

JCM[®] TRAINING OVERVIEW

TBV[™] Series

TBV Transaction Based Validator

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TBV™ Transaction Based Validator

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OVERVIEW

This training course addresses the following JCM TBV™ device versions:

Table 1 TBV Versions

Device	Version Description
TBV-100 FSH	BNF, Horizontal Stack Cash Box, Centering Path
TBV-101 FSH	BNF, Horizontal Stack Cash Box, Fixed Path
TBV-100 FLD	BNF, No Cash Box, Centering Path
TBV-101 FLD	BNF, No Cash Box, Fixed Path
TBV-100 GLD	Single note, Gated Bezel, No Cash Box, Centering Path
TBV-101 GSH	Single note, Gated Bezel, Horizontal Stack Cash Box, Fixed Path
TBV-101 ASH	Single Note, JCM Standard Bezel, Horizontal Stack Cash Box, Fixed Path

TBV TRANSACTION BASED VALIDATOR UNIT

Figure 1 illustrates the TBV FSH, FLD, GSH and GLD Unit Versions (ASH Unit not shown).

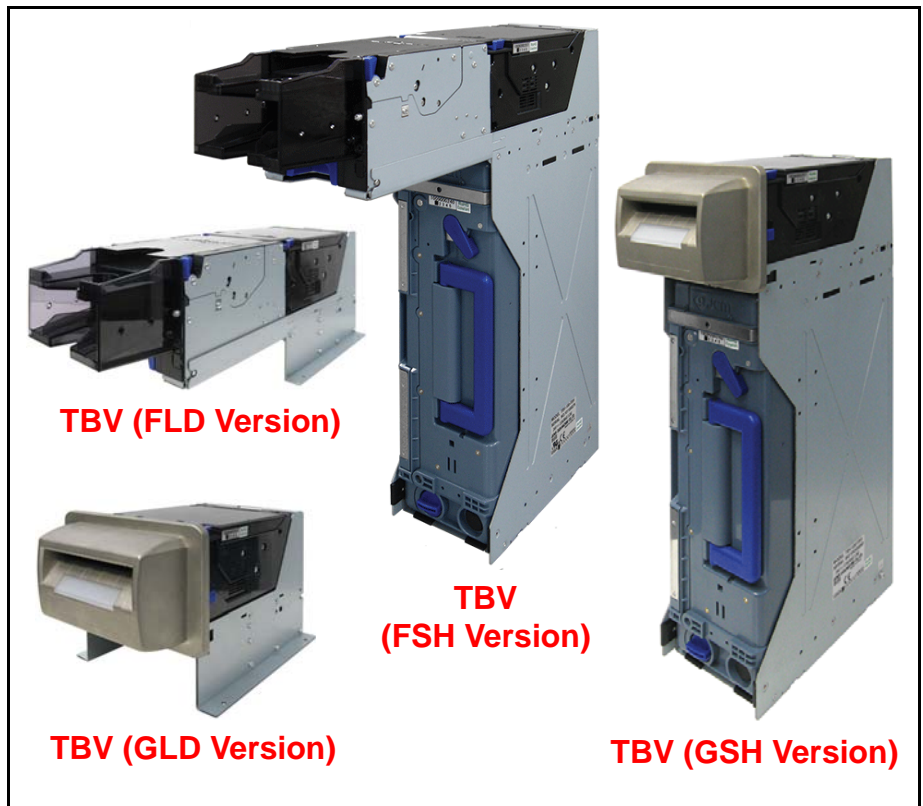


Figure 1 Available TBV Unit Versions

COMPONENT LOCATIONS

Figure 2 illustrates the TBV component names and locations.

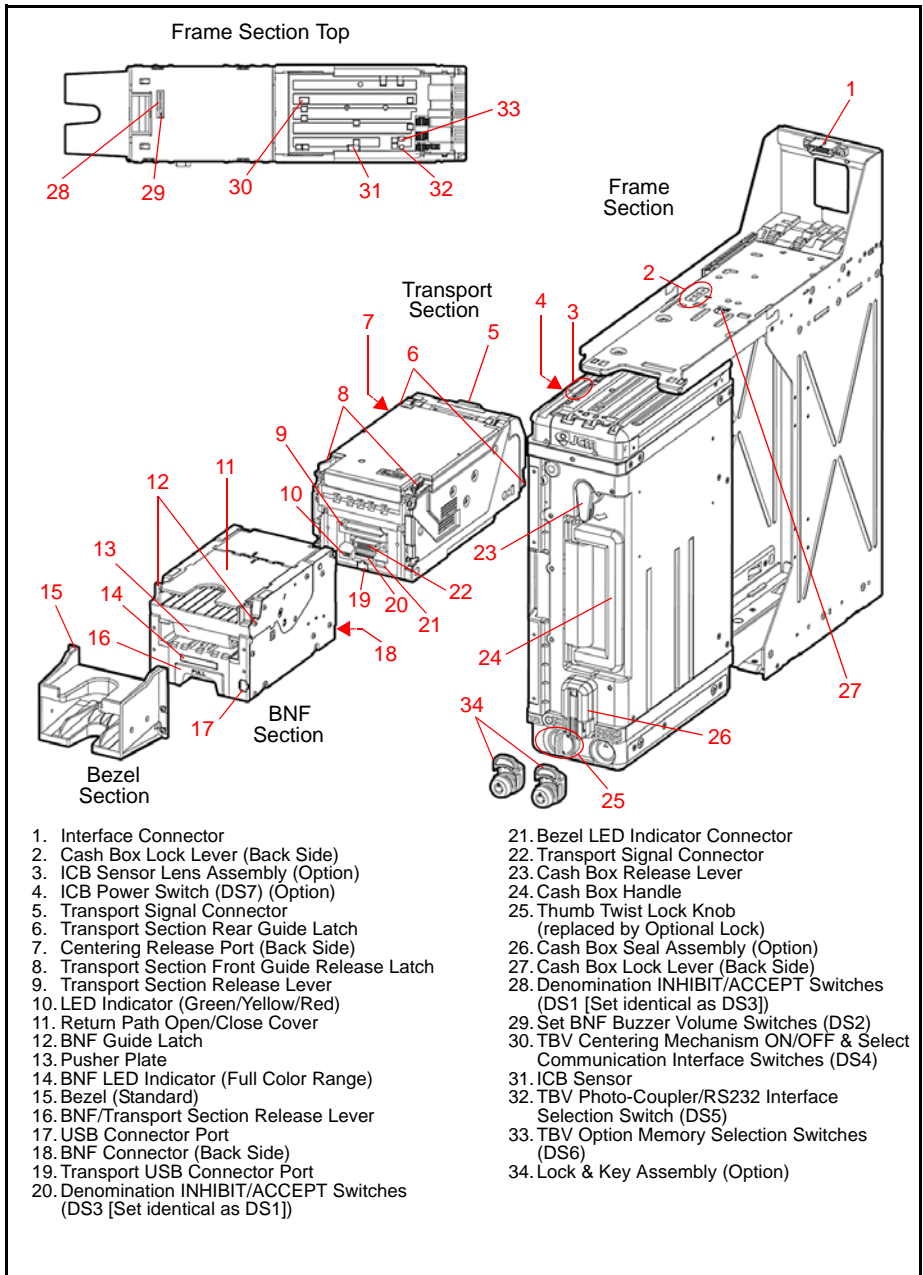


Figure 2 TBV Component Names

DIP SWITCH SETTINGS

Table 2 lists the default TBV DIP Switch Configuration for DS1 on the Bulk Note Feed (BNF) Unit, and DS3 on the Transport Unit.



NOTE: If the BNF Unit is installed, use DS1 (DS3 settings have no effect).
If the BNF Unit is NOT installed (single note configuration), use DS3.

Table 2 BNF Set Vend Denomination Switch DS1/DS3 Settings

Switch No.	Switch ON	Switch OFF
1	VEND 1 INHIBIT	VEND 1 ACCEPT
2	VEND 2 INHIBIT	VEND 2 ACCEPT
3	VEND 3 INHIBIT	VEND 3 ACCEPT
4	VEND 4 INHIBIT	VEND 4 ACCEPT
5	VEND 5 INHIBIT	VEND 5 ACCEPT
6	VEND 6 INHIBIT	VEND 6 ACCEPT
7	VEND 7 INHIBIT	VEND 7 ACCEPT
8	Test Mode	OFF (Fixed)

Table 3 lists the BNF Unit Buzzer Volume Switch settings for DS2.

Table 3 BNF Buzzer Volume Switch DS2 Settings


Switch No.	Switch ON	Switch OFF
1	N/A*	OFF (Fixed)
2	Performance Buzzer ON	Performance Buzzer OFF
3	ON Fixed	N/A
4	N/A*	OFF (Fixed)

* Not Applicable (N/A). Never Switched to ON.

Lecture Notes

Table 4 lists the TBV Centering Mechanism and COM Interface Switch settings for DS4.

Table 4 TBV Centering Mechanism & Select Com Interface Switch DS4 Settings




Switch No.	Switch ON	Switch OFF
1	Fixed Version	Centering Version
2	Barcode Coupon Single Read*	Barcode Coupon Double Read*
3†	I/F Selection	Switch #3
	RS232	OFF
4†	Photo-Coupler	Switch #4
	ccTalk	OFF
	ccTalk with Encryption	ON

* When using the "Single Read" Barcode Coupon setting, its Checksum may have to be changed to improve reading accuracy. The "Double Read" setting however, has a higher reliability and read accuracy by the TBV Validation System.

† Match each setting to equal the setting of DIP Switch DS5 Switch #1.

Table 5 lists the TBV Photo-Coupler/RS-232 Interface Selection Switch setting for DS5.

Table 5 TBV Photo-Coupler/RS232 Interface Selection Switch DS5 Setting



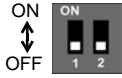
Switch No.	Switch ON	Switch OFF
1*	Photo-Coupler	RS232

* Match each setting to DIP Switch DS4 Switches #3 & #4.

Lecture Notes

Table 6 lists the TBV Optional Memory Selection Switch settings for DS6.

Table 6 TBV Option Memory Selection Switch DS6 Settings

		
Switch No.	Switch ON	Switch OFF
1	N/A*	OFF (Fixed)
2	N/A*	OFF (Fixed)

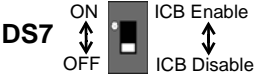
* Not Applicable (N/A). Never Switched to ON.

Table 7 lists the TBV Intelligent Cash Box (ICB) DS7 Settings.



NOTE: DS7 is on the Cash Box if an ICB Module is installed.

