GROUP 23A

AUTOMATIC TRANSAXLE

CONTENTS

GENERAL DESCRIPTION. 23A-3

AUTOMATIC TRANSAXLE DIAGNOSIS 23A-15

- DIAGNOSTIC TROUBLESHOOTING FLOW 23A-15
- INTRODUCTION TO A/T DIAGNOSIS 23A-15
- A/T DIAGNOSTIC TROUBLESHOOTING STRATEGY. 23A-16
- DIAGNOSTIC FUNCTION 23A-16
- HOW TO INITIALIZE A/T LEARNED VALUE 23A-20
- FAIL-SAFE/BACKUP FUNCTION. 23A-20
- ROAD TEST 23A-22
- TORQUE CONVERTER STALL TEST 23A-36
- HYDRAULIC PRESSURE TESTS 23A-37
- HYDRAULIC CIRCUIT 23A-46
- LINE PRESSURE ADJUSTMENT. 23A-64
- DIAGNOSTIC TROUBLE CODE CHART . . 23A-65
- SYMPTOM CHART 23A-66
- DIAGNOSTIC TROUBLE CODE PROCEDURES 23A-67
- SYMPTOM PROCEDURES 23A-304
- DATA LIST REFERENCE TABLE. 23A-368
- ACTUATOR TEST REFERENCE TABLE . . 23A-372
- INVECS-II CANCEL COMMAND (SPECIAL FUNCTION). 23A-373
- PCM TERMINAL VOLTAGE REFERENCE CHART FOR TRANSAXLE OPERATION . . 23A-374
- PCM TERMINAL RESISTANCE AND CONTINUITY INSPECTION CHART 23A-377
- INSPECTION PROCEDURE USING AN OSCILLOSCOPE 23A-378

Continued on next page

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

⚠ WARNING

- ***Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).***
- ***Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.***
- ***MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.***

NOTE
The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, side-airbag module, curtain air bag module, side impact sensors, seat belt pre-tensioners, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

DIAGNOSIS KEY INTERLOCK AND SHIFT LOCK MECHANISM 23A-379
INTRODUCTION TO A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS 23A-379
A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS DIAGNOSTIC TROUBLESHOOTING STRATEGY 23A-379
SYMPTOM CHART 23A-379
SYMPTOM PROCEDURES 23A-380

SPECIAL TOOLS 23A-386

ON-VEHICLE SERVICE 23A-390
A/T CONTROL COMPONENT LAYOUT . . 23A-390
ESSENTIAL SERVICE 23A-393
TRANSMISSION FLUID CHECK 23A-393
TRANSMISSION FLUID CHANGE 23A-394
FLUSHING COOLERS AND TUBES 23A-397
OIL COOLER FLOW CHECK 23A-399
TRANSMISSION RANGE SWITCH CHECK 23A-400
TRANSMISSION RANGE SWITCH AND CONTROL CABLE ADJUSTMENT 23A-400
AUTOMATIC TRANSAXLE CONTROL COMPONENT CHECK 23A-402
CRANKSHAFT POSITION SENSOR CHECK 23A-402
TRANSMISSION FLUID TEMPERATURE SENSOR CHECK 23A-402
TRANSMISSION RANGE SWITCH CHECK 23A-403
STOPLIGHT SWITCH CHECK 23A-403
A/T CONTROL RELAY CHECK 23A-403
SOLENOID VALVE CHECK 23A-403
SELECTOR LEVER OPERATION CHECK . 23A-405
KEY INTERLOCK AND SHIFT LOCK MECHANISM CHECK 23A-405
TRANSAXLE CONTROL CABLE ADJUSTMENT 23A-407

TRANSAXLE CONTROL* 23A-408
REMOVAL AND INSTALLATION 23A-408
INSPECTION 23A-409
DISASSEMBLY AND ASSEMBLY 23A-410
INSPECTION 23A-411

A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS* 23A-412
REMOVAL AND INSTALLATION 23A-412
INSPECTION 23A-414

TRANSAXLE ASSEMBLY 23A-414
REMOVAL AND INSTALLATION 23A-414
REMOVAL AND INSTALLATION 23A-422

TRANSMISSION FLUID COOLER, HOSE AND PIPE 23A-431
REMOVAL AND INSTALLATION 23A-431
REMOVAL AND INSTALLATION 23A-432

SPECIFICATIONS 23A-434
FASTENER TIGHTENING SPECIFICATIONS 23A-434
SERVICE SPECIFICATIONS 23A-436
LUBRICANT 23A-436

GENERAL DESCRIPTION

M1231000100764

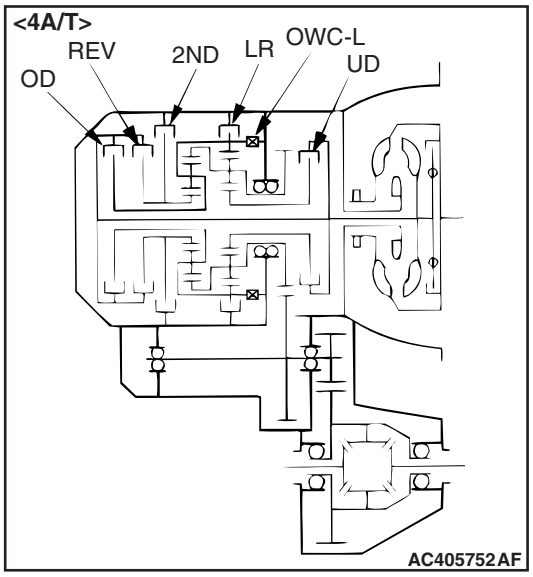
F4A4B and F5A5A models have been established.

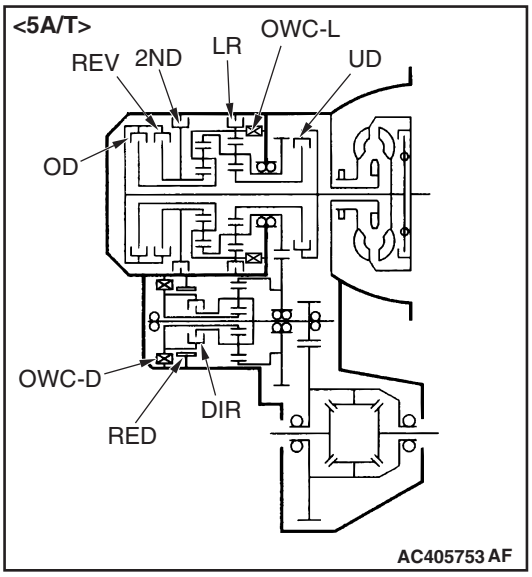
ITEM		SPECIFICATION		
Transaxle model		F4A4B-4-L1Z	F5A5A-4-C4Z	F5A5A-4-C3Z
Engine model		4G69-MPI-MIVEC	6G75-MPI	6G75-MPI-MIVEC
Torque converter	Type	3-element, 1-stage, 2-phase type		
	Lock-up	Provided		
	Stall torque ratio	2.0	1.7	
Transaxle type		4 forward speeds, 1 reverse speed, fully automatic	5 forward speeds, 1 reverse speed, fully automatic	
Transaxle gear ratio	1st	2.842	3.789	
	2nd	1.573	2.162	
	3rd	1.000	1.421	
	4th	0.688	1.000	
	5th	–	0.686	
	Reverse	2.214	3.117	
Final reduction ratio (Differential gear ratio)		3.769	3.325	
Clutch		Multi-disc type 3 sets	Multi-disc type 4 sets	
Brake		Multi-disc type 2 sets	Multi-disc type 2 sets, band type 1 set	
Manual control system		P-R-N-D (4 position) + Sport mode (up, down)		
Shift pattern control		Electronic control (INVECS - II)		
Hydraulic control during shifting		Electronic control (Each clutch hydraulically independently controlled)		
Torque converter clutch control		Electronic control		
Transmission fluid	Specified lubricants	DIAMOND ATF SP III		
	Quantity dm^3 (qt)	7.7 (8.1)	8.4 (8.9)	

TRANSAXLE

The transaxle is made up of the torque converter and gear train. A 3-element, 1-stage, 2-phase torque converter with built-in torque converter clutch is used. The gear train is made up of four sets of multi-disc clutches, two sets of multi-plate brakes, one set of one-way clutches and two sets of planetary gears. The planetary gears are made up of sun gears, carriers, pinion gears and annulus gears.

TRANSAXLE CONFIGURATION DRAWING





COMPONENTS AND FUNCTIONS

COMPONENT		FUNCTION
Underdrive clutch	UD	connects the input shaft to the underdrive sun gear.
Reverse clutch	REV	connects the input shaft to the reverse sun gear.
Direct clutch <5A/T>	DIR	connects the direct sun gear to the direct planetary carrier.
Overdrive clutch	OD	connects the input shaft to the overdrive planetary carrier.
Low-reverse brake	LR	holds the low-reverse annulus gear and the overdrive planetary carrier.
Second brake	2ND	holds the reverse sun gear.
Reduction brake <5A/T>	RED	holds the direct sun gear.
One-way clutch-L	OWC-L	restricts the rotation direction of the low-reverse annulus gear.
One-way clutch-D <5A/T>	OWC-D	controls rotation direction of the direct sun gear.

FUNCTION ELEMENT TABLE <4A/T>

OPERATING ELEMENT / TRANSMISSION RANGE			ENGINE START	PARKING MECHANISM	UNDER -DRIVE CLUTCH (UD)	REVERSE CLUTCH (REV)	OVER -DRIVE CLUTCH (OD)	LOW -REVERSE BRAKE (LR)	SECOND BRAKE (2ND)	ONE-WAY CLUTCH
P		Parking	OK	×	–	–	–	×	–	–
R		Reverse	–	–	–	×	–	×	–	–
N		Neutral	OK	–	–	–	–	×	–	–
D	Sport mode	1st	–	–	×	–	–	×*	–	×
		2nd	–	–	×	–	–	–	×	–
		3rd	–	–	×	–	×	–	–	–
		4th	–	–	–	–	×	–	×	–

×: Function element –: Not applicable

*NOTE: * operates only when the vehicle is stationary [at approximately 10 km/h (6.2 mph) or less].*

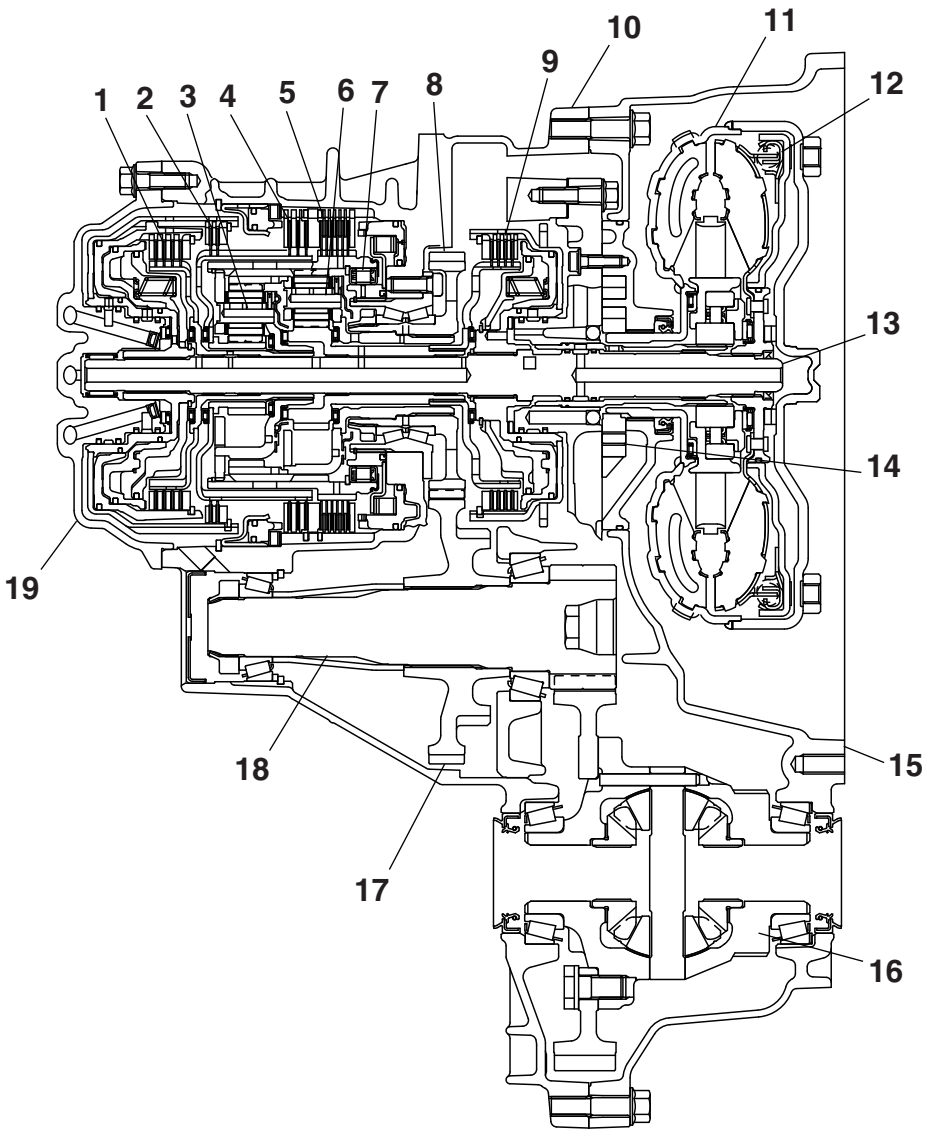
FUNCTION ELEMENT TABLE <5A/T>

OPERATING ELEMENT / SELECTOR LEVER POSITION			ENGINE START	PARKING MECHANISM	UNDER DRIVE CLUTCH (UD)	REVERSE CLUTCH (REV)	OVER -DRIVE CLUTCH (OD)	DIRECT CLUTCH (DIR)	LOW-REVERSE BRAKE (LR)	SECOND BRAKE (2ND)	REDUC-TION BRAKE (RED)	ONE -WAY CLUTCH (OWC-L)	ONE -WAY CLUTCH (OWC-D)
P		Parking	OK	×	–	–	–	–	×	–	×	–	–
R		Reverse	–	–	–	×	–	–	×	–	×	–	–
N		Neutral	OK	–	–	–	–	–	×	–	×	–	–
D	Sport mode	1st	–	–	×	–	–	–	×*	–	×	×	×
		2nd	–	–	×	–	–	–	–	×	×	–	×
		3rd	–	–	×	–	×	–	–	–	×	–	×
		4th	–	–	×	–	×	×	–	–	–	–	–
		5th	–	–	–	–	×	×	–	×	–	–	–

×: Function element –: Not applicable

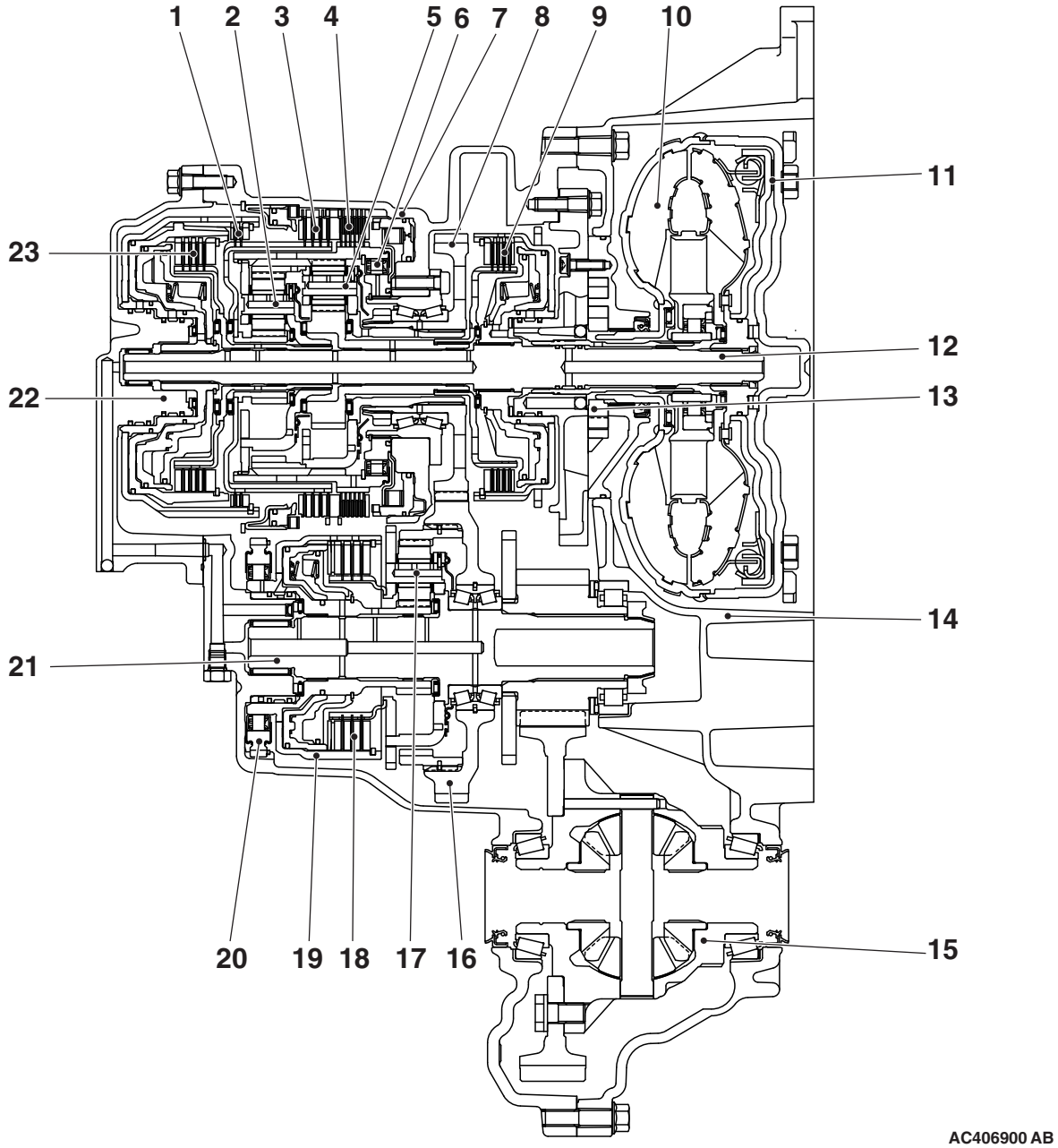
*NOTE: * operates only when the vehicle is stationary [at approximately 10 km/h (6.2 mph) or less].*

SECTIONAL VIEW <4A/T>



1. OVERDRIVE CLUTCH
2. REVERSE CLUTCH
3. OVERDRIVE PLANETARY CARRIER
4. SECOND BRAKE
5. LOW-REVERSE BRAKE
6. OUTPUT PLANETARY CARRIER
7. ONE-WAY CLUTCH-L
8. TRANSFER DRIVE GEAR
9. UNDERDRIVE CLUTCH
10. TRANSAXLE CASE
11. TORQUE CONVERTER
12. TORQUE CONVERTER CLUTCH
13. INPUT SHAFT
14. OIL PUMP
15. TORQUE CONVERTER HOUSING
16. DIFFERENTIAL
17. TRANSFER DRIVEN GEAR
18. OUTPUT SHAFT
19. REAR COVER

SECTIONAL VIEW <5A/T>



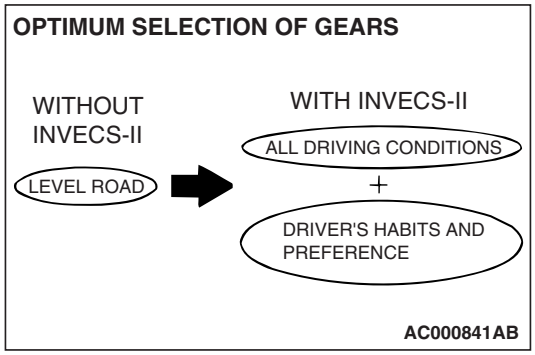
1. REVERSE CLUTCH
2. OVERDRIVE PLANETARY CARRIER
3. SECOND BRAKE
4. LOW-REVERSE BRAKE
5. OUTPUT PLANETARY CARRIER
6. ONE-WAY CLUTCH-L
7. TRANSAXLE CASE
8. TRANSFER DRIVE GEAR
9. UNDERDRIVE CLUTCH
10. TORQUE CONVERTER
11. TORQUE CONVERTER CLUTCH
12. INPUT SHAFT
13. OIL PUMP
14. TORQUE CONVERTER HOUSING
15. DIFFERENTIAL
16. TRANSFER DRIVEN GEAR
17. DIRECT PLANETARY GEAR SET
18. DIRECT CLUTCH
19. REDUCTION BRAKE
20. ONE-WAY CLUTCH-D
21. OUTPUT SHAFT
22. REAR COVER
23. OVERDRIVE CLUTCH

TSB Revision

ELECTRONICALLY-CONTROLLED SYSTEM

INVECS-II

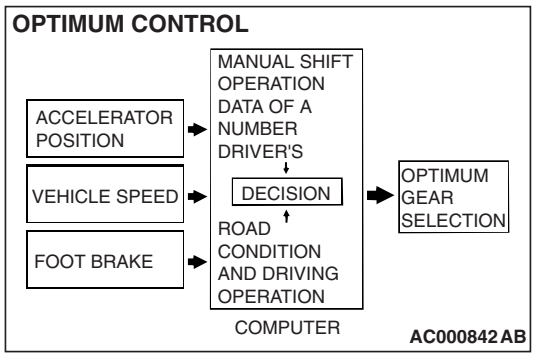
- When in drive ("D" range), the new automatic transaxle employs an innovative shift schedule to provide a high level of comfort and "easy driving style" that matches all driving conditions as well as the driver's driving style.
- INVECS-II features "Optimum Shift Control," which provides shift timing the average driver perceives to be the optimum timing under any road conditions. "Adaptive Shift Control" adjusts shift timing to match the driving habits and preferences of individual drivers.



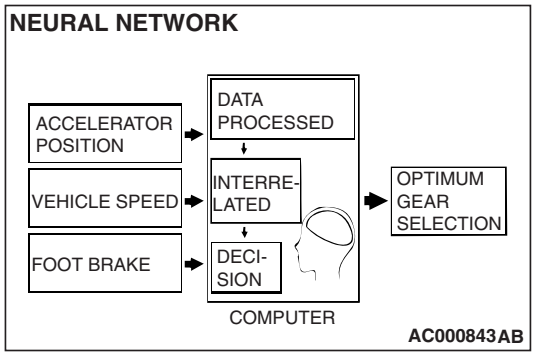
FEATURES

OPTIMUM SHIFT CONTROL

1. The shift patterns found satisfying by the typical driver for all ranges of driving are stored in the computer's memory. The computer uses this data to analyze road conditions and the driver's style of operation, and then outputs the optimal shift patterns stored in its memory to best match the conditions.



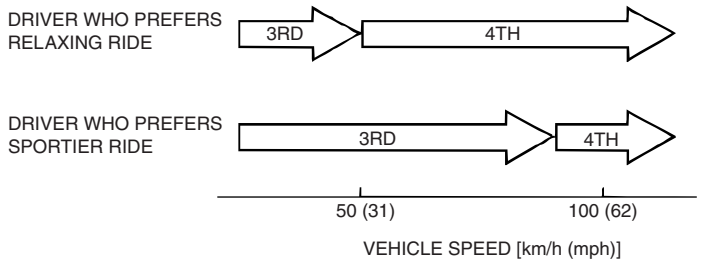
2. We introduce the latest control technologies with an innovative new algorithm called the "neural network" that works to imitate the decision-making processes of the human brain. The neural network links a wide variety of input data regarding road and operating conditions, and instantly makes accurate shift control decisions.



ADAPTIVE SHIFT CONTROL

1. The computer learns the driving habits and preferences of each individual driver by processing driving data on engine output, tire load, foot brake operation, etc. It then uses this data to adjust shift timing to best suit the driver's style.
2. If the computer determines from the driving patterns that the driver is one who enjoys a relaxed, unhurried style, it adjusts timing to execute up-shifts at a lower engine speed to provide a smooth, quiet ride. On the other hand, if the computer determines the driver to prefer a sporty ride, it adjusts timing to shift up at a higher engine speed to provide more powerful response.

ADAPTIVE SHIFT CONTROL DURING ACCELERATION



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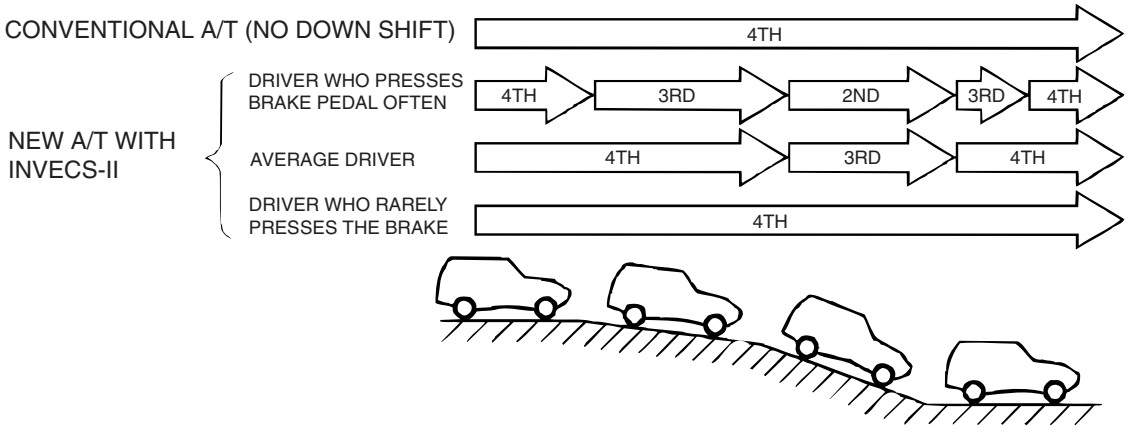
3. If the computer determines that the driver tends to apply the brakes often on a descending roadway, it adjusts timing to down shift sooner so that engine braking is more effectively applied. Conversely, if the computer determines that the driver does not brake much while driving downhill, it delays downshifting to minimize the effect of engine braking.

ADAPTIVE SHIFT CONTROL ON DOWNGRADES



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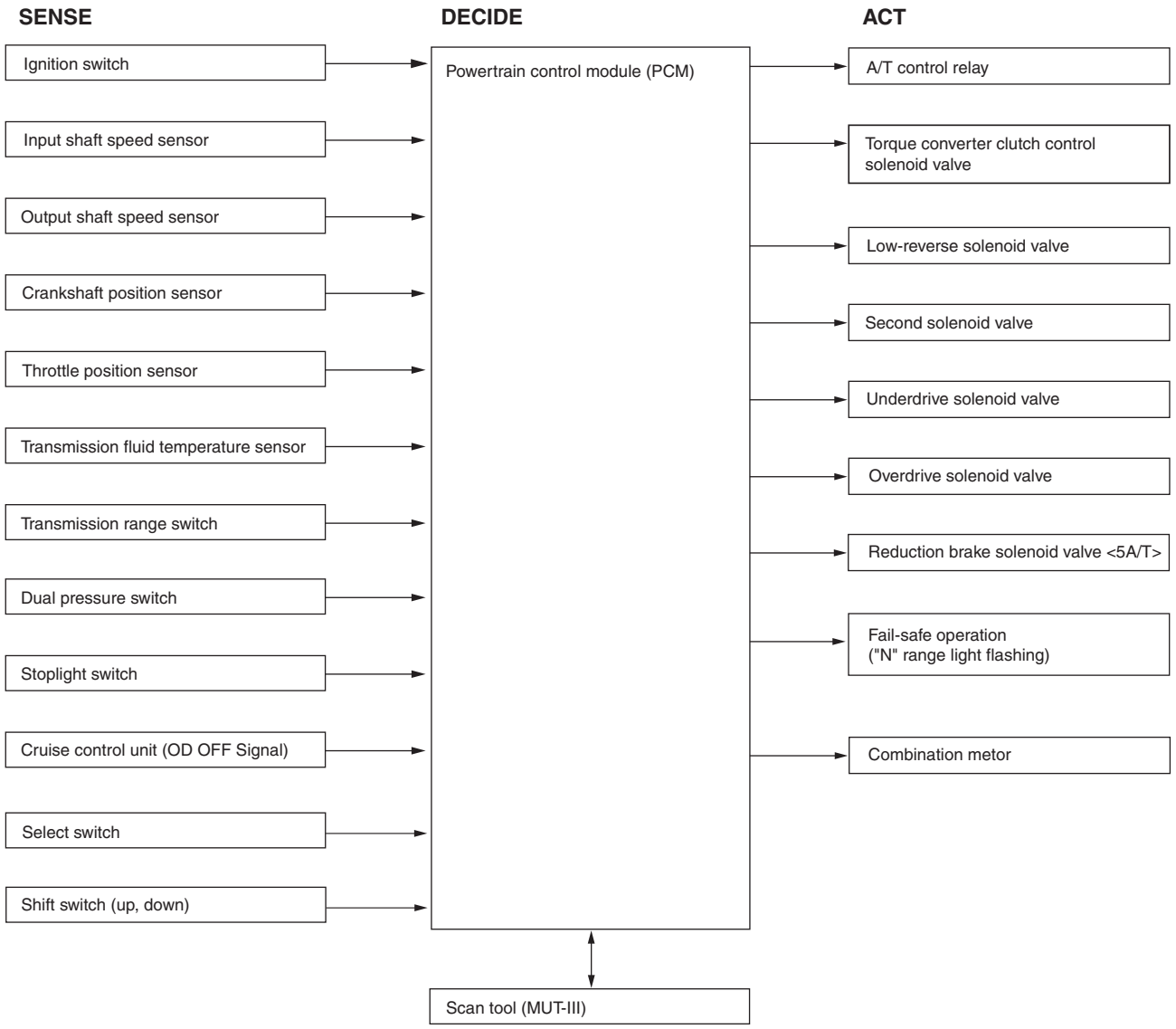
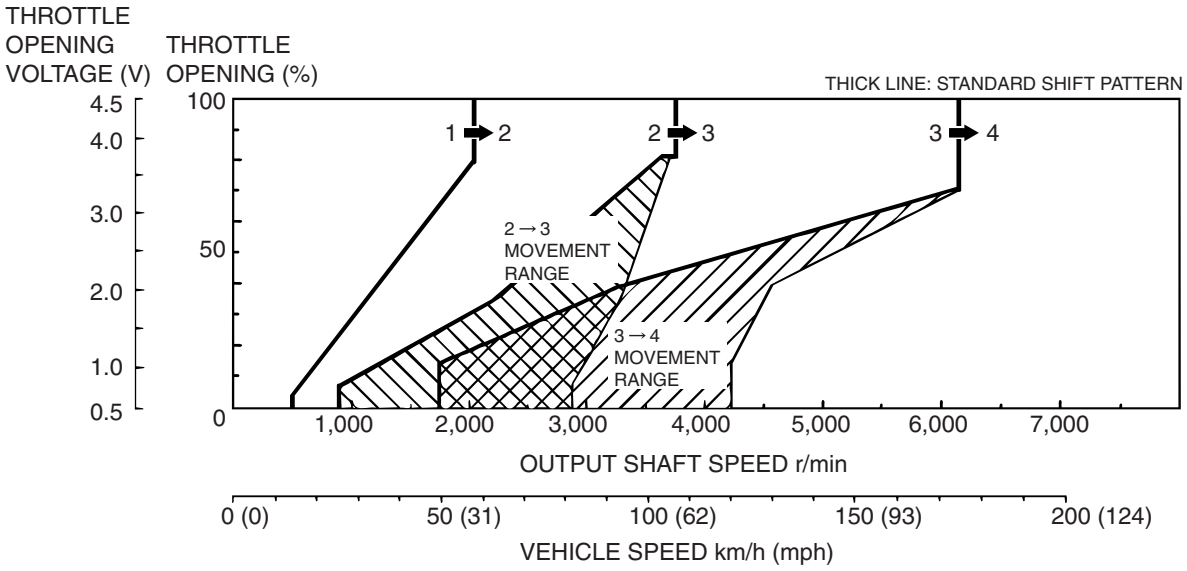
SYSTEM CONSTRUCTION DIAGRAM



SHIFT PATTERN CONTROL

UPSHIFT PATTERN <4A/T>



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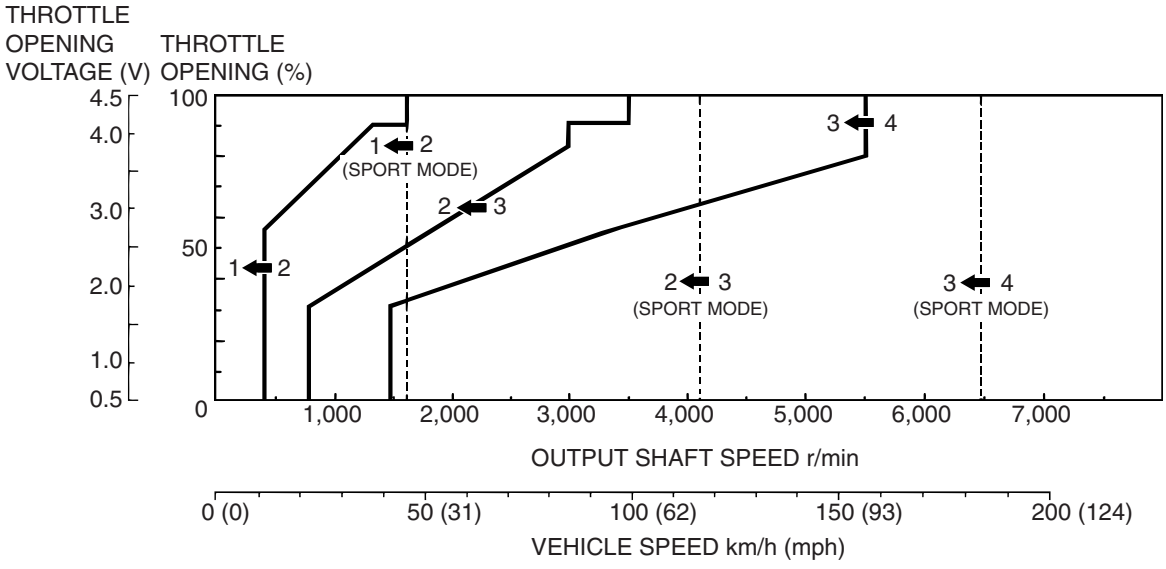
NOTE: Within 2 -to- 3 and 3 -to- 4 movement ranges, the PCM adjusts shift points according to the driving conditions by memorizing the accelerator pedal stroke and braking timing.

DOWNSHIFT PATTERN <4A/T>



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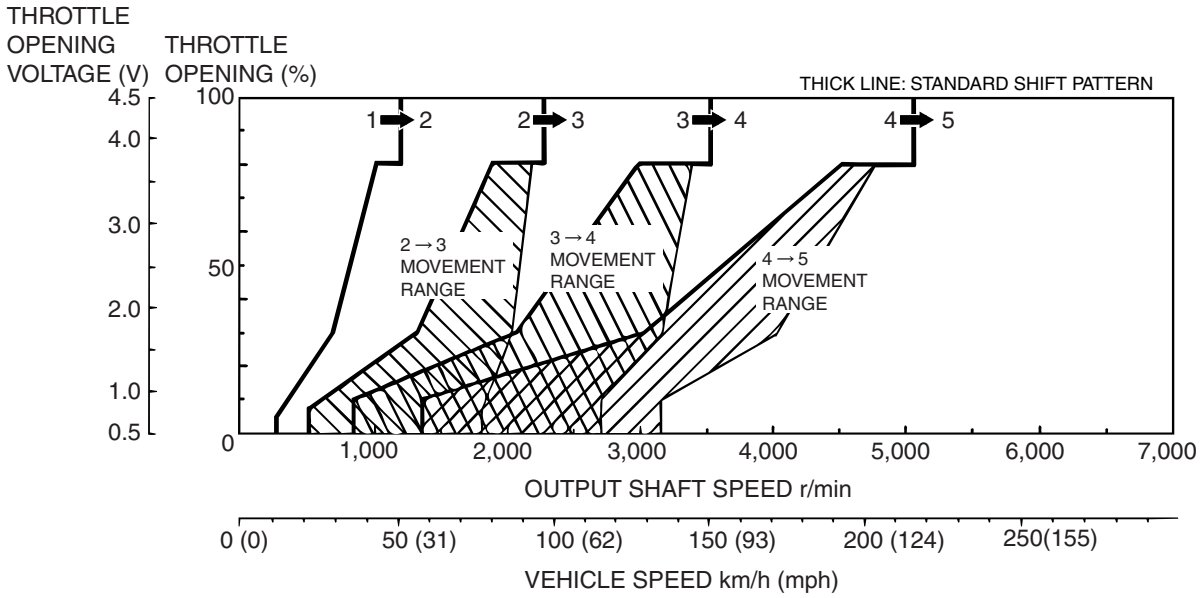
UPSHIFT PATTERN <5A/T>



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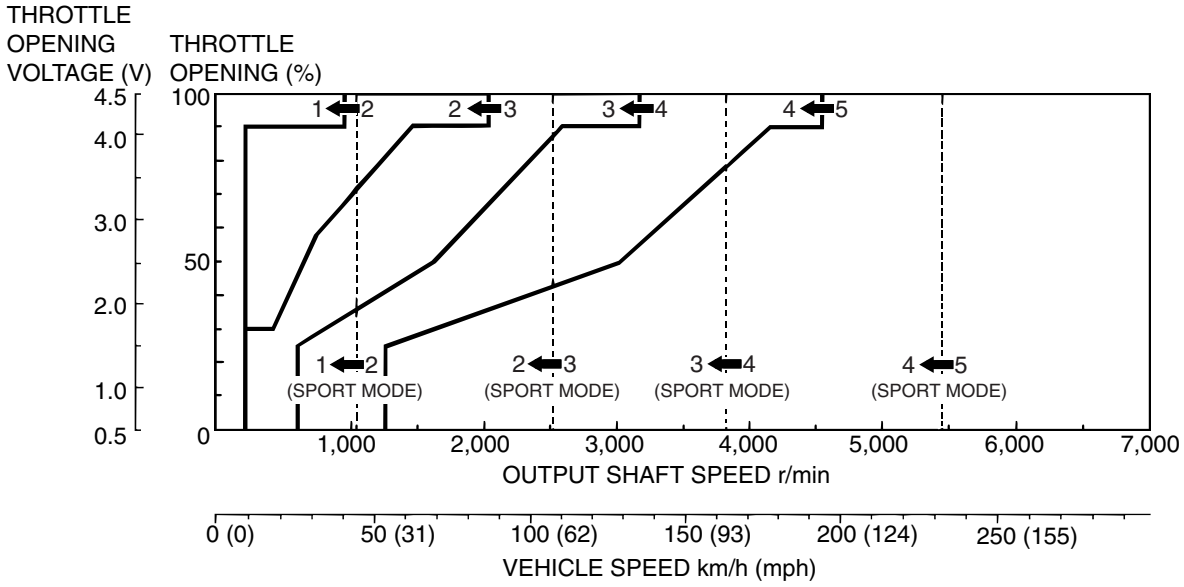
NOTE: Within 2 -to- 3 and 3 -to- 4 movement ranges, the PCM adjusts shift points according to the driving conditions by memorizing the accelerator pedal stroke and braking timing.

DOWNSHIFT PATTERN <5A/T>



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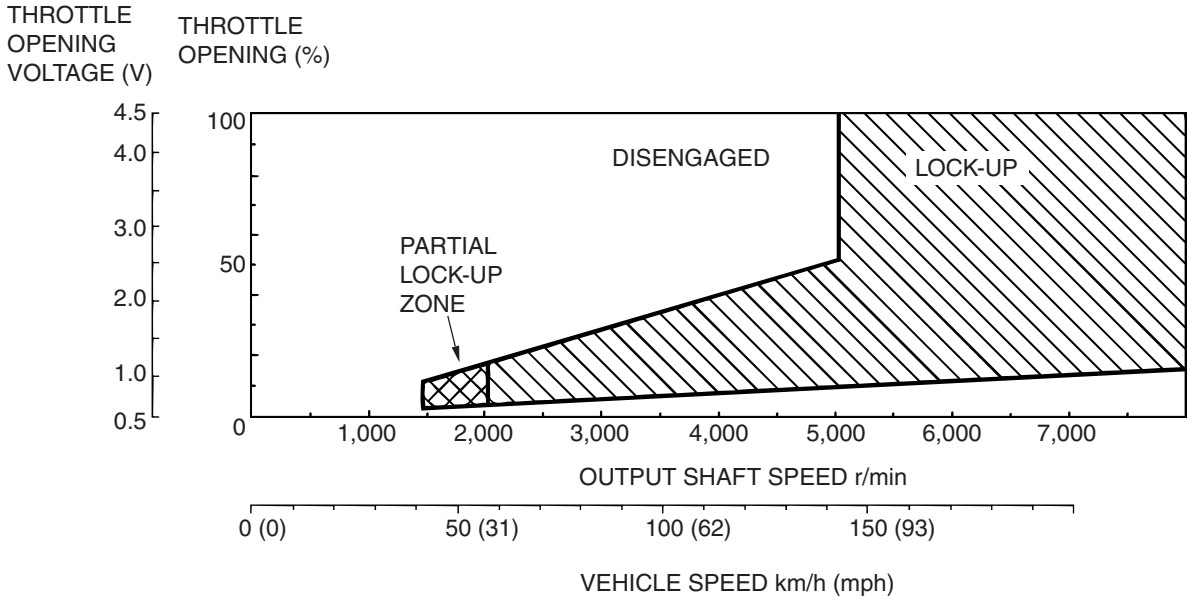
TORQE CONVERTER CLUTCH CONTROL

4TH GEAR RANGE <4A/T>



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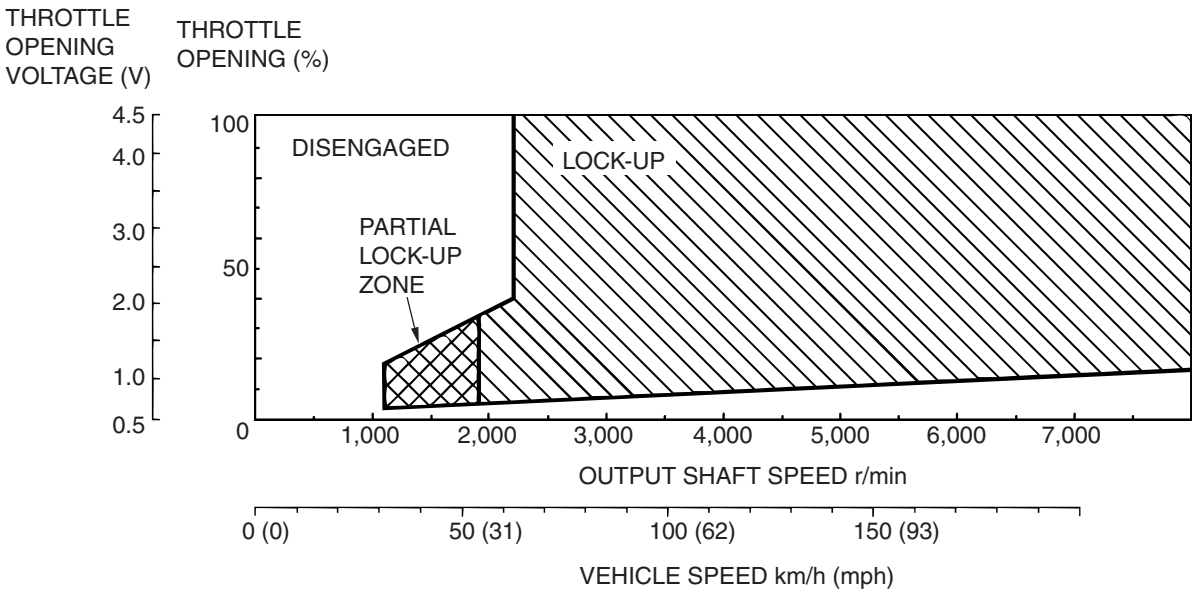
3RD GEAR RANGE <4A/T>



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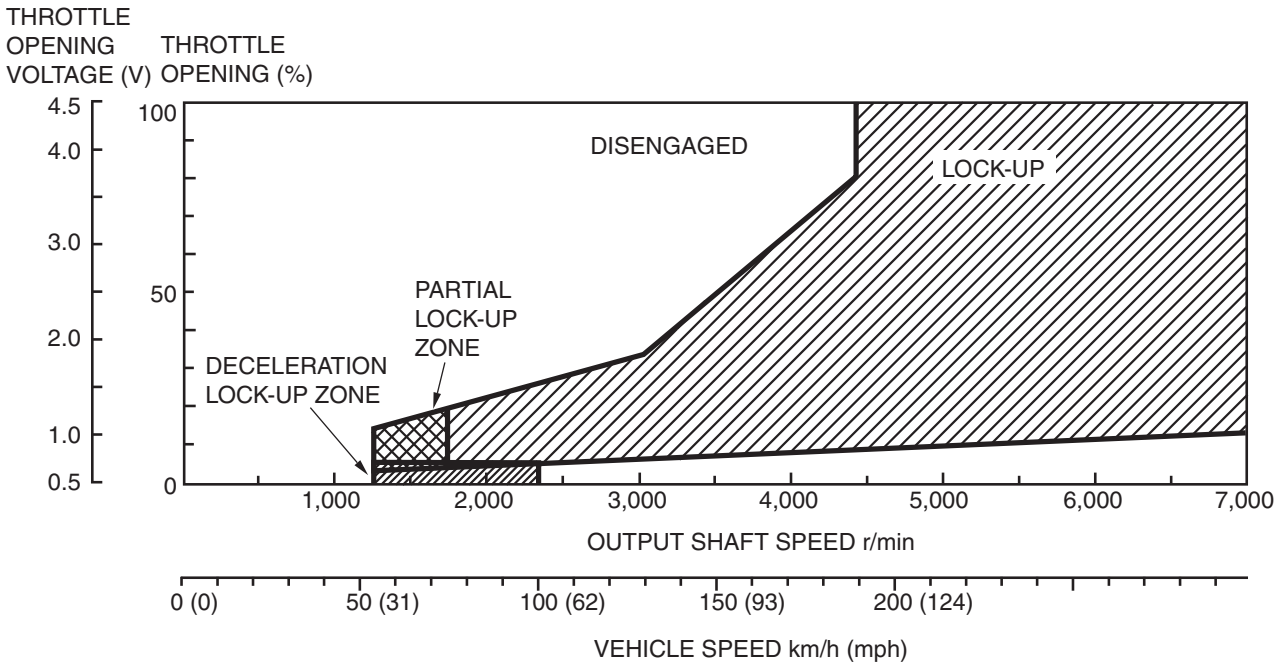
5TH GEAR RANGE <5A/T>



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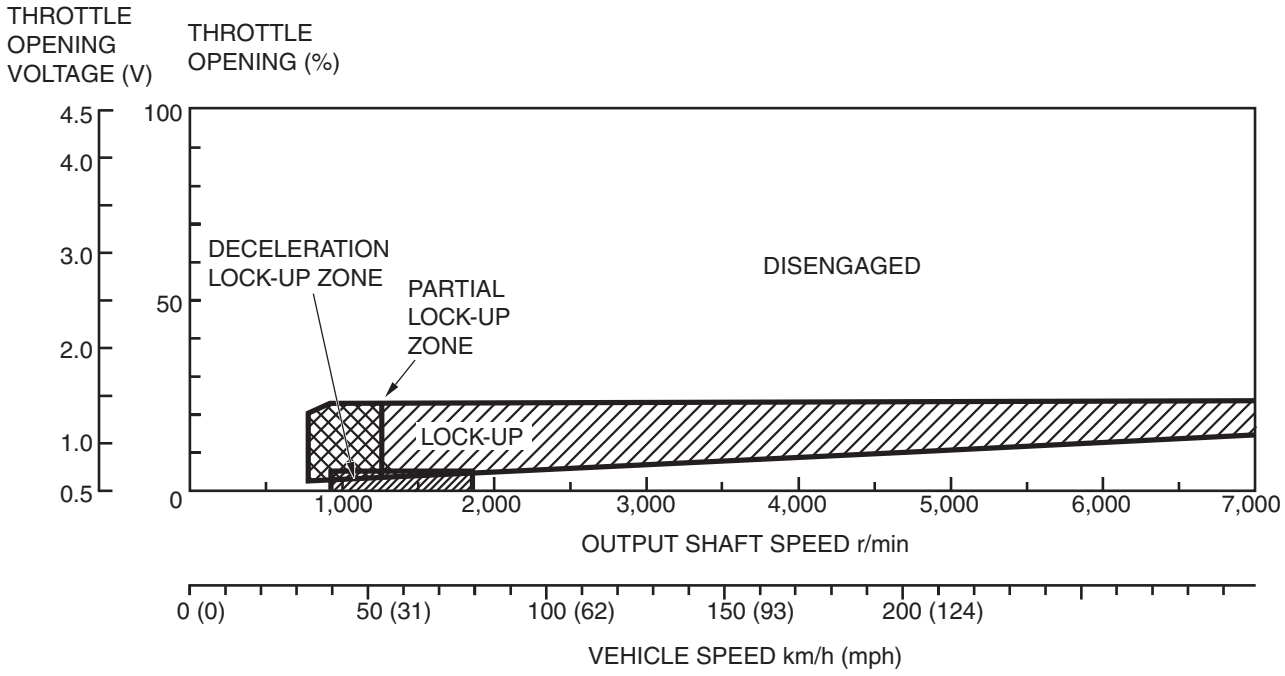
4RD GEAR RANGE <5A/T>



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TSB Revision

AUTOMATIC TRANSAXLE DIAGNOSIS

DIAGNOSTIC TROUBLESHOOTING FLOW

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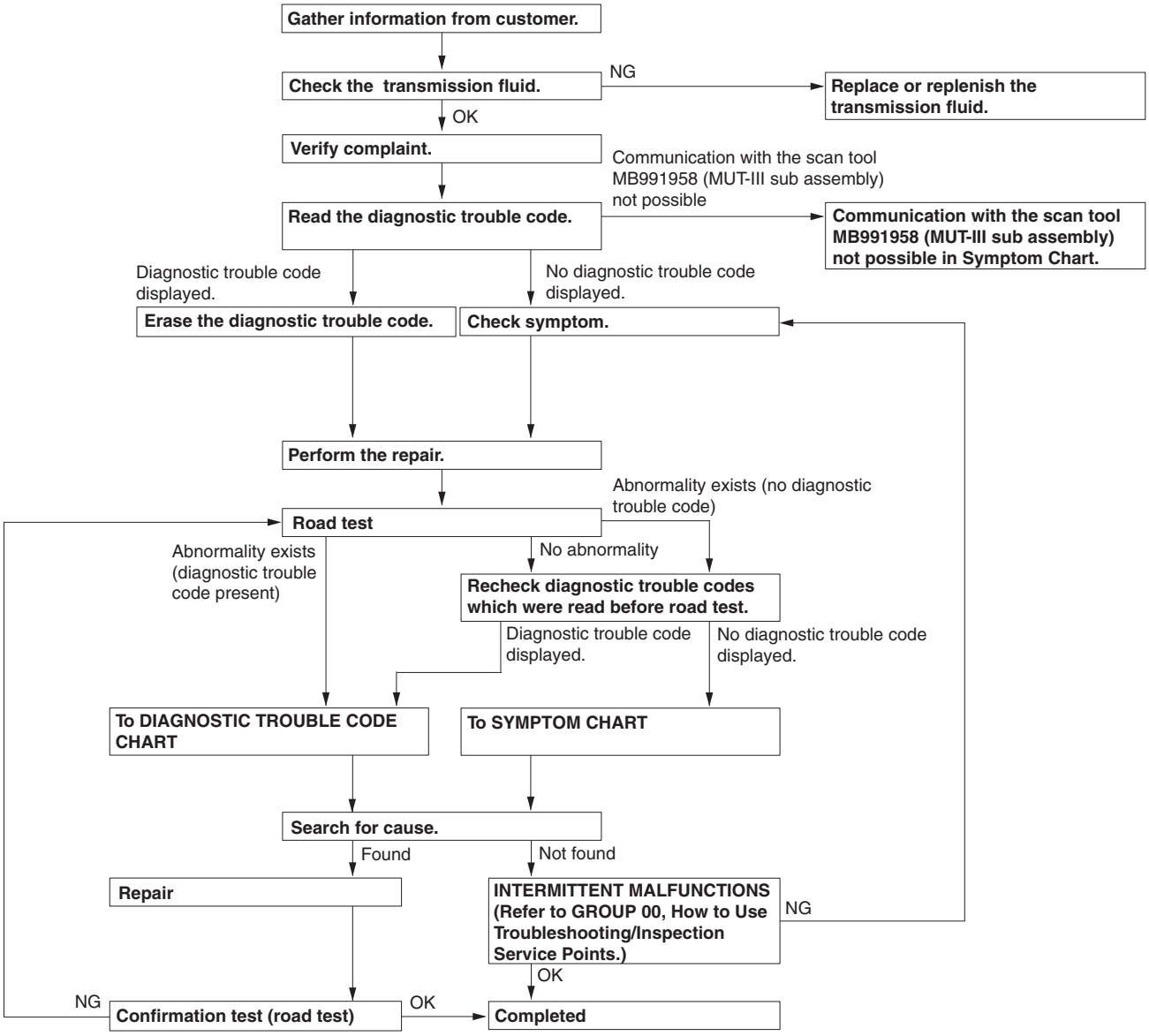

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INTRODUCTION TO A/T DIAGNOSIS

M1231012300226

The automatic transaxle can exhibit any of the following symptoms: noise or vibration is generated, Transmission fluid leaks, the vehicle does not move forward or backward. The causes of these symptoms could come from: Incorrect mounting, the Transmission fluid may be low, or a component of the transaxle may be faulty.

The following items are suspected as causes for the INVECS-II troubles: malfunction of the PCM, the sensors, the switches, the harness or connectors.

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A/T DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1231007600339

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will find most A/T malfunctions.

1. Gather as much information as possible about the complaint from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any A/T Diagnostic Trouble Codes (DTCs).
4. If you can not verify the condition and there are no DTCs, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.
5. If you can verify the condition but there are no DTCs, or the system can not communicate with scan tool, refer to the Symptom Chart P.23A-66.
6. If there is a DTC, record the number of the code, then erase the code from memory using scan tool.
7. Reconfirm the symptom with a Road Test.
8. If a DTC is set again, go to the Inspection Chart for Diagnostic Trouble Codes.
9. If a DTC is not set again, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.
10. After repairs are completed, conduct a Road Test duplicating the complaint conditions to confirm the malfunction has been eliminated.

DIAGNOSTIC FUNCTION

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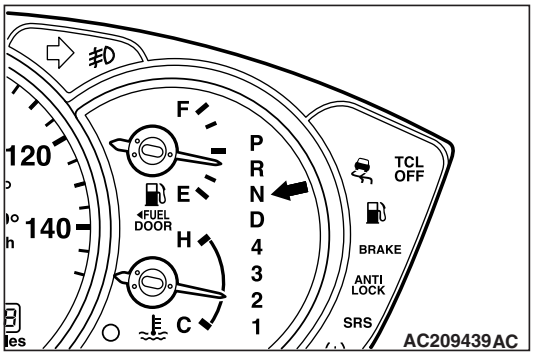


CHECK "N" RANGE LIGHT

The "N" range light flashes once per second if there is an abnormality in any of the items in the table below which are related to the A/T system. Check for diagnostic trouble codes if the "N" range light is flashing once per second.

"N" range light flashing items

- Input shaft speed sensor
- Output shaft speed sensor
- Each solenoid valve
- Gear incorrect ratio
- A/T control relay system

⚠ CAUTION

If the "N" range light is flashing, the transmission fluid temperature is high. (It flushes when the fluid is approximately 125°C or more and goes off when the fluid is approximately 115°C or less)

ON-BOARD DIAGNOSTICS

The powertrain control module (PCM) monitors its input/output signals (some signals all the time and others under specified conditions). When an irregular signal is initially monitored, the PCM decides that a malfunction has occurred and records the occurrence as a diagnostic trouble code. There are 21 diagnostic items. The diagnostic results can be read with scan tool. Diagnostic trouble codes are kept in memory by direct battery feed. The codes are retained in memory even if the ignition switch is in the "LOCK" (OFF) position. DTCs are not erased even after the battery terminals and the PCM connector are disconnected. In addition, the diagnostic trouble code can also be erased by scan tool.

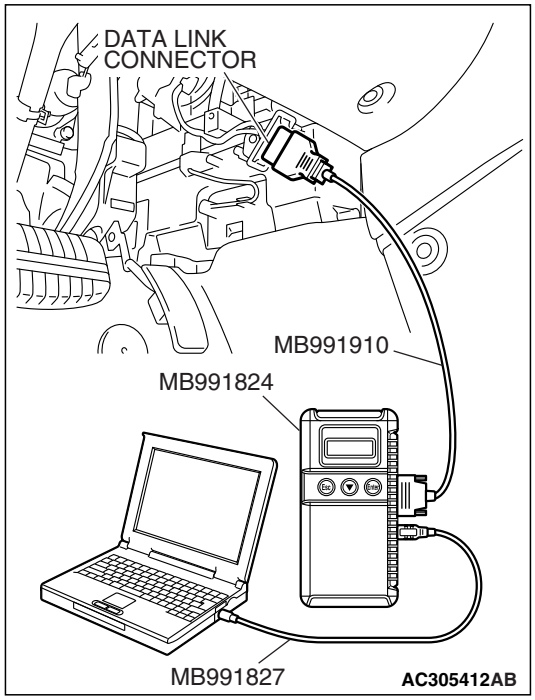
NOTE: If a sensor is disconnected when the ignition switch is in the "ON" position, a diagnostic trouble code is stored in memory. In this case, erase the DTC using scan tool.

The 21 diagnostic items are displayed in numeric order.

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991910 to special tool MB991824.
5. Connect special tool MB991910 to the data link connector.
6. Turn the power switch of special tool MB991824 to the "ON" position.

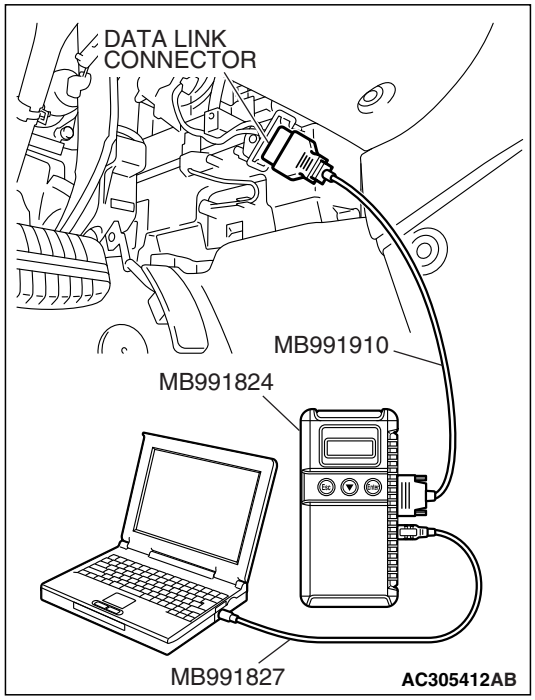
   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

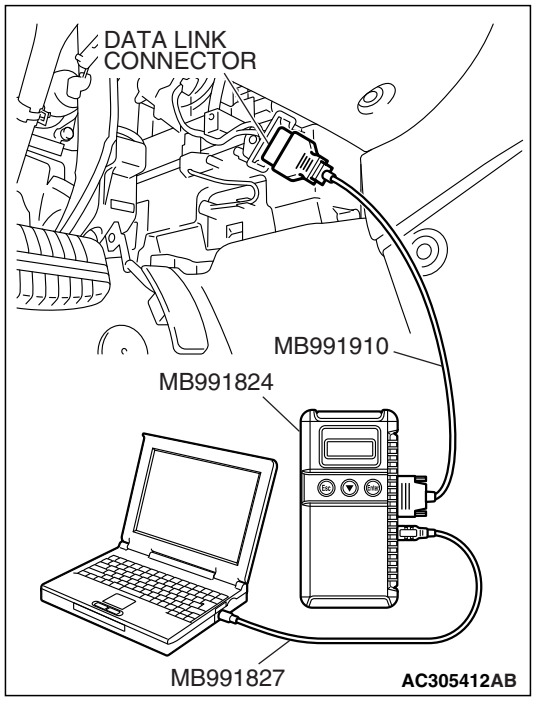
NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "ELC-A/T" from the "POWER TRAIN" tab.
6. Select "MITSUBISHI."
7. Select "Diagnostic Trouble Code."
8. If a DTC is set, it is shown.
9. Choose "Erase DTCs" to erase the DTC.

HOW TO READ DATA LIST

Required Special Tools:

- MB991958 : Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

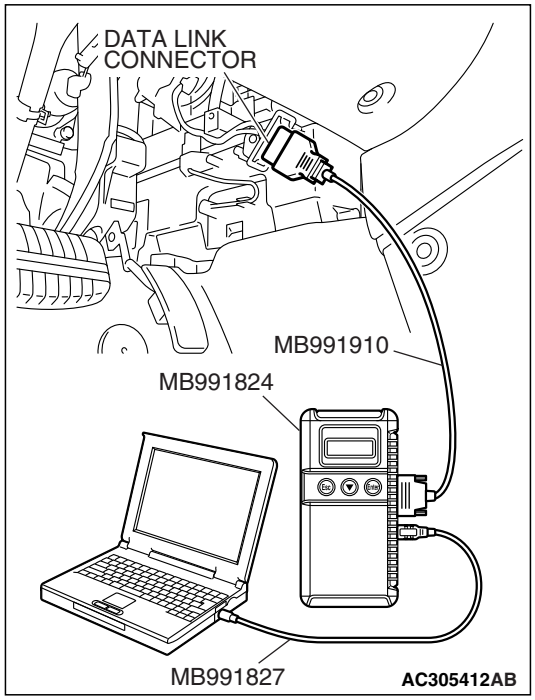
1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "ELC-A/T" from the "POWER TRAIN" tab.
6. Select "MITSUBISHI."
7. Select "Data List."
8. Choose an appropriate item and select the "OK" button.

TSB Revision

HOW TO PERFORM ACTUATOR TEST

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ CAUTION

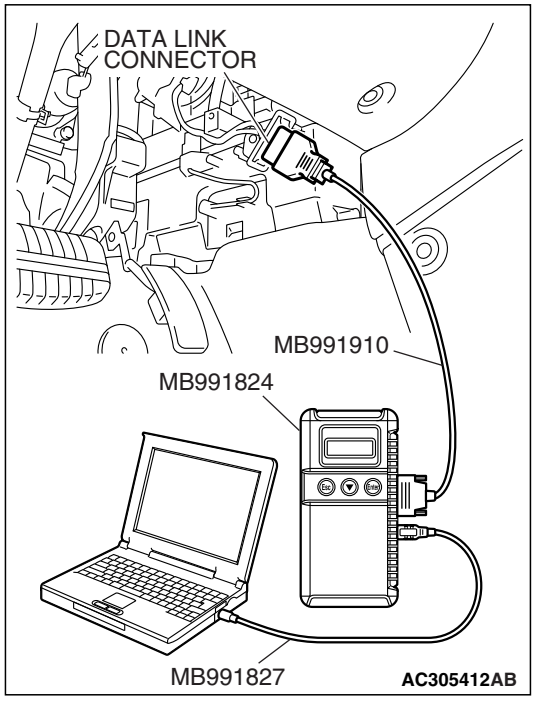
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "ELC-A/T" from the "POWER TRAIN" tab.
6. Select "MITSUBISHI."
7. Select "Actuator Test."
8. Choose an appropriate item and select the "OK" button.

HOW TO DIAGNOSE THE CAN BUS LINES

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "CAN bus diagnosis" from the start-up screen.
4. When the vehicle information is displayed, confirm that it matches the vehicle whose CAN bus lines will be diagnosed.
   - If they matches, go to step 8.
   - If not, go to step 5.
5. Select the "view vehicle information" button.
6. Enter the vehicle information and select the "OK" button.
7. When the vehicle information is displayed, confirm again that it matches the vehicle whose CAN bus lines will be diagnosed.
   - If they matches, go to step 8.
   - If not, go to step 5.
8. Select the "OK" button.
9. When the optional equipment screen is displayed, choose the one which the vehicle is fitted with, and then select the "OK" button.

HOW TO INITIALIZE A/T LEARNED VALUE

M1231022600121

AIM

A/T learned value must be reset whenever the automatic transaxle, engine assembly, A/T valve body, or A/T solenoid valve is replaced. It cannot be reset by disconnecting the battery. Use the M.U.T.-III as follows:

INITIALIZATION PROCEDURE

1. Shift the selector lever to P and turn the ignition switch to the "LOCK" (OFF) position.
2. Connect the M.U.T.-III to the vehicle's data link connector.
3. In the ELC-A/T menu screen, select "Special Function," then select "Memory Reset."
4. Select "OK" to reset the A/T learned memory.
5. After this initialization, make the system learn the idling in accordance with "Learning procedure for idling in MFI engine" (Refer to GROUP 00 – Precautions before Service P.00-28).

NOTE: This reset procedure will also automatically initialize the INVECS-II Learned Value. A/T DTCs and A/T freeze-frame data will be erased. (Engine DTCs, engine-related freeze-frame data, and Readiness status will remain even after A/T Learned Value is reset.)

FAIL-SAFE/BACKUP FUNCTION

M1231008300319

When a malfunction of a main sensor or actuator is detected by the PCM, the transaxle is controlled by pre-set control logic to maintain safe conditions for driving.

The following table shows how the fail-safe/backup function affects vehicle driveability and operation.

MALFUNCTIONING ITEM		JUDGEMENT CONDITION	CONTROL DEFAULT DURING MALFUNCTION
Input shaft speed sensor		If no output pulse from the input shaft speed sensor is detected for one second or more when the vehicle speed is 30 km/h (19 mph) or greater.	The diagnostic trouble code is recorded when the malfunction occurs during 4 monitoring periods in one drive cycle. When the judgment condition is met, the transaxle holds 3rd gear or 2nd gear, depending on speed, as a fail-safe.
Output shaft speed sensor		The output signal from the output shaft speed sensor is not present for one second or more while the vehicle is driven.	The diagnostic trouble code is recorded when the malfunction occurs during 4 monitoring periods in one drive cycle. When the judgment condition is met, the transaxle holds 3rd gear or 2nd gear, depending on speed, as a fail-safe.
Low-reverse solenoid valve		Solenoid valve resistance is below 2.7 ohms for 0.32 seconds.	The diagnostic trouble code is recorded when the malfunction occurs during 4 monitoring periods in one drive cycle. When the judgment condition is met, the A/T control relay is turned off. The transaxle will only operate in 3rd and reverse gears until the system is repaired.
Underdrive solenoid valve			
Second solenoid valve			
Overdrive solenoid valve			
Reduction solenoid valve <5A/T>			
Torque converter clutch solenoid valve			
Incomplete shifting	1st	The gear ratio value from the output shaft speed sensor is not the same as the output from the input shaft speed sensor for one second after shifting has been completed.	The diagnostic trouble code is recorded when the malfunction occurs during 4 monitoring periods in one drive cycle. When the judgment condition is met, the A/T control relay is turned off. The transaxle will only operate in 3rd and reverse gears until the system is repaired.
	2nd		
	3rd		
	4th		
	5th <5A/T>		
	Reverse		
A/T control relay		A/T control relay voltage is less than seven volts for 0.1 second after the ignition switch is turned "ON".	The A/T control relay is switched off. The transaxle will only operate in 3rd and reverse gears until the system is repaired.
Malfunction in the PCM		Malfunction has occurred in the PCM.	The A/T control relay is switched off. The transaxle will only operate in 3rd and reverse gears until the system is repaired.

ROAD TEST

M1231007800861

Check using the following procedures.

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
1	Ignition switch: (LOCK) OFF	Ignition switch (1) ON	Data list No.8 (1) Control Relay Voltage [V]	A/T Control relay output voltage	P1788	A/T Control relay system (P.23A-289).
2	Ignition switch: ON Engine: Stopped Transmission range: P	Transmission range (1) P, (2) R, (3) N, (4) D	Data list No.34 (1) P, (2) R, (3) N, (4) D	Transmission range switch	P1770, P1771	Transmission range switch system (P.23A-143, P.23A-175).
		Transmission range (1) D (1st gear) (2) Select the sport mode (1st gear) (3) Upshift and hold the selector lever in that position (2nd gear) (4) Downshift and hold the selector lever in that position (1st gear)	Data list No.27 (1) OFF, (2) ON, (3) ON, (4) ON Data list No.28 (1) OFF, (2) OFF, (3) ON, (4) OFF Data list No.29 (1) OFF, (2) OFF, (3) OFF, (4) ON	Select switch and Shift switch	-	Shift switch assembly system (P.23A-342).
			Shift indicator light (1) "D" and "1" illuminates (2) Only "1" illuminates (3) Only "2" illuminates (4) Only "1" illuminates			

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
2	Ignition switch: ON Engine: Stopped Transmission range: P	Accelerator pedal (1) Fully closed (2) Depressed (3) Fully open	Data list No.2 (1) 300 – 700 mV (2) Gradually rises from (1) (3) 4,000 mV or more	TP sensor	–	Group 13A <2.4L Engine>, Diagnostic Trouble Code Procedures – DTCs P0122, 0123: Throttle Position Sensor System (P.13A-265, P.13A-276). Group 13B <3.8L Engine>, Diagnostic Trouble Code Procedures – DTCs P0122, 0123: Throttle Position Sensor System (P.13B-270, P.13B-281).
		Brake pedal (1) Depressed (2) Released	Data list No.19 (1) ON (2) OFF	Stoplight switch	P1769	Stoplight switch system (P.23A-134).
3	Ignition switch: ST Engine: Stopped	Cranking test with lever in P or N range	Cranking should be possible	Cranking	-	Engine does not crank (P.23A-304).
4	Engine warming up	Drive for 15 minutes or more so that the transmission fluid temperature becomes 70 – 80°C (158 – 176°F)	Data list No.7 Gradually rises to 70 – 80°C (158 – 176°F)	Transmission fluid temperature sensor	P1763, P1764	Transmission fluid temperature sensor system (P.23A-68, P.23A-82).
5	Engine: Idling Transmission range: N	Brake pedal (Retest) (1) Depressed (2) Released	Data list No.19 (1) ON (2) OFF	Stoplight switch	P1769	Stoplight switch system (P.23A-134).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
5	Engine: Idling Transmission range: N	Accelerator pedal (1) Fully closed (2) Depressed	Data list No.1 (1) Engine tachometer and the scan tool MB991958 (M.U.T.-III sub assembly) shows the same engine speed (2) Gradually rises from (1)	Crankshaft position sensor	-	Group 13A <2.4L Engine>, Diagnostic Trouble Code Procedures – DTC P0335: Crank shaft Position Sensor System (P.13A-567). Group 13B <3.8L Engine>, Diagnostic Trouble Code Procedures – DTC P0335: Crank shaft Position Sensor System (P.13B-610).
		Transmission range (1) N → D (2) N → R	Should be no abnormal shift shocks Time delay when engaging should be within 2 seconds	Malfunction when starting	-	Engine stalls when moving selector lever from N to D or N to R (P.23A-314).
					-	Shift shock when shifting from N to D and long delay (P.23A-315).
					-	Shift shock when shifting from N to R and long delay (P.23A-319).
					-	Shift shock when shifting from N to D, N to R and long delay (P.23A-322).
				Does not move	-	Does not move forward (P.23A-307).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
5	Engine: Idling Transmission range: N	Transmission range (1) N → D (2) N → R	Should be no abnormal shift shocks Time delay when engaging should be within 2 seconds	Does not move	-	Does not move backward (P.23A-310).
					-	Does not move (forward or backward) (P.23A-312).
6 <4A/T>	Transmission range: Sport mode (on a flat and straight road)	Gear range and vehicle speed (Each condition should be maintained for 10 seconds or more). (1) Idling in 1st gear (Vehicle stopped) (2) Driving at constant speed of 10 km/h (6.2 mph) in 1st gear (3) Driving at constant speed of 30 km/h (19 mph) in 2nd gear (4) Driving at constant speed of 50 km/h (31 mph) in 3rd gear (5) Driving at constant speed of 60 km/h (37 mph) in 4th gear	Data list No.11 (2) 1st, (3) 2nd, (4) 3rd, (5) 4th	Shift position	-	-
			Data list No.17 (2) 0%, (3) 100%, (4) 100%, (5) 100%	Low-reverse solenoid valve duty %	P1773	Low-reverse solenoid valve system (P.23A-190).
			Data list No.12 (2) 0%, (3) 0%, (4) 0%, (5) 100%	Underdrive solenoid valve duty %	P1774	Underdrive solenoid valve system (P.23A-204).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
6 <4A/T>	Transmission range: Sport mode (on a flat and straight road)	Gear range and vehicle speed (Each condition should be maintained for 10 seconds or more). (1) Idling in 1st gear (Vehicle stopped) (2) Driving at constant speed of 10 km/h (6.2 mph) in 1st gear (3) Driving at constant speed of 30 km/h (19 mph) in 2nd gear (4) Driving at constant speed of 50 km/h (31 mph) in 3rd gear (5) Driving at constant speed of 60 km/h (37 mph) in 4th gear	Data list No.14 (2)100%, (3) 0%, (4) 100%, (5) 0%	Second solenoid valve duty %	P1775	Second solenoid valve system (P.23A-216).
			Data list No.15 (2) 100%, (3) 100%, (4) 0%, (5) 0%	Overdrive solenoid valve duty %	P1776	Overdrive solenoid valve system (P.23A-228).
			Data list No.5 (4) 1,500 – 1,800 r/min	Input shaft speed sensor	P1766	Input shaft speed sensor system (P.23A-92).
			Data list No.6 (4) 1,500 – 1,800 r/min	Output shaft speed sensor	P1767	Output shaft speed sensor system (P.23A-113).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
6 <5A/T>	Transmission range: Sport mode (on a flat and straight road)	Transmission range and vehicle speed (Each condition should be maintained for 10 seconds or more). (1) Idling in 1st gear (Vehicle stopped) (2) Driving at constant speed of 10 km/h (6.2 mph) in 1st gear (3) Driving at constant speed of 30 km/h (19 mph) in 2nd gear (4) Driving at constant speed of 50 km/h (31 mph) in 3rd gear (5) Driving at constant speed of 60 km/h (37 mph) in 4th gear (6) Driving at constant speed of 70 km/h (43 mph) in 5th gear	Data list No.11 (2) 1st, (3) 2nd, (4) 3rd, (5) 4th, (6) 5th	Shift position	-	-
			Data list No.12 (2) 0%, (3) 100%, (4) 100%, (5) 0%, (6) 0%	Low-reverse solenoid valve duty %	P1773	Low-reverse solenoid valve system (P.23A-190).
			Data list No.13 (2) 0%, (3) 0%, (4) 0%, (5) 0%, (6) 100%	Underdrive solenoid valve duty %	P1774	Underdrive solenoid valve system (P.23A-204).
			Data list No.14 (2)100%, (3) 0%, (4) 100%, (5) 100%, (6) 0%	Second solenoid valve duty %	P1775	Second solenoid valve system (P.23A-216).
			Data list No.15 (2) 100%, (3) 100%, (4) 0%, (5) 0%, (6) 0%	Overdrive solenoid valve duty %	P1776	Overdrive solenoid valve system (P.23A-228).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
6 <5A/T>	Transmission range: Sport mode (on a flat and straight road)	Transmission range and vehicle speed (Each condition should be maintained for 10 seconds or more). (1) Idling in 1st gear (Vehicle stopped) (2) Driving at constant speed of 10 km/h (6.2 mph) in 1st gear (3) Driving at constant speed of 30 km/h (19 mph) in 2nd gear (4) Driving at constant speed of 50 km/h (31 mph) in 3rd gear (5) Driving at constant speed of 60 km/h (37 mph) in 4th gear (6) Driving at constant speed of 70 km/h (43 mph) in 5th gear	Data list No.16 (2) 0%, (3) 0%, (4) 0%, (5)100%, (6)100%	Reduction solenoid valve duty%	P1777	Reduction solenoid valve system (P.23A-240).
			Data list No.5 (5) 1,400 – 1,700 r/min	Input shaft speed sensor	P1766	Input shaft speed sensor system (P.23A-92).
			Data list No.6 (5) 1,400 – 1,700 r/min	Output shaft speed sensor	P1767	Output shaft speed sensor system (P.23A-113).
7 <4A/T>	Transmission range: Sport mode (on a flat and straight road)	Transmission range and vehicle speed (1) Driving at speed of 60 km/h (37 mph) in 3rd gear (2) Driving at constant speed of 60 km/h (37 mph) (3) Release accelerator pedal (Speed under 50 km/h (31 mph)	Data list No.17 (2) 70 – 99.6% (3) 70 – 99.6% to 0%	Torque converter clutch solenoid valve duty %	P1778, P1786, P1787	Torque converter clutch solenoid system (P.23A-252, P.23A-280, P.23A-285).
			Data list No.10 (2) –10 to 10 r/min (3) The value changes from (2)	Torque converter clutch amount of slippage		

TSB Revision

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
7 <5A/T>	Transmission range: Sport mode (on a flat and straight road)	Transmission range and vehicle speed (1) Driving at speed of 50 km/h (31 mph) in 4th gear (2) Driving at constant speed of 50 km/h (31 mph) (3) Release accelerator pedal (Speed under 50 km/h (31 mph)	Data list No.17 (2) 70 – 99.6% (3) 70 – 99.6% to 0%	Torque converter clutch solenoid valve duty %	P1778, P1786, P1787	Torque converter clutch solenoid system (P.23A-252, P.23A-280, P.23A-285).
			Data list No.10 (2) –10 to 10 r/min (3) The value changes from (2)	Torque converter clutch amount of slippage		
8 <4A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1)Accelerate to 4th gear at a throttle position sensor output of 1.5 V (accelerator opening angle of 25%) (2)Slowly decelerate to a stop (3)Accelerate to 4th gear at a throttle position sensor output of 2.5 V (accelerator opening angle of 50%)	Data list No.2, 6 The shifting points correspond with the scan tool display and the TP sensor voltage (opening angle) and output shaft speed, which are shown in the standard shift pattern	Malfunction when shifting	-	Shift shock and slipping (P.23A-323).
				Does not shift according to instructions	-	Early or late shifting in all gears (P.23A-326).
					-	Early or late shifting in some gears (P.23A-330).
				Does not shift	-	No diagnostic trouble code (P.23A-332).
					P1766	Input shaft speed sensor system (P.23A-92).
					P1767	Output shaft speed sensor system (P.23A-113).

