ANTILOCK BRAKE SYSTEM 4-4

1. Diagnostics Chart for On-board Diagnosis System

SUPPLEMENTAL RESTRAINT SYSTEM “AIRBAG”

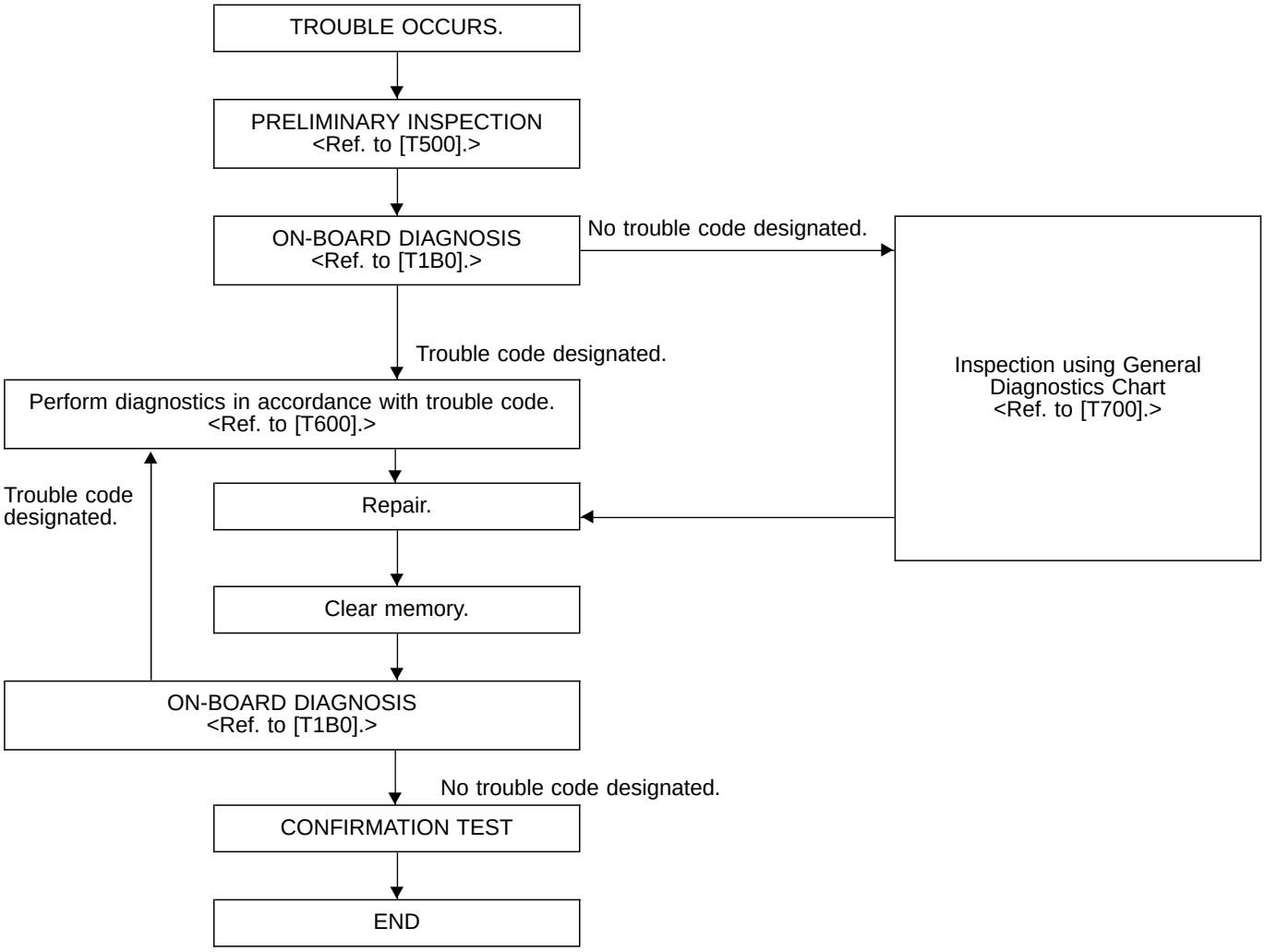
Airbag system wiring harness is routed near the bulkhead harness.

CAUTION:

● All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.

● Be careful not to damage Airbag system wiring harness when servicing the bulkhead harness.

A: BASIC DIAGNOSTICS PROCEDURE



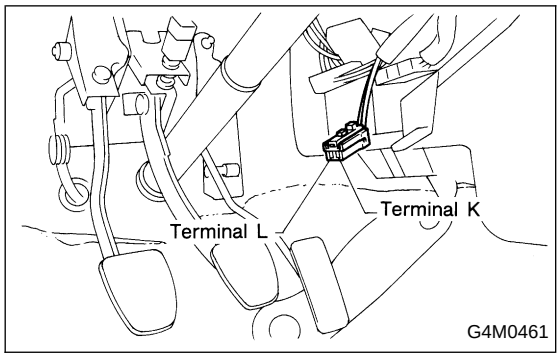
NOTE:

● To check harness for broken wires or short circuits, shake it while holding it or the connector.

● When A.B.S. warning light illuminates, read and record trouble code indicated by A.B.S. warning light.

B: ON-BOARD DIAGNOSIS

The on-board diagnosis system is designed to detect problems after the vehicle has been driven at 10 km/h (6 MPH) or more for at least 20 seconds. If a problem is found, the A.B.S. warning light will illuminate to inform the driver of the occurrence of a problem. When the warning light is on, the A.B.S. system will be inactive and the normal braking function will work. It is possible for a maximum of three trouble codes to be stored in memory until cleared.



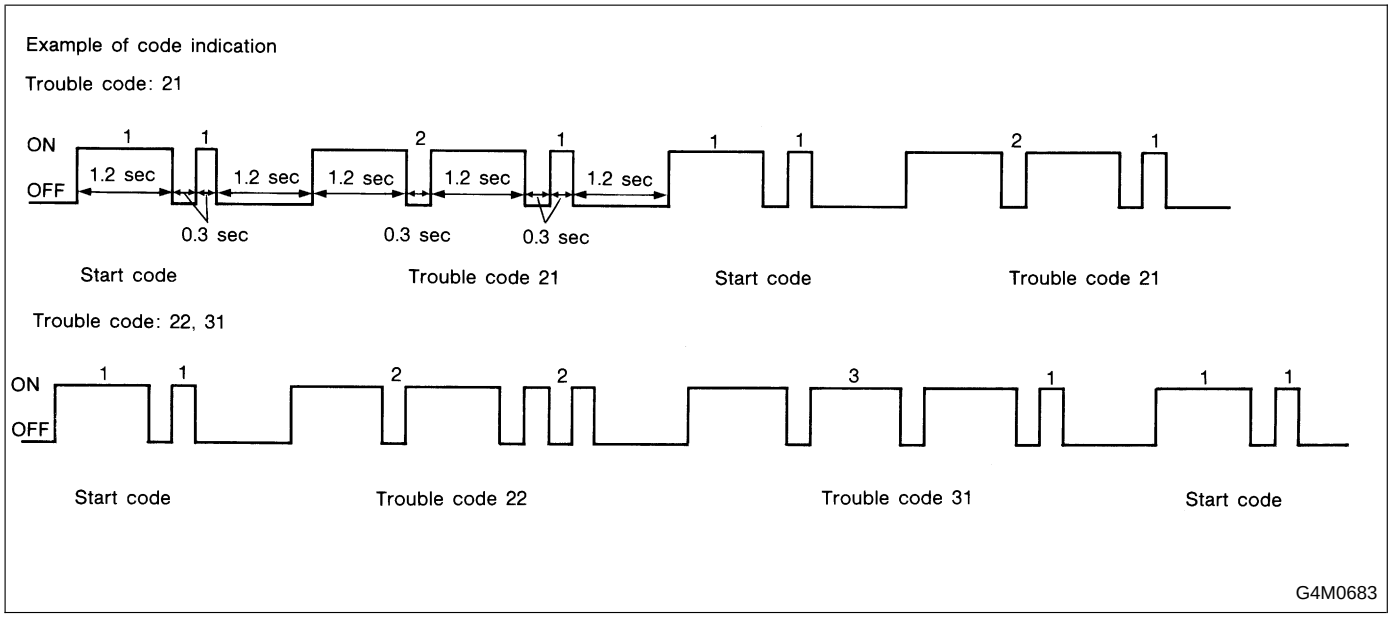
C: TROUBLE CODES

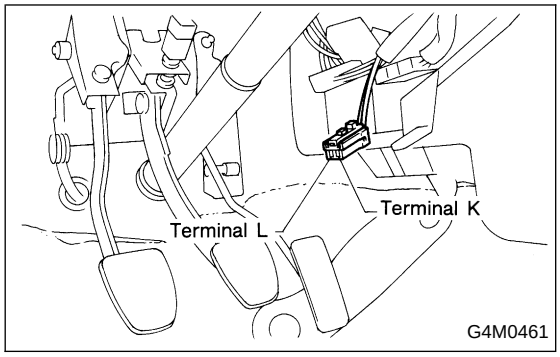
When on-board diagnosis of the A.B.S. control module detects a problem, the information (up to a maximum of three) will be stored in the EEP ROM as a trouble code. When there are more than three, the most recent three will be stored. (Stored codes will stay in memory until they are cleared.)

1. CALLING UP A TROUBLE CODE

1) Take out A.B.S. check connector from under side of steering column.
2) Turn ignition switch OFF.
3) Ground A.B.S. check connector terminal L.
4) Turn ignition switch ON.
5) A.B.S. warning light is set in the diagnostic mode and blinks to identify trouble code.
6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first.
These repeat for a maximum of 5 minutes.

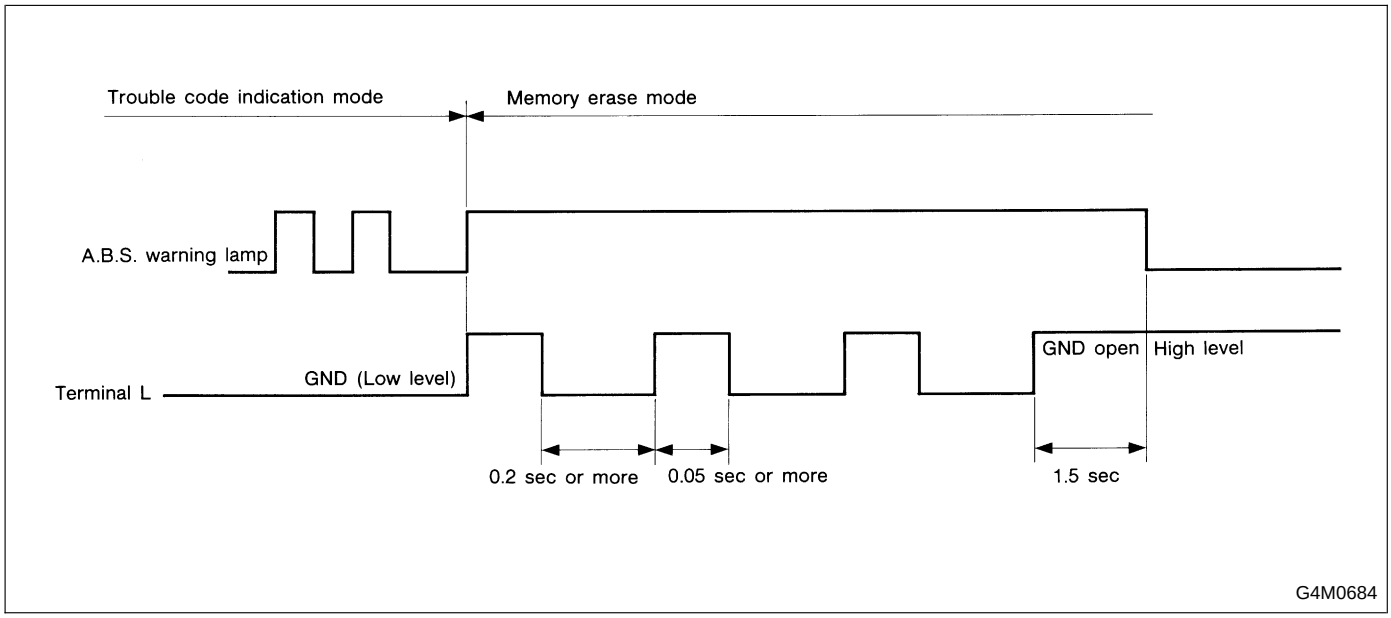
NOTE:
When there are no trouble codes in memory, only the start code (11) is shown.





2. CLEARING MEMORY

1) After calling up a trouble code, disconnect A.B.S. check connector terminal L from body ground.
2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal L and body ground for at least 0.05 seconds each time.

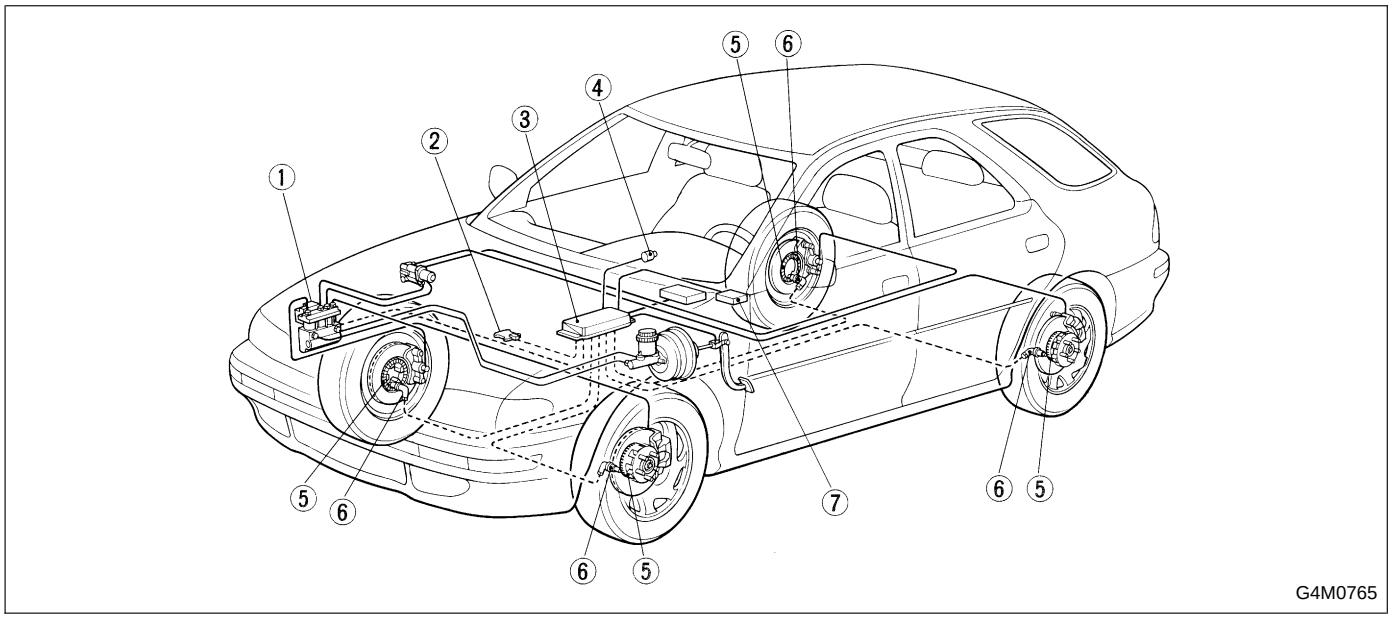


3. LIST OF TROUBLE CODES

Trouble code	Contents of diagnosis	
NONE: A [Warning light OFF]	Trouble in warning light drive circuit (Warning light is not on for 1.5 seconds after ignition switch is on.)	
NONE: B [Warning light ON] or [Abnormal trouble code output]	Trouble in warning light drive circuit	
11	**Start code:** ● **Trouble code is shown after start code.** ● **Only start code is shown in normal condition.**	
21	Faulty A.B.S. sensor (Open circuit or input voltage excessive)	Front right wheel sensor
23		Front left wheel sensor
25		Rear right wheel sensor
27		Rear left wheel sensor
22	Faulty A.B.S. sensor (When there is no open circuit or speed signal input.)	Front right wheel sensor
24		Front left wheel sensor
26		Rear right wheel sensor
28		Rear left wheel sensor
29	Faulty tone wheel, etc.	
31	Faulty solenoid valve circuit(s) in hydraulic unit	Front right wheel control
33		Front left wheel control
39		Rear wheels control
41	Faulty A.B.S. control module	
42	Source voltage is low.	
51	Faulty valve relay	
52	Faulty hydraulic motor and/or motor relay	
54	Faulty stop light circuit	
56	Use of improper A.B.S. control module specification, or faulty G sensor	

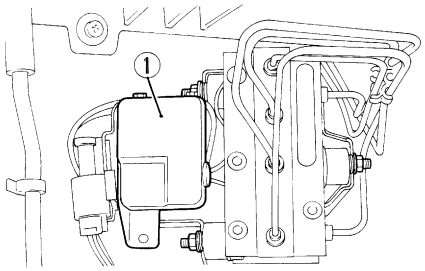
After diagnostics is completed, make sure to clear memory. Make sure only start code (11) is shown after memory is cleared.