Table 7 TBV ICB Cash Box DS7 Settings

		
Switch No.	Switch ON	Switch OFF
1	ICB ON	ICB OFF*

* Initial Switch setting is OFF. When using the ICB, turn the ICB Switch located on the Intelligent Cash Box side to ON.

Lecture Notes

CLEANING PROCEDURES

To clean the TBV Unit, gently wipe the Sensors, Rollers and Belts using a clean, dry (or slightly dampened with soap solution) lint-free Microfiber cloth.



NOTE: When cleaning the TBV Unit, **DO NOT** use alcohol, solvents, citrus-based cleaners or scouring agents. These items may cause damage to the Sensors or Rollers. Use only a mild, non-abrasive detergent or cleaning solution.

Sensor and Roller Cleaning Procedure

1. Turn the TBV Unit power OFF.
2. Remove the TBV Unit from the Host Machine.
3. Open the TBV Unit, BNF, Transport, and Validation sections.
4. Clean the Lens of each Sensor. Refer to Figure 3 for the TBV Sensor Locations and Table 8 for each Sensor's cleaning method.

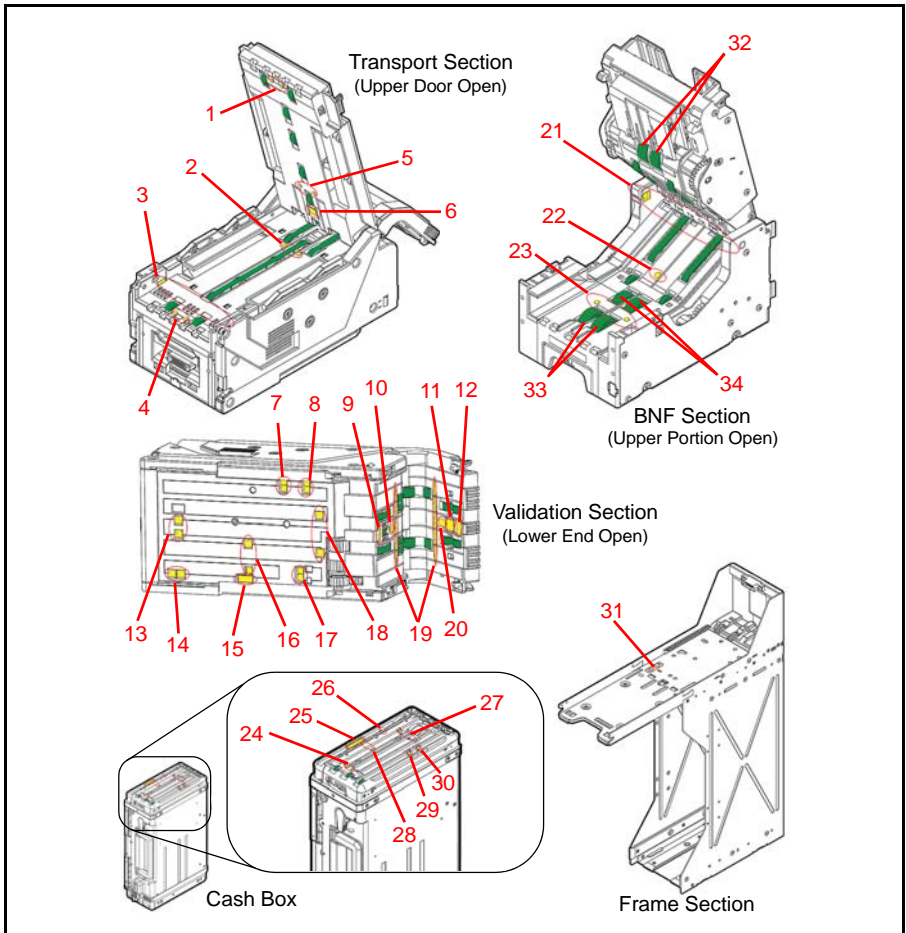


Figure 3 TBV Sensor and Roller Cleaning Locations

Table 8 TBV Sensor/Roller Types and Cleaning Methods

Symbol	Sensor/Roller Type	Cleaning Method
1	Transport Entrance Sensor Prism	Wipe clean using a soft, slightly damp, lint-free Microfiber cloth*
2	Centering Sensor	
3	Side Sensor	
4	Transport Entrance Sensor	
5	Centering Sensor Prism	
6	Bar Sensor	
7	Box Near Full Sensor	
8	Box Full Sensor	
9	Feed Out Sensor Prism	
10	UV Sensor	
11	Magnetic Sensor	
12	Feed Out Sensor	
13	Pusher Plate Home Position Sensor	
14	Box Lock Sensor	
15	ICB	
16	Pusher Mechanism Home Position Sensor	
17	Box Sensor	
18	Box Feed Out Sensor	
19	Line Sensor	
20	UV Sensor	
21	BNF Reject Sensor	
22	BNF Assignment Sensor	
23	BNF Entrance Sensor	
24	Pusher Plate Home Position Sensor Prism	
25	ICB	
26	Box Sensor Prism	
27	Box Feed Out Sensor Prism	
28	Pusher Mechanism Home Position Sensor Prism	
29	Box Near Full Sensor Prism	
30	Box Full Sensor Prism	
31	Cash Box Lock Sensor Prism	
32	Retard Roller	Wipe clean using a damp, lint-free Microfiber cloth†
33	Pick Up Roller	
34	Feed Roller	

* Wipe and clean all Rollers and the GREEN Colored Belts shown in Figure 3 using a soft, lint-free Microfiber cloth.

† When cleaning the Retard Roller, Pick Up Roller, and Feed Roller, use a lint-free Microfiber cloth slightly dampened with water.



NOTE: If Sensor Lenses or Prisms become exposed to water, wipe them dry IMMEDIATELY using a soft, dry lint-free Microfiber cloth. Then allow them to air dry for a sufficient amount of time to allow maximum evaporation.

JCM TOOL SUITE™ OVERVIEW

The JCM Tool Suite™ Standard Edition Software Program supports the following Operational Modes and User-selectable Functions (accessible by clicking the Service Mode drop-down menu as shown in Figure 4):

Table 9 JCM Tool Suite Operational Modes and Functions

Service Mode	Functions
Normal (Operational) Mode (All DS1/DS3 DIP Switches OFF)	Download
	Statistics
	Event Log View
Test Mode* (DS1/DS3 DIP Switch 8 ON)	Download
	Statistics
	Sensor Adjustment
	Performance Test
	Event Log View

* In Test Mode, Bezel LED flashes WHITE.



NOTE: All Diagnostic Tests can be performed by specifying various DIP Switch settings. Refer to Section 6 of the JCM Global® TBV® Series Transaction Based Validator Operation and Maintenance Manual (P/N 960-100926R) for information on setting DIP Switches for testing purposes.

To use the JCM Tool Suite Software Application:

1. Connect a standard USB Type A-to-Mini B cable from the PC's USB Port to the TBV Unit.
2. Apply electrical power to the TBV Unit.
3. Launch the JCM Tool Suite Software Application.

The Main Screen will be displayed (Figure 4).

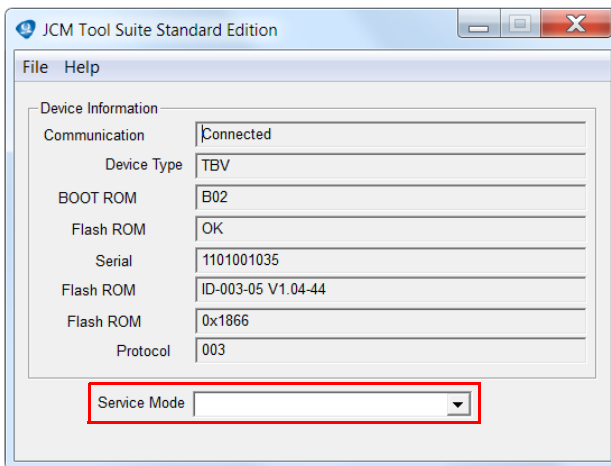


Figure 4 JCM Tool Suite Main Screen

FIRMWARE DOWNLOAD PROCEDURE

To download Firmware to the TBV Unit, proceed as follows:

1. Click on the Service Mode drop down menu, then select Download.
The JCM Downloader Suite Edition screen will appear (Figure 5).
2. Click the “Browse” Screen Button and select the file to be downloaded.
Then click the Open Screen button that appears.
3. The JCM Downloader Suite Edition screen will reappear (Figure 5). Click the “Download” Screen Button to begin downloading the Firmware.



NOTE: A **BLUE**-colored Barograph will display the Download progression. When downloading is complete, the following message is displayed (Figure 5): **Download Success. Reset Done. Waiting for USB Cable Disconnection.**

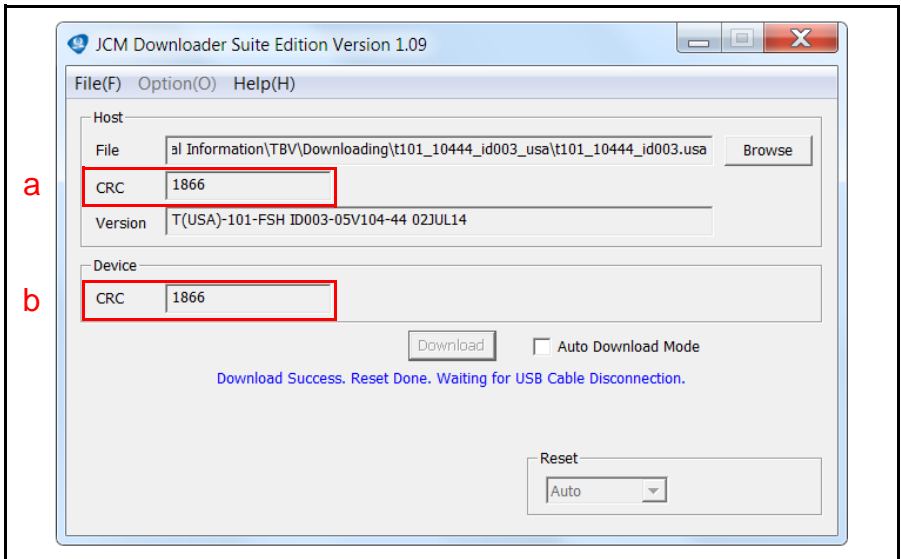


Figure 5 JCM Downloader Suite Edition Main Screen

4. Verify the Host CRC (Cyclic Redundancy Check) (Figure 5 a) and the Device CRC (Figure 5 b) Checksum values are identical.
5. Disconnect the USB Type A-to-Mini B cable from the PC’s USB Port and the TBV Unit.
6. Reset electrical power on the TBV Unit.

This completes the Firmware Download Procedure.



