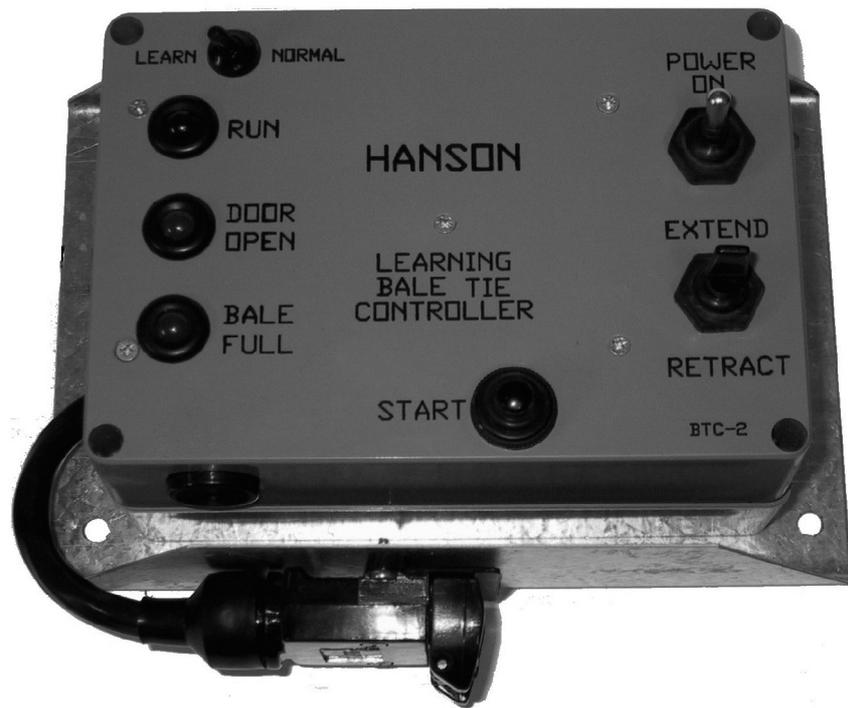


# Hanson Learning Bale Tie Controller



**Fig.1**

## **Use:-**

To replace manually controlled round bale controllers, faulty controllers or to upgrade the features on older controllers. Usable on any brand of baler that uses an electric ram for the tying process. Some brands include GEHL, INTERNATIONAL, VERMEER and NEW HOLLAND.

## **Benefits:-**

Consistent and repeatable bale tying. Reduced strain on neck (no need to watch bale being tied). Fully adjustable tie positions, fully adjustable wrap amount. Manual control still available for inserting string or manually wrapping. Weatherproof enclosure allowing controller to be used on tractors without cabins. Audible and visual indication of bale full and baler door open. Simple teaching process. Up to 10 ties with different wrap amounts available for each wrap. Autostarting (if selected) to start the wrapping process automatically after the bale is full.

## **Controls:-**

There are 6 switches. They are:-

1. Power switch.
2. An EXTEND/RETRACT centre off switch for manually controlling the electric ram.
3. A START push button which starts the automatic tying process and is also used in the 'teaching' process.
4. A switch to select learning or normal.
5. A switch to disable the microprocessor. (Located on control PCB. Used in the event of CPU failure)
6. A switch to enable/ disable the autostart feature. (Located on control PCB)

## Specifications

- Supply voltage:- 12VDC negative earth
- Box:- 170mm x 120mm x 80mm (6.7" x 4.7" x 3.1")
- Mount (2mm galvanised steel):- 200mm x 150mm x 80mm (7.9" x 6.0" x 3.1")
- Number of tie positions:- Up to ten. Dependant on number 'taught'.
- Memory:- Memory retained without power for 100 years  
Up to 1 million write cycles (ie changes to process)
- Operation:- Manual and Automatic
- Positioning method:- Time
- Adjustment method:- CPU mimics 'taught' process
- Wrap time:- Maximum of 30 seconds per wrap
- Time to extend:- Up to maximum of 30 seconds for initial extend
- Time for individual retract:- Up to maximum 15 seconds per retract
- Reverse voltage protection:- Yes
- Overcurrent protection:- Fuse in control box. Needs changing to suit actuator. Replace with same value as original fuse. Supplied with 20A blade type car fuse fitted and set of various current fuses.
- Switching devices:- 2 Heavy duty replaceable 'car' relays
- Run light to indicate auto operation or learning process.
- Bale full light to indicate bale is full. Accompanied by rapid beeping until wrapping is started.
- Gate open light to indicate rear gate of baler is open. Accompanied by slow beeping.
- Selectable autostart switch to allow the controller to start wrapping after the bale reaches the full point.
- Selectable CPU power switch to disable CPU in the event of failure. Allows the use of control in manual.
- Case and switches waterproof/ dustproof to allow use on tractors without cabins.
- Case switchable top to bottom to allow connections from top or bottom.

