

## CHAPTER 4 DIAGNOSTICS

### INTRODUCTION

The diagnostic function is an aid to the user to allow access and control of motors and modules. It allows the user to control the sequence of the machine so that a particular module can be exercised.

Specific operations are selected using the control panel function keys.

**NOTE**

*Refer to the Printer Diagnostics Menu section of this chapter for a navigational guide of diagnostics menus, including a step by step flow chart.*

The following list briefly details the available functions when using the diagnostics mode:

Diagnostic Function	Description
Display Languages	The control panel can be selected to display one of the following languages:
	English (default setting)
	Francais (French)
	Deutsch (German)
Display Units	The control panel can be selected to display one of the following units of measurement:
	Metric (default setting)
	Imperial
Menu Protection	The user can select whether to protect menus from inadvertent alteration.
View Digital Inputs	The user can inspect the present state of a sensor input to check whether it is in an 'On' or 'Off' signal condition.
View Output Tests	As an aid to fault diagnosis, machine mechanisms may be selected for independent operation.
Carriage Speed Calibration	Automatically calibrates the print carriage speed.

## PRINTER DIAGNOSTICS MENU

The following section details the procedures for navigating through the Diagnostics Menu of the control panel, (a flow chart is provided as an aid for navigation). A full description of each diagnostic function is provided in the Diagnostic Functions section of this chapter.

The features of the diagnostics menu are as follows:

**Selection**

To select the diagnostic mode on the machine, carry out the following:

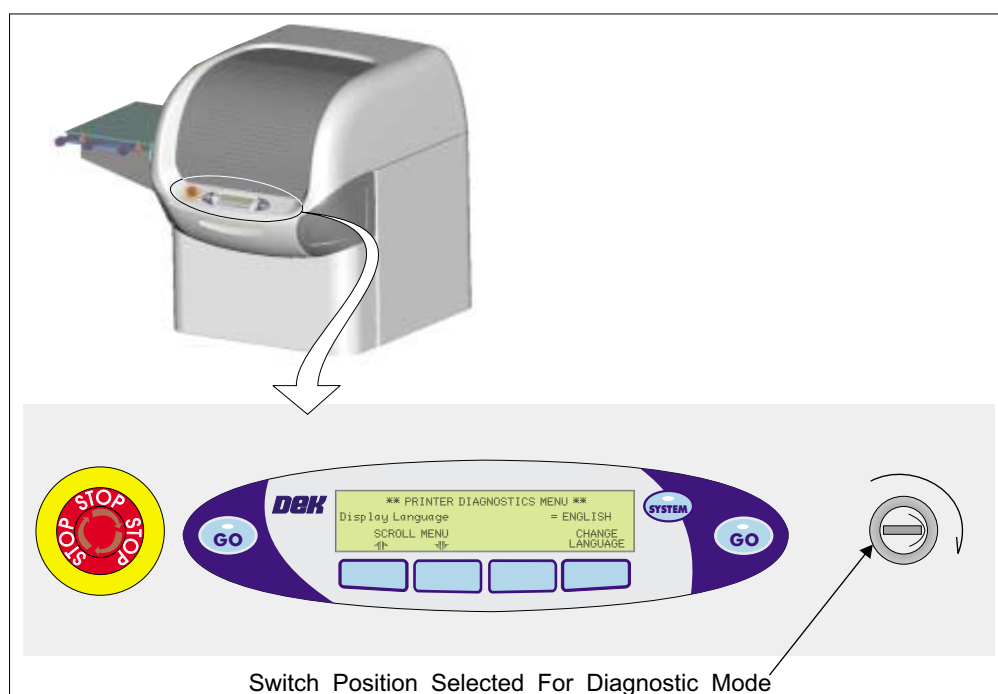
1. At the front operator panel, with the machine key inserted, turn the 3 position keyswitch to the three o'clock position (Diagnostic mode position 3), Selecting Diagnostic Mode figure below refers.
2. The control panel displays '\*\* PRINTER DIAGNOSTICS MENU \*\*'.

```

** PRINTER DIAGNOSTICS MENU **
Display Language           = ENGLISH
SCROLL MENU               CHANGE
  ⬅️ ➡️                     LANGUAGE
  
