



Technical Service Bulletin

SUBJECT:		No: TSB-22-23-002	
MAINTENANCE PROCEDURE IMPROVEMENT FOR CVT – SERVICE MANUAL REVISION		DATE: April 2022	
		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 updates the Maintenance Procedure section, in the Automatic Transmission portion of the affected Service Manual.

AFFECTED VEHICLES

- 2014 - 2022 Mirage
- 2017 - 2022 Mirage G4

AFFECTED SERVICE MANUAL

- 2014 - 2022 Mirage Service Manual, Group 23-Automatic Transmission, CVT
- 2017 - 2022 Mirage G4 Service Manual, Group 23-Automatic Transmission, CVT

PROCEDURE

Please use the following chart on pages 2-4 and replace the indicated pages in the 2014 - 2022 Mirage Service Manual, Group 23-Automatic Transmission, CVT and 2017 - 2022 Mirage G4 Service Manual, Group 23-Automatic Transmission, CVT.



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MIRAGE

AFFECTED MANUAL	PART #	TITLE	REVISED PAGES	
2014 MIRAGE SERVICE MANUAL 2015 MIRAGE SERVICE MANUAL 2017 MIRAGE SERVICE MANUAL	MSCD-016B-2014	CVT └ LUBRICANTS	PAGE 5	
		CVT └ DIAGNOSIS └ DTC P0746: Abnormality in Hydraulic Control System Function	PAGE 6-8	
	MSCD-016B-2015	CVT └ DIAGNOSIS └ DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function	PAGE 9-12	
		CVT └ DIAGNOSIS └ DTC P0841: Abnormality in Secondary Pressure Sensor Function	PAGE 13-14	
	MSCD-016B-2017	CVT └ DIAGNOSIS └ DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up	PAGE 15-17	
		CVT └ DIAGNOSIS └ DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up	PAGE 18-20	
		CVT └ DIAGNOSIS └ DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio	PAGE 21-25	
		CVT └ DIAGNOSIS └ DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio	PAGE 26-29	
		CVT └ SPECIAL TOOLS	PAGE 30	
		Added below CVT └ ON-VEHICLE SERVICE. └ SHIFT LOCK MECHANISM CHECK	PAGE 31-35	
2018 MIRAGE SERVICE MANUAL		MSCD-016B-2018	CVT └ LUBRICANTS	PAGE 5
CVT └ SPECIAL TOOLS			PAGE 30	
2019 MIRAGE SERVICE MANUAL	MSCD-016B-2019	CVT └ DIAGNOSIS └ DTC P0746: Abnormality in Hydraulic Control System Function	PAGE 37-40	
2020 MIRAGE SERVICE MANUAL	MSCD-016B-2020	CVT └ DIAGNOSIS └ DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function	PAGE 41-45	
2021 MIRAGE SERVICE MANUAL	MSCD-016B-2021	CVT └ DIAGNOSIS └ DTC P0841: Abnormality in Secondary Pressure Sensor Function	PAGE 46-49	
		CVT └ DIAGNOSIS └ DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up	PAGE 50-53	
	CVT └ DIAGNOSIS └ DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up	PAGE 54-57		
	CVT └ DIAGNOSIS └ DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio	PAGE 58-63		
	CVT └ DIAGNOSIS └ DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio	PAGE 64-68		
Added below CVT └ ON-VEHICLE SERVICE. └ SHIFT LOCK MECHANISM CHECK	PAGE 31-35			

MIRAGE

AFFECTED MANUAL	PART #	TITLE	REVISED PAGES
2022 MIRAGE SERVICE MANUAL	MSCD-016B-2022	CVT ↳ LUBRICANTS	PAGE 5
		CVT ↳ SPECIAL TOOLS	PAGE 30
		CVT ↳ DIAGNOSIS ↳ DTC P0746: Abnormality in Hydraulic Control System Function	PAGE 37-40
		CVT ↳ DIAGNOSIS ↳ DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function	PAGE 41-45
		CVT ↳ DIAGNOSIS ↳ DTC P0841: Abnormality in Secondary Pressure Sensor Function	PAGE 46-49
		CVT ↳ DIAGNOSIS ↳ DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up	PAGE 50-53
		CVT ↳ DIAGNOSIS ↳ DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up	PAGE 54-57
		CVT ↳ DIAGNOSIS ↳ DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio	PAGE 58-63
		CVT ↳ DIAGNOSIS ↳ DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio	PAGE 64-68
		Added below CVT ↳ ON-VEHICLE SERVICE. ↳ SHIFT LOCK MECHANISM CHECK	PAGE 31-35

MIRAGE G4

AFFECTED MANUAL	PART #	TITLE	REVISED PAGES
2017 MIRAGE G4 SERVICE MANUAL	MSCD-018B-2017	CVT ↳ LUBRICANTS	PAGE 5
		CVT ↳ DIAGNOSIS ↳ DTC P0746: Abnormality in Hydraulic Control System Function	PAGE 6-8
		CVT ↳ DIAGNOSIS ↳ DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function	PAGE 9-12
		CVT ↳ DIAGNOSIS ↳ DTC P0841: Abnormality in Secondary Pressure Sensor Function	PAGE 13-14
		CVT ↳ DIAGNOSIS ↳ DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up	PAGE 15-17
		CVT ↳ DIAGNOSIS ↳ DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up	PAGE 18-20
		CVT ↳ DIAGNOSIS ↳ DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio	PAGE 21-25
		CVT ↳ DIAGNOSIS ↳ DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio	PAGE 26-29
		CVT ↳ SPECIAL TOOLS	PAGE 30
		Added below CVT ↳ ON-VEHICLE SERVICE. ↳ SHIFT LOCK MECHANISM CHECK	PAGE 31-35

MIRAGE G4

AFFECTED MANUAL	PART #	TITLE	REVISED PAGES	
2018 MIRAGE G4 SERVICE MANUAL	MSCD-019B-2018	CVT └ LUBRICANTS	PAGE 5	
		CVT └ SPECIAL TOOLS	PAGE 30	
	MSCD-019B-2019	CVT └ DIAGNOSIS └ DTC P0746: Abnormality in Hydraulic Control System Function	PAGE 37-40	
		MSCD-019B-2020	CVT └ DIAGNOSIS └ DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function	PAGE 41-45
	MSCD-019B-2021		CVT └ DIAGNOSIS └ DTC P0841: Abnormality in Secondary Pressure Sensor Function	PAGE 46-49
		CVT └ DIAGNOSIS └ DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up	PAGE 50-53	
		CVT └ DIAGNOSIS └ DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up	PAGE 54-57	
		CVT └ DIAGNOSIS └ DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio	PAGE 58-63	
		CVT └ DIAGNOSIS └ DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio	PAGE 64-68	
		Added below CVT └ ON-VEHICLE SERVICE. └ SHIFT LOCK MECHANISM CHECK	PAGE 31-35	
2022 MIRAGE G4 SERVICE MANUAL		MSCD-019B-2022	CVT └ LUBRICANTS	PAGE 5
			CVT └ SPECIAL TOOLS	PAGE 30
	CVT └ DIAGNOSIS └ DTC P0746: Abnormality in Hydraulic Control System Function	PAGE 37-40		
	CVT └ DIAGNOSIS └ DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function	PAGE 41-45		
	CVT └ DIAGNOSIS └ DTC P0841: Abnormality in Secondary Pressure Sensor Function	PAGE 46-49		
	CVT └ DIAGNOSIS └ DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up	PAGE 50-53		
	CVT └ DIAGNOSIS └ DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up	PAGE 54-57		
	CVT └ DIAGNOSIS └ DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio	PAGE 58-63		
	CVT └ DIAGNOSIS └ DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio	PAGE 64-68		
	Added below CVT └ ON-VEHICLE SERVICE. └ SHIFT LOCK MECHANISM CHECK	PAGE 31-35		

LUBRICANTS

M1231200400866

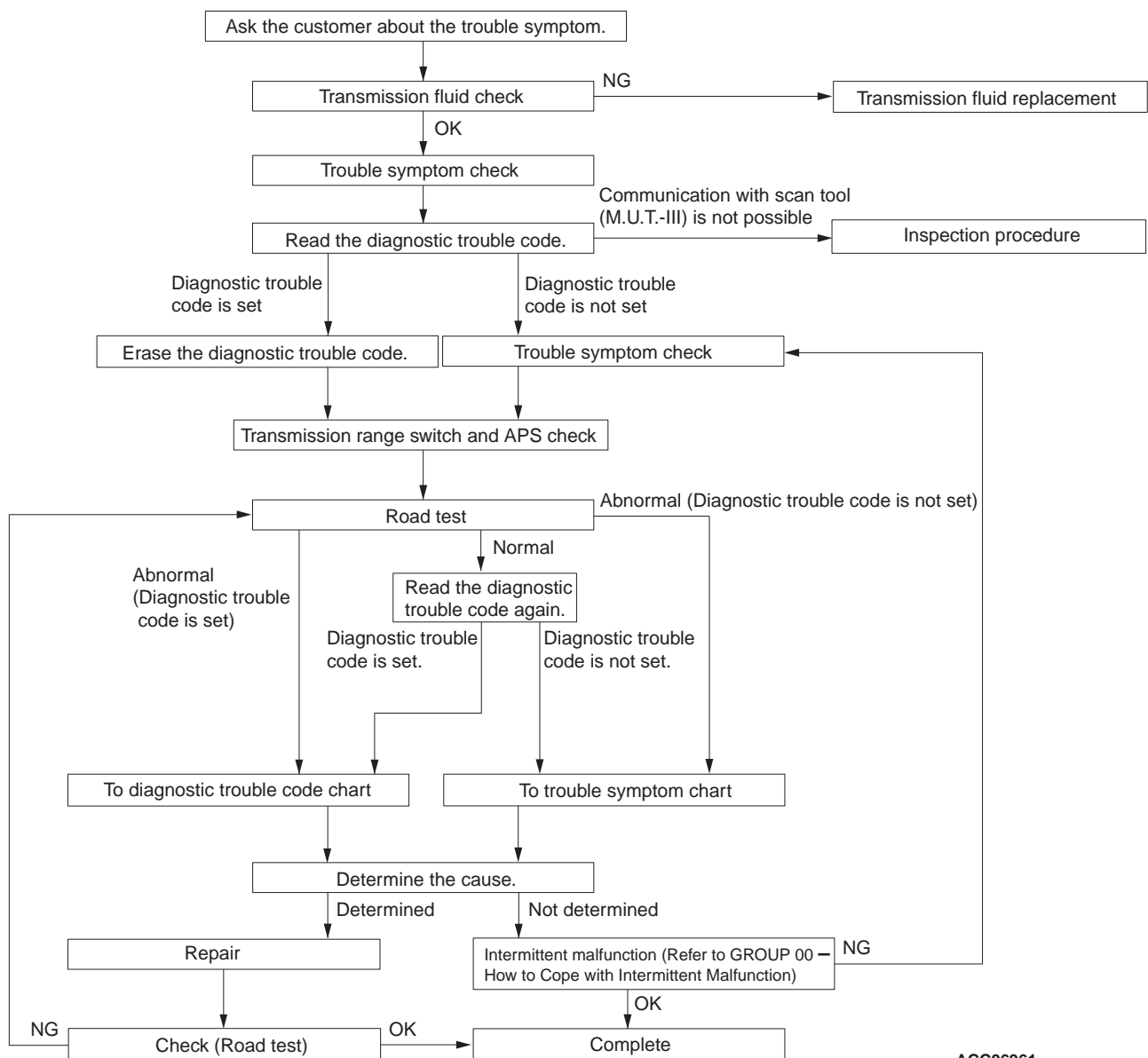
Item	Brand name	Capacity dm ³ (qt)
Transmission fluid	MITSUBISHI MOTORS GENUINE CVTF-J4	7.0 (7.4)
Cleaning the transmission case when CVT belt is inspected	Parts cleaner (MITSUBISHI MOTORS GENUINE Part No. MZ100387) or equivalent	As required

<Added>

DIAGNOSIS

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1231213500283



ACC06961

DTC P0746: Abnormality in Hydraulic Control System Function

DIAGNOSTIC FUNCTION

If the pulley ratio, which is calculated according to the primary pulley speed and the secondary pulley speed, exceeds the standard value, the TCM determines that the line pressure is abnormal.

DESCRIPTIONS OF MONITOR METHODS

- The ratio between the primary pulley speed and the secondary pulley speed is 2.55 or more for 0.2 seconds, or 3.35 or more for 0.1 second.

MONITOR EXECUTION

- Transmission range: D, R or B
- Primary speed: 500 r/min or more
- Acceleration: -0.05G or more
- Engine speed: 450 r/min or more

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

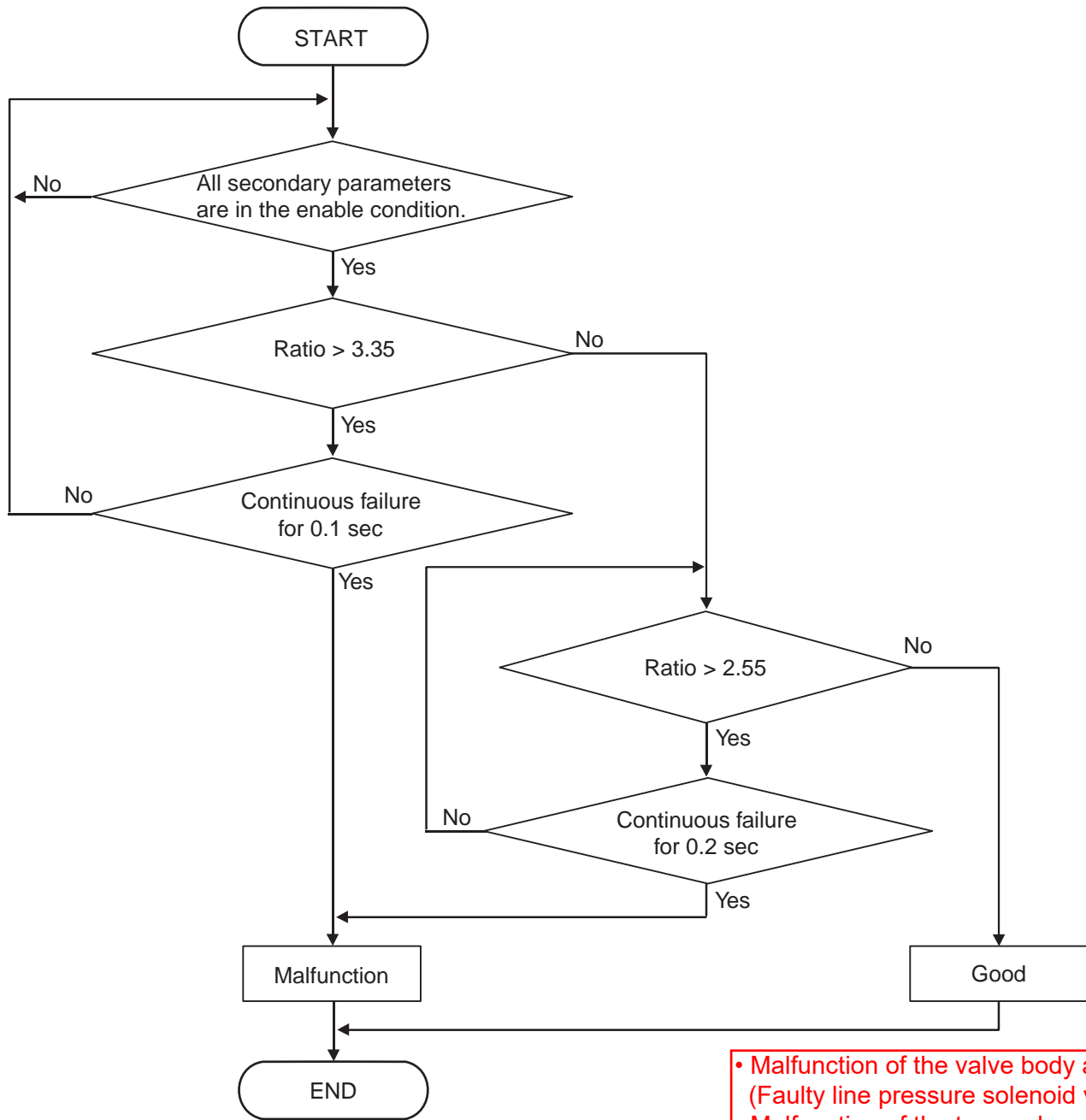
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0705: Malfunction of transmission range switch
- P0715: Malfunction of primary pulley speed sensor
- P0720: Abnormality in output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- U0001: Malfunction of CAN communication
- U0100: CAN time-out error (engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Primary pulley speed sensor
- Output speed sensor
- Secondary pulley speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



<New>

- Malfunction of the valve body assembly (Faulty line pressure solenoid valve)
- Malfunction of the transaxle assembly

DTC SET CONDITIONS

Check Conditions

- Transmission range switch position: D, R or B.
- Engine speed: 450 r/min or more.
- Primary pulley speed: 500 r/min or more.
- Acceleration: -0.05G or more

Judgment Criteria

- Pulley ratio (primary pulley speed/secondary pulley speed) more than 2.55 for 0.2 second.

- Pulley ratio (primary pulley speed/secondary pulley speed) more than 3.35 for 0.1 second.

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 the transaxle assembly (Faulty line pressure solenoid valve or valve body assembly)~~

<Old>

DIAGNOSIS

STEP 1. Check the following connector

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

- YES** : Go to Step 2.
- NO** : Repair the defective connector.

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

- (1) Connect the CVT assembly connector.
- (2) Selector lever position: P range.
- (3) Engine: Idling
- (4) Connect an oscilloscope, and measure the voltage between TCM connector PLLS terminal and body ground.

OK: A wave pattern such as the one shown on P.23A-116 (Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 V or more and the minimum value should be 1 V or less. 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.P0962: Line Pressure Solenoid Valve (short to ground) [P.23A-60](#), or diagnostic trouble code No.P0963: Line Pressure Solenoid Valve (open circuit/ short to power supply) [P.23A-62](#).

STEP 3. Symptom recheck after erasing diagnostic trouble code

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch to the LOCK (OFF) position, and then wait for one minute. Then drive the vehicle until the engine has been warmed up.
- (3) Check if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

- <Old> YES** : ~~Replace the transaxle assembly.~~ **<New> Go to Step 4.**
- NO** : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions [P.00-13](#)).