TSB Revision

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
8 <4A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1) Accelerate from 1st gear to 4th gear. (2) While driving at 60 km/h (37 mph) in 4th gear, downshift to 3rd gear (3) While driving at 40 km/h (25 mph) in 3rd gear, downshift to 2nd gear (4) While driving at 20 km/h (12 mph) in 2nd gear, downshift to 1st gear	Data list No.11 (1) 1st → 2nd → 3rd → 4th (2) 4th → 3rd (3) 3rd → 2nd (4) 2nd → 1st	Does not shift from 1 to 2 or 2 to 1	P1773	Low-reverse solenoid valve system (P.23A-190).
					P1775	Second solenoid valve system (P.23A-216).
					P1779	1st gear incorrect ratio (P.23A-264).
					P1780	2nd gear incorrect ratio (P.23A-264).
				Does not shift from 2 to 3 or 3 to 2	P1775	Second solenoid valve system (P.23A-216).
					P1776	Overdrive solenoid valve system (P.23A-228).
					P1780	2nd gear incorrect ratio (P.23A-264).
					P1781	3rd gear incorrect ratio (P.23A-264).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
8 <4A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1) Accelerate from 1st gear to 4th gear. (2) While driving at 60 km/h (37 mph) in 4th gear, downshift to 3rd gear (3) While driving at 40 km/h (25 mph) in 3rd gear, downshift to 2nd gear (4) While driving at 20 km/h (12 mph) in 2nd gear, downshift to 1st gear	Data list No.11 (1) 1st → 2nd → 3rd → 4th (2) 4th → 3rd (3) 3rd → 2nd (4) 2nd → 1st	Does not shift from 3 to 4 or 4 to 3	P1774	Underdrive solenoid valve system (P.23A-204).
					P1775	Second solenoid valve system (P.23A-216).
					P1781	3rd gear incorrect ratio (P.23A-264).
					P1782	4th gear incorrect ratio (P.23A-264).
8 <5A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1)Accelerate to 5th gear at a throttle position sensor output of 1.5 V (accelerator opening angle of 25%) (2)Slowly decelerate to a stop (3)Accelerate to 5th gear at a throttle position sensor output of 2.5 V (accelerator opening angle of 50%)	Data list No.2, 6 The shifting points correspond with the scan tool display and the TP sensor voltage (opening angle) and output shaft speed, which are shown in the standard shift pattern	Malfunction when shifting	-	Shift shock and slipping (P.23A-323).
				Does not shift according to instructions	-	Early or late shifting in all gears (P.23A-326).
					-	Early or late shifting in some gears (P.23A-330).

TSB Revision

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
8 <5A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1)Accelerate to 5th gear at a throttle position sensor output of 1.5 V (accelerator opening angle of 25%) (2)Slowly decelerate to a stop (3)Accelerate to 5th gear at a throttle position sensor output of 2.5 V (accelerator opening angle of 50%)	Data list No.2, 6 The shifting points correspond with the scan tool display and the TP sensor voltage (opening angle) and output shaft speed, which are shown in the standard shift pattern	Does not shift	-	No diagnostic trouble code (P.23A-332).
					P1766	Input shaft speed sensor system (P.23A-92).
					P1767	Output shaft speed sensor system (P.23A-113).
8 <5A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1) Accelerate from 1st gear to 5th gear. (2) While driving at 70 km/h (43 mph) in 5th gear, downshift to 4th gear (3) While driving at 60 km/h (37 mph) in 4th gear, downshift to 3rd gear (4) While driving at 40 km/h (25 mph) in 3rd gear, downshift to 2nd gear (5) While driving at 20 km/h (12 mph) in 2nd gear, downshift to 1st gear	Data list No.11 (1) 1st → 2nd → 3rd → 4th → 5th (2) 5th → 4th (3) 4th → 3rd (4) 3rd → 2nd (5) 2nd → 1st	Does not shift from 1 to 2 or 2 to 1	P1773	Low-reverse solenoid valve system (P.23A-190).
					P1775	Second solenoid valve system (P.23A-216).
					P1779	1st gear incorrect ratio (P.23A-264).

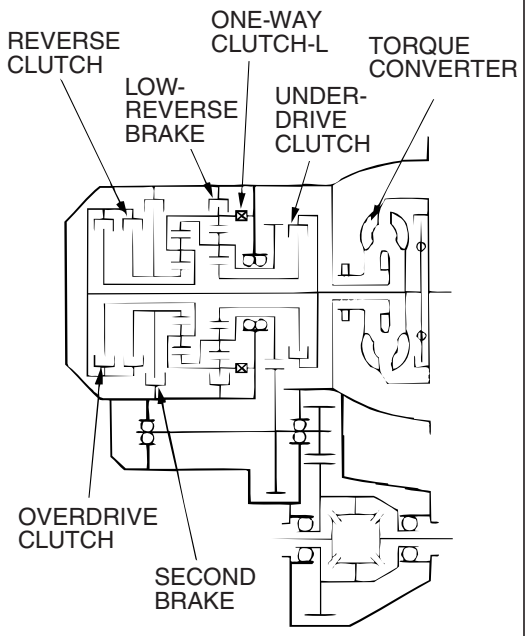
TSB Revision

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
8 <5A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1) Accelerate from 1st gear to 5th gear. (2) While driving at 70 km/h (43 mph) in 5th gear, downshift to 4th gear (3) While driving at 60 km/h (37 mph) in 4th gear, downshift to 3rd gear (4) While driving at 40 km/h (25 mph) in 3rd gear, downshift to 2nd gear (5) While driving at 20 km/h (12 mph) in 2nd gear, downshift to 1st gear	Data list No.11 (1) 1st → 2nd → 3rd → 4th → 5th (2) 5th → 4th (3) 4th → 3rd (4) 3rd → 2nd (5) 2nd → 1st	Does not shift from 1 to 2 or 2 to 1	P1780	2nd gear incorrect ratio (P.23A-264).
				Does not shift from 2 to 3 or 3 to 2	P1775	Second solenoid valve system (P.23A-216).
					P1776	Overdrive solenoid valve system (P.23A-228).
					P1780	2nd gear incorrect ratio (P.23A-264).
					P1781	3rd gear incorrect ratio (P.23A-264).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
8 <5A/T>	Use the scan tool MB991958 (M.U.T.-III sub assembly) to stop the INVECS-II function Transmission range: D (on a flat and straight road)	(1) Accelerate from 1st gear to 5th gear. (2) While driving at 70 km/h (43 mph) in 5th gear, downshift to 4th gear (3) While driving at 60 km/h (37 mph) in 4th gear, downshift to 3rd gear (4) While driving at 40 km/h (25 mph) in 3rd gear, downshift to 2nd gear (5) While driving at 20 km/h (12 mph) in 2nd gear, downshift to 1st gear	Data list No.11 (1) 1st → 2nd → 3rd → 4th → 5th (2) 5th → 4th (3) 4th → 3rd (4) 3rd → 2nd (5) 2nd → 1st	Does not shift from 3 to 4 or 4 to 3	P1774	Low-reverse solenoid valve system (P.23A-190).
					P1777	Reduction solenoid valve system (P.23A-240).
					P1781	3rd gear incorrect ratio (P.23A-264).
					P1782	4th gear incorrect ratio (P.23A-264).
				Does not shift from 4 to 5 or 5 to 4	P1774	Underdrive solenoid valve system (P.23A-204).
					P1775	Second solenoid valve system (P.23A-216).
					P1782	4th gear incorrect ratio (P.23A-264).
					P1783	5th gear incorrect ratio (P.23A-264).

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
9	Transmission range: N (on a flat and straight road)	Monitor data list No.5 and No.6 with the scan tool MB991958 (M.U.T.-III sub assembly) (1) Move selector lever to R range, drive at constant speed of 10 km/h (6.2 mph)	The ratio between data list No.5 and No.6 should be the same as the gear ratio when reversing.	Does not match	P1766	Input shaft speed sensor system (P.23A-92).
					P1767	Output shaft speed sensor system (P.23A-113).
					P1784	Reverse gear incorrect ratio (P.23A-264).

<4A/T>



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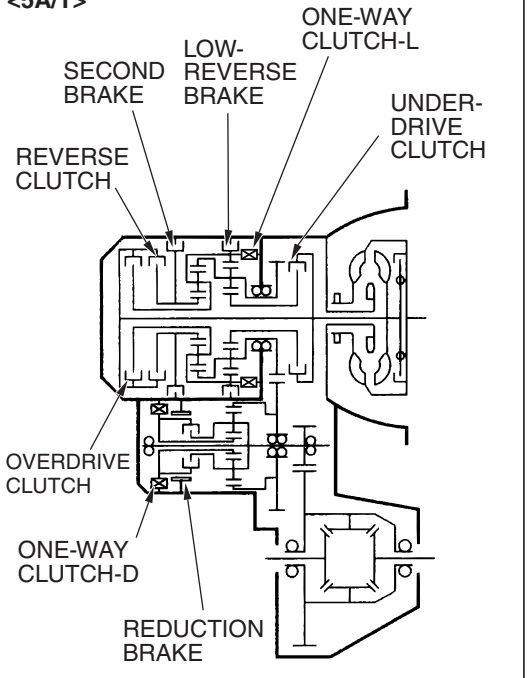

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TORQUE CONVERTER STALL TEST

M1231005400544

This test measures the maximum engine speed when the selector lever is in the "D" or "R" position and the torque converter stalls. This tests the operation of the torque converter, stator and one-way clutch operation, as well as the holding performance of the clutches and brakes in the transaxle.

⚠ *WARNING*

Do not let anyone stand in front of or behind the vehicle while this test is performed.

1. Check the transmission fluid level and temperature. Check the engine coolant temperature.
   - Transmission fluid level: At the "HOT" mark on the dipstick
   - Transmission fluid temperature: 70 – 80°C (158 – 176°F)
   - Engine coolant temperature: 80 – 100°C (176 – 212°F)

   NOTE: Measure transmission fluid temperature with scan tool MB991958 (M.U.T.-III sub assembly).
2. Chock both rear wheels.
3. Connect a tachometer.
4. Apply the parking and service brakes fully.
5. Start the engine.

⚠ CAUTION

- **The throttle should not be fully open for more than five seconds.**
- **If you repeat the stall test when the transmission fluid temperature is greater than 80°C (176°F), move the selector lever to the "N" position and let the engine run at approximately 1,000 r/min for at least one minute. Wait until the transmission fluid temperature returns to 80°C (176°F) or less.**

6. Move the selector lever to the "D" position. Fully depress the accelerator pedal and read the maximum engine speed.

   Standard value: Stall speed: 2,200 – 2,700 r/min
7. Move the selector lever to the "R" position. Fully depress the accelerator pedal and read the maximum engine speed.

   Standard value: Stall speed: 2,200 – 2,700 r/min

TORQUE CONVERTER STALL TEST JUDGMENT RESULTS

1. Stall speed is too high in both "D" and "R" range
   - Malfunction of the torque converter (Slippage on the splines of the torque converter and the input shaft)
   - Low line pressure
   - Low-reverse brake slippage and malfunction of the one-way clutch
2. Stall speed is too high in "D" range only
   - Underdrive clutch slippage
3. Stall speed is too high in "R" range only
   - Reverse clutch slippage
4. Stall speed is too low in both "D" and "R" ranges
   - Malfunction of the torque converter (Slippage of the one-way clutch)
   - Insufficient engine output

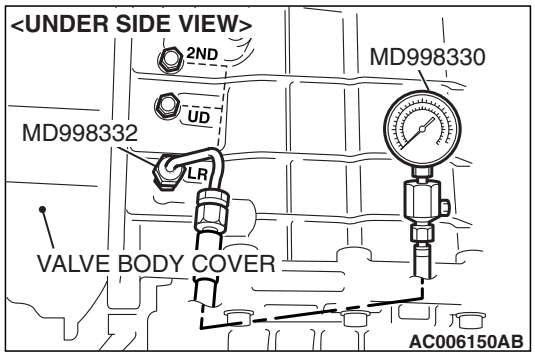
HYDRAULIC PRESSURE TESTS

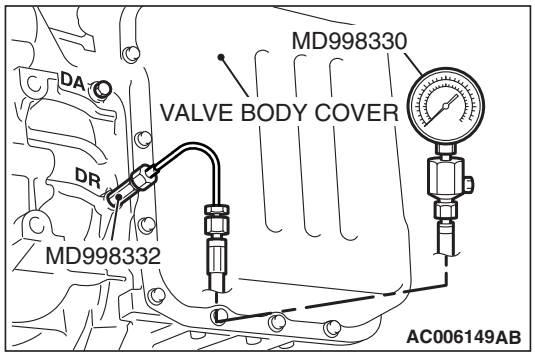
M1231005500660

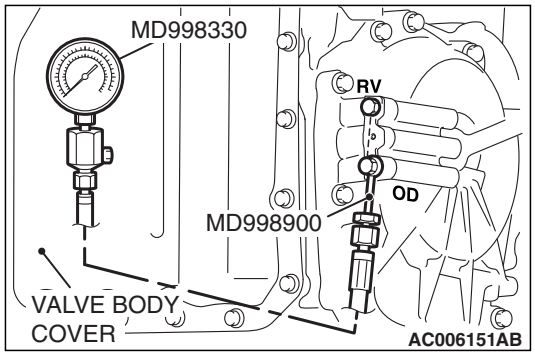
⚠ CAUTION

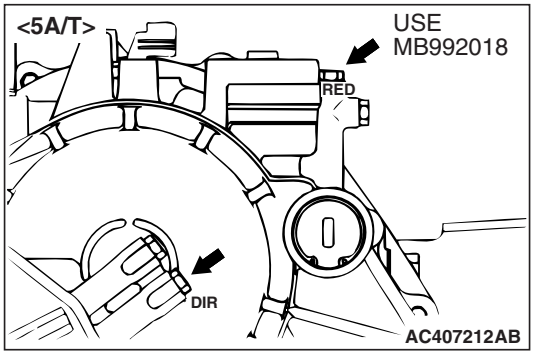
The transmission fluid temperature should be between 70 – 80°C (158 – 176°F) during the test.

1. Check the transmission fluid level and temperature. Check engine coolant temperature.
   - Transmission fluid level: "HOT" mark on the dipstick
   - Transmission fluid temperature: 70 – 80°C (158 – 176°F)
   - Engine coolant temperature: 80 – 100°C (176 – 212°F)
2. Raise the vehicle so that the wheels are free to turn.









3. Connect the special tools (3.0 MPa (427 psi) oil pressure gauge [MD998330] and adapters [MD998332, MD998900, MB992018 <5A/T>]) to each pressure discharge port.

   NOTE:
   - *2ND: Second brake pressure port*
   - *UD: Underdrive clutch pressure port*
   - *LR: Low-reverse brake pressure port*
   - *DR: Torque converter release pressure port*
   - *DA: Torque converter apply pressure port*
   - *RV: Reverse clutch pressure port*
   - *OD: Overdrive clutch pressure port*
   - *DIR: Direct clutch pressure port <5A/T>*
   - *RED: Reduction brake pressure port <5A/T>*
4. Restart the engine.
5. Check that there are no leaks around the special tool port adapters.
6. Measure the hydraulic pressure at each port under the conditions given in the standard hydraulic pressure table, and check that the measured values are within the standard value ranges.
7. If the pressure is not within the standard value, stop the engine and refer to the hydraulic pressure test diagnosis table.
8. Remove the O-ring from the port plug and replace it.
9. Remove the special tool, and install the plugs to the hydraulic pressure ports.
10. Start the engine and check that there are no leaks around the plugs.

STANDARD HYDRAULIC PRESSURE TABLE

<4A/T>

MEASUREMENT CONDITION			STANDARD HYDRAULIC PRESSURE MPa (psi)					
TRANS-MISSION RANGE	SHIFT POSITION	ENGINE SPEED (r/min)	UNDER-DRIVE CLUTCH PRESSURE [UD]	REVERSE CLUTCH PRESSURE [RV]	OVERDRIVE CLUTCH PRESSURE [OD]	LOW-REVERSE BRAKE PRESSURE [LR]	SECOND BRAKE PRESSURE [2ND]	TORQUE CONVERTER PRESSURE [DR]
P	–	2,500	–	–	–	0.31 – 0.39 (44 – 56)	–	0.22 – 0.36 (32 – 52)
R	Reverse	2,500	–	1.27 – 1.77 (185 – 256)	–	1.27 – 1.77 (185 – 256)	–	0.50 – 0.73 (73 – 106)
N	–	2,500	–	–	–	0.31 – 0.39 (44 – 56)	–	0.22 – 0.36 (32 – 52)
Sport mode	1st gear	2,500	0.95 – 1.06 (137 – 153)	–	–	0.95 – 1.06 (137 – 153)	–	0.50 – 0.73 (73 – 106)
	2nd gear	2,500	0.95 – 1.06 (137 – 153)	–	–	–	0.95 – 1.06 (137 – 153)	0.50 – 0.73 (73 –106)
	3rd gear	2,500	0.78 – 0.90 (113 – 131)	–	0.78 – 0.90 (113 – 131)	–	–	-
	4th gear	2,500	–	–	0.78 – 0.90 (113 – 131)	–	0.78 – 0.88 (113 – 128)	-

<5A/T>

MEASUREMENT CONDITION			STANDARD HYDRAULIC PRESSURE MPa (psi)							
TRANS-MISSION RANGE	SHIFT POSITION	ENGINE SPEED (r/min)	UNDER-DRIVE CLUTCH PRESSURE [UD]	REVERSE CLUTCH PRESSURE [RV]	OVERDRIVE CLUTCH PRESSURE [OD]	DIRECT CLUTCH PRESSURE [DIR]	LOW-REVERSE BRAKE PRESSURE [LR]	SECOND BRAKE PRESSURE [2ND]	REDUC-TION BRAKE PRESSURE [RED]	TORQUE CONVERTER CLUTCH PRESSURE [DR]
P	–	2,500	–	–	–	–	0.31 – 0.39 (44 – 56)	–	0.31 – 0.39 (44 – 56)	0.22 – 0.36 (32 – 52)
R	Reverse	2,500	–	1.27 – 1.77 (185 – 256)	–	–	1.27 – 1.77 (185 – 256)	–	1.27 – 1.77 (185 – 256)	0.50 – 0.73 (73 – 106)
N	–	2,500	–	–	–	–	0.31 – 0.39 (44 – 56)	–	0.31 – 0.39 (44 – 56)	0.22 – 0.36 (32 – 52)
Sport mode	1st gear	2,500	0.95 – 1.06 (137 – 153)	–	–	–	0.95 – 1.06 (137 – 153)	–	0.95 – 1.06 (137 – 153)	0.50 – 0.73 (73 – 106)
	2nd gear	2,500	0.95 – 1.06 (137 – 153)	–	–	–	–	0.95 – 1.06 (137 – 153)	0.95 – 1.06 (137 – 153)	0.50 – 0.73 (73 – 106)
	3rd gear	2,500	0.78 – 0.90 (113 – 131)	–	0.78 – 0.90 (113 – 131)	–	–	–	0.78 – 0.88 (113 – 128)	0.45 – 0.72 (65 – 104)
	4th gear	2,500	0.78 – 0.90 (113 – 131)	–	0.78 – 0.90 (113 – 131)	0.78 – 0.88 (113 – 128)	–	–	–	–
	5th gear	2,500	–	–	0.78 – 0.90 (113 – 131)	0.78 – 0.88 (113 – 128)	–	0.78 – 0.88 (113 – 128)	–	–

NOTE: When the torque converter pressure is measured, the engine speed should be 1,500 r/min or less.

HYDRAULIC PRESSURE TEST DIAGNOSIS TABLE

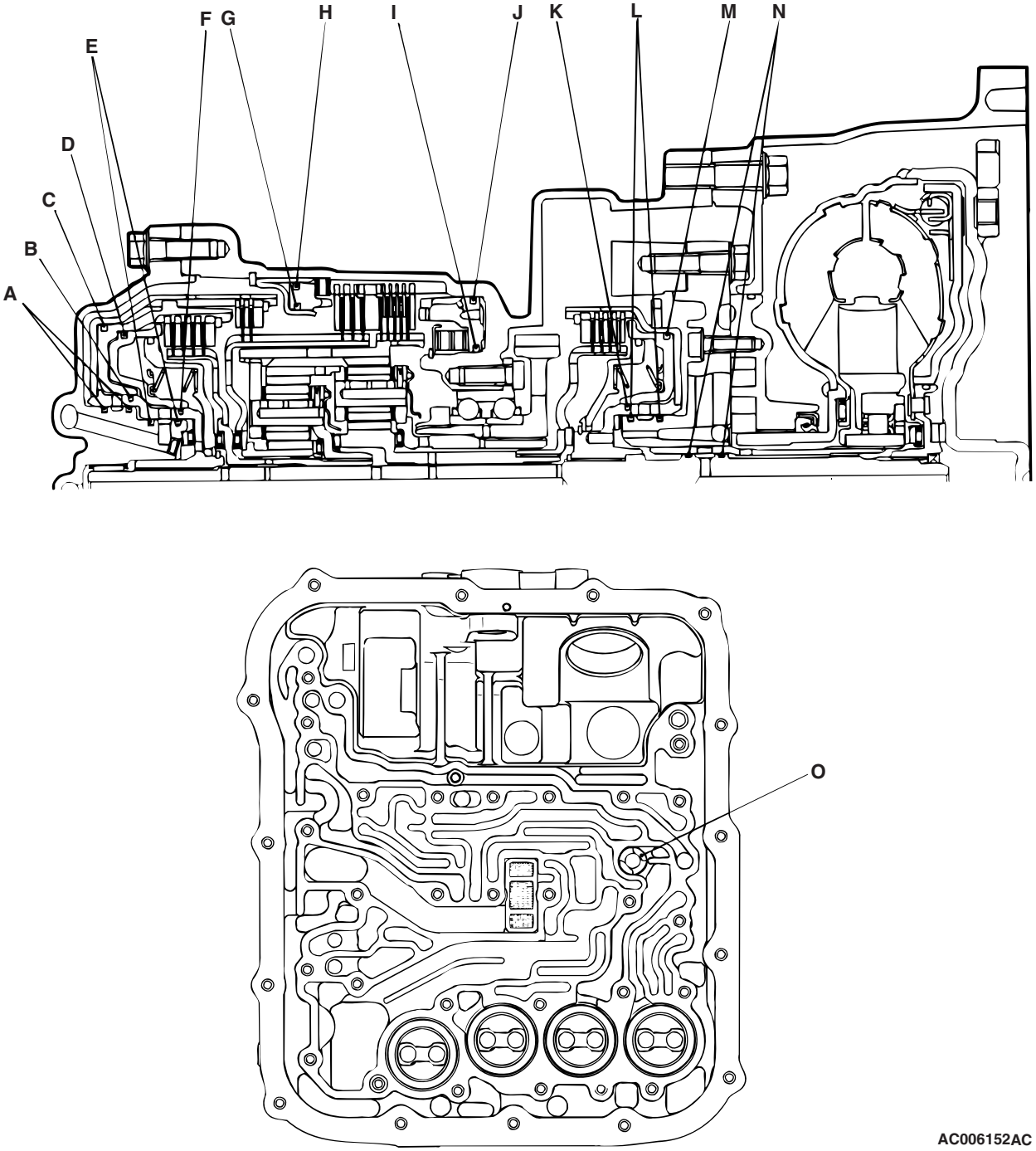
SYMPTOM	PROBABLE CAUSE
All hydraulic pressures are high.	Malfunction of the regulator valve
All hydraulic pressures are low.	Malfunction of the oil pump
	Clogged internal oil filter
	Clogged oil cooler
	Malfunction of the regulator valve
	Malfunction of the relief valve
	Incorrect valve body installation
	Improperly installed solenoid valves
	Damaged solenoid valve O-rings
Hydraulic pressure is abnormal in reverse gear only.	Malfunction of the regulator valve
	Clogged orifice
	Incorrect valve body installation
Hydraulic pressure is abnormal in 3rd or 4th gear only.	Malfunction of the overdrive solenoid valve
	Malfunction of the overdrive pressure control valve
	Malfunction of the regulator valve
	Malfunction of the switch valve
	Clogged orifice
	Incorrect valve body installation
Only underdrive clutch hydraulic pressure is abnormal.	Malfunction of the oil seal K
	Malfunction of the oil seal L
	Malfunction of the oil seal M
	Malfunction of the underdrive solenoid valve
	Malfunction of the underdrive pressure control valve
	Malfunction of the check ball
	Clogged orifice
	Incorrect valve body installation
	Malfunction of the accumulator for underdrive clutch
Only reverse clutch hydraulic pressure is abnormal.	Malfunction of the oil seal A
	Malfunction of the oil seal B
	Malfunction of the oil seal C
	Clogged orifice
	Incorrect valve body installation

SYMPTOM	PROBABLE CAUSE
Only overdrive clutch hydraulic pressure is abnormal.	Malfunction of the oil seal D
	Malfunction of the oil seal E
	Malfunction of the oil seal F
	Malfunction of the overdrive solenoid valve
	Malfunction of the overdrive pressure control valve
	Malfunction of the check ball
	Clogged orifice
	Incorrect valve body installation
	Malfunction of the accumulator for overdrive clutch
Only direct clutch hydraulic pressure is abnormal <5A/T>.	Malfunction of the oil seal R
	Malfunction of the oil seal S
	Malfunction of the oil seal T
	Malfunction of the low-reverse solenoid valve (Shared with direct clutch)
	Malfunction of the low-reverse pressure control valve
	Malfunction of the switch valve
	Malfunction of the fail safe valve C
	Clogged orifice
	Incorrect valve body installation
Only low-reverse brake hydraulic pressure is abnormal.	Malfunction of the oil seal I
	Malfunction of the oil seal J
	Malfunction of the low-reverse solenoid valve
	Malfunction of the low-reverse pressure control valve
	Malfunction of the switch valve
	Malfunction of the fail safe valve A
	Malfunction of all the check balls
	Clogged orifice
	Incorrect valve body installation
	Malfunction of the accumulator for low-reverse brake
Only second brake hydraulic pressure is abnormal.	Malfunction of the oil seal G
	Malfunction of the oil seal H
	Malfunction of the oil seal O
	Malfunction of the second solenoid valve
	Malfunction of the second pressure control valve
	Malfunction of the fail safe valve B
	Clogged orifice
	Incorrect valve body installation
	Malfunction of the accumulator for second brake

SYMPTOM	PROBABLE CAUSE
Only reduction brake hydraulic pressure is abnormal <5A/T>.	Malfunction of the oil seal P
	Malfunction of the oil seal Q
	Malfunction of the reduction solenoid valve
	Malfunction of the reduction pressure control valve
	Clogged orifice
	Incorrect valve body installation
Only torque converter pressure is abnormal.	Clogged oil cooler
	Malfunction of the oil seal N
	Malfunction of the torque converter clutch solenoid
	Malfunction of the torque converter pressure control valve
	Clogged orifice
	Incorrect valve body installation
Pressure applied to element which should not receive pressure.	Incorrect transaxle control cable adjustment
	Malfunction of the manual valve
	Malfunction of the check ball
	Incorrect valve body installation

OIL SEAL LAYOUT

<4A/T>



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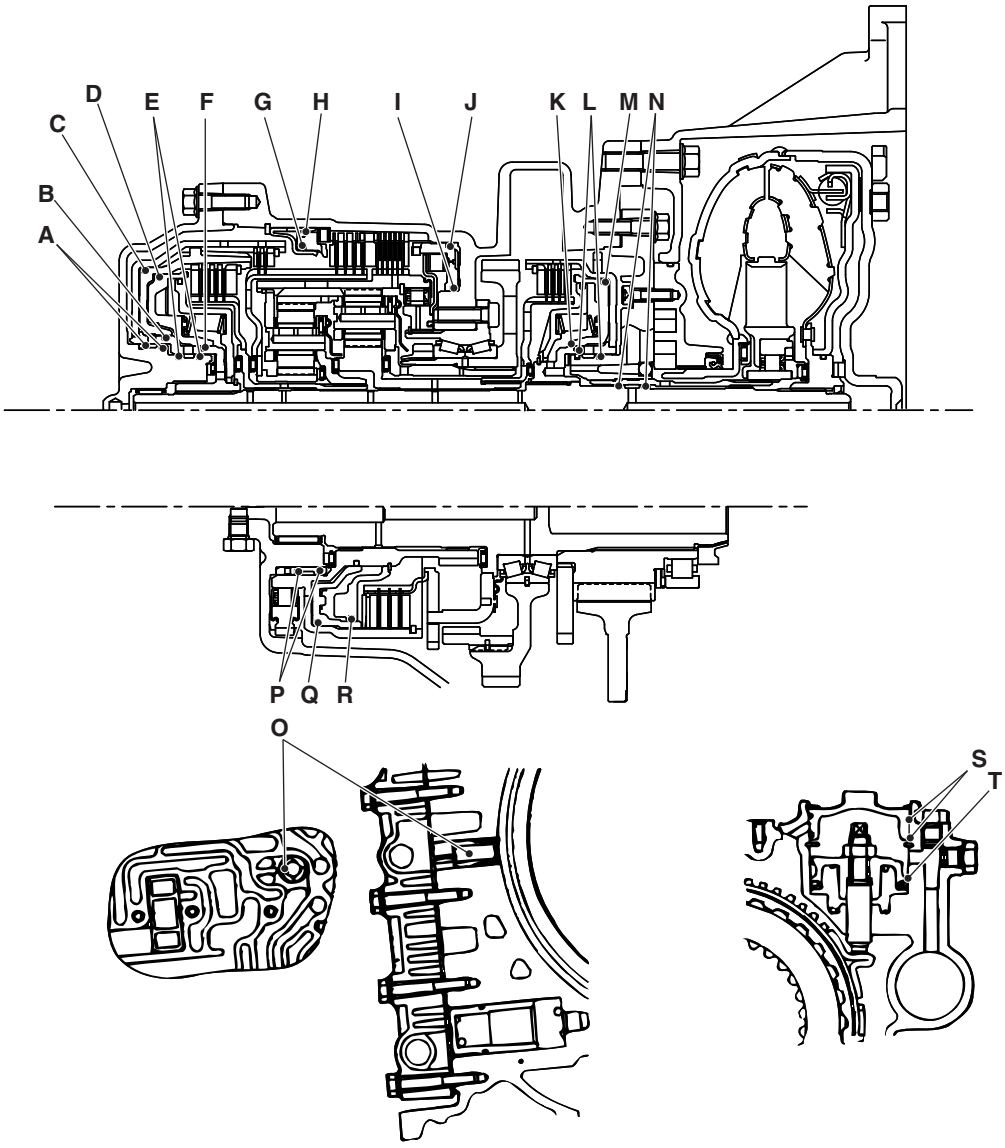

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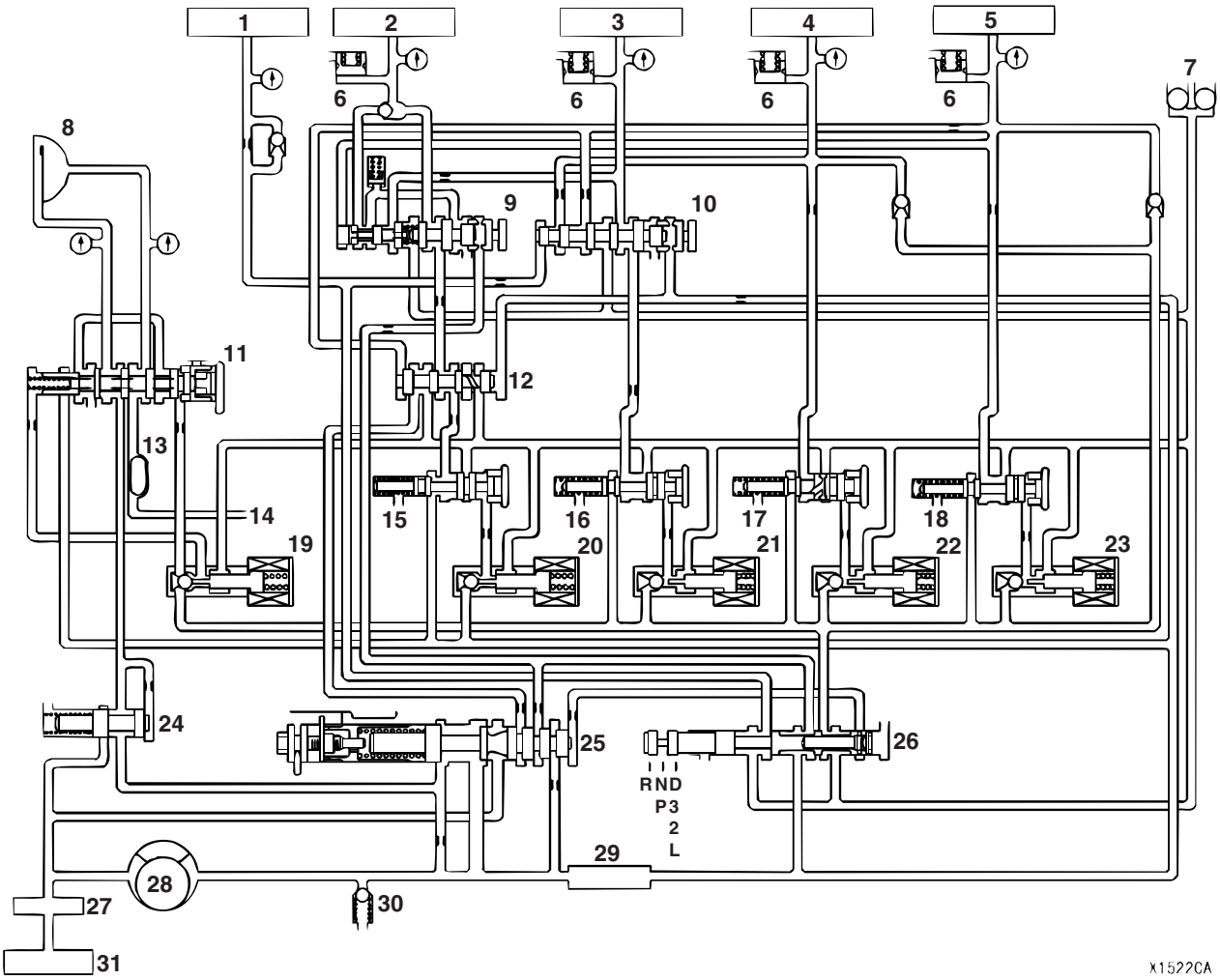
HYDRAULIC CIRCUIT

M1231008800507

PARKING AND NEUTRAL <4A/T>

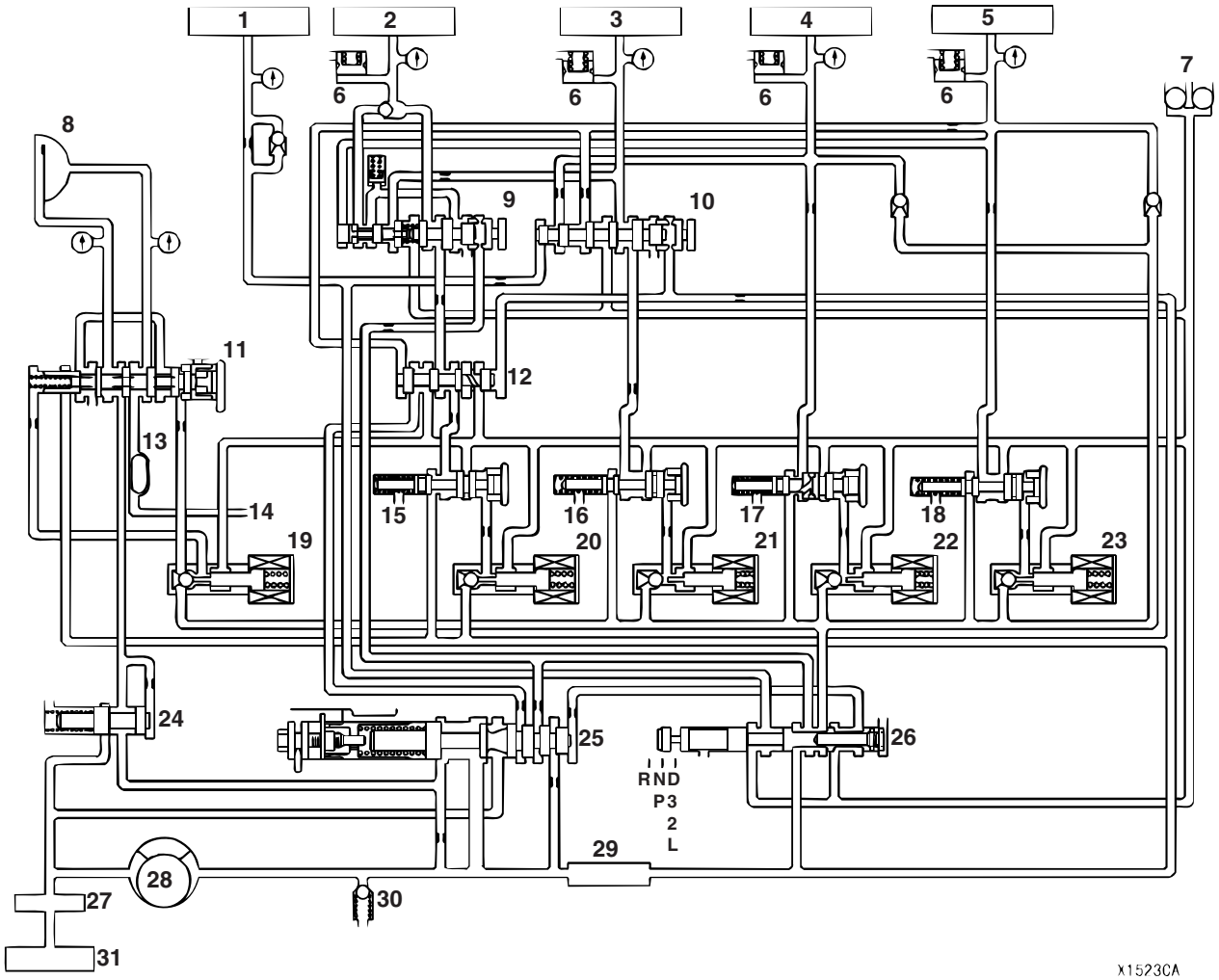


: LINE PRESSURE
: OIL PUMP SUCTION PRESSURE
: TORQUE CONVERTER CLUTCH PRESSURE
: TORQUE CONVERTER AND LUBRICATION PRESSURE
: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

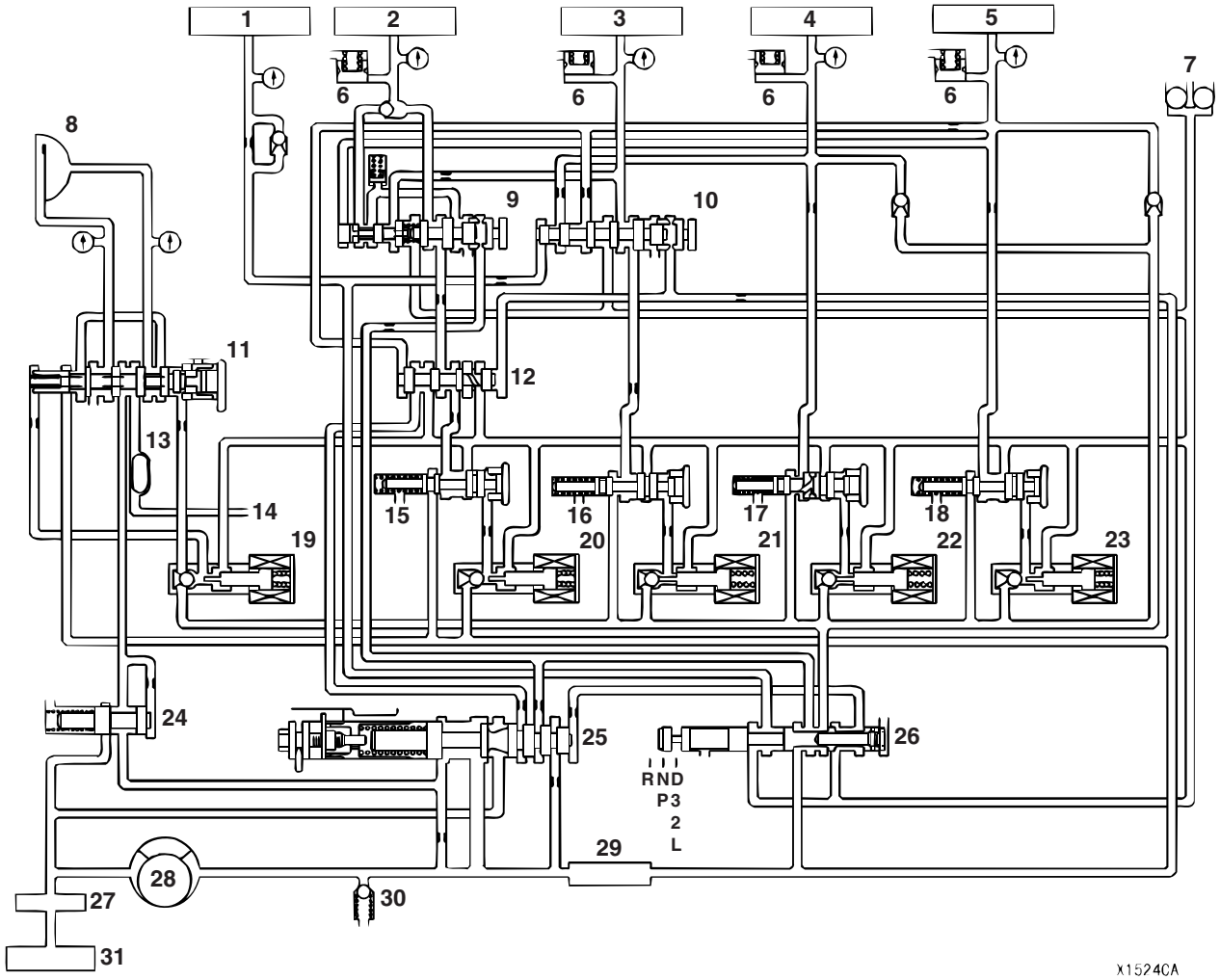
1ST GEAR <4A/T>



1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

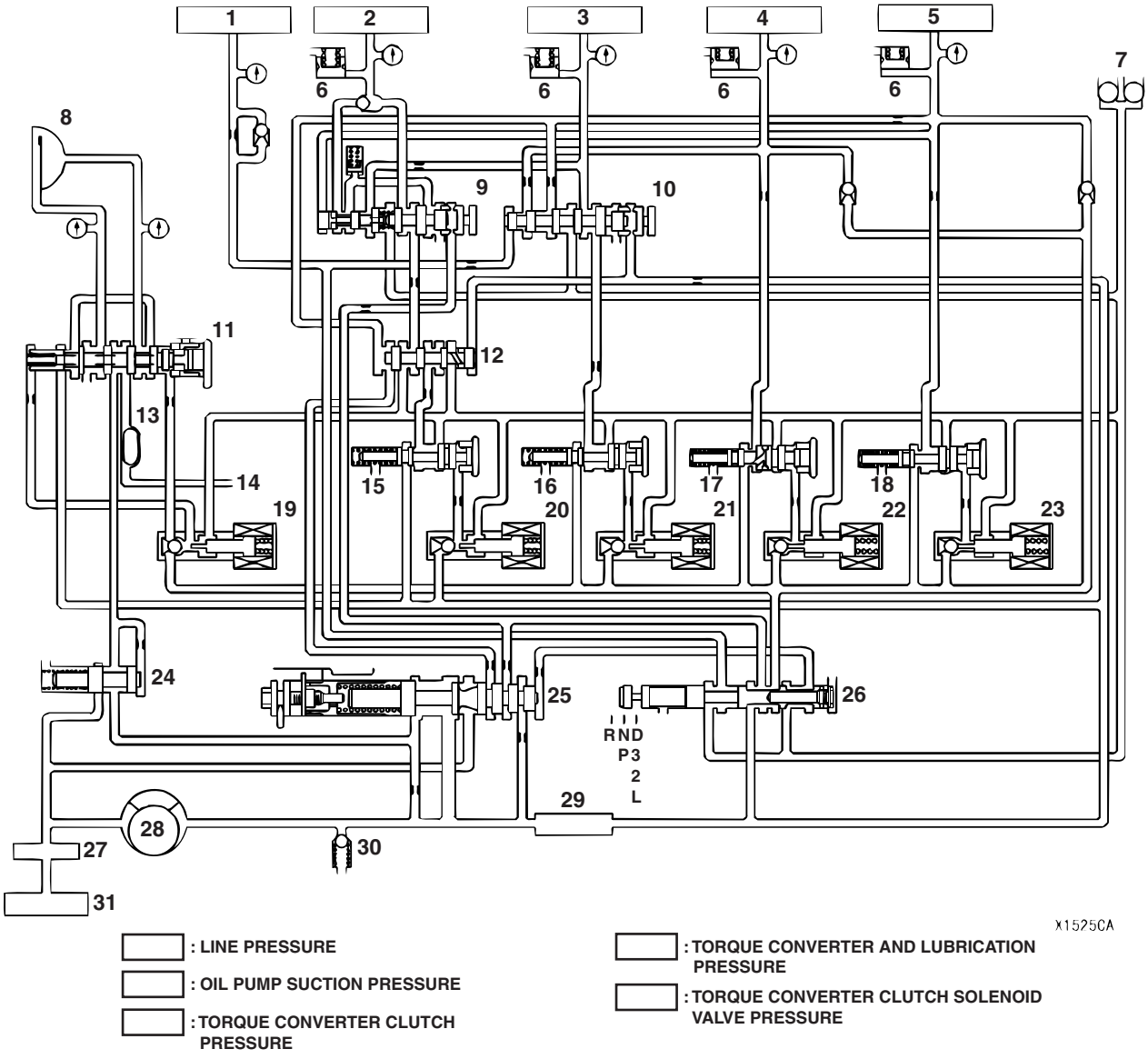
2ND GEAR <4A/T>



1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

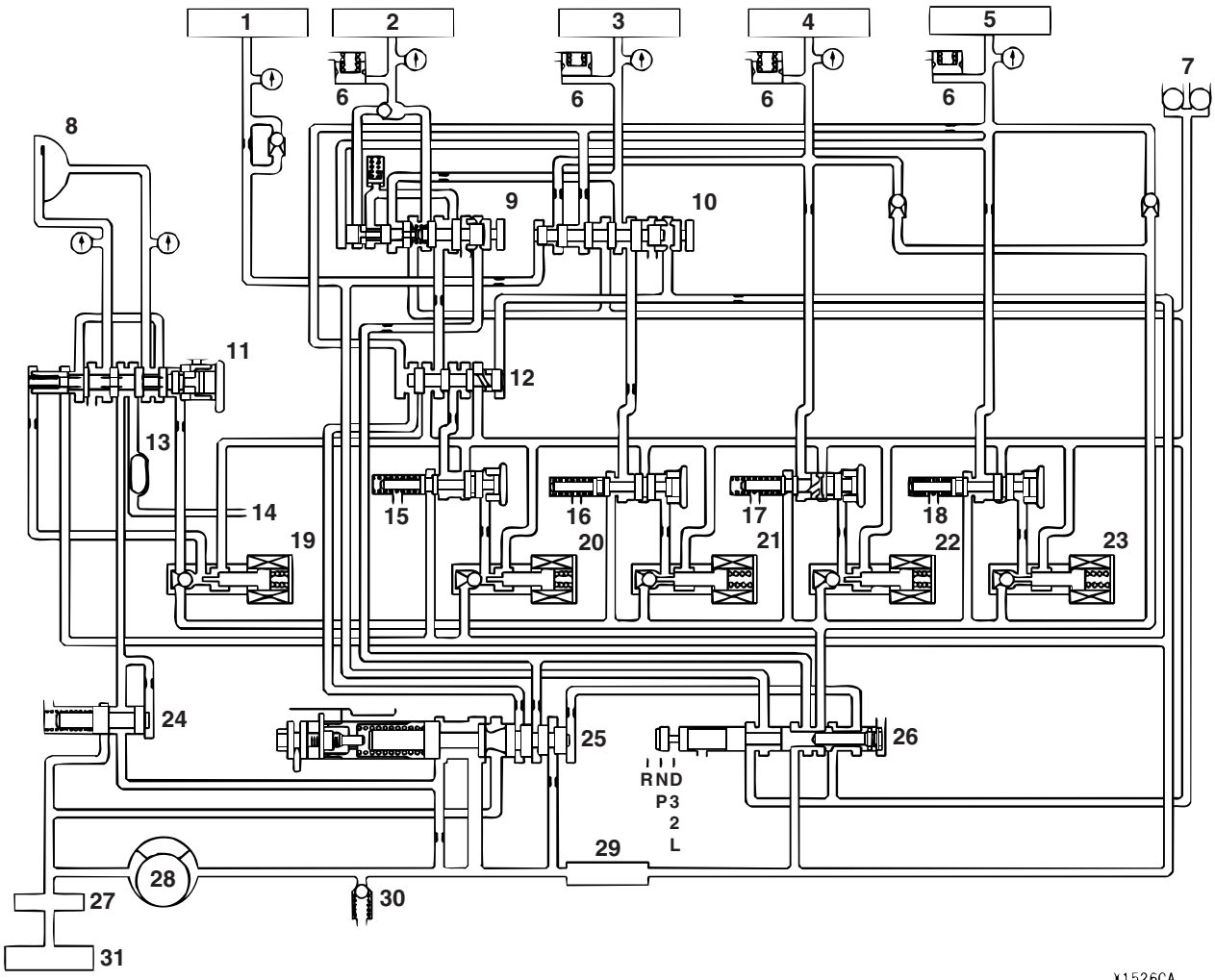
3RD GEAR <4A/T>



1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

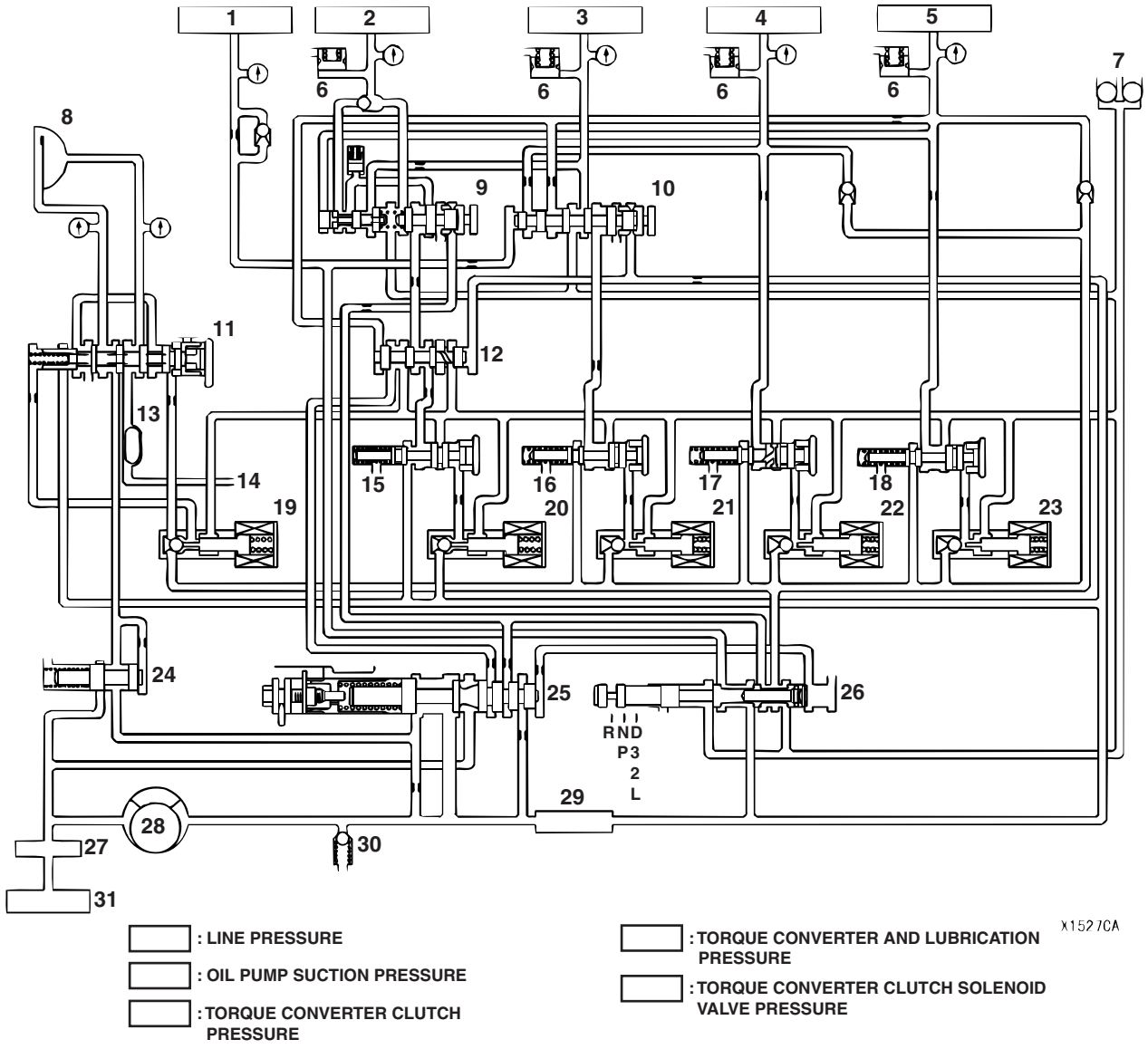
4TH GEAR <4A/T>



1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

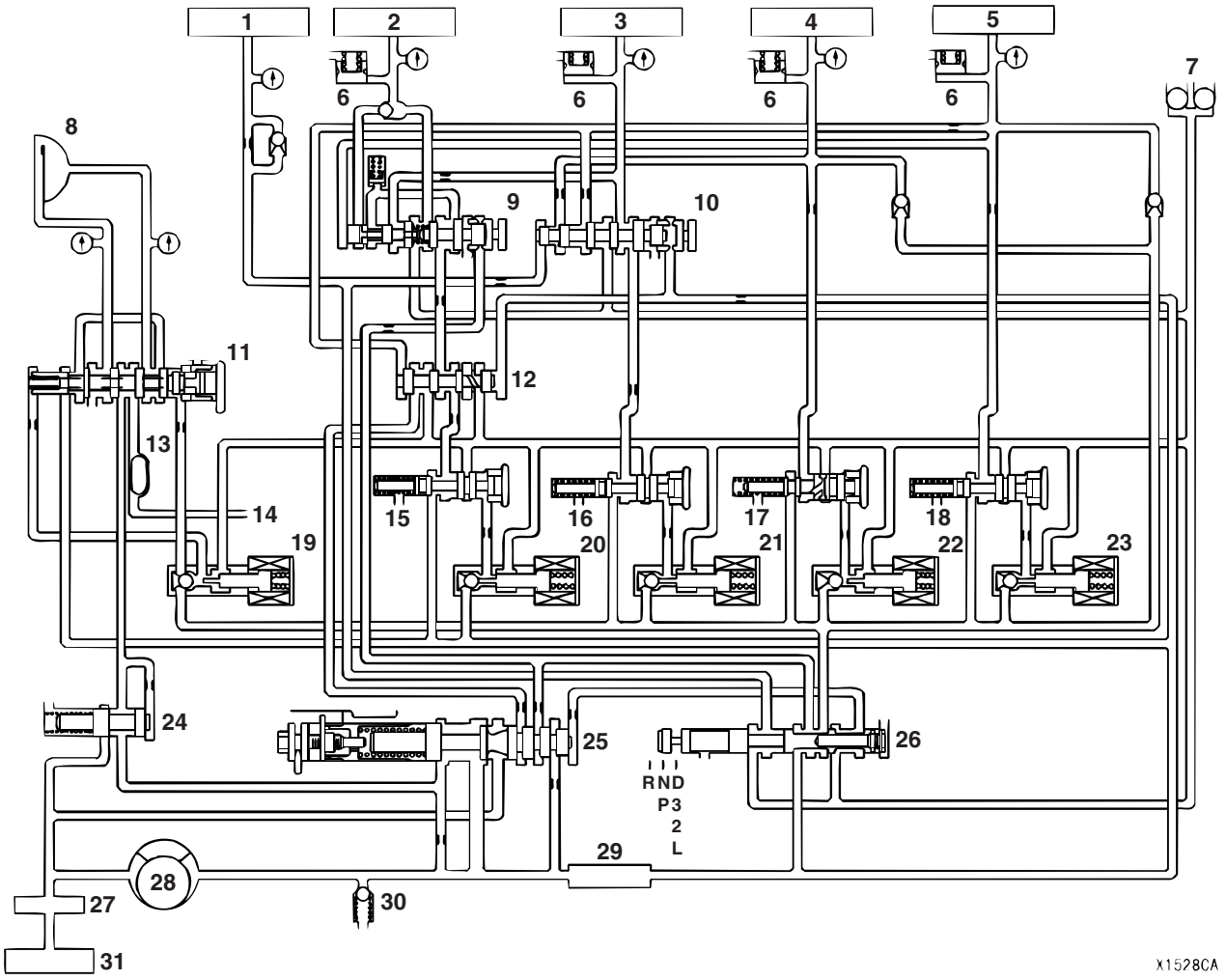
REVERSE GEAR <4A/T>



1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

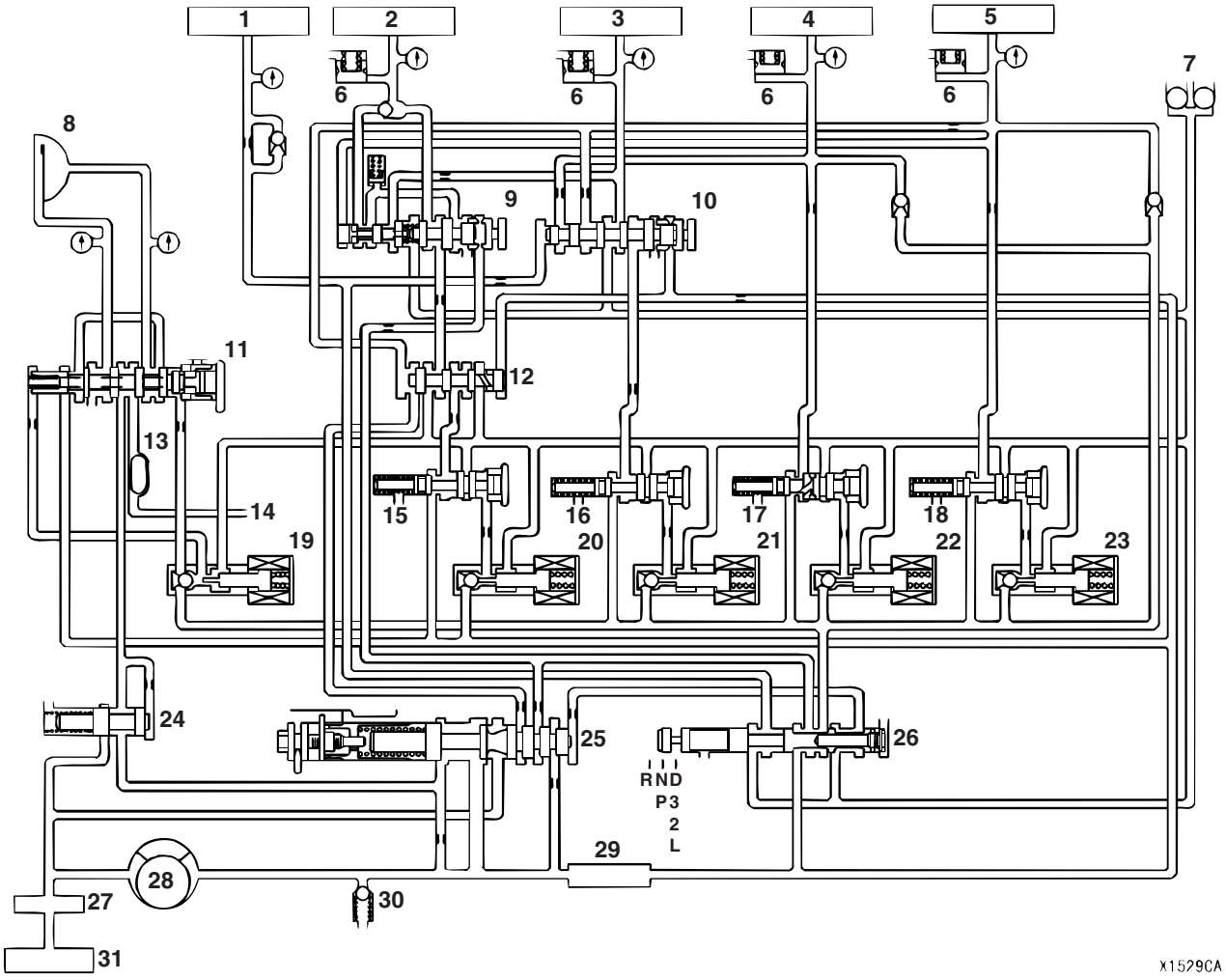
FAIL-SAFE (IN CASE OF FAIL-SAFE VALVE A OPERATION) <4A/T>



1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

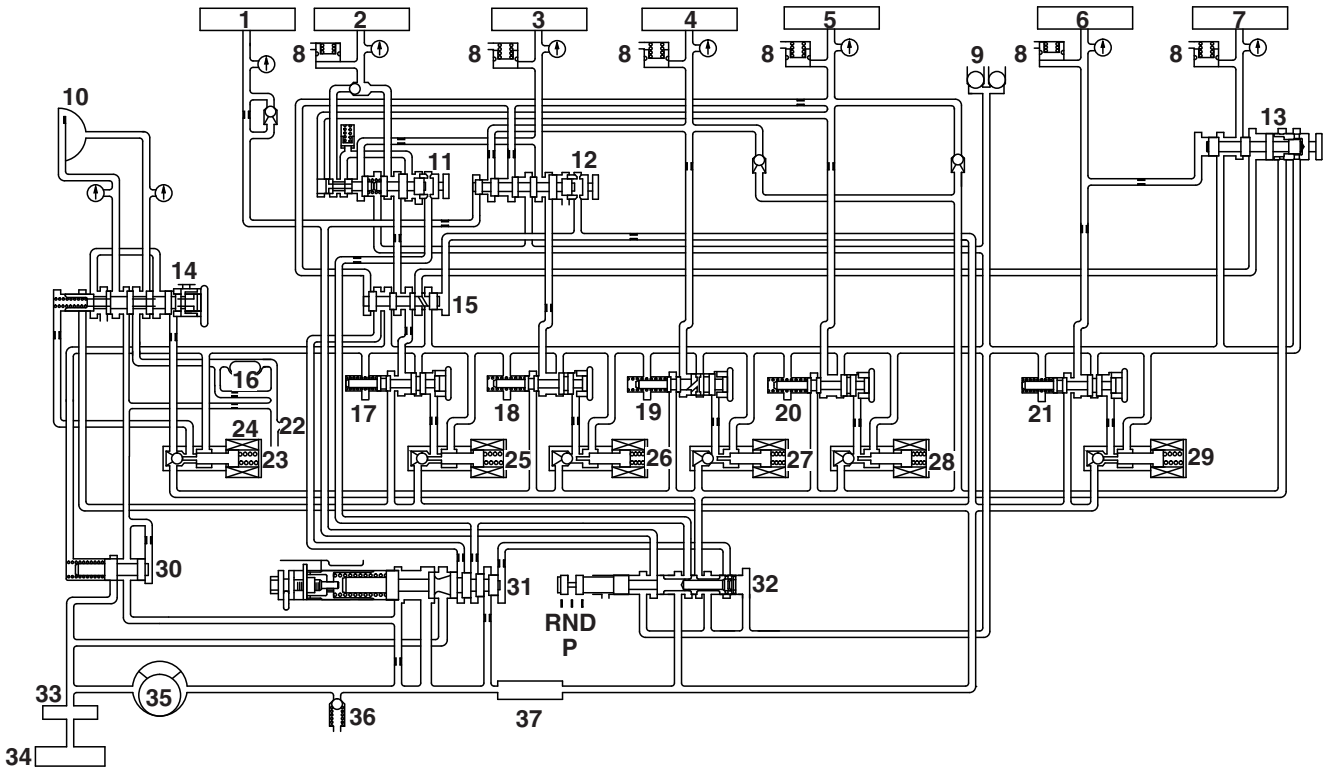
FAIL-SAFE (IN CASE OF FAIL-SAFE VALVE B OPERATION) <4A/T>



1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. ACCUMULATOR
7. CHECK BALL
8. TORQUE CONVERTER CLUTCH
9. FAIL SAFE VALVE A
10. FAIL SAFE VALVE B
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. TRANSMISSION FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE SOLENOID VALVE
21. SECOND SOLENOID VALVE
22. UNDERDRIVE SOLENOID VALVE
23. OVERDRIVE SOLENOID VALVE
24. TORQUE CONVERTER PRESSURE CONTROL VALVE
25. REGULATOR VALVE
26. MANUAL VALVE
27. OIL FILTER
28. OIL PUMP
29. OIL STRAINER
30. RELIEF VALVE
31. OIL PAN

TSB Revision

PARKING AND NEUTRAL <5A/T>



AC501664AB

: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

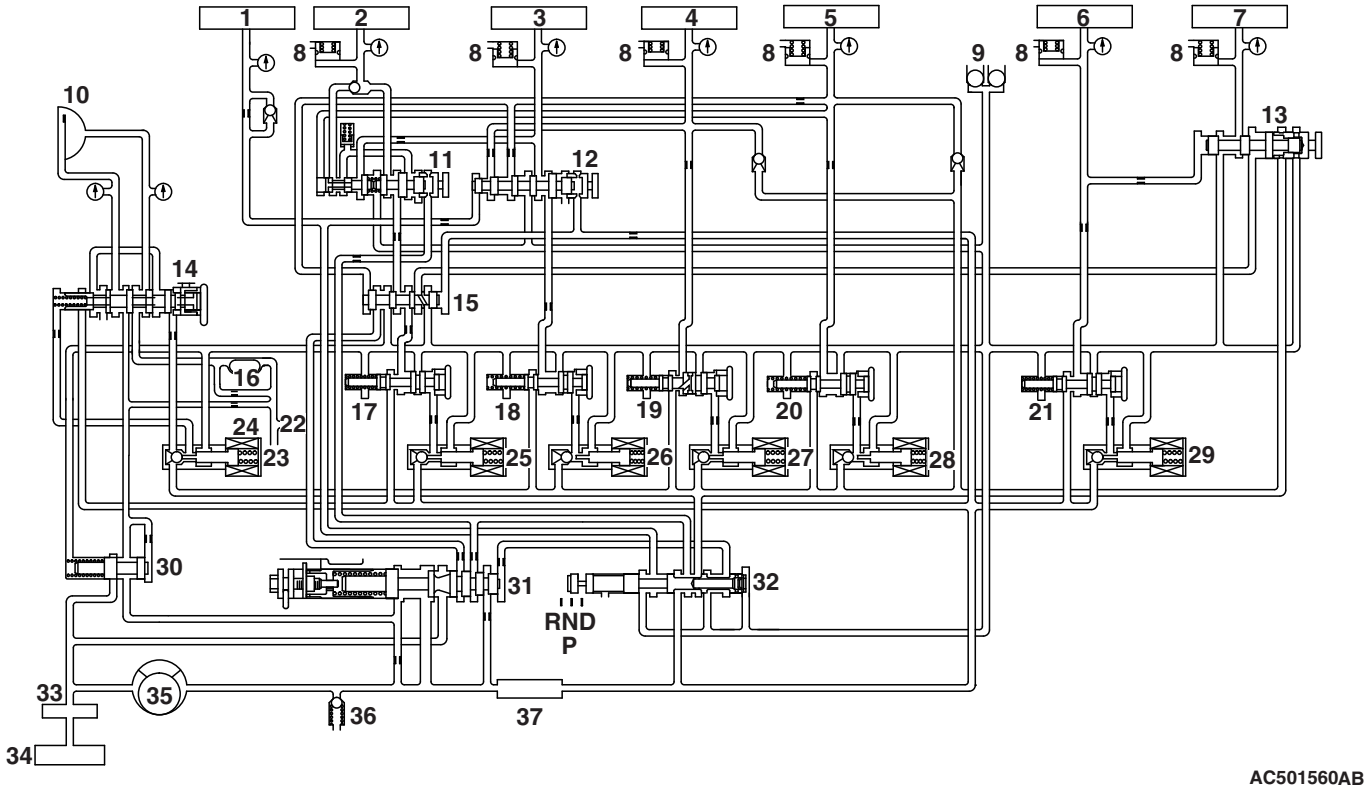
: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
7. DIRECT CLUTCH
8. ACCUMULATOR
9. CHECK BALL
10. TORQUE CONVERTER CLUTCH
11. FAIL SAFE VALVE A
12. FAIL SAFE VALVE B
13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
33. OIL FILTER
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

1ST GEAR <5A/T>



AC501560AB

: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
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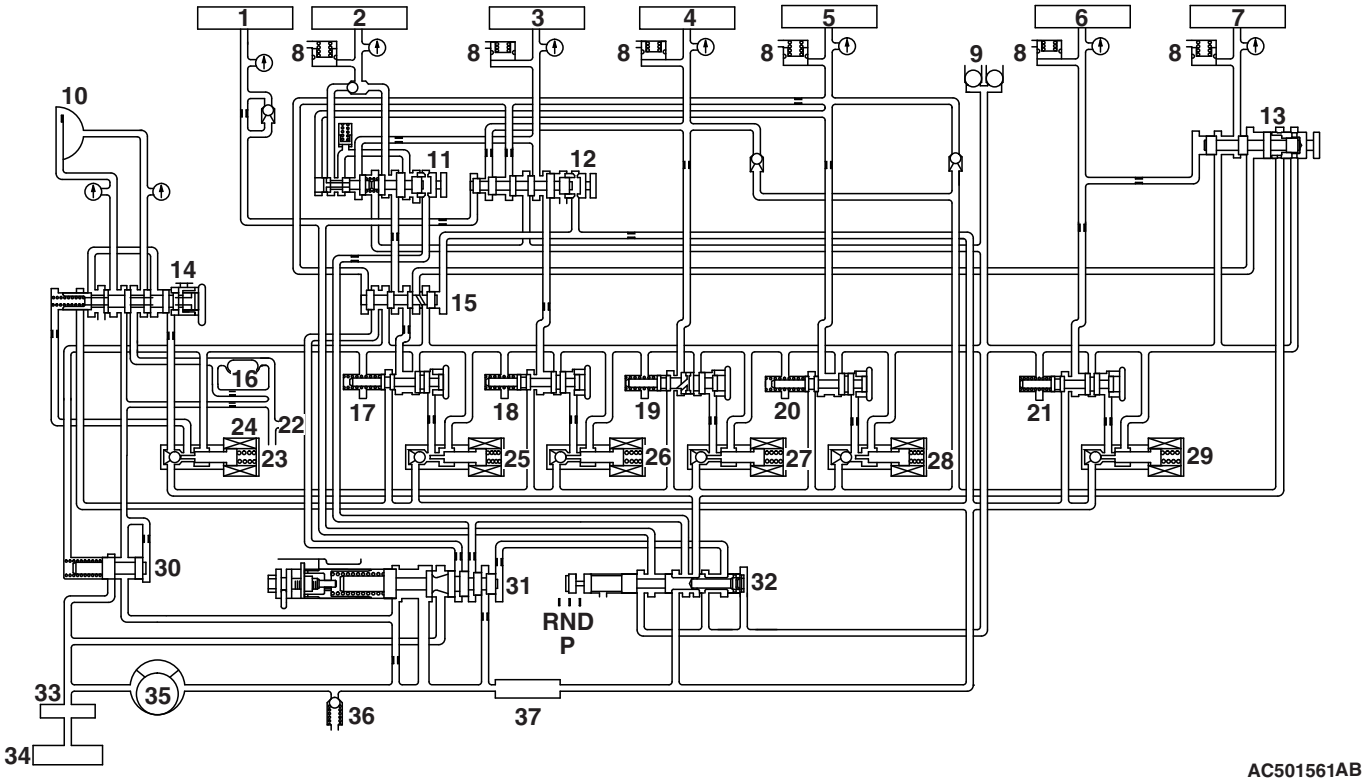
9. CHECK BALL
10. TORQUE CONVERTER CLUTCH
11. FAIL SAFE VALVE A
12. FAIL SAFE VALVE B
13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
33. OIL FILTER
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

2ND GEAR <5A/T>



: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
7. DIRECT CLUTCH
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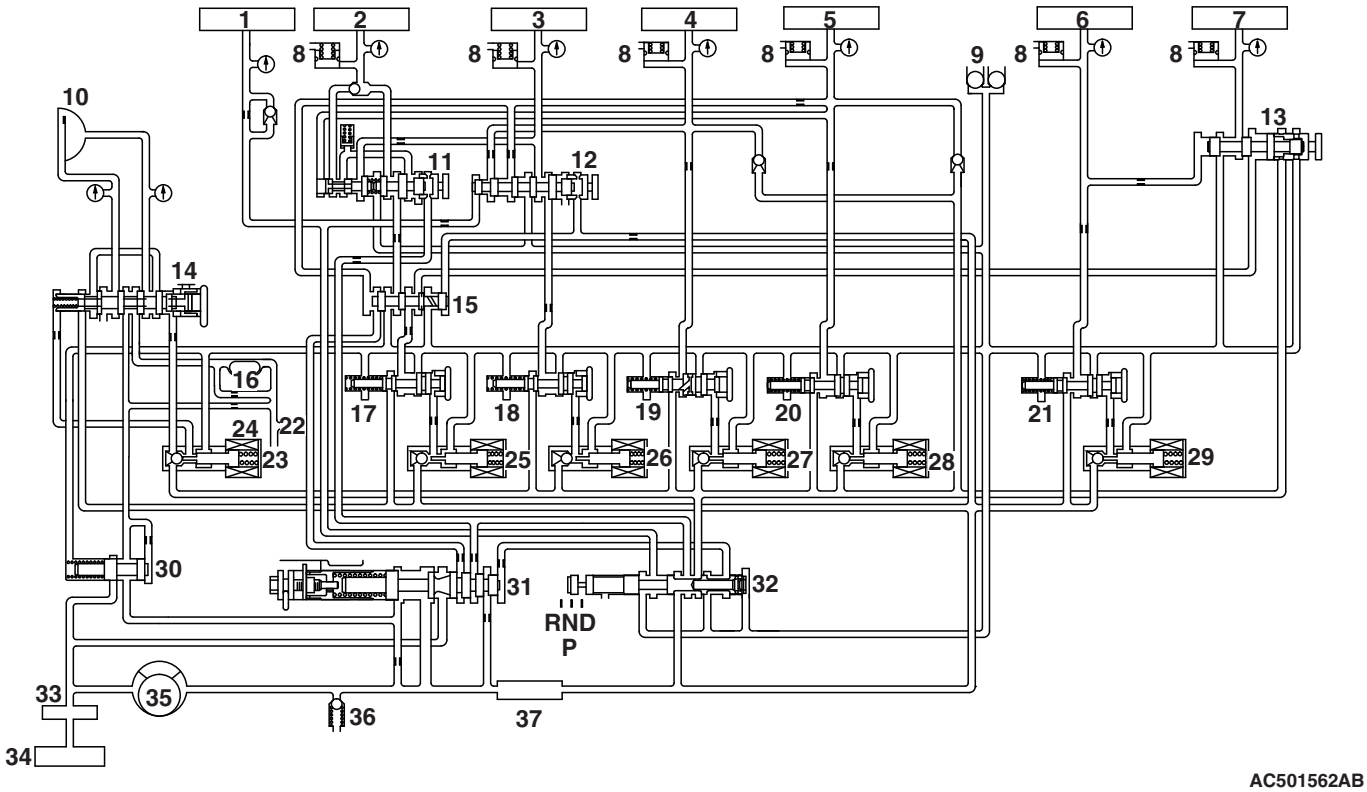
10. TORQUE CONVERTER CLUTCH
11. FAIL SAFE VALVE A
12. FAIL SAFE VALVE B
13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
33. OIL FILTER
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

