2012 - Mazda6 - Engine

DTC P0442:00, P0455:00, P0456:00 [MZR 2.5]

DTC P0442:00	EVAP system leak detected (small leak)
DTC P0455:00	EVAP system leak detected (gross leak/no flow)
DTC P0456:00	EVAP system leak detected (very small leak)
DETECTION CONDITION	• P0442:00 indicates that a leak has been detected as small as **1 mm {0.04 in}** in the EVAP vapor management valve solenoid system when there is **less than 0.809 kPa {6.09 mmHg, 0.24 inHg}** bleed-up **over 20 s** at **75 %** fuel fill. Bleed-up and evaluation time vary as a function of fuel fill level. The vapor generation limit is **more than 0.286 kPa {2.15 mmHg, 0.085 inHg} over 150 s**. • P0455:00 indicates that a substantial leak or blockage has been detected in the EVAP system when there is **−1.94 kPa {−14.6 mmHg, −0.575 inHg} or less** vacuum for **75 s** evaluation time. • P0456:00 indicates that a fuel vapor leak from an opening as small as **0.508 mm {0.020 in}** has been detected by the EVAP running loss monitor test. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.

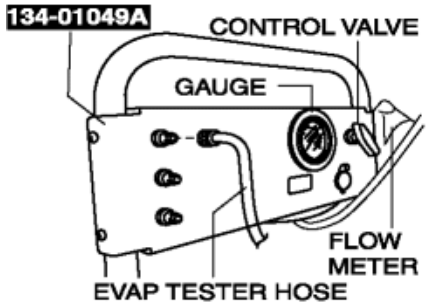
	DTC P0442:00, P0456:00
	• After-market EVAP hardware (such as fuel filler cap) nonconforming to required specifications
	• Fuel filler cap loosely installed
	• Small leaks in components
	  ▪ CV solenoid is not seated on the charcoal canister
	  ▪ Cut or loose connection in the fuel vapor hoses/tubes
	  ▪ Fuel filler pipe damaged
	• Fuel filler cap and fuel filler pipe damaged
	• CV solenoid valve malfunction

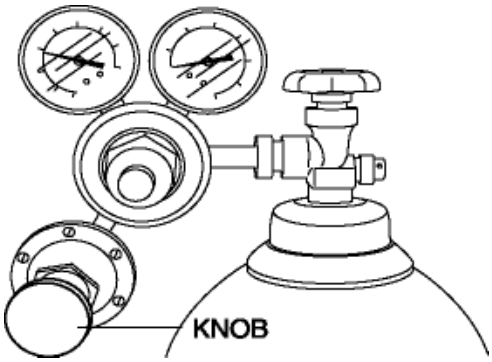
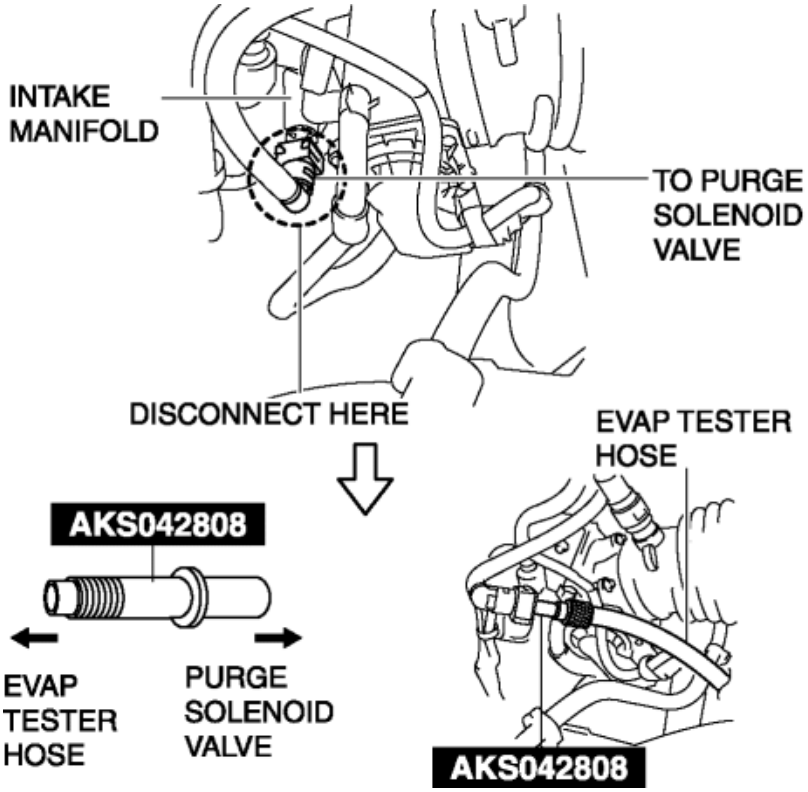
POSSIBLE CAUSE	• Leaks in complete EVAP system • Small leaks from EVAP system return tube to charcoal canister • Small leaks between fuel tank vapor tube and fuel tank filler pipe • PCM malfunction **DTC P0455:00** • Purge solenoid valve related part malfunction ▪ Blockage or loose vacuum hose between intake manifold and purge solenoid valve ▪ Purge solenoid valve malfunction (blockage) • After-market EVAP hardware (such as fuel filler cap) not conforming to required specifications • Large EVAP system leak ▪ Fuel filler cap malfunction (damaged, missing or loosely installed) ▪ Both the input port vacuum hose and EVAP return tube are not attached to the CV solenoid valve ▪ CV solenoid valve is not attached to the charcoal canister ▪ Fuel vapor hoses/tubes disconnected or cracked ▪ Fuel filler pipe and the fuel tank damaged • Blockage between CV solenoid valve and fuel vapor hose joint • CV solenoid valve malfunction • Fuel tank pressure sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**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.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Switch the ignition to off, then to the ON (engine off). • Verify related pending code or stored DTCs. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Are any other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See **DTC TABLE [MZR 2.5]**.)
		No	Go to the next step.
4	**VERIFY DTC FOR SMALL LEAK** • Is the DTC P0456:00 stored?	Yes	Go to Step 9.
		No	Go to the next step.
5	**VERIFY DTC FOR LARGE LEAK** • Is the DTC P0455:00 stored?	Yes	Verify that the purge solenoid valve is not blocked. If the purge solenoid valve is functioning correctly and receiving engine vacuum, go to the next step.
		No	Go to the next step.
6	**PRELIMINARY LEAK TEST (EXCEPT P0456:00)** • Perform the EVAP system leak inspection using the M-MDS. • Verify that all PIDs are within the following specifications: **NOTE:** • To successfully perform this procedure, all PIDs must be within specification before proceeding to the next step. ▪ Select the following items from the initialization screen of the M-MDS. ▪ Select "Powertrain". ▪ Select "Fuel". ▪ Select "EVAP Test". ▪ Verify that ECT and IAT are within specification at the confirmation screen. To successfully perform this procedure, ECT and IAT must be within specification before proceeding to the next step. ▪ The fuel level must be maintained within **15% —85%** . The PCM will cancel the EVAP test if the fuel level is **lower than 15%** or **higher than 85%** . ▪ Allow the M-MDS to run the EVAP test. • Does M-MDS indicate an EVAP system leak exists?	Yes	Go to the next step.
		No	Go to Step 9.
7	**PRELIMINARY LEAK TEST (EXCEPT P0456:00)** • Tighten the fuel-filler cap then repeat the EVAP system leak inspection using the M-MDS again.	Yes	Go to the next step.

