



Technical Service Bulletin

SUBJECT:		No: TSB-23-23-001	
CVT BELT CHECK – SERVICE MANUAL REVISION		DATE: January 2023	
		MODEL: See below	
CIRCULATE TO:	<input type="checkbox"/> GENERAL MANAGER	<input checked="" type="checkbox"/> PARTS MANAGER	<input checked="" type="checkbox"/> TECHNICIAN
<input checked="" type="checkbox"/> SERVICE ADVISOR	<input checked="" type="checkbox"/> SERVICE MANAGER	<input checked="" type="checkbox"/> WARRANTY PROCESSOR	<input type="checkbox"/> SALES MANAGER

PURPOSE

This TSB provides the addition of Diagnostic Procedure for CVT Belt Check for vehicles equipped with CVT type F1CJC and W1CJC.

AFFECTED VEHICLES

- 2016-2017 Lancer
- 2015-2022 Outlander Sport
- 2016-2020 Outlander
- 2018-2020 and 2022 Eclipse Cross

AFFECTED SERVICE MANUAL

- 2016-2017 Lancer/Lancer Sportback* Service Manual, Group 23-CVT
- 2015-2022 Outlander Sport Service Manual, Group 23-CVT
- 2016-2020 Outlander Service Manual, Group 23-CVT
- 2018-2020 and 2022 Eclipse Cross Service Manual, Group 23-CVT

PROCEDURE

Please use the chart on pages 2-3 and add the indicated pages to the affected Service Manuals, Group 23-CVT - Diagnosis, Special Tools, and On-Vehicle Service.



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Applicable manual	Pub. No.	Applicable title (Info)	Contents
2016 LANCER Service Manual	MSCD-106B-2016	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P0776: Abnormality in Secondary Pressure Solenoid Valve Function	Attached sheet 1
2017 LANCER Service Manual	MSCD-106B-2017	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P084A: Abnormality in Primary Pressure Sensor Function	Attached sheet 2
		CVT ↳ DIAGNOSIS ↳ TROUBLE SYMPTOM DIAGNOSIS CHART	Attached sheet 3
		CVT ↳ SPECIAL TOOLS	Attached sheet 4
		CVT ↳ ON-VEHICLE SERVICE ↳ Added below "SHIFT LOCK MECHANISM CHECK"	Attached sheet 5
2015 OUTLANDER SPORT Service Manual	MSCD-017B-2015	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P0776: Abnormality in Secondary Pressure Solenoid Valve Function	Attached sheet 1
2016 OUTLANDER SPORT Service Manual	MSCD-017B-2016		
2017 OUTLANDER SPORT Service Manual	MSCD-017B-2017	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P084A: Abnormality in Primary Pressure Sensor Function	Attached sheet 2
2018 OUTLANDER SPORT Service Manual	MSCD-017B-2018	CVT ↳ DIAGNOSIS ↳ TROUBLE SYMPTOM DIAGNOSIS CHART	Attached sheet 3
2019 OUTLANDER SPORT Service Manual	MSCD-017B-2019		
2020 OUTLANDER SPORT Service Manual	MSCD-017B-2020	CVT ↳ SPECIAL TOOLS	Attached sheet 4
2021 OUTLANDER SPORT Service Manual	MSCD-017B-2021	CVT ↳ ON-VEHICLE SERVICE ↳ Added below "SHIFT LOCK MECHANISM CHECK"	Attached sheet 5
2022 OUTLANDER SPORT Service Manual	MSCD-017B-2022		

Applicable manual	Pub. No.	Applicable title (Info)	Contents
2016 OUTLANDER Service Manual	MSCD-007B-2016	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P0776: Abnormality in Secondary Pressure Solenoid Valve Function	Attached sheet 1
2017 OUTLANDER Service Manual	MSCD-007B-2017	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P084A: Abnormality in Primary Pressure Sensor Function	Attached sheet 2
2018 OUTLANDER Service Manual	MSCD-007B-2018	CVT ↳ DIAGNOSIS ↳ TROUBLE SYMPTOM DIAGNOSIS CHART	Attached sheet 3
2019 OUTLANDER Service Manual	MSCD-007B-2019	CVT ↳ SPECIAL TOOLS	Attached sheet 4
2020 OUTLANDER Service Manual	MSCD-007B-2020	CVT ↳ ON-VEHICLE SERVICE ↳ Added below "SHIFT LOCK MECHANISM CHECK"	Attached sheet 5

