FUEL

CONTENTS

NOTE
THE GROUPS MARKED BY ▒▒ ARE NOT IN THIS MANUAL

MULTIPOINT FUEL INJECTION (MPI)

CONTENTS

GENERAL

OUTLINE OF CHANGES

The following improvements have been made to vehicles with 4G9-SOHC engine. Maintenance service points have been established to correspond to these changes.

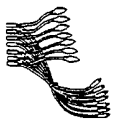
- A new type of air flow sensor has been adopted.
- A composite ECU which incorporates both the engine-ECU and the A/T-ECU has been adopted. <A/T>

GENERAL INFORMATION

Items		Specifications
Engine-ECU	Identification model No.	E2T68471 <4G92-SOHC-M/T> E2T68477 <4G92-SOHC-M/T>*1 E2T68474 <4G92-SOHC-M/T>*2 E2T68572 <4G92-SOHC-A/T> E2T68579 <4G92-SOHC-A/T>*1 E2T68575 <4G92-SOHC-A/T>*2 E2T68472 <4G93-SOHC-M/T (Vehicles without TCL)> E2T68573 <4G93-SOHC-A/T (Vehicles without TCL)> E2T68473 <4G93-SOHC-M/T (Vehicles with TCL)> E2T68574 <4G93-SOHC-A/T (Vehicles with TCL)>
Actuators	Purge control solenoid valve	Duty cycle type solenoid valve

NOTE
*1: 74 kW engine output specifications (SNDVL6, SNDVR6, SNJVL6, SNJVR6, SRDVL6, SRDVR6, SRJVL6, SRJVR6, LNDVL6, LNDVR6, LNJVL6, LNJVR6, LRDVL6, LRDVR6, LRJVL6, LRJVR6)
*2: 6B model

SPECIAL TOOL

Tool	Number	Name	Use
	MB991709	Test harness	• Measurement of voltage during troubleshooting • Inspection using an analyzer

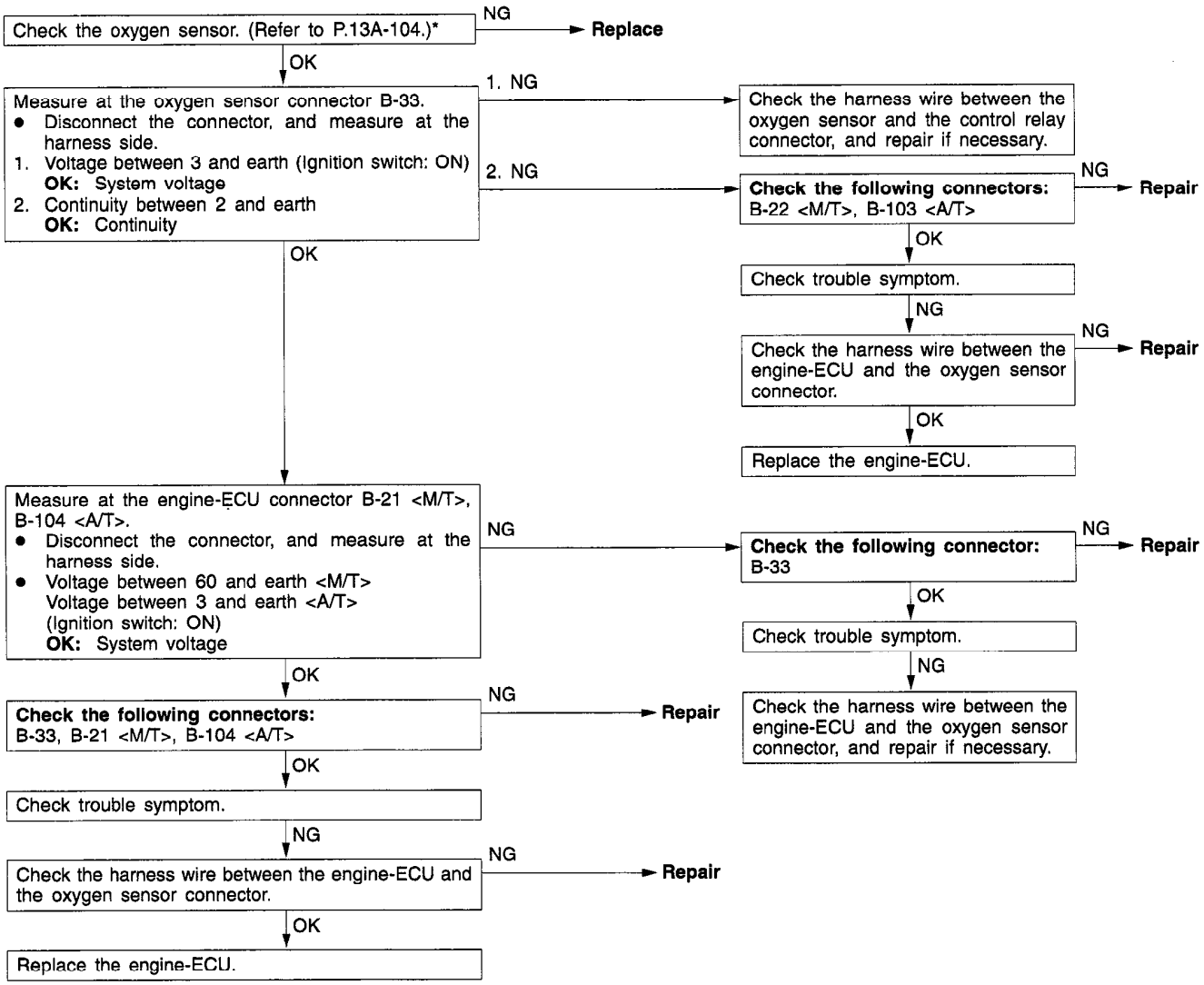
TROUBLESHOOTING

INSPECTION CHART FOR DIAGNOSIS CODES

Code No.	Diagnosis item	Reference page
11	Oxygen sensor system	13A-5
12	Air flow sensor system	13A-6
13	Intake air temperature sensor system	13A-6
14	Throttle position sensor system	13A-7
21	Engine coolant temerature sensor system	13A-8
22	Crank angle sensor system	13A-9
23	Camshaft position sensor system	13A-10
24	Vehicle speed sensor system	13A-11
25	Barometric pressure sensor system	13A-12
31	Detonation sensor system	13A-13
41	Injector system	13A-13
44	Ignition coil and power trnasistor unit system	13A-14
54	Immobilizer system	13A-15
61	Communication wire with A/T-ECU system <A/T>	13A-16
71	Vacuum control solenoid valve system <Vehciles with TCL>	13A-17
72	Ventilation control solenoid valve system <Vehicles with TCL>	13A-18

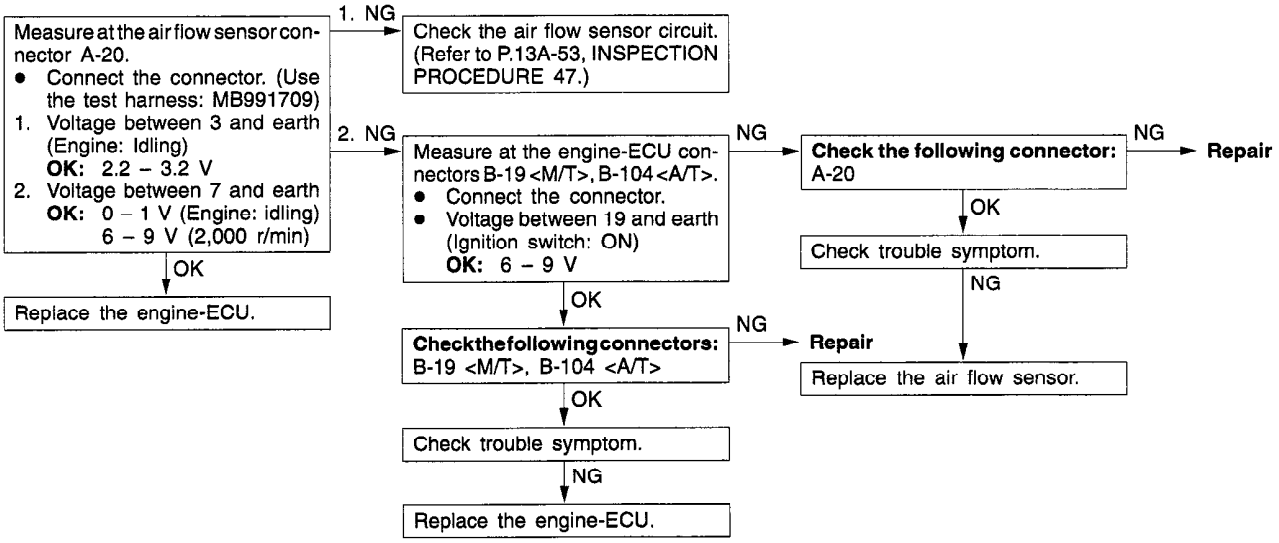
INSPECTION PROCEDURE FOR DIAGNOSIS CODES

Code No. 11 Oxygen sensor system	Probable cause
Range of Check • 3 minutes have passed after engine was started. • Engine coolant temperature is approx. 80°C or more. • Intake air temperature is 20 – 50°C. • Engine speed is approx. 2,000 – 3,000 r/min • Vehicle is moving at constant speed on a flat, level road surface Set conditions • The oxygen sensor output voltage is around 0.6 V for 30 seconds (does not cross 0.6 V for 30 seconds). • When the range of check operations given above which accompany starting of the engine are carried out four time in succession, a problem is detected after each operation.	• Malfunction of the oxygen sensor • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU

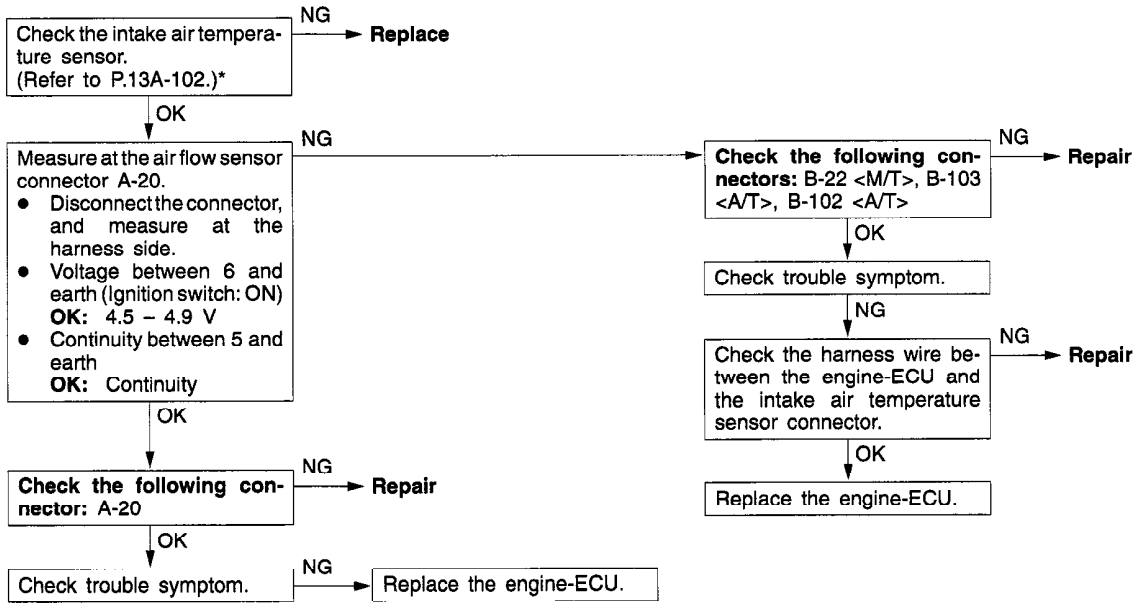


*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

Code No. 12 Air flow sensor system	Probable cause
Range of Check • Engine speed is 500 r/min or more. Set conditions • Sensor output frequency is 3 Hz or less for 4 seconds.	• Malfunction of the air flow sensor • Improper connector contact, open circuit or short-circuited harness wire of the air flow sensor • Malfunction of the engine-ECU

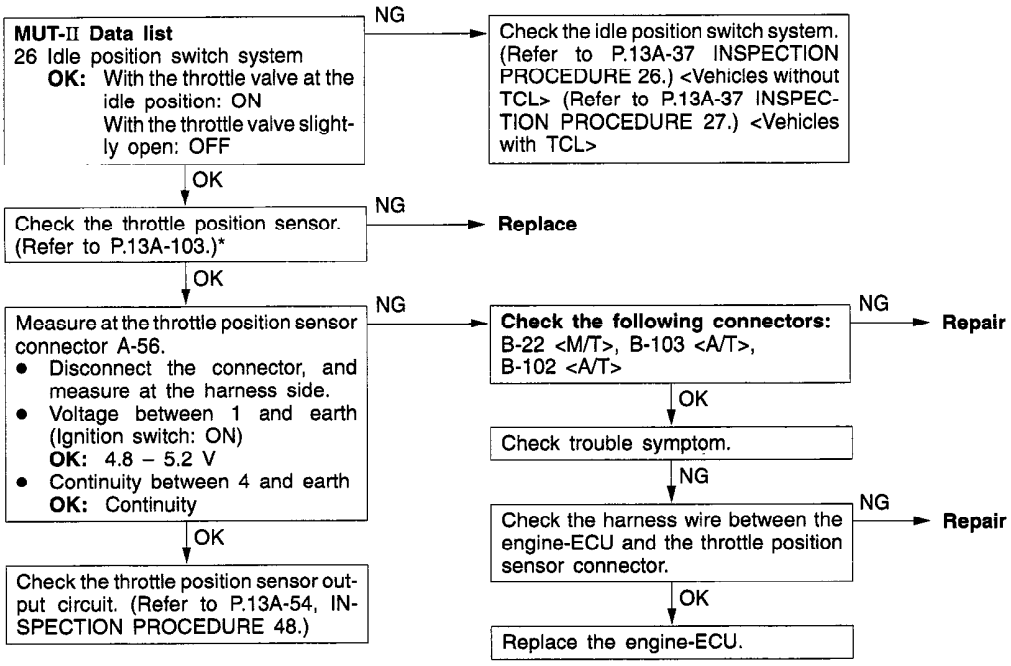


Code No. 13 Intake air temperature sensor system	Probable cause
Range of Check • Ignition switch: ON • Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Set conditions • Sensor output voltage is 4.6 V or more (corresponding to an intake air temperature of –45°C or less) for 4 seconds. or • Sensor output voltage is 0.2V or less (corresponding to an intake air temperature of 125°C or more) for 4 seconds.	• Malfunction of the intake air temperature sensor • Improper connector contact, open circuit or short-circuited harness wire of the intake air temperature sensor circuit • Malfunction of the engine-ECU



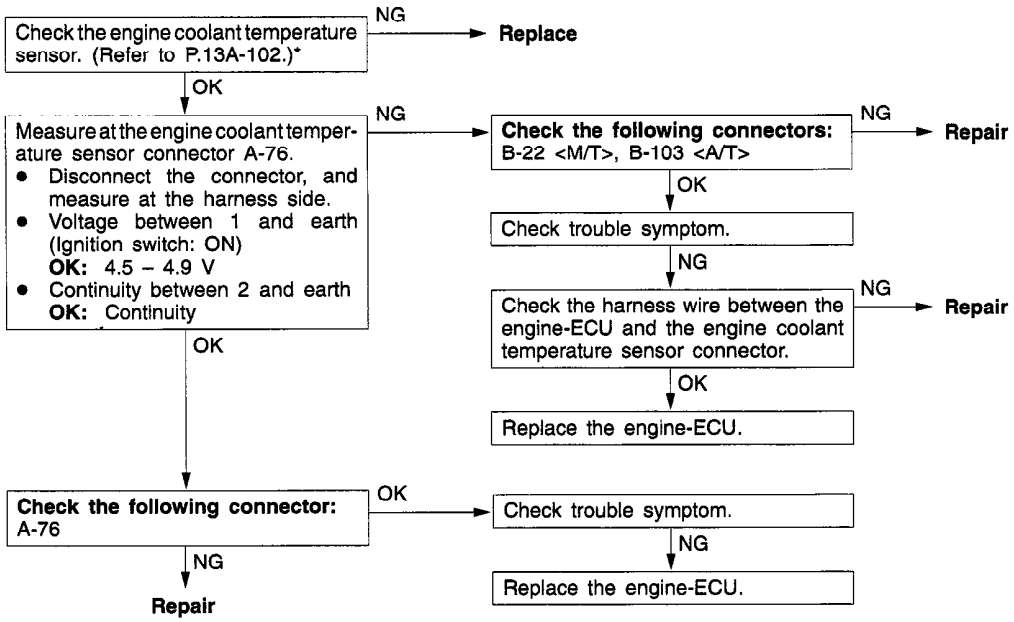
*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

Code No. 14 Throttle position sensor system	Probable cause
Range of Check ● Ignition switch: ON ● Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Set conditions ● When the idle position switch is ON, the sensor output voltage is 2 V or more for 4 seconds. or ● The sensor output voltage is 0.2 V or less for 4 seconds.	● Malfunction of the throttle position sensor or maladjustment ● Improper connector contact, open circuit or short-circuited harness wire of the throttle position sensor circuit ● Improper "ON" state of idle position switch ● Short circuit of the idle position switch signal line ● Malfunction of the engine-ECU



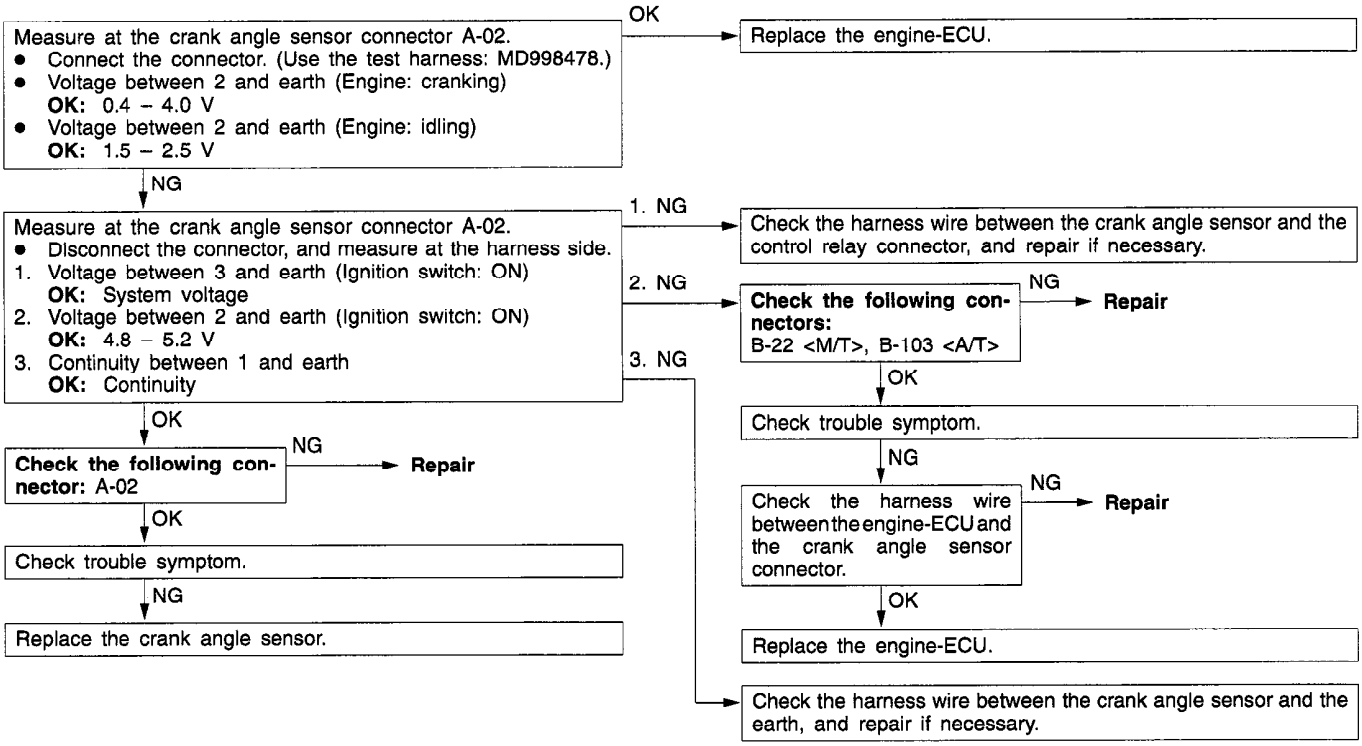
*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

Code No. 21 Engine coolant temperature sensor system	Probable cause
Range of Check • Ignition switch: ON • Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Set conditions • Sensor output voltage is 4.6 V or more (corresponding to an engine coolant temperature of –45°C or less) for 4 seconds. or • Sensor output voltage is 0.1 V or less (corresponding to an engine coolant temperature of 140°C or more) for 4 seconds.	• Malfunction of the engine coolant temperature sensor • Improper connector contact, open circuit or short-circuited harness wire of the engine coolant temperature sensor circuit • Malfunction of the engine-ECU
Range of Check • Ignition switch: ON • Engine speed is approx. 50 r/min or more Set conditions • The sensor output voltage increases from 1.6 V or less (corresponding to an engine coolant temperature of 40°C or more) to 1.6 V or more (corresponding to an engine coolant temperature of 40°C or less). • After this, the sensor output voltage is 1.6 V or more for 5 minutes.	

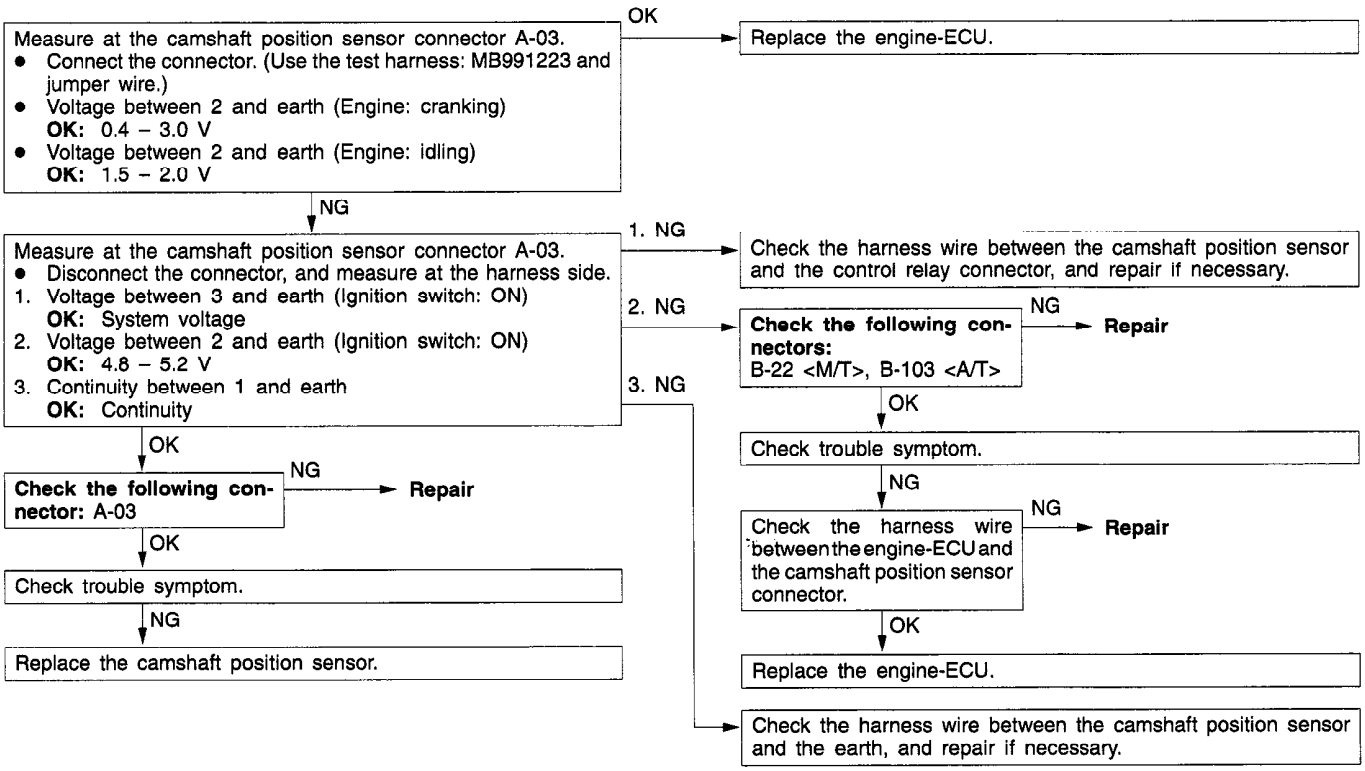


*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

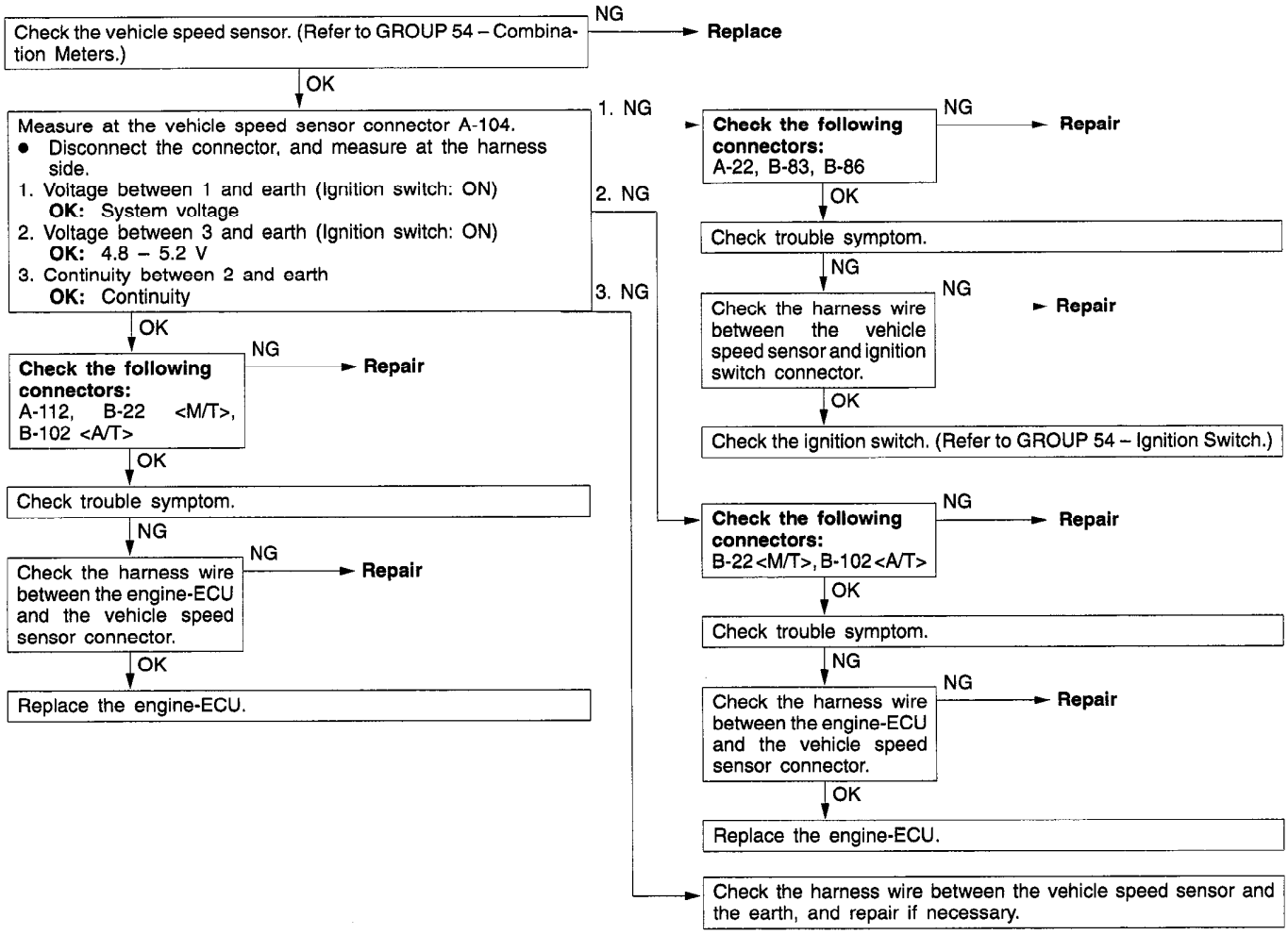
Code No. 22 Crank angle sensor system	Probable cause
Range of Check ● Engine is cranking. Set conditions ● Sensor output voltage does not change for 4 seconds (no pulse signal input.)	● Malfunction of the crank angle sensor ● Improper connector contact, open circuit or short-circuited harness wire of the crank angle sensor ● Malfunction of the engine-ECU



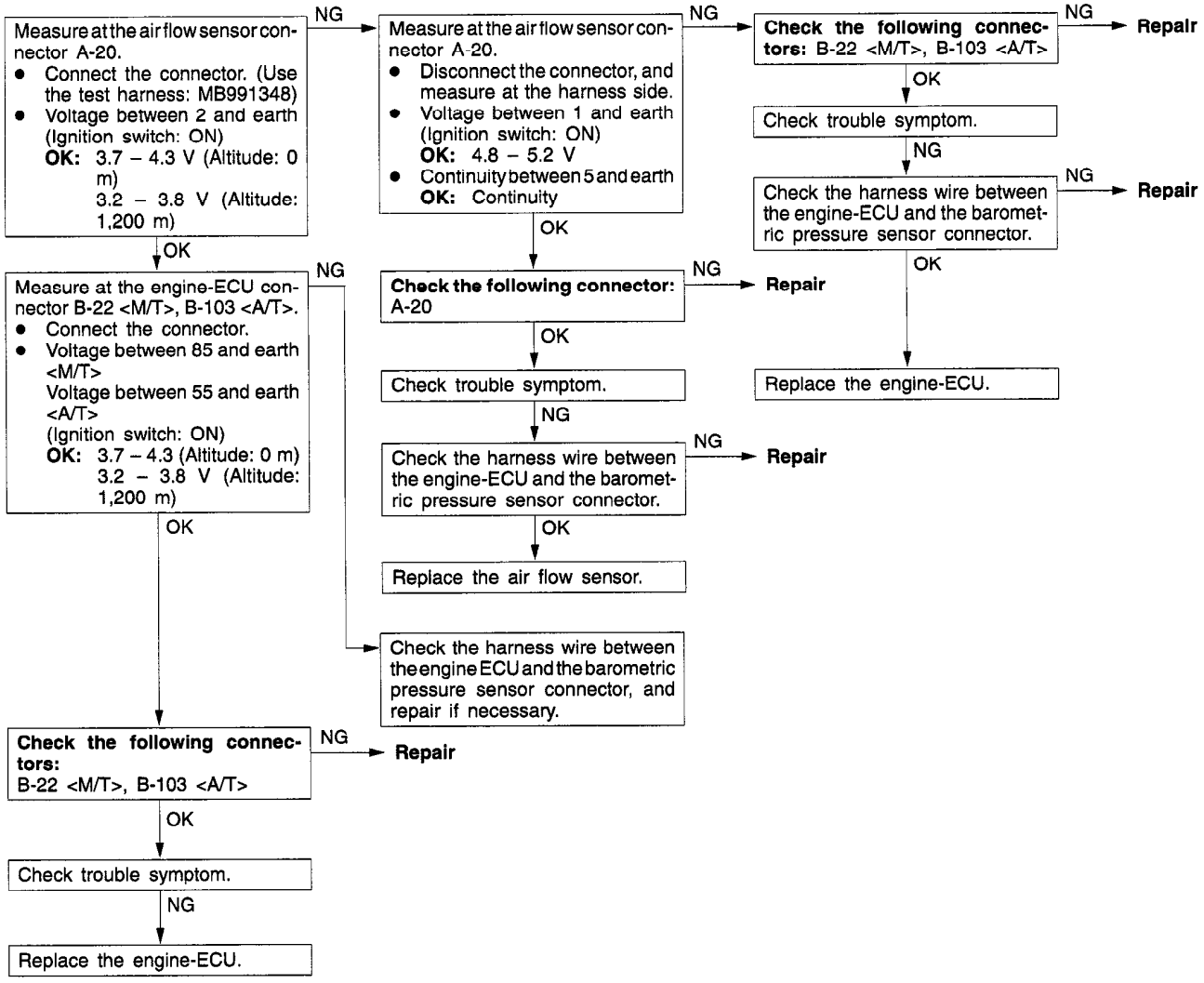
Code No. 23 Camshaft position sensor system	Probable cause
Range of Check • Ignition switch: ON • Engine speed is approx. 50 r/min or more. Set conditions • Sensor output voltage does not change for 4 seconds (no pulse signal input.)	• Malfunction of the camshaft position sensor • Improper connector contact, open circuit or short-circuited harness wire of the camshaft position sensor circuit • Malfunction of the engine-ECU



