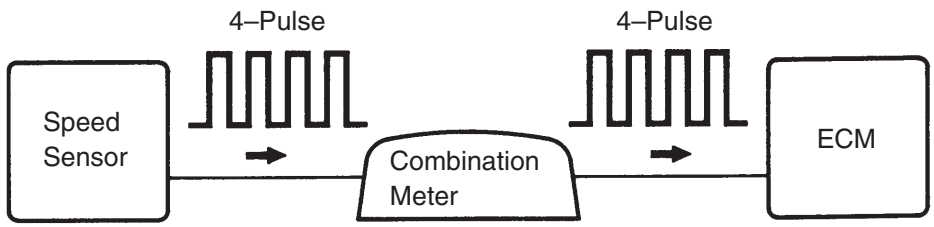
DTC P0500/42 VEHICLE SPEED SENSOR ”A”

CIRCUIT DESCRIPTION

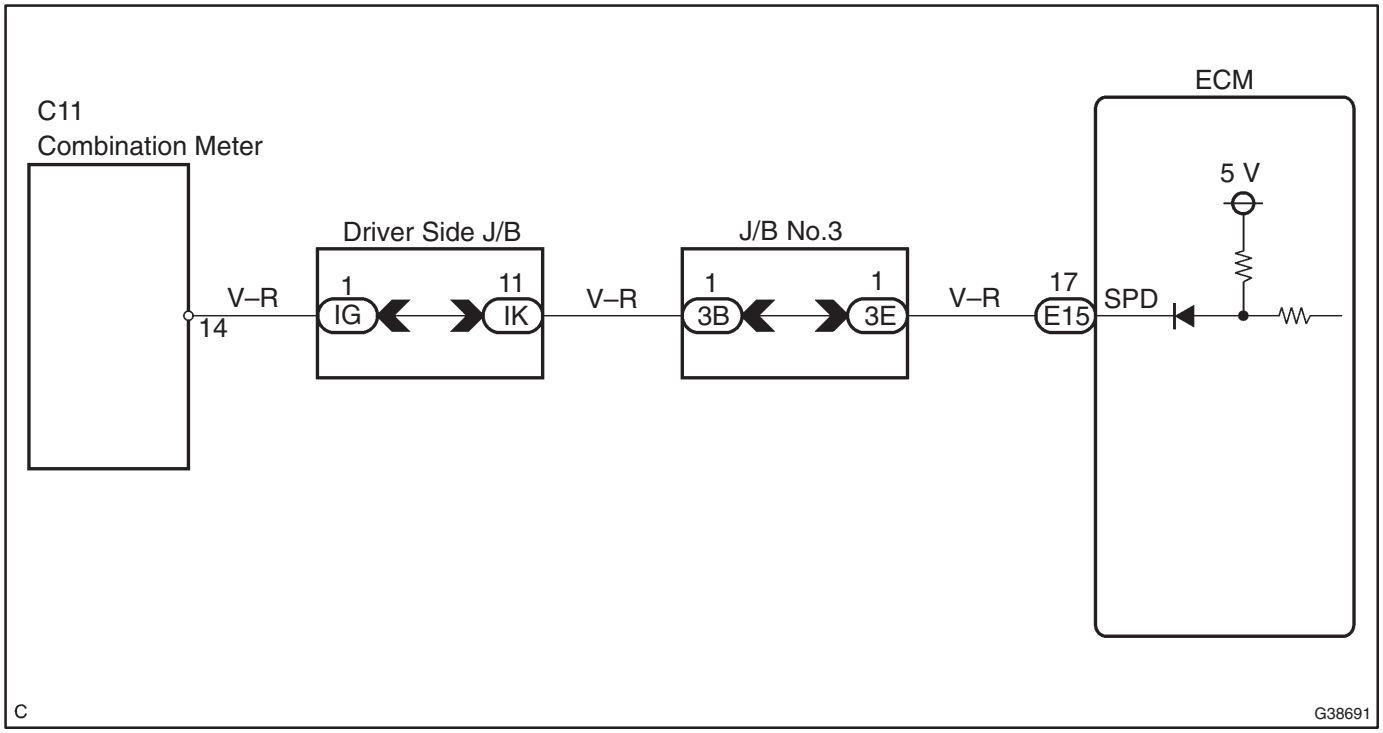
The vehicle speed sensor outputs a 4–pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the ECM. The ECM determines the vehicle speed based on the frequency of these pulse signals.



G36461

DTC No.	DTC Detection Condition	Trouble Area
P0500/42	Conditions (a), (b) and (c) continue for 8 seconds or more: (1 trip detection logic) (a) Engine coolant temperature is more than 70°C (158°F) (b) Engine speed is between 2,840 rpm and 4,000 rpm (c) No speed signal is input to ECM	• Open or short in speed sensor circuit • Speed sensor • Combinationmeter • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using the intelligent tester II. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, and other data from the time the malfunction occurred.

When using intelligent tester II:

1	CHECK OPERATION OF SPEEDOMETER

(a) Check the speedometer reading in the combination meter.