2. Electrical Unit Location

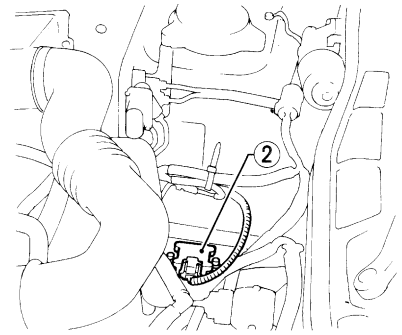


G4M0765

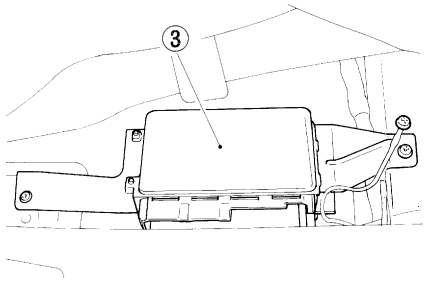
① Hydraulic control unit
② G sensor (AWD MT model)
③ A.B.S. control module
④ Warning light
⑤ Tone wheel
⑥ A.B.S. sensor
⑦ Check connector



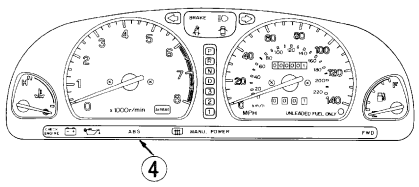
G4M0766



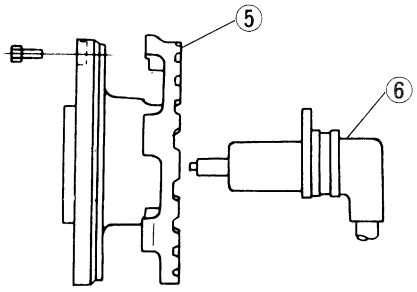
G4M0767



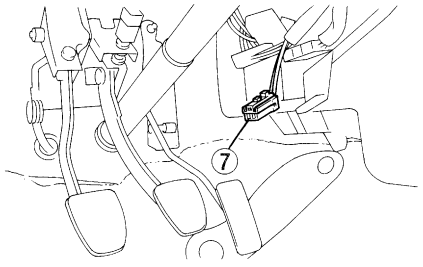
G4M0917



G4M0770

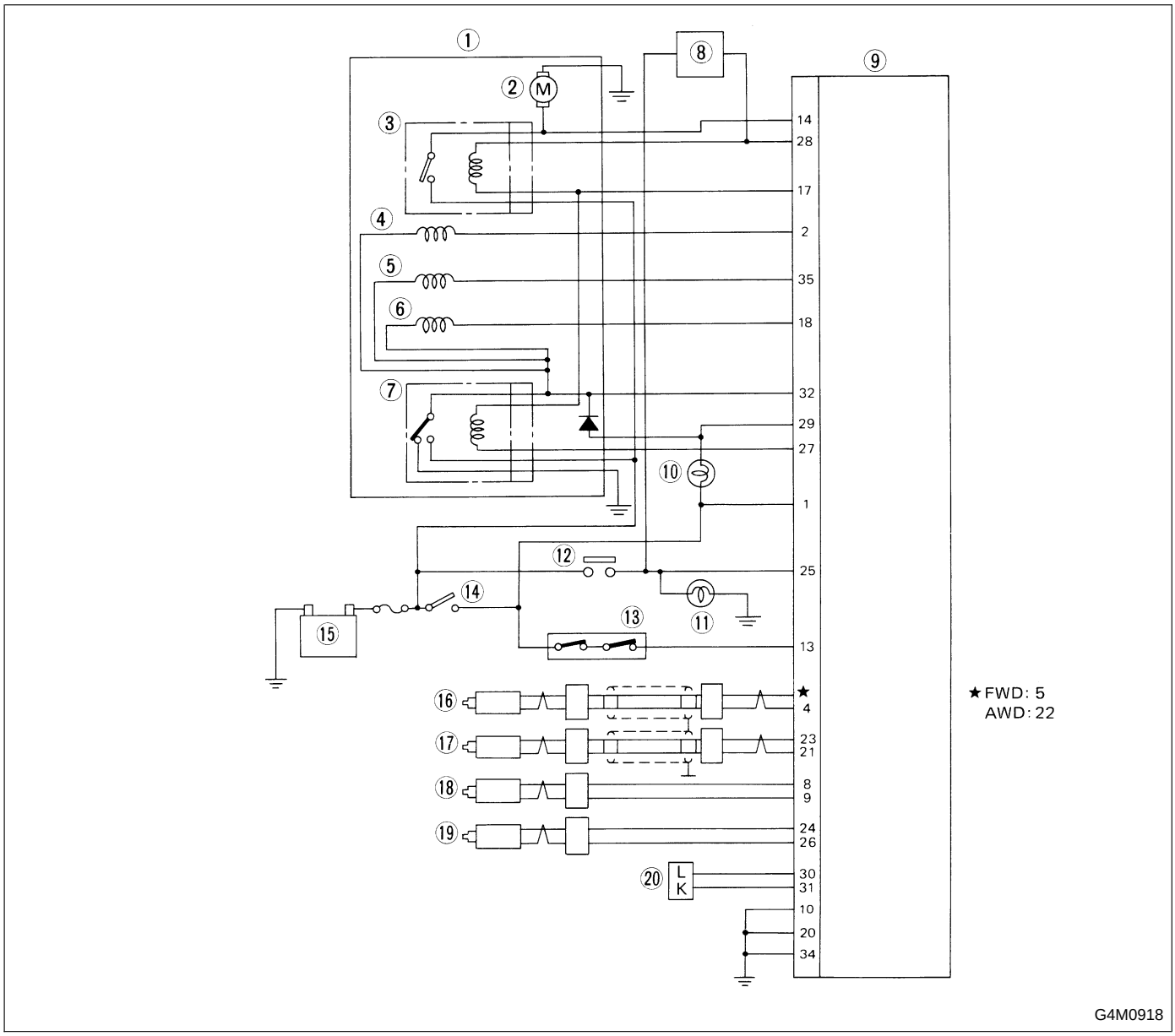


G4M0769



G4M0771

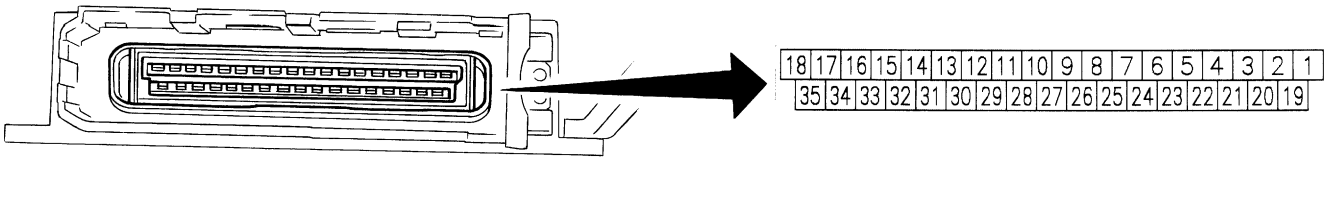
3. Schematic



① Hydraulic unit
② Motor
③ Motor relay
④ Front left solenoid valve
⑤ Front right solenoid valve
⑥ Rear solenoid valve
⑦ Valve relay
⑧ AT control module
⑨ A.B.S. control module
⑩ Warning light
⑪ Stop light
⑫ Stop light switch
⑬ G sensor (AWD MT model)
⑭ Ignition switch
⑮ Battery
⑯ Front left sensor
⑰ Front right sensor
⑱ Rear left sensor
⑲ Rear right sensor
⑳ Check connector

4. Control Module I/O Signal

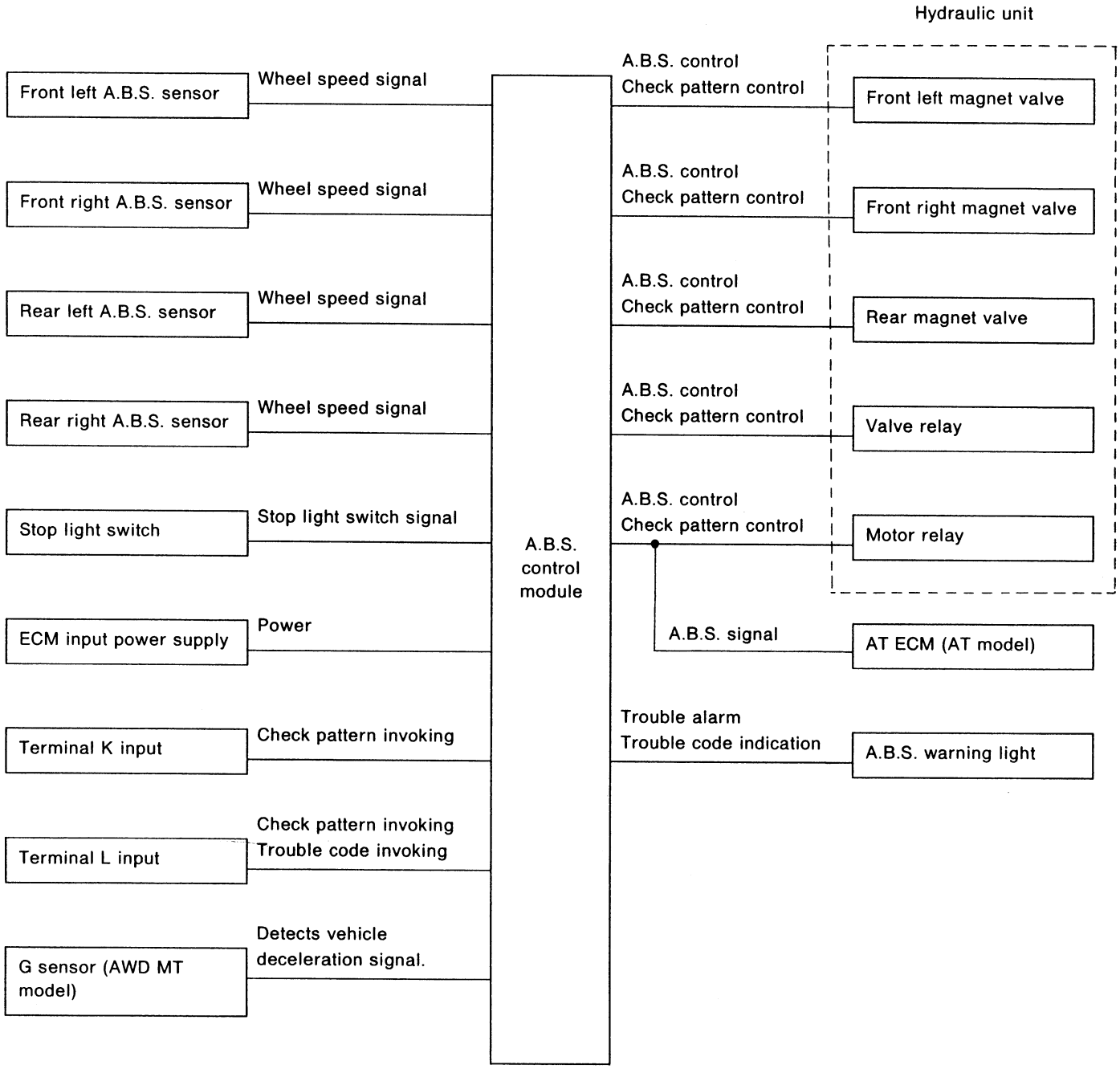
1. I/O SIGNAL VOLTAGE



G4M0685

Contents			Terminal No.	Ignition switch ON, engine OFF	Input/output signals	
					Measured value	Measuring conditions
A.B.S. sensor	Front left wheel		FWD 5	0V	0.12 — 1V (When it is 10 Hz)	• No. 22 or No. 5 — No. 4
			AWD 22			
	GND		4			
	Front right wheel		23	0V	0.12 — 1V (When it is 10 Hz)	• No. 23 — No. 21
	GND		21			
	Rear left wheel		8	0V	0.12 — 1V (When it is 10 Hz)	• No. 8 — No. 9
	GND		9			
	Rear right wheel		24	0V	0.12 — 1V (When it is 10 Hz)	• No. 24 — No. 26
	GND		26			
G sensor (AWD MT model)			13	10 — 12V	0V	When slanting about 14° — 21.3° (θ)
Check connector			30	—	—	—
			31			
Stop light switch			25	0V	5 — 10V	When brake pedal is depressed.
Motor monitoring			14	0V	10 — 12V	When motor operates.
Valve power supply monitoring			32	10 — 12V	10 — 12V	—
Hydraulic unit	Solenoid	Front left wheel	2	10 — 12V	0V	When solenoid is energized to produce output.
		Front right wheel	35	10 — 12V	0V	
		Rear wheel	18	10 — 12V	0V	
	Valve relay coil		27	0V	0V	—
	Motor relay coil		28	10 — 12V	0V	When motor operates to produce output.
Warning light			29	0V	10 — 12V	Ignition switch ON (Engine OFF)
Power supply	Battery		1	10 — 12V	10 — 12V	—
	Relay coil (valve, motor, etc.)		17	10 — 12V	10 — 12V	—
Grounding line			10	0V	0V	—
			20	0V	0V	—
			34	0V	0V	—

2. I/O SIGNAL DIAGRAM



5. Preliminary Inspection

Before performing diagnostics, check the following items which might affect A.B.S. problems:

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12V, or more
Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

1) Brake fluid level
2) Brake fluid leakage

3. BRAKE DRAG

4. BRAKE PAD AND ROTOR

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

6. Diagnostics Chart with Trouble Code

Trouble code	Contents of diagnosis		Page
NONE: A [Warning light OFF]	Trouble in warning light drive circuit (Warning light is not on for 1.5 seconds after ignition switch is on.)		12
NONE: B [Warning light ON] or [Abnormal trouble code output]	Trouble in warning light drive circuit		14
11	**Start code:** ● **Trouble code is shown after start code.** ● **Only start code is shown in normal condition.**		—
21	Faulty A.B.S. sensor (Open circuit or input voltage excessive)	Front right wheel sensor	16
23		Front left wheel sensor	16
25		Rear right wheel sensor	16
27		Rear left wheel sensor	16
22	Faulty A.B.S. sensor (When there is no open circuit or speed signal input.)	Front right wheel sensor	20
24		Front left wheel sensor	20
26		Rear right wheel sensor	20
28		Rear left wheel sensor	20
29	Faulty tone wheel, etc.		24
31	Faulty solenoid valve circuit(s) in hydraulic unit	Front right wheel control	28
33		Front left wheel control	28
39		Rear wheels control	28
41	Faulty A.B.S. control module		30
42	Source voltage is low.		30
51	Faulty valve relay		32
52	Faulty hydraulic motor and/or motor relay		36
54	Faulty stop light circuit		39
56	Use of improper A.B.S. control module specification, or faulty G sensor		40

A: TROUBLE CODE (NONE: A) — TROUBLE IN WARNING LIGHT DRIVE CIRCUIT —

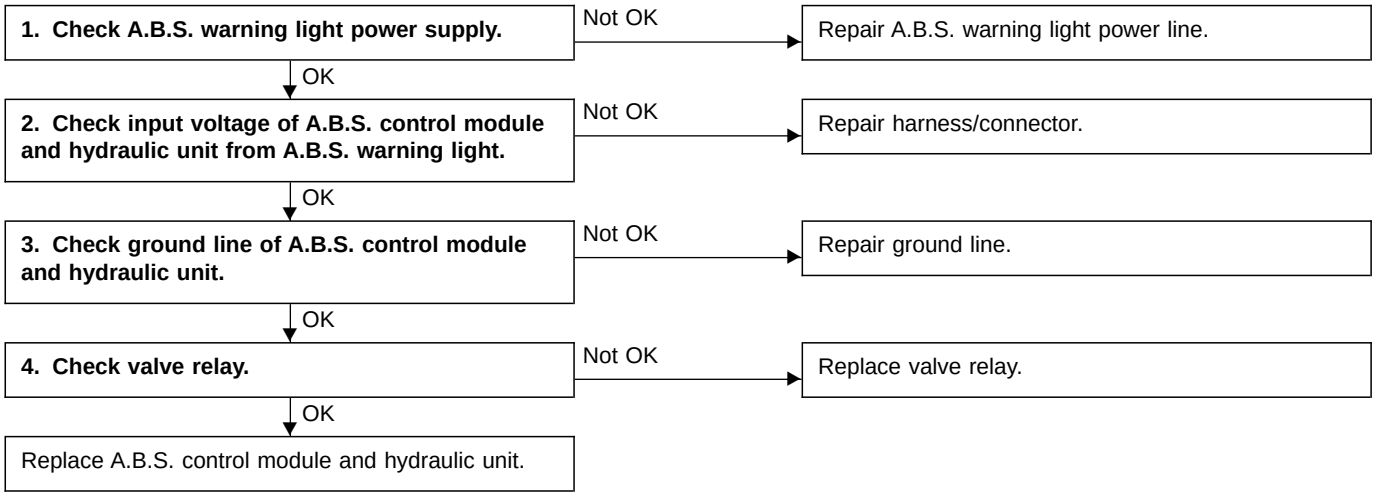
DIAGNOSIS:

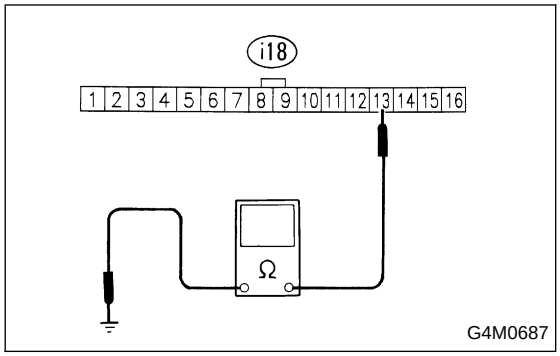
- Faulty A.B.S. warning light
- Faulty harness connector
- Faulty A.B.S. control module
- Faulty valve relay

TROUBLE SYMPTOM:

- Warning light does not illuminate.
- Impossible to read trouble code.

