

# **Technical Service Bulletin**

SUBJECT:	No:	TSB-22-23-001REV		
POTENTIAL TRA	DATE:	February 2022		
WITH POSSII	MODEL: See below			
CIRCULATE TO:	[ ] GENERAL MANAGER	[X] PARTS MANAGER		[X] TECHNICIAN
[X] SERVICE ADVISOR	[X] SERVICE MANAGER	[X] WARRANTY PROCESSO	DR	[] SALES MANAGER

This bulletin supersedes TSB-20-23-001REV, issued June 2020, to update the affected vehicles for US, Canada and Puerto Rico. Revisions are italicized and indicated by ◀.

#### PURPOSE

Certain vehicles with F1CJC/W1CJC (CVT-8) transmissions may exhibit a shudder or surge condition possibly caused by poor reaction of the hydraulic pressure circuit. With continued driving under these conditions, the CVT belt may slip repeatedly when accelerating, and abrasion powder may enter the hydraulic pressure circuit, causing a warning light to turn on with one of the following DTCs: P0776, P0730, P0741, P084A, P0969, P2719. The shudder/surge condition may also be described as engine flare, lack of acceleration, and/or car shake.

This TSB instructs dealers to diagnose and test drive vehicles exhibiting this condition. For all vehicles, verify that SR-16-006 has been completed for vehicles listed in that Recall bulletin (2016 Lancer, 2016 Outlander, and 2015-2016 Outlander Sport: CVT ECU should be updated to the software numbers listed in the "CVT ECU Reprogramming Chart" in this TSB, or higher). If any of the DTCs previously listed are present, dealers are required to submit data from MUTIII-SE, create a Techline case, follow inspection procedures related to recorded DTCs, and make necessary repair based on results. A replacement transmission should ONLY be ordered if approved by Techline or your DPSM.

#### AFFECTED VEHICLES

The following vehicles equipped with F1CJC/W1CJC (CVT-8) transmissions ONLY (US, Canada and Puerto *Rico):* 

- 2018 2022 Eclipse Cross\*
- 2016 2017 Lancer with 2.0L/2.4L engine
- 2016 2020 Outlander with 2.4L engine\*
- 2015 2022 Outlander Sport/RVR with 2.0L engine\*
- 2018 2022 Outlander Sport/RVR with 2.4L engine\*

\* This TSB may also apply to later model years with F1CJC/W1CJC (CVT-8) transmissions.

NOTE: This TSB should be performed on a customer complaint basis only.

Copyright 2022, Mitsubishi Motors North America, Inc.

The information contained in this bulletin is subject to change. For the latest version of this document, go to the Mitsubishi Dealer Link, MEDIC, or the Mitsubishi Service Information website (*www.mitsubishitechinfo.com*).

#### CVT ECU REPROGRAMMING CHART (only for models listed in SR-16-006)

**NOTE:** Look up the vehicle's VIN in the Warranty Superscreen. Check that applicable campaigns or TSBs have been completed.

Madal	ECU		Software Part Number			
Model	Part Number	Data No.	Previous	New		
2016 Lancer (2.0L/4B11) (CYOA, CXOA; F1CJC, W1CJC)	8631B482	8631B802	8631B482 0A 8631B482 0B	8631B482 OC		
2016 Lancer (2.4L/4B12) (CYOA, CXOA; F1CJC, W1CJC)	8631B483	8631B803	8631B483 0A 8631B483 0B	8631B483 OC		
2016 Outlander (2.4L/4J12) (GF0W; F1CJC, W1CJC)	8631B371	8631B788	8631B371 OA 8631B371 OB 8631B371 OC	8631B371 0D		
2015 Outlander Sport/RVR (2.0L/4B11) (GA0W; F1CJC, W1CJC)	8631B287	86318780	8631B287 0A 8631B287 0B 8631B287 0C	8631B287 OD		

#### **REPAIR PROCEDURE**



#### DIAGNOSTIC PROCEDURE 1: MAIN ACTION

1. Connect MUT-III to the vehicle and check for **any** of the following DTCs stored in the CVT ECU: P0776, P0730, P0741, P084A, P0969, P2719.

Are any of the DTCs listed above stored in the CVT ECU?

