

TEST E: SPEEDOMETER/ODOMETER INOPERATIVE - WITH REAR ANTI-LOCK BRAKES (RABS)

1. Connect New Generation Star (NGS) tester to Data Link Connector (DLC). Monitor PID IGN_GEM while turning ignition switch through all positions. If PID values agree with switch positions, go to next step. If PID values do not agree with switch positions, check ignition switch. See STEERING COLUMN SWITCHES - RANGER article. Replace as necessary. If ignition switch is okay, check ignition switch circuits. See appropriate wiring diagram in POWER DISTRIBUTION article in WIRING DIAGRAMS.
2. Perform GEM/CTM SELF-TEST diagnostics. Retrieve DTCs. If DTC C1751 is present, go to step 9. If DTC C1752 is present, go to step 7. If DTC P0500 or no DTCs are present, go to next step.
3. Disconnect Generic Electronic Module (GEM) connector C224. GEM 20-pin connector C224 is located behind center of instrument cluster. Disconnect Rear Anti-lock Brake (RABS) module connector C238. RABS connector C238 is located behind center of dash, to left of ashtray assembly. Disconnect RABS sensor, located at center top of rear differential. Measure resistance between ground and GEM connector C224 terminal No. 9 (Red/Pink wire). See **Fig. 12**. Measure resistance between ground and GEM connector C224 terminal No. 18 (Light Green/Black wire). If either resistance is 10 k/ohms or less, repair short to ground in Red/Pink or Light Green/Black wire. If resistances are more than 10 k/ohms, go to next step.
4. Measure resistance of Red/Pink wire between RABS sensor connector and GEM connector terminal No. 9. Measure resistance of Light Green/Black wire between RABS sensor connector and GEM connector C224 terminal No. 18. If either resistance is 5 ohms or more, repair open in Red/Pink or Light Green/Black wire. If resistances are less than 5 ohms, go to next step.
5. Measure voltage between ground and GEM connector C224 terminal No. 9 (Red/Pink wire). Measure voltage between ground and GEM connector C224 terminal No. 18 (Light Green/Black wire). If voltage is present, repair short to battery voltage in appropriate Red/Pink or Light Green/Black wire. If voltage is not present, go to next step.
6. Using NGS tester, monitor PID VSS_GEM while driving 0-55 MPH. If PID VSS_GEM value is more than zero MPH, go to next step. If PID VSS_GEM value is zero MPH, check RABS sensor. See appropriate ANTI-LOCK article in BRAKES. If RABS sensor is okay, replace GEM.
7. Turn ignition off. Remove instrument cluster and disconnect connectors. See **INSTRUMENT CLUSTER** under REMOVAL & INSTALLATION. Disconnect Powertrain Control Module (PCM). PCM is located at right rear of engine compartment. Disconnect speed control servo. Disconnect Generic Electronic Module (GEM) connector C224. GEM 20-pin connector C224 is located behind center of instrument cluster. Measure resistance between ground and GEM connector C224 terminal No. 1 (Gray/Black wire). See **Fig. 12**. If resistance is 10 k/ohms or less, repair short to ground in Gray/Black wire. If resistance is more than 10 k/ohms, go to next step.
8. Measure resistance of Gray/Black wire between instrument cluster connector C215 terminal No. 1 and GEM connector C224 terminal No. 1. See **Fig. 2** and **Fig. 12**. If resistance is 5 ohms or more, repair open in Gray/Black wire. If resistance is less than 5 ohms, go to next step.
9. Turn ignition off. Remove instrument cluster and disconnect connectors. See **INSTRUMENT CLUSTER** under REMOVAL & INSTALLATION. Disconnect Generic Electronic Module (GEM) connector C224. GEM 20-pin connector C224 is located behind center of instrument cluster. Turn ignition on. Measure voltage between ground and GEM connector C224 terminal No. 1 (Gray/Black wire). See **Fig. 12**. If voltage is more than 10 volts, repair short to voltage in Gray/Black wire. If voltage is 10 volts or less, go to next step.
10. Turn ignition off. Measure voltage between ground and instrument cluster connector C216 terminal

No. 7 (White/Yellow wire). See **Fig. 4**. If voltage is more than 10 volts, go to next step. If voltage is 10 volts or less, repair open White/Yellow wire.

