

# SR5 MechTool Manual



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## 1. Diary of changes

Issue 1.0.....	1 <sup>st</sup> March 2001
Issue 1.1.....	11 <sup>th</sup> March 2002
➤ Applied TMWP v3.0	
Issue 1.2.....	6th Sept 2002
➤ Modification to disclaimer.	
Issue 2.0.....	25 <sup>th</sup> September 2002
➤ Note added to section <a href="#">10 Window Tuning</a>	
Issue 2.1.....	30 <sup>th</sup> June 2004
➤ Change footer	
Issue 2.2.....	10 <sup>th</sup> February 2005
➤ Added "Return to orig pos" in Sections <a href="#">6</a> & <a href="#">7</a> .	

## 2. Introduction

The SR5 now incorporates an advanced programming feature named “**MechTool™**”, which uses the program button, diagnostic pins and the rotary switch. The LED is used to guide the user through the operations. It is assumed the SR5 is powered-up in parallel mode and all the relevant internal Eeprom settings are set appropriately to perform the functions listed.

**Note: MechTool™ ON, must be specified when ordering, otherwise the following features will NOT be available.**

### 2.1 Diagnostics

This feature enables certain self checks / tests to be made on the SR5, these include:-

### 2.2 Inhibit / Accept line and Inductive Noise Test

This mode can be used to check the inhibit and accept lines are working correctly. It will also indicate the level of environmental noise detected by the sensors.

### 2.3 Solenoid and Inductive Sensor Flash Test

This mode checks the operation of the solenoids used in the SR5 and the status of the sensor coils – whether they are functioning or not.

### 2.4 Opto Test

This mode checks the status of the opto's used in the SR5 and the dual coin entry rundown.

### 2.5 MechTool™

**MechTool™** has been added to the SR5 to enable the customer to change various features and options, within the product, without the use of an external programmer. While this is a powerful and useful feature, if used without caution, changes can be made which may affect the operation of the SR5.

**USE WITH CARE.**

### 3. MechTool™ Controls

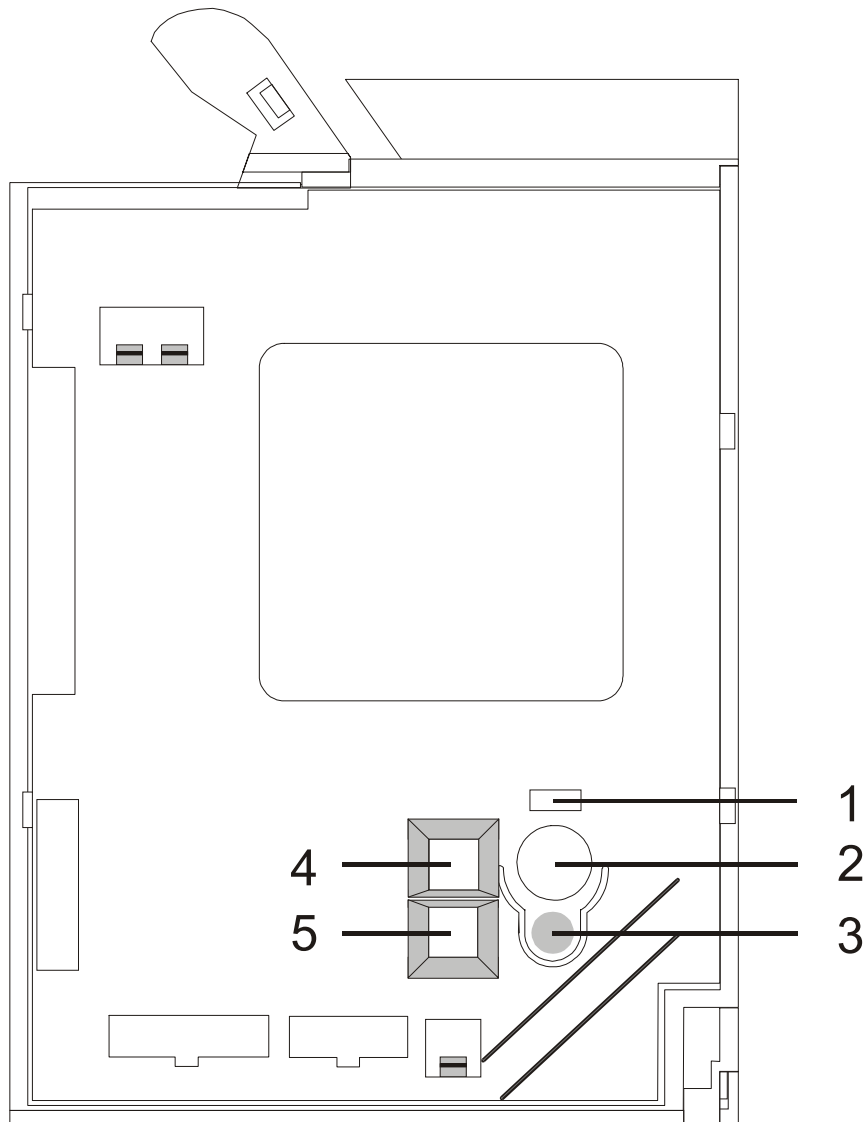


Figure 1: SR5 Connector Side

Table 1: SR5 MechTool™ Controls.

1	LED Indicator
2	Rotary Switch
3	Program button
4	Diagnostic connectors
5	Bank Select switches

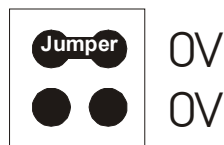
## 4. Diagnostics

Three diagnostics modes are available via connector 4 (Figure 1). The connector has two inputs. If either or both inputs are Low then diagnostics mode can be activated. When both inputs are High – not connected - (inactive) the SR5 is in normal run mode.

To enter diagnostics mode, set the jumpers to perform the required test, set the rotary switch to position 0, then press the program button 3 (Figure 1) until the LED flashes Yellow.

**Note: If the LED stays Green then Diagnostics is not available.**

### 4.1 Inhibit / Accept line and Inductive Noise Test



This mode is used for checking inhibit and accept lines in a loop-back test. Only the status of inhibit lines 1 to 6 are used.

The inhibit line must be Low to activate the corresponding accept line.