- **YES -** Go to step 3.
- **NO -** Go to step 2.
- Did customer report that the vehicle exhibited (currently or previously) a shudder or surge condition? (This condition may also be described as engine flare, lack of acceleration, and/or car shake.)
  - YES Go to "Diagnostic Procedure 2: Special Case" in this TSB.
  - **NO** Go to step 4 to verify that SR-16-006 has been completed for vehicles listed in that Recall bulletin (2016 Lancer, 2016 Outlander, and 2015-2016 Outlander Sport).
- 3. If any of the DTCs listed in step 1 are stored in the CVT ECU, perform the steps below.
  - a. Using MUT3-SE save an "ALL DTC" list or "Freeze Frame Data" file displaying the vehicle's VIN **and** all accompanying DTCs.

For instructions on saving an "ALL DTC" list and "Freeze Frame Data" file and attaching to a Techline case, go to:

- MDL > service > systems > Techline > Techline system
- Click on the "HOW-TO" Instructions button and follow instructions under "DTC LISTS" and "FREEZE FRAME DATA."

#### NOTE: A "screen shot" will <u>NOT</u> be accepted as it does not include the vehicle's VIN.



- b. Create a Techline case and attach the files to the Techline case.
- For DTCs P0730, P0741, P0969, P2719:
  Follow the Flow chart in the applicable Service Manual.
  Group 23A -> Diagnosis <CVT> -> Diagnostic Trouble Code Procedures.

For DTCs P0776 and P084A:

Follow the Flow Chart in the applicable Service Manual, then follow the inspection of the CVTBelt and Pulley system as outlined later in this TSB, in the section called "CVT Belt and Pulley Inspection."

- d. Contact Techline for assistance.
- e. Depending on diagnosis, and instruction from Techline, order replacement parts as needed. Refer to Parts Information in this TSB for the correct part number.
- f. If applicable, replace the CVT-8 transaxle or the control valve body, then perform the CVT ECU coding procedures found in TSB-15-23-001, "F1CJC/W1CJC CVT ECU Coding Procedure."
- 4. If vehicle is listed in SR-16-006: Look up the vehicle's VIN in the Warranty Superscreen and verify

that SR-16-006 has been completed.

Has SR-16-006 and any applicable campaigns or TSBs been completed?

- **YES -** Repair is complete.
- NO Complete SR-16-006 and any applicable campaigns or TSBs.
  NOTE: All CAN reprogramming is now performed with MUT3-SE. Refer to TIN-17-00-001REV for more details on the updated procedures with MUT3-SE.

#### **DIAGNOSTIC PROCEDURE 2: SPECIAL CASE**

ONLY if customer reports a shudder/surge condition, follow this procedure **before** replacing the CVT-8 transmission.



- 1. Look up the vehicle's VIN in the Warranty Superscreen and verify that SR-16-006 *and any applicable campaigns or TSBs* have been completed (for 2016 Lancer, 2016 Outlander, and 2015-2016 Outlander Sport). If not completed, perform SR-16-006 *and any applicable campaigns or TSBs*, then go to step 2.
- 2. Test drive the vehicle to see if the shudder/surge condition can be duplicated.
  - a. Refer to "Figure 1: Test Drive Procedure for Duplicating CVT-8 Belt Slip" on next page.
  - b. Setup MUT-III with the applicable Drive Recording parameters listed in the "Diagnostic Procedure 2: Special Case" diagram above.



For instructions on setting up Drive Recordings in **MUTIII-SE**:

- Using MEDIC, from the main page, click the "MUT3-SE" icon at the top center of the screen to open MUT-III SE.
- Click on the MUTIII-SE User's Manual button in lower left corner; go to Chapter 5: Drive Recorder.
- Set the Manual Trigger to index the recording when the shudder/surge condition is noticed.
- c. Follow the Test Drive procedures to duplicate these conditions. Set the Manual Trigger when the shudder/surge condition is noticed.

WARNING Test drive route should be relatively free from other traffic so you can safely conduct the test and concentrate on vehicle operation and performance. ALWAYS follow all traffic laws and safe driving practices.