NOTE: If the TBV Software becomes corrupted or has not been installed (e.g., when changing the CPU Board), set Forced Download Mode by turning DS1 or DS3 DIP Switches #1, #6, #7 and #8 to ON. Then follow the Firmware Download Procedure described above.

CALIBRATION

Calibration of the TBV Unit needs to be performed whenever the following conditions occur:

- When removing and replacing the CPU Circuit Board in the TBV Unit;
- When removing or replacing any Sensor Circuit Board;
- After cleaning dirt and debris from the TBV Unit; and/or
- Whenever the Banknote Acceptance Rate has degraded.



NOTE: Reference papers are specified for use when calibrating the TBV-100 and TBV-101 Units. Refer to Table 21 on page 38 for the correct Reference Papers to be used.

USING THE CALIBRATION PROGRAM

This section describes how to use the Calibration Program to perform the following functions:

- Validation Sensor Calibration
- Positioning Sensor Calibration



NOTE: Calibration procedures can be performed individually.

Validation Sensor Calibration

To perform the TBV Validation Sensor Calibration procedure:

1. Remove the TBV Transport Unit from the Cash Box Frame.
2. Set DIP Switch #8 on DS1 (or DS3) to ON.
3. Apply electrical power to the TBV Unit.



NOTE: The TBV Unit Front Panel LED will flash WHITE.

4. Connect the Type A-to-Mini B cable between the PC's USB Port and the USB Port on the front of the TBV Unit.
5. Launch the JCM Tool Suite Standard Edition Software Application.
6. Click the Service Mode drop down menu, then select "Sensor Adjustment." The TBV Calibration Tool [Maintenance] screen will be displayed, as shown in Figure 6.

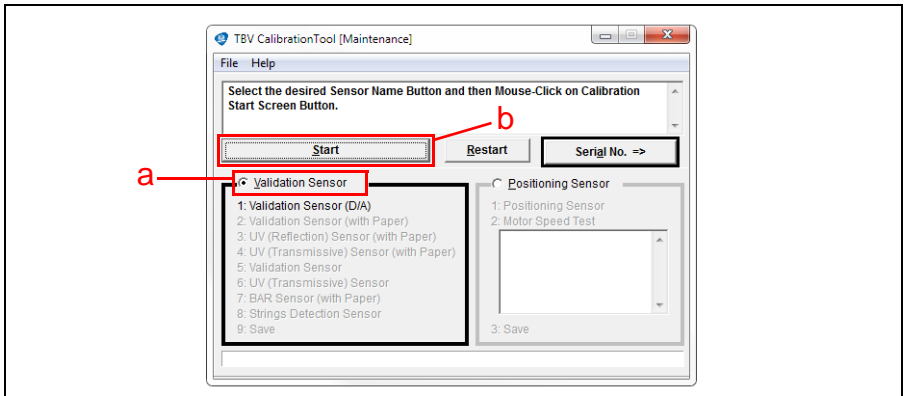
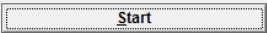


Figure 6 Validation Sensor Calibration-TBV Calibration Tool [Maintenance]

7. Verify that NO Reference Paper is present in the TBV Unit's Transport Path.
8. Make sure that the Transport Section's Upper Door Cover and the Validation Section's Lower End Cover (refer to Figure 3) are closed and locked securely.
9. Click to select the Validation Sensor radio button (Figure 6 a).
10. Click the "Start"  Screen Button (Figure 6 b).
11. Click Calibration Start when prompted to begin TBV Validation Sensor Calibration.
12. Follow all onscreen prompts to complete TBV Validation Sensor Calibration.



NOTE: Every time the Validation Section's Lower End Cover is opened (refer to Figure 3), make sure it is securely closed afterward.

13. Click the "OK"  Screen Button in the Calibration Completed pop-up dialog box once Validation Sensor Calibration is complete.

Positioning Sensor Calibration

To perform the TBV Positioning Sensor Calibration procedure:

1. Mount the TBV Transport Unit in a Frame with a Cash Box.
2. Set the DIP Switch #8 on DS1 (or DS3) to ON.
3. Apply electrical power to the TBV Unit.



NOTE: The TBV Unit Front Panel LED will flash WHITE.

4. Connect the Type A-to-Mini B cable between the PC's USB Port and the USB Port on the front of the TBV Unit.
5. Launch the JCM Tool Suite Standard Edition Software Application.
6. Click the Service Mode drop down menu, then select "Sensor Adjustment." The TBV Calibration Tool [Maintenance] screen will be displayed, as shown in Figure 7.

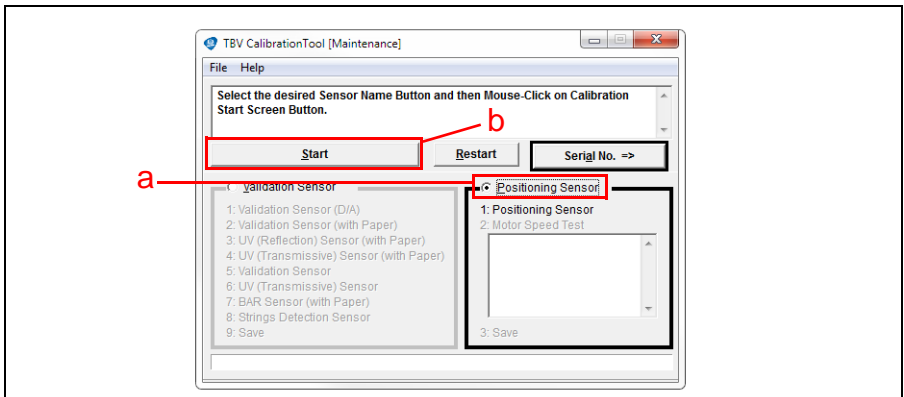



Figure 7 Positioning Sensor Calibration-TBV Calibration Tool [Maintenance]

7. Click to select the Positioning Sensor radio button (Figure 7 a).
8. Click the "Start"  Screen Button (Figure 7 b).
9. Click Calibration Start to begin TBV Positioning Sensor Calibration.

PERFORMANCE TESTING PROCEDURES

Available Tests

- Operation Test (Banknote Acceptance Tests)
- Motor Test
- Motor Speed Test
- Device Function Test

To perform these tests, proceed as follows:

1. Disconnect electrical power from the TBV Unit.
2. Set DIP Switch #8 on DS1 (or DS3) to ON.
3. Restore electrical power to the TBV Unit.
4. Connect the Type A-to-Mini B cable between the PC's USB Port and the USB Port on the front of the TBV Unit.
5. Launch the JCM Tool Suite Standard Edition Software Application.
6. Click the Service Mode drop down menu, then select "Performance Test."

The TBV Performance Tool Version XX.XX screen will be displayed, as shown in Figure 8.



NOTE: The TBV Performance Tool Version Number may vary from the version shown.

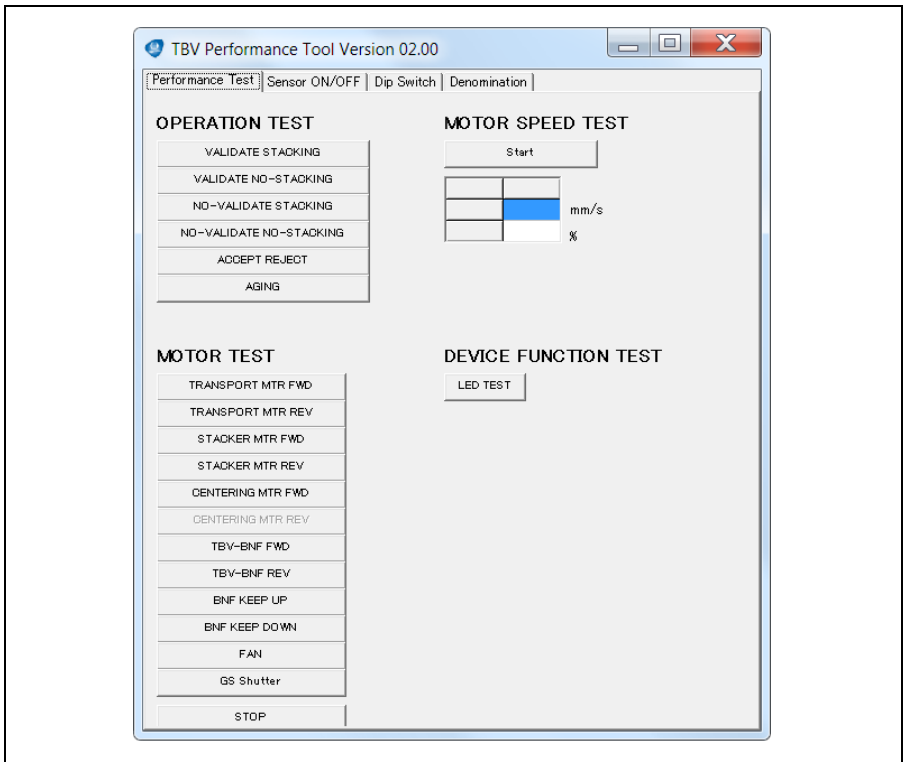


Figure 8 TBV Performance Tool Version XX.XX Screen

OPERATION TESTS

ACCEPTANCE TESTS

To perform each Operation Test, proceed as follows:

1. Click the Performance Test tab (Figure 9 a).
2. In the OPERATION TEST Section (Figure 9 b), click the desired Test Screen Button to begin the test.

The Bezel LED will be lit **BLUE**.

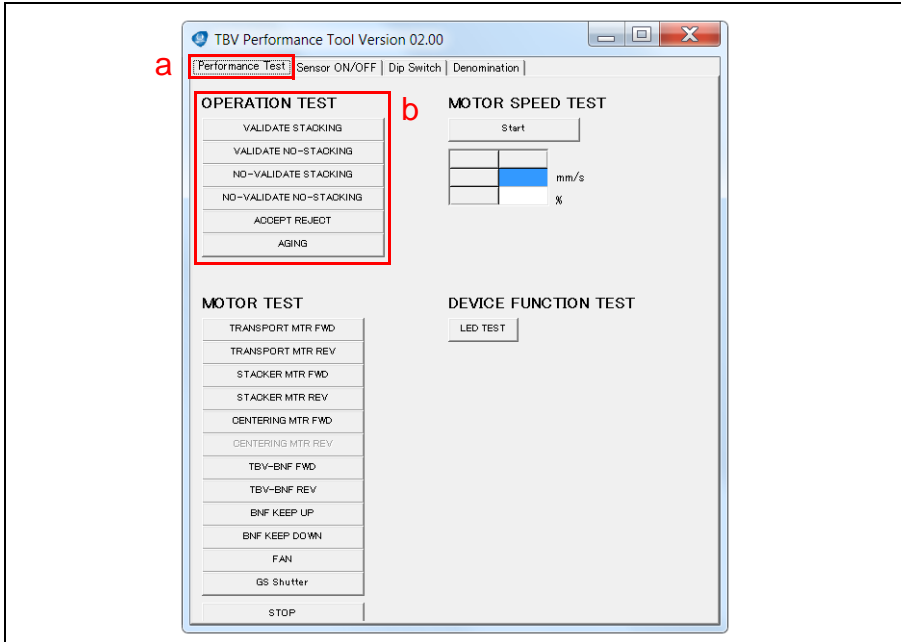


Figure 9 TBV Performance Tool - Operation Test Options





NOTE: For a complete list of Acceptance Test descriptions, refer to Table 10 on page 18. Test information appears in **RED** at the bottom of the Performance Test tab screen as each Test is running.



