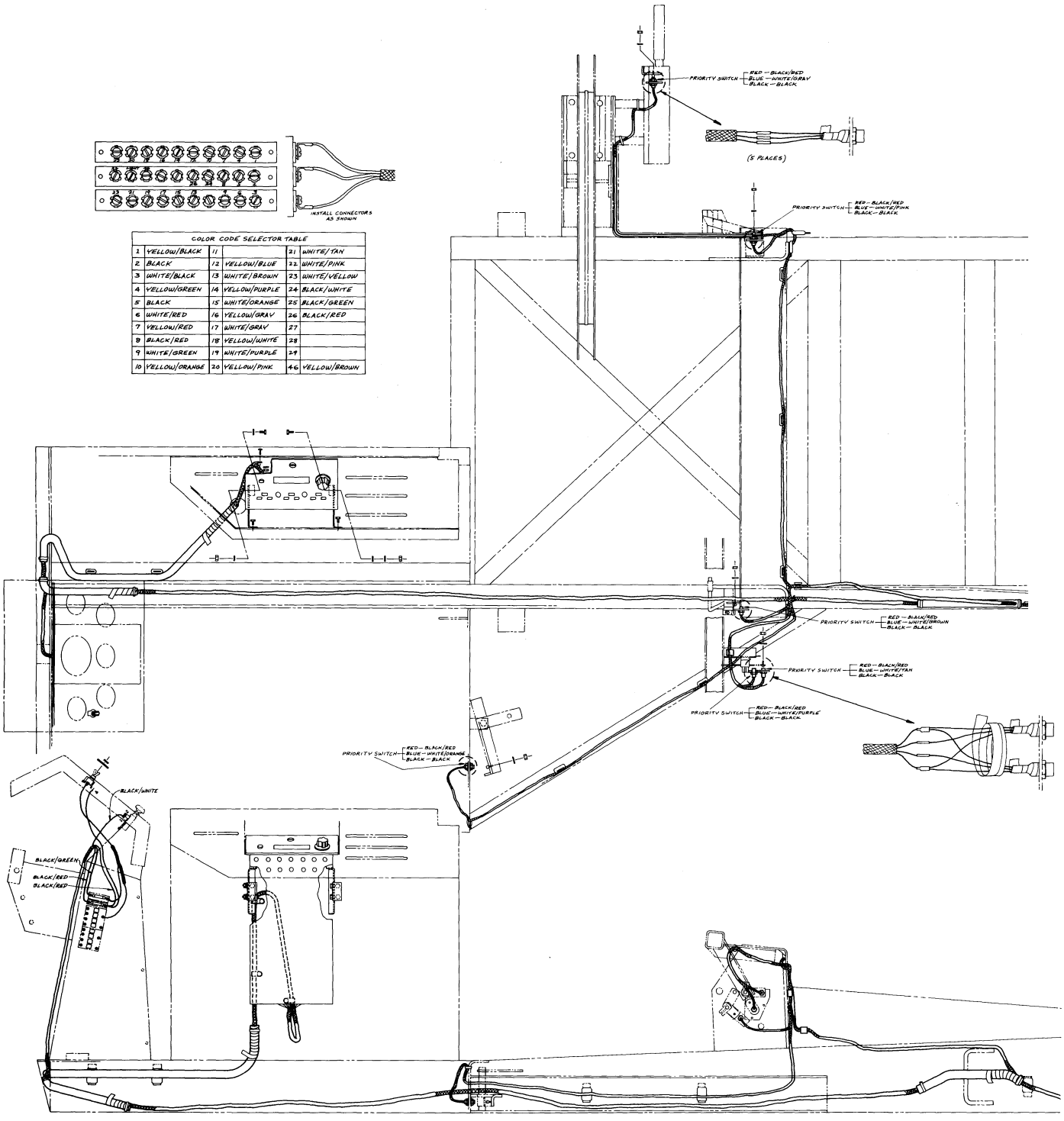


FIGURE 12

SECOND TABLE (Figure 12)

Sequence:

1. Second table up signal is generated from within the controller based on the stack pattern selected and the first and second table counts.
2. Second table up is turned off by 50° limit sensor or 90° limit sensor depending on stack pattern selected and first and second table counts.



