Technical Service Bulletin

SUBJECT:	No:	TSB-19-23-006
UPDATES TO MAINTENANCE & ASSEMBLY PROCEDURES FOR CVT F1CJB - SERVICE MANUAL REVISION	DATE:	June 2019
	MODEL:	2014-19 Mirage, 2017-19 Mirage G4

CIRCULATE TO:	[ ] GENERAL MANAGER	[X] PARTS MANAGER	[X] TECHNICIAN
[X] SERVICE ADVISOR	[X] SERVICE MANAGER	[ ] WARRANTY PROCESSOR	[ ] SALES MANAGER

PURPOSE

This TSB updates the Automatic Transaxle section of the affected Service Manuals to update procedures for CVT F1CJB, including diagnosis, maintenance, and transaxle disassembly and reassembly. Changes have been made to procedures due to the following parts being established as service parts:

- Oil filter
- Torque converter
- Plug
- Valve body assembly
- Plug and O-ring for CVT inspection

AFFECTED VEHICLES

- 2014 - 2015, 2017 - 2019 Mirage*
- 2017 - 2019 Mirage G4*

** See pages 36 and 37 in this TSB for changes to 2017 - 2019 Mirage and Mirage G4.*

AFFECTED SERVICE MANUALS

- 2014 - 2015, 2017 - 2019 Mirage Service Manual, Group 23-Automatic Transaxle
- 2017 - 2019 Mirage G4 Service Manual, Group 23-Automatic Transaxle

Continued

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Initialization Procedure for CVT Learned Value.

DIAGNOSIS

INITIALIZATION PROCEDURE FOR CVT LEARNED VALUE

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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)

<Added>
or valve body assembly

AIM

After the Transaxle assembly is replaced, learned values must be initialized. The initialization procedure is as below.

INITIALIZATION PROCEDURE

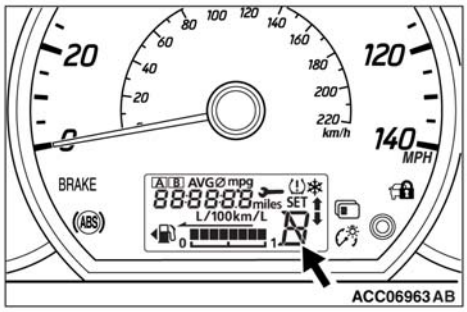
1. Move the selector lever to the "P" range and turn the ignition switch to the "LOCK" (OFF) position. Then, connect scan tool (M.U.T.-III) to the data link connector.
2. Turn the ignition switch to the "ON" position, and then move the selector lever to the "R" range.
3. Depress the accelerator pedal while depressing the brake pedal (Engine stops). Use the scan tool (M.U.T.-III) special function to execute "Reset (item number 3: C/V initial & learned value)" while holding them in applied position.
4. Set the selector lever to the "P" range.
5. Turn the ignition switch to the "LOCK" (OFF) position, and then wait for 10 seconds.

⚠ CAUTION

Do not start the engine.

6. Turn the ignition switch to the "ON" position, and then wait for 10 seconds.
7. Check that "P" is displayed on the transmission range indicator on the multi-information display.

   NOTE: "P" will disappear while the data is being read. "P" will appear when the data reading is complete.
8. Turn the ignition switch to the "LOCK" (OFF) position and then to the "ON" position. Then use the scan tool (M.U.T.-III) to erase the "CVT oil degradation level" (Refer to).



Please **add** the following information to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> ***ADD BELOW:*** Initialization Procedure for CVT Learned Value.

<Added>

CVT FLUID PRESSURE CONTROL LEARNING PROCEDURE

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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)

AIM

When the transaxle control module (TCM) is replaced or when the learned value is initialized, the TCM does not have any learned value. This may degrade the shift quality. The TCM learns by repeating normal driving. In order to make the TCM learn faster, follow the procedure below.

LEARNING PROCEDURE

Steps	Item	Contents
1	Engine idling learning	Refer to GROUP 00, Precautions Before Service – Engine Idling Learning Procedure .
2	Transmission fluid temperature measurement	Use the scan tool (M.U.T.-III) to measure the transmission fluid temperature (data list item number 21).
3	Transmission fluid temperature adjustment	Start the engine and warm it up until the transmission fluid temperature reaches approximately 80°C (176°F). If the transmission fluid temperature does not rise to 80°C (176°F) in cold climates, raise the fluid temperature as much as possible.
4	Secondary pressure sensor	1. Start the engine when the selector lever is in the "P" range and the vehicle is stopped. 2. Turn the ignition switch to the "LOCK" (OFF) position to stop the engine. 3. Wait for 30 seconds in the state described in Step 2. 4. Repeat above steps 1 to 3 three times to complete learning.
5	Select control learning	⚠ **CAUTION** **When moving the selector lever from the "N" range to the "D" range, and from the "N" range to the "R" range, hold for five seconds or more in each range.** 1. Start the engine, and move the selector lever from the "N" range to the "D" range and from the "N" range to the "R" range (two or three times each). If there is no shift shock, the learning is complete. 2. If the shift shock is large, move the selector lever from the "N" range to the "D" range and from the "N" range to the "R" range (up to 10 times each) and the learning is complete.

<Added>

CVT
DIAGNOSTIC TROUBLE CODE PROCEDURES

Steps	Item	Contents
6	Shift control learning 1	1. Check that the "idle neutral active status (data list item number 40)" can be monitored by using the scan tool (M.U.T.-III). 2. Start the engine and wait for at least one minute. 3. Turn off the air conditioning. 4. While the selector lever is at the "D" range, drive the vehicle at 10 km/h (6.2 mph) or more. Then, stop the vehicle with the selector lever at the "D" range. 5. Depress the brake pedal to activate the idle neutral control, and wait for 30 seconds or more. 6. Carry out Step 4 and Step 5 again to complete learning.
7	Shift control learning 2	1. Start the engine. 2. Turn off the air conditioning. 3. While the selector lever is at the "D" range, depress the accelerator pedal by approximately 1/8*1 to accelerate to approximately 60 km/h (37 mph). Depress the brake pedal to decelerate and stop the vehicle. Turn the ignition switch to the "LOCK" (OFF) position to stop the engine and wait for five seconds. 4. If there is no shift shock, the learning at Step 3 is complete. If the shift shock is large, repeat Step 3 (up to five times). 5. While the selector lever is at the "D" range, depress the accelerator pedal by approximately 3/8*2 to accelerate to approximately 60 km/h (37 mph). Drive at a constant speed for five seconds, and depress the brake pedal to decelerate and stop the vehicle. Turn the ignition switch to the "LOCK" (OFF) position to stop the engine and wait for five seconds. 6. If there is no shift shock, the learning at Step 5 is complete. If the shift shock is large, repeat Step 5 (up to 10 times) and the learning is complete.

*NOTE: *1Reference: Data list item number 15 "Accelerator position" on scan tool (M.U.T.-III) measures 10 to 15 percent.*

*NOTE: *2Reference: Data list item number 15 "Accelerator position" on scan tool (M.U.T.-III) measures 25 to 50 percent.*

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0712**: Malfunction of the transmission fluid temperature sensor (low voltage).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- Value of temperature of transmission fluid: 180°C (356°F) or more. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

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

PROBABLE CAUSES

<New> valve body
<Old> ~~transaxle~~

- Malfunction of the ~~transaxle~~ assembly (Faulty transmission fluid temperature sensor)
- Damaged wiring harness and connectors
- Malfunction of TCM

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 SPWR 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. transmission fluid temperature sensor check

Refer to P.23A-129.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the <Old> ~~transaxle~~ assembly. <New> valve body

STEP 4. transmission fluid temperature sensor continuity check

Disconnect the CVT assembly connector, and then check that there is no continuity between the sensor-side terminal No. 12 and the transaxle case.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the <Old> ~~Transaxle~~ assembly. <New> valve body

STEP 5. 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.).

Please make the indicated changes to the **2014 – 2015** Mirage Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0713**: Malfunction of the transmission fluid temperature sensor (high voltage).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- After vehicle speed: 10 km/h (6.2 mph) or more.
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- Value of temperature of transmission fluid: –40°C (-40°F) or less. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

The vehicle is driven for at least 10 seconds at the speed of 20 km/h (12.4 mph) or more.

PROBABLE CAUSES

<New> valve body
<Old> transaxle

- Malfunction of the ~~transaxle~~ assembly (Faulty transmission fluid temperature sensor)
- Damaged wiring harness and connectors
- Malfunction of TCM

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.

STEP 2. Check for open circuit in SPWR and SGND 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. transmission fluid temperature sensor check

Refer to P.23A-129.

<New> valve body
<Old> transaxle

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ~~transaxle~~ assembly.

STEP 4. transmission fluid temperature sensor continuity check

Disconnect the CVT assembly connector, and then check that there is no continuity between the sensor-side terminal No. 12 and the transaxle case.

<New> valve body
<Old> transaxle

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the ~~transaxle~~ assembly.

STEP 5. 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.).

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0841:** Abnormality in Secondary Pressure Sensor Function.

CVT
DIAGNOSIS

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

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

DIAGNOSIS

STEP 1. Hydraulic pressure test
Refer to P.23A-131.

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.

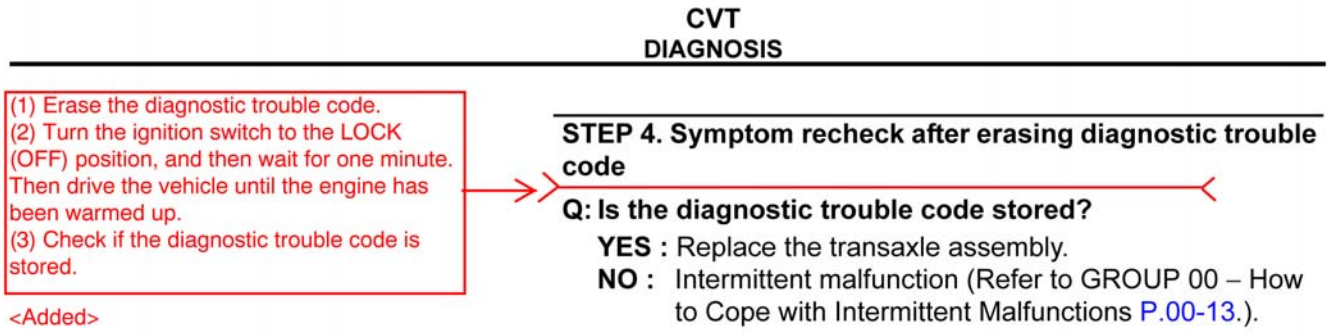
STEP 3. Voltage measurement at TCM connector (LPRS terminal)

(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-50, or diagnostic trouble code No.P0843: Secondary Pressure Sensor (high voltage) P.23A-53.



Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0842**: Malfunction of the Secondary Pressure Sensor (low voltage).

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)

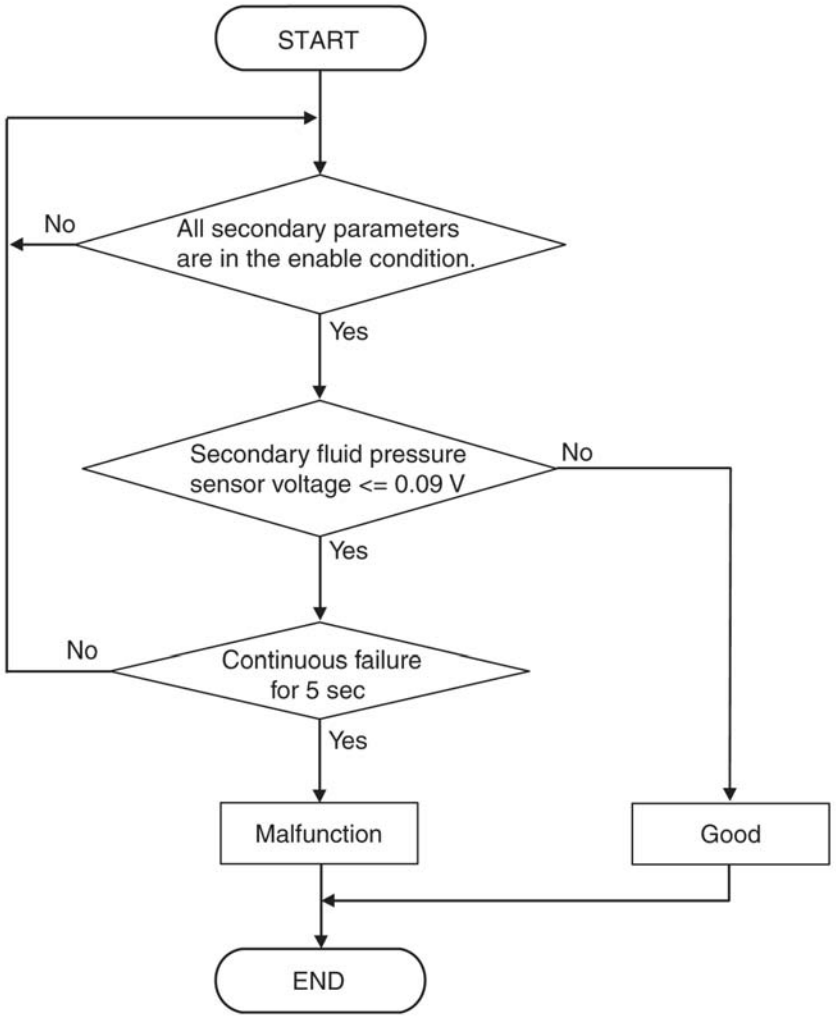
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission fluid temperature: –20°C (–4°F) or more

Judgment Criteria

- The secondary pressure sensor detects a voltage of 0.09 V or less for five seconds.