3. To start the Test, insert a Banknote into the TBV Unit.
4. Verify the Banknote's value using either of the following methods:
 - **LED Flash Count** - For each Banknote inserted, the Bezel LED will flash **PURPLE** for the Denomination Value detected. Count the number of LED Flashes then refer to Table 10 on page 18 for Denomination Flash Codes.



NOTE: For each Banknote inserted into the TBV Unit, the Flash Code repeats three (3) times, then the Bezel LED color returns to **BLUE**.

- **Denomination Update** - Click the Denomination tab (Figure 10 a) to view the Denomination Screen, then click the "Update"  Screen Button (Figure 10 b) to confirm the value of the Banknote inserted.

As an example, by inserting a Banknote into the TBV Unit and clicking the Denomination tab's "Update"  Screen Button, the Banknote value will be displayed in the *Denomi:* field (Figure 10 c).

 **NOTE:** When inserting a Ticket into the TBV Unit and clicking the "Update"  Screen Button, the *Denomi:* field displays a Zero (0) value.

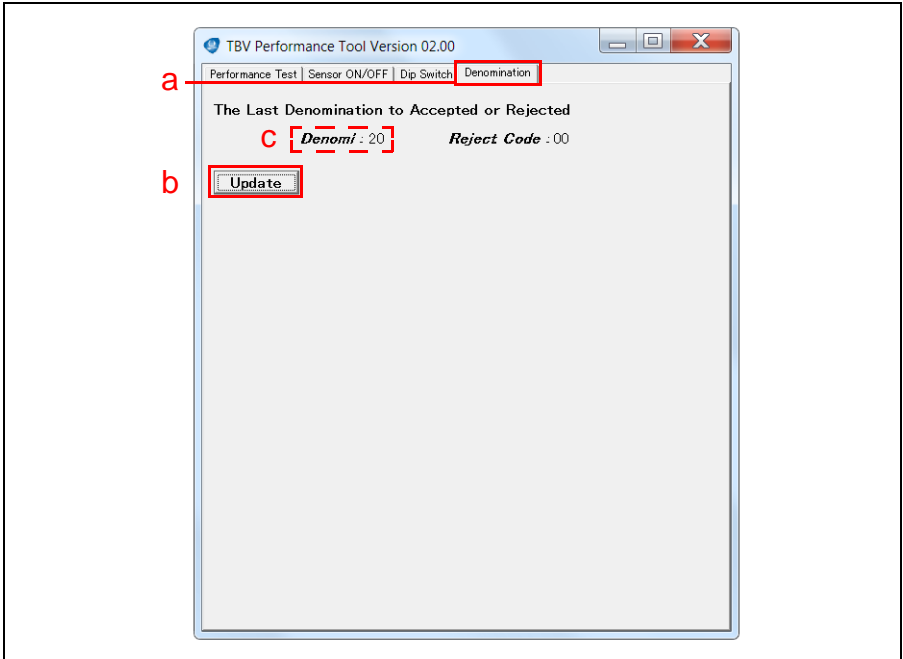



Figure 10 TBV Performance Tool Denomination Screen

 **NOTE:** To conduct other Acceptance Tests:

- 1) Close all screens to return to the JCM Tool Suite Main Menu.
- 2) Allow the TBV Unit to reset.
- 3) Click the Service Mode drop-down menu, then select "Performance Test."
- 4) Click on the Operation Test Screen Button for the desired Acceptance Test.

Refer to Table 10 on page 18 for a list of Operation Test Screen Buttons (listed in order in the "PC Screen" column).

Lecture Notes

Table 10 Operation Test Descriptions and LED Flash Codes

Test Item	PC Screen	Test Purpose	LED			
			Stand-by	Normal Operation	After Banknote Insertion	Abnormal Indication
Banknote Acceptance w/ Cash Box	VALIDATE STACKING	Banknote Acceptance and Stacking Movement	WHITE Flashes	BLUE	PURPLE Flashes \$1=1 time \$5=2 times \$10=3 times \$20=4 times \$50=5 times \$100=6 times Ticket=16 times	YELLOW Flashes
						RED Flashes
						GREEN Flashes
Banknote Acceptance w/o Cash Box	VALIDATE NO-STACKING	Banknote Acceptance	WHITE Flashes	BLUE	PURPLE Flashes \$1=1 time \$5=2 times \$10=3 times \$20=4 times \$50=5 times \$100=6 times Ticket=16 times	YELLOW Flashes
						RED Flashes
						GREEN Flashes
Banknote Acceptance w/ Cash Box (No Validation)	NO-VALIDATE STACKING	Test Transport and Stacking Movement	WHITE Flashes	BLUE	PURPLE Flashes (1 time)*	YELLOW Flashes
						RED Flashes
						GREEN Flashes
Banknote Acceptance w/o Cash Box (No Validation)	NO-VALIDATE NO-STACKING	Test Transport Movement	WHITE Flashes	BLUE	PURPLE Flashes (1 time)*	YELLOW Flashes
						RED Flashes
						GREEN Flashes
Banknote Reject	ACCEPT/REJECT	Test Transport Movement (both directions)	WHITE Flashes	BLUE	GREEN Flashes (10 Times)	YELLOW Flashes
						RED Flashes
						GREEN Flashes
Continuous Acceptance Cycles	AGING	Test Transport Repeatedly	WHITE Flashes	BLUE	OFF	YELLOW Flashes
						RED Flashes

* For Older Firmware versions, LED After Banknote Insertion returns (1) PURPLE Flash. For Newer Firmware versions, LED After Banknote Insertion returns Full Denominational PURPLE Flashes (Table 10).

Lecture Notes

MOTOR TESTS

Ten Motor Tests are available for the TBV Unit.



NOTE: Refer to Table 11 on page 20 for a list of Motor Test Screen Buttons. Only Motor Tests that are applicable to the TBV Model connected will be accessible.

To perform each Motor Test, proceed as follows:

1. In the MOTOR TEST Section, click the desired Test Screen Button (Figure 11 a) to begin the test (e.g., TRANSPORT MTR FWD).
2. Confirm proper operation.
The Bezel LED will be lit **BLUE**.



NOTE: If an Error condition occurs (indicated by the **RED** Bezel LED Flashing), refer to Operational Error Codes on page 27 for details about the Error condition.

3. To end the Test, click the “Stop” Screen Button.

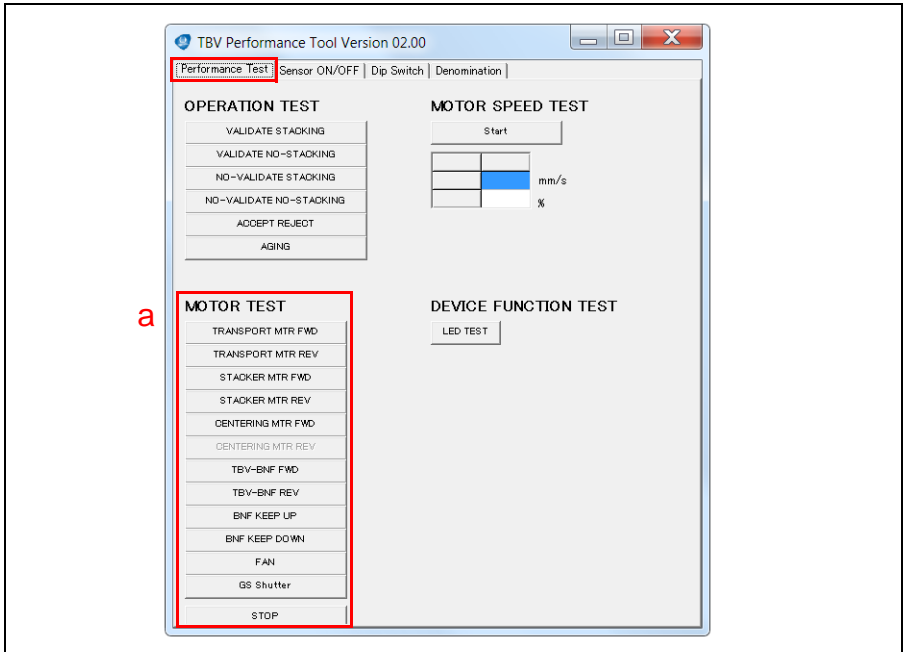


Figure 11 TBV Performance Tool - Motor Test Options

Lecture Notes



Table 11 Motor Test Descriptions and LED Flash Codes

Test Item	PC Screen	Test Purpose	LED		
			Stand-by	Normal Operation	Error Indication
Transport Motor Normal Rotation	TRANSPORT MTR FWD	Tests the Transport Motor in Acceptance Direction	Flashing WHITE	BLUE	RED Flashing
Transport Motor Reverse Rotation	TRANSPORT MTR REV	Tests the Transport Motor in Reject Direction	Flashing WHITE	BLUE	RED Flashing
Stacker Motor Normal Rotation	STACKER MTR FWD	Tests the Stacker Motor Forward movement, Stacker Home and Stacker half sensors	Flashing WHITE	BLUE	RED Flashing
Stacker Motor Reverse Rotation	STACKER MTR REV	Tests the Stacker Motor Reverse movement, Stacker Home and Stacker half sensors	Flashing WHITE	BLUE	RED Flashing
Centering Motor Normal Rotation	CENTERING MTR FWD	Tests the Centering Motor Forward movement, Centering Home sensor	Flashing WHITE	BLUE	RED Flashing
Transport Motor and BNF Transport Motor Normal Rotation	TBV-BNF FWD	Tests the Transport and BNF Motors' Forward movement	Flashing WHITE	BLUE	RED Flashing
Transport Motor and BNF Transport Motor Reverse Rotation	TBV-BNF REV	Tests the Transport and BNF Motors' Reverse movement	Flashing WHITE	BLUE	RED Flashing
BNF Pusher Mechanism - Push Up	BNF KEEP UP	Tests the BNF Pusher Mechanism Push Up Movement	Flashing WHITE	BLUE	RED Flashing
BNF Pusher Mechanism - Push Down	BNF KEEP DOWN	Tests the BNF Pusher Mechanism Push Down Movement	Flashing WHITE	BLUE	RED Flashing
FAN Motor	FAN	Tests the Cooling Fan Motion	Flashing WHITE	BLUE	RED Flashing
Gated Bezel Shutter	GS Shutter	Tests the operation of the Bezel Shutter on the GS Metal Bezel	Flashing WHITE	BLUE	RED Flashing
N/A	STOP	Ends the Current Test	Flashing WHITE	BLUE	RED Flashing

Lecture Notes

MOTOR SPEED TEST

To display the Motor Speed in mm/sec, proceed as follows:

1. In the MOTOR SPEED TEST Section, click the “Start”  Screen Button (Figure 12 a).
The Motor Speed will be displayed in mm/sec.
2. To end the Test, click the “Stop”  Screen Button.



