MITSUBISHI MOTORS

SERVICE BULLETIN

GLOBAL AFTER SALES OFFICE, MITSUBISHI MOTORS CORPORATION

PURPOSE : INFORMATION	ISSUE NO. : MSB-11E13-001	DATE : 2011-09-05
SUBJECT : 4A9 ENGINE: TROUBLESHOOTING FOR DTC P0170		<MODEL> <M/Y>
GROUP : FUEL		(EUR/RUSSIA) See following 2. Applicable Manuals table.

1. Description:

Regarding the troubleshooting for DTC P0170, some items to be inspected (probable causes) are added and the diagnosis procedure is revises. This Service Bulletin contains the correct probable causes and the diagnosis procedure.

2. Applicable Manuals:

See Attached sheets 1 (1/3) to 1 (3/3).

There may be some attached sheets not included in this Service Bulletin because they are not applicable to your market. Their sheet numbers are not listed in the above table.

3. Details:

See Attached sheets 6 to 11 and 16 to 21.

Attached sheet 1 (1/3)

<EUR>

Manual/Model	<M/Y>	Pub. No.	Title (Info-ID)	Attached Sheet
2005 COLT Workshop Manual CD-ROM (Z30A)	05	CZME05E1-CD (English) CZMS05E1-CD (Spanish) CZMF05E1-CD (French) CZMG05E1-CD (German)	G.13B: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-25100-01)	Attached sheet 6, 16
2006 COLT CZ3/ COLT CZT Workshop Manual CD-ROM (Z30A)	06	CZ2E06E1-CD (English) CZ2S06E1-CD (Spanish) CZ2F06E1-CD (French) CZ2G06E1-CD (German)	G.13B: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-19800-01)	
2007–2008 COLT CZC Workshop Manual CD-ROM (Z30A)	07–08	CZ8E08E1-CD (English) CZ8S08E1-CD (Spanish) CZ8F08E1-CD (French) CZ8G08E1-CD (German)	G.13B: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-25100-01)	
2009 COLT Workshop Manual CD-ROM (Z30A)	09	CZME09E2-CD (English) CZMS09E2-CD (Spanish) CZMF09E2-CD (French) CZMG09E2-CD (German) CZMI09E2-CD (Italian)	G.13B: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System <Except FFV> (M131-75-100-51800-01)	
			G.13B: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System <FFV> (M131-75-100-52900-01)	Attached sheet 7, 16
2011 COLT Workshop Manual CD-ROM (Z30A)	11	CZME11E2-CD (English) CZMS11E2-CD (Spanish) CZMF11E2-CD (French) CZMG11E2-CD (German) CZMI11E2-CD (Italian)	G.13B: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System <Except FFV> (M131-75-100-51800-01)	Attached sheet 6, 16
			G.13B: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System <FFV> (M131-75-100-52900-01)	Attached sheet 7, 16
2011 ASX Workshop Manual CD-ROM (GA0W)	11	CGWE11E2-CD (English) CGWS11E2-CD (Spanish) CGWF11E2-CD (French) CGWG11E2-CD (German) CGWI11E2-CD (Italian)	G.13D: Diagnosis Code Procedures Code No. P0171 Abnormal Fuel System (Lean) (M131-78-490-12600-01)	Attached sheet 8, 17
			G.13D: Diagnosis Code Procedures Code No. P0172 Abnormal Fuel System (Rich) (M131-78-500-12600-01)	Attached sheet 9, 18

Attached sheet 1 (2/3)

Manual/Model	<M/Y>	Pub. No.	Title (Info-ID)	Attached Sheet
2008 LANCER Workshop Manual CD-ROM (CY0A)	08	CG1E08E2-CD (English) CG1S08E2-CD (Spanish) CG1F08E2-CD (French) CG1G08E2-CD (German)	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-41100-01)	Attached sheet 10, 19
2009 LANCER Workshop Manual CD-ROM (CY0A)	09	CG1E09E1-CD (English) CG1S09E1-CD (Spanish) CG1F09E1-CD (French) CG1G09E1-CD (German) CG1I09E1-CD (Italian)	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-41100-01)	
2010 LANCER Workshop Manual CD-ROM (CY0A)	10	CG1E10E1-CD (English) CG1S10E1-CD (Spanish) CG1F10E1-CD (French) CG1G10E1-CD (German) CG1I10E1-CD (Italian)	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-53000-01)	
2010 LANCER SPORTBACK Workshop Manual CD-ROM (CX0A)	10	CG4E10E1-CD (English) CG4S10E1-CD (Spanish) CG4F10E1-CD (French) CG4G10E1-CD (German) CG4I10E1-CD (Italian)	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-54100-01)	
2010 LANCER/ LANCER SPORTBACK Workshop Manual CD-ROM (CX0A)	10	CG1E10E1-CD (English) CG1S10E1-CD (Spanish) CG1F10E1-CD (French) CG1G10E1-CD (German) CG1I10E1-CD (Italian)	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System <4A91> (M131-75-100-57400-01)	
			G.13A: Diagnosis Code Procedures Code No. P0171 Abnormal Fuel System (Lean) <4A92> (M131-78-490-14800-01)	Attached sheet 11, 20
			G.13A: Diagnosis Code Procedures Code No. P0172 Abnormal Fuel System (Rich) <4A92> (M131-78-500-14800-01)	Attached sheet 12, 21

Attached sheet 1 (3/3)

<RUSSIA>

Underneath Manual/Model	<M/Y>	Underneath Pub. No.	Title (Info-ID)	Attached Sheet
2011 ASX Workshop Manual CD-ROM (GA0W)	11	N/A	G.13D: Diagnosis Code Procedures Code No. P0171 Abnormal Fuel System (Lean) (M131-78-490-12600-01)	Attached sheet 8, 17
			G.13D: Diagnosis Code Procedures Code No. P0172 Abnormal Fuel System (Rich) (M131-78-500-12600-01)	Attached sheet 9, 18
2008 LANCER Workshop Manual CD-ROM (CY0A)	08	N/A	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-41100-01)	Attached sheet 10, 19
2009 LANCER Workshop Manual CD-ROM (CY0A)	09	N/A	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-41100-01)	
2010 LANCER Workshop Manual CD-ROM (CY0A)	10	N/A	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System (M131-75-100-53000-01)	
2010 LANCER/ LANCER SPORTBACK Workshop Manual CD-ROM (CX0A)	10	N/A	G.13A: Diagnosis Code Procedures Code No. P0170 Abnormal Fuel System <4A91> (M131-75-100-57400-01)	
			G.13A: Diagnosis Code Procedures Code No. P0171 Abnormal Fuel System (Lean) <4A92> (M131-78-490-14800-01)	Attached sheet 11, 20
			G.13A: Diagnosis Code Procedures Code No. P0172 Abnormal Fuel System (Rich) <4A92> (M131-78-500-14800-01)	Attached sheet 12, 21

Code No. P0170: Abnormal Fuel System

OPERATION
- Refer to Code No. P0201: No. 1 Injector System
- Refer to Code No. P0202: No. 2 Injector System
- Refer to Code No. P0203: No. 3 Injector System
- Refer to Code No. P0204: No. 4 Injector System

FUNCTION
- If the fuel system goes out of order, the fuel correction valve will become larger.
- The engine-ECU or engine-A-M/T-ECU checks whether the fuel trim value is within a specified range.

This is replaced with Attached sheet 15

TROUBLE JUDGMENT

Check Condition
- In learning the air-fuel ratio.

Judgment Criteria
- Long-term fuel trim has continued to be +12.5% or higher for 10 seconds.

or
- Long-term fuel trim has continued to be –12.5% or higher for 10 seconds.

PROBABLE CAUSES
- Failed intake air temperature sensor
- Failed purge control solenoid valve
- Failed injector
- Air drawn in from gaps in gasket, seals, etc.
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Exhaust leak
- Incorrect fuel pressure
- Failed engine-ECU or engine-A-M/T-ECU
- Harness damage in injector circuit, or connector damage

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Q: Is any other diagnosis code than P0170 output?

YES : Inspection Chart for Diagnosis Code

NO : Go to Step 2 .

STEP 2. M.U.T.-III data list
- Refer to Data List Reference Table.
  a. Item No. 6: Intake air temperature sensor
  b. Item No. 7: Manifold absolute pressure sensor
  c. Item No. 8: Engine coolant temperature sensor

Q: Are the check results normal?

YES : Go to Step 3.

NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value (Refer to Inspection Chart for Diagnosis Code).

STEP 3. Check throttle body (throttle valve portion) for contamination.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Clean throttle body (throttle valve portion) (Refer to).

STEP 4. Check for intake of air from gaps in gasket, seals, etc.

Q: Is the check result normal?

YES : Go to Step 5 .
NO : Repair for intake of air from gaps in gasket, seals, etc.

STEP 5. Check for leakage of exhaust emission from exhaust manifold.

Q: Is the check result normal?