```

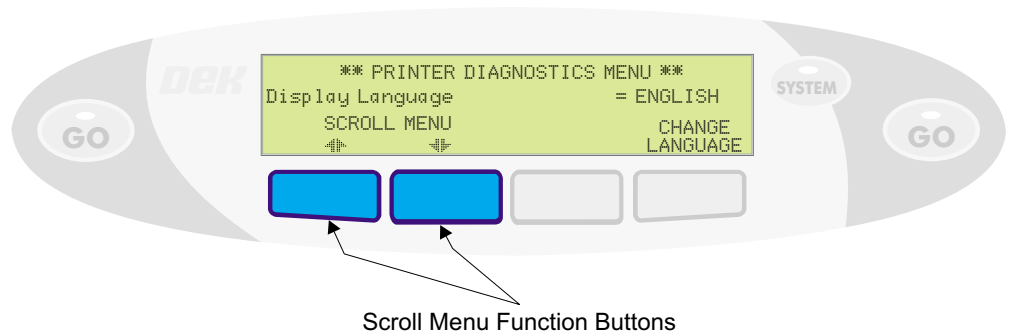
3. Using the 'Scroll Menu' up/down arrow function buttons, the required diagnostic mode can be selected. (Refer to the Diagnostics Menu Sheet Flow Chart - Sheet 1 to 5.)
4. To leave the diagnostics mode, select the switch position 1 or 2 according to the required GO key mode. The menu page reverts to Step Mode with the key selected for normal operating mode.

Key Switch Position	Machine Mode	Reason
Position 1	Two GO button operation	Normal machine operating mode
Position 2	One GO button operation	One hand free operation
Position 3	Diagnostics	Modular control



### Menu Pages

Menu pages are offered in sequence and can be accessed by scrolling through to the required page.



### Output Tests

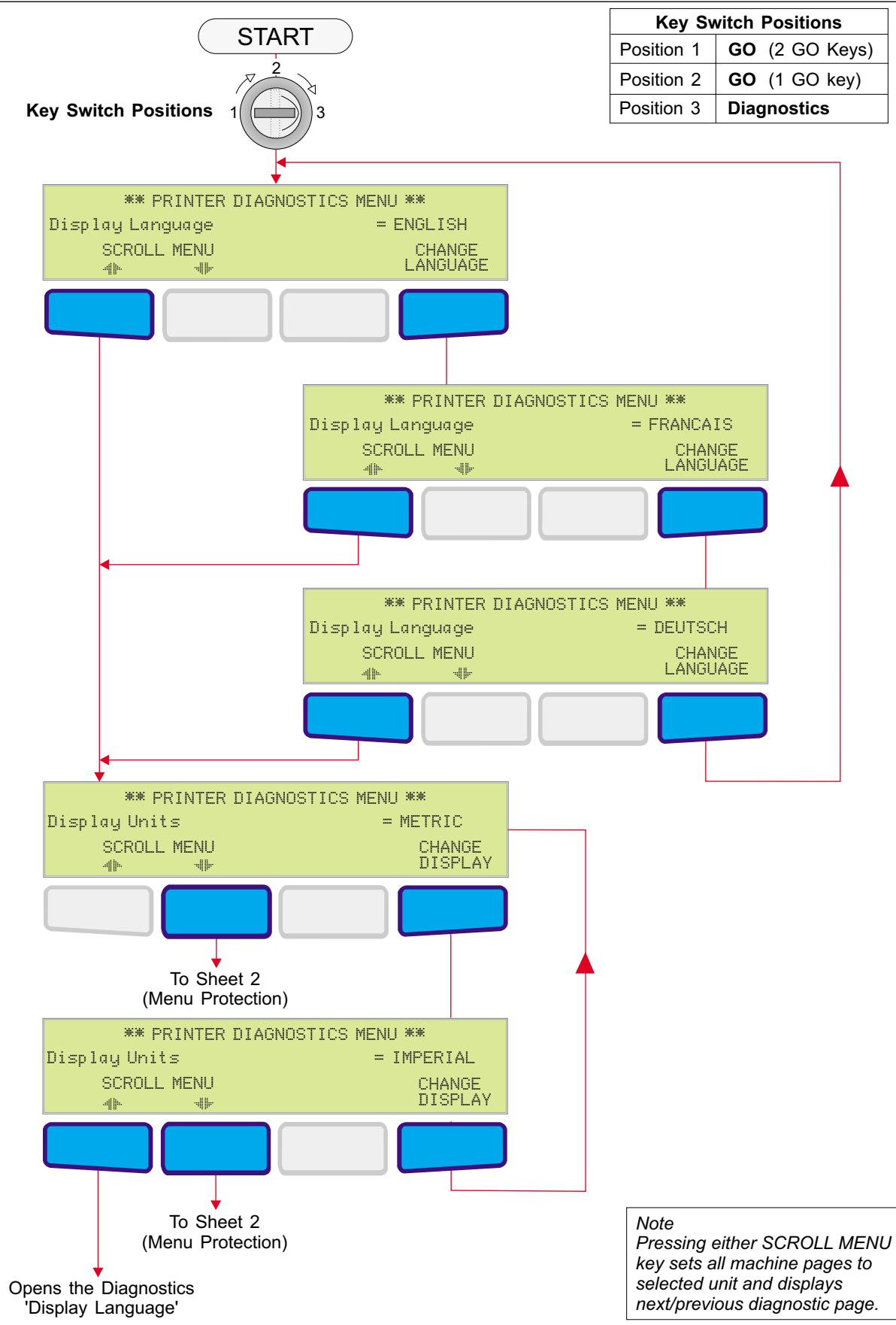
In general, when a 'View Output' function test is selected, the action is performed on pressing the GO button/buttons. However tests No.7 and 8 (listed below), pressing the GO button/buttons toggles between ON and OFF.

