Spitronics Diagnostic Codes Manual for TCU

Introduction

The Spitronics Transmission Control Unit continuously monitors sensor inputs, operating conditions and internal controller functions.
When an abnormal condition or system event occurs, the controller records a **Diagnostic Trouble Code (DTC)** in the Diagnostic Log.
Each log entry contains:

- Timestamp
- Diagnostic code number
- Status type
- Description

These codes assist installers and technicians in diagnosing installation problems, signal faults and controller operating conditions.

Diagnostic Code List

Status Types

= Error – Critical fault affecting operation.
= Warning – Operating limit reached or abnormal condition.
= Information – Normal system event or limiter activation.

Code	Type	Description
1	Error	Missing RPM
2	Error	Missing Speed
3	Error	High RPM Signal Detected
4	Error	High Speed Signal Detected
6	Information	Engine stop – No pulses
14	Warning	Battery low voltage limit reached
15	Warning	Selection refreshed – Confirm driver placement
16	Warning	Cold temperature reached
17	Warning	High temperature reached
18	Warning	Over temperature reached
24	Information	Bootloader not present
27	Information	Map reloaded (refresh screen)
28	Information	Map 1 reloaded
29	Information	Map 2 reloaded
30	Information	Map 3 reloaded
31	Information	Map 4 reloaded
231	Error	Receive Data Table Error
232	Error	Receive Single Byte Error
233	Error	Receive Multiple Byte Error

Code	Type	Description
241	Error	Transmit ID Error
242	Error	Transmit Trigger Error
243	Error	Transmit Data Table Error
244	Error	Transmit Real Time Error
245	Error	Transmit Limits Error
250	Information	Start Code
251	Error	Hardware Class Below Firmware Class
252	Error	Incorrect Firmware Type Loaded
253	Error	Code Space Is Erased
254	Error	Incorrect Firmware Number Loaded

Security / Activation Diagnostics

Code	Description
221	Serial Number 1 Failure
222	Serial Number 2 Failure
223	Activation Number 1 Failure
224	Activation Number 2 Failure
225	Activation Number 3 Failure

Communication Diagnostics

Code	Description
231	Receive Data Table Error
232	Receive Single Byte Error
233	Receive Multiple Byte Error
241	Transmit ID Error
242	Transmit Trigger Error
243	Transmit Data Table Error
244	Transmit Real Time Error
245	Transmit Limits Error

Firmware Diagnostics

Code	Description
250	Start Code
251	Hardware Class Below Firmware Class
252	Incorrect Firmware Type Loaded
253	Code Space Is Erased

Code	Description
254	Incorrect Firmware Number Loaded

Diagnostic Code Details (Extended Codes)

TCU Diagnostics

DTC 1 – Missing RPM

Type: Error

Description

The TCU does not detect a valid engine RPM signal.

Possible Causes

- RPM signal not connected
- wiring fault in RPM signal circuit
- incorrect RPM source configuration

Remedy

1. Verify RPM signal wiring.
2. Confirm correct RPM source configuration.
3. Check engine speed signal from ECU.

DTC 2 – Missing Speed

Type: Error

Description

The TCU does not detect a valid vehicle speed signal.

Possible Causes

- speed sensor wiring fault
- faulty speed sensor
- incorrect speed input configuration

Remedy

1. Inspect vehicle speed sensor wiring.
2. Verify sensor operation.
3. Confirm speed input configuration.

DTC 3 – High RPM Signal Detected

Type: Error

Description

The TCU detected an RPM signal outside the expected operating range.

Possible Causes

- electrical interference on RPM signal
- incorrect signal source
- wiring fault

Remedy

1. Inspect RPM wiring.
2. Verify correct RPM signal source.

DTC 4 – High Speed Signal Detected

Type: Error

Description

The TCU detected a Speed signal outside the expected operating range.

Possible Causes

- electrical interference on Speed signal
- faulty speed sensor
- incorrect sensor scaling
- wiring fault

Remedy

1. Inspect speed sensor wiring.
2. Verify speed sensor type and configuration.

DTC 6 – Engine Stop – No Pulses

Type: Information

Description

The TCU detected that the engine stopped due to loss of RPM signal.

Remedy

No action required.

DTC 14 – Battery Low Voltage Limit Reached

Type: Warning

Description

Battery voltage dropped below the configured operating limit.

Possible Causes

- weak battery
- faulty alternator
- poor electrical connections

Remedy

1. Check battery voltage.
2. Inspect power and ground wiring.
3. Verify charging system operation.

DTC 15 – Selection Refreshed – Confirm Driver Placement

Type: Warning

Description

The controller refreshed output driver configuration.

Possible Causes

- configuration change that may influence wiring
- map loaded

Remedy

Verify correct driver configuration.

DTC 16 – Cold Temperature Reached

Type: Warning
Description
Transmission temperature dropped below the configured operating threshold.
Remedy
No action required.

DTC 17 – High Temperature Reached
Type: Warning
Description
Transmission temperature exceeded the configured operating threshold.
Possible Causes
- heavy load operation
- insufficient transmission cooling

Remedy
Inspect transmission cooling system.