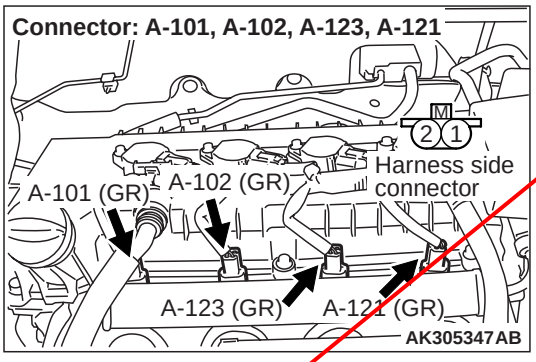
YES : Go to Step 6.
NO : Repair for leakage of exhaust emission from exhaust manifold.

STEP 6. Connector Check: Injector connectors

a. A-101 (No. 1 injector connector).
b. A-102 (No. 2 injector connector).
c. A-123 (No. 3 injector connector).
d. A-121 (No. 4 injector connector).

Q: Are the check results normal?

YES : Go to Step 7 .
NO : Repair or replace the connector.

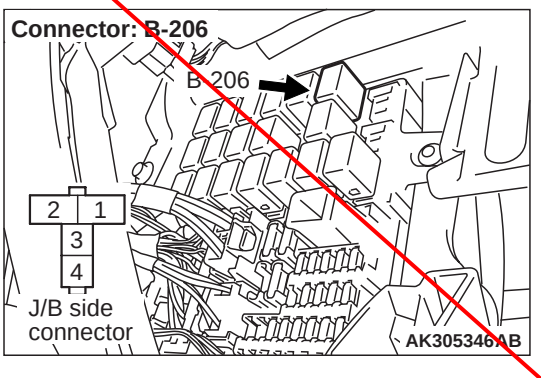


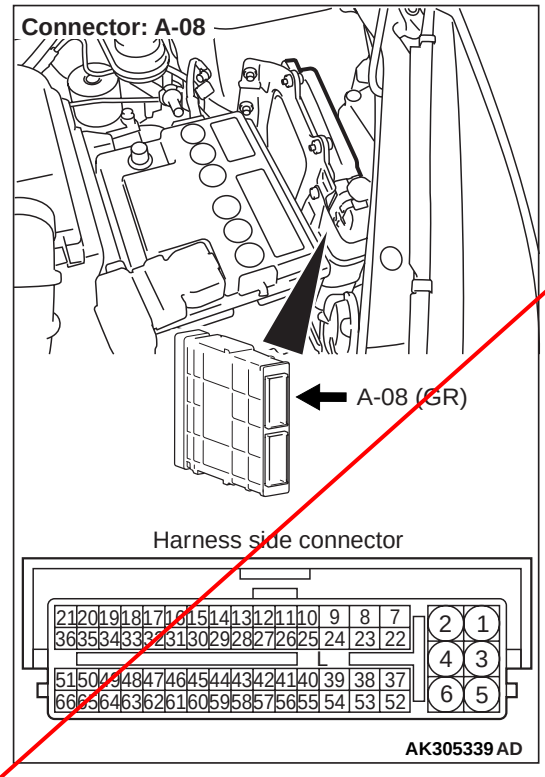
STEP 7. Check injector itself.

- Check Injector itself .

Q: Is the check result normal?

YES : Go to Step 8 .
NO : Replace the injector.



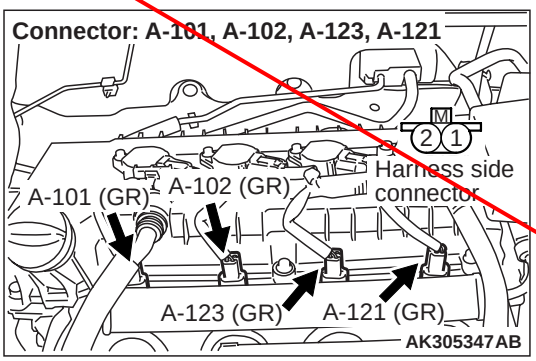


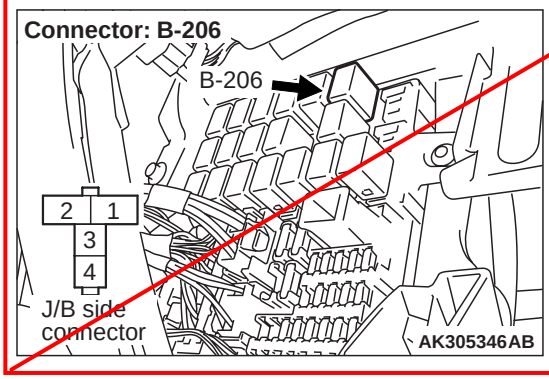
STEP 8. Connector check: B-206 engine control relay connector and A-08 engine-ECU connector or engine-A-M/T-ECU connector

Q: Is the check result normal?

YES : Go to Step 9

NO : Repair or replace the connector.





STEP 9. Check harness between B-206 engine control relay connector and injector connectors.

a. Check harness between B-206 (terminal No. 4) engine control relay connector and A-101 (terminal No. 1) No. 1 injector connector.

b. Check harness between B-206 (terminal No. 4) engine control relay connector and A-102 (terminal No. 1) No. 2 injector connector.

c. Check harness between B-206 (terminal No. 4) engine control relay connector and A-123 (terminal No. 1) No. 3 injector connector.

d. Check harness between B-206 (terminal No. 4) engine control relay connector and A-121 (terminal No. 1) No. 4 injector connector.

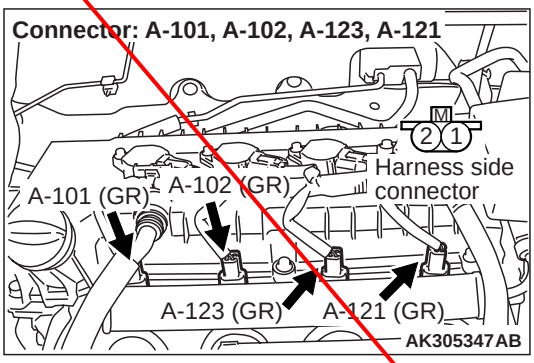
NOTE: Before checking harness, check intermediate connectors A-13 and B-212, and repair if necessary.

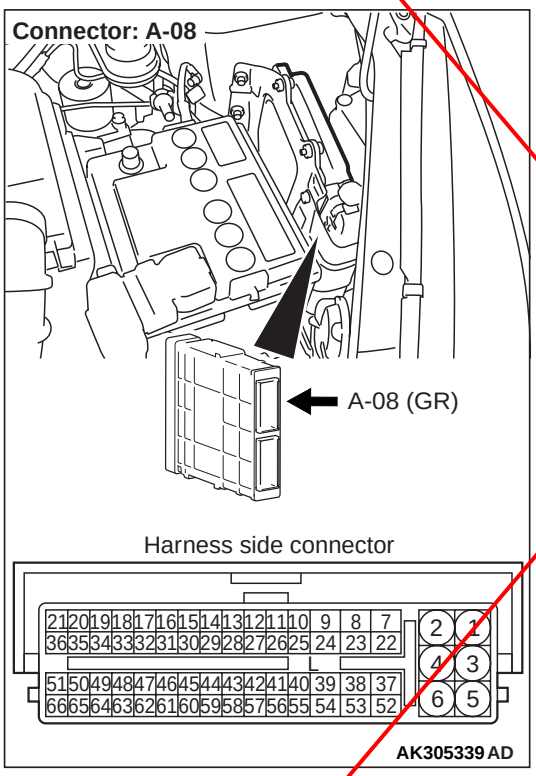
- Check power supply line for damage.

Q: Are the check results normal?

YES : Go to Step 10 .

NO : Repair the damaged harness wire.





STEP 10. Check harness between injector connector and A-08 engine-ECU connector or engine-A-M/T-ECU connectors.

a. Check harness between A-101 (terminal No. 2) No. 1 injector connector and A-08 (terminal No. 8) engine-ECU connector or engine-A-M/T-ECU connector.
b. Check harness between A-102 (terminal No. 2) No. 2 injector connector and A-08 (terminal No. 9) engine-ECU connector or engine-A-M/T-ECU connector.
c. Check harness between A-123 (terminal No. 2) No. 3 injector connector and A-08 (terminal No. 23) engine-ECU connector or engine-A-M/T-ECU connector.
d. Check harness between A-121 (terminal No. 2) No. 4 injector connector and A-08 (terminal No. 24) engine-ECU connector or engine-A-M/T-ECU connector.
   - Check earthing line for damage.

Q: Are the check results normal?

YES : Go to Step 11.
NO : Repair the damaged harness wire.

STEP 11. Check purge control solenoid valve itself.

- Check purge control solenoid valve itself (Refer to GROUP 17 – Emission Control System – Evaporative Emission Control System – Purge Control Solenoid Valve).

Q: Is the check result normal?

YES : Go to Step 12 .
NO : Replace the purge control solenoid valve.

STEP 12. Fuel pressure measurement.

- Fuel pressure measurement (Refer to Fuel Pressure Test

).

Q: Is the check result normal?

YES : Replace the engine-ECU or engine-A-M/T-ECU then perform the variant coding (Refer to GROUP 00 – Precautions Before Service – How to Perform Variant Coding).