- 7 Toggle Table Clamps
- 8 Toggle Table Vacuum

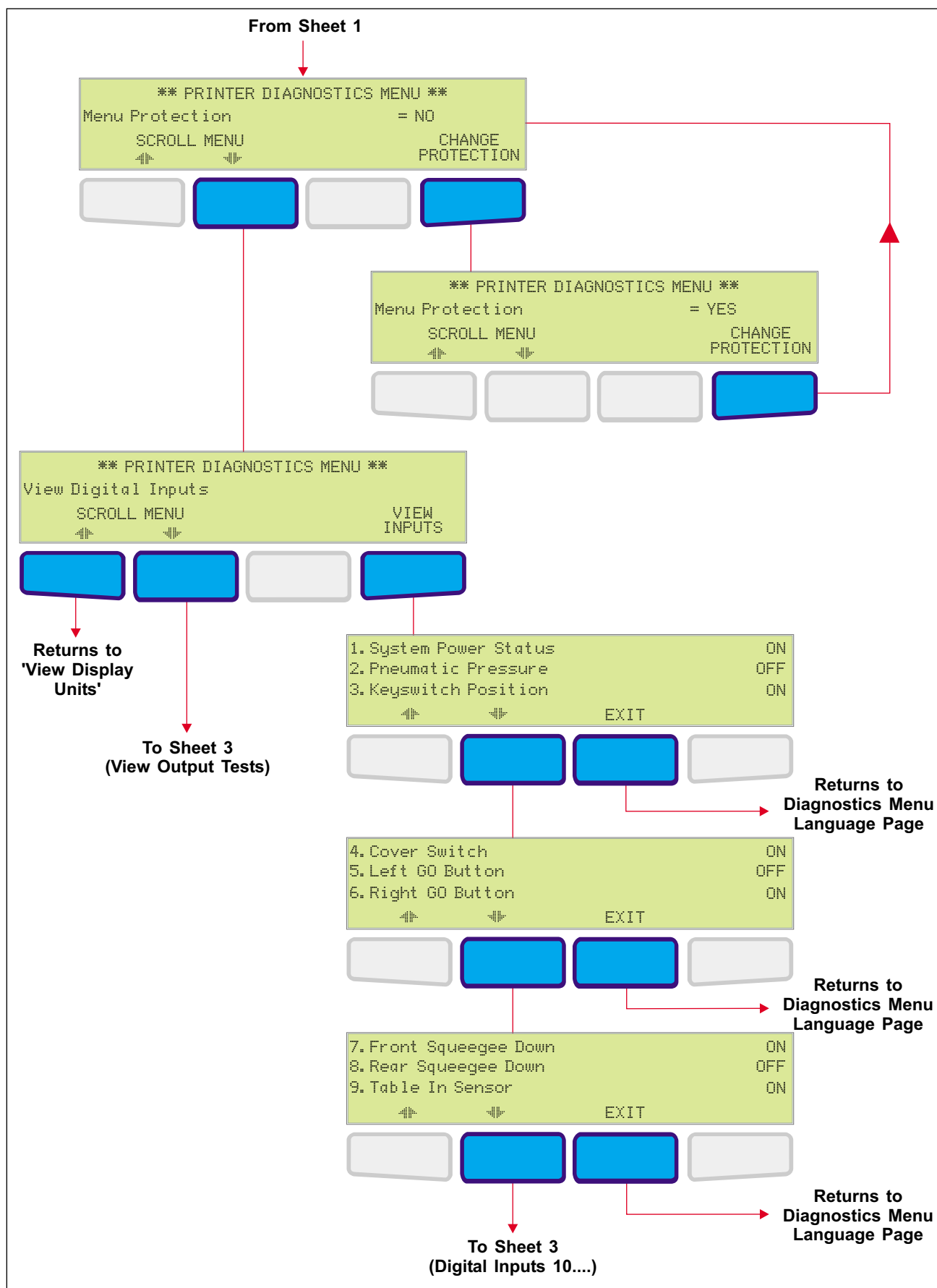
Pressing the '**Stop**' function key stops the test in progress.