HINT:

If the vehicle speed sensor has any malfunctions, the speedometer shows abnormal readings.

OK: Speedometer operates normally.

NG → **CHECK SPEEDOMETER CIRCUIT (INCLUDE SPEED SENSOR)**

OK

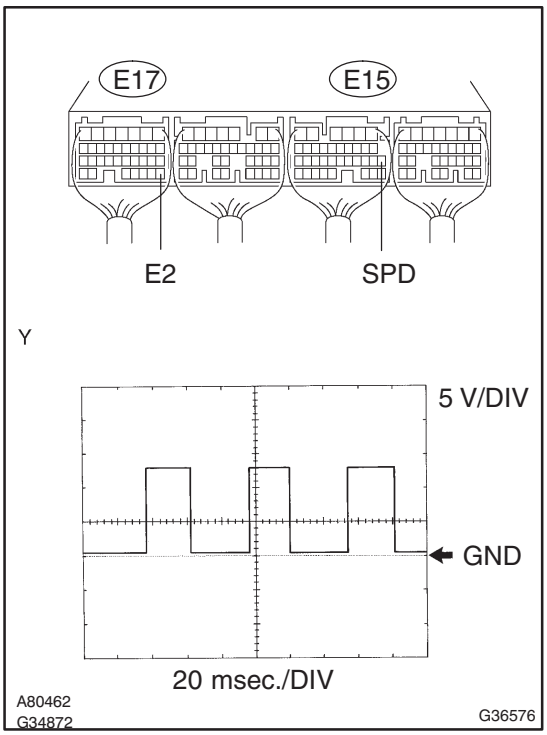
2 READ DATA LIST (VEHICLE SPEED)

(a) Connect the intelligent tester II to the DLC3.
(b) Start the engine and turn the intelligent tester II ON.
(c) Enter the following menus: Powertrain / Engine / Data List / Vehicle Speed.
(d) Check the vehicle speed at an engine speed of 2,000 rpm or more while the vehicle is running.
OK: Same value as actual vehicle speed.

YES → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–439)**

NO

3 INSPECT ECM (SPD SIGNAL)



(a) While idling the engine, check the waveform of the ECM connectors using an oscilloscope.
(b) Move the shift lever to N.
(c) Jack up the vehicle.
(d) Turn the ignition switch ON.
(e) Measure the voltage of the ECM connectors as the wheel is turned slowly.
Standard:

Tester Connection	Specified Condition
E15–17 (SPD) – E17–28 (E2)	Voltage is generated intermittently

HINT:
When the wheel is turning slowly, voltage is output intermittently.

NG → **CHECK AND REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM (See Pub. No. RM990E, page 10–34)

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

When not using intelligent tester II:

1	CHECK OPERATION OF SPEEDOMETER

(a) Check the speedometer reading in the combination meter.

HINT:

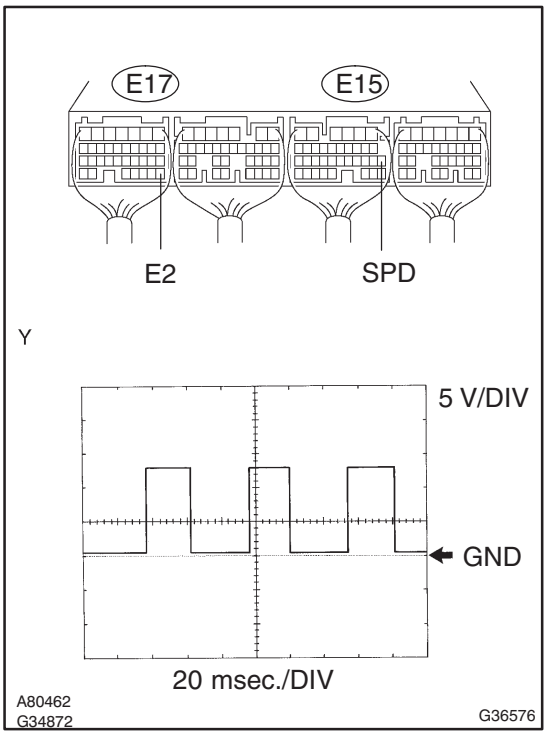
If the vehicle speed sensor has any malfunctions, the speedometer shows abnormal readings.

OK: Speedometer operates normally.

NG → **CHECK SPEEDOMETER CIRCUIT (INCLUDE SPEED SENSOR)**

OK

2	CHECK ECM (SPD SIGNAL)



(a) While idling the engine, check the waveform of the ECM connectors using an oscilloscope.
(b) Move the shift lever to N.
(c) Jack up the vehicle.
(d) Turn the ignition switch ON.
(e) Measure the voltage of the ECM connectors as the wheel is turned slowly.

Standard:

Tester Connection	Specified Condition
E15–17 (SPD) – E17–28 (E2)	Voltage is generated intermittently

HINT:

When the wheel is turning slowly, voltage is output intermittently.

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM (See Pub. No. RM990E, page 10–34)

NOTICE:

After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.