COLOR CODE SELECTOR TABLE

1	YELLOW/BLACK	11		21	WHITE/TAN
2	BLACK	12	YELLOW/BLUE	22	WHITE/PINK
3	WHITE/BLACK	13	WHITE/BROWN	23	WHITE/YELLOW
4	YELLOW/GREEN	14	YELLOW/PURPLE	24	BLACK/WHITE
5	BLACK	15	WHITE/ORANGE	25	BLACK/GREEN
6	WHITE/RED	16	YELLOW/GRAY	26	BLACK/RED
7	YELLOW/RED	17	WHITE/GRAY	27	
8	BLACK/RED	18	YELLOW/WHITE	28	
9	WHITE/GREEN	19	WHITE/PURPLE	29	
10	YELLOW/ORANGE	20	YELLOW/PINK	46	YELLOW/BROWN

ELECTRONIC WIRING SYSTEM DIAGRAM

MODEL 1075 BALE WAGONS BELOW SERIAL NUMBER 1488

1. Electronic control group (Figure 13)
2. Wire harness - internal splice design (Figure 14)

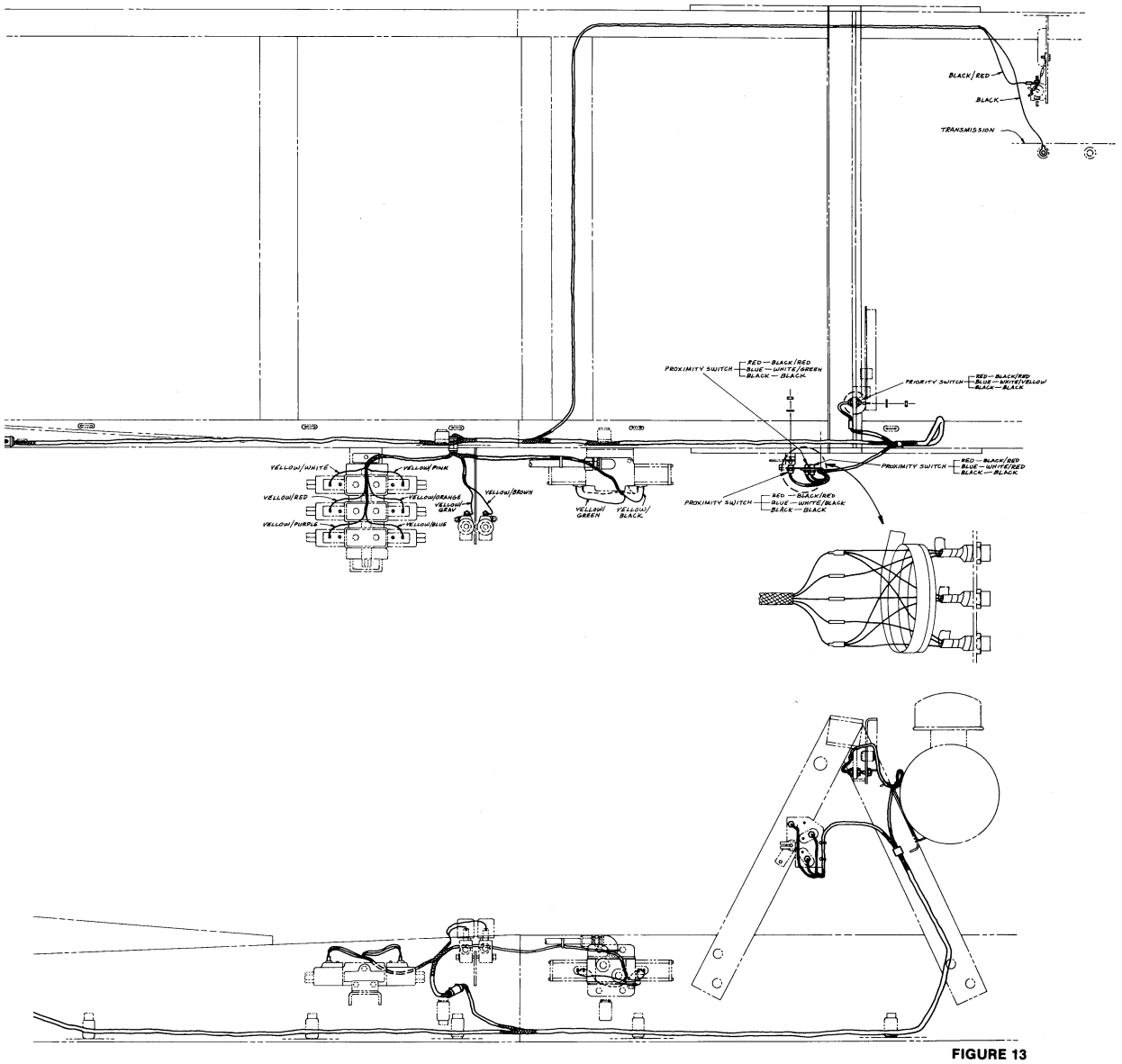


FIGURE 13

21 (Cont`d)

WIRE HARNESS (Figure 14)

ITEM NO.	GA	IDENTIFICATION	APPLICATION
1	16	YELLOW/BLACK	SECOND TABLE UP DRIVE
2	10	BLACK	GROUND
3	20	WHITE/BLACK	SECOND TABLE DOWN SENSOR
4	16	YELLOW/GREEN	SECOND TABLE DOWN DRIVE
5	20	BLACK	SWITCHES GROUND - SECOND TABLE
6	20	WHITE/RED	SECOND TABLE 50° SENSOR
7	16	YELLOW/RED	CROSS CONVEYOR FORWARD DRIVE
8	20	BLACK/RED	SWITCHES POWER - SECOND TABLE
9	20	WHITE/GREEN	SECOND TABLE LIMIT SENSOR
10	16	YELLOW/ORANGE	CROSS CONVEYOR REVERSE DRIVE
11			
12	16	YELLOW/BLUE	FIRST TABLE FLAT DRIVE
