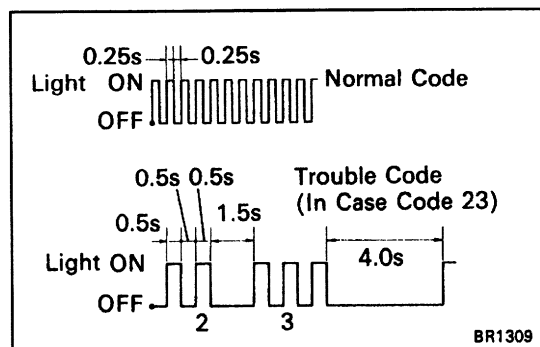
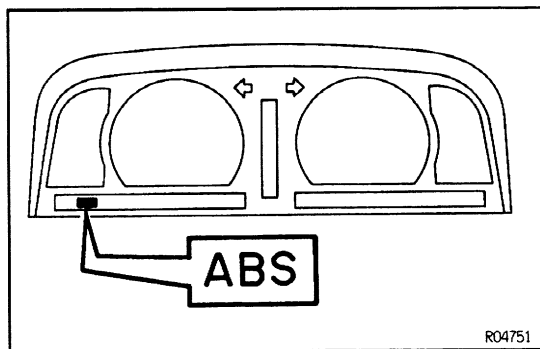




DIAGNOSIS SYSTEM

BR02P-06

DESCRIPTION

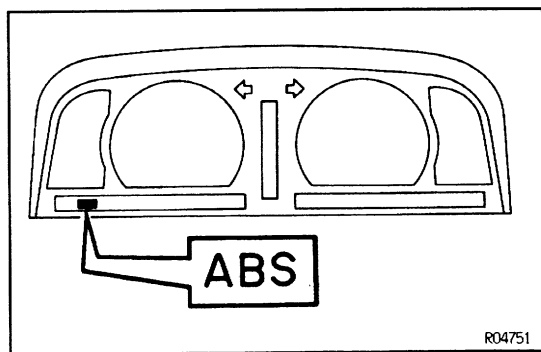
If a malfunction occurs, the system will identify the problem and the ECU will store the codes for the trouble items.

At the same time, the system informs the driver of a malfunction via the "ABS" warning light in the combination meter.

By turning on the ignition switch, disconnecting the short pin of the data link connector 1 and use SST to connect Tc and E₁ of the data link connector 1, the trouble can be identified by the number of blinks (diagnostic trouble code) of the warning light. In the event of two codes, that having the smallest numbered code will be identified first.

HINT: The warning light does not show the diagnostic trouble codes while the vehicle is running.

When the transfer is in L (center differential lock) position, the ABS does not operate and the ABS warning light stays on.



DIAGNOSIS SYSTEM INSPECTION

BR02R-04

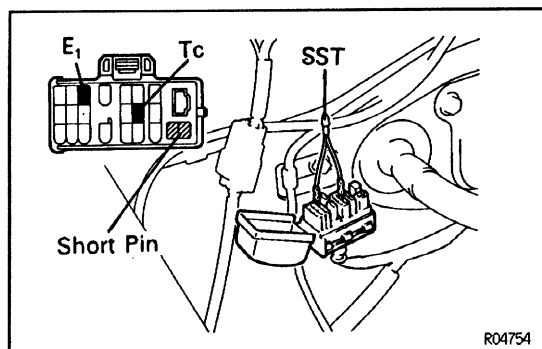
1. INSPECT BATTERY POSITIVE VOLTAGE

Inspect that the battery positive voltage is about 12 V.

2. CHECK THAT WARNING LIGHT TURNS ON

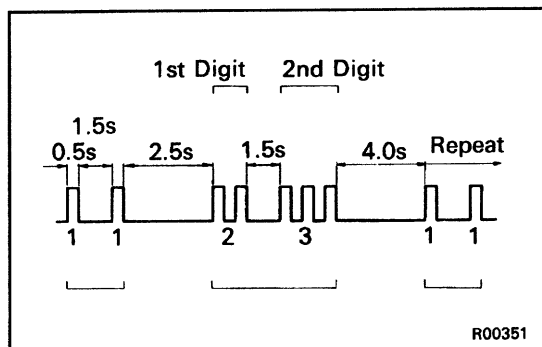
- Confirm that the center differential is free.
- Turn the ignition switch on.
- Check that the "ABS" warning light turns on for 3 seconds.

