

CRUISE CONTROL SYSTEM

1998 Mitsubishi Galant

1998 ACCESSORIES & EQUIPMENT
Mitsubishi - Cruise Control Systems

Galant & 3000GT

DESCRIPTION & OPERATION

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS article. Do not apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

Cruise control system is electronically controlled and vacuum actuated. System components include an Electronic Control Unit (ECU), vacuum pump, actuator, cruise control switch, cruise control relay (3000GT), cruise indicator light, Park/Neutral (P/N) switch (A/T), clutch pedal position switch (M/T), stoplight switch, throttle position sensor and vehicle speed sensor.

System also has self-diagnostic capability. When self-diagnostic mode is activated, each switch and sensor is checked for faults. If cruise control system has been canceled without using a normal cancel method, a trouble code will be set and stored in the cruise control ECU. Trouble codes can be retrieved to help determine which circuit is malfunctioning.

COMPONENT LOCATIONS

COMPONENT LOCATIONS TABLE

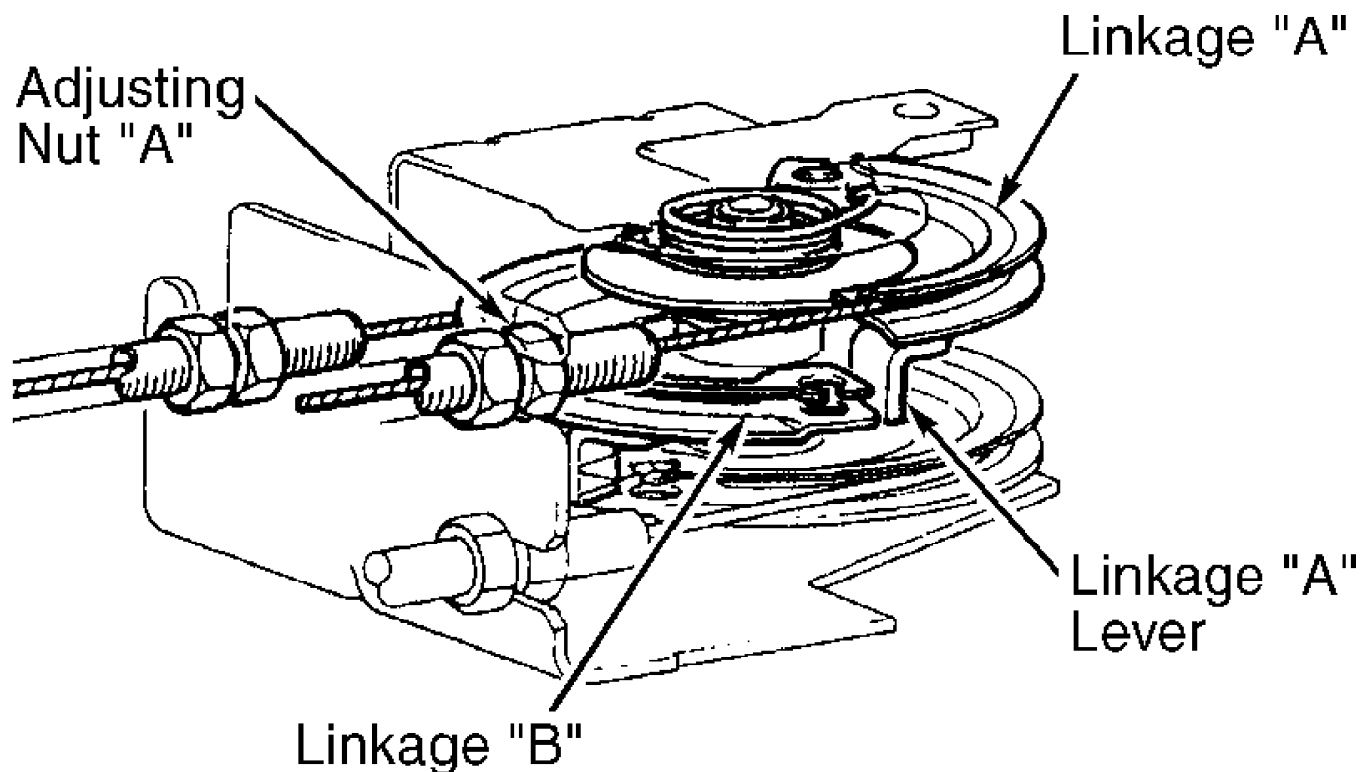
Component	Location
Clutch Pedal	
Position Switch	On Clutch Pedal Bracket
Cruise Control Actuator	
Galant	On Right Rear Of Engine Compartment
3000GT	On Left Rear Of Engine Compartment
Cruise Control ECU	
Galant	Behind Center Of Dash, Under Radio
3000GT	Behind Right Kick Panel
Cruise Control Relay	
3000GT	Behind Center Of Dash, Forward Of Center Console
Data Link Connector (DLC)	Under Left Side Of Dash, Near Steering Column
Stoplight Switch	On Brake Pedal Bracket
Vacuum Pump	On Right Rear Of Engine Compartment
Vehicle Speed Sensor	On Top Of Transaxle

ADJUSTMENTS

CRUISE CONTROL CABLE

1) Warm engine to normal operating temperature. Ensure idle speed is as specified. See underhood label. Adjust as necessary. Turn engine off. Remove cable protector/cover. Ensure cable is free of harsh bends or kinks. Loosen lock nut at adjusting nut. See Fig. 1.

2) With end of linkage "A" lever held in contact with stopper on linkage "B", adjust cable play using adjusting nut "A" on cruise control cable (top cable) to .04-.08" (1-2 mm). Tighten lock nut.



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Fig. 1: Adjusting Cruise Control Cable
Courtesy of Mitsubishi Motor Sales of America

TROUBLE SHOOTING

* PLEASE READ THIS FIRST *

NOTE: For further trouble shooting information, see SYMPTOM TESTS.

PRELIMINARY CHECKS

Inspect vacuum pump, linkage assembly, actuator, cables and vacuum hoses. Ensure linkage and cables move smoothly. Ensure cables do not have excessive slack or tension.

CRUISE CONTROL SWITCH FUNCTION TEST

NOTE: Speed will not set beyond cruise control system speed limit of 124 MPH on both models.

NOTE: If vehicle speed decreases about 9 MPH less than the set speed, set speed will be canceled.

1) Cruise control switch is part of multifunction switch mounted on steering column. To operate cruise control system, turn cruise control switch to ON position. Ensure indicator light inside switch comes on.

2) Drive vehicle to about 25 MPH or greater. Press and release SET button. Vehicle speed should stay at set speed. Instrument cluster cruise indicator light should illuminate. To increase set speed, turn cruise control switch to RESUME position and hold until new set speed is reached.

3) To lower set speed, press SET button and hold until new set speed is reached. To return to set speed after cancellation, move RESUME switch to ON position. Vehicle speed should return to previous setting before cancellation. Set speed should cancel when any of the following occurs:

- * Brake pedal is depressed.
- * Clutch pedal is depressed.
- * Cruise control cancel switch is activated.
- * Cruise control main switch is turned to OFF position.
- * Transmission is shifted to Neutral.

SYMPTOM TESTS

NOTE: To diagnose symptom, see Fig. 2, then go to appropriate test under CIRCUIT TESTS.

Trouble symptom		Circuit Test No.
Communication with scan tool is not possible.	Communication with all systems is not possible.	1
	Communication with auto-cruise control-ECU only is not possible.	2
Input switch inspection using the scan tool is not possible. (However, diagnostic inspection is possible.)		3
Auto-cruise control does not cancel.	When brake pedal is depressed	4
	When clutch pedal is depressed <M/T>	5
	When select lever is set to N range <A/T>	6
	When CANCEL switch is set to ON	7
The diagnosis result displayed on the scan tool is normal even though auto-cruise control cannot be set.		8
Auto-cruise control cannot be set.		9
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed.		10
When the auto-cruise control main switch is ON, the switch indicator on the instrument panel does not illuminate. (However, auto-cruise control is normal.)		11
Auto-cruise control main switch illumination light does not illuminate.		12
Auto-cruise control indicator light inside combination meter does not illuminate. (However, auto-cruise control is normal.)		13

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Fig. 2: Symptoms Chart

Courtesy of Mitsubishi Motor Sales of America

CIRCUIT TESTS

NOTE: To identify connector terminals, see WIRING DIAGRAMS.