NOTE:
When ignition key is on, warning light should turn off after 1.5 seconds if system is normal.

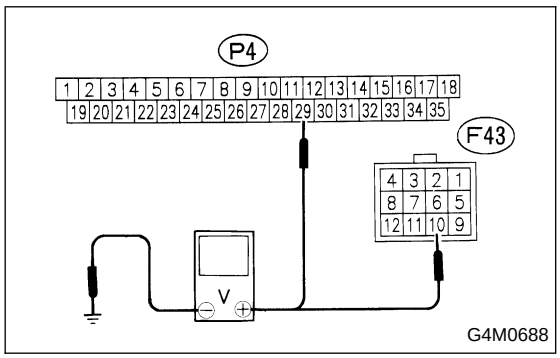




1. CHECK A.B.S. WARNING LIGHT POWER SUPPLY.

1) Turn ignition switch OFF.
2) Disconnect combination meter.
3) Check A.B.S. warning light valve.
4) Turn ignition switch ON.
5) Measure voltage between combination meter connector and body.

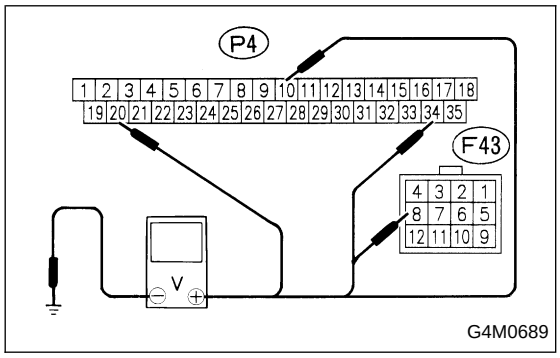
Connector & terminal / Specified voltage:
(i18) No. 13 — Body / 10 — 12 V



2. CHECK INPUT VOLTAGE OF A.B.S. CONTROL MODULE AND HYDRAULIC UNIT FROM A.B.S. WARNING LIGHT.

1) Turn ignition switch OFF and remove combination meter.
2) Disconnect connector from A.B.S. control module and hydraulic unit.
3) Turn ignition switch ON.
4) Measure voltage between A.B.S. control module and body, and between hydraulic unit and body.

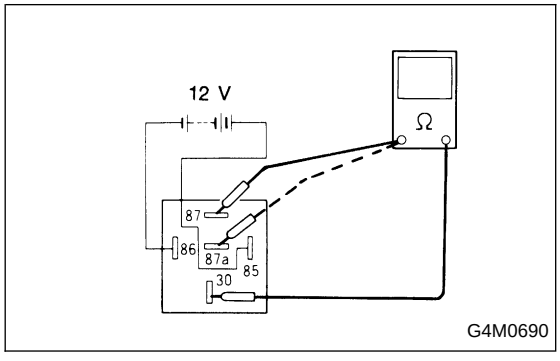
Connector & terminal / Specified voltage:
(P4) No. 29 — body / 10 — 12 V
(F43) No. 10 — body / 10 — 12 V



3. CHECK GROUND LINE OF A.B.S. CONTROL MODULE AND HYDRAULIC UNIT.

1) Measure resistance between A.B.S. control module and body, and between hydraulic unit and body.

Connector & terminal / Specified resistance:
(P4) No. 10 — body / 0 Ω
(P4) No. 20 — body / 0 Ω
(P4) No. 34 — body / 0 Ω
(F43) No. 8 — body / 0 Ω



4. CHECK VALVE RELAY.

1) Remove valve relay.
2) Attach circuit tester probes to terminals, as shown in figure.
3) Measure resistance between respective terminals.

Terminal / Specified resistance:
No. 87 — 30 / 0 Ω (when 12 volts applied.)
No. 87 — 30 / 1 MΩ (when no voltage is applied.)
No. 87a — 30 / 1 MΩ (when 12 volts applied.)
No. 87a — 30 / 0 Ω (when no voltage is applied.)

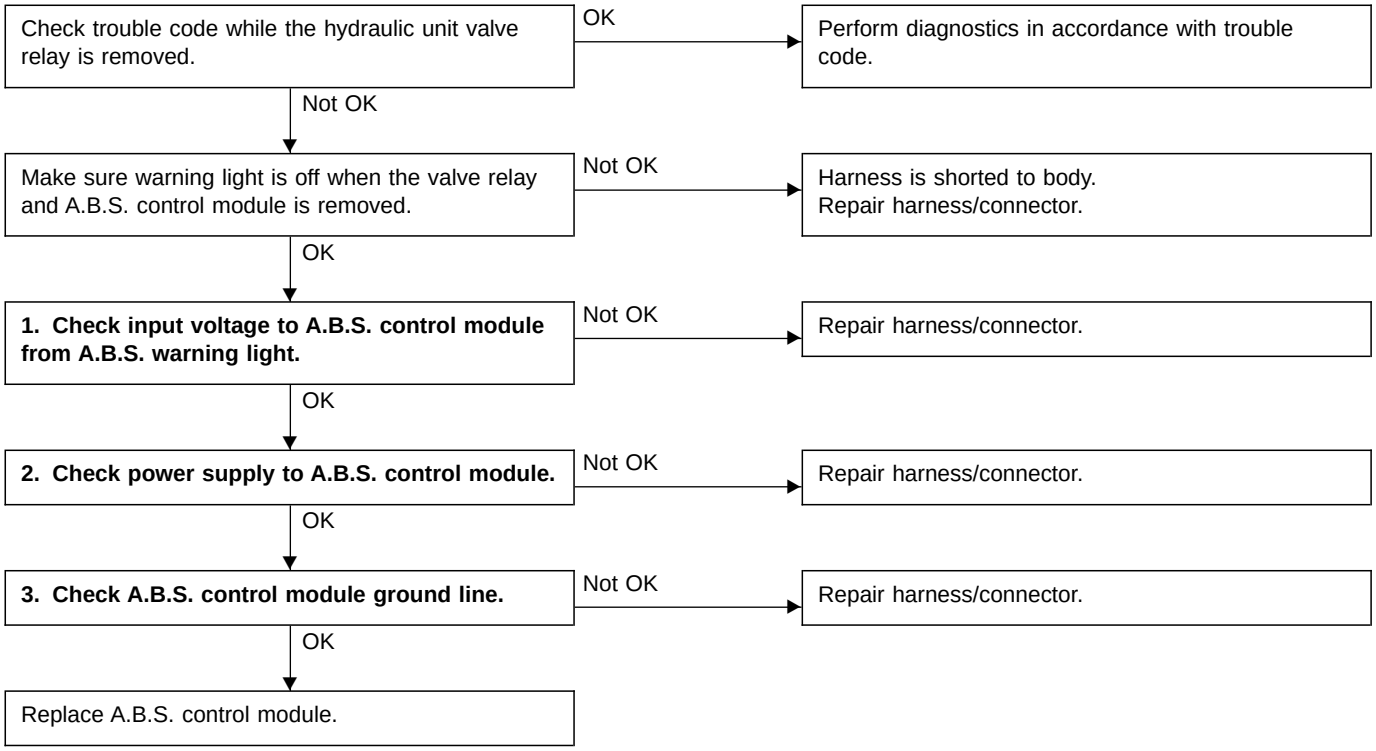
B: TROUBLE CODE (NONE: B) — TROUBLE IN WARNING LIGHT DRIVE CIRCUIT —

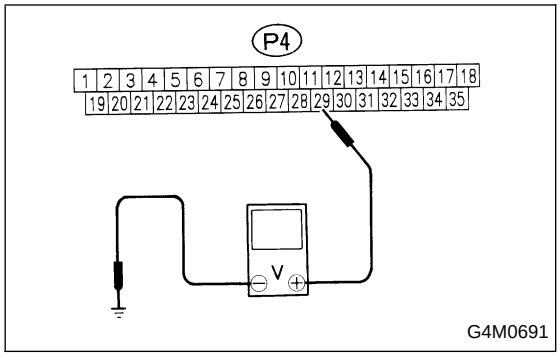
DIAGNOSIS:

- Faulty harness
- Faulty A.B.S. control module

TROUBLE SYMPTOM:

- Warning light remains on.
- Impossible to read trouble code.

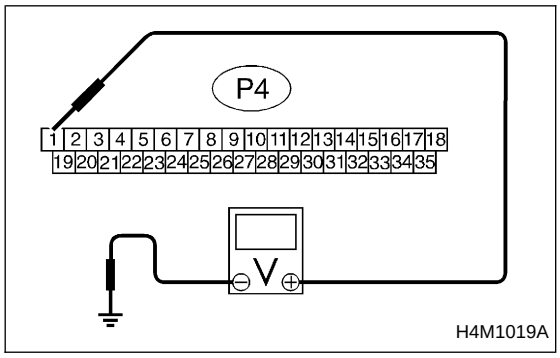




1. CHECK INPUT VOLTAGE TO A.B.S. CONTROL MODULE FROM A.B.S. WARNING LIGHT.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Turn ignition switch ON.
4) Measure voltage between A.B.S. control module connector and body.

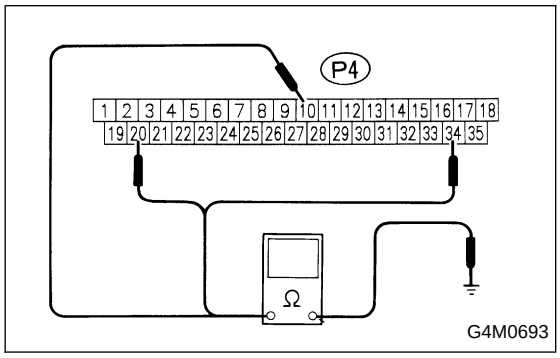
Connector & terminal / Specified voltage:
(P4) No. 29 — Body / 10 — 12 V



2. CHECK POWER SUPPLY TO A.B.S. CONTROL MODULE.

1) Turn ignition switch ON.
2) Measure voltage between A.B.S. control module connector and body.

Connector & terminal / Specified voltage:
(P4) No. 1 — Body / 10 — 12 V



3. CHECK A.B.S. CONTROL MODULE GROUND LINE.

1) Measure resistance between A.B.S. control module and body.

Connector & terminal / Specified resistance:
(P4) No. 10 — body / 0 Ω
(P4) No. 20 — body / 0 Ω
(P4) No. 34 — body / 0 Ω

C: TROUBLE CODE 21, 23, 25 AND 27 — FAULTY A.B.S. SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE EXCESSIVE) —

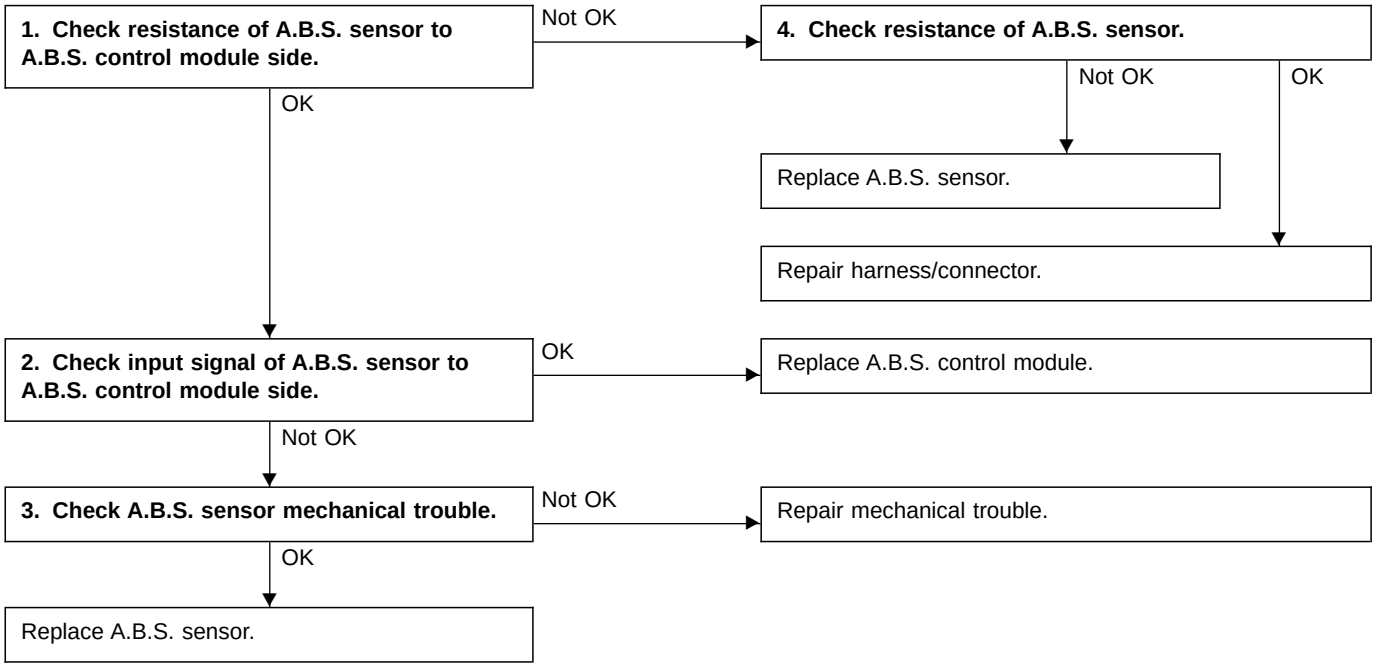
DIAGNOSIS:

- Faulty A.B.S. sensor
- Faulty harness
- Faulty A.B.S. control module

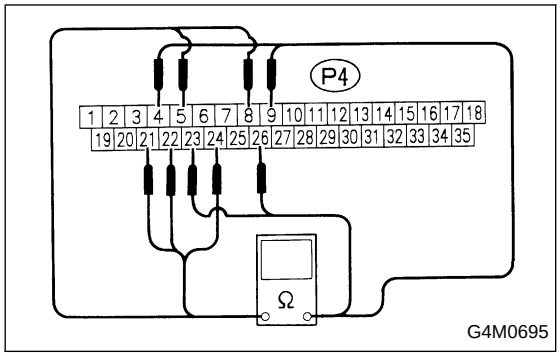
TROUBLE SYMPTOM:

- A.B.S. does not operate.

NOTE:
Trouble codes 21, 23, 25, and 27 will not be stored while vehicle is stationary and can't specify problem location. Drive vehicle first, perform diagnosis and read trouble code.



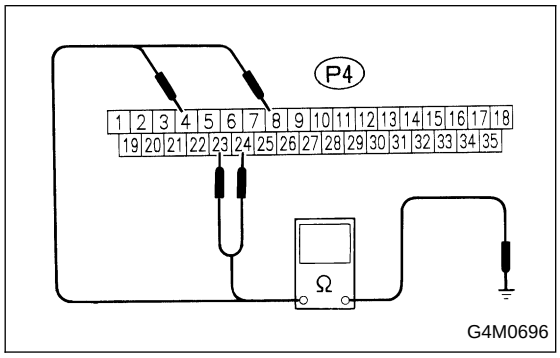
NOTE:
When checking A.B.S. sensor, carefully bend or swing connector and harness to check for improper contacts or open circuits.