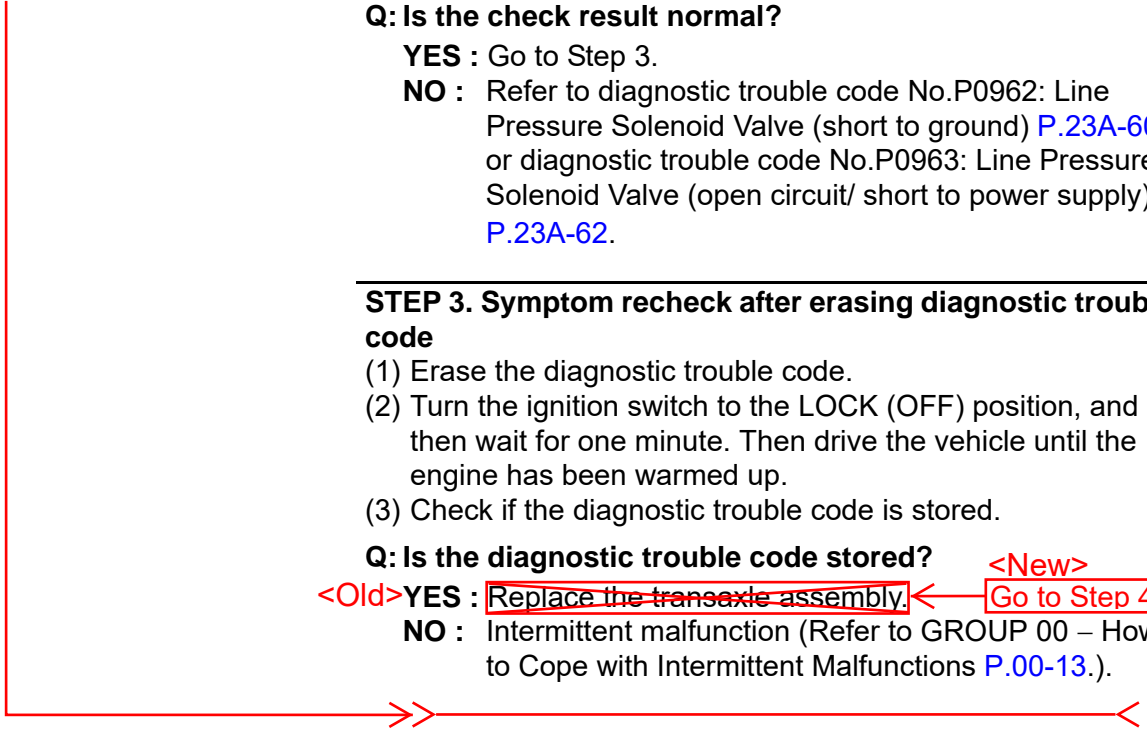
<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

- YES** : Replace the valve body assembly.
- NO** : Replace the transaxle assembly.



DTC P0791: Malfunction of Secondary Pulley Speed Sensor

DIAGNOSTIC FUNCTION

The TCM determines whether the system is defective by monitoring the secondary pulley speed sensor.

STEP 6. Measure the output wave pattern of the secondary pulley speed sensor at TCM connector (SECS terminal).

- (1) Connect the secondary pulley speed sensor connector and TCM connector.
- (2) Selector lever position: D range.
- (3) Drive at a constant speed of approx. 20 km/h.
- (4) Connect an oscilloscope, and measure the voltage between TCM connector SECS terminal and body ground.

OK: A wave pattern such as the one shown on P.23A-116 (Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 V or more and the minimum value should be 1 V or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the secondary pulley speed sensor.

STEP 7. Symptom recheck after erasing diagnostic trouble code**Q: Is the diagnostic trouble code stored?**

YES : Replace the TCM.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions P.00-13.).

DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function**DIAGNOSTIC FUNCTION**

If the actual pulley ratio does not track with the target ratio, the TCM determines whether the system is defective

DESCRIPTIONS OF MONITOR METHODS

- If the actual pulley ratio remains 2.0 to 2.55 for five seconds when the target pulley ratio is 1.2 or less, or if the actual pulley ratio remains 0.2 to 0.75 for five seconds when the target pulley ratio is 1.55 or more, the TCM determines that a malfunction exists.

MONITOR EXECUTION

- Transmission range: D, R or B
- Engine speed: 450 r/min or more
- Primary pulley speed: 306 r/min or more
- Secondary pulley speed: 230 r/min or more

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)**Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

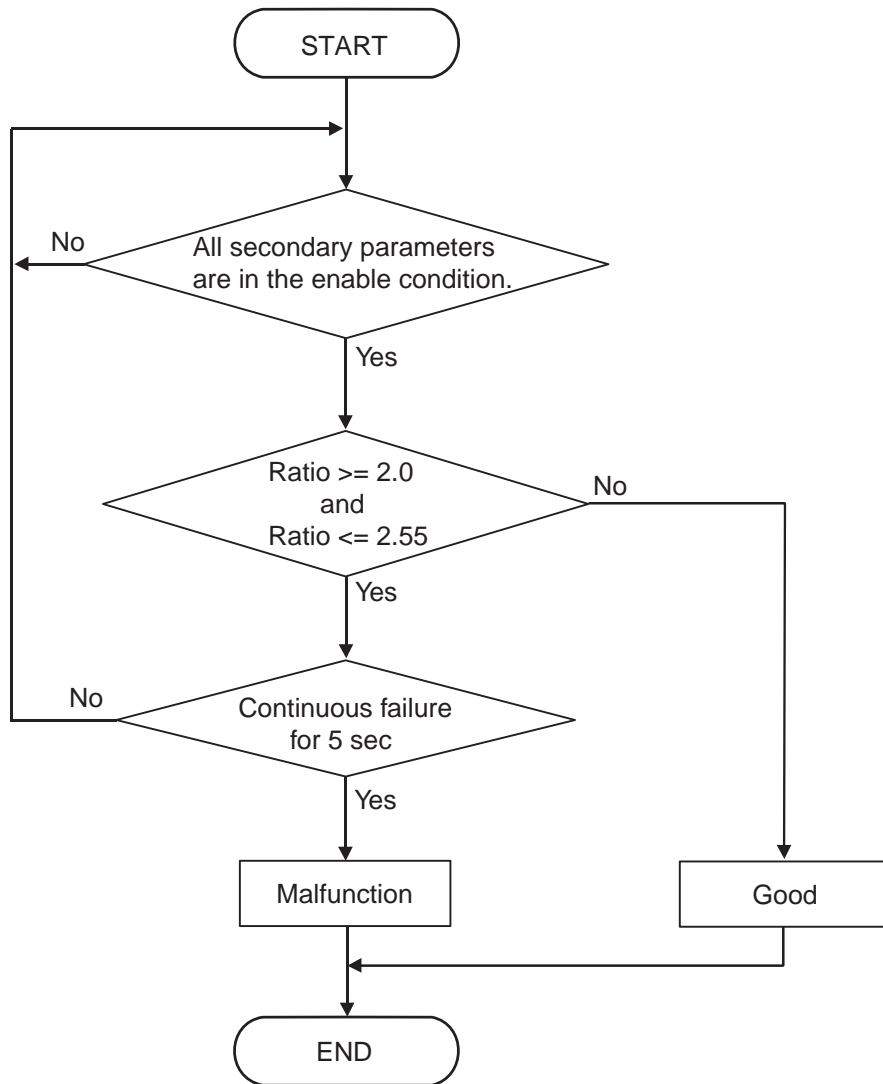
- P0705: Malfunction of transmission range switch
- P0715: Malfunction of primary pulley speed sensor
- P0746: Abnormality in hydraulic control system
- P0791: Malfunction of the secondary pulley speed sensor
- P0842, P0843: Malfunction of the secondary pressure sensor
- P0962, P0963: Malfunction of the line pressure solenoid valve
- P0970, P0971: Malfunction of the primary pressure solenoid valve
- U0001: Malfunction of CAN communication
- U0100: CAN time-out error (engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Primary pulley speed sensor

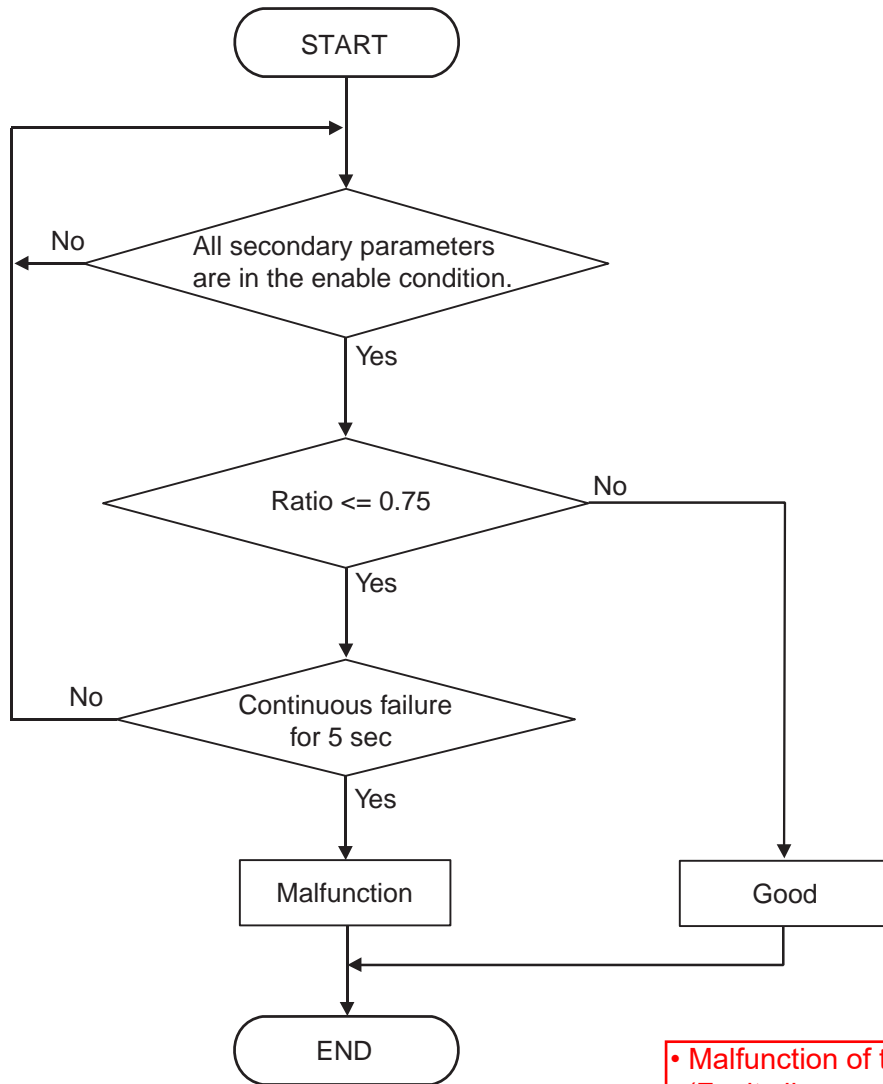
- Secondary pulley speed sensor
- Secondary pressure sensor
- Line pressure solenoid valve
- Primary pressure solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence–Output Functional Low)



ACC07021

LOGIC FLOW CHARTS (Monitor Sequence–Output Functional High)



<New>

- Malfunction of the valve body assembly (Faulty line pressure solenoid valve)
- Malfunction of the transaxle assembly

DTC SET CONDITIONS

Check Conditions

- Transmission range switch position: D, R or B.
- Engine speed: 450 r/min or more.
- Primary pulley speed: 306 r/min or more.
- Secondary pulley speed: 230 r/min or more.

Judgment Criteria

- When the target pulley ratio (primary pulley speed/secondary pulley speed) is less than 1.2 while the vehicle is being driven, the actual pulley ratio remains from 2.0 to 2.55 for five seconds.

- When the target pulley ratio (primary pulley speed/secondary pulley speed) is more than 1.55 while the vehicle is being driven, the actual pulley ratio remains from 0.75 or less for five 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 the transaxle assembly (Faulty primary pressure solenoid valve or valve body assembly)

<Old>

DIAGNOSIS

STEP 1. Check the following connector

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector.

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

- (1) Connect the CVT assembly connector.
- (2) Selector lever position: P range.
- (3) Engine: Idling
- (4) Connect an oscilloscope, and measure the voltage between TCM connector PRLS terminal and body ground.

OK: A wave pattern such as the one shown on P.23A-116 (Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 V or more and the minimum value should be 1 V or less. 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.P0970: Primary Pressure Solenoid Valve (short to ground) P.23A-64, or diagnostic trouble code No.P0971: Primary Pressure Solenoid Valve (open circuit/ short to power supply) P.23A-66.

STEP 3. Symptom recheck after erasing diagnostic trouble code

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch to the LOCK (OFF) position, and then wait for one minute. Then drive the vehicle until the engine has been warmed up.
- (3) Check if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

<Old> YES : ~~Replace the transaxle assembly.~~ **<New> Go to Step 4.**

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions P.00-13.).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P0841: Abnormality in Secondary Pressure Sensor Function**DIAGNOSTIC FUNCTION**

TCM determines that the system is defective by monitoring the secondary pressure sensor.

JUDGMENT CRITERIA

- The difference between the actual and target secondary pressures remains more than 0.675 MPa for five seconds while the vehicle is driven at constant speed.

PROBABLE CAUSES

- <Old>
- Malfunction of the transaxle assembly (Faulty secondary pressure sensor or valve body assembly)
- <New>
- Malfunction of the valve body assembly (Faulty secondary pressure sensor)
 - Malfunction of the transaxle assembly
-

DIAGNOSIS**STEP 1. Hydraulic pressure test**

Refer to [P.23A-130](#).

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the failure sections.

STEP 2. Check the following connector

- TCM connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the defective connector.

STEP 3. Voltage measurement at TCM connector (LPRS terminal)

- (1) Connect the TCM connector.
- (2) Drive the vehicle until the engine is warmed up.
- (3) Selector lever position: P range.
- (4) Engine: Idling
- (5) Measure the TCM connector side by backprobing.
- (6) Measure the voltage between the TCM connector (LPRS terminal) and TCM connector (SGND terminal).

OK: approx. 0.84 V

Q: Is the check result normal?

YES : Go to Step 4.

NO : Refer to diagnostic trouble code No.P0842: Secondary Pressure Sensor (low voltage) [P.23A-51](#), or diagnostic trouble code No.P0843: Secondary Pressure Sensor (high voltage) [P.23A-53](#).

<Added>

STEP 5. CVT belt inspection.
 Check the appearance of the CVT belt.
 (Refer to On-vehicle Service – CVT Belt Inspection)
Q: Is the CVT belt normal?
YES : Replace the valve body assembly.
NO : Replace the transaxle assembly.

STEP 4. Symptom recheck after erasing diagnostic trouble code

Q: Is the diagnostic trouble code stored? <New>
Go to Step 5.
 <Old>**YES :** Replace the transaxle assembly.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions P.00-13.).



DTC P0842: Malfunction of the Secondary Pressure Sensor (low voltage)

DIAGNOSTIC FUNCTION

The TCM determines that the system is defective when the secondary pressure sensor output voltage is lower than a predetermined value.

DESCRIPTIONS OF MONITOR METHODS

- The status with the fluid temperature of -20°C (-4°F) or more and with the secondary pressure sensor voltage of 0.09 volt or less continues for 5 seconds.

MONITOR EXECUTION

- Transmission fluid temperature: -20°C (-4°F) 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

DIAGNOSIS**STEP 1. Check the following connector**

- CVT assembly connector
- TCM connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector(s).

STEP 2. Check for short to ground in LULS line between the CVT assembly connector and the TCM connector**Q: Is the check result normal?**

YES : Go to Step 3.

NO : Repair the wiring harness.

STEP 3. Lockup solenoid valve check

Refer to [P.23A-126](#).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the transaxle assembly.

STEP 4. Symptom recheck after erasing diagnostic trouble code**Q: Is the diagnostic trouble code stored?**

YES : Replace the TCM.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions [P.00-13](#)).

DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up**DIAGNOSTIC FUNCTION**

The TCM determines that the system is defective when the auxiliary gearbox remains at incorrect ratio although the TCM commands the 1st gear.

DESCRIPTIONS OF MONITOR METHODS

- The gear ratio is 2.232 or more for two seconds while the TCM is shifting the auxiliary gear to 1st gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8% or more
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: D or B
- Target auxiliary gear position: 1st

**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)****Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

- P0705: Malfunction of the transmission range switch
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2858: 2nd gear neutral malfunction
- P2859: 1st gear ratio malfunction
- P285A: 2nd gear ratio malfunction
- U0001: Malfunction of CAN communication

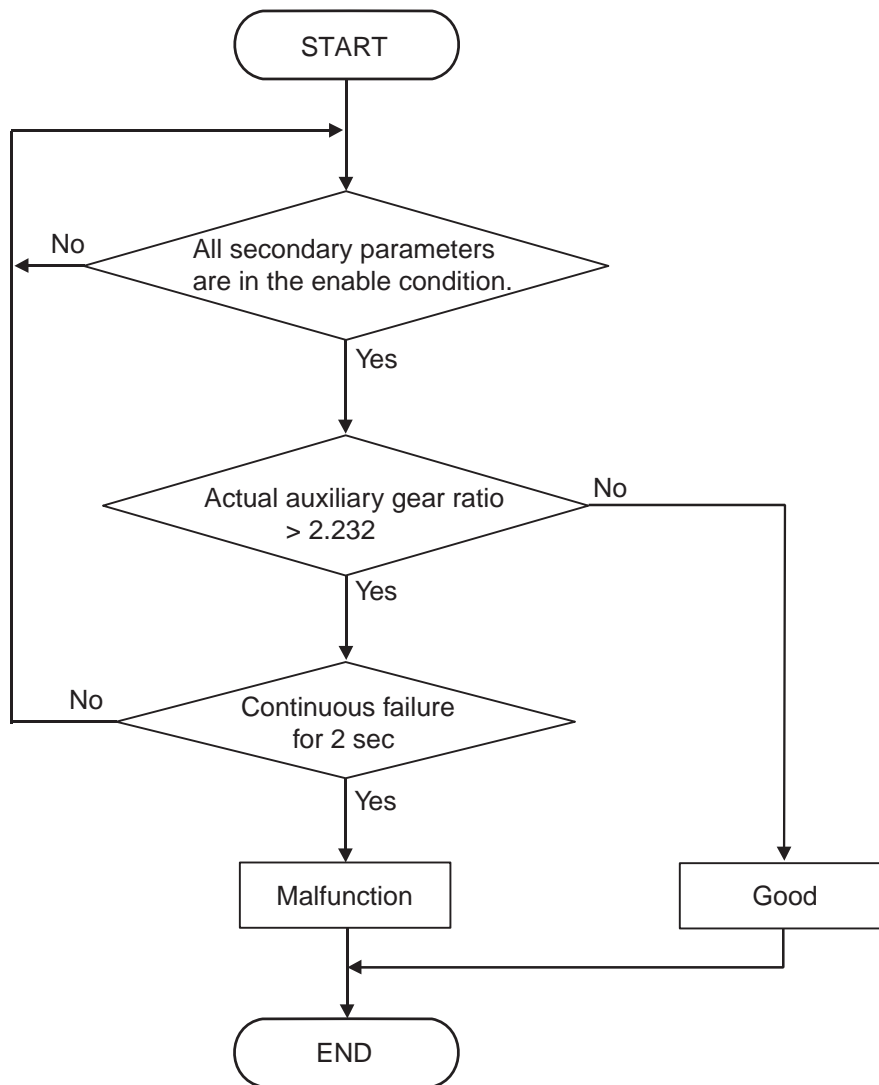
- U0100: CAN time-out error (engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch

- Secondary pulley speed sensor
- Output speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07031

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: D or B
- Accelerator pedal position sensor (main) output voltage: 1.23V or more (Opening angle: 7.8% or more)
- Engine speed: 450 r/min or more

- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Target auxiliary gear position: 1st

Judgment Criteria

- While the vehicle is being driven, the actual gear ratio of the auxiliary gearbox remains more than 2.232 for two seconds although the TCM commands the 1st gear.

OBD-II DRIVE CYCLE PATTERN

Accelerate to 40 km/h (24.9 mph) slowly with the accelerator opening angle at 10% or more.

PROBABLE CAUSES

<Old> • Malfunction of the transaxle assembly (Faulty low brake solenoid valve or valve body assembly)

<New> • Malfunction of the valve body assembly (Faulty low brake solenoid valve)
• Malfunction of the transaxle assembly

DIAGNOSIS

STEP 1. Check the following connector

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector.

STEP 2. Measure the output wave pattern of the low brake solenoid valve at TCM connector (LBLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Selector lever position: D range.
- (3) Drive at a constant speed of approx. 20 km/h (auxiliary gearbox: at 1st gear)
- (4) Connect an oscilloscope, and measure the voltage between TCM connector LBLS terminal and body ground.

OK: A wave pattern such as the one shown on P.23A-116 (Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 V or more and the minimum value should be 1 V or less. 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.P0973: Low Brake Solenoid Valve (short to ground) P.23A-68, or diagnostic trouble code No.P0974: Low Brake Solenoid Valve (open circuit/ short to power supply) P.23A-70.