OBD-II DRIVE CYCLE PATTERN

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

PROBABLE CAUSES

- Malfunction of the ~~transaxle~~ assembly (Faulty secondary pressure sensor ~~or valve body assembly~~)
- Damaged wiring harness and connectors
- Malfunction of TCM

<New> valve body
<Old>
<Deleted>
<Deleted>

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.

STEP 2. Check for open circuit or short to ground in SSPW, LPRS 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.

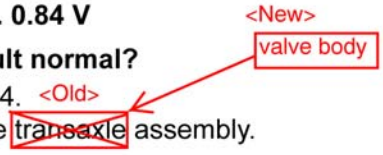
STEP 3. Voltage measurement at TCM connector (LPRS terminal)

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

OK: approx. 0.84 V

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.).

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0843**: Malfunction of the Secondary Pressure Sensor (high voltage).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.
- Transmission fluid temperature: –20°C (–4°F) or more

Judgment Criteria

- The secondary pressure sensor output voltage is 4.70 volts or more.

OBD-II DRIVE CYCLE PATTERN

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

PROBABLE CAUSES

- Malfunction of the transaxle assembly (Faulty secondary pressure sensor or valve body assembly)
- Damaged wiring harness and connectors
- Malfunction of TCM

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.

STEP 2. Check for open circuit in SGND 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. Check for short to power supply in LPRS line between the CVT assembly connector and the TCM connector

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. Voltage measurement at TCM connector (LPRS terminal)

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

OK: approx. 0.84 V

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the transaxle assembly.

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0876**: Malfunction of high clutch oil pressure switch.

CVT
DIAGNOSIS

PROBABLE CAUSES

<Old> valve body <New>

- Malfunction of the ~~transaxle~~ assembly (Faulty high clutch oil pressure switch ~~or valve body assembly~~) <Deleted>
- Damaged wiring harness and connectors
- Malfunction of TCM

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.

STEP 2. Check for open circuit or short to ground in ROM3 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. Check for short to other harness in ROM3 line between the CVT assembly connector and the TCM connector

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. Scan tool data list

Item 73: Oil pressure switch (Refer to Data List Reference Table P.23A-111.)

<New> valve body

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the <Old> ~~transaxle~~ assembly.

STEP 5. Symptom recheck after erasing diagnostic trouble code

Q: Is the check result normal?

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

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0962**: Malfunction of the Line Pressure Solenoid Valve (short to ground).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- A current of at least 1.78 A flows into the line pressure solenoid valve drive circuit for 0.2 seconds.

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

- Malfunction of the <New> valve body <Old> ~~transaxle~~ assembly (Faulty line pressure solenoid valve)
- Damaged wiring harness and connectors
- Malfunction of TCM

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 PLLS 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. Line pressure solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the <New> valve body <Old> ~~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.).

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0963**: Malfunction of the Line Pressure Solenoid Valve (open circuit / short to power supply).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- All the conditions listed below remain for 0.2 seconds.
  1. The line pressure solenoid valve command current is 750 mA or more.
  2. The line pressure solenoid valve current, which the TCM monitors, is 200 mA or less.

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

- Malfunction of the ~~transaxle~~ <New> valve body assembly (Faulty line pressure solenoid valve) <Old>
- Damaged wiring harness and connectors
- Malfunction of TCM

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 open circuit or short to power supply in PLLS 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. Line pressure solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ~~transaxle~~ <New> valve body <Old> 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.).

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0970**: Malfunction of the Primary Pressure Solenoid Valve (short to ground).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- A current of at least 1.78 A flows into the primary pressure solenoid valve drive circuit for 0.5 seconds.

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

- Malfunction of the <Old> ~~transaxle~~ assembly <New> valve body (Faulty primary pressure solenoid valve)
- Damaged wiring harness and connectors
- Malfunction of TCM

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 PRLS 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. Primary pressure solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the <Old> ~~transaxle~~ assembly <New> valve body.

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.).

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0971**: Malfunction of the Primary Pressure Solenoid Valve (open circuit / short to power supply).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- All the conditions listed below remain for 0.2 seconds.
  1. The primary pressure solenoid valve command current is 750 mA or more.
  2. The primary pressure solenoid valve current, which the TCM monitors, is 200 mA or less.

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

- Malfunction of the ~~transaxle~~ <New> valve body <Old> assembly (Faulty primary pressure solenoid valve)
- Damaged wiring harness and connectors
- Malfunction of TCM

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 open circuit or short to power supply in PRLS 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. Primary pressure solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ~~transaxle~~ <New> valve body <Old> 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.).

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0973**: Malfunction of the Low Brake Solenoid Valve (short to ground).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- A current of at least 1.78 A flows into the primary pressure solenoid valve drive circuit for 0.5 seconds.

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

- Malfunction of the <Old> ~~transaxle~~ assembly <New> valve body (Faulty primary pressure solenoid valve)
- Damaged wiring harness and connectors
- Malfunction of TCM

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 PRLS 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. Primary pressure solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the <Old> ~~transaxle~~ assembly <New> valve body.

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.).

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0974**: Malfunction of the Low Brake Solenoid Valve (open circuit / short to power supply).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- All the conditions listed below remain for 0.2 seconds.
  1. The low brake solenoid valve command current is 750 mA or more.
  2. The low brake solenoid valve current, which the TCM monitors, is 200 mA or less.

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

- Malfunction of the ~~transaxle~~ <New> valve body assembly (Faulty low brake solenoid valve) <Old>
- Damaged wiring harness and connectors
- Malfunction of TCM

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 open circuit or short to power supply in LBLS 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. Low brake solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ~~transaxle~~ <New> valve body <Old> 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.).

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0976**: Malfunction of the High Clutch and Reverse Brake Solenoid Valve (short to ground).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria

- A current of at least 1.78 A flows into the high clutch and reverse brake solenoid valve drive circuit for 0.2 seconds.

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

- Malfunction of the ~~transaxle~~ <New> valve body <Old> assembly (Faulty high clutch and reverse brake solenoid valve)
- Damaged wiring harness and connectors
- Malfunction of TCM

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 HRLS 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. High clutch and reverse brake solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ~~transaxle~~ <New> valve body <Old> 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.).

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P0977**: Malfunction of the High Clutch and Reverse Brake Solenoid Valve (open circuit / short to power supply).

CVT
DIAGNOSIS

OBD-II DRIVE CYCLE PATTERN

Ignition switch: ON (start the engine and keep it for 5 seconds or more)

PROBABLE CAUSES

<Old> ~~transaxle~~ <New> valve body

- Malfunction of the ~~transaxle~~ valve body assembly (Faulty high clutch and reverse brake solenoid valve)
- Damaged wiring harness and connectors
- Malfunction of TCM

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 open circuit or short to power supply in HRLS 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. High clutch and reverse brake solenoid valve check

Refer to P.23A-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the <Old> ~~transaxle~~ <New> valve body 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.).

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P2763**: Malfunction of the Lockup Solenoid Valve (open circuit / short to power supply).

CVT
DIAGNOSIS

- All the conditions listed below remain for 5 second.
  1. The solenoid valve drive circuit is not shorted to ground.
  2. The solenoid valve drive circuit system is defective.

OBD-II DRIVE CYCLE PATTERN

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

PROBABLE CAUSES

- Malfunction of the ~~transaxle~~ assembly (Faulty lockup solenoid valve) <New> valve body <Old>
- Damaged wiring harness and connectors
- Malfunction of TCM

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 open circuit or short to power supply 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-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ~~transaxle~~ assembly. <New> valve body <Old>

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.).

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Diagnostic Trouble Code Procedures -> **DTC P2764**: Malfunction of the Lockup Solenoid Valve (short to ground).

CVT
DIAGNOSIS

DTC SET CONDITIONS

Check Conditions
- Voltage of battery: 10 volts or more.
- Voltage of battery: 16.5 volts or less.

Judgment Criteria
- A current of at least 1.78 A flows into the lockup solenoid valve drive circuit for 0.5 seconds.

OBD-II DRIVE CYCLE PATTERN

The vehicle is driven for at least 5 seconds at the speed of 20 km/h (12.4 mph) or more.

PROBABLE CAUSES

- Malfunction of the ~~transaxle~~ <New> valve body assembly (Faulty lockup solenoid valve) <Old>
- Damaged wiring harness and connectors
- Malfunction of TCM

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-128.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the <New> valve body <Old> ~~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.).

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> Diagnosis -> Trouble Symptom Diagnosis Chart -> Possible Cause Chart.

CVT
DIAGNOSIS

Possible cause No.	Probable cause		Remedy
5	Electric system	The TCM is defective.	Check the TCM, and repair or replace if necessary.
6		Malfunction of the transmission range switch	Check the transmission range switch, and repair or replace if necessary.
7		Malfunction of the primary pulley speed sensor	Check the primary pulley speed sensor, and repair or replace if necessary.
8		Malfunction of the secondary pulley speed sensor	Check the secondary pulley speed sensor, and repair or replace if necessary.
9		Malfunction of the output speed sensor	Check the output speed sensor, and repair or replace if necessary.
10		Malfunction of the secondary pressure sensor	Replace the ~~CVT assembly~~ <Old> <New> valve body assembly or CVT assembly
11		Malfunction of the primary pressure solenoid valve	
12		Malfunction of the line pressure solenoid valve	
13		Malfunction of the lock-up solenoid valve	
14		Malfunction of the high clutch or the reverse brake solenoid valve	
15		Malfunction of the low brake solenoid valve	
16		Malfunction of the transmission fluid temperature sensor	
17	Hydraulic system	Malfunction of the valve body or the control valve	<Added>
18		Malfunction of the oil pump	Replace the CVT assembly
19	Drivetrain system	Malfunction of torque converter	
20		Malfunction of the pulley and the steel belt	
21		Malfunction of the low brake	
22		Malfunction of the high clutch	
23		Malfunction of the reverse brake	
24		Malfunction of the bearings	
25		Malfunction of the counter gear	
26		Malfunction of the planetary gear	
27		Malfunction of the reduction gear	
28		Malfunction of the final gear or the differential gear	
29		Malfunction of the parking mechanism	

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> On-Vehicle Service -> CVT Control Component Layout.

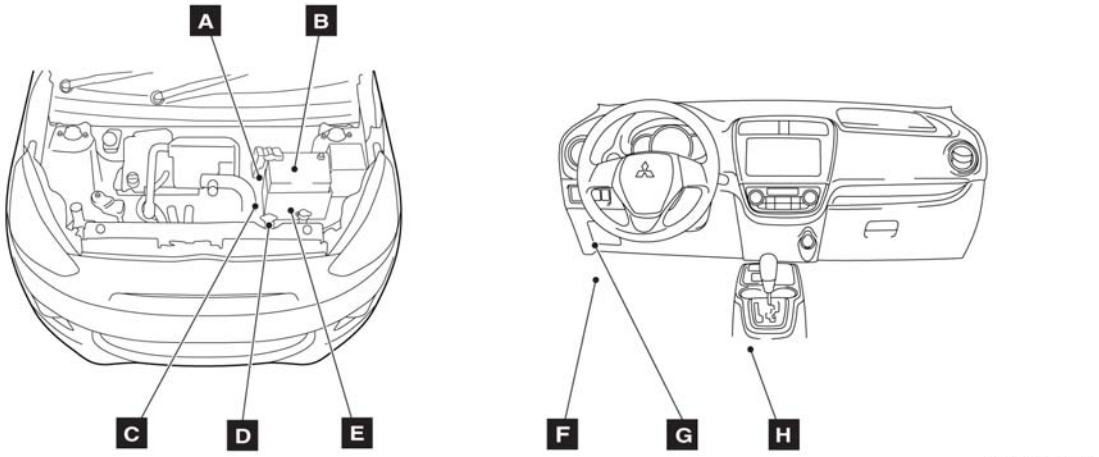
CVT
ON-VEHICLE SERVICE

CVT CONTROL COMPONENT LAYOUT

M1231208600400

<New> Valve body
<Old>

Name	Symbol	Name	Symbol
CVT assembly connector (Solenoid valve assembly, transmission fluid temperature sensor, high clutch oil pressure switch)	D	Secondary pulley speed sensor	B
Data link connector	F	Shift lock solenoid	H
Output speed sensor	A	Transaxle control module (TCM)	G
Primary pulley speed sensor	E	Transmission range switch	C



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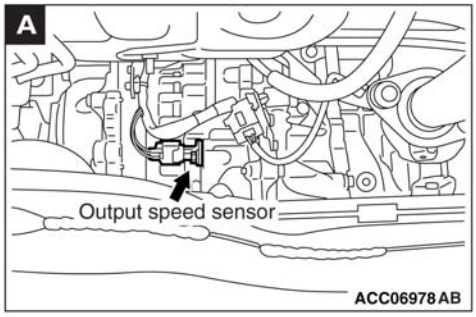

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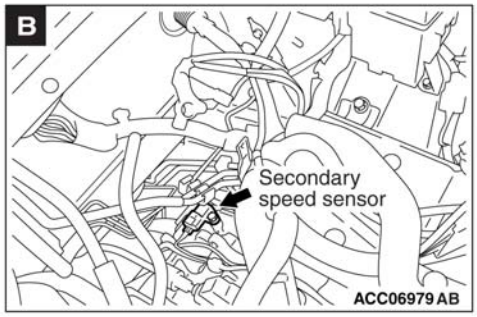

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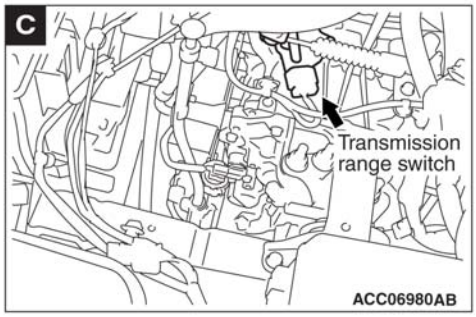

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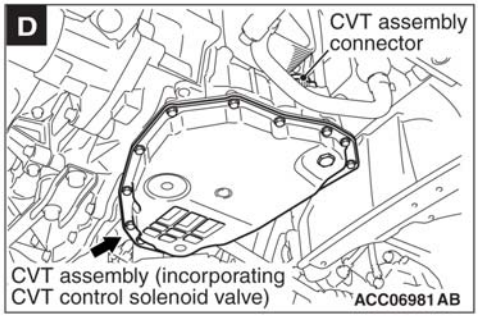

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Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> On-Vehicle Service -> CVT Control Component Check -> Solenoid Valve Check.