3RD GEAR <5A/T>



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: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
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18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
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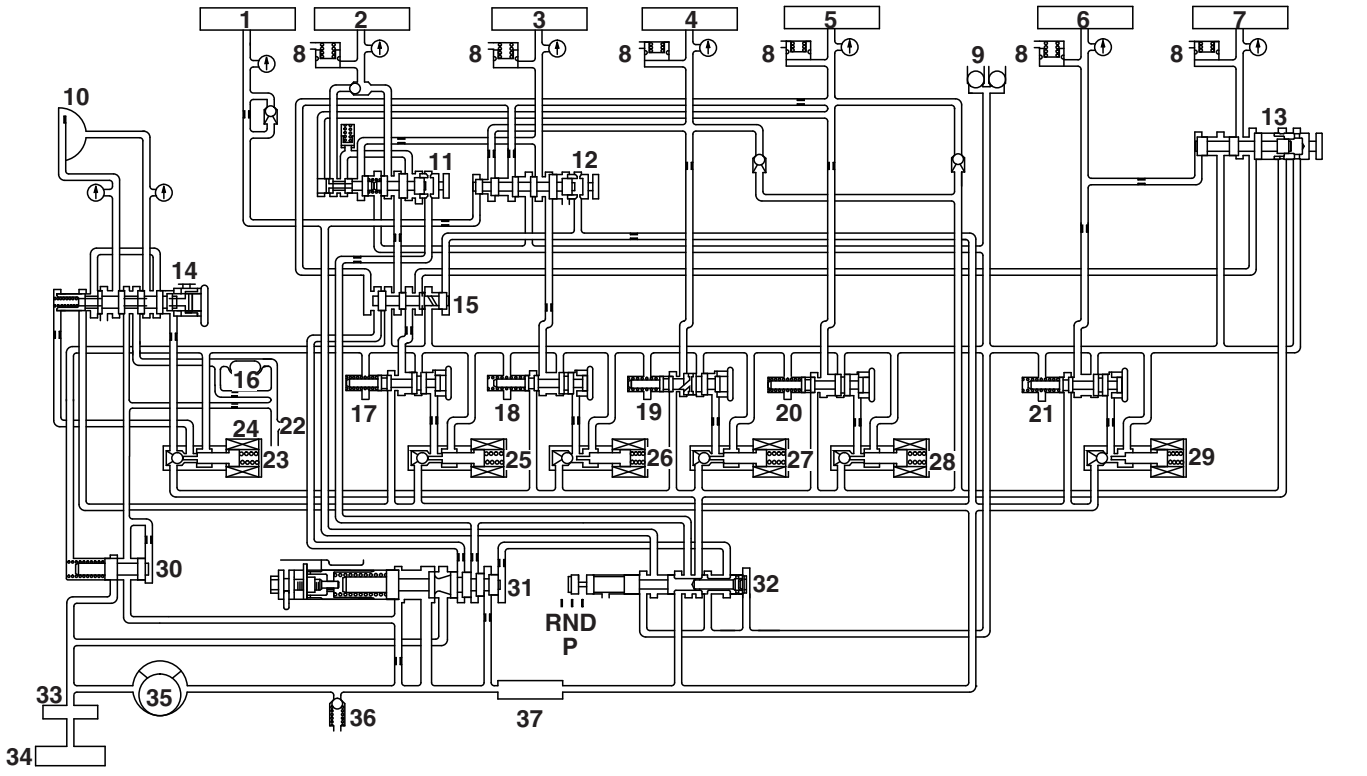
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

4TH GEAR <5A/T>



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: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
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11. FAIL SAFE VALVE A
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13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
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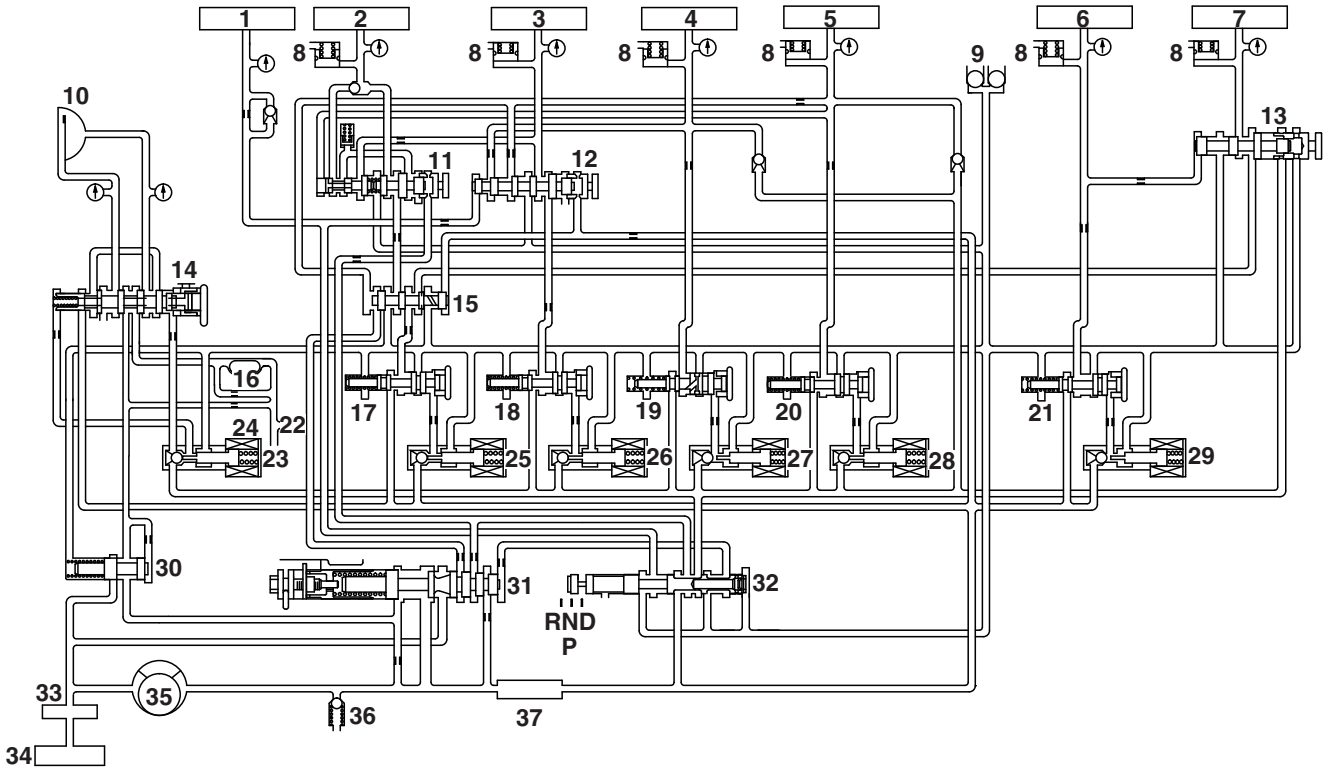
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

5TH GEAR <5A/T>



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: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
7. DIRECT CLUTCH
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12. FAIL SAFE VALVE B
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14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
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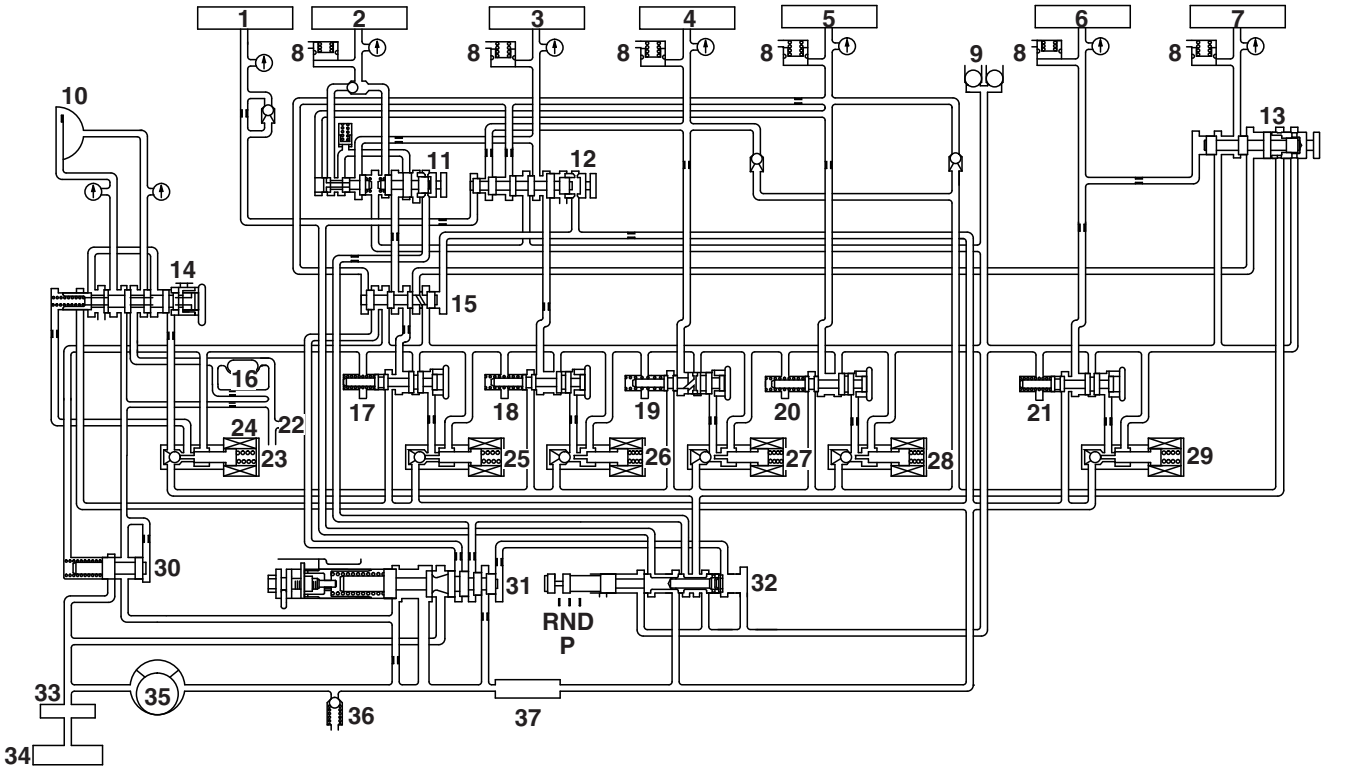
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

REVERSE GEAR <5A/T>



AC501565AB

: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
7. DIRECT CLUTCH
8. ACCUMULATOR
9. CHECK BALL
10. TORQUE CONVERTER CLUTCH
11. FAIL SAFE VALVE A
12. FAIL SAFE VALVE B
13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
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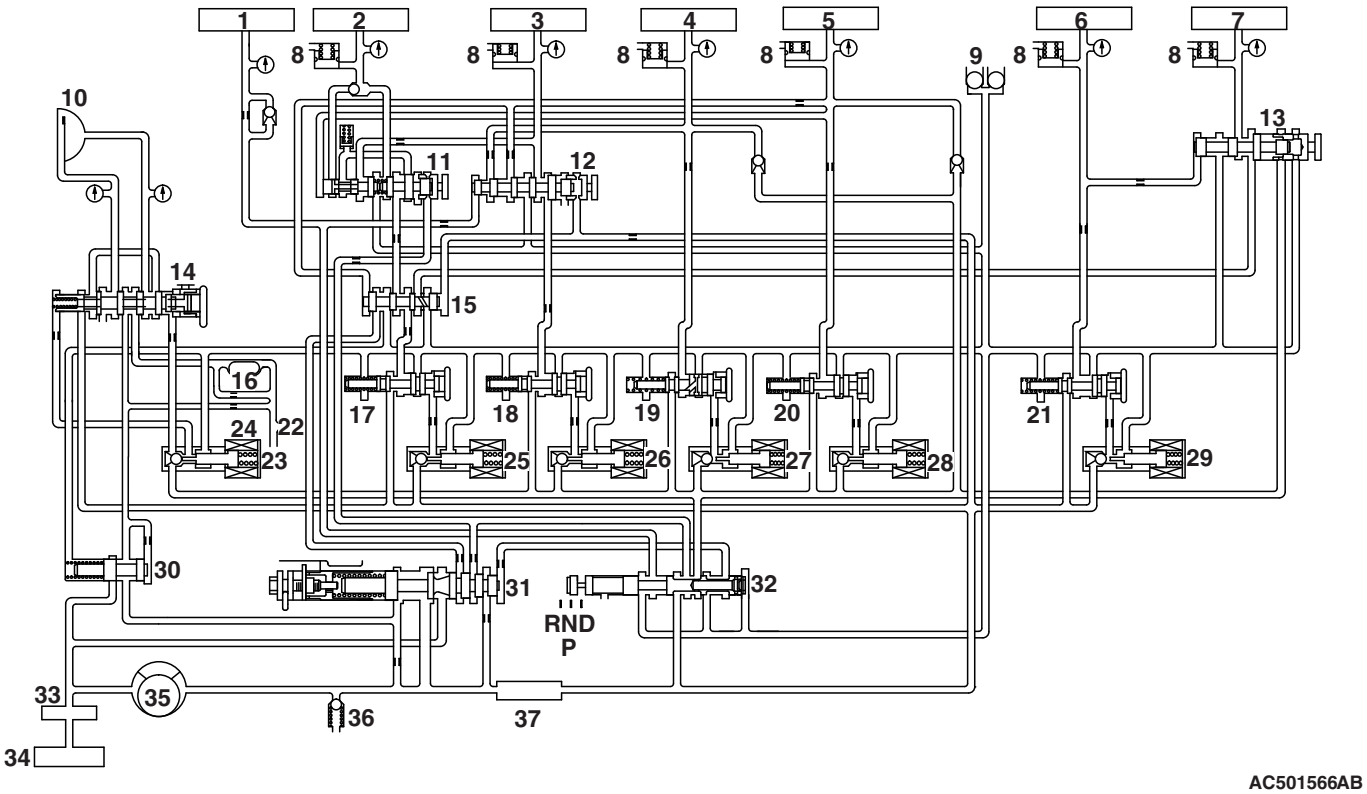
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
33. OIL FILTER
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

FAIL-SAFE (IN CASE OF FAIL-SAFE VALVE A OPERATION) <5A/T>



AC501566AB

: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

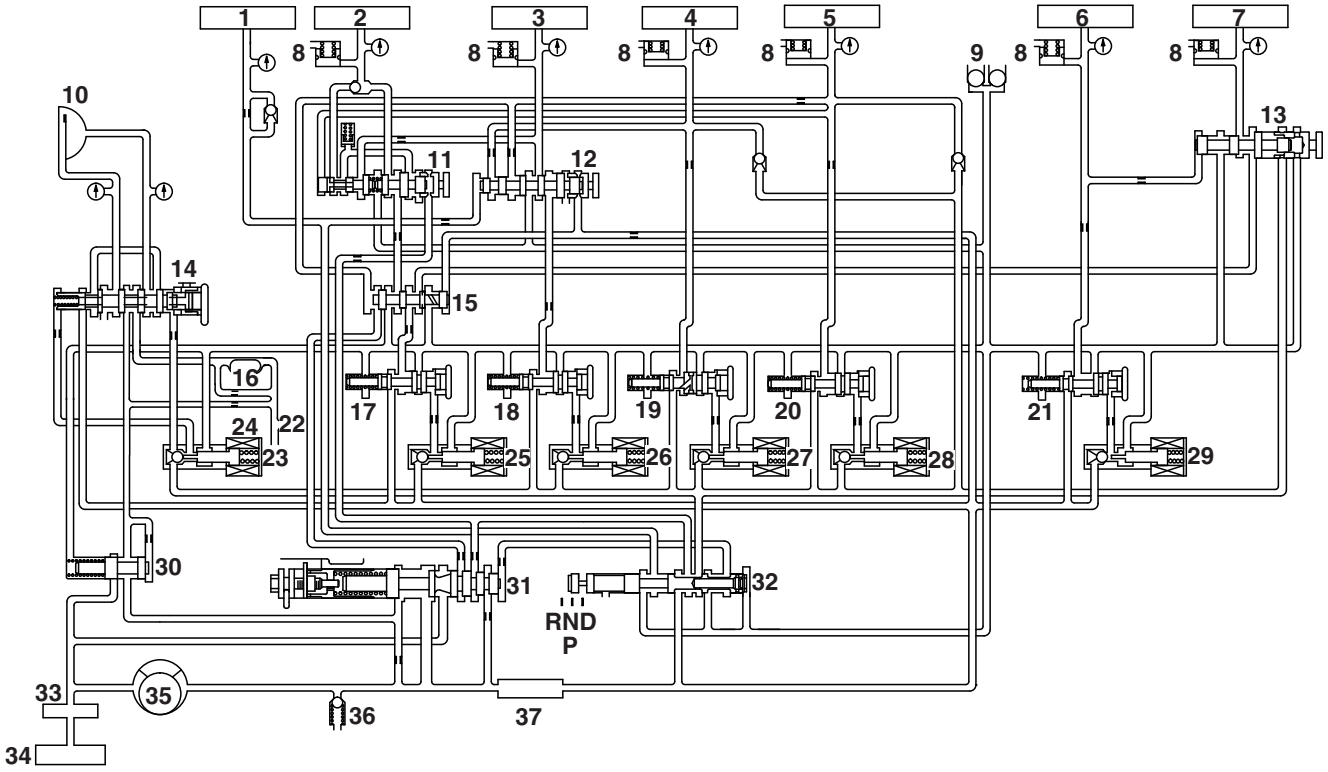
: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
7. DIRECT CLUTCH
8. ACCUMULATOR
9. CHECK BALL
10. TORQUE CONVERTER CLUTCH
11. FAIL SAFE VALVE A
12. FAIL SAFE VALVE B
13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
33. OIL FILTER
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

FAIL-SAFE (IN CASE OF FAIL-SAFE VALVE B OPERATION) <5A/T>



AC501567AB

: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

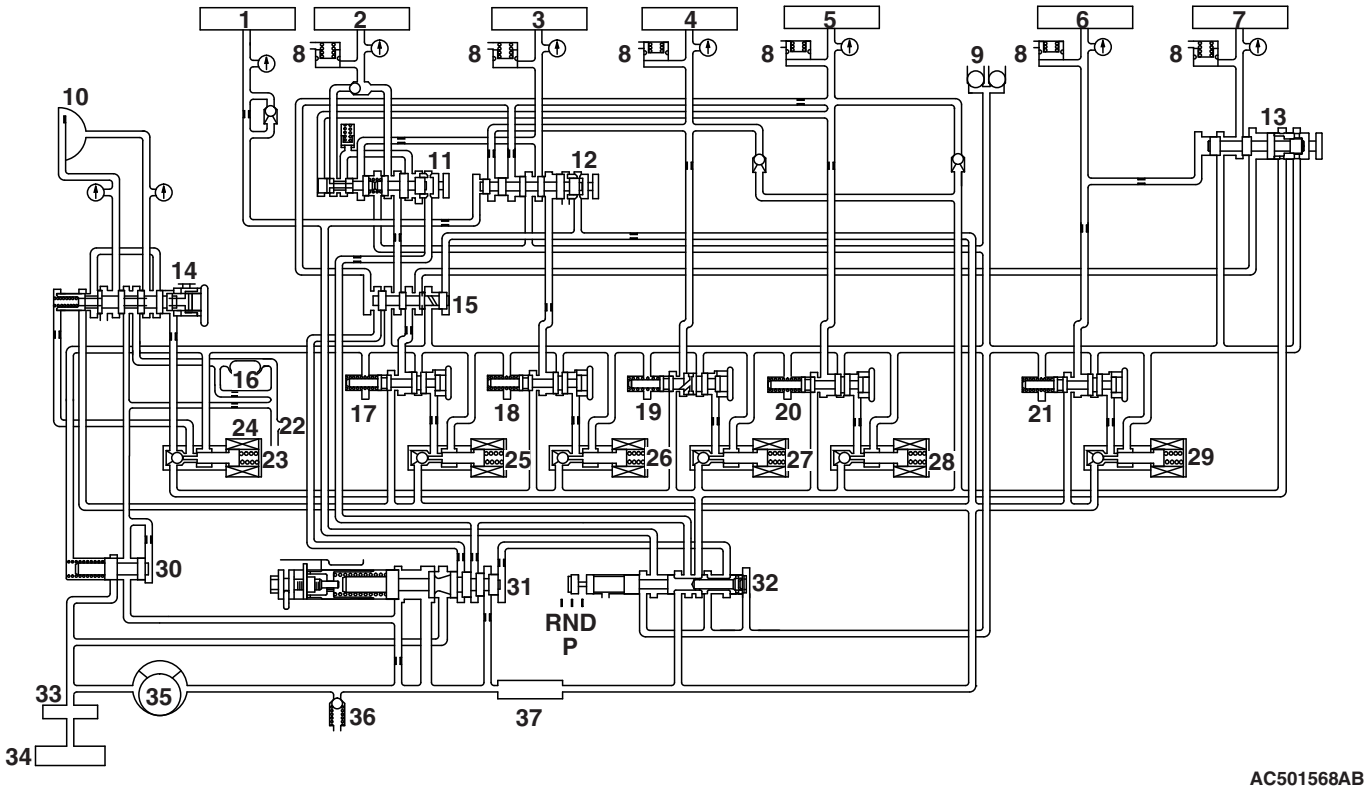
: TORQUE CONVERTER AND LUBRICATION PRESSURE

: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
7. DIRECT CLUTCH
8. ACCUMULATOR
9. CHECK BALL
10. TORQUE CONVERTER CLUTCH
11. FAIL SAFE VALVE A
12. FAIL SAFE VALVE B
13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
33. OIL FILTER
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

FAIL-SAFE (IN CASE OF FAIL-SAFE VALVE C OPERATION) <5A/T>



AC501568AB

: LINE PRESSURE

: OIL PUMP SUCTION PRESSURE

: TORQUE CONVERTER CLUTCH PRESSURE

: TORQUE CONVERTER AND LUBRICATION PRESSURE

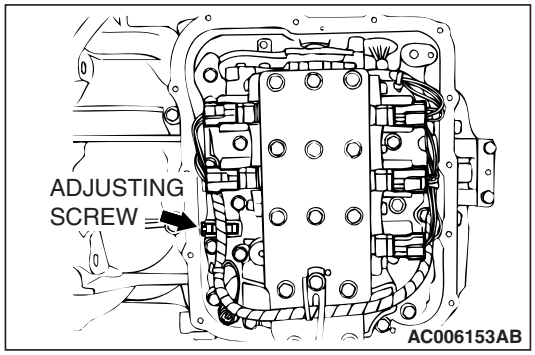
: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

1. REVERSE CLUTCH
2. LOW-REVERSE BRAKE
3. SECOND BRAKE
4. UNDERDRIVE CLUTCH
5. OVERDRIVE CLUTCH
6. REDUCTION BRAKE
7. DIRECT CLUTCH
8. ACCUMULATOR
9. CHECK BALL
10. TORQUE CONVERTER CLUTCH
11. FAIL SAFE VALVE A
12. FAIL SAFE VALVE B
13. FAIL SAFE VALVE C
14. TORQUE CONVERTER CLUTCH CONTROL VALVE
15. SWITCH VALVE
16. TRANSMISSION FLUID COOLER
17. LOW-REVERSE PRESSURE CONTROL VALVE
18. SECOND PRESSURE CONTROL VALVE
19 UNDERDRIVE PRESSURE CONTROL VALVE
20. OVERDRIVE PRESSURE CONTROL VALVE
21. REDUCTION PRESSURE CONTROL VALVE
22. LUBRICATION
23. LUBRICATION
24. TORQUE CONVERTER CLUTCH SOLENOID VALVE
25. LOW-REVERSE SOLENOID VALVE
26. SECOND SOLENOID VALVE
27. UNDERDRIVE SOLENOID VALVE
28. OVERDRIVE SOLENOID VALVE
29. REDUCTION SOLENOID VALVE
30 TORQUE CONVERTER PRESSURE CONTROL VALVE
31. REGULATOR VALVE
32. MANUAL VALVE
33. OIL FILTER
34. OIL PUMP
35. OIL STRAINER
36. RELIEF VALVE
37. OIL PAN

TSB Revision

LINE PRESSURE ADJUSTMENT

M1231001700361



1. Drain the transmission fluid.

   NOTE: The hydraulic pressure test must be performed before attempting any adjustments.
2. Remove the valve body cover.
3. Turn the adjusting screw shown in the illustration to adjust the line pressure to the standard value. The pressure increases when the screw is turned counterclockwise.

   NOTE: When adjusting the line pressure, adjust to the middle of the standard value range.

   Standard value: 0.98 – 1.05 MPa (142 – 152 psi)
4. Install the valve body cover. Pour in one quart transmission fluid.
5. Repeat the hydraulic pressure test. (Refer to P.23A-37). Readjust the line pressure if necessary.

DIAGNOSTIC TROUBLE CODE CHART

M1231007900716

⚠ CAUTION
During diagnosis, a DTC code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for DTC code(s). If DTC code(s) are set, erase them all.

A/T DTC NO.	MFI DTC NO.	DIAGNOSIS ITEM		REFERENCE PAGE
P1606	–	EEPROM malfunction		P.23A-67
P1763	P0713	Transmission fluid temperature sensor system	Open circuit	P.23A-68
P1764	P0712		Short circuit	P.23A-82
P1766	P0715	Input shaft speed sensor system	Short circuit/open circuit	P.23A-92
P1767	P0720	Output shaft speed sensor system	Short circuit/open circuit	P.23A-113
P1769	–	Stoplight switch system	Short circuit	P.23A-134
P1770	P0705	Transmission range switch system	Open circuit	P.23A-143
P1771			Short circuit	P.23A-175
P1773	P0753	Low-reverse solenoid valve system	Short circuit/open circuit	P.23A-190
P1774	P0758	Underdrive solenoid valve system	Short circuit/open circuit	P.23A-204
P1775	P0763	Second solenoid valve system	Short circuit/open circuit	P.23A-216
P1776	P0768	Overdrive solenoid valve system	Short circuit/open circuit	P.23A-228
P1777	P0773	Reduction solenoid valve system <5A/T>	Short circuit/open circuit	P.23A-240
P1778	P0743	Torque converter clutch solenoid valve system	Short circuit/open circuit	P.23A-252
P1779	P0731	1st gear incorrect ratio		P.23A-264
P1780	P0732	2nd gear incorrect ratio		P.23A-264
P1781	P0733	3rd gear incorrect ratio		P.23A-264
P1782	P0734	4th gear incorrect ratio		P.23A-264
P1783	P0735	5th gear incorrect ratio <5A/T>		P.23A-264
P1784	P0736	Reverse gear incorrect ratio		P.23A-264
P1786	P0741	Torque converter clutch system	Defective system	P.23A-280
P1787	P0742		Clutch stuck on	P.23A-285
P1788	P1751	A/T control relay system	Short circuit to ground/open circuit	P.23A-289

NOTE: The MFI diagnostic trouble codes are the codes which are set when item "MFI" is selected on scan tool MB991958 (M.U.T.-III sub assembly). However, the codes above indicate failure in the automatic transmission.

TSB Revision

SYMPTOM CHART

M1231008000620

⚠ CAUTION

During diagnosis, a DTC code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for DTC code(s). If DTC code(s) are set, erase them all.

SYMPTOM		INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool is not possible	Communication with the PCM only is impossible	-	Group 13A <2.4L Engine>, Symptom Procedures P.13A-1055. Group 13B <3.8L Engine>, Symptom Procedures P.13B-1078.
Driving impossible	Engine does not start	1	P.23A-304
	Does not move forward	2	P.23A-307
	Does not move backward	3	P.23A-310
	Does not move (forward and backward)	4	P.23A-312
Malfunction when moving selector into gear	Engine stalls when moving selector lever from "N" to "D" or "N" to "R"	5	P.23A-314
	Shift shock when shifting from "N" to "D" and long delay	6	P.23A-315
	Shift shock when shifting from "N" to "R" and long delay	7	P.23A-319
	Shift shock when shifting from "N" to "D" and "N" to "R" and long delay	8	P.23A-322
Malfunction when shifting	Shift shock and slipping	9	P.23A-323
Does not shift properly	Early or late shifting in all gears	10	P.23A-326
	Early or late shifting in some gears	11	P.23A-330
Does not shift	No diagnostic trouble codes	12	P.23A-332
Malfunction while driving	Poor acceleration	13	P.23A-337
	Vibration	14	P.23A-339
Shift switch assembly system		15	P.23A-342
Shift position indicator light system		16	P.23A-365

TSB Revision

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC P1606: EEPROM Malfunction

DTC SET CONDITIONS

DTC P1606 will be set when abnormal conditions are encountered in the A/T side area of EEPROM.

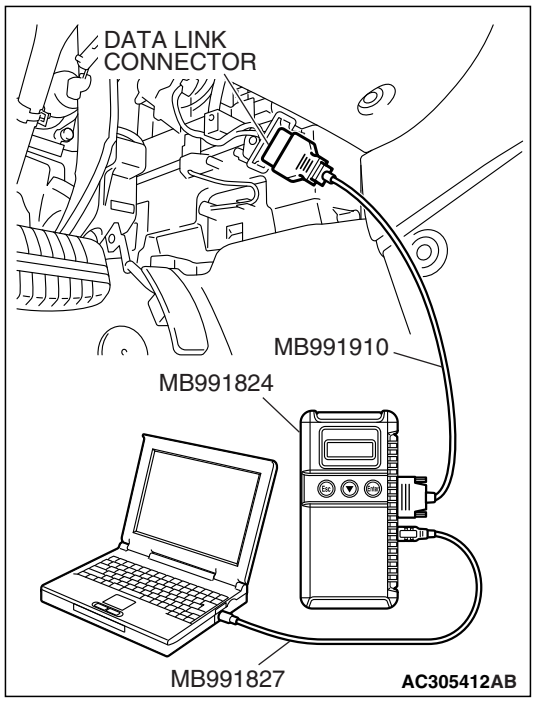
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the PCM

DIAGNOSIS

Required Special Tools:

- MB991958: Scan tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: USB Cable
  - MB991910: Main Harness A



STEP 1. Using scan tool MB991958, read the diagnostic trouble code (DTC)

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK"(OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) After the DTC has been deleted, read the DTC again.
(4) Turn the ignition switch to the "LOCK"(OFF) position.

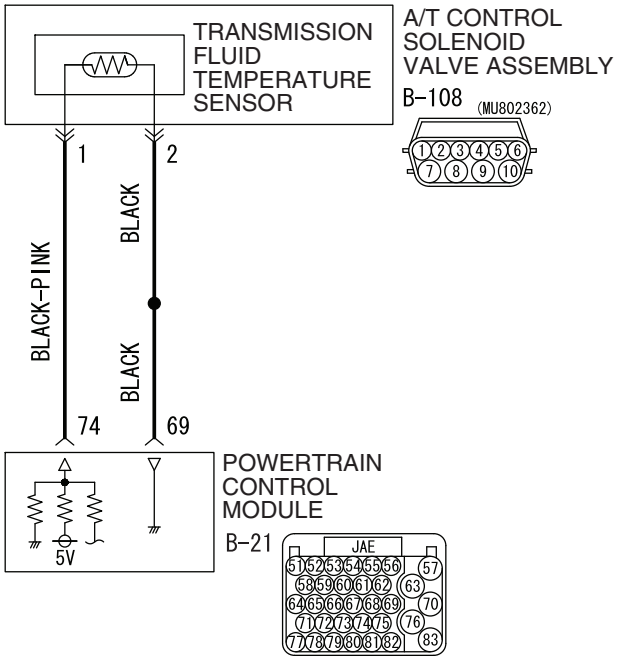
Q: Is DTC P1606 set?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

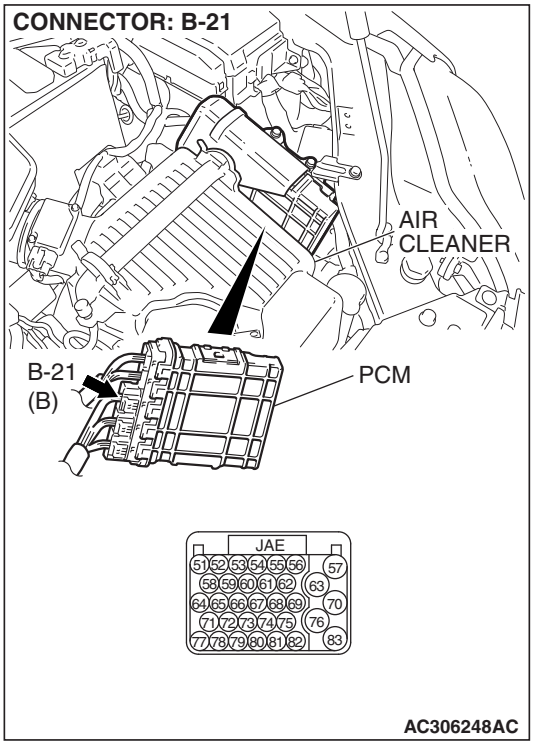
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

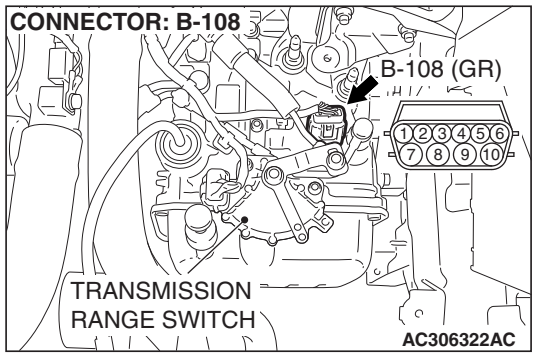
DTC P1763 (P0713): Transmission Fluid Temperature Sensor System (Open Circuit)

Transmission Fluid Temperature Sensor System Circuit



W4P06M00AA
AC209753AC





TSB Revision

CIRCUIT OPERATION

- The PCM (terminal 74) applies 5 volts to the transmission fluid temperature sensor output terminal (terminal 1).
- The transmission fluid temperature sensor circuit is grounded to the PCM (terminal 69).
- When the transmission fluid temperature is cold, the transmission fluid temperature sensor resistance is high. When the transmission fluid temperature is hot, the transmission fluid temperature sensor resistance is low.

DESCRIPTIONS OF MONITOR METHODS

- If transmission fluid temperature is below specified value even after driving test for more than specified period, PCM judges that transmission fluid temperature sensor has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

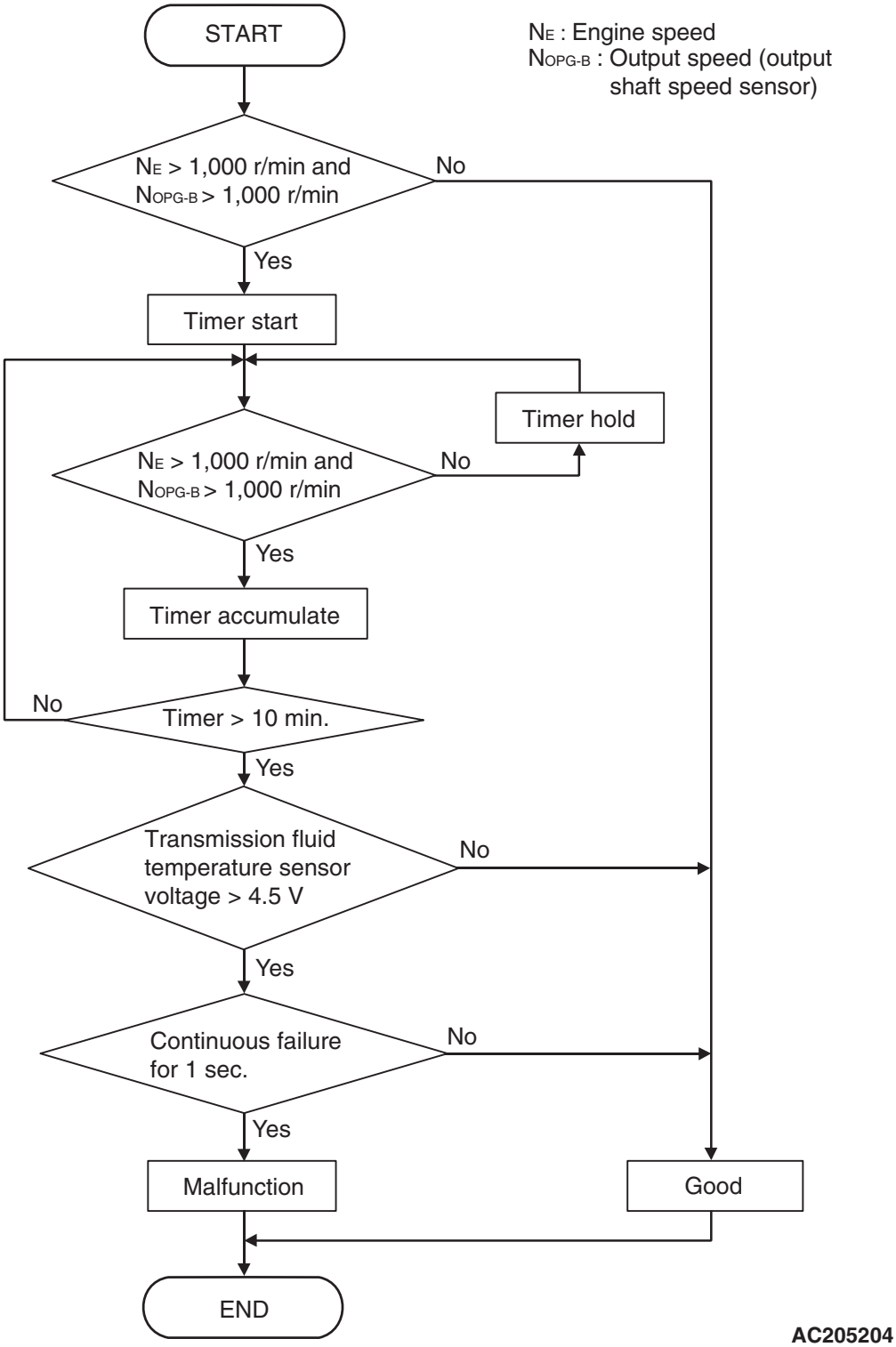
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC P1767 (P0720): Output shaft speed sensor malfunction

Sensor (The sensor below is determined to be normal)

- Output shaft speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



AC205204

DTC SET CONDITIONS

Check Conditions

- Engine speed: 1,000 r/min or more.
- Output speed: 1,000 r/min or more.
- Accumulated time in above condition: 10 minutes.

Judgement Criteria

- Transmission fluid temperature sensor voltage: 4.5 volts or more. (1 second)

TSB Revision

OBD-II DRIVE CYCLE PATTERN

Start the engine, drive at 60 km/h (37 mph) or more for 15 minutes in total.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the transmission fluid temperature sensor circuit
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check data list item 7: Transmission Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 7: Transmission Fluid Temperature Sensor.
  - When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

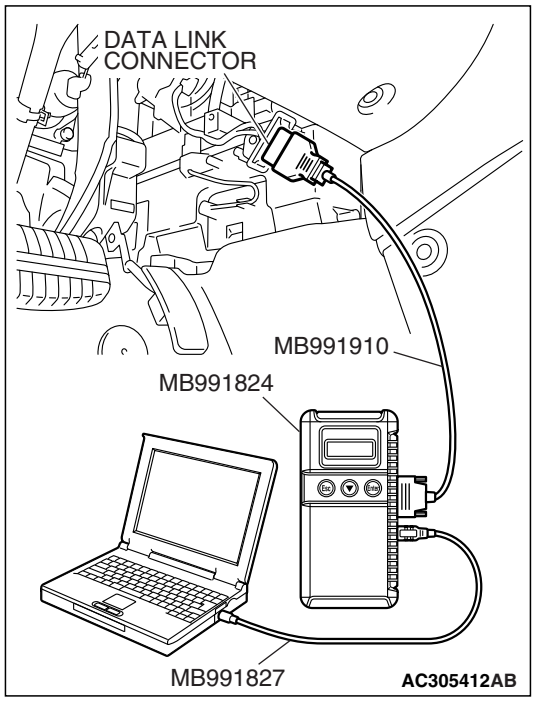
    NOTE: Set scan tool MB991958 to the data reading mode for item number 5, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the Transmission Fluid Temperature Sensor.
  - When the engine is warm: 70 – 80°C (158 – 176°F).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

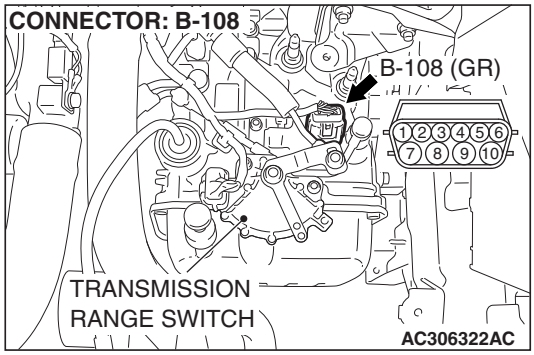
Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

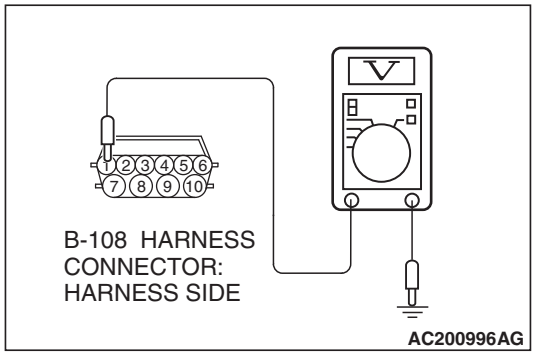
NO : Go to Step 2.



STEP 2. Measure the sensor output voltage at the A/T control solenoid valve assembly connector B-108 by backprobing.



(1) Do not disconnect connector B-108.
(2) Turn the ignition switch to the "ON" position.



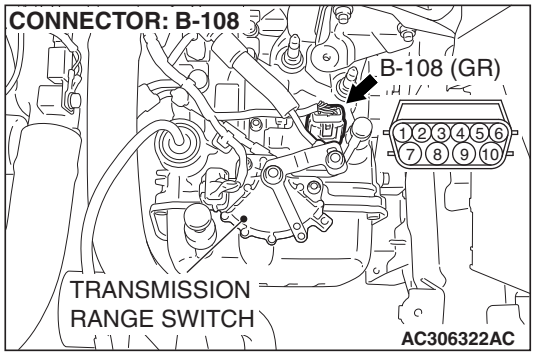
(3) Measure the voltage between terminal 1 and ground by backprobing.
- When transmission fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When transmission fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When transmission fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

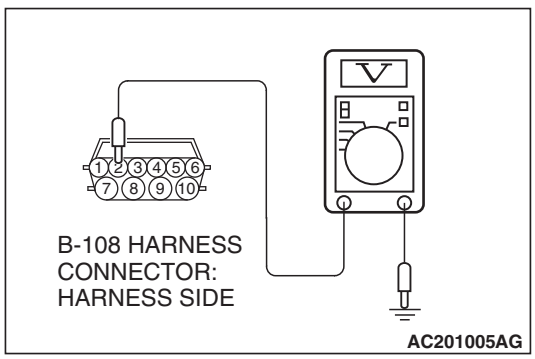
Q: Is the measured voltage within the specified range?

YES : Go to Step 6.
NO : Go to Step 3.

STEP 3. Measure the ground voltage at the A/T control solenoid valve assembly connector B-108 by backprobing.



(1) Do not disconnect connector B-108.
(2) Turn the ignition switch to the "ON" position.

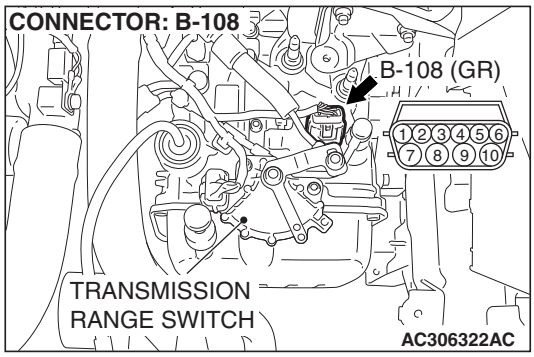


(3) Measure the voltage between terminal 2 and ground by backprobing.
- The voltage should measure 0.5 volt or less.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volt or less?

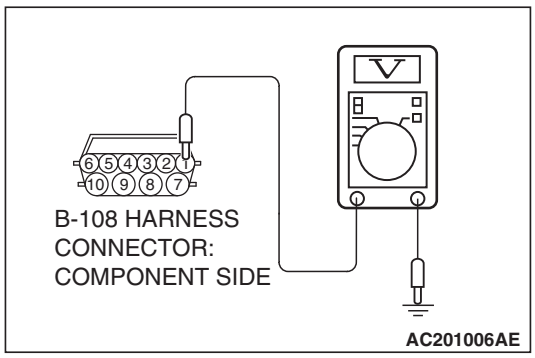
YES : Go to Step 4.
NO : Go to Step 7.



STEP 4. Check the sensor output voltage at A/T control solenoid valve assembly connector B-108.

(1) Disconnect connector B-108 and measure at the harness side.

(2) Turn the ignition switch to the "ON" position.



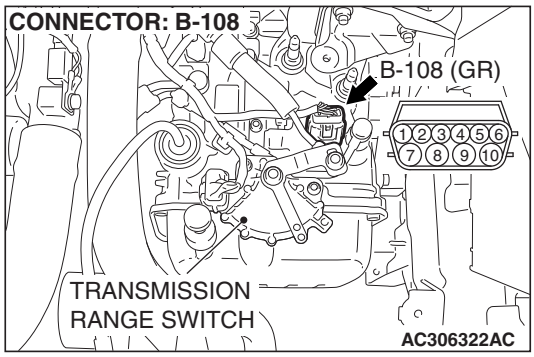
(3) Measure the voltage between terminal 1 and ground.
- The voltage should measure between 4.5 and 4.9 volts.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.5 and 4.9 volts?

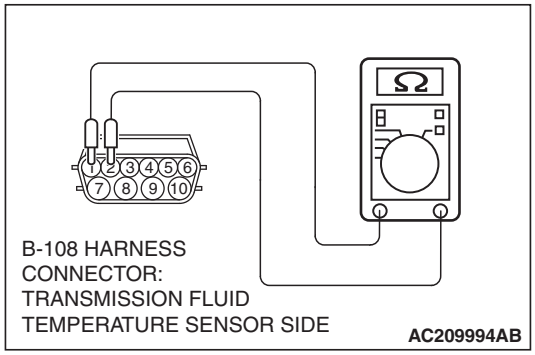
YES : Go to Step 5.

NO : Go to Step 9.



STEP 5. Check the transmission fluid temperature sensor at A/T control solenoid valve assembly connector B-108.

(1) Disconnect connector B-108 and measure at the sensor side.

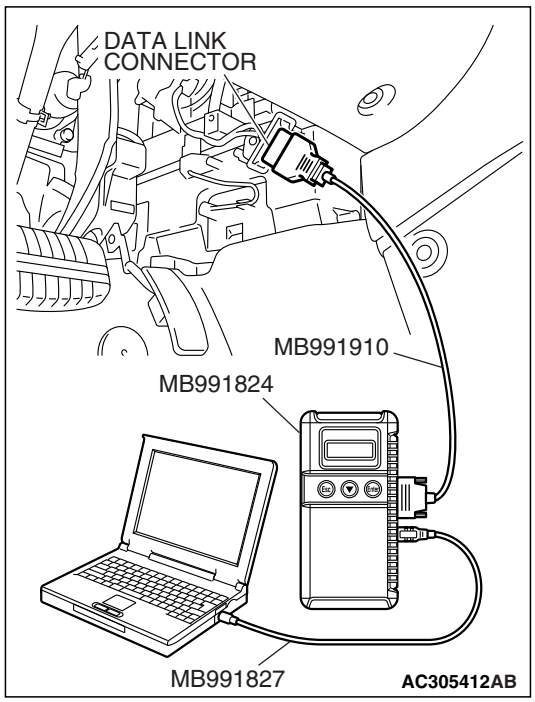


(2) Measure the resistance between terminal 1 and 2.
- When transmission fluid temperature is 0°C (32°F), resistance should be between 16.7 and 20.5 kΩ.
- When transmission fluid temperature is 20°C (68°F), resistance should be between 7.3 and 8.9 kΩ.
- When transmission fluid temperature is 40°C (104°F), resistance should be between 3.4 and 4.2 kΩ.
- When transmission fluid temperature is 60°C (140°F), resistance should be between 1.9 and 2.2 kΩ.
- When transmission fluid temperature is 80°C (176°F), resistance should be between 1.0 and 1.2 kΩ.
- When transmission fluid temperature is 100°C (212°F), resistance should be between 0.57 and 0.69 kΩ.

Q: Is the measured resistance within the specified range?

YES : Go to Step 6.

NO : Replace the transmission fluid temperature sensor. Refer to GROUP 23B, Transaxle <4A/T> P.23B-8 or Refer to GROUP 23C, Transaxle <5A/T> P.23C-8.



STEP 6. Using scan tool MB991958, check data list item 7: Transmission Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 7: Transmission Fluid Temperature Sensor.
  - When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

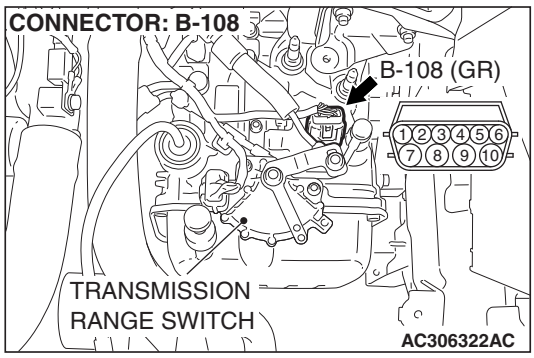
    NOTE: Set scan tool MB991958 to data reading mode for item number 5, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the Transmission Fluid Temperature Sensor.
  - When the engine is warm: 70 – 80°C (158 – 176°F).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

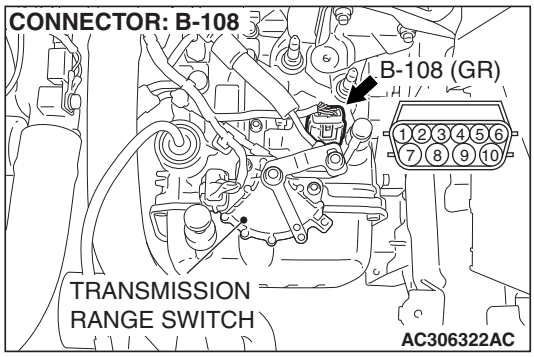


STEP 7. Check A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

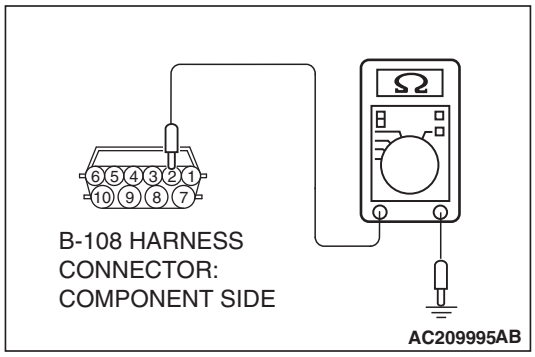
YES : Go to Step 8.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 8. Measure the resistance of the ground circuit at A/T control solenoid valve assembly connector B-108.

(1) Disconnect connector B-108 and measure at the harness side.



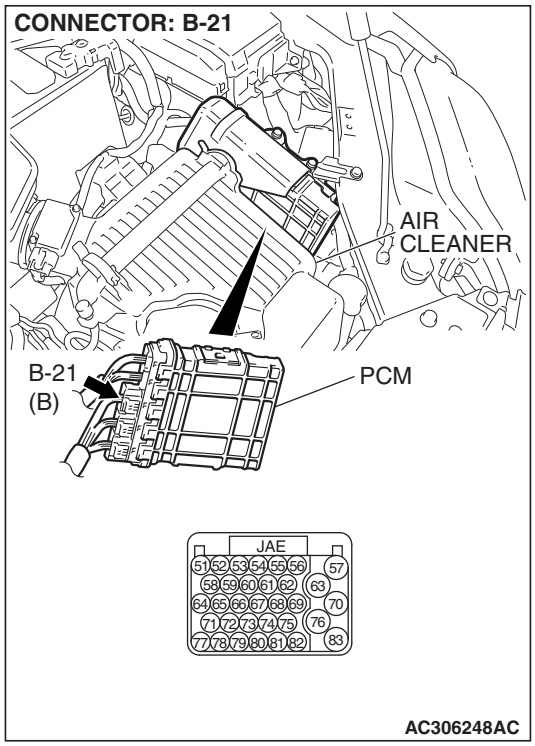
(2) Measure the resistance between terminal 2 and ground.
- The resistance should measure less than 2 ohms.

Q: Is the resistance less than 2 ohms?

YES : Go to Step 5.
NO : Go to Step 12.

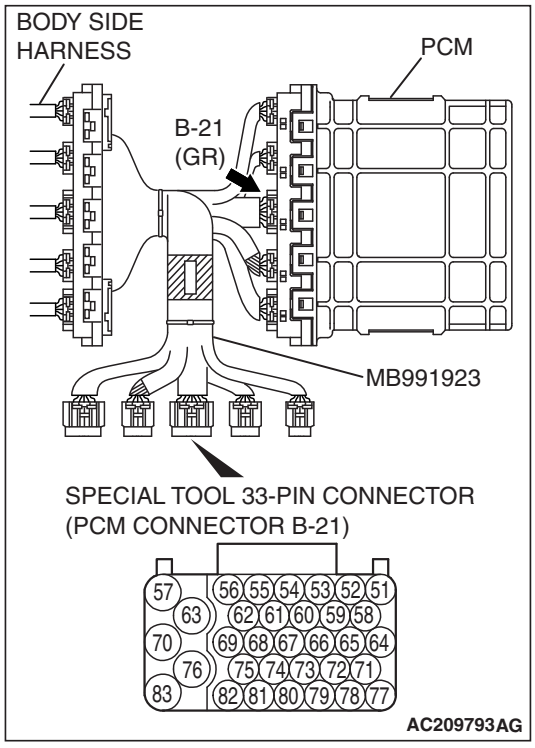
STEP 9. Measure the sensor output voltage at PCM connector B-21 by using check harness special tool MB991923 .

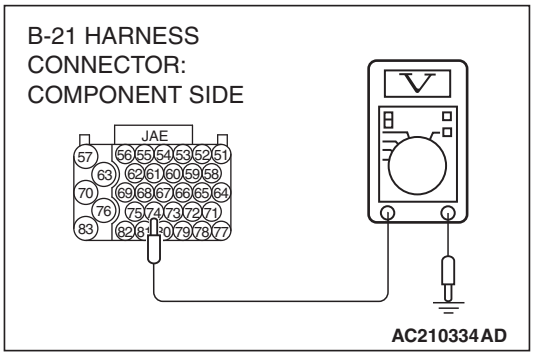
(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.

(3) Turn the ignition switch to the "ON" position.





(4) Measure the voltage between terminal 74 and ground.
- When transmission fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When transmission fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When transmission fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

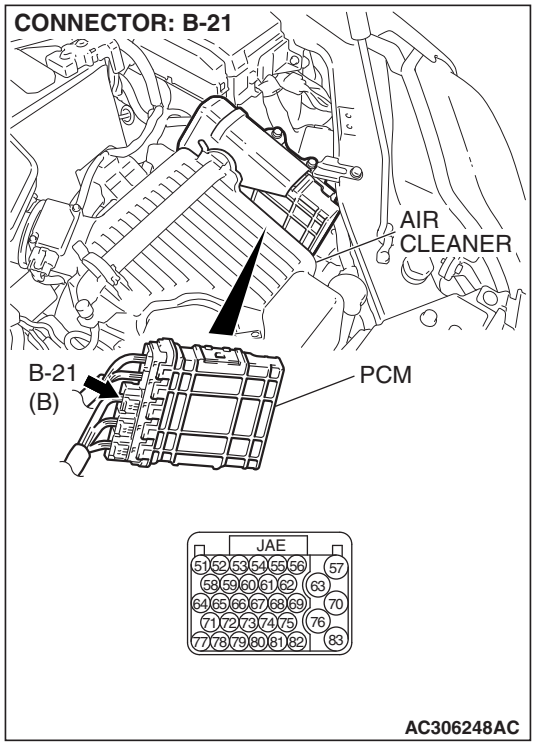
Q: Is the measured voltage within the specified range?

YES : Go to Step 6.
NO : Go to Step 10.

STEP 10. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

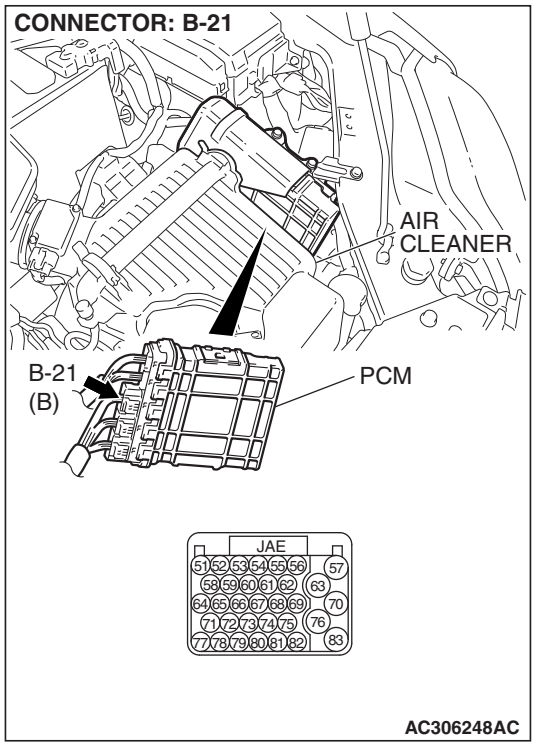
Q: Are the connector and terminals in good condition?

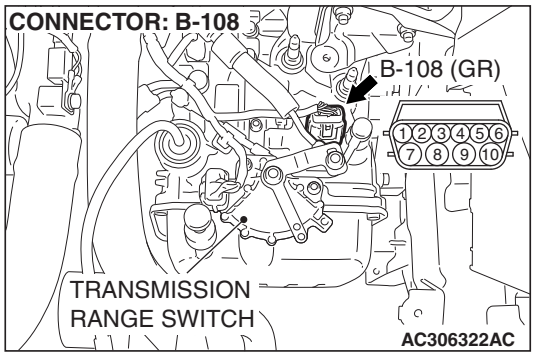
YES : Go to Step 11.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 11. Check the harness for open circuit or short circuit to ground between PCM connector B-21 terminal 74 and A/T control solenoid valve connector B-108 terminal 1.
Q: Is the harness wire in good condition?

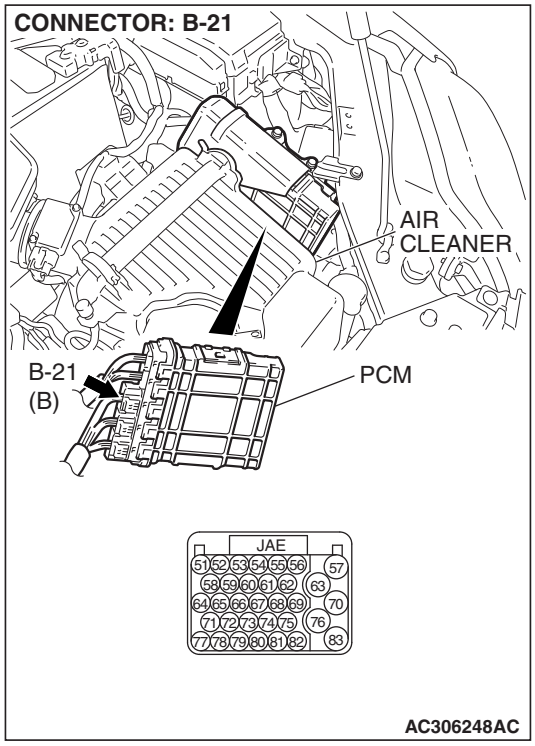
YES : Go to Step 6.
NO : Repair or replace the harness wire.

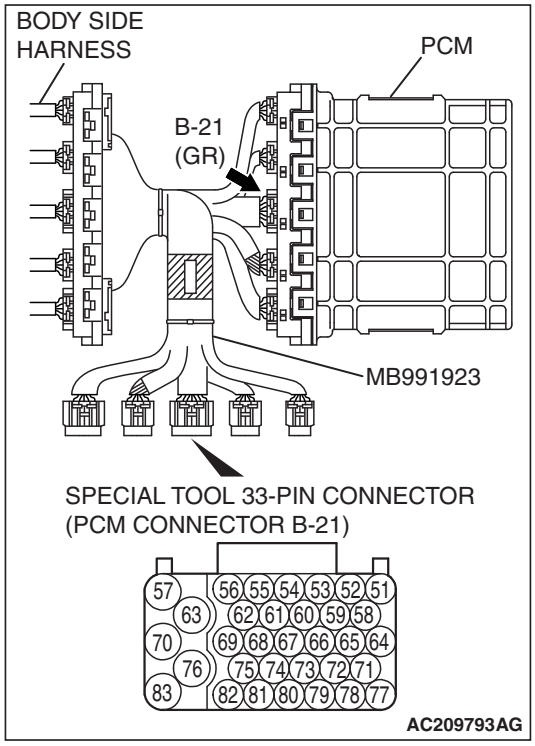




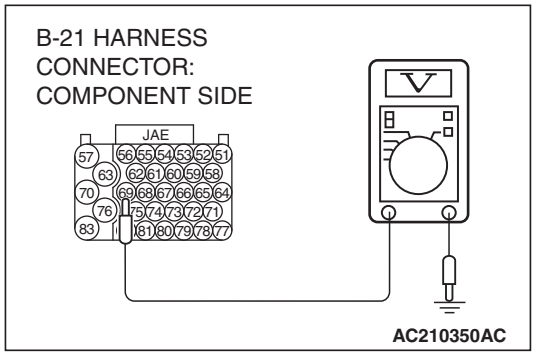
STEP 12. Measure the ground voltage at PCM connector B-21 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.





(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.



(4) Measure the voltage between terminal 69 and ground.
- Voltage should measure 0.5 volt or less.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

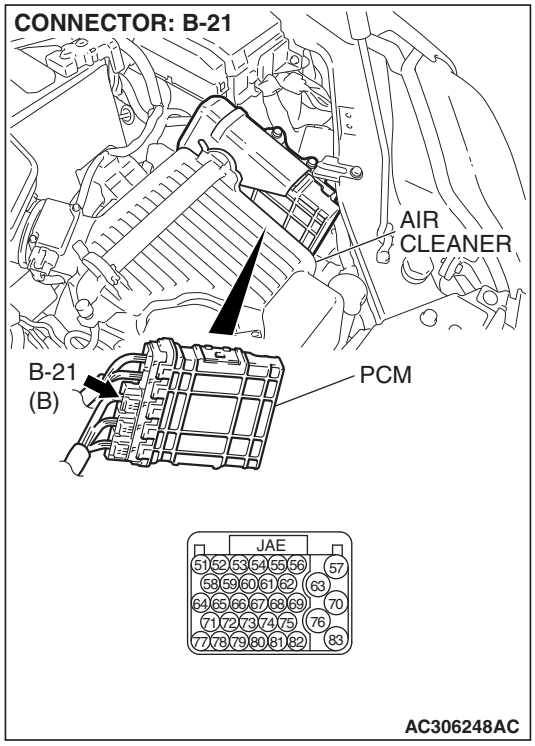
Q: Is the measured voltage within the specified range?

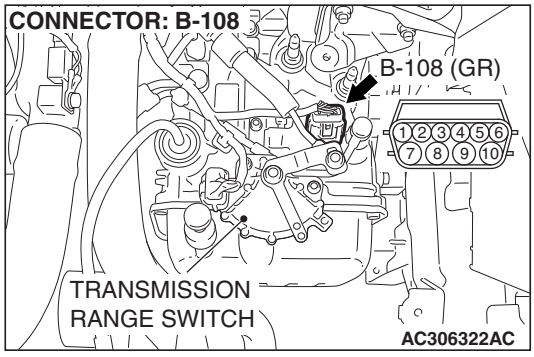
YES : Go to Step 13.
NO : Go to Step 14.

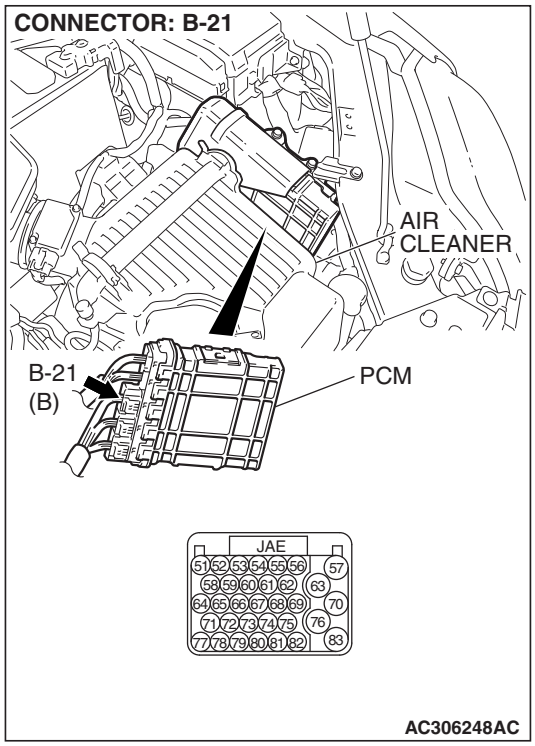
STEP 13. Check the harness for open circuit or damage between PCM connector B-21 terminal 69 and A/T control solenoid valve connector B-108 terminal 2.

Q: Is the harness wire in good condition?

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







STEP 14. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 6.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

DTC P1764 (P0712): Transmission Fluid Temperature Sensor System (Short Circuit)

TRANSMISSION FLUID TEMPERATURE SENSOR SYSTEM CIRCUIT

Refer to P.23A-68.

CIRCUIT OPERATION

Refer to P.23A-68.

DESCRIPTIONS OF MONITOR METHODS

- If transmission fluid temperature equals or exceeds specified value, PCM judges that transmission fluid temperature sensor has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

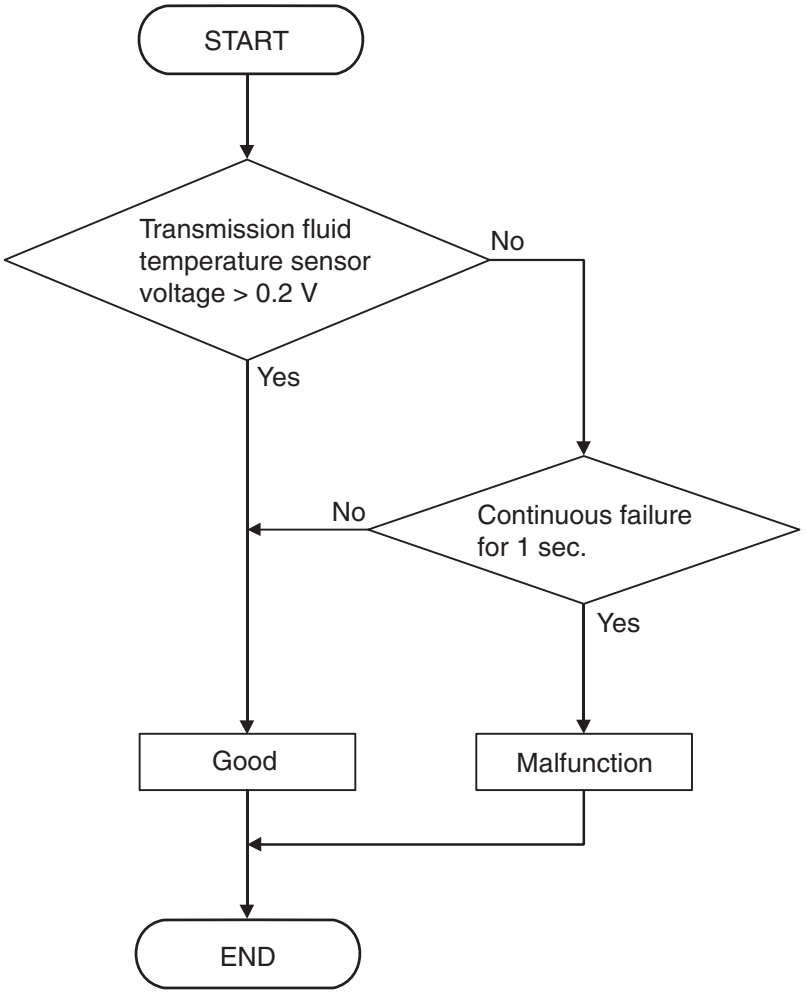
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions, Judgement Criteria

- Transmission fluid temperature sensor voltage: 0.2 volt or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

Start the engine, keep the vehicle stopped in "P" range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the transmission fluid temperature sensor circuit
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

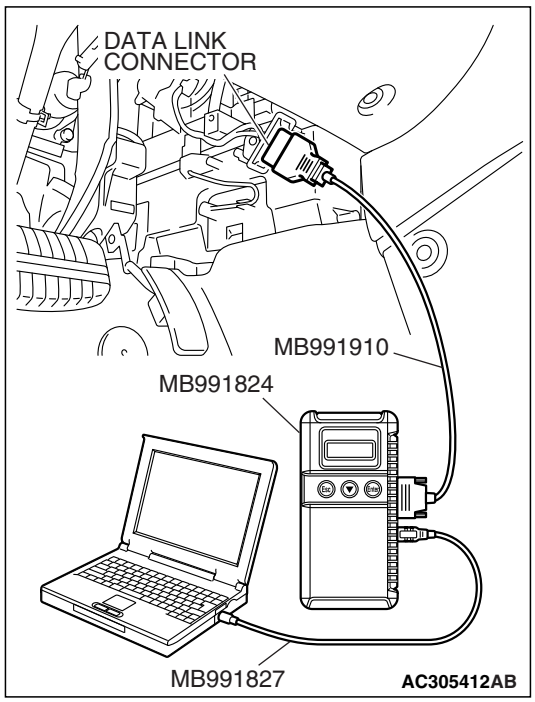
Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check data list item 7: Transmission Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 7: Transmission Fluid Temperature Sensor.
  - When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

    NOTE: Set scan tool MB991958 to the data reading mode for item number 5, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the Transmission Fluid Temperature Sensor.
  - When the engine is warm: 70 – 80°C (158 – 176°F).

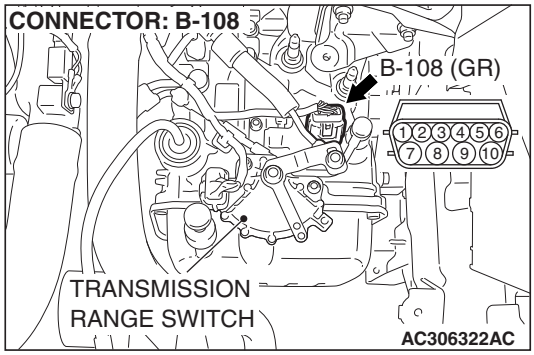
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

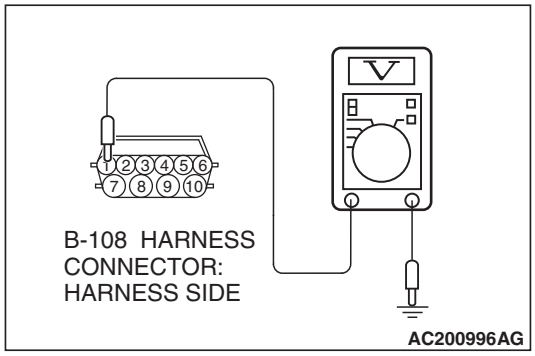
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Go to Step 2.

STEP 2. Measure the sensor output voltage at the A/T control solenoid valve assembly connector B-108 by backprobing.



(1) Do not disconnect connector B-108.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 1 and ground by backprobing.
- When transmission fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When transmission fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When transmission fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

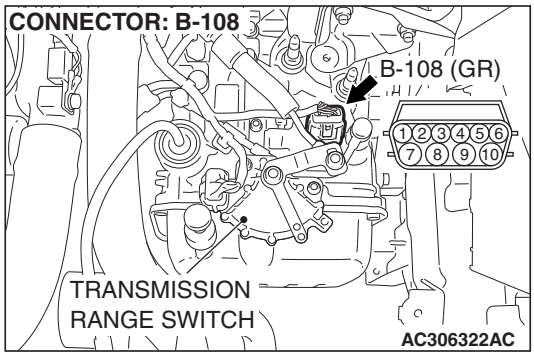
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

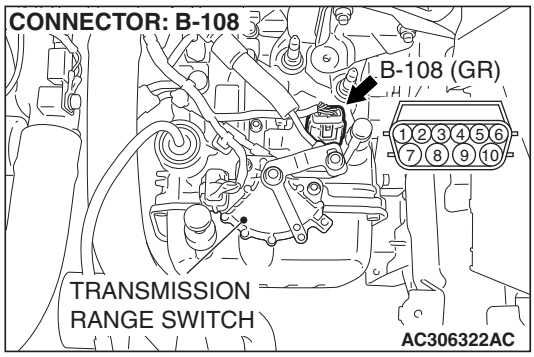
YES : Go to Step 6.
NO : Go to Step 3.

STEP 3. Check A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?



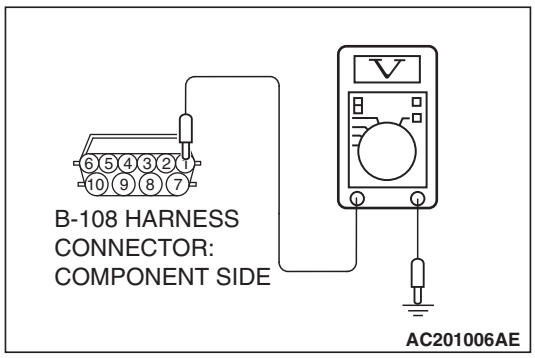
YES : Go to Step 4.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 4. Check the sensor output voltage at A/T control solenoid valve assembly connector B-108.

(1) Disconnect connector B-108 and measure at the harness side.

(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 1 and ground.
- The voltage should measure between 4.5 and 4.9 volts.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

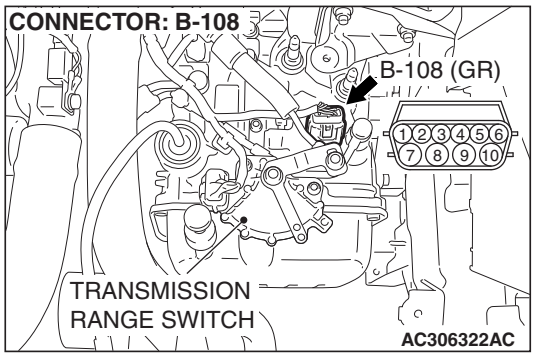
Q: Is the measured voltage between 4.5 and 4.9 volts?

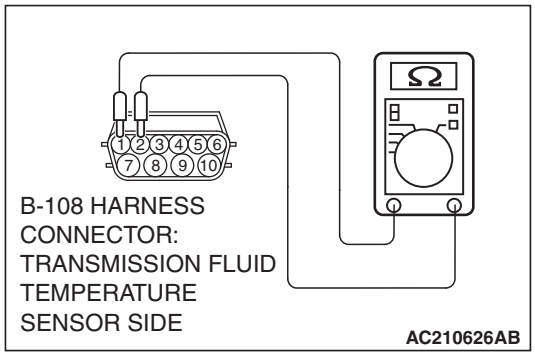
YES : Go to Step 5.

NO : Go to Step 7.

STEP 5. Check the transmission fluid temperature sensor at A/T control solenoid valve assembly connector B-108.

(1) Disconnect connector B-108 and measure at the sensor side.



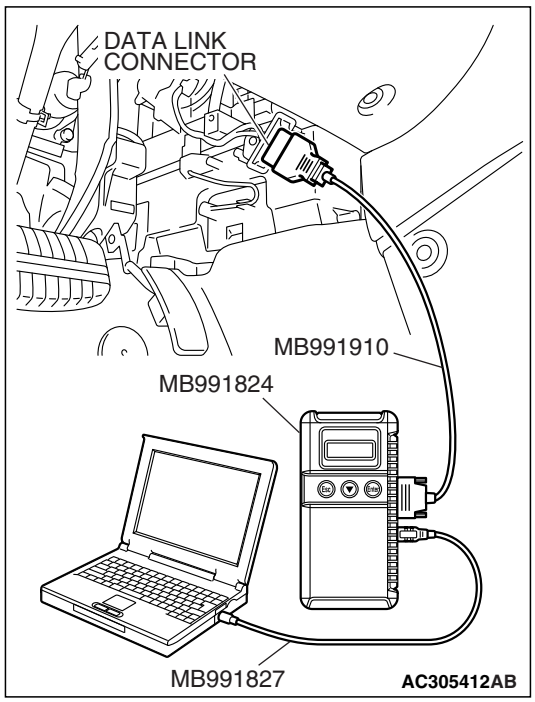


(2) Measure the resistance between terminal 1 and 2.
- When transmission fluid temperature is 0°C (32°F), resistance should be between 16.7 and 20.5 kΩ.
- When transmission fluid temperature is 20°C (68°F), resistance should be between 7.3 and 8.9 kΩ.
- When transmission fluid temperature is 40°C (104°F), resistance should be between 3.4 and 4.2 kΩ.
- When transmission fluid temperature is 60°C (140°F), resistance should be between 1.9 and 2.2 kΩ.
- When transmission fluid temperature is 80°C (176°F), resistance should be between 1.0 and 1.2 kΩ.
- When transmission fluid temperature is 100°C (212°F), resistance should be between 0.57 and 0.69 kΩ.

Q: Is the measured resistance within the specified range?

YES : Go to Step 6.

NO : Replace the transmission fluid temperature sensor. Refer to GROUP 23B, Transaxle <4A/T> P.23B-8 or Refer to GROUP 23C, Transaxle <5A/T>P.23C-8.