Inhibit 1	⇒	Accept 1
Inhibit 2	⇒	Accept 2
Inhibit 3	⇒	Accept 3
Inhibit 4	⇒	Accept 4
Inhibit 5	⇒	Accept 5
Inhibit 6	⇒	Accept 6
Inhibit 7 and 8	⇒	Not used

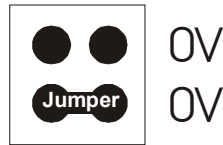
The SR5 will also 'clap' the accept gate a number of times, depending on the level of noise present on the sensors. The more 'claps', the more noise.

- 0 claps      No detectable noise.
- 1 to 5 claps    Small amount of noise – acceptable.
- > 5 claps      Unacceptable amount of noise.

This only happens when the diagnostics mode is first entered. In order to repeat, press the program button, the LED will turn green. Press the program button again until the LED flashes yellow.

To exit the diagnostic tests, remove the links and press the program button until the LED turns Green.

## 4.2 Solenoid and Inductive Sensor Flash Test



### 4.21 SOLENOID TEST

This mode is used for checking the operation of the solenoid drives.

The inhibit line must be Low to activate the corresponding solenoid.

Inhibit 1	⇒	Sorter solenoid 1, Bottom flap
Inhibit 2	⇒	Sorter solenoid 2, Top flap
Inhibit 3	⇒	Manifold solenoid
Inhibit 4	⇒	Accept gate solenoid
Inhibit 5 to 8	⇒	Not used

If there is no sorter fitted then inhibits 1 and 2 will be inactive. Likewise, if the active manifold is not fitted for 8-way sorting, then inhibit 3 will be inactive.

### 4.22 INDUCTIVE SENSOR FLASH TEST

The SR5 will also show the status of the inductive coils on the accept lines.

An inactive accept line indicates there is a fault.

Accept 1	⇒	Inductive sensor 1 status (Active = OK)
Accept 2	⇒	Inductive sensor 2 status
Accept 3	⇒	Inductive sensor 3 status
Accept 4	⇒	Inductive sensor 4 status
Accept 5	⇒	Inductive sensor 5 status
Accept 6	⇒	On

To exit the diagnostic tests, remove the links and press the program button until the LED turns Green.

### 4.3 Opto Test



This mode is used for checking whether the various opto electronic devices used in the product are working correctly.

ON = opto blocked or not fitted.

Accept 1	⇒	DCE coin opto
Accept 2	⇒	DCE token opto
Accept 3	⇒	Sorter optos
Accept 4	⇒	Off
Accept 5	⇒	Off
Accept 6	⇒	Off

The test is interactive, so the optos can be blocked and unblocked with a small piece of card to see if they are working correctly.

The only way to distinguish between a blocked opto – fault – and a missing opto is to physically look for the optic.

**Note: These tests are only useful if the relevant hardware is fitted, i.e. DCE chute and sorter.**

### 4.4 Exit Diagnostics

To exit the diagnostic tests, remove the links and press the program button until the LED turns Green.



## 5. Token Selection.

The rotary switch and the program button allow the user to disable tokens or select another programmed token.

To select the token, ensure that the SR5 is powered up through the main parallel connector.

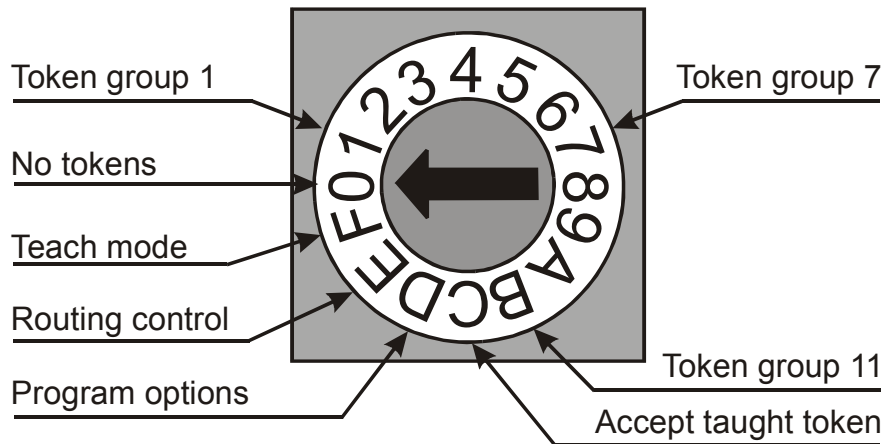


Figure 2: Rotary switch features

### 5.1 Token Disable - Position 0.

In this position, token acceptance is disabled.

To use:

- Turn the rotary switch to position 0.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change back to GREEN.

**Note: The program button must be released when the LED changes colour to RED, otherwise the SR5 will enter MechTool™ mode if the program button is pressed for more than 2 seconds.**

### 5.2 Token Selection - Position 1 to C

11 tokens can be pre-programmed into the SR5 and selected on the rotary switch. Token 12, (position C), is reserved for the **Teach & Run™** token.

To use:

- Turn the rotary switch to the desired token position, 1 to C.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change back to GREEN.

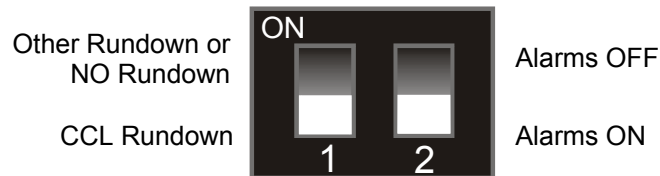
## 6. Mode Control - Position D

For Alarm details see the “[SR5 Technical Manual](#)”.

To set the mode, ensure that the SR5 is powered up through the main parallel connector.

### To use:

- Make a note of the rotary switch position and the bank select switch positions.
- Turn the rotary switch to position D.
- Set the bank select switches to the desired operating mode.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change back to GREEN.
- Set the rotary switch and bank select switches to their original positions.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change back to GREEN.



**Note: If the LED stays Green then mode control “D” is not available.**

Return the rotary switch and the Bank Select switches to their original positions. Press the program button, the LED will change to Red, release the program button; the LED will change back to Green.

**NEVER leave the validator with the rotary switch in positions D, E or F.**

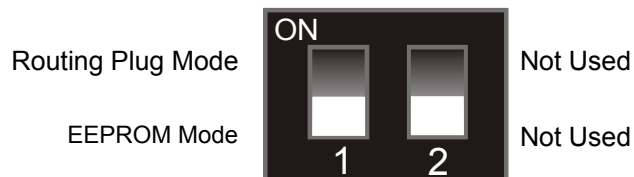
## 7. Routing Control - Position E

The SR5 allows you to change between EEPROM mode, (factory programmed sorting configurations) and routing plug mode.