CVT CONTROL COMPONENT CHECK

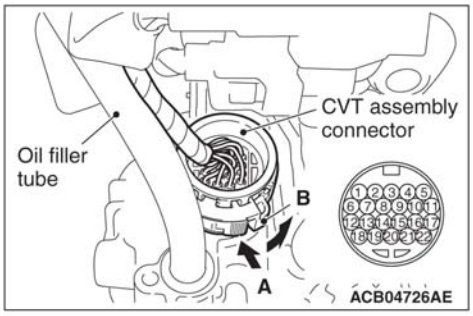
TRANSMISSION RANGE SWITCH CHECK

M1231201400568

Refer to P.23A-124.

SOLENOID VALVE CHECK

M1231229500538



1. While pressing A in the figure, turn B counterclockwise to unlock the CVT assembly connector, and disconnect the connector.
2. Measure the resistance between the terminals of the applicable solenoid valves and ground.

Standard value:

Terminal No.	Applicable solenoid valve	Resistance value Ω
1	Line pressure solenoid valve	• Approximately 5.3 [Fluid temperature: 20°C (68°F)] • Approximately 5.9 [Fluid temperature: 50°C (122°F)] • Approximately 6.5 [Fluid temperature: 80°C (176°F)]
2	Primary pressure solenoid valve	
6	Low brake solenoid valve	
7	High clutch and reverse brake solenoid valve	
8	Lockup solenoid valve	• Approximately 6.1 [Fluid temperature: 20°C (68°F)] • Approximately 6.8 [Fluid temperature: 50°C (122°F)] • Approximately 7.5 [Fluid temperature: 80°C (176°F)]

⚠ CAUTION
Each solenoid valve cannot be removed or replaced as a single unit.

3. When the resistance is outside the standard value, replace the ~~transaxle~~ assembly.

<Old>
<New>
valve body

Please make the indicated changes to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> On-Vehicle Service -> Transmission Fluid Temperature Sensor Check.

TRANSMISSION FLUID TEMPERATURE SENSOR CHECK

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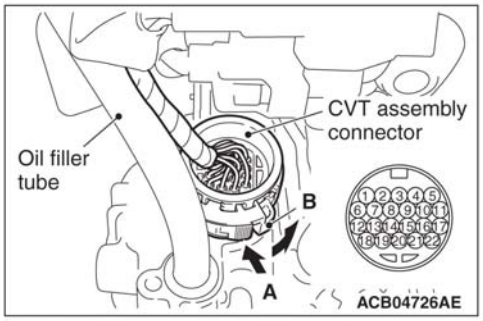
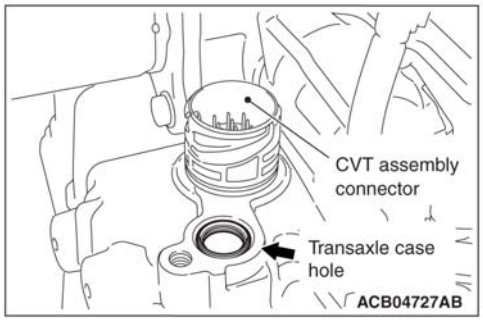


1. While pressing A in the figure, turn B counterclockwise to unlock the CVT assembly connector, and disconnect the connector.



⚠ CAUTION
Insert a thermometer which is made of metal or is put in a metal case [overall length: approximately 150 – 200 mm (6.0 – 7.8 in.)] into the transaxle case hole approximately 80 mm (3.1 in.).

2. Remove the oil filler pipe assembly (Refer to Transaxle Assembly), and insert a thermometer into the transaxle case hole.

   NOTE: If a radiation thermometer (noncontact thermometer) is available, use it to measure the surface temperature of the oil pan.

3. Measure the resistance between the sensor-side connector terminal No. 12 of the CVT assembly connector and ground (terminal No.18).

   Standard value:

Fluid temperature °C (°F)	Resistance kΩ
At 20 (68)	Approximately 6.5
At 40 (104)	Approximately 2.2
At 80 (176)	Approximately 0.9

⚠ CAUTION
The transmission fluid temperature sensor cannot be removed or replaced as a single unit.

4. When the resistance of the transmission fluid temperature sensor is outside the standard value, and the fluid temperature warning comes on/goes out at other than the specified temperatures, replace the ~~transaxle~~ assembly.

<Old>
<New>
valve body

Please make the indicated changes to the **2014 – 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> On-Vehicle Service -> Hydraulic Pressure Test -> Hydraulic Pressure Test Diagnosis Table.

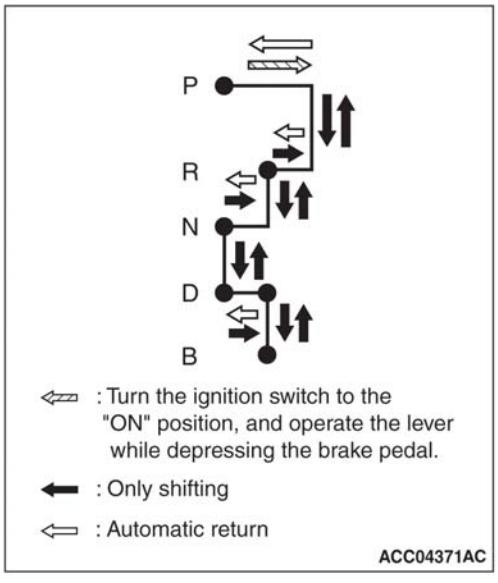
CVT
ON-VEHICLE SERVICE

Hydraulic pressure test diagnosis table

Judgment result		Probable cause		Remedy
During engine idling	Low at all ranges [P, R, N, D (B)]	The hydraulic pressure delivery system or the oil pump may be defective.	• Worn oil pump	Replace the transaxle assembly <Added>
			• Damaged oil pump chain and sprocket	
			• Defective pressure regulator valve, or deteriorated spring	Replace the valve body assembly
			• Leaks in the hydraulic pressure circuit ranging from the oil strainer via the oil pump to the pressure regulator valve	Replace the transaxle assembly
			• The engine idling speed is low.	Check the engine system, and repair or replace if necessary.
	Low at certain range(s) only.	Oil leaks may be present in the device or circuit relating to that range.		Replace the transaxle assembly
	High	Sensor(s) or the pressure adjusting function may be defective.	• Malfunction of the accelerator pedal position sensor	Check the accelerator pedal position sensor, and repair or replace if necessary.
			• Malfunction of the oil pressure sensor	Replace the ~~transaxle~~ assembly <Old> <New> valve body
			• Malfunction of the line pressure solenoid valve (stuck OFF, open circuit or short circuit)	
			• Malfunction of the pressure regulator valve	

Judgment result		Probable cause		Remedy
During engine stall	Oil pressure does not rise from that during the engine idling.	Sensor(s) or the pressure adjusting function may be defective.	• Malfunction of TCM	Check the TCM, and repair or replace if necessary.
			• Malfunction of the line pressure solenoid valve (stuck ON or short circuit)	Replace the ~~transaxle~~ assembly <Old> <New> valve body <Added>
			• Malfunction of the pressure regulator valve	
	Oil pressure rises, but is not within the standard value.	The pressure supply system, sensor(s) or the pressure adjusting function may be defective.	• Worn oil pump	Replace the valve body assembly
			• Malfunction of the line pressure solenoid valve	
			• Malfunction of the pressure regulator valve	
	Low at certain range(s) only.	Oil leaks may be present in the device or circuit relating to that range.		Replace the transaxle assembly

Replace the transaxle assembly



SELECTOR LEVER OPERATION CHECK

M1231202900522

1. Operate the parking brake.
2. Move the selector lever to every range and check that the lever moves smoothly with secure feel of engagement.
3. Make sure that the engine starts when the selector lever is in the "N" or "P" range, and does not start when the selector lever is in other range.
4. Start the engine. Release the parking brake lever.
5. Make sure that the vehicle moves forward when the selector lever is moved to "D" range, or to the "B" range. Also make sure that the vehicle moves backward when the selector lever is moved from the "N" to "R" range.
6. Stop the engine.
7. Turn "ON" the ignition switch, and move the selector lever from the "P" to "R" range. Check that the backup light comes on and the tone alarm sounds at this time.

   NOTE: Since the vehicle is equipped with the CVT wrong-operation preventive device, the selector lever cannot be moved out of the "P" position without depressing the brake pedal after turning "ON" the ignition switch.

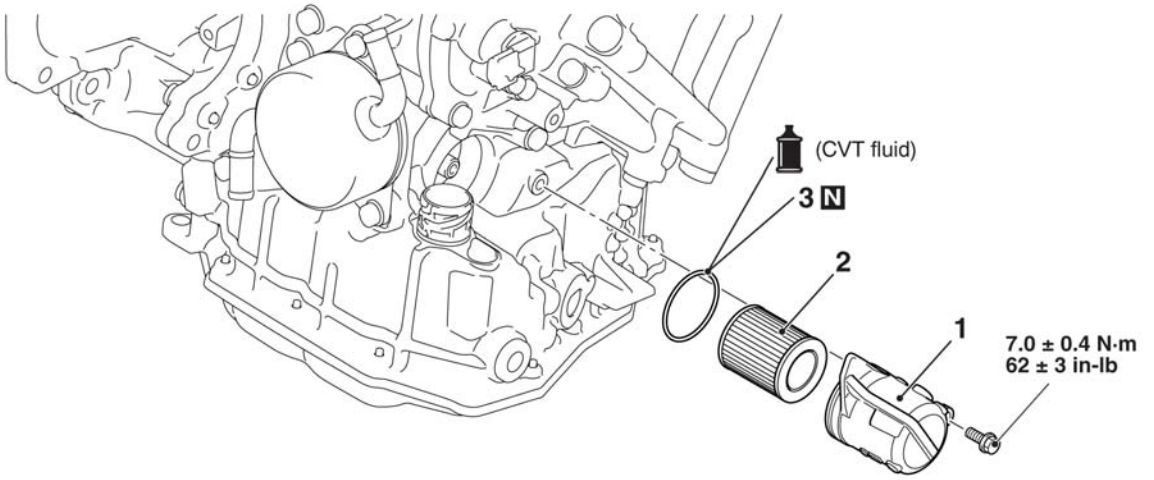
Please add the following information (5 pages) to the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23A-CVT (Continuously Variable Transmission) -> On-Vehicle Service -> ***ADD BELOW:*** Shift Lock Mechanism Check.

OIL FILTER REMOVAL AND INSTALLATION

REMOVAL AND INSTALLATION

M1231223800177

Pre-removal operation	Post-installation operation
• CVT Fluid Draining. • Front Wheelhouse Splash Shield Removal (Refer to GROUP 42A – Splash Shield)	• Front Wheelhouse Splash Shield Installation (Refer to GROUP 42A – Splash Shield) • CVT Fluid Refilling.



