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1997 MAZDA MX-6 OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
10	**INSPECT ION SENSOR No.2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Verify that the ignition coil/ion sensor No.2 and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between ignition coil/ion sensor No.2 terminal C (wiring harness-side) and PCM terminal 1AE (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between ignition coil/ion sensor No.2 terminal C and PCM terminal 1AE. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 12.
11	**INSPECT ION SENSOR No.2** • Inspect the ion sensor No.2. (See ION SENSOR INSPECTION [SKYACTIV-G (WITHOUT EGR COOLER)].) • Is there any malfunction?	Yes	Replace the ignition coil/ion sensor No.2, then go to the next step. (See IGNITION COIL/ION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
12	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
13	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	PURPOSE: RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the FREEZE FRAME DATA/snapshot data on the repair order.	–	Go to the next step.
3	PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY OTHER RELATED DTCs OCCURRING • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE/DTC P0335:00, P0365:00, P2090:00 or P2091:00 also present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P0335:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0365:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P2090:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P2091:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) Go to the next step.
		No	Go to the next step.
4	PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY DTC OCCURRING FROM ENGINE OIL PRESSURE SENSOR • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE/DTC P0524:00 also present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P0524:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) Go to the next step.
		No	Go to the next step.
5	PURPOSE: VERIFY CONFORMITY OF ACTUAL EXHAUST VALVE TIMING AND DETERMINE IF MALFUNCTION IS CAUSED BY OCV FOR HYDRAULIC VARIABLE VALVE TIMING OR CONNECTOR RELATED • Start the engine and idle it. • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — VT_EX_ACT — VT_EX_DES • Implement the repeatability verification procedure. (See Repeatability Verification Procedure.) • Does the monitor value of the PID item VT_EX_ACT conform to the VT_EX_DES PID value?	Yes	Go to the next step.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

STEP	INSPECTION	RESULTS	ACTION
10	PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION • Is any other DTC or pending code stored?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

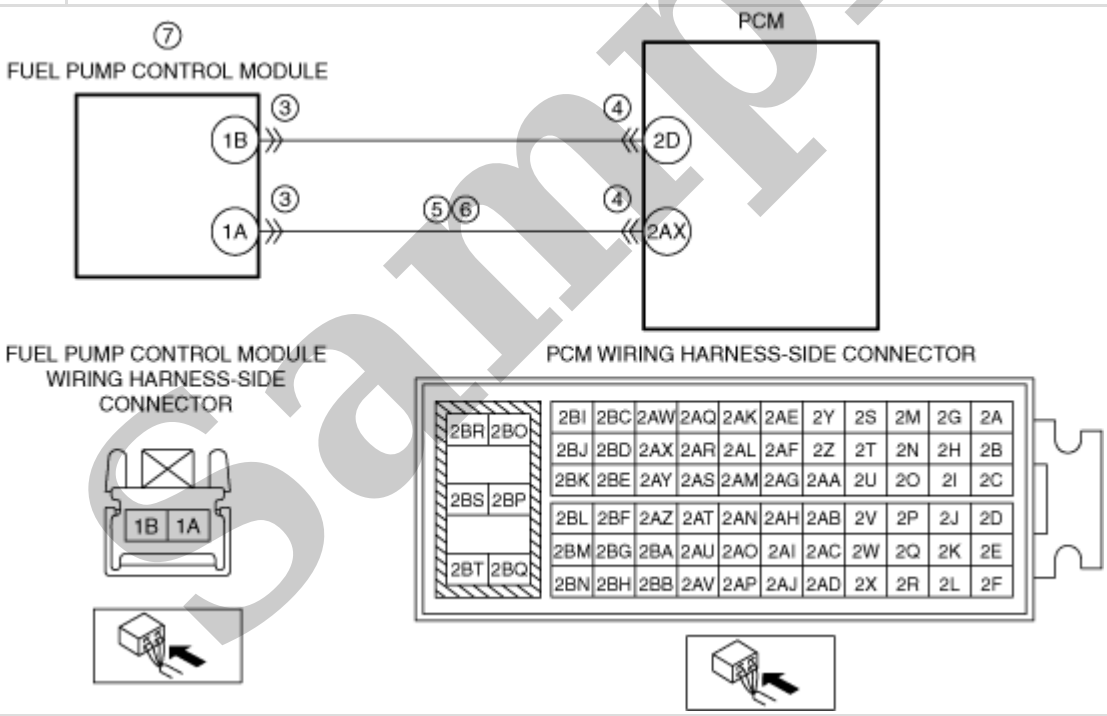
STEP	INSPECTION	RESULTS	ACTION
1	**PURPOSE: VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**PURPOSE: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA** • Is the DTC P0087:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
3	**PURPOSE: RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION** **Note** **• Recording can be facilitated using the screen capture function of the PC.** • Record the FREEZE FRAME DATA/snapshot data on the repair order.	–	Go to the next step.
4	**PURPOSE: VERIFICATION IF MALFUNCTION CAUSED BY LACK OF FUEL** • Verify the snapshot data FLI. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the snapshot data FLI 5% or less?	Yes	Refill the fuel. Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 3.
		No	Go to the next step.
5	**PURPOSE: VERIFY RELATED PENDING CODE AND/OR DTC** • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Are any other PENDING CODEs and/or DTCs present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) Go to the next step.
		No	Go to the next step.
6	**PURPOSE: VERIFY CONNECTOR CONNECTIONS** • Start the engine. • Access the FUEL_PRES PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Does the PID value fluctuate when the following connectors are shaken? — Fuel pressure sensor — PCM	Yes	Repair or replace the applicable wiring harness or connector parts. Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 3.
		No	Go to the next step.