If not, inspect and repair or replace the fuse, bulb and wire harness.



3. READ DIAGNOSTIC TROUBLE CODE

- Turn the ignition switch on.
- Using SST, connect terminals Tc and E₁ of the data link connector 1.
SST 09843-18020
- Pull out the short pin from the terminals WA and WB of the data link connector 1 in the engine room.



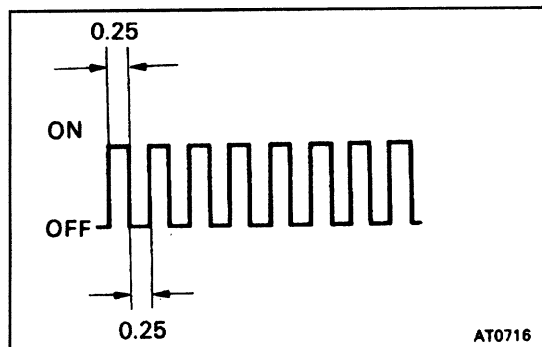
- In event of a malfunction, 4 seconds later the warning light will begin to blink. Read the number of blinks.
(See page [BR-66](#))

HINT: The first number of blinks will equal the first digit of a two digit diagnostic trouble code. After a 1.5 second pause, the 2nd number of blinks will equal the 2nd number of a two digit code. If there are two or more codes, there will be a 2.5 second pause between each, and indication will begin after 4.0 second pause from the smaller value and continue in order to larger.

- If the system is operating normally (no malfunction), the warning light will blink once every 0.5 seconds.
- Repair the system.
- After the malfunctioning components has been repaired, clear the diagnostic trouble codes stored in the ECU.

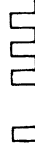
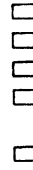
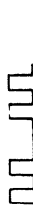
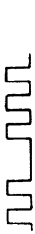
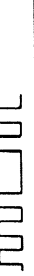
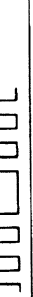
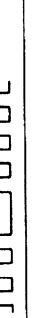
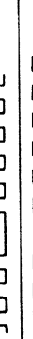
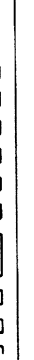
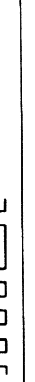
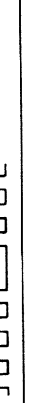
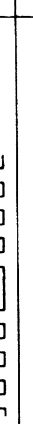
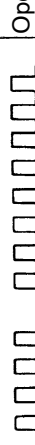
(See page [BR-67](#))

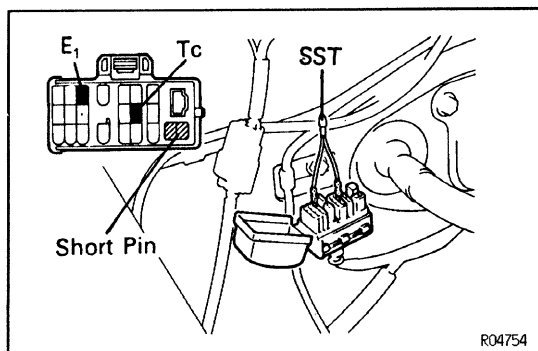
HINT: If you disconnect the battery cable while repairing, all diagnostic trouble codes in the ECU will be erased.



- Remove the SST from terminals Tc and E₁ of the data link connector 1.
SST 09843-18020
- Install the short pin to the terminals WA and WB.
- Turn the ignition switch on, and check that the "ABS" warning light goes off after the warning light goes on for 3 seconds.