Applicable manual	Pub. No.	Applicable title (Info-ID/SIE No.)	Contents
2018 ECLIPSE CROSS Service Manual	MSCD-020B-2018	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P0776: Abnormality in Secondary Pressure Solenoid Valve Function	Attached sheet 1
2019 ECLIPSE CROSS Service Manual	MSCD-020B-2019	CVT ↳ DIAGNOSIS ↳ DIAGNOSTIC TROUBLE CODE CHART ↳ DTC P084A: Abnormality in Primary Pressure Sensor Function	Attached sheet 2
2020 ECLIPSE CROSS Service Manual	MSCD-020B-2020	CVT ↳ DIAGNOSIS ↳ TROUBLE SYMPTOM DIAGNOSIS CHART	Attached sheet 3
2022 ECLIPSE CROSS Service Manual	MSCD-020B-2022	CVT ↳ SPECIAL TOOLS	Attached sheet 4
		CVT ↳ ON-VEHICLE SERVICE ↳ Added below "SHIFT LOCK MECHANISM CHECK"	Attached sheet 5

DTC P0776: Abnormality in Secondary Pressure Solenoid Valve Function

DIAGNOSTIC FUNCTION

TCM conducts fault detection by measuring the difference between the target value and the actual value for the secondary pressure.

DESCRIPTIONS OF MONITOR METHODS

The following three conditions are met for 10 seconds.

- The engine is running.
- Selector lever position: Other than P, N.
- Fluid temperature: More than -20°C (-4°F).
- Difference between the target secondary pressure and actual secondary pressure is 1.2 MPa (174 psi) or more.

MONITOR EXECUTION

- Voltage of battery: 10 volts or more.

**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)**

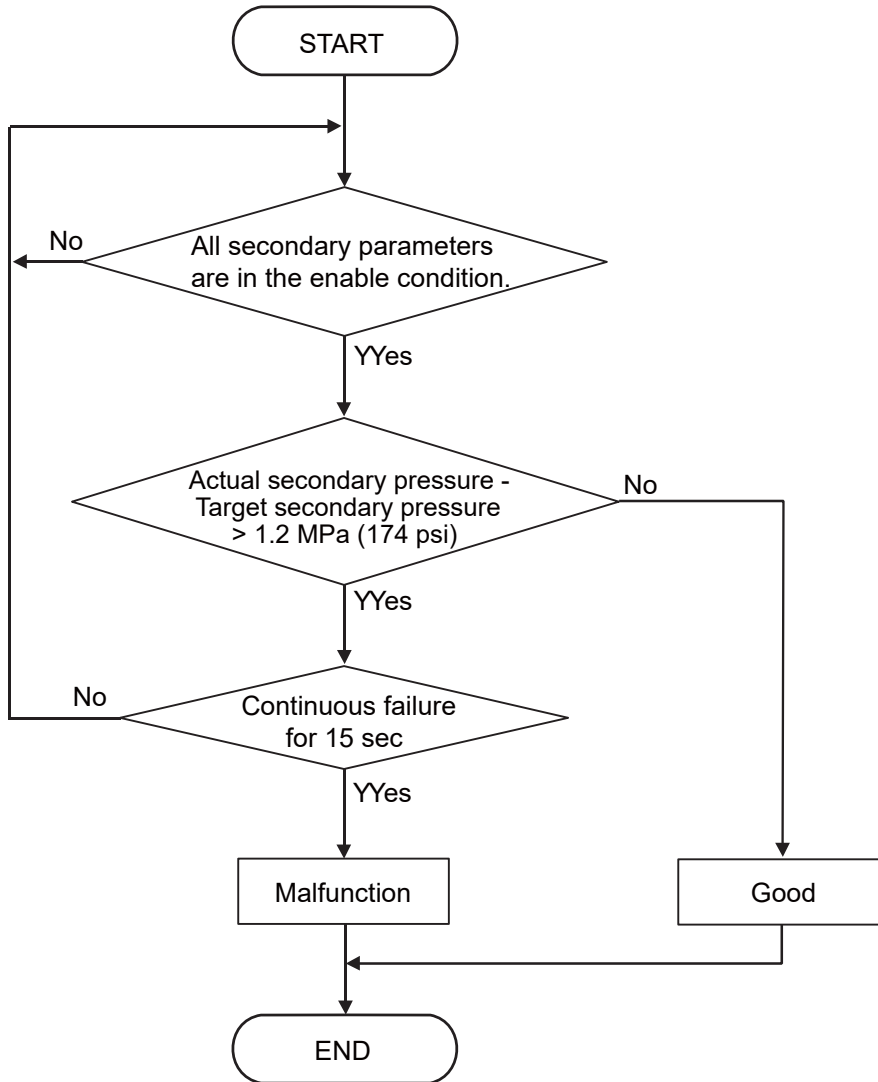
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