DTC P025C:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896637

id0102s900840

DTC P025C:00	Fuel pump control module result of on-board diagnostic test low input
DETECTION CONDITION	• Result of on-board test cannot be received from fuel pump control module (voltage is too low). Diagnostic support note • This is a continuous monitor (CCM). • The check engine light does not illuminate. • FREEZE FRAME DATA is not available. • Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Fuel pump control module connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between fuel pump control module terminal 1A and PCM terminal 2AX • Open circuit in wiring harness between fuel pump control module terminal 1A and PCM terminal 2AX • Fuel pump control module malfunction • PCM malfunction



Diagnostic Procedure

DTC P025D:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896638

id0102s900850

DTC P025D:00	**Fuel pump control module result of on-board diagnostic test high input**
DETECTION CONDITION	• Result of on-board test cannot be received from fuel pump control module (voltage is too high). **Diagnostic support note** • This is a continuous monitor (CCM). • The check engine light does not illuminate. • FREEZE FRAME DATA is not available. • Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Fuel pump control module connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between fuel pump control module terminal 1A and PCM terminal 2AX • Open circuit in wiring harness between fuel pump control module terminal 1A and PCM terminal 2AX • Fuel pump control module malfunction • Short to ground in wiring harness between fuel pump relay terminal D and fuel pump control module terminal 2A • Short to power supply in wiring harness between fuel pump relay terminal D and fuel pump control module terminal 2A • Open circuit in wiring harness between fuel pump relay terminal D and fuel pump control module terminal 2A • Fuel pump relay malfunction • Short to ground or open circuit in fuel pump relay power supply circuit: — Short to ground in wiring harness between battery positive terminal and fuel pump relay terminal C — MAIN 200 A fuse and/or FUEL PUMP 15 A fuse malfunction — Open circuit in wiring harness between battery positive terminal and fuel pump relay terminal C • PCM malfunction