Test No. 1 (Communication With Scan Tool Not Possible On All Systems)

1) Check voltage between ground and Data Link Connector (DLC) terminal No. 16 (Brown/Red wire on Galant or Red/Black wire on 3000GT). See WIRING DIAGRAMS. See Fig. 6. If battery voltage is present, go to step 3). If battery voltage is not present, go to next step.

2) Check joint connector and junction block between DLC terminal No. 16. See WIRING DIAGRAMS. If connectors are okay, check circuit between power supply and DLC. Repair as necessary.

3) Check continuity between ground and DLC terminals No. 4 (Black wire) and No. 5 (Black wire). See Fig. 6. If continuity is present, replace scan tool and retest. If continuity is not present, check circuit between ground and DLC. See WIRING DIAGRAMS. Repair as necessary.

Test No. 2 (Communication With Scan Tool Not Possible With Cruise Control ECU)

1) To check cruise control main switch circuit malfunction, go to next step. To check cruise control ECU ground circuit malfunction, go to step 4).

2) Check cruise control main switch. See CRUISE CONTROL MAIN SWITCH TEST under COMPONENT TESTS. Replace as necessary. If switch is okay, check voltage between ground and switch harness-side connector terminal No. 1 (Black/White wire) on Galant, or terminal No. 3 (Black/White wire) on 3000GT. See WIRING DIAGRAMS. If battery voltage is present, go to next step. If battery voltage is not present, go to step 6).

3) Check harness connectors to main switch and power supply. Repair as necessary. If connectors are okay, check circuit between cruise control main switch and ground or between cruise control main switch and cruise control ECU. See WIRING DIAGRAMS. Repair as necessary.

4) Disconnect cruise control ECU harness connector. Check continuity between ground and harness-side connector terminals No. 6, 8 and 14. See WIRING DIAGRAMS. If continuity is present, go to next step. If continuity is not present, go to step 6).

5) Check cruise control ECU harness connector. Repair as necessary. If connector is okay, replace cruise control ECU.

6) Check joint connector between ECU and ground. Repair as necessary. If connector is okay, check circuit between cruise control main switch and power supply. Repair as necessary.

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS article. Do not apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

Test No. 3 (Input Switch Inspection With Scan Tool Not Possible; Diagnostic Inspection Is Possible)

1) Check cruise control multifunction switch. See CRUISE CONTROL MULTIFUNCTION SWITCH TEST under COMPONENT TESTS. Replace switch as necessary. If switch is okay, go to next step.

2) Check clockspring. See CLOCKSPRING TEST under COMPONENT TESTS. Replace clockspring as necessary. If clockspring is okay, go to next step.

3) Disconnect clockspring harness connector. Check voltage between ground and harness-side of connector terminal No. 2 (Blue wire). If battery voltage is present, go to next step. If battery voltage is not present, go to step 5).

4) Check harness connector to clockspring and cruise control ECU. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, check circuit between clockspring and cruise control ECU. Repair as necessary.

5) Check harness connector to clockspring, junction block connectors to power supply, and harness connector between clockspring and power supply. Repair as necessary. If connectors are okay, check circuit between clockspring and power supply. See WIRING DIAGRAMS. Repair as necessary.

Test No. 4 (Cruise Control Does Not Cancel With Brake Pedal Depressed)

1) Check if stoplights operate/illuminate. If stoplights illuminate, replace cruise control ECU. If stoplights do not illuminate, go to next step.

2) Check stoplight switch. See STOPLIGHT SWITCH TEST under COMPONENT TESTS. Replace stoplight switch if faulty. If switch is okay, go to next step.

3) Disconnect stoplight switch harness connector. Check voltage between ground and stoplight switch harness-side connector terminal No. 2 (Green/Black wire on Galant or Red/Black wire on 3000GT). If battery voltage is present, go to next step. If battery voltage is not present, go to step 5).

4) Check joint connectors and cruise control ECU harness connector. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, check circuit between stoplight switch and cruise control ECU. Repair as necessary.

5) Check stoplight switch harness connector or joint connector between power supply and stoplight switch. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, check circuit between stoplight switch and power supply. Repair as necessary.

Test No. 5 (Cruise Control Does Not Cancel With Clutch Depressed)

1) Check clutch pedal position switch. See CLUTCH PEDAL POSITION SWITCH TEST under COMPONENT TESTS. Replace switch if faulty. If clutch pedal position switch is okay, go to next step.

2) Disconnect clutch pedal position switch. Check voltage between ground and clutch pedal position switch harness-side connector terminal No. 2 (Green/Black wire on Galant or Black/Yellow wire on 3000GT). If battery voltage is present, go to next step. If battery voltage is not present, go to step 4).

3) Check harness connectors to clutch pedal position switch and ground circuit. Repair as necessary. If connectors are okay, check circuit between clutch pedal position switch and ground. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, replace cruise control ECU.

4) Check cruise control harness connector. Repair as necessary. If connector is okay, check circuit between clutch pedal position switch and cruise control ECU. See WIRING DIAGRAMS. Repair as necessary.

Test No. 6 (Cruise Control Does Not Cancel With A/T Select Lever In "N")

1) Check park/neutral switch. See PARK/NEUTRAL SWITCH TEST under COMPONENT TESTS. Replace as necessary. If switch is okay, go to next step.

2) Check voltage between ground and park/neutral switch harness-side connector terminal No. 5 (Galant) or terminal No. 7 (3000GT). See WIRING DIAGRAMS. If battery voltage is present, go to next step. If battery voltage is not present, go to step 4).

3) Check park/neutral switch harness connector. Repair as necessary. If connector is okay, check circuit between park/neutral switch and ground. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, replace cruise control ECU.

4) Check starter relay. See STARTERS article in the STARTING & CHARGING SYSTEMS section. Replace as necessary. If relay is okay, check harness connectors to cruise control ECU, cruise control vacuum pump to cruise control ECU, and starter relay. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, check circuit between park/neutral switch and cruise control ECU. Repair as necessary.

Test No. 7 (Cruise Control Does Not Cancel Using CANCEL Switch)

Replace cruise control multifunction switch.

Test No. 8 (Scan Tool Diagnostic Result Is Normal But Cruise Control Cannot Be Set)

1) Disconnect cruise control ECU harness connector. Check voltage between ground and cruise control ECU harness connector terminal No. 16 (Red/Black wire). If battery voltage is present, go to next step. If battery voltage is not present, go to step 3).

2) Check cruise control ECU harness connector. Repair as necessary. If connector is okay, replace cruise control ECU.

3) Check harness connector to body harness junction block between power supply, cruise control ECU and main switch. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, check circuit between cruise control ECU and power supply. Repair as necessary.

Test No. 9 (Cruise Control Cannot Be Set)

1) Check if scan tool can communicate with cruise control system. If communication is not possible, go to TEST NO. 2. If communication is possible, go to next step for Galant or step 6) for 3000GT.

2) Check if system diagnosis displayed on scan tool is normal. If system diagnosis is not normal, go to TEST NO. 8. If system diagnosis is normal, go to next step.

3) Check if trouble code 11, 12, 15, 16 or 17 is present. If code(s) are present, go to appropriate trouble code diagnosis. See SELF-DIAGNOSTIC SYSTEM. If codes(s) are not present, go to next step.

4) Check if input switch inspection is possible using scan tool. If input switch inspection is not possible, go to TEST NO. 3. If input switch inspection is possible, go to next step.

5) Check if trouble code 23 or 26 is present. If code 23 is present, go to TEST NO. 14. If code 26 is present, go to TEST NO. 15. If trouble code(s) are not present, replace cruise control ECU.

6) Check if input switch inspection is possible using scan tool. If input switch inspection is possible, go to next step. If input switch inspection is not possible, go to TEST NO. 3.

7) Check if code 21, 22 or 27 is present. If any of these code(s) are present, replace cruise control ECU. If code 21, 22 or 27 is not present, go to next step.

8) Check if input switch code 23 or 26 is present. If code(s) are present, go to next step. If code(s) are not present, replace cruise control ECU.

9) If code 23 is present, go to TEST NO. 14. If code 26 is present, go to TEST NO. 15.

Test No. 10 (Hunting Occurs At Set Vehicle Speed)

1) Check vehicle speed sensor. See VEHICLE SPEED SENSOR TEST under COMPONENT TESTS. Replace as necessary. If sensor is okay, go to next step.

