GROUP 23A

AUTOMATIC TRANSAXLE

CONTENTS

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, 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 (*).

GENERAL DESCRIPTION

M1231000100173

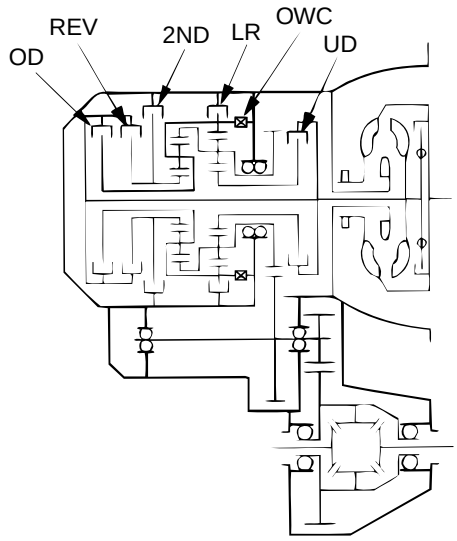
The A/T come in two models, namely, F4A42 and F4A51.

ITEMS		SPECIFICATIONS		
Transaxle model		F4A42-2-JZB7	F4A51-2-FZB2	F4A51-2-LZP
Engine model		4G64 (2.4L Engine)	6G72 (3.0L Engine) <Vehicles without variable induction system>	6G72 (3.0L Engine) <Vehicles with variable induction system>
Torque converter	Type	3-element, 1-stage, 2-phase		
	Torque converter clutch	Provided (3rd to 4th)		
	Stall torque ratio	1.85	2.04	2.04
Transaxle type		4-speed forward, 1-speed reverse fully automatic		
Gear ratio	1st	2.842	2.842	2.666
	2nd	1.529	1.495	1.448
	3rd	1.000	1.000	1.000
	4th	0.712	0.731	0.731
	Reverse	2.480	2.720	2.720
Final gear ratio (Differential gear ratio)		4.042	3.728	4.011
Number of underdrive clutch discs		4		
Number of overdrive clutch discs		4		
Number of reverse clutch discs		2		
Number of low-reverse brake discs		6		
Number of second brake discs		3	4	4
Manual control type		P-R-N-D-3-2-L (7 positions) or P-R-N-D (4 positions) + sport mode (up, down)	P-R-N-D (4 positions) + sport mode (up, down)	
Shift pattern control		Electronic control (INVECS-II)		
Oil pressure control during shifting		Electronic control (each oil pressure independently controlled)		
Torque converter clutch control		Electronic control		

TRANSAXLE

The transaxle is made up of the torque converter and gear train. A 3-element, 1-step, 2-phase torque converter with built-in torque converter clutch is used. The gear train is made up of three sets of multi-plate 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



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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.
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.
One-way clutch	OWC	restricts the rotation direction of the low-reverse annulus gear.

FUNCTION ELEMENT TABLE

<Vehicles without sport mode>

OPERATING ELEMENT / SELECTOR LEVER POSITION		ENGINE START	PARKING MECHANISM	UNDERDRIVE CLUTCH (UD)	REVERSE CLUTCH (REV)	OVER-DRIVE CLUTCH (OD)	LOW-REVERSE BRAKE (LR)	SECOND BRAKE (2ND)
P	Parking	OK	×	–	–	–	×	–
R	Reverse	–	–	–	×	–	×	–
N	Neutral	OK	–	–	–	–	×	–
D	1st	–	–	×	–	–	×*	–
D	2nd	–	–	×	–	–	–	×
D	3rd	–	–	×	–	×	–	–
D	4th	–	–	–	–	×	–	×

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OPERATING ELEMENT / SELECTOR LEVER POSITION		ENGINE START	PARKING MECHANISM	UNDERDRIVE CLUTCH (UD)	REVERSE CLUTCH (REV)	OVER-DRIVE CLUTCH (OD)	LOW-REVERSE BRAKE (LR)	SECOND BRAKE (2ND)
3	1st	–	–	×	–	–	×*	–
3	2nd	–	–	×	–	–	–	×
3	3rd	–	–	×	–	×	–	–
2	1st	–	–	×	–	–	×*	–
2	2nd	–	–	×	–	–	–	×
L	1st	–	–	×	–	–	×	–

×: Function element

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

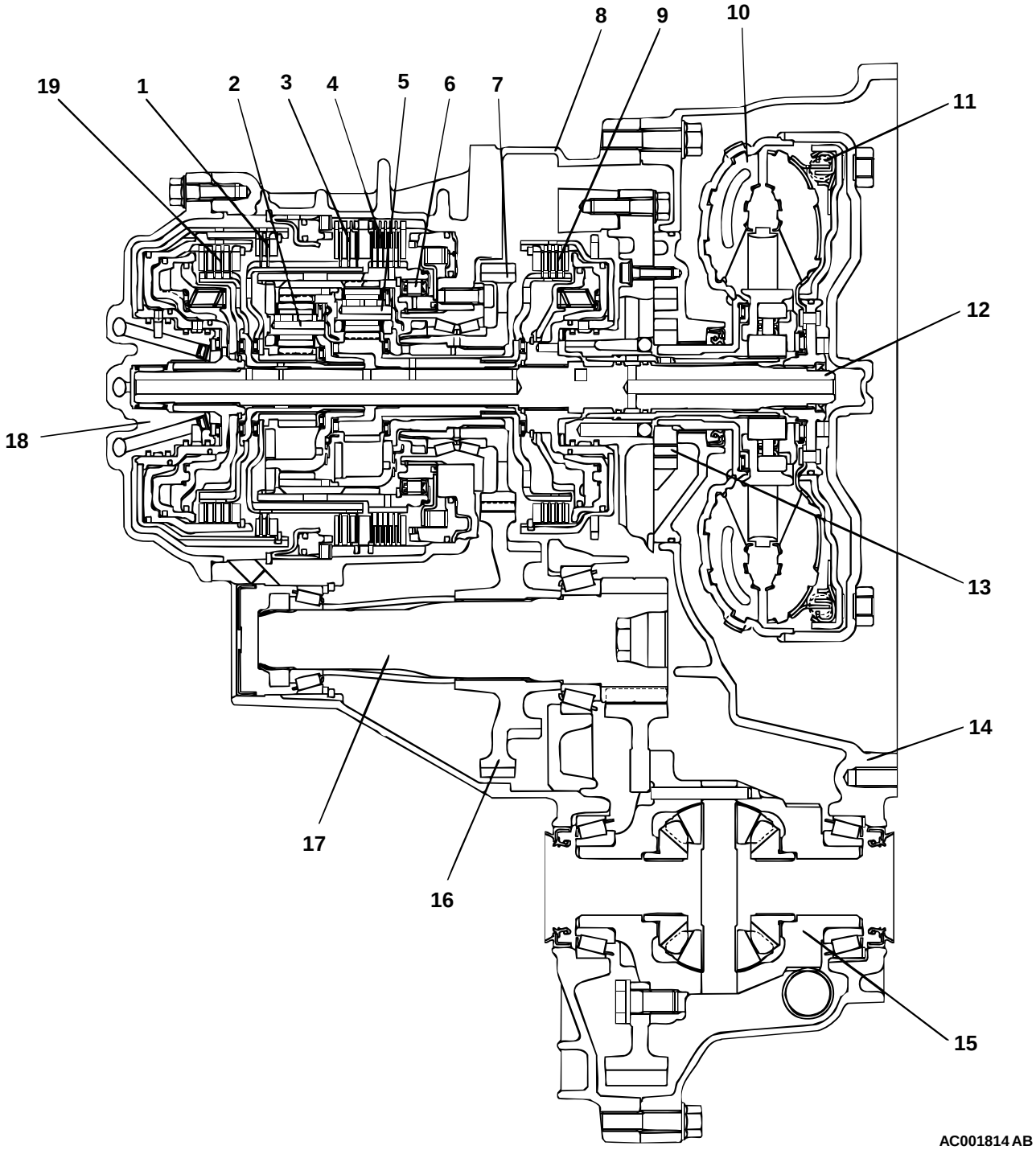
<Vehicles with sport mode>

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

×: Function element

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

SECTIONAL VIEW <F4A42>



1. REVERSE CLUTCH
2. OVERDRIVE PLANETARY CARRIER
3. SECOND BRAKE
4. LOW-REVERSE BRAKE
5. OUTPUT PLANETARY CARRIER
6. ONE-WAY CLUTCH
7. TRANSFER DRIVE GEAR
8. TRANSAXLE CASE
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. OUTPUT SHAFT
18. REAR COVER
19. OVERDRIVE CLUTCH

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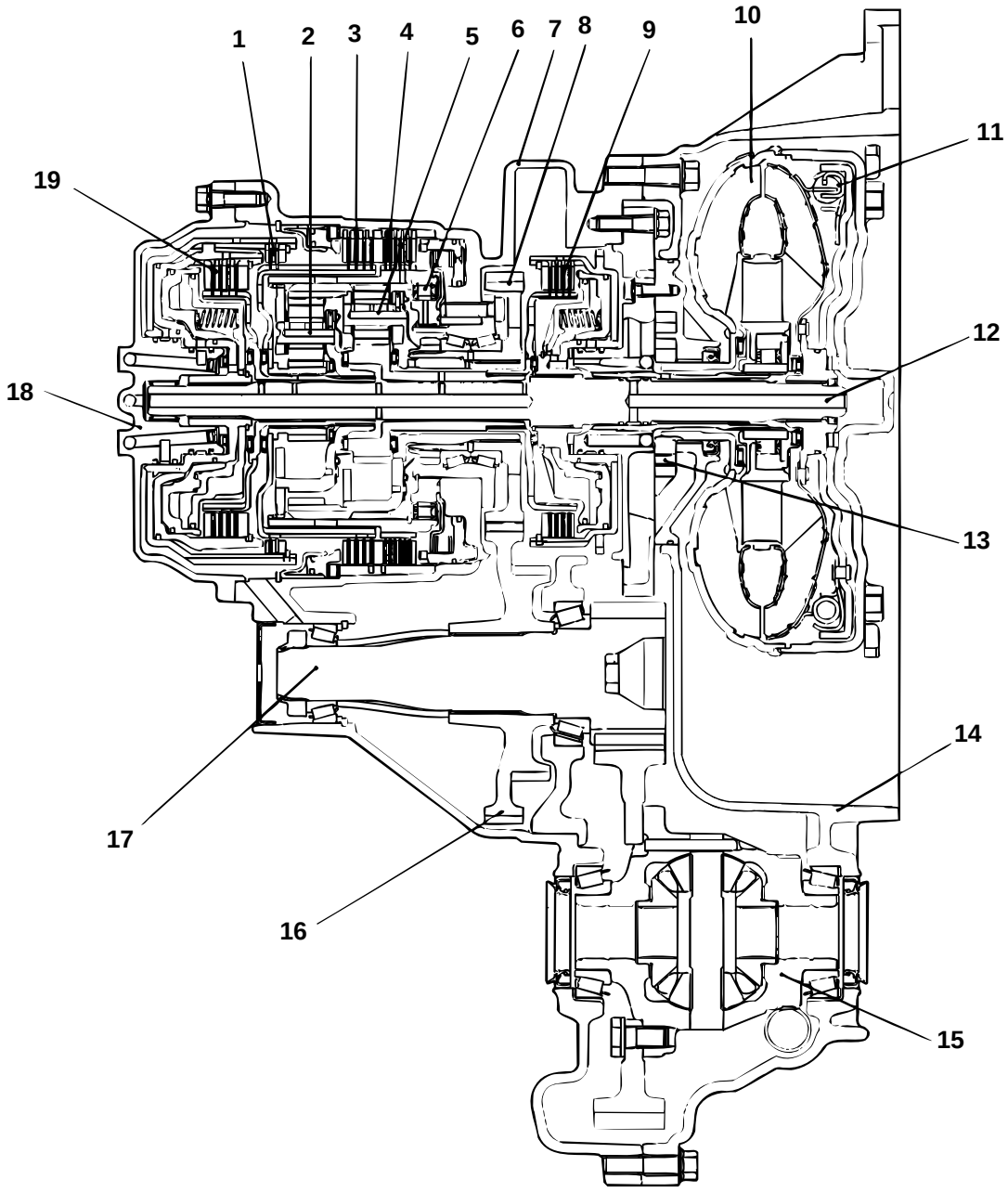
<F4A51>



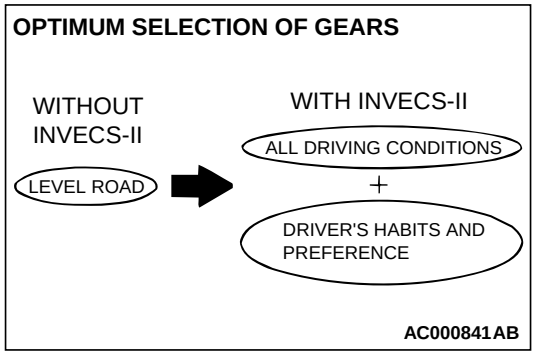
1. REVERSE CLUTCH
2. OVERDRIVE PLANETARY CARRIER
3. SECOND BRAKE
4. LOW-REVERSE BRAKE
5. OUTPUT PLANETARY CARRIER
6. ONE-WAY CLUTCH
7. TRANSFER DRIVE GEAR
8. TRANSAXLE CASE
9. UNDERDRIVE CLUTCH
10. TORQUE CONVERTER
11. TORQUE CONVERTER CLUTCH
12. INPUT SHAFT
13. OIL PUMP
14. TORQUE CONVERTER HOUSING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

TSB Revision

ELECTRONICALLY-CONTROLLED SYSTEM

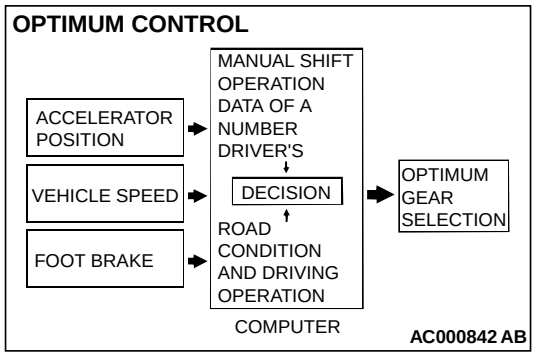
INVECS-II

- When in drive ("D" range), the new automatic transmission 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.

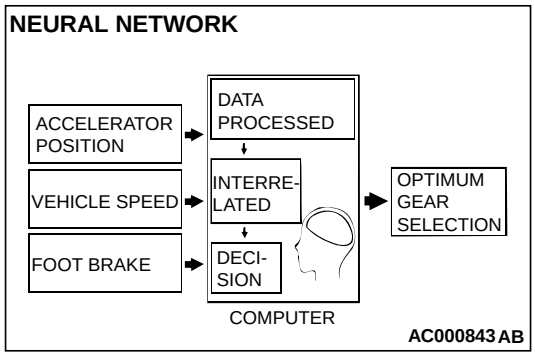


FEATURES

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.

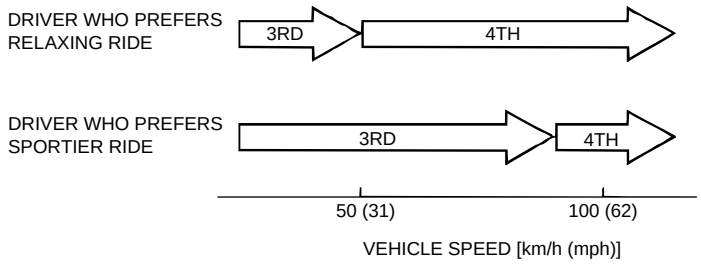


2. We introduce the latest in control technologies with an innovative new algorithm called the "neutral network" that works to imitate the decision-making processes of the human brain. The neural network links a wide variety of input data regarding road and operating conditions, and instantly makes accurate 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 upshifts 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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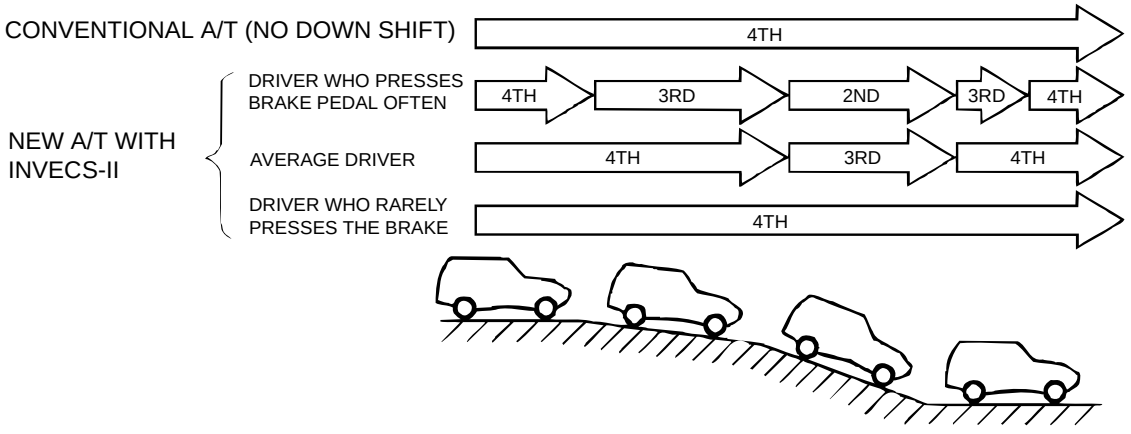
3. If the computer determines that the driver tends to apply the brakes often on a descending roadway, it adjusts timing to down shift sooner so that engine braking is more effectively applied. Conversely, if the computer determines that the driver does not brake much while driving downhill, it delays downshifting to minimize the effect of engine braking.

ADAPTIVE SHIFT CONTROL ON DOWNGRADES



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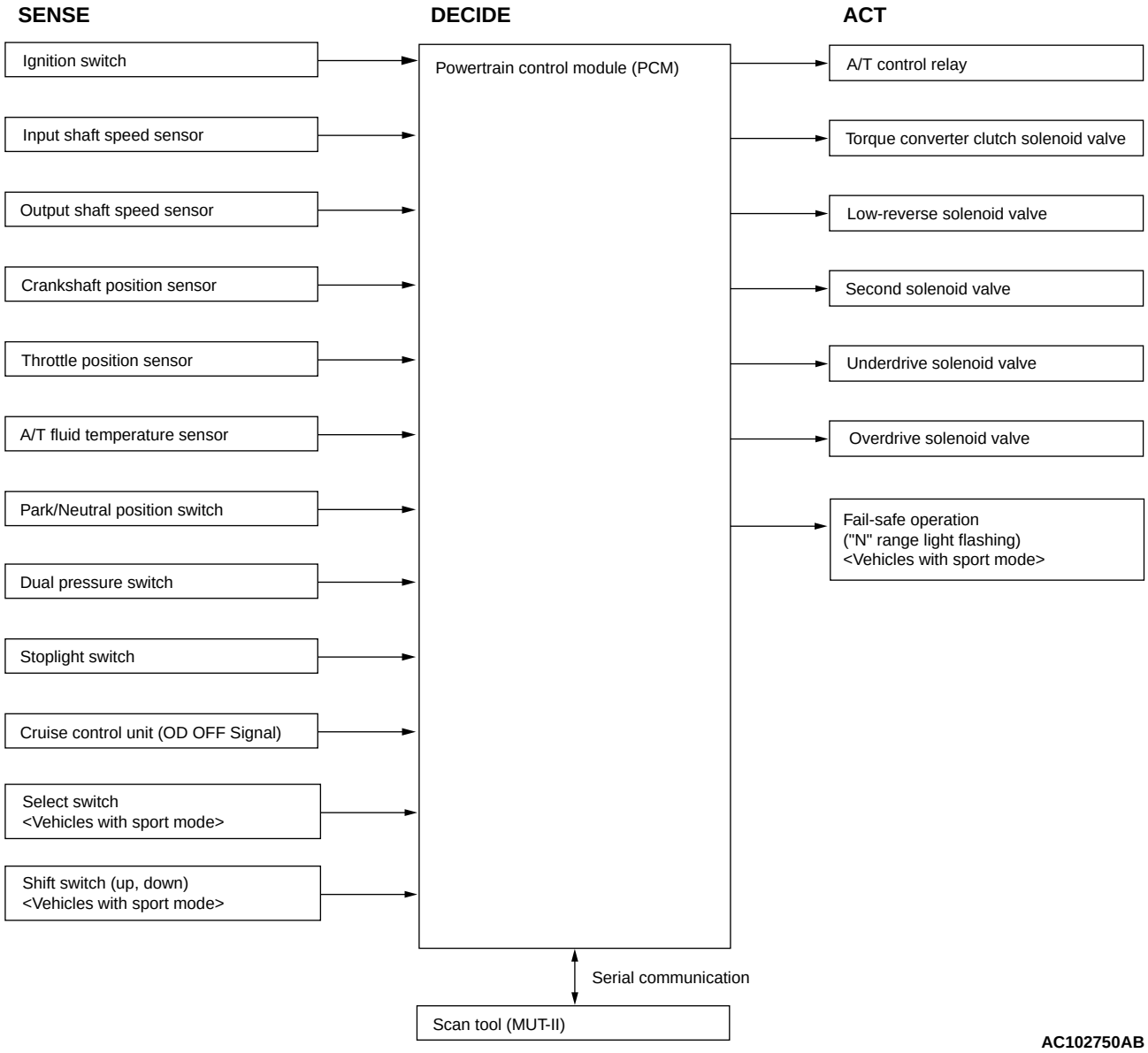
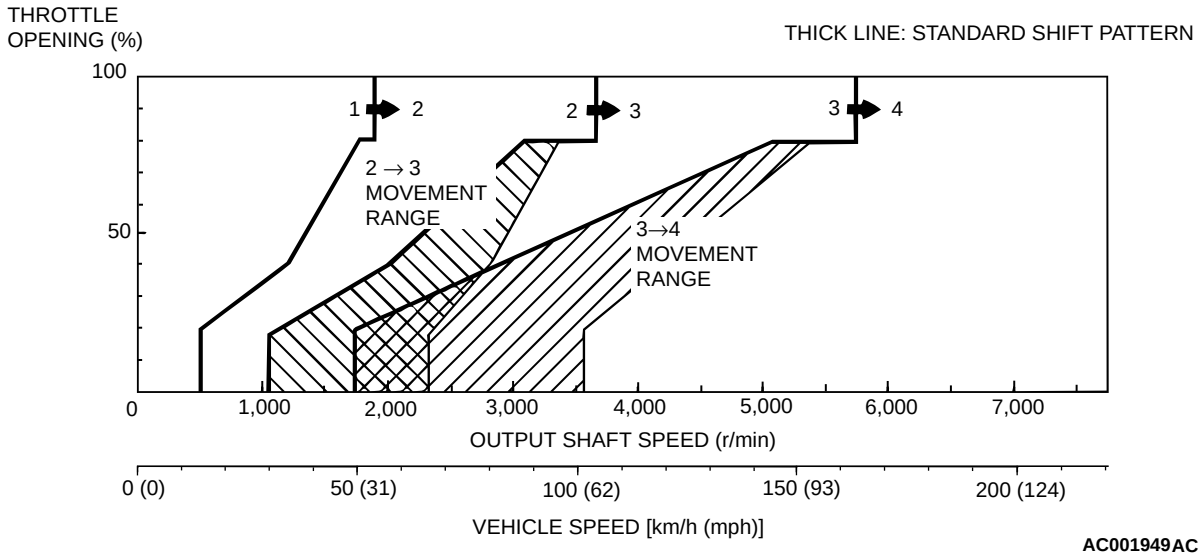
SYSTEM CONSTRUCTION DIAGRAM



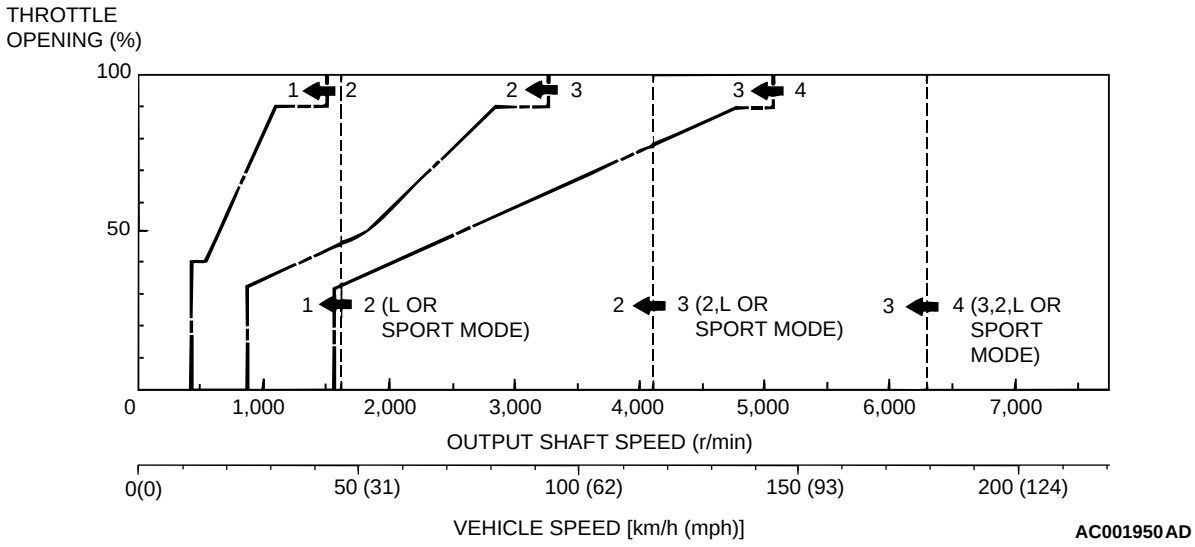
SHIFT PATTERN CONTROL

<2.4L ENGINE> UPSHIFT PATTERN

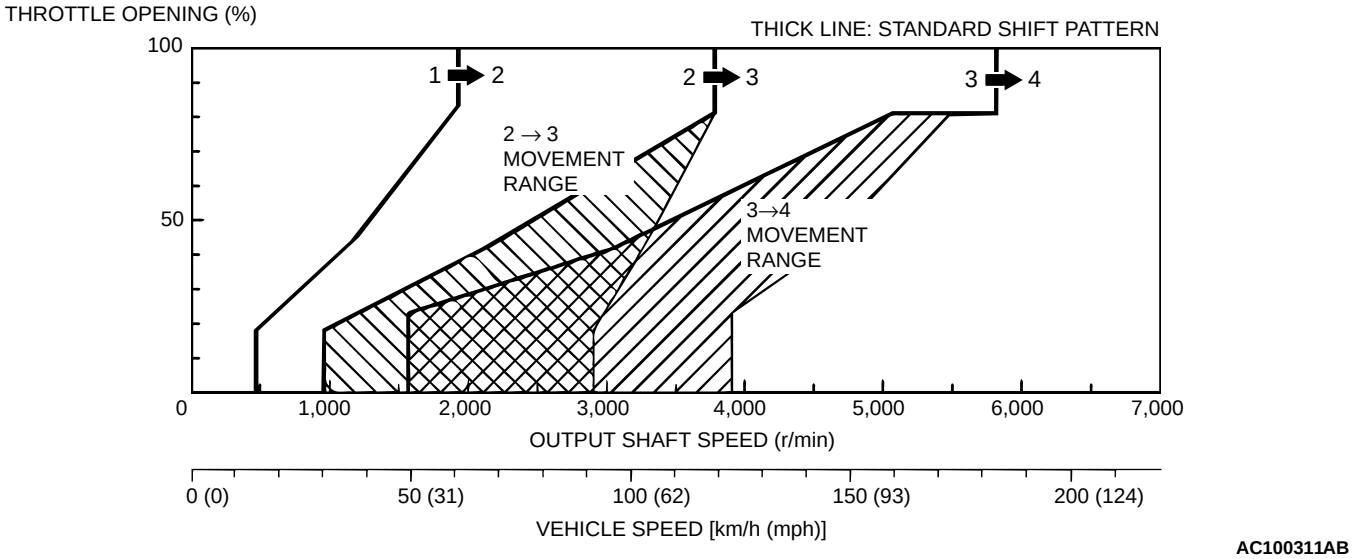


NOTE: Within 2 -to- 3 and 3 -to- 4 movement ranges, the PCM adjusts shift points according to the driving conditions by memorizing the accelerator pedal stroke and braking timing.

<2.4L ENGINE> DOWNSHIFT PATTERN



<3.0L ENGINE (VEHICLES WITHOUT VARIABLE INDUCTION SYSTEM) > UPSHIFT PATTERN



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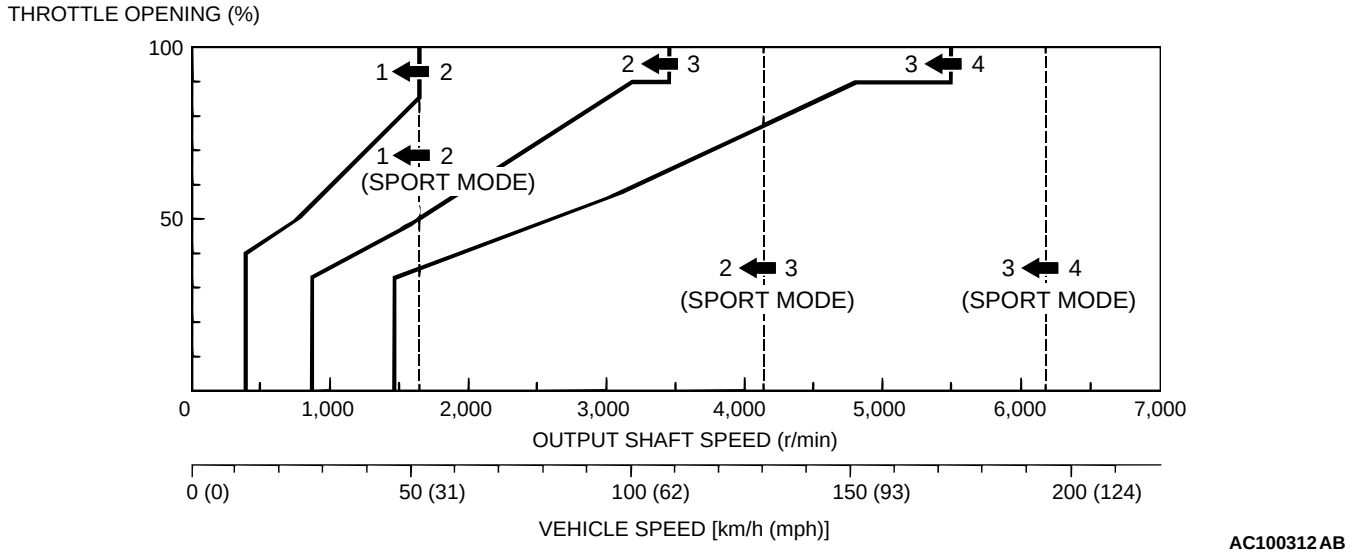
NOTE: Within 2 -to- 3 and 3 -to- 4 movement ranges, the PCM adjusts shift points according to the driving conditions by memorizing the accelerator pedal stroke and braking timing.

<3.0L ENGINE (VEHICLES WITHOUT VARIABLE INDUCTION SYSTEM) > DOWNSHIFT PATTERN



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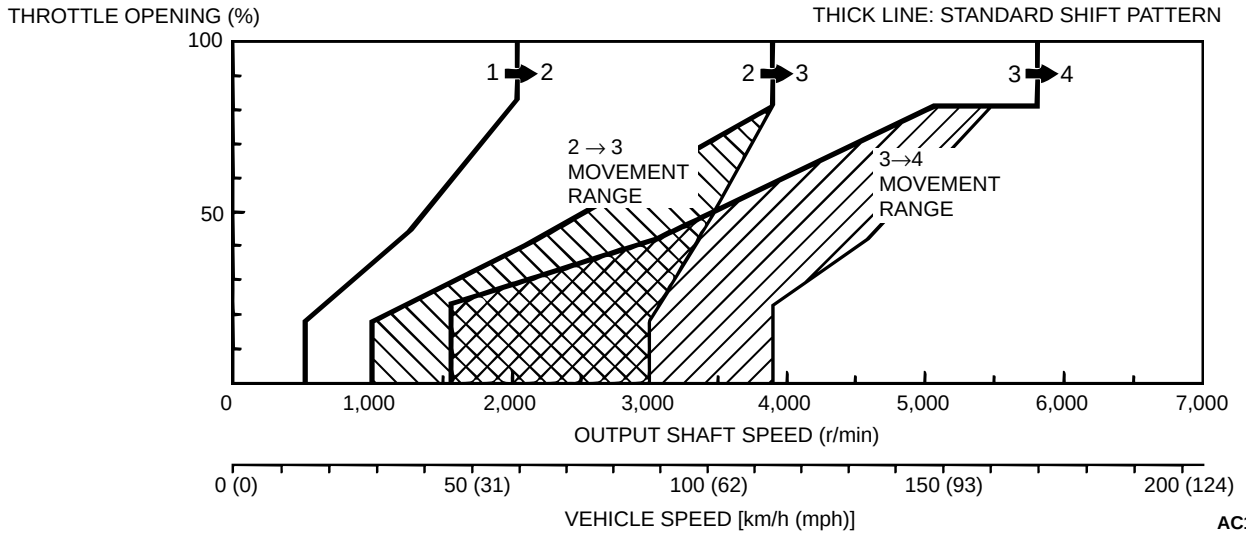
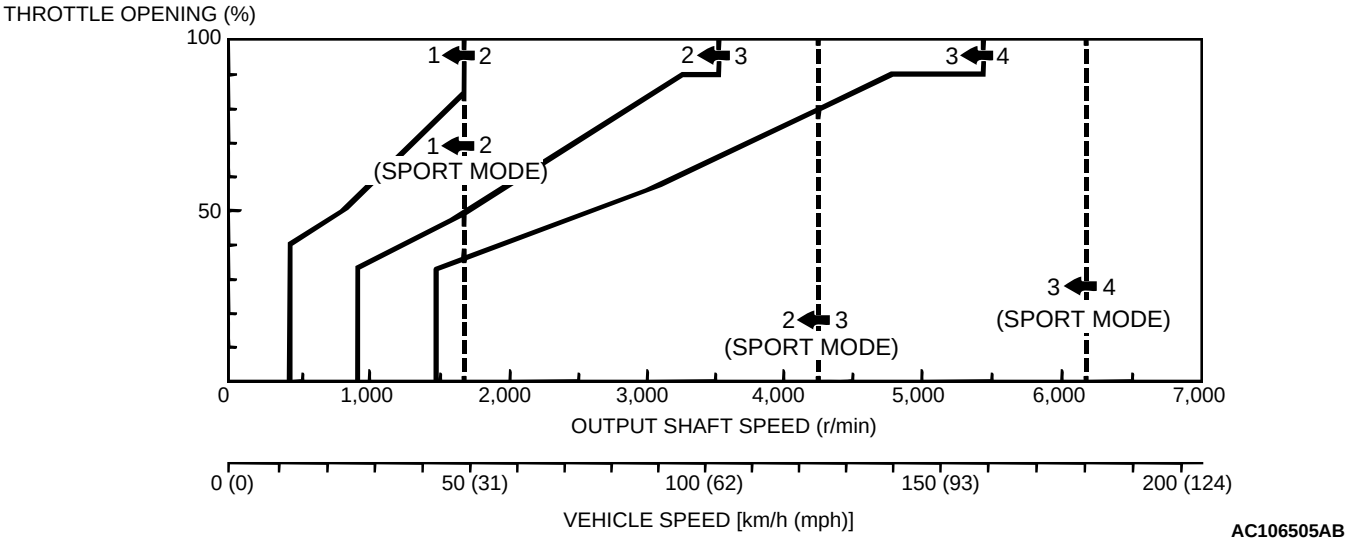
<3.0L ENGINE (VEHICLES WITH VARIABLE INDUCTION SYSTEM) > UPSHIFT PATTERN



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.

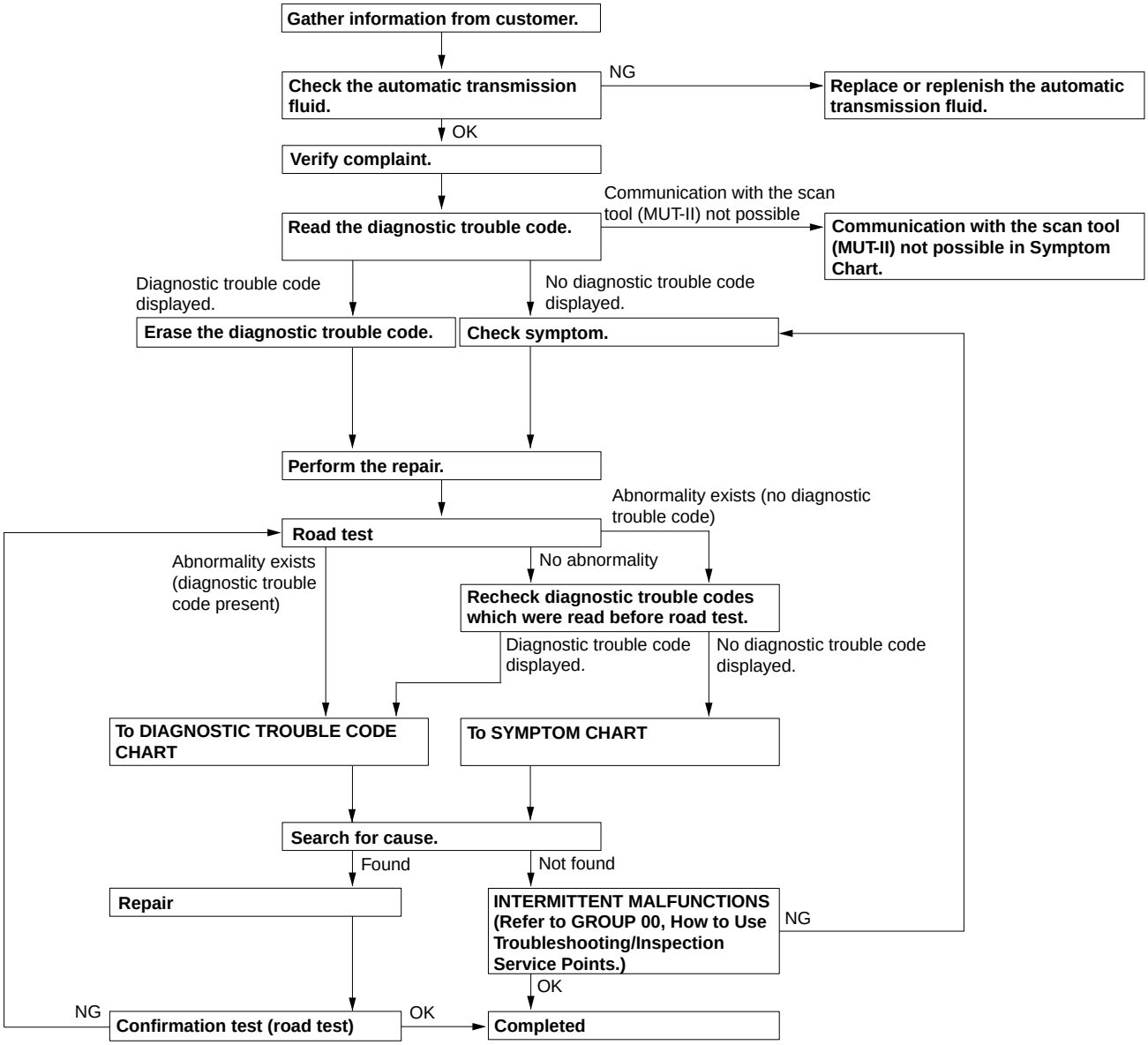
<3.0L ENGINE (VEHICLES WITH VARIABLE INDUCTION SYSTEM) > DOWNSHIFT PATTERN



AUTOMATIC TRANSAXLE DIAGNOSIS

DIAGNOSTIC TROUBLESHOOTING FLOW

M1231013500148



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INTRODUCTION TO A/T DIAGNOSIS

M1231012300130

The automatic transaxle can exhibit any of the following symptoms: noise or vibration is generated, A/T fluid leaks, the vehicle does not move forward or backward. The cases of these symptoms could come from: Incorrect mounting, the A/T 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: malfunctions of the PCM, the sensors, the switches, the harness or connectors.

A/T DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1231007600168

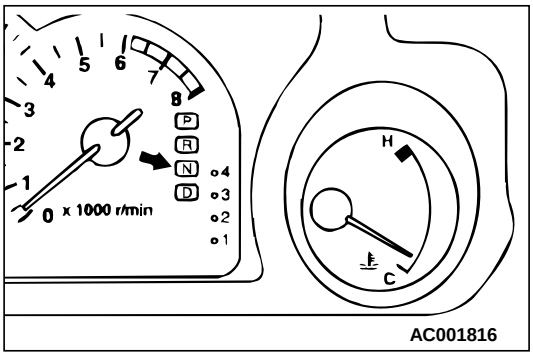
Use these steps to plan your diagnostic strategy. If you follow them carefully, you will find most A/T faults.

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 Code (DTC).
4. If you cannot verify the condition and there are no DTC, 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.00-6.
5. If you can verify the condition but there are no DTC, or the system cannot communicate with the scan tool, refer to Symptom Chart P.23A-41.
6. If there is a DTC, record the number of the code, then erase the code from memory using the scan tool.
7. Reconfirm the symptom using the Road Test.
8. If DTC is set again, go to Inspection Chart for Diagnostic Trouble Codes.
9. If 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.00-6.
10. After repairs are completed, conduct a Road Test duplicating the complaint set conditions to confirm the malfunction has been eliminated.

A/T DIAGNOSTIC TROUBLE CODE DIAGNOSIS

M1231007700154

CHECK "N" RANGE LIGHT <VEHICLES WITH SPORT MODE>



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 twice per second, it means that the A/T fluid temperature is too high. Stop the vehicle in a safe place and wait until the "N" range light switches off.

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 24 <Vehicles without sport mode> or 25 <Vehicles with sport mode> diagnostic items. The diagnostic results can be read with a 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. Diagnostic trouble codes will, however, be erased when a battery terminal or the PCM connector is disconnected. In addition, the diagnostic trouble code can also be erased by the scan tool MUT-II (MB991502).

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

The 24 <Vehicles without sport mode> or 25 <Vehicles with sport mode> diagnostic items are displayed in numeric order.

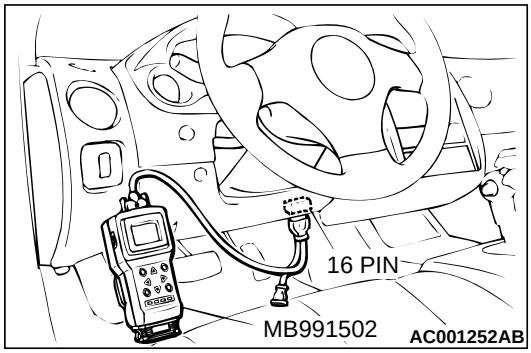
HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:
MB991502: Scan Tool (MUT-II)

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

NOTE: If the battery positive voltage is low, diagnostic trouble codes will not be output. Check the battery if the scan tool cannot display.

NOTE: If the battery is disconnected or if the powertrain control module connector is disconnected, the diagnostic trouble codes will be erased. Do not disconnect the battery or powertrain control module before the diagnostic trouble codes have been read.

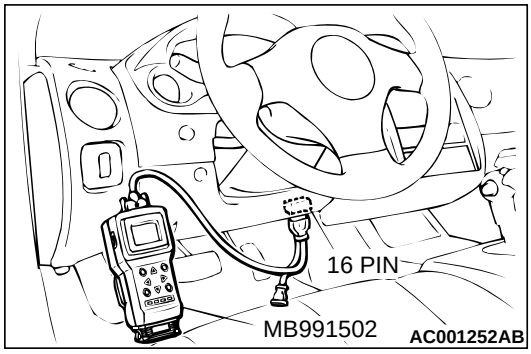


1. Connect the scan tool to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Record the diagnostic trouble codes for A/T.
4. Refer to the Diagnostic Trouble Code Chart.
5. Turn the ignition switch to the "LOCK" (OFF) and then back to "ON" again.
6. Erase the diagnostic trouble code by selecting DTC erase from SPECIAL MENU screen, using scan tool.
7. Check for diagnostic trouble codes. Confirm the scan tool displays "normal."
8. Turn the ignition switch to the "LOCK" (OFF) position.
9. Disconnect the scan tool.

INSPECTION USING SCAN TOOL, ROAD TEST AND DATA LIST

Required Special Tool:
MB991502: Scan Tool (MUT-II)

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool.



1. Connect the scan tool to data link connector.
2. Turn the ignition switch to the "ON" position.
3. Carry out inspection by means of the Road Test and Data List function. If there is an abnormality, check and repair the chassis harnesses and components. Refer to P.23A-19, Road Test. Refer to P.23A-323, Data List Reference Table.
4. Re-check using scan tool and confirm that the abnormal input and output have returned to normal because of the repairs.
5. Check for and inspect any diagnostic trouble code(s) that may have surfaced from testing. Erase the diagnostic trouble code(s) when finished checking.
6. Turn the ignition switch to the "LOCK" (OFF) position.
7. Disconnect the scan tool from the data link connector.
8. Start the engine again and do a test drive to confirm that the problem is eliminated.

FAIL-SAFE/BACKUP FUNCTION

M1231008300137

When malfunctions of the main sensors or actuators are 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 CONTENTS DURING MALFUNCTION
Input shaft speed sensor		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 more.	The diagnostic trouble code is recorded when the judgement condition occurs once. When the judgement condition is met four times, the transaxle holds 3rd gear or 2nd gear depending on speed and for vehicles with sport mode "N" range light flashes as a fail-safe.
Output shaft speed sensor		The output signal from the output shaft speed sensor has been lost for one second or more while the vehicle is being driven.	The diagnostic trouble code is recorded when the judgement condition occurs once. When the judgement condition is met four times, the transaxle holds 3rd gear or 2nd gear depending on speed and for vehicles with sport mode "N" range light flashes as a fail-safe.
Low-reverse solenoid valve		Solenoid valve resistance is below 2.7 W for 0.32 seconds.	When the judgement condition is met four times, the A/T control relay is turned off and for vehicles with sport mode "N" range light flashes. The transaxle will only operate in 3rd and reverse gears until the system is repaired.
Underdrive solenoid valve			
Second solenoid valve			
Overdrive solenoid valve			
Torque converter clutch solenoid valve			
Incomplete shifting	1st	Gear ratio value which is sent from the output shaft speed sensor is not identical to the output from the input shaft speed sensor for one second after shifting finished.	The diagnostic trouble code is displayed and the judgement condition occurs once. When the judgement condition is met four times, the A/T control relay is turned off and for vehicles with sport mode "N" range light flashes. The transaxle will only operate in 3rd and reverse gears until the system is repaired.
	2nd		
	3rd		
	4th		
	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."	Switch the A/T control relay off and for vehicles with sport mode "N" range light flashes. The transaxle will only operate in 3rd and reverse gears until the system is repaired.
Abnormality in the PCM		Abnormality has occurred in the PCM.	Switch the A/T control relay off. The transaxle will only operate in 3rd and reverse gears until the system is repaired.

ROAD TEST

M1231007800162

Check by 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. 54 (1) Control Relay Voltage [V]	A/T Control relay output voltage	54	A/T Control relay system (P.23A-233.)
2	Ignition switch: ON Engine: Stopped Selector lever position: P	Selector lever position <Vehicles without sport mode> (1) P, (2) R, (3) N, (4) D, (5) 3, (6) 2, (7) L	Data list No. 61 (1) P, (2) R, (3) N, (4) D, (5) 3, (6) 2, (7) L	Park/ Neutral position switch	27, 28	Park/Neutral position switch system (P.23A-136, P.23A-166.)
		Selector lever position <Vehicles with sport mode> (1) P, (2) R, (3) N, (4) D	Data list No. 61 (1) P, (2) R, (3) N, (4) D			
		Selector lever position <Vehicles with sport mode> (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. 67 (1) OFF, (2) ON, (3) ON, (4) ON Data list No. 68 (1) OFF, (2) OFF, (3) ON, (4) OFF Data list No. 69 (1) OFF, (2) OFF, (3) OFF, (4) ON	Select switch Shift switch	-	Shift switch assembly system (P.23A-302.)
			Shift indicator light (1) "D" or "1" illuminates (2) Only "1" illuminates (3) Only "2" illuminates (4) Only "1" illuminates			
		Accelerator pedal (1) Fully closed (2) Depressed (3) Fully open	Data list No. 11 (1) 535 – 735 mV (2) Gradually rises from (1) (3) 4,500 – 5,500 mV	TPS	11, 12, 14	TPS system (P.23A-42, P.23A-51, P.23A-59.)
		Brake pedal (1) Depressed (2) Released	Data list No. 26 (1) ON (2) OFF	Stoplight switch	26	Stoplight switch system (P.23A-129.)

TSB Revision

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
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-249.)
4	Warming up	Drive for 15 minutes or more so that the A/T fluid temperature becomes 70 – 80°C (158 – 176°F)	Data list No. 15 Gradually rises to 70 – 80°C (158 – 176°F)	A/T fluid temperature sensor	15, 16	A/T fluid temperature sensor system (P.23A-70, P.23A-77.)

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
5	Engine: Idling Selector lever position: N	Brake pedal (Retest) (1) Depressed (2) Released	Data list No. 26 (1) ON (2) OFF	Stoplight switch	26	Stoplight switch system (P.23A-129.)
		A/C switch (1) ON (2) OFF	Data list No. 65 (1) ON (2) OFF	Dual pressure switch	-	Vehicle shifts differently with A/C engaged (P.23A-279.)
		Accelerator pedal (1) Fully closed (2) Depressed	Data list No. 21 (1) Engine tachometer and the MUT-II shows the same engine speed (2) Gradually rises from (1)	Crankshaft position sensor	21	Crankshaft position sensor system (P.23A-83.)
		Selector lever position (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-256.)
					-	Shift shock when shifting from N to D and long delay (P.23A-258.)
					-	Shift shock when shifting from N to R and long delay (P.23A-260.)
					-	Shift shock when shifting from N to D, N to R and long delay (P.23A-263.)
				Does not move	-	Does not move forward (P.23A-251.)
					-	Does not move backward (P.23A-253.)
					-	Does not move (forward or backward) (P.23A-255.)

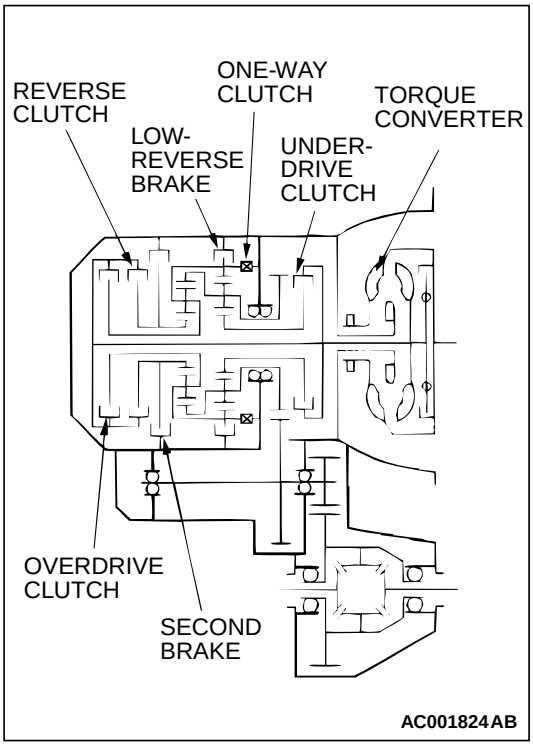
TSB Revision

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
6	Selector lever position: N <Vehicles without sport mode>, Sport mode <Vehicles with sport mode> (on a flat and straight road)	Selector lever position 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 50 km/h (31 mph) in 4th gear	Data list No. 63 (2) 1st, (3) 2nd, (4) 3rd, (5) 4th	Shift position	-	-
			Data list No. 31 (2) 0 %, (3) 100 %, (4) 100 %, (5) 100 %	Low-reverse solenoid valve duty %	31	Low-reverse solenoid valve system (P.23A-180.)
			Data list No. 32 (2) 0 %, (3) 0 %, (4) 0 %, (5) 100 %	Underdrive solenoid valve duty %	32	Underdrive solenoid valve system (P.23A-188.)
			Data list No. 33 (2)100 %, (3) 0 %, (4) 100 %, (5) 0 %	Second solenoid valve duty %	33	Second solenoid valve system (P.23A-195.)
			Data list No. 34 (2) 100 %, (3) 100 %, (4) 0 %, (5) 0 %	Overdrive solenoid valve duty %	34	Overdrive solenoid valve system (P.23A-202.)
			Data list No. 29 (1) 0 km/h (0 mph) (4) 50 km/h (31 mph)	Vehicle speed signal	-	Vehicle speed signal system (P.23A-295.)
			Data list No. 22 (4) 1,600 – 1,900 r/min <2.4L Engine> 1,300 – 1,600 r/min <3.0L Engine>	Input shaft speed sensor	22	Input shaft speed sensor system (P.23A-101.)
			Data list No. 23 (4) 1,600 – 1,900 r/min <2.4L Engine> 1,300 – 1,600 r/min <3.0L Engine>	Output shaft speed sensor	23	Output shaft speed sensor system (P.23A-115.)
7	Selector lever position: 3 <Vehicles without sport mode>, sport mode <Vehicles without sport mode> (on a flat and straight road)	Selector lever position and vehicle speed (1) Driving at speed of 50 km/h (31 mph) in 3rd 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. 36 (2) 70 – 90 % (3) 70 – 90 % → 0 %	Torque converter clutch solenoid valve duty %	36, 52, 53	Torque converter clutch solenoid system (P.23A-209, P.23A-226, P.23A-231.)

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
			Data list No. 52 (2) –10 to 10 r/min (3) The value changes from (2)	Torque converter clutch amount of slippage		
8	Use the scan tool (MUT-II) to stop the INVECS-II function Selector lever position: D (on a flat and straight road) Use the scan tool (MUT-II) to stop the INVECS-II function Selector lever position: D (on a flat and straight road)	(1) Accelerate to 4th gear at a throttle position sensor output of 1.5V (accelerator opening angle of 30 %) (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.11, 23 The shifting points correspond with the scan tool display and the APS voltage (opening angle) and output shaft speed, which are shown in the standard shift pattern	Malfunction when shifting	-	Shift shock and slipping (P.23A-265.)
				Does not shift according to instructions	-	Early or late shifting in all gears (P.23A-267.)
					-	Early or late shifting in some gears (P.23A-270.)
				Does not shift	-	No diagnostic trouble code (P.23A-272.)
					22	Input shaft speed sensor system (P.23A-101.)
					23	Output shaft speed sensor system (P.23A-115.)

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
8	Use the scan tool (MUT-II) to stop the INVECS-II function Selector lever position: D (on a flat and straight road) Use the scan tool (MUT-II) to stop the INVECS-II function Selector lever position: D (on a flat and straight road)	(1) While driving at 60 km/h (37 mph) in 4th gear, downshift to 3rd gear (2) While driving at 40 km/h (25 mph) in 3rd gear, downshift to 2nd gear (3) While driving at 20 km/h (12 mph) in 2nd gear, downshift to 1st gear	Data list No.63 (1) 4th→3rd (2) 3rd→2nd (3) 2nd→1st	Does not shift from 2 to 1	31	Low-reverse solenoid valve system (P.23A-180.)
					33	Second solenoid valve system (P.23A-195.)
					41	1st gear incorrect ratio (P.23A-217.)
					42	2nd gear incorrect ratio (P.23A-217.)
				Does not shift from 3 to 2	33	Second solenoid valve system (P.23A-195.)
					34	Overdrive solenoid valve system (P.23A-202.)
					42	2nd gear incorrect ratio (P.23A-217.)
					43	3rd gear incorrect ratio (P.23A-217.)
				Does not shift from 4 to 3	32	Underdrive solenoid valve system (P.23A-188.)
					33	Second solenoid valve system (P.23A-195.)
					43	3rd gear incorrect ratio (P.23A-217.)
					44	4th gear incorrect ratio (P.23A-217.)

STEP	CONDITION BEFORE TEST/OPERATION	TEST/OPERATION	STANDARD	INSPECTION ITEM	DTC	INSPECTION PROCEDURE PAGE
9	Selector lever position: N (on a flat and straight road)	Monitor data list No. 22 and No. 23 with the scan tool (MUT-II) (1) Move selector lever to R range, drive at constant speed of 10 km/h (6.2 mph)	The ratio between data list No. 22 and No. 23 should be the same as the gear ratio when reversing.	Does not match	22	Input shaft speed sensor system (P.23A-101.)
					23	Output shaft speed sensor system (P.23A-115.)
					46	Reverse gear incorrect ratio (P.23A-217.)



TORQUE CONVERTER STALL TEST

M1231005400157

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

⚠ *WARNING*

Do not let anybody stand in front of or behind the vehicle while this test is being carried out.

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

NOTE: It measures A/T fluid temperature in scan tool (MUT-II).

2. Check both rear wheels.
3. Connect a tachometer.
4. Apply the parking and service brakes fully.
5. Start the engine.
6. Move the selector lever to the "D" position. Fully depress the accelerator pedal and read the maximum engine speed.

⚠ CAUTION

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

Standard value: Stall speed: 2,100 – 2,600 r/min

7. Move the selector lever to the "R" position and repeat step 6.

Standard value: Stall speed: 2,100 – 2,600 r/min

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TORQUE CONVERTER STALL TEST JUDGEMENT RESULTS

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

HYDRAULIC PRESSURE TESTS

M1231005500165

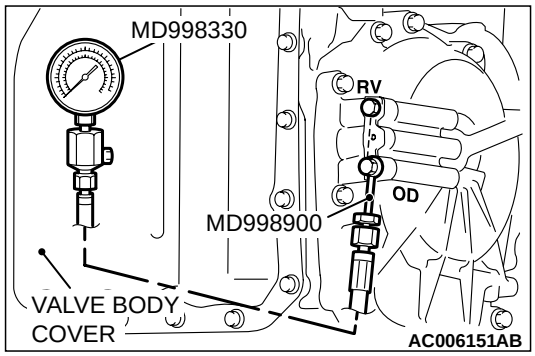
Check the A/T fluid level and temperature. Check engine coolant temperature.

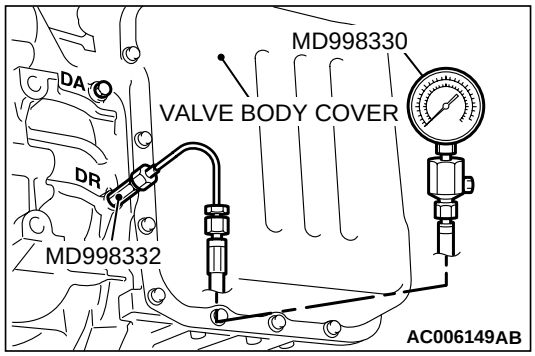
- A/T fluid level: "HOT" mark on the dipstick
- A/T fluid temperature: 70 – 80°C (158 – 176°F)
- Engine coolant temperature: 80 – 100°C (176 – 212°F)

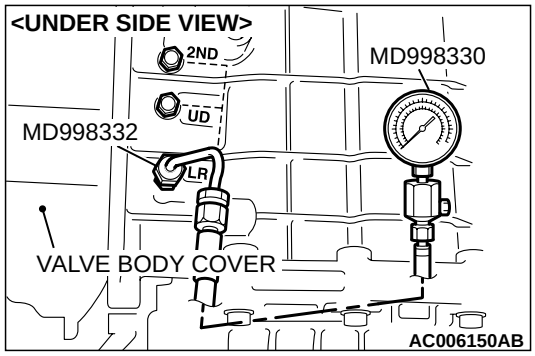
⚠ CAUTION

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

1. Raise the vehicle so that the wheels are free to turn.







2. Connect the special tools (3.0 MPa (427 psi) oil pressure gauge [MD998330] and adapters [MD998332, MD998900]) 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 ("DA" pressure is approximately the same as the "DR" pressure, so measurements are not needed)*
   - *RV: Reverse clutch pressure port*
   - *OD: Overdrive clutch pressure port*
3. Restart the engine.
4. Check that there are no leaks around the special tool port adapters.
5. 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.
6. If not within the standard value, stop the engine and refer to the Hydraulic pressure test diagnosis table.
7. Recover the O-ring from the port plug and replace it.
8. Remove the special tool, and install the plugs to the hydraulic pressure ports.
9. On completion, start the engine and check that there are no leaks around the plugs.

STANDARD HYDRAULIC PRESSURE TEST

MEASUREMENT CONDITION			STANDARD HYDRAULIC PRESSURE MPa (psi)					
SELECTOR LEVER POSITION	SHIFT POSITION	ENGINE SPEED (r/min)	UNDERDRIVE 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 (45 – 57)	–	0.25 – 0.39 (37 – 57)
R	Reverse	2,500	–	1.27 – 1.77 (185 – 256)	–	1.27 – 1.77 (185 – 256)	–	0.50 – 0.70 (73 – 101)
N	–	2,500	–	–	–	0.31 – 0.39 (45 – 57)	–	0.25 – 0.39 (37 – 57)

MEASUREMENT CONDITION			STANDARD HYDRAULIC PRESSURE MPa (psi)					
SELECTOR LEVER POSITION	SHIFT POSITION	ENGINE SPEED (r/min)	UNDERDRIVE CLUTCH PRESSURE [UD]	REVERSE CLUTCH PRESSURE [RV]	OVERDRIVE CLUTCH PRESSURE [OD]	LOW-REVERSE BRAKE PRESSURE [LR]	SECOND BRAKE PRESSURE [2ND]	TORQUE CONVERTER PRESSURE [DR]
L <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	1st gear	2,500	1.01 – 1.05 (147 – 152)	–	–	1.01 – 1.05 (147 – 152)	–	0.50 – 0.70 (73 – 101)
2 <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	2nd gear	2,500	1.01 – 1.05 (147 – 152)	–	–	–	1.01 – 1.05 (147 – 152)	0.50 – 0.70 (73 – 101)
3 <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	3rd gear	2,500	0.59 – 0.69 (86 – 100)	–	0.59 – 0.69 (86 – 100)	–	–	–
D <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	4th gear	2,500	–	–	0.59 – 0.69 (86 – 100)	–	0.59 – 0.69 (86 – 100)	–

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

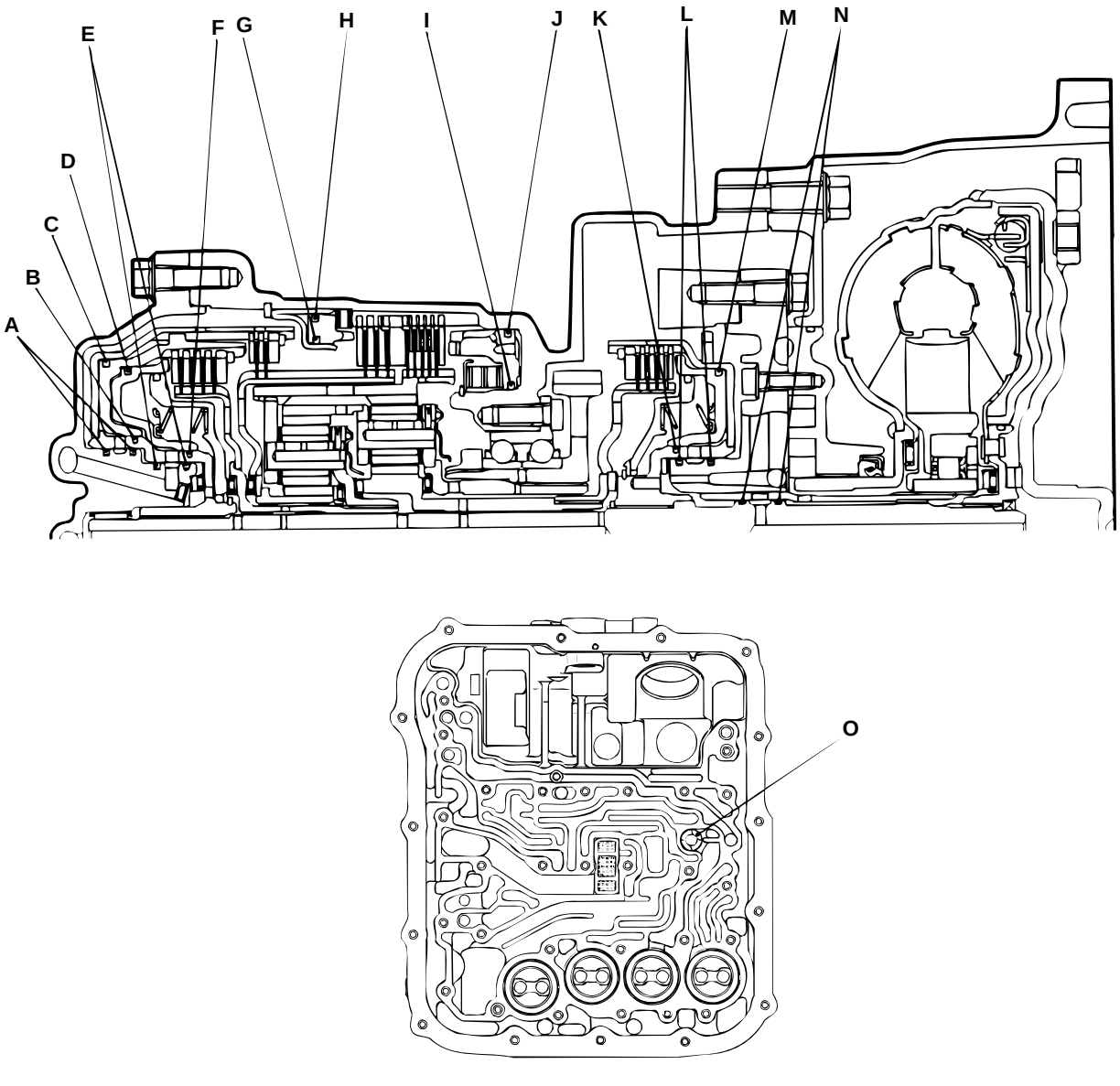
HYDRAULIC PRESSURE TEST DIAGNOSIS TABLE

SYMPTOMS	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 check ball
	Clogged orifice
	Incorrect valve body installation
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
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 check ball
	Clogged orifice
	Incorrect valve body installation

TSB Revision

SYMPTOMS	PROBABLE CAUSE
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 check ball
	Clogged orifice
	Incorrect valve body installation
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
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 check ball
	Incorrect valve body installation

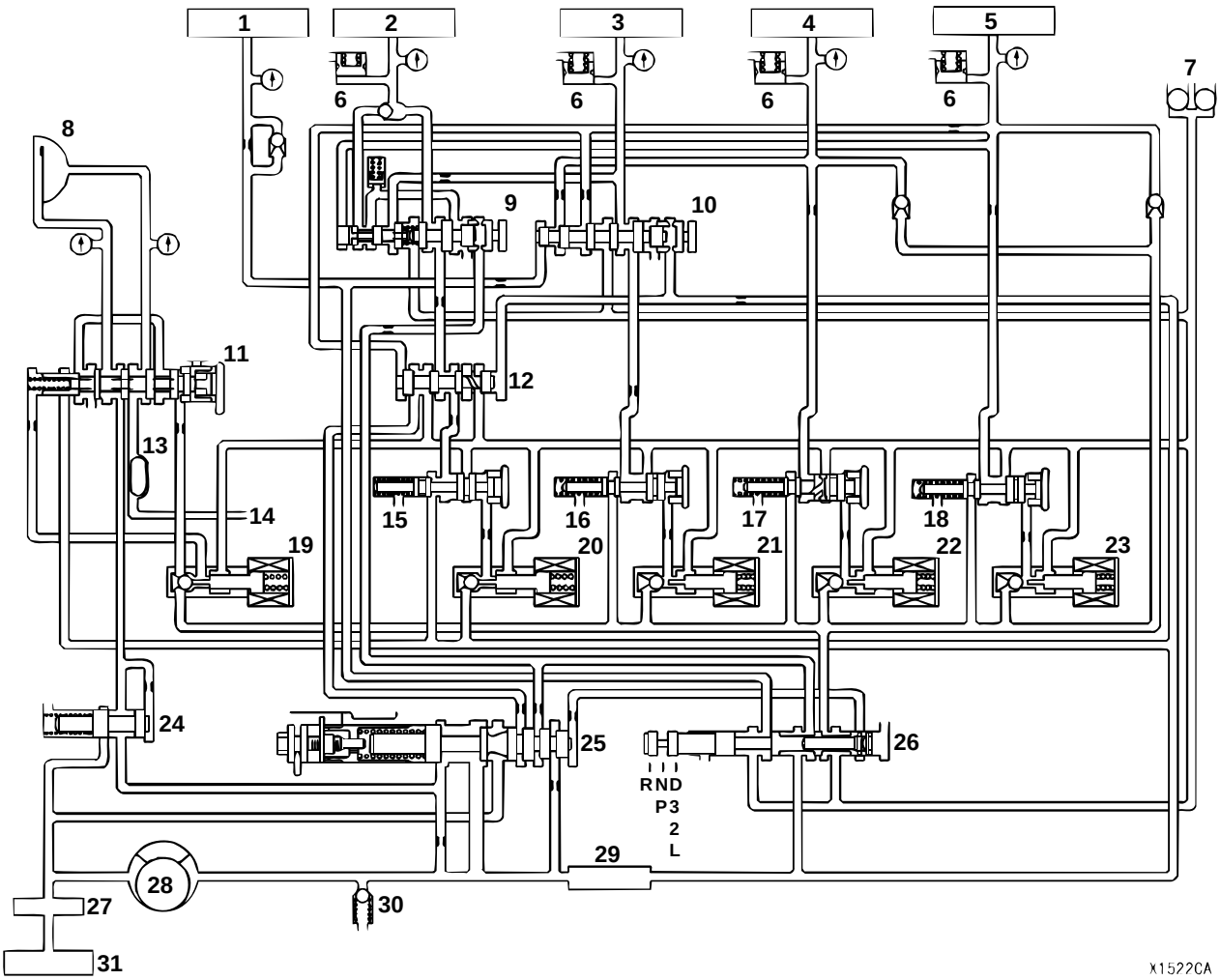
OIL SEAL LAYOUT



HYDRAULIC CIRCUIT

M1231008800046

<4A/T> PARKING AND NEUTRAL



: 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. A/T 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

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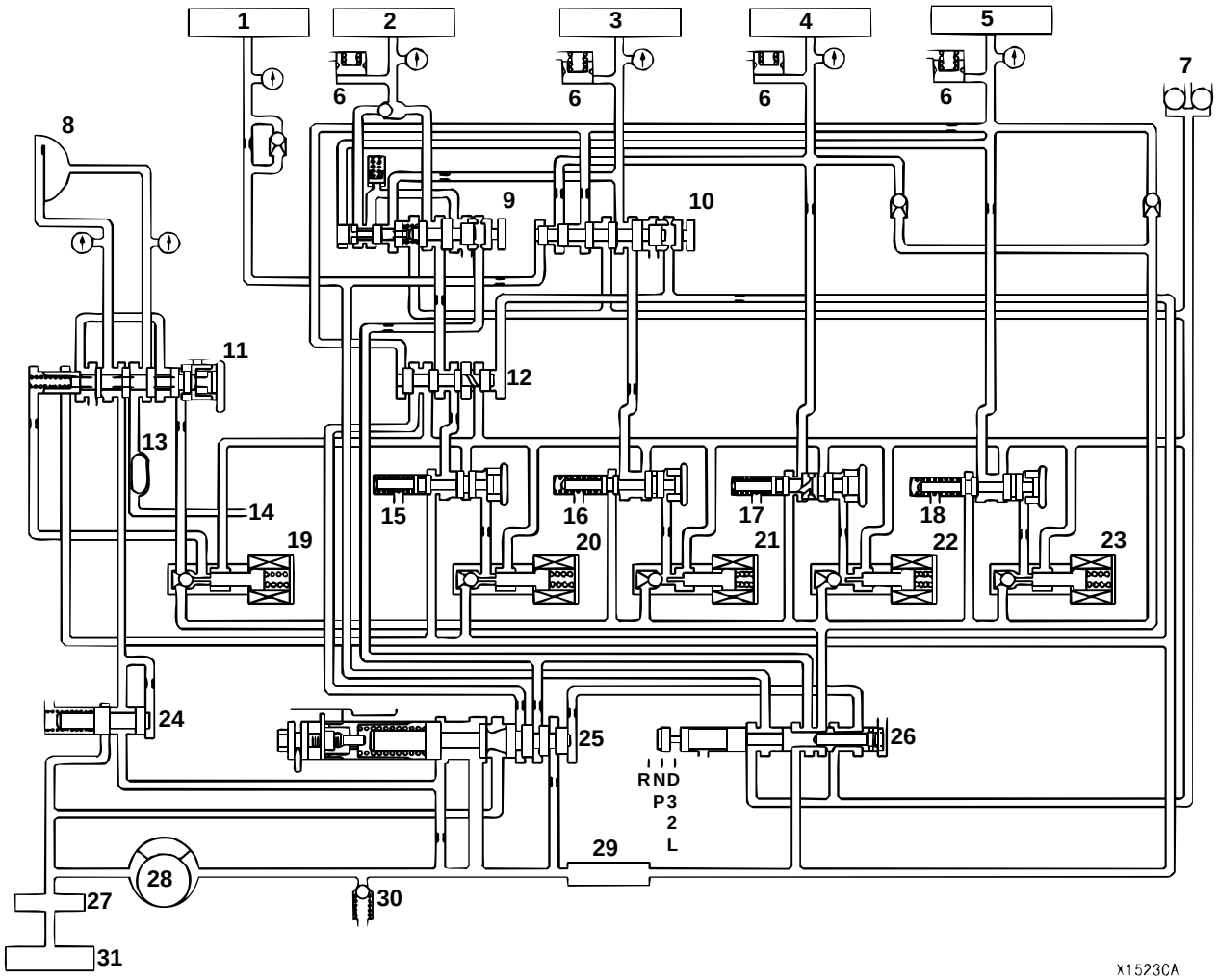
<4A/T> 1ST GEAR



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. A/T 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

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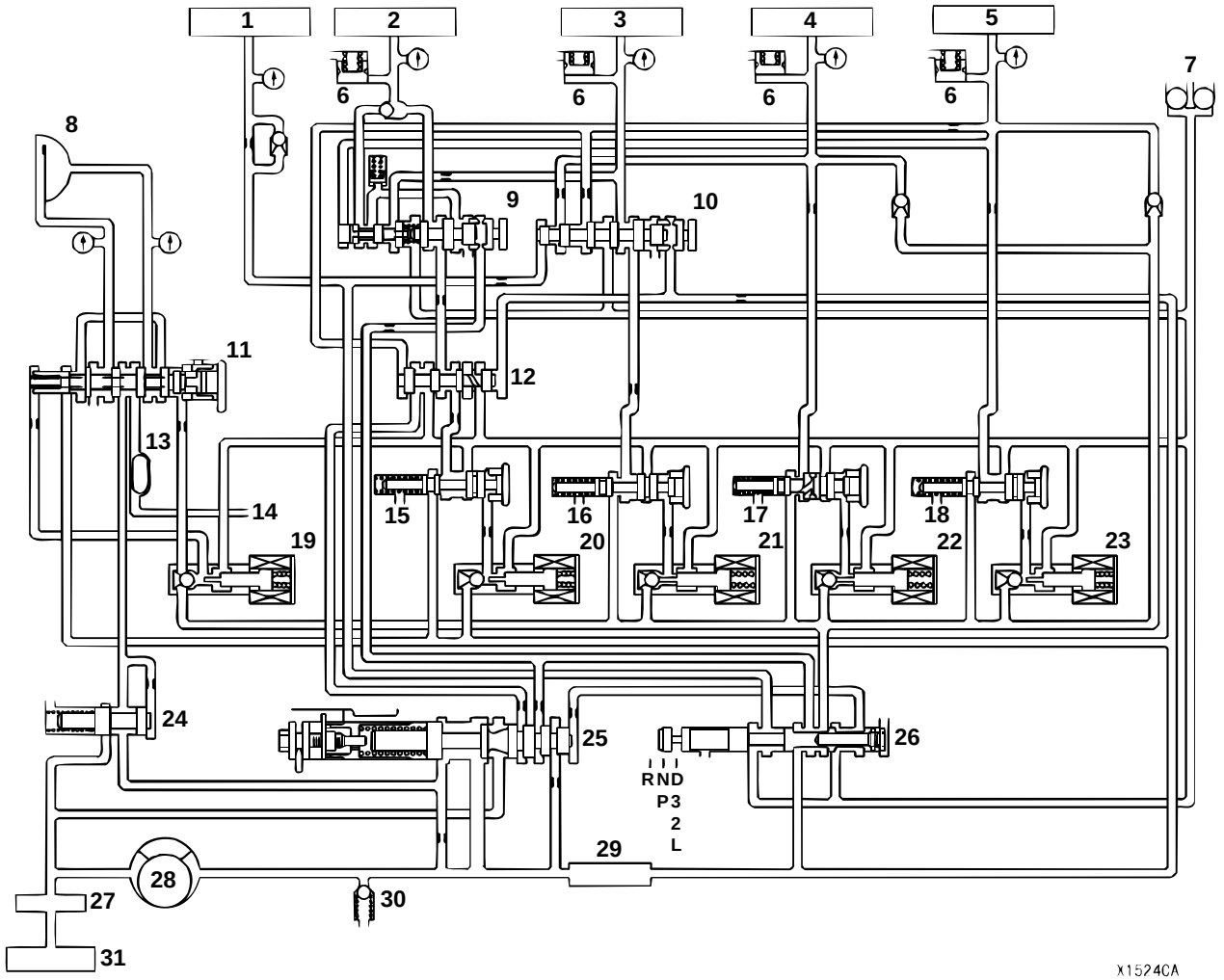
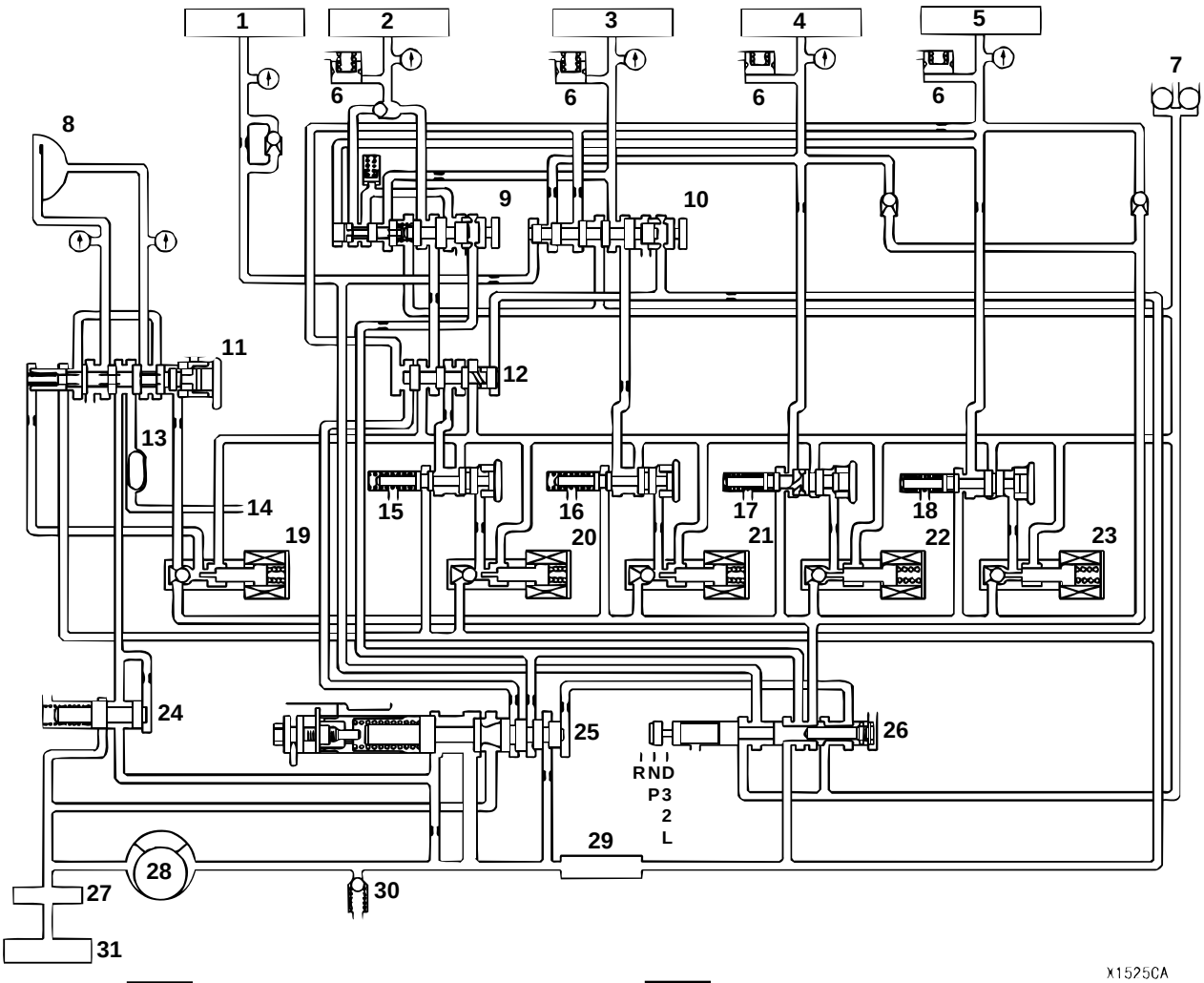
<4A/T> 2ND GEAR



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. A/T 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

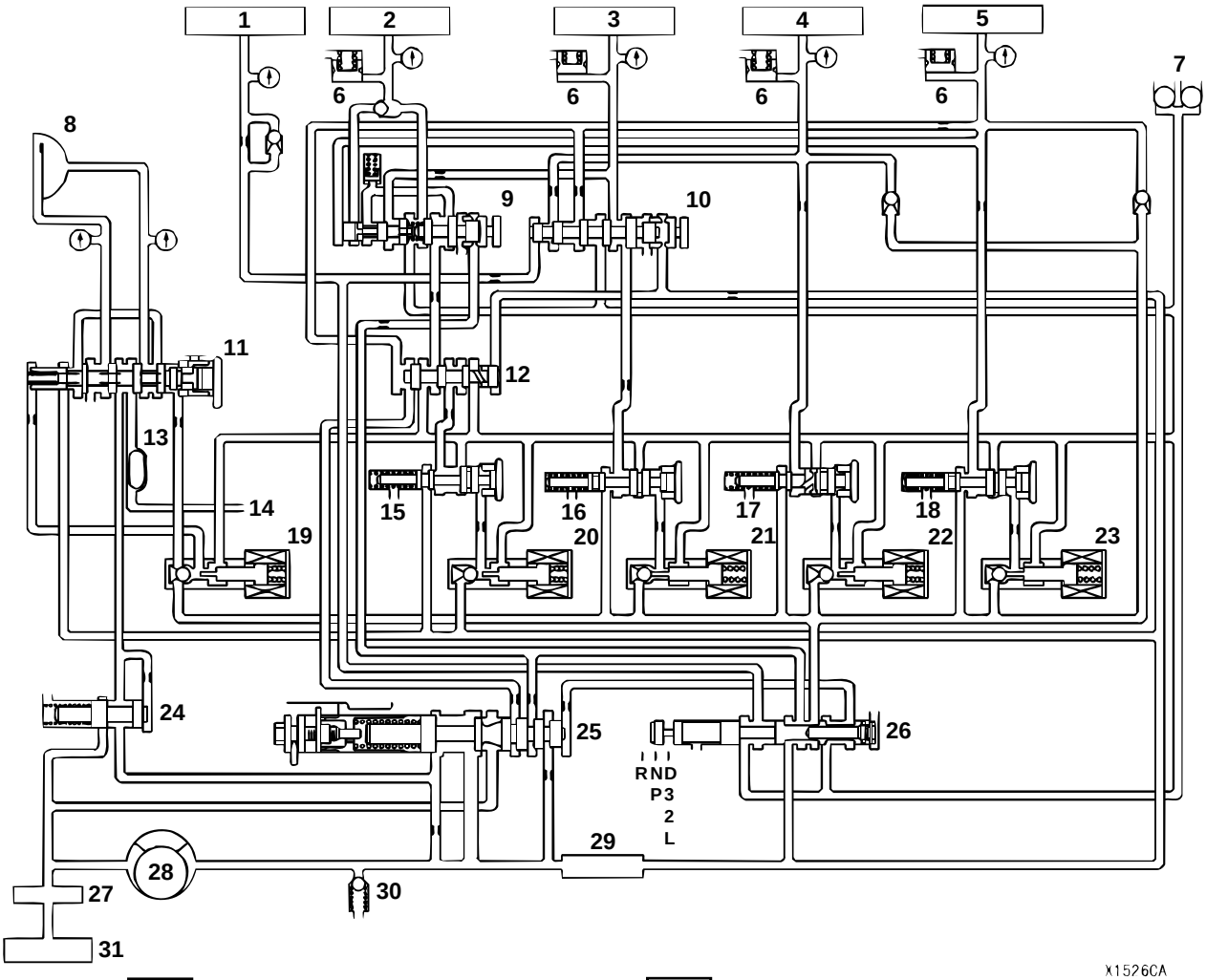
<4A/T> 3RD GEAR



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. A/T 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

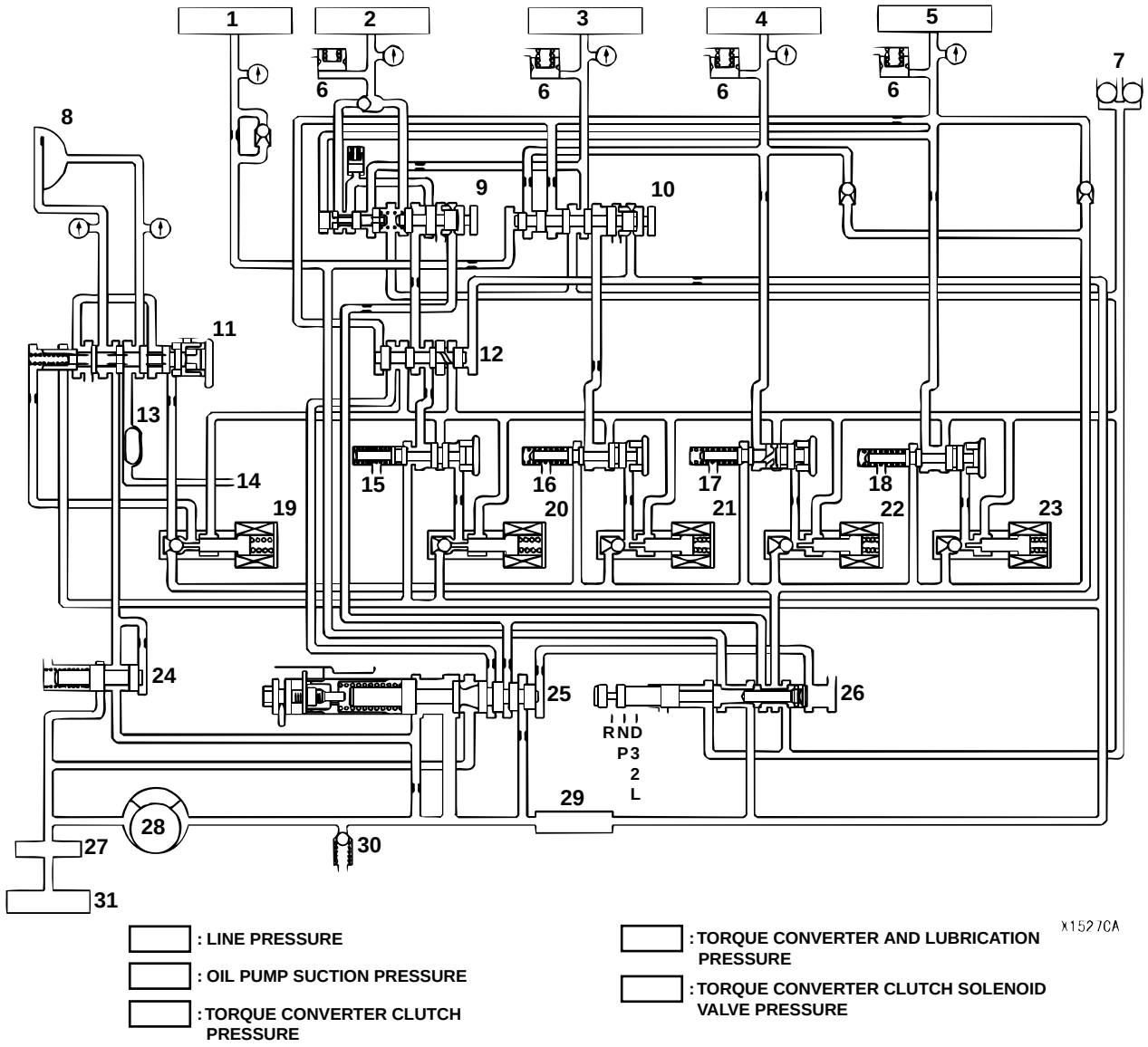
<4A/T> 4TH GEAR



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. A/T 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

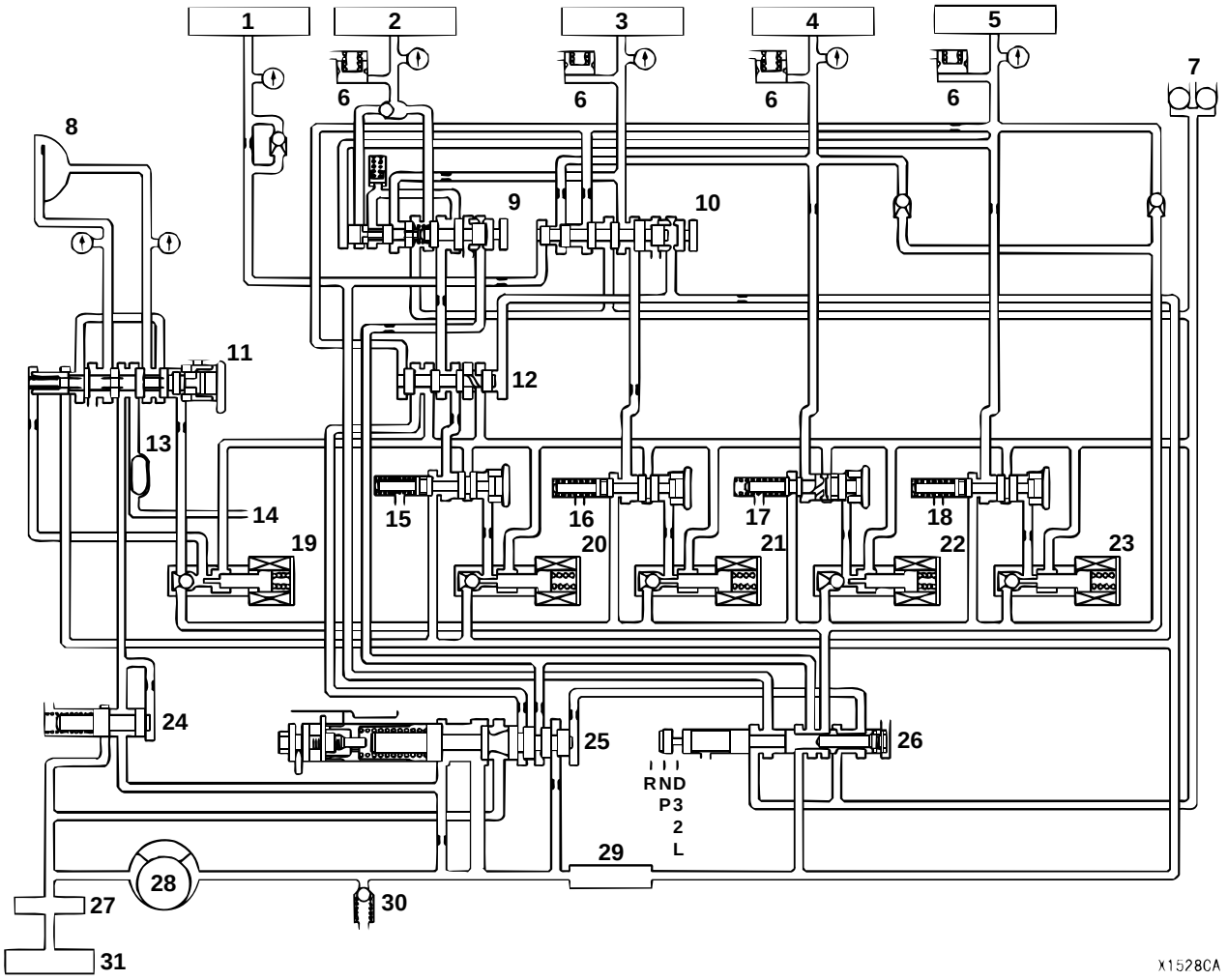
<4A/T> REVERSE



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. A/T 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

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

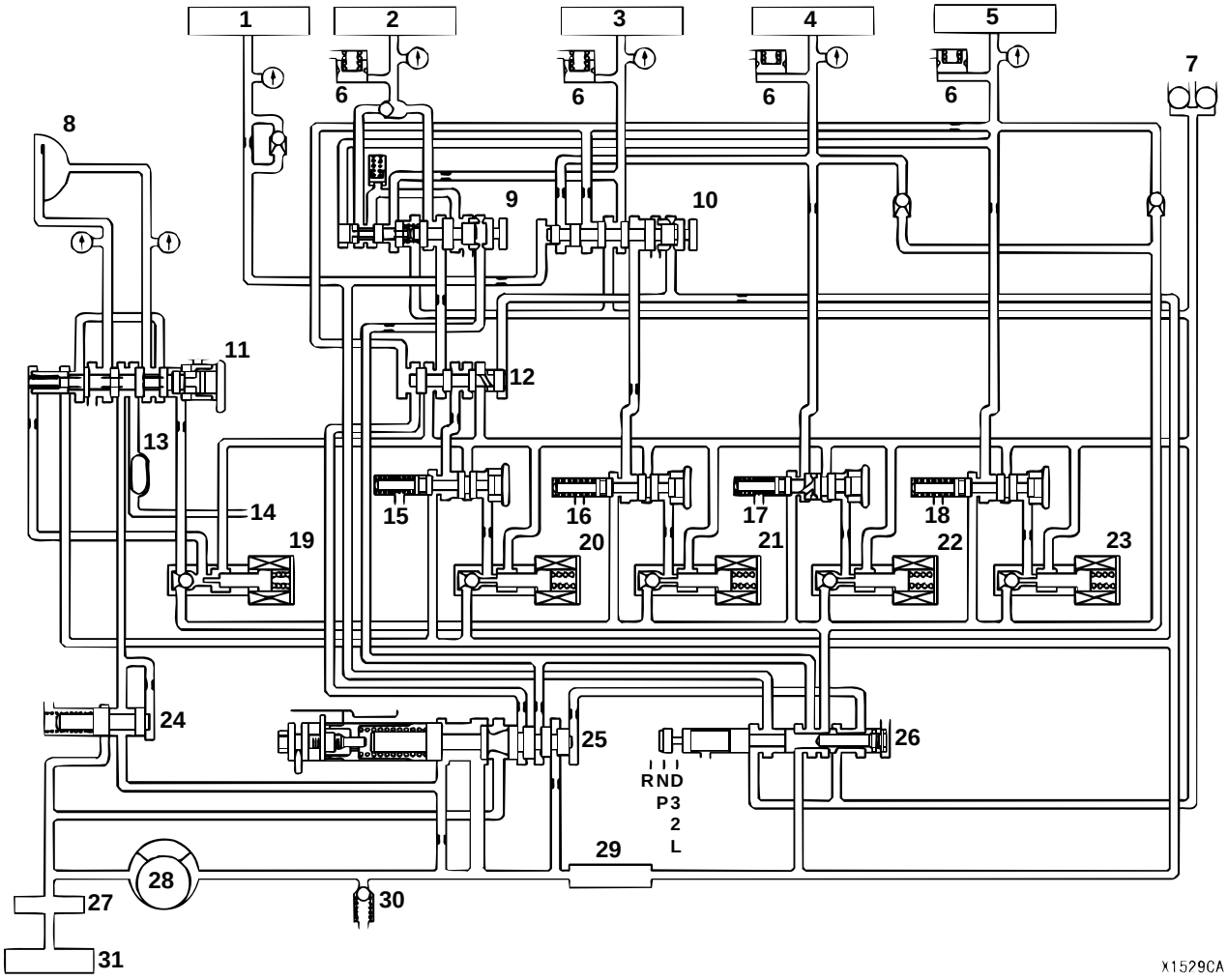


: LINE PRESSURE
: OIL PUMP SUCTION PRESSURE
: TORQUE CONVERTER CLUTCH PRESSURE
: TORQUE CONVERTER AND LUBRICATION PRESSURE
: TORQUE CONVERTER CLUTCH SOLENOID VALVE PRESSURE

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. A/T 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

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



: 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
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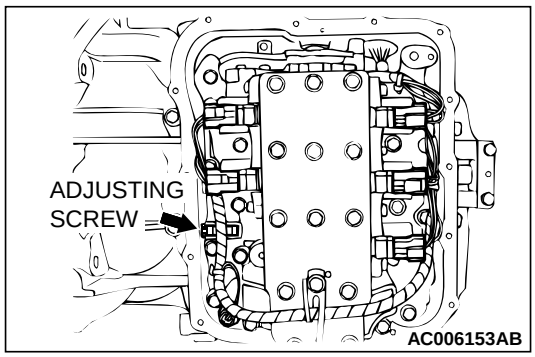
11. TORQUE CONVERTER CLUTCH CONTROL VALVE
12. SWITCH VALVE
13. A/T FLUID COOLER
14. LUBRICATION
15. LOW-REVERSE PRESSURE CONTROL VALVE
16. SECOND PRESSURE CONTROL VALVE
17. UNDERDRIVE PRESSURE CONTROL VALVE
18. OVERDRIVE PRESSURE CONTROL VALVE
19. TORQUE CONVERTER CLUTCH SOLENOID VALVE
20. LOW-REVERSE 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

LINE PRESSURE ADJUSTMENT

M1231001700156



1. Drain the A/T fluid.
   NOTE: Be sure to perform the hydraulic pressure test 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 to the left.
   NOTE: When adjusting the line pressure, adjust to the middle of the standard value range.
   Standard value: 1.01 – 1.05 MPa (147 – 152 psi)
4. Install the valve body cover. Pour in one quart A/T fluid.
5. Repeat the hydraulic pressure test. (Refer to P.23A-26.) Readjust the line pressure if necessary.

DIAGNOSTIC TROUBLE CODE CHART

M1231007900136

CODE	DIAGNOSIS ITEM		REFERENCE PAGE
11	Throttle position sensor system	Short circuit	P.23A-42
12		Open circuit	P.23A-51
14		Sensor out of adjustment	P.23A-59
15	A/T fluid temperature sensor system	Open circuit	P.23A-70
16		Short circuit	P.23A-77
21	Crankshaft position sensor system	Open circuit	P.23A-83
22	Input shaft speed sensor system	Short circuit/open circuit	P.23A-101
23	Output shaft speed sensor system	Short circuit/open circuit	P.23A-115
26	Stoplight switch system	Short circuit	P.23A-129
27	Park/Neutral position switch system	Open circuit	P.23A-136
28		Short circuit	P.23A-166
31	Low-reverse solenoid valve system	Short circuit/open circuit	P.23A-180
32	Underdrive solenoid valve system	Short circuit/open circuit	P.23A-188
33	Second solenoid valve system	Short circuit/open circuit	P.23A-195
34	Overdrive solenoid valve system	Short circuit/open circuit	P.23A-202
36	Torque converter clutch solenoid system	Short circuit/open circuit	P.23A-209
41	1st gear incorrect ratio		P.23A-217
42	2nd gear incorrect ratio		P.23A-217
43	3rd gear incorrect ratio		P.23A-217
44	4th gear incorrect ratio		P.23A-217
46	Reverse gear incorrect ratio		P.23A-217

TSB Revision

CODE	DIAGNOSIS ITEM		REFERENCE PAGE
52	Torque converter clutch solenoid system	Defective system	P.23A-226
53		Clutch stuck on	P.23A-231
54	A/T control relay system	Short circuit to ground/open circuit	P.23A-233
56	"N" range light system <Vehicles with sport mode>	Open circuit	P.23A-242

SYMPTOM CHART

M1231008000158

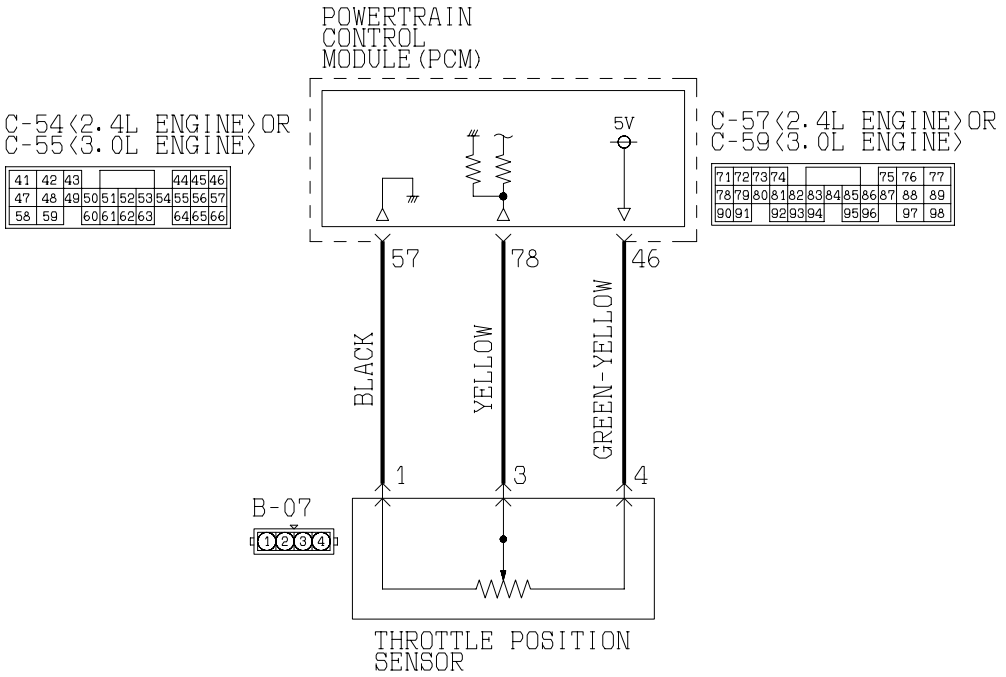
SYMPTOMS			INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool is not possible	Communication with all systems is impossible	2.4L Engine	-	Group 13A, diagnosis P.13A-434.
		3.0L Engine	-	Group 13B, diagnosis P.13B-530.
	Communication with the PCM only is impossible	2.4L Engine	-	Group 13A, diagnosis P.13A-436.
		3.0L Engine	-	Group 13B, diagnosis P.13B-532.
Driving impossible	Engine does not crank		1	P.23A-249
	Does not move forward		2	P.23A-251
	Does not move backward		3	P.23A-253
	Does not move (forward or backward)		4	P.23A-255
Malfunction when moving selector into gear	Engine stalls when moving selector lever from "N" to "D" or "N" to "R"		5	P.23A-256
	Shift shock when shifting from "N" to "D" and long delay		6	P.23A-258
	Shift shock when shifting from "N" to "R" and long delay		7	P.23A-260
	Shift shock when shifting from "N" to "D" or "N" to "R" and long delay		8	P.23A-263
Malfunction when shifting	Shift shock and slipping		9	P.23A-265
Does not shift properly	Early or late shifting in all gears		10	P.23A-267
	Early or late shifting in some gears		11	P.23A-270
Does not shift	No diagnostic trouble codes		12	P.23A-272
Malfunction while driving	Poor acceleration		13	P.23A-274
	Vibration		14	P.23A-276
Vehicle shifts differently with A/C engaged			15	P.23A-279
Transaxle won't downshift under load with auto-cruise engaged			16	P.23A-290
Vehicle speed signal system			17	P.23A-295
Shift switch assembly system <Vehicles with sport mode>			18	P.23A-302

TSB Revision

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC 11: Throttle Position Sensor System (Short Circuit)

Throttle Position Sensor System Circuit



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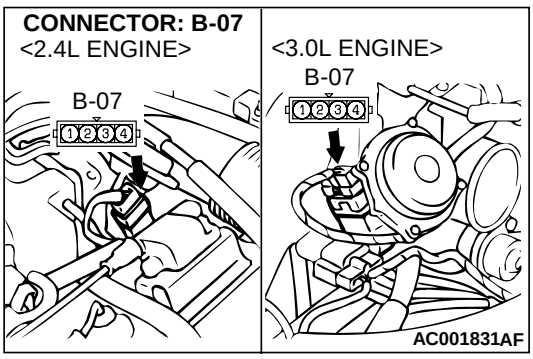
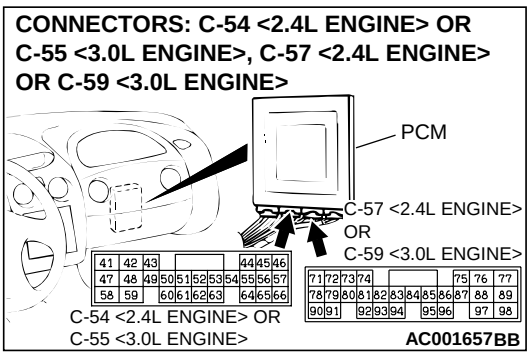




CIRCUIT OPERATION

- When the throttle valve shaft rotates from the idle position to the fully opened position, the resistance between the TPS output terminal (terminal 3) and ground terminal (terminal 1) will increase according to the rotation.
- With the ignition switch in the "ON" position, voltage at pin 78 increases from around 0.7 volts at closed throttle to about 5 volts at wide open throttle.

DTC SET CONDITIONS

If the PCM output voltage is 4.8 volts or higher when the engine is idling, the output is judged to be too high and diagnostic trouble code number "11" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the throttle position sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

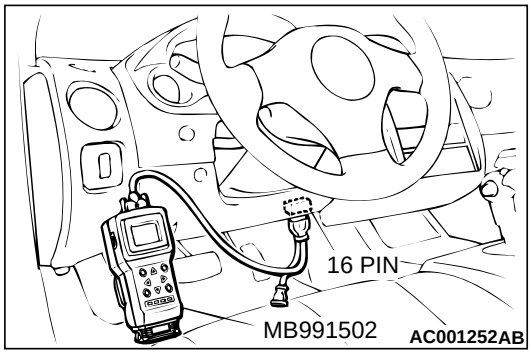
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check data list item 11: Throttle Position Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in full-open position, voltage should be between 4,500 and 5,500 mV.

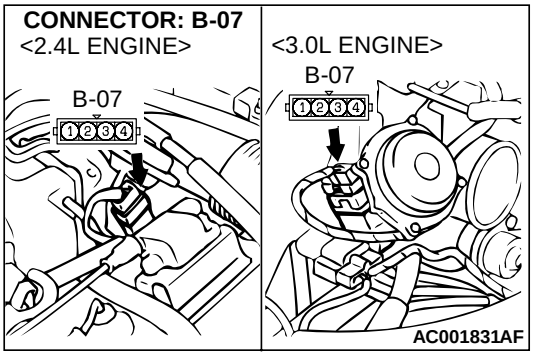
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

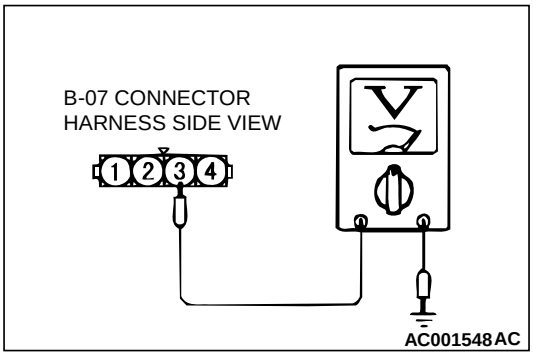
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.

STEP 2. Check the sensor output voltage at throttle position sensor connector B-07 by backprobing.



(1) Do not disconnect connector B-07.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 3 and ground by backprobing.
- With the throttle valve in idle position, voltage should be between 0.535 and 0.735 volts.
- With the throttle valve in full-open position, voltage should be between 4.5 and 5.5 volts.

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

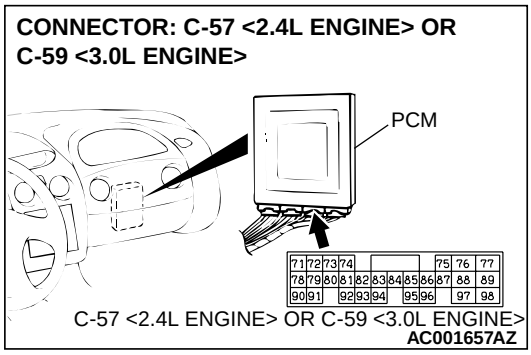
Q: Is the voltage normal?

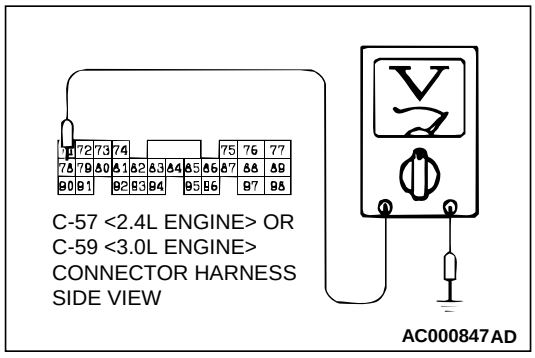
YES : Go to Step 3.

NO : Go to Step 7.

STEP 3. Check the sensor output voltage at PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-57 <2.4L Engine> or C-59 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 78 and ground by backprobing.
- With the throttle valve in idle position, voltage should be between 0.535 and 0.735 volts.
- With the throttle valve in full-open position, voltage should be between 4.5 and 5.5 volts.

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

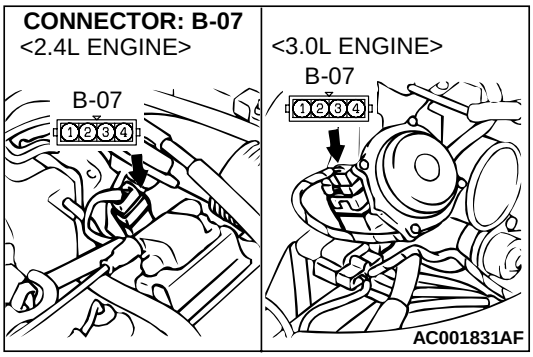
Q: Is the voltage normal?

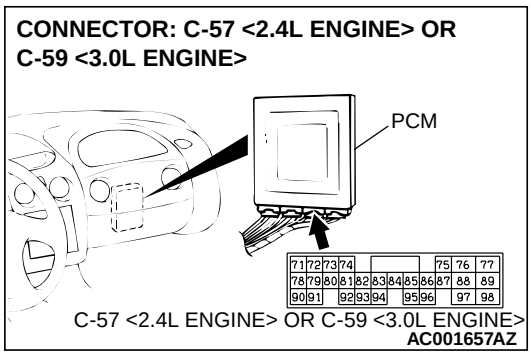
YES : Go to Step 4.
NO : Go to Step 6.

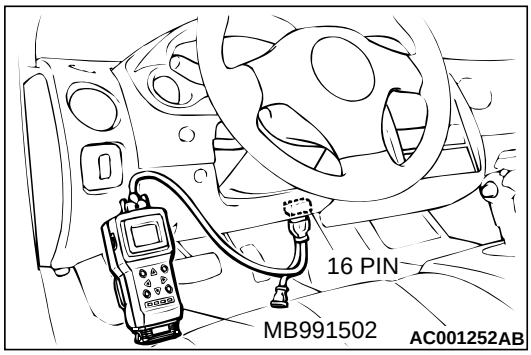
STEP 4. Check connectors B-07 at throttle position sensor and C-57 <2.4L Engine> or C-59 <3.0L Engine> at the PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







STEP 5. Using scan tool MB991502, check data list item 11: Throttle Position Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

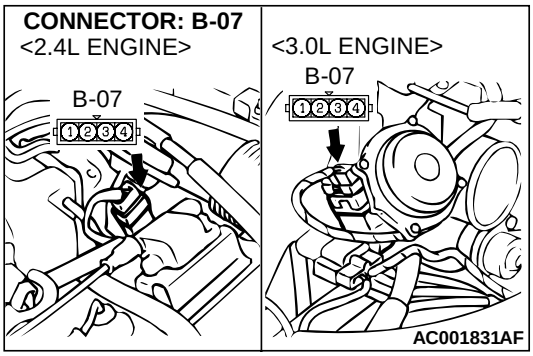
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to the data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in the idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in the full-open position, voltage should be between 4,500 and 5,500 mV.

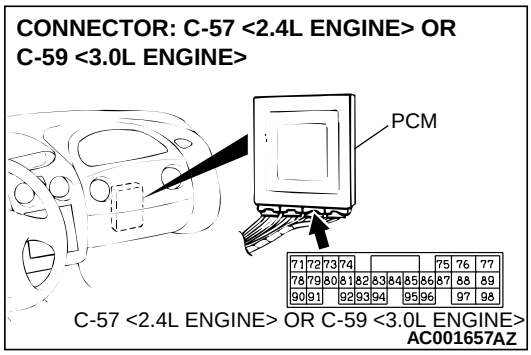
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.



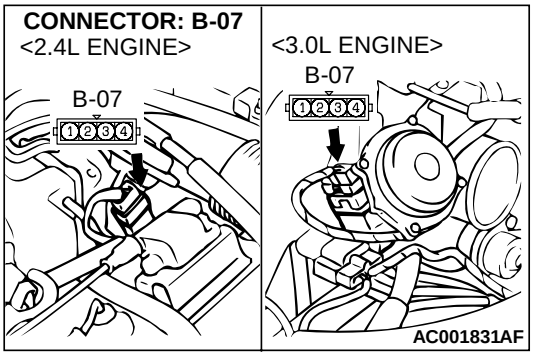


STEP 6. Check connectors B-07 at throttle position sensor and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Repair harness damage between throttle position sensor connector B-07 terminal 3 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 78.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

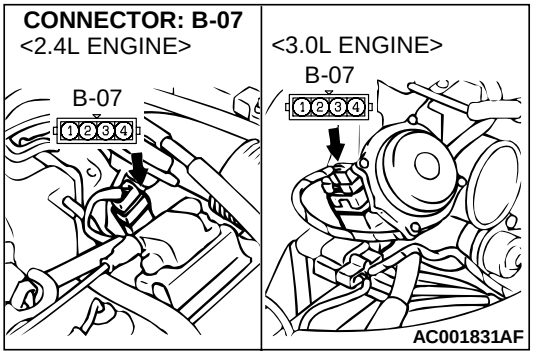


STEP 7. Check connector B-07 at throttle position sensor for damage.