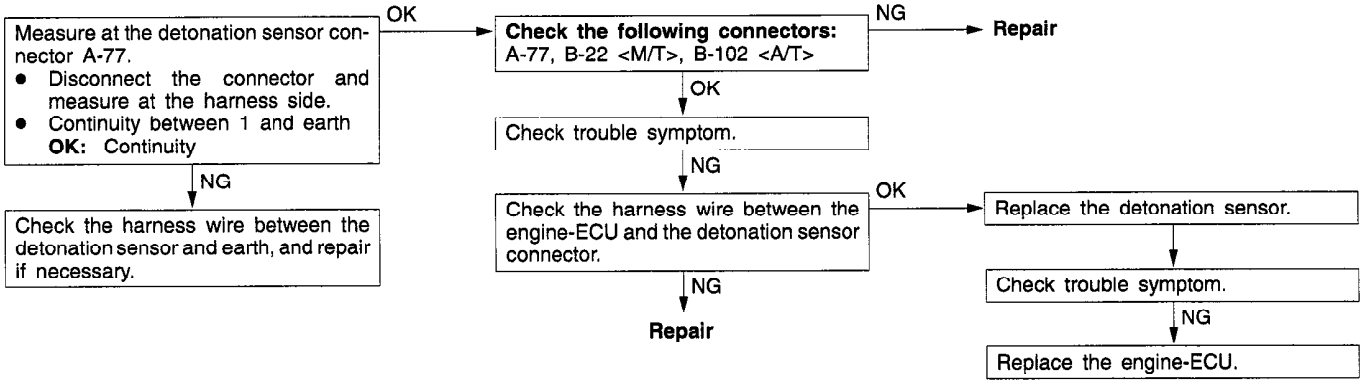
Code No. 24 Vehicles speed sensor system	Probable cause
Range of check ● Ignition switch: ON ● Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. ● Idle position switch: OFF ● Engine speed is 3,000 r/min or more. ● Driving under high engine load conditions. Set conditions ● Sensor output voltage does not change for 4 seconds (no pulse signal input).	● Malfunction of the vehicle speed sensor ● Improper connector contact, open circuit or short-circuited harness wire of the vehicle speed sensor circuit ● Malfunction of the engine-ECU



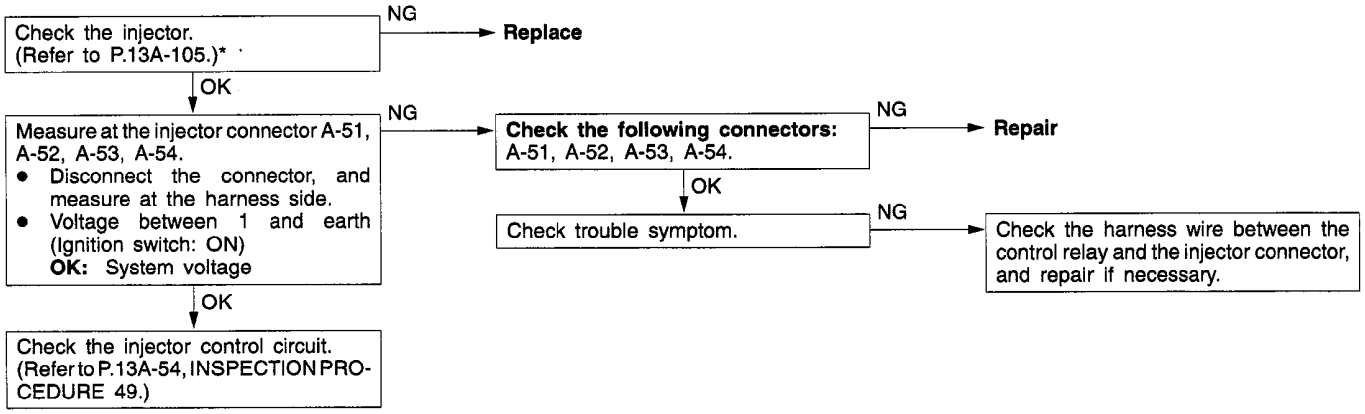
Code No. 25 Barometric pressure sensor system	Probable cause
Range of Check • Ignition switch: ON • Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. • Battery voltage is 8 V or more. Set conditions • Sensor output voltage is 4.5 V or more (corresponding to a barometric pressure of 114 kPa or more) for 4 seconds. or • Sensor output voltage is 0.2 V or less (corresponding to a barometric pressure of 5.33 kPa or less) for 4 seconds.	• Malfunction of the barometric pressure sensor • Improper connector contact, open circuit or short-circuited harness wire of the barometric pressure sensor circuit • Malfunction of the engine-ECU



Code No. 31 Detonation sensor system	Probable cause
Range of Check ● Ignition switch: ON ● Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. ● Engine speed is approx. 5,000 r/min or more Set conditions The change in the detonation sensor output voltage (detonation sensor peak voltage at each 1/2 revolution of the crankshaft) is less than 0.06 V for 200 times in succession.	● Malfunction of the detonation sensor ● Improper connector contact, open circuit or short-circuited harness wire of the detonation sensor circuit ● Malfunction of the engine-ECU

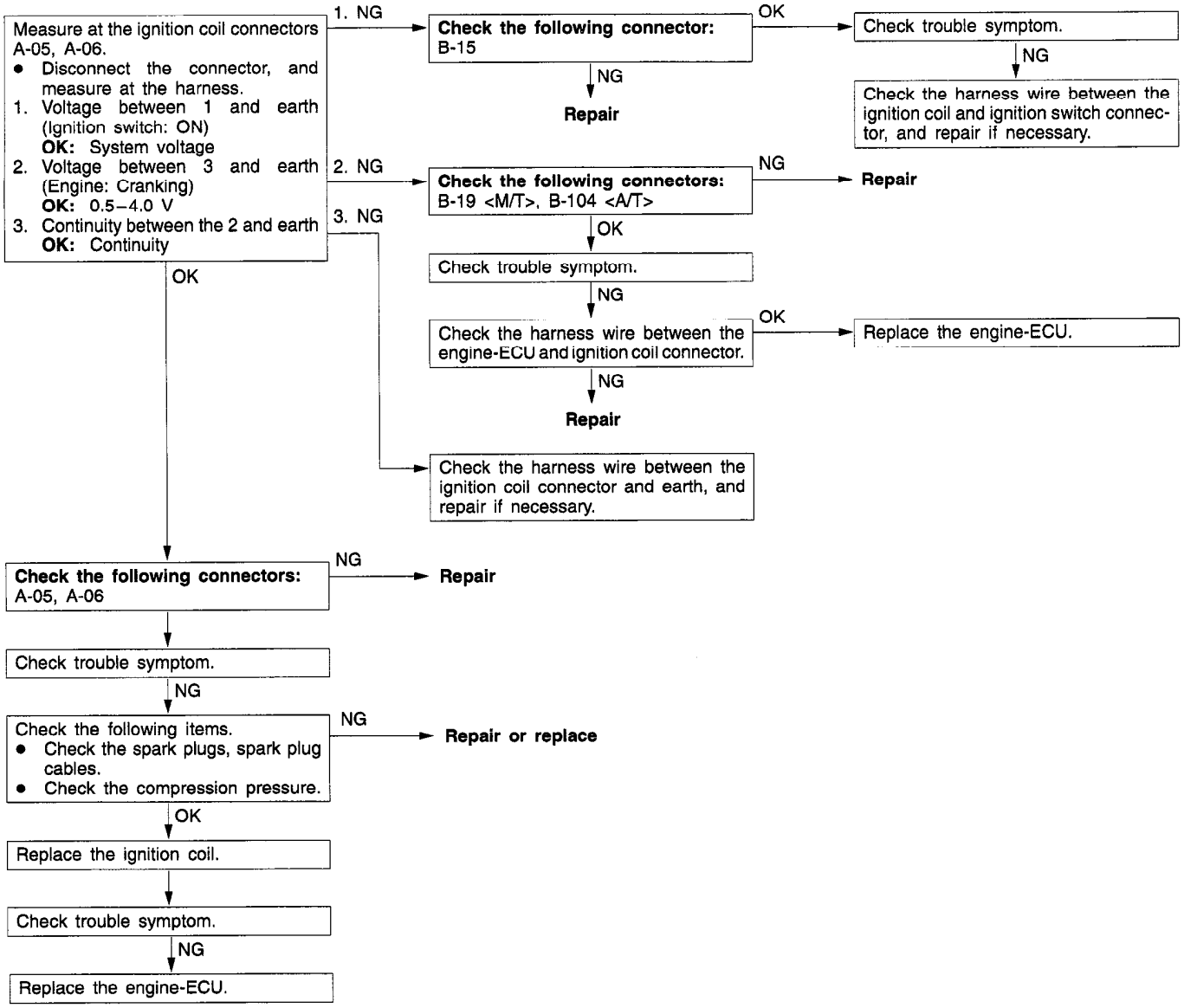


Code No. 41 Injector system	Probable cause
Range of Check ● Engine speed is approx. 50 – 1,000 r/min ● The throttle position sensor output voltage is 1.15 V or less. ● Actuator test by MUT-II is not carried out. Set conditions ● Surge voltage of injector coil is not detected for 4 seconds.	● Malfunction of the injector ● Improper connector contact, open circuit or short-circuited harness wire of the injector circuit ● Malfunction of the engine-ECU



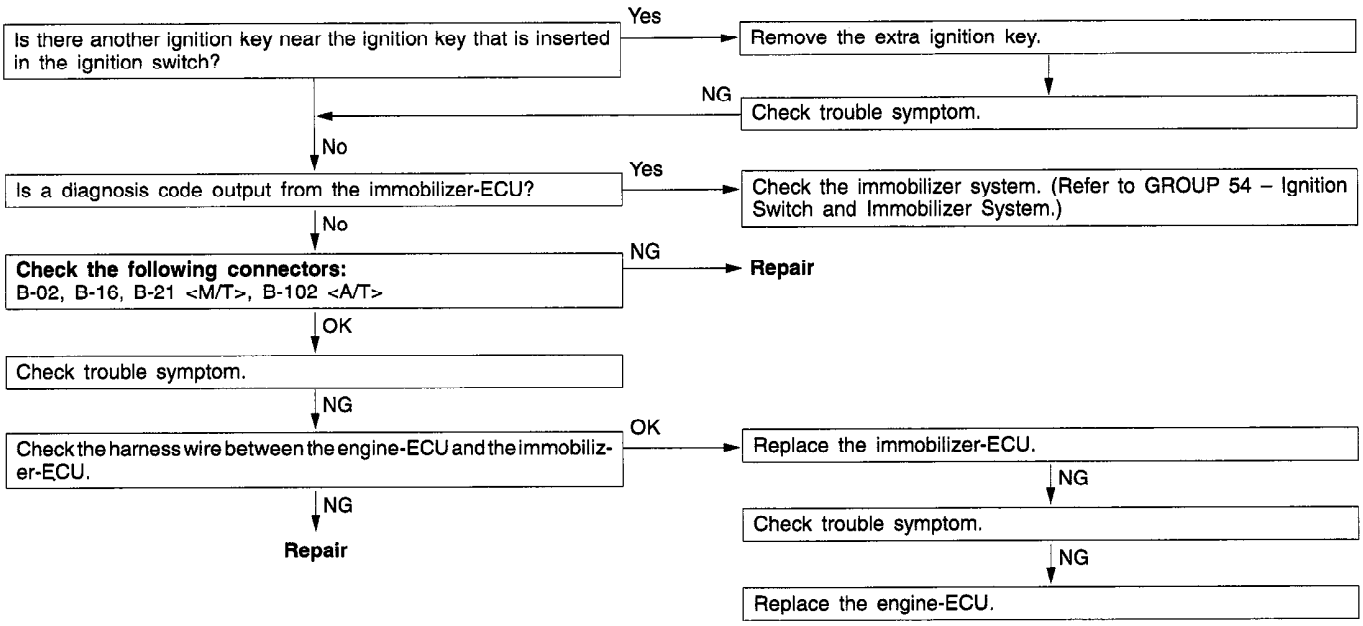
*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

Code No.44 Ignition coil and power transistor unit system	Probable cause
Range of Check ● Engine speed is approx. 50–4,000 r/min ● Excluding deceleration driving and sudden acceleration or deceleration driving Set conditions ● Misfire occurs in No.1 and No.4 cylinders or No.2 and No.3 cylinders more than predeterminated times per 1,000 r/min.	● Malfunction of the ignition coil ● Improper connector contact, open circuit or short-circuited harness wire of the ignition primary circuit ● Malfunction of the spark plug and spark plug cable ● Improper compression pressure ● Malfunction of the engine-ECU



Code No.54 Immobilizer system	Probable cause
Range of Check • Ignition switch: ON Set Conditions • Improper communication between the engine-ECU and immobilizer-ECU	• Radio interference of ID codes • Incorrect ID code • Malfunction of harness or connector • Malfunction of immobilizer-ECU • Malfunction of engine-ECU

NOTE
(1) If the ignition switches are close each other when starting the engine, radio interference may cause this code to be displayed.
(2) This code may be displayed when registering the key ID code.

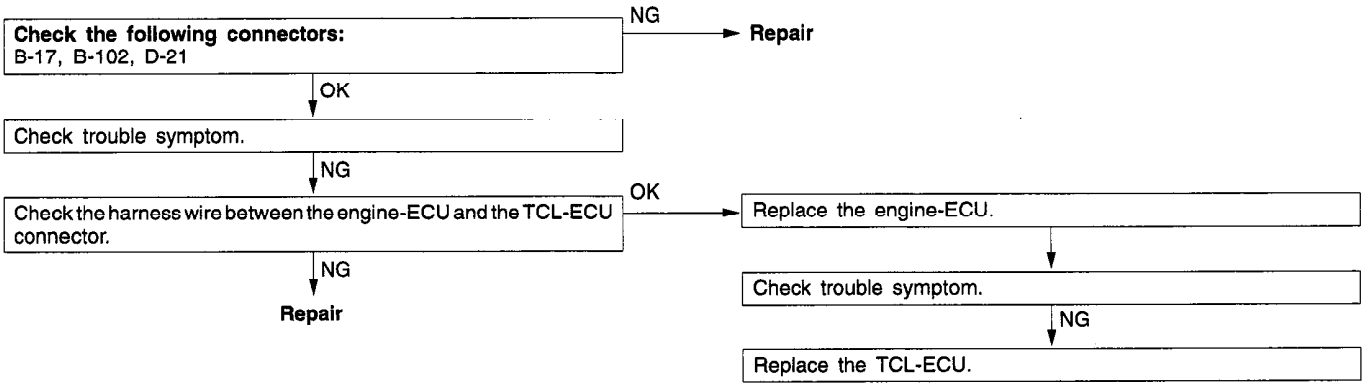


Code No. 61 Communication wire with A/T-ECU system <A/T>	Probable cause
Range of Check • 60 seconds or more have passed immediately after engine was started. • Engine speed is approx. 50 r/min or more Set conditions The voltage of the torque reduction request signal from the A/T-ECU is LOW for 1.5 seconds or more.	• Malfunction of the harness wire and the connector • Malfunction of the engine ECU • Malfunction of the A/T-ECU • Malfunction of the TCL-ECU <Vehicles with TCL>

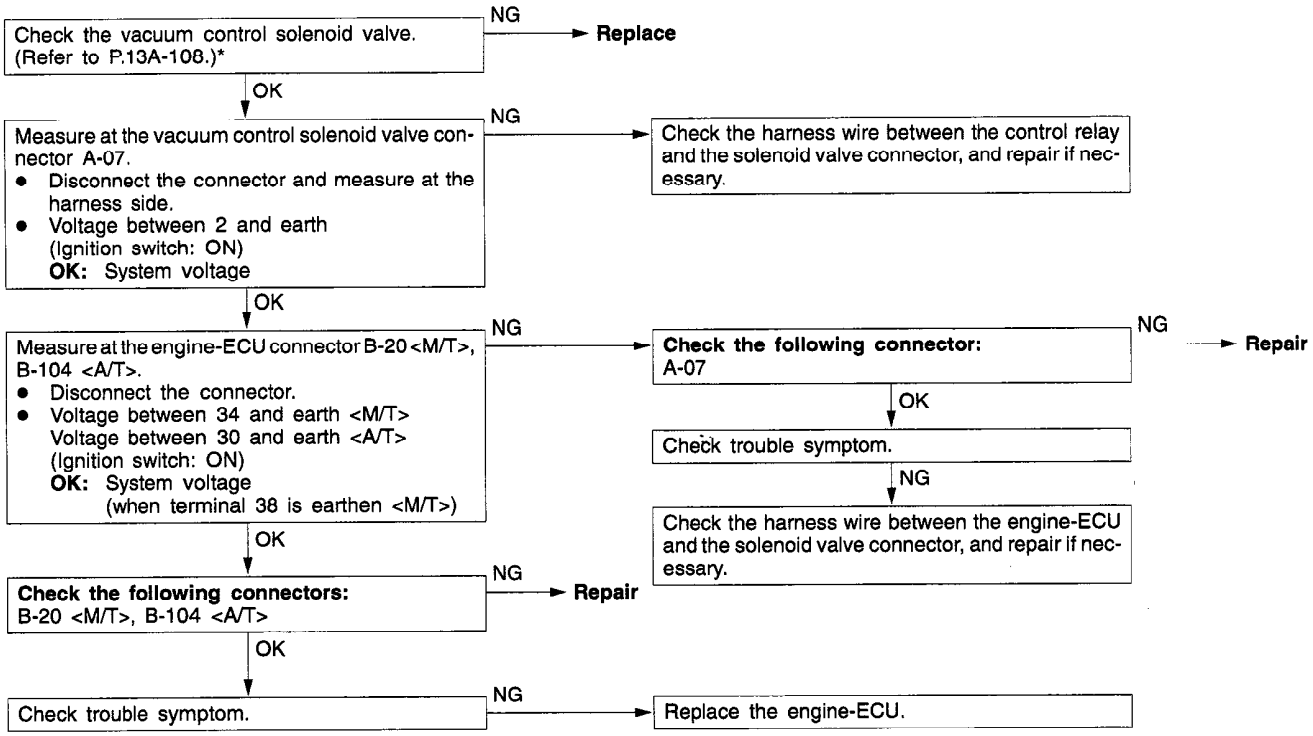
<Vehicles without TCL>

Replace the engine-ECU.

<Vehicles with TCL>

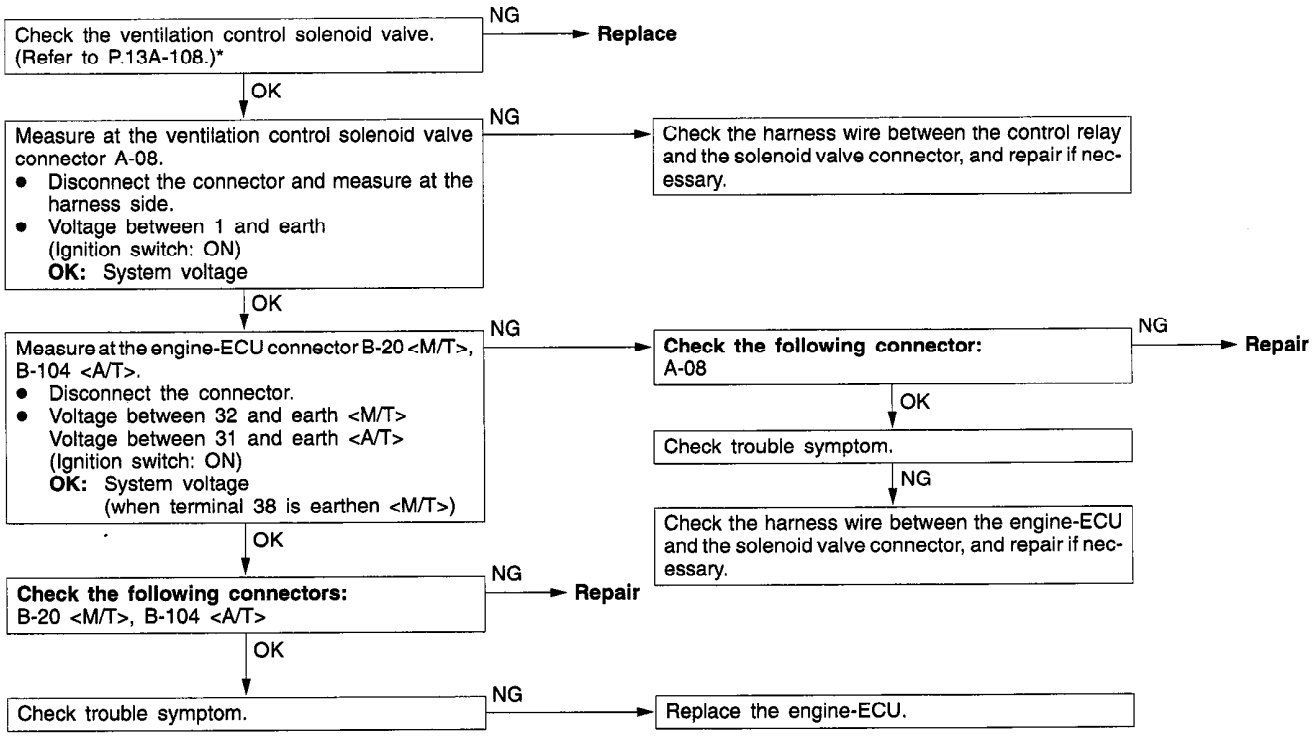


Code No. 71 Vacuum control solenoid valve system <Vehicles with TCL>	Probable cause
Range of Check ● Ignition switch: ON ● Excluding 60 seconds immediately after the engine starts. ● Battery voltage is 10 V or more. ● Forced actuation by means of MUT-II is not being carried out. Set condition Solenoid valve drive or non-drive instruction and energized condition of solenoid coil are different.	● Malfunction of the vacuum control solenoid valve ● Improper connector contact, open circuit or short-circuited harness wire of the vacuum control solenoid valve ● Malfunction of the engine-ECU



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

Code No. 72 Ventilation control solenoid valve system <Vehicles with TCL>	Probable cause
Range of Check ● Ignition switch: ON ● Excluding 60 seconds immediately after the engine starts. ● Battery voltage is 10 V or more. ● Forced actuation by means of MUT-II is not being carried out. Set condition Solenoid valve drive or non-drive instruction and energized condition of solenoid coil are different.	● Malfunction of the ventilation control solenoid valve ● Improper connector contact, open circuit or short-circuited harness wire of the ventilation control solenoid valve ● Malfunction of the engine-ECU



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

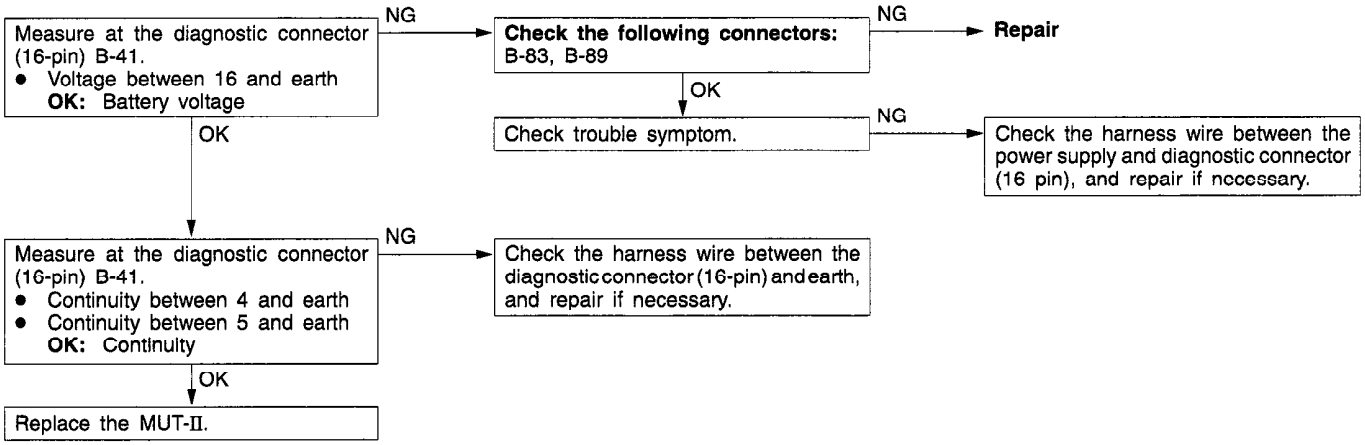
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom		Inspection procedure No.	Reference page
Communication with MUT-II is impossible.	Communication with all systems is not possible.	1	13A-20
	Communication with engine ECU only is not possible.	2	13A-20
Engine warning lamp and related parts	The engine warning lamp does not illuminate right after the ignition switch is turned to the ON position.	3	13A-21
	The engine warning lamp remains illuminating and never goes out.	4	13A-21
Starting	No initial combustion (starting impossible)	5	13A-22
	Initial combustion but no complete combustion (starting impossible)	6	13A-23
	Long time to start (improper starting)	7	13A-24
Idling stability (Improper idling)	Unstable idling (Rough idling, hunting)	8	13A-25
	Idling speed is high. (Improper idling speed)	9	13A-26
	Idling speed is low. (Improper idling speed)	10	13A-27
Idling stability (Engine stalls)	When the engine is cold, it stalls at idling. (Die out)	11	13A-28
	When the engine becomes hot, it stalls at idling. (Die out)	12	13A-29
	The engine stalls when starting the car. (Pass out)	13	13A-30
	The engine stalls when decelerating.	14	13A-30
Driving	Hesitation, sag or stumble	15	13A-31
	The feeling of impact or vibration when accelerating	16	13A-31
	The feeling of impact or vibration when decelerating	17	13A-32
	Poor acceleration	18	13A-32
	Surge	19	13A-33
	Knocking	20	13A-33
Dieseling		21	13A-33
Too high CO and HC concentration when idling		22	13A-34
Fan (radiator fan, A/C condenser fan) are inoperative.		23	13A-35

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

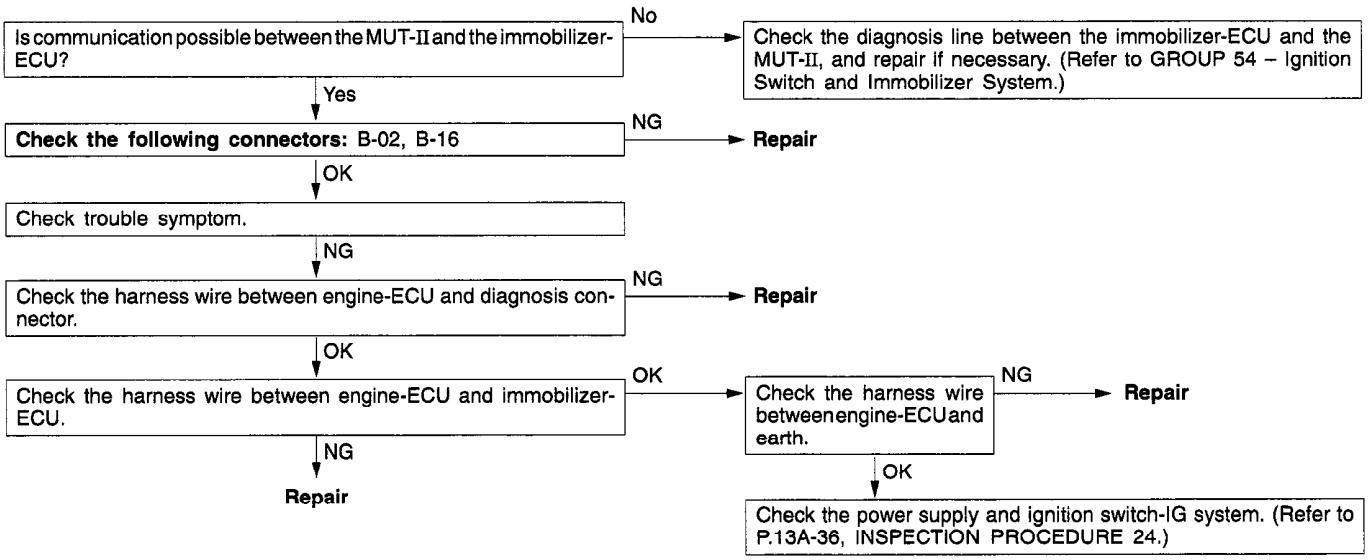
INSPECTION PROCEDURE 1

Communication with MUT-II is not possible. (Communication with all systems is not possible.)	Probable cause
The cause is probably a defect in the power supply system (including earth) for the diagnosis line.	• Malfunction of the connector • Malfunction of the harness wire



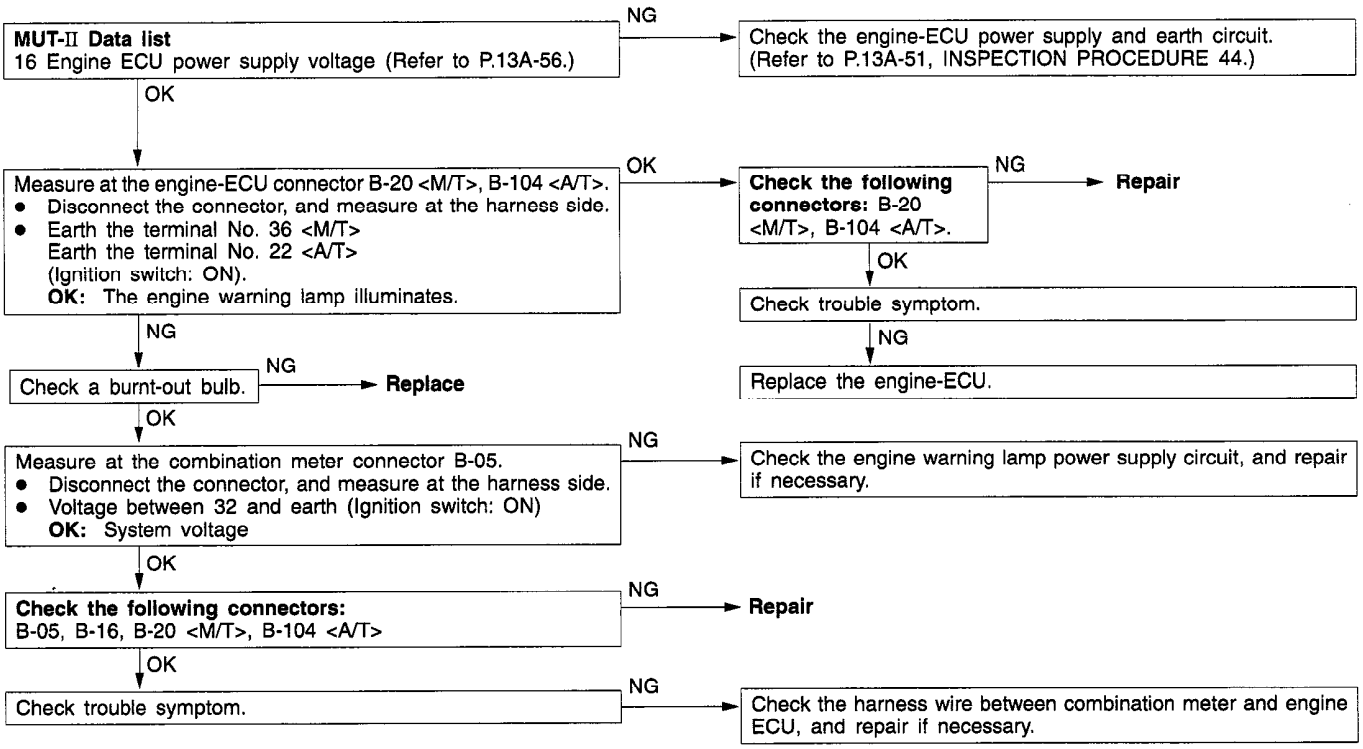
INSPECTION PROCEDURE 2

MUT-II communication with engine-ECU is impossible.	Probable cause
One of the following causes may be suspected. • No power supply to engine-ECU. • Defective earth circuit of engine-ECU. • Defective engine-ECU. • Improper communication line between engine-ECU and MUT-II	• Malfunction of engine-ECU power supply circuit • Malfunction of engine-ECU • Malfunction of immobilizer-ECU • Open circuit between immobilizer-ECU and diagnosis connector • Open circuit between engine-ECU and immobilizer-ECU



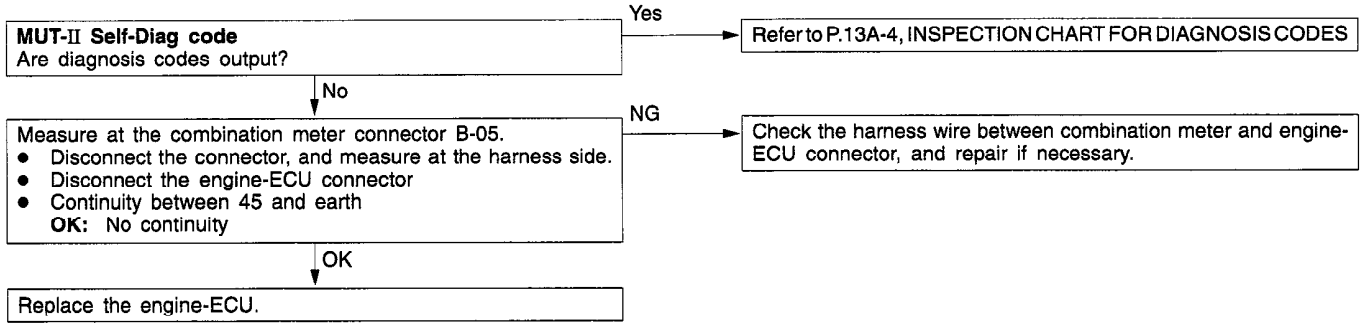
INSPECTION PROCEDURE 3

The engine warning lamp does not illuminate right after the ignition switch is turned to the ON position.	Probable cause
Because there is a burnt-out bulb, the engine-ECU causes the engine warning lamp to illuminate for five seconds immediately after the ignition switch is turned to ON. If the engine warning lamp does not illuminate immediately after the ignition switch is turned to ON, one of the malfunctions listed at right has probably occurred.	• Burnt-out bulb • Defective warning lamp circuit • Malfunction of the engine-ECU