NO : Repair the fuel pressure.

Code No. P0170: Abnormal Fuel System <FFV>

OPERATION
- Refer to Code No. P0201: No. 1 Injector System
- Refer to Code No. P0202: No. 2 Injector System
- Refer to Code No. P0203: No. 3 Injector System
- Refer to Code No. P0204: No. 4 Injector System

This is replaced with Attached sheet 16

FUNCTION
- If the fuel system goes out of order, the fuel correction valve will become larger.
- The engine-ECU checks whether the fuel trim value is within a specified range.

TROUBLE JUDGMENT

Check Condition
- In learning the air-fuel ratio.

Judgment Criterion
- Long-term fuel trim has continued to be +12.5 % or higher for 10 seconds.

or
- Long-term fuel trim has continued to be –12.5 % or higher for 10 seconds.

PROBABLE CAUSES
- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Failed oxygen sensor (front)
- Estimated ethanol concentration not learned
- Failed purge control solenoid valve
- Failed injector
- Air drawn in from gaps in gasket, seals, etc.
- Exhaust leak
- Incorrect fuel pressure
- Harness damage in injector circuit, or connector damage
- Failed engine-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Q: Is any other diagnosis code than P0170 output?

YES : Inspection Chart for Diagnosis Code (Refer to).

NO : Go to Step 2 .

STEP 2. M.U.T.-III data list
- Refer to Data List Reference Table .
  a. Item No. 6: Intake air temperature sensor
  b. Item No. 7: Manifold absolute pressure sensor
  c. Item No. 8: Engine coolant temperature sensor
  d. Item No. 9; Oxygen sensor (front)

Q: Are the check results normal?

YES : Go to Step 3 .

NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value (Refer to Inspection Chart for Diagnosis Code).

STEP 3. Forced learning of estimated ethanol concentration execution
- Erase the set diagnosis code.
- Carry out the estimated ethanol concentration forcible learning (Refer to GROUP 00 – Precautions Before Service – Forced Learning of Estimated Ethanol Concentration

), reconfirm whether the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Go to Step 4 .
NO : Check end.

STEP 4. Check throttle body (throttle valve portion) for contamination.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Clean throttle body (throttle valve portion) (Refer to).

STEP 5. Check for intake of air from gaps in gasket, seals, etc.

Q: Is the check result normal?

YES : Go to Step 6 .
NO : Repair for intake of air from gaps in gasket, seals, etc.

STEP 6. Check for leakage of exhaust emission from exhaust manifold.

Q: Is the check result normal?

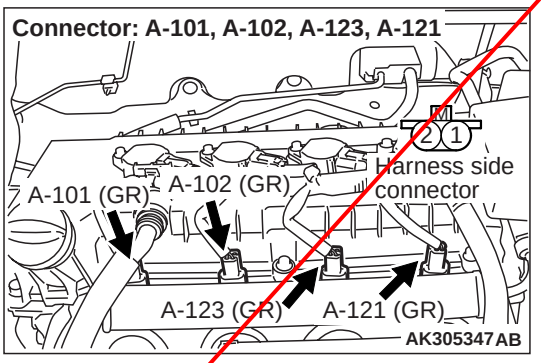
YES : Go to Step 7 .
NO : Repair for leakage of exhaust emission from exhaust manifold.

STEP 7. Connector Check: Injector connectors

a. A-101 (No. 1 injector connector).
b. A-102 (No. 2 injector connector).
c. A-123 (No. 3 injector connector).
d. A-121 (No. 4 injector connector).

Q: Are the check results normal?

YES : Go to Step 8.
NO : Repair or replace the connector.

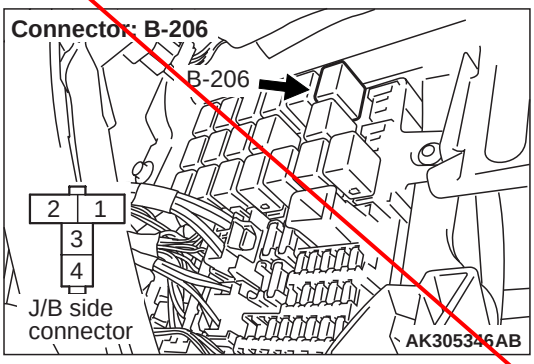


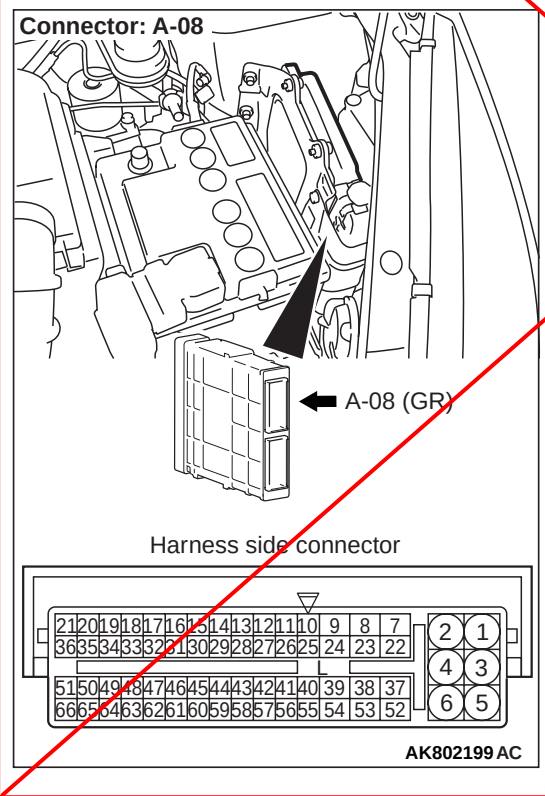
STEP 8. Check injector itself.

- Check Injector itself .

Q: Is the check result normal?

YES : Go to Step 9 .
NO : Replace the injector.



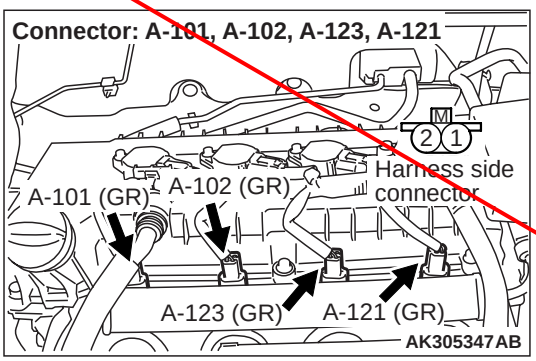


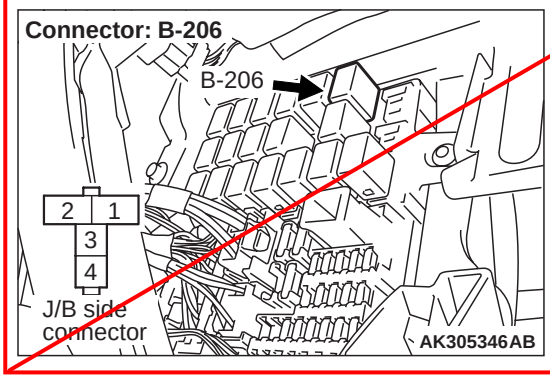
STEP 9. Connector check: B-206 engine control relay connector and A-08 engine-ECU connector

Q: Is the check result normal?

YES : Go to Step 10.

NO : Repair or replace the connector.





STEP 10. Check harness between B-206 engine control relay connector and injector connectors.

a. Check harness between B-206 (terminal No. 4) engine control relay connector and A-101 (terminal No. 1) No. 1 injector connector.

b. Check harness between B-206 (terminal No. 4) engine control relay connector and A-102 (terminal No. 1) No. 2 injector connector.

c. Check harness between B-206 (terminal No. 4) engine control relay connector and A-123 (terminal No. 1) No. 3 injector connector.

d. Check harness between B-206 (terminal No. 4) engine control relay connector and A-121 (terminal No. 1) No. 4 injector connector.

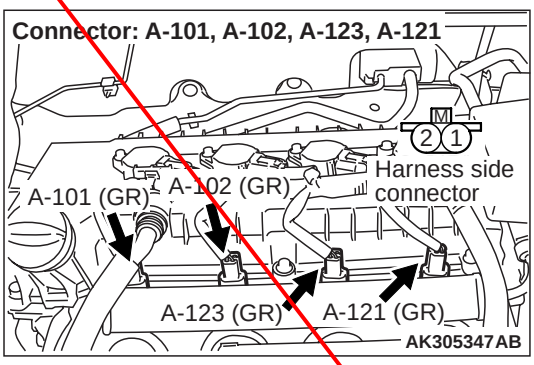
NOTE: Before checking harness, check intermediate connectors A-13 and B-212, and repair if necessary.