2) Check cruise control vacuum pump. See VACUUM PUMP TEST

under COMPONENT TESTS. Replace as necessary. If cruise control pump is okay, check actuator. See ACTUATOR TEST under COMPONENT TESTS. Replace as necessary. If actuator is okay, replace cruise control ECU.

Test No. 11 (Cruise Control Indicator On Instrument Panel Does Not Illuminate; Cruise Control Is Normal)
Replace cruise control main switch.

Test No. 12 (Cruise Control Main Switch Indicator Light Does Not Illuminate)

1) Check cruise control main switch. See CRUISE CONTROL MAIN SWITCH TEST under COMPONENT TESTS. Replace as necessary. If switch is okay, go to next step.

2) Check voltage between ground and harness-side of cruise control main switch connector terminal No. 2 (Green/White wire). If battery voltage is present, go to next step. If battery voltage is not present, go to step 4).

3) Check harness connector to cruise control main switch. Repair as necessary. If connector is okay, check circuit between cruise control main switch and rheostat.

4) Check harness connectors to power supply. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, check circuit between cruise control main switch and power supply.

Test No. 13 (Cruise Control Indicator In Combination Meter Does Not Illuminate; Cruise Control Is Normal)

1) Remove combination meter. See COMBINATION METER/INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. On Galant, check continuity between combination meter terminals No. 24 and 33. On 3000GT, check continuity between combination meter terminals No. 57 and 59. See WIRING DIAGRAMS. On all models, if continuity is not present, replace cruise control indicator. If continuity is present, go to next step.

2) Ground cruise control ECU harness-side connector terminal No. 23 (Light Green/Red wire). If cruise control indicator illuminates, replace cruise control ECU. If cruise control indicator does not illuminate, go to next step.

3) Check harness connector to combination meter, instrument panel-to-body wiring and cruise control ECU. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, check circuit between combination meter and cruise control ECU. Repair as necessary.

Test No. 14 (Stoplight Switch Input Circuit Check)

1) Check stoplight switch. See STOPLIGHT SWITCH TEST under COMPONENT TESTS. Replace as necessary. If stoplight switch is okay, go to next step.

2) Check harness connector to cruise control ECU and power supply. Repair as necessary. If connectors are okay, check circuit between jumper connector and cruise control ECU. Repair as necessary.

Test No. 15 (Clutch Pedal Position Switch Or P/N Switch)

1) For A/T models, go to next step. For M/T models, check clutch pedal position switch. See CLUTCH PEDAL POSITION SWITCH TEST under COMPONENT TESTS. Replace as necessary. If switch is okay, check circuit between clutch pedal position switch and cruise control ECU. See WIRING DIAGRAMS. Repair as necessary.

2) Check Park/Neutral (P/N) switch. See PARK/NEUTRAL SWITCH TEST under COMPONENT TESTS. Replace as necessary. If switch is okay, check starter relay. See STARTERS article in the STARTING & CHARGING SYSTEMS section. Replace as necessary. If relay is okay, check harness connector to starter relay. Repair as necessary. If connector is okay, check circuit between cruise control ECU and power supply. Repair as necessary.

COMPONENT TESTS

ACTUATOR TEST

Remove actuator. Apply vacuum to actuator. Actuator linkage holder should move greater than 1.4" (35 mm). Actuator diaphragm should hold vacuum.

CLUTCH PEDAL POSITION SWITCH TEST

Disconnect clutch pedal position switch connector. Continuity should be present between clutch pedal position switch terminals when clutch pedal is depressed. If continuity is not present, replace clutch switch.

CRUISE CONTROL MAIN SWITCH TEST

Disconnect cruise control main switch harness connector. Remove main switch from instrument panel. Check continuity between specified switch terminals. See MAIN SWITCH TEST table. Replace as necessary.

MAIN SWITCH TEST TABLE

Application & Terminal No.	Condition
Galant	
OFF Position	
2 & 7	Continuity
NEUTRAL Position	
2 & 7	Continuity
4 & 5	Continuity
ON Position	
1 & 4	Continuity
1 & 5	Continuity
2 & 7	Continuity
3000GT	
OFF Position	
2 & 6	Continuity
NEUTRAL Position	
1 & 4	Continuity
2 & 6	Continuity
ON Position	
1 & 3	Continuity
1 & 4	Continuity
2 & 6	Continuity

CRUISE CONTROL MULTIFUNCTION SWITCH TEST

Disconnect cruise control multifunction switch harness connector. Check continuity or resistance between switch terminals No. 1 and 2. See MULTIFUNCTION SWITCH TEST table. Replace as necessary.

MULTIFUNCTION SWITCH TEST TABLE

Switch Position	Condition
OFF	No Continuity
CANCEL (Switch On)	Zero Ohms

RESUME (Switch On)	820 Ohms
SET (Switch On)	2700 Ohms

CRUISE CONTROL RELAY TEST

3000GT

1) Remove cruise control relay. Relay is located on firewall, mounted on cruise control linkage protector/cover. Using a jumper wire, connect battery voltage to relay terminal No. 2 and ground terminal No. 4. Continuity should be present between relay terminals No. 1 and 3. See WIRING DIAGRAMS.

2) Remove power supply to relay. Check continuity between relay terminals No. 2 and 4. Continuity should be present. Check continuity between relay terminals No. 1 and 3. Continuity should not be present. Replace relay as necessary.

PARK/NEUTRAL SWITCH TEST

Disconnect Park/Neutral (P/N) switch harness connector. On Galant, continuity should exist between connector terminals No. 5 (Black/Red wire on models with theft alarm, or Black/Yellow wire on models without theft alarm) and No. 8 (Black/Blue wire). On 3000GT, continuity should exist between connector terminals No. 7 (Black/Red wire) and No. 8 (Black/Yellow wire) when shift lever is in "N" position. If continuity is not as specified, replace switch.

STOPLIGHT SWITCH TEST

Disconnect switch harness connector. When brake pedal is depressed, continuity should exist between terminals No. 2 and 3. See WIRING DIAGRAMS. When brake pedal is released, continuity should exist between terminals No. 1 and 4. If continuity is not as specified, replace stoplight switch.

THROTTLE POSITION SENSOR TEST

1) Disconnect throttle position sensor harness connector. Check resistance between sensor terminals No. 1 and 4. See WIRING DIAGRAMS. Resistance should be 3.5-6.5 ohms.

2) Connect an analog ohmmeter between sensor terminals No. 2 and 4. Operate throttle valve slowly from idle to wide open throttle. Resistance should change smoothly as throttle is opened and closed. Replace throttle position sensor as necessary.

VACUUM PUMP TEST

Galant

1) Disconnect vacuum hose from vacuum pump. Connect a vacuum gauge to vacuum pump. Disconnect vacuum pump harness connector.

2) Using jumper wires, connect battery voltage to pump harness connector terminal No. 1 and connect terminals No. 3 and 4 to ground. Connect another jumper between ground and terminal No. 2. Vacuum pump should start and vacuum gauge should read about 15.7 in. Hg.

3) Disconnect jumper wire from vacuum pump terminals No. 2 and 3. Vacuum gauge should read 6 in. Hg or less. If vacuum pump does not operate or vacuum readings are not as specified, replace vacuum pump.

3000GT

1) Disconnect vacuum pump harness connector. Check resistance

between vacuum pump connector terminals No. 1 and 2 and terminals No. 1 and 3. Resistance should be 50-60 ohms.