1. CHECK RESISTANCE OF A.B.S. SENSOR TO A.B.S. CONTROL MODULE SIDE.

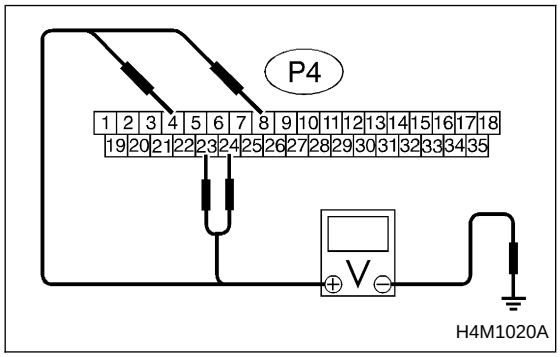
1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Measure resistance between A.B.S. control module connector terminals.

TROUBLE CODE / Connector & terminal:
21 / (P4) No. 23 — No. 21
23 / (P4) No. 22 — No. 4: AWD
(P4) No. 5 — No. 4: FWD
25 / (P4) No. 24 — No. 26
27 / (P4) No. 8 — No. 9
Specified resistance: 0.8 — 1.3 kΩ



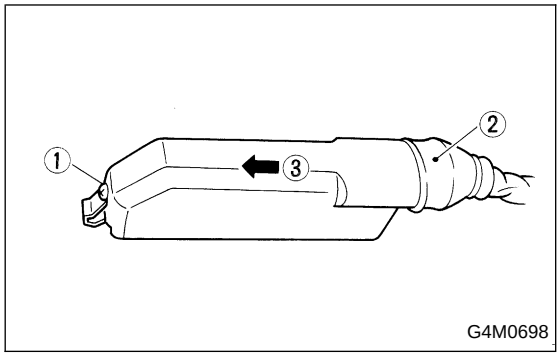
4) Measure resistance between A.B.S. control module connector and body.

TROUBLE CODE / Connector & terminal:
21 / (P4) No. 23 — body
23 / (P4) No. 4 — body
25 / (P4) No. 24 — body
27 / (P4) No. 8 — body
Specified resistance: 1 MΩ, min.



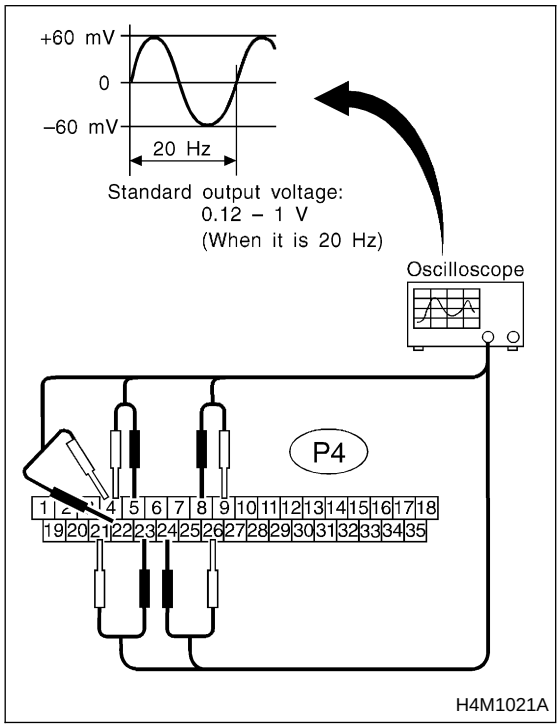
5) Turn ignition switch ON.
6) Measure voltage between A.B.S. control module connector and body.

TROUBLE CODE / Connector & terminal:
21 / (P4) No. 23 — body
23 / (P4) No. 4 — body
25 / (P4) No. 24 — body
27 / (P4) No. 8 — body
Specified voltage: 0 V



2. CHECK INPUT SIGNAL OF A.B.S. SENSOR TO A.B.S. CONTROL MODULE SIDE.

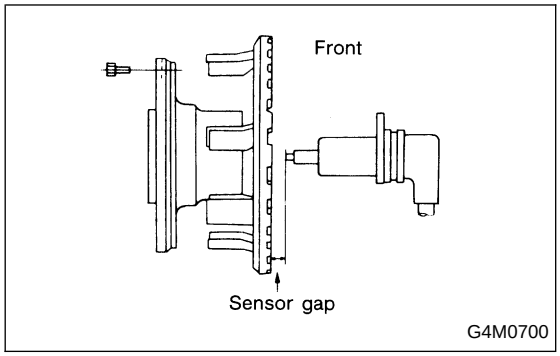
1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Disconnect connector from A.B.S. control module.
4) Disconnect connector cover from connector.
   (a) Remove screw from portion ①.
   (b) Move rubber boot ② back (toward harness).
   (c) Slide cover ③ in direction shown by arrow and remove.
5) Connect connector to A.B.S. control module.
6) Connect the oscilloscope to the A.B.S. control module connector in accordance with trouble code.
7) Turn ignition switch ON.

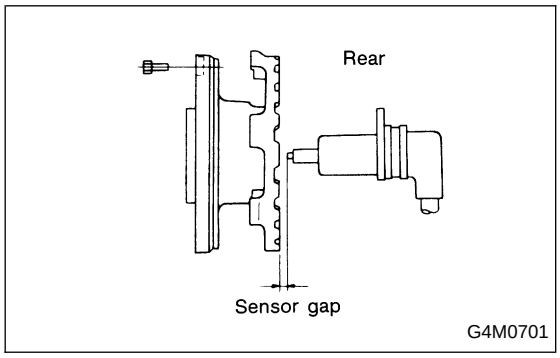


8) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the A.B.S. control module sometimes stores the trouble code 29.

TROUBLE CODE / Connector & terminal:
21 / (P4) No. 23 — No. 21
23 / (P4) No. 22 — No. 4: AWD
(P4) No. 5 — No. 4: FWD
25 / (P4) No. 24 — No. 26
27 / (P4) No. 8 — No. 9
Specified voltage: 0.12 — 1 V (When it is 20 Hz)





3. CHECK A.B.S. SENSOR MECHANICAL TROUBLE.

1) Dismount brake as outlined in manual to gain access to A.B.S. sensor and tone wheel for inspection.
2) Check pole piece and tone wheel for accumulation of foreign particles. If necessary, remove foreign particles and clean.
3) Check tone wheel teeth for cracks for deformities. If necessary, replace tone wheel (No. of teeth: 44) with a new one.
4) Check tone wheel for looseness.

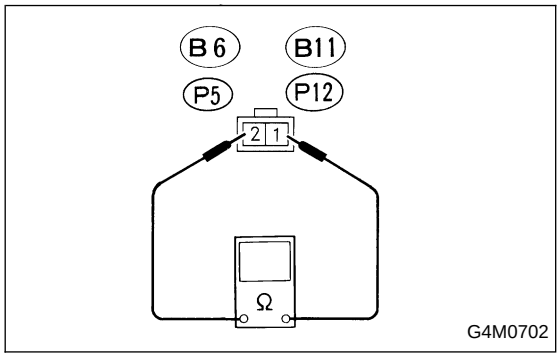
Tightening torque:
10 — 16 N·m (1 — 1.6 kg-m, 7 — 12 ft-lb)

5) Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

If measurements check out “Not OK”, adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.
6) Check hub runout.

Specifications	0.05 mm (0.0020 in)



4. CHECK RESISTANCE OF A.B.S. SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. sensor.
3) Measure resistance between A.B.S. sensor connector terminals.

TROUBLE CODE / Connector & terminal:
21 / (B6) No. 1 — No. 2
23 / (B11) No. 1 — No. 2
25 / (P5) No. 1 — No. 2
27 / (P12) No. 1 — No. 2
Specified resistance: 0.8 — 1.3 kΩ

D: TROUBLE CODE 22, 24, 26 AND 28 — FAULTY A.B.S. SENSOR (WHEN THERE IS NO OPEN CIRCUIT OR SPEED SIGNAL INPUT.) —

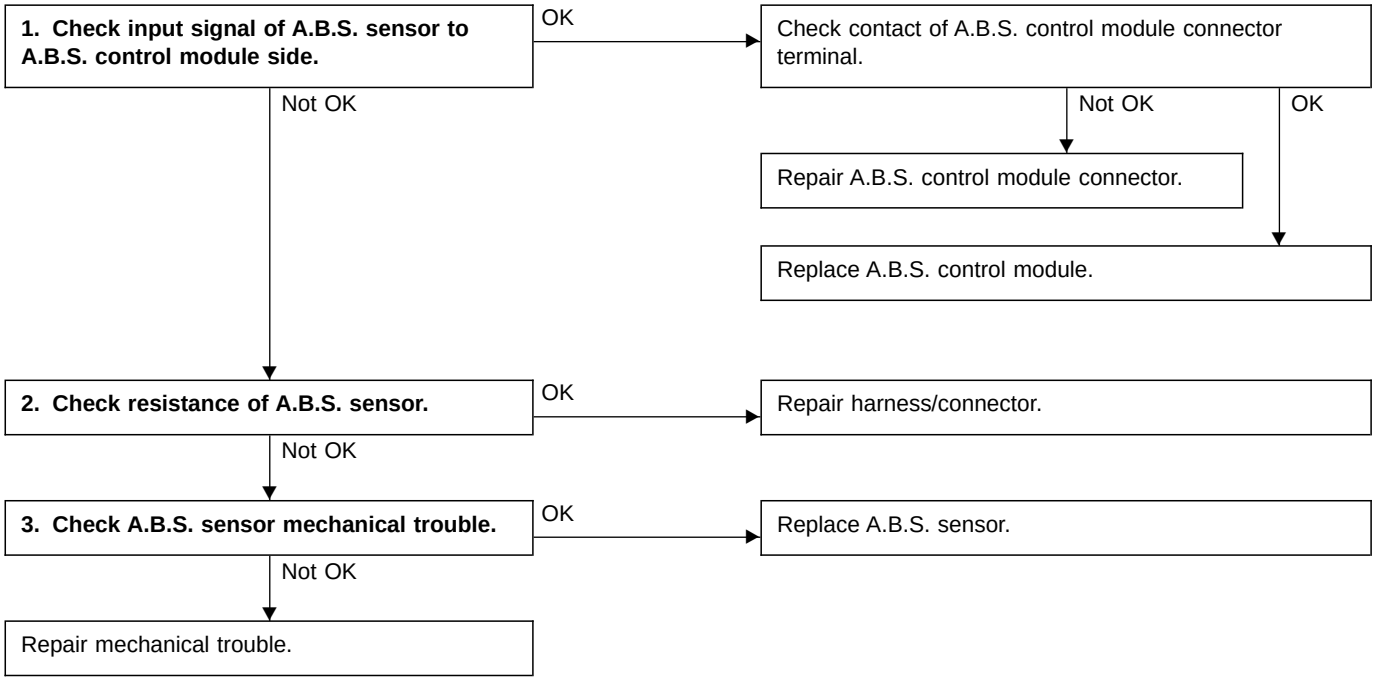
DIAGNOSIS:

- Faulty A.B.S. sensor/harness
- Faulty tone wheel
- Faulty A.B.S. control module

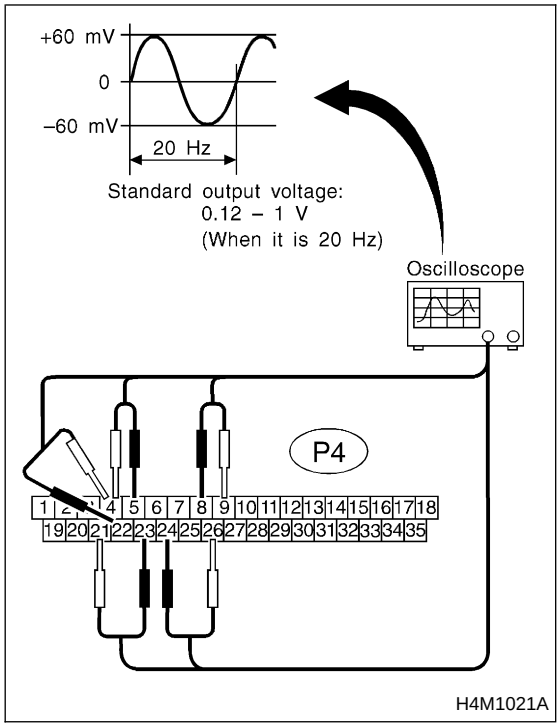
TROUBLE SYMPTOM:

- A.B.S. does not operate.

NOTE:
The A.B.S. control module will sense that the A.B.S. sensor circuit is “open” due to increased resistance but this trouble code will appear when the speed signal is not present or when it suddenly disappears while driving.



NOTE:
When checking A.B.S. sensor, carefully bend or swing connector and harness to check for improper contact or open circuits.

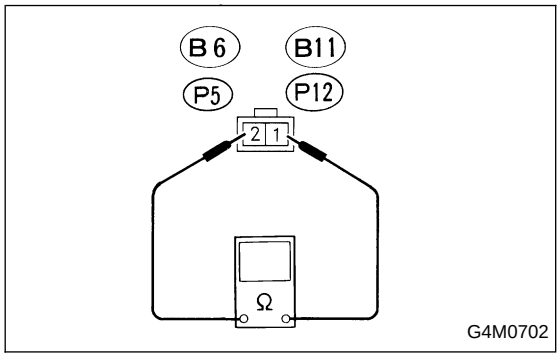


1. CHECK INPUT SIGNAL OF A.B.S. SENSOR TO A.B.S. CONTROL MODULE SIDE.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Disconnect connector from A.B.S. control module.
4) Disconnect connector cover from connector. <Ref. to 4-4 [T6C2].>
5) Connect connector to A.B.S. control module.
6) Connect the oscilloscope to the A.B.S. control module connector in accordance with the trouble code.
7) Turn ignition switch ON.
8) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the A.B.S. control module sometimes memorizes the trouble code 29.

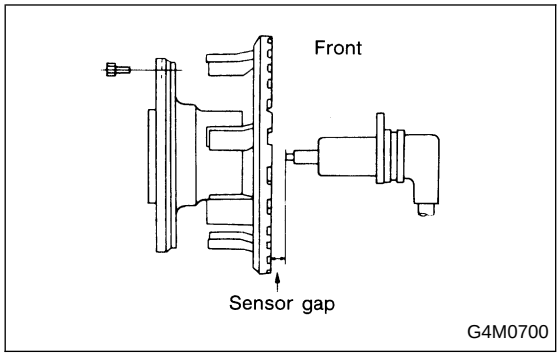
TROUBLE CODE / Connector & terminal:
21 / (P4) No. 23 — No. 21
23 / (P4) No. 22 — No. 4: AWD
(P4) No. 5 — No. 4: FWD
25 / (P4) No. 24 — No. 26
27 / (P4) No. 8 — No. 9
Specified voltage: 0.12 — 1 V (When it is 20 Hz)

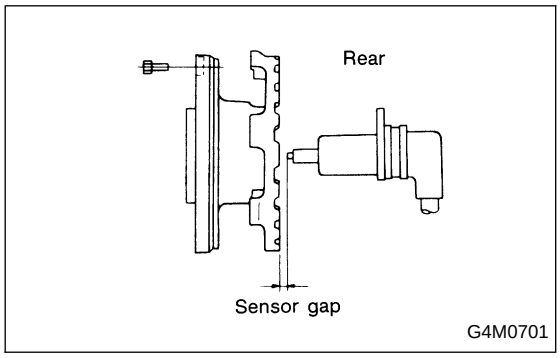


2. CHECK RESISTANCE OF A.B.S. SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. sensor.
3) Measure resistance between A.B.S. sensor connector terminals.

TROUBLE CODE / Connector & terminal:
21 / (B6) No. 1 — No. 2
23 / (B11) No. 1 — No. 2
25 / (P5) No. 1 — No. 2
27 / (P12) No. 1 — No. 2
Specified resistance: 0.8 — 1.3 kΩ





3. CHECK A.B.S. SENSOR MECHANICAL TROUBLE.

1) Dismount brake as outlined in manual to gain access to A.B.S. sensor and tone wheel for inspection.
2) Check pole piece and tone wheel for accumulation of foreign particles. If necessary, remove foreign particles and clean.
3) Check tone wheel teeth for cracks for deformities. If necessary, replace tone wheel (No. of teeth: 44) with a new one.
4) Check tone wheel for looseness.

Tightening torque:
10 — 16 N·m (1 — 1.6 kg-m, 7 — 12 ft-lb)

5) Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

If measurements check out “Not OK”, adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.
6) Check hub runout.