DIAGNOSTIC TROUBLE CODE

Code No.	Light Pattern	Diagnosis	Trouble Part
11	ON OFF 	Open circuit in solenoid relay circuit	● Actuator inside wire harness ● Solenoid relay ● Wire harness and connector of solenoid relay circuit (Include AST circuit)
12		Short circuit in solenoid relay circuit	● Actuator inside wire harness ● Pump motor relay ● Wire harness and connector of pump motor relay circuit (Include MT circuit)
13		Open circuit in pump motor relay circuit	● Actuator inside wire harness ● Pump motor relay ● Wire harness and connector of pump motor relay circuit (Include MT circuit)
14		Short circuit in pump motor relay circuit	● Actuator inside wire harness ● Pump motor relay ● Wire harness and connector of pump motor relay circuit (Include MT circuit)
21		Open or short circuit in 3 position solenoid of front right wheel	● Actuator solenoid ● Wire harness and connector of actuator solenoid circuit
22		Open or short circuit in 3 position solenoid of front left wheel	● Actuator solenoid ● Wire harness and connector of actuator solenoid circuit
23		Open or short circuit in 3 position solenoid of rear wheel	● Actuator solenoid ● Wire harness and connector of actuator solenoid circuit
31		Front right wheel speed sensor signal malfunction	● Speed sensor ● Sensor rotor ● Wire harness and connector of speed sensor
32		Front left wheel speed sensor signal malfunction	● Speed sensor ● Sensor rotor ● Wire harness and connector of speed sensor
33		Rear right wheel speed sensor signal malfunction	● Speed sensor ● Sensor rotor ● Wire harness and connector of speed sensor
34		Rear left wheel speed sensor signal malfunction	● Speed sensor ● Sensor rotor ● Wire harness and connector of speed sensor
35		Open circuit in front left or rear right wheel speed sensor	● Speed sensor ● Sensor rotor ● Wire harness and connector of speed sensor
36		Open circuit in front right or rear left wheel speed sensor	● Speed sensor ● Sensor rotor ● Wire harness and connector of speed sensor
41		Abnormally high or low battery voltage	● Battery ● Voltage regulator
43		Malfunction in deceleration sensor	● Deceleration sensor ● Deceleration sensor installation ● Wire harness and connector of deceleration sensor
44		Open or short circuit in deceleration sensor	● Deceleration sensor ● Deceleration sensor installation ● Wire harness and connector of deceleration sensor
48		Open or short circuit in center differential lock indicator	● Center differential lock ● Center differential lock indicator light ● Center differential lock indicator switch ● Wire harness and connector of center differential lock
51		Pump motor of actuator locked or open circuit in pump motor circuit in actuator	● Pump motor, relay and battery ● Wire harness, connector and ground bolt or actuator pump motor circuit (Include MT circuit)
Always on		Malfunction in ECU	● ECU



DIAGNOSTIC TROUBLE CODES CLEARING

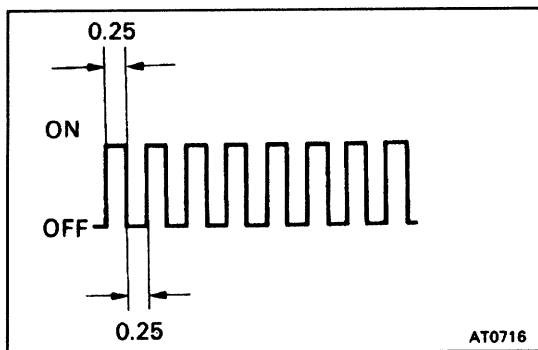
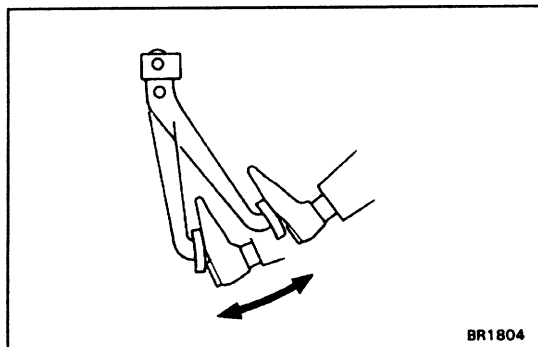
CLEAR DIAGNOSTIC TROUBLE CODES

- Confirm that the center differential is free.
- Turn the ignition switch on.
- Using SST, connect terminals T_c and E₁ of the data link connector 1.

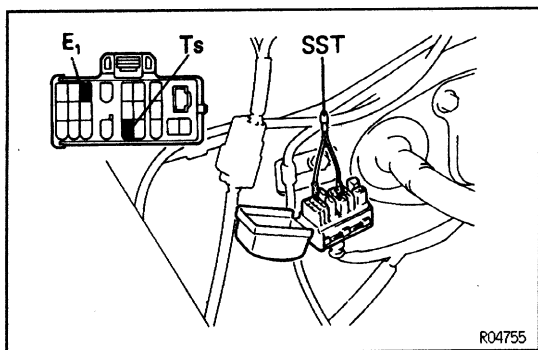
SST 09843-18020

HINT: Keep the vehicle stopped vehicle speed 0 km/h (0 mph).