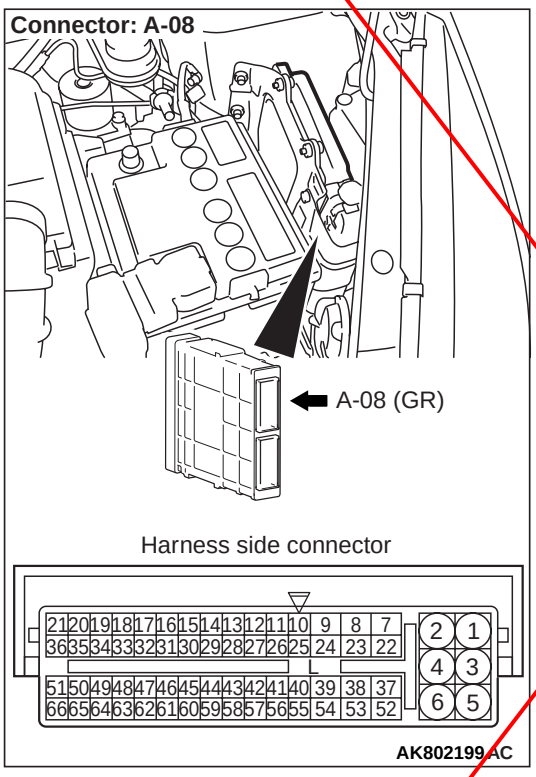
- Check power supply line for damage.

Q: Are the check results normal?

YES : Go to Step 11 .

NO : Repair the damaged harness wire.





STEP 11. Check harness between injector connector and A-08 engine-ECU connector.

a. Check harness between A-101 (terminal No. 2) No. 1 injector connector and A-08 (terminal No. 8) engine-ECU connector.

b. Check harness between A-102 (terminal No. 2) No. 2 injector connector and A-08 (terminal No. 9) engine-ECU connector.

c. Check harness between A-123 (terminal No. 2) No. 3 injector connector and A-08 (terminal No. 23) engine-ECU connector.

d. Check harness between A-121 (terminal No. 2) No. 4 injector connector and A-08 (terminal No. 24) engine-ECU connector.

- Check earthing line for damage.

Q: Are the check results normal?

YES : Go to Step 12

NO : Repair the damaged harness wire.

STEP 12. Check purge control solenoid valve itself.

- Check purge control solenoid valve itself (Refer to GROUP 17 – Emission Control System – Evaporative Emission Control System – Purge Control Solenoid Valve).

Q: Is the check result normal?

YES : Go to Step 13 .

NO : Replace the purge control solenoid valve.

STEP 13. Fuel pressure measurement.

- Fuel pressure measurement.

Q: Is the check result normal?

YES : Replace the engine-ECU then perform the variant coding (Refer to GROUP 00 – Precautions Before Service – How to Perform Variant Coding).

NO : Repair the fuel pressure.

Code No. P0171: Abnormal Fuel System (lean)

OPERATION
- Check code No. P0201: No. 1 injector system .
- Check code No. P0202: No. 2 injector system .
- Check code No. P0203: No. 3 injector system .
- Check code No. P0204: No. 4 injector system .

FUNCTION
- If the fuel system goes out of order, the fuel correction value will become larger.
- The engine-ECU checks whether the fuel trim value is within a specified range.

TROUBLE JUDGMENT

Check Conditions
- Engine coolant temperature is less than 100°C when the engine is started.
- Intake air temperature is less than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +7.0 % for 5 seconds.

Check Conditions
- Engine coolant temperature is less than 100°C when the engine is started.
- Intake air temperature is less than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +12.1 % for 5 seconds.

Check Conditions
- Engine coolant temperature is more than 100°C when the engine is started.
- Intake air temperature is more than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +17.2 % for 5 seconds.

Check Conditions
- Engine coolant temperature is more than 100°C when the engine is started.
- Intake air temperature is more than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +22.3 % for 5 seconds.

Check Conditions
- Engine coolant temperature is more than 79°C.
- Under the closed loop air/fuel ratio control.

Judgement Criterion
- Long-term fuel trim is +12.5 % for 2 seconds.

or
- Short-term fuel trim is +25.0 % for 2 seconds.

FAIL-SAFE AND BACKUP FUNCTION
- None

PROBABLE CAUSES
- Failed intake air temperature sensor
- Failed injector
- Air drawn in from gaps in gasket, seals, etc.
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Exhaust leak
- Incorrect fuel pressure
- Use of incorrect or contaminated fuel
- Harness damage in injector circuit or loose connector contact
- Failed engine-ECU

This is replaced with Attached sheet 17

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Q: Is any other diagnosis code than P0171 set?

YES : Inspection chart for diagnosis code .
NO : Go to Step 2 .

STEP 2. M.U.T.-III data list

- Data list reference table .
  a. Item 5: Intake air temperature sensor
  b. Item 6: Engine coolant temperature sensor
  c. Item 8: Manifold absolute pressure sensor

Q: Are the check results normal?

YES : Go to Step 3 .
NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value. Inspection chart for diagnosis code .

STEP 3. Check for exhaust leaks

Q: Is the check result normal?

YES : Go to Step 4 .
NO : Repair.

STEP 4. Check for intake system vacuum leaks.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair.

STEP 5. Connector Check: Injector connectors

a. B-101 (No. 1 injector connector).
b. B-102 (No. 2 injector connector).
c. B-105 (No. 3 injector connector).
d. B-106 (No. 4 injector connector).

Q: Are the check results normal?

YES : Go to Step 6.
NO : Repair or replace the connector.

STEP 6. Check injector itself.

- Injector check .

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the injector.

STEP 7. Connector check: B-26 engine-ECU connector

Q: Is the check result normal?

YES : Go to Step 8 .
NO : Repair or replace the connector.

STEP 8. Check harness between injector connector and engine-ECU connector.

a. Check and repair harness between B-101 (terminal No. 2) No. 1 injector connector and B-26 (terminal No. 2) engine-ECU connector.

b. Check and repair harness between B-102 (terminal No. 2) No. 2 injector connector and B-26 (terminal No. 3) engine-ECU connector.

c. Check and repair harness between B-105 (terminal No. 2) No. 3 injector connector and B-26 (terminal No. 18) engine-ECU connector.

d. Check and repair harness between B-106 (terminal No. 2) No. 4 injector connector and B-26 (terminal No. 19) engine-ECU connector.

- Check output line for damage.

Q: Are the check results normal?

YES : Go to Step 9 .
NO : Repair the damaged harness wire.

STEP 9. Fuel pressure measurement.

- Fuel pressure test .

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair.

STEP 10. Check fuel.

- Check for entry of foreign matter (water, diesel fuel, etc.) into fuel.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Replace the fuel.

STEP 11. Replace the injector.

- After replacing the injector, reconfirm whether the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace the engine-ECU.
NO : Check end.

Code No. P0172: Abnormal Fuel System (rich)

OPERATION
- Check code No. P0201: No. 1 injector system .
- Check code No. P0202: No. 2 injector system .
- Check code No. P0203: No. 3 injector system .
- Check code No. P0204: No. 4 injector system .

FUNCTION
- If the fuel system goes out of order, the fuel correction value will become larger.
- The engine-ECU checks whether the fuel trim value is within a specified range.

TROUBLE JUDGMENT

Check Conditions
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is less than –12.5 % for 5 seconds.

or
- Short-term fuel trim is less than –10.2 % for 5 seconds.

This is replaced with Attached sheet 18

Check Conditions
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is less than –12.5 % for 5 seconds.

or
- Short-term fuel trim is less than –15.2 % for 5 seconds.

Check Conditions
- Engine coolant temperature is more than 79°C.
- Under the closed loop air/fuel ratio control.

Judgement Criterion
- Long-term fuel trim is –12.5 % for 2 seconds.

or
- Short-term fuel trim is –25.0 % for 2 seconds.

FAIL-SAFE AND BACKUP FUNCTION
- None

PROBABLE CAUSES
- Failed intake air temperature sensor
- Failed injector
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Incorrect fuel pressure
- Failed engine-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Q: Is any other diagnosis code than P0172 set?

YES : Inspection chart for diagnosis code.
NO : Go to Step 2 .

STEP 2. M.U.T.-III data list
- Data list reference table .
  a. Item 5: Intake air temperature sensor
  b. Item 6: Engine coolant temperature sensor
  c. Item 8: Manifold absolute pressure sensor

Q: Are the check results normal?

YES : Go to Step 3.
NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value. Inspection chart for diagnosis code

STEP 3. Check injector itself.

- Injector check .

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the injector.

STEP 4. Fuel pressure measurement.

- Fuel pressure test .

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair.

STEP 5. Replace the injector.

- After replacing the injector, reconfirm whether the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace the engine-ECU.
NO : Check end.

Code No. P0170: Abnormal Fuel System

FUNCTION

This is replaced with Attached sheet 19

- If the fuel system goes out of order, the fuel correction value will become larger.
- The engine-ECU checks whether the fuel trim value is within a specified range.

TROUBLE JUDGMENT

Check Condition

- Engine: In learning the air-fuel ratio

Judgment Criterion

- The correction value of fuel injection amount is too low for 5 seconds or more.

or

- The correction value of fuel injection amount is too high for 5 seconds or more.