- 3. Was the shudder/surge condition duplicated?
  - YES Go to step 4.
  - NO Repair is complete. Return vehicle to customer.
- 4. Create a Techline case.
- 5. Attach the following Drive Recording Data from MUT-III to the Techline case.
  - No. Description
    - No. Description
  - 9 Primary Speed
    10 Secondary Speed
- 20 Primary Pressure
- Secondary Speed
  Engine RPM
- 21 Secondary Pressure
- М 15
- 13 Real Change Gear Ratio
- Accelerator Pedal Position
  Target Secondary Pressure
- For instructions on attaching a Drive Recording to a Techline case, go to:
  - MDL > service > systems > Techline > Techline system
  - Click on the "HOW-TO" Instructions button and follow instructions under "DRIVE RECORDINGS" and "3. Attach A Drive Recording to a Techline Case."



- 6. Contact Techline for assistance.
- 7. Depending on diagnosis, and instruction from Techline, order replacement parts as needed. Refer to Parts Information in this TSB for the correct part number.
- 8. If applicable, replace the CVT-8 transaxle or the control valve body, then perform the CVT ECU coding procedures found in TSB-15-23-001, "F1CJC/W1CJC CVT ECU Coding Procedure."

#### **CVT BELT AND PULLEY INSPECTION**

For DTCs P0776 and P084A, follow the Flow Chart in the applicable Service Manual, then follow the steps below to complete CVT belt and pulley inspection.

Attach any borescope photos to the Techline case. Then contact Techline for assistance. Return to step 6 above.

#### CVT DIAGNOSTIC TROUBLE CODE PROCEDURES

#### DTC P0776: Abnormality in Secondary Pressure Solenoid Valve Function

#### **DIAGNOSTIC FUNCTION**

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

#### DESCRIPTIONS OF MONITOR METHODS

The following three conditions are met for 10 seconds.

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

#### MONITOR EXECUTION

• Voltage of battery: 10 volts or more.

## MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

- Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- · Not applicable
- Sensor (The sensor below is determined to be normal)
- · Not applicable

#### LOGIC FLOW CHARTS (Monitor Sequence-Output Functional High)



ACC07002AV



CVT DIAGNOSTIC TROUBLE CODE PROCEDURES

#### LOGIC FLOW CHARTS (Monitor Sequence-Output Functional Low)

#### DTC SET CONDITIONS

#### Check Conditions < Output Functional High>

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

#### Check Conditions <Output Functional Low (Steady state)>

- Voltage of battery: 10 volts or more.
- Transmission range switch position: D or R.
- Engine speed: 450 r/min or more.

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

ACD04219AB

b. Actual secondary pressure: Less than minimum line pressure.

- c. Accelerator pedal position change rate: 6.25% / 1.52 seconds or less.
- d. Vehicle speed change rate: 15 km/h (9 mph)/ 1.52 seconds or less.

#### Check Conditions <Output Functional Low (Transient state)>

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

#### Judgment Criteria < Output Functional High>

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

## Judgment Criteria <Output Functional Low (Steady state)>

- Target secondary pressure Actual secondary pressure: More than 1.2 MPa (174 psi) (10 seconds).
- Judgment Criteria <Output Functional Low (Transient state)>
- Target secondary pressure Actual secondary pressure: More than 1.2 MPa (174 psi) (10 seconds).

#### **OBD-11 DRIVE CYCLE PATTERN**

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

#### **PROBABLE CAUSES**

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

#### DIAGNOSIS

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

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

**YES**: Carry out the appropriate troubleshooting. **NO**: Go to Step 2.

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

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

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

#### Q: Is the check result normal?

YES : Go to Step 3.

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

#### STEP 3. CVT belt inspection

Use the bore scope to check the appearance (Slip marks, the presence or absence of damage) of the CVT belt. (Refer to Attached sheet 5)

#### Q: Is the CVT belt normal?

**YES** : Replace the valve body assembly. Then go to Step 4. **NO:** Replace the CVT assembly.

## **STEP 4. Check whether the DTC is stored again** Erase the DTC.

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

#### Q: Is the diagnostic trouble code set?

- **YES** : Replace the TCM.
- **NO** : This diagnosis is complete.

#### DTC P084A: Abnormality in Primary Pressure Sensor Function

#### **DIAGNOSTIC FUNCTION**

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

#### **DESCRIPTIONS OF MONITOR METHODS**

All the conditions listed below remain for 5 seconds.

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

#### MONITOR EXECUTION

• Voltage of battery: 10 volts or more.

## MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

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

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

## Sensor (The sensor below is determined to be normal)

· Not applicable



CVT DIAGNOSTIC TROUBLE CODE PROCEDURES

#### DTC SET CONDITIONS

#### **Check Conditions**

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

#### **Judgment Criteria**

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

#### **OBD-11 DRIVE CYCLE PATTERN**

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

#### CVT TROUBLE SYMPTOM DIAGNOSIS CHART

#### PROBABLE CAUSES

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

#### DIAGNOSIS

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

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

**YES**: Carry out the appropriate troubleshooting. **NO**: Go to Step 2.

#### STEP 2. CVT belt inspection

Use the bore scope to check the appearance (Slip marks, the presence or absence of damage) of the CVT belt. (Refer to Attached sheet 5)

#### Q: Is the CVT belt normal?

**YES** : Replace the valve body assembly. Then go to Step 3. **NO:** Replace the CVT assembly.

## **STEP 3.Check whether the OTC is stored again** Erase the OTC.

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

#### Q: Is the diagnostic trouble code set?

YES : Replace the TCM.

NO: This diagnosis is complete.

### TROUBLE SYMPTOM DIAGNOSIS CHART

M1231220500285

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

#### Trouble symptom chart

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

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

#### Possible cause chart

Possible cause No.	Probable cause	Remedy
1	Malfunction of the engine system	Check the engine system, and repair or replace if necessary.
2	Improper transmission fluid level	Check the transmission fluid, and repair or replace if necessary.
3	Not within the standard value of the line pressure	Check the hydraulic system, and repair or replace if necessary.
18	Malfunction of the CVT belt & pulley assembly	Visually inspection of CVT belt.

#### ON-VEHICLE SERVICE CVT BELT INSPECTION

M1231229800012

#### <Valve Body Removal>

- 1. Place the vehicle on a lift, put gear in "N".
- 2. Turn the ignition switch to the "LOCK" (OFF) position.
- 3. Disconnect negative(-) battery terminal.
- 4. Raise the vehicle. Make sure gear is in **"N"** prior to raising the vehicle.
- 5. Tie the right front tire and any vehicle member with a rope not to rotate the wheel.
- 6. Remove the drain plug from CVT oil pan and then drain CVT fluid.
- Remove the oil pan bolts, and then oil pan and oil pan gasket.(Refer to GROUP 23A Oil pan and Valve body assembly)
- 8. Check CVT fluid condition and inside of the oil pan.
- If large metal debris found, stop the incident CVT repair, reinstall the removed oil pan and oil pan gasket with the removed oil pan bolts, and then replace with a new CVT assembly. (Refer to GROUP 23A Transaxle assembly)
  Otherwise, follow next steps for the repair.
- 9. Remove the magnets from the oil pan, and then thoroughly wipe and clean the magnets.

#### **!&CAUTION**

- No need to disconnect the CVT terminal body connector from the vehicle harness.
- Do not remove the snap ring from the CVT terminal body connector.
- Do not press the CVT terminal body connector into the CVT case.
- Valve body harness connector is different from CVT terminal connector and it needs to disconnect the valve body harness connector to remove the valve body from the CVT.









ACIO2299





- Use a flat head screwdriver to prevent manual plate shifting out of "N" position while removing the manual plate fixing nut as shown below figures.
- 10. Remove the valve body assembly. (Refer to GROUP 23A Oil pan and Valve body assembly)

After valve body removal, leave the vehicle rose up on the lift for 30 minutes to drain CVT fluid residue.

#### <Belt Visual Inspection>

#### <u>1.6 сайтіон</u> І

- Slowly rotate the front left tire entire one round to rotate the belt to inspect all around of the belt flanks surfaces.
- Rotate the tire as slow as each belt element flank can be carefully inspected if any evidence of damage presented or not, or pose the rotation periodically such as every 9 -10 elements movement on a camera view, and inspect, and then move to next 9 - 10 elements to inspect.
- The aim is performing inspection to each belt element flank if damaged or not.
- Make a mark on a side wall of the tire to recognize one round of rotation.
- Rotate the tire in the forward rotation only. If the tire is rotated in the backward rotation, the bore scope camera lens may get caught between the belt and pulley.
- Make sure the front right tire is fixed by a rope not to rotate.
- Clean so that foreign matter does not adhere to the insertion portion of the bore scope camera.
- Make sure the 90 degree viewing mirror is securely attached.