STEP 3. Symptom recheck after erasing diagnostic trouble code

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch to the LOCK (OFF) position, and then wait for one minute. Then drive the vehicle until the engine has been warmed up.
- (3) Check if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

<Old> **YES** : Replace the transaxle assembly. <New> **Go to Step 4.**

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions P.00-13.).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up

DIAGNOSTIC FUNCTION

The TCM determines that the system is defective when the auxiliary gearbox remains at incorrect ratio although the TCM commands the 2nd gear.

DESCRIPTIONS OF MONITOR METHODS

- The gear ratio is 2.232 or more for at least two seconds while the TCM is shifting the auxiliary gear to 2nd gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8% or more
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: D or B
- Target auxiliary gear position: 2nd

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

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

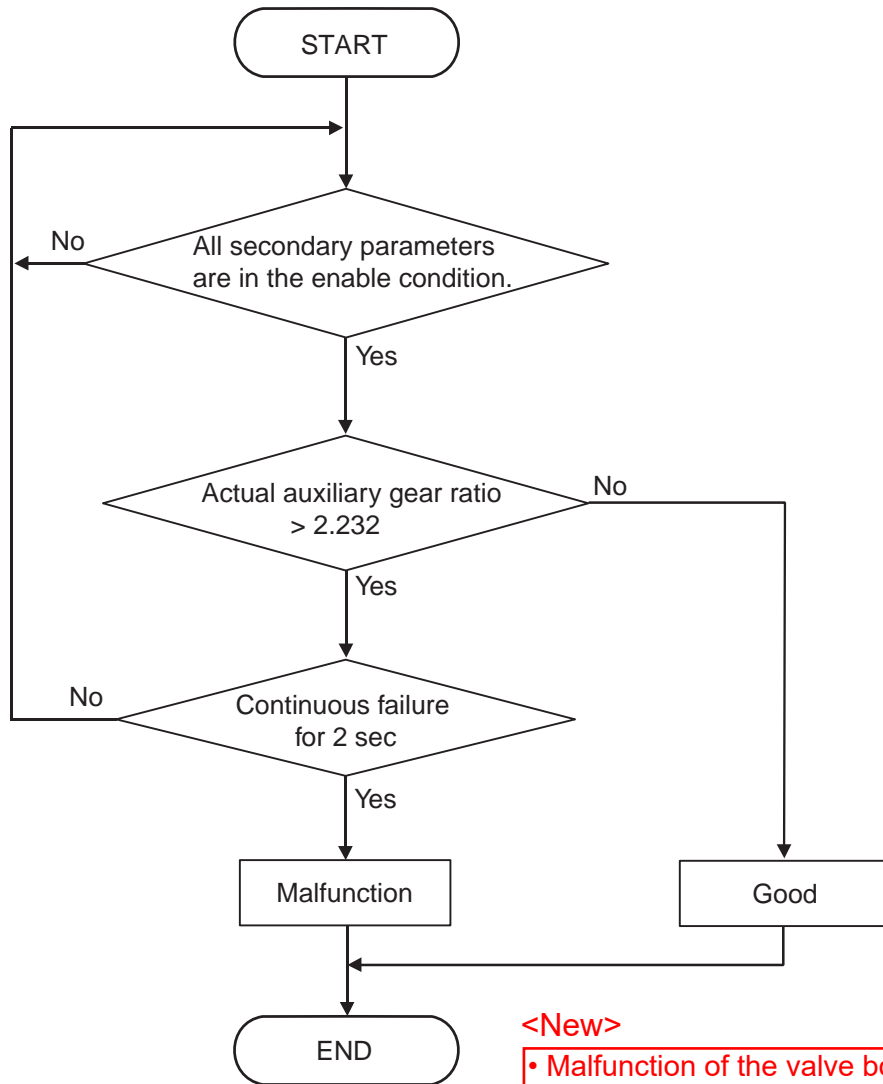
- P0705: Malfunction of the transmission range switch

- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: 1st gear neutral malfunction
- P2859: 1st gear ratio malfunction
- P285A: 2nd gear ratio malfunction
- U0001: Malfunction of CAN communication
- U0100: CAN time-out error (engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Secondary pulley speed sensor
- Output speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



<New>

- Malfunction of the valve body assembly (Faulty high clutch and reverse brake solenoid valve)
- Malfunction of the transaxle assembly

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: D or B
- Accelerator pedal position sensor (main) output voltage: 1.23V or more (Opening angle: 7.8% or more)
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Target auxiliary gear position: 2nd

Judgment Criteria

- While the vehicle is being driven, the actual gear ratio of the auxiliary gearbox remains more than 2.232 for two seconds although the TCM commands the 2nd gear.

OBD-II DRIVE CYCLE PATTERN

Drive at 40 km/h (24.9 mph) for at least five seconds with the accelerator opening angle at 10% or more.

PROBABLE CAUSES

<Old>

- Malfunction of the transaxle assembly (Faulty high clutch and reverse brake solenoid valve or valve body assembly)

DIAGNOSIS

STEP 1. Check the following connector

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector.

STEP 2. Measure the output wave pattern of the high clutch and reverse brake solenoid valve at TCM connector (HRLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Selector lever position: D range.
- (3) Drive at a constant speed of approx. 20 km/h (auxiliary gearbox: at 2nd gear)
- (4) Connect an oscilloscope, and measure the voltage between TCM connector HRLS terminal and body ground.

OK: A wave pattern such as the one shown on P.23A-116 (Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 V or more and the minimum value should be 1 V or less. 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.P0976: High Clutch and Reverse Brake Solenoid Valve (short to ground) P.23A-72, or diagnostic trouble code No.P0977: High Clutch and Reverse Brake Solenoid Valve (open circuit/ short to power supply) P.23A-74.

STEP 3. Symptom recheck after erasing diagnostic trouble code

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch to the LOCK (OFF) position, and then wait for one minute. Then drive the vehicle until the engine has been warmed up.
- (3) Check if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

<Old> YES : ~~Replace the transaxle assembly.~~ **<New> Go to Step 4.**

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions P.00-13.).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio**DIAGNOSTIC FUNCTION**

The TCM determines that the system is defective when the auxiliary gearbox remains the gear ratio is abnormal although the TCM commands the 1st gear.

DESCRIPTIONS OF MONITOR METHODS

- The system determines that a fault has occurred when the gear ratio is within $\pm 10\%$ of the 2nd gear ratio (0.900 – 1.100) for at least 0.5 seconds while the TCM is shifting the auxiliary gear to 1st gear.
- The system determines that a fault has occurred when the gear ratio is 0.911 or less, or 2.732 or more for at least 0.2 seconds while the TCM is shifting the auxiliary gear to 1st gear.
- If the high clutch pressure switch remains on for at least 1.5 seconds while the TCM is shifting the auxiliary gear to 1st gear, the system determines that a fault has occurred.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8% or more <Only when determining whether 2nd gear ratio is satisfied>
- Vehicle speed: 10 km/h (6 mph) or more <Only when determining whether 1st gear ratio is not satisfied>
- Vehicle speed: 10 km/h (6 mph) or less <Only when the system monitors the high clutch pressure switch>
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more <Except when the system monitors the high clutch pressure switch>
- Secondary pulley speed: 300 r/min or more <Except when the system monitors the high clutch pressure switch>
- Transmission range: D or B

- Acceleration: -0.05 G or less <Only when determining whether 1st gear ratio is not satisfied>
- Target auxiliary gear position: 1st
- The target pressure for the high clutch and reverse brake solenoid valve is 0 MPa or less <Only when the system monitors the high clutch pressure switch>.

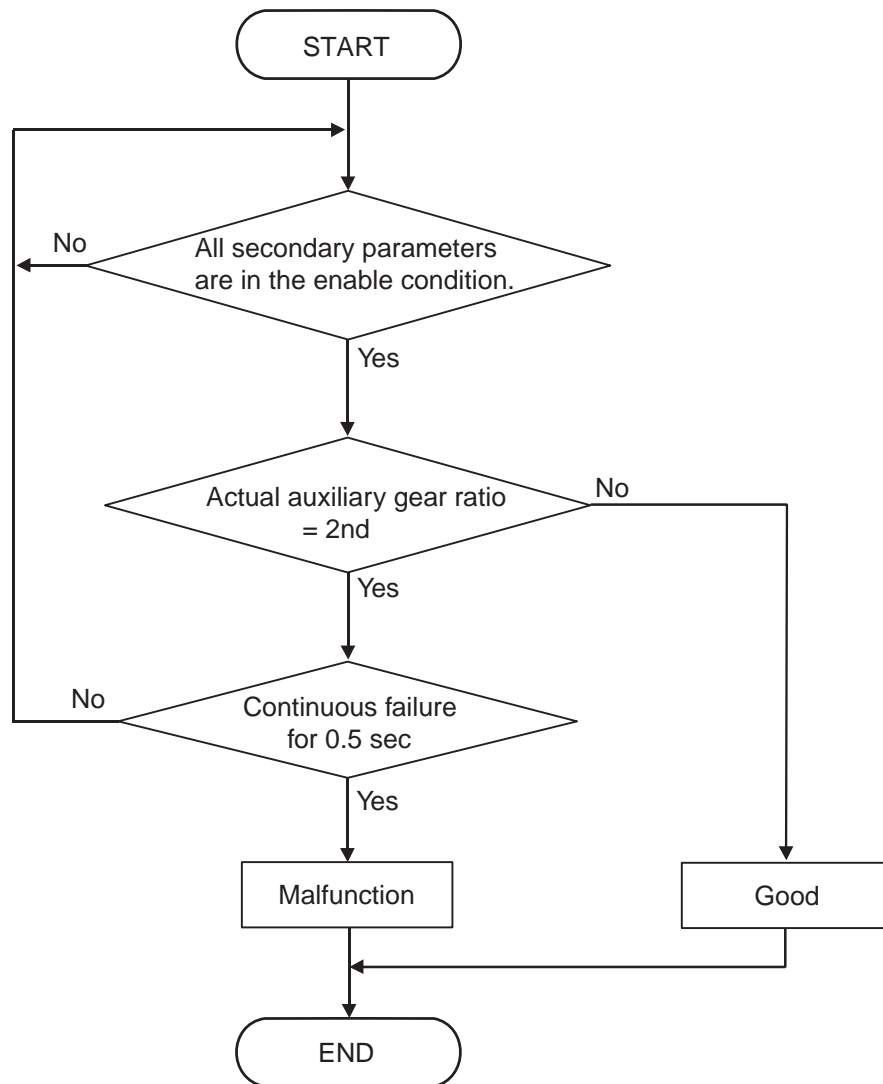
MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)**Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

- P0705: Malfunction of the transmission range switch
- P0715: Malfunction of primary pulley speed sensor
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0876: Malfunction of the high clutch pressure switch
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: 1st gear neutral malfunction
- P2858: 2nd gear neutral malfunction
- P285A: 2nd gear ratio malfunction
- U0001: Malfunction of CAN communication
- U0100: CAN time-out error (engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Primary pulley speed sensor
- Output speed sensor
- Secondary pulley speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07032

DTC SET CONDITIONS

Check Conditions

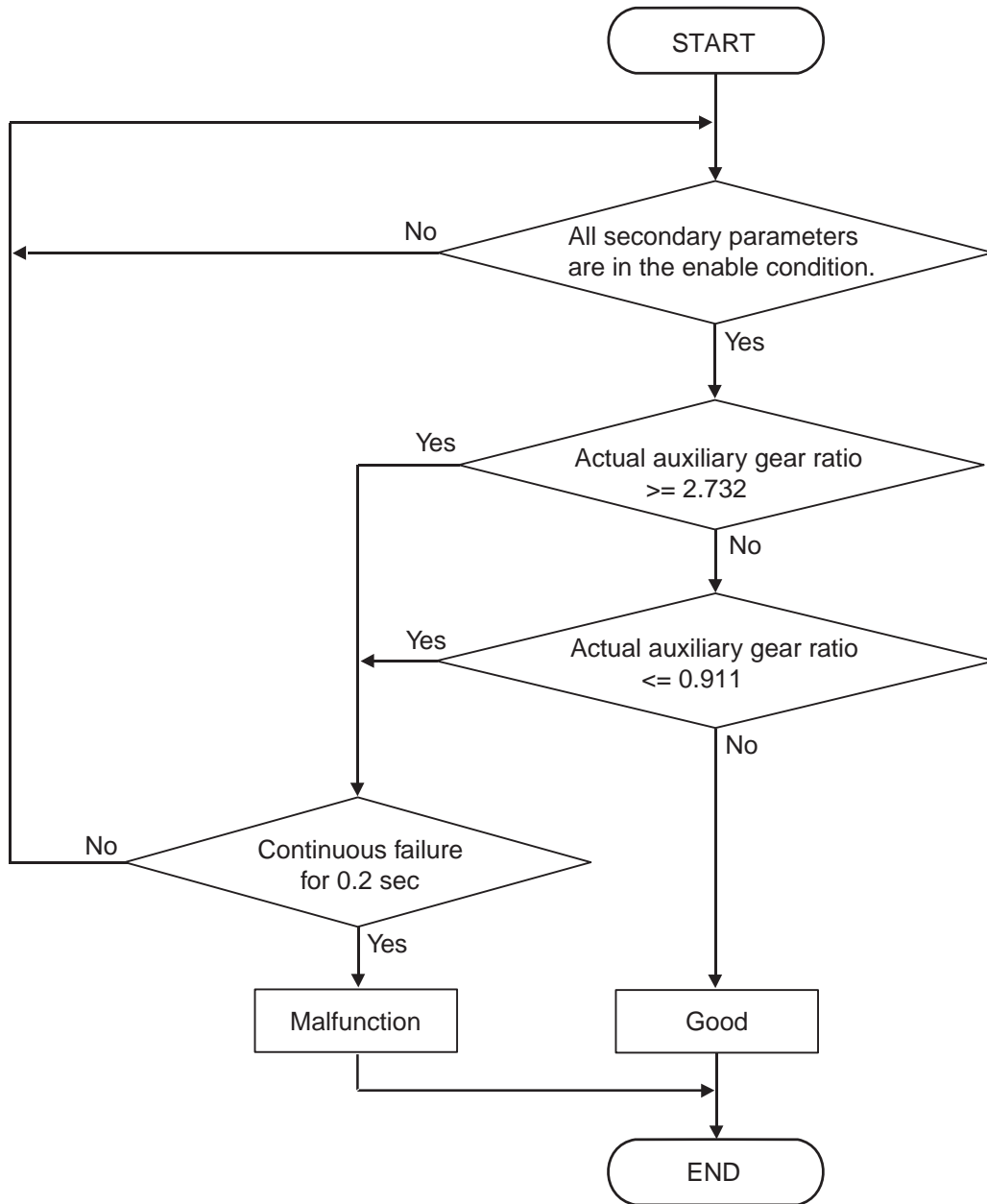
- Target auxiliary gear position: 1st
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: D or B
- Accelerator pedal position sensor (main) output voltage: 1.23 volts or more

- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by $\pm 10\%$ or less from the 2nd gear ratio (0.900 – 1.100) for 0.5 seconds.

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07033

DTC SET CONDITIONS

Check Conditions

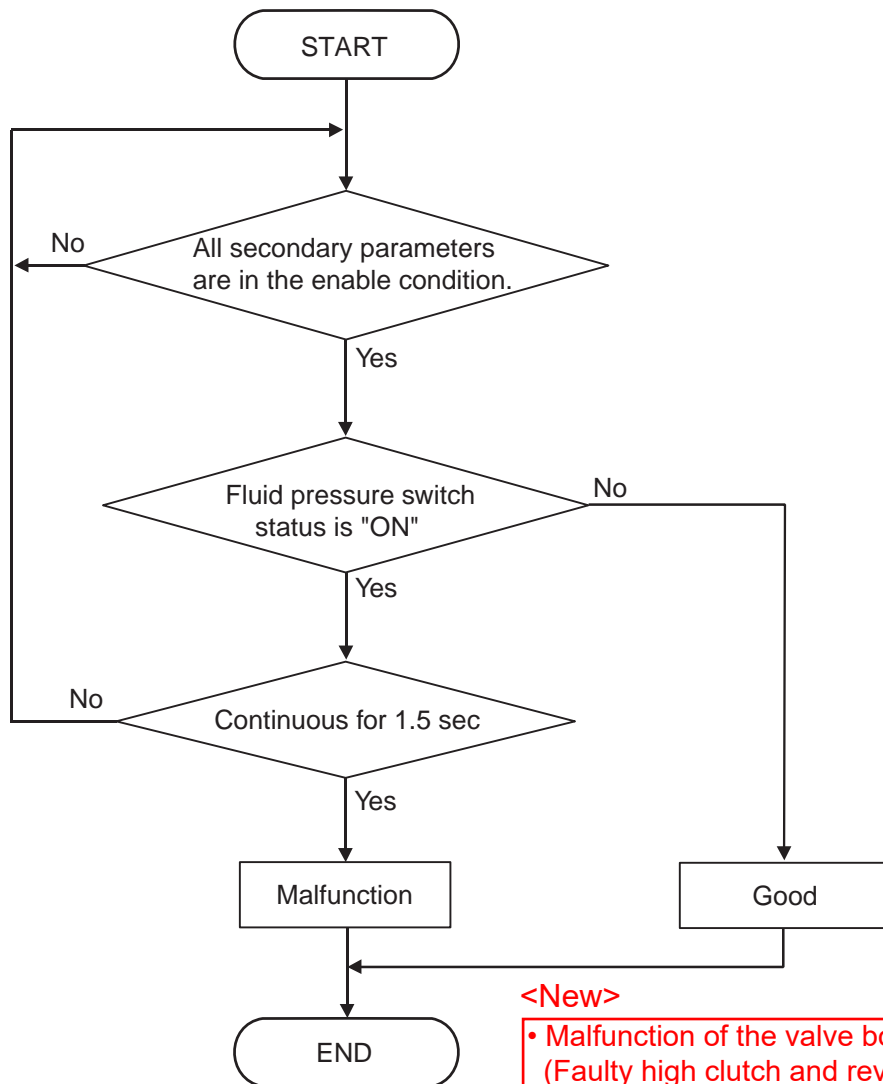
- Target auxiliary gear position: 1st
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: D or B
- Vehicle speed: 10 km/h (6 mph) or more
- Engine speed: 450 r/min or more

- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Acceleration: -0.05G or less

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by $\pm 50\%$ or more from the 1st gear ratio (0.911 or less, 2.732 or more) for 0.2 seconds.

LOGIC FLOW CHARTS (Monitor Sequence)



<New>

- Malfunction of the valve body assembly (Faulty high clutch and reverse brake solenoid valve)
- Malfunction of the transaxle assembly

DTC SET CONDITIONS

Check Conditions

- Target auxiliary gear position: 1st
- The target pressure for the high clutch and reverse brake solenoid valve is 0 MPa or less.
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: D or B
- Vehicle speed: 10 km/h (6 mph) or more
- Engine speed: 450 r/min or more

Judgment Criteria

- The high clutch oil pressure switch is ON for 1.5 seconds.

OBD-II DRIVE CYCLE PATTERN

Accelerate to 50 km/h (31.1 mph) slowly and then stop the vehicle for at least five seconds with the accelerator opening angle at 10% or more.

PROBABLE CAUSES

- Malfunction of the transaxle assembly (Faulty high clutch and reverse brake solenoid valve or valve body assembly)

DIAGNOSIS**STEP 1. Check the following connector**

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector.