DTC 18 – Over Temperature Reached
Type: Warning
Description
Transmission temperature exceeded the critical safety limit.
Possible Causes
- transmission overheating
- cooling system fault

Remedy
1. Stop vehicle operation.
2. Inspect cooling system.

DTC 24 – Bootloader Not Present
Type: Information
Description
The controller bootloader was not detected during system initialization.
Remedy
Reload bootloader firmware if the message persists.

DTC 27 – Map Reloaded
Type: System Event
Description
A different calibration map was loaded.
Remedy
No action required.

DTC 28 – Map 1 Reloaded
DTC 29 – Map 2 Reloaded
DTC 30 – Map 3 Reloaded

DTC 31 – Map 4 Reloaded

Type: System Event

Description

Indicates that the specified calibration map was loaded.

Remedy

No action required.

Activation Diagnostics

DTC 221 – Serial Number 1 Failure

Type: Error

Description

The controller detected an invalid or corrupted Serial Number 1 value.

Possible Causes

- internal memory corruption
- incorrect firmware loaded
- hardware identification mismatch

Remedy

1. Reload correct firmware.
2. Verify correct product firmware is used.
3. Contact Spitronics technical support if the problem persists.

DTC 222 – Serial Number 2 Failure

Type: Error

Description

The controller detected an invalid Serial Number 2 value stored in internal memory.

Possible Causes

- firmware mismatch
- corrupted internal memory

Remedy

1. Reload correct firmware.
2. Restart the controller.
3. Contact technical support if the problem persists.

DTC 223 – Activation Number 1 Failure

Type: Error

Description

The controller detected an invalid activation number.

Possible Causes

- incorrect activation key
- corrupted activation data
- firmware mismatch

Remedy

1. Verify activation key.
2. Reload correct firmware if necessary.

DTC 224 – Activation Number 2 Failure

Type: Error

Description

Activation number validation failed during system startup.

Possible Causes

- invalid activation key
- corrupted activation memory

Remedy

1. Verify product activation data.
2. Reload firmware if required.

DTC 225 – Activation Number 3 Failure

Type: Error

Description

The controller failed to validate the third activation parameter.

Possible Causes

- incorrect firmware
- activation data corruption

Remedy

1. Verify activation configuration.
2. Reload firmware if necessary.

Communication Diagnostics Details

DTC 231 – Receive Data Table Error

Type: Error

Description

An error occurred while receiving a data table from the communication interface.

Possible Causes

- corrupted communication data
- unstable communication link
- software communication interruption

Remedy

1. Restart communication with the ECU.
2. Reload calibration data if necessary.

DTC 232 – Receive Single Byte Error

Type: Error

Description

The controller detected an error while receiving a single byte of data.

Possible Causes

- communication noise
- unstable connection
- corrupted data packet

Remedy

1. Restart software communication.
2. Check communication cable or interface.

DTC 233 – Receive Multiple Byte Error

Type: Error

Description

An error occurred while receiving a multi-byte data packet.

Possible Causes

- communication interruption
- corrupted data transmission

Remedy

1. Restart communication session.
2. Reload data if required.

Transmit Communication Diagnostics

DTC 241 – Transmit ID Error

Type: Error

Description

The controller detected an error while transmitting an identification message.

Possible Causes

- communication protocol mismatch
- corrupted transmission data

Remedy

1. Restart communication with the controller.

DTC 242 – Transmit Trigger Error

Type: Error

Description

An error occurred while transmitting a trigger message.

Possible Causes

- communication timing error
- protocol mismatch

Remedy

Restart communication session.

DTC 243 – Transmit Data Table Error

Type: Error

Description

The controller encountered an error while transmitting calibration table data.

Possible Causes

- corrupted data table
- communication interruption

Remedy

Reload calibration map.

DTC 244 – Transmit Real Time Error

Type: Error

Description

The controller encountered an error while transmitting real-time data.

Possible Causes

- unstable communication connection
- software interruption

Remedy

Restart communication with the ECU.

DTC 245 – Transmit Limits Error

Type: Error

Description

The controller detected an error while transmitting system limits or configuration data.

Possible Causes

- corrupted configuration data
- communication interruption

Remedy

Reload calibration data.

Firmware Diagnostics

DTC 250 – Start Code

Type: Information

Description

Indicates that the controller firmware has started successfully.

Remedy

No action required.

DTC 251 – Hardware Class Below Firmware Class

Type: Error

Description

The firmware loaded requires a hardware class higher than the current controller hardware.

Possible Causes

- incorrect firmware version loaded

Remedy

1. Load firmware compatible with the controller hardware.

DTC 252 – Incorrect Firmware Type Loaded

Type: Error

Description

The firmware type loaded does not match the controller product type.

Possible Causes

- incorrect firmware selected

Remedy

1. Load the correct firmware for the controller.

DTC 253 – Code Space Is Erased

Type: Error

Description

The controller firmware code space is empty or corrupted.

Possible Causes

- incomplete firmware programming
- memory corruption

Remedy

1. Reload firmware.

DTC 254 – Incorrect Firmware Number Loaded

Type: Error

Description

The firmware number does not match the controller requirements.

Possible Causes

- incorrect firmware package

Remedy

1. Install correct firmware version.