Q: Is the connector in good condition?

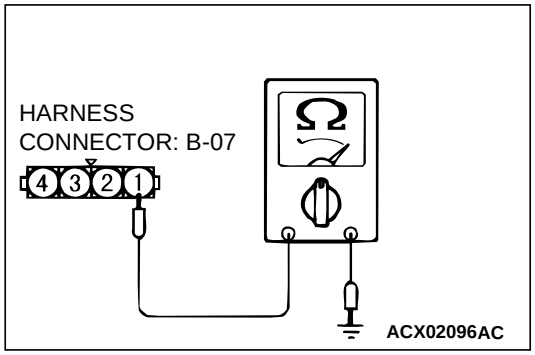
YES : Go to Step 8.

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



STEP 8. Check the continuity at throttle position sensor connector B-07.

(1) Disconnect connector B-07 and measure at the harness side.



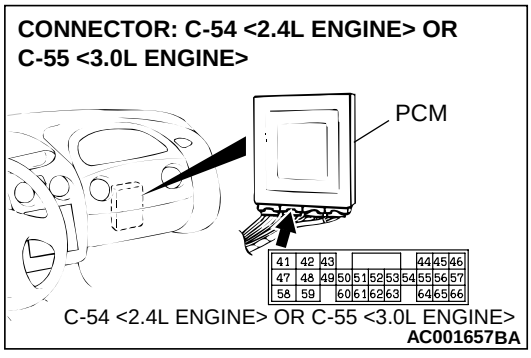
(2) Check for the continuity between terminal 1 and ground.

- Should be less than 2 ohm.

Q: Is the continuity normal?

YES : Go to Step 11.

NO : Go to Step 9.



STEP 9. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 10.

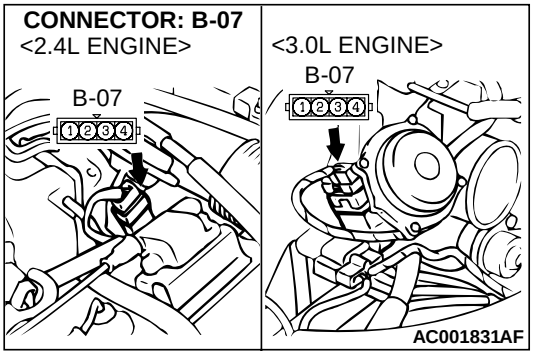
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

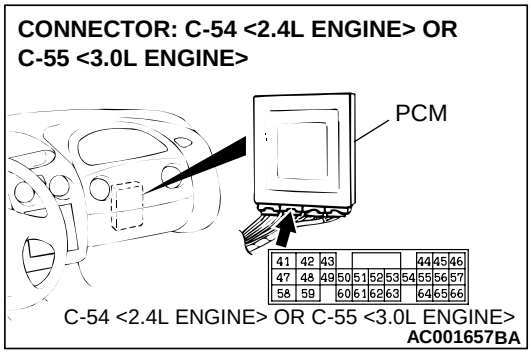
STEP 10. Check harness for open circuit or damage between throttle position sensor connector B-07 terminal 1 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 57.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair it.

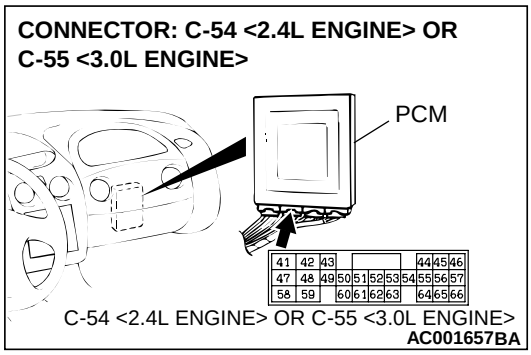




STEP 11. Check the power supply voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.

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



(3) Measure the voltage between terminal 46 and ground by backprobing.

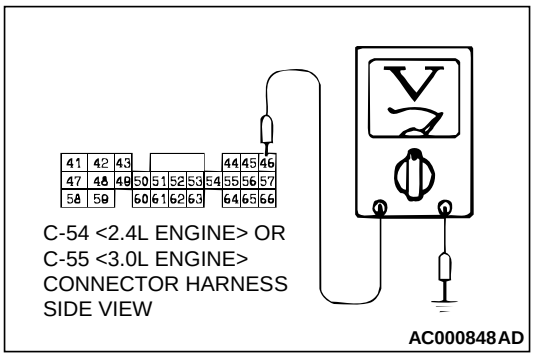
- Voltage should be between 4.9 and 5.1 volts.

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

Q: Is the voltage normal?

YES : Go to Step 14.

NO : Go to Step 12.



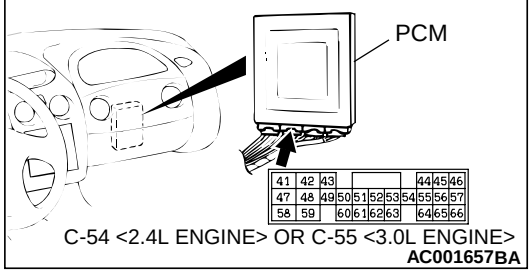
STEP 12. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 13.

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

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>

AC001657BA

STEP 13. Check harness for damage between throttle position sensor connector B-07 terminal 4 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 46.

Q: Is the harness wire in good condition?

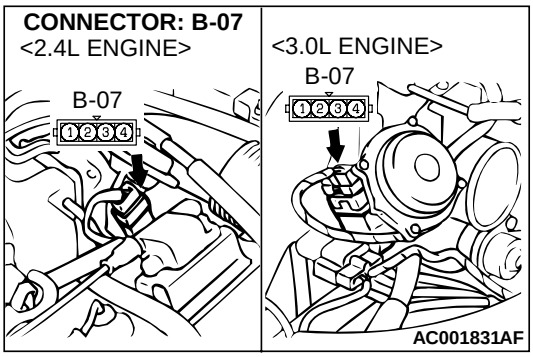
YES : Go to Step 5.

NO : Repair it.

CONNECTOR: B-07

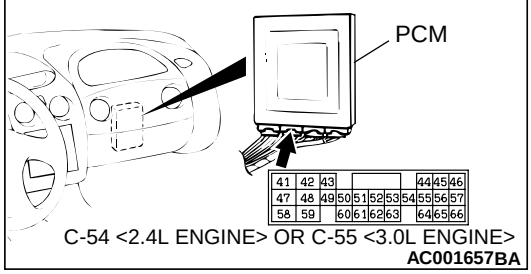
<2.4L ENGINE>

<3.0L ENGINE>



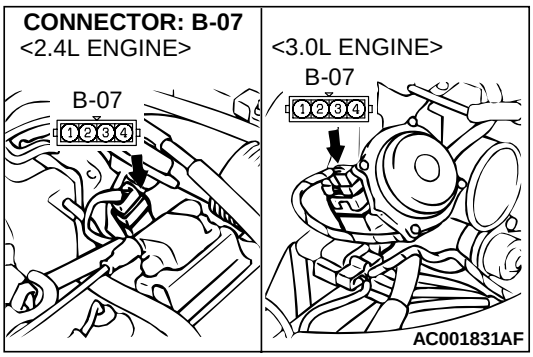
AC001831AF

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



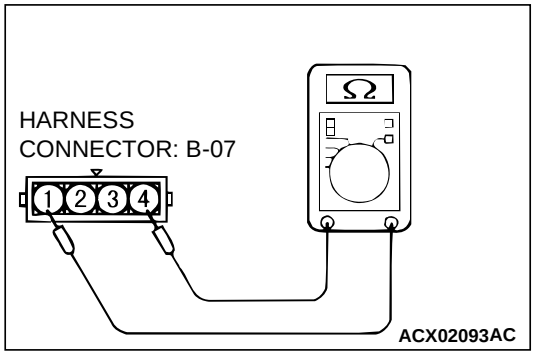
C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>

AC001657BA



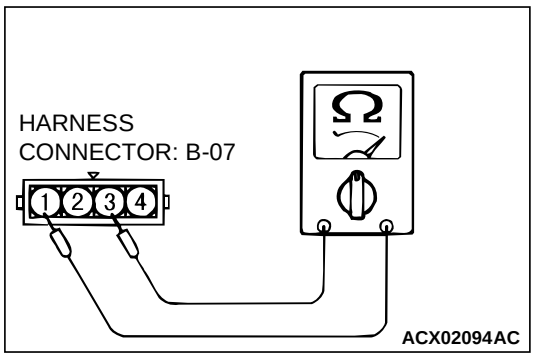
STEP 14. Check the throttle position sensor.

(1) Disconnect connector B-07 and measure at the sensor side.



(2) Measure the resistance between connector terminal 1 and 4.

Standard value: 3.5 – 6.5 kΩ



(3) Measure resistance between the throttle position sensor side connector terminal 1 and 3.

(4) Move the throttle valve from idle position to full-open position.

- Resistance should change smoothly in proportion to opening angle of the throttle valve.

Q: Is the resistance normal?

YES : Go to Step 15.

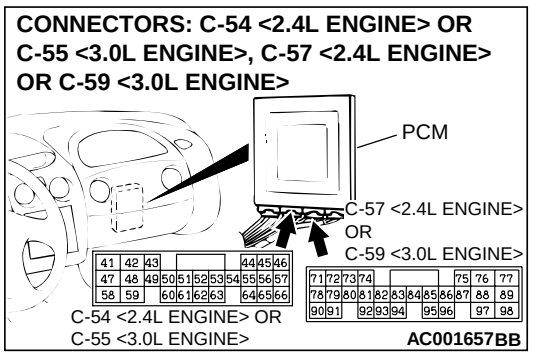
NO : Replace the throttle position sensor. Refer to GROUP 13A <2.4L Engine>, Throttle Body Assembly P.13A-592 or 13B <3.0L Engine>, Throttle Body Assembly P.13B-689.

STEP 15. Check connectors C-54 <2.4L Engine> or C-55 <3.0L Engine> and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 16.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

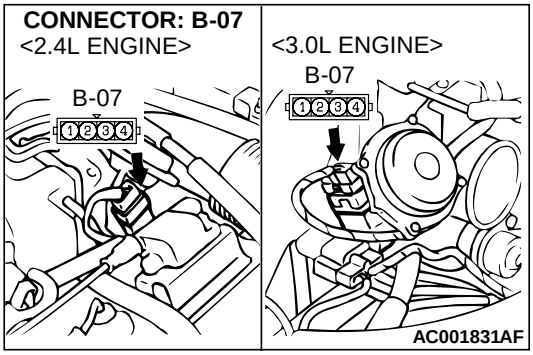


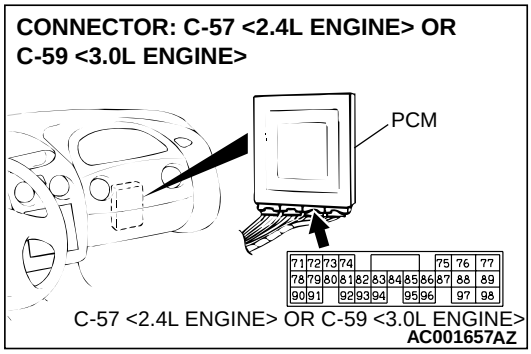
STEP 16. Check harness for damage between throttle position sensor connector B-07 terminal 3 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 78.

Q: Is the harness wire in good condition?

YES : Go to Step 17.

NO : Repair it.



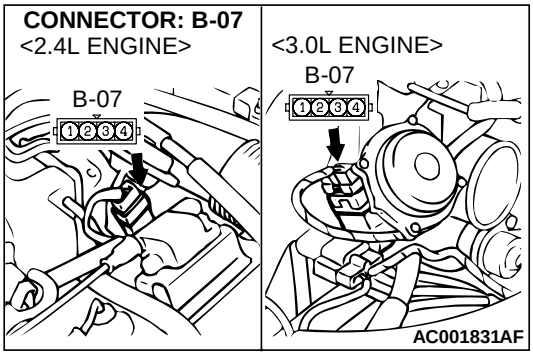


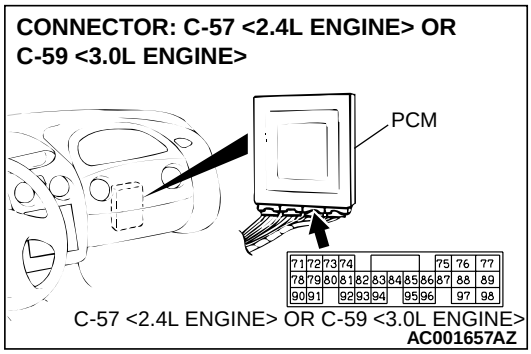
STEP 17. Check harness for damage between throttle position sensor connector B-07 terminal 1 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 57.

Q: Is the harness wire in good condition?

YES : Throttle position sensor adjustment. Refer to GROUP 13A <2.4L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13A-576 or 13B <3.0L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13B-677.

NO : Repair it.





DTC 12: Throttle Position Sensor System (Open Circuit)

Throttle Position Sensor System Circuit
Refer to P.23A-42.

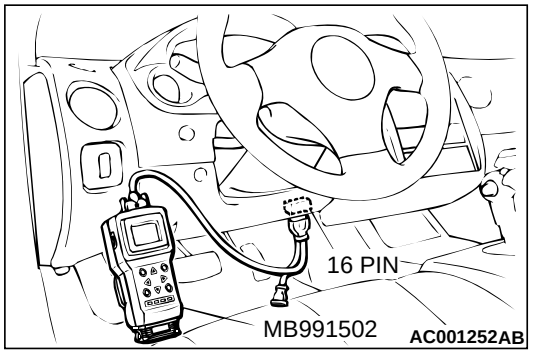
CIRCUIT OPERATION
Refer to P.23A-42.

DTC SET CONDITIONS
If TPS output voltage is 0.2 volts or lower at times other than when the engine is idling, the output is judged to be too low and diagnostic trouble code number "12" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)
- Malfunction of the throttle position sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check data list item 11: Throttle Position Sensor.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in full-open position, voltage should be between 4,500 and 5,500 mV.

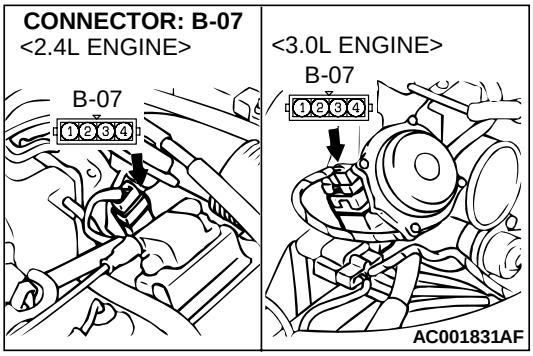
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

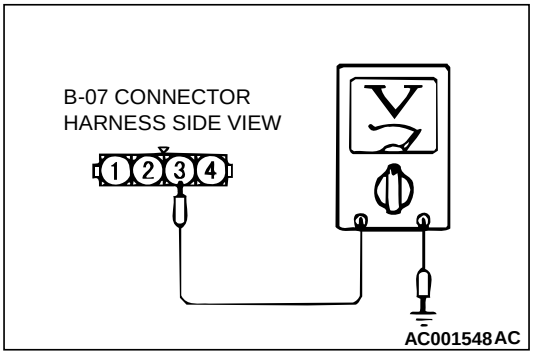
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.

STEP 2. Check the sensor output voltage at throttle position sensor connector B-07 by backprobing.



(1) Do not disconnect connector B-07.
(2) Turn the ignition switch to the "ON" position.



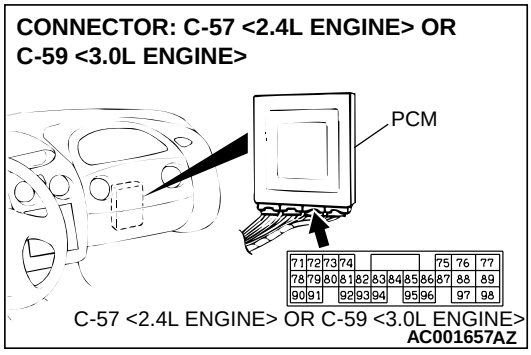
(3) Measure the voltage between terminal 3 and ground by backprobing.
- With the throttle valve in idle position, voltage should be between 0.535 and 0.735 volts.
- With the throttle valve in full-open position, voltage should be between 4.5 and 5.5 volts.

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

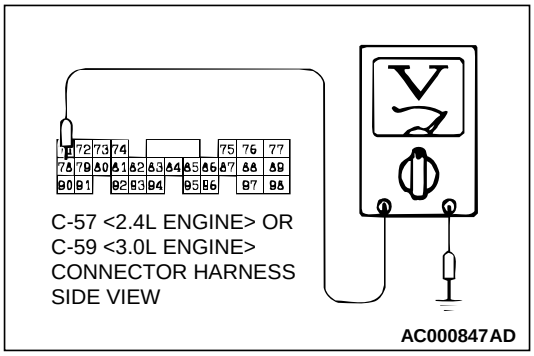
Q: Is the voltage normal?

YES : Go to Step 3.
NO : Go to Step 7.

STEP 3. Check the sensor output voltage at PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> by backprobing.



(1) Do not disconnect connector C-57 <2.4L Engine> or C-59 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 78 and ground by backprobing.
- With the throttle valve in idle position, voltage should be between 0.535 and 0.735 volts.
- With the throttle valve in full-open position, voltage should be between 4.5 and 5.5 volts.

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

Q: Is the voltage normal?

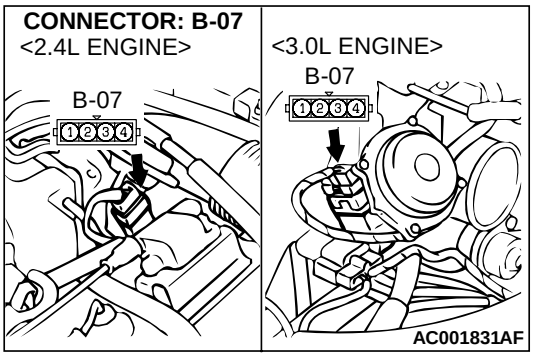
YES : Go to Step 4.
NO : Go to Step 6.

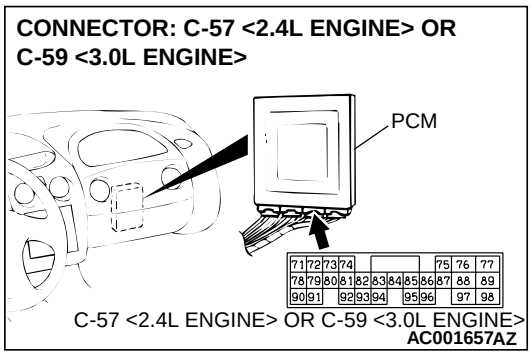
STEP 4. Check connectors B-07 at the throttle position sensor and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 5. Using scan tool MB991502, check data list item 11: Throttle Position Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

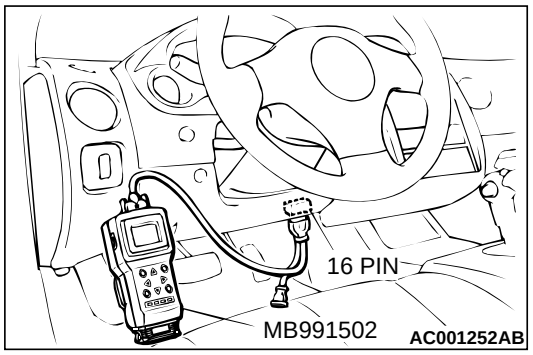
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in full-open position, voltage should be between 4,500 and 5,500 mV.

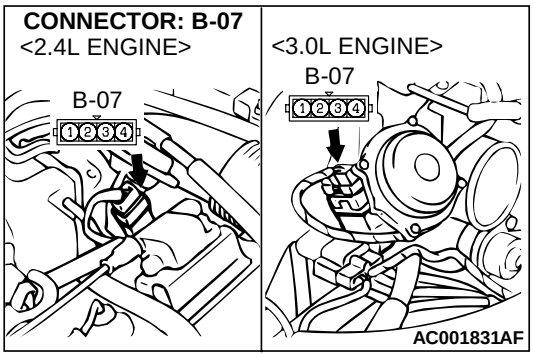
(4) Turn the ignition switch to the "LOCK" (OFF) position.

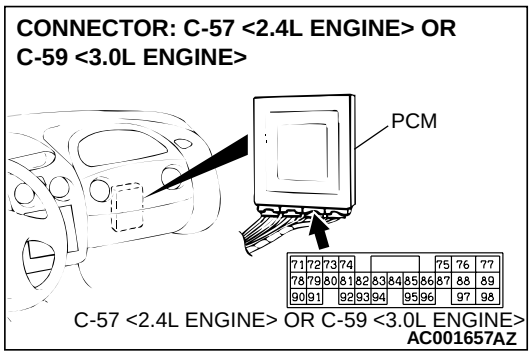
Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.





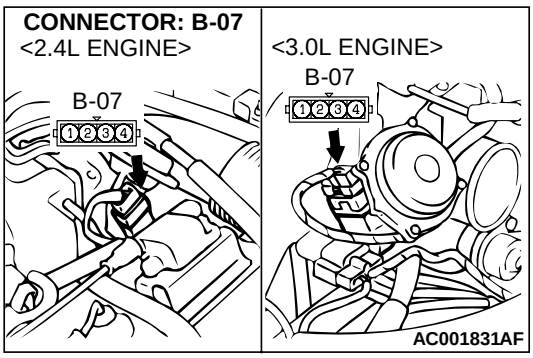


STEP 6. Check connectors B-07 at throttle position sensor and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Repair harness open circuit or damage between throttle position sensor connector B-07 terminal 3 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 78.

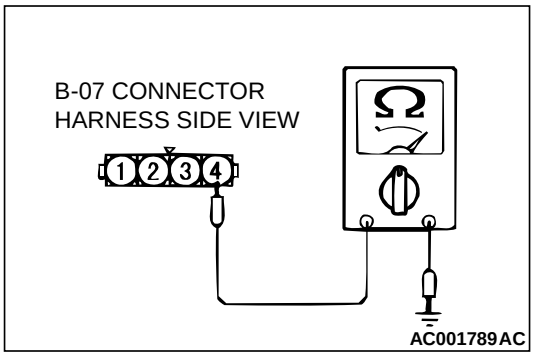
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 7. Check the power supply voltage at throttle position sensor connector B-07 by backprobing.

(1) Do not disconnect connector B-07.

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



(3) Measure the voltage between terminal 4 and ground by backprobing.
- Voltage should be between 4.9 and 5.1 volts.

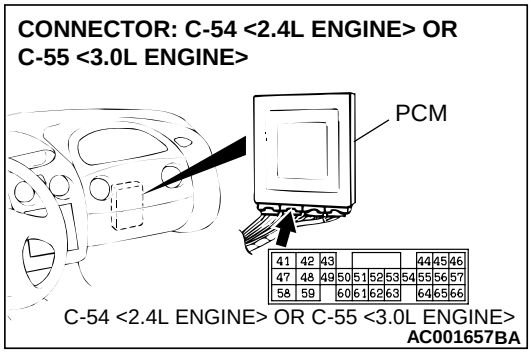
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

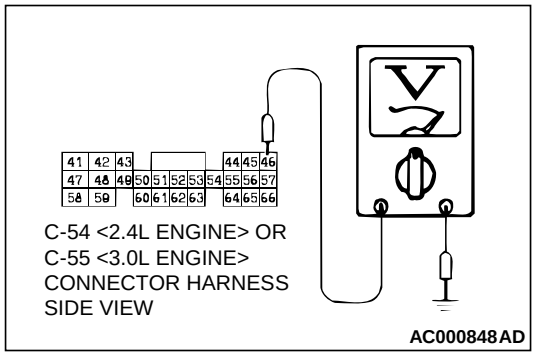
YES : Go to Step 12.

NO : Go to Step 8.

STEP 8. Check the power supply voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.



(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 46 and ground by backprobing.
- Voltage should be between 4.9 and 5.1 volts.

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

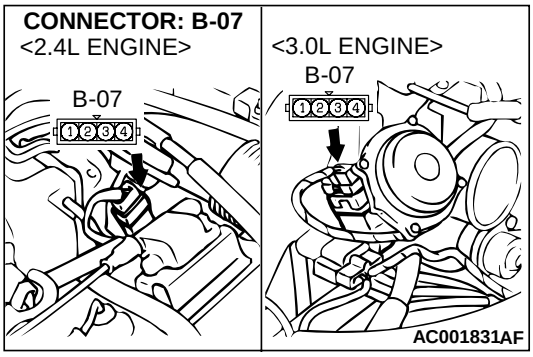
Q: Is the voltage normal?

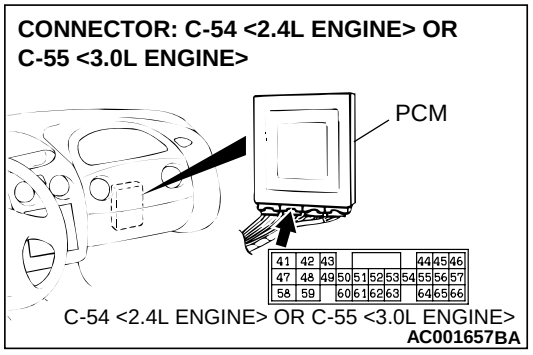
YES : Go to Step 9.
NO : Go to Step 10.

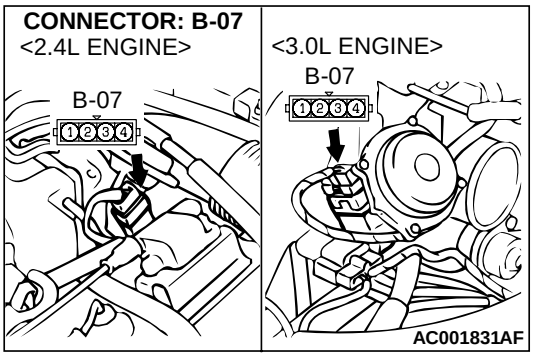
STEP 9. Check connectors B-07 at throttle position sensor and C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

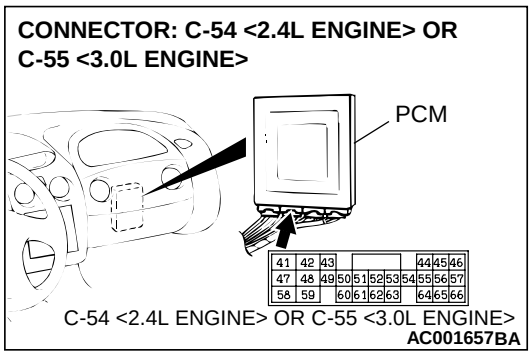
Q: Are the connectors in good condition?

YES : Repair harness open circuit or damage between throttle position sensor connector B-07 terminal 4 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 46.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







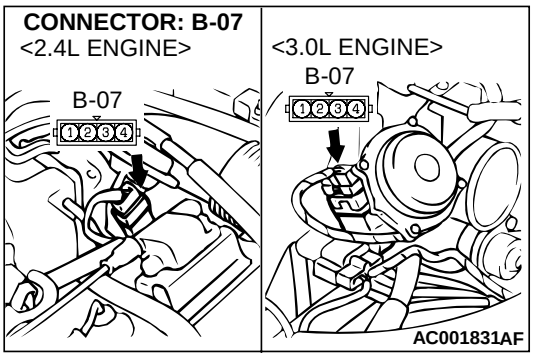


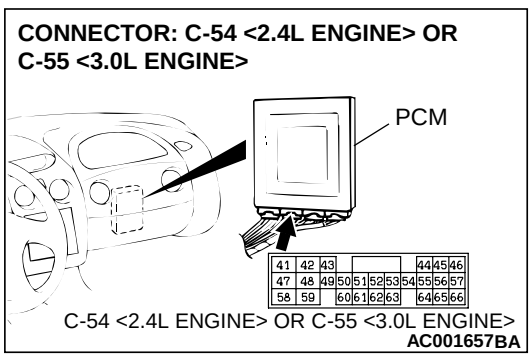
STEP 10. Check connectors B-07 at throttle position sensor and C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 11.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



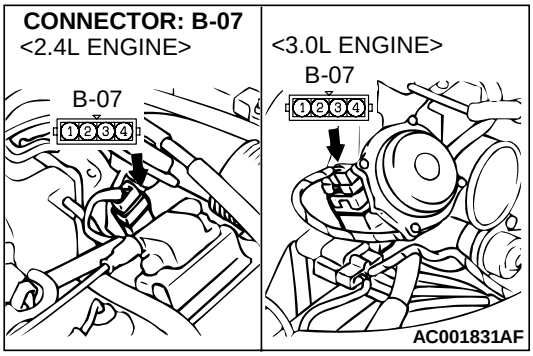


STEP 11. Check harness for short circuit to ground between throttle position sensor connector B-07 terminal 4 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 46.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair it.

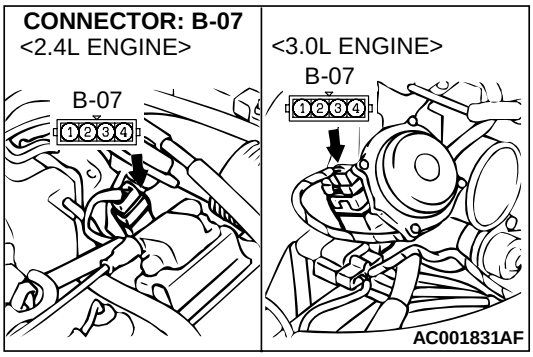


STEP 12. Check connector B-07 at throttle position sensor for damage.

Q: Is the connector in good condition?

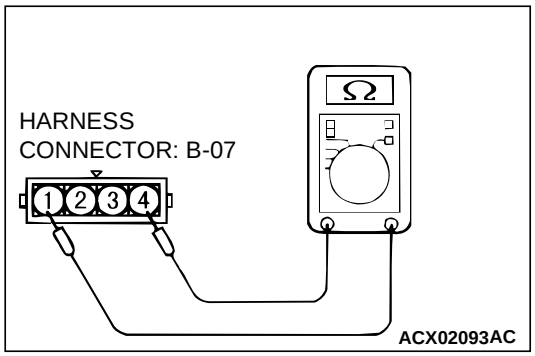
YES : Go to Step 13.

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



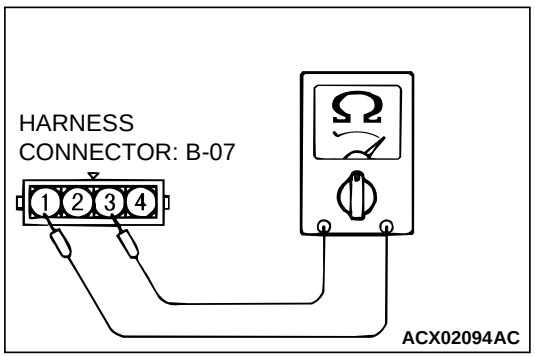
STEP 13. Check the throttle position sensor.

(1) Disconnect connector B-07 and measure at the sensor side.



(2) Measure the resistance between connector terminal 1 and 4.

Standard value: 3.5 – 6.5 kΩ



(3) Measure resistance between the throttle position sensor side connector terminal 1 and 3.

(4) Move the throttle valve from the idle position to full-open position.

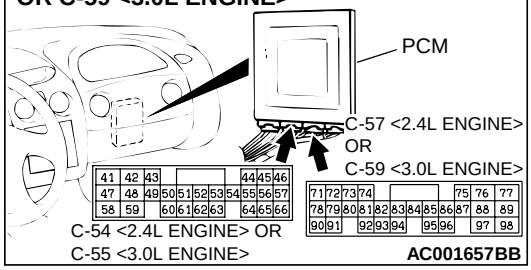
- Resistance should change smoothly in proportion to opening angle of the throttle valve.

Q: Is the resistance normal?

YES : Go to Step 14.

NO : Replace the throttle position sensor. Refer to GROUP 13A <2.4L Engine>, Throttle Body Assembly P.13A-592 or 13B <3.0L Engine>, Throttle Body Assembly P.13B-689.

CONNECTORS: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>, C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>



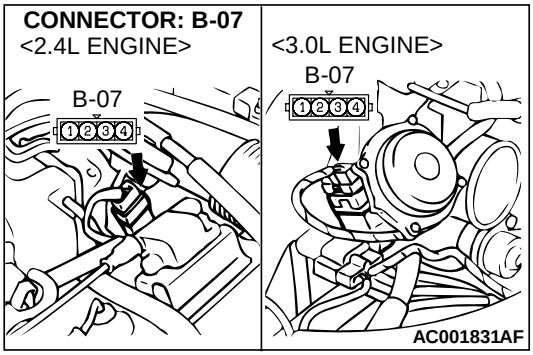
STEP 14. Check connectors C-54 <2.4L Engine> or C-55 <3.0L Engine> and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 15.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: B-07



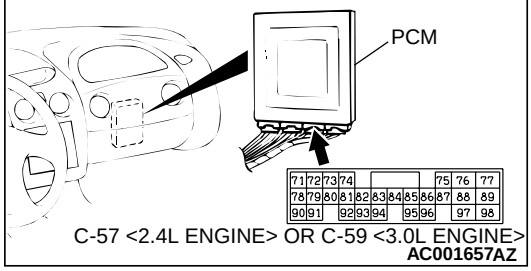
STEP 15. Check harness for short circuit to ground or damage between throttle position sensor connector B-07 terminal 3 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 78.

Q: Is the harness wire in good condition?

YES : Go to Step 16.

NO : Repair it.

CONNECTOR: C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>



STEP 16. Check the connector and the harness for short circuit to ground between the throttle position sensor connector and the auto-cruise control-ECU connector.

Q: Is the harness wire in good condition?

YES : Throttle position sensor adjustment. Refer to GROUP 13A <2.4L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13A-576 or 13B <3.0L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13B-677.

NO : Repair it.

TSB Revision

DTC 14: Throttle Position Sensor System (Maladjusted Sensor)

Throttle Position Sensor System Circuit
Refer to P.23A-42.

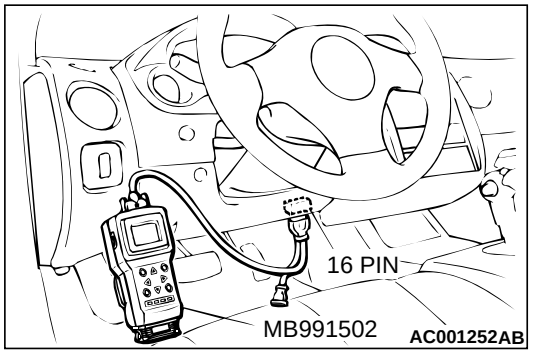
CIRCUIT OPERATION
Refer to P.23A-42.

DTC SET CONDITIONS
If TPS output voltage is 0.2 volts or lower or if it is 1.2 volts or higher when the engine is idling, the TPS adjustment is judged to be incorrect and diagnostic trouble code number "14" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)
- Malfunction of the throttle position sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

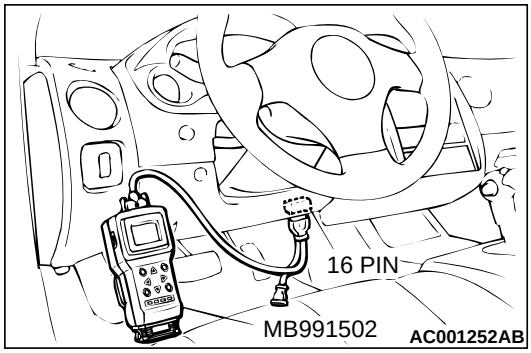
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the A/T diagnostic trouble code number "11" or "12" output?

YES : Refer to P.23A-42, code number 11: Throttle Position Sensor System (Short Circuit) or P.23A-51 code number 12: Throttle Position Sensor System (Open Circuit).

NO : Go to Step 2.



STEP 2. Using scan tool MB991502, check data list item 11: Throttle Position Sensor.

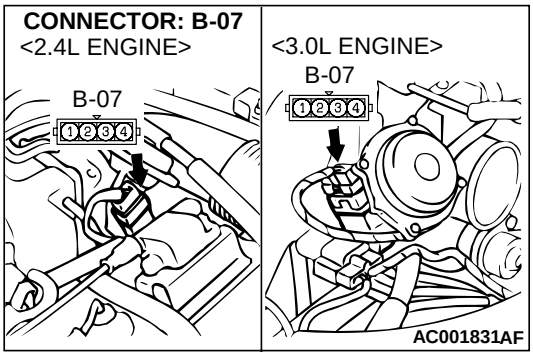
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in full-open position, voltage should be between 4,500 and 5,500 mV.

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

Q: Is the sensor operating properly?

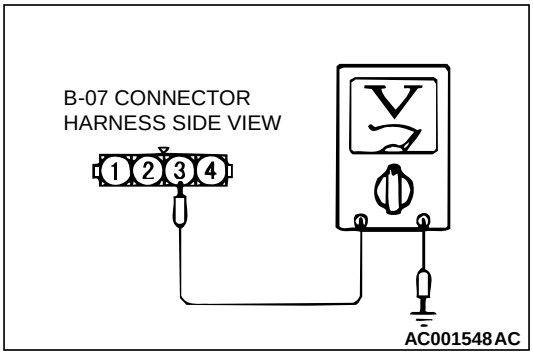
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 3.



STEP 3. Check the sensor output voltage at throttle position sensor connector B-07 by backprobing.

(1) Do not disconnect connector B-07.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 3 and ground by backprobing.
- With the throttle valve in idle position, voltage should be between 0.535 and 0.735 volts.
- With the throttle valve in full-open position, voltage should be between 4.5 and 5.5 volts.

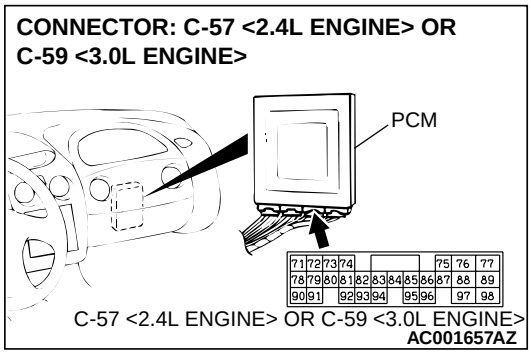
(4) Turn the ignition switch to the "LOCK" (OFF) position.

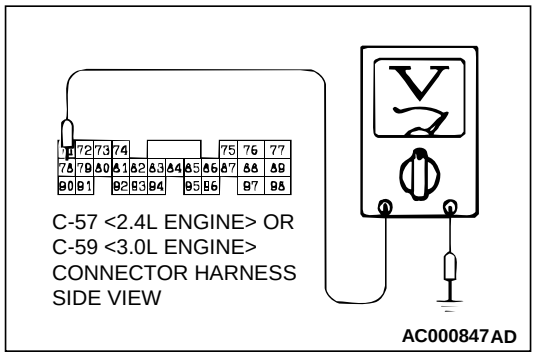
Q: Is the voltage normal?

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

STEP 4. Check the sensor output voltage at PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-57 <2.4L Engine> or C-59 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 78 and ground by backprobing.
- With the throttle valve in idle position, voltage should be between 0.535 and 0.735 volts.
- With the throttle valve in full-open position, voltage should be between 4.5 and 5.5 volts.

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

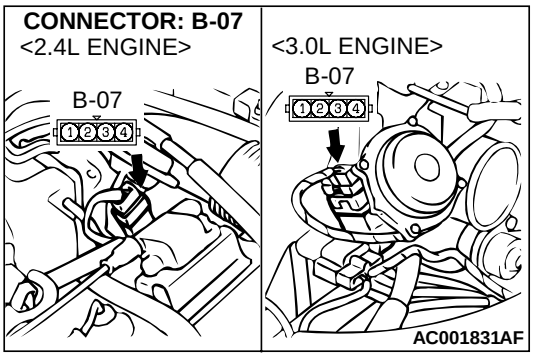
Q: Is the voltage normal?

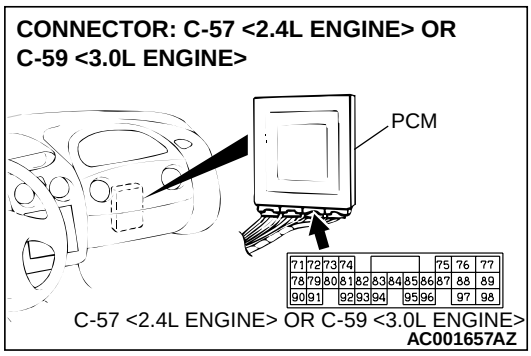
YES : Go to Step 5.
NO : Go to Step 7.

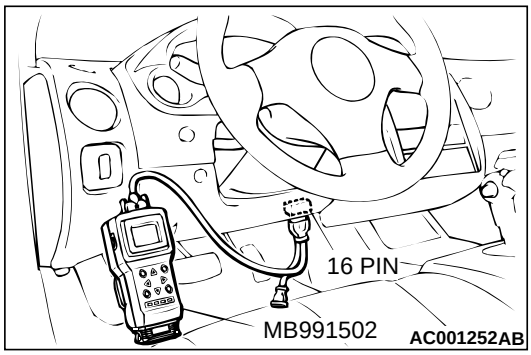
STEP 5. Check connectors B-07 at throttle position sensor and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 6.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







STEP 6. Using scan tool MB991502, check data list item 11: Throttle Position Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

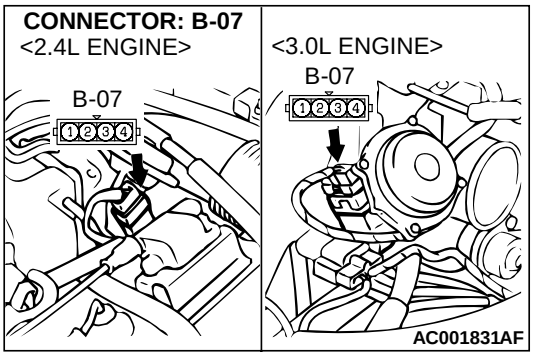
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in the full-open position, voltage should be between 4,500 and 5,500 mV.

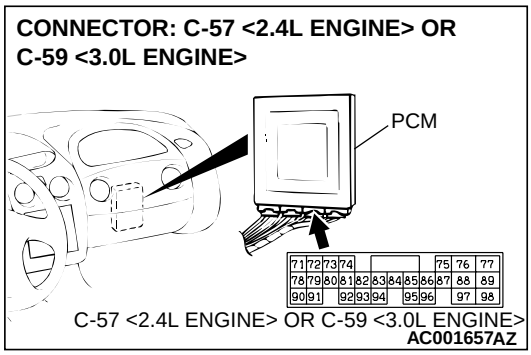
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.





STEP 7. Check connectors B-07 at throttle position sensor and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

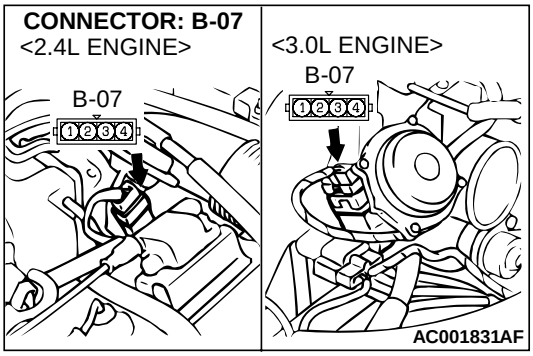
Q: Are the connectors in good condition?

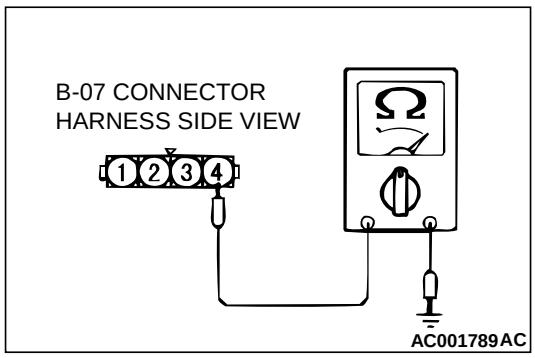
YES : Repair harness open circuit or damage between throttle position sensor connector B-07 terminal 3 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 78.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 8. Check the power supply voltage at throttle position sensor connector B-07 by backprobing.

(1) Do not disconnect connector B-07.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 4 and ground by backprobing.
- Voltage should be between 4.9 and 5.1 volts.

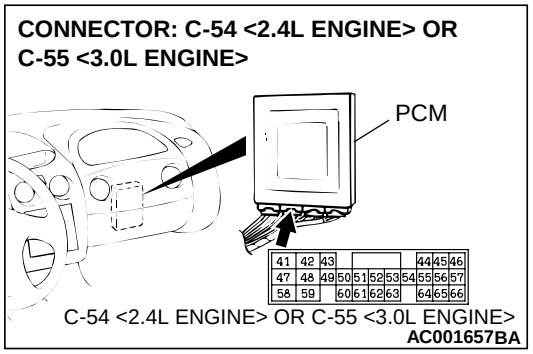
(4) Turn the ignition switch to the "LOCK" (OFF) position.

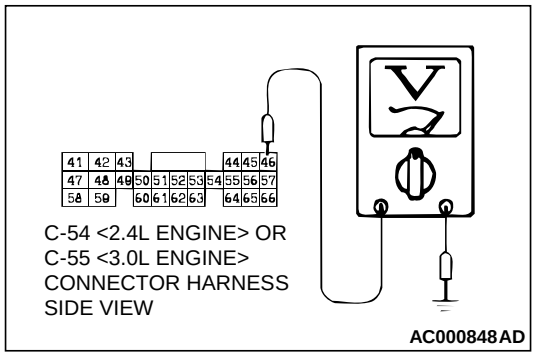
Q: Is the voltage normal?

YES : Go to Step 13.
NO : Go to Step 9.

STEP 9. Check the power supply voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



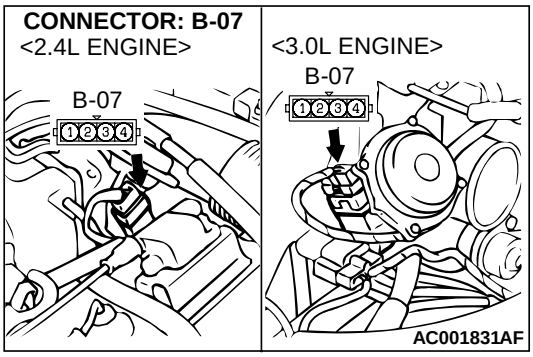


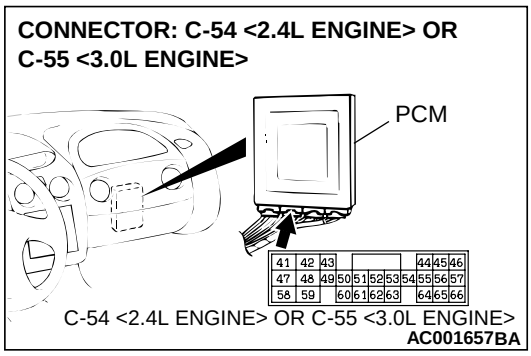
(3) Measure the voltage between terminal 46 and ground by backprobing.
- Voltage should be between 4.9 and 5.1 volts.

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

Q: Is the voltage normal?

YES : Go to Step 10.
NO : Go to Step 11.



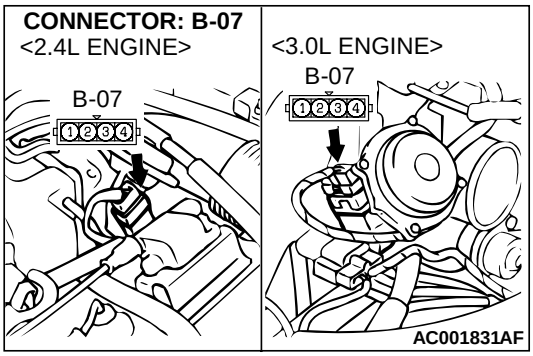


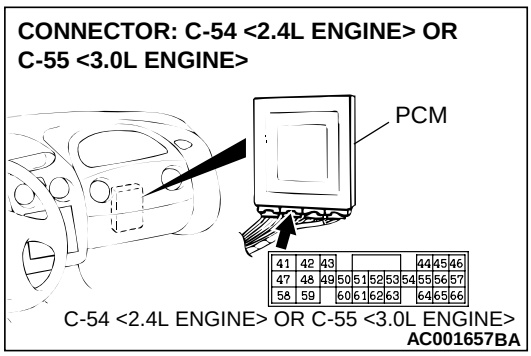
STEP 10. Check connectors B-07 at throttle position sensor and C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Repair harness open circuit or damage between throttle position sensor connector B-07 terminal 4 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 46.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 11. Check connectors B-07 at throttle position sensor and C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 12.

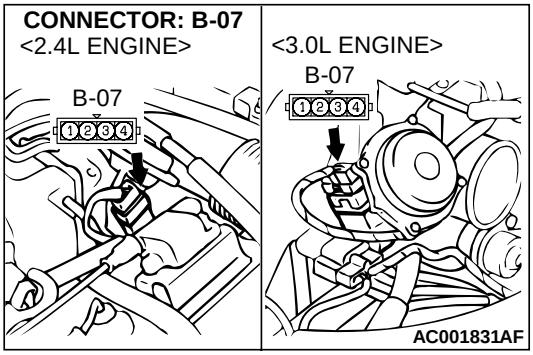
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

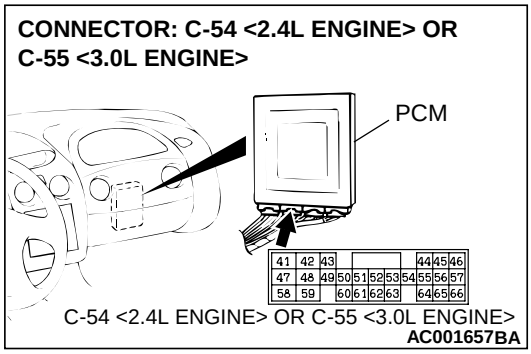
STEP 12. Check harness for short circuit to ground between throttle position sensor connector B-07 terminal 4 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 46.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.

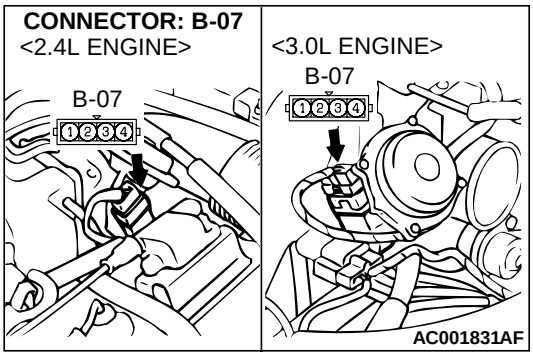


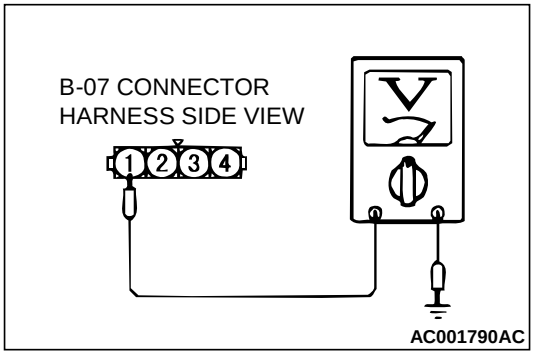


STEP 13. Check the ground voltage at throttle position sensor connector B-07 by backprobing.

(1) Do not disconnect connector B-07.

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





(3) Measure the voltage between terminal 1 and ground by backprobing.
- Voltage should be 0.5 volt or less.

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

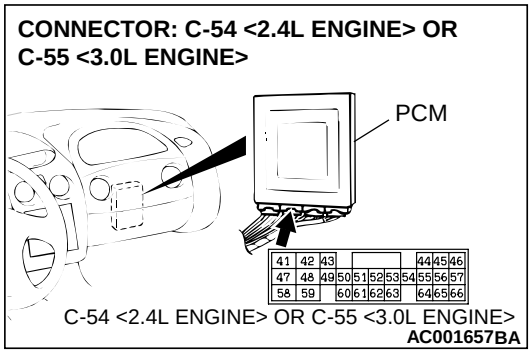
Q: Is the voltage normal?

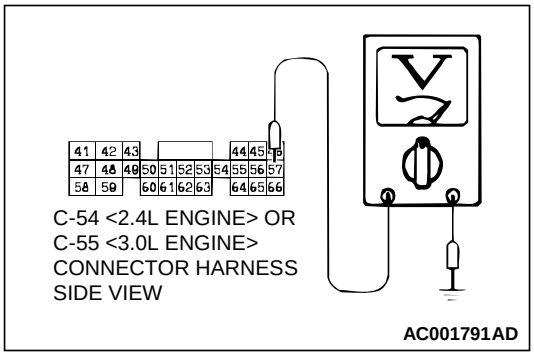
YES : Go to Step 17.

NO : Go to Step 14.

STEP 14. Check the ground voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 57 and ground by backprobing.
- Voltage should be 0.5 volt or less.

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

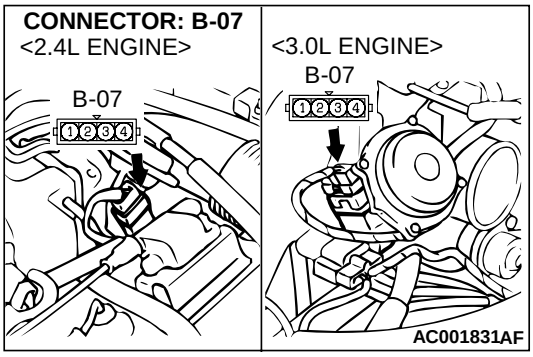
Q: Is the voltage normal?

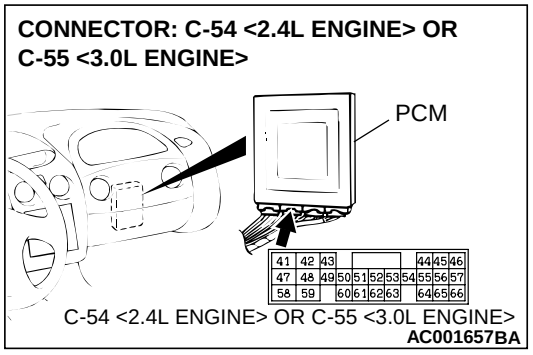
YES : Go to Step 15.
NO : Go to Step 16.

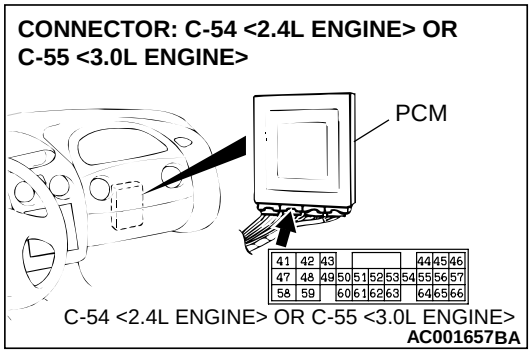
STEP 15. Check connectors B-07 at throttle position sensor and C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Repair harness open circuit or damage between throttle position sensor connector B-07 terminal 1 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 57.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





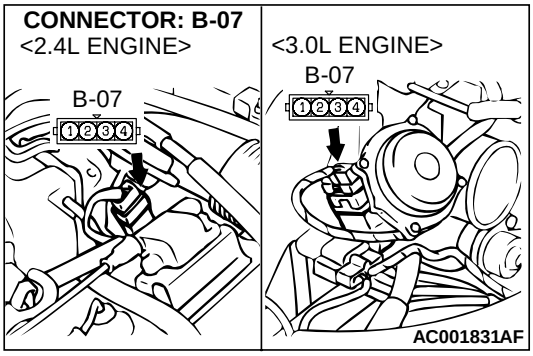


STEP 16. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 6.

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

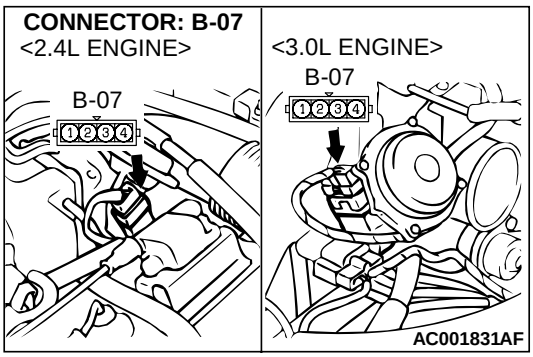


STEP 17. Check connector B-07 at throttle position sensor for damage.

Q: Is the connector in good condition?

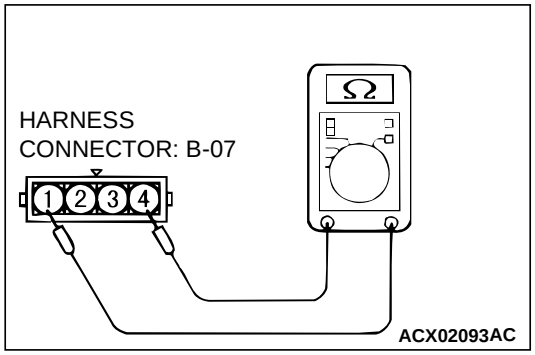
YES : Go to Step 18.

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



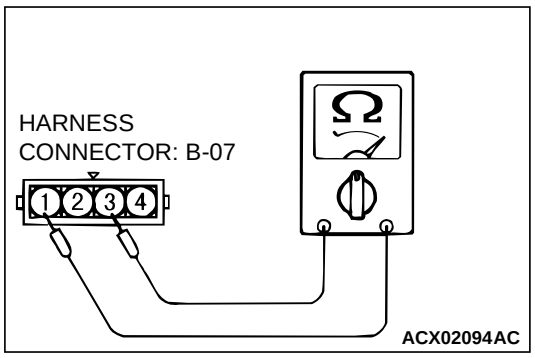
STEP 18. Check the throttle position sensor.

(1) Disconnect connector B-07 and measure at the sensor side.



(2) Measure the resistance between terminal 1 and 4.

Standard value: 3.5 – 6.5 kΩ



(3) Measure resistance between the throttle position sensor side connector terminal 1 and 3.

(4) Move the throttle valve from idle position to full-open position.

- Resistance should change smoothly in proportion to opening angle of the throttle valve.

Q: Is the resistance normal?

YES : Go to Step 19.

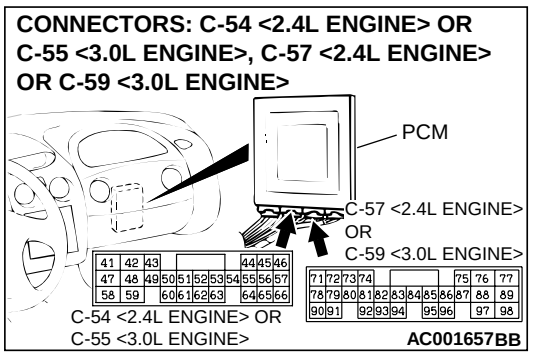
NO : Replace the throttle position sensor. Refer to GROUP 13A <2.4L Engine>, Throttle Body Assembly P.13A-592 or 13B <3.0L Engine>, Throttle Body Assembly P.13B-689.

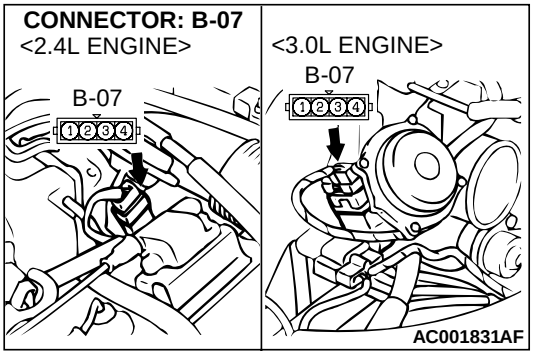
STEP 19. Check connectors C-54 <2.4L Engine> or C-55 <3.0L Engine> and C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 20.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



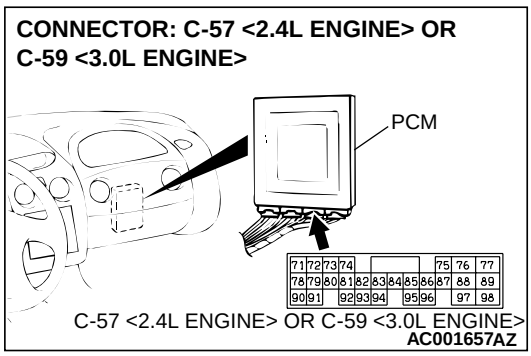


STEP 20. Check harness for short circuit to ground or damage between throttle position sensor connector B-07 terminal 3 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 78.

Q: Is the harness wire in good condition?

YES : Go to Step 21.

NO : Repair it.



STEP 21. Check the connector and the harness for short circuit to ground between the throttle position sensor connector and the auto-cruise control-ECU connector.

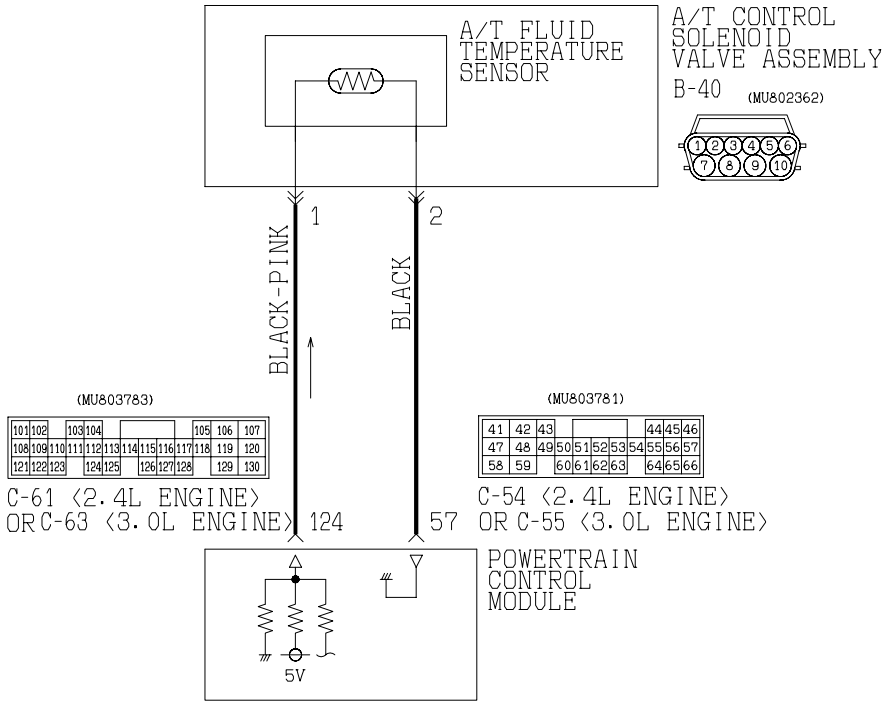
Q: Is the harness wire in good condition?

YES : Throttle position sensor adjustment. Refer to GROUP 13A <2.4L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13A-576 or 13B <3.0L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13B-677.

NO : Repair it.

DTC 15: A/T Fruid Tempeature Sensor System (Open Circuit)

A/T Fluid Temperature Sensor System Circuit



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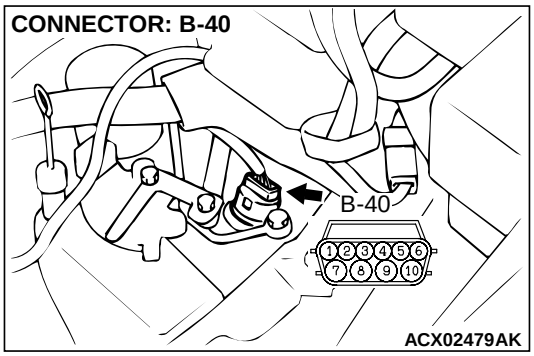
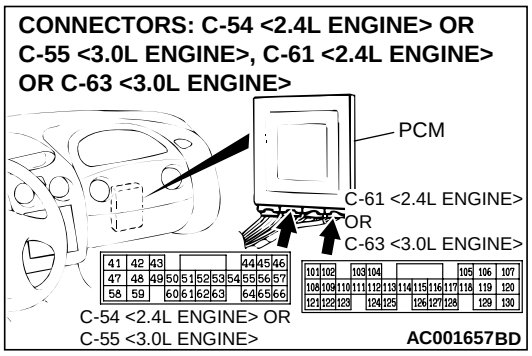




CIRCUIT OPERATION

- The PCM (terminal 124) applies 5 volts to the A/T fluid temperature sensor output terminal (terminal 1).
- Ground terminal (terminal 2) is grounded to the PCM (terminal 57).
- The A/T fluid temperature sensor is an NTC (negative temperature coefficient) type of resistor. When the A/T fluid temperature rises, the resistance decreases.
- The A/T fluid temperature sensor output voltage rises when the resistance increases (cools), and drops when the resistance decreases (heats up).

DTC SET CONDITIONS

If the A/T fluid temperature sensor output voltage is 4.5 volts or more after driving for 10 minutes or more (if the A/T fluid temperature does not increase), there is an open circuit in the A/T fluid temperature sensor and diagnostic trouble code number "15" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the A/T fluid temperature sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

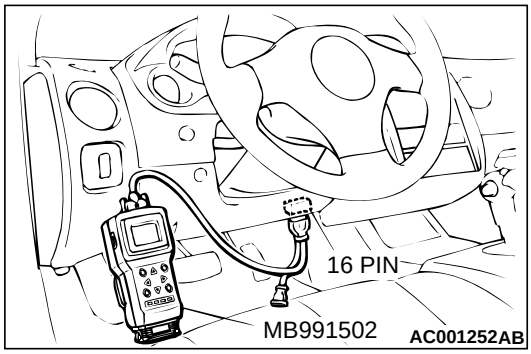
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check data list item 15: A/T Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 15: A/T Fluid Temperature Sensor.
- At cool condition: Almost equal to the ambient temperature (atmospheric temperature)
- At warm condition: 70 to 80°C (158 to 176°F)

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

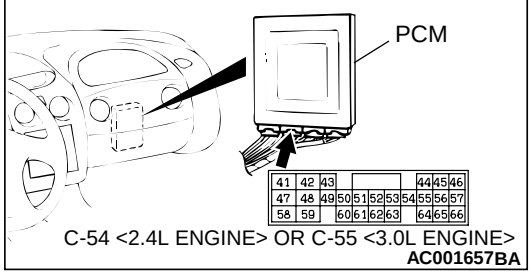
Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

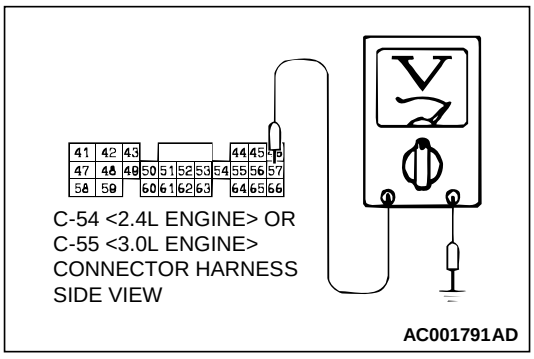
NO : Go to Step 2.

STEP 2. Check the ground voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 57 and ground by backprobing.
- Voltage should be 0.5 volt or less.

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

Q: Is the voltage normal?

YES : Go to Step 5.

NO : Go to Step 3.

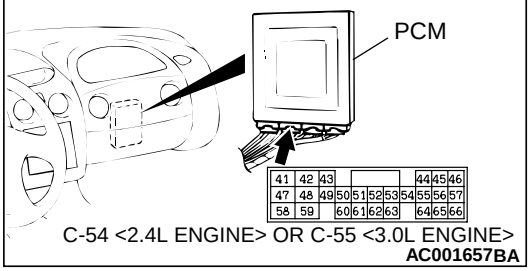
STEP 3. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 4.

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

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



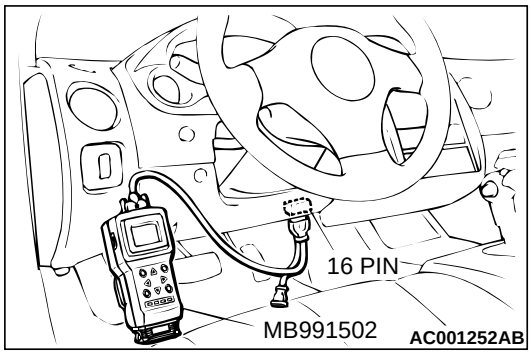
STEP 4. Using scan tool MB991502, check data list item 15: A/T Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to the data reading mode for item 15: A/T Fluid Temperature Sensor.
- At cool condition: Almost equal to the ambient temperature (atmospheric temperature)
- At warm condition: 70 to 80°C (158 to 176°F)

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

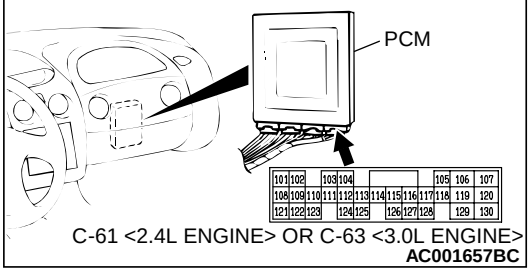


Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



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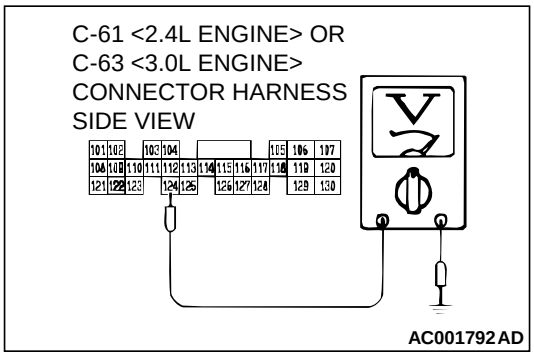
STEP 5. Check the sensor output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.

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



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(3) Measure the voltage between terminal 124 and ground by backprobing.
- When A/T fluid temperature is 20°C (68°F), voltage should be between 3.8 and 4.0 volts.
- When A/T fluid temperature is 40°C (104°F), voltage should be between 3.2 and 4.0 volts.
- When A/T fluid temperature is 80°C (176°F), voltage should be between 1.7 and 1.9 volts.

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

Q: Is the voltage normal?

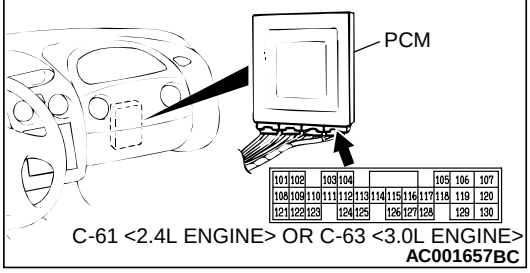
YES : Go to Step 6.
NO : Go to Step 7.

STEP 6. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

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

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



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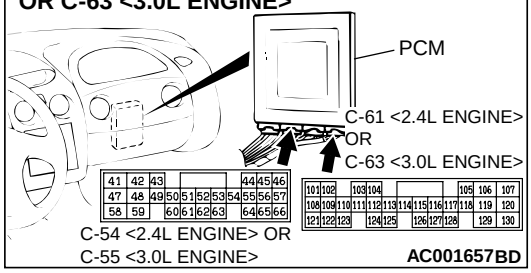
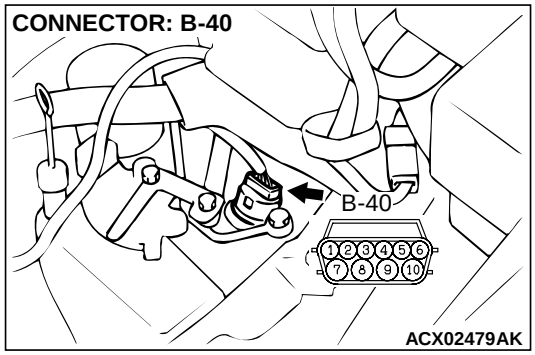
CONNECTORS: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



CONNECTOR: B-40

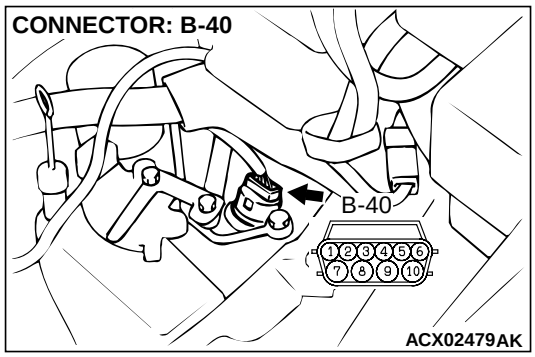


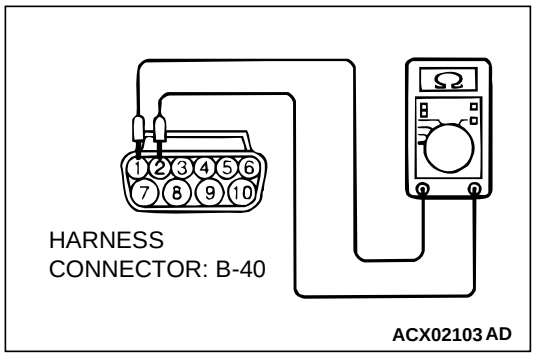
STEP 7. Check connectors C-54 <2.4L Engine> or C-55 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and B-40 at A/T control solenoid valve assembly for damage.

Q: Are the harness connectors in good condition?

YES : Go to Step 8.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 8. Check the A/T fluid temperature sensor at A/T control solenoid valve assembly connector B-40.

(1) Disconnect connector B-40 and measure at the sensor side.

(2) Measure the resistance between terminal 1 and 2.

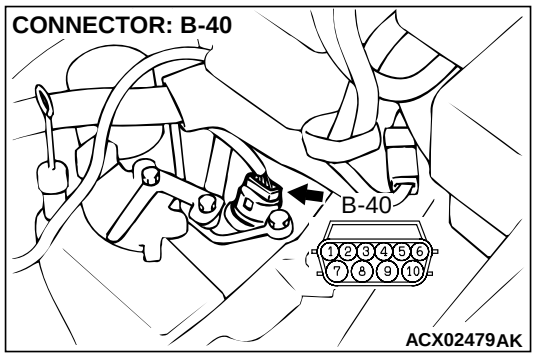
- When A/T fluid temperature is 0°C (32°F), resistance should be between 16.7 and 20.5 kiloohm.
- When A/T fluid temperature is 20°C (68°F), resistance should be between 7.3 and 8.9 kiloohm.
- When A/T fluid temperature is 40°C (104°F), resistance should be between 3.4 and 4.2 kiloohm.
- When A/T fluid temperature is 60°C (140°F), resistance should be between 1.9 and 2.2 kiloohm.
- When A/T fluid temperature is 80°C (176°F), resistance should be between 1.0 and 1.2 kiloohm.
- When A/T fluid temperature is 100°C (212°F), resistance should be between 0.57 and 0.69 kiloohm.

Q: Is the resistance normal?

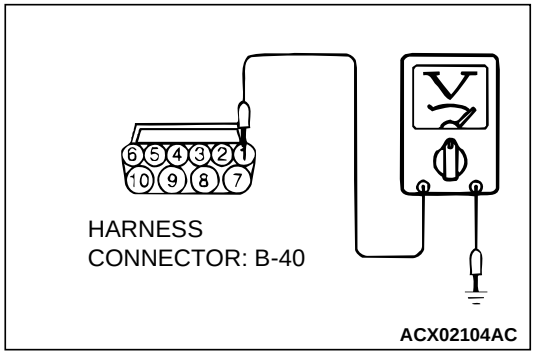
YES : Go to Step 9.

NO : Replace the A/T fluid temperature sensor. Refer to GROUP 23B, Transaxle P.23B-10.

STEP 9. Check the power supply voltage at A/T control solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



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

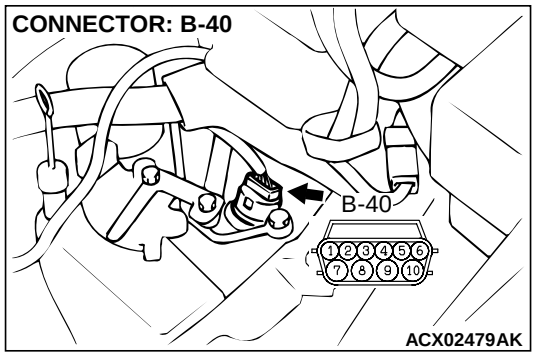
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

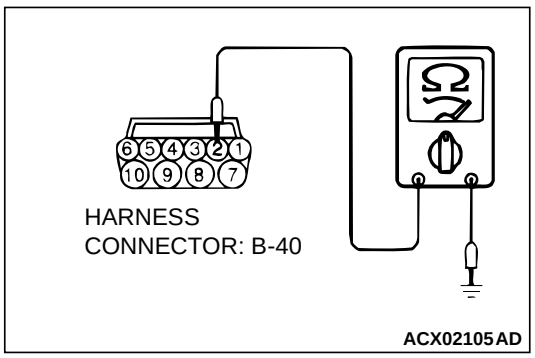
YES : Go to Step 10.

NO : Repair harness open circuit between A/T control solenoid valve assembly connector B-40 terminal 1 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 124.

STEP 10. Check the continuity at A/T control solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.



(2) Check for the continuity between terminal 2 and ground.
- Should be less than 2 ohm.

Q: Is the continuity normal?

YES : Go to Step 11.

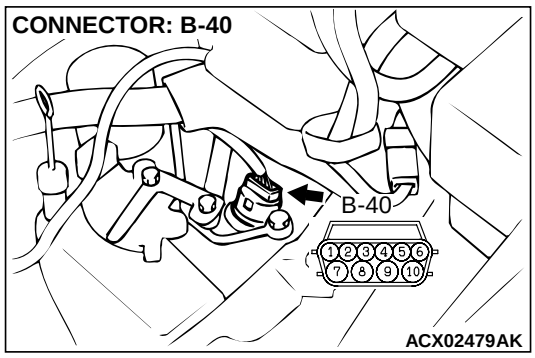
NO : Repair harness open circuit or damage between A/T control solenoid valve assembly connector B-40 terminal 2 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 57.

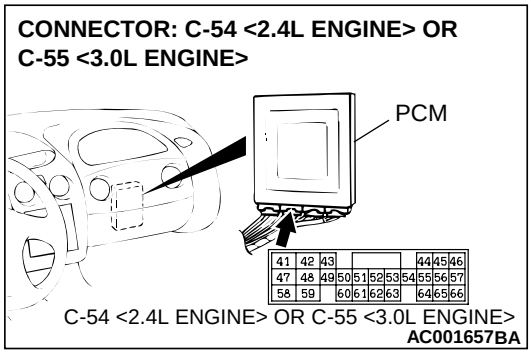
STEP 11. Check harness for damage between A/T control solenoid valve assembly connector B-40 terminal 1 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 124.

Q: Is the harness wire in good condition?

YES : Repair harness damage between A/T control solenoid valve assembly connector B-40 terminal 2 and PCM connector C-64 <2.4L Engine> or C-65 <3.0L Engine> terminal 57.

NO : Repair it.





DTC 16: A/T Fluid Tenperature Sensor System (Short Circuit)

A/T Fluid Temperature Sensor System Circuit
Refer to P.23A-70.

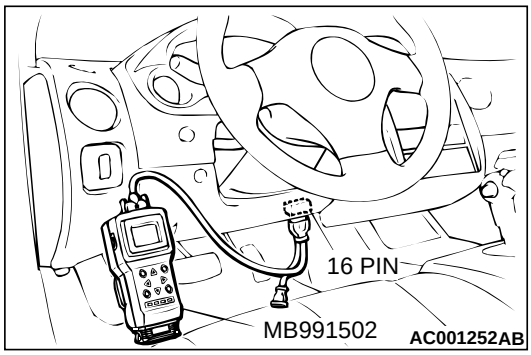
CIRCUIT OPERATION
Refer to P.23A-70.

DTC SET CONDITIONS
If the A/T fluid temperature sensor output detects the voltage which corresponds to 0 volt for more than one second, there is a short in the A/T fluid temperature sensor circuit and diagnostic trouble code number "16" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)
- Malfunction of the A/T fluid temperature sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check data list item 15: A/T Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

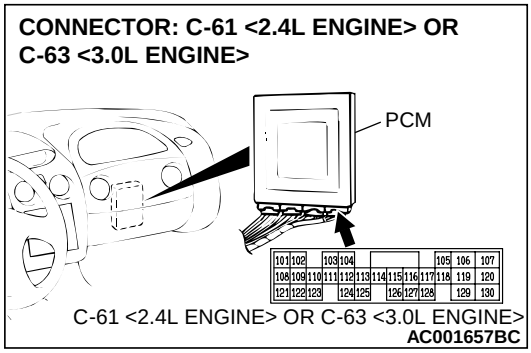
(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 15: A/T Fluid Temperature Sensor.
- At cool condition: Almost equal to the ambient temperature (atmospheric temperature)
- At warm condition: 70 to 80°C (158°F to 176°F)

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

Q: Is the sensor operating properly?

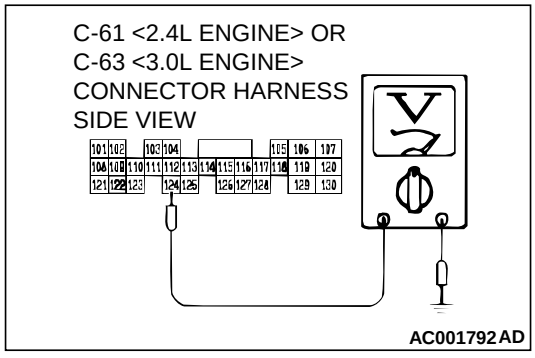
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.



STEP 2. Check the sensor output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



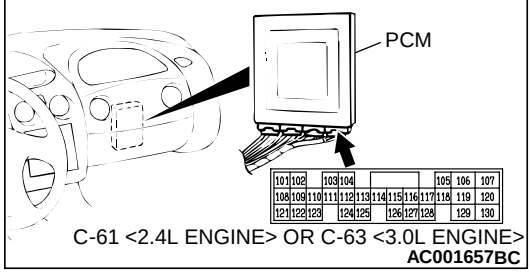
(3) Measure the voltage between terminal 124 and ground by backprobing.
- When A/T fluid temperature is 20°C (68°F), voltage should be between 3.8 and 4.0 volts.
- When A/T fluid temperature is 40°C (104°F), voltage should be between 3.2 and 3.4 volts.
- When A/T fluid temperature is 80°C (176°F), voltage should be between 1.7 and 1.9 volts.

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

Q: Is the voltage normal?

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

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



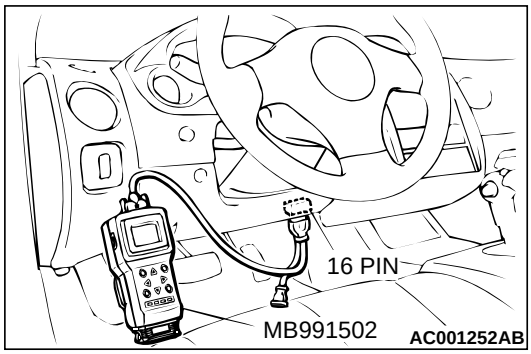
C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC

STEP 3. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 4.

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



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STEP 4. Using scan tool MB991502, check data list item 15: A/T Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 15: A/T Fluid Temperature Sensor.
- At cool condition: Almost equal to the ambient temperature (atmospheric temperature)
- At warm condition: 70 to 80°C (158 to 176°F)

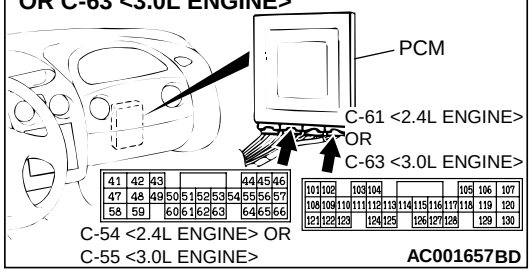
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

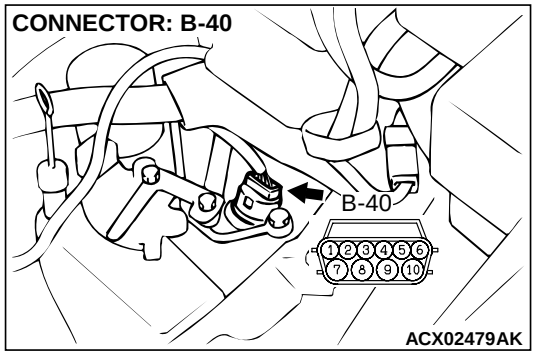
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

CONNECTORS: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



CONNECTOR: B-40

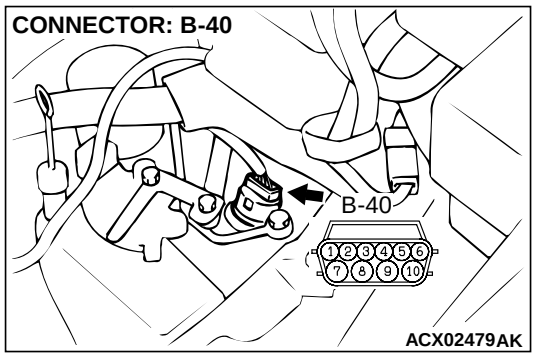


STEP 5. Check connectors C-54 <2.4L Engine> or C-55 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and B-40 at A/T control solenoid valve assembly for damage.

Q: Are the harness connectors in good condition?

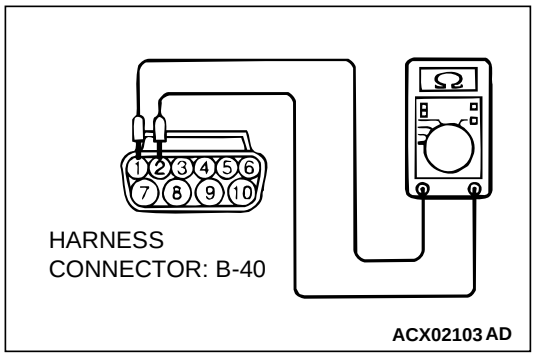
YES : Go to Step 6.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 6. Check the A/T fluid temperature sensor at A/T control solenoid valve assembly connector B-40.

(1) Disconnect connector B-40 and measure at the sensor side.



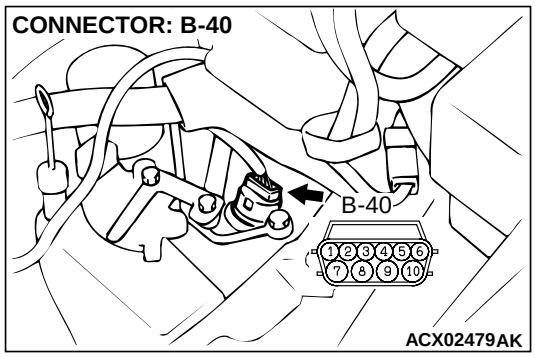
(2) Measure the resistance between terminal 1 and 2.
- When A/T fluid temperature is 0°C (32°F), resistance should be between 16.7 and 20.5 kiloohm.
- When A/T fluid temperature is 20°C (68°F), resistance should be between 7.3 and 8.9 kiloohm.
- When A/T fluid temperature is 40°C (104°F), resistance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

Q: Is the resistance normal?

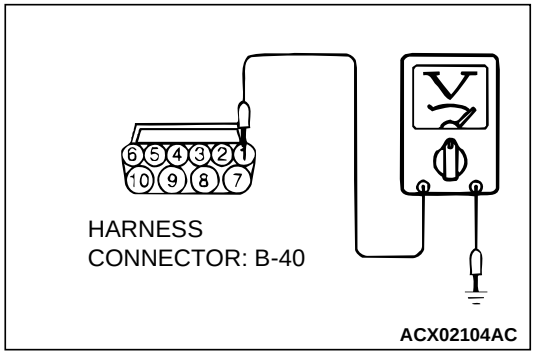
YES : Go to Step 7.

NO : Replace the A/T fluid temperature sensor. Refer to GROUP 23B, Transaxle P.23B-10.

STEP 7. Check the power supply voltage at A/T control solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



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

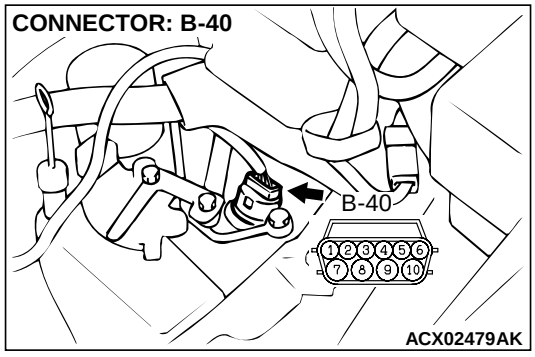
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 8.

NO : Repair harness short circuit to ground between A/T control solenoid valve assembly connector B-40 terminal 1 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 124.

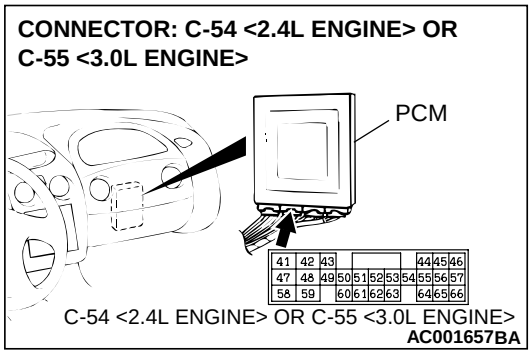
STEP 8. Check harness for damage between A/T control solenoid valve assembly connector B-40 terminal 1 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 124.



Q: Is the harness wire in good condition?

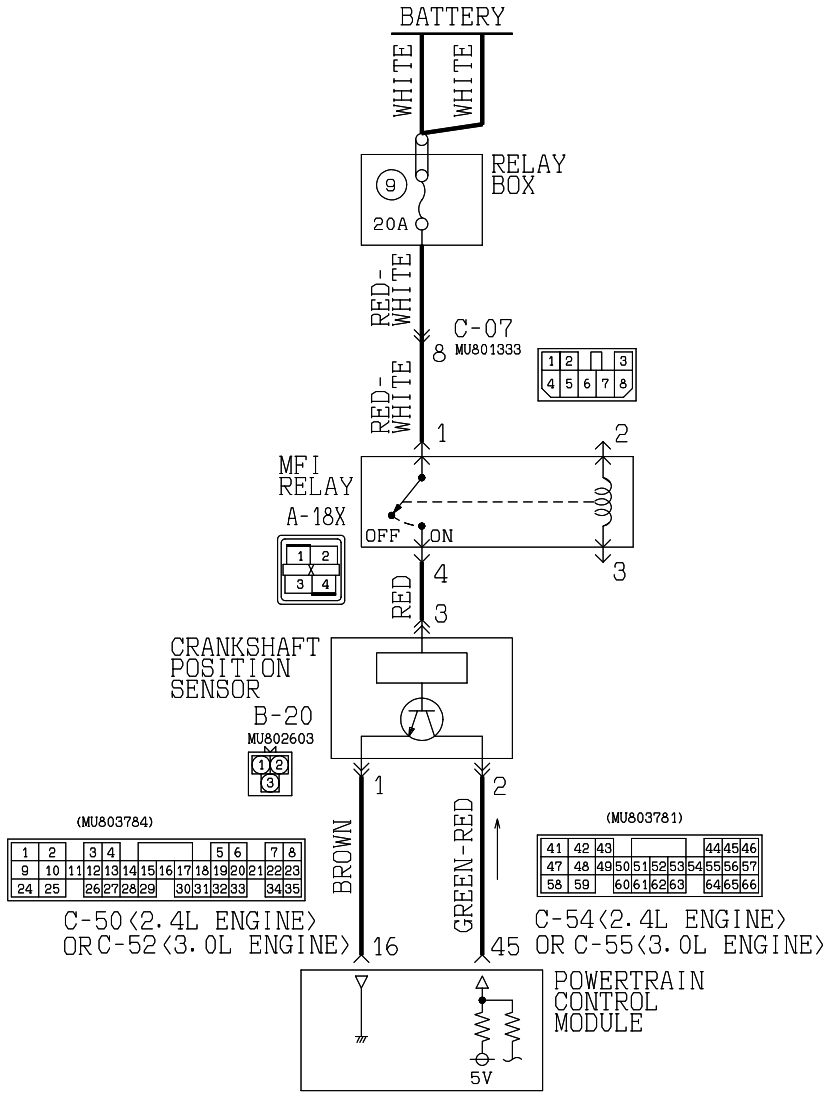
YES : Repair harness damage between solenoid valve assembly connector B-40 terminal 2 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 57.

NO : Repair it.

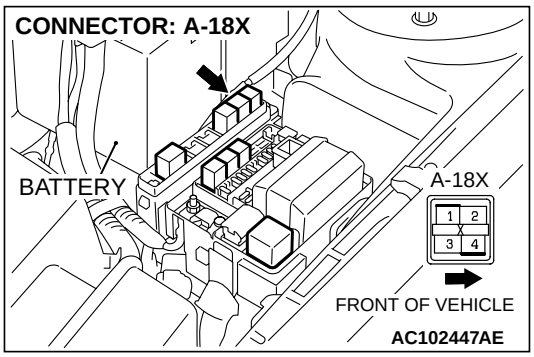


DTC 21: Crankshaft Position Sensor System

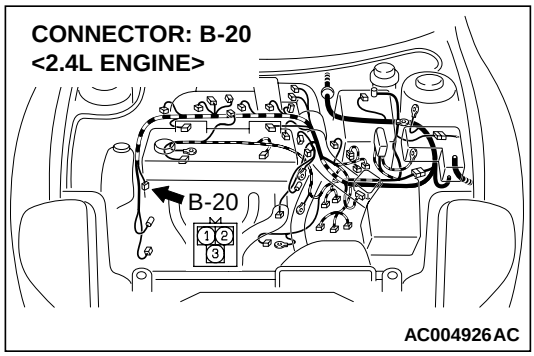
Crankshaft Position Sensor System Circuit



W3S11M01AA
AC106629AB

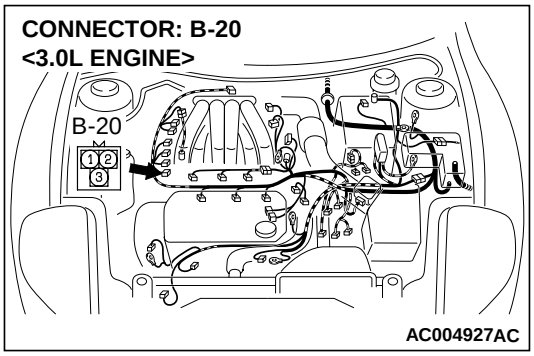


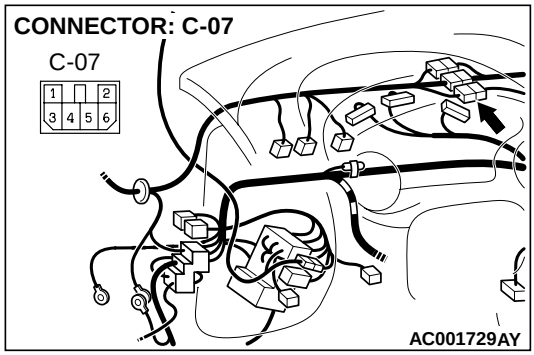
AC102447AE

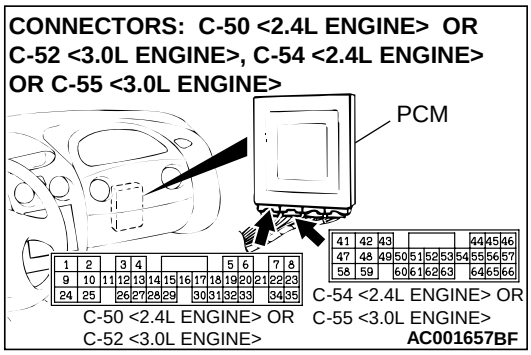


AC004926AC

TSB Revision







CIRCUIT OPERATION

The crankshaft position sensor power is supplied from the MFI relay (terminal 3), and the ground (terminal 1) is provided on the PCM. The PCM supplies a five-volts voltage to crankshaft position sensor output terminal (terminal 2). The crankshaft position sensor generates a pulse signal when the output terminal is opened and grounded. The sensor is opened and closed as the flat on the crankshaft passes by.

DTC SET CONDITIONS

If no output pulse is detected from the crankshaft position sensor for five seconds or more while driving at 25 km/h (16 mph) or more, it is judged that there is an open circuit in the crankshaft position sensor and diagnostic trouble code number "21" is output.

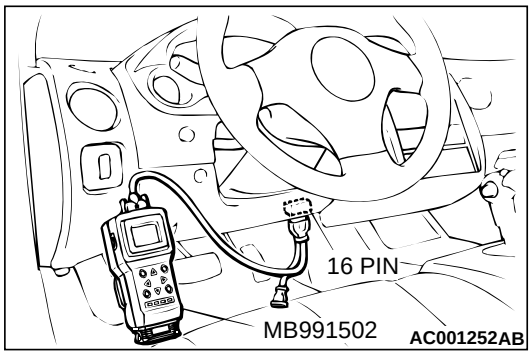
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the crankshaft position sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check data list item 21: Crankshaft Position Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) With the gear selector lever in the "P" position, start the engine and run at idle.
(3) Set scan tool MB991502 to data reading mode for item 21: Crankshaft Position Sensor.
- When the accelerator pedal is not depressed (throttle valve is fully closed) the display should be "600 to 900 r/min."
- With the accelerator pedal depressed, the engine speed display should increase according to engine speed.

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

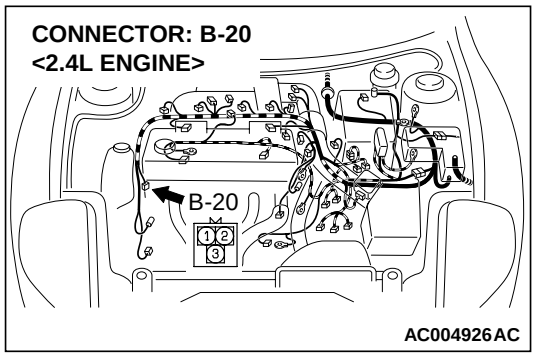
Q: Is the sensor operating properly?

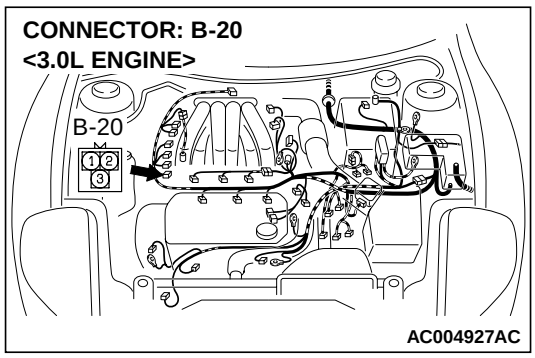
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

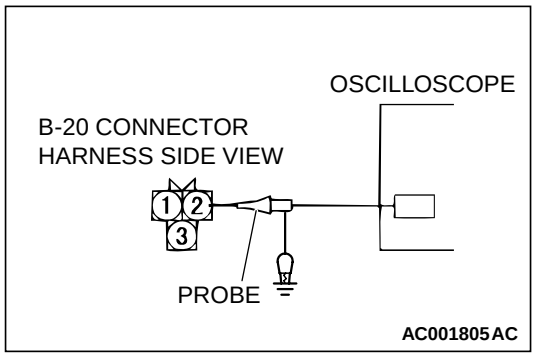
NO : Go to Step 2.

STEP 2. Using the oscilloscope, check the waveform at crankshaft position sensor connector B-20.

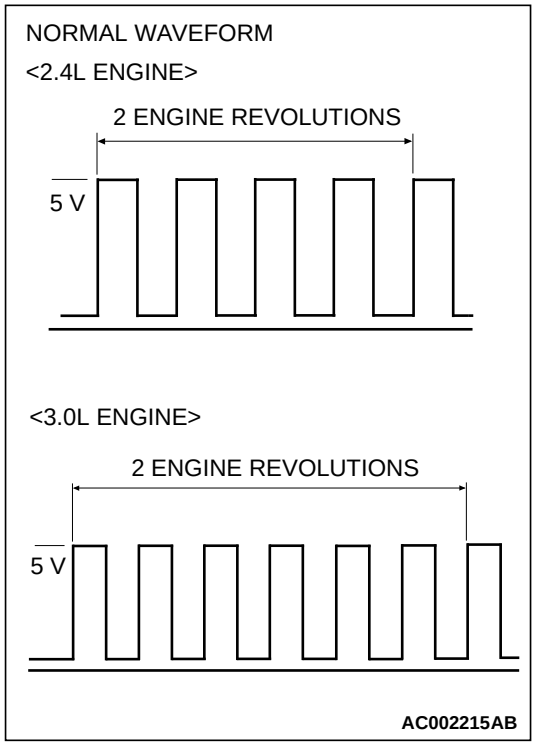
(1) Do not disconnect connector B-20.







(2) Connect an oscilloscope probe to crankshaft position sensor connector B-20 terminal 2 by backprobing.
(3) With the gear selector lever in the "P" position, start the engine and run at idle.



(4) Check the waveform.
- The waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.6 volts and less.

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

Q: Is the waveform normal?

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

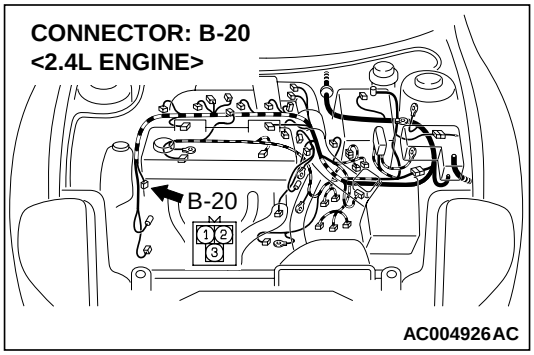
STEP 3. Check connectors B-20 at crankshaft position sensor and C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 4.

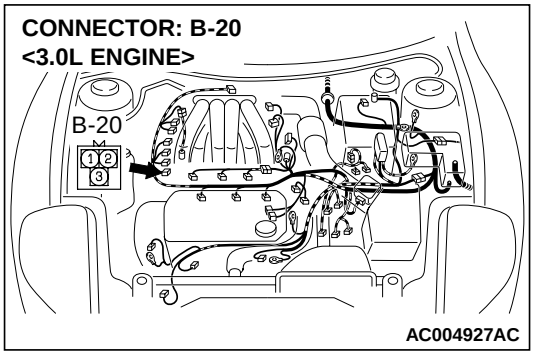
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: B-20 <2.4L ENGINE>



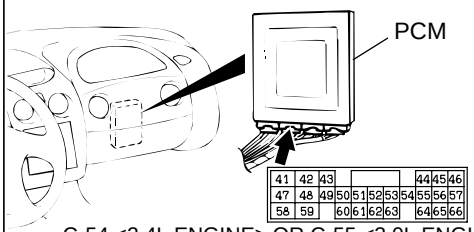
AC004926AC

CONNECTOR: B-20 <3.0L ENGINE>



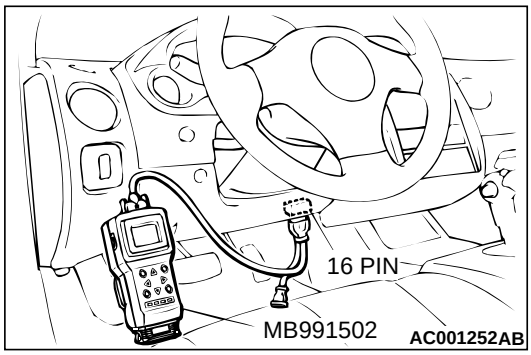
AC004927AC

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>

AC001657BA



STEP 4. Using scan tool MB991502, check data list item 21: Crankshaft Position Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) With the gear selector lever in the "P" position, start the engine and run at idle.
(3) Set scan tool MB991502 to data reading mode for item 21: Crankshaft Position Sensor.
- When the accelerator pedal is not depressed (throttle valve is fully closed) the display should be "600 to 900 r/min."
- With the accelerator pedal depressed, the engine speed display should increase according to engine speed.

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

Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

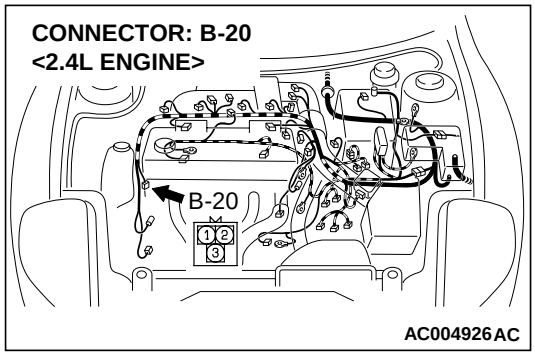
NO : Replace the PCM.

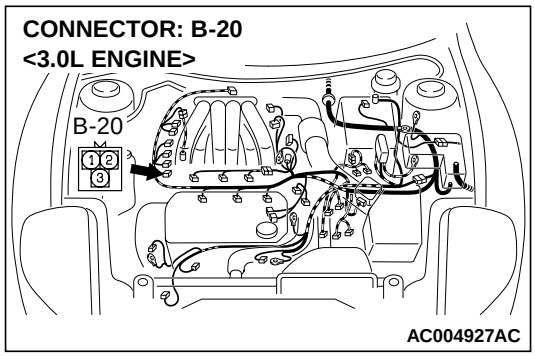
STEP 5. Check connector B-20 at crankshaft position sensor for damage.

Q: Is the connector in good condition?

YES : Go to Step 6.

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

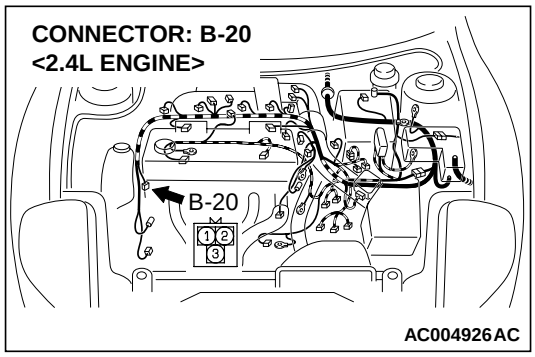


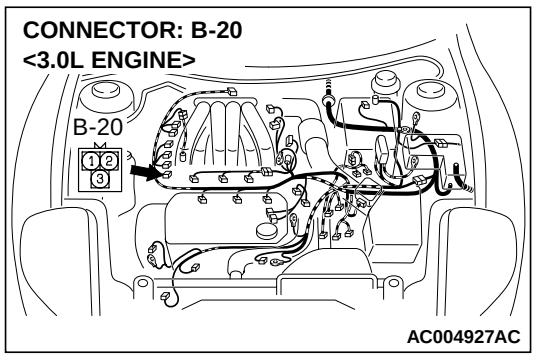


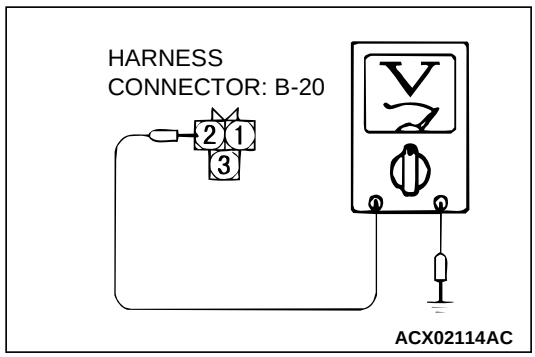
STEP 6. Check the sensor output voltage at crankshaft position sensor connector B-20.

(1) Disconnect connector B-20 and measure at the harness side.

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







(3) Measure the voltage between terminal 2 and ground.
- Voltage should be between 4.9 and 5.1 volts.

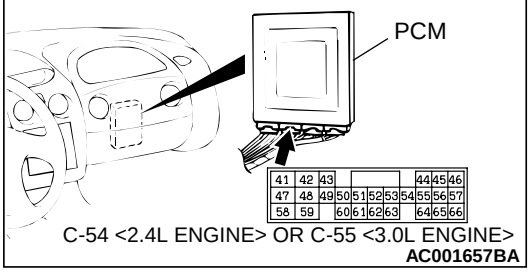
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 11.

NO : Go to Step 7.

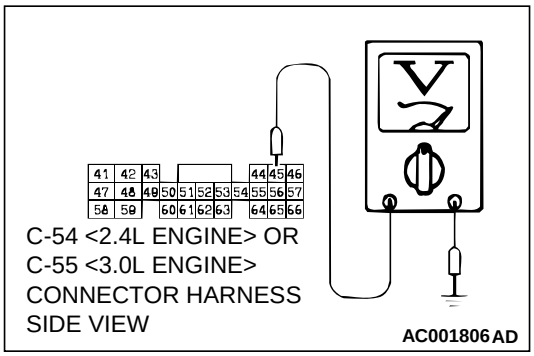
CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>
AC001657BA

STEP 7. Check the sensor output voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.
(2) Disconnect connector B-20 at crankshaft position sensor.
(3) Turn the ignition switch to the "ON" position.



C-54 <2.4L ENGINE> OR
C-55 <3.0L ENGINE>
CONNECTOR HARNESS
SIDE VIEW
AC001806AD

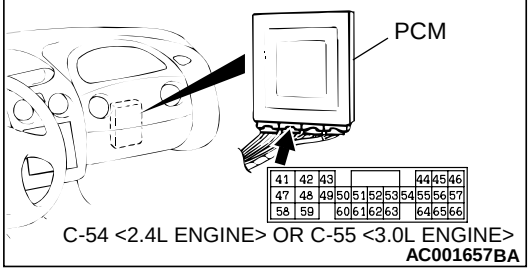
(4) Measure the voltage between terminal 45 and ground by backprobing.
- Voltage should be between 4.9 and 5.1 volts.

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

Q: Is the voltage normal?

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

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



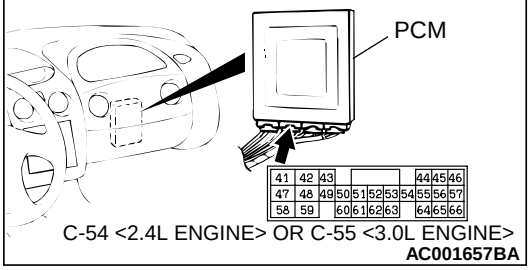
C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>
AC001657BA

STEP 8. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit between crankshaft position sensor connector B-20 terminal 2 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 45.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>



C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>
AC001657BA

STEP 9. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

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

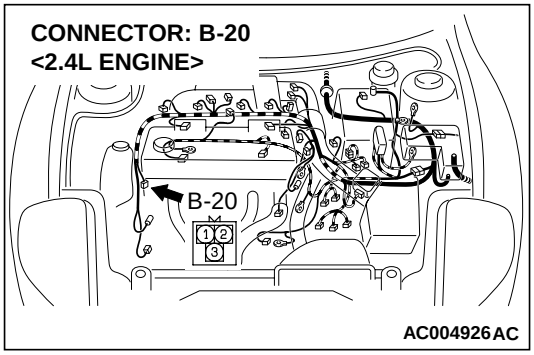
STEP 10. Check harness for short circuit to ground between crankshaft position sensor connector B-20 terminal 2 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 45.

Q: Is the harness wire in good condition?

YES : Go to Step 4.

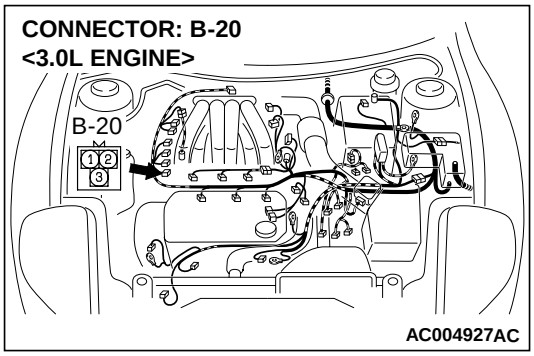
NO : Repair it.

CONNECTOR: B-20 <2.4L ENGINE>



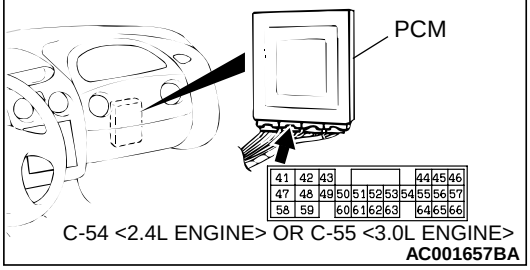
AC004926AC

CONNECTOR: B-20 <3.0L ENGINE>



AC004927AC

CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>

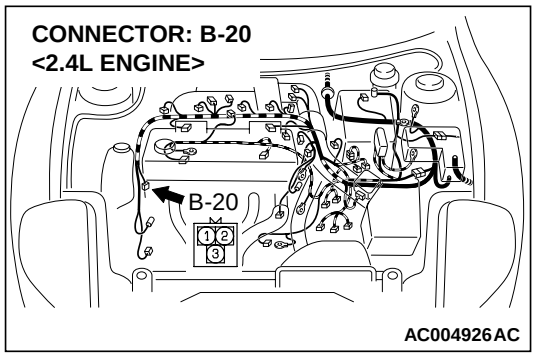


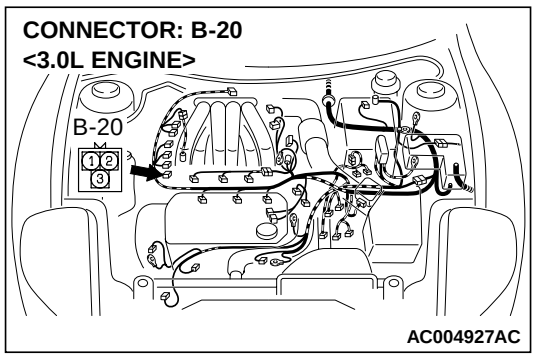
C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>

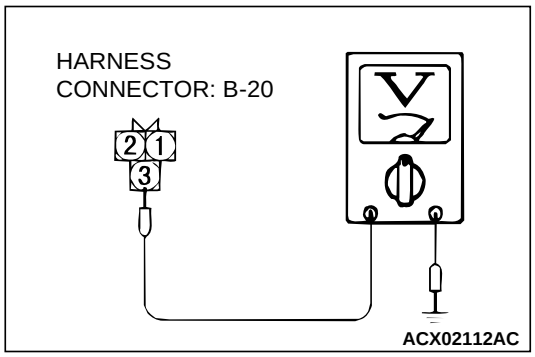
AC001657BA

STEP 11. Check the power supply voltage at crankshaft position sensor connector B-20.

(1) Disconnect connector B-20 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.







(3) Measure the voltage between terminal 3 and ground.
- Voltage should be battery positive voltage.