- Clear the diagnostic trouble codes stored in ECU by depressing the brake pedal 8 or more times within 3 seconds.



- Check that the warning light shows the normal code.



- Remove the SST from terminals T_c and E₁ of the data link connector 1.

SST 09843-18020

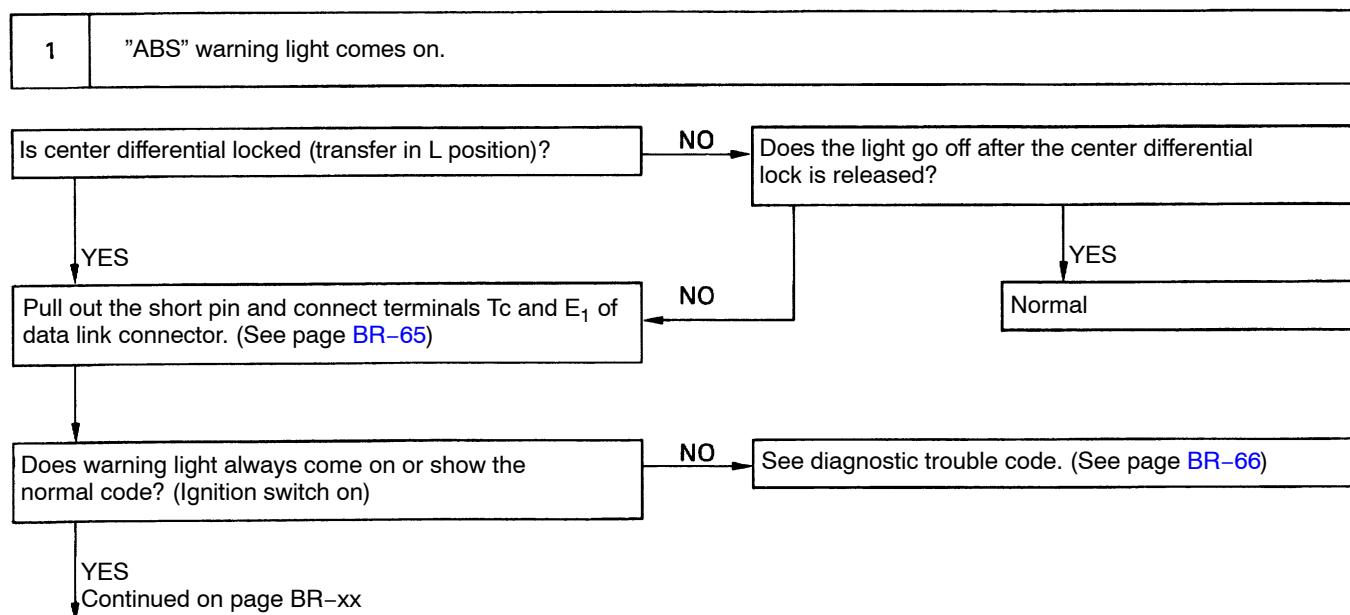
- Check that the warning light goes off.