	• Verify that all PIDs are within the following specifications: **NOTE:** • To successfully perform this procedure, all PIDs must be within specification before proceeding to the next step. ▪ Select the following items from the initialization screen of the M-MDS. ▪ Select "Powertrain". ▪ Select "Fuel". ▪ Select "EVAP Test". ▪ Verify that ECT and IAT are within specification at the confirmation screen. To successfully perform this procedure, ECT and IAT must be within specification before proceeding to the next step. ▪ The fuel level must be maintained within **15% —85%** . The PCM will cancel the EVAP test if the fuel level is **lower than 15%** or **higher than 85%** . ▪ Allow the M-MDS to run the EVAP test. • Does M-MDS still indicate an EVAP system leak exists?	No	The fuel cap was not properly tightened. Go to Step 15.
8	**VISUALLY INSPECT COMPONENTS FOR LEAKS (EXCEPT P0456:00)** • Verify that the CV solenoid valve is properly seated on the charcoal canister. • Visually inspect for cut or loose connections to the fuel vapor hoses/tubes in the following locations: ▪ Charcoal canister to CV solenoid valve. ▪ Charcoal canister to evaporative emission valve component. ▪ Evaporative emission valve component to the fuel tank (if applicable). ▪ Check for fuel-filler pipe damage. • Is a concern with a hose, tube, connection or valve visually evident?	Yes	Repair or install a new component if necessary. Afterwards, verify that the leak is repaired by repeating diagnostic Step 6. If the leak is repaired, go to Step 15.
		No	Go to the next step.
9	**CALIBRATE THE LEAK TESTER FOR DIAGNOSIS** • Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.  • Connect the EVAP Tester Hose (part of the **SST**) to the SELF-TEST port located on the control panel. Hand tighten the fitting. (Do not overtighten.)	Yes	Go to the next step.
		No	Refer to the tester operator's manual for tester repair instructions.

	• Turn the control valve to the TEST position; the gauge should read **331—381 mm {13—15 in}** of water. **NOTE:** • If the gauge is not reading in this range, adjust the pressure by turning the black knob on the low pressure regulator at the nitrogen bottle.  • After verifying the regulator is properly calibrated, turn the control valve to the HOLD position. • Verify that the gauge holds pressure and that the flow meter reads no flow. • Does the gauge hold pressure and the flow meter read no flow?		
10	**PRESSURIZE THE EVAP SYSTEM WITH NITROGEN TO TEST FOR LEAKS** • Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve. • Disconnect the purge solenoid valve hose from the intake manifold and insert **SST** AKS042808 into the purge solenoid valve hose.  • Connect the EVAP Tester Hose to **SST** AKS042808. • Connect the M-MDS to the DLC-2.	Yes	Go to Step 13 to locate the leak.
		No	EXCEPT P0456:00, go to the next step. If diagnosing P0456:00, go to Step 12.

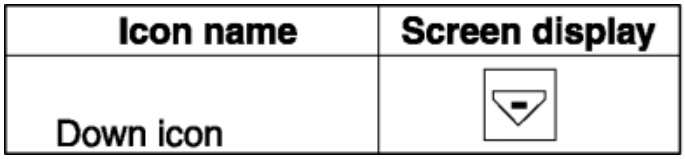
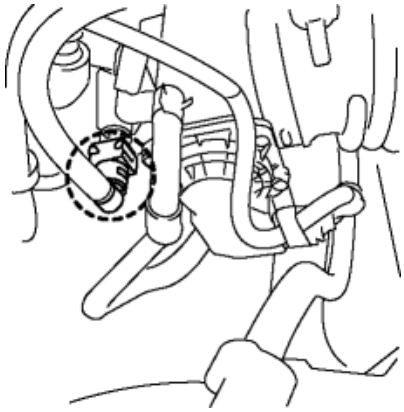
- Switch the ignition to ON (engine off).
- Access the datalogger for the PCM.
- Press the eraser icon to deselect the highlighted PIDs.