To set the routing, ensure that the SR5 is powered up through the main parallel connector.

To use:

- Make a note of the rotary switch position and the bank select switch positions.
- Turn the rotary switch to position E.
- Set bank select switch 1 to the desired routing mode.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change back to GREEN.
- Set the rotary switch and bank select switches to their original positions.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change back to GREEN.



**Note: If the LED stays Green then Routing Control "E" is not available.**

Return the rotary switch and the Bank Select switches to their original positions. Press the program button, the LED will change to Red, release the program button; the LED will change back to Green.

**NEVER leave the validator with the rotary switch in positions D, E or F.**

## 8. Teach and Run™ Token 12 - Position F

Position F allows a token, which is not currently in one of the pre-programmed groups, to be programmed on site.

To **Teach and Run™** token 12, ensure that the SR5 is powered up through the main parallel connector.

### To use:

- Turn the rotary switch to position F.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change to YELLOW/RED.
- Insert several of the coin type to be programmed, typically eight coins, until the LED flashes GREEN.
- Press and hold the program button, the LED will stop flashing.
- Turn the rotary switch to position C.
- Press and hold the program button, the LED will change to RED.
- Release the program button.
- The LED will change back to GREEN.

**Note: If the LED stays Green then Teach and Run™ Token 12 is not available.**

If an error occurs during programming then the LED will change to Red. Press the program button, the LED will change to Green. The token that was previously programmed will still accept.

To stop programming before the LED changes to flashing Green, remove and then re-apply power to the SR5.

The token that was previously taught will still accept.

**NEVER leave the validator with the rotary switch in positions D, E or F.**

### 8.1 Teach and Run™ Coins

The SR5 allows the teaching of all 16 coin positions.

For details please see Flow Chart 1: Teach Coin Mode.

## 9. MechTool™ Mode

The LED is used to show at which stage the user is when the SR5 is in **MechTool™** mode. The colours are used as follows:

- LED green : SR5 normal operation - OK
- LED flashing yellow : **MechTool™** mode selected – first level
- LED flashing yellow-green : second level of **MechTool™** mode
- LED flashing yellow-red : third level of **MechTool™** mode
- LED flashing green : fourth level of **MechTool™** mode

### 9.1 MechTool™ ENTRY

This mode is selected by setting the rotary switch to position 0 and then pressing the program button for minimum of 2 seconds. The LED changes colour from Green to Red and then to flashing Yellow.

If the LED stays Red and then changes back to Green when released, or the LED remains Green, then **MechTool™** has not been enabled and the following functions are not available. The following functions can be selected; flow charts are also attached.

The numbers (below) represent the rotary switch positions.

0. **MechTool™** mode enter/exit.
1. Teach coin mode (after entering this mode, select the window number).
2. Window tweaks mode (after entering this mode, select the window number then select the tweak value).
3. Test credit.
4. Test alarm.
5. Test gate.
6. Flag change mode (after entering this mode the following flags can be changed):
  - i. Teach off.
  - ii. Teach on.
  - iii. Alarm off.
  - iv. Alarm on.
  - v. Diagnostic off.
  - vi. Diagnostic on.
  - vii. Individual window tweaks disabled.
  - viii. Individual window tweaks enabled.
  - ix. Secure tuning disabled.
  - x. Secure tuning enabled.
7. Reset all individual coin tweaks to zero.
8. Erase all windows (the program button has to be pressed twice within 1 second to erase windows).

### 9.2 MechTool™ EXIT

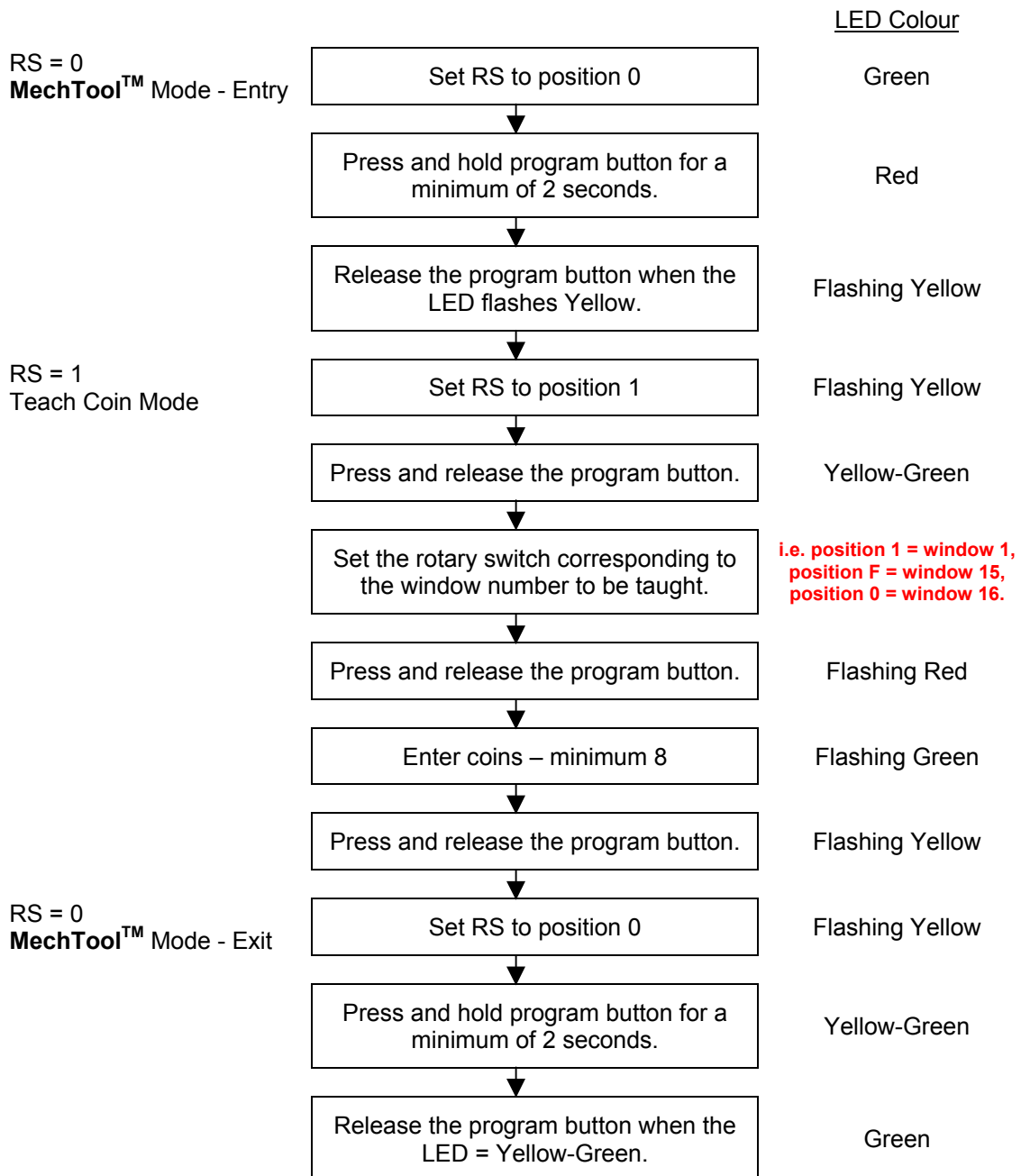
To exit the **MechTool™** mode, set the rotary switch to position 0 and then press the program button for minimum of 2 seconds, the LED changes colour from flashing Yellow to flashing Green-Yellow.