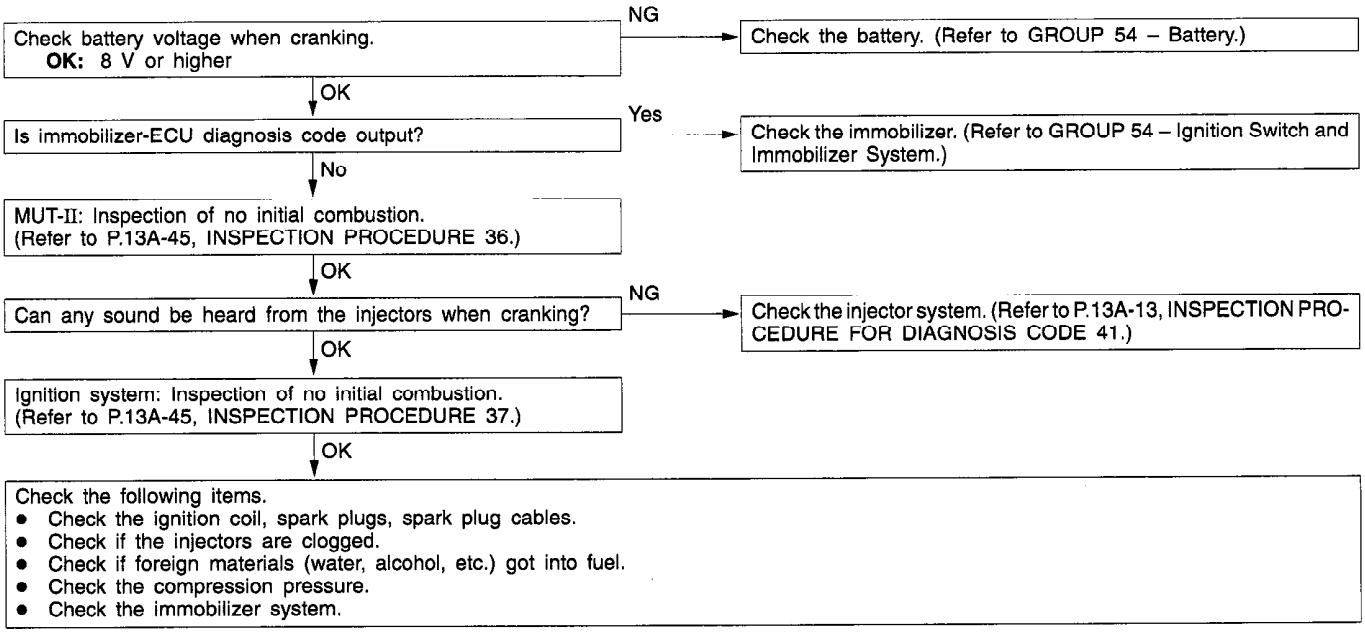
INSPECTION PROCEDURE 4

The engine warning lamp remains illuminating and never goes out.	Probable cause
In cases such as the above, the cause is probably that the engine-ECU is detecting a problem in a sensor or actuator, or that one of the malfunctions listed at right has occurred.	• Short-circuit between the engine warning lamp and engine-ECU • Malfunction of the engine-ECU



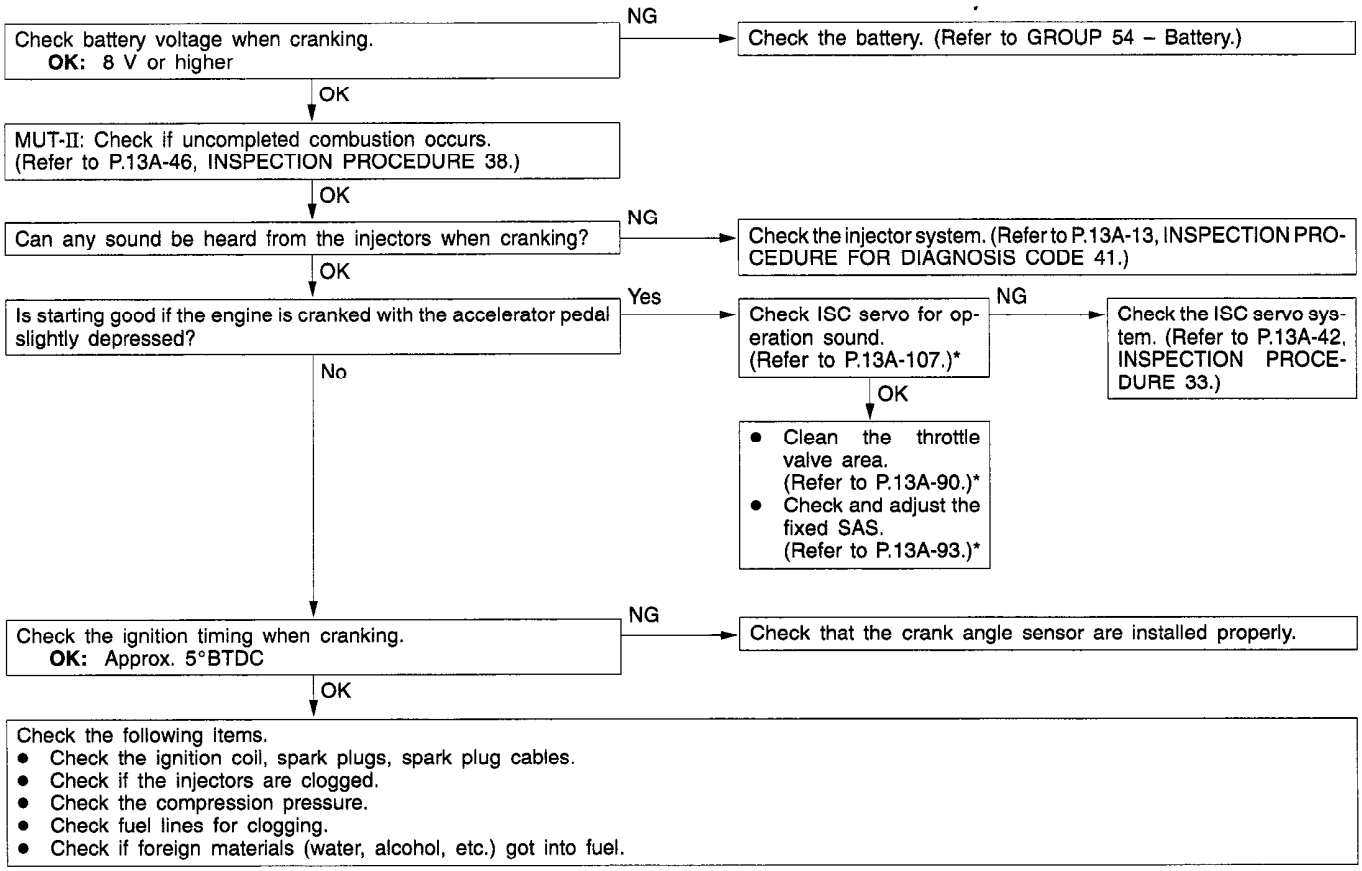
INSPECTION PROCEDURE 5

No initial combustion (starting impossible)	Probable cause
In cases such as the above, the cause is probably that a spark plug is defective, or that the supply of fuel to the combustion chamber is defective. In addition, foreign materials (water, kerosene, etc.) may be mixed with the fuel.	• Malfunction of the ignition system • Malfunction of the fuel pump system • Malfunction of the injectors • Malfunction of the engine-ECU • Malfunction of the immobilizer system • Foreign materials in fuel



INSPECTION PROCEDURE 6

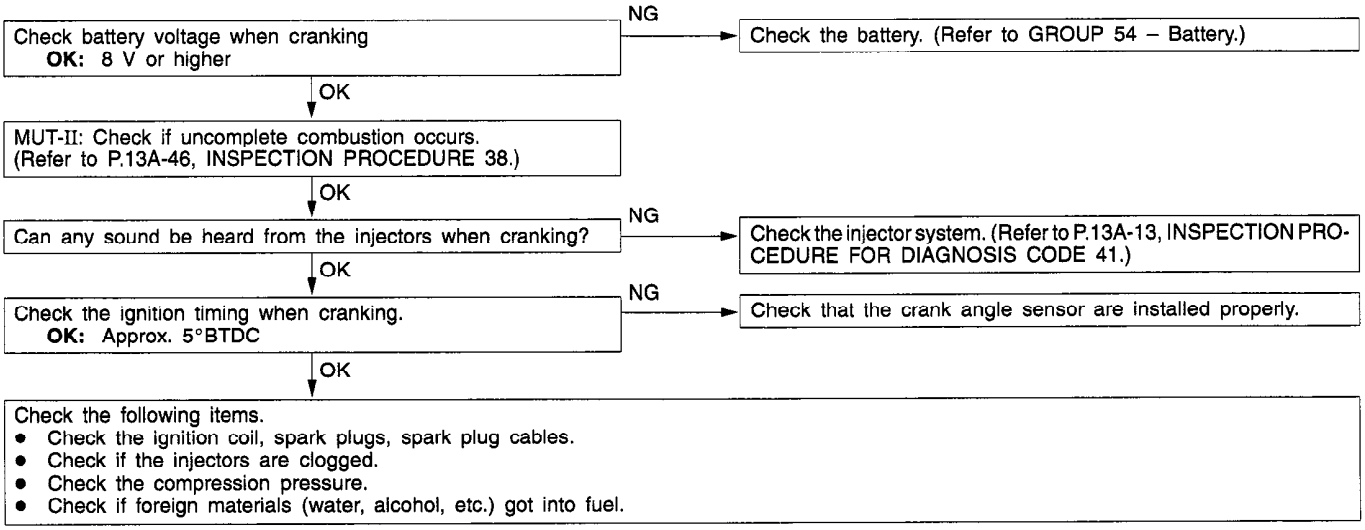
Initial combustion but no complete combustion (starting impossible)	Probable cause
In such cases as the above, the cause is probably that the spark plugs are generating sparks but the sparks are weak, or the initial mixture for starting is not appropriate.	• Malfunction of the ignition system • Malfunction of the injector system • Foreign materials in fuel • Poor compression • Malfunction of the engine-ECU



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

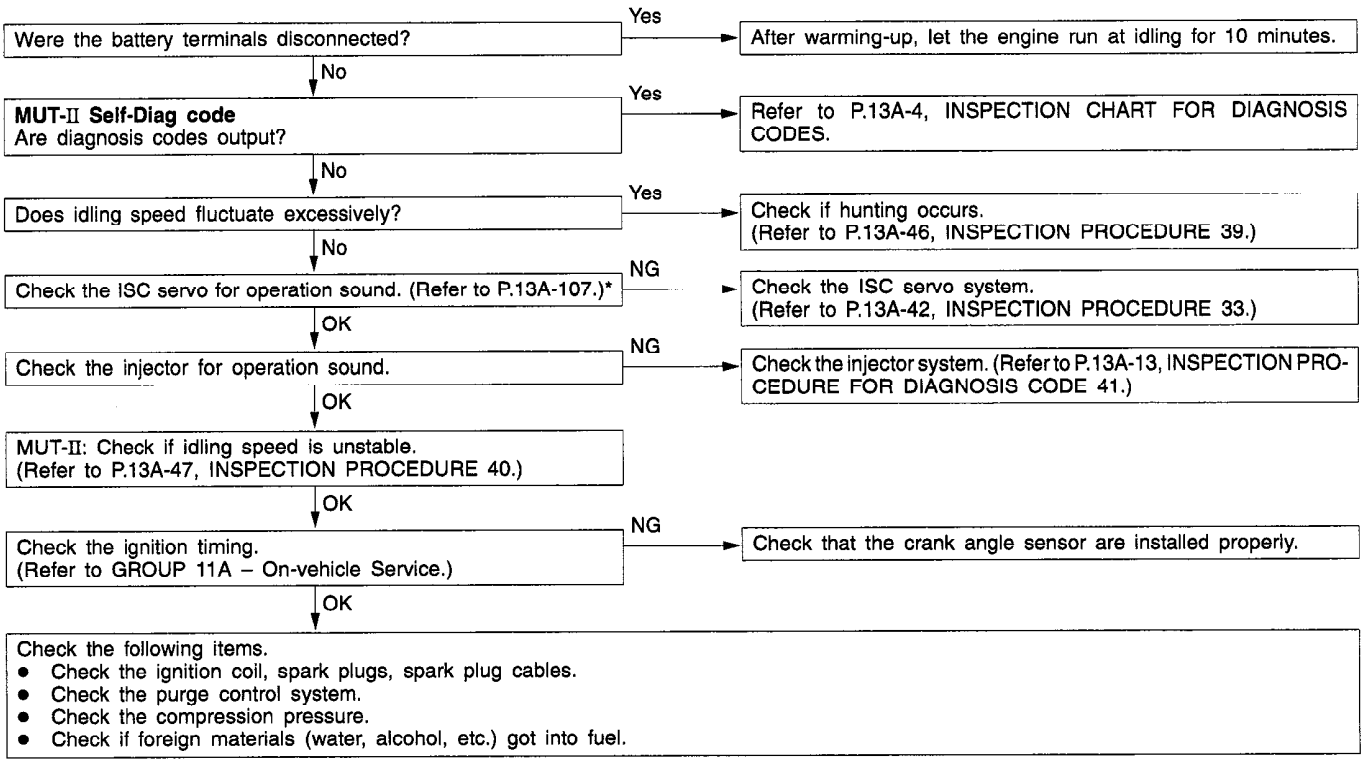
INSPECTION PROCEDURE 7

In takes too long time to start. (Incorrect starting)	Probable cause
In cases such as the above, the cause is probably that the spark is weak and ignition is difficult, the initial mixture for starting is not appropriate, or sufficient compression pressure is not being obtained.	• Malfunction of the ignition system • Malfunction of the injector system • Inappropriate gasoline use • Poor compression



INSPECTION PROCEDURE 8

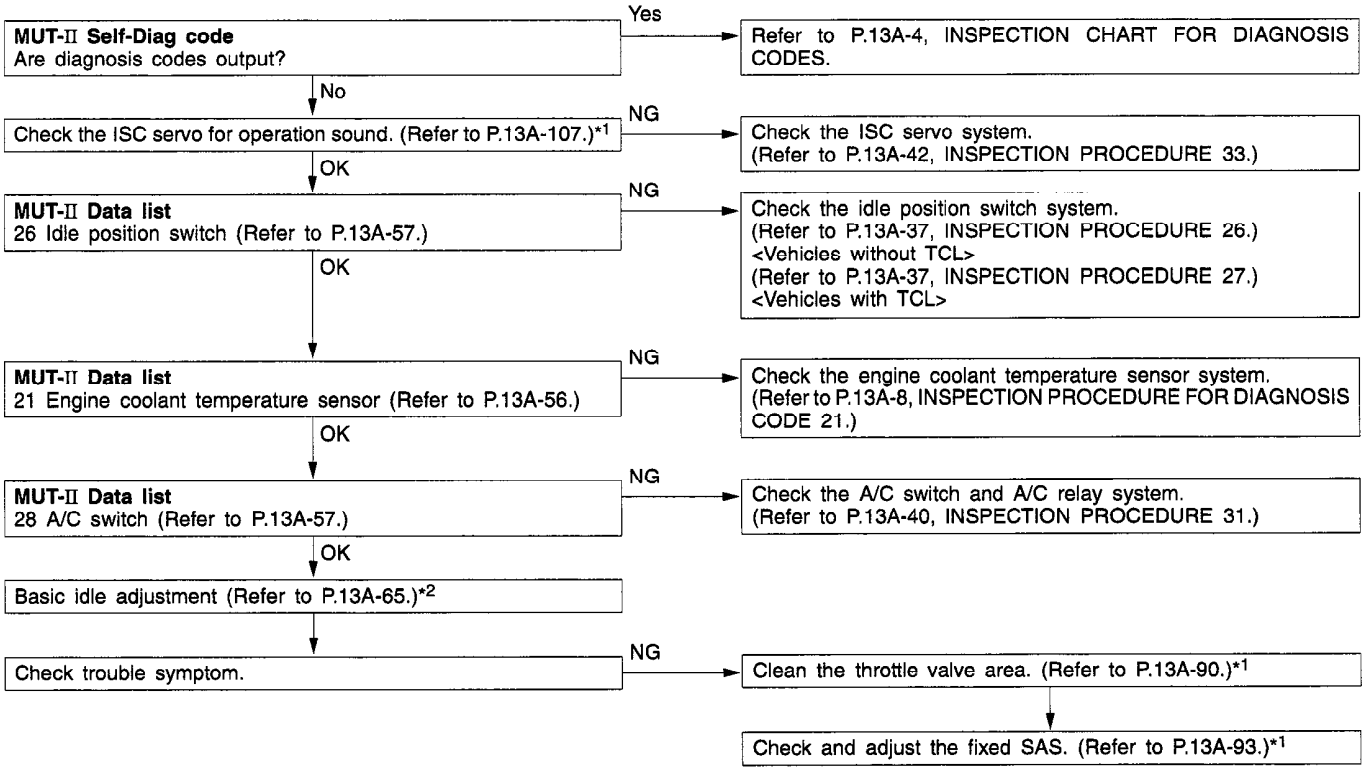
Unstable idling (Rough idling, hunting)	Probable cause
In cases as the above, the cause is probably that the ignition system, air/fuel mixture, idle speed control (ISC) or compression pressure is defective. Because the range of possible causes is broad, inspection is narrowed down to simple items.	• Malfunction of the ignition system • Malfunction of air-fuel ratio control system • Malfunction of the ISC system • Malfunction of the purge control solenoid valve system • Poor compression • Drawing air into exhaust system



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 9

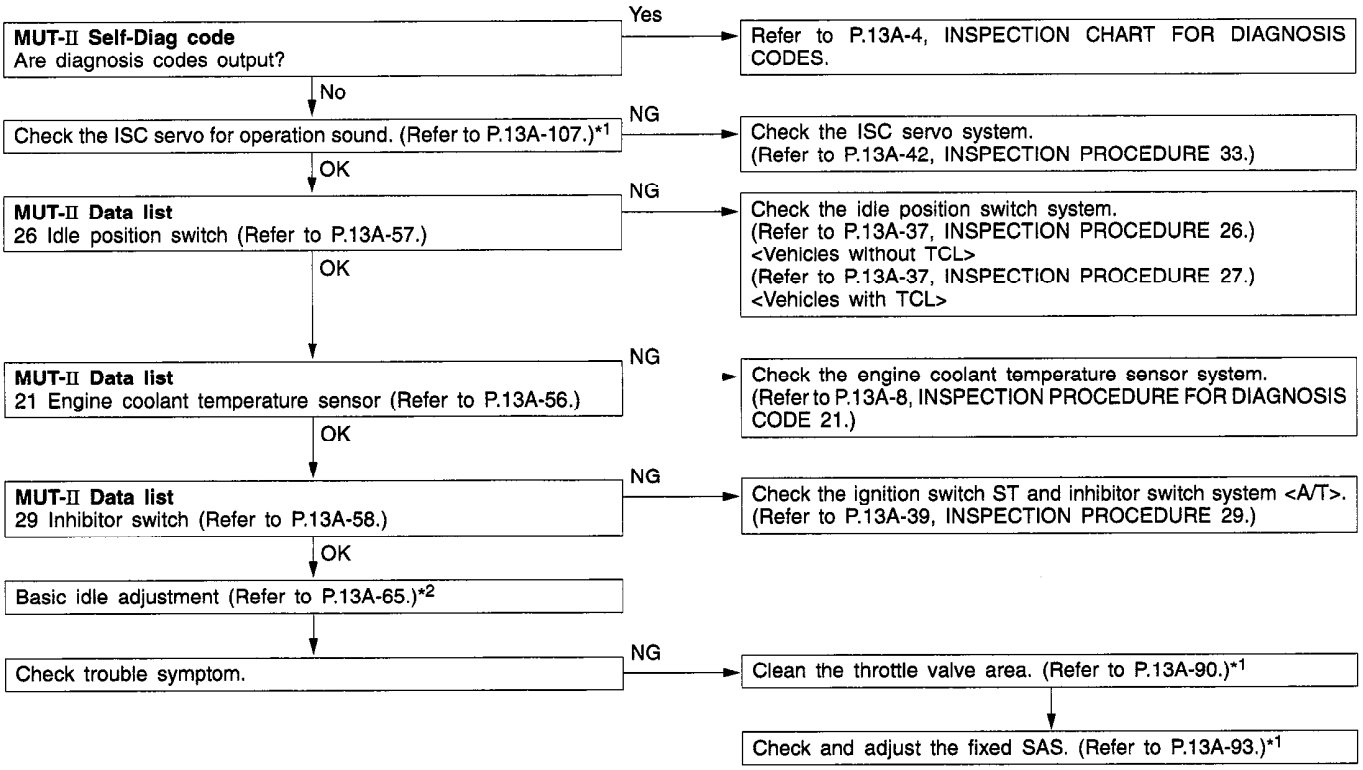
Idling speed is high. (Improper idling speed)	Probable cause
In such cases as the above, the cause is probably that the intake air volume during idling is too great.	• Malfunction of the ISC servo system • Malfunction of the throttle body



*1: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).
*2: Refer to '97 CARISMA Workshop Manual (Pub. No. PWDE9502-A).

INSPECTION PROCEDURE 10

Idling speed is low. (Improper idling speed)	Probable cause
In cases such as the above, the cause is probably that the intake air volume during idling is too small.	• Malfunction of the ISC servo system • Malfunction of the throttle body



*1: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).
*2: Refer to '97 CARISMA Workshop Manual (Pub. No. PWDE9502-A).

INSPECTION PROCEDURE 11

When the engine is cold, it stalls at idling. (Die out)	Probable cause
In such cases as the above, the cause is probably that the air/fuel mixture is inappropriate when the engine is cold, or that the intake air volume is insufficient.	• Malfunction of the ISC servo system • Malfunction of the throttle body • Malfunction of the injector system • Malfunction of the ignition system

Were the battery terminals disconnected?
- Yes → After warming-up, let the engine run at idling for 10 minutes.
- No ↓

MUT-II Self-Diag code
Are diagnosis codes output?
- Yes → Refer to P.13A-4 INSPECTION CHART FOR DIAGNOSIS CODES.
- No ↓

Does the engine stall right after the accelerator pedal is released?
- Yes → Clean the throttle valve area. (Refer to P.13A-90.)* → Check and adjust the fixed SAS. (Refer to P.13A-93.)*
- No ↓

Is engine-idling stable after the warming-up?
- No → Check if the unstable idling (Rough idling, hunting). (Refer to P.13A-25, INSPECTION PROCEDURE 8.)
- Yes ↓

Check the ISC servo for operation sound. (Refer to P.13A-107.)*
- NG → Check the ISC servo system. (Refer to P.13A-42, INSPECTION PROCEDURE 33.)
- OK ↓

Check the injector for operation sound.
- NG → Check the injector system. (Refer to P.13A-13, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 41.)
- OK ↓

MUT-II Data list
26 Idle position switch (Refer to P.13A-57.)
- NG → Check the idle position switch system. (Refer to P.13A-37, INSPECTION PROCEDURE 26.) <Vehicles without TCL> (Refer to P.13A-37, INSPECTION PROCEDURE 27.) <Vehicles with TCL>
- OK ↓

MUT-II Data list
21 Engine coolant temperature sensor (Refer to P.13A-56.)
- NG → Check the engine coolant temperature sensor system. (Refer to P.13A-8, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 21.)
- OK ↓

Check the fuel pressure. (Refer to P.13A-95.)*
- OK ↓

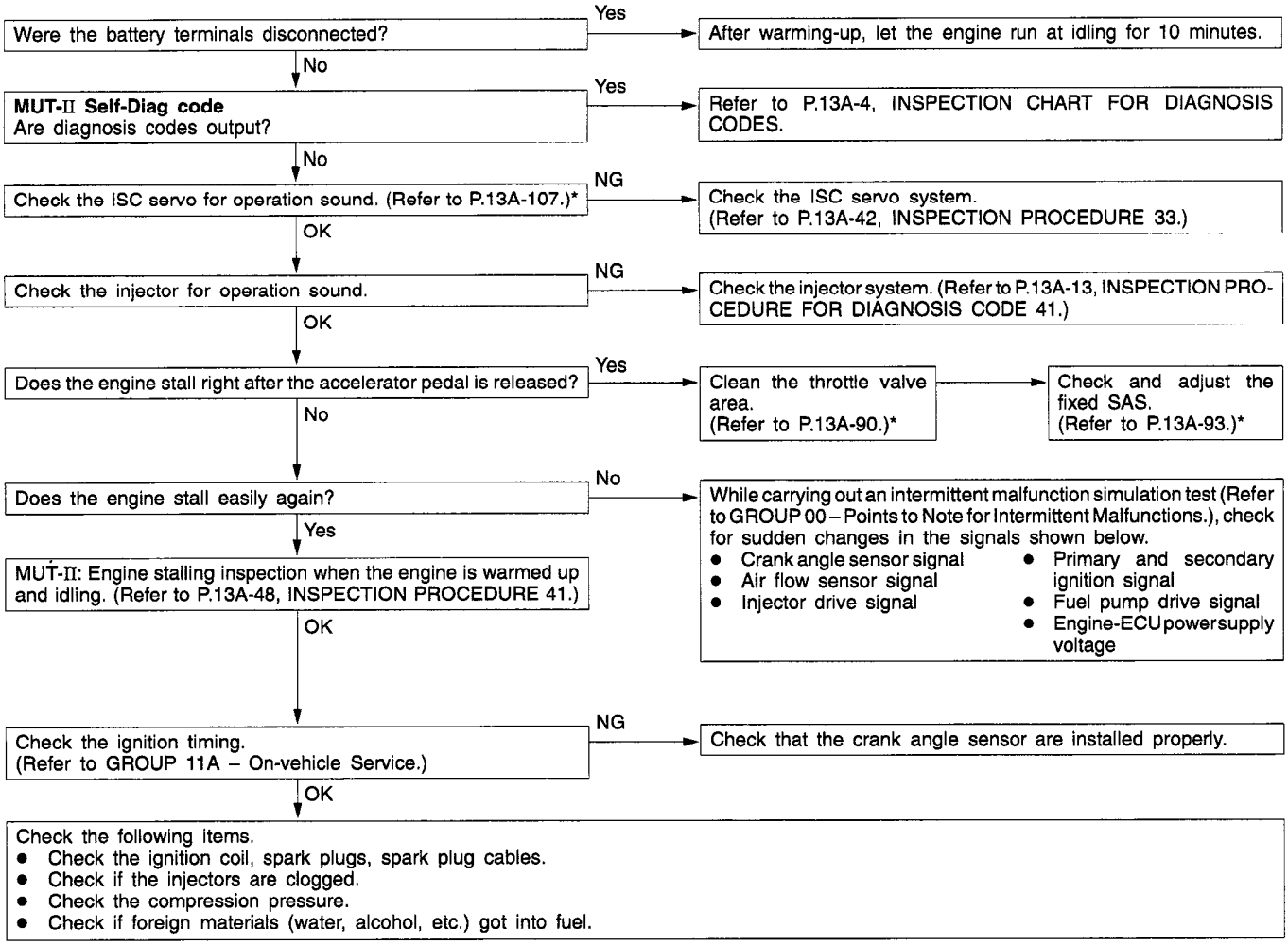
Check the ignition timing. (Refer to GROUP 11A – On-vehicle Service.)
- NG → Check that the crank angle sensor are installed properly.
- OK ↓

Check the following items.
- Check the ignition coil, spark plugs, spark plug cables.
- Check the compression pressure.
- Check the engine oil viscosity.

*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 12

When the engine is hot, it stalls at idling. (Die out)	Probable cause
In such cases as the above, the cause is probably that ignition system, air/fuel mixture, idle speed control (ISC) or compression pressure is defective. In addition, if the engine suddenly stalls, the cause may also be a defective connector contact.	• Malfunction of the ignition system • Malfunction of air-fuel ratio control system • Malfunction of the ISC system • Drawing air into intake system • Improper connector contact



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 13

The engine stalls when starting the car. (Pass out)	Probable cause
In cases such as the above, the cause is probably misfiring due to a weak spark, or an inappropriate air/fuel mixture when the accelerator pedal is depressed.	• Drawing air into intake system • Malfunction of the ignition system

MUT-II Self-Diag code
Are diagnosis codes output?
→ Yes: Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
↓ No:

Check the following items.
- Check the ignition coil, spark plugs, spark plug cables.
- Check if air was drawn into the intake system.
  - Broken intake manifold gasket
  - Broken or disconnected vacuum hose
  - Improper operation of the PCV valve
  - Broken air intake hose

INSPECTION PROCEDURE 14

The engine stalls when decelerating.	Probable cause
In cases such as the above, the cause is probably that the intake air volume is insufficient due to a defective idle speed control (ISC) servo system.	• Malfunction of the ISC system

Were the battery terminals disconnected?
→ Yes: After warming-up, let the engine run at idling for 10 minutes.
↓ No:

MUT-II Self-Diag code
Are diagnosis codes output?
→ Yes: Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
↓ No:

MUT-II Data list
26 Idle position switch (Refer to P.13A-57.)
→ NG: Check the idle position switch system.
(Refer to P.13A-37, INSPECTION PROCEDURE 26.)
<Vehicles without TCL>
(Refer to P.13A-37, INSPECTION PROCEDURE 27.)
<Vehicles with TCL>
↓ OK:

MUT-II Data list
14 Throttle position sensor (Refer to P.13A-56.)
→ NG: Check the throttle position sensor system. (Refer to P.13A-7, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 14.)
↓ OK:

MUT-II Data list
45 ISC servo position
- Is the idle speed control (ISC) servo position drops to 0 – 2 steps when decelerating (engine r/min less than 1,000)?

→ Yes: Check the vehicle speed sensor system. (Refer to P.13A-11, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 24.)
↓ No:

Check the following items.
- Check the ignition coil, spark plugs, spark plug cables.
- Clean the throttle valve area.
- Check and adjust the fixed SAS.

*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 15

Hesitation, sag or stumble	Probable cause
In cases such as the above, the cause is probably that ignition system, air/fuel mixture or compression pressure is defective.	• Malfunction of the ignition system • Malfunction of air-fuel ratio control system • Malfunction of the fuel supply system • Malfunction of the EGR control solenoid valve system • Poor compression

MUT-II Self-Diag code
Are diagnosis codes output?
Yes → Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
No ↓

Check the injectors for operation sound.
NG → Check the injector system. (Refer to P.13A-13, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 41.)
OK ↓

Check the ignition timing.
(Refer to GROUP 11A – On-vehicle Service.)
NG → Check that the crank angle sensor are installed properly.
OK ↓

MUT-II: Check if hesitation, sag, stumble or poor acceleration occur.
(Refer to P.13A-49, INSPECTION PROCEDURE 42.)
OK ↓

Check the fuel pressure. (Refer to P.13A-95.)*
OK ↓

Check the following items.
- Check the ignition coil, spark plugs, spark plug cables.
- Negative pressure check during traction control operation <Vehicles with TCL>
- Throttle valve operation check <Vehicles with TCL>
- Vacuum tank and vacuum actuator check <Vehicles with TCL>
- Check the EGR system.
- Check the compression pressure.
- Check the fuel filter or fuel line for clogging.

INSPECTION PROCEDURE 16

The feeling of impact or vibration when accelerating	Probable cause
In cases such as the above, the cause is probably that there is an ignition leak accompanying the increase in the spark plug demand voltage during acceleration.	• Malfunction of the ignition system

MUT-II Self-Diag code
Are diagnosis codes output?
Yes → Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
No ↓

Check the following items.
- Check the ignition coil, spark plugs, spark plug cables.
- Check for occurrence of ignition leak.

*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 17

The feeling of impact or vibration when decelerating.	Probable cause
Malfunction of the ISC system is suspected.	• Malfunction of the ISC system

MUT-II Self-Diag code
Are diagnosis codes output?
- Yes → Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
- No ↓

Check the ISC servo for operation sound. (Refer to P.13A-107.)*
- NG → Check the ISC servo system. (Refer to P.13A-42, INSPECTION PROCEDURE 33.)
- OK ↓

MUT-II Data list
14 Throttle position sensor (Refer to P.13A-56.)
- NG → Check the throttle position sensor system. (Refer to P.13A-7, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 14.)
- OK ↓

MUT-II Data list
26 Idle position switch (Refer to P.13A-57.)
- NG → Check the idle position switch system. (Refer to P.13A-37, INSPECTION PROCEDURE 26.) <Vehicles without TCL> (Refer to P.13A-37, INSPECTION PROCEDURE 27.) <Vehicles with TCL>
- OK ↓

Clean the throttle valve area. (Refer to P.13A-90.)*

INSPECTION PROCEDURE 18

Poor acceleration	Probable cause
Defective ignition system, abnormal air-fuel ratio, poor compression pressure, etc. are suspected.	• Malfunction of the ignition system • Malfunction of air-fuel ratio control system • Malfunction of the fuel supply system • Poor compression pressure • Clogged exhaust system

MUT-II Self-Diag code
Are diagnosis codes output?
- Yes → Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
- No ↓

Check the injectors for operation sound.
- NG → Check the injector system. (Refer to P.13A-13, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 41.)
- OK ↓

Check the ignition timing. (Refer to GROUP 11A – On-vehicle Service.)
- NG → Check that the crank angle sensor are installed properly.
- OK ↓

MUT-II: Check if hesitation, sag, stumble or poor acceleration occur. (Refer to P.13A-49, INSPECTION PROCEDURE 42.)
- OK ↓

Check the fuel pressure. (Refer to P.13A-95.)*
- OK ↓

Check the following items.
- Check the ignition coil, spark plugs, spark plug cables.
- Negative pressure check during traction control operation <Vehicles with TCL>
- Throttle valve operation check <Vehicles with TCL>
- Vacuum tank and vacuum actuator check <Vehicles with TCL>
- Check the compression pressure.
- Check the fuel filter or fuel line for clogging.
- Broken air intake hose
- Clogged air cleaner

*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 19

Surge	Probable cause
Defective ignition system, abnormal air-fuel ratio, etc. are suspected.	• Malfunction of the ignition system • Malfunction of air-fuel ratio control system • Malfunction of the EGR control solenoid valve system

MUT-II Self-Diag code
Are diagnosis codes output?
Yes → Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
No ↓

Check the injectors for operation sound.
NG → Check the injector system. (Refer to P. 13A-13, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 41.)
OK ↓

Check the ignition timing.
(Refer to GROUP 11A – On-vehicle Service.)
NG → Check that the crank angle sensor are installed properly.
OK ↓

MUT-II: Check if surge occurs.
(Refer to P.13-50, INSPECTION PROCEDURE 43.)
OK ↓

Check the fuel pressure. (Refer to P.13A-95.)*
OK ↓

Check the following items.
- Check the ignition coil, spark plugs, spark plug cables.
- Check the EGR system.