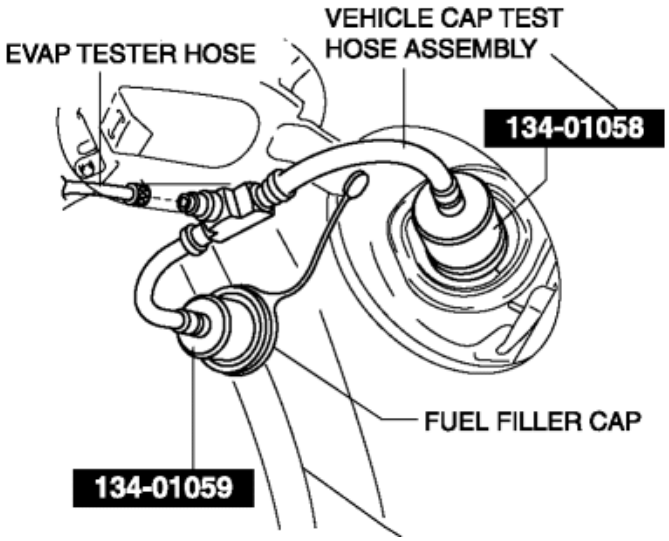
Icon name	Screen display
Eraser icon	
Tick icon	
Control item activate icon	
Control icon	
Up icon	

- Select PIDs EVAPCP and EVAPCV, then click the tick icon.
- Command EVAPCP to 100% duty cycle to open the purge solenoid valve.
    - To open the purge solenoid valve, click the control item activate icon.
    - Click the EVAPCP box on the left-hand side of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon.
- Each click increases the duty cycle by **10%** .
- Continue clicking until the M-MDS shows the purge solenoid valve is open **100%** .
- Command EVAPCV to ON to Close the CV solenoid valve.
    - To close the CV solenoid valve, click the control item activate icon.
    - Click the EVAPCV box in the upper left-hand corner of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon (the EVAPCV should now be on).
- Turn the control valve to the TEST position and let the system fill. A drop in the gauge pressure should be noted along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses.

  NOTE:

    - If the gauge and the flow meter do not settle to a measurable level after **2—3 min**, then refer to the

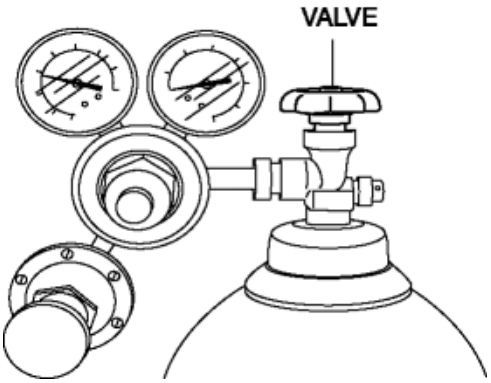
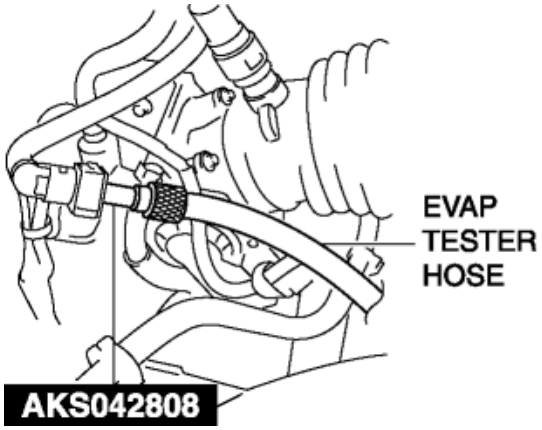
	Mazda Workshop Manual to verify that the canister vent valve is properly closed. If the canister vent valve is properly closed, the EVAP system has a large leak. • Does the test indicate that a leak exists?		
11	**CHECKING SYSTEM FOR BLOCKAGE** • Leave the tester in the test position • Using the M-MDS datalogger, command the CV solenoid valve open. ▪ To open the CV solenoid valve, click the down icon (the EVAPCV should now be off).  • Does the flow indicator in the flow meter immediately jump to the top?	Yes	Go to the next step
		No	System is blocked between the CV solenoid valve and the fuel tank pressure sensor; locate and remove blockage then perform Step 10.
12	**PRESSURIZE THE EVAP SYSTEM WITH NITROGEN TO TEST THE PURGE SOLENOID FOR LEAKAGE** • Reconnect the purge solenoid valve hose.  • Verify that the control valve on the panel is in the HOLD position. • Remove the fuel-filler cap from the vehicle. • If the fuel-filler cap is not a MAZDA part or equivalent, replace it. **NOTE:** • INSPECT FUEL-FILLER CAP AND FILLER NECK ▪ Visually inspect for damage, insufficient sealing, rust, cracks or warps on the filler cap and filler neck ▪ Repair or replace if necessary • Connect the receiver assembly (**SST**: 134-01059) to the vehicle cap test hose assembly (part of the **SST**) and the fuel-filler cap from the vehicle.	Yes	Replace the purge valve then go to the next step.
		No	Go to the next step.