STEP 6. Using scan tool MB991958, check data list item 7: Transmission Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 7: Transmission Fluid Temperature Sensor.
  - When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

    NOTE: Set scan tool MB991958 to the data reading mode for item number 13, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the Transmission Fluid Temperature Sensor.
  - When the engine is warm: 70 – 80°C (158 – 176°F).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

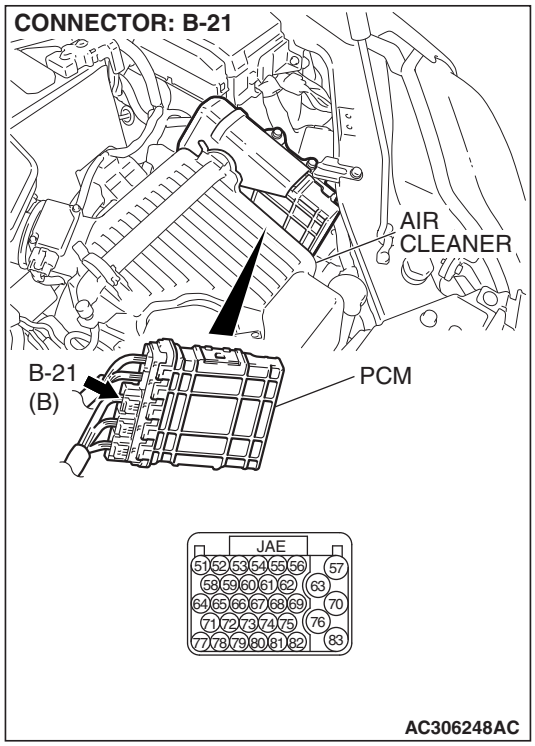
Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

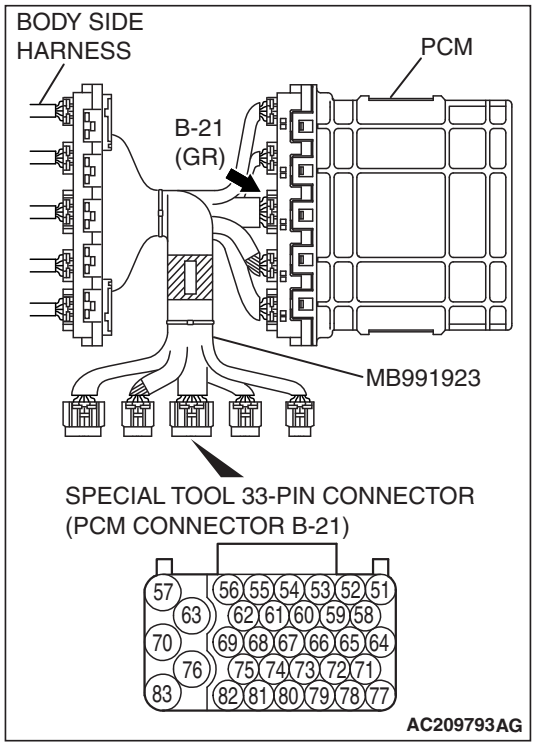
NO : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

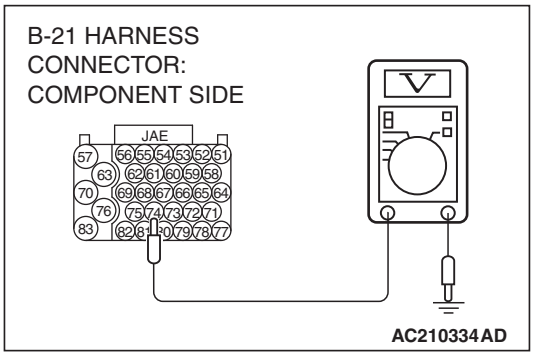
STEP 7. Measure the sensor output voltage at PCM connector B-21 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.





(4) Measure the voltage between terminal 74 and ground.
- When transmission fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When transmission fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When transmission fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

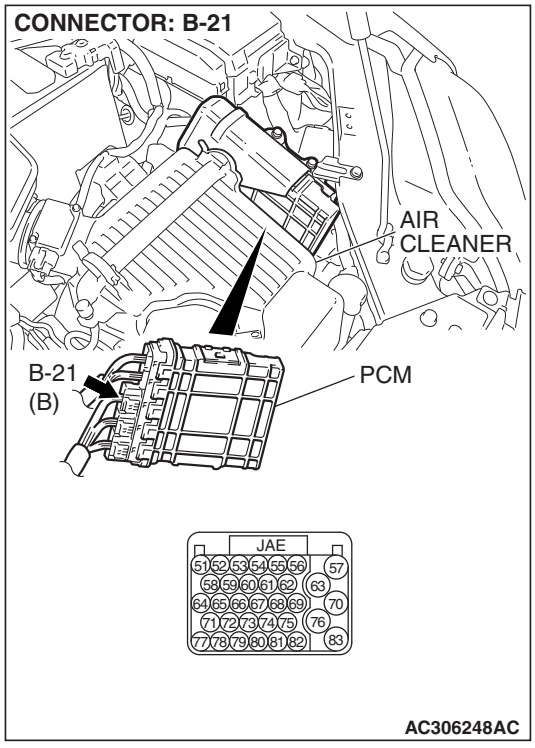
Q: Is the measured voltage within the specified range?

YES : Go to Step 6.
NO : Go to Step 8.

STEP 8. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 9.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

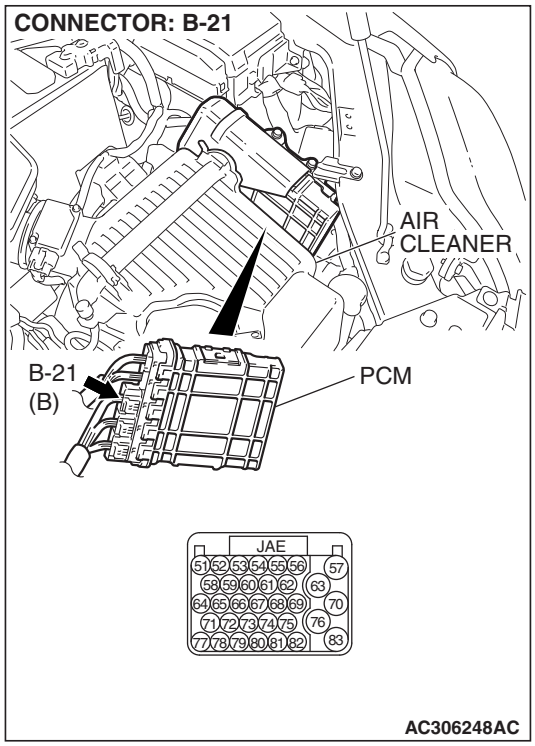


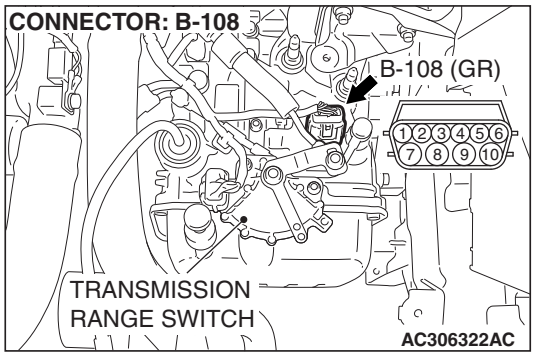
STEP 9. Check the harness for a short circuit to ground between PCM connector B-21 terminal 74 and A/T control solenoid valve connector B-108 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

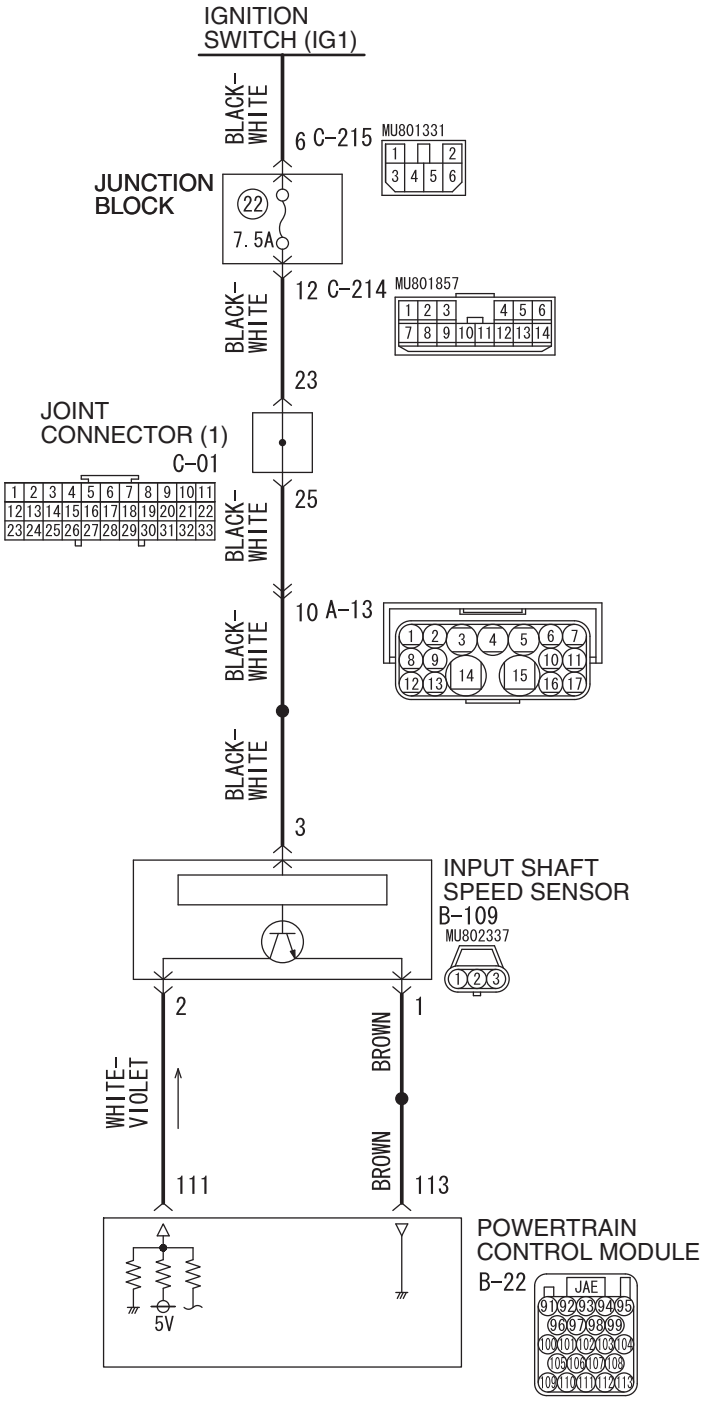
NO : Repair or replace the harness wire.





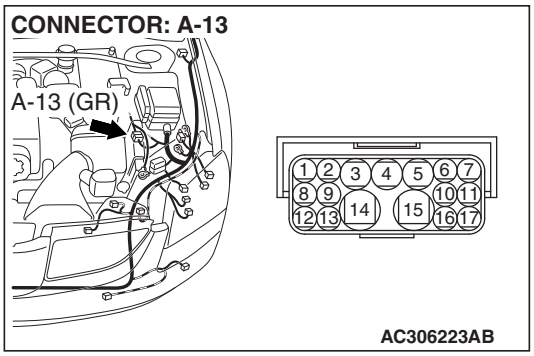
DTC P1766 (P0715): Input Shaft Speed Sensor System

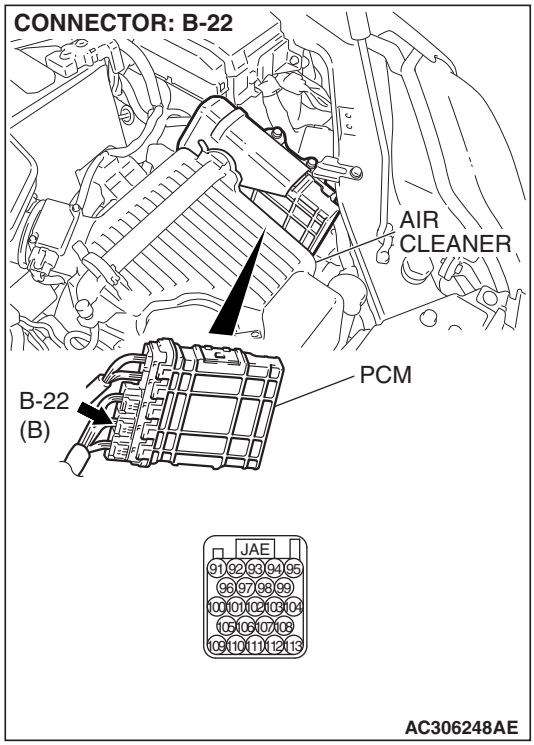
Input Shaft Speed Sensor System Circuit

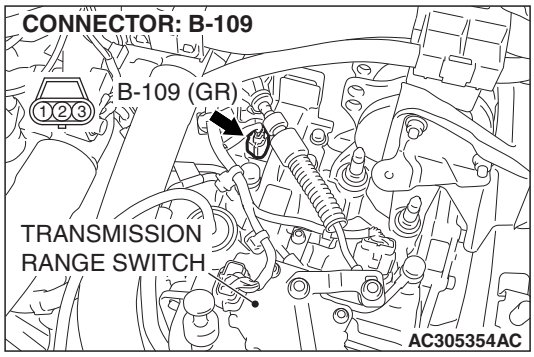


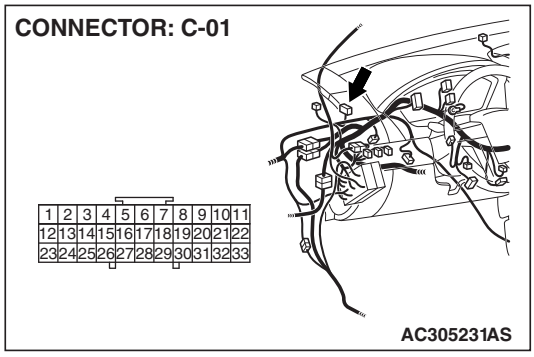
W4P06M02AA
AC209755AC

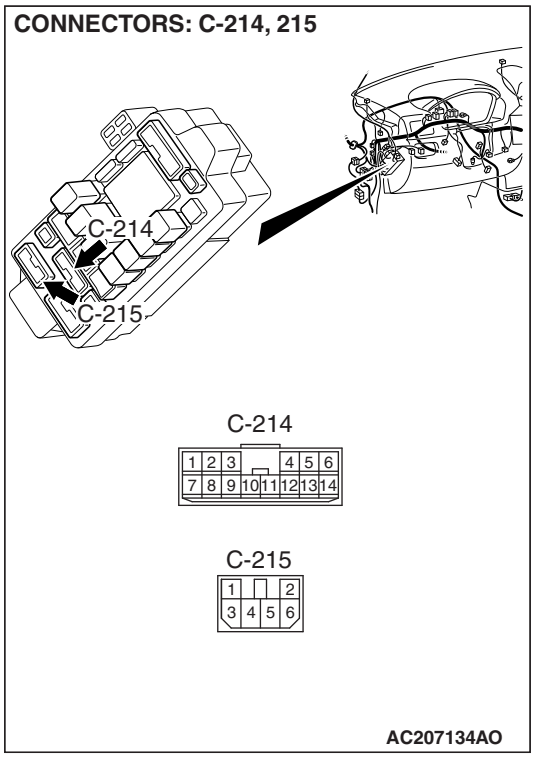
TSB Revision


CONNECTOR: A-13
A-13 (GR)
1 2 3 4 5 6 7
8 9 14 15 10 11
12 13 16 17
AC306223AB


CONNECTOR: B-22
AIR CLEANER
PCM
B-22 (B)
JAE
91 92 93 94 95
96 97 98 99
100 101 102 103 104
105 106 107 108
109 110 111 112 113
AC306248AE


CONNECTOR: B-109
1 2 3
B-109 (GR)
TRANSMISSION RANGE SWITCH
AC305354AC


CONNECTOR: C-01
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30 31 32 33
AC305231AS



CIRCUIT OPERATION

- The input shaft speed sensor generates 0 ⇔ 5 volts pulse signal when the input shaft rotates. The pulse signal frequency increases with a rise in input shaft speed.
- The input shaft speed sensor is connected to the PCM (terminals 111 and 113) via the input shaft speed sensor connector (terminals 1 and 2).
- The PCM detects the input shaft speed by the signal input to terminal 111.
- The input shaft speed sensor generates the pulse signal as the teeth of the underdrive clutch retainer pass the magnetic tip of the sensor.

DESCRIPTIONS OF MONITOR METHODS

- If there is no detection pulse from input shaft speed sensor (turbine rotation) even during driving test at more than specified speed, PCM judges that input shaft speed sensor has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

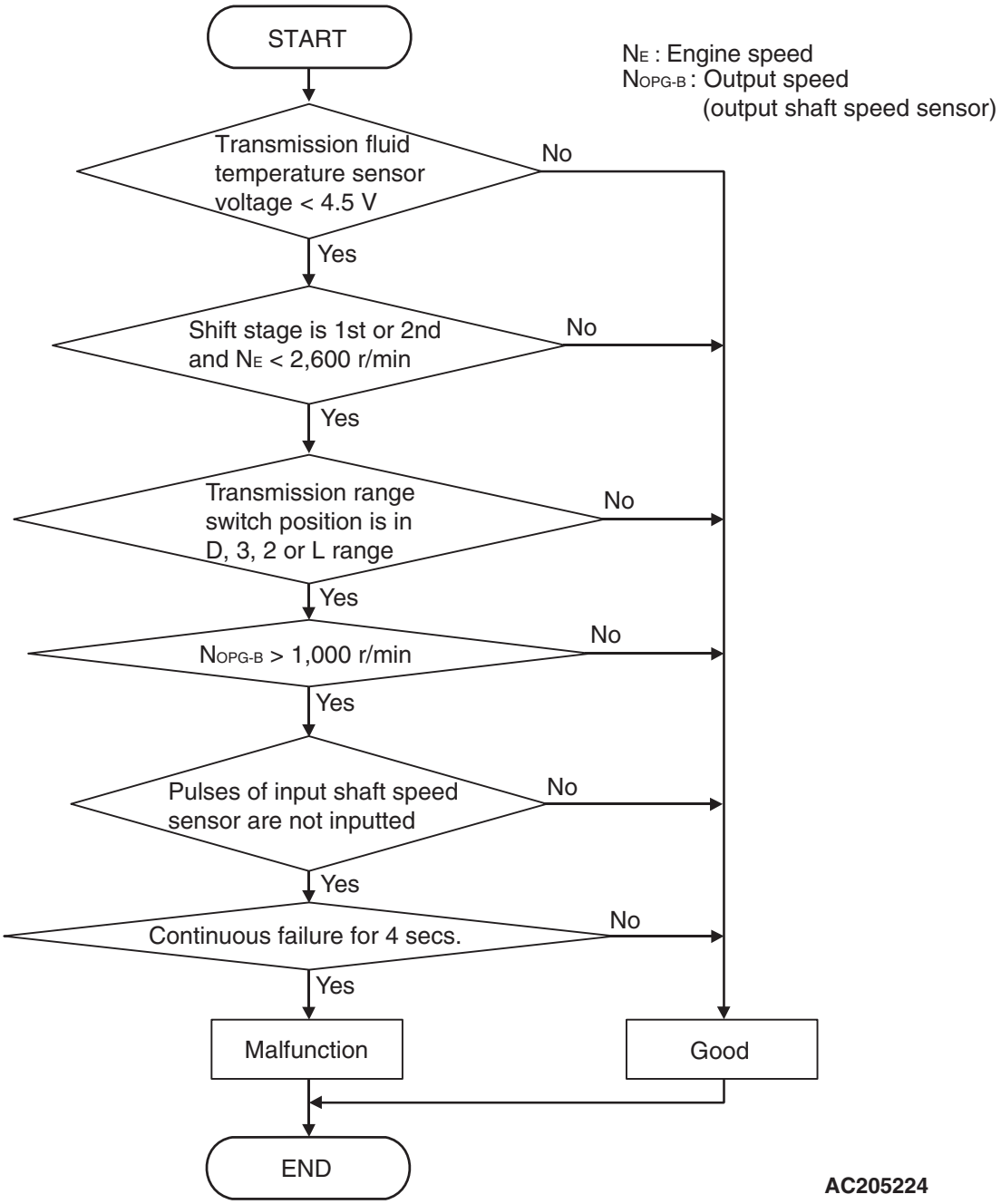
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC P1767 (P0720): Output shaft speed sensor malfunction

Sensor (The sensor below is determined to be normal)

- Output shaft speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Transmission range switch position: D, 3, 2 or L.
- Output speed: 1,000 r/min or more. <4A/T>
- Vehicle speed: 30 km/h (19 mph). <5A/T>
- Transmission fluid temperature sensor voltage: 4.5 volts or less.

Judgement Criteria

- Input shaft speed sensor signal: no signal change. (4 seconds)
- If DTC P1766 (P0715) is set consecutively four times, the transaxle is locked into 3rd gear or 2nd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, shift to 3rd gear or higher, and drive at 40 km/h (25 mph) or more for 10 seconds.

TSB Revision

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the input shaft speed sensor
- Malfunction of the underdrive clutch retainer
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check data list item 5: Input Shaft Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

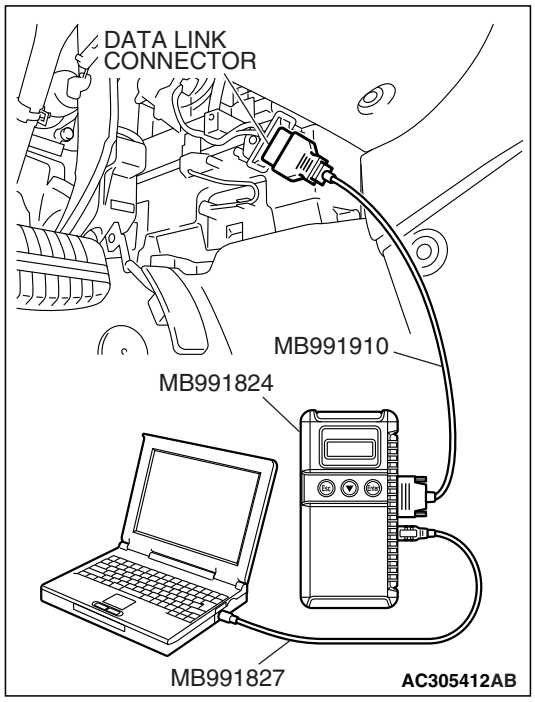
(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to data reading mode.
  - Item 5: Input Shaft Speed Sensor.
    - When driving at constant speed of 50 km/h (31 mph), the display should be "1,400 – 1,700 r/min" (Gear range: 3rd gear). <4A/T>
    - When driving at constant speed of 60 km/h (37 mph), the display should be "1,400 – 1,700 r/min" (Gear range: 4th gear). <5A/T>

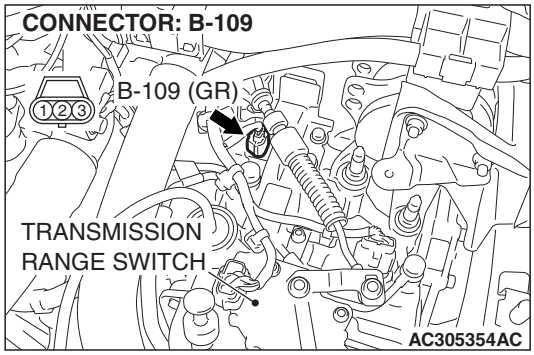
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Go to Step 2.

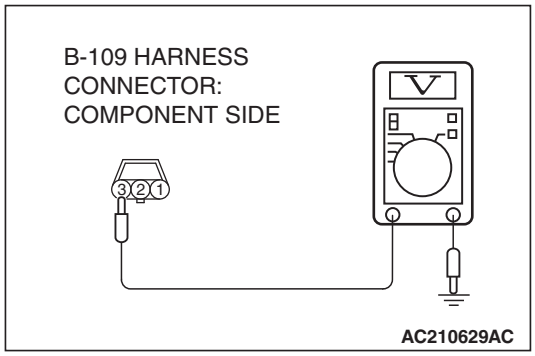




STEP 2. Measure the power supply voltage at the input shaft speed sensor connector B-109.

(1) Disconnect connector B-109 and measure at the harness side.

(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 3 and ground.
- The voltage should measure battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

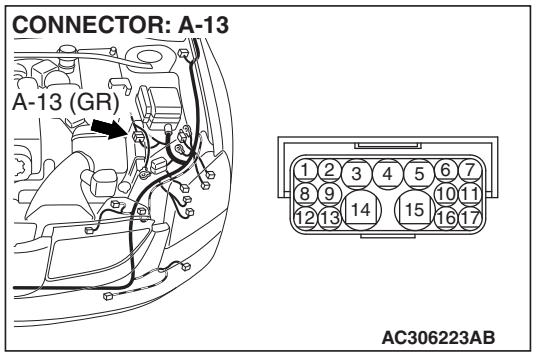
YES : Go to Step 5.
NO : Go to Step 3.

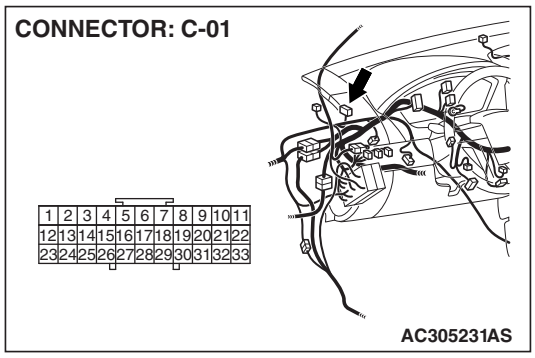
STEP 3. Check intermediate connector A-13, joint connector (1) C-01 and junction block connector C-214 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

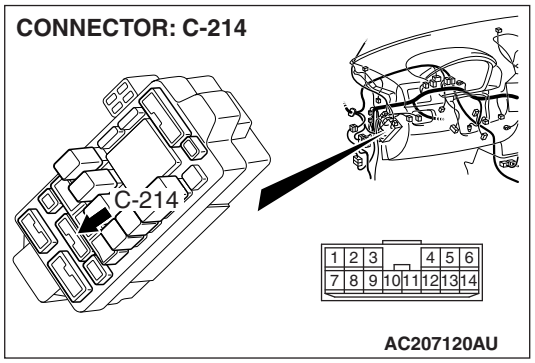
Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





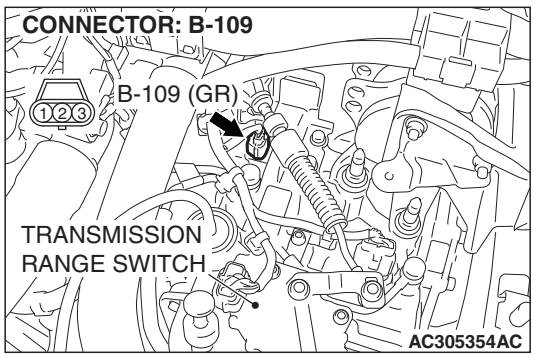


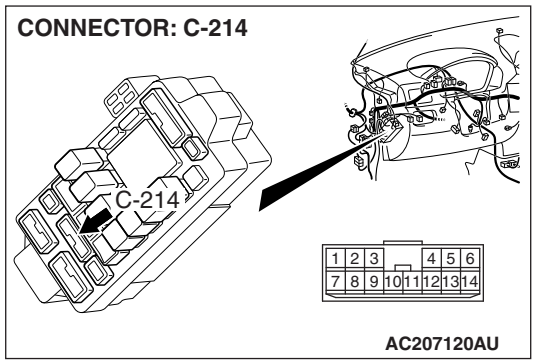
STEP 4. Check the harness for open circuit or short circuit to ground between the input shaft speed sensor connector B-109 terminal 3 and the junction block connector C-214 terminal 12.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair or replace the harness wire.

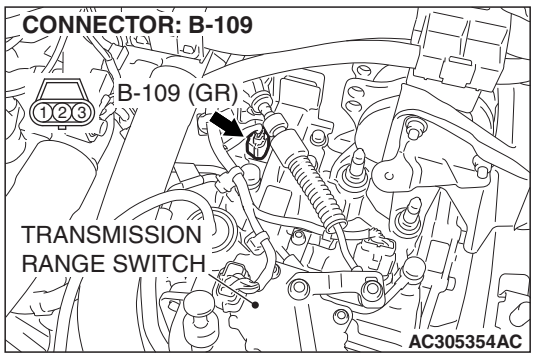


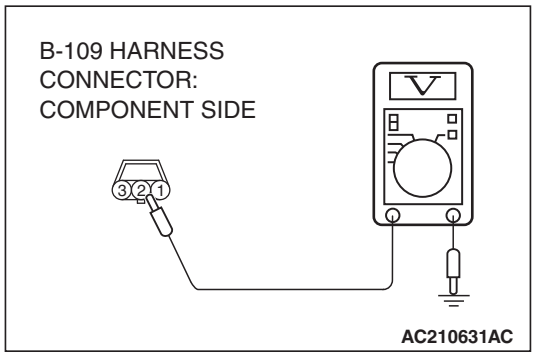


STEP 5. Measure the PCM to speed sensor output voltage at the input shaft speed sensor connector B-109.

(1) Disconnect connector B-109 from the speed sensor and measure voltage at the harness side.

(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 2 and ground.
- The voltage should measure between 4.5 and 4.9 volts.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

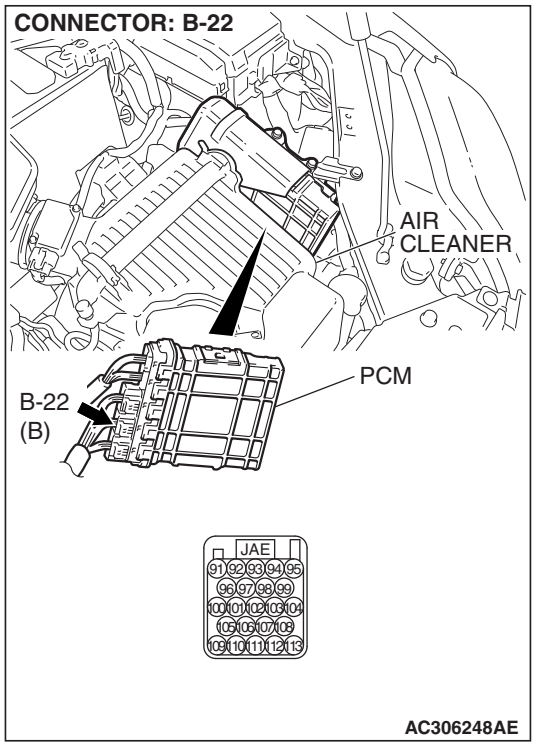
Q: Is the measured voltage between 4.5 and 4.9 volts?

YES : Go to Step 11.

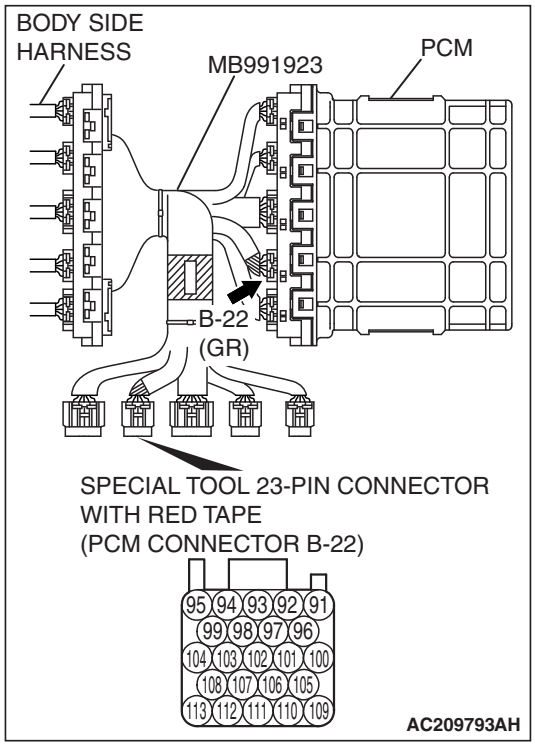
NO : Go to Step 6.

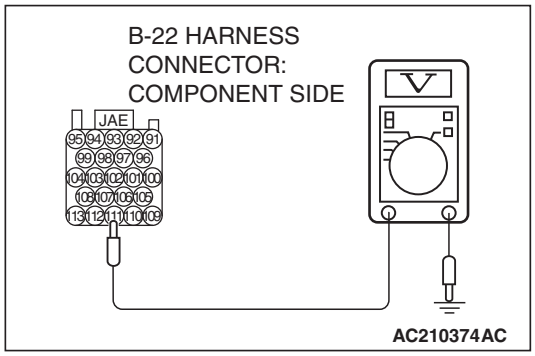
STEP 6. Measure the PCM output voltage to the speed sensor at the PCM connector B-22 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.





(4) Measure the voltage between PCM terminal 111 and ground.
- The voltage should measure between 4.5 and 4.9 volts.

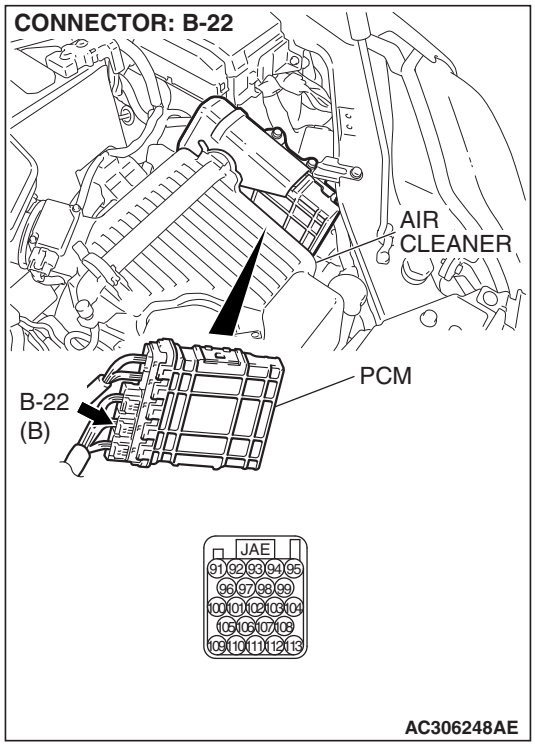
(5) Turn the ignition switch to the "LOCK" (OFF) position.

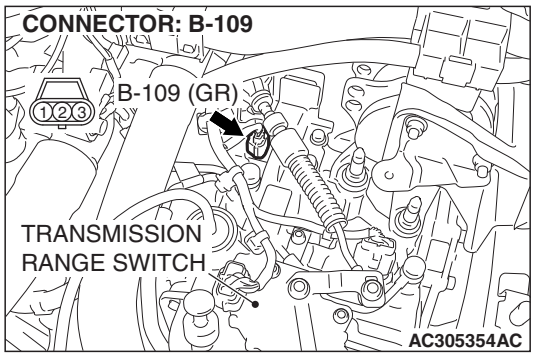
Q: Is the measured voltage between 4.5 and 4.9 volts?

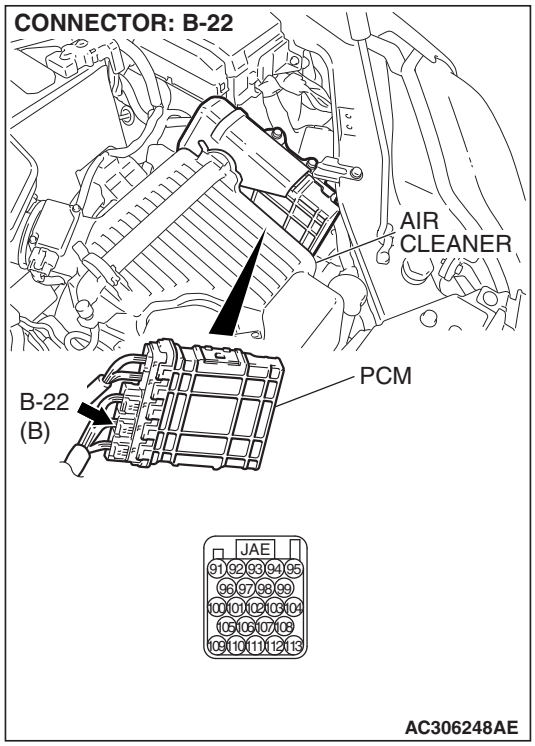
YES : Go to Step 7.
NO : Go to Step 9.

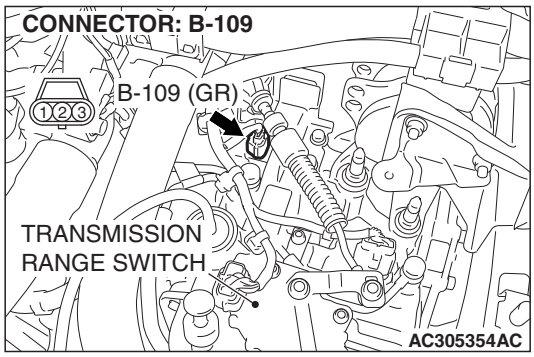
STEP 7. Check PCM connector B-22 and input shaft speed sensor connector B-109 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors in good condition?

YES : Go to Step 8.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







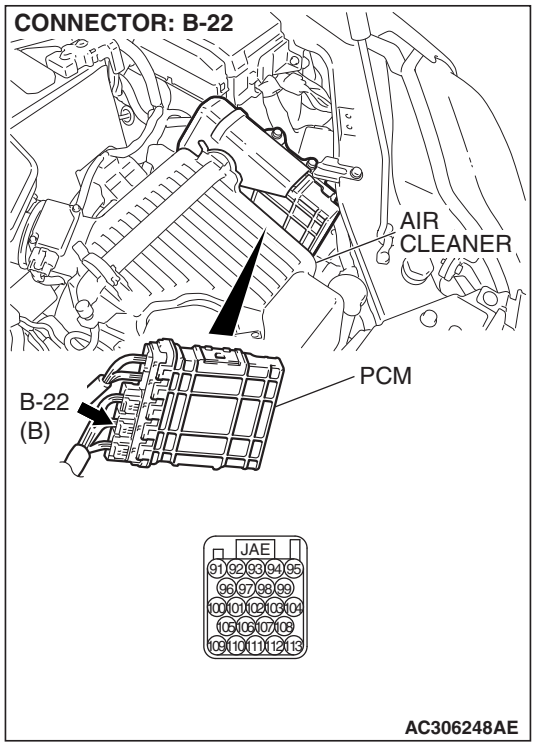


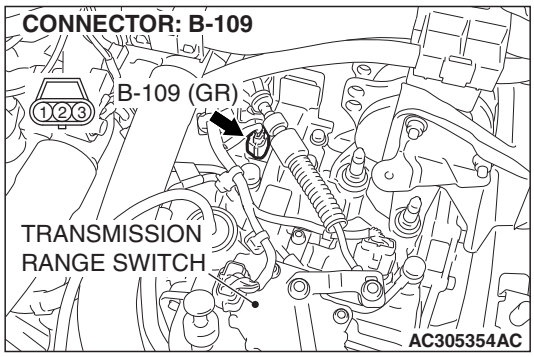
STEP 8. Check the harness for open circuit or damage between PCM connector B-22 terminal 111 and input shaft speed sensor connector B-109 terminal 2.

Q: Is the harness wire in good condition?

YES : Go to Step 19.

NO : Repair or replace the harness wire.

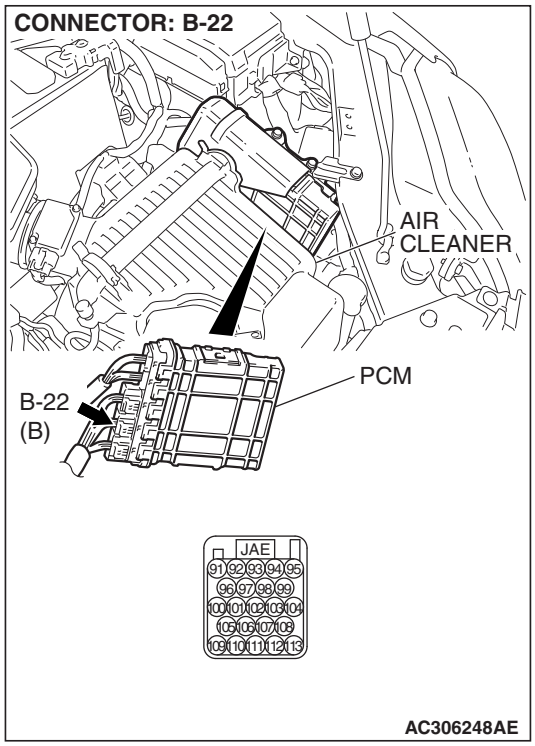


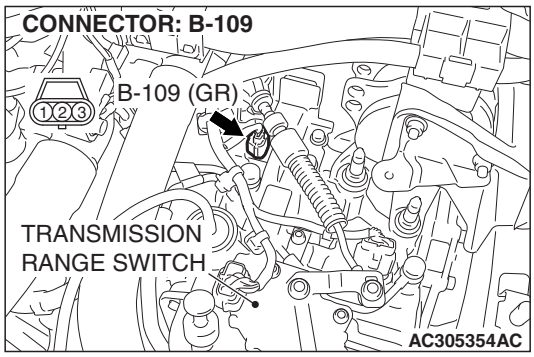


STEP 9. Check PCM connector B-22 and input shaft speed sensor connector B-109 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damages components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



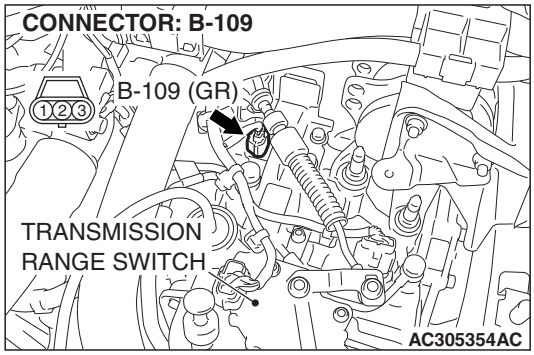


STEP 10. Check the harness for short circuit to ground between PCM connector B-22 terminal 111 and input shaft speed sensor connector B-109 terminal 2.

Q: Is the harness wire in good condition?

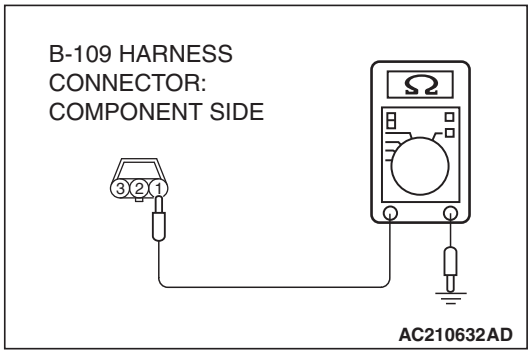
YES : Go to Step 11.

NO : Repair or replace the harness wire.



STEP 11. Measure the ground circuit for resistance at the input shaft speed sensor connector B-109.

(1) Disconnect connector B-109 from the speed sensor and measure at the harness side.



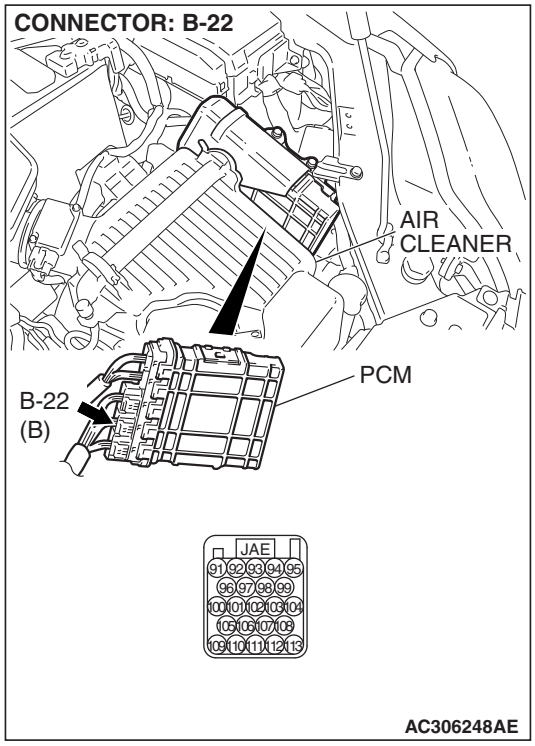
(2) Measure the resistance between terminal 1 and ground.
- The resistance should measure less than 2 ohms.

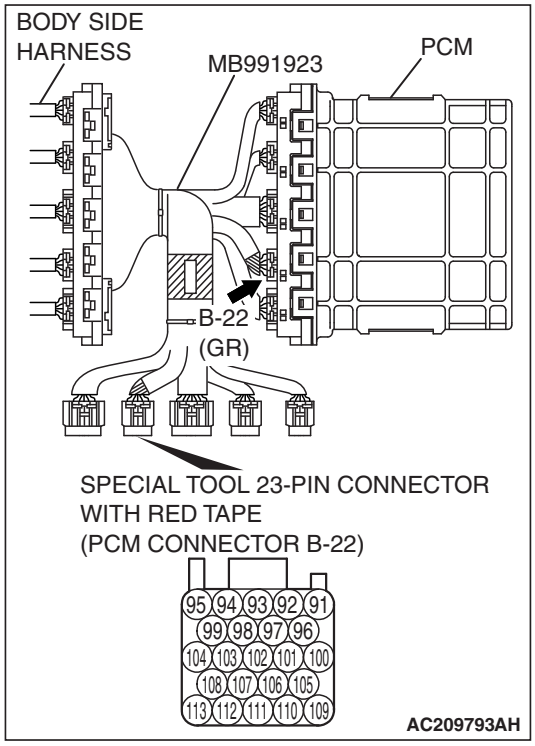
Q: Is the measured resistance less than 2 ohms?

YES : Go to Step 16.
NO : Go to Step 12.

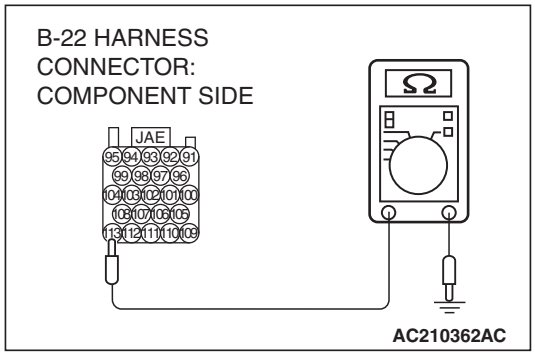
STEP 12. Measure the resistance at the PCM connector B-22 by using check harness special tool.

(1) Disconnect all the connectors from the PCM.





(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.



(4) Measure the resistance between terminal 113 and ground.
- The resistance should measure less than 2 ohms.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

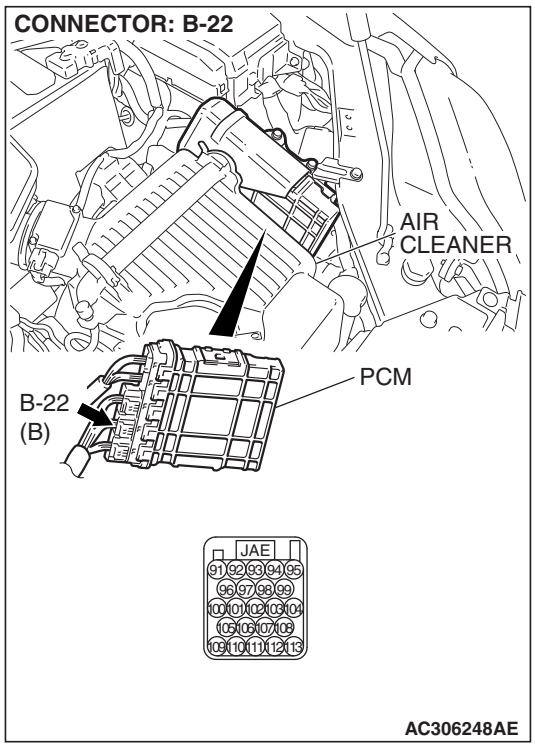
Q: Is the measured resistance less than 2 ohms?

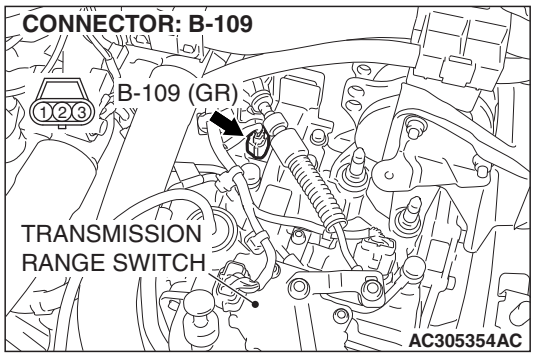
YES : Go to Step 13.
NO : Go to Step 15.

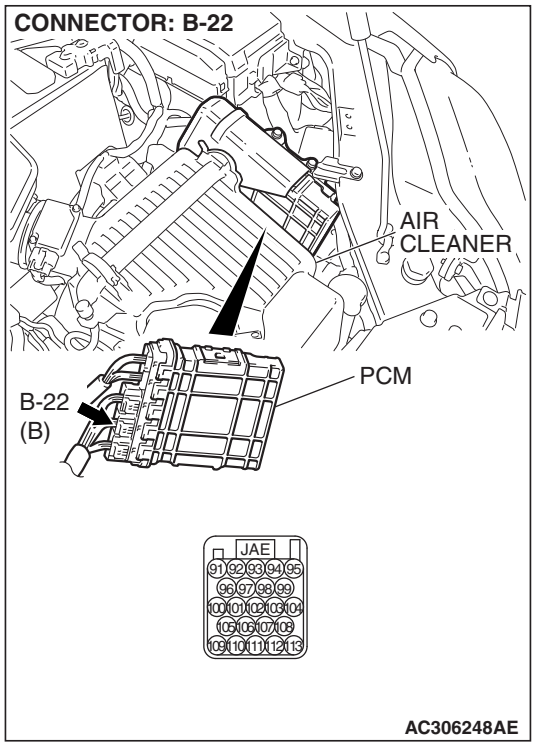
STEP 13. Check PCM connector B-22 and input shaft speed sensor connector B-109 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

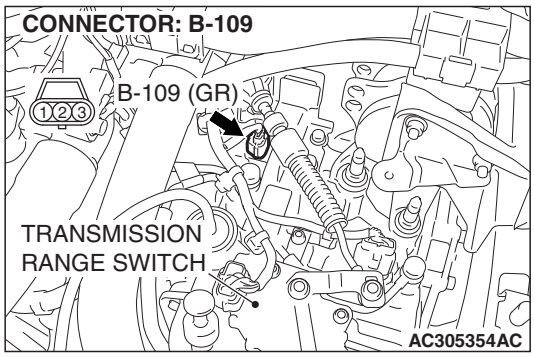
Q: Are the connectors and terminals in good condition?

YES : Go to Step 14.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







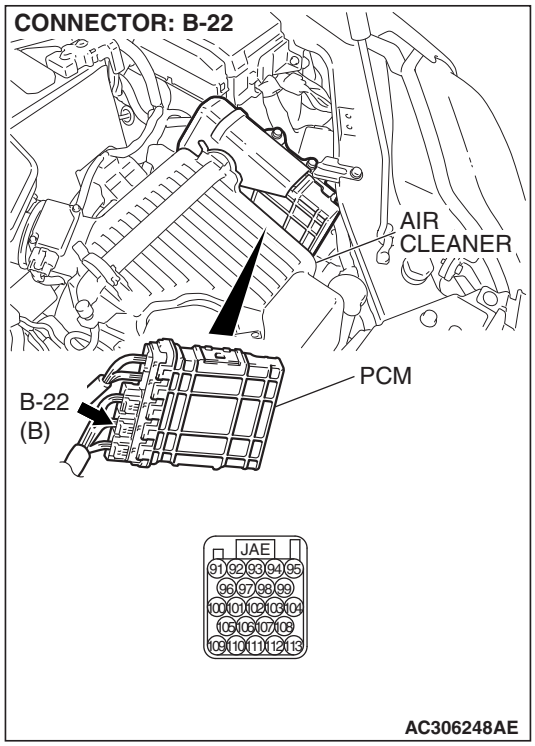


STEP 14. Check the harness for open circuit or damage between PCM connector B-22 terminal 113 and input shaft speed sensor connector B-109 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 16.

NO : Repair or replace the harness wire.



STEP 15. Check PCM connector B-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

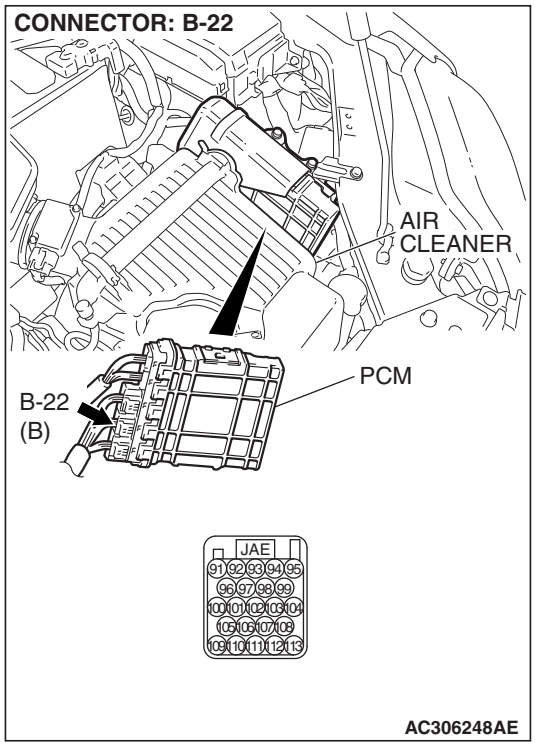
Q: Are the connector and terminals in good condition?

YES : Replace the PCM.

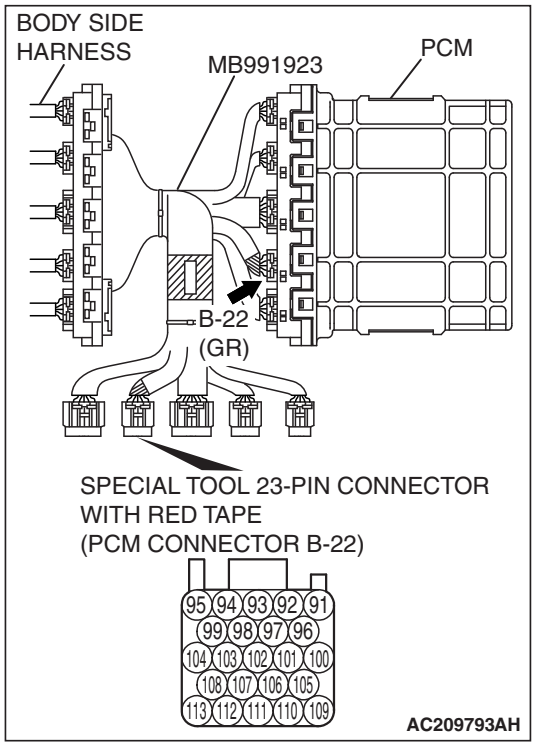
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

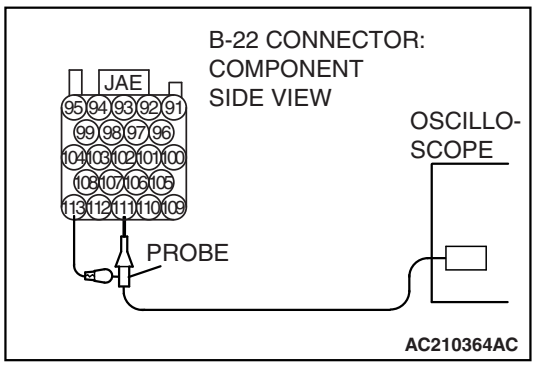
STEP 16. Using the oscilloscope, check the input shaft speed sensor waveform at PCM connectors B-22 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.

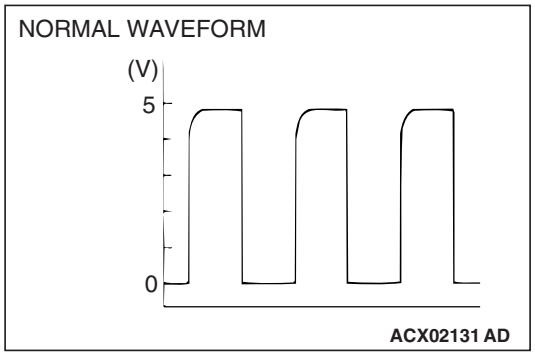


(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.





(3) Connect an oscilloscope probe to PCM connector B-22 terminal 111 and to 113.
(4) Start the engine and drive the vehicle at constant speed of 50 km/h (31 mph) (Gear range: 3rd gear) <4A/T> or 60 km/h (37 mph) (Gear range: 4th gear) <5A/T>.



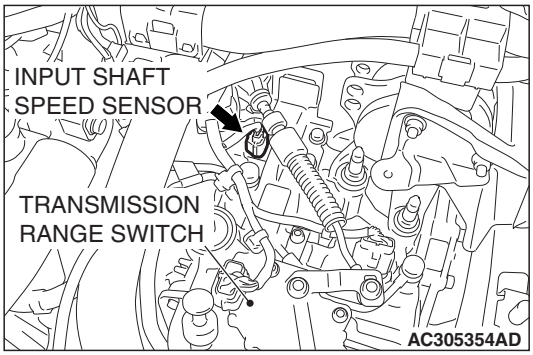
(5) Check the input shaft speed sensor waveform.
- The input shaft speed sensor waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts or more and the minimum value 0.8 volt or less. The output waveform should not contain electrical noise.

(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the waveform normal?

YES : Go to Step 19.
NO : Go to Step 17.

STEP 17. Replace the input shaft speed sensor.

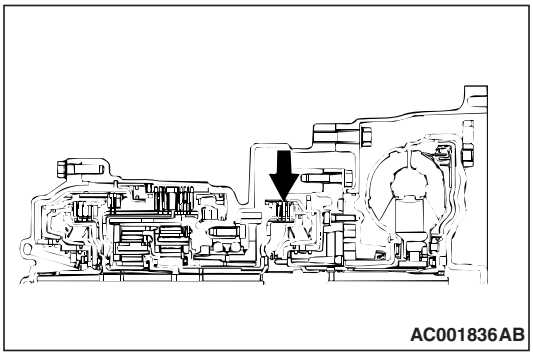


(1) Replace the input shaft speed sensor. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is A/T DTC P1766 set?

YES : Go to Step 18.
NO : The procedure is complete.

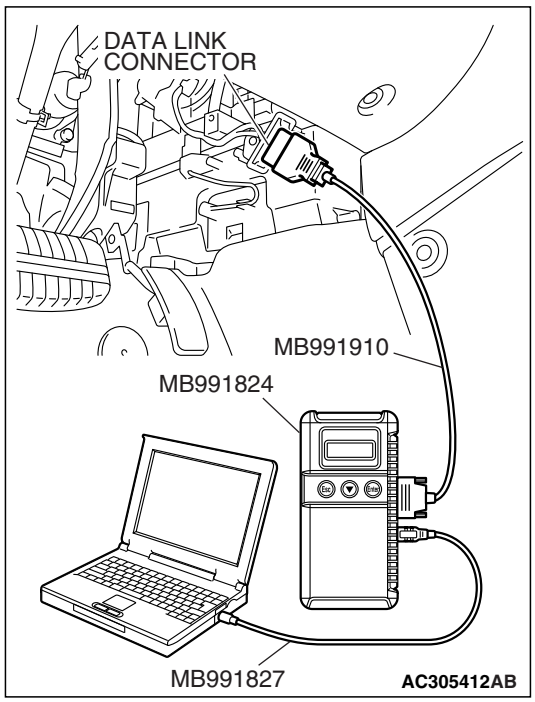
STEP 18. Replace the underdrive clutch retainer.



(1) Replace the underdrive clutch retainer. Refer to GROUP 23B, P.23B-50 Underdrive Clutch and Input Shaft <4A/T> or Refer to GROUP 23C, P.23C-53 Underdrive Clutch and Input Shaft <5A/T>.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is A/T DTC P1766 set?

YES : An A/T DTC may have set due to external radio frequency interference (RFI) possibility caused by cellular phone activity, or aftermarket components installed on the vehicle.
NO : The procedure is complete.



STEP 19. Using scan tool MB991958, check data list item 5: Input Shaft Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to data reading mode.
- Item 5: Input Shaft Speed Sensor.
  - When driving at constant speed of 50 km/h (31 mph), the display should be "1,400 – 1,700 r/min" (Gear range: 3rd gear). <4A/T>
  - When driving at constant speed of 60 km/h (37 mph), the display should be "1,400 – 1,700 r/min" (Gear range: 4th gear). <5A/T>

(4) Turn the ignition switch to the "LOCK" (OFF) position.

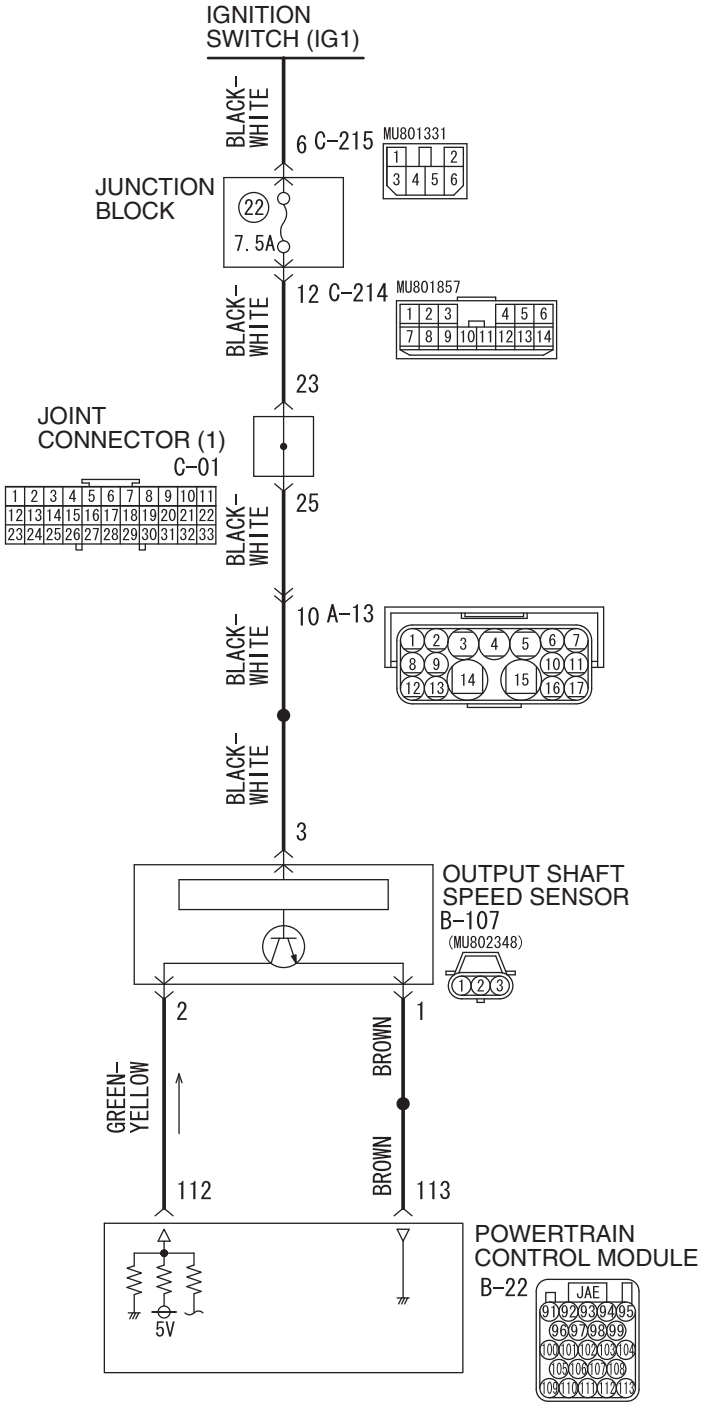
Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

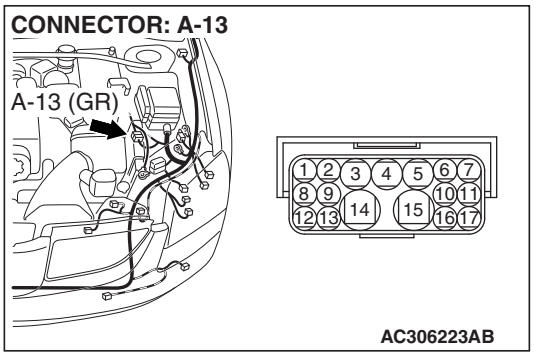
DTC P1767 (P0720): Output Shaft Speed Sensor System

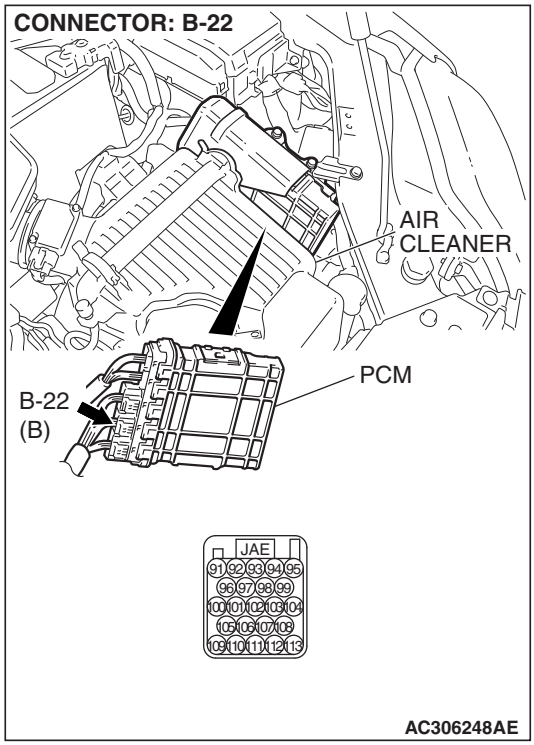
Output Shaft Speed Sensor System Circuit

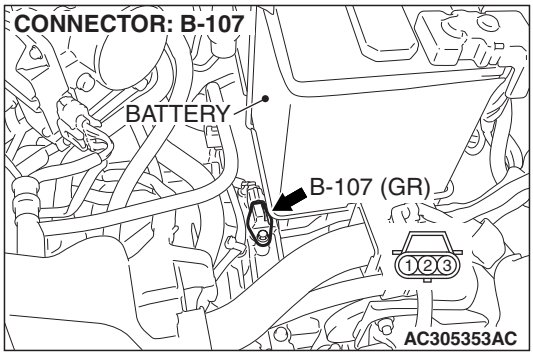


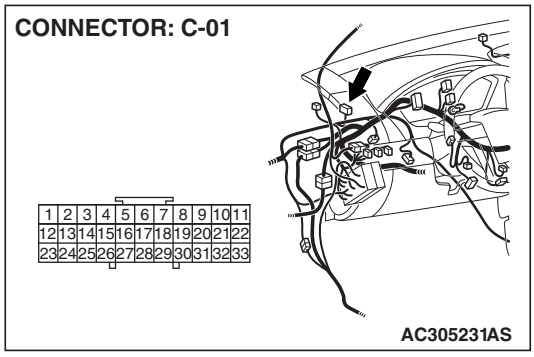
W4P06M03AA
AC209756AC

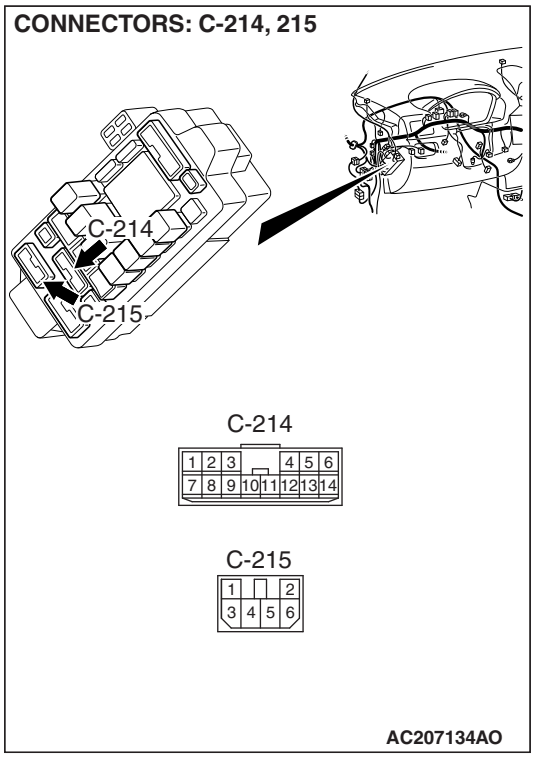
TSB Revision


CONNECTOR: A-13
A-13 (GR)
1 2 3 4 5 6 7
8 9 14 15 10 11
12 13 16 17
AC306223AB


CONNECTOR: B-22
AIR CLEANER
PCM
B-22 (B)
JAE
91 92 93 94 95
96 97 98 99
100 101 102 103 104
105 106 107 108
109 110 111 112 113
AC306248AE


CONNECTOR: B-107
BATTERY
B-107 (GR)
1 2 3
AC305353AC


CONNECTOR: C-01
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30 31 32 33
AC305231AS



CIRCUIT OPERATION

- The output shaft speed sensor generates a 0 ⇔ 5 volt pulse signal when the output shaft rotates. The pulse signal frequency increases with a rise output shaft speed.
- The output shaft speed sensor is connected to the PCM (terminals 112 and 113) via the output shaft speed sensor connector (terminals 1 and 2).
- The PCM detects the output shaft speed by the signal input to terminal 112.
- The output shaft speed sensor generates the pulse signal as the teeth of the transfer drive gear pass the magnetic tip of the sensor.

DESCRIPTIONS OF MONITOR METHODS

- <If open circuit occurs during driving test> If abruptly reduced output revolution is detected during driving test, and a difference between turbine revolution and that value calculated from output revolution equals or exceeds specified value, PCM judges that output shaft speed sensor has a failure.
- <If open circuit occurs with vehicle stopped, and driving test is started> If there is no detection pulse from output shaft speed sensor (output rotation) even when engine revolution and turbine revolution both equal or exceed specified value, PCM judges that output shaft speed sensor has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

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

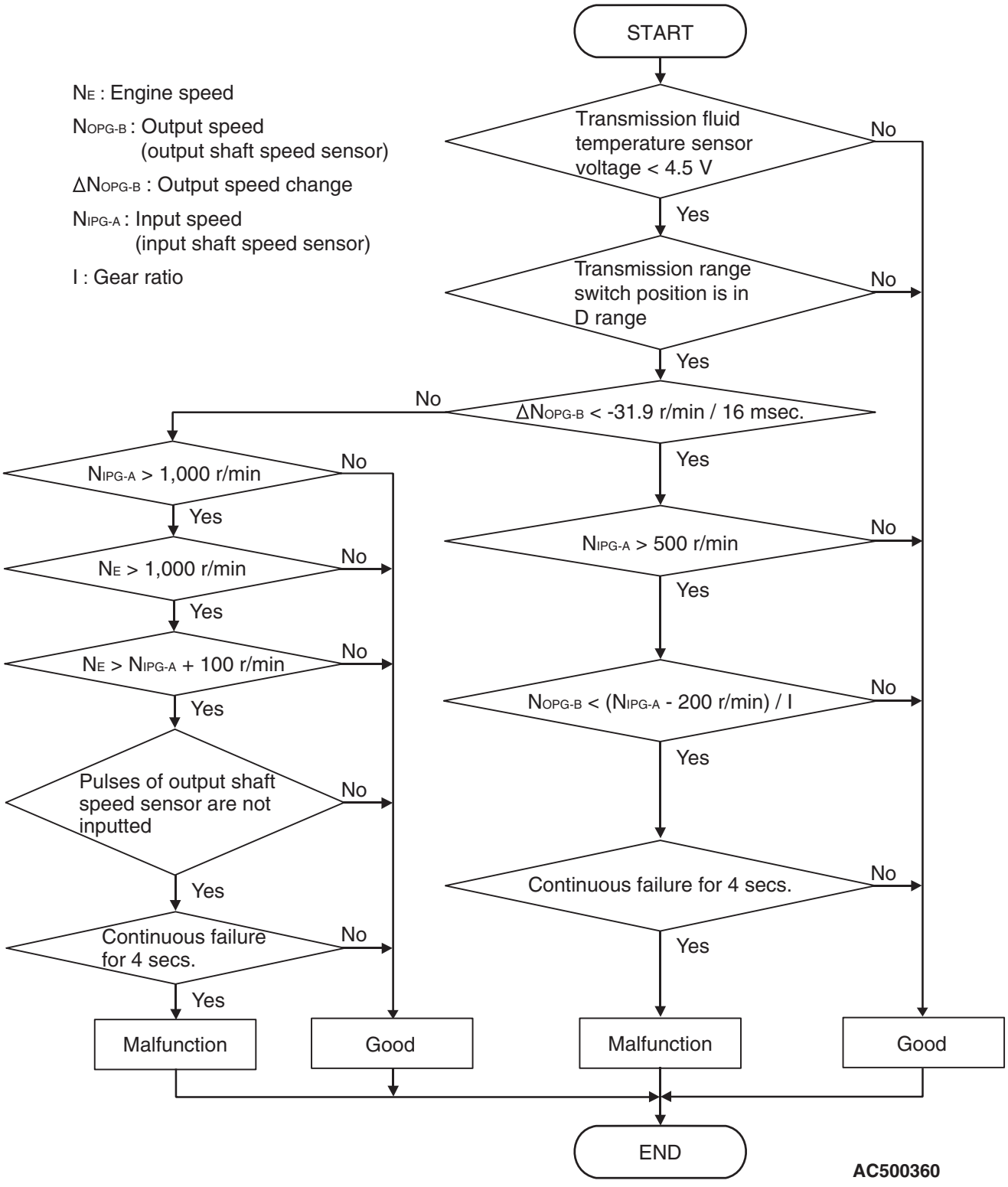
- DTC P1766 (P0715): Input shaft speed sensor malfunction
- DTC P1778 (P0743): Torque converter clutch solenoid malfunction
- DTC P1773 (P0753): Low and reverse solenoid malfunction
- DTC P1774 (P0758): Underdrive solenoid malfunction
- DTC P1775 (P0763): Second solenoid malfunction
- DTC P1776 (P0768): Overdrive solenoid malfunction
- DTC P1777 (P0773): Reduction solenoid malfunction <5A/T>
- DTC P1788 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Input shaft speed sensor
- Torque converter clutch solenoid
- Low and reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid <5A/T>
- A/T control relay

TSB Revision

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Transmission range switch position: D.
- Input speed: 1,000 r/min or more.
- Engine speed: 1,000 r/min or more.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Calculated slip (engine speed - input speed): 100 r/min or more.

TSB Revision

Judgement Criteria
- Output speed: no signal change. (4 seconds)
- If DTC P1767 (P0720) is set consecutively four times, the transaxle is locked into 3rd gear or 2nd gear as a fail-safe measure, and the "N" range light flashes once per second.

Check Conditions
- Transmission range switch position: D.
- Input speed: 500 r/min or more.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Rapid output speed change: -31.9 r/min / 0.016 second or less.

Judgement Criteria
- Output speed: [(input speed - 200 r/min) / gear ratio] or less. (4 seconds)
- If DTC P1767 (P0720) is set consecutively four times, the transaxle is locked into 3rd gear or 2nd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

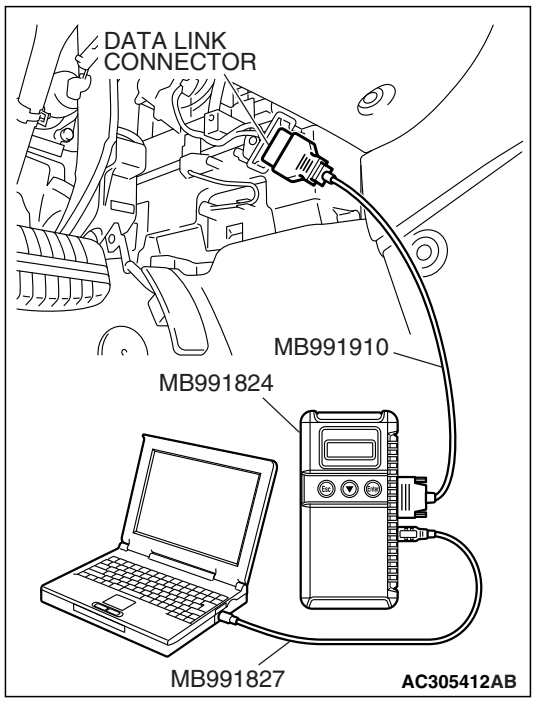
Start the engine, and drive for 5 seconds, with 1st gear fixed (L range or 1st gear in sport mode), at 20 km/h (12 mph) or more with 50% or more of throttle valve opening. Then stop the vehicle, and drive again for 5 seconds, with 1st gear fixed (L range or 1st gear in sport mode), at 20 km/h (12 mph) or more with 50% or more of throttle valve opening.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the output shaft speed sensor
- Malfunction of the transfer drive gear or driven gear <4A/T>
- Malfunction of the direct planetary carrier <5A/T>
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



STEP 1. Using scan tool MB991958, check data list item 6: Output Shaft Speed Sensor.

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 6: Output Shaft Speed Sensor.
  - When driving at a constant speed of 50km/h (31mph), the display should be "1,400 – 1,700 r/min" (Gear range: 3rd gear). <4A/T>
  - When driving at a constant speed of 60km/h (37mph), the display should be "1,400 – 1,700 r/min" (Gear range: 4th gear). <5A/T>

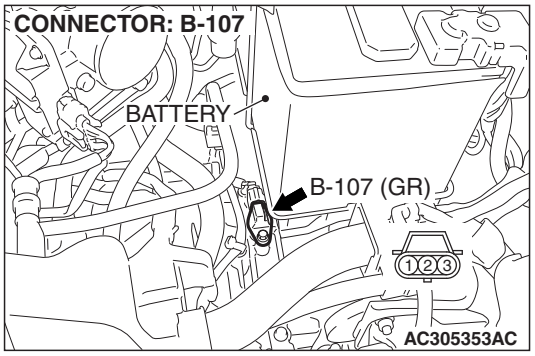
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor within the specified range?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Go to Step 2.

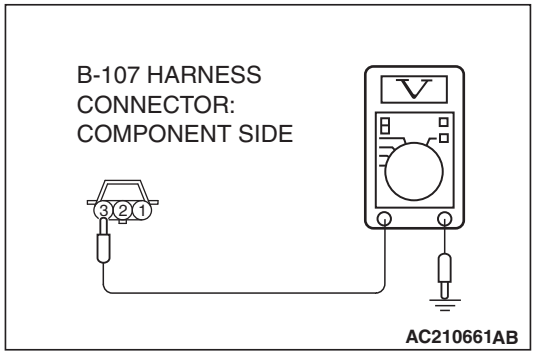
TSB Revision



STEP 2. Measure the power supply voltage at the output shaft speed sensor connector B-107.

(1) Disconnect connector B-107 and measure at the harness side.

(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 3 and ground.
- The voltage should measure battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 5.

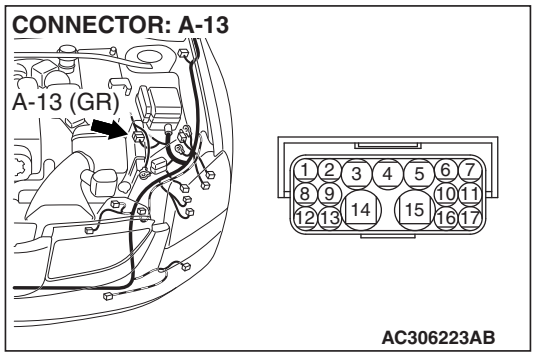
NO : Go to Step 3.