INSPECTION PROCEDURE 20

Knocking	Probable cause
In cases as the above, the cause is probably that the detonation control is defective or the heat value of the spark plug is inappropriate.	• Defective detonation sensor • Inappropriate heat value of the spark plug

MUT-II Self-Diag code
Are diagnosis codes output?
Yes → Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODES.
No ↓

Does knocking occur when driving with the sensor disconnected? At this time, use the MUT-II to check if the timing is retarded compared to when the detonation sensor connector is connected.
No → Check the detonation sensor system. (Refer to P.13A-13, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 31.)
Yes ↓

Check the following items.
- Spark plugs
- Check if foreign materials (water, alcohol, etc.) got into fuel.

INSPECTION PROCEDURE 21

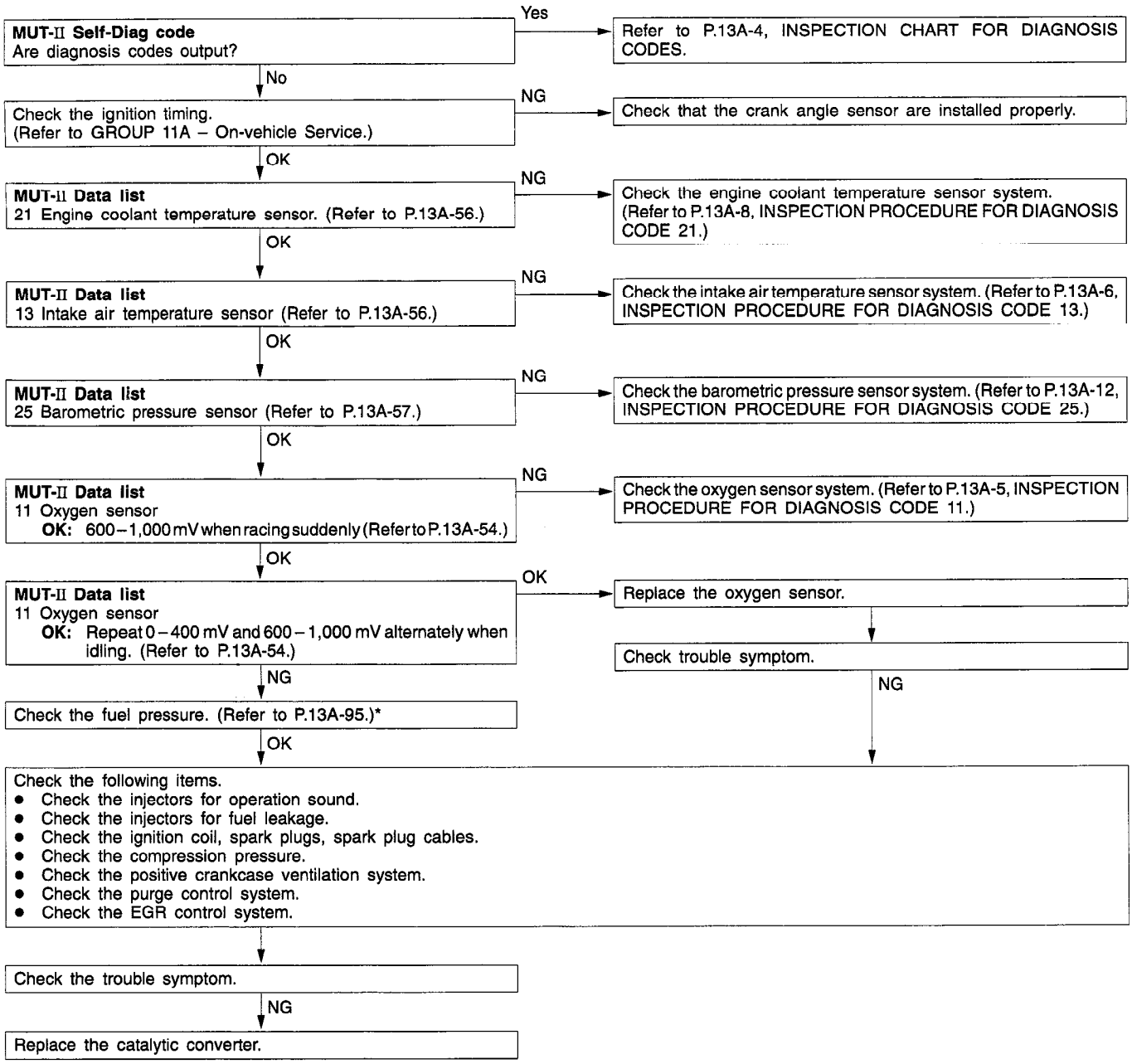
Dieseling	Probable cause
Fuel leakage from injectors is suspected.	• Fuel leakage from injectors

Check the injectors for fuel leakage.

*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 22

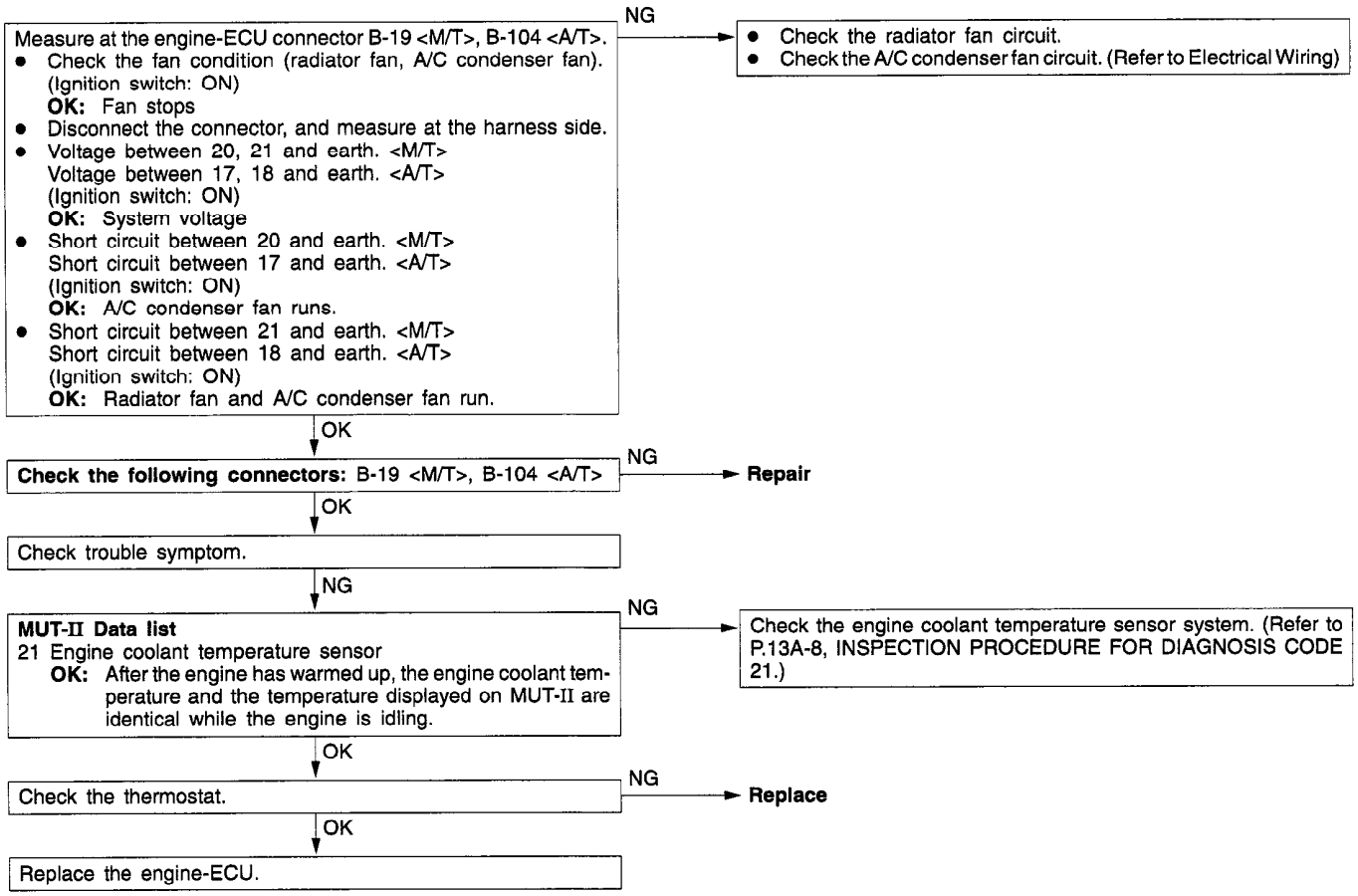
Too high CO and HC concentration when idling	Probable cause
Abnormal air-fuel ratio is suspected.	• Malfunction of the air-fuel ratio control system • Deteriorated catalyst



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

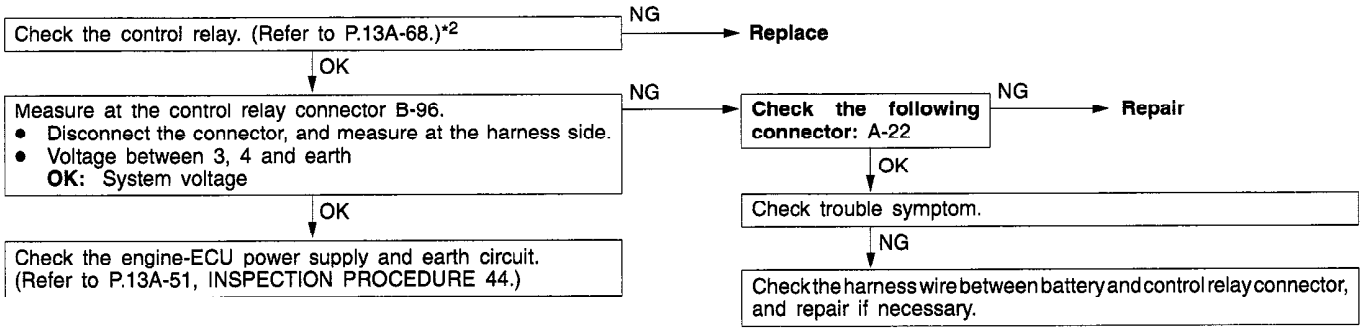
INSPECTION PROCEDURE 23

Fan (radiator fan, A/C condenser fan) are inoperative	Probable cause
The power transistor inside the engine-ECU turns the fan motor relay ON and OFF.	• Malfunction of the fan motor relay • Malfunction of the fan motor • Malfunction of the thermostat • Improper connector contact, open or short-circuited harness wire • Malfunction of the engine-ECU



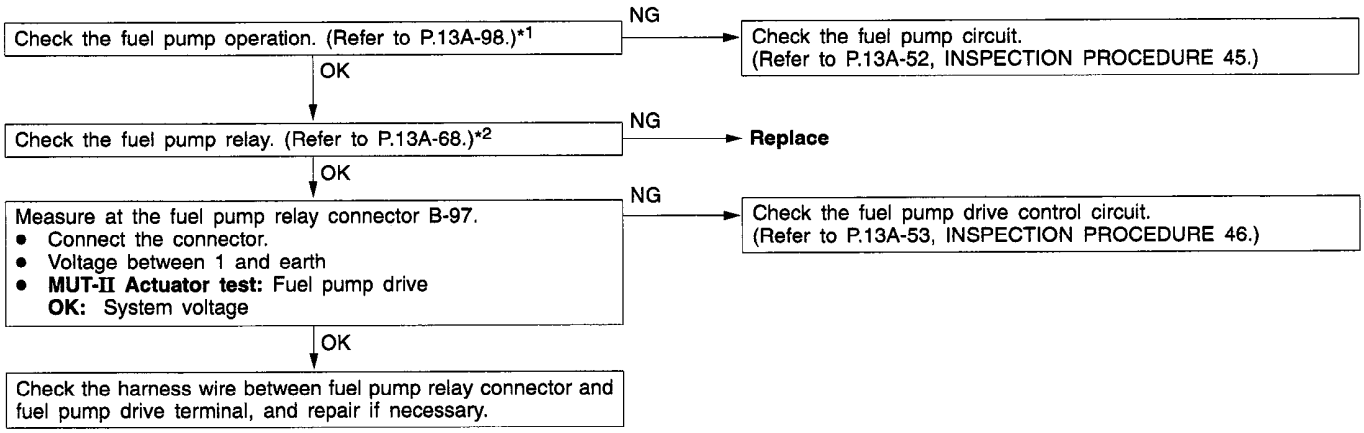
INSPECTION PROCEDURE 24

Power supply system and ignition switch-IG system	Probable cause
When an ignition switch ON signal is input to the engine ECU, the engine ECU turns the control relay ON. This causes battery voltage to be supplied to the engine ECU, injectors and air flow sensor.	• Malfunction of the ignition switch • Malfunction of the control relay • Improper connector contact, open circuit or short-circuited harness wire • Disconnected engine-ECU earth wire • Malfunction of the engine-ECU



INSPECTION PROCEDURE 25

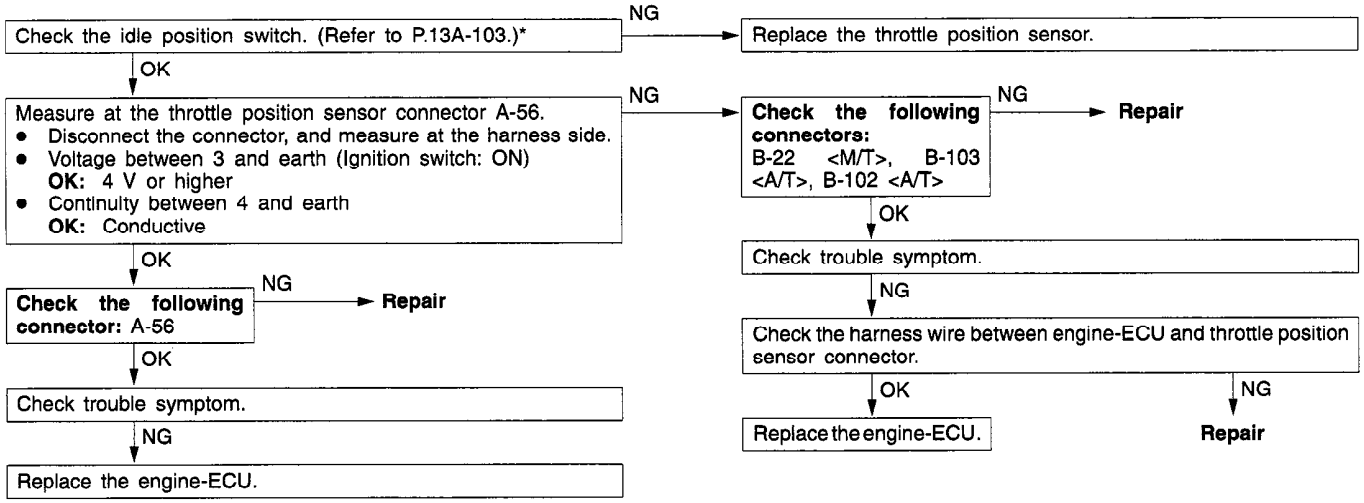
Fuel pump system	Probable cause
The engine-ECU turns the control relay ON when the engine is cranking or running, and this supplies power to drive the fuel pump.	• Malfunction of the fuel pump relay • Malfunction of the fuel pump • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



*1: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).
*2: Refer to '97 CARISMA Workshop Manual (Pub. No. PWDE9502-A).

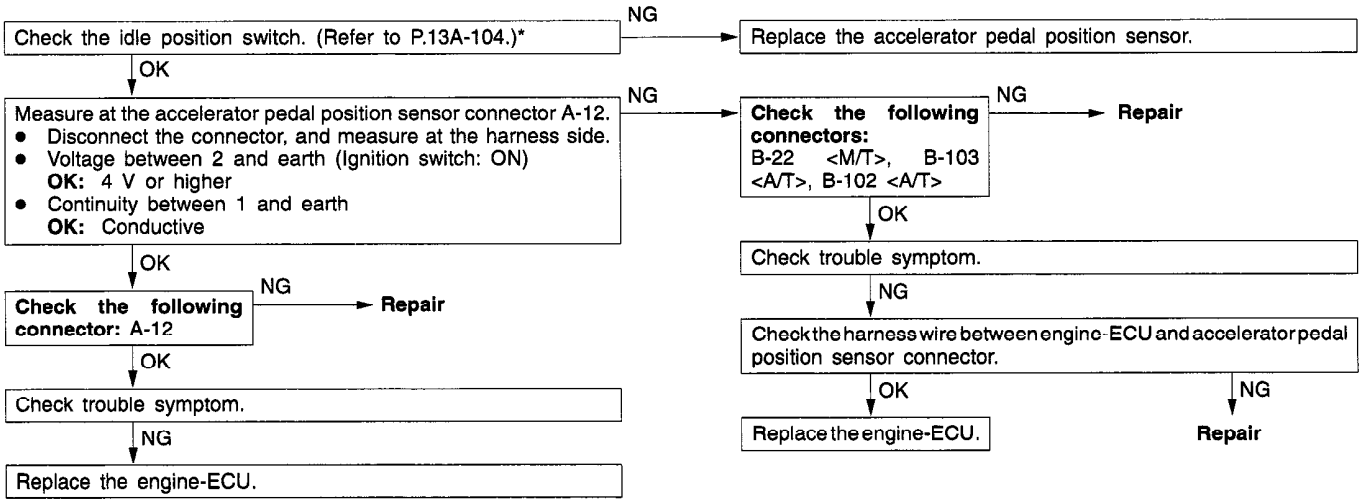
INSPECTION PROCEDURE 26

Idle position switch system <Vehicles without TCL>	Probable cause
The idle position switch inputs the condition of the accelerator pedal, i.e. whether it is depressed or released (HIGH/LOW), to the engine-ECU. The engine-ECU controls the idle speed control servo based on this input.	• Maladjustment of the accelerator pedal • Maladjustment of the fixed SAS • Maladjustment of the idle position switch and throttle position sensor • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



INSPECTION PROCEDURE 27

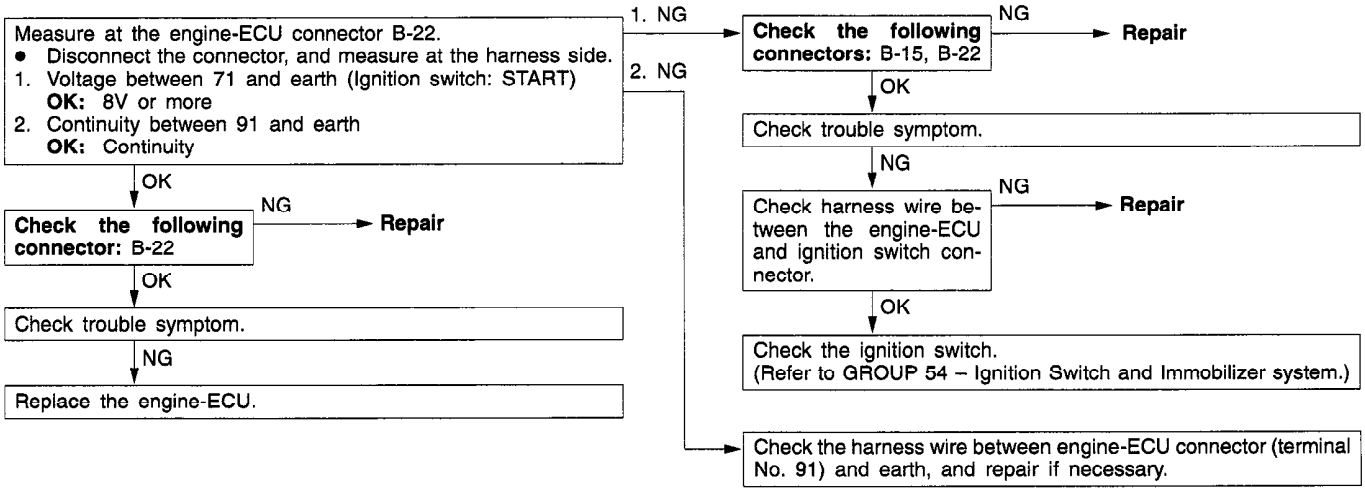
Idle position switch system <Vehicles with TCL>	Probable cause
The idle position switch inputs the condition of the accelerator pedal, i.e. whether it is depressed or released (HIGH/LOW), to the engine-ECU. The engine-ECU controls the idle speed control servo based on this input.	• Maladjustment of the accelerator pedal • Maladjustment of the fixed SAS • Maladjustment of the idle position switch and accelerator pedal position sensor • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

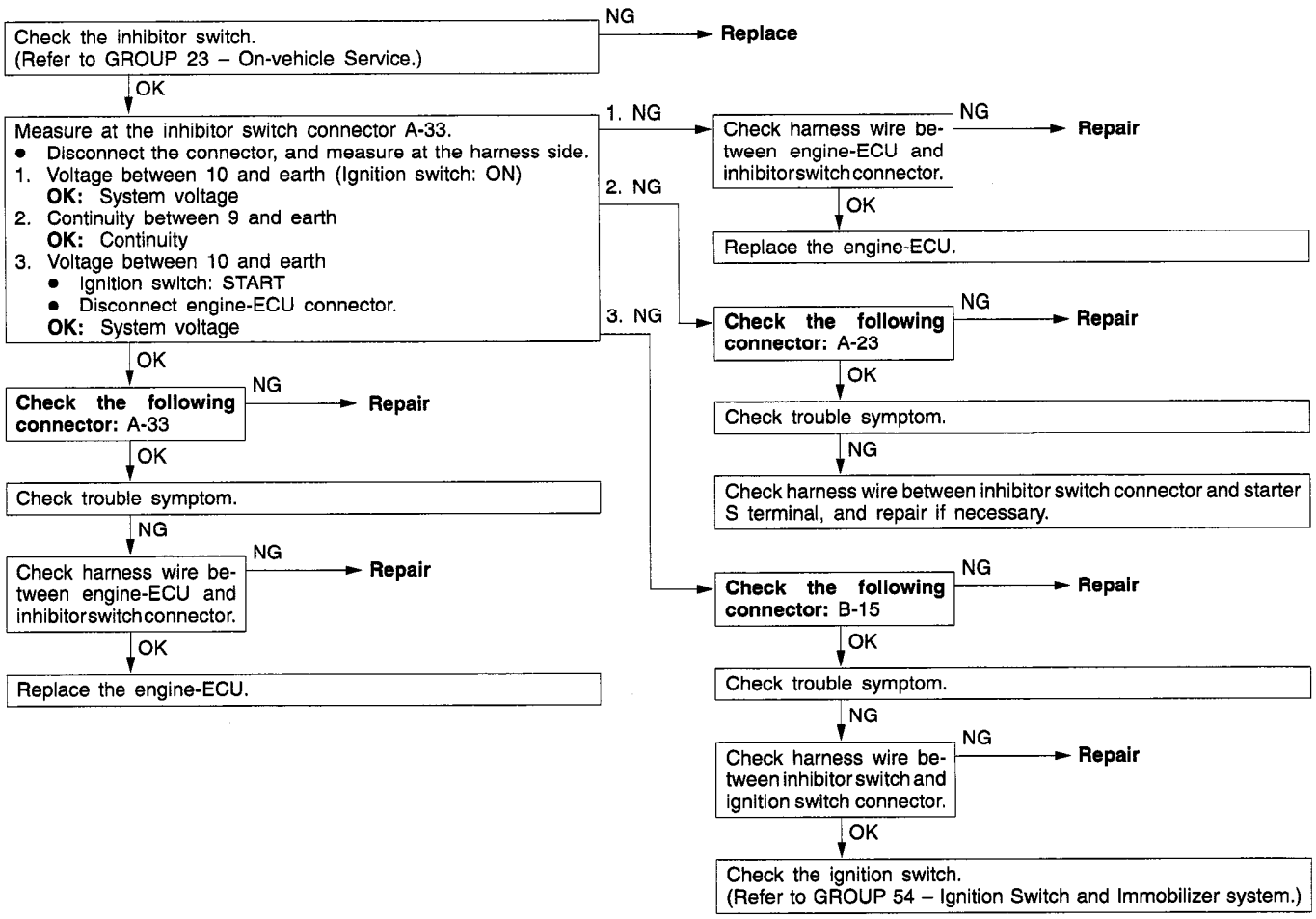
INSPECTION PROCEDURE 28

Ignition switch-ST system <M/T>	Probable cause
The ignition switch-ST inputs a HIGH signal to the engine-ECU while the engine is cranking. The engine-ECU controls fuel injection, etc. during starting based on this input.	• Malfunction of ignition switch • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



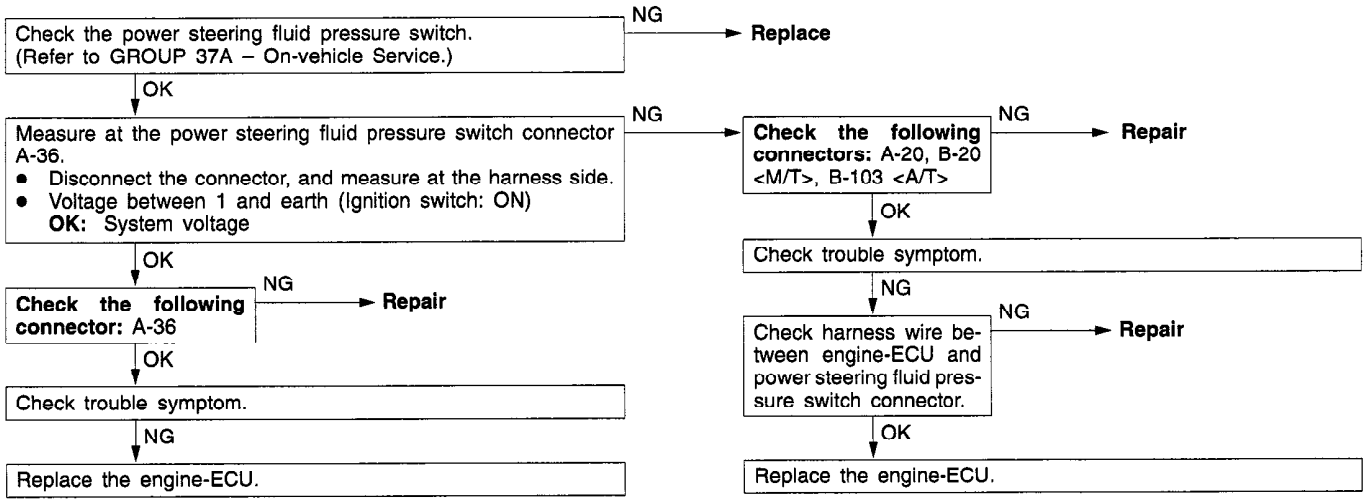
INSPECTION PROCEDURE 29

Ignition switch-ST and inhibitor switch system <A/T>	Probable cause
• The ignition switch-ST inputs a HIGH signal to the engine-ECU while the engine is cranking. The engine-ECU controls fuel injection, etc. during starting based on this input. • The inhibitor switch inputs the condition of the select lever, i.e. whether it is in P or N range or in some other range, to the engine-ECU. The engine-ECU controls the idle speed control (ISC) servo based on this input.	• Malfunction of ignition switch • Malfunction of inhibitor switch • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU.



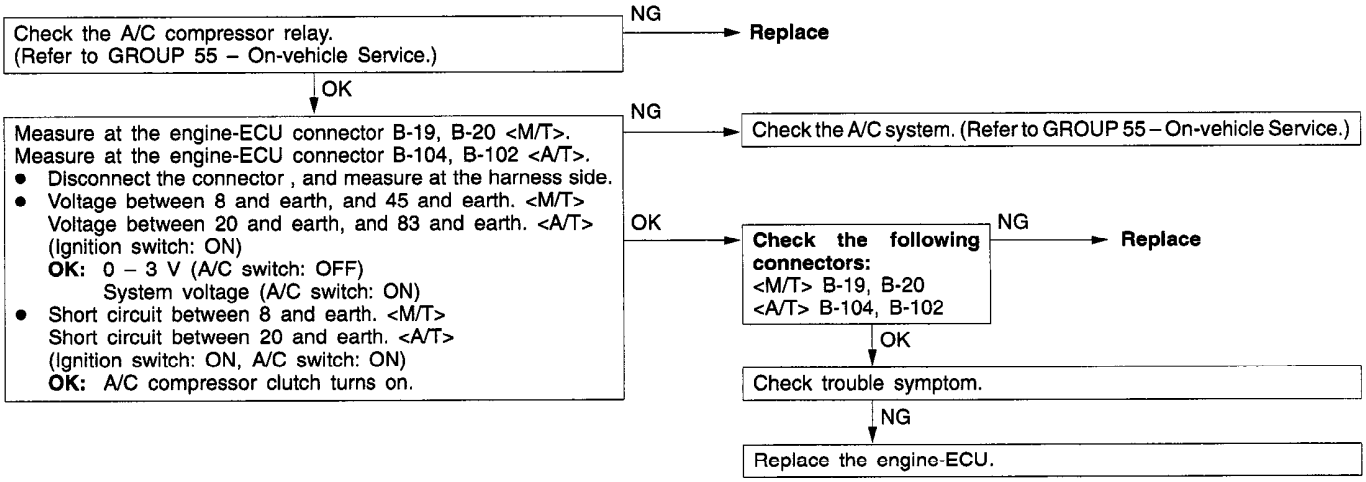
INSPECTION PROCEDURE 30

Power steering fluid pressure switch system	Probable cause
The presence or absence of power steering load is input to the engine-ECU. The engine-ECU controls the idle speed control (ISC) servo based on this input.	• Malfunction of power steering fluid pressure switch • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



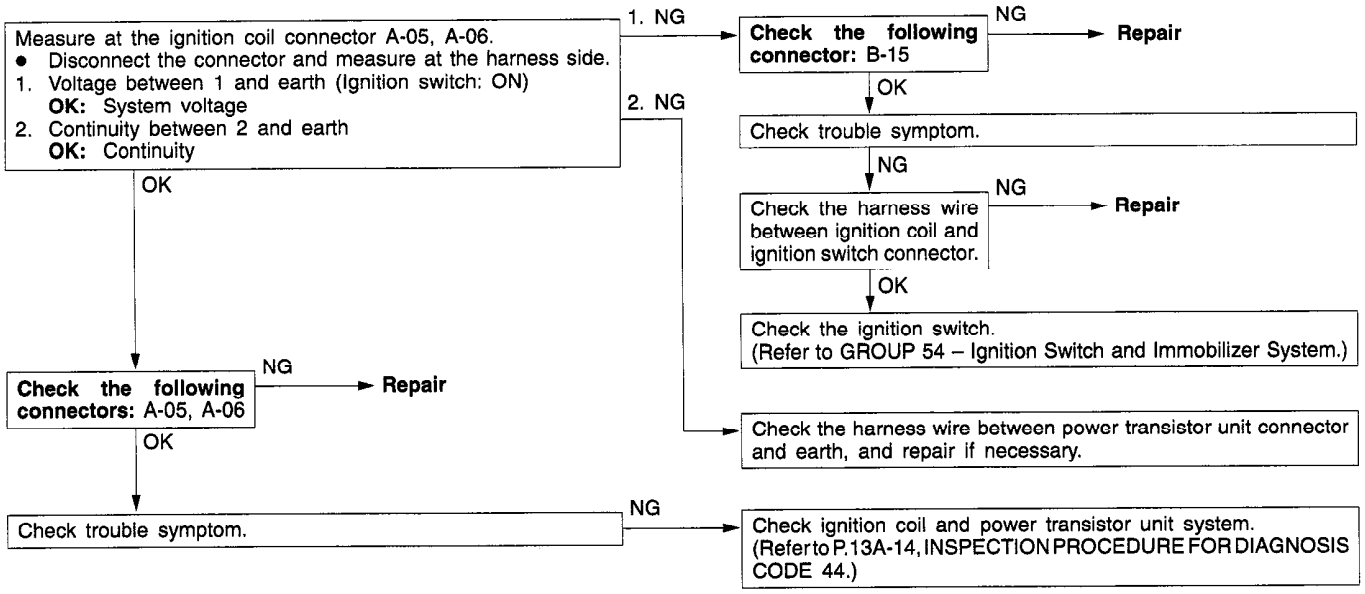
INSPECTION PROCEDURE 31

A/C switch and A/C relay system	Probable cause
When an A/C ON signal is input to the engine-ECU, the engine-ECU carries out control of the idle speed control (ISC) servo, and also operates the A/C compressor magnetic clutch.	• Malfunction of A/C control system • Malfunction of A/C switch • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