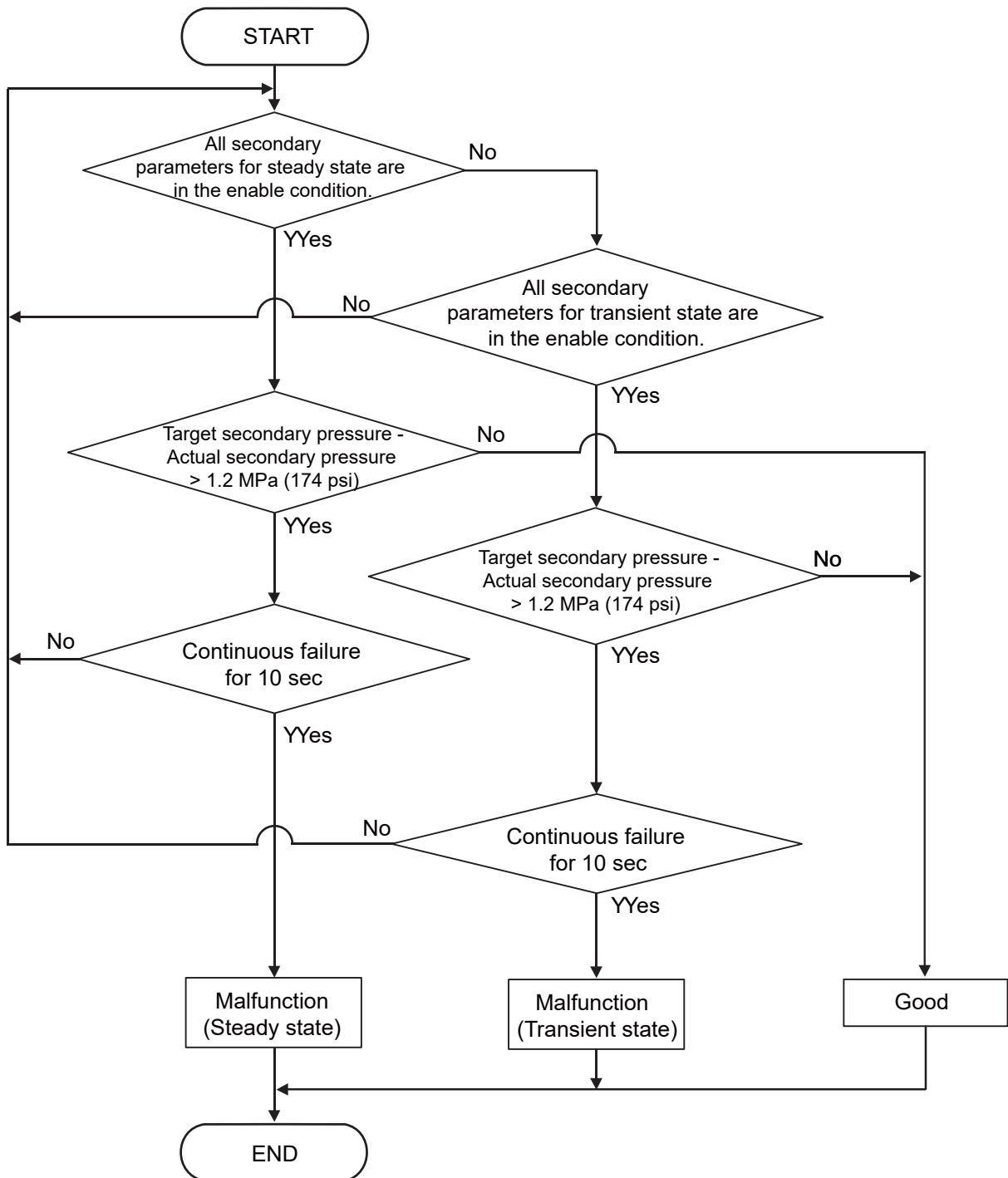
- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence-Output Functional High)



BCC07002AA

LOGIC FLOW CHARTS (Monitor Sequence-Output Functional Low)



BCD04219AA

DTC SET CONDITIONS

Check Conditions <Output Functional High>

- Voltage of battery: 10 volts or more.
- Transmission range switch position: D or R.

Check Conditions <Output Functional Low (Steady state)>

- Voltage of battery: 10 volts or more.
- Transmission range switch position: D or R.

- Engine speed: 450 r/min or more.
- Target secondary pressure: 0 MPa (0 psi) or more.
- Time since following conditions are approved: More than 1.52 seconds [2 times (Interval: 30 second)].
 - a. Target secondary pressure - Actual secondary pressure: 0.25 MPa (36 psi) or more.