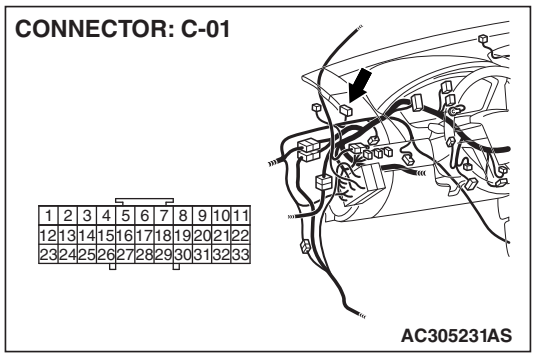
STEP 3. Check intermediate connector A-13, joint connector (1) C-01 and junction block connector C-214 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

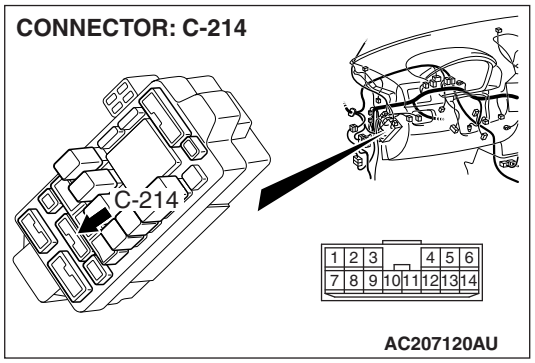
Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





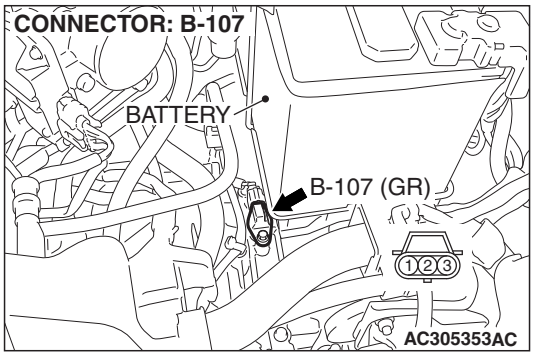


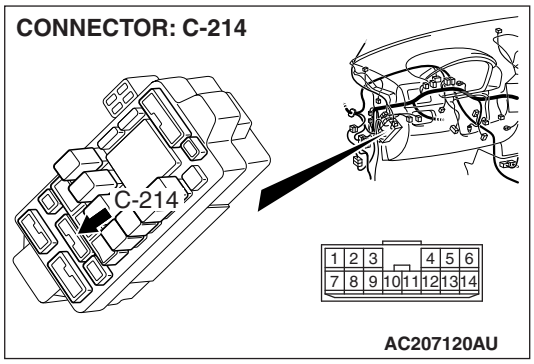
STEP 4. Check the harness for open circuit or short circuit to ground between the output shaft speed sensor connector B-107 terminal 3 and the junction block connector C-214 terminal 12.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair or replace the harness wire.

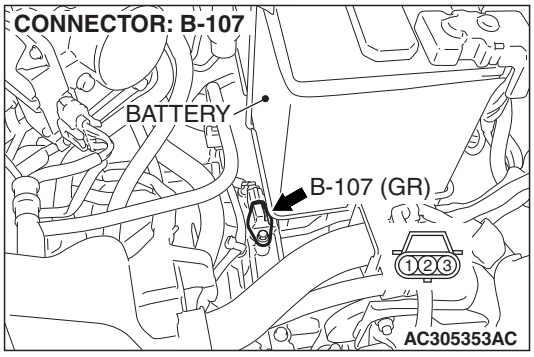


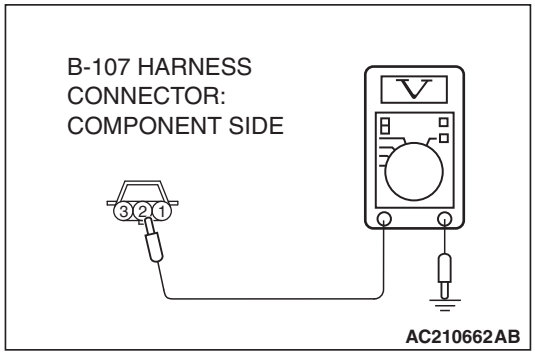


STEP 5. Measure the PCM to speed sensor output voltage at the output shaft speed sensor connector B-107.

(1) Disconnect connector B-107 from the speed sensor and measure voltage at the harness side.

(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 2 and ground.
- The voltage should measure between 4.5 and 4.9 volts.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

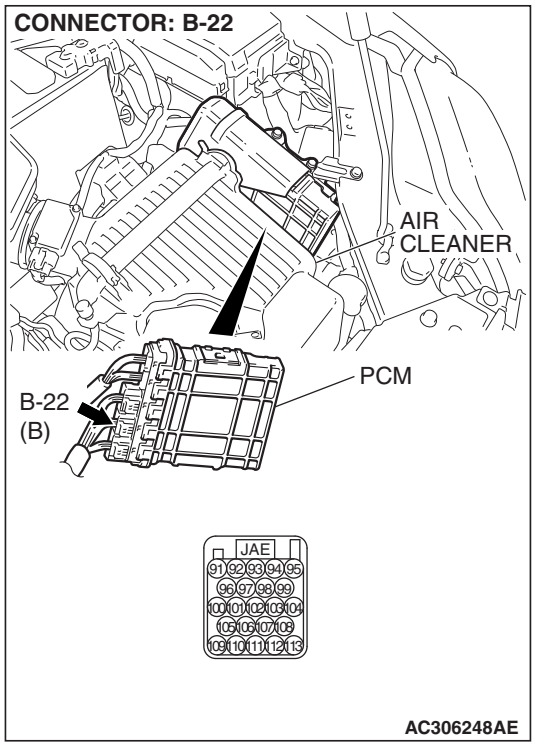
Q: Is the measured voltage between 4.5 and 4.9 volts?

YES : Go to Step 11.

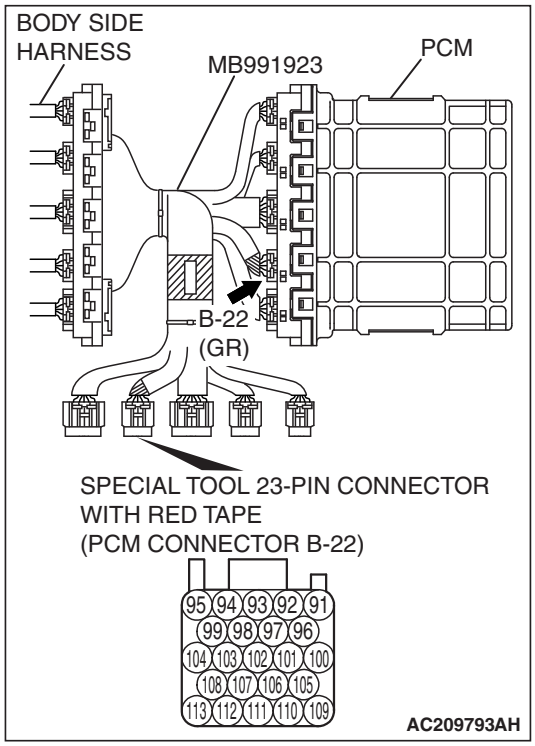
NO : Go to Step 6.

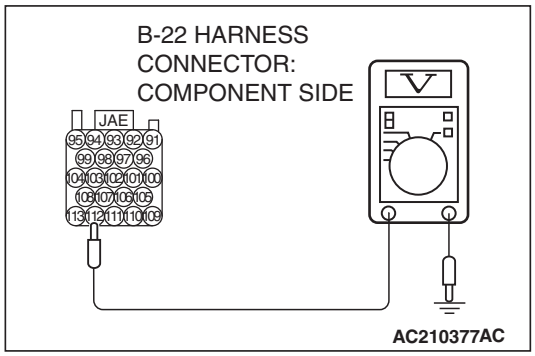
STEP 6. Measure the PCM output voltage to the speed sensor at the PCM connector B-22 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.





(4) Measure the voltage between terminal 112 and ground.
- The voltage should measure between 4.5 and 4.9 volts.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

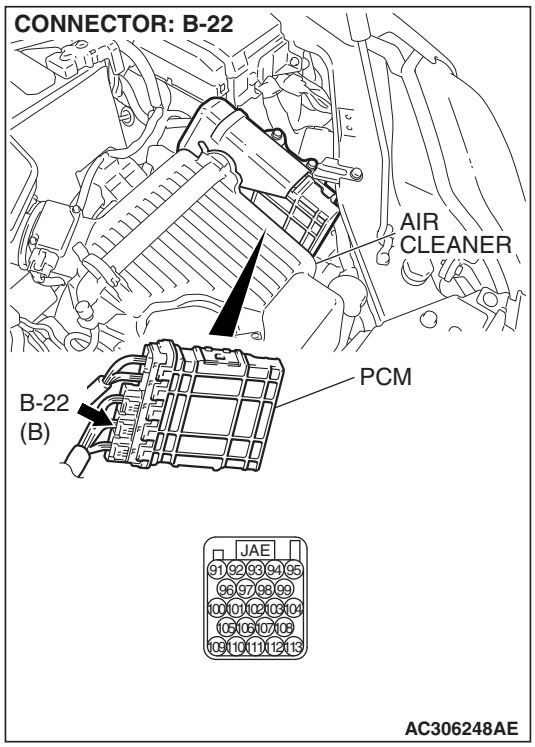
Q: Is the measured voltage between 4.5 and 4.9 volts?

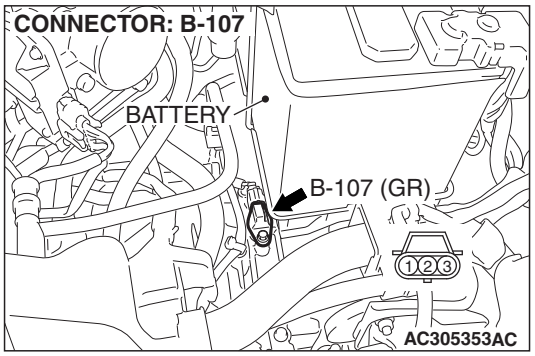
YES : Go to Step 7.
NO : Go to Step 9.

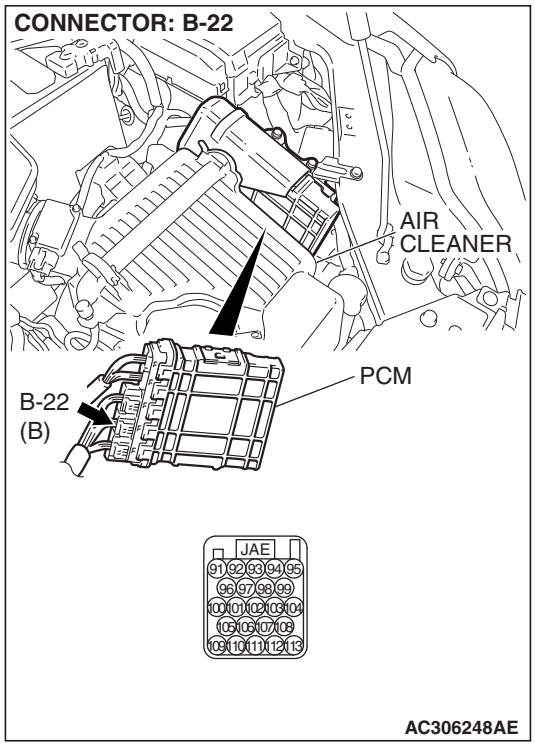
STEP 7. Check PCM connector B-22 and output shaft speed sensor connector B-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

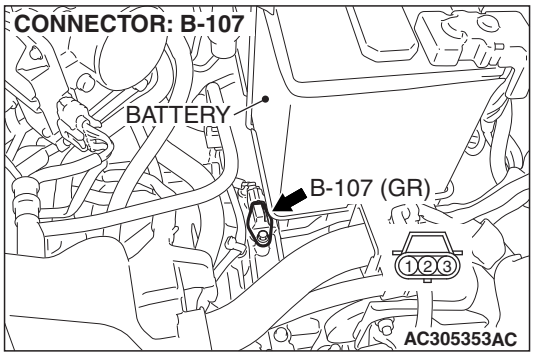
Q: Are the connectors in good condition?

YES : Go to Step 8.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







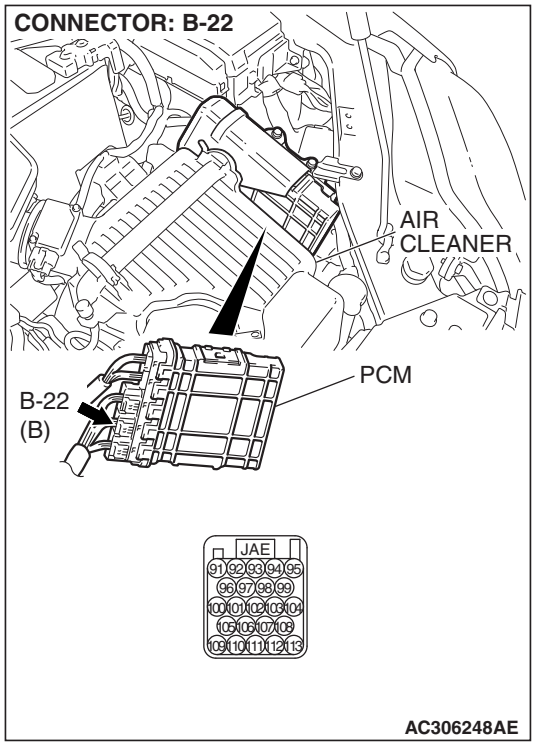


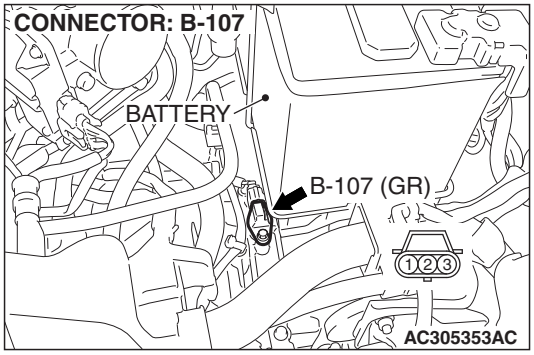
STEP 8. Check the harness for open circuit or damage between PCM connector B-22 terminal 112 and output shaft speed sensor connector B-107 terminal 2.

Q: Is the harness wire in good condition?

YES : Go to Step 19.

NO : Repair or replace the harness wire.



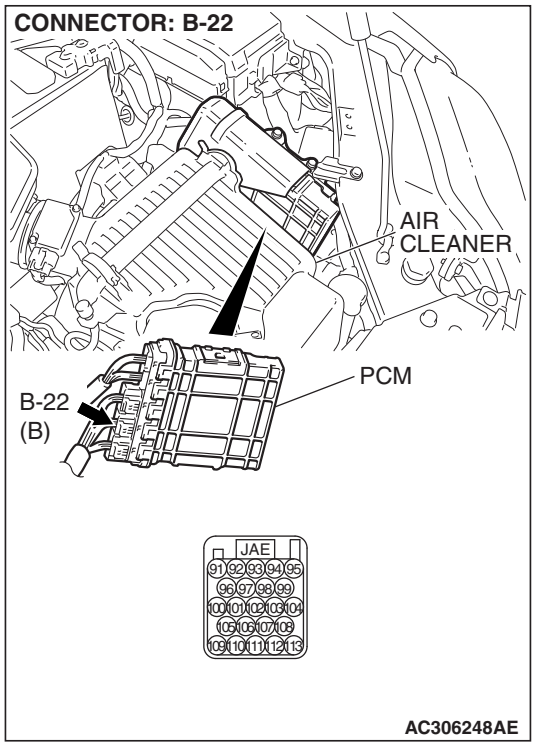


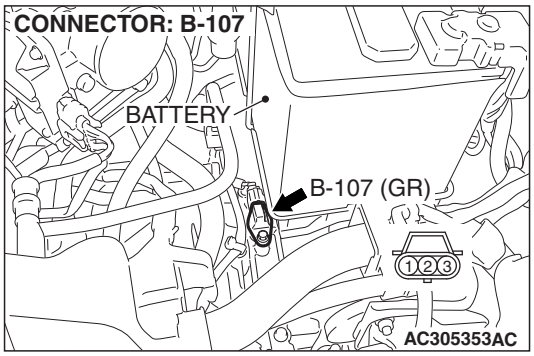
STEP 9. Check PCM connector B-22 and output shaft speed sensor connector B-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damages components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



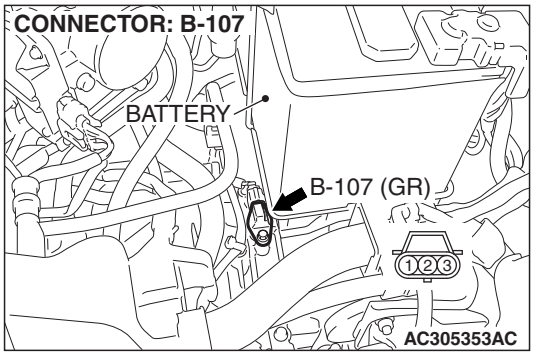


STEP 10. Check the harness for short circuit to ground between PCM connector B-22 terminal 112 and output shaft speed sensor connector B-107 terminal 2.

Q: Is the harness wire in good condition?

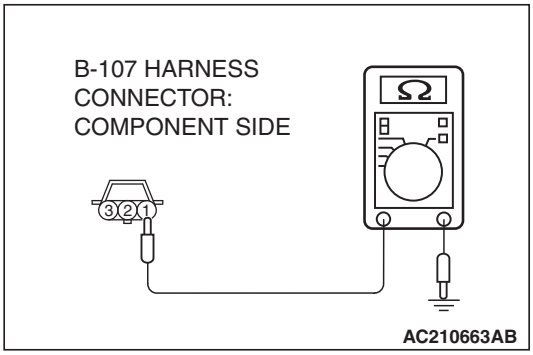
YES : Go to Step 11.

NO : Repair or replace the harness wire.



STEP 11. Measure the ground circuit for resistance at the output shaft speed sensor connector B-107.

(1) Disconnect connector B-107 from the speed sensor and measure at the harness side.



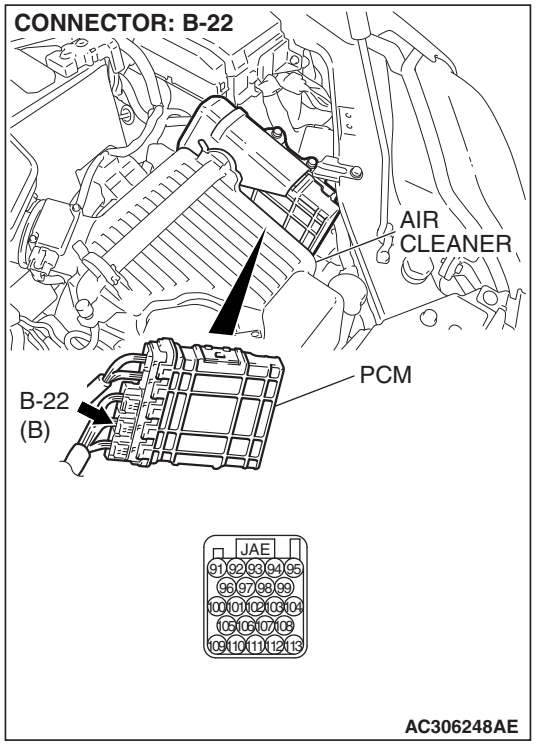
(2) Measure the resistance between terminal 1 and ground.
- The resistance should measure less than 2 ohms.

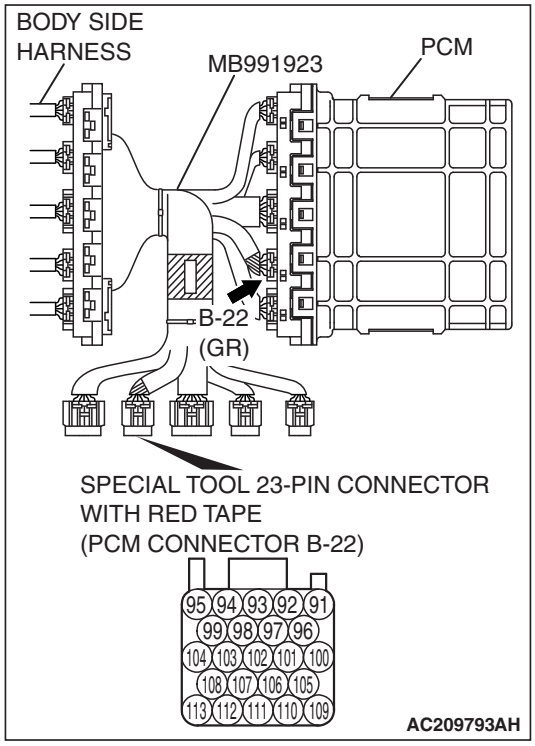
Q: Is the measured resistance less than 2 ohms?

YES : Go to Step 16.
NO : Go to Step 12.

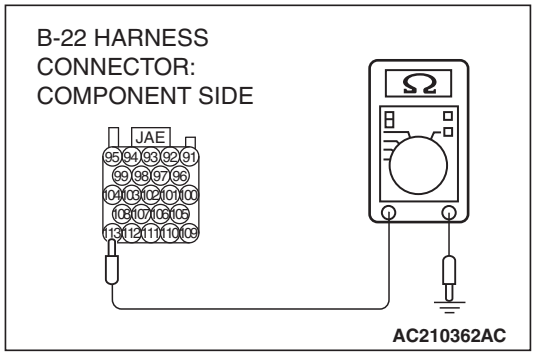
STEP 12. Measure the resistance at the PCM connector B-22 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.





(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.



(4) Measure the resistance between terminal 113 and ground.
- The resistance should measure less than 2 ohms.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

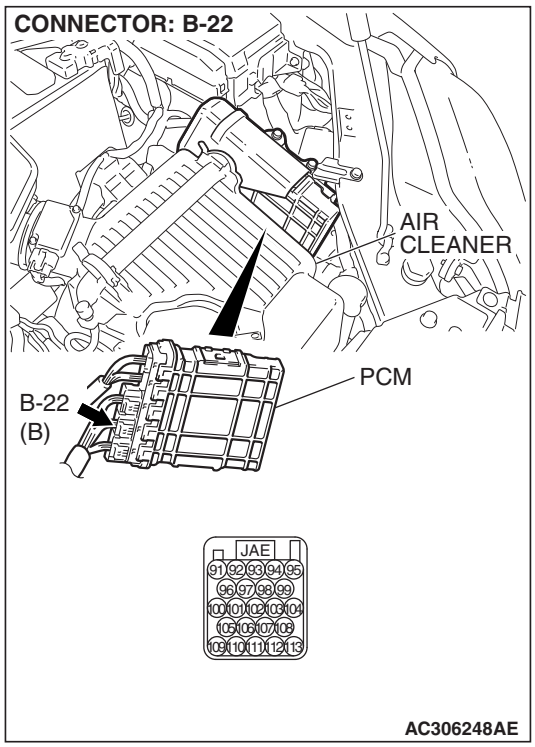
Q: Is the measured resistance less than 2 ohms?

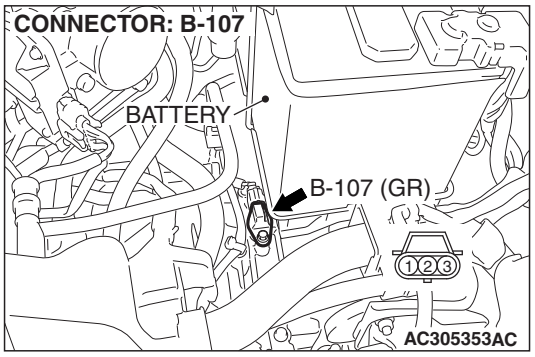
YES : Go to Step 13.
NO : Go to Step 15.

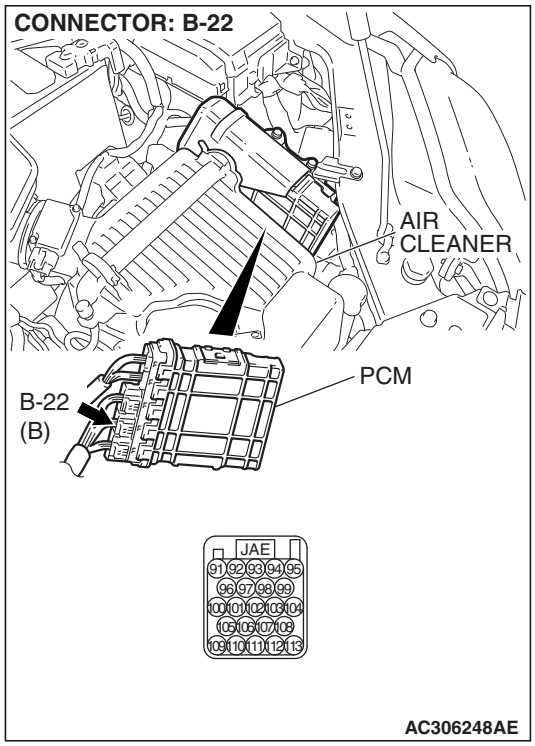
STEP 13. Check PCM connector B-22 and output shaft speed sensor connector B-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

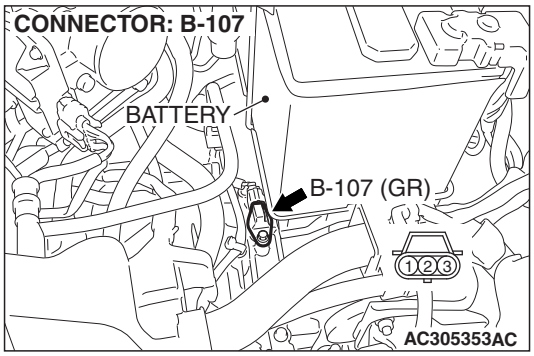
Q: Are the connectors and terminals in good condition?

YES : Go to Step 14.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







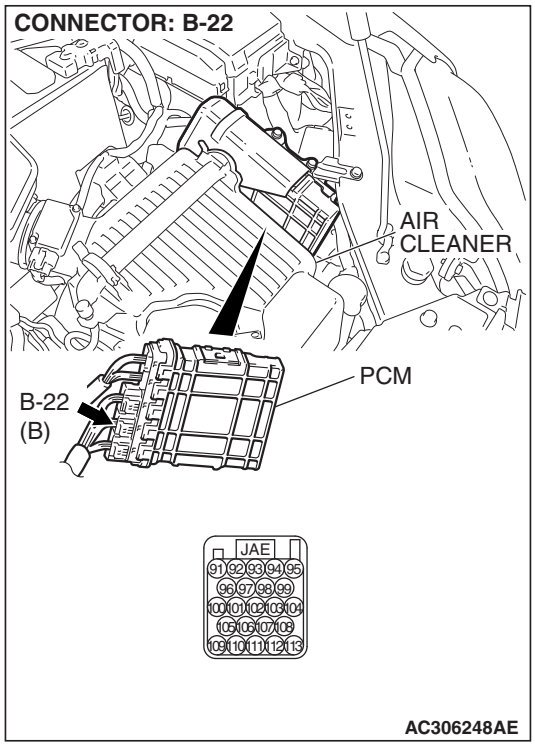


STEP 14. Check the harness for open circuit or damage between PCM connector B-22 terminal 113 and output shaft speed sensor connector B-107 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 16.

NO : Repair or replace the harness wire.

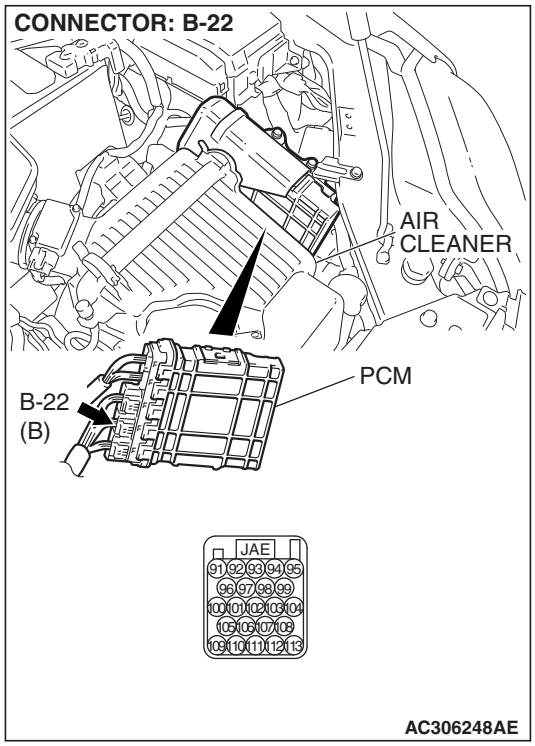


STEP 15. Check PCM connector B-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

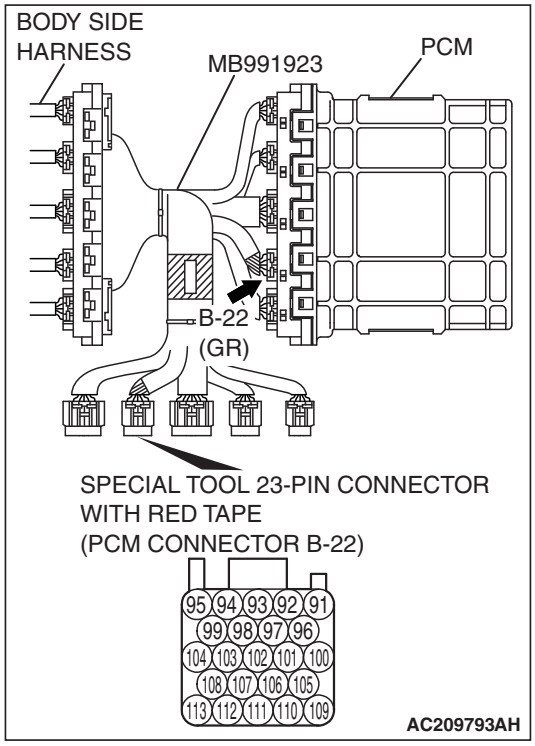
YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

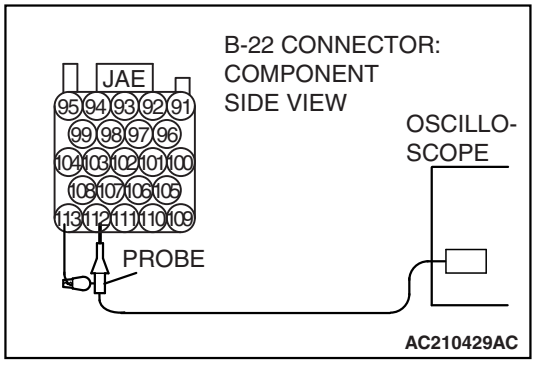


STEP 16. Using the oscilloscope, check the output shaft speed sensor waveform at PCM connectors B-22 by using check harness special tool MB991923.

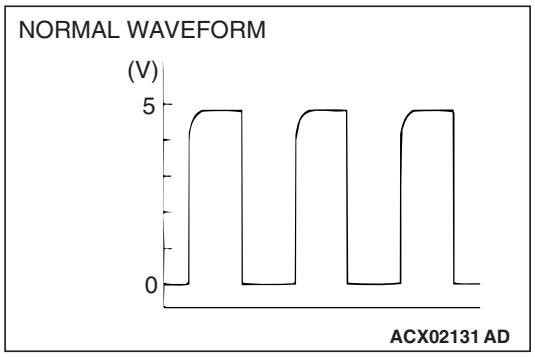
(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.



(3) Connect an oscilloscope probe to PCM connector B-22 terminal 112 and 113.
(4) Start the engine and drive the vehicle at constant speed of 50 km/h (31 mph) (Gear range: 3rd gear) <4A/T> or 60 km/h (37 mph) (Gear range: 4th gear) <5A/T>.

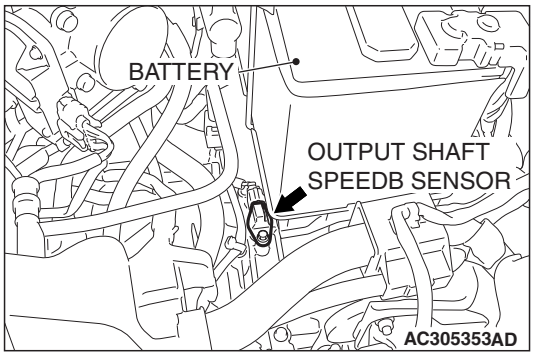


(5) Check the output shaft speed sensor waveform.
- The output shaft speed sensor waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts or more and the minimum value 0.8 volt or less. The output waveform should not contain electrical noise.

(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the waveform normal?

YES : Go to Step 19.
NO : Go to Step 17.

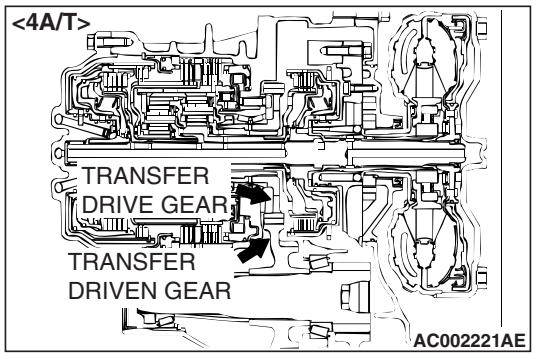


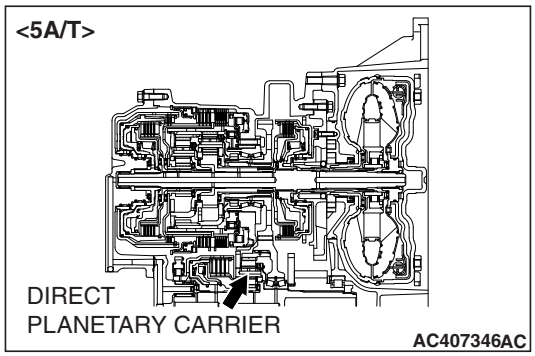
STEP 17. Replace the output shaft speed sensor.

(1) Replace the output shaft speed sensor. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is A/T DTC P1767 set?

YES : Go to Step 18.
NO : The procedure is complete.



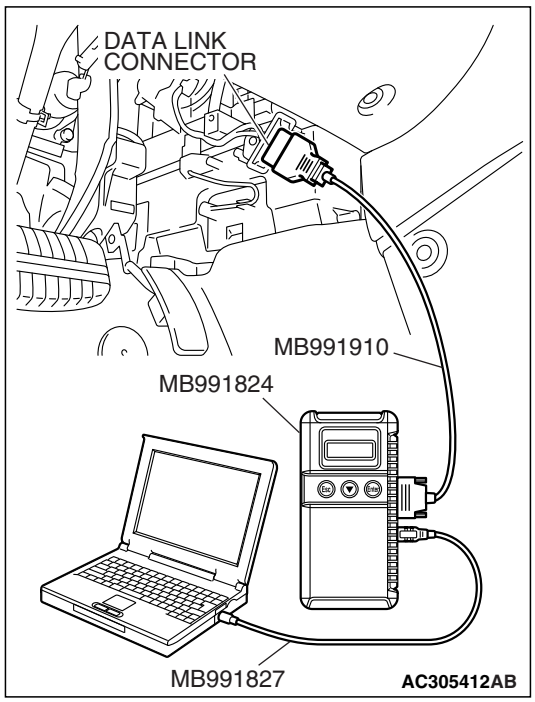


STEP 18. Replace the transfer drive gear, driven gear <4A/T> or direct planetary carrier <5A/T>.

(1) Replace the transfer drive gear or driven gear. Refer to GROUP 23B, Transaxle P.23B-8, Output Shaft P.23B-61 <4A/T> or Refer to GROUP 23C, Direct Planetary carrierP.23C-67 <5A/T>.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is A/T DTC P1767 set?

YES : An A/T DTC may have set due to external radio frequency interference (RFI) possibility caused by cellular phone activity, or aftermarket components installed on the vehicle.
NO : The procedure is complete.



STEP 19. Using scan tool MB991958, check data list item 6: Output Shaft Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to data reading mode.
- Item 6: Output Shaft Speed Sensor.
  - When driving at a constant speed of 50km/h (31mph), the display should be "1,400 – 1,700 r/min" (Gear range: 3rd gear). <4A/T>
  - When driving at a constant speed of 60km/h (37mph), the display should be "1,400 – 1,700 r/min" (Gear range: 4th gear). <5A/T>

(4) Turn the ignition switch to the "LOCK" (OFF) position.

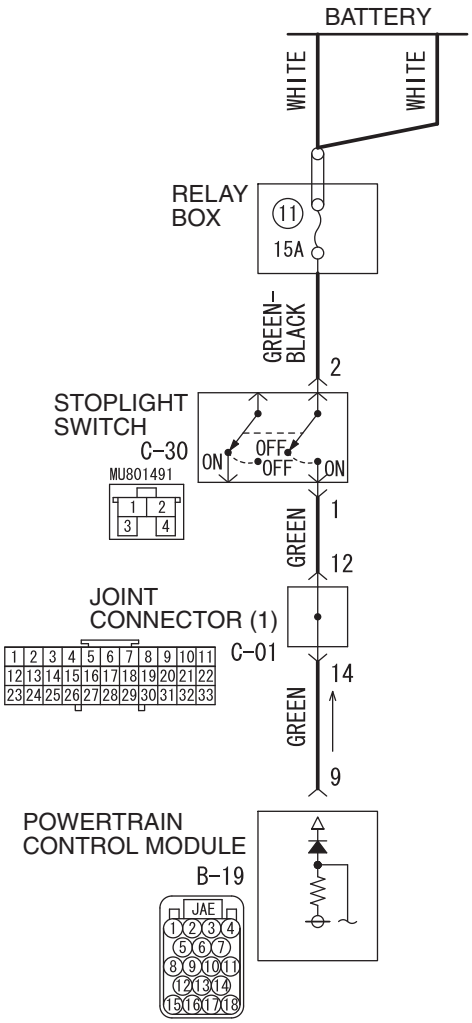
Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

DTC P1769: Stoplight Switch System

Stoplight Switch System Circuit



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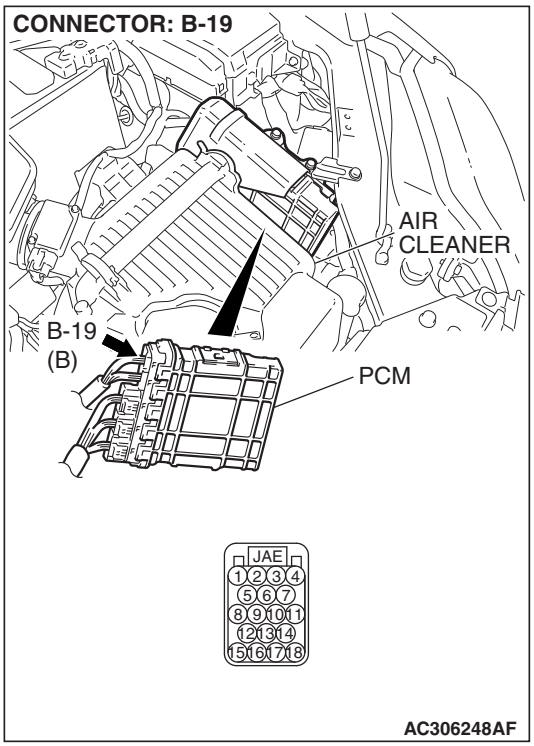
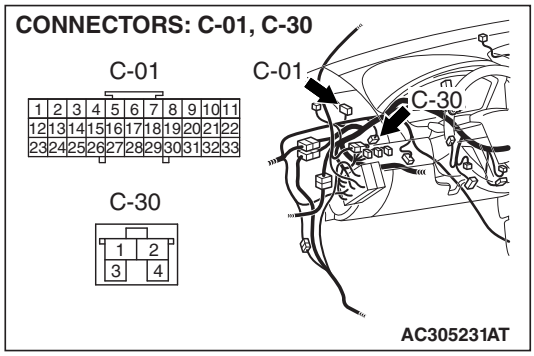




CIRCUIT OPERATION

- Battery positive voltage is supplied to the stop-light switch (terminal 2).
- When the brake pedal is depressed, battery positive voltage is applied to the PCM (terminal 9).

DTC SET CONDITIONS

If the stoplight switch is on for five minutes or more while driving above 50 km/h (31 mph), or all of the stop light bulbs are blown, it is judged there is a short circuit or open circuit in the stoplight switch. This causes DTC P1769 to be set.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the stoplight switch
- Malfunction of stoplight valve
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Check the brake pedal height.

Refer to GROUP 35A, On-vehicle Service – Brake Pedal Check and Adjustment P.35A-13.

Q: Is the height adjusted properly?

YES : Go to Step 2.
NO : Adjust the brake pedal to the proper height.

STEP 2. Check the stoplight valve.

Refer to GROUP 54A, Rear combination light P.54A-137.

Q: Is the stoplight valve in good condition?

YES : Go to Step 3.

NO : Replace the stoplight switch. Refer to GROUP 35A, Brake Pedal P.35A-23.

STEP 3. Using scan tool MB991958, check data list item 19: Stoplight Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.

(2) Turn the ignition switch to the "ON" position.

(3) Set scan tool MB991958 to the data reading mode.

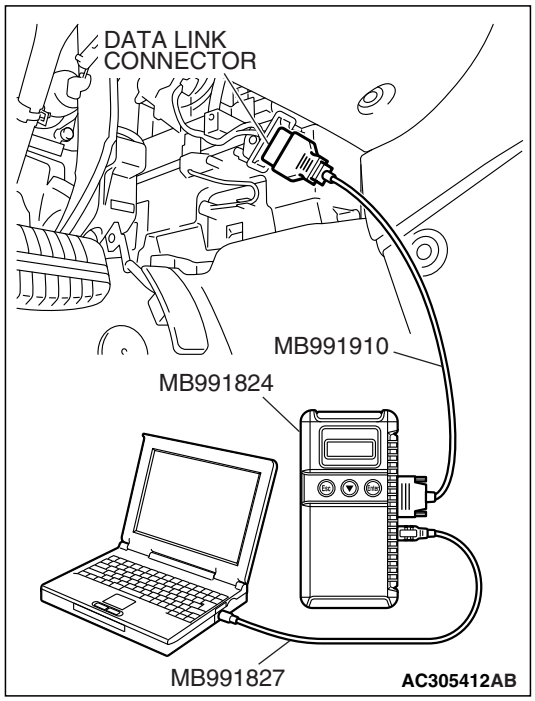
- Item 19: Stoplight Switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON."
  - When the brake pedal is not depressed, the display on scan tool MB991958 should be "OFF."

(4) Turn the ignition switch to the "LOCK" (OFF) position.

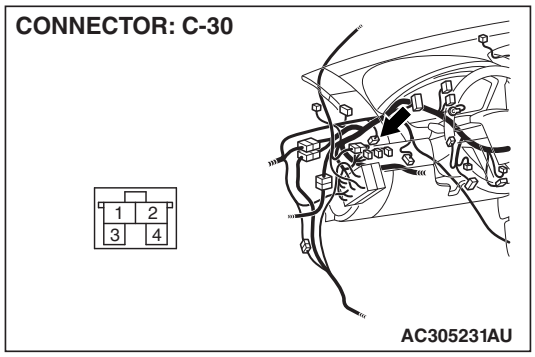
Q: Is the switch operating properly?

YES : It can be assumed that this malfunction may be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

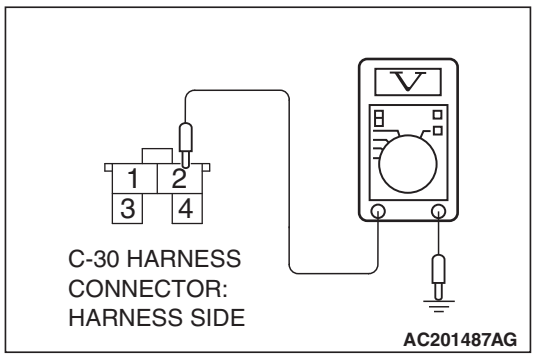
NO : Go to Step 4.



STEP 4. Measure the stoplight switch power supply voltage at connector C-30 by backprobing.



(1) Remove the stoplight switch from the mounting bracket.
(2) Do not disconnect connector C-30.

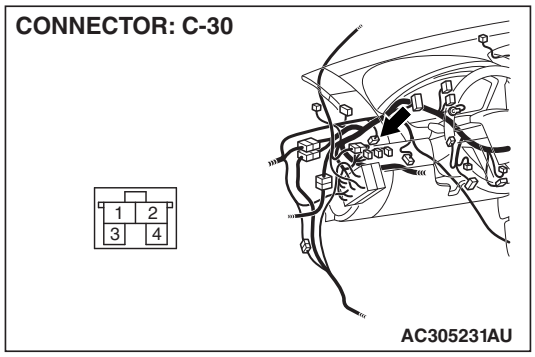


(3) Measure the voltage between terminal 2 and ground by backprobing.
- The voltage should measure battery positive voltage.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 7.
NO : Go to step 5.

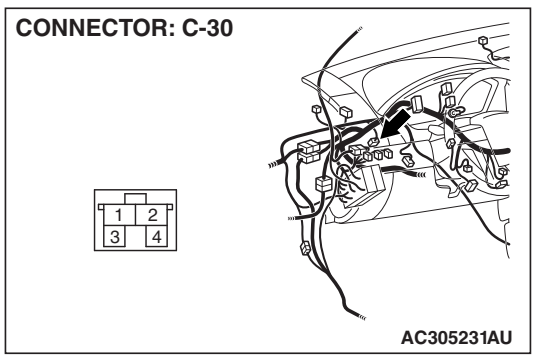
STEP 5. Check stoplight switch connector C-30 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Are the connector and terminals in good condition?

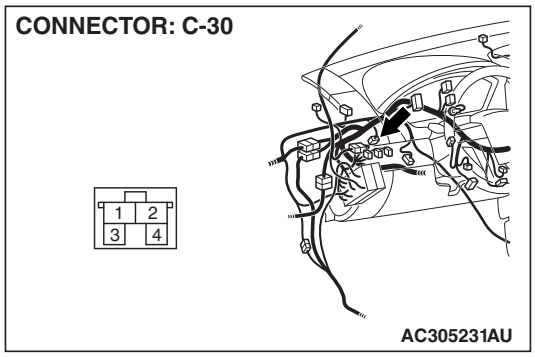
YES : Go to Step 6.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 6. Check the harness for damage between stoplight switch connector C-30 terminal 2 and the power supply fuse.



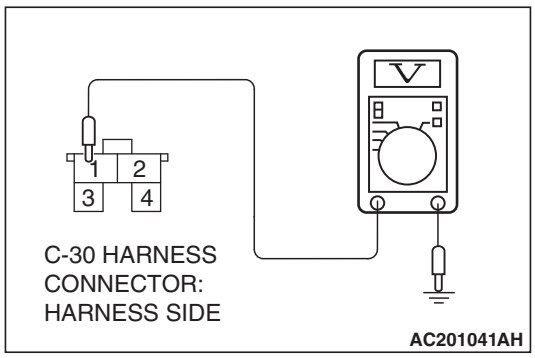
Q: Is the harness wire in good condition?

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



STEP 7. Measure the stoplight switch output voltage to the PCM at connector C-30 by backprobing.

(1) Remove the stoplight switch from the mounting bracket.
(2) Do not disconnect connector C-30.



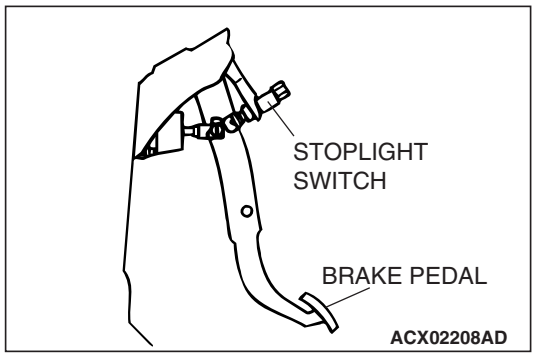
(3) Measure the voltage between terminal 1 and ground by backprobing.
- When the switch button is out (closed circuit), voltage should equal battery positive voltage.
- When the switch button is depressed (open circuit), voltage should measure less than 1.0 volt.

Q: Is the measured voltage battery positive voltage with the switch button released (closed circuit), and less than 1.0 volt with the switch button depressed (open circuit)?

YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Check the stoplight switch.

Refer to GROUP 35A, Brake Pedal – Brake Pedal Inspection P.35A-24.



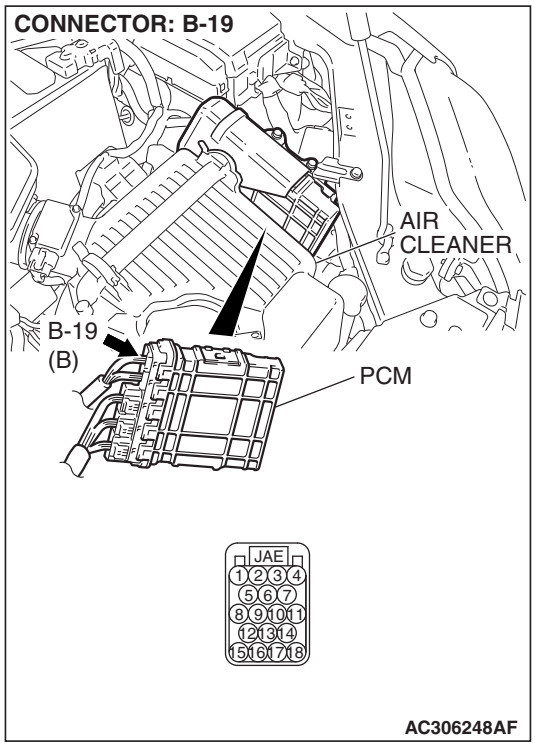
Q: Does the stoplight switch pass the checks?

YES : Go to Step 9.
NO : Replace the stoplight switch. Refer to GROUP 35A, Brake Pedal P.35A-23.

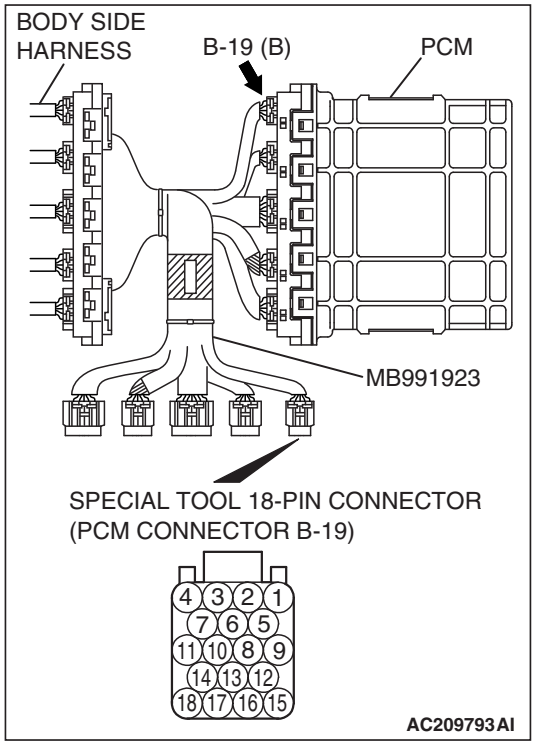
STEP 9. Measure the stoplight switch output voltage at the PCM connector B-19 by using check harness special tool MB991923.

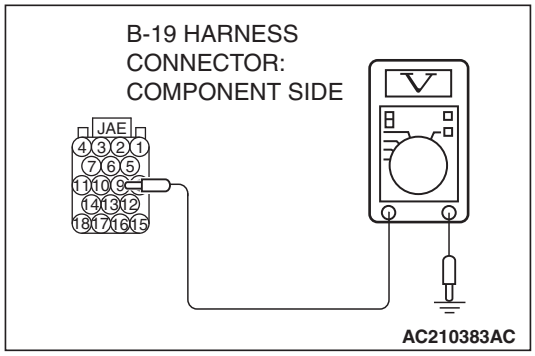
(1) Install the stoplight switch into the mounting bracket if it was removed.

(2) Disconnect all the connectors from the PCM.



(3) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.





(4) Measure the voltage between terminal 9 and ground.
- When the brake pedal is depressed, voltage should measure battery positive voltage.
- When the brake pedal is not depressed, voltage should measure less than 1.0 volt.

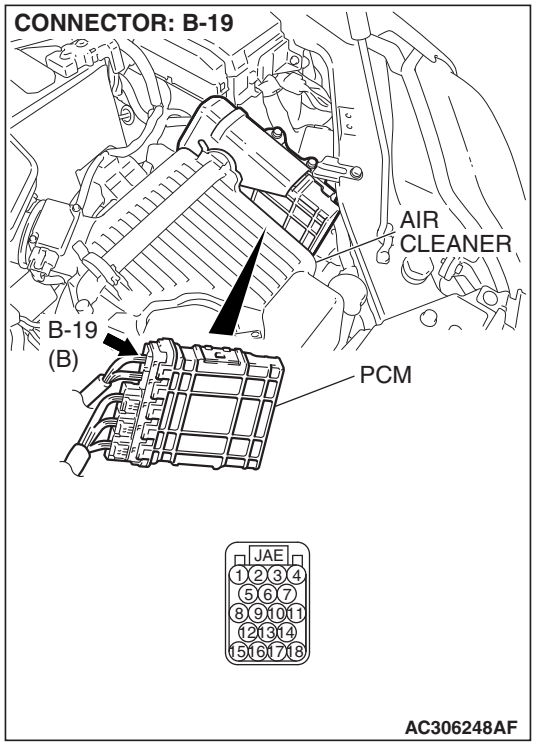
Q: Is the measured voltage battery positive voltage with the brake pedal depressed (closed circuit), and less than 1.0 volt with the brake pedal released (open circuit)?

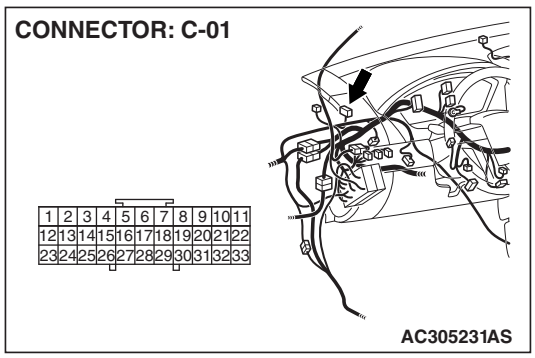
YES : Go to Step 12.
NO : Go to Step 10.

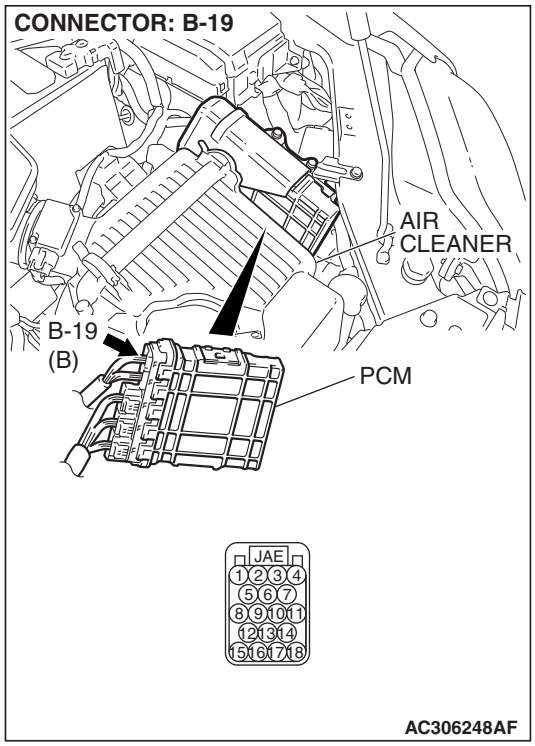
STEP10. Check PCM connector B-19 and joint connector (1) C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

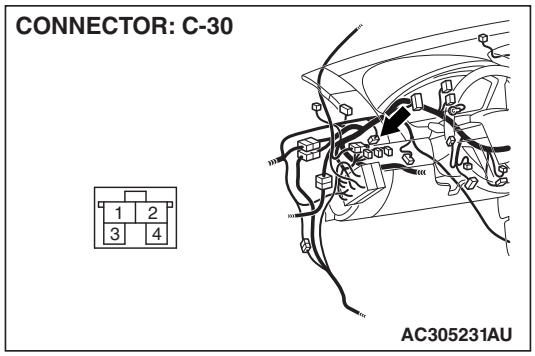
Q: Are the connectors and terminals in good condition?

YES : Go to Step 11.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







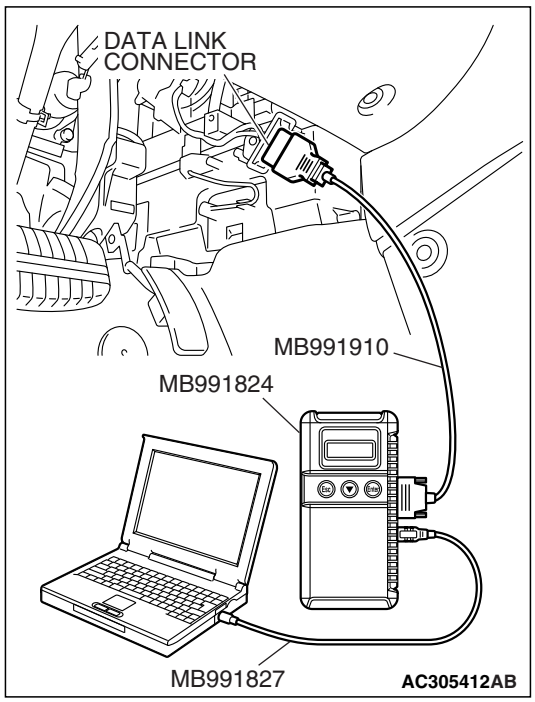


STEP 11. Check the harness for damage between PCM connector B-19 terminal 9 and stoplight switch connector C-30 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 12.

NO : Repair or replace the harness wire.



STEP 12. Using scan tool MB991958, check data list item 19: Stoplight Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
- Item 19: Stoplight Switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON."
  - When the brake pedal is not depressed, the display on scan tool MB991958 should be "OFF."

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : It can be assumed that this malfunction may be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

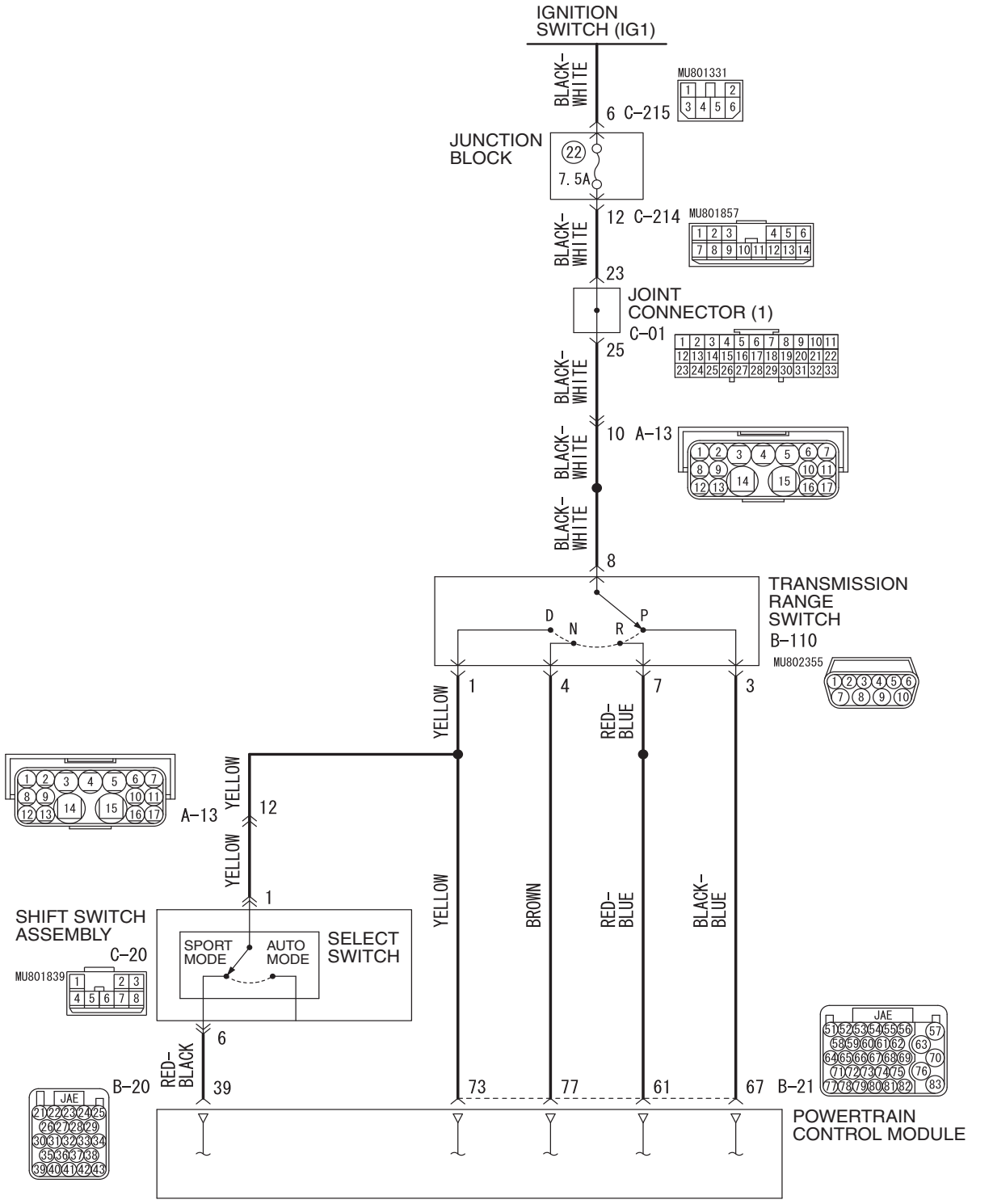
NO : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

DTC P1770 (P0705): Transmission Range Switch System (Open Circuit)

⚠ CAUTION

If DTC P1770 (P0705) has been set, TCL related DTC C1397 is also set. After DTC P1770 (P0705) has been diagnosed, don't forget to erase DTC C1397.

Transmission Range Switch System Circuit



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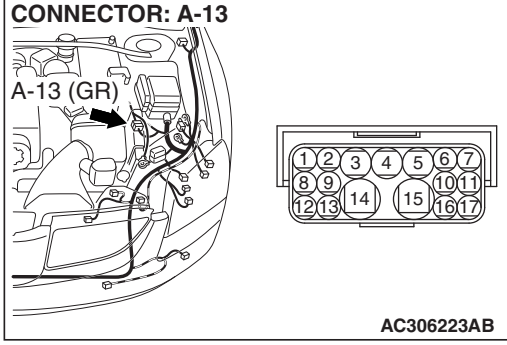
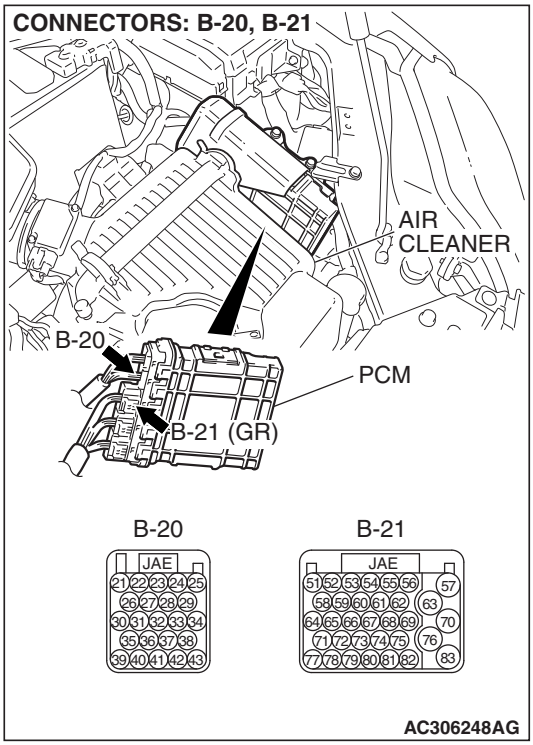
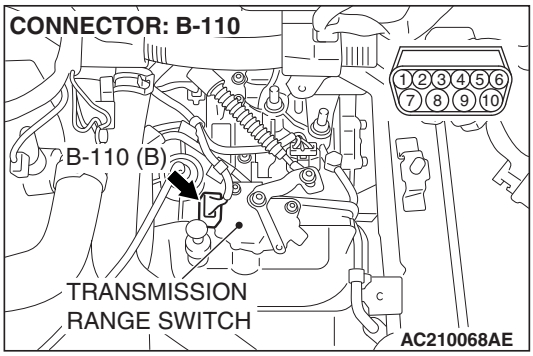
CONNECTOR: A-13



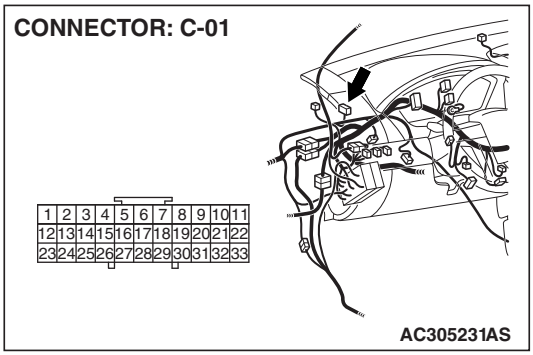
CONNECTORS: B-20, B-21



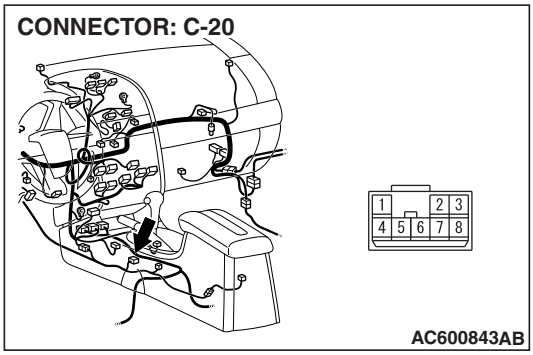
CONNECTOR: B-110



CONNECTOR: C-01



CONNECTOR: C-20



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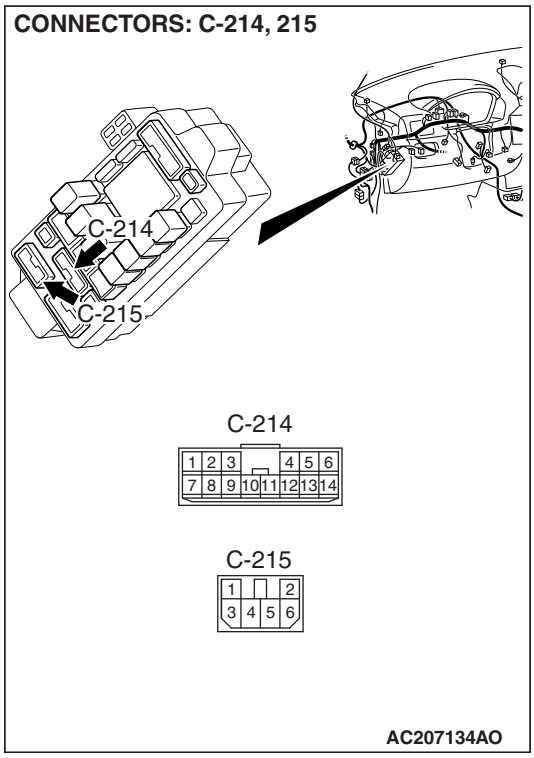


CIRCUIT OPERATION

- Battery positive voltage is applied to the transmission range switch (terminal 8) when the ignition switch is turned "ON."
- Battery positive voltage is applied to the PCM (terminal 67) when the transmission range is in the "P" range. The PCM judges that the transmission range is in the "P" range when the battery positive voltage is applied.
- Battery positive voltage is applied to the PCM terminal 61 (77, 73) when the selector lever is in the "R" range ("N," "D" range). The PCM judges that the selector lever is in the "R" range ("N," "D" range) when the battery positive voltage is applied.

DESCRIPTIONS OF MONITOR METHODS

- If no signal is input from transmission range switch for more than 30 seconds, PCM judges that transmission range switch has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

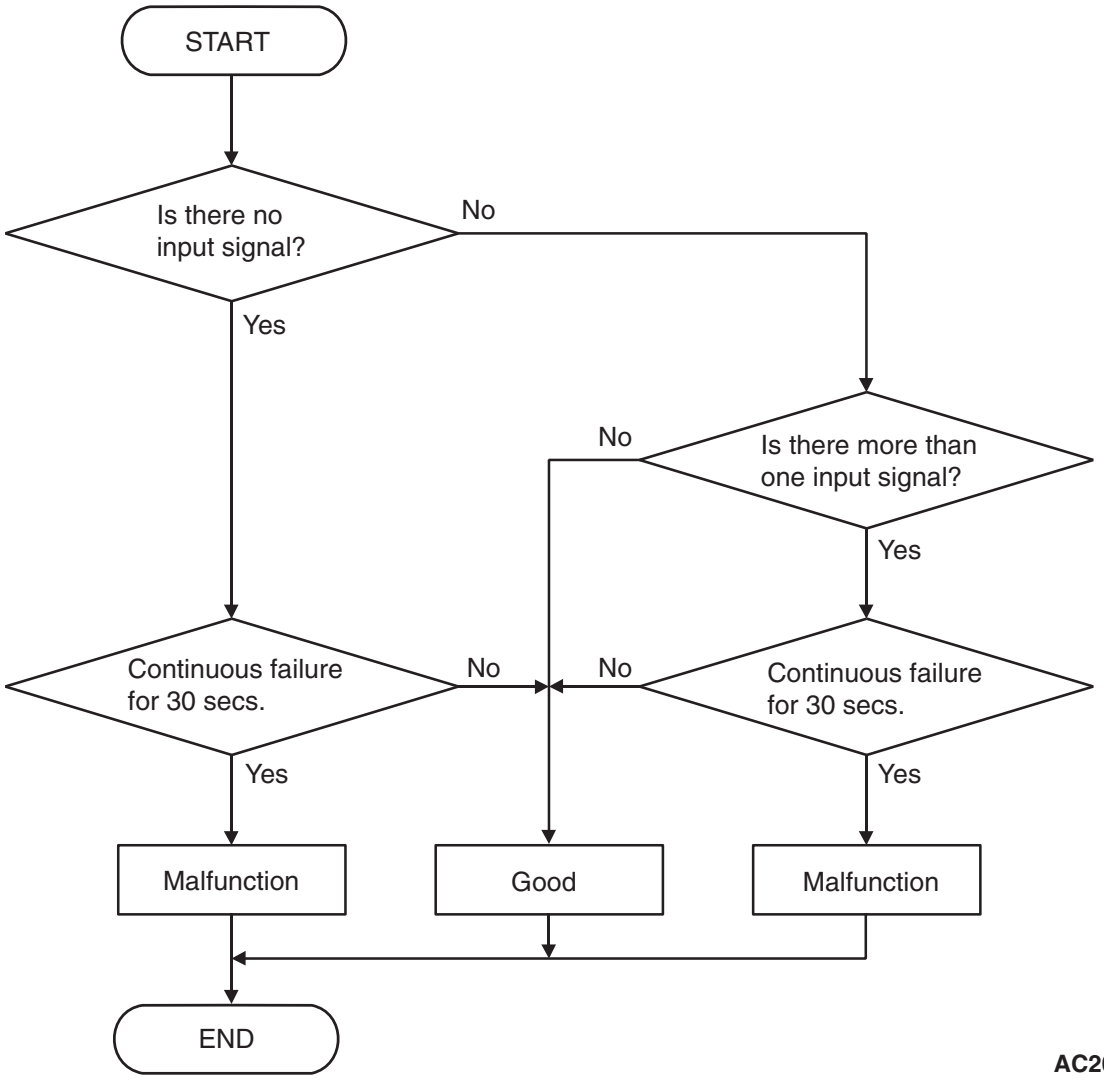
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions, Judgement Criteria

- Transmission range switch: no signal detected. (30 seconds)

OBD-II DRIVE CYCLE PATTERN

Start the engine, keep the vehicle stopped in "P," "R," "N," "D" ranges respectively for more than one minute, and turn "LOCK" (OFF) the ignition switch. Then restart the engine, and stop the vehicle in "P," "R," "N," "D" ranges respectively for more than one minute.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the transmission range switch
- Malfunction of the ignition switch
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

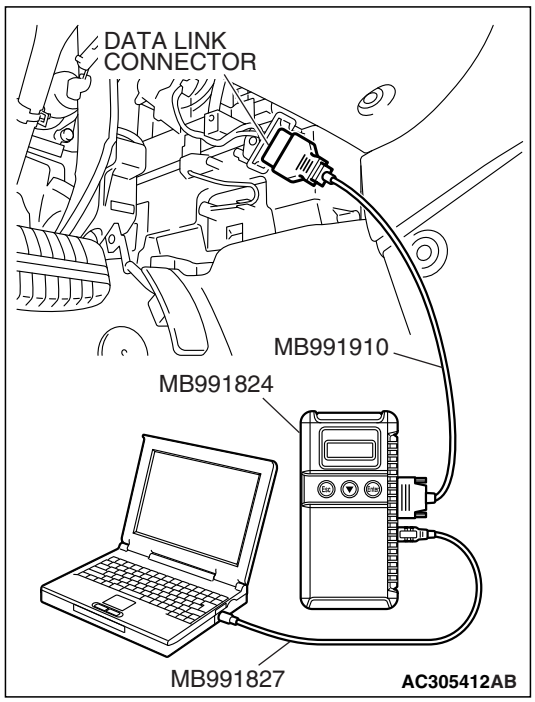
Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check data list item 34: Transmission Range Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
  - Item 34: Transmission Range Switch.
    - Move the selector lever to "P," "R," "N," "D" and sport mode positions and confirm that the selected transmission range match the positions shown on scan tool MB991958. (The scan tool displays "D" range when the selector lever is shifted to the sport mode).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Does the scan tool indication correspond to the actual transmission range?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO (no correct transmission range is displayed) : Go to Step 2.

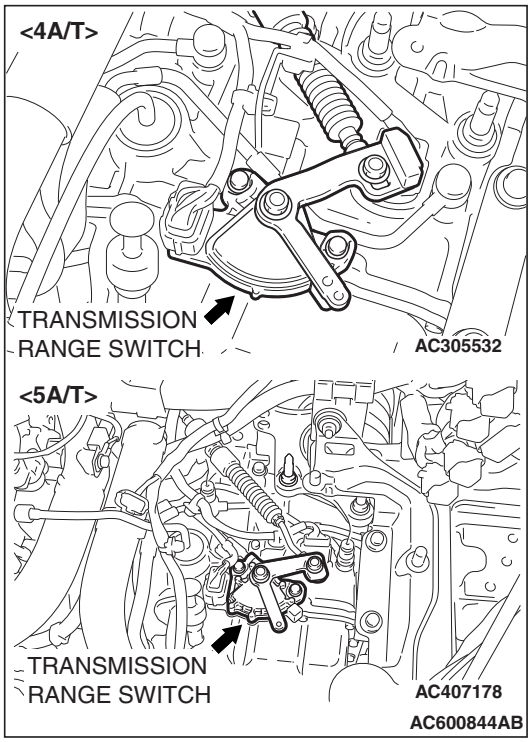
NO (Only "P" position is not displayed correctly) : Go to Step 6.

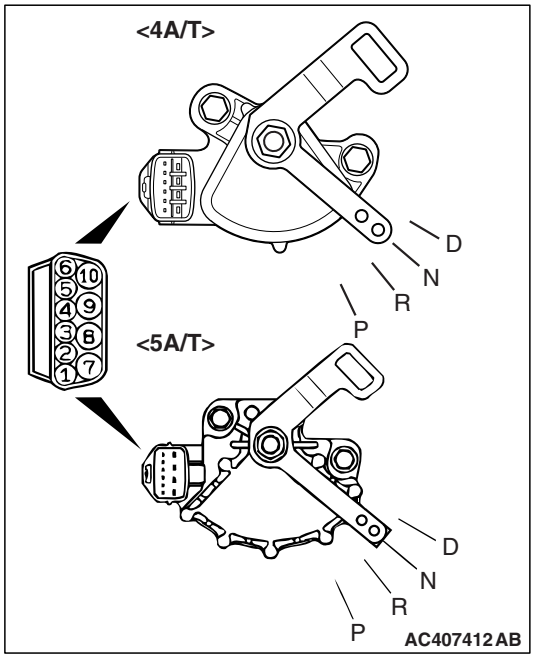
NO (Only "R" position is not displayed correctly) : Go to Step 12.

NO (Only "N" position is not displayed correctly) : Go to Step 17.

NO (Only "D" position is not displayed correctly) : Go to Step 22.

NO [Only sport mode position is not displayed correctly ("D" is not displayed.)] : Go to Step 29.





STEP 2. Check the transmission range switch.

Measure the resistance between the terminals for each transmission range as indicated in the table below.

TRANSMISSION RANGE	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	

NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

Q: Does the resistance measure less than 2 ohms for each transmission range?

YES : Go to Step 3.

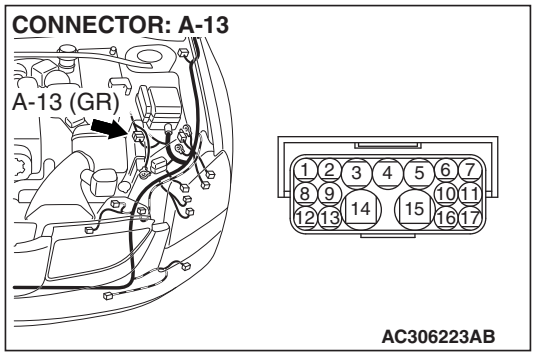
NO : Replace the transmission range switch. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.