Specifications	0.05 mm (0.0020 in)

E: TROUBLE CODE 29 — FAULTY TONE WHEEL, ETC. —

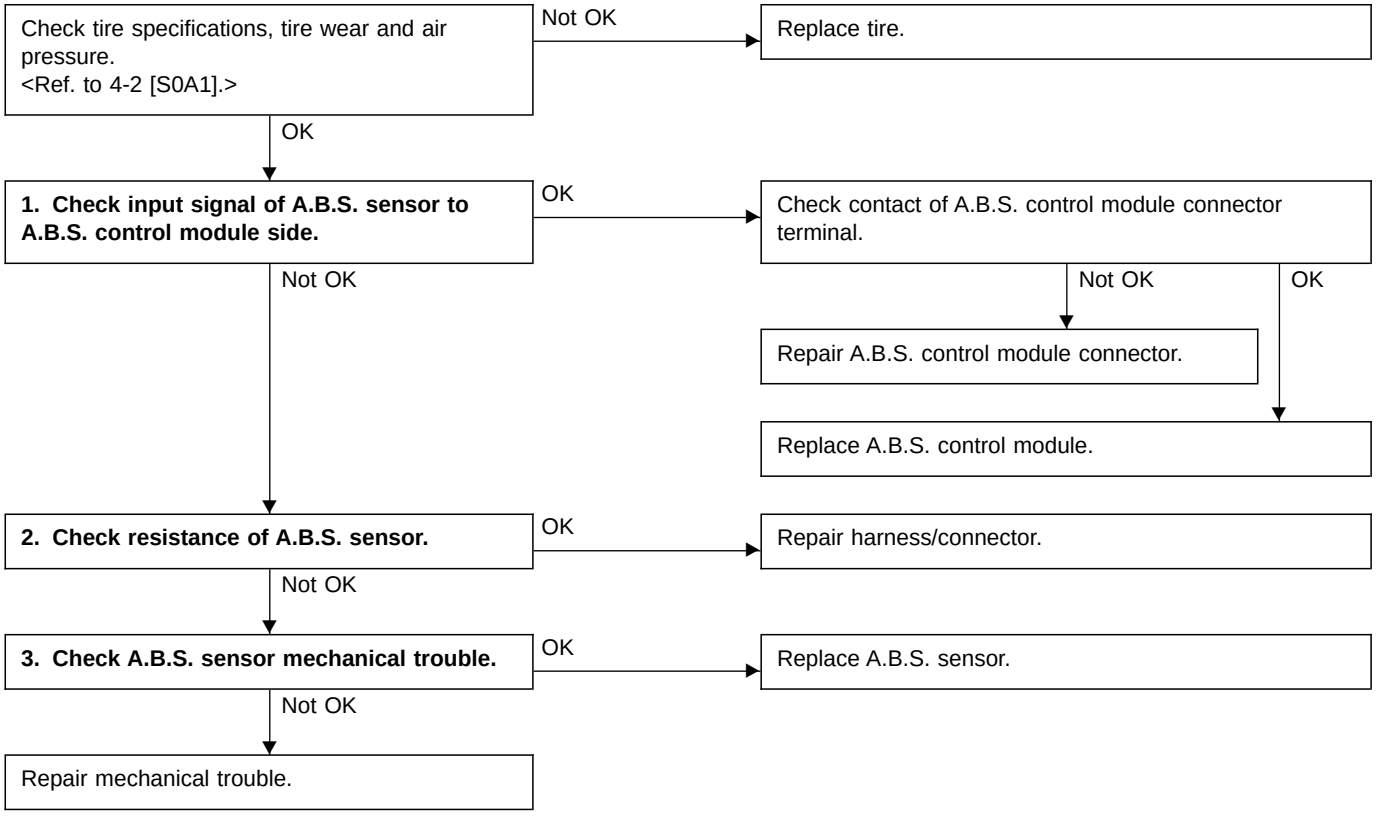
DIAGNOSIS:

- Faulty tone wheel
- Faulty A.B.S. control module

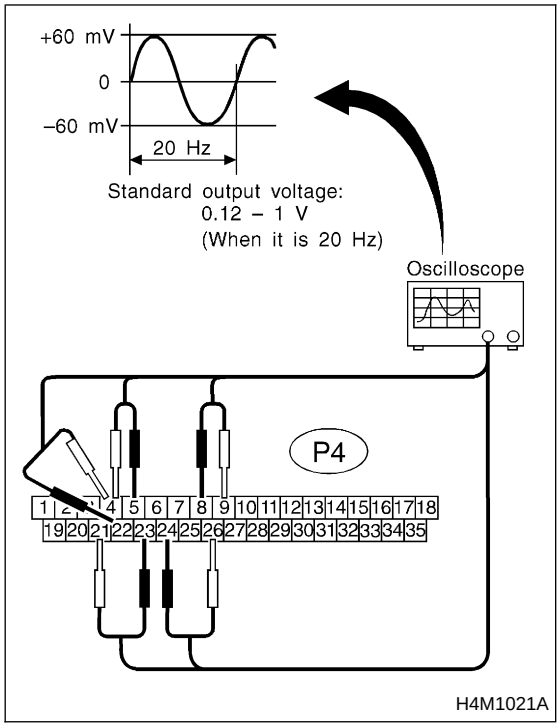
TROUBLE SYMPTOM:

- A.B.S. does not operate.

NOTE:
When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this trouble code may sometimes occur.



NOTE:
When checking A.B.S. sensor, carefully bend or swing connector and harness to check for improper contact or open circuits.

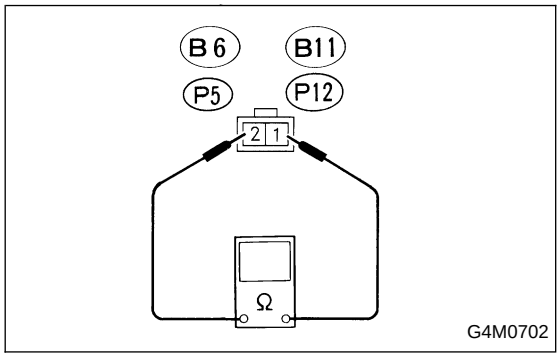


1. CHECK INPUT SIGNAL OF A.B.S. SENSOR TO A.B.S. CONTROL MODULE SIDE.

1) Raise all four wheels of ground.
2) Turn ignition switch OFF.
3) Disconnect connector from A.B.S. control module.
4) Disconnect connector cover from connector. <Ref. to 4-4 [T6C2].>
5) Connect connector to A.B.S. control module.
6) Connect the oscilloscope to the A.B.S. control module connector in accordance with the trouble code.
7) Turn ignition switch ON.
8) Rotate wheels and measure voltage at specified frequency.

NOTE:
When this inspection is completed, the A.B.S. control module sometimes memorizes the trouble code 29.

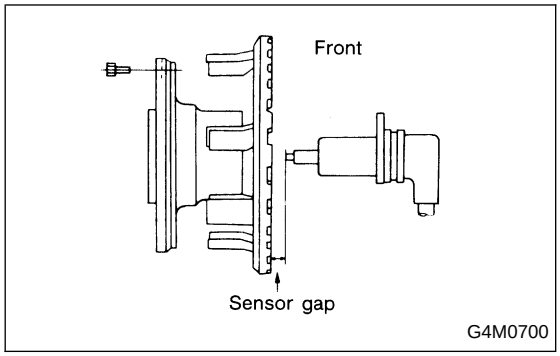
TROUBLE CODE / Connector & terminal:
21 / (P4) No. 23 — No. 21
23 / (P4) No. 22 — No. 4: AWD
(P4) No. 5 — No. 4: FWD
25 / (P4) No. 24 — No. 26
27 / (P4) No. 8 — No. 9
Specified voltage: 0.12 — 1 V (When it is 20 Hz)

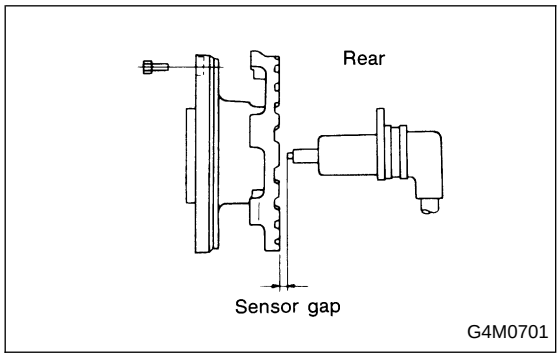


2. CHECK RESISTANCE OF A.B.S. SENSOR.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. sensor.
3) Measure resistance between A.B.S. sensor connector terminals.

TROUBLE CODE / Connector & terminal:
21 / (B6) No. 1 — No. 2
23 / (B11) No. 1 — No. 2
25 / (P5) No. 1 — No. 2
27 / (P12) No. 1 — No. 2
Specified resistance: 0.8 — 1.3 kΩ





3. CHECK A.B.S. SENSOR MECHANICAL TROUBLE.

1) Dismount brake as outlined in manual to gain access to A.B.S. sensor and tone wheel for inspection.
2) Check pole piece and tone wheel for accumulation of foreign particles. If necessary, remove foreign particles and clean.
3) Check tone wheel teeth for cracks for deformities. If necessary, replace tone wheel (No. of teeth: 44) with a new one.
4) Check tone wheel for looseness.

Tightening torque:
10 — 16 N·m (1 — 1.6 kg-m, 7 — 12 ft-lb)

5) Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

If measurements check out “Not OK”, adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.
6) Check hub runout.

Specifications	0.05 mm (0.0020 in)

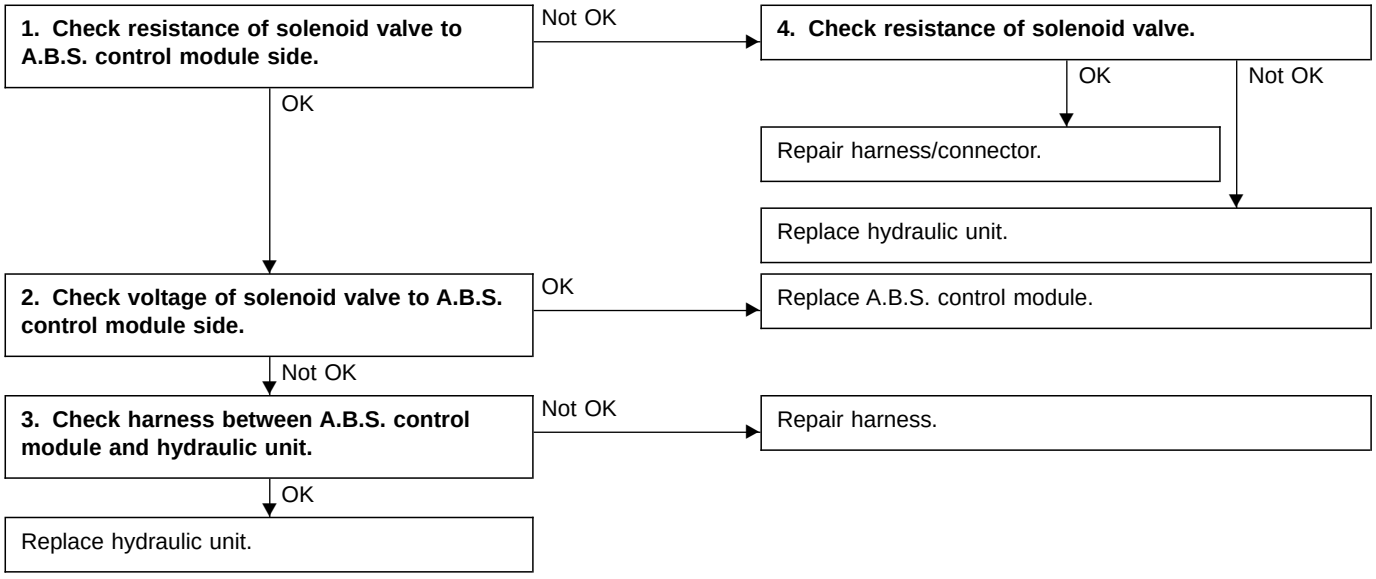
F: TROUBLE CODE 31, 33 AND 39 — FAULTY SOLENOID VALVE CIRCUIT(S) IN HYDRAULIC UNIT —

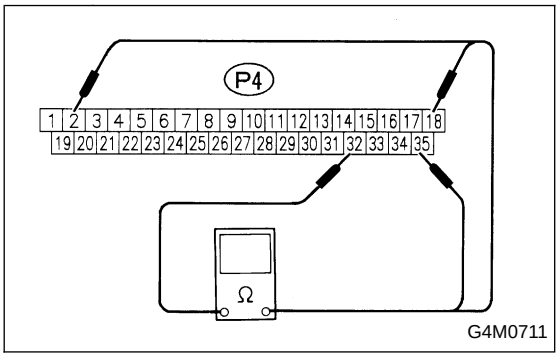
DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty A.B.S. control module

TROUBLE SYMPTOM:

- A.B.S. does not operate.

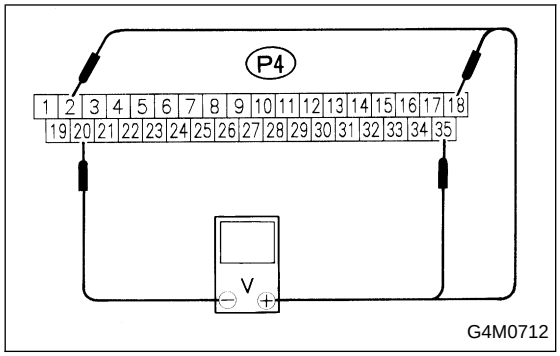




1. CHECK RESISTANCE OF SOLENOID VALVE TO A.B.S. CONTROL MODULE SIDE.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Measure resistance between A.B.S. control module connector terminals.

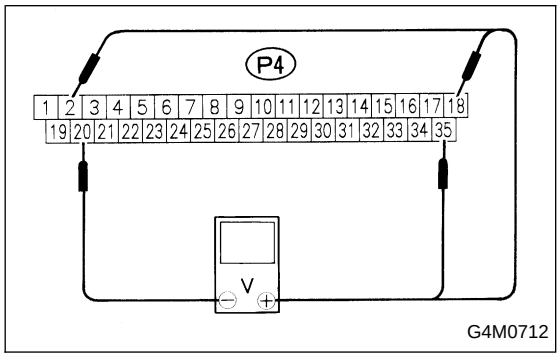
TROUBLE CODE / Connector & terminal:
31 / (P4) No. 35 — No. 32
33 / (P4) No. 2 — No. 32
39 / (P4) No. 18 — No. 32
Specified resistance: approx. 1 Ω



2. CHECK VOLTAGE OF SOLENOID VALVE TO A.B.S. CONTROL MODULE SIDE.

1) Turn ignition switch OFF.
2) Disconnect valve relay from hydraulic unit.
3) Turn ignition switch ON.
4) Measure voltage between A.B.S. control module connector terminals.

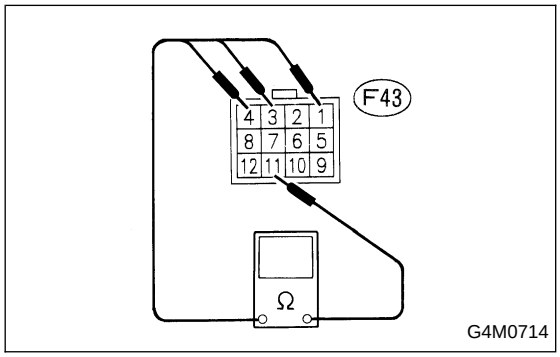
TROUBLE CODE / Connector & terminal:
31 / (P4) No. 35 — No. 20
33 / (P4) No. 2 — No. 20
39 / (P4) No. 18 — No. 20
Specified voltage: 0 V



3. CHECK HARNESS BETWEEN A.B.S. CONTROL MODULE AND HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Turn ignition switch ON.
4) Measure voltage between A.B.S. control module connector terminals.

TROUBLE CODE / Connector & terminal:
31 / (P4) No. 35 — No. 20
33 / (P4) No. 2 — No. 20
39 / (P4) No. 18 — No. 20
Specified voltage: 0 V



4. CHECK RESISTANCE OF SOLENOID VALVE.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Measure resistance between hydraulic unit terminals.

TROUBLE CODE / Connector & terminal:
31 / to (F43) No. 4 — No. 11
33 / to (F43) No. 3 — No. 11
39 / to (F43) No. 1 — No. 11
Specified resistance: approx. 1 Ω

G: TROUBLE CODE 41 — FAULTY A.B.S. CONTROL MODULE —

DIAGNOSIS:

- Faulty A.B.S. control module

TROUBLE SYMPTOM:

- A.B.S. does not operate.

Replace A.B.S. control module.