- b. Actual secondary pressure: Less than minimum line pressure.
- c. Accelerator pedal position change rate: 6.25 / 1.52 seconds or less.
- d. Vehicle speed change rate: 15 km/h (9 mph) / 1.52 seconds or less.

Check Conditions <Output Functional Low (Transient state)>

- Voltage of battery: 10 volts or more.
- Transmission range switch position: D or R.
- Engine speed: 450 r/min or more.
- Target secondary pressure: 0 MPa (0 psi) or more.
- Time since following conditions are approved: More than 1 seconds.
 - a. MIN [(Target secondary pressure - Actual secondary pressure), (Minimum line pressure - Actual secondary pressure)]: 2 MPa (290 psi) or more.

Judgment Criteria <Output Functional High>

- Actual secondary pressure - Target secondary pressure: More than 1.2 MPa (174 psi) (15 seconds).

Judgment Criteria <Output Functional Low (Steady state)>

- Target secondary pressure - Actual secondary pressure: More than 1.2 MPa (174 psi) (10 seconds).

Judgment Criteria <Output Functional Low (Transient state)>

- Target secondary pressure - Actual secondary pressure: More than 1.2 MPa (174 psi) (10 seconds).

OBD-II DRIVE CYCLE PATTERN

The vehicle is driven for at least 10 seconds with the accelerator opening angle at 20° or more.

PROBABLE CAUSES

- Malfunction of valve body assembly (Faulty secondary pressure solenoid valve)
- Malfunction of the CVT assembly
- Malfunction of the TCM

DIAGNOSIS

Required Special Tools:

- MB992006: Extra fine probe
- MQ600069: Bore Scope

STEP 1. Scan tool (M.U.T.-IIISE) DTC.

Q: Is diagnostic trouble code No. P0966 or P0967 set?

YES : Carry out the appropriate troubleshooting.

NO : Go to Step 2.

STEP 2. Measure the output wave pattern of the secondary pressure solenoid valve at TCM connector (SCLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Selector lever position: L range or sport mode (1st gear).
- (3) Drive at a constant speed of approx. 20 km/h (13 mph).
- (4) Connect an oscilloscope, and measure the voltage between TCM connector SCLS terminal and body ground.

OK: A wave pattern such as the one shown on (Check Procedure Using an Oscilloscope) should be output. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to diagnostic trouble code No.P0966: Malfunction of Secondary Pressure Solenoid Valve (low input), or diagnostic trouble code No.P0967: Malfunction of Secondary Pressure Solenoid Valve (high input).

STEP 3. CVT belt inspection.

Use the special tool bore scope (MQ600069) to check the appearance (Slip marks, the presence or absence of damage) of the CVT belt (Refer to Attached sheet 11).

Q: Is the CVT belt normal?

YES : Replace the valve body assembly. Then go to Step 4.

NO : Replace the CVT assembly.

STEP 4. Check whether the DTC is stored again.

Erase the DTC.

Then, drive the vehicle for a while and check again.

Q: Is the diagnostic trouble code set?

YES : Replace the TCM.

NO : This diagnosis is complete.

DTC P084A: Abnormality in Primary Pressure Sensor Function

DIAGNOSTIC FUNCTION

The TCM determines that the system is defective when the primary pressure sensor output voltage is outside the predetermined value range.

DESCRIPTIONS OF MONITOR METHODS

All the conditions listed below remain for 5 seconds.

- The pulley ratio is 0.5 or more, 1.0 or less.
- The primary pulley speed is 300 r/min or more.
- The secondary pulley speed is 250 r/min or more.
- Target shifting speed is 0.1/sec or less.
- The primary pressure is outside the predetermined pressure range.

MONITOR EXECUTION

- Voltage of battery: 10 volts or more.