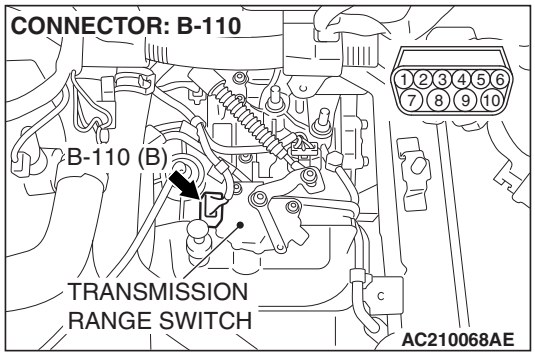
STEP 3. Check intermediate connector A-13, transmission range switch connector B-110, joint connector (1) C-01 and junction block connector C-214 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

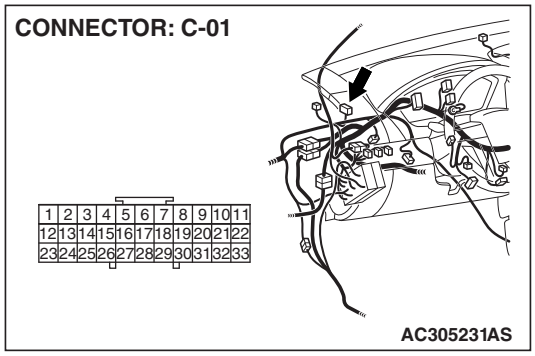
Q: Are the connectors and terminals in good condition?

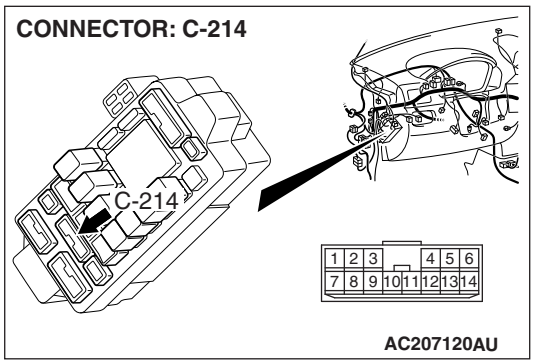
YES : Go to Step 4.

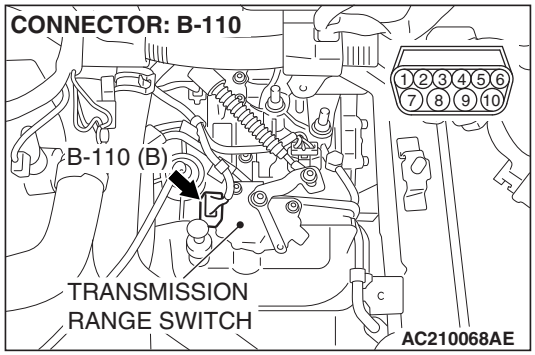
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

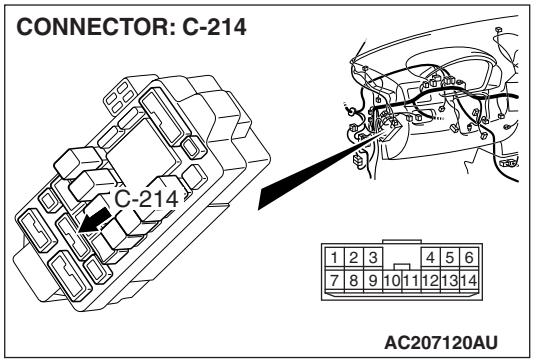










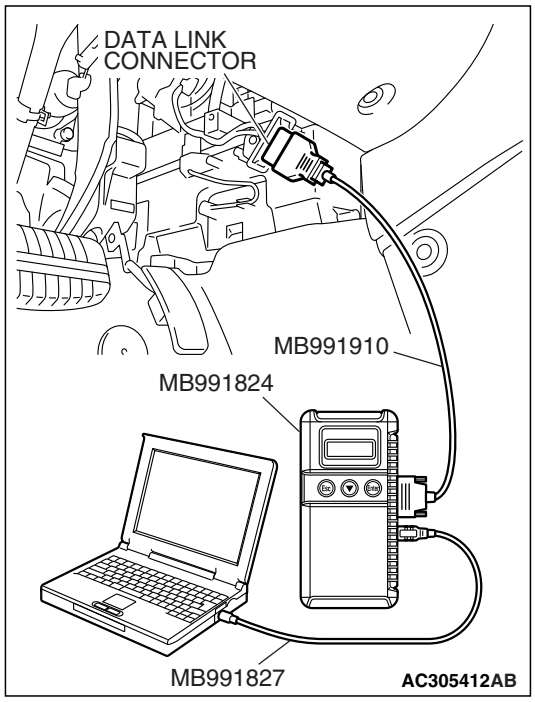


STEP 4. Check harness for open or short circuit to ground between transmission range switch connector B-110 terminal 8 and junction block connector C-214 terminal 12.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair or replace the harness wire.



STEP 5. Using scan tool MB991958, check data list item 34:Transmission Range Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.

(2) Turn the ignition switch to "ON" position.

(3) Set scan tool MB991958 to the data reading mode.

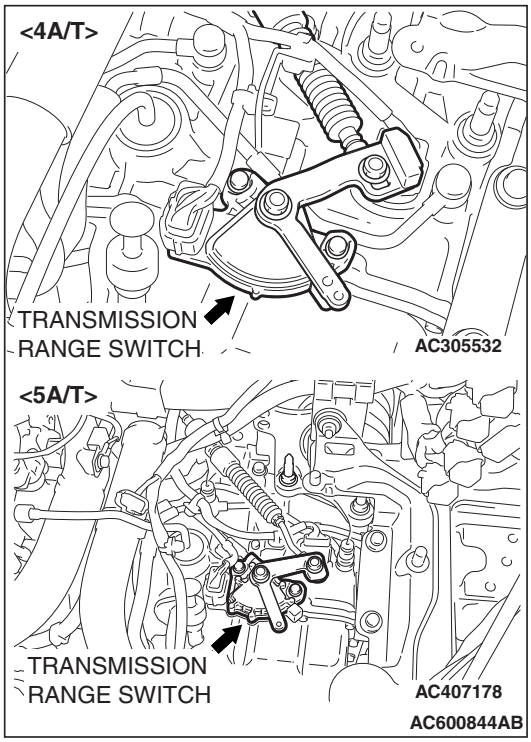
- Item 34: Transmission Range Switch.
  - Move the selector lever to "P," "R," "N," "D" and sport mode positions and confirm that the selected transmission range match the positions shown on scan tool MB991958. (The scan tool displays "D" range when the selector lever is shifted to the sport mode).

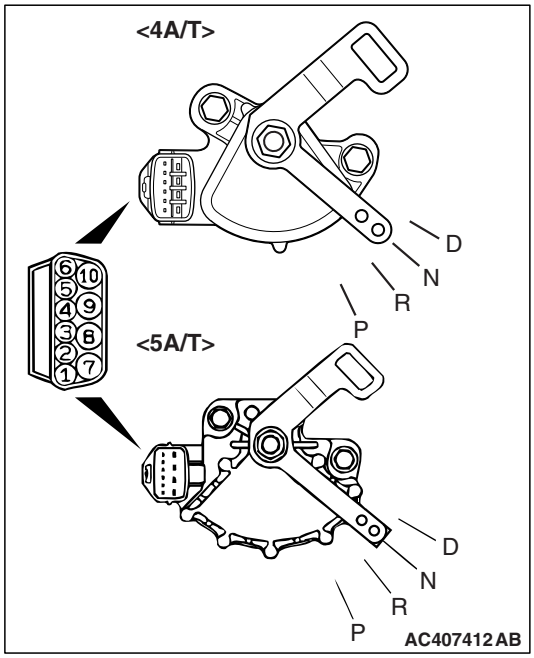
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.





STEP 6. Check the transmission range switch.

Measure the resistance between the terminals for each transmission range as indicated in the table below.

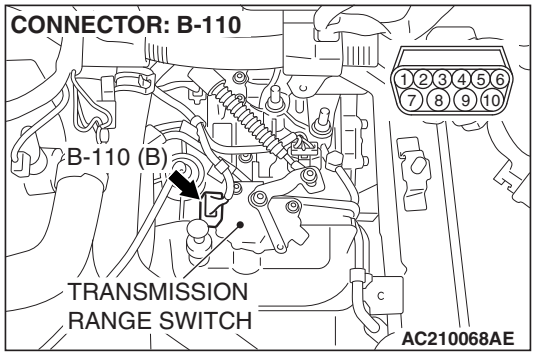
TRANSMISSION RANGE	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	

NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

Q: Does the resistance measure less than 2 ohms for each transmission range?

YES : Go to Step 7.

NO : Replace the transmission range switch. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.



STEP 7. Check transmission range switch connector B-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

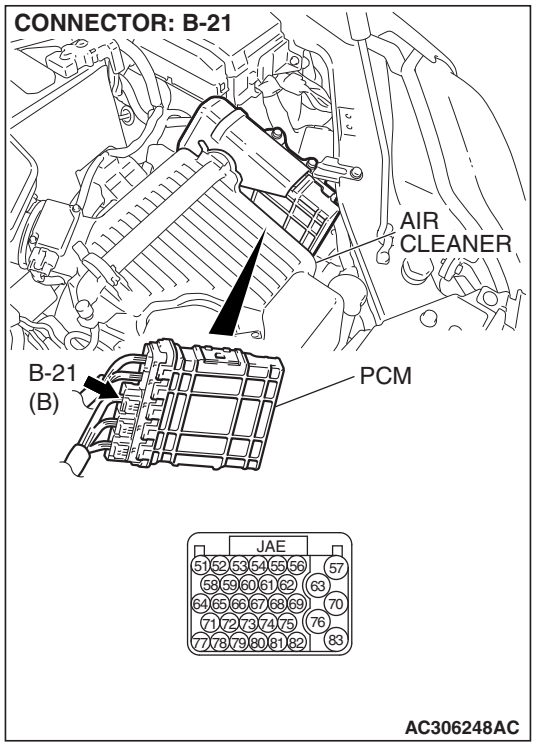
Q: Are the connector and terminals in good condition?

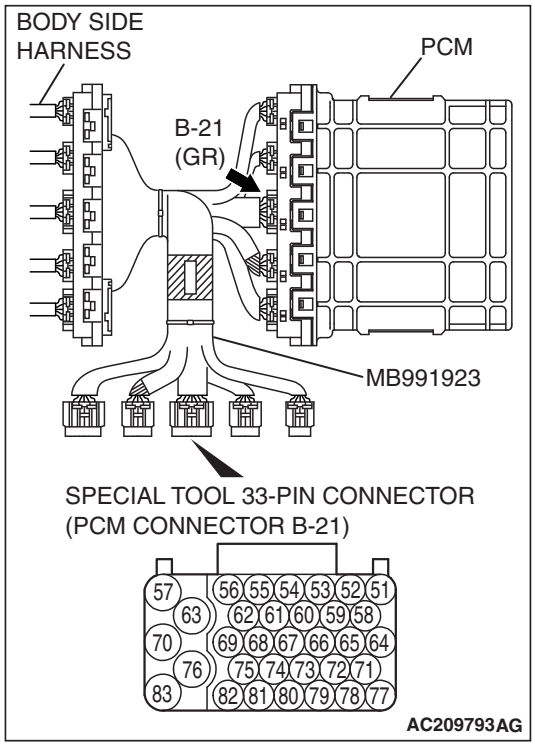
YES : Go to Step 8.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

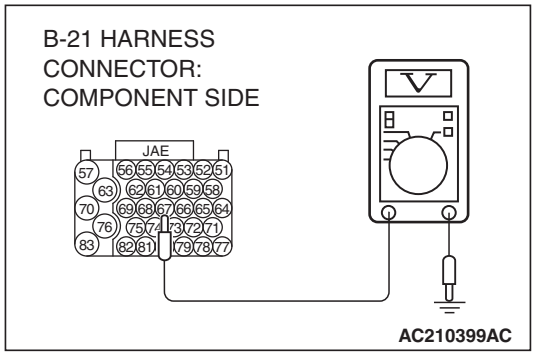
STEP 8. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.





(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.
(4) Move the selector lever to the "P" position.



(5) Measure the voltage between terminal 67 and ground.
- The voltage should measure battery positive voltage.

(6) Turn the ignition switch to the "LOCK" (OFF) position.

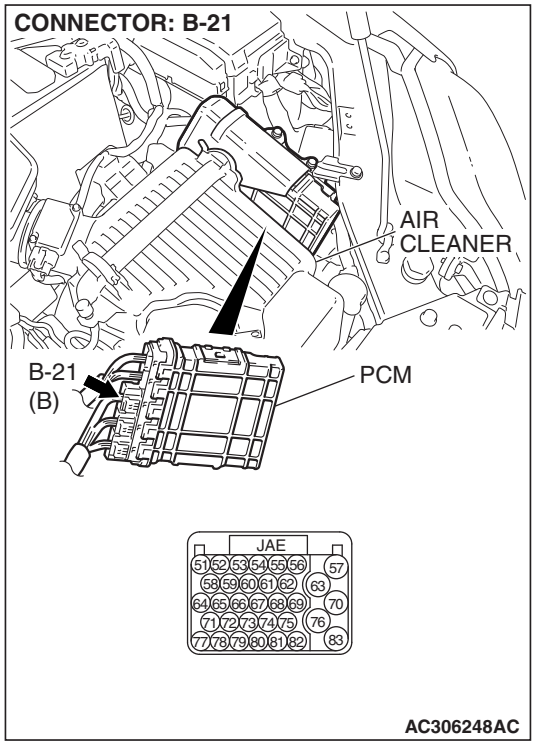
Q: Is the measured voltage battery positive voltage?

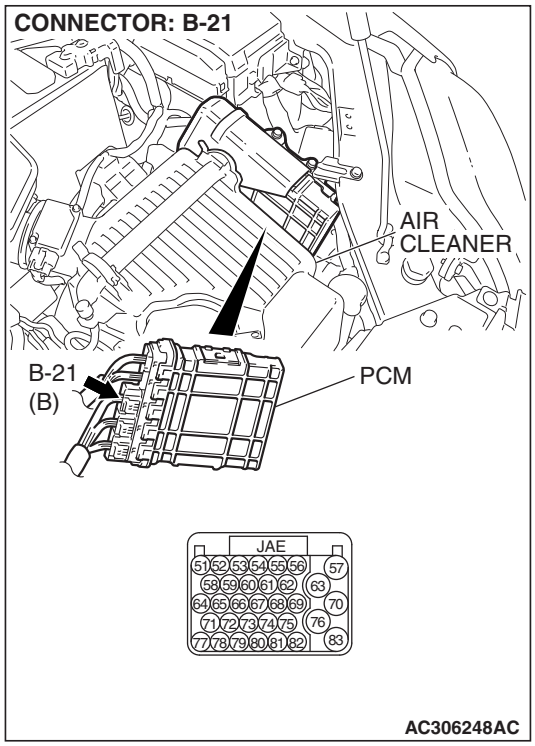
YES : Go to Step 11.
NO : Go to Step 9.

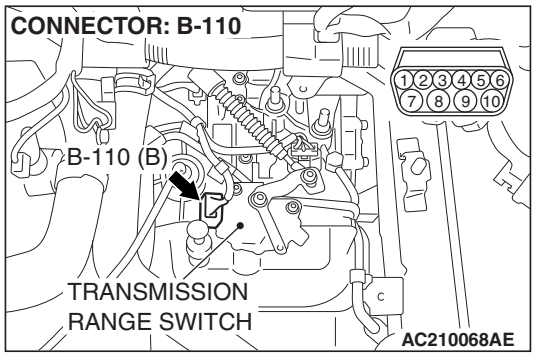
STEP 9. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 10.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

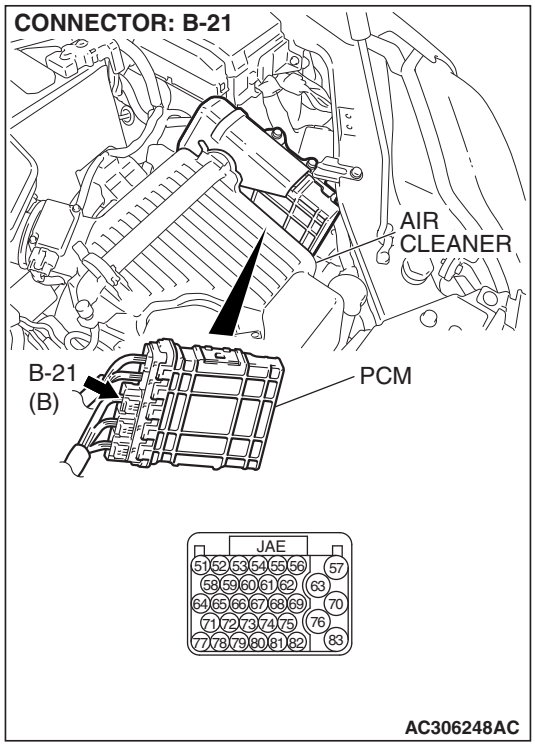






STEP 10. Check harness for open circuit or short circuit to ground between PCM connector B-21 terminal 67 and transmission range switch connector B-110 terminal 3.
Q: Is the harness wire in good condition?

YES : Go to Step 5.
NO : Repair or replace the harness wire.

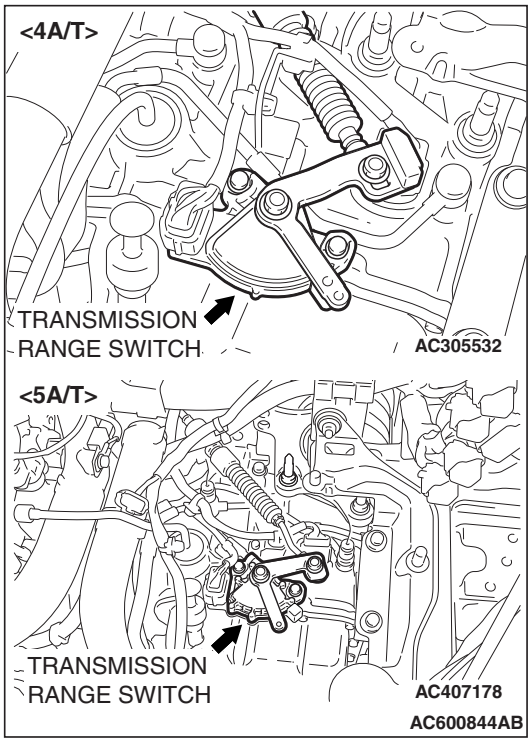


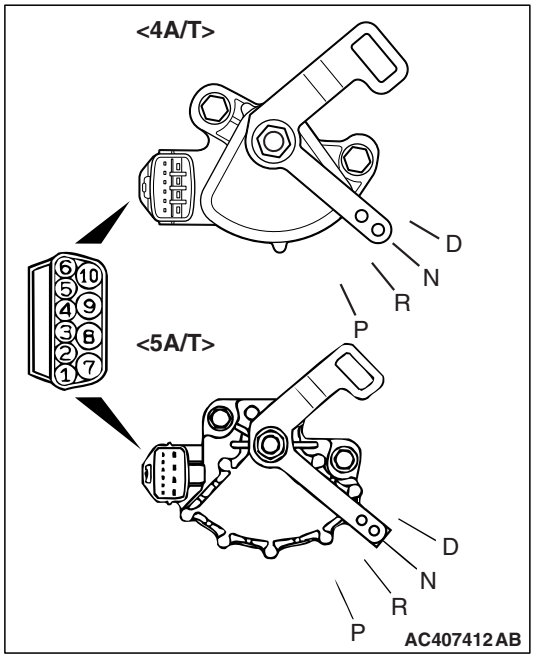
STEP 11. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 5.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 12. Check the transmission range switch.

Measure the resistance between the terminals for each transmission range as indicated in the table below.

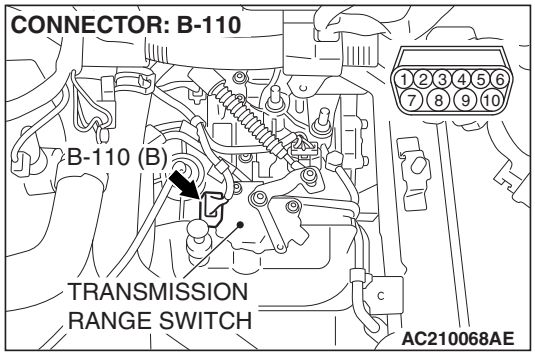
TRANSMISSION RANGE	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	

NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

Q: Is the measured resistance less than 2 ohms for each transmission range?

YES : Go to Step 13.

NO : Replace the transmission range switch. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.

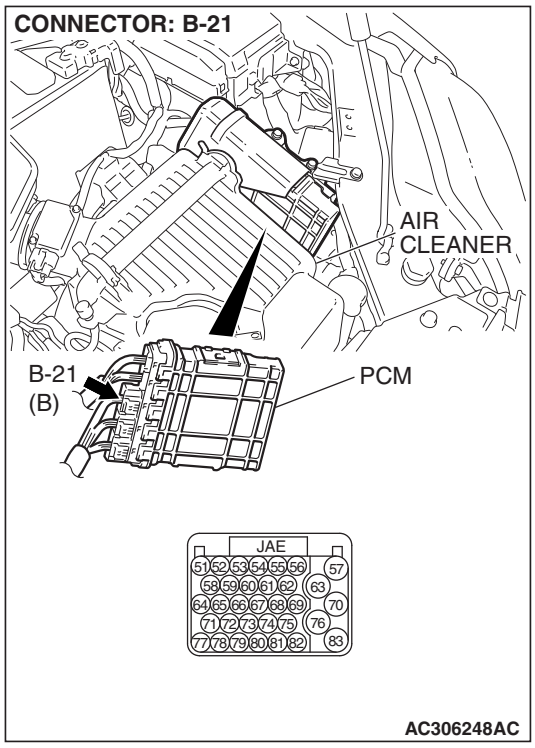


STEP 13. Check transmission range switch connector B-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

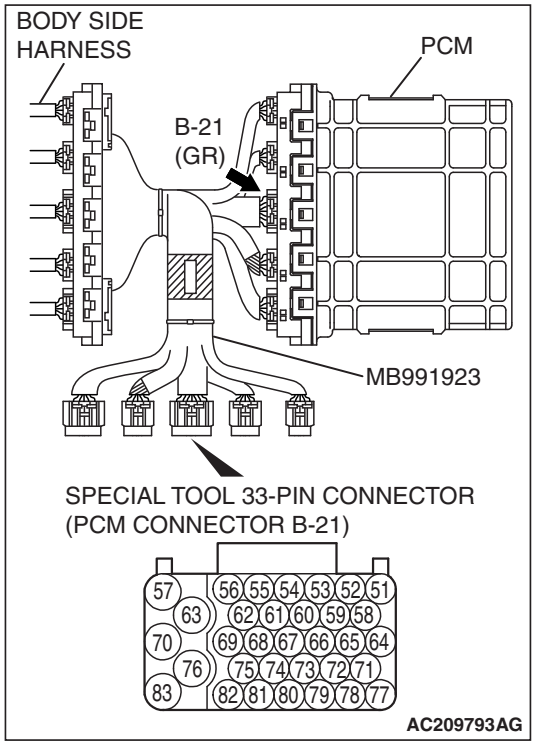
YES : Go to Step 14.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

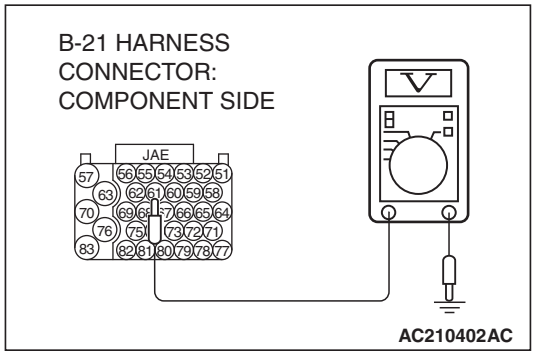


STEP 14. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.
(4) Move the selector lever to the "R" position.

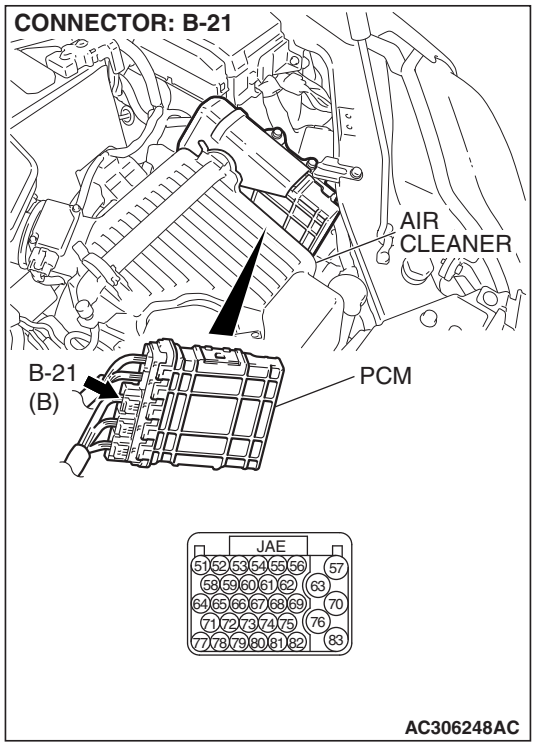


(5) Measure the voltage between terminal 61 and ground.
- The voltage should measure below battery positive voltage.

(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 11.
NO : Go to Step 15.

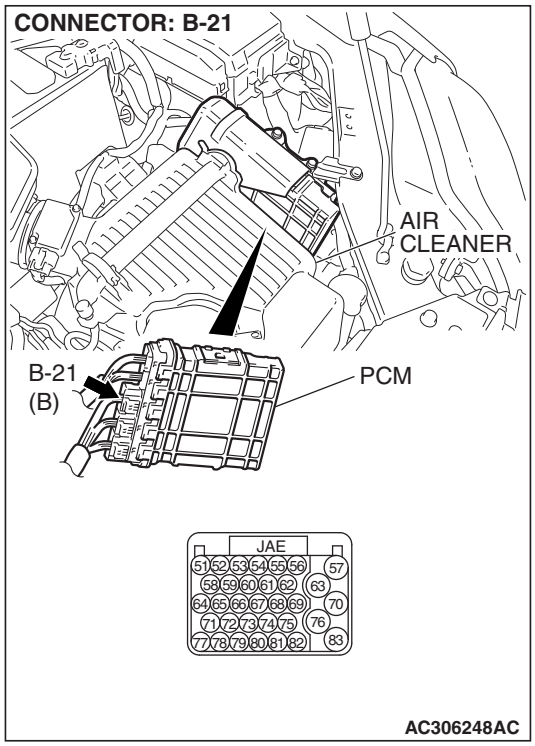


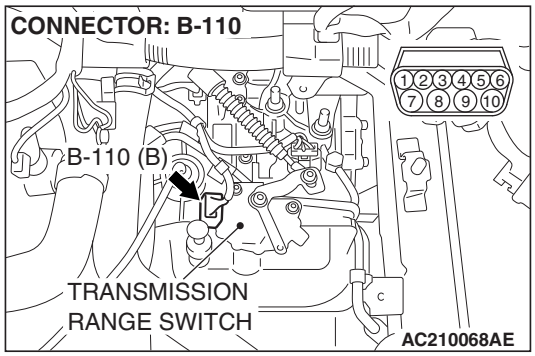
STEP 15. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 16.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



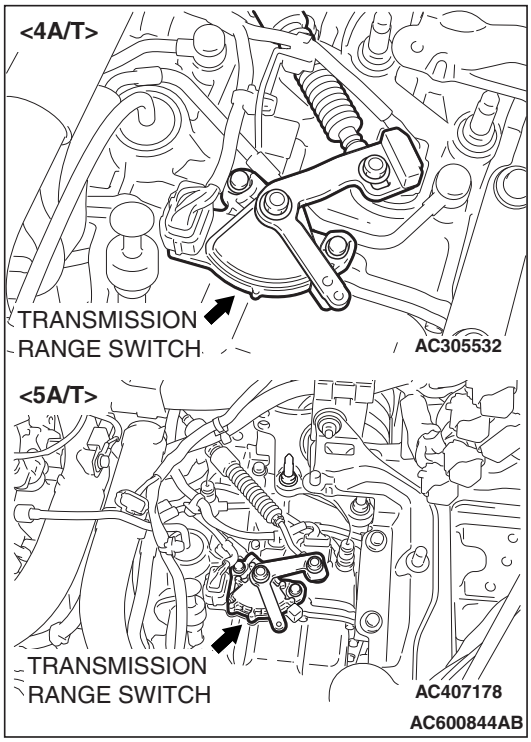


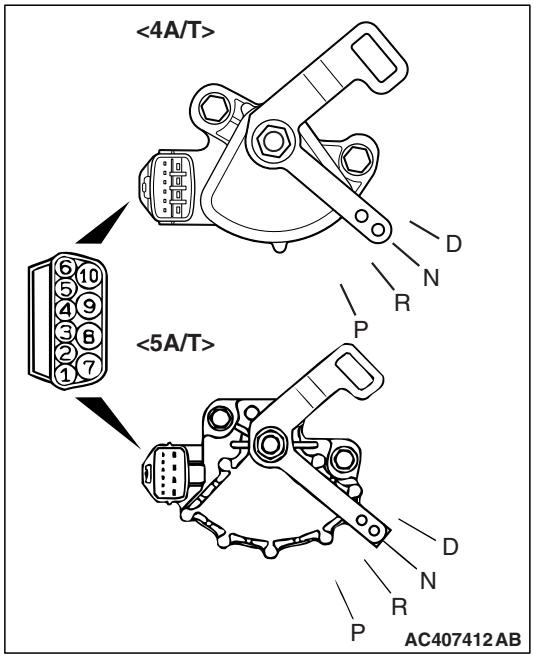
STEP 16. Check harness for open circuit or short circuit to ground between PCM connector B-21 terminal 61 and transmission range switch connector B-110 terminal 7.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair or replace the harness wire.





STEP 17. Check the transmission range switch.

Measure the resistance between the terminals for each transmission range as indicated in the table below.

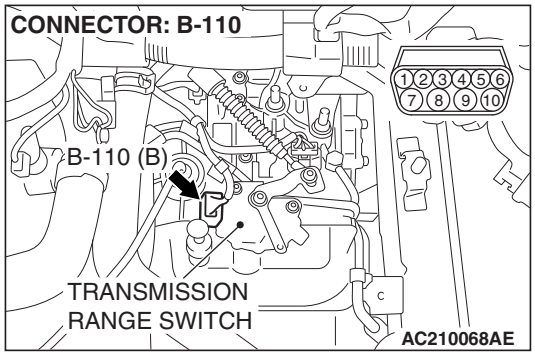
TRANSMISSION RANGE	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	

NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

Q: Is the measured resistance less than 2 ohms for each transmission range?

YES : Go to Step 18.

NO : Replace the transmission range switch. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.



STEP 18. Check transmission range switch connector B-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

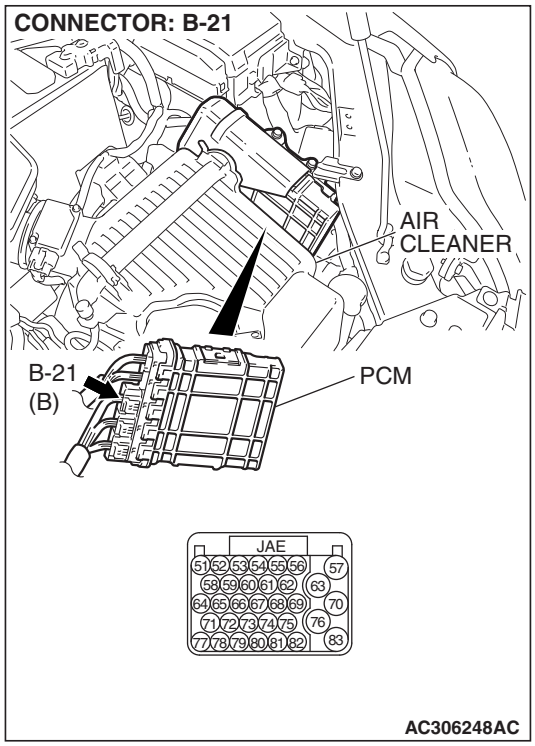
Q: Are the connector and terminals in good condition?

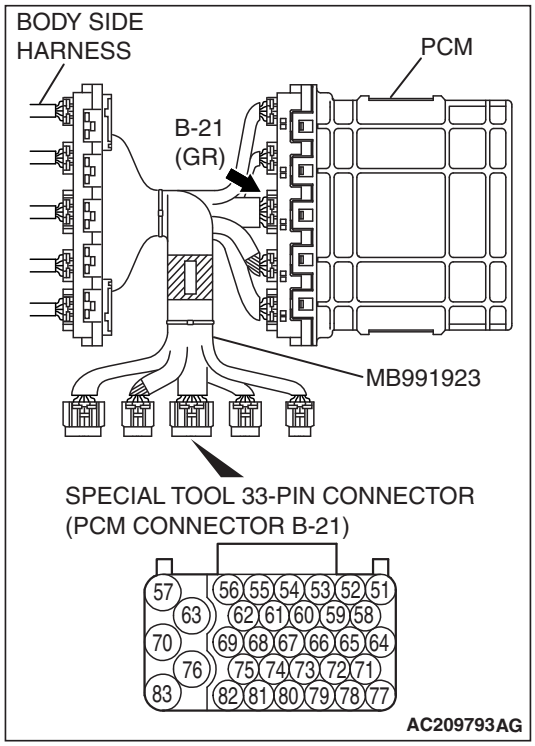
YES : Go to Step 19.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

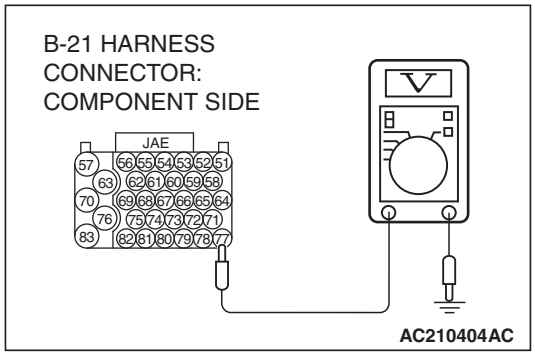
STEP 19. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.





(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.
(4) Move the selector lever to the "N" position.



(5) Measure the voltage between terminal 77 and ground.
- The voltage should measure battery positive voltage.

(6) Turn the ignition switch to the "LOCK" (OFF) position.

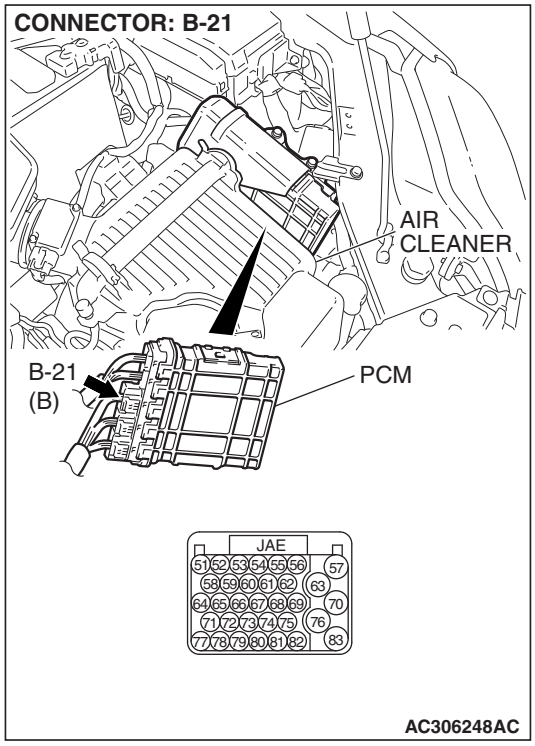
Q: Is the measured voltage battery positive voltage?

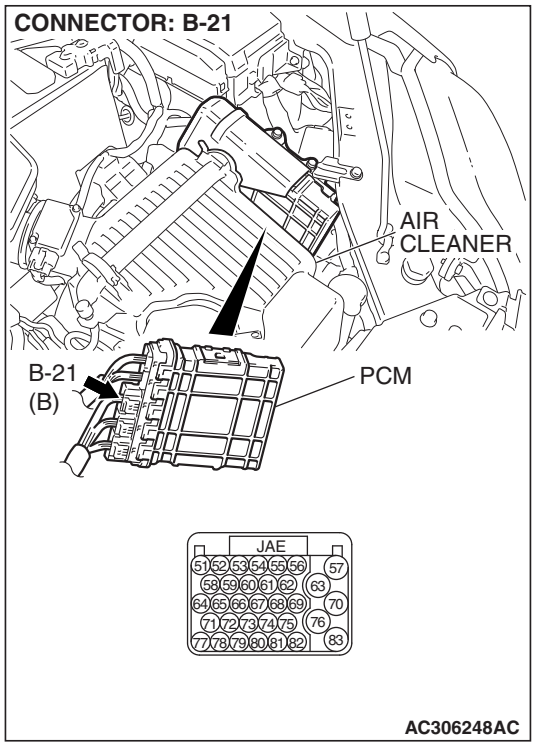
YES : Go to Step 11.
NO : Go to Step 20.

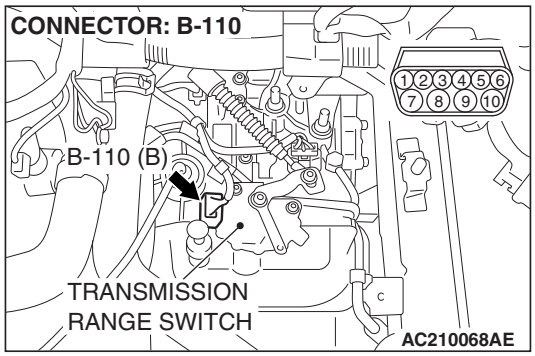
STEP 20. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 21.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

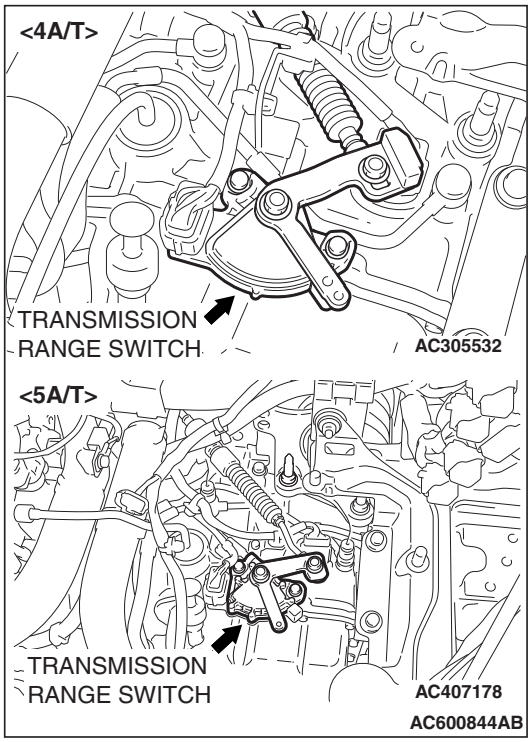


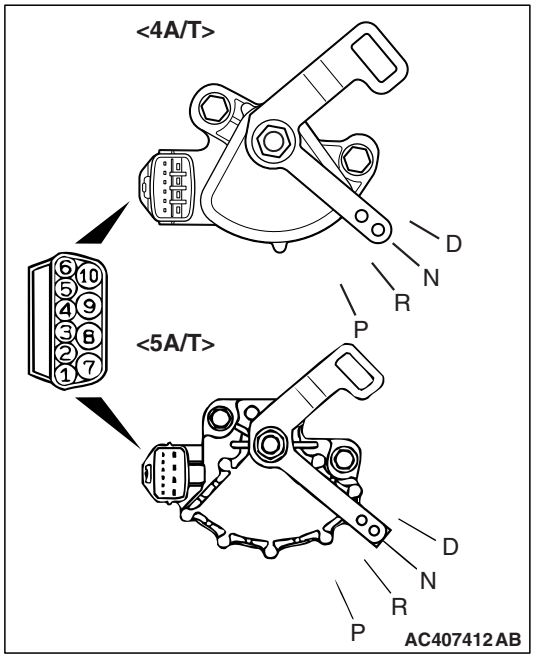




STEP 21. Check harness for open circuit or short circuit to ground between PCM connector B-21 terminal 77 and transmission range switch connector B-110 terminal 4.
Q: Is the harness wire in good condition?

YES : Go to Step 5.
NO : Repair or replace the harness wire.





STEP 22. Check the transmission range switch.

Measure the resistance between the terminals for each transmission range as indicated in the table below.

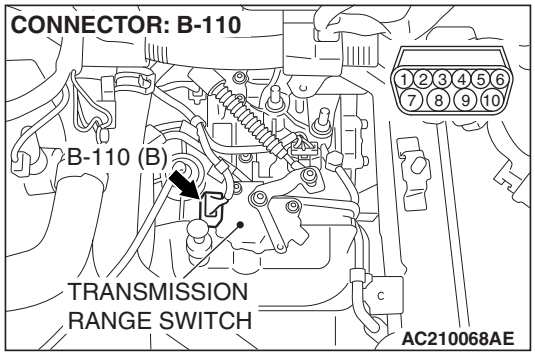
TRANSMISSION RANGE	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	

NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

Q: Is the measured resistance less than 2 ohms for each transmission range?

YES : Go to Step 23.

NO : Replace the transmission range switch. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.

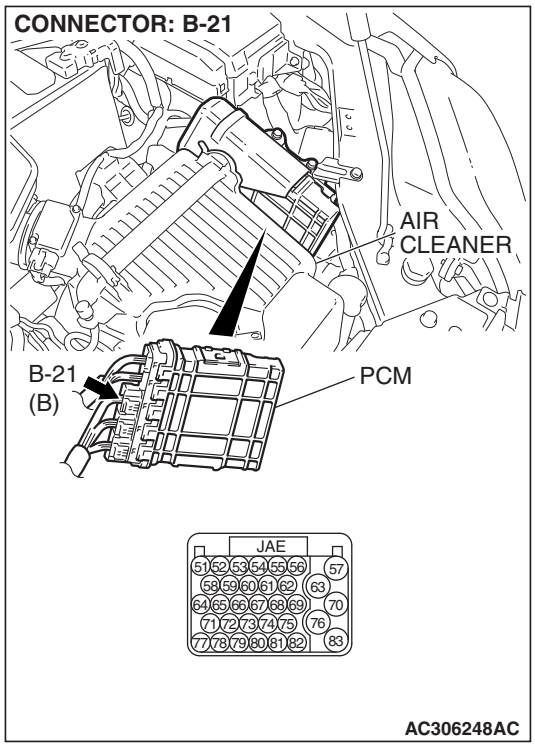


STEP 23. Check transmission range switch connector B-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

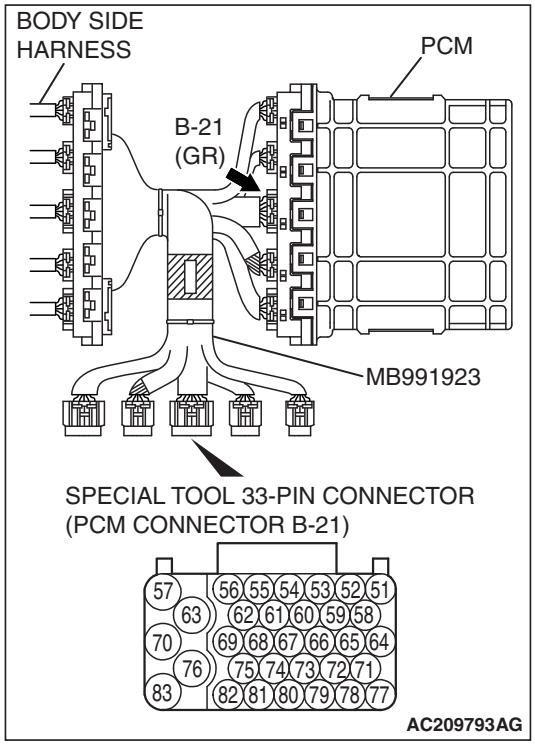
YES : Go to Step 24.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

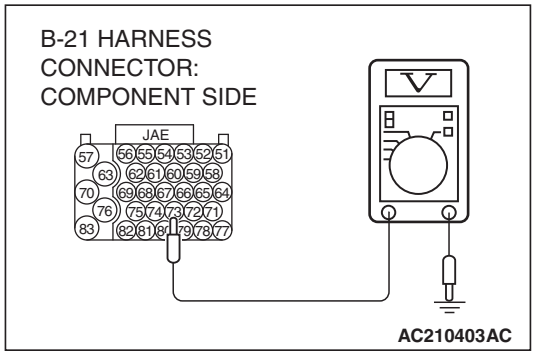


STEP 24. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923.

(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.
(4) Move the selector lever to the "D" position.

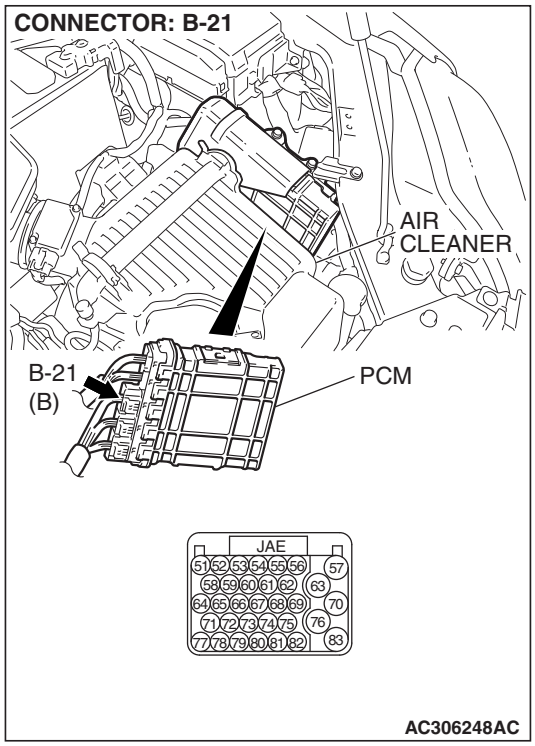


(5) Measure the voltage between terminal 73 and ground.
- The voltage should equal battery voltage (approximately12 volts).

(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Does the voltage measure battery positive voltage?

YES : Go to Step 11.
NO : Go to Step 25.

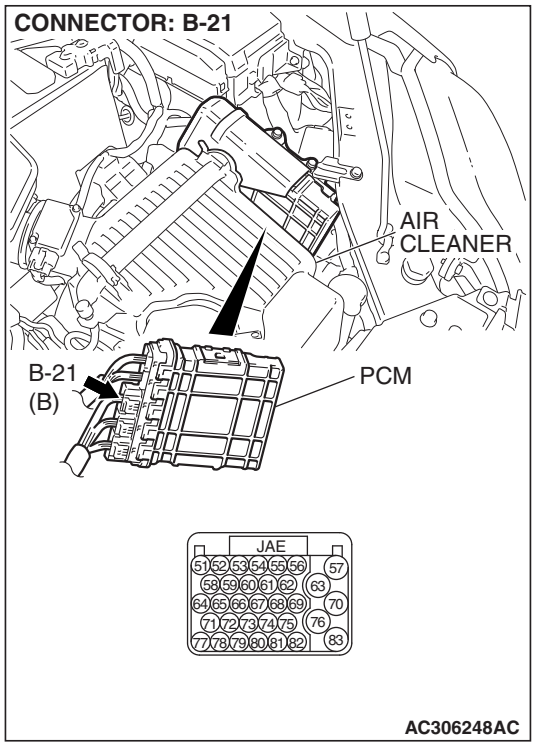


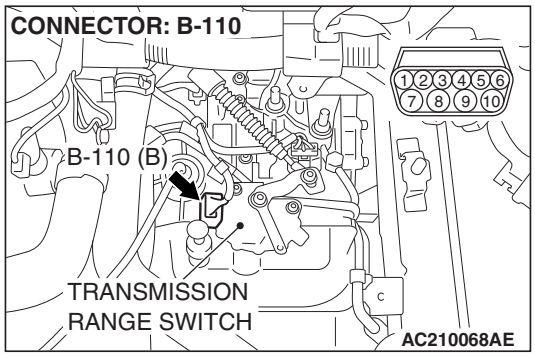
STEP 25. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 26.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 26. Check harness for open circuit or short circuit to ground between PCM connector B-21 terminal 73 and transmission range switch connector B-110 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 27.

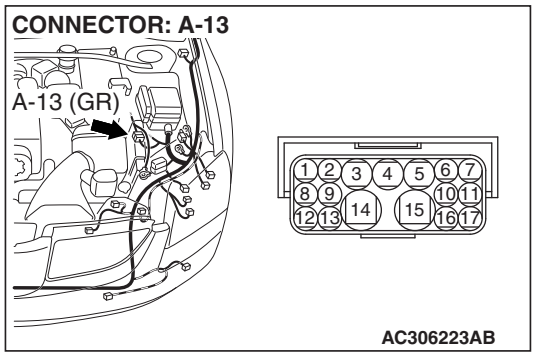
NO : Repair or replace the harness wire.

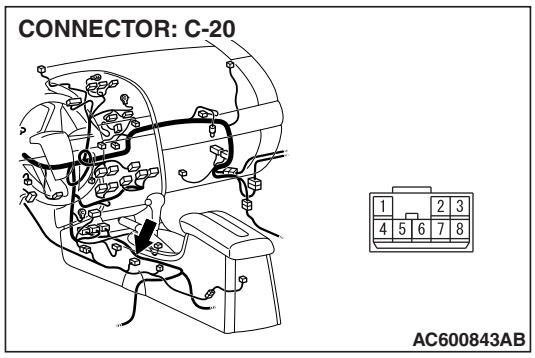
STEP 27. Check intermediate connector A-13 and shift switch assembly connector C-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 28.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



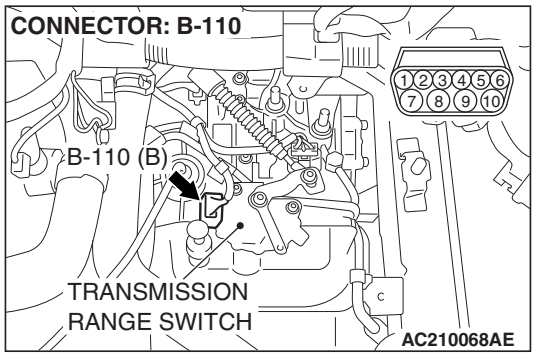


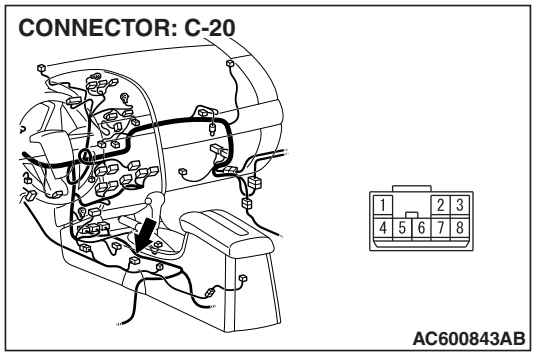
STEP 28. Check harness for short circuit to ground between transmission range switch connector B-110 terminal 1 and shift switch assembly connector C-20 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair or replace the harness wire.





STEP 29. Check the shift switch assembly. Refer to P.23A-408, Transaxle Control.

Q: Is the switch operating properly?

YES : Go to Step 30 .

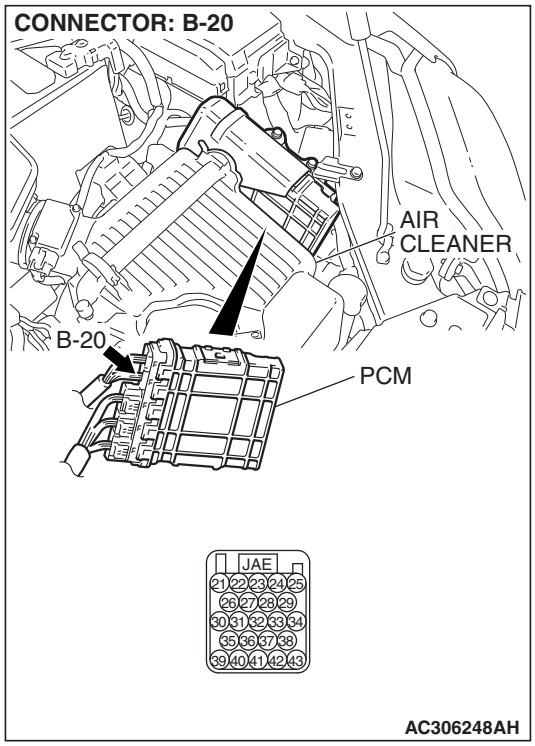
NO : Replace the shift switch assembly. Refer to P.23A-408, Transaxle Control.

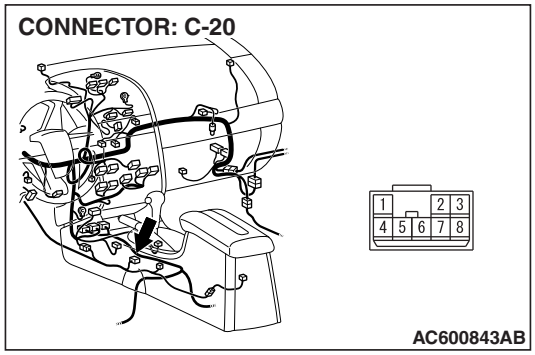
STEP 30. Check PCM connector B-20 and shift switch assembly connector C-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

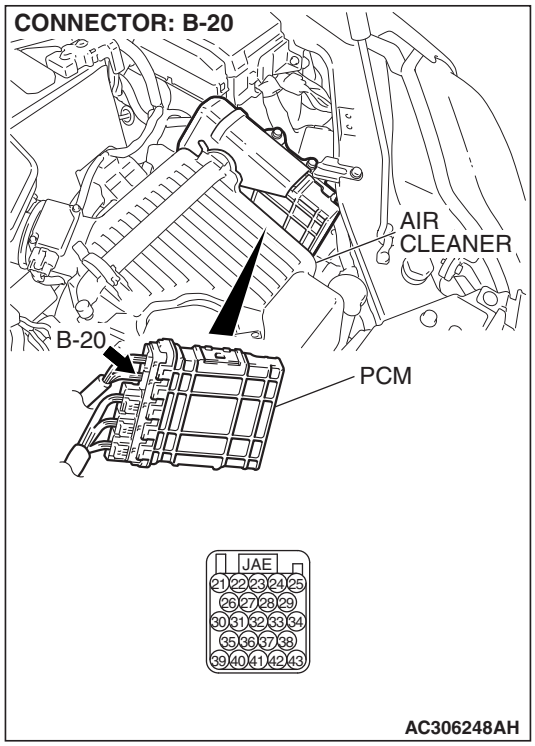
Q: Are the connector and terminals in good condition?

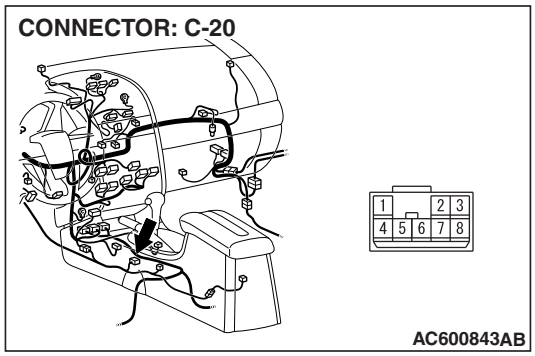
YES : Go to Step 31.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.









STEP 31 . Check harness for short circuit to ground between PCM connector B-20 terminal 39 and shift switch assembly connector C-20 terminal 6.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair or replace the harness wire.

DTC P1771 (P0705): Transmission Range Switch System (Short Circuit)

⚠ CAUTION
If DTC P1771 (P0705) has been set, TCL related DTC C1397 is also set. After DTC P1771 (P0705) has been diagnosed, don't forget to erase DTC C1397.

TRANSMISSION RANGE SWITCH SYSTEM CIRCUIT

Refer to P.23A-143.

CIRCUIT OPERATION

Refer to P.23A-143.

DESCRIPTIONS OF MONITOR METHODS

- If two types or more of signals are input from transmission range switch for more than 30 seconds, PCM judges that transmission range switch has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

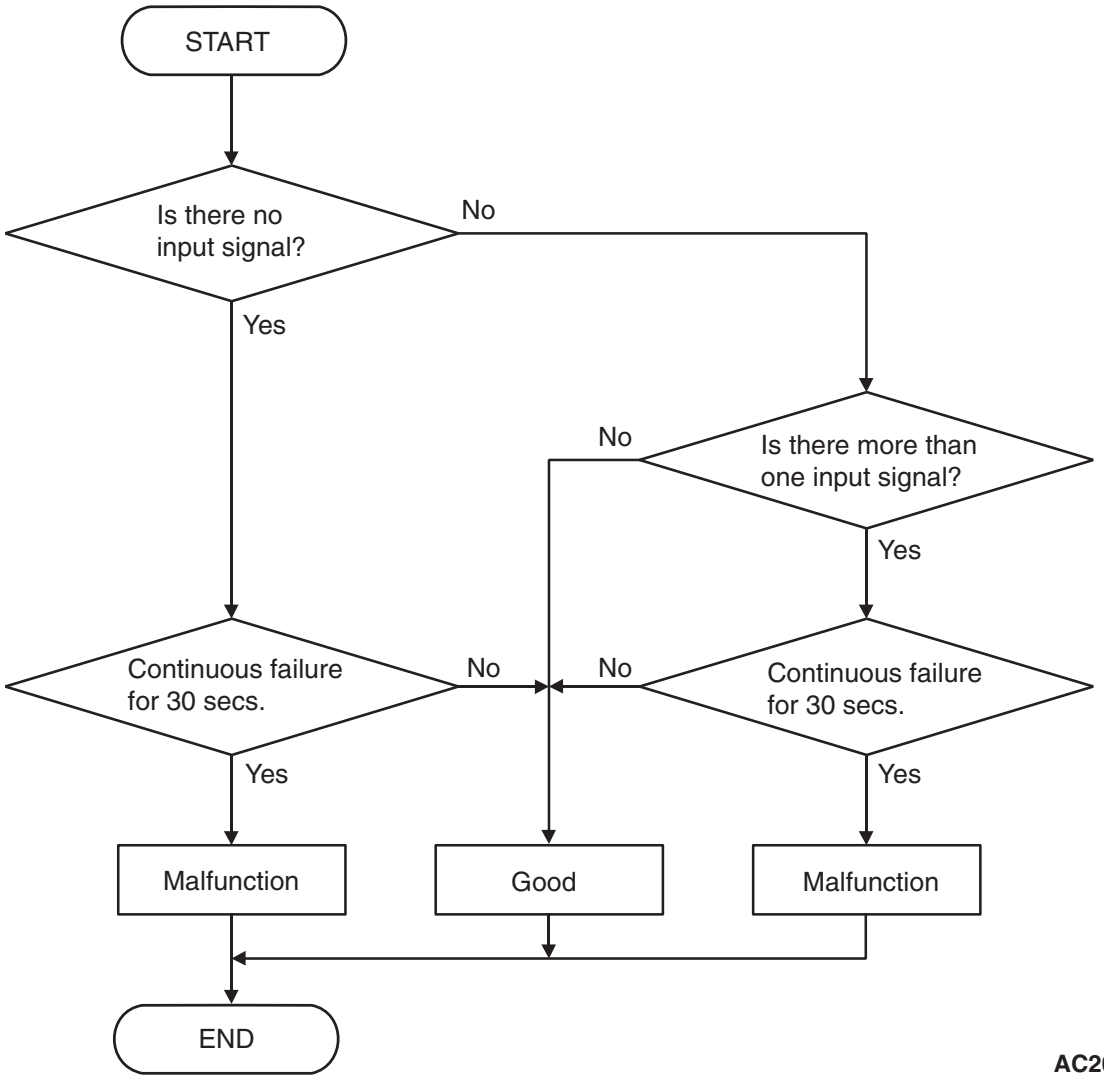
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions, Judgement Criteria

- Transmission range switch: multiple signal. (30 seconds)

OBD-II DRIVE CYCLE PATTERN

Start the engine, keep the vehicle stopped in "P," "R," "N," "D" ranges respectively for more than one minute, and turn "LOCK" (OFF) the ignition switch. Then restart the engine, and stop the vehicle in "P," "R," "N," "D" ranges respectively for more than one minute.

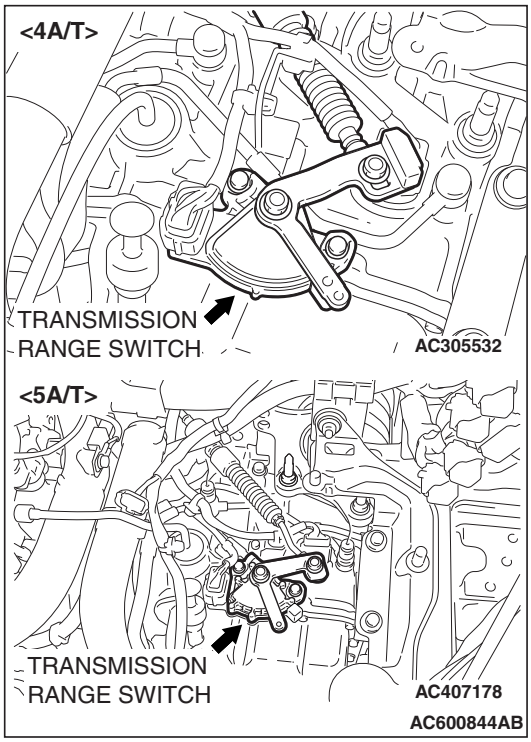
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

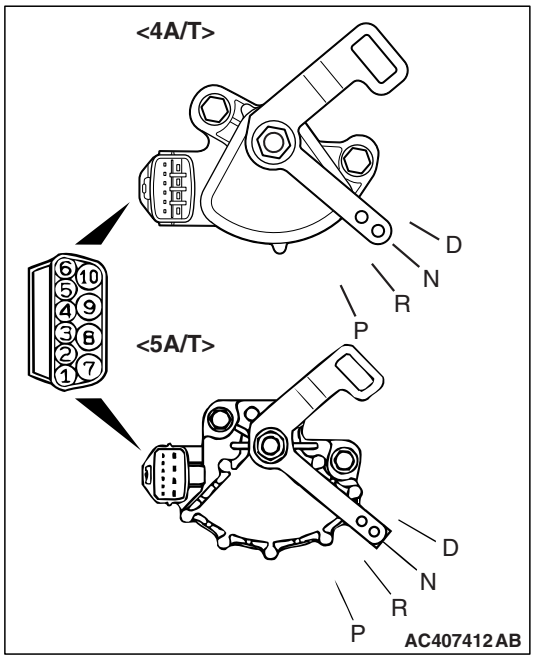
- Malfunction of the transmission range switch circuit
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main harness A





STEP 1. Check the transmission range switch.

Measure the resistance between the terminals for each transmission range as indicated in the table below.

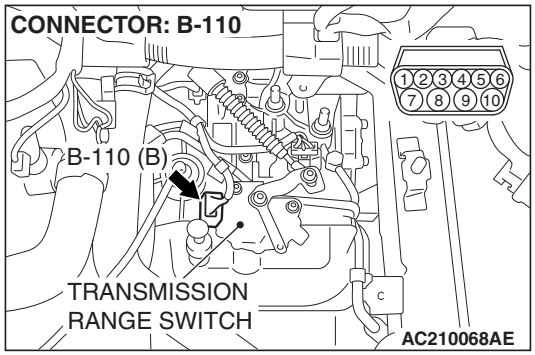
TRANSMISSION RANGE	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	

NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

Q: Does the resistance measure less than 2 ohms for each selector position?

YES : Go to Step 2.

NO : Replace the transmission range switch. Refer to GROUP 23B, P.23B-8 Transaxle <4A/T> or Refer to GROUP 23C, P.23C-8 Transaxle <5A/T>.

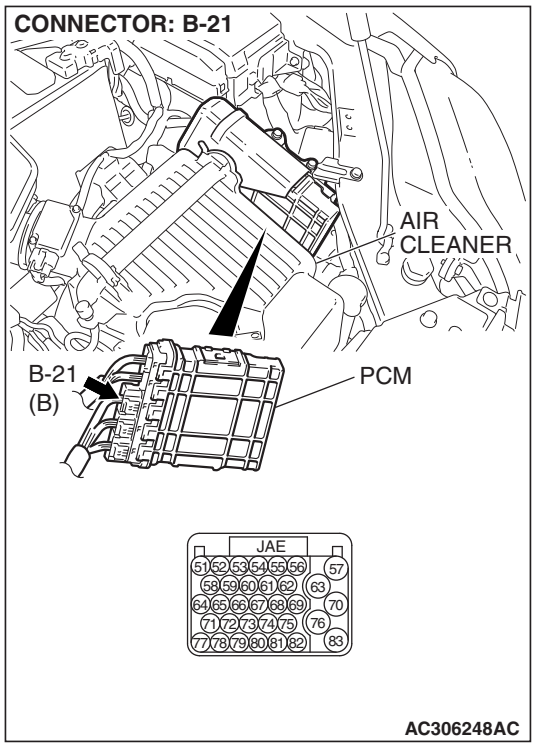


STEP 2. Check transmission range switch connector B-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 3.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 3. Check PCM connector B-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

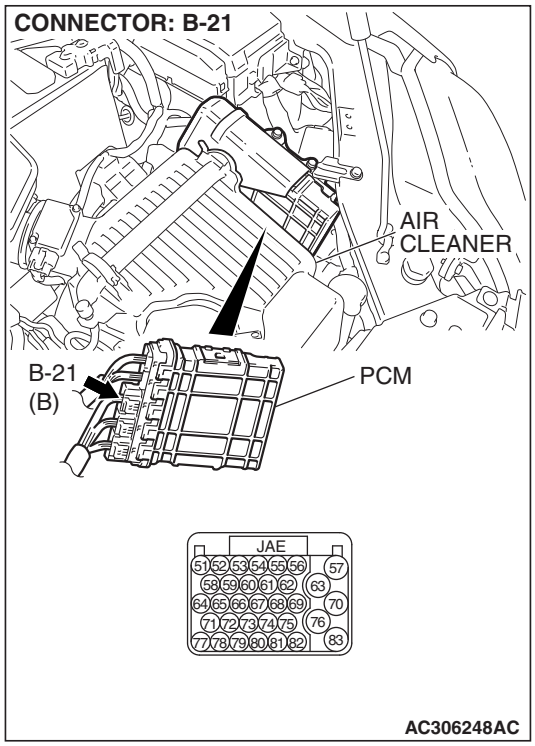
Q: Are the connector and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

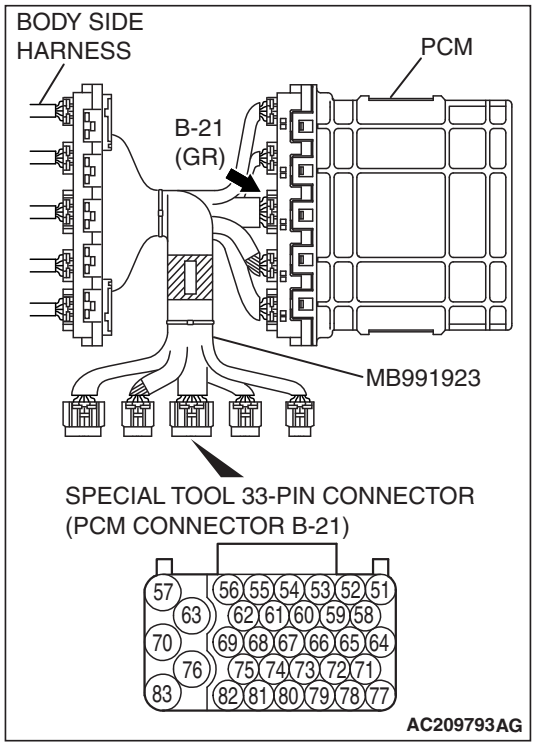
STEP 4. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923. ("P" position)

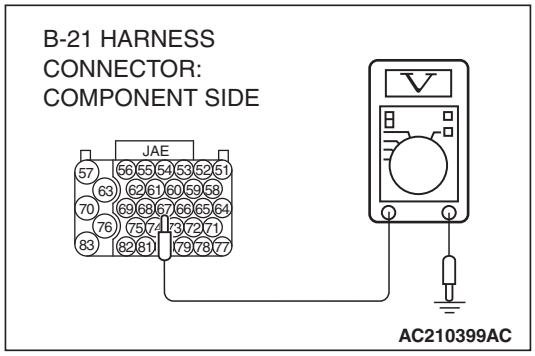
(1) Disconnect all the connectors from the PCM.



(2) Connect special tool MB991923 (check harness) between the PCM and the body-side harness connector.

(3) Turn the ignition switch to the "ON" position.





(4) Measure the voltage between terminal 67 and ground.
- When transmission range is "P," voltage should equal battery positive voltage.
- When transmission range is "R," voltage should measure 0.5 volt or less.
- When transmission range is "N," voltage should measure 0.5 volt or less.
- When transmission range is "D," voltage should measure 0.5 volt or less.
- When transmission range is sport mode, voltage should measure 0.5 volt or less.

Q: Is the measured voltage within the specified range?

YES : Go to Step 6.

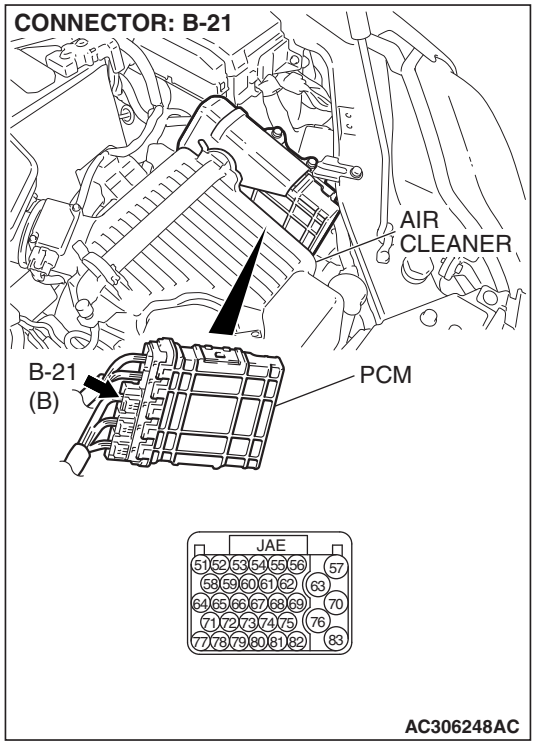
NO : Turn the ignition switch to the "LOCK" (OFF) position. Go to Step 5.

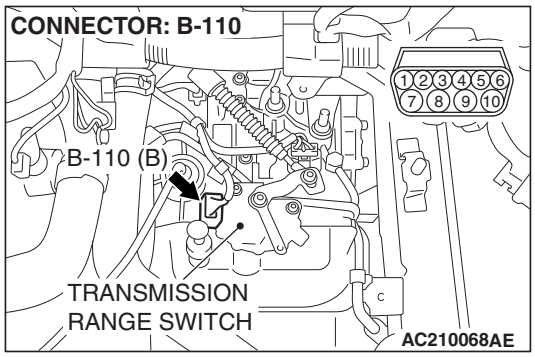
STEP 5. Check harness for damage between PCM connector B-21 terminal 67 and transmission range switch connector B-110 terminal 3.

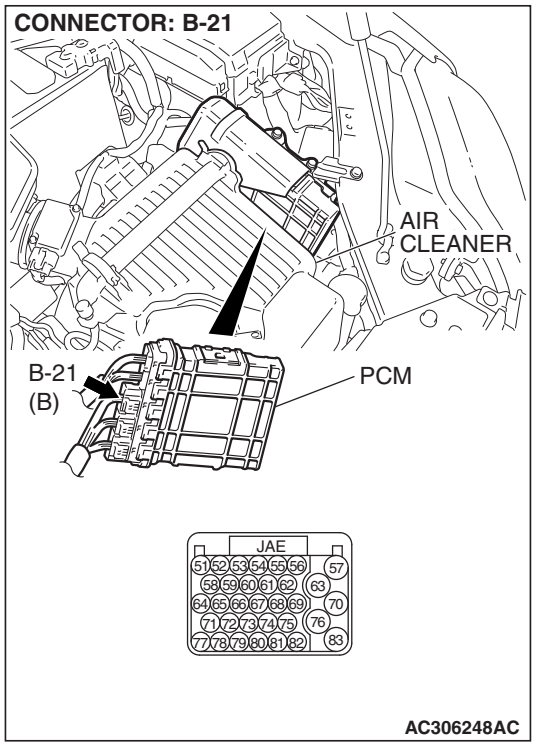
Q: Is the harness wire in good condition?

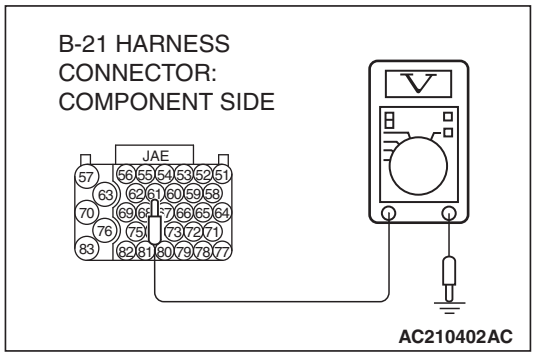
YES : Go to Step 14.

NO : Repair or replace the harness wire.









STEP 6. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923. ("R" position)

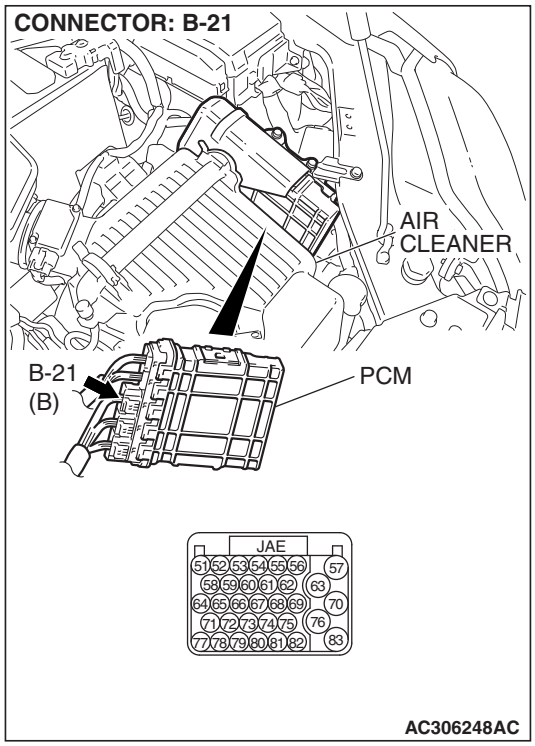
Measure the voltage between terminal 61 and ground.

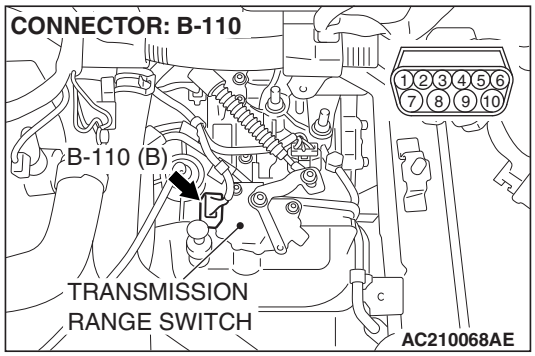
- When transmission range is "P," voltage should measure 0.5 volt or less.
- When transmission range is "R," voltage should equal battery positive voltage.
- When transmission range is "N," voltage should measure 0.5 volt or less.
- When transmission range is "D," voltage should measure 0.5 volt or less.
- When transmission range is sport mode, voltage should measure 0.5 volt or less.

Q: Is the measured voltage within the specified range?

YES : Go to Step 8.

NO : Turn the ignition switch to the "LOCK" (OFF) position. Go to Step 7.



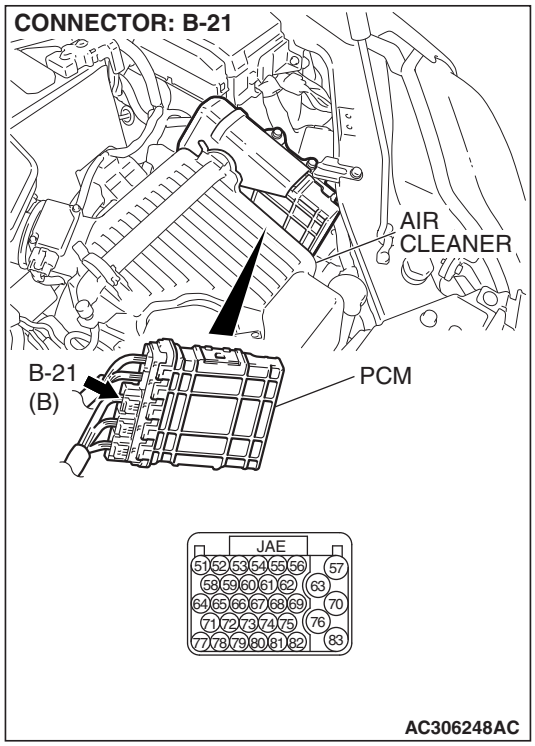


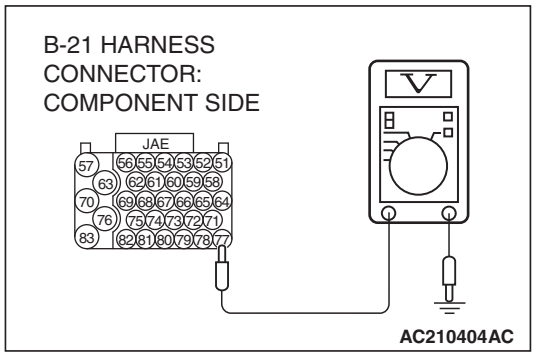
STEP 7. Check the harness for damage between PCM connector B-21 terminal 61 and transmission range switch connector B-110 terminal 7.

Q: Is the harness wire in good condition?

YES : Go to Step 14.

NO : Repair or replace the harness wire.