PROBABLE CAUSES

- Failed fuel supply system
- Failed oxygen sensor (front)
- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Air drawn in from intake hose and inlet manifold
- Exhaust leak from exhaust manifold
- Contamination of throttle body (throttle valve portion)
- Failed injector
- Failed purge control solenoid valve
- Failed fuel pressure
- Failed engine-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Q: Is any other diagnosis code than P0170 output?

YES : Inspection chart for diagnosis code

NO : Go to Step 2 .

STEP 2. M.U.T.-III data list

- Refer to Data List Reference Table .
  a. Item 5: Intake air temperature sensor
  b. Item 6: Engine coolant temperature sensor
  c. Item 8: Manifold absolute pressure sensor

Q: Are the check results normal?

YES : Go to Step 3 .

NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value (Refer to Inspection Chart for Diagnosis Code).

STEP 3. Check air intake from intake hose and inlet manifold.

Q: Is the check result normal?

YES : Go to Step 4 .

NO : Repair.

STEP 4. Check exhaust leak from exhaust manifold.

Q: Is the check result normal?

YES : Go to Step 5 .

NO : Repair.

STEP 5. Check throttle body (throttle valve portion) contamination.

Q: Is the check result normal?

YES : Go to Step 6 .
NO : Clean throttle body (throttle valve portion)

STEP 6. M.U.T.-III data list

- Refer to Data List Reference Table .
  a. Item AC: Oxygen sensor (front)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Check oxygen sensor (front) system (Refer to Code No. P0130 <M/T> or P0130 <A/T>).

STEP 7. Check injector itself.

- Check injector itself .

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the injector.

STEP 8. Check purge control solenoid valve itself.

- Check purge control solenoid valve itself (Refer to GROUP 17 – Emission Control – Purge Control Solenoid Valve Check).

Q: Is the check result normal?

YES : Go to Step 9 .
NO : Replace the purge control solenoid valve.

STEP 9. Fuel pressure measurement.

- Fuel pressure measurement .

Q: Is the check result normal?

YES : Replace the engine-ECU.
NO : Repair.

Code No. P0171: Abnormal Fuel System (lean) <4A92>

OPERATION
- Check code No. P0201: No. 1 injector system
- Check code No. P0202: No. 2 injector system
- Check code No. P0203: No. 3 injector system
- Check code No. P0204: No. 4 injector system

FUNCTION
- If the fuel system goes out of order, the fuel correction value will become larger.
- The engine-ECU checks whether the fuel trim value is within a specified range.

TROUBLE JUDGMENT

Check Conditions
- Engine coolant temperature is less than 100°C when the engine is started.
- Intake air temperature is less than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +7.0 % for 5 seconds.

Check Conditions
- Engine coolant temperature is less than 100°C when the engine is started.
- Intake air temperature is less than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +12.1 % for 5 seconds.

Check Conditions
- Engine coolant temperature is more than 100°C when the engine is started.
- Intake air temperature is more than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +17.2 % for 5 seconds.

Check Conditions
- Engine coolant temperature is more than 100°C when the engine is started.
- Intake air temperature is more than 60°C when the engine is started.
- Under the closed loop air/fuel ratio control.
- Engine coolant temperature is more than 79°C.

Judgement Criterion
- Long-term fuel trim is more than +12.5 % for 5 seconds.

or
- Short-term fuel trim is more than +22.3 % for 5 seconds.

Check Conditions
- Engine coolant temperature is more than 79°C.
- Under the closed loop air/fuel ratio control.

Judgement Criterion
- Long-term fuel trim is +12.5 % for 2 seconds.

or
- Short-term fuel trim is +25.0 % for 2 seconds.

FAIL-SAFE AND BACKUP FUNCTION
- None

PROBABLE CAUSES
- Failed intake air temperature sensor
- Failed injector
- Air drawn in from gaps in gasket, seals, etc.
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Exhaust leak
- Incorrect fuel pressure
- Use of incorrect or contaminated fuel
- Harness damage in injector circuit or loose connector contact
- Failed engine-ECU

This is replaced with Attached sheet 20

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Q: Is any other diagnosis code than P0171 set?

YES : Inspection chart for diagnosis code

NO : Go to Step 2 .

STEP 2. M.U.T.-III data list

- Data list reference table .
  a. Item 5: Intake air temperature sensor
  b. Item 6: Engine coolant temperature sensor
  c. Item 8: Manifold absolute pressure sensor

Q: Are the check results normal?

YES : Go to Step 3.

NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value. Inspection chart for diagnosis code

STEP 3. Check for exhaust leaks

Q: Is the check result normal?

YES : Go to Step 4 .

NO : Repair.

STEP 4. Check for intake system vacuum leaks.

Q: Is the check result normal?

YES : Go to Step 5 .

NO : Repair.

STEP 5. Connector Check: Injector connectors

a. B-101 (No. 1 injector connector).
b. B-102 (No. 2 injector connector).
c. B-105 (No. 3 injector connector).
d. B-106 (No. 4 injector connector).

Q: Are the check results normal?

YES : Go to Step 6.

NO : Repair or replace the connector.

STEP 6. Check injector itself.

- Injector check .

Q: Is the check result normal?

YES : Go to Step 7 .

NO : Replace the injector.

STEP 7. Connector check: B-08 engine-ECU connector

Q: Is the check result normal?

YES : Go to Step 8.

NO : Repair or replace the connector.

STEP 8. Check harness between injector connector and engine-ECU connector.

a. Check and repair harness between B-101 (terminal No. 2) No. 1 injector connector and B-08 (terminal No. 2) engine-ECU connector.

b. Check and repair harness between B-102 (terminal No. 2) No. 2 injector connector and B-08 (terminal No. 3) engine-ECU connector.

c. Check and repair harness between B-103 (terminal No. 2) No. 3 injector connector and B-08 (terminal No. 18) engine-ECU connector.

d. Check and repair harness between B-104 (terminal No. 2) No. 4 injector connector and B-08 (terminal No. 19) engine-ECU connector.

- Check output line for damage.

Q: Are the check results normal?

YES : Go to Step 9.
NO : Repair the damaged harness wire.

STEP 9. Fuel pressure measurement.

- Fuel pressure test .

Q: Is the check result normal?

YES : Go to Step 10 .
NO : Repair.

STEP 10. Check fuel.

- Check for entry of foreign matter (water, diesel fuel, etc.) into fuel.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Replace the fuel.

STEP 11. Replace the injector.

- After replacing the injector, reconfirm whether the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace the engine-ECU.
NO : Check end.

PROBABLE CAUSES

- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Air intake from intake hose and intake manifold
- Air intake around brake booster (such as failed check valve)
- Exhaust gas leakage from exhaust manifold
- Failed purge control solenoid valve
- Harness damage in injector circuit, or connector damage
- Failed injector
- Failed fuel supply system (such as failed fuel pressure)
- Entry of foreign material to fuel (such as water, diesel fuel, water removers and additive)
- Harness damage in oxygen sensor circuit, or connector damage
- Failed oxygen sensor (front)
- Failed installation of oxygen sensor (front)
- Failed engine-ECU

DIAGNOSIS PROCEDURE

∗Preparation to carry out troubleshooting

Store the freeze frame data of the diagnosis code P0170.

STEP 1. M.U.T.-III diagnosis code

Q : Is any other diagnosis code than P0170 output?

YES : Inspection Chart for Diagnosis Code

NO : Go to Step 2

STEP 2. M.U.T.-III data list

- Refer to Data List Reference Table

a. Item No. 6: Intake air temperature sensor
b. Item No. 7: Manifold absolute pressure sensor
c. Item No. 8: Engine coolant temperature sensor
d. Item No. 9: Oxygen sensor (front)

Q : Are the check results normal?

YES : Go to Step 3

NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value.

STEP 3. Forced learning of estimated ethanol concentration execution.

- Erase the set diagnosis code.
- Carry out the estimated ethanol concentration forcible learning (Refer to GROUP 00 – Precautions Before Service – Forced Learning of Estimated Ethanol Concentration), reconfirm whether the diagnosis code is set.

Q : Is the diagnosis code set?

YES : Go to Step 4

NO : Check end.

STEP 4. Check air intake from intake hose and intake manifold.

Q ： Is the check result normal?
YES ： Go to Step 5
NO ： Repair.

STEP 5. Check for emission leakage from exhaust manifold.

Q ： Is the check result normal?
YES ： Go to Step 6
NO ： Repair.

STEP 6. Check installation status of oxygen sensor (front).

Q ： Is the check result normal?
YES ： Go to Step 7
NO ： Repair.

STEP 7. Connector check：B-108 oxygen sensor (front) connector

Q ： Is the check result normal?
YES： Go to Step 8
NO ： Repair or replace the connector.

STEP 8. Connector check: A-09 engine-ECU connector

Q ： Is the check result normal?
YES： Go to Step 9
NO ： Repair or replace the connector.

STEP 9. Check harness between oxygen sensor (front) connector and engine-ECU connector.

a. B-108 (terminal No. 1) oxygen sensor (front) connector and A-09 (terminal No. 97) engine-ECU connector.
b. B-108 (terminal No. 2) oxygen sensor (front) connector and A-09 (terminal No. 98) engine-ECU connector.
・Check output line and earthing line for damage.