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Removal steps

1. Fluid filter cover

Removal steps (Continued)

2. CVT fluid filter
3. O-ring

<Added>

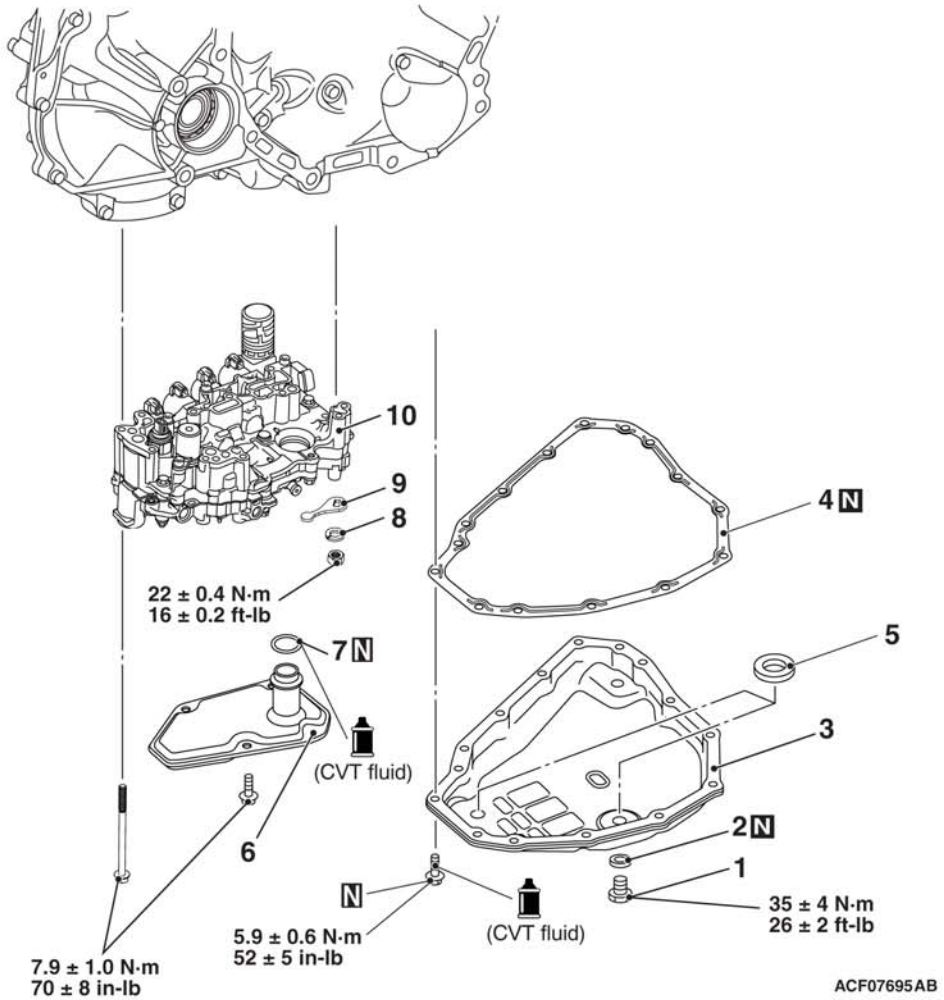
OIL PAN AND VALVE BODY ASSEMBLY REMOVAL AND INSTALLATION

REMOVAL AND INSTALLATION

M1231223600247

⚠ CAUTION
When the valve body assembly is replaced, initialise the CVT learned value.

Pre-removal operation	Post-installation operation
• CVT fluid draining	• CVT fluid refilling

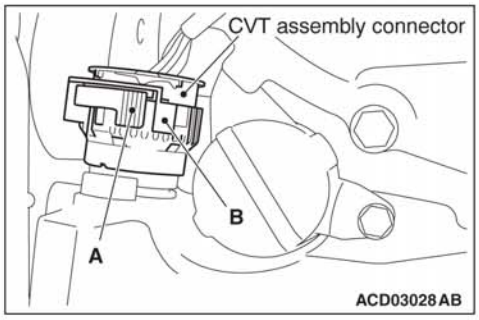


		Removal steps			Removal steps
<<A >>		• Connecting the CVT connector		>>C<<	5. Magnet
		1. Drain plug			6. Fluid strainer
		2. Drain plug gasket			7. O-ring
	>>D<<	3. Oil pan	<<B>>	>>B<<	8. Spring washer
		4. Oil pan gasket	<<C>>	>>A <<	9. Manual plate
					10. Valve body assembly

<Added>

REMOVAL SERVICE POINTS

<<A>> DISCONNECTING THE CVT CONNECTOR

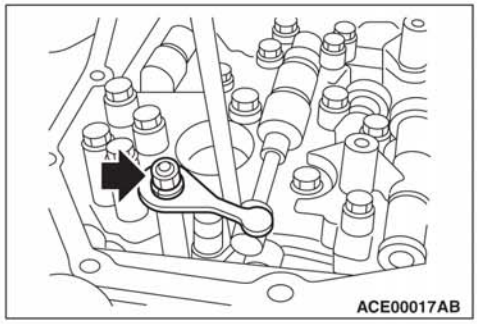


While pushing the part A shown in the figure, and turn the part B anticlockwise to disconnect the CVT assembly connector.

<<B>> MANUAL PLATE REMOVAL

⚠ CAUTION

- **To remove the manual plate, use a flat-tipped screwdriver to counterhold the plate so that excessive torque is not applied to it.**
- **Do not apply any fixture such as a screwdriver directly to the manual valve to protect it from deformation.**

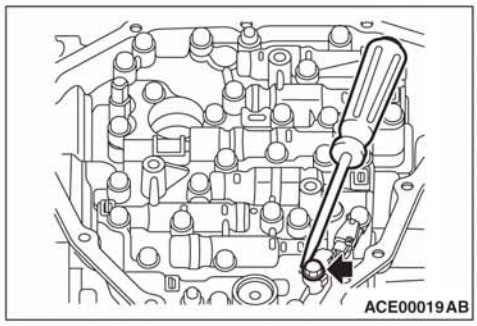


Remove the manual plate mounting nuts, and remove the manual plate and the spring washer from the manual shaft.

<<C>> VALVE BODY ASSEMBLY REMOVAL

⚠ CAUTION

- **To remove the bolts securing the valve body assembly and the oil temperature sensor bracket together, use a flat-tipped screwdriver to counterhold the bracket to avoid it from deformation.**
- **Be careful not to drop the manual valve.**



Remove the valve body assembly mounting bolts, and remove the valve body assembly.

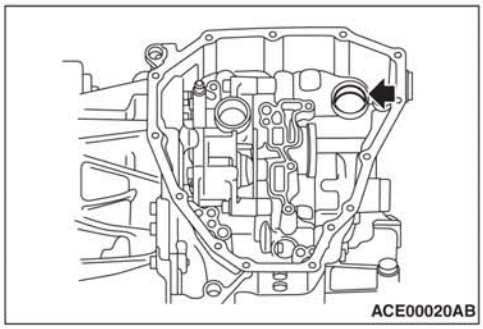
INSTALLATION SERVICE POINTS

>>A<< VALVE BODY ASSEMBLY INSTALLATION

Install the valve body assembly to the transaxle assembly according to the procedure below:

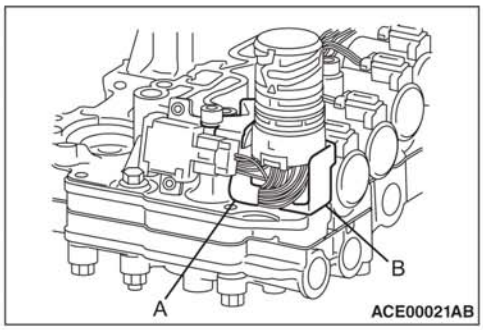
<Added>

CVT
OIL PAN AND VALVE BODY ASSEMBLY REMOVAL AND INSTALLATION



1. Apply the CVT fluid to the terminal assembly mount on the transaxle assembly.

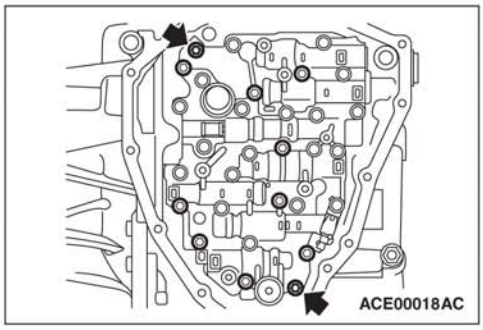
⚠ CAUTION
When the wire(s) on the CVT assembly are pinched, loose or twisted, correct them.



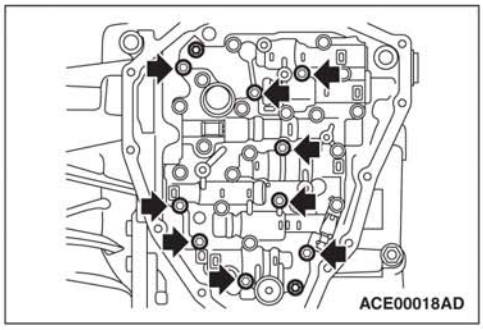
2. The wire (A) on the terminal assembly should not be trapped in the terminal assembly bracket (B).

⚠ CAUTION
- **To install the valve body assembly to the transaxle case, be careful not to scratch the O-ring seated in the connector on the CVT assembly.**
- **Push in it so that it butts up tight to the case.**

3. Install the valve body assembly to the transaxle assembly.



4. Tighten the two bolts by hand.



5. Then tighten nine mounting bolts by hand.

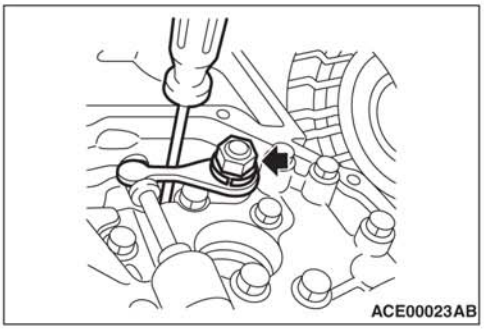
6. Tighten eleven bolts to the specified torque of 7.9 ± 1.0 N·m (70 ± 8 in-lb).

<Added>

>>B<< MANUAL PLATE INSTALLATION

⚠ CAUTION

- **To install the manual plate, use a flat-tipped screwdriver to counterhold the plate so that excessive torque is not applied to it.**
- **Do not apply any fixture such as a screwdriver directly to the manual valve to protect it from deformation.**

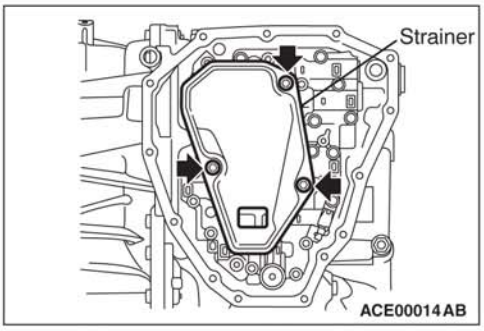


Install the manual plate and the spring washer, and tighten the mounting nuts to the specified torque of 22 ± 0.4 N·m (16 ± 0.2 ft-lb).

>>C<< FLUID STRAINER INSTALLATION

⚠ CAUTION

It should butt tight to the valve body.

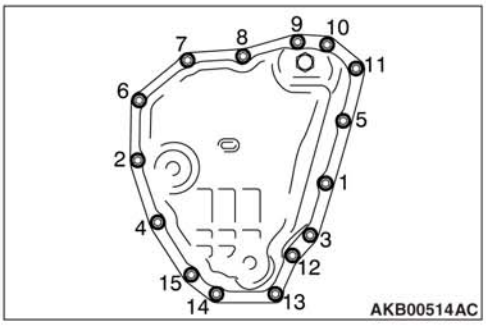


Install the fluid strainer, and then tighten the mounting bolts to the specified torque of 7.9 ± 1.0 N·m (70 ± 8 in-lb).

>>D<< OIL PAN INSTALLATION

⚠ CAUTION

Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.



Install the oil pan to the transaxle assembly, and then tighten the mounting bolts to the specified torque of 5.9 ± 0.6 N·m (52 ± 5 in-lb) in the numerical order.

<Added>

Please **REPLACE** the following information in the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23B-Continuously Variable Transaxle Overhaul -> Transaxle -> Disassembly and Reassembly.