STEP 8. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923. ("N" position)

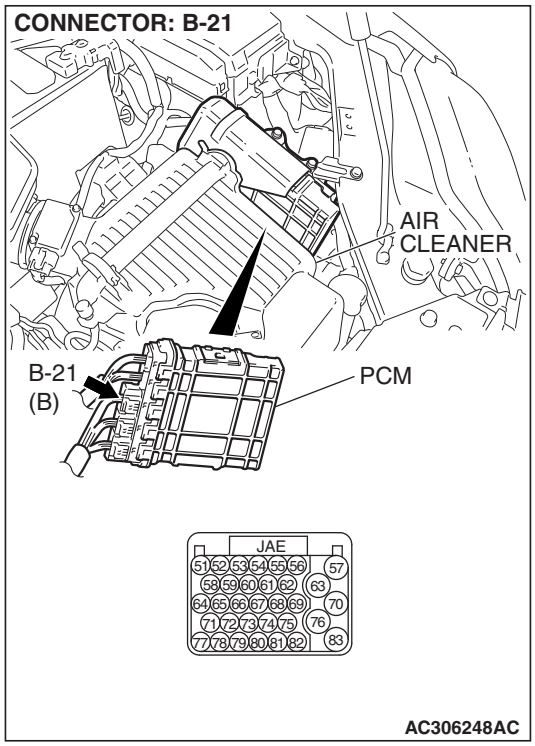
Measure the voltage between terminal 77 and ground.

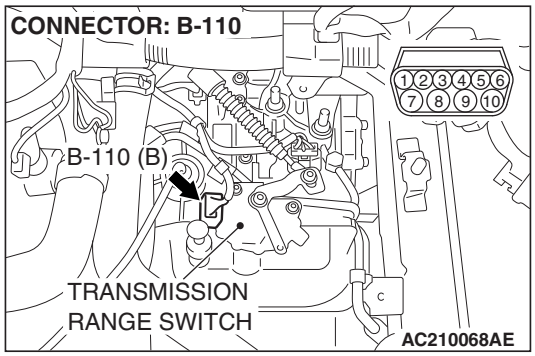
- When transmission range is "P," voltage should measure 0.5 volt or less.
- When transmission range is "R," voltage should measure 0.5 volt or less.
- When transmission range is "N," voltage should equal battery positive voltage.
- When transmission range is "D," voltage should measure 0.5 volt or less.
- When transmission range is sport mode, voltage should measure 0.5 volt or less.

Q: Is the measured voltage within the specified range?

YES : Go to Step 10.

NO : Turn the ignition switch to the "LOCK" (OFF) position. Go to Step 9.



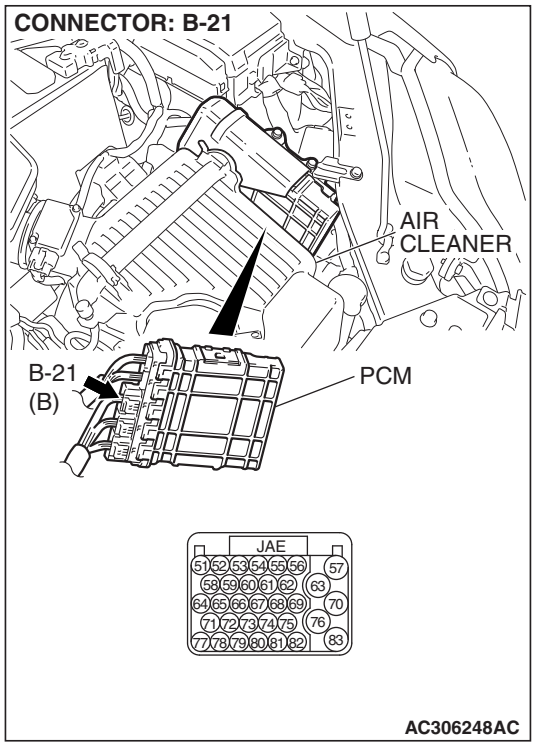


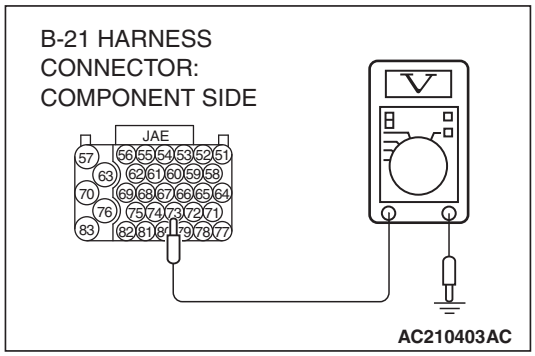
STEP 9. Check the harness for damage between PCM connector B-21 terminal 77 and transmission range switch connector B-110 terminal 4.

Q: Is the harness wire in good condition?

YES : Go to Step 14.

NO : Repair or replace the harness wire.





STEP 10. Measure the transmission range switch output voltage at PCM connector B-21 by using check harness special tool MB991923. ("D" position)

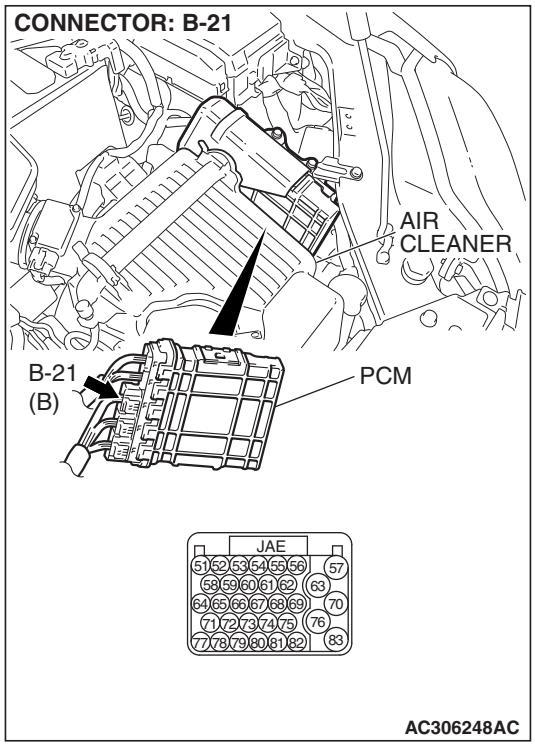
Measure the voltage between terminal 73 and ground.

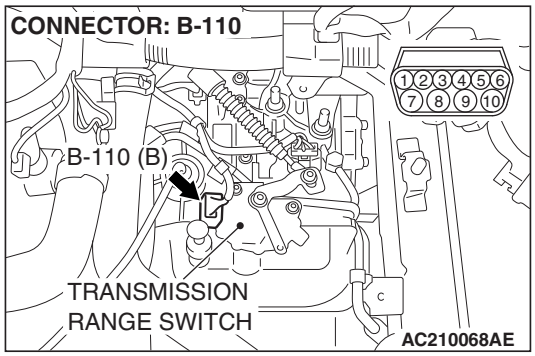
- When transmission range is "P," voltage should measure 0.5 volt or less.
- When transmission range is "R," voltage should measure 0.5 volt or less.
- When transmission range is "N," voltage should measure 0.5 volt or less.
- When transmission range is "D," voltage should equal battery positive voltage.
- When transmission range is sport mode, voltage should equal battery positive voltage.

Q: Is the measured voltage within the specified range?

YES : Go to Step 14.

NO : Turn the ignition switch to the "LOCK" (OFF) position. Go to Step 11.





STEP 11. Check the harness for damage between PCM connector B-21 terminal 73 and transmission range switch connector B-110 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 12.

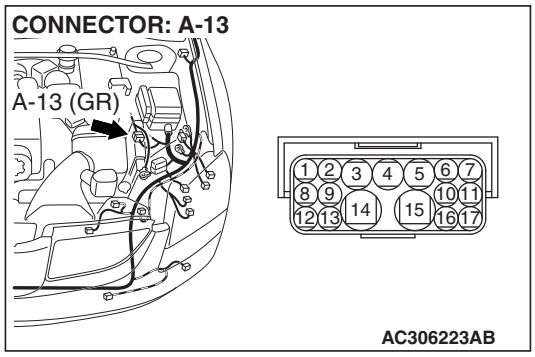
NO : Repair or replace the harness wire.

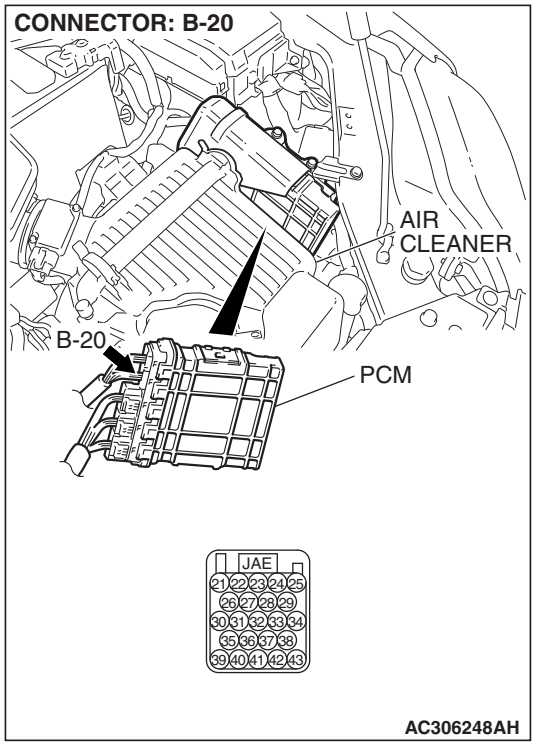
STEP 12. Check intermediate connector A-13, PCM connector B-20 and shift switch assembly connector C-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

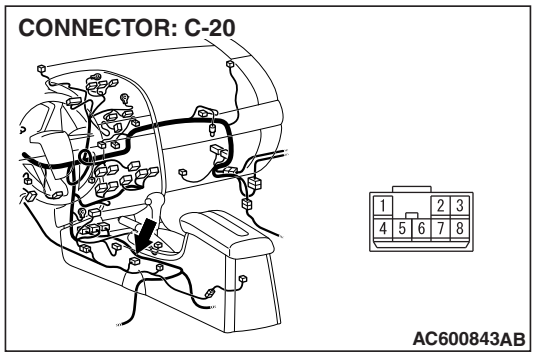
Q: Are the connectors and terminals in good condition?

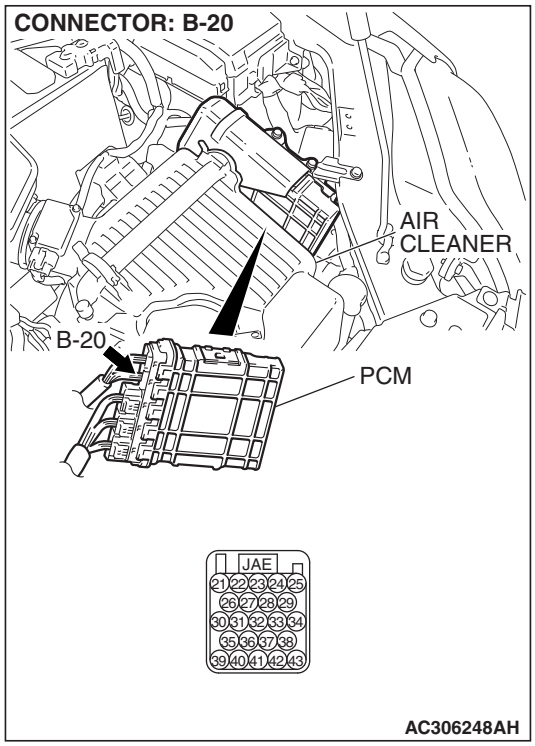
YES : Go to Step 13.

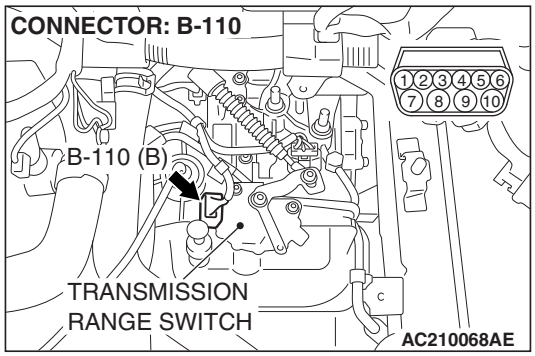
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.









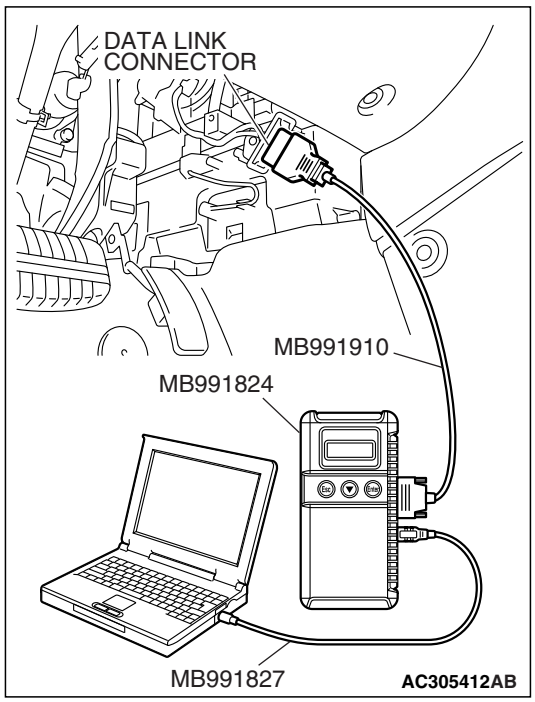


STEP 13. Check the harness for damage between PCM connector B-20 terminal 39 and transmission range switch connector B-110 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 14.

NO : Repair or replace the harness wire.



STEP 14. Using scan tool MB991958, check data list item 34: Transmission Range Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode.
- Item 34: Transmission Range Switch.
  - Move the selector lever to "P," "R," "N," "D" and sport mode positions and confirm that the selected transmission ranges match the positions. (The scan tool displays "D" range when the selector lever is shifted to the sport mode).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

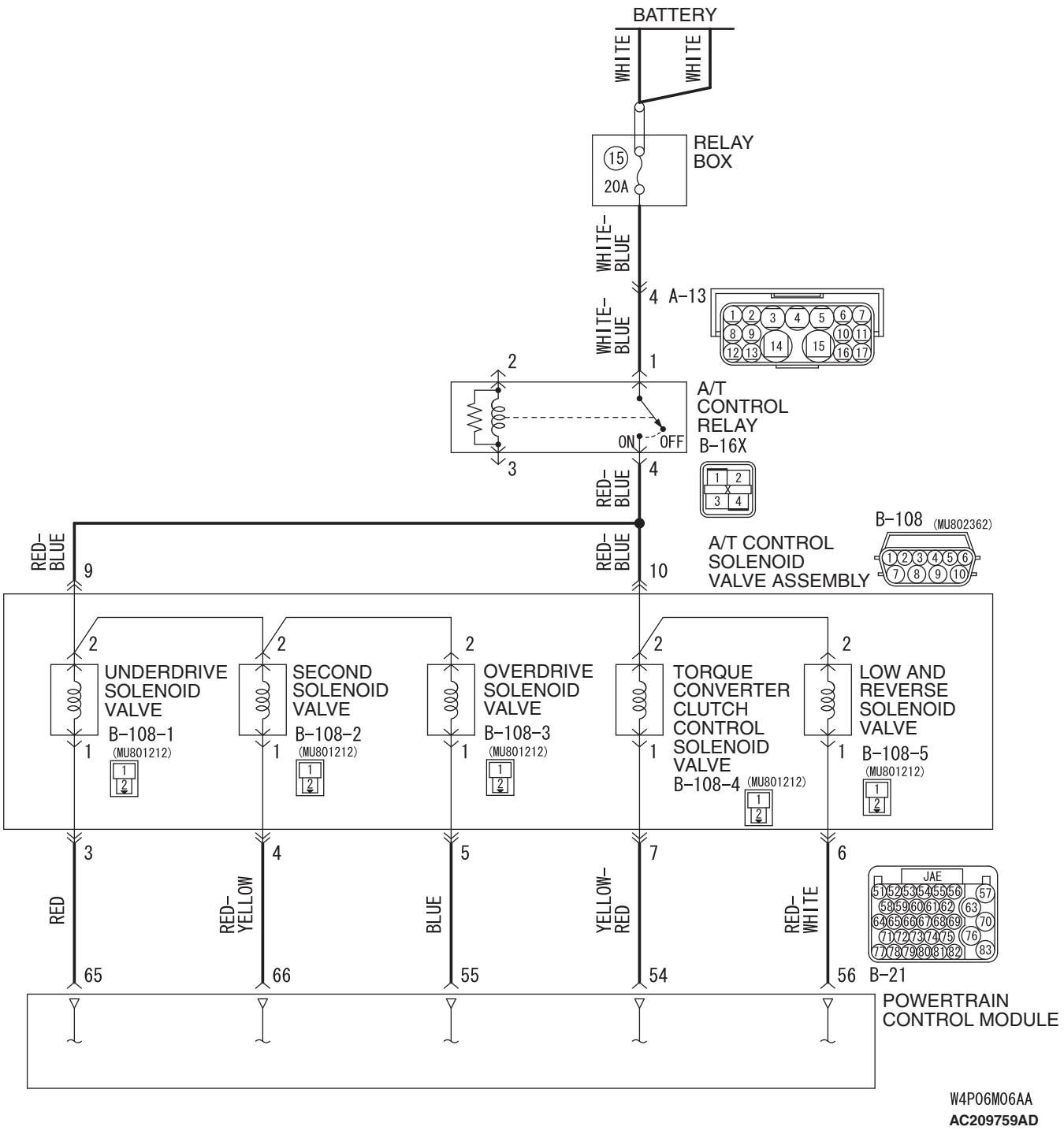
Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14.

NO : Replace the PCM.

DTC P1773 (P0753): Low-Reverse Solenoid Valve System

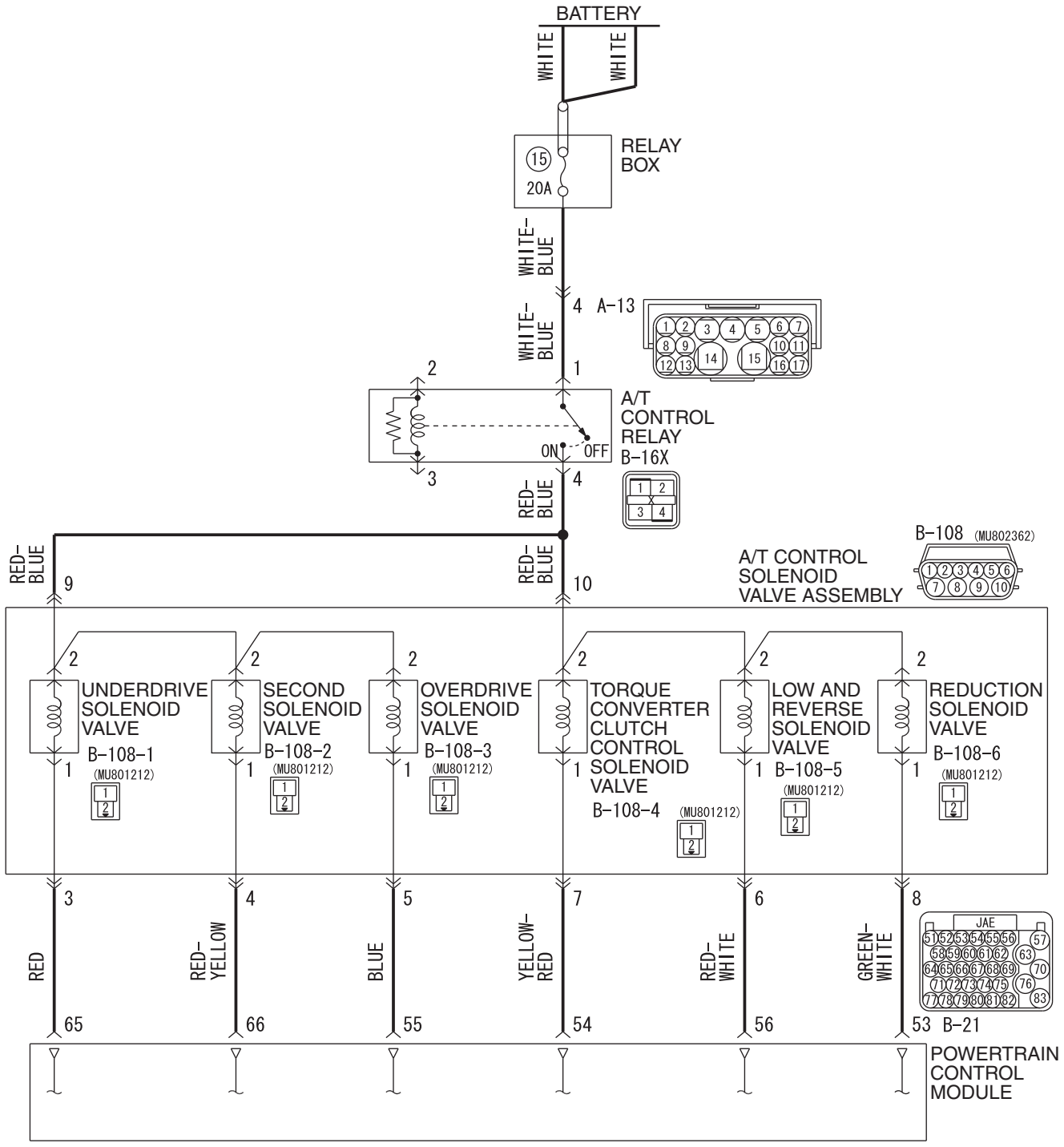
Solenoid Valve System Circuit <4A/T>



W4P06M06AA
AC209759AD

TSB Revision

Solenoid Valve System Circuit <5A/T>



W7P23M011A
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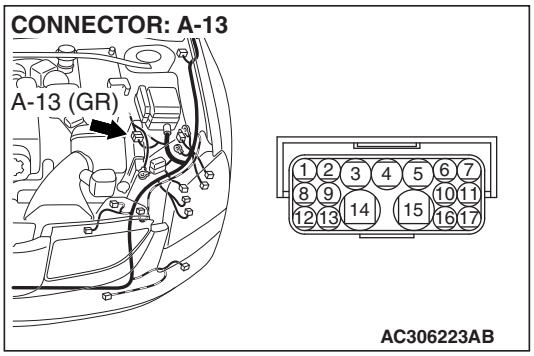
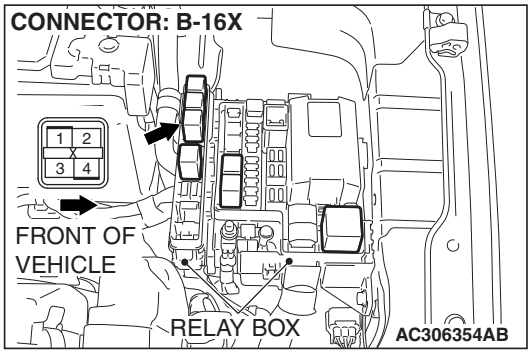
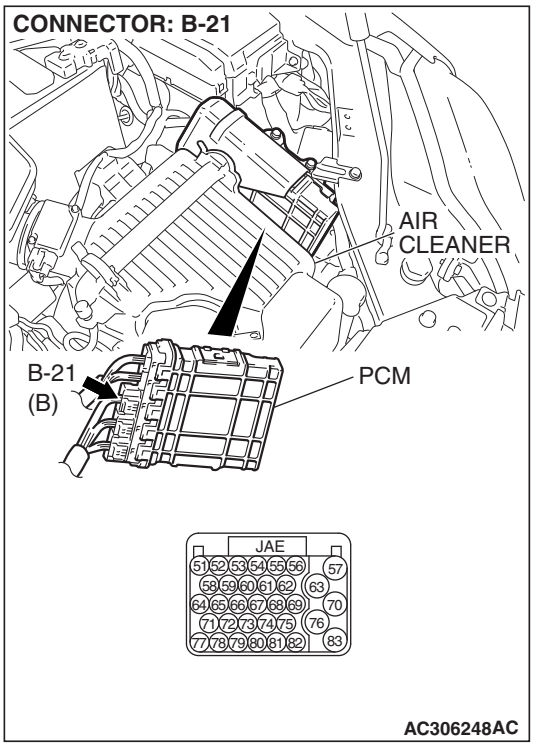
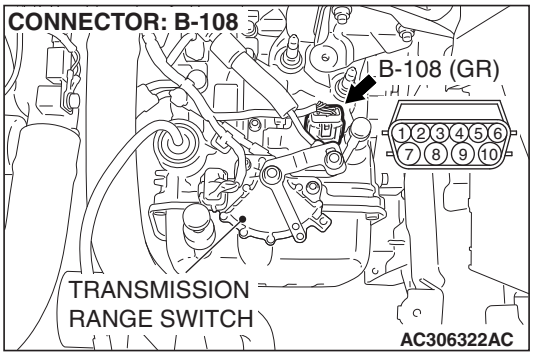
TSB Revision









CIRCUIT OPERATION

- The A/T control relay supplies battery positive voltage to the solenoid valve assembly (terminals 9 and 10).
- The solenoid valve closes when energized (on), and opens when not energized (off). The PCM energizes the solenoid valve based on input data from sensors such as the Throttle Position Sensor, Transmission Range Switch, Stoplight Switch, Input Shaft Speed Sensor, Output Shaft Speed Sensor, and Transmission Fluid Temperature Sensor.
- The PCM provides the ground to energize the solenoid. The amount of time that the circuit is grounded is displayed on scan tool MB991958 in percent.
- When the solenoid is energized or de-energized, fluid passes through the valve body and transaxle passages to apply and release components.

DESCRIPTIONS OF MONITOR METHODS

- If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that low-reverse solenoid valve has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

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

- DTC P1779 (P0731): 1st gear incorrect ratio
- DTC P1780 (P0732): 2nd gear incorrect ratio
- DTC P1781 (P0733): 3rd gear incorrect ratio
- DTC P1782 (P0734): 4th gear incorrect ratio
- DTC P1783 (P0735): 5th gear incorrect ratio <5A/T>

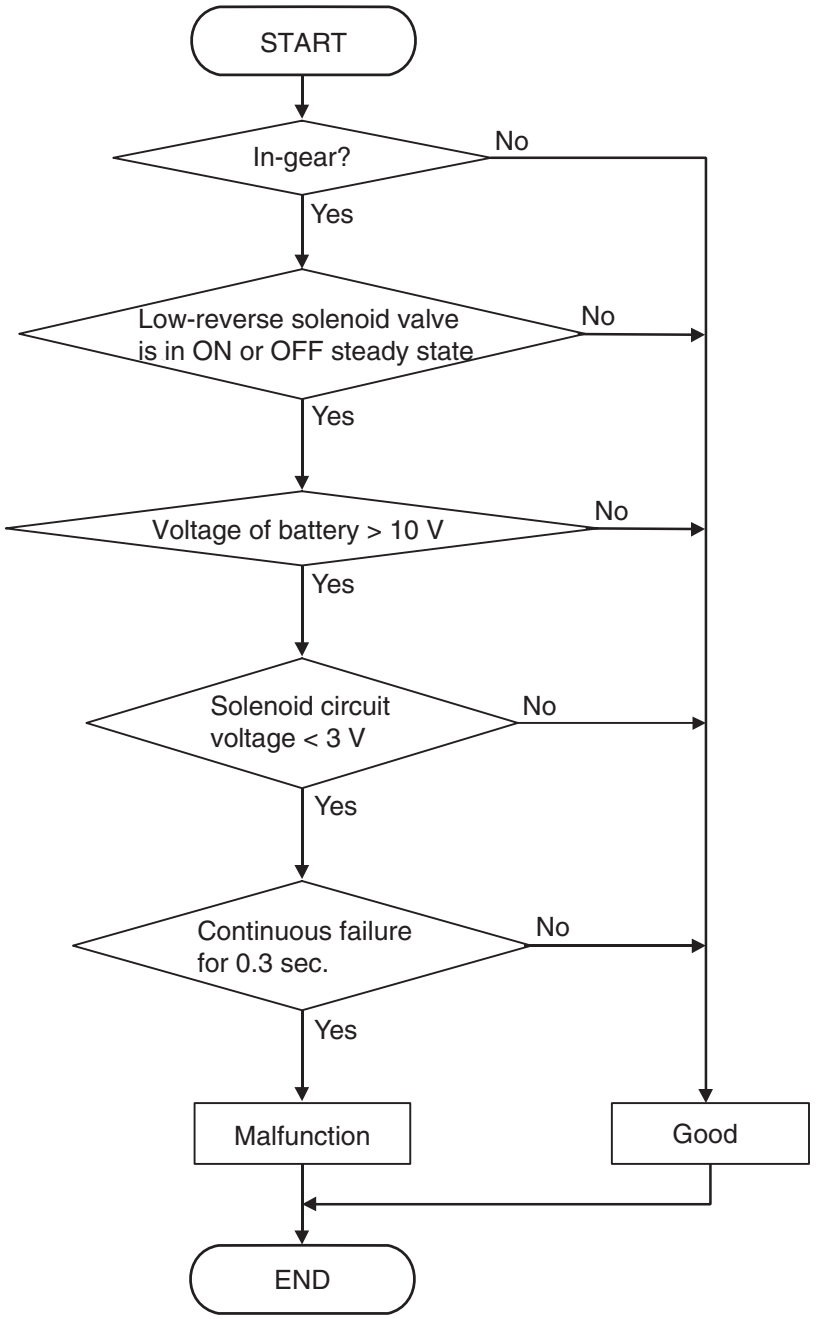
TSB Revision

- DTC P1784 (P0736): Reverse gear incorrect ratio
- DTC P1778 (P0743): Torque converter clutch solenoid malfunction
- DTC P1774 (P0758): Underdrive solenoid malfunction
- DTC P1775 (P0763): Second solenoid malfunction
- DTC P1776 (P0768): Overdrive solenoid malfunction
- DTC P1777 (P0773): Reduction solenoid malfunction <5A/T>
- DTC P1788 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Torque converter clutch solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid <5A/T>
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC P1773 (P0753) is set consecutively four times, the transaxle is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in "P" range for 5 seconds.

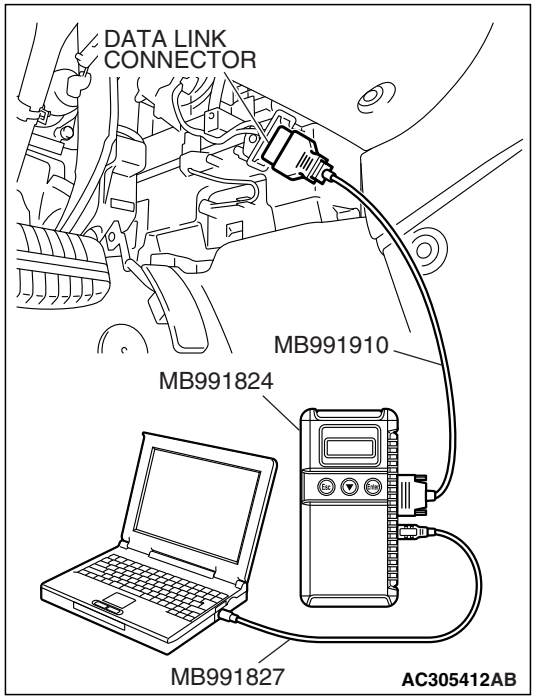
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the low-reverse solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



STEP 1. Using scan tool MB991958, check actuator test item 1: Low-Reverse Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

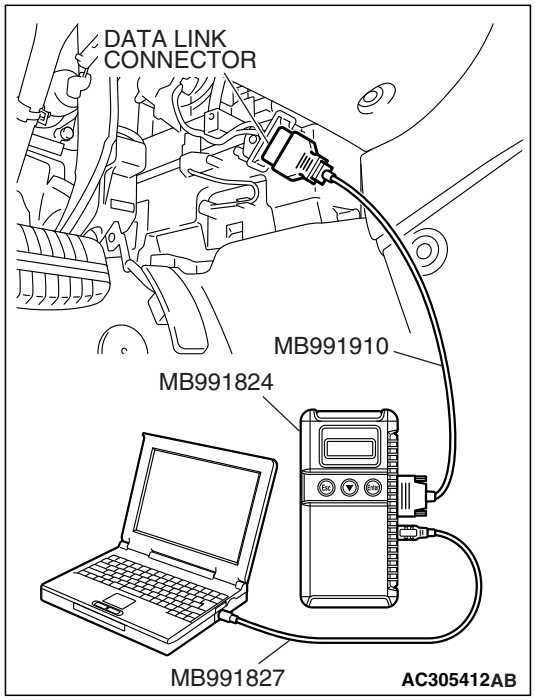
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
  - Item 1: Low-Reverse Solenoid Valve.
    - An audible clicking or buzzing should be heard when the low-reverse solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Go to Step 2.

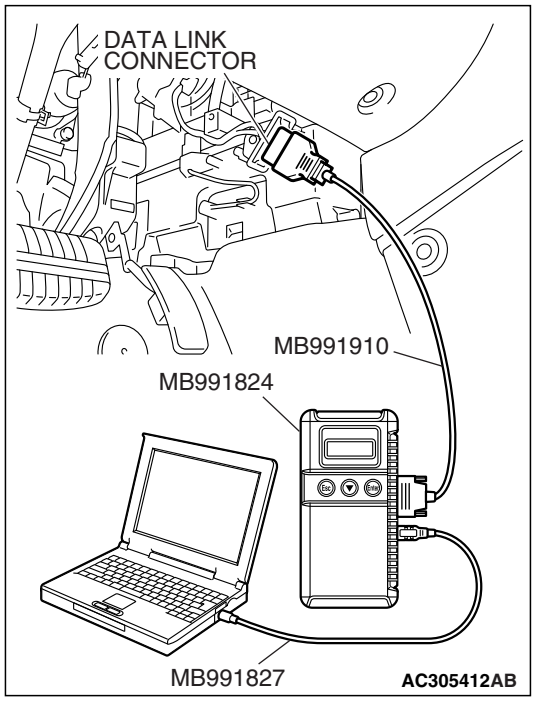


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P1788 (P1751) set? (DTC P1788 (P1751) may be set along with multiple DTCs).

YES : Refer to P.23A-289 DTC P1778 (P1751): A/T Control Relay System.
NO : Go to Step 3.



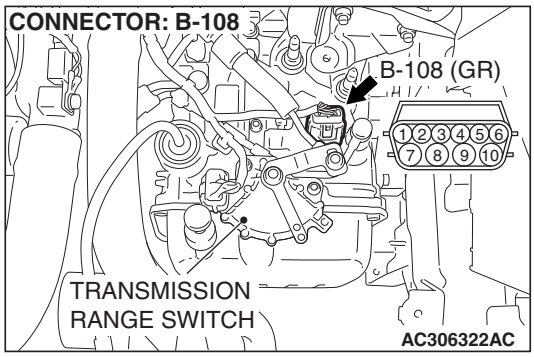
STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

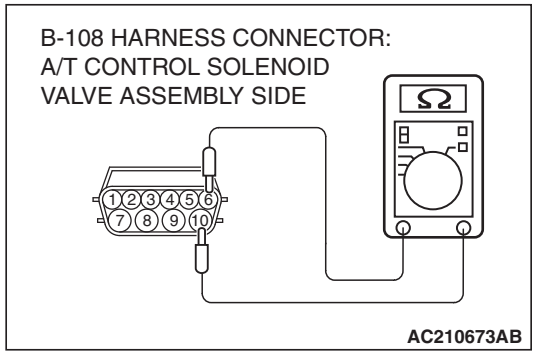
Q: Is DTC P1778 (P0743) set?

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the low-reverse solenoid valve resistance at A/T control solenoid valve assembly connector B-108.



(1) Disconnect connector B-108 and measure at the solenoid valve side.



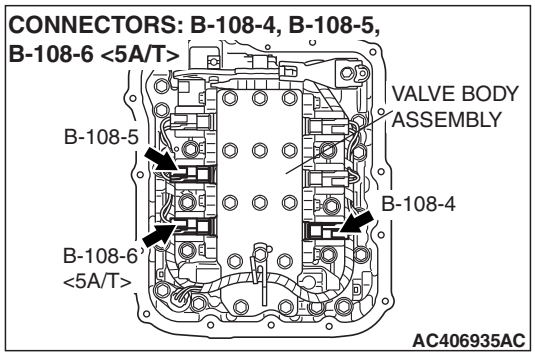
(2) Measure the resistance between solenoid valve assembly connector B-108 terminals 6 and 10.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

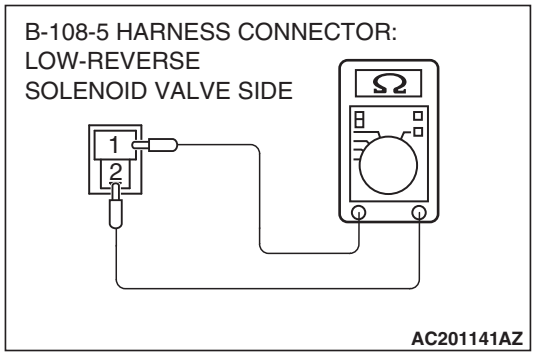
Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the low-reverse solenoid valve assembly inside the transaxle.



(1) Disconnect connector B-108-5 and measure at the solenoid valve side.



(2) Measure the resistance between low-reverse solenoid valve terminals 1 and 2.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)?

YES : Replace the harness wire between A/T control solenoid valve assembly connector B-108 and the solenoid valves.
NO : Replace the low-reverse solenoid valve. Refer to GROUP 23B, P.23B-66 Valve Body <4A/T> or Refer to GROUP 23C, P.23C-74 Valve Body <5A/T>.

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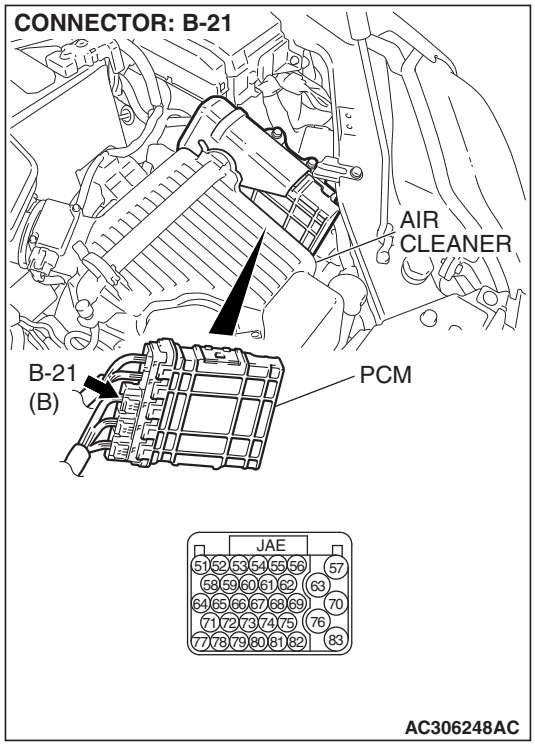
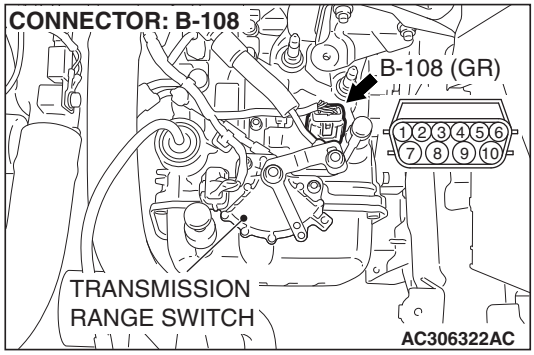


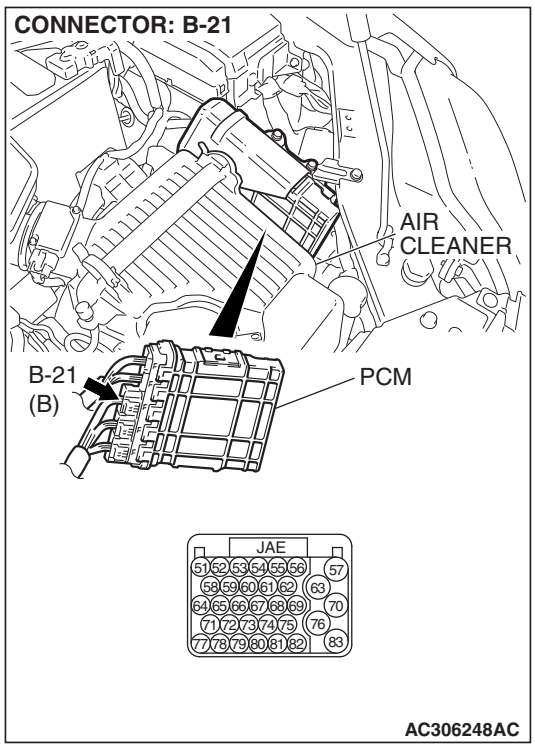


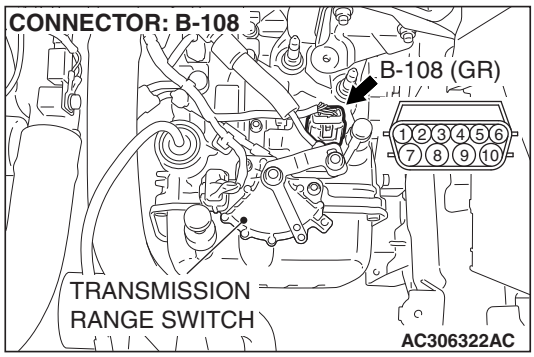
STEP 6. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



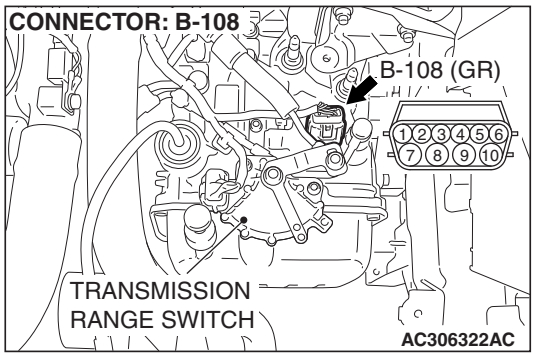


STEP 7. Check the harness for an open or short circuit to ground between PCM connector B-21 terminal 56 and A/T control solenoid valve assembly connector B-108 terminal 6.

Q: Is the harness wire in good condition?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

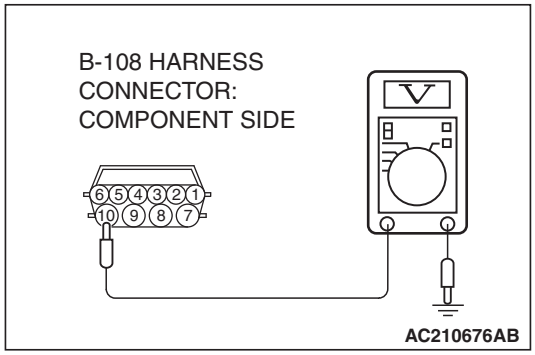
NO : Repair or replace the harness wire.



STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-108.

(1) Disconnect solenoid valve assembly harness connector B-108.

(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between harness connector B-108 terminal 10 and ground.

- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 11.

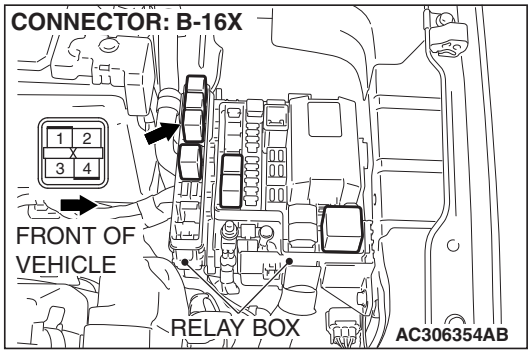
NO : Go to Step 9.

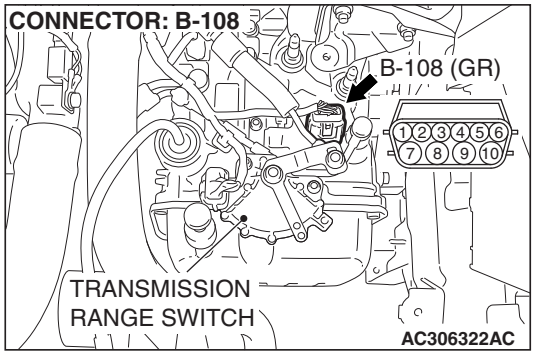
STEP 9. Check A/T control relay connector B-16X in the engine component relay box and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

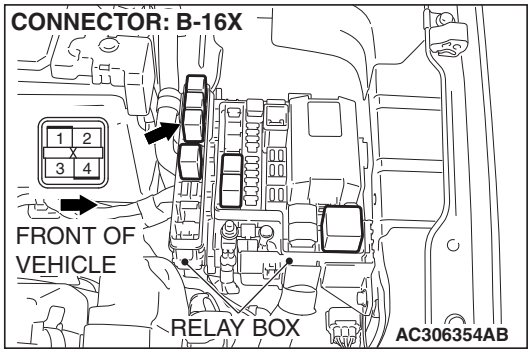
Q: Are the connectors and terminals in good condition?

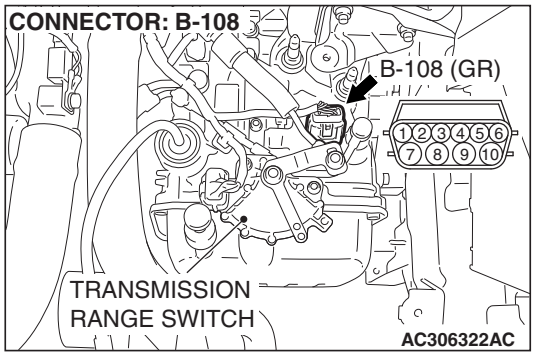
YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







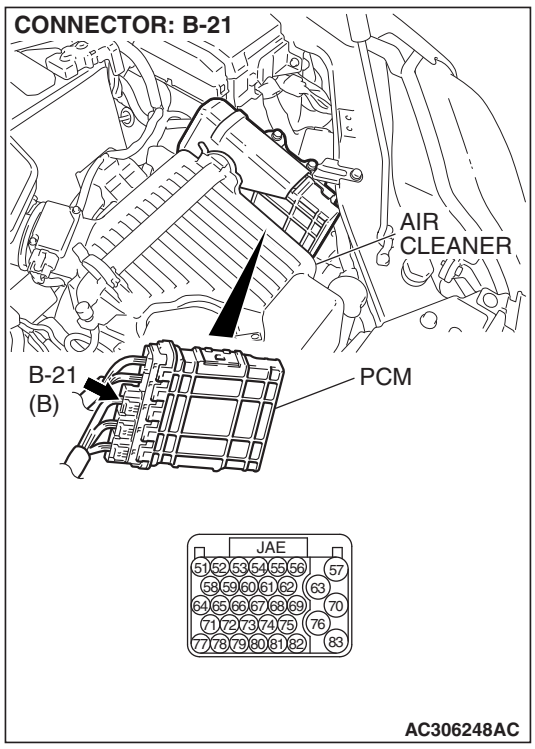


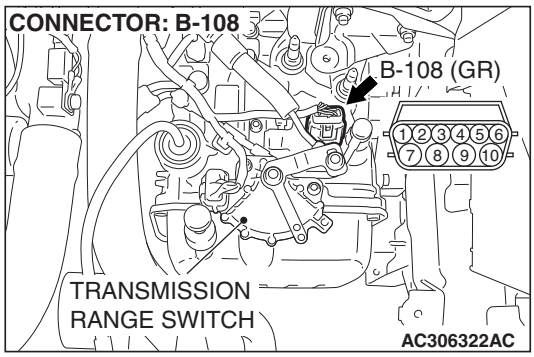
STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-16X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-108 terminal 10.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair or replace the harness wire.





STEP 11. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

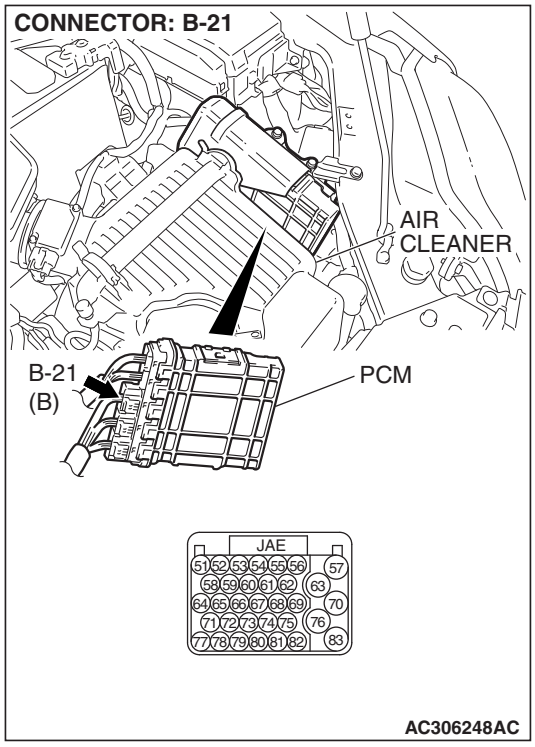
Q: Are the connectors and terminals in good condition?

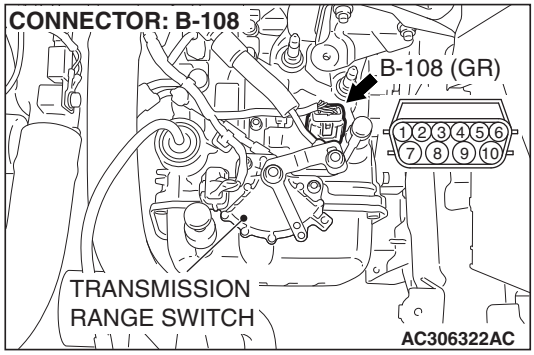
YES : Go to Step 12.

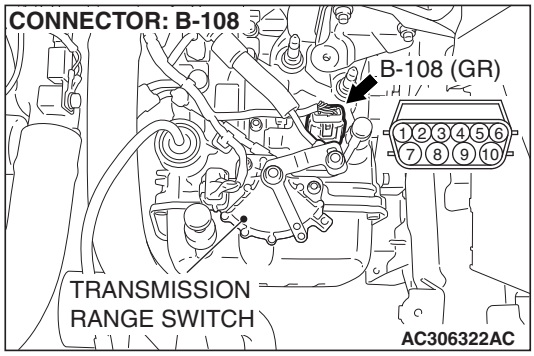
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

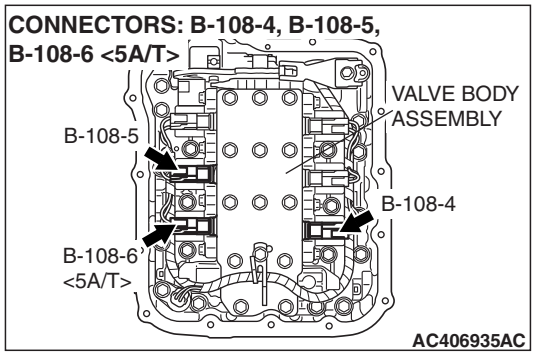
STEP 12. Check the harness for an open or short circuit to ground between PCM connector B-21 (terminals 54, 56 and 53 <5A/T>) and A/T control solenoid valve assembly connector B-108 (terminals 6, 7 and 8 <5A/T>).
Q: Are the harness wires in good condition?

YES : Go to Step 13.
NO : Repair or replace the harness wire.









STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-108 (terminals 6, 7, 8 <5A/T> and 10) and solenoid valve connectors B-108-4, B-108-5 and B-108-6 <5A/T>.

Q: Is the harness wire in good condition?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Replace the harness wire.

DTC P1774 (P0758): Underdrive Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT

Refer to P.23A-190.

CIRCUIT OPERATION

Refer to P.23A-190.

DESCRIPTIONS OF MONITOR METHODS

- If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that underdrive solenoid valve has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

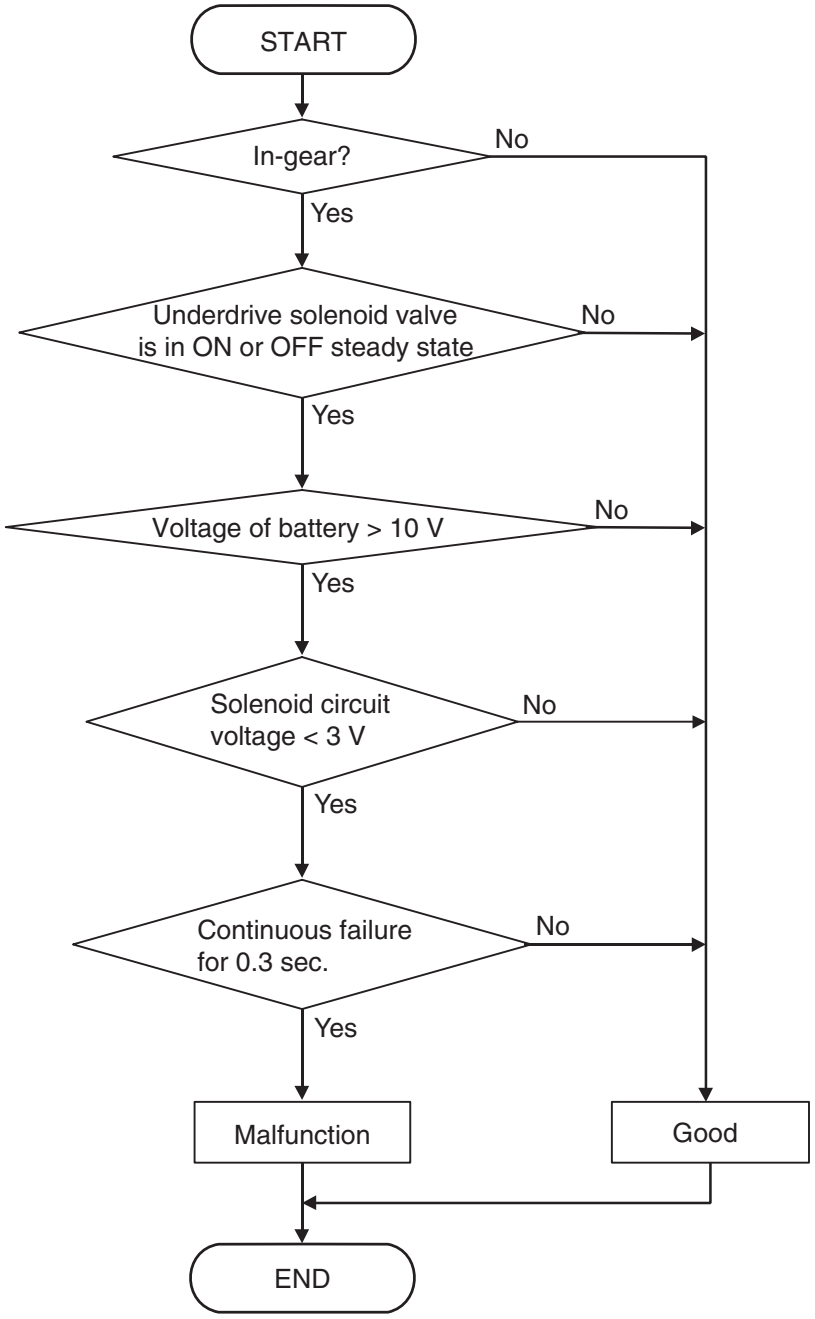
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC P1779 (P0731): 1st gear incorrect ratio
- DTC P1780 (P0732): 2nd gear incorrect ratio
- DTC P1781 (P0733): 3rd gear incorrect ratio
- DTC P1782 (P0734): 4th gear incorrect ratio
- DTC P1783 (P0735): 5th gear incorrect ratio <5A/T>
- DTC P1784 (P0736): Reverse gear incorrect ratio
- DTC P1778 (P0743): Torque converter clutch solenoid malfunction
- DTC P1773 (P0753): Low-reverse solenoid malfunction
- DTC P1775 (P0763): Second solenoid malfunction
- DTC P1776 (P0768): Overdrive solenoid malfunction
- DTC P1777 (P0773): Reduction solenoid malfunction <5A/T>
- DTC P1788 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Torque converter clutch solenoid
- Low-reverse solenoid
- Second solenoid
- Reduction solenoid <5A/T>
- Overdrive solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC P1774 (P0758) is set consecutively four times, the transaxle is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in "P" range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the underdrive solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check actuator test item 2: Underdrive Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

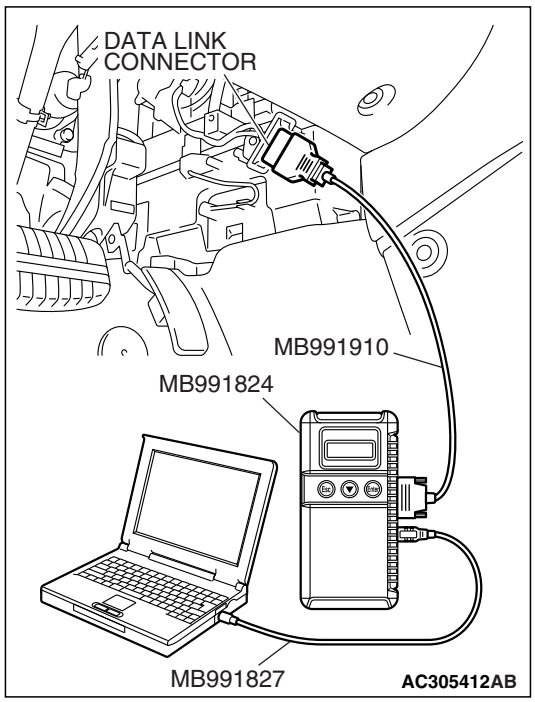
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
  - Item 2: Underdrive Solenoid Valve.
    - An audible clicking or buzzing should be heard when the underdrive solenoid valve is energized.

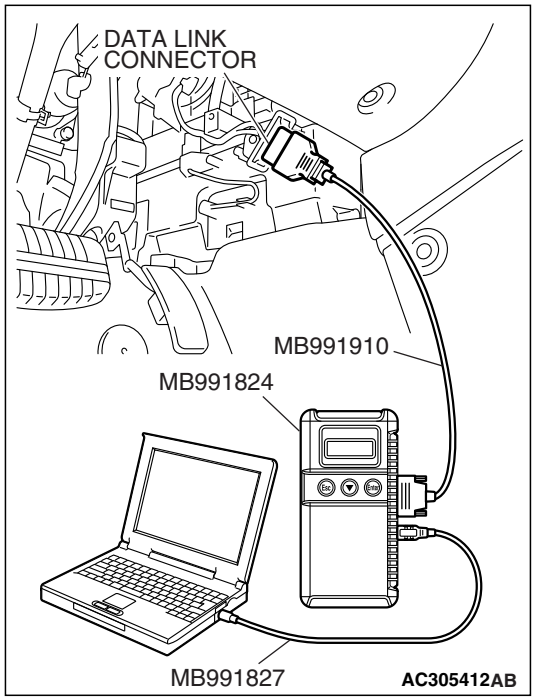
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Go to Step 2.



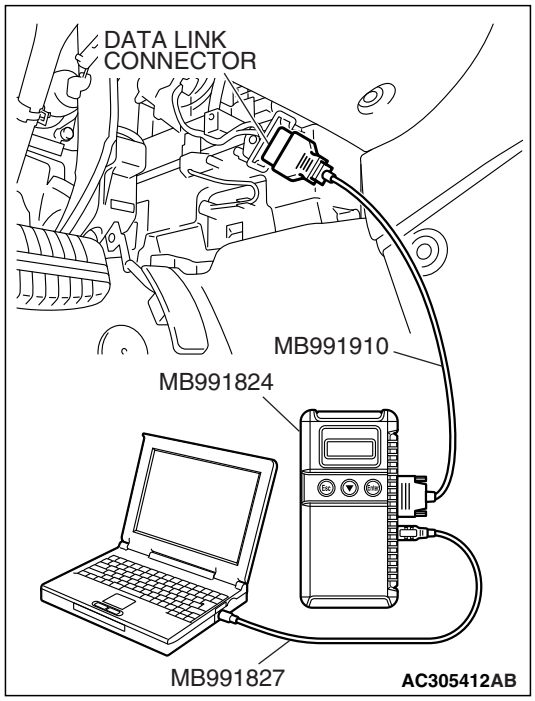


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P1788 (P1751) set? (DTC P1788 (P1751) may be set along with multiple DTCs).

YES : Refer to P.23A-289 DTC P1788 (P1751): A/T Control Relay System.
NO : Go to Step 3.



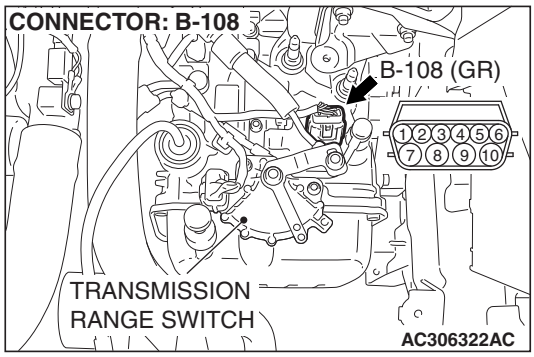
STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

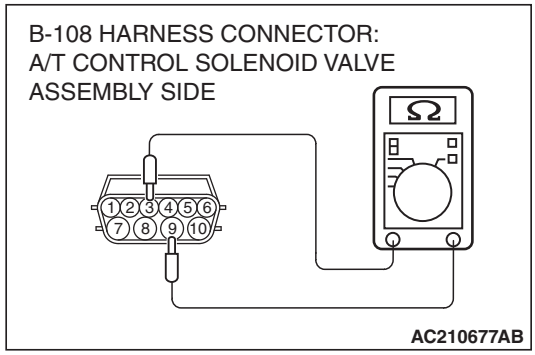
Q: Are DTC P1775 (P0763) and DTC P1776 (P0768) set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the underdrive solenoid valve resistance at A/T control solenoid valve assembly connector B-108.



(1) Disconnect connector B-108 and measure at the solenoid valve side.



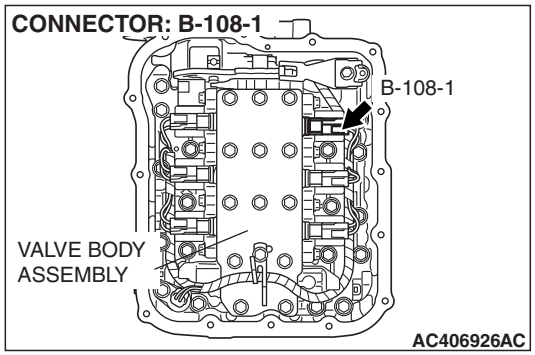
(2) Measure the resistance between solenoid valve assembly connector B-108 terminals 3 and 9.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

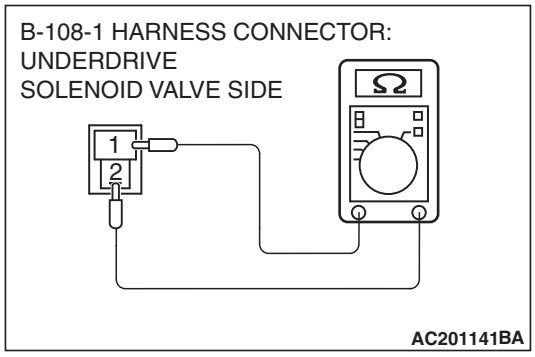
Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the underdrive solenoid valve assembly inside the transaxle.



(1) Disconnect connector B-108-1 and measure at the solenoid valve side.

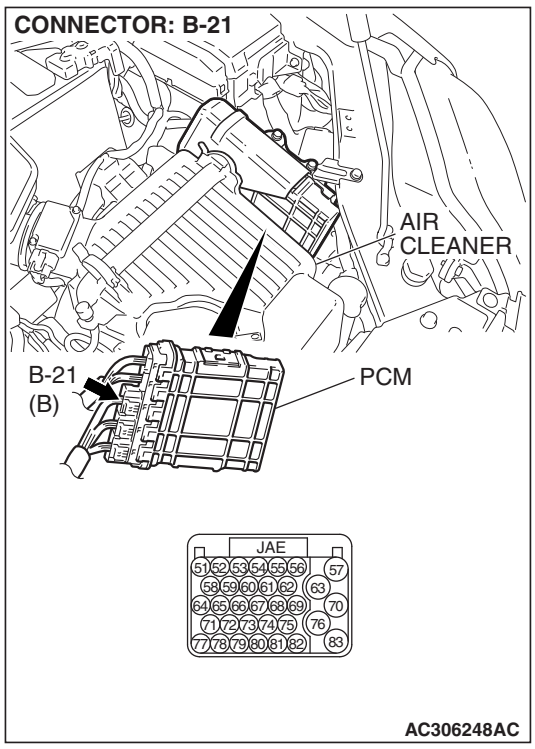


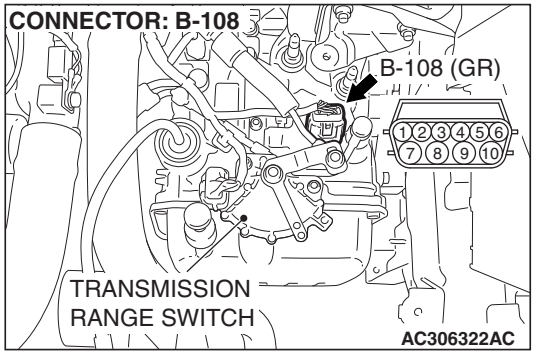
(2) Measure the resistance between Underdrive solenoid valve terminals 1 and 2.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)?

YES : Replace the harness wire between A/T control solenoid valve assembly connector B-108 and the solenoid valves.
NO : Replace the Underdrive solenoid valve. Refer to GROUP 23B, P.23B-66 Valve Body <4A/T> or Refer to GROUP 23C, P.23C-74 Valve Body <5A/T>.



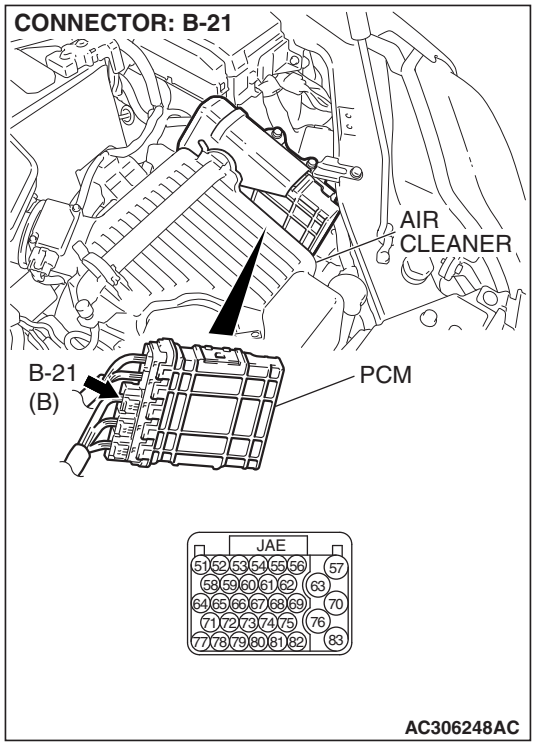


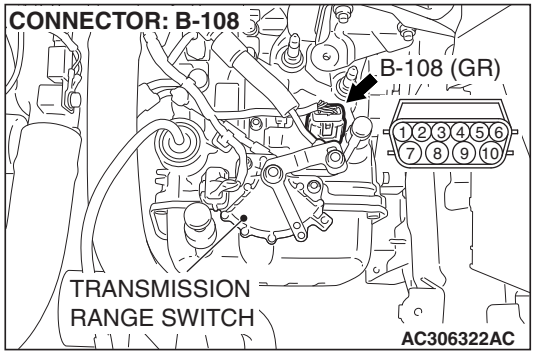
STEP 6. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





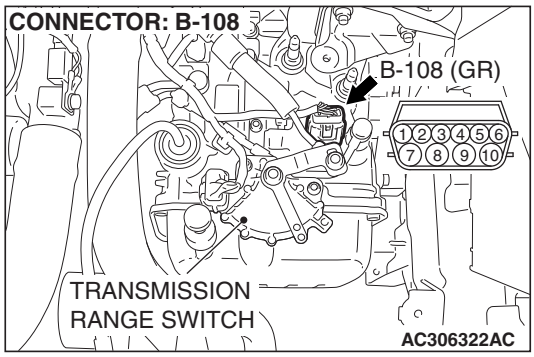
STEP 7. Check the harness for an open or short circuit to ground between PCM connector B-21 terminal 65 and A/T control solenoid valve assembly connector B-108 terminal 3.

Q: Is the harness wire in good condition?

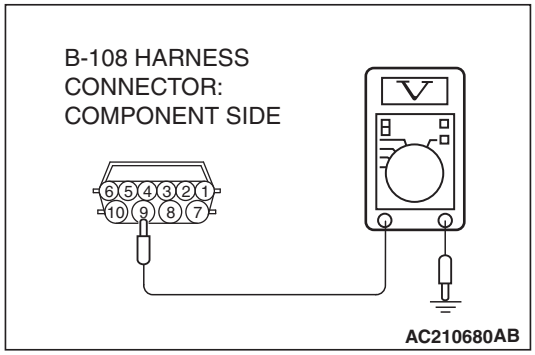
YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Repair or replace the harness wire.

STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-108.



(1) Disconnect solenoid valve assembly harness connector B-108.
(2) Turn the ignition switch to the "ON" position.



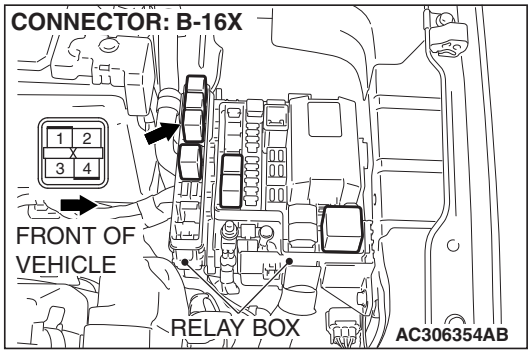
(3) Measure the voltage between harness connector B-108 terminal 9 and ground.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

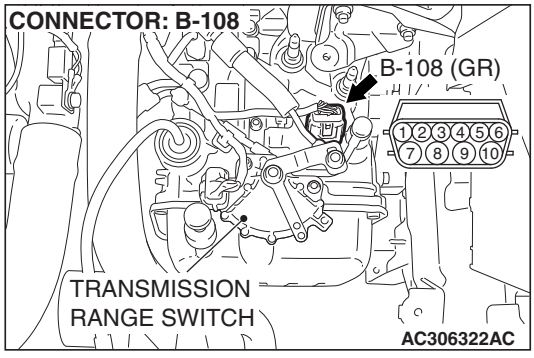
YES : Go to Step 11.
NO : Go to Step 9.

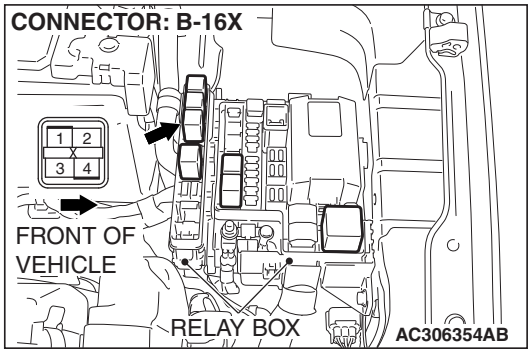
STEP 9. Check A/T control relay connector B-16X in the engine component relay box and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

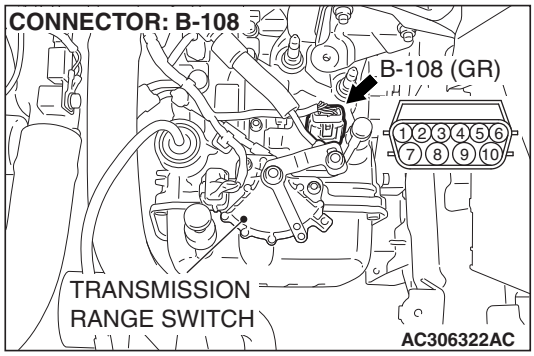


Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





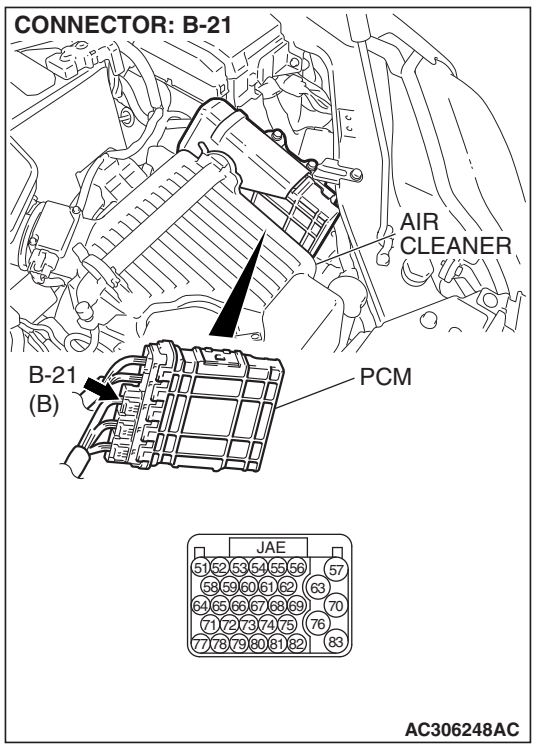


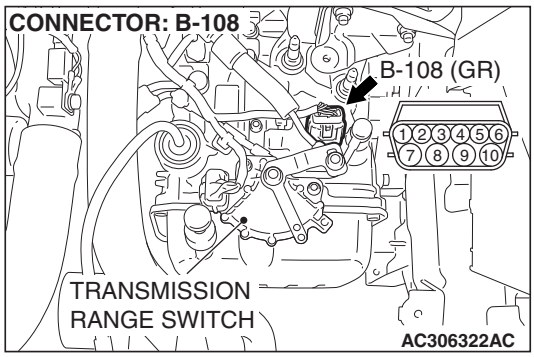
STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-16X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-108 terminal 9.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair or replace the harness wire.





STEP 11. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

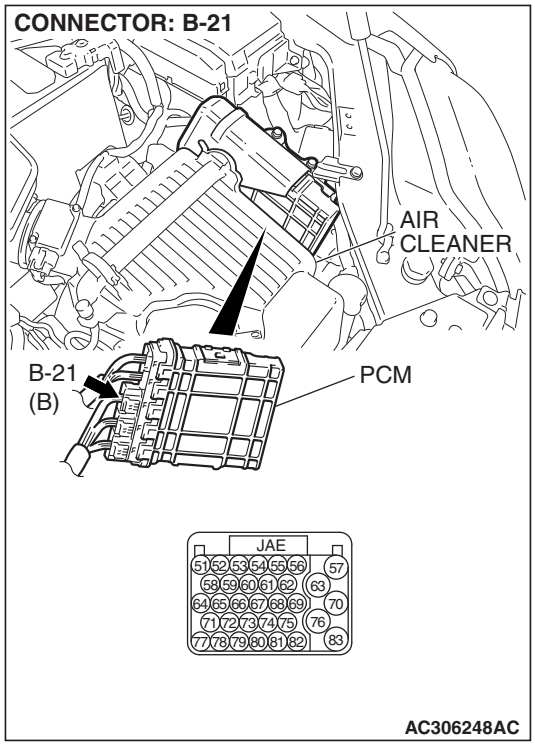
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

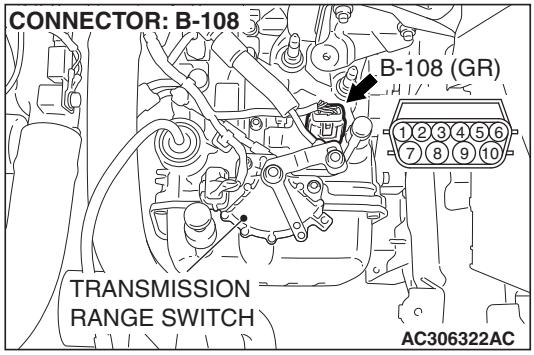
STEP 12. Check the harness for an open or short circuit to ground between PCM connector B-21 (terminals 65, 66 and 55) and A/T control solenoid valve assembly connector B-108 (terminals 3, 4 and 5).

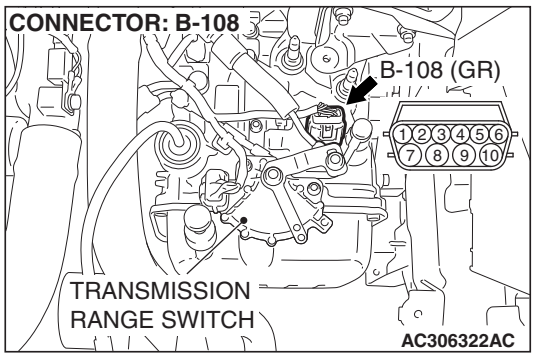
Q: Are the harness wires in good condition?

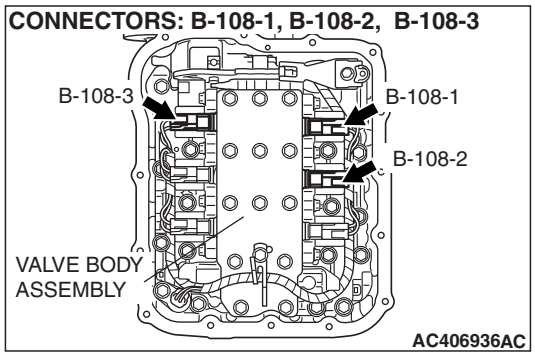
YES : Go to Step 13.

NO : Repair or replace the harness wire.









STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-108 (terminals 3, 4, 5, and 9) and solenoid valve connectors B-108-1, B-108-2 and B-108-3.

Q: Is the harness wire in good condition?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Replace the harness wire.

DTC P1775 (P0763): Second Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT

Refer to P.23A-190.

CIRCUIT OPERATION

Refer to P.23A-190.