DEVICE FUNCTION TEST

The Device Function Test is used to verify that the TBV Bezel LED Displays properly by cycling through the Primary Colors (RED, GREEN, BLUE and WHITE).



NOTE: If the Primary Colors (RED, GREEN, BLUE and WHITE) are not lit when this test is run, the TBV Bezel LED is not functioning properly.

To run the Device Function Test, proceed as follows:

1. In the DEVICE FUNCTION TEST Section, click the “LED TEST”  Screen Button (Figure 12 b).
The LED Test will cycle automatically with each of the Primary Colors being lit.
2. To end the Test, click the “Stop”  Screen Button.

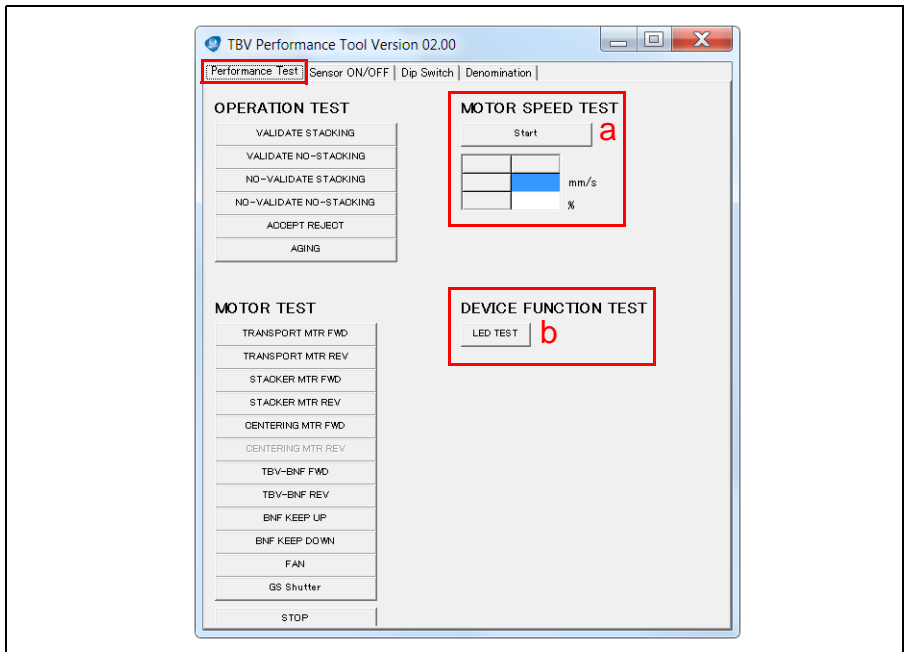


Figure 12 Motor Speed Test/Device Function Test Screen

SENSOR ON/OFF TEST

The Sensor ON/OFF Test verifies the operation of the TBV Sensors.



NOTE: Status indicators for the following Sensors should always appear OFF:

ULL ORE ULL NIR ULL IR
URR ORE URR NIR URR IR

To test the Sensors, proceed as follows:

1. Click the Sensor ON/OFF tab (Figure 13 a).
2. Click the “Start” Screen Button.
3. Confirm that the **Sensor Timer running** text message appears (Figure 13 b).
4. Verify the status of 17 Positioning Sensors (Figure 13 c). If a Sensor is operating properly, its status indicator (Positioning Sensor column) will change from OFF to ON or ON to OFF as the Sensor is blocked or unblocked.



NOTE: Refer to Table 12 on page 23 for the list of Sensor Names. Depending on the TBV Model being tested, some Positioning Sensors may not be used.

5. Verify that the status of 28 Judgment Sensors (Figure 13 d) appears as OFF. If a Sensor is operating properly, its status indicator (Judgment Sensor column) should appear OFF.

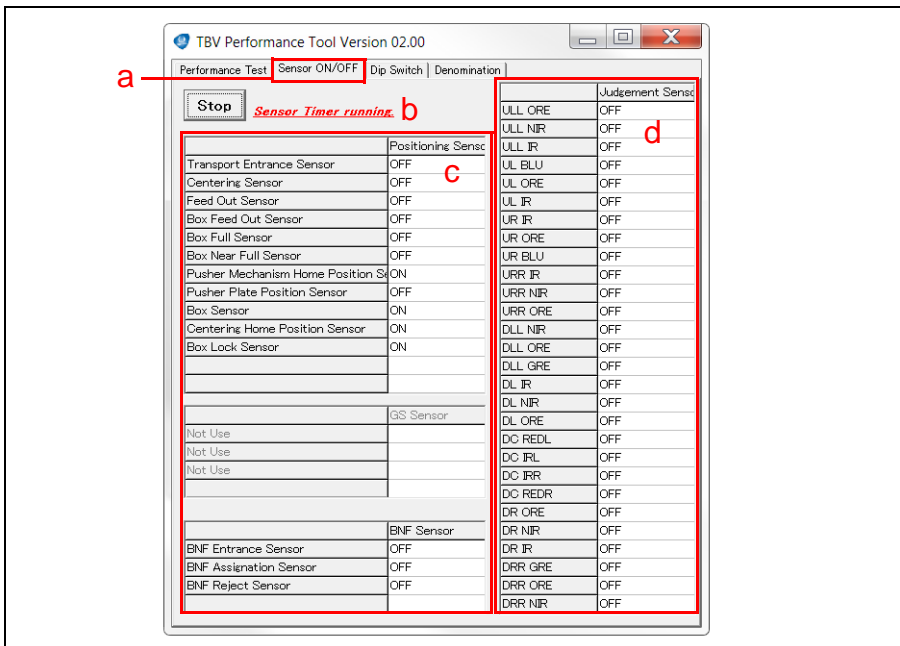



Figure 13 Sensor ON/OFF Test Screen, Positioning & Judgment Sensors

6. Disconnect electrical power from the TBV Unit.
7. Open the Validation Unit Cover (refer to Figure 3 on page 8).
8. Reapply Power to the TBV Unit.
9. Restart the JCM Tool Suite Standard Edition Software Application.
10. Click the Service Mode drop down menu, then select “Performance Test.”

11. Click the Sensor ON/OFF tab, then click the “Start”  Screen Button to restart the Sensor ON/OFF Test.



NOTE: The Sensor status indicators should appear ON. If a Sensor's status indicator did not change from OFF to ON, it is not working properly.


12. To end the Test, click the “Stop”  Screen Button.

Table 12 lists the Sensor Tests, their functions and descriptions.

Table 12 Sensor Test Items

Test No.	PC Screen Sensor Names	Sensor Purpose	PC Screen		LED	
			Detected	NOT Detected	Standby	Operating
1	Transport Entrance Sensor	Detects a Banknote present on the Entrance Sensor	ON	OFF	Flashing WHITE	BLUE
2	Centering Sensor	Detects a Banknote present on the Center Position Sensor	ON	OFF	Flashing WHITE	BLUE
3	Feed Out Sensor	Detects a Banknote existing on the Feed Out Sensor	ON	OFF	Flashing WHITE	BLUE
4	Box Feed Out Sensor	Detects a Banknote existing on the Stack Position Sensor	ON	OFF	Flashing WHITE	BLUE
5	Box Full Sensor	Detects that the Cash Box is Full	ON	OFF	Flashing WHITE	BLUE
6	Box Near Full Sensor	Detects that the Cash Box is nearly full	ON	OFF	Flashing WHITE	BLUE
7	Pusher Mechanism Home Position Sensor	Detects that the Pusher Mechanism's Pusher Plate is correctly positioned at the Home Position	ON	OFF	Flashing WHITE	BLUE
8	Pusher Plate Position Sensor	Detects that the Pusher Mechanism's Pusher Plate correctly positions itself at the half position	ON	OFF	Flashing WHITE	BLUE
9	Box Sensor	Detects that the Cash Box is properly seated	ON	OFF	Flashing WHITE	BLUE
10	Centering Home Position Sensor	Detects that the Centering Mechanism is correctly positioned at the Home Position	ON	OFF	Flashing WHITE	BLUE
11	Box Lock Sensor	Detects that the Cash Box Release Lever is locked	ON	OFF	Flashing WHITE	BLUE
12	GS_INS	Detects a Banknote inserted into the Gated Metal Bezel	ON	OFF	Flashing WHITE	BLUE
13	GS_Home	Detects when the Gate in the GS Bezel is in the Home Position	ON	OFF	Flashing WHITE	BLUE
14	GS_LOK	Detects when the Gate in the GS Bezel is in the Open Position	ON	OFF	Flashing WHITE	BLUE
15	BNF Entrance Sensor	Detects a Banknote existing on the BNF Entrance Sensor	ON	OFF	Flashing WHITE	BLUE

Table 12 Sensor Test Items (Continued)

Test No.	PC Screen Sensor Names	Sensor Purpose	PC Screen		LED	
			Detected	NOT Detected	Standby	Operating
16	BNF Assigination Sensor	Detects a Banknote existing on the BNF Middle Sensor	ON	OFF	Flashing WHITE	BLUE
17	BNF Reject Sensor	Detects a Banknote existing on the BNF Reject Sensor	ON	OFF	Flashing WHITE	BLUE

Lecture Notes

DIP SWITCH TEST

The DIP Switch Test verifies the operation of the DS1 or DS3 8-position DIP Switch. To perform this test, proceed as follows:

1. Click the DIP Switch tab (Figure 14 a).
2. Click the “Start” Screen Button to begin the test.
3. Change each Switch’s position from OFF to ON to verify the operation of the DIP Switch.

The Status indicator for each Switch will change from OFF to ON when the Switch position is changed.