TRANSAXLE

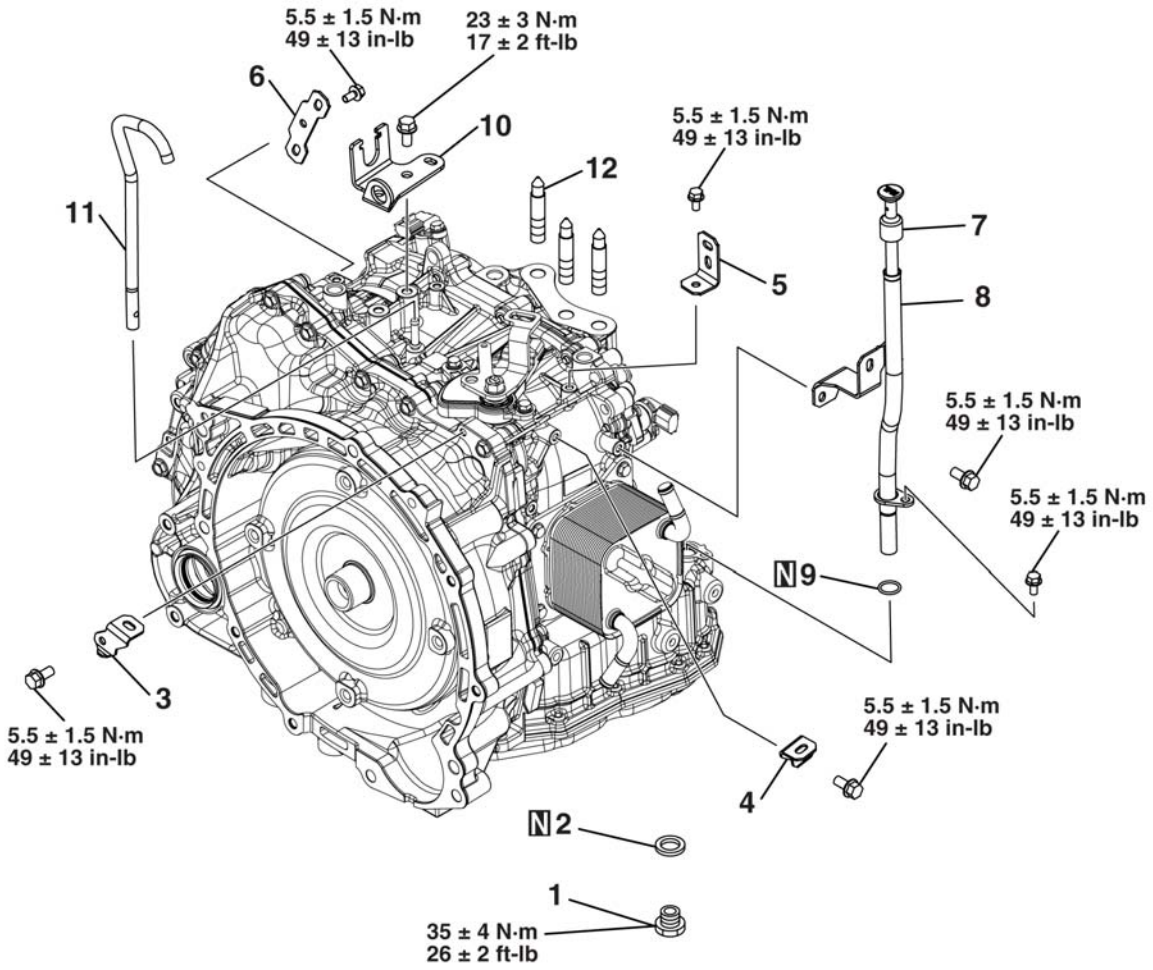
DISASSEMBLY AND REASSEMBLY

M1233208001407

⚠ CAUTION

- **Only use transmission fluid of the specified brand. Use of transmission fluid other than specified will impair driveability and CVT endurance, and may lead to breakage of CVT.**
- **Disassembly work should be done in a clean dust-proof room.**
- **Prior to disassembly, clean any sand or dirt adhered to the outer parts of transaxle using steam, washing oil or another solvent, outside the clean room, so as not to contaminate inner parts of transaxle during disassembly or assembly (Do not allow steam to get inside the transaxle, and do not clean rubber parts with washing oil).**
- **After cleaning, remove the torque converter, and drain the transmission fluid.**
- **Disassembly and assembly work should be done with bare hands or using plastic gloves.**
- **Do not touch inner parts of the transaxle after touching its outer parts. (Wash hands after touching the outer parts).**
- **Do not use cotton gloves and rags to prevent from lint; instead, use paper rags.**
- **Prior to assembly or disassembly work, make sure conditions are appropriate.**
- **Do not re-use the drained transmission fluid.**
- **When the transaxle assembly or the valve body assembly is replaced, follow the initialization procedure for CVT learned value (Refer to GROUP 23A, Diagnosis – Initialization Procedure for CVT Learned Value).**

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE

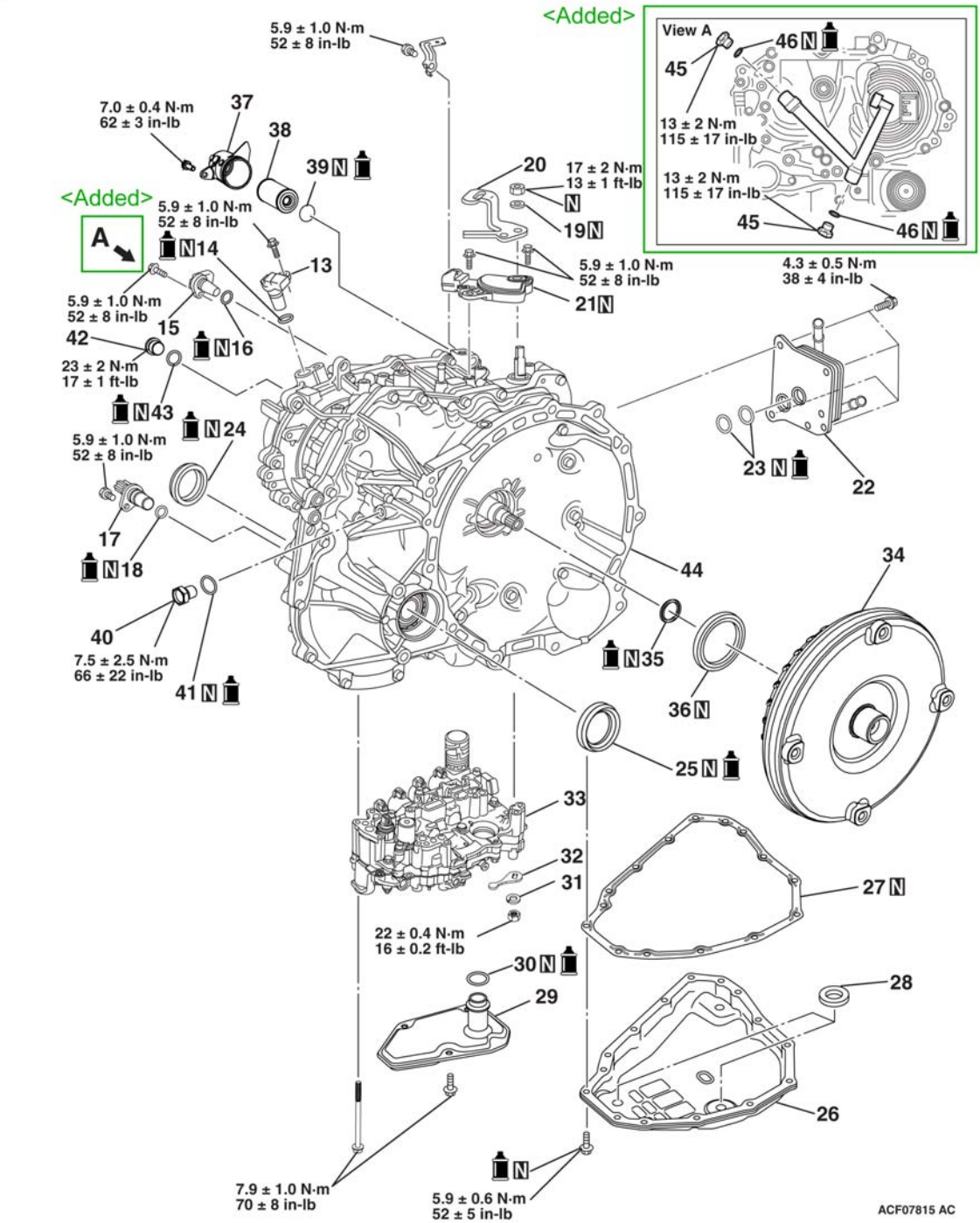


AKB00580AB

1. Drain plug
2. Drain plug gasket
3. Harness bracket
4. Harness bracket
5. Harness bracket
6. Harness bracket
7. Transmission fluid dipstick
8. Oil filler tube
9. O-ring
10. Control cable bracket
11. Breather hose
12. Stud

Please **REPLACE** the following information in the **2014, 2015, 2017 - 2019 Mirage and 2017 - 2019 Mirage G4** Service Manuals, Group 23-Automatic Transaxle -> 23B-Continuously Variable Transaxle Overhaul -> Transaxle -> Disassembly and Reassembly.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE



13. Secondary pulley speed sensor
14. O-ring
15. Primary pulley speed sensor
16. O-ring
17. Output speed sensor
18. O-ring
19. Washer
20. Manual control lever

21. Transmission range switch
22. Transmission fluid cooler
23. O-ring
24. Side oil seal
25. Side oil seal
26. Oil pan
27. Oil pan gasket
28. Magnet
29. Fluid strainer
30. O-ring
31. Spring washer
32. Manual plate
33. Valve body assembly
34. Torque converter
35. O-ring
36. Converter housing oil seal
37. Fluid filter cover
38. Transmission fluid filter
39. O-ring
40. Plug
41. O-ring
42. Plug
43. O-ring
44. Transaxle assembly

<Added>
45. Plug
46. O-ring

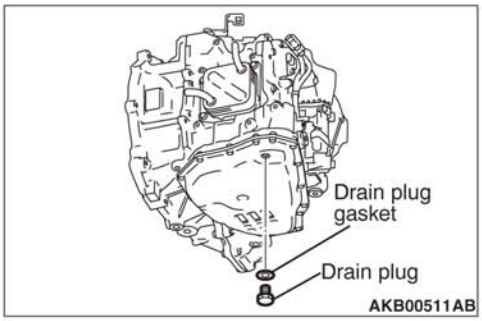
Required Special Tools:

- MD998375: Crankshaft front oil seal installer
- MB990982: Roll stopper bush r & i arbor

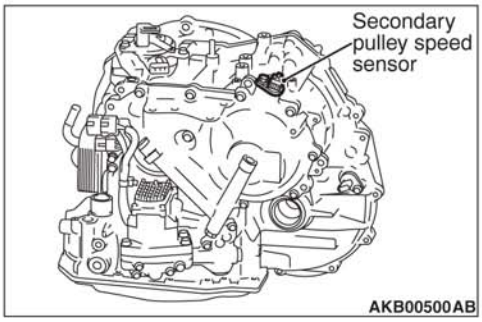
DISASSEMBLY SERVICE POINT

⚠ CAUTION

- **Do not disassemble parts other than specified in this manual.**
- **Be careful not to drop the torque converter during servicing work.**



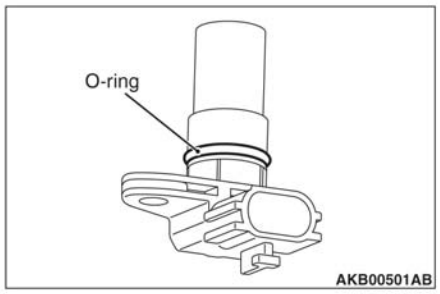
1. Remove the drain plug from the oil pan.
2. Remove the drain plug gasket from the drain plug.
3. Remove the harness bracket from the transaxle assembly.
4. Remove the oil filler tube and transmission fluid dipstick from the transaxle assembly.
5. Remove the control cable bracket and breather hose from the transaxle assembly.



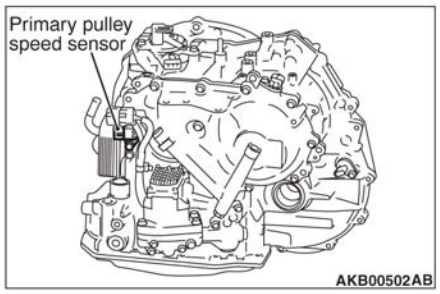
6. Remove the secondary pulley speed sensor from the transaxle assembly.

Please **REPLACE** the following information in the **2014 - 2015 Mirage** Service Manuals, Group 23-Automatic Transaxle -> 23B-Continuously Variable Transaxle Overhaul -> Transaxle -> Disassembly and Reassembly.

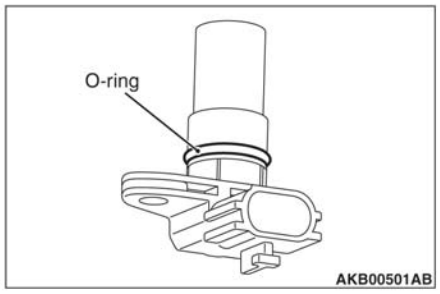
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE



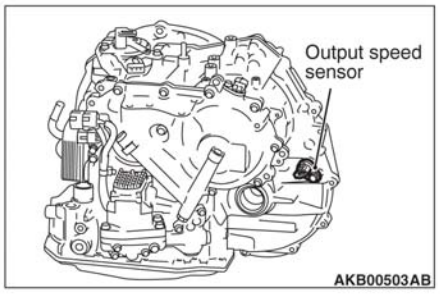
7. Remove the O-ring from the secondary pulley speed sensor.



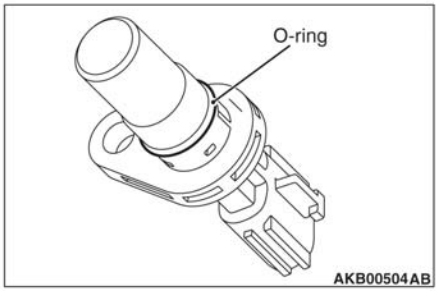
8. Remove the primary pulley speed sensor from the transaxle assembly.



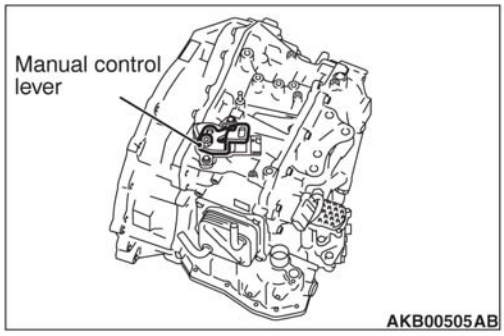
9. Remove the O-ring from the primary pulley speed sensor.



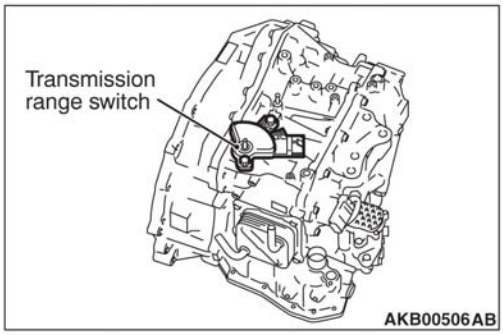
10. Remove the output speed sensor from the transaxle assembly.