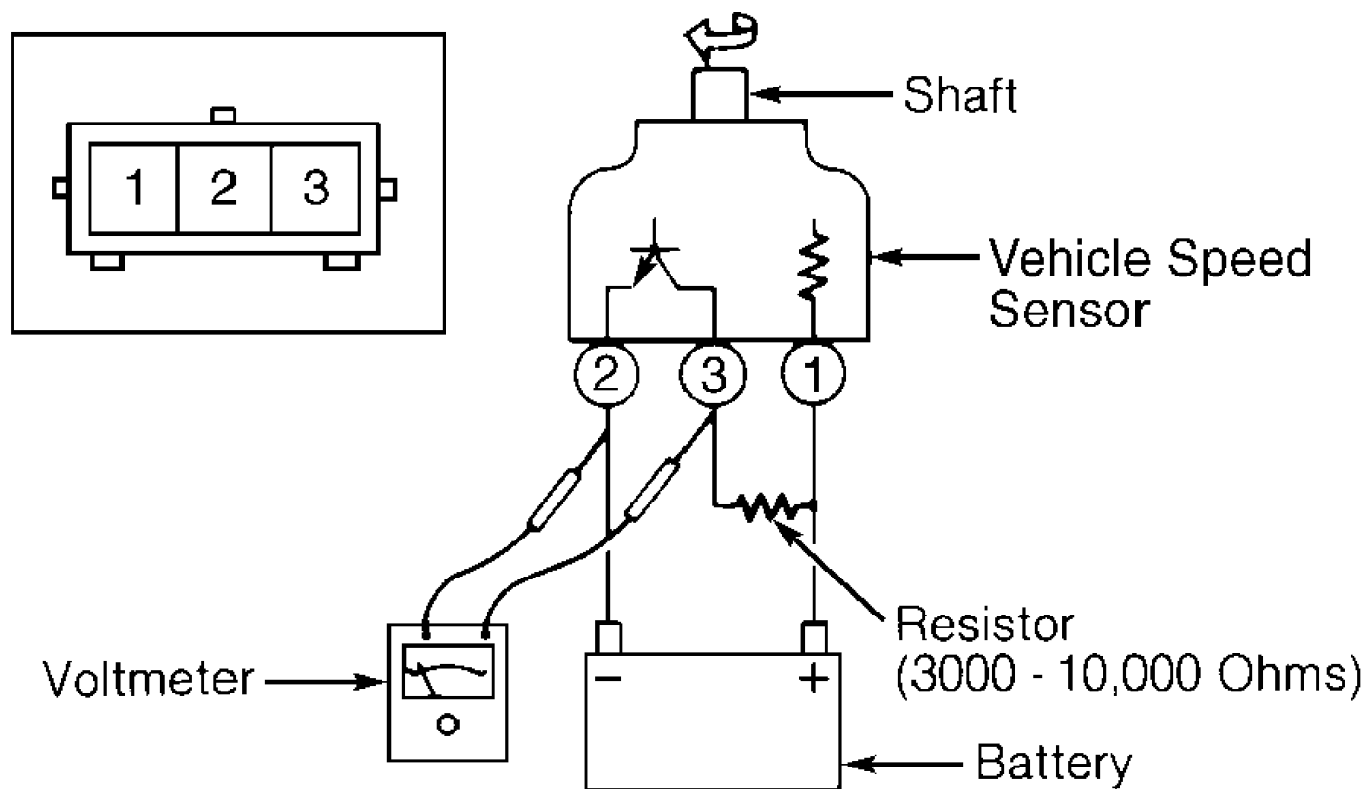
2) Using a jumper wire, apply battery voltage to vacuum pump connectors No. 1 and 2 and terminals No. 1 and 3. If vacuum pump solenoids are activated, go to next step. If solenoids are not activated, replace vacuum pump.

3) Using jumper wires, apply battery voltage to pump terminals No. 1 and 4. Vacuum pump should operate. If pump does not operate, replace vacuum pump.

VEHICLE SPEED SENSOR TEST

1) Remove vehicle speed sensor from transaxle. Jumper a 3000-10,000 ohm resistor between sensor terminals No. 1 and 3. Connect battery positive to sensor terminal No. 1 and battery negative to sensor terminal No. 2. See Fig. 3.

2) Connect a voltmeter between sensor terminals No. 2 and 3. Manually turn speed sensor shaft. Voltage should pulse 4 times each revolution. Replace vehicle speed sensor if voltage is not as specified.



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Fig. 3: Checking Vehicle Speed Sensor
Courtesy of Mitsubishi Motor Sales of America

CLOCKSPRING TEST

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS article. Do not apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

If clockspring fails any check, replace with a NEW clockspring.

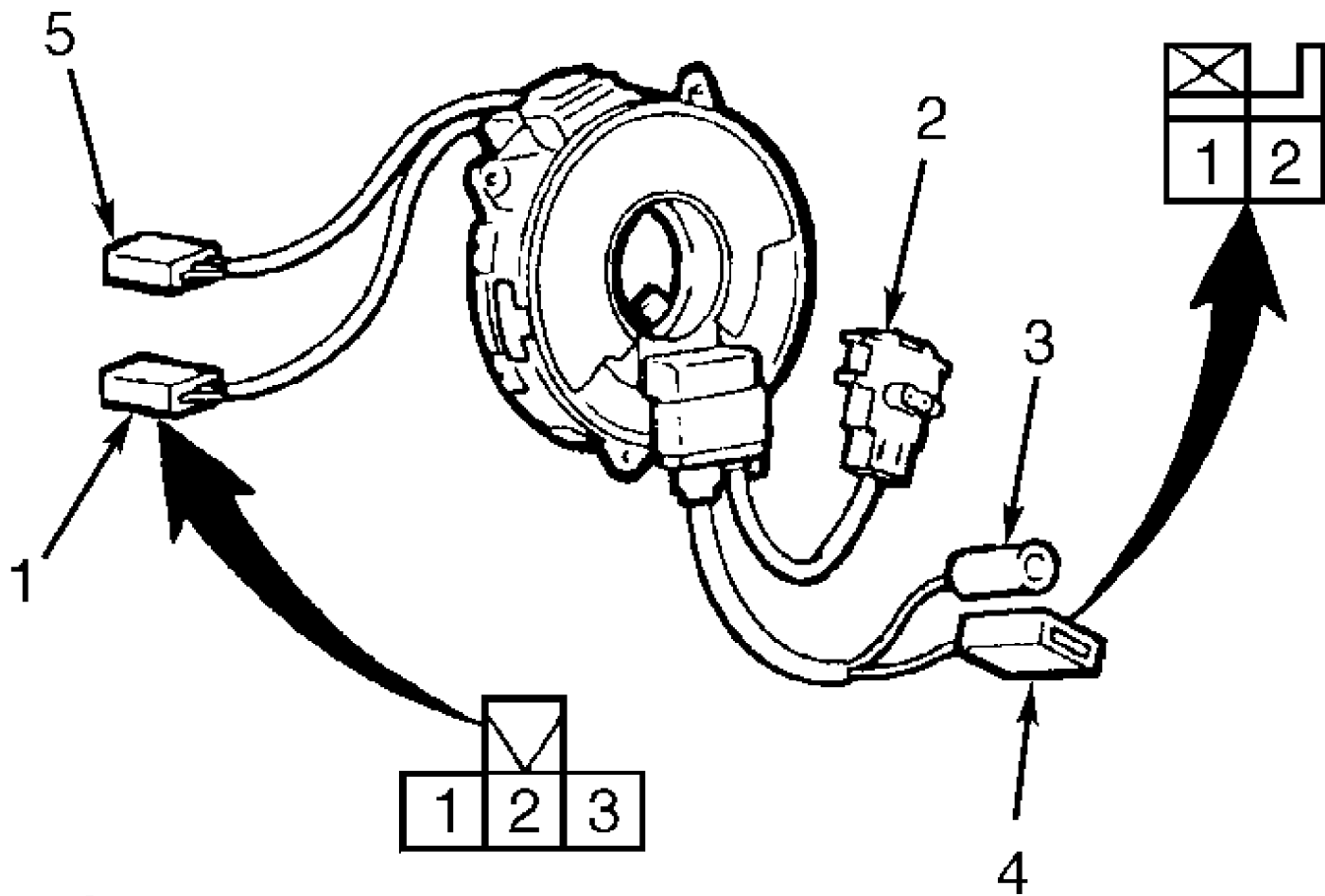
1) Check connectors and protective tube for damage and deformities.

2) Visually check case for damage or deformities.