4. Click the “Stop” Screen Button to end the test.

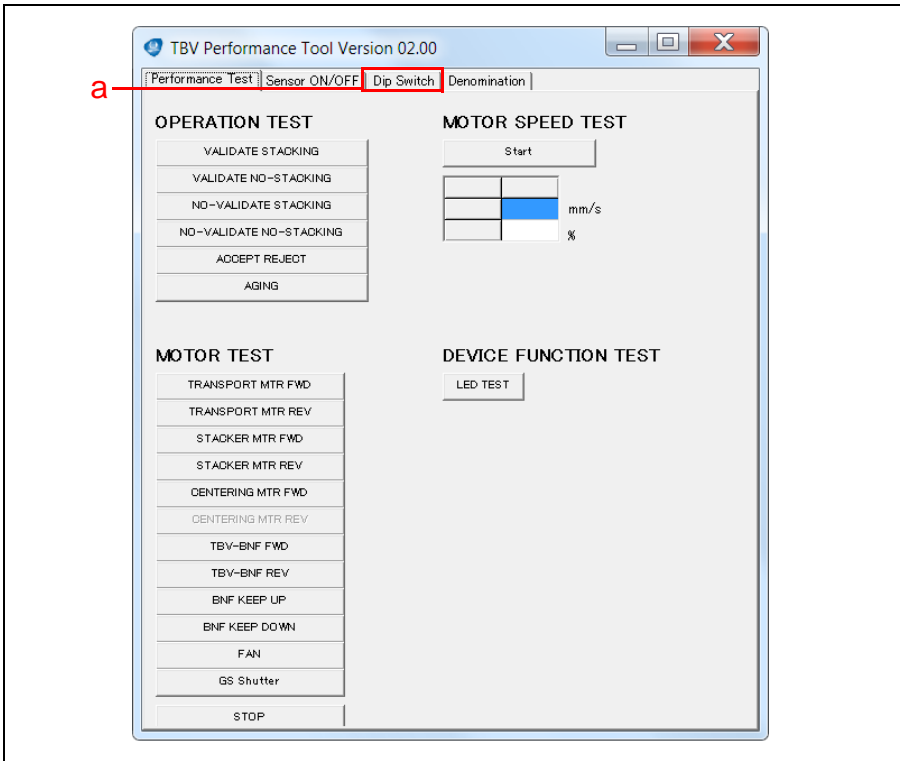


Figure 14 TBV Performance Tool - DIP Switch Tab

TBV ERROR CODE TABLES

This section identifies the Standard LED Error Codes for the TBV Unit. The TBV Bezel LED will flash either **YELLOW**, **GREEN** or **RED** when various Error Conditions occur. Refer to Table 13 below for a list of TBV Banknote Jam Error Codes and their solutions. The LED Color Flash Sequence column indicates the number of times the Bezel LED flashes a particular color and the corresponding Error. As an example, a single Yellow Flash indicates a Banknote Jam Error at the Cash Box.

BANKNOTE JAM ERROR CODES

Banknote Jams are indicated by the Bezel LED flashing a **YELLOW** color. Count the number of Flashes between pauses to identify the Error, Causes and Solutions.

Table 13 TBV Banknote Jam Error Codes

LED Color Flash Sequence	Error	Causes and Solutions
1	Banknote Jam (Cash Box)	A Banknote jam is detected at the Cash Box. [Solution] Check the Cash Box for a jammed Banknote. [Relative Parts] Feed Motor, Stacker Sensor, Feed-Out Sensor If the condition is not resolved, change the above related part or parts and complete a Positioning Sensor Calibration procedure.
2	Banknote Jam (Transport)	Sensors did not detect a Banknote present. [Solution] Check for a jammed Banknote or foreign material. Check/clean all Sensors. [Relative Parts] Feed Motor, BNF Entrance Sensor, BNF Assignment Sensor, Transport Entrance Sensor, Centering Sensor, Side Sensor, Validation Sensor, Feed-Out Sensor If the condition is not resolved, change the above related part or parts and complete a full Calibration procedure.
3	Banknote Chain	Sensors are blocked longer than specified. [Solution] Check for a jammed Banknote or foreign material. Check/clean all Sensors. [Relative Parts] BNF Feed Roller, BNF Retard Roller, BNF Assignment Sensor, Transport Entrance Sensor, Feed-Out Sensor If the condition is not resolved, change the above related part or parts and complete a full Calibration procedure.
4	Cash Box Removed	Cash Box has been removed. [Solution] Check that the Cash Box is seated properly. [Relative Parts] Cash Box Sensor If the condition is not resolved, change the above related part or parts.
5	Banknote Transport Error	Sensors detected a Banknote with abnormal timing. [Solution] Check for a jammed Banknote or foreign material. Check/clean all Sensors. [Relative Parts] Side Sensor, Validation Sensor, Feed-Out Sensor, Cash Box Feed Out Sensor If the condition is not resolved, change the above related part or parts and complete a full Sensor Calibration procedure.

Table 13 TBV Banknote Jam Error Codes (Continued)

LED Color Flash Sequence	Error	Causes and Solutions
6	Cash Box Lock Open	Sensors detected the Cash Box Lock has been opened. [Solution] Check the Cash Box lock for proper operation. [Relative Parts] Cash Box Lock, Cash Box Lock Sensor If the condition is not resolved, change the above related part or parts.
7	Transport Upper Cover Open	Sensors detected the Transport Upper Cover is open. [Solution] Latch the Top Cover properly. [Relative Parts] Centering Sensor, Transport Entrance Sensor If the condition is not resolved, change the above related part or parts and complete a Positioning Sensor Calibration procedure.

OPERATIONAL ERROR CODES

Operational Error Codes are indicated by the Bezel LED flashing a **RED** color. Count the number of Flashes between pauses to identify the Error, Causes and Solutions.

Table 14 TBV Operational Error Codes

LED Color Flash Sequence	Error	Causes and Solutions
1	Cash Box Full	When stacking a Banknote, Sensors detected a full Cash Box. [Solution] Empty the Cash Box, or replace with an empty Cash Box. [Relative Parts] Cash Box Full Sensor, Pusher Mechanism, Pusher Plate If the condition is not resolved, change the above related part or parts, and clean the Unit.
2	Feed Motor Lock-up	Sensors detected improper movement of the Feed Motor. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Feed Motor, Feed Motor Encoder If the condition is not resolved, change the above related part or parts.
3	Stacker Motor Lock-up	Sensors detected improper movement of the Stacker. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Stacker Motor, Stacker Motor Encoder If the condition is not resolved, change the above related part or parts.
4	Centering Motor Lock-up	Sensors detected improper movement of the Centering Mechanism. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Centering Motor, Centering Home Sensor If the condition is not resolved, change the above related part or parts.
5	BNF Unit	Sensors detected improper movement of the BNF Motor. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] BNF Feed Motor, BNF Grip Motor If the condition is not resolved, change the above related part or parts.
6	Shutter Movement	Sensors detected improper movement of the Shutter mechanism. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Shutter Motor, Shutter Sensor If the condition is not resolved, change the above related part or parts.

Table 14 TBV Operational Error Codes (Continued)

LED Color Flash Sequence	Error	Causes and Solutions
7	Pusher Mechanism Movement	The Pusher Mechanism is not at the Home Sensor. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Pusher Mechanism, Stacker Motor, Stacker Home Sensor, Stacker Motor Encoder If the condition is not resolved, change the above related part or parts.
8	Pusher Mechanism Home Position	When stacking a Banknote, the Pusher Mechanism is not returning to the Home Position. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Pusher Mechanism, Stacker Motor, Stacker Home Sensor, Stacker Motor Encoder If the condition is not resolved, change the above related part or parts.
9	Pusher Halfway Position	The Pusher Mechanism is not returning to the Halfway Position. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Pusher Mechanism, Stacker Motor, Stacker Home Sensor, Stacker Motor Encoder If the condition is not resolved, change the above related part or parts.
10	Center Home Position	The Centering Mechanism is not at the Home Position. [Solution] Check for a jammed Banknote or foreign material. Clean the Unit. [Relative Parts] Centering Motor, Centering Guide, Centering Home Sensor If the condition is not resolved, change the above related part or parts.
11	Feed Motor Speed	During initialization, the Feed Motor Speed is incorrect. [Solution] Check the following Parts and Harnesses. Clean the Unit. [Relative Parts] Feed Motor, Feed Motor Encoder If the condition is not resolved, change the above related part or parts.
12	BNF Section Communication	The BNF Unit is not communicating with the CPU. [Solution] Check the BNF Harnesses. [Relative Part] BNF Communications Harness If the condition is not resolved, change the above related part.
13	ICB Communications (1)	During ICB Communication, Data Errors are occurring. [Solution] Check ICB Settings and reseal the Cash Box. Clean the Unit. [Relative Part] ICB PC Board If the condition is not resolved, change the above related part.
14	Voltage	Input voltage is too low. [Solution] Check the Harness and the following part. [Relative Part] Power Supply If the condition is not resolved, change the above related part.
15	Banknote Timing	Sensors detected a Banknote with abnormal timing. [Solution] Clean the Transport Path, check the following parts. [Relative Parts] Line Sensor, Feed-Out Sensor, Box Feed Out Sensor, Side Sensor If the condition is not resolved, change the above related part or parts and calibrate the Unit.
16	I2C Access	While communicating with each device connected to the CPU, Sensors detected an abnormality. [Solution] Check the Harness connections and the following part. [Relative Parts] CPU Board If the condition is not resolved, change the above related part and calibrate the Unit.

Table 14 TBV Operational Error Codes (Continued)

LED Color Flash Sequence	Error	Causes and Solutions
18	SDRAM Reading	SDRAM Reading and/or Writing was not properly completed. [Solution] Check the following parts and Harnesses. [Relative Parts] CPU Board If the condition is not resolved, change the above related part and calibrate the Unit.
19	EEPROM Reading	EEPROM Reading is not properly completed. [Solution] Check the following parts and Harnesses. [Relative Parts] CPU Board If the condition is not resolved, change the above related part and calibrate the Unit.
20	EEPROM Writing	EEPROM Writing is not properly completed. [Solution] Check the following parts and Harnesses. [Relative Parts] CPU Board If the condition is not resolved, change the above related part and calibrate the Unit.
21	Feed Motor Over Current	While operating, the Feed Motor detected an Over Current condition. [Solution] Check the following parts and Harnesses. [Relative Parts] Feed Motor If the condition is not resolved, change the above related part.
22	Stacker Motor Over Current	While operating, the Stacker Motor detected an Over Current condition. [Solution] Check the following parts and Harnesses. [Relative Parts] Stacker Motor If the condition is not resolved, change the above related part.
23	Feed Motor Overheat	While operating, the Feed Motor detected an Overheat condition. [Solution] Check the following parts and Harnesses. Clean the Unit. [Relative Parts] Feed Motor If the condition is not resolved, change the above related part.
24	Calibration	During Power Up, valid Calibration was not detected. [Solution] Calibrate the Unit. [Relative Parts] CPU Board If the condition is not resolved, change the above related part and calibrate the Unit.