**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)**

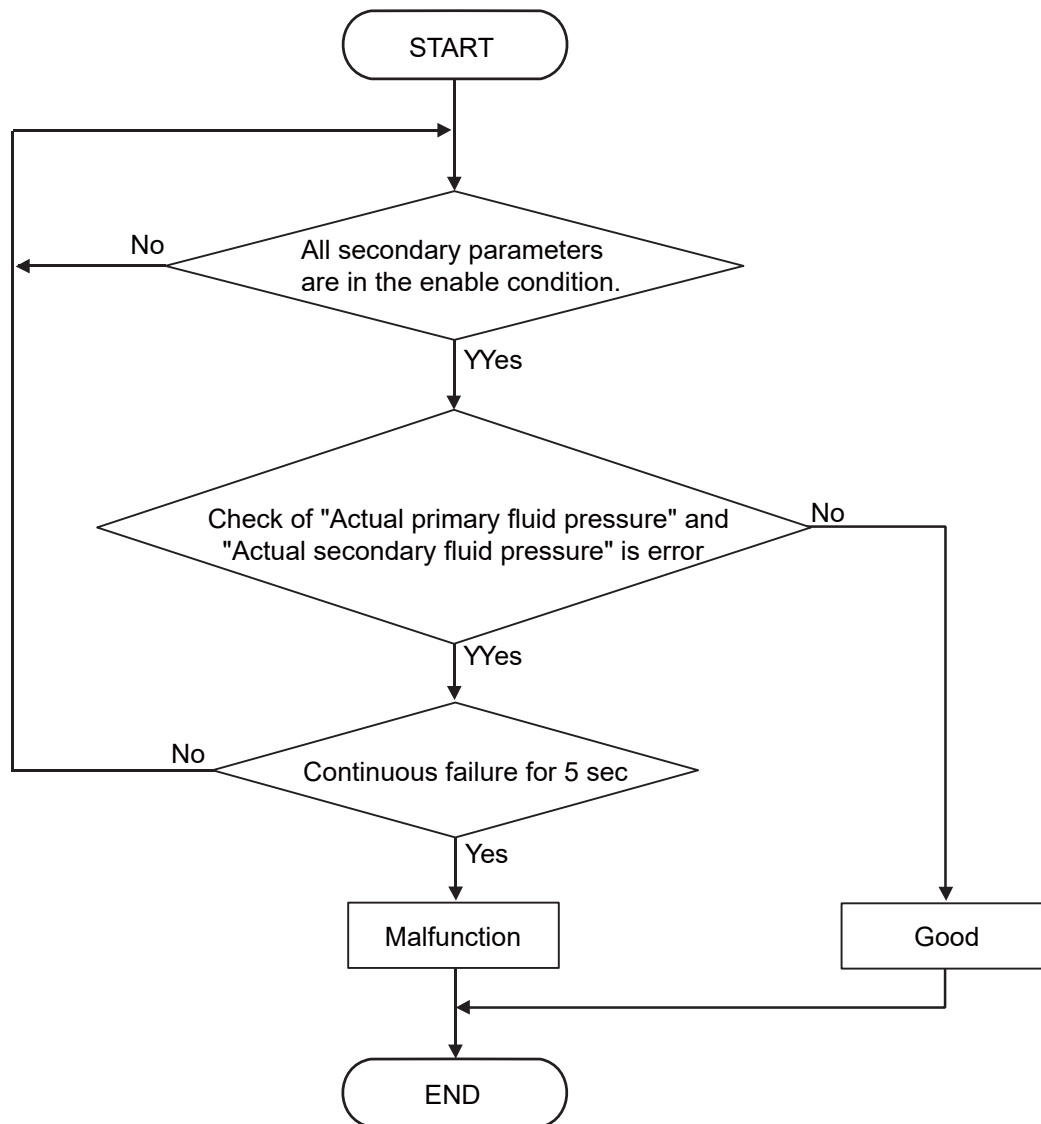
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0966, P0967: Malfunction of secondary pressure solenoid valve
- P0970, P0971: Malfunction of primary pressure solenoid valve

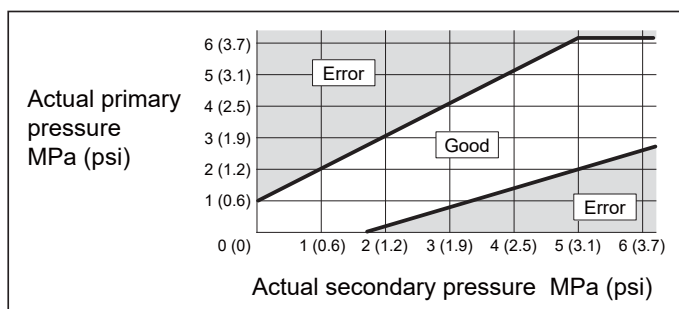
Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



NOTE: :



ACD04282

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Primary pulley speed: 300 r/min or more.
- Secondary pulley speed: 250 r/min or more.
- Pulley ratio: More than 0.5, less than 1.0.

Judgment Criteria

- Check of "Actual primary pressure" and "Actual secondary pressure" is error. (5 seconds).

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 10 seconds or more).

PROBABLE CAUSES

- Malfunction of valve body assembly (Faulty primary pressure sensor, secondary pressure sensor)
- Damaged wiring harness and connectors
- Malfunction of the CVT assembly
- Malfunction of the TCM

DIAGNOSIS

Required Special Tool:

- MQ600069: Bore Scope

STEP 1. Scan tool (M.U.T.-IIISE) DTC.

Q: Is diagnostic trouble code No. P0842, P0843, P0847 or P0848 set?