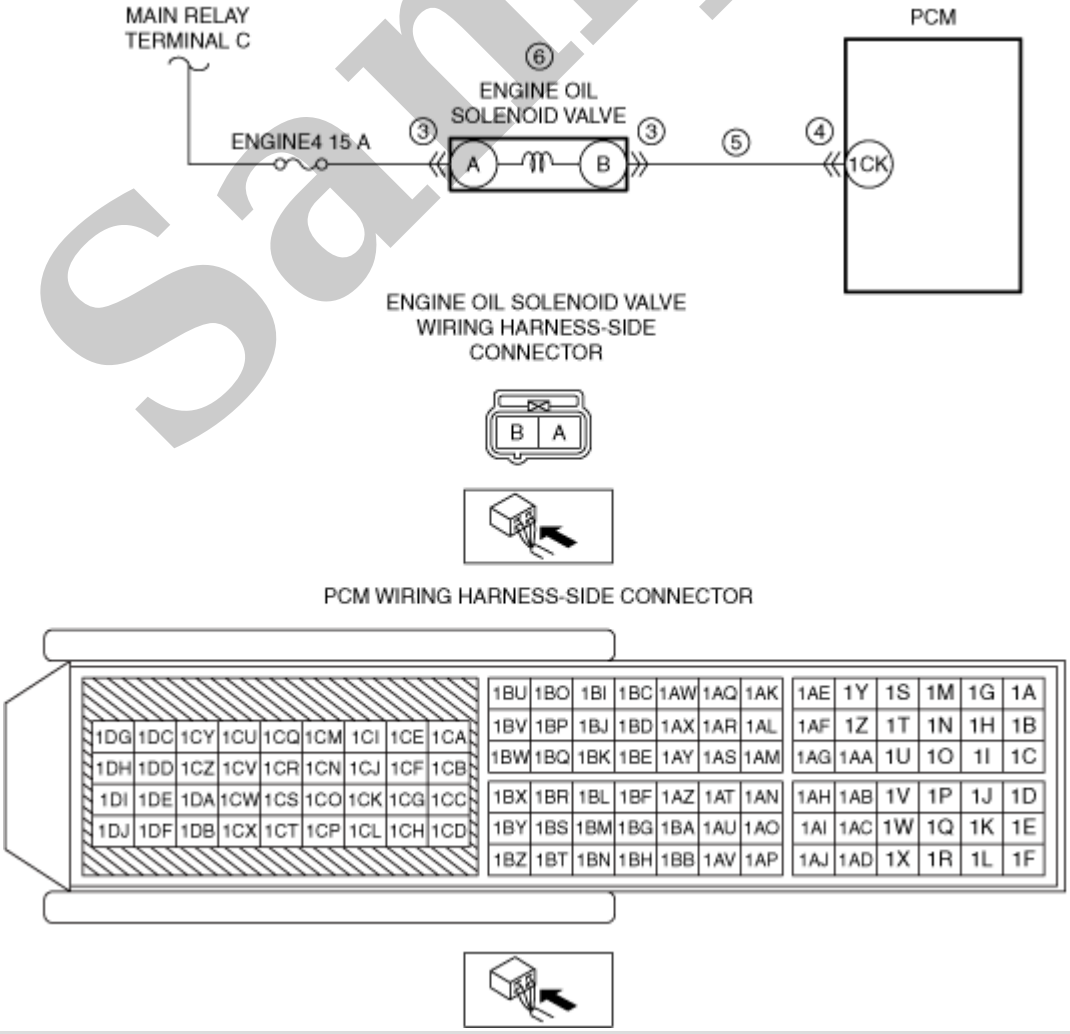
STEP	INSPECTION	RESULTS	ACTION
8	**INSPECT FUEL PUMP RELAY CONTROL CIRCUIT FOR SHORT TO GROUND** • Remove the fuel pump relay. • Verify that the fuel pump control module and PCM connectors are disconnected. • Inspect for continuity between fuel pump relay terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between fuel pump relay terminal D and fuel pump control module terminal 2A. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to ground. Go to Step 13.
		No	Go to the next step.
9	**INSPECT FUEL PUMP RELAY CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that fuel pump relay is removed. • Verify that the fuel pump control module and PCM connectors are disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the fuel pump relay terminal D (wiring harness-side). • Is the voltage 0 V?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between fuel pump relay terminal D and fuel pump control module terminal 2A. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to power supply. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to power supply. Go to Step 13.
10	**INSPECT FUEL PUMP RELAY CONTROL CIRCUIT FOR OPEN CIRCUIT** • Verify that fuel pump relay is removed. • Verify that the fuel pump control module and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between fuel pump relay terminal D (wiring harness-side) and fuel pump control module terminal 2A (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between fuel pump relay terminal D and fuel pump control module terminal 2A. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 13.
11	**INSPECT FUEL PUMP RELAY** • Verify that fuel pump relay is removed. • Inspect the fuel pump relay. (See RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the fuel pump relay, then go to Step 13.
		No	Go to the next step.