Releasing the program button changes the LED colour to Green.

If this is not done then the SR5 will time-out and assume normal operation.

## Flow Chart 1: Teach Coin Mode

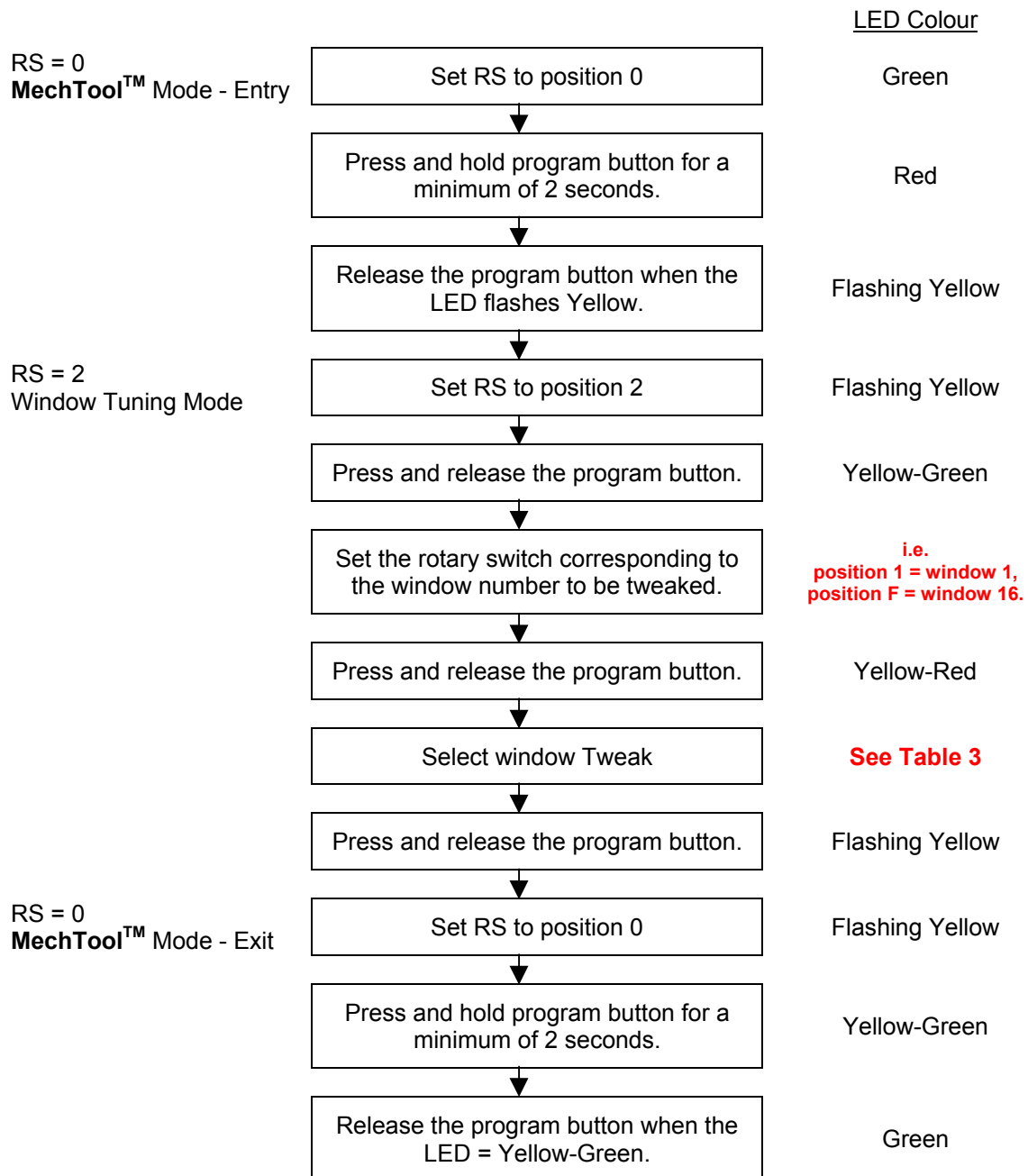
RS = Rotary Switch Position



If an error occurs during teach then the LED colour changes to red (instead of flashing green) and remains red until the program button is pressed.

## Flow Chart 2: Window Tuning Mode

RS = Rotary Switch Position



This programs the window tweaks into EEPROM.

See Note in section [10 Window Tuning](#)

## 10. Window Tuning

The window offset applies to both the upper and lower window limits, e.g. if window offset = 1, window is narrowed by 2 counts i.e. the upper window limit is reduced by 1, and the lower window limit is increased by 1.

The rotary switch allows the following security window tweaks to be programmed.

**Note:- It is still possible to access this function using MechTool™ and tweak the coin windows even though Window Tweaks may have been disabled. The tweak information is saved in the EEPROM memory and only comes into effect when the coin tweak flag is enabled using MechTool™. [Flow Chart 6: Flag Change Mode or ccProgrammer.](#)**

### 10.1 Window adjustment table

Two flags in EEPROM control the tuning as shown in the table below.

Individual Tuning	Secure Tuning	SR5 Functional Operation
OFF*	OFF*	No coin window modification is possible.
OFF	ON	No coin window modification is possible.
ON	OFF	Individual window tweaks possible.
ON	ON	Individual window tweaks possible, tweaks can only narrow programmed window.

\* Indicates factory default settings.