3) Continuity should be present between:

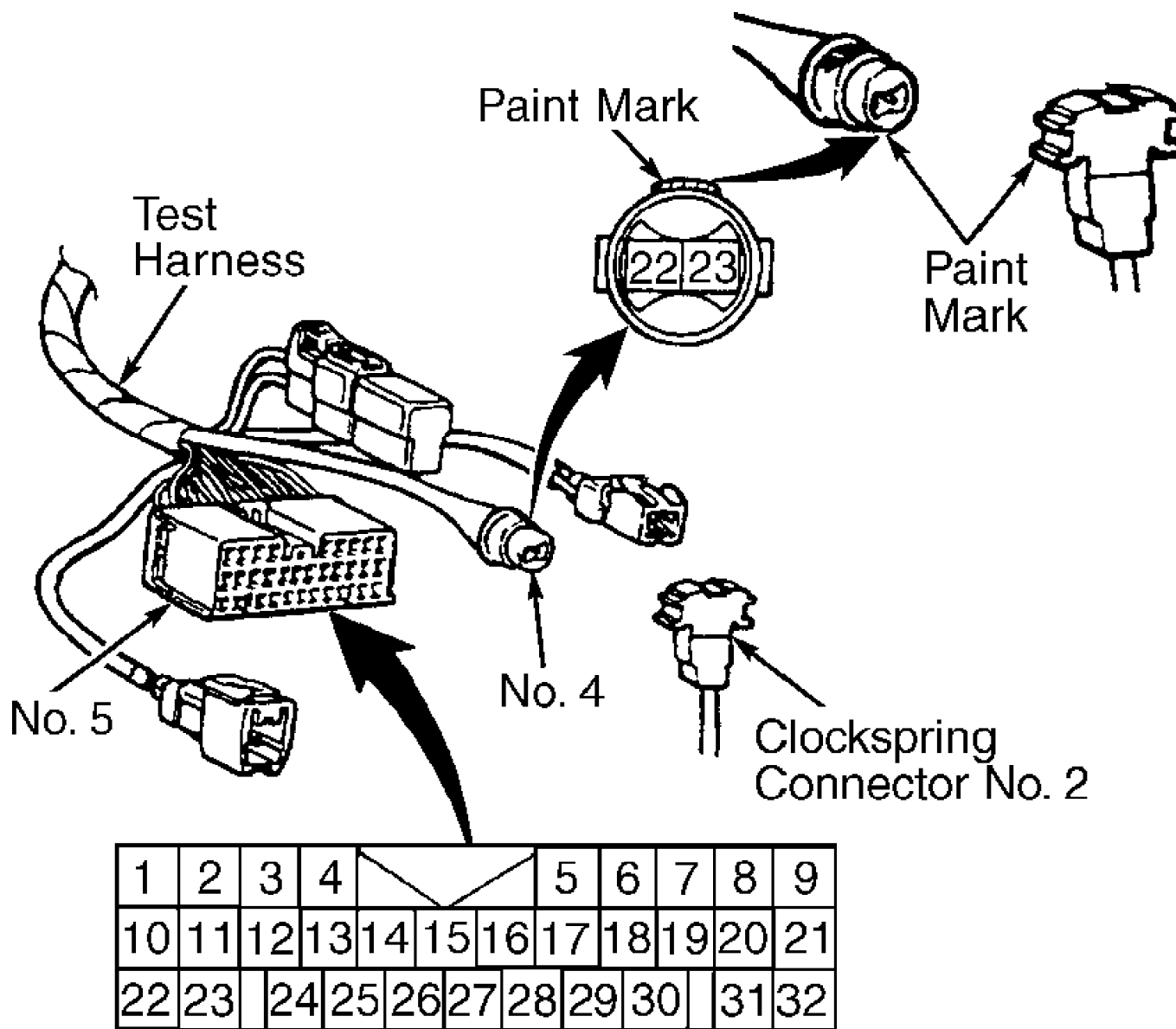
- * Connector No. 1, terminal No. 1 and connector No. 4, terminal No. 2.
 - * Connector No. 1, terminal No. 2 and connector No. 4, terminal No. 1.
 - * Connector No. 1, terminal No. 3 and connector No. 3.
- See Fig. 4.

4) Align paint mark on SRS connector No. 4 with notch in clockspring connector No. 2 and join connectors. See Fig. 5. Using a DVOM, check for continuity between terminals No. 22 and 23 at SRS Test Harness (MB991613) connector No. 5.



96C06404

Fig. 4: Identifying Clockspring Connectors
Courtesy of Mitsubishi Motor Sales of America



98103804

Fig. 5: Identifying SRS Harness Connectors
 Courtesy of Mitsubishi Motor Sales of America

SELF-DIAGNOSTIC SYSTEM

SELF-DIAGNOSTICS

NOTE: Self-diagnostics should be performed when cruise control cancels without driver using normal cancel modes.

RETRIEVING TROUBLE CODES

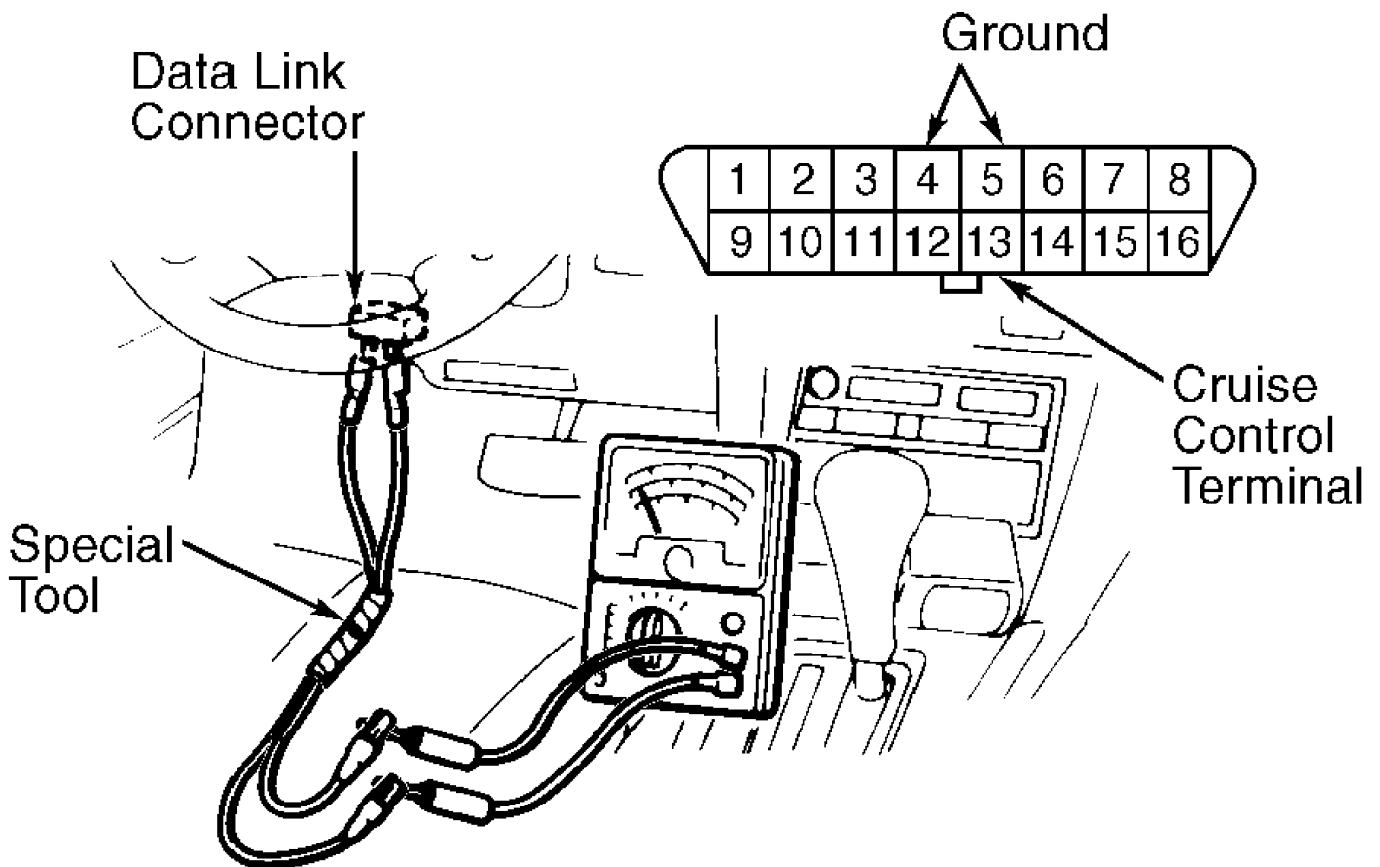
1) Use scan tool or an analog voltmeter for code retrieval. Turn ignition off. Install scan tool. Turn ignition and cruise control main switch on. Read trouble codes. See

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION table. In order to diagnose trouble code(s), go to DIAGNOSTIC TESTS.