## Maintenance

Other than the possibility of a switch breaking the only other items that might need maintaining are the possibility of a wire vibrating loose on the connectors on the control PCB, on the switches or the 'trailer' plug. The 2 relays (see Fig. 2) have an expected life of 100,000 operations at full load (30Amps). As the actuator will typically draw significantly less than that (probably under 10 amps) the life can be expected to be at least that. As the retract relay does most of the switching (2 to 9 operations per bale) it is expected to fail first. This relay should still give you an expected life of between 10 to 50 thousand bales depending on the actuator current and the number of ties per bale. I would suggest replacing both relays at the same time in the event of failure. The relay/s can be removed by cutting the 'dob' of silicon and wiggling the relay out of the base. The relay/s can be replaced with a similar 12V 5 pin car relay. A 'dob' of silicon should be used to retain the relay/s.

## **Operation (Automatic tying):-**

- 1) Make sure that the learn/normal switch is in the normal position.
- 2) Press the start button. The controller will then take over the tying process.
- 3) The controller will now mirror the process that was last taught to it.

The manual control up/down (extend/retract) can be used if there is a problem whilst wrapping. Using this control will immediately revert control back to manual and cause the buzzer to give a long beep indicating an error.

## **Operation (Automatic tying-autostart):-**

The autostart enable switch (AUTO) is on the control PCB. (See Fig.2 for position) This switch needs to be in the on position to enable autostart. To disable change to the off position.

If the autostart switch has been turned on on the control PCB when the bale full switch has been triggered for 4 seconds (8 rapid beeps) the control will start the same as if start had been pressed.

## **Teaching**

The adjustments should be made with the tractor running. This is because the alternator output of the tractor is rev dependant at low revs and the speed of the electric ram used to move the string is related to the battery voltage. It is also possible that headlights/driving lights/ fog lights may cause a drop in the battery voltage and so it may be necessary to 'teach' the controller again if changing from day to night baling.

- 1) Change learn/ normal switch to learn.
- 2) Press start (The run light will flash to indicate learning)
- 3) Activate extend/ retract switch in the extend direction. Release at far side for initial wrap.(Operating the retract at the first operation will cause an error beep and run light will stop flashing and it will be necessary to go back to step 2).
- 4)Proceed to wrap / retract until bale wrapped. If time limits (see specifications) are exceeded then control will cause an error beep and run light will stop flashing. It will then be necessary to go back to step 2.
- 5)When finished press start to save process. Two short beeps will indicate a successful/valid process. One long beep will indicate a failed process.
- 6)Change learn/ normal back to normal. The control is now ready for automatic operation.

Changing from learn to normal whilst the run led is flashing (ie in learning process), or exceeding 10 switch activations will cause an error beep and stop learning process.

## Wiring-(actuator only)

- 1) Mount the bale tie controller.
- 2) The controller is supplied with a 20 amp fuse. This should be replaced with a fuse of the same rating as the fuse in the previous unit. At least 1 spare fuse should be carried whenever the baler is in use.
- 3) There should be 2 wires connecting the electric actuator on the baler with the existing manual control. These 2 wires need to be connected to pins 1 and 4 of 7 pin plug that has been supplied. (At this stage which way around doesn't matter)
- 4) Now connect the Red and Black leads to the battery, alternator or fuse box. Red to positive and black to negative.

**Do not press the START button at this stage.**

- 5) The manual extend/retract control should now be tried. If there is no movement of the actuator then check the wiring and or fuse. If the actuator does not move at all the battery terminals are possibly around the wrong way.
- 6) The retract position should return the actuator to the string cut off position. The extend position should move the actuator away from the cut off position. If the actuator moves the opposite direction then the two wires to pins 1 and 4 will need to be reversed.