STEP 2. Measure the output wave pattern of the high clutch and reverse brake solenoid valve at TCM connector (HRLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Selector lever position: D range.
- (3) Drive at a constant speed of approx. 20 km/h (auxiliary gearbox: at 1st gear)
- (4) Connect an oscilloscope, and measure the voltage between TCM connector HRLS terminal and body ground.

OK: A wave pattern such as the one shown on P.23A-116 (Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 V or more and the minimum value should be 1 V or less. 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.P0976: High Clutch and Reverse Brake Solenoid Valve (short to ground) P.23A-72, or diagnostic trouble code No.P0977: High Clutch and Reverse Brake Solenoid Valve (open circuit/ short to power supply) P.23A-74.

STEP 3. Symptom recheck after erasing diagnostic trouble code

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch to the LOCK (OFF) position, and then wait for one minute. Then drive the vehicle until the engine has been warmed up.
- (3) Check if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

<Old> YES : ~~Replace the transaxle assembly.~~ **<New> Go to Step 4.**

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions P.00-13.).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio

DIAGNOSTIC FUNCTION

The TCM determines that the system is defective when the auxiliary gearbox remains the gear ratio is abnormal although the TCM commands the 2nd gear.

DESCRIPTIONS OF MONITOR METHODS

- The system determines that a fault has occurred when the gear ratio is within $\pm 10\%$ of the 1st gear ratio (1.639 – 2.003) for at least 0.5 seconds while the TCM is shifting the auxiliary gear to 2nd gear.
- The system determines that a fault has occurred when the gear ratio is 0.500 or less, or 1.500 or more for at least 0.2 seconds while the TCM is shifting the auxiliary gear to 2nd gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8% or more <Only when determining whether 1st gear ratio is satisfied>
- Vehicle speed: 10 km/h (6 mph) or more <Only when determining whether 2nd gear ratio is not satisfied>
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: D or B
- Acceleration: -0.05G or less <Only when determining whether 2nd gear ratio is not satisfied>

- Target auxiliary gear position: 2nd

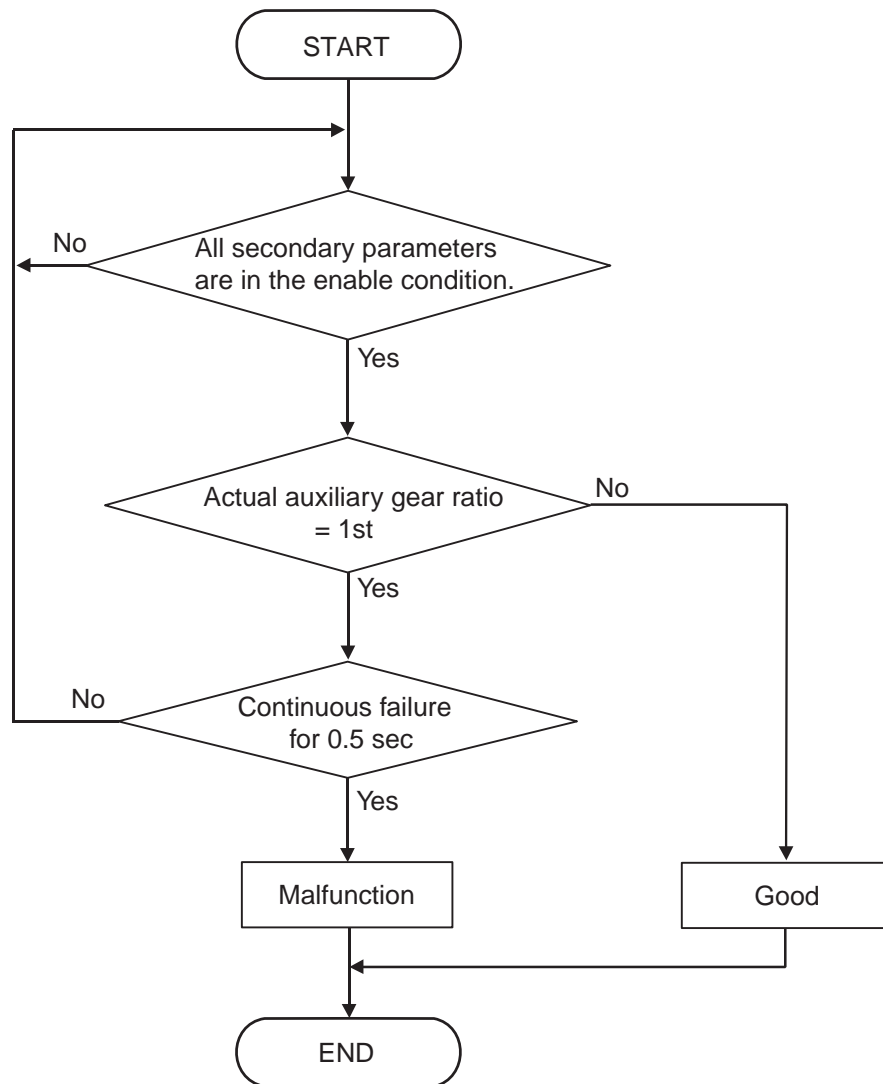
**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)****Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

- P0705: Malfunction of the transmission range switch
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: 1st gear neutral malfunction
- P2858: 2nd gear neutral malfunction
- P2859: 1st gear ratio malfunction
- U0001: Malfunction of CAN communication
- U0100: CAN time-out error (engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Output speed sensor
- Secondary pulley speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07036

DTC SET CONDITIONS**Check Conditions**

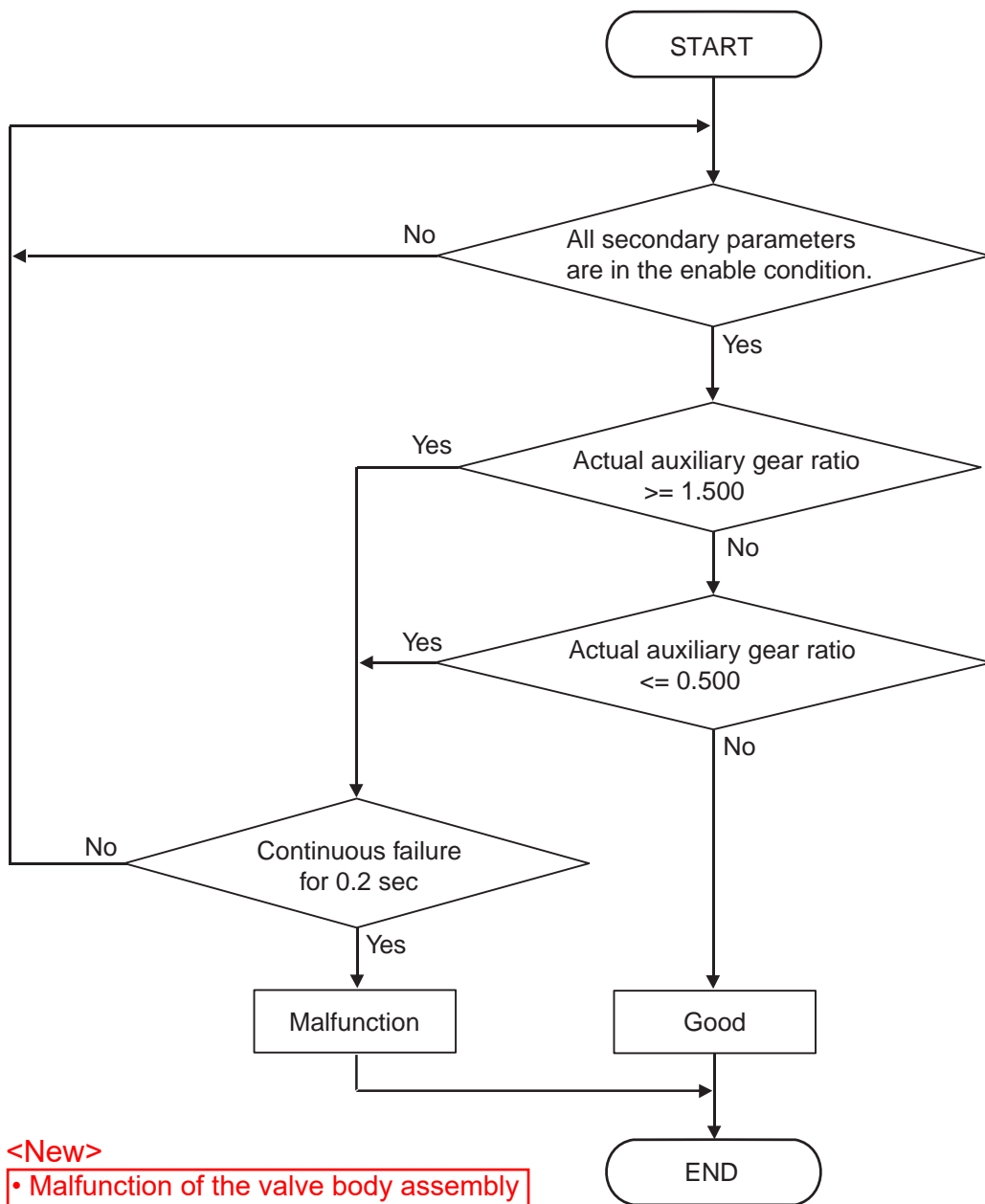
- Target auxiliary gear position: 2nd
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: D or B
- Accelerator pedal position sensor (main) output voltage: 1.23 volts or more

- Engine speed: 450 r/min or more
- Secondary pulley speed: 300 r/min or more
- Output shaft speed: 300 r/min or more

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by $\pm 10\%$ or less from the 1st gear ratio (1.639 – 2.003) for 0.5 seconds.

LOGIC FLOW CHARTS (Monitor Sequence)



<New>

- Malfunction of the valve body assembly (Faulty low brake solenoid valve)
- Malfunction of the transaxle assembly

ACC07037

DTC SET CONDITIONS

Check Conditions

- Target auxiliary gear position: 2nd
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: D or B
- Vehicle speed: 10 km/h (6 mph) or more
- Engine speed: 450 r/min or more
- Secondary pulley speed: 300 r/min or more
- Output shaft speed: 300 r/min or more
- Acceleration: -0.05G or less

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by $\pm 50\%$ or more from the 2nd gear ratio (0.500 or less, 1.500 or more) for 0.2 seconds.

OBD-II DRIVE CYCLE PATTERN

Drive at 40 km/h (24.9 mph) for at least five seconds with the accelerator opening angle at 10% or more.

PROBABLE CAUSES

<Old>

- ~~Malfunction of the transaxle assembly (Faulty low brake solenoid valve or valve body assembly)~~

DIAGNOSIS

STEP 1. Check the following connector

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector.

STEP 2. Measure the output wave pattern of the low brake solenoid valve at TCM connector (LBLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Selector lever position: D range.
- (3) Drive at a constant speed of approx. 20 km/h (auxiliary gearbox: at 2nd gear)
- (4) Connect an oscilloscope, and measure the voltage between TCM connector LBLS terminal and body ground.

OK: A wave pattern such as the one shown on P.23A-116 (Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 V or more and the minimum value should be 1 V or less. 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.P0973: Low Brake Solenoid Valve (low input) P.23A-68, or diagnostic trouble code No.P0974: Low Brake Solenoid Valve (high input) P.23A-70.

STEP 3. Symptom recheck after erasing diagnostic trouble code

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch to the LOCK (OFF) position, and then wait for one minute. Then drive the vehicle until the engine has been warmed up.
- (3) Check if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

<Old> YES : ~~Replace the transaxle assembly.~~ **<New> Go to Step 4.**

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunctions P.00-13.).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

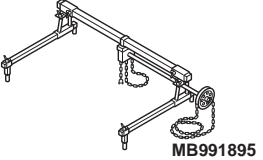
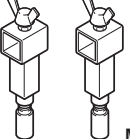
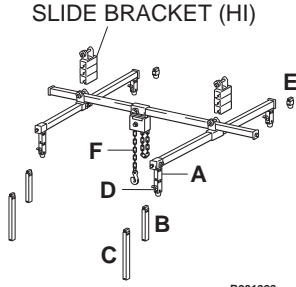
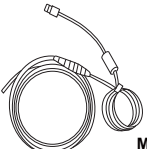
DTC U0001: Malfunction of CAN Communication Circuit

DIAGNOSTIC FUNCTION

The TCM determines that the system is defective if CAN communication information cannot be sent or received.

DESCRIPTIONS OF MONITOR METHODS

- TCM cannot receive the periodic communication data.

Tool	Tool number and name	Supersession	Use
 <p>MB991895</p>	MB991895 Engine hanger	Tool not available	When the engine hanger is used: Supporting the engine assembly during removal and installation of the transaxle assembly
 <p>MB992906</p>	MB992906 Engine hanger attachment	Tool not available	
 <p>SLIDE BRACKET (HI) B991928</p>	MB991928 Engine hanger A: MB991929 A: Joint (50) ×2 B: MB991930 B: Joint (90) ×2 C: MB991931 C: Joint (140) ×2 D: MB991932 D: Foot (standard) ×4 E: MB991933 E: Foot (short) ×2 F: MB991934 F: Chain and hook assembly	Tool not available	
 <p>MQ600069</p>	MQ600069 Bore scope	Tool not available	CVT belt inspection

<Added>

ON-VEHICLE SERVICE

ESSENTIAL SERVICE

TRANSMISSION FLUID CHECK

M1231211700719

⚠ CAUTION

Replace the transmission fluid whenever the transaxle is replaced with a new one or the vehicle is driven in harsh conditions.

1. Drive the vehicle until the transmission fluid is warmed up to the normal operating temperature 50 – 80°C (122 – 176°F).

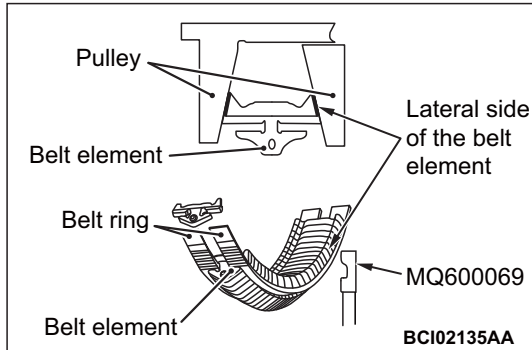
NOTE: Use scan tool (M.U.T.-III.) to measure the transmission fluid temperature.

CVT BELT INSPECTION

Required Special Tools:

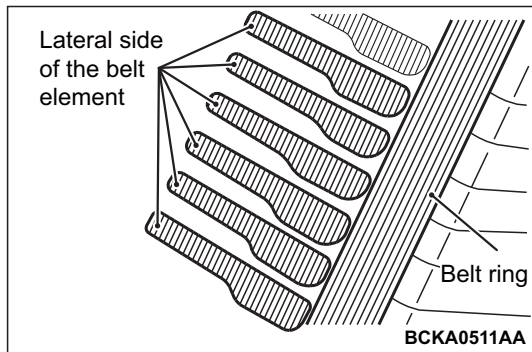
- MQ600069: Bore scope

JUDGMENT CRITERIA



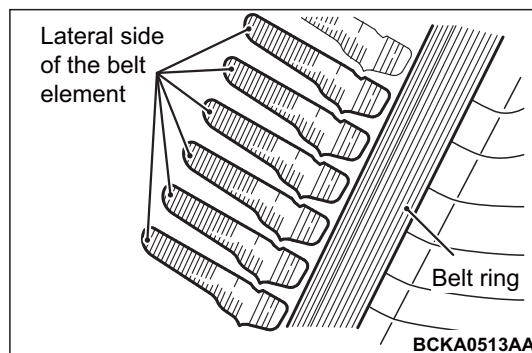
Use special tool bore scope (MQ600069), confirm that the lateral side of the belt element illustrated in the figure is not damaged.

<Good>



The CVT belt is good if the lateral side of the belt element is not damaged, and the lines are regular.

<Bad>

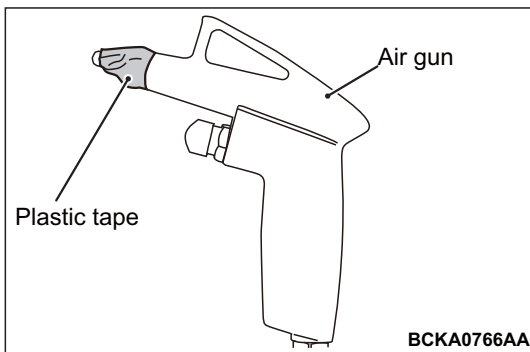
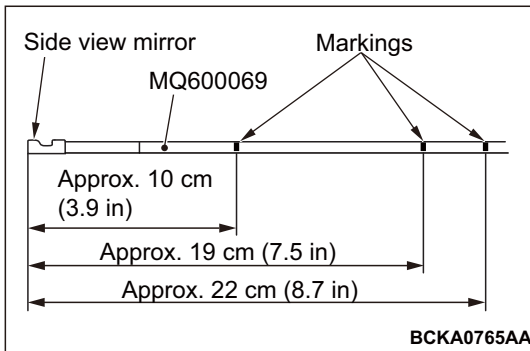
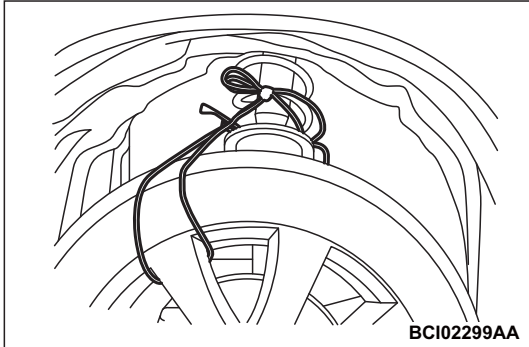


The CVT belt is bad if the lateral side of the belt element is damaged, and the lines are worn out.

<Added>

Advance Preparations

1. Bring the selector lever to "N".
2. Tie the front tire (RH) with a rope, etc. so that the tire does not move.



3. Install the side view mirror that is included with the special tool bore scope (MQ600069) on to the bore scope and make 3 markings as indicated in the figure.

NOTE:

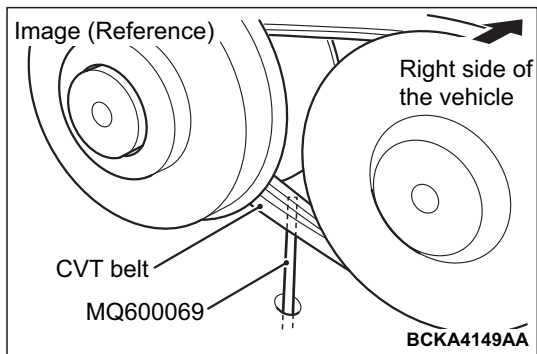
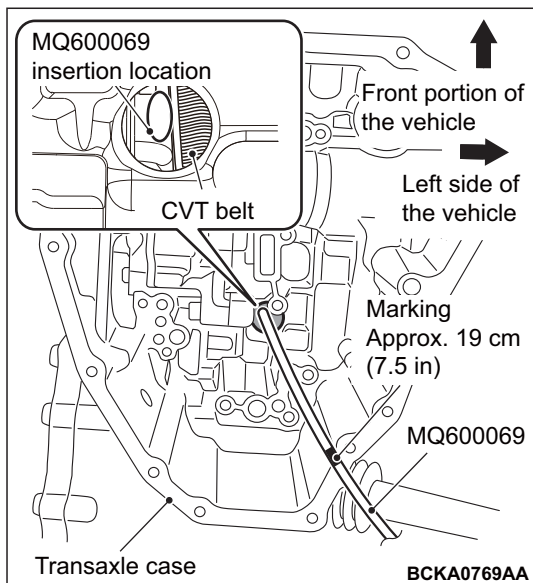
- A general commercial fiberscope available on the market may be used as well. (Outer diameter of the tip approximately $\phi 5.5$ mm (0.2 inch), focal length approximately 10 mm (0.4 inch), pixel count approximately 450,000 pixels, side view mirror required)
 - Wash the side view mirror using Mitsubishi Motors Genuine parts cleaner (MZ100387) or an equivalent product and air blow it to enhance visibility.
4. Wrap plastic tape around the tip of the air gun approximately 5 times. NOTE: The plastic tape is not required if a tapered rubber attachment is used.
 5. Make a marking on the lateral side of the front tire (LH).