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

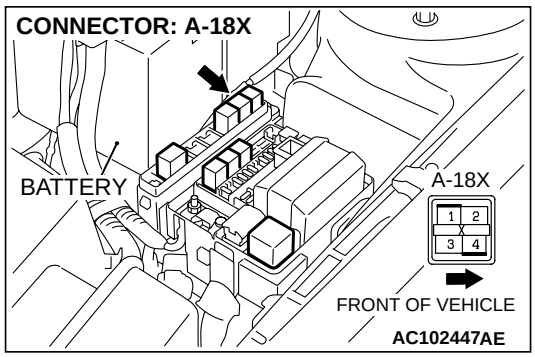
Q: Is the voltage normal?

YES : Go to Step 13.
NO : Go to Step 12.

STEP 12. Check connector A-18X at MFI relay for damage.

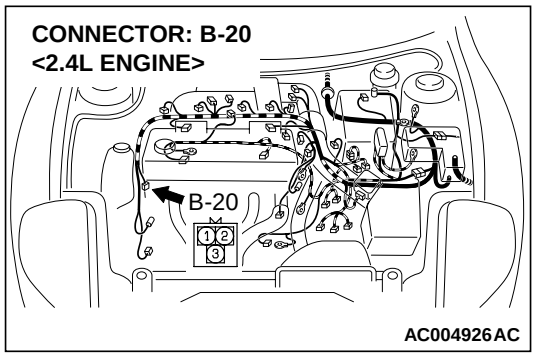
Q: Is the connector in good condition?

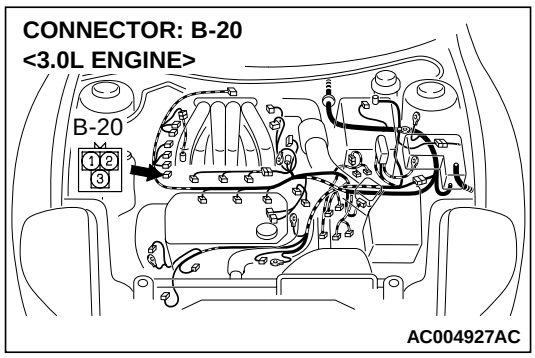
YES : Repair harness open circuit or short circuit to ground between MFI relay connector A-18X terminal 4 and crankshaft position sensor connector B-20 terminal 3.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

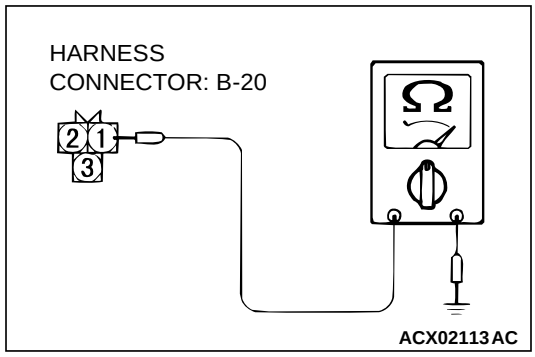


STEP 13. Check the continuity at crankshaft position sensor connector B-20.

(1) Disconnect connector B-20 and measure at the harness side.







(2) Check for the continuity between terminal 1 and ground.
- Should be less than 2 ohm.

Q: Is the continuity normal?

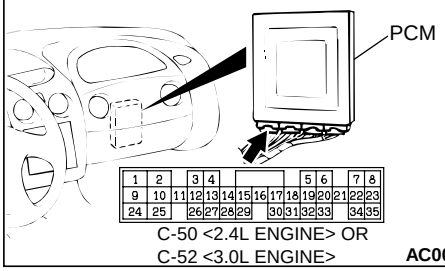
YES : Go to Step 18.
NO : Go to Step 14.

STEP 14. Check the ground voltage at PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-50 <2.4L Engine> or C-52 <3.0L Engine>.

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

CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>



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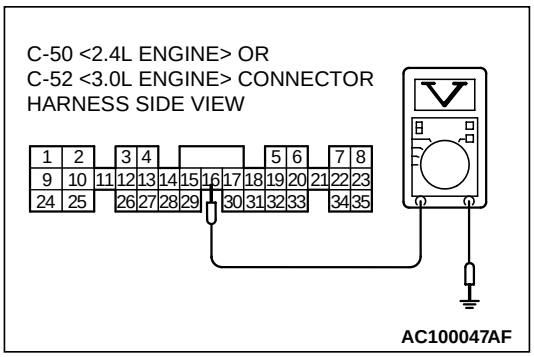


AC100047AF

(3) Measure the voltage between terminal 16 and ground by backprobing.
- Voltage should be 0.5 volt or less.

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

Q: Is the voltage normal?

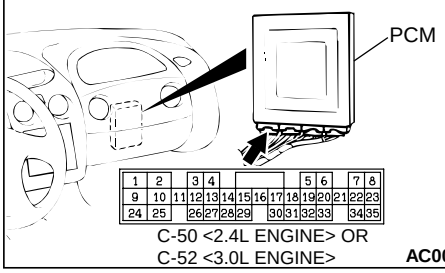
YES : Go to Step 15.
NO : Go to Step 16.

STEP 15. Check connector C-50 <2.4L Engine> or C-52 <3.0L Engine> at PCM for damage.

Q: Is the harness connector in good condition?

YES : Repair harness open circuit or damage between crankshaft position sensor connector B-20 terminal 1 and PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>



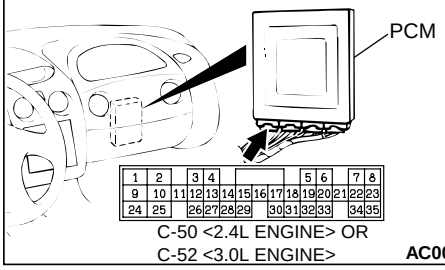
AC001657BE

STEP 16. Check connector C-50 <2.4L Engine> or C-52 <3.0L Engine> at PCM for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 17.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>



AC001657BE

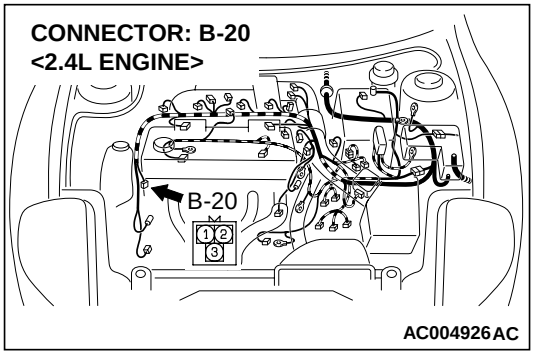
STEP 17. Check harness for short circuit to ground between crankshaft position sensor connector B-20 terminal 1 and PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16.

Q: Is the harness wire in good condition?

YES : Go to Step 4.

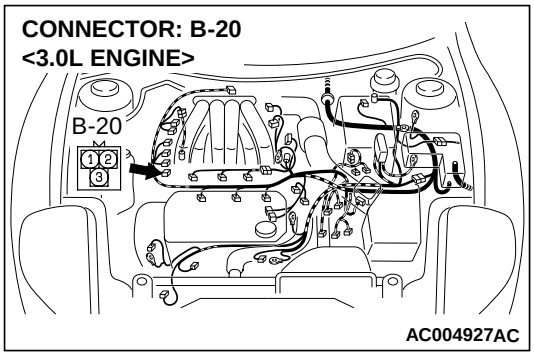
NO : Repair it.

CONNECTOR: B-20 <2.4L ENGINE>



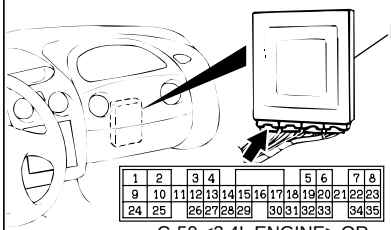
AC004926AC

CONNECTOR: B-20 <3.0L ENGINE>



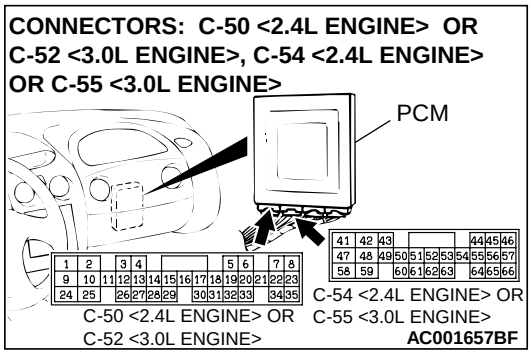
AC004927AC

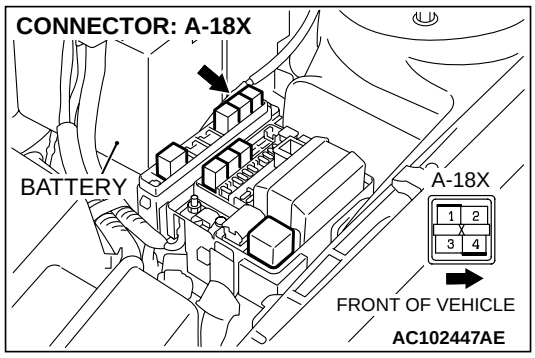
CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>



C-50 <2.4L ENGINE> OR
C-52 <3.0L ENGINE>

AC001657BE





STEP 18. Check connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM and A-18X at the MFI relay for damage.
Q: Are the harness connectors in good condition?

YES : Go to Step 19.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

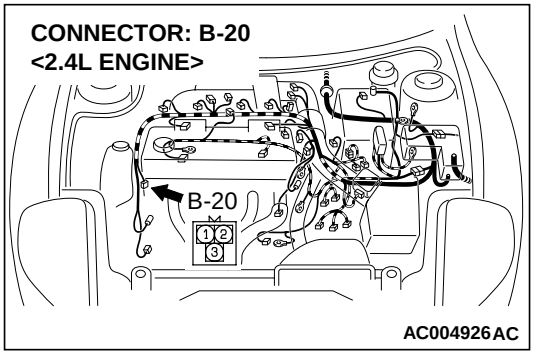
STEP 19. Check harness for damage between crankshaft position sensor connector B-20 terminal 1 and PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16.

Q: Is the harness wire in good condition?

YES : Go to Step 20.

NO : Repair it.

CONNECTOR: B-20 <2.4L ENGINE>



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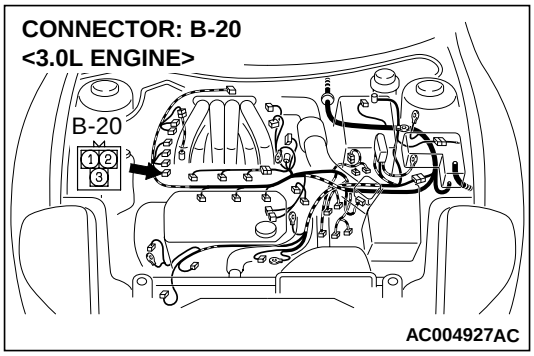
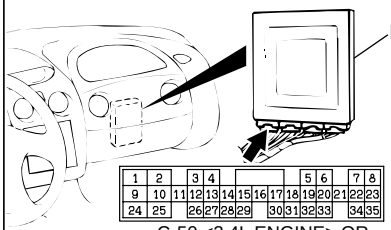
CONNECTOR: B-20 <3.0L ENGINE>



AC004927AC

CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>



C-50 <2.4L ENGINE> OR
C-52 <3.0L ENGINE>

AC001657BE

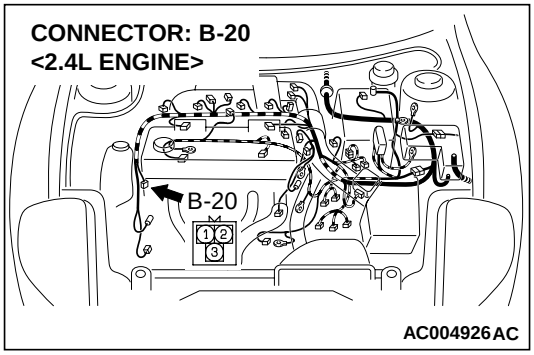
STEP 20. Check harness for damage between crankshaft position sensor connector B-20 terminal 2 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 45.

Q: Is the harness wire in good condition?

YES : Go to Step 21.

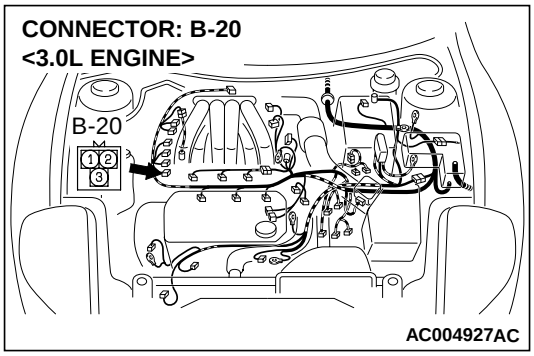
NO : Repair it.

CONNECTOR: B-20 <2.4L ENGINE>



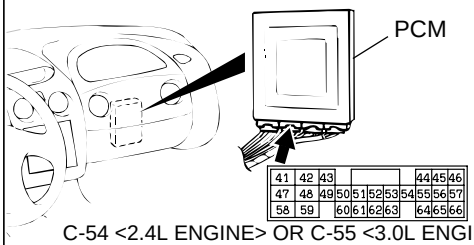
AC004926AC

CONNECTOR: B-20 <3.0L ENGINE>



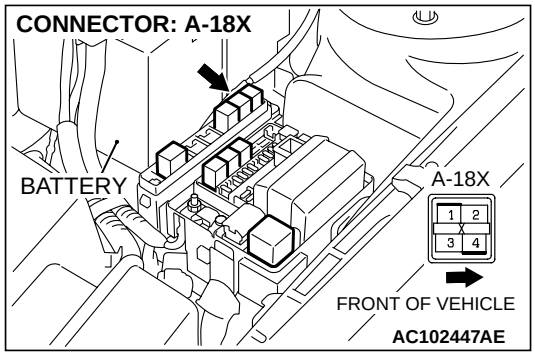
AC004927AC

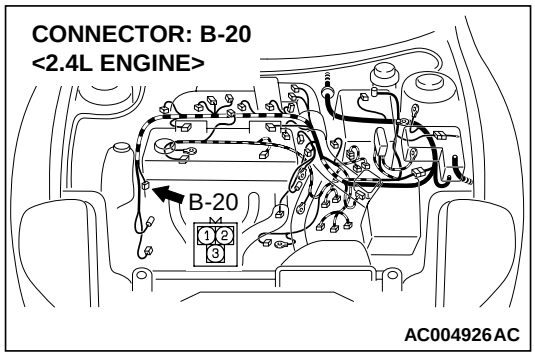
CONNECTOR: C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>

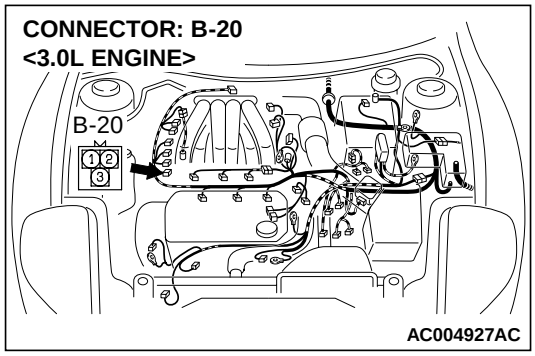


C-54 <2.4L ENGINE> OR C-55 <3.0L ENGINE>

AC001657BA







STEP 21. Check harness for damage between MFI relay connector A-18X terminal 4 and crankshaft position sensor connector B-20 terminal 3.

Q: Is the harness wire in good condition?

YES : Go to Step 22.

NO : Repair it.

STEP 22. Check the crankshaft position sensor vane.

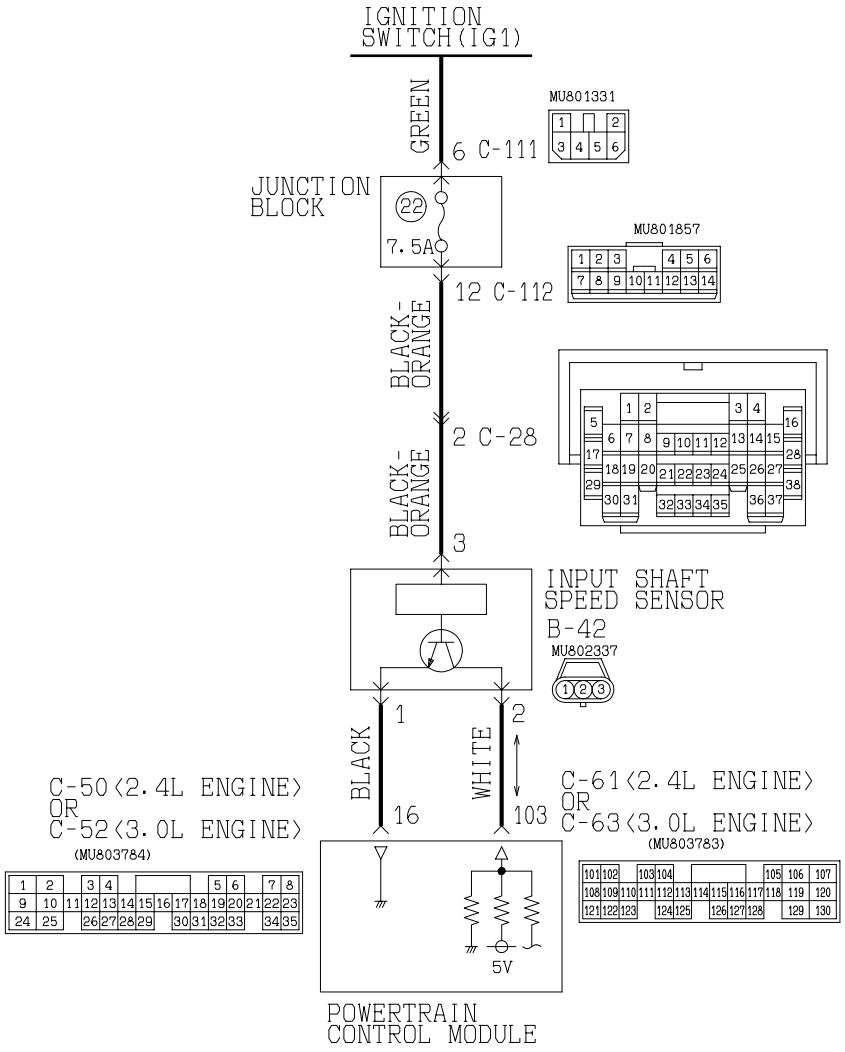
Q: Is the vane in good condition?

YES : Replace the crankshaft position sensor. Refer to GROUP 16, Ignition System – Crankshaft Position Sensor Removal and Installation <2.4L Engine>P.16-55 or <3.0L Engine>P.16-56 .

NO : Repair or replace it.

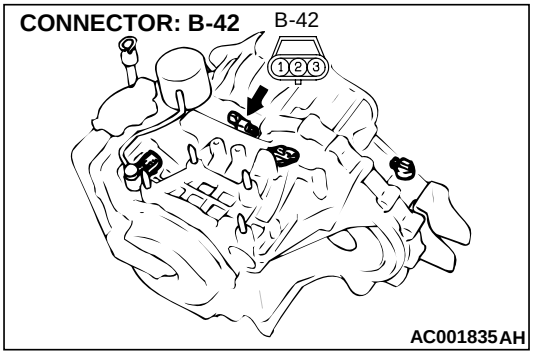
DTC 22: Input Shaft Speed Sensor System

Input Shaft Speed Sensor System Circuit



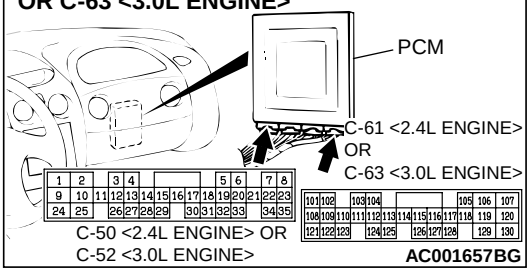
W3S11M02AA
AC106630AB

CONNECTOR: B-42



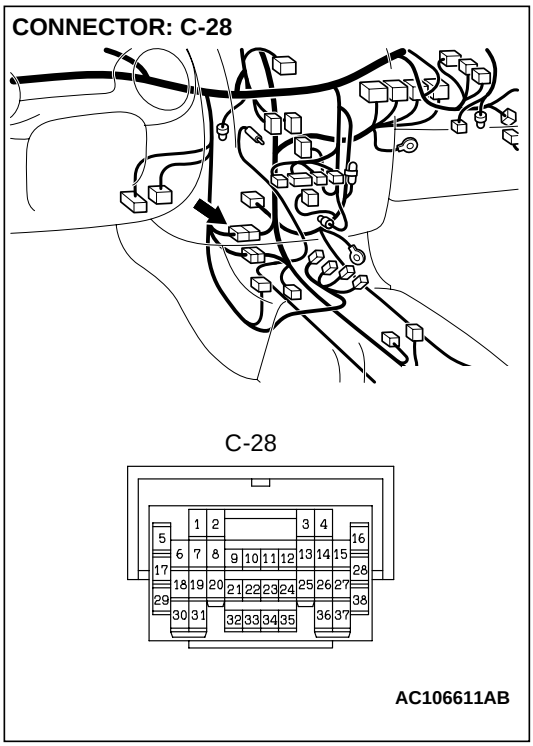
AC001835AH

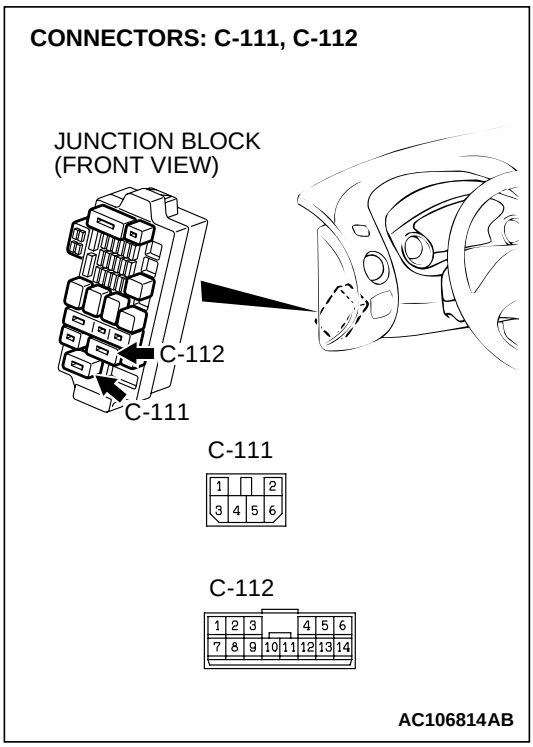
CONNECTORS: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



AC001657BG

TSB Revision





CIRCUIT OPERATION

- A coil built into the input shaft speed sensor generates a pulse signal at both ends of this coil when the input shaft rotates. The pulse signal frequency increases with a rise in input shaft speed.
- Both ends of the coil are connected to the PCM (terminals 16 and 103) via the input shaft speed sensor connector (terminals 1 and 2).
- The PCM detects the input shaft speed by the signal input to terminal 103.
- The input shaft speed sensor generates the pulse signal as the teeth of the underdrive clutch retainer pass the magnetic tip of the sensor.

DTC SET CONDITIONS

If no output pulse is detected from the input shaft speed sensor for one second or more while driving in 3rd or 4th gear at a speed of 30 km/h (19 mph) or more, it is judged to be an open circuit or short circuit in the input shaft speed sensor circuit. If diagnostic trouble code number "22" is output 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.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

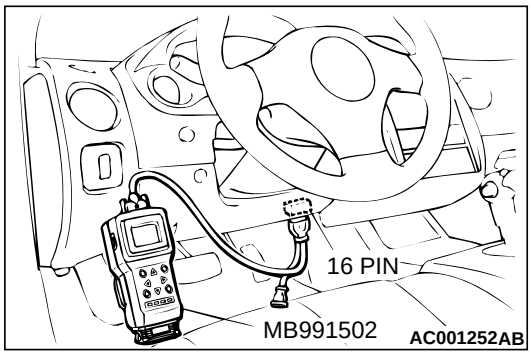
- Malfunction of the input shaft speed sensor circuit
- Malfunction of the underdrive clutch retainer
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

TSB Revision



STEP 1. Using scan tool MB991502, check data list item 22: Input Shaft Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

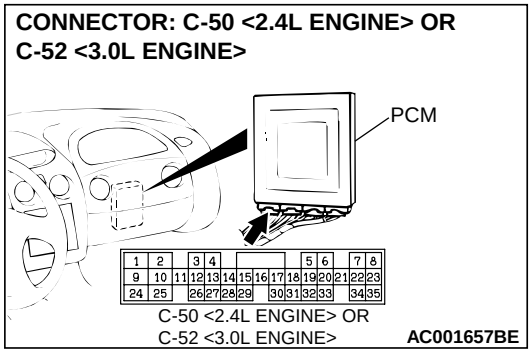
(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 22: Input Shaft Speed Sensor.
- When driving at constant speed of 50km/h (31mph), the display should be "1,600 – 1,900 r/min." <2.4L Engine>, "1,300 – 1,600 r/min." <3.0L Engine> (Gear range: 3rd gear)

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

Q: Is the sensor operating properly?

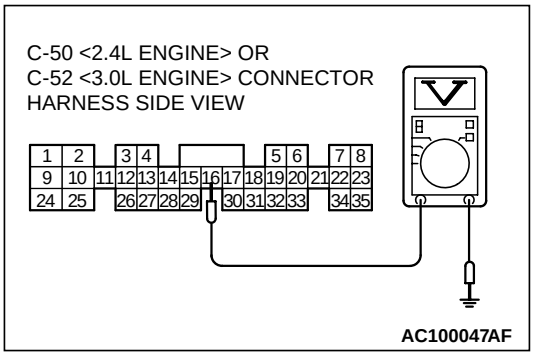
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.



STEP 2. Check the ground voltage at PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-50 <2.4L Engine> or C-52 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 16 and ground by backprobing.
- Voltage should be 0.5 volt or less.

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

Q: Is the voltage normal?

YES : Go to Step 5.

NO : Go to Step 3.

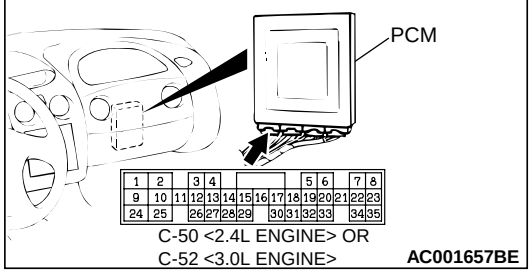
STEP 3. Check connector C-50 <2.4L Engine> or C-52 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 4.

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

CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>



C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>

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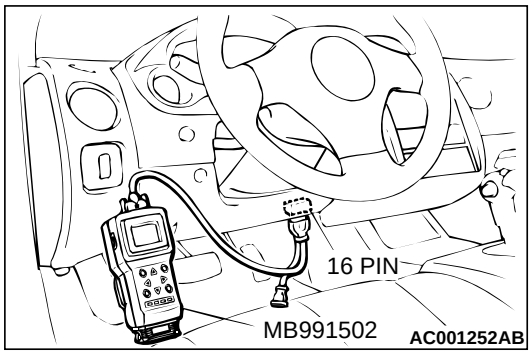
STEP 4. Using scan tool MB991502, check data list item 22: Input Shaft Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 22: Input Shaft Speed Sensor.
- When driving at constant speed of 50km/h (31mph), the display should be "1,600 – 1,900 r/min." <2.4L Engine>, "1,300 – 1,600 r/min." <3.0L Engine> (Gear range: 3rd gear)

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



AC001252AB

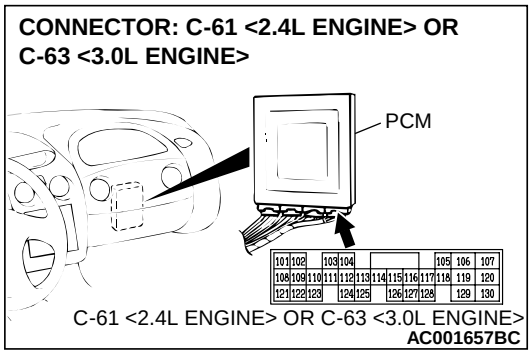
Q: Is the sensor operating properly?

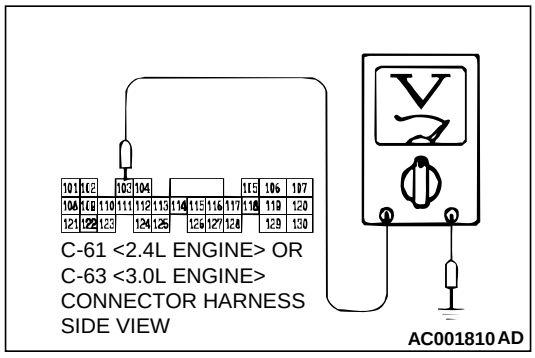
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

STEP 5. Check the sensor output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Disconnect connector B-42 at the input shaft speed sensor.
(3) Turn the ignition switch to the "ON" position.





(4) Measure the voltage between terminal 103 and ground by backprobing.
- Voltage should be between 4.5 and 4.9 volts.

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

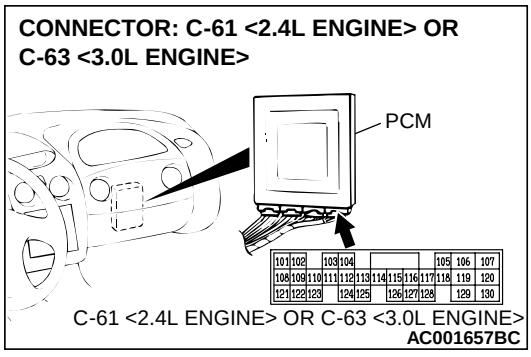
Q: Is the voltage normal?

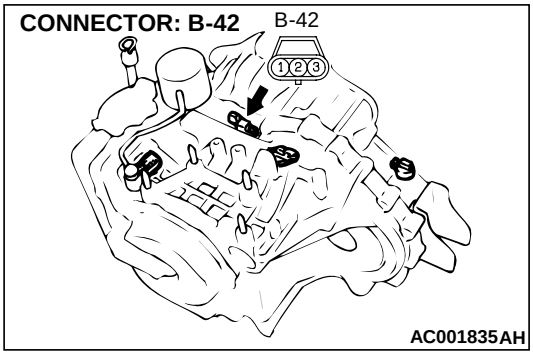
YES : Go to Step 8.
NO : Go to Step 6.

STEP 6. Check connectors C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and B-42 at input shaft speed sensor for damage.

Q: Are the connectors in good condition?

YES : Go to Step 7.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





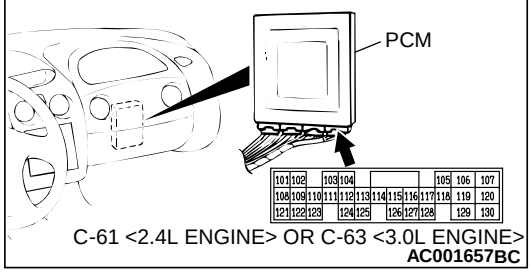
STEP 7. Check harness for short circuit to ground between PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 103 and input shaft speed sensor connector B-42 terminal 2.

Q: Is the harness wire in good condition?

YES : Go to Step 4.

NO : Repair it.

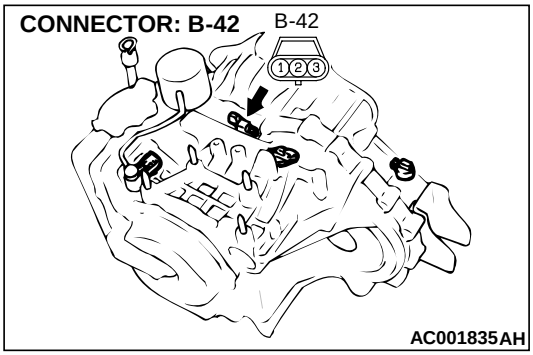
CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

AC001657BC

CONNECTOR: B-42

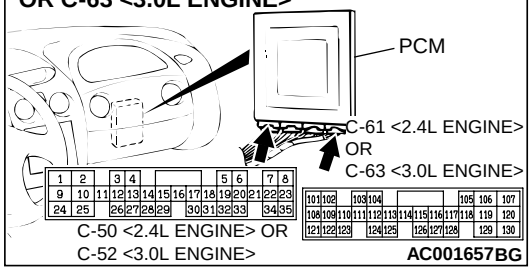


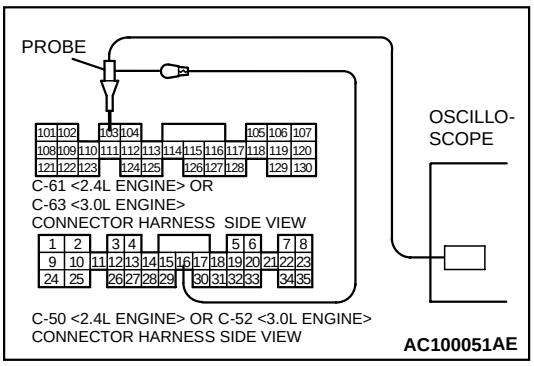
AC001835AH

STEP 8. Using the oscilloscope, check the waveform at PCM connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine>.

CONNECTORS: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

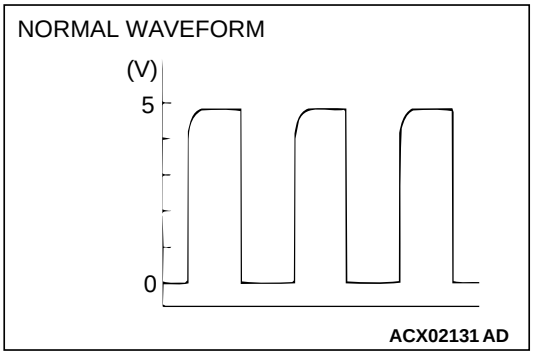




(2) Connect an oscilloscope probe to PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16 and to PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 103 by backprobing.

(3) Start the engine and run at constant speed of 50km/h (31mph). (Gear range: 3rd gear)

NORMAL WAVEFORM



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

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

Q: Is the waveform normal?

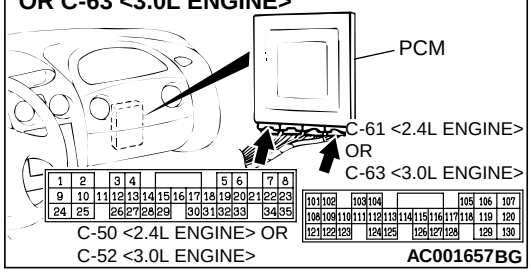
YES : Go to Step 9.
NO : Go to Step 10.

STEP 9. Check connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 4.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTORS: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

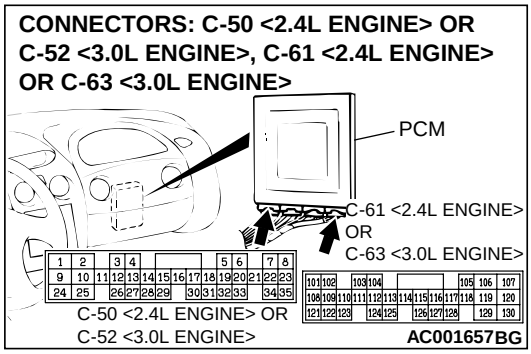


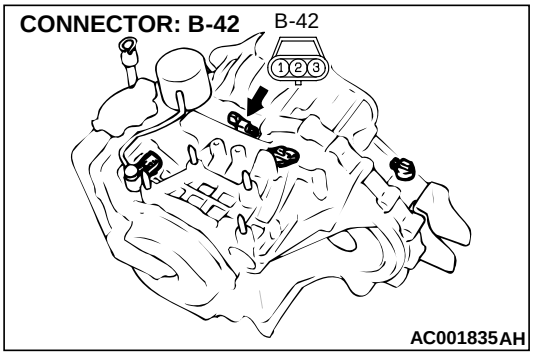
STEP 10. Check connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and B-42 at input shaft speed sensor for damage.

Q: Are the connectors in good condition?

YES : Go to Step 11.

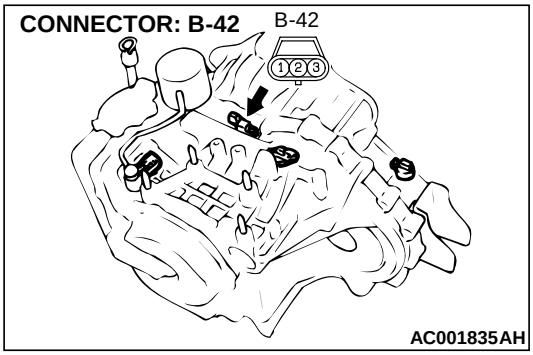
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





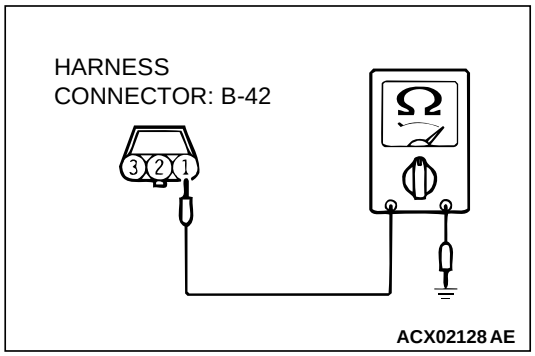
STEP 11. Check the continuity at input shaft speed sensor connector B-42.

(1) Disconnect connector B-42 and measure at the harness side.



(2) Check for the continuity between terminal 1 and ground.

- Should be less than 2 ohm.

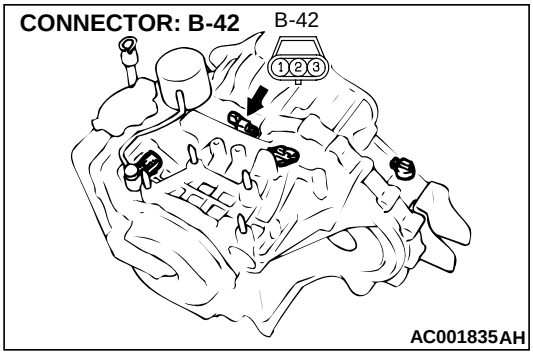


Q: Is the continuity normal?

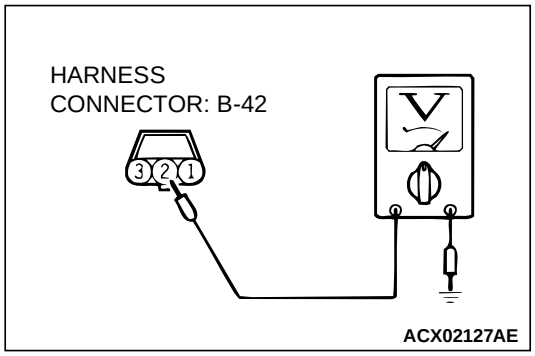
YES : Go to Step 12.

NO : Repair harness open circuit or damage between input shaft speed sensor connector B-42 terminal 1 and PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16.

STEP 12. Check the sensor output voltage at input shaft speed sensor connector B-42.



(1) Disconnect connector B-42 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



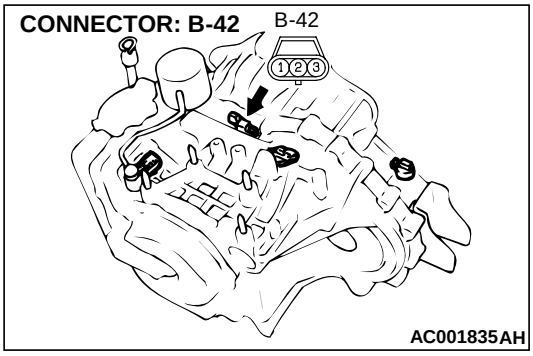
(3) Measure the voltage between terminal 2 and ground.
- Voltage should be between 4.5 and 4.9 volts.

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

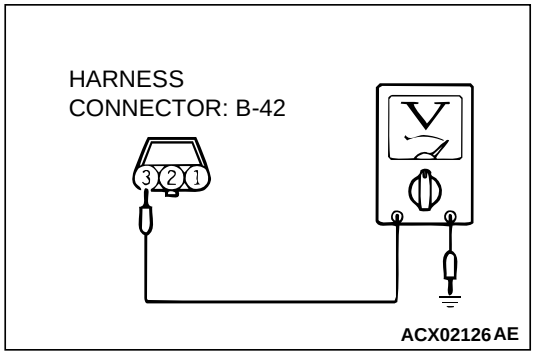
Q: Is the voltage normal?

YES : Go to Step 13.
NO : Repair harness open circuit or damage between input shaft speed sensor connector B-42 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 103.

STEP 13. Check the power supply voltage at input shaft speed sensor connector B-42.



(1) Disconnect connector B-42 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



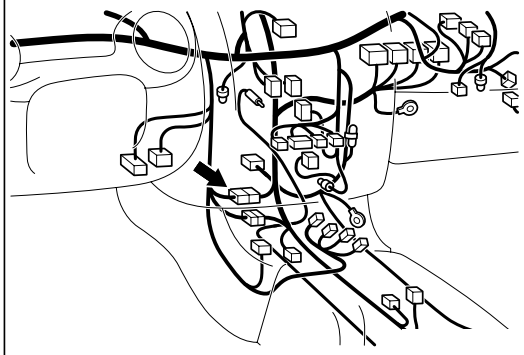
(3) Measure the voltage between terminal 3 and ground.
- Voltage should be battery positive voltage.

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

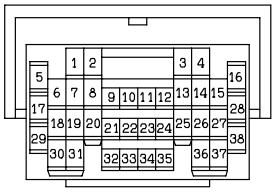
Q: Is the voltage normal?

YES : Go to Step 15.
NO : Go to Step 14.

CONNECTOR: C-28



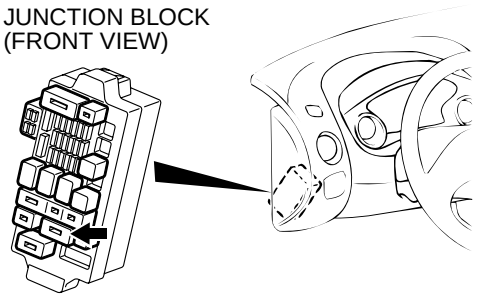
C-28



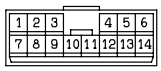
AC106611AB

CONNECTOR: C-112

JUNCTION BLOCK
(FRONT VIEW)



C-112

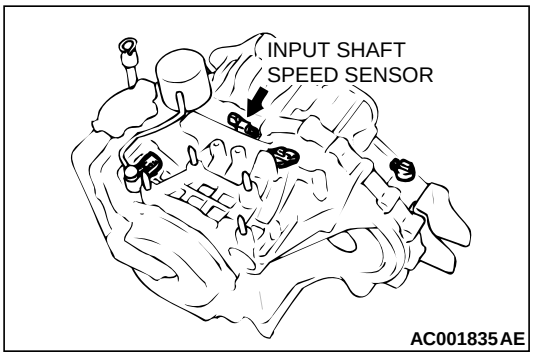


AC106612AB

STEP 14. Check connectors C-28 at intermediate connector and C-112 at junction block for damage.
Q: Are the connectors in good condition?

YES : Repair harness open circuit or short circuit to ground between input shaft speed sensor connector B-42 terminal 3 and junction block connector C-112 terminal 12.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



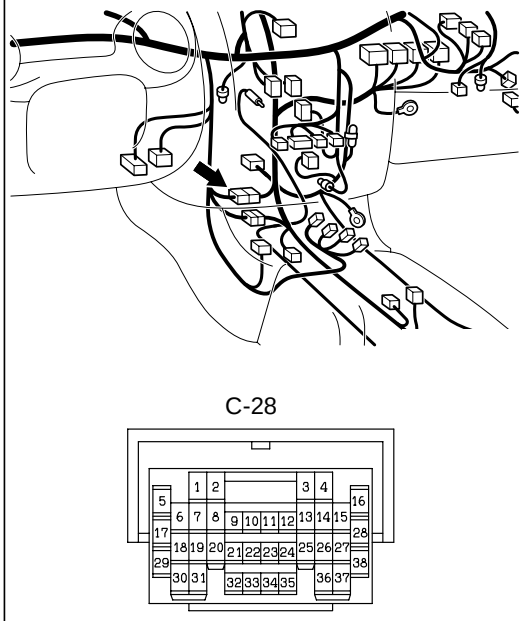
STEP 15. Replace the input shaft speed sensor.

(1) Replace the input shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for diagnostic trouble code.

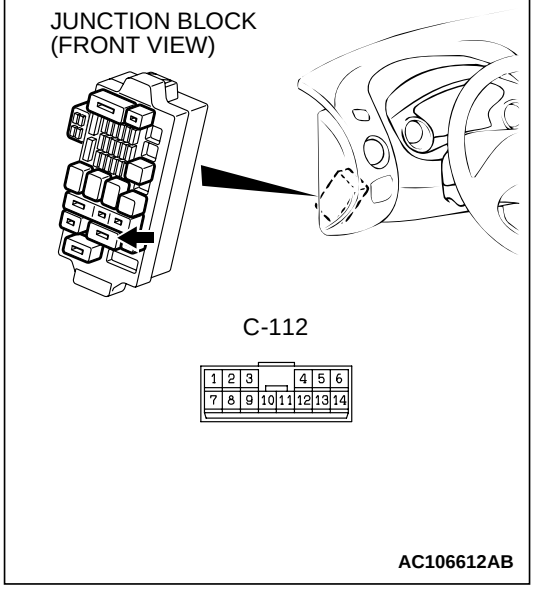
Q: Is the A/T diagnostic trouble code number "22" output?

YES : Go to Step 16.
NO : The inspection is complete.

CONNECTOR: C-28



CONNECTOR: C-112



STEP 16. Check connectors C-28 at intermediate connector and C-112 at junction block for damage.
Q: Are the connectors in good condition?

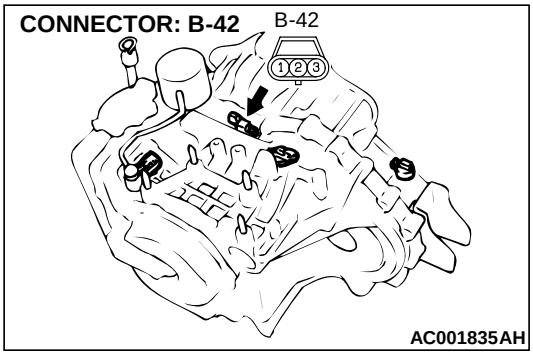
YES : Go to Step 17.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

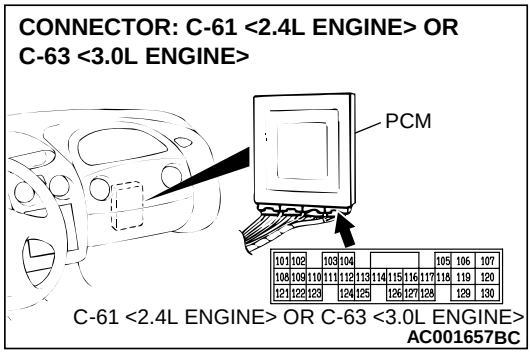
STEP 17. Check harness for damage between input shaft speed sensor harness side connector B-42 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 103.

Q: Is the harness wire in good condition?

YES : Go to Step 18.

NO : Repair it.



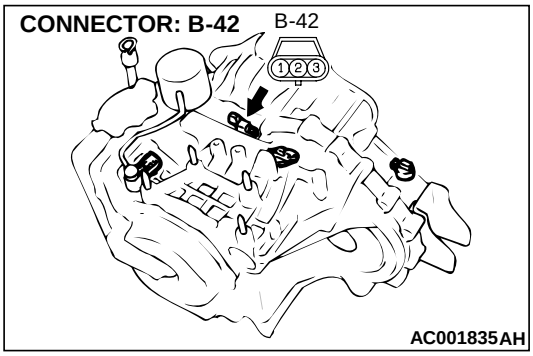


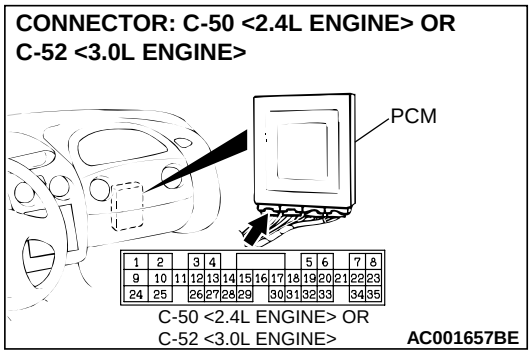
STEP 18. Check harness for damage between input shaft speed sensor harness side connector B-42 terminal 1 and PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16.

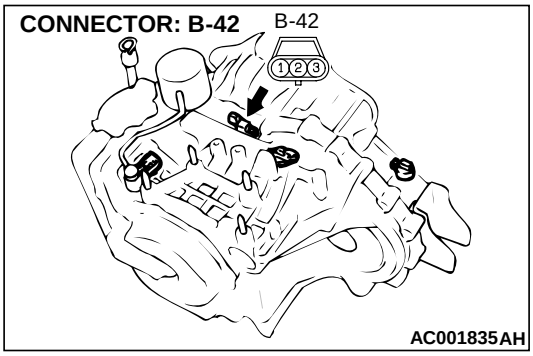
Q: Is the harness wire in good condition?

YES : Go to Step 19.

NO : Repair it.





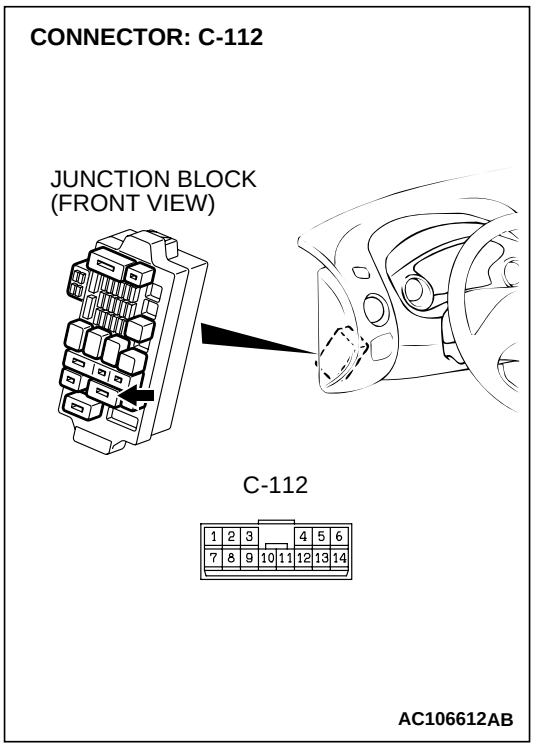


STEP 19. Check harness for damage between input shaft speed sensor harness side connector B-42 terminal 3 and junction block connector C-112 terminal 12.

Q: Is the harness wire in good condition?

YES : Go to Step 20.

NO : Repair it.



STEP 20. Replace the underdrive clutch retainer.

(1) Replace the underdrive clutch retainer. Refer to GROUP 23B, Underdrive Clutch and Input Shaft P.23B-59.

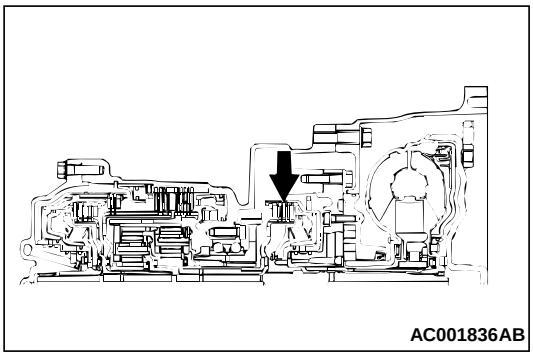
(2) Test drive the vehicle.

(3) Check for diagnostic trouble code.

Q: Is the A/T diagnostic trouble code number "22" output?

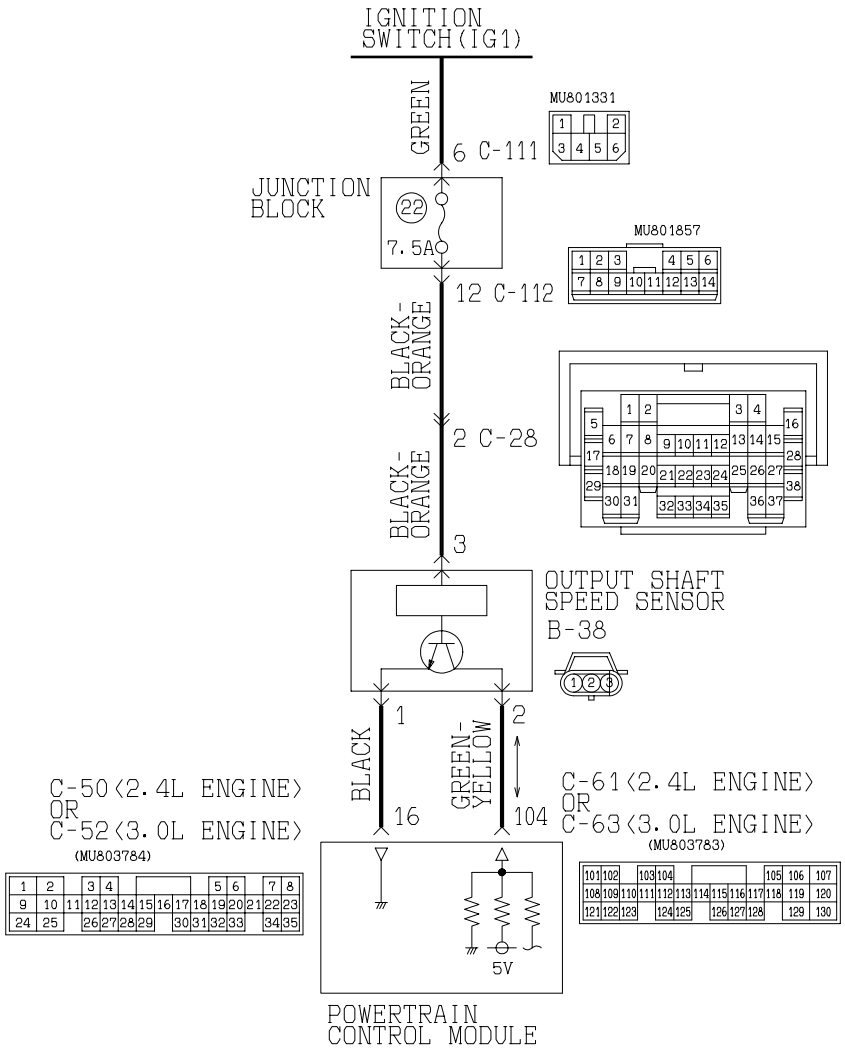
YES : The A/T diagnostic trouble code may have set due to external radio frequency (RFI), possibility caused by cellular phone activity, after market components installed on the vehicle, etc.

NO : The inspection is complete.



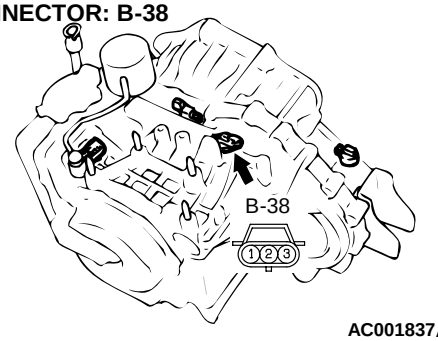
DTC 23: Output Shaft Speed Sensor System

Output Shaft Speed Sensor System Circuit



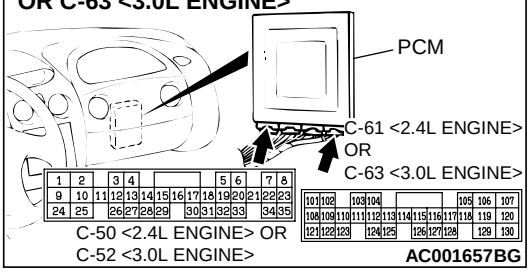
W3S11M03AA
AC106631AB

CONNECTOR: B-38



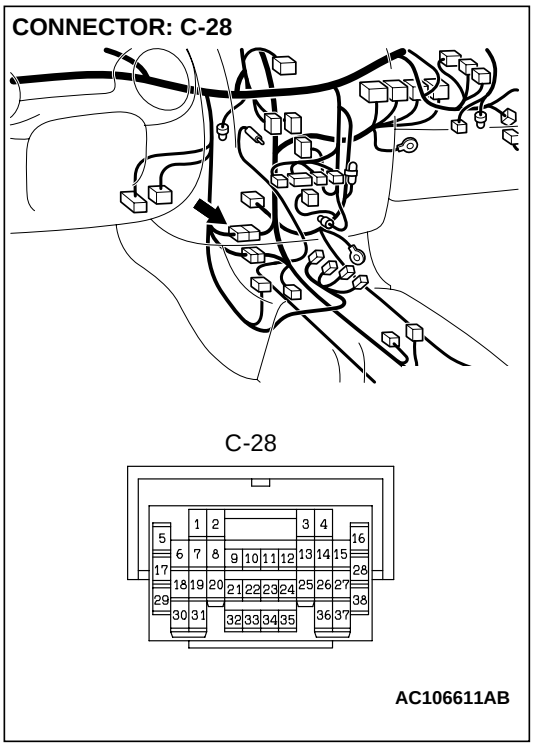
AC001837AI

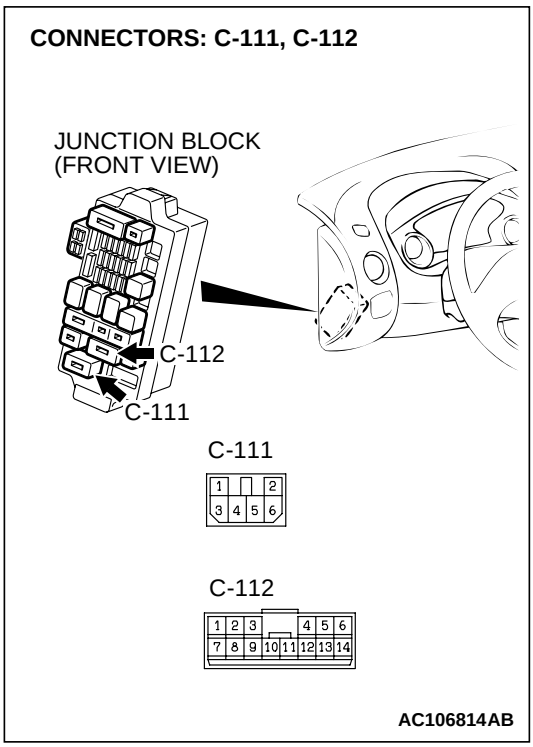
CONNECTORS: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



AC001657BG

TSB Revision





CIRCUIT OPERATION

- A coil built into the output shaft speed sensor generates a pulse signal at both ends of this coil when the output shaft rotates. The pulse signal frequency increases with a rise in output shaft speed.
- Both ends of the coil are connected to the PCM (terminals 16 and 104) via the output shaft speed sensor connector (terminals 1 and 2).
- The PCM detects the output shaft speed by the signal input to terminal 104.
- The output shaft speed sensor generates the pulse signal as the teeth of the transfer drive gear pass the magnetic tip of the sensor.

DTC SET CONDITIONS

If the output signal from the output shaft speed sensor has been lost for one second or more while the vehicle is being driven, it is judged to be an open circuit or short circuit in the output shaft speed sensor circuit and diagnostic trouble code number "23" is set. If diagnostic trouble code number "23" is output 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.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

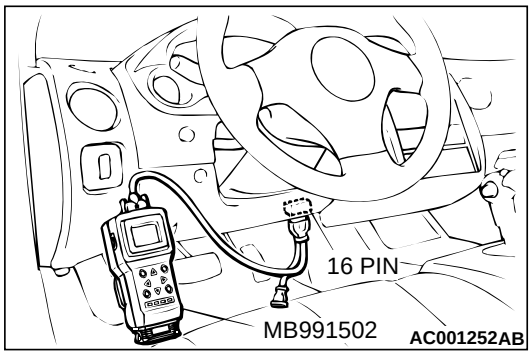
- Malfunction of the output shaft speed sensor
- Malfunction of the transfer drive gear or driven gear
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

TSB Revision



STEP 1. Using scan tool MB991502, check data list item 23: Output Shaft Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 23: Output Shaft Speed Sensor.
- When driving at constant speed of 50km/h (31mph), the display should be "1,600 – 1,900 r/min." <2.4L Engine>, "1,300 – 1,600 r/min." <3.0L Engine> (Gear range: 3rd gear)

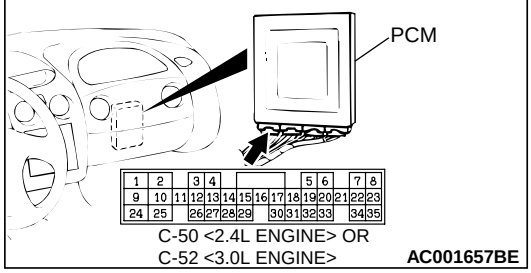
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

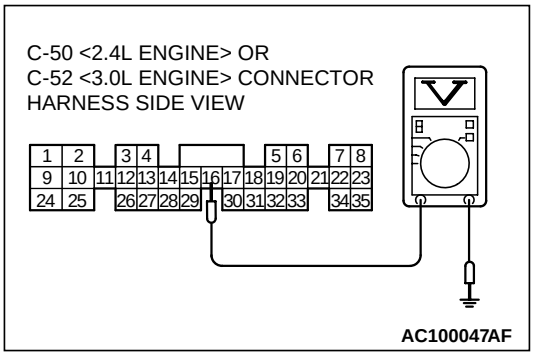
NO : Go to Step 2.

CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>



STEP 2. Check the ground voltage at PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-50 <2.4L Engine> or C-52 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 16 and ground by backprobing.
- Voltage should be 0.5 volt or less.

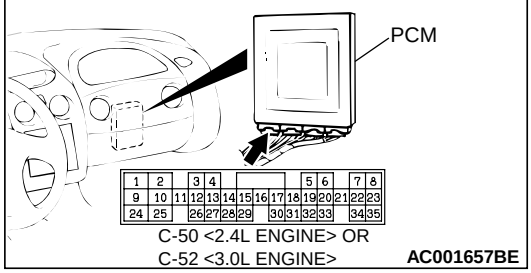
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 5.

NO : Go to Step 3.

CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>

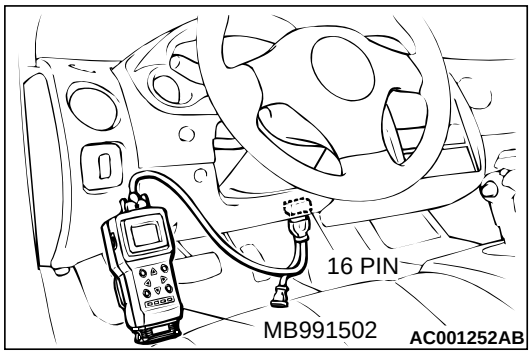


STEP 3. Check connector C-50 <2.4L Engine> or C-52 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 4.

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



STEP 4. Using scan tool MB991502, check data list item 23: Output Shaft Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to the data reading mode for item 23: Output Shaft Speed Sensor.
- When driving at constant speed of 50km/h (31mph), the display should be "1,600 – 1,900 r/min." <2.4L Engine>, "1,300 – 1,600 r/min." <3.0L Engine> (Gear range: 3rd gear)

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

Q: Is the sensor operating properly?

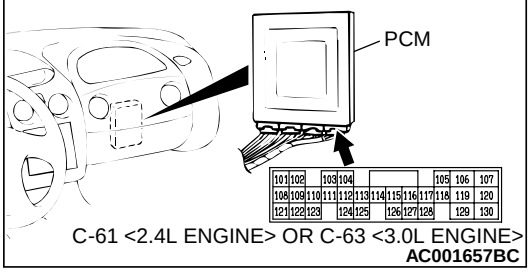
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

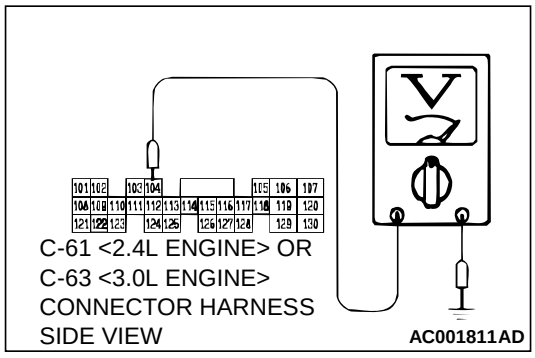
STEP 5. Check the sensor output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Disconnect connector B-38 at the output shaft speed sensor.
(3) Turn the ignition switch to the "ON" position.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



AC001657BC



AC001811AD

(4) Measure the voltage between terminal 104 and ground by backprobing.
- Voltage should be between 4.5 and 4.9 volts.

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

Q: Is the voltage normal?

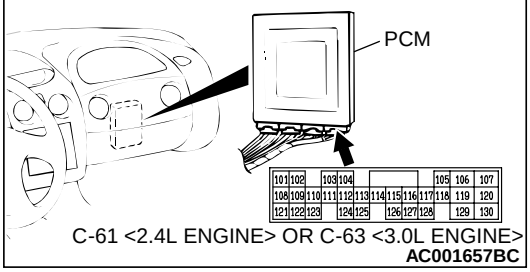
YES : Go to Step 8.
NO : Go to Step 6.

STEP 6. Check connectors C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and B-38 at output shaft speed sensor for damage.

Q: Are the connectors in good condition?

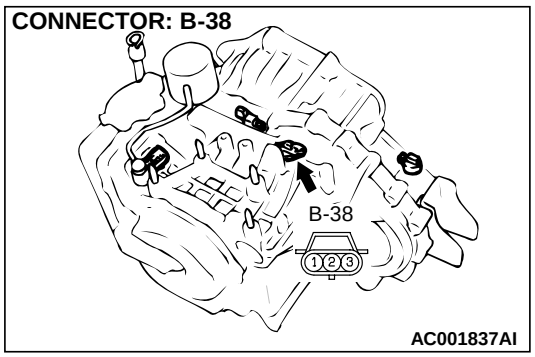
YES : Go to Step 7.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



AC001657BC

CONNECTOR: B-38



AC001837AI

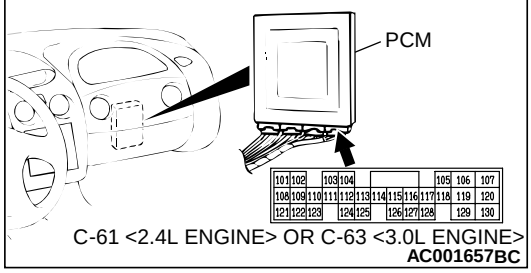
STEP 7. Check harness for short circuit to ground between PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 104 and output shaft speed sensor connector B-38 terminal 2.

Q: Is the harness wire in good condition?

YES : Go to Step 4.

NO : Repair it.

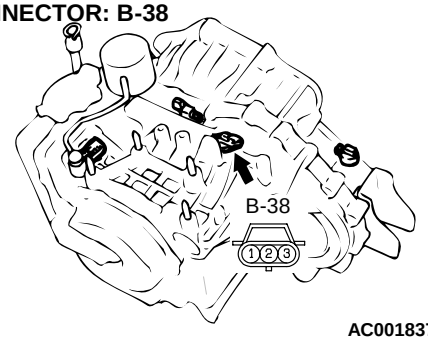
CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

AC001657BC

CONNECTOR: B-38

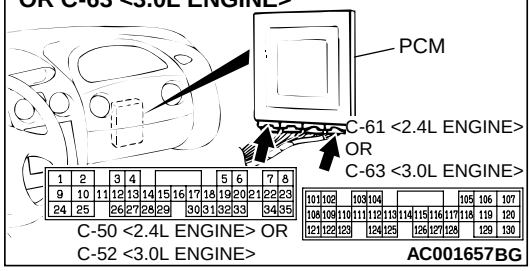


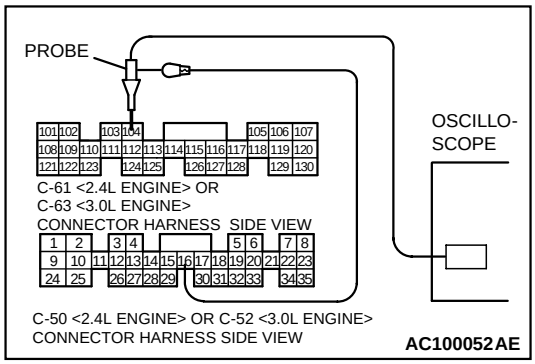
AC001837AI

STEP 8. Using the oscilloscope, check the waveform at PCM connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine>.

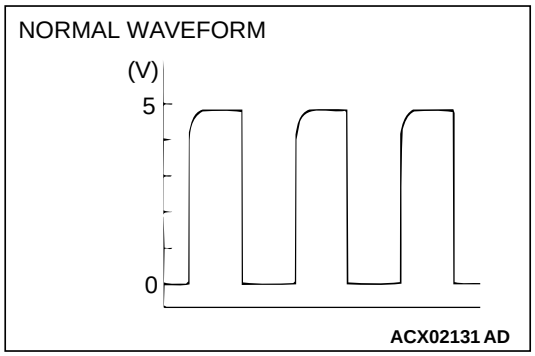
CONNECTORS: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>





(2) Connect an oscilloscope probe to PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16 and to PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 104 by backprobing.

(3) Start the engine and run at constant speed of 50km/h (31mph). (Gear range: 3rd gear)



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

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

Q: Is the waveform normal?

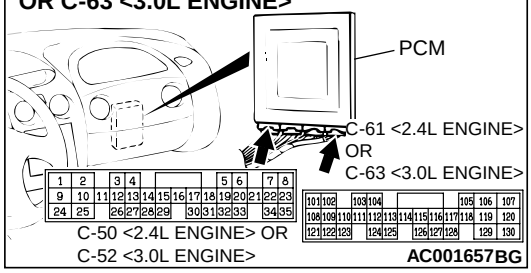
YES : Go to Step 9.
NO : Go to Step 10.

STEP 9. Check connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 4.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTORS: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

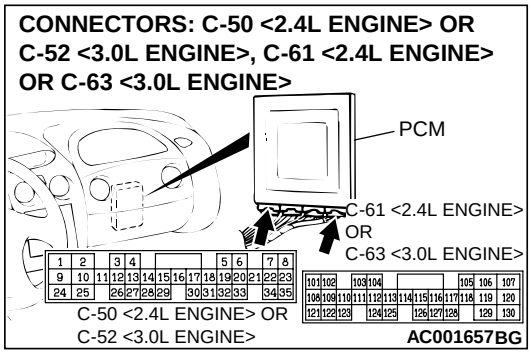


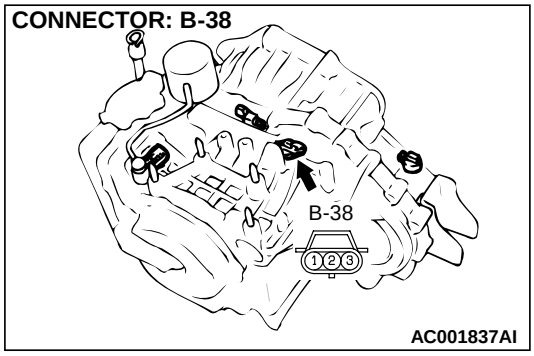
STEP 10. Check connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and B-38 at output shaft speed sensor for damage.

Q: Are the connectors in good condition?

YES : Go to Step 11.

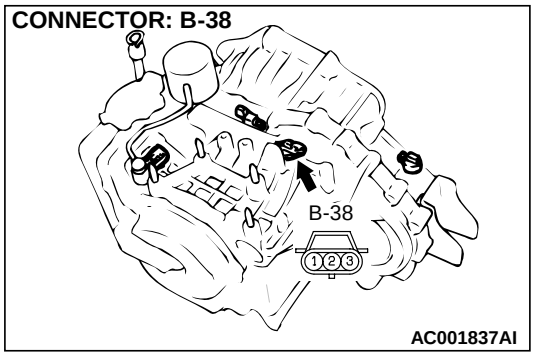
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

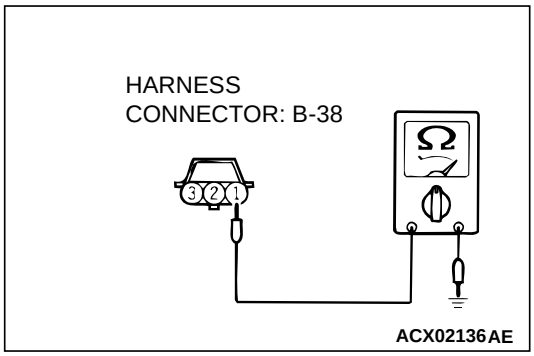




STEP 11. Check the continuity at output shaft speed sensor connector B-38.

(1) Disconnect connector B-38 and measure at the harness side.





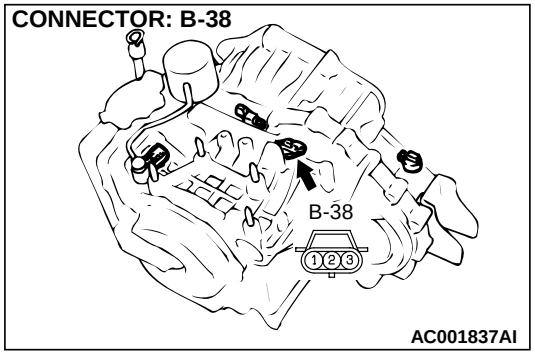
(2) Check for the continuity between terminal 1 and ground.
- Should be less than 2 ohm.

Q: Is the continuity normal?

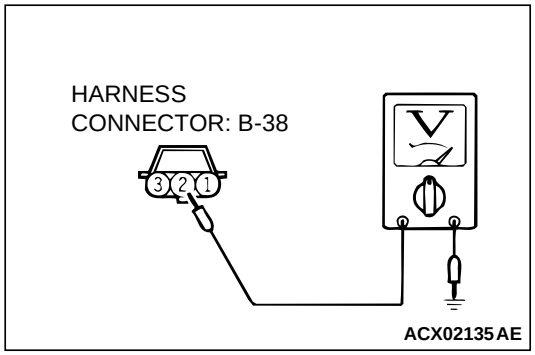
YES : Go to Step 12.

NO : Repair harness open circuit or damage between output shaft speed sensor connector B-38 terminal 1 and PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16.

STEP 12. Check the sensor output voltage at output shaft speed sensor connector B-38.



(1) Disconnect connector B-38 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



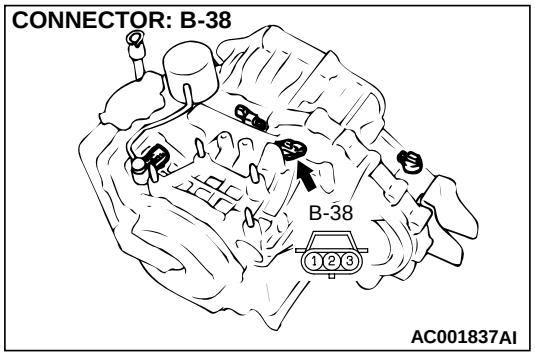
(3) Measure the voltage between terminal 2 and ground.
- Voltage should be between 4.5 and 4.9 volts.

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

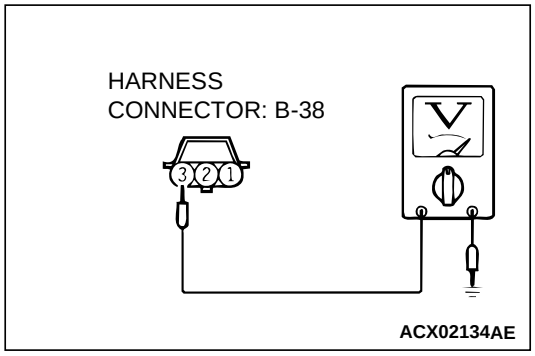
Q: Is the voltage normal?

YES : Go to Step 13.
NO : Repair harness open circuit between output shaft speed sensor connector B-38 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 104.

STEP 13. Check the power supply voltage at output shaft speed sensor connector B-38.



(1) Disconnect connector B-38 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



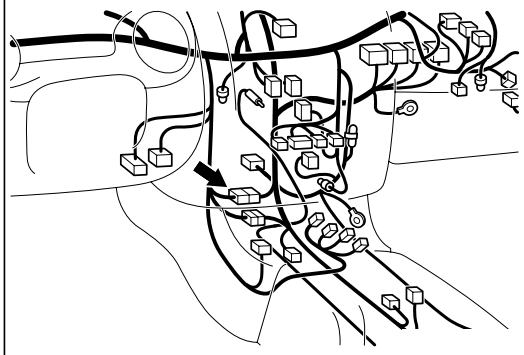
(3) Measure the voltage between terminal 3 and ground.
- Voltage should be battery positive voltage.

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

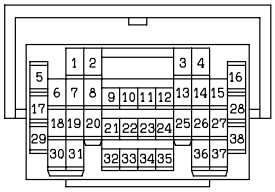
Q: Is the voltage normal?

YES : Go to Step 15.
NO : Go to Step 14.

CONNECTOR: C-28



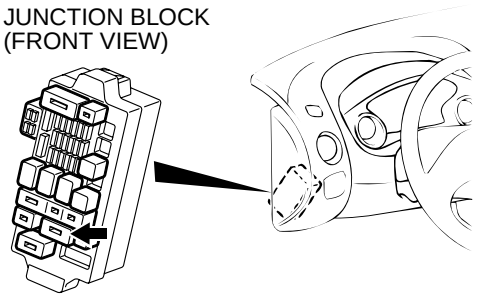
C-28



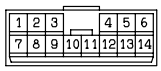
AC106611AB

CONNECTOR: C-112

JUNCTION BLOCK
(FRONT VIEW)



C-112

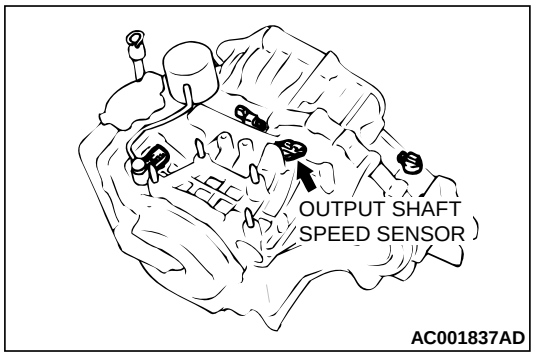


AC106612AB

STEP 14. Check connectors C-28 at intermediate connector and C-112 at junction block for damage.
Q: Are the connectors in good condition?

YES : Repair harness open circuit or short circuit to ground between output shaft speed sensor connector B-38 terminal 3 and junction block connector C-112 terminal 12.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



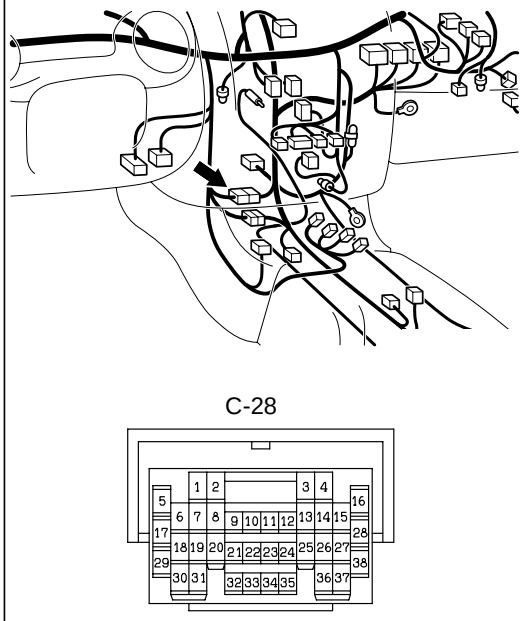
STEP 15. Replace the output shaft speed sensor.

(1) Replace the output shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

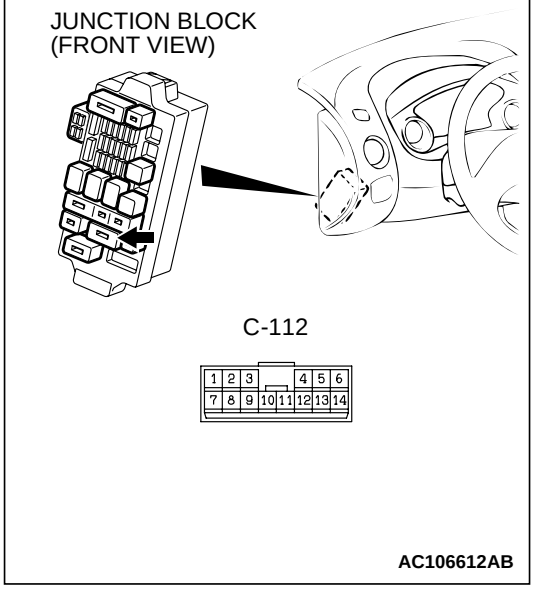
Q: Is the A/T diagnostic trouble code "23" output?

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

CONNECTOR: C-28



CONNECTOR: C-112



STEP 16. Check connectors C-28 at intermediate connector and C-112 at junction block for damage.
Q: Are the connectors in good condition?

YES : Go to Step 17.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

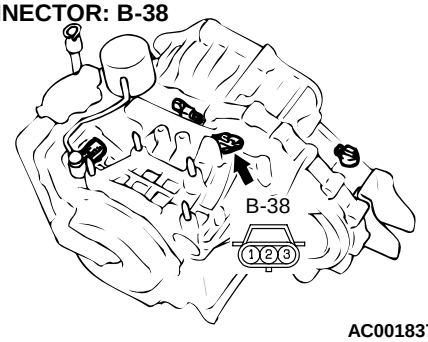
STEP 17. Check harness for damage between output shaft speed sensor harness side connector B-38 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 104.

Q: Is the harness wire in good condition?

YES : Go to Step 18.

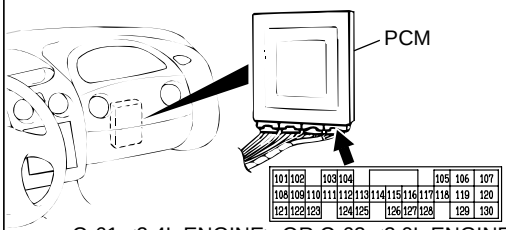
NO : Repair it.

CONNECTOR: B-38



AC001837AI

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

AC001657BC

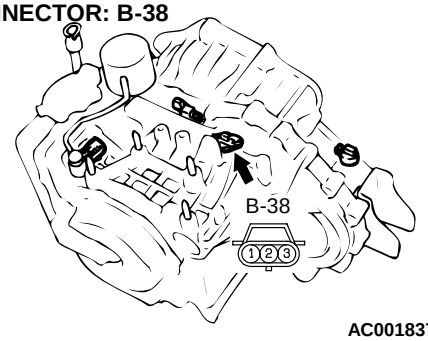
STEP 18. Check harness for damage between output shaft speed sensor harness side connector B-38 terminal 1 and PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16.

Q: Is the harness wire in good condition?

YES : Go to Step 19.

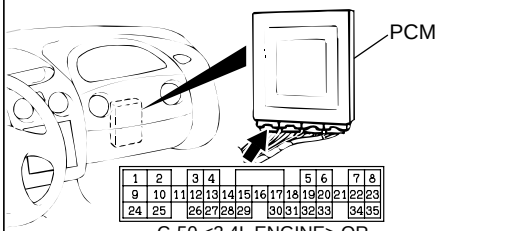
NO : Repair it.

CONNECTOR: B-38



AC001837AI

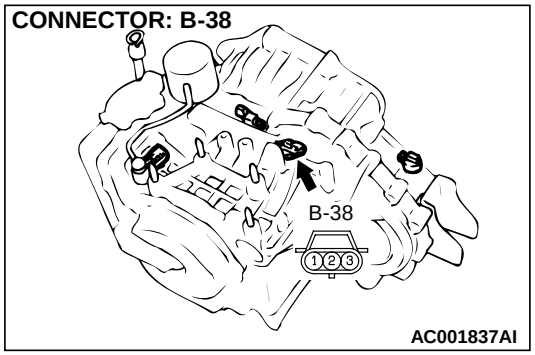
CONNECTOR: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>

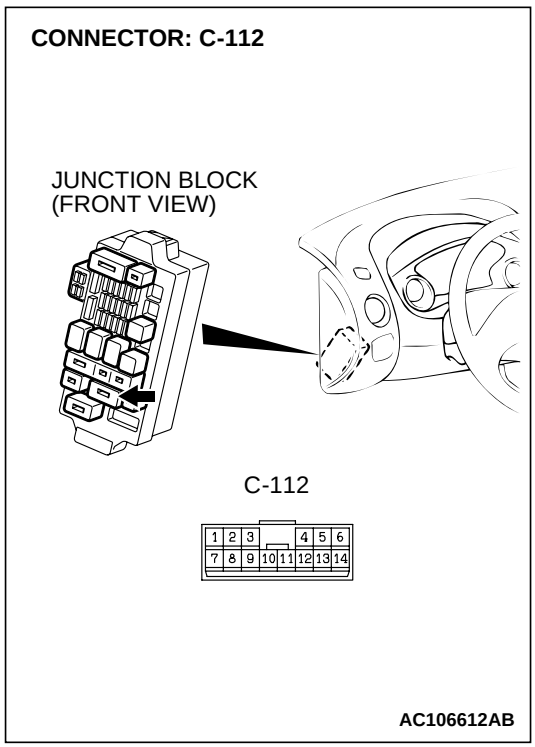


C-50 <2.4L ENGINE> OR
C-52 <3.0L ENGINE>

AC001657BE

TSB Revision



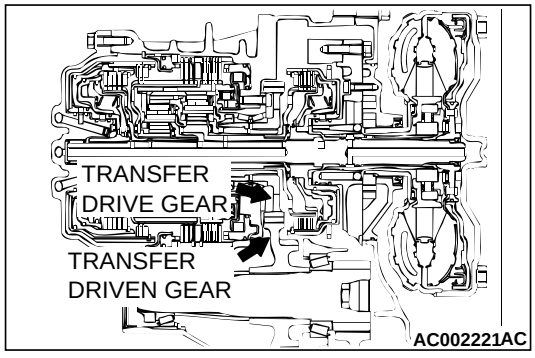


STEP 19. Check harness for damage between output shaft speed sensor harness side connector B-38 terminal 3 and junction block connector C-112 terminal 12.

Q: Is the harness wire in good condition?

YES : Go to Step 20.

NO : Repair it.



STEP 20. Replace the transfer drive gear or driven gear.

(1) Replace the transfer drive gear driven gear. Refer to GROUP 23B, Transaxle P.23B-10, Output Shaft P.23B-68.

(2) Test drive the vehicle.

(3) Check for A/T diagnostic trouble code.

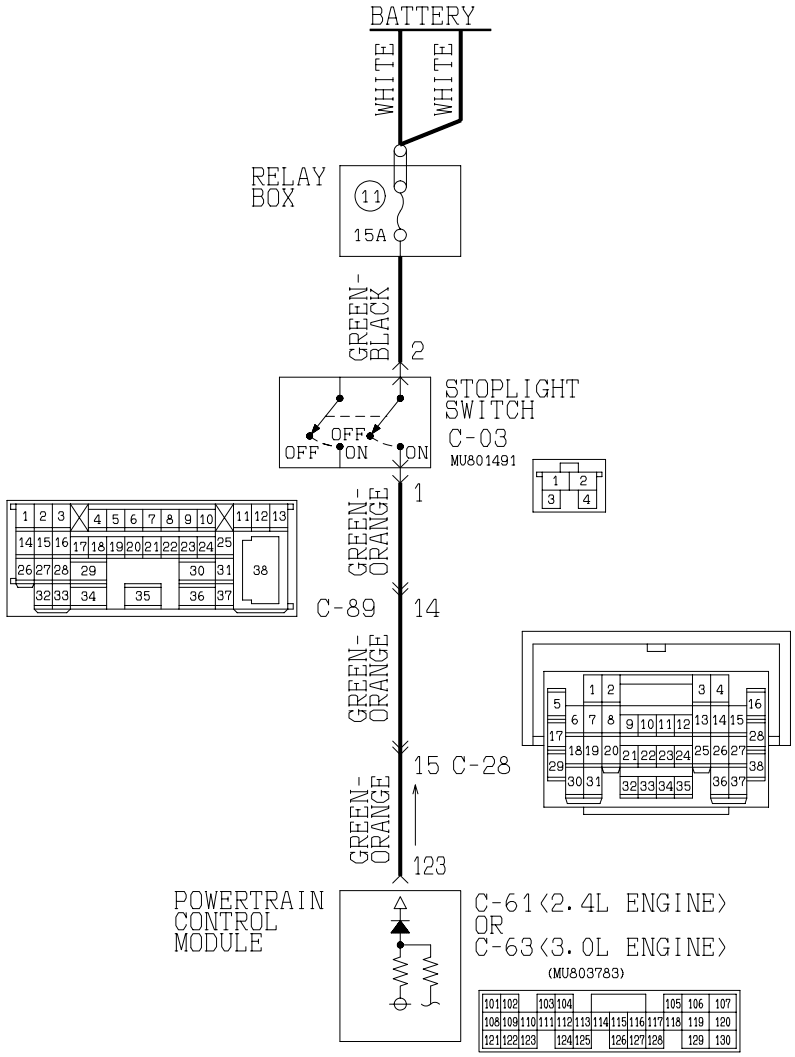
Q: Is the A/T diagnostic trouble code number "23" output?

YES : The A/T diagnostic trouble code may have set due to external radio frequency (RFI), possibility caused by cellular phone activity, after market components installed on the vehicle, etc.

NO : The inspection is complete.

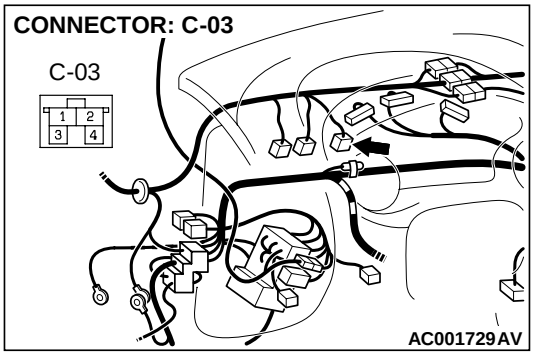
DTC 26: Stoplight Switch System

Stoplight Switch System Circuit



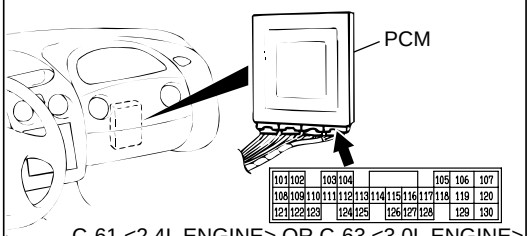
W3S11M04AA
AC106632AB

CONNECTOR: C-03



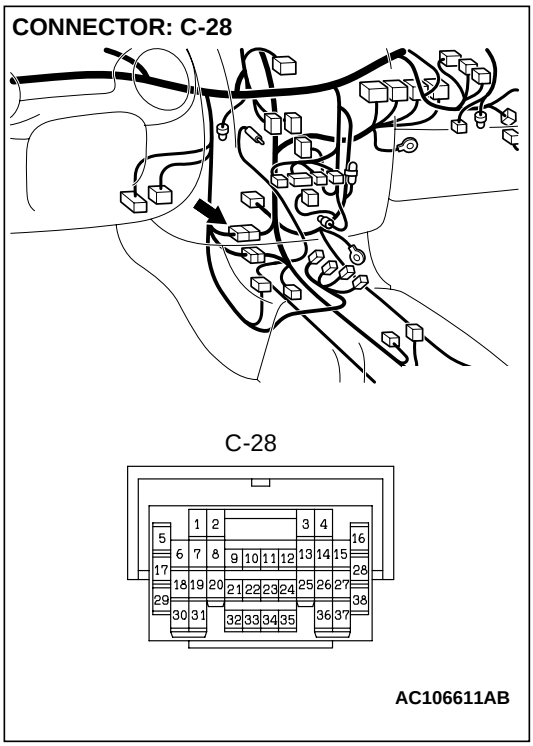
AC001729AV

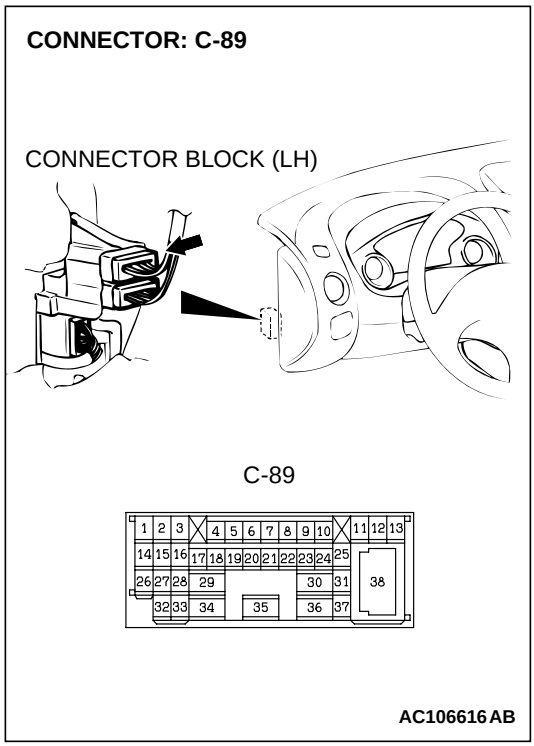
CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC

TSB Revision





CIRCUIT OPERATION

- Battery positive voltage is supplied to the stoplight switch (terminal 2).
- When the brake pedal is depressed, battery positive voltage is applied to the PCM (terminal 123). The PCM judges that the brake pedal is depressed and the stoplight switch is on when battery positive voltage is sensed at the PCM (terminal 123).

DTC SET CONDITIONS

If the stoplight switch is on for five minutes or more while driving 50 km/h (31 mph), it is judged there is a short circuit in the stoplight switch and diagnostic trouble code number "26" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the stoplight switch circuit
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

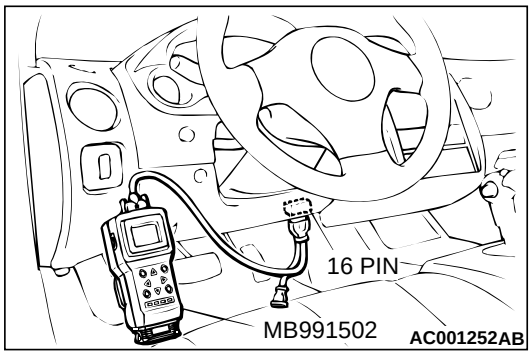
- MB991502: Scan Tool (MUT-II)

STEP 1. Check the brake pedal height.

Refer to GROUP 35A, On-vehicle Service – Brake Pedal Check and Adjustment P.35A-17.

Q: Is the height adjusted properly?

YES : Go to Step 2.
NO : Adjust it.



STEP 2. Using scan tool MB991502, check data list item 26: Stoplight Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

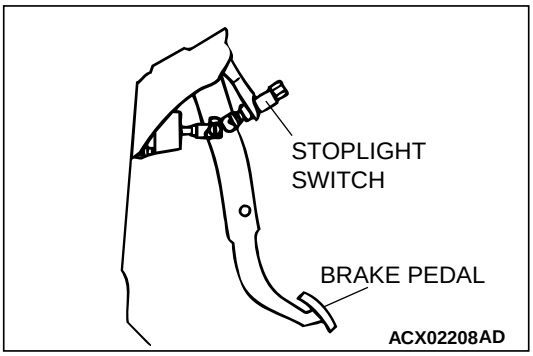
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 26, Stoplight Switch.
- When the brake pedal is depressed, the display should be "ON."
- When the brake pedal is not depressed, the display should be "OFF."

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

Q: Is the switch operating properly?

YES : This malfunction may be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 3.



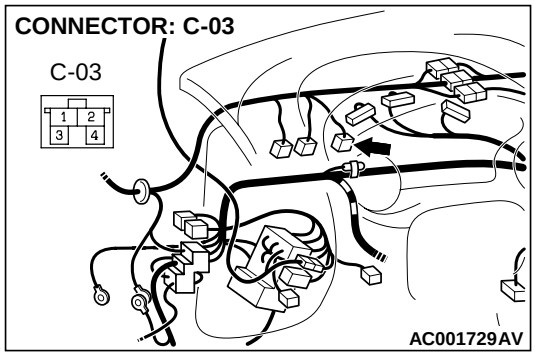
STEP 3. Check the stoplight switch as single part.

Refer to GROUP 35A, On-vehicle Service – Stoplight Switch Check P.35A-18.

Q: Is the switch normal?

YES : Go to Step 4.

NO : Replace the stoplight switch. Refer to GROUP 35A, Stoplight Switch Check P.35A-18.



STEP 4. Check connector C-03 at stoplight switch for damage.

Q: Is the connector in good condition?

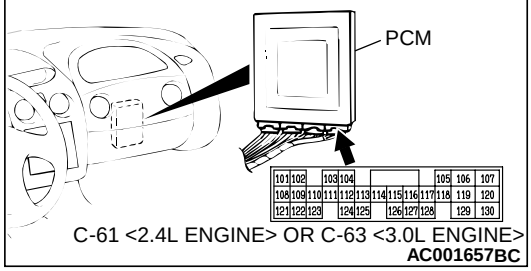
YES : Go to Step 5.

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

STEP 5. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

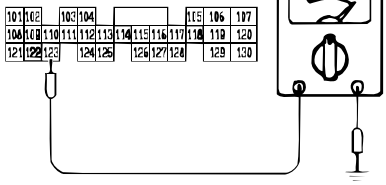
(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC

C-61 <2.4L ENGINE> OR
C-63 <3.0L ENGINE>
CONNECTOR HARNESS
SIDE VIEW



AC001812 AD

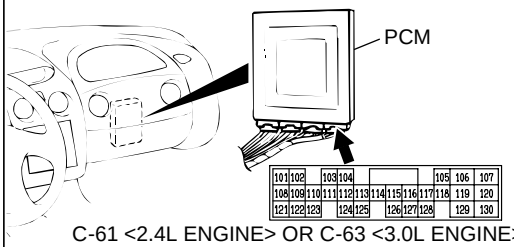
(2) Measure the voltage between terminal 123 and ground by backprobing.
- When the brake pedal is depressed, voltage should be battery positive voltage.
- When the brake pedal is not depressed, voltage should be less than 1.0 volt.

Q: Is the voltage normal?

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

STEP 6. Check connectors C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and C-89, C-28 at intermediate connector for damage.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

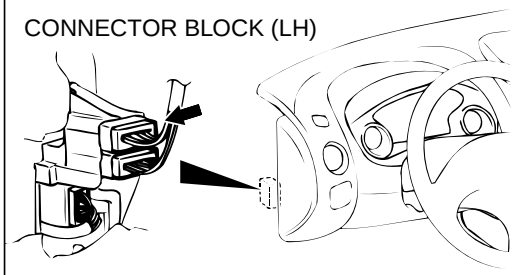


C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>

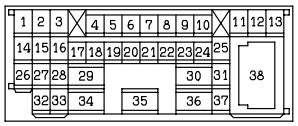
AC001657BC

CONNECTOR: C-89

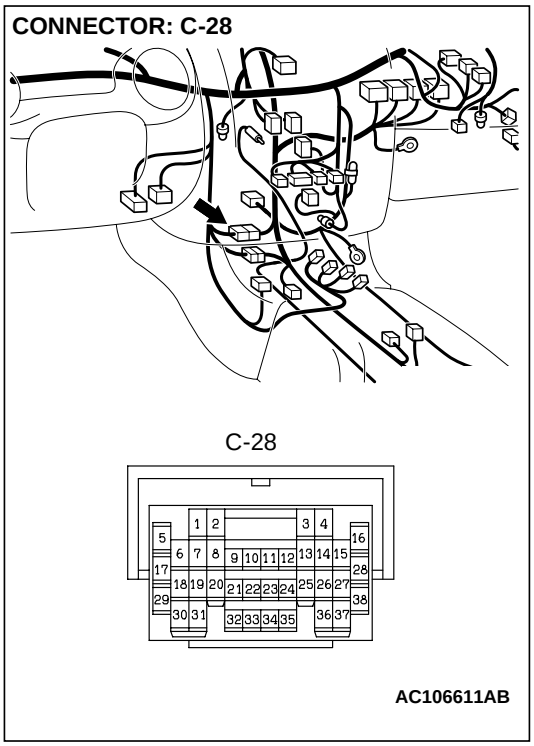
CONNECTOR BLOCK (LH)



C-89



AC106616 AB



Q: Are the connectors in good condition?

YES : Go to Step 7.

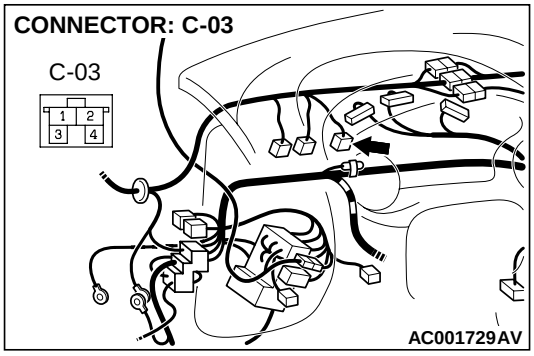
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

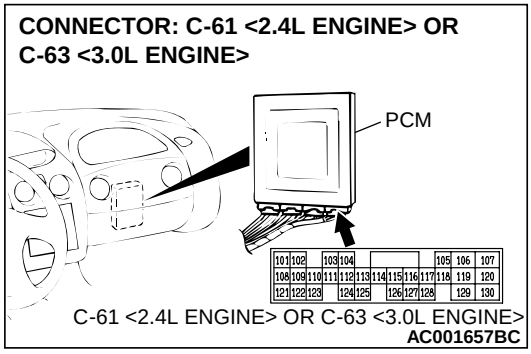
STEP 7. Check harness for damage between stoplight switch connector C-03 terminal 1 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 123.

Q: Is the harness wire in good condition?

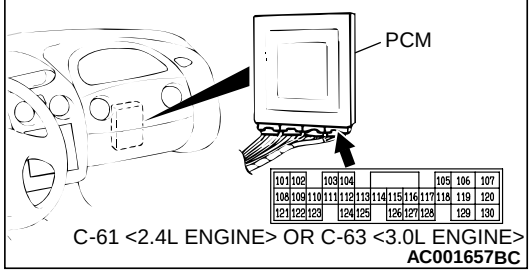
YES : Go to Step 9.

NO : Repair it.





CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



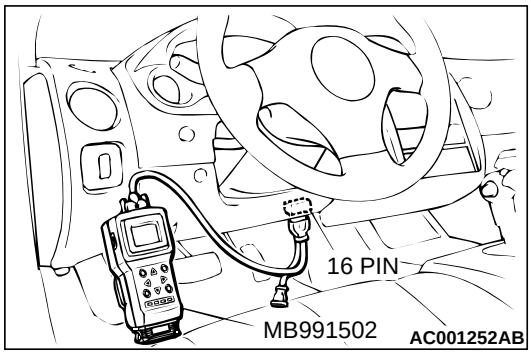
C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC

STEP 8. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 9.

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



AC001252AB

STEP 9. Using scan tool MB991502, check data list item 26: Stoplight Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 26: Stoplight Switch.
- When the brake pedal is depressed, the display should be "ON."
- When the brake pedal is not depressed, the display should be "OFF."

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

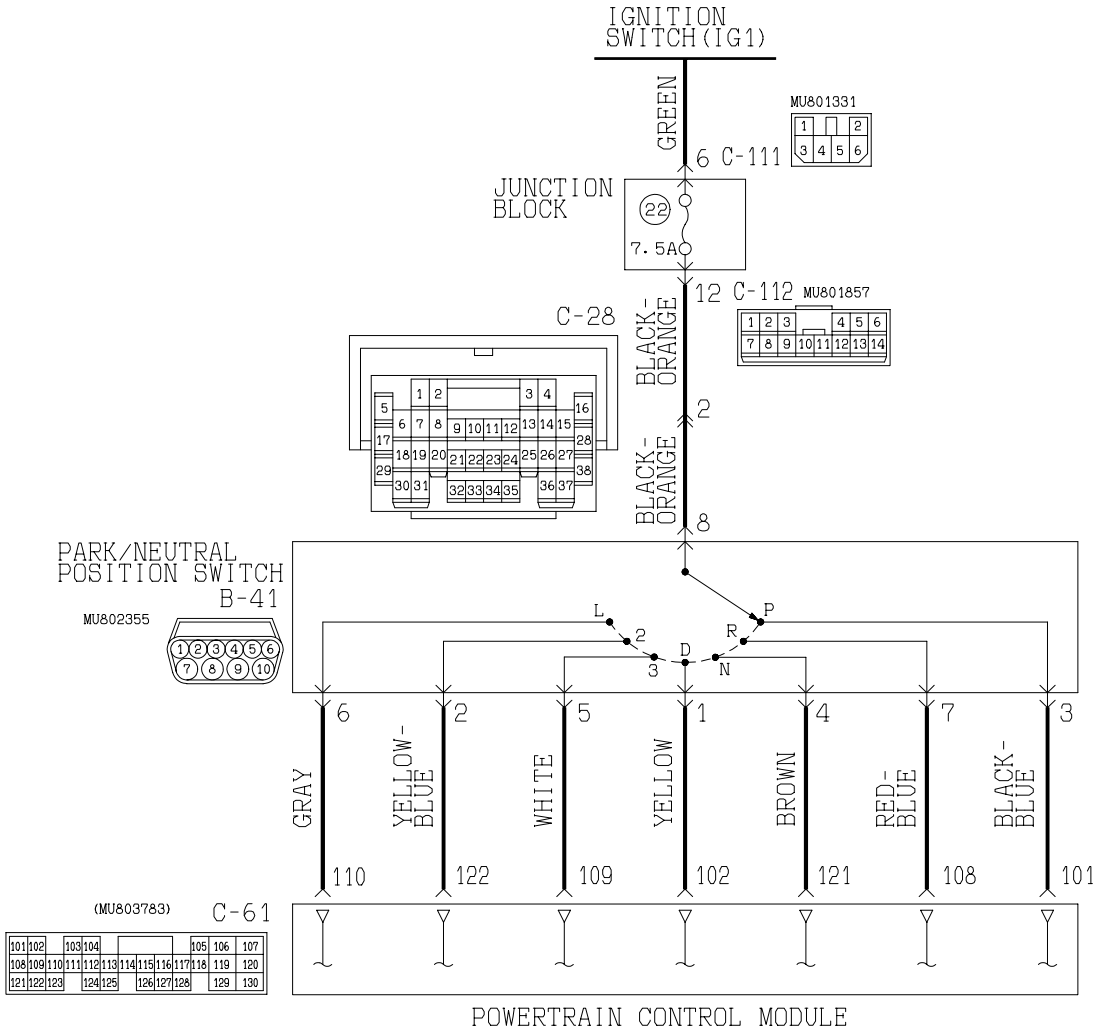
Q: Is the switch operating properly?

YES : This malfunction may be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

DTC 27: Park/Neutral Position Switch System (Open Circuit)

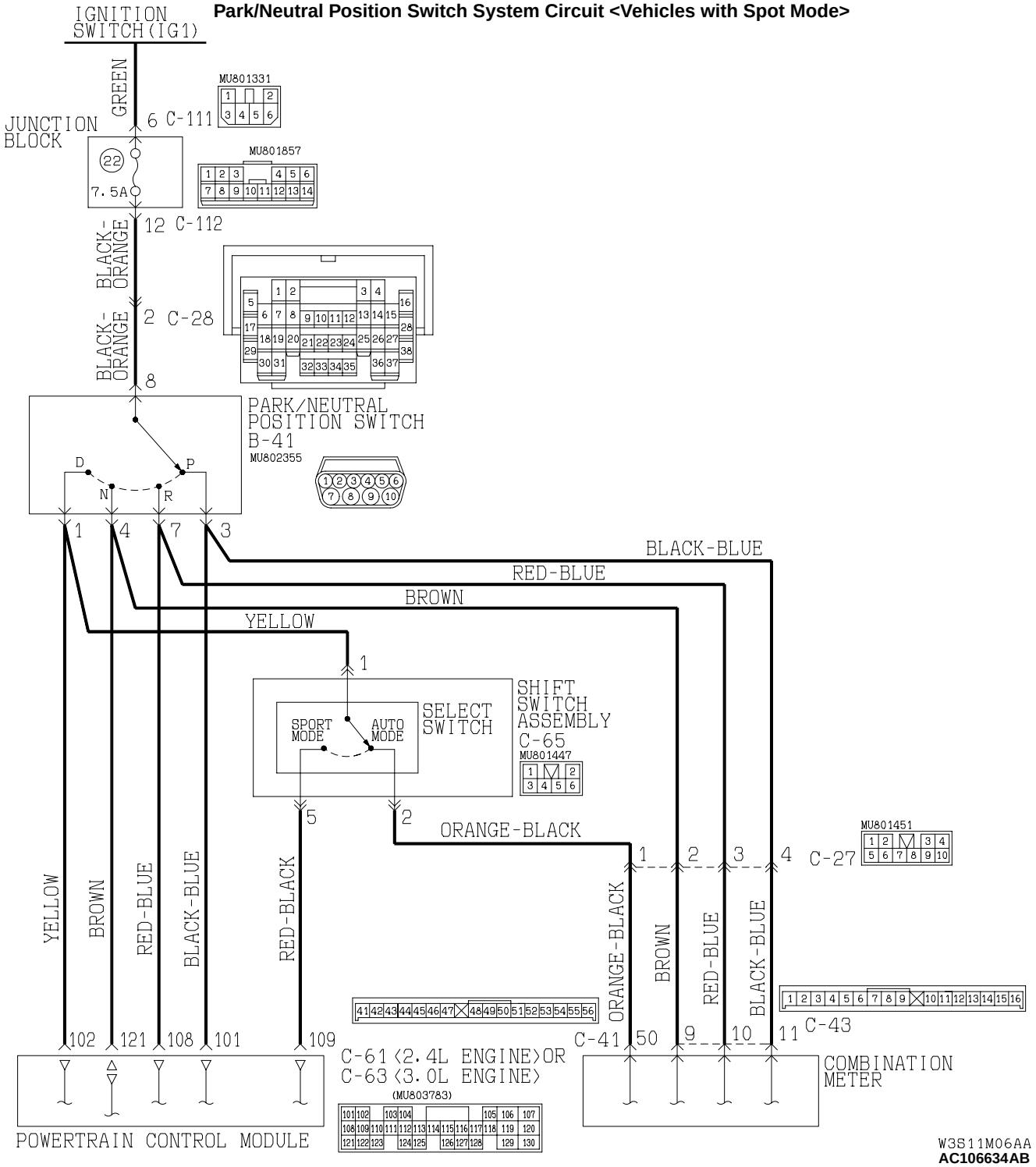
Park/Neutral Position Switch System Circuit <Vehicles without Sport Mode>



W3S11M05AA
AC106633AB

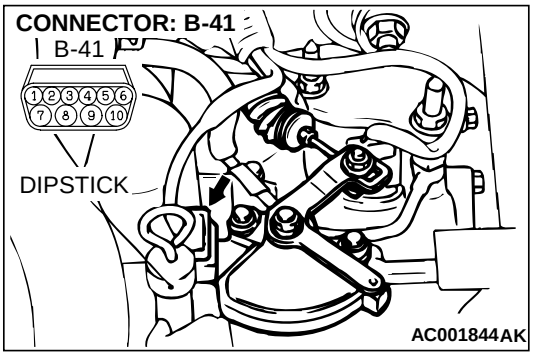
TSB Revision

Park/Neutral Position Switch System Circuit <Vehicles with Spot Mode>

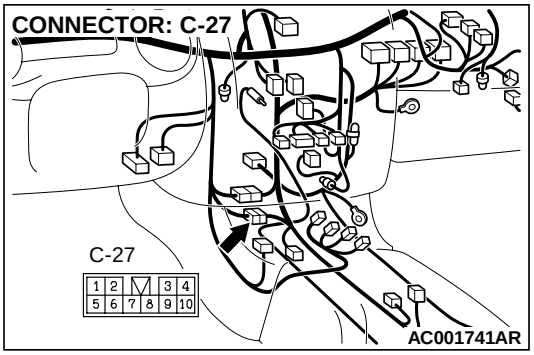


TSB Revision

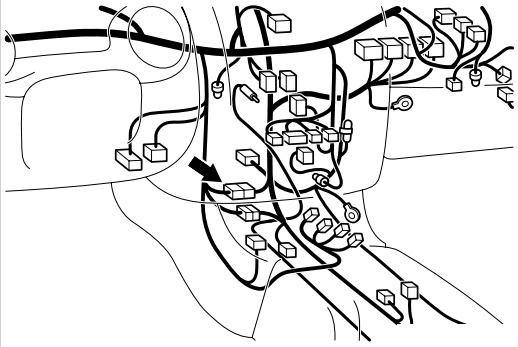
CONNECTOR: B-41



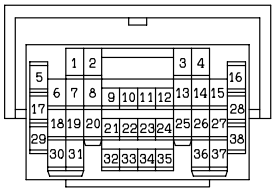
CONNECTOR: C-27



CONNECTOR: C-28

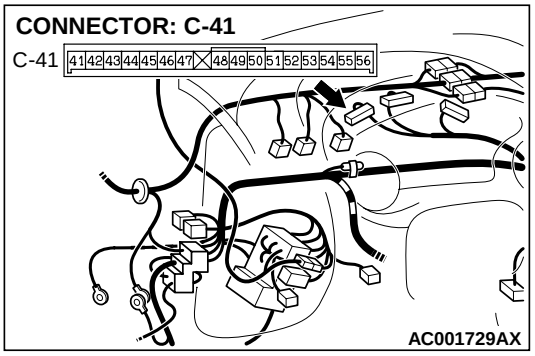


C-28

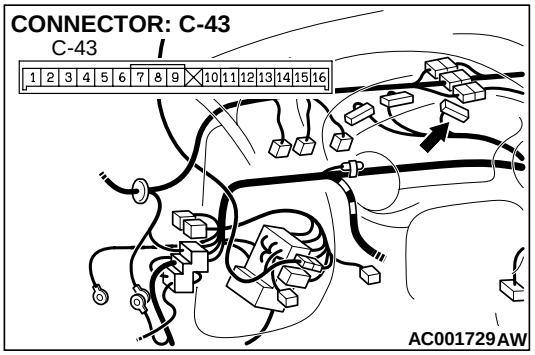


AC106611AB

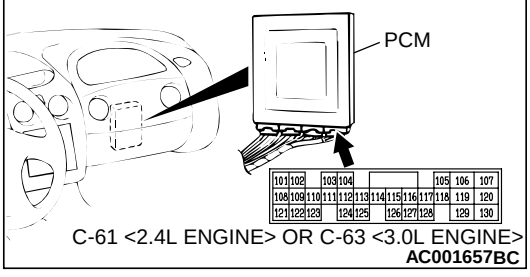
CONNECTOR: C-41



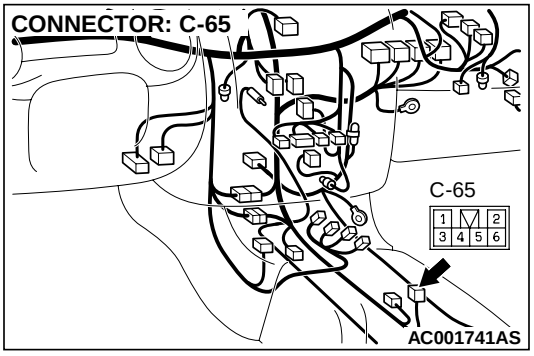
CONNECTOR: C-43



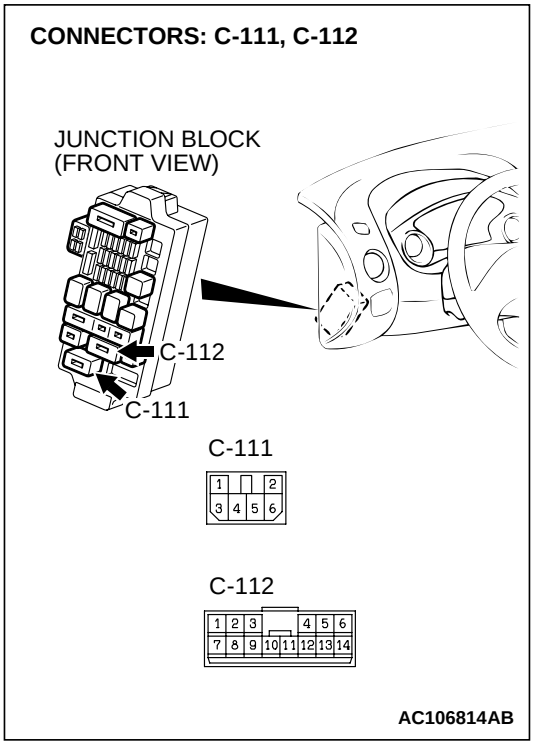
CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



CONNECTOR: C-65



TSB Revision



CIRCUIT OPERATION

- Battery positive voltage is applied to the Park/ Neutral position switch (terminal 8) when the ignition switch is turned "ON."
- Battery positive voltage is applied to the PCM (terminal 101) when the selector lever is in the "P" range. The PCM judges that the selector lever is in the "P" range when the battery positive voltage is applied.
- Battery positive voltage is applied to the PCM terminal 108 (121, 102, 109, 122 or 110) when the selector lever is in the "R" range ("N," "D," "3," "2" or "L" range). The PCM judges that the selector lever is in the "R" range ("N," "D," "3," "2" or "L" range) when the battery positive voltage is applied.