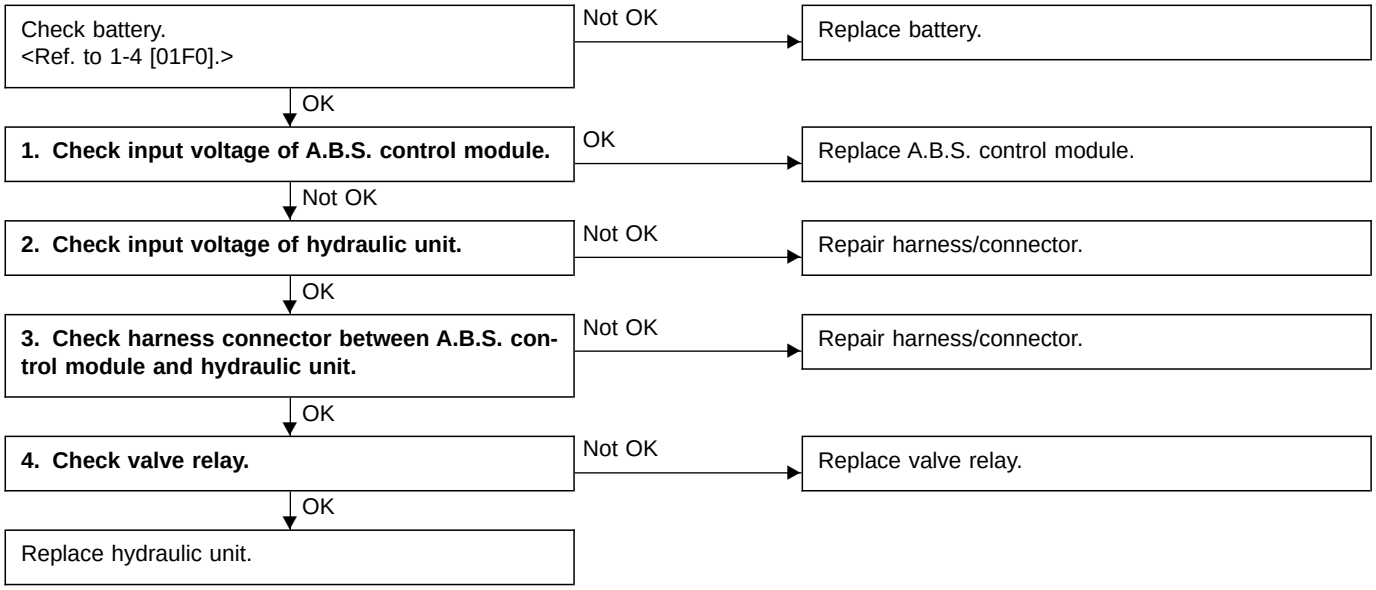
H: TROUBLE CODE 42 — SOURCE VOLTAGE IS LOW. —

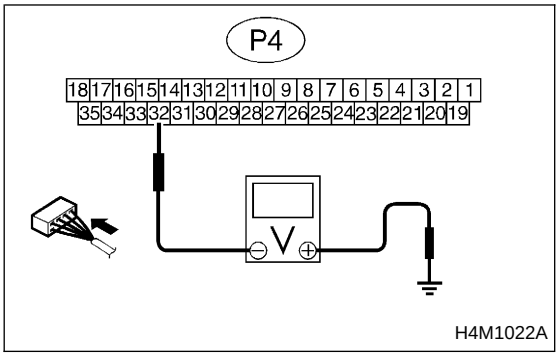
DIAGNOSIS:

- Faulty battery
- Faulty A.B.S. control module
- Faulty harness
- Faulty valve relay

TROUBLE SYMPTOM:

- A.B.S. does not operate.

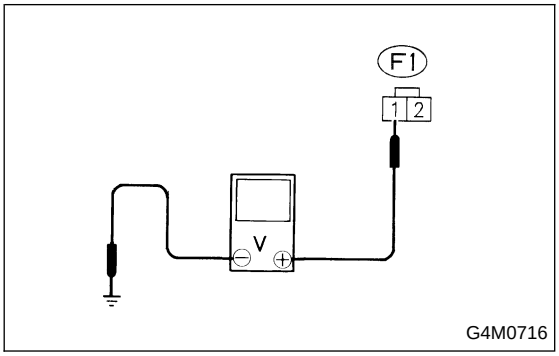




1. CHECK INPUT VOLTAGE OF A.B.S. CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Disconnect connector cover from connector. <Ref. to 4-4 [T6C2].>
4) Connect connector to A.B.S. control module.
5) Turn ignition switch ON.
6) Measure input voltage between A.B.S. control module connector and body.

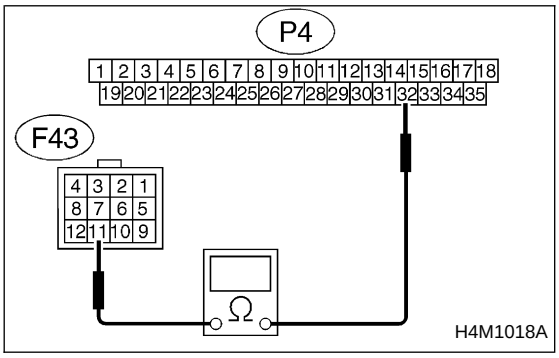
Connector & terminal / Specified voltage:
(P4) No. 32 — Body / 9.2 — 12 V



2. CHECK INPUT VOLTAGE OF HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Turn ignition switch ON.
4) Measure input voltage between hydraulic unit connector and body.

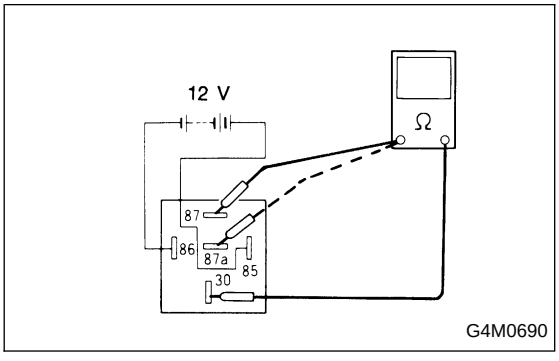
Connector & terminal / Specified voltage:
(F1) No. 1 — Body / 10 — 12 V



3. CHECK HARNESS CONNECTOR BETWEEN A.B.S. CONTROL MODULE AND HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module and hydraulic unit.
3) Measure resistance between A.B.S. control module and hydraulic unit.

Connector & terminal / Specified resistance:
(P4) No. 32 — (F43) No. 11 / 0 Ω



4. CHECK VALVE RELAY.

1) Remove valve relay.
2) Attach circuit tester probes to terminals, as shown in figure.
3) Measure resistance between respective terminals.

Terminal / Specified resistance:
No. 87 — 30 / 0 Ω (when 12 volts applied.)
No. 87 — 30 / 1 MΩ (when no voltage is applied.)
No. 87a — 30 / 1 MΩ (when 12 volts applied.)
No. 87a — 30 / 0 Ω (when no voltage is applied.)

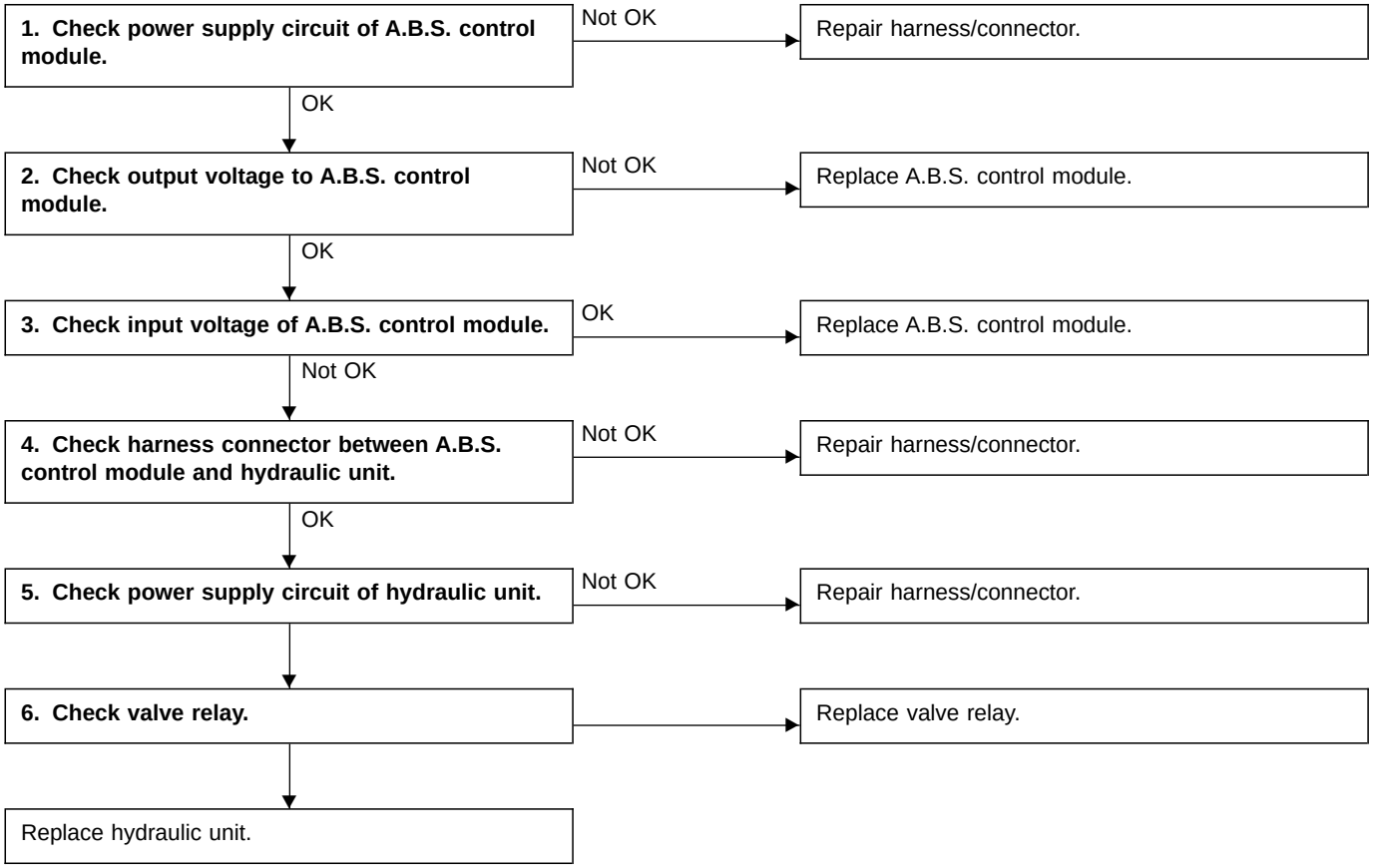
I: TROUBLE CODE 51 — FAULTY VALVE RELAY —

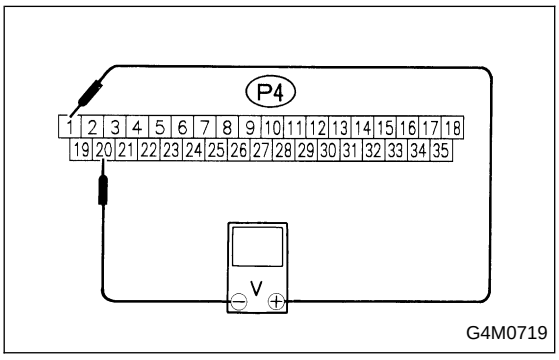
DIAGNOSIS:

- Faulty valve relay
- Faulty harness
- Faulty A.B.S. control module

TROUBLE SYMPTOM:

- A.B.S. does not operate.

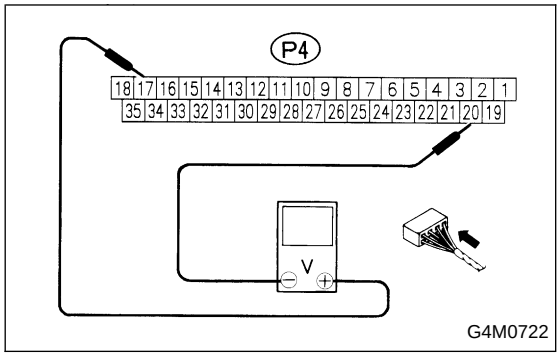




1. CHECK POWER SUPPLY CIRCUIT OF A.B.S. CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Turn ignition switch ON.
4) Measure voltage between A.B.S. control module connector terminals.

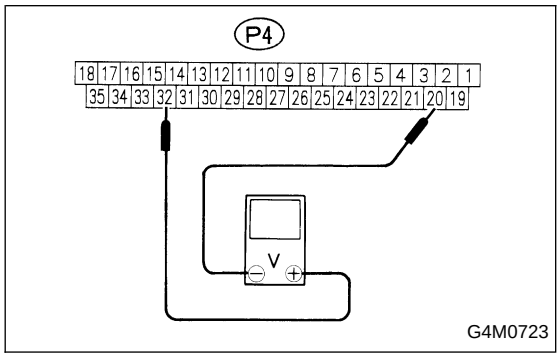
Connector & terminal / Specified voltage:
(P4) No. 1 — No. 20 / 10 — 12 V



2. CHECK OUTPUT VOLTAGE TO A.B.S. CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Disconnect connector cover from connector.
4) Connect connector to A.B.S. control module.
5) Turn ignition switch ON.
6) Measure voltage between A.B.S. control module connector terminals.

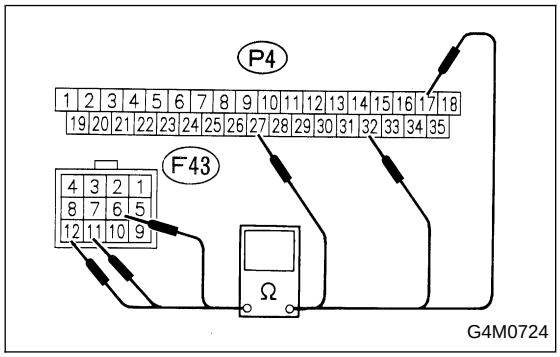
Connector & terminal / Specified voltage:
(P4) No. 17 — No. 20 / 10 — 12 V



3. CHECK INPUT VOLTAGE OF A.B.S. CONTROL MODULE.

1) Turn ignition switch ON.
2) Measure voltage between A.B.S. control module connector terminals.

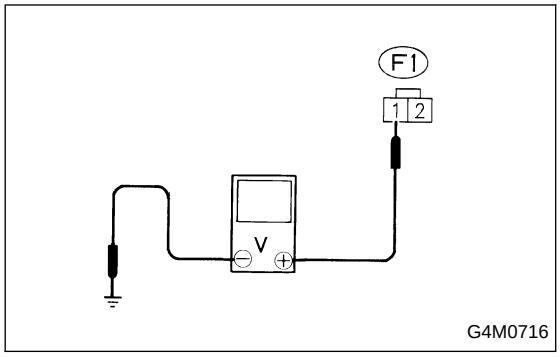
Connector & terminal / Specified voltage:
(P4) No. 32 — No. 20 / 10 — 12 V



4. CHECK HARNESS CONNECTOR BETWEEN A.B.S. CONTROL MODULE AND HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module and hydraulic unit.
3) Measure resistance between A.B.S. control module and hydraulic unit.

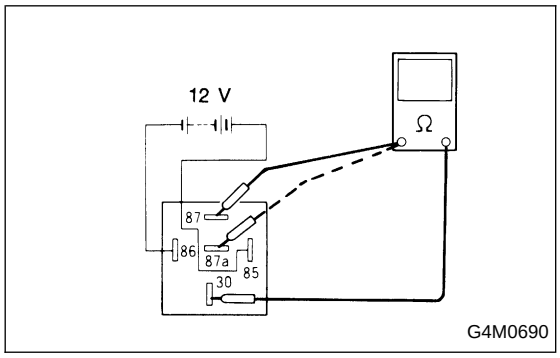
Connector & terminal / Specified resistance:
(P4) No. 17 — (F43) No. 6 / 0 Ω
(P4) No. 32 — (F43) No. 11 / 0 Ω
(P4) No. 27 — (F43) No. 12 / 0 Ω



5. CHECK POWER SUPPLY CIRCUIT OF HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Turn ignition switch ON.
4) Measure voltage between hydraulic unit and body.

Connector & terminal / Specified voltage:
(F1) No. 1 — Body / 10 — 12 V



6. CHECK VALVE RELAY.

1) Remove valve relay.
2) Attach circuit tester probes to terminals, as shown in figure.
3) Measure resistance between respective terminals.

Terminal / Specified resistance:
No. 87 — 30 / 0 Ω (when 12 volts applied.)
No. 87 — 30 / 1 MΩ (when no voltage is applied.)
No. 87a — 30 / 1 MΩ (when 12 volts applied.)
No. 87a — 30 / 0 Ω (when no voltage is applied.)