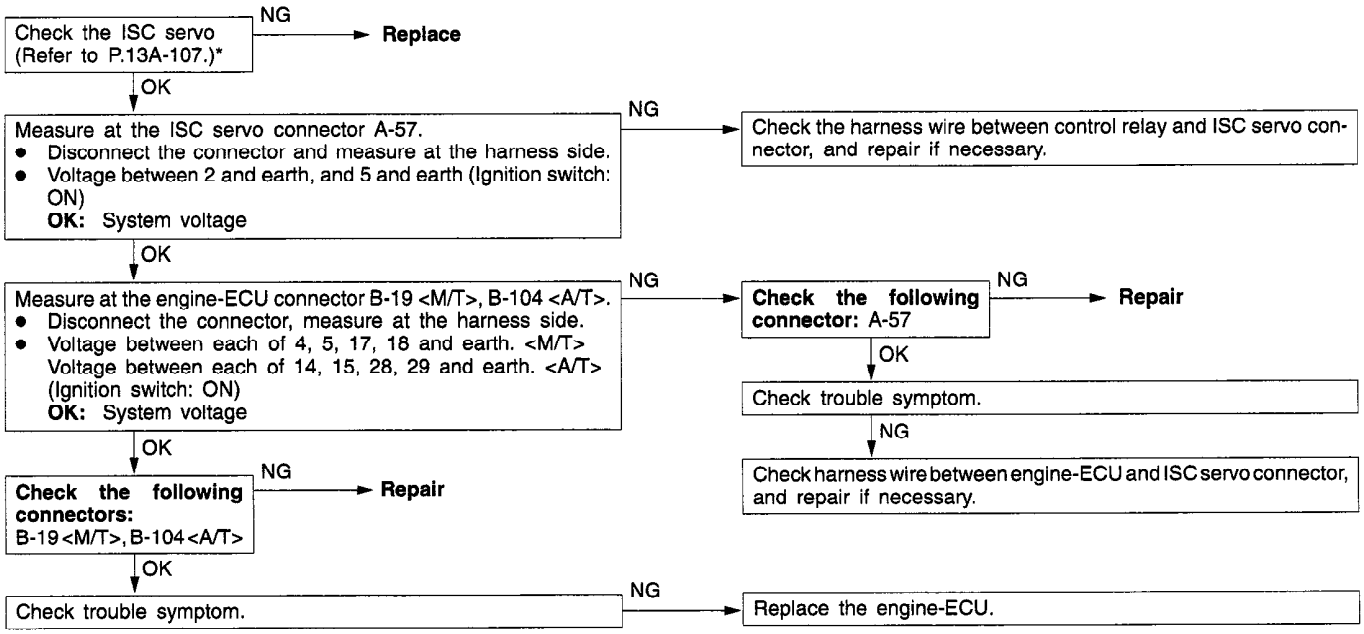
INSPECTION PROCEDURE 32

Ignition circuit system	Probable cause
The engine-ECU interrupts the ignition coil primary current by turning the power transistor inside the engine-ECU ON and OFF.	• Malfunction of ignition switch. • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



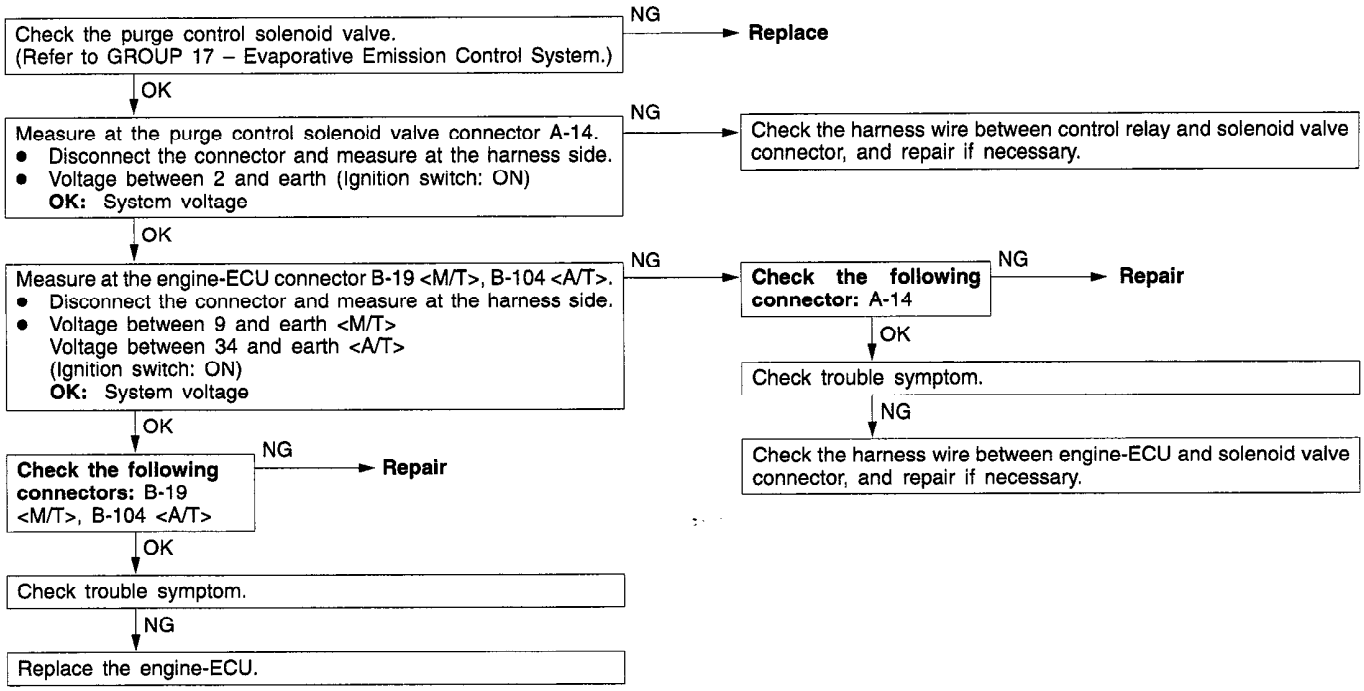
INSPECTION PROCEDURE 33

Idle speed control (ISC) servo (Stepper motor) system	Probable cause
The engine ECU controls the intake air volume during idling by opening and closing the servo valve located in the bypass air passage.	• Malfunction of ISC servo • Improper connector contact, open circuit or short-circuited harness wire • Malfunction of the engine-ECU



INSPECTION PROCEDURE 34

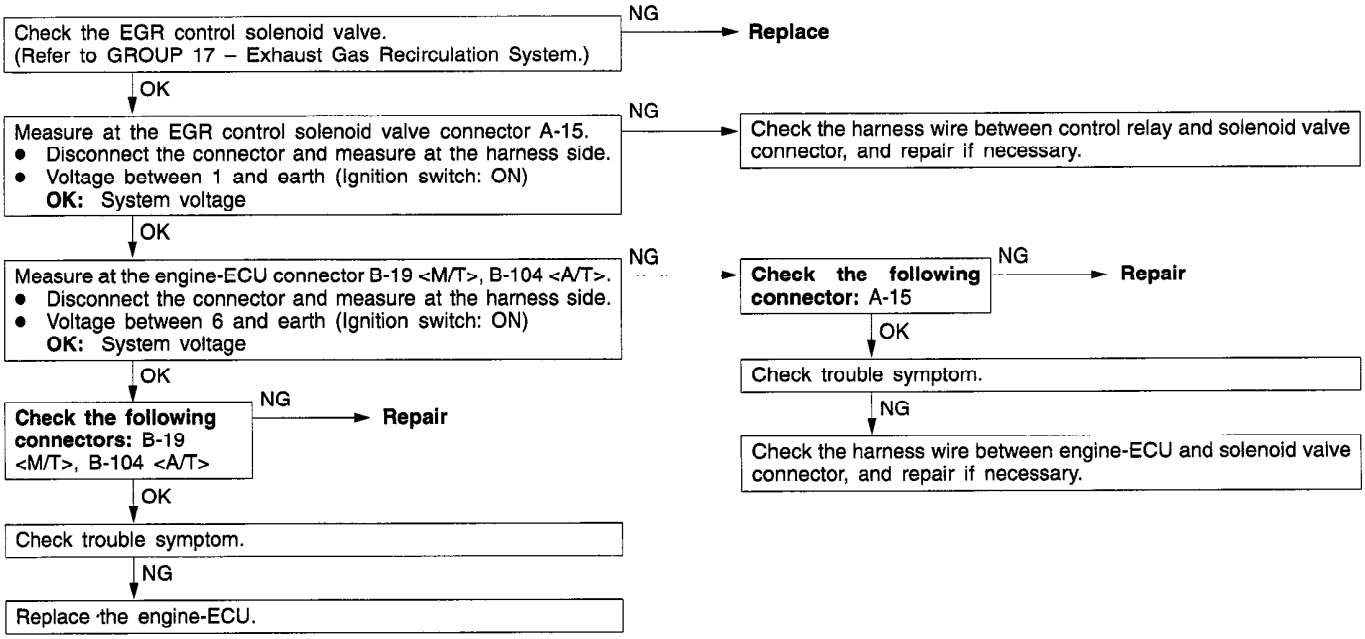
Purge control solenoid valve system	Probable cause
The purge control solenoid valve controls the purging of air from the canister located inside the intake manifold.	• Malfunction of solenoid valve • Improper connector contact, open circuit or short-circuited harness wire. • Malfunction of the engine-ECU



*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

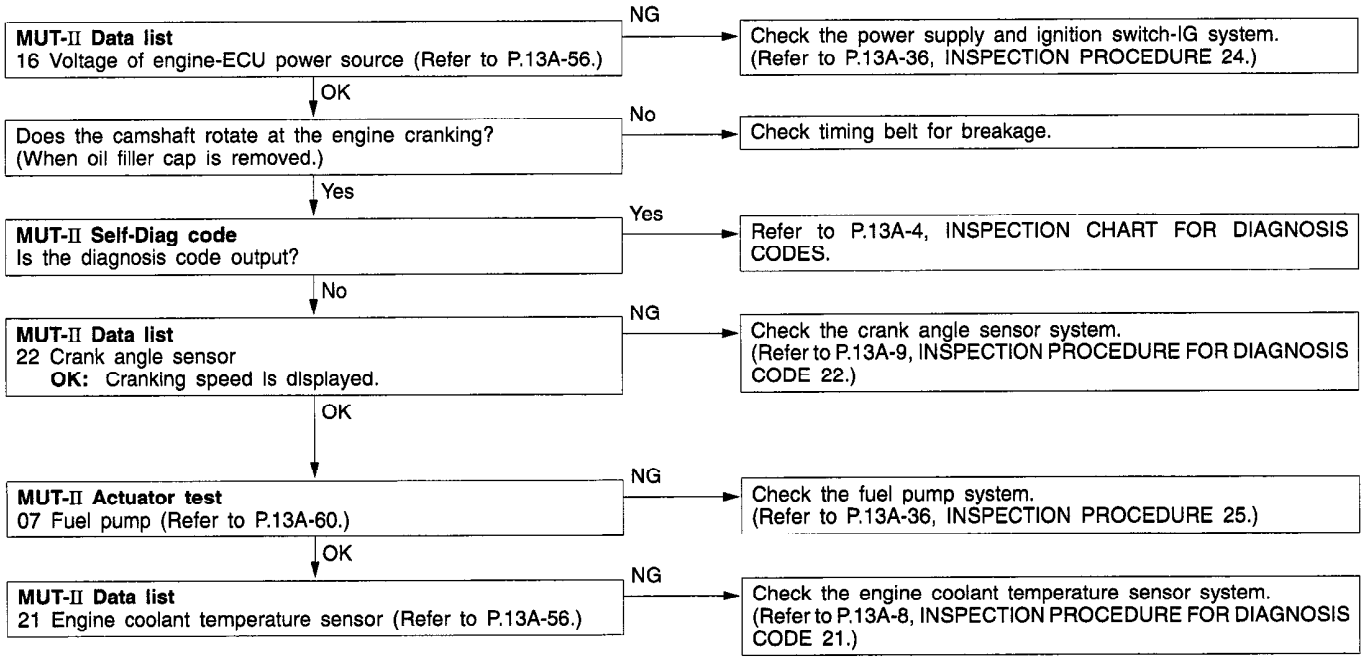
INSPECTION PROCEDURE 35

EGR control solenoid valve system	Probable cause
The EGR control solenoid valve is controlled by the negative pressure resulting from EGR operation leaking to port "A" of the throttle body.	• Malfunction of solenoid valve • Improper connector contact, open circuit or short-circuited harness wire. • Malfunction of the engine-ECU



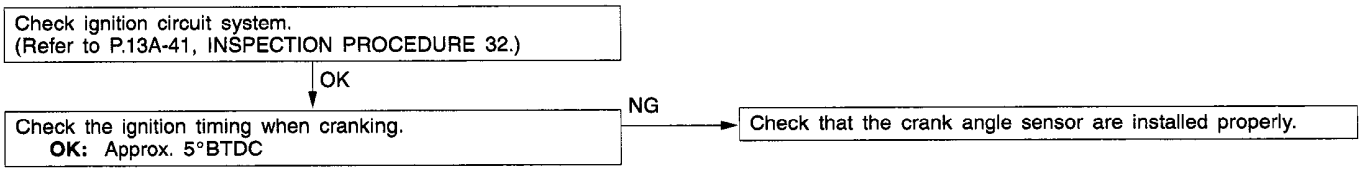
INSPECTION PROCEDURE 36

MUT-II: Inspection of no initial combustion



INSPECTION PROCEDURE 37

Ignition system: Inspection of no initial combustion.



INSPECTION PROCEDURE 38

MUT-II: Check if uncomplete combustion occurs.

MUT-II Self-Diag code
Is the diagnosis code output?
- Yes → Refer to P.13A-4, INSPECTION CHART FOR DIAGNOSIS CODE
- No ↓

MUT-II Actuator test
07 Fuel pump (Refer to P.13A-60.)
- NG → Check the fuel pump system. (Refer to P.13A-36, INSPECTION PROCEDURE 25.)
- OK ↓

MUT-II Data list
21 Engine coolant temperature sensor (Refer to P.13A-56.)
- NG → Check the engine coolant temperature sensor system. (Refer to P.13A-8, INSPECTION PROCEDURES FOR DIAGNOSIS CODE 21.)
- OK ↓

MUT-II Data list
18 Ignition switch-ST (Refer to P.13A-56.)
- NG → Check the ignition switch-ST system <M/T>. (Refer to P.13A-38, INSPECTION PROCEDURE 28.) Check the ignition switch-ST and inhibitor switch system <A/T>. (Refer to P.13A-39, INSPECTION PROCEDURE 29.)

INSPECTION PROCEDURE 39

Check if hunting occurs.

Clean the throttle body. (Refer to P.13A-90.)*
↓
Check and adjust the fixed SAS. (Refer to P.13A-93.)*
↓
Check trouble symptom.
- NG ↓

Inspect the intake of air into the air intake system
- Broken intake manifold gasket
- Broken air intake hose
- Broken vacuum hose
- Positive crankcase ventilation valve does not operate.

*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 40

MUT-II: Check if idling speed is unstable.

MUT-II Data list
26 Idle position switch (Refer to P.13A-57.)
NG → Check the idle position switch system. (Refer to P.13A-37, INSPECTION PROCEDURE 26.) <Vehicles without TCL> (Refer to P.13A-37, INSPECTION PROCEDURE 27.) <Vehicles with TCL>
OK ↓

MUT-II Data list
13 Intake air temperature sensor (Refer to P.13A-56.)
NG → Check the intake air temperature sensor system. (Refer to P.13A-6, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 13.)
OK ↓

MUT-II Data list
25 Barometric pressure sensor (Refer to P.13A-57.)
NG → Check the barometric pressure sensor system. (Refer to P.13A-12, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 25.)
OK ↓

MUT-II Data list
21 Engine coolant temperature sensor (Refer to P.13A-56.)
NG → Check the engine coolant temperature sensor system. (Refer to P.13A-8, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 21.)
OK ↓

MUT-II Actuator test
08 Purge control solenoid valve (Refer to P.13A-60.)
NG → Check the purge control solenoid valve system (Refer to P.13A-43, INSPECTION PROCEDURE 34.)
OK ↓

MUT-II Data list
11 Oxygen sensor
OK: 600–1,000 mV during sudden racing
NG → Check the oxygen sensor system. (Refer to P.13A-5, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 11.)
OK ↓

MUT-II Data list
11 Oxygen sensor
OK: Changes between 0–400 mV and 600–1,000 mV during idling
NG → Check the fuel pressure. (Refer to P.13A-95.)*1
OK → 1. Inspect the intake of air into the air intake system.
- Broken intake manifold gasket
- Broken vacuum hose
- PCV valve does not operate.
- Broken air intake hose

2. Check the injector for clog.

OK ↓

MUT-II Data list
27 Power steering fluid pressure switch (Refer to P.13A-57.)
NG → Check the power steering fluid pressure switch system. (Refer to P.13A-40, INSPECTION PROCEDURE 30.)
OK ↓

MUT-II Data list
28 A/C switch (Refer to P.13A-57.)
NG → Check the A/C switch and A/C relay system. (Refer to P.13A-40, INSPECTION PROCEDURE 31.)
OK ↓

MUT-II Data list
29 Inhibitor switch (Refer to P.13A-58.)
NG → Check the ignition switch-ST and inhibitor switch system. <A/T> (Refer to P.13A-39, INSPECTION PROCEDURE 29.)
OK ↓

MUT-II Data list
45 ISC Servo position (Refer to P.13A-59.)
NG → Adjust the basic idle speed. (Refer to P.13A-65.)*2

*1: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).
*2: Refer to '97 CARISMA Workshop Manual (Pub. No. PWDE9502-A).

INSPECTION PROCEDURE 41

MUT-II: Engine stalling inspection when the engine is warmed up and idling.

MUT-II Data list
26 Idle position switch (Refer to P.13A-57.)
NG → Check the idle position switch system. (Refer to P.13A-37, INSPECTION PROCEDURE 26.) <Vehicles without TCL> (Refer to P.13A-37, INSPECTION PROCEDURE 27.) <Vehicles with TCL>
OK ↓

MUT-II Data list
13 Intake air temperature sensor (Refer to P.13A-56.)
NG → Check the intake air temperature sensor system. (Refer to P.13A-6, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 13.)
OK ↓

MUT-II Data list
25 Barometric pressure sensor (Refer to P.13A-57.)
NG → Check the barometric pressure sensor system. (Refer to P.13A-12, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 25.)
OK ↓

MUT-II Data list
21 Engine coolant temperature sensor (Refer to P.13A-56.)
NG → Check the engine coolant temperature sensor system. (Refer to P.13A-8, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 21.)
OK ↓

MUT-II Data list
11 Oxygen sensor
OK: Changes between 600 – 1,000 mV during sudden racing
NG → Check the oxygen sensor system. (Refer to P.13A-5, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 11.)
OK ↓

MUT-II Data list
11 Oxygen sensor
OK: Changes between 0 – 400 mV and 600 – 1,000 mV during idling
NG → Check the fuel pressure. (Refer to P.13A-95.)*1
OK → 1. Inspect the intake of air into the air intake system
- Broken intake manifold gasket
- Broken vacuum hose
- PCV valve does not operate.
- Broken air intake hose

2. Check the injector for clog.

OK ↓

MUT-II Data list
27 Power steering fluid pressure switch (Refer to P.13A-57.)
NG → Check the power steering fluid pressure switch system. (Refer to P.13A-40, INSPECTION PROCEDURE 30.)
OK ↓

MUT-II Data list
28 A/C switch (Refer to P.13A-57.)
NG → Check the A/C switch and A/C relay system. (Refer to P.13A-40, INSPECTION PROCEDURE 31.)
OK ↓

MUT-II Data list
29 Inhibitor switch (Refer to P.13A-58.)
NG → Check the ignition switch-ST and inhibitor switch system. <A/T> (Refer to P.13A-39, INSPECTION PROCEDURE 29.)
OK ↓

MUT-II Data list
45 ISC servo position (Refer to P.13A-59.)
NG → Adjust the basic idle speed. (Refer to P.13A-65.)*2

*1: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).
*2: Refer to '97 CARISMA Workshop Manual (Pub. No. PWDE9502-A).

INSPECTION PROCEDURE 42

MUT-II: Check if hesitation, sug, stumble or poor acceleration occurs.

MUT-II Data list
26 Idle position switch (Refer to P.13A-57.)
NG → Check the idle position switch system. (Refer to P.13A-37, INSPECTION PROCEDURE 26.) <Vehicles without TCL> (Refer to P.13A-37, INSPECTION PROCEDURE 27.) <Vehicles with TCL>
OK ↓

MUT-II Data list
13 Intake air temperature sensor (Refer to P.13A-56.)
NG → Check the intake air temperature sensor system. (Refer to P.13A-6, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 13.)
OK ↓

MUT-II Data list
25 Barometric pressure sensor (Refer to P.13A-57.)
NG → Check the barometric pressure sensor system. (Refer to P.13A-12, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 25.)
OK ↓

MUT-II Data list
21 Engine coolant temperature sensor (Refer to P.13A-56.)
NG → Check the engine coolant temperature sensor system. (Refer to P.13A-8, INSPECTION PROCEDURE FOR DIAGNOSTIC CODE 21.)
OK ↓

MUT-II Data list
14 Throttle position sensor (Refer to P.13A-56.)
NG → Check the throttle position sensor system. (Refer to P.13A-7, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 14.)
OK ↓

MUT-II Actuator test
10 EGR control solenoid valve (Refer to P.13A-60.)
NG → Check the EGR control solenoid valve system. (Refer to P.13A-44, INSPECTION PROCEDURE 35.)
OK ↓

MUT-II Data list
11 Oxygen sensor
OK: Changes between 600 – 1,000 mV during sudden racing
NG → Check the oxygen sensor system. (Refer to P.13A-5, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 11.)
OK ↓

MUT-II Data list
11 Oxygen sensor
OK: Changes between 0 – 400 mV and 600 – 1,000 mV during idling
NG → Check the fuel pressure. (Refer to P.13A-95.)*
OK → 1. Inspect the intake of air into the air intake system
- Broken intake manifold gasket
- Broken vacuum hose
- PCV valve does not operate.
- Broken air intake hose

2. Check the injector for clog.

OK ↓

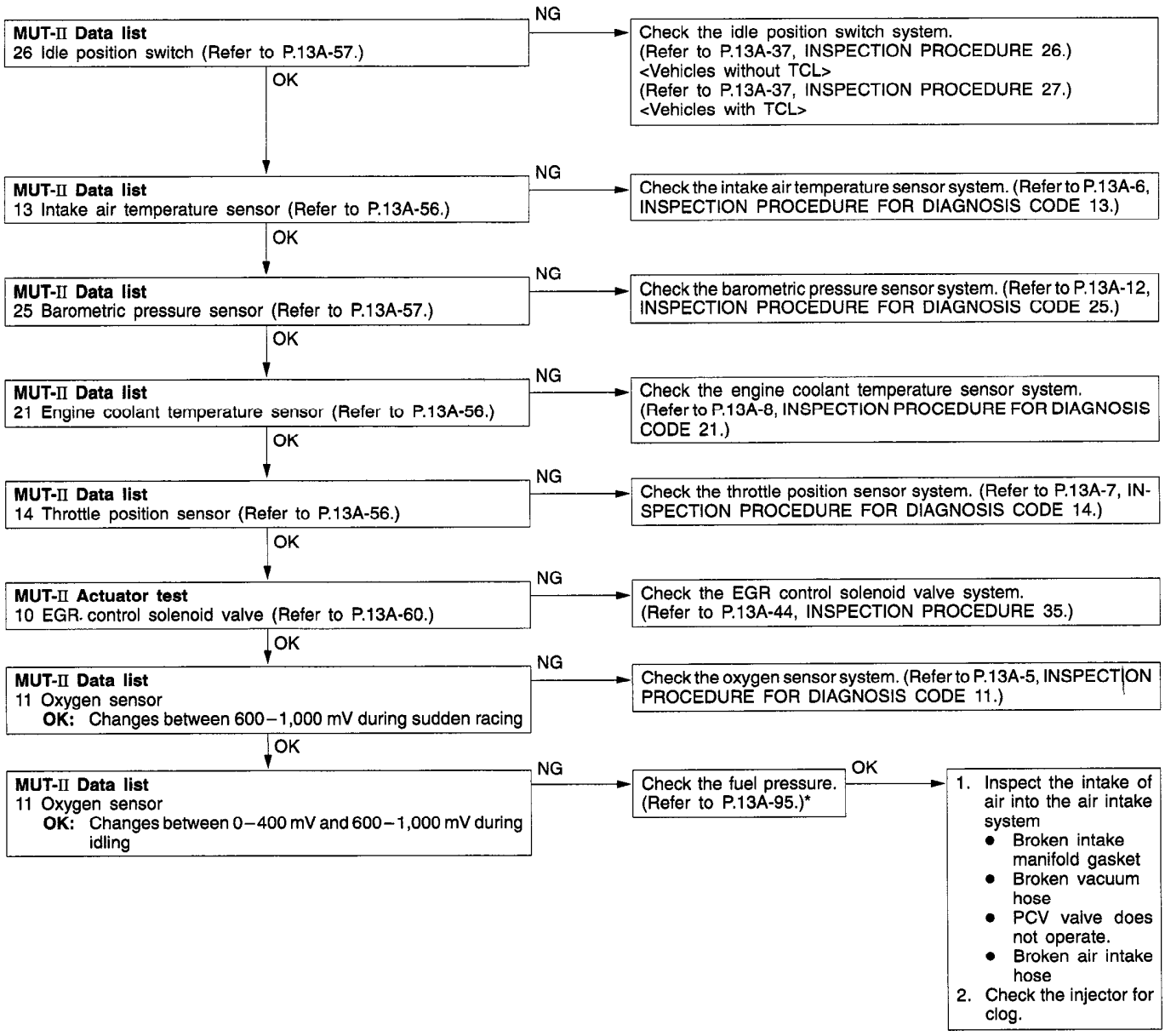
MUT-II Actuator test
15 Vacuum control solenoid valve <Vehicle with TCL> (Refer to P.13A-60.)
NG → Check the vacuum control solenoid valve system. (Refer to P.13A-17, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 71.)
OK ↓

MUT-II Actuator test
16 Ventilation control solenoid valve <Vehicle with TCL> (Refer to P.13A-61.)
NG → Check the ventilation control solenoid valve system. (Refer to P.13A-18, INSPECTION PROCEDURE FOR DIAGNOSIS CODE 72.)

*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

INSPECTION PROCEDURE 43

MUT-II Check if surge occurs.

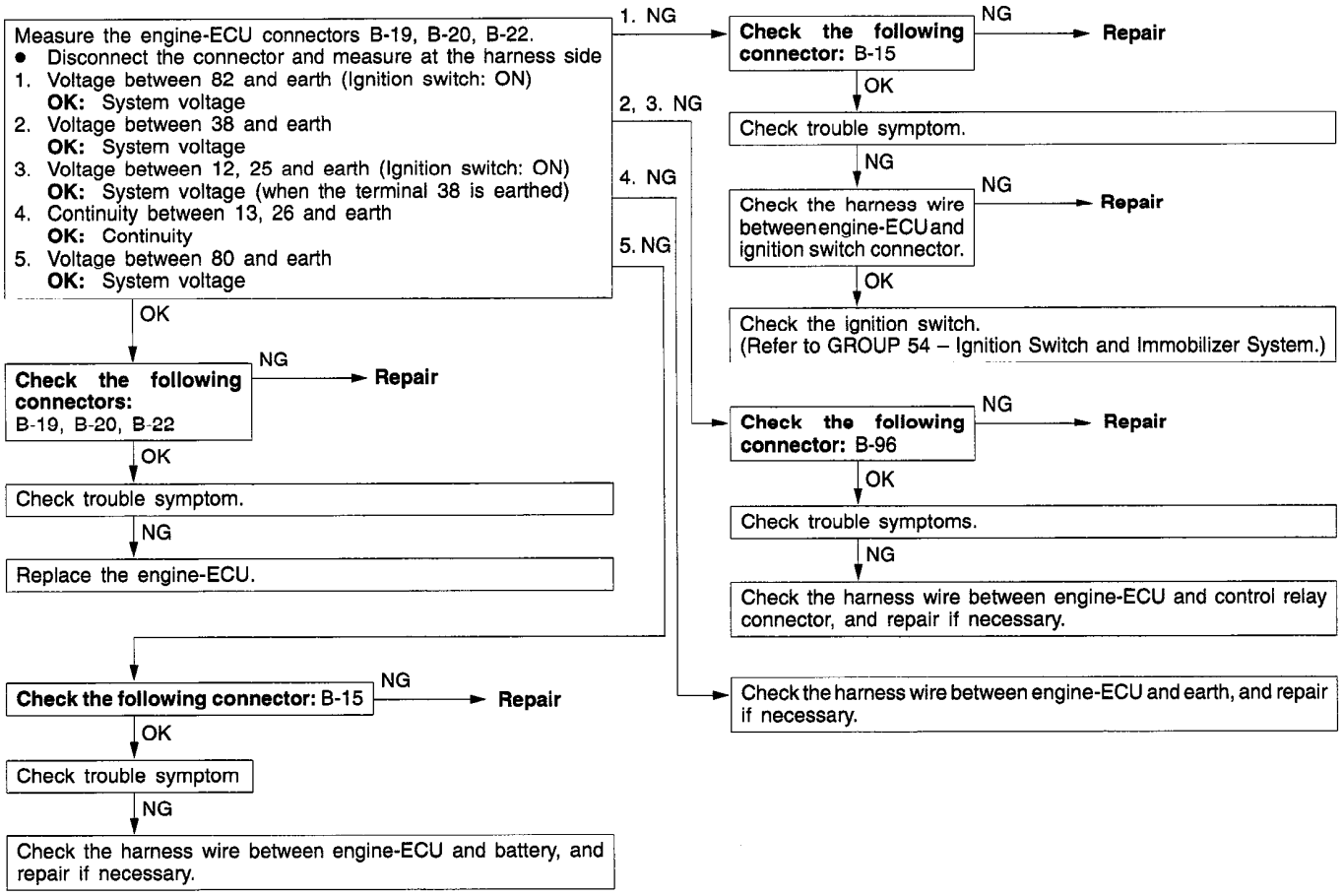


*: Refer to '96 CARISMA Workshop Manual (Pub. No. PWDE9502).

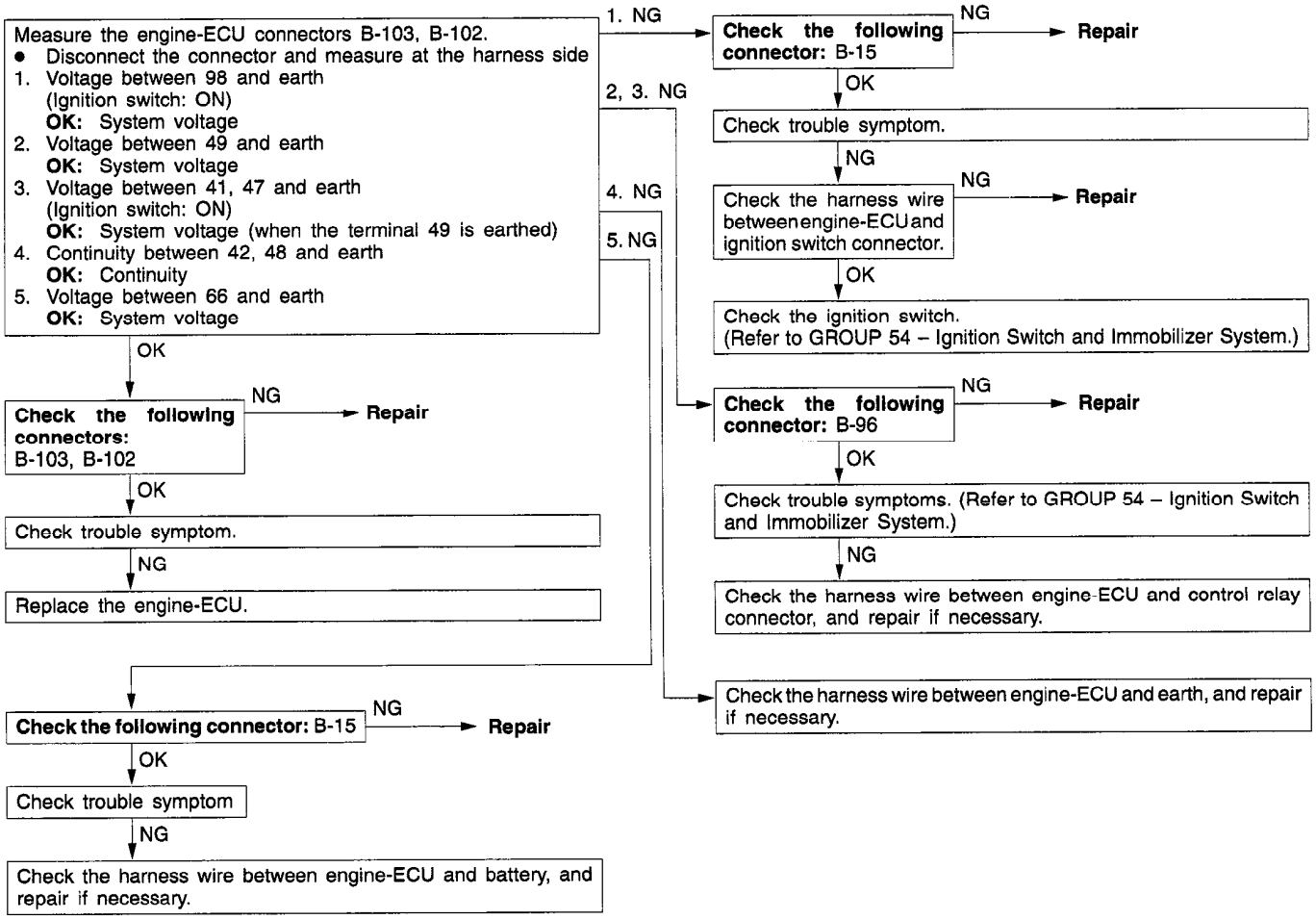
INSPECTION PROCEDURE 44

Check the engine-ECU power supply and earth circuit.