2) If using an analog voltmeter, connect Diagnostic Trouble Code Check Harness (MB991529) leads between DLC terminals No. 4 or 5 (ground) and No. 13 (output). See Fig. 6. Connect voltmeter to check harness. Read voltmeter needle sweeps to determine trouble code. Once trouble codes have been displayed, see DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION table. In order to diagnose trouble code(s), go to DIAGNOSTIC TESTS.

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION TABLE

Code	Probable Cause
11	Vacuum Pump Drive System
12	Vehicle Speed Signal System
15	Cruise Control Switch
16	Cruise Control ECU
17	Throttle Position Sensor



97C04264

Fig. 6: Identifying Data Link Connector (DLC) Terminals
 Courtesy of Mitsubishi Motor Sales of America

RETRIEVING INPUT SWITCH CODES

NOTE: System input switch test should be performed if no trouble codes are stored when performing self-diagnostics. System

input tests cycle each cruise control switch and sensor.

1) Use scan tool or an analog voltmeter for code retrieval. Turn ignition off. Install scan tool. Turn ignition and cruise control SET switch on. Turn on cruise control main switch, and within one second, turn on RESUME switch.

2) Operate each switch listed in CHECK RESULTS CODE IDENTIFICATION table, and read input switch codes on scan tool or voltmeter. Repair or replace components as necessary.

CHECK RESULTS CODE IDENTIFICATION TABLE

Code	Input Operation
21 SET Switch ON
22 RESUME Switch ON
23 Stoplight Switch ON (Brake Pedal Depressed)
24 (1) Vehicle Speed Signal
25 (2) Vehicle Speed Signal
26 (3) P/N Switch ON With Lever In "N" Range (A/T) Or (3) Clutch Pedal Position Switch (M/T)
27 CANCEL Switch ON
28 (4) Throttle Position (TP) Sensor Signal
29 (5) Closed Throttle Position Switch

- (1) - ECU determines that vehicle speed is 25 MPH or greater.
 - (2) - ECU determines that vehicle speed is less than 25 MPH.
 - (3) - ECU determines that P/N or clutch pedal position switch is ON.
 - (4) - ECU determines that TP sensor voltage is 1.5 volts or greater.
 - (5) - ECU determines that closed throttle position switch is OFF.
-

CLEARING TROUBLE CODES

To clear trouble codes, disconnect negative battery cable for about 10 seconds. Codes can also be cleared by turning ignition on and then turning on cruise control SET switch. Turn cruise main switch on, and within one second, turn RESUME switch on. Depress brake pedal and hold cruise control SET switch in ON position for 5 seconds or more. Verify codes are cleared.

DIAGNOSTIC TESTS

CODE 11: CRUISE CONTROL VACUUM PUMP SYSTEM

1) Check cruise control vacuum pump. See VACUUM PUMP TEST under COMPONENT TESTS. Replace as necessary. If vacuum pump is okay, go to next step.

2) Disconnect vacuum pump harness connector. Check voltage between ground and vacuum pump harness-side connector terminal No. 1. See WIRING DIAGRAMS. If battery voltage is present, go to next step. If battery voltage is not present, go to step 4).

3) Disconnect cruise control ECU harness connector. Check voltage between ground and ECU harness-side connector terminals No. 12, 13 and 26. See WIRING DIAGRAMS. If battery voltage is present, go to step 5). If battery voltage is not present, go to step 6).

4) Check stoplight switch. See STOPLIGHT SWITCH TEST under

COMPONENT TESTS. Replace as necessary. If switch is okay, check harness connectors to stoplight switch, cruise control vacuum pump and power supply. Repair as necessary. If connectors are okay, check circuit between cruise control main switch and vacuum pump. See WIRING DIAGRAMS. Repair as necessary.

5) Check harness connector to cruise control ECU. Repair as necessary. If connector is okay, replace cruise control ECU.

6) Check harness connectors to cruise control ECU and vacuum pump. Repair as necessary. If connectors are okay, go to next step.

7) Check circuit between cruise control vacuum pump and cruise control ECU. See WIRING DIAGRAMS. Repair as necessary.

CODE 12: VEHICLE SPEED SIGNAL

Galant

1) Check vehicle speed sensor. See VEHICLE SPEED SENSOR TEST under COMPONENT TESTS. Replace sensor as necessary. If sensor is okay, go to next step.

2) Disconnect vehicle speed sensor harness connector. Turn ignition on. Check voltage between ground and sensor harness-side connector terminal No. 1 (Black/White wire). If battery voltage is present, go to next step. If battery voltage is not present, check circuit between sensor and ignition switch. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, check ignition switch. See STEERING COLUMN SWITCHES article. Replace as necessary.

3) Check voltage between ground and sensor harness-side connector terminal No. 3 (Yellow/White wire). Reading should be 4.8-5.2 volts. If voltage is as specified, go to next step. If voltage is not as specified, check harness connectors and circuit between cruise control ECU and vehicle speed sensor. See WIRING DIAGRAMS. Repair as necessary. If connectors and circuits are okay, replace cruise control ECU.

4) Check continuity between ground and vehicle speed sensor harness-side connector terminal No. 2 (Black wire). If continuity is present, go to next step. If continuity is not present, check harness between vehicle speed sensor and ground. See WIRING DIAGRAMS. Repair as necessary.

5) Check harness connectors to vehicle speed sensor, joint connector between combination meter and PCM, and joint connector between ignition switch and overdrive switch. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, go to next step.

6) Check circuit between cruise control ECU and vehicle speed sensor. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, replace cruise control ECU.

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1) Check vehicle speed sensor. See VEHICLE SPEED SENSOR TEST under COMPONENT TESTS. Replace sensor as necessary. If sensor is okay, go to next step.

2) Disconnect vehicle speed sensor harness connector. Turn ignition on. Check voltage between ground and sensor harness-side connector terminal No. 3 (Yellow wire). Reading should be 4.5 volts or greater. If voltage is as specified, go to next step. If voltage is not as specified, check harness connectors and circuit between cruise control ECU and vehicle speed sensor. See WIRING DIAGRAMS. Repair as necessary.

3) Check continuity between ground and vehicle speed sensor harness-side connector terminal No. 2 (Black wire). If continuity is present, go to next step. If continuity is not present, check harness between vehicle speed sensor and ground. See WIRING DIAGRAMS. Repair as necessary.

4) Check harness connectors to vehicle speed sensor. See WIRING DIAGRAMS. Repair as necessary. If connectors are okay, replace

cruise control ECU.

CODE 15: CRUISE CONTROL SWITCH

This code sets if cruise control RESUME, SET or CANCEL switch remains on. Replace cruise control multifunction switch.

CODE 16: CRUISE CONTROL ECU

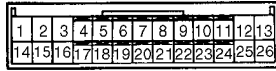
This code sets if there is an abnormality in CANCEL hold circuit or in microprocessor monitor circuit in cruise control ECU. Replace cruise control ECU.

CODE 17: THROTTLE POSITION SENSOR

1) Check if PCM DTC P0120 (engine performance code) is also present. If DTC P0120 is present, diagnose using G - TESTS W/CODES article in the ENGINE PERFORMANCE section. If DTC P0120 is not present, go to next step.

2) Check harness connector to cruise control ECU. Repair as necessary. If connector is okay, check circuit between throttle position sensor and cruise control ECU. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, replace cruise control ECU.