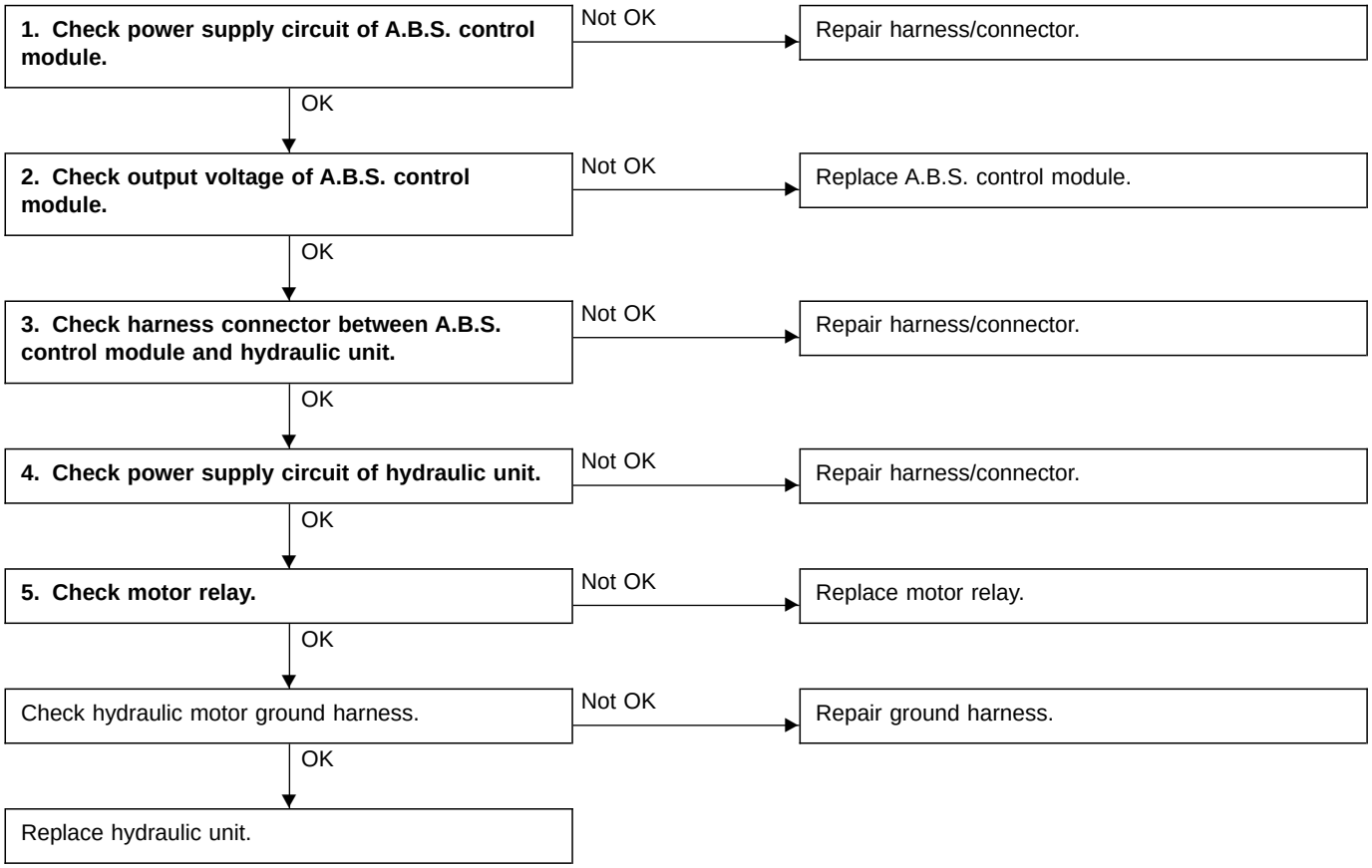
J: TROUBLE CODE 52 — FAULTY HYDRAULIC MOTOR AND/OR MOTOR RELAY —

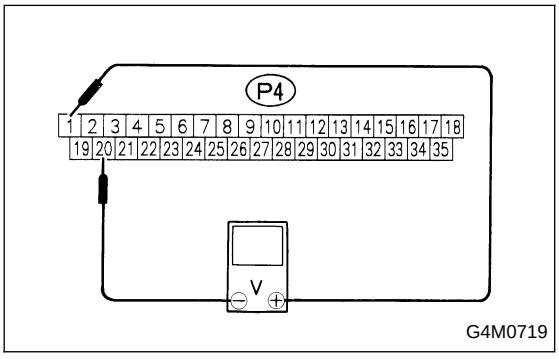
DIAGNOSIS:

- Faulty motor relay
- Faulty hydraulic unit
- Faulty harness
- Faulty A.B.S. control module

TROUBLE SYMPTOM:

- A.B.S. does not operate.

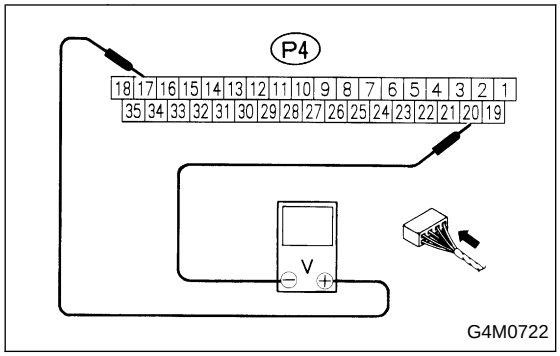




1. CHECK POWER SUPPLY CIRCUIT OF A.B.S. CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Turn ignition switch ON.
4) Measure voltage between A.B.S. control module connector terminals.

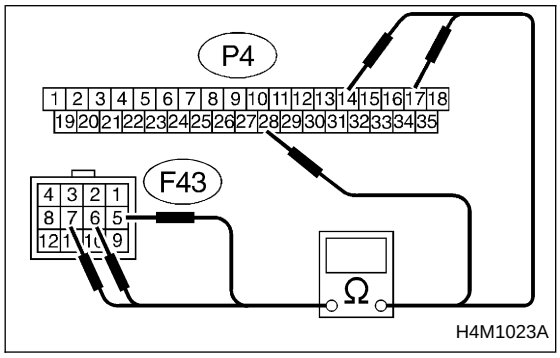
Connector & terminal / Specified voltage:
(P4) No. 1 — No. 20 / 10 — 12 V



2. CHECK OUTPUT VOLTAGE OF A.B.S. CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Disconnect connector cover from connector. <Ref. to 4-4 [T6C2].>
4) Connect connector to A.B.S. control module.
5) Turn ignition switch ON.
6) Measure voltage between A.B.S. control module connector terminals.

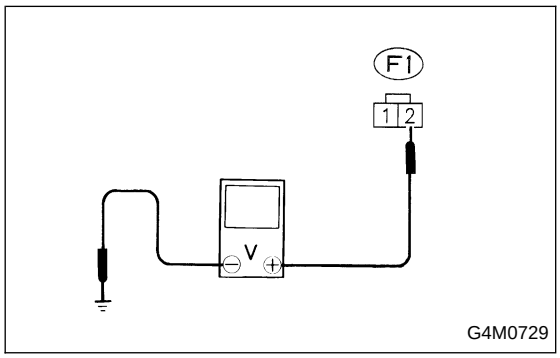
Connector & terminal / Specified voltage:
(P4) No. 17 — No. 20 / 10 — 12 V



3. CHECK HARNESS CONNECTOR BETWEEN A.B.S. CONTROL MODULE AND HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Disconnect connector from hydraulic unit.
4) Measure resistance between A.B.S. control module connector and hydraulic unit connector.

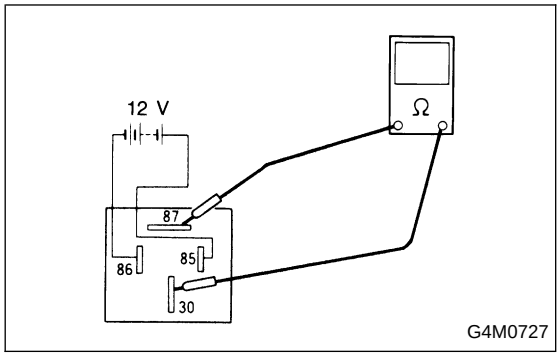
Connector & terminal / Specified resistance:
(P4) No. 17 — (F43) No. 6 / 0 Ω
(P4) No. 28 — (F43) No. 5 / 0 Ω
(P4) No. 14 — (F43) No. 7 / 0 Ω



4. CHECK POWER SUPPLY CIRCUIT OF HYDRAULIC UNIT.

1) Turn ignition switch OFF.
2) Disconnect connector from hydraulic unit.
3) Measure voltage between hydraulic unit connector and body.

Connector & terminal / Specified voltage:
(F1) No. 2 — Body / 10 — 12 V



5. CHECK MOTOR RELAY.

1) Remove motor relay.
2) Attach circuit tester probes to terminals, as shown in figure.
3) Measure resistance between terminals.

Terminal / Specified resistance:

No. 30 — 87 / 0 Ω (when 12 volts applied.)
No. 30 — 87 / 1 MΩ, min. (when no voltage is applied.)

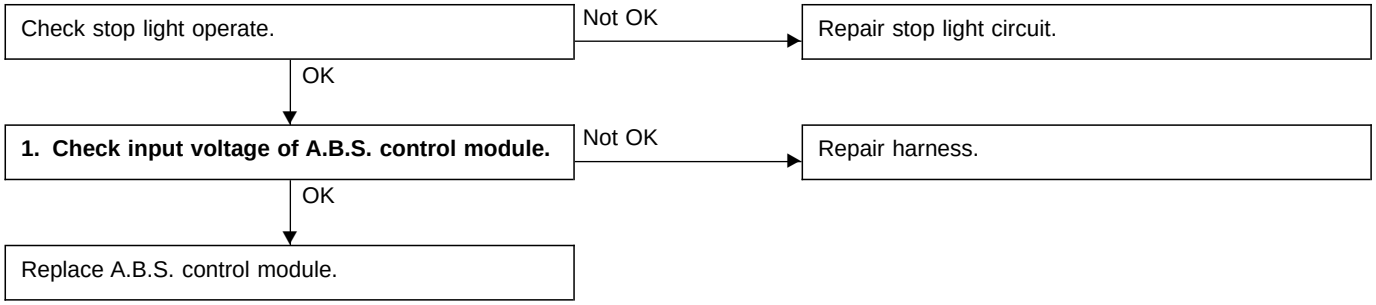
K: TROUBLE CODE 54 — FAULTY STOP LIGHT CIRCUIT —

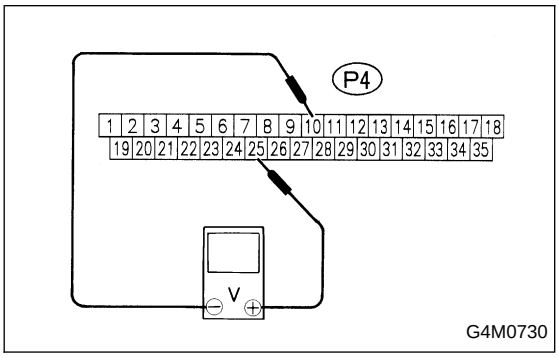
DIAGNOSIS:

- Faulty stop light circuit.
- Faulty harness
- Faulty A.B.S. control module

TROUBLE SYMPTOM:

- A.B.S. does not operate.





1. CHECK INPUT VOLTAGE OF A.B.S. CONTROL MODULE.

1) Turn ignition switch OFF.
2) Disconnect connector from A.B.S. control module.
3) Measure voltage between A.B.S. control module connector terminals.

Connector & terminal / Specified voltage:
(P4) No. 25 — No. 10 / More than 4 V (when brake pedal is depressed.)

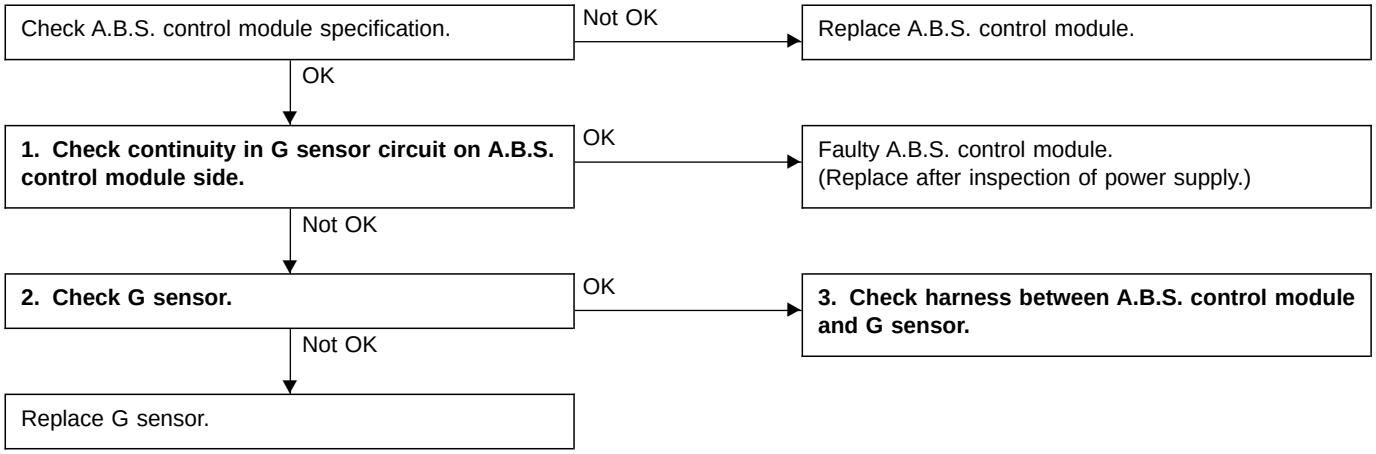
L: TROUBLE CODE 56 — USE OF IMPROPER A.B.S. CONTROL MODULE SPECIFICATION, OR FAULTY G SENSOR —

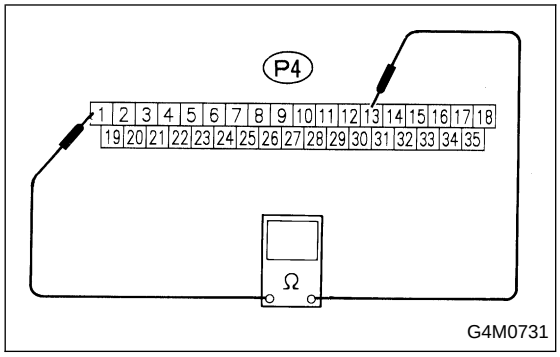
DIAGNOSIS:

- Improper A.B.S. control module specification
- Faulty G sensor
- Faulty G sensor harness and connector

TROUBLE SYMPTOM:

- A.B.S. does not operate.
- A.B.S. activates faster than specifications when braking on high "μ" (dry asphalt) road.
- Warning light comes on and trouble code "56" is displayed approximately 20 seconds after vehicle starts.

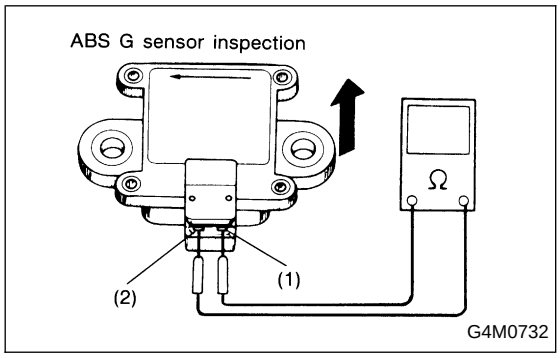




1. CHECK CONTINUITY IN G SENSOR CIRCUIT ON A.B.S. CONTROL MODULE SIDE.

1) Position vehicle on a flat surface.
2) Disconnect connector from A.B.S. control module.
3) Disassemble connector.
4) Measure resistance between A.B.S. control module connector terminals.

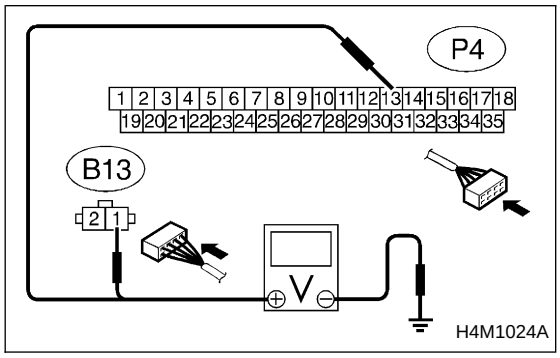
Connector & terminal / Specified Resistance:
(P4) No. 1 — No. 13 / 550 — 670 Ω



2. CHECK G SENSOR.

1) Disconnect G sensor connector.
2) Measure resistance between G sensor terminals. (Ensure that G sensor is horizontal during measurement.)