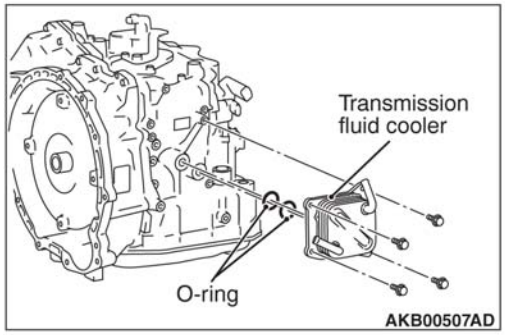
11. Remove the O-ring from the output speed sensor.



12.Remove the manual control lever from the manual shaft.



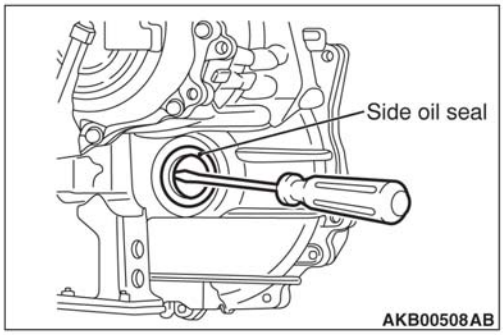
13.Remove the transmission range switch from the transaxle assembly.



14.Remove the transmission fluid cooler from the transaxle assembly, and detach the O-ring from the transmission fluid cooler.

⚠ CAUTION

When removing the side oil seal, be careful not to cause damage to the transaxle assembly.

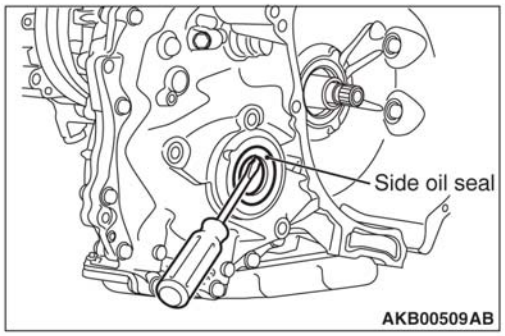


15.Using a flat-tipped screwdriver, remove the side oil seal from the transaxle assembly.

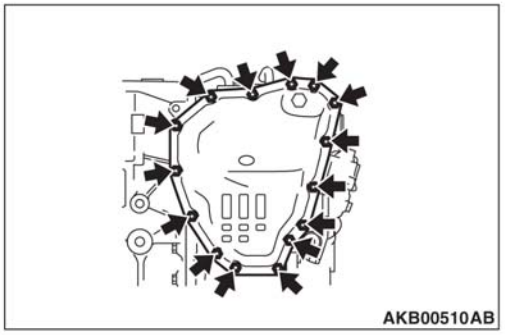
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE

⚠ CAUTION
When removing the side oil seal, be careful not to cause damage to the transaxle assembly.

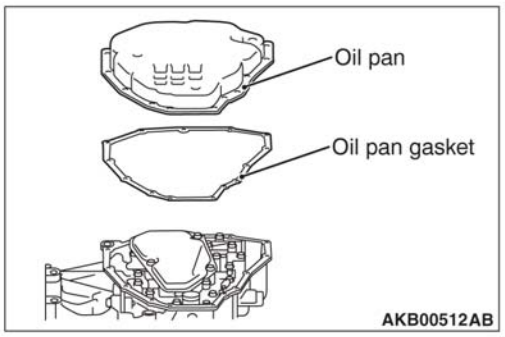
16. Using a flat-tipped screwdriver, remove the side oil seal from the transaxle assembly.



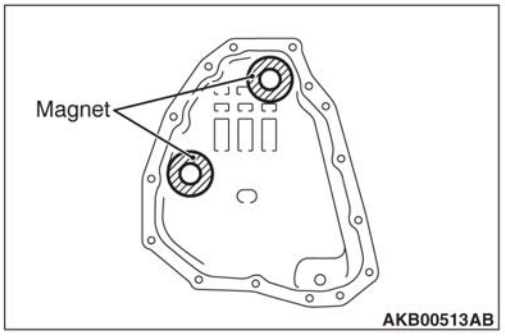
17. Remove the oil pan mounting bolts from the transaxle assembly.

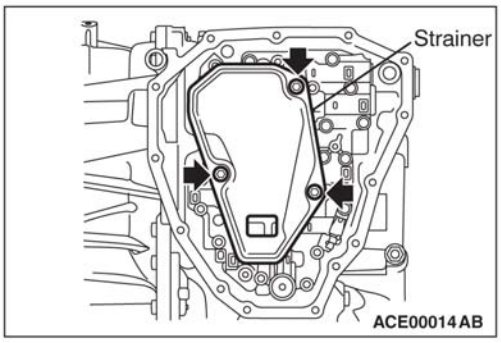


18. Remove the oil pan and oil pan gasket from the transaxle assembly.

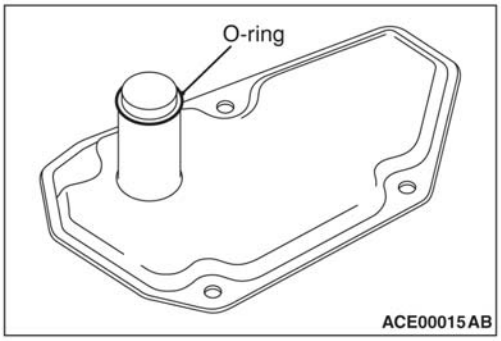


19. Remove the magnet from the oil pan.





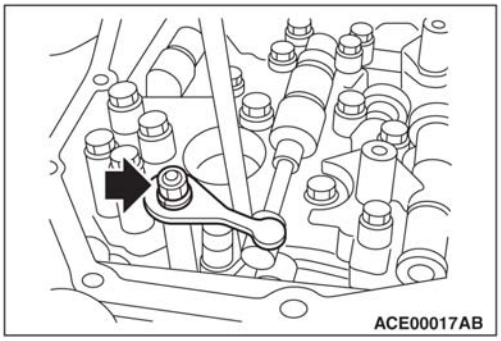
20. Remove the fluid strainer mounting bolts to remove the fluid strainer from the valve body assembly.



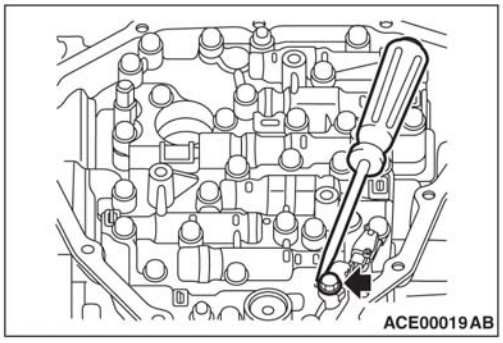
21. Remove the O-ring from the fluid strainer.

⚠ CAUTION

- **To remove the manual plate, use a flat-tipped screwdriver to counterhold the plate so that excessive torque is not applied to it.**
- **Do not apply any fixture such as a screwdriver directly to the manual valve to protect it from deformation.**

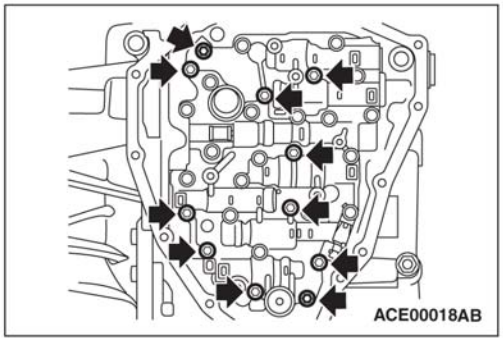


22. Remove the manual plate mounting nuts, and remove the manual plate and the spring washer from the manual shaft.



⚠ CAUTION

- **To remove the bolts securing the valve body assembly and the oil temperature sensor bracket together, use a flat-tipped screwdriver to counterhold the bracket to avoid it from deformation.**
- **Be careful not to drop the manual valve.**



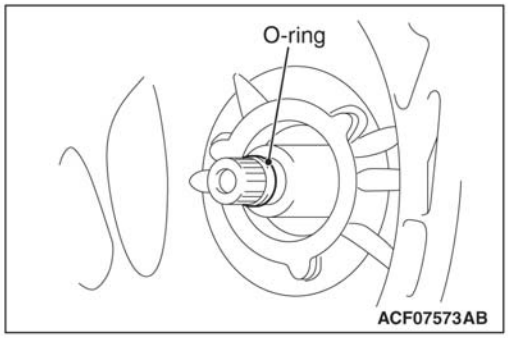
23. Remove the valve body assembly mounting bolts, and remove the valve body assembly.

Length beneath the head mm (in)	87 (3.4)
Quantity	11

⚠ CAUTION

To remove the torque converter, be careful not to scratch the bushing inside the sleeve.

24. Remove the torque converter.

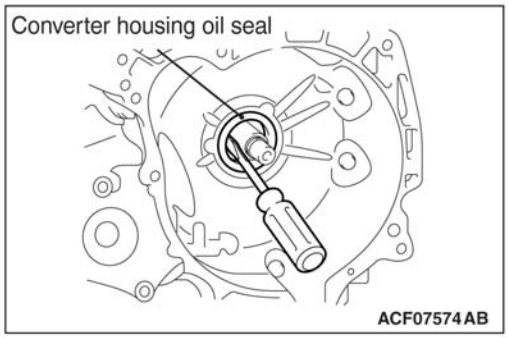


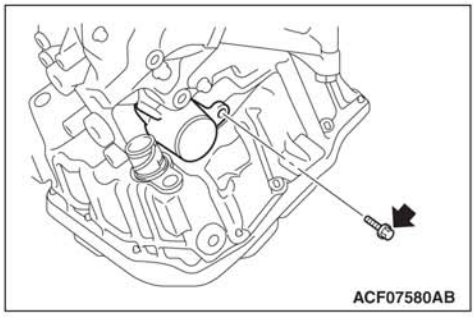
25. Remove the O-ring and the input shaft.

⚠ CAUTION

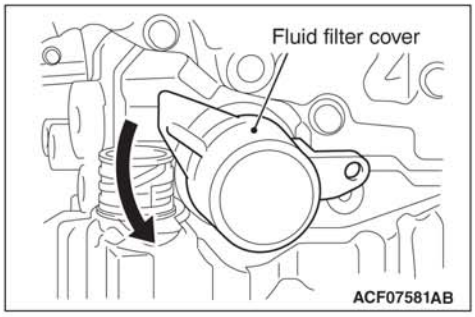
To remove the converter housing oil seal, be careful not to scratch the converter housing and the input shaft.

26. Use a flat-tipped screwdriver to remove the converter housing oil seal from the transaxle assembly.

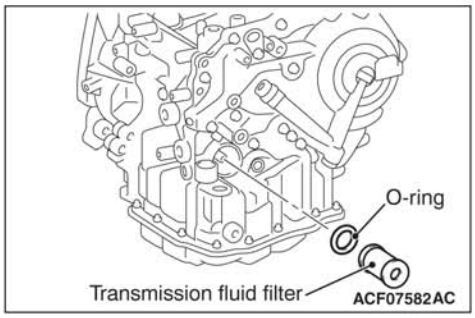




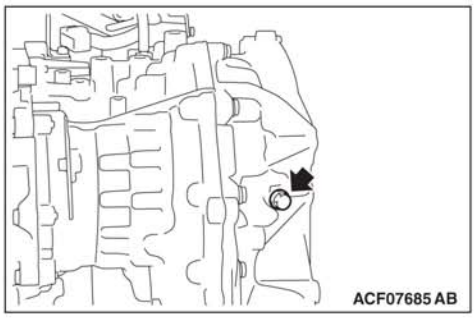
27. Remove the fluid filter cover mounting bolt.



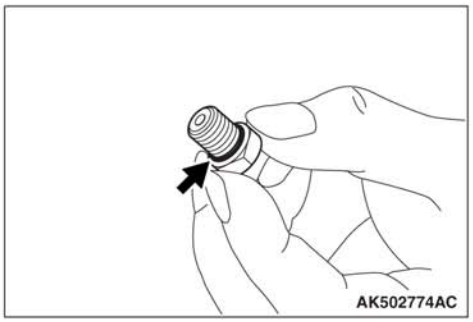
28. Rotate the fluid filter cover counterclockwise to remove it from the transaxle assembly.



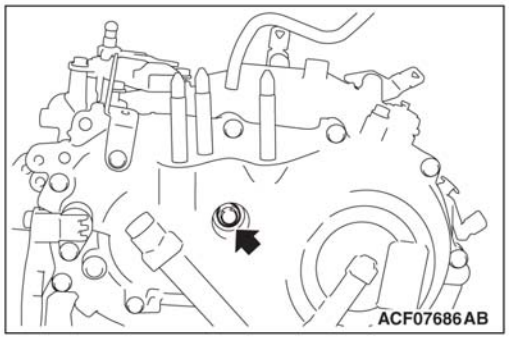
29. Remove the transmission fluid filter and the O-ring from the transaxle assembly.



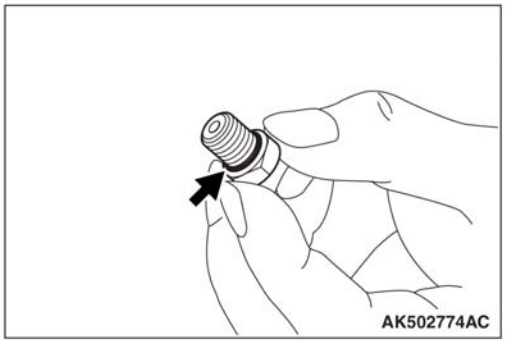
30. Remove the plug from the transaxle assembly.