Pressing the '**Exit**' function button returns the menu to the diagnostics page.

The following Menu Sheets are presented in the form of flow charts for easy reference.



**Figure 4-1 Diagnostics Flow Chart - Sheet 1**



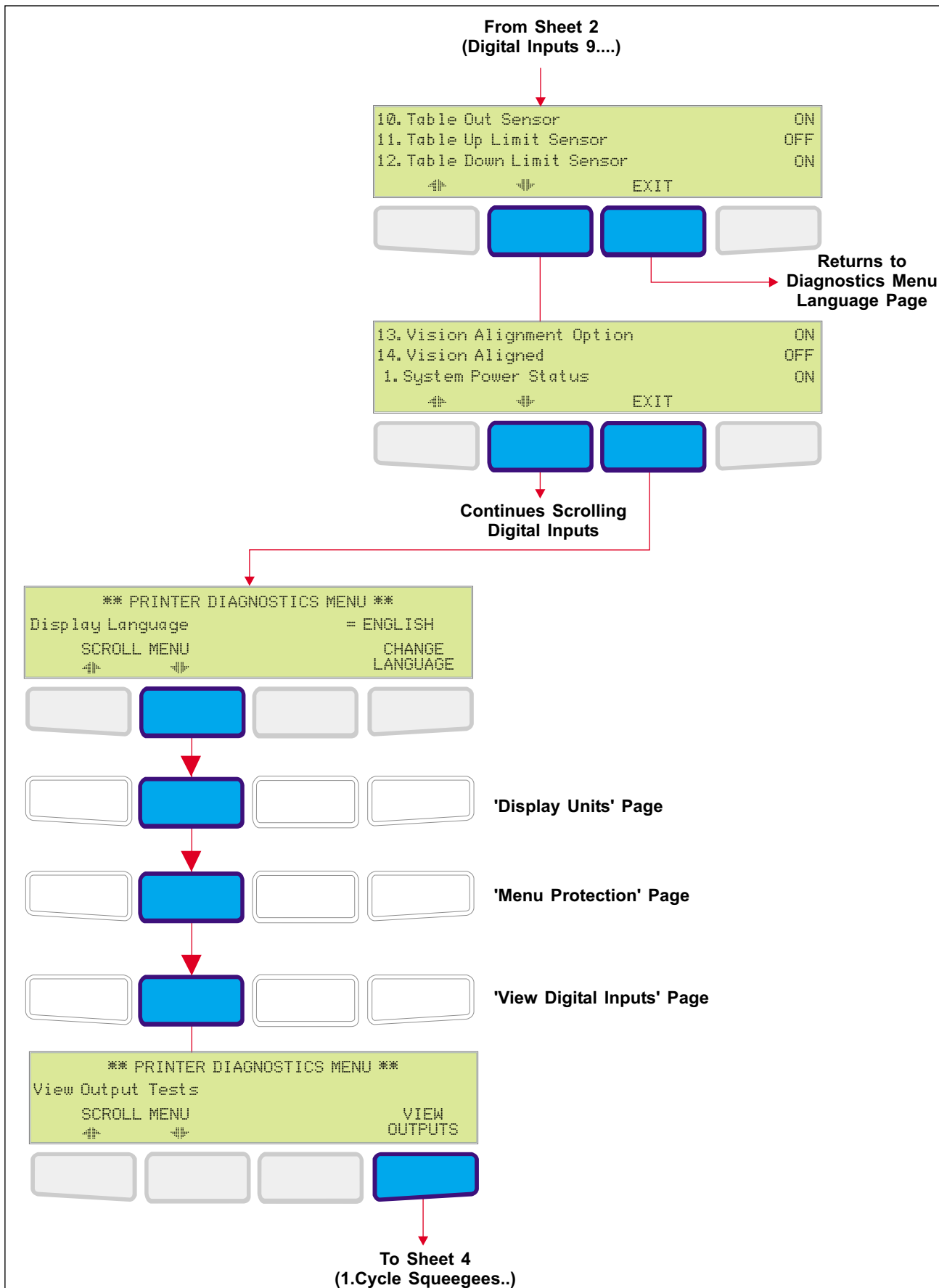