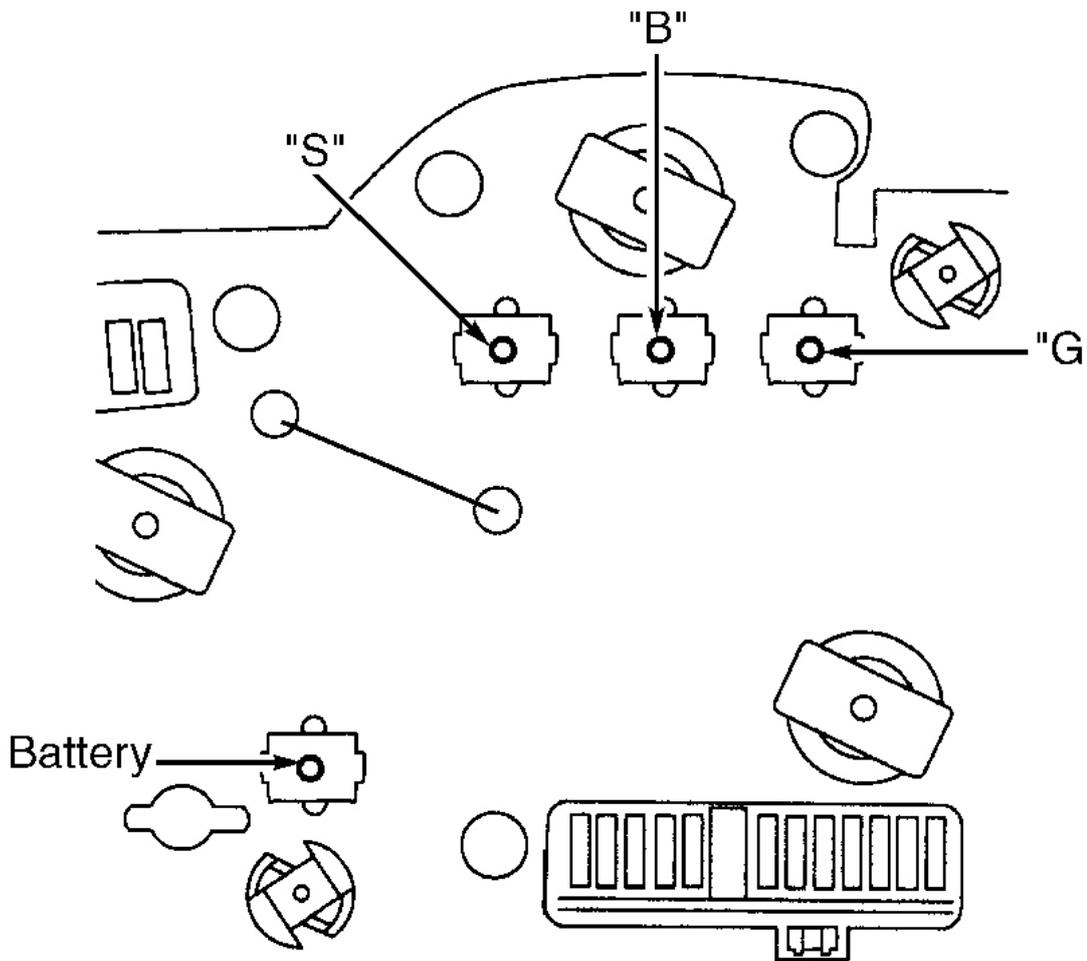
NOTE: Measurements must be made at speedometer gauge pins inside instrument cluster printed circuit clips.