13	20	WHITE/BROWN	FIRST TABLE LIMIT SENSOR
14	16	YELLOW/PURPLE	FIRST TABLE EDGE DRIVE
15	20	WHITE/ORANGE	LEFT SIDE SENSOR
16	16	YELLOW/GRAY	FIRST TABLE DUMP DRIVE
17	20	WHITE/GRAY	RIGHT SIDE SENSOR
18	16	YELLOW/WHITE	SPIKES UP DRIVE
19	20	WHITE/PURPLE	SPIKES UP SENSOR
20	16	YELLOW/PINK	SPIKES DOWN DRIVE
21	20	WHITE/TAN	SPIKES DOWN SENSOR
22	20	WHITE/PINK	BALE LOADER DOWN SENSOR
23	20	WHITE/YELLOW	LOAD RACK SENSOR
24	16	BLACK/WHITE	CONTROL UNIT LIGHT TO LIGHT SWITCH "L"
25	16	BLACK/GREEN	CONTROL UNIT POWER (KEY SWITCH) TO FUSE BLOCK "IGN."
26	10	BLACK/RED	CONTROL UNIT POWER (MAIN) TO FUSE BLOCK
27	10	BLACK/RED	FUSE BLOCK TO STARTER SOLENOID "BAT."
28	20	BLACK	LEFT SIDE SENSOR GROUND TO HARNESS SPLICE
29			
30	20	BLACK	HARNESS SPLICE TO FIRST TABLE LIMIT SENSOR GROUND
31	20	BLACK	HARNESS SPLICE TO RIGHT SIDE SENSOR GROUND
32	20	BLACK	HARNESS SPLICE TO BALE LOADER DOWN SENSOR GROUND
33	20	BLACK	HARNESS SPLICE TO GROUND SPIKES
34			
35	20	BLACK	HARNESS SPLICE TO LOAD RACK SENSOR GROUND
36			
37			
38	20	BLACK/RED	LEFT SIDE SENSOR POWER TO HARNESS SPLICE
39			
40	20	BLACK/RED	HARNESS SPLICE TO FIRST TABLE LIMIT SENSOR POWER