Figure 4-3 Diagnostic Flow Chart - Sheet 3

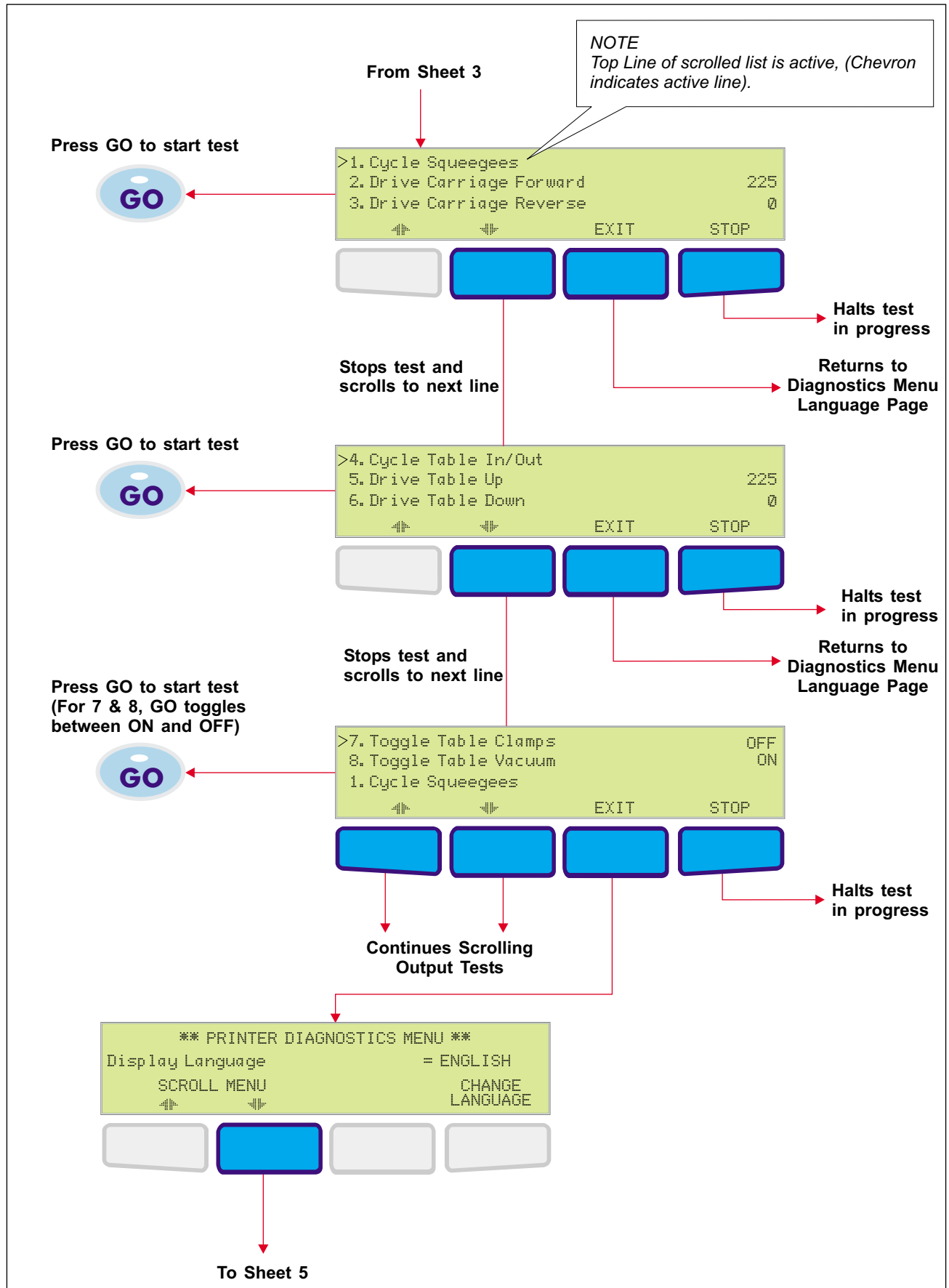
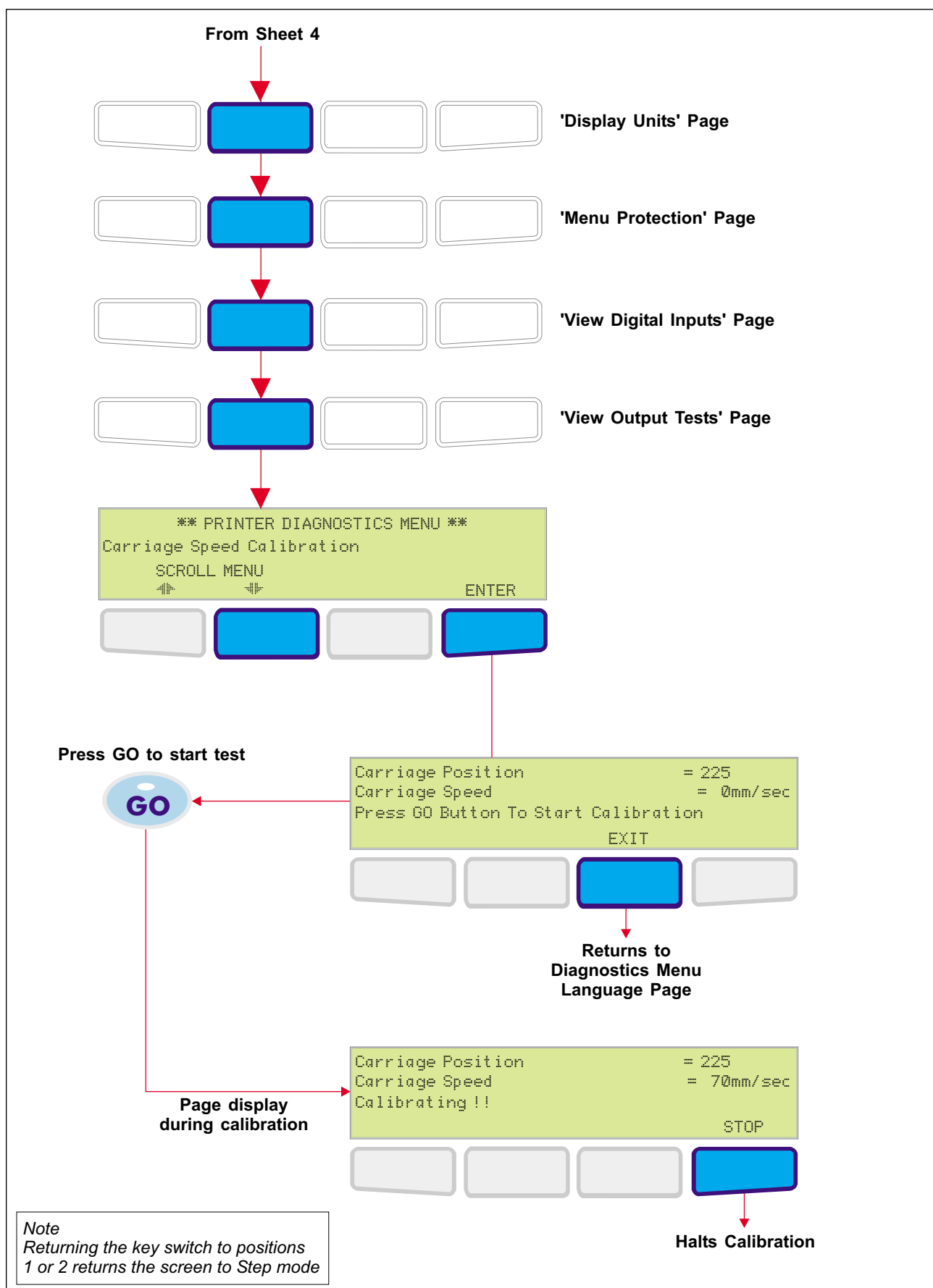