TROUBLESHOOTING

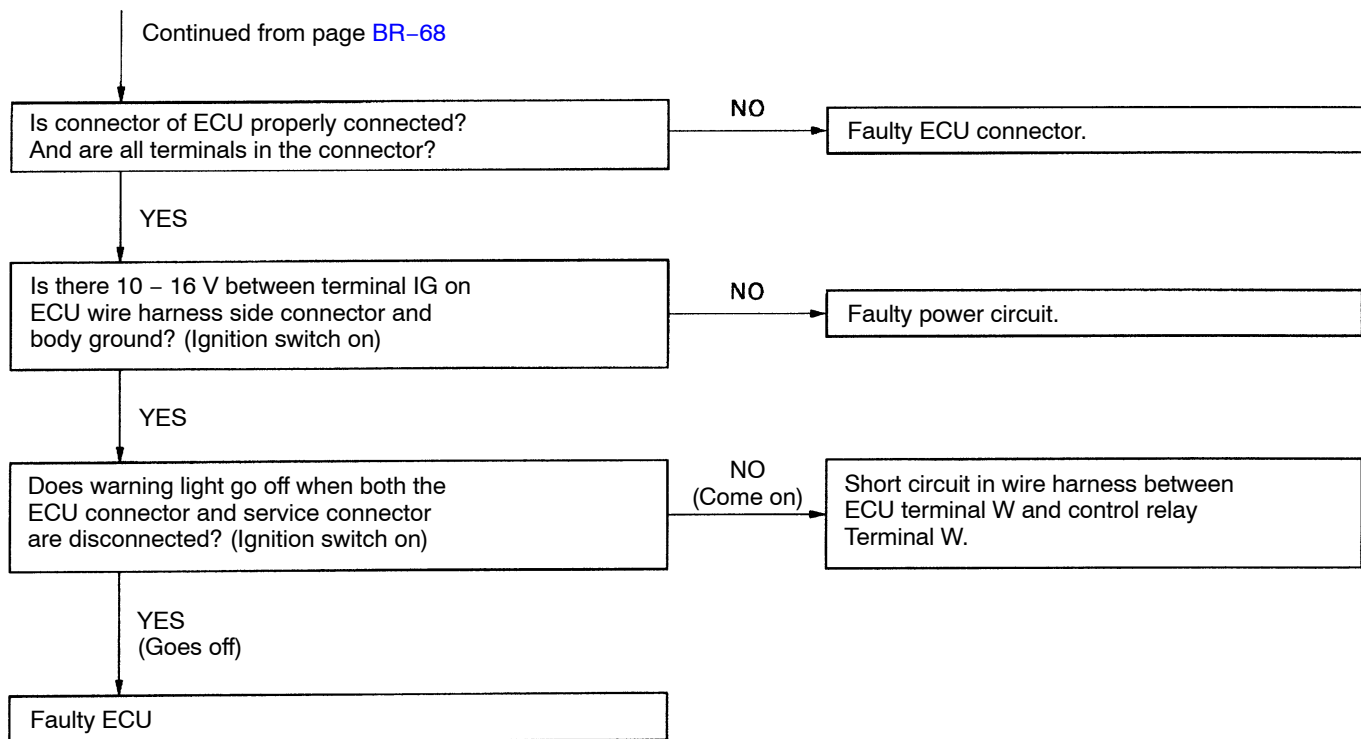
Problem		No.
"ABS" warning light	Always comes on after ignition switch is turned on.	1
	Does not come on for 3 seconds after ignition switch on.	2
	Goes on and off.	3
	Comes on while running.	1
	Does not light up when the transfer is in L (center differential lock) position.	6
Brake condition	Brakes pull.*	4
	Braking inefficient. *	4
	ABS operates at ordinary braking.	4
	ABS operates just before stopping at ordinary braking	4
	Brake pedal pulsates abnormally while ABS is operating.	4
	Skidding noise occurs while ABS operating. (ABS operates inefficiently)	5
	When the transfer is in L (center differential lock) position, the ABS operates.	6