YES : Carry out the appropriate troubleshooting.

NO : Go to Step 2.

STEP 2. CVT belt inspection

Use the special tool bore scope (MQ600069) to check the appearance (Slip marks, the presence or absence of damage) of the CVT belt (Refer to Attached sheet 11).

Q: Is the CVT belt normal?

YES : Replace the valve body assembly. Then go to Step 3.

NO : Replace the CVT assembly.

STEP 3. Check whether the DTC is stored again

Erase the DTC.

Then, drive the vehicle for a while and check again.

Q: Is the diagnostic trouble code set?

YES : Replace the TCM.

NO : This diagnosis is complete.

TROUBLE SYMPTOM DIAGNOSIS CHART

Diagnose the system by referring to the trouble symptom chart and the possible cause chart. Then check, repair or replace if necessary.

Trouble symptom chart

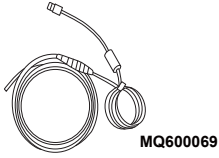
NOTE: Diagnose the system in the order of "Possible cause No.".

Trouble symptom		Possible cause No.
Others	Malfunction of hesitation or poor acceleration	2 → 1 → 3 → 18

Possible cause chart

Possible cause No.	Probable cause	Remedy
1	Malfunction of the engine system	Check the engine system, and repair or replace if necessary.
2	Improper transmission fluid level	Check the transmission fluid, and repair or replace if necessary.
3	Not within the standard value of the line pressure	Check the hydraulic system, and repair or replace if necessary.
18	Malfunction of the CVT belt	Visually inspection of CVT belt (Refer to Attached sheet 11).

SPECIAL TOOL

Tool	Tool number and name	Supersession	Application
 <p>MQ600069</p>	MQ600069 Bore scope	-	Check of the CVT belt

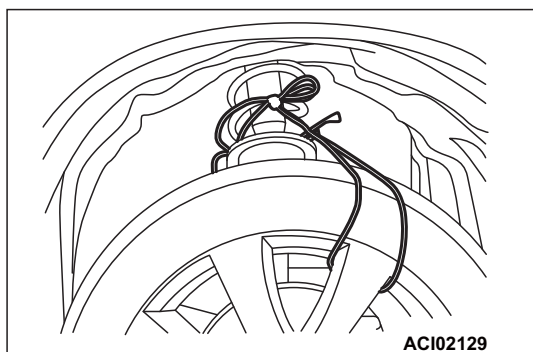
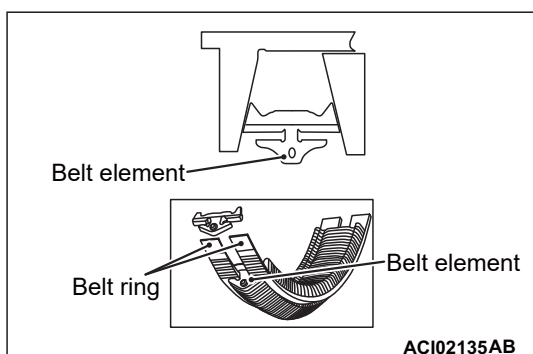
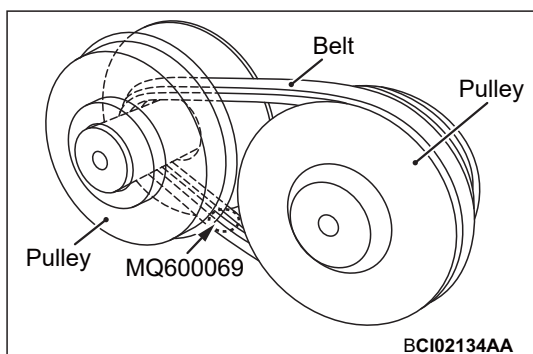
CVT BELT INSPECTION

Required Special Tool:

- MQ600069: Bore Scope

Visually inspect all around of the both pulley mating surfaces of the belt (flanks surfaces of belt elements) using the special tool bore scope (MQ600069) camera with a 90 degree viewing mirror.

1. Place the vehicle on a lift, put gear in "N".
2. Turn the ignition switch to the "LOCK" (OFF) position.
3. Disconnect the negative (-) battery terminal.
4. Raise the vehicle. Make sure gear is in "N" prior to raising the vehicle.