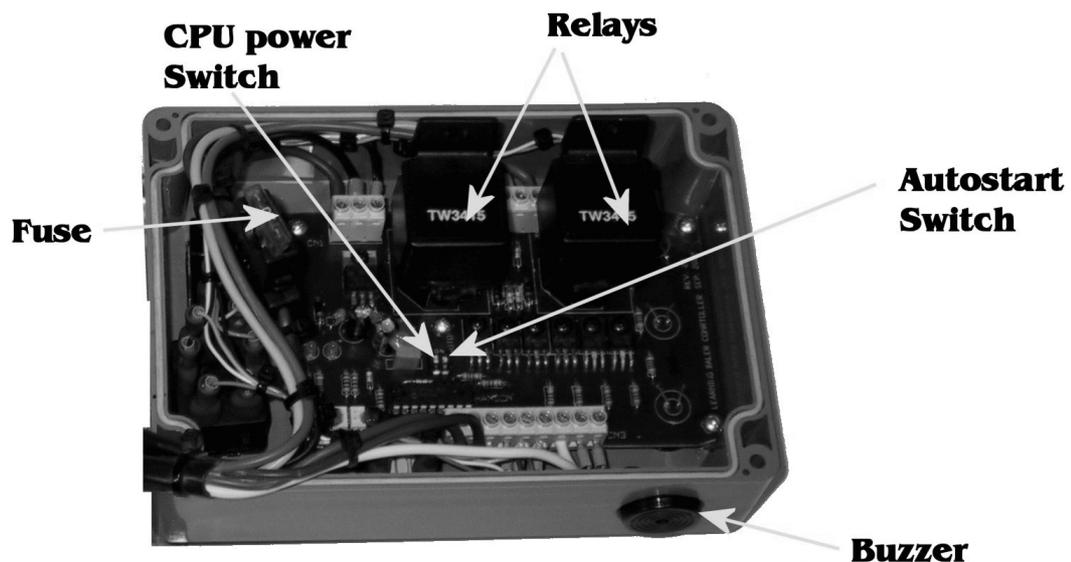
## Wiring-(bale full and door open switches)

The control will operate without the full and/ or door switches connected.

The requirements for the switches are

- 1) the switch for the bale full closes (makes contact) when the bale is full. The switch is wired between pins 3 and 6 of the 7 pin plug. Operation of this switch will cause rapid beeping of the control.
- 2) the switch for the door open closes (makes contact) when the door opens. The switch is wired between pins 3 and 7.

See Fig.3 for wiring diagram.