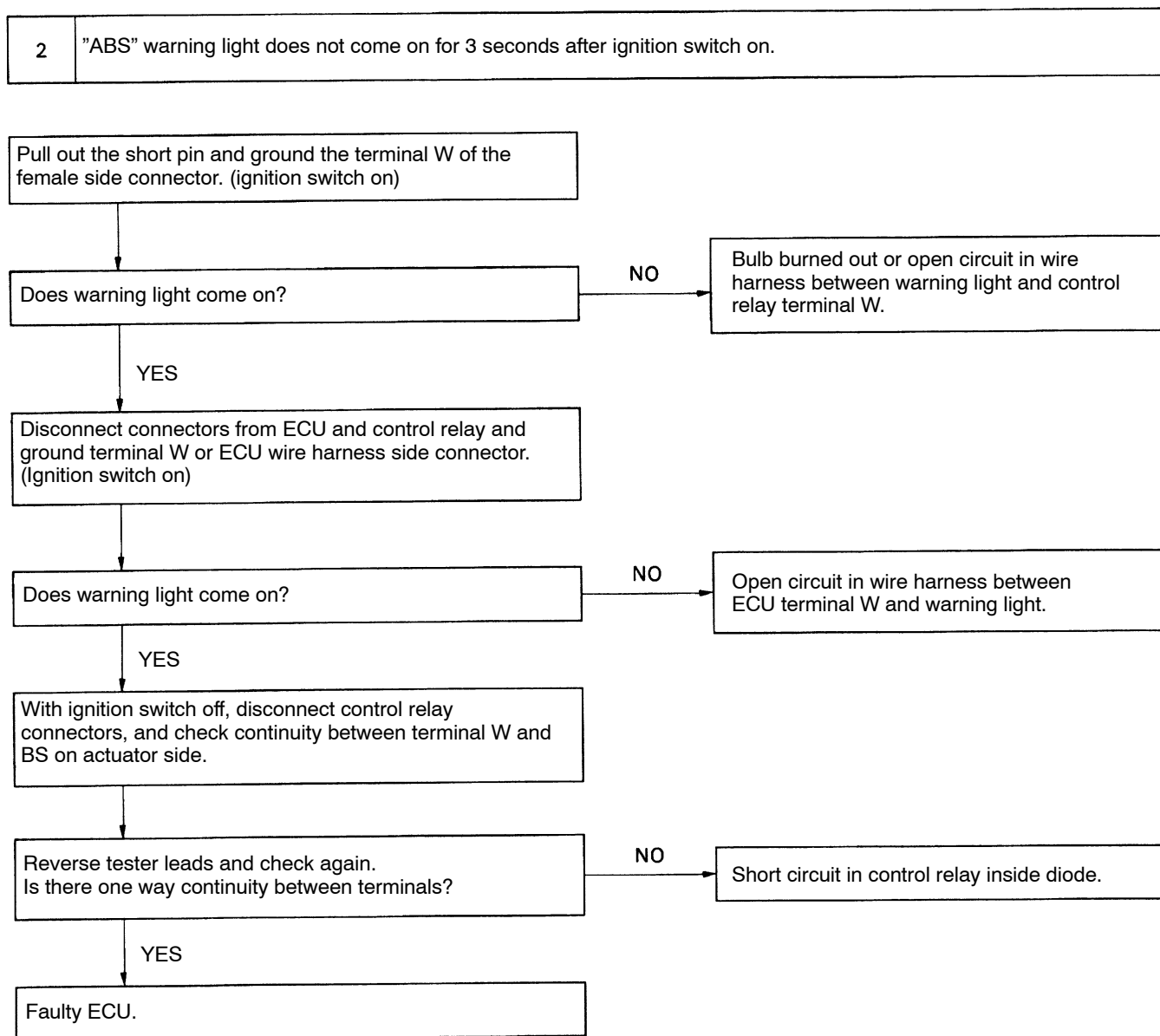
* Also check the parts of the brake system (brake cylinders, pads, hydraulic lines, etc.) not specifically part of the ABS.

V02251



V02252





HINT: If the diode is short-circuited, a malfunction at ECU terminal W will occur. When inspecting the terminal, connect the ECU connector, and disconnect actuator connectors and data link connector. Then turn the ignition switch on, and check that the warning light goes on. If it does, the ECU terminal is OK.

3

"ABS" warning light comes on and off.

- Check for short circuit in wire harness between terminal Tc and E₁ of data link connector.

4

- Brakes pull.
- Braking inefficient.
- ABS operates at ordinary braking.
- ABS operates just before stopping at ordinary braking.
- Brake pedal pulsates abnormally while ABS is operating.

Pull out the short pin and connect terminals Tc and E₁ of data link connector. (See page BR-65)

Does warning light show the diagnostic normal code?
(ignition switch on)

NO

See diagnostic trouble code. (See page BR-xx)

YES

Are each speed sensors installed in place?
And are each installation bolts tightened securely?

NO

Speed sensor installation faulty.

YES

Try speed sensor and deceleration sensor diagnosis
system. Is sensor signal level OK? (See page BR-74)

NO

Inspect speed sensor, and replace if necessary.

YES

Try speed sensor and deceleration sensor diagnosis
system. Is sensor signal change OK?
(See page BR-xx)

NO

Inspect sensor rotor, and replace if necessary.

YES

Disconnect connector from ECU, inspect continuity
between each speed sensor terminals on wire
harness side. (See page BR-96)

Does any abnormal change occur in continuity when
the connectors or wire harness of the speed sensor
and intermediate connectors are twisted or bent?