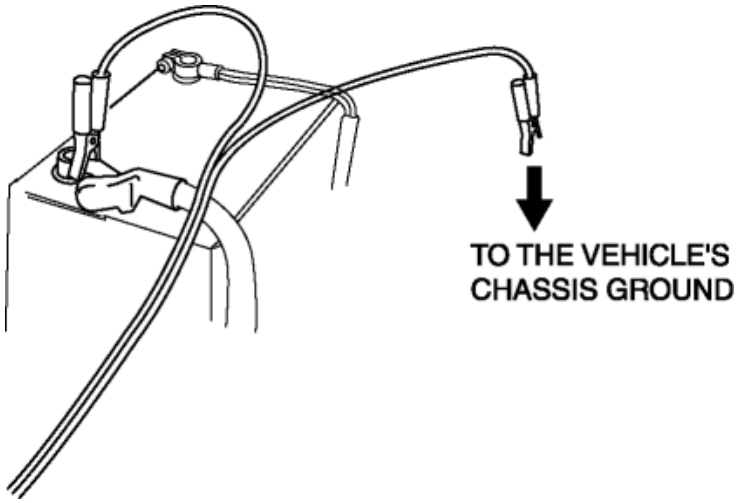


- Connect the cap adaptor (**SST**: 134-01058) to the vehicle cap test hose assembly (part of the **SST**) and to the fuel-filler neck.
- Connect the EVAP Tester Hose (part of the **SST**) to the center fitting of the vehicle cap test hose assembly (part of the **SST**).
- Connect the M-MDS to the DLC-2.
- Switch the ignition to ON (engine off).
- Access the datalogger for the PCM.
- Press the eraser icon to deselect the highlighted PIDs.

Icon name	Screen display
Eraser icon	
Tick icon	
Control item activate icon	
Control icon	
Up icon	

- Select PID EVAPCV, then click the tick icon.
- Command EVAPCV to ON to close the CV solenoid valve.
    - To close the CV solenoid valve, click the control item activate icon.
    - Click the EVAPCV box in the upper left-hand corner of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon (the EVAPCV should now be on).

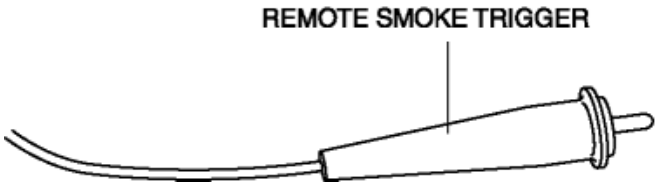
	Verify that the valve on the nitrogen bottle is still open.  • Turn the control valve to the TEST position and let the system fill. A drop in the gauge pressure should be noted along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses. • Does the test indicate that a leak exists?		
13	**LOCATE LEAKAGE POI NT** • Verify that the control valve on the panel is in the HOLD position and the valve on the nitrogen bottle valve is open. • Disconnect the purge solenoid valve hose from the intake manifold and insert **SST** AKS042808 into the purge solenoid valve hose.  • Connect the EVAP Tester Hose to **SST** AKS042808. • Connect the 12 volt power connector leads on the smoke generation unit to the vehicle’s battery. Make sure to connect the red lead to the positive post (+) or power, and the black lead to the vehicle’s chassis ground.	Yes	Repair or install a new component if necessary. Go to the next step.
		No	Check all EVAP connections. Conduct diagnosis of intermittent concerns, then go to the next step.



- Connect the M-MDS to the DLC-2.
- Switch the ignition to ON (engine off).
- Access the datalogger for the PCM.
- Press the eraser icon to deselect the highlighted PIDs.

Icon name	Screen display
Eraser icon	
Tick icon	
Control item activate icon	
Control icon	
Up icon	

- Select PIDs EVAPCP and EVAPCV, then click the tick icon.
- Command EVAPCP to **100%** duty cycle to open the purge solenoid valve.
    - To open the purge solenoid valve, click the control item activate icon.
    - Click the EVAPCP box on the left-hand side of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon.
- Each click increases the duty cycle by 10%.
- Continue clicking until the M-MDS shows the purge solenoid valve is open 100%.
- Command EVAPCV to ON to close the CV solenoid valve.
    - To close the CV solenoid valve, click the control item activate icon.

	▪ Click the EVAPCV box in the upper left-hand corner of the screen to select it ▪ Click the control icon on the right-hand side of the screen. ▪ Click the up icon immediately below the control icon (the EVAPCV should now be on). • Turn the control valve to the TEST position. • Press the remote smoke trigger on the smoke generation unit and let the system fill with smoke.  **NOTE:** • It may be necessary to lift the vehicle to provide sufficient clearance underneath to conduct a proper visual inspection of the fuel and EVAP system. • NEVER depress the remote smoke trigger before opening the nitrogen tank valve and setting the tester control valve to TEST • Use a 12 volt 400,000 candle power spot light (part # 4410000-100) or equivalent to help locate the smoke. • Is a leak detected?		
14	**VERIFY LEAK IS REPAIRED** • Were you diagnosing DTC P0456:00?	Yes	Verify that the leak is repaired by repeating diagnostic Step 10. If the leak is repaired, go to the next step.
		No	Verify that the leak is repaired by repeating diagnostic Step 6. If the leak is repaired, go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	DTC troubleshooting completed.