<M/T>

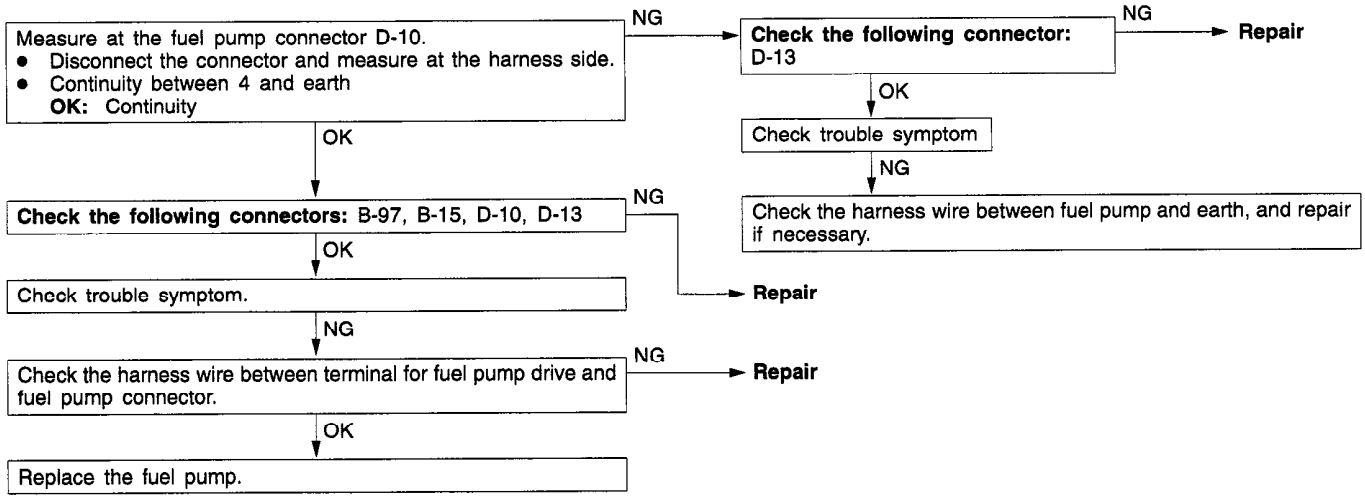


<A/T>



INSPECTION PROCEDURE 45

Check fuel pump circuit.



INSPECTION PROCEDURE 46

Check the fuel pump drive control circuit.

Measure at the fuel pump relay connector B-97.
- Disconnect the connector and measure at the harness side.
- Voltage between 3, 4 and earth (Ignition switch: ON)
  OK: System voltage

NG → **Check the following connector:** B-15
NG → **Repair**
OK → Check trouble symptom.
NG → Check the harness wire between fuel pump relay and ignition switch connector.
NG → **Repair**
OK → Check the ignition switch. (Refer to GROUP 54 – Ignition Switch and Immobilizer System.)

OK → Measure at the engine-ECU connector B-19 <M/T>, B-104 <A/T>.
- Disconnect the connector and measure at the harness side.
- Voltage between 22 and earth <M/T>
  Voltage between 21 and earth. <A/T>
  (Ignition switch: ON)
  OK: System voltage

NG → **Check the following connector:** B-97
NG → **Repair**
OK → Check trouble symptom.
NG → Check the harness wire between engine-ECU and fuel pump relay connector, and repair if necessary.

OK → **Check the following connectors:** B-19 <M/T>, B-104 <A/T>
NG → **Repair**
OK → Check trouble symptom.
NG → Replace the engine-ECU.

INSPECTION PROCEDURE 47

Check air flow sensor (AFS) control circuit.

Measure at the air flow sensor connector A-20.
- Disconnect the connector and measure at the harness side.

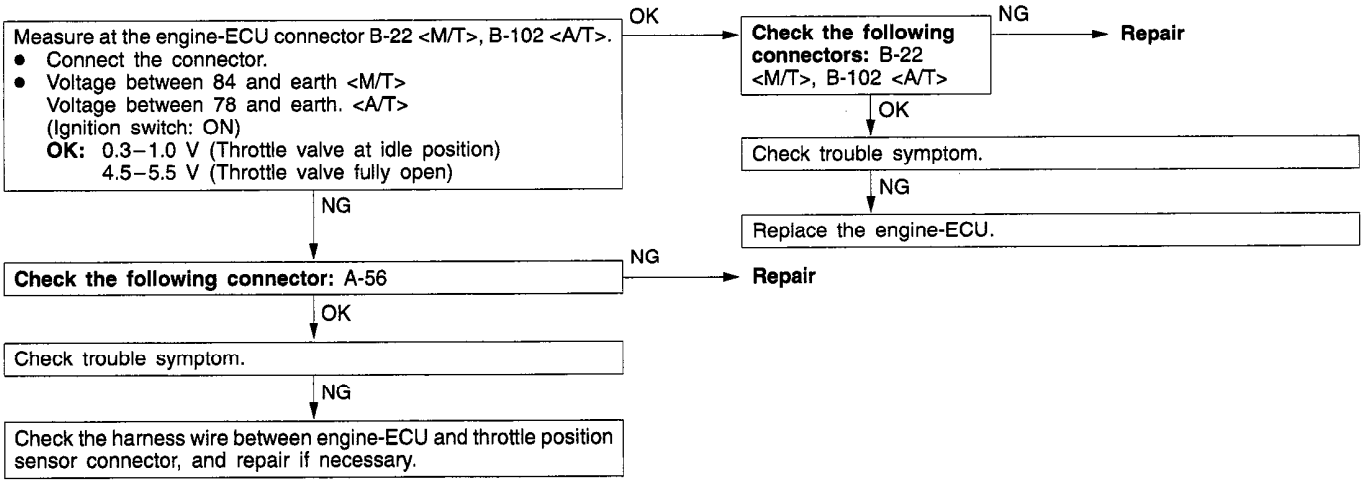
1. Voltage between 4 and earth (Ignition switch: ON)
   OK: System voltage
2. Voltage between 3 and earth (Ignition switch: ON)
   OK: 4.8–5.2 V
3. Continuity between 5 and earth
   OK: Continuity

1. NG → Check the harness wire between the air flow sensor and control relay connector, and repair if necessary.
2, 3. NG → **Check the following connectors:** B-22 <M/T>, B-103 <A/T>
NG → **Repair**
OK → Check trouble symptom.
NG → Check the harness wire between the engine-ECU and air flow sensor connector.
NG → **Repair**
OK → Replace the engine-ECU.

OK → **Check the following connector:** A-20
NG → **Repair**
OK → Check trouble symptom.
NG → Replace the air flow sensor.

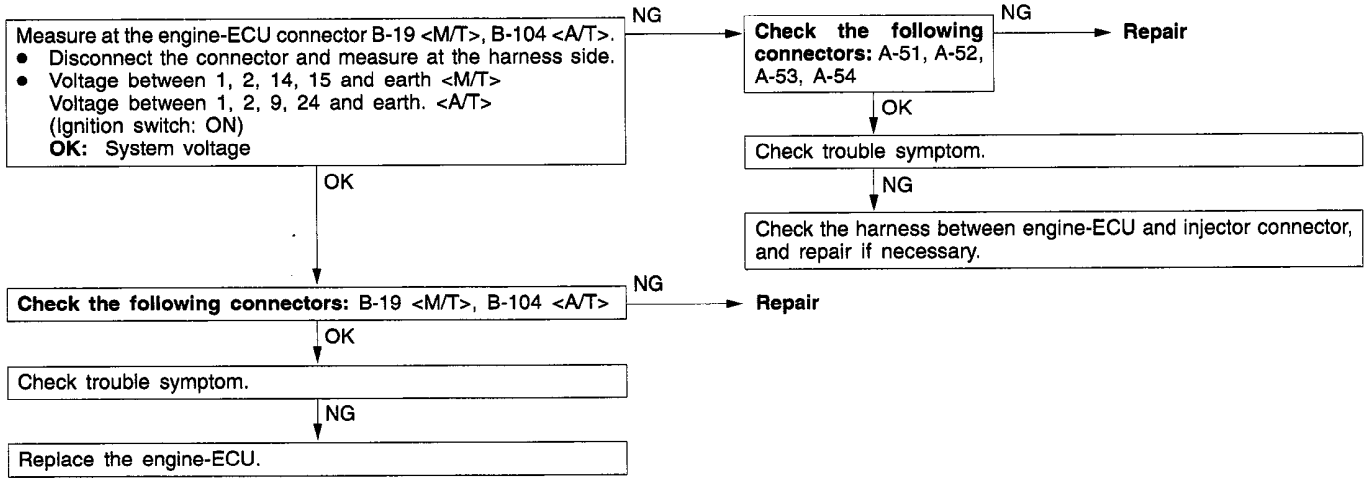
INSPECTION PROCEDURE 48

Check throttle position sensor (TPS) output circuit.



INSPECTION PROCEDURE 49

Check injector control circuit



DATA LIST REFERENCE TABLE

Caution
When shifting the select lever to D range, the brakes should be applied so that the vehicle does not move forward.

NOTE
*1. In a new vehicle [driven approximately 500 km or less], the air flow sensor output frequency is sometimes 10% higher than the standard frequency.
*2. When idling to warm-up from an engine coolant temperature of approx. –20°C, if the idling speed is lower than the standard value even when the stepper motor is fully opened, the air volume limiter built in the throttle body could be defective.
*3. The idle position switch normally turns off when the voltage of the throttle position sensor is 50 – 100 mV higher than the voltage at the idle position. If the throttle position switch turns back on after the throttle position sensor voltage has risen by 100 mV and the throttle valve has opened, the idle position switch and the throttle position sensor need to be adjusted.
*4. The injector drive time represents the time when the cranking speed is at 250 r/min or below when the power supply voltage is 11 V.
*5. In a new vehicle [driven approximately 500 km or less], the injector drive time is sometimes 10% longer than the standard time.
*6. In a new vehicle [driven approximately 500 km or less], the step of the stepper motor is sometimes 30 steps greater than the standard value.

Item No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
11	Oxygen sensor	Engine:After having warmed up Air/fuel mixture is made leaner when decelerating, and is made richer when racing.	When at 4,000 r/min, engine is suddenly decelerated	200 mV or less	Code No. 11	13A-5
			When engine is suddenly raced	600 – 1,000 mV		
		Engine:After having warmed up The oxygen sensor signal is used to check the air/fuel mixture ratio, and control condition is also checked by the ECU.	Engine is idling	400 mV or less (Changes)		
			2,500 r/min	600 – 1,000 mV		
12	Air flow sensor*1	• Engine coolant temperature: 80 – 95°C • Lamps and all accessories: OFF • Transmission: Neutral (A/T: P range)	Engine is idling	25 – 51 Hz <Except 4G92 (6B model)> 18 – 44 Hz <4G92 (6B model)>	–	–
			2,500 r/min	80 – 120 Hz <4G92> 55 – 95 Hz <4G92 (6B model), 4G93>		
			Engine is raced	Frequency increases in response to racing		

Item No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
13	Intake air temperature sensor	Ignition switch: ON or with engine running	When intake air temperature is –20°C	–20°C	Code No. 13	13A-6
			When intake air temperature is 0°C	0°C		
			When intake air temperature is 20°C	20°C		
			When intake air temperature is 40°C	40°C		
			When intake air temperature is 80°C	80°C		
14	Throttle position sensor	Ignition switch: ON	Set to idle position	300 – 1,000 mV	Code No. 14	13A-7
			Gradually open	Increases in proportion to throttle opening angle		
			Open fully	4,500 – 5,500 mV		
16	Power supply voltage	Ignition switch: ON		System voltage	Procedure No. 24	13A-36
18	Cranking signal (ignition switch-ST)	Ignition switch: ON	Engine: Stopped	OFF	Procedure No. 28 <M/T> Procedure No. 29 <A/T>	13A-38 <M/T> 13A-39 <A/T>
			Engine: Cranking	ON		
21	Engine coolant temperature sensor	Ignition switch: ON or with engine running	When engine coolant temperature is –20°C	–20°C	Code No. 21	13A-8
			When engine coolant temperature is 0°C	0°C		
			When engine coolant temperature is 20°C	20°C		
			When engine coolant temperature is 40°C	40°C		
			When engine coolant temperature is 80°C	80°C		

Item No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
22	Crank angle sensor*2	• Engine: Cranking • Tachometer: Connected	Compare the engine speed readings on the tachometer and the MUT-II.	Accord	Code No. 22	13A-9
		• Engine: Idling • Idle position switch: ON	When engine coolant temperature is –20°C	1,400 – 1,600 r/min		
			When engine coolant temperature is 0°C	1,350 – 1,550 r/min		
			When engine coolant temperature is 20°C	1,300 – 1,500 r/min <4G92> 1,250 – 1,200 r/min <4G93>		
			When engine coolant temperature is 40°C	1,100 – 1,300 r/min <4G92> 1,000 – 1,200 r/min <4G93>		
			When engine coolant temperature is 80°C	650 – 850 r/min <4G92> 700 – 900 r/min <4G93>		
25	Barometric pressure sensor	Ignition switch: ON	At altitude of 0 m	101 kPa	Code No. 25	13A-12
			At altitude of 600 m	95 kPa		
			At altitude of 1,200 m	88 kPa		
			At altitude of 1,800 m	81 kPa		
26	Idle position switch	Ignition switch: ON Check by operating accelerator pedal repeatedly	Throttle valve: Set to idle position	ON	Procedure No. 26 <Vehicles without TCL> Procedure No. 27 <Vehicles with TCL>	13A-37 <Vehicles without TCL> 13A-37 <Vehicles with TCL>
			Throttle valve: Slightly open	OFF*3		
27	Power steering fluid pressure switch	Engine: Idling	Steering wheel stationary	OFF	Procedure No. 30	13A-40
			Steering wheel turning	ON		
28	A/C switch	Engine: Idling (when A/C switch is ON, A/C compressor should be operating.)	A/C switch: OFF	OFF	Procedure No. 31	13A-40
			A/C switch: ON	ON		

Item No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
29	Inhibitor switch <A/T>	Ignition switch: ON	P or N	P or N	Procedure No. 29	13A-39
			D, 2, L or R	D, 2, L or R		
41	Injectors*4	Engine: Cranking	When engine coolant temperature is 0°C (injection is carried out for all cylinders simultaneously)	13 – 19 ms <4G92> 15 – 22 ms <4G93>	–	–
			When engine coolant temperature is 20°C	27 – 40 ms <4G92> 31 – 46 ms <4G93>		
			When engine coolant temperature is 80°C	5.9 – 8.9 ms <Except 4G92 (6B model)> 6.4 – 9.6 ms <4G92 (6B model)> 7.2 – 10.8 ms <4G93>		
	Injectors*5	• Engine coolant temperature: 80 – 95°C • Lamps and all accessories: OFF • Transmission: Neutral (A/T : P range)	Engine is idling	1.7 – 2.9 ms <Except 4G92 (6B model)> 1.4 – 2.6 ms <4G92 (6B model)> 2.2 – 3.4 ms <4G93>		
			2,500 r/min	1.4 – 2.6 ms <Except 4G92 (6B model)> 1.2 – 2.4 ms <4G92 (6B model)> 2.0 – 3.2 ms <4G93>		
			When engine is suddenly raced	Increases		

Item No.	Inspection item	Inspection contents		Normal condition	Inspection procedure No.	Reference page
44	Ignition coils and power transistors	• Engine: After having warmed up • Timing lamp is set. (The timing lamp is set in order to check actual ignition timing.)	Engine is idling	2 – 18 °BTDC <Except 4G92 (6B model)> 0 – 16 °BTDC <4G92 (6B model)>	–	–
			2,500 r/min	30 – 50 °BTDC <4G92> 22 – 42 °BTDC <4G93>		
45	ISC (stepper) motor position *6	• Engine coolant temperature: 80 – 95°C • Lamps and all accessories: OFF • Transmission: Neutral (A/T : P range) • Idle position switch: ON • Engine: Idling • When A/C switch is ON, A/C compressor should be operating	A/C switch: OFF	2 – 25 STEP		
			A/C switch: OFF → ON	Increases by 10 – 70 steps		
			• A/C switch: OFF • Select lever: N range → D range	Increases by 5 – 50 steps		
49	A/C relay	Engine: After having warmed up/Engine is idling	A/C switch: OFF	OFF (Compressor clutch is not operating)	Procedure No. 31	13A-40
			A/C switch: ON	ON (Compressor clutch is operating)		

ACTUATOR TEST REFERENCE TABLE

Item No.	Inspection item	Drive contents	Inspection contents		Normal condition	Inspection procedure No.	Reference page
01	Injectors	Cut fuel to No. 1 injector	Engine: After having warmed up/Engine is idling (Cut the fuel supply to each injector in turn and check cylinders which don't affect idling.)		Idling condition becomes different (becomes unstable).	Code No. 41	13A-13
02		Cut fuel to No. 2 injector					
03		Cut fuel to No. 3 injector					
04		Cut fuel to No. 4 injector					
07	Fuel pump	Fuel pump operates and fuel is recirculated.	• Engine: Cranking • Fuel pump: Forced driving Inspect according to both the above conditions.	Pinch the return hose with fingers to feel the pulse of the fuel being recirculated.	Pulse is felt.	Procedure No. 25	13A-36
				Listen near the fuel tank for the sound of fuel pump operation.	Sound of operation is heard.		
08	Purge control solenoid valve	Solenoid valve turns from OFF to ON.	Ignition switch: ON		Sound of operation can be heard when solenoid valve is driven.	Procedure No. 34	13A-43
10	EGR control solenoid valve	Solenoid valve turns from OFF to ON.	Ignition switch: ON		Sound of operation can be heard when solenoid valve is driven.	Procedure No. 35	13A-44
15	Vacuum control solenoid valve <Vehicles with TCL>	Solenoid valve turns from OFF to ON.	Ignition switch: ON		Sound of operation can be heard when solenoid valve is driven.	Code No. 71	13A-17

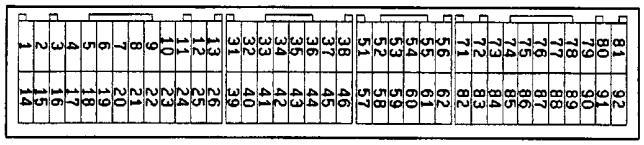
Item No.	Inspection item	Drive contents	Inspection contents	Normal condition	Inspection procedure No.	Reference page
16	Ventilation control solenoid valve <Vehicles with TCL>	Solenoid valve turns from OFF to ON.	Ignition switch: ON	Sound of operation can be heard when solenoid valve is driven.	Code No. 72	13A-18
17	Basic ignition timing	Set to ignition timing adjustment mode	Engine: Idling Timing light is set	5° BTDC	–	–
20	Condenser fan	Drive the fan motors (condenser)	• Ignition switch: ON • A/C switch: ON	Fan motor operates	Procedure No. 23	13A-35
21	Radiator fan and Condenser fan	Drive the fan motors (radiator and condenser).	Ignition switch: ON A/C switch: ON	Fan motor operates	Procedure No. 23	13A-35

CHECK AT THE ENGINE-ECU TERMINALS

TERMINAL VOLTAGE CHECK CHART

Engine ECU Connector Terminal Arrangement

<M/T>



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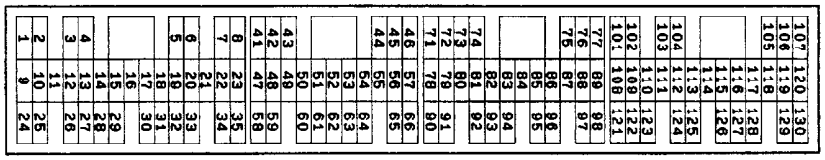
<A/T>



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Terminal No. <M/T>	Terminal No. <A/T>	Check item	Check condition (Engine condition)	Normal condition
1	1	No. 1 injector	While engine is idling after having warmed up, suddenly depress the accelerator pedal.	From 11 – 14 V, momentarily drops slightly
14	9	No. 2 injector		
2	24	No. 3 injector		
15	2	No. 4 injector		
4	14	Stepper motor coil <A1>	Engine: Soon after the warmed up engine is started	System voltage ↔ 0 V (Changes repeatedly)
17	28	Stepper motor coil <A2>		
5	15	Stepper motor coil <B1>		
18	29	Stepper motor coil <B2>		
6	6	EGR control solenoid valve	Ignition switch: ON	System Voltage
			While engine is idling, suddenly depress the accelerator pedal.	From system voltage, momentarily drops
8	20	A/C relay	• Engine: Idle speed • A/C switch: OFF → ON (A/C compressor is operating)	System voltage or momentarily 6 V or more → 0 – 3 V
9	24	Purge control solenoid valve	Ignition switch: ON	System voltage
			Running at 3,000r/min while engine is warming up after having been started.	0 – 3 V

Terminal No. <M/T>	Terminal No. <A/T>	Check item	Check condition (Engine condition)		Normal condition
10	11	Ignition coil – No. 1, No. 4 (power transistor)	Engine r/min: 3,000 r/min		0.3 – 3.0 V
23	12	Ignition coil – No. 2, No. 3 (power transistor)			
12	41	Power supply	Ignition switch: ON		System voltage
25	47				
19	19	Air flow sensor reset signal	Engine: Idle speed		0 – 1 V
			Engine r/min: 3,000 r/min		6 – 9 V
21	18	Fan motor relay	Engine: Idle speed	Radiator fan is not operating	System voltage
				Radiator fan is operating	0 – 3 V
22	21	Fuel pump relay	Ignition switch: ON		System voltage
			Engine: Idle speed		0 – 3 V
32	31	Ventilation control solenoid valve <Vehicles with TCL>	Ignition switch: ON		System voltage
34	30	Vacuum control solenoid valve <Vehicles with TCL>	Ignition switch: ON		System voltage
36	22	Engine warning lamp	Ignition switch: OFF → ON		0 – 3 V → 9 – 13 V (After several seconds have elapsed)
37	52	Power steering fluid pressure switch	Engine: Idling after warming up	When steering wheel is station-ary	System voltage
				When steering wheel is turned	0 – 3 V
38	49	Control relay	Ignition switch: OFF		System voltage
			Ignition switch: ON		0 – 3 V
45	83	A/C switch	Engine: Idle speed	Turn the A/C switch OFF	0 – 3 V
				Turn the A/C switch ON (A/C compressor is operating)	System voltage
58	43	Engine ignition signal	Engine r/min: 3,000 r/min		0.3 – 3.0 V

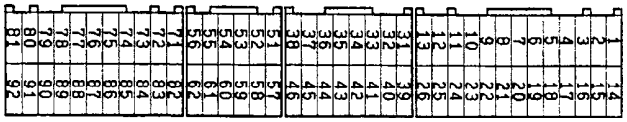
Terminal No. <M/T>	Terminal No. <A/T>	Check item	Check condition (Engine condition)		Normal condition
60	3	Oxygen sensor heater	Engine: Idling after warming up		0 – 3 V
			Engine r/min: 5,000r/min		System voltage
71	58	Ignition switch – ST	Engine: Cranking		8 V or more
72	64	Intake air temperature sensor	Ignition switch: ON	When intake air temperature is 0°C	3.2 – 3.8 V
				When intake air temperature is 20°C	2.3 – 2.9 V
				When intake air temperature is 40°C	1.5 – 2.1 V
				When intake air temperature is 80°C	0.4 – 1.0 V
76	71	Oxygen sensor	Engine: Running at 2,000 r/min after warmed up (Check using a digital type voltmeter)		0 ↔ 0.8 V (Changes repeatedly)
80	66	Backup power supply	Ignition switch: OFF		System voltage
81	46	Sensor impressed voltage	Ignition switch: ON		4.5 – 5.5 V
82	98	Ignition switch – IG	Ignition switch: ON		System voltage
83	44	Engine coolant temperature sensor	Ignition switch: ON	When engine coolant temperature is 0°C	3.2 – 3.8 V
				When engine coolant temperature is 20°C	2.3 – 2.9 V
				When engine coolant temperature is 40°C	1.3 – 1.9 V
				When engine coolant temperature is 80°C	0.3 – 0.9 V
84	78	Throttle position sensor	Ignition switch: ON	Set throttle valve to idle position	0.3 – 1.0 V
				Fully open throttle valve	4.5 – 5.5 V
85	55	Barometric pressure sensor	Ignition switch: ON	When altitude is 0 m	3.7 – 4.3 V
				When altitude is 1,200 m	3.2 – 3.8 V

Terminal No. <M/T>	Terminal No. <A/T>	Check item	Check condition (Engine condition)		Normal condition
86	80	Vehicle speed sensor	• Ignition switch: ON • Move the vehicle slowly forward		0 ↔ 5 V (Changes repeatedly)
87	79	Idle position switch	Ignition switch: ON	Set throttle valve to idle position	0 – 1 V
				Slightly open throttle valve	4 V or more
88	56	Camshaft position sensor	Engine: Cranking		0.4 – 3.0 V
			Engine: Idle speed		0.5 – 2.0 V
89	45	Crank angle sensor	Engine: Cranking		0.4 – 4.0 V
			Engine: Idle speed		1.5 – 2.5 V
90	65	Air flow sensor	Engine: Idle speed		2.2 – 3.2 V
			Engine r/min: 2,000r/min		
–	59	Inhibitor switch <A/T>	Ignition switch: ON	Set selector lever to P or N	0 – 3 V
				Set selector lever to Other than P or N	8 – 14 V

CHECK CHART FOR RESISTANCE AND CONTINUITY BETWEEN TERMINALS

Engine ECU Harness Side Connector Terminal Arrangement

<M/T>



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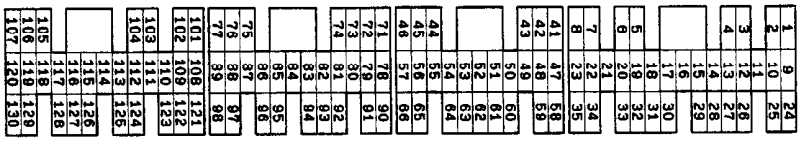
<A/T>



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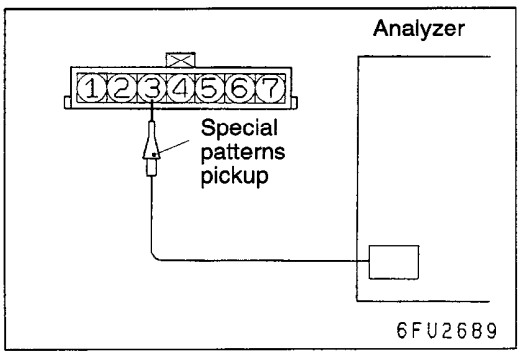
Terminal No. <M/T>	Terminal No. <A/T>	Inspection item	Normal condition (Check condition)
1 – 12	1 – 41	No. 1 injector	13 – 16 Ω (At 20°C)
14 – 12	9 – 41	No. 2 injector	
2 – 12	24 – 41	No. 3 injector	
15 – 12	2 – 41	No. 4 injector	
32 – 12	31 – 41	Ventilation control solenoid valve <Vehicles with TCL>	36 – 44 Ω (At 20°C)
4 – 12	14 – 41	Stepper motor coil (A1)	28 – 33 Ω (At 20°C)
17 – 12	28 – 41	Stepper motor coil (A2)	
5 – 12	15 – 41	Stepper motor coil (B1)	
18 – 12	29 – 41	Stepper motor coil (B2)	
6 – 12	6 – 41	EGR control solenoid valve	36 – 44 Ω (At 20°C)
9 – 12	34 – 41	Purge control solenoid valve	36 – 44 Ω (At 20°C)
34 – 12	30 – 41	Vacuum control solenoid valve <Vehicles with TCL>	36 – 44 Ω (At 20°C)
13 – Body earth	42 – Body earth	ENGINE-ECU earth	Continuity (0Ω)
26 – Body earth	48 – Body earth		

Terminal No. <M/T>	Terminal No. <A/T>	Inspection item	Normal condition (Check condition)
60 – 12	3 – 41	Oxygen sensor heater	Approx. 3.5 Ω (At 20°C)
72 – 92	64 – 57	Intake air temperature sensor	5.3 – 6.7 kΩ (When intake air temperature is 0°C)
			2.3 – 3.0 kΩ (When intake air temperature is 20°C)
			1.0 – 1.5 kΩ (When intake air temperature is 40°C)
			0.30 – 0.42 kΩ (When intake air temperature is 80°C)
83 – 92	44 – 57	Engine coolant temperature sensor	5.1 – 6.5 kΩ (When coolant temperature is 0°C)
			2.1 – 2.7 kΩ (When coolant temperature is 20°C)
			0.9 – 1.3 kΩ (When coolant temperature is 40°C)
			0.26 – 0.36 kΩ (When coolant temperature is 80°C)
87 – 92	79 – 57	Idle position switch	Continuity (when throttle valve is at idle position)
			No continuity (when throttle valve is slightly open)
–	59 – Body earth	Inhibitor switch	Continuity (when select lever is at P or N)
			No continuity (when select lever is at D, 3, 2, L or R)



INSPECTION PROCEDURE USING AN ANALYZER

AIR FLOW SENSOR (AFS)

Measurement Method

Measurement method has been changed to correspond to change of the air flow sensor. Other inspection procedure are the same as before. (Refer to '96 CARISMA Workshop Manual [Pub. No. PWDE9502])

1. Disconnect the air flow sensor connector, and connect the special tool (test harness: MB991709) in between. (All terminals should be connected.)
2. Connect the analyzer special patterns pickup to air flow sensor connector terminal 3.

Alternate Method (Test harness not available)

1. Connect the analyzer special patterns pickup to the engine-ECU terminal 90 <M/T> or terminal 65 <A/T>.

CAMSHAFT POSITION SENSOR AND CRANK ANGLE SENSOR

Alternate method (test harness not available) has been established. <A/T> Other inspection procedures are the same as before. (Refer to '96 CARISMA Workshop Manual [Pub. No. PWDE9502])

Alternate Method (Test harness not available)

1. Connect the analyzer special patterns pickup to engine-ECU terminal 56. (When checking the camshaft position sensor signal wave pattern.)
2. Connect the analyzer special patterns pickup to engine-ECU terminal 45. (When checking the crank angle sensor signal wave pattern.)

INJECTOR

Alternate method (test harness not available) has been changed. <A/T> Other inspection procedures are the same as before. (Refer to '96 CARISMA Workshop Manual [Pub. No. PWDE9502])

Alternate Method (Test harness not available)

1. Connect the analyzer special patterns pickup to engine-ECU terminal 1. (When checking the No. 1 cylinder.)
2. Connect the analyzer special patterns pickup to engine-ECU terminal 9. (When checking the No. 2 cylinder.)
3. Connect the analyzer special patterns pickup to engine-ECU terminal 24. (When checking the No. 3 cylinder.)
4. Connect the analyzer special patterns pickup to engine-ECU terminal 2. (When checking the No. 4 cylinder.)

STEPPER MOTOR

Alternate method (test harness not available) has been established. <A/T> Other inspection procedures are the same as before. (Refer to '96 CARISMA Workshop Manual [Pub. No. PWDE9502])

Alternate Method (Test harness not available)

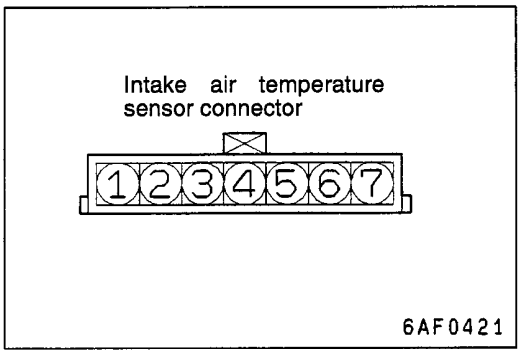
1. Connect the analyzer special patterns pickup to engine-ECU terminal 14, connection terminal 15, connection terminal 28, and connection terminal 29 respectively.

IGNITION COIL AND POWER TRANSISTOR

Alternate method (test harness not available) has been established. <A/T> Other inspection procedures are the same as before. (Refer to '96 CARISMA Workshop Manual [Pub. No. PWDE9502])

Alternate Method (Test harness not available)

1. Connect the analyzer special patterns pickup to engine-ECU terminal 11 (No. 1 – No. 4), terminal 12 (No. 2 – No. 3) respectively.



ON-VEHICLE SERVICE

INTAKE AIR TEMPERATURE SENSOR CHECK

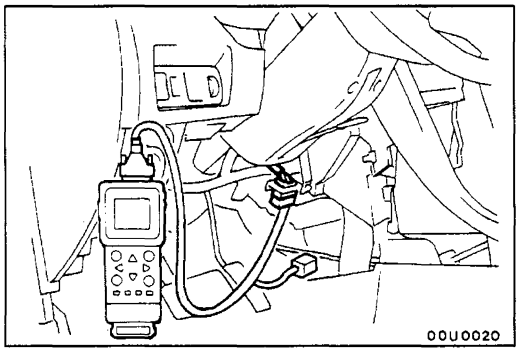
Connector form has been changed. Inspection procedure is the same as before. (Refer to '96 CARISMA Workshop Manual [Pub. No. PWDE9502])

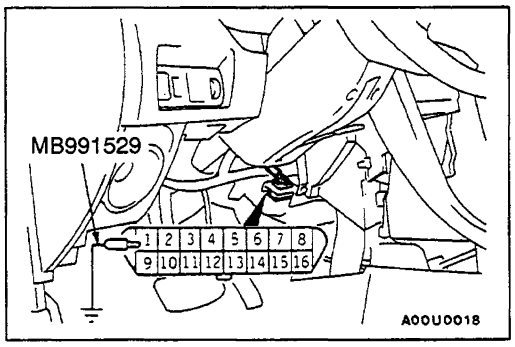
GROUP 13H
TRACTION CONTROL SYSTEM (TCL)

GENERAL

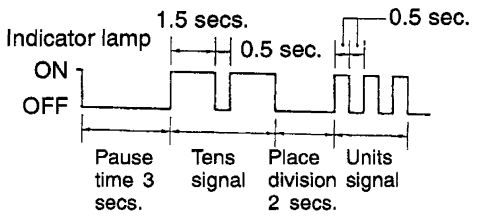
OUTLINE OF CHANGE

- The troubleshooting has been changed to correspond to the integration of the engine-ECU and A/T-ECU and the change of the TCL-ECU.