Q ： Is the check result normal?
YES： Go to Step 10
NO ： Repair the damaged harness wire.

STEP 10. Check single brake booster check valve.
・Check valve operation check（Refer to GROUP 35A — Basic Brake System — On-Vehicle Service）

Q ： Is the check result normal?
YES ： Go to Step 11
NO ： Replace the check valve.

STEP 11. Check Purge control solenoid valve itself.

・Check purge control solenoid valve itself (Refer to GROUP 17 - Emission Control System - Evaporative Emission Control System - Purge Control Solenoid Valve Check).

Q ： Is the check result normal?

YES ： Go to Step 12

NO ： Replace the purge control solenoid valve.

STEP 12. Measure fuel pressure.

・Measure fuel pressure (Refer to Fuel Pressure Test).

Q ： Is the check result normal?

YES ： Go to Step 13

NO ： Repair the fuel pressure.

STEP 13. Connector check: A-101, A-102, A-123, A-121 injector connector

Q ： Is the check result normal?

YES： Go to Step 14

NO ： Repair or replace the connector.

STEP 14. Check harness injector connector and engine-ECU connector.

a. A-101 (terminal No. 2) injector connector and A-08 (terminal No. 8) engine-ECU connector.

b. A-102 (terminal No. 2) injector connector and A-08 (terminal No. 9) engine-ECU connector.

c. A-123 (terminal No. 2) injector connector and A-08 (terminal No. 23) engine-ECU connector.

d. A-121 (terminal No. 2) injector connector and A-08 (terminal No. 24) engine-ECU connector.

・Check output line for damage.

Q ： Is the check result normal?

YES： Go to Step 15

NO ： Repair the damaged harness wire.

STEP 15. Connector check: B-212 junction block connector

Q ： Is the check result normal?

YES： Go to Step 16

NO ： Repair or replace the connector.

STEP 16. Check harness junction block connector and injector connector.

a. B-212 (terminal No. 6) junction block connector and A-101 (terminal No. 1) injector connector.
b. B-212 (terminal No. 6) junction block connector and A-102 (terminal No. 1) injector connector.
c. B-212 (terminal No. 6) junction block connector and A-123 (terminal No. 1) injector connector.
d. B-212 (terminal No. 6) junction block connector and A-121 (terminal No. 1) injector connector.

NOTE: Before checking harness, check intermediate connector A-13, and repair if necessary.

・Check output line for damage.

Q : Is the check result normal?

YES : Go to Step 17
NO : Repair the damaged harness wire.

STEP 17. Check injector itself.

・Check injector itself.

Q : Is the check result normal?

YES : Go to Step 18
NO : Replace the injector.

STEP 18. Check fuel.

・Check whether foreign materials enter into fuel such as water, diesel fuel, water removers and additives.

Q : Is the check result normal?

YES : Go to Step 19
NO : Replace the fuel.

STEP 19. M.U.T.-III data list

・Refer to Data List Reference Table
a. Item No. 11: Oxygen sensor

Q : Are the check results normal?

YES : Go to Step 20
NO : Replace the oxygen sensor.

STEP 20. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0170 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.
・If the diagnosis code P0170 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q : Is the diagnosis code P0170 output?

YES : After replacing the oxygen sensor (front), go to Step 21.
NO : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

STEP 21. After checking stored freeze frame data, check diagnosis codes again.

- If the diagnosis code P0170 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.
- If the diagnosis code P0170 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0170 output?

YES ： Replace the engine-ECU then perform the variant coding (Refer to GROUP 00 - Precautions Before Service - How to Perform Variant Coding).

NO ： Check end

PROBABLE CAUSES

- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Air intake from intake hose and intake manifold
- Air intake around brake booster (such as failed check valve)
- Exhaust gas leakage from exhaust manifold
- Failed purge control solenoid valve
- Harness damage in injector circuit, or connector damage
- Failed injector
- Failed fuel supply system (such as failed fuel pressure)
- Entry of foreign material to fuel (such as water, diesel fuel, water removers and additive)
- Harness damage in oxygen sensor circuit, or connector damage
- Failed oxygen sensor (front)
- Failed installation of oxygen sensor (front)
- Failed engine-ECU

DIAGNOSIS PROCEDURE

∗Preparation to carry out troubleshooting

Store the freeze frame data of the diagnosis code P0171.

STEP 1. M.U.T.-III diagnosis code

Q ： Is any other diagnosis code than P0171 output?

YES ： Inspection Chart for Diagnosis Code

NO ： Go to Step 2

STEP 2. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 6: Intake air temperature sensor

b. Item No. 7: Manifold absolute pressure sensor

c. Item No. 8: Engine coolant temperature sensor

Q ： Are the check results normal?

YES ： Go to Step 3

NO ： Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value.

STEP 3. Check air intake from intake hose and intake manifold.

Q ： Is the check result normal?

YES ： Go to Step 4

NO ： Repair.

STEP 4. Check for emission leakage from exhaust manifold.

Q ： Is the check result normal?

YES ： Go to Step 5

NO ： Repair.

STEP 5. Check installation status of oxygen sensor (front).

Q ： Is the check result normal?
YES ： Go to Step 6
NO ： Repair.

STEP 6. Connector check：B-32 oxygen sensor (front) connector

Q ： Is the check result normal?
YES： Go to Step 7
NO ： Repair or replace the connector.

STEP 7. Connector check: B-26 engine-ECU connector

Q ： Is the check result normal?
YES： Go to Step 8
NO ： Repair or replace the connector.

STEP 8. Check harness between oxygen sensor (front) connector and engine-ECU connector.
a. B-32 (terminal No. 1) oxygen sensor (front) connector and B-26 (terminal No. 38) engine-ECU connector.
b. B-32 (terminal No. 2) oxygen sensor (front) connector and B-26 (terminal No. 39) engine-ECU connector.
・Check output line and earthing line for damage.

Q ： Is the check result normal?
YES： Go to Step 9
NO ： Repair the damaged harness wire.

STEP 9. Check single brake booster check valve.
・Check valve operation check（Refer to GROUP 35A — Basic Brake System — On-Vehicle Service）

Q ： Is the check result normal?
YES ： Go to Step 10
NO ： Replace the check valve.

STEP 10. Check purge control solenoid valve itself.
・Check purge control solenoid valve itself (Refer to GROUP 17 - Emission Control System - Evaporative Emission Control System - Purge Control Solenoid Valve Check).

Q ： Is the check result normal?
YES ： Go to Step 11
NO ： Replace the purge control solenoid valve.

STEP 11. Measure fuel pressure.

・Measure fuel pressure (Refer to Fuel Pressure Test).

Q ： Is the check result normal?

YES ： Go to Step 12

NO ： Repair the fuel pressure.

STEP 12. Connector check: B-101, B-102, B-105, B-106 injector connector

Q ： Is the check result normal?

YES： Go to Step 13

NO ： Repair or replace the connector.

STEP 13. Check harness injector connector and engine-ECU connector.

a. B-101 (terminal No. 2) injector connector and B-26 (terminal No. 2) engine-ECU connector.

b. B-102 (terminal No. 2) injector connector and B-26 (terminal No. 3) engine-ECU connector.

c. B-105 (terminal No. 2) injector connector and B-26 (terminal No. 18) engine-ECU connector.

d. B-106 (terminal No. 2) injector connector and B-26 (terminal No. 19) engine-ECU connector.

・Check output line for damage.

Q ： Is the check result normal?

YES： Go to Step 14

NO ： Repair the damaged harness wire.

STEP 14. Connector check: A-70X injector relay connector

Q ： Is the check result normal?

YES： Go to Step 15

NO ： Repair or replace the connector.

STEP 15. Check harness injector relay connector and injector connector.

a. A-70X (terminal No. 3) injector relay connector and B-101 (terminal No. 1) injector connector.

b. A-70X (terminal No. 3) injector relay connector and B-102 (terminal No. 1) injector connector.

c. A-70X (terminal No. 3) injector relay connector and B-105 (terminal No. 1) injector connector.

d. A-70X (terminal No. 3) injector relay connector and B-106 (terminal No. 1) injector connector.

NOTE: Before checking harness, check intermediate connector A-17, and repair if necessary.

・Check output line for damage.

Q ： Is the check result normal?

YES： Go to Step 16

NO ： Repair the damaged harness wire.

STEP 16. Check injector itself.

・Check injector itself.

Q ： Is the check result normal?

YES ： Go to Step 17

NO ： Replace the injector.

STEP 17. Check fuel.

・Check whether foreign materials enter into fuel such as water, diesel fuel, water removers and additives.

Q ： Is the check result normal?

YES ： Go to Step 18

NO ： Replace the fuel.

STEP 18. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 11: Oxygen sensor

Q ： Are the check results normal?

YES ： Go to Step 19

NO ： Replace the oxygen sensor.

STEP 19. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0171 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0171 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0171 output?

YES ： After replacing the oxygen sensor (front), go to Step 20.

NO ： Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

STEP 20. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0171 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0171 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0171 output?

YES ： Replace the engine-ECU then perform the variant coding (Refer to GROUP 00 - Precautions Before Service - How to Perform Variant Coding).