DTC SET CONDITIONS

If the PCM detects no Park/Neutral position switch input signal from any selector position for continuous period of thirty seconds, it is judged that there is an open circuit in the Park/Neutral position switch and diagnostic trouble code number "27" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the Park/Neutral position switch
- Malfunction of the ignition switch
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

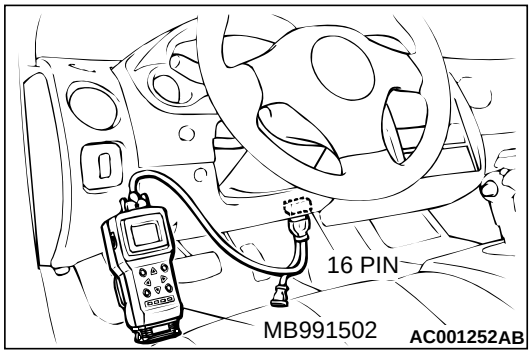
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check data list item 61: Park/Neutral Position Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



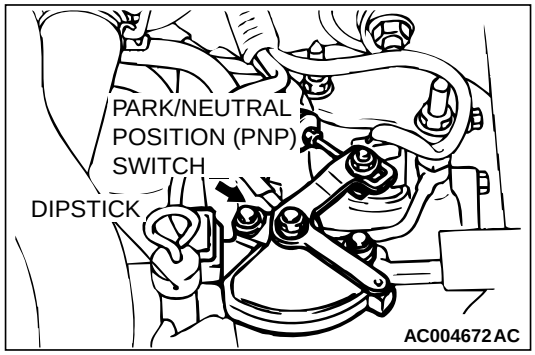
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 61: Park/Neutral Position Switch.
  - Move the selector lever to "P," "R," "N," "D," "3," "2," "L" and sport mode positions to confirm whether shown on the scan tool. (Vehicles with sport mode is indicated as "D" on the scan tool.)

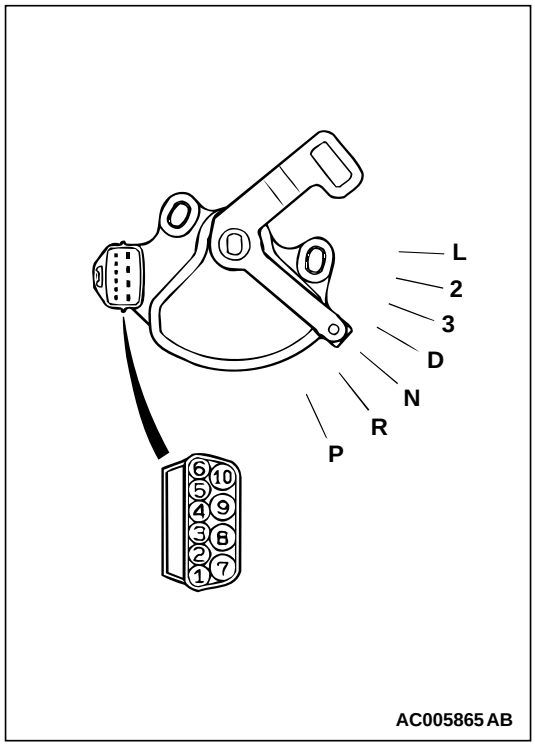
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : When indication disagrees at all positions: Go to Step 2. When indication disagrees at "P" position: Go to Step 6. When indication disagrees at "R" position: Go to Step 13. When indication disagrees at "N" position: Go to Step 19. When indication disagrees at "D" position: Go to Step 25. When indication disagrees at "3" position: Go to Step 32 . When indication disagrees at "2" position: Go to Step 36. When indication disagrees at "L" position: Go to Step 40. When indication disagrees at sport mode position (agrees at "D" position): Go to Step 44.





STEP 2. Check the Park/Neutral position switch.

ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

Check for continuity between terminals for each selector position.

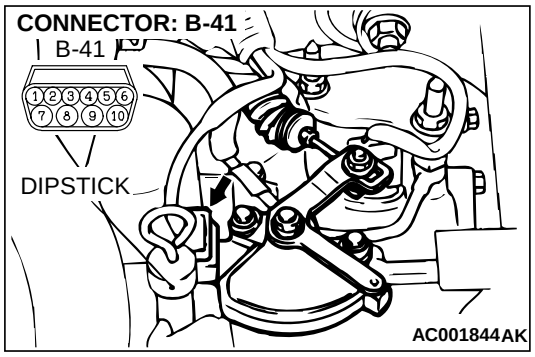
NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

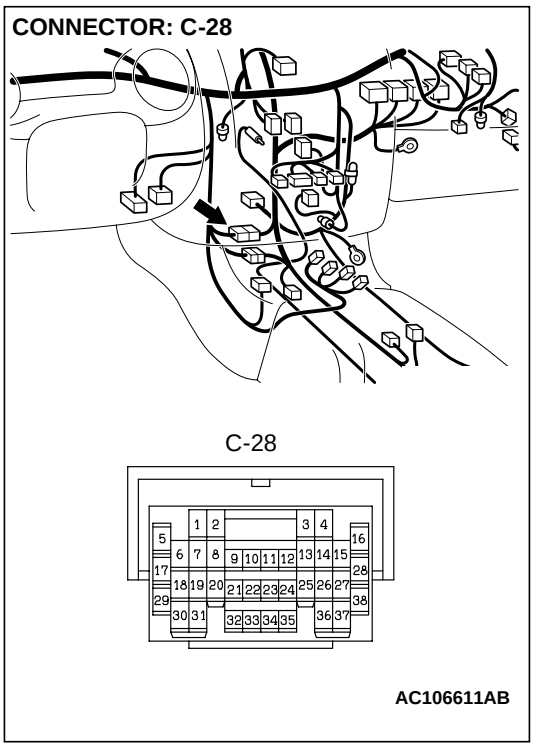
Q: Is the switch operating properly?

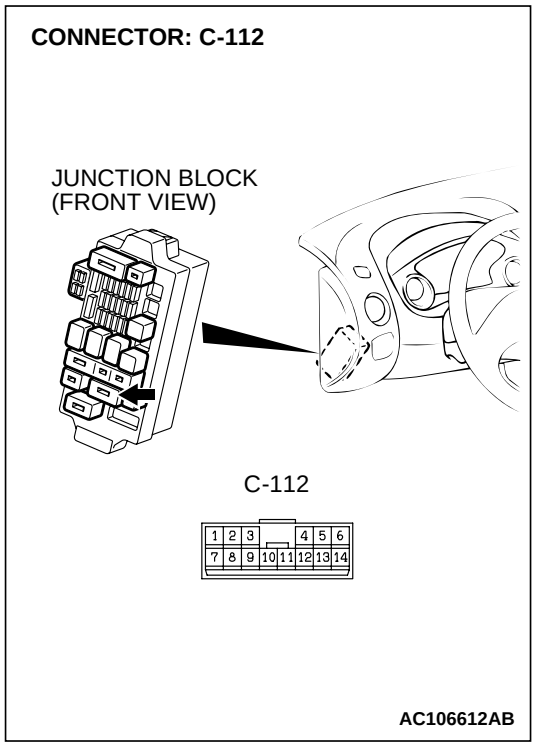
YES : Go to Step 3.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.

STEP 3. Check connectors B-41 at Park/Neutral position switch, C-28 at intermediate connector and C-112 at junction block for damage.



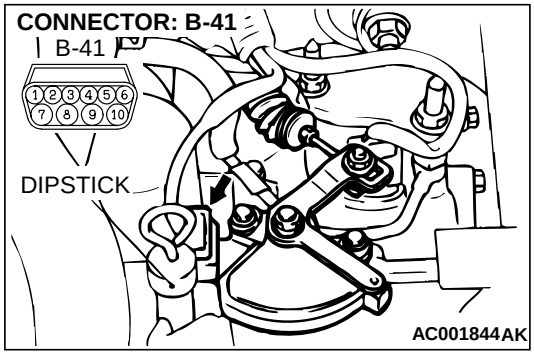


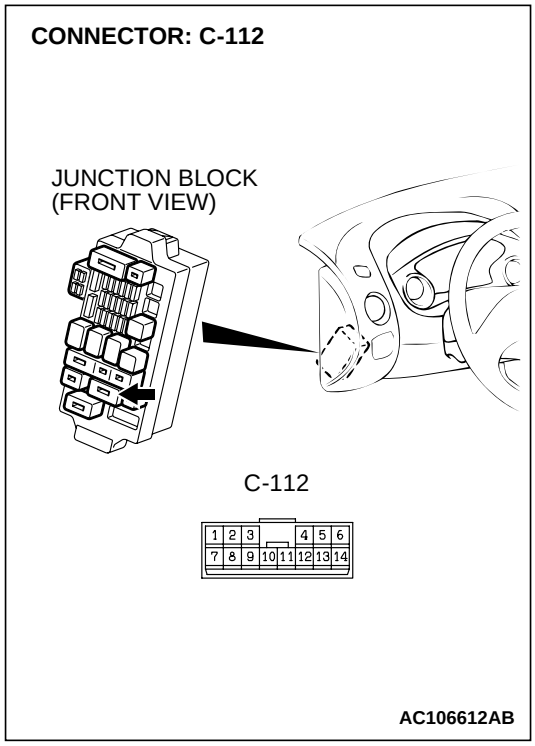


Q: Are the connectors in good condition?

YES : Go to Step 4.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



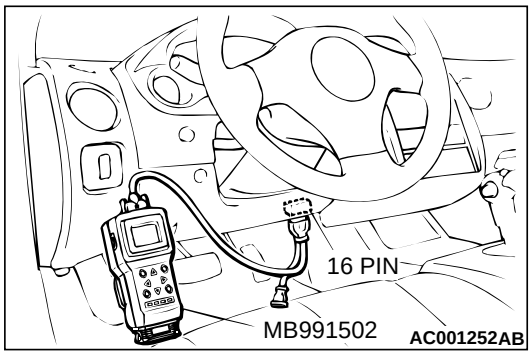


STEP 4. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 8 and junction block connector C-112 terminal 12.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair it.



STEP 5. Using scan tool MB991502, check data list item 61: Park/Neutral Position Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

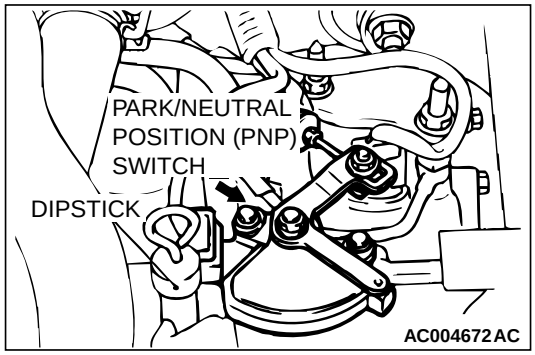
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 61: Park/Neutral Position Switch.
- Move the selector lever to "P," "R," "N," "D," "3," "2," "L" and sport mode positions to confirm whether shown on the scan tool. (Vehicles with sport mode is indicated as "D" on the scan tool.)

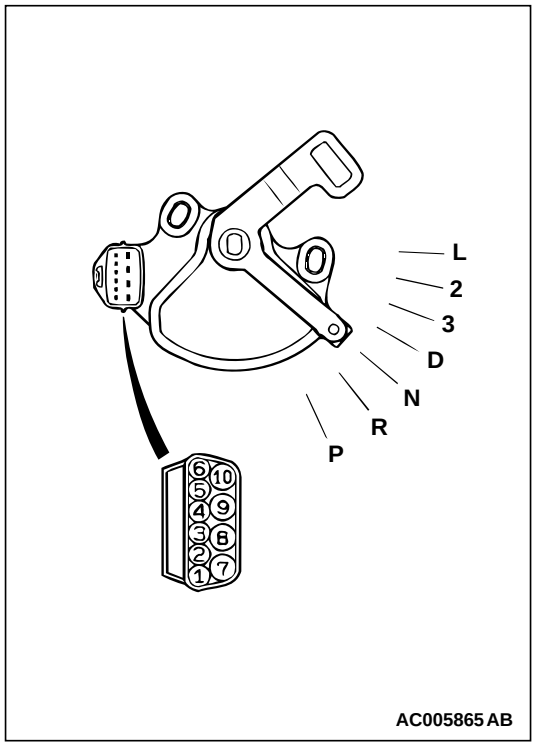
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.





STEP 6. Check the Park/Neutral position switch.

ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

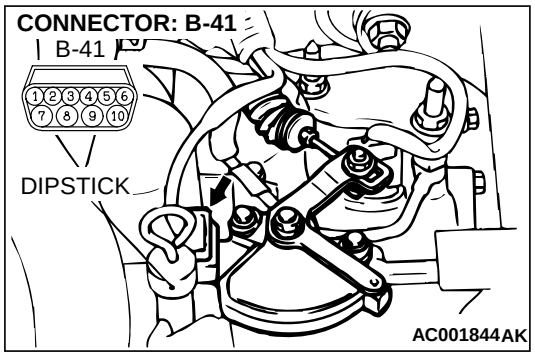
Check for continuity between terminals for each selector position.

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

Q: Is the switch operating properly?

YES : Go to Step 7.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.



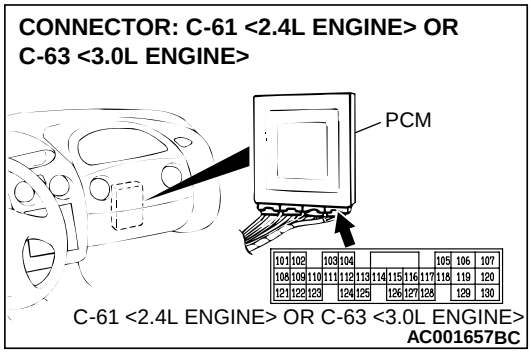
STEP 7. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

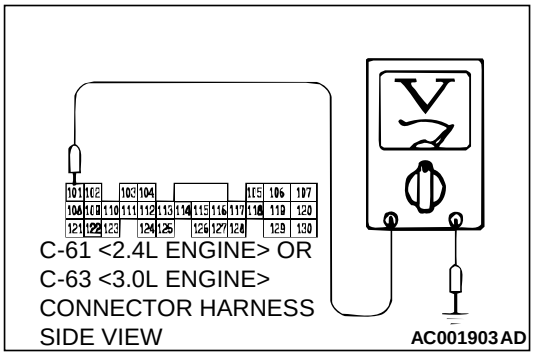
YES : Go to Step 8.

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

STEP 8. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.



(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever to the "P" position.



(4) Measure the voltage between terminal 101 and ground by backprobing.
- Voltage should be battery positive voltage.

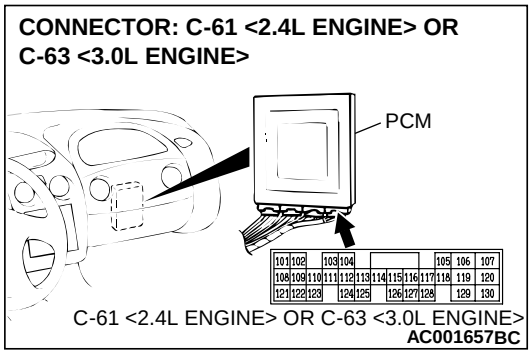
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 12.
NO : Go to Step 9.

STEP 9. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?



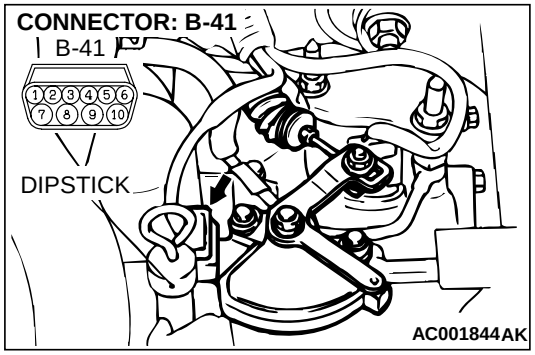
YES : Go to Step 10 <Vehicles with sports mode>. Repair harness open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 3 and PCM connector C-61 terminal 101 <Vehicles without sports mode>.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

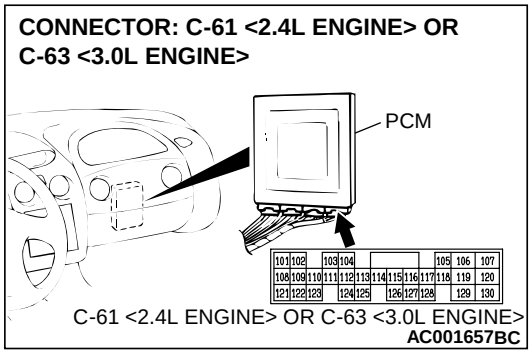
STEP 10. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 3 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 101 <Vehicles with sport mode>.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair it.



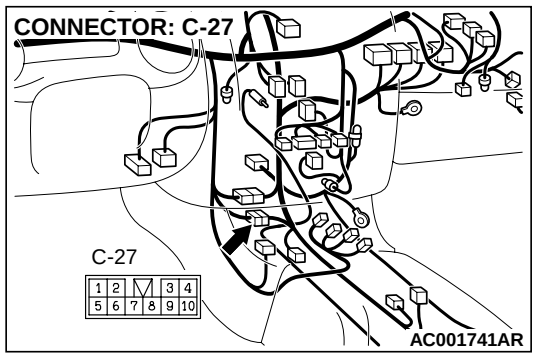


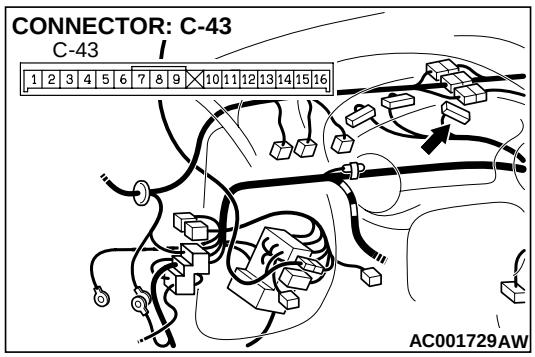
STEP 11. Check connectors C-27 at intermediate connector and C-43 at combination meter for damage <Vehicles with sport mode>.

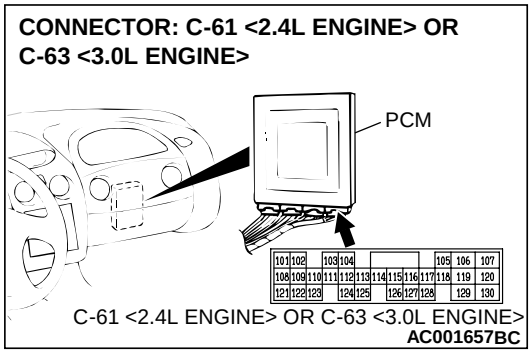
Q: Are the connectors in good condition?

YES : Repair harness short circuit to ground between Park/Neutral position switch connector B-41 terminal 3 and combination meter connector C-43 terminal 11.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





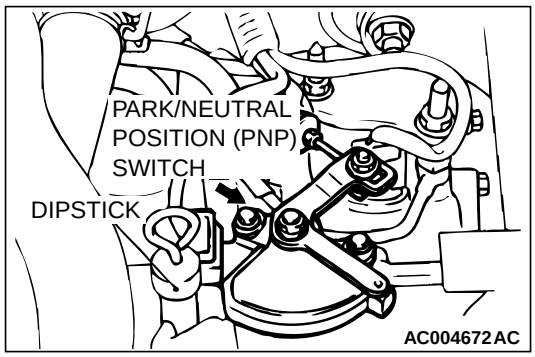


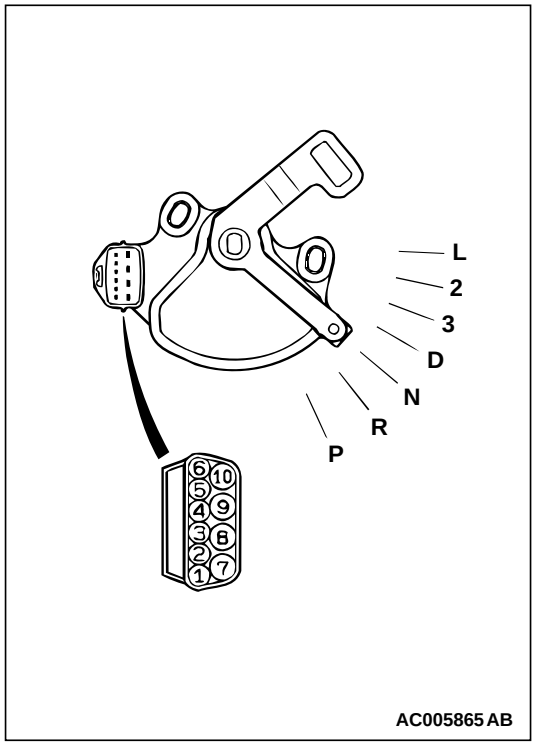
STEP 12. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 5.

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





STEP 13. Check the Park/Neutral position switch.

ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

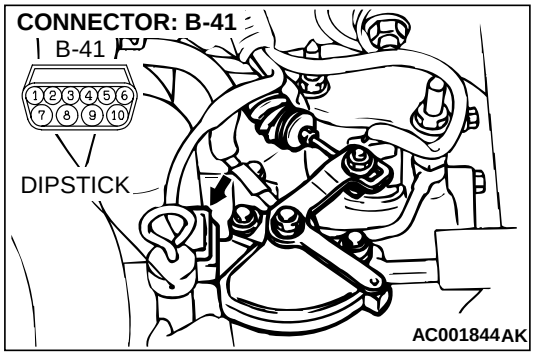
Check for continuity between terminals for each selector position.

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

Q: Is the switch operating properly?

YES : Go to Step 14.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.

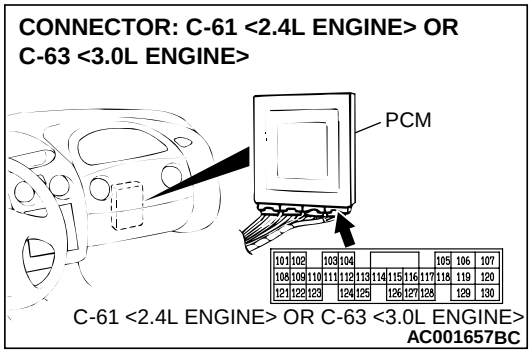


STEP 14. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

YES : Go to Step 15.

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

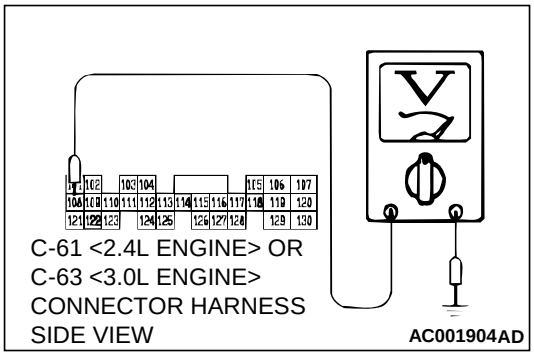


STEP 15. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.

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

(3) Move the selector lever to the "R" position.



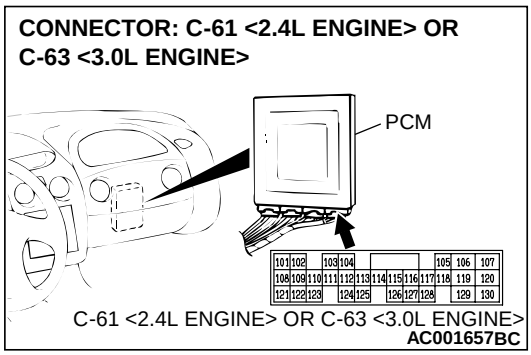
(4) Measure the voltage between terminal 108 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 12.

NO : Go to Step 16.



STEP 16. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 17 <Vehicles with sports mode>. Repair harness open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 7 and PCM connector C-61 terminal 108 <Vehicles without sports mode>.

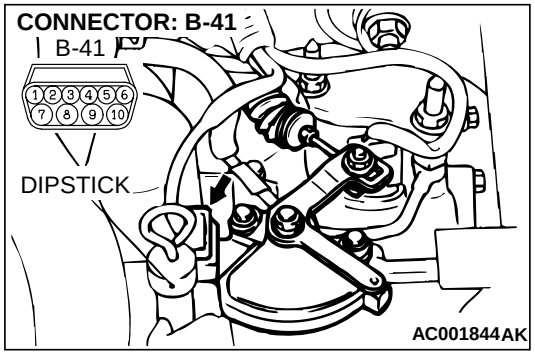
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

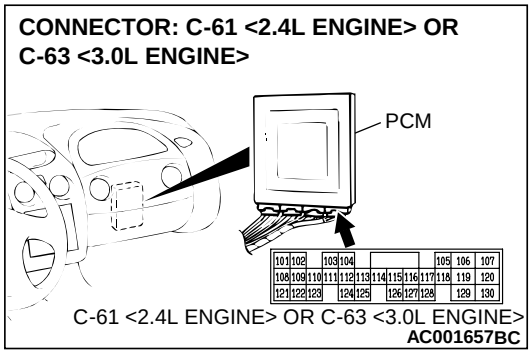
STEP 17. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 7 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 108 <Vehicles with sport mode>.

Q: Is the harness wire in good condition?

YES : Go to Step 18.

NO : Repair it.



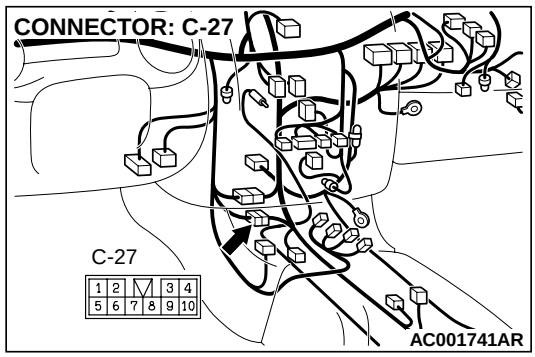


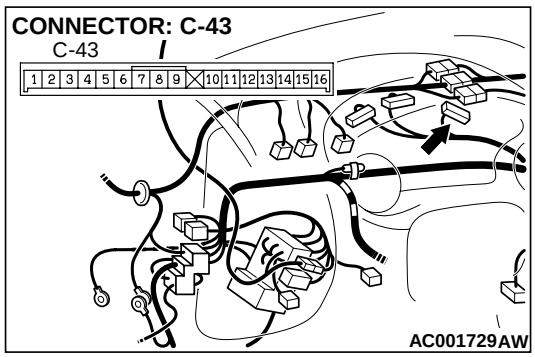
STEP 18. Check connectors C-27 at intermediate connector C-43 at combination meter for damage <Vehicles with sport mode>.

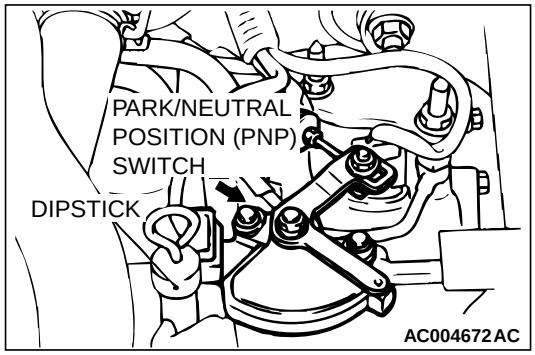
Q: Are the connectors in good condition?

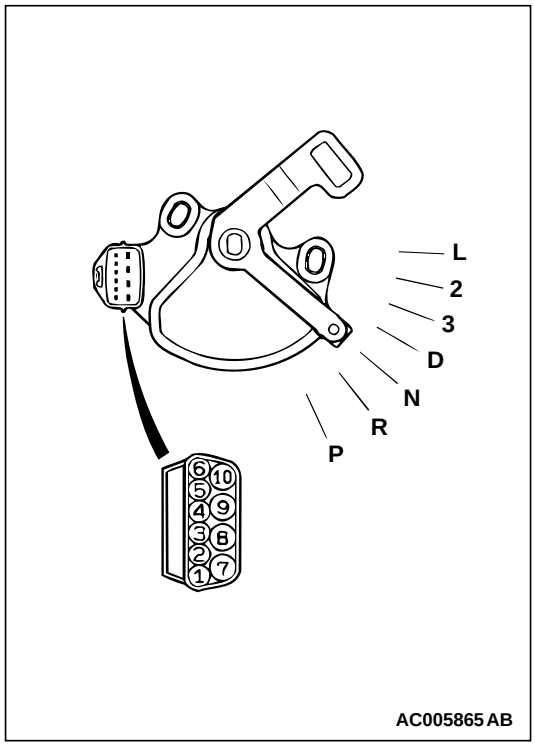
YES : Repair harness short circuit to ground between Park/Neutral position switch connector B-41 terminal 7 and combination meter connector C-43 terminal 10.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.









STEP 19. Check the Park/Neutral position switch.

ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

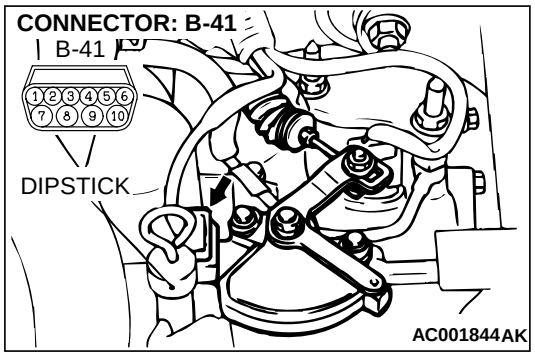
Check for continuity between terminals for each selector position.

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

Q: Is the switch operating properly?

YES : Go to Step 20.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.



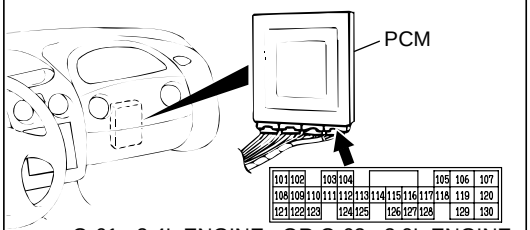
STEP 20. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

YES : Go to Step 21.

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

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



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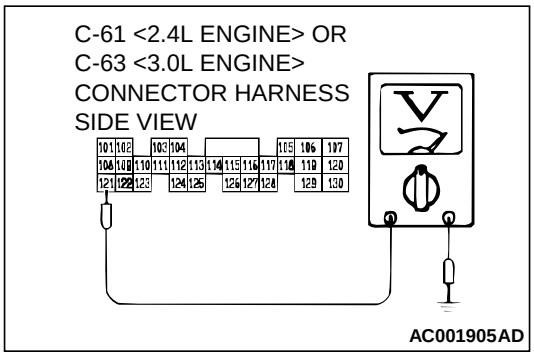
STEP 21. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever to the "N" position.



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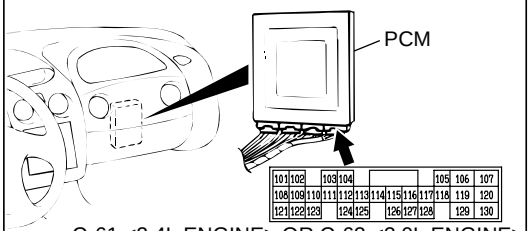
(4) Measure the voltage between terminal 121 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 12.
NO : Go to Step 22.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



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STEP 22. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

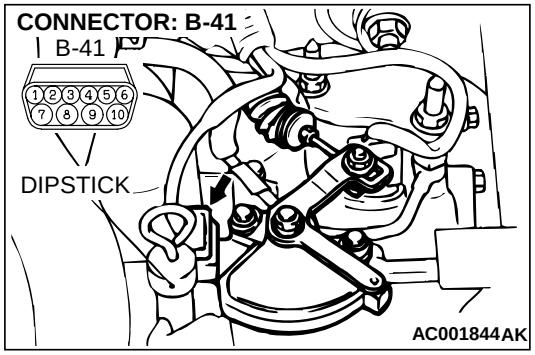
YES : Go to Step 23 <Vehicles with sport mode>. Repair harness open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 4 and PCM connector C-61 terminal 121 <Vehicles without sport mode>.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

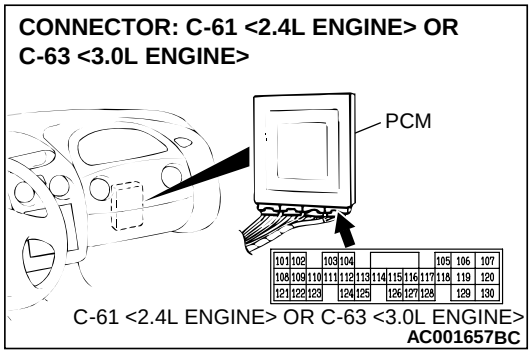
STEP 23. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 4 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 121 <Vehicles with sport mode>.

Q: Is the harness wire in good condition?

YES : Go to Step 24.

NO : Repair it.



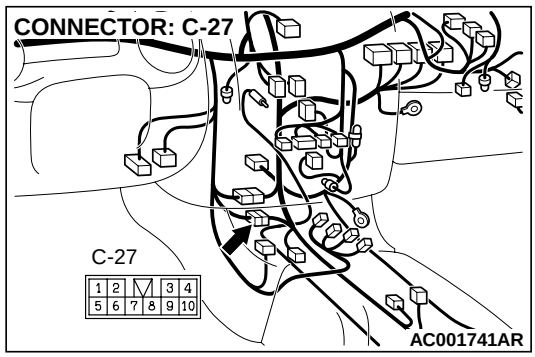


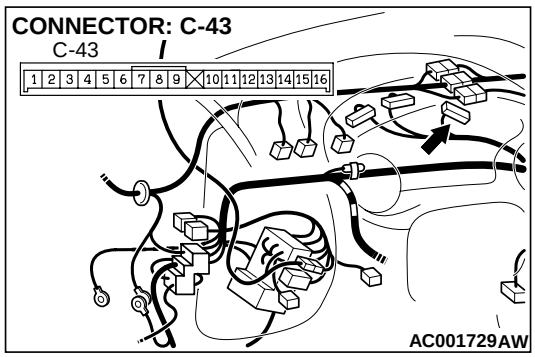
STEP 24. Check connectors C-27 at intermediate connector and C-43 at combination meter for damage <Vehicles with sport mode>.

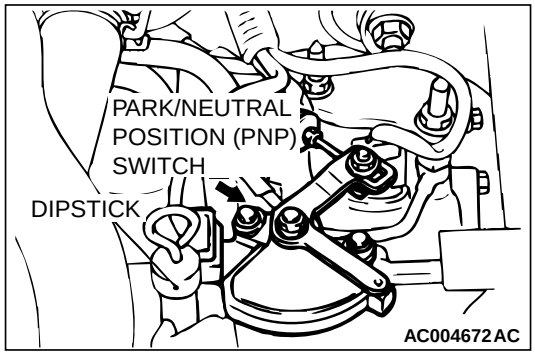
Q: Are the connectors in good condition?

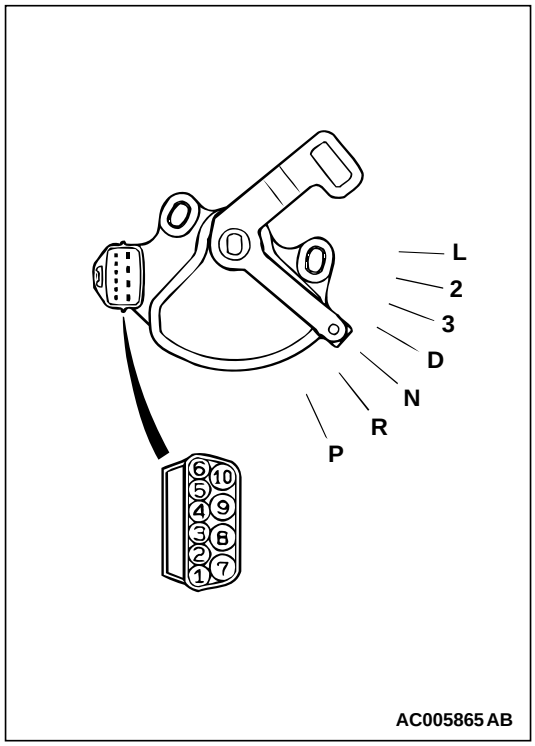
YES : Repair harness short circuit to ground between Park/Neutral position switch connector B-41 terminal 4 and Combination meter C-43 terminal 9.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.









STEP 25. Check the Park/Neutral position switch.

ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

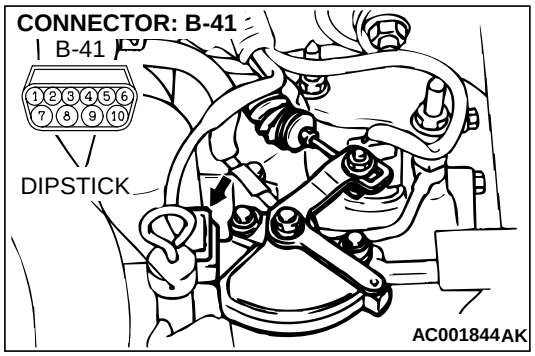
Check for continuity between terminals for each selector position.

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

Q: Is the switch operating properly?

YES : Go to Step 26.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.



STEP 26. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

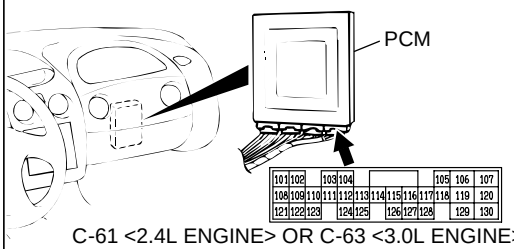
YES : Go to Step 27.

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

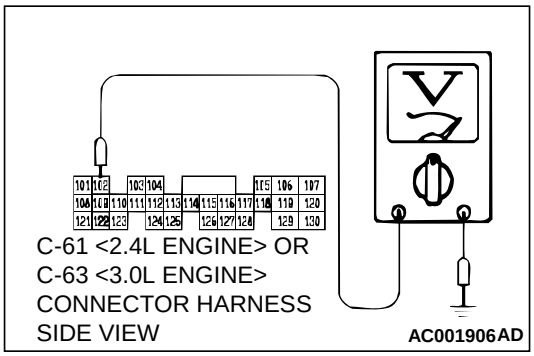
STEP 27. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever to the "D" position.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE> CONNECTOR HARNESS SIDE VIEW
AC001906AD

(4) Measure the voltage between terminal 102 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

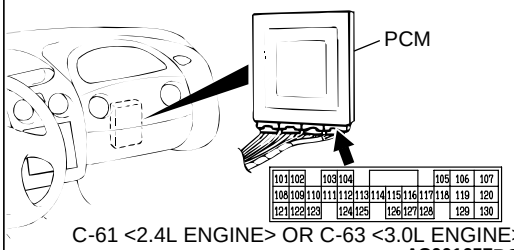
YES : Go to Step 12.
NO : Go to Step 28.

STEP 28. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

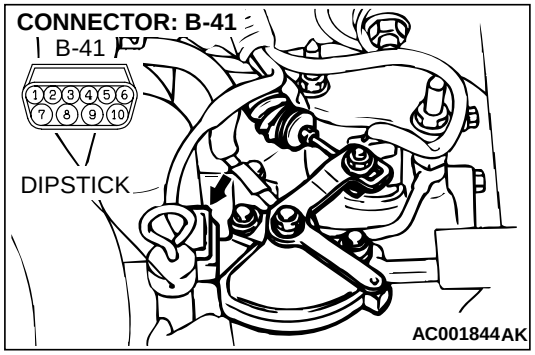
Q: Is the connector in good condition?

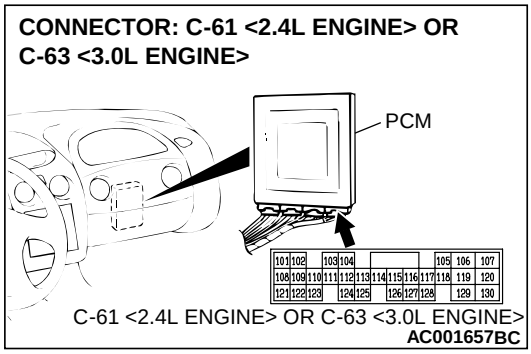
YES : Go to Step 29 <Vehicles with sport mode>. Repair harness open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 1 and PCM connector C-61 terminal 102 <Vehicles without sport mode>.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC



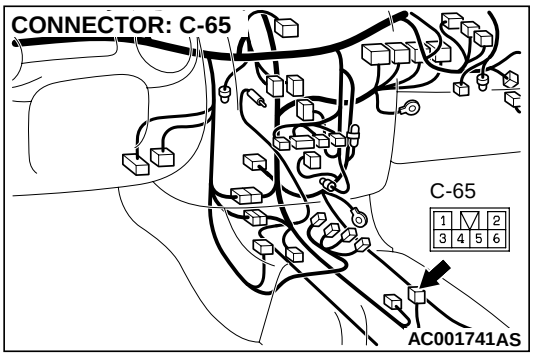


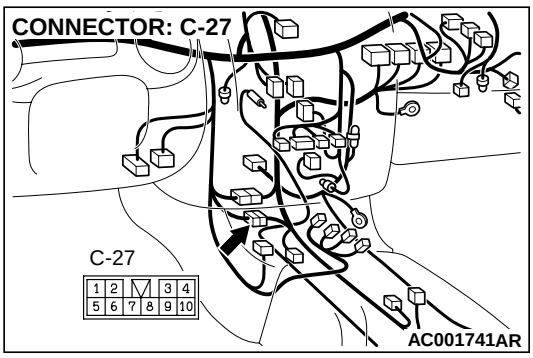
STEP 29. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 1 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 102 <Vehicles with sport mode>.

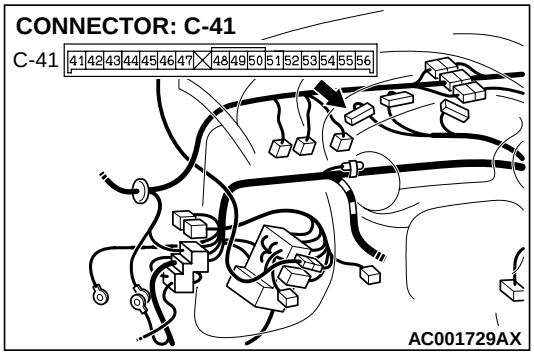
Q: Is the harness wire in good condition?

YES : Go to Step 30.

NO : Repair it.

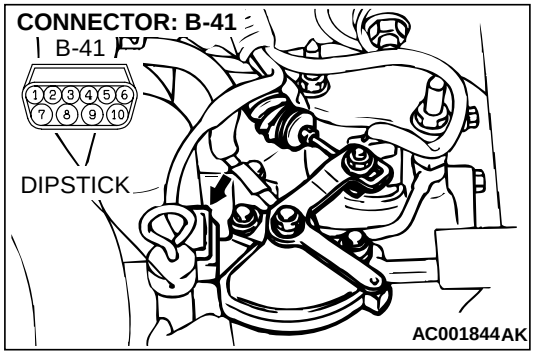


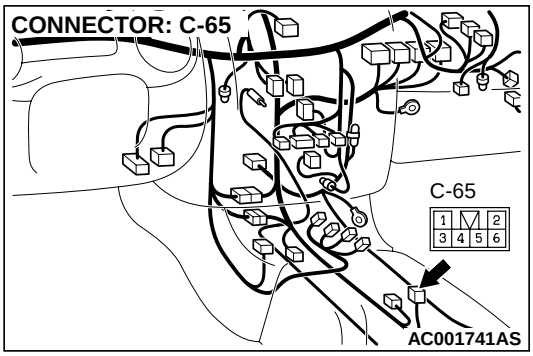




STEP 30. Check connectors C-65 at shift switch assembly, C-27 at intermediate connector and C-41 at combination meter for damage <Vehicles with sport mode>.
Q: Are the connectors in good condition?

YES : Go to Step 31.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



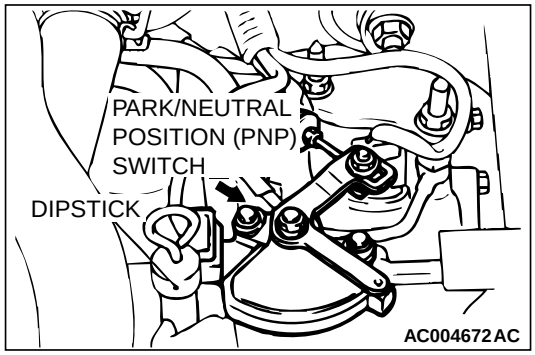


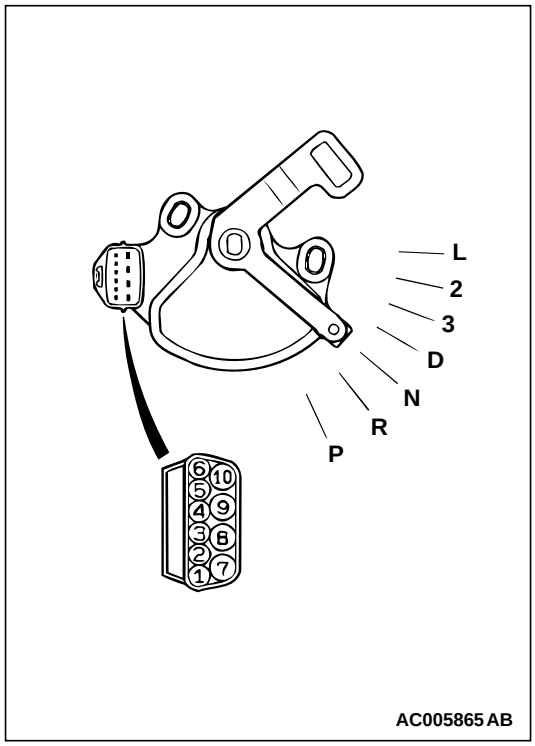
STEP 31. Check harness for short circuit to ground between Park/Neutral position switch connector B-41 terminal 1 and shift switch assembly connector C-65 terminal 1 <Vehicles with sport mode>.

Q: Is the harness wire in good condition?

YES : Repair harness short circuit to ground between shift switch assembly connector C-65 terminal 2 and combination meter connector C-41 terminal 50.

NO : Repair it.





STEP 32. Check the Park/Neutral position switch.

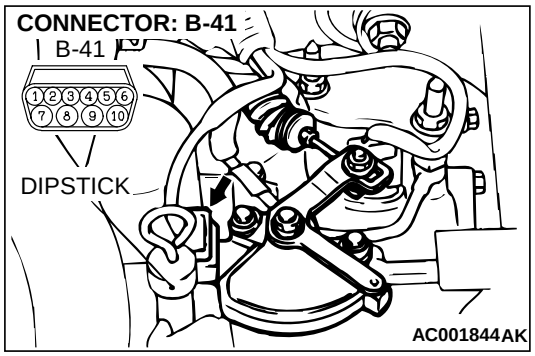
ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

Check for continuity between terminals for each selector position.

Q: Is the switch operating properly?

YES : Go to Step 33.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.

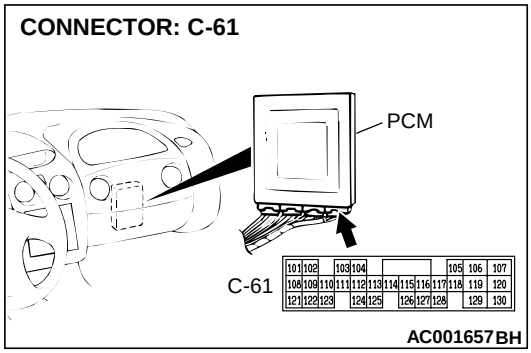


STEP 33. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

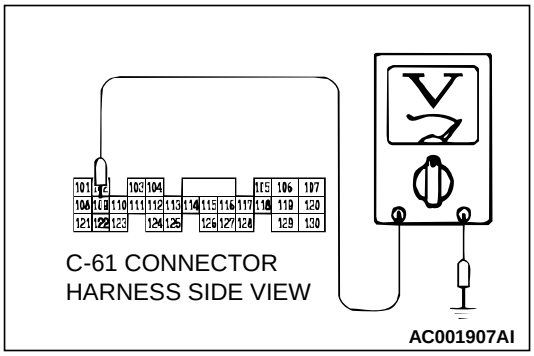
YES : Go to Step 34.

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



STEP 34. Check the switch output voltage at PCM connector C-61 by backprobing.

(1) Do not disconnect connector C-61.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever to the "3" position.

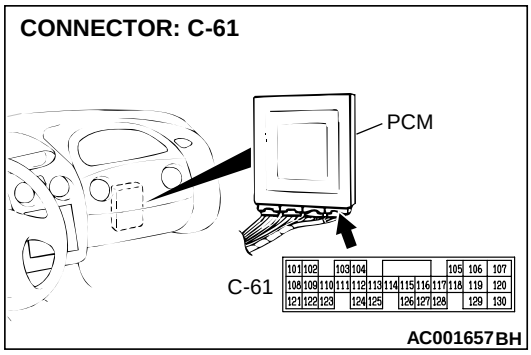


(4) Measure the voltage between terminal 109 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

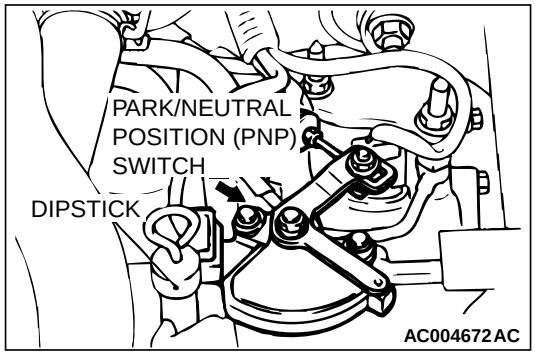
YES : Go to Step 12.
NO : Go to Step 35.

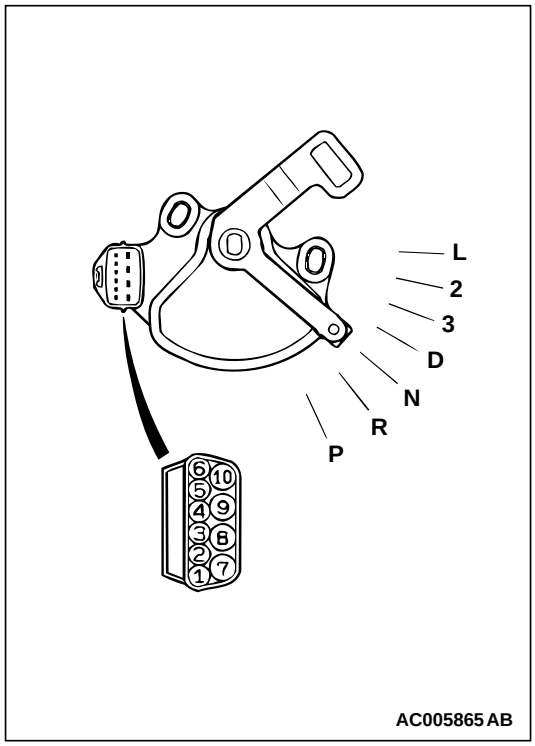


STEP 35. Check connector C-61 at PCM for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 5 and PCM connector C-61 terminal 109.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 36. Check the Park/Neutral position switch.

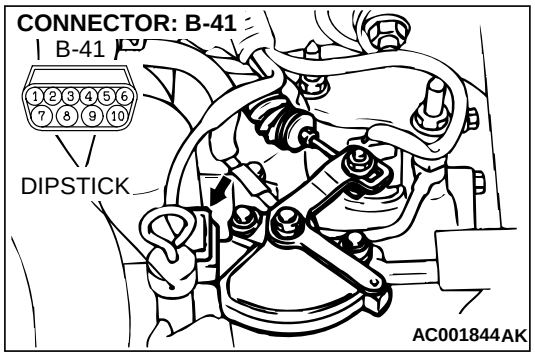
ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

Check for continuity between terminals for each selector position.

Q: Is the switch operating properly?

YES : Go to Step 37.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.

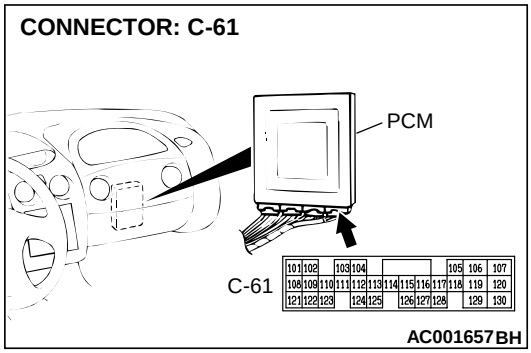


STEP 37. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

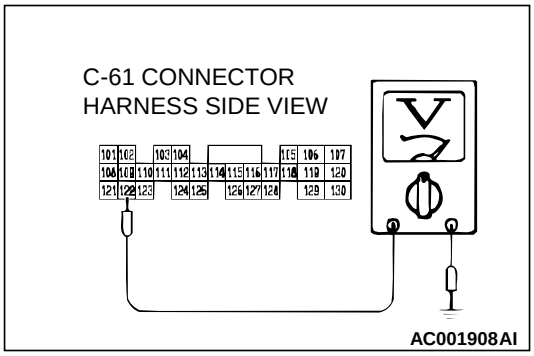
YES : Go to Step 38.

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



STEP 38. Check the switch output voltage at PCM connector C-61 by backprobing.

(1) Do not disconnect connector C-61.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever to the "2" position.

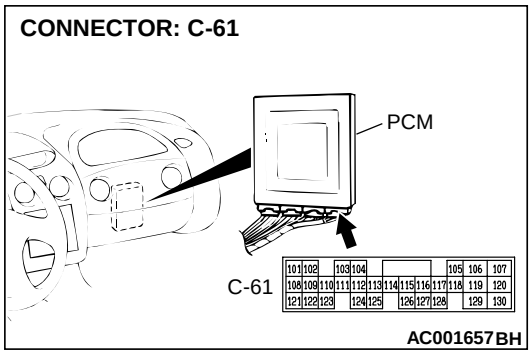


(4) Measure the voltage between terminal 122 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

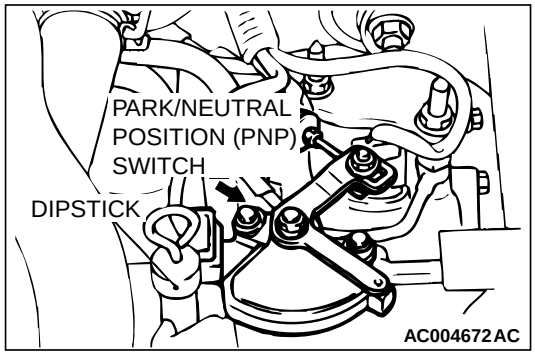
YES : Go to Step 12.
NO : Go to Step 39.

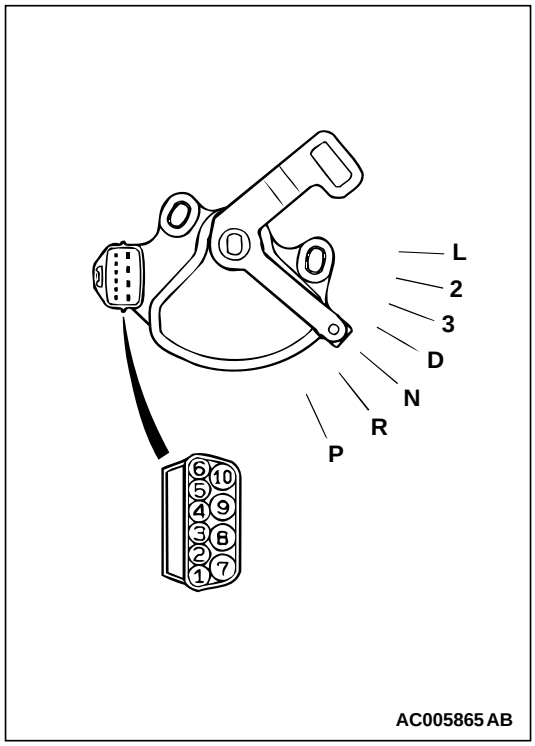


STEP 39. Check connector C-61 at PCM for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 2 and PCM connector C-61 terminal 122.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 40. Check the Park/Neutral position switch.

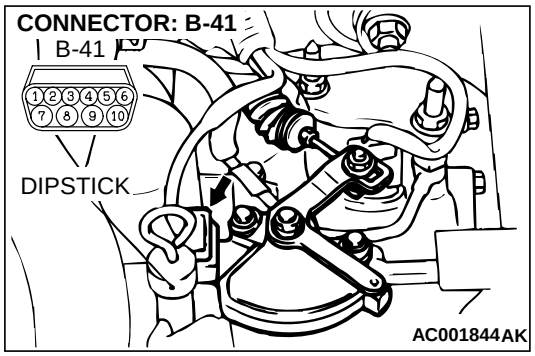
ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

Check for continuity between terminals for each selector position.

Q: Is the switch operating properly?

YES : Go to Step 41.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.

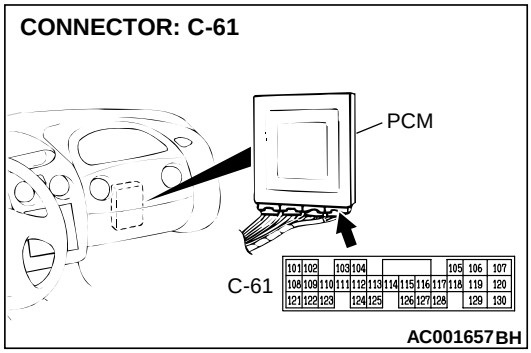


STEP 41. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

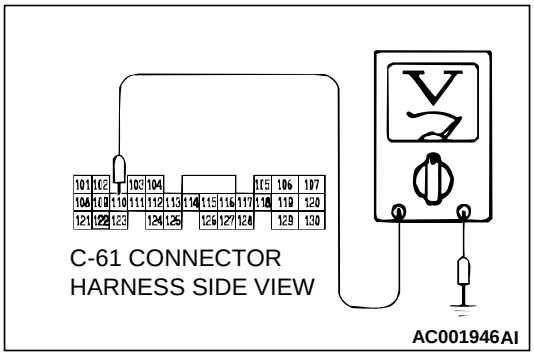
YES : Go to Step 42.

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



STEP 42. Check the switch output voltage at PCM connector C-61 by backprobing.

(1) Do not disconnect connector C-61.
(2) Turn the ignition switch to the "ON" position.
(3) Move the selector lever to the "L" position.

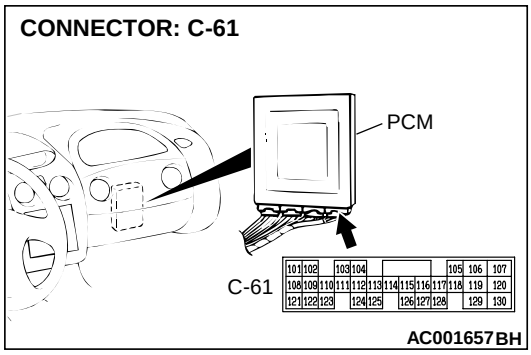


(4) Measure the voltage between terminal 110 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 12.
NO : Go to Step 43.



STEP 43. Check connector C-61 at PCM for damage.

Q: Is the connector in good condition?

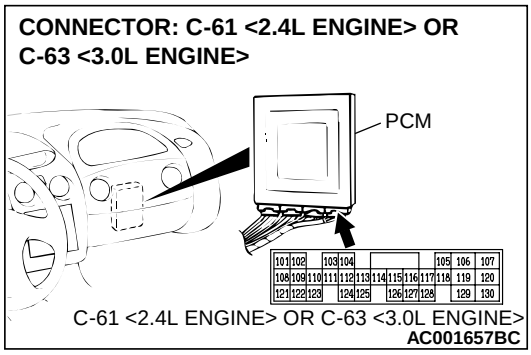
YES : Repair harness open circuit or short circuit to ground between the Park/Neutral position switch connector B-41 terminal 6 and PCM connector C-61 terminal 110.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

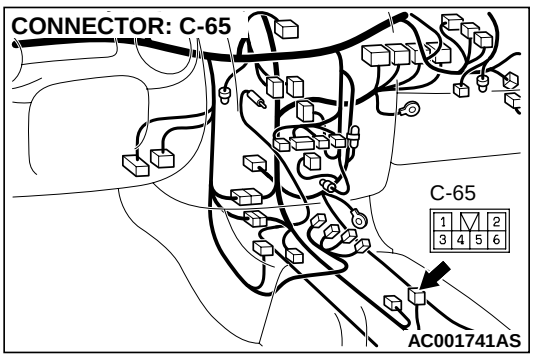
STEP 44. Check connectors C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM and C-65 at shift switch assembly for damage.

Q: Are the connectors in good condition?

YES : Repair harness short circuit to ground between shift switch assembly connector C-65 terminal 4 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 109.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





DTC 28: Park/Neutral Position Switch System (Short Circuit)

Park/Neutral Position Switch System Circuit
Refer to P.23A-136.

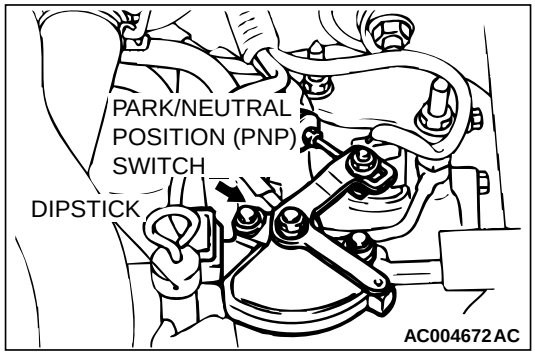
CIRCUIT OPERATION
Refer to P.23A-136.

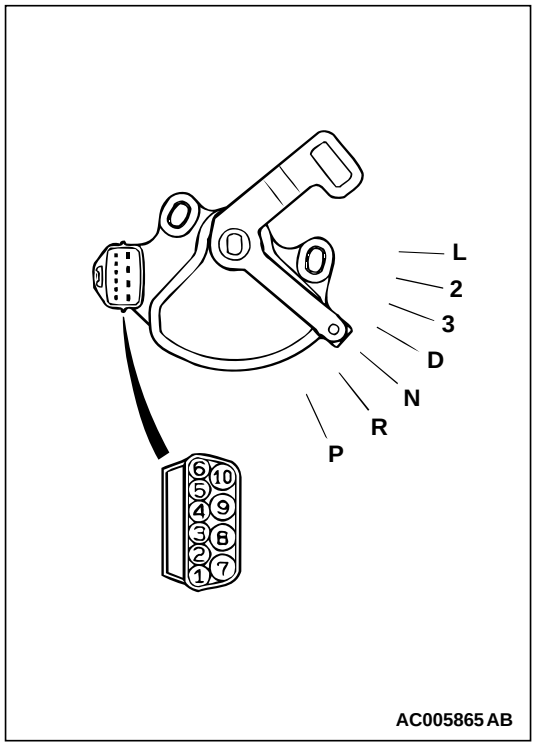
DTC SET CONDITIONS
If the PCM detects more than one kind of park/neutral position switch input signals for continuous period of thirty seconds, it is judged that there is a short circuit in the Park/Neutral position switch and diagnostic trouble code number "28" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)
- Malfunction of the Park/Neutral position switch
- Malfunction of the ignition switch
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)





STEP 1. Check the Park/Neutral position switch.

ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

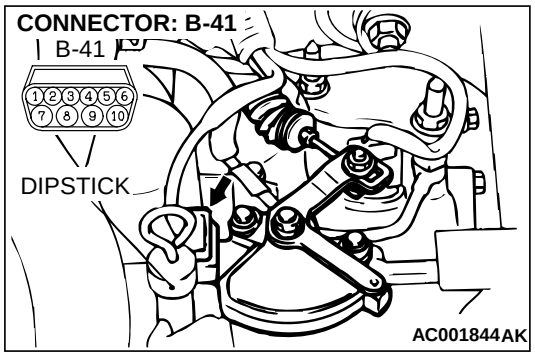
Check for continuity between terminals for each selector position.

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

Q: Is the switch operating properly?

YES : Go to Step 2.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.



STEP 2. Check connector B-41 at the Park/Neutral position switch for damage.

Q: Is the connector in good condition?

YES : Go to Step 3.

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

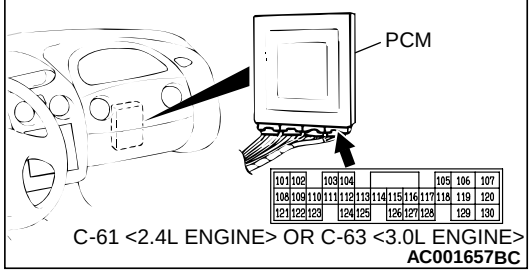
STEP 3. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 4.

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

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



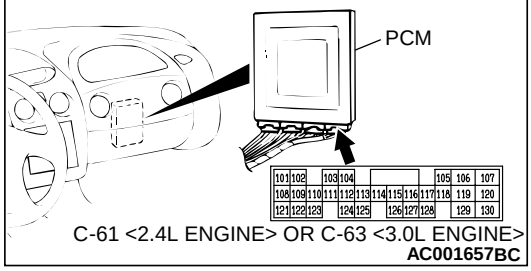
C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC

STEP 4. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing. ("P" position)

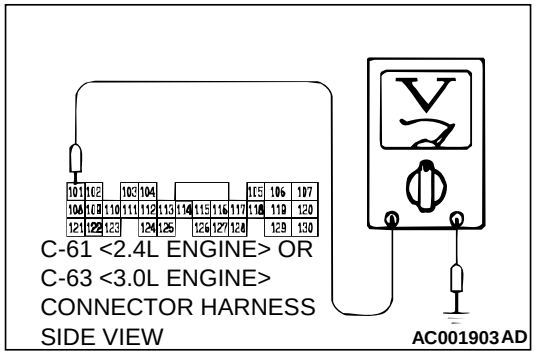
(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.

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

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE> CONNECTOR HARNESS SIDE VIEW
AC001903AD

(3) Measure the voltage between terminal 101 and ground by backprobing.

- When selector lever position is "P," voltage should be battery positive voltage.
- When selector lever position is "R," voltage should be 0.5 volt or less.
- When selector lever position is "N," voltage should be 0.5 volt or less.
- When selector lever position is "D," voltage should be 0.5 volt or less.
- When selector lever position is "3," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "2," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "L," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is sport mode, voltage should be 0.5 volt or less. <Vehicles with sport mode>

Q: Is the voltage normal?

YES : Go to Step 7.

NO : Turn the ignition switch to the "LOCK" (OFF) position. Go to Step 5 <Vehicles with sport mode>. Repair harness damage between the Park/Neutral position switch connector B-41 terminal 3 and PCM connector C-61 terminal 101 <Vehicles without sport mode>.

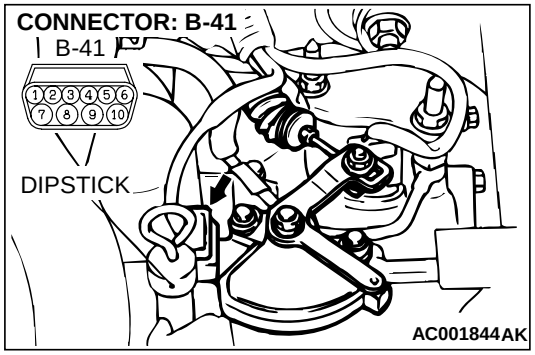
TSB Revision

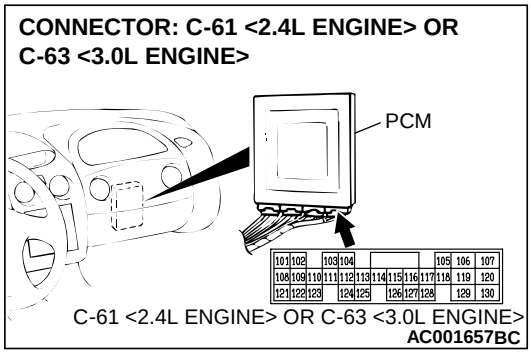
STEP 5. Check harness for damage between Park/Neutral position switch connector B-41 terminal 3 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 101. <Vehicles with sport mode>

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.



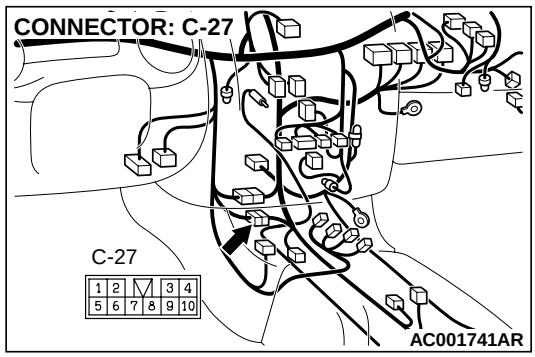


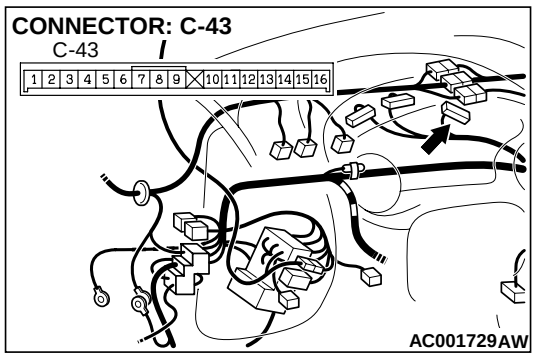
STEP 6. Check connectors C-27 at intermediate connector and C-43 at combination meter for damage. <Vehicles with sport mode>

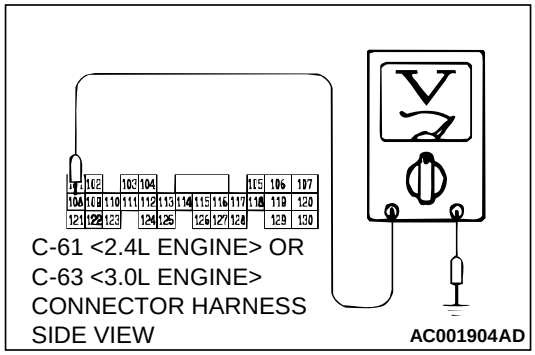
Q: Are the connectors in good condition?

YES : Repair harness damage between the Park/Neutral position switch connector B-41 terminal 3 and combination meter connector C-43 terminal 11.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







STEP 7. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing. ("R" position)

Measure the voltage between terminal 108 and ground by backprobing.

- When selector lever position is "P," voltage should be 0.5 volt or less.
- When selector lever position is "R," voltage should be battery positive voltage.
- When selector lever position is "N," voltage should be 0.5 volt or less.
- When selector lever position is "D," voltage should be 0.5 volt or less.
- When selector lever position is "3," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "2," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "L," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is sport mode, voltage should be 0.5 volt or less. <Vehicles with sport mode>

Q: Is the voltage normal?

YES : Go to Step 10.

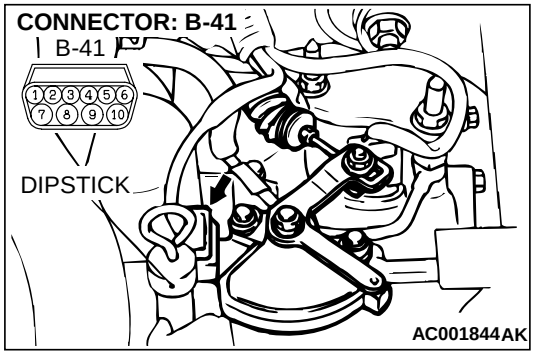
NO : Turn the ignition switch to the "LOCK" (OFF) position. Go to Step 8 <Vehicles with sport mode>. Repair harness damage between the Park/Neutral position switch connector B-41 terminal 7 and PCM connector C-61 terminal 108 <Vehicles without sport mode>.

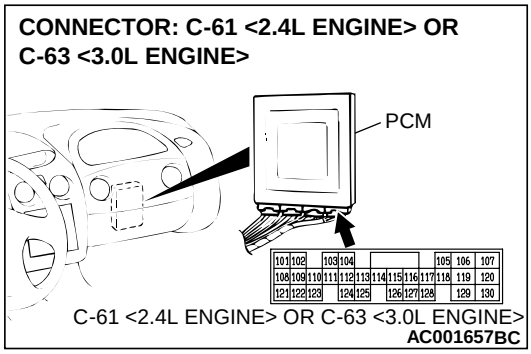
STEP 8. Check harness for damage between Park/Neutral position switch connector B-41 terminal 7 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 108. <Vehicles with sport mode>

Q: Is the harness wire in good condition?

YES : Go to Step 9.

NO : Repair it.



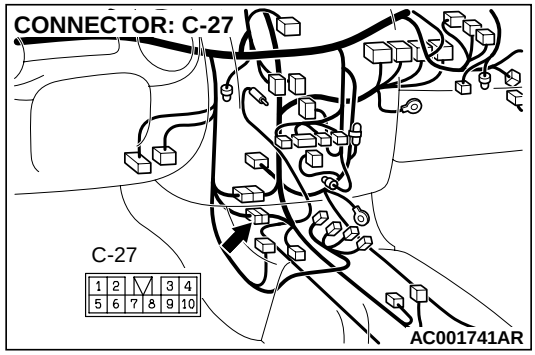


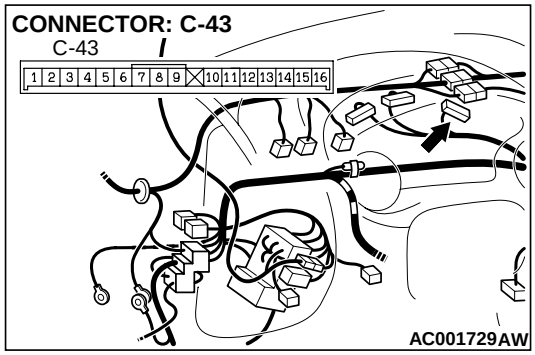
STEP 9. Check connectors C-27 at intermediate connector and C-43 at combination meter for damage. <Vehicles with sport mode>

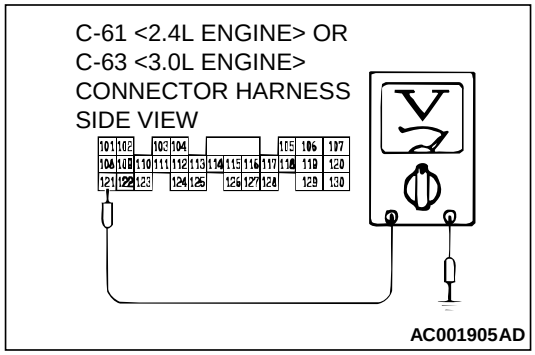
Q: Are the connectors in good condition?

YES : Repair harness damage between the Park/Neutral position switch connector B-41 terminal 7 and combination meter connector C-43 terminal 10.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







STEP 10. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing. ("N" position)

Measure the voltage between terminal 121 and ground by backprobing.

- When selector lever position is "P," voltage should be 0.5 volt or less.
- When selector lever position is "R," voltage should be 0.5 volt or less.
- When selector lever position is "N," voltage should be battery positive voltage.
- When selector lever position is "D," voltage should be 0.5 volt or less.
- When selector lever position is "3," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "2," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "L," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is sport mode, voltage should be 0.5 volt or less. <Vehicles with sport mode>

Q: Is the voltage normal?

YES : Go to Step 13.

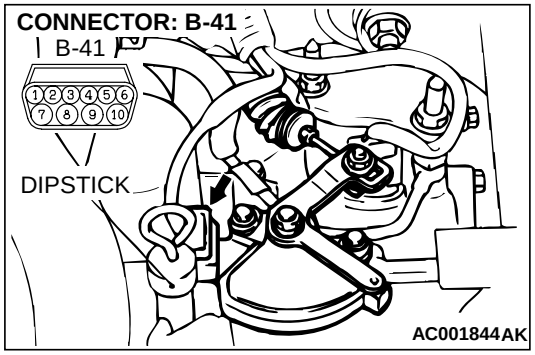
NO : Turn the ignition switch to the "LOCK" (OFF) position. Go to Step 11 <Vehicles with sport mode>. Repair harness damage between the Park/Neutral position switch connector B-41 terminal 4 and PCM connector C-61 terminal 121 <Vehicles without sport mode>.

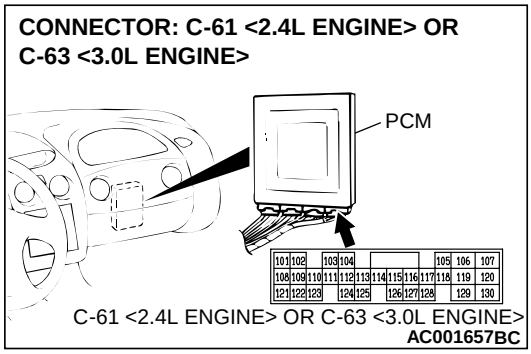
STEP 11. Check harness for damage between Park/Neutral position switch connector B-41 terminal 4 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 121. <Vehicles with sport mode>

Q: Is the harness wire in good condition?

YES : Go to Step 12.

NO : Repair it.



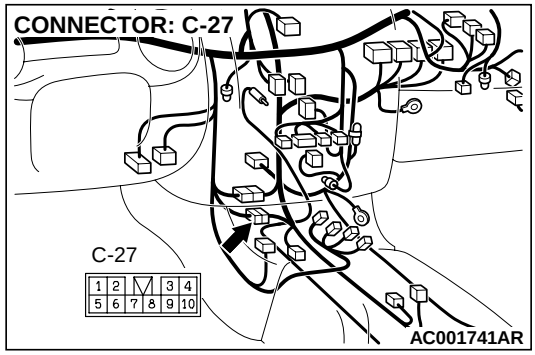


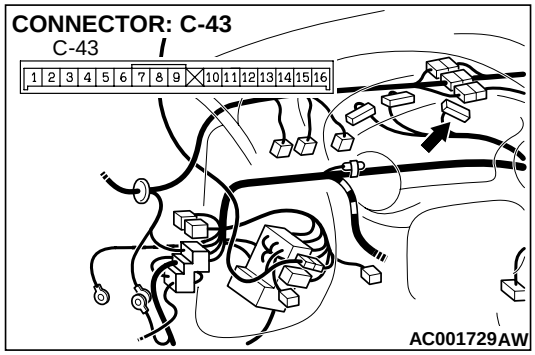
STEP 12. Check connectors C-27 at intermediate connector C-43 at combination meter for damage. <Vehicles with sport mode>

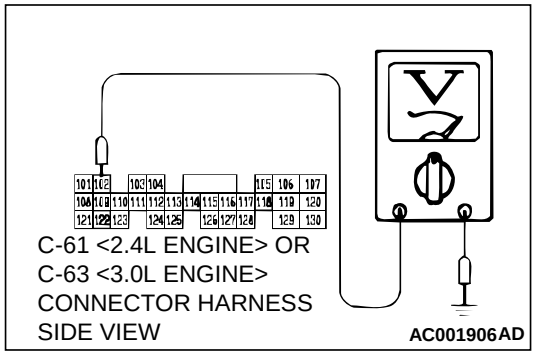
Q: Are the connectors in good condition?

YES : Repair harness damage between the Park/Neutral position switch connector B-41 terminal 4 and combination meter connector C-43 terminal 9.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







STEP 13. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing. ("D" position)

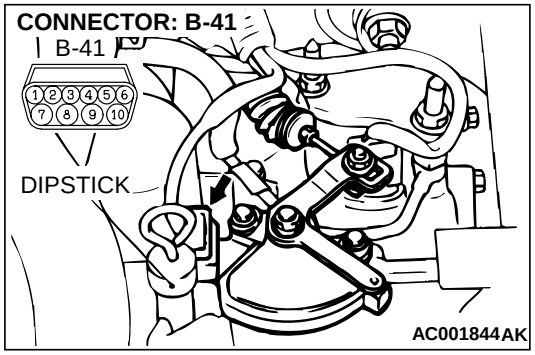
Measure the voltage between terminal 102 and ground by backprobing.

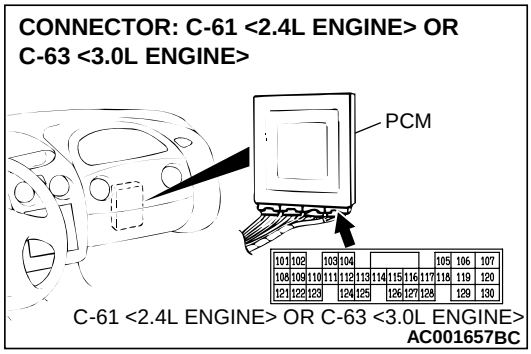
- When selector lever position is "P," voltage should be 0.5 volt or less.
- When selector lever position is "R," voltage should be 0.5 volt or less.
- When selector lever position is "N," voltage should be 0.5 volt or less.
- When selector lever position is "D," voltage should be battery positive voltage.
- When selector lever position is "3," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "2," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is "L," voltage should be 0.5 volt or less. <Vehicles without sport mode>
- When selector lever position is sport mode, voltage should be 0.5 volt or less. <Vehicles with sport mode>

Q: Is the voltage normal?

YES : Go to Step 20 <Vehicles with sport mode>. Go to Step 17 <Vehicles without sport mode>.

NO : Tern the ignition switch to the "LOCK" (OFF) position. Go to Step 14 <Vehicles with sport mode>. Repair harness damage between the Park/Neutral position switch connector B-41 terminal 1 and PCM connector C-61 terminal 102 <Vehicles without sport mode>.



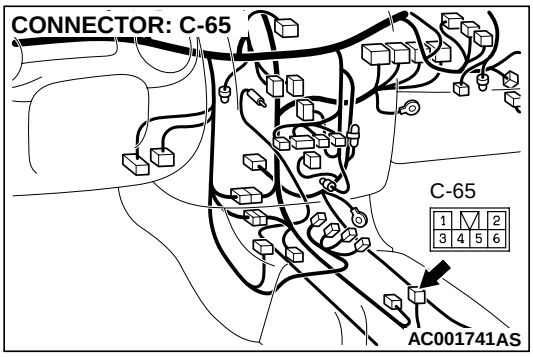


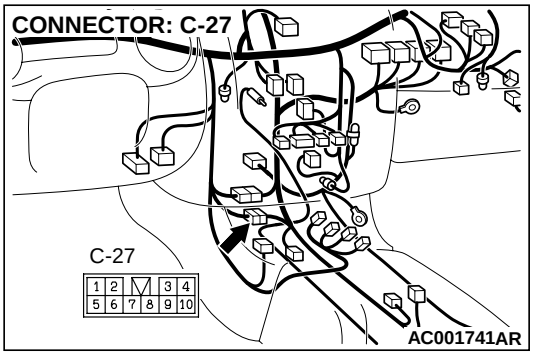
STEP 14. Check harness for damage between Park/Neutral position switch connector B-41 terminal 1 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 102. <Vehicles with sport mode>

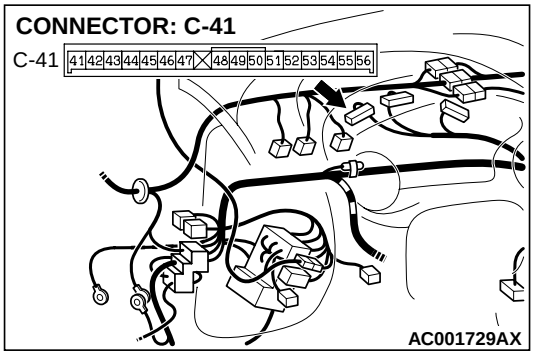
Q: Is the harness wire in good condition?

YES : Go to Step 15.

NO : Repair it.





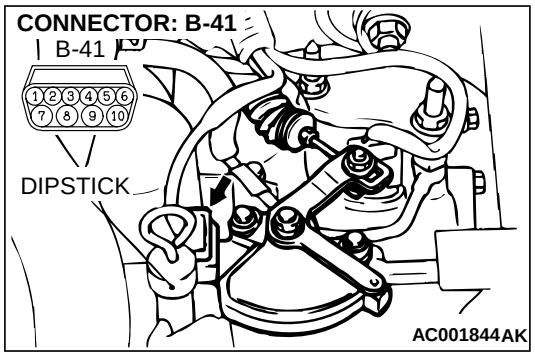


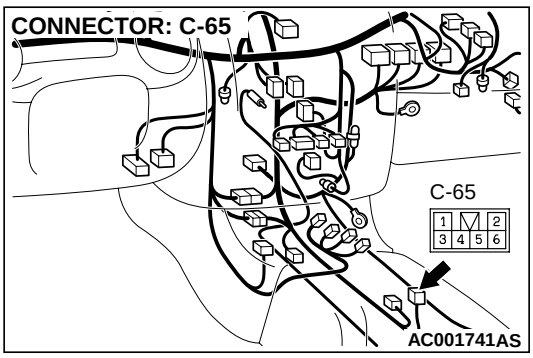
STEP 15. Check connectors C-65 at shift switch assembly, C-27 at intermediate connector and C-41 at combination meter for damage. <Vehicles with sport mode>

Q: Are the connectors in good condition?

YES : Go to Step 16.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



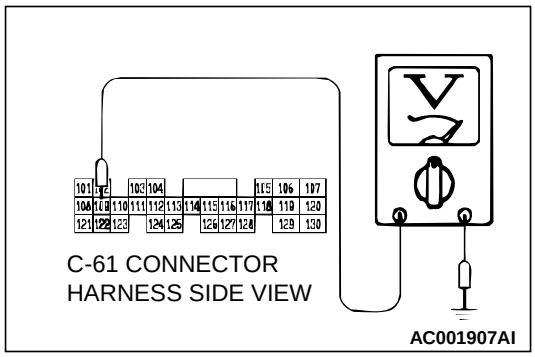


STEP 16. Check harness for damage between Park/Neutral position switch connector B-41 terminal 1 and shift switch assembly connector C-65 terminal 1.

Q: Is the harness wire in good condition?

YES : Repair harness damage between shift switch assembly connector C-65 terminal 2 and combination meter connector C-41 terminal 50.

NO : Repair it.



STEP 17. Check the switch output voltage at PCM connector C-61 by backprobing. ("3" position) <Vehicles without sport mode>

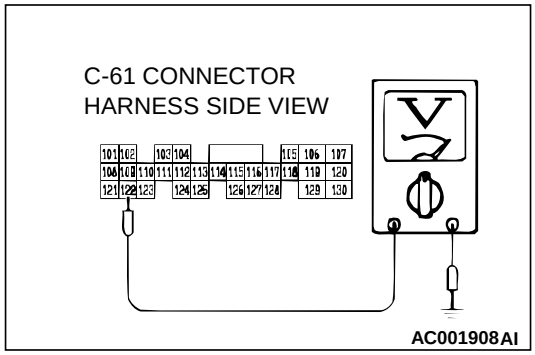
Measure the voltage between terminal 109 and ground by backprobing.

- When selector lever position is "P," voltage should be 0.5 volt or less.
- When selector lever position is "R," voltage should be 0.5 volt or less.
- When selector lever position is "N," voltage should be 0.5 volt or less.
- When selector lever position is "D," voltage should be 0.5 volt or less.
- When selector lever position is "3," voltage should be battery positive voltage.
- When selector lever position is "2," voltage should be 0.5 volt or less.
- When selector lever position is "L," voltage should be 0.5 volt or less.

Q: Is the voltage normal?

YES : Go to Step 18.

NO : Tern the ignition switch to the "LOCK" (OFF) position. Repair harness damage between the Park/Neutral position switch connector B-41 terminal 5 and PCM connector C-61 terminal 109.



STEP 18. Check the switch output voltage at PCM connector C-61 by backprobing. ("2" position) <Vehicles without sport mode>

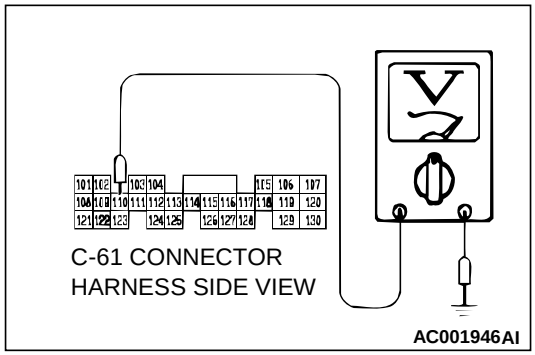
Measure the voltage between terminal 122 and ground by backprobing.

- When selector lever position is "P," voltage should be 0.5 volt or less.
- When selector lever position is "R," voltage should be 0.5 volt or less.
- When selector lever position is "N," voltage should be 0.5 volt or less.
- When selector lever position is "D," voltage should be 0.5 volt or less.
- When selector lever position is "3," voltage should be 0.5 volt or less.
- When selector lever position is "2," voltage should be battery positive voltage.
- When selector lever position is "L," voltage should be 0.5 volt or less.

Q: Is the voltage normal?

YES : Go to Step 19.

NO : Tern the ignition switch to the "LOCK" (OFF) position. Repair harness damage between the Park/Neutral position switch connector B-41 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 122.



STEP 19. Check the switch output voltage at PCM connector C-61 by backprobing. ("L" position) <Vehicles without sport mode>

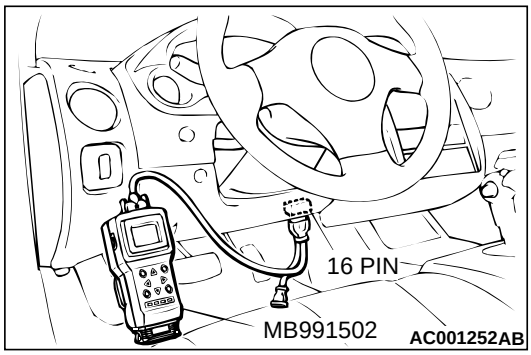
Measure the voltage between terminal 110 and ground by backprobing.

- When selector lever position is "P," voltage should be 0.5 volt or less.
- When selector lever position is "R," voltage should be 0.5 volt or less.
- When selector lever position is "N," voltage should be 0.5 volt or less.
- When selector lever position is "D," voltage should be 0.5 volt or less.
- When selector lever position is "3," voltage should be 0.5 volt or less.
- When selector lever position is "2," voltage should be 0.5 volt or less.
- When selector lever position is "L," voltage should be battery positive voltage.

Q: Is the voltage normal?

YES : Go to Step 20.

NO : Tern the ignition switch to the "LOCK" (OFF) position. Repair harness damage between the Park/Neutral position switch connector B-41 terminal 6 and PCM connector C-61 terminal 110.



STEP 20. Using scan tool MB991502, check data list item 61: Park/Neutral Position Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 61: Park/Neutral Position Switch.
- Move the selector lever to "P," "R," "N," "D," "3," "2," "L" and sport mode positions and confirm the scan tool display. (Vehicles with sport mode is indicated as "D" on the scan tool.)

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

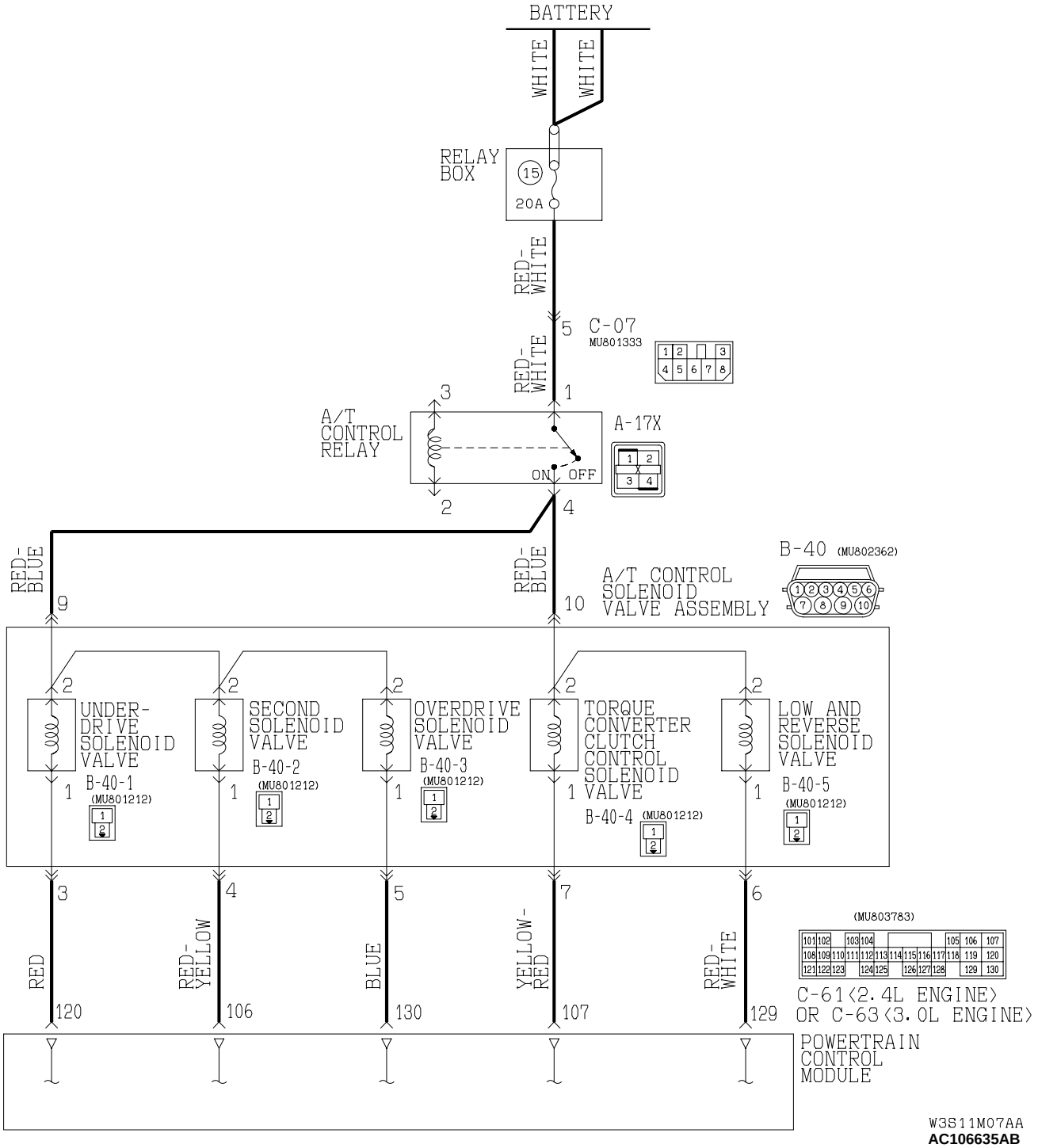
Q: Is the switch operating properly?

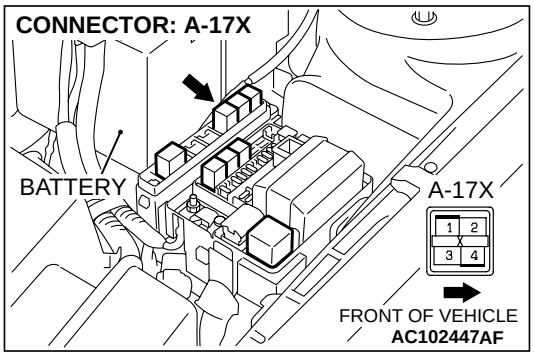
YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

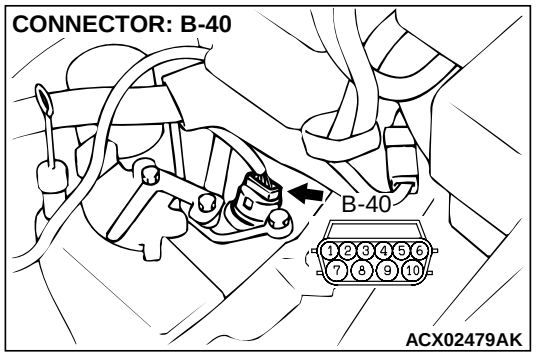
NO : Replace the PCM.

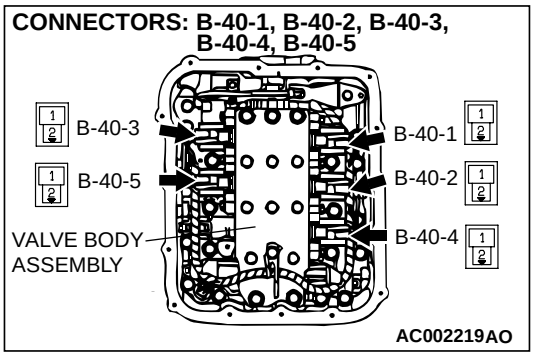
DTC 31: Low-Reverse Solenoid Valve System

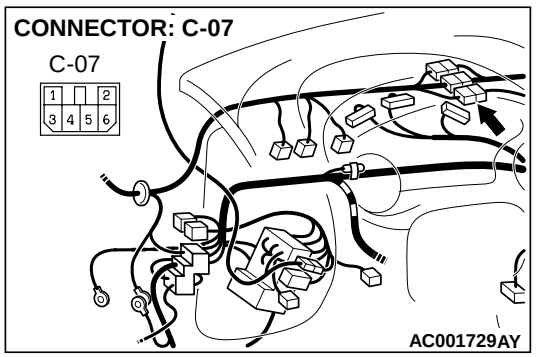
Solenoid Valve System Circuit

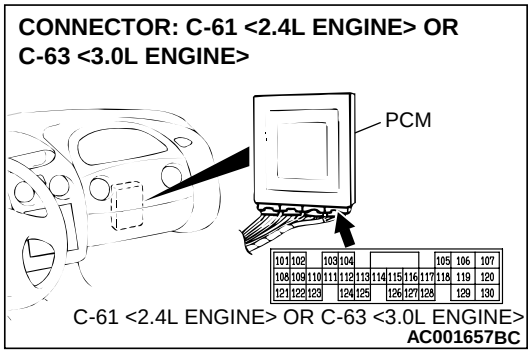












CIRCUIT OPERATION

- A/T control relay supplies battery positive voltage to each solenoid valve (terminal 9 and 10).
- Solenoid valve closes when energized (on), and opens when deenergized (off). The PCM energizes or deenergizes solenoid valve, based on inputs from sensors such as Throttle Position Sensor, Park/Neutral Position Switch, Stoplight Switch, Vehicle Speed Sensor, Input Shaft Speed Sensor, Output Shaft Speed Sensor, A/T Fluid Temperature Sensor, etc.
- The PCM provides the ground to energize solenoid. The ground time is displayed in percent.
- As solenoid is energized or deenergized, it influences hydraulic pressure in the transmission applying and releasing elements.

DTC SET CONDITIONS

If the resistance value for a solenoid valve circuit is greater than 3.5 Ω for 4 seconds or less than 2.6 Ω for 4 seconds, it is judged that there is a short circuit or an open circuit in the solenoid valve and the diagnostic trouble code number "31" is displayed. The transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

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

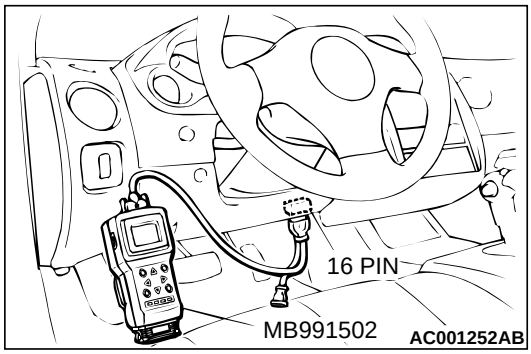
TSB Revision

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

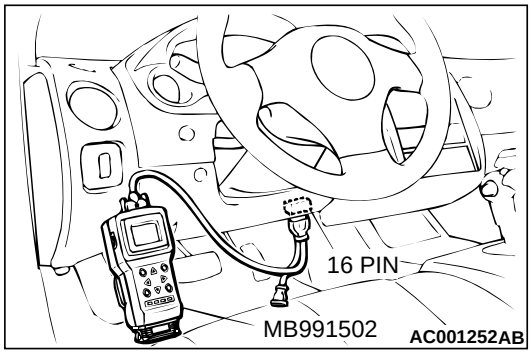


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the A/T diagnostic trouble code number "54" output?

YES : Refer to P.23A-233, code number 54: A/T control relay system.
NO : Go to Step 2.

STEP 2. Using scan tool MB991502, carry out the actuator test item 01: Low-Reverse Solenoid Valve.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 01: Low-Reverse Solenoid Valve.
- An operation sound should be heard from solenoid valve when the low-reverse solenoid valve is operated.

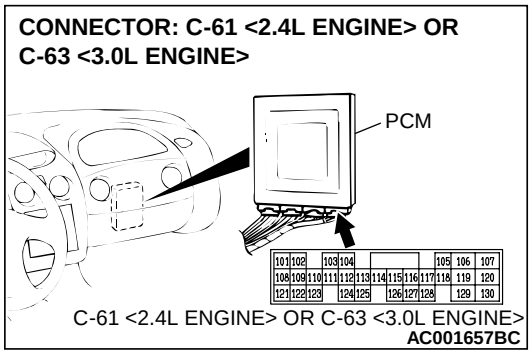
(4) Turn the ignition switch to the "LOCK" (OFF) position.

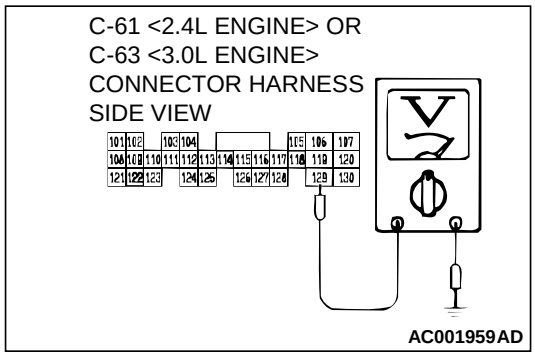
Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 3.

STEP 3. Check the solenoid valve output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 129 and ground by backprobing.
- Voltage should be battery positive voltage.

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

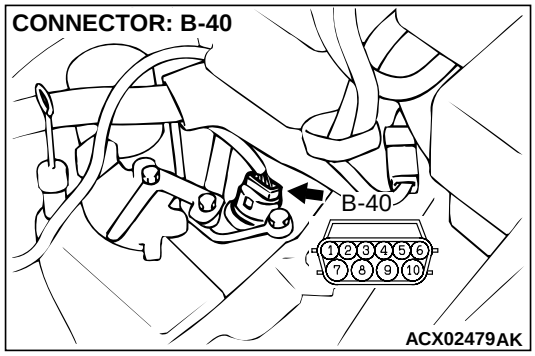
Q: Is the voltage normal?

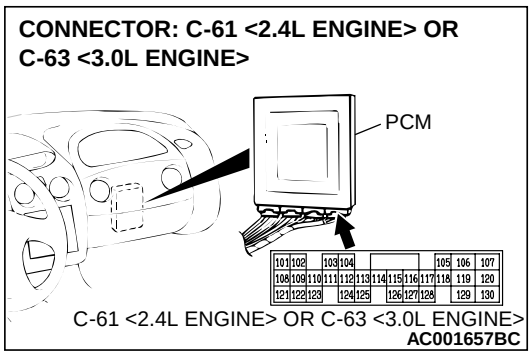
YES : Go to Step 4.
NO : Go to Step 9.

STEP 4. Check connectors B-40 at solenoid valve assembly and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



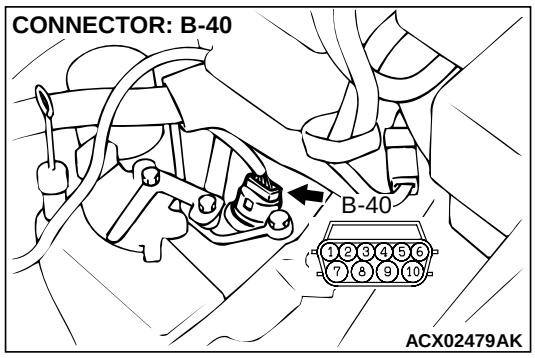


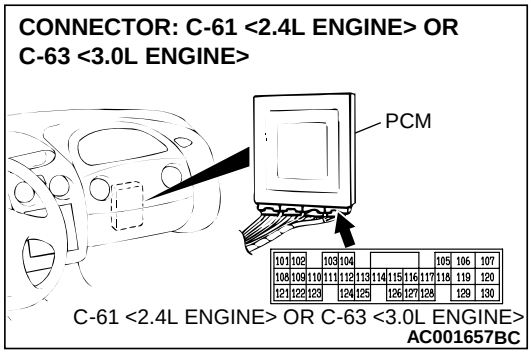
STEP 5. Check harness for damage between solenoid valve assembly connector B-40 terminal 6 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 129.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.



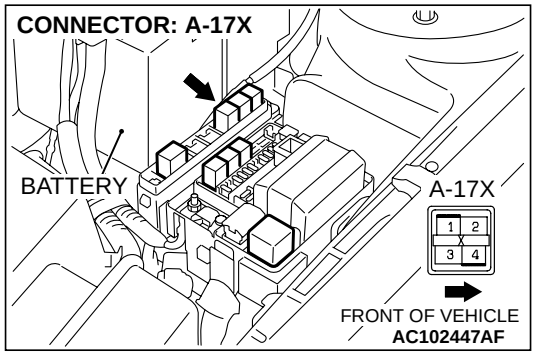


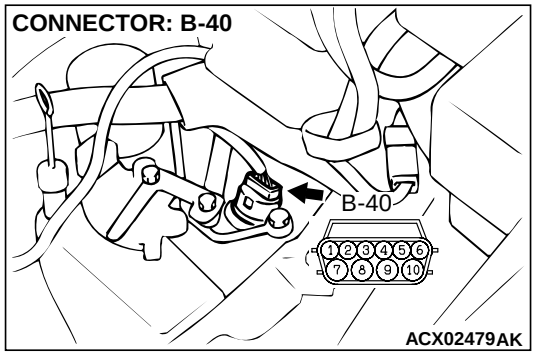
STEP 6. Check connector A-17X at A/T control relay for damage.

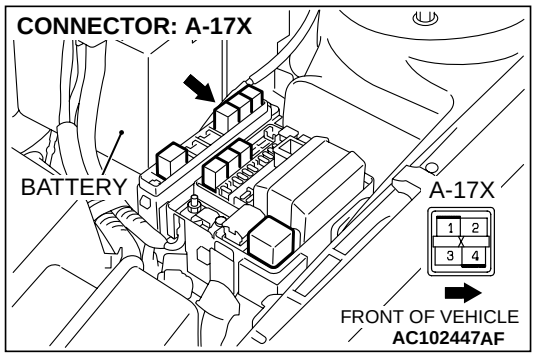
Q: Is the connector in good condition?

YES : Go to Step 7.

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





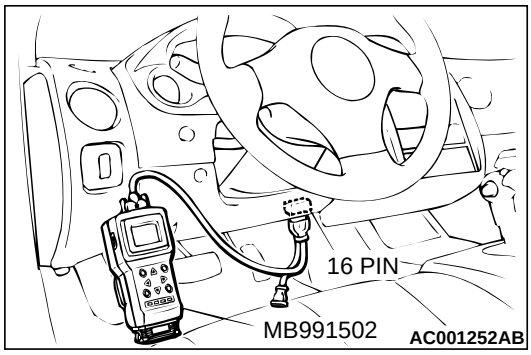


STEP 7. Check harness for damage between solenoid valve assembly connector B-40 terminal 10 and A/T control relay connector A-17X terminal 4.

Q: Is the harness wire in good condition?

YES : Go to Step 8.

NO : Repair it.



STEP 8. Using scan tool MB991502, carry out the actuator test item 01: Low-Reverse Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to data link connector.

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

(3) Set scan tool MB991502 to the actuator test mode for item 01: Low-Reverse Solenoid Valve.

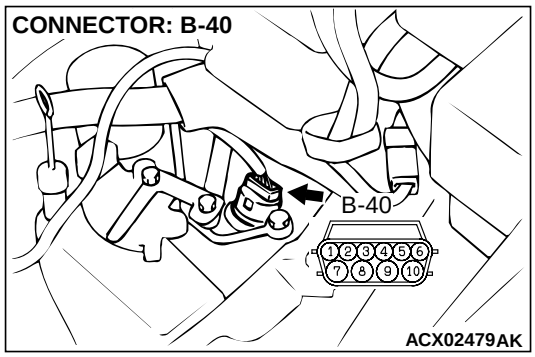
- An operation sound should be heard from solenoid valve when the low-reverse solenoid valve is operated.

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

Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

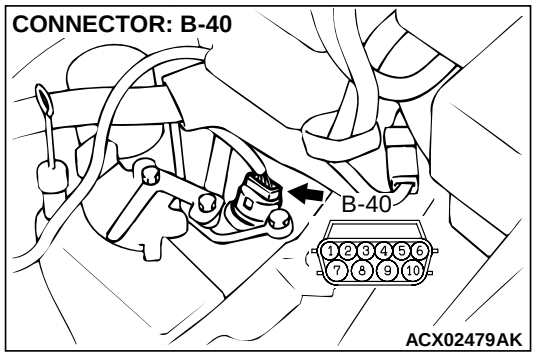


STEP 9. Check connector B-40 at solenoid valve assembly for damage.

Q: Is the connector in good condition?

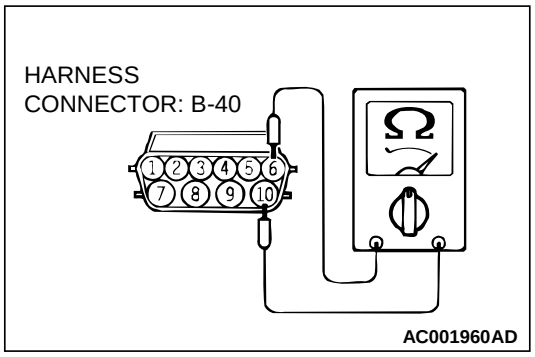
YES : Go to Step 10.

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



STEP 10. Check the low-reverse solenoid valve at solenoid valve assembly connector B-40.

(1) Disconnect connector B-40 and measure at the solenoid valve side.



(2) Measure the resistance between terminal 6 and 10.

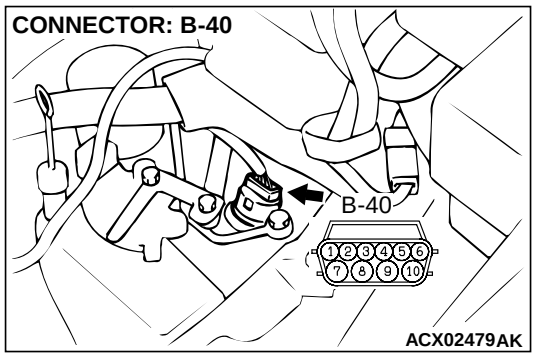
Standard value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the resistance at the standard value?

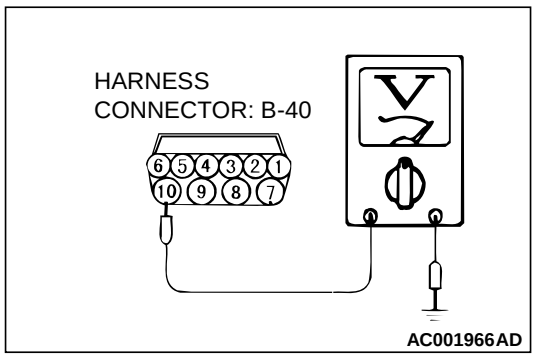
YES : Go to Step 11.

NO : Replace the low-reverse solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

STEP 11. Check the power supply voltage at solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



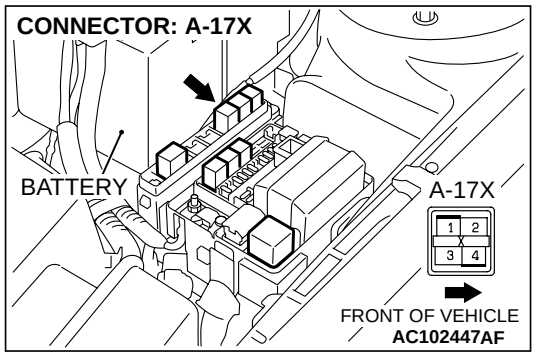
(3) Measure the voltage between terminal 10 and ground.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 13.
NO : Go to Step 12.