Inspection Procedure

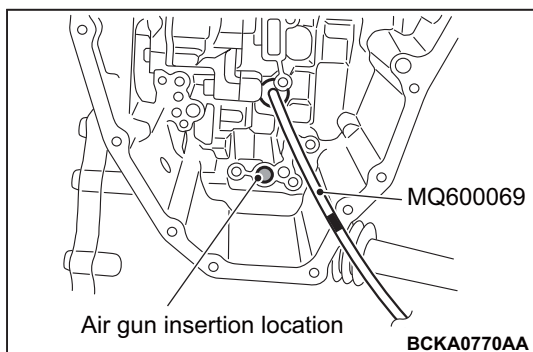
⚠ CAUTION

Make sure no foreign material (trash, debris, etc.) enters the transaxle assembly, as this could cause malfunction.

1. Remove the valve body assembly. While removing the oil pan, if there are bearing fragments, solid metal pieces, etc. on the oil pan, replace the transaxle assembly without inspecting the CVT belt.
2. Let the side view mirror of the special tool bore scope (MQ600069) face the left side of the vehicle, and insert the scope from the location illustrated in the figure all the way until the end of the transmission case and the marking {approximately 19 cm (7.5 inches)} coincide.



3. Slightly adjust the position of the side view mirror of the special tool bore scope (MQ600069) so that the lateral side of the belt element (right side of the vehicle) is reflected in it.



4. Insert the tip of the air gun at the location illustrated in the figure and press it firmly.

⚠ CAUTION

- Do not apply more than 1 MPa (145 psi) of air pressure so as not to cause any damage.
- If air pressure is applied at once without firmly pressing the tip of the air gun, the CVT fluid is likely to gush out. Hence wear protective glasses and be careful while performing the task.

5. Slowly continue applying air pressure using the air gun to engage the clutch.

NOTE: When the front tire (LH) is rotated in the forward direction (rolling direction), as the CVT belt rotates, the clutch gets engaged.

<Added>

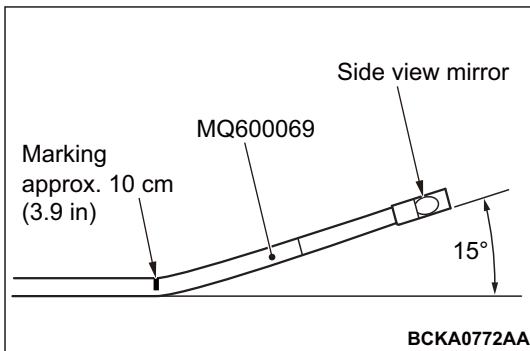
CAUTION

If the tire is rotated in the reverse direction (backward direction), the tip of the special tool bore scope (MQ600069) could get caught between the belt and the pulley. Hence rotate the tire in the forward direction.

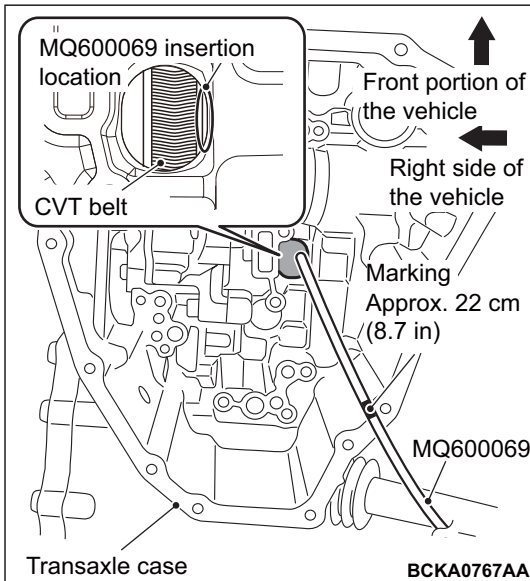
6. Slowly move the front tire (LH) to make 1 rotation while referring to the markings made on the tire during advance preparations and check the entire perimeter of the CVT belt based on the judgment criteria.

NOTE: If the belt does not move, make sure the air gun is firmly pressed.

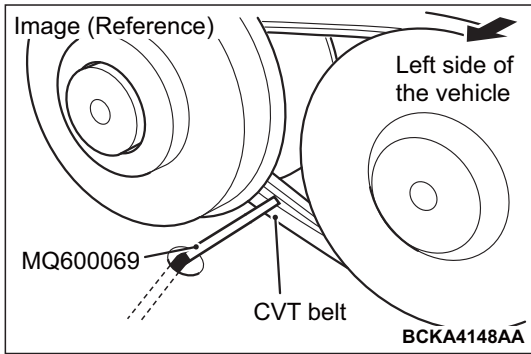
7. If the lateral side of the belt element (right side of the vehicle) is damaged, replace the transaxle assembly. If it is not damaged, proceed to the next step and inspect the other lateral side of the belt element (left side of the vehicle).
8. Use special tool bore scope (MQ600069) at the marked location {approximately 10 cm (3.9 inches)} as illustrated in the figure.



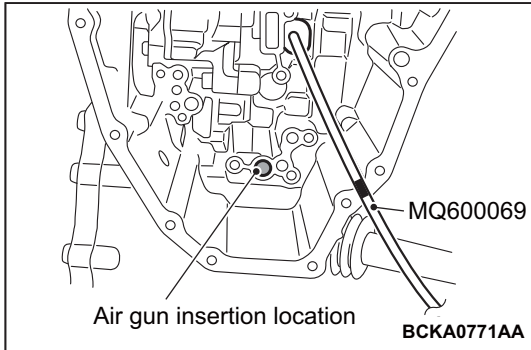
9. Let the side view mirror of the special tool bore scope (MQ600069) face the right side of the vehicle, and insert the scope from the location illustrated in the figure all the way until the end of the transmission case and the marking {approximately 22 cm (8.7 inches)} coincide.



<Added>



10. Slightly adjust the position of the side view mirror of the special tool bore scope (MQ600069) so that the lateral side of the belt element (left side of the vehicle) is reflected in it.



11. Insert the tip of the air gun at the location illustrated in the figure and press it firmly.

CAUTION

- Do not apply more than 1 MPa (145 psi) of air pressure so as not to cause any damage.
- If air pressure is applied at once without firmly pressing the tip of the air gun, the CVT fluid is likely to gush out. Hence wear protective glasses and be careful while performing the task.

12. Slowly continue applying air pressure using the air gun to engage the clutch.

NOTE: When the front tire (LH) is rotated in the forward direction (rolling direction), as the CVT belt rotates, the clutch gets engaged.

CAUTION

If the tire is rotated in the reverse direction (backward direction), the tip of the special tool bore scope (MQ600069) could get caught between the belt and the pulley. Hence rotate the tire in the forward direction.

13. Slowly move the front tire (LH) to make 1 rotation while referring to the markings made on the tire during advance preparations and check the entire perimeter of the CVT belt based on the judgment criteria.

NOTE: If the belt does not move, make sure the air gun is firmly pressed.

14. If the lateral side of the belt element (left side of the vehicle) is damaged, replace the transaxle assembly. If it is not damaged, proceed to the next step.

15. After the inspection, if some of the adhesive of the plastic tape still remains on the location where the air gun is inserted, remove it with Mitsubishi Motors Genuine parts cleaner (MZ100387) or an equivalent product.

16. Install the valve body assembly.

NOTE: Replace the valve body assembly if the CVT belt is inspected in the process of troubleshooting (No. P0746, P0796, P0841, P2857, P2858, P2859, P285A).

CVT
LUBRICANTS

LUBRICANTS

M1231200400866

Item	Brand name	Capacity dm ³ (qt)
Transmission fluid	MITSUBISHI MOTORS GENUINE CVTF-J4 or CVTF-J4+	7.0 (7.4)
Cleaning the transmission case when CVT belt is inspected	Parts cleaner (MITSUBISHI MOTORS GENUINE Part No. MZ100387) or equivalent	As required

<Added>

STEP 2. Measure the output wave pattern of the lockup solenoid valve at TCM connector (LULS terminal).

- (1) Connect the CVT assembly connector.
- (2) Connect an oscilloscope between TCM connector LULS terminal and body ground (Refer to [P.23A-160](#)).
- (3) Driving conditions.
- (4) During the lockup control.
- (5) Use an oscilloscope, measure the voltage between TCM connector LULS terminal and body ground.

OK: A wave pattern such as the one shown on [P.23A-160](#)(Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 volts or more and the minimum value should be 1 volt or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to DTC P2763: Malfunction of the lockup solenoid valve (open circuit/ short to power supply) [P.23A-114](#), or DTC P2764: Malfunction of the lockup solenoid valve (short to ground) [P.23A-117](#).

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P0741 stored?

YES : Replace the transaxle assembly (Refer to [P.23A-183](#)).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions [P.00-15](#)).

DTC P0746: Abnormality in Hydraulic Control System Function

DIAGNOSTIC FUNCTION

If the pulley ratio, which is calculated according to the primary pulley speed and the secondary pulley speed, exceeds the standard value, the TCM determines that the line pressure is abnormal.

DESCRIPTIONS OF MONITOR METHODS

The ratio between the primary pulley speed and the secondary pulley speed is 2.55 or more for 0.2 second, or 3.35 or more for 0.1 second.

MONITOR EXECUTION

- Transmission range: "D", "R" or "L"
- Primary speed: 500 r/min or more
- Acceleration: -0.05 G or more
- Engine speed: 450 r/min or more

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

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

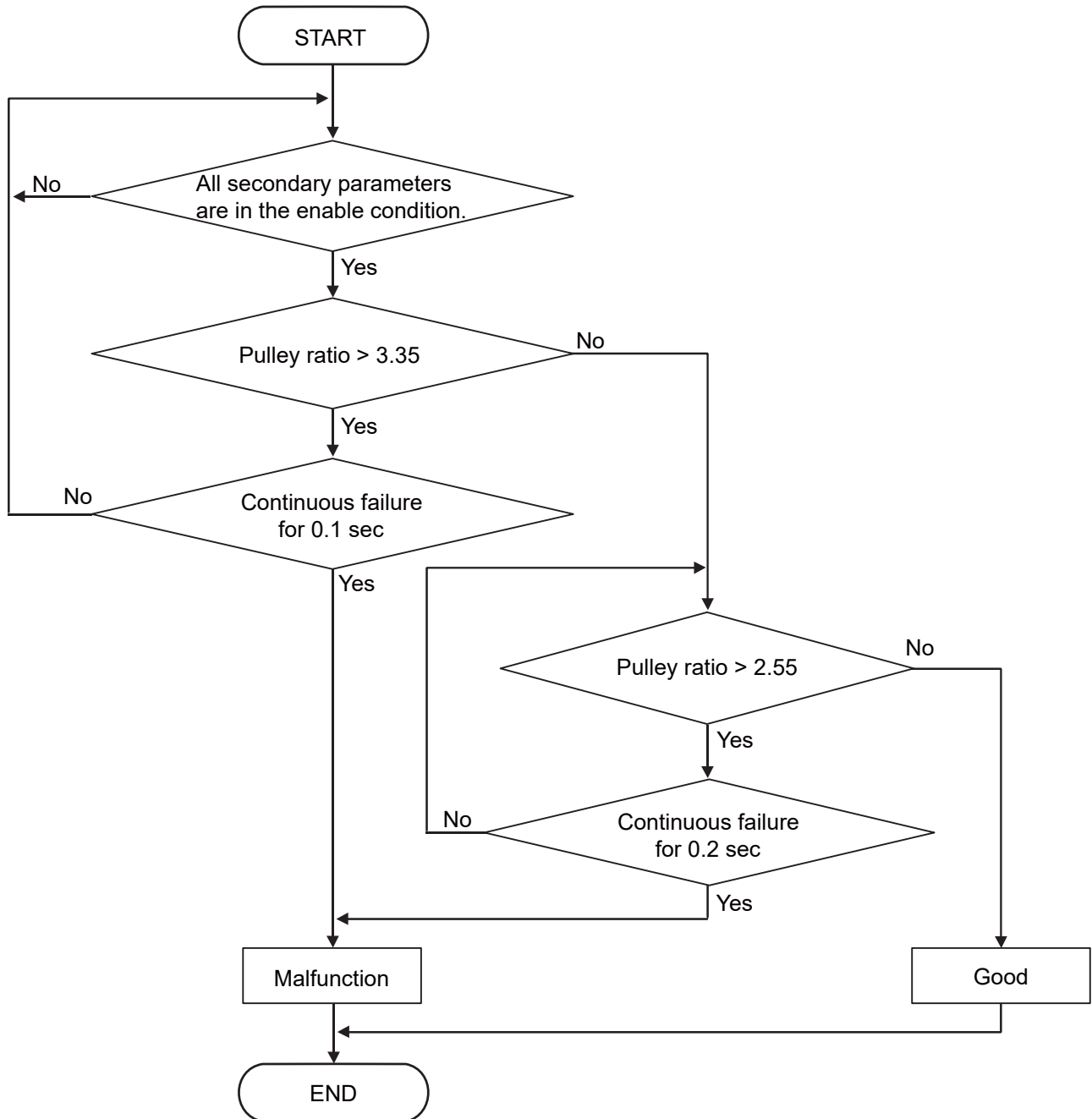
- P0705: Malfunction of transmission range switch
- P0715: Malfunction of primary pulley speed sensor
- P0720: Abnormality in output speed sensor

- P0791: Malfunction of the secondary pulley speed sensor
- U0001: Malfunction of CAN communication
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Primary pulley speed sensor
- Output speed sensor
- Secondary pulley speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Transmission range switch position: "D", "R" or "L"
- Engine speed: 450 r/min or more
- Primary pulley speed: 500 r/min or more
- Acceleration: -0.05 G or more

Judgment Criteria

- Pulley ratio (primary pulley speed/secondary pulley speed) more than 2.55 for 0.2 second.

- Pulley ratio (primary pulley speed/secondary pulley speed) more than 3.35 for 0.1 second.

OBD-II DRIVE CYCLE PATTERN

Accelerate to approximately 10 km/h (6.2 mph) slowly. Then drive at a constant speed for 10 seconds.

PROBABLE CAUSES

<Old>

~~Malfunction of the transaxle assembly (Faulty line pressure solenoid valve or valve body assembly)~~

DIAGNOSIS

Required Special Tools:

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the following connector.

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the faulty connector.

<New>

- Malfunction of the valve body assembly (Faulty line pressure solenoid valve)
- Malfunction of the transaxle assembly

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

- (1) Connect the CVT assembly connector.
- (2) Connect an oscilloscope between TCM connector PLLS terminal and body ground (Refer to P.23A-160).
- (3) Transmission range: "P" range
- (4) Engine: Idling
- (5) Use an oscilloscope, measure the voltage between TCM connector PLLS terminal and body ground.

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

- YES** : Replace the valve body assembly.
- NO** : Replace the transaxle assembly.

OK: A wave pattern such as the one shown on P.23A-160(Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 volts or more and the minimum value should be 1 volt or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

- YES** : Go to Step 3.
- NO** : Refer to DTC P0962: Malfunction of the line pressure solenoid valve (short to ground) P.23A-79, or DTC P0963: Malfunction of the line pressure solenoid valve (open circuit/ short to power supply) P.23A-82.

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P0746 stored?

~~<Old> YES : Replace the transaxle assembly (Refer to P.23A-183).~~ ← **<New> Go to Step 4.**

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15).

DTC P0791: Malfunction of Secondary Pulley Speed Sensor

DIAGNOSTIC FUNCTION

The TCM determines whether the system is faulty by monitoring the secondary pulley speed sensor.

DESCRIPTIONS OF MONITOR METHODS

- The status with the primary pulley speed of 1,000 r/min or more and with the secondary pulley speed of 150 r/min or less continues for five seconds.
- When the secondary pulley speed has dropped abruptly from 1,000 r/min or more to 240 r/min or less, and then it keeps 240 r/min or less for 0.5 second continuously.

DTC P0796: Abnormality in Primary Pressure Solenoid Valve Function

DIAGNOSTIC FUNCTION

If the actual pulley ratio does not track with the target ratio, the TCM determines whether the system is faulty.

DESCRIPTIONS OF MONITOR METHODS

If the actual pulley ratio remains 2.0 to 2.55 for five seconds when the target pulley ratio is 1.2 or less, or if the actual pulley ratio remains 0.2 to 0.75 for five seconds when the target pulley ratio is 1.55 or more, the TCM determines that a malfunction exists.

MONITOR EXECUTION

- Transmission range: "D", "R" or "L"
- Engine speed: 450 r/min or more
- Primary pulley speed: 306 r/min or more
- Secondary pulley speed: 230 r/min or more

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

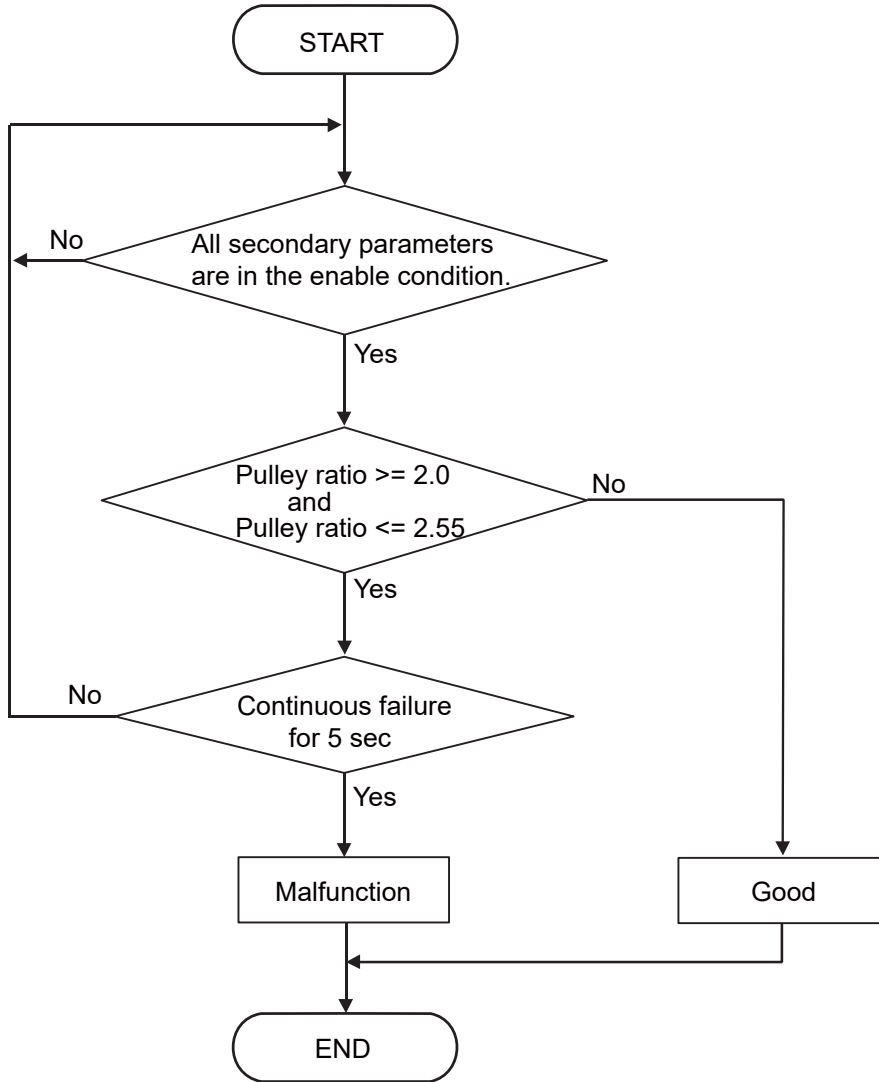
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0705: Malfunction of transmission range switch
- P0715: Malfunction of primary pulley speed sensor
- P0746: Abnormality in hydraulic control system
- P0791: Malfunction of the secondary pulley speed sensor
- P0842, P0843: Malfunction of the secondary pressure sensor
- P0962, P0963: Malfunction of the line pressure solenoid valve
- P0970, P0971: Malfunction of the primary pressure solenoid valve
- U0001: Malfunction of CAN communication (Bus off)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