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DTC P0442:00, P0455:00, P0456:00 [MZR 2.5]

DTC P0442:00	EVAP system leak detected (small leak)
DTC P0455:00	EVAP system leak detected (gross leak/no flow)
DTC P0456:00	EVAP system leak detected (very small leak)
DETECTION CONDITION	• P0442:00 indicates that a leak has been detected as small as **1 mm {0.04 in}** in the EVAP vapor management valve solenoid system when there is **less than 0.809 kPa {6.09 mmHg, 0.24 inHg}** bleed-up **over 20 s** at **75 %** fuel fill. Bleed-up and evaluation time vary as a function of fuel fill level. The vapor generation limit is **more than 0.286 kPa {2.15 mmHg, 0.085 inHg} over 150 s**. • P0455:00 indicates that a substantial leak or blockage has been detected in the EVAP system when there is **−1.94 kPa {−14.6 mmHg, −0.575 inHg} or less** vacuum for **75 s** evaluation time. • P0456:00 indicates that a fuel vapor leak from an opening as small as **0.508 mm {0.020 in}** has been detected by the EVAP running loss monitor test. **Diagnostic support note** • This is an intermittent monitor (EVAP system). • The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.

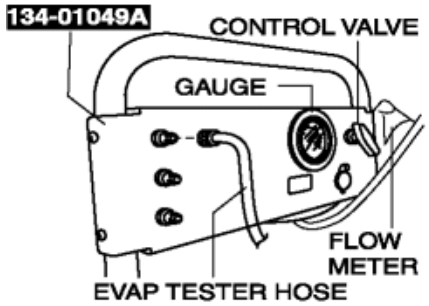
	DTC P0442:00, P0456:00
	• After-market EVAP hardware (such as fuel filler cap) nonconforming to required specifications
	• Fuel filler cap loosely installed
	• Small leaks in components
	  ▪ CV solenoid is not seated on the charcoal canister
	  ▪ Cut or loose connection in the fuel vapor hoses/tubes
	  ▪ Fuel filler pipe damaged
	• Fuel filler cap and fuel filler pipe damaged
	• CV solenoid valve malfunction

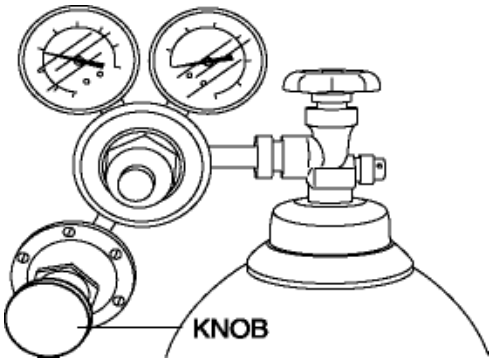
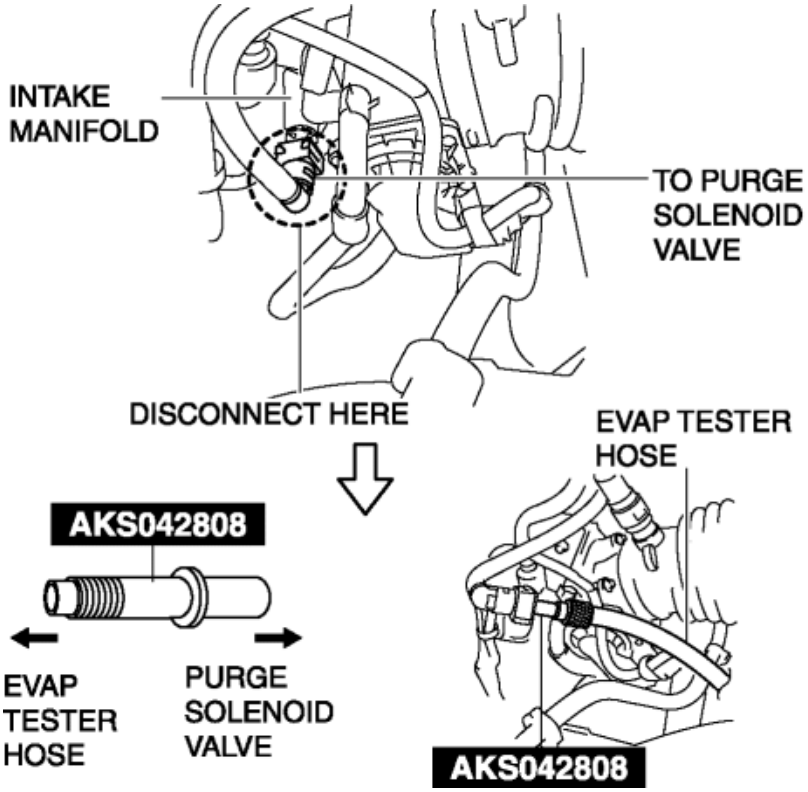
POSSIBLE CAUSE	• Leaks in complete EVAP system • Small leaks from EVAP system return tube to charcoal canister • Small leaks between fuel tank vapor tube and fuel tank filler pipe • PCM malfunction **DTC P0455:00** • Purge solenoid valve related part malfunction ▪ Blockage or loose vacuum hose between intake manifold and purge solenoid valve ▪ Purge solenoid valve malfunction (blockage) • After-market EVAP hardware (such as fuel filler cap) not conforming to required specifications • Large EVAP system leak ▪ Fuel filler cap malfunction (damaged, missing or loosely installed) ▪ Both the input port vacuum hose and EVAP return tube are not attached to the CV solenoid valve ▪ CV solenoid valve is not attached to the charcoal canister ▪ Fuel vapor hoses/tubes disconnected or cracked ▪ Fuel filler pipe and the fuel tank damaged • Blockage between CV solenoid valve and fuel vapor hose joint • CV solenoid valve malfunction • Fuel tank pressure sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**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.
3	**VERIFY RELATED PENDING CODE OR STORED DTCs** • Switch the ignition to off, then to the ON (engine off). • Verify related pending code or stored DTCs. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Are any other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See **DTC TABLE [MZR 2.5]**.)
		No	Go to the next step.
4	**VERIFY DTC FOR SMALL LEAK** • Is the DTC P0456:00 stored?	Yes	Go to Step 9.
		No	Go to the next step.
5	**VERIFY DTC FOR LARGE LEAK** • Is the DTC P0455:00 stored?	Yes	Verify that the purge solenoid valve is not blocked. If the purge solenoid valve is functioning correctly and receiving engine vacuum, go to the next step.
		No	Go to the next step.
6	**PRELIMINARY LEAK TEST (EXCEPT P0456:00)** • Perform the EVAP system leak inspection using the M-MDS. • Verify that all PIDs are within the following specifications: **NOTE:** • To successfully perform this procedure, all PIDs must be within specification before proceeding to the next step. ▪ Select the following items from the initialization screen of the M-MDS. ▪ Select "Powertrain". ▪ Select "Fuel". ▪ Select "EVAP Test". ▪ Verify that ECT and IAT are within specification at the confirmation screen. To successfully perform this procedure, ECT and IAT must be within specification before proceeding to the next step. ▪ The fuel level must be maintained within **15% —85%** . The PCM will cancel the EVAP test if the fuel level is **lower than 15%** or **higher than 85%** . ▪ Allow the M-MDS to run the EVAP test. • Does M-MDS indicate an EVAP system leak exists?	Yes	Go to the next step.
		No	Go to Step 9.
7	**PRELIMINARY LEAK TEST (EXCEPT P0456:00)** • Tighten the fuel-filler cap then repeat the EVAP system leak inspection using the M-MDS again.	Yes	Go to the next step.