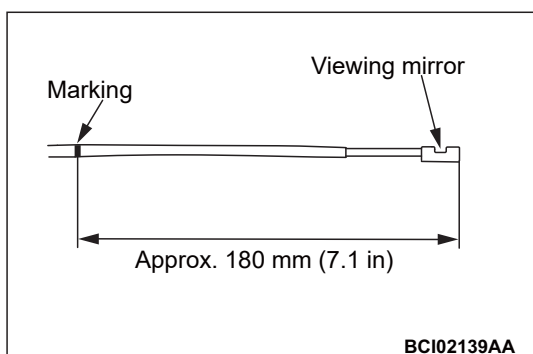
5. Tie the front right tire and any vehicle member with a rope not to rotate the wheel.

CAUTION

Check the CVT fluid and the inside of the oil pan. If a large metal chip is found, abort the operation and replace the CVT assembly (Refer to GROUP 23A - Transaxle assembly).

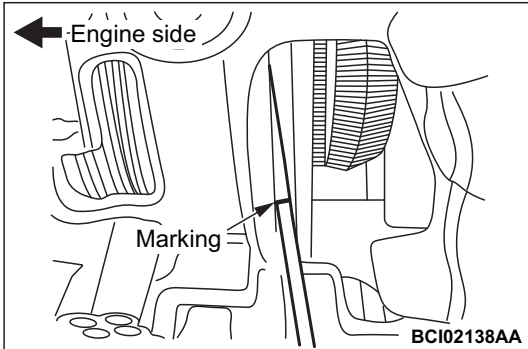
6. Remove the valve body assembly (Refer to GROUP 23A - Oil pan and Valve body assembly).
7. Check the engine side (right side of the vehicle) of the flanks of belt elements according to the procedure below.

- (1) With the 90 degree viewing mirror, which is provided with the special tool bore scope (MQ600069), attached to the special tool bore scope (MQ600069), put a mark on the position shown in the figure.

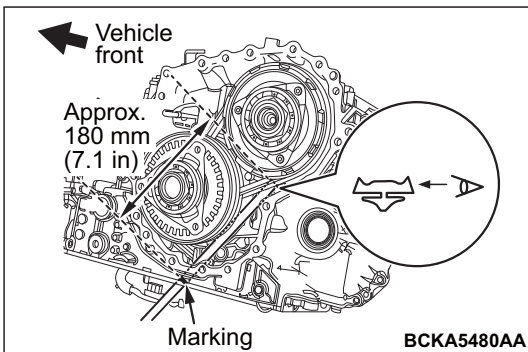


⚠ CAUTION

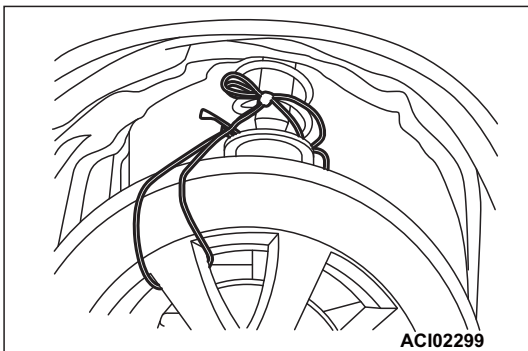
Clean so that foreign matter does not adhere to the insertion portion of the special tool bore scope (MQ600069) camera.



- (2) Insert the special tool bore scope (MQ600069) into the Transaxle case from the position shown in the figure until the mark [approximately 180 mm (7.1 inches)] on the special tool bore scope comes to the end of the Transaxle case, while making sure that the 90 degree viewing mirror is facing toward the left side of the vehicle.



- (3) Adjust the position of the 90 degree viewing mirror of the special tool bore scope (MQ600069) so that the side face of the belt element (the right side of the vehicle) can be seen.
- (4) Make a mark on a side wall of the front left tire to recognize one round of rotation.



⚠ CAUTION

- Make sure the front right tire is fixed by a rope not to rotate.
- Rotate the tire in the forward rotation only. If the tire is rotated in the backward rotation, the special tool bore scope (MQ600069) camera lens may get caught between the belt and pulley.

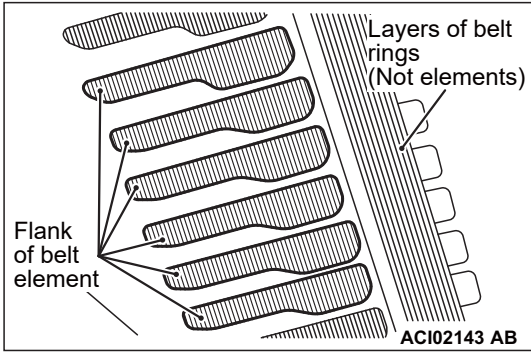
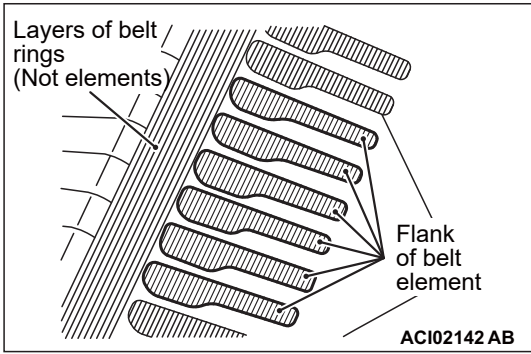
- (5) Slowly rotate the front left tire entire one round to rotate the belt to inspect all around of the belt element flanks surfaces.