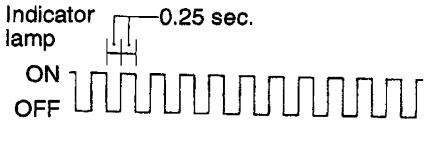




When diagnosis code No. 23 is output



When no diagnosis code is output



TROUBLESHOOTING

DIAGNOSIS FUNCTION

DIAGNOSIS CODES CHECK

With the MUT-II

Connect the MUT-II to the diagnosis connector (16-pin), then check diagnosis codes.

Caution
Turn the ignition switch off before connecting or disconnecting the MUT-II.

Without the MUT-II

1. Use the special tool to earth diagnosis connector terminal No. 1.
2. Turn the ignition switch to ON and then take a reading of the diagnosis codes from the flashing of the TCL-OFF indicator lamp.

ERASING DIAGNOSIS CODES

When using the MUT-II

- Connect the MUT-II to the diagnosis connector and erase the diagnosis code.

Caution

- **Connection and disconnection of the MUT-II should always be carried out with the ignition switch in the OFF position.**

When not using the MUT-II

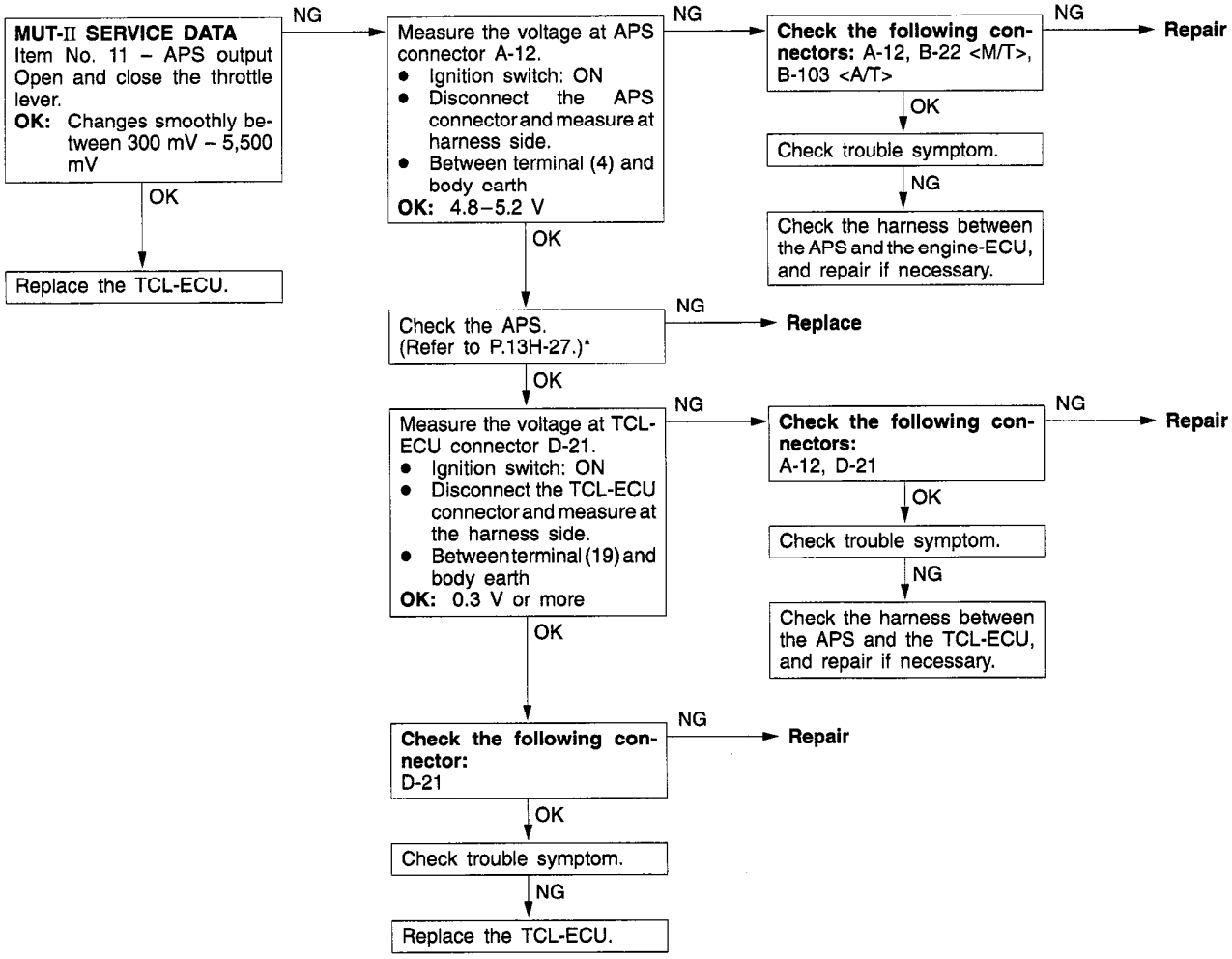
(1) Turn the ignition switch to OFF.
(2) After disconnecting the battery cable from the battery (–) terminal for 10 seconds or more, reconnect the cable.
(3) After the engine has warmed up, run it at idle for about 15 minutes.

INSPECTION CHART FOR DIAGNOSIS CODES

Code No.	Diagnosis item	Reference page
11	APS circuit system	13H-3
12	APS or TPS circuit system	13H-4
13	TPS or APS circuit system	13H-5
23	Stop lamp switch circuit system	13H-5
24	TCL switch circuit system	13H-6
26	Ignition switch (IG2) circuit system	13H-6
27	TCL-ECU power supply voltage circuit (engine control relay circuit) system	13H-7
31	Front right wheel speed sensor circuit system	13H-8
32	Front left wheel speed sensor circuit system	13H-8
33	Rear right wheel speed sensor circuit system	13H-8
34	Rear left wheel speed sensor circuit system	13H-8
35	Rear wheel speed sensor circuit system (1)	13H-9
36	Rear wheel speed sensor circuit system (2)	13H-9
41	Steering wheel sensor (ST-1) circuit system (open circuit)	13H-10
42	Steering wheel sensor (ST-2) circuit system (open circuit)	13H-10
43	Steering wheel sensor (ST-N) circuit system (open circuit)	13H-10
44	Steering wheel sensor circuit system (short circuit)	13H-11
45	Steering wheel sensor (ST-N) circuit system (short circuit)	13H-11
71	Engine-ECU communication circuit system	13H-12
72	Engine-ECU circuit system	GROUP 13A – Troubleshooting
73		
74	A/T-ECU communication circuit system	13H-12
76	ABS circuit system	13H-13

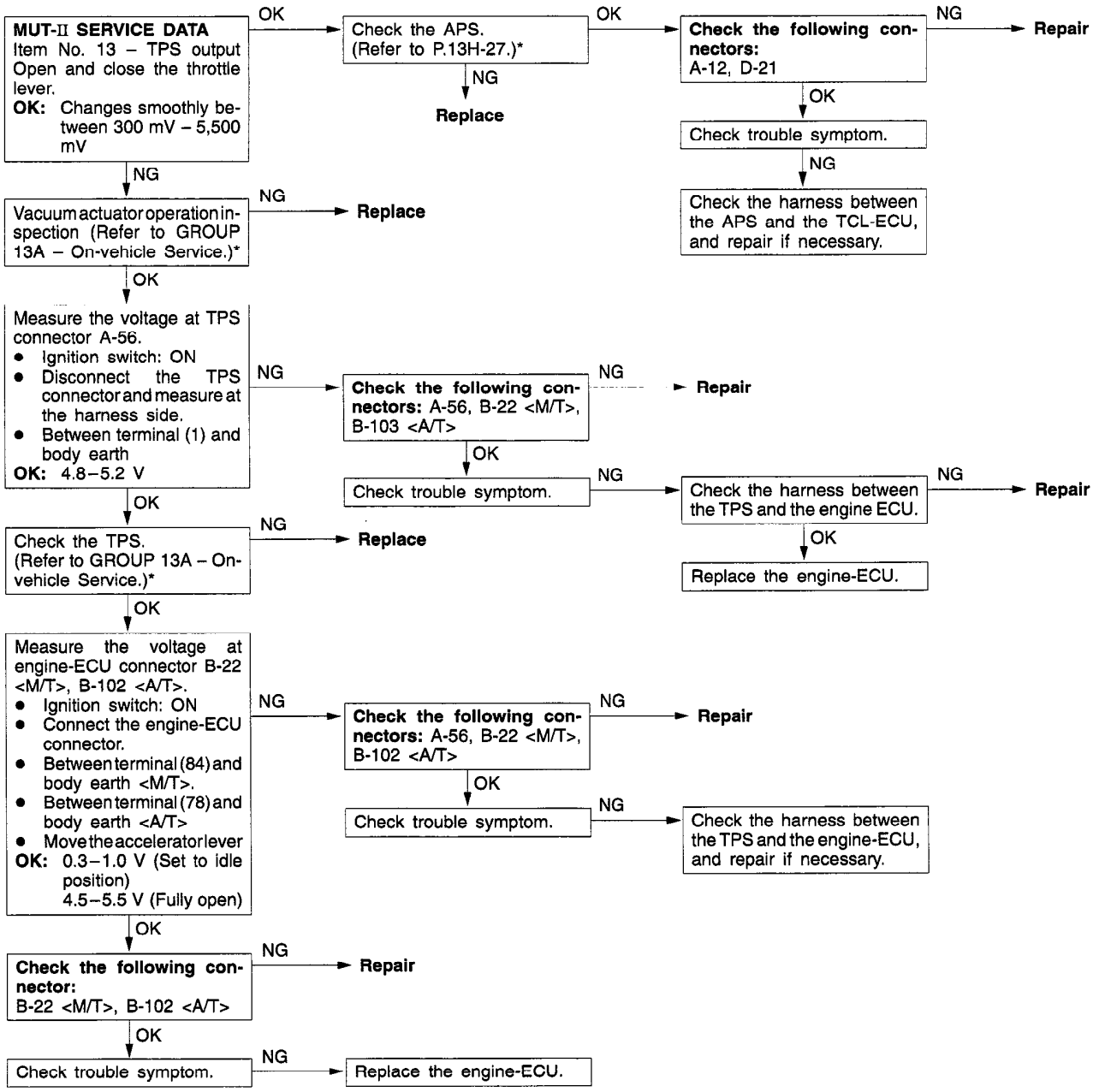
INSPECTION PROCEDURES FOR DIAGNOSIS CODES

Code No. 11 APS circuit system	Probable cause
This diagnosis code is output if the APS output voltage is less than 0.2 V due to an open circuit or other malfunction in the APS circuit. The APS power supply and earth are supplied from the engine ECU, and the output signal is used by the A/T-ECU and auto-cruise control-ECU as well as by the TCL-ECU.	• Malfunction of APS • Malfunction of TCL-ECU • Malfunction of engine-ECU • Malfunction of harness or connector



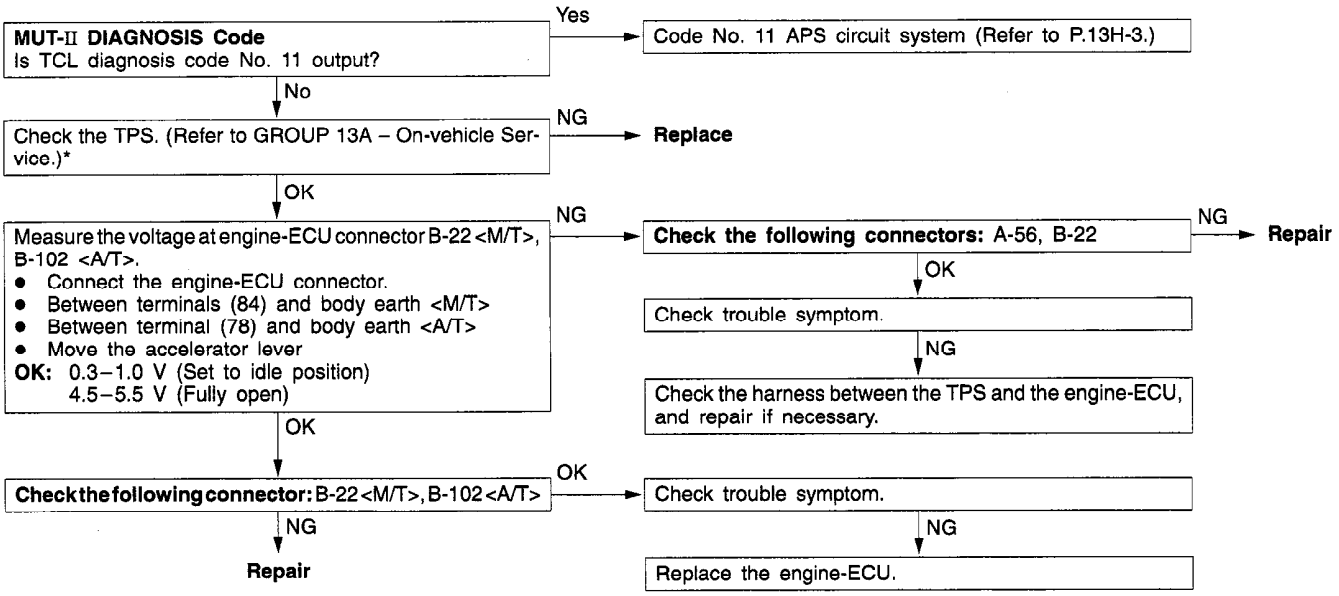
NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

Code No. 12 APS or TPS circuit system	Probable cause
This diagnosis code is output if the APS opening angle is 20° or greater than the TPS opening angle because of a short in the APS, an open circuit in the TPS or sticking of the vacuum actuator. As this detection condition can be applicable during throttle control, trouble diagnosis is invalid at this time.	• Malfunciton of APS • Malfunction of TPS • Malfunction of TCL-ECU • Malfunction of harness or connector • Malfunction of vacuum actuator



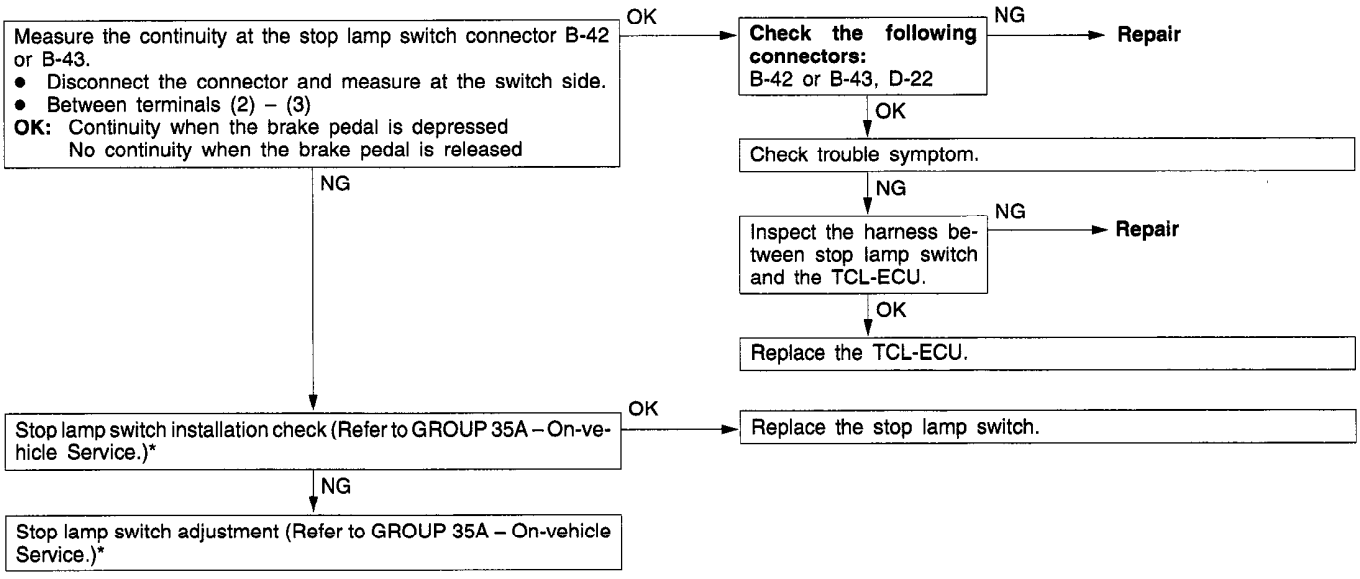
NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

Code No. 13 TPS circuit system	Probable cause
This diagnosis code is output if the TPS opening angle is 20° or greater than the APS opening angle because of a short in the TPS or an open circuit in the APS. If there is an open circuit in the APS, diagnosis code No. 11 is output at the same time. Accordingly, if only diagnosis code No. 11 is output, the cause is probably an abnormality in the TPS circuit system.	• Malfunction of APS • Malfunction of TPS • Malfunction of harness or connector • Malfunction of engine-ECU



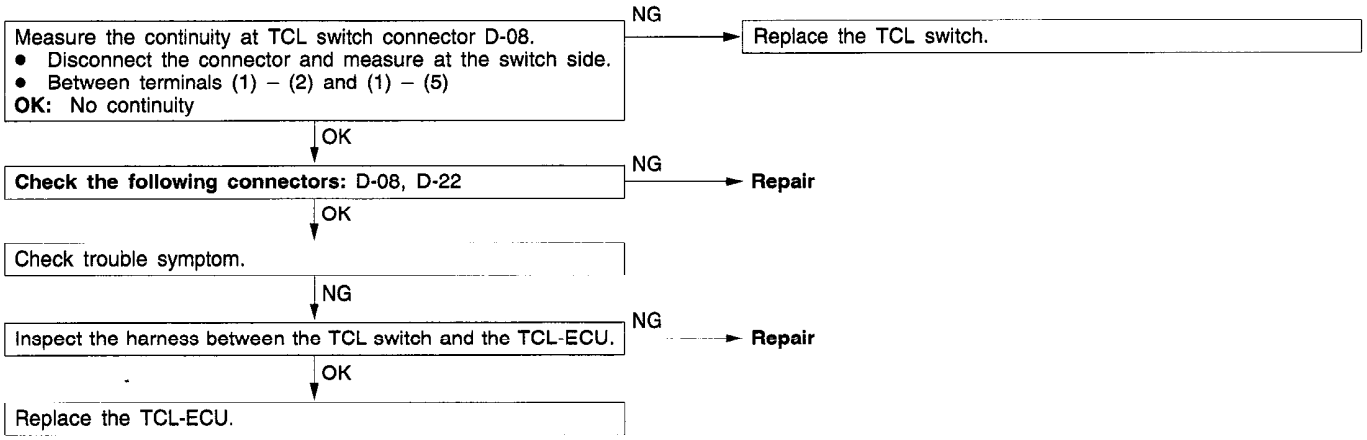
NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

Code No. 23 Stop lamp switch circuit system	Probable cause
This diagnosis code is output if the stop lamp switch remains ON for a continuous period of 15 minutes or more, or for a continuous period of 1 minute or more when driving at a speed of 10 km/h or more, because of a short circuit or defective adjustment of the stop lamp switch. This diagnosis code No. may also occur while driving in traffic jams or if the foot is resting on the brake pedal with driving.	• Malfunction of stop lamp switch • Malfunction of harness or connector • Malfunction of TCL-ECU

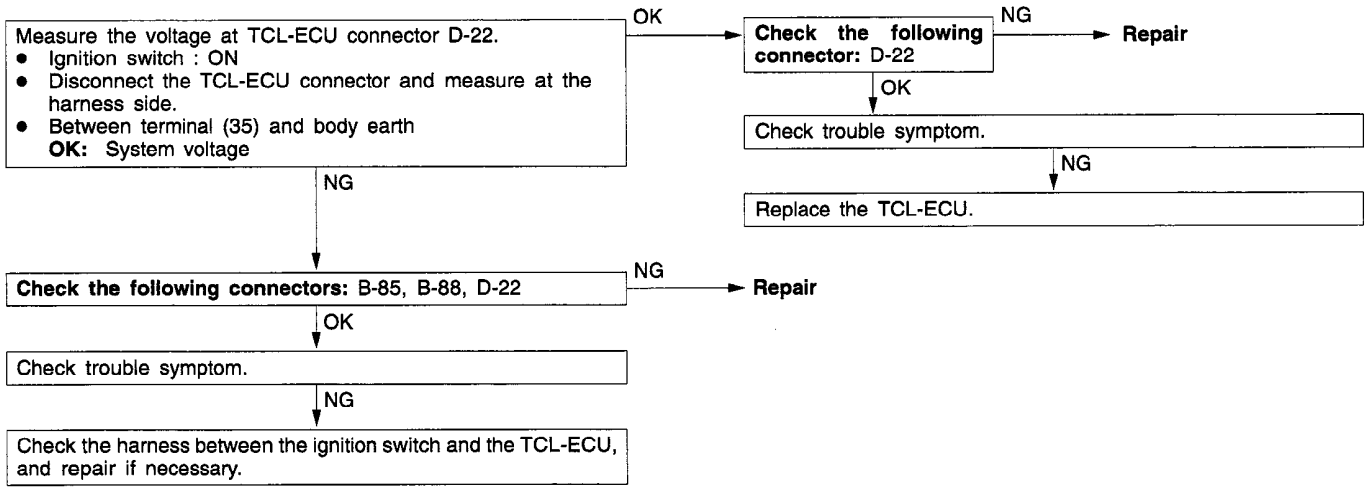


NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

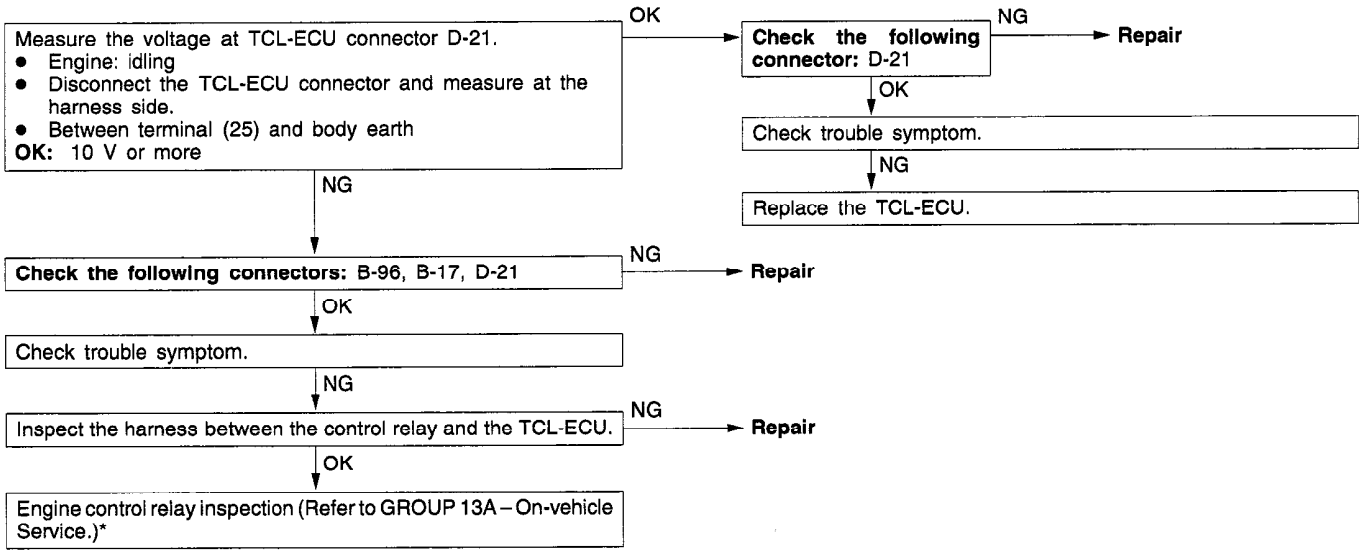
Code No. 24 TCL switch circuit system	Probable cause
This diagnosis code is output if signals are input simultaneously from both the TCL-OFF and TCL-ON positions because of a short circuit in the TCL switch circuit.	• Malfunction of the TCL switch • Malfunction of harness or connector • Malfunction of TCL-ECU



Code No. 26 Ignition switch (IG2) circuit system	Probable cause
This diagnosis code is output if the IG2 power supply is not distributed, even though the engine speed is 450 r/min or more.	• Malfunction of harness or connector • Malfunction of TCL-ECU



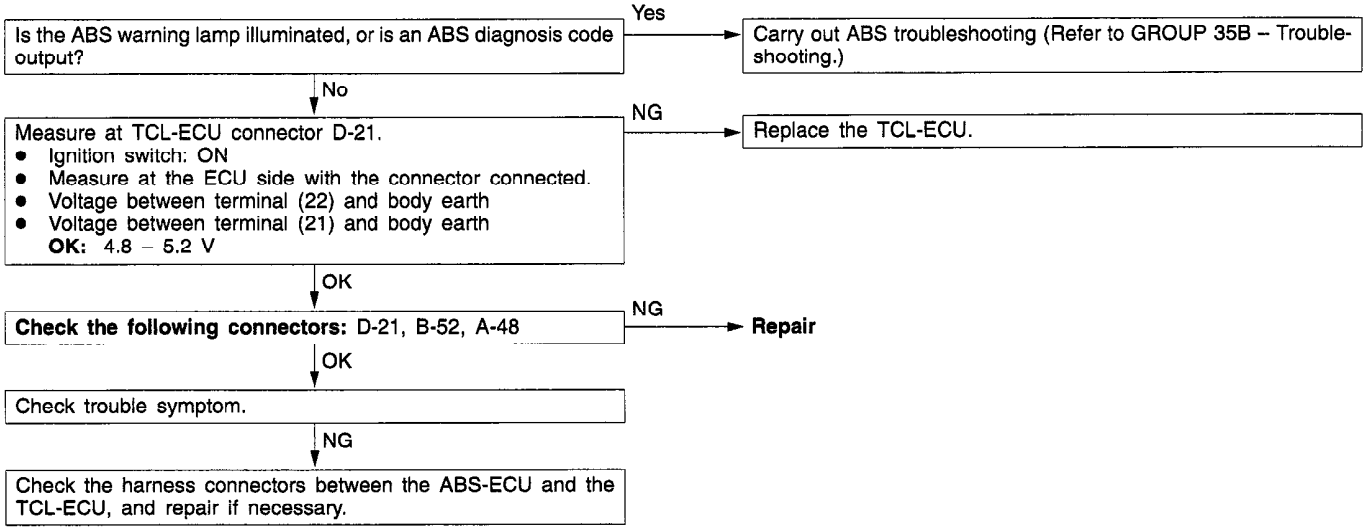
Code No. 27 TCL-ECU power supply voltage circuit (engine control relay circuit) system	Probable cause
This diagnosis code is output if the TCL-ECU power supply voltage (engine control relay supply voltage) is lower than the specified value. If the voltage returns to the specified value or greater, the diagnosis code is erased.	• Malfunction of control relay • Malfunction of harness or connector • Malfunction of TCL-ECU



NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

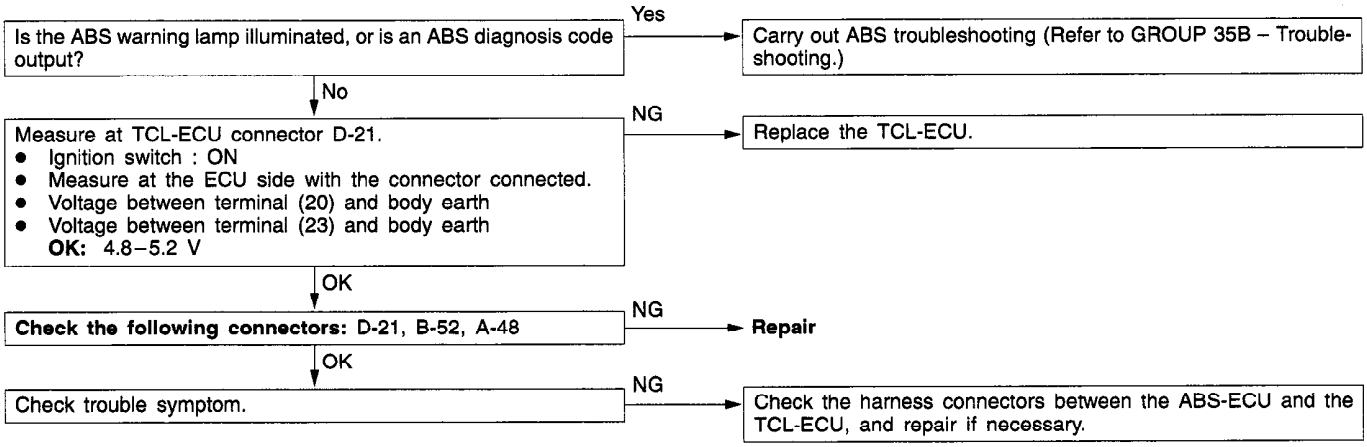
Code No. 31 Front right wheel speed sensor circuit system Code No. 32 Front left wheel speed sensor circuit system	Probable cause
These diagnosis codes are output if a pulse (from the front wheels) indicates that the difference between the front wheels and the rear wheels is 8 km/h or more because of an open or short circuit in a wheel speed sensor or a malfunction of sensor.	• Malfunction of front speed sensor • Malfunction of harness or connector • Malfunction of TCL-ECU • Malfunction of ABS-ECU

NOTE
When these diagnosis codes are output, erase the diagnosis code memory after carrying out repairs, and then carry out a road test at 20 km/h or more and check to be sure that the diagnosis codes are not output again.



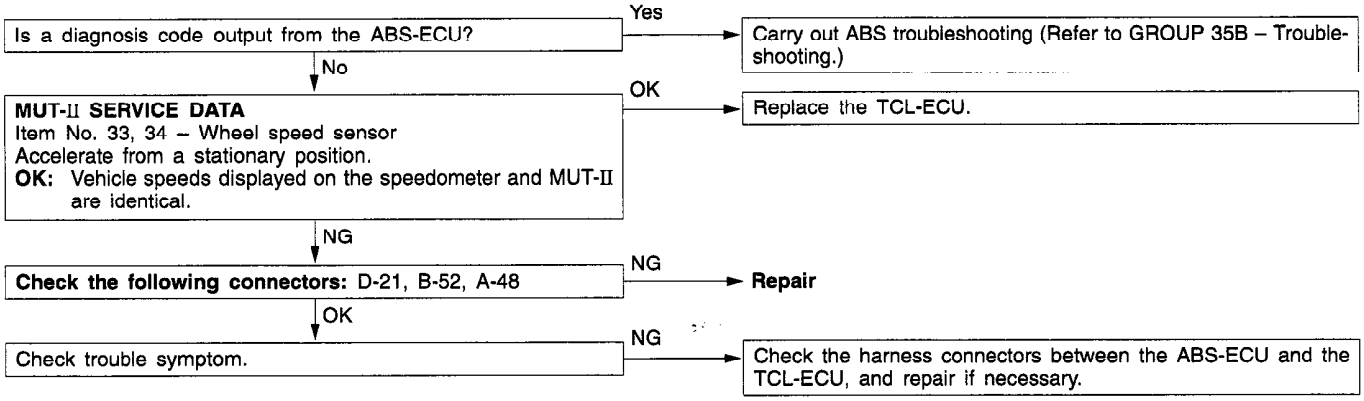
Code No. 33 Rear right wheel speed sensor circuit system Code No. 34 Rear left wheel speed sensor circuit system	Probable cause
These diagnosis codes are output if a pulse (from the wheels on one side of rear) indicates that the difference between the left wheel and the right wheel is 8 km/h or more because of an open or short circuit in a wheel speed sensor or a defective sensor.	• Malfunction of rear wheel speed sensor • Malfunction of harness or connector • Malfunction of TCL-ECU • Malfunction of ABS-ECU

NOTE
When these diagnosis codes are output, erase the diagnosis code memory after carrying out repairs, and then carry out a road test at 20 km/h or more and check to be sure that the diagnosis codes are not output again.