11. Check resistance of printed circuit by making appropriate measurements. See **SPEEDOMETER PRINTED CIRCUIT MEASUREMENTS** table. If all resistance values are less than one ohm, replace speedometer. See **GAUGES** under REMOVAL & INSTALLATION. If resistance in any circuit measurement is one ohm or more, replace instrument cluster printed circuit. See **PRINTED CIRCUIT** under REMOVAL & INSTALLATION.

SPEEDOMETER PRINTED CIRCUIT MEASUREMENTS

Connector/Terminal ⁽¹⁾	Connector/Terminal No.
Speedometer/S	C215/1
Speedometer/G	C215/2
Speedometer/B	C214/13
Batt	C216/7

(1) See **Fig. 6**.



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Fig. 6: Identifying Speedometer Printed Circuit Terminals

Courtesy of FORD MOTOR CO.

TEST F: SPEEDOMETER/ODOMETER INOPERATIVE - WITH 4-WHEEL ANTI-LOCK BRAKES (4WABS)

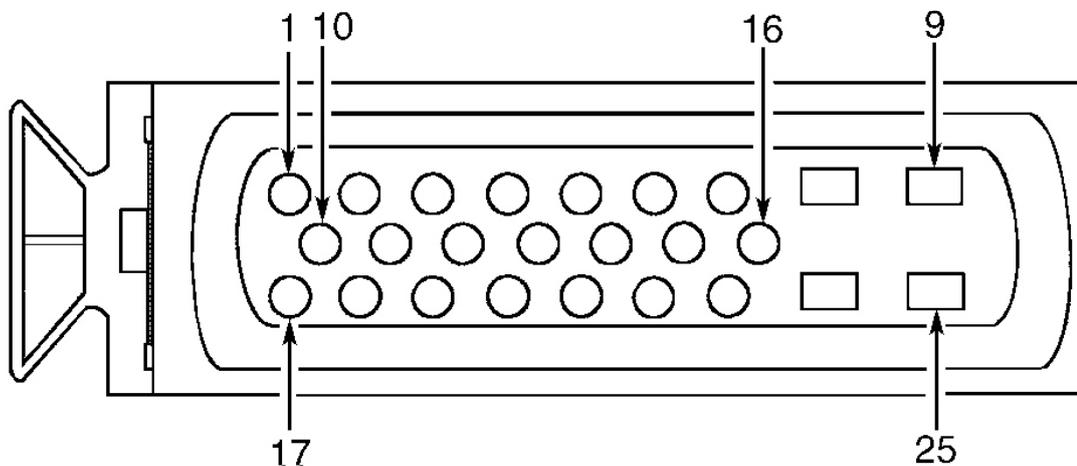
1. Turn ignition off. Remove instrument cluster. See **INSTRUMENT CLUSTER** under REMOVAL & INSTALLATION. Disconnect instrument cluster connector C216. Measure voltage between ground and instrument cluster connector C216 terminal No. 7 (White/Yellow wire). See **Fig. 4**. If voltage is more than 10 volts, go to next step. If voltage is less than 10 volts, repair open in White/Yellow wire between instrument cluster connector and fuse No. 25 located in interior fuse panel and retest system.

2.

NOTE: Measurements must be made at speedometer gauge pins inside instrument cluster printed circuit clips.

Measure resistance of printed circuit. See **SPEEDOMETER PRINTED CIRCUIT MEASUREMENTS** table. If all resistance values are less than one ohm, go to next step. If resistance in any circuit is one ohm or more, replace instrument cluster printed circuit.

3. Disconnect 4-Wheel Anti-lock Brakes (4WABS) 25-pin connector C154. 4WABS connector C154 is located in left rear corner of engine compartment. Measure resistance of Gray/Black wire between instrument cluster connector C215 terminal No. 1 and 4WABS connector C154 terminal No. 19. See **Fig. 2** and **Fig. 7**. If resistance is less than 5 ohms, replace speedometer. If resistance is more than 5 ohms, repair open in Gray/Black wire between instrument cluster connector and 4WABS harness connector and retest system.



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Fig. 7: Identifying 4WABS Connector C154 Terminals