*Table 2: Window Adjustment Table*

The above can be set or cleared using **MechTool™** to change the flag settings, see [Flow Chart 6: Flag Change Mode](#), Flags 6, 7, 8 and 9.



## **Caution must be observed when using this function.**

Window narrowing should be used when trying to reject a fraud coin.  
Incorrect use can result in 0% acceptance of true coins.

Window widening is used to increase true coin acceptance.  
Incorrect use could see the acceptance of fraud coins.

**NOTE: Money Controls program the SR5 to optimum coin acceptance at the factory. Should true coin acceptance start to decline, this would indicate a fault and we DO NOT recommend window widening as a 'fix'.**

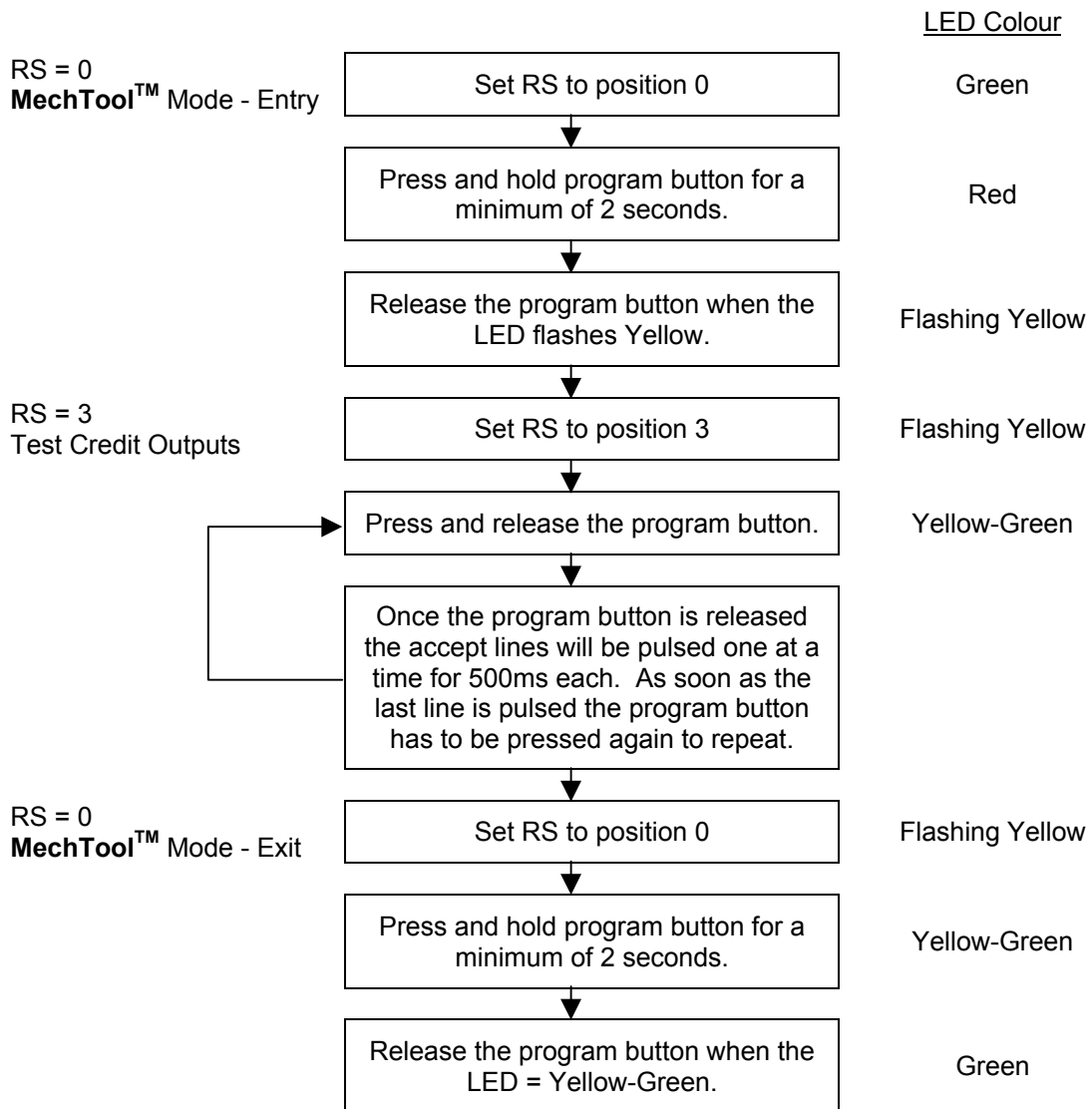
Rotary Switch setting	Window offset applied	Change in window width
0	0 <sup>§</sup>	Windows not modified
1	1 <sup>§</sup>	Narrowed by 2 counts
2	2 <sup>§</sup>	Narrowed by 4 counts
3	3 <sup>§</sup>	Narrowed by 6 counts
4	4	Narrowed by 8 counts
5	5	Narrowed by 10 counts
6	6	Narrowed by 12 counts
7	7	Narrowed by 14 counts
8	Not used	
9	7	widened by 14 counts
A	6	widened by 12 counts
B	5	widened by 10 counts
C	4	widened by 8 counts
D	3	widened by 6 counts
E	2	widened by 4 counts
F	1	widened by 2 counts

<sup>§</sup> Recommended window adjustments.