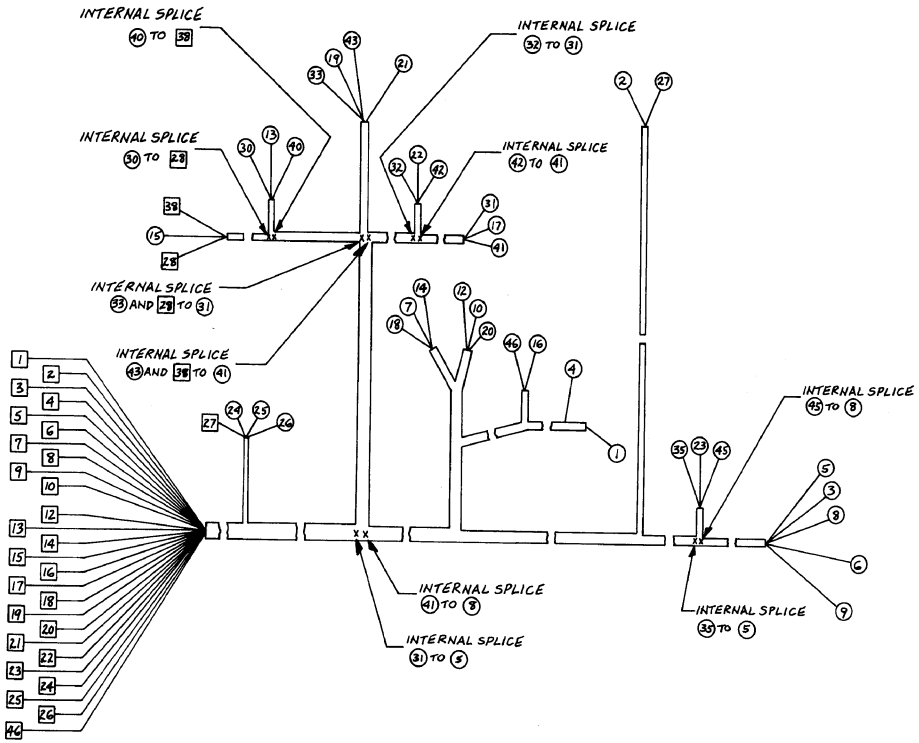
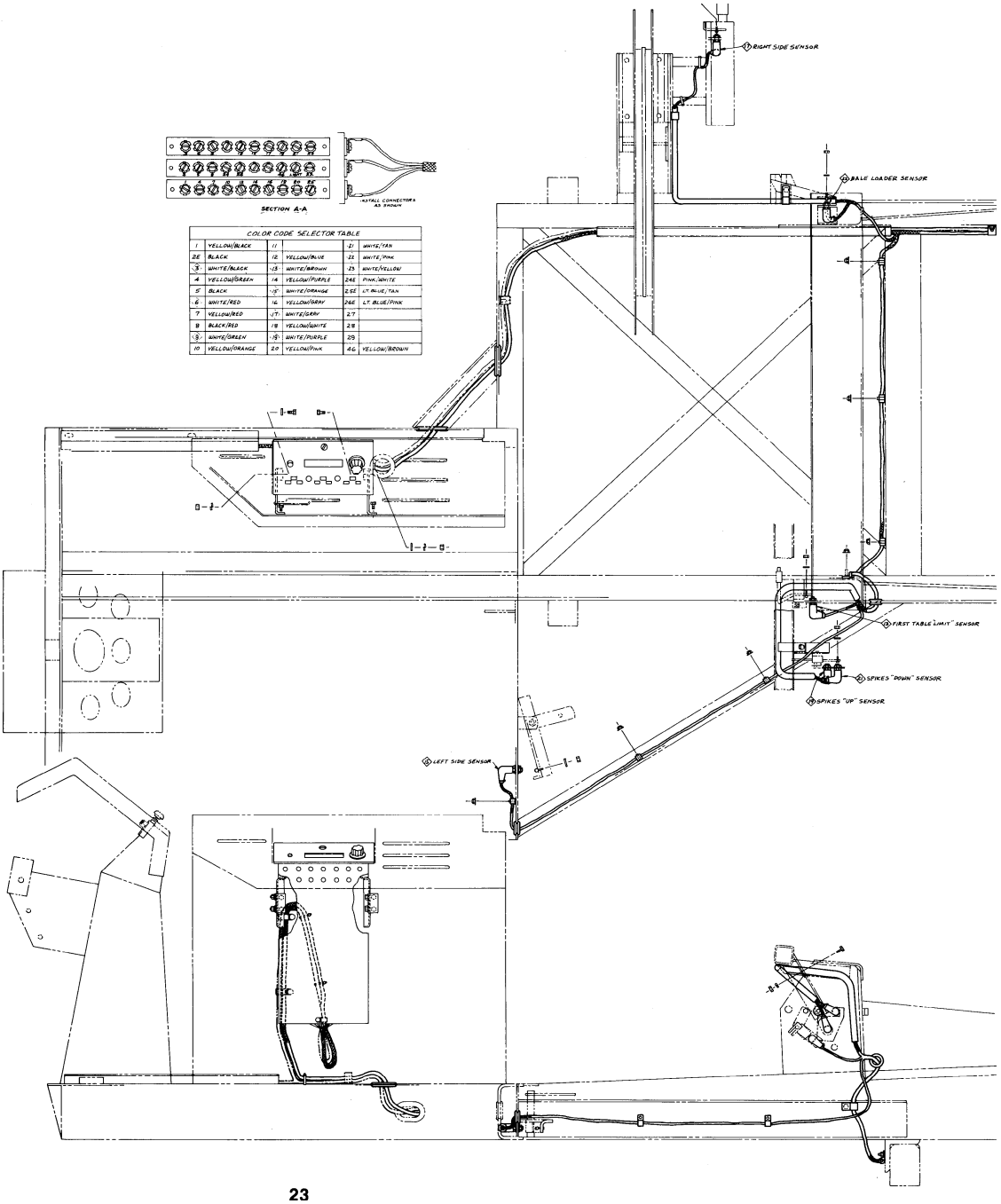