DTC P06DC:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896682

id0102s921400

DTC P06DC:00	Engine oil solenoid valve control circuit high input
DETECTION CONDITION	• If the PCM detects that the engine oil solenoid valve control current at the PCM terminal 1CK is specified value or more for 4 s with the following condition met, the PCM determines that the engine oil solenoid valve circuit voltage is high. MONITORING CONDITIONS — Battery voltage: 8–16 V — 0.5 s have elapsed after the ignition was switched ON (engine off or on) — Engine oil solenoid valve control duty value: 5% or more Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is not stored in the PCM memory.
FAIL-SAFE FUNCTION	• PCM restricts engine torque.
POSSIBLE CAUSE	• Engine oil solenoid valve connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between engine oil solenoid valve terminal B and PCM terminal 1CK • Engine oil solenoid valve malfunction • PCM malfunction



DTC B10A2:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896683

id0102s921520

Note

• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

Details On DTCs

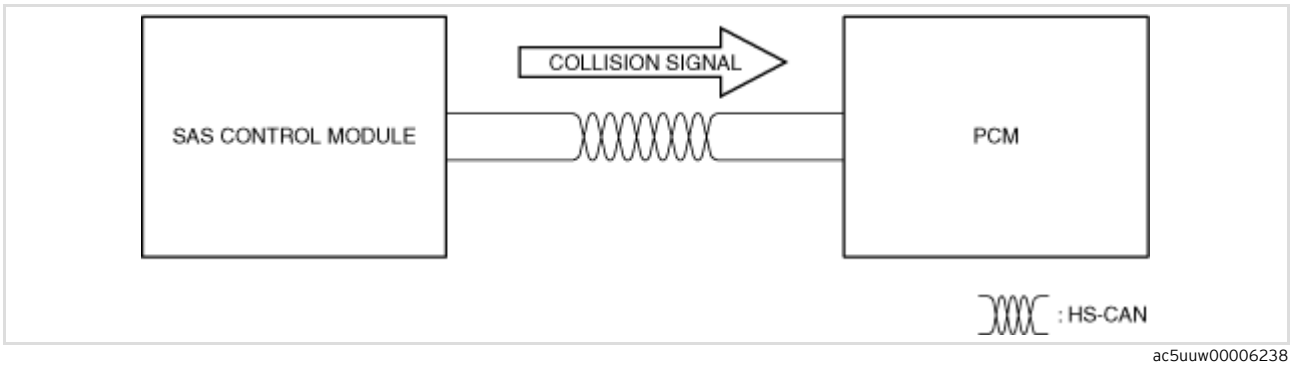
DESCRIPTION	Vehicle collision	
DETECTION CONDITION	Determination conditions	• A collision signal from the SAS control module is received.
	Preconditions	• Not applicable.
	Drive cycle	• 1
	Self test type	• CMDTC self test
	Sensor used	• PCM
FAIL-SAFE FUNCTION	• Stops fuel injection control • Stops fuel pump control • Stops ignition control • Stops engine coolant fan control	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Stops fuel pump operation when ignition is switched ON • Delays starter operation during cranking for maximum 1.2 s.	
POSSIBLE CAUSE	• Vehicle is involved in collision (collision signal from SAS control module is received) • SAS control module malfunction • PCM malfunction	

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• During a collision, the SAS control module sends a collision signal to the PCM via the CAN signal. The PCM records a DTC by receivin
a collision signal.
• This DTC does not indicate a part malfunction. It indicates operation of fail-safe from safety assurance during a vehicle collision.



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Repeatability Verification Procedure