Figure 4-4 Diagnostic Flow Chart - Sheet 4





### DIAGNOSTIC FUNCTIONS

The following section provides the user with information on each available diagnostic function, and details any relevant control panel action.

#### NOTE

*As an aid to the information below, refer to the Diagnostics Flow Charts - Sheets 1 to 5.*

**Display Languages** The 248 Printer control panel can be adjusted to display one of three languages:

- English (default)
- Francais
- Deutsch

When the Diagnostics Mode is selected, the first function available is the **'Display Language'** menu.

1. Press the **'Change Language'** function button once to open the French menu display.
2. Press the **'Change Language'** function button again if the German menu display is required.
3. Press either **'Scroll Menu'** up/down arrow function button to set all machine pages to the selected language display. The next Diagnostic Menu page is also displayed.

### Display Units

The 248 Printer control panel can be adjusted to display one of two measurement types:

From the diagnostics menu, **'Display Units'**, either metric or imperial units of measurement may be selected.

- Metric (default)
- Imperial

### Menu Protection

The user can select whether to protect menus from inadvertent alteration by selecting either Yes or No.

Yes

Selecting **'YES'** prevents menu changes to all parameter values of any menu. At the control panel, entry to **'Edit Menu Parameters'** page is no longer possible.

#### NOTE

*If the optional DEKLink is used, the menu edit facility 'transmit' command is disabled. Any parameters changed cannot be passed to the printer.*

No

Selecting **'NO'** allows normal function of the edit menu parameters page at the control panel, or transmission of edit changes made at the DEKLink menu edit facility.

#### NOTE

*If the optional DEKLink is used, the menu edit facility 'transmit' command is enabled, allowing parameter values to be changed.*

The printer default is set to no protection, to enable the menu protection setting carry out the following:

1. Press the '**Scroll Menu**' up/down arrow function buttons to scroll through the menu pages until '**Menu Protection**' is displayed.
2. Press the '**Change Protection**' function button once to change the display to '**YES**'.
3. Press either '**Scroll Menu**' up/down arrow function button to set the machine to the selected protection display. The next/previous Diagnostic Menu page is also displayed.

**View Digital Inputs** Sensors that can have two possible states return the current state of the sensor at the display. Therefore, the present state of a sensor input may be inspected to check whether it is in an 'on' or 'off' signal condition.

The following list of digital inputs is available for viewing:

- 1 System Power Status
- 2 Pneumatic Pressure
- 3 Keyswitch Position
- 4 Cover Switch
- 5 Left GO Button
- 6 Right GO Button
- 7 Front Squeegee Down
- 8 Rear Squeegee Down
- 9 Table In Sensor
- 10 Table Out Sensor
- 11 Table Up Limit Sensor
- 12 Vision Alignment Option
- 13 Vision Aligned
- 1 System Power Status

To access the digital inputs menu carry out the following:

1. Press the '**Scroll Menu**' up/down arrow function buttons to scroll through the menu pages until '**View Digital Inputs**' is displayed.
2. Pressing the '**View Inputs**' function button displays the first three rows of inputs, pressing the 'down' arrow button scrolls through the 14 inputs.
3. Pressing the '**Exit**' function button reverts the Diagnostic Menu page back to the start, ('**Display Language**' menu page).

The following tables details each input describing the purpose for each state:

#### System Power Status

Indication	Purpose
ON	Indicates +24V system power is applied

#### Pneumatic Pressure

Indication	Purpose
ON	Indicates that air pressure at the pressure switch is sufficient to activate the pressure switch (approx. 3.5 bar)

### Keyswitch Position

Indication	Purpose
OFF	Indicates the key is in the 12 o'clock position (position 2) or the 3 o'clock position (position 3)
ON	Indicates key is in position 1. (9 o'clock)

### Cover Switch

Indication	Purpose
OFF	Indicates that the cover switch is not activated, or the machine cover is open.
ON	Indicates that the cover switch is activated, i.e. that the cover is closed.

### Left GO Button

Indication	Purpose
ON	Indicates that the left front panel or the left remote start GO switch is activated. Press to test.

### Right GO Button

Indication	Purpose
ON	Indicates that the right front panel or the right remote start GO switch is activated. Press to test.

### Front Squeegee Down

Indication	Purpose
ON	Indicates that the front squeegee down reed switch is activated. The front squeegee is down.

### Rear Squeegee Down

Indication	Purpose
ON	Indicates that the rear squeegee down reed switch is activated. The rear squeegee is down.

### Table In Sensor

Indication	Purpose
ON	ON indicates that the inboard switch on the X,Y table pneumatic drive assembly is activated; the X,Y table has reached the table-in position.

### Table Out Sensor

Indication	Purpose
ON	ON indicates that the outboard switch on the X,Y table pneumatic drive assembly is activated; the X,Y table has reached the table-out position.

### Table Up Limit Sensor

Indication	Purpose
ON	ON indicates that the X,Y table lift upper switch is activated. The table is not fully up but the table is at least as high as the limit switch position.
OFF	OFF indicates that the table is not at the upper limit.

Table Down Limit  
Sensor

Indication	Purpose
ON	ON indicates that the detector for the X,Y table lowest position is activated; the table is fully down.
OFF	OFF indicates that the table is not fully down.

Vision Alignment  
Option

Indication	Purpose
ON	Vision system fitted.
OFF	Vision system not fitted.