31. Remove the O-ring from the plug.



32.Remove the plug from the transaxle assembly.



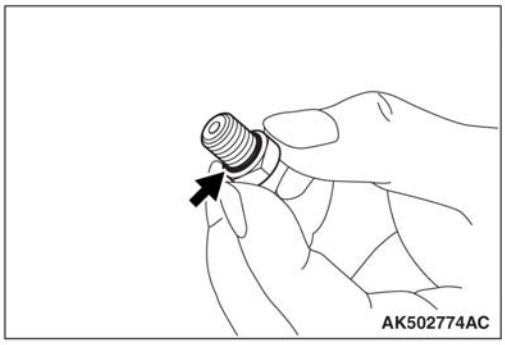
33.Remove the O-ring from the plug.

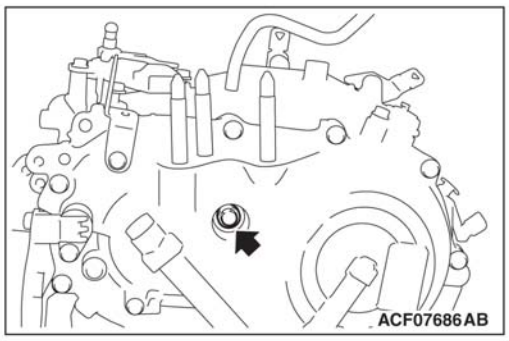
REASSEMBLY SERVICE POINT

⚠ CAUTION

- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**

1. Install the O-ring to the plug.



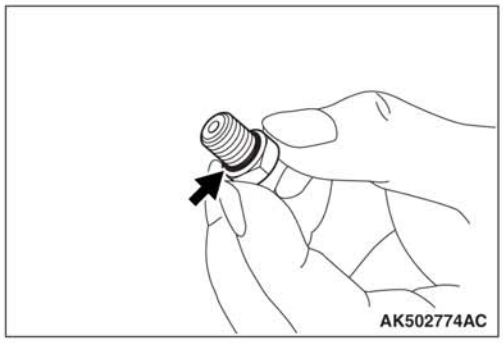


2. Tighten the plug to the specified torque.

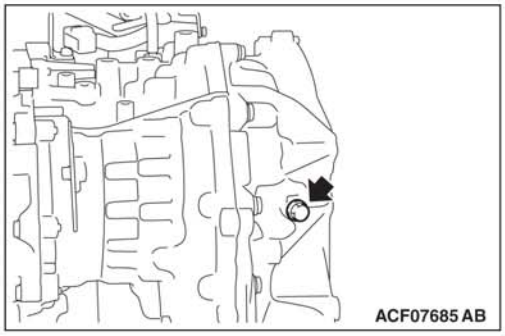
Tightening torque:
23 ± 2 N·m (17 ± 1 ft-lb)

⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**

3. Install the O-ring to the plug.

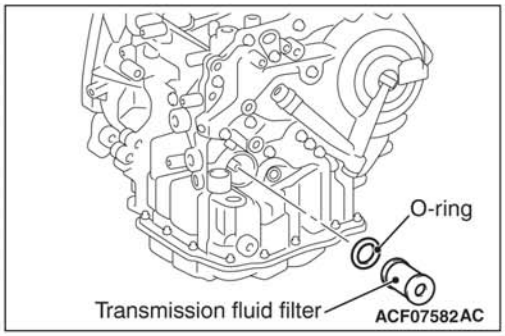


4. Tighten the plug to the specified torque.
   Tightening torque:
   7.5 ± 2.5 N·m (66 ± 22 in-lb)

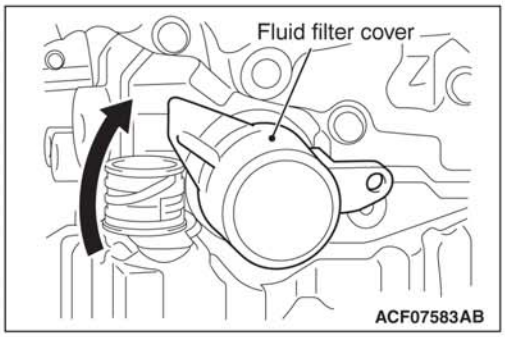


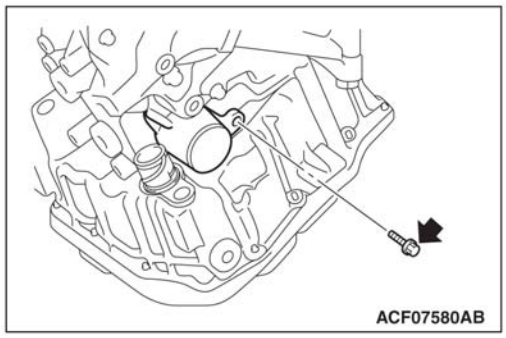
⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**

5. Install the ttransmission fluid filter and the O-ring to the transaxle assembly.



6. Install the fluid filter cover to the transaxle assembly, and then rotate it clockwise to secure it.

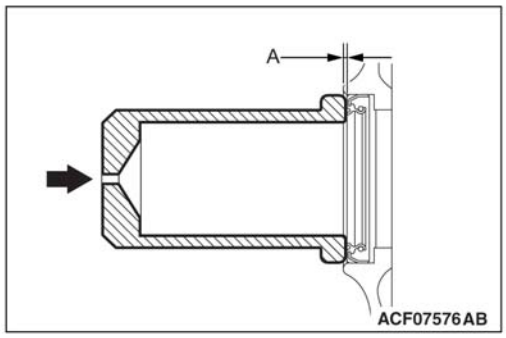




7. Tighten the fluid filter cover mounting bolt to the specified torque.

   Tightening torque:
   7.0 ± 0.4 N·m (62 ± 3 in-lb)

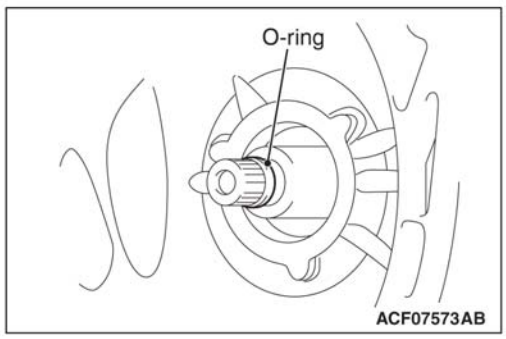
⚠ CAUTION
- **Do not re-use the converter housing oil seal.**
- **Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.**



8. Apply the transmission fluid around the circumference of the converter housing oil seal. Then use the special tool MD998375 to install the converter housing oil seal so that the dimension (A) shown meets the standard value.

   Standard value (A): 1.3 ± 0.5 mm (0.05 ± 0.02 inch)

⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**

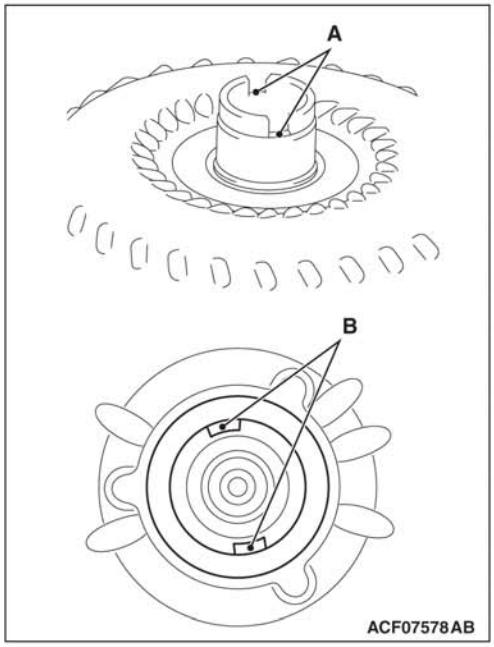


9. Install the O-ring to the input shaft.

⚠ CAUTION

- **Fit the torque converter fully into position by twisting it back and forth.**
- **To install the torque converter, be careful not to scratch the bushing inside the sleeve.**

10.Align (A) on the torque converter with the (B) on the drive sprocket at the transaxle assembly.

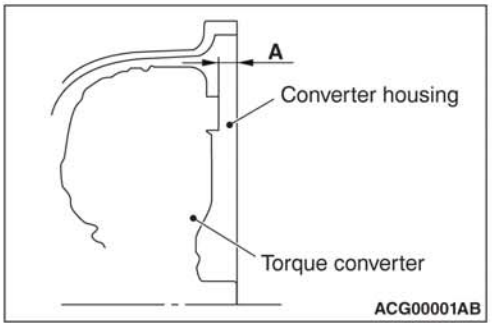


⚠ CAUTION

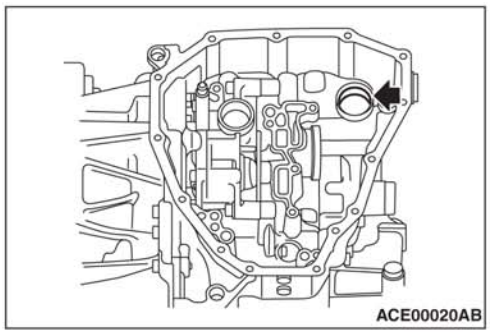
Measure at two points or more to determine an average value.

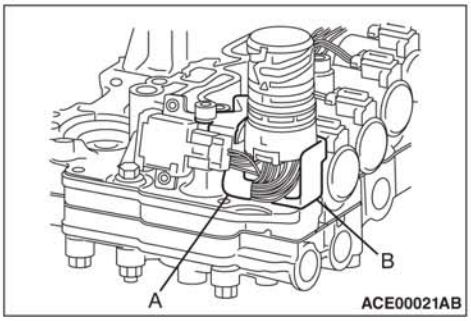
11.The dimension (A) should meet the standard value.

Standard value (A): approximately 12.2 mm (0.48 inch)



12.Apply the transmission fluid to the terminal assembly mount on the transaxle assembly.



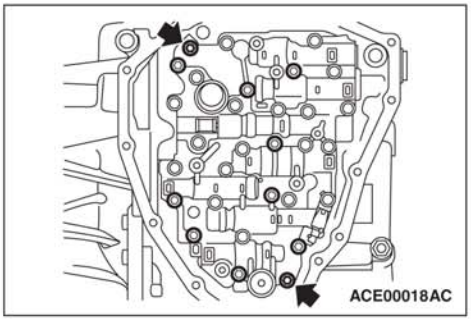


⚠ CAUTION
When the wire(s) on the valve body assembly are pinched, loose or twisted, correct them.

13. The wire (A) on the terminal assembly should not be trapped in the terminal assembly bracket (B).

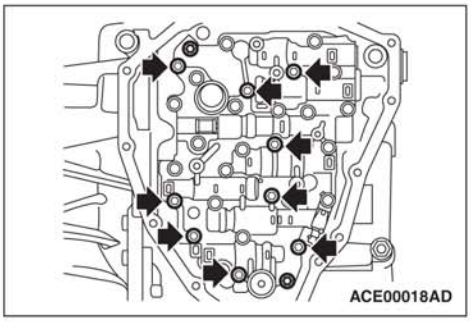
⚠ CAUTION
- **To install the valve body assembly to the transaxle assembly, be careful not to scratch the O-ring seated in the connector on the valve body assembly.**
- **Push in the valve body assembly so that it butts up tight to the case.**

14. Install the valve body assembly to the transaxle assembly.



15. Tighten the two mounting bolts by hand.

Length beneath the head mm (in)	87 (3.4)
Quantity	2



16. Then tighten nine mounting bolts by hand.

Length beneath the head mm (in)	87 (3.4)
Quantity	9

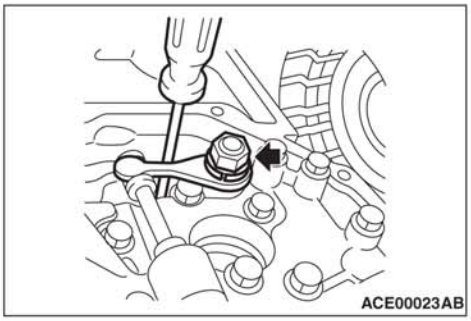
17. Tighten 11 bolts to the specified torque.

Tightening torque:
7.9 ± 1.0 N·m (70 ± 8 in-lb)

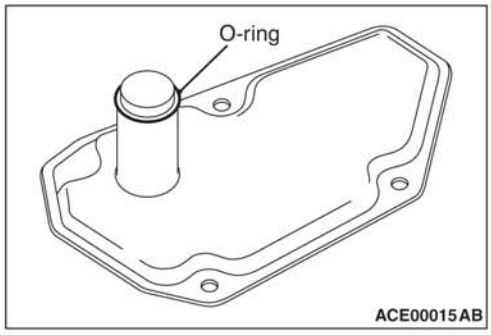
⚠ CAUTION
- **To install the manual plate, use a flat-tipped screwdriver to counterhold the plate so that excessive torque is not applied to it.**
- **Do not apply any fixture such as a screwdriver directly to the manual valve to protect it from deformation.**

18. Install the manual plate and the spring washer, and tighten the mounting nuts to the specified torque.

Tightening torque:
22 ± 0.4 N·m (16 ± 0.2 ft-lb)

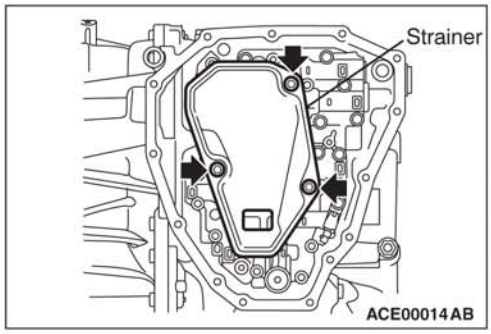


CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE



⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**

19. Install the O-ring to the fluid strainer.

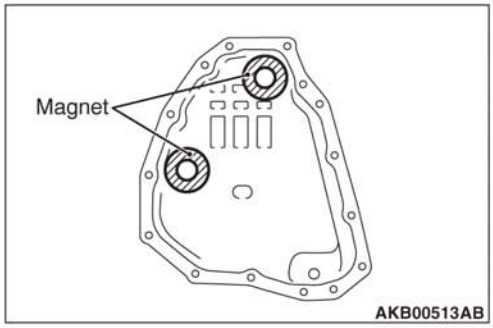


⚠ CAUTION
The fluid strainer should butt tight to the valve body.