	• Verify that all PIDs are within the following specifications: **NOTE:** • To successfully perform this procedure, all PIDs must be within specification before proceeding to the next step. ▪ Select the following items from the initialization screen of the M-MDS. ▪ Select "Powertrain". ▪ Select "Fuel". ▪ Select "EVAP Test". ▪ Verify that ECT and IAT are within specification at the confirmation screen. To successfully perform this procedure, ECT and IAT must be within specification before proceeding to the next step. ▪ The fuel level must be maintained within **15% —85%** . The PCM will cancel the EVAP test if the fuel level is **lower than 15%** or **higher than 85%** . ▪ Allow the M-MDS to run the EVAP test. • Does M-MDS still indicate an EVAP system leak exists?	No	The fuel cap was not properly tightened. Go to Step 15.
8	**VISUALLY INSPECT COMPONENTS FOR LEAKS (EXCEPT P0456:00)** • Verify that the CV solenoid valve is properly seated on the charcoal canister. • Visually inspect for cut or loose connections to the fuel vapor hoses/tubes in the following locations: ▪ Charcoal canister to CV solenoid valve. ▪ Charcoal canister to evaporative emission valve component. ▪ Evaporative emission valve component to the fuel tank (if applicable). ▪ Check for fuel-filler pipe damage. • Is a concern with a hose, tube, connection or valve visually evident?	Yes	Repair or install a new component if necessary. Afterwards, verify that the leak is repaired by repeating diagnostic Step 6. If the leak is repaired, go to Step 15.
		No	Go to the next step.
9	**CALIBRATE THE LEAK TESTER FOR DIAGNOSIS** • Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.  • Connect the EVAP Tester Hose (part of the **SST**) to the SELF-TEST port located on the control panel. Hand tighten the fitting. (Do not overtighten.)	Yes	Go to the next step.
		No	Refer to the tester operator's manual for tester repair instructions.

	• Turn the control valve to the TEST position; the gauge should read **331—381 mm {13—15 in}** of water. **NOTE:** • If the gauge is not reading in this range, adjust the pressure by turning the black knob on the low pressure regulator at the nitrogen bottle.  • After verifying the regulator is properly calibrated, turn the control valve to the HOLD position. • Verify that the gauge holds pressure and that the flow meter reads no flow. • Does the gauge hold pressure and the flow meter read no flow?		
10	**PRESSURIZE THE EVAP SYSTEM WITH NITROGEN TO TEST FOR LEAKS** • Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve. • Disconnect the purge solenoid valve hose from the intake manifold and insert **SST** AKS042808 into the purge solenoid valve hose.  • Connect the EVAP Tester Hose to **SST** AKS042808. • Connect the M-MDS to the DLC-2.	Yes	Go to Step 13 to locate the leak.
		No	EXCEPT P0456:00, go to the next step. If diagnosing P0456:00, go to Step 12.

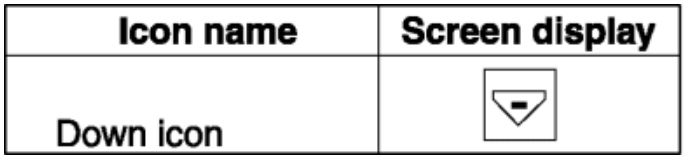
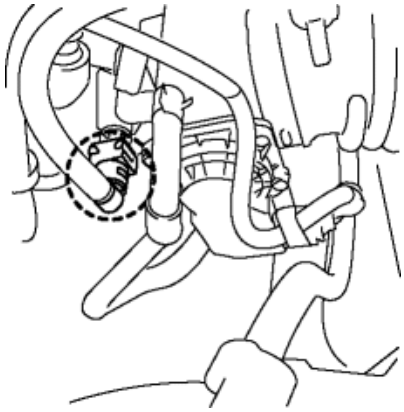
- Switch the ignition to ON (engine off).
- Access the datalogger for the PCM.
- Press the eraser icon to deselect the highlighted PIDs.