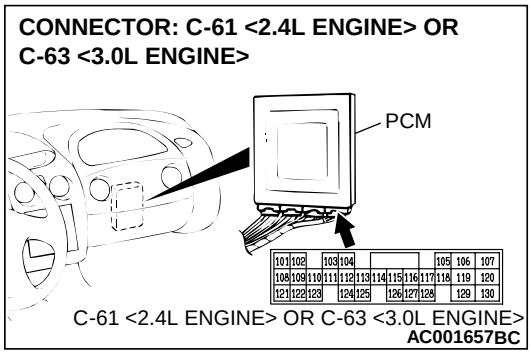
STEP 12. Check connector A-17X at A/T control relay for damage.



Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between solenoid valve assembly connector B-40 terminal 10 and A/T control relay connector A-17X terminal 4.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 13. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.



Q: Is the connector in good condition?

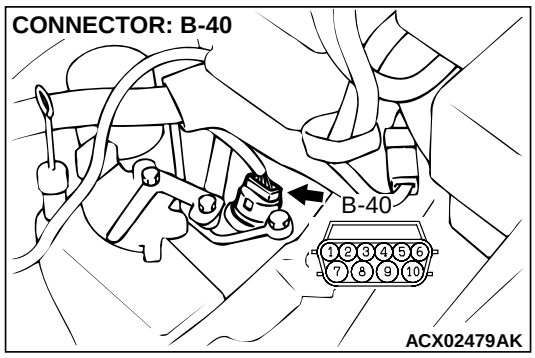
YES : Go to Step 14.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

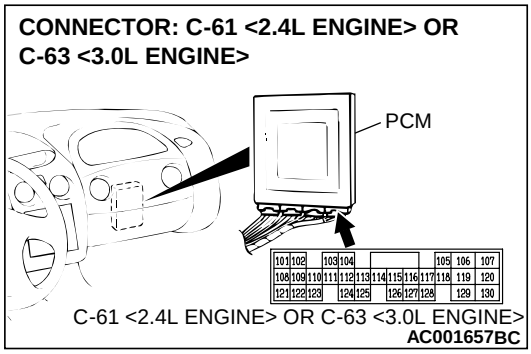
STEP 14. Check harness for open circuit, or short circuit to ground between solenoid valve assembly connector B-40 terminal 6 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 129.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

NO : Repair it.





DTC 32: Underdrive Solenoid Valve System

Solenoid Valve System Circuit

Refer to P.23A-180.

CIRCUIT OPERATION

Refer to P.23A-180.

DTC SET CONDITIONS

If the resistance value for a solenoid valve circuit is greater than 3.5 Ω for 4 seconds or less than 2.6 Ω for 4 seconds, it is judged that there is a short circuit or an open circuit in the solenoid valve and the diagnostic trouble code number "32" is displayed. The transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

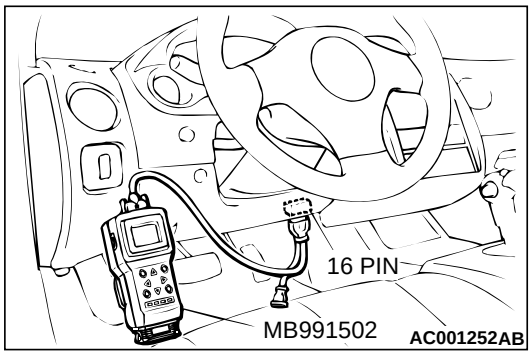
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

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

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

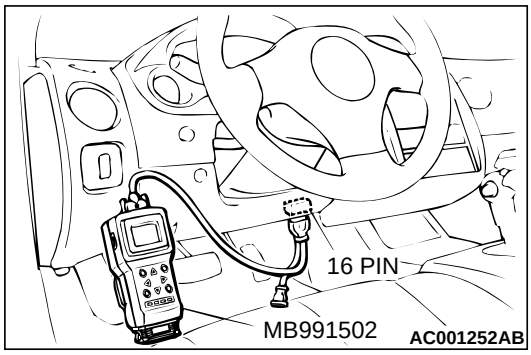
⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the A/T diagnostic trouble code number "54" output?

YES : Refer to P.23A-233, code number 54: A/T control relay system.
NO : Go to Step 2.



STEP 2. Using scan tool MB991502, carry out the actuator test item 02: Underdrive Solenoid Valve.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 02: Underdrive Solenoid Valve.
- An operation sound should be heard from solenoid valve when the underdrive solenoid valve is operated.

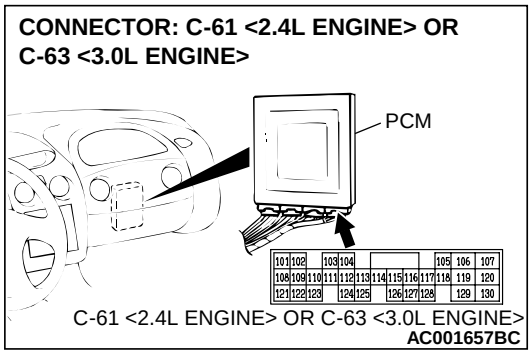
(4) Turn the ignition switch to the "LOCK" (OFF) position.

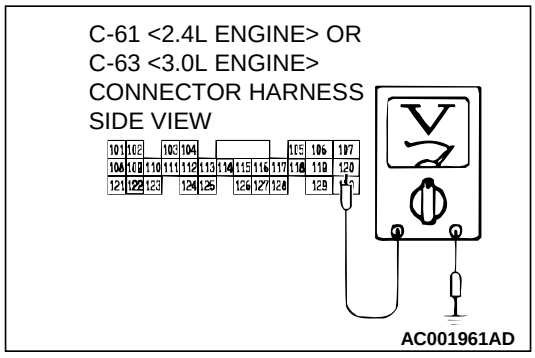
Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 3.

STEP 3. Check the solenoid valve output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 120 and ground by backprobing.
- Voltage should be battery positive voltage.

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

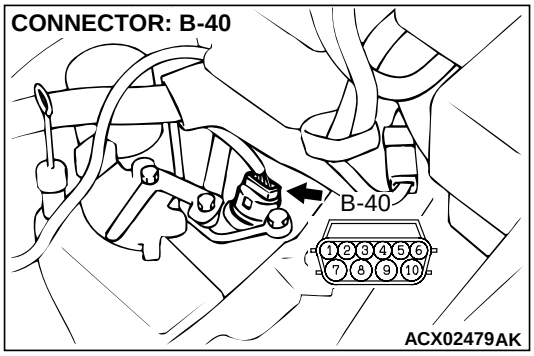
Q: Is the voltage normal?

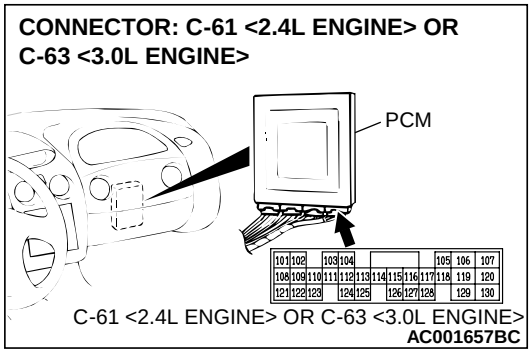
YES : Go to Step 4.
NO : Go to Step 9.

STEP 4. Check connectors B-40 at solenoid valve assembly and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



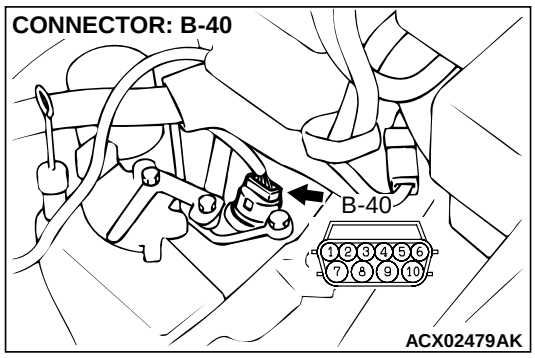


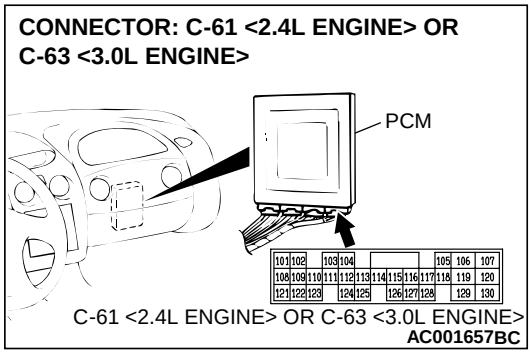
STEP 5. Check harness for damage between solenoid valve assembly connector B-40 terminal 3 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 120.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.



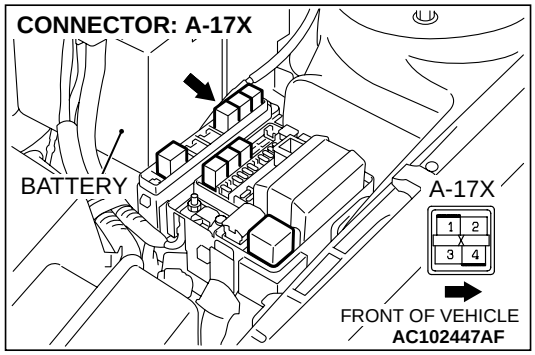


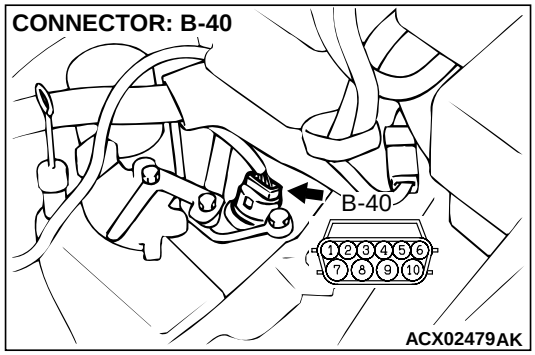
STEP 6. Check connector A-17X at A/T control relay for damage.

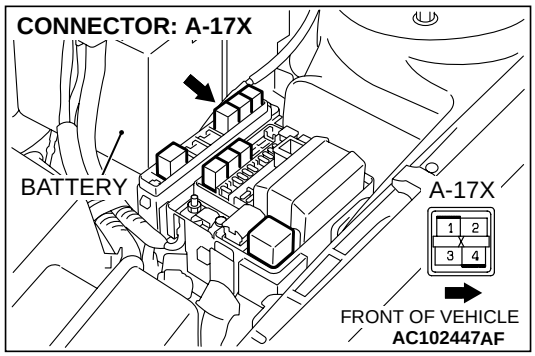
Q: Is the connector in good condition?

YES : Go to Step 7.

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





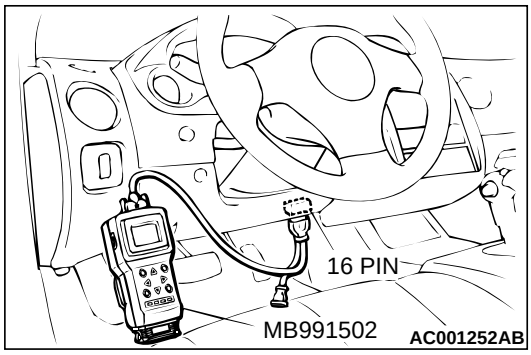


STEP 7. Check harness for damage between solenoid valve assembly connector B-40 terminal 9 and A/T control relay connector A-17X terminal 4.

Q: Is the harness wire in good condition?

YES : Go to Step 8.

NO : Repair it.



STEP 8. Using scan tool MB991502, carry out the actuator test item 02: Underdrive Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to data link connector.

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

(3) Set scan tool MB991502 to the actuator test mode for item 02: Underdrive Solenoid Valve.

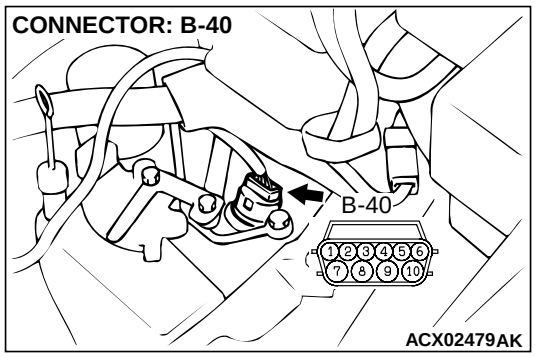
- An operation sound should be heard from solenoid valve when the underdrive solenoid valve is operated.

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

Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

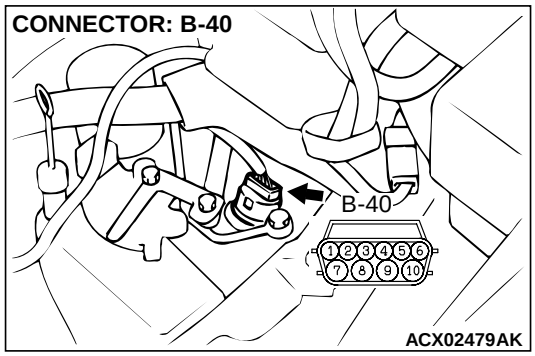


STEP 9. Check connector B-40 at solenoid valve assembly for damage.

Q: Is the connector in good condition?

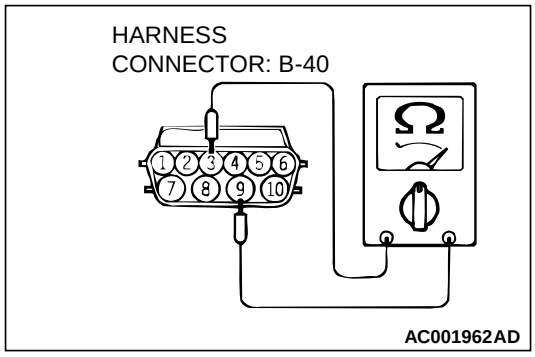
YES : Go to Step 10.

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



STEP 10. Check the underdrive solenoid valve at solenoid valve assembly connector B-40.

(1) Disconnect connector B-40 and measure at the solenoid valve side.



(2) Measure the resistance between terminal 3 and 9.

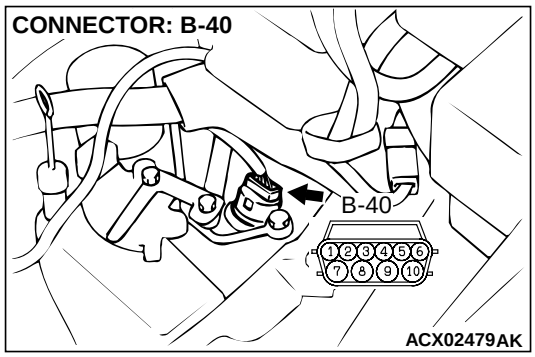
Standard value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the resistance at the standard value?

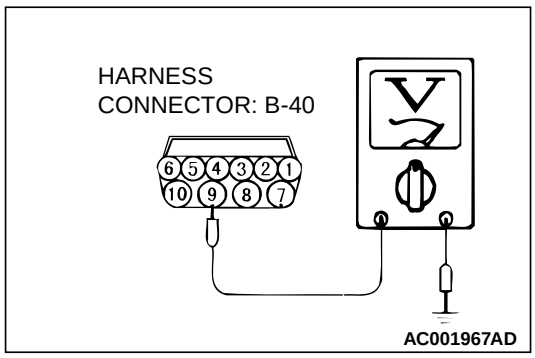
YES : Go to Step 11.

NO : Replace the underdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

STEP 11. Check the power supply voltage at solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



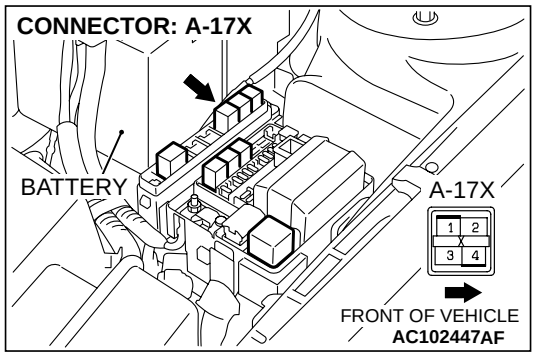
(3) Measure the voltage between terminal 9 and ground.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 13.
NO : Go to Step 12.

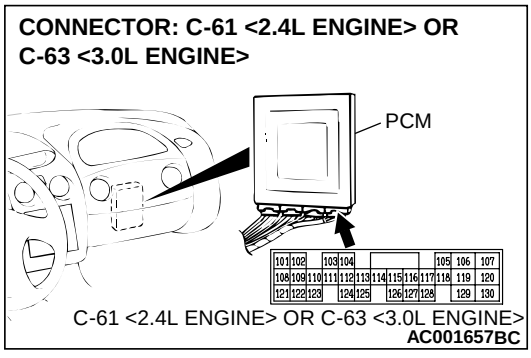
STEP 12. Check connector A-17X at A/T control relay for damage.



Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between solenoid valve assembly connector B-40 terminal 9 and A/T control relay connector A-17X terminal 4.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 13. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.



Q: Is the connector in good condition?

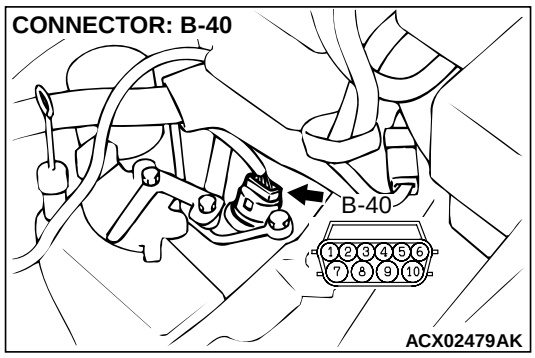
YES : Go to Step 14.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

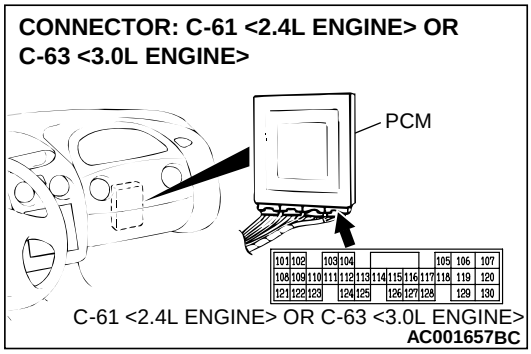
STEP 14. Check harness for open circuit, or short circuit to ground between solenoid valve assembly connector B-40 terminal 3 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 120.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

NO : Repair it.





DTC 33: Second Solenoid Valve System

Solenoid Valve System Circuit

Refer to P.23A-180.

CIRCUIT OPERATION

Refer to P.23A-180.

DTC SET CONDITIONS

If the resistance value for a solenoid valve circuit is greater than 3.5 Ω for 4 seconds or less than 2.6 Ω for 4 seconds, it is judged that there is a short circuit or an open circuit in the solenoid valve and the diagnostic trouble code number "33" is displayed. The transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

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

DIAGNOSIS

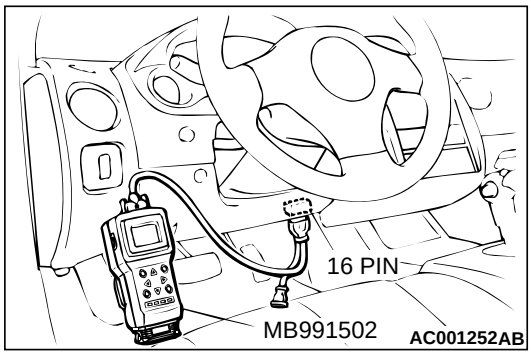
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

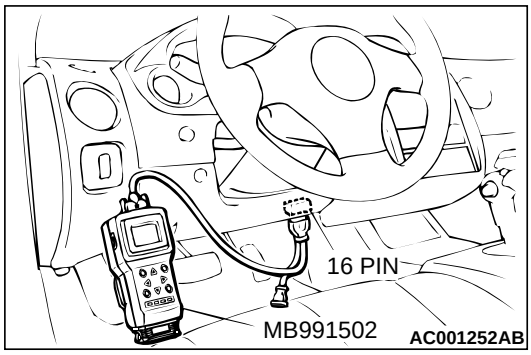


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the A/T diagnostic trouble code number "54" output?

YES : Refer to P.23A-233, code number 54: A/T control relay system.
NO : Go to Step 2.

STEP 2. Using scan tool MB991502, carry out the actuator test item 03: Second Solenoid Valve.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 03, Second Solenoid Valve.
- An operation sound should be heard from solenoid valve when the second solenoid valve is operated.

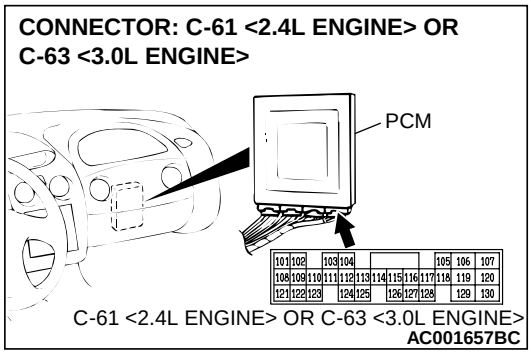
(4) Turn the ignition switch to the "LOCK" (OFF) position.

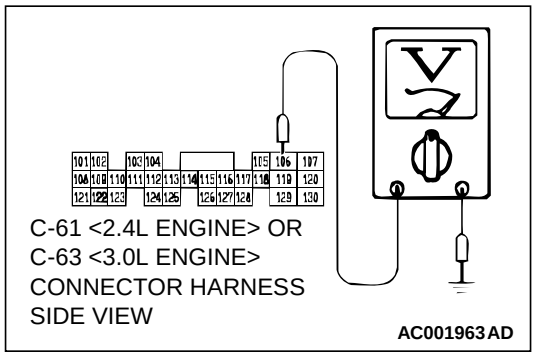
Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 3.

STEP 3. Check the solenoid valve output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 106 and ground by backprobing.
- Voltage should be battery positive voltage.

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

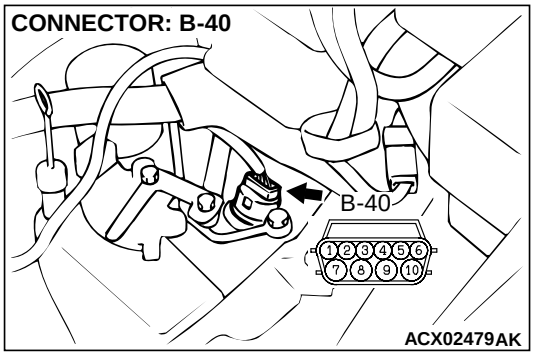
Q: Is the voltage normal?

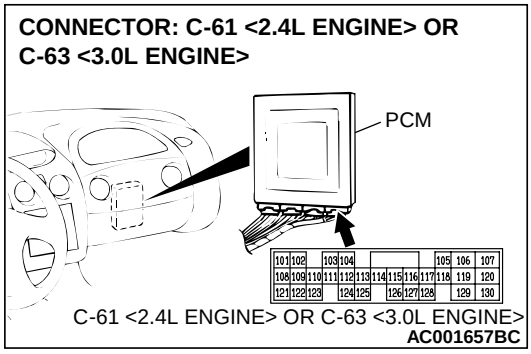
YES : Go to Step 4.
NO : Go to Step 9.

STEP 4. Check connectors B-40 at solenoid valve assembly and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



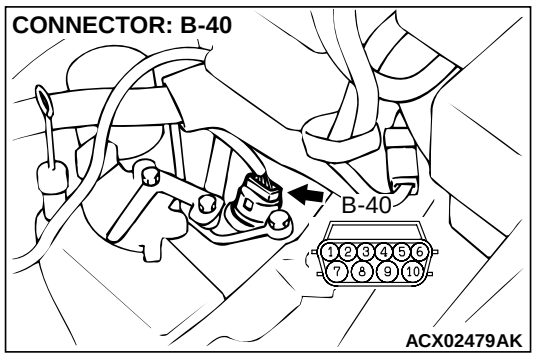


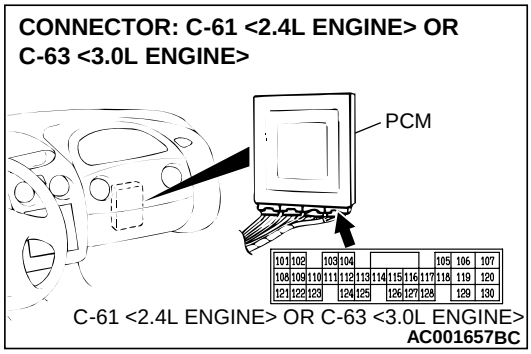
STEP 5. Check harness for damage between solenoid valve assembly connector B-40 terminal 4 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 106.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.



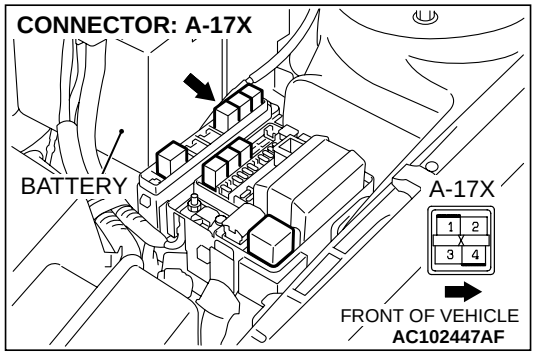


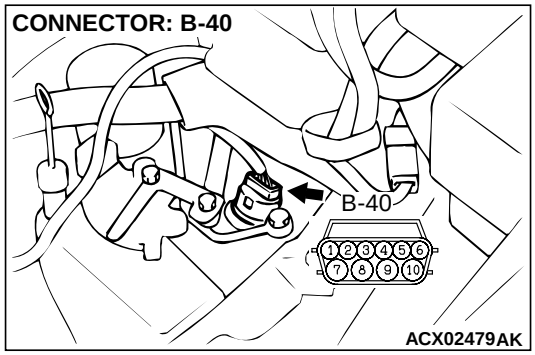
STEP 6. Check connector A-17X at A/T control relay for damage.

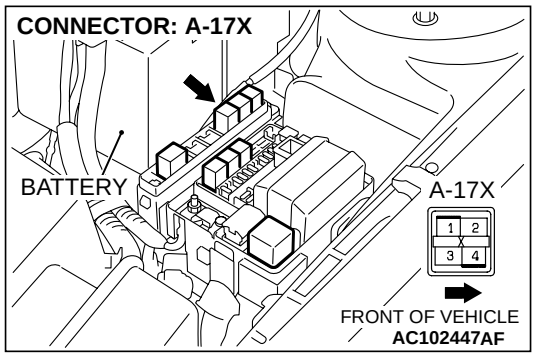
Q: Is the connector in good condition?

YES : Go to Step 7.

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





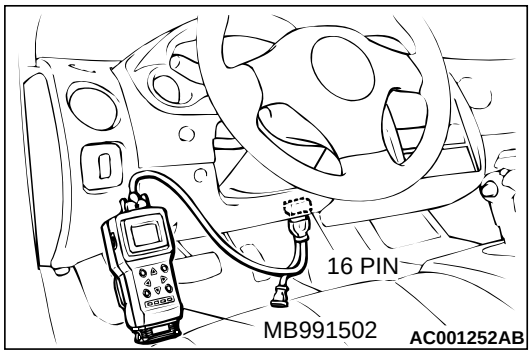


STEP 7. Check harness for damage between solenoid valve assembly connector B-40 terminal 9 and A/T control relay connector A-17X terminal 4.

Q: Is the harness wire in good condition?

YES : Go to Step 8.

NO : Repair it.



STEP 8. Using scan tool MB991502, carry out the actuator test item 03: Second Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to data link connector.

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

(3) Set scan tool MB991502 to the actuator test mode for item 03: second Solenoid Valve.

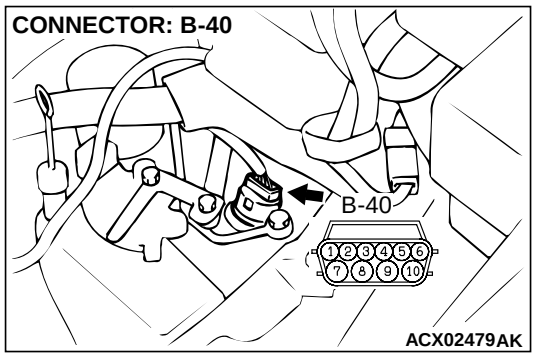
- An operation sound should be heard from solenoid valve when the second solenoid valve is operated.

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

Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

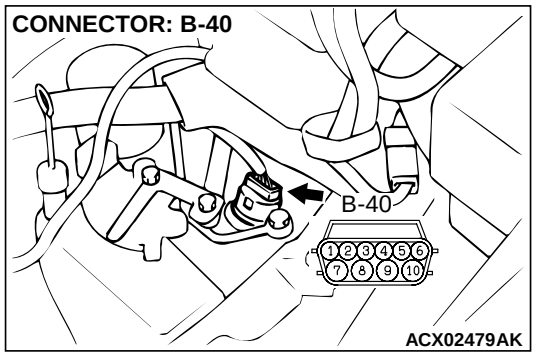


STEP 9. Check connector B-40 at solenoid valve assembly for damage.

Q: Is the connector in good condition?

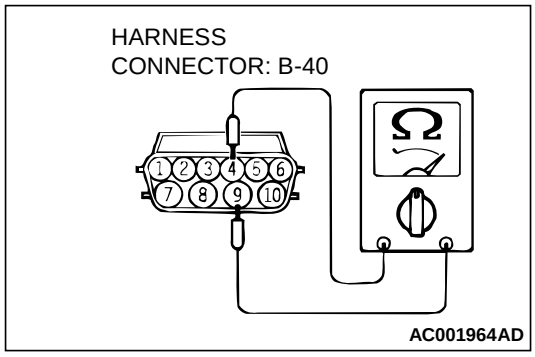
YES : Go to Step 10.

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



STEP 10. Check the second solenoid valve at solenoid valve assembly connector B-40.

(1) Disconnect connector B-40 and measure at the solenoid valve side.



(2) Measure the resistance between terminal 4 and 9.

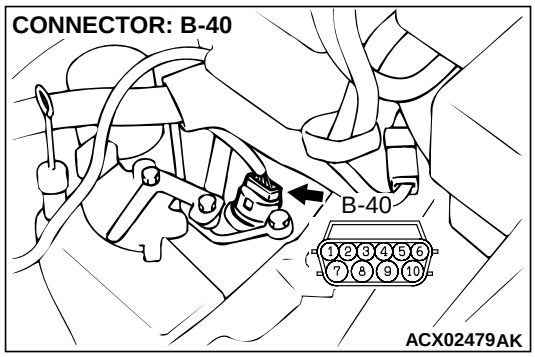
Standard value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the resistance at the standard value?

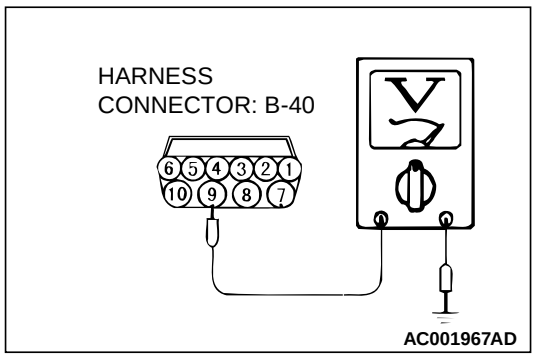
YES : Go to Step 11.

NO : Replace the second solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

STEP 11. Check the power supply voltage at solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



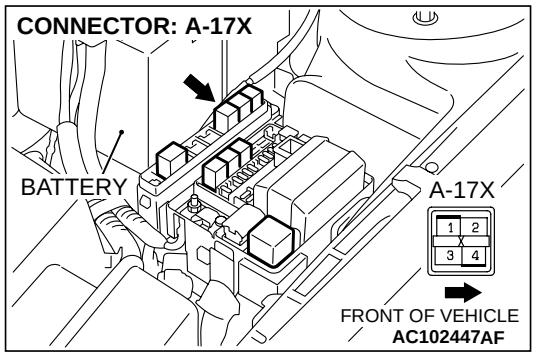
(3) Measure the voltage between terminal 9 and ground.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 13.
NO : Go to Step 12.

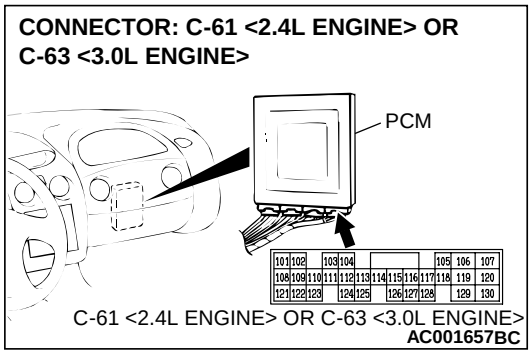
STEP 12. Check connector A-17X at A/T control relay for damage.



Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between solenoid valve assembly connector B-40 terminal 9 and A/T control relay connector A-17X terminal 4.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 13. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.



Q: Is the connector in good condition?

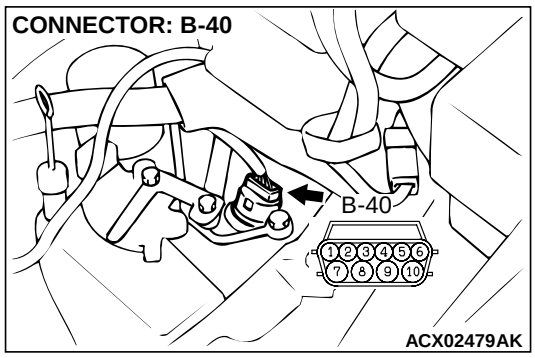
YES : Go to Step 14.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

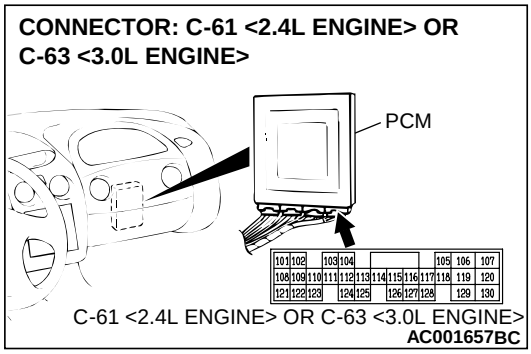
STEP 14. Check harness for open circuit, or short circuit to ground between solenoid valve assembly connector B-40 terminal 4 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 106.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

NO : Repair it.





DTC 34: Overdrive Solenoid Valve System

Solenoid Valve System Circuit

Refer to P.23A-180.

CIRCUIT OPERATION

Refer to P.23A-180.

DTC SET CONDITIONS

If the resistance value for a solenoid valve circuit is greater than 3.5 Ω for 4 seconds or less than 2.6 Ω for 4 seconds, it is judged that there is a short circuit or an open circuit in the solenoid valve and the diagnostic trouble code number "34" is displayed. The transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

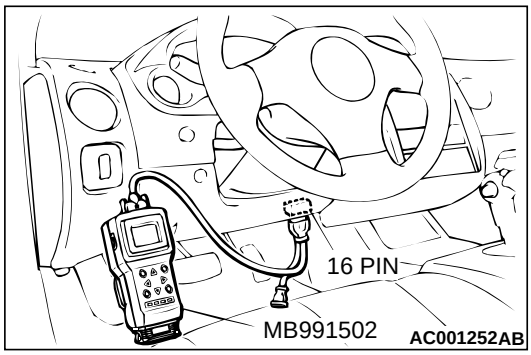
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

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

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

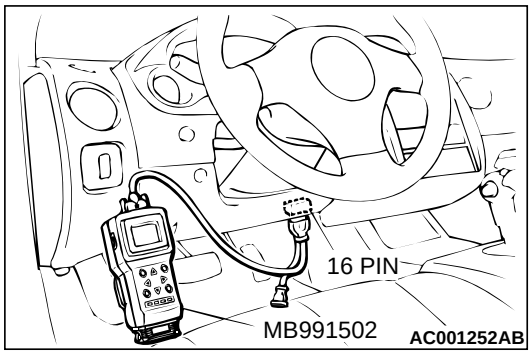
⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the A/T diagnostic trouble code number "54" output?

YES : Refer to P.23A-233, code number 54: A/T control relay system.
NO : Go to Step 2.



STEP 2. Using scan tool MB991502, carry out the actuator test item 04: Overdrive Solenoid Valve.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 04, Overdrive Solenoid Valve.
- An operation sound should be heard from solenoid valve when the overdrive solenoid valve is operated.

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

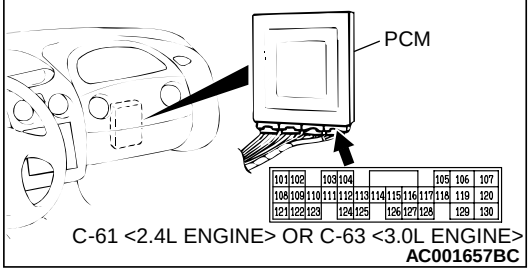
Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 3.

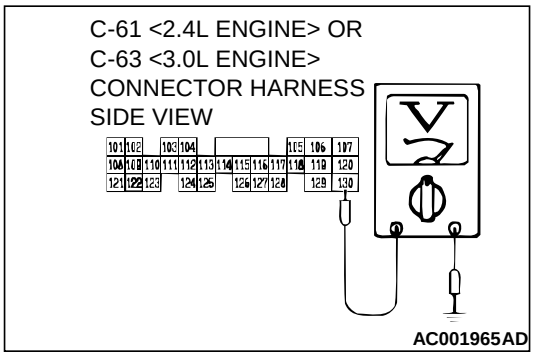
STEP 3. Check the solenoid valve output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



AC001657BC



AC001965AD

(3) Measure the voltage between terminal 130 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

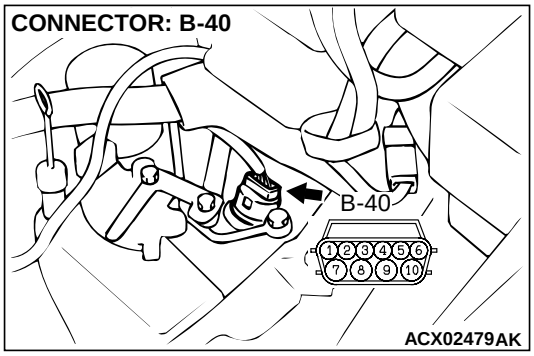
YES : Go to Step 4.
NO : Go to Step 9.

STEP 4. Check connectors B-40 at solenoid valve assembly and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: B-40



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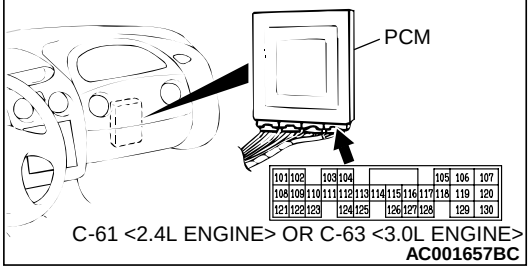
CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



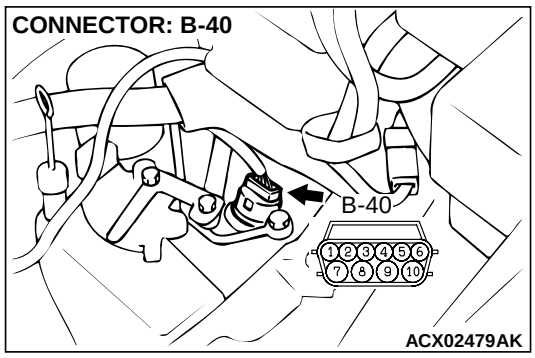
AC001657BC

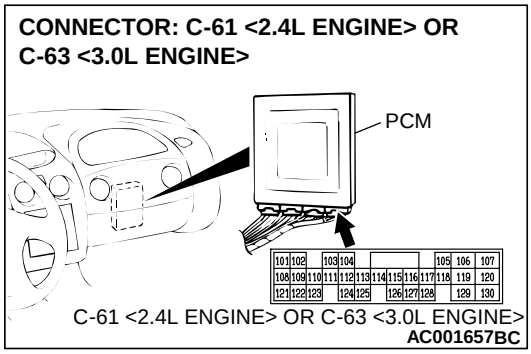
STEP 5. Check harness for damage between solenoid valve assembly connector B-40 terminal 5 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 130.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.



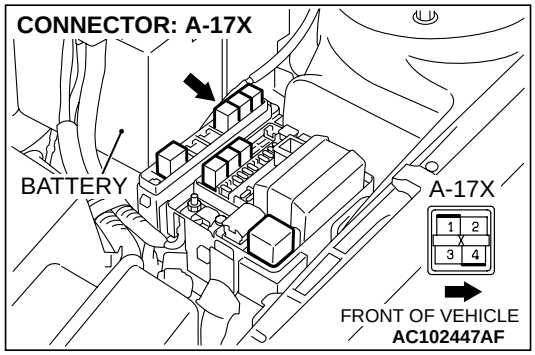


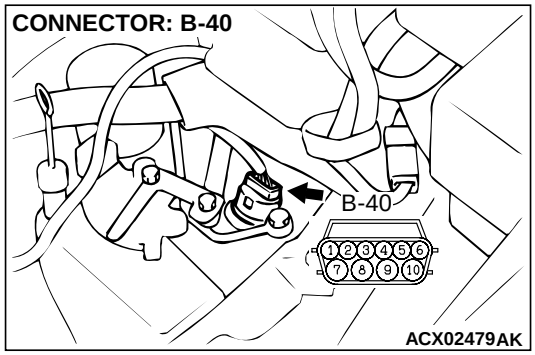
STEP 6. Check connector A-17X at A/T control relay for damage.

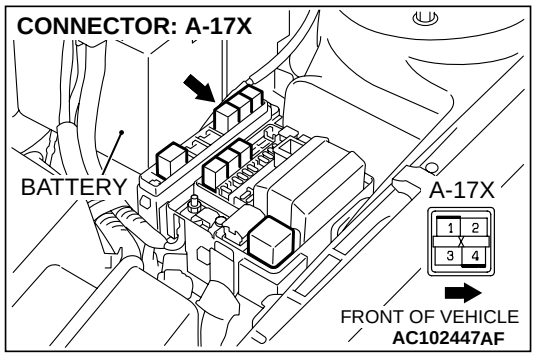
Q: Is the connector in good condition?

YES : Go to Step 7.

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





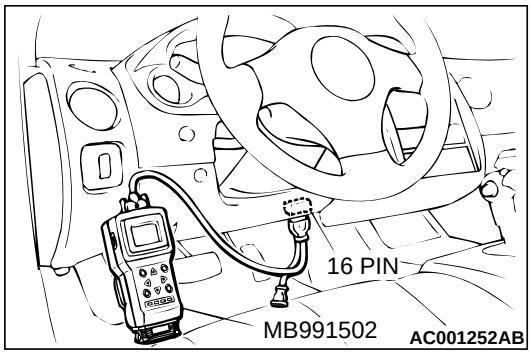


STEP 7. Check harness for damage between solenoid valve assembly connector B-40 terminal 9 and A/T control relay connector A-17X terminal 4.

Q: Is the harness wire in good condition?

YES : Go to Step 8.

NO : Repair it.



STEP 8. Using scan tool MB991502, carry out the actuator test item 04: Overdrive Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

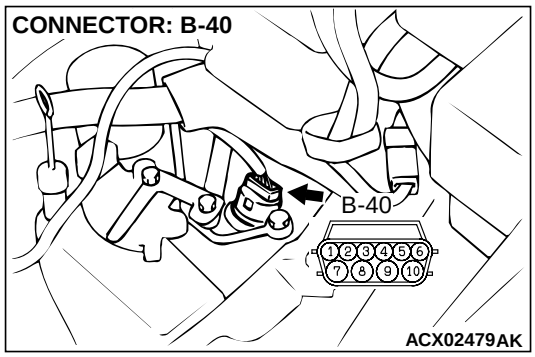
(1) Connect scan tool MB991502 to data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to the actuator test mode for item 04: Overdrive Solenoid Valve.
- An operation sound should be heard from solenoid valve when the overdrive solenoid valve is operated.

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

Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

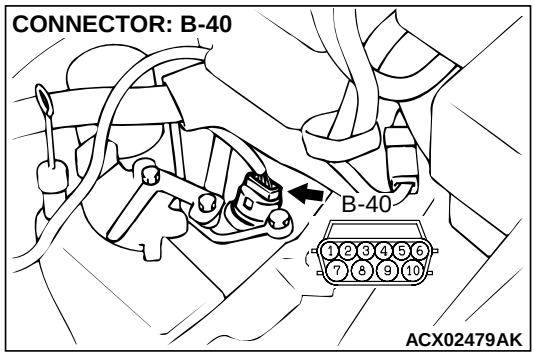


STEP 9. Check connector B-40 at solenoid valve assembly for damage.

Q: Is the connector in good condition?

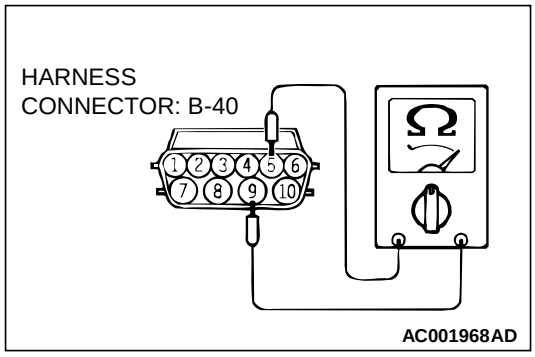
YES : Go to Step 10.

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



STEP 10. Check the overdrive solenoid valve at solenoid valve assembly connector B-40.

(1) Disconnect connector B-40 and measure at the solenoid valve side.



(2) Measure the resistance between terminal 5 and 9.

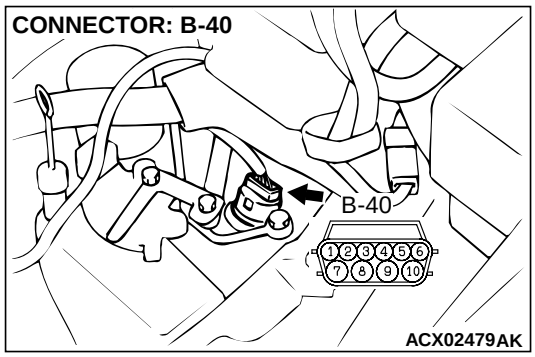
Standard value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the resistance at the standard value?

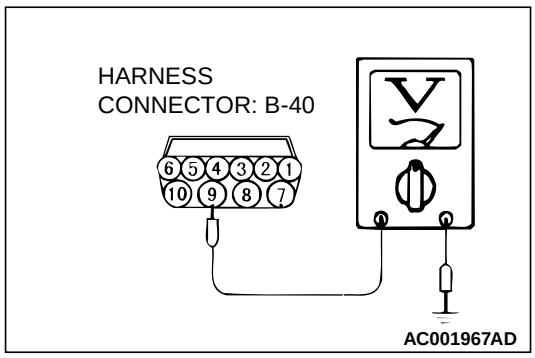
YES : Go to Step 11.

NO : Replace the overdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

STEP 11. Check the power supply voltage at solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



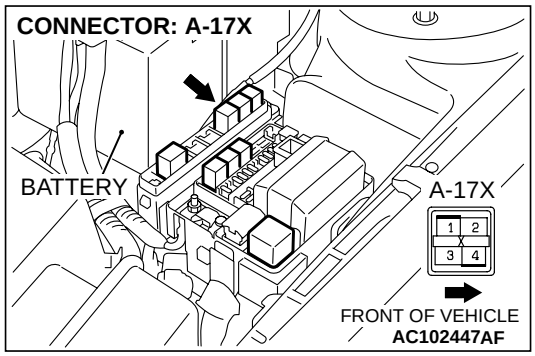
(3) Measure the voltage between terminal 9 and ground.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 13.
NO : Go to Step 12.

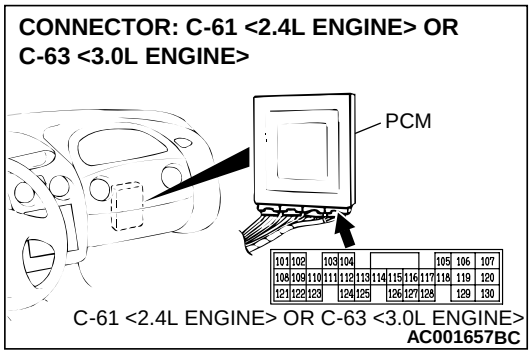
STEP 12. Check connector A-17X at A/T control relay for damage.



Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between solenoid valve assembly connector B-40 terminal 9 and A/T control relay connector A-17X terminal 4.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 13. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.



Q: Is the connector in good condition?

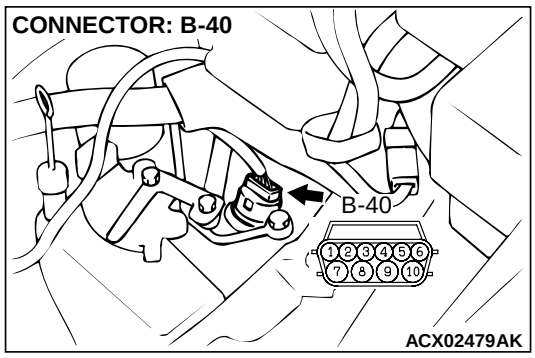
YES : Go to Step 14.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

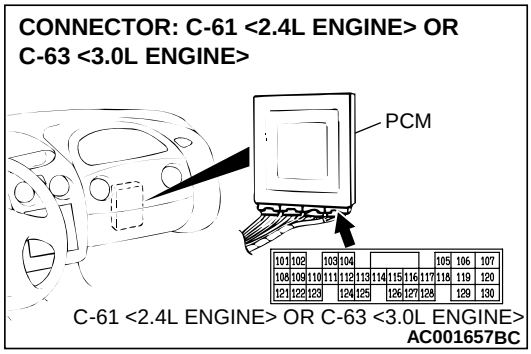
STEP 14. Check harness for open circuit, or short circuit to ground between solenoid valve assembly connector B-40 terminal 5 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 130.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

NO : Repair it.





DTC 36: Torque Converter Clutch Solenoid Valve System

Solenoid Valve System Circuit

Refer to P.23A-180.

CIRCUIT OPERATION

Refer to P.23A-180.

DTC SET CONDITIONS

If the resistance value for a solenoid valve circuit is greater than 3.5 Ω for 4 seconds or less than 2.6 Ω for 4 seconds, it is judged that there is a short circuit or an open circuit in the solenoid valve and the diagnostic trouble code number "36" is displayed. The transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of torque converter clutch solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

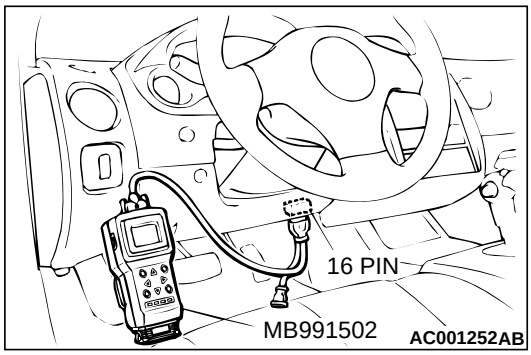
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

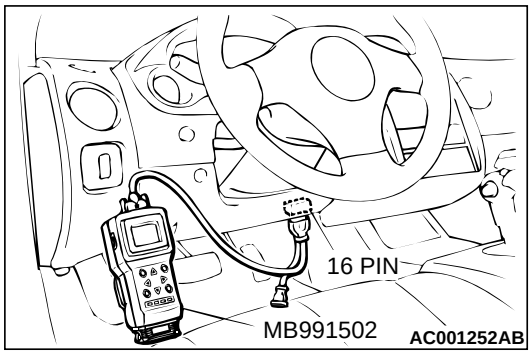


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the A/T diagnostic trouble code number "54" output?

YES : Refer to P.23A-233, code number 54: A/T control relay system.
NO : Go to Step 2.

STEP 2. Using scan tool MB991502, carry out the actuator test item 06: Torque Converter Clutch Solenoid Valve.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 06: Torque Converter Clutch Solenoid Valve.
- An operation sound should be heard from solenoid valve when the torque converter clutch solenoid valve is operated.

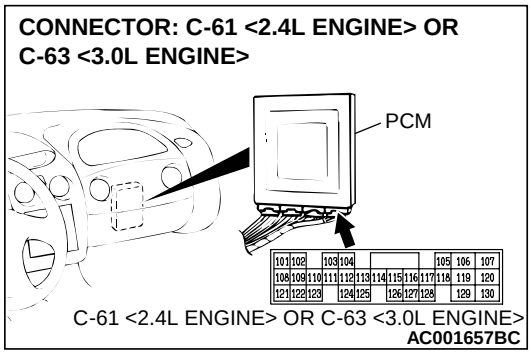
(4) Turn the ignition switch to the "LOCK" (OFF) position.

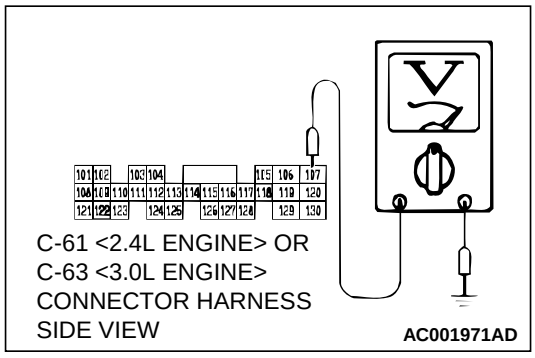
Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 3.

STEP 3. Check the solenoid valve output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 107 and ground by backprobing.
- Voltage should be battery positive voltage.

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

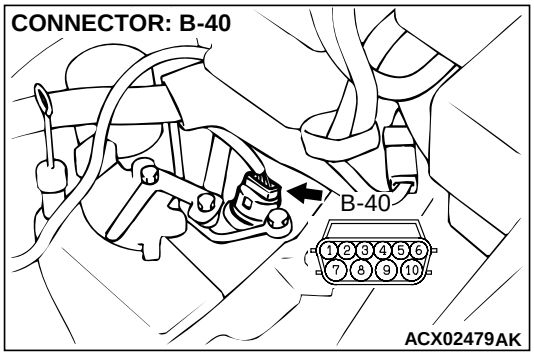
Q: Is the voltage normal?

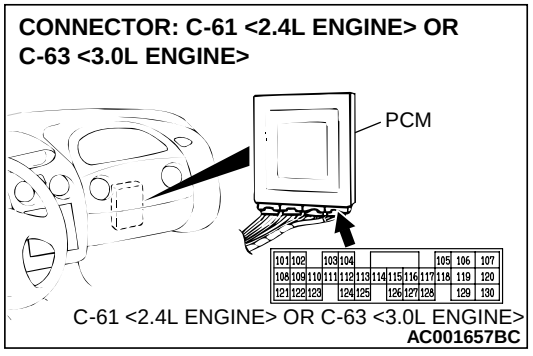
YES : Go to Step 4.
NO : Go to Step 9.

STEP 4. Check connectors B-40 at solenoid valve assembly and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



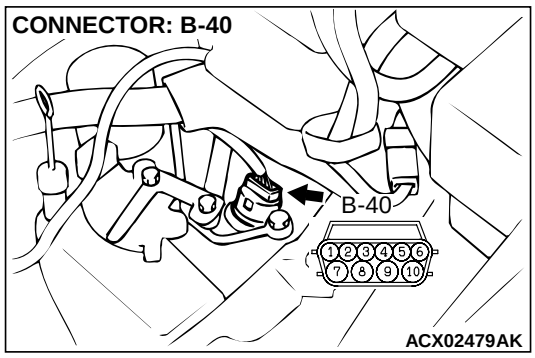


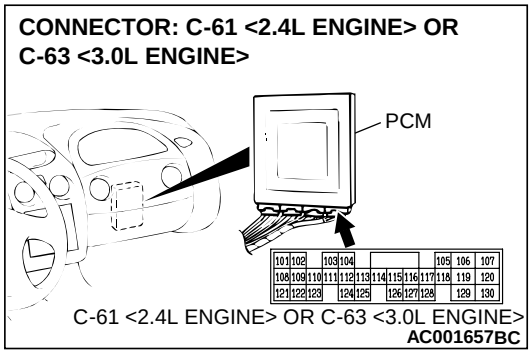
STEP 5. Check harness for damage between solenoid valve assembly connector B-40 terminal 7 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 107.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.



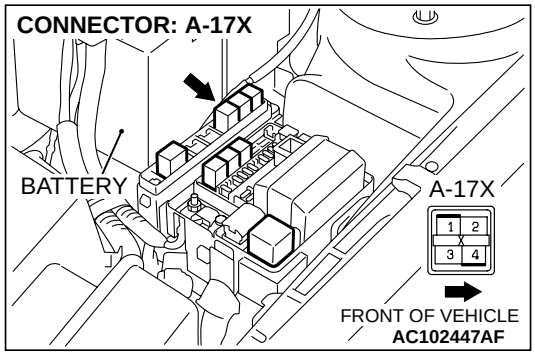


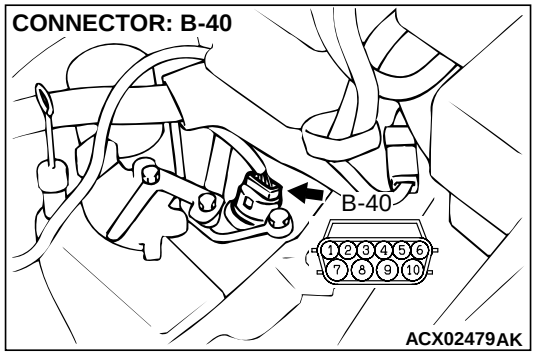
STEP 6. Check connector A-17X at A/T control relay for damage.

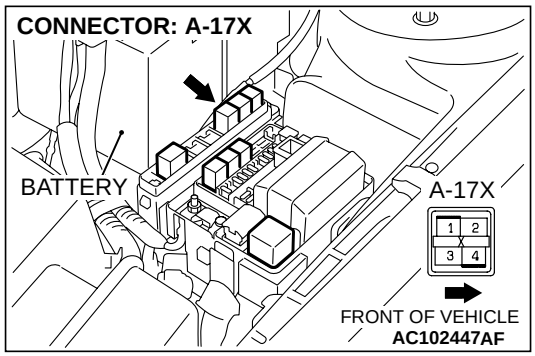
Q: Is the connector in good condition?

YES : Go to Step 7.

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





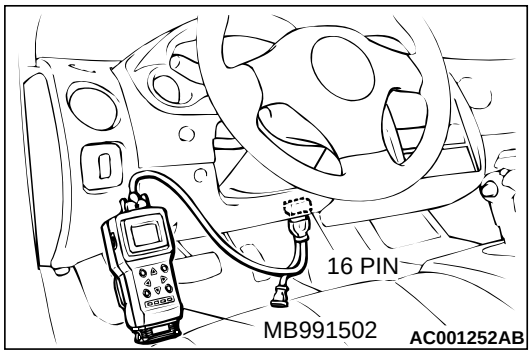


STEP 7. Check harness for damage between solenoid valve assembly connector B-40 terminal 10 and A/T control relay connector A-17X terminal 4.

Q: Is the harness wire in good condition?

YES : Go to Step 8.

NO : Repair it.



STEP 8. Using scan tool MB991502, carry out the actuator test item 06: Torque Converter Clutch Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to data link connector.

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

(3) Set scan tool MB991502 to the actuator test mode for item 06: Torque Converter Clutch Solenoid Valve.

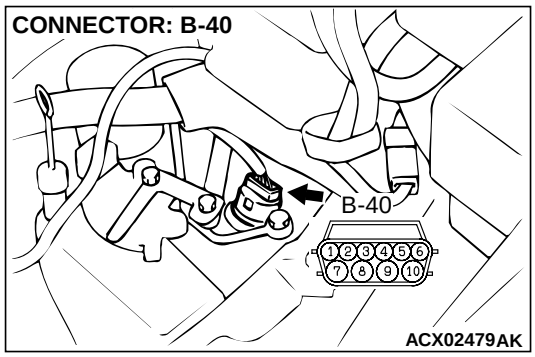
- An operation sound should be heard from solenoid valve when the torque converter clutch solenoid valve is operated.

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

Q: Is the solenoid valve operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

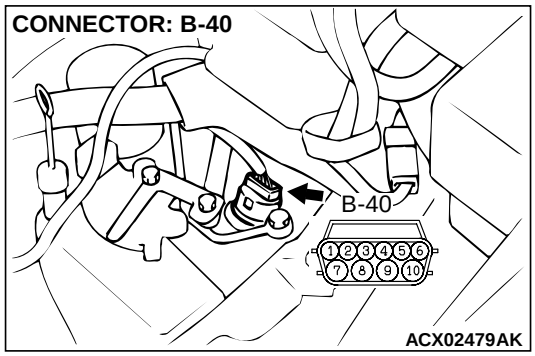


STEP 9. Check connector B-40 at solenoid valve assembly for damage.

Q: Is the connector in good condition?

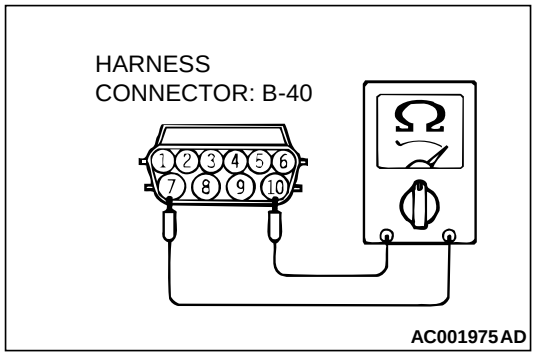
YES : Go to Step 10.

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



STEP 10. Check the torque converter clutch solenoid valve at solenoid valve assembly connector B-40.

(1) Disconnect connector B-40 and measure at the solenoid valve side.



(2) Measure the resistance between terminal 7 and 10.

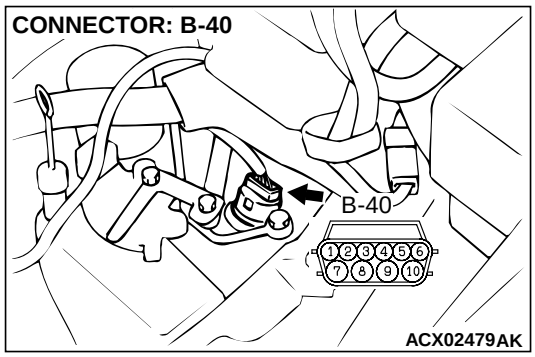
Standard value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the resistance at the standard value?

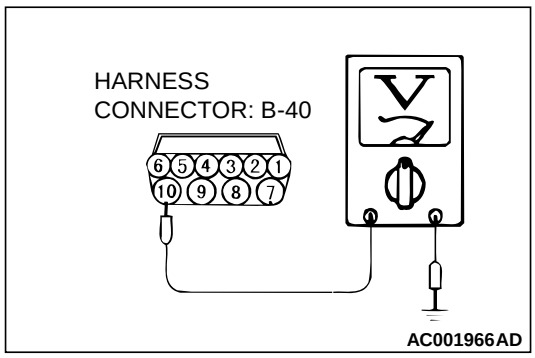
YES : Go to Step 11.

NO : Replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

STEP 11. Check the power supply voltage at solenoid valve assembly connector B-40.



(1) Disconnect connector B-40 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



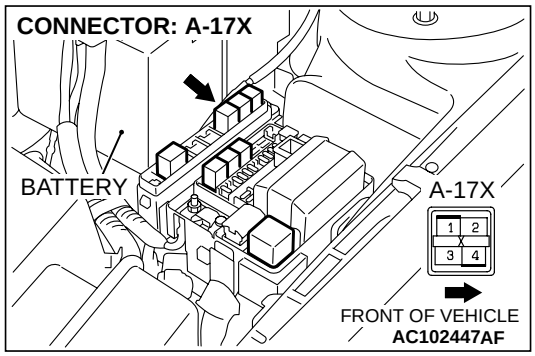
(3) Measure the voltage between terminal 10 and ground.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 13.
NO : Go to Step 12.

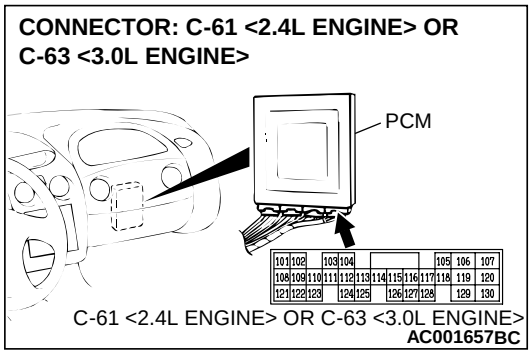
STEP 12. Check connector A-17X at A/T control relay for damage.



Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between solenoid valve assembly connector B-40 terminal 10 and A/T control relay connector A-17X terminal 4.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 13. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.



Q: Is the connector in good condition?

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

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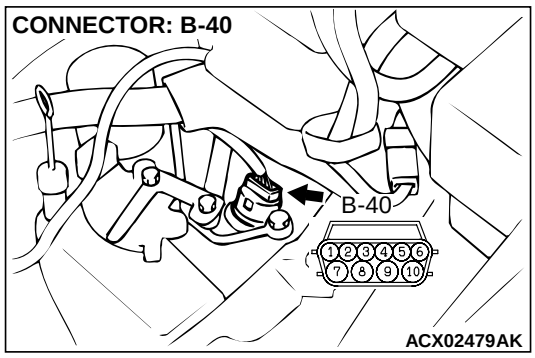
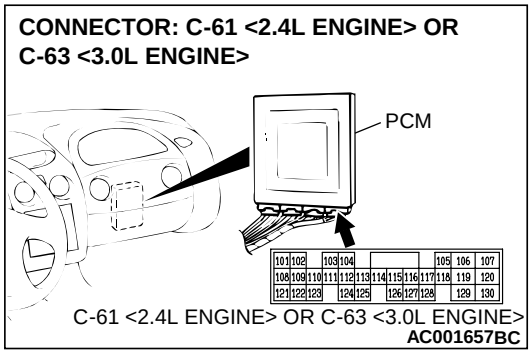
STEP 14. Check harness for open circuit, or short circuit to ground between solenoid valve assembly connector B-40 terminal 7 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 107.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

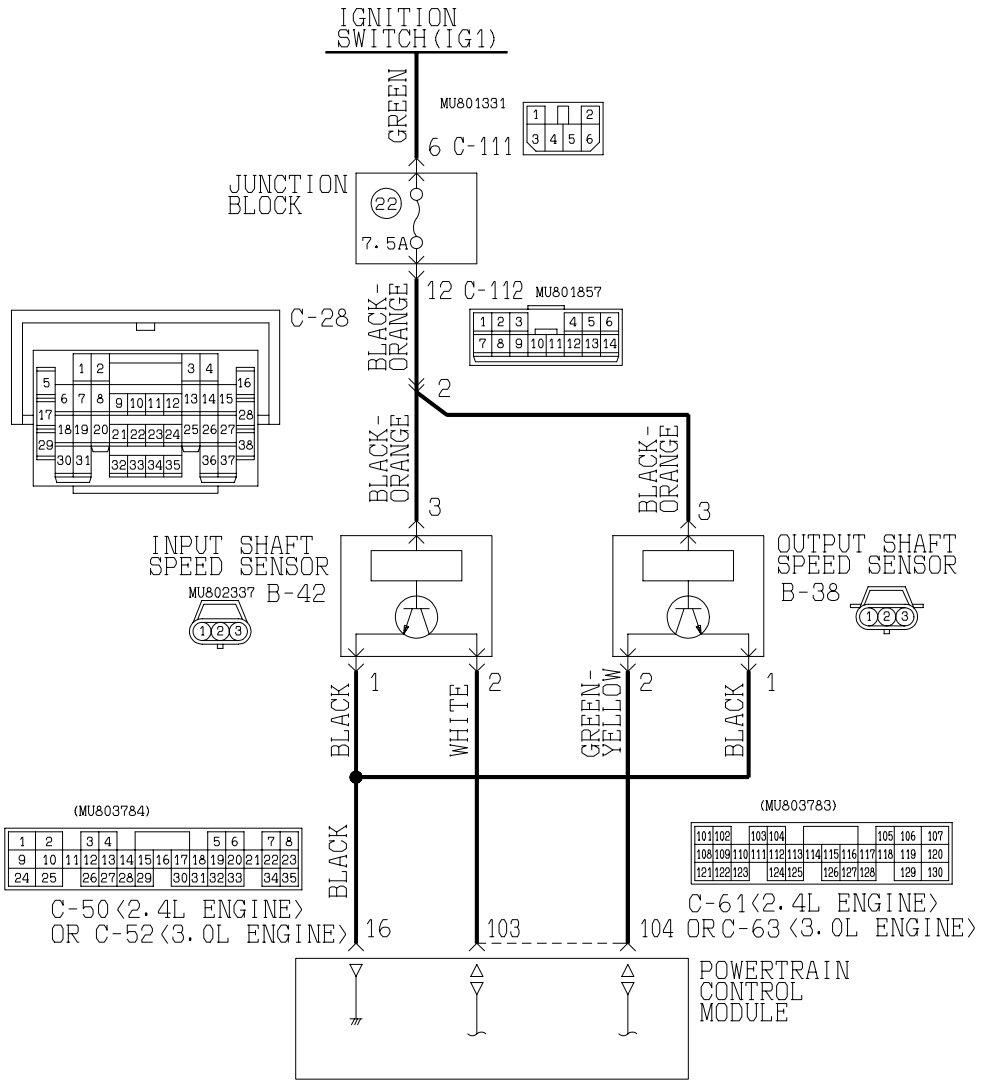
NO : Repair it.





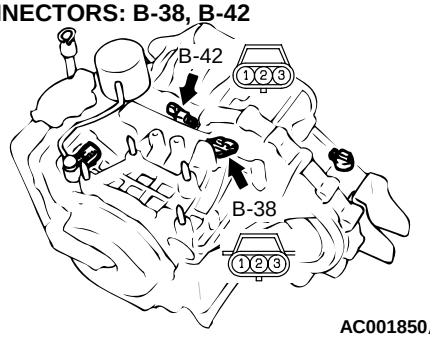
DTC 41: 1st Gear Incorrect Ratio
DTC 42: 2nd Gear Incorrect Ratio
DTC 43: 3rd Gear Incorrect Ratio
DTC 44: 4th Gear Incorrect Ratio
DTC 46: Reverse Gear Incorrect Ratio

Input Shaft Speed Sensor and Output Shaft Speed Sensor System Circuit



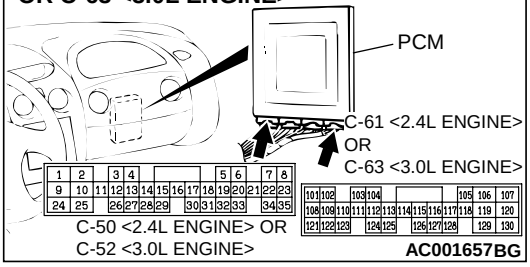
W3S11M08AA
AC106636AB

CONNECTORS: B-38, B-42



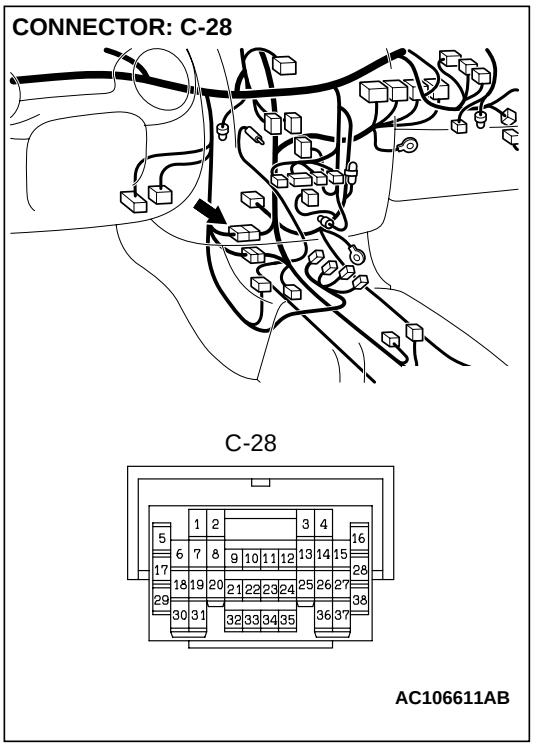
AC001850AG

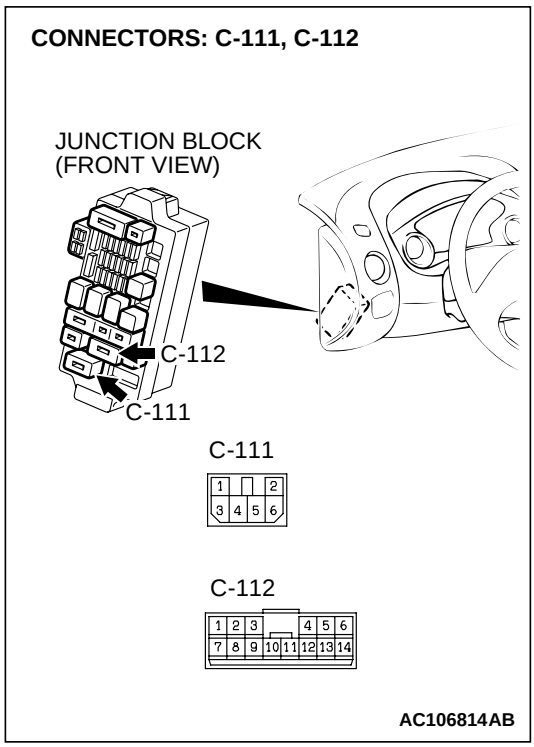
CONNECTORS: C-50 <2.4L ENGINE> OR C-52 <3.0L ENGINE>, C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



AC001657BG

TSB Revision





CIRCUIT OPERATION

- A coil built into the input shaft speed sensor generates pulse signal of 0 ⇔ 5 volts at both ends of this coil when the input shaft rotates. The pulse signal frequency increases with the rise in input shaft speed.
- Both ends of the coil are connected to the PCM (terminals 16 and 103) via the input shaft speed sensor connector (terminals 1 and 2).
- The PCM detects the input shaft speed with the signal input to terminal (terminal 103).
- A coil built into the output shaft speed sensor generates pulse signal of 0 ⇔ 5 volts at both ends of this coil when the output shaft rotates. The pulse signal frequency increases with the rise in output shaft speed.
- Both ends of the coil are connected to the PCM (terminals 16 and 104) via the output shaft speed sensor connector (terminals 1 and 2).
- The PCM detects the output shaft speed with the signal input to terminal (terminal 104).

DTC SET CONDITIONS

If the output from the output shaft speed sensor multiplied by the 1st gear ratio is not the same as the output from the input shaft speed sensor after shifting to 1st gear has been completed, diagnostic trouble code number "41" is output. If diagnostic trouble code number "41" is output four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the input shaft speed sensor
- Malfunction of the output shaft speed sensor
- Malfunction of the PCM
- Malfunction of the underdrive clutch retainer
- Malfunction of the transfer drive gear or driven gear
- Malfunction of the low-reverse brake system (for code number "41," "46")
- Malfunction of the underdrive clutch system (for code number "41," "42," "43")
- Malfunction of the second brake system (for code number "42," "44")
- Malfunction of the overdrive clutch system (for code number "43," "44")
- Malfunction of the reverse clutch system (for code number "46")
- Noise generated

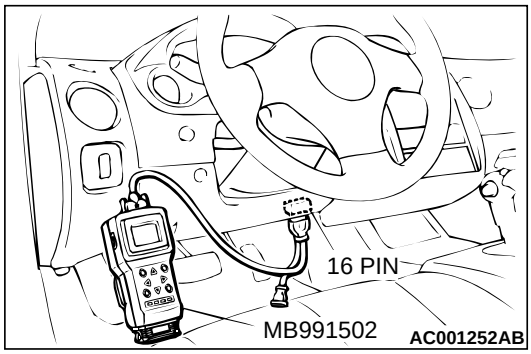
TSB Revision

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

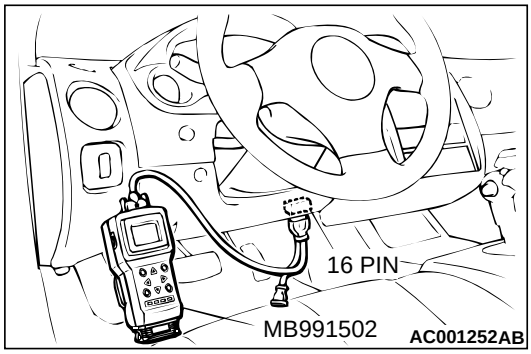


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is A/T diagnostic trouble code numbers "22" or "23" output?

YES : Refer to P.23A-101, code number 22: Input Shaft Speed Sensor System, or refer to P.23A-115, code number 23: Output Shaft Speed Sensor System.
NO : Go to Step 2.

STEP 2. Using scan tool MB991502, carry out the actuator test.



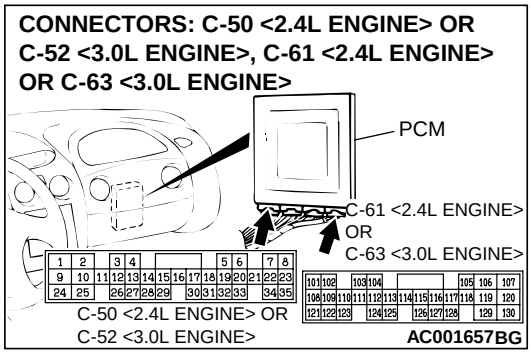
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for following items.
   a. item 01: Low-reverse Solenoid Valve
   b. item 02: Underdrive Solenoid Valve
   c. item 03: Second Solenoid Valve
   d. item 04: Overdrive Solenoid Valve
      - An operation sound should be heard from solenoid valve when solenoid valve is operated.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 3.
NO : Replace the corresponding solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

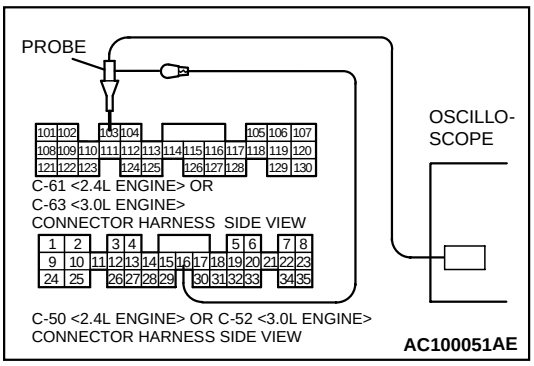
STEP 3. Using the oscilloscope, check the waveform at PCM connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L engine> or C-63 <3.0L Engine>.



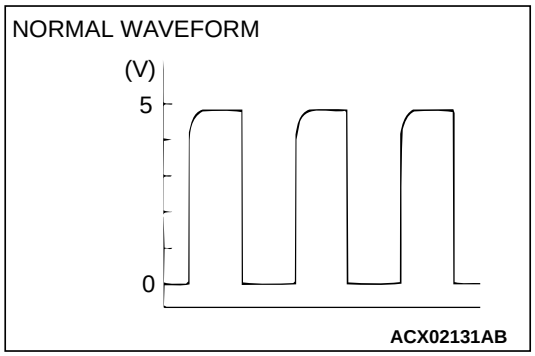
(2) Connect an oscilloscope probe to PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16 and to PCM connector C-61 <2.4L engine> or C-63 <3.0L Engine> terminal 103 by backprobing.

(3) Start the engine and run at constant speed of 50km/h (31mph). (Gear range: 3rd gear)



(4) Check the waveform.

- The waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.8 volts and less. The output waveform should not contain electrical noise.



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

Q: Is the waveform normal?

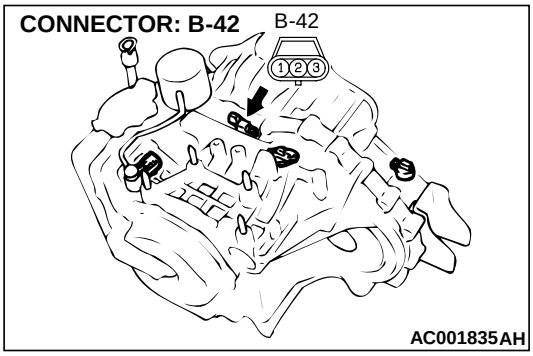
YES : Go to Step 8.
NO : Go to Step 4.

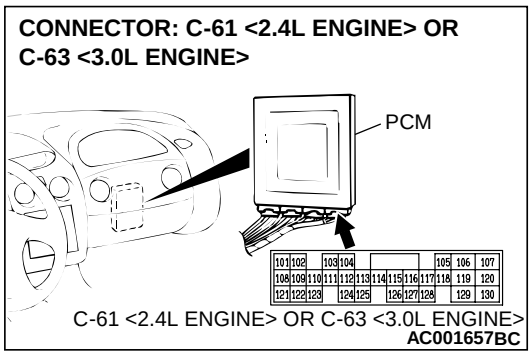
STEP 4. Check connectors B-42 at input shaft speed sensor and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



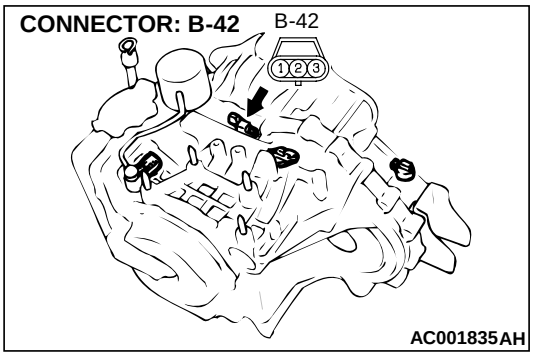


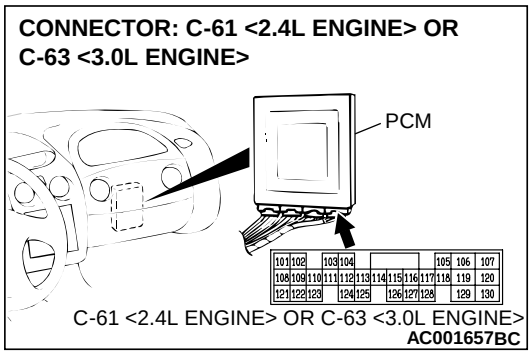
STEP 5. Check harness for damage between input shaft speed sensor connector B-42 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 103.

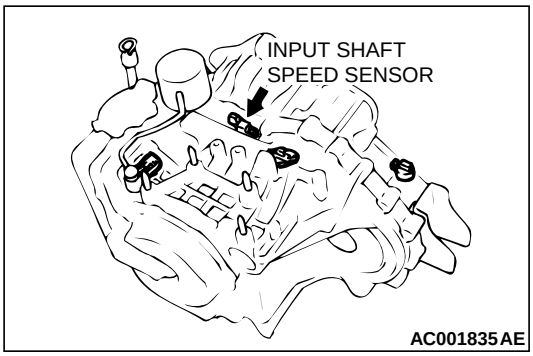
Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.





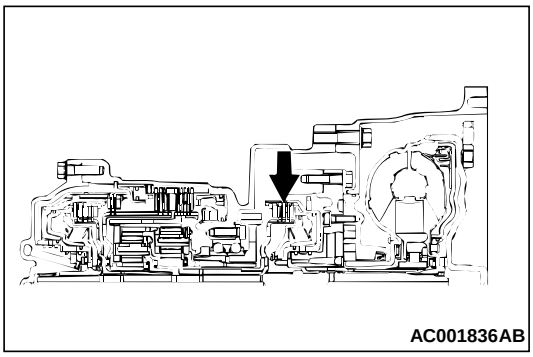


STEP 6. Replace the input shaft speed sensor.

(1) Replace the input shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code output?

YES : Go to Step 7.
NO : The inspection is complete.



STEP 7. Replace the underdrive clutch retainer.

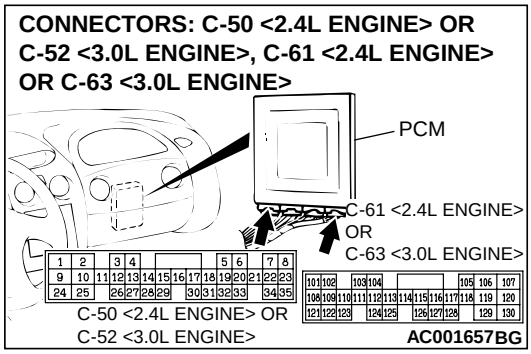
(1) Replace the underdrive clutch retainer. Refer to GROUP 23B, Underdrive Clutch and Input Shaft P.23B-57.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code output?

YES : The A/T diagnostic trouble code may have set due to external radio frequency (RFI), possibly caused by cellular phone activity, after market components installed on the vehicle, etc.
NO : The inspection is complete.

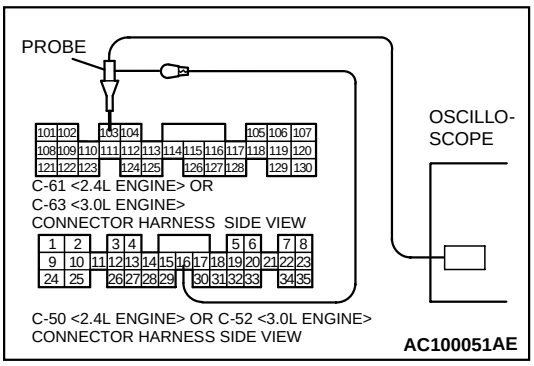
STEP 8. Using the oscilloscope, check the waveform at PCM connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L engine> or C-63 <3.0L Engine>.



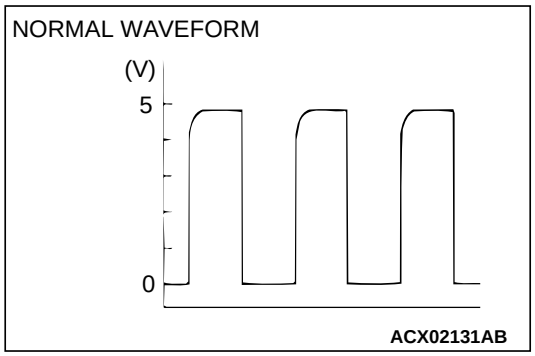
(2) Connect an oscilloscope probe to PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16 and to PCM connector C-61 <2.4L engine> or C-63 <3.0L Engine> terminal 104 by backprobing.

(3) Start the engine and run at constant speed of 50km/h (31mph). (Gear range: 3rd gear)



(4) Check the waveform.

- The waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.8 volts and less. The output waveform should not contain electrical noise.



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

Q: Is the waveform normal?

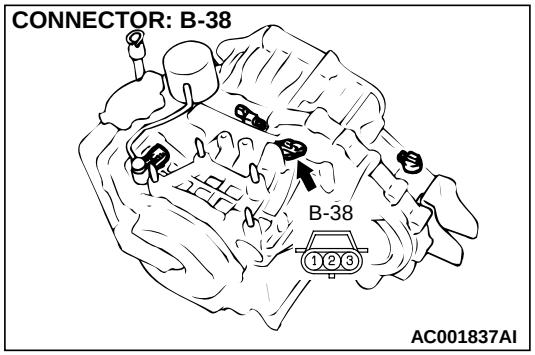
YES : Go to Step 13.
NO : Go to Step 9.

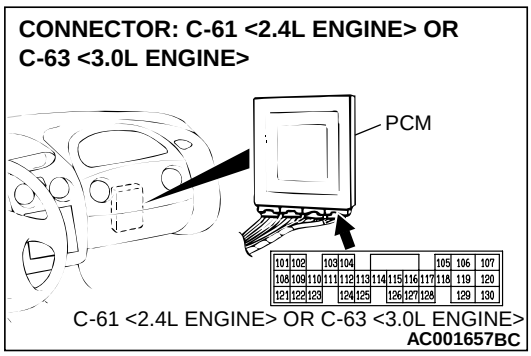
STEP 9. Check connectors B-38 at output shaft speed sensor and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 10.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



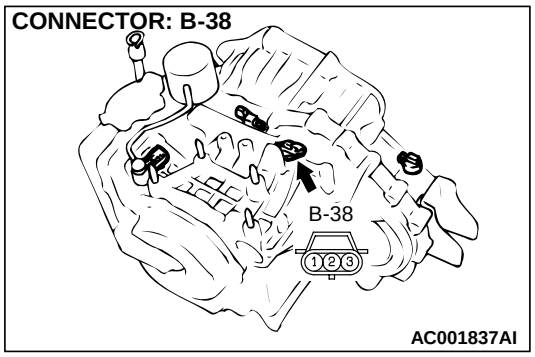


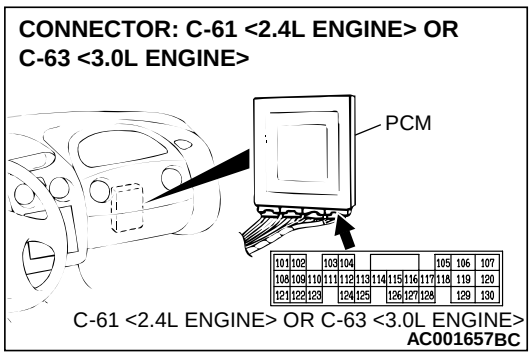
STEP 10. Check harness for damage between output shaft speed sensor connector B-38 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 104.

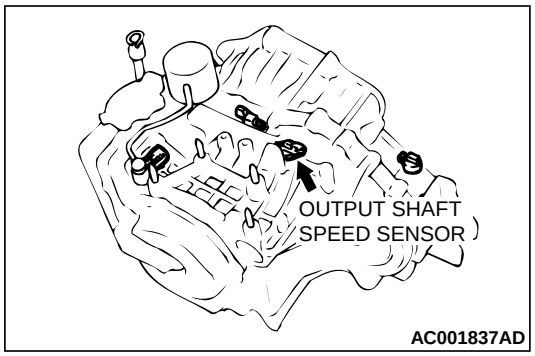
Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair it.





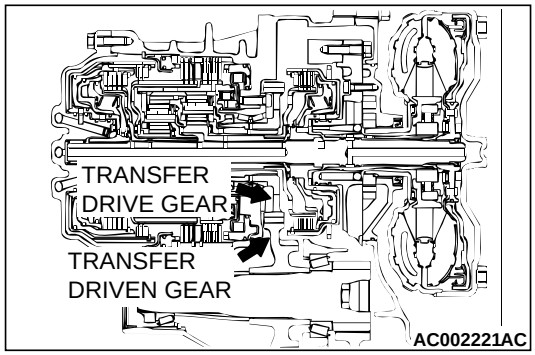


STEP 11. Replace the output shaft speed sensor.

(1) Replace the output shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code (DTC).

Q: Is the A/T diagnostic trouble code output?

YES : Go to Step 12.
NO : The inspection is complete.



STEP 12. Replace the transfer drive gear or driven gear.

(1) Replace the transfer drive gear or driven gear. Refer to GROUP 23B, Transaxle P.23B-10, Output Shaft P.23B-68.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code output?

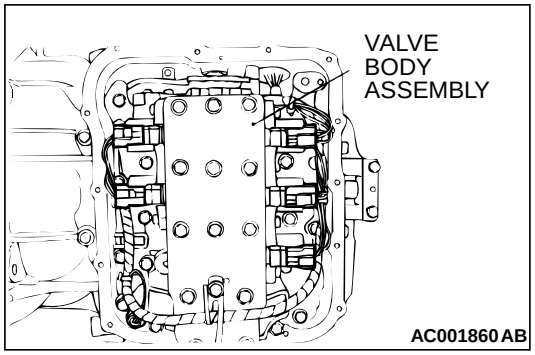
YES : The A/T diagnostic trouble code may have set due to external radio frequency (RFI), possibly caused by cellular phone activity, after market components installed on the vehicle, etc.
NO : The inspection is complete.

STEP 13. Replace the PCM.

(1) Replace the PCM.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code output?

YES : Go to Step 14.
NO : The inspection is complete.

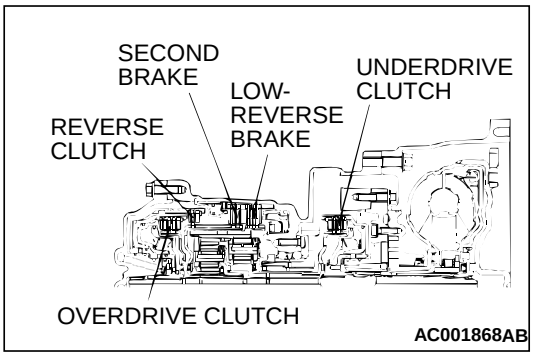


STEP 14. Replace the valve body.

(1) Replace the valve body. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code output?

YES : Go to Step 15.
NO : The inspection is complete.



STEP 15. Overhaul the A/T.

(1) Replace the following parts.
- If DTC No.41, No.42, No.43 are output individually or in a group, replace the underdrive clutch. Refer to GROUP 23B, Underdrive Clutch and Input Shaft P.23B-57.
- If DTC No.43, No.44 are output individually or in a group, replace the overdrive clutch. Refer to GROUP 23B, Reverse and Overdrive Clutch P.23B-59.
- If DTC No.46 is output, replace the reverse clutch. Refer to GROUP 23B, Reverse and Overdrive Clutch P.23B-59.
- If DTC No.41, No.46 are output individually or in a group, replace the low-reverse brake. Refer to GROUP 23B, Transaxle P.23B-10.
- If DTC No.42, No.44 are output individually or in a group, replace the second brake. Refer to GROUP 23B, Transaxle P.23B-10.
- If DTC No.41 is output, replace the one-way clutch (OWC-L). Refer to GROUP 23B, Planetary Gear P.23B-64.

(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code output again?

YES : The A/T diagnostic trouble code may have set due to external radio frequency (RFI), possibly caused by cellular phone activity, after market components installed on the vehicle, etc.

NO : The inspection is complete.

DTC 52: Torque Coverter Clutch System

DTC SET CONDITIONS

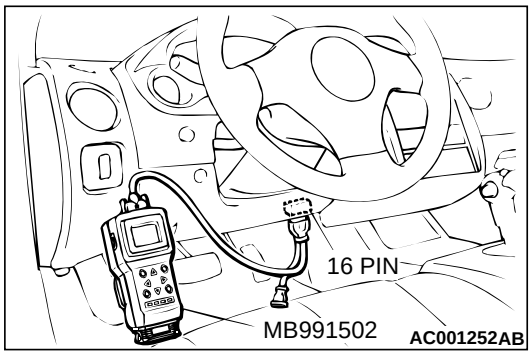
If input shaft speed sensor is abnormal and drive duty rate for the torque converter clutch solenoid valve is 100 percent for continuous period of 4 seconds or more, it is judged that there is an abnormality in the torque converter clutch system and diagnostic trouble code number "52" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the torque converter clutch solenoid valve
- Damaged harness, connector
- Malfunction of the PCM
- Malfunction of the underdrive clutch

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

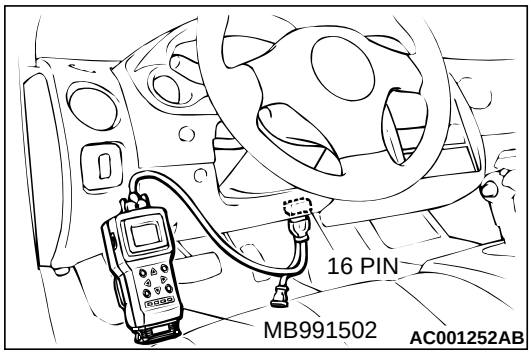
⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is A/T diagnostic trouble code number "22" output?

YES : Refer to P.23A-101, code number 22: Input Shaft Speed Sensor System.
NO : Go to Step 2.



STEP 2. Using scan tool MB991502, carry out the actuator test item 06: Torque Converter Clutch Solenoid Valve.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 06: Torque Converter Clutch Solenoid Valve.
- An operation sound should be heard from solenoid valve when the torque converter clutch solenoid valve is operated.

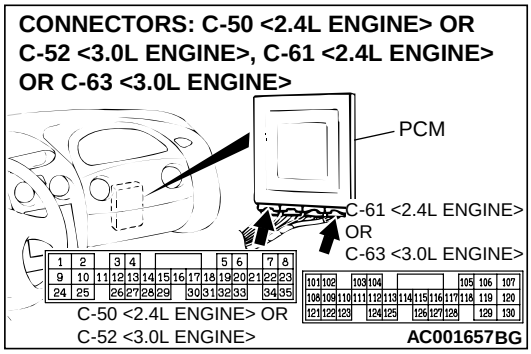
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 3.
NO : Replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

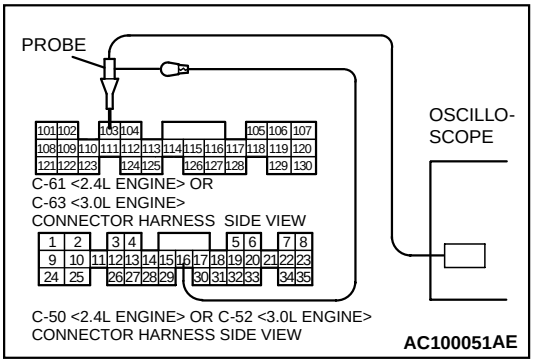
STEP 3. Using the oscilloscope, check the waveform at PCM connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connectors C-50 <2.4L Engine> or C-52 <3.0L Engine> and C-61 <2.4L Engine> or C-63 <3.0L Engine>.



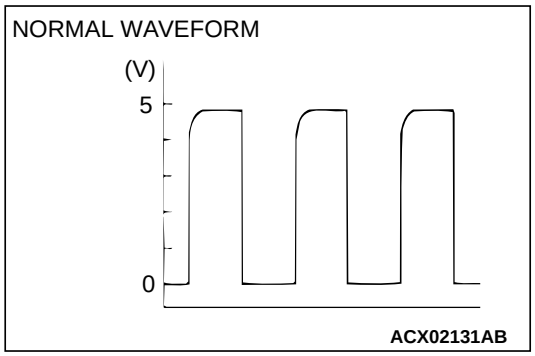
(2) Connect an oscilloscope probe to PCM connector C-50 <2.4L Engine> or C-52 <3.0L Engine> terminal 16 and to PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 103 by backprobing.

(3) Start the engine and run at constant speed of 50km/h (31mph). (Gear range: 3rd gear)



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

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



Q: Is the waveform normal?

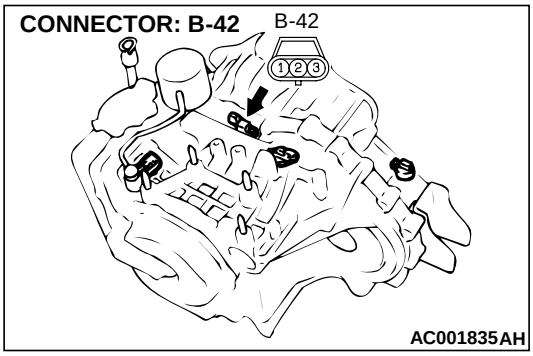
YES : Go to Step 8.
NO : Go to Step 4.

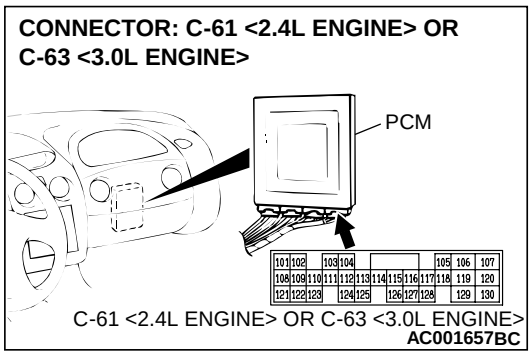
STEP 4. Check connectors B-42 at input shaft speed sensor and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 5.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



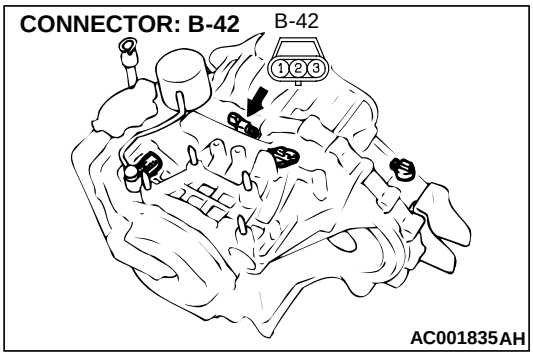


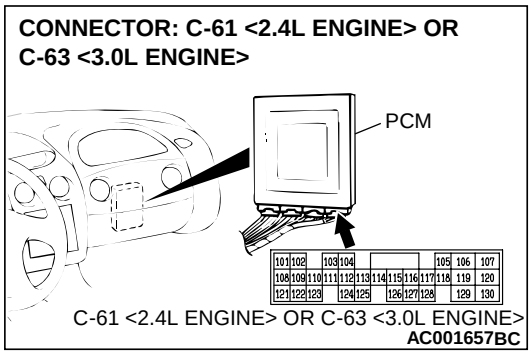
STEP 5. Check harness for damage between input shaft speed sensor connector B-42 terminal 2 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 103.

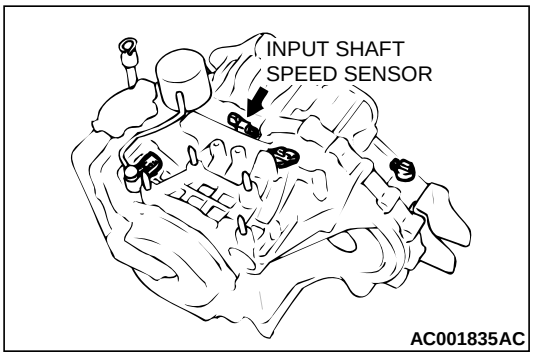
Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair it.





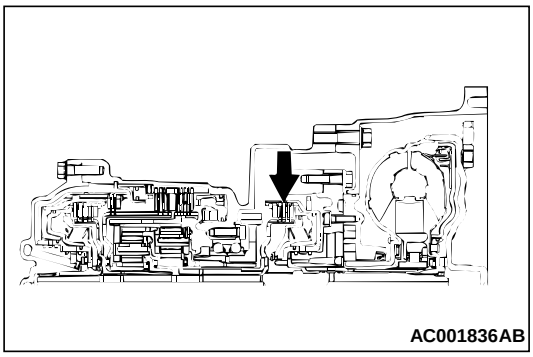


STEP 6. Replace the input shaft speed sensor.

(1) Replace the input shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code "52" is output?

YES : Go to Step 7.
NO : The inspection is complete.



STEP 7. Replace the underdrive clutch retainer.

(1) Replace the underdrive clutch retainer. Refer to GROUP 23B, Underdrive Clutch and Input Shaft P.23B-57.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code "52" is output?

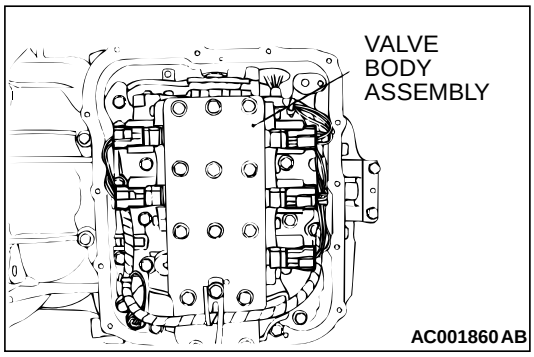
YES : The A/T diagnostic trouble code may have set due to external radio frequency (RFI), possibility caused by cellular phone activity, after market components installed on the vehicle, etc.
NO : The inspection is complete.

STEP 8. Replace the PCM.

(1) Replace the PCM.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code "52" is output?

YES : Go to Step 9.
NO : The inspection is complete.



STEP 9. Replace the valve body.

(1) Replace the valve body. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code "52" is output?

YES : Replace the torque converter. Refer to GROUP 23B, Transaxle P.23B-10.
NO : The inspection is complete.

DTC 53: Torque Converter Clutch is Stuck on

DTC SET CONDITIONS

If the torque converter clutch remains engaged for a continuous period of ten seconds when the PCM is attempting to disengage the torque converter clutch, it is judged that the torque converter clutch is stuck on and diagnostic trouble code number "53" is output.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the torque converter clutch solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

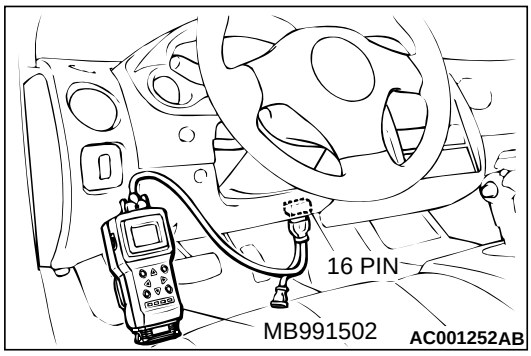
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check data list item 52: Amount of Torque Converter Clutch Slippage.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



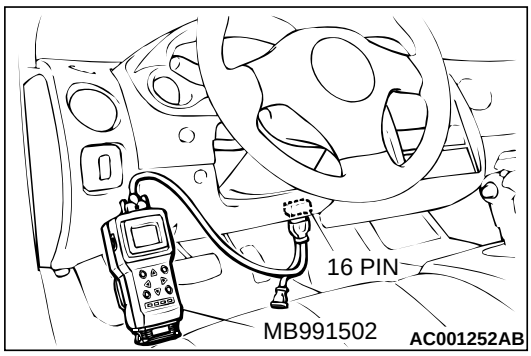
(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine and run at constant speed of 50km/h (31mph). (Gear range: 3rd gear)
(3) Set scan tool MB991502 to data reading mode for item 52: Amount of Torque Converter Clutch Slippage.
  - Driving at constant speed of 50 km/h (31 mph), the display should be "–10 to 10 r/min."
  - If the accelerator pedal is released, the display on the scan tool changes.(50 km/h (31 mph) and less).
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : . This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : . Go to Step 2.

STEP 2. Using scan tool MB991502, carry out the actuator test item 06: Torque Converter Clutch Solenoid Valve.



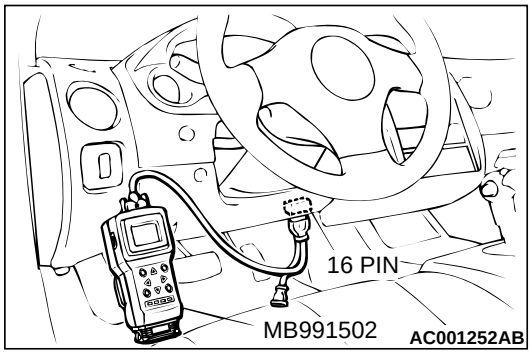
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 06: Torque Converter Clutch Solenoid Valve.
  - An operation sound should be heard from solenoid valve when the torque converter clutch solenoid valve is operated.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 3.

NO : Replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74.

TSB Revision



STEP 3. Using scan tool MB991502, check data list item 52: Amount of Torque Converter Clutch Slippage. (Second check)

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine and run at constant speed of 50km/h (31mph). (Gear range: 3rd gear)
(3) Set scan tool MB991502 to data reading mode for item 52: Amount of Torque Converter Clutch Slippage.
- Driving at constant speed of 50km/h (31mph), the display should be "–10 to 10 r/min."
- The display should be "–300 to –100 r/min" or "100 to 300 r/min" when the accelerator pedal is released (50 km/h (31 mph) and less).

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

Q: Is the sensor operating properly?

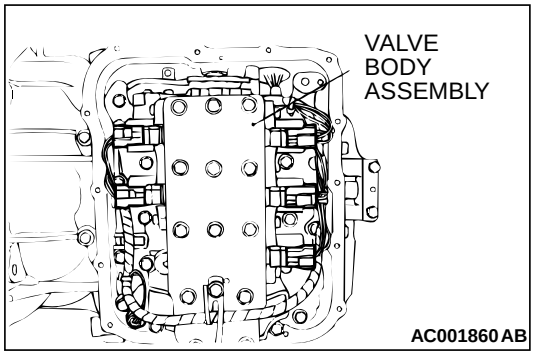
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 4.

STEP 4. Replace the PCM.

(1) Replace the PCM.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code (DTC).

Q: Is the A/T diagnostic trouble code "53" is output?

YES : Go to Step 5.
NO : The inspection is complete.



STEP 5. Replace the valve body.

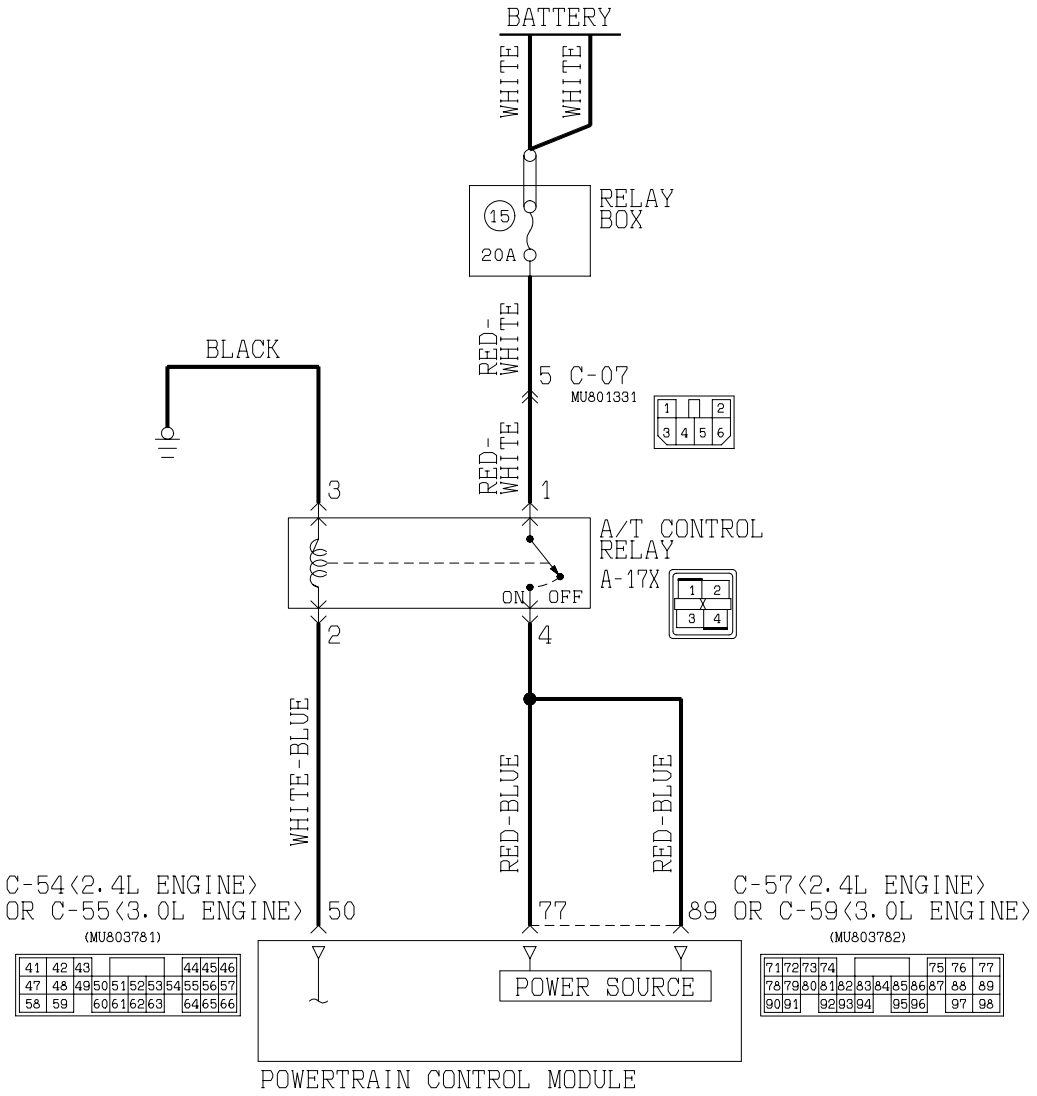
(1) Replace the valve body. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is the A/T diagnostic trouble code "53" is output?

YES : Replace the Torque Converter. Refer to GROUP 23B, Transaxle P.23B-10.
NO : The inspection is complete.

DTC 54: A/T Contorl Relay System

A/T Control Relay System Circuit



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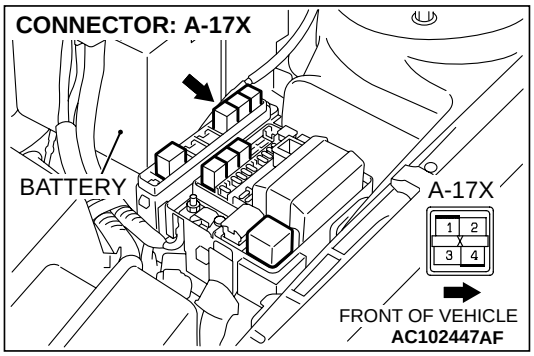
AC106637AB



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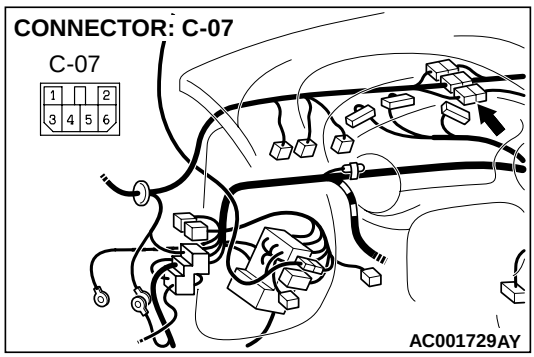

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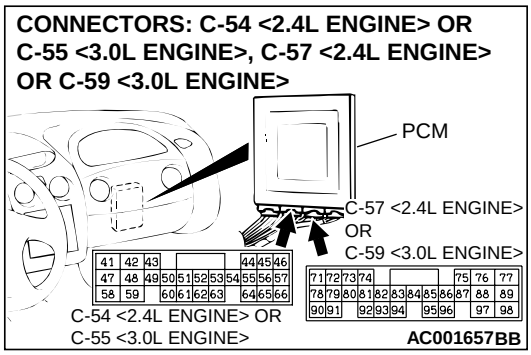
TSB Revision



CIRCUIT OPERATION

- A/T control relay (terminal number 1) receives the battery positive voltage from the battery.
- When turning the ignition switch to the "ON" position the PCM receives battery voltage from the ignition switch (terminal 98). Then the PCM (terminal number 50) applies a voltage to the A/T control relay (terminal number 4), and the A/T control relay switch is turned on. When the A/T control relay switch is turned on, the battery applies a power supply voltage to the PCM (terminal numbers 77 and 89).

DTC SET CONDITIONS

If the A/T control relay voltage is less than 7 volts at terminals 77 and 89 after the ignition switch has been turned to the "ON" position it is judged that there is an open circuit or a short-circuit in the A/T control relay ground and diagnostic trouble code number "54" is output. The transmission is locked into the 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

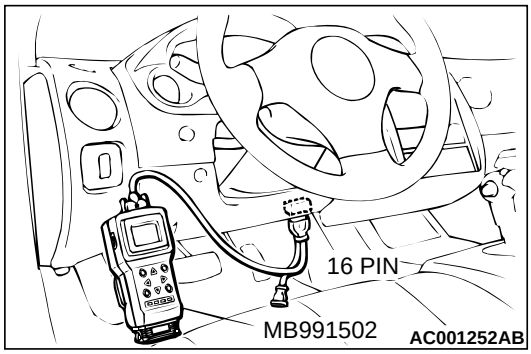
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the A/T control relay
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check data list item 54: A/T Control Relay Output Voltage.