Lecture Notes

ICB ERROR CODES

ICB LED Flash Error Codes shown in Table 15 are related to the Intelligent Cash Box (ICB) system, and are indicated by the Bezel LED flashing a **RED** color. Count the number of Flashes between pauses to identify the Error, Causes and Solutions.

Table 15 ICB LED Error Codes

Online	Offline	Error	Causes and Solutions
LED Color Flash Sequence	LED Color Flash Sequence		
13	13	ICB Communications (1)	During ICB Communication, Data Errors are occurring. [Solution] Check ICB Settings and reseal the Cash Box. Clean the Unit. [Relative Part] ICB Board If the condition is not resolved, change the above related part.
26	OFF	Incorrect ICB Settings	During startup, the ICB function is disabled and an ICB-enabled Cash Box is inserted. [Solution] Ensure that ICB is enabled. Clean the ICB Sensors. [Relative Part] CPU Board If the condition is not resolved, change the above related part.
27	OFF	ICB Communications (2)	During startup, ICB is not communicating. [Solution] Check for proper ICB settings. Clean the ICB Sensors. [Relative Part] ICB Circuit Board, ICB Sensors, ICB Cash Box Module If the condition is not resolved, change the above related part or parts.
28	OFF	ICB Checksum	During startup, the ICB data is not correct. [Solution] Initialize the ICB enabled Cash Box by redocking on a Read/Write Tool. [Relative Part] CPU Board, ICB Cash Box Module If the condition is not resolved, change the above related part or parts.
29	OFF	ICB Number	During startup, there is a mismatch between the TBV Machine Number and the Cash Box Machine Number. [Solution] Install a properly initialized Cash Box. [Relative Part] CPU Board, ICB Cash Box Module If the condition is not resolved, change the above related part or parts.
30	OFF	ICB Initialization	The ICB Cash Box has not been initialized. [Solution] Dock the ICB Cash Box on a Read/Write Tool to initialize it. [Relative Part] CPU Board, ICB Cash Box Module If the condition is not resolved, change the above related part or parts.
31	OFF	ICB Module	During ICB Communication, the ICB enabled Cash Box was removed. [Solution] Check ICB Settings and reseal the Cash Box. [Relative Part] Cash Box Sensor, ICB Cash Box Module If the condition is not resolved, change the above related part or parts.

REJECT ERROR CODES

Reject Error Codes apply to a Banknote or Ticket not being accepted, and are indicated by the Bezel LED flashing a **GREEN** color in Test Mode (Offline).



NOTE: In Operational Mode (Online), Reject Errors are not displayed on the Bezel LED, which remains lit **BLUE**.

Count the number of Flashes between pauses to identify the Error, Causes and Solutions.

Table 16 TBV Reject Error Codes

Offline LED Color Flash Sequence	Error	Causes and Solutions
1	Skewed Insertion	A Banknote has been inserted in an incorrect or crooked direction. [Solution] Clean or adjust the following parts. [Relative Parts] Centering Mechanism, Rollers. If the condition is not resolved, change the above related part or parts.
2	Abnormal Magnetic Detection	Magnetic Sensor detected improper levels. [Solution] Clean the Banknote Path. Check that the Banknote is not damaged or exhibiting unfit conditions. [Relative Parts] Magnetic Head If the condition is not resolved, change the above related part.
3	Remaining Banknotes Returned	While initializing, a Banknote was detected in the Unit. [Solution] Clean or adjust the following parts. [Relative Parts] Centering Mechanism, Rollers, Validation Sensors, Entrance and Exit Sensors If the condition is not resolved, change the above related part or parts. Calibrate the Unit.
4	Magnification	While transporting a Banknote, improper Sensor levels were detected. [Solution] Clean the Banknote path. Check that the Banknote is not damaged or exhibiting unfit conditions. [Relative Parts] Validation Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.
5	Banknote Transportation	The Sensors detected improper movement of a Banknote or no Banknote. [Solution] Clean the Rollers and Banknote Path. [Relative Parts] BNF Assignment Sensor, Entrance Sensors, Centering Sensor, Validation Sensors, Feed-out Sensor, Box Feed-out Sensor If the condition is not resolved, change the above related part or parts. Calibrate the Unit.
6	UV Sensor	The UV Sensor detected an abnormal Banknote type. [Solution] Clean and check for foreign material in the Validation area. [Relative Parts] UV Sensors If the condition is not resolved, change the above related part or parts. Calibrate the Unit.
7	Pattern Error	The Sensors detected an abnormal Banknote type. [Solution] Check that the Banknote is not damaged or exhibiting unfit conditions. Clean the Unit. [Relative Parts] Validation Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.

Table 16 TBV Reject Error Codes (Continued)

Offline LED Color Flash Sequence	Error	Causes and Solutions
8	Double Banknote Detected	<p>Sensor detected a double Banknote.</p> <p>[Solution] Check Banknote condition. Clean the Unit.</p> <p>[Relative Parts] BNF Assignment Sensor, Validation Sensors</p> <p>If the condition is not resolved, change the above related part or parts. Calibrate the Unit.</p>
9	Inhibit Setting	<p>The Banknote has been inhibited by DIP Switch Setting or Host Command.</p> <p>[Solution] Check DIP Switch Block 1 or 3 settings.</p> <p>[Relative Parts] BNF Circuit Board, CPU</p> <p>If the condition is not resolved, change the above related part or parts. Calibrate the Unit.</p>
10	Reject Command	<p>The Banknote was returned in response to a Host Command.</p> <p>[Solution] Check for proper communications with the Host computer.</p> <p>[Relative Parts] CPU</p> <p>If the condition is not resolved, change the above related part or parts. Calibrate the Unit.</p>
11	Cash Box Removed	<p>While transporting a Banknote, the Cash Box was removed.</p> <p>[Solution] Reseat the Cash Box. Check Cash Box Sensors. Clean the Unit.</p> <p>[Relative Parts] Cash Box Sensor, Cash Box Lock Sensor</p> <p>If the condition is not resolved, change the above related part or parts.</p>
12	Banknote Detection	<p>The Sensors detected a Banknote with abnormal timing.</p> <p>[Solution] Clean the Banknote Path, Belts and Rollers.</p> <p>[Relative Parts] Entrance, Exit, Validation and Side Sensors, Transport Belts, Transport Rollers</p> <p>If the condition is not resolved, change the above related part or parts. Calibrate the Unit.</p>
13	Banknote Length	<p>The Sensors detected the Banknote Length was longer or shorter than the specified value.</p> <p>[Solution] Clean the Banknote path. Check that the Banknote is not damaged or exhibiting unfit conditions.</p> <p>[Relative Parts] Rollers, Validation Sensors</p> <p>If the condition is not resolved, change the above related part or parts. Calibrate the Unit.</p>
14	Pattern Error 1	<p>The Sensors detected an improper Banknote Pattern.</p> <p>[Solution] Clean the Banknote path. Check that the Banknote is not damaged or exhibiting unfit conditions.</p> <p>[Relative Parts] Validation Sensor</p> <p>If the condition is not resolved, change the above related part. Calibrate the Unit.</p>
15	Authentic Banknote Identity	<p>The Sensors detected a Banknote as invalid.</p> <p>[Solution] Check that the Banknote is not damaged or exhibiting unfit conditions. Clean the Transport Path and Sensors.</p> <p>[Relative Parts] Validation Sensor</p> <p>If the condition is not resolved, change the above related part. Calibrate the Unit.</p>
16	Pattern Error 2	<p>The Sensors detected an improper Banknote Pattern.</p> <p>[Solution] Clean the Banknote path. Check that the Banknote is not damaged or exhibiting unfit conditions.</p> <p>[Relative Parts] Validation Sensor</p> <p>If the condition is not resolved, change the above related part. Calibrate the Unit.</p>

TICKET REJECT ERROR CODES

Ticket Reject Error Codes apply to a Ticket not being accepted, and are indicated by the Bezel LED flashing a **GREEN** color in Test Mode (Offline).



*NOTE: In Operational Mode (Online), Reject Errors are not displayed on the Bezel LED, which remains lit **BLUE**.*

Count the number of Flashes between pauses to identify the Error, Causes and Solutions.

Table 17 TBV Ticket Reject Error Codes

Offline LED Color Flash Sequence	Error	Causes and Solutions
1	Unconfigured Barcode Coupon	Barcode coupon information is not set. [Solution] Check that a proper Barcode Coupon is inserted. Check that Barcode Coupon specifications are set correctly. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Check that a proper Barcode Coupon is inserted. Calibrate the Unit.
2	Format Error	The format does not meet the Barcode Coupons specification. [Solution] Check that a properly formatted Barcode Coupon is inserted. Clean the Transport Path. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.
3	Number of Characters is less or more than its settings	The number of Barcode Coupons characters does not match settings. [Solution] Check that a properly formatted Barcode Coupon is inserted. Clean the Transport Path. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part or parts. Calibrate the Unit.
4	Start Bit Detection Error	The Start Bit of the Barcode Coupon cannot be detected. [Solution] Check that a properly formatted Barcode Coupon is inserted. Clean the Transport Path. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.
5	Stop Bit Detection Error	The Stop Bit of the Barcode Coupon cannot be detected. [Solution] Check that a properly formatted Barcode Coupon is inserted. Clean the Transport Path. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.
6	Barcode Coupon Type Error	The Barcode Coupon Type does not match the settings. [Solution] Check that a properly formatted Barcode Coupon is inserted. Clean the Transport Path. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.
7	Magnification Abnormal	The Sensors detected abnormal Barcode magnification, Light print. [Solution] Check the Barcode Coupon for proper printing. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.