NOTE: Rotate the tire as slow as each belt element flank can be carefully inspected if any evidence of damage presented or not, or pose the rotation periodically such as every 9 - 10 elements movement on a camera view, and inspect, and then move to next 9 - 10 elements to inspect.

8. Refer to the OK samples and the damage samples below to determine the condition of the flanks (grooved surfaces) of belt elements. When a damage is found on the flanks of the belt elements, replace the CVT assembly (Refer to GROUP 23A - Transaxle assembly).

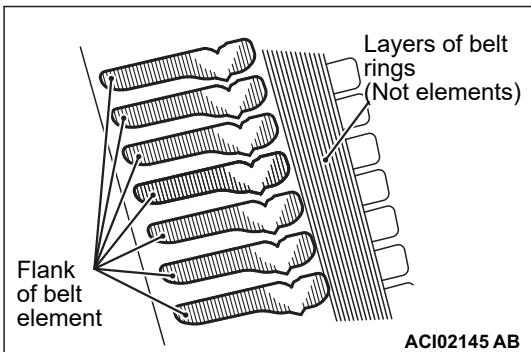
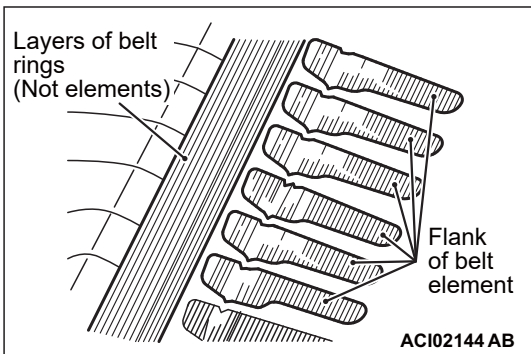
<OK SAMPLES>

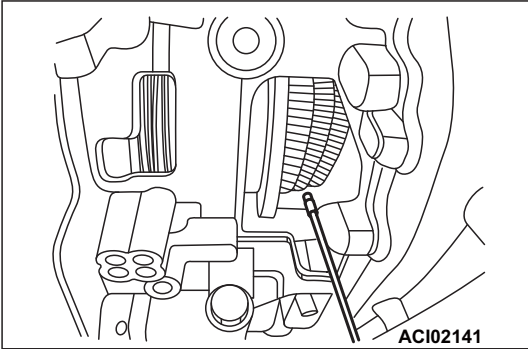
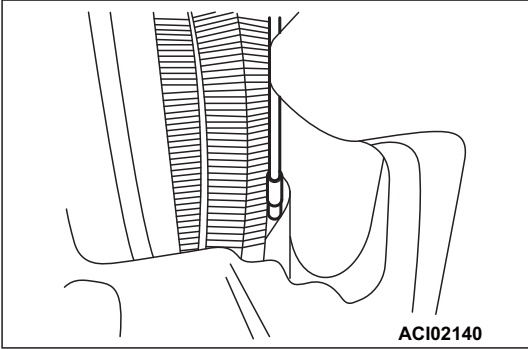
- No damage is observed on flanks (grooved surfaces) of belt elements.



<DAMAGE SAMPLES>

- Damages to grooves are observed on flanks of belt elements.





9. When the check result of the engine side (right side of the vehicle) of the flanks of the belt elements is normal, check the Transaxle side cover side (left side of the vehicle) of the flanks of the belt elements.
10. When a damage is found on the flanks of the belt elements, replace the CVT assembly (Refer to GROUP 23A - Transaxle assembly). When there is no problem, the inspection is complete.
11. Install the valve body assembly (Refer to GROUP 23A - Oil Pan and Valve Body assembly).
NOTE: If the CVT belt was checked by diagnosis (DTC P0776, P084A), replace the valve body assembly.
12. Remove the rope which tying the front right tire and vehicle member.
13. Connect the negative (-) battery terminal.
14. When the valve body assembly is replaced, carry out the following operations.
 - Initialization Procedure for CVT Learned Value (Refer to GROUP 23A - Diagnosis <CVT> - Initialization Procedure for CVT Learned Value).
 - Learning Procedure (Refer to GROUP 23A - Diagnosis <CVT> - Learning Procedure).
15. Test drive the vehicle.