⚠ CAUTION

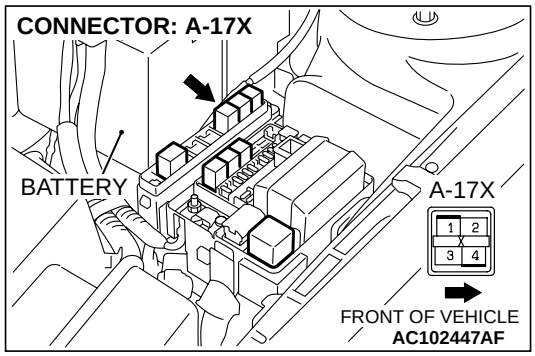
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 54: A/T Control Relay Output Voltage.
  - Voltage should be battery positive voltage.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the relay operating properly?

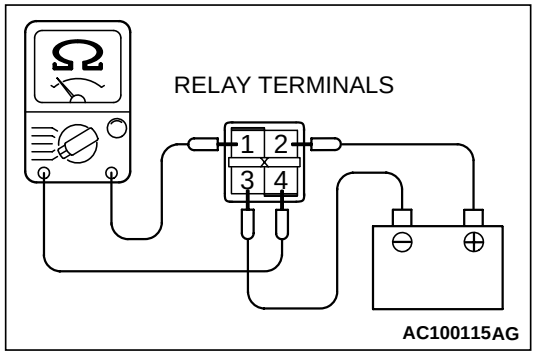
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.



STEP 2. Check the A/T control relay.

(1) Remove the A/T control relay A-17X.



(2) Use jumper wires to terminal 2 of A/T control relay connector A-17X to the positive battery terminal, and terminal number 3 of A/T control relay connector A-17X to the negative battery terminal.

(3) Measure the resistance between terminal 1 and 4 of A/T control relay connector A-17X.

- Should be than 2 ohm when the jumper wire connected.
- Open circuit when the jumper wire disconnected.

Q: Is the resistance normal?

YES : Go to Step 3.

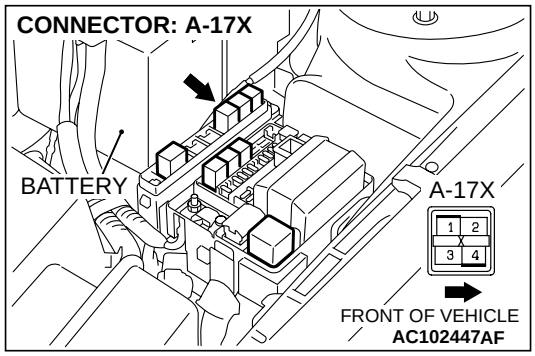
NO : Replace the A/T control relay.

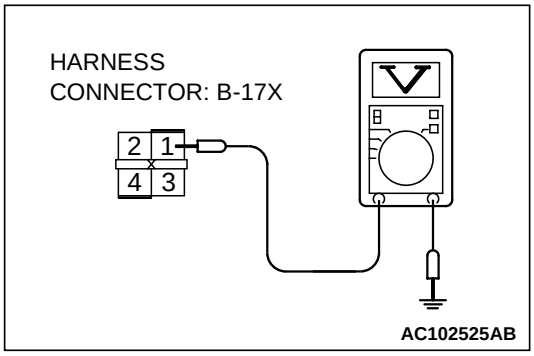
STEP 3. Check connector A-17X at A/T control relay for damage.

Q: Is the connector in good condition?

YES : Go to Step 4.

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





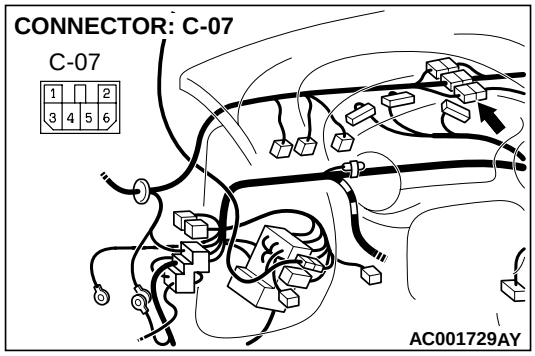
STEP 4. Check the power supply voltage at A/T control relay connector A-17X.

(1) Disconnect the A/T control relay and measure at the connector side.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and ground.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

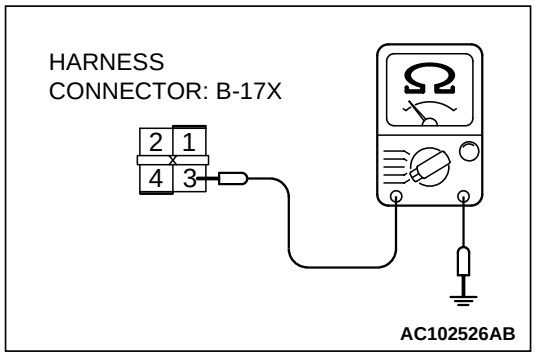
YES : Go to Step 6.
NO : Go to Step 5.



STEP 5. Check connector C-07 at intermediate connector for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between A/T control relay connector A-17X terminal 1 and battery.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

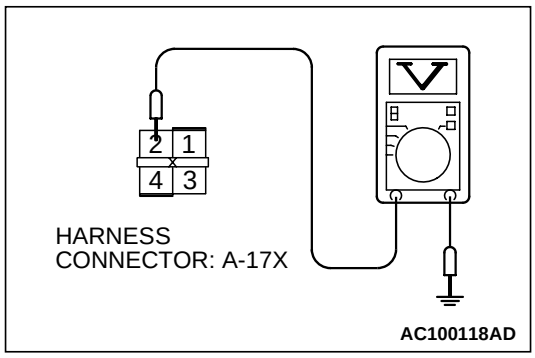


STEP 6. Check the continuity at A/T control relay connector A-17X.

(1) Disconnect the A/T control relay and measure at the connector side.
(2) Check for the continuity between terminal 3 and ground.
- Should be less than 2 ohm.

Q: Is the continuity normal?

YES : Go to Step 7.
NO : Repair harness open circuit or damage between A/T control relay connector A-17X terminal 3 and the earth.



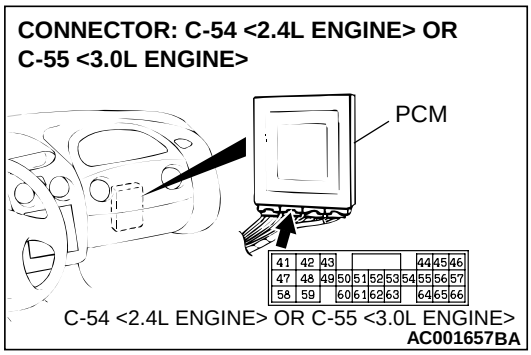
STEP 7. Check the power supply voltage at A/T control relay connector A-17X.

(1) Disconnect the A/T control relay and measure at the connector side.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 2 and ground.
- Voltage should be battery positive voltage.

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

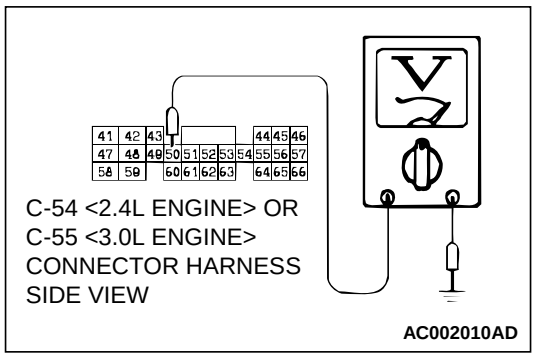
Q: Is the voltage normal?

YES : Go to Step 11.
NO : Go to Step 8.



STEP 8. Check the power supply voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 50 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

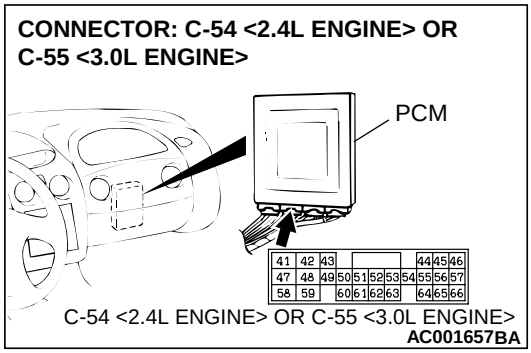
YES : Go to Step 9.
NO : Go to Step 10.

STEP 9. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit between A/T control relay connector A-19X terminal 4 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 50.

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

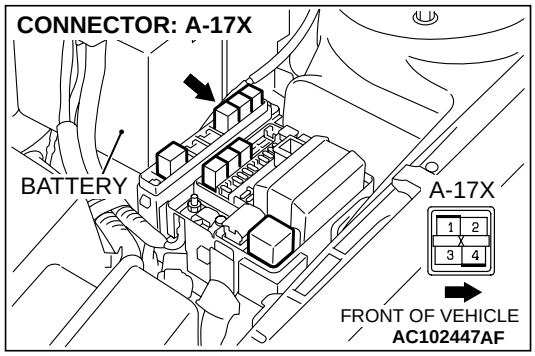


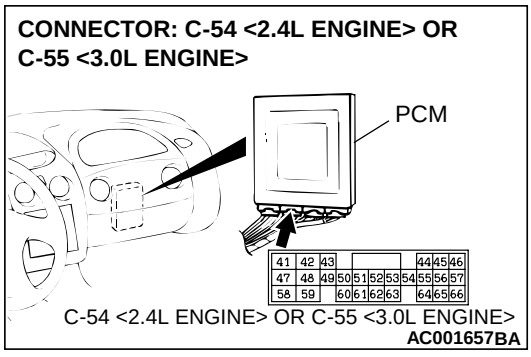
STEP 10. Check harness for short circuit to ground between A/T control relay connector A-17X terminal 2 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 50.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair it.

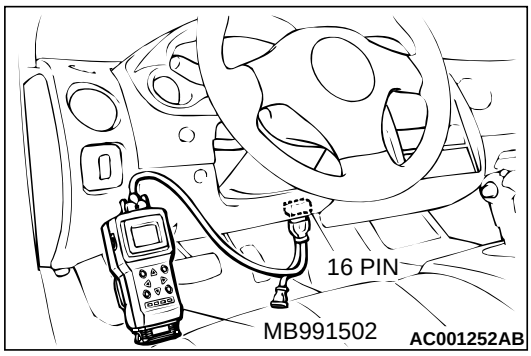




STEP 11. Using scan tool MB991502, check data list item 54: A/T control relay output Voltage.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



. (1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 54: A/T Control Relay Output Voltage.
- Voltage should be battery positive voltage.

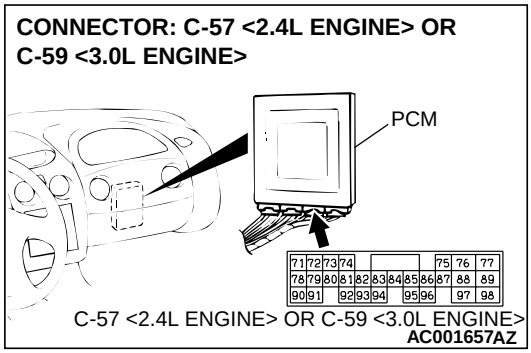
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the relay operating properly?

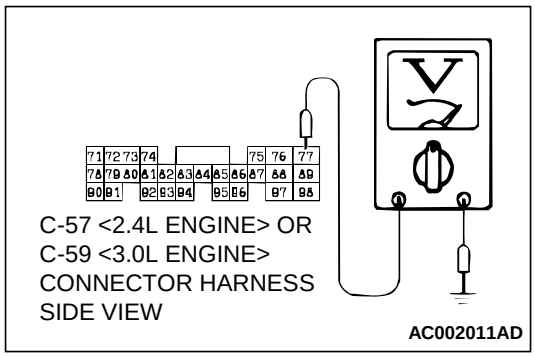
YES : . This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : . Replace the PCM.

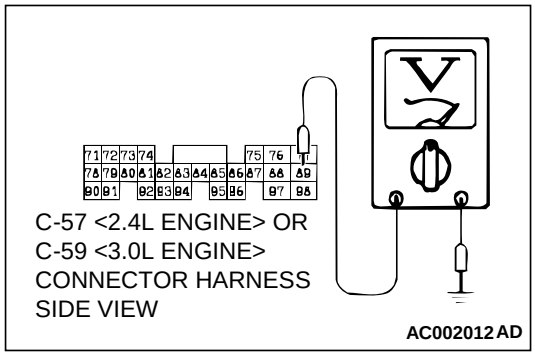
STEP 12. Check the relay output voltage at PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> by backprobing.



(1) Do not disconnect connector C-57 <2.4L Engine> or C-59 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 77 and ground by backprobing.
- Voltage should be battery positive voltage.



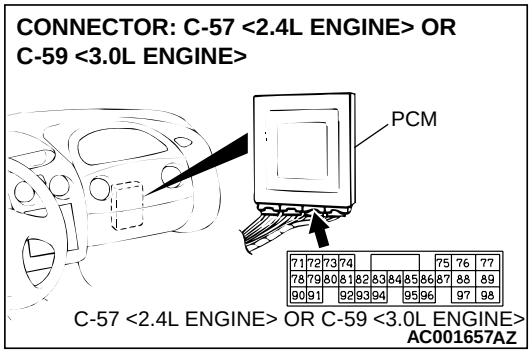
(4) Measure the voltage between terminal 89 and ground by backprobing.
- Voltage should be battery positive voltage.

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

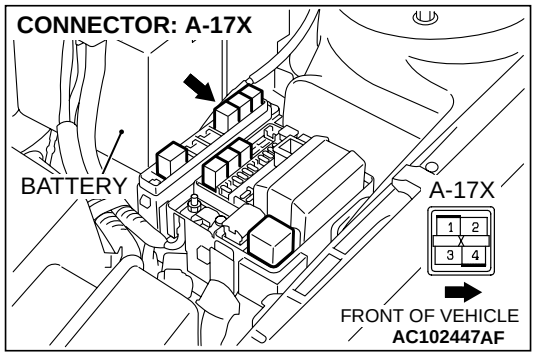
Q: Is the voltage normal?

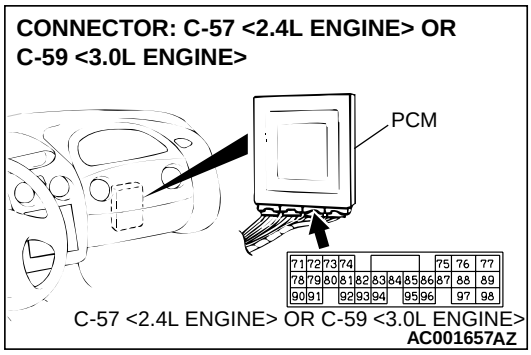
YES : Go to Step 11.
NO : Go to Step 13.

STEP 13. Check connector C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.
Q: Is the connector in good condition?
YES : Go to Step 14.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

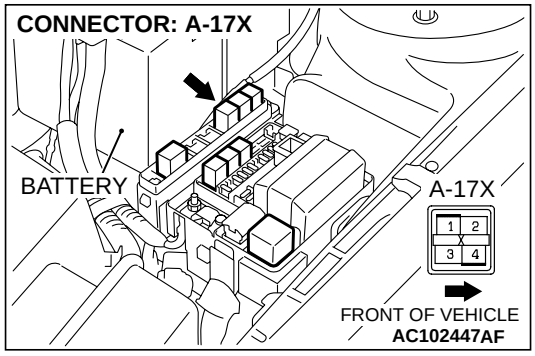


STEP 14. Check harness for short circuit to ground, open circuit or damage between A/T control relay connector A-17X terminal 4 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminals 77 and 89.
Q: Is the harness wire in good condition?
YES : Go to Step 15.
NO : Repair it.

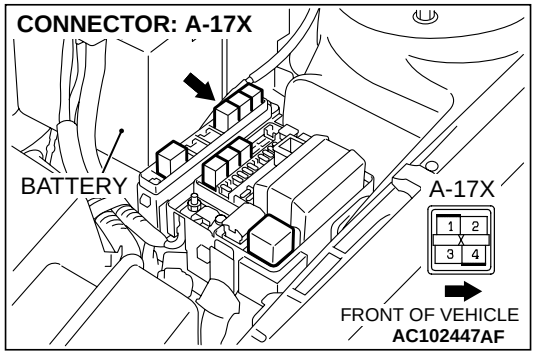




STEP 15. Check harness for damage between A/T control relay connector A-17X terminal 1 and battery.
Q: Is the harness wire in good condition?
YES : Go to Step 16.
NO : Repair it.



TSB Revision

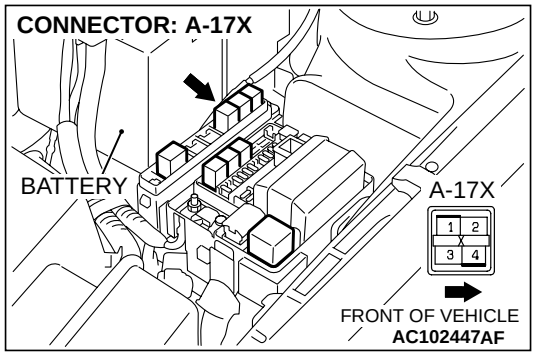


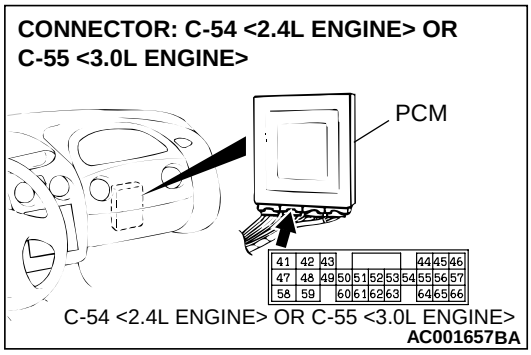
STEP 16. Check harness for damage between A/T control relay connector A-17X terminal 3 and the ground.

Q: Is the harness wire in good condition?

YES : Go to Step 17.

NO : Repair it.





STEP 17. Check harness for short circuit to ground between A/T control relay connector A-17X terminal 2 and PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 50.

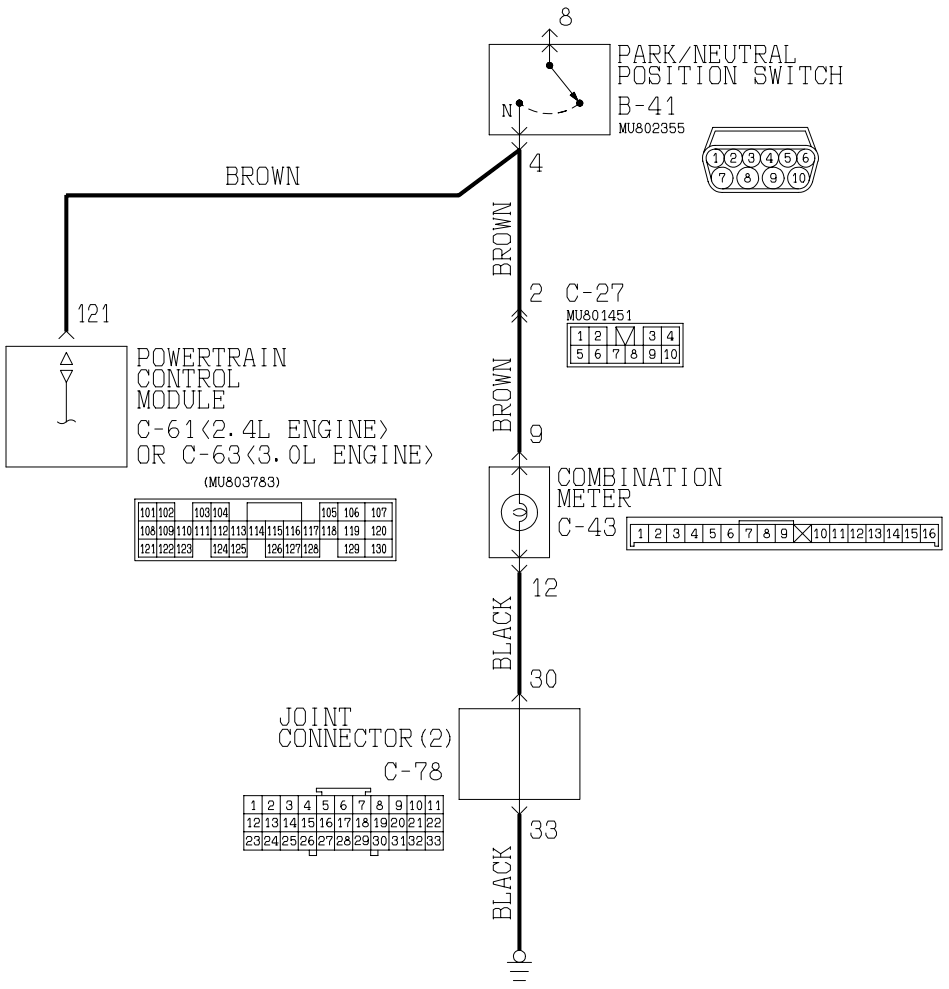
Q: Is the harness wire in good condition?

YES : Repair harness short circuit to ground between A/T control relay connector A-17X terminal 4 and solenoid valve assembly connector B-40 terminal 9 and 10.

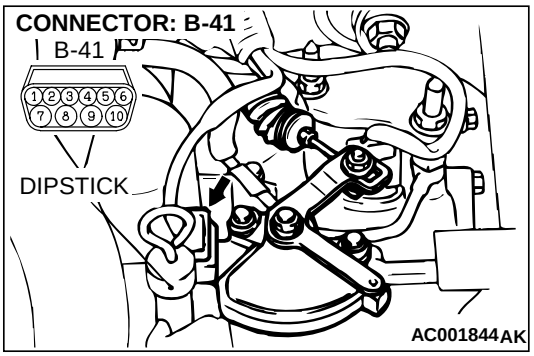
NO : Repair it.

DTC 56: "N" Range Light System <Vehicles with sport mode>

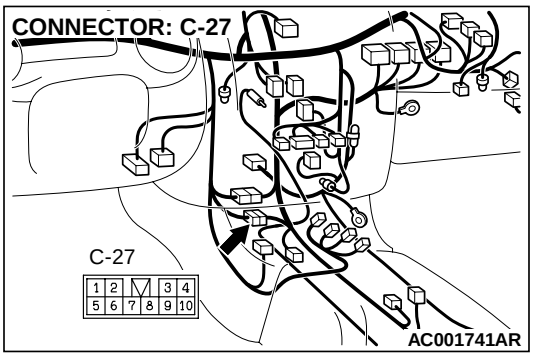
"N" Range Light System Circuit



W2S11M10AA
AC102731AB

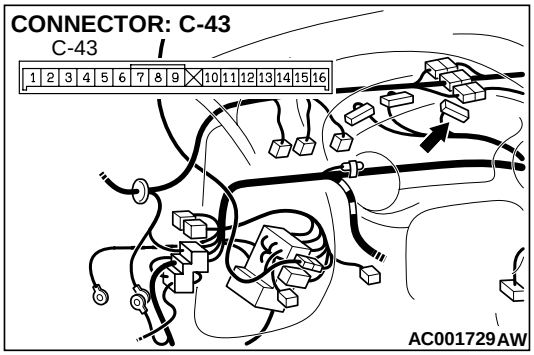


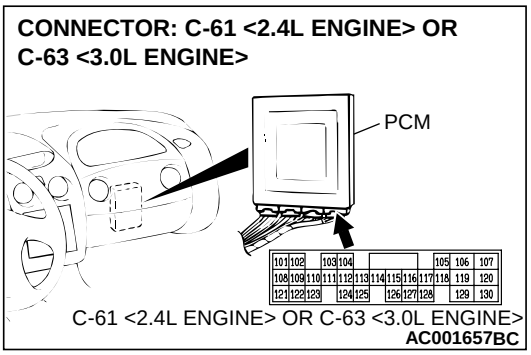
AC001844AK

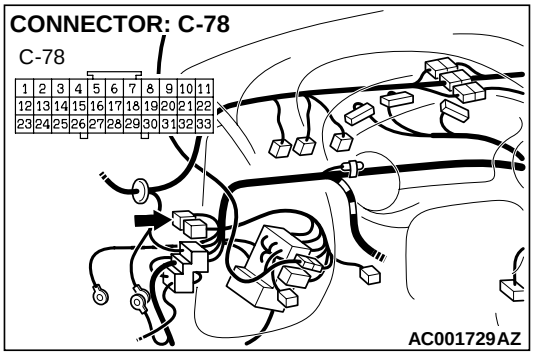


AC001741AR

TSB Revision







CIRCUIT OPERATION

If a fail-safe is triggered while driving forward, the PCM flashes the "N" range light once per second (triggered fail-safe). The PCM does this by switching battery positive voltage to terminal 121.

DTC SET CONDITIONS

If the PCM detects a fail-safe condition, it will attempt to illuminate the "N" range light. The PCM sends a 12 volts pulse for 60 – 180 ms. If it does not detect a voltage drop during the pulse, it waits about 60 seconds and pulses 12 volts again for 60 – 180 ms. If the PCM does no detect the voltage drop before the ignition switch is turned "LOCK" (OFF), the PCM will consider it as an short circuit of the "N" range light circuit and output code number "56."

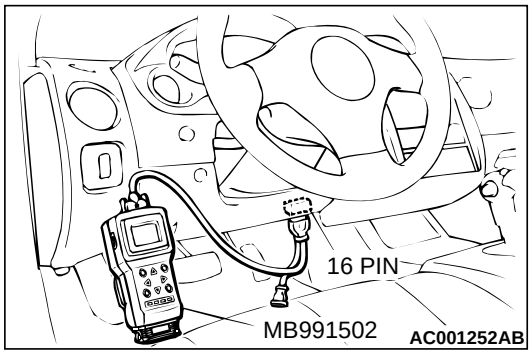
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Defective "N" range light bulb
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check the light bulb.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
- The "N" range light in the combination meter flushes.

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

Q: Does the "N" range light flush?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.

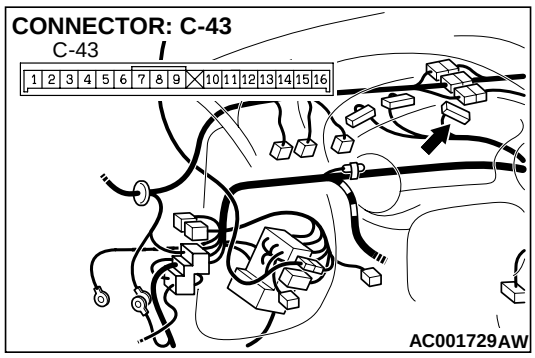
STEP 2. Check the "N" range light bulb.

(1) Remove the combination meter. Refer to GROUP 54A, Chassis Electrical – Combination Meters Assembly and Vehicle Speed Sensor P.54A-105.
(2) Check the "N" range light bulb.

Q: Is the bulb in good condition?

YES : Go to Step 3.

NO : Replace the "N" range light bulb. Refer to GROUP 54A, Chassis Electrical – Combination Meters Assembly and Vehicle Speed Sensor P.54A-105.



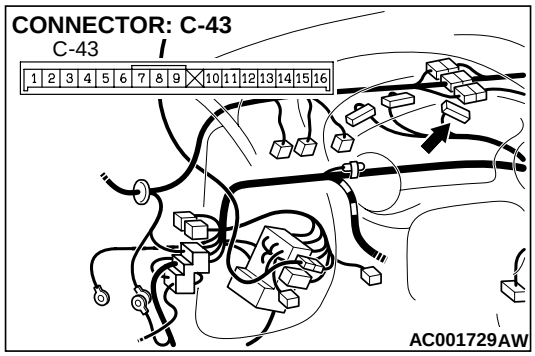
STEP 3. Check connector C-43 at combination meter for damage.

Q: Is the connector in good condition?

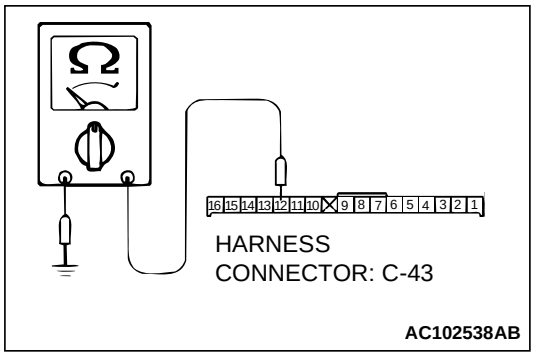
YES : Go to Step 4.

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

STEP 4. Check the continuity at combination meter connector C-43.



(1) Disconnect connector C-43 and measure at the harness side.



(2) Check for the continuity between terminal 12 and ground.
- Should be less than 2 ohm.

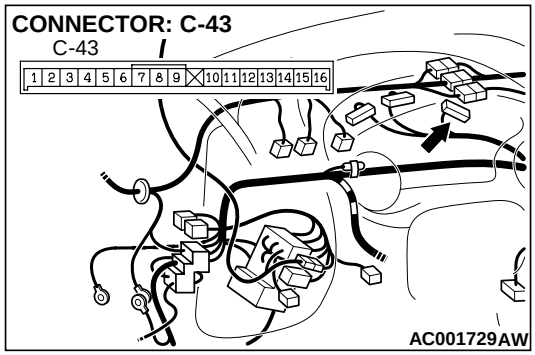
Q: Is the continuity normal?

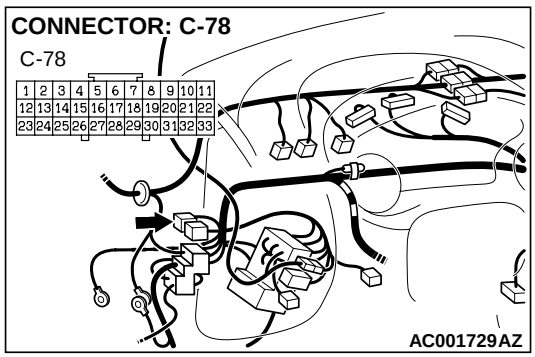
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check connectors C-43 at combination meter and C-78 at joint connector (2) for damage.

Q: Are the connectors in good condition?

YES : Repair harness open circuit or harness damage between combination meter connector C-43 terminal 12 and the ground.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



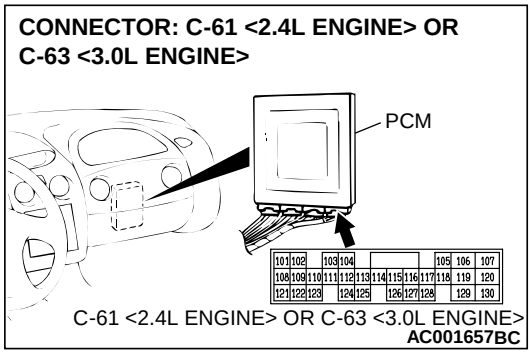


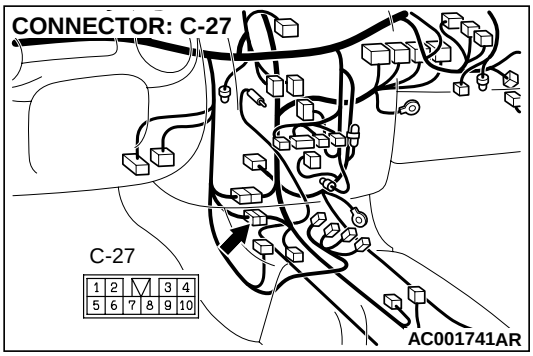
STEP 6. Check connectors C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM, C-27 at intermediate connector, B-41 Park/Neutral position switch connector and C-43 at combination meter for damage.

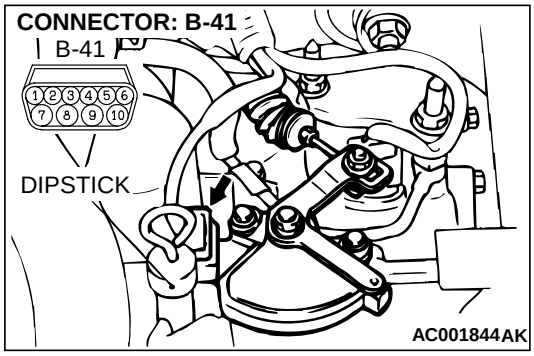
Q: Are the connectors in good condition?

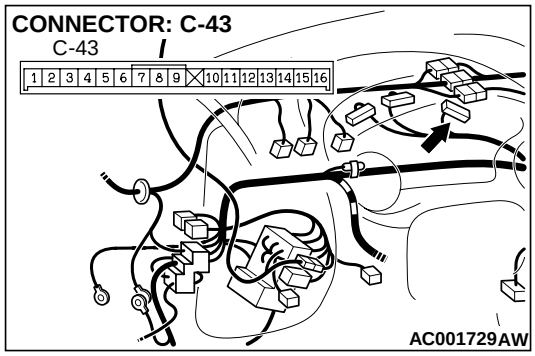
YES : Go to Step 7.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



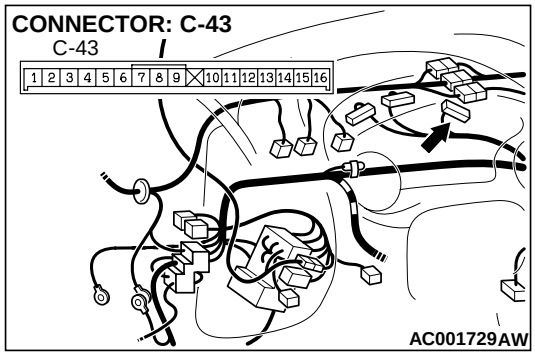


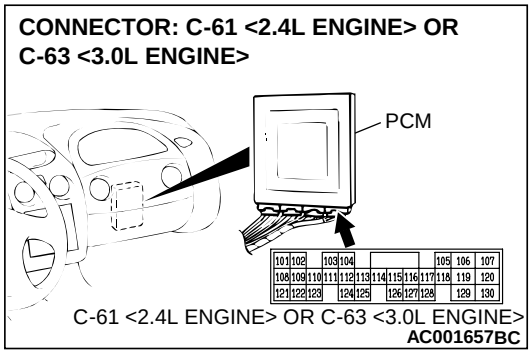




STEP 7. Check harness for open circuit, short circuit to ground and damage between combination meter connector C-43 terminal 9 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 121.
Q: Is the harness wire in good condition?

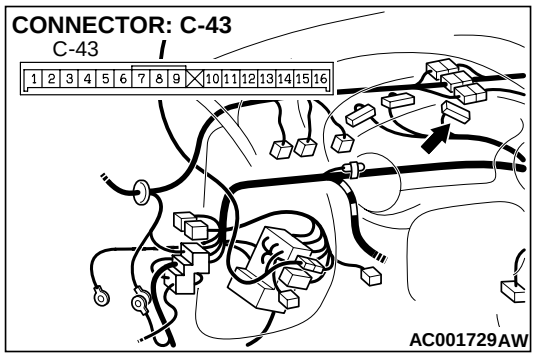
YES : Go to Step 8.
NO : Repair it.





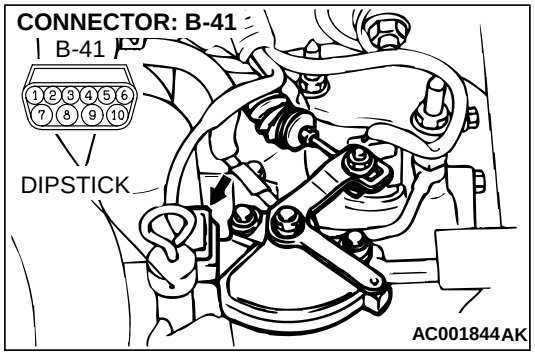
STEP 8. Check harness for damage between combination meter connector C-43 terminal 12 and the ground.
Q: Is the harness wire in good condition?

YES : Go to Step 9.
NO : Repair it.



STEP 9. Check connector B-41 at Park/Neutral position switch for damage.
Q: Is the connector in good condition?

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



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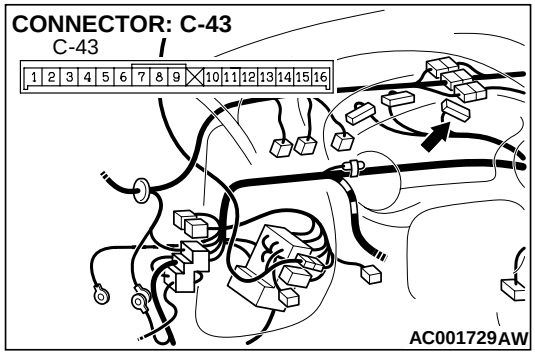
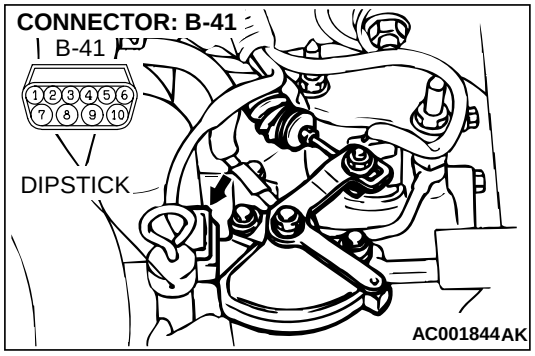


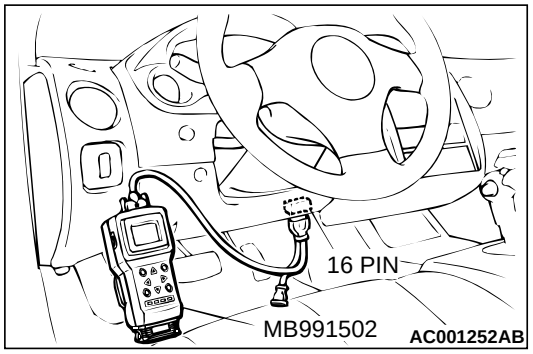


STEP 10. Check harness for short circuit to ground between combination meter connector C-43 terminal 9 and Park/Neutral position switch connector B-41 terminal 4.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair it.



STEP 11. Using scan tool MB991502, check the light bulb.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.

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

- The "N" range light in the combination meter flushes.

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

Q: Does the "N" range light flush?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Engine does not Crank

COMMENT
If the engine does not crank when the selector lever is placed in the "P" or "N" position, the cause is probably a malfunction of the Park/Neutral position switch system, transaxle control cable assembly, engine system, torque converter or transaxle oil pump.

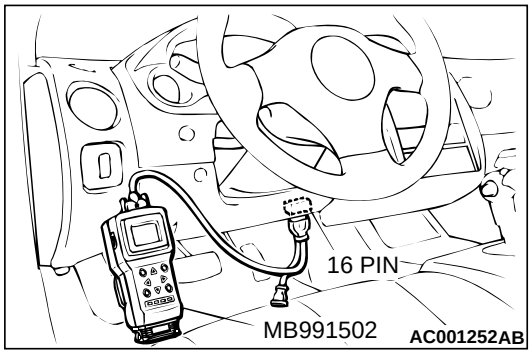
TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the Park/Neutral position switch
- Malfunction of the transaxle control cable assembly
- Malfunction of the engine system
- Malfunction of the torque converter
- Malfunction of the transaxle oil pump
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

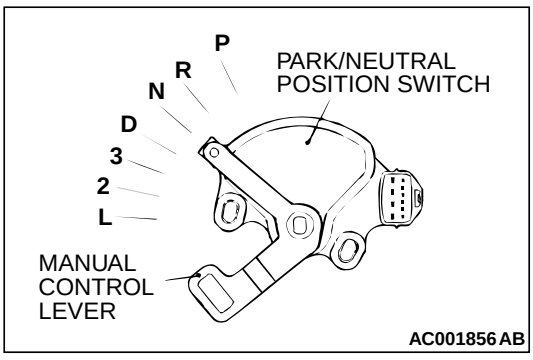
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is A/T diagnostic trouble code numbers "27" or "28" displayed?
YES : Refer to P.23A-136, P.23A-166, code number 27, 28: Park/Neutral Position Switch System.
NO : Go to Step 2.

STEP 2. Check the transaxle control cable assembly.
Move the selector lever to each position. The manual control lever position of the Park/Neutral position switch should match the selector lever position.



Q: Is the manual control lever position correct?
YES : Go to Step 3.
NO : Repair the transaxle control cable. Refer to P.23A-352, Park/Neutral Position Switch and Control Cable Adjustment. Retest the system to verify the repair.

STEP 3. Check the engine.

Refer to GROUP 13A <2.4L Engine>, Diagnosis – Trouble Symptom Chart – Starting P.13A-25 or GROUP 13B <3.0L Engine>, Diagnosis – Trouble Symptom Chart – Starting P.13B-26.

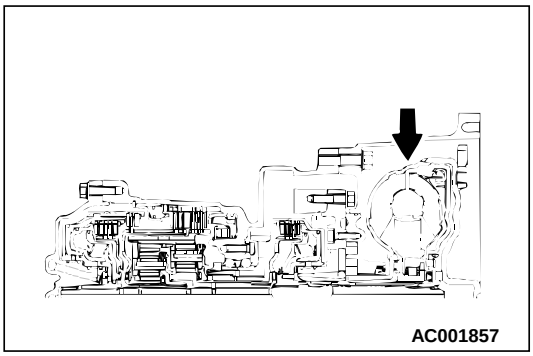
Q: Are the engine checks satisfactory?

YES : Go to Step 4.
NO : Repair or replace the defective engine components.

STEP 4. Check the torque converter.

(1) Remove the starter.
(2) Turn the torque converter and check for a binding or sticking condition. Check the ring gear for damaged or missing teeth.

NOTE: Since the torque converter drives the oil pump, turning the torque converter also checks for a binding oil pump. If either of these components are damaged the transaxle will need to be removed for inspection.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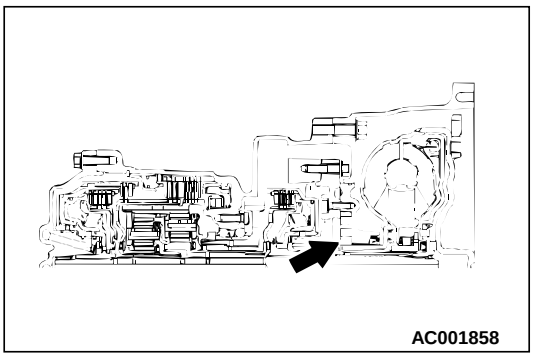
Q: Dose the torque converter turn freely without any missing or damaged teeth?

YES : Replace the starter and go to Step 5.
NO : Replace the torque converter. Refer to GROUP 23B, Transaxle P.23B-10.

STEP 5. Replace the oil pump.

Replace the oil pump (Oil pump cannot be repaired). Refer to GROUP 23B, Transaxle P.23B-10. Confirm that the malfunction symptom is eliminated.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Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 6.

STEP 6. Replace the PCM.

Q: Dose the engine crank when the selector lever is placed in the "P" or "N" position?

YES : Diagnosis is complete.
NO : Start over at Step 1.

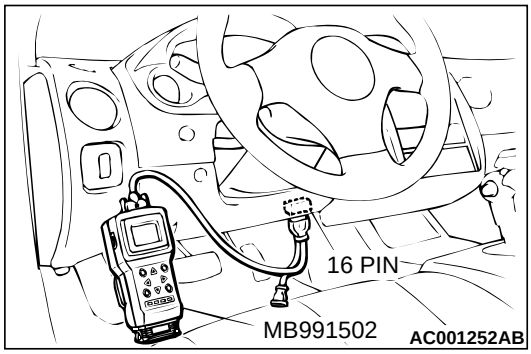
INSPECTION PROCEDURE 2: Does not Move Forward

COMMENT
If the vehicle does not move forward when the selector lever is shifted from "N" to "D," "2" or "L" range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the underdrive clutch or valve body.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Abnormal line pressure
- Malfunction of the underdrive solenoid valve
- Malfunction of the underdrive clutch
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, carry out the actuator test item 02: Underdrive Solenoid Valve.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 02: Underdrive Solenoid Valve.
- An operation sound should be heard from solenoid valve when solenoid valve is operated.

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

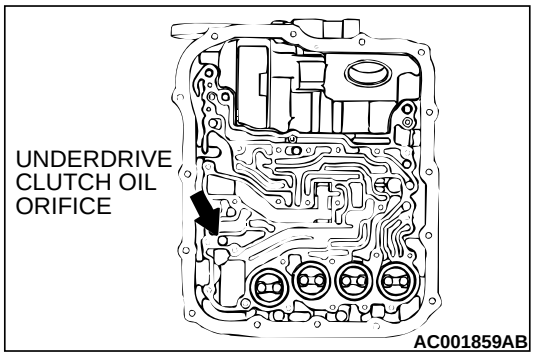
Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the underdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74. Then confirm that the symptom is eliminated.

STEP 2. Check the hydraulic pressure.
Measure the hydraulic pressure of each element when the selector lever is at the "L" range, and check if each hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 3.
NO : Go to Step 4.



STEP 3. Check the underdrive clutch system.

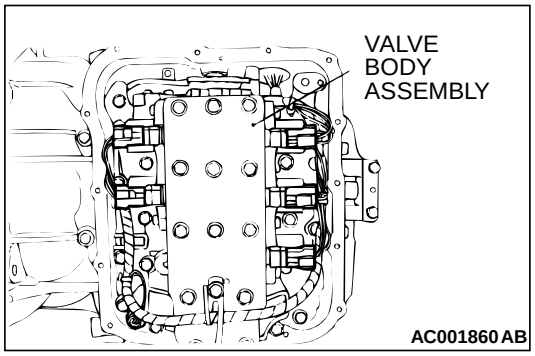
(1) Remove the valve body cover and valve body. Refer to P.23A-366, Transaxle Assembly and GROUP 23B, Transaxle P.23B-10.

(2) Blow 108 kPa (15 psi) compressed air into the underdrive clutch oil orifice of the transaxle case, and check if the underdrive clutch piston moves and air pressure is maintained in that condition.

Q: Is the air pressure maintained?

YES : Go to Step 6.

NO : Go to Step 5.



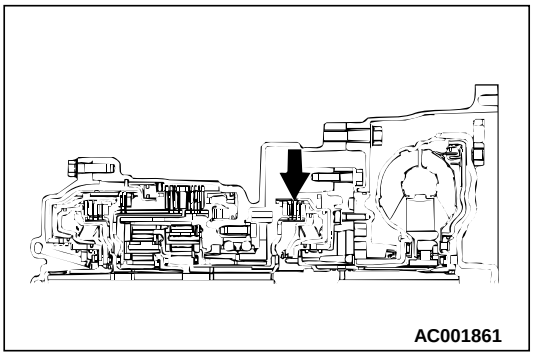
STEP 4. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.

NO : Replace the valve body assembly. Then check the symptom. If the symptom is not eliminated, go to Step 6.



STEP 5. Check the underdrive clutch.

(1) Remove the transaxle assembly.

(2) Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Underdrive Clutch and Input Shaft P.23B-57. Then check the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.

NO : Go to Step 6.

STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 3: Does not Move Backward

COMMENT
If the vehicle does not backward when the selector lever is shifted from "N" to "R" range while the engine is idling, the cause is probably abnormal pressure or a malfunction of the reverse clutch, low-reverse brake, or valve body.

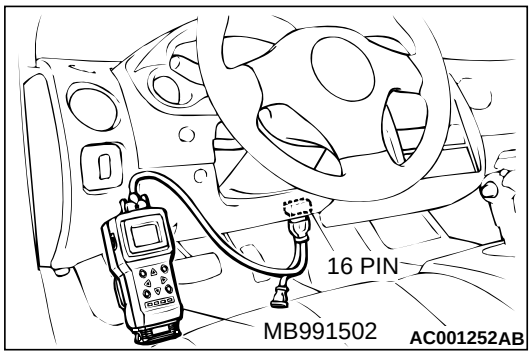
TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Abnormal reverse clutch pressure
- Abnormal low-reverse brake pressure
- Malfunction of the low-reverse solenoid valve
- Malfunction of the reverse clutch
- Malfunction of the low-reverse brake
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, carry out the actuator test item 01: Low-Reverse Solenoid Valve.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 01: Low-Reverse Solenoid Valve.
- An operation sound should be heard from solenoid valve when solenoid valve is operated.

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

Q: Is the solenoid valve operating properly?
YES : . Go to Step 2.
NO : . Repair or replace the low-reverse solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74. Then confirm that the symptom is eliminated.

STEP 2. Check the hydraulic pressure (for reverse clutch).
Measure the hydraulic pressure for reverse clutch when the selector lever is at the "R" range, and check if the hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?
YES : . Go to Step 3.
NO : . Go to Step 5.

STEP 3. Check the hydraulic pressure (for low-reverse brake).
Measure the hydraulic pressure for low-reverse brake when the selector lever is at the "R" range, and check if the hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?
YES : . Go to Step 4.
NO : . Go to Step 5.

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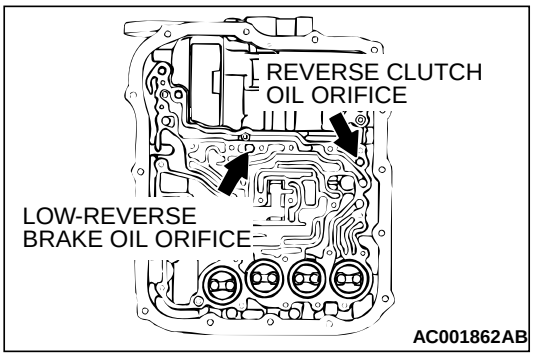
STEP 4. Check the reverse clutch system and low-reverse brake system.

(1) Remove the valve body cover and valve body. Refer to P.23A-366, Transaxle Assembly and GROUP 23B, Transaxle P.23B-10.

(2) Blow 108 kPa (15 psi) compressed air into the reverse clutch oil orifice of the transaxle case. Then check if the reverse clutch piston moves and air pressures are maintained in that condition. Repeat for the low-reverse brake.

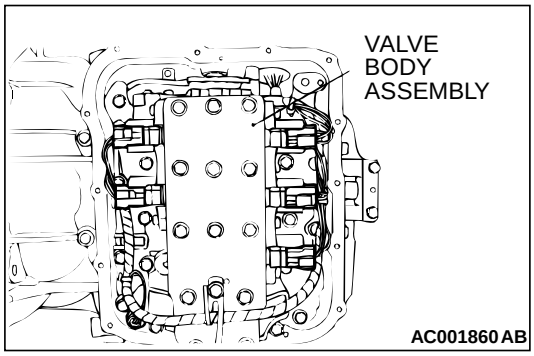


Q: Are the reverse clutch, low-reverse brake or both air pressures maintained?

YES : Go to Step 7.
NO : Go to Step 6.

STEP 5. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

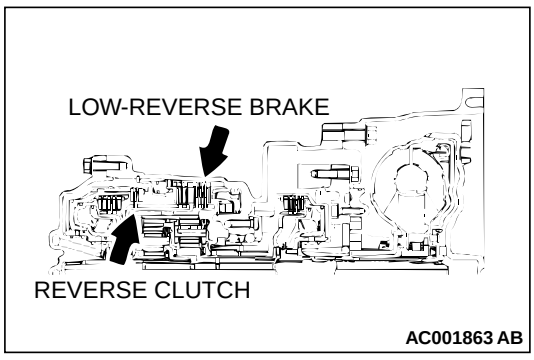


Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 7.

STEP 6. Check the reverse clutch, low-reverse brake or both. Remove the transaxle.

Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transaxle P.23B-10, Reverse and Overdrive Clutch P.23B-59. Then check the symptom.



Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 7.

STEP 7. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

TSB Revision

INSPECTION PROCEDURE 4: Does not Move (forward or backward)

COMMENT
If the vehicle does not move forward or backward when the selector lever is shifted to any position while the engine is idling, the cause is probably abnormal line pressure, or a malfunction of the power train, oil pump or valve body.

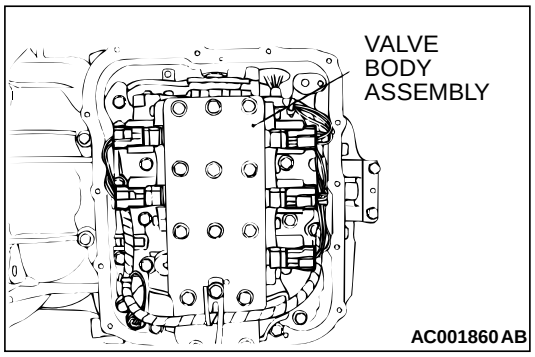
TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Abnormal line pressure
- Malfunction of the power train
- Malfunction of the oil pump
- Malfunction of the valve body
- Low A/T fluid level
- Malfunction of the PCM

DIAGNOSIS

STEP 1. Check the hydraulic pressure.
Measure the hydraulic pressure of each element when the transaxle is in 1st, 2nd or reverse. Check if each hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test. If some elements are within the standard value and some are not, recheck the symptom.

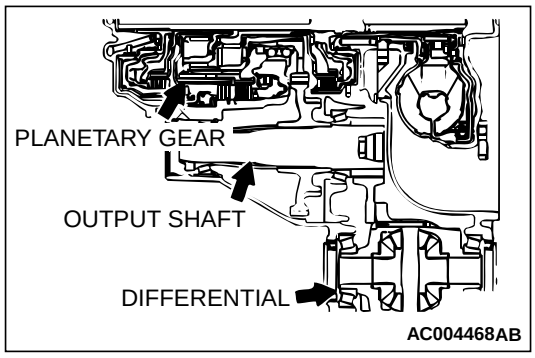
Q: Are all pressures within the standard value?
YES : Check A/T fluid level and condition. If not OK, repair or replace as necessary, then recheck symptom. If OK, go to Step 3.
NO : Go to Step 2.

STEP 2. Disassemble and clean the valve body.
Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

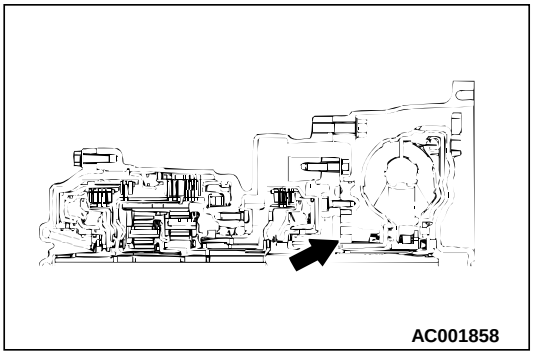


Q: Is the repair possible and the symptom eliminated?
YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. If the symptom is not eliminated, go to Step 4.

STEP 3. Check the transaxle power train components.
Disassemble the transaxle and check the planetary carrier and output shaft, etc. Repair or replace the damaged parts. Refer to GROUP 23B, Transaxle P.23B-10, Planetary Gear P.23B-64, Output Shaft P.23B-68, Differential P.23B-70. Then check the symptom.



Q: Is the symptom eliminated?
YES : Diagnosis is complete.
NO : Go to Step 5.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STEP 4. Replace the oil pump.
(1) Remove the transaxle.
(2) Replace the oil pump (Oil pump cannot be repaired). Refer to GROUP 23B, Transaxle P.23B-10. Then check the symptom.

Q: Is the symptom eliminated?
YES : Diagnosis is complete.
NO : Go to Step 5.

STEP 5. Replace the PCM.

Q: Is the symptom eliminated?
YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 5: Engine Stalls when Moving Selector Lever from "N" to "D" or "N" to "R"

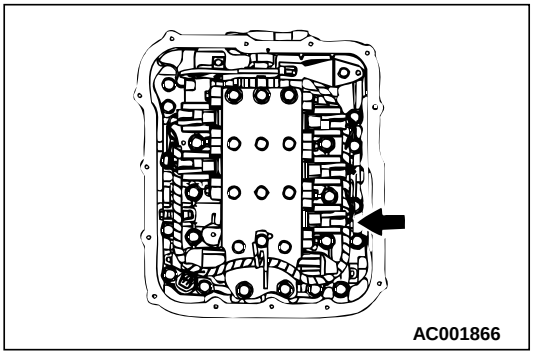
COMMENT
If the engine stalls when the selector lever is shifted from "N" to "D" or "R" range while the engine is idling, the cause is probably a malfunction of the engine system, torque converter clutch solenoid valve, valve body or torque converter (torque converter clutch malfunction).

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the engine system
- Malfunction of the torque converter clutch solenoid
- Malfunction of the valve body
- Malfunction of the torque converter (Malfunction of the torque converter clutch)
- Malfunction of the PCM

DIAGNOSIS

STEP 1. Check the engine system.
Refer to GROUP 13A <2.4L Engine>, Diagnosis – Trouble Symptom Chart – When the engine is hot, it stalls at idle P.13A-25 or GROUP 13B <3.0L Engine>, Diagnosis – Trouble Symptom Chart – When the engine is hot, it stalls at idle P.13B-26.

Q: Is the inspection result good?
YES : Go to Step 2.
NO : Repair or replace the engine components.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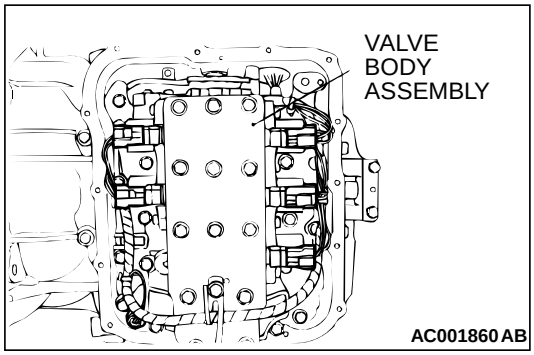
STEP 2. Replace the torque converter clutch solenoid valve.

Replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74. Then check the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 3.



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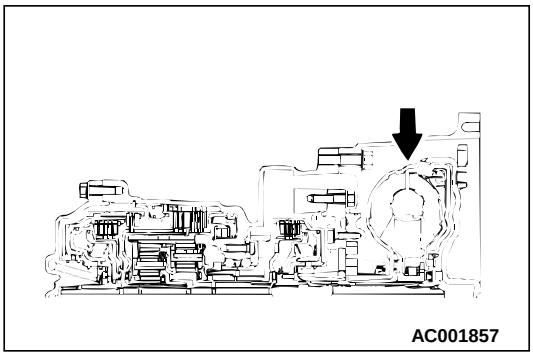
STEP 3. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. If the symptom is not eliminated, go to Step 4.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STEP 4. Replace the torque converter assembly.

(1) Remove the transaxle.
(2) Replace the torque converter assembly. Refer to GROUP 23B, Transaxle P.23B-10. Then check the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 5.

STEP 5. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 6: Shift Shock when Shifting from "N" to "D" and Long Delay

COMMENT
If abnormal shock or delay of two seconds or more occurs when the selector lever is shifted from "N" to "D" range while the engine is idling, the cause is probably abnormal underdrive clutch pressure or a malfunction of the underdrive clutch, valve body or throttle position sensor.

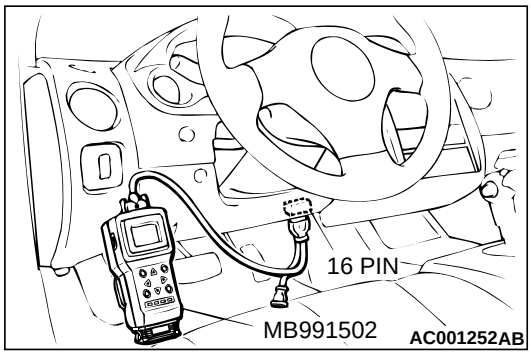
TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Abnormal underdrive clutch pressure
- Malfunction of the underdrive solenoid valve
- Malfunction of the underdrive clutch
- Malfunction of the valve body
- Malfunction of the throttle position sensor
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, carry out the actuator test item 02: Underdrive Solenoid Valve.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 02: Underdrive Solenoid Valve.
- An operation sound should be heard from solenoid valve when solenoid valve is operated.

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

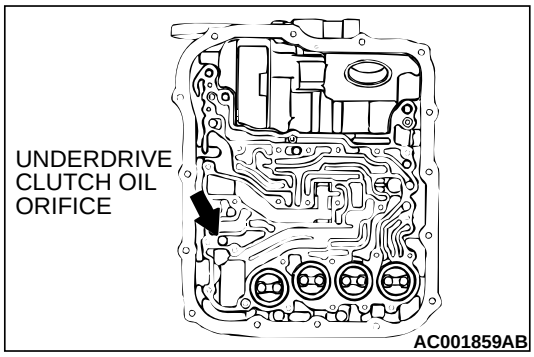
Q: Is the solenoid valve operating properly?
YES : Go to Step 2.
NO : Repair or replace the underdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74. Then confirm that the symptom is eliminated.

STEP 2. Check when shock occurs.

Q: When does the shock occur?
When engaging from N to D : Go to Step 3.
When the vehicle starts moving : Go to Step 6.

STEP 3. Check the hydraulic pressure (for underdrive clutch).
Measure the hydraulic pressure for underdrive clutch when the selector lever is shifted from "N" to "D" range. Check if the hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?
YES : Go to Step 4.
NO : Go to Step 8.



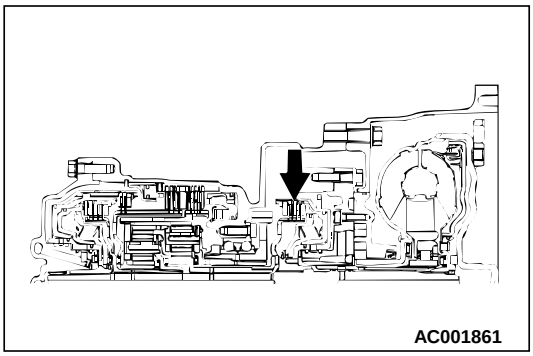
STEP 4. Check the underdrive clutch system.

(1) Remove the valve body cover and valve body. Refer to P.23A-366, Transaxle Assembly and GROUP 23B, Transaxle P.23B-10.

(2) Blow 108 kPa (15 psi) compressed air into the underdrive clutch oil orifice of the transaxle case, and check if the underdrive clutch piston moves and air pressure is maintained in that condition.

Q: Is the air pressure maintained?

YES : Go to Step 9.
NO : Go to Step 5.



STEP 5. Check the underdrive clutch.

(1) Remove the transaxle assembly.

(2) Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B P.23B-57, Underdrive Clutch and Input Shaft. Then check the symptom.

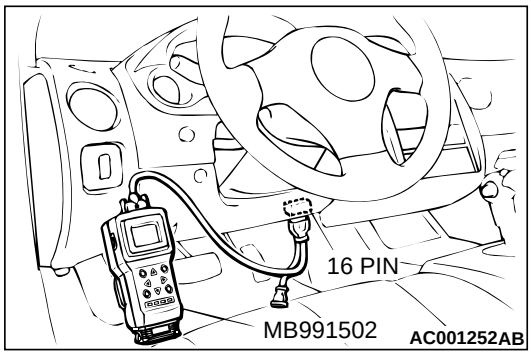
Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 9.

STEP 6. Check shock.

Q: Does shock occur sometimes?

YES : Go to Step 7.
NO : Go to Step 8.



STEP 7. Using scan tool MB991502, check data list item 11: Throttle position sensor.

⚠ CAUTION

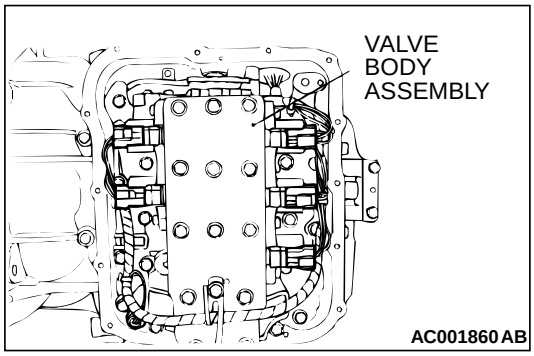
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in full-open position, voltage should be between 4,500 and 5,500 mV.

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

Q: Is the sensor operating properly?

YES : . Go to Step 8.
NO : . Check the throttle position sensor. Refer to P.23A-42, P.23A-51, P.23A-59, diagnostic trouble code number 11, 12, 14: Throttle Position Sensor System. Then check the symptom.



STEP 8. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. Go to Step 9.

STEP 9. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 7: Shift Shock when Shifting from "N" to "R" and Long Delay

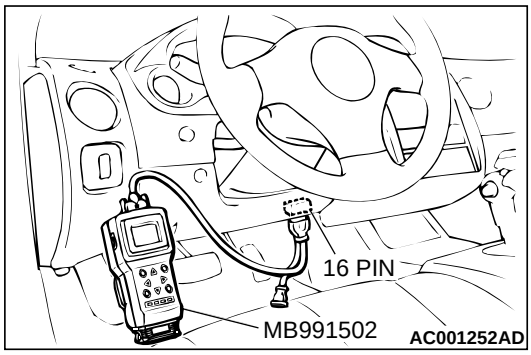
COMMENT

If abnormal shock or delay of two seconds or more occurs when the selector lever is shifted from "N" to "R" range while the engine is idling, the cause is probably abnormal reverse clutch pressure or low-reverse brake pressure, or a malfunction of the reverse clutch, low-reverse brake, valve body or throttle position sensor.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Abnormal reverse clutch pressure
- Abnormal low-reverse brake pressure
- Malfunction of the low-reverse solenoid valve
- Malfunction of the reverse clutch
- Malfunction of the low-reverse brake
- Malfunction of the valve body
- Malfunction of the throttle position sensor
- Malfunction of the PCM

TSB Revision



DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, carry out the actuator test item 01: Low-Reverse Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 01: Low-Reverse Solenoid Valve.
  - An operation sound should be heard from solenoid valve when solenoid valve is operated.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the low-reverse solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74. Then confirm that the symptom is eliminated.

STEP 2. Check when shock occurs.

Q: When does the shock occur?

When engaging from N to R : Go to Step 3.
When the vehicle starts moving : Go to Step 7.

STEP 3. Check the hydraulic pressure (for reverse clutch).

Measure the hydraulic pressure for reverse clutch when the selector lever is at the "R" range. Check if the hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 4.
NO : Go to Step 9.

STEP 4. Check the hydraulic pressure (for low-reverse brake).

Measure the hydraulic pressure for low-reverse brake when the selector lever is at the "R" range. Check if the hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

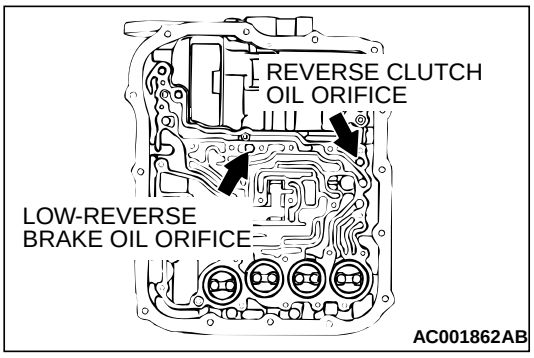
Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 5.
NO : Go to Step 9.

STEP 5. Check the reverse clutch system and low-reverse brake system.

(1) Remove the valve body cover and valve body. Refer to P.23A-366, Transaxle Assembly and GROUP 23B, Transaxle P.23B-10.

(2) Blow 108 kPa (15 psi) compressed air into the reverse clutch oil orifice of the transaxle case, and check if the reverse clutch piston moves and air pressures are maintained in that condition. Repeat for the low-reverse brake.



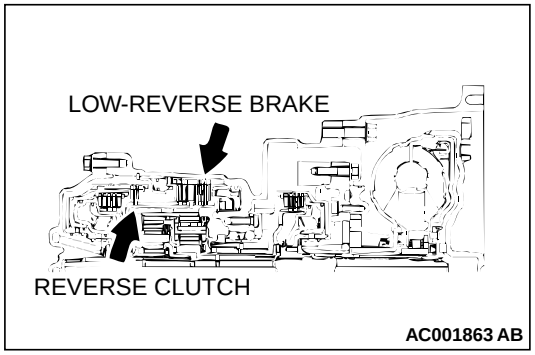
Q: Are both air pressures maintained?

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

STEP 6. Check the reverse clutch and low-reverse brake.

(1) Remove the transaxle assembly.

(2) Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transaxle P.23B-10, Reverse and Overdrive Clutch P.23B-59. Then check for the symptom.



Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 10.

STEP 7. Check shift shock.

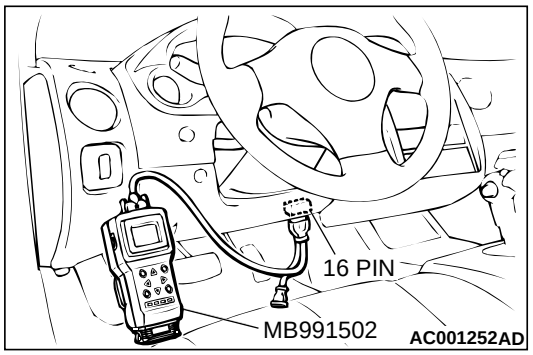
Q: Does shock occur sometimes?

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

STEP 8. Using scan tool MB991502, check data list item 11: Throttle position sensor.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



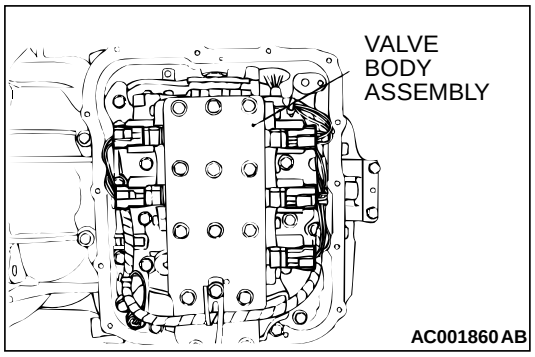
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in full-open position, voltage should be between 4,500 and 5,500 mV.

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

Q: Is the sensor operating properly?

YES : Go to Step 9.
NO : Check the throttle position sensor. Refer to P.23A-42, P.23A-51, P.23A-59, diagnostic trouble code number 11, 12, 14: Throttle Position Sensor System. Then check the symptom.

STEP 9. Disassemble and clean the valve body.



Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. Go to Step 10.

STEP 10. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 8: Shift Shock when Shifting from "N" to "D," "N" to "R" and Long Delay

COMMENT

If abnormal shock or delay of two seconds or more occurs when the selector lever is moved from "N" to "D" range and from "N" to "R" range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the oil pump or valve body.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Abnormal line pressure
- Malfunction of the oil pump
- Malfunction of the valve body
- Malfunction of the PCM

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DIAGNOSIS

STEP 1. Check the hydraulic pressure.

(1) Measure the hydraulic pressure of each element when the transaxle is in 1st, 2nd or reverse. Check if each hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

(2) If some elements are within the standard value and some are not, recheck the symptom.

Q: Are all hydraulic pressures within the standard value?

YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Adjust line pressure.

Adjust line pressure. Refer to P.23A-40, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 3.

STEP 3. Check when shock occurs.

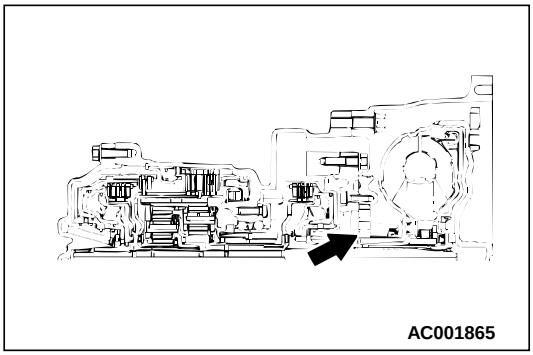
Q: When does the shock occur?

When engaging from N to D and N to R : Go to Step 4.
When the vehicle starts moving : Go to Step 5.

STEP 4. Replace the oil pump.

(1) Remove the transaxle.

(2) Replace the oil pump. (Oil pump cannot be repaired). Refer to GROUP 23B, Transaxle P.23B-10. Then check the symptom.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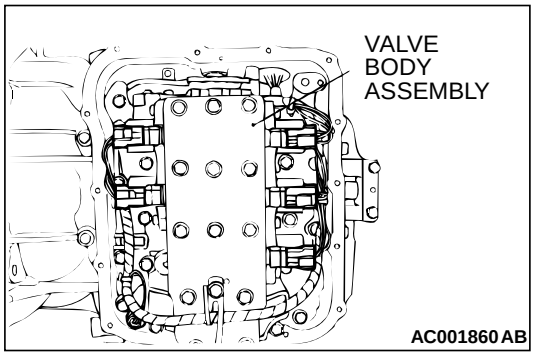
Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 6.

STEP 5. Disassemble and clean the valve body.

Check the installation bolts for looseness and the O-ring, valves and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.



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Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. Go to Step 6.

STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 9: Shift shock and slipping

COMMENT
If shift shock when driving are due to upshifting or downshifting and the transaxle speed become higher than the engine speed, the cause is probably abnormal line pressure or a malfunction of a solenoid valve, oil pump, valve body or of a brake or clutch.

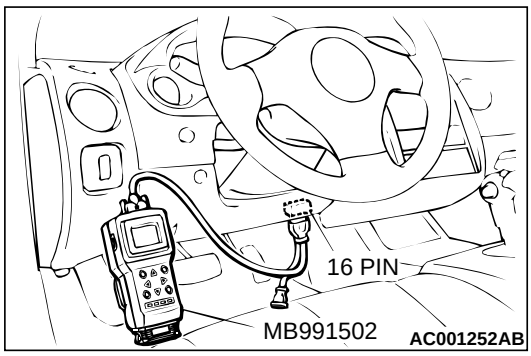
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)
- Abnormal line pressure
- Malfunction of each solenoid valve
- Malfunction of the oil pump
- Malfunction of the valve body
- Malfunction of each brake or each clutch
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, carry out the actuator test.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for following items.
   a. Item 01: Low-reverse solenoid valve
   b. Item 02: Underdrive solenoid valve
   c. Item 03: Second solenoid valve
   d. Item 04: Overdrive solenoid valve
      - An operation sound should be heard from solenoid valve when solenoid valve is operated.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are the solenoid valves operating properly?

YES : Go to Step 2.
NO : Repair or replace the solenoid valves. Refer to GROUP 23B, Valve Body P.23B-74. Then confirm that the symptom is eliminated.

STEP 2. Check the hydraulic pressure.

(1) Measure the hydraulic pressure of each element. Check if each hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.
(2) If some elements are within the standard value and some are not, recheck the symptom.

Q: Are all hydraulic pressures within the standard value?

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

STEP 3. Adjust the line pressure.

Adjust the line pressure. Refer to P.23A-40, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?

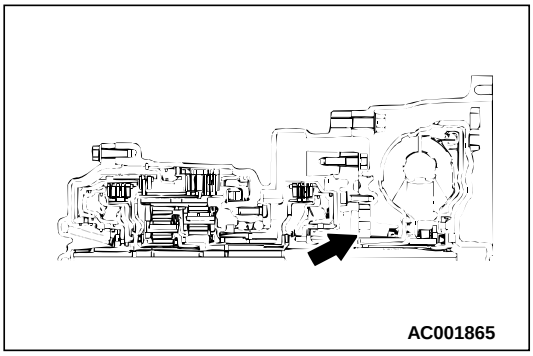
YES : Diagnosis is complete.
NO : Go to Step 4.

STEP 4. Replace the oil pump.

(1) Remove the transaxle.
(2) Replace the oil pump. (Oil pump can not be repaired). Refer to GROUP 23B, Transaxle P.23B-10. Then check the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 5.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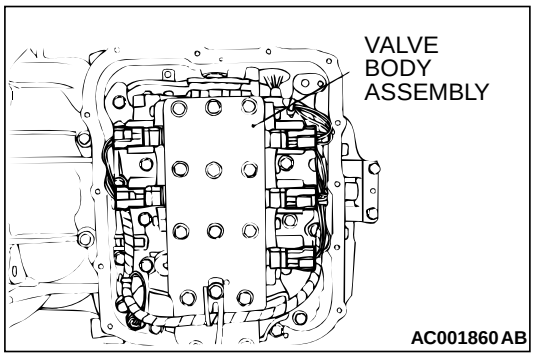
STEP 5. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. Go to Step 7.



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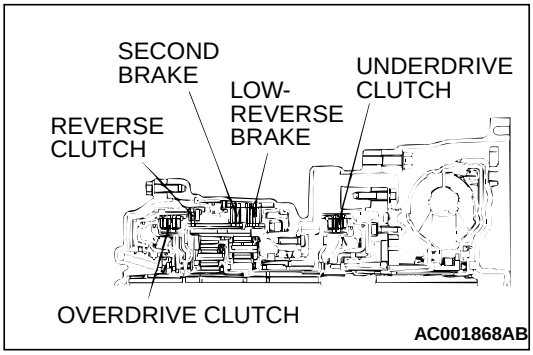


STEP 6. Check each brake and clutch.

(1) Remove the transaxle.
(2) Check the facing for seizure and piston seal ring for damage and interference with retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transaxle P.23B-10, Underdrive Clutch and Input Shaft P.23B-57, Reverse and Overdrive Clutch P.23B-59. Then check for the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 7.

STEP 7. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 10: Does not Shift Properly All Points (Early or Late Shift Points)

COMMENT

If all shift points are early or late while driving, the cause is probably a malfunction of the output shaft speed sensor, throttle position sensor or a solenoid valve.

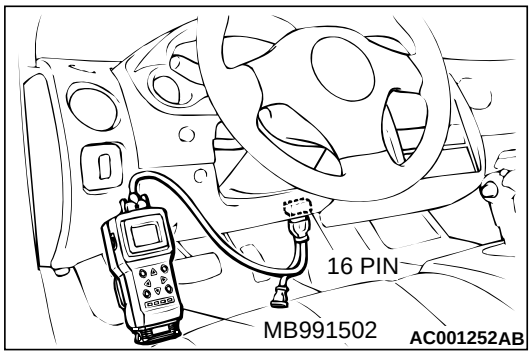
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the output shaft speed sensor
- Malfunction of the throttle position sensor
- Malfunction of each solenoid valve
- Abnormal line pressure
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check data list item 23: Output Shaft Speed Sensor.

⚠ CAUTION

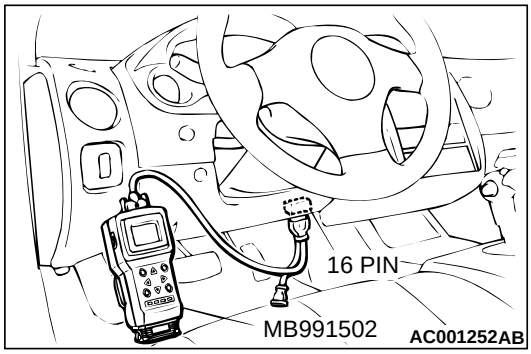
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 23: Output Shaft Speed Sensor.
- When driving at constant speed of 50km/h (31mph), the display should be 1,600 – 1,900 r/min <2.4L Engine>, 1,300 – 1,600 r/min <3.0L Engine>. (Gear range: 3rd gear)

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

Q: Is the sensor operating properly?

YES : Go to Step 2.
NO : Refer to P.23A-115, diagnostic trouble code number 23: Output shaft speed sensor system.



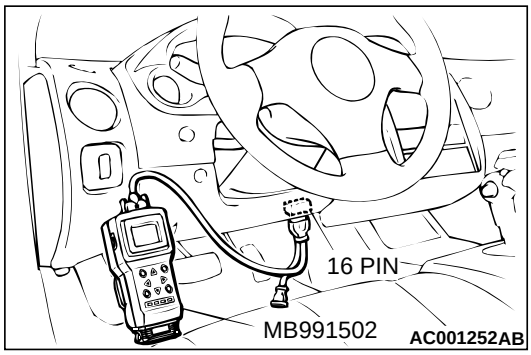
STEP 2. Using scan tool MB991502, check data list item 11: Throttle position sensor.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 11: Throttle Position Sensor.
- With the throttle valve in idle position, voltage should be between 535 and 735 mV.
- With the throttle valve in full-open position, voltage should be between 4,500 and 5,500 mV.

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

Q: Is the sensor operating properly?

YES : Go to Step 3.
NO : Check the throttle position sensor. Refer to P.23A-42, P.23A-51, P.23A-59, diagnostic trouble code number 11, 12, 14: Throttle Position Sensor System. Then check the malfunction.



STEP 3. Using scan tool MB991502, check data list.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for following items.
  a. Item 31: Low-Reverse Solenoid Valve Duty Percent
  b. Item 32: Underdrive Solenoid Valve Duty Percent
  c. Item 33: Second Solenoid Valve Duty Percent
  d. Item 34: Overdrive Solenoid Valve Duty Percent
    - Check that the values shown below are displayed when each data list item is entered.

DRIVING CONDITION	DATA LIST ITEM			
	31	32	33	34
Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	0%	0%	100%	100%
Driving at constant speed of 30 km/h (19 mph) in 2nd gear	100%	0%	0%	100%
Driving at constant speed of 50 km/h (31 mph) in 3rd gear	100%	0%	100%	0%
Driving at constant speed of 50 km/h (31 mph) in 4th gear	100%	100%	0%	0%

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

Q: Are the solenoid valves operating properly?

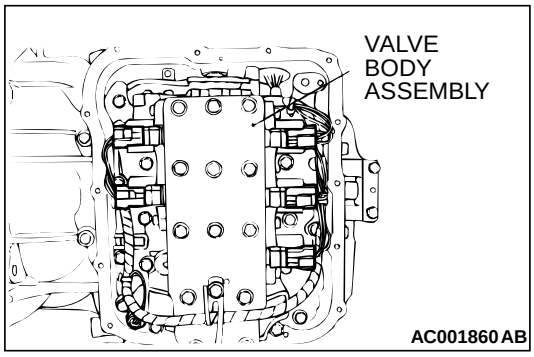
YES : Go to Step 4.
NO : Go to Step 6.

STEP 4. Adjust the line pressure.

Adjust the line pressure. Refer to P.23A-40, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 5.

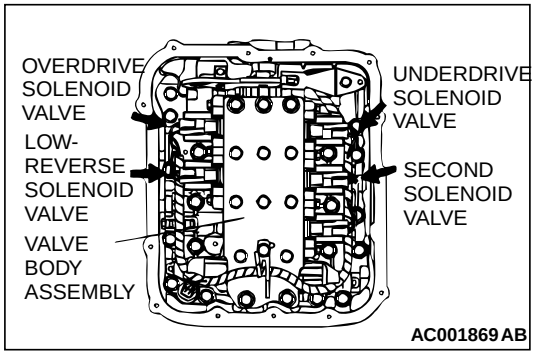


STEP 5. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. Go to Step 7.



STEP 6. Replace each solenoid valve.

Replace the faulty solenoid valve with a new one.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 7.

STEP 7. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 11: Does not Shift Properly Some Points (Early or Late Shift Points)

COMMENT

If some of the shift points are early or late when driving, the cause is probably a malfunction of the valve body, or it is due to the characteristics of the INVECS-II system but is not an abnormality.

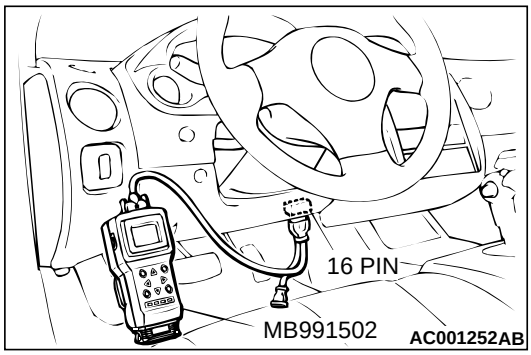
TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, carry out the actuator test item 14: INVECS-II Cancel Command.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to actuator test mode for item14: INVECS-II Cancel Command.
- Drive the vehicle and confirm the gear shifting correspond to the standard shift line of the shift pattern diagram. Refer to P.23A-3.

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

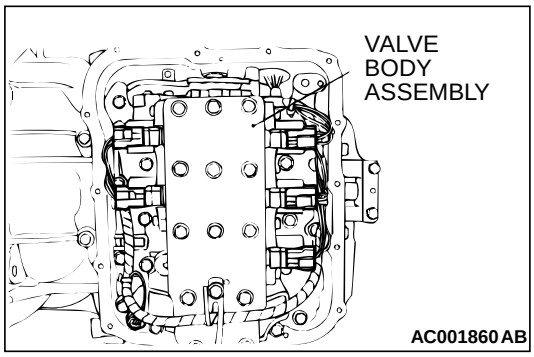
Q: Does the gear shifting correspond to the standard shift line of the shift pattern diagram?

YES : The symptom is due to characteristics of the INVECS-II system, but is not abnormal.
NO : Go to Step 2.

STEP 2. Check the shift points.

Q: Are the shift points early or late only when A/T fluid is -29°C (84°F) or less (early), or 125°C (257°F) or more (late)?

YES : The symptom is due to characteristics of the INVECS-II system, but is not abnormal.
NO : Go to Step 3.



STEP 3. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. Go to Step 4.

STEP 4. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

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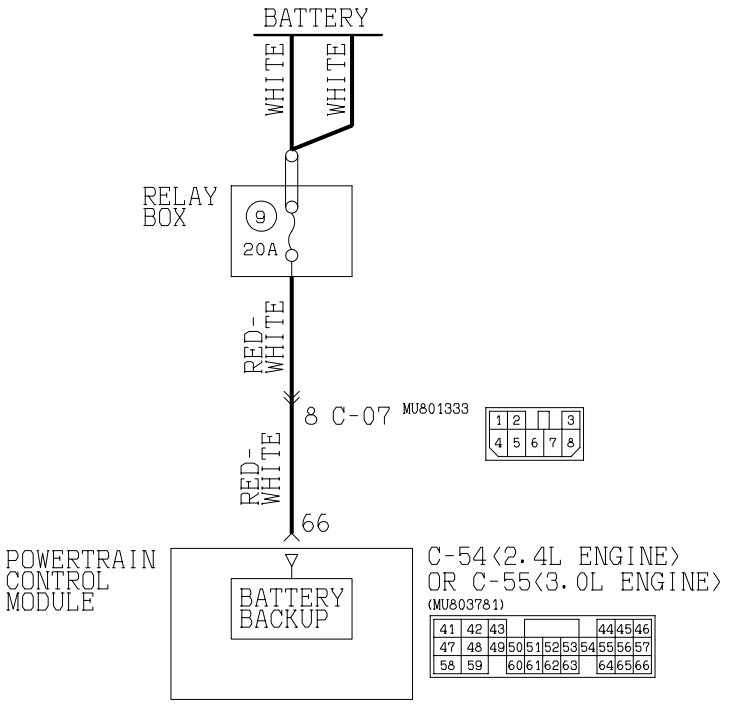
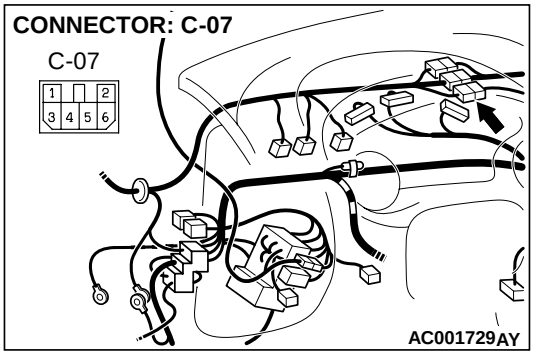
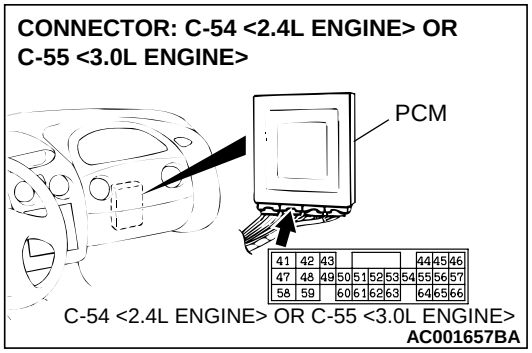
INSPECTION PROCEDURE 12: No Diagnostic Trouble Codes (Does not Shift)

Backup Power Supply System Circuit







CIRCUIT OPERATION
PCM (terminal number 66) receives battery positive voltage from the battery.

COMMENT
If shifting does not occur while driving and no diagnostic trouble codes are output, a malfunction of the Park/Neutral position switch, or PCM may exist.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of Park/Neutral position switch
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

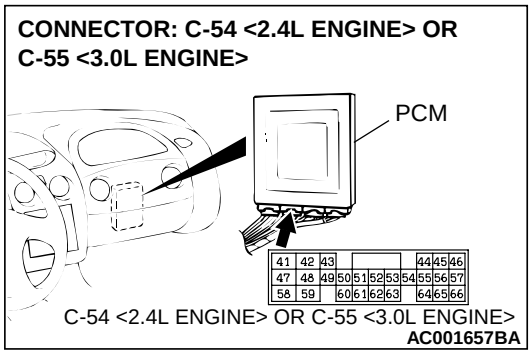
STEP 1. Check the vehicle acceleration.

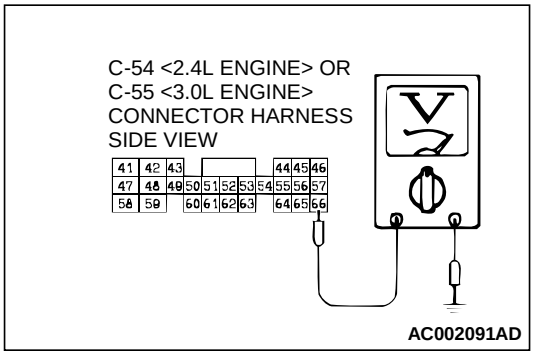
Q: Does the vehicle accelerate poorly (transaxle stays in 3rd gear) when starting from a stop with the selector lever in "D" range?

YES : Go to Step 2.
NO : Go to Step 5.

STEP 2. Check the backup power supply voltage at PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-54 <2.4L Engine> or C-55 <3.0L Engine>.





(2) Measure the voltage between terminal 66 and ground by backprobing.
- Voltage should be battery positive voltage.

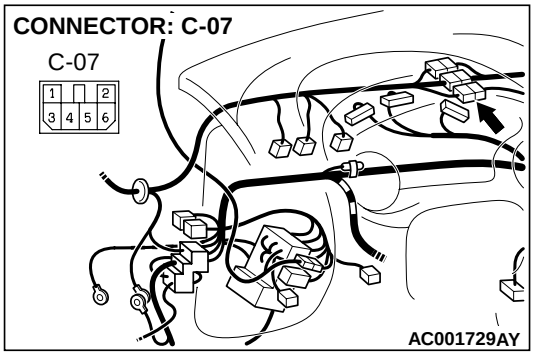
Q: Is the voltage normal?

YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check connector C-07 at intermediate connector for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between PCM connector C-54 <2.4L Engine> or C-55 <3.0L Engine> terminal 66 and battery.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

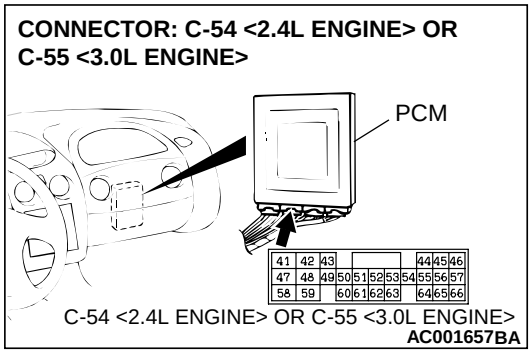


STEP 4. Check connector C-54 <2.4L Engine> or C-55 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then check for the symptom.



STEP 5. Using scan tool MB991502, check data list item 61: Park/Neutral Position Switch.

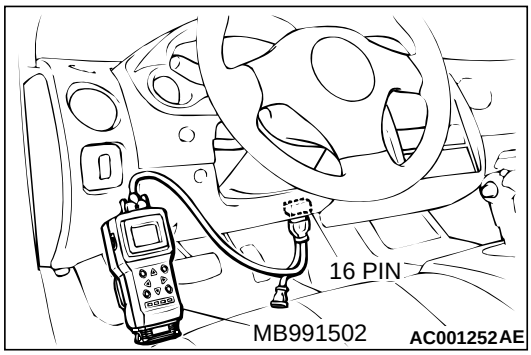
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 61: Park/Neutral Position Switch.
- Move the selector lever to "P," "R," "N," "D," "3," "2," "L" and sport mode positions to confirm whether the scan tool.

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

Q: Is the switch operating properly?

YES : Go to Step 6.

NO : Refer to P.23A-136, P.23A-166, diagnostic trouble code number 27, 28: Park/Neutral position switch system.



STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 13: Poor Acceleration

COMMENT

If acceleration is poor when downshifting occurs while driving, a malfunction of the engine system or a brake or clutch may exist.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the engine system
- Malfunction of the clutch system and brake system
- Malfunction of the PCM

DIAGNOSIS

STEP 1. Check the engine system.

(1) Refer to GROUP 13A <2.4L Engine>, Diagnosis – Symptom Chart – Poor acceleration P.13A-25, or GROUP 13B <3.0L Engine>, Diagnosis – Symptom Chart – Poor acceleration P.13B-26.

Q: Is the inspection result good?

YES : Go to Step 2.
NO : Repair or replace the engine component(s).

STEP 2. Check each brake and clutch.

Perform the torque converter stall test. Refer to P.23A-25, Torque Converter Stall Test. Then check for the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 3.

STEP 3. Perform the hydraulic pressure test.

Perform the hydraulic pressure test. Refer to P.23A-26, Hydraulic Pressure Test. Then check for the symptom.

Q: Is the symptom eliminated?

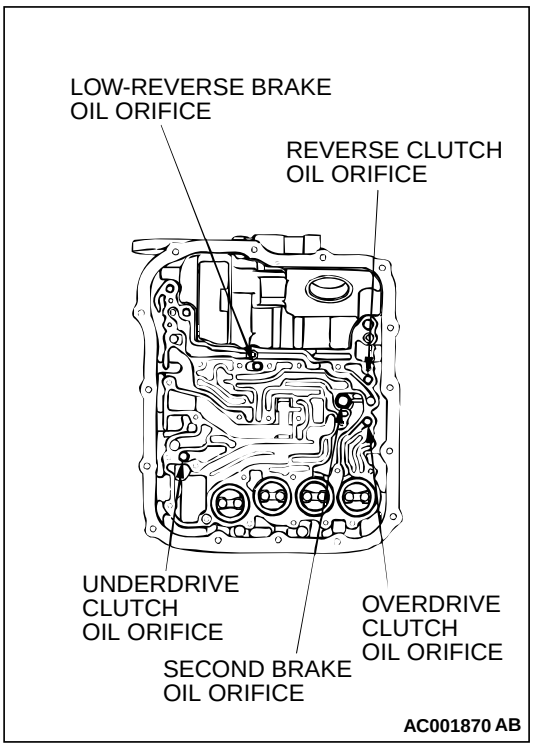
YES : Diagnosis is complete.
NO : Go to Step 4.

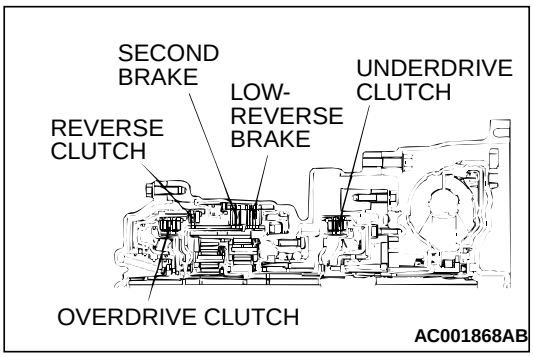
STEP 4. Check each brake system and clutch system.

(1) Remove the valve body cover and valve body. Refer to GROUP 23B, Transaxle P.23B-10.
(2) Blow 108 kPa (15 psi) compressed air into the each brake oil orifice and clutch oil orifice of the transaxle case, and check if each brake and clutch piston move and air pressure is maintained.

Q: Is the air pressure maintained?

YES : Diagnosis is complete.
NO : Go to Step 5.





STEP 5. Check each brake system and clutch system.

(1) Remove the transaxle.
(2) Check the facings for seizure and piston seal ring for damage and interference with retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transaxle P.23B-10, Underdrive Clutch and Input Shaft P.23B-57, Reverse and Overdrive Clutch P.23B-59. Then check for the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 6.

STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 14: Vibration

COMMENT

If vibration occurs when driving at constant speed or when accelerating in 4th gear, abnormal torque converter clutch pressure or a malfunction of the engine system, torque converter clutch solenoid, torque converter or valve body may exist.

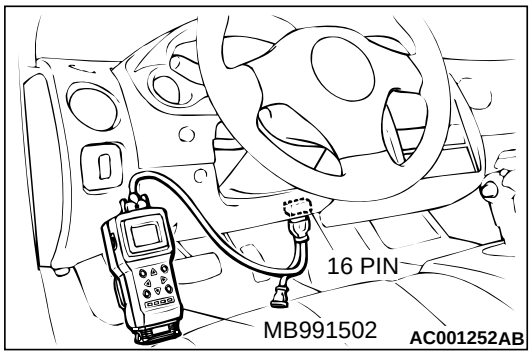
TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Abnormal torque converter clutch pressure
- Malfunction of the engine system
- Malfunction of the torque converter clutch solenoid
- Malfunction of the torque converter
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, carry out the actuator test item 06: Torque Converter Clutch Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to actuator test mode for item 06: Torque Converter Clutch Solenoid Valve.
- An operation sound should be heard from solenoid valve when the torque converter clutch solenoid valve is operated.

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

Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-74. Then confirm that the symptom is eliminated.

STEP 2. Check the vibration.

Q: Does the vibration occur when the transmission fluid temperature sensor connector has been disconnected?

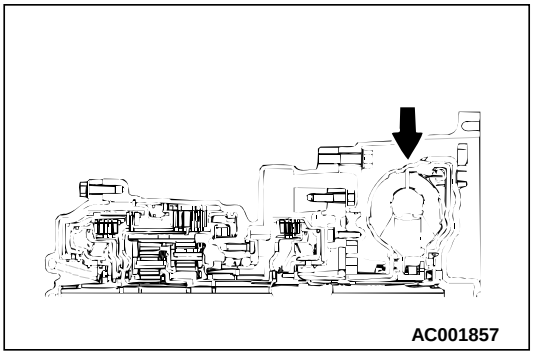
YES : Check the engine system. Refer to GROUP 13A <2.4L Engine>, Diagnosis – Symptom Chart – Driving P.13A-25, or GROUP 13B <3.0L Engine>, Diagnosis – Symptom Chart – Driving P.13B-26. If the inspection result is not good, diagnose, repair, and/or replace the engine component(s).
NO : Go to Step 3.

STEP 3. Check the torque converter hydraulic pressure.

Measure the torque converter hydraulic pressure. Then check if the torque converter hydraulic pressure is within the standard value. Refer to P.23A-26, Hydraulic Pressure Test.

Q: Is the torque converter hydraulic pressure within the standard value?

YES : Go to Step 4.
NO : Go to Step 5.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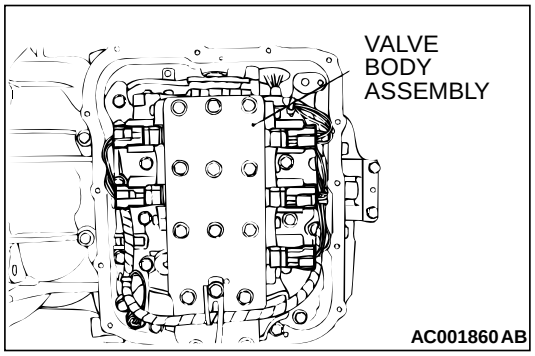
STEP 4. Replace the torque converter assembly.

(1) Remove the transaxle.
(2) Replace the torque converter assembly. Refer to GROUP 23B, Transaxle P.23B-10. Then check the symptom.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Go to Step 6.



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STEP 5. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-74.

Q: Is the repair possible and the symptom eliminated?

YES : Diagnosis is complete.
NO : Replace the valve body assembly. Then check the symptom. Go to Step 6.

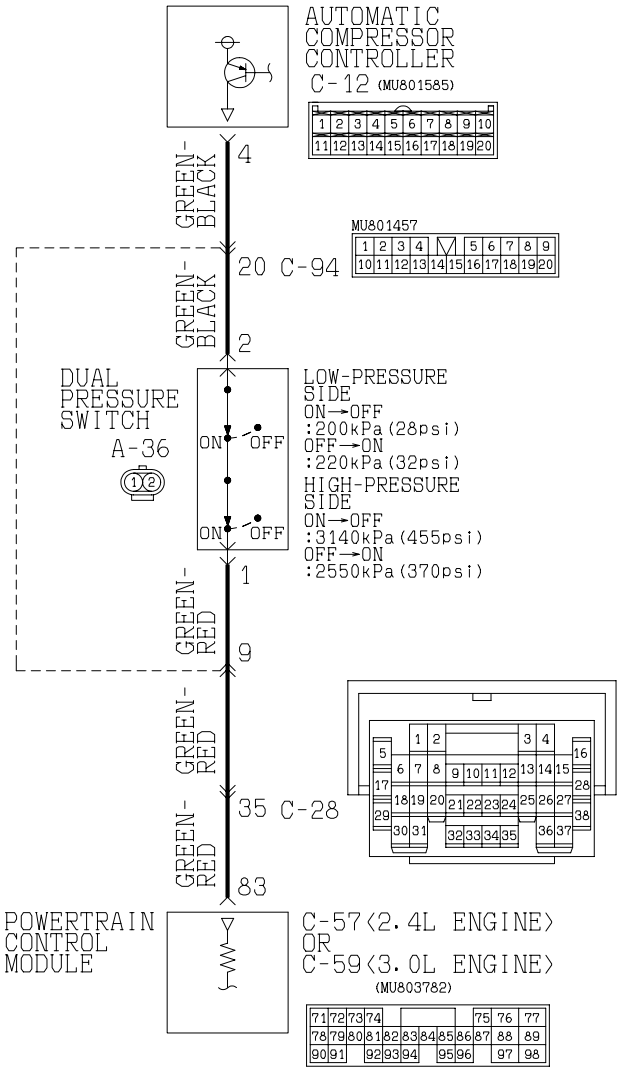
STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : Diagnosis is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 15: Vehicle Shifts Differently with A/C Engaged

Dual Pressure Switch System Circuit



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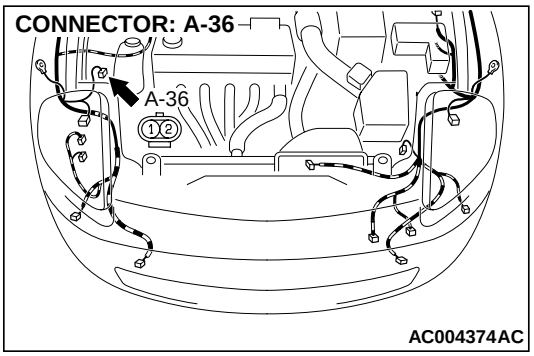

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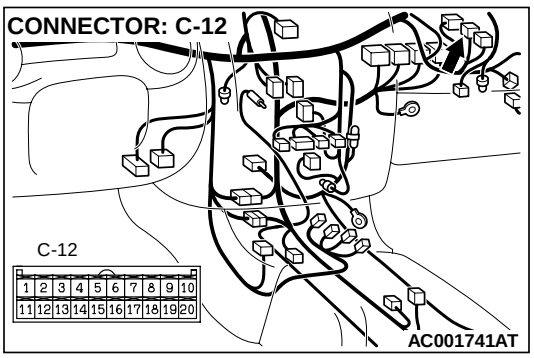

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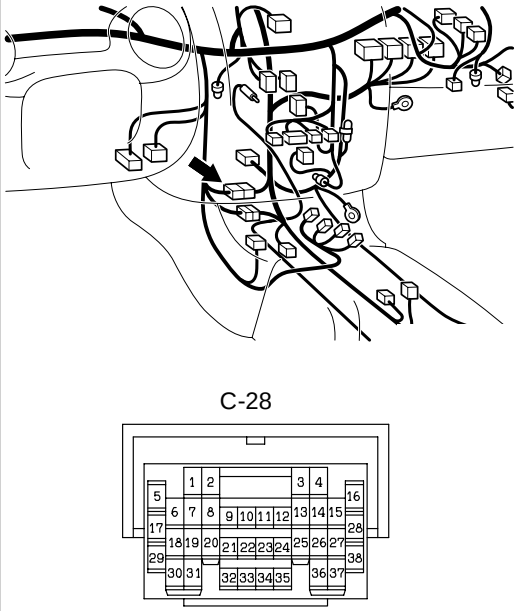
TSB Revision

CONNECTOR: C-28



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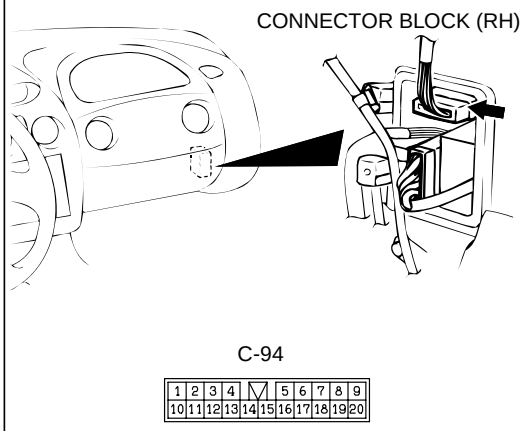
CONNECTOR: C-94



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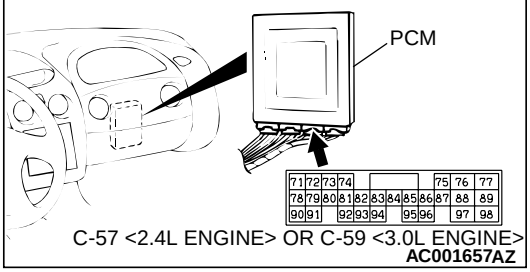
CONNECTOR: C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>



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CIRCUIT OPERATION

- When the A/C is turned ON and the dual pressure switch is closed, PCM (terminal number 83) receives battery voltage and then determines the A/C compressor has been signaled to engage.
- When the A/C compressor is engaged, the PCM increases line pressure and briefly delays shift points to compensate for the additional engine load.

COMMENT

The cause is probably a faulty dual pressure switch circuit or a defective PCM.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the dual pressure switch
- Damaged harness, connector
- Malfunction of A/C system
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

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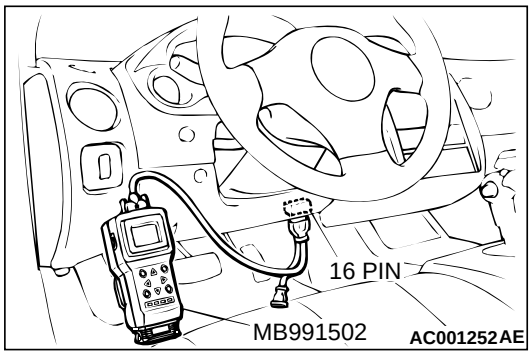


STEP 1. Using scan tool MB991502, check data list item 65: Dual Pressure Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

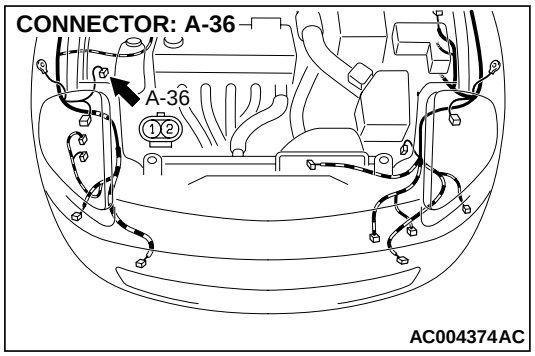
(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine and run at idle.
(3) Set scan tool MB991502 to data reading mode for item 65: Dual Pressure Switch.
- When the A/C is in operation, the scan tool display should be "ON."
- When the A/C is not in operation, the scan tool display should be "OFF."

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

Q: Is the switch operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.

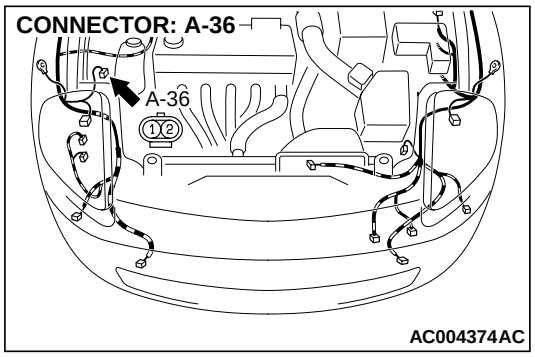


STEP 2. Check connector A-36 at dual pressure switch for damage.

Q: Is the connector in good condition?

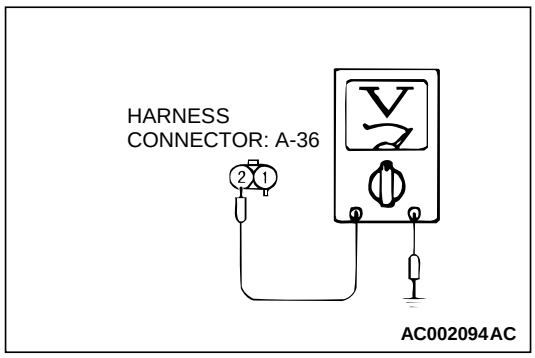
YES : Go to Step 3.

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



STEP 3. Check the power supply voltage at dual pressure switch connector A-36.

(1) Disconnect the connector A-36 and measure at the harness side.
(2) Start the engine and run at idle.

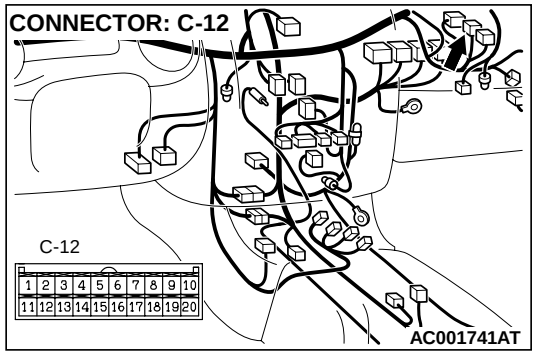


(3) Measure the voltage between terminal 2 and ground.
- Voltage should be battery positive voltage.

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

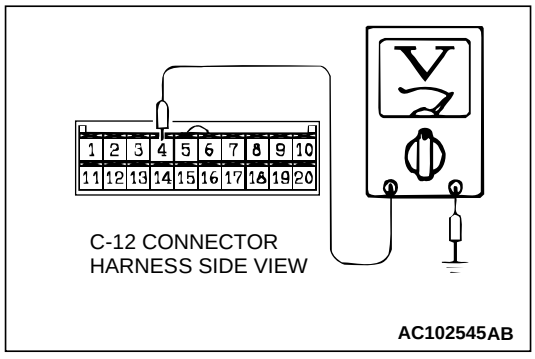
Q: Is the voltage normal?

YES : Go to Step 9.
NO : Go to Step 4.



STEP 4. Check the power supply voltage at automatic compressor controller connector C-12 by backprobing.

(1) Do not disconnect connector C-12.
(2) Start the engine and run at idle.
(3) Operate the A/C.

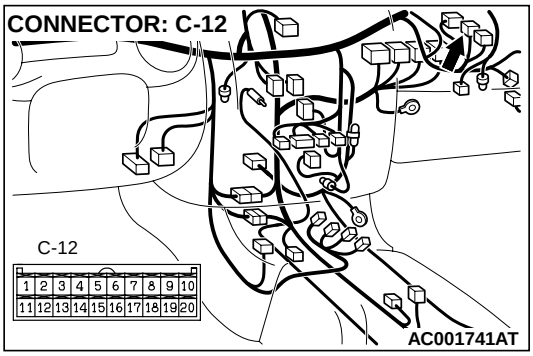


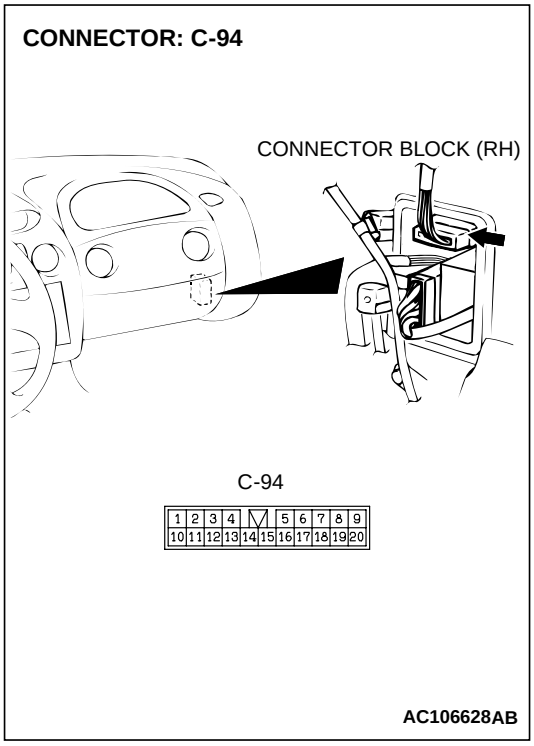
(4) Measure the voltage between terminal 4 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 8.
NO : Go to Step 5.

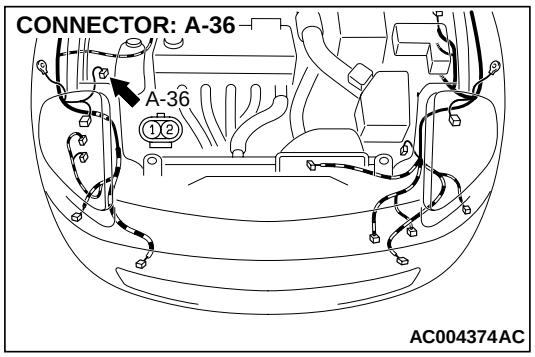


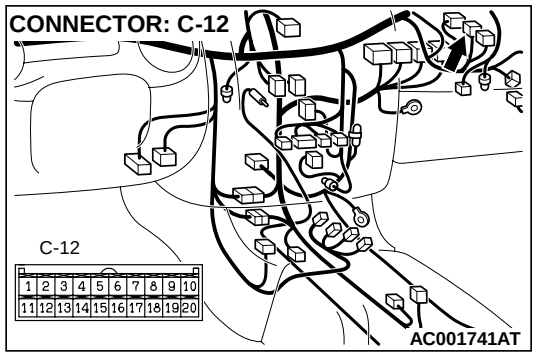


STEP 5. Check connectors C-12 at automatic compressor controller and C-94 at intermediate connector for damage.
Q: Are the connectors in good condition?

YES : Go to Step 6.
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 6. Check harness for short circuit to ground between dual pressure switch connector A-36 terminal 1 and automatic compressor controller connector C-12 terminal 4.





Q: Is the harness wire in good condition?