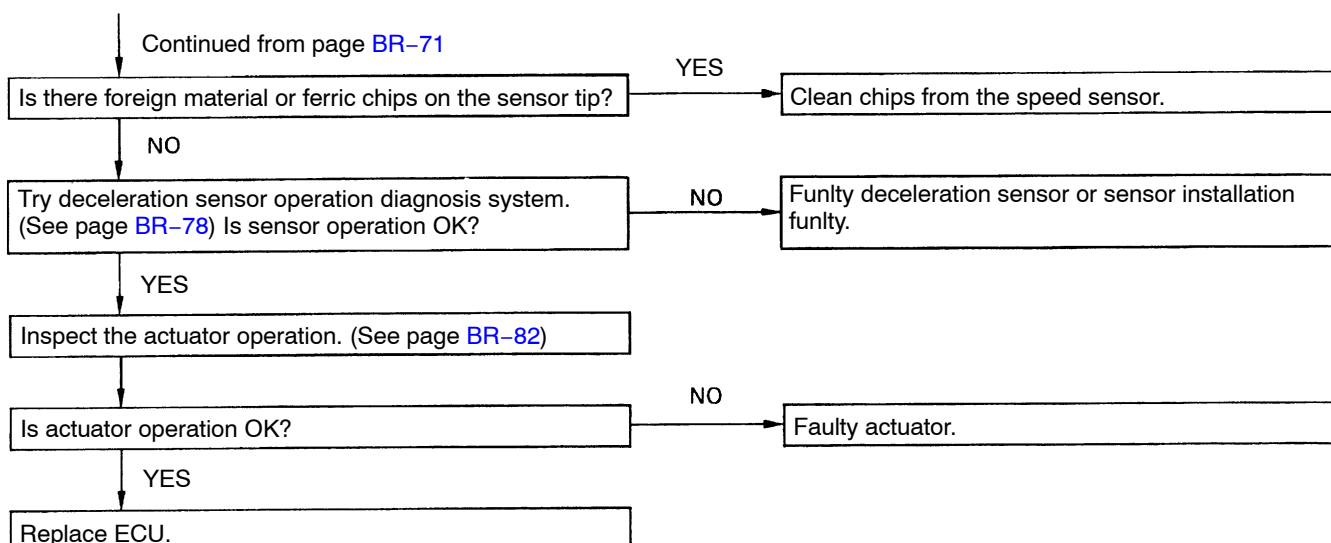
YES

(Abnormal
change)

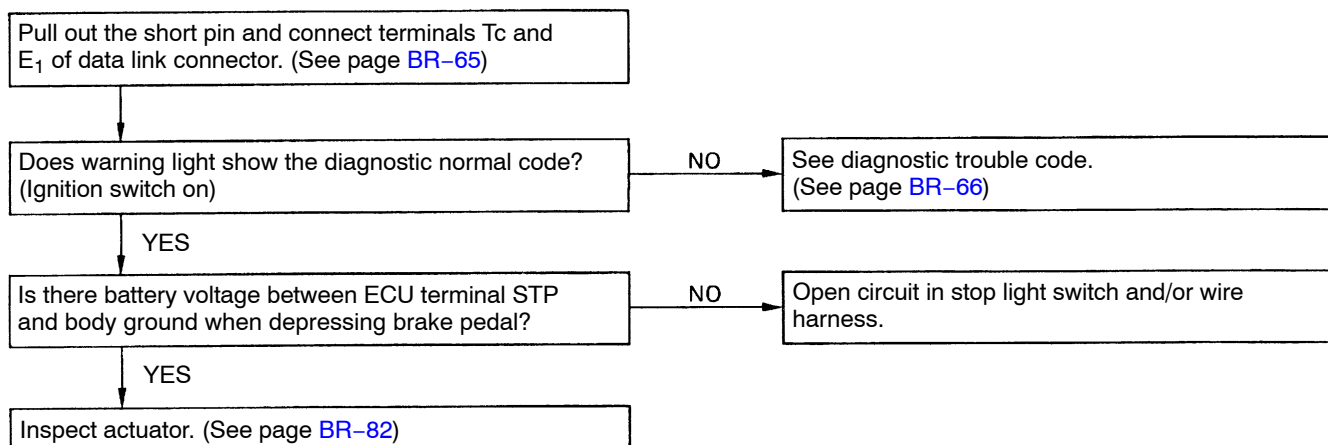
Faulty wire harness.

NO
(No change)

Continued on page BR-72



5 Anti-lock brake system operations inefficiently.



6

- Does not light up when the transfer is in L position.
- When the transfer is in L position, the ABS operates.

When the transfer is in L position, does the center differential lock indicator light come on?

NO

- Open circuit in center differential lock indicator switch or wire harness.
- Faulty center differential lock.

YES

When the ECU connector is disconnected, is there continuity between the body and terminal EX1 on the vehicle wire harness side?

NO

Open circuit in wire harness.

YES

Replace ECU.