20. Install the fluid strainer to the valve body assembly, and then tighten the mounting bolts to the specified torque.

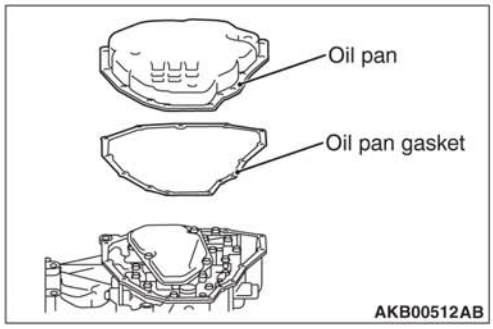
Length beneath the head mm (in)	12 (0.47)
Quantity	3

Tightening torque:
7.9 ± 1.0 N·m (70 ± 8 in-lb)

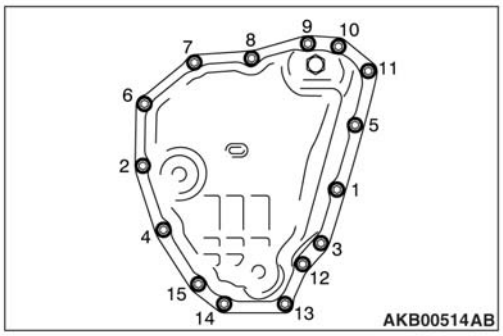


21. Install the magnet on the oil pan.

⚠ CAUTION
Do not re-use the oil pan gasket.



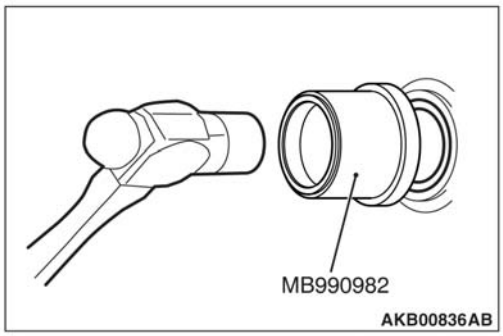
22. Install the oil pan and oil pan gasket on the transaxle assembly.
23. Tighten the front oil pan mounting bolts by hand.



24. Tighten the oil pan mounting bolts to the specified torque in the order shown.

Tightening torque:
5.9 ± 0.6 N·m (52 ± 5 in-lb)

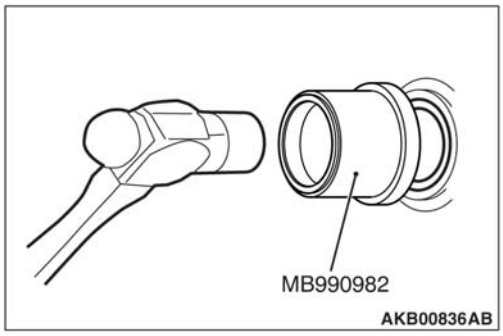
⚠ CAUTION
- **Do not re-use the oil seal.**
- **Apply transmission fluid to the outer circumference of the oil seal.**
- **Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.**



25. Use the special tool roll stopper bush r & i arbor (MB990982) to drive in the side oil seal to the converter housing so that the oil seal is deeper than the case end surface by the standard value.

Standard value: −1.8 ± 0.5 mm (recessed)

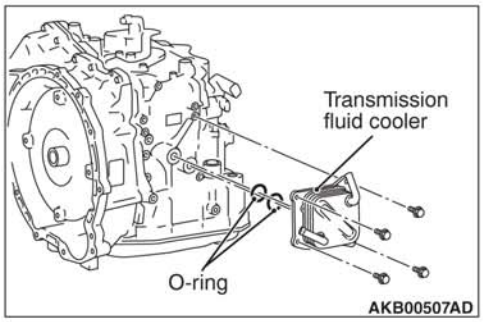
⚠ CAUTION
- **Do not re-use the oil seal.**
- **Apply transmission fluid to the outer circumference of the oil seal.**
- **Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.**



26. Use the special tool roll stopper bush r & i arbor (MB990982) to drive in the side oil seal to the transmisaxle assembly so that the oil seal is deeper than the case end surface by the standard value.

Standard value: −1.8 ± 0.5 mm (recessed)

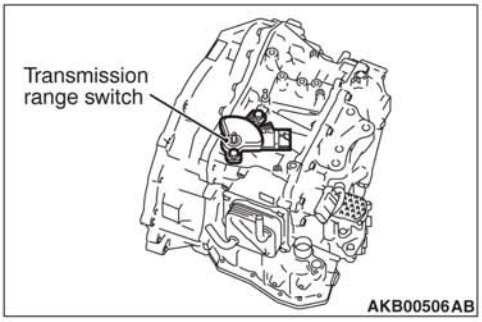
⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**
- **The O-ring should be seated fully into the groove on the transmission fluid cooler.**



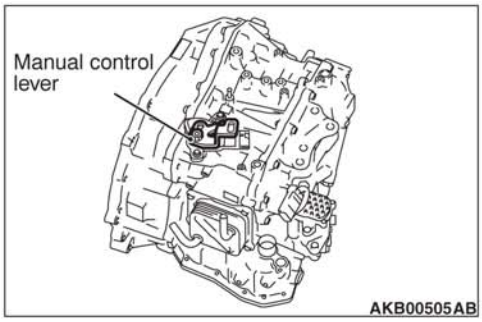
27. Install the O-ring on the transmission fluid cooler.
28. Install the transmission fluid cooler on the transaxle assembly, and tighten the mounting bolts to the specified torque.

    Tightening torque:
    4.3 ± 0.5 N·m (38 ± 4 in-lb)

⚠ CAUTION
Do not re-use the transmission range switch.

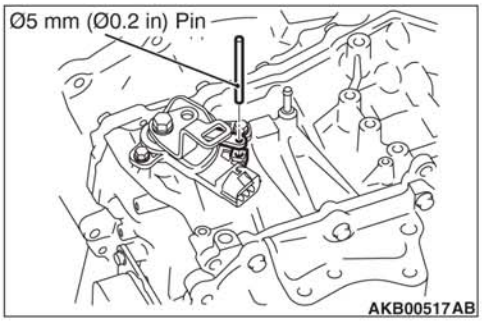


29. Install the transmission range switch on the transaxle assembly as shown.
30. Tighten the transmission range switch mounting bolts by hand.



31. Install the manual control lever on the manual shaft.
32. Install the washer on the manual shaft, and tighten the mounting nut to the specified torque.

    Tightening torque:
    17 ± 2 N·m (13 ± 1 ft-lb)
33. Set the manual shaft at N position.



34. Insert a ϕ5 mm (ϕ0.2 inch) pin through the hole on the manual control lever down to the recess on the transmission range switch to align the transmission range switch.

⚠ CAUTION
The pin should be engaged fully into the recess on the transmission range switch.

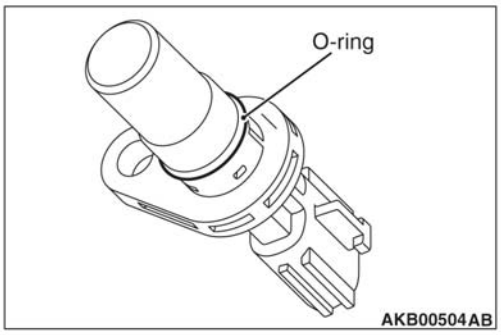
35. Tighten the transmission range switch mounting bolts to the specified torque.

    Tightening torque:
    5.9 ± 1.0 N·m (52 ± 8 in-lb)
36. Remove the pin.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE

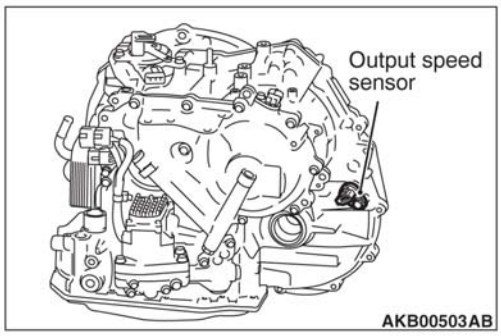
⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**
- **Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.**

37. Install the O-ring on the output speed sensor.



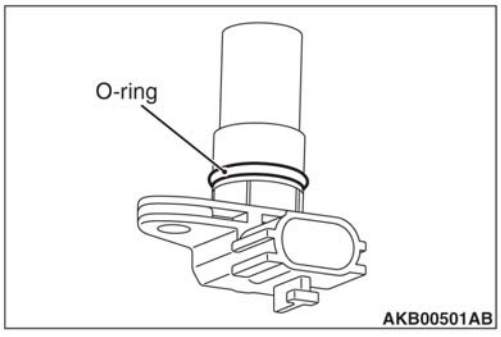
38. Install the output speed sensor on the transaxle assembly, and tighten the mounting bolt to the specified torque.

Tightening torque:
5.9 ± 1.0 N·m (52 ± 8 in-lb)

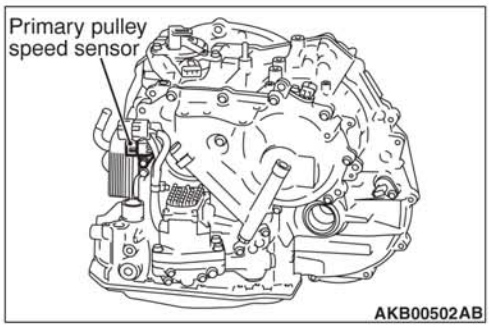


⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**
- **Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.**

39. Install the O-ring on the primary pulley speed sensor.



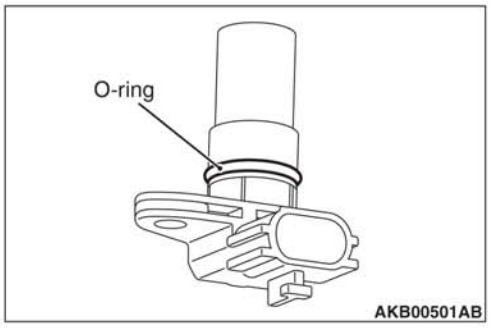
CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE



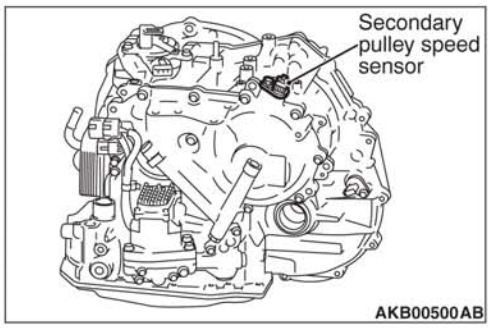
40. Install the primary pulley speed sensor on the transaxle assembly, and tighten the mounting bolt to the specified torque.

Tightening torque:
5.9 ± 1.0 N·m (52 ± 8 in-lb)

⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**
- **Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.**



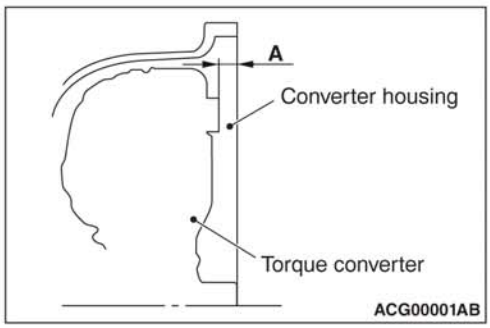
41. Install the O-ring on the secondary pulley speed sensor.



42. Install the secondary pulley speed sensor on the transaxle assembly, and tighten the mounting bolt to the specified torque.

Tightening torque:
5.9 ± 1.0 N·m (52 ± 8 in-lb)

⚠ CAUTION
Measure at two or more points to determine an average value.



43. The dimension (A) should meet the standard value.

Standard value (A): approximately 12.2 mm (0.48 inch)

44. Install the control cable bracket and breather hose on the transaxle assembly.
45. Install the harness bracket on the transaxle assembly.

CONTINUOUSLY VARIABLE TRANSAXLE OVERHAUL
TRANSAXLE

⚠ CAUTION
- **Do not re-use the O-ring.**
- **Apply transmission fluid when installing the O-ring.**
- **Wipe off excessive fluid to avoid incorrect diagnosis of fluid leakage.**

46. Install the oil filler tube and transmission fluid dipstick on the transaxle assembly.

⚠ CAUTION
Do not re-use the drain plug gasket.

47. Install the drain plug and drain plug gasket on the transaxle assembly, and tighten to the specified torque.

Tightening torque:
35 ± 4 N·m (26 ± 2 ft-lb)