NO ： Check end

PROBABLE CAUSES

- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Failed injector
- Failed fuel supply system (such as failed fuel pressure)
- Entry of foreign material to fuel (such as water, diesel fuel, water removers and additive)
- Harness damage in oxygen sensor circuit, or connector damage
- Failed oxygen sensor (front)
- Failed installation of oxygen sensor (front)
- Failed engine-ECU

DIAGNOSIS PROCEDURE

∗Preparation to carry out troubleshooting

Store the freeze frame data of the diagnosis code P0172.

STEP 1. M.U.T.-III diagnosis code

Q : Is any other diagnosis code than P0172 output?

YES : Inspection Chart for Diagnosis Code

NO : Go to Step 2

STEP 2. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 6: Intake air temperature sensor

b. Item No. 7: Manifold absolute pressure sensor

c. Item No. 8: Engine coolant temperature sensor

Q : Are the check results normal?

YES : Go to Step 3

NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value.

STEP 3. Check installation status of oxygen sensor (front).

Q : Is the check result normal?

YES : Go to Step 4

NO : Repair.

STEP 4. Connector check : B-32 oxygen sensor (front) connector

Q : Is the check result normal?

YES : Go to Step 5

NO : Repair or replace the connector.

STEP 5. Connector check: B-26 engine-ECU connector

Q : Is the check result normal?

YES : Go to Step 6

NO : Repair or replace the connector.

STEP 6. Check harness between oxygen sensor (front) connector and engine-ECU connector.

a. B-32 (terminal No. 1) oxygen sensor (front) connector and B-26 (terminal No. 38) engine-ECU connector.

b. B-32 (terminal No. 2) oxygen sensor (front) connector and B-26 (terminal No. 39) engine-ECU connector.

・Check output line and earthing line for damage.

Q ： Is the check result normal?

YES ： Go to Step 7

NO ： Repair the damaged harness wire.

STEP 7. Measure fuel pressure.

・Measure fuel pressure (Refer to Fuel Pressure Test).

Q ： Is the check result normal?

YES ： Go to Step 8

NO ： Repair the fuel pressure.

STEP 8. Check injector itself.

・Check injector itself.

Q ： Is the check result normal?

YES ： Go to Step 9

NO ： Replace the injector.

STEP 9. Check fuel.

・Check whether foreign materials enter into fuel such as water, diesel fuel, water removers and additives.

Q ： Is the check result normal?

YES ： Go to Step 10

NO ： Replace the fuel.

STEP 10. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 11: Oxygen sensor

Q ： Are the check results normal?

YES ： Go to Step 11

NO ： Replace the oxygen sensor.

STEP 11. After checking stored freeze frame data, check diagnosis codes again.

- If the diagnosis code P0172 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.
- If the diagnosis code P0172 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0172 output?

YES ： After replacing the oxygen sensor (front), go to Step 12.

NO ： Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

STEP 12. After checking stored freeze frame data, check diagnosis codes again.

- If the diagnosis code P0172 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.
- If the diagnosis code P0172 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0172 output?

YES ： Replace the engine-ECU then perform the variant coding (Refer to GROUP 00 - Precautions Before Service - How to Perform Variant Coding).

NO ： Check end

PROBABLE CAUSES

- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Air intake from intake hose and intake manifold
- Air intake around brake booster (such as failed check valve)
- Exhaust gas leakage from exhaust manifold
- Failed purge control solenoid valve
- Harness damage in injector circuit, or connector damage
- Failed injector
- Failed fuel supply system (such as failed fuel pressure)
- Entry of foreign material to fuel (such as water, diesel fuel, water removers and additive)
- Harness damage in oxygen sensor circuit, or connector damage
- Failed oxygen sensor (front)
- Failed installation of oxygen sensor (front)
- Failed engine-ECU

DIAGNOSIS PROCEDURE

∗Preparation to carry out troubleshooting

Store the freeze frame data of the diagnosis code P0170.

STEP 1. M.U.T.-III diagnosis code

Q ： Is any other diagnosis code than P0170 output?

YES ： Inspection Chart for Diagnosis Code

NO ： Go to Step 2

STEP 2. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 5: Intake air temperature sensor

b. Item No. 6: Engine coolant temperature sensor

c. Item No. 8: Manifold absolute pressure sensor

Q ： Are the check results normal?

YES ： Go to Step 3

NO ： Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value.

STEP 3. Check air intake from intake hose and intake manifold.

Q ： Is the check result normal?

YES ： Go to Step 4

NO ： Repair.

STEP 4. Check for emission leakage from exhaust manifold.

Q ： Is the check result normal?

YES ： Go to Step 5

NO ： Repair.

STEP 5. Check installation status of oxygen sensor (front).

Q : Is the check result normal?
YES : Go to Step 6
NO : Repair.

STEP 6. Connector check : C-45 <M/T> or B-05 <A/T> oxygen sensor (front) connector

Q : Is the check result normal?
YES : Go to Step 7
NO : Repair or replace the connector.

STEP 7. Connector check: B-08 engine-ECU connector

Q : Is the check result normal?
YES : Go to Step 8
NO : Repair or replace the connector.

STEP 8. Check harness between oxygen sensor (front) connector and engine-ECU connector.

a. C-45 (terminal No. 3) <M/T> or B-05 (terminal No. 1) <A/T> oxygen sensor (front) connector and B-08 (terminal No. 38) engine-ECU connector.
b. C-45 (terminal No. 4) <M/T> or B-05 (terminal No. 2) <A/T> oxygen sensor (front) connector and B-08 (terminal No. 39) engine-ECU connector.
NOTE: Before checking harness, check intermediate connector A-11, and repair if necessary <M/T>.

・Check output line and earthing line for damage.

Q : Is the check result normal?
YES : Go to Step 9
NO : Repair the damaged harness wire.

STEP 9. Check single brake booster check valve.
・Check valve operation check（Refer to GROUP 35A — Basic Brake System — On-Vehicle Service）

Q : Is the check result normal?
YES : Go to Step 10
NO : Replace the check valve.

STEP 10. Check purge control solenoid valve itself.
・Check purge control solenoid valve itself (Refer to GROUP 17 - Emission Control System - Evaporative Emission Control System - Purge Control Solenoid Valve Check).

Q : Is the check result normal?
YES : Go to Step 11
NO : Replace the purge control solenoid valve.

STEP 11. Measure fuel pressure.

・Measure fuel pressure (Refer to Fuel Pressure Test).

Q ： Is the check result normal?

YES ： Go to Step 12

NO ： Repair the fuel pressure.

STEP 12. Connector check: B-101, B-102, B-103, B-104 injector connector

Q ： Is the check result normal?

YES： Go to Step 13

NO ： Repair or replace the connector.

STEP 13. Check harness injector connector and engine-ECU connector.

a. B-101 (terminal No. 2) injector connector and B-08 (terminal No. 2) engine-ECU connector.

b. B-102 (terminal No. 2) injector connector and B-08 (terminal No. 3) engine-ECU connector.

c. B-103 (terminal No. 2) injector connector and B-08 (terminal No. 18) engine-ECU connector.

d. B-104 (terminal No. 2) injector connector and B-08 (terminal No. 19) engine-ECU connector.

・Check output line for damage.

Q ： Is the check result normal?

YES： Go to Step 14

NO ： Repair the damaged harness wire.

STEP 14. Connector check: A-23X injector relay connector

Q ： Is the check result normal?

YES： Go to Step 15

NO ： Repair or replace the connector.

STEP 15. Check harness injector relay connector and injector connector.

a. A-23X (terminal No. 3) injector relay connector and B-101 (terminal No. 1) injector connector.

b. A-23X (terminal No. 3) injector relay connector and B-102 (terminal No. 1) injector connector.

c. A-23X (terminal No. 3) injector relay connector and B-103 (terminal No. 1) injector connector.

d. A-23X (terminal No. 3) injector relay connector and B-104 (terminal No. 1) injector connector.

NOTE: Before checking harness, check intermediate connector A-11, and repair if necessary.

・Check output line for damage.

Q ： Is the check result normal?

YES： Go to Step 16

NO ： Repair the damaged harness wire.

STEP 16. Check injector itself.

・Check injector itself.

Q ： Is the check result normal?

YES ： Go to Step 17

NO ： Replace the injector.

STEP 17. Check fuel.

・Check whether foreign materials enter into fuel such as water, diesel fuel, water removers and additives.

Q ： Is the check result normal?

YES ： Go to Step 18

NO ： Replace the fuel.

STEP 18. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 11: Oxygen sensor

Q ： Are the check results normal?

YES ： Go to Step 19

NO ： Replace the oxygen sensor.

STEP 19. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0170 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0170 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0170 output?

YES ： After replacing the oxygen sensor (front), go to Step 20.

NO ： Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

STEP 20. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0170 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0170 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0170 output?

YES ： Replace the engine-ECU then perform the variant coding (Refer to GROUP 00 - Precautions Before Service - How to Perform Variant Coding).