FIGURE 14

41	20	BLACK/RED	HARNESS SPLICE TO RIGHT SIDE SENSOR POWER
42	20	BLACK/RED	HARNESS SPLICE TO BALE LOADER DOWN SENSOR POWER
43	20	BLACK/RED	HARNESS SPLICE TO SENSOR POWER - SPIKES
44			
45	20	BLACK/RED	HARNESS SPLICE TO LOAD RACK SENSOR POWER
46	16	YELLOW/BROWN	ROLLING RACK RELIEF DRIVE



COLOR CODE SELECTOR TABLE

1	YELLOW/BLACK	11		21	WHITE/TAN
22	BLACK	12	YELLOW/BLUE	22	WHITE/PINK
3	WHITE/BLACK	13	WHITE/BROWN	23	WHITE/YELLOW
4	YELLOW/GREEN	14	YELLOW/PURPLE	24	PINK/WHITE
5	BLACK	15	WHITE/ORANGE	25	LT. BLUE/TAN
6	WHITE/RED	16	YELLOW/GRAY	26	LT. BLUE/PINK
7	YELLOW/RED	17	WHITE/GRAY	27	
8	BLACK/RED	18	YELLOW/WHITE	28	
9	WHITE/GREEN	19	WHITE/PURPLE	29	
10	YELLOW/ORANGE	20	YELLOW/PINK	46	YELLOW/BROWN