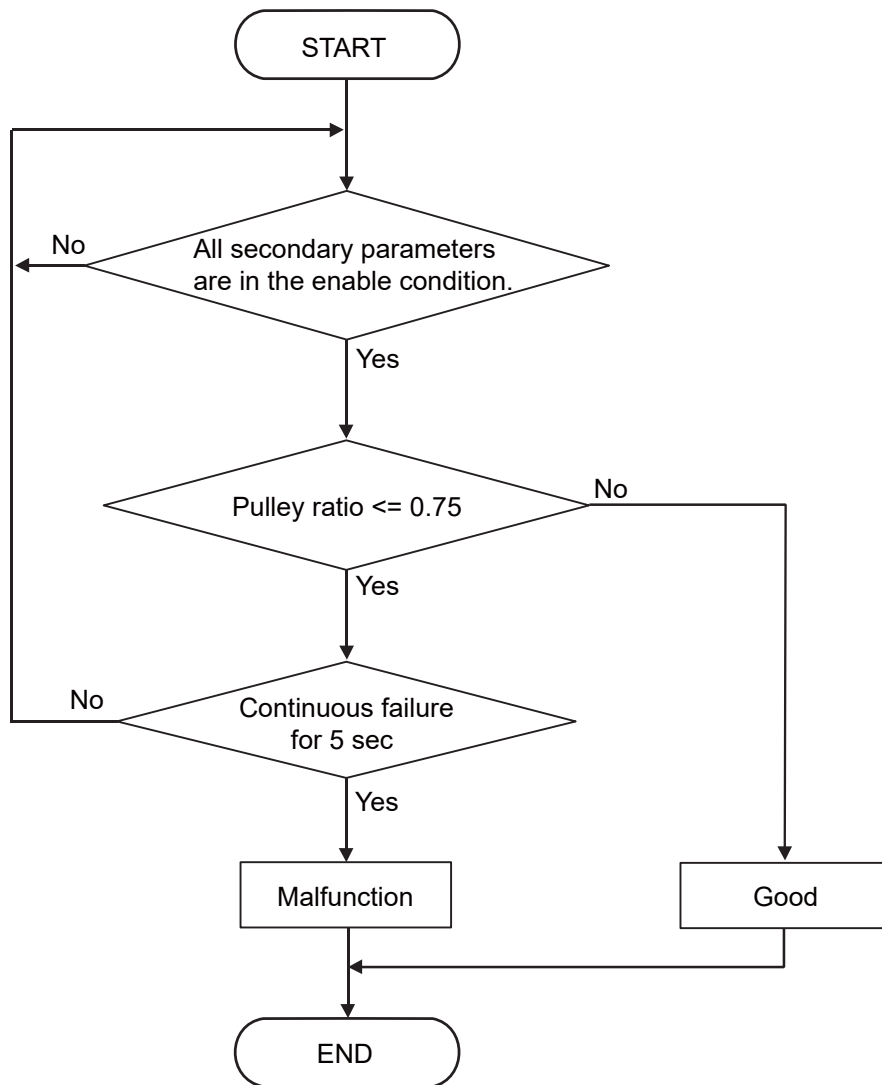
- Transmission range switch
- Primary pulley speed sensor
- Secondary pulley speed sensor
- Secondary pressure sensor
- Line pressure solenoid valve
- Primary pressure solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence-Output Functional Low)



ACC07021AB

LOGIC FLOW CHARTS (Monitor Sequence-Output Functional High)



ACC07020AB

DTC SET CONDITIONS

Check Conditions

- Transmission range switch position: "D", "R" or "L"
- Engine speed: 450 r/min or more
- Primary pulley speed: 306 r/min or more
- Secondary pulley speed: 230 r/min or more

Judgment Criteria

- When the target pulley ratio (primary pulley speed/secondary pulley speed) is less than 1.2 while the vehicle is being driven, the actual pulley ratio remains from 2.0 to 2.55 for five seconds.
- When the target pulley ratio (primary pulley speed/secondary pulley speed) is more than 1.55 while the vehicle is being driven, the actual pulley ratio remains from 0.75 or less for five seconds.

OBD-II DRIVE CYCLE PATTERN

Accelerate to approximately 10 km/h (6.2 mph) slowly. Then drive at a constant speed for 10 seconds.

PROBABLE CAUSES

~~<Old> Malfunction of the transaxle assembly (Faulty primary pressure solenoid valve or valve body assembly)~~

<New>

- Malfunction of the valve body assembly (Faulty line pressure solenoid valve)
- Malfunction of the transaxle assembly

DIAGNOSIS**Required Special Tools:**

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the following connector.

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the faulty connector.

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

- (1) Connect the CVT assembly connector.
- (2) Connect an oscilloscope between TCM connector PRLS terminal and body ground (Refer to [P.23A-160](#)).
- (3) Transmission range: "P" range
- (4) Engine: Idling
- (5) Use an oscilloscope, measure the voltage between TCM connector PRLS terminal and body ground.

OK: A wave pattern such as the one shown on [P.23A-160](#)(Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 volts or more and the minimum value should be 1 volt or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to DTC P0970: Malfunction of the primary pressure solenoid valve (short to ground) [P.23A-85](#), or DTC P0971: Malfunction of the primary pressure solenoid valve (open circuit/ short to power supply) [P.23A-88](#).

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P0796 stored?

YES : ~~Replace the transaxle assembly (Refer to P.23A-183).~~ ^{<Old>} ← ^{<New>} **Go to Step 4.**

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

- YES :** Replace the valve body assembly.
NO : Replace the transaxle assembly.

Code P0841: Abnormality in Secondary Pressure Sensor Function

DIAGNOSTIC FUNCTION

TCM determines that the system is defective by monitoring the secondary pressure sensor.

DESCRIPTIONS OF MONITOR METHODS

The difference between the actual and target secondary pressures remains more than 0.675 MPa (97.9 psi) for five seconds while the vehicle is driven at constant speed.

MONITOR EXECUTION

- Transmission range: "D"
- Primary pulley speed: 306 r/min or more
- Secondary pulley speed: 230 r/min or more
- Actual pulley ratio change rate: 0.1 or less per second
- Vehicle speed change rate: 50 km/h (31 mph) or less per five seconds
- Accelerator pedal position change rate: 21 percents or less per five seconds

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

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

- P0705: Malfunction of transmission range switch

- P0715: Malfunction of primary pulley speed sensor
- P0720: Malfunction of output speed sensor
- P0746: Abnormality in hydraulic control system function
- P0791: Malfunction of secondary pulley speed sensor
- P0842: Malfunction of the secondary pressure sensor (low voltage)
- P0843: Malfunction of the secondary pressure sensor (high voltage)
- P0962: Malfunction of the line pressure solenoid valve (short to ground)
- P0963: Malfunction of the line pressure solenoid valve (open circuit/ short to power supply)
- P1607: Malfunction of the system power supply (low voltage)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Primary pulley speed sensor
- Secondary pulley speed sensor
- Output speed sensor
- Line pressure solenoid valve

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P0796 stored?

YES : Replace the transaxle assembly (Refer to [P.23A-183](#)).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions [P.00-15](#)).

Code P0841: Abnormality in Secondary Pressure Sensor Function**DIAGNOSTIC FUNCTION**

TCM determines that the system is defective by monitoring the secondary pressure sensor.

DESCRIPTIONS OF MONITOR METHODS

The difference between the actual and target secondary pressures remains more than 0.675 MPa (97.9 psi) for five seconds while the vehicle is driven at constant speed.

MONITOR EXECUTION

- Transmission range: "D"
- Primary pulley speed: 306 r/min or more
- Secondary pulley speed: 230 r/min or more
- Actual pulley ratio change rate: 0.1 or less per second
- Vehicle speed change rate: 50 km/h (31 mph) or less per five seconds
- Accelerator pedal position change rate: 21 percents or less per five seconds

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

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

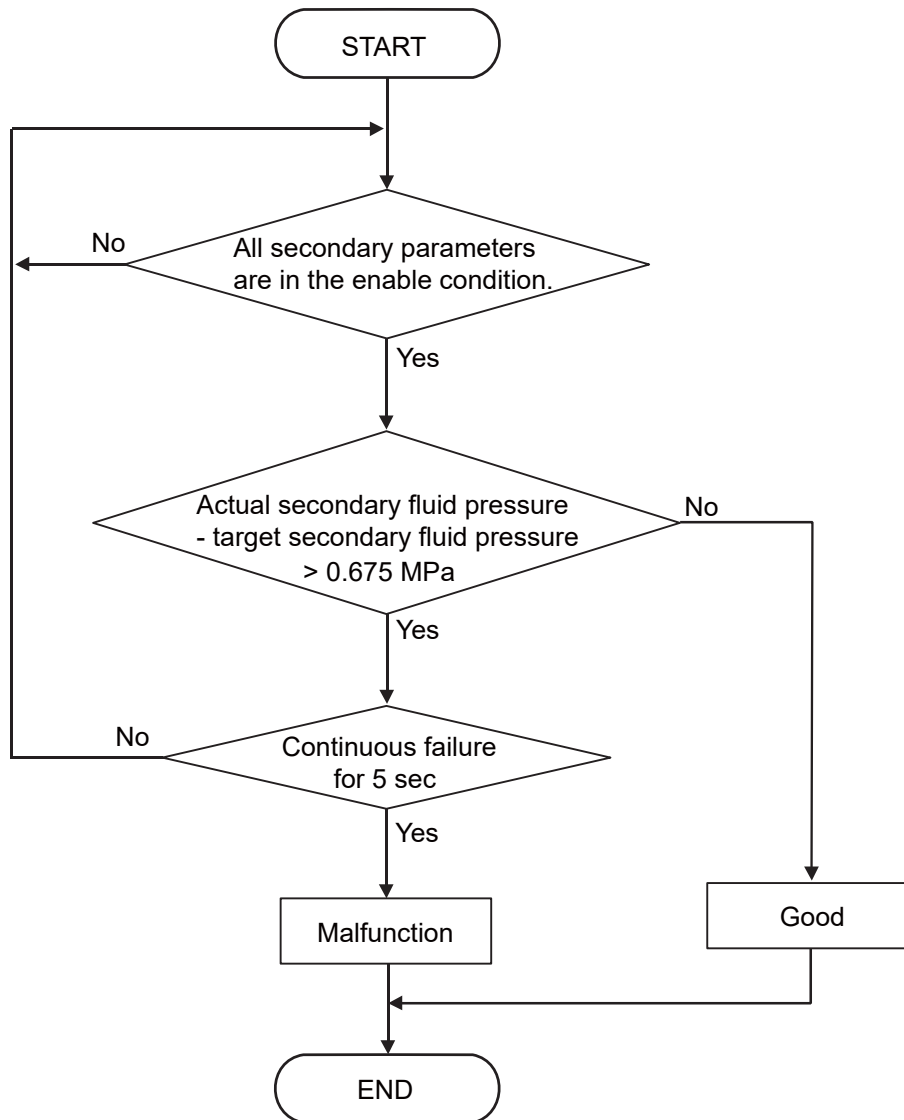
- P0705: Malfunction of transmission range switch

- P0715: Malfunction of primary pulley speed sensor
- P0720: Malfunction of output speed sensor
- P0746: Abnormality in hydraulic control system function
- P0791: Malfunction of secondary pulley speed sensor
- P0842: Malfunction of the secondary pressure sensor (low voltage)
- P0843: Malfunction of the secondary pressure sensor (high voltage)
- P0962: Malfunction of the line pressure solenoid valve (short to ground)
- P0963: Malfunction of the line pressure solenoid valve (open circuit/ short to power supply)
- P1607: Malfunction of the system power supply (low voltage)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Primary pulley speed sensor
- Secondary pulley speed sensor
- Output speed sensor
- Line pressure solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



ACH01226

DTC SET CONDITIONS**Check Conditions**

- Transmission range: "D"
- Primary pulley speed: 306 r/min or more
- Secondary pulley speed: 230 r/min or more
- Actual pulley ratio change rate: 0.1 or less per second
- Vehicle speed change rate: 50 km/h (31 mph) or less per five seconds
- Accelerator pedal position change rate: 21 percents or less per five seconds
- Voltage of battery: 10 volts or more
- Voltage of battery: 16.5 volts or less

Judgment Criteria

- The difference between the actual and target secondary pressures remains more than 0.675 MPa (97.9 psi) for five seconds.

OBD-II DRIVE CYCLE PATTERN

The vehicle is driven for at least 15 seconds without depressing the accelerator pedal and brake pedal while the selector lever is at "D" range.

<Old> PROBABLE CAUSES

~~Malfunction of the transaxle assembly (Faulty secondary pressure sensor or valve body assembly)~~

<New>

- Malfunction of the valve body assembly (Faulty secondary pressure sensor)
- Malfunction of the transaxle assembly

DIAGNOSIS**Required Special Tools:**

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Hydraulic pressure test.

Refer to [P.23A-171](#).

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the failure sections.

STEP 2. Check the following connector.

- TCM connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the defective connector.

STEP 3. Voltage measurement at TCM connector (LPRS terminal).

- (1) Connect the TCM connector.
- (2) Drive the vehicle until the engine is warmed up.
- (3) Transmission range: "P"
- (4) Engine: Idling
- (5) Measure the TCM connector side by backprobing.
- (6) Measure the voltage between the TCM connector (LPRS terminal) and TCM connector (SGND terminal).

OK: approximately 0.84 volt

Q: Is the check result normal?

YES : Go to Step 4.

NO : Refer to DTC P0842: Malfunction of the secondary pressure sensor (low voltage) [P.23A-68](#), or DTC P0843: Malfunction of the secondary pressure sensor (high voltage) [P.23A-71](#).

STEP 4. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P0841 stored?

YES : ~~Replace the transaxle assembly (Refer to P.23A-183).~~ ^{<Old>} Go to Step 5. ^{<New>}

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15).

<Added>

STEP 5. CVT belt inspection.

Check the appearance of the CVT belt.

(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P0842: Malfunction of the Secondary Pressure Sensor (Low Voltage)**DIAGNOSTIC FUNCTION**

The TCM determines that the system is defective when the secondary pressure sensor output voltage is lower than a predetermined value.

DESCRIPTIONS OF MONITOR METHODS

The status with the fluid temperature of -20°C (-4°F) or more and with the secondary pressure sensor voltage of 0.09 volt or less continues for five seconds.

MONITOR EXECUTION

Transmission fluid temperature: -20°C (-4°F) 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

DTC P2857: Auxiliary Gearbox Gear 1 Incorrect Ratio Run-up**DIAGNOSTIC FUNCTION**

The TCM determines that the system is faulty when the auxiliary gearbox remains at incorrect ratio although the TCM commands the 1st gear.

DESCRIPTIONS OF MONITOR METHODS

The gear ratio is 2.232 or more for two seconds while the TCM is shifting the auxiliary gear to 1st gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8 percent or more
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: "D" or "L"
- Target auxiliary gear position: 1st

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

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

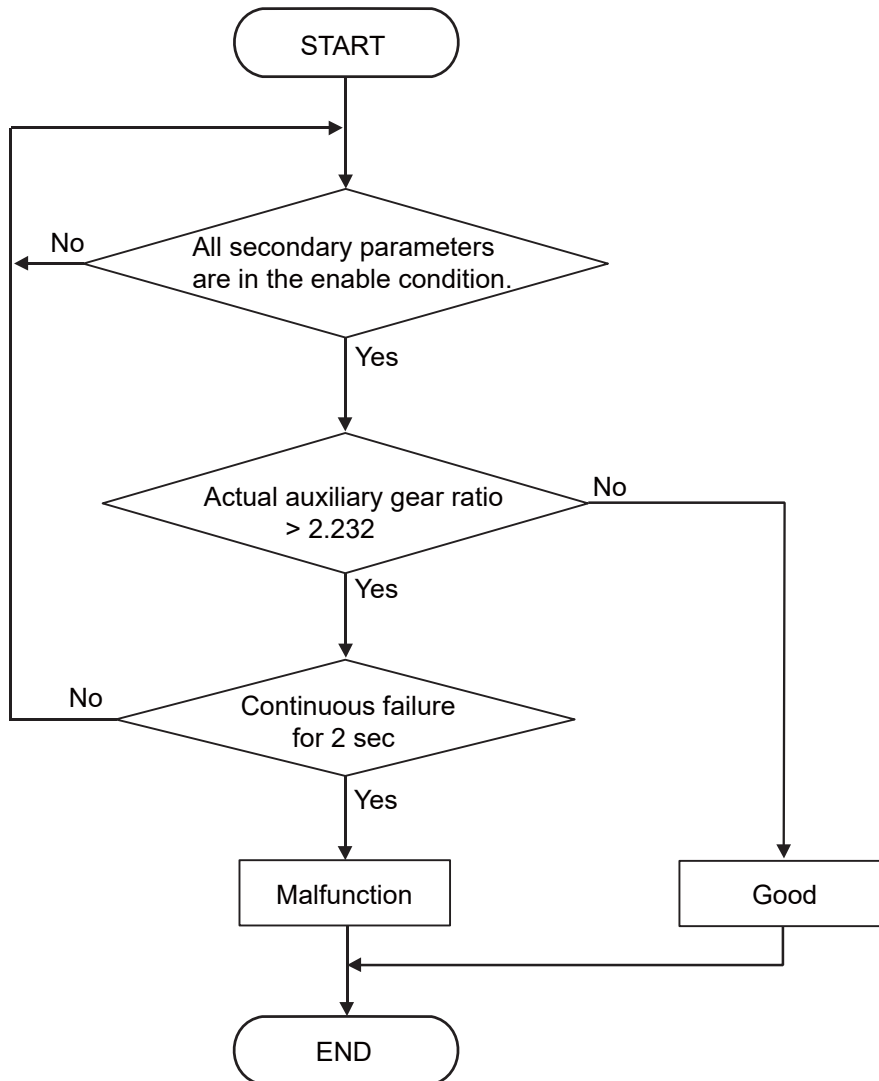
- P0705: Malfunction of the transmission range switch

- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2858: Auxiliary gearbox gear 2 incorrect ratio run-up
- P2859: Auxiliary gearbox gear 1 incorrect ratio
- P285A: Auxiliary gearbox gear 2 incorrect ratio
- U0001: Malfunction of CAN communication circuit (Bus off)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Secondary pulley speed sensor
- Output speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07031

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: "D" or "L"
- Accelerator pedal position sensor (main) output voltage: 1.23 volts or more (Opening angle: 7.8 percent or more)
- Engine speed: 450 r/min or more
- Output speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Target auxiliary gear position: 1st

Judgment Criteria

- While the vehicle is being driven, the actual gear ratio of the auxiliary gearbox remains more than 2.232 for two seconds although the TCM commands the 1st gear.

OBD-II DRIVE CYCLE PATTERN

Accelerate to 40 km/h (24.9 mph) slowly with the accelerator opening angle at 10 percent or more.

PROBABLE CAUSES

<Old> ~~Malfunction of the transaxle assembly (Faulty low brake solenoid valve or valve body assembly)~~

<New>

- Malfunction of the valve body assembly (Faulty low brake solenoid valve)
- Malfunction of the transaxle assembly

DIAGNOSIS**Required Special Tools:**

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the following connector.