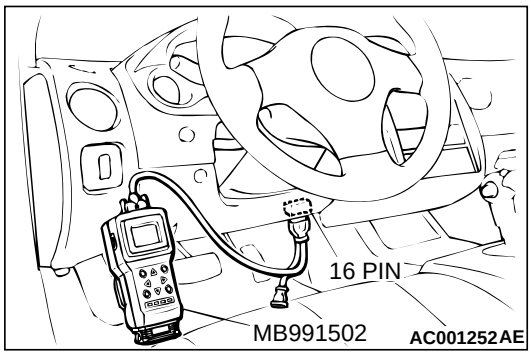
YES : Go to Step 7.

NO : Repair it.

STEP 7. Using scan tool MB991502, check data list item 65: Dual Pressure Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



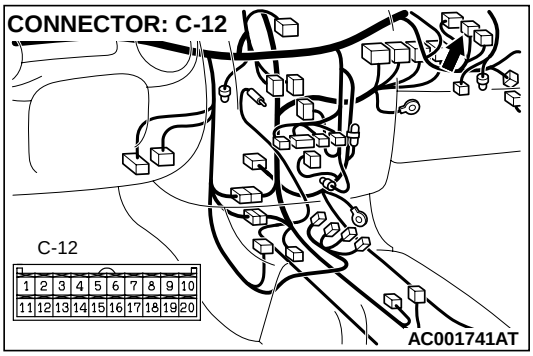
(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine and run at idle.
(3) Set scan tool MB991502 to data reading mode for item65: Dual Pressure Switch.
- When the A/C is in operation, the scan tool display should be "ON."
- When the A/C is not in operation, the scan tool display should be "OFF."

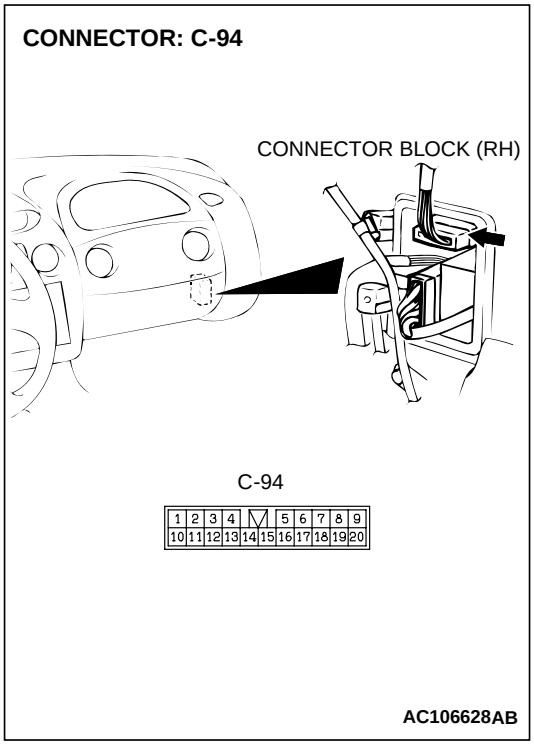
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Check the air conditioning system. Refer to GROUP 55A, Troubleshooting Strategy P.55-5.





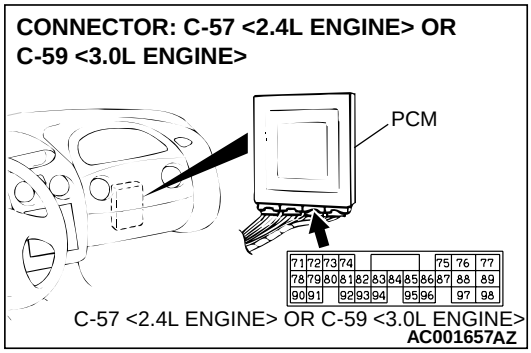
STEP 8. Check connectors C-12 at automatic compressor controller and C-94 at intermediate connector for damage.
Q: Are the connectors in good condition?

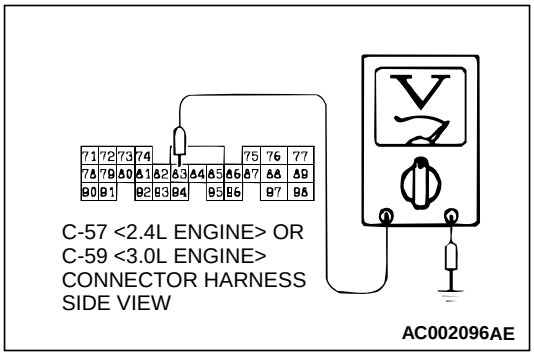
YES : Repair harness open circuit between automatic compressor controller connector C-12 terminal 4 and dual pressure switch connector A-36 terminal 1.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 9. Check the switch output voltage at PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-41.
(2) Start the engine and run at idle.
(3) Operate the A/C.





(4) Measure the voltage between terminal 83 and ground by backprobing.
- When the A/C is in operation, the voltage should be battery positive voltage.
- When the A/C is not in operation, the voltage should be 0.5 volt or less.

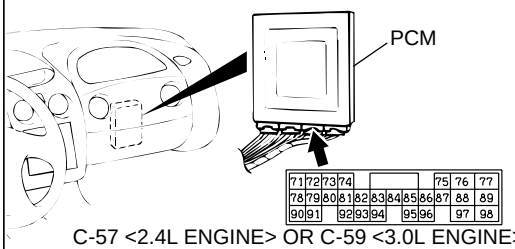
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 14.
NO : Go to Step 10.

STEP 10. Check connectors C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM, C-28 and C-94 at intermediate connector for damage.

CONNECTOR: C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>



C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>

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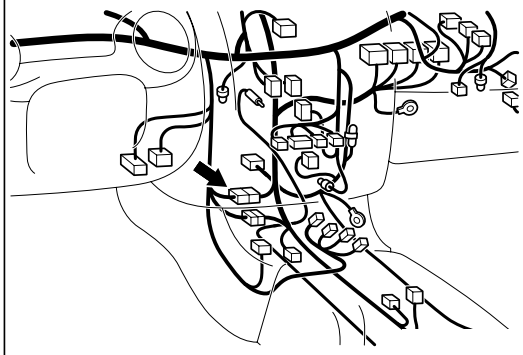
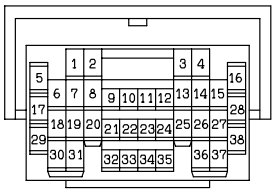
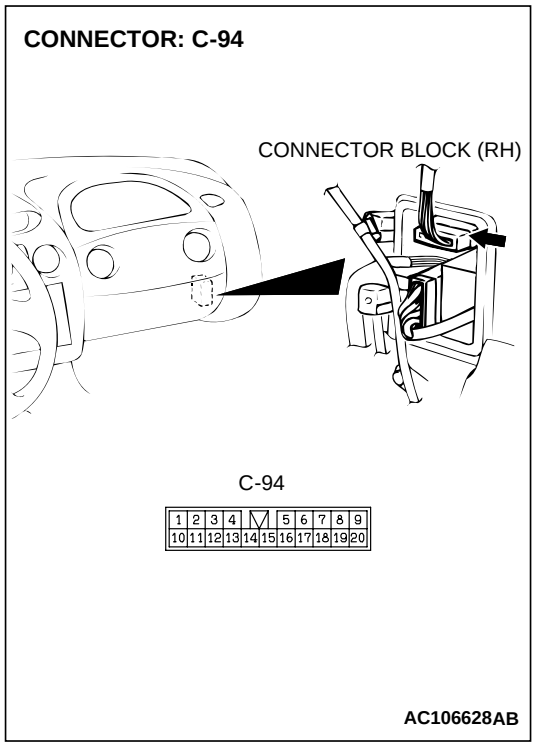
CONNECTOR: C-28



C-28



AC106611AB



Q: Are the connectors in good condition?

YES : Go to Step 11.

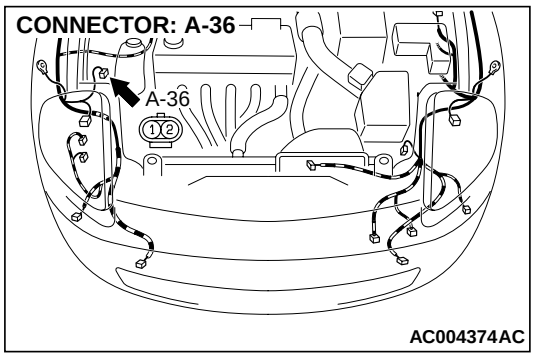
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

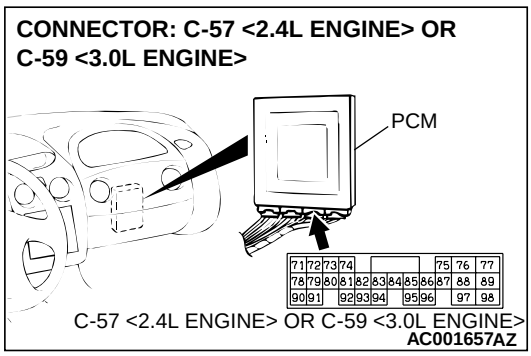
STEP 11. Check harness for short circuit to ground or open circuit between dual pressure switch connector A-36 terminal 2 and PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 83.

Q: Is the harness wire in good condition?

YES : Go to Step 12.

NO : Repair it.





STEP 12. Check the dual pressure switch.
Refer to GROUP 55A, Dual Pressure Switch Check P.55-25.

Q: Is the switch operating properly?

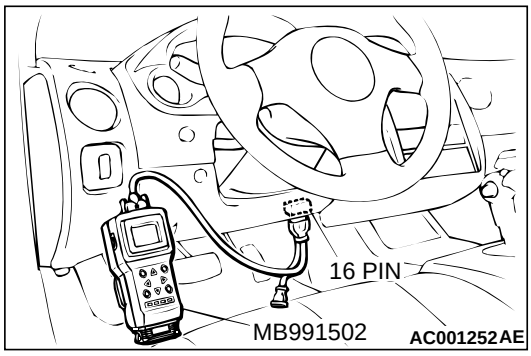
YES : Go to Step 13.
NO : Replace the dual pressure switch. Refer to GROUP 55A, Refrigerant Line P.55-52.

STEP 13. Using scan tool MB991502, check data list item 65: Dual Pressure Switch.

⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine and run at idle.
(3) Set scan tool MB991502 to data reading mode for item65: Dual Pressure Switch.
- When the A/C is in operation, the scan tool display should be "ON."
- When the A/C is not in operation, the scan tool display should be "OFF."

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



Q: Is the switch operating properly?

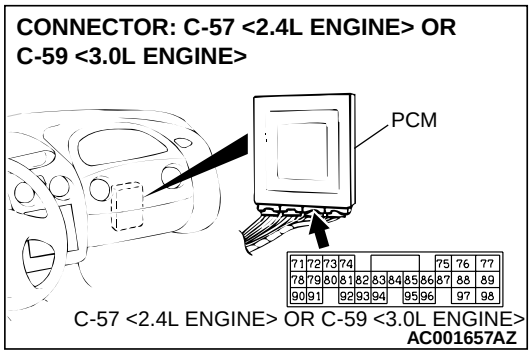
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Replace the PCM.

STEP 14. Check connector C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

Q: Is the connector in good condition?

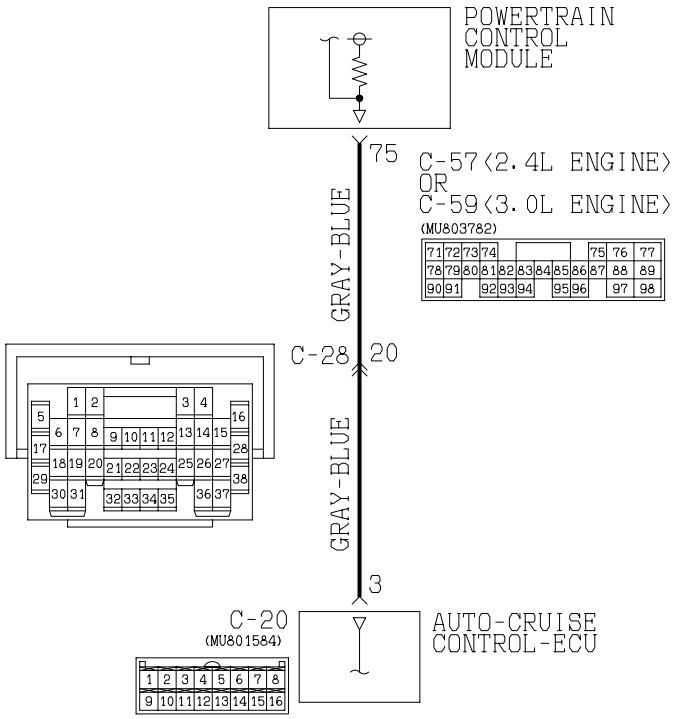
YES : Go to Step 13.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>



INSPECTION PROCEDURE 16: Transaxle won't Downshift under Load with Auto-cruise Engaged.

Auto-cruise Signal Line System Circuit



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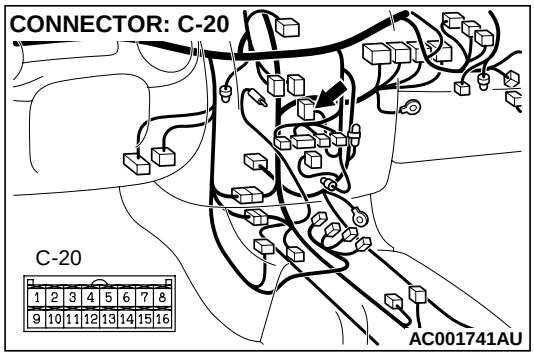

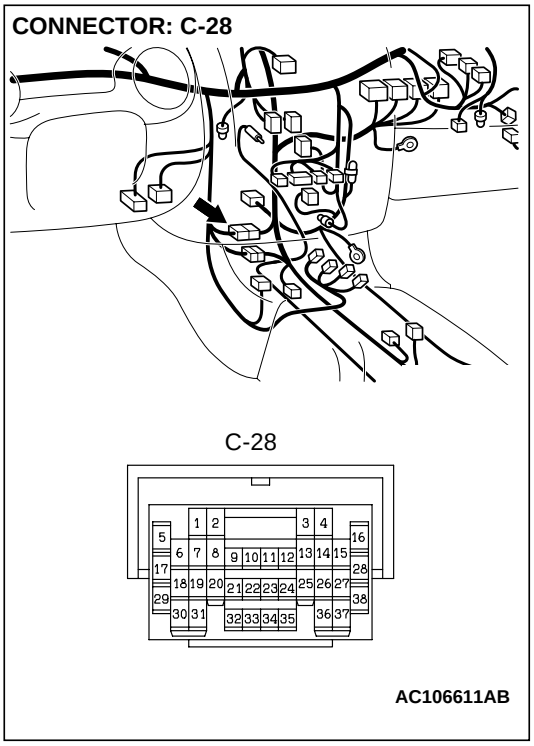

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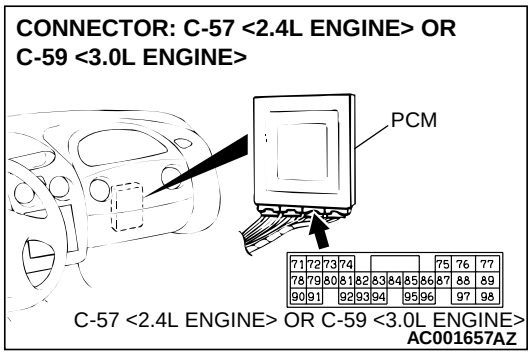


CIRCUIT OPERATION

When the battery positive voltage from PCM (terminal number 75) is grounded at auto-cruise control-ECU (terminal number 3), the auto-cruise control-ECU emits an overdrive cancel signal. When a malfunction of the auto-cruise control circuit occurs, the transaxle may downshift harshly with the auto-cruise control engaged.

COMMENT

A malfunction may be present on the auto-cruise signal line circuit, auto-cruise control ECU or the PCM.

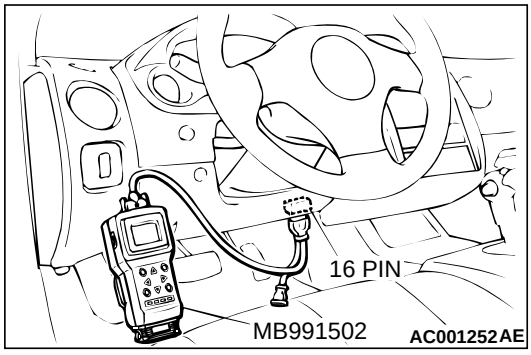
TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Damaged harness, connector
- Malfunction of the PCM
- Malfunction of the auto-cruise control ECU

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check data list item 66: Overdrive Off Signal (Auto-cruise ECM Signal).

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine and prepare to test drive the vehicle. (Operate the auto-cruise)
(3) Set scan tool MB991502 to data reading mode for item 66: Overdrive Off Signal (Auto-cruise ECM Signal).
  - When driving at level road, the display should be "OFF."
  - When driving at uphill road, the display should be "ON."
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : This malfunction can be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 2.

STEP 2. Check the auto-cruise system.

Check the auto-cruise system. Refer to GROUP 17, Auto-cruise Control System Diagnostic Troubleshooting Strategy P.17-8.

Q: Is the auto-cruise system operating properly?

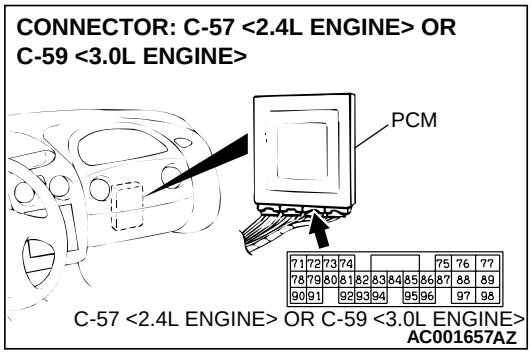
YES : Go to Step 3.

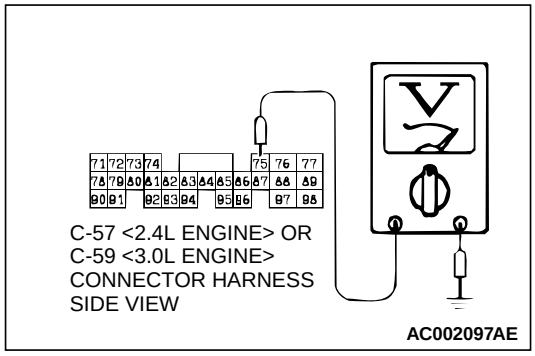
NO : Repair it, then check the symptom.

STEP 3. Check the signal voltage at PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-57 <2.4L Engine> or C-59 <3.0L Engine>.

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





(3) Measure the voltage between terminal 75 and ground by backprobing.
- Voltage should be battery positive voltage.

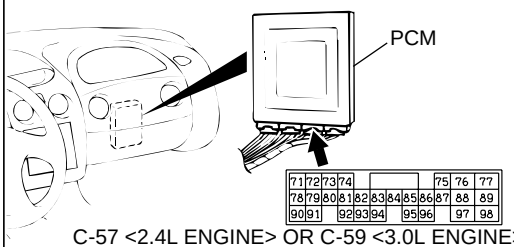
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the voltage normal?

YES : Go to Step 5.

NO : Go to Step 4.

CONNECTOR: C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>



C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>

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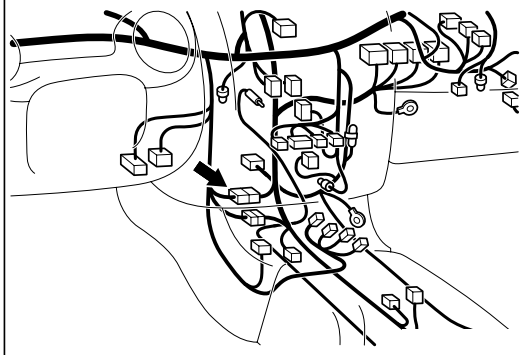
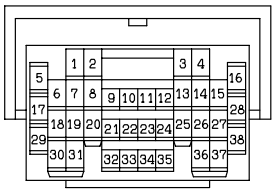
CONNECTOR: C-28



C-28



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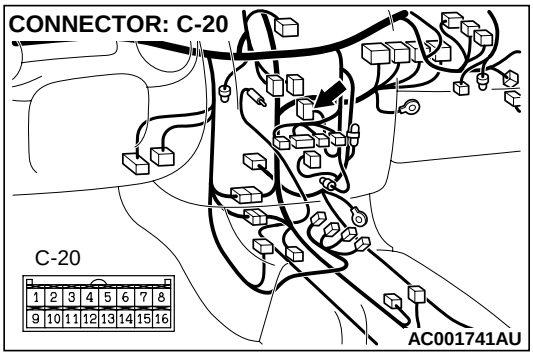
STEP 4. Check connectors C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM and C-28 at inter mediate connector for damage.

Q: Are the connectors in good condition?

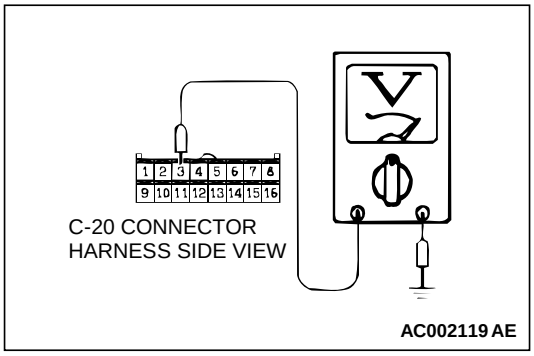
YES : Replace the PCM.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 5. Check the signal voltage at auto-cruise control-ECU connector C-20 by backprobing.



(1) Do not disconnect connector C-20.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 3 and ground by backprobing.
- Voltage should be battery positive voltage.

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

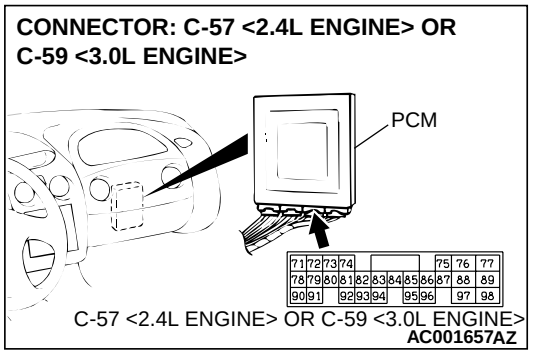
Q: Is the voltage normal?

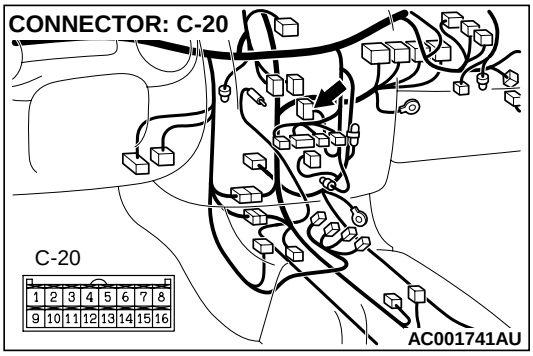
YES : Go to Step 7.
NO : Go to Step 6.

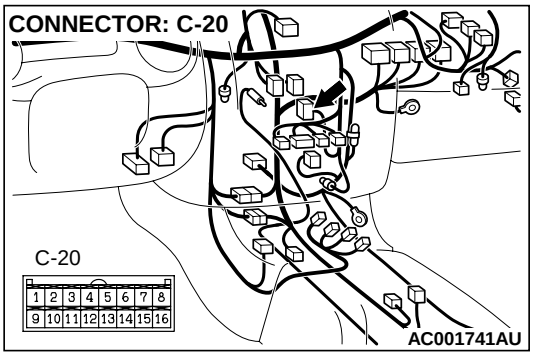
STEP 6. Check harness for short circuit to ground, open circuit or damage between PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 75 and auto-cruise control-ECU connector C-20 terminal 3.

Q: Is the harness wire in good condition?

YES : Go to Step 7.
NO : Repair it.







STEP 7. Check connector C-20 at auto-cruise control-ECU connector for damage.

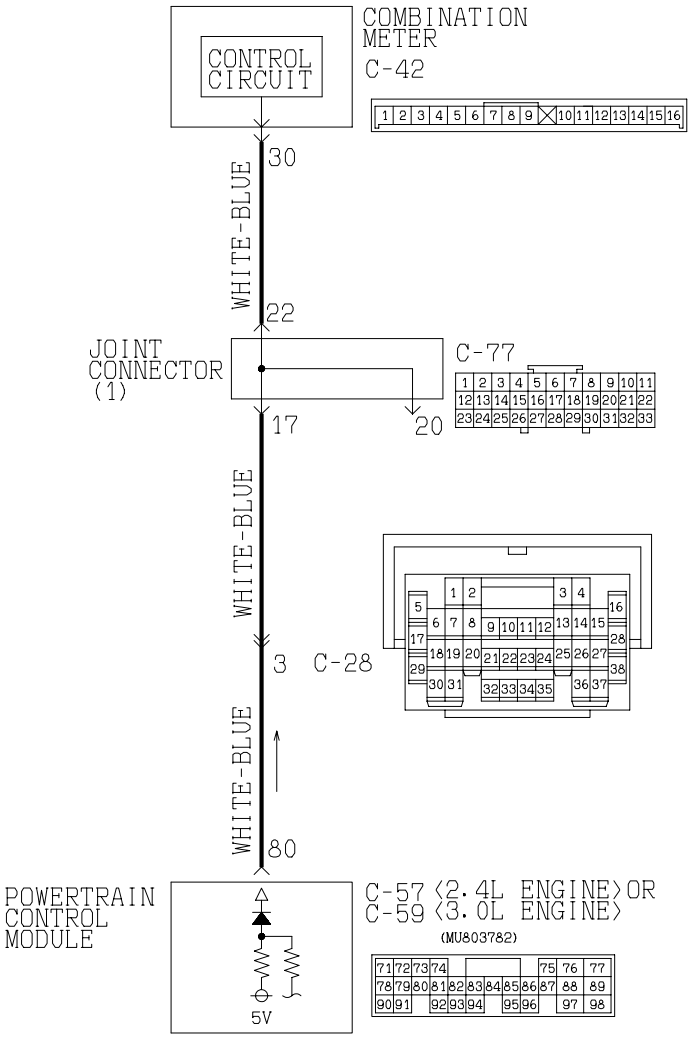
Q: Is the connector in good condition?

YES : Replace the auto-cruise control-ECU.

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

INSPECTION PROCEDURE 17: Vehicle Speed Signal System

Vehicle Speed Signal System Circuit



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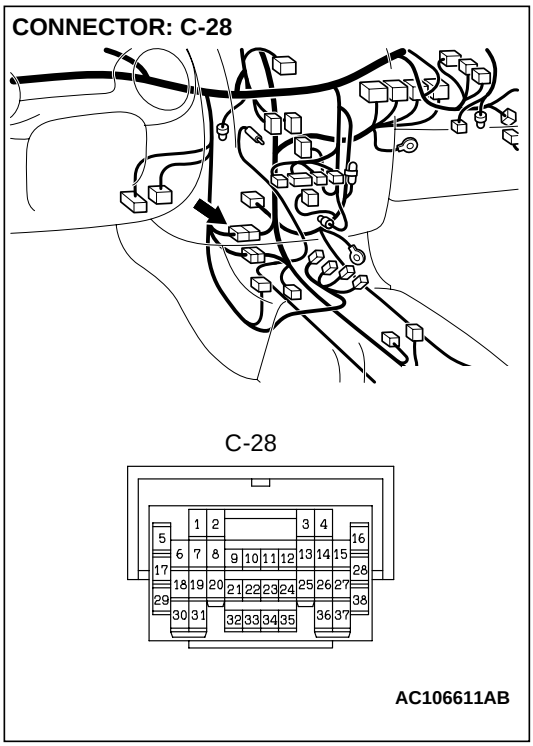
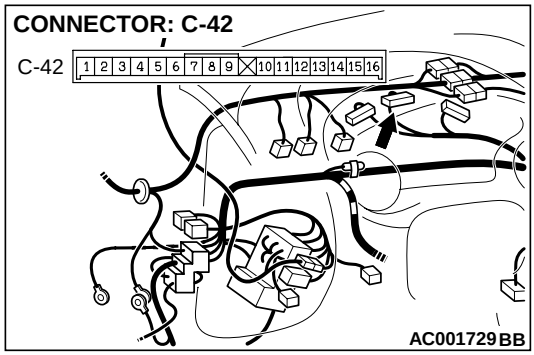
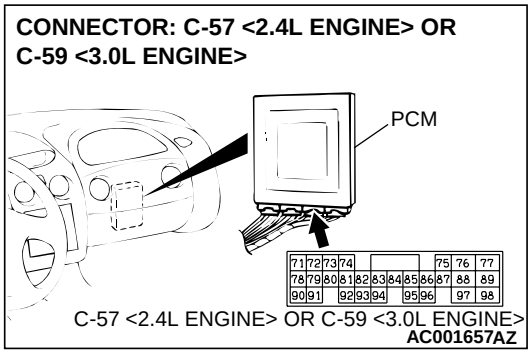
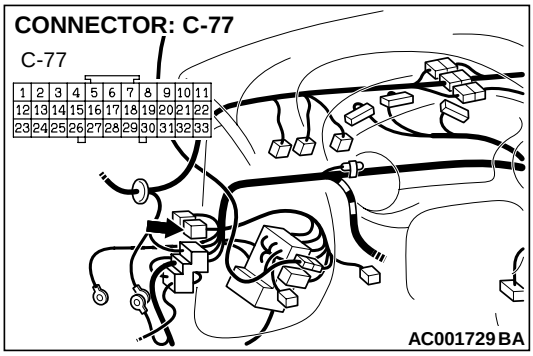








CIRCUIT OPERATION

- While the vehicle is being driven, the PCM sends pulse signals (ranging from 0 to 12 volts) to the combination meter according to output signals from the output shaft speed sensor. The combination meter displays vehicle speed according to the pulse signals.
- If the vehicle speed signal becomes inoperative, the transaxle will not shift normally.

COMMENT

Failure may occur on vehicle speed signal circuit, speedometer and PCM.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set:)

- Malfunction of the output shaft speed sensor
- Malfunction of the speedometer
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

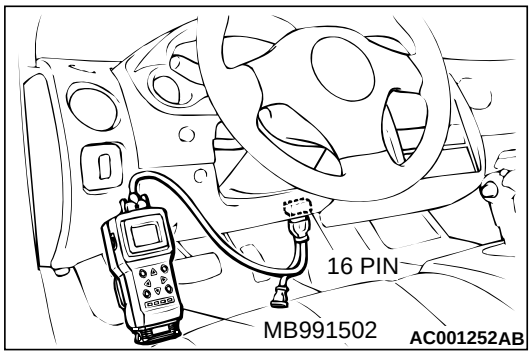
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check the A/T diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.



Q: Is A/T diagnostic trouble code number "23" set?

YES : Refer to P.23A-115, diagnostic trouble code number 23: Output Shaft Speed Sensor System.
NO : Go to Step 2.

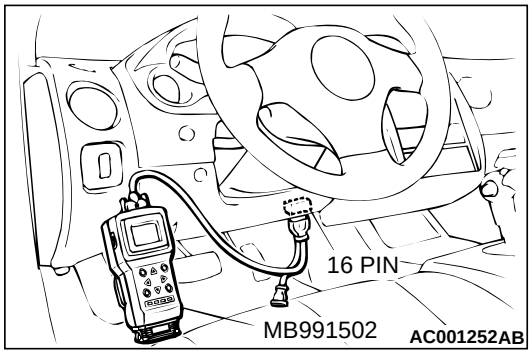
STEP 2. Using scan tool MB991502, check data list item 29: Vehicle Speed Signal.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 29: Vehicle Speed Signal.
- Check that the speedometer and scan tool display speed match when driving at a vehicle speed of 40 km/h (25 mph).

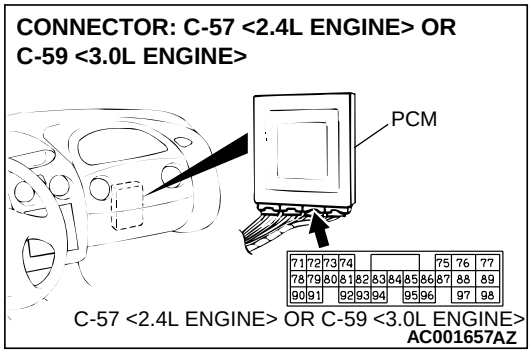
(4) Turn the ignition switch to the "LOCK" (OFF) position.



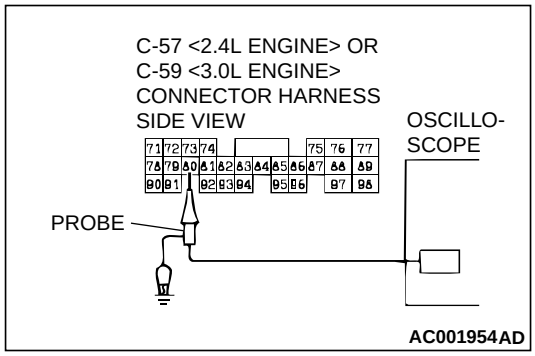
Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 3.

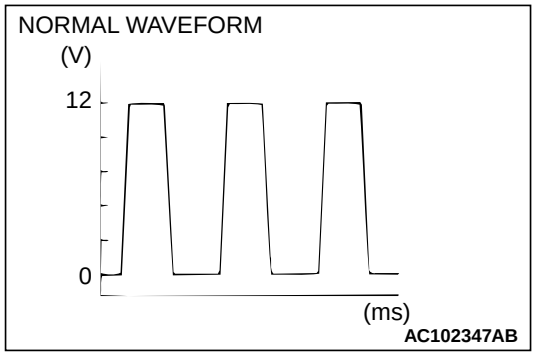
STEP 3. Using an oscilloscope, check the waveform at PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine>.



(1) Do not disconnect connector C-57 <2.4L Engine> or C-59 <3.0L Engine>.



(2) Connect an oscilloscope probe to PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 80 by backprobing.
(3) Start the engine.



(4) Check the waveform.
- The waveform should show a pattern similar to the illustration when running the vehicle.

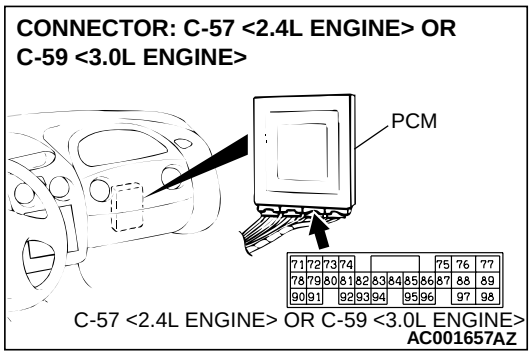
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the waveform normal?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check connector C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM for damage.

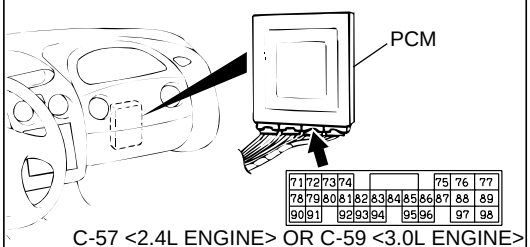
Q: Is the connector in good condition?



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

STEP 5. Check connectors C-57 <2.4L Engine> or C-59 <3.0L Engine> at PCM, C-28 at intermediate connector, C-77 at joint connector and C-42 combination meter connector for damage.

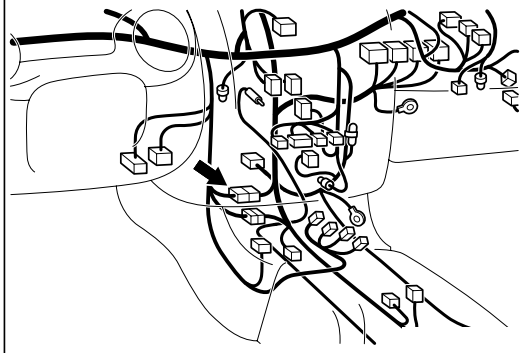
CONNECTOR: C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>



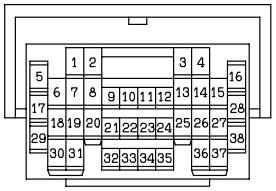
C-57 <2.4L ENGINE> OR C-59 <3.0L ENGINE>

AC001657AZ

CONNECTOR: C-28



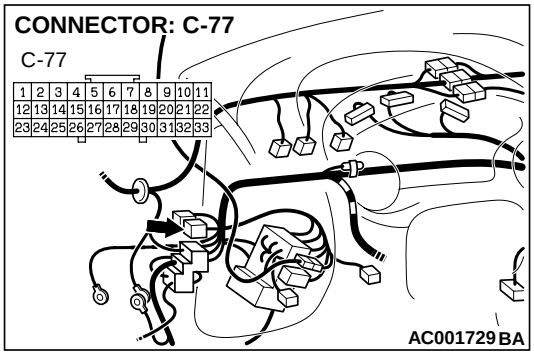
C-28



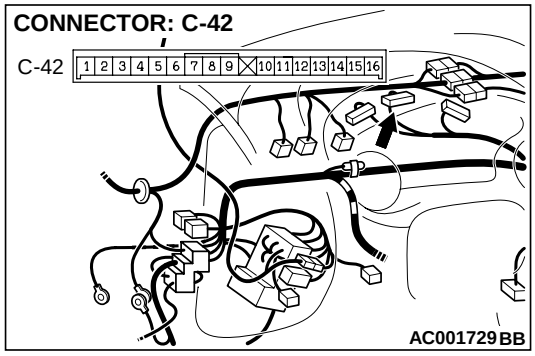
AC106611AB

CONNECTOR: C-77

C-77



AC001729BA



Q: Are the connectors in good condition?

YES : Go to Step 6.

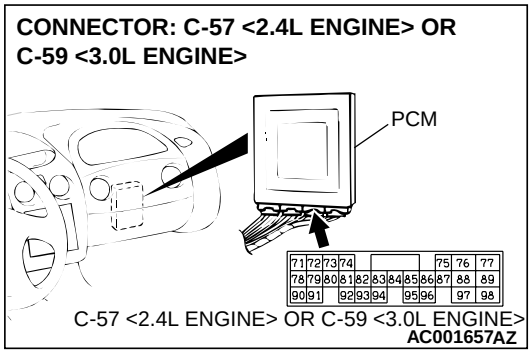
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

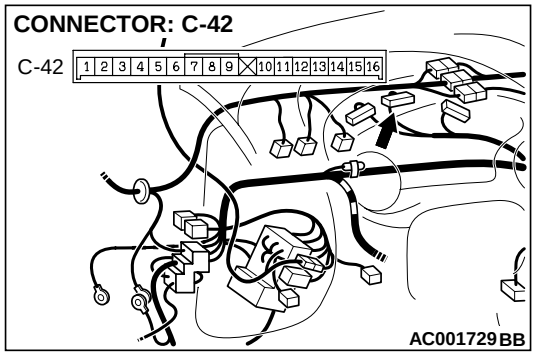
STEP 6. Check harness for open circuit or damage between PCM connector C-57 <2.4L Engine> or C-59 <3.0L Engine> terminal 80 and combination meter connector C-42 terminal 30.

Q: Is the harness wire in good condition?

YES : Go to Step 7.

NO : Repair it.



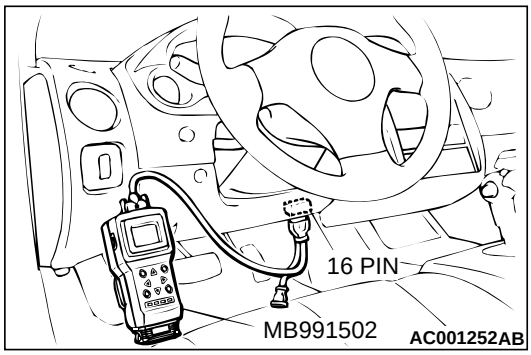


STEP 7. Check the speedometer.

Q: Is the speedometer operating properly?

YES : Go to Step 8.

NO : Repair harness damage or short circuit to ground between joint connector C-77 terminal 20 and data link connector C-29 terminal 14.



STEP 8. Using scan tool MB991502, check data list item 29: Vehicle Speed Signal.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991502 to data reading mode for item 29, Vehicle Speed Signal.
- Check that the speedometer and scan tool display speed match when driving at a vehicle speed of 40 km/h (25 mph).

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

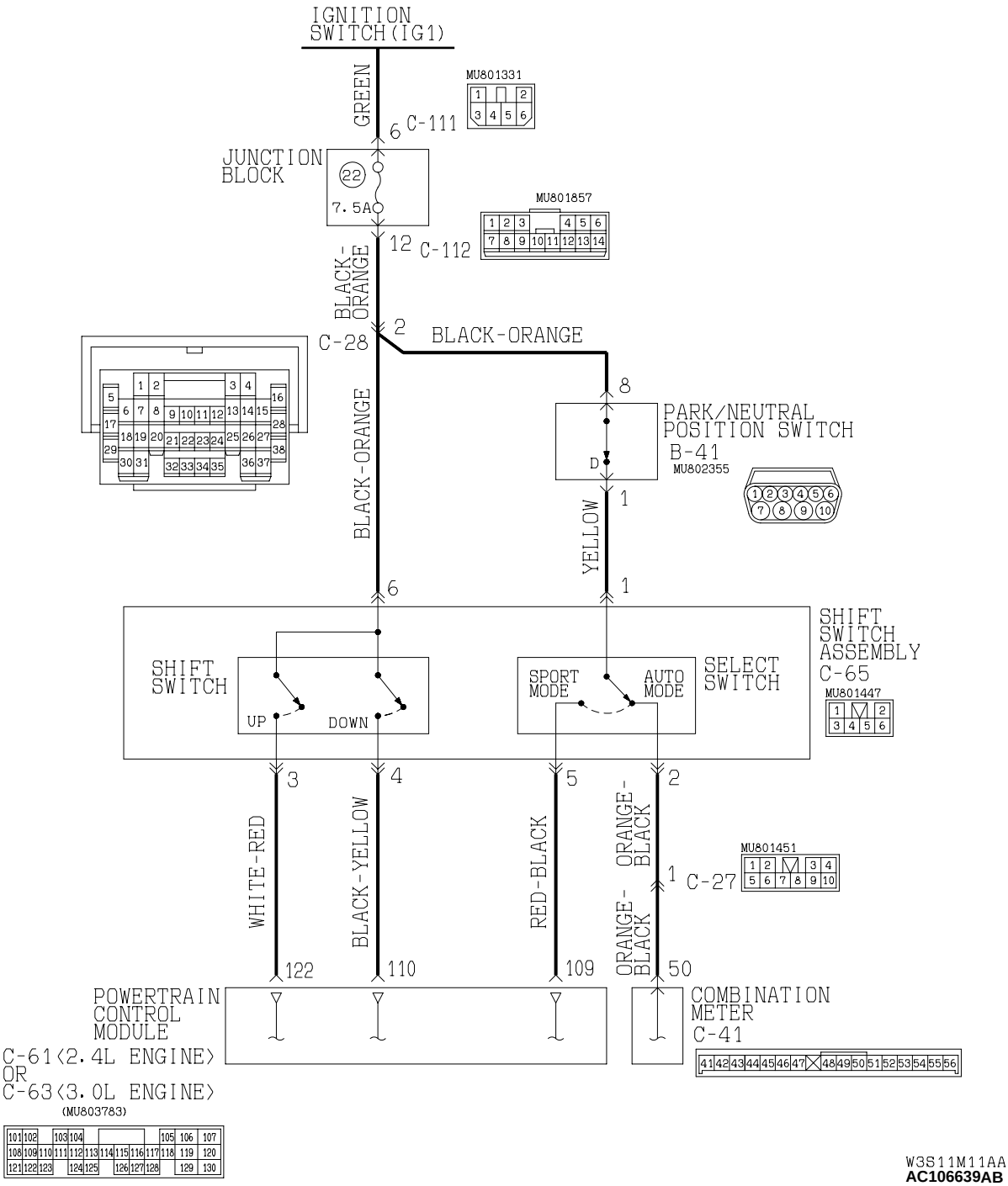
Q: Is the sensor operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

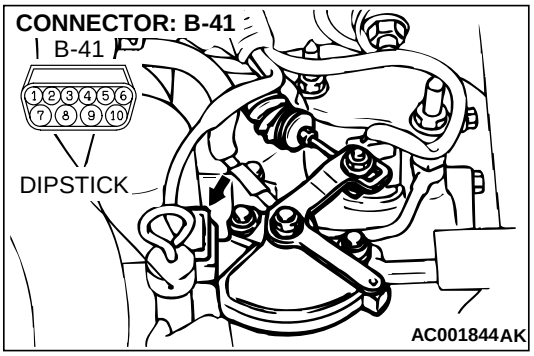
INSPECTION PROCEDURE 18: Shift Switch Assembly System <Vehicles with Sport Mode>

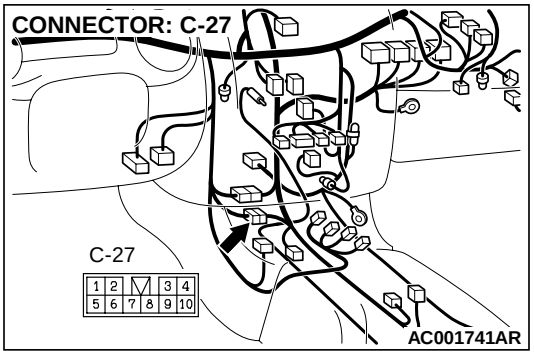
Shift Switch Assembly System Circuit

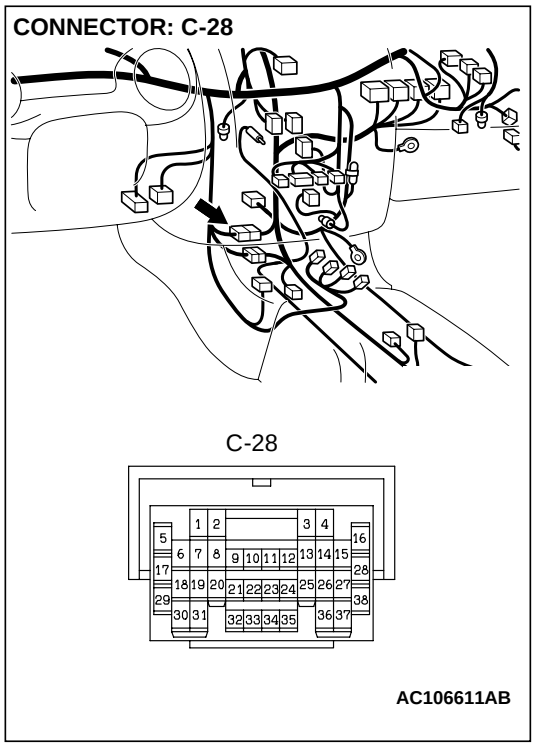


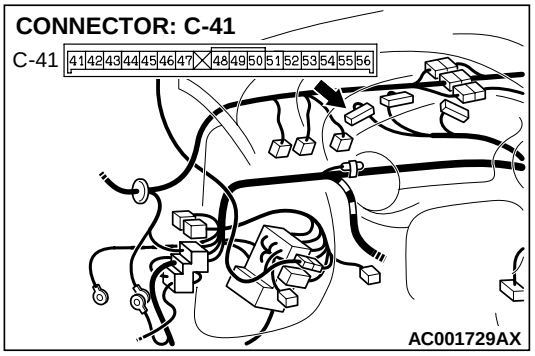
W3S11M11AA
AC106639AB

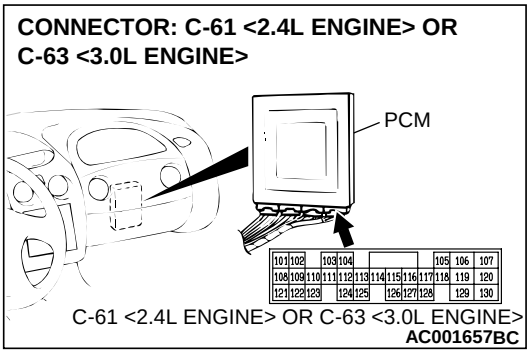
TSB Revision

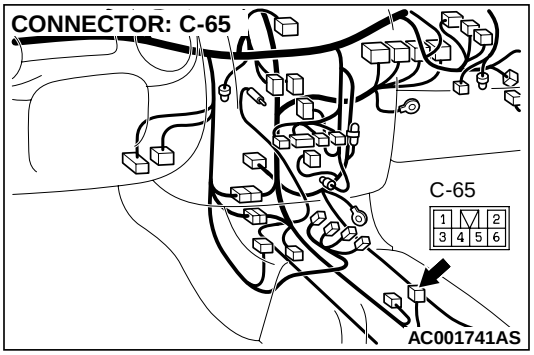

CONNECTOR: B-41
B-41
1 2 3 4 5 6
7 8 9 10
DIPSTICK
AC001844AK

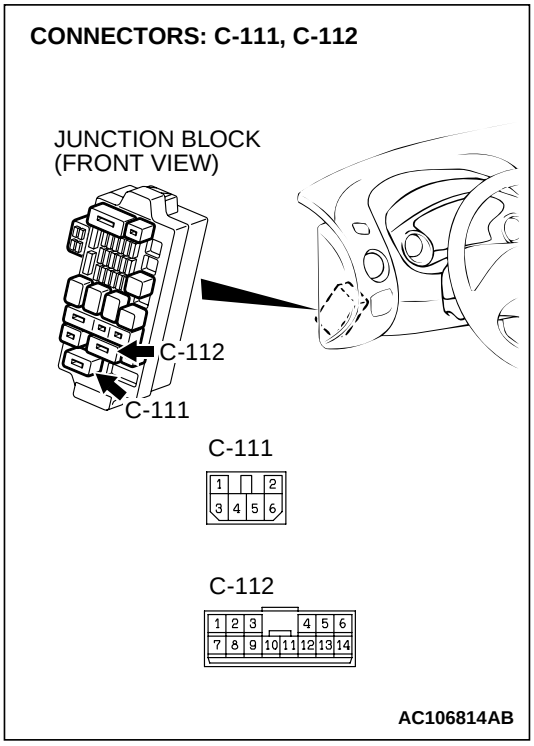

CONNECTOR: C-27
C-27
1 2 3 4
5 6 7 8 9 10
AC001741AR


CONNECTOR: C-28
C-28
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 34 35 36 37 38
AC106611AB


CONNECTOR: C-41
C-41
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56
AC001729AX


CONNECTOR: C-61 <2.4L ENGINE> OR
C-63 <3.0L ENGINE>
PCM
101 102 103 104 105 106 107
108 109 110 111 112 113 114 115 116 117 118 119 120
121 122 123 124 125 126 127 128 129 130
C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC


CONNECTOR: C-65
C-65
1 2
3 4 5 6
AC001741AS



CIRCUIT OPERATION

If the select switch of the shift switch assembly is set to the sport mode, battery positive voltage will be applied to the PCM (terminal number 109). If the shift switch of the shift switch assembly is set to "UP" or "DOWN" position, battery positive voltage will be applied to the PCM (terminal number 122, 110).

COMMENT

The cause is probably a malfunction of the Park/Neutral position switch circuit, shift switch assembly circuit or a defective PCM.

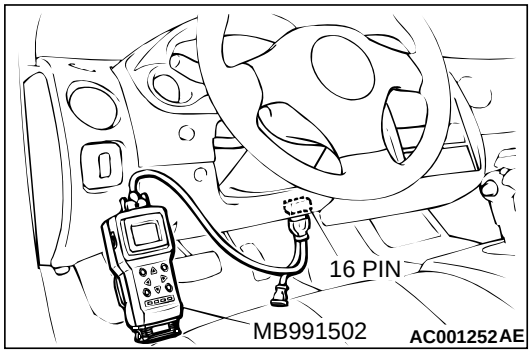
TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the Park/Neutral position switch
- Malfunction of the shift switch assembly select switch
- Malfunction of the shift switch assembly shift switch (Up)
- Malfunction of the shift switch assembly shift switch (Down)
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, check data list item 67: Select Switch, item 68: Shift Switch (Up), item 69: Shift Switch (Down).

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for following items.
  a. item 67: Select Switch
  b. item 68: Shift Switch (Up)
  c. item 69: Shift Switch (Down)
    - The switches above are displayed, depending on the selector lever condition as shown in the table.

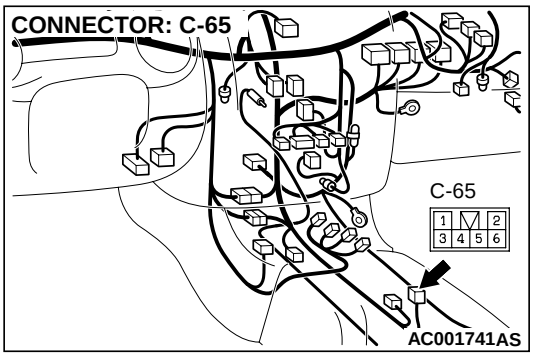
SELECTOR LEVER OPERATION	DATA LIST ITEM		
	67	68	69
D range	OFF	OFF	OFF
Sport mode	ON	OFF	OFF
Upshift and hold the selector lever	ON	ON	OFF
Downshift and hold the selector lever	ON	OFF	ON

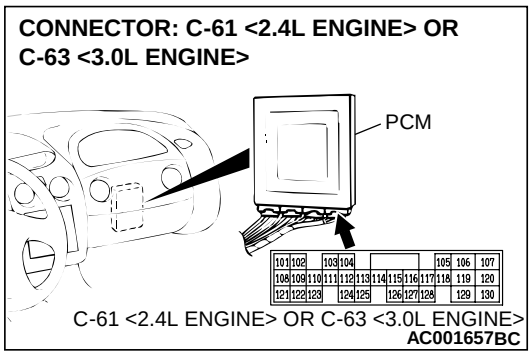
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : If completely NG: Go to Step 2. If item 68 and item 69 both are NG: Go to Step 4. If only item 67 is NG: Go to Step 7. If only item 68 is NG: Go to Step 24. If only item 69 is NG: Go to Step 28 .



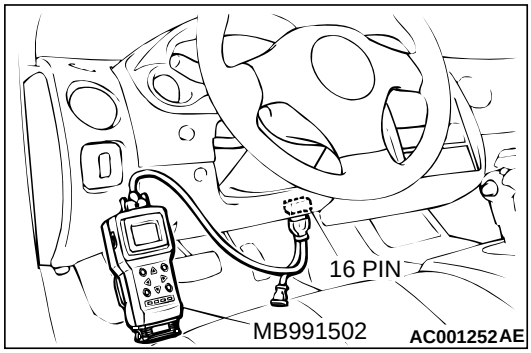


STEP 2. Check connectors C-65 at shift switch assembly and C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

Q: Are the connectors in good condition?

YES : Go to Step 3.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 3. Using scan tool MB991502, check data list item 67: Select Switch, item 68: Shift Switch (Up), item 69: Shift Switch (Down).

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list.
  a. item 67: Select Switch
  b. item 68: Shift Switch (Up)
  c. item 69: Shift Switch (Down)
  The switches above are displayed, depending on the selector lever condition as shown in the table.

SELECTOR LEVER OPERATION	DATA LIST ITEM		
	67	68	69
D range	OFF	OFF	OFF
Sport mode	ON	OFF	OFF
Upshift and hold the selector lever	ON	ON	OFF
Downshift and hold the selector lever	ON	OFF	ON

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

Q: Is the switch operating properly?

YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

NO : Replace the PCM.

STEP 4. Check the shift switch assembly.

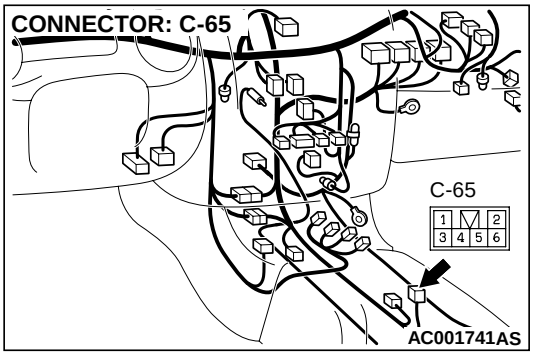
Refer to P.23A-363, Transaxle Control.

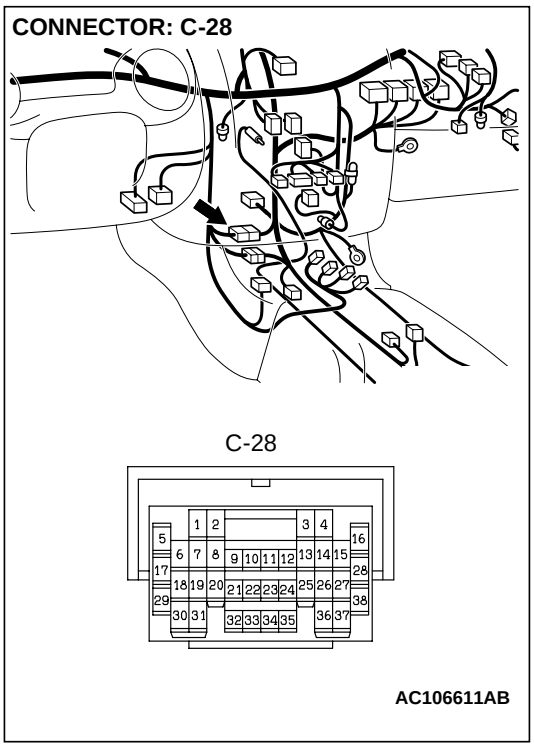
Q: Is the switch operating properly?

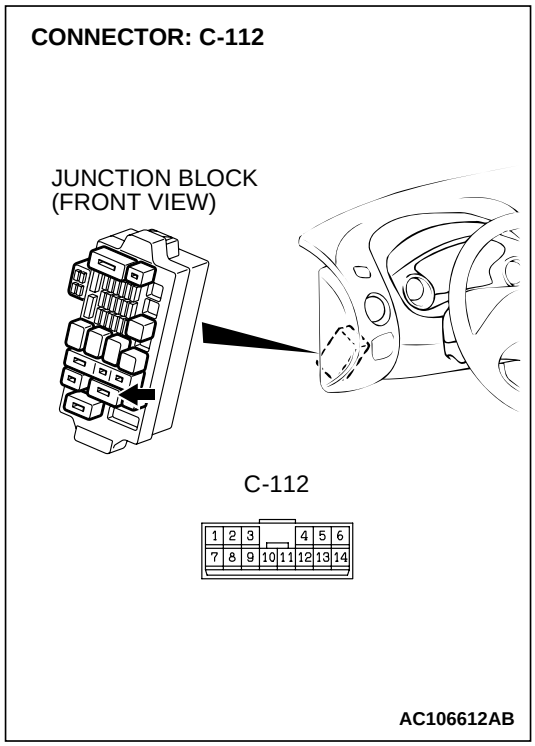
YES : Go to Step 5.

NO : Replace the shift switch assembly. Refer to P.23A-361, Transaxle Control.

STEP 5. Check connectors C-65 at shift switch assembly, C-28 at intermediate connector and C-112 at junction block for damage.



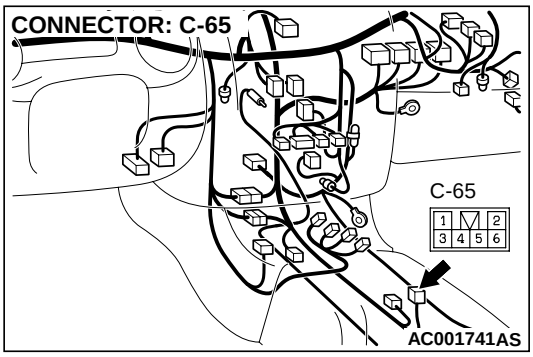


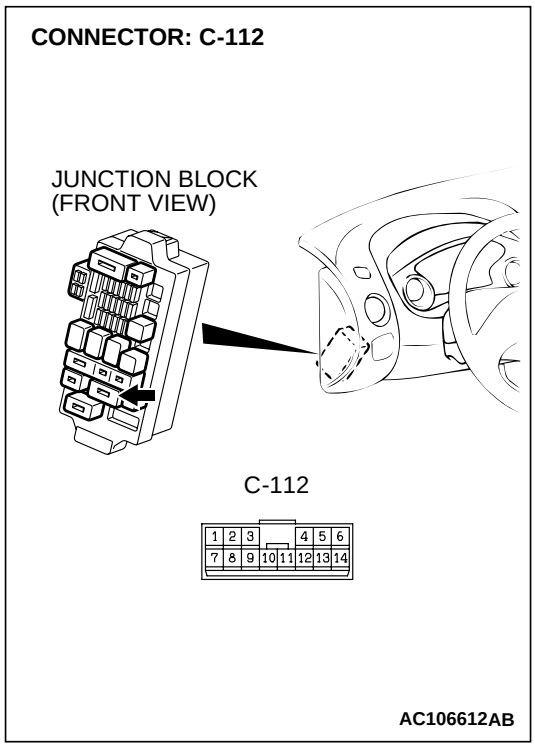


Q: Are the connectors in good condition?

YES : Go to Step 6.

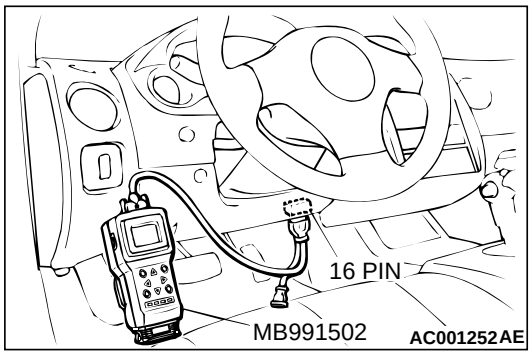
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 6. Check harness for open circuit or short circuit to ground between shift switch assembly connector C-65 terminal 6 and junction block connector C-112 terminal 12.
Q: Is the harness wire in good condition?

YES : Go to Step 3.
NO : Repair it.



STEP 7. Using scan tool MB991502, check data list item 61: Park/Neutral Position Switch.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to data reading mode for item 61: Park/Neutral Position Switch.
- The scan tool should display "D" when the selector lever is "D" range.

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

Q: Is the switch operating properly?

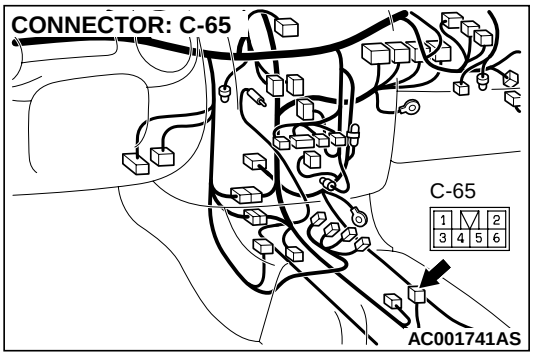
YES : Go to Step 8.
NO : Go to Step 15.

STEP 8. Check the shift switch assembly.

Refer to P.23A-363, Transaxle Control.

Q: Is the switch operating properly?

YES : Go to Step 9.
NO : Replace the shift switch assembly. Refer to P.23A-361, Transaxle Control.

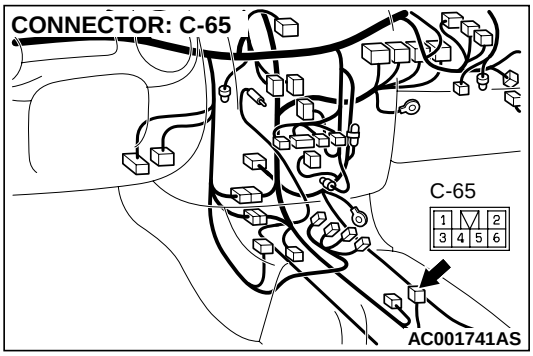


STEP 9. Check connector C-65 at shift switch assembly for damage.

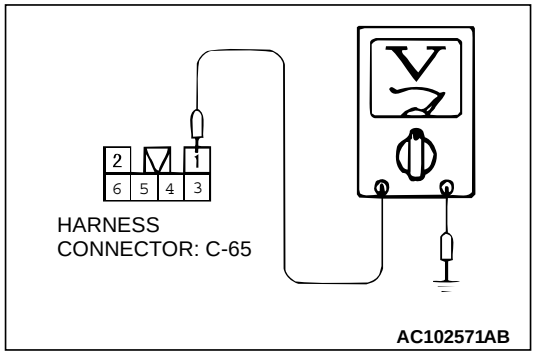
Q: Is the connector in good condition?

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

STEP 10. Check the power supply voltage at shift switch assembly connector C-65.



(1) Disconnect connector C-65 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Selector lever position should be "D" range.



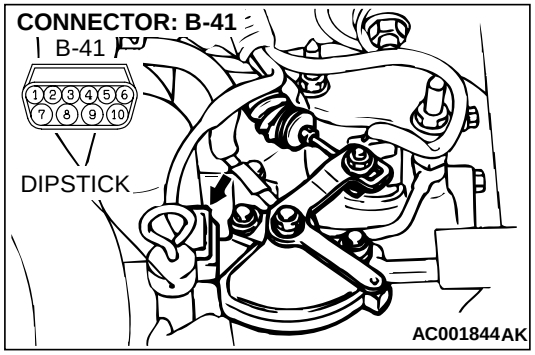
(4) Measure the voltage between terminal 1 and ground.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

YES : Go to Step 12.
NO : Go to Step 11.

STEP 11. Check connector B-41 at Park/Neutral position switch for damage.



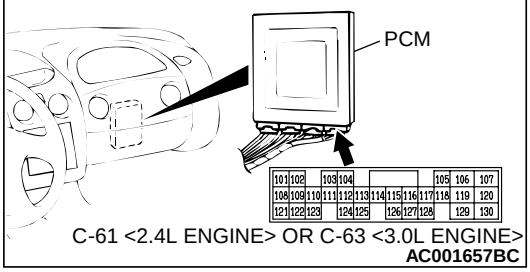
Q: Is the connector in good condition?

YES : Repair harness open circuit between shift switch assembly connector C-65 terminal 1 and Park/Neutral position switch connector B-41 terminal 3.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 12. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> by backprobing.

(1) Do not disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.
(2) Turn the ignition switch to the "ON" position.
(3) Selector lever position should be sport mode.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



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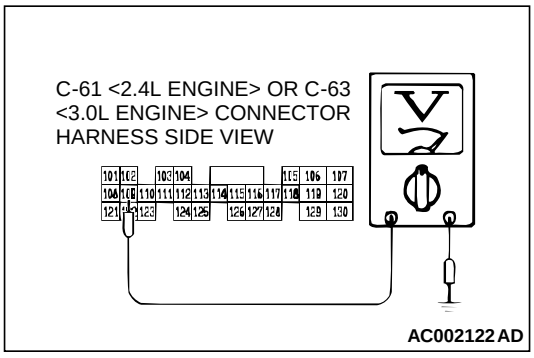


AC002122AD

(4) Measure the voltage between terminal 109 and ground by backprobing.
- Voltage should be battery positive voltage.

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

Q: Is the voltage normal?

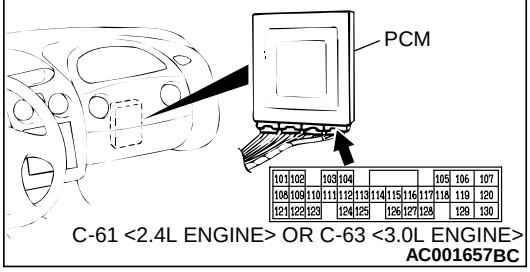
YES : Go to Step 14.
NO : Go to Step 13.

STEP 13. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between shift switch assembly connector C-65 terminal 5 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 109.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



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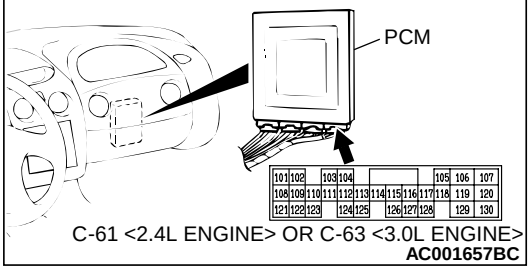
STEP 14. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM for damage.

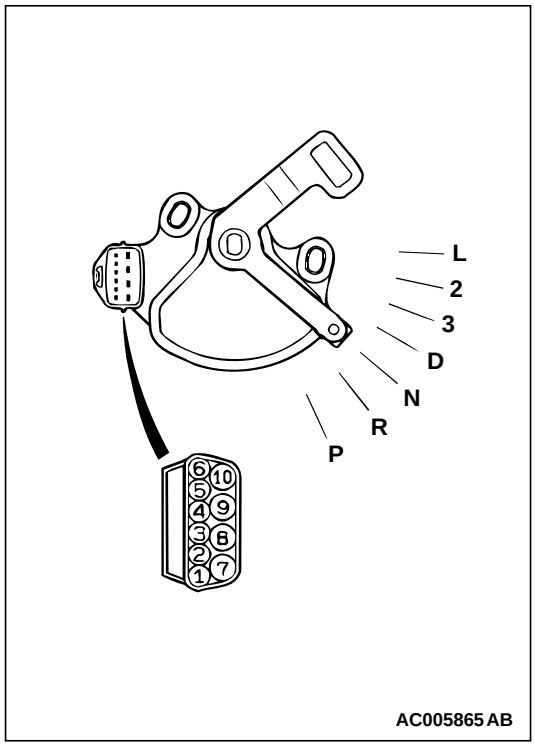
Q: Is the connector in good condition?

YES : Go to Step 3.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



AC001657BC



STEP 15. Check the Park/Neutral position switch.

SWITCH POSITION	TERMINAL NUMBER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	

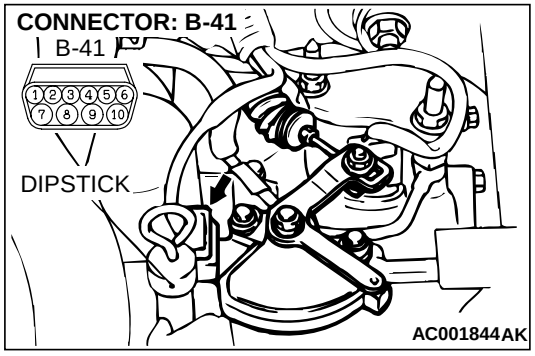
Check for continuity between terminals for each selector position.

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

Q: Is the switch operating properly?

YES : Go to Step 16.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle P.23B-10.

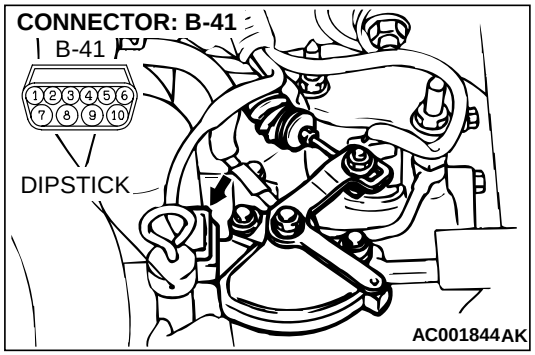


STEP 16. Check connector B-41 at Park/Neutral position switch for damage.

Q: Is the connector in good condition?

YES : Go to Step 17.

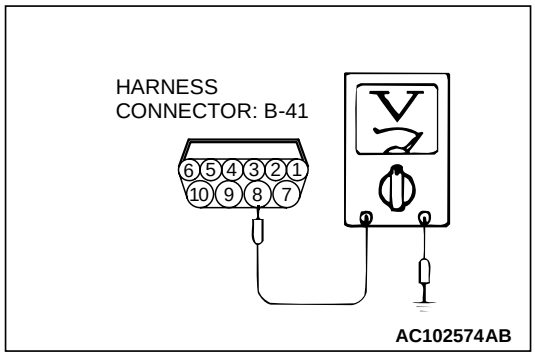
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 17. Check the power supply voltage at Park/Neutral position switch connector B-41.

(1) Disconnect connector B-41 and measure at the harness side.

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



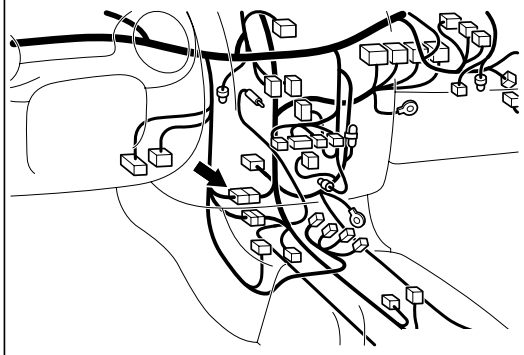
(3) Measure the voltage between terminal 8 and ground.
- Voltage should be battery positive voltage.

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

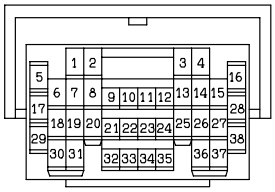
Q: Is the voltage normal?

YES : Go to Step 19.
NO : Go to Step 18.

CONNECTOR: C-28



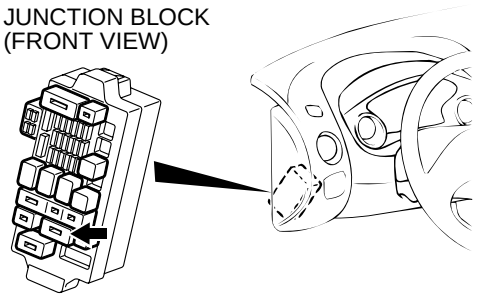
C-28



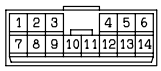
AC106611AB

CONNECTOR: C-112

JUNCTION BLOCK
(FRONT VIEW)



C-112



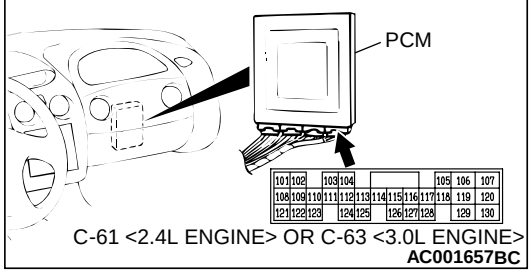
AC106612AB

STEP 18. Check connectors C-28 at intermediate connector and C-112 at junction block for damage.
Q: Are the connectors in good condition?

YES : Repair harness open circuit or short circuit to ground between Park/Neutral position switch connector B-41 terminal 8 and junction block connector C-112 terminal 12.

NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC

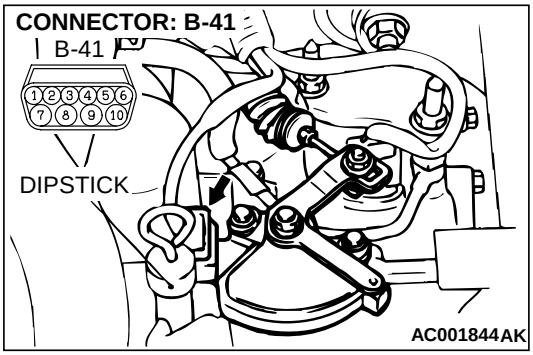
STEP 19. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.

Q: Is the connector in good condition?

YES : Go to Step 20.

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

CONNECTOR: B-41



AC001844AK

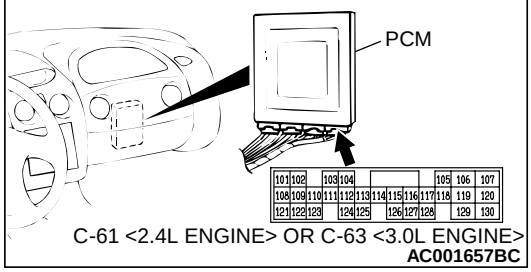
STEP 20. Check harness for short circuit to ground between Park/Neutral position switch connector B-41 terminal 1 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 102.

Q: Is the harness wire in good condition?

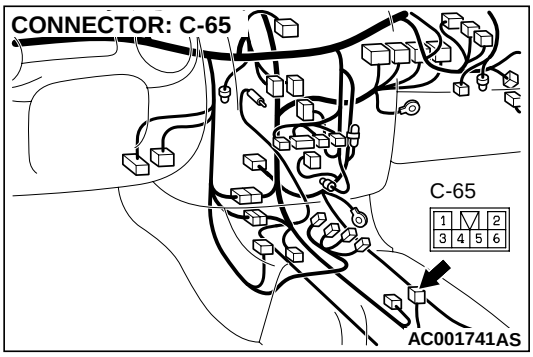
YES : Go to Step 21.

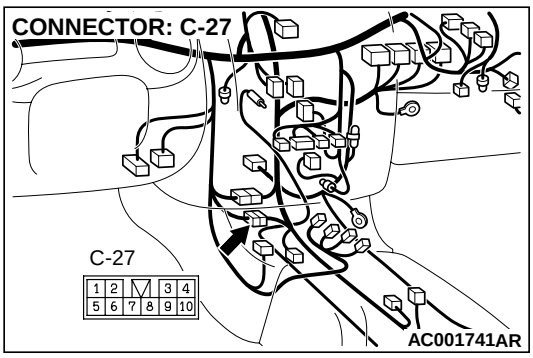
NO : Repair it.

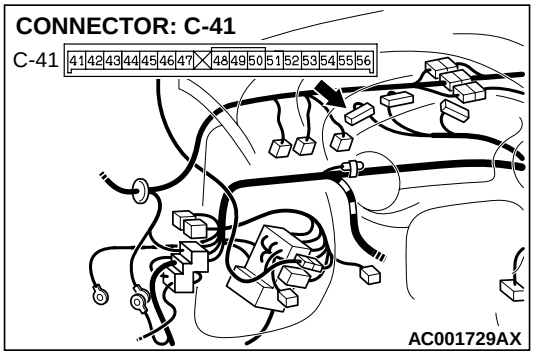
CONNECTOR: C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>



C-61 <2.4L ENGINE> OR C-63 <3.0L ENGINE>
AC001657BC







STEP 21. Check connectors C-65 at shift switch assembly, C-27 at intermediate connector and C-41 at combination meter for damage.

Q: Are the connectors in good condition?

YES : Go to Step 22.

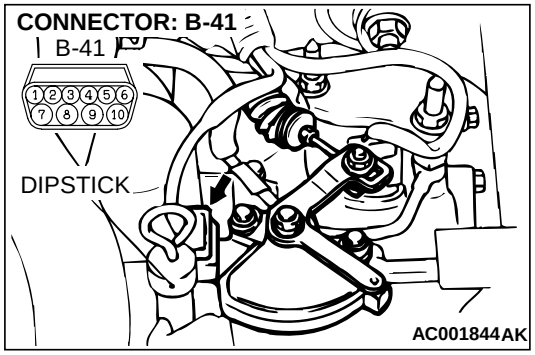
NO : Repair or replace the defective connector(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

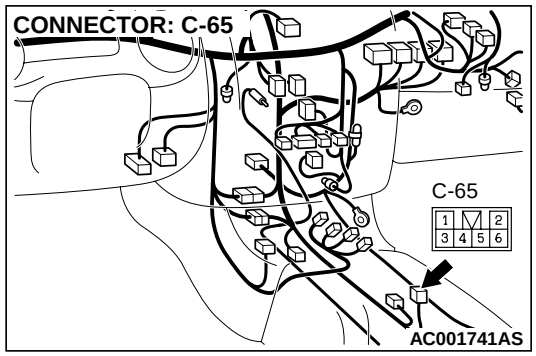
STEP 22. Check harness for short circuit to ground between Park/Neutral position switch connector B-41 terminal 1 and shift switch assembly connector C-65 terminal 1.

Q: Is the harness wire in good condition?

YES : Go to Step 23.

NO : Repair it.



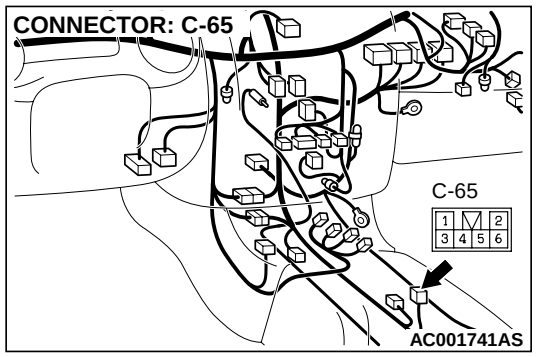


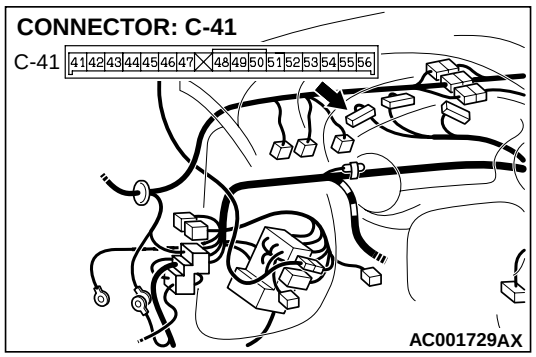
STEP 23. Check harness for short circuit to ground between shift switch assembly connector C-65 terminal 2 and combination meter connector C-41 terminal 50.

Q: Is the harness wire in good condition?

YES : Go to Step 3.

NO : Repair it.





STEP 24. Check the shift switch assembly.
Refer to P.23A-363, Transaxle Control.

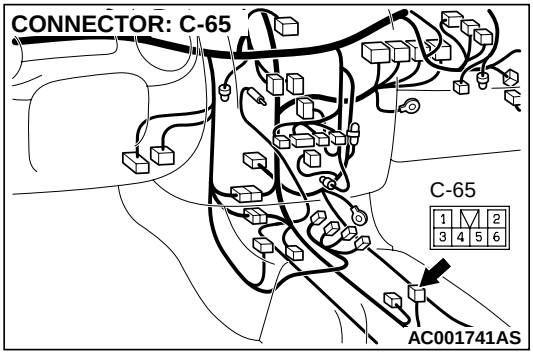
Q: Is the switch operating properly?

YES : Go to Step 25.
NO : Replace the shift switch assembly. Refer to P.23A-361, Transaxle Control.

STEP 25. Check connector C-65 at the shift switch assembly for damage.

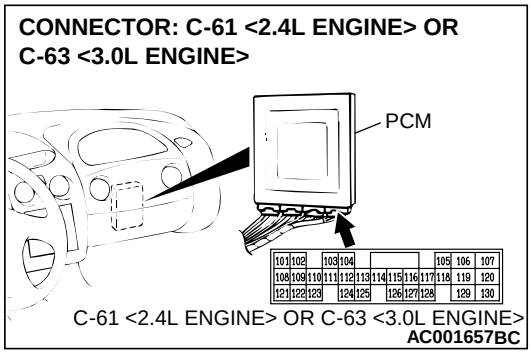
Q: Is the connector in good condition?

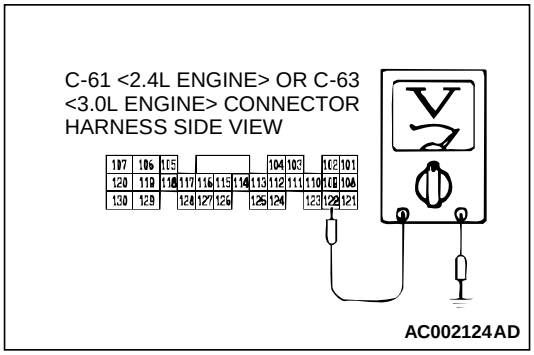
YES : Go to Step 26.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 26. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.

(1) Disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine> and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



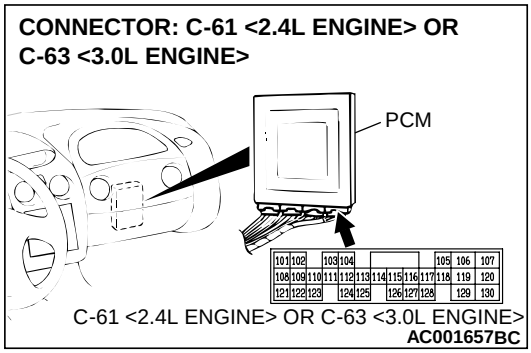


(3) Measure the voltage between terminal 122 and ground.
- Voltage should be battery positive voltage when the selector lever is upshift and hold.

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

Q: Is the voltage normal?

YES : Go to Step 14.
NO : Go to Step 27.



STEP 27. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.

Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between shift switch assembly connector C-65 terminal 3 and PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine> terminal 122.

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

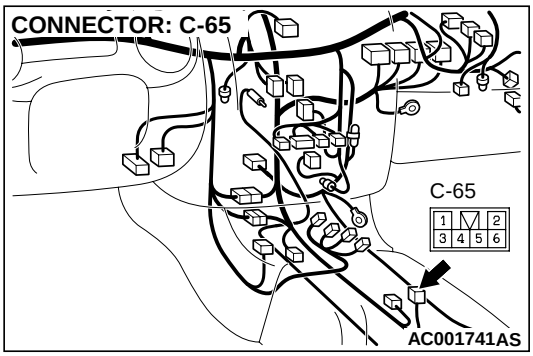
STEP 28. Check the shift switch assembly.

Refer to P.23A-363, Transaxle Control.

Q: Is the switch operating properly?

YES : Go to Step 29.

NO : Replace the shift switch assembly. Refer to P.23A-361, Transaxle Control.



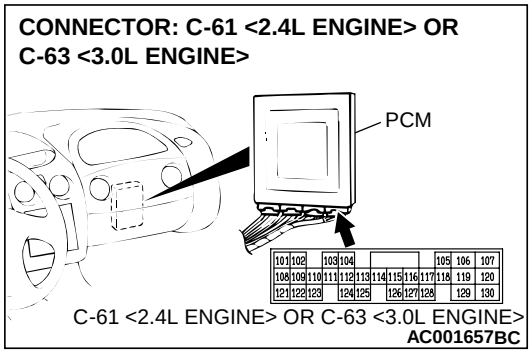
STEP 29. Check connector C-65 at shift switch assembly for damage.

Q: Is the connector in good condition?

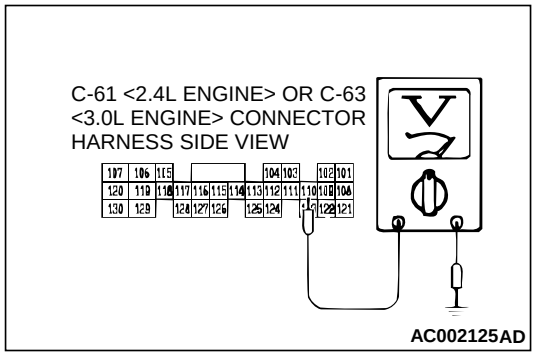
YES : Go to Step 30.

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

STEP 30. Check the switch output voltage at PCM connector C-61 <2.4L Engine> or C-63 <3.0L Engine>.



(1) Disconnect connector C-61 <2.4L Engine> or C-63 <3.0L Engine> and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



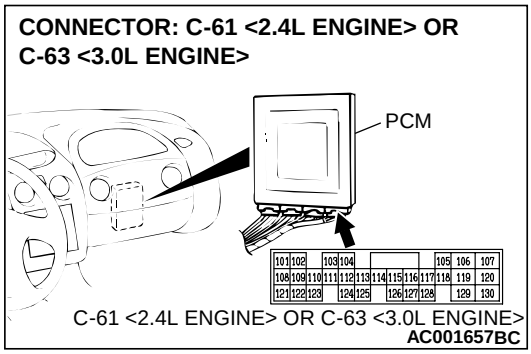
(3) Measure the voltage between terminal 110 and ground.
- Voltage should be battery positive voltage when the selector lever is downshift and hold.

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

Q: Is the voltage normal?

YES : Go to Step 14.
NO : Go to Step 31.

STEP 31. Check connector C-61 <2.4L Engine> or C-63 <3.0L Engine> at PCM connector for damage.



Q: Is the connector in good condition?

YES : Repair harness open circuit or short circuit to ground between shift switch assembly connector C-65 terminal 4 and PCM connector C-61 <2.4L Engine> C-63 <3.0L Engine> terminal 110.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

DATA LIST REFERENCE TABLE

M1231008100144

MUT-II SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
2ND SOL DUTY	33	Second solenoid valve duty %	Selector lever position: L, 2, 3, D <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	100%
				Driving at constant speed of 30 km/h (19 mph) in 2nd gear	0%
				Driving at constant speed of 50 km/h (31 mph) in 3rd gear	100%
				Driving at constant speed of 50 km/h (31 mph) in 4th gear	0%
A/T CONT RLY	54	A/T control relay output voltage	Ignition switch: ON		Battery positive voltage
A/T TMP SNSR	15	A/T fluid temperature sensor	Warming up	Drive for 15 minutes or more so that the A/T fluid temperature becomes 70 – 80 °C (158 – 176 °F)	Gradually rises to 70 – 80 °C (158 – 176 °F)
CRANK SENSOR	21	Crankshaft position sensor	Engine: Idling (after the worming up) Selector lever position: P	Accelerator pedal: Fully closed	600 – 900 r/min
				Accelerator pedal: Depressed	Gradually rises from the above value
DUAL PRESS SW	65	Dual pressure switch	Engine: Idling Selector lever position: P, N	A/C switch: ON (While the A/C compressor is in operation)	ON
				A/C switch: OFF	OFF
ENGINE LOAD	57	Engine load (volumetric efficiency)	Engine: Idling Selector lever position: P, N	Accelerator pedal: fully closed → depressed	Data changes
INP SHFT SNSR	22	Input shaft speed sensor	Gear range: 3rd gear	Driving at constant speed of 50 km/h (31 mph)	1,600 – 1,900 r/min <2.4L Engine> 1,300 – 1,600 r/min <3.0L Engine>

MUT-II SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
L/R SOL DUTY	31	Low-reverse solenoid valve duty %	Selector lever position: L, 2, 3, D <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	0%
				Driving at constant speed of 30 km/h (19 mph) in 2nd gear	100%
				Driving at constant speed of 50 km/h (31 mph) in 3rd gear	100%
				Driving at constant speed of 50 km/h (31 mph) in 4th gear	100%
O/D SOL DUTY	34	Overdrive solenoid valve duty %	Selector lever position: L, 2, 3, D <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	100%
				Driving at constant speed of 30 km/h (19 mph) in 2nd gear	100%
				Driving at constant speed of 50 km/h (31 mph) in 3rd gear	0%
				Driving at constant speed of 50 km/h (31 mph) in 4th gear	0%
OD OFF SIGNAL	66	Overdrive off signal (Auto-cruise ECM signal)	While auto-cruise is engaged	Level road	OFF
				Uphill grade	ON
OUT SHFT SNSR	23	Output shaft speed sensor	Gear range: 3rd gear	Driving at constant speed of 50 km/h (31 mph)	1,600 – 1,900 r/min <2.4L Engine> 1,300 – 1,600 r/min <3.0L Engine>

MUT-II SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
PNP SWITCH	61	Park/Neutral position switch	Ignition switch: ON	Selector lever position: P	P
				Selector lever position: R	R
				Selector lever position: N	N
				Selector lever position: D	D
				Selector lever position: 3 <Vehicles without sport mode>	3
				Selector lever position: 2 <Vehicles without sport mode>	2
				Selector lever position: L <Vehicles without sport mode>	L
SELECT SW	67	Select switch <Vehicles with sport mode>	Ignition switch: ON	Selector lever position: D	OFF
				Selector lever operation: Select sport mode	ON
				Selector lever operation: Upshift and hold the selector lever	ON
				Selector lever operation: Downshift and hold the selector lever	ON
SHIFT POS	63	Shift position	Selector lever position: L, 2, 3, D <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	1st
				Driving at constant speed of 30 km/h (19 mph) in 2nd gear	2nd
				Driving at constant speed of 50 km/h (31 mph) in 3rd gear	3rd
				Driving at constant speed of 50 km/h (31 mph) in 4th gear	4th
			Selector lever position: R	Driving at constant speed of 5 km/h (3.1 mph) in reverse gear	REV

TSB Revision

MUT-II SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
SHIFT SW DOWN	69	Shift switch (Down) <Vehicles with sport mode>	Ignition switch: ON	Selector lever position: D	OFF
				Selector lever operation: Select sport mode	OFF
				Selector lever operation: Upshift and hold the selector lever	OFF
				Selector lever operation: Downshift and hold the selector lever	ON
SHIFT SW UP	68	Shift switch (Up) <Vehicles with sport mode>	Ignition switch: ON	Selector lever position: D	OFF
				Selector lever operation: Select sport mode	OFF
				Selector lever operation: Upshift and hold the selector lever	ON
				Selector lever operation: Downshift and hold the selector lever	OFF
STOPLIGHT SW	26	Stoplight switch	Ignition switch: ON	Brake pedal: Depressed	ON
				Brake pedal: Released	OFF
TCC SLIPPAGE	52	Torque converter clutch amount of slippage	Warming up Selector lever position: 3 <Vehicles without sport mode> or Sport mode <Vehicles with sport mode> Driving at speed of 50 km/h (31 mph) in 3rd gear	Driving at constant speed of 50 km/h (31 mph)	−10 to 10 r/min
				Release accelerator pedal [at less than 50 km/h (31 mph)]	The value changes

MUT-II SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
TCC SOL DUTY	36	Torque converter clutch solenoid valve duty %	Warming up Selector lever position: 3 <Vehicles without sport mode> or Sport mode <Vehicles with sport mode> Driving at speed of 50 km/h (31 mph) in 3rd gear	Driving at constant speed of 50 km/h (31 mph)	70 – 90%
				Release accelerator pedal [at less than 50 km/h (31 mph)]	70 – 90% → 0% Decreases gradually as the vehicle speed decreases
TP SENSOR	11	Throttle position sensor	Ignition switch: ON Engine: Stopped Selector lever position: P	Accelerator pedal: Fully closed	535 – 735 mV
				Accelerator pedal: Depressed	Gradually rises from the above value
				Accelerator pedal: Fully open	4,500 – 5,500 mV
U/D SOL DUTY	32	Underdrive solenoid valve duty %	Selector lever position: L, 2, 3, D <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	0%
				Driving at constant speed of 30 km/h (19 mph) in 2nd gear	0%
				Driving at constant speed of 50 km/h (31 mph) in 3rd gear	0%
				Driving at constant speed of 50 km/h (31 mph) in 4th gear	100%
VSS	29	Vehicle speed signal	Selector lever position: 3 <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	Idling with 1st gear (Vehicle stopped)	0 km/h (0 mph)
				Driving at constant speed of 50 km/h (31 mph)	50 km/h (31 mph)

ACTUATOR TEST REFERENCE TABLE

M1231008200130

MUT-II SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	TEST CONTENT	INSPECTION REQUIREMENT	NORMAL CONDITION
1st SHIFT LMP	07	1st indicator light <Vehicles with sport mode>	Illuminate each indicator light for three to the signal from the MUT-II.	• Ignition switch: ON • Selector lever position: P • Engine: stopped • Throttle opening voltage: Less than one volts	Shift indicator light illuminates.
2nd SHIFT LMP	08	2nd indicator light <Vehicles with sport mode>			
2ND SOL	03	Second solenoid valve	Drive the solenoid valve specified by the scan tool (MUT-II) at 50 % duty for five seconds. No other solenoid valve should be energized.		The solenoid should click when activated
3rd SHIFT LMP	09	3rd indicator light <Vehicles with sport mode>	Illuminate each indicator light for three to the signal from the MUT-II.		Shift indicator light illuminates.
4th SHIFT LMP	10	4th indicator light <Vehicles with sport mode>			
A/T RELAY	12	A/T control relay	Control relay is OFF for three seconds.		Data list No. 54 • (1) During test: 0 V • (2) Normal: Battery positive voltage [12 V]
L/R SOL	01	Low-reverse solenoid valve	Drive the solenoid valve specified by the scan tool (MUT-II) at 50 % duty for five seconds. No other solenoid valve should be energized.		The solenoid should click when activated
O/D SOL	04	Overdrive solenoid valve			
TCC SOL	06	Torque converter clutch solenoid valve			
U/D SOL	02	Underdrive solenoid valve			

TSB Revision

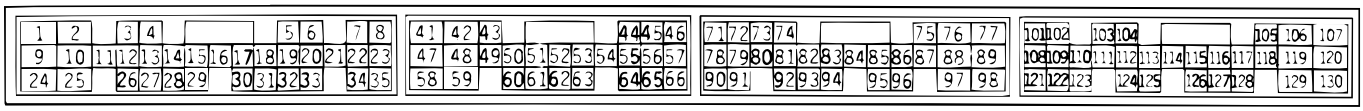
INVECS-II CANCEL COMMAND

M1231009500145

MUT-II SCAN TOOL DISPLAY	ITEM NO.	ITEM	CONTENT	REMARKS
Std. SIFT PATN	14	Standard shift pattern	Stops the INVECS-II control and shifts gears according to the standard shift pattern.	Use this function when performing procedure 8 in the road tests. (Refer to P.23A-19.) If the ignition switch is turned from "LOCK" (OFF) to "ON," this function restores the INVECS-II control.

PCM TERMINAL VOLTAGE REFERENCE CHART FOR TRANSAXLE OPERATION

M1231008400134



ACX01182 AB

TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT		NORMAL CONDITION
45	Crankshaft position sensor	Engine: Cranking		0.4 – 4.0 V
		Engine: Idling		1.5 – 2.5 V
46	Throttle position sensor supplied voltage	Ignition switch: ON		4.8 – 5.2 V
50	A/T control relay	Ignition switch: LOCK (OFF)		0 V
		Ignition switch: ON		10 – 12 V
57	Throttle position sensor ground	Always		0.5 V or less
75	Auto-cruise signal	Ignition switch: ON		Battery positive voltage
76	Ground	Always		1 V or less
77	Solenoid valve power supply	Ignition switch: LOCK (OFF)		0 V
		Ignition switch: ON		Battery positive voltage
78	Throttle position sensor	Ignition switch: ON (check for smooth voltage increase as throttle is moved from idle position to wide open throttle	Idle	0.6 – 0.8 V
			Wide open throttle	4.5 – 5.5 V
80	Vehicle speed signal	• Measure between terminals 80 and ground with an oscilloscope. • Engine: 2,000 r/min • Selector lever position: 3 (3rd gear) <Vehicles without sport mode>, Sport mode (3rd gear) <Vehicles with sport mode>		Refer to P.23A-333, Inspection Procedure Using an Oscilloscope.
88	Ground	Always		0 V
89	Solenoid valve power supply	Ignition switch: LOCK (OFF)		0 V
		Ignition switch: ON		Battery positive voltage
97	Ground	Always		0 V

TSB Revision

TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT	NORMAL CONDITION
101	Park/Neutral position switch: P	• Ignition switch: LOCK (OFF) • Selector lever position: P	0 V
		• Ignition switch: LOCK (OFF) • Selector lever position: Other than above	Battery positive voltage
102	Park/Neutral position switch: D	• Ignition switch: LOCK (OFF) • Selector lever position: D	0 V
		• Ignition switch: LOCK (OFF) • Selector lever position: Other than above	Battery positive voltage
103	Input shaft speed sensor	• Measure between terminals 57 and 103 with an oscilloscope. • Engine: 2,000 r/min • Selector lever position: 3 (3rd gear) <Vehicles without sport mode>, Sport mode (3rd gear) <Vehicle with sport mode>	Refer to P.23A-333, Inspection Procedure Using an Oscilloscope.
104	Output shaft speed sensor	• Measure between terminals 57 and 104 with an oscilloscope. • Engine: 2,000 r/min • Selector lever position: 3 (3rd gear) <Vehicles without sport mode>, Sport mode (3rd gear) <Vehicle with sport mode>	Refer to P.23A-333, Inspection Procedure Using an Oscilloscope.
105	Shift indicator light: 1st <Vehicles with sport mode>	• Engine: Idling • Gear range: 1st gear	Battery positive voltage
		• Engine: Idling • Gear range: other than 1st gear	0 – 0.9 V
106	Second solenoid valve	• Engine: Idling • Selector lever position: 2 (2nd gear) <Vehicles without sport mode>, Sport mode (2nd gear) <Vehicles with sport mode>	Battery positive voltage
		• Engine: Idling • Selector lever position: P	7 – 9 V
107	Torque converter clutch solenoid valve	• Engine: Idling • Selector lever position: L (1st gear) <Vehicles without sport mode>, Sport mode (1st gear) <Vehicles with sport mode>	Battery positive voltage
108	Park/Neutral position switch: R	• Ignition switch: ON • Selector lever position: R	0 V
		• Ignition switch: ON • Selector lever position: Other than above	Battery positive voltage

TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT	NORMAL CONDITION
109	Park/Neutral position switch: 3 <Vehicles without sport mode>	• Ignition switch: ON • Selector lever position: 3	0 V
		• Ignition switch: ON • Selector lever position: Other than above	Battery positive voltage
	Select switch <Vehicles with sport mode>	• Ignition switch: ON • Selector lever position: Sport mode	0 V
		• Ignition switch: ON • Selector lever position: Other than above	Battery positive voltage
110	Park/Neutral position switch: L <Vehicles without sport mode>	• Ignition switch: ON • Selector lever operation: L	0 V
		• Ignition switch: ON • Selector lever operation: Other than above	Battery positive voltage
	Select switch (Down) <Vehicles with sport mode>	• Ignition switch: ON • Selector lever operation: Downshift and hold the selector lever	0 V
		• Ignition switch: ON • Selector lever operation: Other than above	Battery positive voltage
105	Shift indicator light: 3rd <Vehicles with sport mode>	• Engine: Idling • Gear range: 3rd gear	Battery positive voltage
		• Engine: Idling • Gear range: other than 3rd gear	0 – 0.9 V
117	Shift indicator light: 2 nd <Vehicles with sport mode>	• Engine: Idling • Gear range: 2nd gear	Battery positive voltage
		• Engine: Idling • Gear range: other than 2nd gear	0 – 0.9 V
120	Under drive solenoid valve	• Engine: Idling • Selector lever position: L (1st gear) <Vehicles without sport mode>, Sport mode (1st gear) <Vehicles with sport mode>	Battery positive voltage
		• Engine: Idling • Selector lever position: P	7 – 9 V
121	Park/Neutral position switch: N	• Ignition switch: ON • Selector lever position: N	Battery positive voltage
		• Ignition switch: ON • Selector lever position: Other than above	0 V

TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT	NORMAL CONDITION
122	Park/Neutral position switch: 2 <Vehicles without sport mode>	• Ignition switch: ON • Selector lever operation: 2	Battery positive voltage
		• Ignition switch: ON • Selector lever operation: Other than above	0 V
	Select switch (Up) <Vehicles with sport mode>	• Ignition switch: ON • Selector lever operation: Upshift and hold the selector lever	Battery positive voltage
		• Ignition switch: ON • Selector lever operation: Other than above	0 V
123	Stoplight switch	• Ignition switch: ON • Brake pedal: Depressed	Battery positive voltage
		• Ignition switch: ON • Brake pedal: Released	0 V
124	A/T fluid temperature sensor	A/T fluid temperature: 20°C (68°F)	3.8 – 4.0 V
		A/T fluid temperature: 40°C (104°F)	3.2 – 3.4 V
		A/T fluid temperature: 80°C (176°F)	1.7 – 1.9 V
128	Shift indicator light: 4th <Vehicles with sport mode>	• Engine: Idling • Gear range: 4th gear	Battery positive voltage
		• Engine: Idling • Gear range: other than 4th gear	0 – 0.9 V
129	Low-reverse solenoid valve	• Engine: Idling • Selector lever position: P	Battery positive voltage
		• Engine: Idling • Selector lever position: 2 (2nd gear) <Vehicles without sport mode>, Sport mode (2nd gear) <Vehicles with sport mode>	7 – 9 V
130	Overdrive solenoid valve	• Engine: Idling • Selector lever position: 3 (3rd gear) <Vehicles without sport mode>, Sport mode (3rd gear) <Vehicles with sport mode>	Battery positive voltage
		• Engine: Idling • Selector lever position: P	7 – 9 V

PCM TERMINAL RESISTANCE AND CONTINUITY INSPECTION CHART

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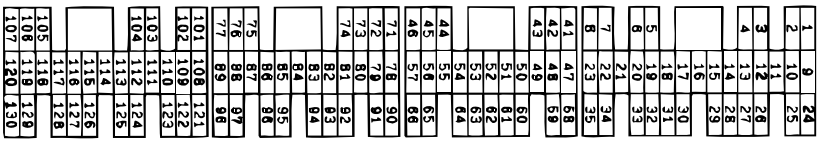

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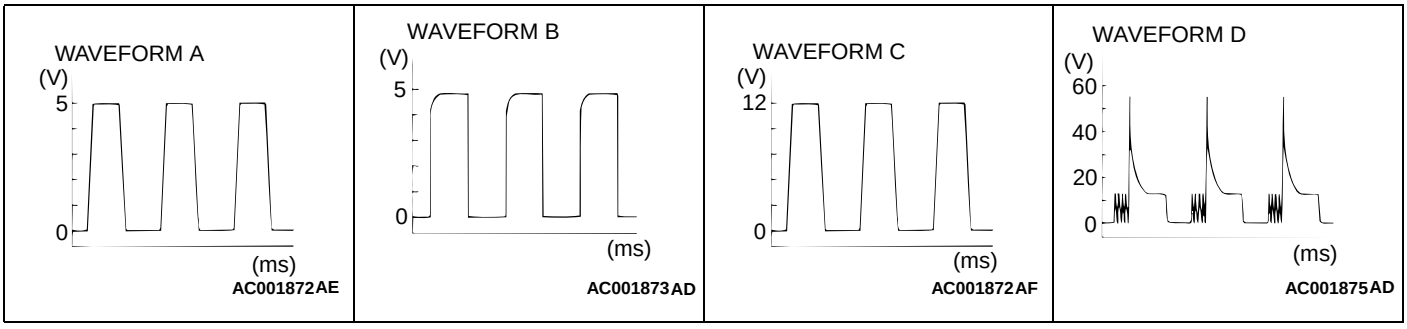
TERMINAL NO.	INSPECTION ITEM	NORMAL CONDITION (CHECK CONDITION)
57 – 124	A/T fluid temperature sensor	16.7 – 20.5 kΩ [at 0 °C (32 °F)]
		7.3 – 8.9 kΩ [at 20 °C (68 °F)]
		3.4 – 4.2 kΩ [at 40 °C (104 °F)]
		1.9 – 2.2 kΩ [at 60 °C (140 °F)]
		1.0 – 1.2 kΩ [at 80 °C (176 °F)]
		0.57 – 0.69 kΩ [at 100 °C (212 °F)]

INSPECTION PROCEDURE USING AN OSCILLOSCOPE

M1231008500131

TERMINAL NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION (WAVEFORM SAMPLE)
45	Crankshaft position sensor	Selector lever position: N	Idling (Vehicle stopped)	Waveform A
103	Input shaft speed sensor	Selector lever position: 3 <Vehicles without sport mode>, Sport mode <Vehicles with sport mode>	Driving at constant speed of 50 km/h (31 mph) in 3rd gear (2.4L Engine: 1,600 – 1,900 r/min, 3.0L Engine: 1,300 – 1,600 r/min)	Waveform B
104	Output shaft speed sensor			
80	Vehicle speed signal			Waveform C
129	Low-reverse solenoid valve	• Ignition switch: ON • Selector lever position: P • Engine: Stopped • Throttle (Accelerator) opening angle: Less than 1 Volt	Force drive each solenoid valve (Actuator test)	Waveform D
120	Underdrive solenoid valve			
106	Second solenoid valve			
130	Overdrive solenoid valve			
107	Torque converter clutch control solenoid			

Waveform sample



A/T FAULTY OPERATION PREVENTION MECHANISM DIAGNOSIS

INTRODUCTION TO A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS

M1232001600130

If the key interlock and shift lock mechanisms indicates a malfunction, the key interlock cable, the shift lock cable, or the selector lever assembly may be defective. In this case, follow troubleshooting below.

A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1232001700137

Use these steps to plan your diagnostic strategy. If your follow then carefully, you will be sure that you have exhausted most of the possible ways to find automatic transaxle key interlock and shift lock mechanisms fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify malfunction is eliminated.

SYMPTOM CHART

M1232001800219

SYMPTOMS	INSPECTION PROCEDURE	REFERENCE PAGE
Selector lever can be moved from "P" to "R" position without depressing brake pedal when ignition key is at any position other than "LOCK" (OFF) position.	1	P.23A-334
Selector lever cannot be moved from "P" to "R" position with brake pedal depressed when ignition key is at any position other than "LOCK" (OFF) position.	2	P.23A-335
Selector lever can be moved from "P" to "R" position with brake pedal depressed when ignition key is at "LOCK" (OFF) position.	3	P.23A-336
Selector lever cannot be moved from "P" to "R" position smoothly.	4	P.23A-337
Selector lever cannot be moved from "P" to "R" position.	5	P.23A-338
Ignition key cannot be turned to "LOCK" (OFF) position when selector lever is at "P" position.	6	P.23A-339
Ignition key can be turned to "LOCK" (OFF) position when selector lever is at any position other than "P" position.	7	P.23A-340

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Selector Lever can be Moved from "P" to "R" Position without Depressing Brake Pedal when Ignition Key is at any Position Other than "LOCK" (OFF) Position.

TECHNICAL DESCRIPTION (COMMENT)

- Lock cam or shift lock cable may be defective.

TROUBLESHOOTING HINTS

- Malfunction of lock cam
- Malfunction of shift lock cable

DIAGNOSIS

STEP 1. Check the fit of the lock cam.

Q: Is the lock cam installed correctly?
YES : Go to Step 2.
NO : Install the lock cam correctly. Refer to P.23A-361. When the brake pedal is released with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

STEP 2. Check the lock cam.

Q: Is the lock cam in good condition?
YES : Go to Step 3.
NO : Replace the lock cam. Refer to P.23A-361. When the brake pedal is released with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

STEP 3. Check the fit of the shift lock cable.

Q: Is the shift lock cable installed correctly?
YES : Go to Step 4.
NO : Install the shift lock cable correctly. Refer to P.23A-363. When the brake pedal is released with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

STEP 4. Check the shift lock cable.

Q: Is the shift lock cable in good condition?
YES : No action to be taken.
NO : Replace the shift lock cable. Refer to P.23A-363. When the brake pedal is released with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

INSPECTION PROCEDURE 2: Selector Lever cannot be Moved from "P" to "R" Position with Brake Pedal Depressed when Ignition Key is at any Position Other than "LOCK" (OFF) Position.

TECHNICAL DESCRIPTION (COMMENT)
Selector lever assembly, shift lock cable, key interlock cable, transmission control cable, or lock cam may be defective.

TROUBLESHOOTING HINTS
- Malfunction of selector lever assembly
- Malfunction of shift lock cable
- Malfunction of key interlock cable
- Malfunction of transmission control cable
- Malfunction of lock cam

DIAGNOSIS

STEP 1. Check the connection of lock cam and key interlock cable.

Q: Is the connection of lock cam and key interlock cable in good condition?
YES : Go to Step 2.
NO : Repair the connection of lock cam and shift lock cable. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

STEP 2. Check the connection of selector lever assembly and shift transaxle control cable.

Q: Is the connection of selector lever assembly and shift transaxle control cable in good condition?
YES : Go to Step 3.
NO : Repair the connection of selector lever assembly and shift transaxle control cable. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

STEP 3. Check the fit of the shift lock cable.

Q: Is the shift lock cable installed correctly?
YES : Go to Step 4.
NO : Install the shift lock cable correctly. Refer to P.23A-363. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

STEP 4. Check the shift lock cable.

Q: Is the shift lock cable in good condition?
YES : Go to Step 5.
NO : Replace the shift lock cable. Refer to P.23A-363. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

STEP 5. Check the fit of the key interlock cable.

Q: Is the key interlock cable installed correctly?
YES : Go to Step 6.
NO : Install the key interlock cable correctly. Refer to P.23A-363. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

STEP 6. Check the key interlock cable.

Q: Is the key interlock cable in good condition?
YES : Go to Step 7.
NO : Replace the key interlock cable. Refer to P.23A-363. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

STEP 7. Check the fit of the transaxle control cable.

Q: Is the transaxle control cable installed correctly?
YES : Go to Step 8.
NO : Install the transaxle control cable correctly. Refer to P.23A-358. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

STEP 8. Check the transaxle control cable.

Q: Is the transaxle control cable in good condition?
YES : Repair or replace the selector lever assembly. Refer to P.23A-358 and P.23A-361. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.
NO : Replace the transaxle control cable. Refer to P.23A-358. When the brake pedal is depressed with the ignition key at other positions than "LOCK" (OFF) position, check that the selector lever can be moved from "P" position to "R" position.

INSPECTION PROCEDURE 3: Selector Lever can be Moved from "P" to "R" Position with Brake Pedal Depressed when Ignition Key is at "LOCK" (OFF) Position.

TECHNICAL DESCRIPTION (COMMENT)
Key interlock cable or lock cam may be defective.

TROUBLESHOOTING HINTS
- Malfunction of lock cam
- Malfunction of key interlock cable

DIAGNOSIS

STEP 1. Check the connection of lock cam and key interlock cable.

Q: Is the connection of lock cam and key interlock cable in good condition?
YES : Go to Step 2.
NO : Repair the connection of lock cam and shift lock cable. When the brake pedal is depressed with the ignition key at the "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

STEP 2. Check the fit of the lock cam.

Q: Is the lock cam installed correctly?
YES : Go to Step 3.
NO : Install the lock cam correctly. Refer to P.23A-361. When the brake pedal is depressed with the ignition key at the "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

STEP 3. Check the lock cam.

Q: Is the lock cam in good condition?
YES : Go to Step 4.
NO : Replace the lock cam. Refer to P.23A-361. When the brake pedal is depressed with the ignition key at the "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

STEP 4. Check the fit of the key interlock cable.

Q: Is the key interlock cable installed correctly?
YES : Go to Step 5.
NO : Install the key interlock cable correctly. Refer to P.23A-363. When the brake pedal is depressed with the ignition key at the "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

STEP 5. Check the key interlock cable.

Q: Is the key interlock cable in good condition?
YES : No action to be taken.
NO : Replace the key interlock cable. Refer to P.23A-363. When the brake pedal is depressed with the ignition key at the "LOCK" (OFF) position, check that the selector lever can not be moved from "P" position to "R" position.

INSPECTION PROCEDURE 4: Selector Lever cannot be Moved from "P" to "R" Position Smoothly.

TECHNICAL DESCRIPTION (COMMENT)
Key interlock cable, shift lock cable, transaxle control cable, lock cam, or selector lever assembly may be defective.

TROUBLESHOOTING HINTS
- Malfunction of key interlock cable
- Malfunction of shift lock cable
- Malfunction of transaxle control cable
- Malfunction of lock cam
- Malfunction of selector lever assembly

DIAGNOSIS

STEP 1. Check the connection of lock cam and key interlock cable.

Q: Is the connection of lock cam and key interlock cable in good condition?
YES : Go to Step 2.
NO : Repair the connection of lock cam and shift lock cable. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 2. Check the connection of selector lever assembly and transaxle control cable.

Q: Is the connection of selector lever assembly and transaxle control cable in good condition?
YES : Go to Step 3.
NO : Repair the connection of selector lever assembly and transaxle control cable. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 3. Check the fit of the lock cam.