*Table 3: Rotary Switch to Window Tuning Values*

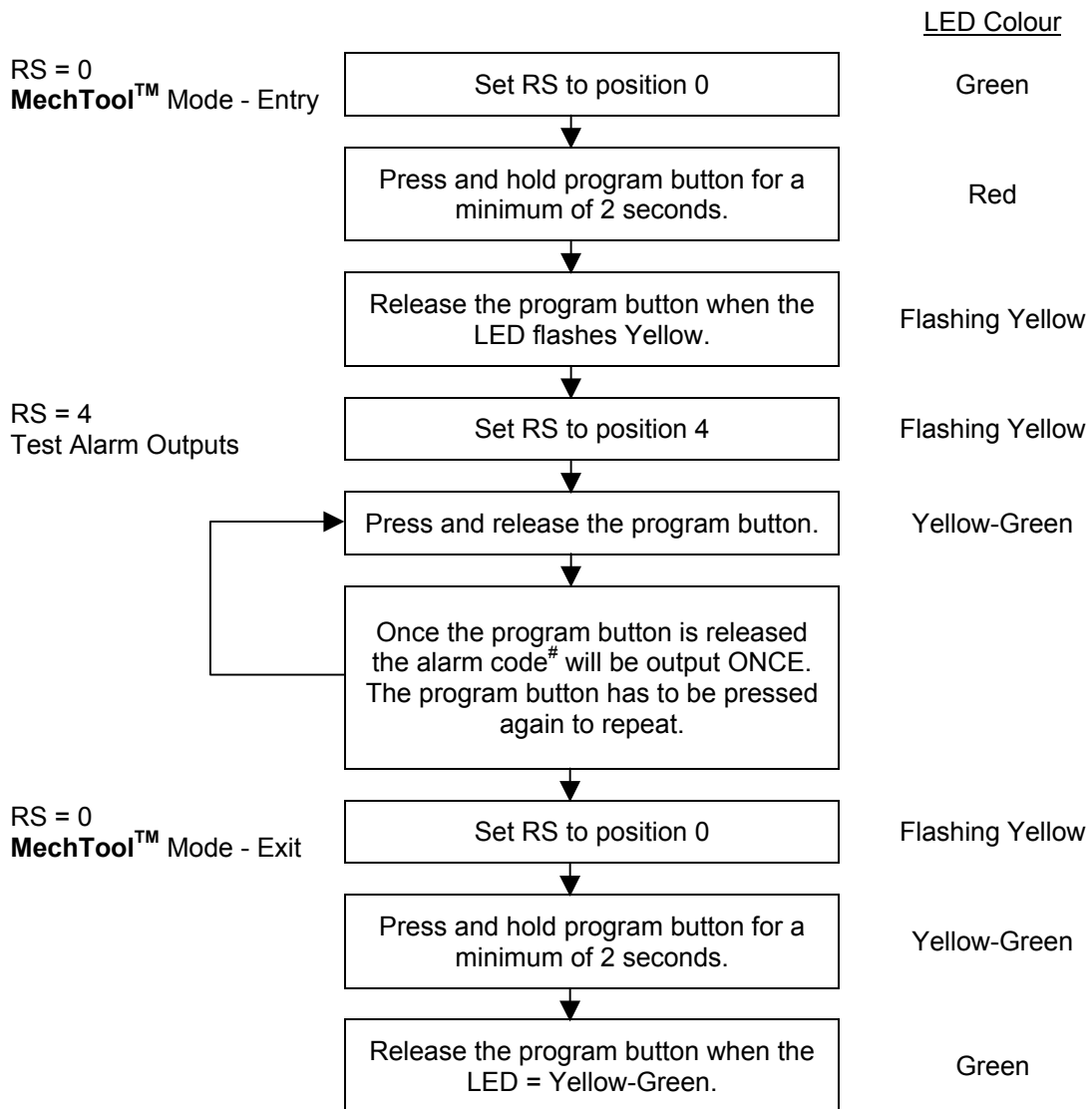
### **Flow Chart 3: Test Credit Outputs**

RS = Rotary Switch Position



## Flow Chart 4: Test Alarm Outputs

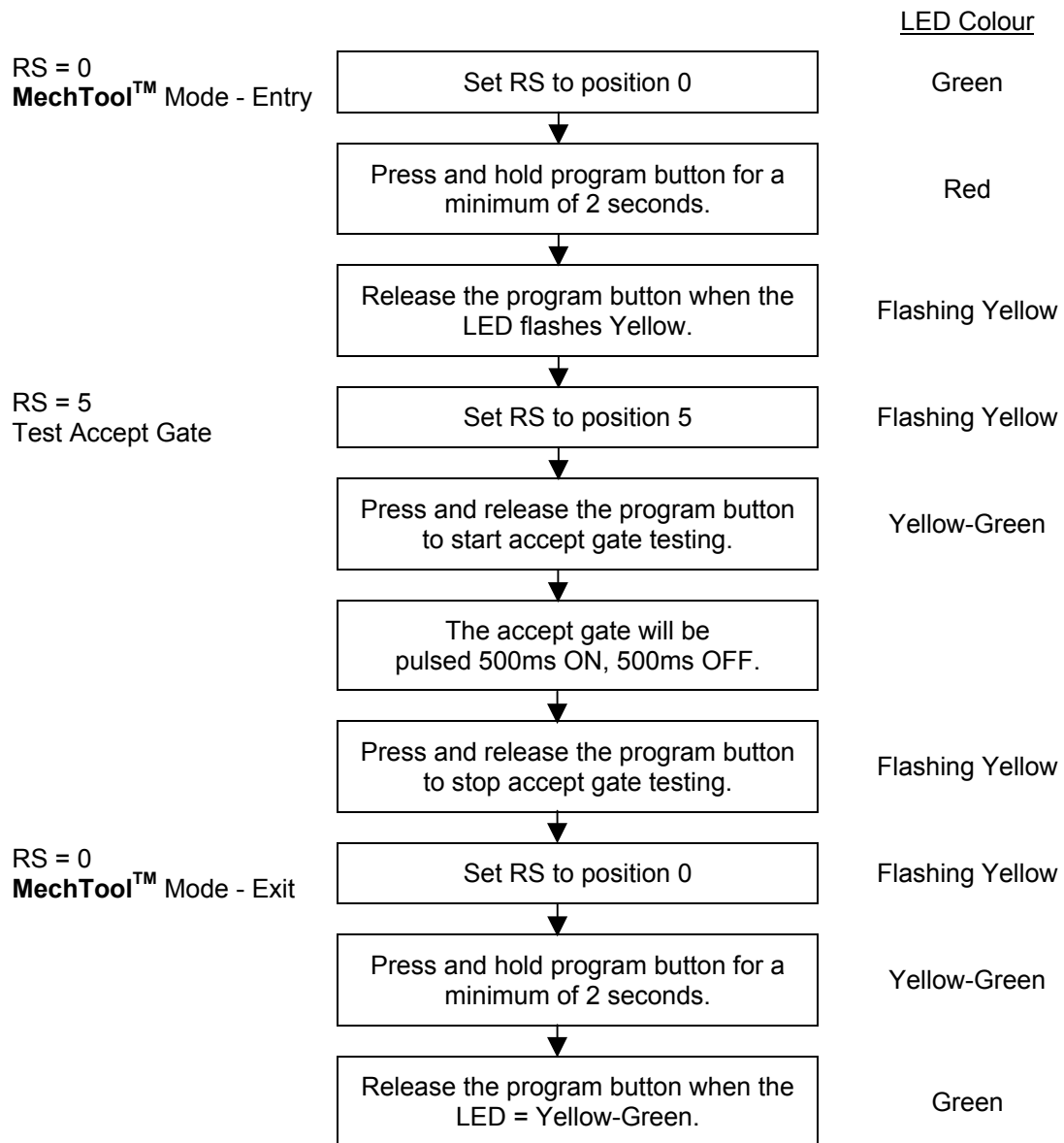
RS = Rotary Switch Position



<sup>#</sup> Alarm code = 110111 (A6 to A1).