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the faulty connector.

STEP 2. Measure the output wave pattern of the low brake solenoid valve at TCM connector (LBLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Connect an oscilloscope between TCM connector LBLS terminal and body ground (Refer to [P.23A-160](#)).
- (3) Transmission range: "D" range
- (4) Drive at a constant speed of approximately 20 km/h (12.4 mph) (auxiliary gearbox: at 1st gear).
- (5) Use an oscilloscope, measure the voltage between TCM connector LBLS terminal and body ground.

OK: A wave pattern such as the one shown on [P.23A-160](#)(Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 volts or more and the minimum value should be 1 volt or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to DTC P0973: Malfunction of the low brake solenoid valve (short to ground) [P.23A-91](#), or DTC P0974: Malfunction of the low brake solenoid valve (open circuit/short to power supply) [P.23A-94](#).

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P2857 stored?

YES : ~~Replace the transaxle assembly (Refer to P.23A-183).~~ ^{<Old>} Go to Step 4. ^{<New>}

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.

(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up**DIAGNOSTIC FUNCTION**

The TCM determines that the system is faulty when the auxiliary gearbox remains at incorrect ratio although the TCM commands the 2nd gear.

DESCRIPTIONS OF MONITOR METHODS

The gear ratio is 2.232 or more for at least two seconds while the TCM is shifting the auxiliary gear to 2nd gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8 percent or more
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: "D" or "L"
- Target auxiliary gear position: 2nd

**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)****Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

- P0705: Malfunction of the transmission range switch
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: Auxiliary gearbox gear 1 incorrect ratio run-up
- P2859: Auxiliary gearbox gear 1 incorrect ratio
- P285A: Auxiliary gearbox gear 2 incorrect ratio
- U0001: Malfunction of CAN communication circuit (Bus off)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Secondary pulley speed sensor
- Output speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P2857 stored?

YES : Replace the transaxle assembly (Refer to [P.23A-183](#)).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions [P.00-15](#)).

DTC P2858: Auxiliary Gearbox Gear 2 Incorrect Ratio Run-up**DIAGNOSTIC FUNCTION**

The TCM determines that the system is faulty when the auxiliary gearbox remains at incorrect ratio although the TCM commands the 2nd gear.

DESCRIPTIONS OF MONITOR METHODS

The gear ratio is 2.232 or more for at least two seconds while the TCM is shifting the auxiliary gear to 2nd gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8 percent or more
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: "D" or "L"
- Target auxiliary gear position: 2nd

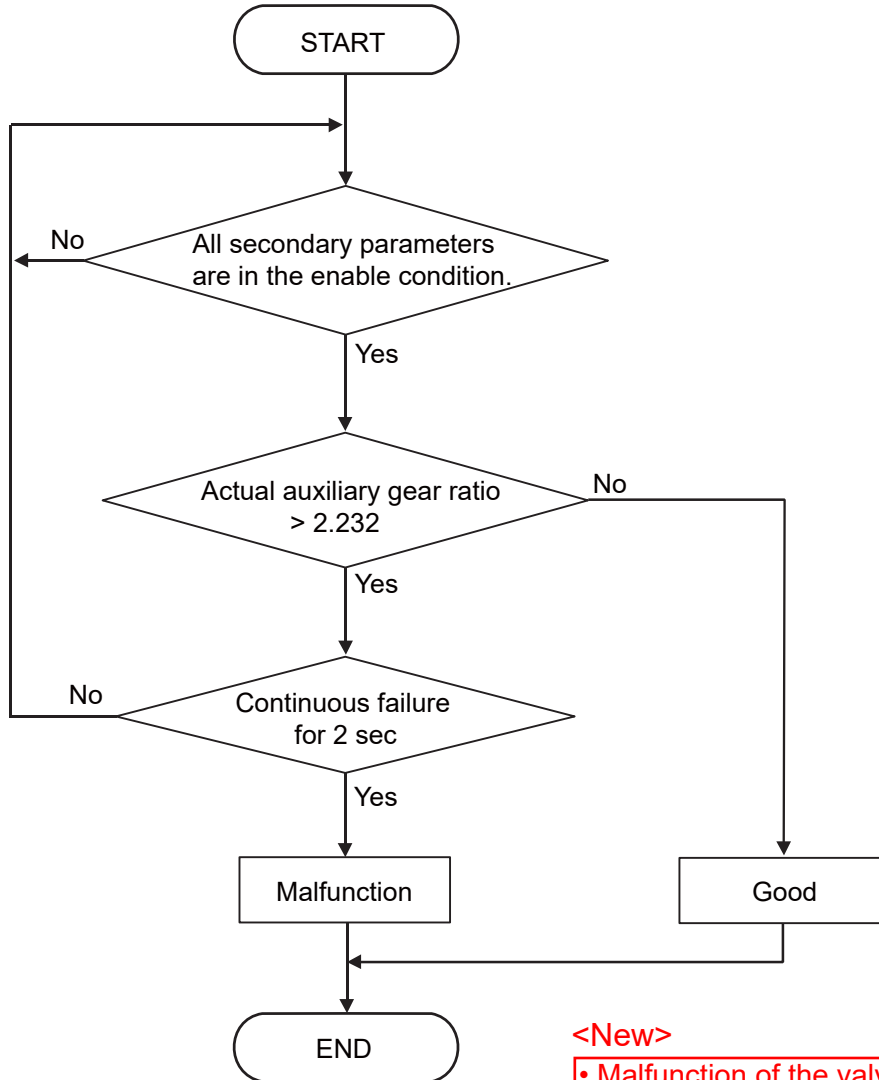
**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)****Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

- P0705: Malfunction of the transmission range switch
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: Auxiliary gearbox gear 1 incorrect ratio run-up
- P2859: Auxiliary gearbox gear 1 incorrect ratio
- P285A: Auxiliary gearbox gear 2 incorrect ratio
- U0001: Malfunction of CAN communication circuit (Bus off)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Secondary pulley speed sensor
- Output speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



<New>

- Malfunction of the valve body assembly (Faulty high clutch and reverse brake solenoid valve)
- Malfunction of the transaxle assembly

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more
- Voltage of battery: 16.5 volts or less
- Transmission range: "D" or "L"
- Accelerator pedal position sensor (main) output voltage: 1.23 volts or more (Opening angle: 7.8 percent or more)
- Engine speed: 450 r/min or more
- Output speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Target auxiliary gear position: 2nd

Judgment Criteria

- While the vehicle is being driven, the actual gear ratio of the auxiliary gearbox remains more than 2.232 for two seconds although the TCM commands the 2nd gear.

OBD-II DRIVE CYCLE PATTERN

Drive at 40 km/h (24.9 mph) for at least five seconds with the accelerator opening angle at 10 percent or more.

PROBABLE CAUSES

<Old> Malfunction of the transaxle assembly (Faulty high clutch and reverse brake solenoid valve or valve body assembly)

DIAGNOSIS**Required Special Tools:**

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the following connector.

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the faulty connector.

STEP 2. Measure the output wave pattern of the high clutch and reverse brake solenoid valve at TCM connector (HRLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Connect an oscilloscope between TCM connector HRLS terminal and body ground (Refer to [P.23A-160](#)).
- (3) Transmission range: "D" range
- (4) Drive at a constant speed of approximately 20 km/h (12.4 mph) (auxiliary gearbox: at 2nd gear).
- (5) Use an oscilloscope, measure the voltage between TCM connector HRLS terminal and body ground.

OK: A wave pattern such as the one shown on [P.23A-160](#)(Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 volts or more and the minimum value should be 1 volt or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to DTC P0976: Malfunction of the high clutch and reverse brake solenoid valve (short to ground) [P.23A-97](#), or DTC P0977: Malfunction of the high clutch and reverse brake solenoid valve (open circuit/short to power supply) [P.23A-100](#).

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P2858 stored?

YES : ~~Replace the transaxle assembly (Refer to P.23A-183).~~ <Old> ← <New> Go to Step 4.

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15).

<Added>

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.
(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio

DIAGNOSTIC FUNCTION

The TCM determines that the system is faulty when the auxiliary gearbox remains the gear ratio is abnormal although the TCM commands the 1st gear.

DESCRIPTIONS OF MONITOR METHODS

- The system determines that a fault has occurred when the gear ratio is within ± 10 percent of the 2nd gear ratio (0.900 - 1.100) for at least 0.5 second while the TCM is shifting the auxiliary gear to 1st gear.
- The system determines that a fault has occurred when the gear ratio is 0.911 or less, or 2.732 or more for at least 0.2 second while the TCM is shifting the auxiliary gear to 1st gear.
- If the high clutch pressure switch remains on for at least 1.5 seconds while the TCM is shifting the auxiliary gear to 1st gear, the system determines that a fault has occurred.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8 percent or more <Only when determining whether 2nd gear ratio is satisfied>
- Vehicle speed: 10 km/h (6 mph) or more <Only when determining whether 1st gear ratio is not satisfied>
- Vehicle speed: 10 km/h (6 mph) or less <Only when the system monitors the high clutch pressure switch>
- Engine speed: 450 r/min or more

- Output shaft speed: 300 r/min or more <Except when the system monitors the high clutch pressure switch>
- Secondary pulley speed: 300 r/min or more <Except when the system monitors the high clutch pressure switch>
- Transmission range: "D" or "L"
- Acceleration: - 0.05 G or less <Only when determining whether 1st gear ratio is not satisfied>
- Target auxiliary gear position: 1st
- The target pressure for the high clutch and reverse brake solenoid valve is 0 MPa (0 psi) or less <Only when the system monitors the high clutch pressure switch>.

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

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

- P0705: Malfunction of the transmission range switch
- P0715: Malfunction of primary pulley speed sensor
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0876: Malfunction of the high clutch pressure switch
- P0973, P0974: Malfunction of the low brake solenoid valve

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P2858 stored?

YES : Replace the transaxle assembly (Refer to [P.23A-183](#)).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions [P.00-15](#)).

DTC P2859: Auxiliary Gearbox Gear 1 Incorrect Ratio**DIAGNOSTIC FUNCTION**

The TCM determines that the system is faulty when the auxiliary gearbox remains the gear ratio is abnormal although the TCM commands the 1st gear.

DESCRIPTIONS OF MONITOR METHODS

- The system determines that a fault has occurred when the gear ratio is within ± 10 percent of the 2nd gear ratio (0.900 - 1.100) for at least 0.5 second while the TCM is shifting the auxiliary gear to 1st gear.
- The system determines that a fault has occurred when the gear ratio is 0.911 or less, or 2.732 or more for at least 0.2 second while the TCM is shifting the auxiliary gear to 1st gear.
- If the high clutch pressure switch remains on for at least 1.5 seconds while the TCM is shifting the auxiliary gear to 1st gear, the system determines that a fault has occurred.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8 percent or more <Only when determining whether 2nd gear ratio is satisfied>
- Vehicle speed: 10 km/h (6 mph) or more <Only when determining whether 1st gear ratio is not satisfied>
- Vehicle speed: 10 km/h (6 mph) or less <Only when the system monitors the high clutch pressure switch>
- Engine speed: 450 r/min or more

- Output shaft speed: 300 r/min or more <Except when the system monitors the high clutch pressure switch>
- Secondary pulley speed: 300 r/min or more <Except when the system monitors the high clutch pressure switch>
- Transmission range: "D" or "L"
- Acceleration: - 0.05 G or less <Only when determining whether 1st gear ratio is not satisfied>
- Target auxiliary gear position: 1st
- The target pressure for the high clutch and reverse brake solenoid valve is 0 MPa (0 psi) or less <Only when the system monitors the high clutch pressure switch>.

**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)****Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

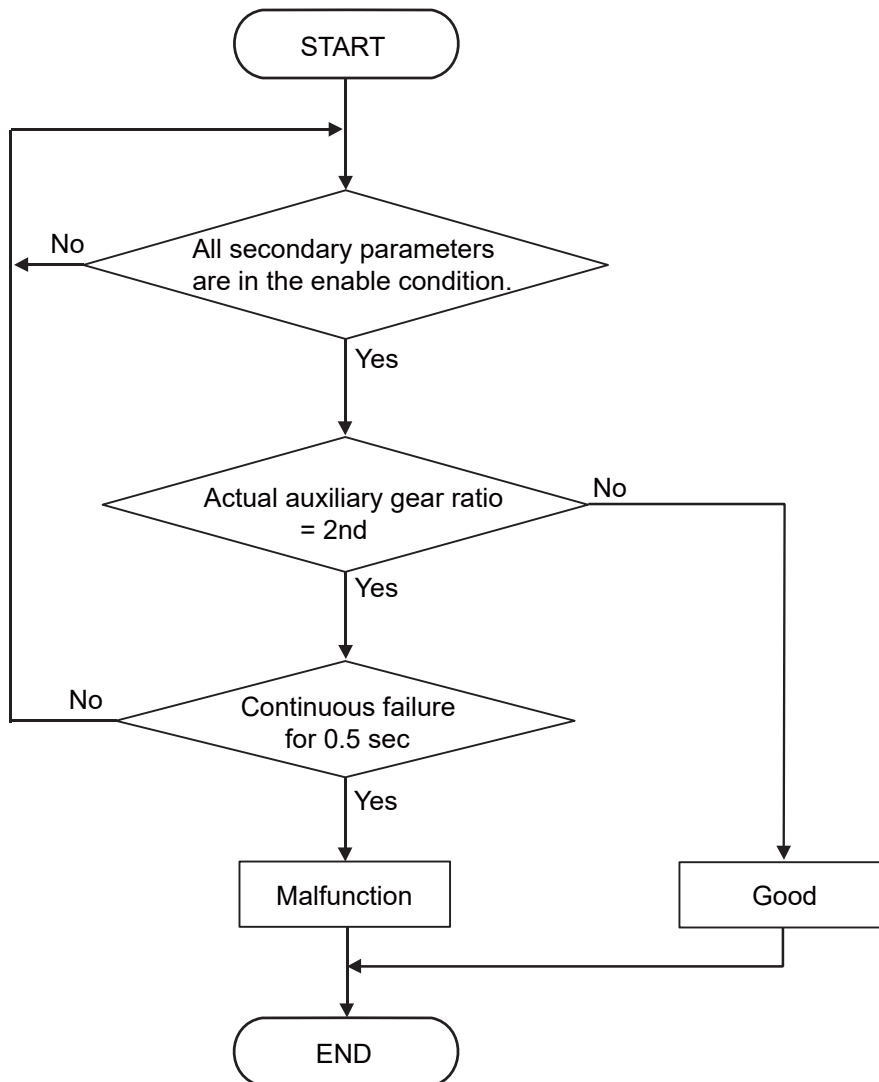
- P0705: Malfunction of the transmission range switch
- P0715: Malfunction of primary pulley speed sensor
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0876: Malfunction of the high clutch pressure switch
- P0973, P0974: Malfunction of the low brake solenoid valve

- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: Auxiliary gearbox gear 1 incorrect ratio run-up
- P2858: Auxiliary gearbox gear 2 incorrect ratio run-up
- P285A: Auxiliary gearbox gear 2 incorrect ratio
- U0001: Malfunction of CAN communication circuit (Bus off)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Primary pulley speed sensor
- Output speed sensor
- Secondary pulley speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve
- High clutch oil pressure switch

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07032

DTC SET CONDITIONS

Check Conditions

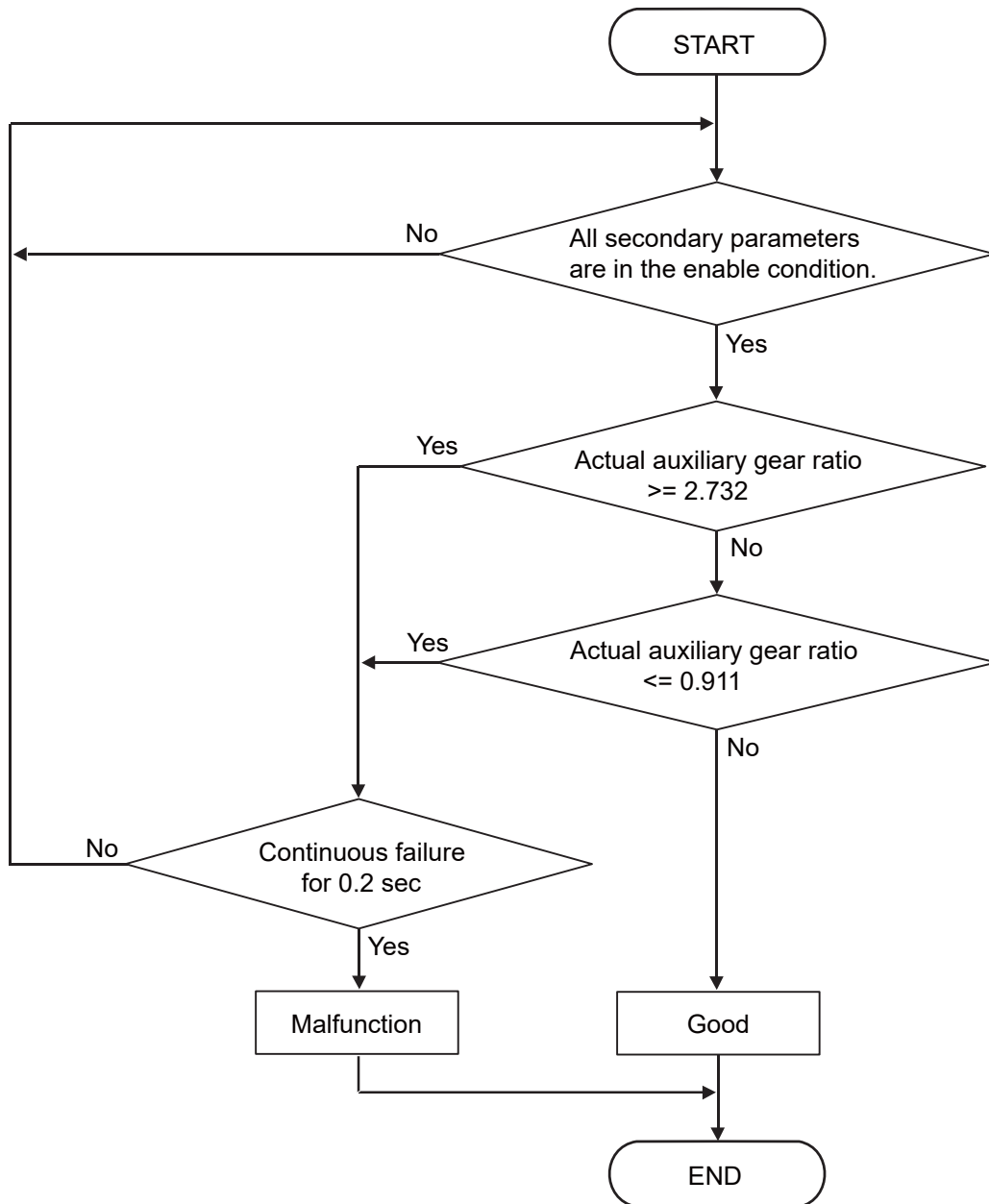
- Target auxiliary gear position: 1st
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: "D" or "L"
- Accelerator pedal position sensor (main) output voltage: 1.23 volts or more (Opening angle: 7.8 percent or more)

- Engine speed: 450 r/min or more
- Output speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by ± 10 percent or less from the 2nd gear ratio (0.900 - 1.100) for 0.5 second.