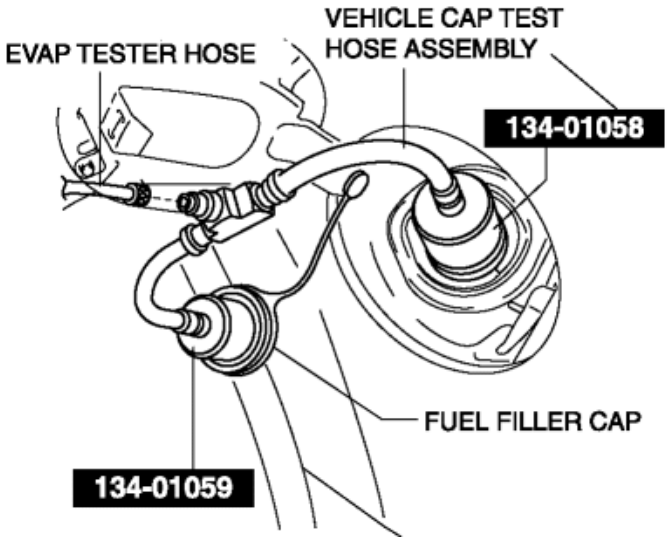
Icon name	Screen display
Eraser icon	
Tick icon	
Control item activate icon	
Control icon	
Up icon	

- Select PIDs EVAPCP and EVAPCV, then click the tick icon.
- Command EVAPCP to 100% duty cycle to open the purge solenoid valve.
    - To open the purge solenoid valve, click the control item activate icon.
    - Click the EVAPCP box on the left-hand side of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon.
- Each click increases the duty cycle by **10%** .
- Continue clicking until the M-MDS shows the purge solenoid valve is open **100%** .
- Command EVAPCV to ON to Close the CV solenoid valve.
    - To close the CV solenoid valve, click the control item activate icon.
    - Click the EVAPCV box in the upper left-hand corner of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon (the EVAPCV should now be on).
- Turn the control valve to the TEST position and let the system fill. A drop in the gauge pressure should be noted along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses.

  NOTE:

    - If the gauge and the flow meter do not settle to a measurable level after **2—3 min**, then refer to the

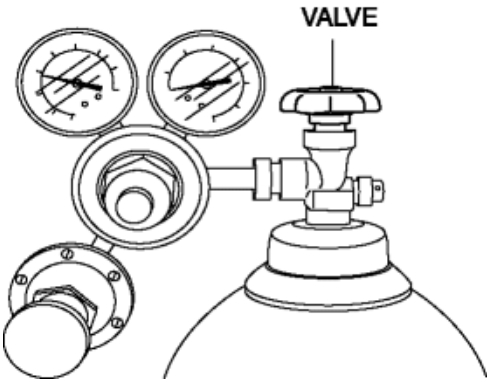
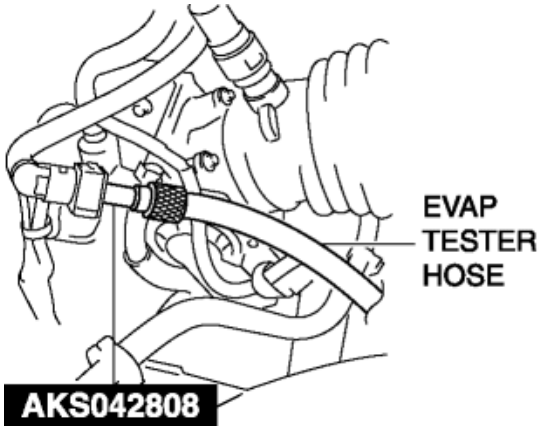
	Mazda Workshop Manual to verify that the canister vent valve is properly closed. If the canister vent valve is properly closed, the EVAP system has a large leak. • Does the test indicate that a leak exists?		
11	**CHECKING SYSTEM FOR BLOCKAGE** • Leave the tester in the test position • Using the M-MDS datalogger, command the CV solenoid valve open. ▪ To open the CV solenoid valve, click the down icon (the EVAPCV should now be off).  • Does the flow indicator in the flow meter immediately jump to the top?	Yes	Go to the next step
		No	System is blocked between the CV solenoid valve and the fuel tank pressure sensor; locate and remove blockage then perform Step 10.
12	**PRESSURIZE THE EVAP SYSTEM WITH NITROGEN TO TEST THE PURGE SOLENOID FOR LEAKAGE** • Reconnect the purge solenoid valve hose.  • Verify that the control valve on the panel is in the HOLD position. • Remove the fuel-filler cap from the vehicle. • If the fuel-filler cap is not a MAZDA part or equivalent, replace it. **NOTE:** • INSPECT FUEL-FILLER CAP AND FILLER NECK ▪ Visually inspect for damage, insufficient sealing, rust, cracks or warps on the filler cap and filler neck ▪ Repair or replace if necessary • Connect the receiver assembly (**SST**: 134-01059) to the vehicle cap test hose assembly (part of the **SST**) and the fuel-filler cap from the vehicle.	Yes	Replace the purge valve then go to the next step.
		No	Go to the next step.