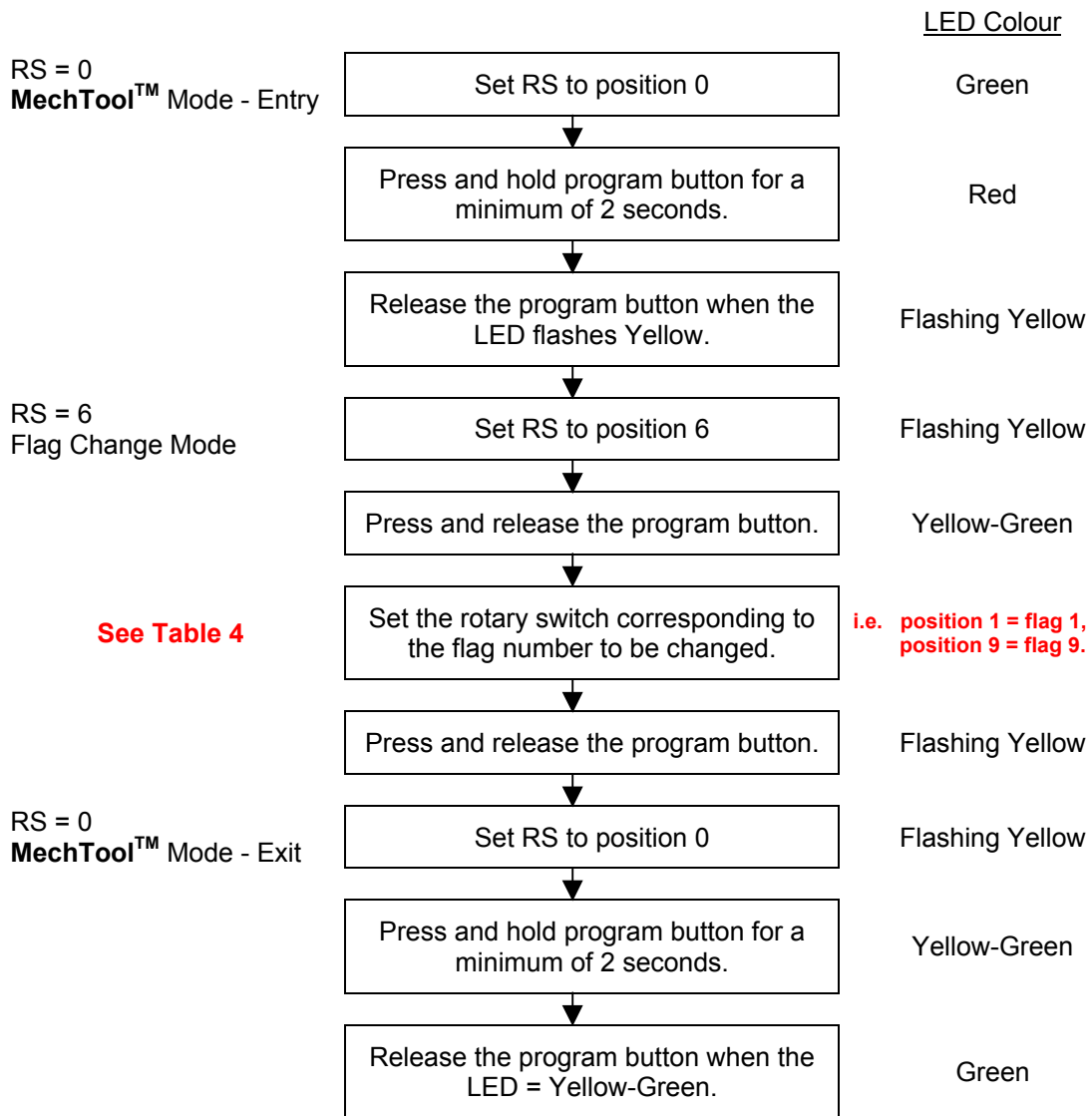
## **Flow Chart 5: Test Accept Gate**

RS = Rotary Switch Position



## Flow Chart 6: Flag Change Mode

RS = Rotary Switch Position



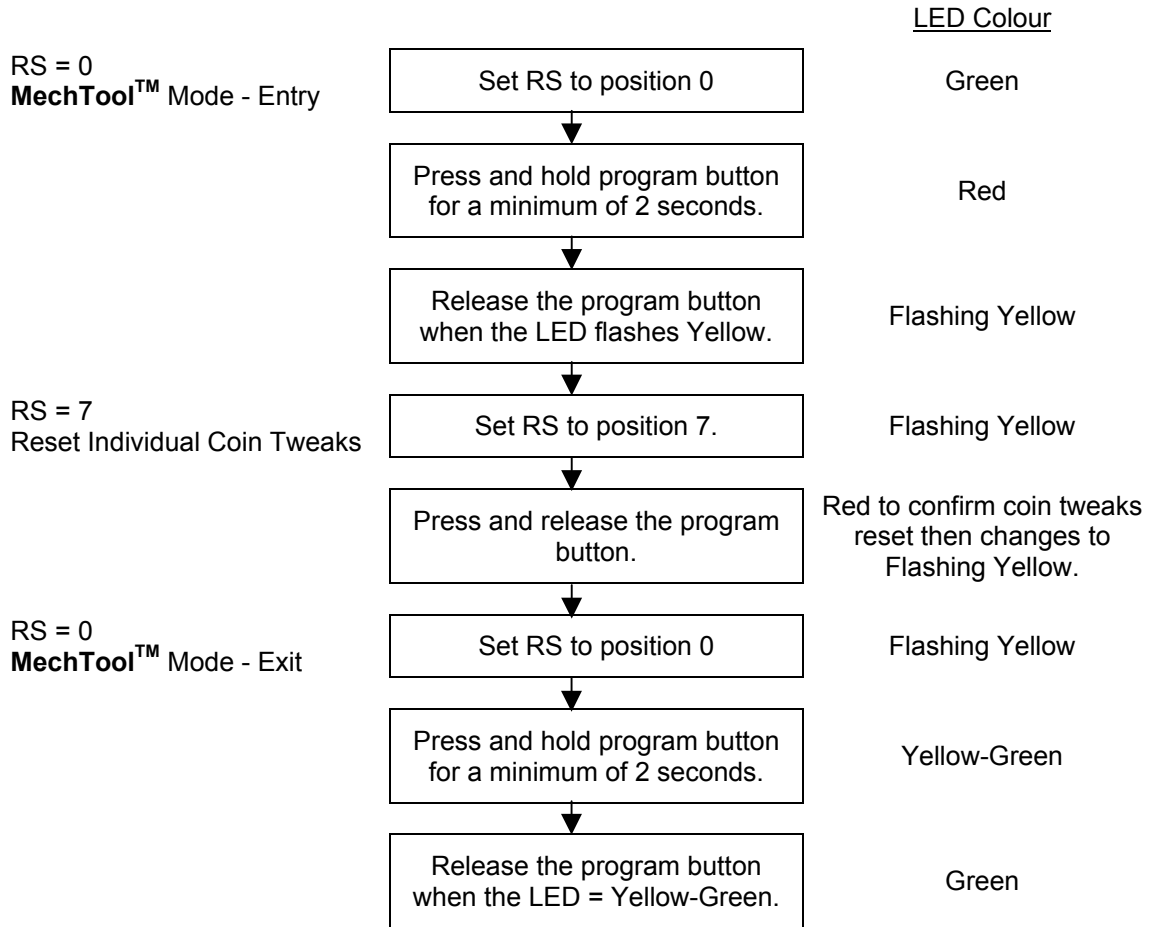
This programs the selected flag change to EEPROM.