PIN VOLTAGE TESTS



Terminal No.	Check item	Check conditions		Normal condition
1	Clutch pedal position switch input <M/T>	When pedal is not depressed	When clutch pedal position switch is OFF	Battery positive voltage
		When pedal is depressed	When clutch pedal position switch is ON	0V
	Park/neutral position switch input <A/T>	When select lever is in a position other than N range	When park/neutral position switch is OFF	5V - Galant 12V - 3000GT
		When select lever is in N range	When park/neutral position switch is ON	0V
2	ECU power supply	When ignition switch is ON		Battery positive voltage
3	Power supply for OD signal control <A/T>	-		Battery positive voltage
4	Closed throttle position switch output	When accelerator pedal is depressed	When idle switch is OFF	4.5-5.5V
		When accelerator pedal is not depressed	When idle switch is ON	0V
5	Throttle position sensor input	When accelerator pedal is fully depressed		4.0-5.5V
		When accelerator pedal is released		0.5-0.7V
6	Ground	-		Continuity
8	Ground	-		Continuity
10	OD control output <A/T>	When OD switch is ON		Battery positive voltage
		When OD switch is OFF		0V
11	OD switch input <A/T>	When OD switch is ON		Battery positive voltage
		When OD switch is OFF		0V
12	Auto-cruise vacuum pump release valve and control valve input	When driving at constant speed using the SET switch	Release valve closed	0V
13			Control valve closed	0V
12		When accelerating with the RESUME switch while driving at constant speed	Release valve closed	0V
13			Release valve closed	0V
12		When decelerating with the SET switch while driving at constant speed	Release valve closed	0V
13			Control valve open	Battery positive voltage
12		When cancelling constant-speed driving with the CANCEL switch	Release valve open	Battery positive voltage
13			Control valve open	Battery positive voltage
14	Ground	-		Continuity

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Fig. 7: Pin Voltage Chart (1 Of 2)
 Courtesy of Mitsubishi Motor Sales of America

Terminal No.	Check item	Check conditions		Normal condition
15	Stop light switch input	When brake pedal is depressed	When stop light switch is ON	Battery positive voltage
		When brake pedal is not depressed	When stop light switch is OFF	0V
16	ECU backup power supply	-		Battery positive voltage
18	Auto-cruise control switch input	When SET switch is pressed	When SET switch is ON	3V
		When SET switch is not pressed	When SET switch is OFF	0V
		When RESUME switch is pressed	When RESUME switch is ON	6V
		When RESUME switch is not pressed	When RESUME switch is OFF	0V
		When CANCEL switch is pressed	When CANCEL switch is ON	Battery positive voltage
		When CANCEL switch is not pressed	When CANCEL switch is OFF	0V
19	Vehicle speed sensor input	When vehicle is moved forwards and backwards, sensor turns ON and OFF repeatedly.	When sensor is ON	0V
			When sensor is OFF	4.5 V or more
20	ACC power supply	When ignition switch is in ACC position		Battery positive voltage
23	Indicator input (inside combination meter)	When driving at constant speed	When indicator is illuminated	0V
		When constant-speed driving is cancelled	When indicator is switched off	Battery positive voltage
24	Diagnosis control input	When ignition switch is ON		4V or more
26	Auto-cruise vacuum pump motor input	When driving at constant speed using the SET switch	Motor stopped	Battery positive voltage
		When accelerating with the RESUME switch while driving at constant speed	Motor running	0V
		When decelerating with the SET switch while driving at constant speed	Motor stopped	Battery positive voltage
		When cancelling constant-speed driving with the CANCEL switch	Motor stopped	Battery positive voltage

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Fig. 8: Pin Voltage Chart (2 Of 2)
 Courtesy of Mitsubishi Motor Sales of America

REMOVAL & INSTALLATION

*** PLEASE READ THIS FIRST ***

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS article. Do not apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in the GENERAL INFORMATION section before disconnecting battery.

AIR BAG MODULE

Removal & Installation

1) Remove air bag module mounting nuts from back of steering wheel. When disconnecting clockspring connector, press connector toward outer side to spread it open.

2) Disconnect clockspring connector from air bag module. DO NOT apply excessive force to connector. Lay air bag with pad cover face up. To install, reverse removal procedure. Recheck system operation. See AIR BAG RESTRAINT SYSTEMS article.

ACTUATOR

Removal & Installation

Remove linkage protector. Remove cruise control cable. Remove accelerator and throttle cables. Disconnect vacuum hoses and electrical connectors. Remove linkage assembly. Remove vacuum pump and bracket. Remove actuator and bracket. To install, reverse removal procedure.

CRUISE CONTROL ECU

Removal & Installation (Galant)

Remove center console panel. Remove radio assembly. Remove cruise control ECU. To install, reverse removal procedure.

Removal & Installation (3000GT)

Cruise control unit is located behind right kick panel. Remove kick panel. Remove cruise control ECU. To install, reverse removal procedure.

INDICATOR LIGHT

Removal & Installation

Indicator light is located in instrument cluster. Remove instrument cluster. See COMBINATION METER/INSTRUMENT CLUSTER. To install, reverse removal procedure.

COMBINATION METER/INSTRUMENT CLUSTER

Removal & Installation

1) Disconnect negative battery cable. Remove cluster cover. Remove cluster mounting screws. Disconnect all necessary electrical connectors. Remove combination meter/instrument cluster.

2) Disconnect speedometer cable at transaxle end. Pull speedometer cable slightly toward vehicle interior. Release adapter by turning left or right, and remove adapter. To install, reverse removal procedure.

MULTIFUNCTION SWITCH

WARNING: DO NOT hammer steering shaft. Collapsible steering column mechanism may be damaged.

Removal & Installation

Remove knee protector and lower panel. Remove column covers. Remove air bag module and bracket. See AIR BAG MODULE. Mark steering wheel location for installation reference. Using puller, remove steering wheel. Remove clip and column switch. To install, reverse removal procedure.

VEHICLE SPEED SENSOR

Removal & Installation

Vehicle speed sensor is located on top of transaxle. Remove hold-down bolt and remove sensor. To install, reverse removal procedure. Install NEW "O" ring.

WIRING DIAGRAMS

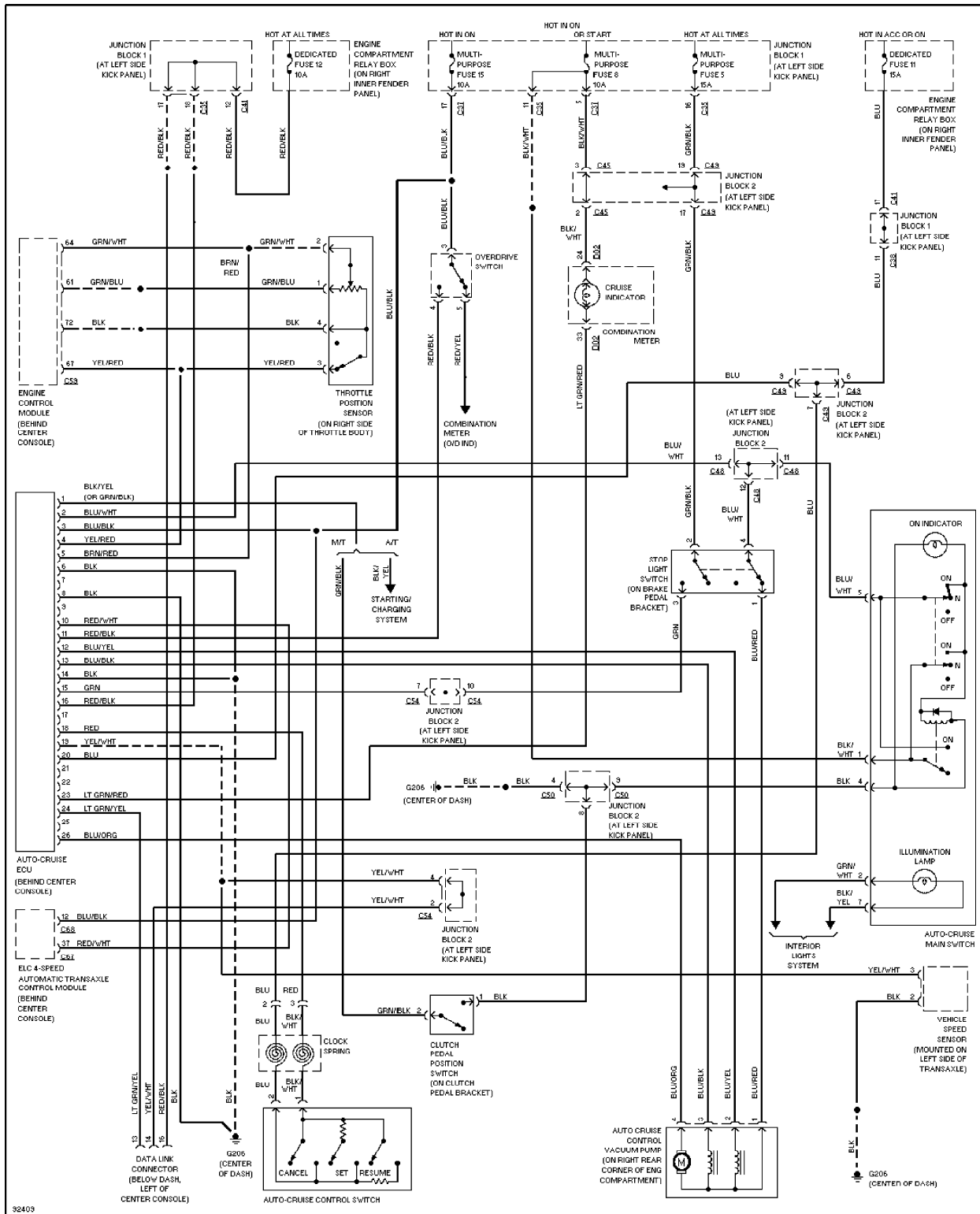


Fig. 9: Cruise Control System Wiring Diagram (Galant)