DESCRIPTIONS OF MONITOR METHODS

- If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that second solenoid valve has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

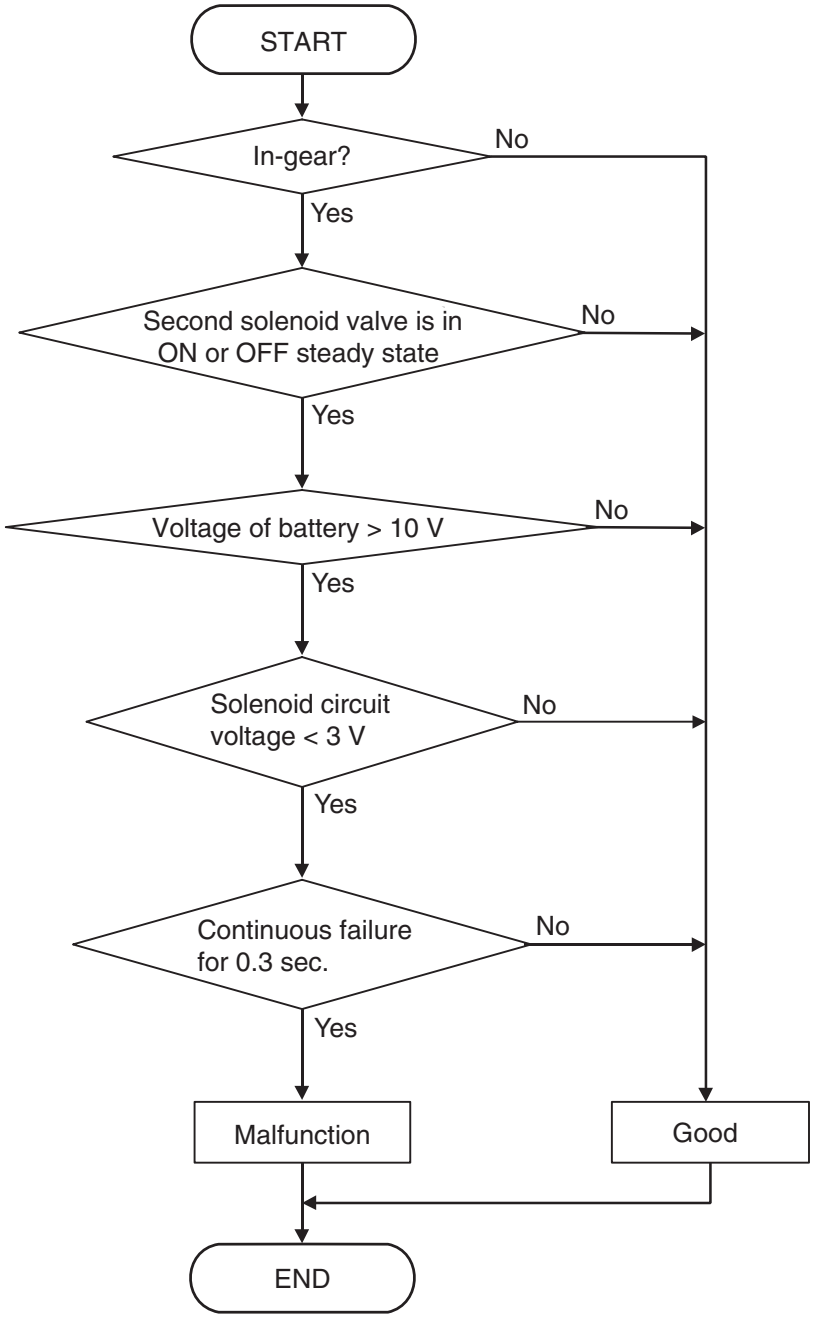
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC P1779 (P0731): 1st gear incorrect ratio
- DTC P1780 (P0732): 2nd gear incorrect ratio
- DTC P1781 (P0733): 3rd gear incorrect ratio
- DTC P1782 (P0734): 4th gear incorrect ratio
- DTC P1783 (P0735): 5th gear incorrect ratio <5A/T>
- DTC P1784 (P0736): Reverse gear incorrect ratio
- DTC P1778 (P0743): Torque converter clutch solenoid malfunction
- DTC P1773 (P0753): Low-reverse solenoid malfunction
- DTC P1774 (P0758): Underdrive solenoid malfunction
- DTC P1776 (P0768): Overdrive solenoid malfunction
- DTC P1777 (P0773): Reduction solenoid malfunction <5A/T>
- DTC P1788 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Reduction solenoid <5A/T>
- Overdrive solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC P1775 (P0763) is set consecutively four times, the transaxle is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in "P" range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the second solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

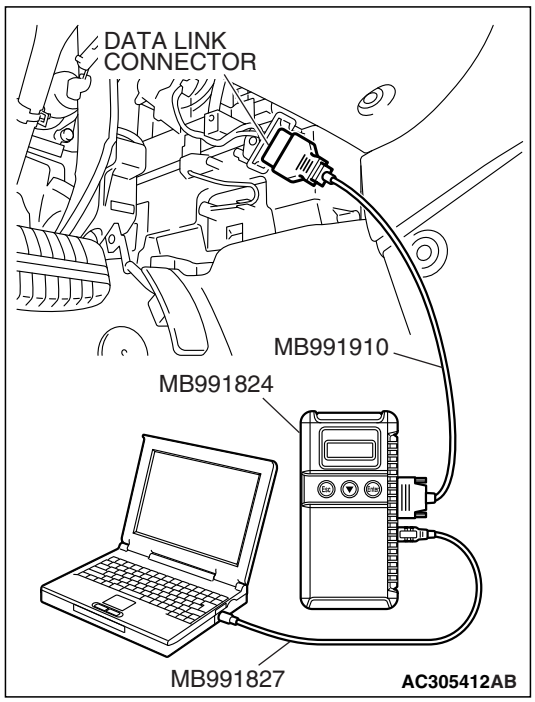
TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check actuator test item 3: Second Solenoid Valve.



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

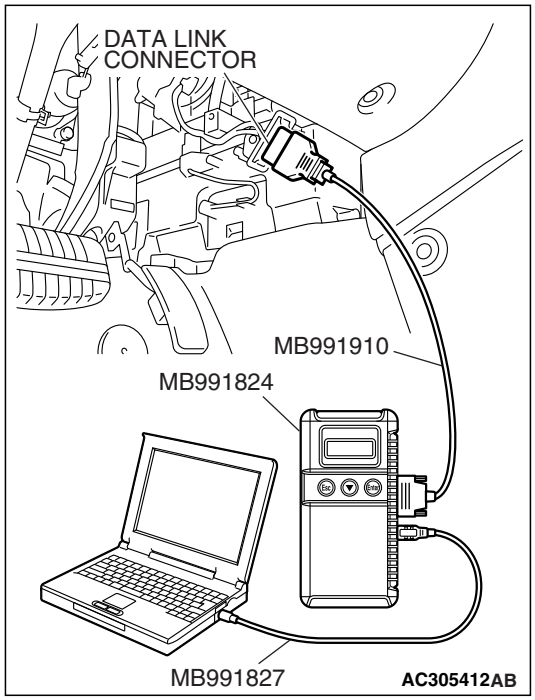
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
  - Item 3: Second Solenoid Valve.
    - An audible clicking or buzzing should be heard when the second solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Go to Step 2.

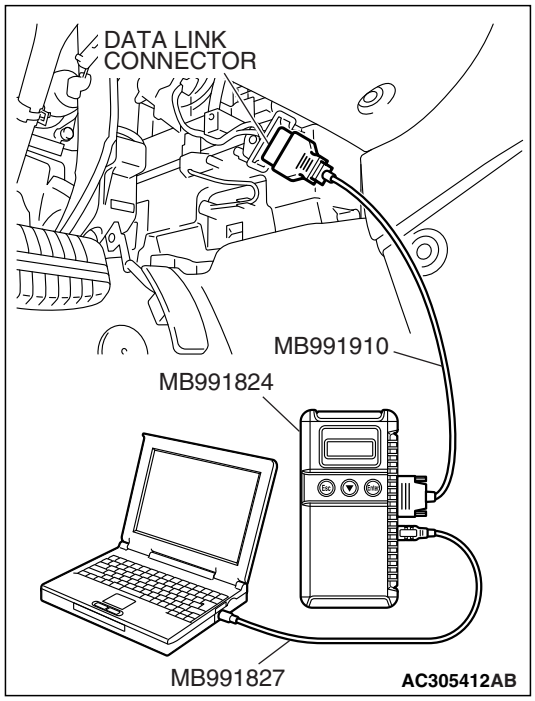


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P1788 (P1751) set? (DTC P1788 (P1751) may be set along with multiple DTCs).

YES : Refer to P.23A-289 DTC P1788 (P1751): A/T Control Relay System.
NO : Go to Step 3.



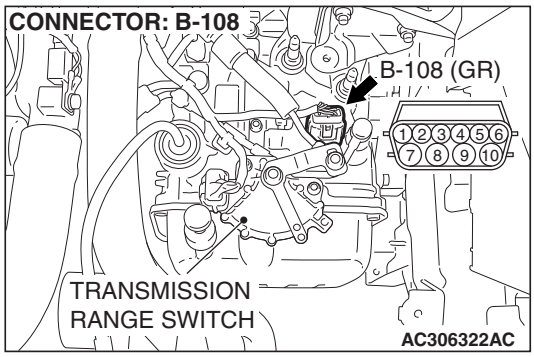
STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

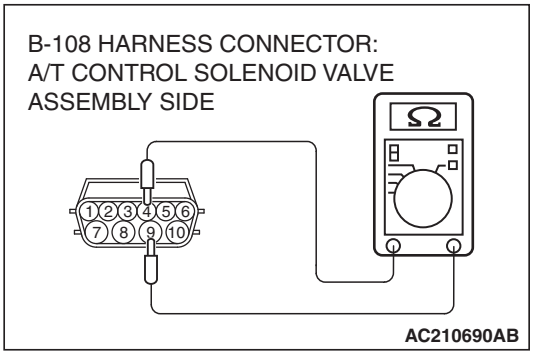
Q: Are DTC P1774 (P0758) and DTC P1776 (P0768) set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the Second solenoid valve resistance at A/T control solenoid valve assembly connector B-108.



(1) Disconnect connector B-108 and measure at the solenoid valve side.



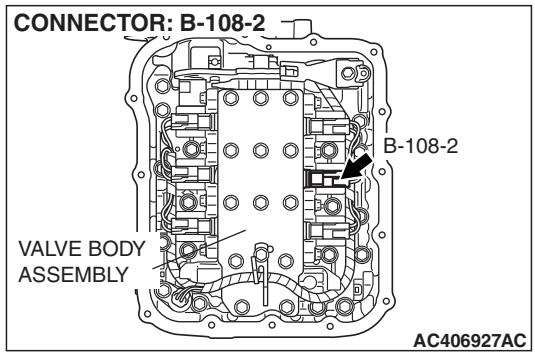
(2) Measure the resistance between solenoid valve assembly connector B-108 terminals 4 and 9.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

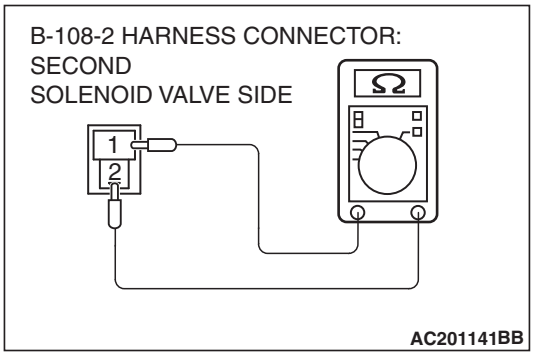
Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the second solenoid valve assembly inside the transaxle.



(1) Disconnect connector B-108-2 and measure at the solenoid valve side.



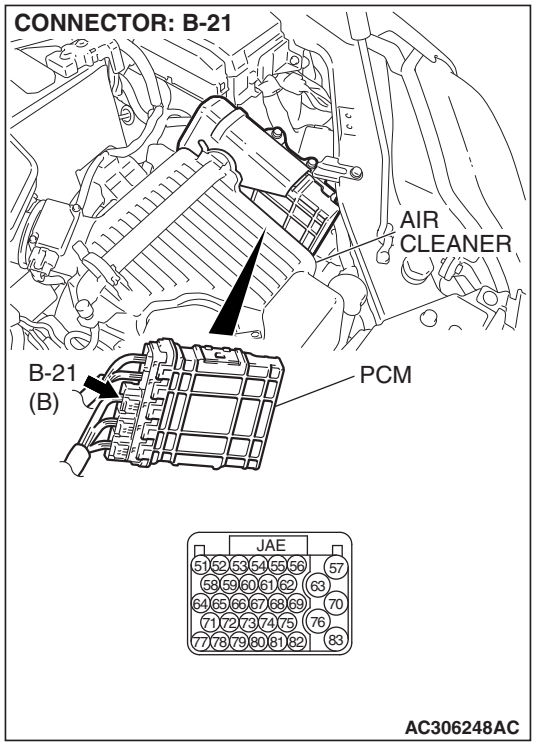
(2) Measure the resistance between Second solenoid valve terminals 1 and 2.

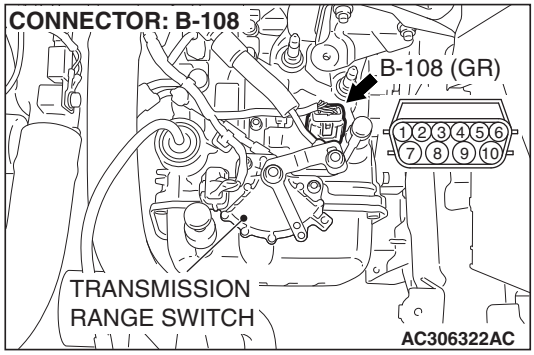
Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)?

YES : Replace the harness wire between A/T control solenoid valve assembly connector B-108 and the solenoid valves.
NO : Replace the Second solenoid valve. Refer to GROUP 23B, P.23B-66 Valve Body <4A/T> or Refer to GROUP 23C, P.23C-74 Valve Body <5A/T>.

TSB Revision



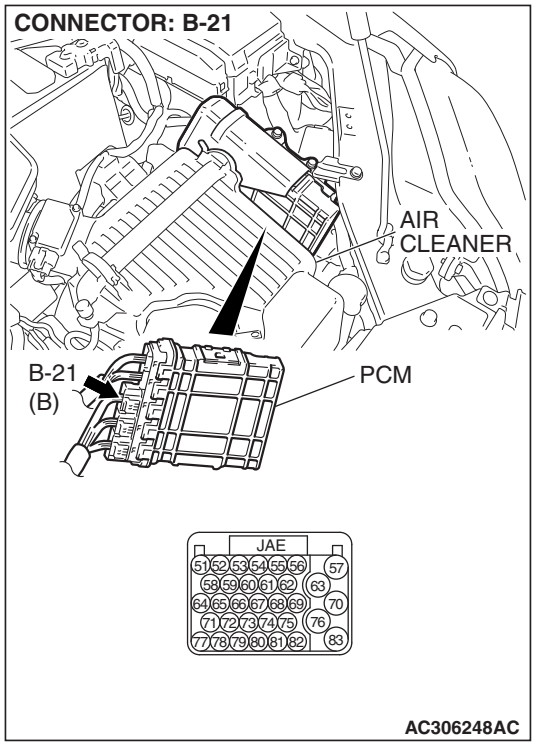


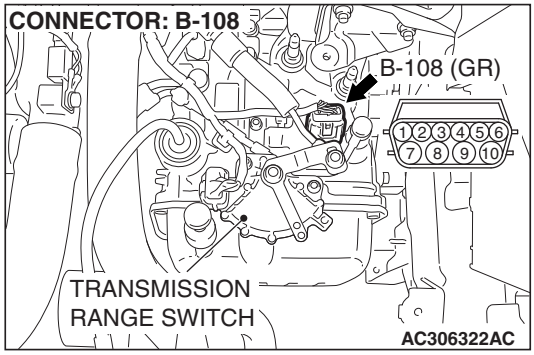
STEP 6. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





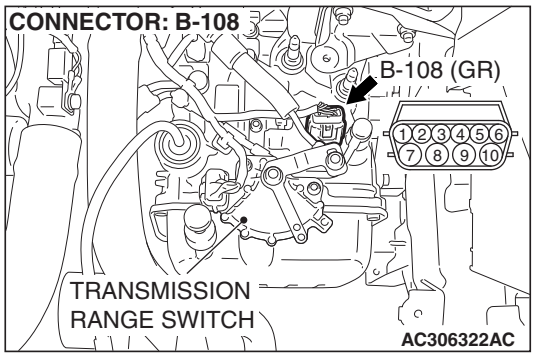
STEP 7. Check the harness for an open or short circuit to ground between PCM connector B-21 terminal 66 and A/T control solenoid valve assembly connector B-108 terminal 4.

Q: Is the harness wire in good condition?

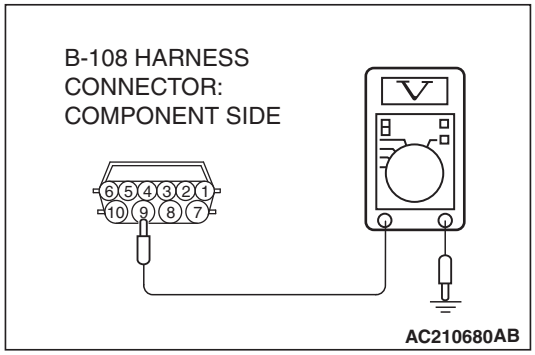
YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Repair or replace the harness wire.

STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-108.



(1) Disconnect solenoid valve assembly harness connector B-108.
(2) Turn the ignition switch to the "ON" position.



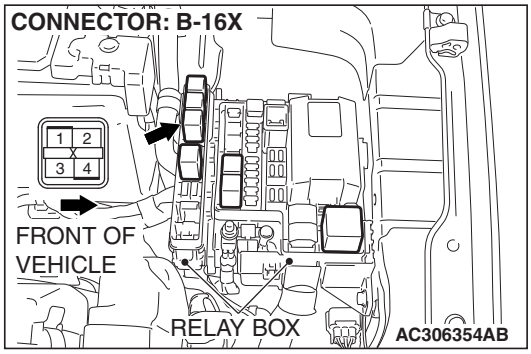
(3) Measure the voltage between harness connector B-108 terminal 9 and ground.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

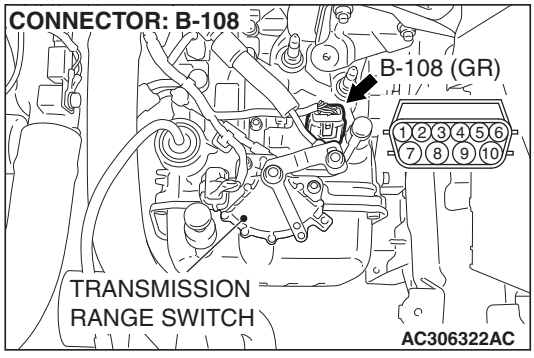
YES : Go to Step 11.
NO : Go to Step 9.

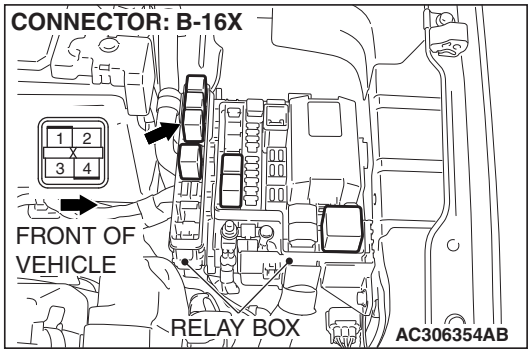
STEP 9. Check A/T control relay connector B-16X in the engine component relay box and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

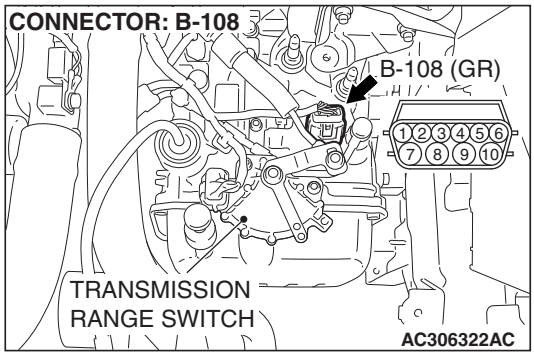


Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





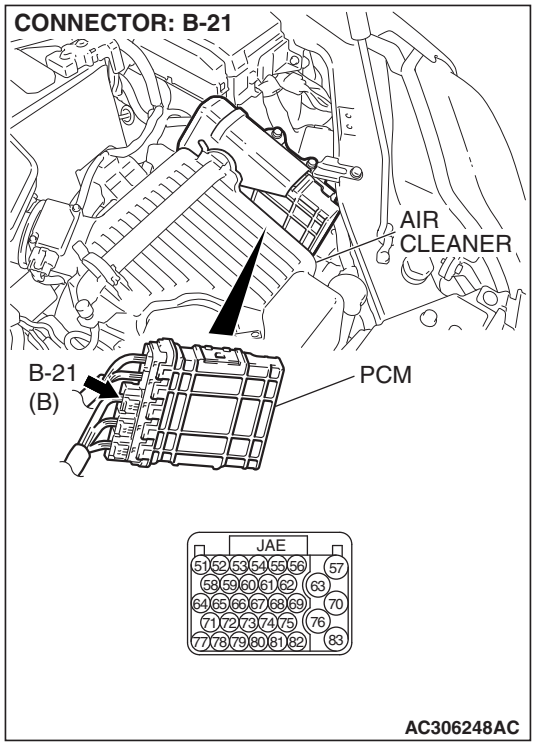


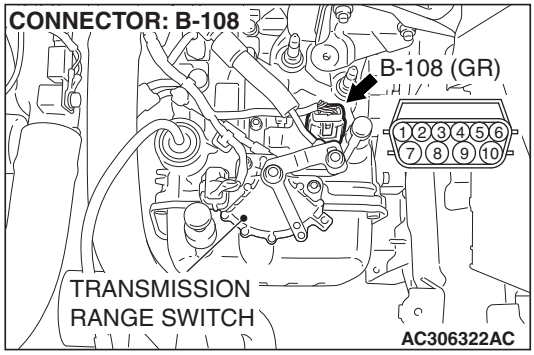
STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-16X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-108 terminal 9.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair or replace the harness wire.





STEP 11. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

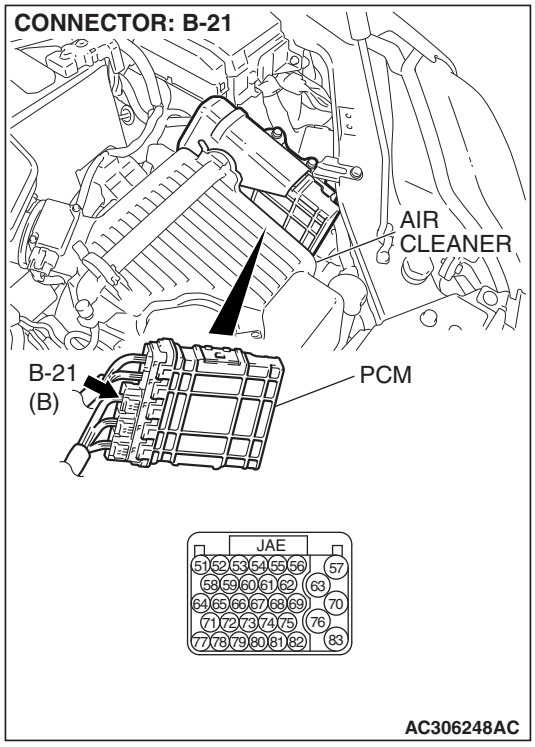
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

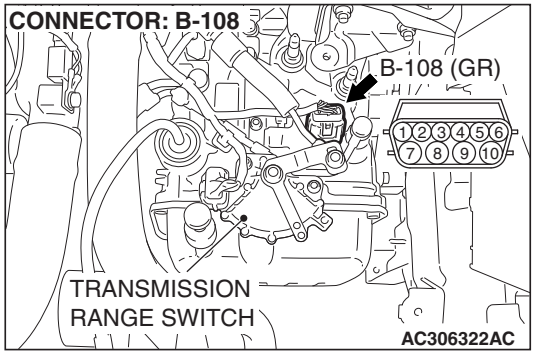
STEP 12. Check the harness for an open or short circuit to ground between PCM connector B-21 (terminals 65, 66 and 55) and A/T control solenoid valve assembly connector B-108 (terminals 3, 4 and 5).

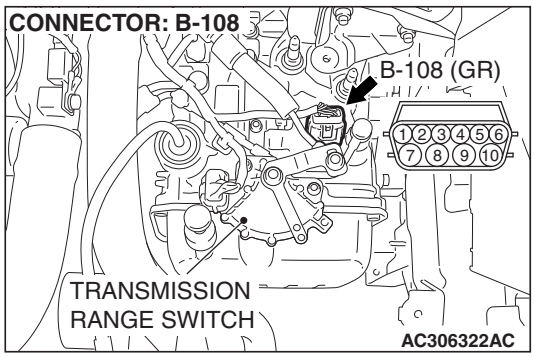
Q: Are the harness wires in good condition?

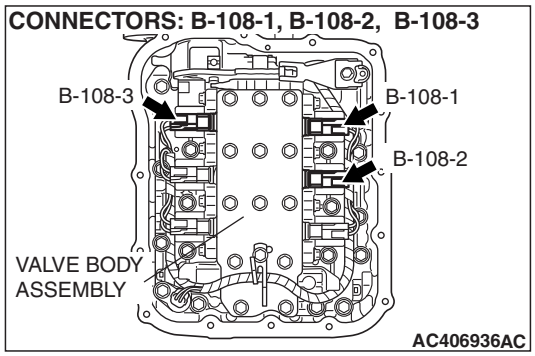
YES : Go to Step 13.

NO : Repair or replace the harness wire.









STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-108 (terminals 3, 4, 5, and 9) and solenoid valve connectors B-108-1, B-108-2 and B-108-3.

Q: Is the harness wire in good condition?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Replace the harness wire.

DTC P1776 (P0768): Overdrive Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT

Refer to P.23A-190.

CIRCUIT OPERATION

Refer to P.23A-190.

DESCRIPTIONS OF MONITOR METHODS

- If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that overdrive solenoid valve has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

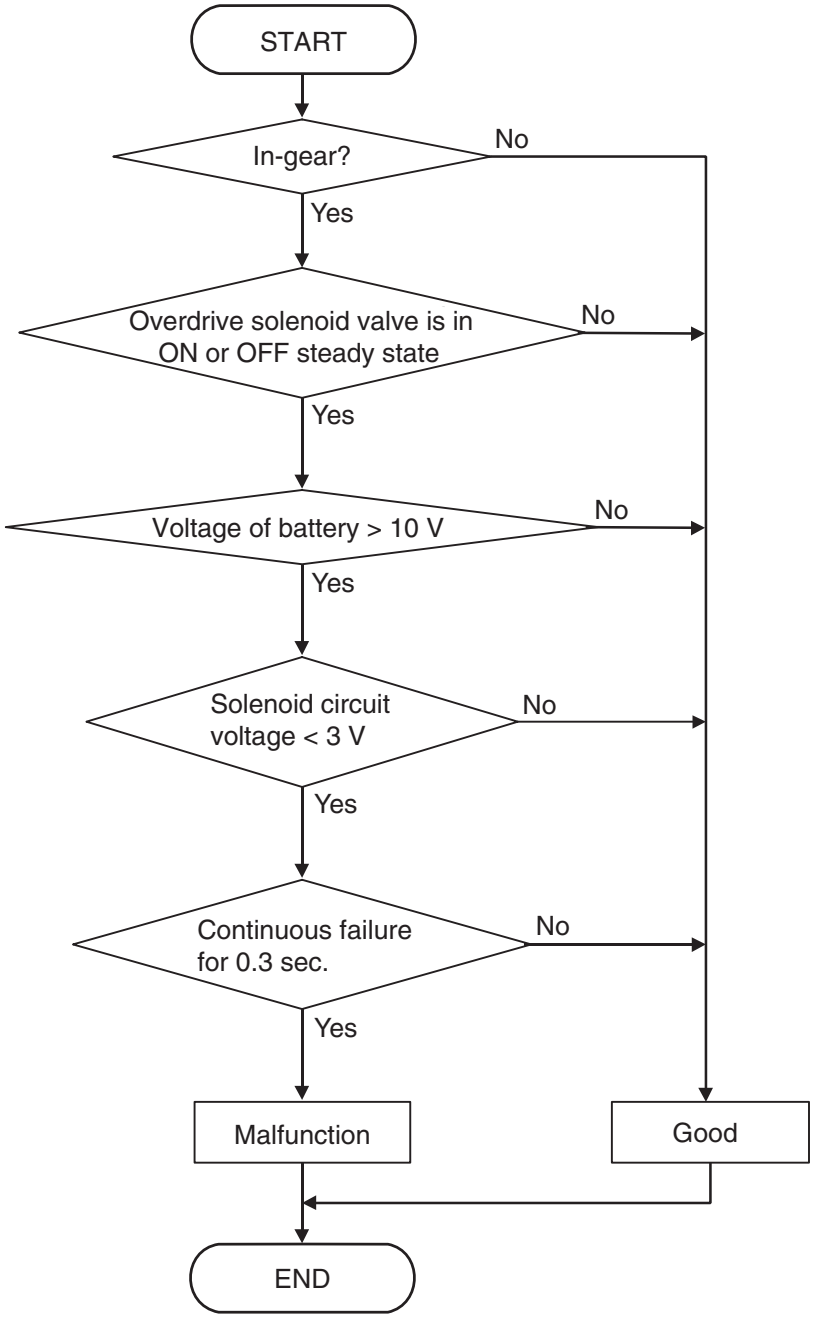
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC P1779 (P0731): 1st gear incorrect ratio
- DTC P1780 (P0732): 2nd gear incorrect ratio
- DTC P1781 (P0733): 3rd gear incorrect ratio
- DTC P1782 (P0734): 4th gear incorrect ratio
- DTC P1783 (P0735): 5th gear incorrect ratio <5A/T>
- DTC P1784 (P0736): Reverse gear incorrect ratio
- DTC P1778 (P0743): Torque converter clutch solenoid malfunction
- DTC P1773 (P0753): Low-reverse solenoid malfunction
- DTC P1774 (P0758): Underdrive solenoid malfunction
- DTC P1775 (P0763): Second solenoid malfunction
- DTC P1777 (P0773): Reduction solenoid malfunction <5A/T>
- DTC P1788 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Reduction solenoid <5A/T>
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC P1776 (P0768) is set consecutively four times, the transaxle is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in "P" range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the overdrive solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

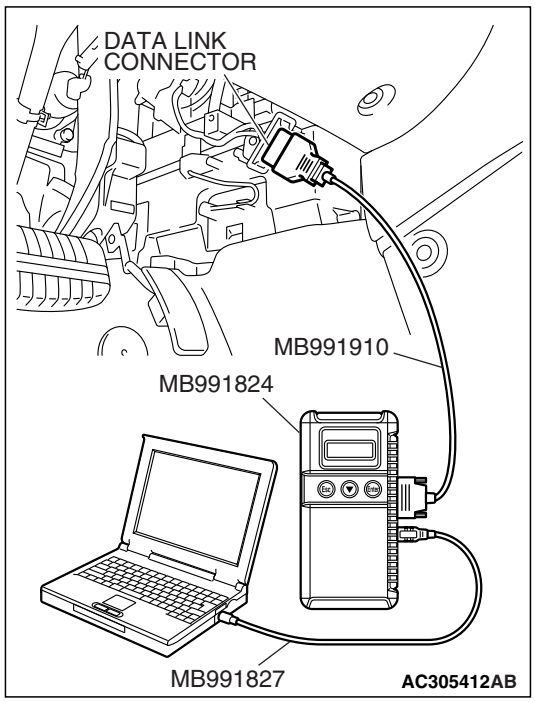
TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check actuator test item 4: Overdrive Solenoid Valve.



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

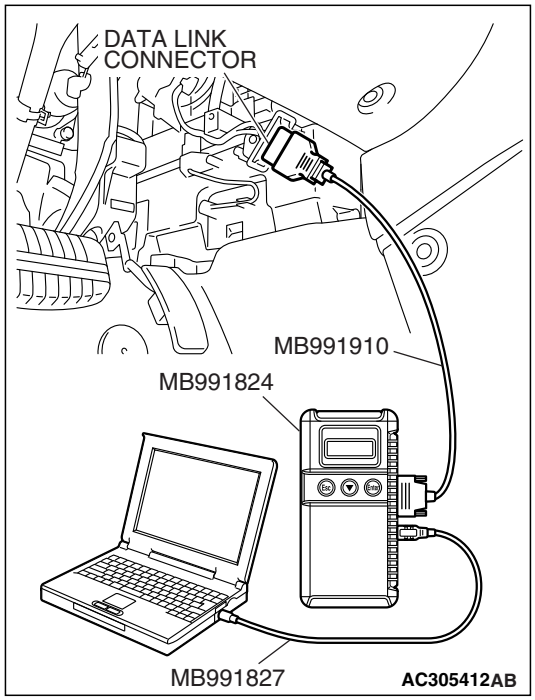
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 4: Overdrive Solenoid Valve.
  - An audible clicking or buzzing should be heard when the overdrive solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Go to Step 2.

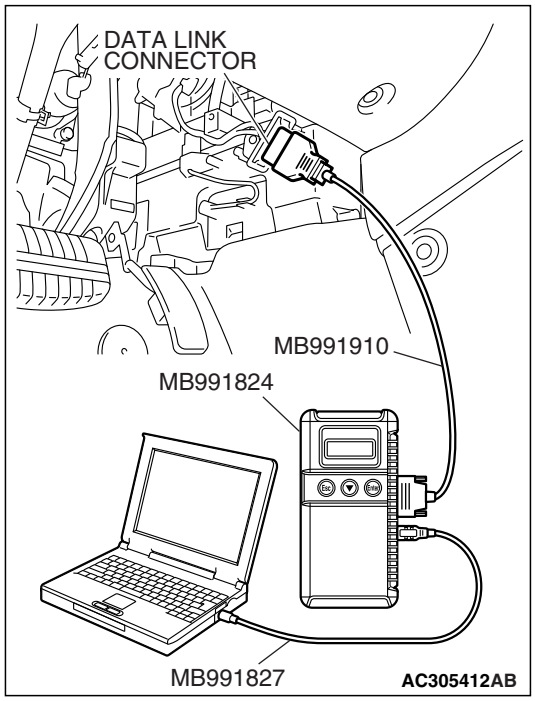


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P1788 (P1751) set? (DTC P1788 (P1751) may be set along with multiple DTCs).

YES : Refer to P.23A-289 DTC P1788 (P1571): A/T Control Relay System.
NO : Go to Step 3.



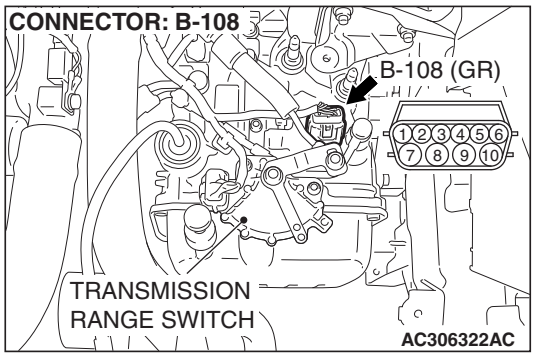
STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

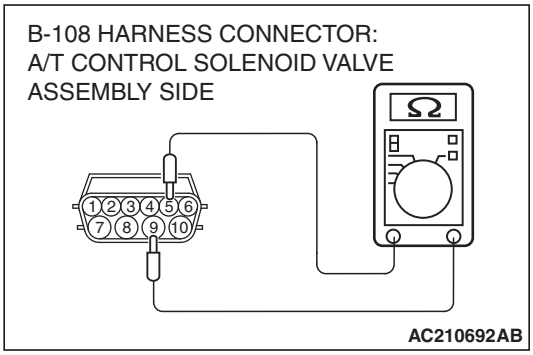
Q: Are DTC P1774 (P0758) and DTC P1775 (P0763) set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the Overdrive solenoid valve resistance at A/T control solenoid valve assembly connector B-108.



(1) Disconnect connector B-108 and measure at the solenoid valve side.



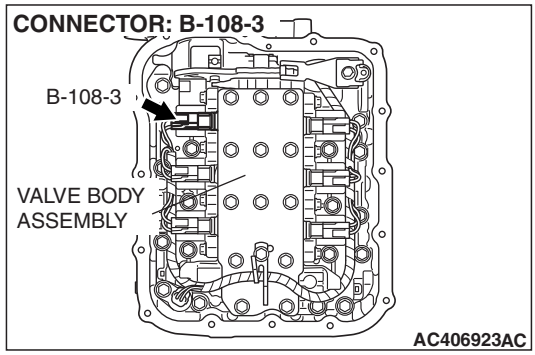
(2) Measure the resistance between solenoid valve assembly connector B-108 terminals 5 and 9.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

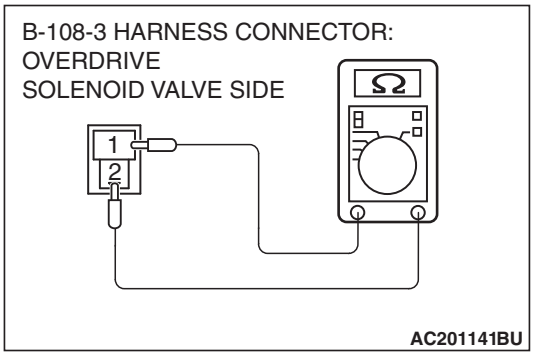
Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the overdrive solenoid valve assembly inside the transaxle.



(1) Disconnect connector B-108-3 and measure at the solenoid valve side.



(2) Measure the resistance between Overdrive solenoid valve terminals 1 and 2.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)?

YES : Replace the harness wire between A/T control solenoid valve assembly connector B-108 and the solenoid valves.
NO : Replace the Overdrive solenoid valve. Refer to GROUP 23B, P.23B-66 Valve Body <4A/T> or Refer to GROUP 23C, P.23C-74 Valve Body <5A/T>.

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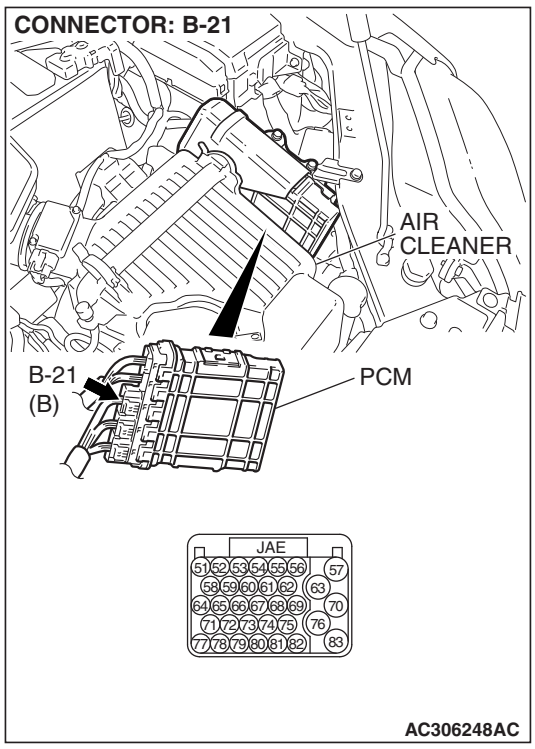
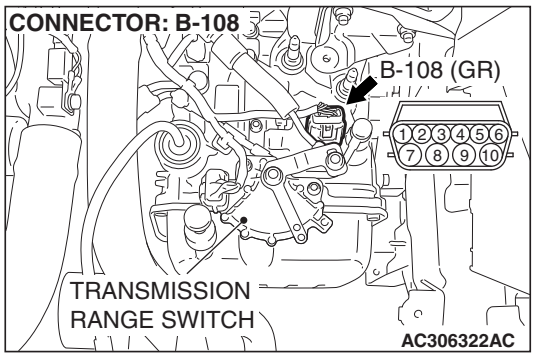


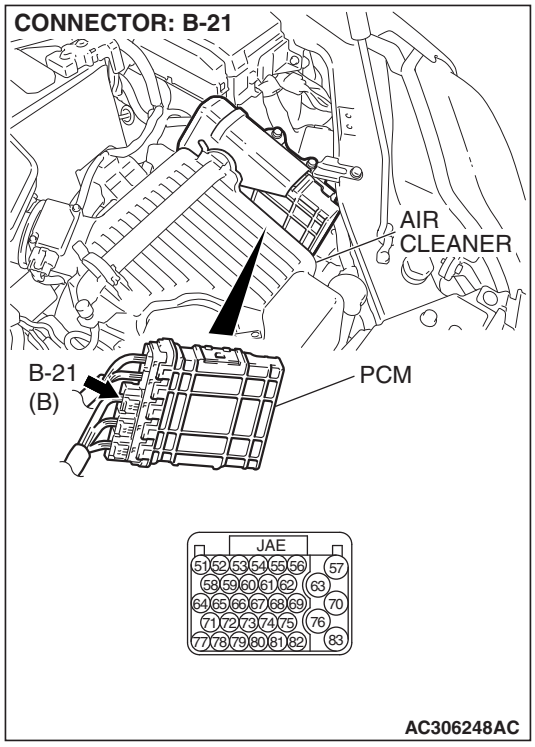


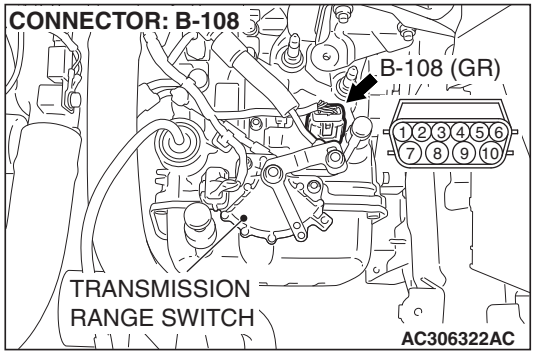
STEP 6. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





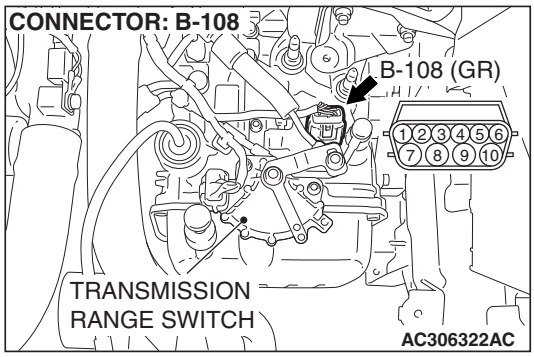
STEP 7. Check the harness for an open or short circuit to ground between PCM connector B-20 terminal 55 and A/T control solenoid valve assembly connector B-108 terminal 5.

Q: Is the harness wire in good condition?

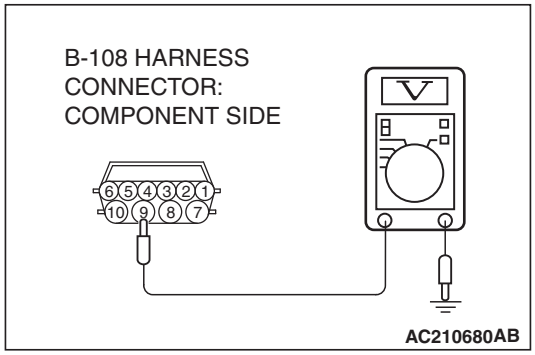
YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Repair or replace the harness wire.

STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-108.



(1) Disconnect solenoid valve assembly harness connector B-108.
(2) Turn the ignition switch to the "ON" position.



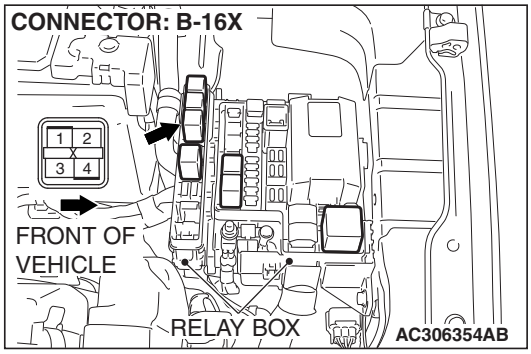
(3) Measure the voltage between harness connector B-108 terminal 9 and ground.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

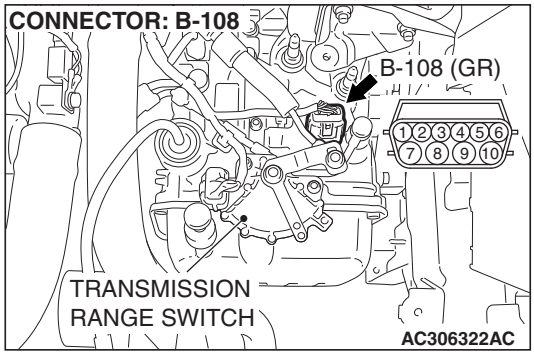
YES : Go to Step 11.
NO : Go to Step 9.

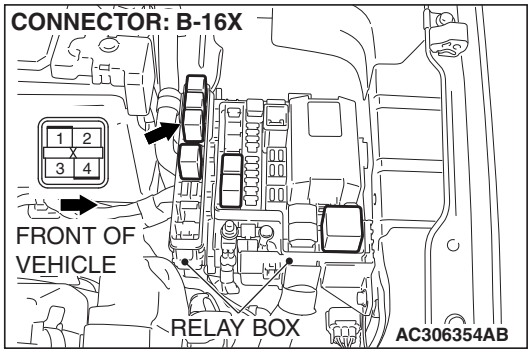
STEP 9. Check A/T control relay connector B-16X in the engine component relay box and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

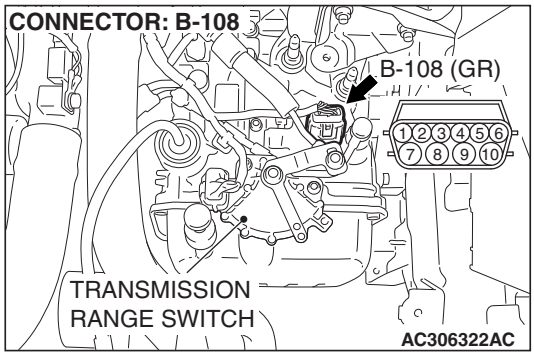


Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





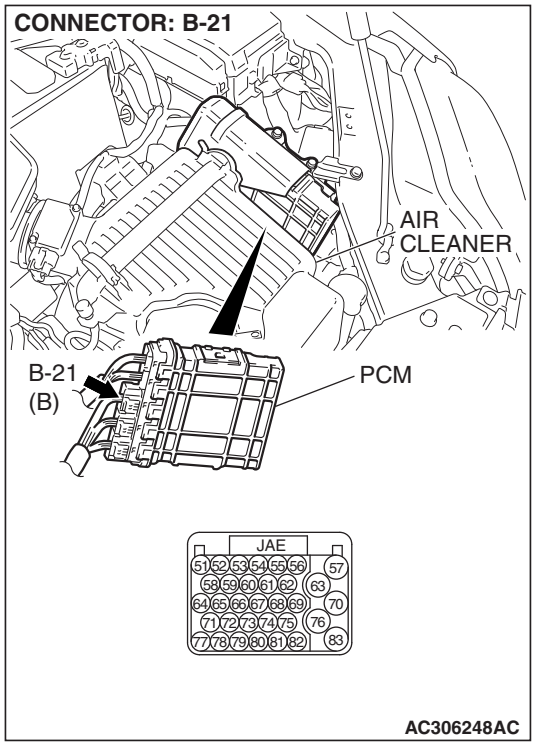


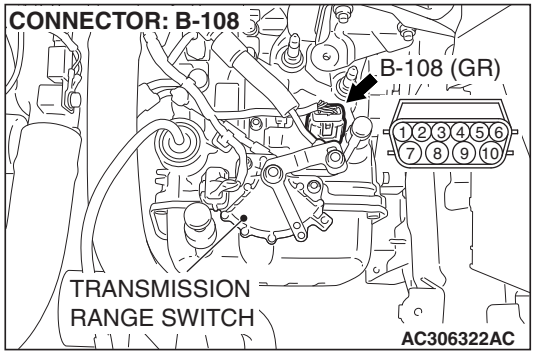
STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-16X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-108 terminal 9.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair or replace the harness wire.





STEP 11. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

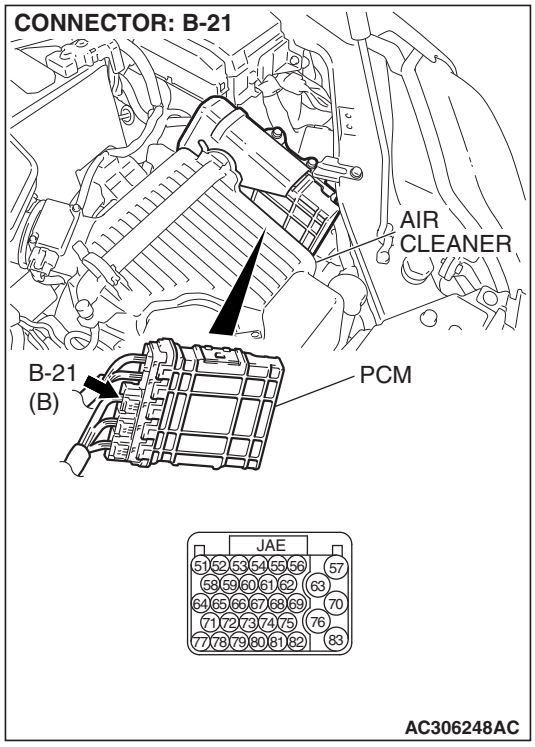
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

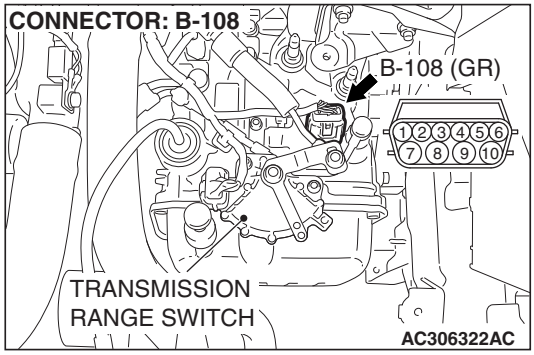
STEP 12. Check the harness for an open or short circuit to ground between PCM connector B-21 (terminals 65, 66 and 55) and A/T control solenoid valve assembly connector B-108 (terminals 3, 4 and 5).

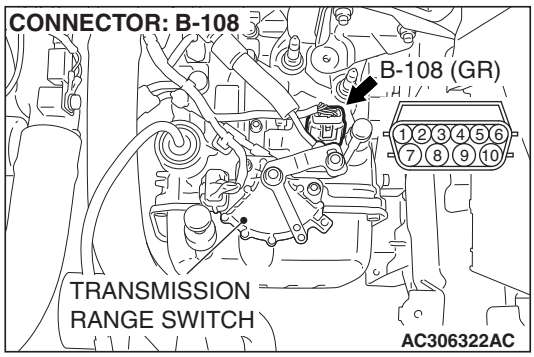
Q: Are the harness wires in good condition?

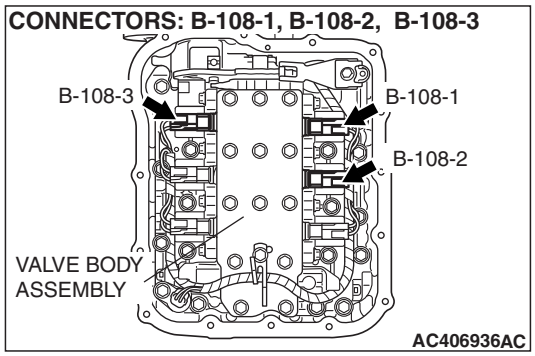
YES : Go to Step 13.

NO : Repair or replace the harness wire.









STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-108 (terminals 3, 4, 5, and 9) and solenoid valve connectors B-108-1, B-108-2 and B-108-3.

Q: Is the harness wire in good condition?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Replace the harness wire.

DTC P1777 (P0773): Reduction solenoid valve system <5A/T>

SOLENOID VALVE SYSTEM CIRCUIT

Refer to P.23A-190.

CIRCUIT OPERATION

Refer to P.23A-190.

DESCRIPTIONS OF MONITOR METHODS

- If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that reduction solenoid valve has a failure.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

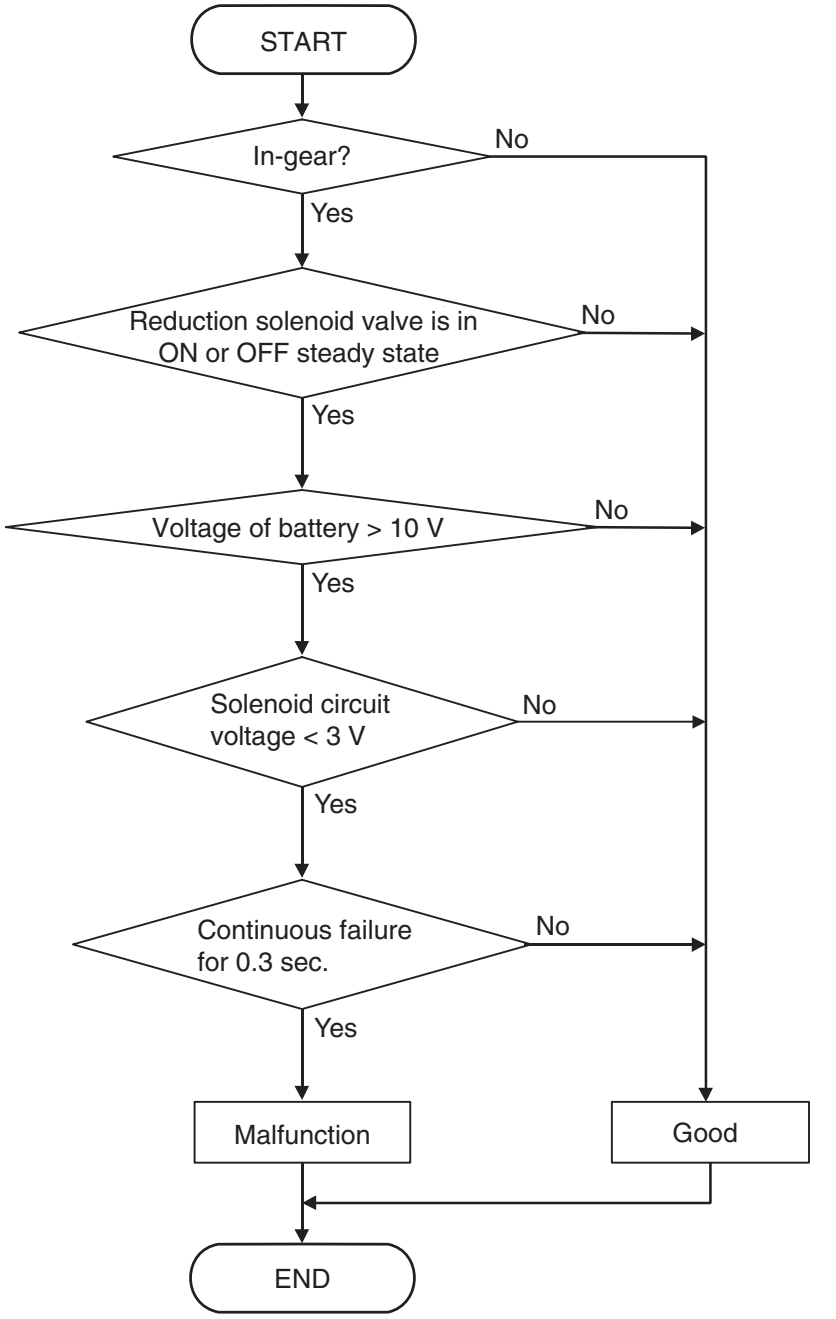
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC P1779 (P0731): 1st gear incorrect ratio
- DTC P1780 (P0732): 2nd gear incorrect ratio
- DTC P1781 (P0733): 3rd gear incorrect ratio
- DTC P1782 (P0734): 4th gear incorrect ratio
- DTC P1783 (P0735): 5th gear incorrect ratio
- DTC P1784 (P0736): Reverse gear incorrect ratio
- DTC P1778 (P0743): Torque converter clutch solenoid malfunction
- DTC P1773 (P0753): Low-reverse solenoid malfunction
- DTC P1774 (P0758): Underdrive solenoid malfunction
- DTC P1775 (P0763): Second solenoid malfunction
- DTC P1776 (P0768): Overdrive solenoid malfunction
- DTC P1788 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC P1777 (P0773) is set consecutively four times, the transaxle is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in "P" range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the reduction solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

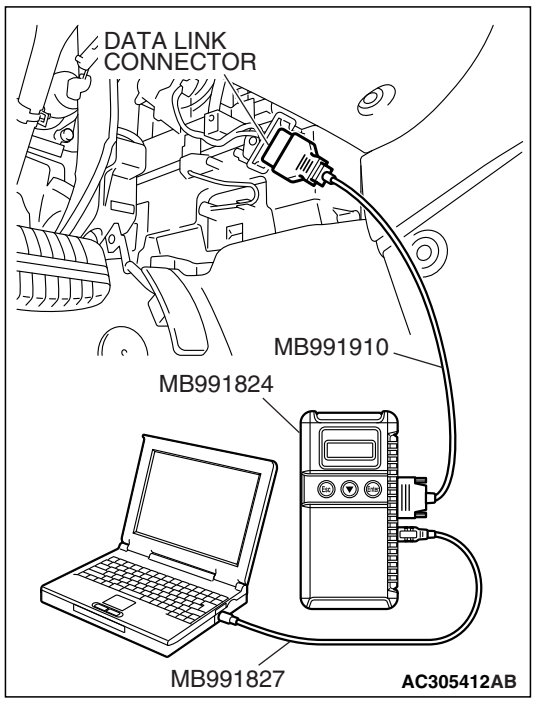
TSB Revision

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Using scan tool MB991958, check actuator test item 5: Reduction Solenoid Valve.



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

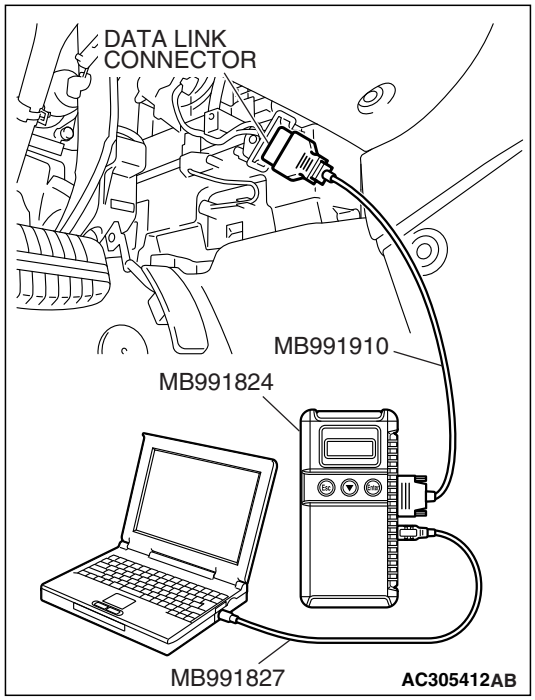
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
  - Item 5: Reduction Solenoid Valve.
    - An audible clicking or buzzing should be heard when the reduction solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Go to Step 2.

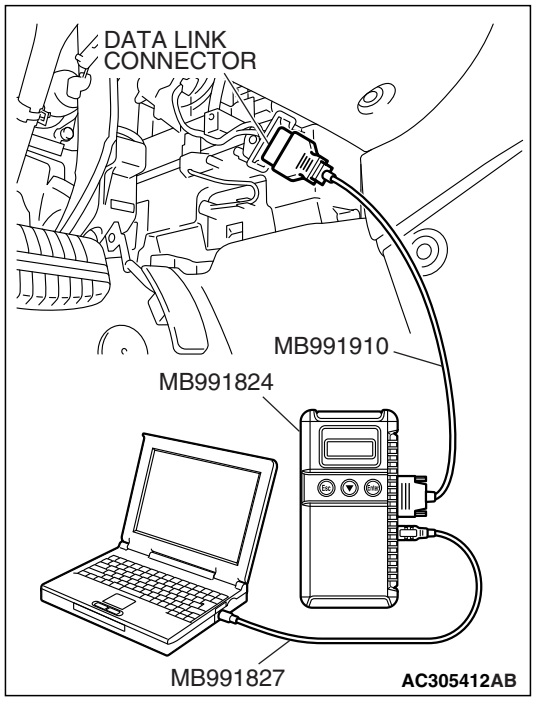


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P1788 (P1751) set? (DTC P1788 (P1751) may be set along with multiple DTCs).

YES : Refer to P.23A-289 DTC P1788 (P1751): A/T Control Relay System.
NO : Go to Step 3.



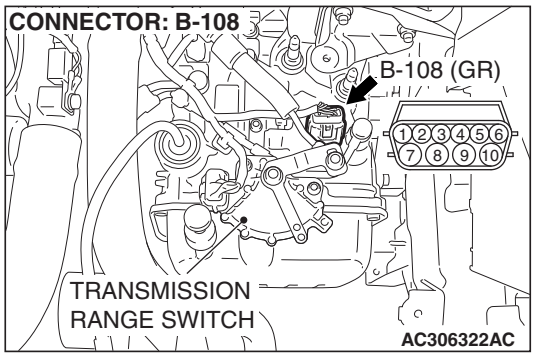
STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

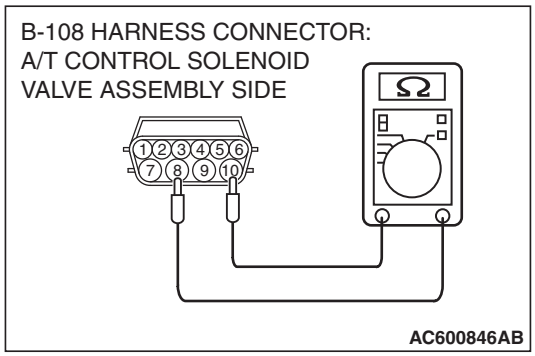
Q: Are DTC P1778 (P0743) and DTC P1773 (P0753) set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the Reduction solenoid valve resistance at A/T control solenoid valve assembly connector B-108.



(1) Disconnect connector B-108 and measure at the solenoid valve side.



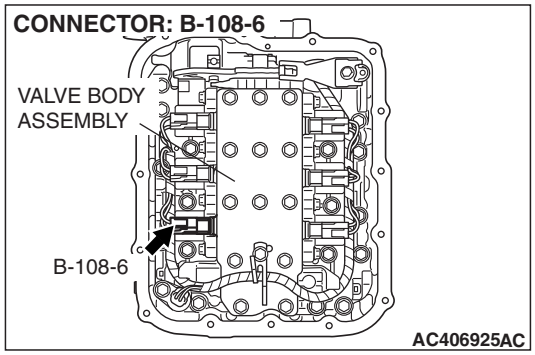
(2) Measure the resistance between solenoid valve assembly connector B-108 terminals 8 and 10.

Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

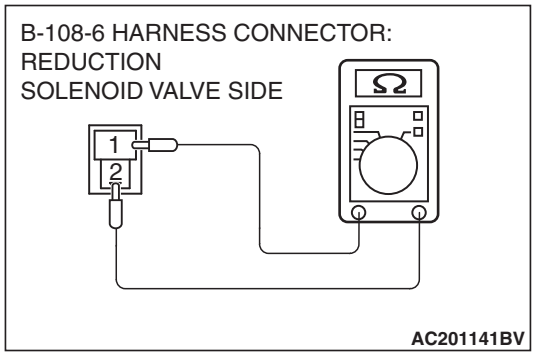
Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the reduction solenoid valve assembly inside the transaxle.



(1) Disconnect connector B-108-6 and measure at the solenoid valve side.



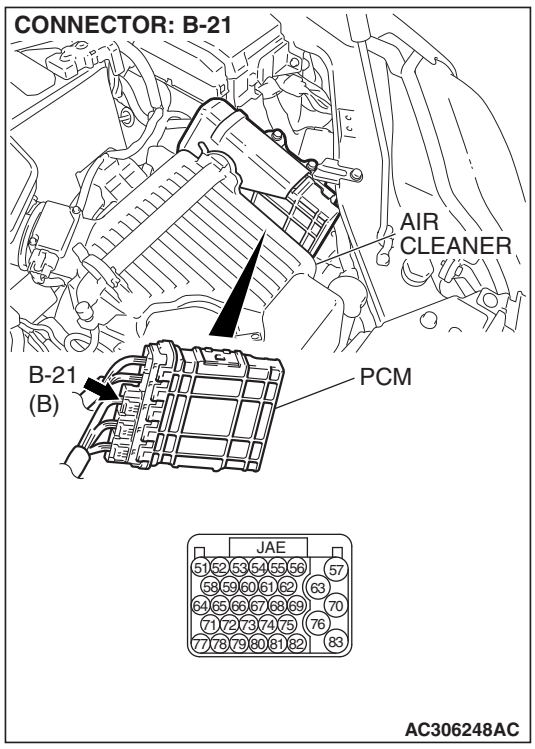
(2) Measure the resistance between Reduction solenoid valve terminals 1 and 2.

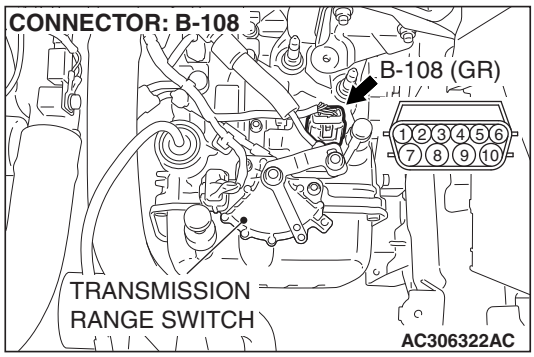
Resistance value: 2.7– 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7– 3.4 Ω [at 20°C (68°F)?

YES : Replace the harness wire between A/T control solenoid valve assembly connector B-108 and the solenoid valves.
NO : Replace the Reduction solenoid valve. Refer to GROUP 23C, P.23C-74 Valve Body.

TSB Revision



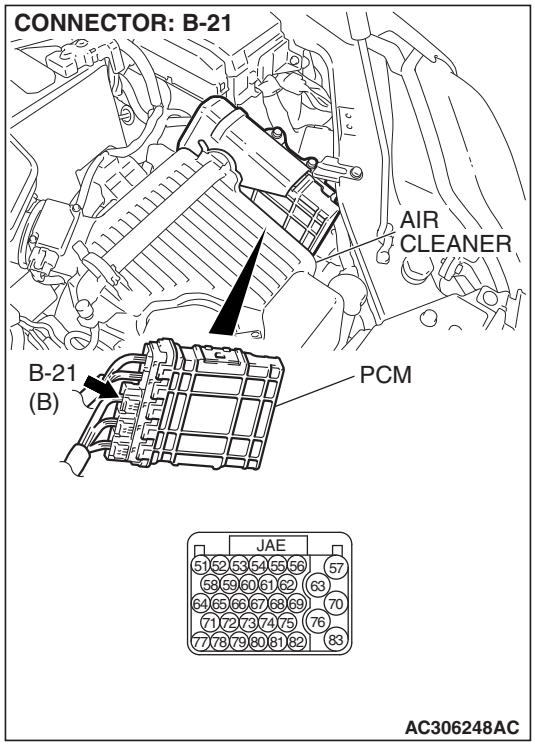


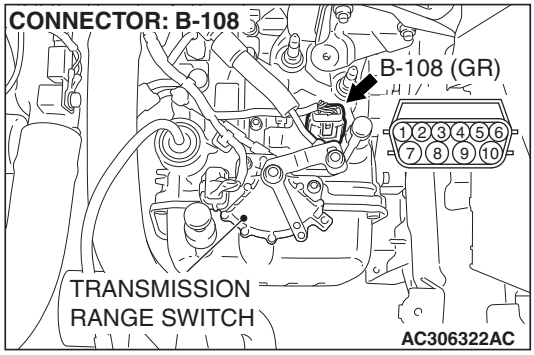
STEP 6. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



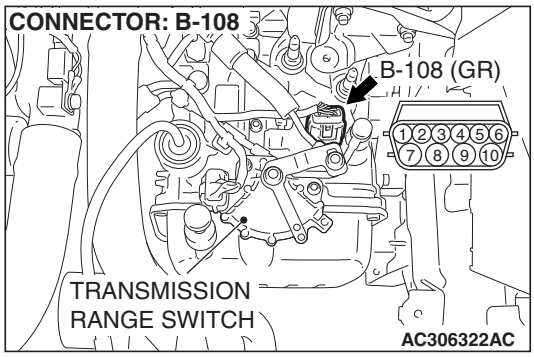


STEP 7. Check the harness for an open or short circuit to ground between PCM connector B-21 terminal 55 and A/T control solenoid valve assembly connector B-108 terminal 5.

Q: Is the harness wire in good condition?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

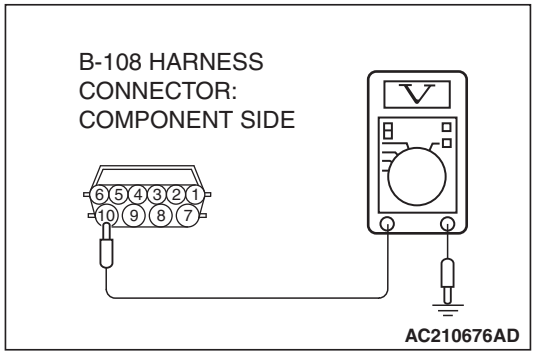
NO : Repair or replace the harness wire.



STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-108.

(1) Disconnect solenoid valve assembly harness connector B-108.

(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between harness connector B-108 terminal 10 and ground.

- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 11.

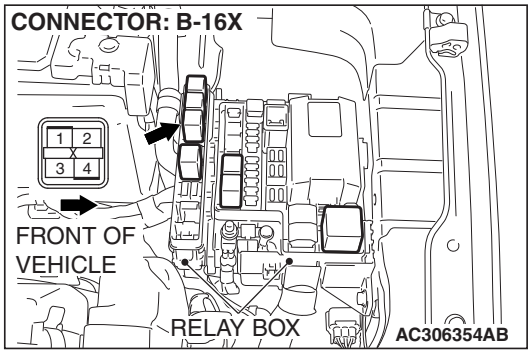
NO : Go to Step 9.

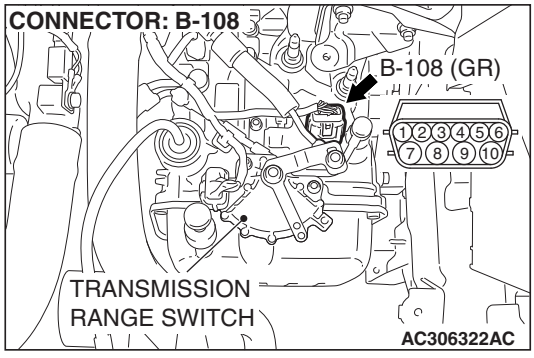
STEP 9. Check A/T control relay connector B-16X in the engine component relay box and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

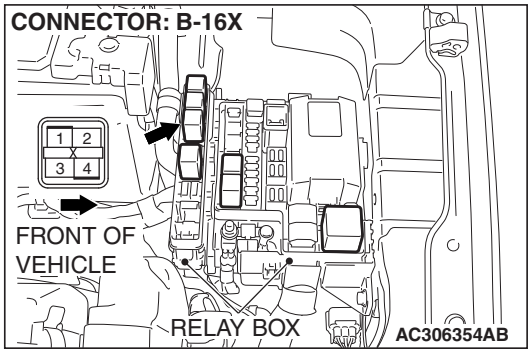
Q: Are the connectors and terminals in good condition?

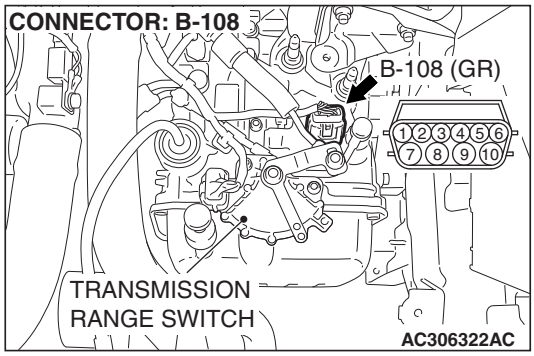
YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







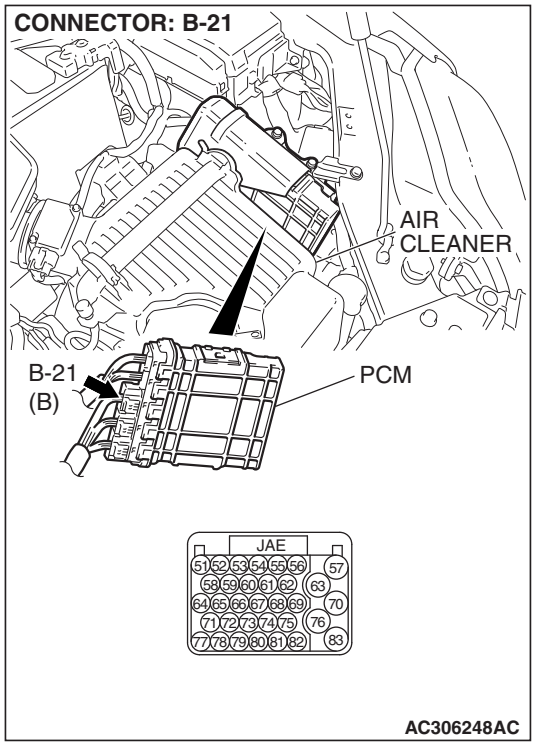


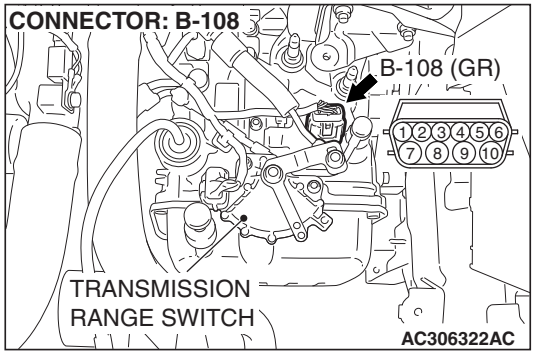
STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-16X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-108 terminal 10.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair or replace the harness wire.





STEP 11. Check PCM connector B-21 and A/T control solenoid valve assembly connector B-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

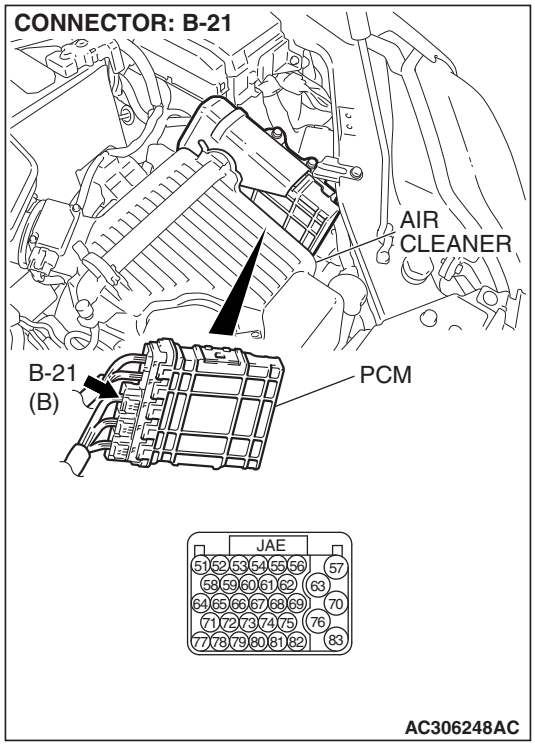
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

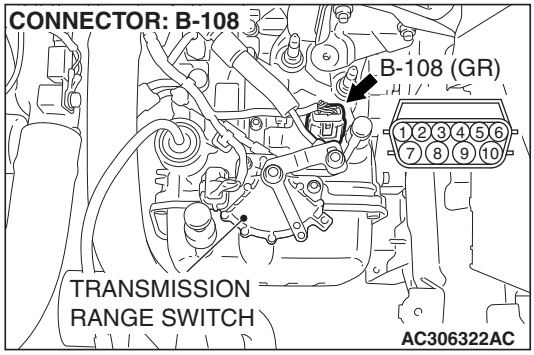
STEP 12. Check the harness for an open or short circuit to ground between PCM connector B-21 (terminals 54, 56 and 53) and A/T control solenoid valve assembly connector B-108 (terminals 7, 6 and 8).

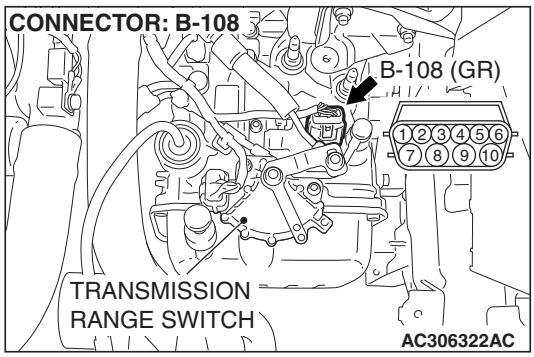
Q: Are the harness wires in good condition?

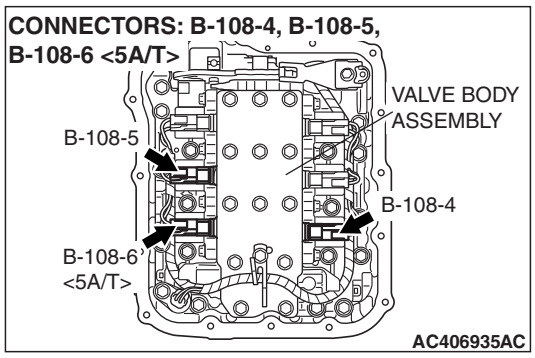
YES : Go to Step 13.

NO : Repair or replace the harness wire.









STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-108 (terminals 7, 6, 8, and 10) and solenoid valve connectors B-108-4, B-108-5 and B-108-6.

Q: Is the harness wire in good condition?

YES : Replace the PCM. When the PCM is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-10.

NO : Replace the harness wire.