Q: Is the lock cam installed correctly?
YES : Go to Step 4.
NO : Install the lock cam correctly. Refer to P.23A-361. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 4. Check the lock cam.

Q: Is the lock cam in good condition?
YES : Go to Step 5.
NO : Replace the lock cam. Refer to P.23A-361. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 5. Check the fit of the shift lock cable.

Q: Is the shift lock cable installed correctly?
YES : Go to Step 6.
NO : Install the shift lock cable correctly. Refer to P.23A-363. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 6. Check the shift lock cable.

Q: Is the shift lock cable in good condition?
YES : Go to Step 7.
NO : Replace the shift lock cable. Refer to P.23A-363. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 7. Check the fit of the key interlock cable.

Q: Is the key interlock cable installed correctly?
YES : Go to Step 8.
NO : Install the key interlock cable correctly. Refer to P.23A-363. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 8. Check the key interlock cable.

Q: Is the key interlock cable in good condition?
YES : Go to Step 9.
NO : Replace the key interlock cable. Refer to P.23A-363. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 9. Check the fit of the transaxle control cable.

Q: Is the transaxle control cable installed correctly?
YES : Go to Step 10.
NO : Install the transaxle control cable correctly. Refer to P.23A-358. Check that the selector lever can be moved from "P" position to "R" position smoothly.

STEP 10. Check the transaxle control cable.

Q: Is the transaxle control cable in good condition?
YES : Repair or replace the selector lever assembly. Refer to P.23A-358 and P.23A-361. Check that the selector lever can be moved from "P" position to "R" position smoothly.
NO : Replace the transaxle control cable. Refer to P.23A-358. Check that the selector lever can be moved from "P" position to "R" position smoothly.

INSPECTION PROCEDURE 5: Selector Lever cannot be Moved from "R" to "P" Position.

TECHNICAL DESCRIPTION (COMMENT)
Selector lever assembly, transaxle control cable, or lock cam may be defective.

TROUBLESHOOTING HINTS
- Malfunction of selector lever assembly
- Malfunction of transaxle control cable
- Malfunction of lock cam

STEP 2. Check the fit of the lock cam.

Q: Is the lock cam installed correctly?
YES : Go to Step 3.
NO : Install the lock cam correctly. Refer to P.23A-361. Check that the selector lever can be moved from "R" position to "P"

DIAGNOSIS

STEP 1. Check the connection of selector lever assembly and transaxle control cable.

Q: Is the connection of selector lever assembly and transaxle control cable in good condition?
YES : Go to Step 2.
NO : Repair the connection of selector lever assembly and transaxle control cable. Check that the selector lever can be moved from "R" position to "P" position.

position.

STEP 3. Check the lock cam.

Q: Is the lock cam in good condition?
YES : Go to Step 4.
NO : Replace the lock cam. Refer to P.23A-361. Check that the selector lever can be moved from "R" position to "P" position.

STEP 4. Check the fit of the transaxle control cable.

Q: Is the transaxle control cable installed correctly?
YES : Go to Step 5.
NO : Install the transaxle control cable correctly. Refer to P.23A-358. Check that the selector lever can be moved from "R" position to "P" position.

STEP 5. Check the transaxle control cable.

Q: Is the transaxle control cable in good condition?
YES : Repair or replace the selector lever assembly. Refer to P.23A-358 and P.23A-361. Check that the selector lever can be moved from "P" position to "R" position smoothly.
NO : Replace the transaxle control cable. Refer to P.23A-358. Check that the selector lever can be moved from "R" position to "P" position.

INSPECTION PROCEDURE 6: Ignition Key cannot be Turned to the "LOCK" (OFF) Position when Selector Lever is at "P" Position.

TECHNICAL DESCRIPTION (COMMENT)
Lock cam, steering lock cylinder assembly, transaxle control cable, or key interlock cable may be defective.

TROUBLESHOOTING HINTS
- Malfunction of lock cam
- Malfunction of key interlock cable
- Malfunction of transaxle control cable
- Malfunction of steering lock cylinder assembly

DIAGNOSIS

STEP 1. Check the connection of lock cam and key interlock cable.

Q: Is the connection of lock cam and key interlock cable in good condition?
YES : Go to Step 2.
NO : Repair the connection of lock cam and shift lock cable. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at "P" position.

STEP 2. Check the fit of the lock cam.

Q: Is the lock cam installed correctly?
YES : Go to Step 3.
NO : Install the lock cam correctly. Refer to P.23A-361. Check that the selector lever can be moved from "R" position to "P" position.

STEP 3. Check the lock cam.

Q: Is the lock cam in good condition?
YES : Go to Step 4.
NO : Replace the lock cam. Refer to P.23A-361. Check that the selector lever can be moved from "R" position to "P" position.

STEP 4. Check the fit of the key interlock cable.

Q: Is the key interlock cable installed correctly?
YES : Go to Step 5.
NO : Install the key interlock cable correctly. Refer to P.23A-363. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at "P" position.

STEP 5. Check the key interlock cable.

Q: Is the key interlock cable in good condition?
YES : Go to Step 6.
NO : Replace the key interlock cable. Refer to P.23A-363. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at "P" position.

STEP 6. Check the fit of the transaxle control cable.

Q: Is the transaxle control cable installed correctly?
YES : Replace the steering lock cylinder assembly. Refer to P.37A-21 and P.37A-23. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at "P" position.
NO : Install the transaxle control cable correctly. Refer to P.23A-358. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at "P" position.

INSPECTION PROCEDURE 7: Ignition Key can be Turned to the "LOCK" (OFF) Position when Selector Lever is at any Position Other than "P" Position.

TECHNICAL DESCRIPTION (COMMENT)
Lock cam, steering lock cylinder assembly, transaxle control cable, or key interlock cable may be defective.

TROUBLESHOOTING HINTS
- Malfunction of lock cam
- Malfunction of steering lock cylinder assembly
- Malfunction of transmission control cable
- Malfunction of key interlock cable

DIAGNOSIS

STEP 1. Check the connection of lock cam and key interlock cable.

Q: Is the connection of lock cam and key interlock cable in good condition?
YES : Go to Step 2.
NO : Repair the connection of lock cam and shift lock cable. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at any position other than "P" position.

STEP 2. Check the fit of the lock cam.

Q: Is the lock cam installed correctly?
YES : Go to Step 3.
NO : Install the lock cam correctly. Refer to P.23A-361. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at any position other than "P" position.

STEP 3. Check the lock cam.

Q: Is the lock cam in good condition?
YES : Go to Step 4.
NO : Replace the lock cam. Refer to P.23A-361. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at any position other than "P" position.

STEP 4. Check the fit of the key interlock cable.

Q: Is the key interlock cable installed correctly?
YES : Go to Step 5.
NO : Install the key interlock cable correctly. Refer to P.23A-363. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at any position other than "P" position.

STEP 5. Check the key interlock cable.

Q: Is the key interlock cable in good condition?
YES : Go to Step 6.
NO : Replace the key interlock cable. Refer to P.23A-363. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at any position other than "P" position.

STEP 6. Check the fit of the transaxle control cable.

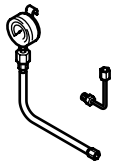
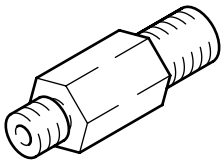
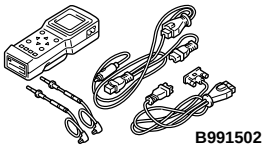
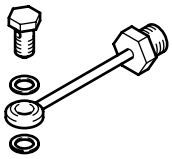
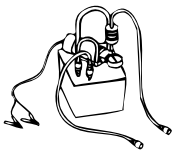
Q: Is the transaxle control cable installed correctly?

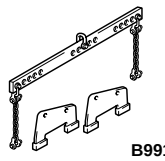
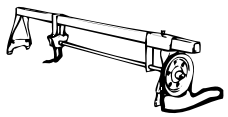
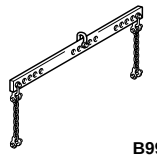
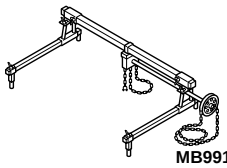
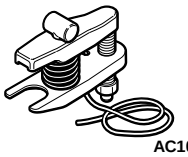
YES : Replace the steering lock cylinder assembly. Refer to P.37A-21 and P.37A-23. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at any position other than "P" position.

NO : Install the transaxle control cable correctly. Refer to P.23A-358. Check that the ignition key can not be turned to the "LOCK" (OFF) position with the selector lever at any position other than "P" position.

SPECIAL TOOLS

M1231000600167

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MD998330 (Includes MD998331) Oil pressure gauge (3.0 MPa, 427 psi)	MD998330-01	Measurement of hydraulic pressure
	MD998332 Adapter	MD998332-01	Connection for oil pressure gauge
	MD998478 Test harness (3 pin, triangle)	MD998478-01	Inspection using an oscilloscope
 B991502	MB991502 Scan tool (MUT-II)	MB991496-OD	Checking diagnostic trouble codes
	MB991709 Test harness set	Tool not available	Inspection using an oscilloscope
	MD998900 Adapter	MD998900-01	Connection for oil pressure gauge
	MB995062 Flushing tool	–	Flushing cooler and tube

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 B991453	MB991453 Engine hanger attachment set	MZ203827-01	When an engine lifer is used: Supporting the engine assembly during removal and installation of the transaxle
 MZ203827	GENERAL SERVICE TOOL MZ203827 Engine lifter	MZ203827-01	
 B991454	MB991454 Engine hanger balancer	MZ203827-01	When the engine hanger is used: Supporting the engine assembly during removal and installation of the transaxle *NOTE: Special tool MB991454 is a part of engine hanger attachment set MB991453.*
 MB991895	MB991895 Engine hanger	–	
 AC106827	MB991897 Ball joint remover	MB991113-01, MB990635-01 or general service tool	Knuckle and tie rod end ball joint breakaway torque check *NOTE: Steering linkage puller(MB990635 or MB991113)is also used to disconnect knuckle and tie rod end ball joint.*

ON-VEHICLE SERVICE

A/T CONTROL COMPONENT LAYOUT

M1231008600149

NAME	SYMBOL	NAME	SYMBOL
A/T control relay	D	Park/Neutral position (PNP) switch	F
A/T fluid temperature sensor	G	Power train control module (PCM)	H
Crankshaft position sensor <2.4L Engine>	E	Shift switch assembly <Vehicles with sport mode>	K
Crankshaft position sensor <3.0L Engine>	E	Solenoid valves	G
Data link connector	J	Stoplight switch	I
Dual pressure switch	A	Throttle position sensor <2.4L Engine>	B
Input shaft speed sensor	C	Throttle position sensor <3.0L Engine>	B
Output shaft speed sensor	C		

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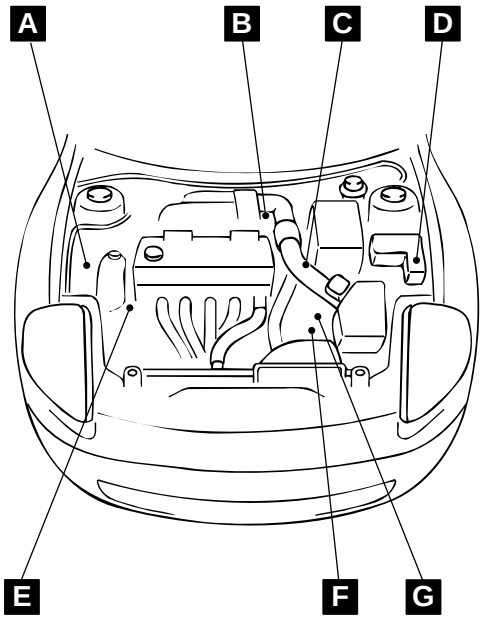

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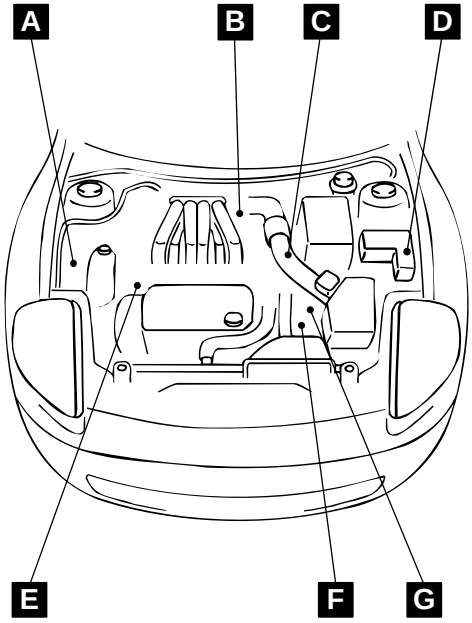

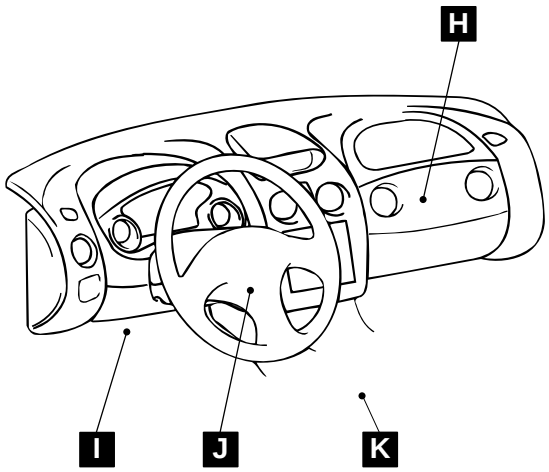

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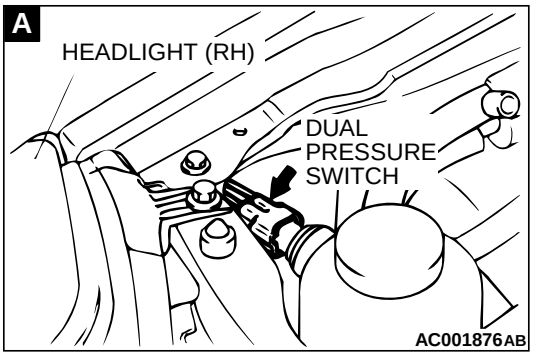

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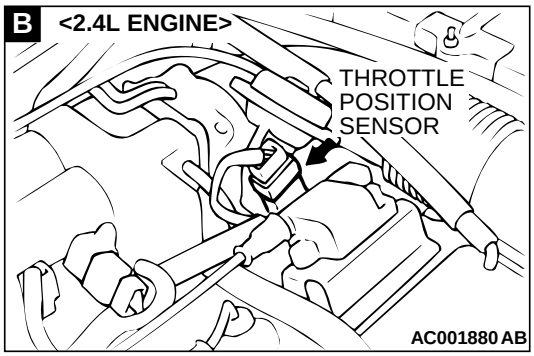

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TSB Revision

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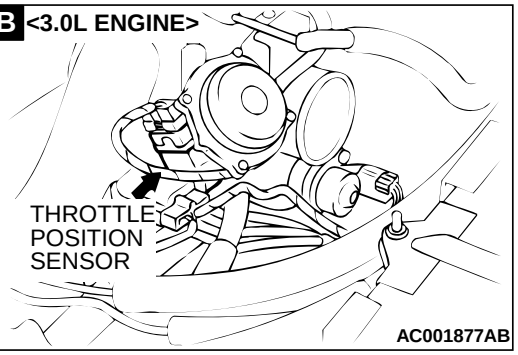

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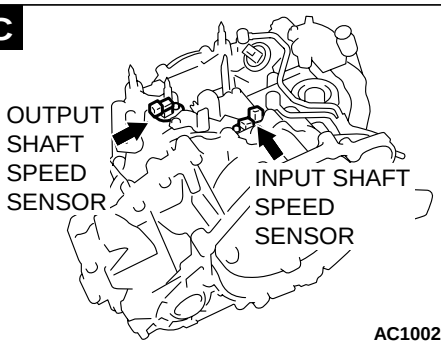

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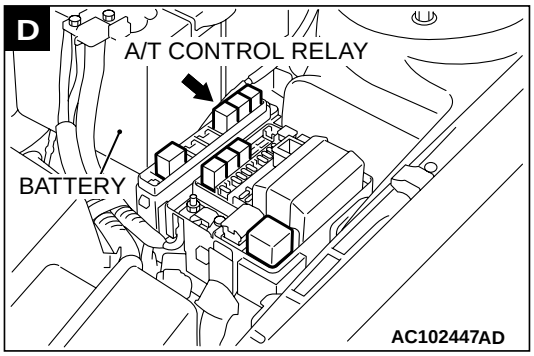

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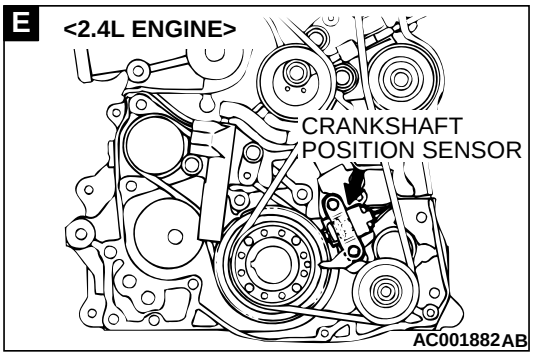

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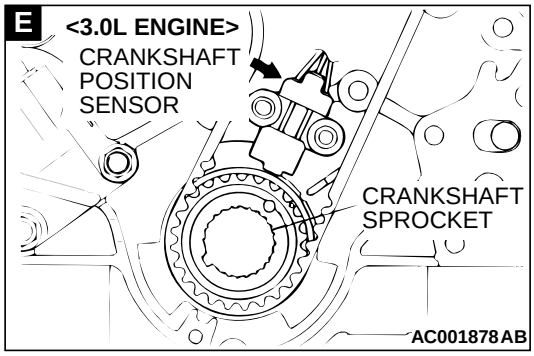

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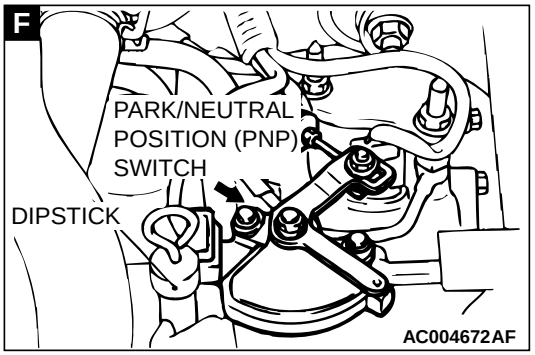

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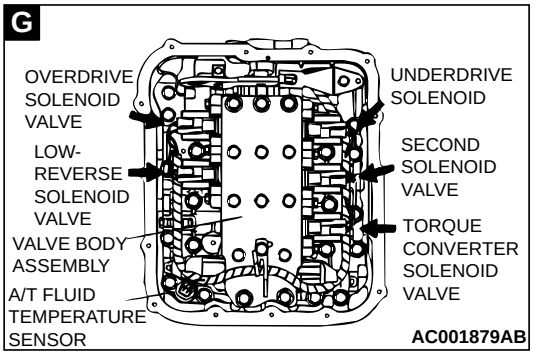

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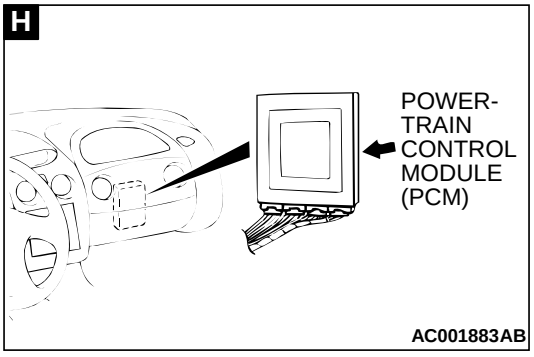
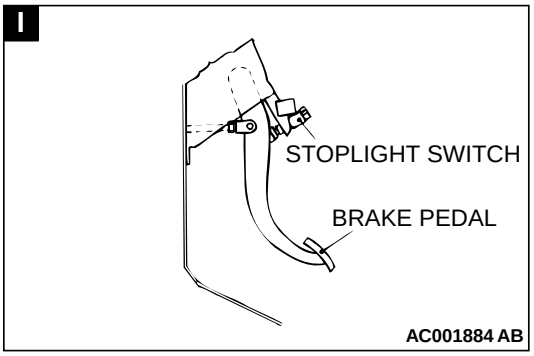
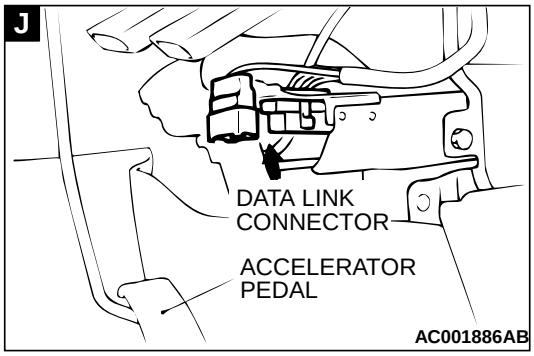
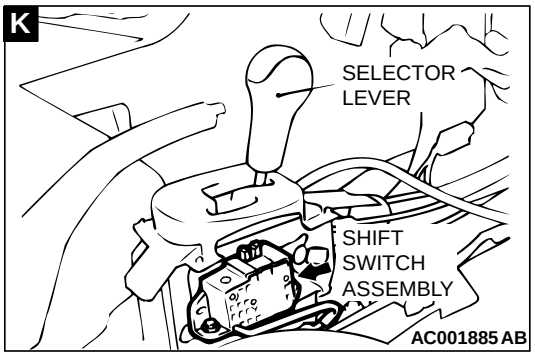


TSB Revision







ESSENTIAL SERVICE

A/T FLUID CHECK

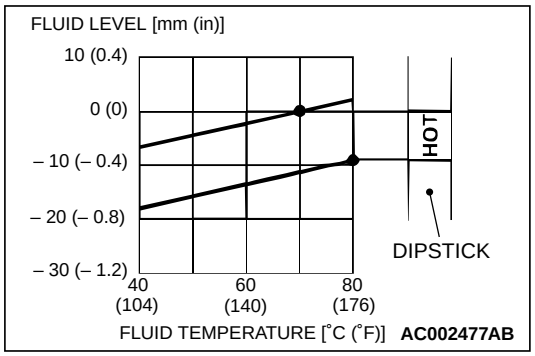
M1231000900157

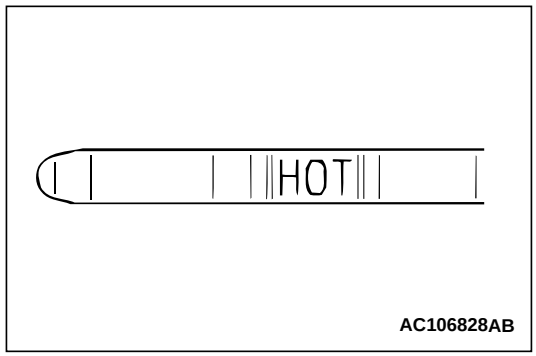
1. Drive the vehicle until the A/T fluid temperature rises to the normal temperature [70 – 80°C (158 – 176°F)].

   NOTE: The A/T fluid temperature is measured with scan tool (MUT-II).

   NOTE: If it takes some amount of time until the A/T fluid reaches its normal operating temperature [70 – 80°C (158 – 176°F)], check the A/T fluid level by referring to the left diagram.
2. Park the vehicle on a level surface.
3. Move the selector lever through all positions to fill the torque converter and the hydraulic circuits with fluid, and then move the selector lever to the "N" position.
4. After wiping off any dirt around the dipstick, remove the dipstick and check the condition of the A/T fluid.

   NOTE: If the A/T fluid smells as if it is burnt, it means that the A/T fluid has been contaminated by fine particles from the bushings and friction materials. A transaxle overhaul and cooler line flushing may be necessary.
5. Check that the A/T fluid level is at the "HOT" mark on the dipstick. If the A/T fluid level is lower than this, pour in more DIAMOND ATF SP III or equivalent until the level reaches the "HOT" mark.





NOTE: If the A/T fluid level is too low, the oil pump will draw in air along with the A/T fluid, which will cause bubbles to form. If the A/T fluid level is too high, rotating components inside the transaxle will churn the fluid and air into a foamy liquid. Both conditions (level too low or too high) will cause the hydraulic pressure to drop, which will result in late shifting and slipping of the clutches and brakes.

NOTE: In either case, air bubbles can interfere with normal valve, clutch, and brake operation. Also, foaming can cause A/T fluid to escape from the transaxle vents where case it may be mistaken for a leak.

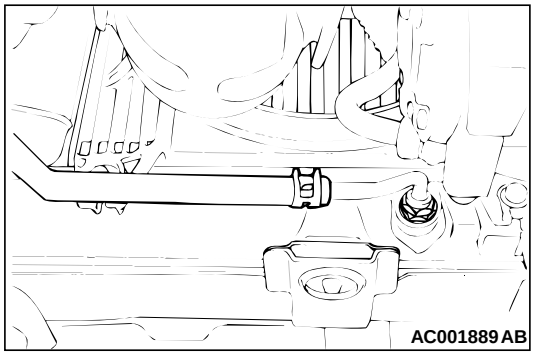
6. Securely insert the dipstick.

NOTE: The A/T fluid should always be replaced in the following conditions:

- *When troubleshooting the transaxle*
- *When overhauling the transaxle*
- *When the A/T fluid is noticeably dirty or burnt (driving under severe conditions)*

A/T FLUID REPLACEMENT

M1231001000146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If you have an A/T fluid changer, use this changer to replace the A/T fluid. If you do not have an A/T fluid changer, replace the A/T fluid by the following procedure.

1. Disconnect the hose shown in the illustration which connects the transaxle and the oil cooler (inside the radiator). Place a container under the hose to collect the discharge.

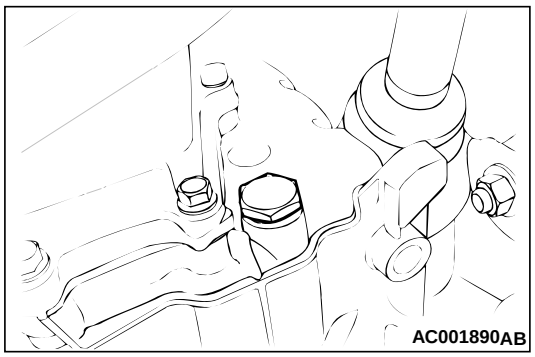
⚠ CAUTION

The engine should be stopped within one minute after it is started. If the A/T fluid has all drained out before then, the engine should be stopped at that point.

Discharge volume: Approximately 3.5 dm^3 (3.7 quarts)

2. Start the engine and let the A/T fluid drain out.

Running conditions: "N" range with engine idling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3. Remove the drain plug from the bottom of the transaxle case to drain the A/T fluid.

Discharge volume: Approximately 2.0 dm^3 (2.1 quarts)

4. Install the drain plug with a new gasket, and tighten it to the specified torque.

Tightening torque: 32 ± 2 N·m (24 ± 1 ft-lb)

⚠ CAUTION

Stop pouring if the full volume of A/T fluid cannot be poured in.

5. Pour new A/T fluid (DIAMOND ATF SP III or equivalent) in through the oil filter tube.

Adding volume: Approximately 5.5 dm^3 (5.8 quarts)

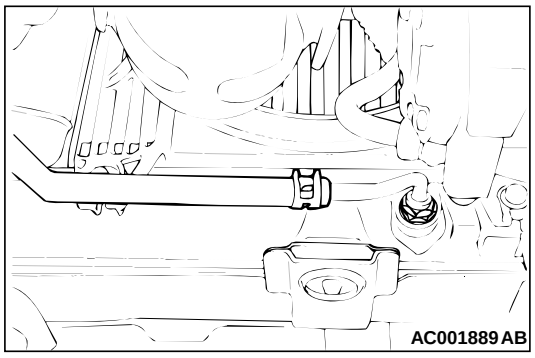
6. Repeat the procedure in Step 2. (to pump out the rest of the contaminated A/T fluid)

7. Pour the new A/T fluid in through the oil filler tube.

   Adding volume: Approximately 3.5 dm^3 (3.7 quarts)

   NOTE: Check for contamination or burnt smell. If fluid is still contaminated or burnt, repeat Steps 6 and 7 before proceeding to Step 8.

8. Reconnect the hose which was disconnected in step 1 above, and firmly replace the dipstick.
9. Start the engine and run it at idle for one to two minutes.
10. Move the selector lever through all positions, and then move it to the "N" position.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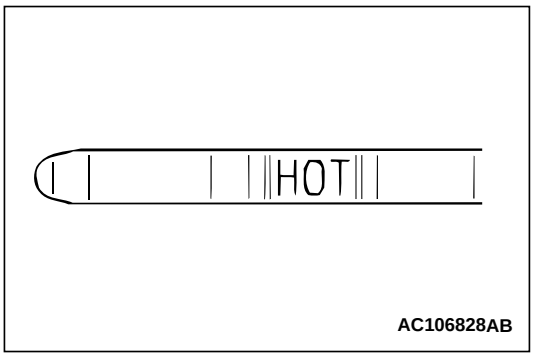

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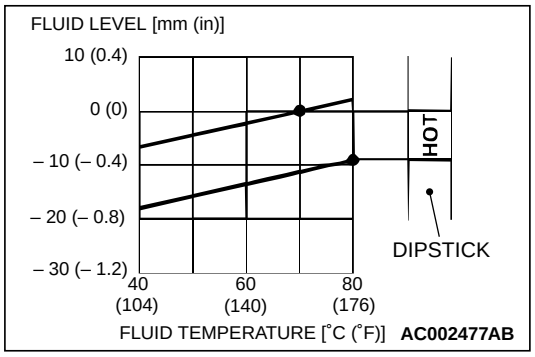
11. Check that the A/T fluid level is at the "COLD" mark on the dipstick. If the level is lower than this, pour in more A/T fluid.
12. Drive the vehicle until the A/T fluid temperature rises to the normal temperature [70 – 80°C (158 – 176°F)], and then check the A/T fluid level again. The A/T fluid level must be at the "HOT" mark.

    NOTE: The A/T fluid temperature is measured with scan tool (MUT-II).

    NOTE: The "COLD" level is for reference only; the "HOT" level should be regarded as the standard level.

    NOTE: If it takes some amount of time until the A/T fluid reaches its normal operating temperature [70 – 80°C (158 – 176°F)], check the A/T fluid level by referring to the left diagram.

13. When A/T fluid is under the specified level, pour in more A/T fluid. When A/T fluid is under the specified level, drain the excessive A/T fluid from the drain plug to adjust A/T fluid level to the specified level.
14. Firmly insert the dipstick into the oil filler tube.



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FLUSHING COOLERS AND TUBES

M1231013000143

Required Special Tool:
MB995062: Flushing Tool

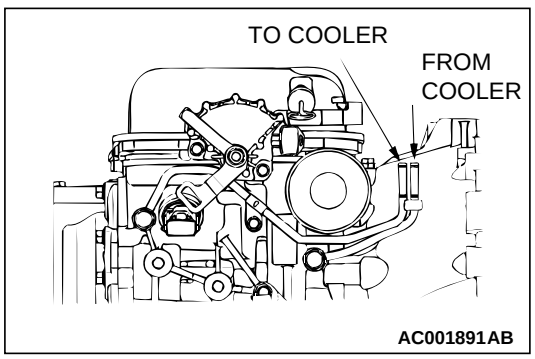
⚠ WARNING

- ***Wear protective eye wear that meets the requirements of OSHA and ANSI Z87.1 – 1968. Wear standard industrial rubber gloves.***
- ***Keep lighted cigarettes, sparks, flames, and other ignition sources away from the area to prevent the ignition of combustible liquids and gases. Keep a class (B) fire extinguisher in the area where the flushing tool will be used. Keep the area well ventilated. Do not let flushing solvent come in contact with eyes or skin. In case it does, flush with water for 15 to 20 seconds. Remove contaminated clothing and wash affected skin with soap and water. Seek medical attention.***

When a transaxle failure has contaminated the A/T fluid, the oil cooler(s) must be flushed. The cooler by-pass valve in the transaxle must also be replaced. The torque converter must also be replaced with an exchange unit. This will ensure that metal particles or sludged A/T fluid are not later transferred back into the reconditioned (or replaced) transaxle. There are two different procedures for flushing coolers and lines. The recommended procedure is to use Tool MB995062 Cooler Flusher. The other procedure is to use a hand suction gun and mineral spirits.

1. Remove the cover plate filler plug on special tool MB995062. Fill the reservoir 1/2 to 3/4 full of fresh flushing solution. Flushing solvents are petroleum based solutions generally used to clean transaxle components. Do not use solvents containing acids, water, gasoline, or any other corrosive liquids.
2. Reinstall filler plug on special tool MB995062.
3. Verify the pump power switch is turned "OFF." Connect the red alligator clip to the positive battery terminal. Connect the black alligator clip to a good ground.
4. Disconnect the cooler lines at the transaxle.

   NOTE: When flushing the transaxle cooler and lines, always reverse flush.
5. Connect the BLUE pressure line to the OUTLET (From) cooler line.
6. Connect the CLEAR return line to the INLET (To) cooler line.
7. Turn the pump "ON" for two to three minutes to flush the cooler(s) and lines. Monitor the pressure readings. Clear the return lines. Pressure readings should stabilize below 138 kPa (20 psi) for vehicles equipped with a single cooler and 208 kPa (30 psi) for vehicles equipped with dual coolers. If flow is intermittent or exceeds these pressures, replace the cooler.



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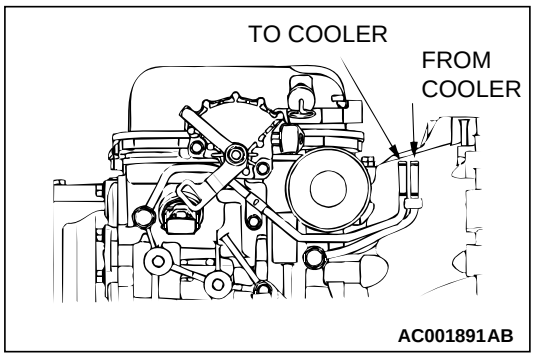
8. Turn the pump "OFF."
9. Disconnect the CLEAR suction line from the reservoir at cover plate. Disconnect the CLEAR return line at the cover plate, and place it in a drain pan.
10. Turn the pump "ON" for 30 seconds to purge flushing solution from the cooler and lines. Turn the pump "OFF."
11. Place the CLEAR suction line into a one quart container of DIAMOND ATF SP III or equivalent A/T fluid.
12. Turn the pump "ON" until all A/T fluid is removed from the one quart container and lines. This purges any residual cleaning solvent from the transaxle cooler and lines. Turn the pump "OFF."
13. Disconnect the alligator clips from the battery. Reconnect the flusher lines to the cover plate, and remove the flushing adapters from the cooler lines. Reconnect the cooler lines.

OIL COOLER FLOW CHECK

M1231013100139



After the new or repaired transaxle has been installed, fill to the proper level with DIAMOND ATF SP III or equivalent A/T fluid. The flow should be checked using the following procedure:

⚠ CAUTION

With the fluid set at the proper level, A/T fluid collection should not exceed one quart or internal damage to the transaxle may occur.

1. Disconnect the OUTLET (From cooler) line at the transaxle and place a collecting container under the disconnected line.
2. Run the engine at curb idle speed with the shift selector in neutral.
3. If A/T fluid flow is intermittent or it takes more than 20 seconds to collect one quart of A/T fluid, replace the cooler.
4. If flow is found to be within acceptable limits, reconnect the cooler line. Then fill the transaxle to the proper level, using DIAMOND ATF SP III or equivalent fluid.

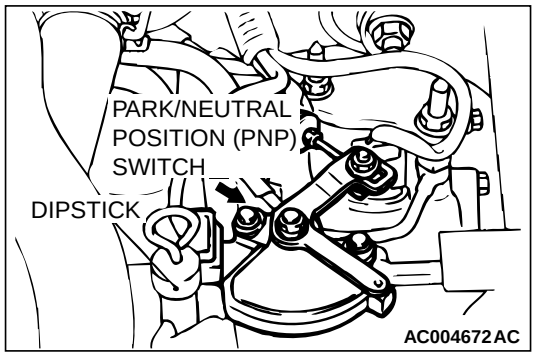
THROTTLE POSITION SENSOR ADJUSTMENT

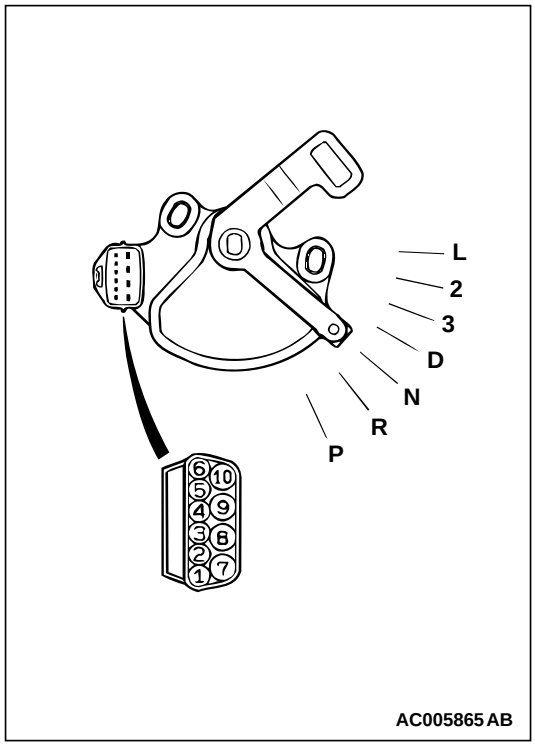
M1231001900127

Refer to GROUP 13A <2.4L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13A-576.
Refer to GROUP 13B <3.0L Engine>, On-vehicle Service – Throttle Position Sensor Adjustment P.13B-677.

PARK/NEUTRAL POSITION SWITCH CONTINUITY CHECK

M1231001400252



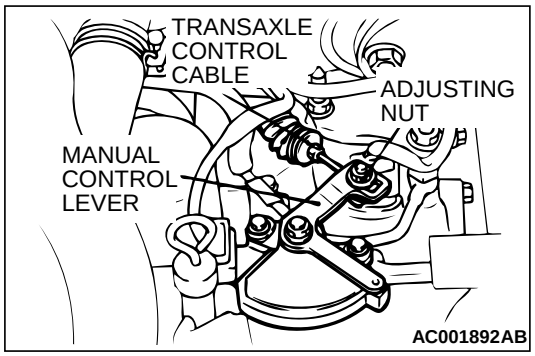


ITEMS	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohm
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

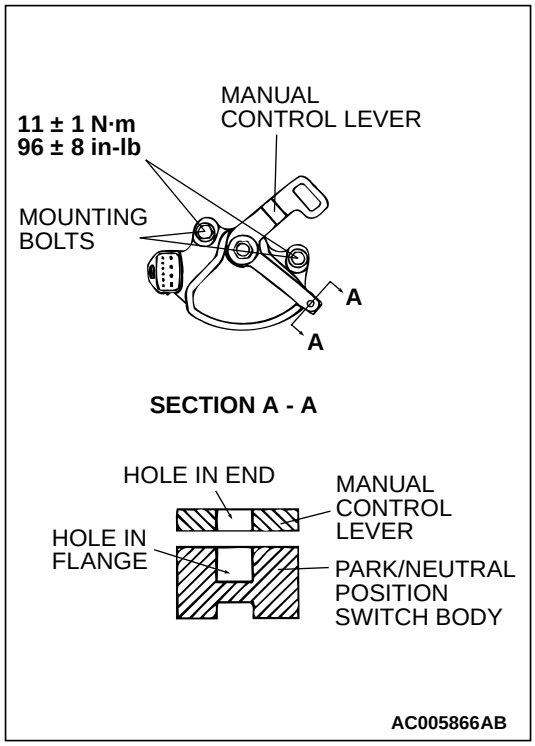
NOTE: For vehicles with sport mode, four positions (P, R, N, D) are used.

PARK/NEUTRAL POSITION SWITCH AND CONTROL CABLE ADJUSTMENT

M1231010300134



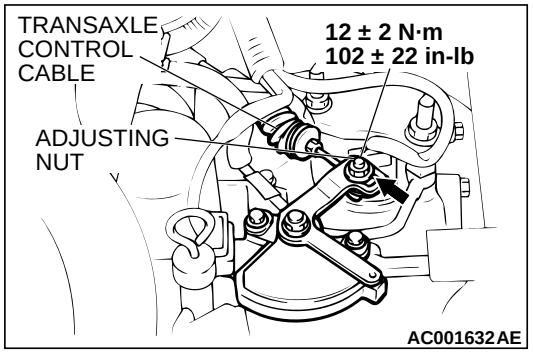
1. Set the selector lever to the "N" position.
2. Loosen the control cable to the manual control lever coupling nut to free the cable and lever.
3. Set the manual control lever to the neutral position.



4. Loosen the park/neutral position switch body mounting bolts and turn the park/neutral position switch body so the hole in the end of the manual control lever and the hole (section A – A in the figure on the left) in the flange of the park/neutral position switch body flange are aligned.

   NOTE: The park/neutral position switch body can be aligned by inserting a 5-mm diameter steel bar into the end hole of the manual control lever and the flange hole of the park/neutral position switch body.
5. Tighten the park/neutral position switch body mounting bolts to the specified torque. Be careful at this time that the switch body does not move.

   Tightening torque: 11 ± 1 N·m (96 ± 8 in-lb)



6. Gently push the transaxle control cable in the direction of the arrow, until the cable is taut. Tighten the adjusting nut.

   Tightening torque: 12 ± 2 N·m (102 ± 22 in-lb)
7. Check that the selector lever is in the "N" position.
8. Check that each position of the manual control lever matches each position of the selector lever and using scan tool.

AUTOMATIC TRANSAXLE CONTROL COMPONENT CHECK

CRANKSHAFT POSITION SENSOR CHECK

M1231009000151

Refer to GROUP 13A <2.4L Engine>, Diagnosis – Inspection Procedure Using an Oscilloscope P.13A-560.
Refer to GROUP 13B <3.0L Engine>, Diagnosis – Inspection Procedure Using an Oscilloscope P.13B-661.

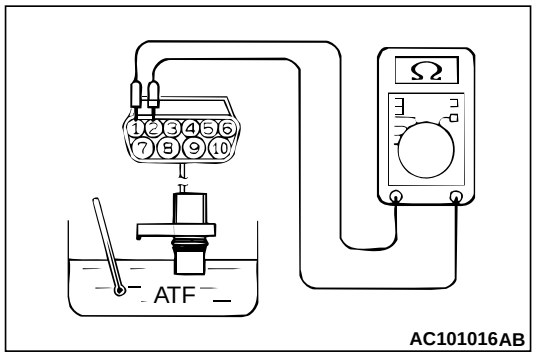
THROTTLE POSITION SENSOR CHECK

M1231003900123

Refer to GROUP 13A <2.4L Engine>, On-vehicle Service – Throttle Position Sensor Check P.13A-584.
Refer to GROUP 13B <3.0L Engine>, On-vehicle Service – Throttle Position Sensor Check P.13B-683.

A/T FLUID TEMPERATURE SENSOR CONTINUITY CHECK

M1231004500139



1. Remove the A/T fluid temperature sensor.
2. Measure the resistance between terminals 1 and 2 of the A/T fluid temperature sensor connector.

   Standard value:

A/T FLUID TEMPERATURE	RESISTANCE
0°C (32°F)	16.7 – 20.5 kΩ
20°C (68°F)	7.3 – 8.9 kΩ
40°C (104°F)	3.4 – 4.2 kΩ
60°C (140°F)	1.9 – 2.2 kΩ
80°C (176°F)	1.0 – 1.2 kΩ
100°C (212°F)	0.57 – 0.69 kΩ

3. If the A/T fluid temperature sensor resistance is not consistent with the fluid temperature, replace A/T fluid temperature sensor.

   NOTE: The N range indicator light on the combination meter flashes when the temperature reaches approximately 125°C (257°F) or higher, and then stops flashing when the temperature drops below approximately 115°C (239°F).

PARK/NEUTRAL POSITION SWITCH CHECK

M1231001400263

Refer to P.23A-351.

STOPLIGHT SWITCH CHECK

M1231009100114

Refer to GROUP 35A, On-vehicle Service – Stoplight Switch Check P.35A-18.

PRESSURE SWITCH CHECK

M1231004700122

Refer to GROUP 55A, On-vehicle Service – Pressure Switch Check P.55-25.

SELECT SWITCH CHECK

M1231012700064

Refer to P.23A-363.

SHIFT SWITCH (UP) CHECK

M1231012800050

Refer to P.23A-363.

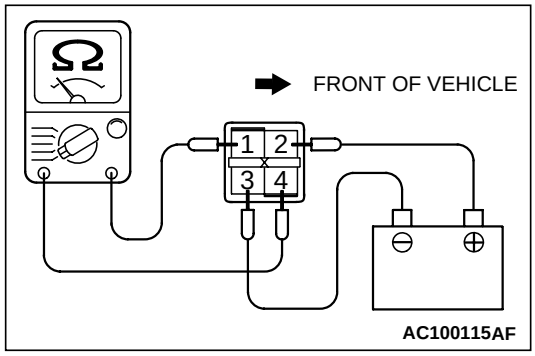
SHIFT SWITCH (DOWN) CHECK

M1231012900057

Refer to P.23A-363.

A/T CONTROL RELAY CHECK

M1231009300118



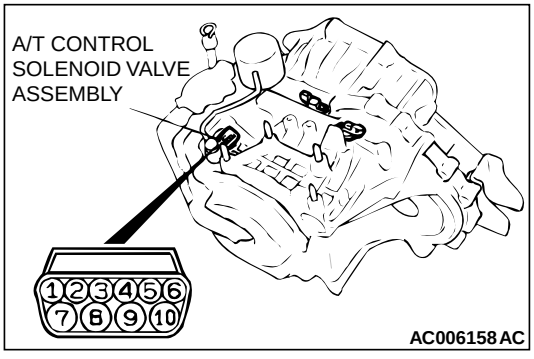
1. Remove the A/T control relay.
2. Use jumper wires to connect the A/T control relay terminal 2 to the positive battery terminal and terminal 3 to the negative battery terminal.
3. Check the continuity between terminal 1 and terminal 4 of the A/T control relay when the jumper wires are connected to and disconnected from the battery.

JUMPER WIRE	CONTINUITY BETWEEN TERMINALS NO.1 AND NO.4
Connected	Less than 2 ohm
Disconnected	Open circuit

4. If there is any problem with the A/T control relay, replace it.

SOLENOID VALVE CHECK

M1231009400115

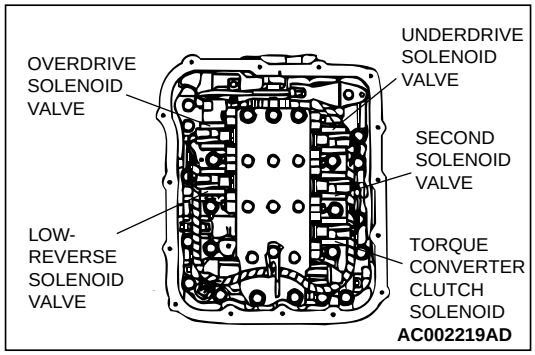


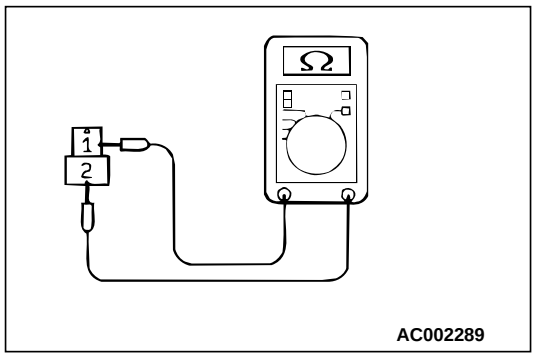
1. Use the scan tool to measure the ATF temperature and set the ATF temperature to 20°C (68°F).
2. Remove the A/T control solenoid valve assembly connector.
3. Measure the resistance between the solenoid valve terminals.
4. Check that the measured values are within the standard values at Steps 1 and 2.

Standard value:

TERMINAL CONNECTION OF TESTER	ITEMS	RESISTANCE
7 - 10	Torque converter clutch solenoid valve	2.7 – 3.4 Ω [at 20°C (68°F)]
6 - 10	Low-reverse solenoid valve	
4 - 9	Second solenoid valve	
3 - 9	Underdrive solenoid valve	
5 - 9	Overdrive solenoid valve	

5. If within the standard value, check the power supply and the ground circuits.
6. If not within the standard value, drain the ATF and remove the valve body cover.
7. Disconnect the connectors of each solenoid valve.





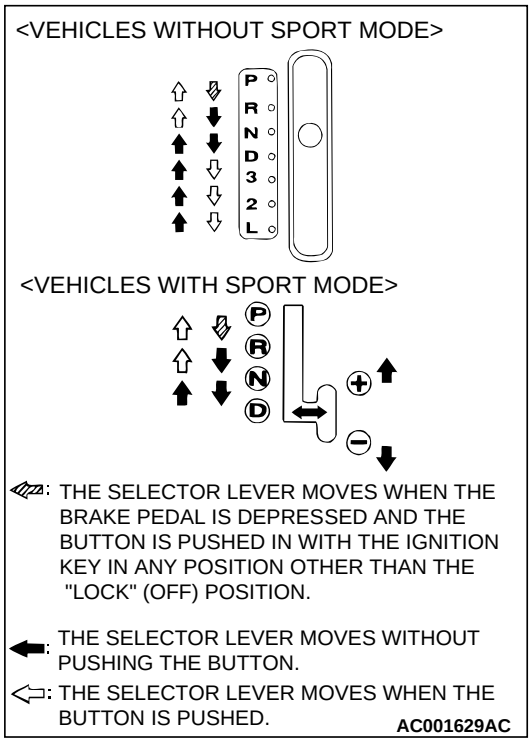
8. Measure the resistance between terminals 1 and 2 of each solenoid valve.

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

9. If the resistance is not within the standard value, replace the solenoid valve.
10. If within the standard value, check each wiring harness between A/T control solenoid valve assembly and each solenoid valve. If a problem is not found at the steps above, check the solenoid valve O-rings and replace if necessary.

SELECTOR LEVER OPERATION CHECK

M1231001300211



1. Apply the parking brake, and check that the selector lever moves smoothly and accurately to each position.
2. Check that the engine starts when the selector lever is at the "N" or "P" position, and that it does not start when the selector lever is in any other position.
3. Start the engine, release the parking brake, and check that the vehicle moves forward when the selector lever is moved from "N" position to "D," "3," "2" or "L" position or to 1st or 2nd gear in Sports mode, and that the vehicle reverses when the selector lever is moved to "R" position.
4. Stop the engine.
5. Turn the ignition switch to the "ON" position, and check that the backup lamp illuminates when the selector lever is shifted from "P" position to "R" position.

   NOTE: The A/T mis-operation prevention mechanism is provided so that the selector lever cannot be moved from the "P" position if the ignition switch is at a position other than the "LOCK" (OFF) position and the brake pedal is not depressed.

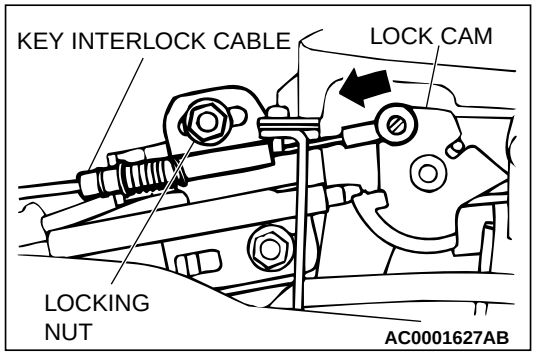
KEY INTERLOCK MECHANISM CHECK

M1232000900202

1. Carry out the following inspection.

INSPECTION PROCEDURE	INSPECTION REQUIREMENTS	INSPECTION ITEM (NORMAL CONDITION)	
1	Brake pedal: Depressed	Ignition key position: "LOCK" (OFF) or removed	Push in the selector lever push button. Shifting from "P" position to other positions is not possible.
2		Ignition key position: "ACC"	Push in the selector lever push button. Shifting from "P" position to other positions is possible.
3	Brake pedal: Not depressed	Selector lever: Other than "P" position	Turning the ignition key to "LOCK" (OFF) position is not possible.
4		Selector lever: "P" position	Turning the ignition key to "LOCK" (OFF) position smoothly is possible.

2. When any of the above checks are not normal, adjust the key interlock cable in following procedure.
   (1) Remove the floor console. (Refer to GROUP 52A – Floor Console P.52A-8.)
   (2) Shift selector lever to "P" position.
   (3) Turn the ignition key to "LOCK" (OFF) position.



(4) Loosen the locking nut of the key interlock cable.
(5) Push the cable joint on the lock cam gently toward the arrow until the cable stops. Tighten the locking nut.
(6) Install the floor console.

3. After adjusting, check the operation once more. If the operation is still incorrect, replace the key interlock cable. (Refer to P.23A-363.)

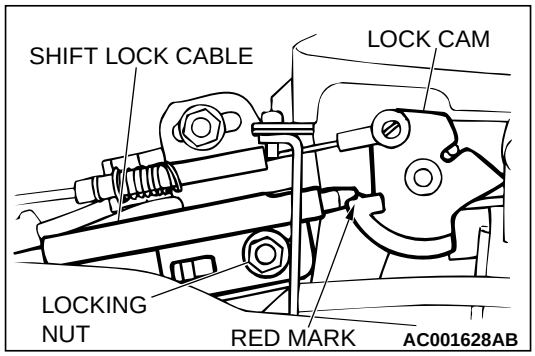
SHIFT LOCK MECHANISM CHECK

M1232001000194

1. Carry out the following inspections.

INSPECTION PROCEDURE	INSPECTION CONTENTS		CHECK DETAILS (NORMAL CONDITION)
1	Brake pedal: Not depressed	Ignition key position: "ACC"	Push in the selector lever push button. Shifting from "P" position to other positions is not possible.
2	Brake pedal: Depressed		Push in the selector lever push button. Shifting from "P" position to other positions smoothly is possible.
3	Brake pedal: Not depressed		Push in the selector lever push button. Shifting from "R" position to "P" position smoothly is possible.

2. When the above operations are defective, adjust the shift lock cable as follows:
(1) Remove the floor console. (Refer to GROUP 52A – Floor Console P.52A-8.)
(2) Shift selector lever to "P" position.
(3) Loosen the locking nut of shift lock cable.
(4) Tighten the locking nut so that the end of the shift lock cable comes above the red marking of the lock cam.
(5) Install the floor console.
3. After adjusting, check the operation once more. If the operation is still incorrect, replace the shift lock cable. (Refer to P.23A-363.)



TRANSAXLE CONTROL

REMOVAL AND INSTALLATION

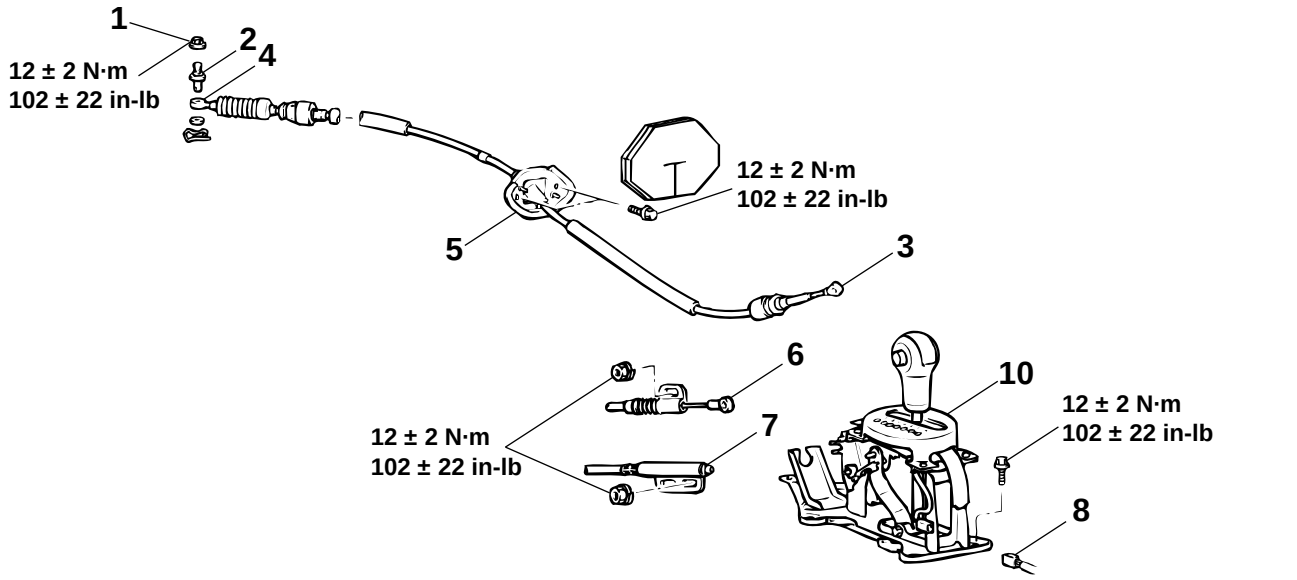
M1231006600165

⚠ CAUTION

When removing and installing the transmission control cable and shift lock cable unit, be careful not to hit the SRS-ECU.

Pre-removal and Post-installation Operation
- Air Cleaner Assembly Removal and Installation (Refer to GROUP 15 P.15-6.)
- Battery and Battery Tray Removal and Installation (Refer to GROUP 54A P.54A-8.)
- Front Driver's Side Under Cover Removal and Installation (Refer to GROUP 52A, Instrument Panel P.52A-3.)
- Floor Console Box Removal and Installation (Refer to GROUP 52A, Floor Console P.52A-8.)

<VEHICLES WITHOUT SPORT MODE>



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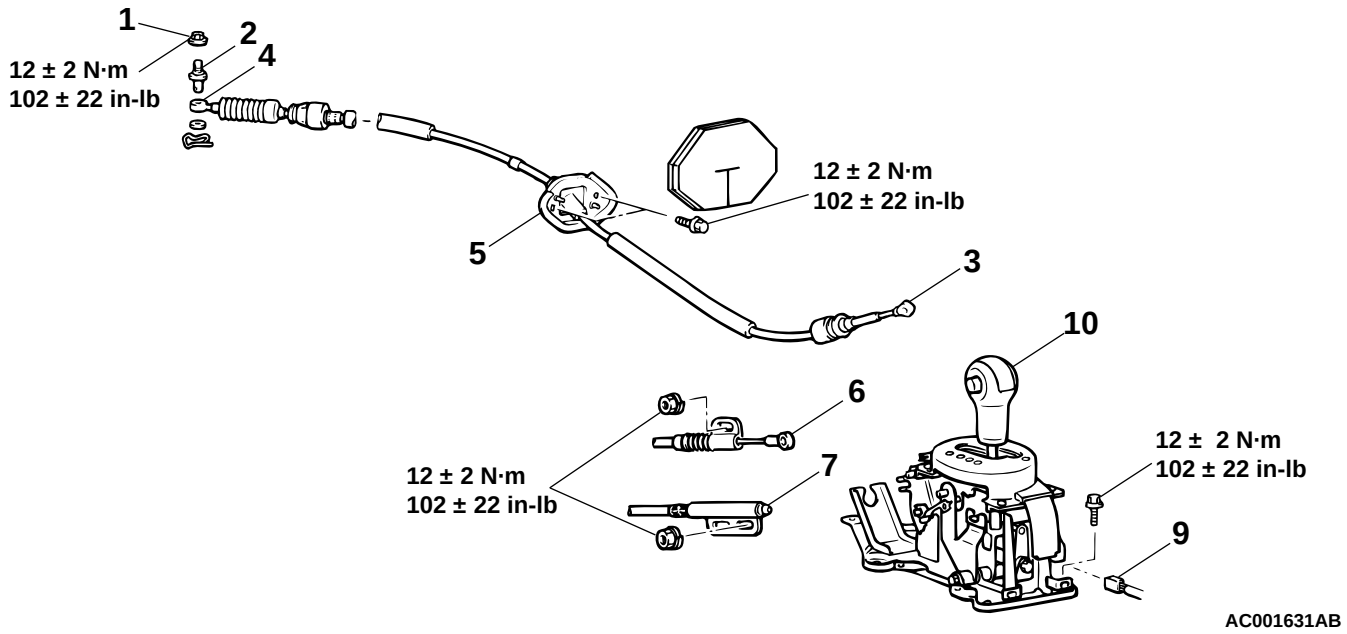
<VEHICLES WITH SPORT MODE>



TRANSAXLE CONTROL CABLE ASSEMBLY REMOVAL STEPS

>>C<< 1. NUT
2. ADJUSTER
3. TRANSAXLE CONTROL CABLE ASSEMBLY CONNECTION (SELECTOR LEVER ASSEMBLY SIDE)
4. TRANSAXLE CONTROL CABLE ASSEMBLY (TRANSAXLE SIDE)
- HEATER/COOLER UNIT (REFER TO GROUP 55, HEATER/COOLER UNIT, HEATER CORE AND EVAPORATOR P.55-35.)
5. TRANSAXLE CONTROL CABLE ASSEMBLY

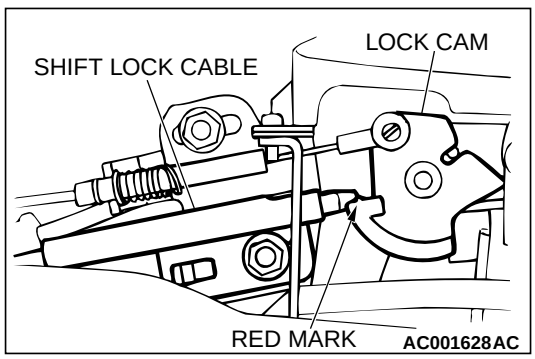
SELECTOR LEVER ASSEMBLY REMOVAL STEPS

3. TRANSAXLE CONTROL CABLE ASSEMBLY CONNECTION (SELECTOR LEVER ASSEMBLY SIDE)
>>B<< 6. KEY INTERLOCK CABLE CONNECTION (SELECTOR LEVER SIDE)
>>A<< 7. SHIFT LACK CABLE CONNECTION (SELECTOR LEVER SIDE)
8. A/T SELECTOR LEVER POSITION ILLUMINATION LIGHT CONNECTOR
9. HARNESS CONNECTOR
10. SELECTOR LEVER ASSEMBLY

INSTALLATION SERVICE POINTS

>>A<< SHIFT LOCK CABLE (SELECTOR LEVER SIDE) INSTALLATION

1. Place the selector lever to "P" position.
2. Fasten the shift lock cable at the position where the end of the shift lock cable is positioned above the red marking.



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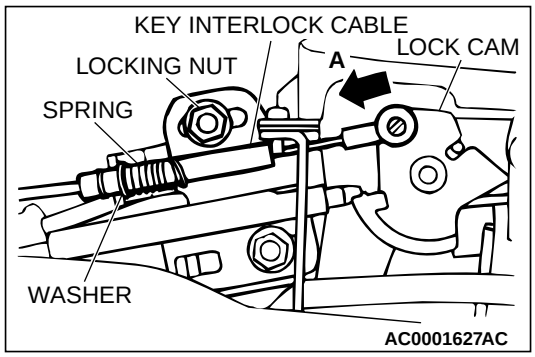
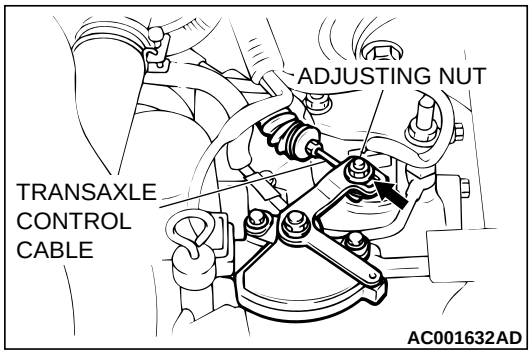


>>B<< KEY INTERLOCK CABLE (SELECTOR LEVER SIDE) INSTALLATION

1. Install the key interlock cable on the lock cam.
2. Install the spring and washer of the key interlock cable as shown.
3. While lightly pushing the cable coupling portion of the lock cam in the direction A, tighten the nut to the specified torque.

   Tightening torque: 12 ± 2 N·m (102 ± 22 in-lb)



>>C<< NUT INSTALLATION

1. Put the selector lever in the "N" position.
2. Loosen the nut. Gently push the transaxle control cable in the direction of the arrow until the cable is taut. Tighten the nut at the specified torque.

   Tightening torque: 12 ± 2 N·m (102 ± 22 in-lb)

INSPECTION

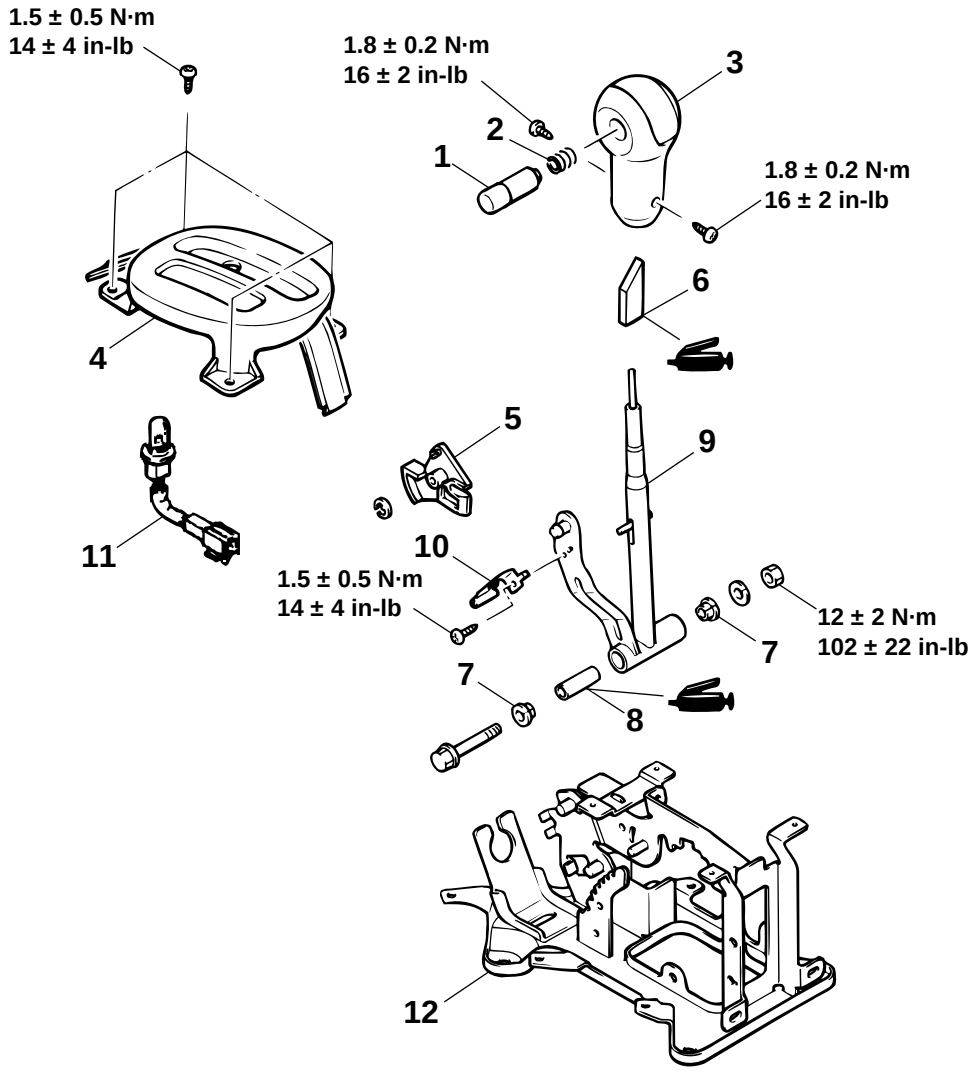
M1231006700117

Check the cable assembly for function and for damage.

DISASSEMBLY AND ASSEMBLY

M1231006800181

<VEHICLES WITHOUT SPORT MODE>



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REMOVAL STEPS

1. PUSH BUTTON
2. SPRING
3. SHIFT KNOB
4. INDICATOR PANEL ASSEMBLY
5. LOCK CAM
6. SLEEVE
7. BUSHING

REMOVAL STEPS (Continued)

8. PIPE
9. LEVER ASSEMBLY
10. DETENTE SPRING
11. POSITION INDICATOR LAMP ASSEMBLY
12. BASE BRACKET

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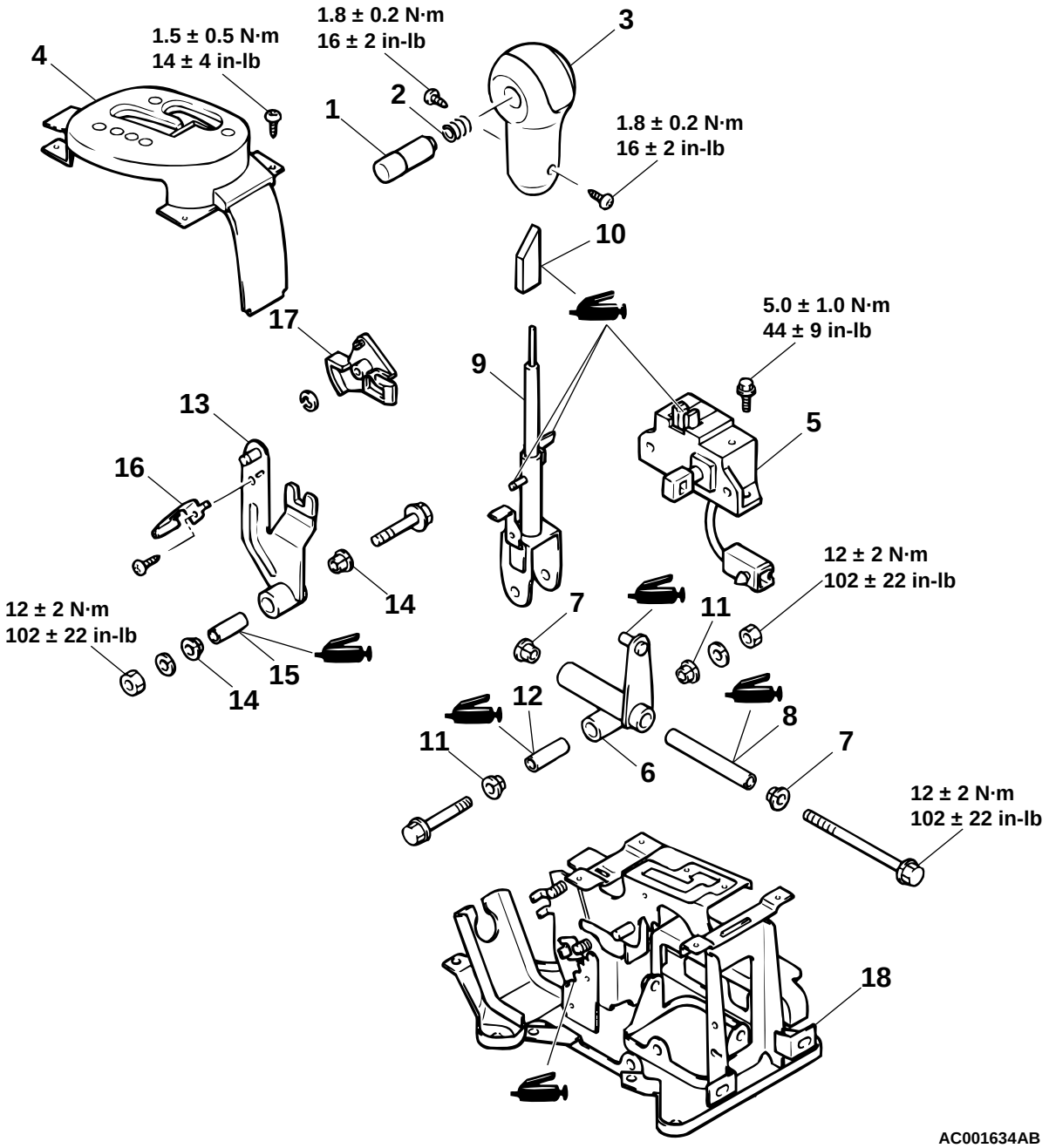
<VEHICLES WITH SPORT MODE>



REMOVAL STEPS

1. PUSH BUTTON
2. SPRING
3. SHIFT KNOB
4. INDICATOR PANEL ASSEMBLY
5. SHIFT SWITCH
6. SELECT LEVER
7. BUSHING
8. PIPE
9. LEVER ASSEMBLY

REMOVAL STEPS (Continued)

10. SLEEVE
11. BUSHING
12. PIPE
13. CABLE ARM
14. BUSHING
15. PIPE
16. DETENTE SPRING
17. LOCK CAM
18. BASE BRACKET

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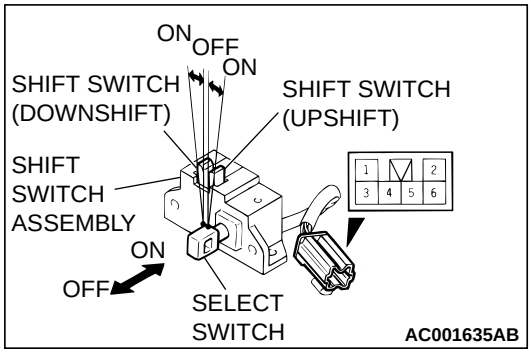
INSPECTION

M1231006900111



SHIFT SWITCH ASSEMBLY CONTINUITY CHECK

SWITCH POSITION		TERMINAL NO.
Select switch	ON	1 – 5
	OFF	1 – 2
Shift switch (up shift)	ON	3 – 6
	OFF	–
Shift switch (down shift)	ON	4 – 6
	OFF	–

A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS

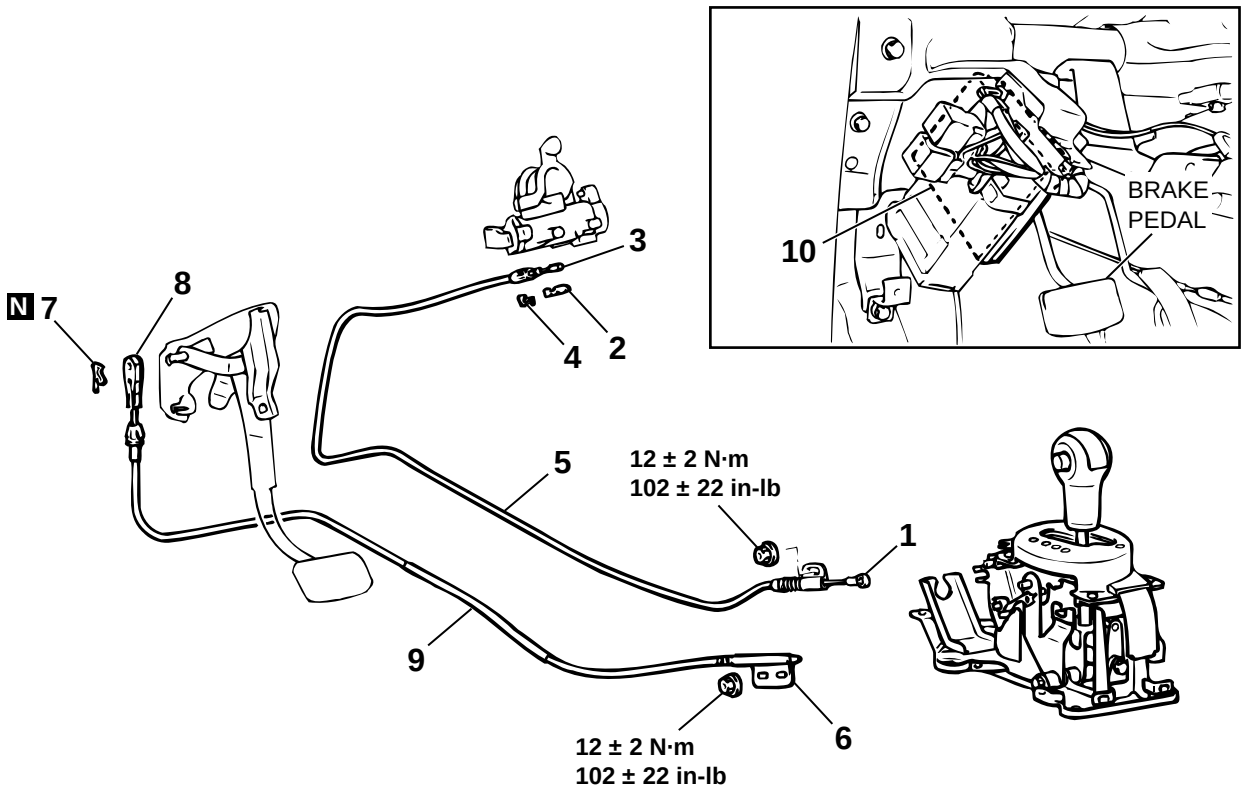
REMOVAL AND INSTALLATION

M1232001200217

⚠ CAUTION

When removing and installing the transmission control cable and shift lock cable unit, be careful not to hit the SRS-ECU.

Pre-removal and Post-installation Operation
Floor Console Removal and Installation (Refer to GROUP 52A, Floor Console P.52A-8.)



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KEY INTERLOCK CABLE REMOVAL STEPS

>>C<< 1. KEY INTERLOCK CABLE CONNECTION (SELECTOR LEVER SIDE)
- LOWER COLUMN COVER (REFER TO GROUP 37A, STEERING WHEEL AND SHAFT P.37A-21.)

2. COVER
>>B<< 3. KEY INTERLOCK CABLE CONNECTION (STEERING LOCK CYLINDER SIDE)
4. SLIDER
5. KEY INTERLOCK CABLE

SHIFT LOCK CABLE REMOVAL STEPS

>>A<< 6. SHIFT LOCK CABLE CONNECTION (SELECTOR LEVER SIDE)
7. COTTER PIN
8. SHIFT LOCK CABLE CONNECTION (BRAKE PEDAL SIDE)
9. SHIFT LOCK CABLE

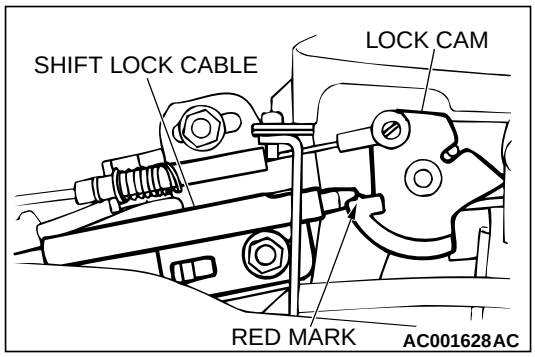
ETACS-ECU REMOVAL

10. ETACS-ECU

INSTALLATION SERVICE POINTS

>>A<< SHIFT LOCK CABLE (SELECTOR LEVER SIDE) INSTALLATION

1. Place the selector lever to "P" position.
2. Fasten the shift lock cable at the position where the end of the shift lock cable is positioned above the red marking.



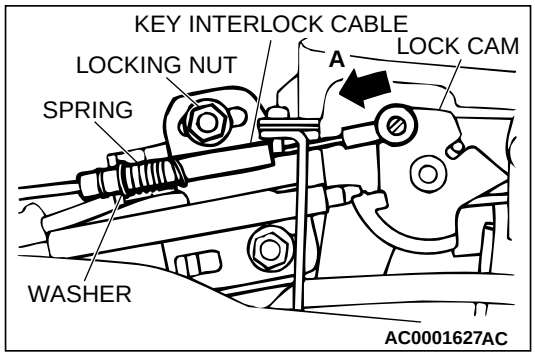
>>B<< KEY INTERLOCK CABLE (STEERING LOCK CYLINDER SIDE) INSTALLATION

Turn the ignition key to the "LOCK" (OFF) position and install the key interlock cable.

>>C<< KEY INTERLOCK CABLE (SELECTOR LEVER SIDE) INSTALLATION

1. Install the key interlock cable on the lock cam.
2. Install the spring and washer of the key interlock cable as shown.
3. While lightly pushing the cable coupling portion of the lock cam in the direction A, tighten the locking nut to the specified torque.

   Tightening torque: 12 ± 2 N·m (102 ± 22 in-lb)



INSPECTION

M1232001300117

Check the cable assembly for function and for damage.

TRANSAXLE ASSEMBLY

REMOVAL AND INSTALLATION

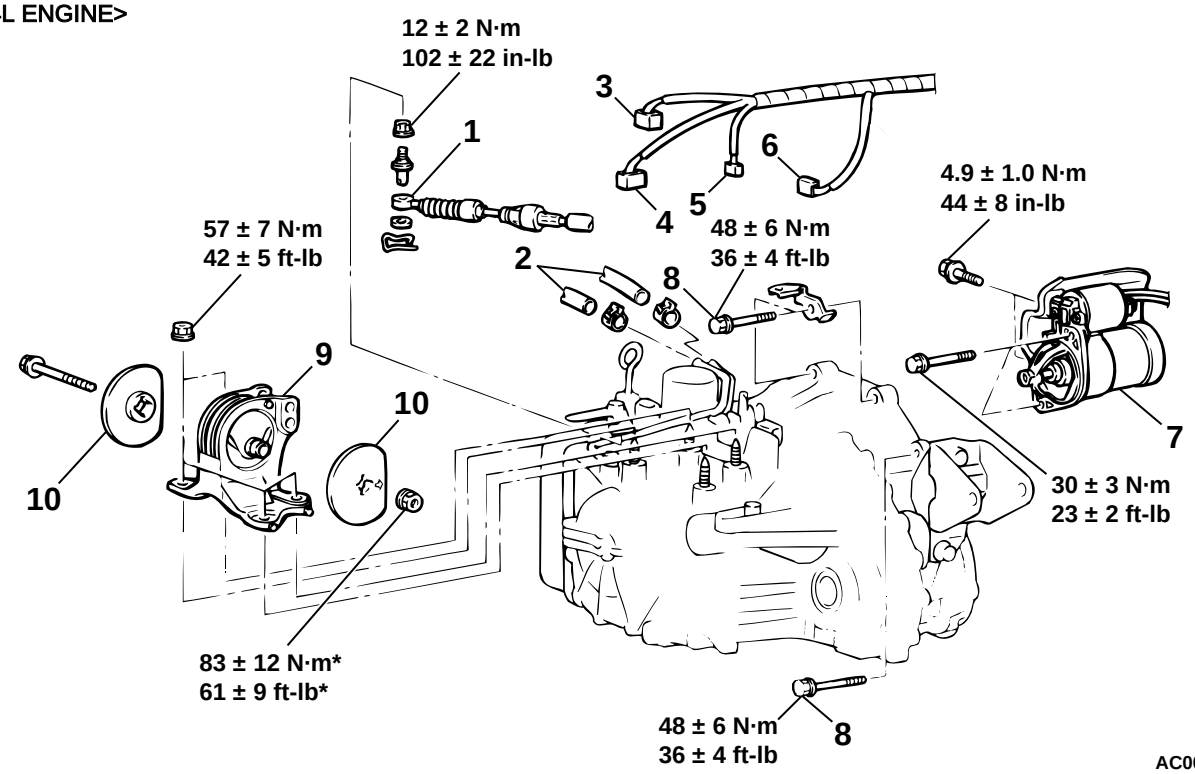
M1231005700181

⚠ CAUTION

***: Indicates parts which should be temporarily tightened, and then fully tightened after placing the vehicle on the ground and loading the full weight of the engine on the vehicle body.**

Pre-removal Operation	Post-installation Operation
• Transmission Fluid Draining (Refer to GROUP 00, Maintenance Service – Automatic Transmission Fluid P.00-53.) • Under Cover Removal • Battery and Battery Tray Removal (Refer to GROUP 54A, Battery P.54A-8.) • Air Cleaner Assembly Removal (Refer to GROUP 15, Air Cleaner P.15-6.)	• Air Cleaner Assembly Installation (Refer to GROUP 15, Air Cleaner P.15-6.) • Battery and Battery Tray Installation (Refer to GROUP 54A, Battery P.54A-8.) • Under Cover Installation • Transmission Fluid Supplying (Refer to GROUP 00, Maintenance Service – Automatic Transmission Fluid P.00-53.) • Selector Lever Operation Check (Refer to P.23A-356.) • Speedometer Operation Check (Refer to GROUP 54A, Combination Meter – On-vehicle Service – Speedometer Check P.54A-8.)

<2.4L ENGINE>



AC001637AE

REMOVAL STEPS

1. TRANSAXLE CONTROL CABLE
2. TRANSAXLE OIL COOLER HOSE
3. PARK/NEUTRAL SOLENOID VALVE ASSEMBLY CONNECTOR
4. A/T CONTROL SOLENOID VALVE ASSEMBLY CONNECTOR
5. INPUT SHAFT SPEED SENSOR CONNECTOR

<<A>>

<<B>>

>>B<<

<<C>>

REMOVAL STEPS (Continued)

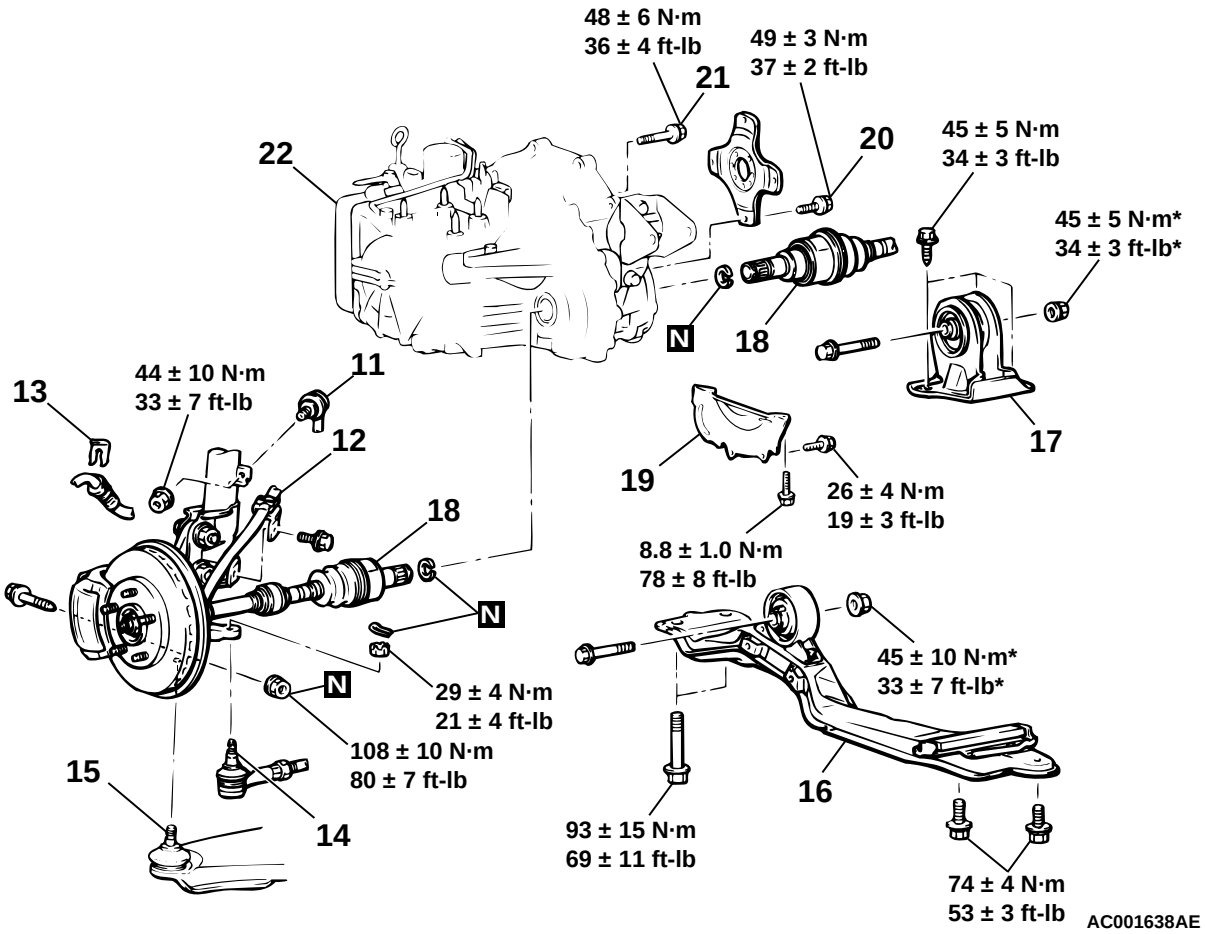
6. OUTPUT SHAFT SPEED SENSOR CONNECTOR
7. STARTER MOTOR
8. TRANSAXLE ASSEMBLY UPPER PART COUPLING BOLTS
9. TRANSAXLE MOUNT BRACKET
10. TRANSAXLE MOUNT STOPPER

• ENGINE ASSEMBLY SUPPORTING

TSB Revision

⚠ CAUTION

***: Indicates parts which should be temporarily tightened, and then fully tightened after placing the vehicle on the ground and loading the full weight of the engine on the vehicle body.**



REMOVAL STEPS

- LIFTING UP OF THE VEHICLE

11. STABILIZER LINK <STRUT SIDE>
12. SPEED SENSOR CABLE <VEHICLES WITH ABS>
13. BRAKE HOSE CLAMP

<<D>> 14. TIE ROD END

<<D>> 15. LOWER ARM

REMOVAL STEPS (Continued)

16. CENTERMEMBER ASSEMBLY
17. REAR ROLL STOPPER

<<E>> 18. DRIVE SHAFT

19. BELL HOUSING COVER

<<F>> 20. DRIVE PLATE BOLTS

<<F>> 21. TRANSAXLE ASSEMBLY LOWER PART COUPLING BOLTS

<<F>> >>A<< 22. TRANSAXLE ASSEMBLY

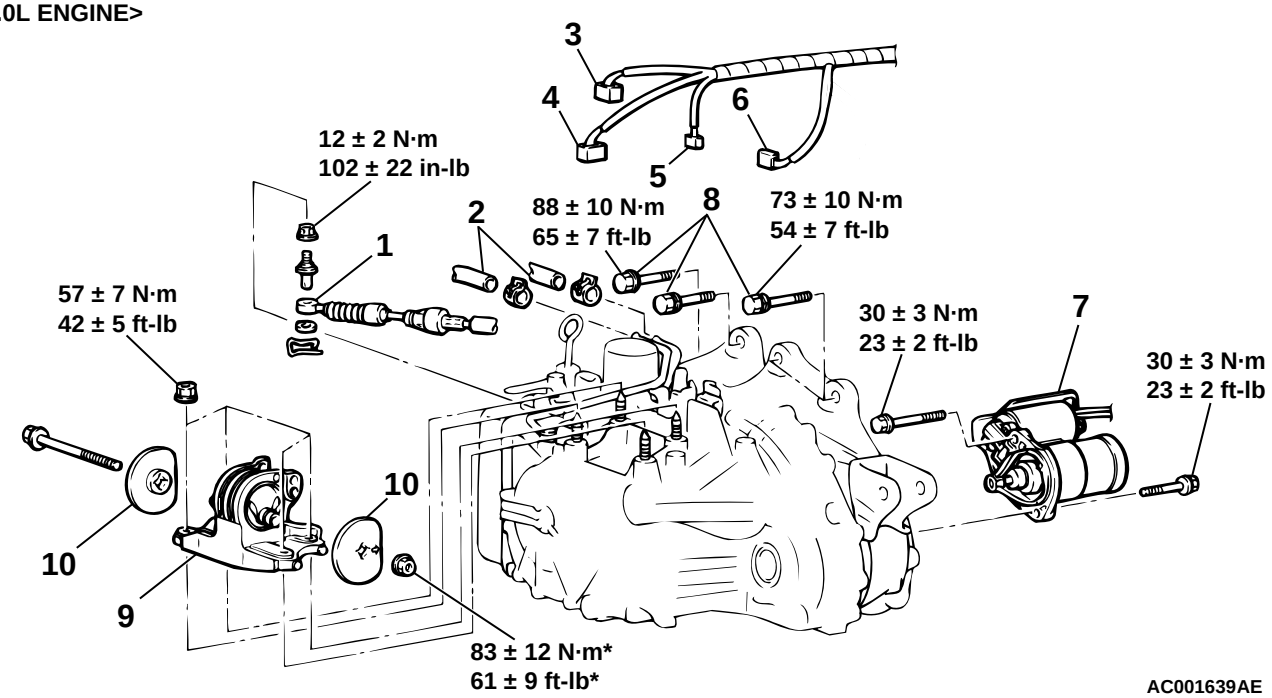
Required Special Tools:

- MB991113: Steering Linkage Puller
- MB991453: Engine Hanger Attachment Set
- MZ203827: Engine Lifter
- MB991454: Engine Hanger Balancer (a part of MB991453 Engine Hanger Attachment Set)
- MB991895: Engine Hanger

⚠ CAUTION

***: Indicates parts which should be temporarily tightened, and then fully tightened after placing the vehicle on the ground and loading the full weight of the engine on the vehicle body.**

<3.0L ENGINE>



AC001639AE

REMOVAL STEPS

1. TRANSAXLE CONTROL CABLE
2. TRANSAXLE OIL COOLER HOSES **<<A>>**
3. PARK/NEUTRAL POSITION SWITCH CONNECTOR
4. A/T CONTROL SOLENOID VALVE ASSEMBLY CONNECTOR **<<B>>**
5. INPUT SHAFT SPEED SENSOR CONNECTOR **<<C>>**

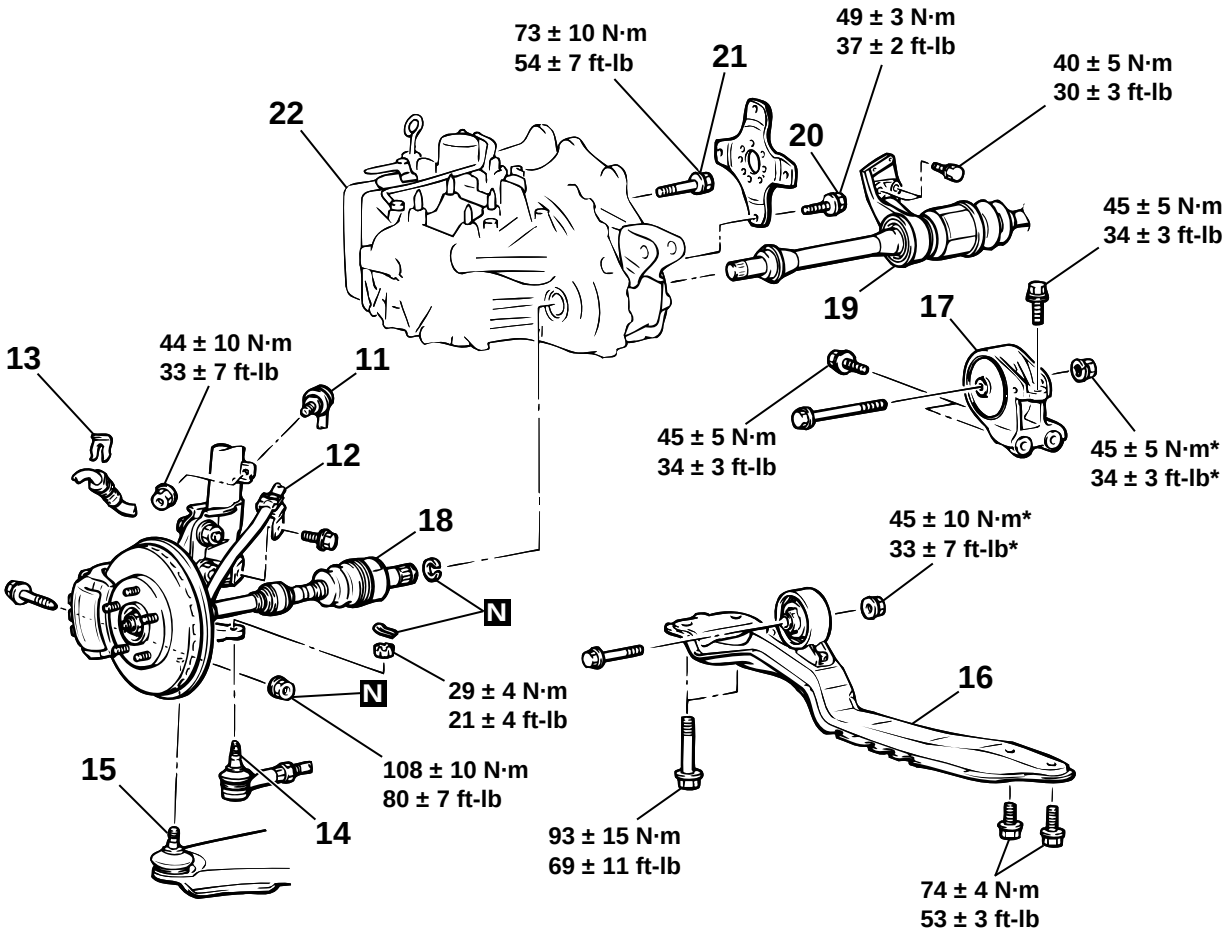
REMOVAL STEPS (Continued)

6. OUTPUT SHAFT SPEED SENSOR CONNECTOR **>>B<<**
7. STARTER MOTOR
8. TRANSAXLE ASSEMBLY UPPER PART COUPLING BOLTS
9. TRANSAXLE MOUNT BRACKET
10. TRANSAXLE MOUNT STOPPER
- ENGINE ASSEMBLY SUPPORTING

TSB Revision

⚠ CAUTION

***: Indicates parts which should be temporarily tightened, and then fully tightened after placing the vehicle on the ground and loading the full weight of the engine on the vehicle body.**



AC001640AE

REMOVAL STEPS

- LIFTING UP THE VEHICLE

11. STABILIZER LINK <STRUT SIDE>
12. SPEED SENSOR CABLE <VEHICLES WITH ABS>
13. BRAKE HOSE CLAMP

<<D>> 14. TIE ROD END

<<D>> 15. LOWER ARM

16. CENTERMEMBER ASSEMBLY

REMOVAL STEPS (Continued)

17. REAR ROLL STOPPER

<<E>> 18. DRIVE SHAFT

<<E>> 19. DRIVE SHAFT AND INNER SHAFT

<<F>> 20. DRIVE PLATE BOLTS

<<F>> 21. TRANSAXLE ASSEMBLY LOWER PART COUPLING BOLTS

<<F>> >>A<< 22. TRANSAXLE ASSEMBLY

Required Special Tools:

- MB991113: Steering Linkage Puller
- MB991453: Engine Hanger Attachment Set
- MZ203827: Engine Lifter
- MB991454: Engine Hanger Balancer (a part of MB991453 Engine Hanger Attachment Set)
- MB991895: Engine Hanger

TSB Revision

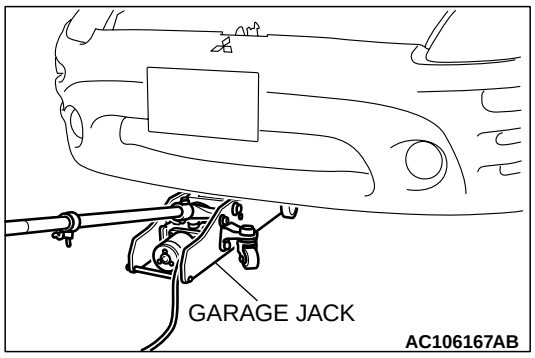
REMOVAL SERVICE POINTS

<<A>> STARTER MOTOR REMOVAL

Remove the starter motor with the starter motor harness still connected, and secure it inside the engine compartment.

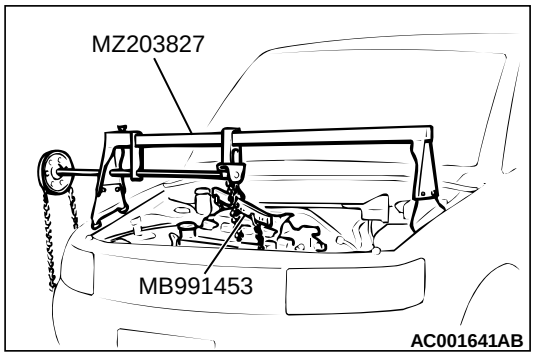
<<B>> TRANSAXLE MOUNT BRACKET REMOVAL

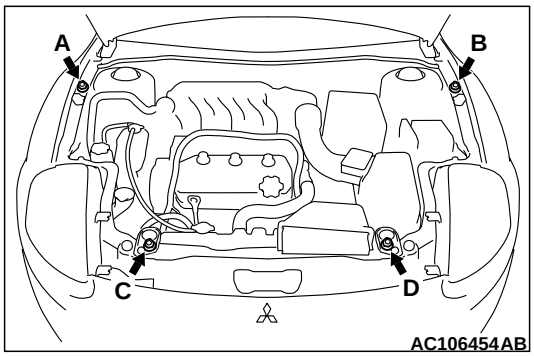
Jack up the transaxle assembly gently and then remove the transaxle mounting.



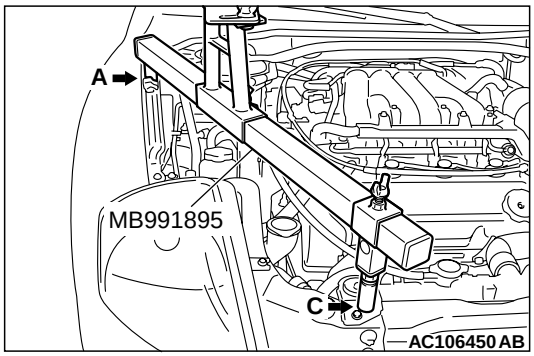
<<C>> ENGINE ASSEMBLY SUPPORTING

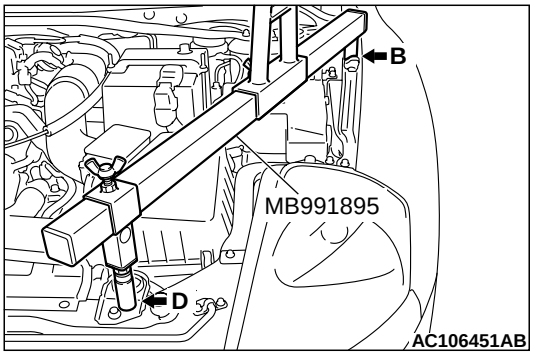
1. <Engine lifter MZ2073827 is used>
   Set special tools MB991453 and MZ203827 to the vehicle to support the engine assembly.

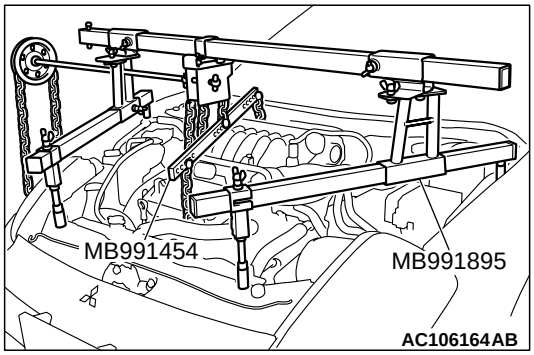




2. <Engine hanger MB991895 is used>
   (1) Set special tool MB991895 to the front fender mounting bolts (A and B) and the radiator support upper insulator mounting bolts (C and D), which are located in the engine compartment, as shown.







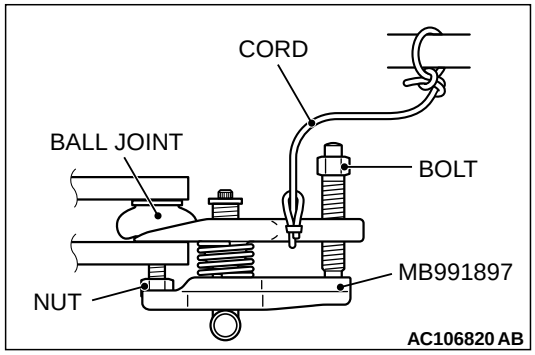
   (2) Set special tools MB991454 and MB991527 to hold the engine/transaxle assembly.

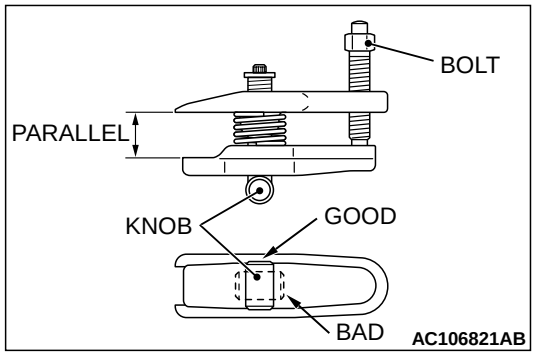
<<D>> TIE ROD END/LOWER ARM DISCONNECTION

⚠ CAUTION

- **Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.**
- **Hang special tool MB991897 with rope or wire to prevent them from falling.**

1. Install the special tool MB991897 as shown in the figure.





2. After turning the bolt and knob to adjust the insert arms of the special tool MB991897 in parallel, tighten the bolt by hand and confirm that the insert arms are parallel.

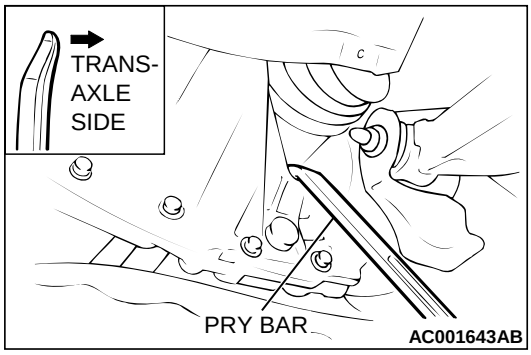
   NOTE: When adjusting the insert arms in parallel, turn the knob in the direction shown in the figure.

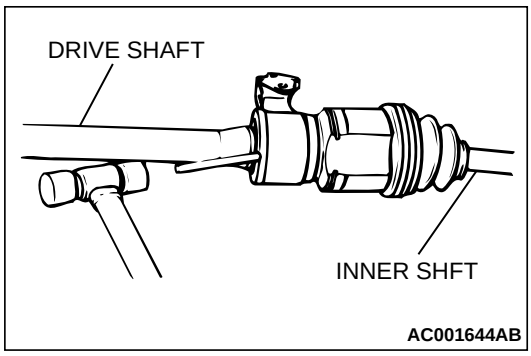
<<E>> DRIVE SHAFT/DRIVE SHAFT AND INNER SHAFT DISCONNECTION

⚠ CAUTION

- **Do not pull on the drive shaft; doing so will damage the TJ; be sure to use a pry bar.**
- **Do not insert the pry bar so deep as to damage the oil seal.**
- **Do not damage the transaxle oil seal with the spline of the drive shaft.**

1. Insert the pry bar between the transaxle case and the driveshaft as shown to remove the drive shaft. <2.4L ENGINE, 3.0L ENGINE-LH>

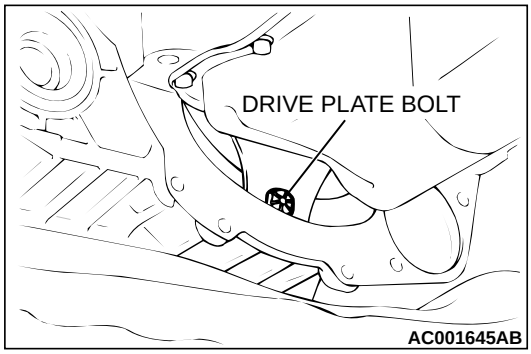




⚠ CAUTION
Do not damage the transaxle oil seal with the spline of the inner shaft.

2. If the inner shaft and transaxle are tightly joined, tap the center bearing bracket lightly with a plastic hammer, etc. to remove the drive shaft and inner shaft from the transaxle. <3.0L ENGINE-RH>
3. Cover the transaxle case with a shop towel to prevent foreign material from entering it.

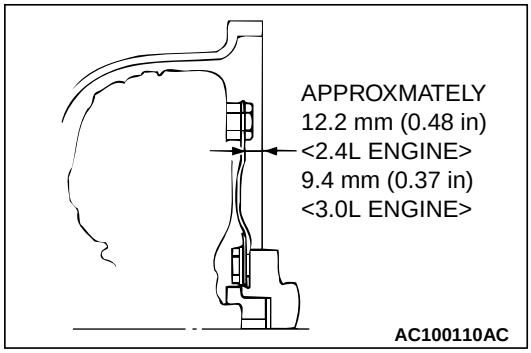
<<F>> DRIVE PLATE BOLTS/TRANSAXLE ASSEMBLY LOWER PART COUPLING BOLTS/TRANSAXLE ASSEMBLY REMOVAL



1. Support the transaxle assembly by using a transaxle jack.
2. Remove the drive plate bolts while turning the crank shaft.
3. Press in the torque converter to the transaxle side so that the torque converter does not stay engaged to the drive plate.
4. Remove the transaxle assembly lower bolts and lower the transaxle assembly.

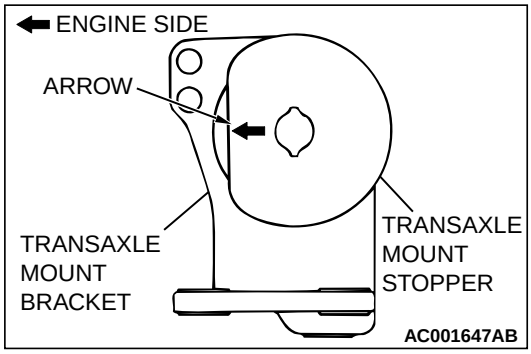
INSTALLATION SERVICE POINTS

>>A<< TRANSAXLE ASSEMBLY INSTALLATION



Inserting the torque converter into the transaxle oil pump so that the shown dimension is approximately. 12.2 mm (0.48 inch) <2.4L ENGINE>, approximately 9.4 mm (0.37 inch) <3.0L ENGINE>. Install the transaxle assembly to the engine.

>>B<< TRANSAXLE MOUNT STOPPER INSTALLATION



Install the transaxle mount stopper so that the arrow mark points as shown in the illustration.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1231012400137

ITEMS			SPECIFICATIONS
Key interlock and shift lock mechanisms			
Key interlock cable			12 ± 2 N·m (102 ± 22 in-lb)
Shift lock cable			12 ± 2 N·m (102 ± 22 in-lb)
Transaxle assembly			
Bell housing cover <2.4L engine>		To engine	8.8 ± 1.0 N·m (78 ± 8 in-lb)
		To transaxle	26 ± 4 N·m (19 ± 3 ft-lb)
Centermember assembly		Front	93 ± 15 N·m (69 ± 11 ft-lb)
		Front roll stopper	45 ± 10 N·m (33 ± 7 ft-lb)
		Rear	74 ± 4 N·m (53 ± 3 ft-lb)
Drive plate bolt			49 ± 3 N·m (37 ± 2 ft-lb)
Drive shaft and inner shaft <3.0L engine>			40 ± 5 N·m (30 ± 3 ft-lb)
Lower arm connection			108 ± 10 N·m (80 ± 7 ft-lb)
Park/neutral position switch mounting bolt			11 ± 1 N·m (96 ± 8 in-lb)
Rear roll stopper bracket			45 ± 5 N·m (34 ± 3 ft-lb)
Starter motor			30 ± 3 N·m (23 ± 2 ft-lb)
Starter cover mounting bolt <2.4L engine>			4.9 ± 1.0 N·m (44 ± 8 in-lb)
Stabilizer link connection			44 ± 10 N·m (33 ± 7 ft-lb)
Tie rod end connection			29 ± 4 N·m (21 ± 4 ft-lb)
Transaxle assembly lower part coupling bolt	2.4L engine		48 ± 6 N·m (36 ± 4 ft-lb)
	3.0L engine		73 ± 10 N·m (54 ± 7 ft-lb)
Transaxle assembly upper part coupling bolt	2.4L engine		48 ± 6 N·m (36 ± 4 ft-lb)
	3.0L engine	Bolt, flange	73 ± 10 N·m (54 ± 7 ft-lb)
		Bolt, washer assembled	88 ± 10 N·m (65 ± 7 ft-lb)
Transaxle control cable connection			12 ± 2 N·m (102 ± 22 in-lb)
Transaxle mount bracket			57 ± 7 N·m (42 ± 5 ft-lb)
Transaxle mount stopper			83 ± 12 N·m (61 ± 9 ft-lb)
Transaxle control			
Cable arm <vehicles with sport mode>			12 ± 2 N·m (102 ± 22 in-lb)
Detente spring <vehicles without sport mode>			1.5 ± 0.5 N·m (14 ± 4 in-lb)
Indicator panel assembly			1.5 ± 0.5 N·m (14 ± 4 in-lb)
Key interlock cable connection			12 ± 2 N·m (102 ± 22 in-lb)
Lever assembly <vehicles without sport mode>			12 ± 2 N·m (102 ± 22 in-lb)
Nut			12 ± 2 N·m (102 ± 22 in-lb)
Shift lock cable connection			12 ± 2 N·m (102 ± 22 in-lb)
Shift knob			1.8 ± 0.2 N·m (16 ± 2 in-lb)
Shift switch <vehicles with sport mode>			5.0 ± 1.0 N·m (44 ± 9 in-lb)

ITEMS	SPECIFICATIONS
Select lever <vehicles with sport mode>	12 ± 2 N·m (102 ± 22 in-lb)
Selector lever assembly	12 ± 2 N·m (102 ± 22 in-lb)
Transaxle control cable assembly	12 ± 2 N·m (102 ± 22 in-lb)

SERVICE SPECIFICATIONS

M1231000300122

ITEMS		STANDARD VALUE
Line pressure kPa (psi)		1,010 – 1,050 (147 – 152)
A/T fluid temperature sensor kΩ	at 0°C (32°F)	16.7 – 20.5
	at 20°C (68°F)	7.3 – 8.9
	at 40°C (104°F)	3.4 – 4.2
	at 60°C (140°F)	1.9 – 2.2
	at 80°C (176°F)	1.0 – 1.2
	at 100°C (212°F)	0.57 – 0.69
Resistance of torque converter clutch control solenoid valve coil [at 20°C (68°F)] Ω		2.7 – 3.4
Resistance of low-reverse solenoid valve coil [at 20°C (68°F)] Ω		2.7 – 3.4
Resistance of second solenoid valve coil [at 20°C (68°F)] Ω		2.7 – 3.4
Resistance of underdrive solenoid valve coil [at 20°C (68°F)] Ω		2.7 – 3.4
Resistance of overdrive solenoid valve coil [at 20°C (68°F)] Ω		2.7 – 3.4
Stall speed r/min		2,100 – 2,600

LUBRICANTS

M1231000400174

ITEMS		SPECIFIED LUBRICANTS	QUANTITY
A/T fluid dm^3 (qt)	F4A42	DIAMOND ATF SP III or equivalent	7.7 (8.1)
	F4A51		8.4 (8.9)

NOTES