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

- 1. Inspect the near engine side vehicle right side of flanks surfaces of the belt.
  - (1) Straighten the cable and face the scope towards side of the primary pulley.

CVT ON-VEHICLE SERVICE



(2) Enter the scope in between rear of the primary pulley and CVT case.

(3) Feed the cable straight in about 180 mm (7 inche) until a side of the belt appears in the camera screen. (Past pulley.)

 If the inspection result is OK, inspect the other side - near CVT side cover side - vehicle left side of flanks surfaces of the belt.

#### 

Refer to below damage sample illustrations.

- If damage is found on either side of mating surfaces of the belt, CVT assembly replacement is required.
- If no damage is found on mating surfaces of the belt, a new valve body Installation is required. Follow next steps.

NOTE: Be sure to replace the filter screen and external filter element. Refer to ASA CAPS for correct part numbers for the vehicle.







#### CVT **ON-VEHICLE SERVICE**

# ACIO2135



#### 

The magnets and the oil pan must be thoroughly cleaned.

2. Place the magnets on the oil pan.

#### 

Do not re-use the old oil pan gasket.

3. Install an oil pan gasket and the oil pan.

#### 

- Do not re-use the drain washer. Use a new one.
- Drain washer has two sides. Refer to below figures.
- *Replace the oil strainer and transmission fluid filter, circled in diagram below.*
- 4. Place a drain plug washer on the drain plug, and then install the drain plug with washer.

Tightening torque: 33  $\pm$  1 N·m (24  $\pm$  0.4 ft-lb)

- 5. Connect the battery negative terminal.
- 6. Remove the rope which tying the front right tire and vehicle member.

#### 

#### Make sure no fluid leak.

- 7. Fill CVT fluid into CVT assembly.
- Perform TCM initialization. (Refer to GROUP 23A Initialization Procedure for CVT Learned Value)
- 9. Perform TCM Learning Procedure. (Refer to GROUP 23A Learning Procedure)

10.Test drive the vehicle.



#### PARTS INFORMATION

Use the genuine Mitsubishi Parts listed below:

Transmission Fluid: Mitsubishi	011	M772010E	601(73  at)
Motors Genuine CVTF-J4	All	1412320105	0.9 L (7.5 qt)

## NOTE: ONLY order a new control valve body or CVT-8 transmission after following instructions in the Repair Procedure in this TSB.

Vehicle Specification		Quantity	Control Valve Body Part No.	CVT ASSY Part No.
OUTLANDER	2WD	1	1 2	
SPORT 4B11	4WD	1		2700A403
OUTLANDER	2WD	1		2700A341
SPORT 4B12	4WD	1		2700A314
OUTLANDER 4J12	2WD	1		2700A435
	4WD	1	20004107	2700A406
LANCER	2WD	1	28004187	2700A401
4B11	4WD	1		2700A403
LANCER	2WD	1		2700A435
4B12	4WD	1		2700A406
ECLIPSE CROSS	2WD	1		2700A451
<i>4B40</i>	4WD	1		2700A453

#### WARRANTY INFORMATION

Look up the vehicle's VIN in the Warranty Superscreen. Check that all applicable campaigns or TSBs have been completed.

Country	Operation Code	Operation	Model	Model	Quantity	Nature Code	Cause Code	Work Time (HOURS)	
			Loae					2WD	4WD
		CVT belt appearance check (using boroscope) and the control valve body removal	OUTLANDER SPORT	GAOW	1	05A	440	2.0 H	
	77758070		OUTLANDER	GFOW					
	23358030		LANCER	GYOW					
<i>USA</i> .			ECLIPSE CROSS	GKOW					
	233580A1	Valve body assy – install (Not including removal)	OUTLANDER SPORT / RVR	GAOW				1.2H	
CANADA,			OUTLANDER	GFOW					
AND PUERTO RICO			LANCER	GYOW					
			ECLIPSE CROSS	GKOW					
	233580A2	42 CVT assy- replacement	OUTLANDER SPORT / RVR	GAOW				5.8H	6.8H
			OUTLANDER	GFOW				5.3H	5.9H
			LANCER	GYOW				5.2H	6.1H
			ECLIPSE CROSS	GKOW				6.9H	6.5H

#### Warranty Coverage: Powertrain coverage

- 10/100 if Original owner
- 5/60 if Subsequent owner