Table 17 TBV Ticket Reject Error Codes (Continued)

Offline LED Color Flash Sequence	Error	Causes and Solutions
8	Double Insertion Error	Two or more Barcoded Coupons were detected. [Solution] Insert a single Barcode Coupon into the Unit. [Relative Parts] BNF Assignment Sensor, Feed-in Sensor If the condition is not resolved, change the above related part or parts. Calibrate the Unit.
9	Reserved	Contact your local JCM Service Representative if this error occurs.
10	Reserved	Contact your local JCM Service Representative if this error occurs.
11	Upside down Insertion	A Barcode Coupon was inserted into the Unit upside down. [Solution] Insert the Barcode Coupon into the Unit in the proper orientation. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.
12	Reserved	Contact your local JCM Service Representative if this error occurs.
13	Barcode Coupon Length Abnormal	The Sensors detected an improper Ticket Length. [Solution] Check that the proper Barcode Coupon is inserted into the Unit. Clean the Transport Path. [Relative Parts] Barcode Sensor, Feed-in Sensor If the condition is not resolved, change the above related part or parts. Calibrate the Unit.
14	ICB Enable/Disable Ticket Read or Setting	The Barcode Coupon inhibited by the settings was inserted. [Solution] Insert a properly formatted Barcode Coupon. Clean the Transport Path. [Relative Parts] Barcode Sensor If the condition is not resolved, change the above related part. Calibrate the Unit.

Lecture Notes

CALIBRATION ERRORS

Tables 18, 19 and 20 provide information about Calibration Error Codes.

These errors are divided into functions:

- UV Sensor Errors (refer to Table 18) are 8 digits, starting with 03, 04 or 06;
- String Detection Sensor Errors (refer to Table 18) are 8 digits, starting with 08;
- Bar Code Errors (refer to Table 19) are 8 digits, starting with 07;
- Positioning Sensor Errors (refer to Table 19) are 8 digits, starting with 09;
- Validation Sensor Errors (refer to Table 20) are 18 digits.

Table 18 Sensor Calibration Error Code Format

Sensor Calibration	Digit Number	Error Code Format
Validation Sensor [D/A Value, non-paper]	18 digits	01-YYYY-YYYY-YYYY-YYYY*
Validation Sensor [with the Reference paper]	18 digits	03-YYYY-YYYY-YYYY-YYYY*
Validation Sensor [non-paper]	18 digits	05-YYYY-YYYY-YYYY-YYYY*
UV [Reflection] Sensor with paper	8 digits	03-000-000
UV [Transmissive] Sensor with paper	8 digits	04-000-000
UV [Transmissive] Sensor non-paper	8 digits	06-000-000
Bar Sensor	8 digits	07-zz-zz-zz†
String Detection Sensor	8 digits	08-zz-zz-zz†
Positioning Sensor	8 digits	09-zz-zz-zz†

* Refer to Table 19 for Sensor Flag Values indicated in the “zz-zz-zz” format.

† Refer to Table 20 for Sensor Flag Values indicated in the “YYYY-YYYY-YYYY-YYYY” format.

Table 19 Sensor Flag Values

(Bar Sensor or Positioning Sensor Calibration Error)

String	Sensor	Sensor Flag Value
INS	Entrance Sensor	00-00-01
WID_PO	Centering Sensor	00-00-02
FEEDOUT	Feed Out Sensor	00-00-04
STK_POS	Box Feed Out Sensor	00-00-08
BOX_FUL	Box Full Sensor	00-00-10
BOX_NFUL	Box Near Full Sensor	00-00-20
STK_HOM	Pusher Plate Home Position Sensor	00-00-40
STK_HAF	Pusher Plate Half-way Position Sensor	00-00-80
BOX_IN	Box Sensor	00-01-00
WID_HOM	Centering Mechanism Home Position Sensor	00-02-00
GS_INS_L	Shutter Unit Home Positioning Sensor (left)	00-04-00
GS_INS_R	Shutter Unit Home Positioning Sensor (right)	00-08-00
BOX_LOK	Box Lock Sensor	00-10-00
GS_HOME	Shutter Unit Home Positioning Sensor	00-20-00
BNF_INS	BNF Entrance Sensor	01-00-00
BNF_MID	BNF Assignment Sensor	02-00-00
BNF_REJ	BNF Reject Sensor	04-00-00
BAR	Bar Sensor	10-00-00

Table 20 Sensor Flag Values
(Validation Sensor Calibration Error)

String	Sensor Flag Value	String	Sensor Flag Value
dll_ore_ref	0000-0000-0000-0001	dl_ir_pen	0000-0000-0400-0000
dl_blu_ref	0000-0000-0000-0002	dc_irl_pen	0000-0000-0800-0000
dc_redl_ref	0000-0000-0000-0004	dr_ir_pen	0000-0000-1000-0000
dr_blu_ref	0000-0000-0000-0008	drr_nir_pen	0000-0000-2000-0000
drr_ore_ref	0000-0000-0000-0010	dll_ore_pen	0000-0000-4000-0000
dl_ir_ref	0000-0000-0000-0020	dl_nir_pen	0000-0000-8000-0000
dc_irl_ref	0000-0000-0000-0040	dc_irr_pen	0000-0001-0000-0000
dc_ir_ref	0000-0000-0000-0080	dr_nir_pen	0000-0002-0000-0000
dc_irr_ref	0000-0000-0000-0100	drr_ore_pen	0000-0004-0000-0000
dll_gre_ref	0000-0000-0000-0200	dll_gre_pen	0000-0008-0000-0000
dc_redr_ref	0000-0000-0000-0400	dl_ore_pen	0000-0010-0000-0000
drr_gre_ref	0000-0000-0000-0800	dc_redr_pen	0000-0020-0000-0000
ull_ore_ref	0000-0000-0000-1000	dr_ore_pen	0000-0040-0000-0000
ul_blu_ref	0000-0000-0000-2000	drr_gre_pen	0000-0080-0000-0000
uc_redl_ref	0000-0000-0000-4000	ull_ore_pen	0000-0100-0000-0000
ur_blu_ref	0000-0000-0000-8000	ul_blu_pen	0000-0200-0000-0000
urr_ore_ref	0000-0000-0001-0000	ur_blu_pen	0000-0400-0000-0000
uc_irl_ref	0000-0000-0002-0000	urr_ore_pen	0000-0800-0000-0000
uc_irr_ref	0000-0000-0004-0000	ull_nir_pen	0000-1000-0000-0000
ull_gre_ref	0000-0000-0008-0000	ul_ore_pen	0000-2000-0000-0000
ul_ir_ref	0000-0000-0010-0000	ur_ore_pen	0000-4000-0000-0000
uc_redr_ref	0000-0000-0020-0000	urr_nir_pen	0000-8000-0000-0000
ur_ir_ref	0000-0000-0040-0000	ull_ir_pen	0001-0000-0000-0000
urr_gre_ref	0000-0000-0080-0000	ul_ir_pen	0002-0000-0000-0000
dc_redl_pen	0000-0000-0100-0000	ur_ir_pen	0004-0000-0000-0000
dll_nir_pen	0000-0000-0200-0000	urr_ir_pen	0008-0000-0000-0000

Lecture Notes

TBV MAINTENANCE EQUIPMENT

Maintenance Equipment required to test a TBV Transaction Based Validator Unit is shown in Figure 15 and listed in Table 21 on page 38.

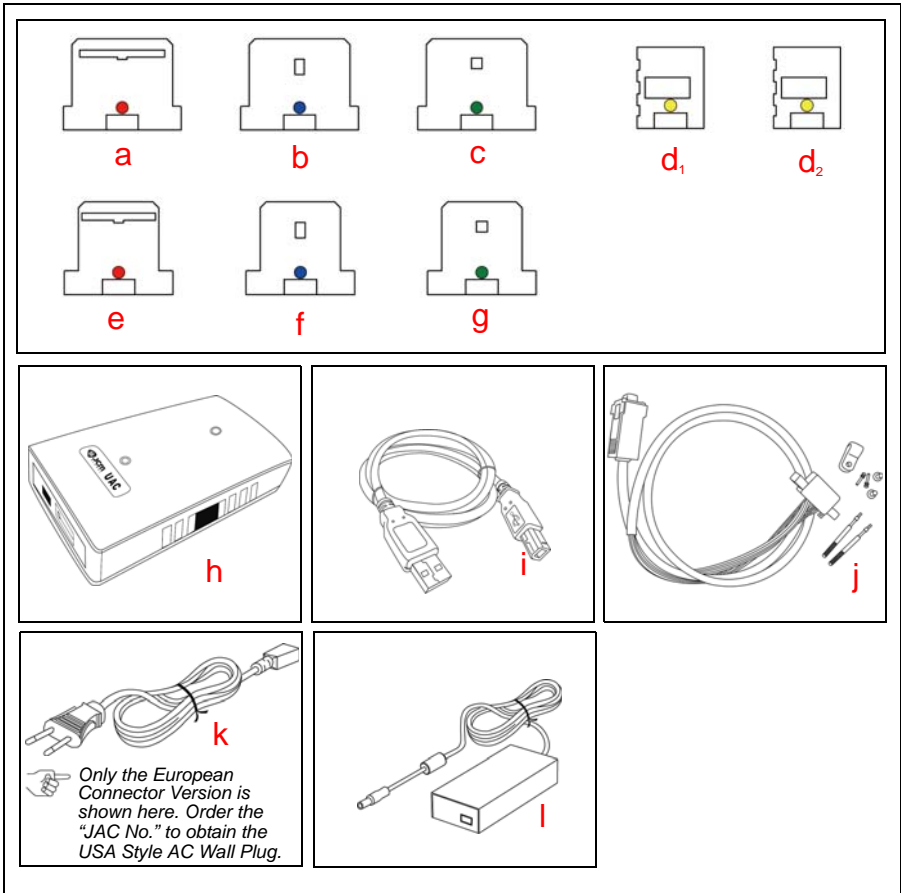


Figure 15 TBV Maintenance Equipment Requirements

Lecture Notes

MAINTENANCE EQUIPMENT PARTS LIST

Table 21 TBV Maintenance Equipment Parts List

Ltr.	EDP No.*	JAC No.	Description	Qty.	Remark
a	191048	N/A	Reference Paper (White: KS-073)	1	For TBV-100
b	191049	N/A	Reference Paper (White: KS-074)	1	For TBV-100
c	191050	N/A	Reference Paper (White: KS-075)	1	For TBV-100
d1	191051	N/A	Reference Paper (White: KS-076)	2	For TBV-100
d2	191051	N/A	Reference Paper (White: KS-076)	2	For TBV-101
e	191052	N/A	Reference Paper (White: KS-077)	1	For TBV-101
f	191053	N/A	Reference Paper (White: KS-078)	1	For TBV-101
g	191054	N/A	Reference Paper (White: KS-079)	1	For TBV-101
h	G00205	501-100218R	UAC	1	
i	G00230	400-100249R	UAC USB Cable	1	
j	G00262	40i-000026R	UAC iVIZION/TBV Harness (ID-003)	1	
k	G00213	302-100007RA	Power Cord	1	For AC Adapter
l	G00286	N/A	AC Adapter	1	For UAC

* Products that include a "G" in their EDP Numbers are JCM-E developed products.

Lecture Notes

PERSONAL NOTES AND COMMENTS

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