*Table 4: Eeprom flags v Rotary switch position*

Rotary switch position.	Flag function.	Rotary switch position.	Flag function.
0	Teach off.	5	Diagnostic on.
1	Teach on.	6	Individual window tweaks disabled.
2	Alarm off.	7	Individual window tweaks enabled.
3	Alarm on.	8	Secure tuning disabled.
4	Diagnostic off.	9	Secure tuning enabled.

## **Flow Chart 7: Reset Individual Coin Tweaks**

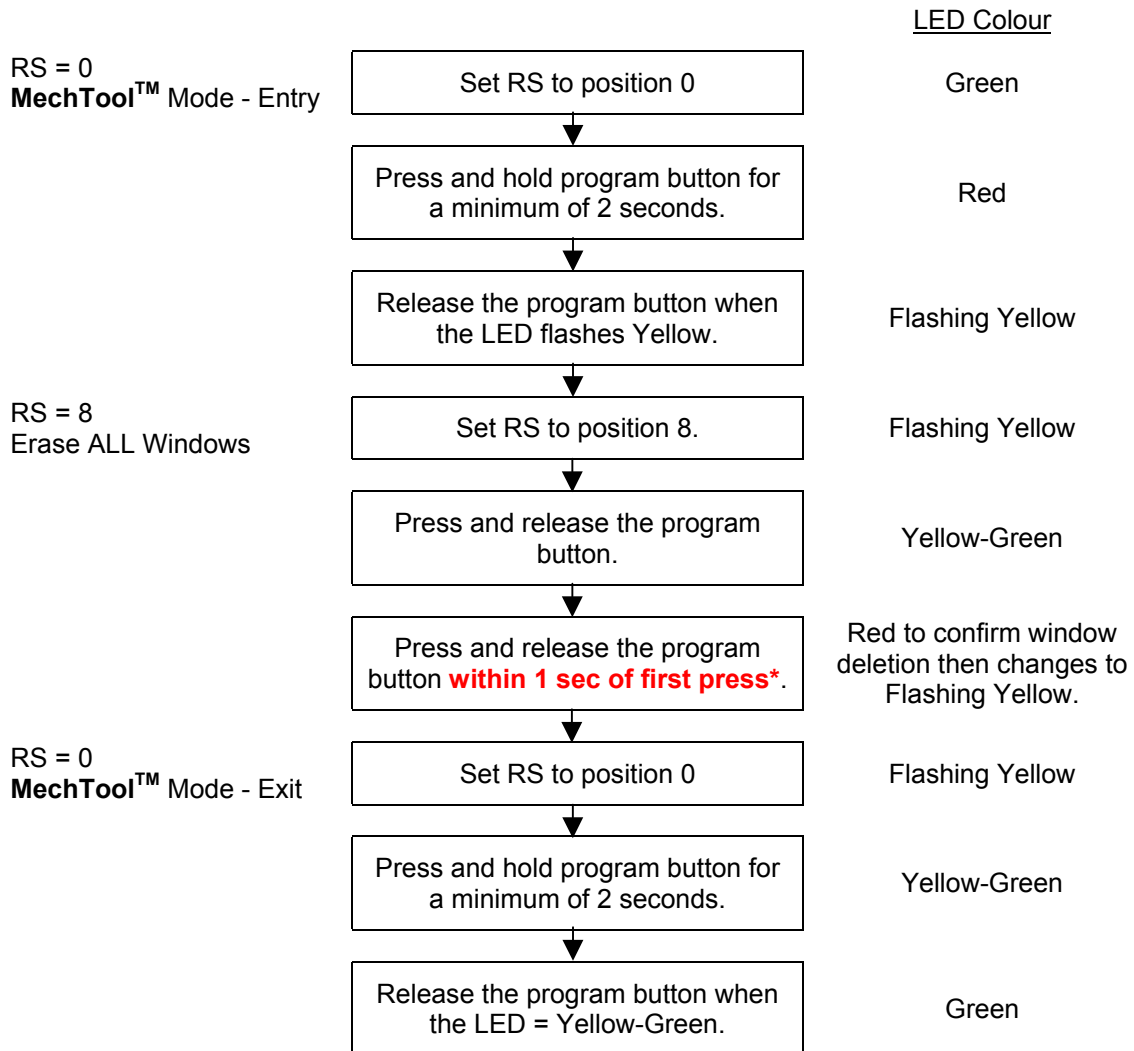
RS = Rotary Switch Position



This clears the tweaks in EEPROM for ALL coin windows.

## Flow Chart 8: Erase ALL Windows

RS = Rotary Switch Position



\* Keep pressing twice – until the LED changes to RED = Windows Erased.

This clears ALL the windows in EEPROM, including window tweaks.

As a safeguard with this function, the program button must be pushed twice within 1 second to ensure erasure of the coin windows.

Failure to do so will leave the coin windows intact.

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