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07033

DTC SET CONDITIONS

Check Conditions

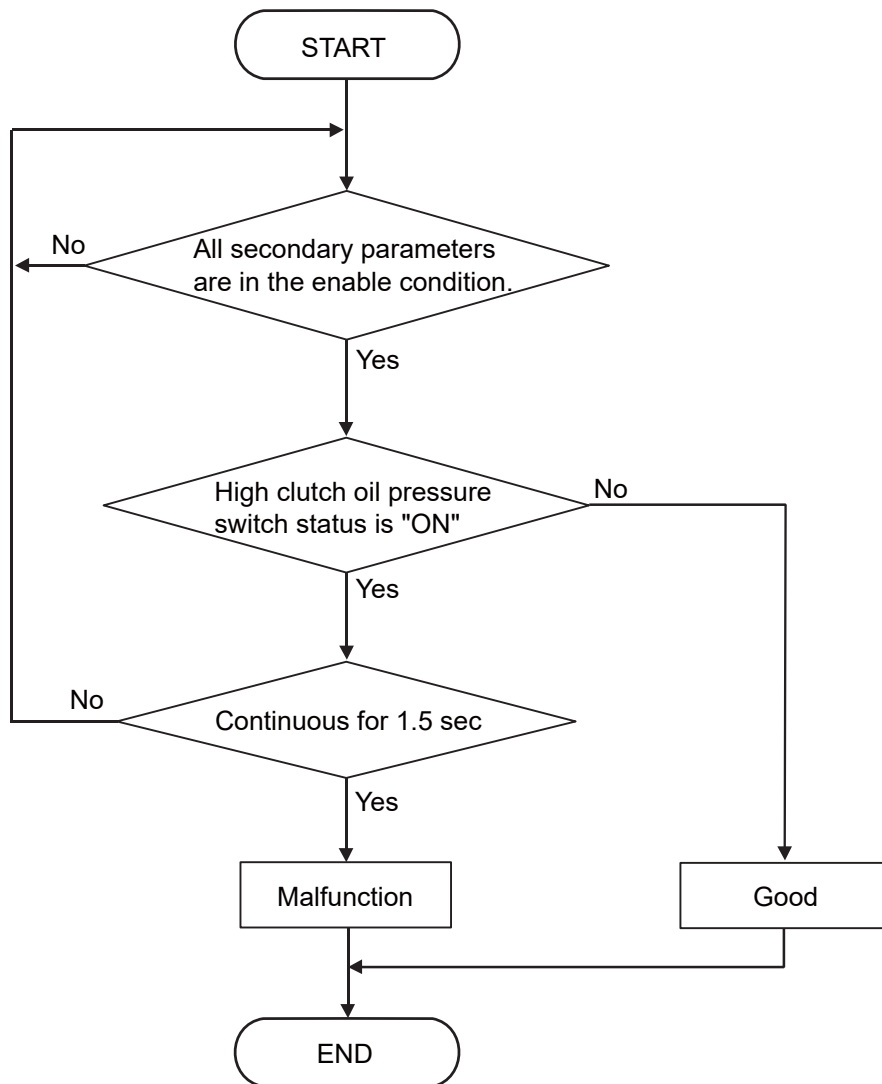
- Target auxiliary gear position: 1st
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission range: "D" or "L"
- Vehicle speed: 10 km/h (6 mph) or more
- Engine speed: 450 r/min or more

- Output speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Acceleration: -0.05 G or less

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by ± 50 percent or more from the 1st gear ratio (0.911 or less, 2.732 or more) for 0.2 second.

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07034AB

DTC SET CONDITIONS

Check Conditions

- Target auxiliary gear position: 1st
- The target pressure for the high clutch and reverse brake solenoid valve is 0 MPa (0 psi) or less.

- Transmission range: "D" or "L"
- Vehicle speed: 10 km/h (6 mph) or less
- Engine speed: 450 r/min or more

Judgment Criteria

- The high clutch oil pressure switch is ON for 1.5 seconds.

OBD-II DRIVE CYCLE PATTERN

Accelerate to 50 km/h (31.1 mph) slowly and then stop the vehicle for at least five seconds with the accelerator opening angle at 10 percent or more.

<Old> PROBABLE CAUSES

~~Malfunction of the transaxle assembly (Faulty high clutch and reverse brake solenoid valve or valve body assembly)~~

<New>

- Malfunction of the valve body assembly (Faulty high clutch and reverse brake solenoid valve)
- Malfunction of the transaxle assembly

DIAGNOSIS**Required Special Tools:**

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the following connector.

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

NO : Repair the faulty connector.

STEP 2. Measure the output wave pattern of the high clutch and reverse brake solenoid valve at TCM connector (HRLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Connect an oscilloscope between TCM connector HRLS terminal and body ground (Refer to [P.23A-160](#)).
- (3) Transmission range: "D" range
- (4) Drive at a constant speed of approximately 20 km/h (12.4 mph) (auxiliary gearbox: at 1st gear).
- (5) Use an oscilloscope, measure the voltage between TCM connector HRLS terminal and body ground.

OK: A wave pattern such as the one shown on [P.23A-160](#)(Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 volts or more and the minimum value should be 1 volt or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to DTC P0976: Malfunction of the high clutch and reverse brake solenoid valve (short to ground) [P.23A-97](#), or DTC P0977: Malfunction of the high clutch and reverse brake solenoid valve (open circuit/short to power supply) [P.23A-100](#).

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P2859 stored?

YES : ~~Replace the transaxle assembly (Refer to P.23A-183).~~ ^{<Old>} Go to Step 4. ^{<New>}

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15).

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.

(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio**DIAGNOSTIC FUNCTION**

The TCM determines that the system is faulty when the auxiliary gearbox remains the gear ratio is abnormal although the TCM commands the 2nd gear.

DESCRIPTIONS OF MONITOR METHODS

- The system determines that a fault has occurred when the gear ratio is within ± 10 percent of the 1st gear ratio (1.639 - 2.003) for at least 0.5 second while the TCM is shifting the auxiliary gear to 2nd gear.
- The system determines that a fault has occurred when the gear ratio is 0.500 or less, or 1.500 or more for at least 0.2 second while the TCM is shifting the auxiliary gear to 2nd gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8 percent or more <Only when determining whether 1st gear ratio is satisfied>
- Vehicle speed: 10 km/h (6 mph) or more <Only when determining whether 2nd gear ratio is not satisfied>
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: "D" or "L"
- Acceleration: -0.05G or less <Only when determining whether 2nd gear ratio is not satisfied>
- Target auxiliary gear position: 2nd

**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)****Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

- P0705: Malfunction of the transmission range switch
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: Auxiliary gearbox gear 1 incorrect ratio run-up
- P2858: Auxiliary gearbox gear 2 incorrect ratio run-up
- P2859: Auxiliary gearbox gear 1 incorrect ratio
- U0001: Malfunction of CAN communication circuit (Bus off)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Output speed sensor
- Secondary pulley speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P2859 stored?

YES : Replace the transaxle assembly (Refer to [P.23A-183](#)).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions [P.00-15](#)).

DTC P285A: Auxiliary Gearbox Gear 2 Incorrect Ratio**DIAGNOSTIC FUNCTION**

The TCM determines that the system is faulty when the auxiliary gearbox remains the gear ratio is abnormal although the TCM commands the 2nd gear.

DESCRIPTIONS OF MONITOR METHODS

- The system determines that a fault has occurred when the gear ratio is within ± 10 percent of the 1st gear ratio (1.639 - 2.003) for at least 0.5 second while the TCM is shifting the auxiliary gear to 2nd gear.
- The system determines that a fault has occurred when the gear ratio is 0.500 or less, or 1.500 or more for at least 0.2 second while the TCM is shifting the auxiliary gear to 2nd gear.

MONITOR EXECUTION

- Accelerator pedal opening angle: 7.8 percent or more <Only when determining whether 1st gear ratio is satisfied>
- Vehicle speed: 10 km/h (6 mph) or more <Only when determining whether 2nd gear ratio is not satisfied>
- Engine speed: 450 r/min or more
- Output shaft speed: 300 r/min or more
- Secondary pulley speed: 300 r/min or more
- Transmission range: "D" or "L"
- Acceleration: -0.05G or less <Only when determining whether 2nd gear ratio is not satisfied>
- Target auxiliary gear position: 2nd

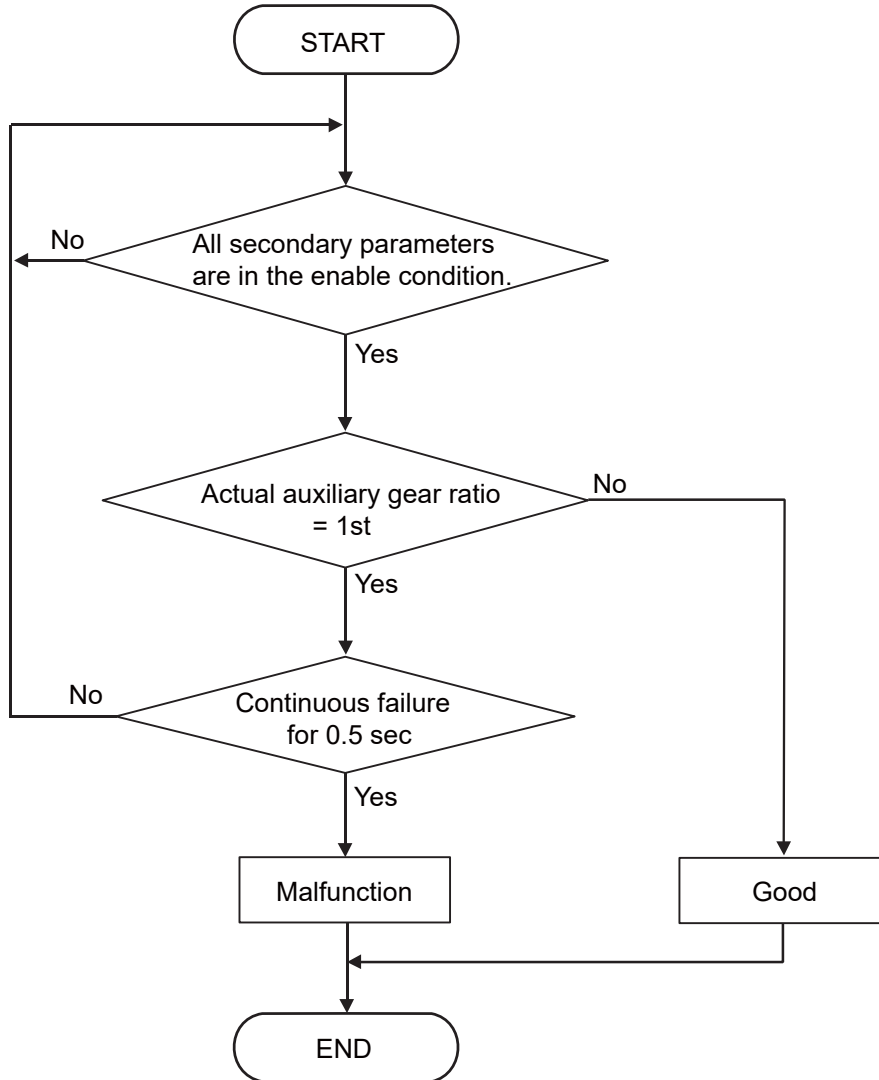
**MONITOR EXECUTION CONDITIONS
(OTHER MONITOR AND SENSOR)****Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

- P0705: Malfunction of the transmission range switch
- P0720: Malfunction of the output speed sensor
- P0791: Malfunction of the secondary pulley speed sensor
- P0973, P0974: Malfunction of the low brake solenoid valve
- P0976, P0977: Malfunction of the high clutch and reverse brake solenoid valve
- P2857: Auxiliary gearbox gear 1 incorrect ratio run-up
- P2858: Auxiliary gearbox gear 2 incorrect ratio run-up
- P2859: Auxiliary gearbox gear 1 incorrect ratio
- U0001: Malfunction of CAN communication circuit (Bus off)
- U0100: CAN time-out error (Engine)

Sensor (The sensor below is determined to be normal)

- Transmission range switch
- Output speed sensor
- Secondary pulley speed sensor
- Low brake solenoid valve
- High clutch and reverse brake solenoid valve

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07036

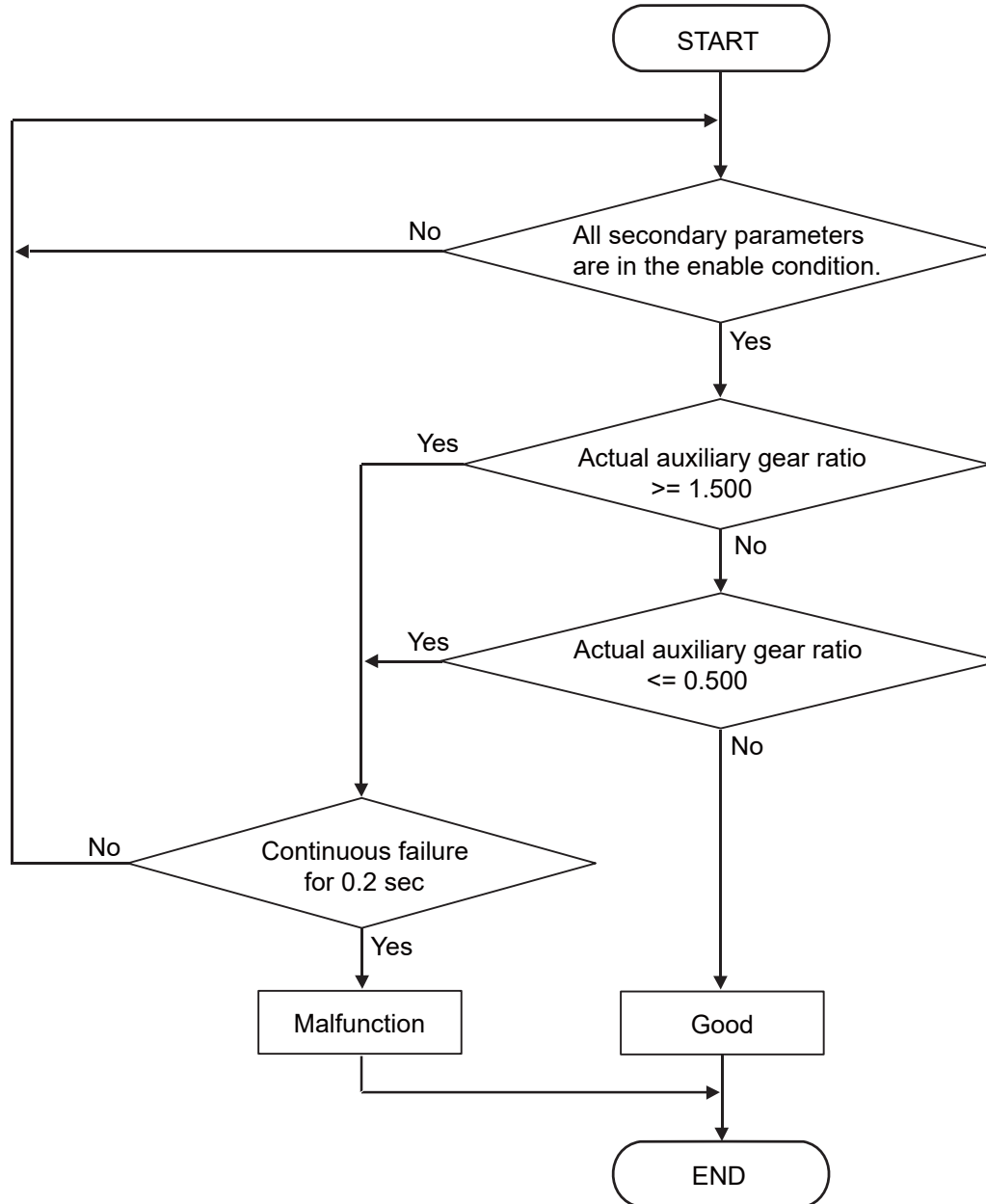
DTC SET CONDITIONS**Check Conditions**

- Target auxiliary gear position: 2nd
- Voltage of battery: 10 volts or more
- Voltage of battery: 16.5 volts or less
- Transmission range: "D" or "L"
- Accelerator pedal position sensor (main) output voltage: 1.23 volts or more (Opening angle: 7.8 percent or more)
- Engine speed: 450 r/min or more
- Secondary pulley speed: 300 r/min or more
- Output speed: 300 r/min or more

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by ± 10 percent or less from the 1st gear ratio (1.639 - 2.003) for 0.5 second.

LOGIC FLOW CHARTS (Monitor Sequence)



ACC07037

DTC SET CONDITIONS**Check Conditions**

- Target auxiliary gear position: 2nd
- Voltage of battery: 10 volts or more
- Voltage of battery: 16.5 volts or less
- Transmission range: "D" or "L"
- Vehicle speed: 10 km/h (6 mph) or more
- Engine speed: 450 r/min or more
- Secondary pulley speed: 300 r/min or more
- Output speed: 300 r/min or more
- Acceleration: -0.05 G or less

Judgment Criteria

- The actual gear ratio of the auxiliary gearbox deviates by ± 50 percent or more from the 2nd gear ratio (0.500 or less, 1.500 or more) for 0.2 second.

OBD-II DRIVE CYCLE PATTERN

Drive at 40 km/h (24.9 mph) for at least five seconds with the accelerator opening angle at 10 percent or more.

<Old> PROBABLE CAUSES

~~Malfunction of the transaxle assembly (Faulty low brake solenoid valve or valve body assembly)~~

<New>

- Malfunction of the valve body assembly (Faulty low brake solenoid valve)
- Malfunction of the transaxle assembly

DIAGNOSIS**Required Special Tools:**

- MB992744: Vehicle communication interface-Lite (V.C.I.-Lite)
- MB992745: V.C.I.-Lite main harness A
- MB992747: V.C.I.-Lite USB cable short
- MB992748: V.C.I.-Lite USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the following connector.

- CVT assembly connector

Check the terminals for a contact status problem and internal short circuit.

Q: Is the check result normal?

YES : Go to Step 2.

STEP 2. Measure the output wave pattern of the low brake solenoid valve at TCM connector (LBLS terminal).

- (1) Connect the CVT assembly connector.
- (2) Connect an oscilloscope between TCM connector LBLS terminal and body ground (Refer to [P.23A-160](#)).
- (3) Transmission range: "D" range
- (4) Drive at a constant speed of approximately 20 km/h (12.4 mph) (auxiliary gearbox: at 2nd gear).
- (5) Use an oscilloscope, measure the voltage between TCM connector LBLS terminal and body ground.

OK: A wave pattern such as the one shown on [P.23A-160](#)(Check Procedure Using an Oscilloscope) should be output, and the maximum value should be 11 volts or more and the minimum value should be 1 volt or less. There should be no noise in the output wave pattern.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to DTC P0973: Malfunction of the low brake solenoid valve (short to ground) [P.23A-91](#), or DTC P0974: Malfunction of the low brake solenoid valve (open circuit/short to power supply) [P.23A-94](#).

STEP 3. Using scan tool (M.U.T.-III), recheck the DTC.

Check again if the DTC is stored.

- (1) Erase the DTC.
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Carry out a test drive with the OBD-II drive cycle pattern.
- (4) Recheck the DTC.

Q: Is DTC P285A stored?

<Old> YES : ~~Replace the transaxle assembly (Refer to P.23A-183).~~ **<New> Go to Step 4.**

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use

<Added> Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15).

STEP 4. CVT belt inspection.

Check the appearance of the CVT belt.

(Refer to On-vehicle Service – CVT Belt Inspection)

Q: Is the CVT belt normal?

YES : Replace the valve body assembly.

NO : Replace the transaxle assembly.

DTC U0001: Malfunction of CAN Communication Circuit (Bus Off)

DIAGNOSTIC FUNCTION

The TCM determines that the system is defective if CAN communication information cannot be sent or received.

DESCRIPTIONS OF MONITOR METHODS

TCM cannot receive the periodic communication data.

MONITOR EXECUTION

Continuous

**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