NO ： Check end

PROBABLE CAUSES

- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Air intake from intake hose and intake manifold
- Air intake around brake booster (such as failed check valve)
- Exhaust gas leakage from exhaust manifold
- Failed purge control solenoid valve
- Harness damage in injector circuit, or connector damage
- Failed injector
- Failed fuel supply system (such as failed fuel pressure)
- Entry of foreign material to fuel (such as water, diesel fuel, water removers and additive)
- Harness damage in oxygen sensor circuit, or connector damage
- Failed oxygen sensor (front)
- Failed installation of oxygen sensor (front)
- Failed engine-ECU

DIAGNOSIS PROCEDURE

∗Preparation to carry out troubleshooting

Store the freeze frame data of the diagnosis code P0171.

STEP 1. M.U.T.-III diagnosis code

Q ： Is any other diagnosis code than P0171 output?

YES ： Inspection Chart for Diagnosis Code

NO ： Go to Step 2

STEP 2. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 5: Intake air temperature sensor

b. Item No. 6: Engine coolant temperature sensor

c. Item No. 8: Manifold absolute pressure sensor

Q ： Are the check results normal?

YES ： Go to Step 3

NO ： Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value.

STEP 3. Check air intake from intake hose and intake manifold.

Q ： Is the check result normal?

YES ： Go to Step 4

NO ： Repair.

STEP 4. Check for emission leakage from exhaust manifold.

Q ： Is the check result normal?

YES ： Go to Step 5

NO ： Repair.

STEP 5. Check installation status of oxygen sensor (front).

Q ： Is the check result normal?
YES ： Go to Step 6
NO ： Repair.

STEP 6. Connector check：B-05 oxygen sensor (front) connector

Q ： Is the check result normal?
YES： Go to Step 7
NO ： Repair or replace the connector.

STEP 7. Connector check: B-08 engine-ECU connector

Q ： Is the check result normal?
YES： Go to Step 8
NO ： Repair or replace the connector.

STEP 8. Check harness between oxygen sensor (front) connector and engine-ECU connector.
a. B-05 (terminal No. 1) oxygen sensor (front) connector and B-08 (terminal No. 38) engine-ECU connector.
b. B-05 (terminal No. 2) oxygen sensor (front) connector and B-08 (terminal No. 39) engine-ECU connector.
・Check output line and earthing line for damage.

Q ： Is the check result normal?
YES： Go to Step 9
NO ： Repair the damaged harness wire.

STEP 9. Check single brake booster check valve.
・Check valve operation check（Refer to GROUP 35A — Basic Brake System — On-Vehicle Service）

Q ： Is the check result normal?
YES ： Go to Step 10
NO ： Replace the check valve.

STEP 10. Check purge control solenoid valve itself.
・Check purge control solenoid valve itself (Refer to GROUP 17 - Emission Control System - Evaporative Emission Control System - Purge Control Solenoid Valve Check).

Q ： Is the check result normal?
YES ： Go to Step 11
NO ： Replace the purge control solenoid valve.

STEP 11. Measure fuel pressure.

・Measure fuel pressure (Refer to Fuel Pressure Test).

Q ： Is the check result normal?

YES ： Go to Step 12

NO ： Repair the fuel pressure.

STEP 12. Connector check: B-101, B-102, B-103, B-104 injector connector

Q ： Is the check result normal?

YES： Go to Step 13

NO ： Repair or replace the connector.

STEP 13. Check harness injector connector and engine-ECU connector.

a. B-101 (terminal No. 2) injector connector and B-08 (terminal No. 2) engine-ECU connector.

b. B-102 (terminal No. 2) injector connector and B-08 (terminal No. 3) engine-ECU connector.

c. B-103 (terminal No. 2) injector connector and B-08 (terminal No. 18) engine-ECU connector.

d. B-104 (terminal No. 2) injector connector and B-08 (terminal No. 19) engine-ECU connector.

・Check output line for damage.

Q ： Is the check result normal?

YES： Go to Step 14

NO ： Repair the damaged harness wire.

STEP 14. Connector check: A-23X injector relay connector

Q ： Is the check result normal?

YES： Go to Step 15

NO ： Repair or replace the connector.

STEP 15. Check harness injector relay connector and injector connector.

a. A-23X (terminal No. 3) injector relay connector and B-101 (terminal No. 1) injector connector.

b. A-23X (terminal No. 3) injector relay connector and B-102 (terminal No. 1) injector connector.

c. A-23X (terminal No. 3) injector relay connector and B-103 (terminal No. 1) injector connector.

d. A-23X (terminal No. 3) injector relay connector and B-104 (terminal No. 1) injector connector.

NOTE: Before checking harness, check intermediate connector A-11, and repair if necessary.

・Check output line for damage.

Q ： Is the check result normal?

YES： Go to Step 16

NO ： Repair the damaged harness wire.

STEP 16. Check injector itself.

・Check injector itself.

Q ： Is the check result normal?

YES ： Go to Step 17

NO ： Replace the injector.

STEP 17. Check fuel.

・Check whether foreign materials enter into fuel such as water, diesel fuel, water removers and additives.

Q ： Is the check result normal?

YES ： Go to Step 18

NO ： Replace the fuel.

STEP 18. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 11: Oxygen sensor

Q ： Are the check results normal?

YES ： Go to Step 19

NO ： Replace the oxygen sensor.

STEP 19. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0171 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0171 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0171 output?

YES ： After replacing the oxygen sensor (front), go to Step 20.

NO ： Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

STEP 20. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0171 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0171 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0171 output?

YES ： Replace the engine-ECU then perform the variant coding (Refer to GROUP 00 - Precautions Before Service - How to Perform Variant Coding).

NO ： Check end

PROBABLE CAUSES

- Failed intake air temperature sensor
- Failed engine coolant temperature sensor
- Failed manifold absolute pressure sensor
- Failed injector
- Failed fuel supply system (such as failed fuel pressure)
- Entry of foreign material to fuel (such as water, diesel fuel, water removers and additive)
- Harness damage in oxygen sensor circuit, or connector damage
- Failed oxygen sensor (front)
- Failed installation of oxygen sensor (front)
- Failed engine-ECU

DIAGNOSIS PROCEDURE

∗Preparation to carry out troubleshooting

Store the freeze frame data of the diagnosis code P0172.

STEP 1. M.U.T.-III diagnosis code

Q : Is any other diagnosis code than P0172 output?

YES : Inspection Chart for Diagnosis Code

NO : Go to Step 2

STEP 2. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 5: Intake air temperature sensor

b. Item No. 6: Engine coolant temperature sensor

c. Item No. 8: Manifold absolute pressure sensor

Q : Are the check results normal?

YES : Go to Step 3

NO : Perform the diagnosis code classified check procedure for the sensor that has shown an abnormal data value.

STEP 3. Check installation status of oxygen sensor (front).

Q : Is the check result normal?

YES : Go to Step 4

NO : Repair.

STEP 4. Connector check : B-05 oxygen sensor (front) connector

Q : Is the check result normal?

YES : Go to Step 5

NO : Repair or replace the connector.

STEP 5. Connector check: B-08 engine-ECU connector

Q : Is the check result normal?

YES : Go to Step 6

NO : Repair or replace the connector.

STEP 6. Check harness between oxygen sensor (front) connector and engine-ECU connector.

a. B-05 (terminal No. 1) oxygen sensor (front) connector and B-08 (terminal No. 38) engine-ECU connector.

b. B-05 (terminal No. 2) oxygen sensor (front) connector and B-08 (terminal No. 39) engine-ECU connector.

・Check output line and earthing line for damage.

Q ： Is the check result normal?

YES： Go to Step 7

NO ： Repair the damaged harness wire.

STEP 7. Measure fuel pressure.

・Measure fuel pressure (Refer to Fuel Pressure Test).

Q ： Is the check result normal?

YES ： Go to Step 8

NO ： Repair the fuel pressure.

STEP 8. Check injector itself.

・Check injector itself.

Q ： Is the check result normal?

YES ： Go to Step 9

NO ： Replace the injector.

STEP 9. Check fuel.

・Check whether foreign materials enter into fuel such as water, diesel fuel, water removers and additives.

Q ： Is the check result normal?

YES ： Go to Step 10

NO ： Replace the fuel.

STEP 10. M.U.T.-III data list

・Refer to Data List Reference Table

a. Item No. 11: Oxygen sensor

Q ： Are the check results normal?

YES ： Go to Step 11

NO ： Replace the oxygen sensor.

STEP 11. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0172 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0172 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0172 output?

YES ： After replacing the oxygen sensor (front), go to Step 12.

NO ： Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

STEP 12. After checking stored freeze frame data, check diagnosis codes again.

・If the diagnosis code P0172 is output while the vehicle is idling, let the vehicle idle for more than 20 minutes.

・If the diagnosis code P0172 is output while the vehicle is running, let the vehicle run with the same conditions of the freeze frame data, such as the vehicle speed, the crank angle sensor and the coolant temperature sensor, for more than 10 minutes.

Q ： Is the diagnosis code P0172 output?

YES ： Replace the engine-ECU then perform the variant coding (Refer to GROUP 00 - Precautions Before Service - How to Perform Variant Coding).

NO ： Check end