Vision Aligned

Indication	Purpose
ON	Vision system aligned (green overlay).
OFF	Vision system not aligned.

**View Output Tests**

Exercises are known as Output Tests. Mechanisms of the machine may be selected for independent exercising, or the present status of the analogue sensors fitted to the machine may be inspected.

The ability to perform such tests may be used as an aid to fault diagnosis.

For example the squeegee blade mechanism may be raised or lowered, independent of the print cycle, to prove the efficiency of the switch setting following switch replacement or repair.

As a safeguard, the control system automatically prevents selection of movements that could damage the mechanisms. For example, the table cannot be selected to be raised whilst in the table-out position. This prevents subsequent collision with the printhead structure should the next selected action be table-in.

Output tests are viewed by selecting the '**View Outputs**' function button. The first three rows of output tests are displayed, pressing the 'down' arrow button scrolls through each output test.

**NOTE**

*The active test line is always on the top row and denoted by a chevron, (example below refers).*

```
> 1. Cycle Squeegees
  2. Drive Carriage Forward      225
  3. Drive Carriage Reverse      0
    ⬅➡      ⬅➡      EXIT      STOP
```

The following Output Tests are available for viewing and testing:

- 1 Cycle Squeegees
- 2 Drive Carriage Forward
- 3 Drive Carriage Reverse
- 4 Cycle Table In / Out
- 5 Drive table Up
- 6 Drive Table Down
- 7 Toggle Table Clamps
- 8 Toggle Table Vacuum

To access the View Outputs Tests menu, carry out the following:

1. Press the '**Scroll Menu**' up/down arrow function buttons to scroll through the menu pages until '**View Output Tests**' is displayed.
2. Pressing the '**View Outputs**' function button displays the first three rows of test outputs. The top line of the list is the active line and is denoted by a chevron, (see example on previous page). Pressing the 'down' arrow button scrolls through the 8 outputs.
3. When the required output line required for test is displayed on the top line with a chevron indicator, press the **GO** button/buttons. The test is carried out. Pressing the '**Stop**' function button stops the test in progress.
4. Pressing the '**Exit**' function button reverts the Diagnostic Menu page back to the start, ('**Display Language**' menu page).

The following tables lists each output test, describing the machine action during test cycle:

### Cycle Squeegees

Control Selection	Purpose
GO	Squeegees cycle continuously.
STOP	Halts test.

### Drive Carriage Forward

Control Selection	Purpose
GO	Print carriage drives from rear to front of machine. Current position shown in range 0 - 225.
STOP	Halts test.

### Drive Carriage Reverse

Control Selection	Purpose
GO	Print carriage drives from front to rear of machine. Current position shown in range 0 - 225.
STOP	Halts test.

### Cycle Table In/Out

Control Selection	Purpose
GO	Reciprocating sliding table cycles continuously from table-in to table-out position.
STOP	Halts test.

### Drive Table Up

Control Selection	Purpose
GO	Drives RS table, (also known as the X,Y table assembly), to upper limit position. Current table-position indicated in range 0 to 255. (This is a diagnostic number only, related to, but not a directly measurable, item.)
STOP	Halts test.

### Drive Table Down

Indication	Purpose
GO	Drives RS table to lower limit position. Select ' <b>ENTER</b> ' to stop in intermediate position. Current table-position indicated in range 0 to 255. (This is a diagnostic number only, related to, but not a directly measurable item.)
STOP	Halts test.

### Toggle Clamps

Indication	Purpose
GO	Toggle the table clamps on/off. Momentarily pressing the switch alternates the current state. When clamps are 'on' attempts to move the table using the table positioners are rendered ineffective.
GO	Halts test.

### Toggle Table Vacuum

Indication	Purpose
GO	Toggle the table vacuum on/off. Momentarily pressing the ' <b>GO</b> ' switch alternates the current state.
GO	Halts test.

### Carriage Speed Calibration

This diagnostic function enables the operator to carry out an automatic calibration of the print carriage speed. Full details for this operation are highlighted in the 248 Technical Reference Manual - Calibrations and Settings chapter.

To access the Carriage Speed Calibration menu, carry out the following:

1. Press the '**Scroll Menu**' up/down arrow function buttons to scroll through the menu pages until '**Carriage Speed Calibration**' is displayed.
2. Pressing the **GO** button starts the test.
3. '**Calibrating!!**' is displayed in the menu page during the calibration period. To halt the calibration press the '**Stop**' function button.
4. Pressing the '**Exit**' function button returns the Diagnostic Menu page back to the start, ('**Carriage Speed Calibration**' menu page).