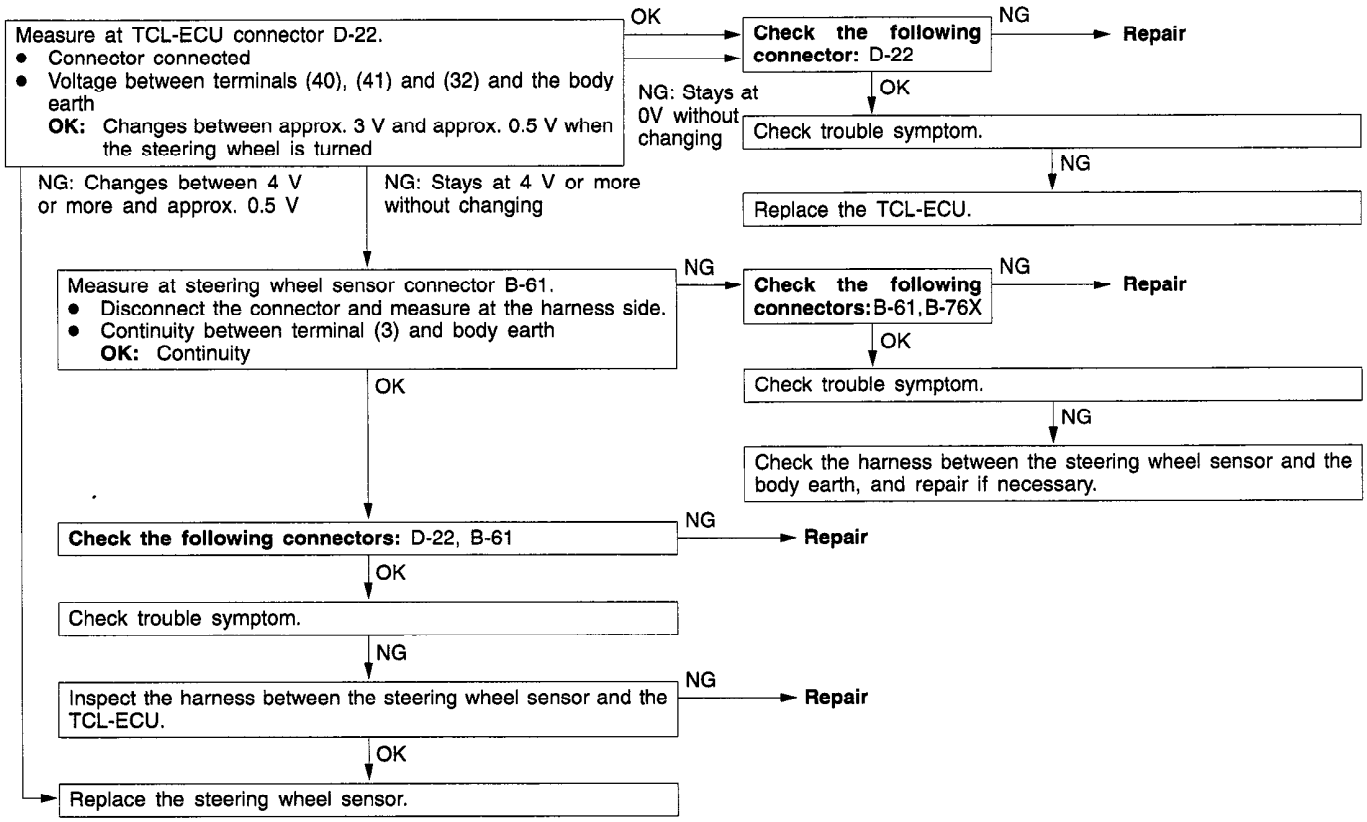


Code No. 35 Rear wheel speed sensor circuit system (1) Code No. 36 Rear wheel speed sensor circuit system (2)	Probable cause
Diagnosis code No. 35 is output if the pulse signal from a rear wheel sensor is momentarily interrupted (0.02 sec.) because of a transient open circuit in a rear wheel speed sensor. Diagnosis code No. 36 is output if a rear wheel speed sensor abnormality is judged when the turning speed of both rear wheels is 0 km/h for 20 seconds or more while TCL is operating.	• Malfunction of rear wheel speed sensor • Malfunction of harness or connector • Malfunction of ABS-ECU • Malfunction of TCL-ECU

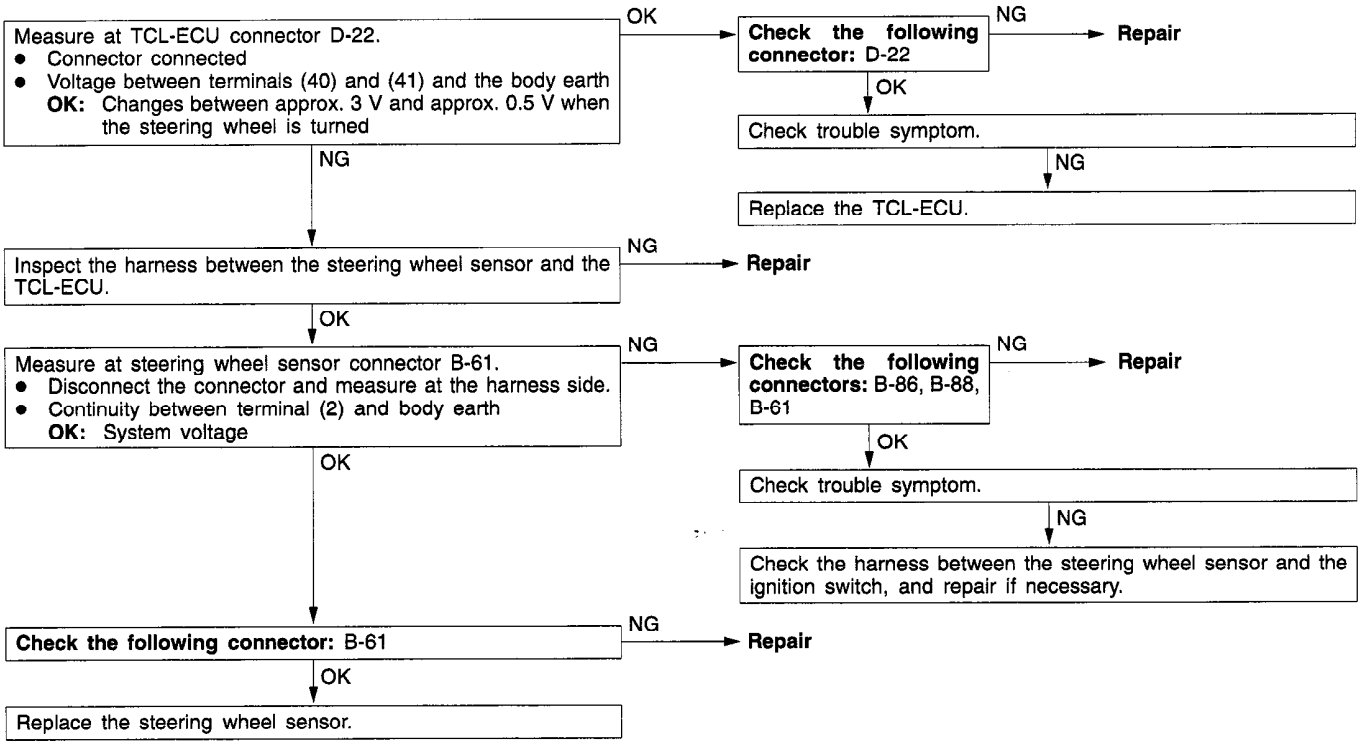
NOTE
(1) If the front wheels only are turning while the rear wheels are stationary (wheel slip), the TCL-OFF indicator will start flashing after 20 seconds, and the system will be isolated.
(2) When these diagnosis codes are output, erase the diagnosis code memory after carrying out repairs, and then carry out a road test at 20 km/h or more and check to be sure that the diagnosis codes are not output again.



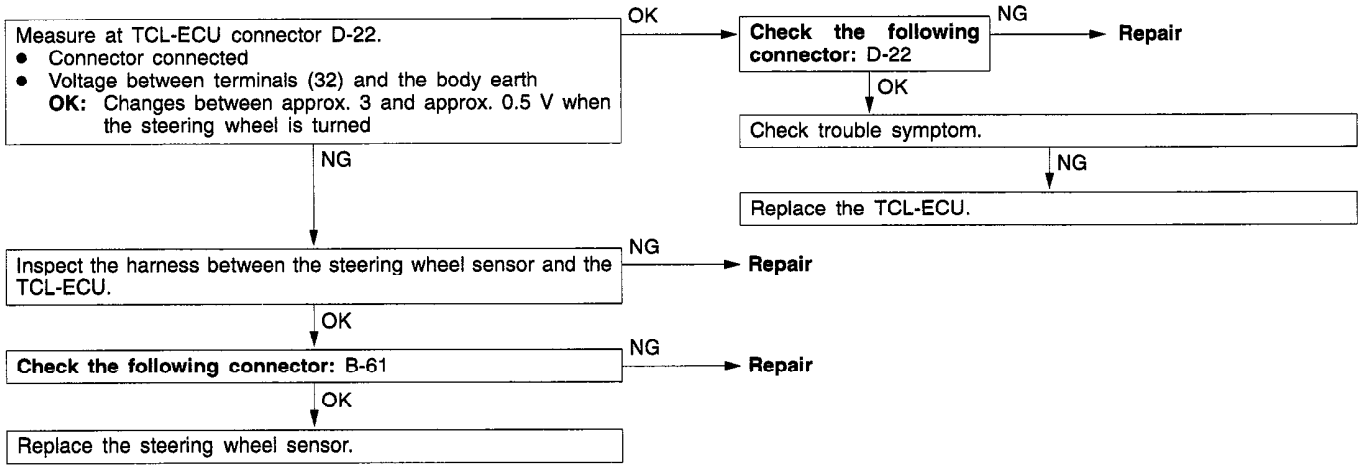
Code No. 41 Steering wheel sensor (ST-1) circuit system (open circuit) Code No. 42 Steering wheel sensor (ST-2) circuit system (open circuit) Code No. 43 Steering wheel sensor (ST-N) circuit system (open circuit)	Probable cause
These diagnosis codes are output if there is an open circuit in the output wire of the steering wheel sensor circuit.	• Malfunction of harness or connector • Malfunction of steering wheel sensor • Malfunction of TCL-ECU



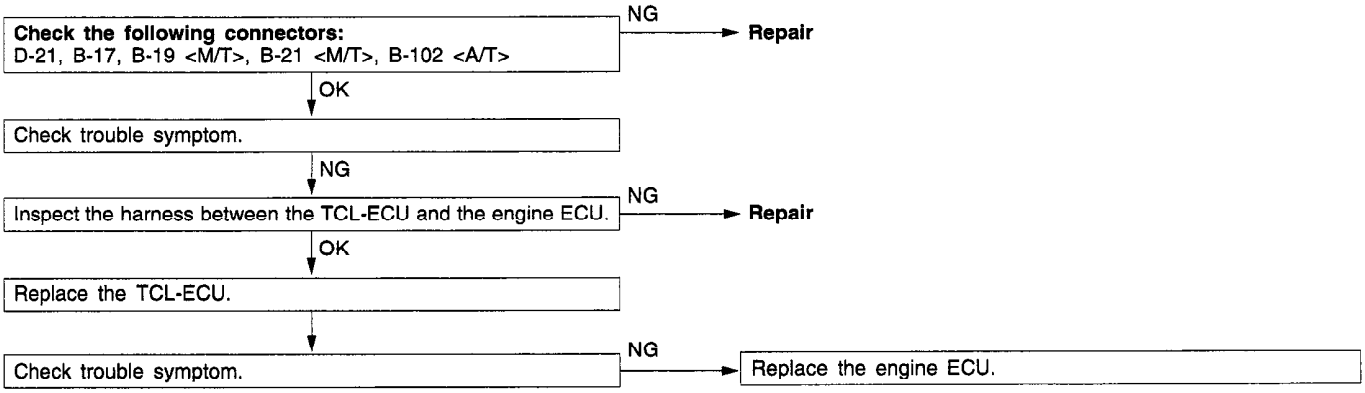
Code No. 44 Steering wheel sensor circuit system (short circuit)	Probable cause
This diagnosis code is output when no steering angle signal is output because there is a short-circuit in either steering wheel sensor ST-1 or steering wheel sensor ST-2 when the speed averages output by the left and right rear wheel speed sensors are 10 km/h or more.	• Malfunction of harness or connector • Malfunction of steering wheel sensor • Malfunction of TCL-ECU



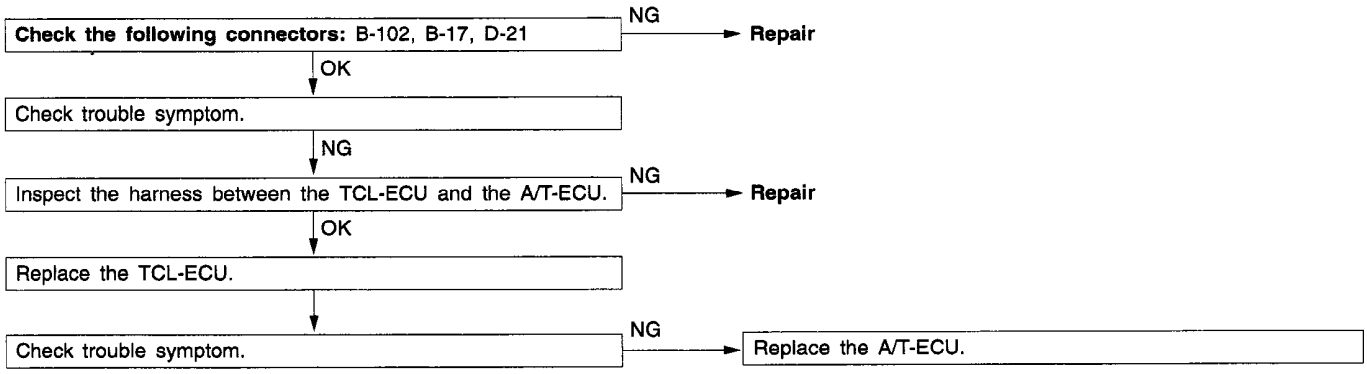
Code No. 45 Steering wheel sensor (ST-N) circuit system (short circuit)	Probable cause
This diagnosis code is output if it is considered that there is an abnormality in the steering wheel sensor (ST-N) circuit system when the straight-ahead position is continuously detected even though the steering wheel is turned 20° or more.	• Malfunction of steering wheel sensor • Malfunction of harness or connector • Malfunction of TCL-ECU



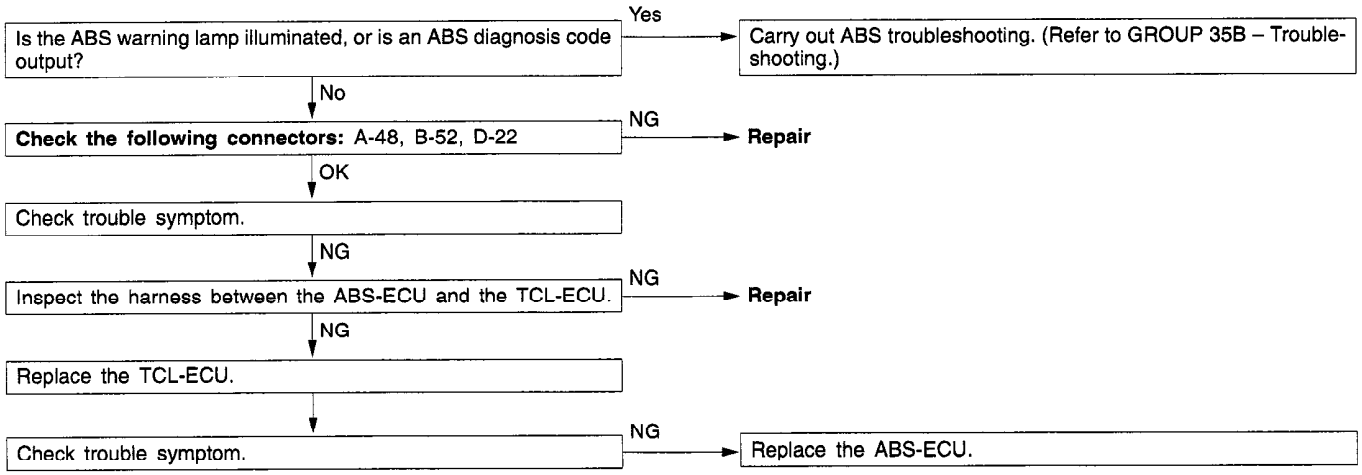
Code No. 71 Engine-ECU communication circuit system	Probable cause
This diagnosis code is output if an error is detected in the communication contents because of an open or short circuit in the serial communication circuit between the TCL-ECU and the engine ECU, a malfunction of ECU and a defective shielding of the shield wire.	• Malfunction of harness or connector • Malfunction of TCL-ECU • Malfunction of engine ECU



Code No. 74 A/T-ECU communication circuit system	Probable cause
This diagnosis code is output if an error is detected in the communication contents because of an open or short circuit in the serial communication circuit between the TCL-ECU and the A/T-ECU, a malfunction of ECU and a defective shielding of the shield wire.	• Malfunction of harness or connector • Malfunction of TCL-ECU • Malfunction of A/T-ECU



Code No. 76 ABS circuit system	Probable cause
This diagnosis code is output if the ABS-ECU detects the system abnormality (when ABS warning lamp illumination is controlled).	• Malfunction of harness or connector • Malfunction of TCL-ECU • Malfunction of ABS-ECU



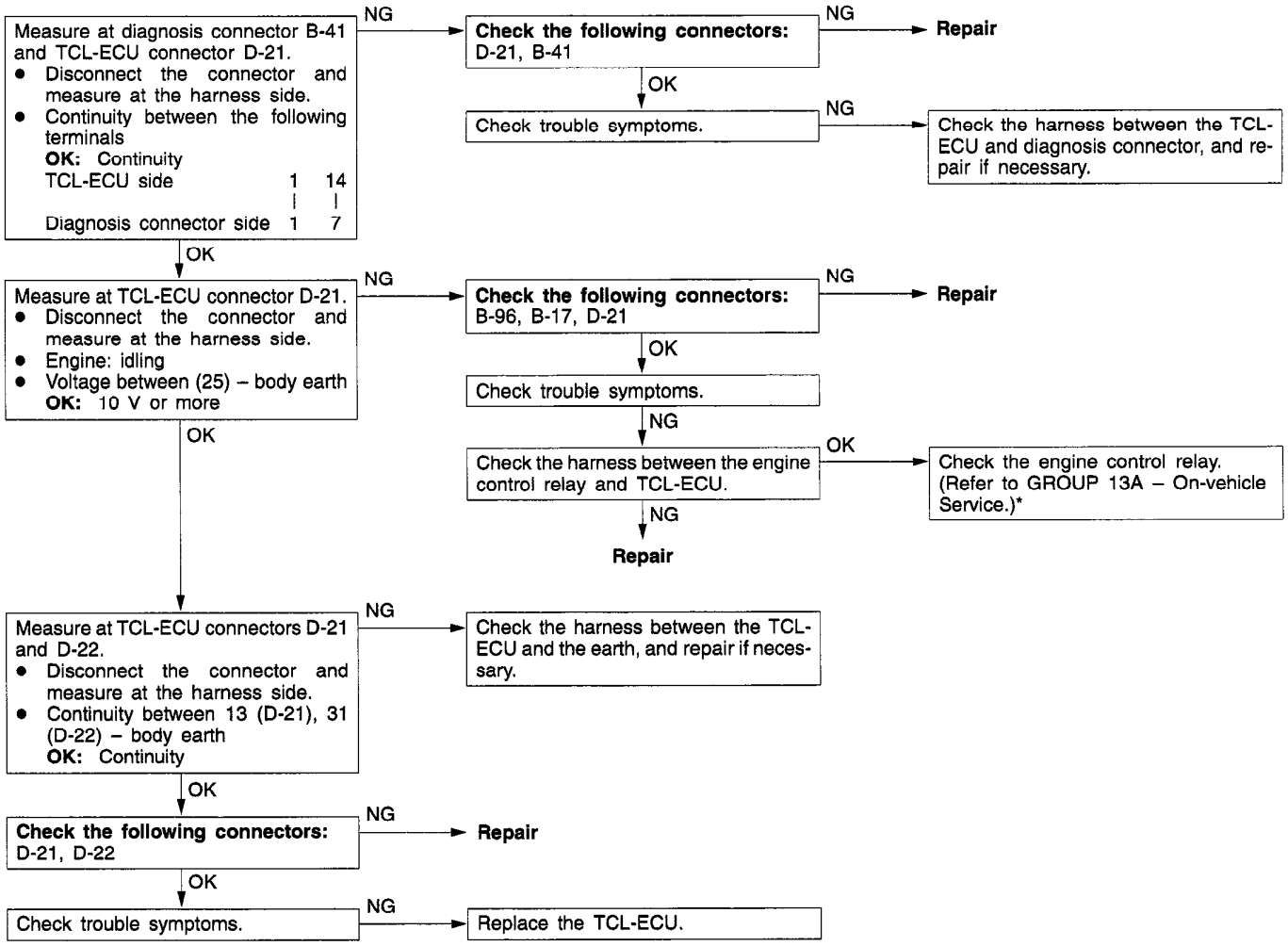
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom		Inspection procedure No.	Reference page
Communication with the MUT-II is not possible.	Communication with all systems is not possible.	1*	–
	Communication with TCL-ECU only is not possible.	2	13H-14
Malfunction of TCL indicator lamp display	None of the TCL indicator lamps (TCL OFF, TCL) illuminate when the ignition switch is ON.	3	13H-15
	One of the TCL indicator lamps does not illuminate when the ignition switch is ON (Another lamp does illuminate).	4	13H-15
	TCL OFF indicator lamp remains illuminated even after the engine is started.	5	13H-16
	TCL OFF indicator lamp flashes after the engine is started.		
	TCL remains illuminated even after the engine is started.	6	13H-16
	TCL OFF indicator lamp does not illuminate even if the TCL switch is continuously pressed to the OFF side while the engine is idling.	7*	–
Malfunction of TCL operation	TCL illuminates in the TCL operation range, but torque is not reduced.	8*	–
Poor starting Poor acceleration	Engine output is reduced in the TCL non-operation range (TCL indicator lamp does not illuminate) and starting and acceleration performance is poor.		

NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

Inspection Procedure 2

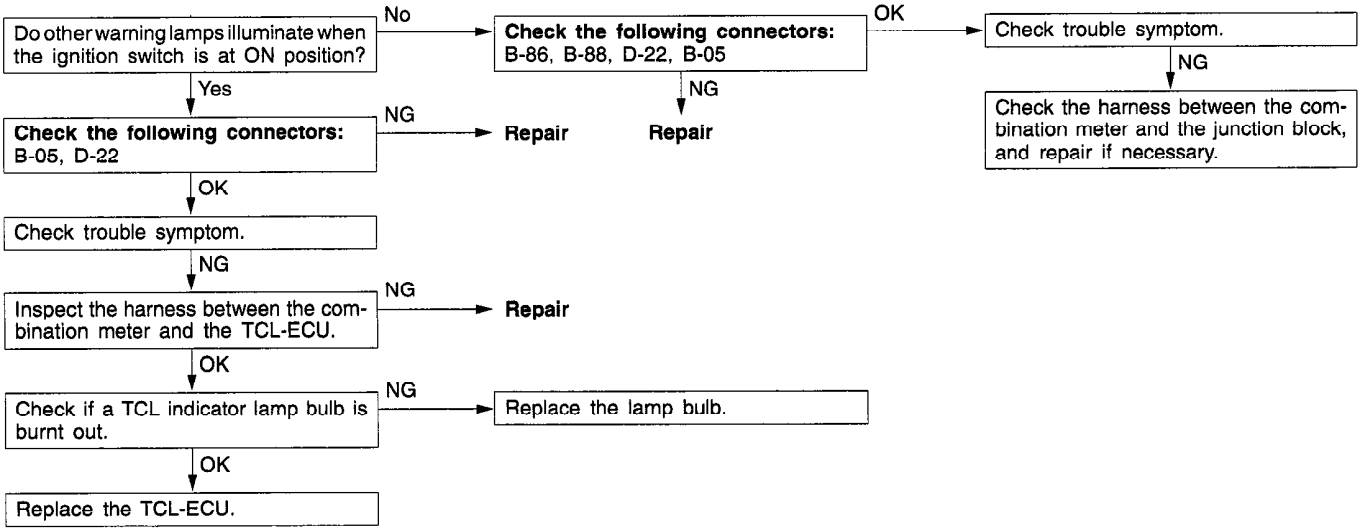
Communication with the MUT-II is not possible. (Communication with TCL-ECU only is not possible.)	Probable cause
If the MUT-II cannot communicate with the TCL-ECU only, the cause is probably an abnormality in the TCL diagnosis line or in the TCL-ECU power supply line or earth line.	• Malfunction of harness or connector • Malfunction of engine control relay • Malfunction of TCL-ECU



NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

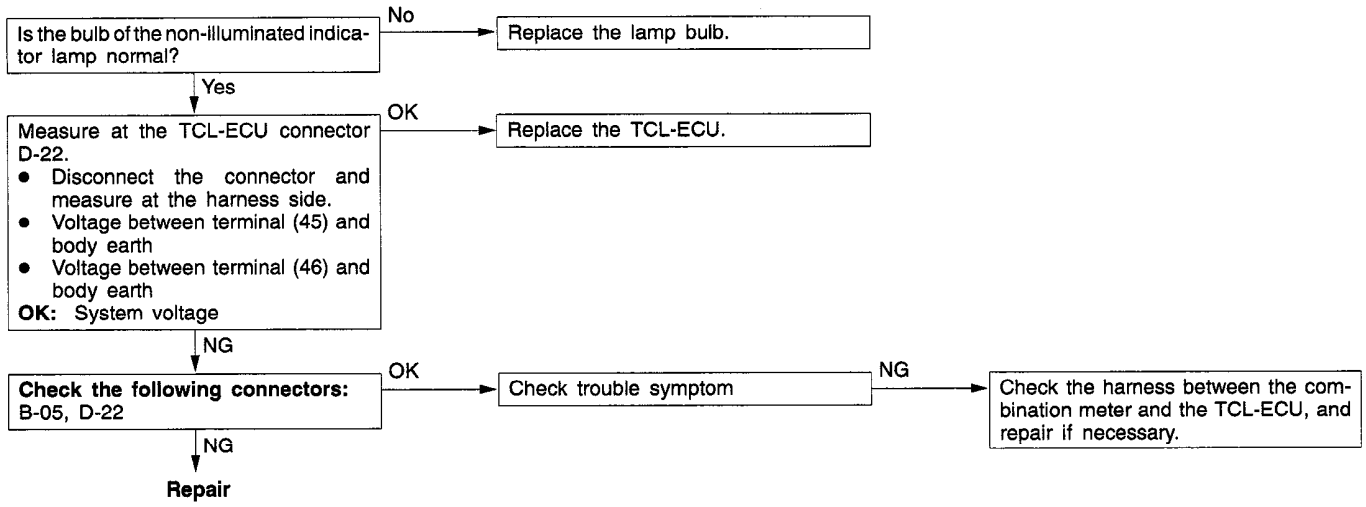
Inspection Procedure 3

None of the TCL indicator lamps (TCL OFF, TCL) illuminate when the ignition switch is ON.	Probable cause
The main cause is an open circuit in the indicator circuit because of a burnt-out indicator lamp bulb.	• Malfunction of harness or connector • Malfunction of TCL-ECU • Malfunction of indicator lamp bulb



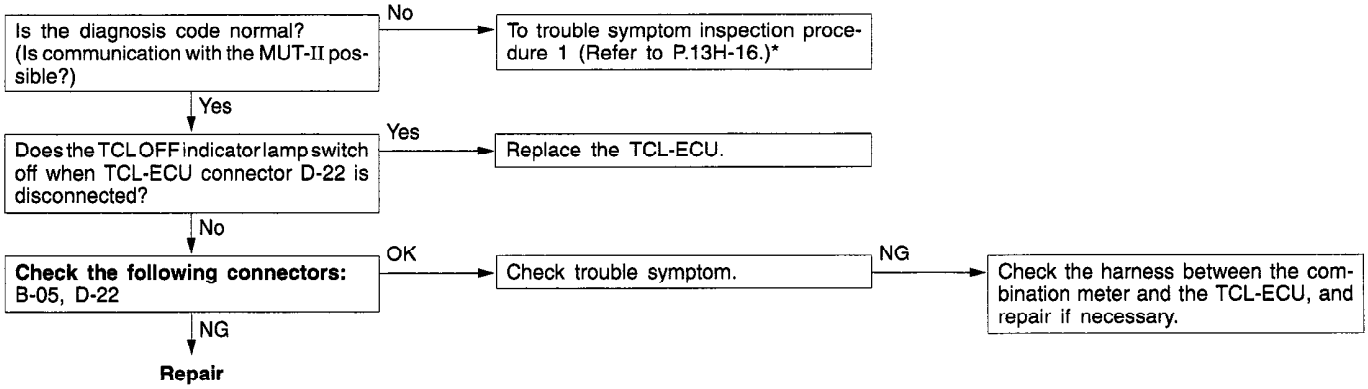
Inspection Procedure 4

One of the TCL indicator lamps does not illuminate when the ignition switch is ON.	Probable cause
Because the TCL indicators utilise shared power supply circuits, if one of the indicator lamps is illuminated, the power supply circuit can be judged to be normal.	• Open circuit in indicator lamp power supply circuit. • Burnt-out indicator lamp bulb



Inspection Procedure 5

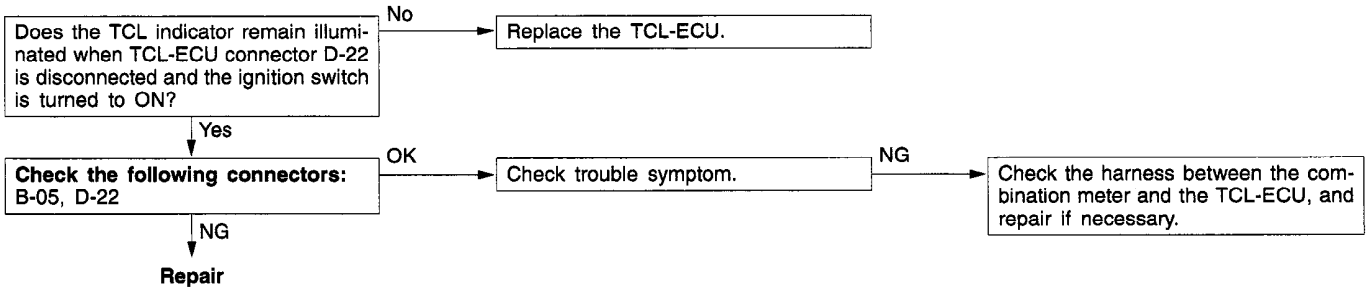
• TCL OFF indicator lamp remains illuminated even after the engine is started. • TCL OFF indicator lamp illuminate after the engine is started.	Probable cause
The TCL-OFF indicator is also used as a system warning indicator. If there is a system abnormality, this indicator will illuminate or flash.	• Other system related to the TCL • Malfunction of harness or connector



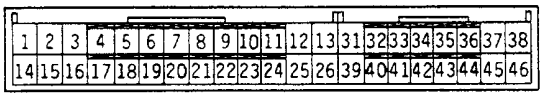
NOTE
*: Refer to '96 CARISMA Basic Manual (Pub. No. PWDE9502).

Inspection Procedure 6

TCL indicator lamp remains illuminated even after the engine is started.	Probable cause
The TCL indicator lamp only illuminates while the engine is running if the TCL is operating.	• Malfunction of TCL indicator power supply circuit • Malfunction of TCL-ECU • Malfunction of harness or connector



CHECK AT ECU TERMINALS



03U0061

Terminal No.	Check item	Measurement condition	Normal condition
1	Diagnosis control	Do not connect the MUT-II	Approx. 12 V
		Connect the MUT-II	0 V
13	Earth	At all times	0 V
14	Diagnosis data input	Connect the MUT-II	Serial communication with MUT-II
		Do not connect the MUT-II	1 V or less
15	A/T-ECU data communication	Engine: Idling	Other than 0 V
16	A/T-ECU data communication	Engine: Idling	Other than 0 V
17	Engine ECU data communication	Engine: Idling	Other than 0 V
18	Engine ECU data communication	Engine: Idling	Other than 0 V
19	APS output	Ignition switch: ON Accelerator pedal fully open	4.5 – 5.5 V
		Ignition switch: ON Accelerator pedal fully closed	0.3 – 1.0 V
20	Rear left wheel speed sensor input	Engine: Idling Vehicle slowly moving forward	Changes between 0 V and approx. 5 V
21	Front right wheel speed sensor input	Engine: Idling Vehicle slowly moving forward	Changes between 0 V and approx. 5 V
22	Front left wheel speed sensor input	Engine: Idling Vehicle slowly moving forward	Changes between 0 V and approx. 5 V
23	Rear right wheel speed sensor input	Engine: Idling Vehicle slowly moving forward	Flashes between 0 V and approx. 5 V
25	ECU power supply	Ignition switch: ON	System voltage
26	Earth	At all times	0 V
31	Earth	At all times	0 V
32	Steering wheel sensor STN input	Engine: Idling Steering wheel in straight-ahead position	0.5 V or less
		Engine: Idling Steering wheel turned 90° straight-ahead position	2.5 – 3.5 V

Terminal No.	Check item	Measurement condition	Normal condition
34	TCL ON switch	Ignition switch: ON TCL switch: Pressed to ON side	2 V or less
		Ignition switch: ON TCL switch: Release	System voltage
35	Ignition switch (IG2)	Ignition switch: ON	System voltage
39	ECU back-up power supply	Ignition switch: OFF	System voltage
40	Steering wheel sensor ST1 input	Ignition switch: ON Steering wheel turned slowly	Flashes between 0 V and approx. 3 V
41	Steering wheel sensor ST2 input	Ignition switch: ON Steering wheel turned slowly	Flashes between 0 V and approx. 3 V
42	TCL OFF switch	Ignition switch: ON TCL switch: Pressed to OFF side	2 V or less
		Ignition switch: ON TCL switch: Release	System voltage
43	Stop lamp switch input	Ignition switch: ON Brake pedal depressed	System voltage
		Ignition switch: ON Brake pedal released	0 V
44	ABS fail signal	During ABS fail	2 V or less
		When ABS is normal	System voltage
45	TCL OFF indicator	Ignition switch: ON TCL ON condition	System voltage
		Ignition switch: ON TCL OFF condition	2 V or less
46	TCL indicator	Ignition switch: ON TCL ON condition	2 V or less
		Ignition switch: ON TCL OFF condition	System voltage