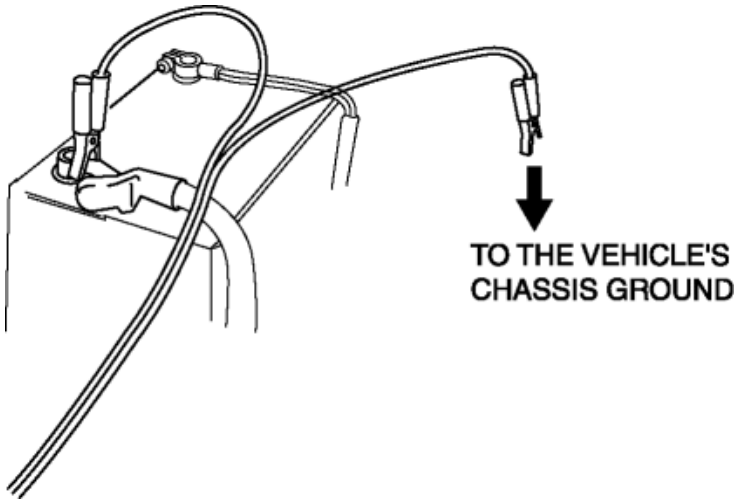


- Connect the cap adaptor (**SST**: 134-01058) to the vehicle cap test hose assembly (part of the **SST**) and to the fuel-filler neck.
- Connect the EVAP Tester Hose (part of the **SST**) to the center fitting of the vehicle cap test hose assembly (part of the **SST**).
- Connect the M-MDS to the DLC-2.
- Switch the ignition to ON (engine off).
- Access the datalogger for the PCM.
- Press the eraser icon to deselect the highlighted PIDs.

Icon name	Screen display
Eraser icon	
Tick icon	
Control item activate icon	
Control icon	
Up icon	

- Select PID EVAPCV, then click the tick icon.
- Command EVAPCV to ON to close the CV solenoid valve.
    - To close the CV solenoid valve, click the control item activate icon.
    - Click the EVAPCV box in the upper left-hand corner of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon (the EVAPCV should now be on).

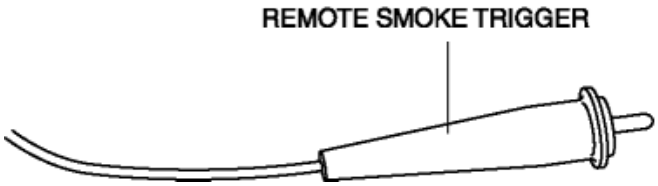
	Verify that the valve on the nitrogen bottle is still open.  • Turn the control valve to the TEST position and let the system fill. A drop in the gauge pressure should be noted along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses. • Does the test indicate that a leak exists?		
13	**LOCATE LEAKAGE POI NT** • Verify that the control valve on the panel is in the HOLD position and the valve on the nitrogen bottle valve is open. • Disconnect the purge solenoid valve hose from the intake manifold and insert **SST** AKS042808 into the purge solenoid valve hose.  • Connect the EVAP Tester Hose to **SST** AKS042808. • Connect the 12 volt power connector leads on the smoke generation unit to the vehicle’s battery. Make sure to connect the red lead to the positive post (+) or power, and the black lead to the vehicle’s chassis ground.	Yes	Repair or install a new component if necessary. Go to the next step.
		No	Check all EVAP connections. Conduct diagnosis of intermittent concerns, then go to the next step.



- Connect the M-MDS to the DLC-2.
- Switch the ignition to ON (engine off).
- Access the datalogger for the PCM.
- Press the eraser icon to deselect the highlighted PIDs.

Icon name	Screen display
Eraser icon	
Tick icon	
Control item activate icon	
Control icon	
Up icon	

- Select PIDs EVAPCP and EVAPCV, then click the tick icon.
- Command EVAPCP to **100%** duty cycle to open the purge solenoid valve.
    - To open the purge solenoid valve, click the control item activate icon.
    - Click the EVAPCP box on the left-hand side of the screen to select it.
    - Click the control icon on the right-hand side of the screen.
    - Click the up icon immediately below the control icon.
- Each click increases the duty cycle by 10%.
- Continue clicking until the M-MDS shows the purge solenoid valve is open 100%.
- Command EVAPCV to ON to close the CV solenoid valve.
    - To close the CV solenoid valve, click the control item activate icon.

	▪ Click the EVAPCV box in the upper left-hand corner of the screen to select it ▪ Click the control icon on the right-hand side of the screen. ▪ Click the up icon immediately below the control icon (the EVAPCV should now be on). • Turn the control valve to the TEST position. • Press the remote smoke trigger on the smoke generation unit and let the system fill with smoke.  **NOTE:** • It may be necessary to lift the vehicle to provide sufficient clearance underneath to conduct a proper visual inspection of the fuel and EVAP system. • NEVER depress the remote smoke trigger before opening the nitrogen tank valve and setting the tester control valve to TEST • Use a 12 volt 400,000 candle power spot light (part # 4410000-100) or equivalent to help locate the smoke. • Is a leak detected?		
14	**VERIFY LEAK IS REPAIRED** • Were you diagnosing DTC P0456:00?	Yes	Verify that the leak is repaired by repeating diagnostic Step 10. If the leak is repaired, go to the next step.
		No	Verify that the leak is repaired by repeating diagnostic Step 6. If the leak is repaired, go to the next step.
15	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	DTC troubleshooting completed.

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