MODEL 1075 BALE WAGONS ABOVE SERIAL NUMBER 1487

1. Electronic control group (Figure 15)
2. Wire harness - no internal splices (Figure 16)

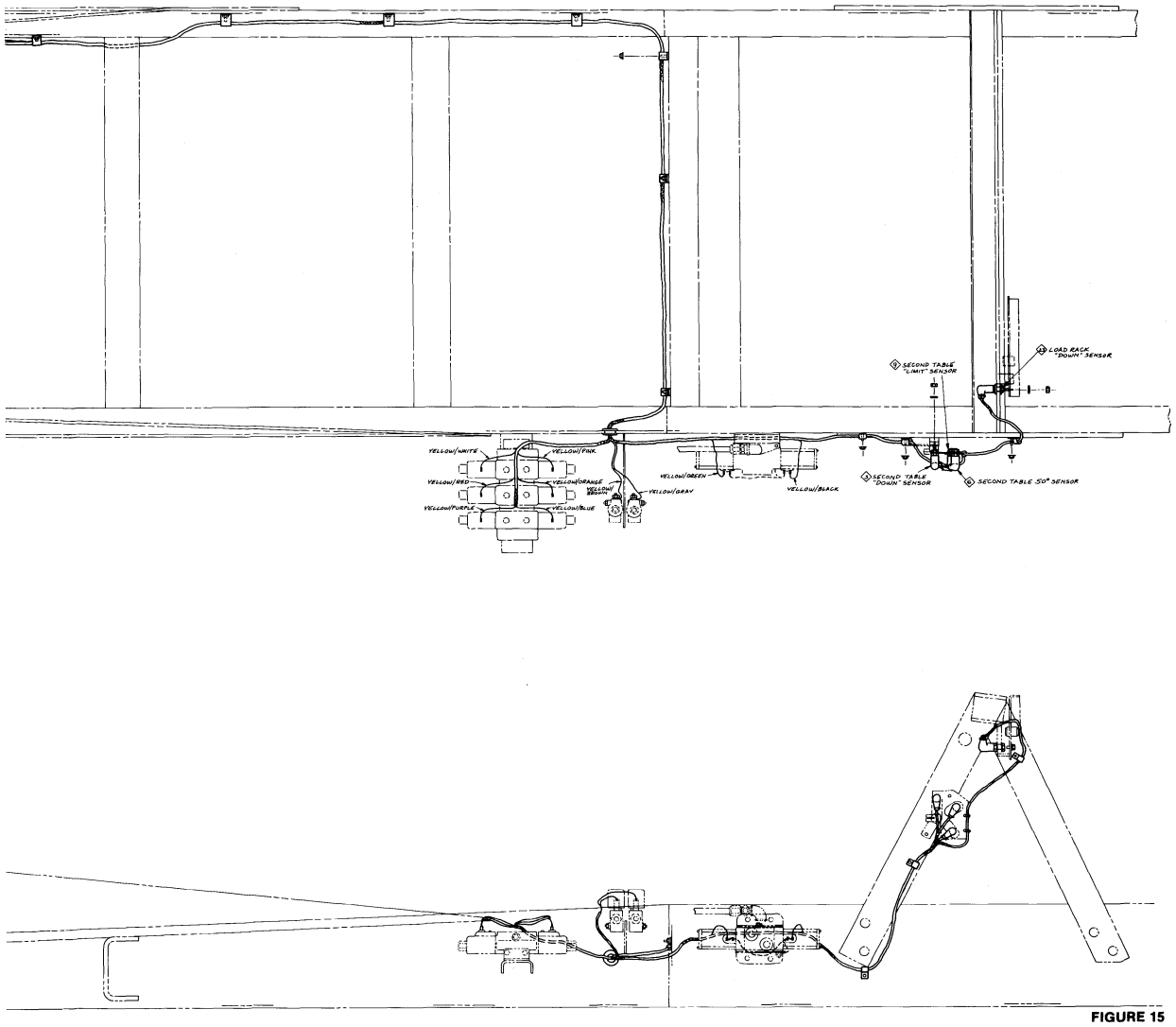


FIGURE 15

23 (cont`d)

WIRE HARNESS (Figure 16)