Specified Resistance:
550 — 670 Ω



3. CHECK HARNESS BETWEEN A.B.S. CONTROL MODULE AND G SENSOR.

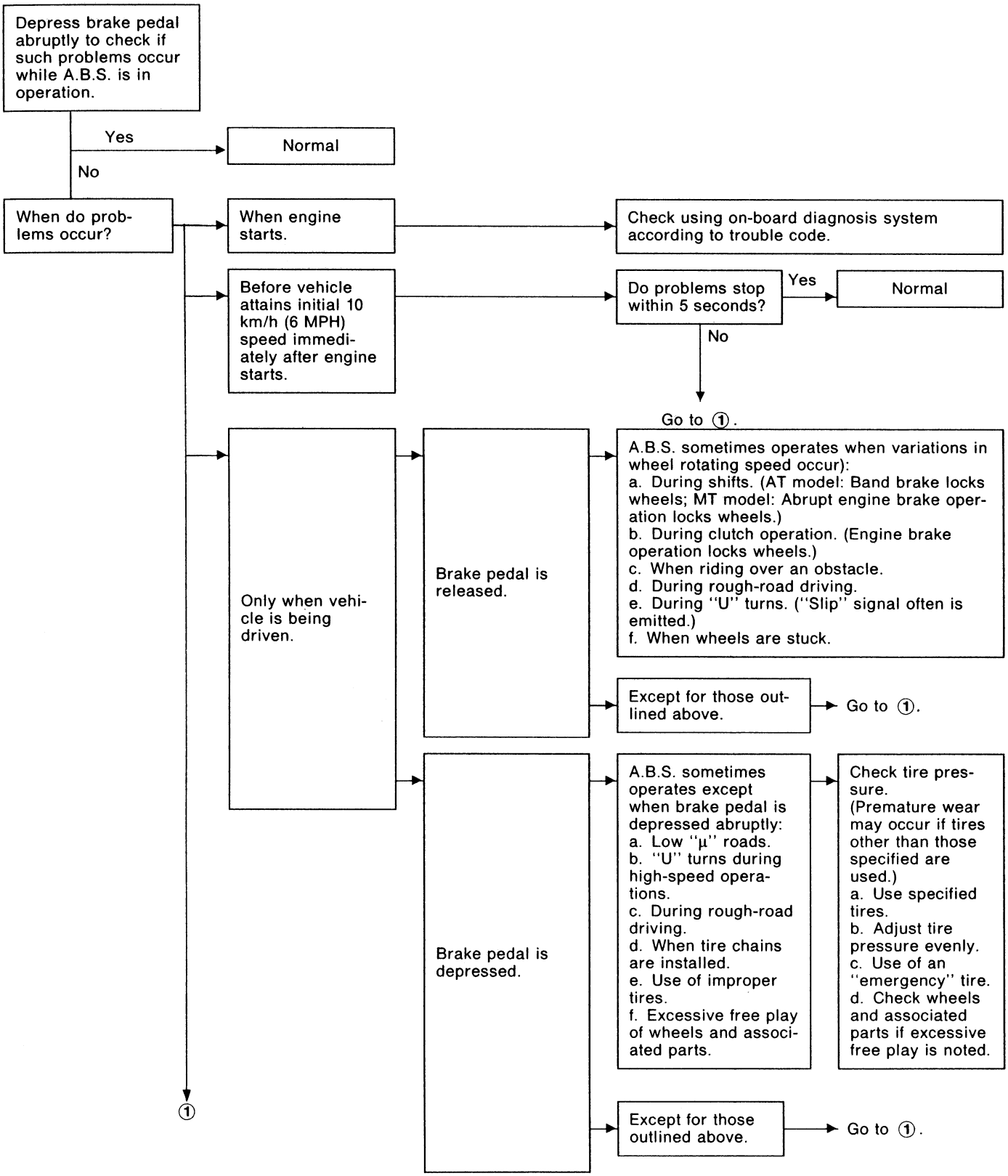
1) Turn ignition switch ON.
2) Connect G sensor connector.
3) Measure voltage between connector and body.

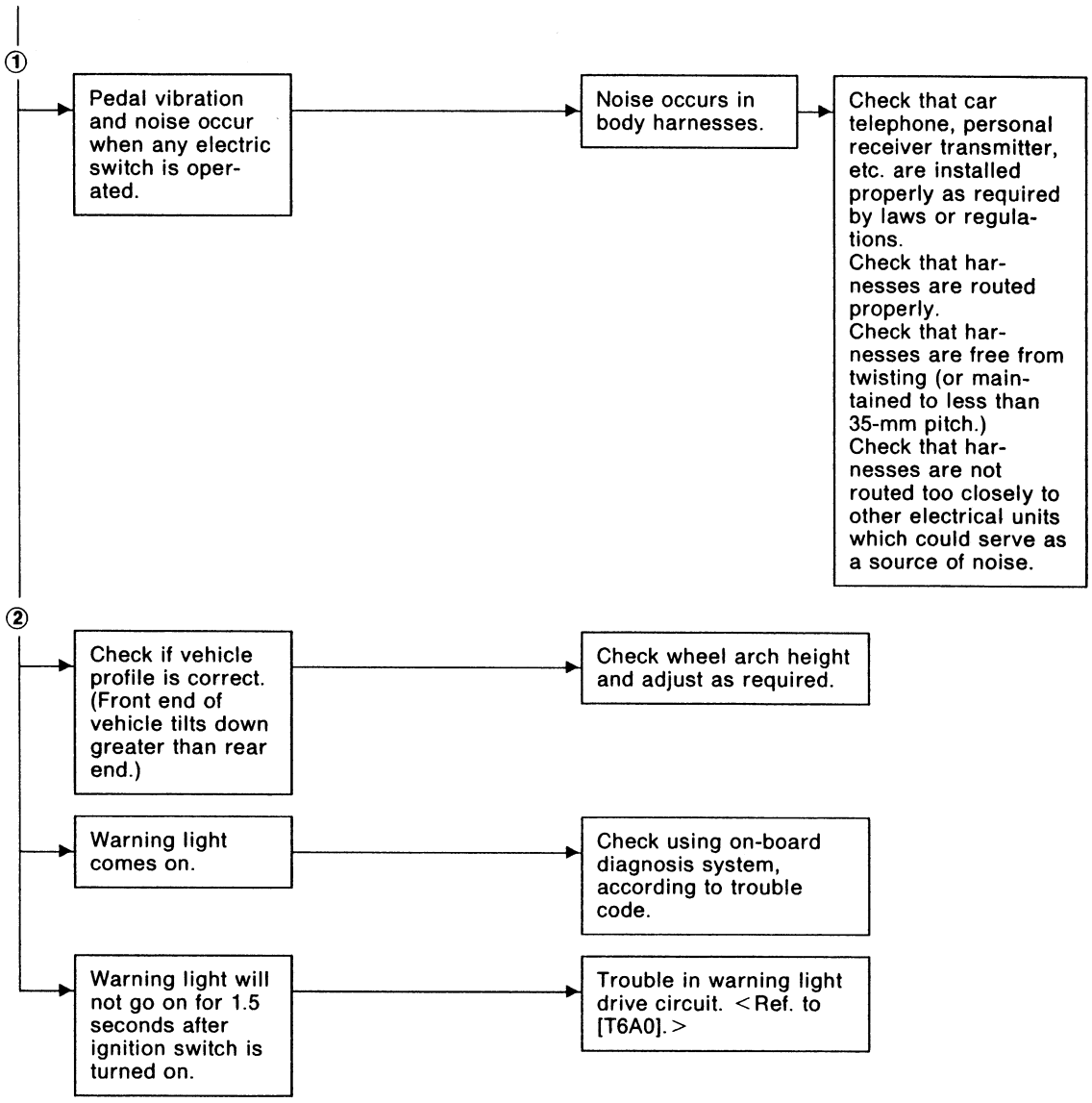
Connector & terminal / Specified Voltage:
(B13) No. 1 — Body / 10 — 12 V
(P4) No. 13 — Body / 10 — 12 V

NOTE:
When voltage checks out “OK”, replace A.B.S. control module.

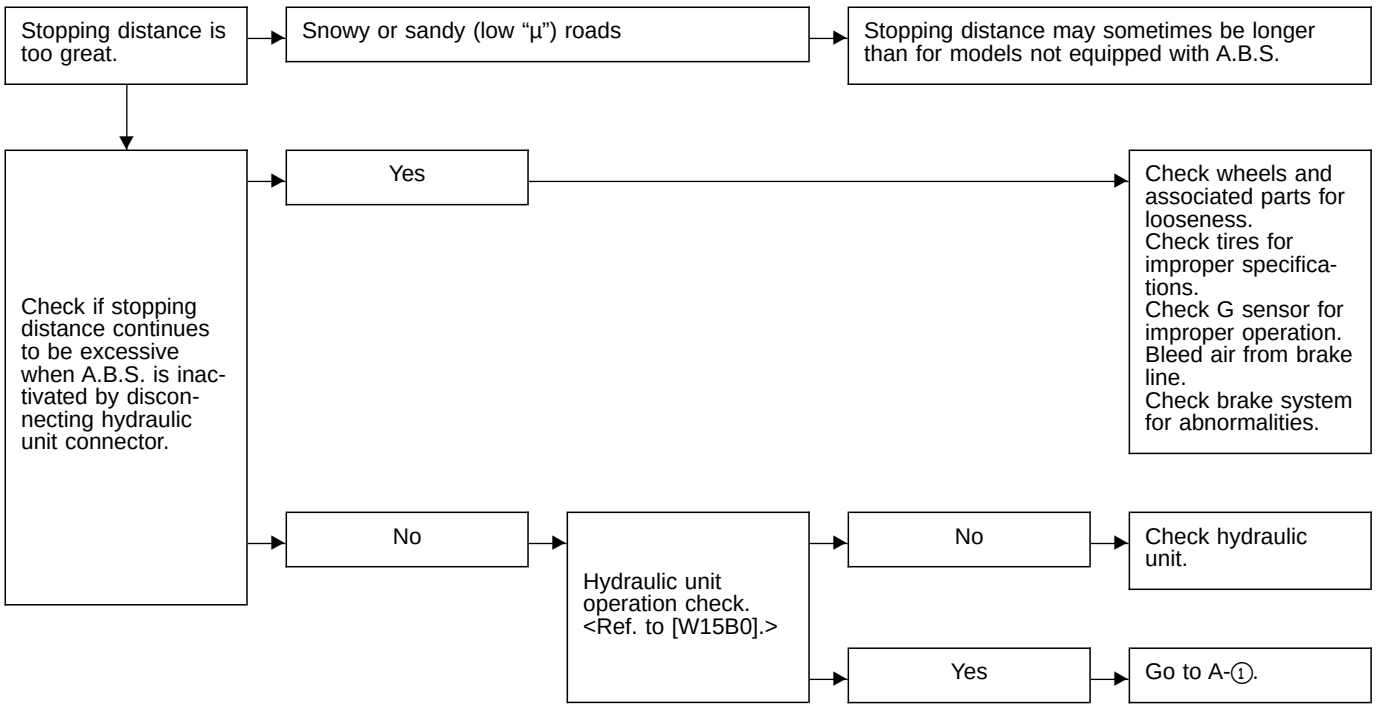
7. General Diagnostics Chart

A: VIBRATING PEDAL AND NOISE

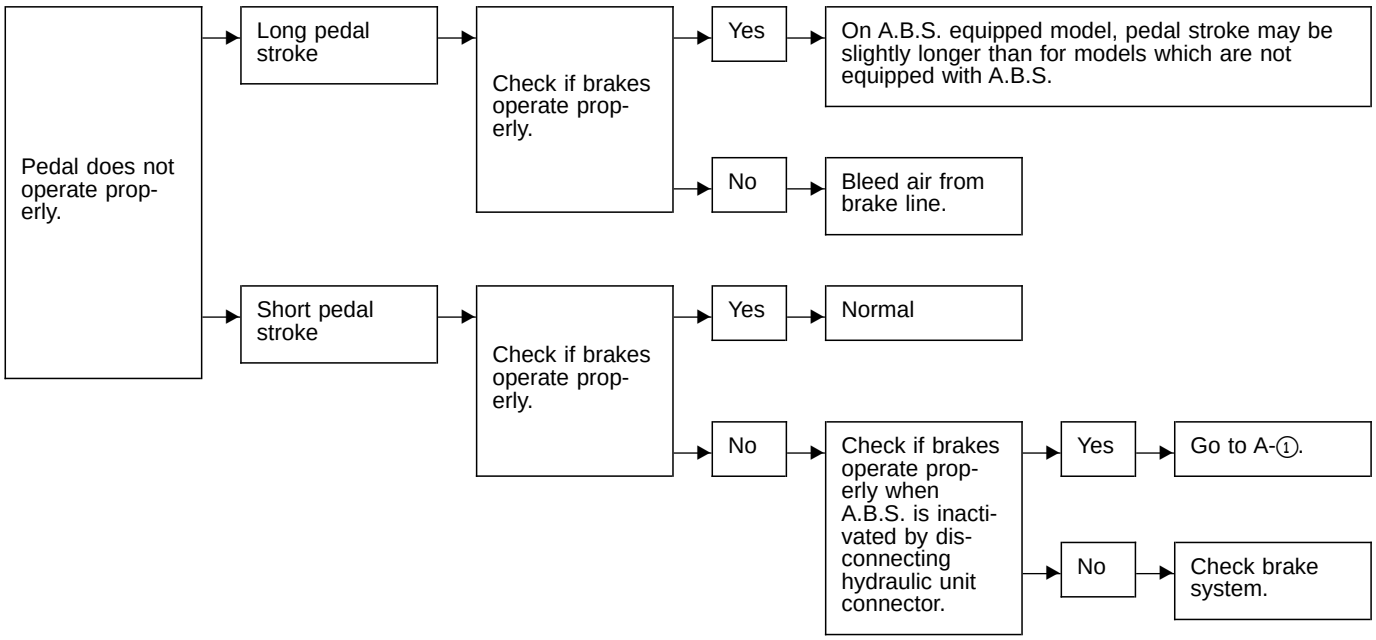



①
Pedal vibration and noise occur when any electric switch is operated.
Noise occurs in body harnesses.
Check that car telephone, personal receiver transmitter, etc. are installed properly as required by laws or regulations.
Check that harnesses are routed properly.
Check that harnesses are free from twisting (or maintained to less than 35-mm pitch.)
Check that harnesses are not routed too closely to other electrical units which could serve as a source of noise.
②
Check if vehicle profile is correct. (Front end of vehicle tilts down greater than rear end.)
Check wheel arch height and adjust as required.
Warning light comes on.
Check using on-board diagnosis system, according to trouble code.
Warning light will not go on for 1.5 seconds after ignition switch is turned on.
Trouble in warning light drive circuit. <Ref. to [T6A0].>

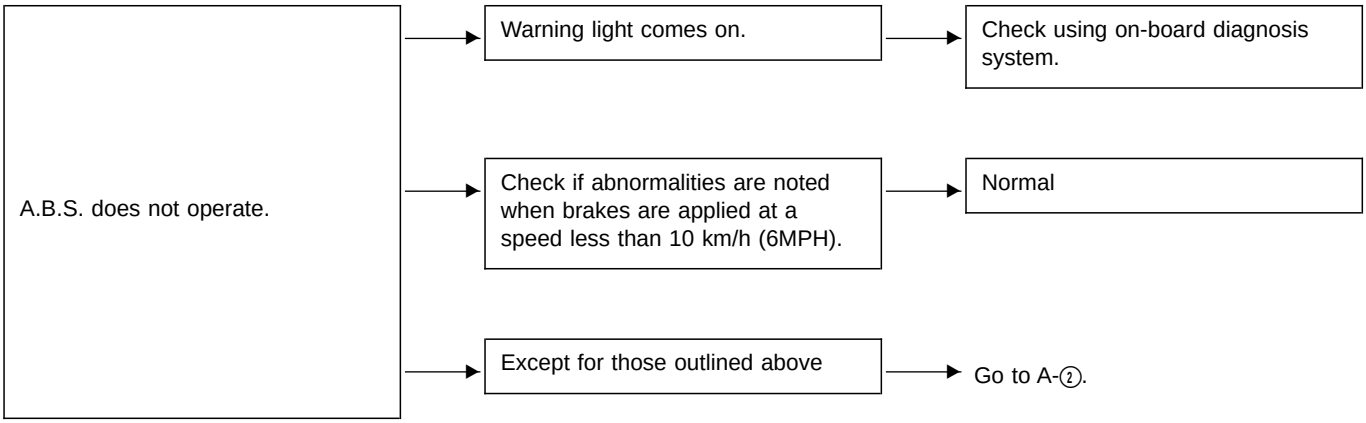
B: EXCESSIVE STOPPING DISTANCE



C: IMPROPER PEDAL OPERATION



D: A.B.S. INOPERATIVE



E: FREQUENT A.B.S. OPERATION