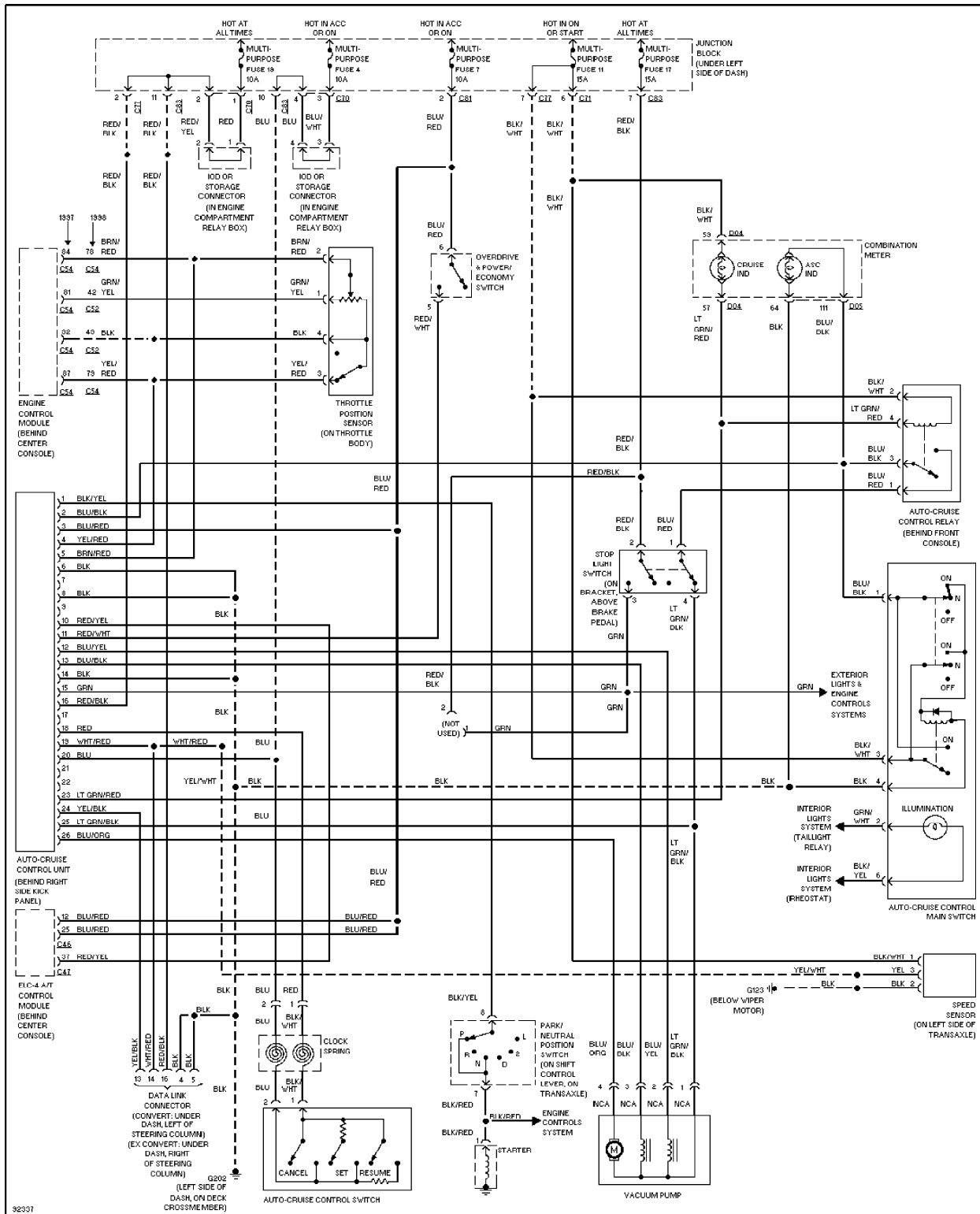


Fig. 10: Cruise Control System Wiring Diagram (3000GT - With A/T)

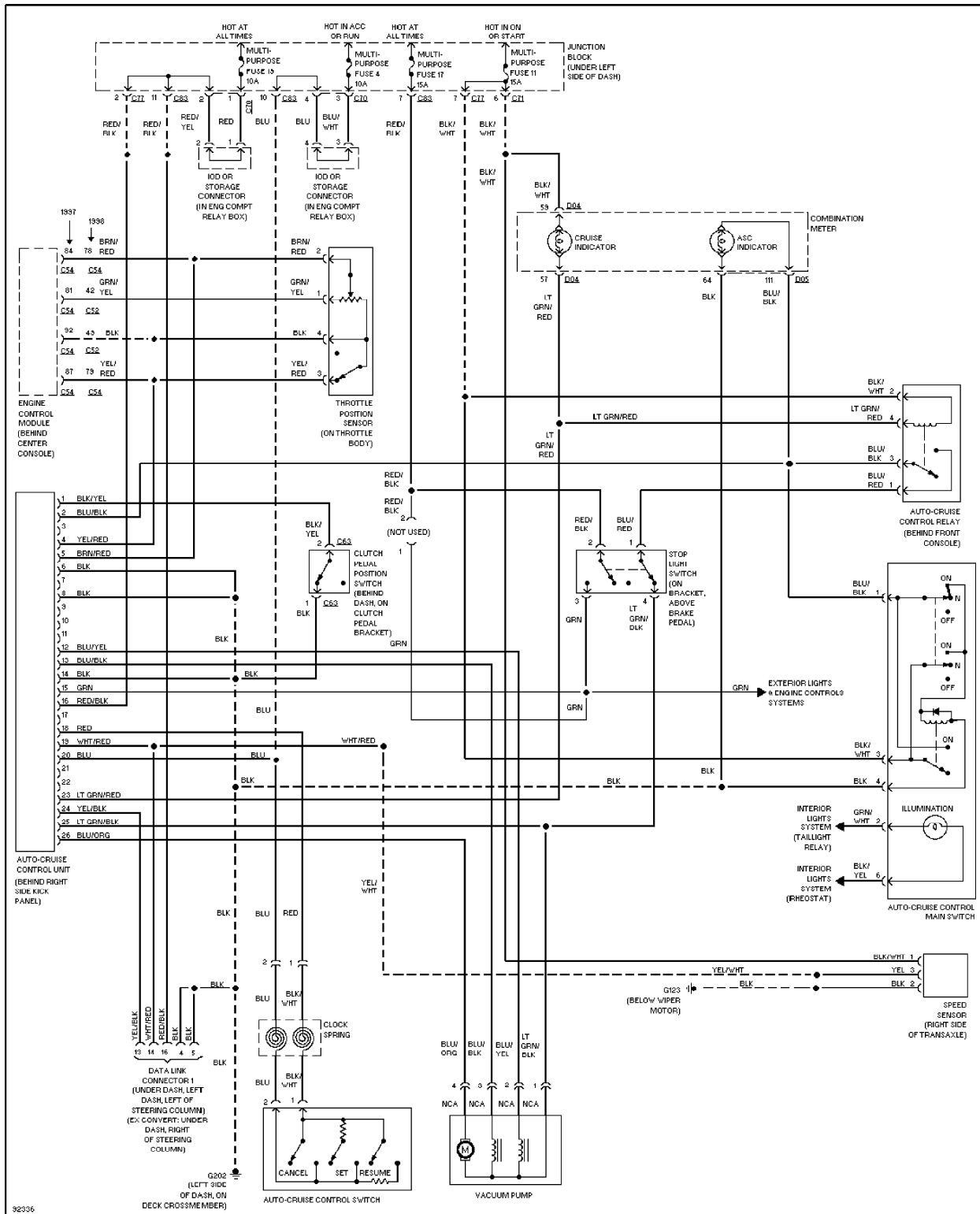


Fig. 11: Cruise Control System Wiring Diagram (3000GT - With M/T)