ITEM	GA	IDENTIFICATION	APPLICATION
1	18	YELLOW/BLACK	2nd TABLE UP DRIVE
2	18	WHITE/BLACK	2nd TABLE DOWN SENSOR
3	18	YELLOW/GREEN	2nd TABLE DOWN DRIVE
4	18	BLACK	SENSOR GROUND
5	18	WHITE/RED	2nd TABLE 50° LIMIT SENSOR
6	18	YELLOW/RED	CROSS CONVEYOR FORWARD DRIVE
7	18	BLACK/RED	+5 VOLT; SENSOR POWER
8	18	WHITE/GREEN	2nd TABLE LIMIT SENSOR
9	18	YELLOW/ORANGE	CROSS CONVEYOR REVERSE DRIVE
10	18	YELLOW/BLUE	1st TABLE FLAT DRIVE
11	18	WHITE/BROWN	1st TABLE LIMIT SENSOR
12	18	YELLOW/PURPLE	1st TABLE EDGE DRIVE
13	18	WHITE/ORANGE	LEFT SIDE SENSOR
14	18	YELLOW/GRAY	1st TABLE DUMP DRIVE
15	18	WHITE/GRAY	RIGHT SIDE SENSOR
16	18	YELLOW/WHITE	SPIKES UP DRIVE
17	18	WHITE/PURPLE	SPIKES UP SENSOR
18	18	YELLOW/PINK	SPIKES DOWN DRIVE
19	18	WHITE/TAN	SPIKES DOWN SENSOR
20	18	WHITE/PINK	BALE LOADER DOWN SENSOR
21	18	WHITE/YELLOW	LOAD RACK DOWN SENSOR
22	18	BLACK/RED	+5 RIGHT SIDE SENSOR TO BALE LOADER DOWN SENSOR
23	18	BLACK/RED	+5 BALE LOADER DOWN SENSOR TO LEFT SIDE SENSOR
24	18	BLACK/RED	+5 LEFT SIDE SWITCH TO 1st TABLE LIMIT SENSOR
25	18	BLACK/RED	+5 1st TABLE LIMIT SENSOR TO SPIKES DOWN SENSOR
26	18	BLACK/RED	+5 SPIKES DOWN SENSOR TO SPIKES UP SENSOR
27	18	BLACK/RED	+5 SPIKES UP SENSOR TO 2nd TABLE DOWN SENSOR
28	18	BLACK/RED	+5 2nd TABLE DOWN SENSOR TO 2nd TABLE 50° SENSOR
29	18	BLACK/RED	+5 2nd TABLE 50° SENSOR TO 2nd TABLE LIMIT SENSOR
30	18	BLACK/RED	+5 2nd TABLE LIMIT SENSOR TO LOAD RACK DOWN SENSOR
31	18	BLACK	GROUND - RIGHT SIDE SENSOR TO BALE LOADER DOWN SENSOR
32	18	BLACK	GROUND - BALE LOADER DOWN SENSOR TO LEFT SIDE SENSOR
33	18	BLACK	GROUND - LEFT SIDE SENSOR TO 1st TABLE LIMIT SENSOR
34	18	BLACK	GROUND - 1st TABLE LIMIT SENSOR TO SPIKES DOWN SENSOR
35	18	BLACK	GROUND - SPIKES DOWN SENSOR TO SPIKES UP SENSOR
36	18	BLACK	GROUND - SPIKES UP SENSOR TO 2nd TABLE DOWN SENSOR
37	18	YELLOW/BROWN	ROLLING RACK DUMP DRIVE
38	18	BLACK	GROUND - 2nd TABLE DOWN SENSOR TO 2nd TABLE 50° SENSOR
39	18	BLACK	GROUND 2nd TABLE 50° SENSOR TO 2nd TABLE LIMIT SENSOR
40	18	BLACK	GROUND - 2nd TABLE LIMIT SENSOR TO LOAD RACK DOWN SENSOR
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			

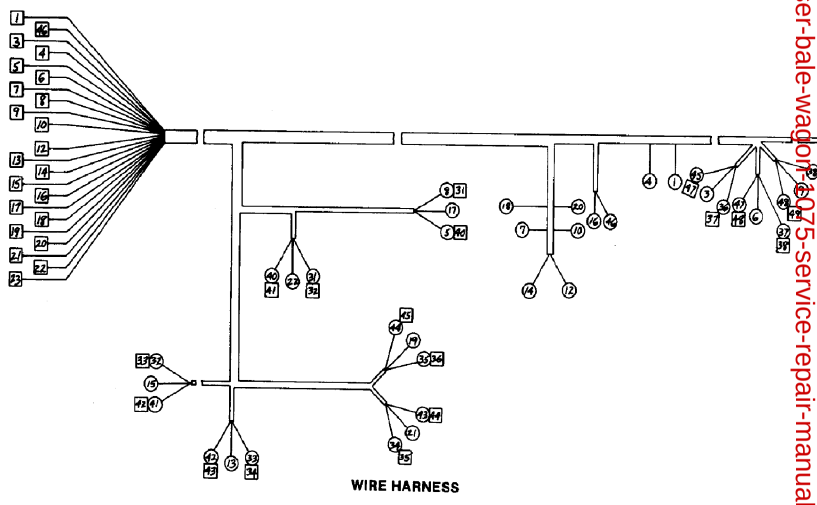


FIGURE 16