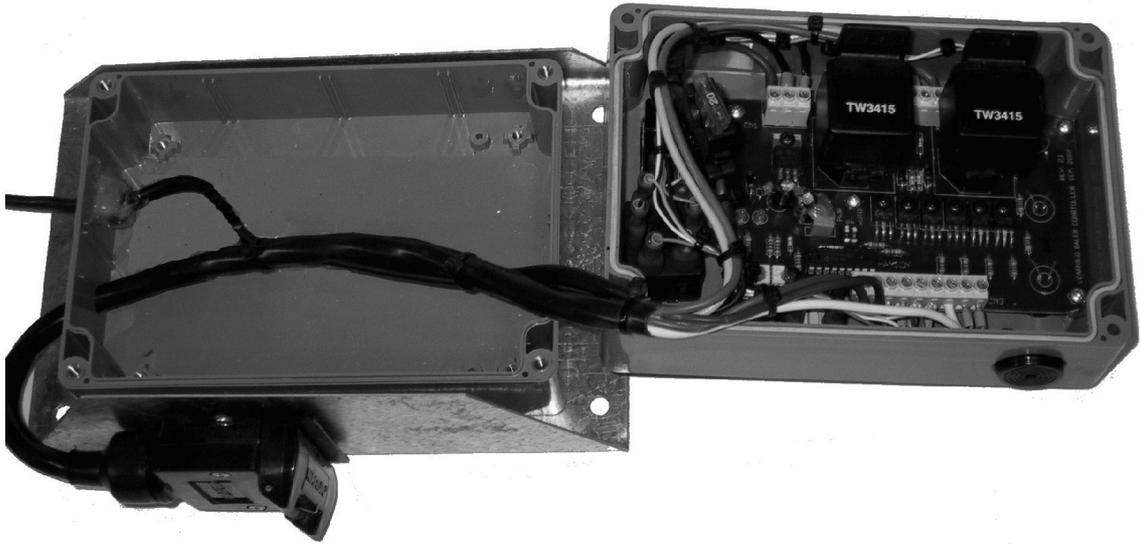
**Fig. 2**

Revision 2.1 Software. Date 6-September-2002

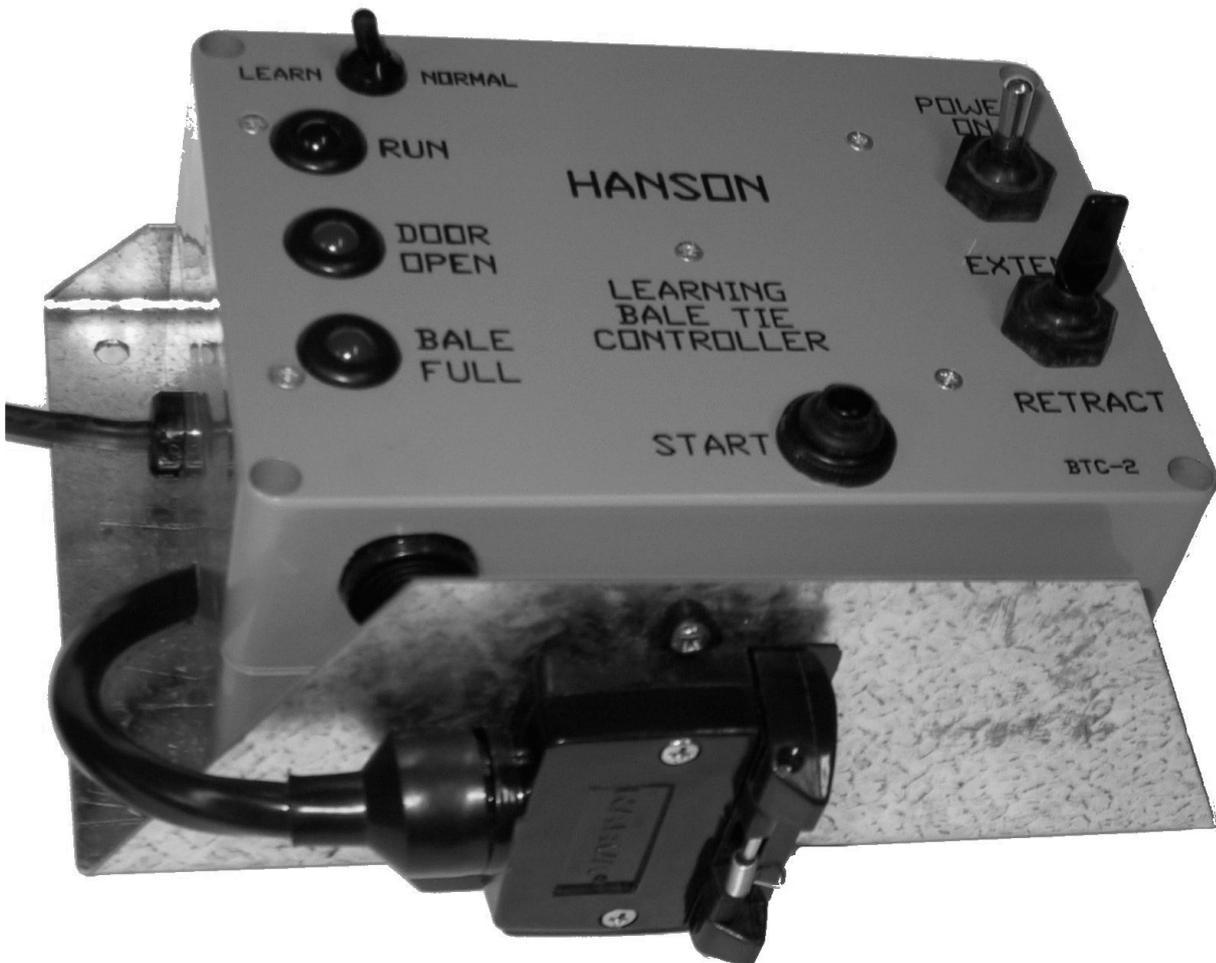


# Faultfinding

<u>Fault</u>	<u>Cure</u>
1. Control will not work on manual	Check power switch turned on Check learn / normal switch not on learn Check fuse, plugs Check for wires off inside control box Check polarity of power wires
2. Control will not work on auto	Check learn / normal switch not on learn Check CPU power switch not turned off. (See fig.2 for location)
3. Control beeps to indicate failure of teaching process	Control requires extend as initial step. Control requires at least 3 steps. Time exceeds maximum for a given step Start wasn't pressed to save process. Too many steps.
4. Tie positions appear to have moved	Positions are dependant on battery voltage. Headlights, faulty alternator, loose wire or faulty battery may be the cause. The position will vary with tractor running/ not running.
5. Control appears to have hung	A) Turn off power for 10 seconds B) If fault continues turn off CPU power (see Fig.2). The control will still operate manually but LED's and buzzer will not work. The control may need repair.
6. The control will no longer retract but will extend (or possibly but less likely extend but not retract)	Most likely relay failure but possibly switch failure. (This should not occur for at least 10000 bales).



**Fig. 4** Control with lid open



**Fig 5.** Control from below showing 'trailer' plug

## **Warranty**

This bale tie controller is covered by a warranty for a period of 12 months from the time of purchase.

The warranty covers only faulty material and workmanship if properly setup and operated in accordance with the specifications and setup sections of this document.

The repair and or replacement of this controller will only be at the workshop of Alan Hanson. The cost of freight to/from will be born by the user.

The warranty does not cover damage due to misuse i.e.. cables broken by PTO shafts,switch actuators broken etc..

Alan Hanson shall not be liable for any incidental damage, inconvenience, rental, loss of profits or any other commercial loss due to the unsuitability, failure or use of this controller.

If the user does not agree to these terms the cost of the product (minus freight) will be refunded on the return of the product. The controller must be in unused condition and must be returned within 14 days.

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